START

TITLE: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK OFFICE. PATENTS.

REEL NO: 5 PATENTS: 4,920,575 - 4,930,160

VOLUME: 1114 ISSUES: 1-5

DATE: MAY 1 - 29, 1990

PUBLICATION NO: 10426.00

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VOL
114

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VOL
1114
ISS
1
MY
1
1990
UMI

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
May 1, 1990 Volume 1114 Number 1

CONTENTS

Patent and Trademark Office Notices	Page
Patent Cooperation Treaty (PCT) Information	1114 OG 2
Status of Appeal Cases	1114 OG 2
Notice of Maintenance Fees Payable	1114 OG 2
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1114 OG 3
Notification of Acceptance of Delayed Payment of Maintenance Fee	1114 OG 4
Reissue Applications Filed	1114 OG 5
Requests for Reexaminations Filed	1114 OG 5
Patent Certificates of Correction	1114 OG 6
Disclaimers	1114 OG 6
Dedication	1114 OG 6
Special Boxes for Mail	1114 OG 7
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1114 OG 8
Condition of Patent Applications	1114 OG 10
Reexaminations	1
Statutory Inventory Registrations	3
Reissue Patents Granted (33,206)	7
Plant Patents Granted (7,224)	9
Patents Granted	
General and Mechanical (4,920,575)	11
Chemical (4,921,503)	327
Electrical (4,922,056)	487
Design Patents Granted (307,505)	659
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design, Plant Patentees and Statutory Invention Registrations	PI 79
Classification of	
Patents (Including Reissues, and Reexaminations)	PI 87
Designs, and Plants Applications	PI 91
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 92
Designs and Plant Applications	PI 94
Change of Address Form and Subscription Order Form	Back Page

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
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GENERAL INFORMATION concerning TRADEMARKS.

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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

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VOL
1114
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
For each independent claim in excess of 3	18.00	36.00
For each claim in excess of 20	6.00	12.00
For each application containing a multiple dependent claim	60.00	120.00
Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of March 30, 1990.

Chemical Discipline	July 3, 1989
Mechanical Discipline	September 30, 1989
Electrical Discipline	November 2, 1988

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of March 30, 1990.

Chemical	November 1, 1988
Electrical	October 17, 1989
Mechanical	March 2, 1989

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of February 1990.

Affirmed	242
Affirmed-in-Part	68
Reversed	175
Total Decided	485

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on April 28, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,660,223 through 4,662,004
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 26, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,380,833 through 4,381,566
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 11, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,083	07/154,402	10/10/89
(4,569,463)	(06/578,811)	(02/11/86)
Re. 33,083	07/154,402	10/10/89
(4,569,463)	(06/578,811)	(02/11/86)
4,314,638	06/250,452	02/09/82
4,314,922	06/231,720	02/09/82
4,314,962	06/220,749	02/09/82
4,314,978	06/229,468	02/09/82
4,315,033	06/227,354	02/09/82
4,315,094	06/235,495	02/09/82
4,569,099	06/564,488	02/11/86
4,569,100	06/649,534	02/11/86
4,569,102	06/495,351	02/11/86
4,569,107	06/639,364	02/11/86
4,569,110	06/644,033	02/11/86
4,569,114	06,652,966	02/11/86
4,569,128	06/509,630	02/11/86
4,569,143	06/643,482	02/11/86
4,569,144	06/654,399	02/11/86
4,569,147	06/587,249	02/11/86
4,569,148	06/627,652	02/11/86
4,569,158	06/532,844	02/11/86
4,569,169	06/723,282	02/11/86
4,569,173	06/657,736	02/11/86
4,569,175	06/612,548	02/11/86
4,567,177	06/580,427	02/11/86
4,569,180	06/585,780	02/11/86
4,569,187	06/556,089	02/11/86
4,569,188	06/330,582	02/11/86
4,569,196	06/602,343	02/11/86
4,569,200	06/609,974	02/11/86
4,569,201	06/547,320	02/11/86
4,569,219	06/613,591	02/11/86
4,569,222	06/685,401	02/11/86
4,569,227	06/664,888	02/11/86
4,569,228	06/634,019	02/11/86
4,569,234	06/647,324	02/11/86
4,569,236	06/500,866	02/11/86
4,569,239	06/511,310	02/11/86
4,569,241	06/600,783	02/11/86
4,569,242	06/409,973	02/11/86
4,569,251	06/644,803	02/11/86
4,569,257	06/713,809	02/11/86
4,569,259	06/603,601	02/11/86
4,569,261	06/691,551	02/11/86
4,569,276	06/627,313	02/11/86
4,569,277	06/698,233	02/11/86
4,569,278	06/677,836	02/11/86
4,569,281	06/688,234	02/11/86
4,569,283	06/601,879	02/11/86
4,569,295	06/569,901	02/11/86
4,569,296	06/575,818	02/11/86
4,569,301	06/702,813	02/11/86
4,569,304	06/637,557	02/11/86
4,569,305	06/543,902	02/11/86
4,569,315	06/680,818	02/11/86
4,569,327	06/685,719	02/11/86

VOL
1114
ISS
1
MY
1
1990
UMI

Patent Number	Serial Number	Issue Date
4,569,333	06/494,141	02/11/86
4,569,342	06/541,318	02/11/86
4,569,359	06/588,982	02/11/86
4,569,360	06/556,572	02/11/86
4,569,363	06/669,131	02/11/86
4,569,364	06/735,663	02/11/86
4,569,374	06/588,704	02/11/86
4,569,379	06/552,060	02/11/86
4,569,383	06/616,853	02/11/86
4,569,386	06/552,029	02/11/86
4,569,389	06/661,031	02/11/86
4,569,390	06/623,362	02/11/86
4,569,417	06/666,919	02/11/86
4,569,418	06/589,277	02/11/86
4,569,422	06/532,987	02/11/86
4,569,427	06/620,301	02/11/86
4,569,431	06/611,313	02/11/86
4,569,436	06/501,299	02/11/86
4,569,451	06/597,497	02/11/86
4,569,461	06/403,789	02/11/86
4,569,464	06/623,216	02/11/86
4,569,467	06/586,424	02/11/86
4,569,473	06/548,497	02/11/86
4,569,474	06/248,962	02/11/86
4,569,486	06/574,860	02/11/86
4,569,500	06/410,084	02/11/86
4,569,502	06/647,354	02/11/86
4,569,505	06/624,675	02/11/86
4,569,506	06/578,004	02/11/86
4,569,511	06/774,386	02/11/86
4,569,517	06/494,294	02/11/86
4,569,523	06/610,466	02/11/86
4,569,527	06/550,966	02/11/86
4,569,531	06/521,298	02/11/86
4,569,532	06/636,820	02/11/86
4,569,534	06/621,843	02/11/86
4,569,539	06/450,979	02/11/86
4,569,544	06/450,842	02/11/86
4,569,545	06/522,324	02/11/86
4,569,546	06/652,949	02/11/86
4,569,559	06/616,524	02/11/86
4,569,581	06/466,766	02/11/86
4,569,598	06/627,595	02/11/86
4,569,606	06/599,885	02/11/86
4,569,607	06/603,980	02/11/86
4,569,611	06/480,237	02/11/86
4,569,613	06/577,604	02/11/86
4,569,614	06/393,612	02/11/86
4,569,619	06/538,444	02/11/86
4,569,620	06/444,311	02/11/86
4,569,625	06/751,058	02/11/86
4,569,630	06/387,567	02/11/86
4,569,643	06/548,781	02/11/86
4,569,654	06/612,231	02/11/86
4,569,655	06/567,422	02/11/86
4,569,661	06/646,678	02/11/86
4,569,666	06/617,592	02/11/86
4,569,669	06/551,971	02/11/86
4,569,677	06/583,039	02/11/86
4,569,684	06/486,282	02/11/86
4,569,685	06/627,950	02/11/86
4,569,720	06/607,553	02/11/86
4,569,728	06/667,306	02/11/86
4,569,730	06/692,521	02/11/86
4,569,741	06/537,317	02/11/86
4,569,756	06/551,097	02/11/86
4,569,760	06/678,471	02/11/86
4,569,771	06/685,070	02/11/86
4,569,802	06/507,813	02/11/86
4,569,805	06/656,079	02/11/86
4,569,806	06/573,272	02/11/86
4,569,808	06/716,741	02/11/86
4,569,810	06/627,448	02/11/86
4,569,816	06/688,681	02/11/86
4,569,819	06/586,830	02/11/86
4,569,822	06/609,455	02/11/86
4,569,875	06/570,298	02/11/86
4,569,883	06/693,033	02/11/86
4,569,890	06/375,110	02/11/86
4,569,900	06/700,156	02/11/86
4,569,901	06/666,591	02/11/86
4,569,904	06/663,924	02/11/86
4,569,912	06/570,027	02/11/86
4,569,924	06/556,003	02/11/86
4,569,940	06/500,850	02/11/86
4,569,941	06/692,602	02/11/86
4,569,946	06/244,056	02/11/86
4,569,957	06/672,020	02/11/86
4,569,974	06/705,157	02/11/86
4,569,992	06/226,300	02/11/86
4,569,995	06/505,729	02/11/86
4,569,996	06/517,543	02/11/86
4,570,008	06/662,680	02/11/86
4,570,009	06/669,192	02/11/86
4,570,013	06/668,650	02/11/86
4,570,014	06/330,915	02/11/86
4,570,017	06/593,154	02/11/86
4,570,023	06/247,411	02/11/86
4,570,035	06/616,437	02/11/86
4,570,038	06/581,914	02/11/86
4,570,041	06/626,637	02/11/86
4,570,045	06/587,565	02/11/86
4,570,074	06/427,620	02/11/86
4,570,087	06/504,328	02/11/86
4,570,099	06/660,248	02/11/86
4,570,101	06/529,742	02/11/86
4,570,107	06/563,844	02/11/86
4,570,108	06/598,315	02/11/86
4,570,112	06/554,555	02/11/86
4,570,116	06/499,268	02/11/86
4,570,122	06/480,192	02/11/86
4,570,128	06/628,101	02/11/86
4,570,145	06/631,561	02/11/86
4,570,151	06/455,211	02/11/86
4,570,152	06/603,103	02/11/86
4,570,155	06/424,584	02/11/86
4,570,171	06/636,461	02/11/86
4,570,190	06/511,610	02/11/86
4,570,208	06/444,733	02/11/86
4,570,209	06/637,647	02/11/86
4,570,231	06/574,510	02/11/86
4,570,234	06/385,899	02/11/86
4,570,236	06/545,739	02/11/86
4,570,255	06/606,018	02/11/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,454,387	06/334,065	06/12/84	12/23/81	03/22/90
4,469,268	06/349,634	09/04/84	02/17/82	03/14/90

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,469,316	06/446,244	09/04/84	12/02/82	03/29/90
4,478,970	06/564,479	10/23/84	12/21/83	03/29/90
4,484,594	06/507,498	11/24/84	06/24/83	03/23/90
4,489,433	06/587,526	12/18/84	03/08/84	03/29/90
4,537,237	06/561,123	08/27/84	12/12/83	03/27/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,169,124, Re. S. N. 07/498,165, Filed Mar. 12, 1990, Cl. 422/33, COLD GAS STERILIZATION PROCESS, Richard Forstrom, et al., Owner of Record: *American Sterilizer Company, Erie, Pa.*, Attorney or Agent: Christine R. Ethridge, Ex. Gp.: 181

4,560,809, Re. S. N. 07/498,793, Filed Mar. 19, 1990, Cl. 568/789, ALKYLATION PROCESS, Dixie E. Goins, et al., Owner of Record: *Ethyl Corporation, Richmond, Va.*, Attorney or Agent: Edgar E. Spielman, Ex. Gp.: 126

4,599,285, Re. S. N. 07/496,536, Filed Mar. 16, 1990, Cl. 430/54, MULTIPLE IMAGE REPRODUCING METHOD, Satoshi Henada, et al., Owner of Record: *Konishiroku Photo Industry Co., Ltd., Tokyo, Japan*, Attorney or Agent: Jordan B. Bierman, Ex. Gp.: 156

4,701,240, Re. S. N. 07/425,310, Filed Oct. 20, 1989, Cl. 156/555, DEVICE FOR JOINING BY CALENDERING AT LEAST ONE SHEET OF GLASS AND AT LEAST ONE FILM OF PLASTIC MATERIAL, Johannes Kraemer, et al, Owner of Record: *Saint-Gobian Vitrage Aubervilliers Cedex, France*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 131

4,721,165, Re. S. N. 07/452,494, Dec. 19, 1990, Cl. 168/24, HORSESHOE, Eugene D. Ovnicek, Owner of Record: *World Wide Horseshoes, Inc., Michigan*, Attorney or Agent: George M Cole, Ex. Gp.: 333

4,732,782, Re. S. N. 07/497,071, Filed Mar. 21, 1990, Cl. 427/427, METHOD FOR APPLYING NO MIX CEMENTS, H. Nash Babcock, et al., Owner of Record: *Nomix Corp., Fairfield, Ct.*, Attorney or Agent: Michael E. Zall, Ex. Gp.: 139

4,734,679, Re. S. N. 07/499,167, Mar. 26, 1990, Cl. 340/902, MOTOR VEHICLE TAIL LIGHT ASSEMBLY WITH DIMMER CONTROLLER, Melvis I. Robinson, et al., Owner of Record: *Inventor*, Attorney or Agent: Malcolm B. Wittenberg, Ex. Gp.: 268

4,736,101, Re. S. N. 07/499,947, Filed Mar. 27, 1990, Cl. 250,29.2, METHOD OF OPERATION ION TRAP DECTECTOR IN MS/MS MODE, John E.P. Syka, et al., Owner of Record: *Finnigan Corp., San Jose, Calif.*, Attorney or Agent: James A. Sheridan, Ex. Gp.: 256

4,745,727, Re. S. N. 07/455,289, Filed Dec. 22, 1989, 374/122, NON-INVASIVE TEMPERATURE MONITOR, Kenneth L. Carr, Owner of Record: *M/A COM, Inc., Burlington, Mass.*, Attorney or Agent: David M. Driscoll, Ex. Gp.: 246

4,747,878, Re. S. N. 07/497,070, Filed Mar. 21, 1990, Cl. 106/97, COMPOSITIONS AND METHODS OF MAKING NO MIX CEMENTS, H. Nash Babcock, et al., Owner of Record: *Nomix Corp., Fairfield, Conn.*, Attorney or Agent: Michael E. Zall, Ex. Gp.: 118

4,752,781, Re. S. N. 07/497,536, Filed Mar. 21, 1990, Cl. 427/140, METHODS FOR APPLYING NOMIX CEMENTS, H. Nash Babcock, Owner of Record: *Nomix Corp., Fairfield, Conn.*, Attorney or Agent: Michael E. Zall, Ex. Gp.: 139

4,807,448, Re. S. N. 07/495,657, Filed Mar. 14, 1990, Cl 62/376, FREEZING APPARATUS, Masahide Hashimoto, et al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 344

4,810,583, Re. S. N. 07/478,145, Feb. 1, 1990, Cl. 428/423.3, ADHESIVE IN PREPARATION OF LAMINATES, Gerald Daude, et al., Owner of Record: *Saint-Gobain Vitrage, Neuilly-Sur-Seine, France*, Attorney or Agent: Norman F. Oblon, Ex. Gp.: 154

4,873,081, Re. S. N. 07/496,454, Filed Mar. 20, 1990, Cl. 424/81, PERCUTANEOUS ABSORPTION PREPARATION, Taro Ogiso, Owner of Record: *Maruho Company, Ltd., Osaka, Japan*, Attorney or Agent: Birgit E. Morris, Ex. Gp.: 155

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

Re. 31,852, Reexam. No. 90/001,963, Requested Mar. 19, 1990, Cl. 370/90, DATA TRANSMISSION SYSTEM, Olof Soderblom, Owner of Record: *Willemijn Houdstermaatschappji, Rotterdam, Netherlands*, Attorney or Agent: Pollock, Vande Sante & Priddy, Ex. Gp.: 260, Requester: Arnold, White & Durkee, Houston, Tex.

4,226,669, Reexam. No. 90/001,964, Requested Mar. 19, 1990, Cl. 159/6.9, VACUUM CENTRIFUGE WITH MAGNETIC DRIVE, Frank Vilardi, Owner of Record: *Savant Holdings, Inc., Farmingdale, N.Y.*, Attorney or Agent: Unknown, Ex. Gp.: 130, Requester: AHL, Inc., Laurel Md.

4,762,129, Reexam. No. 90/001,965, Requested Mar. 16, 1990, Cl. 128/344, DILATION CATHETER, Tassilo Bonzel, Owner of Record: *Inventor, Freiburg, Fed Republic of Germany*, Attorney or Agent: Lawrence C. Akers, Ex. Gp.: 330, Requester: Fulwider, Patton, Lee & Utecht, Los Angeles, Calif.

4,812,626, Reexam. No. 90/001,962, Requested Mar. 19, 1990, Cl. 219/523, THERMOSTATICALLY CONTROLLED ELECTRIC IMMERSION HEATER FOR AQUARIUMS, Antonio Strada, Pordenone, Italy, Owner of Record: *Inventor*, Attorney or Agent: Hoffman, Wasson, Fallow & Gitler, Ex. Gp.: 210, Requester: Helfgott & Karas, New York, N.Y.

VOL
114
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PATENT NOTICES

Certificates of Correction For Week of May 1, 1990

B1. 3,868,274	4,809,761	4,834 097	4,842,987
D. 301,458	4,809,909	4,834,223	4,842,998
D. 302,319	4,810,450	4,834,493	4,843,249
Re. 32,960	4,810,561	4,834,522	4,843,343
4,496,743	4,811,694	4,834,759	4,843,410
4,611,799	4,812,441	4,835,098	4,843,870
4,618,524	4,813,979	4,835,259	4,843,950
4,647,681	4,814,989	4,835,812	4,843,963
4,694,634	4,815,317	4,836,010	4,844,111
4,720,851	4,816,451	4,836,219	4,844,306
4,725,325	4 818,017	4,836,375	4,844,414
4,725,391	4,818,877	4,836,779	4,844,547
4,750,917	4,821,720	4,837,059	4,844,681
4,751,697	4,822,583	4,837,161	4,844,714
4,757,574	4,822,812	4,837,170	4,844,726
4,758,413	4,822,934	4,837,378	4,844,888
4,765,921	4,823,590	4,837,399	4,845,090
4,766,179	4,824,982	4,837,731	4,845,282
4,767,823	4,825,359	4,837,983	4,845,630
4,769,127	4,826,590	4,838,322	4,845,653
4,770,003	4,826,627	4,838,788	4,845,844
4,776,881	4,826,803	4,838,972	4,846,013
4,781,733	4,827,111	4,839,331	4,847,137
4,782,330	4,827,507	4,839,439	4,847,394
4,783,224	4,827,603	4,839,475	4,848,004
4,784,666	4,827,833	4,840,133	4,848,160
4,786,867	4,827,950	4,840,219	4,848,400
4,789,580	4,828,601	4,840,243	4,848,713
4,789,672	4,828,632	4,840,443	4,848,886
4,792,821	4,829,650	4,840,466	4,849,063
4,793,300	4,830,477	4,840,473	4,849,351
4,794,598	4,831,104	4,840,700	4,849,456
4,797,667	4,831,235	4,840,928	4,849,494
4,798,751	4,831,540	4,841,380	4,849,753
4,799,082	4,831,813	4,841,458	4,849,837
4,801,456	4,831,992	4,841,526	4,850,010
4,801,804	4,832,121	4,841,684	4,850,047
4,803,645	4,832,180	4,842,076	4,850,855
4,803,966	4,832,929	4,842,279	4,853,667
4,804,492	4,833,086	4,842,367	4,855,170
4,805,692	4,833,294	4,842,406	4,865,103
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4,808,585	4,834,055	4,842,764	
4,809,662	4,834,092	4,842,921	

Disclaimers

4,455,333.—*Charles A. Hong*, Deerfield Township, Hamilton County; *William J. Brabbs*, Springfield Township, Hamilton County, both of Ohio. DOUGHS AND COOKIES PROVIDING STORAGE-STABLE TEXTURE VARIABILITY. Patent dated June 19, 1984. Disclaimer filed Jan. 8, 1990, by the assignee, The Proctor & Gamble Company.

Hereby enters this disclaimer to claim 35 of said patent.

4,735,078.—*Paul E. Wesebaum*, Elyria, Ohio. TUBE EXPANDING TOOL. Patent dated Apr. 5, 1988. Disclaimer filed Feb. 6, 1990, by the assignee, Emerson Electric Co.

Hereby enters this disclaimer to claims 1 and 9 of said patent.

4,894,156.—*Joseph S. Murken*, Springfield, Mo. HOSE CONSTRUCTION, COUPLING ARRANGEMENT THEREFOR AND METHOD OF MAKING THE SAME. Patent dated Jan. 16, 1990. Disclaimer filed Nov. 9, 1989, by the assignee, Dayco Products, Inc.

The term of this patent subsequent to October 27, 2004, has been disclaimed

4,895,304.—*Thomas J. Smrt*, Cary, Ill. SPRAYING APPARATUS. Patent dated Jan. 23, 1990. Disclaimer filed Jan. 25, 1990, by the assignee, Fox Valley System, Inc.

The term of this patent subsequent to February 10, 2004, has been disclaimed

4,895,893.—*Yoshikatsu Satake*, *Takashi Kaneko*, *Yutaka Kobayashi*, *Yukio Ichikawa*, *Yo Iizuka*, all of Iwaki; *Makoto Fukuda*, Kasukabe; *Toshio Enoki*, Iwaki; *Takayuki Katto*, Iwaki; *Yasuo Sakaguchi*, Iwaki; *Zenya Shiiki*, Iwaki, all of Japan. HEAT-RESISTANT RESIN COMPOSITIONS, AND HEAT-RESISTANT MOLDED OR FORMED ARTICLES AND PRODUCTION PROCESS THEREOF. Patent dated Jan. 23, 1990. Disclaimer filed Feb. 14, 1990, by the assignee, Kureha Kagaku Kogyo K. K.

The term of this patent subsequent to October 10, 2006, has been disclaimed.

Dedication

4,374,211.—*John P. Gallagher*, Bayville, N.J.; *Philip H. Dougherty*, Penndel, Pa. ARAMID CONTAINING FRICTION MATERIALS. Patent dated Feb. 15, 1983. Dedication filed Jan. 29, 1990, by the assignee, Friction Division Products, Inc.

Hereby dedicates to the Public the remaining term of said patent.

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VOL
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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF March 24, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-7-87 9-1-88
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88 1-28-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	2-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M BLIX, Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	3-23-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260	3-25-88
STEWART LEVY, Acting Director	2-6-86
DESIGN, GROUP 290—K. L. CAGE, Director	
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-13-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—I. J. LOVE, Director	10-11-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during March 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,718,937 to 3,723,991 inclusive
Plant Patents ..... 3,314 to 3,320 inclusive

REEXAMINATIONS

MAY 1, 1990

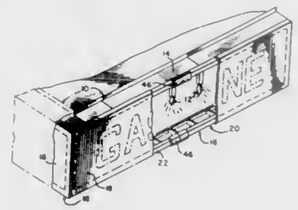
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,512,098 (1260th)

SIGN FRAME AND METHOD FOR FACTORY INSTALLING FLEXIBLE SIGN FACING MATERIAL THEREON

Robert J. Ready, Cincinnati, Ohio; Donald E. Whipple, Edgewood, Ky., and James P. Sferra, Pleasant Plain, Ohio, assignors to LSI Lighting Systems Inc.

Reexamination Request No. 90/001,791, Jun. 16, 1989.
Reexamination Certificate for Patent No. 4,512,098, issued Apr. 23, 1985, Ser. No. 553,719, Nov. 21, 1983.
Int. Cl.[5] G09F *15/00*
U.S. Cl. 40—610



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **14** is confirmed.

Claims **5** and **19** having been finally determined to be unpatentable, are cancelled.

Claims **1**, **6**, **7**, **15** and **20** are determined to be patentable as amended.

Claims **2–4**, **8–13** and **16–18**, dependent on an amended claim, are determined to be patentable.

New claims **21–40** are added and determined to be patentable.

1. Sign frame whereby flexible sign facing material composed of flexible film can be installed away from the job site on said frame in the manufacture of fascias having a longitudinal dimension exceeding 12 feet to provide an assembly which can be collapsed to reduce only the longitudinal dimension for transportation and restored to full length at the job site, said sign frame comprising

(a) left and right end sections, each section comprising

(i) a vertical member,

(ii) a first horizontal member rigidly and fixedly connected to the vertical member and extending between one end of the vertical member and a free end,

(iii) a second horizontal member rigidly and fixedly connected to the vertical member and extending between the other end of the vertical member and a free end, and

(iv) *temporary, removable* rigid bracing means connecting the horizontal members, and

(b) means for locking the left and right end sections in alignment, said locking means comprising means slidable on a horizontal member to partly encompass the free end of an adjacent horizontal member.

B1 4,618,348 (1261st)

COMBUSTION OF VISCOUS HYDROCARBONS

Michael E. Hayes, Fernandina Beach; Kevin R. Hrebenar, Jacksonville; Patricia L. Murphy; Laurence E. Futch, Jr., both of Fernandina Beach, and James F. Deal, III, Amelia Island, all of Fla., assignors to Petroleum Fermentations N.V., Curacao, Netherlands Antilles

Reexamination Request No. 90/001,581, Aug. 23, 1988.
Reexamination Certificate for Patent No. 4,618,348, issued Oct. 21, 1986, Ser. No. 547,892, Nov. 2, 1983.
Int. Cl.[5] C10L *1/32*
U.S. Cl. 44—51

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6**, **9**, **10**, **15–20** is confirmed.

Claims **7**, **8** and **21** are determined to be patentable as amended.

Claims **11–20**, dependent on an amended claim, are determined to be patentable.

1. A method for utilizing viscous hydrocarbons as combustible fuels comprising:

(A) forming a hydrocarbosol using a surfactant package in a proportion of about 1:100 to about 1:20,000 by weight based on hydrocarbon,

(1) said surfactant package comprising

(a) at least one water-soluble surfactant, an effective amount of which surfactant promotes emulsification of a hydrocarbon with API gravity of about 20° API or less, viscosity of about 100 centipoise or greater at 150° F., paraffin content of about 50% by weight or less and aromatic content of about 40% by weight or greater into an aqueous phase to form a hydrocarbon-in-water emulsion wherein the proportion of hydrocarbon to aqueous phase is about 90:10 by volume or less, the viscosity of which emulsion is reduced by at least a factor of about 10 compared to the viscosity of the hydrocarbon; and

(b) at least one water-soluble bioemulsifier, being a microboally-derived substance which predominantly resides at hydrocarbon/water interfaces to substantially surround hydrocarbon droplets in hydrocarbon-in-water emulsions, an effective amount of which bioemulsifier stabilizes a hydrocarbon-in-water emulsion formed with a hydrocarbon as in (a) by maintaining viscosity reduced by at least a factor of about 10 for a period of at least about a day under static conditions,

(2) said hydrocarbosol

(a) comprising a hydrocarbon characterized by an API gravity of about 20° API or less, viscosity of 100 centipoise or greater at 150° F., paraffin content of about 50% by weight or less and aromatic content of about 40% by weight or greater; and

(b) having a hydrocarbon:water ratio of about 70:30 by volume; and

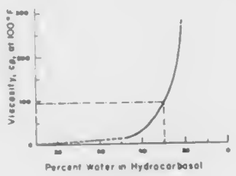
(B) burning the resultant hydrocarbosol.

B1 4,666,457 (1262nd)

METHOD FOR REDUCING EMISSIONS UTILIZING PRE-ATOMIZE FUELS

Michael E. Hayes, Fernandina Beach; Kevin R. Hrebenar, Jacksonville; James F. Deal, III, Amelia Island, and Paul L. Bolden, Jr., Fernandina Beach, all of Fla., assignors to Petroleum Fermentations N.V., Curacao, Netherlands Antilles

Reexamination Request No. 90/001,582, Aug. 23, 1988.
Reexamination Certificate for Patent No. 4,666,457, issued May 19, 1987, Ser. No. 787,293, Oct. 15, 1985.
Continuation-in-part of Ser. No. 653,808, Sep. 24, 1984, which is a continuation-in-part of Ser. No. 547,892, Nov. 2, 1983.
The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **25–39** is confirmed.

Claims **1, 4, 5** and **12** are determined to be patentable as amended.

Claims **2, 3, 6–11** and **13–24**, dependent on an amended claim, are determined to be patentable.

1. A method for reducing particulate emissions during combustion of a hydrocarbon with API gravity of about 20° API or less, viscosity of about 40,000 centipoise *or greater* at 122° F., paraffin content of about 50% by weight or less, aromatic content of about 15% by weight or greater, and asphaltene content of about 50% by weight or greater [which comprises:
(a) emulsifying such hydrocarbon to form a hydrocarbon-in-water], *comprising burning a preheated* emulsion *of the hydrocarbon in water, said emulsion* having a hydrocarbon:water ratio from about 60:40 to about 90:10 by volume and in which emulsion the hydrocarbon has a particle size predominantly of about 50 microns in diameter or less[;
(b) preheating such hydrocarbon-in-water emulsion prior to combustion; and
(c) burning such hydrocarbon-in-water emulsion].

B1 4,684,372 (1263rd)

COMBUSTION OF VISCOUS HYDROCARBONS

Michael E. Hayes, Fernandina Beach; Kevin R. Hrebenar, Jacksonville; Patricia L. Murphy, Amelia Island; Laurence E. Futch, Jr., Fernandina Beach; James F. Deal, III, Amelia Island, and Paul L. Bolden, Jr., Fernandina Beach, all of Fla., assignors to Petroleum Fermentations N.V., Curacao, Netherlands Antilles

Reexamination Request No. 90/001,583, Aug. 23, 1988.
Reexamination Certificate for Patent No. 4,684,372, issued Aug. 4, 1987, Ser. No. 653,808, Sep. 24, 1984.
Continuation-in-part of Ser. No. 547,892, Nov. 2, 1983, Pat. No. 4,618,348.
The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–14** is confirmed.

Claim **1** is determined to be patentable as amended.

Claims **3–7** and **9**, dependent on an amended claim, are determined to be patentable.

1. A method for utilizing viscous hydrocarbons as combustible pre-atomized fuels, comprising[.
(A) forming a]
burning a hydrocarbon-in-water emulsion *formed* using an effective amount of a surfactant package comprising at least one water-soluble surfactant, said hydrocarbon-in-water emulsion
(1) comprising a hydrocarbon characterized by API gravity of about 20° API or less, viscosity of about 1000 centipoise or greater at 212° F., a paraffin content of about 50% by weight or less and, an aromatic content of about 15% by weight or greater, and
(2) having a hydrocarbon:water ratio from about 60:40 to about 90:10 by volume[, and
(B) burning the resultant hydrocarbon-in-water emulsion].

STATUTORY INVENTION REGISTRATIONS

PUBLISHED MAY 1, 1990

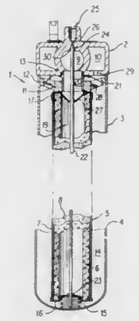
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H773

COALESCER FILTER UNIT DRAIN DEVICE

Cyril A. Keedwell, Victoria, Canada, and Steven L. Mills, Old Portsmouth, England, assignors to Pall Corporation, Glen Cove, N.Y.

Filed Sep. 30, 1988, Ser. No. 251,385
Claims priority, application United Kingdom, Oct. 1, 1987, 8723063
Int. Cl.[4] B01D *46/10*
U.S. Cl. 55—498 1 Claim



1. In a spin-on type coalescer filter unit having a spin-on filter element including a canister with a head end and a bottom end and a filter cartridge within the canister, a head with a mounting surface, an attachment means for attaching the filter element to the mounting surface, an inlet passage for allowing fluid to flow into filter element and an outlet passage for allowing fluid to flow from the filter element, a drain device comprising:
a tube means with a bottom end and a head end and a tube passage means for conducting fluid flow from an opening at said tube means bottom end to said tube means head end, said tube means bottom end located within said canister at its bottom end and said tube means head end located proximate to the head end of the canister,
a receiver fitting in said head including a receiving means for receiving said tube means head end and a return passage means for conducting fluid flow from said head end of said tube means out of the filter unit, so that fluid may flow from the bottom end of said canister through said tube passage means and return passage means and out of said filter unit under the influence of elevated pressure within the canister.

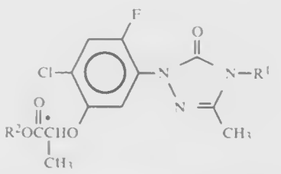
H774

R-ENANTIOMERS OF A Δ^2-1,2,4-TRIAZOLIN-5-ONE DERIVATIVES

Yuzo Miura, Nishinomiya; Naoya Yamamoto, Osakasayami; Atsushi Tsushima, Kawachinagano, and Mitsuru Kajioka, Sakai, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,290
Claims priority, application Japan, Dec. 5, 1986, 61-290175
Int. Cl.[4] A01N *43/653*; C07D *249/12*
U.S. Cl. 71—92 19 Claims

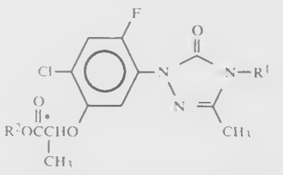
1. An R-Enantiomer of a Δ^2-1,2,4-triazolin-5-one compound represented by formula (I):



(I)

wherein R^1 represents a difluoromethyl group or a tetrafluoroethyl group and R^2 represents a chloropropyl group or a methoxyethoxyethyl group.

10. A herbicidal composition comprising as an active ingredient an R-enantiomer of a Δ^2-1,2,4-triazolin-5-one compound represented by formula (I):



(I)

wherein R^1 represents a difluoromethyl group or a tetrafluoroethyl group and R^2 represents a chloropropyl group or a methoxyethoxyethyl group.

H775

METHOD OF ASSEMBLY OF COMPACTED POWDER AND EXPLOSIVE CHARGE FOR EFFECTIVE DISSEMINATION

William G. Rouse, Aberdeen; Ronald E. Rhea, Bel Air; Michael J. Burnham, Kingsville, all of Md.; Connie S. Kilgore, Delta, Pa.; John P. Fiala, Forest Hill, and Lisa A. Bray, Joppa, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1989, Ser. No. 387,905
Int. Cl.[4] F42B *3/00*
U.S. Cl. 86—20.1 10 Claims

1. The method of forming a product which may be explosively burst apart to form a minimal hazard visual screening cloud, comprising forming a slurry mixture of fine spherical particles of titanium dioxide and a volatile liquid to thereby wet the particles, causing said particles to adhere to one another in a randomly compacted form at the bottom of said slurry mixture, and removing said volatile liquid from said mixture while maintaining said titanium dioxide particles in a nonaerosol compact adhered mass form, to thereby leave and form a compact mutually surface to surface adhered solid mass of said particles.

8. The method of forming a product which may be explosively burst apart to form a minimal hazard visual screening cloud, comprising forming a slurry mixture of particles and a volatile liquid in which said particles are of greater density than said liquid to thereby wet the particles, thereby causing said particles to adhere to one another in a random self-compacted form at the bottom of said slurry mixture, removing said volatile liquid from said mixture while maintaining said particles in a non-aerosol closely adjacent condition, to thereby leave and form a compact mutually adhered solid mass

of said particles, in which said particles are of submicron diameter, extruding said mixture into a suitable shaped container to form a compact linear mass of particles, and separating said linear mass.

H776

AERODYNAMIC FLAIL FOR A SPINNING PROJECTILE

James K. Cole, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 6, 1989, Ser. No. 306,359
Int. Cl.[5] F42B *8/00, 13/20, 15/10*
U.S. Cl. 102—498 13 Claims



13 In a method for recovering a spinning projectile fired into the air, including the deployment of a parachute during descent of the projectile, the method including the step of

deploying a plurality of flexible filaments from the spinning projectile during flight of the projectile along its trajectory, whereby the centrifugal acceleration of the spinning projectile causes the filaments to move through the air and create aerodynamic drag about the spin axis of the projectile, whereby the drag serves to decrease the rate of spin of the projectile

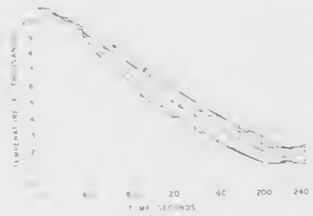
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H777

METHOD FOR JET GAS IMPINGEMENT QUENCHING

Mani Natarajan, Perrysburg, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 19, 1987, Ser. No. 51,420
Int. Cl. C21D *1/54*
U.S. Cl. 148—128 6 Claims



1 A method for quenching a uniformly heated plate shaped workpiece comprising at least a first thick section and a second thin section at a rate substantially equal to at least the critical cooling rate of said workpiece comprising the steps of:

(a) supporting said workpiece in a sealed chamber;

(b) providing a source of gas coolant under pressure to said chamber;

(c) forming from said coolant source first, second, third and fourth pluralities of substantially equally spaced jet streams of gas coolant, said first and second jet streams aligned with said first and second sections, respectively, of said workpiece at one side thereof, said third and fourth jet streams aligned with said first and second sections, respectively, of said workpiece at the opposite side thereof;

(d) straightening each first and second stream by means of a lattice plate to produce a plurality of side-by-side rectilinearly shaped jet streams, each straightened jet stream closely adjacent one another, and impinging said straightened first and second jet streams against said workpiece substantially perpendicular to one side thereof thus enveloping said first and second sections by closely spaced columnar jet streams having a lower coolant mass flow adjacent said second section than said first section;

(e) impinging said third and fourth pluralities of said jet streams substantially perpendicular to the opposite side of said workpiece; and

(f) controlling the flow of said jet streams so that said first and second pluralities of jet streams and said third and fourth pluralities of said jet streams cool said first and second workpiece sections at approximately the same rate on each side and also opposite sides of said workpiece whereby the workpiece is quenched without any significant distortion

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H778

MICROENCAPSULATED CATALYST AND ENERGETIC COMPOSITION CONTAINING SAME

Lloyd C. Carlton, Gloucester, and Julie A. Finnegan, Newport News, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 4, 1986, Ser. No. 901,063
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.2 19 Claims

1 An encapsulated curing catalyst which comprises:

a catalyst selected from the of ferric acetylacetonate, dibutyltin dilaurate and mixtures thereof, said catalyst having an average particle size of less than about 50 micrometers;

a coating selected from the group consisting of a copolymer of ethylene and vinyl acetate wherein the weight percentage of ethylene is from about 55 to 70 percent, a copolymer of propylene and vinyl acetate wherein the weight percentage of propylene is from about 55 to 70 percent, and mixtures thereof, said coating having an average thickness from about 0.7 to 2 times the average radius of said catalyst

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H779

DAYTIME FLIGHT SYMBOLOGY DISPLAY SYSTEM

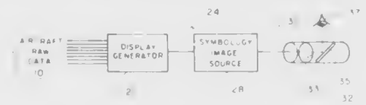
Robert W. Verona, 2801 Park Center Dr., Apt. #807, Alexandria, Va. 22302

Filed Nov. 1, 1988, Ser. No. 265,450
Int. Cl.[5] G02B *27/14;* G09G *3/02*
U.S. Cl. 350—174 3 Claims

1 A miniature dynamic alphanumeric and graphic flight symbology generator system for use in a heads up helmet mounted display daytime environment, said system comprising:

a display generator having various inputs thereto from raw aircraft data and internal signal generating means providing various output signals therefrom in direct relationship to the aircraft data and variable signal control means to increase the value of said output signals during the daytime to provide daytime observance of the symbology generated;

a symbology image source which has a luminance in direct relation to said output signals applied as inputs thereto through a signal transmission means from said display generator to said symbology image source; and



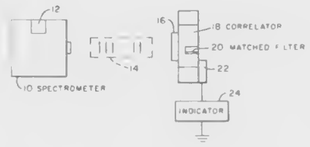
a beam combiner means positioned in the line of sight of at least one eye of an aviator, said beam combiner means comprised of focussing optics and a mirror positioned at an angle to reflect the display on said symbology image source directly back into the eye of the pilot wherein said mirror has a spectral coating thereon for enhancing the image for daytime viewing.

H780

OPTICAL DATA PROCESSING DETECTION OF CHEMICAL AGENTS

Richard L. Hartman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1988, Ser. No. 227,570
Int. Cl.[5] G01J *3/457*
U.S. Cl. 356—71 2 Claims



1 A method of determining predetermined chemical agents comprising, providing a spectrometer with a chemical sample therein to be tested for the presence of predetermined chemical species, producing an output from the spectrometer that depicts spectra of the chemical species present in the sample, transmitting the output of the spectrometer to an image forming modulator of a correlator that has a predetermined matched filter with a pattern thereon for detecting the desired chemical species, processing the input provided to said image forming modulator to produce an output at detector means of the correlator when the predetermined chemical species are present, producing signal means from said detector means and controlling indicator means that indicate the chemical species detected.

H781

METHOD OF MAKING A FERRITE CIRCULATOR

Richard A. Stern, Allenwood,. and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1988, Ser. No. 171,325
Int. Cl.[5] B05D *1/00*
U.S. Cl. 427—34 4 Claims

1. In the manufacture of a ferrite circulator wherein a ferrite material is introduced into the cavity area of a microstrip circuit, the improvement of introducing the ferrite material into the cavity area by arc plasma spraying and subsequent annealing, thus eliminating any chance of gaps between ferrite material and microstrip circuit material.

H782

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

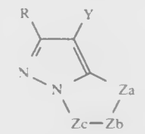
Mitsunori Ono; Koji Tamoto; Yoshisada Nakamura, and Shingo Sato, all of c/o Fuji Photo Film Co., Ltd., 210, Nakanuma, Minami Ashigara-shi, Kanagawa, Japan

Filed Sep. 14, 1987, Ser. No. 95,714
Claims priority, application Japan, Sep. 12, 1986, 61-215256
Int. Cl.[5] G03C *1/08, 7/26, 7/32*
U.S. Cl. 430—548 14 Claims

1. A silver halide color photographic material comprising a support having thereon at least one sliver halide emulsion layer, wherein the photographic material contains at least one compound represented by general formula (I) and at least one compound represented by general formula (II) in combination:

$$Cp-(TIME)_n-X-Dye \quad (I)$$

wherein Cp represents a coupler residue capable of releasing —(TIME)$_n$—X—Dye upon coupling with an oxidation product of an aromatic primary amine developing agent; TIME represents a timing group; n represents 0 or a positive integer; Dye represents a non-diffusible dye residue, and X represents an auxochromic group of said dye;



(II)

wherein R represents a hydrogen atom or a substituent; Y represents a hydrogen atom or a coupling-off group; Za, Zb and Zc each represents a methine group, a substituted methine group, —N— or —NH—; either the Za—Zb bond or the Zb—Zc bond represents a double bond and the other represents a single bond, provided that when Za, Zb or Zc represents a substituted methine group, one of the substituted methine group or R may be a divalent group capable of linking to form a dimer or higher polymer, and provided that Y does not represent —(TIME)$_n$—X—Dye as defined in general formula (I), wherein X-Dye moiety of general formula (I) is represented by general formula (III):

$$-X-W_1-N=N-W_2 \quad (III)$$

wherein X has the same meaning as defined in general formula (I); W_1 represents an atomic group which contains at least one unsaturated bond in conjugation with the azo group and connects with X on an atom forming the unsaturated bond; W_2 represents an atomic group which contains at least one unsaturated bond capable of conjugating with the azo group; and W_1 and W_2 contain a total of at least 10 carbon atoms, wherein said X is an oxygen atom or a sulfur atom, and wherein said photographic material further comprises a phenol type coupler containing a phenylureido group in the 2-position and an acylamino group in the 5-position.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue

Re. 33,206

MALE CONDOM CATHETER HAVING ADHESIVE ON ROLLED PORTION

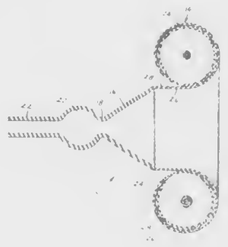
James A. Conway; Peter R. Conway and Philip J. Conway, all of Chatfield, Minn., assignors to Mentor Corporation, Goleta, Calif.

Original No. 4,475,910, dated Oct. 9, 1984, Ser. No. 307,792, Oct. 2, 1981. Application for reissue Oct. 9, 1986, Ser. No. 917,145

Int. Cl.[4] A61E *5/44*

U.S. Cl. 604—349

8 Claims



1. A male condom catheter designed to be connected to a urine collection means and comprising a thin cylindrical sheath member of resilient material rolled outwardly upon itself to form consecutively larger rolls, said sheath member having an outer surface and an inner surface designed to engage a penis when the catheter is unrolled, and

the outer surface of the sheath member having prior to the rolling thereof a layer of pressure sensitive adhesive over a substantial portion thereof with a release layer between said adhesive and the outer surface of the sheath member so that as the sheath member is rolled up the pressure sensitive adhesive on the outer surface is in direct contact with the inner surface of an adjacent roll so that as the sheath member is unrolled the adhesive on the outer surface is transferred to the porton of the inner surface in engagement with the outer surface, without rolling the catheter inside out, to cause the inner surface to adhere to the penis over which the sheath is placed.

Re. 33,207

BRAKE SYSTEM

Rene H. Brodeur, Punta Gorda, Fla.; Boris S. Terlecky, Woodridge, and Gerald R. Misner, Peotone, both of Ill., assignors to Trailer Train Company, Chicago, Ill.

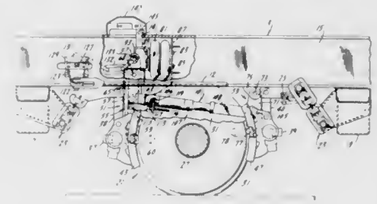
Original No. 4,596,311, dated Jun. 24, 1986, Ser. No. 653,831, Sep. 24, 1984. Application for reissue Nov. 19, 1987, Ser. No. 122,701

Int. Cl.[4] F16D *66/00, 65/14, 65/52*

U.S. Cl. 188—1.11

22 Claims

12. A brake system for a railroad car including a car body supported by a wheel truck having at least one pair of wheels connected by an axle, said system comprising first and second brake riggings extended across said wheel truck at opposite edges of said wheels and provided with brake shoes at each end for engaging said wheels, first and second linkage means operable to move said brake shoes toward and away from said wheels, said first linkage means including a live lever pivotally connected at one end to one of said brake riggings, an expandable actuator means secured to said car body and connected to said live lever at its opposite end, said second linkage means including a dead lever pivotally connected at one end to said car body and at its opposite end to the other of said brake riggings, connecting link means pivotally connected at one end to said live lever intermediate the connection of said live lever to said one of said brake riggings and



said actuator means, and at an opposite end to said dead lever intermediate the connection of said dead lever to said car body and the other of said brake riggings, expansion of said actuator means causing said first and second linkage means to move said brake shoes toward said wheels, contraction of said actuator means causing said first and second linkage means to move said broke shoes away from said wheels.

Re. 33,208

PHOTOELECTRIC CONVERSION PANEL AND ASSEMBLY THEREOF

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co.,Ltd., Tokyo, Japan

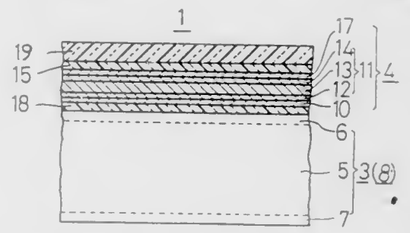
Original No. 4,571,446, dated Feb. 18, 1986, Ser. No. 614,211, May 25, 1984. Application for reissue Feb. 17, 1988, Ser. No. 156,905

Claims priority, application Japan, May 25, 1983, 58-92177

Int. Cl.[4] H01L *25/02, 31/06;* H02N *6/00*

U.S. Cl. 136—244

11 Claims



7. A semiconductor device comprising:

at least one non-single-crystal semiconductor layer;

an alkali containing, glass substrate for supporting the non-single-crystal semiconductor layer where the substrate comprises a flexible, chemically reinforced glass sheet having potassium containing glass layers formed in the opposite main surfaces of an alkali free or alkali containing glass sheet having a thickness of 0.2 to 1.2 mm; and

an impurity blocking layer disposed between the alkali containing, glass substrate and the non-single-crystal semiconductor layer for preventing the potassium in the substrate from entering the semiconductor layer.

Re. 33,209

MONOLITHIC SEMICONDUCTOR SWITCHING DEVICE

James D. Plummer, Mt. View, Calif., assignor to Board of Trustees of the Leland Stanford Jr. Univ., Stanford, Ill.

Original No. 4,199,774, dated Apr. 22, 1980, Ser. No. 943,200, Sep. 18, 1978. Application for reissue Dec. 5, 1983, Ser. No. 539,111

Int. Cl.[5] H01L *29/78*

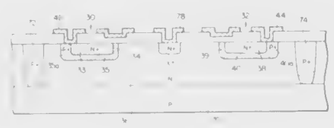
U.S. Cl. 357—23.4 20 Claims

1 A monolithic semiconductor *SCR* device comprising:

a semiconductor [body] *substrate of one conductivity type and an epitaxial layer of opposite conductivity type, said epitaxial layer* having at least one major surface, and

[a body region adjacent to said surface of one conductivity type,] first and second spaced regions of [opposite] *said one* conductivity type formed in said [body region] *epitaxial layer* and abutting said major surface, third and fourth regions of said [one conductivity] *opposite conductivity* type formed in said first and second regions, respectively, abutting said major surface and defining first and second channel regions in said first and second regions, respectively,

a layer of insulation on said major surface,



a gate electrode formed on said layer of insulation and above said first and second channel regions, an ohmic contact to said first and third regions, and an ohmic contact to said second and fourth regions, *and*

an ohmic contact to said semiconductor substrate.

PLANT PATENTS

GRANTED MAY 1, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,224

EXACUM PLANT NAMED BLUE ROPENDEL

Erik Rosendal, Assens, Denmark, assignor to J & L Plants, Inc., Amarillo, Tex.

Filed Nov. 18, 1988, Ser. No. 273,402

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1 A new and distinct cultivar of Exacum plant named Blue Ropendel, as illustrated and described.

7,225

CHRYSANTHEMUM PLANT NAMED SUNDORO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 22, 1988, Ser. No. 247,525

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—76 1 Claim

1 A new and distinct Chrysanthemum plant named Sundoro, as described and illustrated.

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PATENTS

GRANTED MAY 1, 1990

ERRATA

For CLASS	See PATENT NO.
002-424	4,920,585
312-214	4,920,696
056-249	4,920,737
068-018	4,920,768
475-052	4,920,826
475-166	4,920,827
475-299	4,920,828
082-001	4,920,838
400-708	4,920,882
427-255	4,920,908
118-301	4,920,911
606-096	4,920,958
606-053	4,920,959
606-014	4,920,961
606-152	4,920,962
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376-451	4,921,663
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419-023	4,921,665
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524-839	4,921,842
423-235	4,921,886
514-326	4,921,887
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548-452	4,921,981
564-015	4,922,012
244-003	4,922,096

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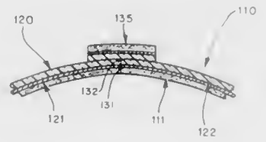
358-140 4,922,118
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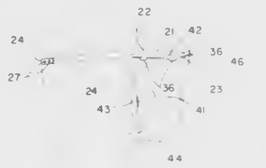
GENERAL AND MECHANICAL

4,920,575
PROTECTIVE GARMENT MATERIAL AND CONSTRUCTION
James E. Bartasis, Gurnee, and Richard L. McIntire, Winnetka, both of Ill., assignors to Bodigard Technologies, Inc., Buffalo Grove, Ill.
Continuation of Ser. No. 920,361, Oct. 20, 1986, abandoned. This application Jan. 18, 1989, Ser. No. 298,828
Int. Cl.[4] A62B *17/00;* **A41D** *27/24*
U.S. Cl. 2—2 **13 Claims**



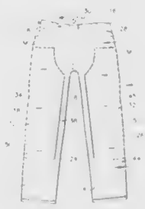
1. A protective garment for hazardous chemical environments, comprising:
(a) two or more adjacent segments of material having adjacent edges;
(b) each of said material segments including a multi-layer film made of polymeric substance and having an intermediate EVOH layer, a polymer layer on each side of said EVOH layer, and a water resistant resin tie means between said polymer layers and said EVOH layer;
(c) each of said material segments also including a substrate;
(d) said film and said substrate being laminated together;
(e) said garment further comprising a strip of said multi-layer film;
(f) said adjacent segments being joined at said edges by placing said strip of film above said edges and bonding said strip of film to said adjacent segments to create a substantially moisture-impervious seam between said segments;
(g) said garment being effective to protect a worker in a hazardous chemical environment while retaining its chemical resistance properties in the presence of moisture.

4,920,576
VISOR-TYPE MASK FOR DENTISTS
Timothy J. Landis, 2006 McLaren Dr., Roseville, Calif. 95661-4945
Continuation-in-part of Ser. No. 194,150, May 16, 1988, which is a continuation-in-part of Ser. No. 214,437, Jul. 1, 1988, which is a continuation-in-part of Ser. No. 229,349, Aug. 8, 1988. This application Jan. 17, 1989, Ser. No. 297,050
Int. Cl.[4] A42B *1/06;* **A61F** *9/06*
U.S. Cl. 2—9 **14 Claims**



1. A face mask comprising a visor, said visor comprising first means comprising a bill for engaging or lying against the forehead, said bill projecting forwardly above eye level and second means for attaching the visor to the head of the wearer, said bill being formed with first cooperating means extending along the outer edge of said bill, said first cooperating means comprising a plurality of projections spaced along said outer edge of said bill, and a shield transparent over at least a substantial portion of its area, said shield having an upper edge, second cooperating means on said shield shaped and positioned to engage said first cooperating means so that said shield is supported by said visor, said shield being dimensioned to extend down below the mouth and around the face, said second cooperating means comprising spaced slits in said shield dimensioned to receive and retain said projections, said shield having its upper edge disposed above said bill and being further disposed in contact with said outer edge of said bill.

4,920,577
WORK PANTS
Gary W. Scharf, 10656 Marbury, San Diego, Calif. 92126
Filed Sep. 30, 1988, Ser. No. 251,300
Int. Cl.[4] A41D *1/06, 17/00*
U.S. Cl. 2—24 **5 Claims**



1. A pair of work pants, comprising:
two legs joined together at a crotch area, each leg comprising a front panel and a rear panel,
a protective layer secured to the front panel of each leg, each protective layer having an upper edge located no lower than the crotch area and a lower edge below the knee area, the upper edge and opposite side edges of the protective layer being secured to the front panel of the respective leg to define a pocket, the pocket having an opening at its lower end;
releasable securing means for releasably securing the lower edge of each protective layer to the front panel of the respective leg to close the pocket opening; and
a padding member removably mounted in the pocket, the member having a lower edge adjacent to the lower end of the pocket and an upper edge no higher than the top of the knee when in a kneeling position;
the width of the padding member being no greater than the width of the pocket opening to allow insertion and removal of said padding member via said opening.

4,920,578
PATIENT'S GOWN
Bertha Janzen, Box 1503, Virden, Manitoba, Canada R0M 2CC, and Virginia Janzen, 14728 Deer Ridge Dr Se, Calgary, Alberta, Canada T2J 6B5
Filed Apr. 3, 1989, Ser. No. 331,969
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—114 **15 Claims**

1. A patient gown comprising:
a body with two arm openings each with a front edge and a back edge, a neck opening, a front panel with side edges

VOL 114 ISS 1 MY 1 1990 UMI

that extend downwardly from the neck opening adjacent heads of the respective clavicles of a wearer, over the wearer's respective subclavian areas to at least the mid axillary line, the front panel side edges defining the front edges of the arm openings, and back panel means extending from the front panel for closing the back of the gown and having side edges defining the back edges of the respective arm openings;



sleeve panels extending outwardly over the arm openings the sleeve panels having front edges shorter than the front edges of the arm openings and back edges shorter than the back edges of the arm openings, the back edges of the sleeve panels being secured to the back panel means along upper parts of the respective back edges of the arm openings; and

releasable front panel fastener means for releasably connecting the front edges of the sleeve panels to the side edges of the front panel.

4,920,579

APPARATUS TO RESTRAIN NECK TIE TAILS

Eugene D. Swain, Box #100, R.D. #1, Weirton, W. Va. 26062

Filed Apr. 1, 1988, Ser. No. 176,722
Int. Cl.[5] A41D *25/00*
U.S. Cl. 2—145 4 Claims



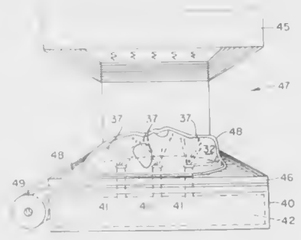
1 In a combination tie restraint apparatus for holding a transversely extending strip secured at spaced apart attachment sites at the back surface of an elongated tie tail end portion of a four-in-hand neck tie along the front portion of a shirt having consecutive uniformly spaced buttons therealong, said tie restraint apparatus comprising an endless loop of flexible strip material for encircling and retention by the transversely extending strip, said loop being folded to form opposite end portions and two legs of equal length extending across opposite face surfaces of the transversely extending strip, each end portion of said loop having an opening therein to releasably receive one of the consecutive buttons on the front portion of the shirt, said loop having a narrow width sufficient to slide back and forth along opposite face surfaces and between the attachment sites of the transversely extending strip while the transversely extending strip can move longitudinally between the legs of said loop to maintain the tail end portion of the neck tie at the front portion of the shirt; said endless loop further including interlocking fastener members for joining terminal ends of said flexible strip material together while the flexible strip material extends along said opposite face surfaces of said strip.

4,920,580

FACE MASK AND BODY PROSTHESIS

Lawrence J. Liff, 6502 N. Central, Phoenix, Ariz. 85012

Filed Sep. 19, 1989, Ser. No. 409,304
Int. Cl.[5] A41G *7/00*
U.S. Cl. 2—206 2 Claims



1 A face prosthesis including in combination a sheet of synthetic resinous material formed into a shell and of a shape to closely conform to the face of a human, said synthetic resinous material of said sheet consisting essentially of a closed-cell, cross-linked polyethylene foam and being of a thickness of between 1/64 inch and ¼ inch and having a density of 1½ and 9 pounds per cubic foot

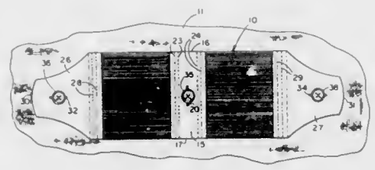
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4,920,581

WAISTBAND REDUCER FOR PANTS

Ruben L. Gray, 5853 Cedar Ave., Philadelphia, Pa. 19143

Filed Nov. 8, 1988, Ser. No. 268,831
Int. Cl.[5] A41F *9/02*
U.S. Cl. 2—237 1 Claim



1 A waistband reducer for pants comprising:

a generally rectangular medial panel constructed of leather, and having first and second generally vertically extending side edges, said medial panel including a generally vertically extending button hole centrally disposed therein for receiving a central button connected to a pair of pants therethrough;

first and second elastic generally identical and rectangular side panels each having a first and second generally vertically extending side edge, said first and second side edges of said side panels being of the same vertical length as the medial panel side edges, said first side edge of said first side panel being secured to said first side edge of said medial panel by stitching extending completely therealong and said first side edge of said second side panel being secured to said second edge of said medial panel by stitching extending completely therealong such that said side panels extend from opposite sides of said medial panel for location along the waistband of the pair of pants;

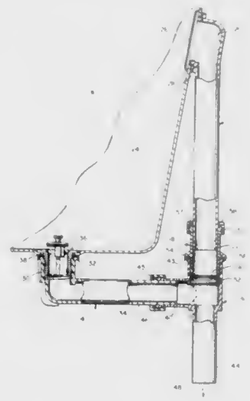
first and second generally trapezoid-like flexible inelastic end panels each having a vertically extending base portion, said first and second side edges of said side panels being of the same vertical length as the base portions, said second side of said first side panel being secured to said base portion of said first end panel by stitching extending completely therealong and said second side of said second side panel being secured to said base portion of said second end panel by stitching extending completely therealong, said end panels being constructed of leather and including generally horizontally extending button holes therein for receiving additional buttons connected to the pair of pants therethrough, said medial panel button hole and said horizontally extending button holes all being generally linearly arranged on said waistband reducer, whereby complementary buttons on the waistband of the pants effect resilient contraction of the waistband when said central button and additional buttons are positioned through the complementary button holes.

4,920,582

UNIVERSAL WASTE AND OVERFLOW DRAIN ASSEMBLY

James R. Alker, 5898 12th Ave. N.W., Rochester, Minn. 55901

Filed Jun. 20, 1989, Ser. No. 360,372
Int. Cl.[5] E03C *1/24, 1/22*
U.S. Cl. 4—198 11 Claims



1 A universal drain assembly for use with a bathtub having a main drain opening with an externally threaded tubular member mounted therein, and an overflow drain opening, which comprises:

an overflow tube adapted for connection at one end thereof to the overflow drain opening and having a length such that the opposite end thereof terminates adjacent the lower end of the bathtub;

a drain pipe;

said drain pipe having a turned, internally threaded end adapted to be connected to the tubular member, and an opposite straight end;

a t-connector;

said t-connector having a lateral, externally threaded stem and straight, opposing ends, one of which is internally threaded and adapted to be connected to the tubular member;

an adapter having straight, opposing externally threaded ends;

one end of said adapter having an internal diameter sized to selectively receive the opposite end of said overflow tube and the straight end of said drain pipe therein;

means for circumferentially sealing and securing the one end of said adapter to the selected other end of said overflow tube or the straight end of said drain pipe;

the other end of said adapter being adapted for selective threaded engagement with the internally threaded end of said t-connector and the internally threaded end of said drain pipe, whereby in order to vary the location of drainage out the other straight end of said t-connector as desired, said universal drain assembly can be assembled in one of the following configurations; (1) with the one end of said adapter connected to the opposite end of said overflow tube, the other end of said adapter connected to the internally threaded end of said t-connector, the internally threaded end of said drain pipe connected to the tubular member, and the straight end of said drain pipe connected to the stem of said t-connector; (2) with the one end of said adapter connected to the opposite end of said overflow tube, the other end of said adapter connected to the internally threaded end of said drain pipe, the internally threaded end of said t-connector connected to the tubular member, and the straight end of said drain pipe connected to the stem of said t-connector; and (3) with the one end of said adapter connected to the straight end of said drain pipe, the other end of said adapter connected to the internally threaded end of said t-connector, the internally threaded end of said drain pipe connected to the tubular member, and the stem of said t-connector connected to the opposite end of said overflow tube; and

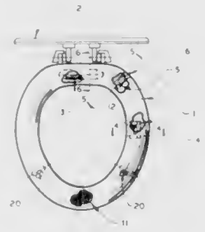
means for circumferentially sealing and securing the stem of said t-connector to the selected other end of said overflow tube or the straight end of said drain pipe.

4,920,583

VIBRATING TOILET SEAT

Thomas W. Hough, 4013 Lawndale St., Philadelphia, Pa. 19124, and Warren D. Brown, 7412 Pennway St., Apt. #1, Philadelphia, Pa. 19111

Filed Jun. 10, 1985, Ser. No. 743,038
Int. Cl.[5] A47K *13/00*; A61H *1/00*
U.S. Cl. 4—237 10 Claims



1 A self-contained vibrating auxiliary seat apparatus comprising: (a) a base portion adapted to be movably supported on a support surface and to support a person in a seated position thereon, at least a portion of the base portion being hollow; (b) vibrating means mounted within the hollow of the base portion and completely concealed within the base portion; and (c) actuation means for controlling the operation of the vibrating means, the actuation means mounted within the hollow of the base portion and concealed within the base portion, the actuation means including a first switch means mounted within the base portion, the switch means positioned for actuation from the pressure from a person sitting on the base portion; wherein the base portion substantially has an outward appearance of an ordinary seat.

4,920,584
DISPOSABLE TOILET SEAT COVER AND METHOD OF MANUFACTURE
Ahmed H. Abdrabbo, 4 E. Garden Dr., Roselle, N.J. 07203
Continuation-in-part of Ser. No. 40,066, Apr. 20, 1987, abandoned. This application Mar. 8, 1988, Ser. No. 169,162
Int. Cl.[5] A47K *13/14*
U.S. Cl. 4—242 2 Claims



1. A sanitary cover arrangement for a toilet seat, the arrangement comprising a sheet of nonporous material formed as one of a plurality of sequentially arranged sheets of said nonporous material obtained from a continuous sleeve of said nonporous material, said continuous web of nonporous material being collapsed to form first and second layers of nonporous material with first and second folds arranged longitudinally along respective edges of said continuous web where said first and second layers join one another, each of said sheets being separated from sequentially prior and sequentially subsequent ones of others of said sheets of said nonporous material by respective longitudinally transverse perforation lines in said first and second layers, said first layer having a further perforation line extending therealong longitudinally with respect to said continuous web of nonporous material in the vicinity of said first fold for facilitating unfolding of said sheet of nonporous material during use of the sanitary cover arrangement, and having a waste portion in the form of a removable blank central portion arranged in the vicinity of said second fold, and a protective portion configured to overlie the toilet seat, said waste and protective portions being separated from one another by a perforation line, said protective portion further having a protective flap portion formed integrally therewith, said protective flap portion being defined in said protective portion at least partially by perforation lines.

4,920,585
SHIELD MOUNTING ASSEMBLY FOR A SAFETY HELMET
Michio Arai, 1-164, Horinouchi, Shmiya-shi, Saitama-Ken, Japan
Filed Oct. 11, 1988, Ser. No. 255,861
Claims priority, application Japan, Oct. 20, 1987, 62-160951[U]
Int. Cl.[5] A42B *3/02*
U.S. Cl. 2—424 9 Claims

1. A safety helmet comprising:
(a) a helmet body having left and right outer sides;
(b) a shield rotatably supported on said left and right outer sides of said helmet body;
(c) support means for rotatably supporting said shield on said left and right outer sides of said helmet body;
(d) shield keep covers detachably connected to said left and right outer sides of said helmet body; and
(e) flexible string means of a predetermined length for connecting each said shield keep cover to said helmet body,

said string means being completel[illegible]ned and unexposed between said helmet body an[illegible] shield keep



covers when the shield keep covers are connected to the outer sides of the helmet body.

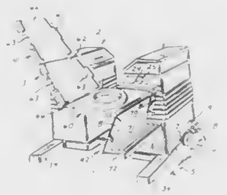
4,920,586
SEAT HANDLE ATTACHMENT
Anthony M. Giallourakis, P.O. Box Drawer 1307, Tarpon Springs, Fla. 33589
Filed Dec. 12, 1988, Ser. No. 283,467
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.
Int. Cl.[5] A47K *17/00*
U.S. Cl. 4—251 8 Claims



1. A seat handle attachment, comprising:
(a) a rigid planar member, wherein said planar member has an attachment portion and a handle portion, and wherein said attachment portion is wider than said handle portion for sturdy anchoring and said handle portion is longer than the attachment portion to facilitate handling; and
(b) attachment means permanently affixed to the attachment portion, wherein said attachment means comprises tape made of a compressible sponge-like material having opposite sticky surfaces for sticking to the attachment portion and an underside section of a toilet seat and for compensating for surface differences between a surface of the rigid planar member and a surface of the underside of the toilet seat, and wherein said attachment portion has an oblongated shape to fit within curved contours of a toilet seat, and further has an inward curvilinear edge and outward curvilinear edges, said outward curvilinear edges being aligned with an outward edge of a toilet seat and further comprises a scent-dispersing means having an impregnated volatile substance which releases slowly, wherein said scent-dispersing means is impregnated in said tape; and
wherein further the handle portion is a ringlike protrusion from the attachment means which protrudes from under the toilet seat, provides a fingerhold for fastening point for some leverage device for maneuvering, and a small surface area for proliferation of germs; the handle portion further provides a means for allowing fingers to partially or wholly enter the center of the handle portion, thus

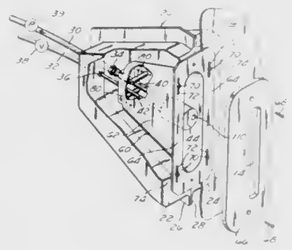
preventing slippage of the handle from a hand during lifting or lowering.

4,920,587
BEDSIDE TOILET
Harry D. Kerr, 4641 North Ardmore Ave., Whitefish Bay, Wis. 53211
Filed Dec. 7, 1988, Ser. No. 281,183
Int. Cl.[5] A61G *7/02*
U.S. Cl. 4—480 21 Claims



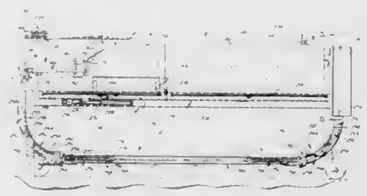
20. A bedside toilet construction, comprising an elongated platform to support a patient and including a back section, a posterior section and leg section, a toilet associated with said posterior section, said sections being hingedly connected for movement between a generally horizontal position and an operative position wherein said posterior section is disposed generally horizontally and said back section extends upwardly from said posterior section and said leg section extends downwardly from said posterior section, a supporting structure, cantilevered support means for supporting said platform in cantilevered relation from said supporting structure, first drive means for moving said platform laterally to position said platform over a bed containing a patient, and second drive means for moving said sections between said horizontal and operative positions, said toilet comprising a seat mounted on said posterior section, a tray located beneath the seat and removably mounted with respect to said posterior section, and a receptacle carried by the tray and disposed in alignment with said seat.

4,920,588
MEANS PROVIDING MOVING WATER STREAM EJECTING INTO SPA TANK
Jonathan Watkins, 1004 Hopper Ave., San Marcos, Calif. 92069
Continuation-in-part of Ser. No. 665,445, Oct. 26, 1984, abandoned. This application Nov. 19, 1985, Ser. No. 799,744
The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.
Int. Cl.[5] A61H *33/02*
U.S. Cl. 4—542 10 Claims



1. The improvement in a spa or the like, comprising:
(a) a tank containing water for body immersion and a flexible tube directed to exhaust water into said tank from a side thereof and a source of pressurized water connected to said tube, said tube having a free end adapted to whip by reaction of water exhausting therefrom for massage of users, said tube being annular in cross-section with a wider horizontal thickness and a narrower vertical thickness whereby said tube tends to bend around horizontal axes and to travel in a vertical plane, and
(b) said tube having a portion fixedly secured relative to said tank with said free end extending inwardly therefrom towards the inside of said tank and an upper and a lower abutment positioned respectively above and below said tube forming upper and lower bending points above and below said tube and spaced from said fixedly secured portion of said tube in a direction generally inwardly relative to said tank, said abutments being rollers to minimize tube abrasion and there being separate support means operative to rotatably support each roller, said support means for each roller being operative to independently support each roller at a number of locations at different distances relative to said fixedly secured portion generally horizontally and inwardly relative to said tank thereby to relocate the upper and lower bending points as needed to produce effective whipping action of said tube.

4,920,589
THERAPEUTIC TABLE
Richard E. LaVelle, Olympia Fields; Gary L. Wood, Park Forest; Kevin P. Morrey, Richton Park, and Clayton E. Bossert, Aurora, all of Ill., assignors to Thomas J. Ring, Palos Heights, Ill.
Filed Apr. 17, 1985, Ser. No. 724,405
Claims priority, application PCT Int'l Appl., Aug. 24, 1983, PCT/US83/01298
Int. Cl.[5] A61G *7/10*
U.S. Cl. 5—61 10 Claims



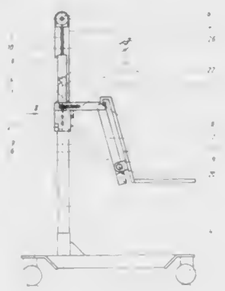
1. In a therapeutic table having a frame and an elongate patient support mounted to the frame, an improved adjustable lateral support assembly for holding a portion of the patient's body against lateral movement in at least one direction, comprising:
an elongate lateral support member which is substantially symmetrical with respect to an elongate central axis thereof;
a mounting member attached to the lateral support member and having a connection portion at a location offset laterally from said central axis; and
means for releasibly attaching the connection portion of the mounting member to the therapeutic table adjacent a side of the patient support.

4,920,590

INVALID LIFTING AND CARRYING APPARATUS

Rudolf Weiner, Danziger Str. 62, 6360 Friedberg, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,161
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3729987
Int. Cl.[5] A61G 7/10
U.S. Cl. 5—86 5 Claims



1. Invalid lifting and carrying apparatus comprising:
a frame;
a vertical standard supported by said frame;
slide means movably mounted to said standard and vertically movable thereon; and
cantilever means comprising a first cantilever component and a second cantilever component joined unadjustably at an obtuse angle;
wherein said first cantilever component is pivotally mounted to said slide means at a swiveling axis; and
wherein said cantilever means is pivotally movable between a first position for holding a seat and a second position for carrying a belt device

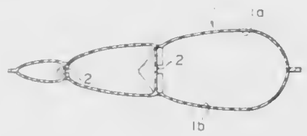
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4,920,591

AIR SUPPORT FOR CHAIR AND METHOD FOR MANUFACTURING CHAIR UTILIZING THE AIR SUPPORT

Hiroshi Sekido, 772-48, Nippashi, Tomisato-mura, Inba-gun, Chiba-ken, and Toshimichi Hioki, 1037-8, Soinakajima, Motosu-cho, Motosu-gun, Gifu-ken, both of Japan

Filed Jul. 25, 1985, Ser. No. 758,800
Int. Cl.[4] A47C 27/08
U.S. Cl. 5—455 3 Claims



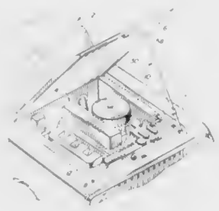
1. An inflatable support means for incorporation in a chair, said inflatable support means comprising
a pair of identical, generally rectangular outer elements, each of said pair of generally rectangular outer elements being made of a flexible material having a peripheral edge portion, said pair of generally rectangular outer elements being sealingly connected together along their corresponding peripheral edge portions to provide an air chamber therebetween, and one of said generally rectangular outer elements including means for enabling air to be supplied to or removed from said air chamber, and
an elongated internal connection element connecting said pair of generally rectangular outer elements inwardly of their connected peripheral edge portions, said elongated internal connection element having a first side edge connected to one of said pair of generally rectangular outer elements and a second side edge connected to the other of said pair of generally rectangular outer elements, one of said first and second side edges of said elongated internal connection element having a sinusoidal configuration so as to provide a sinusoidal configuration to the generally rectangular outer element to which it is connected when said air chamber is filled with air.

4,920,592

COMBINATION HOOD SUPPORT, JACK CRANK, LUG WRENCH AND WHEEL COVER REMOVAL APPARATUS

Robert S. Scott, 3043 W. Clinton, Phoenix, Ariz. 85029

Continuation-in-part of Ser. No. 205,476, Jun. 13, 1988, Pat. No. 4,811,440. This application Mar. 10, 1989, Ser. No. 321,899
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[5] B25F 1/00
U.S. Cl. 7—100 8 Claims





1. Hood support and lug wrench tool apparatus convertible to a jack crank for raising and lowering a jack, comprising, in combination:
support rod means for supporting a vehicle hood, including a first end securable to the jack and a second end;
lug wrench tool means having a first arm and a socket on the first arm for receiving lug nuts and having a second arm comprising a lever arm for the first arm and the socket for loosening and tightening lug nuts and securable to the second end of the support rod means; and
means for securing the second end of the support rod means to the second arm to comprise a jack crank.

4,920,593

COMBINATION TOOL

Patrick W. Finn, 1400 Seminole Rd., Algonquin, Ill. 60102

Filed May 25, 1989, Ser. No. 356,507
Int. Cl.[5] B25B 7/22
U.S. Cl. 7—127 8 Claims



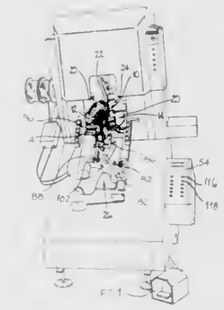
1. A combination hand tool having a pliers function, a screwdriver function and a nail pulling function in one tool, wherein:
a. said pliers function is accomplished by providing a pliers having a first side and a second side pivotally connected by a pivot means;
b. said first side has a first jaw at one end thereof and a first handle at opposing end thereof;
c. said first jaw is oppositely disposed from said first handle;
d. said second side has a second jaw at one end thereof and a second handle at opposing end thereof;
e. said second jaw is oppositely disposed from said second handle;
f. said second jaw is movable to a position adjacent to said first jaw;
g. a locking means for locking said second jaw away from said first jaw is positioned adjacent said pivot means;
h. said screwdriver function includes a first screw driver means and a second screw driver means;
i. said first screw driver means is at an end of said first handle and oppositely disposed from said first jaw;
j. said second screw driver means is at an end of said second handle and oppositely disposed from said second jaw;
k. said locking means includes a fixing means and a bracing means; and
l. said fixing means and said bracing means cooperate to lock said pliers in an open position for efficient use of said first screw driver means and said second screw driver means;
m. said bracing means includes a first jaw brace on said first jaw side and a second jaw brace on said second jaw side;
n. said first jaw brace is between said first jaw and said first handle;
o. said second jaw brace is between said second jaw and said second handle;
p. said first handle and said second handle are mutually and substantially perpendicular as said first jaw brace and said second jaw brace abut;
q. said fixing means includes a rotatable jaw bolt having a large enough to be turned by hand; and
r. said rotatable jaw bolt is in threaded relation with said second jaw and threadably movable to contact said first jaw and lock said pliers in an open position to use either of said first screw driver means and said second screw driver means.

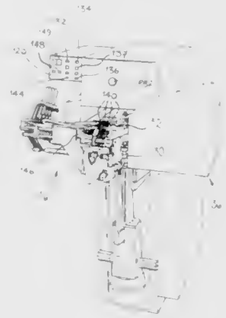
4,920,594

APPARATUS FOR LASTING TOE, SIDE AND HEEL SEAT PORTIONS OF A SHOE

James R. Flanders, Blaby; Frank Bramley, Glenfield; Francis B. Sharp, Syston; Robert A. Newton, Cosby, and Graham J. Mansfield, Newton Harcourt, all of England, assignors to British United Shoe Machinery Ltd., Leicester, England

Filed Apr. 13, 1989, Ser. No. 337,293
Claims priority, application United Kingdom, Apr. 28, 1988, 8810109
Int. Cl.[5] A43D 21/00, 21/16, 21/18
U.S. Cl. 12—7 40 Claims





1. Apparatus for lasting toe, side and heel seat portions of a shoe, comprising a pulling over and toe lasting machine and a side and heel seat lasting machine,
wherein the pulling over and toe lasting machine comprises
first transducer means for monitoring the movement of a heel end engaging support member of the machine relative to a toe support thereof,
second transducer means for monitoring adjustment movement of said heel end engaging member heightwise of the machine, and
actuator means whereby, when wiper plates of a wiper assembly of said machine reach a predetermined position in their inwiping movement, the output value of each of the first and second transducer means is "read", and
wherein the side and heel seat lasting machine comprises
two side lasting assemblies each of which can tilt in a direction lengthwise of a shoe supported by a shoe support of said machine, to accommodate to the spring of the last of the shoe to be operated upon,
adhesive-applying means comprising two nozzles arranged to track along opposite side portions of the shoe thus supported,
first motor means for driving the nozzles as aforesaid,

second motor means for effecting tilting movement of the side lasting assemblies, and

computer control means which receives the output value information from the first and second transducer means of the pulling over and toe lasting machine and in accordance therewith, in a cycle of operation of the side and heel seat lasting machine, causes the second motor means to be actuated to set the angle of tilt of the side lasting assemblies and causes the distance to be set through which the nozzles are driven by the first motor means.

4,920,595

SOLID BRIDGE KIT

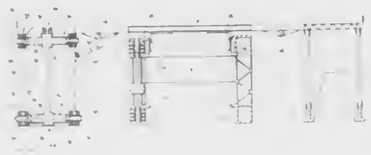
Reinhold Füssinger, Friedrichshafen, and Friedrich Graf, Daisendorf, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 418,065, Sep. 4, 1982, abandoned. This application May 24, 1984, Ser. No. 613,756

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138853

Int. Cl.[5] E01D *15/12*

U.S. Cl. 14—2.4 **16 Claims**



1. In a solid or dry bridge kit, composed of individual bridge bays with a U-shaped cross-section and a cross-sectionally H-shaped traversing beam,

the improvement comprising; the bridge bays (2,4) each comprise a central part (12) and two side parts 10, said side parts containing track ways in the shape of hollow boxes; hinge connector means for hingedly connecting the two side parts to the central part, so that the two side parts (10) can be folded by 90° under the central part (12), whereby upper surface of said side parts are perpendicular to an upper surface of said central part (12) for purposes of transport;

the traversing beam as assembled providing support for the individual bridge bays (2,4) as coupled together and moved over said traversing beam, the traversing beam connected to one of the bridge bays to remain a support element in the bridge.

4,920,596

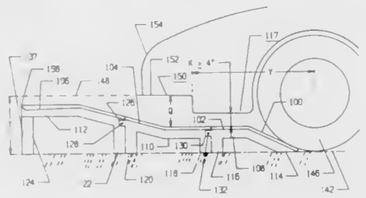
VEHICLE WHEEL ELEVATING DEVICE

Michael L. Stevens, 1506 Tree Trail Pkwy., Norcross, Ga. 30093

Filed Mar. 2, 1989, Ser. No. 318,183

Int. Cl.[5] E02C *3/00*

U.S. Cl. 14—69.5 **20 Claims**



11. A two level car wheel elevating ramp for elevating a wheel of a sports car and the like having a lesser ground level to bumper assembly distance (F + K) and a longer distance Y measured from the bottom dead center of the front wheel to the front end of the bumper assembly than most conventional family type cars, where F is the minimum distance from ground level to the top of the sidewall of said second wheel tread segment and is less than the distance from the lowest point on the bottom of said bumper assembly to ground level, and where K is the minimum distance of any portion of the extended portion of the extended nose of the car or the low slung bumper assembly from any point on the two level wheel elevating device when the car is in any position on said two level wheel elevating device and comprising;

a wheel tread surface having an overall side view contour comprising in the order set forth below;

a first wheel tread surface entrance ramp segment rising from ground level to a second level a distance G above ground level and whose vertical projection onto ground level has a horizontal distance N, where G is less than the minimum vertical distance of the lowest point on the bottom of said bumper assembly above ground level;

a second wheel tread surface segment extending substantially horizontally for at least a portion thereof from the top of said first wheel surface ramp a distance not greater than L and at a vertical distance G from ground level over said distance L; and

a topmost substantially horizontal level segment;

a second wheel surface ramp segment rising from said second wheel surface segment to said topmost substantially horizontal level which is approximately a distance H above ground level;

the distance L + N being at least equal to a distance Y and the bumper assembly being at least a distance K above the wheel elevating ramp at any position of the car as it begins to climb the car wheel elevating ramp until and when it reaches the topmost substantially horizontal level segment of said car wheel elevating ramp, where Y is the distance between the dead bottom center of the wheel tread when said wheel is at the entrance to said first wheel tread segment and the front end of said bumper assembly;

the angle of slope of said first wheel surface ramp segment at any point thereon upon which the bottom dead center of said front wheel rests being greater than the angle of slope of said second wheel surface ramp segment at the point of intersection of the nearest point of said bumper assembly with said second wheel surface ramp segment along a vertical plane parallel to the axis of the car wheel; and

a clock like wheel stop formed at the end of the topmost substantially horizontal level segment to prevent the automobile wheel from rolling off the end of said topmost substantially horizontal level segment to ground level.

4,920,597

DRIVE-ON VEHICLE SUPPORTING ARRANGEMENT

Harold F. Hamilton, McPherson, Kans., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Nov. 9, 1988, Ser. No. 269,200

Int. Cl.[5] E01D *1/00*

U.S. Cl. 14—69.5 **4 Claims**

1. A drive-on vehicle support arrangement for use with a floor anchor system comprising.

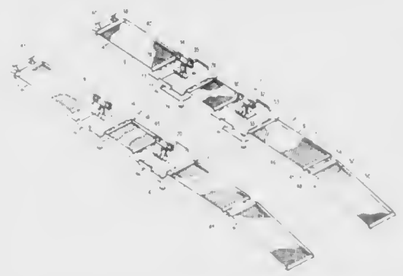
(a) a pair of parallel, vehicle supporting treadways, each of said treadways including:

(i) vehicle support stand means having means connectible to a floor anchor pot to secure said support stand means connectible to the undercarriage of a vehicle to restrain same for pulls and pushes thereon;

(ii) treadway means and means for detachable connection of said treadway means to said vehicle support stand means in longitudinal alignment therewith;

(iii) treadway support means elevating said treadway means above a floor surface and horizontally level with said vehicle support means;

(iv) said means for detachable connection include apertures and tabs extending between said treadway means and said vehicle support stand means and said treadway support means whereby said treadway means is liftable in and out of engagement with said vehicle support stand means said treadway support means;



(v) entrance ramps means associated with said treadway means for driving a vehicle thereon;

(b) whereby said treadways are arranged in parallel relation so that a vehicle may be positioned thereon by its wheels and said treadway means removed for access to said vehicle to facilitate repair.

4,920,598

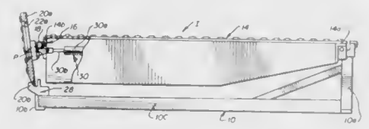
DOCK LEVELER WITH AUTOMATIC VEHICLE BARRIER

Norbert Hahn, South Milwaukee, Wis., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Filed Oct. 13, 1988, Ser. No. 257,425

Int. Cl.[5] E01D *1/00*

U.S. Cl. 14—71.1 **11 Claims**



1. A dock leveler assembly comprising a pivotally mounted loading ramp adjustable to a substantially horizontal stored position;

barrier means operatively connected to said loading ramp for movement between a depending first position wherein a portion of said barrier means protrudes above a plane defined by an exposed surface of said loading ramp when the latter is in a substantially horizontal stored position and a depending second position wherein said ramp is in a non-stored position and no portion of said barrier means protrudes above said plane;

retaining means for supporting said barrier means in said first position; and

an attaching means for operatively connecting said barrier means to said loading ramp.

4,920,599

AUTOMATIC SWIMMING POOL CLEANER

Dieter J. Rief, Rohnert Park, Calif., assignor to Pooltec Establishment, Lemgo, Fed. Rep. of Germany

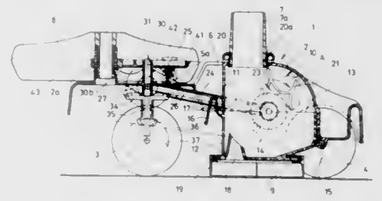
Filed Nov. 18, 1988, Ser. No. 273,279

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1988, 88113599; Oct. 18, 1988, 88117338

Int. Cl.[5] E04H *3/20*

U.S. Cl. 15—1.7 **20 Claims**

1. A suction head for the cleaning of submerged surfaces, in particular the bottoms of swimming pools which consists of a housing open at the lower side to which at least one front steerable wheel and rear wheels are rotatably mounted, a water-driven turbine disposed in the housing comprising a turbine chamber with an inlet opening facing the lower side of the housing, a rotatable connecting pipe traversing the upper side of the housing for connection to a suction tube and a turbine wheel rotatably mounted in the turbine chamber which drives said at least one front wheel via transmission means, wherein the turbine wheel comprises a horizontal rotational axis, the turbine chamber consists of an upper housing part integrally connected to the suction head housing and into



which the connecting pipe ends, and a lower housing part linked to the suction head housing and in which the inlet opening is formed, the lower housing part being held by a detachable elastic locking means in a position closing the turbine chamber, and wherein the axis of the turbine wheel is in the separating line of the turbine housing parts so that the turbine wheel is freely accessible when said turbine chamber is opened upon detaching said elastic locking means, and the inlet opening and the connecting pipe are in one line extending approximately as a chord with respect to the rotary circle of the turbine wheel.

4,920,600

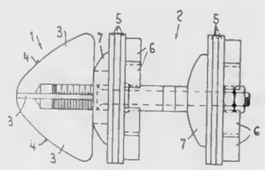
PIPE CLEANER

Pietro Reinhart, Raiffeisenstrasse, Switzerland, assignor to Reinhart S. A., Delemont, Switzerland

Filed Aug. 13, 1987, Ser. No. 84,990

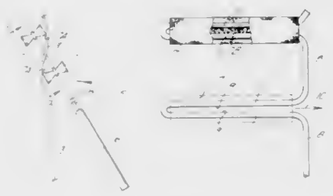
Int. Cl.[5] B08B *9/02*

U.S. Cl. 15—104.061 **6 Claims**



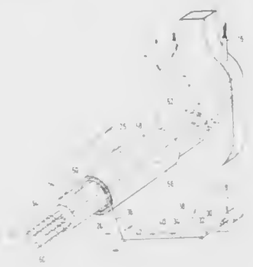
1. Pipe cleaner with a cleaning assembly (1) comprising at least one ring of cleaning elements (3) and with a drive assembly (2) characterized by the fact that rigid cleaning elements (3) are provided, rigidly mounted, with the effective diameter of the cleaning assembly increasing lengthwise thereof, wherein said drive assembly (2) includes a shaft, and at least one momentum transmission washer assembly adapted to vibrate in response to water pressure and transmit pulsed momentum to said cleaning elements, said washer assembly comprising a flexible sealing washer, an inertial mass attached to said sealing washer, and momentum transfer means rigidly connected to said shaft and adapted to transmit momentum from said inertial mass through said sealing washer to said cleaning element via said shaft.

4,920,601
STRIP CURTAIN CLEANING DEVICE
Eric E. Alburas, 1441 N. McClellan St., Portland, Oreg. 97217
Filed Sep. 26, 1988, Ser. No. 248,643
Int. Cl.[5] A47L *13/16, 13/46*
U.S. Cl. 15—244.1 1 Claim



1. A cleaning device for cleaning pliable strips of a curtain, said device comprising,
an elongate handle,
absorbent members in spaced apart parallel relationship and generally perpendicular to the projected major axis of the handle, said members adapted to simultaneously wipe the opposite surfaces of said strips, and
a bent wire having an end segment in said handle, said wire having pairs of parallel wire segments with the segments of each pair at all times spaced from one another a distance less than the normal thickness of each of said absorbent members, each of said pairs in frictional engagement with one of said absorbent members.

4,920,602
WINDOW WASHER APPARATUS FOR A MOTOR VEHICLE WINDOW
Gerd Kuehbauch, Buehlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Apr. 14, 1989, Ser. No. 339,234
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824483
Int. Cl.[4] A47L *1/02*
U.S. Cl. 15—250.04 11 Claims



1. In a window washer apparatus for a motor vehicle window, with a wiper arm oscillating over said window sitting on a hollow shaft, which is provided with at least one nozzle directed at said window to be washed and a washer fluid feed to said nozzle through a structural element in said hollow shaft, whose one downstream end portion is rigidly attached with said hollow shaft, the improvement wherein said structural element is at least partially made from a pliable material and the other upstream end portion of said structural element is held fixed adjacent an upstream opening of said hollow shaft.

4,920,603
INDUSTRIAL-TYPE WASHING MACHINE
Kenneth J. Keim, 520 Ellencroft Dr., Lewisberry, Pa. 17339, and William R. Pattison, 419 Springhouse Rd., Camp Hill, Pa. 17011
Filed Sep. 28, 1989, Ser. No. 413,998
Int. Cl.[5] B08B *3/02*
U.S. Cl. 15—302 8 Claims

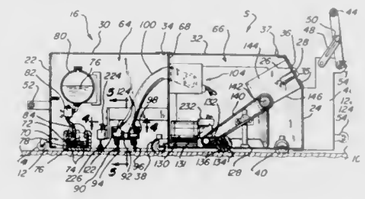


1. An industrial-type washing machine for removing from a continuous metal strip oleaginous and similar materials used in preceding operations upon said strip, said machine comprising in combination,
a. a washing compartment in compact longitudinal alignment with a rinsing compartment,
b. each of said compartments being mounted above reservoirs respectively to contain washing and rinsing liquids,
c. each of said compartments having longitudinally-spaced support and guide rollers therein defining a longitudinal path of movement for a strip passing through said compartments,
d. upper and lower spray manifolds in each of said compartments provided with longitudinally-spaced discharge jets adapted to discharge liquid upon opposite surfaces of a strip when moving through said compartments,
e. an inlet for said strip in the end of said washing compartment opposite said rinsing compartment and an exit in the end of said rinsing compartment opposite said washing compartment,
f. each of said reservoirs having a pump connected thereto and conduits leading respectively therefrom to said spray manifolds in said compartments,
g. liquid-removing air spray means mounted within a space of limited length between said compartments and a compressor connected thereto removes washing liquid from said strip before entering said rinsing compartment to minimize contamination of rinsing liquid,
h. coacting relatively fixed and movable pairs of baffle members supported respectively below and above said path of movement and positioned respectively adjacent the inlets of said compartments and an additional pair mounted at the exit of said rinsing compartment, and
i. drying air jets at the exit of said rinsing compartment and connected to a compressor to provide drying air under pressure to be applied against opposite surfaces of said strip

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4,920,604
AUTOMATIC VACUUM BOWLING LANE STRIPPER
Donald E. Ingermann, Arvada; Ronald L. Smith, Boulder; Stephen F. Caffrey, Arvada, and Lonney J. Steinhoff, Evergreen, all of Colo., assignors to Century International Corporation, Golden, Colo.
Filed Jun. 26, 1989, Ser. No. 371,295
Int. Cl.[4] A47L *11/282*
U.S. Cl. 15—302 15 Claims

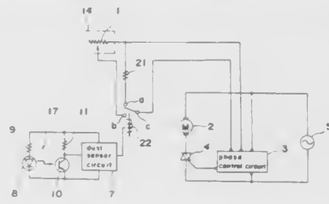
1. An automatic vacuum bowling lane stripper comprising:
a carriage for movement along a bowling alley from a foul line to the pit and back again, said carriage having a forward portion and a rearward portion;
a reversible drive mechanism connected to said carriage and having a drive shaft and surface-engaging drive wheels mounted on said drive shaft operative to advance said carriage along a predetermined course in a forward and reverse direction;
cleaner applicator means extending transversely of said carriage in said forward portion and mounted for movement with respect thereto between an operative lane-engaging position and a retracted position within said carriage and above the lane;
a cleaner reservoir;
means for supplying cleaner from said reservoir to said applicator, said cleaner supplying means having a fluid valve for permitting the flow of cleaner to said applicator when open and prohibiting flow of cleaner to said applicator when closed;
a vacuum means for removing cleaner and dirt from the surface of the lane, said vacuum means having a vacuum head extending transversely of said carriage rearwardly of said applicator means and mounted for movement with respect to said carriage between an operative lane-engaging position and a retracted position within said carriage and above the lane;
power supply means in said carriage;



control means connected to said power supply means responsive to control signals to selectively activate and deactivate each function of said stripper;
an on-off switch which can be closed for activating said drive mechanism so that said carriage travels in a forward direction from the foul lane to the pit;
first means responsive to said control means for opening said fluid valve during at least a portion of said forward travel;
second means responsive to said control means for moving said applicator into said lane-engaging position;
third means responsive to said control means for moving said vacuum head into said lane-engaging position;
fourth means responsive to said control means for deactivating said first and second responsive means to shut-off said fluid valve and to move said applicator to said retracted position; and
a limit switch responsive to said carriage reaching the pit to cause said control means to deactivate said drive mechanism to stop said carriage and to deactivate said third responsive means to raise said vacuum head to said retracted position.

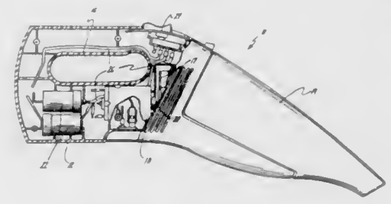
4,920,605
ELECTRIC CLEANER
Yoshinori Takashima, Omihachiman, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 17, 1988, Ser. No. 258,611
Claims priority, application Japan, Oct. 16, 1987, 62-261088; Oct. 16, 1987, 62-261089
Int. Cl.[5] A47L *9/28*
U.S. Cl. 15—319 2 Claims

1. An electric cleaner comprising a main body including a blower motor whose speed is continuously varied by a control unit, and a dust sensor unit provided in a suction opening or between a suction opening and the main body, and a control means for running the blower motor at a predetermined constant speed irrespective of the speed selected by the control unit in the absence of dust being detected by the dust sensor unit, and for increasing the speed of the blower motor up to a



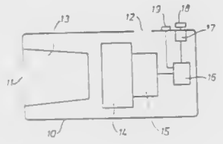
speed selected by the control unit when dust has been detected by the dust sensor unit.

4,920,606
ELECTRICAL POWER CIRCUIT FOR A VACUUM CLEANER
Burton E. Gerke, Jr., Newtown; Michael E. Bitzel, Monroe; Robert Kubicko, Huntington, and Charles Z. Krasznai, Trumbull, all of Conn., assignors to Black & Decker, Inc., Newark, Del.
Filed Jan. 9, 1989, Ser. No. 294,617
Int. Cl.[5] A47L *5/26*
U.S. Cl. 15—338 12 Claims



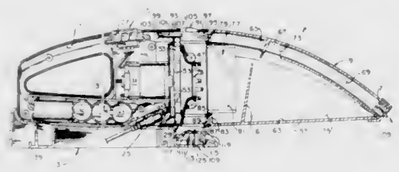
1. A vacuum cleaner and accessory attachment assembly comprising:
a vacuum cleaner including a motor, a housing enclosing said motor, a fan driven by said motor for producing a vacuum, a canister removably attached to said housing for reception of air and foreign matter into said canister in response to the vacuum produced by said fan, a plurality of batteries electrically connected together for supplying electrical power to said motor;
an accessory attachment removably mounted to said vacuum cleaner and including a motor, and means for electrically connecting said motor to said plurality of batteries of said vacuum cleaner; and
said vacuum cleaner including electrical circuit means for connecting the motor of said accessory attachment to a constant number of said plurality of batteries while enabling the motor of said vacuum cleaner to be selectively connected to a first group of said plurality of batteries to operate the motor at a first speed and to a second group of said plurality of batteries to operate the motor at a second speed.

4,920,607
ARRANGEMENT IN A VACUUM CLEANER
Siegfried W. Köhn, Malmö, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
PCT No. PCT/SE86/00438, § 371 Date May 4, 1987, § 102(e) Date May 4, 1987, PCT Pub. No. WO87/01921, PCT Pub. Date Apr. 9, 1987
PCT Filed Oct. 1, 1986, Ser. No. 53,852
Claims priority, application Sweden, Oct. 4, 1985, 8504598
Int. Cl.[5] A47L *9/28*
U.S. Cl. 15—339 7 Claims



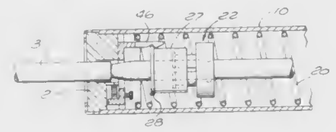
1. In a vacuum cleaner arrangement having an electric motor, a suction fan connected to the motor, and an electronic speed control device for controlling the motor for the adjustment of the suction power of the vacuum cleaner, said motor having a maximum power for continuous operation, the improvement wherein the speed control device comprises means for permitting adjustment of the motor within a speed range limited at its upper end to a value corresponding to the maximum motor power for continuous operation, the control device further comprising control means for controlling the motor to rotate at a speed corresponding to a power level exceeding said maximum power for a first predetermined period of time and then to return to the speed of rotation at which the motor was operating immediately preceding said first predetermined period of time, and means for inhibiting the operation of said motor at speeds corresponding to a power level exceeding said maximum power during a second predetermined period of time immediately following the first predetermined period of time.

4,920,608
PORTABLE HAND HELD VACUUM CLEANER
David R. Hult, and Mark J. Tomasiak, both of County of St. Charles, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 8, 1988, Ser. No. 229,494
Int. Cl.[5] A41L *5/24*
U.S. Cl. 15—339 24 Claims



1. A portable hand held vacuum cleaner comprising a housing having a handle permitting a user to lift and operate said vacuum cleaner and a nozzle/debris container releasably secured to said housing, said housing having a motor, a blower driven by said motor and being in communication with said nozzle/debris container for forcibly drawing air and debris entrained in the air into the nozzle/debris container to deposit debris within said container while also exhausting air from the nozzle/debris container and then through exhaust openings in said housing to the atmosphere, said housing and said nozzle/debris container being releasably secured and also sealed to one another in the vicinity of complementary interfitting circumferential portions of the housing and nozzle/debris container, a combined outer circumferential compressible seal and inner filter for joint insertion or removal relative to the housing and nozzle/debris container, and said outer circumferential compressible seal being in compressible sealing engagement between said complementary interfitting circumferential portions while said inner filter extends substantially across the nozzle/debris container when said housing and nozzle/debris container are releasably secured to one another, in order to seal off from the atmosphere the air communication between the blower in the housing and nozzle/debris container while requiring air exhausted from the nozzle/debris container to pass through the inner filter.

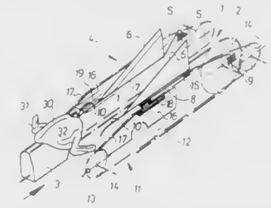
4,920,609
PNEUMATIC DOOR CLOSER
Chun-Hsien Lin, Taipez, Taiwan, assignor to Solid Well International Corp., Taipei, Taiwan
Filed Jul. 24, 1989, Ser. No. 383,706
Int. Cl.[5] F16F *9/32*; E05F *3/00*
U.S. Cl. 16—66 9 Claims



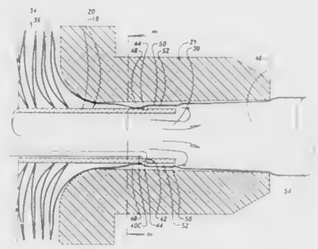
1. In a hold open device for a door closer having a housing, a plunger rod slidingly carried in an end of said housing, a plunger at the inner end of said rod, and a mainspring positioned about said rod between said housing and said plunger, the improvement including a combination:
an actuator carried on said housing for transverse sliding motion relative to said rod, said actuator having an opening for said rod;
said rod including a collar and latch means defining a latch space on said rod;
a sleeve slidingly positioned on said collar; and
hold open means positioned between said housing and said actuator for urging said actuator transversely toward said rod into latching engagement with said latch means.

4,920,610
METHOD FOR MECHANICALLY REMOVING THE WINGS FROM POULTRY BODIES AND APPARATUS THEREFOR
Hans Callsen, Am Bormbrook 2, 2407 Bad Schwartau, Fed. Rep. of Germany, and Wilhelm Richert, 1412 Kelly Bridge Rd., Dawsonvill, Ga. 30534
Filed Oct. 21, 1988, Ser. No. 260,786
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735849
Int. Cl.[5] A22C *21/00*
U.S. Cl. 17—11 17 Claims

1. An apparatus for processing poultry by mechanically removing wings from bodies of said poultry, said wings including the humerus (wing bone, upper arm bone) connected with the bodies in body joints and held by tendons, said apparatus comprising conveying means for positively securing said poultry body to be processed, said conveying means defining a plane of revolution and advancing said poultry body in its plane of symmetry in a predetermined conveying direction, as well as a severing mechanism comprising separating tools for separating said wings, which tools are arranged symmetrically on either side of said plane of revolution of said conveying means, wherein said severing mechanism comprises a first separating tool for cutting through said wing tendons and a second separating tool downstream of said first tool for cutting off said wings, and wherein in the region of said severing mechanism guide means are arranged for seizing said wings and moving them away from said poultry body.



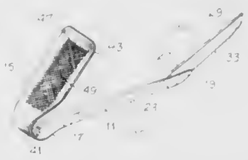
4,920,611
METHOD AND MEANS FOR ENCASING MEAT PRODUCTS
Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa
Filed Apr. 17, 1989, Ser. No. 338,858
Int. Cl.[5] A22C *11/02*
U.S. Cl. 17—49 11 Claims



1. The method of encasing a meat product and removing air therefrom;
forcing a plastic emulsion through a stuffing horn having an exit end with an elongated casing member mounted thereon in close spaced relationship so that said emulsion extruded through said exit end will fill said elongated casing adjacent said exit end;
subjecting the space between the exit end of said horn and said casing to a negative pressure so that air between said horn and said casing, and air in said emulsion extruded through said exit end will be removed to make said filled casing substantially free from air particles.

4,920,612
FISH FILLET KNIFE
George A. Moore, 1508 Deane Blvd., Racine, Wis. 53405
Filed Jun. 5, 1989, Ser. No. 361,426
Int. Cl.[5] A22C *25/16*
U.S. Cl. 17—56 19 Claims

1. A knife for filleting fish including:
a generally flat cutting blade disposed in a first plane and having a proximal, end and a distal end;
a generally flat boning blade disposed in a second plane and having a proximal end, a distal end and a cutting edge, said proximal end of said boning blade being attached to said distal end of said cutting blade in a manner such that said first plane and said second plane are generally normal one to the other;
a handle attached to said proximal end of said cutting blade, said knife thereby permitting cutting of said fish along either of two cutting axes without substantially changing the orientation of said knife with respect to said fish.



4,920,613
FLOCK DELIVERY SYSTEM
Rolf Binder, Schottikon; Daniel Hanselmann; Walter Schlepfer, both of Winterthur, and Christoph Staehelı. Frauenfeld, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland
Continuation of Ser. No. 168,898, Mar. 16, 1988, abandoned, which is a division of Ser. No. 914,116, Oct. 1, 1986, Pat. No. 4,690,297. This application May 4, 1989, Ser. No. 352,693
Claims priority, application United Kingdom, Oct. 2, 1985, 8524304
Int. Cl.[5] D01G *7/00*
U.S. Cl. 19—80 B 10 Claims



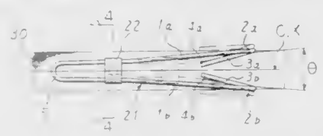
7. A flock extraction apparatus comprising
means defining a track;
a pair of ducts extending along said track for conveying fiber flock therethrough;
a carrier movable along said track;
a pair of flock extracting means extending in opposite directions from said carrier to opposite sides of said track;
a transport duct extending from each said flock extracting means through said carrier to a respective duct for directing flock thereto; and
means for actuating each said flock extracting means to selectively inhibit or perform a predetermined extracting operation in selected blocks of fiber hales disposed along said track.

4,920,614
CLAMPING DEVICE
Tatusabu Tsukamoto, No. 2570 Ohaza Mukaizima, Chiyodamachi, Kanzakigun, Saga 842, Japan
Continuation of Ser. No. 205,059, Jun. 3, 1988, abandoned, which is a continuation of Ser. No. 883,466, Jul. 11, 1986, abandoned, which is a continuation of Ser. No. 755,555, Jul. 16, 1985, abandoned, which is a continuation of Ser. No. 548,860, Sep. 23, 1983, abandoned. This application Apr. 26, 1989, Ser. No. 344,421
Claims priority, application Japan, Jan. 23, 1982, 57-9204
Int. Cl.[5] B42F *1/04*
U.S. Cl. 24—67.5 3 Claims

1. A clamping device for clamping together sheets of paper, comprising:
(A) a clamping body formed of elastic wire and consisting of:

(1) a pair of arms formed by sections of said wire, and a bight section connecting said arms at proximal ends thereof to form substantially a V-shape in a first plane; said arms being biased apart to diverge from said bight section to define an angle of opening in said first plane; said arms being movable in opposite directions in said first plane towards and away from each other;

(2) a pair of press members formed by sections of said wire and respectively integrally formed on distal ends of said arms; said press members being disposed on either side of a second plane which is perpendicular to said first plane and bisects said angle of opening, wherein each said press member forms an acute angle with the first plane and said arm to which said press member is attached, said press members having free ends which are disposed closer to the said second plane than the distal ends of said press members, said free ends making an acute angle with said second plane greater than half said angle of opening; and



(B) a single clamping plate slidably mounted on said arms and having engaging sections forming at least two channels for receiving said arms; said two channels being spaced apart a distance which is less than the spacing between said distal ends of said arms whereby said arms are forced together as said clamping plate is moved from said bight section towards said distal ends so that said press members engage and clamp together sheets of paper placed between said press members.

4,920,615

SLIDE FASTENER SLIDER WITH DETACHABLE PULL TAB

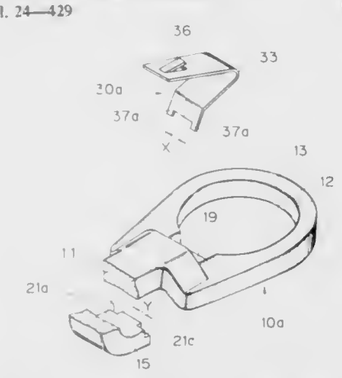
Tsunetaka Aoki, Toyamaken, and Susumu Ishii, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 11, 1989, Ser. No. 336,115

Claims priority, application Japan, Apr. 20, 1988, 63-53305[U]

Int. Cl.[5] A44B *19/26*

U.S. Cl. 24—429 **9 Claims**



1 A slide fastener slider comprising a slider body, a pull tab support pivotally connected at one end to the slider body, and a pull tab removably attached to the opposite end of the pull tab support, said pull tab support comprising: a support body including a peripheral wall defining therein an aperture for the pivotal connection to the slider body, a beam lying substantially in the plane defined by the arcuate shape of the peripheral wall and linking confronting ends of the peripheral wall and a hook portion including an upper wall extending from the confronting ends and a lower wall hooked therefrom to define with the upper wall a gap for loosely receiving an annular portion of the pull tab, said upper wall being raised above the level of the peripheral wall to thus define an opening facing the peripheral wall between the proximal end of the upper wall and the beam, the upper wall and the lower wall having in their respective inner surfaces upper engaging means and lower engaging means; and a substantially U-shaped resilient member including an upper leg, a lower leg and an arcuate joint joining the upper and lower legs, the upper leg and the lower leg having at their respective distal ends upper fitting means and lower fitting means; the resilient member having its upper and lower fitting means brought into fitting engagement with the upper and lower engaging means, respectively, of the upper and lower wall, with its upper leg fitted through the opening in and with its arcuate joint snugly embracing the beam, so that the resilient member comes into reliable engagement with the support body to thus close the gap.

4,920,616

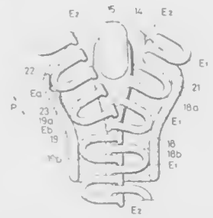
SLIDER FOR A SLIDE FASTENER

Hideo Takabatake, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,567

Int. Cl.[5] A44B *19/30*

U.S. Cl. 24—418 **6 Claims**



1 A slider for a slide fastener of the type comprising a pair of oppositely disposed stringers each carrying a row of ladder-like or meandering coupling elements, each of which elements has a head portion and a heel portion, said slider comprising upper and lower wing members spaced in parallel and joined together at their one or front ends by a connecting post, a pair of opposed lateral flanges extending from each of said wing members and inwardly directed to define with said wing members a substantially Y-shaped guide channel for the passage of said stringers, and means of locking the slider in place against inadvertent movement comprising a locking lug extending from one end of at least either one of said upper and lower flanges and adapted to arrest one of the heel portions of said elements on one of said stringers when a stress is applied to spread apart the stringers, a first locking projection extending from one end of the opposite flange and adapted to arrest one of the heel portions of said elements on the other stringer when a stress is applied to spread apart said stringers and a second locking projection on said opposite flange positioned one element pitch apart from said first locking projection such that when said first locking projection fails to arrest any one of said heel portions, said second locking projection positively arrests the next succeeding heel.

4,920,617

SEPARABLE FASTENER

Yukitoshi Higashinaka, Iruma, Japan, assignor to Kuraray Company, Ltd., Kurashiki, Japan

Continuation of Ser. No. 71,378, Jul. 9, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 266,329

Claims priority, application Japan, Jul. 30, 1986, 61-181154

Int. Cl.[5] A44B *18/00*

U.S. Cl. 24—442 **15 Claims**

1. A male fastener strip:

(a) having a multitude of hooking elements on one side of a substrate cloth woven from nylon or polyester yarn;

(b) possessing the capability of repeated engagements of interlocking and unlocking to a female fastener strip having loop elements;

(c) said hooking elements being formed by a weaving process on one side of said substrate cloth; and

(d) said hooking elements being spaced from adjacent hooking elements by X(mm) and Y(mm) in the transverse and longitudinal directions of said substrate cloth, respectively, such that the value of X is between 2.7–2.9 mm, inclusive, and the ratio X/Y is between 0.9–1.6, inclusive, whereby:



(e) directional variations of the coupling force when engaged face-to-face with a female fastener strip are small and

(f) the male fastener strip is soft in texture.

4,920,618

FASTENING CLIP

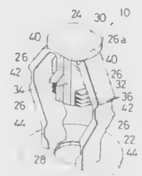
Tatsuya Iguchi, Toyota, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Nov. 29, 1988, Ser. No. 277,156

Claims priority, application Japan, Dec. 2, 1987, 62-183955

Int. Cl.[5] F16B *13/04*

U.S. Cl. 24—453 **12 Claims**



1. A clip for clampingly supporting a first member, comprising:

a flange portion having a first surface for engaging a first surface of a first member, having aperture means defined therein, to be supported upon said clip;

aperture means defined within said flange portion and defining a longitudinal axis for said clip;

axially collapsible, radially expansible, coupling means, fixedly secured at one end thereof to said first surface of said flange portion, for achieving two different states in order to support said first member upon said clip, a first one of said two different states being defined by said coupling means extending substantially axially in the direction of said longitudinal axis of said clip, and having a first axial extent, so as to be capable of insertion through said aperture means defined within said first member to be supported upon said clip, and a second one of said two different states being defined by said coupling means being axially collapsed with respect to said flange portion, and having a second axial extent which is less than said first axial extent, and being expanded radially outwardly so as to thereby engage a second surface of said first member to be supported upon said clip whereby said axially collapsible, radially expansible coupling means cooperate with said flange portion to clampingly support said first member therebetween;

insertion means, fixedly secured at one end thereof to a second end of said axially collapsible, radially expansible coupling means, for axial movement in a predetermined direction through said aperture means of said flange portion so as to axially collapse and radially expand said axially collapsible, radially expansible coupling means from said first one of said two different states to said second one of said two different states;

locking means fixedly disposed upon a second end of said insertion means for lockingly engaging a second surface of said flange portion so as to retain said axially collapsible, radially expansible coupling means in said second one of said two different states when said insertion means has been moved through said aperture means of said flange portion in said predetermined direction and to a first predetermined extent; and

means provided upon said insertion means between said first and second ends thereof for engaging said flange portion so as to limit said axial movement of said insertion means in said predetermined direction through said aperture means of said flange portion.

4,920,619

SAFETY BELT WITH INTEGRATED LOCK RELEASE

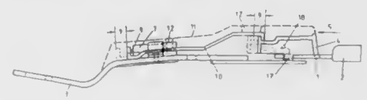
Richard Bender, Lauf, and Anton Bretfeld, Fürth, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Sep. 13, 1989, Ser. No. 406,553

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1988, 3831145

Int. Cl.[5] A44B *11/25*

U.S. Cl. 24—602 **4 Claims**



1. A safety belt device in a vehicle which comprises a lock attachable to the vehicle for accommodation of a belt provided with a lock plate wherein, by depression of a trigger key at the lock, a shape-mating connection of the lock plate with the lock is released, and a belt lock release containing a sensor, a delay device, and a pyrotechnical power element with an electrical igniter and an axially movable pin; the pin of the pyrotechnical power element being connected to the trigger key by way of a connecting member in such a way that the movement of the pin of the pyrotechnical power element, triggered by ignition, results in the complete depression of the trigger key and the depression of the trigger key by hand remains possible without hinderance.

4,920,620

BUCKLE DEVICE WITH SWITCH FOR DETECTING TONGUE LOCK

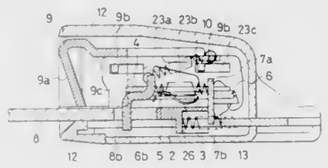
Shigemi Yamamoto, Chigasaki, and Toshiaki Seto, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,642

Claims priority, application Japan, Nov. 26, 1987, 62-178857[U]

Int. Cl.[5] A44B *11/25*

U.S. Cl. 24—641 13 Claims



1. A buckle device with a switch for detecting tongue-lock comprising:

a base;

a latch piece supported on said base so as to move between a tongue-lock position and a tongue-unlock position;

an engagement means provided so as to move between an engaged position at which said latch piece remains stationary in said tongue-lock position and a disengaged position which permits movement out of said tongue-lock position of said latch piece, such that said engagement means moves to said engaged position following said movement of said latch piece to said tongue-lock position;

a release means for setting said engagement means in said disengaged position; and

a switch assembly having an actuator and a switch for detecting whether said engagement means is located in said engaged position or not; and

said actuator positioned so that only when said latch piece is located in said tongue-lock position with said engagement means fully forcing said actuator, said switch is forced to cause said switch assembly to output a detection signal.

4,920,621

APPARATUS AND METHOD FOR FINISHING A TRAVELING TEXTILE FABRIC WEB

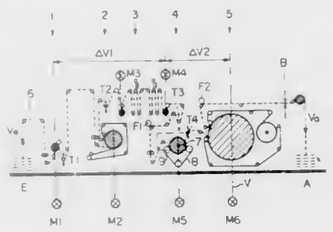
Heinz Metzen, Monchen-Gladbach, Fed. Rep. of Germany, assignor to A. Monforts GmbH & Co., Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 256,058

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734455

Int. Cl.[5] D06C *27/00*

U.S. Cl. 26—18.6 14 Claims



1. An apparatus for finishing a traveling textile fabric web comprising means for drawing the fabric web into the apparatus, means for wetting the fabric web, means for lengthwise elongation of the fabric web for producing a corresponding reduction of the widthwise dimension of the fabric web, means for compressively shrinking the fabric web in its lengthwise dimension, means for drying the fabric web, said drawing-in means, said wetting means, said elongation means, said shrinking means, and said drying means being arranged for fabric web travel sequentially thereto, means for sensing the moisture content of the fabric web immediately following said drying means and operatively associated with said drying means for controlling the drying temperature thereof, means for measuring the width of the fabric web following said moisture sensing means following said drying means and operatively associated with said elongation means for controlling the degree of lengthwise fabric web elongation and the corresponding degree of reduction of widthwise fabric web dimension, and individual respective driving means for each of said drawing-in means, said wetting means, said elongation means, said shrinking means, and said drying means, said driving means for said shrinking means being arranged as a master driving means and being operative for driving said shrinking means as a function of the lengthwise elongation of the fabric web by said elongation means to achieve a desired degree of lengthwise shrinkage of the fabric web.

4,920,622

APPARATUS FOR THE SPREADING THE GUIDING OF A WEB OF FLEXIBLE MATERIAL

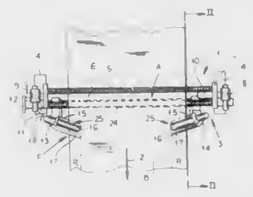
Franz Mair, Augsburg, and Wolfgang Lönner, Neusäss, both of Fed. Rep. of Germany, assignors to Erhardt & Leimer GmbH, Augsburg, Fed. Rep. of Germany

Filed Oct. 12, 1988, Ser. No. 256,841

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 8713698

Int. Cl.[5] D06C *3/06*

U.S. Cl. 26—75 18 Claims



1. An apparatus for spreading and guiding a flexible web, comprising:

a spreading device disposed along a path of a moving flexible web and including:

two spaced-apart spreading rollers extending across a width of said web generally transverse to a travel direction thereof, each of said spreading rollers being formed with thread formations of opposite hand at each longitudinal side of said web, said spreading rollers engaging opposite surfaces of said web,

common support means for journaling said spreading rollers, and

means for rotating said spreading rollers to spread said web as said web is engaged by said spreading rollers; and

a guide device downstream of said spreading rollers in said direction, said guide device including:

respective pairs of fingerlike guide rollers straddling and engaging between the rollers of each pair only respective longitudinal-edge regions of said web at said opposite sides thereof, and

means for journaling said guide rollers only at ends thereof whereby said guide rollers are cantilevered over said web, the guide rollers of each pair having axes lying in a common plane perpendicular to a plane of the web at said guide device, each of said pairs of guide rollers being inclined opposite the rollers of the other pair to said direction, said guide device being mounted on said support means so that said guide device forms a structural unit with said spreading device.

4,920,623

HEATABLE GLAZING OR CALENDERING ROLL

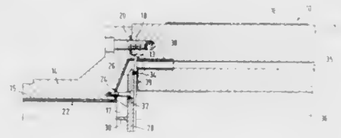
Hans-Friedrich Neuhöffer, and Erich Vomhoff, both of Konigsbronn, Fed. Rep. of Germany, assignors to Schwabische Hutenwerke GmbH, Aalen-Wasseralfingen, Fed. Rep. of Germany

Continuation of Ser. No. 175,995, Mar. 31, 1988, abandoned. This application Aug. 30, 1989, Ser. No. 401,515

Claims priority, application Japan, Apr. 2, 1987, 3711027; May 14, 1987, 3716223

Int. Cl.[5] B21B *31/08*

U.S. Cl. 29—129 10 Claims



1. A heatable glazing or calendering roll comprising:

a cylindrical roll body having a central bore, an outer material contacting cylindrical surface and axially spaced end faces extending from said central bore to said outer cylindrical surface,

a plurality of peripheral bores extending axially through the cylindrical roll body for the passage of a fluid heat carrier, each of said plurality of peripheral bores opening through said axially spaced end faces of said roll body between said roll body central bore and said outer cylindrical surface,

a flange journal for each end of the roll body,

supply and discharge conduits for the fluid heat carrier including a central bore in at least one flange journal,

a cutout in the end face of said at least one flange journal and bounded by an end face of said roll body, said cutout extending from said central bore of said flange radially outward to said end face openings of said plurality of peripheral bores to provide distribution of a fluid heat carrier to each of said plurality of peripheral bores, and

a heat insulating bush in each of said plurality of peripheral bores receiving fluid heat carrier from said supply conduit.

4,920,624

METHOD AND APPARATUS FOR MAKING A DOUBLE HELIX THERMOSTAT METAL SPRING

Henry Ty, Attleboro, Mass.; John Baptista, Pawtucket, R.I., and George DeAmaral, Rehoboth, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 7, 1988, Ser. No. 281,298

Int. Cl.[5] B21F *35/00*

U.S. Cl. 29—173 12 Claims

1. The method of fabricating a double helix coil comprising the steps of:

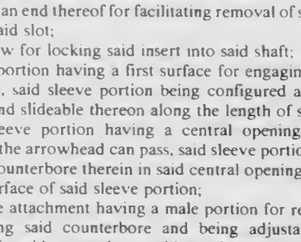
(a) providing a strip of wire;

(b) coiling said wire into a first helix;

(c) removably securing one end portion of said first helix to an arbor and forming said end portion of said first helix about said arbor to provide a proper helix shape in said one end portion of the first helix on the arbor;

(d) coiling said first helix about said arbor to form a coil having a second helix including said one end portion therein;

(e) detaching said one end portion from said arbor; and



(f) removing said coil having said second helic from said arbor.

4,920,625

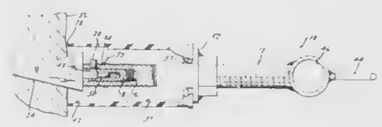
ARROWHEAD EXTRACTOR

Mark A. Smith, 408 S. 7th St., St. Clair, Mich. 48079

Filed Dec. 5, 1988, Ser. No. 280,128

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—264 4 Claims



4. An arrowhead extractor apparatus for removal of an arrowhead which is imbedded in a workpiece having a work surface, said arrowhead having a threaded shaft on the non-embedded side, said extractor comprising:

a shaft portion having surfaces defining a threaded bore at a first end thereof, a handle portion at a second end of said shaft portion, said handle including a sealable storage cavity therein for storage of tools or survival implements therein, portions of said shaft being threaded between said handle and said first end;

a removable insert, externally threaded for removable threaded engagement in said threaded bore of said shaft, said removable shaft having a threaded bore for engaging the threaded shaft of said arrowhead and a screwdriver slot on an end thereof for facilitating removal of said insert from said slot;

a set screw for locking said insert into said shaft;

a sleeve portion having a first surface for engaging a work surface, said sleeve portion being configured about said shaft and slideable thereon along the length of said shaft, said sleeve portion having a central opening through which the arrowhead can pass, said sleeve portion including a counterbore therein in said central opening adjacent said surface of said sleeve portion;

a separate attachment having a male portion for removably engaging said counterbore and being adjustably positioned in said counterbore, said attachment being removably inserted into said sleeve portion for adapting said extractor for use with an uneven work surface; and

a nut means for threadedly engaging said threaded portion of said shaft and for engaging said sleeve portion to provide relative movement between said shaft portion and said sleeve portion in response to rotation of said nut means, and for providing engagement of said first surface or said slanted surface with said work surface when said insert is engaging the threaded a shaft of an arrowhead, and said

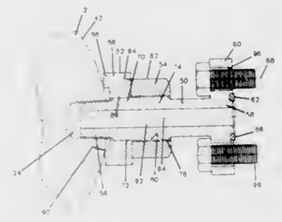
relative movement operatively pulling said arrowhead from said work surface.

4,920,626

STABILIZED CONNECTOR FLANGE FOR INTERCONNECTING AN INSTRUMENT MANIFOLD WITH AN ORIFICE PLATE ASSEMBLY

Spencer M. Nimberger, Houston, Tex., assignor to Precision General, Inc., Houston, Tex.

Filed Apr. 7, 1989, Ser. No. 335,143
Int. Cl.[5] F16L *23/00*
U.S. Cl. 29—282 12 Claims



1. Apparatus for structurally interconnecting an instrument manifold with a differential pressure assembly, the instrument manifold having first and second pressure receiving inlet ports, first and second pressure transmitting outlet ports, and a plurality of apertures positioned radially outward of a corresponding inlet port for receiving securing members to structurally interconnect the instrument manifold to the apparatus, the differential pressure assembly including first and second body surfaces and having first and second tapered NPT threaded outlet ports adjoining a respective body surface each for transmitting a pressure signal through the instrument manifold and to a differential pressure sensor, the apparatus comprising:

first and second connector flange means each having a central axis and a through passageway formed about the central axis for transmitting a pressure signal from a corresponding outlet port in the differential pressure assembly to a corresponding inlet port in the instrument manifold, each connector flange means including:

(a) a tapered threaded end fixed on the connector flange means for metal-to-metal sealing engagement with the corresponding tapered threaded outlet port in the differential pressure assembly,

(b) a flange end fixed on the connector flange means and including first and second apertures each positioned radially outward of the through passageway,

(c) a guide portion fixed on the connector flange means axially between the threaded end and the flange end, the guide portion having an external guide surface, and

(d) a threaded portion fixed on the connector flange means axially between the guide portion and the flange end and having external threads;

first and second stabilizer feet means each mounted on and axially movable along a corresponding connector flange means and having an internal surface for sliding engagement with the external surface on the guide portion, each stabilizer foot means including a plurality of stabilizer members each spaced substantially radially outward of and projecting axially toward the threaded end of the respective connector flange means for rigid engagement with the corresponding body surface on the differential pressure assembly; and

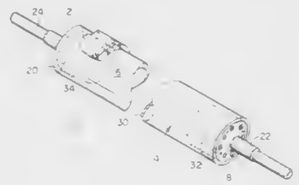
first and second tensioning nut means each threaded to the threaded portion of the respective connector flange means for exerting a substantially axially-directed compressive force on the corresponding stabilizer foot means to force the foot means into stabilized engagement with the corresponding body surface on the differential pressure assembly, such that each of the threaded ends of each connector flange means will be in tension from the compressive force of the tensioning nut means, and the stabilizer feet means will transmit substantially all radially-directed forces acting on the connector flange means to the differential pressure assembly.

4,920,627

BALANCED CARRIER ROLLS AND METHODS OF FABRICATION

Robert D. Aikins, Norristown; Lee R. Bandy, West Chester; William P. Davis, Downingtown; Robert E. Delaney, Devon; Michael E. Guyer, Coatesville; Edward D. Lovera, Aston, and Thomas A. Scamuffa, Parkesburg, all of Pa., assignors to LG Industries, Inc., Wagontown, Pa.

Filed Feb. 26, 1988, Ser. No. 160,620
Int. Cl.[5] B23P *7/00*
U.S. Cl. 29—402.08 22 Claims



1. A method of constructing a carrier roll comprising a body assembly and a pair of journals, the roll having a mass of at least about 100 pounds and being balanced to within a predetermined first residual unbalance value for rotation up to a predetermined maximum service speed of at least about 100 RPM, comprising the steps of:

fabricating a pair of substantially identical metal journals, each journal being adapted for removable mounting to either end of the body assembly and being balanced to within a second residual unbalance value less than the first residual unbalance value;

fabricating a body assembly including a hollow, generally cylindrical metal body with a pair of opposing axial ends, and a pair of metal end heads, each end head being fixedly mounted with the body in a separate one of the axial ends of the body and being adapted for removably mounting one of the journals, the body assembly being balanced to within a third residual unbalance value less than the difference between the first residual unbalance value and twice the second residual unbalance value; and

removably mounting the pair of journals to the end heads to form the roll balanced to within the first residual unbalance value

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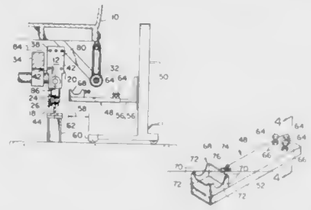
4,920,628

REPLACEMENT METHOD FOR A RAILROAD CAR BRAKE TREAD UNIT USING REMOVABLE LIFT FIXTURE

James Gennodie, 16 North St., Montrose, N.Y. 10548, and John Di Domenico, Tripp St., R.F.D. 3, Mount Kisco, N.Y. 10549

Filed Jun. 14, 1989, Ser. No. 365,892
Int. Cl.[5] B23P *19/04*; B23Q *3/16*
U.S. Cl. 29—402.08 2 Claims

1. A method for replacing a railroad car brake tread unit operably threadably bolted in depending relation beneath a railroad car using a vertically ascending and descending fork lift having a base for supporting the fork lift, said replacement method comprising the steps of: affixing a lift fixture to one of said fork lift forks, said lift fixture having a hollow arm adapted to be supported by at least one of said forks, said lift fixture having an upper surface portion conforming to at least a portion of a lower surface of said brake tread unit located at a distal end of said hollow arm, said affixing step comprising slidably receiving and securely assembling said one fork into said hollow arm such that said lift fixture extends outwardly beyond the base of said lift fork, moving said fork lift beneath said railroad car with said lift fixture in alignment beneath said brake tread unit, moving said fork lift in an ascending path, thereby establishing engagement between said brake tread unit and said lift fixture, unbolting said brake tread unit free of a railroad car supporting structure, moving said lift fixture with said brake tread supported upon said lift fixture in a descending path, moving said fork lift to a clearance position away from said railroad car and removing the brake tread unit from said lift fixture, placing a substitute break tread unit in position on said lift fixture for attachment in depending relation beneath



said railroad car, moving said fork lift with said substitute brake tread unit thereon beneath said railroad car, aligning said substitute brake tread unit with the railroad car supporting structure for same, moving said lift fixture in an ascending path, thereby positioning said substitute brake tread unit thereon in adjacent position to said railroad car supporting structure, simultaneously bolting and position-adjusting said brake tread unit with respect to said railroad car supporting structure by corresponding select ascending and descending movements of said lift fixture, thereby establishing the threadably bolted attached position of said substitute brake tread unit in said depending relation beneath said railroad car, and moving said lift fixture in a descending path, there disengaging said fixture from said substitute brake tread unit whereby said brake tread unit is replaced with optimum minimal manual handling thereof.

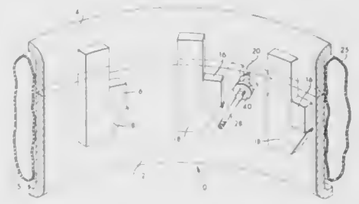
4,920,629

METHOD OF SECURING A RETREADING TUBE TO A RETREADING RIM SECTION

Thad A. Perdue, and Bobby G. Johnson, both of Muscle Shoals, Ala., assignors to Robbins Tire & Rubber Co., Inc., Tuscumbia, Ala.

Division of Ser. No. 222,267, Jul. 21, 1988, Pat. No. 4,828,470, which is a continuation-in-part of Ser. No. 942,878, Dec. 17, 1986, Pat. No. 4,780,949. This application May 8, 1989, Ser. No. 348,694
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—428 1 Claim

1. A method for securing a retreading tube to a retreading rim section, said tube having a threaded valve stem and a spacer element surrounding at least part of said stem and said rim section having a slot for reception of said stem, which comprises inserting said stem and said spacer element on said stem in said slot whereby to securely anchor said retreading



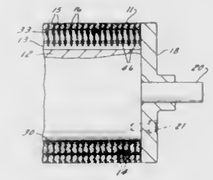
tube against said retreading rim and limit movement of said stem and said tube relative to said rim section.

4,920,630

METHOD OF MAKING PARTS FOR A MAGNETIC CYLINDER

Gregory D. Leanna, Appleton, Wis., assignor to Integrated Design Corp., Green Bay, Wis.

Division of Ser. No. 151,315, Feb. 1, 1988, Pat. No. 4,831,930. This application Jan. 19, 1989, Ser. No. 299,877
Int. Cl.[5] B21D *39/00*; B23P *19/02*
U.S. Cl. 29—521 4 Claims



1. A method of making parts for forming a magnetic cylinder including the steps of:

forming in circular disks of magnetically susceptible material, which have central apertures and opposite plane sides, a circular array of tabs which all diverge at an acute angle from one of the plane sides of each of the disks and have radially outwardly presented edges lying on a circle that is concentric to the disk,

depositing a nonmagnetic spacer ring on the surface of each disk from which the tabs diverge such that the inside of the ring surrounds and is contiguous to said radially outwardly presented edges of the tabs, and

pressing said tabs on each disk toward said one side of the disk such that said edges of the tabs wedge against the inside of the ring to fasten the ring concentrically to the disk.

4,920,631

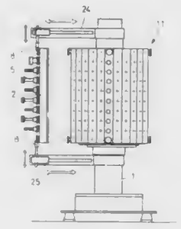
TOOL RACK FOR MACHINE TOOLS

Peter Novak, Tägerwilen, Switzerland, assignor to Starrfraschmachinen, AG., Rorschacjerberg, Switzerland

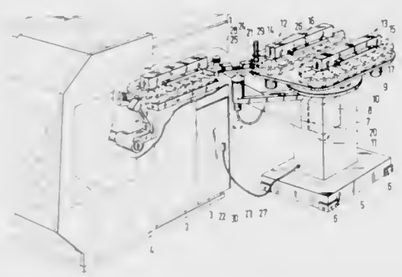
Filed Sep. 30, 1988, Ser. No. 251,899
Claims priority, application Switzerland, Oct. 8, 1987, 3941/87
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 29—568 11 Claims

1. A tool rack for machine tools with numerical control for machining workpieces, comprising storage means for storing tools; tool interchanger means for removing tools from and returning tools to said storage means; a fixed, bottom-secured, vertical column, said storage means including a cylindrical, rotatably mounted rotor supported on said column and pro-

vided with bearing means for a positive mounting of tools so that axes of said tools extend radially of said rotor, said tools being placed in a dense, closely adjacent, uninterrupted manner over an entire circumference of the bearing means of said rotor so that any direct access for said tool interchanger means to said tools for removing and returning of the tools will not be possible; and displacement means corresponding to said storage means and including gripping means radially displaceable to and from said bearing means and enabling at least one of said tools to be disengaged radially outwardly over and beyond the length of the tool stored in said rotor of said storage means to a transfer position in which direct access of said tool interchanger means to said at least one of said tools is no longer impeded and the tool can be gripped and removed from said storage means laterally thereof.



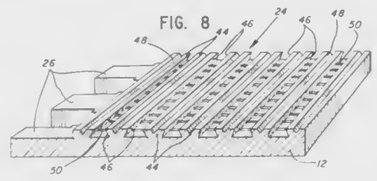
4,920,632
AUXILIARY MAGAZINE FOR ELECTRONICALLY-DRIVEN MACHINE TOOLS
Werner Babel, Pfronten, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 5, 1988, Ser. No. 280,004
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 8716086[U]
Int. Cl.[5] B23Q *3/155*
U.S. Cl. 29—568 7 Claims



1. An auxiliary magazine for use with electronically-driven machine tools especially for cutting and drilling centers, such machine tools having a machine-native tool magazine, said auxiliary magazine comprising:
a front end column;
tool storage means mounted on said front end column;
said tool storage means comprising two tool storage units mounted on a common revolving table, which table is rotatably attached to the front end column and is movable about a vertical axis;
means for selectively rotating said revolving table between tool exchange positions for each said tool storage unit; and
stationary tool exchanger means extending from the side of the said front end column, said tool exchanger means comprising a tool exchanger having a guide shoe with means to rotate it about a vertical axis, said guide shoe having two mechanically movable tongs mounted on opposite sides of said guide shoe, said movable tongs being movable by contrarotation and being thereby adapted to interchange tools between a selected one off said tool storage units and the machine-native tool magazine.

4,920,633
METHOD OF MANUFACTURING COMMUTATOR ASSEMBLIES
Thaddeus Wojcik, Des Plaines, Ill., assignor to Resinoid Engineering Corporation, Newark, Ohio
Continuation of Ser. No. 855,393, Apr. 24, 1986, abandoned. This application Mar. 9, 1988, Ser. No. 169,124
Int. Cl.[5] H01R *43/08*
U.S. Cl. 29—597 11 Claims

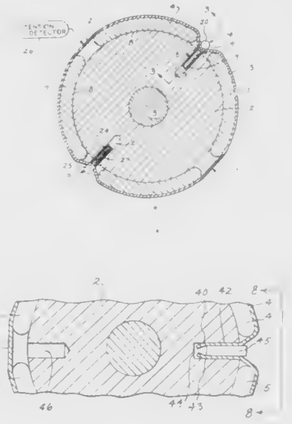
FIG. 8



1. A method of fabricating an electric motor commutator shell having a predetermined rib and groove pattern on the inside surface thereof for anchoring to a molded insulating commutator core, comprising the steps of:
providing an elongated ribbon of electrically conductive material;
rolling a plurality of relatively shallow preliminary grooves to a depth significantly less than an intended full depth of the grooves, said preliminary grooves having a bottom wall and extending longitudinally on one side of the ribbon to partially displace the conductive material, the preliminary grooves having a given width;
rolling said preliminary grooves to the full depth to completely displace the material with a width substantially equal to said given width of the preliminary grooves to form said predetermined pattern of grooves between adjacent ribs whereby fissures or other discontinuities are substantially eliminated at the bottom of the full depth grooves;
severing a length of the rolled ribbon; and
shaping the severed length into an annular form so that the rib and groove pattern is on the inside thereof for anchoring to a core of insulating material molded inside the annular form.

4,920,634
PERMANENT MAGNET ROTOR WITH MAGNET RETENTION BAND
Robert L. Cole, Ludlow Falls, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.
Division of Ser. No. 190,703, May 5, 1988, Pat. No. 4,855,630. This application May 25, 1989, Ser. No. 357,080
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—598 8 Claims

1. The method of forming a permanent magnet rotor for a dynamoelectric machine, comprising forming a rotor core having a smooth cylindrical outer surface, forming a plurality of permanent magnets having a curvature corresponding to the curvature of said core and adapted to be disposed by abutting engagement with said circumferential surface of said core, adhesively bonding a plurality of magnets in equicircumferentially spaced relation to said core, said magnets being assembled in axial alignment and circumferentially spaced from each other to define at least first and second diametrically located gaps establishing access to said core,
wrapping a retention band having free ends about said magnets with said ends aligned with one of said gaps,



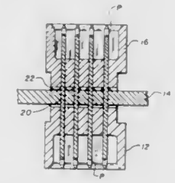
pulling said band tightly about said magnets and securing said free ends to said core to establish a predetermined tension in said band to fix said magnets to said core.

4,920,635
A METHOD OF MANUFACTURING A THERMO-SENSITIVE RESISTOR
Yasuhito Yajima, Nagoya City, Japan, assignor to NGK Insulators, Ltd., Japan
Continuation-in-part of Ser. No. 035,433, Apr. 7, 1987, abandoned. This application Jun. 28, 1988, Ser. No. 212,477
Claims priority, application Japan, May 7, 1986, 61-103178
Int. Cl.[5] H01C *7/00*
U.S. Cl. 29—612 16 Claims



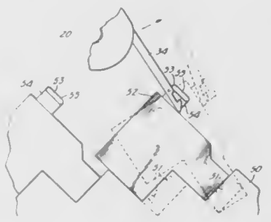
1. A method of manufacturing a thermo-sensitive resistor comprising:
providing a cylindrical or plate shape electrically insulating substrate;
forming an initial thin-film heating resistor on a surface of said substrate;
adjusting the resistance of said initial thin-film heating resistor to form a final thin-film heating resistor, said adjusting being performed by increasing or decreasing a film thickness of said initial thin-film heating resistor by means of an electroplating method or an electroless plating method without changing a width of said initial thin-film heating resistor; and
electrically connecting lead wires to said thin-film heating resistor, said lead wires being used to electrically connect said resistor with external elements and to mechanically support said thermo-sensitive rsistor.

4,920,636
PIN ALIGNMENT APPARATUS AND METHOD
Michael P. Eck, Wellsville, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed May 11, 1988, Ser. No. 192,689
Int. Cl.[5] H05K *3/00*
U.S. Cl. 29—747 25 Claims



1. An apparatus for constraining pins in a pin field and for installing a selected component onto the constrained pins, the apparatus comprising:
means for constraining an array of pins in a pin field, said constraining means having a size-controllable aperture for each pin to be constrained, the aperture controllable between at least first and second sizes, said constraining means including a first member having a fixed-size aperture therein for each pin to be constrained, a second member having a fixed-size aperture therein for each pin to be constrained, said first and second members overlying one another and relatively movable between a first position in which the fixed-size apertures are in substantial registration with one another to define a first size pin-accepting opening and second position to define a second size pin-accepting opening; and
means for positioning a component for installation on each pin in substantial alignment with the corresponding size-controlled aperture of said first-mentioned means, said positioning means including a third member overlying said first and second members and having an opening for each pin to be constrained formed therethrough for accepting a component for installation onto the pin.

4,920,637
WIRE INSERTION AND REMOVAL TOOL WITH MODULE REMOVAL MEANS
Carl Meyerhoefer, Dix Hills, and Peter Visconti, Baldwin, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.
Filed Sep. 28, 1989, Ser. No. 413,690
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—764 2 Claims



1. In a tool for removing an engaged wire conductor from a slot in an insulation displacement terminal, the tool including a manually engageable handle element and a wire removal ele-

ment having a free end projecting from said handle element, said wire removal element having hook-like means for engaging said conductor, the improvement comprising: said wire removal element being of generally U-shaped cross section and forming a base wall and a pair of parallel side walls extending to a free end thereof, said hook-like means being located in at least one of said side walls; said base wall being longitudinally shorter than said side walls to form an elongated slot between said side walls; whereby said side walls are adapted to engage an enlargement on a protector module overlying said insulation displacement terminal to facilitate removal therefrom to gain access to said insulation displacement terminal.

4,920,638

METHOD AND DEVICE FOR THE PRODUCTION OF WIRE JOINTED BAND

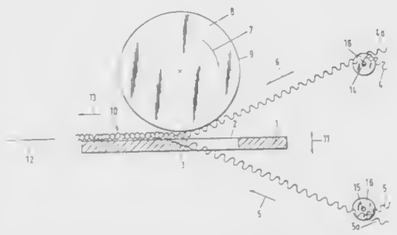
Friedrich Metzinger, Max-Reger-Str. 14, D-600 Frankfurt am Main 70, Fed. Rep. of Germany

Continuation of Ser. No. 46,872, May 12, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 281,870

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 8525221[U]

Int. Cl.[5] B23P *21/00*

U.S. Cl. 29—786 6 Claims



1 A device for producing a wire jointed-band, comprising a narrow pass provided between a roller driven in a transporting direction and a plate positioned adjacent said roller to form a space between said roller and said plate to define the narrow pass, said plate having a plurality of parallel slots having one end positioned near to said narrow pass and extending in a direction opposite from said transporting direction, said parallel slots having inclined portions at the said end near to the narrow pass, the plate existing in a first plane, the axis of rotation of the roller existing in a second plane which is perpendicular to the first plane, the inclined portions being intersected by said second plane, wherein a plurality of parallel, alternatively clockwise and counter-clockwise, respectively, wound spirals of wire which are fitted into each other to form a plurality of pairs of fitted spirals are directed to said narrow pass and opened by deflection in the vicinity of said narrow pass such that said pairs fit and partly overlap into each other, wherein a plurality of said fitted spirals are guided to said narrow pass from above and below said plate to form a wire jointed band having a plurality of overlapped fitted spirals.

4,920,639

METHOD OF MAKING A MULTILEVEL ELECTRICAL AIRBRIDGE INTERCONNECT

Ian Y. K. Yee, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Aug. 4, 1989, Ser. No. 389,845

Int. Cl.[5] H05K *3/02*

U.S. Cl. 29—846 22 Claims

1. A method of making a multilevel electrical airbridge interconnect on a substrate comprising,

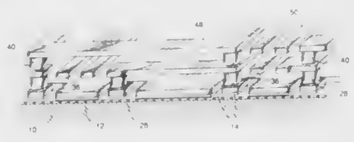
applying a metal seed layer over an underlying layer,

selectively patterning a photopolymer mask on the metal seed layer,

applying an electrically conductive layer on the unmasked portion of the metal seed layer for forming a first conductor lavel and a first part of metal support pillars,

adding a second layer of a photopolymer mask for forming another part of the support pillars,

applying another part of the metal support pillars to the first part of the metal support pillars,



applying a second metal seed layer over the second mask and said another part layer of the metal pillars,

repeating these steps one or more times for building additional levels of metal pillar supported conductors, and

sequentially removing the seed and mask layers leaving electrical conductors supported from metal pillars with a dielectric therebetween.

4,920,640

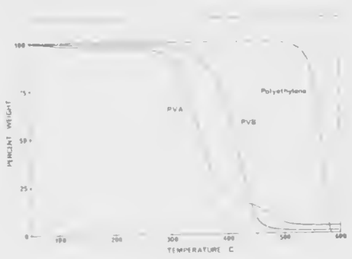
HOT PRESSING DENSE CERAMIC SHEETS FOR ELECTRONIC SUBSTRATES AND FOR MULTILAYER ELECTRONIC SUBSTRATES

Jack H. Enloe, Columbia; John W. Lau, Gaithersburg; Christian B. Lundsager, Ashton, all of Md., and Roy W. Rice, Alexandria, Va., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jan. 27, 1988, Ser. No. 148,829

Int. Cl.[5] H05K *1/03, 1/11, 3/46*

U.S. Cl. 29—852 28 Claims



1. A process for producing dense ceramic electronic substrates comprising the following steps:

(a) preparing at least one ceramic green sheet comprising ceramic powder and organic binders which leave no undesirable residue upon pyrolysis in the absence of oxygen;

(b) placing boron nitride sheets comprising boron nitride (BN) powder and organic binders which leave no undesirable carbonaceous residue upon pyrolysis in the absence of oxygen, on each side of the ceramic green sheet prepared in step (a) to form a composite;

(c) hot pressing the composite prepared in step (b) under sufficient temperature and pressure to densify the ceramic; and

(d) removing the BN layers on each side of the dense ceramic sheet.

4,920,641

METHOD OF MANUFACTURING AN ELECTRONIC PART

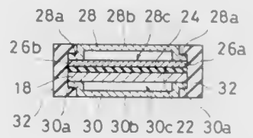
Takeshi Nakamura, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Division of Ser. No. 62,975, Jun. 17, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,735

Claims priority, application Japan, Jun. 19, 1986, 61-143776

Int. Cl.[5] H01L *41/22;* H01R *43/00*

U.S. Cl. 29—856 2 Claims



1. A method of manufacturing a plurality of electronic parts, comprising the steps of:

preparing a plurality of plate-shaped electronic elements spaced apart in a direction parallel with main surfaces of said plate-shaped electronic elements and interconnected with one another by interconnecting joints which maintain a fixed spacing between adjacent elements, each plate-shaped electronic element having connecting electrodes on both surfaces thereof;

preparing a plurality of first external electrodes spaced apart and in corresponding relationship with said spaced apart electronic elements, said plurality of first external electrodes being interconnected by interconnecting joints and each having a size large enough to substantially cover a surface of said electronic element;

preparing a plurality of second external electrodes spaced apart and in corresponding relationship said spaced apart electronic elements, said plurality of second external electrodes being interconnected by interconnecting joints and each having a size large enough to substantially cover a surface of said electronic element;

substantially simultaneously positioning said plurality of first external electrodes and said plurality of second external electrodes to contact said connecting electrodes of said corresponding plate-shaped electronic elements, respectively;

substantially simultaneously providing an insulating material in the spaces between adjacent electronic elements and on the surfaces of peripheral portions of said plurality of first external electrodes and said plurality of second external electrodes and edge portions of said plurality of electronic elements, such that said first and second external electrodes are respectively clamped onto, and in electrical contact with, respective connecting electrodes of each of said plate-shaped electronic elements so that said first and second external electrodes and said insulating material completely cover said electronic elements; and

separating said plurality of electronic elements and first and second external electrodes into individual electronic parts, each having a first and second external electrode, by cutting said insulating material between adjacent electronic elements and severing the interconnecting joints of the plurality of electronic elements, the plurality of first external electrodes, and the plurality of second external electrodes, said insulating material forming a fixing member for each electronic part.

4,920,642

METHOD FOR CONNECTING WIRES TO AN ELECTRICAL CONNECTOR

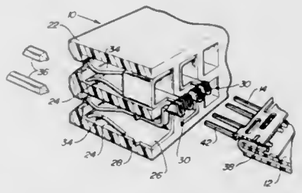
Masami Yanai, and Hiroki Maeda, both of Kanagawa, Japan, assignors to Elco Corporation, Laguna Hills, Calif.

Filed Sep. 4, 1987, Ser. No. 94,180

Claims priority, application Japan, Sep. 24, 1986, 61-223725

Int. Cl.[5] H01R *43/02*

U.S. Cl. 29—860 11 Claims



1. A method for connecting a plurality of conductors extending from a flat cable to a crimp tye micro-connector including a plurality of contacts having crimp barrels, comprising:

providing a solder-plated bus bar,

mounting a first group of selected conductors of said flat cable to said bus bar,

securing said bus bar to said flat cable,

heating said bus bar to fuse said solder plating thereon,

allowing said bus bar to cool, whereby said first group of conductors of secured to said bus bar by means of said solder,

providing a solder plating upon said crimp barrels,

positioning portions of a second group of selected conductors within said crimp barrels,

crimping said crimp barrels into contact with said second group of conductors therein,

heating said crimp barrels, thereby fusing said solder plating, and

allowing said solder to cool, whereby said second group of conductors are secured to said respective crimp barrels by means of said solder.

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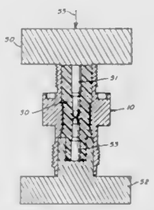
METHOD OF ASSEMBLING ELECTRICAL CONNECTOR

Ronald A. Wilson, Medway, Mass., assignor to Microwave Development Laboratories, Needham, Mass.

Filed Sep. 26, 1988, Ser. No. 248,601

Int. Cl.[5] H01R *43/20*

U.S. Cl. 29—876 41 Claims



1. A method of assembling an electrical connector that is constructed employing a rigid outer conductor body, an inner conductor, and a resilient and deformable insulating sleeve adapted to be supported between said rigid outer conductor body and said inner conductor, said method comprising the steps of, providing a bore in the rigid outer conductor body having an inwardly directed substantially annular ridge ex-

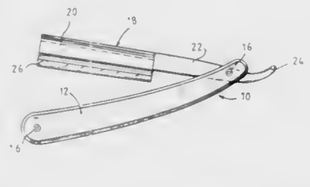
tending therefrom defining a minimum bore diameter of said outer conductor body, providing a bore in the insulating sleeve and a substantially annular recess in the outer surface of the sleeve, providing a maximum diameter of the insulating sleeve greater than said minimum bore diameter of the outer conductor body when said insulating sleeve is at a rest position, radially compressing said insulating sleeve to a smaller diameter than at said rest position absent the requirement for heat, inserting said insulating sleeve, while at least partially compressed, into the bore of said rigid outer conductor body to a position in which said rigid outer conductor body ridge is in alignment with said insulating sleeve recess, and inserting the inner conductor into said insulating sleeve bore after said insulating sleeve has been inserted into the bore of the outer conductor body.

4,920,644

DISPOSABLE STRAIGHT RAZOR AND/OR BLADE HOLDER THEREFOR

Milton LaGattuta, 61 Kings Point Rd., East Hampton, N.Y. 11937

Filed Mar. 30, 1989, Ser. No. 330,687
Int. Cl.[5] B26B *21/00, 21/08, 1/00, 1/04*
U.S. Cl. 30—53 **4 Claims**



1. An economical simply-constructed straight razor which is at least in part disposable comprising a handle, a blade holder having a holder portion and a shank portion connected to said holder portion, said shank portion being pivotally mounted on said handle at an end of said shank portion opposite said holder portion and a razor blade forming a heel mounted in said holder portion, said blade holder and said handle being made of inexpensive, easily-used materials, said handle being made of two substantially parallel similar shaped handle panels connected by two connecting pins, said shank portion being pivotally mounted on one of said connecting pins, said shank portion being deformable and having a nearly circular-cross sectioned recess located in a side facing said handle which is engageable with said connecting pin so that said blade holder with said razor blade is replaceable or disposable, said holder portion having a longitudinal groove having deformable side walls, said side walls of said holder portion having a plurality of projections for holding a heel of said razor blade, said longitudinal groove being laterally smaller than said razor blade and said side walls having opposing pressing lips so that said razor blade is tensionally held when slid in said longitudinal groove with said pressing lips.

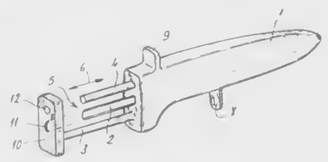
4,920,645

VEGETABLE OR FRUIT PEELER

Jacques Baudouin, Les Tourelles, 07100 Rouiffieux, France

Filed Feb. 21, 1989, Ser. No. 312,518
Claims priority, application France, Feb. 19, 1988, 88 02504
Int. Cl.[5] B26B *3/03, 11/00, 29/00, 1/00*
U.S. Cl. 30—162 **15 Claims**

1. A fruit or vegetable peeler, comprising:
a handle;
a cutting blade;
at least one guide bar parallel to said blade,
a unit consisting of said cutting blade and said at least one spaced guide bar having means for moving the unit in translation towards said handle to selectively retract said



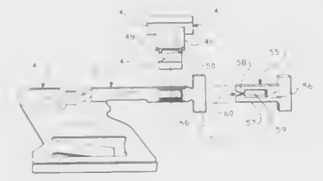
unit into said handle to release peels wedged between said blade and said guide bars.

4,920,646

REPLACEABLE ADJUSTMENT MECHANISM

Jerry L. Grant, 14744 Washington Ave. #306, San Leandro, Calif. 94578

Filed Apr. 5, 1988, Ser. No. 177,626
Int. Cl.[5] B26B *1/08*
U.S. Cl. 30—162 **5 Claims**



4. A retractable blade utility knife having a replaceable adjustment mechanism, comprising:
a pair of mating housing components fastenable together to form a generally hollow interior space and an exterior surface which is contoured to facilitate grasping of said exterior surface;
a blade carrier and a cutting blade mountable thereon, said blade carrier adjustable between a retracted safety position and at least one exposed cutting position, and said blade carrier having a bore for receiving an adjustment mechanism; and
a replaceable adjustment mechanism including an adjustment member having a manual interface button fastened to a shank mounted in said bore in said blade carrier, and a clip means mounted on said shank and abutting the surface of said blade carrier wherein said shank has a reduced perimeter portion defined by notches and a further reduced perimeter portion defined by a groove, and said clip means has two opposed resilient arms defining an inner recess and an access opening, said inner recess having dimensions corresponding to said further reduced perimeter portion of said adjustment member, wherein the outer contour of said clip means corresponds generally to the outer contour of the receiving structure, wherein the thickness of said reduced perimeter portion of said shank at said notches corresponds to the thickness of the receiving structure, and the thickness of said further reduced portion of said shank at said groove corresponds to the thickness of said resilient arms of said clip means, wherein said clip means abuts the lower surface of the receiving structure.

4,920,647

DEVICES FOR THE REMOVAL OF CAULK FROM EXISTING CAULKED JOINTS

Michael D. Riley, 1431 W. 183rd St., Homewood, Ill. 60430

Continuation-in-part of Ser. No. 42,042, Apr. 24, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 329,273
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—169 **20 Claims**



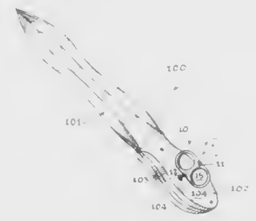
1. A caulk bead removal tool for removing caulk and beading from a groove between spaced side-by-side concrete building panels comprising a handle, a U-shaped mounting bracket at one end of the handle, means securing a center bracket leg of the bracket to one end of the handle, the bracket having a pair of parallel bracket legs extending from opposite ends of said center bracket leg in a longitudinal direction along a longitudinal axis of the handle but away from the handle, a pair of relatively flat tool steel cutting blades, means securing said blades to said parallel bracket legs, each of said blades having four bevel cut edges, and four right angle corners where said bevel cut edges meet, the four bevel cut edges being arranged in two sets with the edges in each set being disposed in parallel relation, the blades having their bevel cut sides mounted on the parallel bracket legs in such a way that one of said blades has its bevel cut side secured in face to face relation to the associated bracket leg and with another of said blades having its flat back side secured in abutment with an outside face of the associated parallel bracket leg.

4,920,648

SWIVEL GRIP ARRANGEMENT FOR COMBAT KNIVES

Gerald L. Jones, 2130 Deauville Rd., Richmond, Va. 23235

Filed Mar. 23, 1989, Ser. No. 310,579
Int. Cl.[5] B26B *27/00, 1/02, 29/00, 9/00*
U.S. Cl. 30—298 **7 Claims**



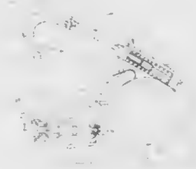
1. A swivel grip arrangement in combination with a combat knife including a knife blade having a blade stem with at least one cutting surface and a relatively sharp point and a knife handle having hand grip members disposed on opposite sides of the blade stem wherein the arrangement comprises:
a finger grip unit including a finger grip member having a plurality of finger holes;
an axle unit comprising an elongated axle member operatively engaged with said finger grip member; and,
an axle capturing unit comprising a capture member which radially projects from, and is secured to, the periphery of the elongated axle member; wherein, the finger grip unit is disposed on one side of the knife handle; the axle member projects through at least one of the hand grip members on said one side of the knife handle; and, the capture member is disposed on the opposite side of said at least one handle grip member; whereby the finger grip member is capable of at least rotary movement relative to said combat knife; wherein the at least one cutting surface is operatively exposed regardless of the orientation of the knife blade relative to the users hand.

4,920,649

ARRANGEMENT IN A CHAIN SAW

Hans I. Ström, Kode, and Ulf J. G. Petersson, Floda, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 16, 1989, Ser. No. 311,723
Claims priority, application Sweden, Feb. 24, 1988, 8800626
Int. Cl.[5] B23D *59/00;* **H02N** *7/00*
U.S. Cl. 30—382 **5 Claims**



1. In a chain saw having:
a body;
a cutter bar connected to the body for carrying a cutting chain;
a cockable cutting chain brake releasable by means of an electromagnetically controlled release mechanism (15), and
an electrical system, the improvement comprising:
(a) an amplifier and an input circuit therefor provided in the release mechanism, said input circuit including a piezo-electric crystal (37) positioned near the base of the cutter bar where the cutter bar is fastened to the saw body, said piezo-electric crystal generating a voltage when substantial forces are exerted on the cutter bar during a kick-back, the voltage being transmitted as a release impulse to said amplifier, said amplifier also being supplied a reference voltage from the electrical system of the chain saw, the output of said amplifier activating said release mechanism to cause release of said chain brake as a result of said kick-back.

4,920,650

TENSION ARRANGEMENT

Dag H. Edlund, Huskvarna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 24, 1989, Ser. No. 315,727
Claims priority, application Sweden, Mar. 4, 1988, 8800793
Int. Cl.[5] B27B *17/00*
U.S. Cl. 30—386 **5 Claims**

1. A tension arrangement at the saw sword (15) of a chain saw in which the sword is secured with at least one sword bolt

(11) to the saw body (12) and is displaceable in its longitudinal direction by means of a tension screw (24) extending in the same longitudinal direction, said screw being journaled in bearings on a clutch cover (10) connected to said saw body, means defining as elongated groove (17) on said saw body, a cavity (18) on said saw body in alignment with said groove, a



pin (19) movable along said groove and said cavity and extending through and fixed to said sword, said pin having an end portion protruding at the opposite side of the said sword for engagement with threads (27) on said tension screw so that rotation of said tension screw produces relative movement between said sword and said saw body.

4,920,651
SHEETROCK BEVELING APPARATUS
Douglas W. Schmidt, R.R. 2, Box 135, Mott Farm Rd., Tomkins Cove, N.Y. 10986
Filed Feb. 13, 1989, Ser. No. 309,610
Int. Cl.[5] B27C *1/10*
U.S. Cl. 30—475 **4 Claims**



1. A sheetrock beveling apparatus for use with a pair of abutting pieces of sheetrock to bevel the opposed edges of the sheetrock, wherein the apparatus comprises:
a housing, said housing having a substantially planar surface on one side thereof;
a handle attached to the opposite side of said housing;
a blade having a cutting edge wherein the effective cutting surface of the edge is wider at the center than at the ends thereof such that the center of the blade will extend a greater distance than the ends beyond the planar surface of said housing during rotation thereof to produce a beveled cut on the opposed surfaces of the abutting pieces of sheetrock;
means for rotatably attaching said blade to said housing about an axis;
power means for selectively causing said blade to rotate; and
an elongated guide means attached to said housing on said planar surface and being dimensioned to be received in a seam between said two abutting pieces of sheetrock to guide said blade to bevel the abutting edges of sheetrock, said elongated guide means extending longitudinally transverse to the axis of rotation of said blade.

4,920,652
DOUBLE SIDED HACK-SAW BLADE
James D. Johnson, 9623 Majestic La., Stockton, Calif. 95209
Filed Mar. 29, 1989, Ser. No. 330,131
Int. Cl.[5] B23D *49/10*
U.S. Cl. 30—504 **5 Claims**



1. A double sided hack-saw blade, comprising:
a thin elongated metal strip having opposed longitudinal side edges provided with first and second parallel saw tooth cutting edges;
means for reversibly securing said strip to a hack-saw handle to allow alternative use of said first and second cutting edges;
a removable cover for engagement with one of said cutting edges when not in use;
and
a lubricating wick in said cover for lubricating said hack-saw blade

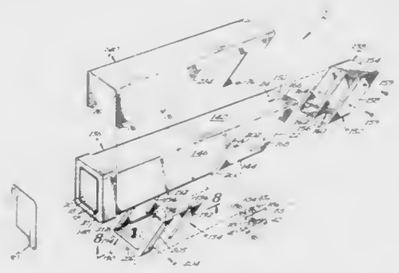
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4,920,653
FABRIC MARKING SYSTEM
Ernest A. Kussmaul, 146 Sunset Dr., Sayville, N.Y. 11782
Filed Jul. 18, 1988, Ser. No. 220,065
Int. Cl.[5] D06H *1/00*
U.S. Cl. 33—18.1 **10 Claims**



1. A fabric marking system for marking a fabric, said fabric being one of stationary and in linear motion, comprising:
first and second applicator pads in opposition facing first and second surfaces of said fabric;
means for disposing said first and second applicator pads in a selectable one of first and second positions;
said first position being spaced from said fabric, forming a gap therewith;
said second position being in urged contact with said fabric;
means for feeding a supply of markers;
said supply of markers including a carrier having a plurality of markers disposed thereon at generally regular intervals;
means for partially stripping one of said markers from said carrier to produce a stripped portion, an unstripped portion of said marker remaining affixed to said carrier;
said stripped portion projecting into said gap; and
said first and second applicator pads being effective in said second position for affixing at least said stripped portion of said fabric.

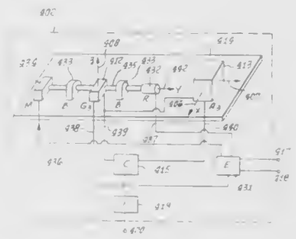
4,920,654
VIEWING APPARATUS
Ronald J. Sanders, P.O. Box 658, Floodwood, Minn. 55736
Filed Apr. 1, 1988, Ser. No. 176,617
Int. Cl.[5] F41G *1/16*
U.S. Cl. 33—252 **12 Claims**



1. Device for providing elevation adjustment of a sighting apparatus with respect to weaponry comprising, in combination: means for adjustably securing the sighting apparatus to the weaponry at one of a plurality of positions with respect to the weaponry between an upper position and a lower position, with the sighting apparatus being parallel in each of the plurality of positions to the upper and lower positions; with the adjustably securing means comprising, in combination: a generally U-shaped member for slidably receiving the sighting apparatus, with the U-shaped slidably receiving member including first and second legs extending on opposite sides of a central portion, with the central portion secured to the weaponry, with the first and second legs having a thickness; elongated protuberances formed on opposite sides of the sighting apparatus and having a height beyond the sides of the sighting apparatus generally equal to the thickness of the legs; elongated slots formed in the first and second legs of the slidably receiving U-shaped member for receiving the elongated protuberances, with the protuberances being accessible through the elongated slots; and means for removably fixing the sighting apparatus in the slidably receiving member.

4,920,655
HIGH SPEED WELL SURVEYING AND LAND NAVIGATION
Donald H. Van Steenwyk, San Marino, Calif., assignor to Applied Technologies Associates, San Marino, Calif.
Continuation of Ser. No. 60,648, Jun. 11, 1987, Pat. No. 4,833,787, which is a continuation-in-part of Ser. No. 768,740, Aug. 23, 1985, Pat. No. 4,706,388. This application Nov. 7, 1988, Ser. No. 267,551
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[5] G01C *9/00*
U.S. Cl. 33—304 **6 Claims**

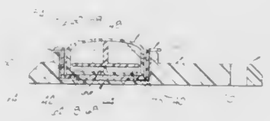
1. In a land vehicle navigation apparatus, the combination with the vehicle comprising
(a) inertial angular rate sensor means having a sensitive axis,
(b) inertial acceleration or tilt sensor means having at least two sensitive axes, said sensitive axes being arranged to be nominally located at the vehicle in a plane parallel to the Earth's surface,
(c) a rotary drive operatively connected to said (a) means to rotate said (a) means about an axis extending generally at the vehicle in a plane parallel to the Earth's surface,
(d) circuitry operatively connected with said (a) and (b) sensor means to determine three vehicle orientation angles, roll, pitch, and azimuth, with respect to an Earth-fixed coordinate set at a first location, and to also determine said three vehicle orientation angles as the land vehicle travels over the Earth's surface wherein changes to said azimuth angle during travel are determined by integration of the output of said (a) sensor means,



(e) said (a) and (b) means and said (c) drive being carried by the vehicle, having support means on which the vehicle travels over the Earth's surface,
(f) at least one of said (a) and (b) sensitive axes being canted

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4,920,656
COMPASS ASSEMBLY WITH DIAL BIASING DISK
Gregory L. Cross, Arvada, Colo., assignor to Sun Company, Inc., Arvada, Colo.
Filed Aug. 11, 1989, Ser. No. 393,521
Int. Cl.[5] G01C *17/04*
U.S. Cl. 33—355 R **8 Claims**



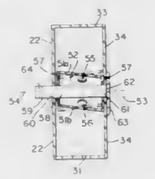
1. A compass assembly comprising:
(a) a base member;
(b) a dial member received in a recessed portion of said base member and rotatable relative the base member about a dial member central longitudinal axis;
(c) a compass housing member received in a recessed portion of said dial member and fixedly secured to said base member by a connection device;
(d) said connection device having a first surface attached to said housing member and a second surface attached to said base member and a peripheral edge surface positioned in frictionally engaging contact with said dial member;
(e) whereby said dial member is captured between said base member and said compass housing member and whereby said dial member is biased against rotation relative said base member and said compass housing member by said connection device.

4,920,657
ASSEMBLY FOR PLUMB BOB AND LINE
Richard A. Doyle, 54 E. Kidder St., Portland, Me. 04103
Filed Oct. 23, 1987, Ser. No. 113,146
Int. Cl.[5] G01C *15/10*
U.S. Cl. 33—393 **10 Claims**

1. An assembly for a plumb bob and line comprising:
a casing;
a rotor mounted in the casing for rotation about a first axis normal to the casing, the rotor having a body formed therewith that is concentric with a second axis that intersects the first axis at an acute angle centrally of the rotor, the body terminating at each end in a plane normal to the first axis;
a plumb bob;

a line having two ends one of which is connected to the rotor body and the other end of which is connected to the plumb bob; and

means for rotating the rotor about the first axis in two directions, respectively, to wind in and distribute the line axially along the axis of rotation and to pay out the line, the casing having side walls respectively substantially normal to the first axis closely beyond the rotor ends to restrict the axial distribution of the line to within the side walls.



4,920,658

COLLAPSABLE FRAMING SQUARE

Jeffrey B. Hile, Rear 95 Benlomond St., Uniontown, Pa. 15401

Filed Oct. 19, 1988, Ser. No. 259,827

Int. Cl.[5] B43L *7/06*

U.S. Cl. 33—499 **11 Claims**



1. A collapsible framing square, comprising:

a first flat rigid arm;

a second flat rigid arm;

a pivot pin permanently attached to one side of said first arm adjacent an end thereof;

a pivot plate permanently attached to said second arm adjacent and extending beyond an end thereof, said pivot plate defining a hole with a diameter equal to that of the diameter of said pivot pin such that said pivot plate fits over said pivot pin;

a spring situated over said pivot pin to engagingly bias said pivot plate against said first arm; and

locking means for securing said spring onto said pivot pin.

4,920,659

MEASURING APPARATUS FOR DETERMINING A CIRCUMFERENTIAL LENGTH OF A BODY

Reinhard Becher, Engelbergstrasse 42, D-7000 Stuttgart 31, Fed. Rep. of Germany

Filed Oct. 5, 1988, Ser. No. 253,968

Int. Cl.[5] G01B *3/10*

U.S. Cl. 33—555.4 **4 Claims**

1. A measuring apparatus for determining a circumferential length of a body, comprising:

an elongate, non-extensible tape measure having a first and a second terminal;

a measuring scale applied to said tape measure; first guide means for guiding said tape measure, and having first actuating means for either axially locking or allowing axial displacement of said tape measure relative to said first guide means, and, further, having a first index mark adjacent said tape measure;

second guide means for guiding said tape measure, and having second actuating means for either axially locking or allowing axial displacement of said tape measure relative to said second guide means, and, further, having a second index mark adjacent said tape means;



an elastic element having a first terminal fixedly attached to said first guide means and having a second terminal fixedly attached to said second guide means;

said first terminal of said tape measure being fixedly attached to said first guide means in a direction opposite said elastic element, said tape measure extending from said first guide means through said second guide means for being guided therein adjacent said second index mark and, then, extending further through said first guide means for being guided therein adjacent said first index mark.

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FINE POSITIONING DEVICE AND DISPLACEMENT CONTROLLER THEREFOR

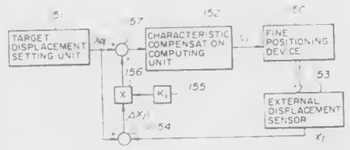
Kiyoshi Nagasawa, Ibaragi; Kozo Ono, Toride; Kojiro Ogata, Ishioka; Ken Murayama, Ibaragi, and Yoshihiro Hoshino, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Division of Ser. No. 94,294, Sep. 8, 1987. This application Sep. 14, 1988, Ser. No. 244,169

Claims priority, application Japan, Sep. 9, 1986, 61-210616; Sep. 9, 1986, 61-210618; Sep. 9, 1986, 61-210619; Nov. 4, 1986, 61-262437; Nov. 29, 1986, 61-283061; Nov. 29, 1986, 61-283062; Nov. 29, 1986, 61-283063; Mar. 31, 1987, 62-76269; Mar. 31, 1987, 62-76270

Int. Cl.[5] G01B *7/00*; **G05B** *11/01*

U.S. Cl. 33—568 **3 Claims**



1. A displacement controller for a fine positioning device constructed by combining a plurality of fine motion units which are individually equipped with planar flexible beams arranged in an opposing relation between two rigid members and an actuator for applying a force between the rigid members so as to produce a relative displacement corresponding to a drive voltage of the actuator between the rigid members, which comprises:

(a) a target displacement setting unit for setting a target displacement for each predetermined point on the fine positioning device and outputting a target displacement signal corresponding to the target displacement; and

(b) a characteristic compensation computing unit having characteristics opposite to a characteristic matrix, which represents the relation between the drive voltage applied to each fine motion unit and the resulting displacement at the predetermined point, and adapted to compute a drive voltage signal corresponding to a voltage to be applied to each actuator of each fine motion unit on the basis of the target displacement signal in accordance with the opposite characteristics, said characteristic compensation computing unit being composed of electrical computing means.

4,920,661

DEHYDRATING MACHINE

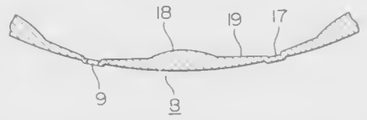
Sooichi Fukuzawa, Hitachi, and Tamotu Shikamori, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,575

Claims priority, application Japan, Oct. 9, 1987, 62-253774

Int. Cl.[5] F26B *17/30*

U.S. Cl. 34—58 **6 Claims**



1. A dehydrating machine for performing a centrifugal dehydration by a high speed rotation of a dehydrating tub having a plurality of dehydrating ports, wherein the dehydrating tub includes a plurality of inwardly directed circumferentially spaced protrusions formed on an inner surface of a wall of the dehydrating tub, and wherein a total volume of the plurality of imperforate protrusions is in a range of 3 to 6% of a total volume of the dehydrating tub.

4,920,662

LINT REMOVER FOR TUMBLE-DRYER

James W. Seeburger, 16310 Heatherdale Dr., Houston, Tex. 77059

Filed Oct. 11, 1988, Ser. No. 255,783

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—60 **17 Claims**



1. A device to aid in cleaning for removing lint and other light surface articles from the fabrics in a tumble-type machine such as a laundry dryer, said device comprising:

a weighted object for tumbling in a tumble-type machine with fabric to be treated with at least one adhesive area on its surface, said adhesive area intermittently comes into physical contact when tumbles with the fabric to be treated,

whereby light surface articles on the fabrics would be drawn to said adhesive area when said device and the fabrics are co-tumbling in an operative tumble-type machine.

4,920,663

ATHLETIC SHOE, PARTICULARLY A TENNIS SHOE, AND PROCESS FOR PRODUCING SUCH A SHOE

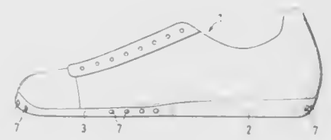
Udo Flemming, Erlangen, Fed. Rep. of Germany, assignor to PUMA Aktiengesellschaft Rudolf Dassler Sport, Herzogenaurach, Fed. Rep. of Germany

Filed Jun. 20, 1989, Ser. No. 368,706

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1988, 3820787

Int. Cl.[5] A43B *13/24*

U.S. Cl. 36—73 **21 Claims**



1. An athletic shoe with wear-resistant parts provided in an area of an outsole to increase the wear resistance of the sole, wherein the wear-resistant parts are made of a material selected from the group consisting of oxide ceramics, metal carbides and metal nitrides, and are embedded in.to the outsole in an upwardly directed edge in at least a toe area of the outsole in such a way that an outer surface of the wear-resistant parts ends approximately flush with an outer surface of the edge of the outsole.

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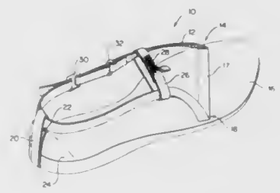
LONGITUDINAL SUPPORT SLING

Rob R. McGregor, Concord, Mass.; Kenneth W. Misevich, Griswold, Conn., and Thomas E. Mintel, Rahway, N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Oct. 31, 1988, Ser. No. 264,618

Int. Cl.[5] A43B *3/12*

U.S. Cl. 36—11.5 **21 Claims**



1. A foot support structure which is attached to a shoe so as to provide support to the medial arch of a foot in a longitudinal direction while acting as a supplement to the longitudinal fascia, ligaments and tendons of the foot, comprising:

a shoe outsole having medial and lateral side portions and a heel portion; and

a sling strap having a pair of anterior end portions, one anterior end portion being secured adjacent said medial side portion of the outsole and the other anterior end portion being secured adjacent said lateral side portion of the outsole, said sling strap extending around the periphery of said heel portion and having a portion extending along the medial and lateral side portions of said outsole, the anterior end portion of said sling strap on the medial

side portion being anchored to said outsole at a position anterior to the location of the first metatarsal of the foot and with the anterior end portion of said sling strap on the lateral side portion being anchored to said outsole at a position proximate and adjacent a location of the posterior portion of the fifth metatarsal of the foot.

4,920,665

PIVOTING SKI BOOT

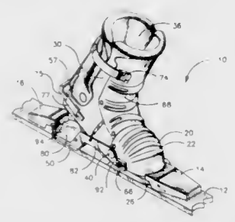
Roger N. Pack, Box 841, Edwards, Colo. 81632, and Eddress Ahmad, Box 1725, Avon, Colo. 81620

Filed Apr. 13, 1987, Ser. No. 37,531

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.[5] A43B *5/04;* **A43C** *9/00*

U.S. Cl. 36—117 **43 Claims**



1. A ski boot for receiving a skier's foot and ankle in a manner that minimizes torsional rotation of the foot, while permitting bending movement about the ball of the foot and adapted for releaseable attachment to front and rear boot bindings on a ski, the ski boot comprising:

a toe portion having a toe sole and a relatively rigid upper toe shell, said toe sole in said upper toe shell configured to extend around and enclose a forward part of the foot from a forward tip receiving the toes rearwardly to a location proximate the ball of the foot, said upper toe shell having a rear edge extending over the ball of the foot, said forward tip defining an exterior surface which is sized and configured to be capable of being received and engaged by a front binding mounted on a ski for releaseable binding engagement therewith;

a rear heel portion having a rear sole and a relatively rigid upper rear shell, said upper rear shell having an access opening to permit insertion and removal of the foot and extending around the ankle and back part of the foot forwardly to a location proximate the ball of the foot and having a forward edge extending over the ball of the foot, said rear sole underlying the foot and extending from a location proximate the ball of the foot rearwardly to a sole heel beneath the heel of the foot;

hinge means for interconnecting said toe portion and said rear heel portion in relative rotational motion about a rotational axis in a plane substantially parallel to the plane of the toe sole, said relative rotational motion taking place between a flat position wherein the respective planes of said toe and rear soles are substantially parallel and a flex position wherein the planes of said soles are at an angle with respect to one another, said forward edge and said rear edge defining a wedge-shaped cutout region between said toe and rear shells when said soles are in the flat position, said hinge means further inner-connecting said toe portion and said rear heel portion in a manner substantially prohibiting relative torsional movement therebetween;

a heel bracket including a heel member located adjacent said sole heel when the boot is in the flat position, said heel bracket pivotally connected to said toe portion for pivotal movement with respect thereto independently of pivotal motion of said heel portion, said heel member sized and configured to be capable of being received and engaged by the rear binding mounted on the ski for releaseable binding engagement therewith;

said toe portion being secured by said front binding and said heel member being secured by said rear binding such that the plane of said toe sole is substantially parallel to the side of the ski upon which said front and rear bindings are mounted, said securing of the toe portion being such that said heel portion is capable of pivoting about said fixed rotational axis between said flat and flexed positions while said rear binding secures said heel member, said pivoting thereby facilitating skiing in the traditional nordic style.

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DYNAMIC INNER LINING SHOE FOR BOOTS

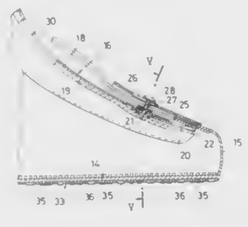
Antonello Marega, Nervesa della Battaglia Treviso, Italy, assignor to Calzaturificio Tecnica Spa, Treviso, Italy

Filed Nov. 10, 1988, Ser. No. 269,415

Claims priority, application Italy, Nov. 26, 1987, 22762 A/87

Int. Cl.[5] A43B *5/04, 19/00, 23/26*

U.S. Cl. 36—119 **11 Claims**



1. An inner lining for boots, comprising a sole, an upper containing a fore opening, and provided at said fore opening with a tongue, and a leg portion by which said upper is completed, wherein said tongue is forwardly and rearwardly slidably connected to said upper.

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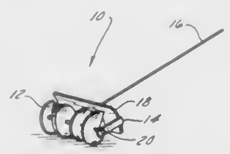
SNOW REMOVAL DEVICE

James W. Dixon, 856 E. Badger La., West Bend, Wis. 53095

Filed Apr. 3, 1989, Ser. No. 333,023

Int. Cl.[5] E01H *5/02*

U.S. Cl. 37—285 **11 Claims**



7. A device for removing various types of materials from a surface, said device comprising:

an auger having an axle and said auger being in rolling engagement with the surface,

a blade mounted for pivotal movement on said axle, and

a handle operatively connected to said blade for rolling said auger on the surface to discharge the material transversely from said blade.

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STEAM IRON WITH PRESSURE EQUALIZATION CONDUIT

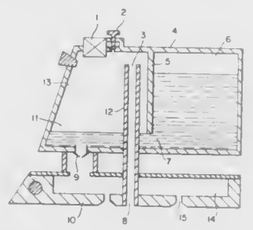
Gerd Henneberger, Neu Isenburg, and Gerald Reiss, Heusenstamm, both of Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,649

Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715059

Int. Cl.[5] D06F *75/18*

U.S. Cl. 38—77.81 **6 Claims**



1. A steam iron having a water tank, a vaporization chamber, a drip valve for supplying water from the water tank to the vaporization chamber, the drip valve being the only opening between the tank and the vaporization chamber, pressure generator means for pressurizing the interior of the water tank, and a conduit having one opening in the tank interior arranged to be above the water level during ironing, and another opening formed in the sole of the iron, whereby the tank interior is connected to the sole of the iron by the conduit.

4,920,669

IRONING BOARD COVER COATING WITH SOLE IRON SOLE LUBRICANT

Henry Mattesky, Cedar Grove, N.J., assignor to Herbert Glatt, Morristown, N.J.

Filed Jan. 12, 1989, Ser. No. 296,240

Int. Cl.[5] D06F *83/00*

U.S. Cl. 38—140 **11 Claims**



1. A fabric cover for an ironing board, of size and shape to completely cover at least the upper surface of a conventional ironing board, having at least a segment thereof coated upon upper surface of the said cover with at least 3 g/m^2 dry loading of a coating selected from the group consisting of silicone elastomers and resin matrices containing lubricating agents, whereby the drag resistance of a laundry iron sole, to be used to iron laundry on said ironing board cover is reduced by heating said sole to between 100° to 290° C. and passing said heated sole in sliding contact over the surface of said coated segment.

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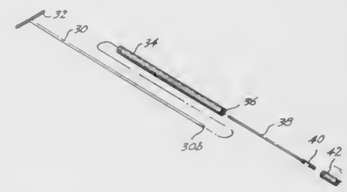
FISH TAG

Russell D. Amick, Seattle, Wash., assignor to Floy Tag & Mfg., Inc., Seattle, Wash.

Filed Dec. 21, 1988, Ser. No. 288,613

Int. Cl.[5] G09F *3/00*

U.S. Cl. 40—300 **3 Claims**



1. A fish tag comprising:

a flexible tube having a longitudinal channel, a first end and a second end,

a first monofilament extending through said channel from said first end through and beyond said second end of said tube,

the first end of the first monofilament carrying a tag retention means for securing the tag to a fish,

the second end of the first monofilament terminating outside and adjacent the second end of the tube,

a second monofilament having a first end extending part way into said channel inwardly from the second end of the flexible tube and further having a second end terminating adjacent the second end of said first monofilament, and

a heat shrinkable member shrinkably secured to the second end of the first monofilament and the second end of the second monofilament to prevent the tube from separating from the monofilaments.

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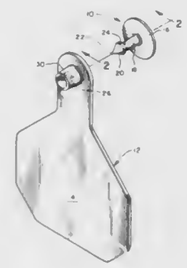
MALE COMPONENT FOR TWO-PIECE ANIMAL EAR TAG

Robert J. Zatkos, Cody, Wyo., assignor to Y-TEX Corporation, Cody, Wyo.

Filed Feb. 22, 1985, Ser. No. 704,159

Int. Cl.[5] G09F *3/00*

U.S. Cl. 40—301 **9 Claims**



1 A male component for a two-piece animal ear tag comprising:

a tab portion formed of a relatively flexible plastic material;

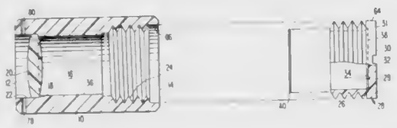
a tip portion formed of a relatively hard plastic material; and

a hollow stem portion joining said tab and tip portions, said stem portion being unitary and including a relatively flexible portion adjacent to said tab, a relatively hard portion adjacent to said tip, and a transition zone between

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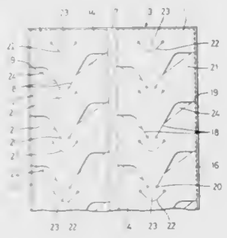
said relatively flexible portion and said relatively hard portion, said plastics being blended in said transition zone to form a unitary piece of plastic material.

4,920,672
MEDICAL PENDANT WITH ENHANCED VISIBILITY
Frederick W. Scott, Jr., and Joseph P. Santi, both of Pembroke Pines, Fla., assignors to Medi-Quip, Inc., Davie, Fla.
Filed Nov. 18, 1988, Ser. No. 272,817
Int. Cl.[5] G02B *27/02*
U.S. Cl. 40—363 **15 Claims**



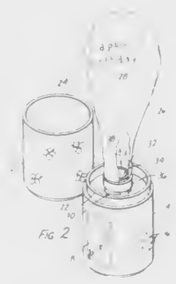
1. A pendant for viewing medical or physical information comprising:
a hollow center, elongated plastic housing with two opposing open ends made of a material that is translucent to light and which diffuses light into the housing's interior;
magnifying lens sealingly mounted in said interior at one end of the housing, said lens providing a first closure for said interior adjacent said one end;
a film retainer sealingly and removably mounted at the other end, opposite said one end, of said housing, said film retainer made of a material that is translucent to light such that light is diffused through said retainer, said film retainer providing a second closure for said interior adjacent said other end; and
a diazo film having a solid color background with light transmissive character depicting said information, said film mounted on an inboard surface of said film retainer;
wherein said film retainer is threadably attached to said housing.

4,920,673
CARD HOLDER
Masuhiro Mitsuyama, 1071, Kinugasa, Wake-cho, Wake-gun, Okayama, Japan
Filed Mar. 30, 1988, Ser. No. 175,247
Claims priority, application Japan, Oct. 23, 1987, 62-162872[U]
Int. Cl.[5] B42F *5/00*
U.S. Cl. 40—405 **2 Claims**



1. A card holder for holding cards and the like, comprising:
two plate-like bases hinged together and moveable from an open to a folded position,
the inside of said plate-like bases being formed of a transparent material and having provided thereon a plurality of pairs of opposing slits for inserting cards, said pairs of opposing slits being spaced vertically apart from each other at intervals slightly greater than the vertical height of the cards so that the cards do not overlap when inserted, whereby the entire faces of the inserted cards are visible without having to be removed,
the top ends of each pair of opposing slits being spaced horizontally apart from each other at an interval slightly greater than the horizontal length of said cards, the top ends of each pair of opposing slits bending downwardly and inwardly, each pair of opposing slits extending downwardly and toward each other and terminating at opposite ends thereof, said opposite ends being spaced horizontally apart from each other at an interval less than the horizontal length of said cards, and
at least one pair of opposing slits having one opposing slit which is different from the other opposing slit in vertical height at the top ends thereof.

4,920,674
INFLATABLE COMMUNICATION DEVICE
Henry W. Shaeffer, 825 Elyria Dr., Los Angeles, Calif. 90065
Filed Nov. 14, 1988, Ser. No. 270,791
Int. Cl.[5] G09F *19/08*
U.S. Cl. 40—412 **5 Claims**



1. In combination, an assembly comprising:
(a) an inflatable balloon having an interior with an opening capable of being inflated by an introduction of gas;
(b) means for providing pressurized gas adapted to be assembled in pneumatic relation to the opening of said balloon to inflate said balloon upon actuation of switch means, said pressurized gas providing means comprising a turbine in an air flow channel pneumatically connected to the opening of said balloon, and in which channel said turbine compresses gas when rotated; and
(c) switch means selectively actuable into an opened positioned and into a closed position and pneumatically connected to said inflatable balloon and to said means for providing pressurized gas, said switch means for opening an air conduit between said pressurized gas means and said balloon when in an opened position, and for sealing said conduit when in a closed position.

4,920,675
ADVERTISEMENT TOOL
Norio Mashimo, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 12, 1989, Ser. No. 337,046
Claims priority, application Japan, Apr. 27, 1988, 63-055862[U]
Int. Cl.[5] G09F *7/00*
U.S. Cl. 40—492 **16 Claims**

1. An advertising tool comprising a rectangular-shaped case having a top wall, bottom wall and a side wall connecting the top wall to the bottom wall; a plurality of plates; and means for rotatably coupling one end of each of the plates to one end of the case for movement between a position with the plates received in the case to a position with the plates being pivoted

to extend out of the case, one of said plates supporting a picture panel which is slidably mounted for movement in the longitudinal direction of the plate from a free end of said plate, said

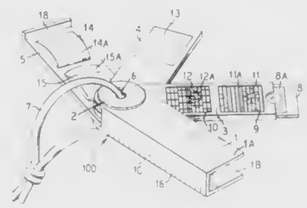
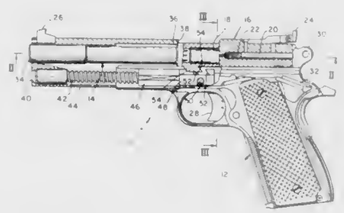


plate having a window so that pictures on said picture panel can be viewed from outside as the picture panel is moved in said plate.

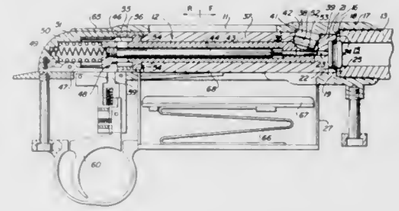
4,920,676
PISTOL WITH AN INTERCHANGEABLE BARREL
Franz-Josef Peters, Senefelder Str. 19, D-4790 Paderborn, Fed. Rep. of Germany
Filed Jul. 1, 1988, Ser. No. 214,384
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 8709136[U]
Int. Cl.[5] F41C *3/00, 21/22, 11/00*
U.S. Cl. 42—25 **12 Claims**



1. A pistol comprising:
a grip piece;
barrel means for holding a cartridge;
a breech movably mounted on said grip piece for holding the barrel means and movable relative to the barrel means, the breech having a smooth concussion base;
first claw means for engaging a cartridge base;
second claw means, opposite the first claw means, for supporting the cartridge base;
an ejector cooperating with the breech; and
means responsive to movement of the breech relative to the barrel, for spreading the second claw means from the cartridge base while the first claw means retains engagement of the cartridge base, thus pivoting the cartridge for ejection.

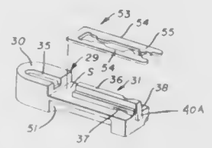
4,920,677
BOLT ACTION RIFLE
Dale E. Schuerman, 10335 N. Scottsdale Rd., Suite B, Scottsdale, Ariz. 85253
Filed Jun. 19, 1989, Ser. No. 367,886
Int. Cl.[5] F41A *3/22*
U.S. Cl. 42—16 **7 Claims**

1. A bolt action rifle comprising firing chamber means for the support of the entirety of the surface of the cartridge case during detonation exclusive only of such area of such cartridge case as must unavoidably be unsupported due to engineering tolerances in the fit together of manufactured components wherein said firing chamber means comprises a cavity formed by the abutment together of a non-rotating bolt, an extractor hook (**26**), a breech ring (**18**), and a barrel, said cavity sized and shaped to entirely surround, contact, and support the case of a cartridge inserted therein said cavity, said extractor hook attached to said bolt and movable therewith, said extractor hook adapted to seize said cartridge forcing said cartridge to move with said bolt during both movement of said bolt toward and away from said firing chamber means abutment-formed cavity such that the resulting controlled round feeding pre-



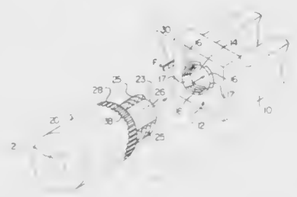
vents double loading because an improperly retracted bolt ejects a firstly inserted cartridge before a second cartridge can be inserted into said abutment-formed cavity, said breech ring (**18**) having a flange adapted to fill entirely within engineering tolerances an undercut (**20**) in said bolt not filled by said extractor hook such that mutual abutment of said flanged breech ring **18**, barrel, extractor hook, and bolt form the described cavity which provides support for said cartridge during detonation preventing cartridge rupture due to non-support and sealing said rifle mechanism to contain debris from a cartridge rupture.

4,920,678
CONVERSION KIT FOR SEMIAUTOMATIC WEAPONS
Michael W. Brown, 215 Steedly Drive, Louisville, Ky. 40214
Filed May 4, 1989, Ser. No. 347,225
Int. Cl.[5] F41D *7/03*
U.S. Cl. 42—25 **4 Claims**



1. An improvement to a caliber conversion kit for semiautomatic firearms having original replaceable barrel, an original replaceable ammunition clip, an original replaceable bolt assembly before the modification to small caliber ammunition use, the improvement comprises in combination a replacement barrel of a reduced caliber bore, a replacement bolt assembly for the original bolt assembly, said replacement bolt assembly comprises a bolt housing and a striker bolt assembly affixed in said bolt housing, said striker bolt assembly comprising a multi-portioned main body member, one of said portions being multi-configured with an upstanding stepped rib, a bifurcated ejection clip engageable on said rib, a tapered firing pin protrusion positioned on one end of said upstanding stepped rib, said tapered firing pin protrusion is tapered outwardly from a free end of said stepped rib to an end face of said striker bolt below said upstanding stepped rib, means for engaging said tapered firing pin protrusion, and means for registering said striker bolt with one end of said replacement barrel.

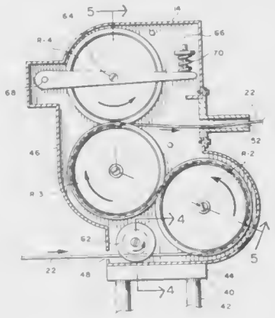
4,920,679
FIREARM WITH DETACHABLE BARREL
J. Stephen Sarles, and L. P. Thompson, Jr., both of Bldg. D, 412 Space Park South, Nashville, Tenn. 37211
Filed Sep. 21, 1988, Ser. No. 247,386
Int. Cl.[5] F41C *21/22*
U.S. Cl. 42—75.02 13 Claims



1. A firearm including a barrel adapted for facile mounting on and removal from the breech thereof, comprising:
a barrel extension as part of the breech and terminating in a resistance surface adapted to maintain said barrel extension against forces exerted thereon,
a bore formed in said barrel extension and extending inwardly from said resistance surface,
said bore having spaced around the periphery thereof internal threads interrupted to from three thread segments extending into said bore from the periphery thereof and separated by threadless portions of the bore, two of said segments describing an arc of about 60° and the third an arc of about 62.5°,
and a barrel terminating at one end in a portion protruding axially therefrom, said barrel protrusion defining a blocking surface at its juncture with said barrel end,
said barrel protrusion carrying on its periphery external threads interrupted to form three thread segments extending outwardly from the periphery thereof and separated by three threadless portions of the protrusion,
the thread segments of the barrel protrusion being sized to complement the threadless portions of the barrel extension bore so that the threaded end of the barrel can be inserted into the bore of the barrel extension by aligning thread segments of one with threadless portions of the other,
the thread segments of the barrel and the barrel extension being so constructed that upon relative rotation of the barrel and the barrel extension when the barrel protrusion is in the bore, thread segments of each engage each other and on rotation the barrel and barrel extension are movable axially together to a position in which said barrel extension resistance surface and said barrel blocking surface are contiguous and substantially no further rotation and conjunctive axial movement between said barrel and barrel extension can take place.

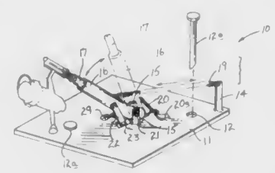
4,920,680
LINE SETTER METHOD AND APPARATUS
Peter B. Lindgren, 871 S.W. 19th St., Boca Raton, Fla. 33486
Filed Nov. 3, 1988, Ser. No. 266,512
Int. Cl.[5] B66D *1/76*
U.S. Cl. 43—4.5 23 Claims

1. A method of setting mainline of a longline fishing system including a fishing vessel having a forward speed, a supply spool, payout rollers, and a drive roller comprising the steps of:
winding the mainline to be set on a cylindrical supply spool,
removing the line from the supply spool by drive rollers thereby inducing a tension in the mainline,
sensing the tension in the mainline while the same is being set to determine an empirical tension for maintaining a tension on the line from the cylindrical supply spool and the drive roller, and driving the payout rollers at a speed which is



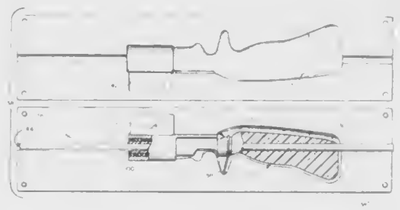
the same as or greater than that of the forward speed of the fishing vessel.

4,920,681
FISHING POLE HOLDER APPARATUS
Joseph Toliver, Jr., 8717 Dolomite, El Paso, Tex. 79904, and John T. Crank, 4821 Junction, El Paso, Tex. 79924
Filed Aug. 11, 1989, Ser. No. 392,370
Int. Cl.[5] A01K *97/10*
U.S. Cl. 43—21.2 6 Claims



1. A fishing rod holder comprising,
a planar base member, and
a tubular rod member pivotally mounted at its lowermost end relative to an upper surface of the base member, and
a first spring biasing the rod holder in a retracted second position, and
a pivoted hook link mounted forwardly of the rod holder maintaining the rod holder in a first trigger position when the hook link is selectively secured to the rod holder a boss member, including an enlarged head and an elongate shank is orthogonally and integrally mounted to a side surface of the rod holder, and the hook link includes an opening directed rearwardly of a forward edge of the hook link to receive the boss member therein.

4,920,682
ONE-PIECE INTEGRAL FISHING ROD HANDLE
James E. Andreasen, Magnolia Springs; Casey J. Childre, and David B. Peed, both of Foley, all of Ala., assignors to Lew Childre & Sons, Inc., Foley, Ala.
Division of Ser. No. 822,752, Jan. 27, 1986, Pat. No. 4,762,584.
This application Apr. 18, 1988, Ser. No. 182,468
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—22 14 Claims



7. The fishing rod handle of claim 1, wherein said solid handle portion is molded around said reel seat body.

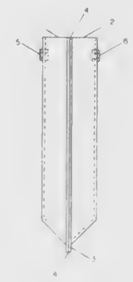
4,920,683
FISHING BAIT AND LURE HOLDER
Jimmie L. Weber, 13915 Jaycreek Ct., Houston, Tex. 77070
Filed Jun. 20, 1989, Ser. No. 368,658
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—25.2 6 Claims



1. A readily attachable and removable bait or lure holder for fishing tackle, comprising:
first and second semi-cylindrical portions;
hinge mean joining said portions together along adjacent elongated sides;
latching means on opposite elongated sides of said portions adapted to secure said portions together to define a cylindrical cavity therein;
semicircular end walls integral with each end of each said portion, each said end wall having therein a semi-circular recess with recesses in like end walls together defining aligned holes in opposite ends of said holder, said aligned holes being offset from the elongated axis of said holder providing a greater unobstructed volume for said cavity, whereby said holder can be mounted on a fishing pole or rod to enclose and protect bait or lure attached to a fishing line during transport and/or storage of the fishing tackle.

4,920,684
THROW-AWAY CASTING BAG
Ogden W. Vincent, 2166 La Miel Way, Campbell, Calif. 95008
Continuation-in-part of Ser. No. 882,776, Jul. 7, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 122,358
Int. Cl.[5] A01K *97/04*
U.S. Cl. 43—41.2 6 Claims

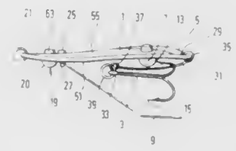
1. A casting bag comprising:
(a) said bag being made of at least one sheet of material which is made to allow water to penetrate from one side to the other,
(b) said material being held together in at least one overlapped seam by a glue which loses its holding ability when immersed in water,



(c) said bag being closed on the front, back, bottom, and sides, said bag being open at the top, and
(d) an attachment means being two grommets located in said material on each side near the top of said bag and an attachment hook for insertion through said grommets, said hook also being attached to a fishing line

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4,920,685
FISHING SPINNER
Louis J. Landuydt, 200 Ducharme, Dorval, Quebec, Canada (H9S 2H7)
Filed Jun. 20, 1989, Ser. No. 378,578
Claims priority, application Canada, Jul. 8, 1988, 571561
Int. Cl.[5] A01K *83/00*
U.S. Cl. 43—42.04 43 Claims



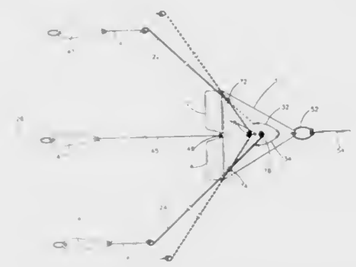
1. A fishing lure, comprising:
a fishing lure body having a front and rear portion;
a fishing treble hook having barbed points and means for attachment of said lure to said hook, said attachment allowing for an extended and retracted position of said hook;
a replaceable spring-steel weed guard positioned to protect said hook from snagging weeds while said hook is in the retracted position;
replaceable rubber nubs releasably attached to and located under said body to permit embedding of said barbed points into said nubs when said hook is in said retracted position; and
said barbed points being forced free of said nubs and said hook being free to move to said extended position upon a fish striking said hook.

4,920,686
SIDE STEPPER WORMS WITH RATTLE AND SINKER
Welbourne D. McGahee, 1120 Federal Dr., Melbourne, Fla. 36107, and John W. Campbell, Montgomery, Ala., assignors to Loop-A-Line, Inc., Melbourne, Fla., by said Welbourne D. McGahee
Filed Feb. 7, 1989, Ser. No. 307,099
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.24 33 Claims



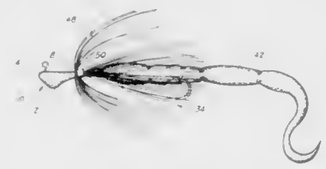
1. A fishing lure, comprising:
a lure body;
a body cavity within said lure body;
a slot entrance into said cavity;
a cylindrical body including a lure adjunct receiving cavity and cap means for retaining said lure adjunct within said cavity; and
said body cavity providing a means for carrying said cylindrical body entirely within said lure body.

4,920,687
ROTATING FISHING LURE SPREADER FOR USE WHILE TROLLING
O. Lynn Barnett, 39 Elora Ave., Akron, Ohio 44319
Filed Jun. 29, 1989, Ser. No. 373,266
Int. Cl.[5] A01K *91/04*
U.S. Cl. 43—42.74 13 Claims



1. A rotatable spreader for use in fishing and specifically for trolling, said spreader comprising:
a substantially planar body having a surface area on each side thereof and having a leading edge adapted at the forwardmost portion thereof for connecting to a fishing line and a trailing edge adapted to cause rotation of said body about a longitudinal axis thereof when said body moves relative to the surrounding water; and
a plurality of elongate sweep arms extending beyond the area of said body said sweep arms being attached at the proximal end thereof to said body such that each sweep arm forms an obtuse angle with said longitudinal axis of said body, each said sweep arm adapted on the distal end thereof for the attachment of additional fishing tackle for attracting and hooking a fish, said sweep arms rotating with said planar body and thereby causing said additional tackle to revolve in a substantially helical path relative to said surrounding water.

4,920,688
SWIVEL JIG FISHING LURE
Chuck Devereaux, Stratford, and Joe D. Craig, Moore, both of Okla., assignors to Hart Tackle Company, Inc., Stratford, Okla.
Continuation-in-part of Ser. No. 931,200, Nov. 17, 1986, Pat. No. 4,751,789. This application May 27, 1988, Ser. No. 199,530
The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.39 3 Claims

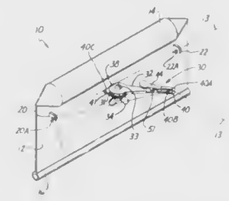


1. A swivel jig fishing pure comprising:
a hard body which has a forward end and a rear end and which includes:
a protuberant lobe on the lower side thereof;
a rounded nose portion at the upper side of the forward end thereof;
a rear end portion; and
a neck portion between said lobe and said rear end portion;
a continuous wire extending through said hard body and including:
a forward eye disposed immediately above the nose portion of the body for the engagement of a retrieving line;
a rear eye projecting rearwardly from the rear end portion of the body;
a central portion extending between the forward eye and the rear eye from one end of the body to the other end thereof;
a first, forward leg connected to and extending from said forward eye into the body, and diverging from, and extending at an acute angle to, said central portion of said wire; and
a second, rear leg connected to and extending from said rear eye into the body and diverging from, and extending at an acute angle to, said central portion of said wire;
a hook movably connected to rear eye; and
a resilient flexible artificial bait species having a portion threaded over the connection between the hook and the rear eye, and further having a portion impaled by the barb of the hook.

4,920,689
WATER KITE AND METHOD OF USING THE SAME
Kenneth D. Anderson, 705 W. 30th, Kearney, Nebr. 68847
Filed Jan. 27, 1989, Ser. No. 303,717
Int. Cl.[5] A01K *91/00*
U.S. Cl. 43—43.13 9 Claims

1. A fishing apparatus, comprising:
a plate having a float at its upper end and an elongated axially extending protuberance at its lower end to maintain the plate vertical in the water;
means for slidably securing a fishing line to said plate; said means being disposed on one side of said plate and said line being freely slidable relative to the plate;
means for releasably securing said fishing line to said plate and for guiding said plate in predetermined discrete angles relative to the fishing line when said plate is drawn through water; and

wherein said means for slidably securing a fishing line to said plate is a pair of eyelets each with a slit defined by a pair



of convex walls for releasably receiving the fishing line within said eyelet.

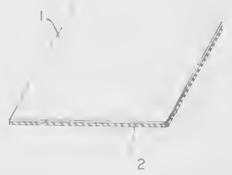
4,920,690
CABLE TRAP
Ray Olecko, 28 MacAuley Place, Winnipeg, Manitoba, Canada (R2G 0P8)
Filed Sep. 5, 1989, Ser. No. 403,199
Claims priority, application Canada, Jul. 7, 1986, 499159
Int. Cl.[5] A01M *23/34*
U.S. Cl. 43—87 20 Claims

1. An animal trap comprising in combination a pair of elongated arms movable from a set position to a sprung or released position and vice versa, means at one end of said arms connecting same together and including spring means normally urging the distal ends of said arms away from one another, a flexible cable being connected by one end thereof, for sliding movement, along the length of one of said arms, a trapping loop on the other end of said cable, means on the distal end of the other of said arms slidably receiving said trapping loop of said cable and freely guiding same, cable pivot means on said one arm adjacent said spring means, trap retainer means for detachably supporting said trap by said one arm thereof, a flexible link extending from said one end of said flexible cable, freely passing through said cable pivot means and being secured to said trap retainer means, and trigger means operatively extending between said arms when in the set position, said one end of said cable means sliding along said one arm away from said one end thereof, when said trap is sprung thereby pulling said trapping loop through said means on the distal end of the other of said arms and rapidly decreasing the size of said sliding loop as the distal ends of said arms are moved apart by said spring means.

4,920,691
FUEL ADDITIVE
Morton Z. Fainman, 11200 Homedale St., Los Angeles, Calif.
Filed May 22, 1989, Ser. No. 355,438
Int. Cl.[5] C10L *1/18*
U.S. Cl. 44—57 10 Claims

1. A liquid hydrocarbon fuel and additive composition for use in a reciprocating liquid fuel engine, the additive being present in an amount sufficient to increase engine performance and reduce smoke emissions, from about 100 to 1,000 parts per million by volume of said fuel and consisting essentially of a mixture of:
(a) from 10 to 90 wt.% of the additive being a straight-chain carboxylic acid ester having a molecular weight of about 125 to 200; and
(b) from about 90 to 10 wt.% of a combustion-survivable neopentylpolyol ester of a straight-chain carboxylic acid, having a molecular weight of from about 300 to 1000.

4,920,692
MULCHING FILM FOR REPELLING INSECT PESTS
Shuji Kitamura, Nagaokakyo; Kiyohiko Nakae, Nishinomiya; Kozo Kotani, Toyonaka; Takanori Kume, Takatsuki, and Hideo Negawa, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Feb. 5, 1987, Ser. No. 11,035
Claims priority, application Japan, Aug. 6, 1986, 61-185853
Int. Cl.[5] A01G *7/00, 13/10*
U.S. Cl. 47—9 17 Claims



1. A mulching film for lowering underground temperature and repelling insect pests, which comprises a reflective film layer having a reflective peak at a wavelength of less than 0.4 μm and having not less than 1.4 of a ratio (R_A/R_B) of the ultraviolet peak reflectance (R_A) and the visible light reflectance (R_B) at a wavelength of 0.5 μm, and a black film layer with the proviso that said reflective film layer contains a reflective material other than titanium oxide of the rutilated type or aluminum powder.

4,920,693
FLOWER POT
Phyllis Meade, 809 8th Ave., Largo, Fla. 34640, and George Spector, 233 Broadway #3815, New York City, N.Y. 10007
Filed Oct. 5, 1989, Ser. No. 417,899
Int. Cl.[5] A47G *7/00*
U.S. Cl. 47—41.12 5 Claims



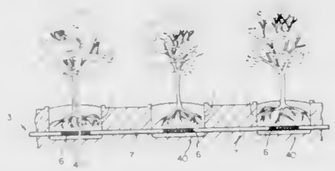
1. A flower pot for decorative artificial flowers comprising:
(a) a pair of cans, each having an open end with a cutout slot extending therefrom;
(b) a styrofoam block sized to be placed into the open end of each of said cans so that said cans will abut each other with said cutout slots in alignment with each other;
(c) adhesive tape for securing the open ends of said cans to each other;
(d) a small tube placed into side wall of one of said cans for fluid drainage therefrom; and
(e) means for coating said cans to simulate a log so that the decorative artificial flowers can be inserted through the cutout slots and into said styrofoam block to offer a new novel and decorative external appearance.

4,920,694

METHOD AND APPARATUS FOR CULTURING PLANTS

Teruo Higa, Ginowan, Japan, assignor to Saken Co., Ltd., Fukuoka and Ryoko Co., Ltd., Tokyo, both of, Japan

Division of Ser. No. 863,563, May 15, 1986, Pat. No. 4,771,572.
This application Jun. 23, 1988, Ser. No. 189,978
Claims priority, application Japan, Sep. 12, 1985, 60-202280
Int. Cl.[5] A01G *25/06;* A01C *21/00*
U.S. Cl. 47—58 4 Claims



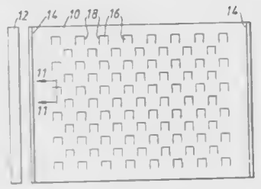
1. A method for culturing plants, comprising the steps of:
providing a culture bed having means for containing moisture and being filled with soil;
planting said plants in said soil;
introducing moisture into said culture bed through pipe means buried in said culture bed;
controlling the level of capillary penetration of said moisture such that said moisture penetrates the entirety of said culture bed prior to germination of said plants and penetrates a preselected distance below ground level subsequent to germination of said plants; and
leaching accumulated salts from said culture bed at predetermined intervals to achieve substantially complete removal of said salts from said culture bed, including the steps of:
applying an aqueous solution of a coagulant of an acrylamide derivative to the surface of said culture bed; and
removing said aqueous solution including said accumulated salts from said culture bed through said pipe means.

4,920,695

CONTAINER SYSTEM FOR GROWING PLANTS

Jeffrey S. S. Garden, Aberdeen, assignor to Ceretech Limited, Oak Harbor, Wash.

PCT No. PCT/GB87/00066, § 371 Date Jul. 27, 1988, § 102(e) Date Jul. 27, 1988, PCT Pub. No. WO87/04589, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 30, 1987, Ser. No. 227,911
Claims priority, application United Kingdom, Jan. 31, 1986, 8602460; Mar. 22, 1986, 8607173
Int. Cl.[5] A01G *9/02*
U.S. Cl. 47—83 8 Claims



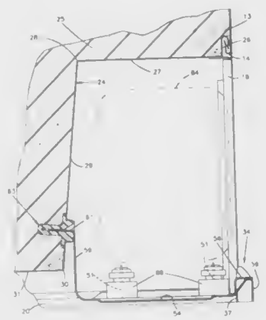
1. A container for growing plants in a growing medium which comprises:
at least one wall panel provided with openings through which plants can be grown, said one wall panel being generally stiff but capable of being resiliently flexed between planar and curved configurations, being essentially planar in its unflexed state, and being vertical and curved in ground plan in the assembled container;
closure means for said openings in said wall panel, said closure means comprising flaps which are integral with the panel, which lie in the plane of the wall panel when closed, which are formed by making cuts through the panel, which open outwardly to form the openings on horizontal hinges defined between opposite ends of the cuts at the lowermost edges of the flaps, and which are retained in the openings when the flaps are reclosed; and
panel connector means connecting together adjacent wall panel edges to form a continuous container wall.

4,920,696

REFRIGERATION COMPRESSOR MOUNT

Harold S. Mawby, Belding, and Douglas E. Weaver, Greenville, both of Mich., assignors to While Consolidated Industries, Inc., Cleveland, Ohio

Filed Feb. 3, 1989, Ser. No. 306,775
Int. Cl.[5] F25D *11/00*
U.S. Cl. 312—214 11 Claims



1. A refrigerated cabinet assembly having a compressor compartment and a compressor within said compartment, said compartment being defined by a pair of side wall portions of said cabinet and a compartment wall extending between said side wall portions and including a vertically extending portion, a compressor support including a rail extending across said compartment and secured at each end to the adjacent side wall portion, a mounting plate secured at one side to said rail, said mounting plate extending horizontally from said rail toward said compartment wall, means securing said compressor to said mounting plate, a resilient bushing secured in said vertically extending portion of said compartment wall, and a tongue on said mounting plate extending into said bushing.

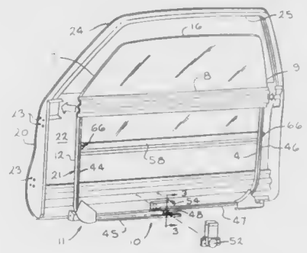
4,920,697

DUAL DRIVE WINDOW REGULATOR MECHANISM

Curtis F. Vail, Ann Arbor; Robert H. Dietze, Bloomfield Hills; Thomas F. Kracht, St. Clair Shores; Joanne H. Cole, Ann Arbor, and Marc D. Hewko, Dearborn, all of Mich., assignors to Hoover Universal Inc., Ann Arbor, Mich.

Continuation of Ser. No. 272,640, Nov. 17, 1988, abandoned.
This application Oct. 18, 1989, Ser. No. 423,659
Int. Cl.[5] E05F *11/38*
U.S. Cl. 49—348 5 Claims

1. In a vehicle door assembly having a generally vertical window opening and a storage cavity beneath the window opening, a generally vertical window glass having fore and aft upright edges and a generally horizontal lower edge, said glass being movable between a raised position closing the opening and a lowered position stored in the storage cavity, the improvement comprising a window regulator mechanism operable to drive the glass along a path extending between said raised and lowered positions and operable to guide said window glass within said path, said regulator mechanism being coupled to said glass at two spaced locations adjacent the lower glass edge for driving and guiding said glass, said regulator mechanism including:
a pair of elongated hollow tracks in said cavity, at least a portion of each track being upright, said tracks having side walls and one side wall of each track having a continuous slot extending lengthwise of said tracks, each of said tracks terminating in upper ends at the top of said upright portions, said upper ends being disposed adjacent the top of said storage cavity;
a pair of flexible and elongated sliding members, one of said pair of sliding members disposed within one of said tracks and the other of said pair of sliding members disposed within the other track, said sliding members being confined within said tracks so that movement of said sliding members relative to said tracks is limited to sliding movement lengthwise in said tracks, said sliding members including means for engaging said members to drive said members within said tracks, said engaging means being accessible through the slot in said tracks;
means for attaching said sliding members to said glass at two separate point locations adjacent said lower glass edge for moving and guiding said glass along said path in response to movement of said sliding members within said tracks, said glass attaching means being firmly attached to said glass to provide the guidance for said glass along said path whereby said glass is driven and guided at said two point locations; and
drive means extending through said slots in both of said tracks and operatively associated with said engaging means of said sliding members for simultaneously moving said sliding members within said tracks to effect movement of said glass along said path between said raised and lowered positions.



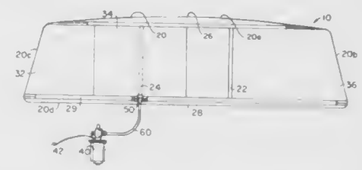
4,920,698

POWERED SLIDING TRUCK CAB WINDOW

Donald E. Friese, Northridge; James W. Brown, Costa Mesa; Frank MacEwen, Anaheim; E. G. LeVan, Long Beach, and Michael Smith, Torrance, all of Calif., assignors to Noran, Sherman Oaks, Calif.

Filed Oct. 28, 1988, Ser. No. 264,216
Int. Cl.[5] E06B *1/00*
U.S. Cl. 49—380 12 Claims

1. A power window replacement assembly for the rear window opening of a truck cab or the like, comprising:
a frame having at least two opposed sides and having substantially the same shape as the window opening;
three window panes housed within the frame, wherein a first pane is fixedly mounted in the frame to form the first side of the frame, a second pane is fixedly mounted to form part of the second side of the frame and a third sliding pane is mounted in the frame, the third sliding pane being adapted to slide at least partially past the first fixed pane in a first horizontal direction to a fully opened position and to slide in a second horizontal direction to a closed position wherein when the sliding pane is moved to its fully closed position, the three panes filling the frame when the sliding pane is in the closed position;
an electrical motor;
an engagement means affixed to the sliding pane; and



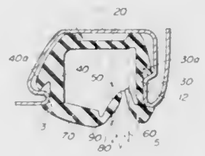
a drive engagement means coupled to the motor and mounted at least partially in the frame and contacting the engagement means for moving the engagement means in the first and second horizontal directions.

4,920,699

STRUCTURE OF A WEATHERSTRIP MEMBER FOR SEALING AN END OF A PANE OF WINDOW GLASS APPLICABLE TO A VEHICULAR DOOR

Nobuyoshi Nagata; Hideki Sugiyama; Kiyotaka Uemura, and Mikio Takebayashi, all of Chiba, Japan, assignors to Kinugawa Rubber Industrial Co., Ltd., Chiba, Japan

Filed Feb. 11, 1988, Ser. No. 155,117
Claims priority, application Japan, Feb. 18, 1987, 62-035162; Mar. 12, 1987, 62-057848; Mar. 13, 1987, 62-058478
Int. Cl.[5] E06B *7/22*
U.S. Cl. 49—441 5 Claims



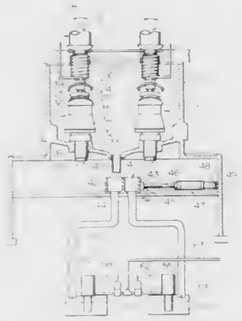
1. A door construction, comprising;
a door frame including a door sash portion having a sash bottom portion and opposing side portion;
a pane of window glass for a vehicular door, said pane of window glass being movable between a closed position and an open position,;
a weatherstrip member adapted to be received in said door sash portion, said weatherstrip member being substantially in a letter U shape of cross section having a bottom portion and a pair of said wall portions, these portions defining an internal space for receiving the pane of window glass;
said weatherstrip member having a thickened support portion extending laterally and outwardly toward a second of said side wall portions from a first upper tip of said first side wall portion,
means provided on the weatherstrip for providing a face contact with at least one part of the end of the pane of window glass when the pane of glass window is moved to said closed position, the means comprising first and second seal lips arranged to come into face contact with the side surfaces of the end of the pane of window glass when the pane of window glass is moved to said closed position; said first seal lip extending obliquely toward said bottom portion from a terminal portion of said thickened support; and said second seal lip extending obliquely toward said bottom portion from a second upper tip of said second wall portion; and

means for pivoting said first and second seal lips about said terminal portion and second upper tip, respectively;
said thickened support portion being of sufficient thickness to prevent bending thereof upon movement of said pane of window glass to said closed position;
said thickened support portion being substantially thicker than said seal lips.

4,920,700
PROCESS FOR FINISHING OPTICAL LENSES AND APPARATUS THEREFOR

Hiroyuki Murahashi, Tokyo; Yukio Akutsu, Ohme, and Shinichi Koyama, Higashi-kurume, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,456
Claims priority, application Japan, Apr. 30, 1987, 62-107332
Int. Cl.[5] B24B *7/00*
U.S. Cl. 51—124 L 15 Claims

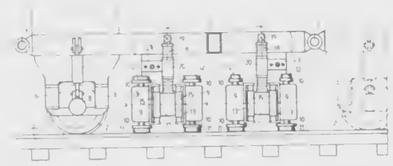


1. An apparatus for finishing optical lenses comprising:
a housing enclosing at least one lens processing chamber;
at least one processing unit within said chamber, said processing unit including a lens holder adapted to receive and hold an optical lens thereon, and a finishing tool mounted for operative engagement with the optical lens held by said lens holder, said finishing tool comprising one or the other of a smoothing pad and a polishing pad;
means for moving said lens holder toward and away from said finishing tool;
feeding means for feeding one of a smoothing compound and a polishing compound onto said lens and said finishing tool;
exit tube means associated with said chamber for discharging said one of said smoothing compound and polishing compound;
first and second receiver means for separately receiving spent smoothing compound and spent polishing compound from said exit tube means;
drive means for moving one of said first and second receiver means into operative association with said exit tube means; and
recirculation means connected to said feeding means and to said first and second receiver means for recirculating one of said spent smoothing compound and said spent polishing compound from said first and second receiver means to said feeding means.

4,920,701
DEVICE FOR THE REPROFILING OF THE RAILS OF A RAILWAY TRACK

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Filed Jan. 31, 1989, Ser. No. 304,193
Claims priority, application Switzerland, Mar. 4, 1988, 817/88
Int. Cl.[5] E01B *31/17*
U.S. Cl. 51—165.71 8 Claims

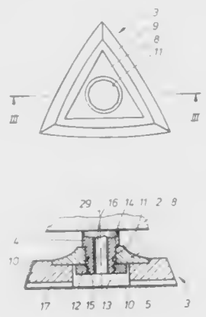


1. Reprofiling device of the head of at least one rail of a railway track comprising a support carrying at least one grinding unit pivotally mounted on a rotating table around an axis parallel to the length of the rail, said unit comprising at least one motor driving at least one grinding wheel in rotation and means for displacing both horizontally and vertically the axis of pivoting of the grinding unit perpendicular to the length of the rail; said grinding unit also comprising means for displacing the grinding wheel to apply it against the rail, the support comprising the framing of a railroad vehicle provided at one of its ends with at least two wheels resting each on one of the rails of the railroad track, hinge means supporting the framing at its other end on a rigid frame provided with at least two wheels resting each on one rail of the railroad track, said hinge means permitting movement of said framing and said rigid frame relative to each other about an axis parallel to the length of the rail, each grinding unit comprising a casing connected to the framing by said means for displacing the pivoting axis of said grinding unit; and each grinding wheel being connected to said casing by means of said rotating table and by said means for displacing the grinding wheel.

4,920,702
PORTABLE GRINDER

Günter Kloss; Gustav Schuhmacher, and Fritz Gramm, all of Stuttgart, Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 86,331
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540561
Int. Cl.[5] B24B *23/00*
U.S. Cl. 51—170 R 85 Claims



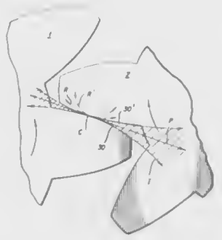
1. A portable grinder comprising:

a housing;
a grinding or polishing tool having a first working surface with a plurality of side edges meeting to form at least one corner region having an angle less than 90°; and
drive means, supported in said housing, for pivotably oscillating said grinding tool about a pivot axis, said pivot axis intersecting said grinding tool in a central region thereof; and wherein
regions of said grinding tool along said side edges are exposed such that the side edge regions can work along an inside longitudinal edge of a second surface along the junction of said second surface and a third surface angled thereto, with one of said side edges engaging said third surface.

4,920,703
METHOD AND APPARATUS FOR FINISHING A TOOTH SURFACE OF A GEAR

Norio Hosoya, Kokubunji, Japan, assignor to Koganei Seiki Seisakusho, Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,546
Claims priority, application Japan, Aug. 10, 1987, 62-198291; Jan. 28, 1988, 63-17963
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—287 23 Claims



1. A method of finishing an involute gear tooth surface of a workpiece gear, comprising the steps of:
engaging said workpiece gear with a master gear having involute gear tooth surfaces in a meshing fashion for cooperatively rotating said workpiece gear with said master gear so that contacting involute gear tooth surfaces of said workpiece and master gears contact through at least one contact point, said contact point shifting along said contacting involute gear tooth surfaces as said workpiece and master gears rotate; and
simultaneously causing at least one of said gears to rock with respect to the other along a tooth profile direction extending between a tooth root and a tooth top of a contacting gear tooth of said workpiece gear in a manner such that the relative rocking motion between said contacting involute gear surfaces at any position of said shifting contact point is along said tooth profile direction and is always substantially tangent with respect to said involute gear tooth surface of said workpiece at said shifting contact point and said shifting contact point does not interfere, at any position thereof, substantially beyond an involute curve, and into the body, of said contacting involute gear tooth surface of said workpiece gear.

4,920,704
GRINDING WHEEL CONTAINING DISSOLVABLE GRANULAR MATERIAL

Richard T. Caserta, and Roy E. Zimmerman, both of Lansdale, Pa., assignors to Red Hill Grinding Wheel Corporation, Pennsburg, Pa.

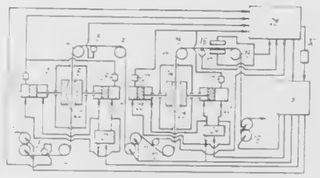
Filed Jul. 23, 1987, Ser. No. 76,627
Int. Cl.[5] C09K *3/14*
U.S. Cl. 51—302 7 Claims

1. In a grinding wheel for use in precision wet grinding involving the use of a water base coolant, said wheel comprising at least an abrasive and a resin, the improvement comprising the presence in said wheel of an effective amount of a randomly distributed, relatively coarse granular water soluble material to achieve a controlled amount of porosity in the wheel during wet grinding, said material being inert to the other components of said mix and achieving a relatively neutral or mild alkaline pH in water solution during wet grinding, and wherein said relatively coarse water soluble material is not materially changed during any process for making said wheel, and whereby as said wheel is used in wet grinding, the surface of said wheel is gradually worn away to expose granules of said material to said coolant, thereby causing the dissolving of said granules to form clearance pores to aid the free grinding action of the wheel.

4,920,705
METHOD OF ABRASIVE POWDER DESCALING OF A STRIP

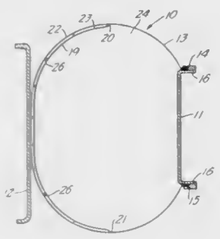
Jury V. Lipukhin, ploschad Metallurgov, 5, kv.15.; Eduard A. Garber, ulitsa M. Gorkogo, 85, kv.17., both of Vologodskaya oblast, Cherepovets; Boris Y. Orlov, ulitsa Krasnykh Partizan, 3, kv.4.; Viktor N. Ponosov, ulitsa Pobedy, 24, kv.115., both of Sverdlovsk; Vladimir M. Novikov, prospekt Lunacharskogo, 48, kv.157., Vologodskaya oblast, Cherepovets, and Gennady N. Rumako, deceased, late of prospekt Ordzhonikidze, 11, kv.9., Sverdlovsk, all of U.S.S.R. (by Tamara A. Rumako, Administrator)

PCT No. PCT/SU88/00049, § 371 Date Nov. 2, 1988, § 102(e) Date Nov. 2, 1988, PCT Pub. No. WO88/06497, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 2, 1988, Ser. No. 294,066
Claims priority, application U.S.S.R., Mar. 3, 1987, 4199247
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—318 3 Claims



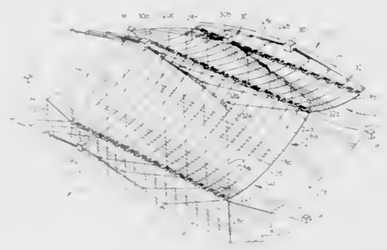
1. A method of abrasive powder descaling of a strip comprising the steps of pulling the strip at a tension through at least two successive descaling zones having an inlet and an outlet where the strip is cleaned by forcing the abrasive powder thereto at a pressure varied, depending on the material of the strip and the type of scale, within a preset range for each descaling zone; measuring tension of the strip at the inlet to and outlet from each descaling zone; computing the difference between these tension forces; and comparing with a preset difference in the tension forces, and deviation in the measured difference of the tension forces from the preset tension force being compensated by changing the pressure exerted by the powder in each descaling zone.

4,920,706
PNEUMATICALLY INFLATABLE ROOF SEAL
William H. Fischer, New Milford, Conn., assignor to The Presray Corporation, Pawling, N.Y.
Filed Sep. 21, 1988, Ser. No. 247,358
Int. Cl.[5] E04H *15/20*
U.S. Cl. 52—2 B 6 Claims



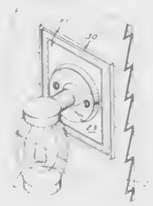
1. A pneumatically inflatable seal especially for large structures, which comprises
(a) a first elongated tubular element formed of a flexible membrane material,
(b) a second elongated tubular element substantially coextensive with said first tubular element and secured thereto,
(c) said secured tubular sections comprising a composite inflatable sealing structure,
(d) means for controllably inflating and depressurizing said tubular elements,
(e) said first tubular element, when pressurized, imparting a first cross-sectional configuration to said composite structure, expanded at least in a first predetermined direction, as for forming a seal,
(f) said second tubular element, when pressurized, imparting a second cross sectional configuration to said composite structure, expanded in a second predetermined direction and correspondingly retracted in said first predetermined direction, as for controllably retaining said composite structure in a retracted condition,
(g) said second tubular element being formed within said first tubular element.

4,920,707
INTERIOR CANOPY FOR STADIUM
Wiktor Moskaliuk, 270 Lisgar St., Toronto, Ontario, Canada (M6J 3G7); Christopher M. Allen, 18 Birchview Rd., Ottawa, Ontario, Canada (K2G 3G4), and Roderick G. Robbie, 16 Cornish Rd., Toronto, Ontario, Canada (M4T 2E2)
Filed Oct. 7, 1988, Ser. No. 255,032
Int. Cl.[4] E04B *7/16*
U.S. Cl. 52—6 17 Claims



1 To form an audience chamber within a stadium closed by a roof, at least one truss suspendible from the roof, and a canopy comprising a plurality of parallel, contiguous elongated panels of flexible material each being removably connectable to the truss.

4,920,708
WALL MOUNTING ASSEMBLY
Richard J. MacLeod, Milford, and Charles E. Schiedegger, Metamora, both of Mich., assignors to Tapco Products Company, Inc., Detroit, Mich.
Continuation-in-part of Ser. No. 192,237, May 10, 1988, Pat. No. 4,875,318. This application May 5, 1989, Ser. No. 347,830
Int. Cl.[5] E06B *1/02*
U.S. Cl. 52—60 10 Claims



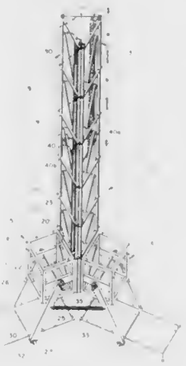
1. A wall mounting bracket assembly comprising
a one-piece plastic body including an integral front wall,
an integral continuous peripheral wall extending from the front wall and
an integral continuous peripheral flange for attachment to a wall of a building, such that the body may be mounted on a building and then siding may be applied to the wall of the building and the edges of the siding brought into closely adjacent relation to said peripheral wall of the body, and
a removable plastic flange member including an integral laterally extending flange and having an integral continuous axial wall adapted to be telescoped over said peripheral wall of the body and until the flange of the flange member engages the siding,
said axial wall of said flange member and said peripheral wall of said body including interengaging means for selectively positioning the flange member at predetermined distances with respect to the integral flange of the body on the body to accommodate siding of varying thicknesses,
said interengaging means being provided at spaced positions along said continuous axial wall and said continuous peripheral wall.

4,920,709
J-CHANNEL MEMBER FOR SIDING
Ray W. Garries, Conneaut; Edward H. Burke, Jefferson; Kevin D. Mueller, Conneaut, all of Ohio, and Joseph D. Leone, Erie, Pa., assignors to Webb Mfg., Inc., Conneaut, Ohio
Filed Apr. 11, 1989, Ser. No. 336,035
Int. Cl.[4] E04G *15/02*
U.S. Cl. 52—85 28 Claims

17. In combination with a building structure having exterior sheathing, a radiused opening in said sheathing surrounded by a frame member, and exterior siding covering said sheathing, said siding having trimmed end portions around said frame member to provide a clearance space therebetween, a J-channel member fitted around said frame member for receipt of the trimmed end portions of said siding, said J-channel member comprising a bottom wall having front and back legs extending in the same general direction from opposite edges of said bottom wall, said back leg being longer than said front leg for ease of attachment of said back leg to said exterior sheathing, said back leg and bottom wall being made of a relatively rigid plastic material, said back leg having slits along the length thereof to permit bending of said bottom wall to fit said frame member, and said front leg being made of a relatively flexible plastic material to permit stretching of said front leg during such bending of said bottom wall.



4,920,710
RETRACTABLE COLUMN AND METHOD OF FORMING
David L. Paine, Rte. 1, Box 192, Ellendale, Minn. 56026
Filed Apr. 25, 1989, Ser. No. 343,057
Int. Cl.[5] E04H *12/34*
U.S. Cl. 52—108 23 Claims



1. A retractable column for supporting an overhead structure comprising:
a first link chain, said first link chain having pivotable links, said pivotable links including a plurality of C shaped hooks extending laterally outward from said first link chain;and
a second link chain, said second link chain having pivotable links with a plurality of offset C shaped hooks for forming interlocking engagement with said plurality of C shaped hook on said first link chain to thereby couple said first link chain and said second link chain into a rigid support column.

4,920,711
BUILDING CONSTRUCTION SYSTEM
Richard F. Mitchell, Sr., 114 Rose St., Waterbury, Conn. 06704
Filed Nov. 14, 1988, Ser. No. 271,168
Int. Cl.[5] E02D *1/00*
U.S. Cl. 52—169.2 20 Claims

1. A building construction system providing a building structure containing four separate but connected self-standing units each with its won roof and four walls defining a quadrilateral, and a member in the shape of a cross extending vertically above said roofs and horizontally beyond said walls wherein said member has two arms intersecting each other at right angles along a central vertical axis, thus defining four 90 degree quadrants each of which contains a different one of said four units.

4,920,712
CONCRETE RETAINING WALL BLOCK, RETAINING WALL AND METHOD OF CONSTRUCTION THEREFORE
Robert W. Dean, Jr., Milwaukee, Wis., assignor to Stonewall Landscape Systems, Inc., Milwaukee, Wis.
Filed Jan. 31, 1989, Ser. No. 304,793
Int. Cl.[5] E02D *29/02*; E04C *1/10*
U.S. Cl. 52—169.4 17 Claims



1. A retaining wall comprising:
a plurality of stacked, individual blocks, each said block comprising:
a front outer wall presenting a block face having a predetermined width;
a rear wall spaced from said front wall and having a width substantially equal to that of said front wall;
a pair of side walls extending between said front outer wall and said rear wall.
an upper block surface; and
a lower block surface;
wherein each said block is provided with a core therethrough, with the area of said block disposed between the core and the rear wall of said block defining a rear web;
said wall being formed by a plurality of courses of said blocks, with a joint being formed between the blocks in adjacent upper and lower courses by the lower and upper block surfaces, respectively, of the blocks forming said upper and lower courses, each said course comprising a plurality of said blocks placed in a side-by-side relationship, wherein each end of the front outer wall of each block is located closely adjacent an end of the front outer wall of its neighboring block, and each end of the rear wall of each block is located closely adjacent an end of the rear wall of its neighboring block;
engagement means interposed between the blocks in adjacent courses for preventing relative forward movement between the blocks in adjacent courses, said engagement

means comprising clip means mountable to the rear web of a block in one of said upper and lower courses, said clip means including a substantially horizontal portion for placement adjacent the surface of said block forming said joint, and a substantially vertical projecting portion adapted to engage the rear web of a block placed in an adjacent course for preventing forward movement of blocks in an upper course relative to blocks forming the course therebelow; and

a recess formed in one of said block surfaces forming said joint for receiving the substantially horizontal portion of said clip means to prevent interference thereof with said joint, with the vertical projecting portion of said clip means projecting outwardly past said recess

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4,920,713

PREFABRICATED WINDOW FOR INSTALLATION IN AN INCLINED ROOF

Bjarne Borresen, Soborg, and Hans C. Blumensaadt, Virum, both of Denmark, assignors to V. Kann Rasmussen Industri A/S, Soborg, Denmark

Filed Oct. 18, 1989, Ser. No. 423,195
Int. Cl.[5] E04B *7/18*
U.S. Cl. 52—200 **7 Claims**



1 A prefabricated window for installation in an inclined roof of the type having a supporting structure, a sheathing secured to the supporting structure, and a roofing fixed to the sheathing; the window comprising a main frame with an outer sidewall and a plurality of mounting brackets, wherein each mounting bracket comprises

a first leg;

a second leg forming an angle with the first leg;

a positioning member having a hole for a mounting means; and

a portion connecting the first leg integrally with the positioning member;

the positioning member being secured to the outer sidewall of the main frame in such a position that during transportation of the window the first leg is abutting against the main frame and the second leg is situated below the main frame, whereas during installation of the window the first leg is swung into a position in which it abuts against the positioning member and the second leg is outside the main frame and ready for fixation to the sheathing;

the connecting portion defining the axis of said swinging of the first and second legs in relation to the positioning member

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4,920,714

ASSEMBLY OF MOLDING STRIPS ADAPTED TO MOUNT FLEXIBLE COVERINGS ON SUPPORT SURFACES

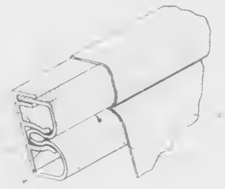
R. Gregg Sease, 6457 S. Heritage Pl. W., Englewood, Colo. 80111

Division of Ser. No. 841,593, Mar. 20, 1986, Pat. No. 4,788,806. This application Dec. 5, 1988, Ser. No. 280,681
Int. Cl.[5] A47H *13/00*; E04B *1/00*
U.S. Cl. 52—222 **22 Claims**

1 A molding strip assembly adapted to secure an edge of a flexible covering to a surface to which the molding strip assembly is attached, comprising:

a molding element having a relative flat base wall operative to receive fastening elements for attaching said molding element to the surface, a pair of spaced-apart resilient retaining walls extending upwardly from a central portion of said base wall and converging towards one another to define a retaining channel, and a first locking wall extending upwardly from said base wall; and

a mounting element having first and second raised support walls interconnected to one another by a channel structure defined by a pair of downwardly extending channel sidewalls and a channel bottom wall forming an interior storage channel and sized for engagement in said retaining channel by deflecting the retaining walls as said mounting structure is inserted therein, said retaining walls resiliently



locking said channel structure in a locked position wherein said first and second support walls are oriented above said base wall, said mounting element having a first sidewall extending downwardly from said first support wall and a second sidewall extending downwardly from said second sidewall, said first sidewall terminating at an edge adjacent said base wall and said second sidewall biased against said locking wall when the mounting element is in the locked position so that said first and second sidewalls help orient the first and second support walls and said second sidewall interacting with said locking wall to resist separation of said mounting and molding elements;

said covering adapted to be secured to said surface by inserting a peripheral edge portion adjacent an edge thereof into said storage channel.

4,920,715

BREADAWAY UTILITY POLE

James H. Parsons, Prosperity; Philippe H. McLain, Columbia; John F. Boozer, III, Pomaria, and John R. Lewis, Jr., Chapin, all of S.C., assignors to Shakespeare Company, Newberry, S.C.

Continuation-in-part of Ser. No. 165,530, Mar. 8, 1988, and a continuation-in-part of Ser. No. 165,62, Mar. 8, 1988, and a continuation-in-part of Ser. No. 165,620, Mar. 8, 1988. This application Apr. 3, 1989, Ser. No. 332,553
Int. Cl.[5] E02D *27/42*
U.S. Cl. 52—298 **19 Claims**

1. A breakaway utility pole mounting structure comprising:

a utility pole having at least one substantially tubular end portion;

a base anchored in the ground substantially below ground level and having a tubular portion extending below ground level for a distance at least substantially equal to the diameter of said pole end portion;

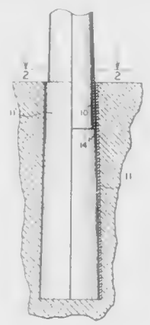
said tubular portion adapted telescopically to enclose said pole end portion;

said pole end portion and said base tubular portion being substantially coextensive longitudinally;

an adhesive material bonding said pole end portion to said base tubular portion;

said adhesive material adapted to fail and release said pole

when it is subjected to an impact at a predetermined distance above the base from a vehicle of predetermined



minimum weight moving at a predetermined minimum speed.

4,920,716

VENEER CONSTRUCTION AND METHOD OF ACHIEVING SAME

Jess R. Coffey, 25632 Mead St., Loma Linda, Calif. 92354

Filed Jun. 9, 1988, Ser. No. 204,377
Int. Cl.[5] E04F *13/08*
U.S. Cl. 52—386 **15 Claims**



3. A veneered wall comprising:

a wall;

a layer of reinforcing mesh having a plurality of parallel ridge configurations defining elongate troughs therebetween;

fastening means holding said reinforcing mesh against said wall with the elongate troughs horizontally disposed;

a plurality of facing units disposed in rows in said elongate troughs, said rows being flanked by said ridge configurations;

mortar disposed between said facing units and said wall and embedding said reinforcing mesh behind said units; and

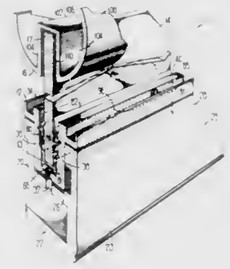
groud disposed between said facing units and embedding said ridge configurations.

4,920,717

ORNAMENTAL HANDRAIL SYSTEM

William J. Hooper, Jr., Duluth, Ga., assignor to Kawneer Company, Inc., Norcross, Ga.

Filed May 11, 1989, Ser. No. 350,602
Int. Cl.[5] E04H *17/14*; E04B *1/62*
U.S. Cl. 52—400 **16 Claims**



1. An apparatus for supporting and leveling a lower edge of a vertical panel, comprising:

an elongated frame member having an upper surface and defining a longitudinal glazing recess in said upper surface, said glazing recess including a bottom wall and opposing side walls;

a retaining seat disposed within said glazing recess, said retaining seat having an upper retaining seat portion, a lower retaining seat portion, and a flexible bellows portion interconnecting said upper and lower retaining seat portions;

locking means operatively associated with said side walls of said glazing recess and said upper retaining seat portion for fixing said upper retaining seat portion with respect to said side walls; and

leveling jacks operatively associated with said bottom wall of said glazing recess for bearing against said lower portion of said retaining seat,

whereby when the lower edge of the panel is supported within said retaining seat in said glazing recess, said leveling jacks are operable to effect elevational adjustment of the panel, said bellows portion of said retaining seat being flexible to accommodate elevational displacement of said lower retaining seat portion while said locking means maintains said upper retaining seat portion fixed with respect to said side walls of said glazing recess.

4,920,718

INTEGRAL DOOR LIGHT AND RELATED DOOR CONSTRUCTION

Kert E. Artwick, Holland, and Steven R. Wilkening, Wyoming, both of Mich., assignors to ODL, Incorporated, Zeeland, Mich.

Continuation of Ser. No. 169,610, Mar. 17, 1988, abandoned. This application May 1, 1989, Ser. No. 346,246
Int. Cl.[5] E06B *3/54*
U.S. Cl. 52—476 **37 Claims**

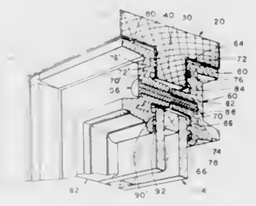
1. A door assembly comprising:

a door having inner and outer sides and defining an opening, said door including a lip extending into said opening about the entire perimeter of said opening, said lip being recessed from both said inner and outer sides;

a panel; and

a frame means for supporting said panel within said opening, said frame means including inner and outer frames and fastening means for fastening said frames together, said inner and outer frames each including a panel-support portion engaging opposite sides of said panel and sand-

wiching said panel therebetween, said inner and outer frames each including a door-support portion engaging opposite sides of said lip and sandwiching said lip therebetween, said frame means further including panel-sealing means for providing a weather seal between said panel-support portion of one of said frames and said panel, said frame means further including lip-sealing means for providing a weather seal between said door-support portion of one of said frames and said lip, said fastening means extending between said lip and said panel and engaging said inner and outer frames to draw said frames together against said panel and against said lip, both said panel-sealing means and said lip-sealing means being compressed when said frames are drawn together by said fastening means.

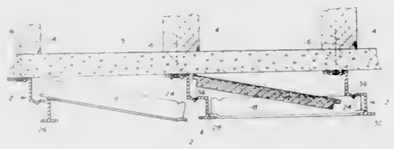


4,920,719

METHOD AND APPARATUS OF POSITIONING A NEW CEILING OVER AN EXISTING CEILING

Melvin H. Shaub, Lancaster, and J. Robert Herr, Millersville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Mar. 13, 1989, Ser. No. 322,696
Int. Cl.[5] E04B *5/55*
U.S. Cl. 52—488 **3 Claims**



1. A ceiling system comprising:

(a) at least two first runners each having a generally z cross-section, the first runner having a vertical web, at the lower end of the vertical web there being lower horizontal flanges extending either side of the vertical web perpendicular to the web, at the top of the vertical web there being a single long upper horizontal flange extending from one side of the vertical web perpendicular to the web and beyond the lower flanges, said first runners being adapted to be fastened to the face of an existing ceiling by a means fastening the upper flange to the ceiling with the lower flanges spaced from and parallel to the face of the existing ceiling,

(b) at least one cross-runner having an inverted T-shape, the cross-runner having a vertical web with an upper and lower end, and, at the lower end of the vertical web, there being horizontal flanges extending either side of the vertical web perpendicular to the web, at the upper end of the vertical web near at least one end thereof there being positioned a notch;

(c) said cross-runner being positioned between two adjacent first runners with one end of the cross-runner resting on the lower flange of one first runner and the other end of the cross runner resting on the lower flange of the adjacent second first runner, the notch on at least one end of the cross runner engaging the below defined projection on the two adjacent runners whereby the projection and notch engagement holds the cross runner in position between two adjacent runners; and

(d) the improvement comprising:

(i) said vertical web being formed of a lower member perpendicular to the lower flanges, an upper member perpendicular to the upper flange, said two members being parallel to, but spaced from each other, another member interconnecting said two parallel members and having a projection thereon extending therefrom in the direction of the lower flanges.

4,920,720

FLOORING COMPOSITE AND METHOD FOR MAKING SAME

Michael H. LaBianca, Northampton, Pa., assignor to Tarkett Inc., Parsippany, N.J.

Filed Jul. 11, 1988, Ser. No. 217,288
Int. Cl.[5] E04B *1/38, 2/00;* **B32B** *23/02*
U.S. Cl. 52—506 **16 Claims**



9. A flooring composite, comprising:

a subfloor ..g; and

a shrink sheet floor covering, applied over said subflooring, said shrink sheet floor covering being attached to said subflooring by means of a double-faced adhesive tape positioned between said shrink sheet floor covering and said subflooring along the perimeter of a surface of said subflooring;

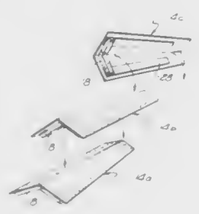
wherein the double-faced adhesive tape includes a substrate layer which is substantially impermeable to plasticizer.

4,920,721

HIGH PROFILE FIBERGLASS SHINGLE

Joseph E. Pressutti, 7323 N. Tamera, and George E. Conley, 7616 N. Monte Ave., both of Fresno, Calif. 93711

Filed Feb. 2, 1989, Ser. No. 305,738
Int. Cl.[5] E04D *1/30*
U.S. Cl. 52—518 **20 Claims**



1. A roofing accessory shingle for use only along angled roof locations such as ridges, hips, and rakes, said shingle having a transverse axis and a longitudinal axis, as well as a weather surface and an inner surface, including:

a base comprising a continuous, flexible sheet of fiber glass having an upper edge and a butt edge extending in the transverse direction, as well as two side edges extending mainly in the longitudinal direction;

at least one stiffening member secured to the base and extending generally in the longitudinal direction;

a sealing member extending mainly in the transverse direction comprising an elongated strip of an elastic, deformable material and located adjacent to the butt edge of the base; and

said shingle including the fiber glass sheet and elastic sealing member being flexible to permit bending of said shingle about its longitudinal axis for mounting at angled roof locations such as ridges, hips, and rakes.

4,920,722

COMPOSABLE WELL

Giulio Bosi, Conegliano, Italy, assignor to Europlast S.p.A., Treviso, Italy

Filed May 10, 1988, Ser. No. 192,372
Claims priority, application Italy, May 14, 1987, 85545 A/87
Int. Cl.[5] E02D *29/12*
U.S. Cl. 52—591 **3 Claims**



1. A composable well of right prismatic or right cylindrical shape having a polygonal or circular base respectively, which consists of a plurality of walls (**1**) having lateral or vertical borders said walls having on the lateral borders thereof, on one side a plurality of hooking elements (**2**) of male type and on the opposite side thereof a plurality of hooking elements (**3**) of female type wherein the hooking elements (**2**) of male type consist of sectors (**2'**) of substantial planar shape, said sectors being the extensions from one of said lateral borders of each of said walls (**1**), said sectors having at the end thereof a portion (**2''**) of enlarged section and in the shape of an isosceles trapezium, and wherein the hooking elements (**3**) of female type consist of a plurality of slits (**3'**) which constitute the inlet mouth of a conduit defined by a pair of small walls (**3'''**) and (**3'**), said pair of small walls being disposed essentially transversally with respect to each of said walls (**1**). the first of said small walls (**3'''**) being perpendicular with respect to said wall (**1**), the second small wall (**3'**) being slightly inclined with respect to said wall (**1**), whereby at the end of said conduit it is closer to said first small wall (**3'''**), said small walls being made of elastic material with a portion of the male hooking element passing through and beyond said pair of small walls.

4,920,723

HOLLOW GRANITE BOX BEAM AND METHOD OF FORMING

Douglas R. Porter, Mount Airy, N.C., assignor to The L.S. Starrett Company, Athol, Mass.

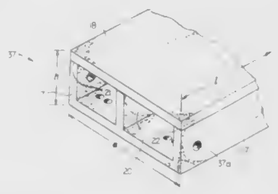
Filed Jul. 21, 1989, Ser. No. 383,203
Int. Cl.[5] E04C *2/04*
U.S. Cl. 52—606 **35 Claims**

1. A method for constructing at least one box beam from at least two elongated component blocks of igneous rock, comprising the steps of:

forming at least one flat surface on each of said at least two component blocks, said at least two flat surfaces having identical dimensions;

removing igneous rock material from the flat surface of at least one of said component blocks so as to form at least one open cavity in said at least one component block, said at least one cavity having boundary walls of a predetermined thickness; and

bonding together the said at least two component blocks along the remaining unremoved portions of said flat surfaces so as to form said box beam.

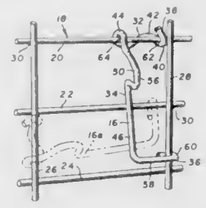


4,920,724

SPACER FOR CONCRETE REINFORCING FABRIC

Christopher B. Leach, 11576 Blue Water Hwy., Lowell, Mich. 49331, and John L. Kaines, 303 N. Gaylord, Ludington, Mich. 49431

Filed Mar. 28, 1988, Ser. No. 173,107
Int. Cl.[5] E04C *5/16*
U.S. Cl. 52—685 **7 Claims**



1. An apparatus suited for removable attachment to a concrete reinforcing framework, said framework including a plurality of parallel and spaced apart longitudinally directed first frame members and a plurality of parallel, spaced apart and generally transverse second frame members, said frame members connected to one another at a plurality of junctions, said apparatus including:

a unitary spacing member constructed of a flexible material and having a mounting section positionable in wrapping engagement about a selected one of said first frame members, with a first end portion of said mounting section positioned against a selected one of said second frame members;

an intermediate section at least twice as long as said mounting section, said intermediate section extended generally orthogonally from a second end portion of said mounting section to define a reference plane including said mounting section and said intermediate section, said intermediate section including a spacing means directed generally normal to said reference plane with an apex positioned a predetermined distance from the reference plane; and

a latching means, at the end of said intermediate section remote from said mounting section, for forming a latching engagement with said selected second frame member;

wherein said spacing member is constrained, due to said

VOL 114 ISS 1 MY 1 1990 UMI

wrapping engagement, against rotation relative to the framework in a first direction about axes normal to said reference plane, and wherein said latching means is located proximate said selected second frame member whenever said mounting section is so positioned against said selected second frame member, whereby movement of said latching means in said first direction, toward said selected second frame member and into said latching engagement, causes an elastic bending of said intermediate section substantially in said reference plane and further causes an elastic compression of said mounting section, and wherein the residual forces of said elastic bending and said elastic compression are parallel to said reference plane and tend to maintain said latching engagement to thereby secure said spacing member on said framework.

4,920,725

SELF-GRIPPING HANGER DEVICE

Charles E. Gore, Colleyville, Tex., assignor to Truswal Systems Corporation, Arlington, Tex.

Filed Feb. 14, 1989, Ser. No. 310,840
Int. Cl.[5] F16B *9/00*
U.S. Cl. 52—702 **27 Claims**



1. A hanger device having a back wall, first and second opposed side walls protruding from the back wall to define a recessed region for receiving a portion of a construction member, and a base member protruding from the back wall in substantially the same direction as the first and second side walls to provide a seat for the construction member, wherein the improvement comprises at least one pair of opposed projections extending into the recessed region from the respective first and second side walls, said projections being medially disposed on the respective side walls between the back wall and respective distal edges of the side walls, each of said projections having a surface curving downwardly and inwardly from the corresponding side wall into the recessed region for urging the construction member downwardly into the recessed region.

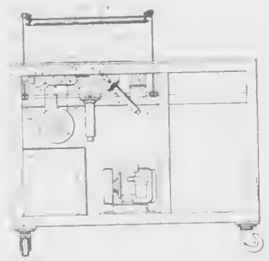
4,920,726

VACUUM-PACKING MACHINE

Chiharu Yamada, 17, Agari-machi, Seki-shi, Gifu-ken, 501-32, and Hideto Yamada, 1065-14, Yamada, Seki-shi, Gifu-ken, 501-32, both of Japan

Filed Nov. 3, 1988, Ser. No. 266,744
Claims priority, application Japan, Nov. 17, 1987, 62-290145
Int. Cl.[5] B65B *31/04*
U.S. Cl. 53—79 **3 Claims**

1. A vacuum-packing machine comprising:
puncturing means for making holes on a wrapping bag,
sucking means functionally connected to said puncturing means, for sucking the air out of wrapping bag through said holes on said wrapping bag, means mounting said puncturing means adjacent said sucking means and
attaching means
integral to said sucking means, said attaching means being able to be moved independently of said sucking means and to be protruded toward said wrapping bag for sticking a



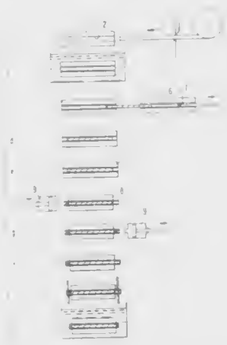
seal on said holes on said wrapping bag while said sucking means keeps sucking the air.

4,920,727

CASSETTE SYSTEM AND APPARATUS FOR MANUFACTURING AN ACTIVE AGENT LIBERATING CAPSULE FOR SUBCUTANEOUS USE

Mikko V. Ristimaki, Nouoiainen; Matti J. Lehtinen, Kaarina; Krister J. Lindstrom, and Rolf R. Hartzell, both of Turku, all of Finland, assignors to Huhtamaki Oy, Finland

Filed Dec. 27, 1988, Ser. No. 289,711
Claims priority, application Finland, Dec. 30, 1987, 875762
Int. Cl.[5] B65B *1/04;* **B29C** *39/18*
U.S. Cl. 53—252 **7 Claims**



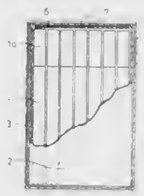
1. An apparatus for manufacturing a subcutaneous prophylactic capsule, having a tubular fluid-permeable basic element, and a hormone rod inserted therein, said apparatus comprising a tubing cassette, a filling means, a drying means as well as a glueing and final rinsing means, said filling means further comprising,
a first conveyor with means for catching an empty tubing cassette and carrying it one step forward and a tubing advancing and cutting means,
a second conveyor for carrying said tubing cassette, with pieces of tubing inserted in its channels, associated with a swelling bath and a hormone rod insertion means,
a third conveyor a hormone cassette, for carrying said hormone cassette provided with hormone rods alongside said tubing cassette to insertion means with channels of the cassettes in alignment, and a pusher cooperating with said third conveyor and which pusher after the insertion of a hormone capsule is movable towards the hormone capsule in the direction of its channels, whereby shanks corresponding to the number and position of the channels in said cassettes penetrate into channels of hormone cassette for inserting the hormone rods into the tubes in the tubing cassette whereby said pusher, after a pushing motion is completed, being movable away from cassettes to a rest position, said third conveyor being further positioned to carry an empty hormone cassette into a cassette storage means,
a fourth conveyor, a predrying means and drying means positioned relative said fourth conveyor such that the fourth conveyor can carry a tubing cassette filled with hormone rods or capsules sequentially to aid predrying means and said drying means.
a capsule switching means, wherein the capsules are movable by means of a pusher into a glueing cassette whose width is less than the length of the capsules so that both ends of the capsules project on either side of cassette,
a glueing means for glueing the projecting ends of a capsule simultaneously or periodically,
said apparatus further including a cutting means for cutting a capsule to a desired length and a rinsing and washing assembly.

4,920,728

METHOD FOR PACKING CIGARETTES

Kiyotake Shibuya, No. 2-6-10, Omori-Minami, Ota-ku, Tokyo-to, 143, Japan

Filed Mar. 2, 1989, Ser. No. 318,214
Int. Cl.[5] B65B *61/20;* **A24F** *15/00*
U.S. Cl. 53—410 **3 Claims**



1. A method for packing cigarettes which comprises interposing a flat flexible thin sheet between an upper portion of a package of cigarettes to be opened to define a cigarette removal opening and tips of cigarettes packed in the package, raising up said flexible sheet after said package is opened to permit removal of a cigarette through said opening, and then closing off said opening by releasing said flexible sheet whereby said thin flexible sheet returns to its original position due to its natural resiliency.

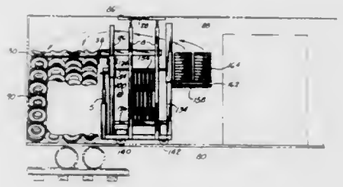
4,920,729

APPARATUS AND PROCESS FOR MORE EFFICIENT SHIPMENT OF TIRES

John Doster; Joe Barnett, and Jimmy Barnett, all of Rt. 1, Box 516, Nettleton, Miss. 38858

Continuation-in-part of Ser. No. 77,884, Jul. 27, 1987, Pat. No. 4,777,781. This application Jul. 25, 1988, Ser. No. 224,556
Int. Cl.[5] B65B *63/02*
U.S. Cl. 53—523 **7 Claims**

1. An apparatus for increasing the efficiency of shipment of tires by compression comprising:
a substantially flat, horizontal plate, having a top and a bottom surface, said plate having inward and outward ends, said plate, adapted for vertical motion against compressive resistance of a stack of tires;
means for applying a substantial downward force to said plate against said compressive resistance;
a horizontal stripper bar, slideably encompassing said plate, having means for relative inward and outward motion with respect to said plate, along said plate; and
scraper means intermediate said stripper bar and said plate for preventing the friction driven extrusion of tires be-



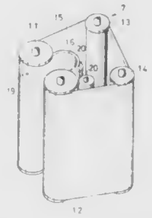
tween said stripper bar and said plate said means for preventing extrusion further comprises means within said stripper bar means for compressibly and uniformly engaging said stripper bar means against said top and said bottom surface of said plate.

4,920,730

COIN WRAPPING APPARATUS

Mitsuyoshi Inoue, Nara; Shuji Nakanishi, and Yoshiaki Uemizo, both of Osaka, all of Japan, assignors to Nihon Kinsen Kikai Kabushiki Kaisha, Osaka, Japan

Filed Aug. 29, 1988, Ser. No. 238,004
Claims priority, application Japan, Aug. 31, 1987, 62-218929; Aug. 31, 1987, 62-218930; Sep. 11, 1987, 62-229312
Int. Cl.[5] B65B *11/04, 35/50*
U.S. Cl. 53—532 **29 Claims**



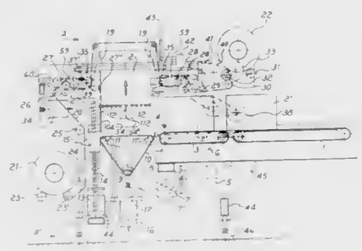
14. A coin stacking and wrapping apparatus for stacking coins in a vertical stack and for wrapping said vertical stack with a wrapping material comprising a support means, a pair of main rollers mounted on said support means for rotation about vertical axes, said main rollers being spaced from one another, guide roller means mounted on said support means spaced from said main rollers, said guide roller means comprising a guide roller having an axis which is vertically disposed, an endless belt disposed about said main rollers and said guide roller means, said endless belt passing over said main rollers and extending past said main rollers to form a substantially cylindrical loop section which opens up into the space between said pair of main rollers, said loop section having an inner side and an outer side, said inner side receiving said coins to be stacked, wrapping means operable to feed wrapping material into said space between said two mains rollers, and drive means for driving said endless belt about said main rollers and said guide roller means as said coins are fed downwardly into said loop section to thereby stack said coins in said loop section and subsequently wrap said stacked coins in said loop section with said wrapping material.

4,920,731

MACHINE FOR PACKAGING PLURAL TYPES OF ARTICLES WITHIN A STRETCHABLE PLASTIC FILM

Renato Rimoldi, Bologna, and Angelo Cappi, Moderna, both of Italy, assignors to A.W.A.X. Progettazione E Ricerca S.r.l., Modena, Italy

Filed May 4, 1988, Ser. No. 190,201
Claims priority, application Italy, May 5, 1987, 20380 A/87
Int. Cl.[5] B65B *11/18*
U.S. Cl. 53—556 22 Claims



1. A machine for packaging one or more articles within a stretchable plastic film, the articles either alone or when bundled together having an outer profile which is substantially parallelepipedal, said machine comprising:

(a) stretching means for longitudinally stretching a segment of film web before wrapping the segment around the articles to be packaged;

(b) feeding means disposed in film feeding association with said stretching means for feeding the segment of film web to said stretching means;

(c) horizontal forwarding means for forwarding the articles to be packaged toward said stretching means, said horizontal forwarding means being located at a lower vertical height relative to said stretching means, said horizontal forwarding means comprising one or more conveyor belts;

(d) vertical forwarding means for lifting the articles to be packaged toward said stretching means, said vertical forwarding means being located beneath said stretching means and being in article receiving relationship to said horizontal forwarding means when said vertical forwarding means is in a lowered position, said vertical forwarding means comprising two half series of rollers, each said half series of rollers being configured so that they may be brought together to form an article support plane in cooperative alignment with the one or more conveyor belts of said horizontal forwarding means for receiving articles therefrom, said vertical forwarding means further comprising a motor, the motor being operatively attached to each of the half series of rollers for raising and lowering the half series of rollers;

(e) means for wrapping the stretched segment of film web longitudinally around the top, side and bottom of the articles;

(f) sealing means for sealing the segment of film web after the segment has been stretched and wrapped around the articles and while the segment is still under tension, said sealing means including two roller tables; and

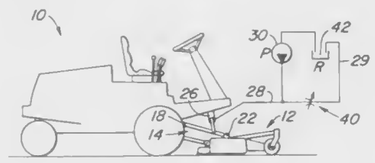
(g) means associated with said sealing means for displacing each of the half-series of rollers of the vertical forwarding means while moving the roller tables towards one another and under the articles undergoing wrapping with the segment of film web being simultaneously positioned between the roller tables and the articles and maintained in tension prior to sealing.

4,920,732

HYDRAULIC LIFT WITH WEIGHT TRANSFER

Michael C. Lee; Robert N. Behrens, both of Beaver Dam; Dale R. Dobberpuhl, Horicon; Lloyd A. Wykhuis, Mayville, all of Wis., and Dix S. Montgomery, St. Charles, Ill., assignors to Deere & Company, Moline, Ill.

Filed Mar. 15, 1989, Ser. No. 324,364
Int. Cl.[5] A01B *63/11*
U.S. Cl. 56—10.2 17 Claims



1. In a vehicle having a frame, lift arm structure movably connected to the frame and an implement supported from the lift arm structure and movable therewith, a source of hydraulic fluid under pressure and a fluid reservoir located on the vehicle, a hydraulic lift motor connected to the lift arm structure, means for controlling the lift motor for selectively providing an implement lift function for raising and lowering the implement between ground engaging and fully lifted positions and an implement weight transfer function for transferring implement weight to the vehicle frame, said means controlling comprising:

means for directing fluid flow from the source to the lift motor to tend to cause the motor to lift the implement relative to the vehicle frame;

valve means including a valve body, an orifice adjustably directing fluid flow from the lift motor to the reservoir to thereby control the working pressure of the fluid at the motor, and spool means supported by the body and selectively movable in a first longitudinal direction and a second rotational direction with respect to the body for controlling fluid flow, means for moving the spool means in one of the first and second directions between an adjustable orifice position for providing controlled weight transfer and a full lift position for providing increased fluid pressure to the lift motor to lift the implement from the ground, and means responsive to the movement of the spool means in the other of the first and second directions for adjusting the orifice to control weight transfer.

4,920,733

SELF-PROPELLED, WALK-BEHIND, HYDRAULIC MOTOR-OPERATED MOWER

Joseph E. Berrios, 975 NW. 114th Ave., Coral Springs, Fla. 33071

Filed Oct. 5, 1989, Ser. No. 417,506
Int. Cl.[5] A01D *35/12*
U.S. Cl. 56—10.9 16 Claims

1. A walk-behind mower comprising:

a rigid framework including a deck with a front section and a rear section;

first and second laterally spaced, vertically pivoted, directional wheels supported from said deck at the front of said front section of the deck;

first and second ground-engaging drive wheels on opposite sides of said rear section of said deck, each of said wheels having an axial hub;

first and second hydraulic motors, each having a rotor attached directly to said hub of a corresponding drive wheel;

first and second variable displacement, reversible pumps mounted on top of said rear section of said deck behind said drive wheels, said first and second pumps being respectively connected hydraulically to said motors to drive said motors individually, each of said pumps having a rotatably adjustable trunnion controlling the direction and fluid displacement of said pump;

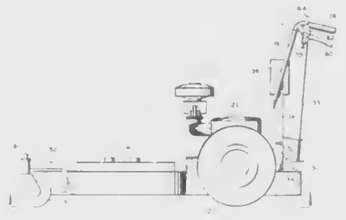
a hydraulic reservoir supported by said framework and connected to said pumps and motors to provide hydraulic fluid for operating said motors;

rotary cutters below said front section of said deck in front of said drive wheels;

an internal combustion engine mounted on top of said rear section of said deck between said drive wheels, said engine having a rotary output shaft extending below said rear section of said deck;

first pulley means on said output shaft of said engine below said rear section of the deck;

first endless flexible belt means driven by said first pulley means and driving said pumps;



second pulley means below said rear section of the deck;

an electric clutch below said rear section of the deck driven by said engine and driving said second pulley means;

second endless flexible belt means driven by said second pulley means and driving said cutters;

first and second manually operable handle mechanisms on said framework at laterally spaced positions above and behind said rear section of the deck;

first and second elongated control rods extending generally vertically down from said first and second handle mechanisms, respectively, and operable to be raised and lowered individually by said handle mechanisms;

and first and second linkage means respectively acting between said first and second control rods and said rotatably adjustable trunnions of said first and second pumps to control the fluid displacement and direction of each pump in accordance with the setting of the corresponding handle mechanism.

4,920,734

DRIVE CONTROL FOR WALK-BEHIND MOWER WITH HYDROSTATIC TRANSMISSION

Philip H. Wenzel, Vernon Center, N.Y., assignor to Ferris Industries, Inc., Oneida, N.Y.

Continuation-in-part of Ser. No. 276,912, Nov. 28, 1988, which is a continuation-in-part of Ser. No. 63,007, Jun. 17, 1987, Pat. No. 4,787,195. This application Sep. 15, 1989, Ser. No. 409,584
Int. Cl.[5] A01D *69/06*
U.S. Cl. 56—11.1 10 Claims

1. A self-propelled mower that comprises:

a front mowing deck housing a blade assembly containing one or more movable blades,

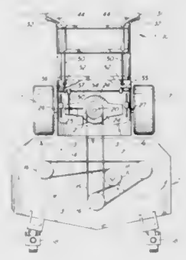
a rear power deck containing an engine, a pair of drive wheels, and a power train coupling the engine to the drive wheels, power take off means for connecting the blade assembly to the engine,

handle bar means attached to the back of the power deck for steering the drive wheel, and handle bar means having left and right grips,

independent brake means for selectively braking the left and right drive wheels including independently actuable brake levers adjacent the left and right grips of said handle bar means,

said power train further including a hydrostatic transmission having an input shaft means connected to the engine and differential drive means with right and left drive wheels and a speed regulator to set the speed ratio of the drive shaft means to the input shaft means within a continuous range from reverse through neutral, wherein the drive shaft means are idle, to maximum forward; and

control means positioned on the handle bar means and connected to the speed regulator by a speed control linkage



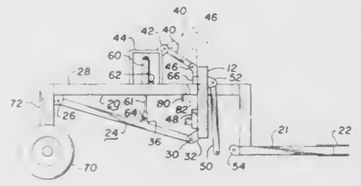
for setting the regulator at any desired position within the continuous range so that the operator can select a desired drive wheel speed without releasing the handle bar means or uncoupling the transmission from the engine, said control means including left and right speed control levers mounted on said handle bar means respectively adjacent said left and right grips for rocking motion about a transverse axis, and with said speed control linkage connecting said speed control levers to said regulator to permit an operator to control the speed and direction of motion of the mower with either hand without removing that hand from the respective grip.

4,920,735

OPERATIONAL CARRIER FOR WHEEL-TYPE HAY RAKE

Gilber D. Bailey, 3978 Beechwood La., Dallas, Tex. 75220, and James C. Bailey, Rte. 1, Cleburne, Tex. 76031

Filed Jul. 20, 1989, Ser. No. 383,336
Int. Cl.[5] A01D *67/00*
U.S. Cl. 56—14.9 5 Claims



1. An operational carrier for a wheel-type hay rake comprising:

an upper frame having one end for single point attachment to the draw bar of a towing vehicle,

a lower frame disposed beneath said upper frame and pivotally connected at one end to said upper frame,

a first linkage pivotally connected at one end to said upper frame and having an opposite end for attachment to a frame of the hay rake

said lower frame being provided with means for pivotally

attaching an opposite end of said lower frame to the frame of the hay rake, and

hydraulic means mounted on said upper frame and having a piston rod connected to said lower frame for raising said lower frame to move the frame of the hay rake, when said first linkage is connected to the frame of the hay rake, in a substantially vertical direction from a raking position to a transport position.

4,920,736

ARRANGEMENT FOR INTERRUPTING THE OPERATION OF AN INDIVIDUAL DRAFTING FRAME AT A SPINNING MACHINE

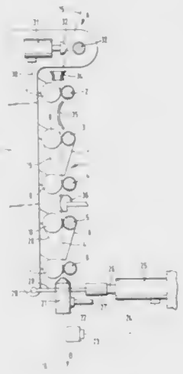
Fritz Stahlecker, Bad Uberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,314

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731886

Int. Cl.[5] D01H *13/16, 13/18;* D01G *31/00*

U.S. Cl. 57—84 19 Claims



1. A drafting frame arrangement for a spinning machine having a plurality of spinning units comprising:

driven bottom drafting roller means which extend over a plurality of spinning units,

load carrier means at respective spinning units which carry top pressure roller means which cooperate with the bottom roller means to draft sliver passing therebetween when the load carrier means is in an operative drafting position,

load carrier lifting means for lifting the load carrier means from the operative drafting position to a non-drafting position with the pressure roller means spaced from the bottom roller means,

disturbance monitoring means for monitoring disturbances at individual spinning units and corresponding drafting units composed of a load carrier means and adjacent portions of the bottom roller means,

and sliver control means for controlling the sliver at a respective drafting unit in response to detection of a disturbance by the disturbance monitoring means, said sliver control means including means for automatically moving the load carrier means to its non-drafting position and sliver contact reducing means for reducing sliver contact at the bottom roller means.

4,920,737

WORM MOWER

Franz Wieneke, Bovenden, Fed. Rep. of Germany, assignor to Münich, Steinmann, Schiller, München, Fed. Rep. of Germany

PCT No. PCT/DE87/00480, § 371 Date Jun. 22, 1988, § 102(e) Date Jun. 22, 1988, PCT Pub. No. WO88/02983, PCT Pub. Date May 5, 1988

PCT Filed Oct. 22, 1987, Ser. No. 221,255

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635925; Jan. 22, 1987, 3701668

Int. Cl.[5] A01D *34/53*

U.S. Cl. 56—249 22 Claims



1. A worm mower for cutting stalk material of various kinds, having an auger cutting worm means, which turns at a high circumferential velocity about an axis of the auger cutting worm means, wherein the auger cutting worm means has an angle of inclination (α) smaller than an angle of friction (glide angle) of the material to be cut, and wherein a circumference of said auger cutting worm means is provided in an axial direction of the auger cutting worm means axis with a continuous cutting surface, which is slightly inclined (γ) towards said auger cutting worm means axis so that the material to be cut is discharged at right angles to the auger cutting worm axis and is not bent along that axis.

4,920,738

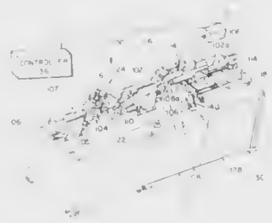
APPARATUS FOR WINDING OPTICAL FIBER ON A BOBBIN

James C. White, Decatur, and George T. Pinson, Huntsville, both of Ala., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 180,337, Apr. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 32,243, Mar. 3, 1987, Pat. No. 4,746,080. This application Sep. 14, 1989, Ser. No. 407,713

Int. Cl.[5] B65H *55/04*

U.S. Cl. 57—62 20 Claims



1. Apparatus for winding optical fiber on a bobbin comprising:

means for mounting the bobbin on which optical fiber is to be wound, the bobbin having a deployment axis along which the wound fiber is deployed during use;

means for supplying a strand of optical fiber along said deployment axis toward said bobbin, said fiber supply means imparting a selected twist to the fiber about said deployment axis; and

means including a winding arm for receiving said supplied optical fiber strand along said deployment axis and rotatably winding said axially received strand in coils on the bobbin,

wherein said fiber supply means includes a fiber supply reel with optical fiber wound thereon, said reel having a reel axis, and wherein said fiber supply means further includes a fiber supply reel twist arm for mounting said fiber supply reel for rotation about said deployment axis with said reel axis being substantially orthogonal to said deployment axis.

4,920,739

METHOD AND APPARATUS FOR REESTABLISHING THE SPINNING OPERATION

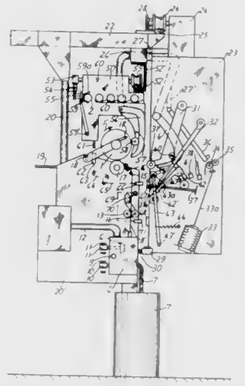
Hans Raasch, Mönchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchengladbach, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,954

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 3801964

Int. Cl.[5] D01H *15/02*

U.S. Cl. 57—263 16 Claims



1. A method for reestablishing the spinning operation at a spinning station of an open end spinning machine of the type having a plurality of spinning stations with a spinning element at each station, having a traveling package changing unit for removing a full yarn package at a spinning station and placing an empty tube in position for winding spun yarn therein, and having a traveling yarn restarting unit with a supply of auxiliary yarn thereon, the traveling package changing unit and the traveling yarn restarting unit being independently movable, comprising:

generating at each spinning station a signal responsive to a yarn break thereat;

generating at each spinning station a signal responsive to the completion of a package changing operation thereat by the traveling package changing unit;

positioning said traveling yarn restarting unit at a spinning station in response to either of said signals being generated thereat; and

operating said positioned yarn restarting unit to selectively either engage a broken yarn end from the yarn package in response to a yarn break signal, guide the yarn end to the spinning element to piece the yarn end with fibers and withdraw the pieced yarn from the spinning element, and restarting winding of the pieced yarn onto the yarn package, or provide a yarn end from an auxiliary yarn package in response to a package changing signal to guide the yarn end to the spinning element to piece the yarn end with fibers and withdraw the pieced yarn from the spinning element, and engage the pieced yarn onto an empty tube at said station.

4,920,740

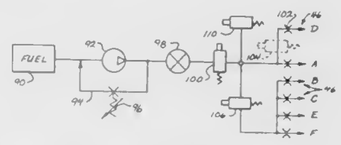
STARTING OF TURBINE ENGINES

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 23, 1987, Ser. No. 124,073

Int. Cl.[5] F02C *7/26*

U.S. Cl. 60—39.141 1 Claim



1. A relatively small turbine engine comprising:

a rotary turbine wheel;

a rotary compressor coupled to said turbine wheel;

an annular combustor for receiving air from said compressor and fuel from a fuel source, combusting the same and providing gases of combustion to said turbine wheel to drive the same;

a plurality of substantially identical main fuel injectors including fuel injecting nozzles angularly spaced about said compressor;

fuel and air from said compressor being introduced into said combustor generally in the tangential direction;

a fuel pump;

a control schedule valve; and

first and second main fuel solenoid valves;

said first valve being operable to connect a minority of said injectors to said control schedule valve and said fuel pump for starting said engine, there being an even number of said injectors and said minority of injectors consisting of two diametrically opposite injectors;

said first and second valves being operable to connect all of said injectors to said control schedule valve and said pump for causing normal operation of said engine;

said engine further being characterized by the absence of start fuel injectors for said combustor.

4,920,741

APPARATUS FOR VENTING THE ROTOR STRUCTURE OF A COMPRESSOR OF A GAS TURBINE POWER PLANT

Josef Liebl, Dachau, Fed. Rep. of Germany, assignor to MTU Motoren-UND Turbinen-Union München GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 20,125, Feb. 27, 1987, abandoned. This application Mar. 29, 1989, Ser. No. 329,955

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 3606598; Jan. 12, 1987, 3627306

Int. Cl.[5] F02C *7/18*

U.S. Cl. 60—39.07 9 Claims

1. Apparatus for cooling the rotor of a multi-stage axial compressor of a gas turbine power plant and for maintaining optimum rotor vane clearance in which the compressor has an axial diffusor located downstream of the rotor vanes and stator vanes of the last stage of the compressor, said apparatus comprising:

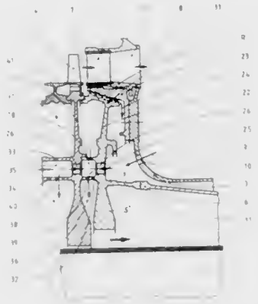
seal means at the last stage of the compressor for sealing a flow channel in the compressor in which compressed air flows but permitting leakage flow of air therethrough, said seal means including a rotating part and a stationary part,

the rotor of the compressor including a rotor disk at the last compressor stage and a further rotor disk downstream thereof, said rotor having an axis of rotation, said disks

having root portions closest to said axis of rotation, said rotating part of the seal means being secured to the peripheries of said rotor disk at the last compressor stage and said further rotor disk,

a combustion chamber into which the compressed air from the compressor is supplied, said combustion chamber including a housing which supports said stationary part of the seal means,

means for bleeding off air in the flow channel of the compressor at a location between the stator and rotor vanes at the last compressor stage and supplying the bled air to said seal means, said bled air flowing through said seal means,



an annular chamber formed between said further rotor disk and said housing of the combustion chamber for receiving bled air which has flowed through said seal means,

said combustion chamber housing having an opening through which compressed air which has passed through the diffusor can enter said annular chamber and be mixed therein with the bled air which has flowed through the seal means, and

flow channel means provided in said disk at the last compressor stage and said further disk downstream thereof for flow of the mixture of air in said annular chamber in a direction opposite the direction of flow of the compressed air in said flow channel and radially inwards against said root portions of said disks.

4,920,742

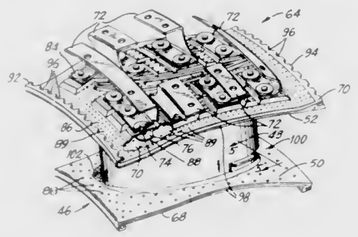
HEAT SHIELD FOR GAS TURBINE ENGINE FRAME

Dudley O. Nash, Cincinnati, and Ronald E. Quinn, Hamilton, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 31, 1988, Ser. No. 200,333

Int. Cl.[5] F02C *7/20*

U.S. Cl. 60—39.32 **31 Claims**



1. A support structure for supporting a flowpath liner on a turbine engine frame member, wherein said support structure comprises:

a support bracket connected to said turbine engine frame member;

a support means connected to said flowpath liner, said support means engaging said support bracket with a free-floating interconnection to freely accommodate axial and circumferential thermal expansion and contraction of said flowpath liner; and

a clearance hole formed in said support bracket wherein said support means projects through said clearance hole to provide said free-floating interconnection therebetween.

4,920,743

CRASH BAG PROPELLANT COMPOSITION AND METHOD FOR GENERATING NITROGEN GAS

Richard V. Cartwright, Sussex, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jul. 25, 1988, Ser. No. 223,965

Int. Cl.[5] C06D *5/00;* **C06B** *45/10*

U.S. Cl. 60—205 **11 Claims**

1 A crash bag propellant composition comprising, in combination,

(a) a metal azide salt component of a group 1(a)- or 2(a)-type metal; and

(b) an oxide of a non-toxic transition metal element sufficient to react with up to about 70% of said metal azide salt component; and

(c) an effective amount of a modifier component represented by the formula

$$Me_x(An)_o$$

wherein

Me is defined as a cation of iron or copper;

An is defined as phosphorus containing anion group which is chemically compatible with Me and capable of reacting with said metal azide salt component to obtain non-toxic by-products less basic than a metal hydroxide corresponding to said metal azide salt component; and

x is defined as a positive number of about 1-4; and

o is defined as a positive number not exceeding about 3, the sum of which does not exceed about 7.

9 A method for reducing corrosive properties of by-products generated by initiating the reaction of a crash bag propellant composition comprising a group 1(a)- or 2(a)-type metal azide component and an oxide of a transition metal as an oxidizer component, comprising replacing said oxidizer component, at least in part, with an effective amount of a modifier component of the formula

$$Me_xAn_o$$

wherein

Me is defined as a cation of a non-toxic iron or copper metal element;

An is defined as phosphorus containing anion group which is chemically compatible with said transition metal cation of said modifier component, and capable of reacting with said metal azide salt component to obtain non-toxic by-products less basic than a metal hydroxide corresponding to said metal azide salt component;

x is defined as a positive number of about 1-4; and

o is defined as positive number not exceeding about 3, the sum of which does not exceed about 7.

4,920,744

DUCTED FAN TURBINE ENGINE

Alain Garcia, Aussonne; Jean-Claude Tchavdarov, Castelmaurou, and Alain Porte, Colomiers, all of France, assignors to Aerospatiale-Societe Nationale Industrielle, Paris, France

Filed Nov. 4, 1988, Ser. No. 267,458

Claims priority, application France, Nov. 6, 1987, 87 15434

Int. Cl.[5] F02K *3/04*

U.S. Cl. 60—226.1 **11 Claims**



1. A ducted fan turbine engine comprising a central engine provided with a housing encompassed by a gas generator compartment externally delimited by an intermediate ring, a fan duct delimited between the intermediate ring and an outer ring, the intermediate ring comprising two articulated caps with a C-shaped section allowing for access to be gained to the central engine, and means for moving said caps, wherein each of said caps is connected to the housing of the engine by said moving means so that each of said caps can be displaced between a closed position whereby a front end portion of said cap is located within said outer ring, and a rear intermediate position whereby said cap is fully displaced beyond a rear edge of said outer ring, each of said caps being mounted on said moving means so that said caps can be rotated between said rear intermediate position and an open position, said caps being rotated about an axis substantially parallel to a longitudinal axis o the ducted fan turbine engine.

4,920,745

INTERNAL COMBUSTION ENGINES

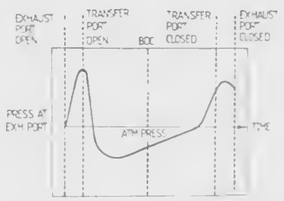
Wayne Ross Gilbert, City Beach, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

Filed Aug. 11, 1987, Ser. No. 175,425

Claims priority, application Australia, Apr. 9, 1984, PG4492

Int. Cl.[5] F02B *27/02*

U.S. Cl. 60—273 **21 Claims**



1. A method of operating an internal combustion engine having a cylinder with a piston movable therein defining a combustion chamber, a charge inlet port and an exhaust port in said cylinder, said ports being arranged to be opened and closed in a timed relation to the movement of the piston in the cylinder so the inlet port is open during at least part of the time the exhaust port is open and closes before the exhaust port is closed, the method including the steps of: delivering the gaseous products of combustion from the cylinder to an exhaust passage communicating with the exhaust port downstream thereof, said exhaust passage being dimensionally proportioned to establish when the engine is operating in a first selected speed range a pressure pattern in the gas in the exhaust passage in response to opening of the exhaust port that will create at the exhaust port a pressure pulse of predetermined character before the exhaust port closes, and, in response to a predetermined engine operating condition existing when the engine is operating in a second speed range outside of said first selected speed range and having a lower limit of 1.6 times the normal idle speed of the engine, regulating the temperature of the gas in the exhaust passage in relation to the engine speed and load to establish a pressure pattern in said exhaust passage in response to opening of the exhaust port to create a pressure pulse of said predetermined character at the exhaust port before the exhaust port closes when the engine is operating in said second speed range outside of said first selected speed range.

4,920,746

EXHAUST SYSTEM FOR COMBUSTION ENGINES

Sven R. V. Gebelius, P.O. Box 15008, S-1615 Bromma, Sweden

PCT No. PCT/SE87/00107, § 371 Date Aug. 30, 1988, § 102(e) Date Aug. 30, 1988, PCT Pub. No. WO87/05357, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 4, 1987, Ser. No. 240,124

Claims priority, application Sweden, Mar. 10, 1986, 8601099

Int. Cl.[5] F01N *3/28*

U.S. Cl. 60—299 **21 Claims**



1. An exhaust system for a combustion engine comprising a longitudinally extending tubular member having a first end portion for connection to an exhaust manifold of a combustion engine and having, in a direction away from the first portion, a plurality of alternating smooth portions and circumferentially corrugated portions thereon and including an air permeable sound damping insert inside the tubular member which extends along the length of the tubular member.

4,920,747

HEADER DUMP ASSEMBLY

Billy L. Haney, 20078 5B Rd., Plymouth, Ind. 46563

Filed Dec. 16, 1988, Ser. No. 285,745

Int. Cl.[5] F01N *7/00;* **B65D** *45/00*

U.S. Cl. 60—324 **15 Claims**

1. A header dump assembly for an engine having an exhaust manifold and a muffler in fluid communication with the engine, which comprises:

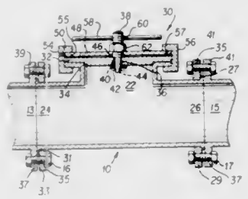
(a) a header dump inlet port sized to receive exhaust gasses without excessive restriction from the exhaust manifold;

(b) a header dump outlet port sized to pass exhausting gasses without excessive restriction from the header dump inlet port, the header dump outlet port further in fluid communication with the muffler;

(c) a bypass port disposed between the inlet and the outlet ports of the header dump assembly, the bypass port sized to selectively pass exhausting gasses without excessive restriction from the bypass port to atmosphere;

(d) a closure assembly with a handle thereon for selectively

sealing or removing the closure assembly from the bypass port of the header dump assembly with less than one full rotation of the handle, the closure assembly comprising a closure plate sized to sealingly engage the bypass port, the closure plate having an aperture therethrough; a threaded rod disposed through the aperture in the closure plate and rotatably secured therein; at least one boss secured in proximity to the bypass port; a retaining bar having a threaded aperture therethrough sized to threadably engage the threaded rod; the retaining bar further having at least one stop positioned to align the retaining bar in relation to the boss secured in proximity to the bypass port; a handle secured to the rod for ease of rotation of the rod; the rod being preferably stepped to a reduced diameter for rotatable securement through the first aperture in the closure plate, and the rod is rotatably secured beneath the closure plate by a cotter pin extending through an



aperture in the reduced diameter portion of the rod; rotation of the handle rotates the rod to rotatably bias the retaining bar stop against the boss, and further rotation of the handle raises the retaining bar against the underside of the boss to bias the closure plate against the bypass port, and opposite rotation of the handle lowers the retaining bar from the boss, releasing the retaining bar for rotation from beneath the boss, allowing the closure assembly to be removed from the bypass port with less than one full rotation of the handle;

wherein exhaust gasses from the exhaust manifold pass through the header dump assembly to the muffler to reduce engine noise when the closure assembly is selectively sealed about the bypass port; and the exhaust gasses pass through the bypass port to atmosphere to relieve back pressure on the engine, and improve engine performance, when the closure assembly is selectively removed from the bypass port.

4,920,748

HYDRAULIC DRIVE SYSTEM

Rolf Kordak, Lohr; Heinrich Nikolaus, and Frank Metzner, both of Hamburg, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lahr, Fed. Rep. of Germany

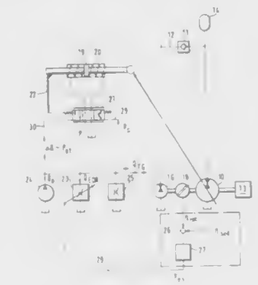
Filed Aug. 10, 1984, Ser. No. 639,917

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1983, 3330367

Int. Cl.[5] F16H *39/50*

U.S. Cl. 60—414 7 Claims

1 A hydraulic drive system, comprising a first hydraulic machine having an adjustable volume of through-put and operable as a pump or motor, a line of load-independent pressure to which said first machine is connected, a second hydraulic machine coupled for rotation with said first machine for functioning as a signal transmitter for providing a hydraulic signal indicative of speed of said first machine, said second machine being operable as a motor or pump in response to the direction of rotation of said first machine to produce a control flow speed signal proportional to the actual speed of the first machine, and means for adjusting the through-put of said first machine comprising a flow restricting system for providing a pressure signal including a pump and an adjustable throttle cooperable with the control flow of said signal transmitter for delivering a pressure signal P_{st} which is compared with a predetermined pressure P_O for setting the volume of through-put of said first machine in response to the differential pressure $p_{st} - p_O$, characterized by a tacho generator driven by said first



machine for providing an electrical signal indicative of actual speed of operation of said first machine, n_{ist}, said adjustable throttle being set by an output signal of an electrical control means receiving a differential signal which is defined by a desired speed signal n_{soll} and an actual speed n_{ist}.

4,920,749

METHOD OF AND MEANS FOR PRODUCING ELECTRICITY

John R. Letarte, 21 Juniper Ridge, Shelburne, Vt. 05482

Filed Aug. 24, 1989, Ser. No. 397,862

Int. Cl.[5] F01K *25/10*

U.S. Cl. 60—648 2 Claims



1. A method of producing electricity, for use when gas is reduced in pressure through a sequential process, comprising the steps of:

expanding the gas to maintain a desired pressure level using an expansion device, gearbox and generator designed to convert a portion of the energy available from isentropic expansion of said gas to electricity;

warming said gas by circulating a working fluid between a heat exchanger that warms the gas and a second heat exchanger that absorbs heat from a thermal storage medium heated by an intermittent heat pump; and

further warming of said gas to a desired temperature by the use of an optional supplemental heater as required by design ambient temperature conditions.

4,920,750

HEAT EXCHANGING SYSTEM FOR POWER GENERATION

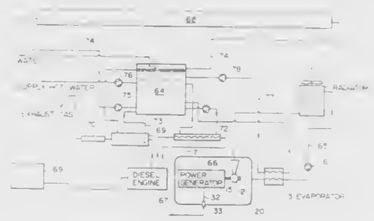
Naotsugu Iishiki, Tokyo; Shigetou Okano, Kashiwa, and Shiro Mishima, Kamagaya, all of Japan, assignors to Yamato Kosan Co., Ltd., Ichikawa, Japan

Filed Oct. 13, 1988, Ser. No. 260,471

Claims priority, application Japan, May 19, 1986, 61-113979; Oct. 29, 1986, 61-257584; Feb. 20, 1987, 62-37247; Feb. 20, 1987, 62-37246; Mar. 6, 1987, 62-51544

Int. Cl.[5] F01K *25/00*

U.S. Cl. 60—671 4 Claims



1. A temperature difference driven type heat exchanger/-power generator, comprising:

a radiator exposed to cold outdoor air;

an evaporator exposed to indoor air warmer than said outdoor air;

a main heating medium circulation line connecting said radiator and said evaporator in a closed loop, whereby a main heating medium may be evaporated in said evaporator and condensed in said radiator, an amount of said evaporation and said condensation being a function of a temperature difference between said outdoor air and said indoor air;

a temperature difference engine mounted in said main heating medium circulation line at a position wherein said temperature difference engine receives an evaporated main heating medium from said evaporator and supplies said main heating medium to said radiator, said temperature difference engine being applied with a negative pressure corresponding to a volume reduction of said main heating medium due to phase transition of the main heating medium from gas to liquid in said radiator, whereby an output of said temperature difference engine is a function of the temperature difference between said outdoor air and said indoor air;

means for supplementing the temperature of said indoor air in said evaporator, comprising an external heat source and an auxiliary heating medium circulation line connected between said external heat source and said evaporator; and

a power generator connected to the output of said temperature difference engine, whereby the power generated by said power generator is a function of the temperature difference between said outdoor air and said indoor air,

wherein said temperature-difference-driven engine and said power generator are housed in a pressure vessel together with a lubricant oil pump, a heating medium inlet port of said temperature difference engine is open to inside of said pressure vessel while an output port thereof is communicated to said heating medium circulation line so that the heating medium which is introduced in said temperature-difference-drive engine is filled in said pressure vessel via said main heating medium circulation line, and the output electric current from said power generator is taken out via an electric source plug attached on said pressure vessel.

4,920,751

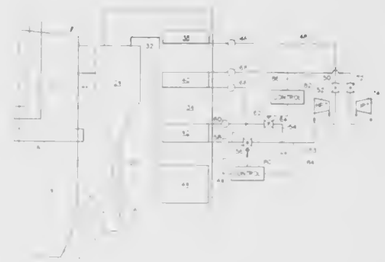
SYSTEM AND METHOD FOR REHEAT STEAM TEMPERATURE CONTROL IN CIRCULATING FLUIDIZED BED BOILERS

Ponnusami K. Gounder, San Diego; Neil R. Raskin, Carlsbad, and Timo M. Kauranen, San Diego, all of Calif., assignors to Pyropower Corporation, San Diego, Calif.

Continuation of Ser. No. 301,621, Jan. 24, 1989, abandoned. This application Nov. 20, 1989, Ser. No. 440,416

Int. Cl.[5] F01K *13/02*

U.S. Cl. 60—679 27 Claims



1. A power plant including a steam generator having a fluidized bed combustion system that includes a fluidized bed combustor, at least one separator, and a reheater having first and second stages, the improvement comprising:

means for dividing cold steam from a turbine into selective first and second portions and directing said first portion through said first stage reheater; and

means for recombining said first and second portions and directing same through the second stage of said reheater.

4,920,752

APPARATUS AND PROCESS FOR STORING HYDRATE-FORMING GASEOUS HYDROCARBONS

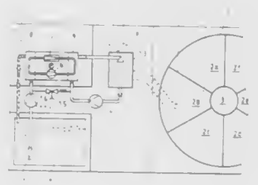
Christian Ehrsam, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 27, 1988, Ser. No. 290,437

Claims priority, application Switzerland, Jan. 14, 1988, 00132/88

Int. Cl.[5] F17C *11/00*; 62 *46.1, 54.1*; 585 *15*

U.S. Cl. 62—46.1 11 Claims



1. An apparatus for storing hydrate-forming gaseous hydrocarbons, said apparatus comprising:

a hydrate reservoir having at least one chamber for storing a frozen hydrate in a pressure range of one atmosphere and at a temperature below the decomposition temperature of the hydrate;

a hydrate forming installation for supplying frozen hydrate to said chamber;

a water tank connected to said installation to deliver water thereto;
first means for passing gas evolved from said chamber in heat exchange relation with the water from said tank to heat the gas while cooling the water; and
second means for supplying the heated gas to said chamber to decompose the hydrate therein into gas and ice.

4,920,753

METHOD OF STORING VOLATILE SUBSTANCES, CONTAINER FOR STORING SAID SUBSTANCES, AND FLOW-CONTROL METHOD FOR SURFACE FLOW OF SUPERFLUID HELIUM

Shosuke Sasaki, Amagasaki, and Yasuyuki Kitano, Hiroshima, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,177
Claims priority, application Japan, Aug. 4, 1987, 62-194596; Aug. 20, 1987, 62-205156
Int. Cl.[5] F25B *19/00*
U.S. Cl. 62—51.3 **10 Claims**



1. A method for storing liquid helium in a container, comprising the steps of:
storing the liquid helium in the container;
maintaining the liquid helium at a temperature such that it is in a superfluid state; and
suppressing the superfluid surface flow of the liquid helium by blocking means disposed on a wall surface of the container

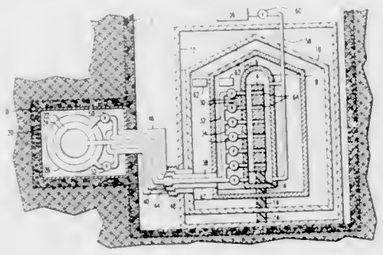
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4,920,754

SYSTEM FOR DUMPING CRYOGENS IN A SUPERCONDUCTING SOLENOID INSTALLATION

Jeffrey T. Dederer, Penn Hills, and Donald T. Hackworth, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1989, Ser. No. 306,360
Int. Cl.[5] F17C *1/00*
U.S. Cl. 62—53.1 **13 Claims**



13. In an installation disposed below ground level in a trench provided with a concrete lining defining a horizontal floor, the installation including a superconducting solenoid coil in the form of an annulus having a vertical axis, a first vessel having an annular form and enclosing the coil for containing a primary cryogen at a temperature sufficient to maintain the coil superconductive, and at least one second vessel having an annular form and enclosing the first vessel for containing a secondary cryogen at a selected temperature, the improvement comprising:
cryogen storage means spaced horizontally from said coil and said vessels for receiving the cryogens contained in said vessels;
conduit means coupled between said vessels and said storage means for permitting the flow of cryogens therebetween;
structural support means supporting said coil and said vessels directly from the lining floor;
a source of primary cryogen in gaseous form, and piping means connected between said source and said first vessel for controllably supplying the primary cryogen in gaseous form from said source to the interior of said first vessel; and
heater means disposed in the vicinity of the upper end of said second vessel for heating the secondary cryogen to place the secondary cryogen in a gaseous state; wherein:
said cryogen storage means comprise a first cryogen storage tank connected to said conduit means for receiving the primary cryogen from said first vessel, and a second storage tank surrounding said first storage tank to form, with said first storage tank, an annular storage space, said second storage tank being connected to said conduit means for receiving, in said annular storage space, the secondary cryogen from said second vessel,
said conduit means comprise a first conduit connected to form a fluid flow path between said first vessel and said first storage tank, and a second conduit connected to form a fluid flow path between said second vessel and said second storage tank, said second conduit surrounding said first conduit so that the fluid flow path defined by said second conduit is an annular flow path surrounding said first conduit, each conduit having a portion extending transversely to the vertical axis of the coil, and a respective bellows disposed in said transversely extending portion of each said conduit for permitting movements of said vessels relative to said storage means transverse to the vertical axis of the coil,
said conduit means further comprise: a plurality of pipes spaced apart along the vertical axis of the coil and each communicating with the interior of said first vessel; a manifold connected between said pipes and said cryogen storage means; and a plurality of remotely operable valves each connected in a respective one of said pipes, and
said coil is provided with a plurality of fluid flow passages extending through said coil transversely to the vertical axis of said coil, with each said passage being aligned with a respective one of said pipes.

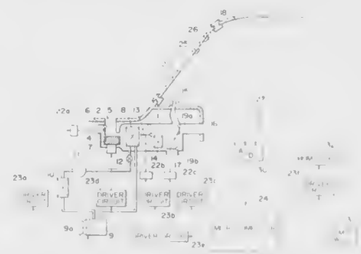
4,920,755

CONTROL APPARATUS FOR AUTOMOBILE AIR-CONDITIONERS

Takahashi Tadahiro, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,369
Claims priority, application Japan, Jun. 10, 1988, 63-143203
Int. Cl.[5] F28D *3/00*
U.S. Cl. 62—171 **2 Claims**

1. A control apparatus for an automobile air-conditioner, comprising:
(a) windowpane humidity detection means for detecting a relative humidity on the inside surface of a windowpane of a motor vehicle;
(b) mist judgment means for making a judgment, according to the output from said windowpane humidity detection means, to determine whether the inside surface of the windowpane is misted or not;
(c) windowpane temperature detection means for detecting a temperature of the inside surface of the windowpane;
(d) vehicle compartment temperature detection means for detecting a temperature of the air inside the vehicle compartment;
(e) vehicle compartment humidity calculation means for calculating a relative humidity in the vehicle compartment by conversion from the relative humidity on the inside surface of the windowpane, the temperature of the inside surface of the windowpane and the temperature of the air in the vehicle compartment;
(f) humidification demand judgment means for making a judgment as to whether the relative humidity calculated by said vehicle compartment humidity calculation means is lower than a predetermined humidity; and



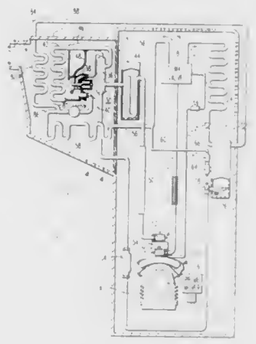
(g) control mean for controlling said air-conditioner to achieve a demist operation if the judgment by said mist judgment means indicates the misted state of the inside surface of the windowpane, and to achieve a humidifying operation if the judgment by said mist judgment means indicates the non-misted state of the inside surface of the windowpane and the judgment by said humidication demand judgment means indicates the relative humidity in the vehicle compartment which is lower than said predetermined humidity.

4,920,756

TRANSPORT REFRIGERATION SYSTEM WITH DEHUMIDIFIER MODE

Leland L. Howland, Belle Plaine, and David H. Taylor, Minneapolis, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 15, 1989, Ser. No. 310,551
Int. Cl.[5] F25B *29/00*
U.S. Cl. 62—173 **10 Claims**



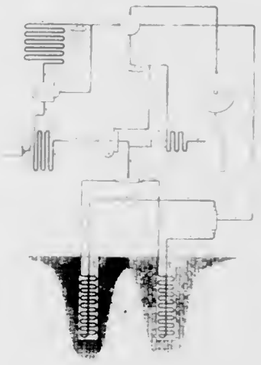
1. In a transport refrigeration system having an air flow path in communication with a served space for providing conditioned air controlled to a predetermined set point temperature via cooling and heating modes in which a refrigerant compressor respectively provides refrigerant in the form of hot gas for a first refrigerant circuit which includes an evaporator having an input and an output, with the evaporator being in the conditioned air flow path, a primary condenser having an input and an output, with the primary condenser being outside the conditioned air flow path, and an expansion valve disposed between the output of the primary condenser and the input of the evaporator, and for a second refrigerant circuit which by-passes the primary condenser and expansion valve and directs hot gas from the compressor to the input of the evaporator, a dehumidifying mode which removes moisture from the conditioned air without intentionally changing the temperature of the conditioned air, characterized by:
a secondary condenser having an input and an output,
said secondary condenser being in the air flow path,
means connecting said secondary condenser in parallel with the primary condenser,
a prime mover for the compressor operable in a selected one of predetermined high and low speeds,
and control means selecting the low prime mover speed during the dehumidifying mode,
said control means effectively connecting the secondary condenser in the first refrigerant circuit during the dehumidifying mode, while effectively disconnecting the primary condenser from the first refrigerant circuit, whereby the evaporator cools and removes moisture from the conditioned air and the secondary condenser heats the conditioned air.

4,920,757

GEOTHERMAL HEATING AND AIR CONDITIONING SYSTEM

Jimmy Gazes, 803 O'Sullivan Dr., Mt. Pleasant, S.C. 29464, and Dewey Mixson, 1117 Dickson Ave., Hanahan, S.C. 29406

Continuation-in-part of Ser. No. 233,418, Aug. 18, 1988. This application Aug. 17, 1989, Ser. No. 395,262
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—181 **4 Claims**



1. A geothermal heating and air conditioning system, comprising:
a. a compressor means for compressing a refrigerant;
b. one or more indoor coils for heat exchange between said refrigerant and inside air;
c. one or more outdoor coils which are placed vertically below ground for heat exchange between said refrigerant and earth surrounding said outdoor coils;
d. a condenser/receiver which allows the refrigerant to pass through said condenser/receiver in either direction, and which is positioned between said indoor coil and said ground coils, allowing for heat exchange so as to control the state and temperature of the refrigerant, and having

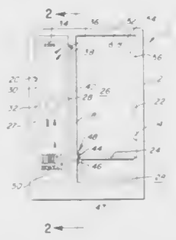
sufficient volume capacity to accumulate liquid refrigerant to prevent liquid refrigerant from entering said compressor;
e. a means for allowing a portion of said refrigerant traveling between said indoor coils and said outdoor coils to be diverted to an inlet side of said compressor; and
f. a valve which controls a flow of refrigerant through said means in response to refrigerant pressure on said inlet side of said compressor.

4,920,758

REFRIGERATOR TEMPERATURE RESPONSIVE AIR OUTLET BAFFLE

Donald E. Janke, Benton Township, Berrien County, and Edwin H. Frohbieter, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 18, 1988, Ser. No. 221,039
Int. Cl.[5] F25D *17/04*
U.S. Cl. 62—187 **14 Claims**



1. A refrigeration apparatus comprising:
a compartment to be cooled by refrigerated air;
refrigerated air providing means for circulating refrigerated air;
air inlet means for providing an air inlet passage, through which air flows from the refrigerated air providing means to said compartment;
first air outlet means for providing a first air return passage, through which air flows from said compartment to said refrigerated air providing means;
second air outlet means for providing a second air return passage, through which air flows from said compartment to said refrigerated air providing means;
baffle means for selectively and independently opening and closing said first and second air return passages, said baffle means comprising a unitary baffle positioned at both said first and said second air outlet means; and
temperature control means operatively associated with said baffle means for controlling said baffle means to selectively open and close said first and second air return passages to control the movement of air through said compartment to maintain said compartment at a desired temperature.

4,920,759

RADIANT HEAT CONTROL APPARATUS FOR AUTOMOTIVE VEHICLE

Masakazu Tanaka, Isehara, and Toshio Ohashi, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 26, 1989, Ser. No. 343,216
Claims priority, application Japan, Apr. 26, 1988, 63-101358
Int. Cl.[5] B60H *1/32*
U.S. Cl. 62—244 **16 Claims**

1. A radiant heat control apparatus for an automotive vehicle with a vehicle body and a passenger compartment, comprising:
(a) radiant heat sensing means, disposed within the passenger compartment, for sensing radiant heat transferred between an inner surface of the vehicle body and an inner position within the passenger compartment;
(b) temperature adjusting means, disposed in the vehicle body, for adjusting temperature on the inner surface of the vehicle body;



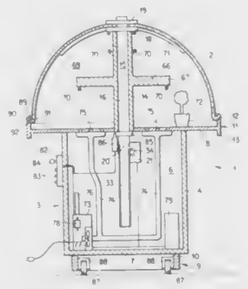
(c) control means, coupled to said radiant heat sensing means and said temperature adjusting means, for controlling the amount of radiant heat transferred between the inner surface of the vehicle body and the inner position within the passenger compartment on the basis of signals from said radiant heat sensing means.

4,920,760

DISPLAY BOOTH

Horst Muhlack, D-2300 St. Adde, Kiel Julien Lusterweg 23, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,660
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641354; Denmark, May 1, 1987, 2226/87; European Pat. Off., Oct. 31, 1987, 87116029.7
Int. Cl.[5] A47F *3/04*
U.S. Cl. 62—255 **67 Claims**



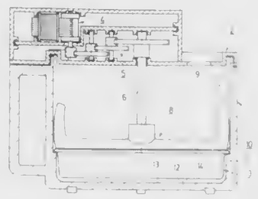
1 A display booth comprising a support; a dome above said support, said dome having an internal space and a top portion and being movable with reference to said support up and down between a plurality of different positions; means for locating said dome in at least one of said positions including a substantially upright carrier for said dome and said carrier having an upper end portion disposed in said internal space adjacent the top portion of said dome, said carrier being movable up and down with said dome; and means for connecting said upper end portion with said top portion including a platform disposed in said internal space on said upper end portion adjacent said top portion, a cap overlying said top portion, said cap, top portion, and platform each having an opening in alignment with each other, and means for clamping said top portion between said platform and said cap including a threaded fastener having a top portion overlying the cap and a second portion which extends through said openings and into the upper end portion of said carrier.

4,920,761

ICE-CREAM MAKER

Romuald L. Bukoschek, Klagenfurt; Wolfgang Ramusch, Brückl/Kärnten, both of Austria, and Johann Schröder, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 23, 1986, Ser. No. 877,653
Claims priority, application Austria, Jun. 26, 1985, A1903/85
Int. Cl.[5] A23G *9/00*
U.S. Cl. 62—342 **7 Claims**



1. An ice-cream maker comprising:
a cylindrical container;
a discoid cold cartridge insertable into said container residing near the bottom of said container;
a holding and sealing arrangement including a continuous outwardly extending edge provided around the circumference of said cold cartridge and a corresponding step in the wall of said container extending inside said container, around its circumference supporting a top wall of said discoid cold cartridge at a fixed vertical position, and for holding said cartridge inserted into said container at a distance from a bottom wall of said container, whereby a small free space is formed between at least a bottom wall of said cold cartridge and the bottom wall of said container permitting expansion and contraction of said bottom wall without changing said vertical position of said top wall, said arrangement sealingly closing said space to prevent leakage of any ice-cream mixture into said space;
a shaft located centrally in said container supported above said cold cartridge;
an electric motor driving said shaft through a gear unit; and
a scraper and stirrer tool located on said shaft and biased against said top wall of said cold cartridge for scraping the top of said cold cartridge.

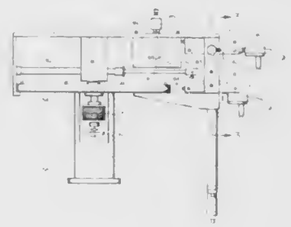
4,920,762

CRYOGENIC TARGET AND METHOD AND APPARATUS FOR MAKING SAME

Gary K. Beckstead, 3532 Baringwood Cir., Kearns, Utah 84118, and Dennis L. Fleming, 4280 Mackay Dr., Salt Lake City, Utah 84119

Filed Apr. 11, 1988, Ser. No. 179,837
Int. Cl.[5] F25C *1/06*
U.S. Cl. 62—353 **3 Claims**

1. Apparatus for forming a target for use by shooters and the like, comprising
a mold having a cavity formed within a lower mold portion and a pair of upper mold halves, said cavity being shaped to form a saucer shaped target;
means for injecting a volume of water into the mold cavity;
means for freezing the volume of water in the cavity into a target having a saucer shape; and
means for removing the target from the cavity, said removing means including a fluid cylinder connected to one of said mold halves and operable to move said mold half relative to the other said mold half to separate the mold halves from one another and at least one fluid cylinder



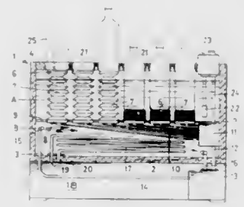
connected to said lower mold portion and operable to move said lower mold portion towards and away from said mold halves.

4,920,763

CHILLING APPARATUS

Phillip B. Provest, 54 Congdon Way, Booragoon, Western Australia, Australia (6154), and David J. Van Dal, 383 Marmion Street, Milville, Western Australia, Australia (6156), assignors to Phillip B. Provest, Booragoon; David J. Van Dal, Melville; Kenneth C. Abbott, Trigg and Roland Misteli, Pearcedale, all of, Australia

PCT No. PCT/AU87/00361, § 371 Date Jul. 14, 1988, § 102(e) Date Jul. 14, 1988, PCT Pub. No. WO88/03251, PCT Pub. Date May 5, 1988
PCT Filed Oct. 23, 1987, Ser. No. 241,985
Claims priority, application Australia, Oct. 23, 1986, PI18654
Int. Cl.[5] F25D *25/00*
U.S. Cl. 62—378 **7 Claims**



1. Apparatus for chilling at least one item of a commodity by immersion in a body of chilling liquid, comprising:
a bottom and sidewalls defining a vessel for containing a body of chilling liquid;
a refrigeration means for removing heat from the body of chilling liquid in said vessel;
sensing and control means operatively connected with the refrigeration means, for monitoring temperature in said body of chilling liquid and operating the refrigeration means to maintain the temperature of the body of chilling liquid below a selected temperature;
platform means for supporting at least one item of a commodity relative to said vessel
means for moving said platform means between an elevated location at which an item of a commodity may be placed thereon and retrieved therefrom outside the body of chilling liquid, and a depressed location at which an item of a commodity which has been placed on said platform means is substantially immersed in the body of chilling liquid;
said vessel further including a top wall having a plurality of horizontally spaced apertures therethrough;

said platform means including a respective platform underlying each said aperture; and

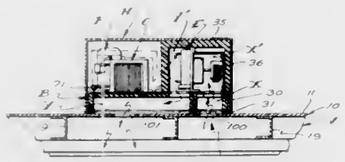
said means for moving said platform means including means permitting each said platform to be moved from the elevated location thereof to the depressed location thereof upon placement of a respective said item thereon, and means for moving each depressed said platform from the depressed location thereof to the elevated location thereof upon attainment by the item supported on such platform of a selected extent of chilling.

4,920,764

REFRIGERATION UNIT FOR VENDING MACHINES

Ernest N. Martin, 26937 N. Broadway, Escondido, Calif. 92026

Filed Apr. 4, 1989, Ser. No. 333,013
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—259.1 9 Claims



1. In combination, a coin-operated vending machine having a boxlike cabinet with at least one panel with a flat surface; a box-like refrigeration unit with an open side removably positioned adjacent the exterior surface of the panel; the refrigeration unit has air-receiving and air delivery chambers with open sides at the open side of the unit and that together are substantially coextensive with said open side of the unit and that are disposed toward the panel and are closed thereby, the panel has air delivery and air return openings communicating with the delivery and return chambers and with the interior of the cabinet, the unit has a case defining air intake and air outlet compartments, an air intake port communicates with the air-receiving chamber and intake compartments, an air outlet port communicates with the air delivery chamber and the air outlet compartment, an evaporator coil with upstream and downstream sides is positioned in the case with its upstream and downstream sides disposed toward the intake and outlet compartments, a motor-driven fan unit in the case forcibly moves air from the intake compartment through the evaporator coil into the outlet compartment, a motor-driven compressor at the exterior of the chambers and compartments has an inlet connected with an outlet of the evaporator coil, a condensing coil at the exteriors of the chambers and compartments and between an outlet of the compressor, and an inlet of the evaporator coil; and, power supply means is connected with the compressor and fan unit

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4,920,765

REFRIGERATOR CABINET HAVING AIR FLOW CONTROL MEANS

Michael J. McCauley, Cox's Creek; David G. Beers, Louisville, and John P. Raymond, Cox's Creek, all of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 11, 1989, Ser. No. 295,558
Int. Cl.[5] F25D *17/04*
U.S. Cl. 62—408 20 Claims

1. A refrigerator cabinet including:

a fresh food compartment;

a freezer compartment;

an evaporator mounted in said freezer compartment;

an evaporator cover mounted in said freezer compartment forward of said evaporator;

a duct cover mounted in said freezer compartment, said duct cover being spaced from said evaporator cover and forwardly thereof;

a chamber formed between said duct cover and said evaporator cover;

duct means for communicating said chamber with said fresh food compartment;

said duct cover having communicating means for communicating said chamber with said freezer compartment;

fan means for circulating air from said fresh food compartment and said freezer compartment over said evaporator and from said fan means through said chamber to said fresh food compartment and said freezer compartment;



valve means rotatably supported by said duct cover and controlling the air flow into said duct means from said chamber;

said duct cover and said valve means having first cooperating means to dispose said valve means in a predetermined position;

and said duct cover and said valve means having second cooperating means to dispose said valve means at one of a plurality of selected positions in accordance with the desired air flow after said first cooperating means is rendered permanently ineffective.

4,920,766

RECEIVER FOR REFRIGERANT APPARATUS

Yuji Yamamoto; Kanichi Shiina, and Toshinori Tokutake, all of Tochigi, Japan, assignors to Showa Aluminum Corporation, Sakai, Japan

Filed Sep. 1, 1989, Ser. No. 401,689
Claims priority, application Japan, Sep. 5, 1988, 63-222161
Int. Cl.[5] F25B *43/00*
U.S. Cl. 62—474 7 Claims

1. A receiver comprising:

a closed tank having a top wall with a planar upper surface, the top wall being formed with a blind screw bore and two refrigerant channels each having an outer end opened at the upper surface of the top wall and an enlarged portion at the outer end,

inlet and outlet refrigerant pipes connected to the top wall and inserted each at its one end in the respective refrigerant channels, each of the refrigerant pipes having an annular projection formed on its outer periphery over the entire circumference thereof and fitted in the enlarged portion of the refrigerant channel,

a pipe fixing plate having a planar lower surface and disposed over the upper surface of the top wall for fixing the refrigerant pipes to the tank top wall, the pipe fixing plate being formed with a screw hole, two circular holes each having a diameter approximately equal to the outside diameter of the annular projection for the annular projection to pass therethrough, and pipe inserting circular-arc cutouts communicating with the respective circular holes each at a peripheral portion of the hole and extending in the same circumferential direction about the screw hole so as to be positioned on a circle concentric with the screw hole when seen from above, each of the circular-arc cutouts having a width not permitting the annular projection to pass therethrough, and

a screw extending through the screw hole of the pipe fixing plate and screwed into the blind screw bore in the top wall for fastening the pipe fixing plate to the tank top wall,



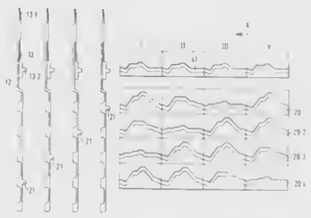
the angle made by a line through the center of one of the circular holes in the pipe fixing plate and the center of the screw hole therein with a line through the forward end of the cutout communicating with said one circular hole and the center of the screw hole being greater than the angle made by a line through the center of the other circular hole in the pipe fixing plate and the center of the screw hole with a line through the center of one of the refrigerant channels in the top wall and the center of the screw hole when said one circular hole is positioned immediately above the outer end of the other refrigerant channel.

4,920,767

ANNULAR KNITTING MACHINE WITH SLIDE NEEDLES

Ernst-Dieter Plath, Albstadt-Tailfingen, and Kurt Juenthner, Bitz, both of Fed. Rep. of Germany, assignors to Sipra Patentwicklungs-und Beteiligungsges. dmbH, Albstadt/Tailfingen, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 223,602
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724732; Jun. 23, 1988, 3821213
Int. Cl.[5] D04B *15/06, 15/32*
U.S. Cl. 66—13 12 Claims



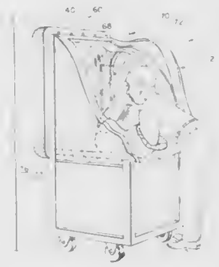
1. A circular knitting machine comprising at least one needle carrier; a plurality of slide needles, each slide needle having a head portion with a head and a slide portion with a tip; a plurality of sinkers cooperating with said slide needles; a plurality of knitting systems along said needle carrier; and control means at said knitting systems for causing relative movements of said needle portions, said slide portions, and said sinkers such that knitting, tucking and welting operations are performed, said control means including at each of said knitting systems a sinker cam curve for controlling said sinkers, a slide portion cam curve for controlling said slide portions, and a head portion cam curve for controlling said head portions, said slide portion cam curve having portions for raising and lowering said slide portions in a same manner irrespective of performance of knitting, tucking, or welting operation at each of said systems, said head portion cam curve having different types of courses, a first one of said types of courses causing movements of said head portions for providing said knitting operations, a second one of said type of courses causing movement of said head portions for providing said tucking operations, and a third one of said types of courses causing movements of said head portions for providing said welting operations.

4,920,768

VAPOR RETAINING CLOTHES TRANSFER SYSTEM

Georges Cares, Grand Rapids; Paul Cares, Holland, and Louis G. Cares, Caledonia, all of Mich., assignors to GPL Partnership, Kentwood, Mich.

Filed Jun. 20, 1989, Ser. No. 368,847
Int. Cl.[5] D06F *43/04*
U.S. Cl. 68—18 R 24 Claims



1. An apparatus for transferring articles from a solvent cleaning machine adapted for cleaning textile articles to a solvent reclaiming machine adapted for removing solvent from articles, each of said cleaning and reclaiming machines having a front face, an internal article treating chamber, means defining an access opening in said front face to said chamber and access closure means for selectively closing said access opening, said apparatus comprising:

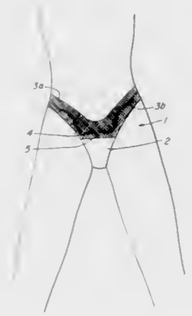
transporting means for transporting articles, said transporting means including wall means defining a substantially enclosed receptacle and means for conveying said receptacle between said cleaning machine and said reclaiming machine;

transfer means for transferring articles from said treating chamber of said cleaning machine to said receptacle and from said receptacle to said reclaiming machine;

said transfer means including means defining an opening in said wall means, closure means for selectively closing said opening and containment means for containing vapor during transfer of articles;

said containment means including sealing means for selectively sealing the portion of said wall means surrounding said transfer opening with the portion of one of said front faces surrounding the associated said access opening, such that said closure means and said access closure closing the associated access opening can be opened with said containment means positioned between said receptacle and one of said cleaning machine and said reclaiming machine

4,920,769
WARP KNITTED V-SHAPED BRIEFS
Peter Rickerl, Wiebl, Fed. Rep. of Germany, assignor to Müller Textil GmbH, Wiebl, Fed. Rep. of Germany
Filed Feb. 18, 1988, Ser. No. 157,733
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705137
Int. Cl.[5] A41B 9/06
U.S. Cl. 66—176 3 Claims





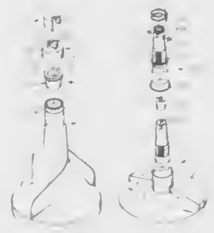
1. A process of producing warp knitted briefs or a warp knitted part of a pair of tights where the knitted brief or knitted part includes a crotch part and side bands connected to the crotch part, comprising the steps of knitting continuously in a knitting direction a double layer of material formed of repeating first layer units having a first end and a second end extending transversely of the knitting direction superimposed on repeating second layer units having a direction superimposed on repeating second layer units having a first end and a second end extending transversely of the knitting direction and being separate from the first layer units, knitting one of the first layer units and second layer units as a crotch portion with a center line extending in the knitting direction and knitting the other one of the first and second layer units as a pair of side bands extending in the knitting direction and being separated from one another and forming a waist opening, at least partially in the knitting direction, knitting the first ends of said first and second layer units together and knitting the second ends of said first and second layer units together along a line extending transversely of the knitting direction, and cutting the double layer material along the first and second ends so that each first and second layer units knitted together at the first and second ends thereof form one of a knitted brief or a knitted part of a pair of tights.

4,920,770
VARIABLE ARC AGITATOR SYSTEM
Eddie W. Dooley, Jeffersonville, Ind., and Joseph R. Noland, Crestwood, Ky., assignors to General Electric Company, Louisville, Ky.
Filed Jul. 3, 1989, Ser. No. 374,844
Int. Cl.[5] D06F 17/08
U.S. Cl. 68—133 19 Claims

8. In an automatic washing machine of the vertical axis type having container means to receive liquid and fabrics, an adjustable agitation system comprising:

elongated agitator drive means mounted for oscillation about a generally vertical shaft in said container means and including an outwardly flared skirt adapted to be immersed in liquid in said container means;

an elongated agitator positioned over said agitator drive means and mounted for oscillation about a generally vertical shaft; said agitator including an outwardly flared skirt adapted to be immersed in liquid in said container means in close proximity to said agitator drive means skirt;



manually selectable means for selectively connecting said agitator to said agitator drive means for conjoint oscillation and disconnecting said agitator from said drive means; and

means forming a lost motion fluid drive between said agitator and said agitator drive means so that, when said manually selectable means has disconnected said agitator from said agitator drive means, oscillation of said agitator drive means through an arc of predetermined length will cause said agitator to oscillate through a shorter arc.

4,920,771
CASE LOCK
Jy-Chang Jiang, 14, Sec. 1, Shin Ren Rd., Tay Pyng Shi, Taichung Hsien, Taiwan
Filed Oct. 20, 1988, Ser. No. 260,563
Int. Cl.[5] E05B 65/48, 37/02
U.S. Cl. 70—4 2 Claims



1. A case lock comprising:

a housing having a plurality of holes and two first side plates one of which has an arcuate groove;

a plurality of coaxial numerical wheels rotatably mounted in said housing and respectively protruding from said holes for being rotated outside of said housing;

an actuating plate mounted in said housing and driven by said numerical wheels to have a first position when they have correct numbers and a second position when they are in an incorrect number set;

a hooking member pivotally connected to said housing and having a first hooking piece and two second side plates which pivotally connect therebetween said two first side plates and one of which has a projection guided in said accurate groove for defining a first predetermined included angle between said housing and said hooking member;

a first elastic member mounted between said housing and said hooking member for usually tending to urge them apart with said first predetermined included angle;

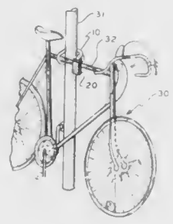
a securing plate pivotally connected to said housing, having a tongue end and adapted to be fixed to a body portion of a case having a cover portion having a second hooking piece engagable with said first hooking piece;

a second elastic member mounted between said housing and said securing plate for usually tending to urge them apart with a second predetermined included angle;

an engaging medium pivotally fixed to said housing, and having a first engaging portion engaging with said tongue end, a handle portion for allowing said engaging medium to be rotated to engage together said first engaging portion and said tongue end if said case is to be re-locked after being unlocked, and a second engaging portion engagable with said actuating plate so that when said second engaging portion engages with said actuating plate in said second position, said first and second hooking pieces engage with each other to thus lock said case;

a third elastic member mounted between said housing and said engaging medium for usually tending to urge them in a pivoted relationship with respect to each other; and first and second pin respectively pivotally pinning together said securing plate and said housing as well as said engaging medium and said housing.

4,920,772
BICYCLE LOCK
Robert Denison, 526 E. 83rd St., New York, N.Y. 10028
Continuation of Ser. No. 188,963, May 2, 1988, abandoned. This application May 9, 1989, Ser. No. 349,917
Int. Cl.[5] E05B 67/06
U.S. Cl. 70—53 14 Claims



1. A lock for bicycles and the like, said lock comprising:

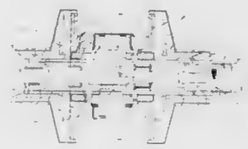
(a) a shackle having an open end and a closed end;

(b) a cross member adapted to lock to said shackle across the open end thereof for closing said shackle;

(c) said shackle comprising a substantially rigid serpentive bar having two ends defining its length, said bar bent over itself at approximate mid point of its said length in a first U-shape configuration having first and second single bar legs spaced from each other a first distance, a U-shape area of said first U-shape configuration defining said closed end of said shackle and said two ends of said serpentive bar defining said open end of said shackle, said first and second single bar legs bent over themselves in a second U-shape configuration having first and second double bar legs spaced from each other a distance greater than said first distance, said first double bar leg including a first part of said first single bar leg, a first part of said second single bar leg and said U-shape area, said second double bar leg including a second part of said first single bar leg, a second part of said second single bar leg and said two ends of said serpertive bar; and

(d) said cross member having at least first and second holes having centerspaced from each other said first distance, said holes for receiving said two ends respectively of said serpentive bar defining said open end of said shackle for closing said shackle.

4,920,773
DOOR LOCK HAVING DISENGAGES OUTER LEVER HANDLE WHEN IN THE LOCKED CONDITION AND MEANS TO BIAS THE HANDLE TOWARD HORIZONTAL POSITION
Walter E. Surko, Jr., Southington, Conn., assignor to Yale Security Inc., Monroe, N.C.
Filed Feb. 8, 1988, Ser. No. 153,215
Int. Cl.[5] E05B 13/10
U.S. Cl. 70—224 14 Claims



1. A door lock comprising an inner handle, an outer handle in the form of a lever normally disposed horizontally and having a rose, a latch housing between the handles and containing a latch retractor, and first spring means biasing the retractor outwardly toward latched disposition, an inner and an outer tubular spindle receiving the respective handles and both terminating respectively inside the lock in arcuate pull-back scoops, the two scoops being aligned end-to-end and disposed against the side of the retractor opposite the first spring means and each being adapted when turned to move the retractor inwardly, the inside handle being keyed to the inner spindle, the outer spindle being notched out at its outer end, the notch comprising a longitudinal slot and an adjoining partial circumferential space, the outer spindle having thereinside a central boss having a radial finger and second spring means urging the boss inward toward the latch housing, the outside handle having a shank with a longitudinal interior keyway, the boss and finger normally disposed by the second spring means with the finger extending through the longitudinal slot and into the keyway to key the outer handle and the outer tubular spindle into unitary rotation with each other, and push-piece means terminating in an actuator central of the inner knob and extending through the outer and inner tubular spindles and adapted on depressing to engage and push the boss to move the radial finger into the circumferential space so that the outer handle is free to turn unkeyed from the outer spindle, releasable catch means for holding the push-piece means in the depressed condition, and third spring means disposed in the rose of the outer handle for biasing the outer handle toward its normal position.

4,920,774

SELF-ALIGNING RE-KEYABLE PIN TUMBLER CABINET DOOR LOCK

Frank J. Martin, Seattle, Wash., assignor to Frank J. Martin Company, Seattle, Wash.

Continuation-in-part of Ser. No. 40,364, Apr. 17, 1987, abandoned, and a continuation-in-part of Ser. No. 328,748, Mar. 22, 1989, Pat. No. 4,899,563. This application Jul. 7, 1988, Ser. No. 216,075

The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.

Int. Cl.[5] E05B *27/00*

U.S. Cl. 70—367 2 Claims



1. A re-keyable lock, comprising:

a bolt housing including a movable bolt operatively engaged with a rotatable cam mechanism having a rotary guide portion;

a unitary shell having a bolt housing cover connected to the bolt housing, a cylinder housing having a radially directed circular aperture, a forward opening sized to removably receive a cylinder and plug assembly, a rearward opening sized and positioned to receive the guide portion of the cam mechanism to guide rotation of the cam mechanism about a cam rotation axis, and a forwardly directed, aligning lug extending inwardly from the cylinder housing and forwardly towards the forward opening;

a cylinder and plug assembly having a threaded bore positioned so as to be alignable with the circular aperture, a forward end and a rearward end with a rearwardly directed alignment groove positioned to mate with the aligning lug and to prevent rotation of the cylinder and plug assembly with respect to the unitary shell, wherein the cylinder and plug assembly is removable and reinsertable through the forward opening without rotating the cylinder and plug assembly so that the threaded bore and circular aperture are automatically aligned and so that the cylinder and plug assembly is simultaneously engaged with the rotatable cam mechanism quickly and accurately; and

a screw engageable through the circular aperture with the treaded bore to rotatably and longitudinally fix the cylinder and plug assembly within the cylinder housing.

4,920,775

APPARATUS FOR MAKING BARBED TAPE

John W. Mainiero, Sandy Hook, Conn., assignor to MRM Security Systems, Inc., Waterbury, Conn.

Division of Ser. No. 317,642, Mar. 1, 1989, Pat. No. 4,884,425, which is a division of Ser. No. 236,652, Aug. 25, 1988, Pat. No. 4,833,904, which is a division of Ser. No. 876,715, Jun. 20, 1986, Pat. No. 4,784,373. This application Aug. 30, 1989, Ser. No. 400,485

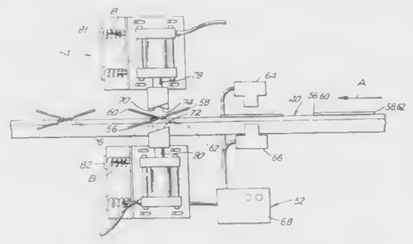
Int. Cl.[5] B21C *51/00;* B21F *25/00*

U.S. Cl. 72—10 4 Claims

1. An apparatus for offsetting the barbs of a continuously moving strip of barbed tape, said tape defining an elongated generally planar metallic tape having a central tape portion and clusters of barbs at spaced apart locations along said central tape portion, each said cluster of barbs defining a pair of oppositely directed barbs on one side of said tape portion and a second pair of oppositely directed barbs along the opposed side of said tape portion, said apparatus comprising:

barb sensor means for sensing the presence of a cluster of barbs on the tape moving relative thereto;

barb setter means operatively connected to said barb sensor



means for offsetting the barbs relative to the plane of said tape in response to the sensed presence of a barb cluster; and

means for moving the barb setter means parallel to the direction of movement of the tape while simultaneously offsetting the barbs with the barb setter means.

4,920,776

PROCESS AND APPARATUS FOR THE INTERMITTENT STRAIGHTENING OF WIRE

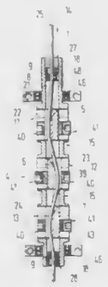
Emil Denzler, Wuerenlos, Switzerland, assignor to H. A. Schlatter AG., Schlieren, Switzerland

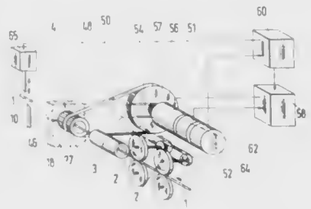
Filed Sep. 12, 1988, Ser. No. 242,912

Claims priority, application Switzerland, Oct. 1, 1987, 3819/87

Int. Cl.[5] B21D *3/00;* B21F *1/02*

U.S. Cl. 72—79 18 Claims





1. Process for the intermittent straightening of wire (1) comprising the steps of accelerating the wire (1) to a feeding speed, radially deflecting the wire by a group of straightening blocks (5, 6, 7) of a fixedly mounted straightening rotor (4) while simultaneously rotating the straightening rotor at an angular velocity, decelerating the wire from the feeding speed for a subsequent operation on the wire, and decelerating the rotation of the straightening rotor (4) in synchronism with the decelerating of the wire from the feeding speed prior to the subsequent operation, and thereafter again accelerating the rotation of the straightening rotor.

4,920,777

METHOD AND REVERSING MILL TRAIN FOR ROLLING PARTICULARLY SHEET PILES

Dietmar Kosak, Neuss, and Georg Engel, Kaarst, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 24, 1987, Ser. No. 137,754

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644353

Int. Cl.[5] B21B *13/10*

U.S. Cl. 72—225 6 Claims



1. In a method for rough rolling of sheet pile sections by carrying out passes in an adjustable rolling pass and bending and finishing rolling the sections by carrying out a plurality of passes in two-high roll stands and universal stands, the improvement comprising the rough rolling being effected in steps in at least one universal stand, the at least one universal stand being further adjusted after each pass.

4,920,778

ROLL STAND WITH ROLL RINGS PLACED FROM ONE SIDE ON A PAIR OF ROLL SUPPORT SHAFTS SUPPORTED ON TWO SIDES

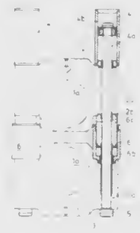
Alexadr Svagr, Hilden; Hans Bogendörfer, Düsseldorf, and Wolfgang Igelhorst, Mülheim/Ruhr, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 133,292

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642903

Int. Cl.[5] B21B *37/08, 31/00*

U.S. Cl. 72—237 3 Claims



1. In a roll stand including roll rings placed from one side on a pair of adjustable roll shafts which are supported on two sides, wherein both roll support shafts have extension journals which project beyond the roll rings and journal bearings which can be slid onto and are fixable on the extension journals, and wherein the journal bearings have bearing housings, first piston-cylinder units for acting on the bearing housings against the direction of the rolling forces, the first piston-cylinder units having piston rods and being actuated by a pressure medium and movable parallel to the direction of adjustment of the roll support shafts, one of the bearing housings being rigidly connected to the piston rods of the first piston-cylinder units and the other bearing housing being rigidly connected to the cylinders of the first piston-cylinder units, such that the bearing housings are connected to each other in a frictionally engaging manner, the improvement comprising second piston-cylinder units arranged between the two bearing housings, the cylinders and pistons of the second piston-cylinder being slidingly guided by the piston rods of the first piston-cylinder units which connect the bearing housings, the pistons of the second piston-cylinder units resting against one of the two bearing housings and the cylinders of the second piston-cylinder units resting against the other of the bearing housings, wherein the first piston-cylinder units whose piston rods connect the two bearing housings and the second piston-cylinder units which are arranged between the bearing housings have working surface areas of equal size and are connected to a common pressure generating unit, means for individually adjusting the pressure acting on the first and second piston-cylinder units and means for individually separating the first and second piston-cylinder units from the pressure generating units and means for individually closing the first and second piston-cylinder units.

4,920,779

BENDING APPARATUS

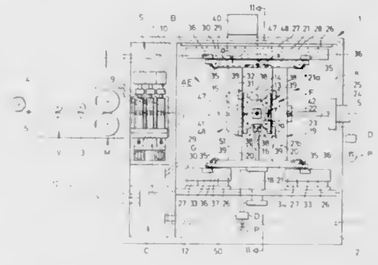
Friedheim Post, Bad Säckingen-Wallbach, Fed. Rep. of Germany, assignor to Alpha Maschinenbau AG, Zurich, Switzerland

Filed Jul. 26, 1989, Ser. No. 385,552

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1988, 3825393

Int. Cl.[5] B21D *7/02;* B21F *1/00*

U.S. Cl. 72—7 17 Claims



1 Apparatus for bending an elongated material such as wire, strip or section bar, comprising:

a support frame (2);

means mounted on said support frame (2) for feeding material along a feed direction into a working plane (AE) of a bending station;

carriage means movably mounted to said support frame (2) displaceable during a bending operation in a plane parallel to said working plane (AE) along a path defined by the simultaneous movement of two intersecting work paths (x, y), the direction of at least one work path directed across the material feed direction;

a bending drive mechanism for displacing said carriage means;

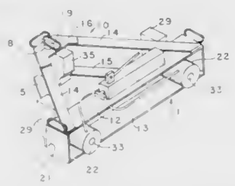
a control device (C) connected to said bending drive mechanism;

a carrier (14) mounted on said carriage means;

a bending finger (13) for bending said wire, strip or section bar mounted on said carrier (14) and perpendicularly

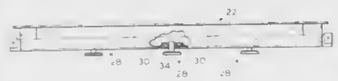
extendable and retractable into and out of said working plane (AE), respectively, and a bending mandrel (**44**) for cooperation with said bending finger (**13**).

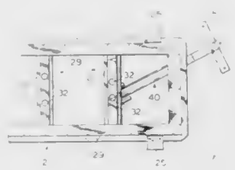
4,920,780
HYDRAULIC RAM RAIL BENDER
Ralph V. Switzer, Waukegan, Ill., assignor to The Aldon Company, Waukegan, Ill.
Filed Jun. 5, 1989, Ser. No. 361,331
Int. Cl.[5] B21D *9/08*
U.S. Cl. 72—389 **4 Claims**



1. A rail bender having a substantially triangularly shaped frame having at its angled portions rail engaging bending blocks spaced to receive therebetween the rail to be bent, with one block being stationary yet swivelable about a vertical axis while the remaining set of opposing bending blocks are movable through a horizontal plane in the direction of the stationary block and against the rail to be bent, wherein the improvement comprises:
(a) a set of hydraulic cylinders having expellable rams in contact with said set of bending blocks for moving the same under pressure against the rail to be bent as it is held by said stationary block,
(b) means mounting said set of bending blocks to said rams including a swivel head and socket arrangement with said rams providing said swivel heads and said blocks formed to provide the receiving and retaining socket,
(c) means for adjusting the length of movement of said rams and said set of blocks toward the stationary block so as to accommodate rails of various sizes and to vary the degree of bend of the rail about the stationary block.

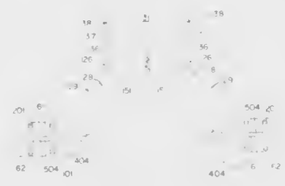
4,920,781
VEHICLE REPAIR RACK SYSTEM
Gerald P. Horan, Markham; John T. Wickmann, Omemee, and Stanislaus McNamee, Oshawa, all of Canada, assignors to Chart Industries Ltd., Ontario, Canada
Filed Apr. 19, 1988, Ser. No. 183,646
Int. Cl.[5] B21D *1/12*
U.S. Cl. 72—447 **11 Claims**





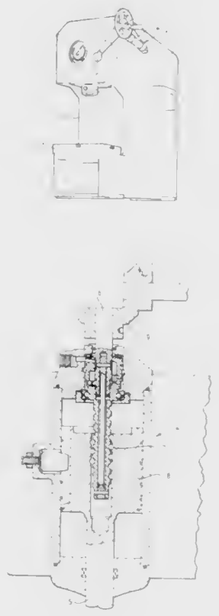
1. A racking frame for applying rectification forces to a vehicle body by means of separable trolley mounted racking towers, each racking tower being mounted on an elongated wheeled trolley having a substantially horizontal body portion with a free end remote from said tower;
said racking frame comprising a plurality of spaced apart first rigid members defining a rack of regular geometry;
said rigid members further defining upper and lower surfaces of said frame;
a plurality of rigid load transfer members connected to said first rigid members in a downwardly extending spaced apart relationship beneath the underside of said frame, each rigid load transfer member comprising a rigid post extending substantially vertically and a cam plate extending horizontally from adjacent the bottom of said post, said cam plate having an inclined upper surface thereof defining a cam surface engageable with said trolley free end to urge said trolley upwardly into wheel-on load transfer engagement with said load transfer member.

4,920,782
PRESS DRIVE
Waldemar Hellwig, Arbon, Switzerland, assignor to Bruderer AG, Switzerland
PCT No. PCT/CH88/00027, § 371 Date Oct. 3, 1988, § 102(e) Date Oct. 3, 1988, PCT Pub. No. WO88/05724, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 3, 1988, Ser. No. 275,411
Claims priority, application Switzerland, Feb. 3, 1987, 364/87
Int. Cl.[5] B21J *9/18*
U.S. Cl. 72—451 **29 Claims**



1. A press drive for two tool supports which are displaceable relative to one another, at least one of which is driven by means of at least two toggle levers, each having two dead center positions,
each of said toggle levers being driven and braked by at least one respective drive energy source by means of at least one respective connecting rod,
at least one dead center position of the toggle levers corresponding to the closest approach to each other of said tool supports which are displaceable relative to one another,
the toggle levers having knee joints which bend symmetrically in opposite directions, and the drive energy sources being synchronized with one another via a synchronizing arrangement,
wherein each of the drive energy sources comprises an energy store of the non-flywheel type, the energy store being adapted to release stored energy when driving said toggle levers in order to accelerate the tool supports, and to store braking energy when braking said toggle levers during braking of the tool supports.

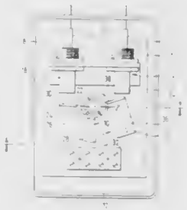
4,920,783
HYDRAULIC PRESS
Brian Greaves, Kinver, and Hugh M. Jenkins, Wombourne, both of England, assignors to Wyko Equipments Ltd., Dudley, England
Filed Mar. 9, 1989, Ser. No. 321,566
Claims priority, application United Kingdom, Mar. 9, 1988, 8805577
Int. Cl.[5] B21J *9/18*
U.S. Cl. 72—454 **3 Claims**



1. An hydraulic press having a fixed tool carrier, a movable tool carrier, a first rotatable shaft for generating movement of the movable tool carrier towards and away from the fixed tool carrier, said shaft having its axis aligned with the direction of movement of the movable tool carrier, a second rotatable shaft extending transverse to said first rotatable shaft, drive transmission means coupling said first and second shafts, an angularly movable, manual operating lever, centering means urging said lever to a central, rest position from which said lever is movable manually in opposite angular directions, and, coupling means for coupling said lever to said second shaft during angular movement of the lever in either direction from said central, rest position, said shaft being rotatable relative to said lever in said central, rest position.

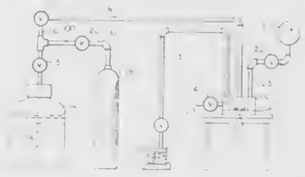
4,920,784
APPARATUS WITH AN INITIATOR
Wolfgang Gonsior, Lindau-Bodolz, Fed. Rep. of Germany, assignor to Guide Regelarmaturen GmbH & Co. KG, Ludwigshafen, Fed. Rep. of Germany
Filed Jan. 3, 1989, Ser. No. 292,854
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1987, 3744629
Int. Cl.[5] G01D *13/26*
U.S. Cl. 73—1 E **15 Claims**

1. An apparatus with an initiator for detecting the rotational position of a shaft comprising a housing containing an electric sensor element of said initiator and a movable revolving body fastened on said shaft, wherein said revolving body is rotationally fixed directly to said shaft by a clamping connection and completely surrounds the periphery of said shaft, and said revolving body is adjustable with respect to said shaft once a retaining force determined by the clamping force of said



clamping connection has been overcome, and a stop body for said revolving body is arranged in said housing in such a way that upon contact with said revolving body a self-adjustment of the positioning of said revolving body can be carried out, said shaft being rotated into a predetermined end position when said retaining force is overcome.

4,920,785
HERMETICITY TESTING METHOD AND SYSTEM
Edward Etess, La Jolla, Calif., assignor to Web Technology, Inc., Dallas, Tex.
Filed Jun. 21, 1984, Ser. No. 623,009
Int. Cl.[5] G01M *3/20*
U.S. Cl. 73—40.7 **15 Claims**



1. A method for testing the hermeticity of a sealed cavity within an electronic package for gross leaks, said method comprising the steps of:
(a) pressure bombing the package in a detector liquid bath using a detector liquid having a vapor state with recognizable infrared absorption characteristics, attempting thereby to introduce a quantity of detector liquid into the cavity;
(b) removing the package from the detector liquid bath to permit a quantity of any detector liquid within the cavity to vaporize and evolve from the cavity as an indication of a leak; and
(c) detecting evolving detector vapor by measuring the infrared absorption of the vapor.

4,920,786
METHOD OF RETROFITTING EXISTING FUEL TANKS
Ricky E. Danielson, 14925 Brookside Cir., Omaha, Nebr. 68144
Filed May 8, 1989, Ser. No. 348,379
Int. Cl.[5] G01M *3/32*
U.S. Cl. 73—49.2 **5 Claims**

4. The method of preventing leakage from or into an underground fuel storage tank having a fill pipe extending upwardly therefrom to ground level, comprising the steps of:
creating an access opening in said tank to permit a person to enter the interior of the tank;

positioning an inverted V-shaped perforated channel along the bottom length of said tank;
placing a leak monitoring means within said perforated channel for sensing the presence of fluids;
positioning a flexible liner means adjacent the interior wall surfaces of the tank to create a flow path therebetween so



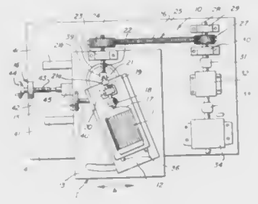
that any fluid between the exterior of the liner means and the interior wall surface of the tank will flow downwardly towards said leak monitoring means;
applying a material to the interior surface of said liner means to maintain said liner means in position adjacent the interior wall surfaces of said tank;
and closing access opening.

4,920,787
VISCOMETER
Jurg Dual, Bergstrasse 5, Zurich, Switzerland (CH-8044); Mahir Sayir, Im Straler 7, Zurich, Switzerland (CH-8047), and Joseph Goodbread, Grossmannstrasse 34, Zurich, Switzerland (CH-8049)
Filed May 24, 1988, Ser. No. 197,990
Claims priority, application Switzerland, Jun. 12, 1987, 2220/87; Feb. 26, 1988, 730/88
Int. Cl.[5] G01N *11/16*
U.S. Cl. 73—54 10 Claims



1. A viscometer comprising, a resonator having a contact surface in contact with a fluid the viscosity of which is to be measured, the resonator vibrating parallel to its contact surface over the entire area of the contact surface, a vibration exciter electrically connected to an oscillator, and a sensor for measuring the vibration of the resonator, said vibration exciter comprising a piezoelectric annular shear transducer comprising a plurality of individual segments rigidly attached to said resonator, the natural frequency of said transducer being substantially higher than the natural frequency of said resonator.

4,920,788
ROTATION VARIATION TESTING MACHINE
Masakatsu Ando, Kobe; Minori Kawaguchi, Miki, and Susumu Yamakawa, Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan
Filed Nov. 21, 1988, Ser. No. 273,941
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.1 30 Claims



1. A testing apparatus for testing a power transmission drive intended for use with a reciprocating engine having a periodically varying angular velocity, said apparatus comprising
an electric drive motor having an output shaft;
means for connecting said output shaft to the power transmission drive to be tested;
braking means; and
control means for causing said braking means to apply a periodically varying braking force to the power transmission drive to simulate the variable application of force to the drive and resultant variable speed of the drive by a reciprocating engine in testing the drive by means of the electric drive motor.

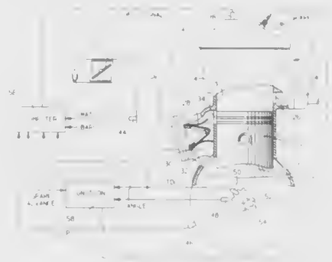
4,920,789
METHOD AND MEANS FOR DETERMINING AIR MASS IN A CRANKCASE SCAVENGED TWO-STROKE ENGINE
Aparicio J. Gomez, Birmingham; Douglas E. Trombley, Warren, and Kenneth J. Buslepp, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 19, 1989, Ser. No. 409,377
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.2 9 Claims



1. In a crankcase scavenged two-stroke engine of the type in which, air is inducted into a crankcase chamber, is then subjected to compression during a portion of the engine cycle when the crankcase chamber shrinks in volume, and thereafter is transferred to a combustion chamber; an apparatus for determining the mass of air transferred to the combustion chamber based upon the occurrence of a polytropic phase of air compression within the crankcase chamber, the apparatus comprising:
means for sensing the pressure P of the air mass M within the crankcase chamber during the polytropic phase of compression;
means for determining the volume V of the crankcase chamber during the polytropic phase of compression;
means for deriving an indication of the temperature T of the air mass within the crankcase chamber during the polytropic phase of compression;
means for determining the polytropic exponent n for that portion of the engine cycle characterized by polytropic compression, where the expression PV^n is substantially constant in value; and
means for deriving an indication of the mass of air transferred to the combustion chamber in accordance with the expression
$M=[P2*V2-P1*V1]/[(n-1)*Cv*(T2-T1)]$,

where the sets (P1,V1,T1) and (P2,V2,T2) denote the respective pressure, volume, and temperature of air at predetermined states 1 and 2, which occur during polytropic compression, with Cv representing the specific heat capacity of air at constant volume.

4,920,790
METHOD AND MEANS FOR DETERMINING AIR MASS IN A CRANKCASE SCAVENGED TWO-STROKE ENGINE
Steven D. Stiles, Clarkston; Paul E. Reinke, Rochester, and Aparicio J. Gomez, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 10, 1989, Ser. No. 377,383
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.2 11 Claims



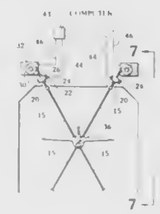
1. In a crankcase scavenged two-stroke engine characterized by an operating cycle including portions during which air is inducted into the engine, is thereafter compressed within a crankcase chamber of shrinking volume, and is then transferred to the combustion chamber; a method for determining the mass of air transferred to the combustion chamber comprising the steps of:
deriving an indication of the pressure P of the air mass M within the crankcase chamber during compression;
deriving an indication of the volume V of the crankcase chamber during compression;
deriving an indication of the temperature T of the air mass within the crankcase chamber during compression; and
deriving an indication of the mass of air transferred to the combustion chamber in accordance with the integral expression

$$M = \int_{V1}^{V2} PdV/\{Cv(T2 - T1)\}$$

where
V1 is the volume at the beginning of the integral,
V2 is the volume at the end of the integral,

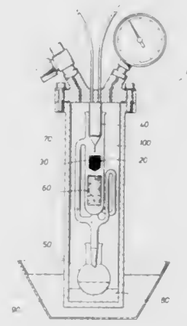
T1 is the temperature at the beginning of the integral,
T2 is the temperature at the end of the integral, and
Cv is the specific heat capacity of air at constant volume.

4,920,791
WIND TUNNEL MODEL SUPPORT AND ATTITUDE CONTROL
Stanley A. Griffin, La Jolla, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.
Filed Oct. 14, 1988, Ser. No. 257,609
Int. Cl.[5] G01M *9/00*
U.S. Cl. 73—147 10 Claims



1. An improved system for positioning a model and a balance contained therein in a wind tunnel for flow testing comprising:
a plurality of aerovane means connected to the ends of said balance;
a plurality of adjustment means equal in number to the number of said aerovanes, said adjustment means having a rotatable and a fixed position, said rotatable portion being attached to the ends of each of said aerovanes for maintaining a preselected tautness to said aerovanes whereby said model is maintained in a preselected location within said wind tunnel; and
positional attachment means to which each of said fixed portions of said adjustment means are fixedly attached.

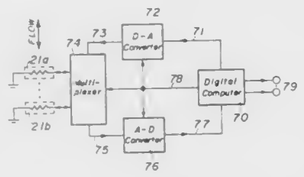
4,920,792
METHOD FOR DETERMINING THE AMOUNT OF FLUID IN A CORE
Rocco DiFoggio, Houston, Tex., assignor to Shell Oil Company, Houstoo, Tex.
Filed Mar. 4, 1988, Ser. No. 164,153
Int. Cl.[5] F21B *49/00*
U.S. Cl. 73—153 9 Claims



1. A method for determining the amount of fluids in a porous sample, comprising:
providing a representative specimen of porous sample,
extracting both aqueous and hydrocarbon fluids from said

sample with a solvent capable of dissolving both aqueous and hydrocarbon fluids,
separating said aqueous and hydrocarbon fluids, and
determining the amount of aqueous and hydrocarbon fluid from said separated fluids.

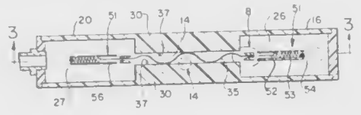
4,920,793
DIRECTIONAL THERMAL ANEMOMETER TRANSDUCER
Robert S. Djorup, 20 Lovewell Rd., Wellesley, Mass. 02181
Division of Ser. No. 866,604, May 23, 1986, Pat. No. 4,794,795. This application Aug. 4, 1988, Ser. No. 228,601
Int. Cl.[5] G01F *1/68*
U.S. Cl. 73—189 **7 Claims**



1. A directional thermal anemometer transducer comprising:
(a) electrically non-conducting oblong substrate having a longitudinal axis and having adhered at least two closely spaced opposing areas substantially thermally and electrically isolated from one another, each area covered with a temperature coefficient resistive sensing conductor, including at least one structural bar positioned in close proximity to and parallel with each said sensing conductor to create aerodynamic turbulence to improve performance for shallow angles between incident flow and the transducer longitudinal axis;
(b) digital-to-analog converter means operatively connected to each of said sensing conductors to provide said sensing conductor with its excitation power;
(c) analog-to-digital converter means operatively connected to each of said sensing conductors to measure the operating level of said sensing conductor; and
(d) digital computer means, operatively connected to said digital-to-analog converter means and said analog-to-digital converter means, to control each of said sensing conductor's excitation power and readback each of each sensing conductor's operating level.
whereby said digital computer means is used to compute said sensing conductor operating power loss to a flowing fluid surrounding said sensing conductor; and
whereby said digital computer means thereby provides output readout derived from said sensing conductor thermal anemometer operation.

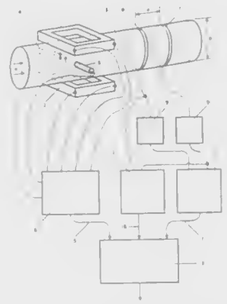
4,920,794
FLUID FLOW METER
Dov Ingman, Haifa, Israel, assignor to Select Corporation, Los Angeles, Calif.
Filed Jun. 29, 1988, Ser. No. 212,955
Claims priority, application Israel, Jun. 10, 1988, 86705
Int. Cl.[5] G01F *1/54, 3/00*
U.S. Cl. 73—269 **34 Claims**

1 A fluid flow meter comprising:
a housing having a pair of fluid ports and defining therebetween a fluid flow path:
a flexible membrane defining a pair of opposing faces and being mounted in said fluid flow path such that said pair of faces simultaneously define with said housing fluid impermeable seals at at least two different locations along said flow path, said membrane being operative to flex so as to permit passage therepast of discrete quanta of fluid, each having a known volume varying as a function of flow rate;
means for generating electrical signals corresponding to flexure of said membrane; and



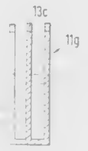
monitoring means for receiving the electrical signals over a measured period of time, determining the rate of said electrical signals, determining the volume of said quanta based upon said electrical signal rate, and thereby determining a fluid flow rate along said flow path.

4,920,795
ELECTROMAGNETIC FLOWMETER FOR CONDUCTIVE OR DIELECTRIC FLUIDS AND ITS APPLICATIONS IN PARTICULAR OILFIELD
Daniel Codazzi; Jean-Yves Mioque, both of St Etienne, and Bernard Montaron, St Priest en Jarez, all of France, assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.
Filed Nov. 19, 1987, Ser. No. 123,074
Claims priority, application France, Nov. 25, 1986, 86 16529; Nov. 26, 1986, 86 16607
Int. Cl.[5] G01F *1/58, 1/712*
U.S. Cl. 73—195 **9 Claims**



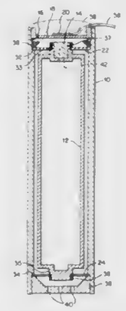
1. System for measuring flow rate of a fluid flowing through a conduit, characterized in that the system comprises an electromagnetic flow rate measuring device for conductive fluids producing an output signal and a triboelectric noise cross-correlation measuring device for measuring flow rates of dielectric fluids producing an output signal and including two antenna which are isolated from the fluid, the triboelectric noise cross-correlation device being connected to an electronic current amplifier and to an electronic device which measures conductance between said antennae, further including a signal analyzer circuit which selects a signal corresponding to a fluid flow rate measurement from signal outputs of said electromagnetic flow rate measuring device and said triboelectric noise cross-correlation device in conjunction with a conductance value.

4,920,796
TANK LEVEL METER
Anton Duckart, Wörth; Peter Hauler, Ettlingen, and Erich Zabler, Stutensee, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Division of Ser. No. 255,649, Oct. 11, 1988. This application Aug. 23, 1989, Ser. No. 398,043
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738515
Int. Cl.[5] G01F *23/28*
U.S. Cl. 73—290 V **4 Claims**



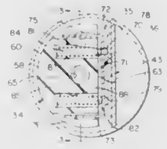
1. A tank lever meter particularly for measuring contents of a fuel tank of a motor vehicle, comprising a sound conducting member extending from the bottom to a top of a tank, a sound generator coupled to one end of said sound conducting member to generate bending waves thereon, a sound receiver coupled to the opposite end of said sound conducting member, the material of said sound conducting member having an acoustic impedance which differs from that of a measured medium in said tank, said sound receiver detecting a measuring signal which depends on variations of velocity of the sound waves propagating at the interface of said sound conducting member and surrounding media present in said tank, and wherein said sound conducting member has a W-shaped configuration defining two lateral legs and a central leg, each of said lateral legs is coupled to a sound receiver and said central leg being coupled to a common sound generator.

4,920,797
FLUID LEVEL SENSOR
Harold L. Swartz, and Warren W. Stansberry, both of Phoenix, Ariz., assignors to Schaevitz Sensing Systems, Inc., Phoenix, Ariz.
Filed Jan. 9, 1989, Ser. No. 301,964
Int. Cl.[5] G01B *21/18;* **G01F** *23/62*
U.S. Cl. 73—309 **17 Claims**



1. A fluid level sensor for providing an electrical output indicative of the level of a fluid over a fluid level sensing range, said sensor comprising:
float means for providing positive buoyancy in said fluid;
spring suspension means for positioning said float means for non-sliding movement between first and second positions where the distance between said first and second positions is less than said fluid level sensing range; and
non-sliding proximity detection means, responsive to the position of said float means between said first and second positions, for providing an electrical output indicative of fluid level over said fluid level sensing range.

4,920,798
LIQUID LEVEL SENDER WITH LINEAR FLOAT
Frank C. Weaver, Chicago, Ill., assignor to Stewart Warner Instrument Corporation, Chicago, Ill.
Filed Nov. 17, 1988, Ser. No. 272,629
Int. Cl.[5] G01F *23/30, 23/60*
U.S. Cl. 73—313 **5 Claims**



1. A liquid level sender for use in conjunction with an electrical circuit comprising:
a generally cylindrical support tube with a vertical support rod fixed therein;
a thick-film resistor plate mounted vertically in the tube having a thick-film sender resistor and a thick-film ground resistor on one side thereof;
means for placing said sender resistor in electrical communication with the electrical circuit and means for placing said ground resistor in electrical communication with ground;
a foam float in the tube slideably mounted on the support rod and permitted limited pivotal movement thereabout;
a generally U-shaped contact member having arms mounted for movement in and generally transverse to the float toward and away from the resistor plate, a sender contact proximate one end at a base portion of the contact member engagable with the sender resistor and a ground contact proximate a second end of said base portion on the contact member engagable with the ground resistor;
a first spring in the float biasing said one end of the contact member toward the resistor plate and a second spring biasing the second end of the contact member toward the resistor plate, said contact member being mounted for limited pivotal movement in the float in its own plane.

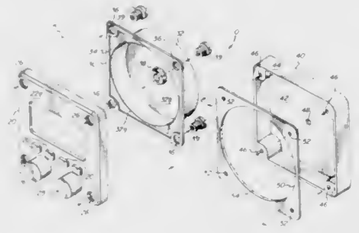
4,920,799
UNIVERSAL CASING FOR AN INSTRUMENT
Douglas W. Low, Essex, Conn., assignor to International Marine Industries, Inc., Stamford, Conn.
Filed Sep. 22, 1988, Ser. No. 247,894
Int. Cl.[5] G01D *11/24, 11/26, 11/30;* **G12B** *9/02*
U.S. Cl. 73—431 **16 Claims**

1. A universal casing for an instrument having a read-out and adapted to be suitable for any selected one of flush, surface or bracket mounting, said casing comprising:
a. a watertight instrument module which comprises
(i) a facepiece having at least one aperture through which the read-out of the instrument can be observed; and
(ii) an instrument housing extending rearwardly from said facepiece, said housing comprising a hollow body having an open front end mounted to said facepiece and a closed rear end wherein said instrument housing further comprises a flange formed on the open front end of said instrument housing, said instrument housing being

VOL 114 ISS 1 MY 1 1990 UMI

mounted on said facepiece through the agency of said flange, and

b. a splash-resistant surface mount housing removably



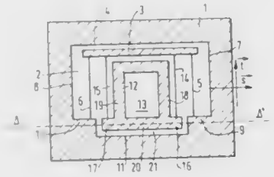
mounted to said facepiece such that said flange is disposed between said facepiece and said surface mount housing, said surface mount housing having the hollow body of said instrument housing disposed therein.

4,920,800

ACCELEROMETRIC SENSOR WITH PLANE PENDULUM STRUCTURE

And e Boura, Chatellerault, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne, Cedex, France

Filed Sep. 30, 1988, Ser. No. 251,606
Claims priority, application France, Oct. 2, 1987, 87 13619
Int. Cl.[5] G01P *15/02*
U.S. Cl. 73—517 R **7 Claims**



1. An accelerometer sensor comprising a pendulum structure having a planar test body suspended on a fixed part by at least first and second parallel blades, flexible in the plane of the said test body, so that the planar test body is able to move in translation in the said plane according to a sensitive axis substantially perpendicular to the said blades, wherein the planar test body comprises a moving support element linked to the said flexible blades and a planar test mass suspended to the said support element by at least third and fourth blades parallel to the above mentioned ones and flexible in the plane of the said test body.

4,920,801

ACCELEROMETER

Peter D. Church, Harrow, United Kingdom, assignor to The Marconi Company Limited, England

Filed Jul. 21, 1988, Ser. No. 222,138
Claims priority, application United Kingdom, Jul. 29, 1987, 8718004
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—517 R **22 Claims**

1. An accelerometer, comprising:

(a) at least three cantilever mounted beams, each of said beams having a length and a width and each of said beams having a longitudinal surface extending along said length and across said width,

(b) a common plane containing said longitudinal surface of each beam,

(c) a sensing axis of each said beam, each said beam having a greater response to acceleration along the respective sensing axis than to acceleration along any other axis of said beam,



(d) each said beam having a mass distribution along a line normal to said longitudinal surface to cause said sensing axis to be inclined to said common plane,

(e) said beams being oriented in said common plane to cause the inclined sensing axes to be aligned with a set of coordinate axes, and

(f) sensing means in respect of each said beam for determining acceleration-induced beam deflection.

4,920,802

ULTRASONIC CHECK VALVE INSPECTION

Craig W. McMullin, and John E. Rosenberger, both of Granby, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 27,527, Mar. 18, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 229,788
Int. Cl.[5] G01B *17/00*
U.S. Cl. 73—597 **16 Claims**



1. A method of inspecting the operability of a check valve situated in a process plant flow line for operation under plant process conditions, the valve having a body, a flow bore through the body, a seat associated with the flow bore, and a closure member pivotally mounted to swing on a path in the body between a closed position against the seat and a fully open position spaced from the seat in response to plant process flow in the line in reverse and forward flow directions respectively, comprising the steps of:

operating flow control means in the process plant flow line upstream of the valve to establish a valve inspection mode of operation;

during the inspection mode of operation, manually positioning and aiming an ultrasonic transmitter on the body exterior oriented so that the transmitted ultrasonic signal passes through the body and intercepts the path of the member at least at one location;

during the inspection mode of operation, manually positioning and aiming an ultrasonic receiver on the body exterior oriented to detect ultrasonic signals reflected from the body and the member when the member is on said at least one location along said path;

filling the valve body with fluid capable of transmitting ultrasonic signals;

during the inspection mode of operation, operating the flow control means to induce the closure member to move along the path;

operating the transmitter and receiver to transmit an output signal commensurate with the magnitude of the ultrasonic signal reflected from the closure member as the member moves relative to said at least one location;

from the output signal, diagnosing at least one operating characteristic of the valve member associated with said path, selected from the group of characteristics consisting of range of closure member motion, closure member position versus flow rate, and susceptibility to closure member flutter; and

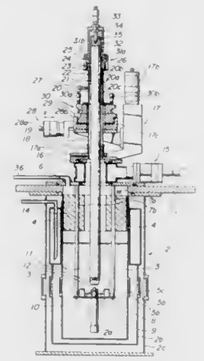
removing the transmitter and receiver from the body.

4,920,803

ULTRASONIC MICROSCOPE APPARATUS

Kouichi Karaki, Hino; Mitsugu Sakai, and Yasuo Sasaki, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Aug. 24, 1988, Ser. No. 235,544
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—606 **47 Claims**



1. An ultrasonic microscope apparatus comprising:

a heat insulated vessel having an opening at the upper portion thereof for containing a cryogenic fluid serving as an ultrasonic propagating medium;

a sample rod having one end on which a specimen to be observed is supported, said sample rod being introduced into and withdrawn from said heat insulated vessel via said opening such that the specimen is immersed in the cryogenic fluid contained in the vessel;

an acoustic lens arranged in said heat insulated vessel such that the acoustic lens is immersed in the cryogenic liquid, for making an ultrasonic beam incident upon said specimen, when the sample rod is inserted into said heat insulated vessel;

scanning means for driving said acoustic lens in two-dimensional directions relative to the specimen;

a sliding seal member adapted to selectively move between a first operational mode in which said seal member moves integrally with said sample rod, and a second operational mode in which the sample rod moves slidably relative to said sliding seal member; and

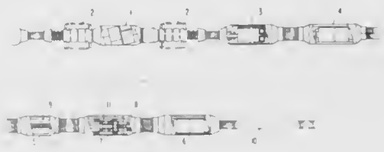
a hollow airtight member arranged such that at least a part of said member is deformable, one end of which is airtightly connected to said sliding seal member and the other end of which is airtightly connected to said heat insulated vessel.

4,920,804

INSERT TYPE ULTRASONIC CRACK HUNTING APPARATUS

Keiichi Iwamoto, and Masaaki Torichigai, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,514
Claims priority, application Japan, Oct. 27, 1987, 62-269452
Int. Cl.[5] G01N *29/04*
U.S. Cl. 73—623 **6 Claims**



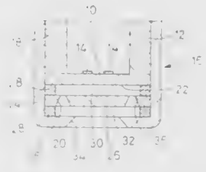
3. An insert type ultrasonic crack hunting apparatus as claimed in claim 1, wherein said coupling members, said output shaft and said coupling shaft are flexible.

4,920,805

PRESSURE SENSOR HAVING BAFFLING MEANS

Yasuhito Yajima; Yasushi Watanabe, and Kazuyoshi Shibata, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Nov. 7, 1988, Ser. No. 268,278
Claims priority, application Japan, Nov. 27, 1987, 62-301147
Int. Cl.[5] G01L *7/08, 9/06*
U.S. Cl. 73—706 **8 Claims**



1. A pressure sensor having a ceramic diaphragm which is exposed at one of opposite surfaces thereof to a measurement fluid in an external space and deformable in response to a pressure of said measurement fluid, and strain detector means for producing an electrical output representative of an amount of deformation of the ceramic diaphragm, said pressure sensor comprising:

a support member for fixedly supporting said ceramic diaphragm at a peripheral portion of said diaphragm, so as to allow a central working portion of said diaphragm to be deformed in response to the pressure of said measurement fluid applied thereto; and

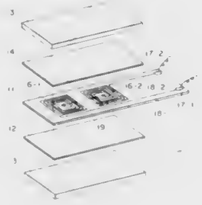
a baffling structure disposed adjacent said one surface of said ceramic diaphragm, and including portions which cooperate with said one surface to define a chamber to which said one surface of the ceramic diaphragm is exposed, said baffling structure having at least one communication hole for communication between said chamber and said external space, said at least one communication hole including at least one aperture formed through a portion of said baffling structure which faces said one surface of the ceramic diaphragm, said at least one aperture being substantially aligned with said support member such that said one surface of said central working portion of said ceramic diaphragm is protected against direct exposure to a straightforward flow of said measurement fluid from said external space toward said central working portion of the diaphragm.

4,920,806

STRAIN GAGE

Masao Obama, Yokosuka, and Masaaki Kikuchi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 16, 1989, Ser. No. 311,340
Claims priority, application Japan, Feb. 19, 1988, 63-36766
Int. Cl.[5] G01L *1/00*
U.S. Cl. 73—779 17 Claims



1. A strain gage bonded to an object and capable of outputting a detection signal which represents a load added to the object or strain of the object caused by the load added, when the load is added to the object and the object is deformed by the load added creating a strain, said strain gage comprising:

a substrate having a pair of faces opposite to each other and flexibility;

a pair of coils printed on one face of the substrate, each of said coils having a spiral pattern and said paired coils being positioned in such a way that magnetic flux generated by one of these coils links with the other coil when an alternating signal is supplied to these coils;

an amorphous magnetic metallic plate having a magnetostrictive effect which causes the magnetic permeability of said amorphous magnetic metallic plate to be changed responsive to the load added to the object, said amorphous magnetic metallic plate being located on one of the opposite faces of the substrate so that at least a part of the magnetic flux generated by one of the paired coils forms a closed magnetic circuit, passing through the amorphous magnetic metallic plate, and linking with the other coil and then with one coil; and

means for electrically insulating the amorphous magnetic metallic plate from the paired coils;

wherein when the load is added to the object to be measured and strain of the object is thus caused by the load added, the magnetic permeability of said amorphous magnetic metallic plate is changed in response to the load added, the density of the magnetic flux passing through the amorphous magnetic metallic plate is changed as the magnetic permeability of the amorphous magnetic metallic plate changes, and the composite inductance of the paired coils is changed in response to the change of this flux density, so that the detection signal which respresents the change of this composite inductance can be outputted by the strain gage to measure the load added or strain caused in the object by the load added.

4,920,807

METHOD FOR PREDICTING THE FATIGUE LIFE OF A VEHICLE SUSPENSION COMPONENT

Richard S. Stokes, Orwigsburg, and Robert M. Muldowney, Stowe, both of Pa., assignors to Dana Corporation, Toledo, Ohio

Filed May 11, 1989, Ser. No. 350,594
Int. Cl.[5] G01N *3/32*
U.S. Cl. 73—808 9 Claims

1. A method for obtaining fatigue life information for an article comprising the steps of:

(a) determining an area of interest on the article;

(b) defining a durability schedule for the article as a predetermined number of passes through each of a predetermined number of events, each of the events being defined by the generation of strains in the article having a predetermined range of magnitudes and frequencies;

(c) determining a total effective damage factor caused to the article by one pass through each of the events;

(d) determining a total durability factor for all of passes for all of the events defined in the durability schedule;

(e) testing the article by subjecting it to a plurality of passes through all of the events defined in the durability schedule until a termination criteria is reached;

(f) determining a total actual damage factor based upon the number of tested passes through each of the events defined in the durability schedule;

(g) determining a final durability factor for the article by dividing the the total actual damage factor by the total durability factor;

(h) repeating steps (a) through (g) for a plurality of articles;

(i) assigning a median rank to each of the final durability factors; and

(j) obtaining the fatigue life information for an article based upon the final durability factors and the median ranks.

4,920,808

DEVICE AND METHOD FOR MEASURING THE FLOW VELOCITY OF A FREE FLOW IN THREE DIMENSIONS

Roland Sommer, 6231 Schwalbach/Taunus, Kronthaler Weg, Fed. Rep. of Germany (15)

PCT No. PCT/DE87/00182, § 371 Date Jan. 12, 1988, § 102(e) Date Jan. 12, 1988, PCT Pub. No. WO87/06710, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 24, 1987, Ser. No. 146,830
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613867; Oct. 6, 1986, 3634005
Int. Cl.[5] G01F *1/34*
U.S. Cl. 73—861.42 17 Claims

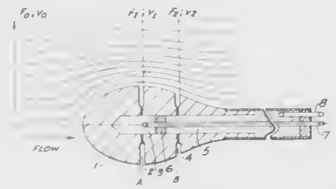


Fig 6

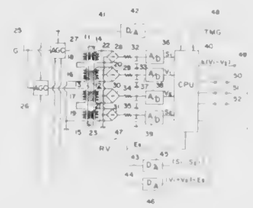
1. A device for measuring the flow velocity of a free fluid flow in space, comprising an elongated aerodynamic flow body having a measuring head rotationally symmetrical about an axis and of varying thickness along said axis, said body defining an internal space divided by a partition into two chambers, said head having first and second sets of peripherally-spaced openings in the side of said head in spaced relationship with a foremost tip thereof, said first openings being located in a thicker region of said head and communicating with one of said chambers, and said second openings being located in a thinner region of said head and communicating with the other of said chambers, and means for obtaining a measurement of the pressure in each chamber, whereby a flow velocity dependent pressure difference between the static pressures within said chambers may be determined.

4,920,809

MAGNETICALLY ANISOTROPIC TORQUE MEASURING DEVICE WITH ERROR CORRECTION

Shigeo Yoshimura; Renshiro Ishino; Shiro Takada, all of Hirakata, and Hitoshi Kimura, Yao, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Oct. 21, 1988, Ser. No. 260,990
Claims priority, application Japan, Dec. 28, 1987, 62-334861; Dec. 28, 1987, 62-334862; Dec. 28, 1987, 62-334863; Dec. 28, 1987, 62-334864
Int. Cl.[5] G01L *3/10*
U.S. Cl. 75—862.36 7 Claims



1. A device for measuring torque acting on a shaft, comprising:

torque detecting means having first and second torque detecting knurled or mechanically grooved regions formed on the outer peripheral surface of a torque transmitting shaft and provided with magnetic anisotropy, the regions being inclined in opposite directions to form angles with respect to the axis of rotation of said shaft, and first and second detecting coils capable of detecting changes in permeability in the torque detecting magnetically anisotropic regions, and

correcting means having first and second axially spaced correcting knurled or mechanically grooved regions, with magnetic anisotropy imparted thereto in a direction parallel with the axis of rotation of said shaft, formed on the outer peripheral surface of said shaft in the vicinity of said first and second torque detecting magnetically anisotropic regions, and first and second correcting coils capable of detecting changes in permeability in the correcting magnetically anistropic regions resulting from an axial temperature gradient in said shaft.

4,920,810

SAMPLE WARMING DEVICE FOR SURFACE AREA ANALYZER

Cyde Orr, Jr., Dunnwoody, and Ronnie W. Camp, Duluth, both of Ga., assignors to Micromeritics Instrument Corporation, Norcross, Ga.

Filed Feb. 19, 1988, Ser. No. 157,880
Int. Cl.[5] G01N *15/08*
U.S. Cl. 73—865.5 16 Claims

1. A flowing gas surface area analyzer, comprising:

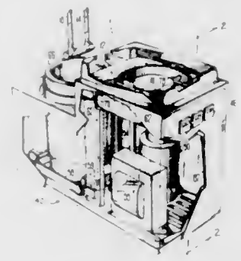
a sample chamber for containing a sample of material to be analyzed;

means for flowing a stream of gas through said sample chamber containing said sample;

detector means for receiving said stream of gas downstream from said sample chamber and for providing a signal correlative with adsorption or desorption of said gas by said sample;

means for cooling said sample to a temperature at which adsorption of said gas by said sample occurs;

means for warming said sample comprising means for directing a flow of room temperature air over said sample chamber such that said sample is warmed to a temperature at which desorption of said gas by said sample occurs; and



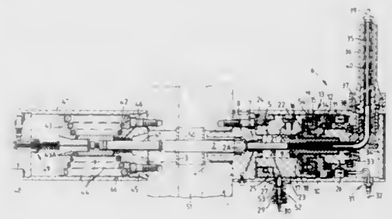
means for controlling the operation of said cooling means and said warming means responsive to said signal provided by said detector means.

4,920,811

FAIL-SAFE RELEASE ACTUATOR MECHANISM

Hans P. Hopper, Aberdeen, Scotland, assignor to The British Petroleum Company p.l.c., London, England

Filed Mar. 7, 1989, Ser. No. 320,332
Claims priority, application United Kingdom, Mar. 10, 1988, 8805744
Int. Cl.[5] G05G *17/00;* F16H *25/20;* F16K *31/02*
U.S. Cl. 74—2 10 Claims



1. A mechanical actuator for moving a shaft axially comprising:

a motor and a source of power for the motor, said motor driving,

a gear assembly comprising a drive gear, a reaction gear and an operating gear, the drive gear, reaction gear and operating gear cooperating to give a mechanical advantage of at least 30:1 between the drive gear and operating gear, said operating gear engaging with

an internally screw threaded sleeve engaging with an external screw thread on the shaft so that rotation of the sleeve moves the shaft axially relative to the sleeve, and,

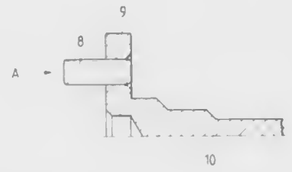
a stop connected to the reaction gear preventing axial movement of the sleeve.

4,920,812

ENGINE STARTER STRUCTURE

Kyoichi Okamoto; Noriyuki Tanaka, and Shigeru Shiroyama, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,666
Claims priority, application Japan, Oct. 28, 1987, 62-165630[U]
Int. Cl.[5] F02N *15/00*
U.S. Cl. 74—6 1 Claim



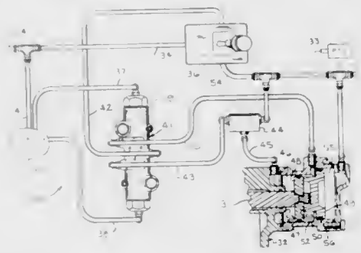
1. An engine starter having a motor and a planet reduction gear mechanism comprising a planet gear arm formed with a driven shaft of said mechanism, said planet gear arm having a plurality of holes and a corresponding number of roller pins pressure-inserted into said holes of said planet gear arm from one side surface of said planet gear arm; and rotatably supported planet gears mounted on each of said roller pins, wherein each of said holes are chamfered in the other side surface of said planet gear arm to provide a chamfered portion such that when said roller pins are press-fitted into said holes from said one side, a resulting deformation of said gear arm proximate said holes is formed in said chamfered portion and does not protrude beyond said other side surface.

4,920,813

POWER TAKE-OFF CONTROL APPARATUS

George A. Willford, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed May 20, 1988, Ser. No. 196,918
Int. Cl.[5] F16H *37/00, 3/08;* B60K *20/00;* G05G *9/00*
U.S. Cl. 74—11 3 Claims



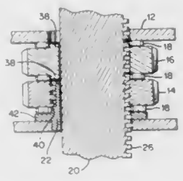
1. Power take-off control apparatus for a transmission including an actuator responsive to fluid pressure for selectively engaging and disengaging a power take-off mechanism, a control valve for selectively applying and interrupting fluid pressure to said actuator, said transmission further having speed range gears shiftable by movement of a range selecting rod between a high speed gear range wherein said transmission is operable in one of a first plurality of gear ratios and a low speed gear range wherein said transmission is operable in one of a second plurality of gear ratios, a fluid operated control for moving said range selecting rod between a first position engaging said high speed gear rage, an intermediate neutral position and a second position engaging said low speed gear range, said power take-off control apparatus being characterized by: first means for inhibiting said fluid operated control from moving said range selecting rod to either of said first and second positions when said control valve applies fluid pressure to said actuator to engage the power take-off mechanism, and second means always responsive to said control valve applying fluid pressure to said actuator to engage the power take-off mechanism for positioning and holding said range selecting rod in said intermediate position between said first and second positions whenever fluid pressure is applied to said power take-off mechanism actuator.

4,920,814

APPARATUS FOR OPERATING A SHAFT

Isaac P. Espy, 3518 Tall Pins La., Tuscaloosa, Ala. 35405

Filed Mar. 13, 1989, Ser. No. 322,197
Int. Cl.[5] F16H *1/20*
U.S. Cl. 74—89.15 5 Claims



1. A gear assembly for mechanical movement of a shaft in axial and rotational directions selectively, comprising:
a first gear and a second gear mounted on a shaft;
said first gear being toroidal in shape, having an inner surface parallel with and radial to its axis of rotation and having a threaded inner surface, and having means for restraining all motion of the gear relative to the shaft except rotation;
said shaft having an axis of translation along its longitudinal axis coincident with the axis of rotation of said first gear, having superimposed on the shaft a toothed rack parallel with and radially distant from the shaft axis with said rack having teeth at a pitch matching and engaging the threaded inner surface of the first gear, said shaft having freedom of translation restrained only by the threads of said first gear;
said second gear being toroidal in shape, having an inner surface which is parallel with the axis of the shaft and which in cross-section in a plane normal to the axis of the shaft is substantially identical in periphery to the periphery of the shaft and rack, said second gear enclosing said shaft and allowing translation of the shaft relative to said gear;
means for imparting rotation to said first gear; and
means for imparting rotation to said second gear and enclosed shaft.

4,920,815

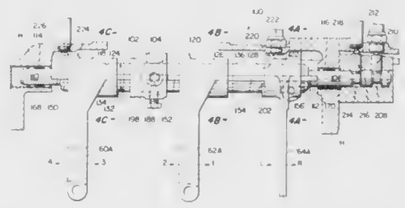
SINGLE SHAFT SHIFTING MECHANISM

Joseph D. Reynolds, Climax, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 24, 1989, Ser. No. 342,507
Int. Cl.[5] B60K *20/12*
U.S. Cl. 74—335 9 Claims

1. A single shaft shifting mechanism (**100**) for selection and engagement of selectable gear ratios in a change speed transmission (**10**), said mechanism comprising the housing (**H**), the shaft (**106**) mounted for relative axial and rotational movement in said housing, a block member (**102**) axially and rotationally connected to said shaft, a plurality of shift forks (**60A**, **62A**, **64A**) each including a sleevelike hub portion (**118**, **120** and **122**), respectively, each of said hub portions having a through

bore (**124**, **126** and **128**, respectively), an outer surface and a pair of axially opposite end surfaces extending generally perpendicular to the axis of said shaft, a set of shift teeth (**138**, **140**, **142**, and **144**) projecting radially outwardly from said shaft in an axially-spaced relationship such that each of said hub portions is arranged between two adjacent teeth of said set of shift teeth, said shift teeth being axially and circumferentially fixed relative to said shaft, a set of interlocking teeth (**150**, **152**, **154** and **156**) projecting radially from said shaft in an axially-spaced relationship such that each of said hub portions is arranged between two adjacent teeth of said set of interlocking teeth, said set of interlocking teeth being axially movable but circumferentially fixed relative to said shaft and axially fixed relative to said housing, each of said hub portions having at least one pair of grooves (**184** and **186**, **178**, **180**, and **182**, and **174** and **176**) extending axially from respective end faces thereof, said



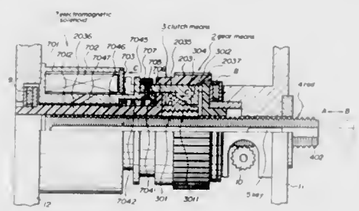
grooves being formed to receive a corresponding one of said teeth, said grooves being arranged in predetermined positions along the through bores of said hubs such that when one of said grooves of one of said hubs is aligned with a corresponding one of said interlocking set of teeth and none of the grooves in said hubs is aligned with one of said shifting set of teeth in response to rotation of said shaft, one of said grooves of each hub portion other than said one hub portion is aligned with a corresponding one of said shifting set of teeth and none of the grooves of each of said hub portions other than said one hub portion is aligned with one of said interlocking set of teeth, said shifting mechanism characterized by:
said grooves extending completely from axial end face to axial end face of each of said hub portions and extending only partially radially outwardly from the inner diameter bores of said hub portions.

4,920,816

ACTUATOR WITH A CLUTCH MECHANISM

Shinya Inabe, Kawasaki, and Ko Hirato, Yamato, both of Japan, assignors to Niles Parts Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,341
Claims priority, application Japan, Apr. 22, 1988, 63-99684
Int. Cl.[5] F16H *1/20;* F16D *19/00*
U.S. Cl. 74—424.8 A 15 Claims



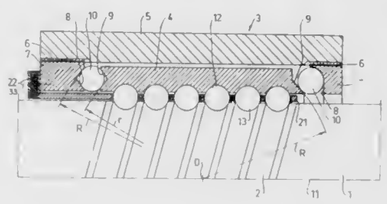
1. An actuator for driving an external mechanism, comprising:
a hollow member; means for rotating said hollow member;
a driving element extending into said hollow member, said element being connected to the external mechanism;
clutch means mounted in said hollow member for selectively moving said driving element in response to rotation of said hollow member;
a hollow spindle portion for supporting said driving element; and
a solenoid mounted on said hollow spindle portion for driving said clutch means;
whereby said driving element drives said external mechanism.

4,920,817

BALL SCREW WITH SCREW CAGE IN RACEWAY RING OF NUT

Bo Granbom, 5, Södergatan, S-736 00 Kungsör, Sweden

Filed Jul. 26, 1988, Ser. No. 224,353
Claims priority, application Sweden, Jul. 28, 1987, 8702982
Int. Cl.[5] F16H *25/22*
U.S. Cl. 74—424.8 NA 5 Claims



1. A ball screw, comprising:
a longitudinally elongated screw having a radially outer peripheral surface provided with a helical groove;
a nut coaxially surrounding said screw and including a raceway ring coaxially received in a nut sleeve; the raceway ring being freely rotatable relative to the nut sleeve about the longitudinal axis of the screw;
means defining a series of parallel, radially inwardly opening inner circumferential grooves in said raceway ring, extending perpendicularly to the longitudinal axis of the screw;
a series of balls having a radially inner portion received in said helical groove in said screw and a radially outer portion received in a said respective groove in said raceway ring;
a ball cage having a plurality of openings provided radially therethrough; said ball cage being coaxially received radially between said raceway ring and said screw, so that a radially intermediate portion of each ball protrudes through a respective said opening; and
means connecting the ball cage with the nut sleeve thereby fixing the ball cage with respect to the nut sleeve for preventing rotational translation of the balls with respect to the nut sleeve as the screw rotates about the longitudinal axis thereof.

4,920,818

SPEED CONTROL DEVICE FOR A BICYCLE

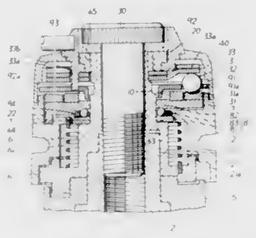
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 11, 1988, Ser. No. 217,336
Claims priority, application Japan, Jul. 13, 1987, 62-107346[U]
Int. Cl.[5] G05G *1/04, 1/06*
U.S. Cl. 74—475 6 Claims

1. A speed control device for a bicycle, comprising:
a fixing member including a lever shaft;
an operating lever supported to rotate relative to said lever shaft;

a positioning mechanism for setting the speed change stage by said operating lever, said positioning mechanism comprising (i) a positioning member having a plurality of engaging portions and supported to one of said fixing member and said operating lever, (ii) an engaging member supported to the other of said fixing member and said operating lever and selectively engageable one at a time with said engaging portions, said positioning member and said engaging member being disposed adjacent one another axially of said lever shaft, and (iii) an elastic member for biasing one of said positioning member and said engaging member axially of said lever shaft and toward the other of said positioning member and said engaging member and for providing a clicking feeling to a cyclist on operation of said operating lever;

engagement means for causing said operating lever and said



one of said positioning member and said engaging member to rotate together, said engagement means comprising means for allowing said operating lever to rotate with respect to said one of said positioning member and said engaging member in a predetermined range; and

a thrust bearing means provided between said fixing member and said one of said positioning member and said engaging member, for bearing a reaction force of said elastic member, for preventing said reaction force of said elastic member from acting on said operating lever when said operating lever rotates with respect to said one of said positioning member and said engaging member in said predetermined range and for reducing a rotational torque of said operating lever in response to said engaging member disengaging from one of said engaging portions and transferring to the adjacent engaging portion, so that said clicking feeling is amplified.

4,920,819

JUNCTION UNIT USED IN DUAL STATION SYSTEM

Tatsumi Uchida; Yoshikazu Hoshina, both of Yokohama, and Seiichi Nishimura, Hamamatsu, all of Japan, assignors to NHK Morse Co., Ltd., Yokohama and Sanshin Industries Co., Ltd., Shizuoka, both of, Japan

Filed Feb. 21, 1989, Ser. No. 313,792

Claims priority, application Japan, Mar. 4, 1988, 63-51208; Apr. 14, 1988, 63-92042

Int. Cl.[5] G05G *11/00*

U.S. Cl. 74—480 B 2 Claims

2. A junction unit for controlling an engine of a ship, arranged between a first and second remote control unit and a shifter and a throttle lever controlled by said control units, comprising;

a body having one axis and a first surface and a second surface located at an opposite side to said first surface;

guide means arranged on said body and extending parallel to the axis:

first and second movable racks arranged to be movable from reference positions in the axial direction of said body along said guide means, said racks having opposing gears, and being arranged parallel to each other on said first surface of said body;

third and fourth movable racks arranged to be movable from reference positions in the axial direction of said body along said guide means, said racks having opposing gears, and being arranged parallel to each other on said second surface of said body;

a first intermediate gear located between said first and second racks to mesh with said gears of said first and second racks;

a second intermediate gear located between said third and fourth racks to mesh with said gears of said third and fourth racks;

a first control cable connected to said first movable rack and said first remote control unit;

a second control cable connected to said second movable rack and said second remote control unit;

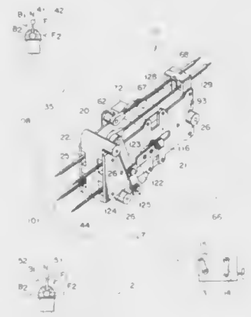
a third control cable connected to said third movable rack and said second remote control unit;

a fourth control cable connected to said fourth movable rack and said first remote control unit;

a first interlocking member for, when said first intermediate gear is moved in the axial direction of said body, transmitting the movement to said shifter;

a second interlocking member for, when said second intermediate gear is moved in the axial direction of said body, transmitting the movement to said throttle lever;

first lock means for, when one of said first and second racks is moved from its reference position, locking movement of the other rack;



second lock means for, when one of said first and third racks is moved from its reference position, locking movement of the other rack, said second lock means including:

a hole extending through said body between said first and third movable racks;

recesses opposing two end openings of said hole when said first and third movable racks are located at the reference positions; and

a second lock member which, when one of said first and third movable racks is moved from its reference position, runs onto the surface of the moved rack to be urged against the recess of the other rack; and

third lock means for, when one of said second and fourth racks is moved from its reference position, for locking movement of the other rack, said third lock means including:

a hole extending through said body between said second and fourth movable racks;

recesses opposing two end openings of said hole when said second and fourth movable racks are located at the reference positions; and

a third lock member which, when one of said second and fourth movable racks is moved from its reference position, runs onto the surface of the moved rack to be urged against the recess of the other rack.

4,920,820

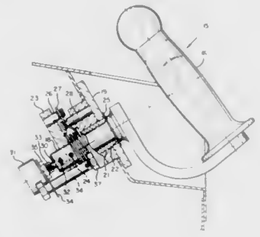
VEHICLE STEERING CONTROL

David C. Ingham, Gresham, and Delmar G. Schwab, Portland, both of Oreg., assignors to Hyster Company, Portland, Oreg.

Filed Oct. 15, 1985, Ser. No. 787,270

Int. Cl.[5] G05G *9/00*

U.S. Cl. 74—491 7 Claims



1. A hand operated vehicle control comprising:

(a) a hand grip arranged for engagement by a hand of an operator;

(b) a mounting means supporting the hand grip for rotation about an axis extending through the lunate bone of the wrist of the hand engaging the hand grip in a direction generally parallel to the forearm; and

(c) a means of communicating rotational movement of the handgrip to a vehicle system to be controlled.

4,920,821

STEERING WHEEL FOR VEHICLE

Hiroaki Shinto; Syuji Nakamura; Terumoto Yamaguchi; Tomoji Oguri, and Tuneo Terashima, all of Aichi, Japan, assignors to Kabushiki Kaishma Tokai-Rika-Denki-Seisakusho, Aichi and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 21, 1986, Ser. No. 820,147

Claims priority, application Japan, Jan. 22, 1985, 60-6881[U]

Int. Cl.[5] G05G *1/10*

U.S. Cl. 74—552 8 Claims



1. A steering wheel for a vehicle comprising:

a. a cylindrical boss for securing said steering wheel to the distal end of a steering shaft provided on the vehicle;

b. a steering wheel rim, and

c. a one piece structure made of a casting alloy by a molding process, said structure being cast about to integrally connect said boss and said steering wheel rim, said structure comprising:

1. flexible spokes cast about said steering wheel rim;

2. a spoke hub formed at an inner center portion of said spokes and being cast about said boss, and

3. an annular energy absorbing portion connecting said spokes to said spoke hub so as to coaxially surround the axis of said steering shaft and said boss through said spoke hub, and wherein said energy absorbing portion includes at least one bend, an end of which is connected to a thick walled portion of the energy absorbing portion, the inner ends of the spokes being connected to the thick walled portion.

4,920,822

LEATHER-COVERED STEERING WHEEL

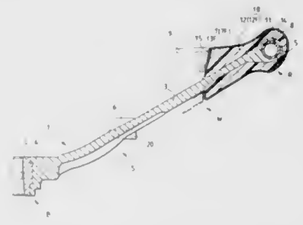
Toru Abiko, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jul. 19, 1989, Ser. No. 381,970

Claims priority, application Japan, Aug. 22, 1988, 63-109911[U]

Int. Cl.[5] B62D *1/04*

U.S. Cl. 74—552 6 Claims



1 A leather-covered steering wheel, comprising:

a metal core including a ring core section and a plurality of spoke core sections;

an elastic cover layer for covering said ring core section of said metal core and the end portions of said spoke core sections of said metal core thereof at the side of said ring core section;

a leather for covering said elastic cover layer; and

a plurality of configuration maintaining plates for maintaining the configuration of said elastic cover layer, each of said plates being formed between the end portion of said elastic cover layer covering each of the end portions of said spoke sections and leather, said plates being higher in hardness than said elastic cover layer and having a configuration corresponding to the outer periphery edge of the end portions of said elastic cover layer.

4,920,823

ROTARY KNOB FOR CONTROL DEVICES OR THE LIKE

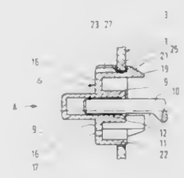
Michael A. Mohr, Saarlouis-Roden, and Günter W. W. Koglin, Altleiningen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1989, Ser. No. 306,365

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803356

Int. Cl.[5] G05G *1/10*

U.S. Cl. 74—553 19 Claims



1. A rotary knob, comprising:

a base member, said base member comprising a first hub having a first bore therein for receiving an end section of an actuation shaft and a bearing portion comprising first snapping means for rotatably securing said base member in

a circular opening of a control panel with said first hub receiving the actuation shaft; and

a switching handle for connection to said base member, said switching handle comprising a second hub having a second bore therein for receiving said first hub, said second bore and the outer surface of said first hub comprising locking means for locking said switching handle and base member against relative rotation.

4,920,824

SLIP CLUTCH HANDLE FOR PARKING METER SYSTEM

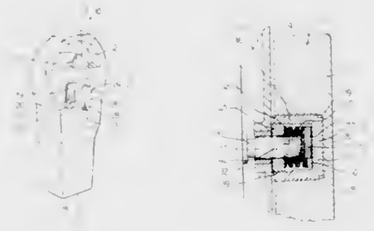
Seth Ward, II, Little Rock, Ark., assignor to POM Incorporated, Russellville, Ark.

Continuation-in-part of Ser. No. 204,352, Jun. 9, 1988, Pat. No. 4,881,631. This application Sep. 23, 1988, Ser. No. 248,166

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[5] G05G *1/10;* G04F *1/04*

U.S. Cl. 74—553 1 Claim



1. In a parking meter, a rotatable non-oriented symmetrical actuating handle,

a cylindrical cup shaped receptor in said handle having a end wall intersecting the central axis thereof and a side wall extending axially and longitudinally with respect to said central axis;

a shaft having a flange on one end thereof positioned in said receptor adjacent said end wall, said flange having a plurality of slotted recesses formed therein spaced radially from said longitudinal central axis,

said handle comprising a fully symmetrical first part adapted to be rotatably actuated by the hands of a user from any position in a 360 degree orientation,

said shaft comprising a second part adapted to be connected to an operative mechanism of a parking meter; and

clutch slip action means between the first and second parts preloaded to be co-rotatable under normal operating conditions from any position of relative orientation but being selectively yieldable to abnormal banging torque forces to protect the operating mechanism against vandalism which clutch slip action means comprises:

a substantially flat radial engagement surface formed by said end wall intersecting the central axis thereof;

said shaft and said flange on said second part being angularly displaceable around said axis;

a plurality of slip bearing members each comprising a cylinder disposed between said first and second parts and received in respective ones of said recesses in said flange which are sized and shaped to retain said slip bearing members for angular displacement in unison with said first part, but allowing limited axial displacement; and

axial loading means comprising a plurality of spring washers bottomed against said flange to provide frictional engagement between said first and second parts at said engagement surface and said slip bearing members when a torque force less than a predetermined threshold is applied to said first part and displaceable in response to abnormal banging torque forces applied to said first part to accommodate temporary slipping or rolling of said slip bearing members on said engagement surface until said abnormal banging torque force subsides, said actuating handle being operable to facilitate acceptance of a coin immediately after removal of said abnormal banging torque force.

4,920,825

VEHICLE ENGINE

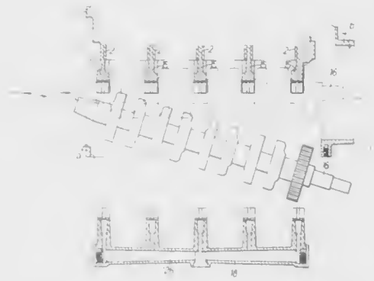
Kouji Okazaki; Tsugio Ikeda, and Takashi Inagaki, all of Saitama, Japan, assignors to Honda Giken Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,416

Claims priority, application Japan, Mar. 6, 1987, 62-51376; Mar. 6, 1987, 62-32926[U]

Int. Cl.[5] F16H *57/02*

U.S. Cl. 74—606 R 8 Claims



1. A vehicle engine including walls forming a housing structure defining an integrally formed cylinder block, crankcase and transmission case, mounting means in said crankcase for rotatably mounting a crankshaft, a transmission rotatably mounted in said transmission case, said transmission case being transversely disposed with respect to said crankcase and means forming a first closable opening in a wall of said crankcase below said crankshaft sized to permit installation and withdrawal of said crankshaft from said crankcase and means forming a second closable opening in a wall of said transmission case separate from said crankcase wall sized to permit installation and withdrawal of said transmission from said transmission case.

4,920,826

TRANSMISSION APPARATUS

Leonard A. Theriault, 22962 96th Avenue, Fort Langley, British Columbia, Canada (VOX 1JO)

Filed Mar. 11, 1988, Ser. No. 166,934

Int. Cl.[5] F16H *47/08*

U.S. Cl. 475—52 14 Claims



1. A transmission apparatus for providing a variable ratio transmission between first and second shafts, the transmission apparatus comprising: an epicyclic gear unit which comprises a first gear, a second gear, a planet carrier, and at least one first planet gear rotatably mounted on the planet carrier and engaging the first and second gears, the first and second gears and the planet carrier forming three elements of the epicyclic gear unit; and a fluid coupling which comprises only an impeller and a turbine as two elements of the fluid coupling; wherein one element of the epicyclic gear unit is connected by a first connection to one element of the fluid coupling, and one other element of the epicyclic gear unit is connected by a second connection to the other element of the fluid coupling, wherein at least one of the first and second connections includes a reversing device to reverse the direction of rotation of the two respective elements, whereby both the impeller and the turbine of the fluid coupling rotate in the same direction, and wherein the third element of the epicyclic gear unit is adapted for connection to a first shaft and another of said elements of the epicyclic gear unit and the fluid coupling is adapted for connection to a second shaft.

4,920,827

STEPLESS SPEED CHANGE DEVICE

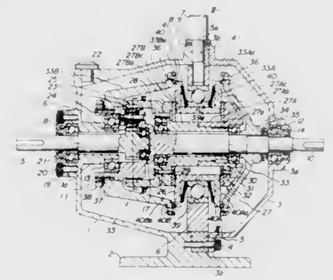
Kikuzo Takamiya, Kitamoto; Yoshitaka Tamura, Kitasaitama; Yoichi Shibayama, Ageo; Ritsuo Nishimura, Urawa; Kiyofumi Hirai, and Hiromitsu Serizawa, both of Ageo, all of Japan, assignors to Bridgestone Cycle Co., Ltd., Japan

Filed Feb. 28, 1989, Ser. No. 317,181

Claims priority, application Japan, Mar. 8, 1988, 63-52505; Mar. 8, 1988, 63-52506

Int. Cl.[5] F16H *37/06, 15/50, 13/10*

U.S. Cl. 475—166 8 Claims



1. A stepless speed change device having an input shaft and an output shaft, comprising a planetary carrier provided at an inner end of said input shaft, a sun gear provided at an inner end of said output shaft to be in mesh with planet gears carried on the planetary carrier, and an internal gear in mesh with the planet gears to form a planetary gear, and further comprising a driven rotor rotatable about said input shaft and in the form of a hollow cylinder having flanges at both ends and concentrically connected to said internal gear, a driving rotor enclosing said driven rotor and including two members connected to said input shaft on both sides of said driven rotor, and an intermediate friction transmission ring whose eccentricity is adjustable and interposed between said flanges of the driven rotor and between said two members of the driving rotor for transmission of rotating power therebetween.

4,920,828

PLANETARY GEAR TYPE TRANSMISSION

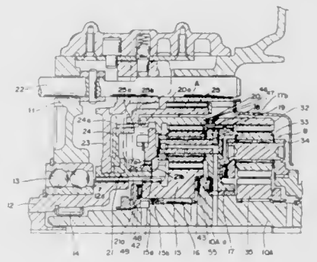
Osamu Kameda; Satoshi Fujikawa, and Toshiharu Shinmoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 7, 1989, Ser. No. 307,286

Claims priority, application Japan, Feb. 8, 1988, 63-26814; Sep. 12, 1988, 63-118903

Int. Cl.[5] F16H *57/10, 55/18*

U.S. Cl. 475—299 9 Claims



1. A transmission having a planetary gear type transmission unit comprising:

a casing;

an input member;

an output member;

a sun gear, a ring gear, and a carrier carrying a plurality of planet gears in said casing for coupling said input member to said output member in a direct drive mode or a reduction ratio drive mode, said planet gears being in mesh with said sun gear said ring gear, said carrier being coupled with said output member, and at least said carrier being unmovable in an axial direction of said input member;

a first change-over member connected with said input member for selectively connecting said input member with said carrier in said direct drive mode or with said sun gear in said reduction ratio drive mode; and

a second change-over member secured to said first change-over member for engaging said ring gear with said casing in said reduction ratio drive mode or disengaging said ring gear from said casing in said direct drive mode.

4,920,829

HYDRAULIC PRESSURE CONTROL DEVICE FOR AUTOMATIC TRANSMISSION FOR VEHICLE INCLUDING REVERSE STAGE AND LOCK-UP CLUTCH CONTROL SYSTEMS

Mitsuru Takada; Hiroshi Itoh, both of Toyota, and Tokuyuki Takahashi, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jan. 27, 1989, Ser. No. 302,254

Claims priority, application Japan, Feb. 17, 1988, 63-34598

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—868 6 Claims

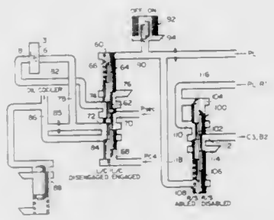
1. A hydraulic pressure control device for an automatic transmission for a vehicle, comprising:

a manual shift valve for selecting a forward range in which at least one forward speed stage is enabled and a reverse range in which a reverse stage is enabled;

a first hydraulic pressure control valve having a first and a second control signal port and controlling switching over of an operation of the automatic transmission according to conversion between supply and non supply of a first and a second signal hydraulic pressure to said first and said second control signal port, respectively, said second signal hydraulic pressure being available in a certain forward

speed stage or stages but not available in the reverse stage, said first hydraulic pressure control valve being reactive to the conversion between supply and non supply of said first signal hydraulic pressure when and only when said second signal hydraulic pressure is supplied;

a second hydraulic pressure control valve having a third control signal port and selectively interrupting transmission of a third signal hydraulic pressure according to conversion between supply and non supply of said first signal hydraulic pressure to said third control signal port,



said third signal hydraulic pressure being available when and only when the manual shift valve is set to the reverse range and serving to set up the reverse stage; and

a third hydraulic pressure control valve for controlling the conversion between supply and non supply of said first signal hydraulic pressure so that in the forward speed stage at which said second signal hydraulic pressure is available said operation of the automatic transmission is selectively switched over and in the reverse range the setting up of the reverse stage is selectively interrupted.

4,920,830

ROTARY WIRE STRIPPER

Jiri Stepan, St. Gallerstrasse 76, CH-7320 Sargans, Switzerland

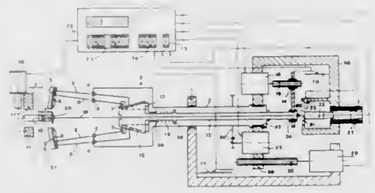
Continuation of Ser. No. 832,463, Feb. 21, 1986, Pat. No. 4,745,828. This application Apr. 20, 1988, Ser. No. 183,782

Claims priority, application Switzerland, Feb. 22, 1985, 815/85

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[5] H02G *1/12*

U.S. Cl. 81—9.51 **21 Claims**



1. Device for removing at least two layers from electrical or optical cable, the device comprising:

frame means;

blade means mounted on the frame means for being movably radially with respect to the cable for movement into contact with said layers of the cable to be removed, and blade rotating means for rotating the blade means around the axis of the cable, enabling the blade means to sever around the cable said layers of the cable to be removed;

clamping jaw means mounted on the frame means for being moved into clamping engagement with the cable for fixing the cable in an axial position with a free end of the cable at a predetermined terminal position relative to the frame means;

centering jaw means mounted on the frame means and disposed axially of the cable in a location near the blade means, and means for moving the centering jaw means radially of the cable into engagement with the cable for radially holding and positioning the cable with respect to the centering jaw means and the blade means, and for placing the centering jaw means so that when the centering jaw means clamp the cable, the centering jaw means are directly next to the blade means;

blade moving means for automatically moving the blade means radially toward the cable, to at least two different preselectable radial positions within the cable, comprising a first bevel surface spaced axially of the cable from the blade means, the blade means having follower means attached to it that are in engagement with the first bevel surface, the first bevel surface being so oriented that upon movement of the first bevel surface in a direction axially of the cable, the follower means is moved by the first bevel surface and thereby the blade means is moved radially to contact said layers of the cable to be removed; said first bevel surface being supported on said frame means;

said blade moving means also automatically moving said blade means axially with respect to the end of the cable to at least two different pre-selectable positions thereby to establish at least two respective stripping lengths of the cable and thereby establish at least two lengths of the at least two cable layers which can be removed from the cable; and

means for controlling the blade moving means, to control automatically the movement of the blade means towards all of said pre-selectable positions axially and radially, with respect to the cable;

wherein said centering jaw means are biased by a spring, the spring being compressed by said means for moving the centering jaw means, for moving the centering jaws to the cable; and

wherein the centering jaw means are biased by a second bevel surface; said second bevel surface comprising bevel surface moving means which are supported on said frame means.

4,920,831

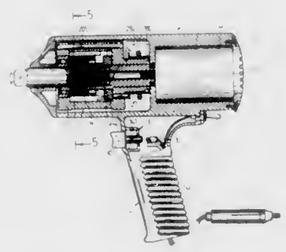
VEHICLE-CARRYING PURPOSE WRENCH

Chan S. Huang, Taipei, Taiwan, assignor to Dora Hsian Ling Huang, Taipei Hsien, Taiwan

Continuation-in-part of Ser. No. 900,176, Aug. 25, 1986, Pat. No. 4,727,780. This application Apr. 19, 1988, Ser. No. 185,246

Int. Cl.[5] B25B *13/00*

U.S. Cl. 81—54 **1 Claim**



1. A vehicle-carrying wrench, comprising:

a housing assembly, having:

a motor casing;

a tool casing, integrally formed with the motor casing;

a front cover, tightly fixed by screws to the tool casing;

a rear cover, tightly fixed by screws to the motor casing, said rear cover having several radiator louvers;

a handle integrally formed with the motor housing, said handle resembling a pistol grip and having stripes to facilitate holding, a trigger switch mounted on the forepart of the handle and a direction control switch mounted on the rear part of the handle;

a reversible motor, mounted inside the motor casing, a plug and cord means connected to said motor for supplying electrical power thereto, said plug being connectible to a lighter socket in the vehicle;

a tool assembly contained inside the tool casing, the tool assembly comprising:

a main body, including a first side wall, a second side wall and a space existing in between the two side walls, a projected circular tube located in said space at the center of the first side wall, a notched slot having a predetermined depth is set at an end of said tube having a circular spherical angle and having a number of apertures in said first side wall located at an appropriate radius away from the center of the circular tube, movable pins which are longer in length than the wall thickness of the first side wall being contained in said aperture;

a drive member mounted in said space by a fixed pin passing through an aperture in the first and second side walls, said drive member having a wing part extending outwardly and slanting downwardly from a lateral side of its body and an extension part extending out of a ridge and projecting at the width of the wing part;

a transmission member, having a shape of a hollow ring body, having first and second circumferences, wherein the radius of curvature of the first circumference is similar to that of an interior edge circular spherical plane of the wing part located at the two lateral sides of the drive member, an aperture notched slot is located at the upper portion of the second circumference to facilitate the mounting of an extension part of the drive member and a square shaped button extending inside the hollow ring body;

a main drive shaft in the shape of a hollow cylindrical body, said main drive shaft having hollow bores at both of its two ends, a bearing mounted in a first bore in one of the ends and another bearing mounted in a second bore at the other end which is to be connected with a follower shaft, including a ring shaped stop ring projecting from the end adjacent said second bore and including a button notched slot;

an elastic member mounted on the drive shaft and located at the rear portion of the transmission member and abutting said stop ring, a follower shaft with one of its ends piercing through the hollow main drive shaft and a bearing mounted at the other end which is in the shape of a square cylindrical body for receiving the wrench; a follower member tightly fixed to the follower shaft and resembling a ring-shaped body, having a tooth part projected outwardly from its periphery;

an arrester, comprising two slightly U-shaped pushing pieces attached to counter balanced weight blocks via connecting planes, said U-shaped pieces to be mounted at each of the C-shaped fixed pieces and are coupled together by pin holes and two pin rods which are secured with C-shaped rings to enable each of the two U-shaped pushing pieces to be connected at the lateral side of the C-shaped fixed pieces, elastic springs are mounted to connect the ends of the pin rods which are located on the upper and the lower planes of the C-shaped fixed pieces, a convex disk is sandwiched by feet of the two U-shaped pushing pieces and a triangular shaped projecting edge on said convex disk is being engaged by the tips of the feet as a result of centrifugal force, whereby the tips of the feet of the U-shaped pushing pieces control the movement of said convex disk.

4,920,832

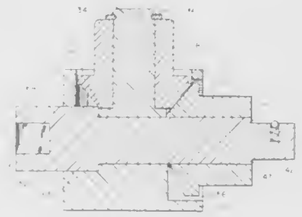
TOOL DRIVER

Jan Van Gennep, 715 Laurel Ave., Menlo Park, Calif. 94025

Filed Nov. 22, 1988, Ser. No. 274,925

Int. Cl.[5] B25B *17/00*

U.S. Cl. 81—57.29 **5 Claims**



1. A device for tightening and loosening fasteners, comprising:

a housing formed with inner surfaces that define a cylindrical hole extending completely through said housing between first and second surfaces thereof, said hole having a first smaller diameter portion at said first surface, and a second larger diameter portion at said second surface, and said housing formed with surfaces that define an enlarged bore located on a third surface;

a first bevel gear assembly, rotatably positioned in said second larger diameter portion of said cylindrical hole, and having teeth which are recessed below said second surface;

direct driving means, extending through said cylindrical hole and integrally coupled to said first bevel gear assembly, said direct driving means including a tool connector at a first area thereof, adapted for the receipt of a tool to tighten or loosen a fastener, and a tool driver connector at a second area thereof to directly drive said tool; and

indirect driving means, including a second bevel gear assembly rotatably coupled to said enlarged bore, and having teeth which are recessed below said third surface, said teeth, integrally meshing with said teeth of said first bevel gear assembly, such that rotating said second bevel gear assembly causes said first bevel gear assembly and said direct driving means to rotate, said second bevel gear assembly including means for receiving a tool driver adapted to rotate said second bevel gear assembly to indirectly drive said tool.

4,920,833

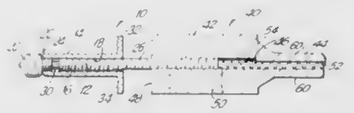
BLIND SETTING RIVET

Eric Rosenthal, 112-50 78th Ave., Forest Hills, N.Y. 11375

Filed Dec. 12, 1988, Ser. No. 282,617

Int. Cl.[5] B25B *13/02*

U.S. Cl. 87—124.1 **7 Claims**



1. A blind setting rivet in combination with a rivet installation tool, said rivet comprising:

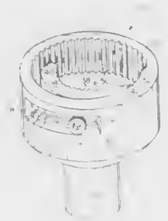
a shank having a drilling bit on a forward end thereof and a mandrel section on a rear end thereof;

said shank being externally threaded;

a sleeve having a forward end portion, a rear end and an

internally threaded opening disposed longitudinally through said sleeve to matingly receive said shank;
said shank being threadingly engaged in said sleeve with a rear end of said drilling bit abutting against said forward end portion of said sleeve, and said mandrel section extending outwardly from said rear end of said sleeve;
said sleeve having an enlarged flange on said rear end thereof to provide a stop to prevent said sleeve from passing entirely out through holes formed in the walls, panels and the like by said drilling bit, so that said forward end portion of said sleeve extends entirely outwardly from an inner surface of the walls, panels and the like;
said mandrel section having a non-circular configuration in order to rotate said shank;
said flange being provided with engagement means to prevent rotation of said sleeve while said shank is rotating when said flange engages an outer surface of the walls, panels and the like, so that continued rotation of said shank causes said shank to be threaded rearwardly through said sleeve in order for said drilling bit to deform said forward end portion of said sleeve to provide an enlarged collar thereon, with said sleeve flange being disposed on one side of the walls, panels and the like, and said collar being disposed on an opposite side thereof to join the walls, panels and the like together;
said drilling bit having a predetermined axial length;
said forward end portion of said sleeve having an axial length greater than said predetermined axial length of said drilling bit;
said rear end of said drilling bit being rounded, and said forward end portion of said sleeve being also rounded, so that said drilling bit is formed into and enlarges said forward end portion of said sleeve when said collar is being formed; and
said drilling bit being disposed entirely within said collar after rotational setting of said rivet so that a forward tip of said drilling bit is positioned within said collar to avoid any damage when brushing up against said collar; and
said tool comprising:
a forward cylindrical portion and a rear stem portion;
said forward cylindrical portion being provided with an opening in a forward surface thereof;
said opening of said cylindrical portion extending longitudinally through said cylindrical portion along its central axis;
walls of said opening of said cylindrical portion being non-circular and sized to matingly and slidingly receive said mandrel section of said rivet therein so that said tool rotates said shank when said tool is rotated;
said rear stem portion having a non-circular outer surface to be gripped and rotated by a rotating device;
said shank of said rivet being fabricated from a magnet attracting metal, and said cylindrical portion of said tool being provided with magnetic means in communication with a forward portion of said opening to releasably secure said mandrel section of said rivet in said opening when said mandrel portion is in a first position;
spring means being provided in a rear portion of said opening to act upon said mandrel section of said rivet when said mandrel section is in a second position spaced rearwardly from said first position in order to eject said mandrel section from said opening after said rivet is set; and
said spring means having a greater force than said magnetic means to overcome any magnetic attraction of said magnetic means when ejecting said mandrel section of said rivet.

4,920,834
SOCKET PIPE WRENCH
Kent Womack, Rte. 2, Box 52, Chillicothe, Tex. 79225, and Tony Hise, Box 211, Dumas, Tex. 79209
Continuation of Ser. No. 98,278, Sep. 18, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,167
Int. Cl.[5] B25B *13/16*
U.S. Cl. 81—165 **15 Claims**



1. An apparatus for tightening and loosening a threaded member, comprising:
a socket member having a circular cavity therein defining an inner annular surface for receiving a portion of said threaded member, said inner annular surface having teeth and a cam lobe;
jaw means attached to said socket member and located within said circular cavity, whereby rotation of said socket member causes said jaw means to forcibly impinge upon said portion of said threaded member, said portion of said threaded member being grasped between said jaw means and a part of said teeth of said annular surface, thereby exerting rotational torque on said threaded member; wherein said jaw means includes:
a crescent-shaped member having inner and outer peripheries, said outer periphery having a curvature essentially identical
to curvature of said inner annular surface of said cavity,
said inner periphery having teeth for grasping said portion of said threaded member, said crescent-shaped threaded member having distal and proximate ends with said distal end being wider than said proximate end, said distal end being separated from said proximate end by an angular distance of an arc of a circle, said arc including a substantial position of said circle up to and including a semicircle;
said cam lobe is attached to and integral with said inner annular surface of said circular cavity, located near said proximate end of said crescent shaped member whereby, as said crescent shaped member slides away from said cam lobe, said proximate end of said crescent shaped member is forced toward the center of said circular cavity; and
means for attaching said crescent-shaped member to said socket member.

4,920,835
WRENCH FOR REMOVAL OF DOUBLE NUT ASSEMBLY
Donald R. Hendricks, 2272 E. 34th, Tulsa, Okla. 74105
Continuation-in-part of Ser. No. 108,942, Oct. 16, 1987, abandoned. This application Aug. 2, 1988, Ser. No. 227,629
Int. Cl.[5] B25B *23/08*
U.S. Cl. 81—462 **16 Claims**

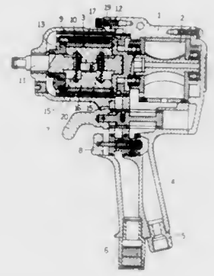
1. A wrench assembly for use with a lug wrench to remove a stud-nut and an outer nut of a double nut assembly from a wheel mount, the wheel mount having an unrestricted hub opening in a rim portion thereof, the wrench assembly comprising:
a wrench member having a nut receiving opening formed therein for engaging the outer nut of the double nut assembly; and

retention means for selectively securing the wrench member to the rim portion of the wheel mount so that the wrench member is retained in a stationary outer nut engaging position when torque is applied to the stud-nut, the retention means comprising:
a substantially planar body member having an upper side and a lower side, the body member positionable within the hub opening of the wheel mount so as to be disposed substantially adjacent the rim portion, the wrench member connected to the body member such that the nut receiving opening is disposed a distance from the body member;



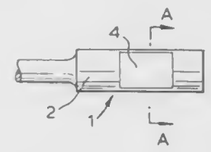
tongue means supported by the body member for stabilizing the body member, the tongue means having a tongue member which engages the rim portion when the outer nut is positioned within the nut receiving opening of the wrench member; and,
track means supported on the lower side of the body member for slideably retaining the tongue member and for permitting the tongue member to be selectively moved between an extended wheel mount engaging position and a retracted position.

4,920,836
TWO BLADE TYPE IMPULSE WRENCH
Tadakatsu Sugimoto; Yoshiaki Igarashi; Shiro Saito; Eiichi Wada, and Keiji Murai, all of Osaka, Japan, assignors to Yokota Industrial Co., Ltd., Osaka, Japan
Division of Ser. No. 937,108, Dec. 2, 1986, Pat. No. 4,766,787. This application May 20, 1988, Ser. No. 196,948
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[5] B25B *19/00*
U.S. Cl. 81—463 **6 Claims**



1. A two-blade type impulse wrench comprising a liner rotated by a motor, a main shaft inserted in the liner to be rotatable coaxially therewith, and two blades inserted to be retractable respectively into two grooves formed in the main shaft with their outer ends abutting against an inside wall of said liner, being intended to generate an impact pulse on said main shaft when said liner rotates and seals formed on the inside wall of said liner which coincide with seals formed on the outside wall of said main shaft and the outer ends of said blades, wherein said seals formed on the inside wall of said liner comprise at least four seals, and said seals formed on the outside wall of said main shaft and the outer ends of said blades comprise at least two seals, whereas two seals of said at least four seals formed on said liner and two seals of said at least two seals formed on said main shaft are all of a same shape which is other than a single straight line parallel to a rotational axis of said main shaft, so that the same two seals formed on said liner and the same two seals formed on said main shaft coincide with each other only once per rotation of said liner.

4,920,837
TOOL
John A. Phillips, Balsham, United Kingdom, assignor to Dom Holdings PLC, United Kingdom
Continuation of Ser. No. 39,758, Apr. 16, 1987, abandoned, which is a continuation of Ser. No. 804,868, Dec. 5, 1985, abandoned. This application Oct. 11, 1988, Ser. No. 255,499
Claims priority, application United Kingdom, Dec. 7, 1984, 8431027
Int. Cl.[5] B25B *19/00*
U.S. Cl. 81—463 **1 Claim**



1. A drill bit for insertion in the tool receiver of a rotary percussive machine, said drill bit having a shank portion and a working portion extending axially from said shank portion, wherein said shank portion has a boundary which is cylindrical with the exception of two opposed parallel chordal flats lying entirely in planes parallel to the axis of the bit at opposite sides of said shank portion for receiving a rotational driving force by engagement with driving means of the tool receiver in order to effect rotation of the drill bit in use, said flats lying intermediate opposite axial ends of said shank portion.

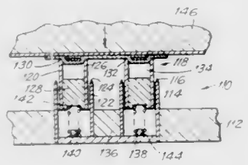
4,920,838
METHOD OF CUTTING WITH CERAMIC CUTTING TOOL HAVING IMPROVED TOUGHNESS BEHAVIOR
Nils G. L. Brandt, Solna, and Anders G. Thelin, Vällingby, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden
Division of Ser. No. 201,931, Jun. 3, 1988, Pat. No. 4,849,331. This application May 9, 1989, Ser. No. 349,094
Claims priority, application Sweden, Jun. 9, 1987, 8702391; Jun. 9, 1987, 8702392
Int. Cl.[5] B23C *1/00*
U.S. Cl. 82—1.11 **10 Claims**

1. In a method of cutting metal wherein a cutting tool is brought into contact with a metal workpiece and at least one of the cutting tool and metal workpiece moves relative to the other whereby metal is removed from the workpiece, the improvement which comprises using as the tool a whisker reinforced ceramic cutting tool material characterized by increased toughness behaviour over a wide range of metal cutting applications, consisting essentially of a composite defined by a matrix of silicon nitride or alumina with up to 35 weight % whiskers homogeneously dispersed therein, said whiskers having a monocrystalline structure and said composite being characterized in that it has at least 5 weight % of each of at least two of three whisker single crystals characterized by geometry and size range as follows:

VOL 114 ISS 1 MY 1 990 UMI

(i) single crystal fibers with a diameter less than 1 μm and an aspect ratio of 15–150;
(ii) single crystal fibers with a diameter of 1–6 μm and an aspect ratio of 5–100; and
(iii) single crystal discs with an equivalent diameter of 5–50 μm and an aspect ratio of 5–50.

4,920,840
APPARATUS FOR TRIMMING FABRIC COVERED ARTICLES
Richard Fink, 210 Oliver Way, Merrick, N.Y. 11516
Continuation of Ser. No. 125,239, Nov. 25, 1987, abandoned, which is a continuation-in-part of Ser. No. 113,224, Oct. 28, 1987, Pat. No. 4,793,881. This application Apr. 10, 1989, Ser. No. 334,820
Int. Cl.[5] B26D *7/01*
U.S. Cl. 83—140 **3 Claims**



1. A mechanism for trimming excess material from a fabric-covered belt buckle or similar article having a three dimensional insert between layers of fabric comprising:
(a) a substantially flat block having a flat working surface and an upwardly extending cutting edge substantially corresponding in size and shape to the size and shape of the trimmed fabric-covered belt buckle or article;
(b) a positioning means defined as a ridge substantially conforming in size and shape to the edges defined by said insert, telescopically housed within the interior of said cutting edge and vertically reciprocal therein, said positioning means being spring-biased such that, in its unloaded state, the top edge of said ridge extends above said cutting edge, said ridge of said positioning means providing a positive locating and alignment mechanism for said fabric covered insert with respect to said cutting edge prior to trimming;
(c) a top cutting backboard overlying said ridge and said cutting edge; and,
(d) said positioning means having an overall height less than the height of said cutting edge such that downward pressure on said positioning means transmitted through said cutting backboard causes said top edge of said ridge to retract beneath said top edge of said cutting edge such that said cutting edge contacts said top cutting backboard to effectuate trimming of said excess material.

4,920,841
ENERGY DISSIPATING RECEPTACLE
Christopher L. Johnson, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.
Filed Dec. 29, 1988, Ser. No. 291,680
Int. Cl.[5] B24C *5/00*
U.S. Cl. 83—177 **8 Claims**

7. An apparatus for cutting by means of a high velocity fluid stream, said apparatus comprising:
a working nozzle supplying a high velocity fluid stream;
a material to be cut, said material being located below said working nozzle in alignment with said high velocity fluid stream;
an energy dissipating receptacle located opposite said material to be cut for receiving said high velocity stream of fluid, said receptacle comprising:
a body having an internal cavity and an aperture for receiving said high velocity stream of fluid;
dissipating means located within said internal cavity in alignment with said high velocity stream of fluid and oriented in a 90 degree plane thereto for dissipating the energy associated with said high velocity stream of fluid at a point of contact once it has passed within said internal cavity; and



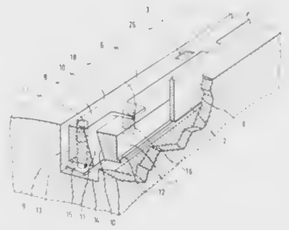
a mechanically driven rotating means for rotating the dissipating means in said 90 degree plane within said internal cavity to thereby vary the point of contact with said high velocity stream of fluid in a circumferential path about the dissipating means to increase the useful life of said dissipating means.

4,920,842
PASSIVE WEB CUTTER
David M. Orlicki, Rochester; David B. Gropp, Fairport, and Thomas E. VanValkenburgh, Rochester, all of, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 31, 1989, Ser. No. 387,182
Int. Cl.[5] B26D *7/14*
U.S. Cl. 83—308 **14 Claims**



1. A passive cutter for severing a web under tension in response to the tension in the web reaching a predetermined threshold, the cutter comprising:
(a) a rotatable hub;
(b) means mounting the hub for rotation about a fixed axis;
(c) at least one knife for cutting the web, said knife being supported by the hub for rotation with the hub, the knife projecting from said hub in a radial direction relative to the axis; and
(d) means for supporting the web for travel along an arcuate path about the axis and spaced from said knife when tension in the web is below said predetermined threshold, the suporting means enabling the web to move radially inwardly into contact with the knife to effect severing of the web when tension in the web reaches the predetermined threshold.

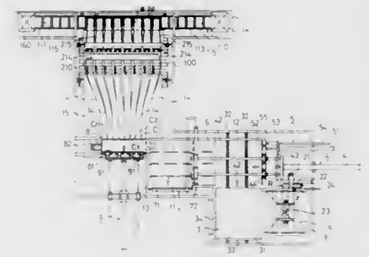
4,920,843
DEVICE FOR RETAINING KNIFE BLADE FOR CUTTING A PAPER WEB
Sven A. R. Strömberg, Norbybillsbro, Ringåker, Sweden, and Rolf A. Larsson, Södra Promenaden 7, Påsboda, Sweden
Filed Aug. 30, 1989, Ser. No. 400,392
Claims priority, application Sweden, Feb. 6, 1989, 8900391
Int. Cl.[5] B26D *1/62*
U.S. Cl. 83—346 **10 Claims**



1. A device for retaining a knife blade for cutting, perforation or other treatment of a running web, preferably a paper web, whereby said web (4) runs between a rotatable knife retaining cylinder (3) and a rotatable counter pressure cylinder (5) and whereby the knife blade (2) and a retaining ruler (7) for retaining the blade (2) are provided in a slot (6) in the knife retaining cylinder (3), comprising: (a) a first wedge surface (10) downwardly inclined relative to the slot (6) and formed on the retaining ruler (7); (b) a tightening ruler disposed beside the retaining ruler in the slot (6); (c) a second corresponding downwardly inclined wedge surface (11) on the tightening ruler (9) disposed beside the retaining ruler in the slot (6) such that the first and second wedge surfaces are in contact whereby, during an adjustment maneuver in which the knife retaining cylinder (3) is rotated relative to the counter pressure cylinder (5), the knife blade is pressed downwards into the slot (6) by said counter pressure cylinder (5), whereby the blade (2), through a support portion (12) on the retaining ruler (7), displaces said retaining ruler (7) downwards relative to the tightening ruler (9) for wedging up said rulers (7, 9) and the blade (2) in the slot (6).

4,920,844
APPARATUS FOR CUTTING BEAN CURD INTO PIECES OF THE FIXED SIZE AND PACKING THEM
Zenji Nagata, Yamatotakada, Japan, assignor to Sanyo Shokuhin Kabushiki Kaisha, Nara, Japan
Filed Jul. 5, 1988, Ser. No. 215,416
Claims priority, application Japan, Jul. 2, 1987, 62-166042; Jul. 6, 1987, 62-168250
Int. Cl.[5] A23L *1/20;* **B26D** *7/00*
U.S. Cl. 83—404.3 **1 Claim**

1. A bean curd automatic cutting apparatus comprising:
a tiltable coagulating box for holding soybean milk for coagulating into a large block of coagulated soy bean curd, and means on said coagulating box for releasing a large block of coagulated soy bean curd when said tiltable box is tilted;
a lifting and tilting means attached to said coagulating box for raising and lowering said box and for tilting said box for causing a large block of soy bean curd to be released by said releasing means on said box from said box onto a sending out table;
a sending out table disposed adjacent to said coagulating box for receiving a large block of bean curd from said box thereon;
a first plurality of cutting blades disposed adjacent to said sending out table for cutting a large block of soy bean curd into a plurality of elongated blocks of bean curd;
a pushing out means disposed adjacent to said sending out table for pushing a large block of soy bean curd received on said sending out table in a first direction against said first plurality of cutting blades for cutting a large block of bean curd into a plurality of elongated blocks, said pushing out means including a first and a second reciprocably movable pushing out plate, and said pushing out means having an actuating means for simultaneously actuating said first and second pushing out plates for jointly pushing a large block of bean curd in the first direction against said first plurality of cutting blades, said second pusing out plate being a fixed quantity pushing out means for further pushing one of a plurality of cutting blades, said actuating means causing said second pushing out plate to move still further in the first direction after said first plurality of cutting blades has cut a large block of soy bean curd into a plurality of elongated blocks for further pushing one of said plurality of elongated blocks into a pushing out and cutting means;
a pushing out and cutting means disposed adjacent to said first plurality of cutting blades for receiving one elongated block of soy bean curd from said fixed quantity pushing out means, an up and down guide on said pushing out and cutting means for receiving and substantially physically supporting the one elongated block of soy bean curd



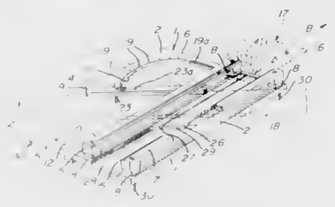
received from said fixed quantity pushing out means, a second plurality of cutting blades on said pushing out and cutting means for cutting an elongated block of soy bean curd into a plurality of predetermined size blocks, a plurality of guides on said pushing out and cutting means for guiding and supporting said plurality of predetermined size blocks cut by said second plurality of cutting blades;
a horizontally pushing out means disposed adjacent to said fixed quantity pushing out means and said pushing out and cutting means for advancing the plurality of elongated blocks of bean curd cut by said first plurality of cutting blades sequentially in a second direction substantially perpendicular to the first direction causing one of the plurality of elongated blocks at a time to be adjacent to said second pushing out plate of said fixed quantity pushing out means for being further pushed in the first direction thereby; and
a water tank means for holding water for continuously covering each one of a large soy bean curd block, a plurality of elongated soy bean curd blocks, and a plurality of predetermined size soy bean curd blocks when received in and on said coagulating box, said sending out table, said pushing out means, said pushing out and cutting means, and said horizontally pushing out means, respectively.

4,920,845

MITER BOX FOR PORTABLE CIRCULAR SAW

Richer Blanchette, 1345 Labadie Street, Longueuil, Canada (J4N 1E2)

Filed May 4, 1988, Ser. No. 190,117
Int. Cl.[5] B27B *11/04*
U.S. Cl. 83—574 **2 Claims**



1. A table assembly for assisting in the precision cutting of a board by a portable circular saw, comprising:

(a) a flat, rigid panel, provided with a lengthwise, rectangular groove on its top face;

(b) support means to support said panel about a horizontal plane;

(c) track means, for slidingly and guidingly supporting said saw spacedly parallel to said panel and in overlying register with said panel groove;

(d) a pivotal arm, pivotally mounted to said panel about a plane parallel to said panel, said arm extending exteriorly of said groove for guiding said board to be cut transversely of said groove;

(e) protractor means, for cooperating with said pivotal arm and said saw for enabling determination of the chosen angle of cut of the board;

(f) lock means, to releasably lock said pivot arm in a position chosen via use of said protractor means;

(g) a rectangular plank, completely engaged into said groove removably thereinto, and defining at least one lengthwise cavity on the top surface thereof, said cavity being parallel to said groove; and

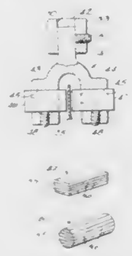
(h) securing means, for releasably securing said plank to said panel within said groove; wherein, prior to operation of said circular saw, said cavity is used as a reference mark for accurately positioning said board to be cut, depending on the angular plane of cut of the saw blade relative to the plane of the latter.

4,920,846

GUIDE BLOCKS FOR BANDSAW BLADE

Mark A. Duginske, 1011 North First Avenue, Wausau, Wis. 54401, and Barry C. Cutter, 1011 South Virginia Street, Hopkinsville, Ky. 42240

Filed Sep. 7, 1988, Ser. No. 241,299
Int. Cl.[5] B26D *1/54*
U.S. Cl. 83—820 **3 Claims**



1. In a bandsaw including a saw blade in the form of a continuous metal band that is trained about a pair of spaced wheels and rotatably driven past a worktable, and further including guide blocks for restricting side-to-side movement of the saw blade during cutting of a workpiece supported on the worktable,

the improvement wherein:

the guide blocks are made of a fiber reinforced phenolic resin material impregnated with graphite, and the bandsaw includes at least one pair of guide blocks arranged with one guide block positioned along one side of the blade and the other positioned along the opposite side of the blade.

4,920,847

TUNING PIN FOR PIANOS

Harold A. Conklin, Jr., P.O. Box 1915, Dunedin, Fla. 34697

Filed Mar. 20, 1989, Ser. No. 325,87_
Int. Cl.[5] G10C *3/10*
U.S. Cl. 84—202 **16 Claims**



1. In a piano having a string plate, a tuning pin for mounting on the string plate, the string plate being of any type providing a panel for tuning pins, the panel being of substantially uniform thickness and having a substantially flat upper surface and a lower surface substantially parallel with the upper surface, the panel having a mounting hole for the tuning pin, the mounting hole passing through the panel at an angle of substantially 90 degrees to the upper surface, the tuning pin comprising:

(a) a core, said core being generally cylindrical and having a central axis and having a length equal to several times its diameter, the core comprising a threaded portion and an unthreaded portion, the threaded portion comprising external screw threads beginning near one end of the core and ending intermediate the length of the core, the unthreaded portion comprising means to attach a piano string and means to engage a tuning tool;

(b) a lubricated friction interface, said lubricated friction interface comprising a movable friction element coaxial with the core, a stationary friction element in intimate proximity with the movable friction element, and a film of lubricant material situated between said movable and said stationary friction elements, the movable friction element being arranged to rotate in synchronism with the core during tuning, the stationary friction element being arranged to remain fixed with respect to the panel during tuning, the movable and the stationary friction elements being adjustably compressed together when the tuning pin is operational, the lubricant material being characterized by greases and dry film lubricants;

(c) a collar, said collar being coaxial with the core and being positioned on the core and being secured to the core so as to function as an integral part of the core during tuning, the collar having a bearing surface, the bearing surface of the collar being substantially flat and being generally annular and being larger diametrically than the core and facing toward the threaded portion of the core and extending in a direction at substantially 90 degrees to the central axis of the core, the bearing surface of the collar being a movable friction element;

(d) a lock nut, said locknut having internal threads complementary to the external threads of the core, the locknut having a bearing surface, the bearing surface of the locknut being substantially flat and being generally annular and being larger diametrally than the core and extending in a direction at substantially 90 degrees to the central axis of the core and facing toward the collar;

(e) a compliance element, said compliance element being assembled coaxially onto the core and being situated between the collar and the locknut;

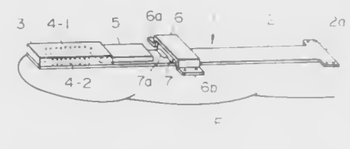
(f) so that the elements of the tuning pin may be assembled and mounted onto the panel, the mounting procedure comprising introducing the threaded portion of the core into the mounting hole, engaging the threads of the locknut with the threads of the core, and adjustably tightening the locknut.

4,920,848

MUSICAL WEAR

Hideo Suzuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 26, 1988, Ser. No. 161,176
Claims priority, application Japan, Feb. 27, 1987, 62-44234; Feb. 27, 1987, 62-44233
Int. Cl.[5] G10H *1/06, 1/18*
U.S. Cl. 84—600 **6 Claims**



1. A musical tone generating apparatus comprising:

(a) a plurality of detectors each mounted at a player's finger for detecting bending and stretching actions of the player's finger;

(b) musical tone data generating means for converting detected results of said detectors into musical tone data representative of a specific musical tone based on a combination of the bent or stretched fingers such that a player can designate a number of musical tones greater than the number of detectors; and

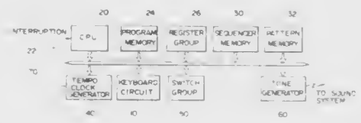
(c) musical tone signal generating means for converting said musical tone data into a musical tone signal, whereby a musical tone corresponding to said musical tone signal is generated.

4,920,849

AUTOMATIC PERFORMANCE APPARATUS FOR AN ELECTRONIC MUSICAL INSTRUMENT

Kotaro Mizuno, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 5, 1989, Ser. No. 293,938
Claims priority, application Japan, Jan. 6, 1988, 63-271
Int. Cl.[5] G10H *1/38, 7/00*
U.S. Cl. 84—613 **3 Claims**



1. An automatic performance apparatus for an electronic musical instrument, comprising:

input means for designating tone information including pitch information;

mode selection means for selecting one of a record mode and a play mode, wherein said modes represent controlling states;

chord detection means for, when the mode selection means has selected a record mode, discriminating based on pitch information outputted from said input means whether or not a chord is established, and for, when a cord is established, generating chord information;

storage means for storing chord information and tone information;

writing means for, when a chord is established in a record mode, writing chord information in said storage means, and for, when a chord is not established in a record mode, writing tone information in said storage means; and

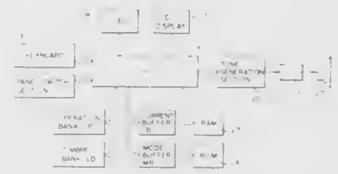
reading means for, in a play mode, reading out the information written in said storage means so as to control generation of tones.

4,920,850

ELECTRONIC MUSICAL INSTRUMENT WITH DATA MODIFICATION MEANS FOR MODIFYING OUTPUT SOUND

Naoaki Matsumoto, and Kenichi Tsutsumi, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 45,128, Apr. 30, 1987, abandoned. This application Jul. 31, 1989, Ser. No. 388,751
Claims priority, application Japan, May 8, 1986, 61-103881
Int. Cl.[5] G10H *1/02, 1/06, 7/00*
U.S. Cl. 84—622 **8 Claims**



1. An electronic musical instrument which is operable in a plurality of modes including an operation mode, comprising:

operation data storage means for storing a plurality of operation data items each including a combination of different timbre data and/or effect data;

operation mode selecting means for selecting an operation mode of the instrument for generating a musical tone by using one of said operation data items stored in said operation data storage means;

canceling means for canceling said operation mode selected by said operation mode selecting means and for selecting a mode other than said selected operation mode;

operator means operable by an operator of the instrument for designating one of said plurality of operation data items stored in said operation data storage means when the instrument is in said operation mode and for designating one of the timbre data and effect data allotted to said operator means when the instrument is in a mode other than said operation mode;

operation data read-out means for reading out from said operation data storage means the operation data item designated by said operator means when the instrument is in said operation mode;

tone generating means for generating a musical tone by using the operation data item read out by said operation data read-out means;

holding means for holding the operation data item read out while the instrument was in said operation mode when the mode other than said operation mode is selected by said

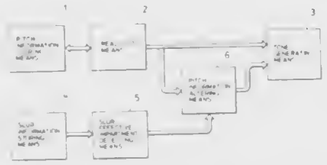
canceling means when the instrument is in said operation mode;
updating means for updating the operation data item held in said holding means by changing timbre data and/or effect data included in the operation data item held in said holding means to designated timbre data or effect data by said operation means when the instrument is in the mode other than said operation mode; and
writing means for writing the updated operation data item in said holding means into said operation data storage means.

4,920,851

AUTOMATIC MUSICAL TONE GENERATING APPARATUS FOR GENERATING MUSICAL TONES WITH SLUR EFFECT

Yasunao Abe, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 20, 1988, Ser. No. 196,974
Claims priority, application Japan, May 22, 1987, 62-126750
Int. Cl.[5] G10H *7/00, 1/02, 1/06*
U.S. Cl. 84—626 **7 Claims**



1. An automatic musical tone generating apparatus for generating musical tones with slur effect comprising:
a pitch information storing means for storing pitch information for each of a plural number of musical tones to be automatically produced;
a read-out means for successively reading out at a predetermined tempo said pitch information stored in said pitch information storing means;
a tone generating means for receiving the pitch information read out by said read-out means and generating musical tones having pitches corresponding to said pitch information;
a slur information storing means for storing slur information indicating whether or not the slur effect is to be imparted to the musical tones to be produced in correspondence to the plural sets of pitch information stored in said pitch information storing means;
a slur effect impartment detecting means for detecting, on the basis of the slur information stored in said slur effect storing means whether or not the slur effect is to be imparted to the musical tones corresponding to the pitch information read out by said read-out means; and
a pitch information altering means for altering, when the slur effect impartment is detected by said slur effect impartment detecting means, the pitch information read out by said read-out means to pitch information gradually approaching with time lapse to the pitch of the musical tone to be produced next and outputs the latter pitch information to said tone generating means.

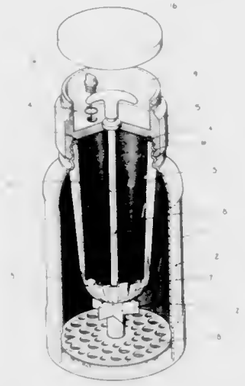
4,920,852

PORTABLE, SELF-CONTAINED EXPLOSIVES SYSTEM

Kenneth A. Miller, West Jordan, Utah, assignor to Ireco Incorporated, Salt Lake City, Utah

Continuation-in-part of Ser. No. 192,868, May 10, 1988, abandoned. This application Apr. 7, 1989, Ser. No. 334,807
Int. Cl.[5] C06B *21/00;* **F42B** *3/00*
U.S. Cl. 86—1.1 **23 Claims**

10. A portable, self-contained system for manufacturing a fluid explosive comprising ingredients of the explosive and further comprising:
(a) a first container holding an ingredient comprising an inorganic oxidizer salt solution,
(b) a second container disposed within the first container and holding an ingredient comprising a fuel component, and
(c) a means for rupturing the second container, and
(d) a mixing element adapted to rupture the second container and to mix by mechanical agitation the ingredient(s) of the second container with the ingredient(s) of the first container to form the explosive.



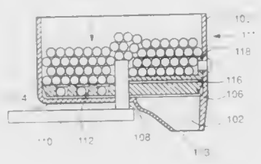
15. A portable, self-contained unit for transporting and mixing ingredients to form a fluid explosive comprising:
(a) a container for holding the ingredients which comprise an inorganic oxidizer salt solution and a fuel component,
(b) a rupturable membrane having opposite sides and disposed within the container so as to separate the oxidizer salt solution on one side of the membrane from the fuel component on the other side of the membrane,
(c) a means for rupturing the membrane, and
(d) a mixing element for mixing together by mechanical agitation all of the ingredients of the container to form an explosive.

4,920,853

SHOT MEASURE FOR SHELL RELOADER ACCESSORY

Joel M. Odom, 6830 59th St., Tulsa, Okla. 74145

Continuation-in-part of Ser. No. 337,257, Apr. 13, 1989. This application Jul. 3, 1989, Ser. No. 374,991
Int. Cl.[5] F42B *33/02*
U.S. Cl. 86—33 **3 Claims**



1. An accessory for loading shotgun shell hulls comprising; a shot container having a bottom with a shot drop hole therein; a cover plate fixed to an inner wall of the shot container and covering a portion of the shot container's cross-sectional area; a charge wheel rotatably supported between the bottom of the shot container and the cover plate and having a plurality of shot receiving holes extending therethrough; and a means to rotate said charge wheel from a position wherein said shot receiving holes are exposed from under said cover plate to a position wherein said shot receiving holes are covered by said cover plate and over said drop hole in the bottom of said shot container.

4,920,854

FLUIDIC NOISE SUPPRESSOR AND STABILIZER

Michael V. Scanlon, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 27, 1989, Ser. No. 374,126
Int. Cl.[5] F41F *17/12*
U.S. Cl. 89—14.4 **9 Claims**



1. A noise suppressor for a firearm having a breech end, a muzzle end, and a bore comprising:
a plurality of fluidic oscillator laminates each comprising an annulus disk having a first surface, as second surface opposed to said first surface, a center, and an aperture having an axis, said aperture located at the center of said annulus disk, said first surface being smooth and said second surface having a plurality of fluidic pressure controlled oscillators disposed thereon;
said aperture having a diameter slightly greater than the diameter of the bore of said firearm;
said plurality of pressure controlled oscillators each having a supply nozzle opening upon said aperture of said annulus disk and at least one output channel open at the circumference of said annulus disk;
said plurality of fluidic oscillator laminates fixedly attached to one another forming a laminate stack such that said first surface of each said fluidic oscillator laminate is attached to said second surface of an adjacent said fluidic oscillator laminate;
said laminate stack fixedly attached to the muzzle end of said firearm such that the axis of said aperture of each said fluidic oscillator laminate is coaxially aligned with the bore of said firearm.

4,920,855

BOLT ASSEMBLY FOR SELF-LOADING GUN

Frank E. Waters, Boxfield, Kimpton Avenue, Brentwood, Essex, England

Filed Jul. 27, 1988, Ser. No. 224,627
Claims priority, application United Kingdom, Jul. 27, 1987, 8717722
Int. Cl.[5] F41D *3/06*
U.S. Cl. 89—172 **4 Claims**



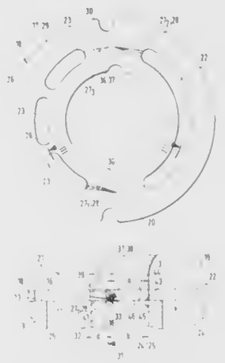
1. A bolt assembly for a self-loading gun, the bolt assembly comprising:
a rotating bolt having a head and mounted in a bolt carrier for limited rotational movement relative thereto between a first extreme angular position in which the bolt is, in use, locked in engagement with a locking structure fast with the barrel of the gun, and a second extreme angular position in which the bolt is, in use, free to move axially relative to the barrel;
a cam slot in said bolt carrier;
a cam pin secured to the bolt and located in the cam slot whereby relative axial movement of the bolt and bolt carrier causes relative rotational movement thereof; and
means on the bolt carrier for retaining the cam pin in the zone of the cam slot corresponding to the second extreme angular position of the bolt at all times when the bolt is clear of the locking structure, said retaining means comprising a lever pivotally mounted on the bolt and spring biased into a normal position in which an end face of the lever engages the cam pin to prevent the cam pin from leaving the zone of the cam slot corresponding to the second extreme angular position of the bolt, and means for pivoting the lever out of said normal position to disengage said end face from the cam pin after the head of the bolt is received within an extension of said barrel.

4,920,856

AXIAL PISTON MACHINE OF THE SWASHPLATE OR BENT AXIS TYPE HAVING SLOT CONTROL AND PRESSURE BALANCING PASSAGES

Heinz Berthold, Horb; Josef Beck, Haigerloch, and Manfred Lotter, Neu-Ulm, all of Fed. Rep. of Germany, assignors to Brueninghaus Hydraulik GmbH, Horb, Fed. Rep. of Germany

Filed Jul. 19, 1988, Ser. No. 221,118
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725361
Int. Cl.[5] F04B *1/20*
U.S. Cl. 91—6.5 **13 Claims**



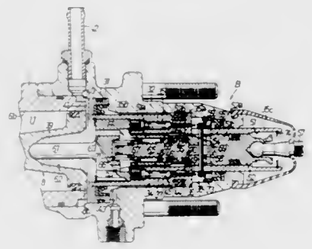
1. An axial piston machine of the swashplate or bent axis type having slot control and a pressure balancing passage at the inlet end of the high pressure (HP) control slot, characterised in that at the inlet end of the HP-control slot an interference jet passage starting from the high pressure is provided whose opening is arranged so that the streams of liquid issuing from the pressure balancing passage and the outlet of the interference jet passage intersect.

4,920,857

HYDRAULIC PRESSURE BOOSTER

Makoto Horiuchi, Ueda; Yoshitaka Miyakawa, and Kazuya Sakurai, both of Wako, all of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Ueda and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jun. 15, 1988, Ser. No. 206,783
Claims priority, application Japan, Jun. 16, 1987, 62-149454; Jun. 16, 1987, 62-149455; Jun. 16, 1987, 62-149457
Int. Cl.[5] F15B 9/10
U.S. Cl. 91—373 6 Claims



1. A hydraulic pressure booster comprising: a booster piston slidably fitted in a booster cylinder coupled to a rear end of a master cylinder, the piston having at a leading end thereof an output rod abutting against a rear end of a master piston slidably fitted in the master cylinder; an inlet valve interposed between an output hydraulic oil chamber defined to face a back surface of the booster piston and an input hydraulic oil chamber leading to a hydraulic pressure supply source, the inlet valve being opened in response to an advancing movement, relative to the booster piston, of a valve piston connected to an operating member and slidably fitted in the booster piston; an outlet valve interposed between said output hydraulic oil chamber and an outlet chamber leading to an oil tank, said outlet valve being adapted to be closed in response to the advancing movement of said valve piston relative to the booster piston; and a reaction mechanism provided between the valve piston and the output rod for transmitting an operational reaction force of the output rod to the valve piston, wherein said reaction mechanism comprises a reaction piston slidably fitted in the valve piston in such a manner that a front end thereof is capable of abutting against either of the output rod and the booster piston integral with the output rod, and a hydraulic pressure of the output hydraulic oil chamber acting on a back surface of the reaction piston, and an operation-starting set spring interposed between the valve piston and the reaction piston for biasing the reaction piston rearwardly relative to the valve piston.

4,920,858

NUMERICAL CONTROL APPARATUS FOR A MECHANICAL HYDRAULIC SERVO VALVE

Fu-Long Chang, No. 29, Lane 596, Min Sheng S. Rd., Chiayi City, Taiwan

Filed Dec. 30, 1988, Ser. No. 292,096
Int. Cl.[5] F15B 9/10
U.S. Cl. 91—380 9 Claims

5. A servo system comprising:

a housing;

a rotary driving source having a rotating shaft, said drive shaft including a first bearing, and an annular abutment element sleeved rotatably on said drive shaft by said first bearing and having a keyway formed in said abutment element, and wherein said housing includes a key fixed therein and engaged with said keyway for preventing relative rotation between said abutment element and said housing while permitting relative movement between said abutment element and said housing;

an active gear integral with said rotating shaft of said rotary driving source;

a tubular drive shaft journaled in said housing and movable axially relative to said housing;

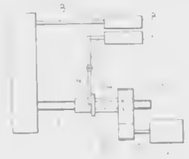
a reactive gear integral with said drive shaft and meshing with said active gear so that said rotary driving source can rotate said drive shaft;

a nut fixed in said drive shaft;

a screw extending through said drive shaft and engaged threadably with said nut;

a driven body secured to an end of said screw so that it can move with said screw, both said driven body and said screw being unable to rotate;

a fork mounted pivotally in said housing at an intermediate portion thereof and having a first end;



a biasing means for biasing said first end of said fork to rest against said drive shaft in a manner which enables said first end of said fork to be rotated by said drive shaft when said drive shaft moves;

a mechanical hydraulic servo valve operatively connected to the other end of said fork;

a hydraulic driving unit interconnecting said servo valve and said driven body for hydraulically moving said driven body when said servo valve is activated by said fork;

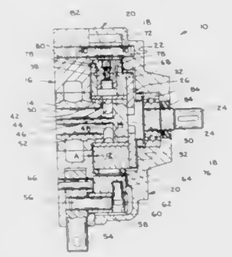
whereby, when said drive shaft is rotated by said rotary driving source to effect a rectilinear axial movement in a certain direction, said fork is rotated to activate said servo valve so that said driven body, said screw and said drive shaft are moved in the opposite direction by said hydraulic driving unit.

4,920,859

RADIAL PISTON PUMP AND MOTOR

Steven T. Smart; William M. Puls, and David L. Hansen, all of Hutchinson, Kans., assignors to Eaton Corporaton, Cleveland, Ohio

Filed Aug. 1, 1986, Ser. No. 891,892
Int. Cl.[5] F04B 19/02
U.S. Cl. 91—497 10 Claims



1. In a hydraulic radial piston power transmitting assembly having:

a housing, a back plate connected to the housing having a

fixed pintle attached thereto with intake and discharge ports therein;

a cylinder block rotatably mounted on the pintle having a plurality of radially spaced cylinder bores therein connected to ports on the inside diameter of the cylinder block for porting fluid to and from the ports in the pintle, a rotating surface on the side of the cylinder block in contact with the back plate, each bore containing a reciprocating piston with a slipper shoe connected thereto;

a cam ring surrounding the cylinder block in a non-concentric position for stroking the pistons and slipper shoes in and out of the cylinder block;

a drive shaft with a thrust bearing thereon passing through the housing; and

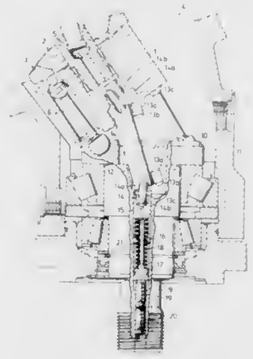
a coupling means connecting the drive shaft to the cylinder block positioned between the cylinder block and the drive shaft limiting the lateral movement of the cylinder block away from the back plate whereby the leakage oil flow between the pintle and inside diameter of the cylinder block creates a hydraulic force between the back plate and the cylinder block urging the cylinder block away from the back plate into contact with the coupling means for correct positioning of the cylinder block ports with the pintle ports.

4,920,860

DEVICE FOR BIASING A CYLINDER DRUM OF A VARIABLE-DISPLACEMENT AXIAL PISTON MACHINE AGAINST AN ASSOCIATED SLIDE VALVE MEMBER

Filip Alm, Surte; Sven Gulbrandsen, Trollhättan; Bo Larsson, Vändersborg, and Sune Ekdahl, Trollhättan, all of Sweden, assignors to Volvo Hydraulik AB, Trollhattan, Sweden

Filed Sep. 14, 1988, Ser. No. 244,181
Claims priority, application Sweden, Sep. 18, 1987, 8703620
Int. Cl.[5] F04B 1/20
U.S. Cl. 91—504 3 Claims



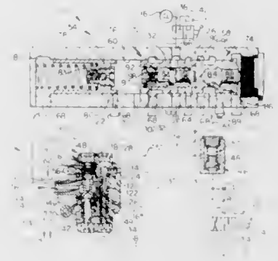
1. A biasing device for biasing a cylinder drum in a variable-displacement axial piston machine against an associated slide valve surface, said axial piston machine having a rotatable cylinder drum disposed in contact with a valve segment adjacent one end of said machine, a rotatable drive disk located between said cylinder drum and the other end of said machine, a drive shaft extending from said drive disk in coaxial relation thereto at said other end of said machine, an elongated bore extending through said drive disk and drive shaft in coaxial relation thereto, the axes of rotation of said cylinder drum and drive disk being at an angle to one another, a synchronizing shaft located between said cylinder drum and said drive disk for synchronizing the rotation of said drum and disk, each end of said synchronizing shaft having a universal joint of the tripoid type for angularly rigid but pivotable connection with said cylinder drum and said drive disk respectively, said synchronizing shaft being supported at its opposite ends by a pair of link pins which are disposed at angles to one another, at angles to said synchronizing shaft, and at angles to the axes of rotation of said cylinder drum and drive disk, one of said link pins extending between the end of said synchronizing shaft closest to said cylinder drum and a first bearing cup in said cylinder drum, and the other of said link pins extending between the other end of said synchronizing shaft and a second bearing cup that is provided in a support member which is axially movable in said bore, spring means located in said bore between said support member and an abutment means that is axially movable in said bore in spaced relation to said support member, and adjustment means in said drive shaft for varying the position of said abutment means in said bore to vary the force that is exerted by said spring means on said support member, the only biasing force other than fluid pressure forces exerted on said cylinder drum to keep said cylinder drum in contact with said valve segment being an adjustable biasing force that is applied to said cylinder drum from said spring means and abutment means via said support member, said synchronizing shaft and said link pins.

4,920,861

LOAD PISTON RESET CONTROL MECHANISM

Larry W. Lorimor, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

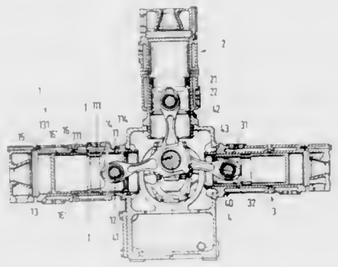
Filed Mar. 21, 1989, Ser. No. 326,764
Int. Cl.[5] F16D 25/10
U.S. Cl. 91—446 22 Claims



1. A load piston reset control mechanism adapted for use in a fluid system having a source of pressurized fluid, a reservoir, first and second force transmitting mechanism adapted to receive fluid from the source, first and second selector valves connected between the source and the respective force transmitting mechanisms and each being movable to selectively direct fluid from the source to fill and pressurize each of the respective force transmitting mechanisms and to vent each of the force transmitting mechanisms to the reservoir, and a modulating pressure relief valve having a valving element operative to control the fluid flow to the force transmitting mechanisms and a load piston movable between a substantially unloaded position and a loaded position in response to a fluid pressure signal controllably received from one of the force transmitting mechanisms, the modulating relief valve being adapted to control the rate of pressure rise of the fluid directed to the force transmitting mechanisms, comprising:

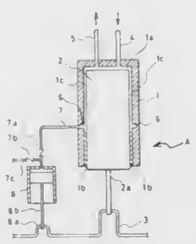
valve means for controllably connecting said fluid pressure signal received from the one force transmitting mechanism with said reservoir in response to the pressure of the fluid directed to the one force transmitting mechanism being below a predetermined value.

4,920,862
TRUNK PISTON COMPRESSOR
Eduard Muller, Ettenhausen, Switzerland, assignor to Maschinenfabrik Sulzer-Burckhardt, Basel, Switzerland
Filed Sep. 22, 1988, Ser. No. 247,945
Claims priority, application Switzerland, Sep. 25, 1987, 03730/87
Int. Cl.[5] F01B *31/10*; F16J *15/18*
U.S. Cl. 92—158 14 Claims



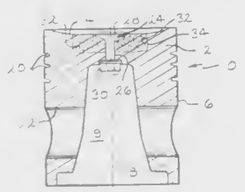
1. A trunk piston compressor comprising
at least one work cylinder;
a work piston reciprocally mounted without contact in said work cylinder for compressing of a medium therein;
a guide cylinder coaxial of said work cylinder;
a guide piston reciprocally mounted in said guide cylinder and connected with said work piston;
sealing means between said guide piston and said guide cylinder within a half-portion of said guide piston proximate to said work piston for blocking a flow of fluid thereby;
means for metering lubricant to said guide piston, said metering means being within second half-portion of said guide piston remote from said work piston; and
a leakage chamber between said cylinders for discharging leakage lubricant therefrom.

4,920,863
PLUNGER PUMP
Jun Taga, Kawasaki, Japan, assignor to Mitsui & Co., Ltd., Tokyo, Japan
PCT No. PCT/JP87/00674, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO88/02443, PCT Pub. Date Apr. 7, 1988
PCT Filed Sep. 11, 1987, Ser. No. 167,476
Claims priority, application Japan, Sep. 24, 1986, 61-225716; Aug. 26, 1987, 62-211628
Int. Cl.[5] F04B *21/00*
U.S. Cl. 92—86 20 Claims



1. A plunger pump comprising:
a cylinder;
a plunger reciprocating within said cylinder;
a chamber formed upon a top of said plunger; means, communicating with the chamber, for providing a first fluid to said chamber for pumping by the plunger;
means, communicating with the chamber, for discharging the first fluid pumped by the plunger;
slidable means, fixed upon an inner wall of said cylinder in the proximity of an open end thereof, for effecting sliding between an outer wall of the plunger and an inner wall of the cylinder;
means for providing an intercepting fluid stream incorporating the first fluid and any contaminants occurring from said slidable means from the cylinder;
manifold means formed about the inner wall of the cylinder above said slidable means for receiving the intercepting fluid stream; and
means for discharging said intercepting fluid stream outside said plunger pump whereby any contaminants occurring from said slidable means are prevented from penetrating into said chamber and are discharged outside said plunger pump together with said intercepting fluid stream.

4,920,864
REINFORCED PISTON
Thomas J. Skingle, Parma, and Milton W. Toaz, Bedford, both of Ohio, assignors to JPI Transportation Products, Inc., Ann Arbor, Mich.
Filed Apr. 14, 1989, Ser. No. 338,196
Int. Cl.[5] F02F *3/06*; F16J *1/04*
U.S. Cl. 92—213 10 Claims



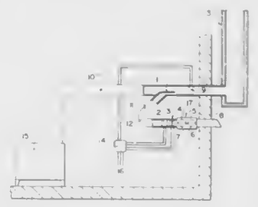
1. A lightweight metal piston having a reinforced upper surface to improve the ability of the piston to withstand thermal cracking and metal creep, said piston comprising:
a cylindrical body having a longitudinal axis, a crown substantially normal to said axis having an upper surface, and a cylindrical skirt extending downwardly from said crown forming a hollow interior cavity;
a heat plug disposed within said crown, said heat plug having a circular top surface of a predetermined diameter covering a portion of said crown upper surface to provide an erosion resistant top surface, a stem having a diameter less than said predetermined diameter extending through said crown and means operatively associated with said stem and said crown for securing said heat plug to said crown, said heat plug being of a material different than said piston lightweight metal and having different material properties; and
means in said crown adjacent said crown upper surface around said heat plug for altering the material properties to reduce the difference in material properties between said heat plug and said piston metal and for reinforcing said crown, said means including reinforcing fibers fully embedded in the metal of a portion of said crown surrounding said heat plug.

4,920,865
DEVICE FOR EXTRACTING AIR FROM AN AUTOMOBILE INTERIOR
Renato Pasquali, Garbagnate; Luigi Verga, Vertemate Con Minoprio, and Franco Mendicino, Arese, all of Italy, assignors to Alfa Lancia Industriale S.p.A., Arese, Italy
Filed Aug. 22, 1988, Ser. No. 234,746
Claims priority, application Italy, Sep. 4, 1987, 22266/87[U]
Int. Cl.[5] B60H *1/26*
U.S. Cl. 98—2.18 5 Claims



1. A device for extracting to atmosphere the air from the interior of an automobile passenger compartment, said device comprising at least one air outlet aperture (**12**) being provided in a wall (**11**) of a luggage compartment (**10**) of the automobile, and at least one non-return valve (**13**) engaged with said aperture (**12**), said valve (**13**) having a framework (**16**) which comprises a grid (**19**) and a casing (**18**), said grid (**19**) having a first side facing the interior of the luggage compartment and a second side opposing said first side and a diaphragm (**20**) which is rotatably supported in the casing of said framework and which, when in the rest state, adheres to said second side of said grid (**19**), said framework (**18**) and grid (**19**) being disposed mainly within the interior of the luggage compartment (**10**), said casing (**18**) comprising an inner rim (**23**), an inner flange (**25**) and an outer rim (**27**), said grid being supported mainly by said inner rim (**23**) and flange (**25**), said diaphragm (**20**) having a plurality of lugs (**24**), the lugs (**24**) being arranged to overlap the inner rim (**23**) of said casing (**18**), the lugs (**24**) being fixed to the inner rim (**23**) by press studs (**33**) each which are pressed through an opening in the lugs (**24**) and an opening in the inner rim (**23**) whereby said diaphragm (**20**) has a portion thereof extending through said grid (**19**).

4,920,866
ANTI BACK DRAFT DEVICE FOR FLUE
Michael Hoban, P.O. Box 188, Pinawa, Manitoba, Canada (R0E 1L0)
Filed Apr. 5, 1989, Ser. No. 333,197
Claims priority, application Canada, May 12, 1988, 566591
Int. Cl.[5] F23L *17/16*
U.S. Cl. 98—45 15 Claims



1. A combustion and flue device comprising a combustion device mounted within the interior of a building, a flue leading from the combustion device and including at least a part thereof which rises to an outlet communicating with the exterior of the building at a height above the combustion device and arranged such that heat in the combustion gases generated by the combustion device is, at least part of the time, sufficient to generate a forward flow of the gases in the flue from the combustion device to the outlet, a nozzle in the flue arranged to inject gases into the flue in a forward direction to tend to induce flow of the gases in the flue in the forward direction, a duct communicating from an inlet means to the nozzle, fan means in the duct for generating a flow of gases from the inlet means to the nozzle, heating means in a duct for heating the gas as it travels from the inlet means to the nozzle, and means responsive to a back draft condition in the flue to actuate said fan means and said heating means.

4,920,867
CHIMNEY SCREEN
Danforth O. Joly, 46 Paddocks Path, Dennis, Mass. 02638
Filed Sep. 19, 1988, Ser. No. 246,264
Int. Cl.[5] F23L *17/12*
U.S. Cl. 98—67 6 Claims

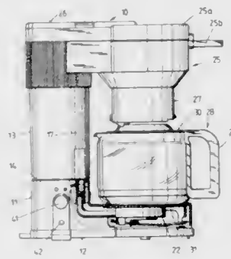


1. A chimney screen device of low profile for covering the open end of a chimney to prevent access into the chimney by squirrels, birds and the like, comprising:
a rigid frame having a first, vertical portion sized and constructed to be disposed about an exposed end of a chimney flue liner, and having a second, horizontal portion sized and constructed to be disposed in engagement upon an exposed end of a chimney flue liner and defining an opening of horizontal extent adapted to correspond with the open end of the chimney flue,
a plane mesh of metallic material attached to said frame about said opening and spanning said opening, said mesh defining a plurality of apertures of grid size selected to prevent access of squirrels, birds and the like therethrough, and said mesh having open area of at least 90% for passage of hot gases from the chimney flue therethrough without significant detrimental effect upon chimney draft, and
means for engaging upon outer surfaces of the flue liner for fixing said frame upon and about the end of the chimney flue liner, said mesh being horizontally disposed to span the open end of the chimney flue liner in close proximity with the end of the chimney flue liner.

4,920,868
ELECTRICALLY OPERATED MACHINE FOR MAKING HOT BEVERAGES
Alfred Gehrmann, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Aug. 31, 1988, Ser. No. 239,139
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 8712337[U]
Int. Cl.[5] A47J *31/54*
U.S. Cl. 99—279 20 Claims

1. Machine for making hot beverages by contacting a heated

liquid with a flavoring agent, comprising a source of liquid having an outlet; a receptacle for flavoring agent, said receptacle having an inlet; and means for heating the liquid including



a one-piece conduit having an inlet sealingly connected to and communicating directly with the outlet of said source and an outlet sealingly connected to and communicating directly with the inlet of said receptacle.

4,920,869

HOUSEHOLD COFFEEMAKER

Francis, P. J. Landais, Alencon, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Filed Jan. 9, 1989, Ser. No. 294,811
Claims priority, application France, Jan. 14, 1988, 88 00384
Int. Cl.[5] A47J *31/00*
U.S. Cl. 99—283 5 Claims



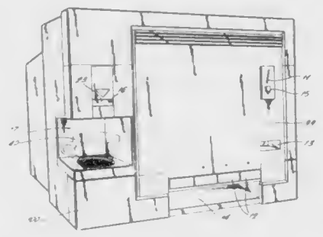
1. Household coffeemaker comprising, in a casing (**10**), a cold water reservoir (**12**) as well as a water heater (**14**) fed by said reservoir and itself feeding through a hot water tube (**16**) to a dripping head (**18**) adapted to drip on to a filter (**20-21**) which contains coffee powder (**22**) and which is located, in operative position, below said head, and above a collecting receptacle (**24**) for the infusion, said head (**18**) having a principal opening (**30**) adapted to drip on the central region of the filter (**20-21**) when this filter is disposed in operative position, as well as a series of holes (**34**) distributed about said central opening (**30**) and adapted to drip on the peripheral region of said filter, wherein the head (**18**) is provided with a valve (**38**) which is controlled by a timing device (**40**) and which can occupy, either a position closing the principal opening (**30**) in which the flow of hot water takes place only through the series of holes (**34**) and in which it is maintained for a predetermined so-called "steeping" period set by the timing device (**40**), or an open position, in which the flow of hot water then takes place through the principal opening and in which it is maintained through all of a so-called "infusion" period which follows said "steeping" period.

4,920,870

METHOD FOR PREPARING BEVERAGES AND BEVERAGE PREPARING MACHINES

Alex T. Newman; Andrew C. Bentley; Christine A. King, all of Banbury; Alistair J. MacMahon, Northants; Robert W. Tansley, and Andrew R. Gibbs, both of Warwickshire, all of United Kingdom, assignors to General Foods Limited, Banbury, England

Filed Mar. 15, 1989, Ser. No. 324,080
Claims priority, application United Kingdom, Mar. 21, 1988, 8806668
Int. Cl.[5] A47J *31/32, 31/36*
U.S. Cl. 99—289 R 10 Claims



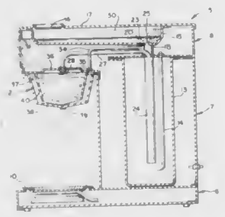
1. A machine for preparing a beverage by employing a package (**10**) having a compartment (**111**) containing at least one beverage ingredient, comprising means (**35**) for locating the package at a brewing station, and means (**48**) for introducing an aqueous medium into the package to enable the aqueous medium to commingle with the beverage ingredient in the compartment to form a beverage, the beverage so formed being collected through an outlet (**38**) formed in the package, characterized in that the compartment of the package is sealed by a covering material (**119**) which determines one dimension of at least one opening (**115**) acting to filter the beverage passing out of the compartment to the outlet of the package, and in that means (**33, 41**) are provided for clamping the package at the brewing station prior to the introduction of the aqueous medium, which clamping means maintains said one dimension during the subsequent formation and collection of the beverage.

4,920,871

BEVERAGE MAKING APPLIANCE

James H. Anson, Auburn; James L. Kates, Rochester; Alan W. Brewer, Divernon, and Brent R. Friedrich, Springfield, all of Ill., assignors to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Jun. 1, 1989, Ser. No. 360,134
Int. Cl.[5] A47J *31/00*
U.S. Cl. 99—295 7 Claims



1. In beverage brewing apparatus comprising, in combination, a cold water basin having a first drain opening and a fill opening through which a batch of cold water may be poured or dumped, a hot water tank under said basin, means for heating water in said tank, a cold water tube having its upper inlet end connected to said first drain opening and having its lower outlet end disposed in the lower portion of said hot water tank whereby cold water in said basin drains by gravity into the lower portion of said hot water tank, a hot water spray head, a siphon tube interconnecting said spray head with a hot water outlet in or adjacent the top of said hot water tank whereby hot water displaced by cold water entering the lower portion of said hot water tank flows through said siphon tube to said spray head through which it discharges, and means for supporting a brewing funnel beneath said spray head, the improvement comprising:

a brewing funnel on said brewing funnel support means comprising a hot water receiving compartment disposed beneath said spray head, a cold water receiving compartment exterior to said hot water receiving compartment, and a funnel bottom outlet opening in communication with both said compartments;

a tubular cold water inlet fitting mounted in said basin, and having an inlet opening located above said first drain opening and an outlet opening communicating with said upper inlet end of said cold water tube whereby said tubular cold water inlet fitting forms an upper extension of said cold water tube; and,

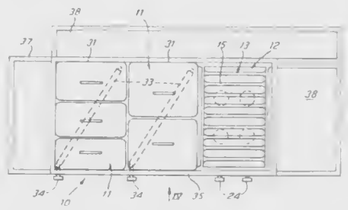
said basin having a second drain opening and a cold water drain tube interconnecting said second drain opening with said cold water receiving compartment of said brewing funnel, whereby when said basin contains cold water at a level above said inlet opening in said cold water inlet tube, cold water drains simultaneously into said hot water tank and said cold water receiving compartment until said level drops below said inlet opening in said cold water inlet tube after which the remaining water in said basins drains through said second drain opening.

4,920,872

APPARATUS FOR COOKING CORN ON THE COB

Peter M. J. Henry, 32 Havil Street, London SE 5 7RS, England

Filed Aug. 21, 1987, Ser. No. 88,167
Claims priority, application United Kingdom, Aug. 22, 1986, 8620415
Int. Cl.[5] A47J *37/04*
U.S. Cl. 99—339 5 Claims



1. Apparatus for use in cooking corn on the cob, comprising a parboiling assembly including:

a wall of generally rectangular plan outline having upper and lower regions,

a pan of rectangular plan outline nested within said upper region of the wall, and

a first gas burner for heating said pan disposed below said pan within said lower region on the wall, the lower region of the wall being apertures for ventilation of the gas burner and the burner comprising an elongate pipe extending generally diagonally of the base of the pan; and further comprising a rotating assembly including:

a gridiron composed of substantially parallel elongate cylindrical elements, said elements being spaced apart to support a said corn cob between the or each pair of neighbouring elements,

means mounting said elements for rotation,

an electric motor and drive transmission therefrom to rotate all the said cylindrical elements in the same one direction and hence rotate the corn cob or cobs on said elements in the opposite direction, and

heating means comprising at least one second gas burner, a grill mounted above said second gas burner(s), and a bed of refractory material supported by said grill beneath the gridiron.

4,920,873

STACKABLE CHAFER ASSEMBLY

Kenneth V. Stevens, Brooklyn, N.Y., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 81,062, Aug. 3, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,935
Int. Cl.[5] A47J *27/00*
U.S. Cl. 99—339 5 Claims



1. A modular chafer assembly which comprises:

a support frame including a pair of end members spaced apart from each other in a longitudinal direction, said end members each including an upper portion and a pair of depending legs which are inclined outwardly in a transverse direction normal to the longitudinal direction such that upper ends of said legs disposed in a vertical direction toward said upper portion of the respective end member are spaced apart transversely by a first width and lower ends thereof are spaced apart transversely by a greater, second width, said support frame also including a lower frame support means connecting said end members in the longitudinal direction for positioning said end members in spaced relation and defining a lower part of a central frame opening therebetween, and upper frame support means connecting said upper portions of said end members in the longitudinal direction and defining an upper part of the central frame opening therebetween, said central frame opening being defined by said upper and lower frame supports in the vertical direction and by said end members in the longitudinal direction;

a water pan having a first peripheral flange and a first depth extending downwardly in the vertical direction from said first peripheral flange, said water pan being dimensioned for housing within said upper part of the central frame opening defined in said support frame, said first peripheral flange being supported on said upper frame support means with said first depth of said water pan extending into said upper part of the central frame opening;

a food pan having a second peripheral flange and a depth in the vertical direction which is less than said first depth of said water pan, said food pan being dimensioned for nesting within said water pan, said second peripheral flange resting on said first peripheral flange;

a cover having a third peripheral flange which rests on said second peripheral flange of said food pan and a height in the vertical direction which is less than said first depth of said water pan; and

heat source support means for supporting a heat source removably mounted on said support frame,

said food pan, cover, and heat source support means being

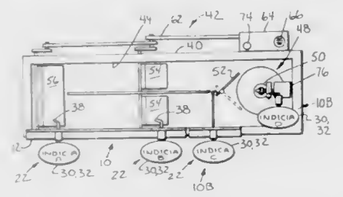
dimensioned for nesting arrangement within said water pan when said chafer assembly is disassembled to provide a compact, stackable unit, and said support frame and nesting arrangement of said water pan of said chafer assembly thereby being stackable on another chafer assembly of a similar configuration by the second width of said lower ends of said inclined legs of said end members of the chafer assembly being nested over the first width of said upper ends of said inclined legs of the end members of the other chafer assembly at an intermediate height between the upper and lower ends of the other chafer assembly in the vertical direction, and by the nesting arrangement of the water pan of the other chafer assembly being housed within the lower part of the central frame opening of said first-mentioned chafer assembly which allows sufficient clearance for said first depth of said water pan of said first-mentioned chafer assembly to be stacked above the water pan of the other chafer assembly.

4,920,874

METHOD AND APPARATUS FOR COOKING AND ADVERTISING FOOD PRODUCTS

Edward M. Anderson, 2620 East Medicine Lake Blvd., Minneapolis, Minn. 55441

Filed Nov. 14, 1988, Ser. No. 270,687
Int. Cl.[5] A47J *37/12*
U.S. Cl. 99—403 23 Claims



1 Apparatus for cooking and advertising food products, comprising:

(a) a deep fat fryer having a cooking vat and a heater for heating of cooking oil in the fryer;

(b) food dispenser means for dispensing a portion of food product into said vat;

(c) mechanical means on the fryer for manipulating the food product while in the cooking vat,

(d) at least one advertising sign movably mounted with respect to fryer, said sign being normally motionless; and

(e) sign drive structure operatively connecting said sign to at least one of said means, for movement of the sign by the said one of said means to call attention to the food product and operation of the fryer.

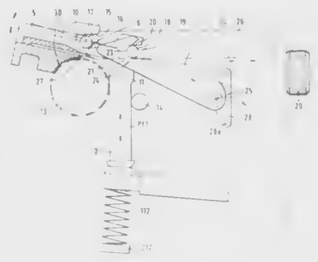
4,920,875

MACHINE FOR SKINNING OR SLICING BACON OR THE LIKE

Hermann Schill, Kehl, Fed. Rep. of Germany, assignor to Maja-Maschinenfabrik Herman Schill GmbH, Kehl-Goldscheuer, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 245,009
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731201
Int. Cl.[5] A22C *17/12*
U.S. Cl. 99—589 48 Claims

1 A machine for slicing and/or skinning slabs of bacon and like products, comprising a housing; means for advancing products in said housing in a predetermined direction along a predetermined path, including a traction member at one side of said path; a blade holder at the other side of said path; a blade in said holder, said blade having a cutting edge; a bearing pivotably mounting said holder for movement of said cutting edge nearer to and further away from said traction member; means for yieldably urging said holder to a starting position in which said cutting edge is located at a predetermined distance from said traction member, said holder being movable away



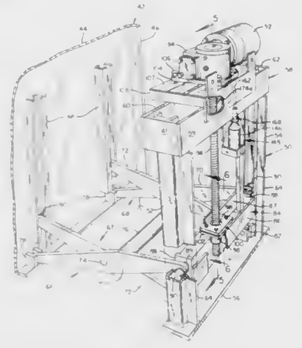
from said starting position as a result of engagement of the cutting edge by the products in said path; and means for limiting the extent of movability of said holder from said starting position.

4,920,876

REFUSE COMPACTOR

Harry R. Cruse, 4351 Imperial Dr., West Linn, Oreg. 97068

Filed Mar. 11, 1988, Ser. No. 166,673
Int. Cl.[5] B30B *15/14*
U.S. Cl. 100—48 12 Claims



1 In a refuse compactor including a container for receiving refuse, upright ram means within the container for compacting refuse against an upright wall of the container, ram activating means for extending and retracting the ram means toward and away from the upright wall including a generally vertically movable actuator, and actuator drive means for operating the vertically movable actuator including ball screw means, the improvement comprising:

said ball screw means including a generally vertically extending ball screw,

bearing means vertically suspending said ball screw at its upper end for rotation about is vertical axis,

said ball screw passing through and being drivingly connected to a ball nut connected to said actuator,

the lower end of said ball screw being unrestrained,

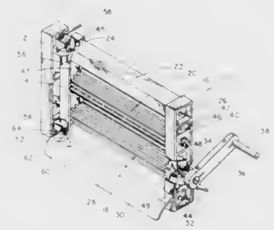
said ball nut being loosely connected to said actuator such that said ball screw and ball nut are self-aligning relative to said actuator and isolated from transverse loads imposed on said actuator by said ram means.

4,920,877

WRINGER DEVICE

Stephen R. Foster, 918 Nashville Ave., New Orleans, La. 70115, and Thomas R. Oschmann, 4951 Bundy Rd., New Orleans, La. 70127

Division of Ser. No. 237,721, Aug. 29, 1988. This application Aug. 7, 1989, Ser. No. 390,232
Int. Cl.[5] B30B *3/04*
U.S. Cl. 100—171 10 Claims



1. A wringer unit for squeezing liquid from an absorbent fabric-like material when sandwiched between first and second rollers having substantially parallel axes, the wringer unit comprising:

a first plastic-material support member having a planar face surface for rigidly mounting the first support member to a wall or similar substantially vertical surface;

a second plastic-material support member pivotably connected to the first member and having a first cylindrical-shaped interior cavity for rotatably receiving an end of the first roller, and having a second cavity for supporting an end of the second roller;

a third plastic-material support member fixedly interconnected with the second support member and having a third cylindrical-shaped interior cavity for rotatably receiving another end of the first roller, and having a fourth cavity for supporting another end of the second roller;

a first block mounted within the second cavity for rotatably receiving the end of the second roller, such that the first end of the second roller can move radially within the second cavity with respect to the axis of the first roller;

a second block mounted within the fourth cavity for rotatably receiving the another end of the second roller, such that the other end of the second roller can move radially within the fourth cavity with respect to the axis of the first roller;

first and second biasing members for biasing the ends of the second roller toward the axis of the first roller; and

a crank arm fixedly connected to the first or second roller for rotating the first or second roller.

4,920,878

SCREEN PRINTER WITH PLATER SIFTING STRUCTURE

Charles W. Harpold, and James Belcher, both of Grand Rapids, Mich., assignors to Harco Graphic Products Inc., Grand Rapids, Mich.

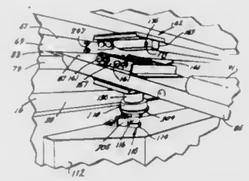
Filed May 3, 1988, Ser. No. 189,728
Int. Cl.[5] B41F *15/10, 15/26*
U.S. Cl. 101—115 38 Claims

1. A printing machine comprising:

at least one printing head fixedly mounted on said machine and having means for printing a pattern on an article;

a plurality of individual moveable platens on said machine for movement in a first direction along a path extending transversely past and below said printing head and in a second direction along a generally vertical path upwardly towards said printing head; and

lifting means for selectively moving each of said platens upwardly into engagement with said printing head when each platen is substantially aligned with said printing head, without simultaneously moving platens upwardly which are not aligned with said printing head, whereby said printing means prints the desired pattern on an article



positioned on a platen when the platen is moved upwardly into engagement with said printing head;

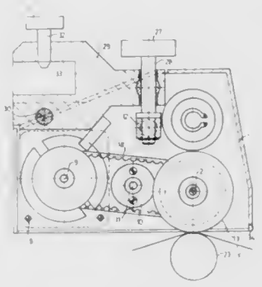
said lifting means being reversible whereby each selected platen is moved downwardly out of engagement with said printing head when printing is completed.

4,920,879

PRINTING APPARATUS HAVING AN INTEGRAL SPEED PICKUP WHEEL

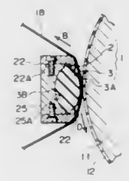
Pierre Leguillochet, Brecey, and Jean Langlet, Caudry, both of France, assignors to Sermatec, France

Filed Jan. 27, 1989, Ser. No. 303,571
Claims priority, application France, Jan. 29, 1988, 88 01044
Int. Cl.[5] B41F *5/04*
U.S. Cl. 101—219 6 Claims



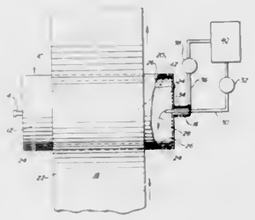
1. A printing apparatus comprising a first shaft, a printing head integral in rotation with the first shaft, a counter-roller defining with the printing head a gap for a film, a second shaft parallel to the first shaft, an inking roller fixed for rotation with the second shaft, means for rotating the second shaft when the first shaft turns, an electric motor having an output shaft and means for driving the first shaft, a third shaft parallel to the first shaft and located in a plane defined by the first shaft and the second shaft, a speed pickup wheel mounted freely on the third shaft and in contact at its periphery with the film, a fourth shaft parallel to the first shaft, a tachometer mounted on the fourth shaft, and a coupling between the speed pickup wheel and the tachometer, whereby the tachometer detects the speed of rotation of the speed pickup wheel.

4,920,880
CLEANING MACHINE FOR A PRINTER
Akira Hara, and Mineru Ochiai, both of Tokyo, Japan, assignors to Baldwin-Japan Limited, Tokyo, Japan
Filed May 26, 1988, Ser. No. 199,960
Claims priority, application Japan, Jul. 10, 1987, 62-172405
Int. Cl.[5] B41F *35/00*
U.S. Cl. 101—425 9 Claims



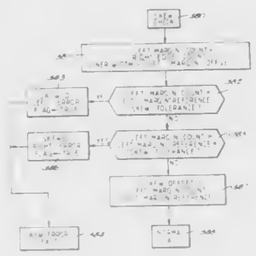
1. A cleaning machine for cleaning a surface of a cylinder of a printer by means of a cleaning cloth which is selectively held in contact with said surface while said cylinder is rotating, said cleaning machine comprising a pressure pad reversible to present different useable surfaces and which has a cross-sectional shape symmetrical along a longitudinal axis thereof spaced from and extending parallel to the longitudinal axis of said cylinder, said pressure pad having a first projecting portion on a first side thereof facing said cylinder and a second identically shaped projecting portion on a second side opposite to said first side, said projecting portions each having an outer surface, said pressure pad being made of elastic material and provided with flanges, and said cleaning cloth being held in pressure contact with said surface of said cylinder by said pressure pad which is mounted parallel to said longitudinal axis of said cylinder and clamped to said cleaning machine by a holder, whereby said surface of said cylinder is cleaned by relative movement between said cleaning cloth and said surface of said cylinder and whereby either the respective outer surface of the first projecting portion or the outer surface of the second projecting portion of said pressure pad can be selectively used to hold said cleaning cloth in pressure contact with said surface of said cylinder by reversing the position of said pressure pad about said longitudinal axis of said pressure pad.

4,920,881
METHOD OF COOLING HOT WEBS
Leonard I. Tafel, Wheeling, Ill., assignor to Webquip Corporation, Wheeling, Ill.
Filed May 2, 1988, Ser. No. 189,033
Int. Cl.[5] B41F *23/04*
U.S. Cl. 101—488 7 Claims



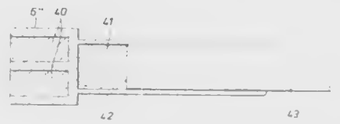
1. A method for cooling a hot web which comprises the steps of:
providing a thermally conductive chill roller;
introducing to said chill roller a liquid refrigerant, at a temperature and pressure permitting said refrigerant to exist in liquid form, said temperature being also above the dew point of the ambient atmosphere, the boiling point of said refrigerant at said temperature and pressure causing heat to be absorbed by said chill roller in response to said vaporization of liquid refrigerant;
rotating said chill roller;
vaporizing said liquid refrigerant by passing said hot web across said rotating chill roller having said refrigerant therein; and
withdrawing refrigerant vapor from said chill roller.

4,920,882
ELECTRONIC LABELER WITH PRINTHEAD AND WEB SENSOR COMBINED FOR CONCURRENT TRAVEL, AND ASSEMBLIES OF IDENTIFICATION DEVICES THEREFOR
Steven D. Hoyt, Lake Geneva, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.
Continuation-in-part of Ser. No. 92,961, Sep. 3, 1987, Pat. No. 4,844,629. This application Oct. 14, 1988, Ser. No. 258,266
Int. Cl.[5] B41J *15/00, 29/42*
U.S. Cl. 400—708 5 Claims



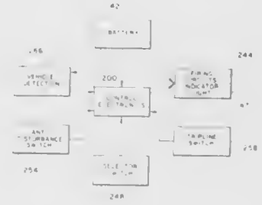
1. In apparatus for providing identification devices with imprinted indicia of the type including (1) a printing mechanism, (2) feed means for advancing an assembly of a plurality of individual identification devices through the printing mechanism, (3) input means for designating indicia to be printed on individual identification devices, (4) memory means for storing a program of instructions for reading the designated indicia, controlling the feed means and controlling the printing mechanism, and (5) microprocessor means responsive to the program of instructions in the memory means and interfaced to control the printing mechanism and the feed means,
the improvement wherein:
(1) the printing mechanism includes a printhead driven transversely back and forth across an assembly of identification devices loaded in the apparatus;
(2) a web edge sensor is attached to the printhead for concurrent transverse movement therewith, and the web edge sensor produces a signal connected to the microprocessor for indicating the presence or absence of the assembly under the current position of the web edge sensor;
(3) a continuous assembly of identification devices loaded in the apparatus for advancement by the feed means has a first longitudinal edge and a second longitudinal edge in which the first and second longitudinal edges define a preselected first width dimension over selected first longitudinal portions of the assembly and a preselected second width dimension over selected second longitudinal portions of the assembly, each second longitudinal portion is associated with one identification device of the assembly, and each second width dimension is different than the first width dimension; and
(4) the program of instructions stored in the memory means includes a first set of instructions responsive to the signal generated by the web edge sensor upon transverse movement across the assembly of identification devices for (a) measuring first and second longitudinal edge positions corresponding, respectively, to the first and second longitudinal edges of the assembly, (b) computing a current width dimension of the assembly along the path of transverse movement of the web edge sensor based on the difference between the first and second longitudinal edge positions, and (c) controlling the feed means for advancing the assembly to a position where one of the identification devices is in registration for printing by detecting the position at which the calculated current width dimension of the assembly is within a preselected tolerance of the second width dimension, and a second set of instructions for (d) computing a skew offset value based on the difference between a predetermined reference position and one of the measured longitudinal edge positions, and (e) utilizing the skew offset value to adjust the horizontal position at which printing is performed on the identification device so that the printing on the identification device is registered with respect to at least one longitudinal edge of the assembly.

4,920,883
DETONATION TRANSFER METHODS AND APPARATUS
James M. Barker, Katy, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.
Filed Jan. 27, 1989, Ser. No. 302,180
Int. Cl.[5] F42B *19/08, 19/12;* F42D *1/04*
U.S. Cl. 102—202.5 2 Claims



1. A fluid tight sealed housing and detonation transfer apparatus for well borehole use in high temperature and pressure wells where explosive train components are exposed, and are heated and pressurized by well borehole fluid, comprising:
(a) a generally elongate cylindrically shaped housing member having a bore therethrough and having an upper end and a lower end, said bore having a shoulder in the lower end of said housing member;
(b) an electrical conductor having a feedthrough connector entering said bore at said upper end of said housing member cooperative with a first hermetic seal means between said feedthrough connector and said housing member;
(c) an explosive initiator carrier in said bore above said shoulder and electrically coupled to said electrical conductor;
(c) sleeve means, being generally cylindrically shaped and sized on its lower end to internally receive a detonating cord and having a bulkhead at the upper end thereof, said bulkhead on the upper surface thereof having at least three axially symmetrically arranged cylindrical recesses sized to receive three axially symmetrically arranged cylindrical shaped pellets of secondary explosive which are capable of simultaneous detonation to form a triple interaction zone of shock wave propagation along a central axis of said sleeve means thereby intensifying said shock wave propagation across said bulkhead, said bulkhead further having a lower surface shaped to axially focus any shock wave transversing said bulkhead along the central axis of said sleeve means thereby intensifying such shock wave, said first charge of secondary explosive functioning as a booster load for propagating a shock wave initiated by said explosive initiator across said bulkhead and into the portion of said sleeve means below said bulkhead, a second charge of secondary explosive below said bulkhead and adjacent a detonating cord entering said sleeve means from its lower end, said second charge of secondary explosive functioning as an additional booster load for further propagating any shock wave initiated by said explosive initiator and boosted by said first charge of secondary explosive, the detonation of said second charge of secondary explosive enabling the initiation of said detonating cord;
(e) retaining means for fixedly retaining said sleeve means in said bore of said housing member; and
(f) separate metal to metal seal means for fluid tight sealing said retaining means to said housing member at its lower end such that said housing member is sealingly connected to said electrical conductor at one end thereof and said detonating cord at the opposite end thereof.

4,920,884
SELECTABLE LIGHTWEIGHT ATTACK MUNITION
Stephen A. Haglund, Minnetonka, and Peter H. Van Sloun, Hopkins, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 12, 1988, Ser. No. 256,437
Int. Cl.[5] F42C *15/14, 15/40*
U.S. Cl. 102—215 24 Claims

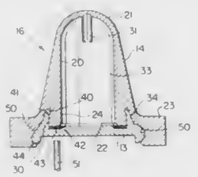


1. A portable munition apparatus comprising:
(a) multiple input means;
(b) manual multiple mode selection means;
(c) multiple firing means for actuator means;
(d) control means providing a number of predetermined operating modes;
(e) power supply means;
(f) status indicator means;
(g) warhead means; and
(h) sighting means.

4,920,885
EXPLOSIVE CHARGE CONTAINING MAGAZINE FOR RAM SETTING GUN
Edward W. Bowman, 1309 Ridgeway Avenue, North Vancouver, Canada (V7L 3R9), and Franciscus J. A. Storimans, 6 Ruth Court, Vandorf, Ontario, Canada (L0H 1G0)
Continuatioo-in-part of Ser. No. 138,431, Dec. 28, 1987, Pat. No. 4,819,562, which is a continuation-in-part of Ser. No. 93,302, Sep. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 243, Jan. 2, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 297,984
Int. Cl.[5] F42B *39/08;* C06C *7/02*
U.S. Cl. 102—281 14 Claims

10. A propellant containing device comprising a cartridge member having a cartridge member housing, said housing having an outer area and an inner substantially cylindrical recess, said recess having an inner open area, a cap member operable to close said inner open area of said cartridge member, an annular retaining arm on the periphery of said cap member, an annular arm recess complementary to said annular retaining arm in said cartridge member for allowing entry into and holding said retaining arm, an annular skirt between said

inner open area and said annular retaining arm, a detonating charge annular recess in said cap member located opposite to



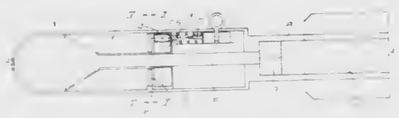
said annular skirt and a detonating charge in said detonating charge annular recess.

4,920,886

ANTI-VEHICLE GRENADE

A. Gabriels, Genk, Belgium, assignor to Fabrique Nationale Herstal Societe Anonyme, en abrege "FN", Herstal, Belgium

Filed Sep. 29, 1988, Ser. No. 250,715
Claims priority, application Belgium, Sep. 30, 1987, 8701106
Int. Cl.[5] F42B *11/22*
U.S. Cl. 102—476 21 Claims



1. An anti-vehicle grenade having a longitudinal axis, comprising:

a head portion;

a tubular tail portion extending along the longitudinal axis from said head portion;

said head and tail portions defining an axial bore therein;

a hollow explosive charge disposed in said head portion symmetrically about said axial bore;

a detonator disposed within said heat portion asymmetrically with respect to the longitudinal axis of the grenade; and

means, disposed between said detonator and said hollow charge, for symmetrically firing the hollow charge;

said firing means comprising means for defining a conduction path for a shockwave caused by said detonator, the conduction path extending from an initial point adjacent said detonator to at least four firing points disposed symmetrically about the longitudinal axis of the grenade, wherein the conduction path distances from the initial point to each of the firing points are equal.

4,920,887

SYSTEM FOR MAINTAINING MULTIPLE WARHEADS PLACED IN A MISSILE ROTATING ON ITS LONGITUDINAL AXIS

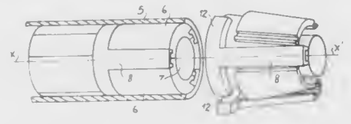
Jean-Pierre Frebaut; Eric Magnaudet, and Jean-Pierre Pineau, all of Orleans, France, assignors to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Jun. 3, 1988, Ser. No. 201,853
Int. Cl.[5] F42B *13/50*
U.S. Cl. 102—489 12 Claims

1. A system for holding a payload consisting of multiple warheads, placed in a missile, that rotates on its longitudinal axis, and dropped, in trajectory, through an end of said missile, said payload comprising:

at least one stage, which includes at least two distinct parts which have to be separated at the moment of dropping,

said missile comprising a casing within which the said payload is placed, said system comprising, for each stage, means for fixing the parts of said stage so that each stage forms a compact unit so as to make longitudinal translation in said casing of said payload easier and with lower



stress, said fixing means being retractable at the moment when the parts are dropped; and

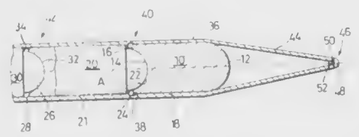
means connected to said fixing means for ejecting said fixing means.

4,920,888

SUBCALIBER, FINSTABILIZED PENETRATOR PROJECTILE

Hans W. Luther; Juergen Winkelmann, both of Kaarst, Fed. Rep. of Germany; Jean-Claude Sauvestre, St Doulchard, and Patrick Montier, Bourges, both of France, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany and Etat Francais, Armees, France

Continuation-in-part of Ser. No. 759,059, Jul. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 476,409, Mar. 17, 1983, abandoned. This application Jan. 7, 1988, Ser. No. 142,044
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1982, 3209594
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[5] F42B *11/06*
U.S. Cl. 102—518 7 Claims



1. An improved subcaliber fin-stabilizer penetrator projectile which has a ballistic hood coaxially mounted on the front end thereof and a plurality of pre-penetrator cores consisting essentially of tungsten alloy and mounted one behind the other in an axial direction behind said ballistic hood, and a main penetrator body consisting essentially of tungsten alloy, a cylindrical casing having a smooth external surface being operatively detachably connected with said main penetrator body, said plurality of pre-penetrator cores being operatively mounted partially in said cylindrical casing and partially in said ballistic hood, the improvement comprising in combination

(a) said cylindrical casing axially extends rearwardly from the ballistic hood to a forward region of the main penetrator;

(b) the outer diameter of the main penetrator corresponds to the outer diameter of the cylindrical casing so that the projectile presents a substantially smooth outer cylindrical surface over its entire axial length with the exception of the ballistic hood;

(c) each one of the plurality of pre-penetrator cores has the same external diameter and said plurality of pre-penetrator cores are of complementary shape so that the front surface of the rearmost core abuts against the rear mating surface of the next forwardly positioned pre-penetrator core and so on;

(d) the mutually contacting front and rear surfaces of the respective pre-penetrator cores are matingly shaped;

(e) the confronting surfaces of the adjoining pre-penetrator cores are complementarily axially convexly and concavely shaped;

(f) each pair of confronting surfaces of adjoining cores and said casing jointly define an annular space in said casing;

(g) the rear end surface of each pre-penetrator core and the front surface of the corresponding pre-penetrator core being rounded off and matingly shaped so that when the foremost pre-penetrator core pivots with respect to the next rearwardly adjoining pre-penetrator core the next rearwardly adjoining pre-penetrator core maintains its direction of movement;

(h) there are only two pre-penetrator cores present, a front pre-penetrator core followed by a rear pre-penetrator core, both made of brittle materials;

(i) the casing is of unitary construction relative to the ballistic hood and consists essentially of aluminum;

(j) the casing is exchangeably mounted at its rear end, said penetrator body has a front end portion which has a smaller diameter than the remainder of said penetrator body, said casing being mounted on said front end portion;

(k) the casing maintains the pre-penetrator cores in confronting position by way of mutually engaging play free seats;

(l) the main penetrator body and at least the rear pre-penetrator core which follows the front pre-penetrator core have on their frontal surfaces cutting edges which are normal to the longitudinal axis of the projectile and respective first and second fracture zones are formed in said casing in confronting relationship to said cutting edges;

(m) the degree of convexity, respectively concavity of the abutting surfaces of the pre-penetrator cores which act like pivot joints in the region of the fracture zones is in all regions identical;

(n) the casing has in the region of the first fracture zone between both pre-penetrators a weakened wall portion so that the casing and the first pre-penetrator core break off, as soon as the latter impacts on the first target plate when the impact is influenced by lateral forces;

(o) the wall thickness and the material properties of the casing are selected in such a way that the casing in the region of the second fracture zone breaks up as soon as the second pre-penetrator penetrates into the middle target plate of a triple plate on that target; and

(p) the casing is of such a strength that each pre-penetrator core centers on the main penetrator body in the target direction until its penetration into the corresponding target plate.

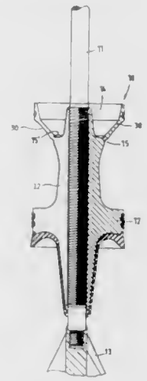
4,920,889

FIN STABILIZED, SUBCALIBER PROPELLING CAGE SOBOT PROJECTILE

Hans W. Luther, Kaarst, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 228,350
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724401
Int. Cl.[5] F42B *13/16*
U.S. Cl. 102—521 11 Claims

1. In a fin stabilized, subcaliber propelling cage sabot projectile including an arrow type projectile body and a propelling cage sabot composed of a plurality of longitudinally extending segments which coaxially surround and form-locking engage the projectile body only over part of its longitudinal extent until it is fired, and with front portions of said segments defining an annular air pocket in a front surface of said propelling cage sabot; the improvement comprising means defining a desired break location for said front portion of each of said propelling cage sabot segments in response to air resistance,



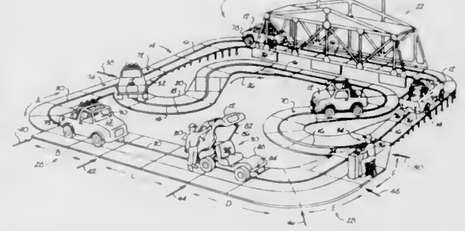
said means being disposed at a position behind the air pocket when seen in the direction of the rear of the sabot.

4,920,890

AMUSEMENT RIDE

Gerald L. Barber, 10 Whittington Ct., Greenville, S.C. 29615

Filed Aug. 5, 1988, Ser. No. 228,759
Int. Cl.[5] A63G *7/00*; B60C *15/38*
U.S. Cl. 104—53 20 Claims



1. A controlled track arrangement for an amusement ride featuring a plurality of guidable, electrically-powered vehicles, said track arrangement comprising:

a primary track having a circuitous guide path which may be controllably electrified over the entire pathway thereof so as to continuously guide and advance in a predetermined direction thereabout guidable, electric-powered vehicles, said primary track including an entrance point at which vehicles off the circuitous guide path may be routed thereunto, and an exit point at which vehicles on the circuitous guide path may be routed therefrom;

a secondary track having a one-way guide path interconnecting between said primary exit point and said entrance point thereof, said secondary track path including a plurality of consecutive, separately electrifiable path segments to permit respective vehicles to be selectively and controllably advanced therealong for loading and unloading of passengers for such vehicles; and

automatic launch control means, responsive to the travel of vehicles on said primary track path, for automatically preventing vehicles situated on said secondary track path and entering said primary track path at said entrance point

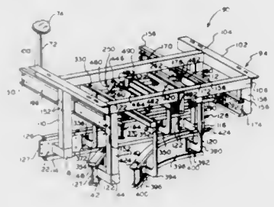
thereof from colliding with vehicles already on said primary track path, therein said automatic launch control means includes sensor means adjacent said primary track path for sensing passage of a vehicle thereby, whereby said automatic launch control means is responsive to the travel of vehicles on said primary track path.

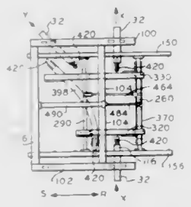
4,920,891

RAIL CONVEYOR AND RAIL SWITCHES THEREFORE

Weston R. Loomer, Boone County, Ky., assignor to Litton Industrial Automation Systems, Inc., Florence, Ky.

Filed Jul. 15, 1988, Ser. No. 219,981
Int. Cl.[5] B61B *3/00*
U.S. Cl. 104—102 **26 Claims**





1. A rail switch, for use in a rail arrangement including at least a first rail pathway and a second rail pathway which merge into and form a common rail pathway for at least a portion of the rail arrangement, the rail switch to be disposed at a predetermined location where the first rail pathway and the second rail pathway merge into the common rail pathway and at which the rails within each of the pathways are separated from each other and thus render each of the pathways discontinuous, the rail switch to function to interconnect either the common rail pathway into the first rail pathway by moving a first shiftable rail section between and into a positon of coaction with the separated rails of the first rail pathway to thus render the first rail pathway continuous or the common rail pathway into the second rail pathway by moving a second shiftable rail section between and into a position of coaction with the separated rails thereof to thus render the second rail pathway continuous, the rail switch comprising:

(a) rail switch support means for disposing the rail switch at a predetermined location;

(b) at least two shiftable rail sections carried by said rail switch support means for simultaneous movement with respect thereto between either a first position wherein a first one of said shiftable rail sections is positioned to establish the first rail pathway as a continuous rail pathway and a second position wherein a second one of said shiftable rail sections is positioned to establish the second rail pathway as a continuous rail pathway;

(c) operating means carried by said rail switch support means for shifting said shiftable rail sections simultaneously between said first position and said second position; and

(d) rail cooperating means to be disposed for coaction with said shiftable rail sections and the separated rails of the rail pathways which the shiftable rail sections are to coact with;

(e) each of said rail cooperating means to include body means of predetermined external configuration carried either by said shiftable rail section or the rail of the rail arrangement with which said shiftable rail section will coact, and, seat means of a configuration corresponding to at least a portion of said predetermined external configuration of said body means, and carried by either said shiftable rail section or the rail of the rail arrangement with which said shiftable rail section will coact, whichever of same is not carrying said body means;

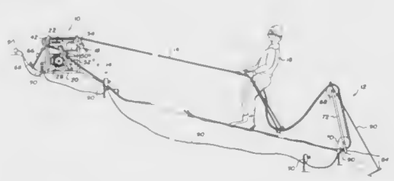
(f) said body means and said seat means being disposed for coaction one with the other when either said first one or said second one of said shiftable rail sections are respectively positioned to establish either said first rail pathway or such second rail pathway as a continuous rail pathway and when so disposed coacting with each other due to said respective configurations such that load forces applied to the shiftable rail section will effect an alignment of said shiftable rail section with the separated rails of the rail pathway which the shiftable rail section is to coact with to render the pathway continuous, and will transfer loads applied to said shiftable rail section directly to the separated rails of the rail pathway which the shiftable rail section is to coact with and any support structure therefor.

4,920,892

PORTABLE ROPE TOW

Roman Pesek, 3 - 119E 6th Street R.P., North Vancouver, British Columbia, Canada (V7L 1N9)

Filed Nov. 7, 1988, Ser. No. 268,309
Int. Cl.[5] B61B *12/02*
U.S. Cl. 104—173.2 **13 Claims**



1. A drive unit for a ski tow rope comprising:

a main frame;

an engine having an output shaft mounted in the main frame;

a drive pulley driven by the output shaft and having a circumferential channel to receive and frictionally engage an untensioned endless tow rope;

a plurality of pulleys to direct the rope into the main frame, around the drive pulley and out of the frame, the pulleys comprising:

a first guide pulley at the leading edge of the frame to receive the rope;

a second guide pulley at the trailing edge of the frame;

a support member pivotally mounted to said main frame;

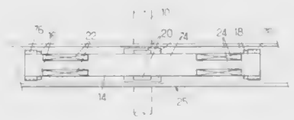
first and second holding pulleys rotatably mounted in said support member adjacent the drive pulley, said first holding pulley being positioned generally above said drive pulley, and said second holding pulley being positioned generally beside said drive pulley and below said first holding pulley with said endless tow rope being trained over and around said first holding pulley, over and around said drive roller, and then over said second holding pulley such that said first and second holding pulleys act to ensure that the rope contacts the maximum possible amount of the circumference of said drive pulley.

4,920,893

AXLE WITH MAGNETIC GUIDANCE FOR RAILROAD VEHICLES

Jean-Louis Maupu, Villejuif, France, assignor to Matra Transport and Institut National de Recherche sur les Transports et leur Securite, both of, France

Filed Jun. 10, 1988, Ser. No. 205,212
Claims priority, application France, Oct. 14, 1986, 86 14255
Int. Cl.[5] B61F *5/38*
U.S. Cl. 104—242 **6 Claims**



1. Angularly movable axle for a railroad vehicle, comprising a shaft having an axis and angularly movable about a vertical direction, independent metal wheels rotatable on said shaft about said axis for rolling movement on a track including a central guide rail, a beam fast with said shaft and perpendicular to said axis, sensor means for measuring an actual angular position of the beam with respect to the track, means for determining a reference position of said beam with respect to the track, electromagnetic means operatively associated with the beam and cooperating with the track for exerting on the axle a force for angularly moving said axle, and a control circuit receiving input signals from said sensor means and arranged for delivering electric currents to the electromagnetic means of such value that said electromagnetic means exert a force on said beam which results in angular movement of the axle in a direction which results in generation of a return force which tends to cancel out the difference between the actual position of the beam and the reference position responsive to movement along the track, wherein the central guide rail has a U shaped section and the beam comprises a girder travelling inside the rail and containing the active part of a linear traction motor and a carrier frame situated on each side of the rail and carrying the sensors and the electromagnetic means cooperating with the rail.

4,920,894

MODULAR ANTI-SPIN UNIT FOR RAILWAY CAR DOOR

Mell R. Thoman, Omaha, Nebr., assignor to Railcar Specialties, Inc., Alsip, Ill.

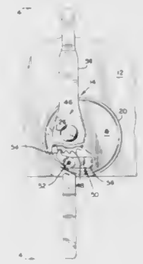
Filed Aug. 31, 1989, Ser. No. 402,079
Int. Cl.[5] B61D *17/00*
U.S. Cl. 105—378 **7 Claims**

1. An anti-spin module for attachment to a railway car plug-in door locking mechanism releasably locking said door responsively to rotation of an actuating shaft having an outer end extending through the outer surface of said door comprising:

a housing having front and rear faces and confrontingly attachable to the outer surface of said door at said rear housing face, said housing having a rear aperture in said rear housing face and a front aperture in said front housing face;

rotatable engagement means for engaging the outer end of said actuating shaft through said rear housing aperture;

an anti-spin mechanism disposed within said housing and coupled to said rotatable engaging means, said anti-spin mechanism including a rotatable input shaft extending through said front housing aperture, brake means for inhibiting torque transmission from said rotatable engaging means to said input shaft in a door-opening direction, coupling means for transmitting torque from said input shaft to said rotatable engagement means in a door-opening direction and a door-closing direction, and automatic



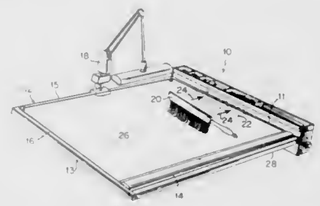
release means for substantially releasing said brake means during rotation of said input shaft in said door-closing direction.

4,920,895

DRAFTING DEVICE FOR THE CONVENIENT CONTAINMENT OF ERASER SHAVINGS

John Burke, 58 Willow St., Wheatley Heights, N.Y. 11798, and John Kraljic, 521 Pease La., West Islip, N.Y. 11795

Filed Apr. 7, 1989, Ser. No. 334,345
Int. Cl.[5] A47B *17/00*
U.S. Cl. 108—26 **16 Claims**



1. A drafting device connectable to a side of a drafting board having a top surface, comprising:

(a) a housing containing a trough having a top, a pair of sides, a length, an interior, and including a slot contained on either of said pair of sides of said housing so that eraser shavings can be brushed from the drafting board through said slot contained on said housing and into said trough for keeping said drafting board free of eraser shavings;

(b) a storage tray for drafting tools and being affixed to said top of said housing; and

(c) said removable trough being slidably mounted in said interior of said housing and having a retracted position, an extended position, and a pair of lips, said pair of lips affixed to said trough and slideable in said housing so that said trough can slide from said retracted position to said extended position and back and fourth, each of said pair of sides of said housing contain an internal recess extending substantially said length of said housing for slidably receiving said pair of lips of said trough so that when said trough requires emptying said trough is pulled out to said extended position and removed from said housing for emptying the shavings and henceforth returned thereto.

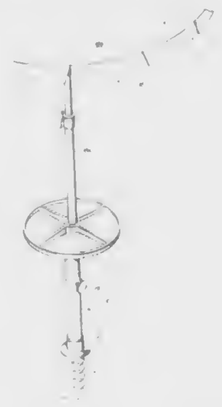
4,920,896
PORTABLE GAME TABLE ARM CUSHION
Virginia Holden, 6623½ Crenshaw Blvd., Los Angeles, Calif. 90043
Filed Aug. 24, 1988, Ser. No. 235,565
Int. Cl.[5] A47B *13/08*
U.S. Cl. 108—90 2 Claims



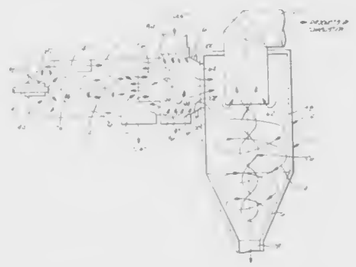
1. A portable game table arm cushion adaptable to be easily removably attached at the edge of a game table for protecting a user's forearms from irritation and abrasion when leaning against the edge of a game table, comprising:
- a plurality of elongated cylindrical cushion portions in which a fold is fabricated between each portion effective to divide said cushion into convenient folding lengths;
- at least a pair of clip pockets fabricated into each of said at least one elongated cylindrical cushion portions, each of said clip pockets having an open end and a closed end so as to form an open-ended sheath perpendicular to a longitudinal axis of said elongated cylindrical cushion portion;
- a plurality of generally U-shaped table edge clips each having a straight leg, a rounded portion and another leg having an outwardly tending portion and each of which is adapted for insertion of its straight leg into said open end of one of said clip pockets;
- whereby said game table arm cushion may be removably attached to a game table by means of said generally U-shaped table edges clips.

4,920,897
BEACH AND LAWN TABLE WITH UMBRELLA HOLDER
Ross Reed; Charles Reed, and Carl H. Gran, all of Naples, Fla., assignors to Lil Twister Inc., Naples, Fla.
Filed Apr. 28, 1989, Ser. No. 344,654
Int. Cl.[5] A47B *13/02*
U.S. Cl. 108—150 5 Claims

1. A beach and lawn table designed to be affixed to the ground on which it rests comprising:
- a single upstanding hollow table leg.
- a table base having a flat horizontal bottom face permanently attached to the lower end of the table leg,
- a leg cap permanently attached to the upper end of the table leg and having a cube-shaped lug extending upwardly and axially aligned with the table leg,
- a table top having a square hole at its center sized to fit snugly over and around the cube-shaped lug and supported by the leg cap,
- the table leg, the table base, the leg cap and the table top all made of a similar thermoplastic material, and,
- a vertically aligned helical auger attached to the bottom face of the table base and designed to be screwed into the ground by turning movement of the table top until the bottom face of the table base rests firmly on the ground.

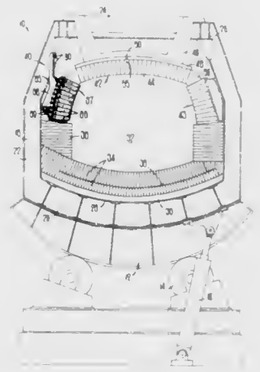


4,920,898
GAS TURBINE SLAGGING COMBUSTION SYSTEM
Albert Solbes, Palos Verdes Estates, and Hideo Iwata, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Continuation of Ser. No. 246,008, Sep. 15, 1988, abandoned, which is a continuation of Ser. No. 170,048, Mar. 11, 1988, abandoned, which is a continuation of Ser. No. 97,393, Sep. 15, 1987, abandoned, which is a continuation of Ser. No. 826,950, Feb. 7, 1986, abandoned. This application Mar. 7, 1989, Ser. No. 319,802
Int. Cl.[5] F23D *1/00*
U.S. Cl. 110—265 71 Claims



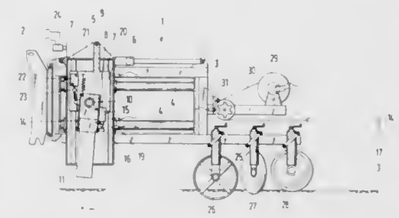
1. In an apparatus for combustion of carbonaceous fuel wherein preheated oxidizer gas and particulate fuel are introduced into a substantially cylindrical primary combustor having a head end and an exit end, and wherein the flow velocities, mass flow rates, and combustion temperatures are regulated to minimize the concentration of volatized and liquid slag in the output gaseous products of combustion, and wherein the walls of the combustion chamber are maintained within a temperature range such that a layer of solidified slag is retained on the inside surfaces of the walls, the improvement comprising:
- (a) means including a precombustor for preheating said oxidizer gas and introducing the preheated oxidizer gas into said primary combustor in a manner to establish first and second high-velocity flow of a mixture comprising oxidizer and combustion products with said first and second high-velocity flows proceeding respectively toward the head end and the exit end of said primary combustor;
- (b) means for injecting said particulate fuel into said primary combustor near the center of the head end in a pattern such that substantially all of the fuel particles are intercepted by said flow and at least partially oxidized before reaching the walls of the primary combustor;
- (c) means for regulating the oxidizer and fuel input velocities and mass-flow rates so that a substoichiometric combustion regime is maintained within said primary combustor, substantially all the slag content of the fuel is driven to the walls of the primary combustor, and substantially all of the fuel is converted to oxides of carbon and hydrogen before the gaseous products of combustion leave the exit end of said primary combustor;
- (d) slag recovery means coupled to said primary combustor and adapted to receive slag formed in the combustion of said carbonaceous fuel to yield said combustion products;
- (e) tertiary oxidant injection-transition means positioned between the exit of said primary combustor and a secondary combustor, said tertiary oxidant injection-transition means adapted to introduce a flow of at least oxidant into said combustion products to form an oxygen-rich fluid at a temperature suitable for use by end-use apparatus;
- (f) secondary combustor means adapted to complete oxidation of carbon monoxide and hydrogen contained in the oxygen-rich fluid and separation of solids from the oxygen-rich fluid to form a substantially solids-free working fluid; and
- (g) means to conduct said substantially solids-free working fluid to said end-use apparatus.

4,920,899
MODULAR FURNACE AND METHODS OF REPAIRING SAME
Robert F. Blundy, Columbia, S.C., and Charles E. Dunbar, Pelion, both of S.C., assignors to American Telephone and Telegraph Company, New York, N.Y.
Filed Jun. 2, 1989, Ser. No. 360,506
Int. Cl.[5] F23M *5/00*
U.S. Cl. 110—336 13 Claims



1. A furnace, comprising:
a frame; and
a refractory lining which is attached to and supported by said frame, said refractory lining comprising:
- a bottom portion which forms a leakproof reservoir for holding molten material;
- a roof portion which is spaced above said bottom portion; and
- a sidewall portion which is disposed between said bottom portion and said roof portion and which comprises a plurality of modular sections which are capable of being removed individually without the need to enter the furnace to permit replacement of individual ones of the modular wall sections.

4,920,900
PLANTING DEVICE ATTACHABLE TO AN AGRICULTURAL VEHICLE
Bernard Clemens, Königsberger Strasse 8, D-5560, Wittlich, Fed. Rep. of Germany
Filed Mar. 21, 1989, Ser. No. 326,341
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3809897
Int. Cl.[5] A01C *5/04, 11/02*
U.S. Cl. 111—115 14 Claims



1. A planting device for attaching to an agricultural vehicle, said device comprising:
a frame;
- a planting slide mounted on said frame for reciprocating sliding motion horizontally in the direction of travel of the vehicle;
- a hydraulically operable pressure cylinder mounted between said frame and said slide for effecting the aforesaid horizontal sliding motion of said slide relative to said frame;
- support means mounted on said slide for sliding adjustment vertically, upwards and downwards, relative thereto;
- a pivot axis mounted on said support means and extending transversely to the direction of travel of the vehicle;
- a planting spade of hollow form, shaped in the manner of a funnel and having a downwardly directed tip, said spade being pivotally mounted on said pivot axis;
- a prestressed spring connected between said support means and said planting spade to hold said spade with its tip pointing in a forwardly directed pivoted rest position;
- a control valve mounted on said planting slide and operatively connected to said pressure cylinder, said valve having a valve stem articulated to said planting spade so that with said spade in its aforesaid rest position said slide is pushed forward in the direction of travel by said pressure cylinder, yet upon rearward deflection of said planting spade, when said support means has moved downwards to enable it to penetrate the ground, said control valve actuates said pressure cylinder to push said planting slide rearwards relative to said frame.

4,920,901
DOUBLE DISC SEED DRILL WITH V-SHAPED FRAME
Rice H. Pounds, Monte Verde, Fla., assignor to Pounds Motor Company, Inc., Winter Garden, Fla.
Filed Jul. 27, 1988, Ser. No. 224,713
Int. Cl.[5] A01C *5/06*
U.S. Cl. 111—164 4 Claims

1. A double disc seed drill comprising:
- a substantially V-shaped frame comprising a forward frame member and a rear frame member, each frame member having an upper end and a lower end, said lower end of

each of said frame members being fixedly connected to each other to create a vertex of said V-shaped frame, and a cross-member interconnected between said forward and said rear frame members for provided further structural support between said members;

hitching means for coupling said upper end of said forward frame member to a pulling apparatus said hitching means including a pair of vertically oriented side plates and a coupling member, said coupling member having fixedly attached on opposite sides thereof said side plates, each said side plate terminating in a shaft receiving member, each shaft receiving member having corresponding aligned apertures for passing a pivot bolt therethrough, said upper end of said forward member having a U-shaped bracket, the legs of which have an aperture alignable with each other for passing an axle member therethrough for pivotably coupling said frame to said coupling member;

first and second axles attached to opposite sides of said frame adjacent said vertex, each of said axles being angularly oriented with respect to a line normal to a standard direction of motion of said frame when the drill is in use;

first and second discs mounted on respective ones of said first and second axles, said discs including axle holes for receiving said axles such that said discs are aligned in planes normal to the orientation of a corresponding one of said axles whereby, during use of the drill, leading edges of said discs are substantially in contact and trailing edges of said discs are spaced apart a preselected distance;

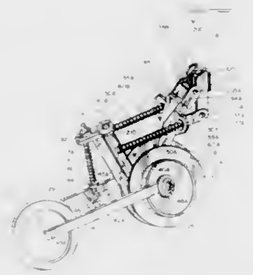
a first end pivotably connected to said cross-member of said carriage assembly, a third support member extending in substantially a horizontal plane from said upper end of said rear frame member of said V-shaped frame, said third support member including an aperture for passing said third shaft therethrough, and a third helical spring encircling said third shaft between said first end thereof and said third support for biasing said carriage assembly downward with respect to said third support, and means connected to an end of said third shaft opposite said first end for preventing withdrawal of said third shaft from said aperture when said drill is lifted vertically.

4,920,902

AUTOMATIC PATTERN SEWING MACHINE

Hideaki Takenoya; Reishi Nomoto, and Yoshikazu Ebata, all of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,455
Claims priority, application Japan, Jun. 5, 1987, 62-86649[U]
Int. Cl.[5] D05C *9/06;* **D05B** *21/00*
U.S. Cl. 112—103 **6 Claims**

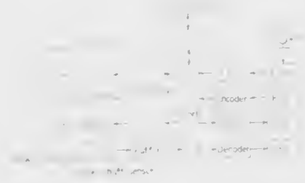


first biasing means for pressuring said frame and said connected discs downward during use of the drill, said biasing means comprising first and second shaft support members fixedly attached to respective opposite sides of said forward frame member adjacent said upper end thereof, each of said support members extending substantially perpendicularly outward of said forward frame member and having at least one aperture adjacent respective outer ends thereof, first and second shafts extending through corresponding ones of said apertures in said support members and being connected at one end thereof to said shaft receiving member, first and second helical springs encircling corresponding ones of said first and second shafts between said support members and a free end of said shafts opposite said one end thereof, means coupled to each of said free ends of said shafts for compressing the springs against said support members whereby said forward frame member is pivotably biased about said axle member to force said discs downward;

a carriage assembly comprising an H-shaped frame member having a leading end and a trailing end and a mid-support cross-member, said leading end being pivotably attached at said first and second axles to said V-shaped frame, said trailing end including a wheel axle connected thereto;

a rolling furrow closer mounted on said wheel axle and aligned to track said discs when the drill is in use; and

second biasing means connected for biasing said furrow closer downward with respect to said V-shaped frame, said second biasing means comprising a third shaft having



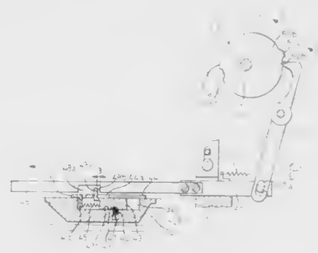
1. An automatic pattern sewing machine having a unit for controlling the stitching of an applique patten on a base cloth, comprising a memory for storing blocks of data assigned to different types of applique patterns; at least one sheet carrying a set of printed patterns corresponding to predetermined different sizes of an applique pattern of one of the types stored in the memory, and printed size identifying marks assigned to respective printed patterns; a plurality of keys each being assigned to an identifying mark, said keys being selectively operated in reference to said patterned sheet to select a block of data pertaining to said applique pattern of a desired size; first coordinate transforming means operated in response to the actuation of the selected key to convert said block of applique pattern data into first coordinates defining a stitch contour of the selected size of said applique pattern; second coordinate transforming means operated in response to the actual formation of said stitch contour in said first coordinates on the base cloth to convert said block of applique pattern data into second coordinates defining the stitches for the selected size of said applique pattern; and means for stitching onto the base cloth an applique pattern piece which conforms with the selected printed pattern and is positioned onto the area of the base cloth delimited by the contour stitched in said first coordinates.

4,920,903

DEVICE FOR ADJUSTING A LOWER THREAD IN A SEWING MACHINE

Kazumasa Hara; Mikio Koike; Mitsuru Nishijima, and Koji Okutani, all of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 277,002
Claims priority, application Japan, Nov. 27, 1987, 62-297379
Int. Cl.[5] D05B *3/02, 19/00, 57/26*
U.S. Cl. 112—229 **4 Claims**



1. A lower thread tension adjusting device for a sewing machine having a needle plate having a laterally elongated needle hole formed therein, stitching forming means including a needle vertically reciprocating through the needle hole and laterally swingable within a laterally elongated range of the needle hole, and a loop taker having a bobbin carrier positioned therein, the bobbin carrier carrying therein a bobbin loaded with a lower thread, the loop taker being rotatable to cooperate with the reciprocating needle to form a stitch with upper and lower threads, and pattern selecting means including pattern selecting keys selectively operated to select different patterns of zigzag stitches including a pattern of straight stitches stored in a memory in a form of pattern data, said lower thread tension adjusting device comprising first tension means mounted on the bobbin carrier for tensioning the lower thread with a predetermined tension; second tension means mounted on the bobbin carrier and movable between an operative position in which said second tension means tensions the lower thread with a predetermined tension in addition to tension provided by said first tension means, and an inoperative position in which said second tension means does not tension the lower thread; positioning means mounted on the bobbin carrier and movable between a first set position in which said positioning means moves said second tension means to the operative position thereof, and a second set position in which said positioning means moves said second tension means to the inoperative position thereof; guide means movable between a first guide position in which said guide means guides the lower thread to a position adjacent to one end of the laterally elongated needle hole and simultaneously guides said positioning means to the first set position, and a second guide position in which said guide means guides the lower thread to a position adjacent to a center of the laterally elongated needle hole and simultaneously guides said positioning means to the second set position; and control means responsive to a selective operation of the pattern selecting keys for selecting the pattern of straight stitches to move said guide means of the first guide position, and responsive to a selection of one of the patterns of zigzag stitches to move said guide means to the second guide position.

4,920,904

TAPE FEEDING METHOD AND APPARATUS

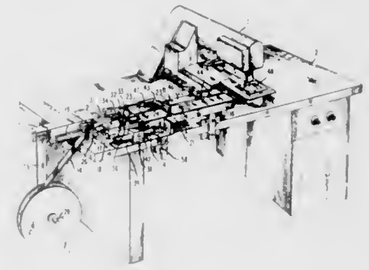
Ricky J. Frye, 1516 Rosina Dr., Miamisburg, Ohio 45342

Filed Nov. 23, 1987, Ser. No. 123,966
Int. Cl.[5] D05B *35/06, 37/06*
U.S. Cl. 112—262.1 **6 Claims**

5. The method of forming patches of tape from successive end portions of a tape supply and feeding the patches toward a sewing location, said method comprising the steps of:

(a) propelling the current end portion of the tape a selected distance forward along a path toward the sewing location, said distance being equal to the length of one of the patches;

(b) holding the current end portion stationary prior to severing it from the remainder of the tape supply;



(c) severing the current end portion from the remainder of the tape supply while continuing to hold said end portion, whereby the severed end portion constitutes a just-cut one of the patches; and

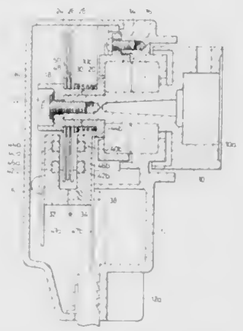
(d) moving the just-cut patch farther along a continuation of the path toward the sewing location while continuing to hold said patch to prevent undesired movement thereof.

4,920,905

DETECTOR FOR USE ON SEWING MACHINES

Takashi Nakamura, and Yutaka Yamaura, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 223,736, Jul. 15, 1988, which is a continuation of Ser. No. 491,970, Feb. 28, 1983. This application Aug. 21, 1989, Ser. No. 396,182
Claims priority, application Japan, Jul. 10, 1981, 56-107866; Jul. 10, 1981, 56-102701; Jul. 10, 1981, 56-102702; Jul. 10, 1981, 56-102703
Int. Cl.[5] D05B *69/24*
U.S. Cl. 112—275 **4 Claims**



1. A detector for use on a sewing machine, comprising a coupling secured to an arm shaft of the sewing machine, a base supported on the coupling and having one end engaging a body of the sewing machine and held at rest in a given position, a collar fitted over said coupling, a spring fitted over said collar, a plurality of photoelectric detector plates coaxially mounted removably in an axial direction on the coupling, each

of said plurality of photoelectric detector plates having at least one light shield, said detector further comprising means for releasably holding said photoelectric detector plates on said coupling, the spring providing tension between the photoelectric detector plates and the collar so that the attachment of the photoelectric detector plates enables adjustment of all the photodetector plates into a given angular position with respect to the coupling through loosening of the securing means, at least one of the photoelectric detector plates being angularly adjustable with respect to the coupling when said securing means is tightened, the light shields on said plurality of photoelectric detector plates being arranged concentrically so that no one of the light shields overlaps any of the other light shields, and light-emitting and photodetector means fixed to the base and disposed one on each side of the plurality of photoelectric detector plates, each of said light-emitting and photodetector means being at least two in number and mounted on one and the same plane.

4,920,906

KEEL STRUCTURES FOR SAILING VESSELS

Warwick I. Collins, 23 Kingston Park, Lymington, Hampshire, England

Continuation of Ser. No. 726,892, Apr. 19, 1985, abandoned.
This application Nov. 29, 1988, Ser. No. 277,493
Claims priority, application United Kingdom, Aug. 23, 1983, 8322576; Sep. 2, 1983, 8323616
Int. Cl.[5] B63B *3/38*; B63H *25/38*
U.S. Cl. 114—140 18 Claims



1 A keel structure for a sailing vessel, said keel structure comprising a fixed main keel including a non-movable section having a foot and a bridge extending forwardly from said foot, said bridge having a forward end, and a forward foil adapted to be mounted between the underside of the vessel and said forward end of said bridge, said main keel and said forward foil when in use of said keel structure having a high pressure side and a low pressure side, said non-movable section of said main keel having an average chord length, said forward foil being disposed forwardly of and in tandem with said main keel an average distance less than the average chord length of said non-movable section of said main keel to provide a relatively close coupling of said forward foil to said main keel to define with said main keel slot means which during use of said keel structure causes water to be accelerated through said slot means from the high pressure side of said forward foil to the low pressure side of said main keel to increase the lift acting on said main keel, said forward foil being smaller than said non-movable section of said main keel.

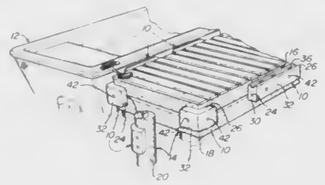
4,920,907

BOAT DOCK BUMPER

Karl E. Richter, Muskego, Wis., assignor to Fulton Manufacturing Corporation, West Allis, Wis.

Filed Dec. 14, 1988, Ser. No. 284,041
Int. Cl.[5] B63B *59/02*
U.S. Cl. 114—219 15 Claims

1. A boat dock bumper securable to a peripheral surface of a docking structure for preventing contact between a marine vessel and the docking structure, said boat dock bumper comprising:
an inflatable body having valve means to vary the volume of fluid within said body;
at least one passage formed through said body for receiving fastening means to secure said body to the docking structure, said at least one passage formed by a tubular sleeve integrally and sealingly formed with said body such that said fastening means extends through said at least one passage while inflation of said body is maintained, said at least one passage including a first diameter portion and a second reduced diameter portion forming an annular shoulder therebetween whereby said fastening means is received within said second reduced diameter portion and



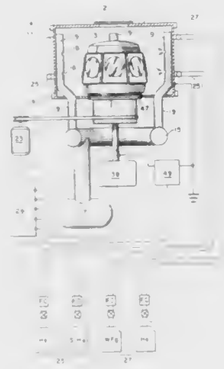
said annular shoulder prevents a flanged head member of said fastening means from extending into said second reduced diameter portion, said first diameter portion receiving said head member of said fastening means; and
an elongated groove formed in a top surface of said body for receiving utility lines of the boat, said groove extending the length of said body and open at both ends, said groove formed substantially parallel and spaced apart from the docking surface.

4,920,908

METHOD AND APPARATUS FOR DEPOSITION OF TUNGSTEN SILICIDES

Daniel L. Brors, Los Altos Hills; James A. Fair, Mountain View, and Kenneth A. Monnig, Palo Alto, all of Calif., assignors to Genus, Inc., Mountainview, Calif.

Continuation of Ser. No. 654,155, Sep. 25, 1984, abandoned, which is a division of Ser. No. 480,030, Mar. 29, 1983, Pat. No. 4,565,157. This application Mar. 13, 1989, Ser. No. 323,199
Int. Cl.[5] C23C *16/00*
U.S. Cl. 427—255.2 1 Claim



1. In a low pressure chemical vapor deposition reactor having a vacuum housing and a mixing chamber, a method of depositing tungsten silicide on a substrate or a plurality of substrates comprising the steps of:
evacuating said vacuum housing;
providing a flow of silane and tungsten hexafluoride into the mixing chamber, the flow rate of silane being greater than 20 times the flow rate of tungsten hexafluoride, said mixing chamber connected to said vacuum housing for introducing silane and tungsten hexafluoride as mixed gases into said vacuum housing;
heating said substrate or plurality of substrates to cause deposition of tungsten silicide on said substrate or plurality of substrates; and
actively cooling the vacuum housing to a temperature of below 60° C. to decrease the deposition of tungsten silicate on said housing.

4,920,909

BOAT WITH ROTATABLE WHEEL KEEL FOR RESISTANCE TO LEEWARD MOVEMENT IN WATER AND FOR SAND TRANSPORT

David Grassi, 675 A Castro St., San Francisco, Calif. 94114, and James K. Antrim, 4018 Archery Way, El Sobrante, Calif. 94803

Continuation of Ser. No. 812,295, Dec. 23, 1985, abandoned.
This application Jun. 17, 1987, Ser. No. 63,777
Int. Cl.[5] B63C *13/00*
U.S. Cl. 114—344 5 Claims



1. In a boat of the type having a hull and a keel aligned with the direction of forward movement of said boat and projecting into the water to resist leeward movement of said boat in the water and to minimize resistance to forward movement of said boat in said water,
said keel is a wheel which is round in perimeter when viewed from the side of said boat and in line with the axis of rotation of said wheel,
said boat contains means for rotatably mounting said wheel so that it can rotate in a vertical plane parallel to the direction of elongation of said boat, and for holding said wheel in said projecting-down position when said boat is in the water,
said wheel has faired, substantially smooth, solid, and continuous side surfaces except for a hole through the wheel wall,
the shape of said surface, as defined by a radial section in the plane of said axis of rotation of said wheel and passing through said axis and any point on the perimeter of said wheel, is a smooth and continuous curve with no abrupt change of radius of curvature.

4,920,910

FOLDABLE DISPLAY MEANS

Chu-Ying Lin, P.O. Box 10160, Taipei, Taiwan

Filed Dec. 29, 1988, Ser. No. 291,668
Int. Cl.[5] G09F *17/00*
U.S. Cl. 116—173 6 Claims

1. A foldable display means comprising:
a hollow handle generally formed as a hollow pipe having a longitudinal slit longitudinally formed in said hollow pipe;
a display sheet selected from a flag, a cloth or paper sheet for advertising uses; and
a pole means pivotally secured to said hollow handle through a pivot means formed on an upper portion of said handle, having said display sheet secured on said pole means, said pole means being pivotally folded around said pivot means into said hollow handle through said longitudinal slit and said display sheet being wound around said pole means in said hollow handle;
the improvement which comprises:
said pole means including a head portion secured on a top end of said pole means having said head portion protruding downwardly beyond a lower opening of said longitudinal slit opposite to said upper portion of said handle when folding said pole means into said handle,



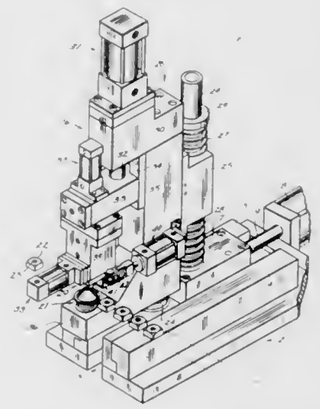
whereby upon a rotation of said head portion of said pole means, said display sheet will be wound on said pole means in said hollow handle.

4,920,911

APPARATUS FOR HIGH PRESSURE IMPACT COATING

Kenneth E. Gould, Vicksburg, and Eugene A. Hamilton, Mattawan, both of Mich., assignors to Peterson American Corporation, Southfield, Mich.

Continuation of Ser. No. 901,728, Aug. 29, 1986, Pat. No. 4,779,559, which is a division of Ser. No. 772,441, Sep. 4, 1985, Pat. No. 4,652,468. This application Oct. 17, 1988, Ser. No. 625,863
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.[5] B05B *15/04*, *13/06*
U.S. Cl. 118—301 5 Claims



1. In a machine for selectively locating and applying a coating to female threads on fasteners in avoidance of the coating material contaminating the balance of the threaded part, the combination comprising:
a main passage defined through a tooling head;
a perforate nozzle connected at one end of said main passage;
a first tapered rigidly resilient ring seal surrounding said nozzle;

a second rigidly resilient ring seal in spaced-apart aligned relation with said first ring seal;
means for closing and opening said ring seals toward registering axial contact with each other and for impinging upon an intermediate fastener axially aligned between said ring seals, said fastener presenting a threaded female opening therethrough and into which said nozzle is thrust;
a metering valve for admitting a charge of coating material under relatively low pressure into said main passage upstream of said nozzle; and
a high pressure valve located upstream of said metering valve and selectively opening to blast said charge by high pressure air through said nozzle into the sealed cavity defined by said threaded part of said fastener and the closure of said seals on said fastener and said cavity thus formed having a communicating passage through which said high pressure air and surplus coating material are dissipated to ambient conditions at a selected rate.

4,920,912

TIME DIAL FOR PHARMACEUTICAL CONTAINERS

William C. Kirkling, 601 E. 32nd St., Chicago, Ill. 60616

Filed Mar. 10, 1988, Ser. No. 166,555
Int. Cl.[5] G09F *9/40*
U.S. Cl. 116—308 **5 Claims**



1. A time dial for a pharmaceutical container cap, comprising:
(a) a member rotatably attached to said cap;
(b) a first indicator on one of said member or said cap;
(c) a first plurality of time marks representing hours on the other of said member or said cap, whereby rotation of said member aligns said first indicator with a select one of said first time marks;
(d) a second indicator on said one of said member or said cap, spaced from said first indicator; and
(e) a second plurality of time marks on said other of said member or said cap, whereby said rotation of said member aligns said second indicator with one of said second time marks the difference between said select one of said first time marks and said one of said second time marks representing a predetermined time interval.

4,920,913

DEVICE FOR COATING A WEB OF MATERIAL

Reinhard Knop, Bochum; Herbert Sommer, Düsseldorf, and Georg Müller, Neuss, all of Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 29, 1988, Ser. No. 226,175
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1987, 3725545
Int. Cl.[5] B05C *1/04, 3/12*
U.S. Cl. 118—410 **9 Claims**

1. In a device for coating a web of material that travels around a backing roller having an operating width and an axis of rotation, including a coating chamber that opens toward the backing roller, that extends over the operating width, and that has a slot, demarcated at the web-intake end by an overflow plate, for supplying liquid coating, and a flow-control system at the downstream end of the device, the improvement comprising means defining a coating-guide channel:
that extends over the operating width of the coating chamber and terminates just upstream of the flow-control system;
that is demarcated at one end by the backing roller and at the other by a baffle that essentially parallels the surface of the backing roller;
that extends along the direction of travel of the web at least about 50% of the distance between the overflow plate and the flow-control system;
that its width is from about 1.5 to 15% of its length; and
that terminates just upstream of the flow-control system.

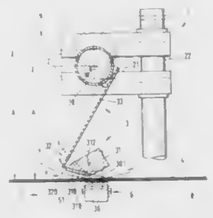


4,920,914

DOCTORING INSTALLATION AND DOCTORING DEVICE

Johannes Zimmer, Ebentaler Strasse 133, 9020 Klagenfurt, Austria

Filed Oct. 11, 1988, Ser. No. 255,604
Claims priority, application European Pat. Off., Oct. 10, 1987, 87730126; Oct. 10, 1987, 87730128; Fed. Rep. of Germany, Oct. 10, 1987, 3734747; Oct. 10, 1987, 8713789; Oct. 10, 1987, 8713788
Int. Cl.[5] B05C *1/06*
U.S. Cl. 118—419 **36 Claims**



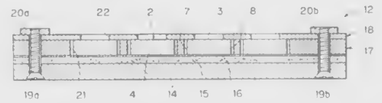
1. An apparatus for applying substances having differing viscosities to an application surface, comprising:
an angularly adjustable doctor device and means for variably positioning the doctor device including a mount;
said doctor device including a profile member having a first longitudinal axis, a doctor having a doctor pressing line guided by said profile member; and
a retaining member having opposite ends wherein one end of the retaining member is supported by the mount and the other end of the retaining member is pivotally connected to the profile member by a joint having a second longitudinal axis such that the pivoting of the profile member about the joint is caused by a change in a spacing of the mount with respect to the application surface.

4,920,915

WORK HOLDER FOR MASKING

Atsuo Senda; Toshi Numata; Tomoaki Ushiro; Takuji Nakagawa, and Masaaki Taniguchi, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 5, 1989, Ser. No. 361,500
Claims priority, application Japan, Jun. 7, 1988, 63-139826
Int. Cl.[5] B05C *1/02, 3/09*
U.S. Cl. 118—503 **15 Claims**



1. A work holder for holding a workpiece while partially masking the same, said work holder comprising:
mask means having a masking surface to be brought into contact with a part of a surface of said workpiece to be masked; and
elastic force applying means for elastically pressing said mask means and said workpiece against each other,
said elastic force applying means including an aggregate of heat-resistant fiber.

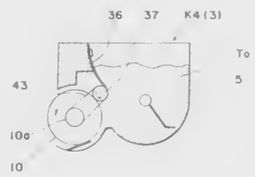
4,920,916

ELECTROSTATIC LATENT IMAGE DEVELOPING DEVICE

Hiroshi Mizuno; Toshiya Natasuhara; Yuji Enoguchi; Akihito Ikegawa; Masasi Yamamoto, and Hiroshi Murasaki, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1989, Ser. No. 323,854
Claims priority, application Japan, Mar. 16, 1988, 63-64525; Aug. 8, 1988, 63-197759; Aug. 22, 1988, 63-207740; Nov. 17, 1988, 63-291825
Int. Cl.[5] G03G *15/08*
U.S. Cl. 118—653 **25 Claims**





1. A developing device comprising:
a toner support member for supporting toner on its surface, which is so provided as to confront an electrostatic latent image support member; and
a regulation member for forming a thin layer of the toner on said toner support member;
said regulation member including a curved member for pressing said toner support member and a support member for supporting said curved member;
wherein an area S of a space satisfies an equation:

$$0<S\leqq 0.15\ mm^2$$

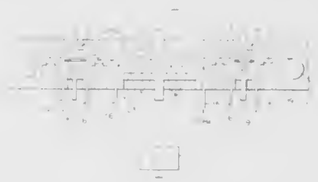
where the area is defined in a plane containing a circle of curvature of said toner support member and a circle of curvature of said curved member and is bounded by said toner support member, said curved member and a line;
the line being drawn in parallel with a normal extending through a point of contact between said toner support member and said curved member and being spaced a radius of curvature of said curved member from the normal at an upstream side of the normal in a direction of rotation of said toner support member.

4,920,917

REACTOR FOR DEPOSITING A LAYER ON A MOVING SUBSTRATE

Kenji Nakatani, Hino; Hiroshi Okaniwa, Hachioji, and Mitsuaki Yano, Osaka, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 11, 1988, Ser. No. 166,689
Claims priority, application Japan, Mar. 18, 1987, 62-61193; Mar. 31, 1987, 62-76384
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—718 **31 Claims**



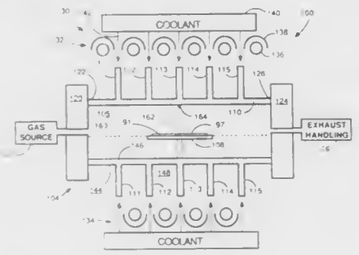
1. A reactor for depositing a layer on a moving substrate, said reactor comprising:
a reaction chamber having opposite ends;
opposite electrodes for electric discharge arranged in the reaction chamber, means for moving said substrate between the opposite electrodes from one end to the other end of the reaction chamber;
first means for feeding a reaction gas into the reaction chamber;
means for separating at least the space between the moved substrate and one of the opposite electrodes into a plurality of regions and substantially preventing a diffusion of a gas between the separated regions; and
a power source for supplying power between the opposite electrodes to excite the reaction gas to a plasma state;
whereby a layer having a modified depth composition profile may be deposited on the substrate.

4,920,918

PRESSURE-RESISTANT THERMAL REACTOR SYSTEM FOR SEMICONDUCTOR PROCESSING

David V. Adams, San Jose; Roger N. Anderson, Santa Clara, and Thomas E. Deacon, San Jose, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Apr. 18, 1989, Ser. No. 339,784
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—724 28 Claims



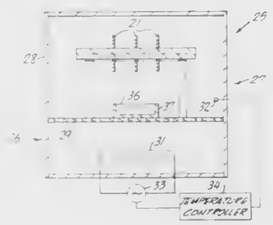
1 A reaction vessel comprising:
an elongated quartz tube having a wall with an inner surface and an outer surface, said tube defining a longitudinal axis, where a cross-section of said tube taken perpendicularly to said longitudinal axis is non-circular; and
external reinforcement means attached to said outer surface of said wall to resist pressure applied against said wall.

4,920,919

METHOD AND DEVICE FOR DEPOSITING A LUBRICANT LAYER TO MANUFACTURE A MAGNETIC RECORDING MEDIUM

Takeo Matsudaira, and Hisanori Suzuki, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Division of Ser. No. 162,023, Feb. 29, 1988, Pat. No. 4,882,197.
This application Sep. 5, 1989, Ser. No. 402,364
Claims priority, application Japan, Feb. 27, 1987, 62-45471
Int. Cl.[5] C23C *14/24*
U.S. Cl. 118—725 4 Claims



1. Apparatus for depositing a lubricant layer on a protection layer formed on a magnetic base to fabricate a magnetic recording medium, said apparatus comprising:
a chamber defining a hollow space therein;
a mesh partition substantially horizontally disposed in said hollow space to divide said hollow space into upper and lower chambers;
a vessel on said mesh partition in said upper chamber to store said lubricant;
holding means for holding a magnetic base substantially vertically relative to said mesh partition;
a frame member supporting said holding means over said vessel in said upper chamber; and
temperature controlling means for controling the temperature in said upper chamber outside said vessel, said temperature controlling means comprising;
a temperature sensor located outside said vessel within said hollow space for sensing the temperature in said hollow space;
a heater located in said lower chamber for electrically heating said hollow space; and
a temperature controller connected to said temperature sensor and to said heater for controlling said heater in response to the temperature in said hollow space to keep said temperature substantially constant.

4,920,920

APPARATUS FOR PRODUCING SEMICONDUCTOR DEVICES

Susumu Shigeki, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 23, 1988, Ser. No. 235,164
Claims priority, application Japan, Aug. 25, 1987, 62-210584
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—725 10 Claims



1. An apparatus for producing semiconductor devices comprising:
a hollow reaction tube having opposed first and second ends;
reaction gas supplying means provided on said first end of said reaction tube for introducing a reaction gas into said reaction tube to flow toward said second end;
a boat received in said reaction tube for carrying a multiplicity of semiconductor wafers having a diameter, arranged in a row, and held transverse to said gas flow;
a flow stabilizing member disposed in said reaction tube near the second end of said reaction tube, said flow stabilizing member having a maximum diameter substantially the same as that of wafers held in said boat, the cross-sectional area of said flow stabilizing member progressively decreasing toward said second end of said reaction tube; and
a duct provided on said second end of said reaction tube for discharging reaction gas to the exterior of said apparatus.

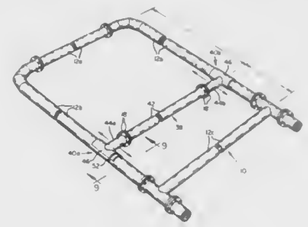
4,920,921

MODULAR AQUACULTURE FISH PEN ASSEMBLY WITH SLIDABLE DIVIDER

Gordon M. Ochs, 5001 P St., Washougal, Wash. 98671

Continuation-in-part of Ser. No. 176,604, Apr. 1, 1988, Pat. No. 4,886,015. This application Jul. 25, 1988, Ser. No. 223,910
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—3 12 Claims

1. A flotation support collar assembly for an aquaculture fish pen comprising:
(a) a perimetrical collar including a plurality of elongate members substantially defining a perimeter, said collar defining a plane, said elongate members lying within said plane;
(b) an elongate pen divider having two ends and a central section interconnecting said ends, said divider lying within said plane and extending between said elongate members so as to partition a portion of said plane which lies within said perimeter;
(c) said pen divider and said collar including flotation means for supporting said support collar assembly upon the surface of the water; and
(d) at least one of said ends of said pen divider having connector means, also lying within said plane, for movably



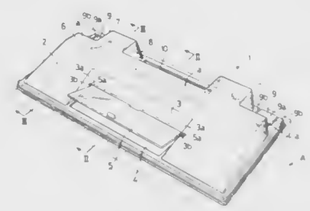
engaging one of said elongate members so as to enable said connector means to be moved longitudinally along said elongate member and change said portion of said plane partitioned by said divider.

4,920,922

AQUARIUM LID

Kazutoshi Tominaga, Higashi Osakashi, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Higashi Osakashi, Japan

Filed Feb. 1, 1989, Ser. No. 305,366
Int. Cl.[5] A01K *64/00*
U.S. Cl. 119—5 1 Claim



1. A lid for covering an aquarium for household use, said lid comprising a clear plastic body through which light readily passes into the interior of the aquarium, said plastic body having a front wall with a feeder port closed by a pivotal cover connected thereto, said front wall having a rising portion and a flat top portion with three recesses opening into the interior of the aquarium and adapted to accept aquarium accessories, said flat top portion having a longitudinal, protruding brim portion toward the rear section of the lid, said protruding brim being sufficiently high to be at least flush with the top surface of any aquarium accessory associated with said recesses opening into the interior of the aquarium.

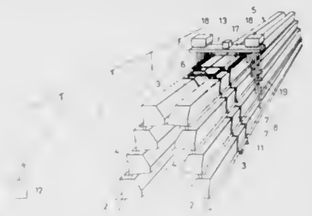
4,920,923

POULTRY BREEDING METHOD

Minoru Hosoya, 412 Fukaya, Ayase-ski, Kanagawa-ken, Japan

Filed Apr. 19, 1988, Ser. No. 183,250
Claims priority, application Japan, Aug. 22, 1987, 62-207410
Int. Cl.[5] A01K *39/012*
U.S. Cl. 119—51.02 1 Claim

1. A poultry breeding method comprising the steps of:
(a) providing a cage device comprising a frame standing on a base and having installed thereon a plurality of cage tiers each comprising a row of horizontally arranged cages;
(b) incorporating in the cage device an independent cage section comprising a plurality of cages supported on a suspension frame;
(c) providing the cage device with feed troughs, water supply means, and egg conveyor belts disposed not to make contact with the independent cage section;
(d) providing the inside of each cage of the independent cage section with a weight sensor means for producing an electric signal representing the actual cumulative weight



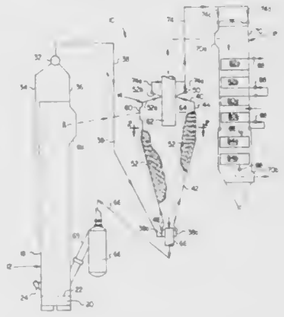
of all hens housed in the cages of the independent cage section;
(e) applying the electric signal from the weight sensor means to an electronic control device having stored therein ideal hen weight data relating to the hens housed in the cages;
(f) comparing the ideal hen weight data with the actual weight represented by the electronic signal; and
(g) using the result of the comparison for controlling the operation of a device for supplying feed to the hens in an amount which enables the hens to be constantly maintained at their ideal weight and their fecundity to be increased.

4,920,924

FLUIDIZED BED STEAM GENERATING SYSTEM INCLUDING A STEAM COOLED CYCLONE SEPARATOR

Iqbal F. Abdulally, Randolph; Alfred S. Touma, West Caldwell, and Peter Bartkowiak, Denville, all of N.J., assignors to Foster Wheeler Energy Corporation, Clinton, N.J.

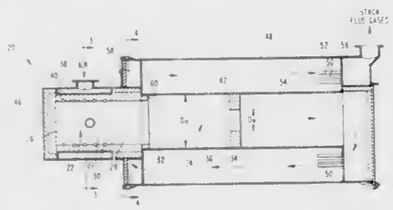
Filed Aug. 18, 1989, Ser. No. 395,865
Int. Cl.[5] F22B *1/00*
U.S. Cl. 122—4 D 13 Claims



1. A fluidized bed steam generating system comprising:
(A) a furnace section comprising:

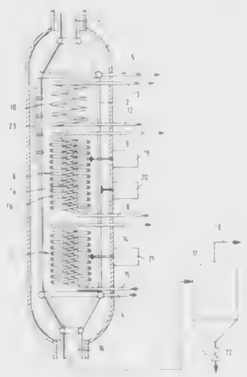
(1) an enclosure containing solid particulate material including fuel; and
(2) means for introducing air into said enclosure at a velocity sufficient to fluidize said particulate material and support combustion or gasification of said fuel to produce flue gases which rise in said enclosure and entrain a portion of said particulate material;
(B) a cyclone separator comprising:
(1) an inner cylinder; and
(2) an outer housing surrounding said inner cylinder for forming chamber, said outer housing comprising:
(a) a plurality of parallel tubes; and
(b) means connecting said tubes to form an air tight structure;
(C) a heat recovery section comprising:
(1) an enclosure comprising:
(a) a plurality of parallel tubes; and
(b) means connecting said tubes to form an air tight structure;
(2) a plurality of bundles of tubes disposed in said enclosure;
(D) means for passing said flue gases from said furnace section to said chamber for separating said entrained particulate material from said flue gases by centrifugal forces;
(E) means passing the separated particulate material from said separators back to said furnace section;
(F) means passing the separated flue gases to said heat recovery section; and
(G) fluid flow circuit means comprising:
(1) a steam drum;
(2) means for connecting said steam drum to said tubes forming said outer housing of said separator for passing steam to said outer housing to cool said separator; and
(3) means for connecting said tubes forming said outer housing to said tubes of said heat recovery section so that fluid passing through said latter tubes is heated by said separated flue gases.

4,920,925
BOILER WITH CYCLONIC COMBUSTION
Jacob Korenberg, York, Pa., and Mark Khinkis, Morton Grove, Ill., assignors to Donlee Technologies Inc., York, Pa.
Continuation of Ser. No. 186,734, Apr. 22, 1988, abandoned, which is a continuation of Ser. No. 928,096, Nov. 7, 1986, abandoned. This application Mar. 29, 1989, Ser. No. 332,395
Int. Cl.[5] F22B *7/12*
U.S. Cl. 122—149 14 Claims



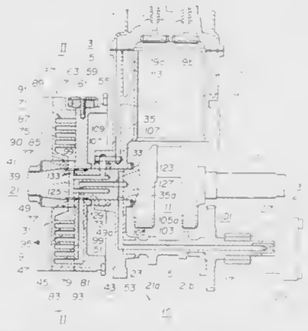
1. A boiler having a cyclonic combustor, comprising:
A first chamber having a front end, a rear end and a substantially cylindrical longitudinally extending outer wall which is substantially uncooled and refractory lined;
a second chamber having a front end, a rear end and a substantially cylindrical longitudinally extending outer wall, the rear end of the first chamber in fluid communication with and substantially longitudinally aligned with the front end of the second chamber;
means for supplying air and fuel directly into the first chamber and for forming a cyclonic flow pattern of hot gases for combustion within the first chamber and the second chamber;
a substantially cylindrical exit throat at the rear end of the second chamber and aligned concentrically therewith for exhausting hot gases from the second chamber, the exit throat having a diameter less than the inner diameter of the second chamber for inducing reverse flow zones within the first and second chambers; and
heat exchange means surrounding the second chamber for substantially cooling the wall of the second chamber without substantially cooling the wall of the first chamber.

4,920,926
WASTE HEAT BOILER FOR COOLING OF PARTIAL OXIDATION CRUDE GAS
Adolf Linke, Essen; Karl-Heinz Dutz, Herten; Hans Niermann, Essen, and Gerhard Wilmer, Hattingen, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany
Filed Nov. 1, 1988, Ser. No. 265,596
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3737359
Int. Cl.[5] F22B *37/18, 37/48*
U.S. Cl. 122—379 9 Claims



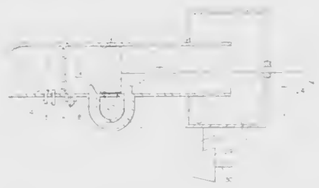
1. A waste heat boiler for cooling partial oxidation crude gas, comprising a pressure container a crude gas-clean gas heat exchanger extending in said container in a predetermined direction for using tangible heat of the partial oxidation crude gas generated during cooling thereof; a tubular body formed as a tubular basket and arranged in said pressure container, said crude gas-clean gas heat exchanger being arranged inside said tubular basket; and heat exchanging surfaces associated with said crude gas-clean gas heat exchanger and arranged at both sides of said heat exchanger as considered in said direction in a spaced relationship relative to said heat exchanger for additionally using the tangible heat of the partial oxidation crude gas.

4,920,927
COOLING STRUCTURE FOR LIQUID-COOLED ENGINE
Haruo Tsusaka, Tokyo; Hirohisa Ishikawa, Saitama; Akihisa Shinoda, Saitama, and Motohiro Fujita, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 6, 1988, Ser. No. 280,474
Claims priority, application Japan, Dec. 7, 1987, 62-308974; Dec. 7, 1987, 62-308975
Int. Cl.[5] F01P *3/00*
U.S. Cl. 123—41.43 16 Claims



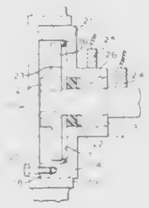
1. A cooling structure for cooling a liquid-cooled engine having cooling passages therein for circulation of a liquid cooling medium therethrough, said cooling structure comprising:
a rotatable assembly located outside of the engine and driven by the engine, said assembly comprising a shaft extending through at least a portion of the engine and an auxiliary rotatable element mounted on a portion of said shaft which projects out of the engine;
said auxiliary element comprising a disc element having at least first and second axially divided portions, a portion thereof comprising a sinuous passage for lowering the temperature of a liquid cooling medium; and
means for connecting a liquid medium of said engine to said auxiliary element for circulation through said sinuous passage.

4,920,928
MOMENTUM ENGINE
Robert B. Hammett, 107 Riverdale Dr., Covington, La. 70433
Continuation-in-part of Ser. No. 801,423, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 583,665, Feb. 27, 1984, abandoned. This application Oct. 13, 1987, Ser. No. 121,066
Int. Cl.[5] F01B *11/00*
U.S. Cl. 123—46 SC 31 Claims



1. Apparatus generating pressurized gas from the combustion of fuel comprising:
a piston fitted to a casing, said piston being able to accelerate when acted on by gas pressure;
a chamber to one side of said piston providing for the combustion of fuel;
a first port in said casing being opened by the travel of said piston;
a second port in said casing being closed by the further travel of said piston;
and a channel communicating said first port to said second port so that the closure of said second port by said piston prevents flow in said channel.

4,920,929
VARIABLE SPEED COUPLING SYSTEM FOR COOLING AN ENGINE
Edward T. Bishop, Northants, United Kingdom, assignor to Jaguar Cars Limited, England
Filed Nov. 18, 1988, Ser. No. 273,260
Claims priority, application United Kingdom, Nov. 18, 1987, 8726966
Int. Cl.[5] F01P *7/10*
U.S. Cl. 123—41.49 7 Claims



1. An engine cooling fan comprising a first member which is adapted to be drivingly connected to the engine and second member mounted rotatably relative to the first member, a series of fan blades being provided on said second member, said first and second members having opposed parallel faces separated from one another, the space between said faces being filled with a fluid the viscosity of which may be varied by applying a magnetic or electric field and means being provided responsive to engine operating parameters to apply a magnetic or electric field to the fluid whereby the strength of the magnetic or electric field applied to the fluid is determined by said operating parameters to vary transmission of rotational energy from the first member to the second member to provide a desired transmission ratio therebetween up to the maximum possible transmission ratio.

4,920,930
SYSTEM FOR BLOW-BY GAS RETURN TO THE COMBUSTION CHAMBER OF AN ENGINE
Kenji Sakano; Hideyuki Nakashima; Hiroo Sakanaka, and Kazutoshi Okamoto, all of Sakaishi, Japan, assignors to Kubota Limited, Osaka, Japan
Continuation of Ser. No. 626,785, Jul. 2, 1984, abandoned. This application Dec. 9, 1987, Ser. No. 133,250
Claims priority, application Japan, Jun. 30, 1983, 58-102392[U]
Int. Cl.[5] F01M *13/00*
U.S. Cl. 123—41.86 5 Claims

1. A system for blow-by gas return to the combustion chamber of an engine having an air filter, the engine also having an oil separator with an inlet and an outlet that communicate with each other through a diffusion chamber and a filter element therein, with said inlet communicating with the crankcase via an inlet pipe and said outlet communicating with the intake manifold of the engine via an outlet pipe, the system comprising:
a breather disposed on a cylinder head cover of said crankcase and communicating therewith through an internal

engine passage, the breather having an outlet communicating with an inlet end of said inlet pipe communicating with the oil separator;

fixing means separate from said inlet and outlet pipes for fixing said oil separator upon said intake manifold in a position to receive heat from the engine during use;

said inlet pipe communicating said breather with said oil separator and said outlet pipe communicating said oil separator to said intake manifold being disposed in a space over said cylinder head and said intake manifold to receive heat therefrom during use; and



an atmospheric passage enabling communication between said diffusion chamber in said oil separator and the atmosphere to enable an air flow received through the atmospheric passage to mingle with a flow of blow-by gas from which entrained oil has been substantially removed when the intake manifold pressure is below a predetermined low value and to enable outflow of said blow-by gas to the atmosphere through the atmospheric passage when said pressure of said flow of blow-by gas flowing from the engine crankcase to the diffusion chamber of the oil separator exceeds a predetermined high value.

4,920,931

TWO CYCLE ENGINE WITH VANED DIFFUSING EXHAUST PORT

Edward D. Klomp, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1989, Ser. No. 369,381
Int. Cl.[5] F02B *75/02*
U.S. Cl. 123—65 PE 4 Claims



1 A two cycle internal combustion engine having a cylinder with a piston reciprocable therein and at least one exhaust port opening through the cylinder between opposite ends thereof and opened and closed by reciprocating motion of the piston in the cylinder to control the passage of exhaust gas from the cylinder, said exhaust port having side walls extending from an inlet at said opening through the cylinder to an outlet spaced from the inlet and at least two opposite portions of said side walls diverging in the direction toward the outlet to provide increasing cross sectional area and diffusing gas flow in the port, and the improvement comprising

vane means in said port and dividing the flow path therethrough into a plurality of adjacent passages spaced axially of the cylinder so that they are serially opened by piston motion, at least the first opened of said passages being shaped as diffusers to provide substantial recovery of pressure from the blowdown of pressurized exhaust gases delivered to said port during engine operation.

4,920,932

RELATING TO CONTROLLING EMISSIONS FROM TWO STROKE ENGINES

Christopher K. Schlunke, Kingsley, Australia, assignor to Orbital Engine Company Pty. Ltd., Balcatta, Australia

Filed Mar. 21, 1989, Ser. No. 326,836
Claims priority, application Australia, May 24, 1985, PH0729
Int. Cl.[5] F02B *33/04*
U.S. Cl. 123—65 PE 39 Claims



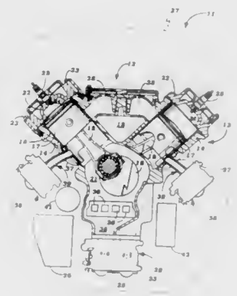
1 A method of operating an internal combustion engine on the two stroke cycle to control the level of contaminants in the exhaust gases, the engine having a cylinder, a piston mounted to reciprocate in the cylinder, said piston and cylinder defining a combustion chamber that cyclically varies in volume as the piston reciprocates, an air inlet port providing communication between the combustion chamber and a source of air, and an exhaust port providing communication between the combustion chamber and an exhaust duct, said inlet and exhaust ports being arranged to be opened and closed by the piston as it reciprocates in the cylinder, said method comprising admitting a charge of air to the combustion chamber through the inlet port, compressing the charge of air in the combustion chamber by the movement of the piston after the inlet and exhaust ports have been closed, injecting a metered quantity of fuel into the air charge in the combustion chamber, igniting said fuel charge, and exhausting the products of combustion through the exhaust port after expansion in the combustion chamber, sensing the engine load demand and engine speed while the engine is operating, and regulating the mass of the products of combustion retained in the combustion chamber at closure of the ports so hydrocarbons present in the exhausted products of combustion are in predetermined limits by controlling the flow of gases through the exhaust port while open in relation to engine speed and load to provide a plurality of predetermined rates of gas flow in the combustion chamber over the full range of engine speeds and loads, said controlling including adjusting the degree of throttling of the exhaust port through a range of values between a minimum and a maximum, said degree of throttling of the exhaust port being preset in relation to engine load and speed.

4,920,933

V-SHAPED TWO CYCLE ENGINE FOR OUTBOARD

Tomio Iwai, and Masanori Takahashi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 19, 1988, Ser. No. 183,653
Claims priority, application Japan, Apr. 21, 1987, 62-97879
Int. Cl.[5] F02M *1/16*
U.S. Cl. 123—73 A 6 Claims



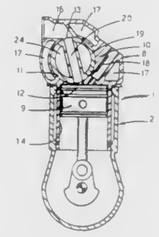
1. In a two cycle, crankcase compression internal combustion engine comprising first and second cylinder banks disposed at an angle to each other and defining a valley therebetween, a crankcase chamber, and primary means for admitting a fuel air charge to said crankcase chamber at a first location, the improvement comprising secondary means for admitting a supplemental fuel air charge to said crankcase chamber, said secondary means being located in an area spaced from said primary means.

4,920,934

ROTARY VALVE INTERNAL COMBUSTION ENGINE

Marco Pizzicara, Brescia, Italy, assignor to Duebi S.R.L., Varese, Italy

Filed Jun. 2, 1989, Ser. No. 360,391
Claims priority, application Italy, Jun. 9, 1988, 3498 A/88
Int. Cl.[5] F01L *7/00*
U.S. Cl. 123—80 BA 10 Claims



1. A rotary valve internal combustion engine, comprising:

a crankcase, affording at least one bore extending from an enclosure that is occupied by a crankshaft passing through and supported by the walls of the crankcase and disposed normal to the axis of the bore, of which the walls encompassing the bore afford at least one set of first coaxial cylindrical holes, located at the end of the bore farthest from the enclosure and disposed with axes parallel to that of the crankshaft;

at least one cylindrical liner accommodated slidably in each bore of the crankcase, of which the end farthest from the enclosure merges with a head exhibiting at least one set of transversely disposed second coaxial holes, substantially equal in diameter to the first coaxial holes of the crankcase, which, with the liner occupying the respective bore of the crankcase, combine with the first set of holes to form at least one continuous bore extending parallel to the crankshaft axis; wherein each liner affords an axial bore with one open end directed toward the crankshaft enclosure, slidably and tightly accommodating a relative piston that is connected mechanically to the crankshaft, and combining with the piston to create a relative combustion chamber, each of the second holes connects by way of relative ports with the respective combustion chamber and with one or more inlet and/or exhaust ducts formed in and emerging externally of the head, and the head affords at least one hole extending from the outside wall toward the respective combustion chamber, serving to accommodate means for igniting or injecting a combustible mixture in or into the respective combustion chamber;

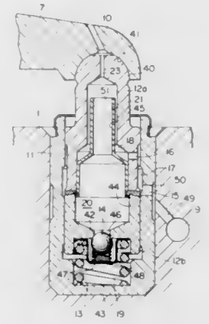
at least one cylindrical valve element or rotor, accommodated rotatably internally of the first and second holes in the crankcase and the heads and providing means for assembly of the crankcase and head one with the other, connected mechanically to the crankshaft, and affording transverse passages designed to coincide cyclically with the inlet and exhaust ports.

4,920,935

HYDRAULIC VALVE LASH ADJUSTER

Toshimitsu Shida, Fujisawa, Japan, assignor to Fuji Valve Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1989, Ser. No. 332,598
Claims priority, application Japan, Jul. 13, 1988, 63-92857[U]
The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.
Int. Cl.[5] F01L *1/24*
U.S. Cl. 123—90.51 3 Claims



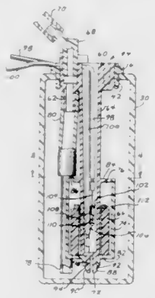
1. A hydraulic valve lash adjuster which includes a cylindrical body; a hollow plunger slidably received within the body and having a reservoir formed therein; a generally cylindrical partition member placed within the plunger to increase the reservoir capacity; and check valve means for permitting oil to flow only from the reservoir into a high-pressure chamber defined between the bottom wall of the body and the bottom wall of the plunger; characterized in that the plunger comprises an upper plunger portion and a lower plunger portion, and the upper and lower plunger portions are welded together with the partition member so that the partition member is sealingly fixed within the plunger.

4,920,936

MARINE OUTBOARD DRIVE WITH OIL TANK DRAW TUBE AND INDICATOR

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jun. 2, 1989, Ser. No. 360,274
Int. Cl.[5] F01M *1/00*
U.S. Cl. 123—196 S 22 Claims



1. A marine outboard drive unit having a two-cycle internal combustion engine, an oil storage tank storing lubricating oil for said engine, an assembly mounted to said tank and extending into said tank for drawing oil from aid tank and indicating the amount of oil in said tank.

4,920,937

DIRECT FUEL INJECTION TYPE SPARK IGNITION INTERNAL COMBUSTION ENGINE HAVING A SQUISH FLOW FOR ASSISTING FUEL EVAPORATION

Shizuo Sasaki, and Yoshiyuki Tamaki, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 8, 1989, Ser. No. 307,480
Claims priority, application Japan, Feb. 26, 1988, 63-42133
Int. Cl.[5] F02B *23/10*
U.S. Cl. 123—305 15 Claims



1. A direct fuel injection type spark ignition internal combustion engine comprising:

a piston/cylinder structure including a cylinder, a piston reciprocally movable in the cylinder, and a cylinder head, wherein fuel is directly injected into the cylinder onto a surface of one of the piston and the cylinder head, the fuel adhering to the surface being evaporated at the surface by heat at the surface and being assisted in evaporation by an air flow generated in the cylinder, the evaporated fuel subsequently being ignited;

a squish portion defined between two squish portion defining surfaces that include one portion of an upper surface of the piston and one portion of a lower surface of the cylinder head and are located in one half cross-section of the cylinder, the squish portion generating a squish flow as the air flow in the cylinder for assisting fuel evaporation when the piston is moved near a top dead center, the squish portion having a closed end defined by one portion of an inside surface of the cylinder and an open end opening in a direction toward a center of the cylinder, the squish portion being enlarged in the direction toward the center of the cylinder so that a central portion of the open end of the squish portion is located adjacent to the center of the cylinder;

a fuel injector for injecting fuel located adjacent to a central portion of the closed end of the squish portion, the fuel injector being directed so as to inject at least one portion of the fuel onto one of the squish portion defining surfaces so that the fuel adhering to the one squish portion defining surface is assisted in evaporation by the squish flow; and

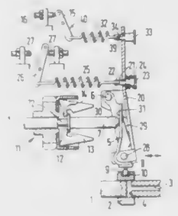
a spark plug located adjacent to the center of the cylinder so as to oppose the central portion of the open end of the squish portion, the spark plug igniting the evaporated fuel blown toward the spark plug by the squish flow.

4,920,938

GOVERNOR FOR FUEL INJECTION PUMPS

Manfred Schwarz, Gerlingen; Wolfgang Braun, Ditzingen, and Carlos Alverez-Avila, Freiberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,806
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743060
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—373 10 Claims



1. A governor for a fuel injection pump of a combustion engine which comprises a one-armed drag lever (**20**) that pivots around a drag lever pivot pin (**28**), said drag lever (**20**) being contacted by a regulating spring (**25**) that is adjustable against a movable sleeve of a speed-dependent force, said governor including a start lever (**5**) coupled at one end to a quantity control slide (**2**) of the fuel injection pump, said starting lever (**5**) being moved, in a first control range, a distance toward the drag lever (**20**) in a direction of increasing fuel injection quantity by said sleeve of the speed-dependent force against the force of a start spring (**29**) that is supported against the drag lever (**20**), said distance being limited by a stop member, and said starting lever (**5**), in a second control range subsequent to the first, being disposed pivotably together with the drag lever (**20**) against the force of the regulating spring (**25**) in a direction of decreasing injection quantity, and as speed increases the start lever (**5**) is able to pivot in the first control range opposite the pivoting motion in the second control range due to movement of said sleeve of said speed dependent force.

4,920,939

POSITION SENSOR MONITORING SYSTEM

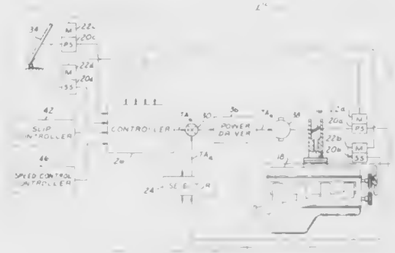
Allan R. Gale, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 27, 1989, Ser. No. 316,191
Int. Cl.[5] F02D *11/10;* F02B *77/08*
U.S. Cl. 123—399 21 Claims

1. An operating condition monitoring apparatus for a position sensor coupled to a control device, comprising:

said position sensor comprising a potentiometer having a main resistor coupled between a node and an electrical return, and a wiper arm responsive to actual position of the control device and electrically coupled to said main resistor;

a sense resistor connected in series between said node and a source of electrical power; and



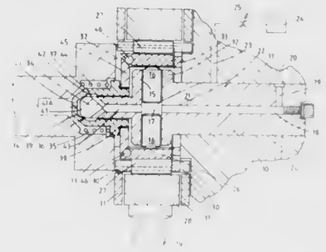
comparison means for comparing electrical power through said sense resistor to a predetermined range to provide an indication of the operation of said main resistor independently of wiper arm position.

4,920,940

FUEL PUMPING APPARATUS

Kenneth M. Harris, Maidstone; George N. Felton; Peter A. G. Collingborn, both of Gillingham; Christopher Stringfellow, Sittingbourne, and Godfrey Greeves, Hatch End, all of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Jan. 13, 1989, Ser. No. 297,413
Claims priority, application United Kingdom, Jan. 16, 1988, 8800957; Jan. 16, 1988, 8800955; May 27, 1988, 8812651
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—450 10 Claims



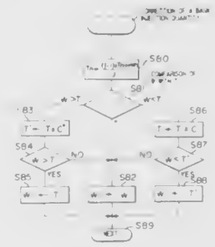
1. A fuel pumping apparatus for supplying fuel to an internal combustion engine, comprising: a body, a rotary distributor member housed in said body, a drive shaft coupled to said distributor member, said drive shaft being driven in timed relationship with an associated engine, a pumping plunger disposed in a bore in said distributor member, a plurality of cam lobes, said cam lobes imparting inward movement to said plunger upon rotation of said distributor member, a low pressure pump, said low pressure pump supplying fuel to said bore to effect outward movement of said plunger, fuel distribution means for delivering fuel from said bore to a plurality of outlet ports, a movable member and said distributor defining an accumulator volume, a seating defined on said distributor member, a spill passage extending from said bore, a seating defined on said distributor member about said spill passage, a valve element formed on said movable member, said valve element cooperating with said seating, and means operable to impart initial movement to said movable member to lift said valve element from said seating to allow fuel to escape from said bore into said accumulator volume, the fuel flowing into said accumulator volume acting on said member to displace said valve element further from said seating, the fuel in said accumulator volume being returned to said bore at the onset of the next bore-filling period.

4,920,941

FUEL INJECTION CONTROL APPARATUS

Toyoaki Fukui; Shogo Omori, both of Kyoto, and Masanobu Uchinami, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 189,802, May 3, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 382,040
Claims priority, application Japan, May 7, 1987, 62-112826
Int. Cl.[5] F02D *41/34*
U.S. Cl. 123—492 3 Claims



1. A fuel injection control apparatus which comprises:

a load detecting means to detect a load to an engine to thereby generate a signal;

a basic injection quantity operating means to operate said signal so as to obtain the pulse width of a basic fuel-injection time for a fuel injector in response to the condition of load,

means for a calculating an average weighted value of said pulse width,

first limiting means for comparing said average weighted value with said pulse width and for adjusting said average weighted value by a limit value correction coefficient if said average weighted value does not equal said pulse width, said limit value correction coefficient being determined only by engine revolutions and load,

a second limiting means for comparing said pulse width with said adjusted average weighted value and for assigning a second pulse width for an actual fuel-injection time based on this comparison;

wherein the basic fuel-injection time, rather than the average weighted value, is used during idling.

4,920,942

METHOD AND APPARATUS FOR SUPPLYING FUEL TO INTERNAL COMBUSTION ENGINES

Kyoichi Fujimori, and Masaki Sano, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,127
Claims priority, application Japan, Apr. 24, 1987, 62-99911; Apr. 24, 1987, 62-99912; Sep. 25, 1987, 62-145347[U]
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—497 12 Claims

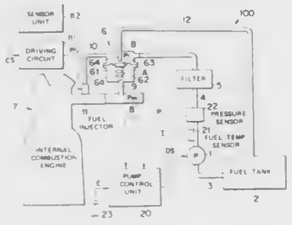
1. A fuel supplying system in which fuel in a fuel supply means is pressurized by means of a fuel supply pump and is supplied to an internal combustion engine; said system comprising:

a pressure regulating member for regulating the pressure of

pressurized fuel derived from said fuel supply pump by returning surplus fuel to said fuel supply means so as to maintain the difference between an output fuel pressure of said fuel supply pump and an inner pressure of an intake manifold of said engine at a prescribed constant value;

a fuel injecting member for injecting into said engine the fuel regulated in pressure by said pressure regulating member;

a sensing means for sensing the pressure of fuel delivered by said fuel supply pump, said sensing means being incorporated in said fuel supply pump; and,



a control means incorporated in said fuel supply pump and responsive to said sensing means for controlling the amount of fuel delivered by said fuel supply pump in accordance with the pressure of fuel delivered from said fuel supply pump so that the amount of surplus fuel produced by the pressure regulating operation of said pressure regulating member and returned to the fuel supply means is effectively reduced.

4,920,943

COVER FOR THE VALVE ROCKER COMPARTMENT OF INTERNAL COMBUSTION ENGINES, WITH A LUBRICATING OIL ANTI-SUCKING DEVICE

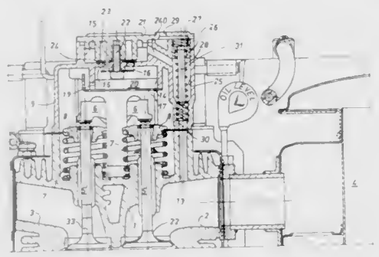
Angelo Castellari, Reggio Emilia, Italy, assignor to Lombardini Fabbrica Italiana Motori S.p.A., Reggio Emilia, Italy

Filed May 10, 1989, Ser. No. 349,638

Claims priority, application Italy, May 13, 1988, 46847 A/88

Int. Cl.[5] F02B *25/06*

U.S. Cl. 123—572 **4 Claims**



1. A cover for a valve rocker compartment of an internal combustion engine, of the type consisting of a hollow shaped casing for housing rockers which operate the engine intake and exhaust valves, which comprises a duct system communicating with the air intake manifold and intercepted by a valving member which is elastically urged towards its open position with a force which exceeds the maximum pulling force exerted on the valving member by the vacuum in the manifold during normal engine operation, but which is less than the pulling force exerted on said valving member by a vacuum of such a vale as to draw up lubricating oil from the crankcase.

4,920,944

IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE WITH TWO SPARK PLUGS PER CYLINDER

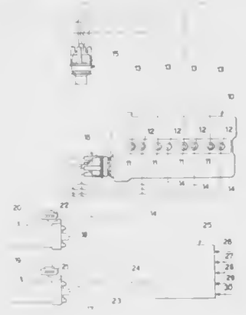
Paolo Lanati, Piacenza; Alessandro Piccone, Milan, and Domenico D'Angelo, Monza, all of Italy, assignors to Alfa Lancia Industriale S.p.A., Arese, Italy

Filed Jun. 5, 1989, Ser. No. 361,282

Claims priority, application Italy, Jun. 9, 1988, 20914 A/88

Int. Cl.[5] F02P *15/08*

U.S. Cl. 123—638 **4 Claims**



1. An ignition device for an internal combustion engine provided with two spark plugs (**11** and **12**) per cylinder, comprising a first and a second spark distributor (**15** and **16**), a first and a second ignit on coil (**19** and **20**), first and second switch means (**21** and **22**), control centre (**25**) and sensors for prechosen engine parameters (**26–30**), a first set of spark plugs (**11**) being operationally connected to said first spark distributor (**15**) and to said first ignition coil (**19**), and a second set of spark plugs (**12**) being operationally connected to said second spark distributor (**16**) and to said second ignition coil (**20**), said first switch means (**21**) being operationally connected to said first coil (**19**) and to said control centre (**25**), and said second switch means (**22**) being operationally connected to said second coil (**20**) and to said control centre (**25**), said control centre (**25**) being operationally connected to said sensors (**26–30**) and comprising processor means arranged to feed to said switch means (**21** and **22**) control signals for the activation of said spark plugs (**11** and **12**) in accordance with said engine parameters, the device being characterised in that said processor means (**25**) are able to feed said control signals to said first and second switch means (**21** and **22**) for predetermined values of determined engine parameters, and are able to feed said control signals alternately to said first and second switch means (**21, 22**) for other predetermined values of said determined engine parameters.

4,920,945

METHOD FOR DRESSING GRINDING WHEELS

Horst J. Wedeniwski, Beutelsbacher Strasse 8/1, D-7064 Remshalden-Grunbach, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 288,014

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743812; Apr. 8, 1988, 3811782

Int. Cl.[5] B24B *53/00*

U.S. Cl. 125—11.03 **11 Claims**

1. A method for dressing grinding wheels, said grinding wheels having a peripheral layer consisting of an embedding compound with cubic boron nitride (CBN) grains embedded therein and portions of said grains protruding therefrom, said peripheral layer having a cylindrical or conical surface with a straight generatrix line, said method utilizing a dressing roll with dressing crystals protruding therefrom with portions of said crystals, said method comprising the steps of:

rotating said grinding wheel at a first circumferential speed about a first axis in a first rotational direction;

rotating said dressing roll at a second circumferential speed about a second axis being essentially parallel to said generatrix line, in a second rotational direction being opposite to said first rotational direction;

approaching said dressing roll and said grinding wheel relative to each other such that said dressing roll and said grinding wheel contact each other at said generatrix line with said protruding grain portions engaging said protruding crystal portions;



displacing said dressing roll in a first feed direction along said generatrix line with a first, higher feed speed being set such that said grain portions are elastically deflected by said crystal portions while said embedding compound is set back between said grains;

displacing said dressing roll in a second direction along said generatrix line with a second feed, lower feed speed being set such that tips of said grain portions are broken by said crystal portions.

4,920,946

BLADE CUTTING APPARATUS FOR HARD BRITTLE MATERIAL

Akio Kuromatsu, Yokohama, Japan, assignor to Applied Magnetic Lab. Co., Ltd., Kanagawa, Japan

Filed Dec. 30, 1987, Ser. No. 139,752

Claims priority, application Japan, Mar. 3, 1987, 62-48354; Mar. 3, 1987, 62-31009[U]; Oct. 2, 1987, 62-249210

Int. Cl.[5] B24B *27/06, 17/00*

U.S. Cl. 125—11.01 **17 Claims**



1. Apparatus for facilitating cutting of a hard workpiece with an elongate metal band blade maintained under tension and reciprocated with a longitudinal cutting edge of the blade pressed against the workpiece, comprising:

an abrasive electrically conductive layer attached to the blade at said longitudinal cutting edge;

a first power source, connected to the blade and to an electrode that is held close to the abrasive layer for selectively applying a continuous or intermittent voltage difference between the blade and the electrode so as to provide a predetermined electrical polarity to the blade;

means for supplying an electrically conductive processing fluid to at least a processing portion between said blade and said workpiece and between said blade and said electrode; and

a second power source for selectively applying a continuous or intermittent second voltage difference between said blade and said workpiece,

wherein said first power source is connected to said blade and to said electrode so as to provide a positive pole at said blade and said second power source is connected to said blade and said workpiece so as to provide a positive pole at said workpiece.

4,920,947

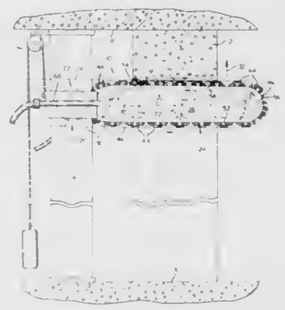
CHAIN SAW COMPONENTS AND SYSTEM FOR CUTTING MASONRY AND THE LIKE

Lewis A. Scott, Lake Oswego; Francis E. Hoffman, Gresham, and Kenneth R. Bolkan, Estacada, all of Oreg., assignors to Blount, Inc., Portland, Oreg.

Filed Apr. 14, 1988, Ser. No. 181,437

Int. Cl.[5] B28D *1/08*

U.S. Cl. 125—21 **3 Claims**



1. A chain saw for cutting aggregate material comprising;

a saw chain, a guide bar having a rear end and a forward rounded nose end, and a chain drive mechanism, said guide bar having a guide edge including a saw chain guide groove and guide rails extended along the sides of the guide groove and around the nose end, and said saw chain having pivotally interconnected center links and side links, said center links having depending tang portions that are slidingly guided in the guide groove of the guide bar, and said side links having bottom edges that slidingly engage and ride on the guide rails of the guide bar,

cutting blocks having an outer surface of a diamond impregnated matrix material, certain of the pairs of side links designated as cutting block supporting side links, said pair of supporting side links having top support edges, and said cutting block extended across the support edges of the pair of supporting side links and being bonded to both of said top support edges,

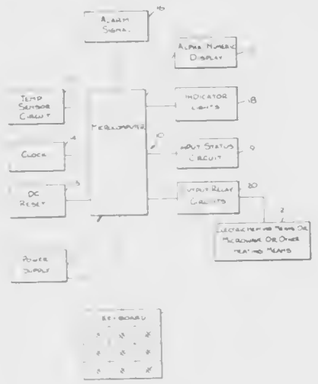
certain other of the pairs of side links alternating with said cutting block supporting side links designated as depth gauge links having upwardly extended spaced apart depth gauge portions, and said guide bar including a plurality of enclosed fluid flow channels including a main channel extending forwardly from the rear end of the guide bar substantially the length of the guide bar, and feeding channels directed from said main channel and opening into the guide bar groove at spaced intervals along the periphery of the guide bar edge, and connection means for connecting flow of a fluid source from the rear end of the guide bar along a passageway define by the main and feeding channels, into the guide bar groove and through the spaced apart depth gauge side links to flush abrasive particles from the bar and saw chain components and away from the kerf being cut, and said fluid flow channels cooperatively configured to be less restrictive progressing from the rear end to the nose end to provide substantially equalized flushing at the nose end of the bar

4,920,948

PARAMETER CONTROL SYSTEM FOR AN OVEN

Bernard G. Koether, Westport, and Mario Pasquini, Milford, both of Conn., assignors to Micro-Technology Licensing Corporation, Tequesta, Fla.

Filed Oct. 29, 1987, Ser. No. 114,563
Int. Cl.[5] A21B *1/40*
U.S. Cl. 126—21 A 13 Claims



1 A parameter control system for controlling temperature and volumetric flow rate for an oven for heating a food product comprising

means for heating a heating medium in the oven;

first digitally programmed means, having temperature sensing means and having product keys and, having a predetermined temperature control algorithm communicating with said temperature sensing means and having program parameter variables per product key programmable for temperature values $T_1, T_2, \ldots T_n$ at time intervals $t_1, t_2, \ldots t_n$, respectively, where n equals **1, 2** . . . n to the number of intervals, and said digitally programmed means including closed loop heat control means controlled by said algorithm, for controlling as a first parameter the temperature of the heating medium;

second digitally programmed means, having a predetermined volumetric control algorithm having program parameter variables per product key programmable for volumetric flow rate values $V_1, V_2 \ldots V_n$ at time intervals $t_1, t_2 \ldots t_n$, respectively, where n equals **1, 2** . . . n to the number of intervals, for controlling as a second parameter the volumetric flow rate of the heating medium; and

said first digitally programmed means including digitally programmed means for controlling a plurality of time intervals for predetermined values of the temperature and for predetermined values of the volumetric flow rate, per product key, of the heating medium in the oven.

11. A parameter control system for controlling temperature and humidity for an oven for heating a food product comprising:

means for heating a heating medium in the oven;

first digitally programmed means, having temperature sensing means and having product keys and, having a predetermined temperature control algorithm communicating with said temperature sensing means and having program parameter variables per product key programmable for temperature values $T_1, T_2, \ldots T_n$ at time intervals $t_1, t_2, \ldots t_n$, respectively, where n equals 1, 2 . . . n to the number of intervals, and said digitally programmed means including closed loop heat control means responsive to said algorithm, for controlling as a first parameter the temperature of the heating medium;

second digitally programmed means, having a predetermined humidity algorithm having program parameter variables per product key programmable for humidity values $H_1, H_2 \ldots H_n$ at time intervals $t_1, t_2 \ldots t_n$, respectively, where n equals 1, 2 . . . n to the number of intervals, including closed loop humidity control means and humidity monitoring means, for controlling as a second parameter the humidity of the heating medium; and

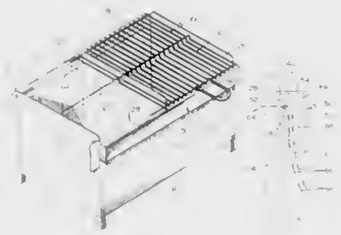
said first digitally programmed means including digitally programmed means for controlling a plurality of time intervals for predetermined values of the temperature and predetermined values of the humidity, per product key, of the heating medium in the oven.

4,920,949

PAPER FUELED COOKER

Norman J. McDonald, Box 155, Hendrix, Okla. 74741

Filed May 8, 1989, Ser. No. 348,886
Int. Cl.[5] A47J *37/00*
U.S. Cl. 126—25 R 12 Claims



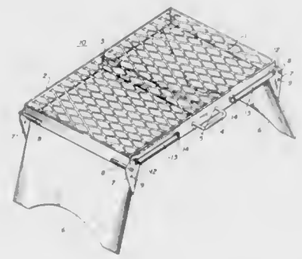
1. A cooker comprising an open-topped housing of a generally rectangular parallelopiped configuration defined by a bottom wall, upstanding spaced side walls, and spaced upstanding front and rear walls, front and rear hoods fixed to upper marginal portions of the front and rear walls at the outer faces thereof, air passageway means through the upper marginal portions of the front and rear walls and opening to the interiors of the hoods in an arrangement such that ambient air entering the hoods can move by convection to enter the uppermost interior of the housing, said hoods being elongated horizontally and including a depending hood wall spaced outwardly from the respective front and rear walls to which they are fixed to define spaces therebetween, said hood walls having lower horizontal edges, with said air passageway means comprising elongated horizontal slots in the front and rear walls at heights greater than the heights of the lower edges of the hood walls, an upper hood wall bridging the space between the upper edge of the depending hood wall and the front and rear wall and a common means removably supported on the housing for substantially closing the open upper end of the housing and for supporting food to be cooked.

4,920,950

CAMP STOVE

Jimmy D. Johnson, Rte. 2, Box 355H, San Angelo, Tex. 76905

Filed Jan. 24, 1989, Ser. No. 301,016
Int. Cl.[5] F24B *3/00*
U.S. Cl. 126—29 10 Claims



1. A collapsible Camp Stove with adjustable height cooking surface comprising:

a. A frame forming an opening extending therethrough over most of its interior and having a grate for supporting and exposing meat or other food to direct heat of a camp fire;

b. A pair of end plates having hinge plates at the upper ends thereof and hinged at opposed sides of said frame for pivotal movement between a collapsed position and at least one erected position, said end plates having cutouts at the unhinged bottom edges to form a four point footing;

c. A latch strap for each said end plate connected at one end to said frame and having a latch pin at an opposite end, said hinge plates having apertures adapted to be engaged by said latch pins to secure said end plates in the collapsed or erected positions; and

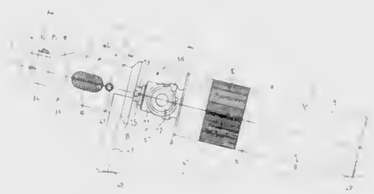
d. A handle attached to the frame adapted to recess flush against the frame for carrying the Camp Stove.

4,920,951

GAS-FIRED HEATING DEVICE

Alain Le Marchand, Villaines Sous Bois, and Francis Moumaneix, Le Raincy, both of France, assignors to Guilbert-Express, Paris, France

Filed Mar. 9, 1989, Ser. No. 321,073
Claims priority, application France, Mar. 11, 1988, 88 03217
Int. Cl.[5] B44B *7/02*
U.S. Cl. 126—403 30 Claims



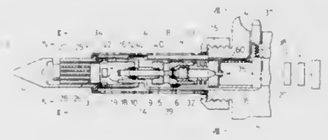
1. Gas-fired heating device comprising a handle, a burner body, an external casing which is part of said burner body, means on said external casing adapted to prevent flames escaping from said burner body and foreign bodies entering said burner body, and a heating tip adapted to be heated by a flame in said burner body, said burner body including a mixer, a perforated tubular structure extending in an axial direction between and securely fixed to said mixer and said tip, and a flame area within it, the ratio of the area of the perforations to the total surface area of said tubular structure being relatively high, and wherein said external casing is perforated, the ratio of the area of the perforations to the total surface area of said external casing is relatively low and said external casing is attached to said mixer and to a forward part of said tubular structure.

4,920,952

HEAT PROCESSING APPARATUS USING LIQUIFIED GAS

Masahiko Nakajima, 2-6, Yayoicho, Itabashi-ku, Tokyo, Japan

Filed Aug. 1, 1988, Ser. No. 226,389
Claims priority, application Japan, Aug. 5, 1987, 62-194412; Aug. 17, 1987, 62-125033
Int. Cl.[5] B23K *3/02*
U.S. Cl. 126—414 10 Claims



1 A heat processing apparatus using liquefied gas comprising:

(a) means for jetting out a liquefied gas in a gas reservoir as a fuel ga;

(b) means, of a cylindrical configuration, disposed at the exit of said gas jetting means having external air in-take ports for sucking external air by the ejector effect of a gas jetted out from said gas jetting means thereby generating a gas mixture;

(c) nozzle means disposed at a downstream end of said gas mixture generation means for jetting out said gas mixture;

(d) means, of a cylindrical configuration, disposed downstream of said nozzle means and having a flaming combustion chamber;

(e) an iron tip means disposed at a downstream end of said flaming combustion means in flow communication therewith;

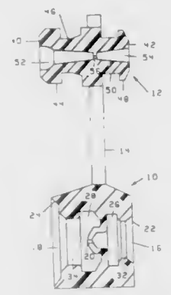
(f) a catalyst means incorporated in said iron tip means for causing flameless combustion of said gas mixture by catalytic oxidizing reaction;

(g) means for piezoelectrically igniting said gas mixture, said piezoelectrical means having spark electrodes disposed in said flame combustion chamber and a piezoelectric ignition button for closing and opening a piezoelectric ignition circuit including said spark electrodes;

(h) means for controlling the amount of a gas discharged to the inlet of said catalyst means, said controlling means being disposed movably about said flaming combustion means, said controlling means (h) being adapted for forming an opening leading directly to an external atmosphere at or near the downstream end of said flaming combustion means thereby discharging a portion of the gas in said flaming combustion means directly to the external atmosphere not passing through said catalyst means, and being adapted for closing said opening, thereby introducing the entire portion of the gas in said flaming combustion means to said catalyst means; and

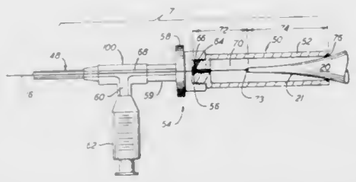
(i) means disposed between said gas discharge controlling means and said ignition button for interlocking the operation of the controlling means with that of the ignition button.

4,920,953
DUAL CHANNEL CAP FOR ENDOSCOPE
George P. McGown, 21500 Johnson St., Box 523, Pembroke Pines, Fla. 33029-0523
Filed Apr. 14, 1989, Ser. No. 338,284
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 7 Claims



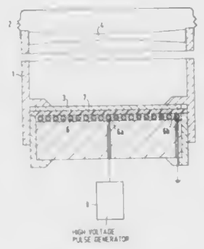
1. An improved dual channel cap for use in conjunction with either a first or a second endoscopic channel valve, comprising:
a main body portion having a first female opening suitable for mating with said first endoscopic channel valve, and having a second female opening suitable for mating with said second endoscopic channel valve;
a channel coupling said first female opening to said second female opening;
a plug portion having a first male member suitable for mating with said first female opening, and a second male member suitable for mating with said second female opening; and
a strap connecting said main body portion to said plug portion.

4,920,954
ULTRASONIC DEVICE FOR APPLYING CAVITATION FORCES
Howard M. Alliger, Melville, and Donald J. Ciervo, Levittown, both of N.Y., assignors to Sonic Needle Corporation, Farmingdale, N.Y.
Filed Aug. 5, 1988, Ser. No. 228,475
Int. Cl.[5] A61B *17/32*
U.S. Cl. 128—24 A 14 Claims



1. An ultrasonic device for use in removing an unwanted material from an artery of a human body by cavitation comprising:
a wire having a first end portion and having a second end portion for causing cavitation adjacent to the unwanted material;
support means having a handpiece having a tapered horn end portion with an integral metal joint fixedly connected to the first end portion of the wire;
drive means including a transducer supported by the handpiece for providing ultrasonic vibration through the tapered horn end portion to the wire and for connection to a generator; and
a catheter assembly surrounding said wire and moveable relative to the wire to permit the second end portion of the wire to be positioned adjacent to the unwanted material; wherein
said catheter assembly has a catheter tube and a container unit, said container unit including a peripheral wall and a front end wall portion and a rear end wall portion enclosing a cavity, said catheter tube having a first end portion connected to the container unit and having a second end portion disposed around the second end portion of the wire; and wherein
said peripheral wall of said container unit has an annular interior partition projecting into said cavity, said partition having an O-ring member through which the wire passes, said O-ring member and partition forming a front sealed chamber and a separate rear chamber in said cavity; and wherein
said O-ring member and partition are located at a selective distance from the tapered horn end portion, said location of the O-ring member being at a nodal point of a longitudinal wave of vibration of the wire, thereby minimizing transverse movement of the wire at the O-ring member and avoiding relatively high stress due to a transverse wave at the integral metal joint.

4,920,955
SHOCK WAVE SOURCE
Mathias Mahler, Erlangen, and Manfred Rattner, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 98,842, Sep. 21, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 274,509
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3634007
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 A 3 Claims



1. A shock wave source comprising:
a housing enclosing a volume filled with a shock wave conducting medium;
an elastic cover closing one end of said volume;
a membrane consisting of electrically conductive material insulated from ground and closing an opposite end of said volume;
a coil disposed substantially parallel to and spaced from said membrane, said coil having opposite ends, one of said opposite ends being connected to ground and the other of said opposite ends being connected to a high voltage pulse generator such that energization of said coil by said pulse generator rapidly repells said membrane therefrom and generates a shock wave in said medium; and
an electrically insulating layer disposed between said coil and said membrane such that both of said opposite ends of said coil are electrically insulated from said membrane.

4,920,956
ACUPRESSURE TYPE RHINITIS THERAPEUTIC DEVICE
Shouji Yamauchi, 3-7, Chuo-cho, Sohara, Kagamigahara-shi, Gifu-ken, Japan
Filed Aug. 29, 1988, Ser. No. 237,532
Claims priority, application Japan, Aug. 31, 1987, 62-133087[U]
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—24.1 33 Claims



1. An acupressure type rhinitis therapeutic device for giving thermal stimulus to a first acupressure point at a center of a glabella and to a pair of second acupressure points at opposite bottom sides of a nasal bone, said acupressure type rhinitis therapeutic device comprising:
a body having only three acupressure members, consisting of a first acupressure member contactable with said first acupressure point and a pair of second acupressure members contactable with said second acupressure points; and
a means for warming said three acupressure members.

4,920,957
SCALP KNEADER
W. Don Sutherland, R.R. #2 Glenbow Rd., Cochrane, Alberta, Canada (T0L 0W0)
Filed Jun. 20, 1988, Ser. No. 208,944
Int. Cl.[5] A61H *7/00*
U.S. Cl. 128—52 3 Claims



1. A massage device comprising:
(a) casing means having a top and a bottom, an inner chamber and an opening in the bottom to said inner chamber,
(b) said chamber including inner walls,
(c) motor means positioned in said chamber,
(d) said chamber including track means extending at least along one of said inner walls of said casing means,
(e) at least one pair of massaging means mounted on said track means and extending outwardly from said opening,
(f) means for mounting each of said massaging means for reciprocal movement with respect to each other and said track means,
(g) drive means associated with said motor means and connected to said pair of massaging means for reciprocally driving each of said massaging means relative to said track means, and to each other,
(h) said drive means associated with said motor means and driven by said motor means for reciprocally driving said massaging means includes a gear means, a transmission means and an eccentrically mounted linking means,
(i) said transmission means is portable by said motor means to transmit rotation to said gear means,
(j) said gear means is eccentrically connected to said linking means to impart a reciprocating motion to said linking means, and
(k) said linking means comprising a cross arm connected to each one of each pair of massaging means and a link arm connecting said cross arm and said driving means for transmitting the reciprocating motion to said massaging means, said track means includes a pair of spaced parallel tracks.

4,920,958
DRILL GUIDE ASSEMBLY
Michael J. Walt, North St. Paul; Craig L. Van Kampen, Oakdale, and Steven J. May, Minnetonka, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 927,128, Nov. 5, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 214,916
Int. Cl.[5] A61F *5/04, 17/32*
U.S. Cl. 606—96 10 Claims



3. A drill guide assembly for use in arthroscopic surgery, said drill guide assembly comprising:
a probe having a target end, an opposite threaded end portion and a locating lug at the end of said threads adjacent said target end;
a cannular elongate cylindrical wire guide having a central through opening adapted to receive and guide a guide wire;
a body generally arcuate about a predetermined point and having a cross sectional area generally perpendicular to the arc of the body that is elongate in a radial direction from said predetermined point, having a first end portion with a through bore adapted to closely receive said wire guide for longitudinal sliding action with the axis of said wire guide aligned with said predetermined point, and having a second end portion having a plurality of sockets extending through said body, each socket adapted to receive said lug and threaded end portion with said target end at said predetermined point and a part of said threaded end portion accessible from the side of said body opposite said predetermined point;
an attaching member adapted to engage the part of said threaded end portion on the side of said body opposite said predetermined point when said probe is engaged in one of said sockets;
means for preventing movement of said wire guide away from said predetermined point; and
means for permitting moving said body and means for preventing movement from around a wire positioned through said bore after said wire guide is removed from said bore and means for preventing movement, the means for permitting moving including corresponding slots in the first end portion of the body and the means for preventing movement, the slots being adapted for affording moving the body and means for preventing movement from around a guide wire positioned through the bore after the

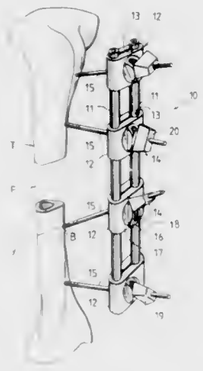
wire guide is removed from the bore and the means for preventing movement.

4,920,959

EXTERNAL FIXTURE FOR OSTEOSYNTHETIS

Ulrich Witzel, Wittener Str. 73d, 5600 Wuppertal 2, and Karl H. Müller, Bochum, both of Fed. Rep. of Germany, assignors to Ulrich Witzel, Wuppertal, Fed. Rep. of Germany

PCT No. PCT/DE87/00146, § 371 Date Nov. 20, 1987, § 102(e) Date Nov. 20, 1987
PCT Filed Apr. 6, 1987, Ser. No. 138,381
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611319
Int. Cl.[5] A61B *17/60*
U.S. Cl. 606—53 7 Claims



1 An external fixture for securing bone parts for osteosynthesis, comprising:

a support having two spaced-apart parallel rods;

a plurality of holders secured to said rods, each of said holders comprising:

clamping means formed by a one-piece body constituting a sleeve having a slit defining two juxtaposed clamping surfaces flanking said rods from opposite sides thereof and on opposite sides of said sleeve and formed with respective generally cylindrically segmental cavities receiving the respective rods whereby said rods are clamped between said clamping surfaces, when said members are drawn toward one another, said clamping surfaces on opposite sides of the sleeve being formed with mutually registering holes,

an operating screw having a head engageable by a user to rotate said screw and a screwthread, said screw passing through said holes and being rotatable to draw said clamping surfaces toward one another and clamp said clamping surfaces against said rods, said operating screw being formed with an axial bore adapted to constrict upon tightening of said screw,

an internally threaded member engaging the screwthread of said operating screw at an end thereof opposite said head, and

means including said internally threaded member forming a swivel enabling said screw to swing relative to said body in said holes and locking said swivel into a fixed position in said body upon tightening of said screw into said member; and

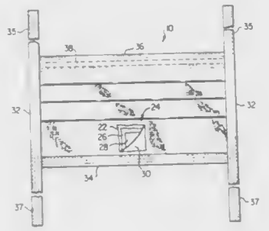
a respective bone screw or bone nail passing through and received in a respective one of said axial bores in a respective operating screw, clamped in the respective bore upon tightening of the respective operating screw into the respective member and fixed in a respective one of said bone parts at an angular orientation determined by an angle at which the respective swivel is locked in the respective body.

4,920,960

BODY FLUIDS BARRIER MASK

Vance M. Hubbard; Welton K. Brunson, and Darrell S. Caldwell, all of Bedford, Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

Filed Oct. 2, 1987, Ser. No. 104,807
Int. Cl.[5] A62B *7/10*
U.S. Cl. 128—206.12 21 Claims



1 A gas-pervious layered material impervious to liquid in one direction therethrough, comprising:

a first layer means of a gas-pervious material having a plurality of apertures therethrough which are impervious to the passage of liquid in the one direction;

a second layer means of a nonwicking material fixed to said first layer means to prevent penetration of said apertures by wicking particles which would draw the liquid therethrough; and

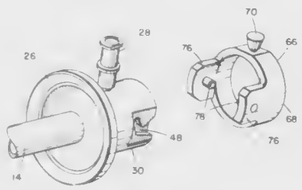
a third layer means of a filter material to prevent the passage of airborne bacteria, said third layer means applied to said material to place the first layer means between said third and second layers means.

4,920,961

SYSTEM FOR DISCONNETABLY MOUNTING AN ENDOSCOPE SHEATH WITH AN ENDOSCOPE TOOL

Benedetto Grossi, Stamford, Conn.; Richard P. Muller, Bronx, and Richard J. O'Hare, Floral Park, both of N.Y., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Jun. 2, 1988, Ser. No. 202,152
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—14 13 Claims



1 A sheath for use with an endoscope tool, the sheath comprising:

tube means having a distal end, a proximal end and an aperture passing therethrough, and

latch receptable means for removably connecting the sheath with the cooperating tool, said latch receptable means being static and having at least one notch means for receiving and channelizing at least one latch pin of a reciprocably movable latch means of the tool, said reciprocably movable latch means being capable of linearly moving between a connecting position wherein said at least one latch pin is retained in said at least one notch and a disconnecting position wherein said at least one notch cooperates with said at least one latch pin to urge said tool away from said sheath whereby said latch receptacle means can be disconnected from the tool without touching the sheath.

4,920,962

SPLINT-LIKE ELEMENT FOR USE IN END-TO-END NERVE SUTURE

Claude Proulx, 1580 Francheville, Montreal, Quebec, Canada (H2C 1X6)

Filed Nov. 23, 1988, Ser. No. 275,458
Int. Cl.[5] A61B *17/04*
U.S. Cl. 606—152 17 Claims



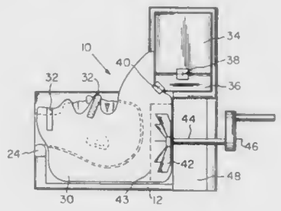
1 A stent element for use in end-to-end nerve suture to eliminate tension between the nerve ends at an anastomosis site and thus allow optimal coaptation between said ends, said stent element comprising an elongated body made of a material that is slightly resilient and is biologically acceptable, said elongated body being long enough to have one end attachable to an epineurium of one of said nerve ends at a first given distance from the anastomosis site by at least one suture, and another end of said elongated body attachable to the epineurium of the other of said nerve ends at a second given distance from the anastomosis site by at least one other suture, said stent element further including pieces of reinforcing material consisting of beads of plastic material embedded into said slightly resilient material of said elongated body and disposed so as to prevent said elongated body from being torn or otherwise cut by said sutures.

4,920,963

APPARATUS FOR PREVENTING BRAIN DAMAGE DURING CARDIAC ARREST, CPR OR SEVERE SHOCK

Eric W. Brader, 42 Canter Dr., Sewickley, Pa. 15143

Continuation-in-part of Ser. No. 834,341, Feb. 28, 1986, Pat. No. 4,750,493. This application Apr. 4, 1988, Ser. No. 177,508
Int. Cl.[5] A61F *7/10*
U.S. Cl. 128—402 14 Claims



1 An apparatus for cranial cooling, comprising:

a watertight shroud having a permanent shape by which said shroud is adapted to extend over the forehead, face and neck as well as the top, back and sides of the head of a patient but leave uncovered the eyes, nasal airway and the mouth of the patient, said shroud including fastening means for fastening adjacent sections of said watertight shroud in the area of the face of a patient;

an endothermic reactant reservoir containing a quantity of a reactant which reacts endothermically with water; and

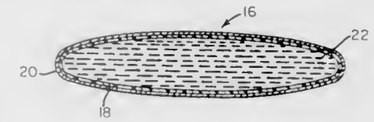
a water reservoir containing water, said water reservoir comprising a structural tank adjacent said shroud and above said endothermic reactant reservoir, said structural tank and said endothermic reaction reservoir having at least one valve therebetween; wherein said combined watertight shroud, structural tank and endothermic reactant reservoir contain means for fluid communication therebetween.

4,920,964

MICROWAVABLE THERMAL COMPRESS AND METHOD AND USE THEREOF

Sam E. Francis, Jr., Melbourne, Fla., assignor to Jack Frost Laboratories, Inc., Fort Pierce, Fla.

Continuation of Ser. No. 734,588, May 15, 1985, Pat. No. 4,756,311. This application May 31, 1988, Ser. No. 200,429
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[5] A61F *7/08*
U.S. Cl. 128—403 30 Claims



1 A process of microwave heating a thermal pack comprising the steps of:

providing a thermal pack comprising a completely sealed envelope constructed from opposed laminate layers, said layers defining an inner chamber within which is disposed a heat transfer material, said chamber being sealed from the exterior of said thermal pack, each of said laminate layers including a pair of co-extensive inner and outer films contacting each other throughout their surface ares, said films being of dissimilar materials;

applying microwave energy to said pack for heating said heat transfer material to a desired temperature; and

selecting the dissimilar materials so that the laminate layers of said thermal pack do not pass said heat transfer material during heating of said thermal pack and do not rupture or separate at the seams thereof when subjected to said microwave energy which is equivalent to the energy developed by a microwave heating device operating at full power of about 750 watts for a period of time greater than about one minute but less than about four minutes.

4,920,965

DUAL CHAMBER PACEMAKER WITH ADAPTIVE ATRIAL ESCAPE INTERVAL

Hermann D. Funke, Bonn, Fed. Rep. of Germany, and Jozef H. Lodew k, Kerkrade, Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 25, 1987, Ser. No. 125,424
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—419 PG 21 Claims

1 In a pacemaker of the type having:

(a) an atrial sense amplifier for producing atrial sense event signals (AS) in response to atrial depolarizations;

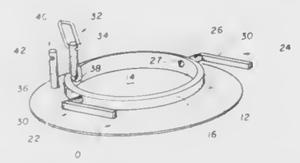
(b) a ventricular sense amplifier for producing ventricular

sense event signals (VS) in response to ventricular depolarizations;
(c) an atrial pulse generator for producing atrial stimulating pulses in response to atrial pace event signals (AP);
(d) a ventricular pulse generator for producing ventricular stimulating pulses in response to ventricular pace event signals (VP);
(e) timing means for timing V-A escape intervals and for generating said atrial pace event signals at the conclusion of said V-A escape intervals and for timing A-V escape intervals and for generating said ventricular pace event signals at the conclusion of said A-V escape intervals, said V-A escape intervals initiated by the occurrence of said ventricular pace event signals or said ventricular sense



event signals, said A-V escape intervals initiated by the occurrence of said atrial sense event signals or said atrial pace event signals, the improvement wherein;
(f) said timing means includes means for dividing each said V-A escape interval into a first time interval and a subsequent second time interval, said timing means initiating timing of said A-V escape intervals in response to the occurrence of said atrial sense events during one of said second time intervals, but not in response to the occurrence of a said atrial sense event signal during one of said first time intervals, said timing means including means responsive to one of said atrial sense event signals occurring within one of said second time intervals to decrease the duration of a subsequent one of said V-A escape intervals and the duration of said first time interval therein.

4,920,966
ULTRASOUND TRANSDUCER HOLDER
Edward H. Hon, 11 Bradbury Hills Rd., Bradbury, Calif. 91010; Edward D. Hon, 1325 6th Ave., San Francisco, Calif. 94122, and Robert W. Hon, 483 Panchita Way, Los Altos, Calif. 94022
Continuation-in-part of Ser. No. 915,130, Oct. 2, 1986. This application Feb. 29, 1988, Ser. No. 162,033
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—662.03 28 Claims



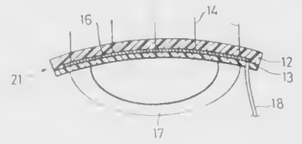
1. A ultrasound transducer holder adapted for being adhesively applied to a patient comprising:
(a) A relatively flexible concave disc having an upper surface and a lower surface and an opening therein;
(b) A relatively rigid support member fixed to said flexible disc in the opening for supporting an ultrasound transducer in said opening; and
(c) At least one grasping means for movably fixedly grasping said ultrasound transducer said grasping means capable of adjustably fixing the orientation of said ultrasound transducer relative to said support member.

4,920,967
DOPPLER TIP WIRE GUIDE
Cliff N. Cottonaro; Scott M. Evans; David R. Pflueger, and Huntly D. Millar, all of New York, N.Y., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 888,060, Jul. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 887,291, Jul. 21, 1986, abandoned. This application Aug. 11, 1987, Ser. No. 83,610
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—662.06 8 Claims



1. A blood velocity measuring wire guide adapted for operative coupling to a catheter, the wire guide comprising:
an elongated flexible support wire having distal and proximal ends which is generally longitudinally inelastic and flexible for threading engagement with the catheter;
Doppler means consisting of a piezoelectric polymeric material mounted to the distal end of said wire for determining the velocity of the blood with the wire guide inserted in a blood vessel, said piezoelectric polymeric material oriented such that the ultrasonic signals are transmitted in a radial direction in relation to said elongated flexible support wire; and
electrical lead means operatively mounted to the distal end of said Doppler means and coupled to said wire along its length.

4,920,968
NEEDLE BASE WITH PLURAL NEEDLES FOR SUBCUTANEOUSLY APPLYING ELECTRIC CURRENT
Haruo Takase, 20-16,3-chome, Shimoochiai Shinjuku-ku, Tokyo, Japan
Continuation of Ser. No. 142,787, Jan. 11, 1988, abandoned. This application Mar. 28, 1989, Ser. No. 332,401
Claims priority, application Japan, Jan. 20, 1987, 62-6395[U]
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—639 10 Claims



1. A needle base device for subcutaneously supplying electric current to the skin of a patient, comprising:
a non-conductive member having a plurality of conductive needles mounted thereon for piercing a skin portion of the patient, said needles projecting from an outer surface of said non-conductive member;
said non-conductive member comprising a convex plate-like member which protrudes outward toward the free ends of said needles at the central portion of said plate-like member, and said needles each perpendicularly projecting from said non-conductive plate-like member by substantially the same amount whereby more efficient and uniform cauterization is facilitated;
said needles each having bottom ends embedded in said non-conductive member and being spaced from one another both laterally and horizontally by predetermined equal intervals or spacings, said needles having respective free ends opposite said embedded bottom ends;
said needles each having a non-conductive covering over a portion of the length thereof which projects from said non-conductive member, said non-conductive covering extending from said non-conductive member to a portion of said respective needles intermediate the free and bottom ends thereof, said needles being uncovered over the remainder of their lengths between said intermediate portion and said free end thereof, the outer diameter of said non-conductive covering being the same as the outer diameter of the uncovered portions of said needles between said intermediate portions and said free ends thereof; and
conductive means coupled to said non-conductive member and to said bottom ends of said needles for conductively connecting together said bottom ends of said needles for simultaneously supplying electrical energy to a plurality of said needles so as to enable simultaneous application of predetermined electric current to at least said plurality of said needles.

4,920,969
AMBULATORY PHYSIOLOGICAL EVALUATION SYSTEM INCLUDING CARDIAC MONITORING
Arata Suzuki, Ramsey, N.J.; William T. Tyberg, Springvalley, N.Y.; George Banks, Emerson, N.J., and Marcia Suzuki, Ramsey, N.J., assignors to Capintec, Inc., Ramsey, N.J.
Division of Ser. No. 785,549, Oct. 8, 1985, abandoned. This application May 7, 1987, Ser. No. 46,854
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—659 6 Claims



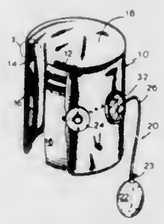
1. An ambulatory evaluation system for monitoring a patient's cardiac activities, said system comprising:
a vest adapted to be worn about the torso of the patient;
a main radiation detector for sensing blood volume through the heart of the patient by detection of gamma rays emitted by radiation labeled blood cells;
a mounting bracket to be mounted to said vest and to receive said main detector;
first mounting means for adjustably mounting said bracket relative to said vest; and
second mounting means for adjustably mounting said main detector along two perpendicular directions relative to said bracket.

4,920,970
METHOD AND APPARATUS FOR ARTERIAL AND VENOUS BLOOD SAMPLING
Philip Wyatt, 1018 Marevgo Dr., Glendale, Calif. 91209
Continuation-in-part of Ser. No. 907,118, Sep. 12, 1986, Pat. No. 4,763,648. This application Jun. 17, 1988, Ser. No. 208,388
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[5] A61B *5/02, 5/14*
U.S. Cl. 128—673 7 Claims



1. An apparatus for use in conjunction with a system which is closed to the atmosphere and interconnected invasively to a patient for obtaining a blood sample from the patient, said system being characterized by having a catheter adapted to be inserted into a vein or artery of the patient, said apparatus comprising proximal and distal, spaced apart access devices operably interconnected by a conduit having a fluid passageway, each of said access devices being independently accessible to withdraw fluid from within the system, said proximal access device comprising a body having an upper and lower chamber, said lower chamber having first and second fluid ports and sealing means carried by said upper chamber for sealing said lower chamber relative to atmosphere, said sealing means being penetratable by a needle of a syringe to gain access to said lower chamber, said proximal access device permitting smooth, laminar fluid flow therethrough and including first connector means for interconnecting said first fluid port of said body of said proximal access device with the catheter of the system and further including means for interconnecting said second fluid port of said body of said proximal device with said conduit, said distal access device comprising a chamber in communication with said fluid passageway of said conduit and means for accessing said chamber whereby said chamber of said distal access device can be accessed to withdraw from the apparatus all fluid contained between the catheter and said chamber of said distal access device and to withdraw blood from the patient in a quantity sufficient to draw blood past said first chamber of said proximal access device so that said lower chamber of said proximal access device can be accessed to withdraw therefrom undiluted blood contained therewithin, in a manner such that when said sample is accessed from said proximal access device, the system is not opened to atmosphere.

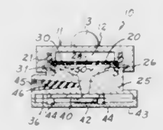
4,920,971
PNEUMATIC VEIN INFLATION DEVICE
Martin W. Blessinger, 95 Sagamore Dr., Syosset, N.Y. 11791
Filed Dec. 9, 1988, Ser. No. 281,627
Int. Cl.[5] A61B *5/022*
U.S. Cl. 128—679 4 Claims



1. A pneumatic vein inflation device for assisting in a medical testing and/or treatment procedure comprising:

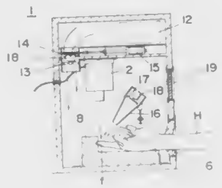
(a) a fastenerless hard inflexible cylindrical tube;
(b) two internal inflatable cylindrical ring-shaped bladders positioned in succession axially inside said fastenerless hard inflexible cylindrical tube having a diameter substantially less than the inner diameter of said fastenerless hard inflexible cylindrical tube and each of said inflatable cylindrical ring shaped bladders being used successively during any and all given usages;
(c) means for pressurization and relief of said inflatable cylindrical ring shaped bladders to and from a predetermined pressure that will be customized for each usage, and for distributing said pressure between said inflatable cylindrical ring shaped bladders, said inflatable cylindrical ring shaped bladders being of a size such that an extremity of an individual undergoing said medical testing and treatment procedure fits therein;
(d) said means for pressurization and relief comprises a hand powered air pump and a single associated relief valve connected by a first air hose section to a three way distribution valve which in turn is connected by a second air hose section to one of said inflatable cylindrical ring shaped bladders and by a third air hose section to the other of said inflatable cylindrical ring shaped bladders, and a pressure gauge connected to said first air hose section; and
(e) an elastic jacket surrounding said inflatable cylindrical ring shaped bladders and said fastenerless hard inflexible cylindrical tube comprising an inner tubular sheath and an outer tubular sheath of substantially the same height as said inner tubular sheath, the opposite ends of said inner tubular sheath being homogeneously attached to the corresponding opposite ends of said outer tubular sheath to form said elastic jacket which holds said inflatable cylindrical ring shaped bladders in place in said fastenerless hard inflexible cylindrical tube.

4,920,972
GEL-FILLED BLOOD PRESSURE TRANSDUCER
Thomas P. Frank, Dublin; Warren B. Nicholson, Worthington, and Mark D. Pfouts, Powell, all of Ohio, assignors to Medex, Inc., Hilliard, Ohio
Continuation-in-part of Ser. No. 9,643, Jan. 27, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 283,224
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—675 6 Claims



1. A reusable pressure transducer comprising:
a body having a recess terminating in an opening surrounded by a rim, said body having an outer surface;
a flexible diaphragm placed over said rim to enclose said recess;
said body having a hole spaced from said diaphragm, said hole connecting the outer surface of said body to said recess;
a pressure sensor mounted on said outer surface over said hole;
and a dielectric gel completely filling said recess and hole and in contact with both said diaphragm and said pressure sensor whereby pressure on said diaphragm will be communicated through said gel to said sensor, said dielectric gel slightly distending said diaphragm.

4,920,973
SKIN TEMPERATURE MEASURING APPARATUS FOR DIAGNOSING DISTURBANCE OF PERIPHERAL CIRCULATION
Isamu Tanaka, Fukuoka, and Fuminao Tanitomi, Ueki, both of Japan, assignors to Kaisei Koguy Corporation, Kumamoto, Japan
Filed Mar. 7, 1988, Ser. No. 164,929
Claims priority, application Japan, Apr. 17, 1987, 62-94840
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—736 3 Claims



1. A skin temperature measuring apparatus for a test section of a patient's skin, the apparatus comprising:
a cold air box having a thermo regulator of low temperature;
a radiation thermometer means for measuring the skin temperature of a test section of the patient's skin disclosed in said cold air box and having a visual field extending through said cold air box;
said cold air box comprising a test section inserting unit, a positioning unit adapted to receive the inserted test section within the visual field of said radiation thermometer, means and a fan for blowing cold air to the positioned test section

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4,920,974
METHOD OF OBTAINING CERVICAL CULTURE SPECIMENS AND DEVICE AND KIT THEREFOR
Alex T. Roth, Foster City, Calif., and Richard M. Soderstrom, Seattle, Wash., assignors to EndoTherapeutics, Menlo Park, Calif.
Filed Apr. 13, 1988, Ser. No. 181,217
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—759 10 Claims



1. A kit for obtaining a cervical culture specimen, comprising:
(a) a disposable test device comprising: (i) an elastically flexible sheath adapted to grip a finger, the sheath having a distal end and a proximal end, and being substantially closed but including a small aperture at its distal end and open at its proximal end; and (ii) a sterile pad of absorbent material affixed to said distal end of said sheath over said aperture and adapted to collect and retain said specimen;
(b) a support member having a first, distal end, and a second, proximal end, structured so as to fit within said sheath so that, after obtaining said culture specimen, said test device is maintained in an elongated, unrolled configuration on said support member with said distal end of said support member inserted within and substantially aligned with said distal end of said test device;
(c) a first, inner container adapted to receive said test device on said support member, said container having an open, proximal end, and a closed, distal end; and
(d) a means for preventing contamination of said inner container,
wherein said means for preventing contamination comprises a cap which seals said inner container, and wherein the proximal end of said support member is affixed to said cap such that said support member extends perpendicularly therefrom;
and wherein said aperture is positioned adjacent said sterile pad for enhancing flow of the cell culture specimen therethrough and for facilitating mixture of the specimen with growth medium.

4,920,975
BIOLOGICAL FLUID COLLECTION APPARATUS WITH THE CAP ON THE COVER
John E. Fay, Leominster, Mass., assignor to Biomedical Polymers, Inc., Leominster, Mass.
Filed Feb. 21, 1989, Ser. No. 312,465
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—760 14 Claims



1. An apparatus for collecting biological fluid comprising:
a container having an open end and a closed end;
a funnel including a mouth at one end and a discharge portion at the other end, said discharge portion being removably attachable to said container to establish fluid communication between said funnel and said container;
a cap for closing the container opening;
a cover for the mouth of said funnel, said cover having a chamber for releasably holding said cap with the inside of the cap facing outward for engaging with the container opening; and
a base having a top which includes a container recess for receiving the closed end of said container to support at least a portion of said container above said base.

4,920,976
SINGLE-USE DEVICES FOR COLLECTING AND HOLDING BLOOD SAMPLES
Claudio Calzi, Milan, Italy, and Gianfranco Zaccai, Boston, Mass., assignors to Instrumentation Laboratory, S.p.A., Milan, Italy
Filed Dec. 12, 1988, Ser. No. 282,516
Claims priority, application Italy, Dec. 18, 1987, 23092 A/87
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—764 9 Claims



1. Single-use device for collecting and containing blood samples, comprising a rigid tube closed at one end and having at the other end an airtight stopper which can be pierced by the first tip of a needle, the second tip of which is adapted to be used for venipuncture, wherein within the tube, at a limited distance from the stopper there is disposed in a stable position and forming a seal with the inner wall of the tube a low-thickness diaphragm, the first tip of the needle being adapted to pass through the diaphragm after piercing the stopper.

4,920,977
BLOOD COLLECTION ASSEMBLY WITH LANCET AND MICROCOLLECTION TUBE
John L. Haynes, Chapel Hill, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Oct. 25, 1988, Ser. No. 262,551
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—770 20 Claims



1. A self-contained blood collection assembly for developing a skin puncture and a resulting blood sample collection in a single housing comprising
(a) an elongated housing;
(b) said housing defining a chamber;
(c) said chamber having a first lancet containing portion and a second blood microcollection tube portion;
(d) said first lancet containing portion extending to a first open end;
(e) said second blood collection tube portion extending to a second open end;
(f) a lancet in said first lancet containing portion;
(g) a blood microcollection tube in said second blood collection tube containing portion;
(h) a first snap cap mounted for closing said first open end;
(i) said first snap cap connected to said elongated housing;
(j) a second snap cap mounted for closing said second open end; and

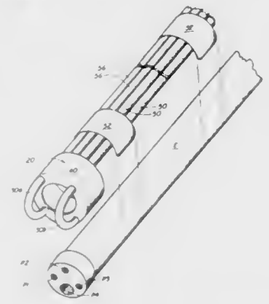
(k) said second snap cap connected to said elongated housing.

4,920,978

METHOD AND APPARATUS FOR THE ENDOSCOPIC TREATMENT OF DEEP TUMORS USING RF HYPERTHERMIA

David P. Colvin, Apex, N.C., assignor to Triangle Research and Development Corporation, Raleigh, N.C.

Filed Aug. 31, 1988, Ser. No. 238,824
Int. Cl.[5] A61N *1/05, 1/06*
U.S. Cl. 128—784 14 Claims



1. An RF hyperthermia attachment for adapting endoscopes having an elongated tubular body with a proximal end and a distal end for quickly treating deep body cancerous tumors by delivering RF energy generated by a control unit thereto, said RF hyperthermia attachment comprising:

electrode means adapted to deliver electrical energy interstitially to the tumor,

means connected to said electrode means for detachably mounting said electrode means to the distal end of the endoscope,

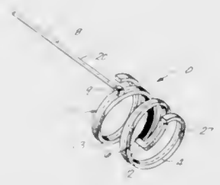
means connected to said electrode means adapted to deliver electrical energy thereto and being adapted to be connected to the body of the endoscope, and wherein said means for delivering electrical energy to the electrode means is adapted to be detachably mounted to the external surface of the body of the endoscope.

4,920,979

BIDIRECTIONAL HELICAL ELECTRODE FOR NERVE STIMULATION

Leo A. Bullara, Glendora, Calif., assignor to Huntington Medical Research Institute, Pasadena, Calif.

Filed Oct. 12, 1988, Ser. No. 256,702
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—784 13 Claims



1. An electrode assembly for implantation on a nerve, comprising:

a flexible supporting matrix of dielectric material, the matrix forming a pair of spaced-apart and oppositely directed helical portions, each helical portion extending circumferentially at least 360 degrees and less than 720 degrees;

a flexible, conductive electrode secured to an inner surface of one of the helical portions; and

a flexible connection means connected to the electrode and extending from the matrix for connection to an electronic device;

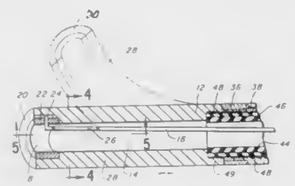
the assembly having a central passage longitudinally therethrough and sized to conform to the external dimension of the nerve, whereby a tool can be inserted in the passage to expand the helical portions to open a lateral passage along the full length of the assembly to enable the assembly to be fitted over and closed upon the nerve.

4,920,980

CATHETER WITH CONTROLLABLE TIP

Stefan A. Jackowski, Hollywood, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Sep. 14, 1987, Ser. No. 95,997
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—786 23 Claims



19. A catheter which comprises:

a tubular body having proximal and distal ends;

said tubular body having a tubular inner wall defining a bore;

a wire member loosely positioned in said bore;

anchoring means within said tubular inner wall securing said wire member to said tubular inner wall adjacent said distal end at a location that is laterally spaced from the central axis of the bore;

said wire member extending through the bore and out of the proximal end of the catheter, whereby the distal end of the catheter is temporarily bent by pulling the wire member.

4,920,981

APPARATUS FOR RELIEF OF PAIN AND CONTRACTIONS USING DISCHARGES OF SPARKS ADJUSTABLE IN INTENSITY OF PIEZO-ELECTRIC ORIGIN WITH A BIPOLAR ELECTRODE OF WHICH ONE OF THE POLES IS IN DIRECT CONTACT WITH THE SKIN AND THE OTHER SPACED THEREFROM

Dominique Dervieux, Nice, France, assignor to Societe Anatomia - La Boutique du Dos, Paris, France

PCT No. PCT/FR86/00449, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/04068, PCT Pub. Date Jul. 16, 1987
PCT Filed Dec. 24, 1986, Ser. No. 97,964
Claims priority, application France, Dec. 31, 1985, 85 19590
Int. Cl.[5] A61N *1/32*
U.S. Cl. 128—800 12 Claims

1. Apparatus for providing relief from pain and contractions via the discharge of sparks of piezo-electric origin resulting from direct application of the apparatus to the skin of a patient, comprising

(a) a handle;

(b) means connected with said handle for generating a piezo-electric charge including actuating means arranged within said handle and a pair of poles; and

(c) bipolar electrode means connected with said poles of said piezo-electric generator means, said bipolar electrode means including

(1) at least one metallic electrode connected with said handle and arranged for direct contact with the skin of the patient, said contact electrode being connected with one pole of said generator means; and



(2) at least one discharge electrode connected with said handle and recessed from said contact electrode, said discharge electrode being connected with the other pole of said generator means, said spaced arrangement of said contact and discharge electrodes producing a series of sparks from said discharge electrode to said contact electrode which are thereby applied to the skin of the patient.

4,920,982

PERCUTANEOUS VASECTOMY METHOD

Marc Goldstein, New York, N.Y., assignor to Vastech Medical Products Inc., New Brunswick, N.J.

Filed Jun. 27, 1988, Ser. No. 211,574
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—842 6 Claims



1. A method of closing the vas deferens to sterilize a male patient without incising the patients scrotum, said method comprising the steps of:

Inserting a sharp-tipped needle having a first predetermined diameter into the scrotum of the male patient and through a wall of the vas deferens, said insertion forming a passageway from the surface of the scrotum to the interior of the vas deferens;

Removing said sharp-tipped needle from the vas deferens and the scrotum;

Inserting a blunt-tipped needle having a second predetermined diameter, less than said first predetermined diameter, said second diameter approximating the diameter of said vas deferens, through said passageway and into the interior of the vas deferens, whereby said blunt-tipped needle can readily slide within the lumen of said vas deferens;

Activating a cauterizing element which includes said blunt-tipped needle for a selected period of time to cauterize and thereby close the vas deferens to sterilize the male patient; and,

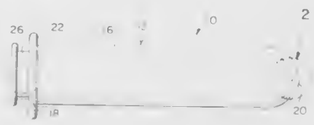
Removing said blunt-tipped needle from the vas deferens and the scrotum.

4,920,983

PHOSPHORESCENT PROPHILACTIC

Francisco G. Jimenez, G.P.O. Box 4805, San Juan, P.R. 00936, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Feb. 1, 1988, Ser. No. 150,843
Int. Cl.[5] A61F *5/44*
U.S. Cl. 128—844 1 Claim



1. A phosphorescent condom having means for distributing a visible phosphorescent substance throughout its extent upon mounting on a penis wherein said means comprises:

(a) a pair of elastic sheaths, one inside the other forming a space therebetween, said sheaths having rear ends sealed by an annular rim and having spaced rounded heads closing the front ends thereof; and

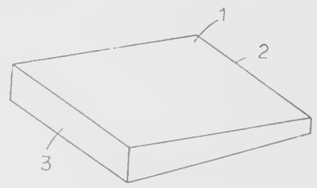
(b) a bead of phosphorescent liquid secured between said sheaths at the center of said rounded heads so that when said sheath members are pulled onto a regular condom by said annular rim, said bead will break under pressure to travel and glow throughout the space between said sheaths.

4,920,984

MOUTHPIECE AND METHOD FOR PRODUCING THE SAME

Hiroshi Furumichi, and Takao Makishima, both of Osaka, Japan, assignors to Sunstar Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1987, Ser. No. 108,677
Claims priority, application Japan, Oct. 15, 1986, 61-246045; Oct. 15, 1986, 61-246046
Int. Cl.[5] A61F *5/56*
U.S. Cl. 128—861 2 Claims



1. A method for producing a mouthpiece comprising the steps of:

preparing a thermoplastic elastic sheet material formed to be increased in thickness from one end to the other end, said elastic sheet material comprising an ethylene-vinyl acetate copolymer having a vinyl acetate content of from 12–33 wt %;

preparing a teeth impression cast of a user who is going to use a mouthpiece to be produced; and

pressing said teeth impression cast against said thermoplastic elastic sheet material in a softened state, in such a position so that the thicker portion of said thermoplastic sheet

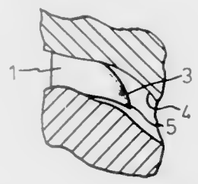
material is at the front teeth position, so as to transfer a shape of said teeth of said user onto said thermoplastic elastic sheet material to thereby obtain a mouthpiece which is set to be thicker at a portion corresponding to a front teeth position than at a portion corresponding to a molar teeth position.

4,920,985

DEVICE FOR CLOSING A CURVED DUCT

N Bertil E. Tindberg, Bjärred, Sweden, assignor to Peltor AB, Varnamo, Sweden

PCT No. PCT/SE86/00024, § 371 Date Sep. 19, 1988, § 102(e) Date Sep. 19, 1988, PCT Pub. No. WO87/04338, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 23, 1986, Ser. No. 223,242
Int. Cl.[5] A61F *11/00*
U.S. Cl. 128—864 1 Claim



1. An ear protector for insertion in the auditory canal (4) of a human ear, the device consisting of a compressible resilient rod-shaped body (1) having a pointed end (5) and a cross-sectional area which is slightly larger than the average cross-sectional area of the auditory canal in a non-compressed condition thereof, the improvement comprising: the pointed end (5) of the rod-shaped body is located in the circumferential surface of the body to form a lip which is unsymmetrical in relation to the longitudinal direction of the body (1) and the rod-shaped body bending to conform to the curved portion of the auditory canal when the body (1) is in a compressed condition to thereby facilitate insertion of the ear protector in the ear.

4,920,986

URINARY INCONTINENCE DEVICE

Nicholas Biswas, Blacktown, Australia, assignor to Zedlani Pty. Limited, Parramatta, Australia

Filed Oct. 13, 1987, Ser. No. 108,276
Claims priority, application Australia, Oct. 14, 1986, PH8486
Int. Cl.[5] A61F *5/48*
U.S. Cl. 128—885 12 Claims



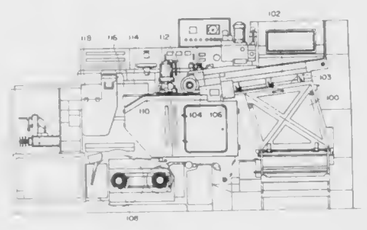
1. An entirely intra-vaginal device, comprising two opposed limbs interconnected by a flexible base portion so as to be of an upwardly convex generally "U-shaped" configuration, one of the limbs being adapted to lie adjacent the anterior vaginal wall and including a cradle-like structure to lift the bladder base and bladder neck, lying behind the vaginal wall, without closing the urethra, the other limb being adapted to lie adjacent the posterior vaginal wall, and the base portion having an aperture which, in use, is adjacent the cervix of the uterus.

4,920,987

DEVICE FOR CONTROLLING THE CONTENT OF TOBACCO ON A CIGARETTE MANUFACTURING MACHINE

Yutaka Okumoto, Musashino, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 116,016, Oct. 30, 1987, Pat. No. 4,836,221. This application Mar. 17, 1989, Ser. No. 324,918
Claims priority, application Japan, Oct. 31, 1986, 61-258185; Apr. 28, 1988, 63-103840
Int. Cl.[5] A21C *5/14, 5/18*
U.S. Cl. 131—84.3 3 Claims



1. A system for controlling content of tobacco in a cigarette manufacturing machine, comprising:

conveying means for conveying shredded tobacco, said conveying means including a hole-provided cigarette conveyor band for holding the shredded tobacco thereon and a a means for generating an input signal in response to detection of movement of a trimming means, said trimming means trims the shredded tobacco on the conveyor band so as to regulate the amount of the shredded tobacco;

wrapping means for wrapping the shredded tobacco trimmed by said trimming means, thereby producing long cigarette rods;

a first radiometric density detector for detecting a density of the shredded tobacco before the shredded tobacco enters the trimming means;

a second radiometric density detector, located downstream of the wrapping means, for detecting the density of the cigarettes;

a feed forward control circuit including a high pass filter for picking up only high-frequency components from a first signal supplied from the first radiometric density detector; and a delay circuit for delaying the high-frequency components by a predetermined time, said feed forward control circuit generating a feed forward control signal corresponding to an instantaneous variation in the first signal;

a feed back control circuit including an integrator for integrating a second signal supplied from the second radiometric density detector, said feed back control circuit generating a feed back control signal corresponding to an average variation in the second signal; and

control means including adding means for adding the feed forward control signal, the input signal and the feed back control signal together, an output of the adder being used for controlling the trimming means.

4,920,988

SAFETY ASHTRAY

Enzo Cancellara, 1707A St. Clair Avenue West, Toronto, Ontario, Canada (M6N 1J2)

Filed Jul. 18, 1988, Ser. No. 220,542
Claims priority, application Canada, Sep. 30, 1987, 548308
Int. Cl.[5] A24F *19/00, 19/14*
U.S. Cl. 131—242 5 Claims



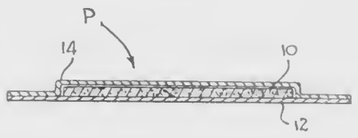
1. A safety ashtray comprising a cigarette rest with an outer surface set an upward inward angle, a plurality of dished regions in said outer surface of said cigarette rest, said dished regions guiding generally upright positioning of a cigarette placed therein so as to burn downwardly along said rest, each of said dished regions having a widened lower end bordered by a deflecting lip to cause a cigarette placed in said ashtray to deflect onto said rest and defining a cigarette receiving pocket at said widened lower end of each of said dished regions.

4,920,989

METHOD AND APPARATUS FOR AIDING IN THE REDUCTION OF INCIDENCE OF TOBACCO SMOKING

Jed E. Rose, Venice; Murray E. Jarvik, Santa Monica, and Karce D. Rose, Healdsburg, all of Calif., assignors to Regents of the University of California, Alameda, Calif.

Division of Ser. No. 727,525, Apr. 25, 1985. This application Feb. 19, 1988, Ser. No. 157,536
Int. Cl.[5] A24F *47/00;* A61K *9/00*
U.S. Cl. 131—270 29 Claims



11. A spray and transdermal patch combination for aiding in the reduction of incidence of tobacco smoking by administration of nicotine in a manner which minimizes harmful side effects of nicotine administration, said combination comprising:

(a) an occulsive patch for application to the skin of a person with whom smoking reduction is desired,

(b) a selected amount of nicotine in the patch which is allowed to transdermally migrate from the patch into the person's bloodstream to achieve a desired systemic nicotine level, and

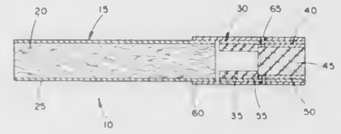
(c) a nicotine containing aerosol spray for delivery of an aerosol to the oral cavity of the user simultaneously with the application of nicotine from the patch, the amount of nicotine contained in the patch and thereby delivered from the patch being generally inversely related to the amount of nicotine normally delivered from the spray but which is still present in an amount to provide the desired sensation in the respiratory tract to which the user is accustomed from normal tobacco smoking and to permit peak levels of nicotine in the bloodstream upon demand by a user, thereby providing the user with desired systemic nicotine levels and the sensation of smoking without most of the other harmful effects of smoking.

4,920,990

CIGARETTE

Brian M. Lawrence; Robert F. Moates; Thomas A. Perfetti, all of Winston-Salem; Renee M. Pogrow, Clemmons; Robert H. Powell, Colfax; Jerry W. Redding; Cynthia A. Stewart, both of Lexington; Karen M. Womble, and Milly M. L. Wong, both of Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 23, 1988, Ser. No. 276,161
Int. Cl.[5] A24B *15/00*
U.S. Cl. 131—359 29 Claims



1. A cigarette having smokable material contained in a circumscribing outer wrapping material, the cigarette exhibiting a ratio of FTC "tar" to FTC nicotine of less than 9 and a resistance to draw between 50 and 200 mm water pressure drop at 17.5 cc/sec. air flow; and having:

(a) smokable filler material comprising (i) from about 40 to about 85 weight percent tobacco filler material, and (ii) about 15 to about 60 weight percent of another smokable material having from about 40 to about 80 weight percent inorganic material, from about 10 to about 50 weight percent carbonaceous material, and from about 5 to about 15 weight percent binding agent;

(b) wrapping material circumscribing the smokable filler and having a permeability from about 5 to about 75 CORESTA units;

(c) air dilution between about 25 and about 75 percent; and

(d) a nicotine content greater than about 2 percent, based on the dry weight of the smokable material.

4,920,991

THERMOCHROMIC ARTIFICIAL NAIL

Yutaka Shibahashi, and Norikazu Nakasuji, both of Aichi, Japan, assignors to Pilot Ink Co., Ltd., Aichi, Japan

Filed Nov. 21, 1988, Ser. No. 274,254
Claims priority, application Japan, Nov. 20, 1987, 62-177731
Int. Cl.[5] A45D *29/00*
U.S. Cl. 132—73 10 Claims

1. A thermochromic artificial nail comprising an artificial nail having provided thereon a thermochromic layer of a thickness of at least 1 μm, said thermochromic layer comprising a thermochromic material changeable in visible external appearance in response to a change in temperature,

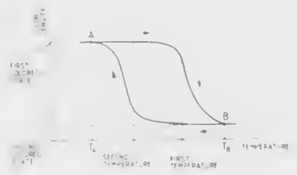
wherein said thermochromic material is formed of microcapsules each having a grain size of about 0.5–50 μm and containing a quasi-reversible thermochromic coloring material which exhibits a hysteresis characteristic in accordance with the change in temperature so as to exhibit interchangeability between a first color state and a second color state, where one of said first and second color states can be colorless,

wherein a two-color holding temperature range is set within a temperature range common to the human environment, and

wherein said microcapsules are fixed in a binder in a dispersed state so as to form said thermochromic layer,

whereby the color of said thermochromic layer is changed

by heating or cooling said layer so as to change the visible external appearances and one of the visible external ap-



pearances is selectively maintained in said temperature range

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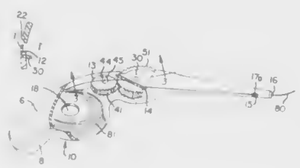
4,920,992
DENTAL FLOSSING APPARATUS
Roberto Precintti, 5883 Cape Horn Dr., Agoura Hills, Calif. 91301
Filed Sep. 21, 1989, Ser. No. 410,424
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—323 8 Claims



1 A dental flossing apparatus comprising:
a. a handle member further comprising,
(i) an elongated shank,
(ii) a throat section extending from the elongated shank and extending to a head section,
(iii) the head section including an internal opening at the top of the head section leading to an internal spherical cavity, the outer surface of the head section having threads thereon,
(iv) a slidable collar which rests around the throat area of the head section and having internal threads for mating engagement with the threads on the head section;
b. a removable yoke further comprising,
(i) a first arm having a rounded upper tip,
(ii) a second arm having a rounded upper tip,
(iii) a base,
(iv) the first and second arms joined to the base of the yoke at their lower ends and extending away from each other to form a V-shape with their respective upper tips at the top of the V shape,
(v) a stem extending from the base in a direction away from the first and second arm,
(vi) a sphere attached at the remote end of the stem, and
(vii) a length of dental floss bonded to the rounded tips of the yoke so that the length of dental floss is stretched taut between the tips of the yoke;
c. whereby the stem and sphere of the yoke are removably inserted into the opening in the head of the handle such that the sphere rests within the spherical cavity and the yoke is oriented at any angle relative to the head and and handle and the collar is threaded onto the head to securely engage the yoke to the head

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4,920,993
DENTAL FLOSS APPLICATOR FOR FLOSSING TEETH
Kenneth H. Mackie, P.O. Box 36086, Pensacola, Fla. 32516
Filed Oct. 3, 1988, Ser. No. 251,769
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—324 11 Claims

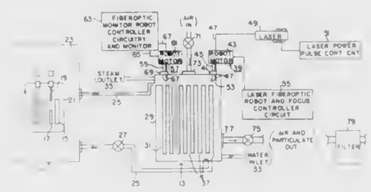


1 A dental floss applicator for dispensing floss and for flossing teeth, comprising: a dispensing unit adapted to be held in one hand, including a supply spool for storing a line of dental floss, a manually operated gear assembly having a thumb wheel control, a drive gear and an idler gear and a lock assembly connected to said idler gear with said lock assembly being responsive to the position of said thumb wheel for releasably wrapping a section of said line of dental floss into a locked position
to prevent dispensing dental floss from said supply spool when said thumb wheel is rotated into a first position and for unwrapping said line of dental floss from said locked position so as to freely permit dental floss to be unwound from said supply spool when said thumb wheel is rotated into a second position.

4,920,994
LASER REMOVAL OF SLUDGE FROM STEAM GENERATORS
Henry D. Nachbar, Ballston Lake, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Sep. 12, 1989, Ser. No. 406,002
Int. Cl.[5] B08B *7/00*; F28G *13/00*
U.S. Cl. 134—1 13 Claims

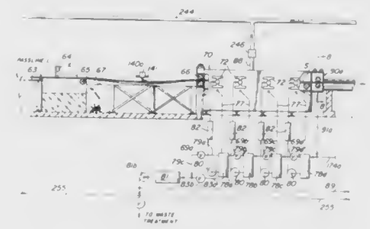
1. A method of removing sludge from steam generator interior surfaces, comprising the steps of:
generating a source of coherent light energy being laser light;
accessing the interior surfaces of said steam generator with a fiberoptic transmission pipe;

transmitting said laser light into said steam generator sludge surface through said fiberoptic transmission pipe;



focusing said laser light from said fiberoptic transmission pipe onto said sludge surface; and
vaporizing said sludge with the energy of said focused light

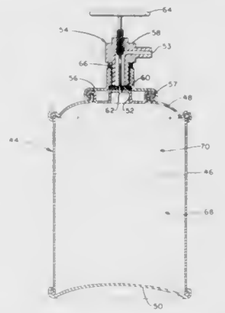
4,920,995
PROCESS FOR CONTINUOUS STRIP PICKLING
Carl G. Seiz, Hatfield, and Clyde G. Robinson, Lansdale, both of Pa., assignors to Continental Installers Corporation, Perkasie, Pa.
Filed Aug. 18, 1988, Ser. No. 233,374
Int. Cl.[5] B08B *1/02*
U.S. Cl. 134—15 15 Claims



1. A process for continuous pickling of metal strip, comprising, in combination, the steps of:
immersing the strip in shallow baths of pickling solution in serially arranged first and second pickling tanks;
ejecting a continuous amount of pickling solution onto the strip near the entrance of each tank;
recirculating the solution drawn from each tank near the exit to the entrance thereof while maintaining the shallow baths;
combining a controlled amount of additional pickling solution with the recirculated solution in either tank;
cascading by gravity any excess amount of the combined solution circulated in the second tank to the first tank; and
discharging by gravity any excess amount of the combined solution circulated in the first tank.

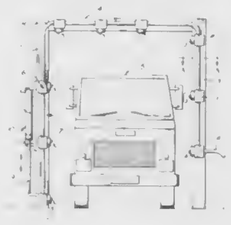
4,920,996
PROCESS FOR CLEANING FUEL INJECTORS
Lloyd T. Flanner, 135 Atterbury Dr., Hudson, Ohio 44236
Filed Apr. 18, 1988, Ser. No. 182,350
Int. Cl.[5] B08B *5/00*
U.S. Cl. 134—22.11 3 Claims

1. A process for cleaning the fuel injectors of an internal combustion engine comprising connecting said injectors to a canister containing an aerosol formulation including a liquid cleaner, and compressed air, said air having an initial pressure from about 25 to about 110 pounds per square inch, gauge, measured at 70° F., and said liquid cleaner being present in an amount such that it occupies from about 25% to about 90%, on a volume basis, of the volume of said canister, and passing said



aerosol formulation through said injectors while the engine is running.

4,920,997
CAR WASHING INSTALLATION
Kurt Vetter, Welzheim; Werner Schulze, Winnenden; Jürgen Krautter, Fellbach/Öff., and Kurt Häfner, Murrhardt, all of Fed. Rep. of Germany, assignors to Alfred Karcher GmbH & Co., Fed. Rep. of Germany
PCT No. PCT/DE87/00453, § 371 Date Apr. 12, 1989, § 102(e) Date Apr. 12, 1989, PCT Pub. No. WO88/02706, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 6, 1987, Ser. No. 340,178
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635213
Int. Cl.[5] B60S *3/04*
U.S. Cl. 134—57 R 22 Claims



1 Vehicle washing installation, in particular for vehicles with a very rugged surface, comprising several spray nozzles for a cleaning liquid possibly with chemicals added thereto arranged next to one another transversely to the longitudinal direction of the vehicle along a portal and moved past said vehicle in the longitudinal direction of said vehicle, said spray nozzles (20) being designed as rotor nozzles which deliver one point contact jet each, said point contact jet issuing at an acute angle of up to approximately 30 degrees at the most at an incline to the axis of rotation of said rotor nozzle and describing the lateral area of a cone, characterized in that said spray nozzles are movable back and forth along the portal around a vehicle in a plane lying transversely to the longitudinal axis of said vehicle, the amplitude of the motion of neighboring spray nozzles (20) being at least so large that the parts of said vehicle (5) over which their point contact jets repeatedly pass ajoin one another.

4,920,998

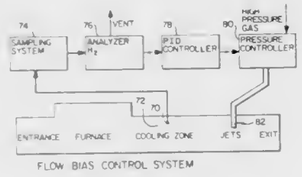
METHOD AND APPARATUS FOR CONTROLLING FLOW BIAS IN A MULTIPLE ZONE PROCESS

Bernard E. Deitrick, Yorktown Heights; Patrick J. Murzyn, Tarrytown; Mark S. Nowotarski, Ossining, and Raymond P. Roberge, Chappaqua, all of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 170,758, Mar. 21, 1988, abandoned. This application Oct. 13, 1989, Ser. No. 421,156

Int. Cl.[5] F27B 9/04; F27D 7/06

U.S. Cl. 137—3 6 Claims



FLOW BIAS CONTROL SYSTEM

1 A method for controlling fluid flow bias within a multiple zone furnace chamber having a free flow of non-air containing gas atmospheres from one zone to another, comprising:

(a) withdrawing a sample of non-air containing atmosphere from within at least one of said zones;

(b) analyzing said non-air containing atmosphere sample for at least one chemical or physical property that is indicative of the existing flow bias, or of a change in said flow bias, in the zone from which said sample was withdrawn;

(c) comparing the property value, or change in property value, obtained upon the analysis of step (b) above with a reference set point or range for said property, or change of property; and

(d) injecting a non-air containing fluid into one of said zones of non-air containing gas atmospheres so as to actively apply a force within one of said zones in response to said comparison of the analyzed property value, or change in property value, with the reference set point of range, thereby controlling the fluid flow bias within said zones to conform the analyzed property with said reference set point or range, whereby fluid flow bias within the multiple zone furnace is conveniently controlled without the introduction of air into the multiple zone furnace or into the gas analysis sample and system employed for such control purposes.

4,920,999

AIR ACTUATED VALVE SYSTEM WITH SEISMIC CONTROLLER

Martin R. Asbra, 2475 Butternut Dr., Hillsborough, Calif. 94010; Andrew F. Asbra, San Mateo, and Nicholas J. Bovis, Burlingame, both of Calif., assignors to Andrene Associates and Martin R. Asbra, both of Burlingame, Calif., a part interest

Continuation-in-part of Ser. No. 254,872, Oct. 7, 1988, Pat. No. 4,852,600. This application Jul. 31, 1989, Ser. No. 387,579

Int. Cl.[5] F16K 17/36

U.S. Cl. 137—38 11 Claims

1 An air actuated valve system for shutting off fluid flow in a fluid conduit, comprising:

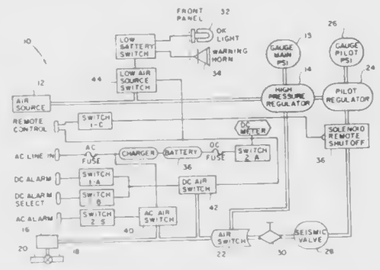
a fluid shut off valve for replacement in the fluid conduit,

an air drive actuator, connected to the fluid shut off valve, for moving the fluid shut off valve between open and closed positions;

a primary air circuit, in fluid communication with the air driven actuator, for supplying air to the air driven actuator at a pressure sufficient to maintain the fluid shut off valve in the open position;

an air switch disposed in the primary air circuit upstream of the air driven actuator and being movable between open and closed positions;

seismic control means, connected to the air switch, for shutting off air to the air driven actuator in response to a predetermined level of seismic activity, said seismic control means including (a) a seismic air circuit, in fluid communication with the primary air circuit and the air switch, for supplying air to the air switch at a pressure sufficient to maintain the air switch in the open position, and (b) a



seismic valve disposed in the seismic air circuit for shutting off air supplied to the air switch in response to a predetermined level of seismic activity, thereby causing the air switch to close and thus the shut off valve to close; and

a venting valve assembly disposed between the air switch and the seismic control means for automatically venting air pressure from the air switch in response to a predetermined level of seismic activity actuating the seismic control means.

4,921,000

BREAK-AWAY COUPLING FOR HOSELINES

Frank E. King, 5 Faraday Rd., Peterlee, Co. Durham, United Kingdom, and Reginald W. Lang, 34 Sandholme Dr., Burkley-in-Wharfedale, Ilkley, West Yorkshire, United Kingdom

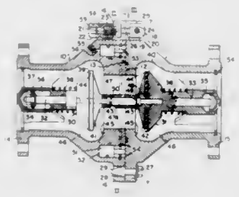
PCT No. PCT/GB83/00312, § 371 Date Jul. 30, 1984, § 102(e) Date Jul. 30, 1984, PCT Pub. No. WO84/02171, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 30, 1983, Ser. No. 637,227

Claims priority, application United Kingdom, Nov. 30, 1982, 8234035

Int. Cl.[5] F16L 29/00

U.S. Cl. 137—68.1 10 Claims



1 A break-away coupling device for use with a hoseline or pipeline, comprising a first coupling member of generally tubular form for connection at its one end to a length of hoseline, pipeline or other fluid-supply or fluid-delivery point, and provided at its other end with a face to be held in sealing engagement with a complementary face of a second coupling member; frangible means holding said faces in sealing engagement; said first coupling member further comprising a valve seat and a valve member, and spring means urging the valve member towards closing engagement with said seat but the valve member usually being held against said spring means out of engagement with the valve seat until said coupling members are separated on breaking of the frangible means; and, separating means to apply pressure between said coupling members which will break said frangible means and separate said faces and said coupling members said separating means comprising an annular channel in the face of one of said coupling members and an annular piston slidably nesting in said channel, whereby the application of fluid pressure to the base of said channel will drive the piston to engage the face of said other coupling member and separate the coupling members.

4,921,001

APPARATUS AND METHOD FOR ADAPTING SENSORS TO AN IRRIGATION CONTROLLER

Stephen D. Pittsinger, Plano, Tex., assignor to Tri-Phase, Inc., Dallas, Tex.

Filed May 22, 1989, Ser. No. 354,891

Int. Cl.[5] F16K 17/36

U.S. Cl. 137—78.2 2 Claims



1 A sensor adapter for use with a water irrigation controller having one or more climatic sensors comprising:

a housing;

a single-pole, double-throw switch enclosed in the housing and having a first and a second input lead and an output lead;

means for conducting current in two directions coupled to the first input lead;

two diodes with leads, the diodes being enclosed in the housing, one lead from each diode being soldered to the first input lead and the remaining lead of each diode being soldered to the second input lead, such that the diodes are oriented in the same direction and connected in parallel; and

a toggle coupled to the switch and protruding from the housing to enable manual actuation of the switch

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4,921,002

AUTOMATIC WATERING ZONE SWITCHER

Thomas M. Christon; Martin A. Richards, both of Omaha, and Eric H. Scholz, Bellevue, all of Nebr., assignors to Rain Matic Corporation, Omaha, Nebr.

Filed Dec. 9, 1988, Ser. No. 282,241

Int. Cl.[5] F16K 11/22

U.S. Cl. 137—119 16 Claims

1 A device for mechanically, automatically, and sequentially switching the flow of fluid from a pressurized source between two fluid outlets, which comprises:

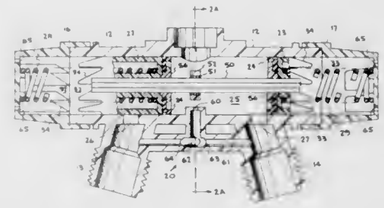
a body defining an interior cylindrical barrel having a circular cross-section;

first piston means disposed in said barrel towards one end thereof, said piston means being capable of rotational and axial motion within said barrel in response to axial force exerted on said piston means;

second piston means, disposed in said barrel toward the other end thereof at a position distal with respect to said first piston means to define an enclosed cylindrical volume within said barrel between said piston means, said second piston means also being capable of rotational and axial motion within said barrel in response to axial force exerted on said piston;

first conduit means capable of connecting said device to said pressurized source of fluid, said conduit means establishing fluid communication with said cylindrical volume within said barrel between said pistons;

first and second output conduits, establishing fluid communication with the interior of said barrel, respectively, in the regions of said barrel capable of being traversed by said first and second piston means;



energy storage means coupled to said first and second piston means, for extracting energy from said pressurized source of fluid and releasing said energy to move said piston means toward said central volume, whereby said piston means may be forced apart when said source of pressurized fluid is turned on to exert pressure against said pistons, and forced together when said source of pressurized fluid is turned off by release of stored energy from said energy storage means coupled to said piston; and

guide means for alternately permitting one of said pistons to open one of said output conduits to selectively establish fluid communication between said output conduit and said central volume.

4,921,003

SHUT-DOWN VALVE

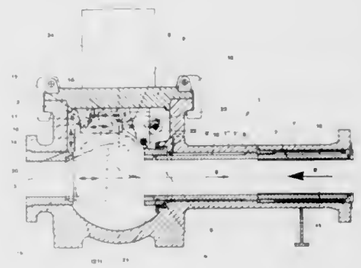
Knut Horvei, Sandnes, Norway, assignor to Den norske stats olkeselskap, Norway

PCT No. PCT/NO85/00062, § 371 Date Apr. 22, 1988, § 102(e) Date Apr. 22, 1988, PCT Pub. No. WO87/02094, PCT Pub. Date Apr. 9, 1987

PCT Filed Oct. 3, 1985, Ser. No. 83,786

Int. Cl.[5] F16K 43/00

U.S. Cl. 137—315 3 Claims



1 In a shut-down valve for use in underwater pipelines for fluids having a valve housing including an inlet conduit and an outlet conduit, said inlet conduit defining a cylindrical valve chamber (12, 13) therein which is orientated along the direc-

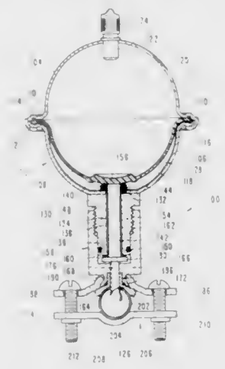
tion of flow of the fluid through the pipeline; a radially placed valve chamber (14) which is closeable with a removable bonnet (9); a clack-valve body (3) which is movable between a closed position, cooperating tightly with a seat (4) in the valve housing, and an open position, in which the valve is open for through-flow of fluid in one direction through said inlet conduit, said valve chamber and into said outlet conduit; a trunk piston (7) which is axially displaceable in the cylindrical valve chamber (12, 13) of the valve housing between an advance position in which the trunk piston (7) extends over the entire radial valve chamber (14) of the valve housing and into engagement with said outlet conduit for separating the radial valve chamber (14) from the cylindrical valve chamber (12, 13) so that maintenance can occur without dismantling the valve, and a retracted position in which the trunk piston (7) is retracted from engagement with the outlet conduit through the area of the radial valve chamber (14) and back into said inlet conduit; the improvement comprising: a clack-valve body (3) pivotably mounted on bonnet (9), said clack-valve body being pivotably moved between said open and closed position by a first actuator means; and a locking means for locking trunk piston (7) in the advanced position, said locking means comprising a second actuator means for actuating a yoke (20) which is adapted to be moved between an upper position in which the trunk piston (7) can be moved unobstructed, and a lower position in which the yoke (20) cooperates with a groove (21) in the trunk piston (7) to lock the trunk piston (7) in an advanced position.

4,921,004

PIERCING SURGE REGULATOR VALVE AND APPARATUS

Joseph A. Lane, Taunton, Mass., and Robert H. Jernberg, East Hampton, Conn., assignors to Amtrol Inc., West Warwick, R.I.

Filed Aug. 15, 1989, Ser. No. 394,113
Int. Cl.[5] F16K *43/00*; F16L *55/04*
U.S. Cl. 137—318 3 Claims



1 A piercing surge regulator valve for use with a liquid-carrying member, comprising:

(a) a valve body adapted to be connected to the liquid-carrying member in a sealing manner, said valve body comprising a housing and a housing fitting inside of the housing, the housing and housing fitting being movable in relation to each other;

(b) a bore in the valve body;

(c) a container containing a flexible diaphragm therein so as to divide the container into two chambers, one chamber adapted to contain pressurized gas and the other chamber adapted to contain pressurized liquid, the container having a hole whereby the pressurized-liquid chamber communicates with the bore; and

(d) a piercing element movable within the bore and having a passage therethrough, the housing fitting engaging the piercing element, movement of the housing fitting inwardly in relation to the housing causing the piercing element to move in a direction toward the liquid-carrying member for piercing a hole in the liquid-carrying member so as to allow liquid pressure to flow through the piercing element into the pressurized liquid chamber to suppress any shock wave or liquid hammering as a result of excessive liquid pressure created when the liquid-carrying member is shut-off.

4,921,005

MASS FLOW CONTROLLER

Tadahiro Ohmi, 2-1-17, Komegafukuro, Sendai-City Miyagi-Prefecture, 980, Japan; Hiroshi Mihira, 74-11, Takaba-cho, Mukaijima, Fushimi-ku, Kyoto, 612, Japan, and Kiyoshi Satoh, 22-1, Terado-cho, Mukoh-City, Kyoto, 617, Japan

Filed Jun. 15, 1989, Ser. No. 366,618
Claims priority, application Japan, Jun. 20, 1988, 63-152674
Int. Cl.[5] G01F *1/68*; G01D *7/00*
U.S. Cl. 137—486 6 Claims

1 An improved mass flow controller having a mass flow meter portion for measuring the flow rate of a fluid provided between a fluid inlet and a fluid outlet and further having a fluid-controlling portion for controlling the flow rate of the fluid, the improvement comprising:

said mass flow meter portion having a fluid conduit with two resistors being wound about said fluid conduit, said resistors forming part of a measuring circuit means and said measuring circuit means supplying said two resistors with an electric current such that the direction of the magnetic field generated in said two resistors is opposite to the direction of the fluid flowing through said conduit.

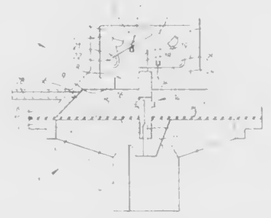
4,921,006

VACUUM REGULATOR APPARATUS

John R. Evans, Gobowen, England, assignor to R. J. Fullwood & Bland Limited, Ellesmer, England

Filed Apr. 7, 1988, Ser. No. 178,525
Claims priority, application United Kingdom, Apr. 7, 1987, 8708244; Jan. 15, 1988, 8800935
Int. Cl.[5] F16K *37/00*
U.S. Cl. 137—554 8 Claims

1 Vacuum pressure control apparatus for a vacuum system that in operation is at a sub-atmospheric pressure, said apparatus comprising: means defining an inlet for ambient air into said vacuum system; a valve that in use is arranged to control the degree of opening of said inlet; first pressure-responsive means responsive to the pressure in said vacuum system and operative to decrease the degree of opening of said valve in response to a rise in said pressure and to increase said degree of opening in response to a fall in said pressure; signaling means responsive to said degree of opening of said valve and operative to give a first signal if said valve is open to admit air to said vacuum system at more than a first predetermined rate and to give a second signal if the degree of opening of said valve is reduced to admit air to said vacuum system at less than a second predetermined rate; and second pressure-responsive means operative to give a third signal if said pressure is outside a predetermined range.

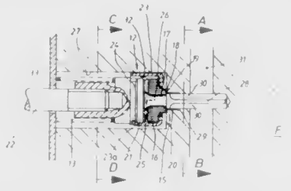


4,921,007

MASTER BRAKE CYLINDER SUCTION REFILL VALVE

Wilhelm Zirps, Hemmingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 182,011, Apr. 15, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 382,047
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717088
Int. Cl.[5] F16K *15/00*; B60T *11/20*
U.S. Cl. 137—543.21 14 Claims



1 A suction refill valve for a master brake cylinder, which comprises a bore (27), an inlet which opens into said bore, a valve seat on said inlet, a valve body (21) in said bore, a sealing element (16) attached to said valve body relative to said valve seat, said valve body is operative in said bore to move said sealing element relative to said valve seat for opening and closing said inlet, said sealing element (16) is an annular molded element and includes an axial passage (26) for fluid flow and a sealing face (18), such that when said inlet is closed by said sealing face of said sealing element, said sealing element is acted upon on all sides sealing element, said sealing element is acted upon on all sides, except on its sealing face (18), by a pressure prevailing in said bore.

4,921,008

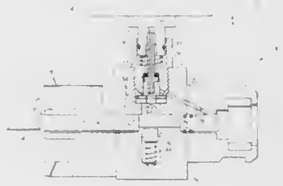
AUTOMATIC FLUID FLOW SHUTOFF DEVICE

Geoffrey F. Foster, Glenorie, Australia, assignor to Premier-Fosters (Australia) Limited, New South Wales, Australia

Filed Jul. 21, 1988, Ser. No. 222,205
Int. Cl.[5] E03B *5/00*
U.S. Cl. 137—557 2 Claims

1 A fluid flow shutoff device comprising:

a body, a chamber within said body, an inlet and an outlet communicating with said chamber to permit fluid flow through said chamber, said outlet defining an outlet orifice connected to an outlet passage, a ball valve located and captured in said chamber to one side of said orifice and permitting fluid flow through said orifice to said outlet passage under a steady flow regime or gradually increasing flow regime of fluid through said chamber but seating upon and closing said orifice to arrest said fluid flow under a sharply increasing flow regime of said fluid through said chamber, a hollow shaft slidably mounted within said body at the other side of said orifice and coaxial therewith and being connected to a pressure measuring gauge for measuring via said hollow tube fluid pressure in said outlet passage, and resilient means urging said hollow shaft away from said orifice whereby depression of said hollow shaft against said resiliently means effect unseating of said ball valve from said orifice wherever restarting of fluid flow is required



4,921,009

TORQUE CONTROL SYSTEM

Gunter H. Adam, 1342 Rutledge Ave., Charlotte, N.C. 28211

Filed Dec. 7, 1988, Ser. No. 280,748
Int. Cl.[4] F16K *37/00*; F01B *25/02*
U.S. Cl. 137—557 7 Claims



1 A torque control system for controlling the amount of torque imparted by an air tool to fasteners to be tightened with a specific torque for the connection of parts during an assembly of parts, said torque control system comprising:

(a) a supply of air;

(b) a plurality of torque circuits within the system;

(c) a control panel;

(d) a selector switch for actuating a selected torque circuit;

(e) means for delivering supply air to the selected torque circuit;

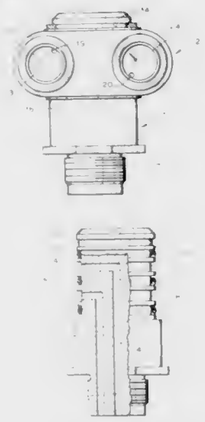
(f) means for stabilizing the air pressure within the selected torque circuit;

(g) means for regulating the volume and pressure of air within the selected torque circuit to predetermined values;

(h) means for delivering air at predetermined values of volume and pressure from the selected torque circuit to the tool; and

(i) means for timing the delivery of air to the tool and stopping the tool after a predetermined time of operation.

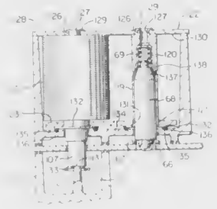
4,921,010
SWIVEL CONNECTOR
Steve Spirer, Haworth, N.J., assignor to Unex Corporation, South Hackensack, N.J.
Filed Apr. 22, 1988, Ser. No. 183,565
Int. Cl.[5] F16K *17/00*
U.S. Cl. 137—580 12 Claims



1. A swivel connector for supplying a fluid, comprising a first member having an axis and an outer cylindrical surface, said first member being provided with two separate first passages which open at said outer cylindrical surface at two axially spaced locations; a second member having an inner cylindrical surface which defines an opening for receiving said outer cylindrical surfaces of said first member so that said members are swivelable relative to one another, said second member being provided with two second passages which are separate from one another and open at said inner cylindrical surface at two axially spaced locations substantially corresponding to said first mentioned axially spaced locations; two circular grooves provided in at least one of said surfaces and each communicating one of said first passages with a respective one of said second passages; a pressure relief valve arranged to relieve a pressure of fluid when it exceeds a predetermined value, said pressure relief valve being arranged in said second member and communicating with at least one of said circular grooves.

4,921,011
FUEL CONTROL VALVE CONSTRUCTION, PARTS THEREFOR AND METHODS OF MAKING THE SAME
Samuel T. Kelly, Torrance, and Jay R. Katchka, Cypress, both of Calif., assignors to Robertshaw Cnntrols Company, Richmond, Va.
Division of Ser. No. 87,419, Aug. 20, 1987, Pat. No. 4,787,414, which is a division of Ser. No. 938,621, Dec. 5, 1986, Pat. No. 4,729,396. This application Sep. 8, 1988, Ser. No. 241,966
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[5] F16K *31/06*
U.S. Cl. 137—595 10 Claims

1. In a control valve arrangement comprising two separate valve means, and solenoid means operatively associated with said valve means for causing said valve means to be in a first condition thereof upon said solenoid means being energized and for causing said valve means to be in a second condition thereof upon said solenoid means being deenergized, the improvement wherein said solenoid means comprises a single electrical coil having an opening passing centrally therethrough and an internal armature means for operating one of said two valve means by having a portion thereof movably disposed in said opening of said coil and an external armature means for operating the other of said two valve means, said



external armature means being entirely external to said coil and in spaced offset relation to said internal armature means, said internal armature means and said external armature means each being adapted to be moved to a certain position thereof only when the flux created by said coil being energized is imposed thereon

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4,921,012
AUTOMATIC WATER SHUT-OFF APPARATUS FOR BUILDING PROTECTION
David R. Bratten, 322 Greenway Rd., Memphis, Tenn. 38117
Filed Sep. 14, 1989, Ser. No. 407,212
Int. Cl.[5] G08B *13/00*
U.S. Cl. 137—599 9 Claims



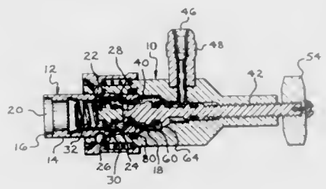
1. An automatic water shut-off apparatus for protection of a building from water damage for attachment to an intrusion alarm system, said alarm system having an armed condition in which the building is monitored for intrusion and a safe condition in which the alarm system is disarmed, comprising the combination of:

(a) electrically controlled valve means for insertion into the water supply for the building, said valve means having an opened position permitting the flow of water through said valve means into said building and a closed position preventing the flow of water through said valve means,

(b) manual shut-off means for forcing said valve means into said closed position, and

(c) control means responsive to the alarm system for operating said valve means from an external power source, said control means having an armed state which is entered when the alarm system is in said armed condition and an unarmed state which is entered when the alarm system is in said safe condition, said armed state directing said valve means to enter said closed position and said unarmed state directing said valve means to enter said opened position.

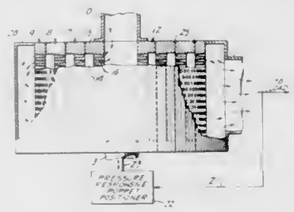
4,921,013
COUPLING ADAPTER
Robert D. Spalink, Grand Rapids; Steven M. Knowles, Leslie, and John T. Kosztowny, Dearborn, all of Mich., assignors to Aeroquip Corporation, Jackson, Mich.
Filed Aug. 21, 1989, Ser. No. 396,323
Int. Cl.[5] F16L *37/28*
U.S. Cl. 137—614.05 1 Claim



1. A coupling adapter for use with a self-sealing valved coupling part having an axially movable valve normally forced to the closed position by a spring member characterized by its ability to selectively control the axial position of the coupling part's valve when under high pressure, comprising, in combination, a tubular body having a coupling end and an outer end, quick-connect coupling means defined on said body adjacent said coupling end for selectively coupling said body and the coupling part in coaxial communication, said coupling means comprising an axially displaceable sleeve defined on said body operatively associated with a plurality of radially displaceable detents defined on said body, an axial passage defined in said body extending from said coupling end intersecting an axially aligned threaded bore formed in said outer end intermediate said ends, said passage including an enlarged cylindrical portion adjacent said coupling end and a concentric reduced diameter cylindrical portion adjacent said enlarged portion, a manually operable valve actuator having a threaded end received in said threaded bore and a head axially displaceable between said enlarged and reduced diameter portions adapted to releasably engage and axially displace the coupling part's valve, said head including a cylindrical portion receivable within said passage reduced diameter portion, and annular seal mounted on said head cylindrical portion sealingly engaging said passage reduced diameter portion when said head cylindrical portion is received therein, a torque applying handle mounted on said valve actuator for rotating said actuator and manually controlling the axial position of the coupling part valve, first sealing means mounted on said actuator intermediate said head and said threaded end establishing a sealing relationship adjacent the intersection of said threaded bore and said passage, and a tubular extension mounted on said body transversely disposed to said body passage having a fluid port intersecting said body passage.

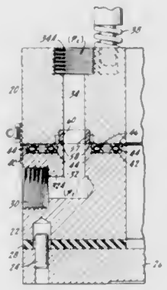
4,921,014
NOISE-REDUCING VALVE CONSTRUCTION
Peter A. Tartaglia, Butler; Richard B. Collins, Denville, and Robert S. Smolen, Bloomingdale, all of N.J., assignors to Marotta Scientific Controls, Inc., Montville, N.J.
Filed Apr. 27, 1989, Ser. No. 344,297
Int. Cl.[5] F16K *47/14*
U.S. Cl. 137—625.3 16 Claims

1. Noise-reducing valve structure, comprising a first tubular member open at one end for accommodating inlet fluid flow, a poppet member guided by the bore of said tubular member for actuated displacement via the opposite end of said tubular member, said tubular member having a circumferentially and axially distributed plurality of like generally radial passages adapted to be opened and closed in accordance with the guided position of said poppet member, said first tubular member being one of a plurality of fitted concentric tubular members each of which has a circumferentially and axially distributed plurality of like radial passages, the interface region between each pair of radially adjacent tubular members being characterized by a circumferentially continuous manifold formation, the radial passages of all said tubular members being characterized by progressively expanding section area in the radially outward direction, whereby, for other than a valve-



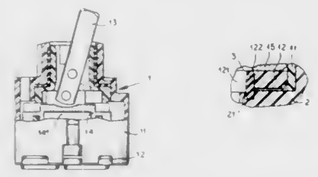
closing position of said poppet member, fluid flow via passages of the inner tubular member of each said pair is to a manifold formation between the inner and outer tubular members of each said pair, and a valve-body outlet having circumferentially manifolded communication with all passages of the outermost one of said tubular members.

4,921,015
ROTARY VACUUM VALVE
Josef Sedy, Singapore, Singapore, assignor to John Crane, Inc., Morton Grove, Ill.
Filed Jul. 21, 1989, Ser. No. 383,003
Int. Cl.[5] F16K *25/00, 29/00*
U.S. Cl. 137—625.11 10 Claims



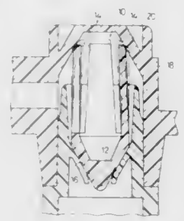
5. In a rotary vacuum valve assembly including a rotor member and stator member, one juxtaposed on the other to impress its weight thereon and thereby tending to produce a tight interface between the opposed surfaces of the seal members, said tight interface being further tightened when vacuum is drawn, the lower one of said seal members having an annular pressurizing chamber therein occupied by an annular expansible seal ring, passage means to admit gas under pressure to said pressurizing chamber to exert a slight lifting force to the upper one of the valve members resulting in a small clearance between the valve members at their interface, and said expansible seal ring expanding into said clearance space, whereby the valve members may be relatively rotated in a dry running condition without need for lubricating the interface.

4,921,016
WATER MIXING VALVE
Werner Gnauert, Iserlohn, and Horst Titze, Hagen, both of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed Sep. 7, 1989, Ser. No. 404,304
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830700
Int. Cl.[5] F16K *11/06*
U.S. Cl. 137—625.17 12 Claims



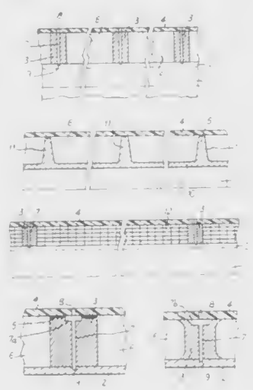
1 A water mixing valve, comprising:
a valve body formed with water inlets and a water outlet;
a valve assembly receivable as a unit in said valve body and comprising:
a generally cup-shaped housing,
a substantially nonmovable valve seat disk received in said housing sleeve and having respective openings corresponding to said inlets and said outlet,
a control disk in said housing sleeve shiftable against said valve seat disk and provided with at least one passage for interconnecting said inlets and said outlet,
a valve bottom shiftable axially in said housing sleeve and provided with openings registering with said openings of said valve seat disk, at least one of said openings of said valve bottom having a wall formed with a respective constriction at a side of said valve bottom turned toward said valve seat disk, and
respective tubular elastic seals received in said openings of said valve bottom, at least one of said seals being seated against a respective constriction, said seals projecting from said valve bottom and being seated against said valve body for sealing between said valve body and said valve seat disk; and
an actuator extending into said assembly and engaging said control disk for actuating same.

4,921,017
CHECK VALVE
Atsushi Tada, 2-6-3 Kakinokizaka, Meguro-Ku, Tokyo, Japan
Filed Aug. 29, 1989, Ser. No. 400,099
Claims priority, application Japan, Nov. 18, 1988, 63-150574[U]
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—843 10 Claims



1. A check valve, comprising:
a valve body made of plastics; and
a plurality of blades made of plastics, said blades being formed integral with said valve body and extending in the axial direction of said valve body, said blades having free ends, and said blades undergoing elastic deformation when pushed onto a tapered inner surface of a stopper at their free ends, thereby biasing said valve body onto a valve seat.

4,921,018
HEAT INSULATED LINE FOR THE TRANSPORT OF FLUIDS
Hamadi Dridi, Paris, and Bernard Dewimille, Grigny, both of France, assignors to Coflexip, Paris, France
PCT No. PCT/FR85/00097, § 371 Date Dec. 26, 1985, § 102(e) Date Dec. 26, 1985, PCT Pub. No. WO85/04941, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 25, 1985, Ser. No. 829,145
Claims priority, application France, Apr. 25, 1984, 84 06483
Int. Cl.[5] F16L *9/14*
U.S. Cl. 138—149 4 Claims



1 A thermally insulated conduit for the transfer of fluids, comprising an inner central pipe through which fluids can flow, a cover covering said pipe, a plurality of annular partitions spaced apart along the length of said pipe and sealed to said cover of the pipe, each partition having an outer peripheral surface and side faces, insulating material filling the annular chambers defined between side faces of successive partitions and the outer surface of said cover of the pipe, said insulating material having a peripheral surface, and an outer continuous extruded casing concentric to said pipe and joined with the peripheral surface of said insulating material, said outer casing being sealed to the peripheral surfaces of said annular partitions, so that said partitions define sealed chambers between said cover of the pipe and said outer casing, where the annular partitions are interconnected by a tube, said partitions extend radially from said tube, and said tube coaxially surrounds said inner pipe.

2. A thermally insulated conduit for the transfer of fluids comprising, an inner central pipe through which fluids can flow, a cover covering said pipe, a plurality of annular partitions spaced apart along the length of said pipe and joined thereto, each partition having an outer peripheral surface and side faces, insulating material filling the annular chambers defined between side faces of successive partitions and the outer surface of said cover of the pipe, said insulating material having a peripheral surface, and an outer continuous extruded casing concentric to said pipe and joined with the peripheral surfaces of said annular partitions and the peripheral surface of said insulating material, and wherein, the partitions comprise at least one inner radial passage providing communication between the outer cover of the inner pipe of the conduit and the outside of the conduit, said passage opening into a corresponding opening provided in the outer casing.

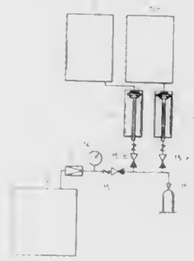
4,921,019
WEFT INSERTION IN JET LOOM
Susumu Kawabata, Aichi; Kazunori Yoshida, Nagoya, and Fujio Suzuki, Toyota, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan
Filed May 2, 1989, Ser. No. 347,434
Claims priority, application Japan, May 2, 1988, 63-107608
Int. Cl.[5] D03D *47/34, 47/12*
U.S. Cl. 139—452 4 Claims



1. A method for weft insertion in a jet loom, comprising the steps of:
continuously drawing out a weft from a supply package;
temporarily accumulating and storing a predetermined length of the weft; and
inserting the weft in a free running period in which the stored weft is inserted in a free running mode into a warp shed by a jet jetted by a main nozzle and in a subsequent constrained running period in which the weft drawn out from the supply package is inserted directly into the warp shed in a constrained running mode;
inserting the weft into the warp shed at a speed higher than a running speed Vf defined by $Vf = Lo/tc$, where Lo is the weft length and tc is a time period necessary for one weaving cycle of the loom during a period of a transient running mode in which the running mode of the inserted weft changes from the free running mode to the constrained running mode.

4,921,020
APPARATUS FOR FILLING AND REFILLING OF CONTAINERS WITH FLOWABLE MATERIAL AND PRESSURIZED PROPELLANT
Viktor Pamper, Budapest, Hungary, assignor to Duna Elelmiszer Es Vegyiaru Kereskedelmi Vallalat, Hungary
Continuation of Ser. No. 688,909, Jan. 4, 1985, abandoned. This application Oct. 29, 1987, Ser. No. 115,627
Claims priority, application Hungary, Jan. 6, 1984, 42/84
Int. Cl.[5] B65B *31/10, 3/04*
U.S. Cl. 141—20 9 Claims

1. An apparatus for the filling and refilling of tanks suitable for the discharge of fusible materials comprising:
(a) a plurality of feed tanks containing different fusible materials;
(b) a feed unit means associated with each feed tank for feeding the output of its respective feed tank;
(c) a plurality of feed check valves for valving the output of a respective feed unit means;
(d) a propellant gas supply tank;
(e) a propellant gas check valve;
(f) a propellant gas conduit between said supply tank and said propellant gas check valve;
(g) a charging stub; and
(h) a further propellant gas conduit between said propellant gas check valve and said charging stub, said further propellant gas conduit also communicating with each of said plurality of feed check valves and thus connecting said feed check valves to said charging stub whereby propellant gas passing through said further propellant gas conduit purges said further propellant gas conduit of any remaining fusible maerial admitted by said plurality of feed check valves.



4,921,021
FILLER PIPE FOR A PACKING MACHINE
Sven A. Andersson, Veberoed, Sweden, assignor to AB Tetra Pak, Lund, Sweden
Filed Dec. 23, 1988, Ser. No. 289,193
Claims priority, application Japan, Dec. 23, 1987, 62-195655[U]
Int. Cl.[5] B65B *3/10*
U.S. Cl. 141—103 2 Claims



1. A filler pipe for packing machine for use in filling a continuous series of connected packing container blanks with a liquid product and a separate jam product, said filler pipe comprising:
a nozzle with a plurality of filling paths with each of said plurality of filling paths adapted for passing said liquid product to at least one of said packing container blanks, said nozzle comprising an upstream end and a downstream end with two outer sides joined by an upper face and a bottom face connecting said upstream and downstream ends, with multiple guide blocks arranged in symmetrical pairs disposed within and along the longitudinal axis of said nozzle so that one wall of each of said guide blocks faces an upstream direction, an outer edge of each of said guide blocks extends to an outer side of said nozzle and an inner edge of said guide blocks gradually extends toward

the longitudinal axis of said nozzle, from both of the outer sides of said nozzle, said guide blocks defining filling paths formed therebetween along the longitudinal axis and on the bottom face of said nozzle and arranged between said upstream and downstream ends;

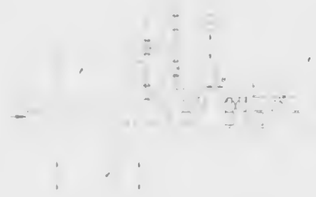
a flat shaped first delivery pipe having an upper face and a bottom face connected to the upstream end of said nozzle to deliver said liquid product to said nozzle; and a second delivery pipe smaller in diameter than said first delivery pipe and positioned parallel to and on the interior of said first delivery pipe and having an outlet opening extending through the bottom face of said first delivery pipe at a predetermined distance above the junction of said first delivery pipe and said nozzle and adapted for passing said jam product to any of the packing container blanks.

4,921,022

APPARATUS FOR FILLING INSULATING GLASS WITH A SPECIAL GAS

Peter Lisec, Bahnbofstrasse 34, A-3363 Amstetten-Hausmening, Austria

Filed Dec. 9, 1988, Ser. No. 282,255
Claims priority, application Austria, Jan. 11, 1988, A43/88
Int. Cl.[5] E06B *3/66*
U.S. Cl. 141—129 **9 Claims**



1. Apparatus for inserting a gas between two sheets of glass that are spaced apart by a spacer, wherein a first opening is provided in the spacer for reception of said gas and at least one second opening is provided through the spacer for the exit of air from between said sheets of glass, comprising means for exerting pressure on the glass sheets during said insertion, means for conveying said sheets, along a conveying route, through and beyond said pressure means, a device including a probe mounted on the device for inserting said gas into said first opening, means mounted on the device for sealing said first opening and said at least one second opening after insertion of said gas, means for moving said device between a first position in which said device is disposed below said conveying route to permit movement of said glass sheets along said conveying route and a second position in which said probe is in alignment with said first opening and a third position in which said sealing means are in alignment with all said openings to seal all said openings, and means supporting said probe on said device for movement relative to said device toward and away from the glass sheets in a direction parallel to said conveying route.

4,921,023

ROUTER GUIDE ATTACHMENT

George J. Pempek, 9740 S. 81st Ct., Palos Hills, Ill. 60465

Filed Nov. 3, 1989, Ser. No. 431,447
Int. Cl.[5] B27C *5/00*
U.S. Cl. 144—136 C **6 Claims**

1. A guide attachment adapted to be mounted on the underside of a router and comprising;

a generally plate member having an area several times greater than that of the underside of the router, having a router blade opening therein closer located in the relatively small area of said plate member that coincides with the underside of said router and having scale indicia on or adjacent the margin of one edge;

an elongated fence member having a straight edge on which there is a router blade accommodating cut-out intermediate its ends;

fastener means pivotally attaching said fence member adjacent one end thereof to said plate member adjacent at a place remote from said one edge and with said straight edge facing said router blade opening; and

clamp means mounted on said fence at or adjacent its distal end and engageable with said plate member for releasably



securing said fence member in selected positions with respect to said plate member;

said cut-out in said straight edge being located and sized so that it at least partially coincides with said router blade opening when said fence member is aligned with said blade opening;

the distance between the location of said pivoted attachment of said fence member to said plate member and said scale being substantially greater than the longest dimension of said underside of said router; and

said scale indicia corresponds to the perpendicular distances between said straight edge and the center of said blade opening in said plate member.

4,921,024

METHOD AND APPARATUS TO FELL A TREE

Ronald W. Wiemeri, Owatonna, Minn., and James N. Mitchell, Skippers, Va., assignors to Blount, Inc., Montgomery, Ala.

Filed Oct. 16, 1989, Ser. No. 422,137
Int. Cl.[5] A01G *23/08*
U.S. Cl. 144—336 **7 Claims**



6. A method to fell a tree comprising the steps of:

attaching to a vehicle a felling head having a circular saw rotatable in a horizontal plane;

overlaying said circular saw with a saw guard having a first portion and a second portion, the guard having an opening in the first portion of the guard to expose a first arcuate cutting portion of said saw and a second portion pivotably attached to the first portion of the guard to selectively cover or uncover a second arcuate cutting portion of said saw;

raising said second guard portion and advancing the vehicle and the felling head toward a first side of a tree to allow the second arcuate cutting portion of the saw to cut a first slot through the first side of the tree;

reversing the vehicle and the felling head to disengage the saw from the first side of the tree;

covering the second arcuate cutting portion of the saw with the second portion of the guard;

advancing the vehicle and the felling head toward the tree opposite said first side such that the first arcuate cutting surface of the saw engages said opposite side of the tree to cut a slot through the second side of the tree intersecting the first slot in the first side of the tree thereby severing the tree.

4,921,025

CARBURIZED LOW SILICON STEEL ARTICLE AND PROCESS

Sheryl A. Tipton, East Peoria; Gary D. Keil, Elmwood; Gregory S. Holloway, Metamora; David R. Gromer, Morton, and Gary L. Biltgen, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

PCT No. PCT/US88/04470, § 371 Date Apr. 13, 1989, § 102(e) Date Apr. 13, 1989, PCT Pub. No. WO89/05865, PCT Pub. Date Jun. 29, 1989
Continuation-in-part of Ser. No. 135,775, Dec. 21, 1987, abandoned. This PCT application Dec. 14, 1988, Ser. No. 348,736
Int. Cl.[5] C21D *1/78*
U.S. Cl. 148—16.5 **18 Claims**

1. A process for forming a steel article having a carburized surface substantially free of intergranular oxides and having carbides on said carburized surface comprising at least 20% thereof, not requiring any further finishing, including the steps of:

selecting a steel material having, by weight percent, from about 0.08% to about 0.35% carbon, from about 0.3% to about 1.7% manganese, not more than 0.10% silicon, not more than 0.15% copper, less than 1.1% chromium, from about 0.2% to about 2.5% carbide forming elements including said chromium, less than 6% additional hardenability agents, less than 1% grain refining elements, and the balance iron and trace impurities;

shaping the steel material to form an article;

carburizing said article at a temperature and for a period of time sufficient to form a surface comprising austenite and a high density of carbides dispersed in said austenite;

quenching said carburized article to transform the surface into a microstructure of martensite, retained austenite and carbides; and

controlling the steps of carburizing and quenching so that the carbides comprise at least 20% of said surface, and the surface is substantially free of intergranular oxides, thereby producing a carburized steel article not requiring any further finishing of the carburized surface.

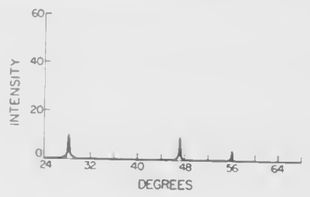
4,921,026

POLYCRYSTALLINE SILICON CAPABLE OF YIELDING LONG LIFETIME SINGLE CRYSTALLINE SILICON

Robert N. Flagella, Ridgefield, and Howard J. Dawson, Washougal, both of Wash., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jun. 1, 1988, Ser. No. 201,567
Int. Cl.[5] C30B *13/16*
U.S. Cl. 148—33 **10 Claims**

1. Polycrystalline silicon rod which is capable of providing within no more than two float zoning passes, unicrystalline silicon exhibiting a resistively of at least 10,000 ohm-cm (donor) and a lifetime of at least about 10,000 microseconds, said polycrystalline silicon rod comprising any starter filament used in its manufacture and a polycrystalline growth layer, said rod having a diameter of at least about 50 millimeters and length of



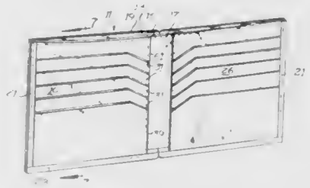
at least about 0.5 meters; said polycrystalline silicon growth layer exhibiting an X-ray powder diffraction pattern (copper radiation) having a peak at 26.85±0.25° (2 theta) which is at least about 1.75 percent of the (111) peak and said polycrystalline silicon rod containing less than 15 ppta boron and less than 20 ppta phosphorus.

4,921,027

BILLFOLD AND MULTI-POCKET LINER THEREFOR

Roy Scheunemann, West Bend, Wis., assignor to Amity Leather Products Company, West Bend, Wis.

Filed Feb. 8, 1989, Ser. No. 308,204
Int. Cl.[5] A45C *1/06, 11/18*
U.S. Cl. 150—147 **10 Claims**



1. A multi-card liner for use in the assembly of a wallet comprising:

(1) A support member, said support member having at least two vertical slits extending from a bottom edge to provide a downwardly-extending tongue member;

(2) a plurality of leaves, each of said leaves having a tongue-receiving slit extending thereacross;

(3) said leaves being strung along said tongue in a vertically-aligned, partially overlapping array to form an integral liner having a series of single edge overlying cavities arranged in shingled relationship for the reception of cards.

4,921,028

DOOR HARDWARE COVER

Nathan H. Schwartz, 5996 Mitchell Rd., NW., Unit 15, Atlanta, Ga. 30328

Filed Aug. 8, 1988, Ser. No. 229,258
Int. Cl.[5] E05D *11/00*
U.S. Cl. 150—155 **7 Claims**

6. A painting cover for a doorknob assembly on a door where the doorknob assembly includes a protruding doorknob and a base plate on the door through which the doorknob is mounted, the base plate having a base peripheral edge at the door surface and the doorknob assembly, including the base peripheral edge of the base plate, to be covered during painting

so that paint does not get on the doorknob assembly, said cover including:

a thin flexible rectilinear sheet having opposed end edges, opposed side edges and an inside surface, said sheet having a prescribed width at least twice as great as the distance the doorknob projects from the door surface and a length greater than the length of said peripheral edge on said base plate;

a pressure sensitive side adhesive strip applied to the inside surface of said sheet along one side edge thereon, said side adhesive strip extending along said side edge on said sheet for a distance at least as great as the length of the periph-



eral edge of the base plate so that said adhesive strip will attach the side edge of said sheet to the peripheral edge of the base plate with said sheet extending over the doorknob to cover both the base plate and the doorknob and with one end edge on said sheet overlapping the other end edge as said side edge is wrapped around the peripheral edge of the base plate; and,

tie means for tying that portion of said sheet projecting past the door hardware to enclose the door hardware therein to prevent paint being inadvertently applied thereto yet will allow the doorknob to be grasped and turned without disconnecting said cover from the base plate.

4,921,029

TRAPEZOIDAL NON-PNEUMATIC TIRE WITH SUPPORTING AND CUSHIONING MEMBERS

Richard L. Palinkas, Northfield, Conn., and Scott R. Pajtas, Warren, Mich., assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio

Continuation-in-part of Ser. No. 190,299, May 4, 1988, abandoned, and a continuation-in-part of Ser. No. 787,867, Oct. 16, 1985, abandoned, and a continuation-in-part of Ser. No. 600,932, Apr. 16, 1984, abandoned. This application May 22, 1989, Ser. No. 354,589

Int. Cl.[5] B60C *7/00*

U.S. Cl. 152—11 14 Claims



1 In a non-pneumatic tire rotatable about an axis, said tire comprising an annular body of resilient elastomeric material, said body consisting essentially of a generally cylindrical outer member at the outer periphery of said body, a generally cylindrical inner member spaced radially inward from and coaxial with said outer member, a plurality of axially extending, circumferentially spaced-apart first and second rib members connected at their corresponding inner and outer ends to said inner and outer cylindrical members, said rib members being generally inclined at an angle of from about 15° to 75° to radial planes which intersect them at their inner ends, and a unitary circumferential web member having opposite side faces, said web member having its inner and outer peripheries connected respectively to said inner and outer cylindrical members, said web member being connected on one side face to said first rib members and on the other side face to said second rib members, said first rib members being directed oppositely to said second rib members with respect to said radial planes, to form with said inner and outer cylindrical members and said web member, a load-carrying structure which provides locally loaded members adapted to buckle, the improvement comprising,

said non-pneumatic tire having a trapezoidal cross-section in which said ribs flare outwardly from the circumferential center-line of said inner and outer cylindrical members, at an angle θ defined by

$$\arctan\theta = (t_o - t_i)/2]/T$$

where t_o is the width of the outer cylindrical member,

t_i is the width of the inner cylindrical member, and,

T is the distance between the outer surface of the inner cylindrical member and the inner surface of the outer cylindrical member, said angle θ being in the range from about 1° to about 40° relative to the vertical plane through the circumferential center-line of said cylindrical members.

4,921,030

SLEEVE-MOUNTED SPIKE FITTED ON A VEHICLE TIRE

Erkki Suvanto, Porvoo, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI88/00016, § 371 Date Oct. 25, 1988, § 102(e) Date Oct. 25, 1988, PCT Pub. No. WO88/06537, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 8, 1988, Ser. No. 267,117

Claims priority, application Finland, Feb. 27, 1987, 870880

Int. Cl.[5] B60C *11/14*

U.S. Cl. 152—210 6 Claims



1 A sleeve-mounted spike (10; 20; 30) fitted on a vehicle tire, comprising

a rivet (11; 21; 31),

a head (12; 22; 32),

a tip (13; 23; 33),

a sleeve (14; 24; 34) of substantially the same length as said rivet (11; 21; 31),

and having a clearance (15; 25; 35) between the sleeve (14; 24; 34) and the rivet (11; 21; 31) when fitted on said vehicle tire;

said clearance (15; 25; 35) increasing in a direction towards the tip (13; 23; 33),

wherein said clearance (15; 25; 35) between the sleeve (14; 24; 34) and the rivet (11; 21; 31) continuously increases substantially over the entire length of the rivet (11; 21; 31) from the head in the direction towards the tip (13; 23; 33).

4,921,031

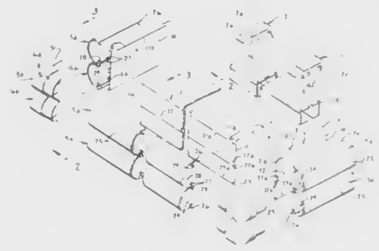
DECORATIVE VALANCE

John S. Wagner, Madison, and John E. Morris, Lake Mills, both of Wis., assignors to Graber Industries, Inc., Middleton, Wis.

Filed May 30, 1989, Ser. No. 358,940

Int. Cl.[5] E06B *9/38*

U.S. Cl. 160—38 18 Claims



1 A valance for concealing a window blind header or drapery fixture comprising, an elongated panel having a front face and lengthwise extending upper and lower edges, means for mounting the valance with the front face of the panel in a generally upright plane, upper rail means on the front face of the panel adjacent the upper edge defining a downwardly projecting upper lip, a lower rail means on the front face of the panel adjacent the lower edge defining an upwardly projecting lower lip, intermediate rail means on the front face intermediate the upper and lower edges defining an upwardly projecting intermediate lip spaced below the upper lip and a downwardly projecting intermediate lip spaced above the lower lip, upper and lower valance face members each having a front wall and first and second rear edges, each face member having means defining a reentrant channel extending lengthwise along the first rear edge and means defining a lengthwise extending hook portion disposed internally of the front wall adjacent the second rear edge, the reentrant channel on the upper valance face member being adapted to receive the upwardly projecting intermediate lip and the internal hook portion on the upper valance face member being adapted to receive the downwardly projecting upper lip, the reentrant channel on the lower valance face member being adapted to receive the downwardly projecting intermediate lip and the internal hook portion on the lower valance face member being adapted to receive the lower upwardly projecting lip of the panel.

4,921,032

ROMAN SHADES

David A. May, Chestnut Hill, Mass., assignor to Appropriate Technology Corporation, Brattleboro, Vt.

Filed Dec. 2, 1988, Ser. No. 278,786

Int. Cl.[5] A47H *5/00*

U.S. Cl. 160—84.1 8 Claims

1 A shade comprising

a flexible panel having a top edge, a bottom edge and a backside;

means for securing said top edge of said panel to an upper portion of a frame;

a plurality of connectors having apertures secured to said back side of said panel, said connectors being arranged in an array to form a plurality of generally vertically extending columns and a plurality of generally horizontally extending rows, each of said apertures of each of said connectors having a diameter;

a plurality of lines, each of said columns having one line associated therewith, each of said lines being connected to the back side of said panel near its bottom edge and passing through each of the apertures of said connectors in succession in its associated column; and

a plurality of spacer means, each spacer means having a predetermined length and being associated with one of said lines passing freely therethrough, each of said spacer means being disposed between an associated pair of adjoining connectors in one of said columns for spacing said



adjoining pair of connectors from one another when said panel is in a raised position, each of said spacer means having an outer diameter which is no less than the diameters of the apertures of said associated pair of connectors.

4,921,033

SECURITY DOOR SYSTEM

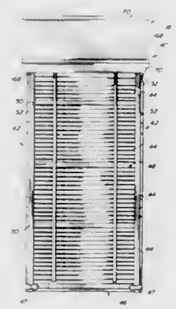
Harry E. Finch, 5273 Vista del Sol, Cypress, Calif. 90630, and Geza J. Szayer, 24771 Acropolis Dr., Mission Viejo, Calif. 92691

Continuation of Ser. No. 846,341, Mar. 31, 1986, Pat. No. 4,807,687. This application Nov. 16, 1988, Ser. No. 271,634

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] E06B *9/08*

U.S. Cl. 160—133 28 Claims



1 A security door system comprising:

a barrel assembly for mounting adjacent the upper edge of an access opening to provide support means rotatable about a horizontal axis;

a roll-up door positionable across said access opening and susceptible of being rolled about said barrel assembly as the door is raised, the door including a plurality of flexible panels and a plurality of rigid metal reinforcing beams interspersed between adjacent pairs of panels in a combination which can be rolled about said horizontal axis; and

vertical door guide members for installing at opposite sides of the door to encompass the side edges of the opening;

said flexible panels being of metal and having a plurality of

horizontal corrugations, said panels and said reinforcing beams each including structural configurations along adjacent edges which are shaped to mate together in a locking joint;

the structural configuration of said reinforcing beams comprising an edge which is shaped with a re-entrant edge portion and a backing portion forming a juncture with the beam;

the structural configuration of a mating panel edge comprising a re-entrant edge portion shaped to mate with the re-entrant edge portion of a reinforcing beam;

the re-entrant edge portion and the backing portion of a reinforcing beam being deformable in a direction toward each other so that, when pressed together with a re-entrant edge portion of a panel therebetween, they serve to lock an adjacent flexible panel and reinforcing beam together in a doubly re-entrant joint configuration.

4,921,034

EMBOSSED PAPER HAVING ALTERNATING HIGH AND LOW STRAIN REGIONS

William H. Burgess, Wallingford, Pa.; Kenneth Kaufman, Mt. Laurel, N.J., and Archie B. Lane, Jr., Wallingford, Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 22, 1988, Ser. No. 185,171

Int. Cl.[5] D21H *5/02*

U.S. Cl. 162—109 **19 Claims**



1. A soft, embossed, sanitary paper product useful for tissues, towels, napkins and wipers, comprising a paper web having a basis weight between about 6 and about 58 pounds per 2,880 square feet, a tensile strength in the cross-machine direction between 2 and 40 ounces per inch of width, and a plurality of bosses of the same size and shape alternating up and down from a formed midplane across the plane of the web in two directions;

the paper product being characterized by:

A. each boss having an asymmetric shape in a cross section parallel to the midplane;

B said asymmetric shape in the up bosses having a different orientation from that of the down bosses; and

C. on each boss, the paper interconnecting it with the adjacent boss on one side being strained more than the paper interconnecting said each boss with the adjacent boss on its opposite side.

4,921,035

PROCESS FOR COMPACTING POWDERY MATERIALS

Hans Leutwiler, Schaffhausen, Switzerland, assignor to Georg Fischer AG, Schaffhausen, Switzerland

PCT No. PCT/CH87/00065, § 371 Date Mar. 10, 1988, § 102(e) Date Mar. 10, 1988, PCT Pub. No. WO87/07544, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 5, 1987, Ser. No. 162,316

Claims priority, application Switzerland, Jun. 13, 1986, 2404/86; Jul. 25, 1986, 2992/86

Int. Cl.[5] B22C *15/00*

U.S. Cl. 164—37 **7 Claims**

1 A process for compacting powdery molding material in a molding apparatus including a pattern plate, a pattern on the pattern plate and a filling and forming frame comprising placing a mass of powdery molding material in the filling and forming frame substantially surrounding the pattern,

applying a first gaseous medium pressure surge G_1 to the exposed surface of the mass of molding material at a time t_1 to cause the mass of material to flow in the direction of the pattern, and



applying a second gaseous medium pressure surge G_2 at a time t_2 to at least one surface (A) of the material mass spaced from said exposed surface in the direction of the pattern, wherein the delay between t_1 and t_2 is no greater than 80 milliseconds such that the pressure surge G_2 impinges upon said at least one surface (A) before or during the active interval of the pressure surge G_1 on said exposed surface of the material.

4,921,036

METHODS OF MANUFACTURING A REAR AXLECASE

Toru Kuwahara, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Division of Ser. No. 136,318, Dec. 22, 1987, Pat. No. 4,843,906. This application Aug. 11, 1988, Ser. No. 231,128

Claims priority, application Japan, Dec. 24, 1986, 61-306326

Int. Cl.[5] B22D *29/00*

U.S. Cl. 164—76.1 **17 Claims**



1 A method of manufacturing a rear axlecase, comprising the steps of:

(A) providing a casting mold for producing an integral casting defining a differential gear housing and axle housing each having an endtube portion;

(B) pouring nodular graphite cast iron into said casting mold; and

(C) then, performing hardening treatment on said endtube portions of said axle housings while at least another portion of the casting remains in said mold after step (B) has been performed

4,921,037

METHOD AND APPARATUS FOR INTRODUCING DIFFERENTIAL STRESSES IN ENDLESS FLEXIBLE METALLIC CASTING BELTS FOR ENHANCING BELT PERFORMANCE IN CONTINUOUS METAL CASTING MACHINES

Norman J. Bergeron; J. F. B. Wood, both of Burlington, and R. W. Hazelett, Colchester, all of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Filed Jul. 19, 1988, Ser. No. 221,230

Int. Cl.[5] B22D *27/02*

U.S. Cl. 164—432 **31 Claims**



1. In the treatment of a wide, thin, endless, flexible, metallic casting belt adapted to be revolved under tension for travelling through a moving mold and having a main middle area for providing a moving wall in the moving mold for continuous casting of hot molten metal in the moving mold, said main middle area being straddled by two marginal areas, and wherein the main middle area of the casting belt becomes heated by the molten metal, causing the main middle area to expand and slacken in the moving mold relative to the two marginal areas, thereby causing lack of flatness of the main middle area of the belt and resulting in cast product issuing from the moving mold having inferior surface finish, and during the treatment the belt is revolved under tension passing against and past at least one relatively small diameter transversely disposed work roller deflecting the course of the tensioned belt for causing inelastic yielding bending elongation of the belt for flattening the belt prior to operation in a moving mold, the improvement in said treatment characterized by:

during said treatment producing greater inelastic yielding elongation in said two marginal areas of the revolving tensioned belt than in said main middle area by work-roller bending stretching of the two marginal areas more than the main middle area for enhancing flatness of the main middle area of the belt when the belt is being revolved under tension travelling through a moving mold and the main middle area is being heated in the moving mold,

said treatment producing a residual longitudinal tensile stress in said main middle area and a residual longitudinal compressive stress in said two marginal areas of said casting belt when at temperature equilibrium in the absence of externally applied force, and

said differential between said residual longitudinal tensile and compressive stresses being at least 6,000 pounds per square inch of belt cross-sectional area.

4,921,038

PROCESS FOR PREPARING MOLD FOR INVESTMENT CASTING

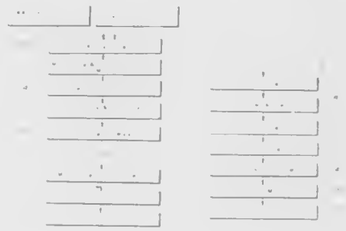
Nobuyoshi Sasaki, 18-13, 1-chome, Aobadai, Midori-ku, Yokohama-shi, Kanagawa, and Susumu Baba, 25-602, 2-chome, Wakabadai, Asahi-ku, Yokohama-shi, Kanagawa, both of Japan

Filed May 19, 1989, Ser. No. 353,956

Claims priority, application Japan, May 20, 1988, 63-122054

Int. Cl.[5] B22C *9/04, 9/10, 1/18*

U.S. Cl. 164—516 **4 Claims**



1 A process for preparing an investment casting mold comprising the steps of:

(a) kneading an aggregate with an organic binder;

(b) casting the kneaded compound composed of the aggregate and the organic binder into a core molding mold to be solidified therein to produce a core matrix;

(c) impregnating a heat resisting binder from the surface of said core matrix;

(d) coating said core matrix impregnated with said heat resisting binder at said step (c) with a wax to form a core mold;

(e) placing said core mold in position within a lost model molding mold and then injecting a lost model forming material into said lost model molding mold to form a lost model surrounding said core mold;

(f) coating a slurry and stucco particles alternately for plural times over said lost model to form a refractory layer which is then dried;

(g) allowing said lost model to vanish so as to obtain a final mold; and

(h) baking said final mold composed of core mold and said refractory layer simultaneously.

4,921,039

DEVICE FOR THE PROTECTION AND THERMAL CONDITIONING OF APPARATUS IN PARTICULAR ELECTRONIC APPARATUS GENERATING HEAT

Alberto Ghiraldi, Via Palatino 8, Milan 20148, Italy

Filed Apr. 21, 1988, Ser. No. 184,605

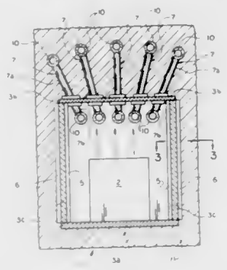
Claims priority, application Italy, Apr. 21, 1987, 20190 A/87

Int. Cl.[5] F28D *15/00*; **H01L** *23/46*

U.S. Cl. 165—32 **4 Claims**

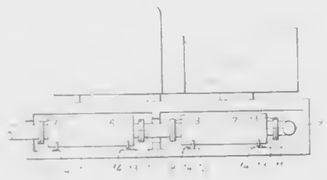
1. A device for providing thermal protection for heat generating apparatus such as electronic apparatus, comprising a box form structure defining an ambient adapted to contain heat generating apparatus and a plurality of conduits connected with said box structure, each of said conduits being substantially completely filled with a thermal carrying liquid, each of said conduits forming a continuous loop disposed such that a first length of each conduit extends outside said ambient and a second length of each conduit is disposed inside said ambient, each of said plurality of conduits being independent from the other conduits, said first length of each of said plurality of conduits being immersed in an underground heat reservoir of a substantially constant temperature, said thermal carrying liquid in each of said conduits being adapted to change density

without changing phase and to circulate in the respective conduit and through said heat reservoir by natural convection in response to heat generated within said ambient, and the



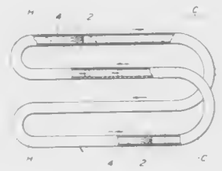
length of each of said conduits inside the ambient being positioned in close proximity to the ceiling of the said box form structure.

4,921,040
POWER THERMO-COUPLING UNIT
Celal Ueruenduel, and Friedemann Zacharias, both of Mannheim, Fed. Rep. of Germany, assignors to Motoren-Werke Mannheim AG, Fed. Rep. of Germany
Filed Mar. 11, 1988, Ser. No. 166,924
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708238
Int. Cl.[5] F01N *7/02, 3/02*
U.S. Cl. 165—51 **11 Claims**



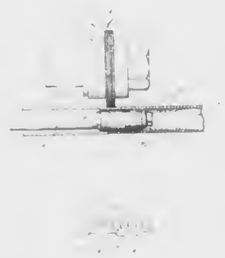
1. A power thermo-coupling unit having a unit support (1), upon which working machines (2, 3) are supported, with a muffler (4, 5) and a connected exhaust gas heat exchanger (6, 7) arranged within the unit support (1), wherein the unit support (1) has a rectangular-shaped frame having longitudinally opposite end walls, lateral openings (11) on opposite lateral sides and a central column (8) with longitudinal openings through which the muffler (4, 5) and the exhaust gas heat exchanger (6, 7) pass the muffler and heat exchanger being generally parallel to the lateral sides of the unit support (1), characterized by said muffler (4, 5) and exhaust gas heat exchanger (6, 7) each being formed by two separate components disposed on opposite sides of said column (8) and shorter in length than the distances between said central column (8) and said end walls, respectively whereby the components can be disconnected and shifted laterally through the lateral openings.

4,921,041
STRUCTURE OF A HEAT PIPE
Hisateru Akachi, Kanagawa, Japan, assignor to Actronics Kabushiki Kaisha, Kanagawa, Japan, a part interest
Filed Jun. 15, 1988, Ser. No. 207,318
Claims priority, application Japan, Jun. 23, 1987, 62-155747
Int. Cl.[5] F28D *15/02*
U.S. Cl. 165—104.29 **44 Claims**



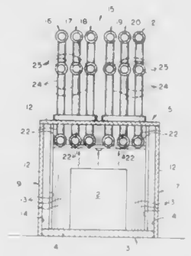
1. A structure of a loop-type heat pipe, comprising:
(a) a continuous elongate tube of continuous capillary dimension having both ends thereof air-tightly connected to each other to form a continuous capillary loop-type flow passage;
(b) a heat carrying fluid within the elongate tube in an amount sufficient to allow flow of the fluid through the loop flow passage in a closed state defined by the elongate tube;
(c) at least one heat receiving portion located on a first part of the elongate tube for heating the fluid therein;
(d) at least one heat radiating portion located on a second part of the elongate tube for cooling the fluid therein; and
(e) flow control means located within the loop-type flow passage for limiting flow of the heat carrying fluid to a single direction in the flow passage, the flow control means together with mutual actions of vapor pressure generated due to the vaporization at the heat receiving portion and attracting force generated due to condensation of vapor at the heat radiating portion providing propelling force and amplifying the propelling force for the heat carrying fluid so as to circulate the heat carrying fluid in the single direction in the flow passage from the heat receiving portion to the heat radiating portion.

4,921,042
HIGH PERFORMANCE HEAT TRANSFER TUBE AND METHOD OF MAKING SAME
Steven R. Zohler, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Division of Ser. No. 111,917, Oct. 21, 1987, Pat. No. 4,866,830.
This application Aug. 18, 1989, Ser. No. 395,665
Int. Cl.[5] F28F *1/42*
U.S. Cl. 165—179 **5 Claims**



1. In a heat transfer tube for transferring heat of condensation of a refrigerant fluid outside the tube to a circulating coolant liquid inside the tube and which is enhanced with a plurality of helically extending interior ribs on the interior surface of the tube for inducing turbulence in the circulating coolant liquid and at least one helically extending exterior fin about the exterior of the tube extending radially outward from a base portion disposed toward the tube axis to a tip portion radially remote from said axis, the fin defining at least one open channel in which the condensed refrigerant fluid can collect; the improvement wherein said external fin has a substantially uniform profile over the circumference of the tube, and said interior ribs are disposed at sufficiently small pitch that the exterior fin is formed without a Moire reduction in height at the positions where the exterior fin crosses the interior ribs and the distance from the base to tip of said fin is substantially uniform.

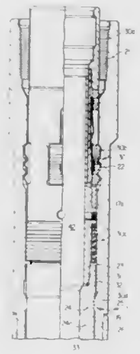
4,921,043
SHELTER DEVICE FOR THE PRODUCTION AND THERMAL CONDITIONING OF APPARATUS, IN PARTICULAR ELECTRONIC APPARATUS GENERATING HEAT
Alberto Ghiraldi, Via Palatino 8, Milan 20148, Italy
Filed Apr. 21, 1988, Ser. No. 184,604
Claims priority, application Italy, Apr. 21, 1987, 20191 A/87
Int. Cl.[5] F28D *15/00;* **H01L** *23/46*
U.S. Cl. 165—32 **9 Claims**

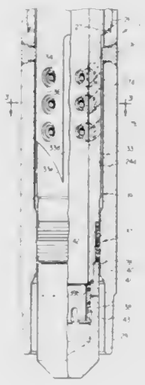


1. A device for the protection and thermal conditioning of heat generating apparatus such as electronic apparatus, comprising a closed box form structure in which is defined an ambient adapted to contain one or more electronic apparatus and at least one heat exchanger placed in close proximity to the ceiling of the box form structure consisting of a plurality of closed circuits containing a thermal carrying fluid which moves solely as a result of natural convection, said circuits having a length within said ambient and a portion outside of said ambient, said length within said ambient being emersed in a predetermined quantity of a mixture of paraffins susceptible to a change in state at a temperature lower than a temperature predetermined for said ambient, said portion of at least one of said circuits outside of said ambient consisting of two parallel conduits, said material being enclosed in the annular space between said length of said circuit within said ambient and a surrounding housing having a diameter larger than said length of said circuit within said ambient, and said length of said circuit within said ambient being furnished internally with longitudinal fins.

4,921,044
WELL INJECTION SYSTEMS
Andrew G. Cooksey, Coppell, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.
Filed Mar. 9, 1987, Ser. No. 23,237
Int. Cl.[5] E21B *43/12*
U.S. Cl. 166—116 **14 Claims**

1. A well system comprising:
(a) a casing in the well, said casing having perforations opposite an earth formation;
(b) a flow conduit in said casing;
(c) a packer on said flow conduit, said packer set in said casing above said formation;
(d) perforations below said packer in said casing, said perforations communicating said formation with the inside of said casing;
(e) a landing nipple in said flow conduit below said packer, said nipple having therein
upper profiled grooving,
a seal bore below said grooving,
a no-go landing shoulder below said bore,





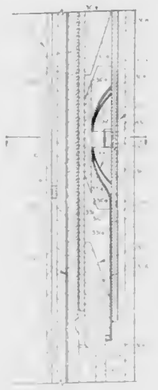
orienting pins below said shoulder,
wall flow openings in said nipple below said pins, and
a smaller seal bore below said openings,
said orienting pins above said lower seal bore; and
(f) mandrel means for landing in said nipple including a lock mandrel having seals thereon for locking and sealing said mandrel means in said nipple, said mandrel means having wall flow openings and orienting means coengageable with said nipple orienting pins for orienting said mandrel means when landed in said nipple to align said nipple and mandrel means wall flow openings so that fluid may flow between said formation and the inside of said flow conduit through said flow openings and perforations.

4,921,045

SLIP RETENTION MECHANISM FOR SUBTERRANEAN WELL PACKER

Downie S. Richardson, Torrance, Calif., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Dec. 6, 1985, Ser. No. 805,882
Int. Cl.[5] E21B *33/129*
U.S. Cl. 166—134 6 Claims



1. In a well packer having a tubular body and a cone element mounted on said body for axial movement, the improvement comprising a slip retention sleeve surrounding the path of axial movement of said cone element and defining an annular space around said body, a plurality of segment-shaped slips insertable in said annular space and radially shiftable outwardly by axial movement of said cone element; each said slip having an axially extending slot in its outer surface; said retention sleeve having a plurality of peripherally spaced windows formed therein and separated by axially extending bar portions; said slots being respectively aligned with said bar portions; a plurality of elongated leaf springs respectively mounted between said solid bar portions and said axial slots in said slips for engaging axially spaced regions of said slips to bias said slips radially inwardly, and each said leaf spring having an axially extending tail portion and hook means on the end of each tail portion engaging said cone element to anchor said leaf spring against axial movement in one direction relative to said cone, thereby preventing inadvertent setting of the packer during run-in.

4,921,046

HORIZONTAL HOLE CLEANUP TOOL

Kenneth D. Caskey, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 13, 1988, Ser. No. 283,638
Int. Cl.[5] E21B *37/02*
U.S. Cl. 166—170 2 Claims

1. A well clean-out tool secured to a conduit string located in a well bore having casing therein, said well clean-out tool and said conduit string forming an annulus with respect to said casing in said well bore for fluid to be pumped thereinto, said casing having debris therein, said well clean-out tool comprising:

an inner mandrel having annular seal means thereon, a plurality of teeth formed on one end thereof by a plurality of longitudinal slots being formed in a frusto-conical annular surface and a cylindrical surface on the one end of the inner mandrel, and a bore therethrough;

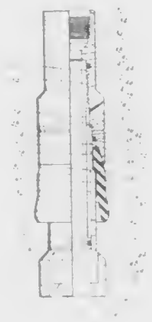
a ported nipple having a portion thereof secured to the other end of the inner mandrel, another portion thereof secured to said conduit string located in said well bore having said casing therein, a plurality of fluid ports therethrough, and a bore therethrough;

an annular packer cup mandrel having one end thereof received within the ported nipple, a portion thereof overlying a portion of the inner mandrel forming an annulus between the exterior of the inner mandrel and the interior of the packer cup mandrel, a portion thereof sealingly engaging the annular seal means on the inner mandrel, and a plurality of fluid ports therethrough;

an elastomeric packer cup retained on a portion of the packer mandrel, the elastomeric packer cup slidingly engaging a portion of said casing in said well bore to separate said casing in said well bore into an upper portion and a lower portion; and

an annular thimble retained on the packer cup mandrel having a portion thereof abutting the packer cup and having an annular seal means therein sealingly engaging a portion of the packer cup mandrel,

whereby when fluid is pumped into said annulus between said well clean-out tool secured to said conduit string and



said casing, the fluid flows through the upper portion of said annulus above the elastomeric packer cup, through the plurality of fluid ports in the ported nipple, through the annulus between the exterior of the inner mandrel and the interior of the packer cup mandrel, out through the plurality of fluid ports in the annulus packer cup mandrel into the lower portion of said annulus below the elastomeric packer cup, through the plurality of longitudinal slots formed on one end of the inner mandrel, and into the bore of the inner mandrel, into the bore of the ported nipple and into said conduit string to thereby wash sand debris from said casing in said well bore into said well clean-out tool and said conduit string and whereby when said well clean-out tool is reciprocated and/or rotated in said casing in said well bore while the elastomeric packer cup remains in sliding sealing engagement with said casing, the plurality of teeth on one end of the inner mandrel loosens said debris in said casing to facilitate said fluid in washing said debris from said casing through said well clean-out tool and into said conduit string.

4,921,047

COMPOSITION AND METHOD FOR SEALING PERMEABLE SUBTERRANEAN FORMATIONS

Laine E. Summers, Katy, Tex., and Jeff J. Jurinak, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Aug. 10, 1989, Ser. No. 392,180
Int. Cl.[5] E21B *33/138, 43/04*
U.S. Cl. 166—276 9 Claims

1. A process which comprises:

(a) combining a liquid epoxy material and two hardeners for the epoxy material to form a mixture, the mixture being characterized in that:

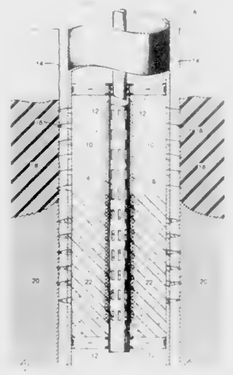
(1) each hardener has a different activation temperature;
(2) the amount of each hardener in the mixture is less than that required to totally react with the epoxy material;
(3) the epoxy material has a low viscosity at subsurface conditions of temperature and pressure;
(4) the hardening time of the epoxy material is of short duration at subsurface conditions of temperature and pressure; and
(5) the epoxy material is substantially immiscible with any fluids which are present in the subsurface area;

(b) introducing the mixture into a subsurface area where the epoxy material is to be hardened; and

(c) allowing the epoxy material to harden.

5. A process which comprises:

(a) mixing an epoxy material and two hardeners for the epoxy material to form a liquid mixture, the mixture being characterized in that:



(1) the epoxy material has a density greater than the density of the well fluid;
(2) the epoxy material has a low viscosity at formation conditions of temperature and pressure;
(3) the epoxy material is immiscible with well fluid;
(4) the mixture of epoxy material and hardeners is essentially free of solids;
(5) the hardening time of the epoxy material is of short duration at formation conditions of temperature and pressure;
(6) each hardener has a different activation temperature; and
(7) the amount of each hardener in the mixture is less than that required to totally react with the epoxy materal;

(b) introducing the mixture into a well traversing a subterranean formation to a point adjacent a zone which is to be plugged;

(c) displacing the mixture into said zone; and

(d) allowing the epoxy material to harden and plug said zone.

4,921,048

WELL PRODUCTION OPTIMIZING SYSTEM

Robert W. Crow, Irving; Ricky M. Holloman, Lewisville, and James B. Pruden, Odessa, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 22, 1988, Ser. No. 247,760
Int. Cl.[5] E21B *43/12*
U.S. Cl. 166—372 39 Claims

1. A method for controlling the cyclic operation of a petroleum producing well having a motor valve connected between the tubing of the well and a flow sales line comprising:

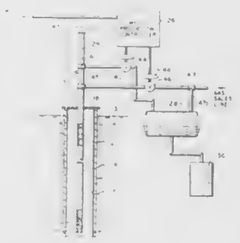
reciprocating a plunger mounted for movement within the tubing of the well from the bottom thereof to the well head to carry production liquids from the well to the flow sales line in response to downhole casing pressure when the motor valve is open;

sensing when the plunger arrives at its uppermost position in the well tubing;

closing said motor valve in response to sensing plunger arrival;

storing in a selectively programmable memory signal indicative of a first time period during which the motor valve is to be closed and the well is to be shut-in and a second time period during which the motor valve is to be open and the fluid in the tubing allowed to flow into the sales line;

closing the motor valve and beginning the first time period;



opening the motor valve in response to expiration of the first time period and beginning the second time period;

closing the motor valve and beginning the first time period in response to sensing plunger arrival;

decreasing the first time period by a first selected incremental time value in response to the arrival of the plunger prior to expiration of the second time period;

closing the motor valve and beginning the first time period in response to expiration of the second time period; and

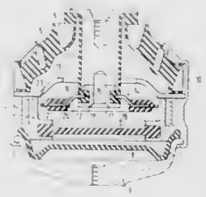
increasing the first time period by a second selected incremental time value in response to the failure of the plunger to arrive prior to the expiration of the second time period.

4,921,049

HYDRAULIC-DAMPING TWO-CHAMBER ENGINE MOUNT

Franz-Josef Kaiser, Bannberscheid, and Wolfgang Sauer, Ransbach, both of Fed. Rep. of Germany, assignors to Metzeler GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 325,208
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808996
Int. Cl.[5] F16F *5/00*
U.S. Cl. 267—140.1 4 Claims



1. Hydraulic-damping two-chamber engine mount, comprising a working chamber, a support spring with a relatively soft spring constant in the form of a conical jacket-like elastomeric wall having an end surface, a bearing plate disposed on said end surface and bordering said working chamber along with said elastomeric wall, said bearing plate having a cylindrical

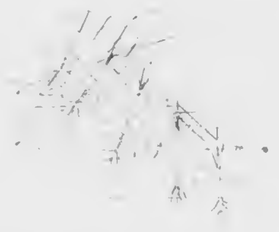
attachment with an end having a groove formed therein defining groove walls, a compensating chamber, a rigid intermediate plate having an overflow conduit formed therein providing communication between said chambers, an integrated tension stop in the form of an annular stop plate projecting into said working chamber and having an inner edge suspended in said groove formed in said end of said cylindrical attachment defining an axial and radial free space between said inner edge and said groove walls and permitting increased play in axial and radial directions and gimbal motion of said stop plate, a substantially conical jacket-like stop ring, axial mobility of said stop plate being limited upwardly by said stop ring and downwardly by said intermediate plate, and damping medium filling said free space and providing a continuous transition from said relatively soft spring constant of said support spring to a relatively hard spring constant during abutment of said stop plate against said stop ring and said intermediate plate.

4,921,050

PLANT EXTRACTOR AND CULTIVATING APPARATUS

Wayne J. Brown, 8 David Muir Street, Slade Point, Mackay, Queensland, 4741, Australia

Filed Oct. 25, 1988, Ser. No. 262,328
Claims priority, application Australia, Oct. 26, 1987, PI5082
Int. Cl.[5] A01D *25/00*
U.S. Cl. 171—51 18 Claims



14 Plant extracting apparatus including:

a supporting frame;

support means associated with said supporting frame whereby the latter may be conveyed along a row of plants;

a pair of endless belts supported by and extending between respective upper and lower guide wheels and having juxtapositioned belt runs which incline upwardly and rearwardly from a plant inlet towards an extracted plant outlet;

said upper guide wheels supported by fluidic rams which are fluidically biassed towards an extended attitude to induce a desired tension in said belts;

drive means for driving said belts whereby said juxtapositioned belt runs move upwardly and rearwardly from said plant inlet;

biassing means for biassing said juxtapositioned belt runs into engagement with one another, and

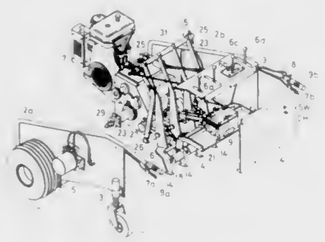
respective intermediate guide pulleys arranged in longitudinally spaced relationship along said juxtapositioned belt runs for displacing said juxtapositioned belt runs from a straight line path between said upper and lower guide wheels whereby the contact pressure between said juxtapositioned belt runs may be increased upwardly of said plant inlet.

4,921,051

GREEN REFRESHER

Osamu Annen, Tonami, Japan, assignor to Kabushiki Kaisha Tonami Seisakusho, Tonami, Japan

Filed Oct. 12, 1988, Ser. No. 256,906
Claims priority, application Japan, Oct. 14, 1987, 62-257445
Int. Cl.[5] A01B *39/10, 45/02*
U.S. Cl. 172—21 4 Claims



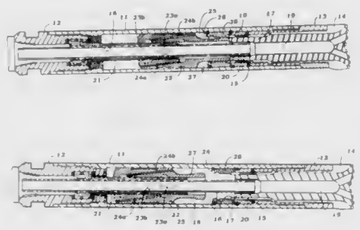
1 A green refresher including chassis supporting a plurality of cutters which are driven into reciprocating oscillations in the fore and aft directions by drive means, said cutters being adapted for cutting the roots of a lawn and crushing the water-impermeable layer of a tramped soil to permit moisture to be penetrated deeply below the ground surface, wherein the improvement includes transmission means for transmitting the motive power of the drive means to said cutters in the form of at least two oscillations having discrete phases of oscillating from one another, said motive power being transmitted to said cutters by an assembly including a crankshaft unit coupled to said drive means, a crankshaft rotatively coupled to said crankshaft unit, each of said cutters being mounted on one end of a respective cutter arm, the other ends of said cutter arms being pivotally mounted on a common shaft, each of said cutter arms also being pivotally mounted on said crankshaft by means of a crank arm connected to each cutter arm at a point below the midpoint of said arm; a lift frame for lifting said cutter arms and therewith said cutters out of contact with the soil, said cutter arms being operatively associated with said lift frame by means of said common shaft; and a fluid cylinder piston assembly means for moving said lift frame with respect to said chassis towards and away from the soil.

4,921,052

DOWNHOLE RECIRCULATING HAMMER

Ian G. Rear, 60 Clavering Road, Bayswater, Australia

Filed Mar. 23, 1989, Ser. No. 328,116
Claims priority, application Australia, Mar. 24, 1988, PI7422
Int. Cl.[4] E21B *4/06*
U.S. Cl. 173—78 4 Claims



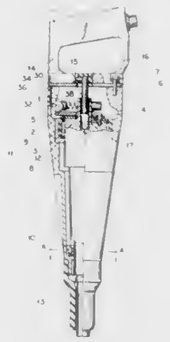
1 A fluid operated hammer comprising a tubular housing, a top sub mounted to one end of the housing and a drill bit support mounted to the other end of the housing, said drill bit support and top sub each having a central axial passageway therein, a central tube extending axially through the housing between the top sub and drill bit support and communicating with said central axial passageways of said drill bit support and top sub, a feed tube concentrically received over the central tube and mounted to the top sub to extend into the housing and terminate intermediate of the top sub and drill bit support between the inner and outer ends thereof, a piston slidably received in the housing over the feed tube for reciprocation between a first position adjacent the top sub and a second position abutting the drill bit support, the one end portion of the piston adjacent the drill bit support having a reduced diameter and the inner walls of the housing adjacent the drill bit support having a reduced diameter portion substantially complementary to the one end portion of the piston, fluid porting means in the feed tube and piston to sequentially admit fluid into a first space between the top sub and the piston when the piston is at or near its first position and into a second space between the end portion of the piston, the wall of the housing and the inner end of the reduced diameter portion of the housing when the piston is at or near the second position, thereby causing the piston to reciprocate to the second and first positions respectively and further wherein the reduced diameter portions of the piston and the housing are engaged when at the second position and the end portion of the piston and the reduced diameter portion of the housing are disengaged when the piston is at an intermediate position between the first and second positions to allow for the escape of fluid from the second space through the fluid passageway.

4,921,053

VIBRO-ISOLATION OF CONNECTIONS OF STRUCTURAL UNITS OF HAND TOOLS

Marian W. Dobry; Czeslaw Cempel, and Wieslaw Garbatowski, all of Poznan, Poland, assignors to Politechnika Poznanska, Poznan, Poland

Filed Mar. 16, 1989, Ser. No. 325,194
Claims priority, application Poland, Mar. 29, 1988, 271525
Int. Cl.[5] B25F *5/00*
U.S. Cl. 173—162.2 3 Claims



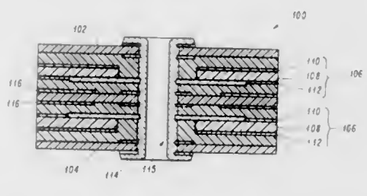
1. In a compressed-air driven hand tool comprising an elongated body-housing (8), a compressed air engine (3) disposed within said body-housing, a first grip (14) for holding the tool, and a constant interaction force vibro-isolator (1) of the type comprising roller springs biased against cams, said vibro-isolator being disposed between and interconnecting said air engine to said first grip, the improvement wherein said vibro-isolator (1) is connected to said air engine by means of a spring washer (2) disposed therebetween and interconnecting screws, elastic sleeves (4) being disposed around said screws, and said vibro-isolator (1) is connected to said first grip (14) by means of a spring washer (6) disposed therebetween and interconnecting screws, elastic sleeves (7) being disposed around said screws, said above-mentioned vibro-isolator connecting and securing means providing improved vibro-isolation between said first grip and said air engine for air engine vibrations in the direction of elongation of said body-housing, elastic guides (9 and 10) disposed between said body-housing and upper and lower portions, respectively, of said air engine allowing sliding of said engine relative to said body-housing for providing vibro-isolation between said air engine and said body housing, a second grip (13) comprising an elastic sleeve screwed onto a lower portion of said body-housing, and means for introducing compressed air into said air engine, said means comprising a sleeve (17) extending into said air engine and a tubing (15) slidably extending into said sleeve, said tubing extending through said first grip and being secured therewithin by means of a silent-block connection (16) for providing vibro-isolation between said air engine and said first grip.

4,921,054

WIRING BOARD

Forrest L. Voss, and Donald R. Witherell, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 149,797, Jan. 29, 1988, Pat. No. 4,830,704.
This application Oct. 21, 1988, Ser. No. 278,295
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—255 6 Claims



1. A multi-layered printed wiring board comprising:

a. a metallic core for controlling thermal expansion having a top side, bottom side and a plurality of holes therein;

b. a noble metal layer disposed on the bottom side of the metallic core for inhibiting etching beyond said metallic core;

c. a top side conductive layer disposed upon the top side of the metallic core;

d a bottom side conductive layer disposed upon the noble metal layer,

e. a top side printed wiring board disposed upon the top side conductive layer; and

f a bottom side printed wiring board disposed upon the bottom side conductive layer.

4,921,055

SOIL DISPLACEMENT HAMMER

Allan G. Kayes, Elwin, Boyce's Hill, Newington, Sittingbourne, Kent, United Kingdom

PCT No. PCT/GB86/00780, § 371 Date Aug. 13, 1987, § 102(e) Date Aug. 13, 1987, PCT Pub. No. WO87/03924, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 19, 1986, Ser. No. 110,719
Claims priority, application United Kingdom, Dec. 20, 1985, 8531382
Int. Cl.[5] E21B *7/04*
U.S. Cl. 175—45 4 Claims

1. A soil displacement hammer for driving holes in the ground, comprising a substantially cylindrical body, a soil displacement head at a forward end of the body, a longitudinally reciprocal striking member housed within the body, and an anvil member within the body adjacent its forward end and adapted to receive hammer blows from the striking member to

cause the body to be driven forward, comprising retractable baffle means mounted adjacent the forward end of the body so as to be movable between a retracted position in which it does not project from the body and an extended soil-engaging position to which it projects transversely from one side of the body



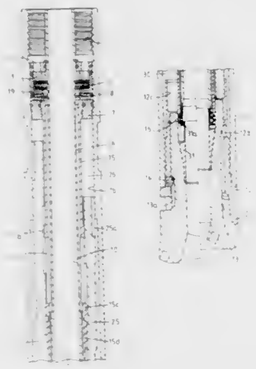
for diverting said hammer in the direction of projection of said baffle means, whereby the solid displacement hammer describes a straight path in the ground when said baffle is retracted and describes a curved path in the ground when said baffle is extended.

4,921,056

HAMMER DRILLS FOR MAKING BOREHOLES

Melvyn S. J. Ennis, 19 Wynnland Park, Carnmoney, Newtownabbey, County Antrim, Northern Ireland (BT36 6SE)

Filed Apr. 6, 1988, Ser. No. 178,688
Claims priority, application United Kingdom, Apr. 23, 1987, 8709572; Jan. 29, 1988, 8801969
Int. Cl.[5] E21B *4/14*
U.S. Cl. 175—92 15 Claims



1. A valveless down-the-hole hammer drill for use with a drill string, comprising;

a body tube for attachment at one end to the drill string:

a chuck carried by said body tube adjacent its opposite end and having an exhaust port and a valve sleeve;

a cutter bit carried by said chuck and having an upwardly directed bore;

means cooperable between said cutter bit and said chuck mounting said cutter bit for axial movement relative to said chuck;

an inner tube extending coaxially within said body tube for supplying fluid under pressure and received at one end in said bore for sliding movement of said cutter bit relative thereto;

an annular piston disposed between said inner tube and said body tube and movable axially relative thereto and for engagement at one end in said valve sleeve, said piston defining with said inner tube and said body tube chambers at opposite ends of said piston and carrying a pair each of inner and outer valve surfaces;

means defining a fluid supply port in said inner tube for communicating the pressure fluid from said inner tube;

means defining valve surfaces on said inner tube and cooperable with the pair of inner valve surfaces on said piston, respectively, for supplying the pressure fluid in said inner tube communicating through said fluid supply port alternately to said chambers; and

means including a valve surface on said body tube and cooperable with a first of said pair of outer valve surfaces carried by said piston for exhausting the fluid from one of said chambers through said exhaust port;

the second of said pair of said outer valve surfaces carried by said piston being cooperable with said valve sleeve for exhausting the fluid from the other of said chambers through said exhaust port;

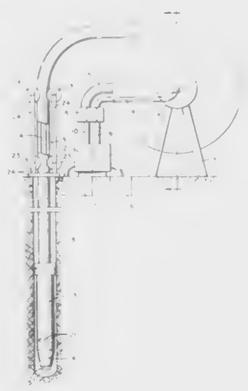
whereby said piston is reciprocable in said body in an axial direction in response to the supply and exhaust of pressure fluid relative to said chambers to repeatedly deliver percussive blows to said cutter bit.

4,921,057

METHOD AND DEVICE FOR MAKING A HOLE IN THE GROUND

Nic H. W. Smet, Kasteelstraat 29, B - 2400 Mol, Belgium

Division of Ser. No. 83,191, Aug. 10, 1987, Pat. No. 4,850,440.
This application May 1, 1989, Ser. No. 345,200
Claims priority, application Belgium, Aug. 13, 1986, 2/61030
Int. Cl.[5] E21B *7/18*
U.S. Cl. 175—203 6 Claims



1. A device for making a hole in the ground, which device comprises

a head which is comprised of a body and an end, said end bearing at least one spray nozzle which is adjustable in direction and said body being provided with at least one sidewise-issuing opening,

a reel;

two concentric inner and outer continuous twistresistant drill pipes for pressurized fluid which are flexible enough to be coiled on and uncoiled from said reel, said inner pipe connecting with said first spray opening in the end and said outer pipe connecting with said sidewise-issuing opening in the body; and

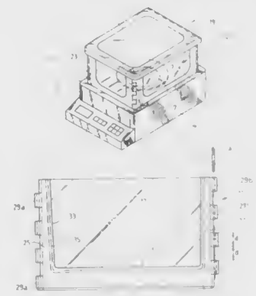
two pumps, one of which is connected to the inner pipe and the other of which is connected to the outer pipe.

4,921,058

WEIGHING APPARATUS WITH PROTECTIVE WIND SCREEN MEANS

Roland Pally, Pfisterhoelzli 14, CH-8606 Griefensee, and Erwin Meixner, Sunnebuelstrasse 80, Ch-8604 Volketswil, both of Switzerland

Filed Jun. 16, 1989, Ser. No. 367,139
Claims priority, application Switzerland, Aug. 5, 1988, 2973/88
Int. Cl.[5] G01G *23/18, 21/00*
U.S. Cl. 177—181 10 Claims



1. Wind screen means for use with weighing apparatus including a housing (3) having an upper surface (15), and a weighing pan (7) connected with said housing for movement relative to said upper surface, comprising:

generally tubular open-ended vertically-arranged wind screen means (9), adapted for mounting on said housing upper surfce concentrically about said weighing pan, said wind screen means including:

(a) a plurality of vertically-arranged wall members (11); and

(b) means (31, 29*a*, 29*b*) connecting said wall members for movement relative to each other;

(c) at least one of said wall members comprising:

(1) a generally U-shaped vertically arranged frame (23) including a horizontal base portion (24), and a pair of upwardly extending leg portions (25,27); and

(2) a plate member (17) mounted between said leg portions.

4,921,059

LOAD CELL BLOCK AND METHOD OF MANUFACTURING THE SAME

Allan S. Woodle, IV, Bellevue, and Marcell N. Benoit, Mountlake Terrace, both of Wash., assignors to Lodec, Inc., Lynnwood, Wash.

Filed Apr. 21, 1989, Ser. No. 341,707
Int. Cl.[5] G01G *3/14, 19/08;* G01L *1/22*
U.S. Cl. 177—211 10 Claims



1. In a load cell assembly providing part of a weighing system having a load-supporting member and a mounting member, the load cell assembly being adapted to be positioned between the load-supporting member and the mounting member and including an elongated block having first and second ends, the block further including a central portion, a pair of lower beams extending outwardly from said central portion to be secured to the mounting member for maintaining the central portion of the block above the mounting member, and a pair of upper beams extending outwardly from said central portion to be secured to the load-supporting member for directing the applied load to the central portion, the upper beams having a lower longitudinal surface and the lower beams having an upper longitudinal surface, the upper and lower longitudinal surfaces defining a slot that extends inwardly from said first and second ends and terminates at an innermost end at the central portion, the improvement comprising:

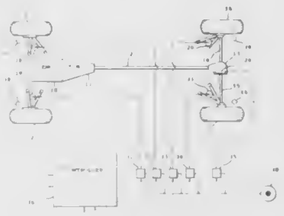
a longitudinal bore drilled at the innermost end of said pair of slots and having a diameter greater than the distance between the upper and lower longitudinal surfaces.

4,921,060

INTEGRATED ROLL RIGIDITY AND DIFFERENTIAL SLIP CONTROL SYSTEM

Takashi Imaseki, and Yuji Kobari, both of Zushi, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 28, 1988, Ser. No. 251,169
Claims priority, application Japan, Oct. 2, 1987, 62-249200
Int. Cl.[5] B60G *12/00*
U.S. Cl. 180—41 7 Claims



7. In a vehicle having a set of steerable front wheels, a set of steerable rear driving wheels, a differential interposed between the rear wheels, a front suspension unit and a rear suspension unit, an integrated roll rigidity and differential slip control system comprising:

a pressurized fluid source;

a plurality of fluid cylinders constituting part of said front and rear suspension units and communicable with said pressurized fluid source for varying roll rigidities on front and rear wheel sides;

a plurality of roll rigidity control valves interposed between said respective fluid cylinders and said fluid source for controlling supply of pressurized fluid from said fluid source to said fluid cylinders;

a clutch incorporated in said differential and communicable with said fluid source for supplying a slip limiting force to said differential to limit a differential action thereof;

a slip limiting force control valve interposed between said fluid source and said clutch for controlling supply of pressurized fluid from said fluid source to said clutch;

a set of first sensors for detecting rotation speeds of said front wheels, respectively;

a set of second sensors for detecting rotation of said rear wheels, respectively; and

a controller having means for controlling said roll rigidity control valves based on the front and rear wheel rotation speeds detected by said first and second sensors and thereby performing a normal roll rigidity control, means for controlling said slip limiting force control valve based on said front and rear wheel rotation speeds detected by said first and second sensors, and means for controlling roll rigidity distribution, in preference to normal roll rigidity control, in such a way that roll rigidity is larger on said front wheel side and smaller on said rear wheel side in

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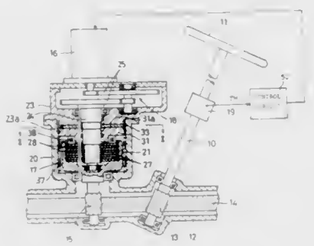
response to a cornering condition in which a driving force is distributed more to a cornering outside driving wheel than to a cornering inside driving wheel.

4,921,061

ELECTRIC POWER STEERING APPARATUS

Hiroaki Asano, Okazaki, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 25, 1988, Ser. No. 223,342
Claims priority, application Japan, Jul. 25, 1987, 62-185834
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 **3 Claims**



1 An electric power steering apparatus comprising
a steering mechanism actuated by the rotation of a steering wheel to change the direction of a steered wheel;
an auxiliary driving shaft connected to said steering mechanism to provide assist power;
an electric motor for generating power to rotate said auxiliary driving shaft;
a speed reducing mechanism connected to said motor to reduce the speed of rotation of said motor;
a clutch mechanism provided between said speed reducing mechanism and said auxiliary driving shaft to selectively connect together a rotary output shaft of said speed reducing mechanism and said auxiliary driving shaft;
a casing in which said clutch mechanism is accommodated,
a piston disposed in said casing so as to be movable only in the axial direction so as to actuate said clutch mechanism, said casing and said piston defining therebetween a pressure generating chamber;
a rotor accommodated in said pressure generating chamber so as to be rotated by the rotary output shaft of said speed reducing mechanism, said rotor having a plurality of blade portions extending radially; and
a high-viscosity fluid sealed in said pressure generating chamber in order to generate a pressure by which said piston is moved axially when said rotor is rotated.

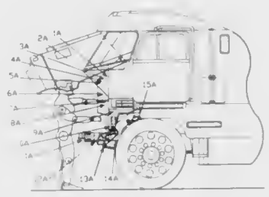
4,921,062

CAB-OVER-ENGINE TRUCK INCLUDING INTEGRATED NOSE HOOD

Huston Marlowe, Orinda, Calif., assignor to PACCAR Inc., Bellevue, Wash.

Filed Sep. 15, 1988, Ser. No. 244,945
Int. Cl.[5] B60K *20/04*
U.S. Cl. 180—89.14 **21 Claims**

1. In a truck of the cab-over-engine type, the improvement comprising a cab having a forward facing bulkhead which extends rearwardly a substantial distance on opposite sides thereof so as to define opposite rearward-most side edges, opposite side doors having forward-most side edges adjacent the rearward-most side edges of said bulkhead and a front windshield which is located above said bulkhead and which extends rearwardly on opposite sides thereof so as to define rearward-most side edges above the side edges of said bulkhead and adjacent the forward-most side edges of said doors, said cab being mounted over the truck engine and many of the engine's cooperating components including its radiator for pivotal movement between an upstanding operating position and a tilted maintenance position, the improvement further comprising a frontal nose hood mounted to said cab in front of said radiator and bulkhead and forward of and below said front windshield for pivotal movement between a closed, generally vertical operating position in front of the radiation and bulkhead and a tilted open position for gaining access to said radiator and bulkhead and certain ones of said components cooperating with truck systems, said frontal nose hood when in its closed operating position extending upward in front of the cab such that its top edge lies immediately in front of and adjacent to the bottom edge of said front windshield and extending rearward on opposite sides and outward of said cab so that its opposite side edges are adjacent the forward-most side edges of said cab doors and adjacent the rearward-most edges of the bulkhead, whereby to enclose the entire bulkhead.

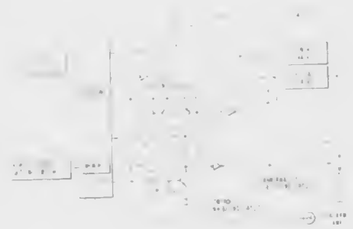


4,921,063

FAIL-SAFE CIRCUIT FOR CONSTANT SPEED DRIVE APPARATUS

Jiro Masuda, Kobe, Japan, assignor to Fujitsu Ten Limited, Kobe, Japan

Filed Feb. 22, 1989, Ser. No. 313,610
Claims priority, application Japan, Feb. 22, 1988, 63-40360
Int. Cl.[5] B60K *31/02*
U.S. Cl. 180—178 **8 Claims**



1 Fail-safe circuit for constant speed drive apparatus which comprises:
means in response to a throttle valve control signal for driving a throttle valve:
means for generating the throttle valve control signal to supply the throttle valve control signal to the throttle valve driving means to maintain a predertermined set vehicle speed:
means for generating a signal indicating abnormality with respect to the constant speed drive control when the throttle valve control signal for controlling the throttle valve in an open throttle direction continues for more than a predetermined period of time,
means in response to the output signal from the abnormality detecting means for disabling the throttle valve driving means when the abnormality of the constant speed drive control is detected, and for causing the throttle valve to move in a close throttle direction; wherein the improvement comprises:
means for generating a test mode signal which is equivalent to the throttle valve control signal for controlling the throttle valve in the open throttle direction continuing for more than a predetermined period of time and
means in response to the test mode signal for deciding whether or not the abnormality detecting means generates the signal indicating abnormality with respect to the constant speed drive control.

4,921,064

DRIVING WHEEL SLIP CONTROL SYSTEM FOR VEHICLES

Yoshio Wazaki; Tetsuya Oono, and Nobuyuki Narisawa, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,259
Claims priority, application Japan, Jun. 11, 1987, 62-145918; Jun. 11, 1987, 62-145919
Int. Cl.[5] B60T *8/32*
U.S. Cl. 180—197 **15 Claims**



1. In a system for controlling the slip of driving wheels of a vehicle equipped with an engine, including
fuel supply means for supplying fuel to said engine,
first slip detecting means for detecting an excessive slip state of at least one of said driving wheels of said vehicle wherein the slip of said at least one driving wheel has a magnitude greater than a predetermined magnitude, and
fuel supply interrupting means associated with said fuel supply means and said first slip detecting means, for causing said fuel supply means to interrupt fuel supply to said engine when said excessive slip state is detected by said first slip detecting means,
the improvement comprising:
second slip detecting means for detecting a predetermined smaller slip state wherein the slip has a magnitude less than said predetermined magnitude;
parameter sensing means for sensing at least one predetermined operating parameter of said engine; and
fuel amount correcting means associated with said fuel supply means, said second slip detecting means, and said parameter sensing means, for correcting an amount of fuel supplied from said fuel supply means to said engine, in dependence on a value of said at least one predetermined operating parameter of said engine, which is sensed by said parameter sensing means, when said second slip detecting means detects said predetermined smaller slip state.

4,921,065

FOUR-WHEEL DRIVE MOTOR VEHICLE HAVING A CONTROLLED DIFFERENTIAL DEVICE

Tetsuro Hamada; Yoshiki Noro, and Noboru Ashikawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 175,827
Claims priority, application Japan, Mar. 31, 1987, 62-079281
Int. Cl.[5] B60K *17/34*
U.S. Cl. 180—245 **15 Claims**



1. A motor vehicle having a first axle shaft which is driven by a drive source and a second axle shaft which is driven by the same drive source, each of a pair of wheels associated with the second axle shaft being powered by way of individual variable torque transmitting means, further comprising:
steering sensor means for detecting a steering angle of the vehicle;
speed detection means for detecting a speed of the vehicle;
a throttle opening sensor for detecting a throttle opening;
control means which control a torque transmission ratio of each of the variable torque transmitting means by using the detected steering angle, vehicle speed and throttle opening as control parameters; and
wherein said speed detection means comprises a speed sensor juxtaposed to each of the wheels for detecting a rotational speed thereof, and the torque transmission ratios of the two variable torque transmitting means are both increased when the speed sensors have detected that all the wheels are stationary.

4,921,066

DUAL CONTROL DRIVING SYSTEM

Challie Conley, Villa Park, Calif., assignor to Refuse Trucks, Inc., Chino, Calif.

Continuation-in-part of Ser. No. 866,862, May 23, 1986, Pat. No. 4,726,441. This application Feb. 22, 1988, Ser. No. 158,350
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.[5] B62D *1/22*
U.S. Cl. 180—322 **12 Claims**

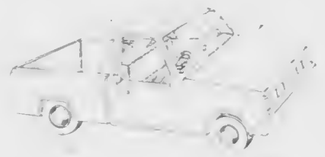
1. An improved dual control driving system for a vehicle movable on wheels, comprising:
a first steering system for altering the vehicle's direction of movement, the first steering system having a first rotating post element operatively engaged to at least one wheel and extending from a floor of said vehicle to a extending from a floor of said vehicle to a dashboard, the first post element being fixed in a cab area of the vehicle to prevent tilting movement of the first post element;
a second steering system dependent upon the first steering system for altering the vehicle's direction of movement the second steering system being constructed so as to obviate the need for another post element similar in function and configuration to the first post element;

first means for connecting the first and second steering systems for tandem operation, the first means being off of a floor area of the cab;

means for stationarily fixing the positions of the first steering system and the second steering system in the cab area, including a plurality of support plates;

a first braking system operatively engaged to at least one wheel;

a second braking system dependent upon the first braking system for retarding the vehicle's movement, the second



system being operatively engaged through the first braking system to those wheel engaged by the first braking system;

second means for connecting the first and second braking systems for tandem operation;

a first accelerator control system for controlling the speed of the vehicle; and

a second acceleration control for controlling the speed of the vehicle independent of the first accelerator control system.

4,921,067

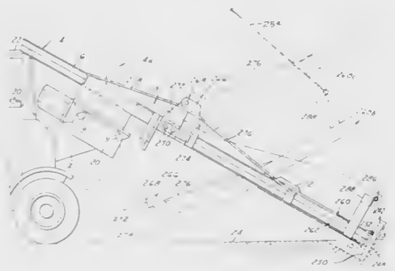
SELF-PROPELLED PERCUSSION UNIT AND METHOD OF USING SAME

David W. Fulkerson, Northville, and Lawrence W. Smith, Novi, both of Mich., assignors to Shear Wave Technology, Northville, Mich.

Division of Ser. No. 30,764, Apr. 17, 1979, Pat. No. 4,175,471, which is a continuation of Ser. No. 830,022, Sep. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 625,141, Oct. 23, 1975, abandoned. This application Dec. 17, 1987, Ser. No. 134,074

Int. Cl.[5] G01V *1/10, 1/147, 1/047*

U.S. Cl. 181—121 3 Claims



1. A method of generating seismic waves for subsurface geophysical exploration or the like comprising the steps of (a) orienting guide means with respect to the earth surface to define a first path at a first selected shear with respect to horizontal adjacent the earth surface, (b) locating shock-transmitting means on the earth surface adjacent said guide means such that a portion of said shock-transmitting means including an impact face is exposed from above the earth surface, and said shock transmitting means having a second portion directed towards the earth and positioned on the earth surface at a preselected shear angle substantially less than 90° and greater than zero° with respect to horizontal, (c) directing an impact hammer through said first path against said impact face in a direction substantially equal to said preselected shear angle with respect to horizontal of said second portion of said shock transmitting means, (d) reorienting said guide means with respect to the earth surface to define a second path at a second selected shear angle horizontally complementary to that of said first path, (e) directing an impact hammer through said second path against said impact face, and (f) transmitting a shear wave and compression wave in the earth in response to said impact hammer contacting said shock transmitting means.

4,921,068

INTERNAL BUBBLE-SUPPRESSION METHOD AND APPARATUS

Adrien P. Pascouet, 12014 Chatam La., Houston, Tex. 77024

Continuation-in-part of Ser. No. 703,302, Feb. 20, 1985, abandoned. This application Mar. 1, 1988, Ser. No. 162,743

The portion of the term of this patent subsequent to Apr. 5, 2007, has been disclaimed.

Int. Cl.[5] G01V *1/04*

U.S. Cl. 181—115 33 Claims



1. A method for generating within a body of water an acoustic signal, comprising:

explosively releasing within said body of water at a time t=o a first charge of a highly pressurized gas having an energy E_a so as to produce in said water a primary pressure pulse and a very low pressure region tending to oscillate at a period T and to generate a secondary pressure pulse;

injecting within said region a second charge of a pressurized gas having an energy E_b such that E_b is at least equal to $\frac{1}{2}(E_a/k-1)$ where k equals the ratio of the specific heats of the injected gas; and,

tuning the duration of said injection and the time when the injection starts so as to substantially establish hydrostatic pressure within said region at about the instant the volume of said region reaches a stationary value.

4,921,069

CLIMBING DEVICE

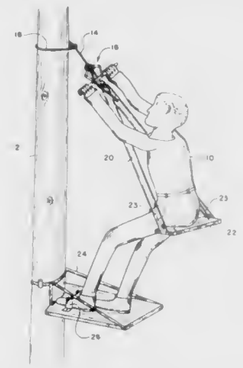
Ralph D. Boyles, 156 Grove Dr., Cortland, Ohio 44410

Filed Mar. 28, 1989, Ser. No. 329,687

Int. Cl.[5] A63B *27/00*

U.S. Cl. 182—135 8 Claims

1. A rope clamp for resisting slippage of a rope therethrough when the clamp is in its locked mode, while allowing slippage when the clamp is in its unlocked mode comprising: two rope-gripping members; two link plates; two support legs; a base bar, and spring means, wherein a first end of each of said members is pivotally attached to a different end of said link plates, one of said link plates being positioned on each side of said members, said first ends being spaced from each other to provide a space defined by said first ends and by said link plates, adapted to receive a rope therein, the other end of each of said members being pivotally connected to an end of one of said support legs, the other end of each of said legs being pivotally connected to said base bar, and wherein said spring means are positioned between said base bars and one of said link plates so as to urge said one of said link plates from said base bar, pivoting said members and thereby reducing said space at a point of minimum spacing between said first ends and, therefore, increasing the frictional engagement between said first ends and a rope positioned therebetween, placing the



clamp in its locked mode, and wherein when said spring means is forced against such urging, said members are also pivoted, whereby said spacing at said point of minimum spacing is maximized, reducing said frictional engagement, and placing the clamp in its unlocked mode.

4,921,070

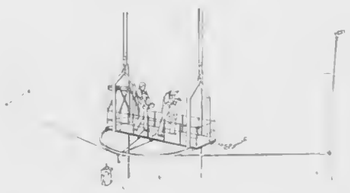
TEMPORARY SUSPENDED ACCESS EQUIPMENT - A BUILDER'S CRADLE

Alan R. Magill, 77/79 Euston Street, London NW1 2ET, England

Filed Jan. 4, 1989, Ser. No. 293,277

Int. Cl.[5] E04G *3/10*

U.S. Cl. 182—142 12 Claims



1. A workman support system for working on a building or other structure, comprising:

a cradle;

a platform forming part of said cradle, and being adapted, in use, to be suspended from said building or other structure;

two elongate guide means positioned on opposite sides of said platform and, in use, extending downwardly from said building or other structure;

a respective rope, cable or other elongate flexible member coupled to, and movable along, each of said elongate guide means, and also coupled to said platform; and

tensioning means for applying tension to said ropes, cables or other elongate flexible members to exert a lateral force on the platform towards said building or other structure from which said platform is suspended.

4,921,071

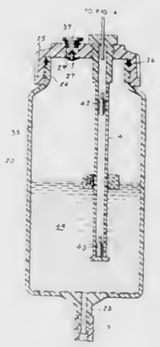
MARINE STERN DRIVE WITH IMPROVED FLUID INSPECTION RESERVOIR

Thomas S. Lonnborg, and Gary L. Meisenburg, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 160,529, Feb. 26, 1988, abandoned. This application Jun. 14, 1989, Ser. No. 366,316

Int. Cl.[5] F01M *11/10*

U.S. Cl. 184—6.4 9 Claims



1. For use with a marine stern drive mounted to the transom (2) of a boat (3), and with said stern drive having a lubricant-filled drive shaft housing (10) visual lubricant inspection means adapted for mounting inboard of a boat and in fluid communication with a connected drive shaft housing, said inspection means comprising, in combination:

(a) a transparent reservoir forming a lubricant-receiving chamber,

(b) means for fluidly connecting said reservoir to the drive shaft housing of a stern drive,

(c) lubricant level detecting means (74–76) supported in said reservoir for automatically warning of the existence of an undesirable level of lubricant within said reservoir,

(d) a removable cap (60) mounted to said reservoir, and with said cap having a central through passage (61), an inner wall (66) and an outer cap wall,

(e) an annular recess (62) disposed on said inner wall,

(f) a vent passage (63) extending transversely outwardly through said cap and communicating between said annular recess and the atmosphere,

(g) a further recess (68) disposed in said outer cap wall,

(h) and a one-way umbrella check valve (64) mounted in said through passage (61),

(i) said umbrella check valve having a large sealing member (65) sealing against said inner wall (66) and covering said annular recess (62),

(j) and said umbrella check valve having a stop member (67) resting against said further recess (68) in said outer cap wall,

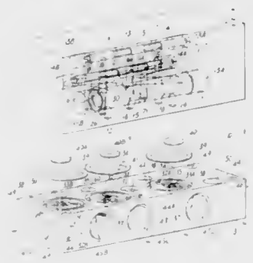
(k) said umbrella check valve providing means to prevent air discharge from said lubricant-receiving chamber and outwardly through said annular recess (62) and said transverse vent passage (63) during running of a connected stern drive, while permitting air inflow through said transverse vent passage and annular recess to said lubricant-receiving chamber when a connected stern drive is at rest.

4,921,072

MODULAR PROGRESSIVE HYDRAULIC DISTRIBUTOR FOR LUBRICATION SYSTEMS

Gualtiero Divisi, Via Massimiano, Italy, assignor to Dropsa S.p.A., Italy

Filed Oct. 13, 1988, Ser. No. 257,436
Claims priority, application Italy, Oct. 19, 1987, 22328 A/87
Int. Cl.[5] F16N *27/00*
U.S. Cl. 184—7.4 7 Claims



1 A progressive hydraulic distributor for distributing a pressurized fluid lubricant, comprising:

(a) a control block having a plurality of cylinders formed therein, and a plurality of consecutively displaceable working pistons, each mounted in a respective cylinder for displacement therein;

(b) a distribution block on which the control block is mounted at an interface, and having inlet means and outlet means into and from which the lubricant respectively flows;

(c) control duct means within the control block and extending from the interface to the cylinders, for consecutively conveying the lubricant to the cylinders;

(d) distribution duct means within the distribution block and extending from the inlet means to the interface, for conveying the lubricant to the control duct means, and also extending from the interface to the outlet means, for conveying the lubricant to the outlet means; and

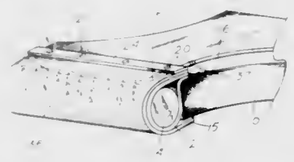
(e) flow control means removably mounted at the interface, for controlling the flow of lubricant to the outlet means.

4,921,073

METHOD AND APPARATUS FOR LUBRICATING THE SHAKER HEADS OF A TREE SHAKING HARVESTER

Ira Compton, 2434 Dayton Rd., Chico, Calif. 95928

Filed Oct. 10, 1989, Ser. No. 419,457
Int. Cl.[5] F01M *9/06*
U.S. Cl. 184—11.2 8 Claims



2 Apparatus for lubricating between padding layers of a shaker head of a tree shaking harvester with said padding layers in position for tree shaking, comprising in combination;

a lubricant reservoir adapted to store a quantity of lubricant;

conduit means between said lubricant reservoir and said padding layers;

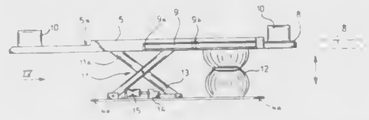
means adapted to cause said lubricant to move from said lubricant reservoir through said conduit means to dispense said lubricant between said padding layers.

4,921,074

VEHICLE LIFTING PLATFORM ATTACHMENT

Eckhard Ochs, Falderbaumstrasse 34, 3500 Kassel-Waldau, Fed. Rep. of Germany

Continuation of Ser. No. 56,549, May 29, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 274,419
Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618160
Int. Cl.[5] B60S *13/00*
U.S. Cl. 187—8.71 2 Claims



1. A lifting platform attachment for motor vehicle lifting platforms or drive-on pits with driving tracks, comprising:

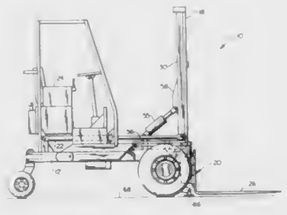
a lifting device mounted on each driving track and adapted for fitting an existing equipment, each lifting device comprising a scissors support with two parallel pairs of scissors which are not acted on directly by a lifting means, a support plate supported by the scissors support, and at least one air spring bellows, being the only mechanical lifting means and which upon deflation permits substantially complete collapse of the lifting device, arranged beneath the support plate, the scissors support and the air spring bellows being mounted on a base plate and said support plate and said base plate form the top and bottom, respectively, sealing plates for the air spring bellows so that the lifting device has a low profile when collapsed to permit a motor vehicle this is to be lifted to drive thereover, and a locking mechanism for the scissors support comprised of a support strut arranged between the two parallel pairs of scissors and a stepped wedge supporting the support strut, wherein during the lifting movement of the air spring bellows, the stepped wedge is pushed under the support strut by means of a piston and cylinder drive whereby steps on the wedge act as a support for the strut to prevent collapse of the lifting platform.

4,921,075

FORK LIFT

Kenneth E. Schumacher, Pleasantville, and Thomas K. Thompson, Granville, both of Ohio, assignors to Teledyne Princeton, Inc., Rexdale, Canada

Filed Feb. 21, 1989, Ser. No. 312,058
Int. Cl.[5] B66B *9/20*
U.S. Cl. 187—9 E 19 Claims



1. A fork lift truck including a U-shaped frame, the legs of the U-shaped frame being parallel; a pair of front wheels mounted on the legs, one wheel on each side of the frame at the open end of the U; a caster wheel mounted on the frame at the closed end of the U; a seat for a driver secured to said frame adjacent the caster wheel mounting; steering and elevation control components mounted on the frame in proximity to the seat; a lift assembly mounted for horizontal travel on said legs including a fork prong vertically movable between ground level and an upper portion; means connected to said frame for moving said lift assembly horizontally along said legs; and hydraulic and chain means in combination for moving the fork prong vertically on a mast, the improvement comprising:

said combination of hydraulic and chain moving means including at least four chains and at least four sprockets combined for mechanically forcing said fork prong to move either up or down,

said lift assembly including a hydraulic piston and cylinder combination, said piston including a piston rod extending upwardly from said cylinder, a horizontally extending axle attached to said piston rod and each of said sprockets rotatably attached to said axle,

said mast including two vertically extending, spaced apart shafts,

two of said chains being attached to said prong, extending upwardly and over two of said sprockets and downwardly to connect with a lower horizontal crossbar, said lower crossbar being immovably connected to said mast shafts,

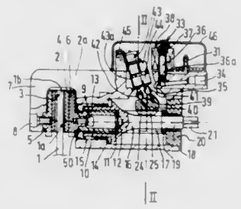
the other two chains being attached to an upper horizontal crossbar, extending downwardly and under the other two sprockets and upwardly to connect with a crossbeam rigidly connected to a vertically movable frame, said movable frame being mounted to vertically reciprocate between said spaced apart shafts of said mast, said upper crossbar being immovably connected to said mast shafts.

4,921,076

VEHICLE PARK BRAKING SYSTEM

Michel Grenier, Dampart; Jean-Etienne de la Gorge, Paris; Daniel Cieplinski, Villemomble; Gérard Leturgie, Auvers S/Oise; Yves Thurin, Suvy en Brie; Laurent Meret, Brunoy, and Christian Doireau, Paris, all of France, assignors to Wabco Westinghouse Equipements Ferroviaries, Sevran and Regie Autonome des Transports Parisiens, Paris, both of, France

Continuation of Ser. No. 62,645, Jun. 16, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 333,885
Claims priority, application France, Jun. 23, 1986, 86 09018
Int. Cl.[5] F16D *55/26, 55/08, 69/00*
U.S. Cl. 188—12.6 3 Claims



1. A park braking system for mechanical connection to at least one wheel of a vehicle for maintaining said vehicle at rest comprising:

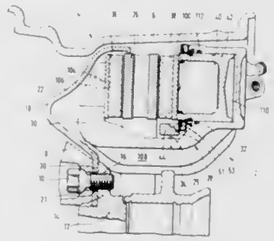
a brake disk having two faces, each of said faces having a friction path, said brake disk enclosed by a brake caliper which straddles the radial cross-section of the disk for applying a brake lining on each of its faces, one of said linings being rigidly secured to said caliper while the other of said linings is movable toward and away from the disk friction path by a threaded rod screwed by an irreversible threading connection in a control nut rotatively mounted through the means of at least one bearing inside the body of said caliper and rotatably driven by application under remote control by a driver of a braking motor either in the brake application direction or in the brake release direction, and adapted to be set in an inactive position, whereby application of said brake is maintained through the opposition of the irreversible threading connection to the release as long as the braking motor is not driven in the release direction, wherein said brake linings are made of an elastomeric material for presenting simultaneously a significant resilience to preserve the application force of the brakes after inactivation of the braking force, a high coefficient of friction when said disk is not rotating, and a rapid wear capacity by melting when the brake disk rotates when the parking brake is not released, thereby causing a fading of the braking torque of the not released parking brake, the control nut being a blind nut, the head of which is extended on the side opposite the threaded rod by a tailpiece which is provided at its periphery with gear teeth and rotatively supported beyond said gear teeth, a gear rack having teeth for mating with said tailpiece gear teeth, the back of said rack opposed to the gear teeth thereof having axial cam outlines, and electrical switches for cooperating with said cam outlines for remote transmissions of indications as to the linear position of the rack corresponding to the release of the brake, the application of the brake or the excessive wear of the brake linings, in cooperation with the remote control of the braking motor.

4,921,077

INWARDLY STRADDLING DISC BRAKE, IN PARTICULAR FOR AUTOMOTIVE VEHICLES

Ulrich Klimt, Muehltal, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

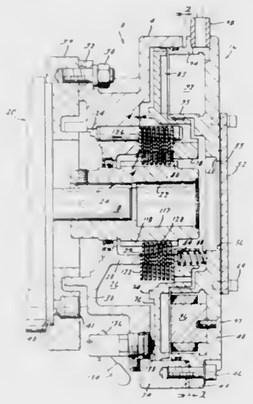
Filed Nov. 7, 1986, Ser. No. 928,316
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1985, 3539602
Int. Cl.[5] F16D *65/02*
U.S. Cl. 188—73.45 3 Claims



1 An inwardly straddling disc brake for automotive vehicles, comprising a brake disc supported at an outer rim thereof, a stationary generally H-shaped brake support member having two substantially radially extending arms interconnected intermediate their ends by a connecting portion extending substantially in a circumferential direction of the disc, the radially inner ends of the arms having means for mounting the brake support member on the automotive vehicle, a brake housing which is axialy slideably supported adjacent the radially outer ends of the arms, an actuating device for actuating said brake housing, said brake housing includes two radially extending legs and a substantially axially extending bridge portion connecting said two legs, a first brake pad disposed and supported on one of the legs adjacent one side of the brake disc so that pressure can be applied directly by the actuating device, a second brake pad disposed and supported on the other one of the legs adjacent a second side of the brake disc so that it can be applied by the other one of said two legs, said connecting

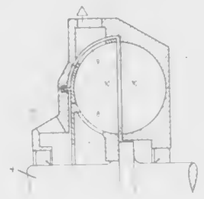
portion of said bridge portion being disposed on the radially inner side of the connecting portion of said brake support member within an opening formed by the connecting portion of said brake support member and the sections of the arms extending radially inwardly therefrom.

4,921,078
ELECTRO-SHEAR BRAKE
Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Company, Warren, Mich.
Filed Feb. 18, 1988, Ser. No. 157,925
Int. Cl.[5] F16D *55/26*
U.S. Cl. 188—171 3 Claims



1 A brake unit for use in combination with a motor having a housing with a generally radially disposed mounting end portion and a rotatable motor shaft projecting axially outwardly therefrom, a brake unit adapted to be surmounted axially onto said motor shaft and be fixedly attached to said mounting end portion, comprising:
a unitary housing member defining a fluid chamber disposed about said motor shaft, said housing member being engagable with said mounting end portion;
first fastening means for fixedly securing said housing member to said mounting end portion;
a cap member engageable with said housing member; further defining said fluid chamber;
a second fastening means for securing said cap member to said housing member in a sealing engagement;
a shaft sleeve at least partially disposed within and defining said fluid chamber having a bore located at one end adapted to nestingly receive the motor shaft for rotation therewith;
a first plurality of brake elements located in said fluid chamber and rotatable with said shaft sleeve;
a brake collar at least partially disposed within said fluid chamber fixedly secured to said housing member, said brake collar disposed generally annularly about said shaft sleeve;
a third fastening means for fixedly securing said brake collar to said housing member;
a second plurality of brake elements located in said fluid chamber and non-rotatably supported upon said housing member,
piston means, comprising at least one magnetically attracted surface, axially translatable relative to said motor shaft supported within said housing member for selectively engaging and disengaging said first and second plurality of brake elements;
biasing means disposed within said fluid chamber for normally biasing said piston in an axial direction to affecting the engagement of said first and second brake elements; and
an electromagnetic coil for selectively translating said piston means axially opposite the biasing means, to selectively disengage said first and second brake elements.

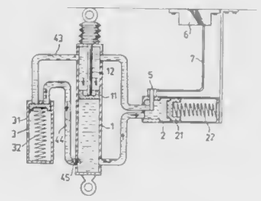
4,921,079
HYDRODYNAMIC RETARDER
Klaus Vogelsang, Crailsheim, Fed. Rep. of Germany, assignor to Voith Turbo GmbH, Fed. Rep. of Germany
Filed Jul. 8, 1988, Ser. No. 216,638
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722477
Int. Cl.[5] B60T *1/087, 10/02;* F16D *57/04*
U.S. Cl. 188—296 22 Claims



1 A hydrodynamic retarder comprising:
a housing defining a torus shaped work chamber;
a stator blade wheel supported in the housing, including blades extending into the work chamber and fixed against rotation around the housing;
a rotor blade wheel in the housing including blades extending into the work chamber and which extend toward the blades of the stator blade wheel; a shaft on which the rotor blade wheel is supported for rotating; the stator blades and the rotor blades together generally filling the torus shaped work space of the work chamber;
a set of slot-shaped inlet filling openings in at least one of the rotor blade wheel and the stator blade wheel for filling the work chamber with work liquid; a pathway in the housing for delivering work liquid to the inlet openings; and
spaced from the inlet filling openings, a set of slot-shaped outlet openings provided on at least one of the stator blade wheel and the rotor blade wheel for emptying the work chamber of work liquid; means for conducting work liquid away from the outlet openings from the work space; said inlet and outlet openings being near and along respective blades of the wheel in which said openings are formed, so that the surfaces of the wheel between said blades are substantially uninterrupted by said openings, so that the radial flow of work liquid between said blades is substantially undisturbed.

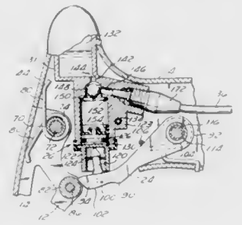
4,921,080
HYDRAULIC SHOCK ABSORBER
Chien H. Lin, No. 113, Chung Shan Rd., Farn Chang Villiage, Charng Chih Hsiang, Ping Tung Hsien, Taiwan
Filed May 8, 1989, Ser. No. 350,129
Int. Cl.[5] F16F *9/46*
U.S. Cl. 188—299 1 Claim

1. A hydraulic shock absorber for a vehicle comprising:
a vertically mounted hydraulic cylinder with a double action piston which divides the interior of said hydraulic cylinder into an upper chamber or compartment and a lower chamber or compartment;
a damping chamber in form of a hydraulic cylinder with a piston supported by a first spring and a first tube to connect with said upper chamber and a second tube to connect with said lower chamber;
and
a return chamber, in form of a hydraulic cylinder with a piston supported by a second spring and a third tube to connect with said upper chamber and a fourth tube to connect with said lower chamber;
said fourth tube being provided with a one-way valve which only opens to the direction toward said hydraulic cylinder;



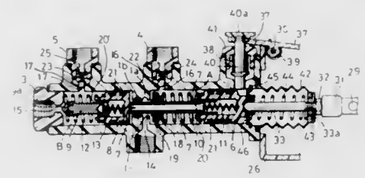
characterized by that a control valve and a shock sensor are provided;
said control valve being provided in a position of said first tube to prevent the oil in said damping chamber from flowing into said upper compartment and controlled by a signal from said shock sensor;
said shock sensor being provided on a position of said vehicle to detect the shock to which said vehicle is subject and being responsive to a shock exceeding a predetermined level to give said signal to said control valve.

4,921,081
HYDRAULIC BRAKE APPARATUS FOR BICYCLES
Keith C. Chilcote, Pacifica, Calif., assignor to Autra-Bike Co., Inc., San Francisco, Calif.
Filed Dec. 22, 1988, Ser. No. 289,627
Int. Cl.[5] B62L *3/02;* B62K *23/06*
U.S. Cl. 188—344 26 Claims



1. An improved hydraulic brake apparatus for a bicycle, comprising:
a means for actuating said brake apparatus;
a brake fluid reservoir;
a fluid outlet chamber, said fluid outlet chamber oriented vertically below said brake fluid reservoir, said fluid outlet chamber comprising:
an inlet providing fluid communication between said reservoir and said fluid outlet chamber;
an outlet providing fluid communication between said fluid outlet chamber and a brake line, said brake line being filled with brake fluid; and
a valve member, said valve member having a rest position and an actuated position, said valve member when in said rest position allowing flow of fluid from said brake fluid reservoir to said fluid outlet chamber through said inlet and when in said actuated position obstructing flow through said inlet; said inlet, outlet and valve member oriented to prevent obstruction of said outlet by said valve member;
a master cylinder, said master cylinder in fluid communication with said brake fluid reservoir through said fluid outlet chamber, said inlet providing a single flow path between said brake fluid reservoir and said master cylinder;
a piston, slidable within said master cylinder, said piston inducing hydraulic pressure in said fluid outlet chamber upon displacement, said actuating means causing displacement of said piston, said hydraulic pressure displacing said valve member from said rest position to said actuated position; and
a brake means disposed proximate a wheel on said bicycle, said brake means upon actuation enforcing braking conditions on said wheel, hydraulic pressure in said brake line causing actuation of said brake means.

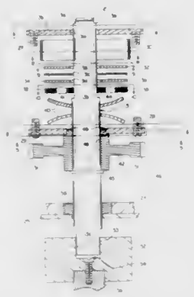
4,921,082
FLUID CONTROL CYLINDER ASSEMBLY FOR AUTOMOBILE BRAKE SYSTEM
Byung K. Kang, 211-88 Sangdo 4-dong, Dongjak-ku, Seoul, and Jin C. So, 525-24 Shinsa-dong, Kangnam-ku, Seoul, both of Rep. of Korea
Filed Nov. 30, 1987, Ser. No. 126,731
Claims priority, application Rep. of Korea, Jul. 24, 1987, 8079/87
Int. Cl.[5] B60K *41/24*
U.S. Cl. 192—13 A 10 Claims



1. A brake fluid control cylinder assembly for use in a brake system of an automobile having a clutch pedal and a brake pedal comprising:
a cylindrical housing having a first end and a second end;
first and second coaxially-spaced cylinder chambers in said housing;
an internal flange wall between said cylinder chambers;
an axial hole through said flange wall communicating between said cylinder chambers;
respective first and second cup-shaped pistons axially movable in said first and second cylinder chambers, said pistons each having a hollow central portion and a bottom;
respective first and second piston rods in said cylinder chambers each having one end thereof axially slidably mounted in said hollow central portion of respective first and second pistons, said second piston rod extending through said axial hole in said flange wall;
a first brake fluid inlet in said first end of said housing communicating with said first cylinder chamber and having a first valve seat therein;
first valve means on the other end of said first piston rod engageable with said first valve seat;
a first piston spring means in said first cylinder chamber for resiliently urging said first piston away from said first end of said housing;
a first piston rod spring means in said hollow central portion of said first piston for resiliently urging said first piston rod toward said first end of said housing and said first

valve means toward sealing engagement with said first valve seat;
a first brake fluid outlet for said first cylinder chamber through said housing disposed between said first valve seat and said first piston;
a first outlet check valve means in said first outlet for providing outlet flow from said first cylinder chamber at a predetermined fluid pressure;
a second valve seat in said flange wall at said axial hole;
a second valve means sealingly and slidably mounted on said second piston rod in said second cylinder chamber engageable in sealing relationship with said second valve seat;
a second piston spring means in said second cylinder chamber having one end connected to said second piston and the other end connected to said second valve means for resiliently urging said second valve means toward engagement with said second valve seat;
a second piston rod spring means in said hollow central portion of said second piston for resiliently urging said second piston rod into engagement at the other end thereof with said first piston;
a second brake fluid inlet through said housing communicating with said axial hole in said flange wall between said second valve seat and said first cylinder chamber;
seal means between said flange and said second piston rod and between said second brake fluid inlet and said first cylinder chamber for sealing said axial hole in said flange wall between said second fluid inlet and said first cylinder chamber;
a second brake fluid outlet through said housing for said second cylinder chamber disposed between said second piston and said second valve seat;
second outlet check valve means in said second outlet for providing outlet flow from said second cylinder chamber at a predetermined fluid pressure; and
clutch pedal operated means operated by depressing the clutch pedal for moving said piston rods to urge said first and second valve means into engagement with the respective valve seats, and for limiting return movement of said second piston upon release of the clutch pedal.

4,921,083
CLUTCH MODULE WITH PREDETERMINED TORQUE
Ronald J. Etscheidt, Anamosa, and Darrell P. Ophaug, Marion, both of Iowa, assignors to Square D Company, Palatine, Ill.
Filed Feb. 28, 1989, Ser. No. 317,269
Int. Cl.[5] F16D *21/04*
U.S. Cl. 192—20 **4 Claims**



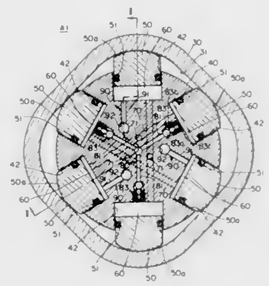
1. A bidirectional torque limited assembly comprising:
a drive shaft adapted to be coupled to a driven member;
gear wheel means rotably mounted on said drive shaft and adapted to be coupled to a drive gear;
a torque limited module movable on said drive shaft with said gear wheel means;
clutch means, having an outer diameter, said clutch means including friction means having first and second friction discs separated by a spacer disc, pressure means including a pair of Belleville washers and a drive plate, all mounted for rotational movement on said drive shaft, in said torque limited module, and being frictionally coupled to said drive shaft;
means in said torque limited module for aligning said clutch means on said drive shaft and within said torque limited module, said aligning means comprising a cylinder having an inner diameter that is slightly greater than said outer diameter of said clutch means; and
wherein said torque limited module includes first and second module plates, said first module plate being drivingly coupled to said gear wheel and said cylinder being sandwiched between said module plates, whereby frictional loading of said clutch means on said drive shaft is predetermined and substantially constant.

4,921,084
LOW FRICTION ROLLER CONTROL CAR
Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 24, 1989, Ser. No. 342,157
Int. Cl.[5] F16D *41/06*
U.S. Cl. 192—45 **2 Claims**



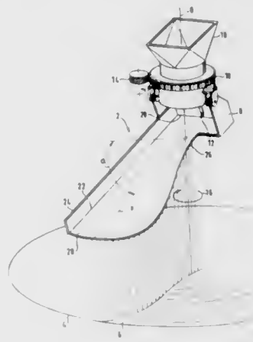
1. An overrunning clutch of the type in which a plurality of cylindrical rollers is located in the annular space between a pair of substantially coaxial clutch races, and in which said rollers are subject to spin and skew during clutch operation, said clutch comprising,
a cage adapted to be installed in said annular space including a pair of axially opposed side rails,
a plurality of roller cars, one for each roller, each of said cars being formed from sheet metal with a base wall and a pair of parallel side walls extending therefrom and sized to fit closely between said cage side rails so as to maintain said roller car square to said cage,
said base wall also having a pair of rear retention tabs extending circumferentially therefrom and engaging the back of said roller only along a pair of edge lines above and below a central plane of said roller,
said roller car side walls each also having a pair of front retention tabs extending axially inwardly therefrom and engaging the front of said roller only along a pair of edge lines above and below said roller central plane, thereby maintaining said roller square to said roller car in cooperation with said rear retention tabs with minimal direct contact between each roller car and roller,
whereby, roller skew is controlled by said roller car while heat generated by friction between said spinning roller and said roller car is kept to a minimum and is also efficiently dissipated by said metal roller car.

4,921,085
ROTATIONAL SPEED DIFFERENTIAL RESPONSIVE TYPE JOINT
Toji Takemura, Yokohama, and Takashi Okubo, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed May 13, 1988, Ser. No. 193,628
Claims priority, application Japan, May 14, 1987, 62-117699
Int. Cl.[5] F16D *31/02*
U.S. Cl. 192—60 **9 Claims**



1. A torque transmitting assembly, comprising:
a first rotary member;
a second rotary member disposed in said first rotary member; and
hydraulic fluid means for transmitting at least a portion of the input torque from one of said first rotary member and said second rotary member to the other in response to a rotational speed of said second rotary member and also to a rotational speed differential occurring between said first rotary member and said second rotary member,
said hydraulic fluid means including an internal cam surface formed on said first rotary member and surrounding said second rotary member, cam followers in radially outwardly opening bores formed in said second rotary member in slidable direct contact engagement with said cam surface and reciprocable in response to said rotational speed differential to define variable volume chambers in the associated radially outwardly opening bores, respectively, and means for restricting flow of hydraulic fluid discharged from each of said variable volume chambers on the discharge stroke of the associated one of said cam followers for transmitting torque through said direct contact between said cam followers and said cam surface,
said cam surface being contoured such that at any angular position of said second rotary member relative to said first rotary member, substantially the same ratio of the input torque is transmitted through said cam followers and cam surface from one of said first and second rotary members to the other during the occurrence of said rotational speed differential.

4,921,086
DEVICE AND METHOD FOR UNIFORMLY DISTRIBUTING MATERIALS ON A CIRCULAR SURFACE
Hans J. Klutz, Erfstadt-Lechenich, Fed. Rep. of Germany; Bruno Flora, Pontpierre, Luxembourg; Gerard Gilles, Mersch, Luxembourg, and Georges Wies, Dudelange, Luxembourg, assignors to Paul Wurth S.A., Luxembourg and Rheinische Braunkohlenwerke AG, Fed. Rep. of Germany
Filed May 17, 1989, Ser. No. 353,119
Claims priority, application Luxembourg, May 25, 1988, 87226
Int. Cl.[5] B65G *11/00*
U.S. Cl. 193—3 **2 Claims**



1. A chute for distributing granular material over a circular surface, comprising:
an elongated flat sliding surface extending from a top end to a bottom end and having a rectilinear longitudinal side,
a retaining edge extending along the rectilinear longitudinal side, and
a pouring side opposite the rectilinear longitudinal side, said pouring side having the overall slope of an elongated "S" extending without interruption and without corners along the bottom end of the sliding surface to the rectilinear longitudinal side.

4,921,087
PICKING APPARATUS
Katsunari Nakamura, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan
Continuation of Ser. No. 145,769, Feb. 22, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 378,469
Claims priority, application Japan, Apr. 30, 1986, 61-100077
Int. Cl.[5] B65G *47/46*
U.S. Cl. 198—350 **6 Claims**

1. An apparatus for automatically picking articles supplied by supply device means disposed along a picking line of a transport device having a plurality of transport routes including said picking line and re-picking and re-packing lines which intersect said picking line, and at least one transverse line connecting said picking line to a by pass line, said apparatus comprising:
at least one picking container adapted to be conveyed along the transport routes of said transport device;
a plurality of supply device means disposed along said picking line for controllably supplying articles to a picking container on said picking line, each said supply device means including control device means, wireless communication means, and a sensor for monitoring a supply of articles;
a plurality of route setting devices each including wireless communication means, one located at each intersection of

said transport routes of said transport device for controllably transferring a picking container from one of said transport routes to another;

a main control device having a wireless communication means for transmitting picking information; and

a data carrier attached to said at least one picking container, said data carrier including a signal receiving section, a control section, a signal transmission section and a memory section, for receiving from said main control device picking information including data indicative at least of the kind and number of articles to be supplied to its associated picking container, for storing said received information in said memory section, for transmitting said stored picking information through said signal transmission section to said route setting devices and to said control device means of said supply device means, and for storing in said memory section result information including data indicative at least of excess or shortage in articles supplied by said supply device means to said at least one picking container, whereby picking of articles is executed based on said pickir g or result information stored in the memory section of a data carrier thereby to disperse information processing tasks and thus reduce the information processing load of said main control device.



4,921,089

TROUGH-TYPE CHAIN CONVEYOR FOR BULK MATERIAL

Lothar Teske, Hegelstrasse 15, D-5000 Köln, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 86,726, Aug. 17, 1987, Pat. No. 4,807,740. This application Oct. 26, 1988, Ser. No. 262,949

The portion of the term of this patent subsequent to Feb. 28, 2066, has been disclaimed.

Int. Cl.[5] B65G *47/19*

U.S. Cl. 198—534 **2 Claims**



1. In combination with a supply of bulk material having an outlet of a predetermined relatively great transverse width, a conveyor for moving the material from the outlet to an output location longitudinally and horizontally offset from the outlet in a transport direction, the conveyor comprising:

a trough having

an intake of generally the large transverse width and opening upward underneath the outlet of the supply for receiving bulk material therefrom,

an output opening downward at the output location,

a base extending in the direction, and a pair of side walls extending upward from the base and also extending in the direction, the side walls flaring upward away from each other at least at the intake and having upper edges spaced transversely apart at least at the intake by the transverse width and having lower edges spaced transversely apart generally along the full length of the trough by a relatively small transverse width;

an endless conveyor chain carrying transversely projecting pushers and having a lower stretch immediately juxtaposed in the through with the base thereof and an upper stretch extending in the trough above the lower stretch and underneath the intake, whereby a stream of bulk material passing out of the supply outlet and into the trough intake is longitudinally traversed by the upper stretch;

means for driving the chain and thereby advancing the lower stretch in the transport direction to move the material from the intake to the outlet and to advance the upper stretch opposite to this direction and break up the incoming bulk-material stream at the intake; and

a first scraper vertically spaced by a first spacing above the upper stretch immediately upstream in the transport direction from the intake;

a second scraper

vertically spaced by a second spacing below the upper stretch and

engaging upward against the upper stretch immediately upstream in the transport direction from the intake;

a third scraper vertically spaced by a third spacing above the lower stretch immediately upstream in the transport direction from the intake; and

a fourth scraper vertically spaced by a fourth spacing above the lower stretch immediately downstream in the transport direction from the intake, the fourth and third spacings being respecitvely greater than the second and first spacings.

4,921,088

DEVICE FOR FORMING A BATCH CONSISTING OF A PREDETERMINED NUMBER OF DISCS

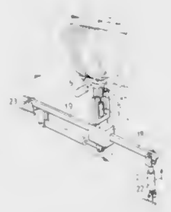
Gerrit H. F. Ter Horst, Schalkhaar, Netherlands, assignor to Thomassen & Drijver-Verblifa N.V., Netherlands

Filed Aug. 31, 1987, Ser. No. 90,928

Claims priority, application Netherlands, Jan. 26, 1987, 8700181

Int. Cl.[5] B65G *47/26*

U.S. Cl. 198—418.7 **13 Claims**



1. A device for separating a group of a predetermined number of disc-like objects from a supply of an indefinite number of such objects arranged in face-to-face contiguous relation and displacing the group a predetermined distance from the supply, comprising the combination of means for feeding the indefinite number of such objects along a given path past a point of counting and separation, means at said point of counting and separation for counting any chosen number of the objects as they are moved along the path past said point of counting and separation to constitute a particular group thereof, control means for bodily separating the particular group from the supply of the objects and transporting the group in face-to-face contact as a separate unit along said path downstream of the supply, said control means including a separating member aligned with and spaced below said counting and separating point, actuating means for vertically shifting said separating member upwardly into penetrating position between a last-counted object and an adjacent but not count object, means for moving the separating member downstream of the path by said predetermined distance from the counting and separating point, the control means also comprising transport fingers contained in the same vertical plane with the separating member and movable in sequential fashion with respect to the separating member for positioning between the adjacent objects and for moving the group downstream.

4,921,090

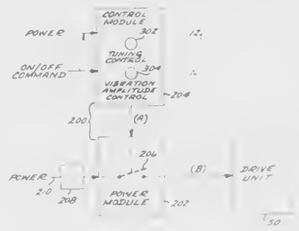
VIBRATORY CONVEYOR

Vaughn Gregor, Beverly Hills, Calif., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 13,222, Feb. 6, 1987, abandoned, which is a continuation of Ser. No. 873,046, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 593,215, Mar. 26, 1984, abandoned. This application Dec. 22, 1988, Ser. No. 289,507

Int. Cl.[5] B65G *27/32*

U.S. Cl. 198—761 **26 Claims**



1. A vibratory material conveyor comprising a frame, an elongated tray for receiving and conveying material along a linear path, resilient mounting means for supporting the tray from the frame and for permitting vibration of the tray along the linear path, electro-magnetic driving means having at least one pair of electrically energizable opposed pole pieces where one pole piece is rigidly connected to the tray and the second pole piece is connected to the frame, an electrical power supply carrying an alternating current at a standard mains voltage and frequency, and a drive controller means for electrically connecting the power supply to the electro-magnetic means for virbating the tray, wherein the drive controller means comprises:

means for periodically turning the alternating current on and off from the power supply to the electro-magnetic driving means; and

user control means for setting a duration for timed bursts of alternating current at the standard mains voltage and frequency delivered to the electro-magnetic driving means and for tuning the electro-magnetic driving means to a harmonic frequency at or near a natural harmonic frequency of the tray when vibrating.

4,921,091

ADJUSTABLE DRAW ROLLER ASSEMBLY

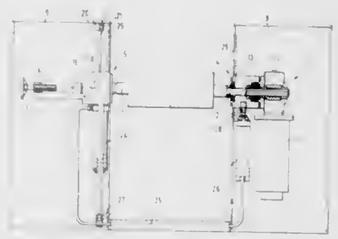
Gunther Kehlenbach, Wurselen, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Wurselen, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,243

Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818409

Int. Cl.[5] B65G *13/02*

U.S. Cl. 198—782 **5 Claims**



1. A driven draw roller assembly comprising a frame having first and second parallel vertically directed supports, first and second roller bearing assemblies mounted on said first and second supports respectively for vertical movement relative thereto, a draw roller having a horizontal shaft the distal ends of which are mounted for rotation in respective said bearing assemblies, drive means on said first bearing assembly operatively connected to said shaft for rotating said roller, height adjustment means on said second bearing assembly, said height adjustment means including a threaded spindle rotatable about an axis co-axial with said shaft, a nut member is threaded engagement with said spindle, said nut member being slidably mounted on said second bearing assembly for horizontal movement toward and away from said roller in response to rotation of said spindle, first and second spaced parallel cable members having lower ends fixed to said nut member and upper ends secured to an anchor portion of said frame above said bearing assemblies, horizontally arrayed pulley means mounted on said second bearing assembly, said cable members including horizontally directed portion extending between said nut member and said pulley means and vertically directed portions extending between said pulley means and said anchor portion, and connecting means linking said first and second bearing assemblies for adjusting the vertical position of said first bearing assembly in accordance with the adjusted position with said second bearing assembly.

4,921,092

COMPUTER CONTROLLED NON-CONTACT FEEDER WITH SPACE-CONTROL DEVICE RESPONSIVE TO ITEM-SENSING DEVICE

Donald C. Crawford, Green Bay; Jeffrey L. Ross, Pulaski, and James W. Krueger, Green Bay, all of Wis., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 792,085, Oct. 28, 1985, abandoned. This application Dec. 17, 1987, Ser. No. 133,216

Int. Cl.[5] B65G *47/26*

U.S. Cl. 198—460 **8 Claims**

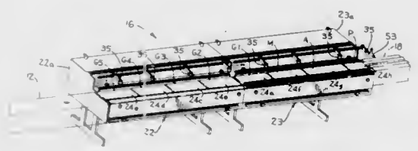
1. A non-contact feeder for receiving randomly spaced nonabutting articles from a supply conveyor and for delivering said articles to a wrapping machine conveyor at a speed and at a spacing to match a flighted conveyor on said wrapping machine without said articles contacting one another, said feeder comprising:

a plurality of conveyors mounted in series for receiving articles from said supply conveyor;

a plurality of optical sensors;

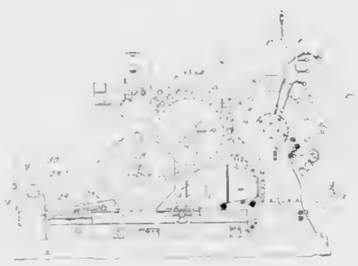
means for mounting each of said sensors adjacent a corre-

sponding one of said conveyors for sensing the presence of an article on said corresponding conveyor;
means for using signals from said sensors to sense the spacing between adjacent articles and to adjust the spacing between said articles as said articles move along said conveyors, said adjusting means including means for increas-



ing the spacing between said articles when the spacing decreases below a first predetermined constant value and means for decreasing the spacing when the spacing increases above said first predetermined constant value; and
means for using signals from said sensors to conform article speed and position to movement of said flighted conveyor on said wrapping machine.

4,921,093
INFEED MEANS FOR HIGH SPEED CONTINUOUS MOTION CAN DECORATOR
Arnold Peters, West Paterson; Theodore Hamot, Saddle Brook, and Leonard Ver Hoven, Oak Ridge, all of N.J., assignors to Sequa Corporation, New York, N.Y.
Filed May 9, 1988, Ser. No. 191,693
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—471.1 **16 Claims**



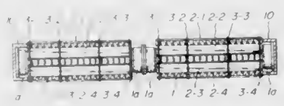
1. Very high speed apparatus for decorating cylindrical objects constituted by cans having a diameter generally in the range of 2 to 4 inches, said apparatus including:
a rotating mandrel wheel and a plurality of angularly spaced mandrels mounted on said mandrel wheel;
a rotating pocket wheel coaxial with said mandrel wheel and having a plurality of equally spaced peripheral pockets equal in number to said plurality of mandrels;
said pocket wheel being provided along its periphery with a plurality of lead-in surfaces to direct cylindrical objects into said pockets;
each of said lead-in surfaces extending downstream from an individual one of said pockets and gradually retreating radially inward as it approaches the pocket into which the particular lead-in surface directs cylindrical objects;
first means for engaging cylindrical objects in said pockets as they pass angularly through a transfer region and directing them axially toward said mandrels for loading thereon while said wheels are rotating at full speed;
second means for conveying cylindrical objects in side by side relationship and delivering same to said pocket wheel for loading in said pockets at a loading region upstream of said transfer region;
third means to apply a suction force to cylindrical objects, with application of said suction force to cylindrical objects being initiated after they are seated in said pockets to stabilize said objects therein while they are carried to said transfer region by said pocket wheel and until such objects are engaged by said first means for transfer to said mandrel; and
cylindrical objects while moving along said lead-in surfaces toward said pockets being free of said suction force.

4,921,094
PRODUCT/CARD COMBINATION
Koos van den Akken, 2109 Broadway, New York, N.Y. 10023
Filed May 22, 1989, Ser. No. 355,571
Int. Cl.[5] B65D *73/00*; **G09F** *23/00*
U.S. Cl. 206—232 **4 Claims**



1. An occasional greeting device, comprising the combination of a display element having a display panel portion thereon and a greeting card operatively connected to said first element, said card having a first, exposed panel bearing a representation of said first element, the portion of said representation depicting said display panel portion being excised to form an opening in said first panel, and a second interior panel hinged to said first panel, said second panel bearing a message sought to be delivered by said card, said message being located on said second panel whereby a portion thereof appears through said opening in said front panel when said panel is closed; the display panel portion of said display element bearing a copy of said message portion appearing through said opening.

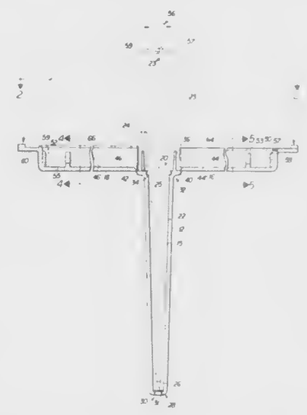
4,921,095
CRATINGS FOR INSULATOR
Tsugiji Kato, Chiryu; Kunitoshi Aoyama, Komaki, and Motokazu Kozakai, Kasugai, all of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Feb. 8, 1989, Ser. No. 307,474
Claims priority, application Japan, Dec. 26, 1988, 63-325965
Int. Cl.[5] B65D *81/02*
U.S. Cl. 206—328 **4 Claims**



1. An insulator crating for an insulator having a metallic fitting provided at each end portion thereof, said crating comprising:
a plurality of plate-like members arranged around an outer peripheral portion of said insulator in a radially spaced manner, each of said plate-like members having at least one engaging member provided on an inner surface thereof; and

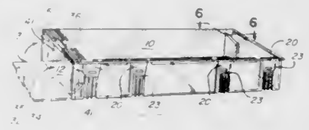
at least two tying members for fixing the plate-like members to the outer peripheral surface of said insulator;
wherein the metallic fittings of said insulator are exposed from the plate-like members to such an extent that one of said metallic fittings can be connected to another metallic fitting of another insulator, and said at least one engaging member fits between adjacent shade portions among a plurality of shade portions of said insulator or between adjoining insulators.

4,921,096
PACKAGE ASSEMBLY
Richard McFarlane, Geneva, Ill., assignor to Taut, Inc., Geneva, Ill.
Filed Jan. 17, 1989, Ser. No. 297,126
Int. Cl.[5] B65D *85/20*
U.S. Cl. 206—349 **10 Claims**



1. A package assembly designed to removably contain a single, substantially elongated product, said package assembly comprising:
(a) an elongated base having a closed cylindrical configuration extending along its length and having a hollow interior defining a storage chamber therein and including an open proximal end and a substantially closed distal end and configured to have a greater length than a first portion of the product contained within said storage chamber,
(b) closure means secured to said base for enclosing a second portion of the product which extends outwardly of said storage chamber through said open proximal end, said closure means comprising two closure segments each pivotally connected to said base adjacent said open proximal end and on substantially opposite sides thereof and selectively disposable between an open and a closed position,
(c) said open position defined by each of said closure segments connected to and extending outwardly from said base and the product therein, said closed position defined by said closure segments collectively disposed in surrounding relation to the second portion of the product,.
(d) said closure means structured to expose the second portion of the product, for removal of the product from said storage chamber, when said closure segments are in said open position and further enclose the second portion of the product between and within said closure segments when in said closed position,
(e) a support means formed in part on each of said closure segments and extending outwardly therefrom for engagement of the second portion of the product when said closure segments are in said closed position, and
(f) a substantially annularly configured skirt formed on said base and extending axially outward from said open proximal end and disposed in engagable relation with the product and with interior surface portions of each closure segment when said closure segments are in said closed position.

4,921,097
DISPLAY CASE FOR A JACKETED CASSETTE
Malcolm K. Finke, Chicago; Marshall Weinstein, Riverwoods, both of Ill., and Kenneth J. Muderlak, Shorewood, Wis., assignors to Specialty Store Services, Inc., Chicago, Ill.
Filed Aug. 1, 1989, Ser. No. 388,585
Int. Cl.[5] B65D *85/672*
U.S. Cl. 206—387 **22 Claims**

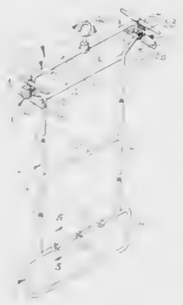


1. A display case for displaying video cassettes having separable jackets, said case comprising:
a sleeve having walls partially enclosing an internal cavity for accommodating a video cassette in its separable jacket and having a closed end of said sleeve and an open end of said sleeve for the slidable withdrawal of the video cassette from said display case and said jacket in a predetermined direction through the open end of said sleeve;
a protrusion projecting into said cavity, in a direction substantially transverse to said predetermined direction, for engagement with the jacket of the video cassette, but not the video cassette itself, to prevent withdrawal of the jacket in said predetermined direction while simultaneously allowing slidable withdrawal of the video cassette from the jacket and said sleeve in said predetermined direction; and
locking means for maintaining said protrusion in engaging relation with the jacket of the video cassette.

4,921,098
HANGER FOR DISPLAYING TEXTILE MATERIAL AND PACKAGE THEREOF
Charles M. Combier, Aiken; Archie E. Taylor, Jr., and Marc Paquette, both of Leesville, all of S.C., assignors to J. B. Martin Company, Inc., Leesville, S.C.
Filed Jun. 9, 1989, Ser. No. 364,816
Int. Cl.[5] B65D *85/66*
U.S. Cl. 206—408 **16 Claims**

1. A hanger for shipping and thereafter displaying a readily crushable textile material such as woven velvet fabric adapted to be convolutely wound on and around the hanger, said hanger comprising a single, unitary one piece generally rectangular skeletal frame of interconnected bars, said frame being considerably longer than it is wide and adapted to be encircled

by fabric wound around medial portions thereof, hanger hook means mounted for swivel movement on an upper medial portion of said frame so as to permit said frame to be rotated about a substantially vertical axis relative to said hanger hook means for facilitating winding and unwinding textile material



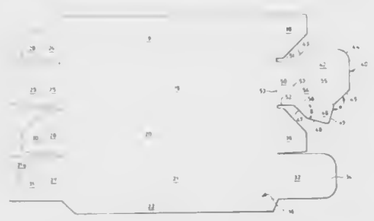
on and around said frame, and opposing pairs of fabric impaling means connected to said frame adjacent opposite upper sides of the frame and positioned to extend outwardly at generally right angles to the plane of said frame, each impaling means including a pair of upright pins offset from said frame so that said frame bisects the respective pairs of pins.

4,921,099

LAMP CARTON WITH FALSE, ANGLED TRAP

William F. Trauschke, Topsfield, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Nov. 28, 1988, Ser. No. 276,753
Int. Cl.[5] **B65D** *85/42*
U.S. Cl. 206—418 20 Claims



1. A blank for forming a lamp container comprising a substantially rectangular sheet having a plurality of parallel fold lines including in sequence a first side panel edge line, a second side panel fold line, a third side panel fold line, a fourth side panel fold line, and a fifth side panel fold line defining by respective pairs in sequence a first side panel, a second side panel, a third side panel, a fourth side panel, and a sealing means, of said container, and a plurality of end panels disposed at a common first end of said side panels, said plurality of common first end panels being formed by fold lines and cut-out portions on said sheet and including:

(a) a rectangular panel coupled to said first end of said second side panel along a first end panel coupling fold line transverse to said second side panel fold line, and transverse to said third side panel fold line,

(b) a triangular panel defined by a first fold line having a base length, a second fold line having a height, and a third fold line; the triangular panel being disposed adjacent, and coupled along said first fold line of said triangular panel to a side of said rectangular panel opposite said first end panel coupling fold line, with said second fold line of said triangular panel opposite said third side panel fold line,

(c) a leg panel having one side thereof formed along said second fold line of said triangular panel and having a side opposite said second fold line of said triangular panel, not parallel with said second fold line of said triangular panel, and extending for a distance less than or equal to the perpendicular distance between said third side panel fold line and said fourth side panel fold line, and

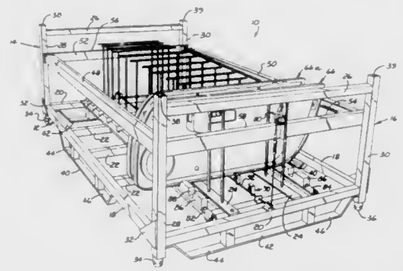
(d) a guide panel having a first side coupled along said third fold line of said triangular panel, said guide panel having a second side opposite the third fold line of said triangular panel having a free edge including at least one point whose distance, projected parallel to the first fold line of said triangular panel, to the second fold line of said triangular panel, and whose distance, projected parallel to the second fold line of said triangular panel, to the first fold line of said triangular panel are not both less than the base length and height length respectively.

4,921,100

RACK LATCH ASSEMBLY

Duane K. Krause, Grosse Pointe Woods, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 20, 1989, Ser. No. 409,841
Int. Cl.[5] **B65D** *85/30, 88/12*
U.S. Cl. 206—448 8 Claims



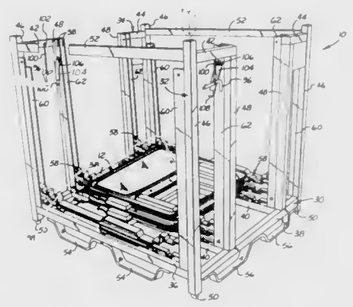
1. A shipping rack for shipping of a plurality of finished vehicle parts in secure spaced relationship for ensuring that the finished show surfaces of the vehicle parts are substantially free from damaging contact with the shipping rack or with one another, said vehicle parts including an upper overturned flange portion and a lower generally horizontally extending flange portion, said shipping rack comprising: a lower wall portion having a length and a width; a pair of upstanding end walls at each end of the length of said lower wall; a plurality of securing elements vertically extending from said lower wall, each including a means for supporting the upper overturned flange of said vehicle part against movement in a downward direction; a pair of dunnage bars for restraining side lateral movement of said vehicle part; a longitudinally extending holding bar made of a non-marring material and having a series of indentations therein corresponding to the number of said plurality of securing elements for engaging the lower ends of said vehicle parts for securing the vehicle parts against movement of the lower end thereof in a longitudinal direction; and a latching assembly for latching the vehicle part into position on said shipping rack, said latching assembly including: a longitudinal bar slideably journaled to said lower wall for longitudinal movement along the axis of the bar, a plurality of latching elements attached along the length of said bar corresponding in number to the number of parts to be latched, and a means for actuating said latching elements into a first position for engaging the lower horizontally extending flange of said vehicle part and to a second position for releasing the part, said latching elements including a pair of vertically spaced latching surfaces, said latching surfaces providing for engagement of vehicle parts having different lengths between the upper overturned flange and the lower extending flange portion thereby allowing for carrying of vehicle parts of different vertical lengths in said shipping rack.

4,921,101

RACK FOR SUN ROOF MODULES

Edward W. Gatt, Richmond, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 11, 1989, Ser. No. 405,158
Int. Cl.[5] **B65D** *85/48*
U.S. Cl. 206—451 9 Claims



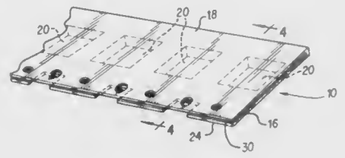
1. A rack for shipping sun roof modules comprising:
a bottom wall having a width and length;
an upstanding end wall at each end of the length of the bottom wall;
a pair of laterally spaced channel members extending upwardly along each end wall;
an insert extending longitudinally and having ends disposed within longitudinally opposed channel members and adapted to receive sun roof modules placed thereon; and
said insert including means for allowing successive inserts to be stacked with a sun roof module contained therebetween.

4,921,102

ONE PIECE CARRIER TAPE AND METHOD OF FORMING SAME

Donald Van Erden, 23456 Lakeview Ct., Wildwood, Ill. 60030

Filed Jan. 6, 1989, Ser. No. 294,201
Int. Cl.[5] **B65D** *73/00*
U.S. Cl. 206—470 18 Claims



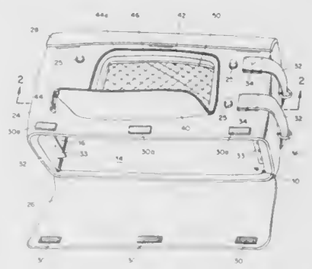
1. A carrier tape comprising an elongated member formed of a plastic material;
a living hinge extending longitudinally along said member dividing said member into first and second longitudinal segments extending from said hinge to said member longitudinal edges;
a plurality of component cavities extending longitudinally along one of said segments;
a plurality of spaced sprocket holes formed in a line extending adjacent said first segment longitudinal edge; and,
means for releasably securing said first segment to said second segment when said plastic material is folded along said living hinge.

4,921,103

VENTILATED RACK CASE

Wayne E. Cohen, Emerson, N.J., assignor to Latin Percussion, Inc., Garfield, N.J.

Filed Aug. 10, 1989, Ser. No. 392,067
Int. Cl.[5] **A45F** *3/04;* **B65D** *81/02*
U.S. Cl. 206—523 9 Claims



1. A ventilated rack case for transportation and operation of a rack mountable electronic unit of the type having a rectangular housing, a front control panel, a rear connector panel and fastening means for rack mounting, said case comprising:
an inner frame having a top portion, bottom portion and opposed side portions arranged in a generally rectangular shape open at the front and back, and means for cooperating with fastening means on an electronic unit, said frame having cutout means for permitting ventilation of an electronic unit while also providing physical protection of such a unit;
cover means for surrounding said frame and having front and back flaps for enclosing and exposing the front and back openings, respectively, a flap operatively cooperating with said cutout means for enclosing and permitting ventilation through said cutout means, and means for securing said flaps in a closed position;
whereby an electronic unit may be fastened in said case and alternatively transported with flaps closed for protection, or placed in operation with the flaps open for front and rear access and ventilation through the cooperative functioning of the cutout means and associated flap.

4,921,104

PACKAGE WITH RECLOSABLE POURING SPOUT

Gordon W. Holmes, Toronto, Canada, assignor to Professional Packaging Limited, Mississauga, Canada

Filed Feb. 13, 1989, Ser. No. 309,139
Claims priority, application United Kingdom, Feb. 12, 1988, 8803290
Int. Cl.[5] **B65D** *17/28*
U.S. Cl. 206—621.4 12 Claims

1. In a carton constructed of paperboard material and housing a pourable product to be dispensed therefrom through a pouring spout, the improvement wherein:
said pouring spout is constructed of said paperboard material and is defined by:
a first rectangular panel comprising inner and outer layers and having said inner panel joined to a side panel of said carton by a first fold line extending transversely across the side panel and dimensioned to fill a rectangular opening in

VOL 114 ISS 1 MY 1 1990 UMI

said side panel adjacent an upper end thereof through which said product is poured,

a first wing panel joined to one side edge of said inner panel of said first rectangular panel by a second fold line,

a second wing panel joined to another side edge of said inner panel of said first rectangular panel by a third fold line, each said wing panel extending substantially at right angles to said first rectangular panel into said opening to define first and second side walls of said pouring spout for the entire extent of opening of said spout to a fully-opened position by folding about said first fold line,

a tab panel comprising inner and outer layers and joined to an upper edge of said first rectangular panel by a force fold line between the inner panels of the first rectangular



panel and the tab panel and a fifth fold line between the outer panels of the first rectangular panel and the tab panel, said tab panel being arranged to be bent between a first position in which said tab panel extends approximately at right angles to said first rectangular panel for entering into said opening when said pouring spout is closed and a second position in which said tab panel permits product to flow over the surface thereof during pouring of product from said carton, and

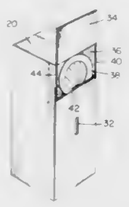
said top panel of said carton having an opening adjacent a joint of said top panel and said side panel which is closed by said tab panel when said pouring spout is closed and which is dimensioned to receive said pull tab means therethrough in interference interlocking relation.

4,921,105

SHIPPING, STORAGE AND DISPENSING CONTAINER FOR FLEXIBLE DUCT AND THE LIKE

Keith C. Culbreth, Anderson, S.C., assignor to Automation Industries, Inc., Greenwood, S.C.

Filed Mar. 20, 1989, Ser. No. 325,991
Int. Cl.[5] B65D *75/58, 77/30*
U.S. Cl. 206—626 **10 Claims**



1. A container (**10**) for shipping, storing and dispensing a longitudinally- and radially-compressible product (**38**), comprising:

(a) four side walls (**12**, **14**, **16** and **18**) of substantially equal length and width with respect to one another;

(b) folding end flaps (**12***a*, **14***a*, **16***a*, **18***a* and **12***b*, **14***b*, **16***b*, **18***b*) extending from said four side walls (**12**, **14**, **16** and **18**) for forming two square end walls (**20**, **22**); and

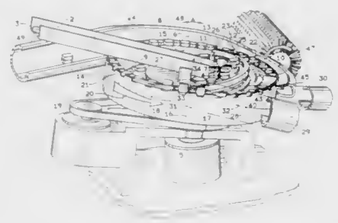
(c) a series of three score lines (**24**, **26**, **28**) in a U-configuration below one folding end flap (**12***a*) of container (**10**) to enable formation in one side (**12**) of a lateral dispensing opening (**36**) which is smaller in one dimension than one diameter of the longitudinally- and radially-compressible product **938**) to be contained and is reclosable by means of a dispensing flap (**34**) formed by hinging a section of said one side **912**) defined by said three score lines (**24**, **26**, **28**) away from said one side (**12**).

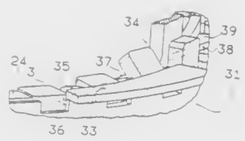
4,921,106

SELECTION DEVICE FOR SWEET CONFECTIONS

Mario Spatafora, and Antonio Gamberini, both of Bologna, Italy, assignors to G.D. Societa per Azioni, Bologna, Italy

Filed Feb. 13, 1989, Ser. No. 309,433
Claims priority, application Italy, Feb. 25, 1988, 3344 A/88
Int. Cl.[5] B07C *5/02, 5/04*
U.S. Cl. 209—539 **13 Claims**





1. A selection device for sweet confections, comprising:

a feeder chute from which loose confections are dispensed to the device;

a central reception table, positioned below the outlet of the feeder chute, rotatable about a substantially vertical axis, and made to turn at a prescribed speed;

a stationary guide, positioned substantially in contact with a top surface of the central table and creating a voluted channel along which confections dispensed from the, chute are conveyed toward a peripheral exit area of the central table, thereby affording an exit from the table;

an orbital selection unit, comprising first conveyor means by which the loose confections departing form the peripheral exit area are accelerated along a first path, and said first conveyor means encircling the vertical axis externally of the central table, said selection unit also including second conveyor means, by which the confections are transported singly, spaced apart at equal distance one from the next along a second path substantially encircling the first path and coinciding therewith at a convergence zone where confections circulating on the first conveyor means are transferred centrifugally to the second conveyor means;

at least two stations comprising a selection station and a rejection station located in sequence along the path of the second conveyor means, at which regular confections are selected and substandard confections rejected, respectively;

gaging means located along the second path;

cam-profile ejection means, positioned at the selection station and serving to ensure the removal of regular confections from the second path by centrifugal force;

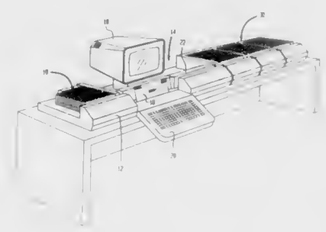
cam-profile ejection means positioned at the reject station, serving to ensure the removal of substandard confections from the second path by centrifugal force.

4,921,107

MAIL SORTATION SYSTEM

John A. Hofer, Ridgefield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 1, 1988, Ser. No. 214,696
Int. Cl.[5] B07C *5/00*
U.S. Cl. 209—546 **14 Claims**





1. A mail sorting system comprising:

(a) input means for input of information to a processor means;

(b) a display responsive to said processor means

(c) sortation means, responsive to said processor means, for sorting mail pieces; wherein,

(d) said processor means is responsive to said input means for:

(d1) controlling said display in response to first information pertaining to one of said mail pieces to display a set of those records in a predetermined data base, said set including at least one record which is consistent with said first information, said records containing sortation information;

(d2) responding to further information input by an operator in response to said displayed records to select one of said displayed records; and

(d3) outputting control signals to said sortation means to sort said one mail piece in accordance with said sortation information contained in said selected record.

4,921,108

APPARATUS FOR GELATIN COATING CAPLETS

Norbert I. Berta, Radnor, Pa., assignor to McNeilab, Inc., Spring House, Pa.

Continuation-in-part of Ser. No. 16,914, Feb. 25, 1987, Pat. No. 4,820,524. This application Dec. 4, 1987, Ser. No. 129,108
Int. Cl.[5] B07C *5/04, 5/12*
U.S. Cl. 209—625 **9 Claims**

1. A feeder device for inserting solid medicaments into a holding fixture during processing, comprising:

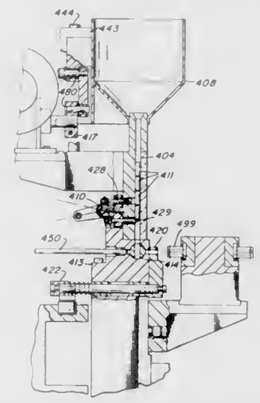
(a) hopper means for containing said solid medicaments and a plurality of partial pieces thereof;

(b) insertion means, for disposing at least said medicaments into said holding fixture, comprising:

(i) a loading bar housing disposed at an outlet and of a medicament channel;

(ii) plunger means slidably disposed within said loading bar housing for advancing said solid medicaments into said holding fixture;

(iii) a loading chamber rotatably mounted to said loading bar housing to provide a first position for receiving at least a one of said medicaments from said medicament channel to a second position axially aligned with said plunger means and said holding fixture; and



(iv) a guide bar disposed between said loading bar housing and said holding fixture, said guide bar having a bore therethrough for receiving at least said one of said solid medicaments and for guiding said medicament into said holding fixture;

(c) guide means having said medicament channel therethrough for directing at least said medicaments from said hopper means into said insertion means; and

(d) selection means for eliminating said partial pieces of said medicaments before said pieces can be disposed into said holding fixture.

4,921,109

CARD SORTING METHOD AND APPARATUS

Shigetsuyo Hasuo; Shigeru Kanazawa; Teruo Kenmochi, and Takamitsu Kadokura, all of Tokyo, Japan, assignors to Shibuya Computer Service Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 158,116
Claims priority, application Japan, May 7, 1985, 60-95365; Sep. 27, 1985, 60-212586
Int. Cl.[5] B07C *3/10*
U.S. Cl. 209—552 **2 Claims**

1. A card sorting method for sorting cards into a predetermined order based on characters or numerals borne by said cards, comprising the steps of:

(a) initially accommodating a plurality of cards to be arranged in one of plural card accommodating means (**101**, (**1**), (**2**);

(b) reading characters or numerals borne by cards selected to be delivered from one of said plural card accommodating means to a card holding means (**103**), (**5**);

(c) delivering a predetermined number of read cards to said card holding means from one of said plural card accommodating means;

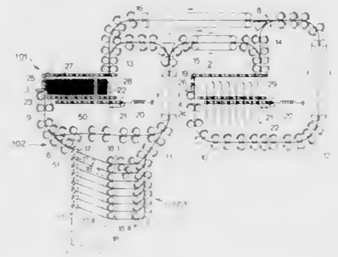
(d) comparing cards held in said card holding means with one another;

(e) delivering a card which meets a selecting condition

corresponding to said predetermined order in said card holding means to a receiving section (**28**, **29**) of one of said plural card accommodating means to empty one portion of said card holding means (**5**);

(f) replenishing said portion of said card holding means from which a card has been delivered to a said receiving section with a read card from said one of plural card accommodating means; and

(g) repeating steps (d) through (f) until all of said plurality of cards initially accommodated in one of said plural card



accommodating means have been read once and selected to be arranged in at least one of said plural card accommodating means, and said card holding means contains no cards;

(h) and thereafter, if more than one of the plurality of card accommodating means accommodate cards which are not arranged in said predetermined order then causing the merging of the plurality of arranged cards between said plurality of card accommodating means until all cards are arranged in the predetermined order in a single one of said card accommodating means.

4,921,110

DEVICE FOR EXTENDING AND RETRACTING A WARDROBE FROM AND INTO A FALSE CEILING

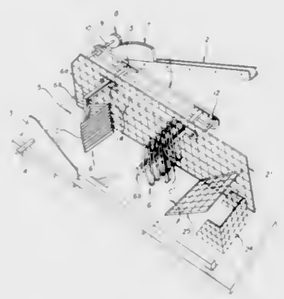
Michel Garcia, "Rabajou Bellevue"- Saint Marcel Saint Sylvestre, 47140 Pennes D'Agenais, France

Filed Jul. 28, 1988, Ser. No. 225,468

Claims priority, application France, Jul. 29, 1987, 87 10858

Int. Cl.[5] **A47F** *5/00*

U.S. Cl. 211—1.3 **10 Claims**



1. A device for extending a wardrobe from and retracting it into a false ceiling which comprises:

a panel, forming a false ceiling and pivoting about an axis between a horizontal closed position and a vertical open position;

a toothed sector fixed laterally and centered on said axis of said panel,

a first pinion and a second pinion fixed on a shaft mounted parallel to said axis, said shaft carried by a support fixed laterally to said panel in the vicinity of said axis, said first pinion engaging said toothed sector, said second pinion driving an endless chain passing over a third pinion, said chain being parallel to said panel and driving an arm, said arm carrying a clothes hanger device so that raising and lowering said panel is translated through said chain to raise and lower said arm.

4,921,111

DEVICE FOR DISPLAYING MERCHANDISE

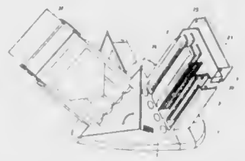
Hermann Hirsch, Klagenfurt, Austria, assignor to Hirsch Armbander Gesellschaft m.b.H., Klagenfurt, Austria

Filed Dec. 9, 1988, Ser. No. 282,254

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1988, 8808556[U]

Int. Cl.[5] **A47F** *7/00*

U.S. Cl. 211—13 **19 Claims**



1. Device for displaying merchandise, especially watchbands packaged into boxes (**3**), comprising at least two elongate carriers (**2**) having holding compartments (**15**) for the merchandise, the carriers (**2**) being affixed to a column (**4**) projecting upwardly from a base section (**1**), wherein the carriers (**2**) have a substantially rectangular portion at one end thereof and exhibit, on the other end thereof, a substantially triangular extension (7), at least one undercut rib (**9**, **10**) being arranged at this extension, this rib being inserted in a slot (**5**) at the upwardly projecting column (**4**) of the base section (**1**) whereby the triangular extension has one angular surface parallel to the column and another angular surface parallel to the base section, whereby the rectangular portion extends at an angle from said column and said base section.

4,921,112

MUG WITH INSERT FOR DISPENSING MEASURED QUANTITY

Sven-Eric Juhlin, Grindstugatan 3, S-134 00 Gustavsberg; Hakan Bergkvist, Beckombergavagen 72, S-161 53 Bromma; Astrid Norberg, Mariehemsvagen 119, S-902 36 UMEA, and Bengt Winblad, Tussmotevagen 120, S-122 41 Enskede, all of Sweden

PCT No. PCT/SE87/00164, § 371 Date Feb. 22, 1988, § 102(e) Date Feb. 22, 1988, PCT Pub. No. WO87/06457, PCT Pub. Date Nov. 5, 1987

PCT Filed Mar. 31, 1987, Ser. No. 138,906

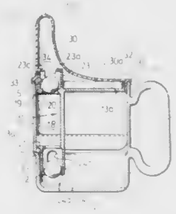
Claims priority, application Sweden, Apr. 21, 1986, 8601829

Int. Cl.[5] **A61J** *7/00*

U.S. Cl. 215—11.4 **11 Claims**

1. A substantially closed nursing mug having an upper end opening, said mug being of the kind comprising an upper discharge nipple (**31**), a liquid flow channel (**18**) extending from the bottom portion of the mug to said upper discharge nipple, and valve means (**11**, **12**) disposed in said liquid flow channel for controlling the discharge liquid flow, wherein said liquid flow channel is located adjacent to a side wall portion (**3***a*) of said mug and includes an elongated dosing chamber (**18**) extending along more than one-half of a longitudinal dimension of said side wall portion and being located on a same side

of said mug as said upper discharge nipple, the volume of said dosing chamber corresponding to a predetermined liquid volume to be drunk at a time, wherein said valve means includes upper and lower valves (**11**, **12**) at upper and lower ends, respectively, of said dosing chamber (**18**), said upper valve (**11**) being closed and said lower valve (**12**) being open when the



mug is in upright position, said lower valve (**12**) is adapted to automatically switch to a closing position when the mug is tilted beyond a first tilting angle v_2, and said upper valve (**11**) is adapted to automatically switch to an opening position when the mug is tilted beyond a second tilting angle (v_3) at least substantially equal to said first tilting angle (v_2).

4,921,113

SNAP CLOSURE WITH ORIGINAL SEAL SAFETY

Werner F. Dubach, Maur, Switzerland, assignor to Alfatechnic AG, Switzerland

Filed Dec. 22, 1988, Ser. No. 289,955

Claims priority, application Austria, Dec. 22, 1987, 3398/87

Int. Cl.[5] **B65D** *41/46*

U.S. Cl. 215—253 **5 Claims**



1. A snap closure with an original seal safety for containers, particularly for bottles with outwardly bulging rim areas, said snap closure comprising a circumferential wall (**13**) projecting around a circumference of said snap closure (**1**), said circumferential wall (**13**) having at least one annular area with a first snap projection (**3**) and a second snap projection (**2**) projecting inwardly in a protruding manner and a release element (**4**) pivotably attached to an exterior surface of said circumferential wall (**13**) and bounded laterally by break points (**5**, **6**) which extend from a free edge of said circumferential wall (**13**), both said break points (**5**, **6**) laterally bounding said release element (**4**) penetrating a lower annular area (**1***b*) with said first snap projection (**3**) in its entirety and an upper annular area (**1***a*) with said second snap projection (**2**) partially, said release element (**4**) having a pressing element (**9**) projecting generally vertically from said circumferential wall (**13**), said pressing element (**9**) pivotally connected to said circumferential wall (**13**) with a film hinge (**14**) beneath said upper annular area (**1***a*).

4,921,114

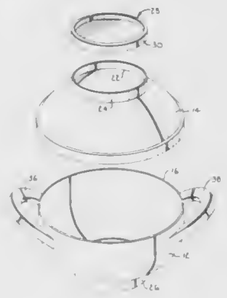
CHILD'S SNACK CARRIER

Brenda J. L. Rome, 1314 Cloud Cir., Garden City, Kans. 67846

Filed Nov. 18, 1988, Ser. No. 273,044

Int. Cl.[5] **B65D** *6/02, 41/62, 25/28*

U.S. Cl. 220—4 B **10 Claims**



1. A dispenser for material comprising:

a pair of oppositely oriented, dish shaped top and bottom members respectively each member having a peripheral rim, said members being releasably fastened together at their respective peripheral rims to conjointly present a hollow, generally globe shape defining an internal cavity;

there being an opening through said top member disposed in spaced apart relationship from the rim of said top member, said opening providing access to the cavity; and

a generally U-shaped handle secured to the dispenser and projecting outwardly from the globe shape defined by the members, said handle being oriented with the bight of the handle extending generally horizontally for convenient grasping of said bight to carry the dispenser in disposition hanging from the handle, said opening being spaced substantially above the lowermost region of said cavity when the dispenser is in said hanging disposition, whereby to minimize the possibility for spillage of said items from the cavity through the opening during carrying of the dispenser by the grasped handle bight with the dispenser in said hanging disposition.

4,921,115

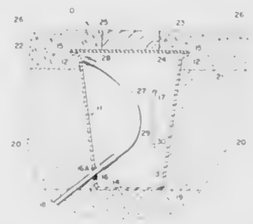
METHOD AND SYSTEM FOR SECONDARY CONTAINMENT

Grethel C. Fields, III, Jacksonville, Fla., assignor to Ray Treadwell Contractors, Inc., Jacksonville, Fla.

Continuation of Ser. No. 182,342, Apr. 18, 1988, abandoned. This application Sep. 20, 1989, Ser. No. 410,027

Int. Cl.[5] **B65D** *88/76*

U.S. Cl. 220—18 **21 Claims**



1. A system for providing leak containment for petroleum dispensing apparatus mounted to a foundation slab having an

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upper surface comprising an elongated rigid container having an open top portion positioned within said foundation slab and beneath said dispensing apparatus, said open top portion being spaced downwardly from said upper surface a predetermined distance said container having at least one vertical side wall contiguous with said top portion and an oppositely disposed bottom portion integral with said side wall, said top portion having a generally horizontal outwardly extending flange for securing said container to said foundation slab said flange being entirely embedded in said foundation slab and being spaced downwardly from said upper surface.

11. A method for providing leak containment for petroleum dispensing apparatus mounted on a concrete slab foundation and having a petroleum inlet supply conduit comprising the steps of:

A. positioning a rigid petroleum impervious container having a flange at its upper end beneath the dispensing apparatus;

B. sealing the inlet supply conduit to and through a side wall of the container;

C. embedding the flange of the container generally medially of the thickness of the concrete slab foundation.

20. A method for providing leak containment for petroleum dispensing apparatus mounted on a slab foundation which overlies a soil foundation and having a petroleum inlet conduit therethrough comprising the steps of:

A. excavating a portion of the soil foundation adjacent to the dispensing apparatus;

B. disconnecting the petroleum inlet conduit from the dispensing apparatus;

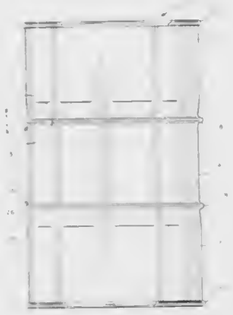
C. positioning a petroleum impervious container beneath the dispensing apparatus

D. sealing the inlet supply conduit to and through a wall of the container;

E. connecting the petroleum inlet conduit to the dispensing apparatus; and

F. refilling the excavated portion of the soil foundation.

4,921,116
STEEL DRUM
Thomas D. Troughton, Richmond, and Robert D. Irwin, San Rafael, both of Calif., assignors to Pacific Rim Packaging Corporation, Richmond, Calif.
Filed Sep. 13, 1988, Ser. No. 243,854
Int. Cl.[5] B65D *3/04*
U.S. Cl. 220—72 — 7 Claims



1. A metallic drum having an annular middle drum section having a first diameter, an expanded annular top drum section having a second diameter that is larger than said first diameter, an expanded annular bottom drum section having a third diameter that is larger than said first diameter, a first and a second annular rolling hoop for providing drum rigidity and resistance to implosion, wherein said first rolling hoop joins said top drum section to said middle drum section, and said second rolling hoop joins said bottom drum section to said middle drum section, each said rolling hoop having a gripping surface that extends outwardly from the middle drum section to facilitate handling of the drum, the maximum diameter of the gripping surface of said first rolling hoop being larger than said second diameter and the maximum diameter of the gripping surface of said second rolling hoop being larger than said third diameter.

7. A method of fabricating a steel drum comprising the steps of:

rolling a steel sheet into a tubular configuration and welding the sheet to form a cylinder having a uniform first diameter, a first open end and a second open end;

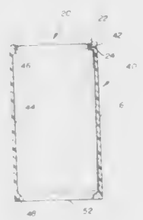
expanding a top portion of the drum adjacent the first open end to create a top drum section having a second diameter that is greater than said first diameter;

expanding a bottom portion of the drum adjacent the second open end to create a bottom drum section having a third diameter that is greater than said first diameter, wherein the region between said top and bottom drum portions forms a middle drum section having a diameter equal to said first diameter;

expanding the boundary between said top and middle drum sections to form a first rolling hoop;

expanding the boundary between said bottom and middle drum sections to form a second rolling hoop.

4,921,117
POP-ART TUMBLER
Domenick Mucciarone, 3645 Boca Ciega Dr., Apt. 206, Naples, Fla. 33962
Filed May 20, 1988, Ser. No. 196,608
Int. Cl.[5] B65D *23/00*
U.S. Cl. 220—65 H — 16 Claims



1. A rigid, unbreakable tumbler having a glass-like feel comprising a cylindrical aluminum can snugly enclosed within a reuseable thin, plastic sleeve,

said can being completely open at the top end and closed at the bottom end and having a cylindrical side wall having a top end exterior bead of greater diameter than the exterior wall neck space immediately below said bead,

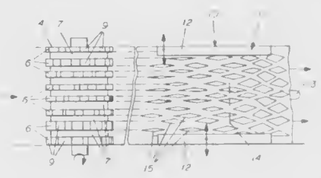
said sleeve comprising a cylindrical thin plastic side wall open at the top and bottom ends and having an interior sleeve spacer at the top end of the inner wall,

the exterior diameter of said can wall and the interior diameter of said sleeve wall being about equal,

the height of said can being slightly greater than said sleeve,

whereby said can is snugly secured skin-tight within said sleeve by pushing said can upward into said sleeve thereby locking said interior sleeve spacer at the top.

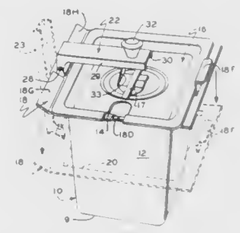
4,921,118
MANUFACTURE OF FILLING MATERIAL
Helmut G. Gass, Grand Cayman, Cayman Islands, assignor to Courtney P. Grover, III, Houston, Tex.
Filed Mar. 30, 1988, Ser. No. 175,273
Claims priority, application Austria, Sep. 4, 1987, 2244/87
Int. Cl.[5] B65D *87/48*
U.S. Cl. 220—88 A — 2 Claims



1. An explosion proof hollow container for holding combustible fluids, and having an improved filling material for use in charging a hollow internal space of the container, comprising:

(a) a plurality of individual filling pieces for charging 9 hollow interior, each formed of a latticed stretched network comprised of a sheet of metallic material having multiple openings therein arranged to form an array of openings, each opening being generally rhombic in shape and the openings being of different sizes spaced over the array.

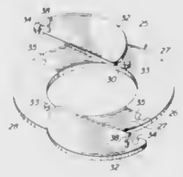
4,921,119
FOOD WARMER AND LIFTING FRAME
Eugine W. Goad, Dayton, and John V. Drube, Minneapolis, both of Minn., assignors to Industrial Design & Engineering Associates, Rogers, Minn.
Filed May 18, 1989, Ser. No. 353,782
Int. Cl.[5] B65D *25/22*
U.S. Cl. 220—212 — 18 Claims



1. The combination of a food warmer and lifting frame comprising, a food warming vessel including side and bottom walls and an upper open wide mouth having a rim thereabout, a ring-shaped lifting frame element encircling the food warming vessel and having a central opening adapted to receive the food warming vessel by inserting the vessel into the central opening from above so that the rim rests on the lifting frame and the vessel is free to move upwardly out of the lifting frame but not downwardly, said lifting frame including portions extending peripherally beyond the free edge of the rim such that the lifting frame is exposed and thereby adapted to be grasped manually for lifting the vessel by supporting the vessel from the rim.

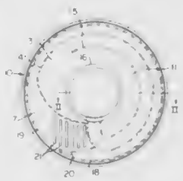
16. A food warming vessel including side and bottom walls and an upper open wide mouth having a rim therearound, a cover for the vessel, a cover support handle arm having outer and inner ends, said outer end being mounted for pivotal movement relative to the food warming vessel adjacent the mouth thereof enabling the cover to be moved from a closed position sealing the vessel to an open position wherein the cover is separated from the vessel, the arm comprises an extrusion having a horizontally disposed center portion, a downwardly extending outer end portion located above the rim and said downwardly extending portion of the arm terminates in a centrally and upwardly directed hook portion having a horizontally disposed transversely extending upwardly opening pivot receiving slot therein for mounting the arm for said pivotal movement.

4,921,120
DEBRIS CAP
Gregory J. Mizioch, 12801 N. 2nd St., Phoenix, Ariz. 85022
Filed Apr. 10, 1989, Ser. No. 335,297
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—254 — 7 Claims



1. A cap for covering an opening in a first structure access to which is restricted by a second structure having an opening therein which is smaller than the opening in the first structure, said cap comprising a segmented ring, the segments of which are separable and insertable through the opening in said second structure, said ring segments when arranged in contiguous relationship providing an opening at their inner edges and having outer edges of dimensions at least as large as the opening to be covered, a locking member pivotally mounted on each of said ring segments and a strike on each of said ring segments, each locking member being moveable between first and second positions, when each locking member is in a first position a portion thereof overlies an adjacent ring segment and engages the strike carried by the adjacent segment to lock adjoining ring segments together, said locking members when in their first position substantially covering the opening in said ring, each said locking member when in its second position being separated from the strike on the adjacent ring segment to at least partially uncover the opening in said ring and to permit separation of said ring segments.

4,921,121
END CLOSURE FOR A PACKAGING CONTAINER
Patrik Duvander, Lund, and Kent Johansson, Marieholm, both of Sweden, assignors to AB Akerlund & Rausing, Sweden
Filed Feb. 10, 1989, Ser. No. 309,254
Claims priority, application Sweden, Feb. 16, 1988, 8800512
Int. Cl.[5] B65D *41/50*
U.S. Cl. 220—270 — 11 Claims



1. An end closure for a packaging container comprising: at least an outer layer and an inner layer, said outer layer having

a circumferential rim defining an outer periphery of said end closure, and an easy opening device integrally attached thereto, said rim and said easy opening device being joined in the proximity of at least a first circumferential tearing denotation spaced inwardly from said rim, said easy opening device having a first tearing strip defined by said first circumferential tearing denotation, a second circumferential tearing denotation spaced inwardly from said first circumferential tearing denotation, and an intermediate tearing denotation joining said first and said second circumferential tearing denotations, said first tearing strip further defining a first grip, and said easy opening device having a second tearing strip defined by said second circumferential tearing denotation and a substantially semicircular tearing denotation spaced inwardly from said second circumferential tearing denotation, said second circumferential tearing denotation and said substantially semicircular tearing denotation being attached to a second grip, and wherein said inner and said outer layers are attached at a joint at least at both sides of said first circumferential tearing denotation, said joint between said outer and said inner layer being stronger than the tearing strength of said inner layer.

4,921,122

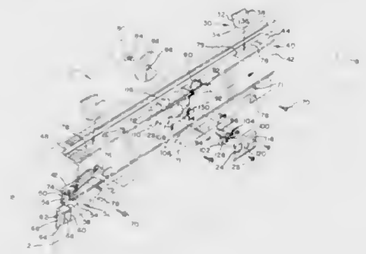
SLIDE BAR LOCKING ARRANGEMENT

Marvin Bornstein, Northbrook; Corney J. Ewert, Oak Park; John D. Saenger, Wood Dale, and Vincent Reyes, Roselle, all of Ill., assignors to Metal Box Corporation, Franklin Park, Ill.

Continuation of Ser. No. 222,176, Jul. 21, 1988, abandoned. This application Nov. 16, 1989, Ser. No. 436,110

Int. Cl.[5] **A45C** *11/00*

U.S. Cl. 220—326 **6 Claims**



1. A slide bar locking arrangement for a storage receptacle having a lid, said slide bar locking arrangement including at least one hook member mounted on and extending from an underside of said lid, an elongated mounting bracket secured to an inner wall of said receptacle, a slide bar slidably supported by said mounting bracket and having a base portion disposed in spaced, parallel relation to said inner wall, a first side wall extending from one edge of said base portion, a second side wall extending from a second edge of said base portion, said side walls being spaced from and parallel to one another, and one of said sidewalls contacting said mounting bracket for sliding thereagainst, said side wall and said base portion forming a generally C-shaped configuration with said base portion being spaced from the inner wall of the receptacle, said slide bar being operable between a first position preventing said lid from opening and a second position allowing said lid to open, said first side wall of said slide bar having at least one aperture sized and positioned to receive said hook member when said slide bar is in said second position and to secure said hook member within said aperture when said slide bar is in said first position, biasing means connected between said slide bar and said storage receptacle to urge said slide bar into said first position, means located externally of said storage receptacle and attached to said slide bar for selectively moving said slide bar from said first position to said second position against the force of said biasing means, whereby said slide bar is normally biased to assume said first position wherein said aperture and said hook member are positioned slightly out of alignment so as to prevent passage of said hook member through said aperture and whereby, upon closure of said lid, said hook member contacts an edge of said aperture resulting in a camming force which urges said slide bar to overcome the force of said biasing means and move from said first position to said second position allowing said hook member to pass through said aperture, at which point said biasing means then returns said slide bar to its first position to secure said lid to said receptacle.

4,921,123

DEBRIS CAP

Gregory J. Mizioch, 12801 N. 2nd St., Phoenix, Ariz. 85022

Filed Apr. 10, 1989, Ser. No. 335,296

Int. Cl.[5] **B65D** *45/28*

U.S. Cl. 220—323 **4 Claims**



1. A debris cap comprising a hollow member having a cylindrical outer surface, a closure for one end of the member, a plurality of resilient pads projecting from the outer surface of said member, a slide having inner and outer ends mounted for reciprocal radial movement in said member, said slide carrying a resilient pad at its outer end, a cam mounted on said closure inside said hollow member for rotation with respect to the hollow member, said cam being engageable with the inner end of said slide for moving said slide, said cam having a low angle of advance whereby external forces applied to the slide do not cause rotation of the cam, and a handle for manipulating said cam.

4,921,124

PRESSURE COMPENSATING ELEMENT FOR ELECTRONIC DEVICE ENCLOSURE

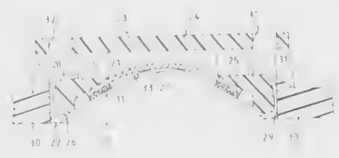
Kurt Stammler, Anderson, S.C., and Lothar Ruttkowski, Ludwigsburg, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,542

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817227

Int. Cl.[5] **B65D** *51/16*

U.S. Cl. 220—367 **5 Claims**



1. Pressure equalizing element, for an electronic device enclosure, having a water-tight but air-transmissive region (21) which communicates with both an interior airspace of said enclosure and ambient airspace,

wherein, in accordance with the invention,

said region (21) has a bowed shape which facilitates runoff of any water contained in said ambient air.

4,921,125

SUPPORT ASSEMBLY

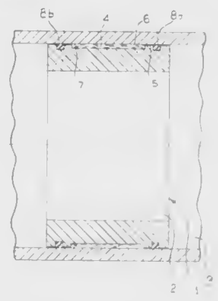
Christopher Scales, Stroud, England, assignor to Dowty Fuel Systems Limited, England

Filed Feb. 25, 1987, Ser. No. 18,613

Claims priority, application United Kingdom, Feb. 27, 1986, 8604841

Int. Cl.[5] **B65D** *25/02, 25/18*

U.S. Cl. 220—426 **8 Claims**



1. A vessel for resisting an inwardly acting pressure differential, including a support assembly comprising a support member in the form of a rigid annular ring detachably housed within the vessel and having a groove formed in an outer surface thereof which together with the inner surface of the vessel defines an annular enclosed and stationary chamber, said chamber being filled with pressurizing means for pressurizing the chamber when an inwardly acting pressure differential is applied against the exterior of the vessel and defining a non-circulating liquid, said chamber having a seal means which maintains the liquid within said chamber when in use, wherein the inwardly acting pressure differential causes the liquid in said chamber to be pressurized and to exert a back pressure on the vessel wall in the vicinity of said chamber whereby the support assembly supports the vessel from collapse by the inwardly acting pressure differential.

4,921,126

LIQUID SUPPLY SYSTEM UTILIZING STACKED TANKS

David L. Waltke, and Larry D. Thomas, both of Beatrice, Nebr., assignors to Hoover Group, Inc., Alpharetta, Ga.

Filed Apr. 14, 1989, Ser. No. 338,195

Int. Cl.[5] **B65D** *25/00*

U.S. Cl. 220—855 **8 Claims**

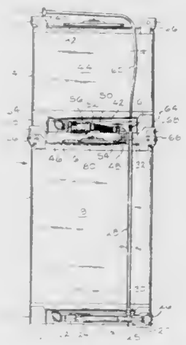
1. A continuous liquid supply system comprising:

a lower liquid supply tank having top and bottom walls, a side wall connecting said top wall and said bottom wall, and a bottom discharge outlet in said bottom wall for flow of liquid from said lower tank therethrough;

an upper liquid transport tank removably mounted on said lower supply tank;

transfer means removably connecting said upper and lower tanks for transferring liquid from said upper transport tank to said lower supply tank; and

vapor return means connected between said lower tank and said upper tank for routing vapors between said tanks as liquid is transferred from said upper tank to said lower tank whereby said upper tank may be installed and removed from said lower tank without interrupting the flow of liquid from said lower tank, said upper tank being used



to replenish the contents of said lower tank as the lower tank liquid contents are depleted.

4,921,127

DISPENSER FOR A STACK OF NOTE PAPER

David C. Windorski, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 29,172, Mar. 23, 1987, Pat. No. 4,796,781. This application Jun. 3, 1988, Ser. No. 202,138

Int. Cl.[5] **B65H** *1/00*

U.S. Cl. 221—45 **4 Claims**



1. A dispenser for sheets of note paper disposed in a stack having upper and lower surfaces with each of said sheets having a narrow band of adhesive coated on one surface along one edge by which the sheets are adhered together and with the sheets being stacked with the band of adhesive of adjacent sheets at alternate opposite edges of the stack, said dispenser comprising:

a base part having a bottom surface adapted to be supported on a horizontal support surface and a top surface comprising a generally planar support surface portion adapted to support the lower surface of the stack;

a body part having a top surface, and a bottom surface including spaced pressure surface portions adapted to engage and be supported on the upper surface of the stack adjacent the edges of the sheets along which the narrow bands of adhesive are coated with the spaced pressure surface portions engaging the upper surface of the sheets at predetermined distances from the edges of the sheets along which the narrow bands of adhesive are coated, and convex arcuate surface portions between said pressure surface portions and said top surface defining a slot through and extending centrally across said body part, said convex arcuate surface portions having radii with a dimension as least as large as said predetermined distances to restrict curling of sheets of paper pulled from the dispenser through the slot, said body part having sufficient weight to afford pulling a sheet from the stack through the

slot without substantially lifting the body part from the stack;

means for positioning said body part above said base part comprising said body part having a periphery disposed at generally a right angle to said support surface portion, and said base part having a peripheral wall adapted to project along said periphery with the stack between said parts; and

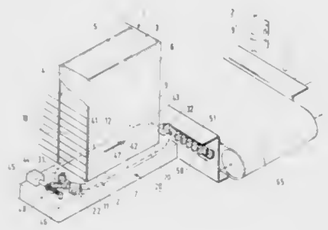
means for locating the stack with the edges of the sheets along which the narrow bands of adhesive are coated generally parallel to said arcuate surface portions and with said slot extending generally transversely across the stack centrally between those edges comprising said peripheral wall having rectangular disposed portions adapted to receive the sides of the stack in close fitting relationship, and said periphery being rectangular, with the orientation provided by said rectangular periphery and said peripheral wall locating the stack.

4,921,128

LINEAR MAGAZINE FOR STORING AND AUTOMATICALLY DISPENSING OBJECTS

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France, and Franck Guigan, 100, rue Saint Dominique, 75007 Paris, France

Filed Oct. 24, 1988, Ser. No. 261,291
Claims priority, application France, Oct. 30, 1987, 87 15078
Int. Cl.[5] B65G *59/06, 47/00*
U.S. Cl. 221—75 **7 Claims**



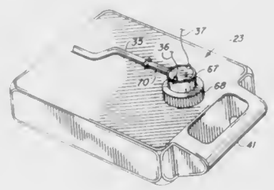
1. A magazine for storing and automatically dispensing packaged objects, the magazine comprising a plurality of juxtaposed bins constituting a linear structure which is generally rectangular in shape, each bin having a horizontal surface and being intended to store a plurality of objects, each bin having an evacuation opening in a front face suitable for passing out a single packaged object, each bin including an ejector cartridge in said horizontal surface thereof, said cartridge serving to eject one packaged object at a time from the bin, said cartridge comprising firstly a chain of links situated substantially in a horizontal plane, at least one of said links including at least one means suitable for ejecting said object through said evacuation opening when said chain is set in motion, and secondly ejection control means for meshing said chain with a cog belt situated parallel to the front face of said linear structure level with the ejector cartridges and operatively coupled with means for constantly driving said cog belt in translation, and wherein said cog belt solely provides the movement of the chain once engagement of the linked chain with said cog belt is effected by said ejection control means, and a conveyor positioned parallel to said structure for removing said ejected object.

4,921,129

LIQUID DISPENSING MODULE

K. Tom Jones, Chandler, and Richard J. Caldwell, Scottsdale, both of Ariz., assignors to Pacific BioSystems, Inc., Phoenix, Ariz.

Filed Jul. 11, 1988, Ser. No. 217,303
Int. Cl.[5] B67D *5/06*
U.S. Cl. 222—23 **21 Claims**



1. A system for dispensing liquid from a disposable liquid dispensing module to equipment having apparatus for withdrawing liquid from such module, the system including in combination:

a hollow container for holding liquid to be dispensed;

liquid level sending means permanently mounted in said container for sensing when the level of liquid in said container is less than a predetermined minimum threshold;

a liquid withdrawal opening for connection to apparatus for withdrawing liquid;

indicator coupling means attached to said sensing means;

removable plug means;

a liquid withdrawal pipe and at least one indicator connector means mechanically mounted together in said removable plug means having dimensions such that when said plug means is interconnected with said hollow container, said pipe extends through the liquid withdrawal opening in said container, and said indicator connector means is releasably interconnected with said indicator coupling means; and

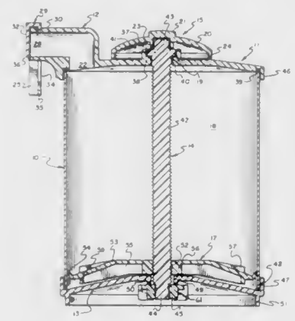
means for closing said withdrawal opening during shipping and storage of such container.

4,921,130

VISCOUS MATERIAL DISPENSING APPARATUS

Virginia R. Hollberg, 1169 Yale Ave., Salt Lake City, Utah 84105

Filed Dec. 5, 1988, Ser. No. 279,996
Int. Cl.[5] B67D *5/22*
U.S. Cl. 222—46 **26 Claims**



1. An apparatus for dispensing viscous materials from a container having open upper and lower ends, said apparatus comprising:

threads shafted means centrally locatable in said container having a lugged washer shaped upper end and a threaded lower end;

top cover means fittable over the open upper container end in a sealing relationship said top cover means containing a discharge opening adjacent the periphery thereof and a central opening through which said threaded shaft means may be inserted up to said lugged washer shaped upper end;

bottom cover means fittable over the open lower container end in fixed relationship said bottom cover means containing a central opening through which the lower end of said threaded shaft means may be inserted;

piston means having a central threaded opening which is threadably engageable to said threaded shaft and locatable between said top and bottom cover means and adapted to move upwardly along said shaft in response to the rotation of said shaft such that the volume of said viscous material in said container will be decreased when said apparatus is assembled on said container and said piston moves upwardly, said piston being sized such that the perimeter thereof will sealingly engage the interior surfaces of said container as said piston moves along said shaft;

attachment means securable to said threaded lower end of said shaft means to fixedly secure said top and bottom covers to said top and bottom edges of said container and freely rotatable against the bottom surface of said bottom cover when said shaft is rotated;

a rotatable dial attachable to said lugged washer shaped end of said shaft means, the rotation of which causes said shaft to rotate and the piston means to move upwardly along said shaft and dispense viscous material through said discharge opening,

said top cover containing a spout mounted over said dispensing opening for directing the flow of viscous material, said spout forming a spout opening therein, and

a cap means attached to said spout, said cap means comprising a flat face piece having side surfaces, and a generally U-shaped attachment member attached to said extending around a substantial portion of said side surfaces, said attachment member being slidable in a linear direction from an open position wherein the flat face piece is positioned away from the spout opening to allow the material to exit the spout opening, to a closed position wherein the flat piece is positioned to cover the spout opening to prevent material from exiting the spout opening.

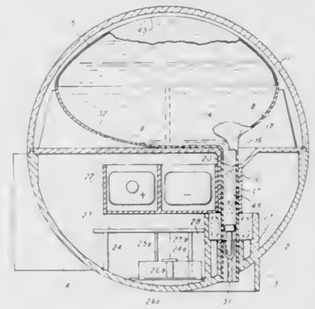
4,921,131

LIQUID DISPENSER

Horst Binderbauer, and Michl Binderbauer, both of 7431 Baxtersbire, Dallas, Tex. 75230

Filed Jul. 27, 1988, Ser. No. 224,666
Int. Cl.[5] B67D *5/08, 3/00;* **G04C** *5/08*
U.S. Cl. 222—52 **3[illegible] Claims**

26. A container adapted for inclusion within a dispenser, said container comprising a fluid containing bag having upper and lower portions, said bag having a major part thereof of reversibly deformable material adapted to deform inwardly as fluid is drained from said container thereby preventing entry of air thereinto to replace drained fluid, an essentially non-deformable tubular extension integrally joined to said fluid container adapted to conduct fluid outwardly from said container, said tubular extension having mounted therein a magnetically actuable single-seated valve member selectively conditionable



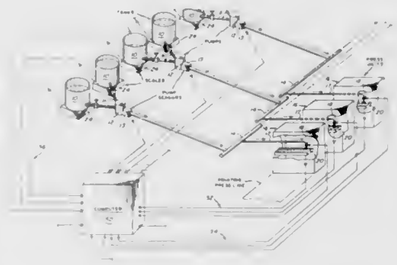
between open and closed conditions, thereby to permit or prevent flow of fluid from said container.

4,921,132

INK MOTOR SYSTEM

R. Langdon Wales, Lincoln, and H. W. Crowley, Newton, both of Mass., assignors to Automation, Inc., Needham, Mass.

Continuation of Ser. No. 792,745, Oct. 30, 1985, Pat. No. 4,796,782. This application Jul. 20, 1988, Ser. No. 221,711
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—57 **22 Claims**



1. A system for monitoring ink flow from an ink storage tank to at least one ink fountain of a high-speed web-fed printing press, said system comprising;

a scale means for measuring the weight of the ink storage tank with stored ink and providing a continuous signal representative of measured weight,

a pump means associated with the storage tank for pumping the ink to the fountain and including coupling lines to the fountain,

ink level sensor means for detecting the level of ink in the fountain and providing an ink demand signal when the level of ink in the fountain falls below a predetermined level,

valve means in the ink coupling line for controlling ink flow to the fountain,

control means responsive to said demand signal for operating said valve means to cause ink flow to the fountain,

means for comparing weight signals from said scale means at successive times to determine the weight of ink consumed over the interval between readings,

means for measuring volume flow in the ink coupling line, a plurality of fountains to which ink is coupled from the

pump means, said means for measuring volume flow includes the pump stroke position sensor and means for determining from the sensor and the tank scale, incremental weight delivery per stroke.

4,921,133

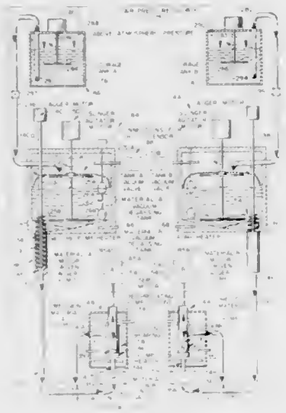
METHOD AND APPARATUS FOR PRECISION PUMPING, RATIOING AND DISPENSING OF WORK FLUIDS

John O. Roeser, Carpentersville, Ill., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 118,330, Nov. 6, 1987, abandoned. This application Aug. 24, 1989, Ser. No. 399,395

Int. Cl.[5] B67D *5/26*

U.S. Cl. 222—63 12 Claims



1. High precision versatile apparatus for positive displacement dispensing of a first work liquid from source means for said first work liquid comprising frame means, pump means having cylinder means and piston means, said cylinder means having inlet means connectable to said source means and outlet means separate from said inlet means, said piston means and said cylinder means being mounted for relative movement to each other to cause positive displacement of said first work liquid receivable from said source means entering through said inlet means and out through said outlet means, one of said cylinder means and said piston means being fixed relative to said frame means and the other being mounted for movement relative to said frame means from a first stop position to a second stop position and a third stop position, motion control means mounted on said frame means for said piston means and said cylinder means to control the relative motion and the relative positions each to the other between said piston means and said cylinder means and thereby the output of work liquid through said outlet means, said motion control means being characterized as being operable to cause said relative movement to:

(a) start and move from said first stop position to said second stop position and thereby displace a first precise portion of said first work liquid through said outlet means,

(b) start and move from said second stop position to said third stop position and thereby displace a second precise portion of said first work liquid through said out let means,

(c) start and move from said first position to said third position without stopping at said second position and thereby displace said first and second precise portions of said first work liquid through said outlet means,

(d) start and move from said second stop position to said first stop position,

(e) start and move from said third stop position to said first stop position without stopping at said second stop position; and operator selective adjustable means for controlling said motion control means characterized as being operable to cause said motion control means to move between said first and second, first and third positions and second and third positions in any repeatable or variable selected sequence, at any repeatable or variable selected time or condition dependent interval between such movements, and at a selected constant or variable relative velocity movement whereby versatile positive displacement precision dispensing of said first work liquid receivable from said source means is provided.

4,921,134

CIRCUIT ARRANGEMENT FOR REGULATING THE FILLING AND REFILLING OF CONTAINERS WITH LIQUIDS

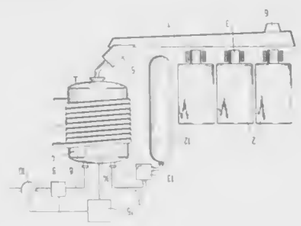
Matthias Aschberger; Karlheinz Färber, both of Giengen, and Anton Deininger, Bachhagel, all of Fed. Rep. of Germany, assignors to The Coca-Cola Company, Atlanta, Ga. and Bosch-Siemens Hausgerate GmbH, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,362

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430934

Int. Cl.[5] B67D *5/08*

U.S. Cl. 222—64 10 Claims



1. A system for supplying water to a carbonator tank, said carbonator tank in operation having a gaseous head space of a variable volume above the level of water in said tank, comprising:

(a) single liquid level sensor means for sensing when the level of water falls below a first predetermined level and generating a water demand signal;

(b) supply means energized by said water demand signal for supplying water to said carbonator tank;

(c) control circuit means enabled by said water demand signal for generating control signals which maintain said supply means energized while said liquid level sensor means are generating said water demand signal to permit the water level in the tank to rise to said first predetermined level; and

(d) timer means included in said control circuit means for generating a further control signal subsequent to the end of said water demand signal, whereby said further control signal maintains said supply means energized for a period of time sufficient to permit the water level in the tank to rise to a second predetermined level above said first predetermined level;

whereby said period to time is selected so that short cycling is substantially eliminated and the volume of said head space and pressure within said tank is maintained substantially constant.

4,921,135

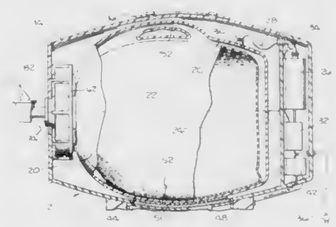
PRESSURIZED BEVERAGE CONTAINER DISPENSING SYSTEM

Lawrence Pleet, No. 9 Flintlock La., Bell Canyon, Calif. 91307

Filed Mar. 3, 1989, Ser. No. 318,596

Int. Cl.[5] B67B *7/24*

U.S. Cl. 222—82 19 Claims



15. A pressurized beverage unit comprising:

an outer housing;

a flexible bag containing a potable liquid, such as beer or a carbonated beverage, requiring pressurization;

means, including a closed container capable of withstanding substantial pressure, for enclosing said flexible bag;

means for supplying pressurized gas into said plastic container;

means for dispensing said potable liquid from said flexible bag;

means for cooling the potable liquid in said bag; and

said closed container having an opening at least 2 inches in diameter and a first set of threads extending around said opening; a cap making threaded engagement with said first set of threads; and a threaded perforatable closure plug mounted in a central threaded opening in said cap.

4,921,136

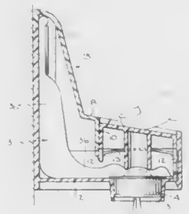
FIXTURE FOR BAG-TYPE LIQUID DISPENSER

Stanley L. Roggenburg, Jr., Staten Island, N.Y., assignor to Inopak Ltd., Mahwah, N.J.

Filed Nov. 29, 1988, Ser. No. 277,229

Int. Cl.[5] B65D *35/28*

U.S. Cl. 222—95 6 Claims



1. A wall fixture containing a liquid dispenser, the fixture comprising a bracket having an upstanding plate from the bottom of which a shelf having a nozzle hole extends forwardly and a removable cover in front of the plate and shelf, the dispenser comprising a flexible bag having front and back walls and containing the liquid and having an upstanding main portion upright in front of the plate and a dispensing portion folded forwardly on the shelf and having a dispensing valve having a dispensing nozzle extending downwardly through said nozzle hole, the valve having an upstanding operator actuated by downward pressure, the cover having a forwardly extending portion covering the bag's forwardly folded dispensing portion and an opening formed in this forwardly extending portion above said actuator, and a push button in said opening for applying downward pressure on said actuator; wherein the improvement comprises the cover having a guideway extending downwardly from said opening and in which the push button moves up and down on said actuator, the cover having springs biasing the push button upwardly and the push button having depending fingers with bottom hooks engaging the bottom of said guideway and holding the push button against the bias of said springs in which said guideway is formed by a short tube having a cross section slidingly fitted by the button and said fingers, the fingers being elastically biased outwardly and their bottom hooks having angular surfaces which wedge the fingers inwardly when the button is pushed downwardly into the guideway with the bottom hooks of the fingers hooking on the bottom of the guideway and holding the button against the upward bias of said springs.

4,921,137

DISPENSING CONTAINER FOR A LIQUID OR PASTE-LIKE SUBSTANCE

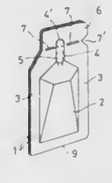
Berend Heijenga, Almelo, Netherlands, assignor to HSM, Almelo, Netherlands

Filed Jul. 5, 1988, Ser. No. 215,290

Claims priority, application Netherlands, Jul. 17, 1987, 8701700

Int. Cl.[5] B65D *35/14*

U.S. Cl. 222—107 12 Claims



1. A dispensing container for a liquid or paste-like substance, comprising:

two superimposed sheets of foil material, interconnected by means of a liquid-tight heat-sealed connecting seam, peripherally enclosing between said sheets a filling space, the interior of said filling space containing a liquid or paste-like substance, said sheets being extended beyond said filling space to form a handle portion;

a channel pre-formed between said superposed sheets extending outwardly from said filling space into said handle portion;

a tube in said preformed channel, said tube being open at both ends, having its inner open end in fluid communication with said filling space forming an outflow opening for said filling space, said tube being heat-sealed at its periphery to said sheets in said channel in a liquid-tight manner to prevent outflow of said substance from said filling space through said channel outside said tube;

at least a portion of said extended sheet portions being adapted to be easily separated in order to uncover the outer open end of said tube so as to allow dispensing of the contents of said filling space;

said pre-formed channel extending a substantial distance beyond the outer open end of said tube end into said handle portion, said heat seal connecting said tube to said two sheets and said heat seal connecting said two sheets of foil material being located sufficiently remote from the outer open end of said tube such that the bore of said tube is not closed by melting;

said tube being made of a rigid pressure-elastic heat sealable plastics material which is resistant to the pressures and temperatures used when connecting said tube to said

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sheets of foil material in said liquid-tight manner, said tube being then deformed only to a slightly unround shape;

a tear line formed in said handle portion for gaining access to said tube to permit discharge of the contents of the container through said tube, said tear line being situated slightly beyond the outer open end of said tube and extending in a direction which passes through said portion of said preformed channel which extends beyond the outer open end of said tube;

the diameter of the bore of said tube depending on the viscosity and the surface tension of the contents of the container in respect of the tube material being, on the one hand, so small that said contents in the closed condition of the container will be kept by the surface tension outside the bore of said tube, and, on the other hand, the diameter of said tube being so large that no capillary effect occurs which would enhance the penetration of the contents of the container therein, whereby the contents of the container will not penetrate into the tube so that during opening, the contents will not splash outwards.

4,921,138

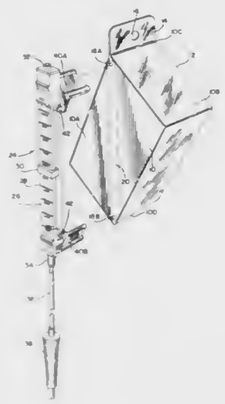
DEVICE FOR ADMINISTRATION OF ENTERAL FLUIDS FROM PRE-FILLED SHAPE RETENTIVE CONTAINERS

David G. Quinn, Grayslake; Robert B. Edwards, II, Libertyville, and Erik Andersen, Vernon Hills, all of Ill., assignors to Corpak, Inc., Wheeling, Ill.

Continuation-in-part of Ser. No. 144,526, Nov. 15, 1988, abandoned. This application Jul. 29, 1988, Ser. No. 226,380

Int. Cl.[5] **B67B** *7/24*

U.S. Cl. 222—85 **23 Claims**



1. A device for aseptic dispensing of therapeutic fluids from a shape retentive container having a plurality of corners, two opposing face panels and a plurality of side panels, comprising:

distensible and formable hanger means for suspending the container in such an orientation to define one uppermost corner and one lowermost corner, the hanger means being wrapped and formed around only the side panels of the container;

means for dispensing therapeutic fluid from the container, said dispensing means having at least an uppermost spike for penetrating the container near the uppermost corner and a lowermost spike for penetrating the container near the lowermost corner, said spikes each having an axial bore being in fluid communication through an enclosed passage in the dispensing means, the uppermost spike venting ambient air into the container through an upper end of the passage, the lowermost spike dispensing fluid out of the container through a lower end of the passage; and,

one corner member for attachment to only the uppermost corner of the container, an other corner member detached from the one corner member, the other corner member for attachment to only the lowermost corner of the container, each of said corner members being carried on the means for dispensing therapeutic fluid, the uppermost spike passing through the one corner member, the lowermost spike passing through the other corner member.

4,921,139

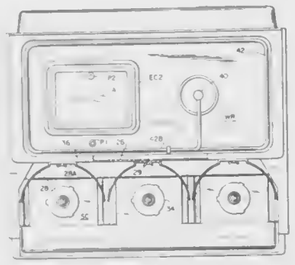
REFRIGERATION SYSTEM FOR A BEVERAGE DISPENSER

Wolfgang Fischer, Stone Mountain, Ga.; Richard T. Kennedy, Palos Heights, Ill., and Ronald L. Wiley, Marietta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 22, 1984, Ser. No. 663,134

Int. Cl.[5] **B67D** *5/56*

U.S. Cl. 222—129.1 **8 Claims**



1. A beverage dispenser apparatus which mixes selected flavor concentrates and water together to produce post-mix beverages of desired flavors comprising:

at least one container having flavor concentrate therein, said container having a predetermined shape and dimensions and a neck portion with an opening therein;

a flavor concentrate supply compartment having at least one wall defined by a thermally conductive plate;

a socket for each container in said flavor concentrate supply compartment for receiving the neck portion thereof;

cooling fin means for each container extending from said plate and conformally shaped to receive and support the sidewalls of an associated container therein, each said cooling fin having a slightly smaller internal dimension than the conforming external sidewall dimension of said container to provide a snapfit between each fin and container;

a water reservoir in direct thermal contact with said plate;

means for cooling the water in said reservoir to a desired temperature;

a source of water to be mixed with said flavor concentrate; and

a dispensing nozzle associated with each container and socket through which post-mix beverages of desired flavors are dispensed.

4,921,140

BAR GUN WITH SELECTABLE OUTLETS

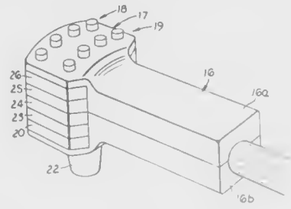
Robert D. J. Belcham, Birmingham, England, assignor to IMI Cornelius (UK) Limited, Alcester, England

Filed Sep. 2, 1988, Ser. No. 242,818

Claims priority, application United Kingdom, Sep. 5, 1987, 8720929

Int. Cl.[5] **B65D** *5/56*

U.S. Cl. 222—144.5 **14 Claims**



1. A bar gun for dispensing a plurality of beverages, the bar gun being formed of a plurality of laminations, passageways for liquids being formed in and through the laminations, the gun having a plurality of buttons on an exterior surface, each button serving to control the flow of an individual beverage, and in the case of flavoured beverages each button controlling both the flow of beverage concentrate and diluent, the buttons operating to push a piston rod extending through two or more laminations, the movement of the piston rod opening passageways for diluent and concentrate, the piston rod carrying a plurality of 'O' rings which form the seals between chambers defined in and between the laminations;

there being four chambers at four levels through the bar gun, the 'O' rings being positioned on the piston such that in the rest position with each respective said button in a fully exposed condition, each chamber associated with a respective such button is isolated from each chamber above and/or below such chamber and associated with such button, and with such button in a depressed condition the uppermost chamber associated with such button and located adjacent such button is fluidly connected to the respective said chamber immediately below it, and the lowermost respective said chamber is fluidly connected to the respective said chamber immediately above it.

8. A bar gun having a generally "T" shape in plan view and having buttons for the direct operation of valves to control the flow of beverages, the buttons being disposed on the cross bar of the "T" and the leg of the "T" being a gripping handle, the buttons being disposed along one or more arcs on the cross bar of the "T", the arcs lying underneath the natural transverse movement of the operator's thumb and being centered on the handle side of the head.

4,921,141

TWO-LAYERED HAT

William E. Branum, Irvine, Calif., assignor to Lush Lid, Inc., Huntington Beach, Calif.

Filed Dec. 13, 1985, Ser. No. 808,551

Int. Cl.[5] **B67D** *5/62*

U.S. Cl. 222—146.6 **9 Claims**

1. A multiple-layered hat for storing a dispensable fluid therein comprising:

upper and lower layers of material innerconnected to form a fluid retaining cavity therebetween;

a discharge port formed in the surface of at least one of said layers;

at least one ventilation port formed in the surface of one of said layers to facilitate discharge of fluid through said discharge port directly into the mouth of a person using the hat without the need to remove the hat from the user's head; and

a thermal exchange unit disposed substantially within said cavity, said thermal exchange unit comprising a substance



having a temperature different than that of the beverage, such that thermal energy is transferred between said substance and fluid within said cavity, said thermal exchange unit being shaped to a form retractably disposable within said cavity.

4,921,142

MANUALLY OPERABLE FLUID DISPENSER

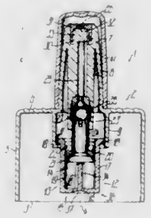
Lothar Graf, Worblingen, and Karl-Heinz Fuchs, Radolfzell, both of Fed. Rep. of Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,414

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532890

Int. Cl.[5] **B67D** *5/64*

U.S. Cl. 222—162 **20 Claims**



1. A manually operable fluid dispenser, comprising:

a thrust piston pump having a pump cylinder and a pump piston displaceably guided in said pump cylinder in a stroke direction over an axial pump stroke between an initial position and a limited end position at the end of the pump stroke, said pump cylinder and a front end of said pump piston defining a pump chamber;

a discharge duct leading from said pump chamber to a discharge nozzle;

a dispenser body bearing said pump piston and said pump cylinder, said dispenser body providing a handle for displacing the pump piston in said pump cylinder, said pump cylinder and an inner sleeve of said dispenser body displaceably engaging with one another,

wherein said inner sleeve depends from said handle, a casing jacket depending from an outermost portion of said handle and surrounding said inner sleeve and said pump cylinder, said casing jacket having an open end on one side and said inner sleeve depending from an inside of said casing jacket

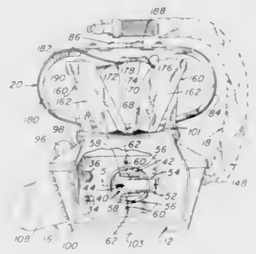
and having a free end for receiving said pump cylinder, said casing jacket and pump cylinder defining longitudinal extensions along said stroke direction such that in the initial position of said pump piston, said pump cylinder is located within said jacket casing, the jacket casing defining a supporting base permitting the fluid dispenser to be supported by said supporting base on a surface without the cylinder being pressed upwardly by the surface.

4,921,143

PORTABLE BEVERAGE DISPENSER

Robert L. Billet, Lower Gwynedd, Pa., assignor to Thirst Aid, Inc., Gwynedd, Pa.

Filed Oct. 25, 1988, Ser. No. 262,546
Int. Cl.[5] B67D *5/64*
U.S. Cl. 222—175 **18 Claims**



1. A portable beverage dispenser for use by a vender, said dispenser including:

(a) an insulated tank having an internal compartment for receiving a beverage to be dispensed, said tank including a front wall adapted to be supported adjacent a vender's back, a rear wall spaced from said front wall and opposed sidewalls connecting said front wall to said rear wall;

(b) a discharge passage means through a sidewall of the insulated tank, said discharge passage means communicating with the internal compartment adjacent the lower end thereof;

(c) a fillport communicating with the internal compartment and through which a beverage to be dispensed can be introduced into said compartment;

(d) a pressurizing passage means through a wall of the insulated tank, said pressurizing passage means communicating with the internal compartment adjacent an upper end thereof;

(e) pump means attached to the sidewall of the tank opposite the sidewall through which the discharge passage means is included, said pump means including a fluid transmitting line communicating with the pressurizing passage means for introducing a pressurizing gas into the upper end of the internal compartment of the tank for pressurizing a beverage in said tank;

(f) a cup dispenser means attached to the same sidewall of the tank as the pump means, for retaining a stack of cups, whereby the vender utilizes either the pump means or the cup dispenser means with one hand; and

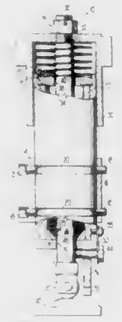
(g) a nozzle means communicating with the discharge passage means for dispensing the beverage in the internal compartment of the tank, whereby the vender utilizes the nozzle means with the other hand to dispense the beverage.

4,921,144

SPOT SEEDER

Naci Vardar, Kapuskasing, Canada, assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 136,228, Dec. 21, 1987, abandoned.
This application Feb. 28, 1989, Ser. No. 316,892
Int. Cl.[5] G01F *11/10*
U.S. Cl. 222—336 **8 Claims**



1. A spot seeder for sowing tree seeds during harvesting and adjacent a harvesting site comprising:

a. a seed canister mounted on and interconnected to a tree harvesting implement, which canister has:

i. a filler opening for filling the canister with tree seeds; and

ii. a dispensing opening in a wall of the canister, which wall has a thickness;

b. a shaft slideably fitted in the dispensing opening for movement between a retracted position and an extended position, wherein the shaft has:

i. an axis; and

ii. a pocket formed therein, which pocket is sized to accommodate a number of seeds, has a length parallel to the shaft axis, which length is less than the thickness of the canister wall, is located on the shaft so that the pocket is within the canister when the shaft is in the retracted position and is outside the canister when the shaft is in the extended position; and

c. means acitivated by said tree harvesting implement when harvesting a tree for driving the shaft between the retracted position and extended position.

4,921,146

SERVER TOP WITH SNAP-FIT PUSH LEVER

Ferdinand F. Salzmann, Praire du Sac, Wis., assignor to Traex Corporation, Dane, Wis.

Filed Jun. 17, 1988, Ser. No. 208,064
Int. Cl.[5] A47G *19/14*
U.S. Cl. 222—473 **4 Claims**

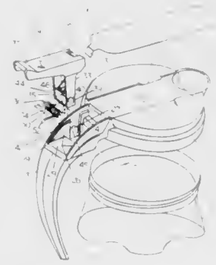
3. A push lever for use in opening and closing over an outlet on a server top having two substantially parallel side faces which each extend outwardly from a lid portion of the server top and which each have a pivot hollow, the push lever comprising;

a push arm which when the push lever is in place on the server top and the push arm is pushed, pivots the push lever away from the outlet;

a pair of sides on the push lever extending from the push arm to be adjacent to the pivot hollows on the side faces of the server top;

two pivot protrusions, each one of which extends outwardly from one push lever side to be received in the adjacent pivot hollow so that the push lever can be pivotally mounted between the two side faces, the push lever and the closure being connectable so that when the lever pivots away from the outlet, the closure slides off from the outlet to allow passage therethrough, and when the lever pivots toward the outlet, the closure slides over the outlet to close the outlet, the entire push lever, with the push arm, two sides, and two protrusions formed in the same molding operation;

three walls which each extend substantially between and perpendicular to the push lever sides, the three walls joined together at their edges and with the push lever sides forming a five sided rectangular compartment for a spring and which is open on the sixth side so that the spring can be placed therein, one of the three walls having a slot into which a spring end can fit and thereby be restrained against the push lever while another spring end can extend out through the open sixth side of the compartment to abut and be restrained against the server top to bias the push lever toward the server top outlet.

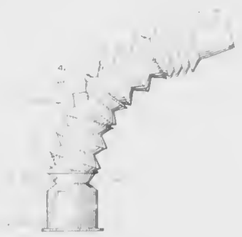


4,921,147

POURING SPOUT

Michel Poirier, 1300 Beauregard Street, Longueuil, Canada (J4K 4Z2)

Filed Feb. 6, 1989, Ser. No. 306,405
Int. Cl.[5] B65D *5/74*
U.S. Cl. 222—527 **14 Claims**



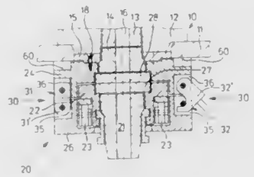
1. A spout to pour a liquid from and through a liquid outlet toward and into an inlet, consisting of a main elongated tubular section, a connector member fixed at one end of said tubular section and releasably secured to said outlet, and a nozzle at the other end of said main section and adapted to freely engage said inlet; said tubular section forming bellows defining a plurality of interconnected first ribs, and being made from a semi-rigid material; further including first means whereby said tubular section will be flexible transversely to its longitudinal axis upon a first forcible action being applied thereon, yet will maintain its last chosen flexed condition when said first forcible action ceases, and second means whereby said tubular section is telescopingly extendable or retractable about its longitudinal axis upon a second forcible action being applied thereon, yet will maintain its last chosen extended or retracted condition when said second forcible action ceases; wherein each rib is circular and consists of a pair of radially inwardly diverging frusto-conical walls which are interconnected at their larger diameter ends by a rounded section and by an offset section; a smaller diameter joint being defined between two adjacent ribs and being provided with a weakening groove at its outer surface; the wall which merges with said offset section being less inclined than the other wall relative to the longitudinal axis of the spout when the latter is straight.

4,921,148

ADJUSTABLE HOUSING ASSEMBLY FOR SLIDING CLOSURE UNIT

Hans Müller, Steinhausen, Switzerland, assignor to Stoping Aktiengesellschaft, Baar, Switzerland

Filed Dec. 26, 1985, Ser. No. 813,552
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500865
Int. Cl.[5] B22D *41/08*
U.S. Cl. 222—597 **16 Claims**



1. In a housing assembly of a sliding closure unit for controlling the discharge of molten metal from a metallurgical vessel, said housing assembly including a housing member to be mounted on the metallurgical vessel adjacent an outlet thereof, and a cover member mounted on said housing member by means of joints to enable said cover member to pivot with respect to said housing member and to be removable therefrom, the improvement wherein said joints comprise:

joint bases on at least four sides of each of said housing and cover members including, for each of said housing and cover members, first and second oppositely spaced sides with said joint bases thereof defining parallel first and second joint axes, respectively, and third and fourth oppositely spaced sides with said joint bases thereof defining parallel third and fourth axes, respectively;

said joint bases on each side of said cover member facing joint bases of a respective side of said housing member; and

means for selective attachment to said joint bases of said first and second sides of said housing and cover members or to said joint bases of said third and fourth sides of said housing and cover members to thereby pivotally and removably connect said cover member to said housing member, said attachment means comprising strap members selectively hinged to said joint bases of said first sides of said housing and cover member or to said joint bases of said second sides of said housing and cover members, such that said cover member is selectively pivotable with respect to said housing member about said first axes or said second axes, and locking levers selectively connectable to said joint bases of said second sides of said housing and cover members or to said joint bases of said first sides of said housing and cover members, to thereby lock or release said cover member with respect to said housing member along said second sides or said first sides.

4,921,149
ICE PORTION CONTROL FOR ICE DISPENSER AND METHOD

Benjamin D. Miller, Chicago, and Thaddeus M. Jablonski, Palatine, both of Ill., assignors to Remcor Products Company, Franklin Park, Ill.

Filed Jun. 9, 1988, Ser. No. 204,423
Int. Cl.[5] G01F *11/28*
U.S. Cl. 222—639 28 Claims

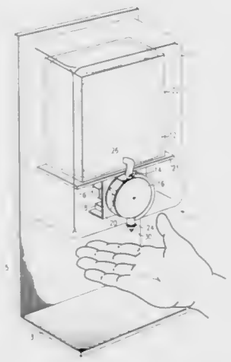


1. An ice dispenser, comprising chute means having an upper end for receiving ice bodies from a supply of ice bodies and a lower end for dispensing ice bodies therefore; means selectively operable for delivering ice bodies from the supply to said chute means upper end to fill said chute means with ice; closure means for selectively closing said chute means lower end; and means for operating said closure means and said delivering means, when said chute means is filled with ice bodies, to remove said closure means from said chute means lower end, while rendering said delivering means inoperative, for a selected one of a plurality of different timed periods of durations selected to dispense from said chute means lower end associated predetermined quantities of ice bodies previously delivered into said chute means.

4,921,150
AUTOMATIC DISPENSING APPARATUS HAVING LOW POWER CONSUMPTION

Peter J. Lagergren, Arlington; C. Cameron Allen, Jr., Richardson, and Lacy C. Lance, Fort Worth, all of Tex., assignors to Pandel Instruments, Inc., Grand Prairie, Tex.

Filed Aug. 26, 1988, Ser. No. 236,948
Int. Cl.[5] B67D *5/08*
U.S. Cl. 222—639 16 Claims



1. An apparatus for dispensing flowable material comprising:

a disposable container for holding flowable material to be dispensed;

releasing means integrated with the container for releasing a predetermined amount of flowable material from the disposable container when the releasing means is actuated;

actuating means when electrically-energized for actuating the releasing means to release the predetermined amount of material; and

electronic control means for controlling the actuating means, the electronic control means comprising:

photoelectric means comprising an emitter for emitting electromagnetic radiation, and a detector for receiving electromagnetic radiation reflected from a target;

first timing means for periodically activating the detector for a predetermined first time period;

second timing means triggered by the first timing means for activating the emitter during a predetermined portion of the first time period when the detector is activated to thereby generate a single, high energy pulse having a predetermined second time period, the predetermined second time period being at least one order of magnitude less than the predetermined first time period during which the detector is activated;

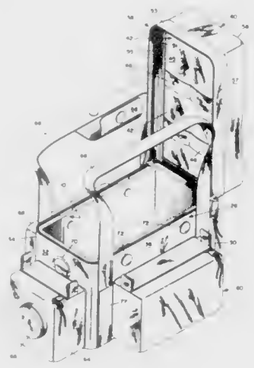
wherein the second timing means includes means connected to the detector for sensing electromagnetic radiation reflected from the target and in response thereto generating an actuation signal; and

third timing means responsive to the actuation signal for activating the actuating means for a predetermined third time period to thereby actuate the releasing means to release the predetermined amount of material.

4,921,151
BICYCLE REAR CARRIER PACK

Anna E. Duvall, Saxton, Pa., assignor to Cannondale Corporation, Georgetown, Conn.

Filed Sep. 24, 1985, Ser. No. 779,686
Int. Cl.[5] B62J *7/00*
U.S. Cl. 224—32 R 11 Claims



1. A bicycle rear carrier pack comprising a receptacle having a bottom, side and end walls of a substantially rigid thermally insulating material, an outer enclosure for the receptacle having a bottom, side and end walls, and a top, all of a flexible material, the outer enclosure closely fitting over the receptacle, means joined to the enclosure for fastening the pack to the platform of a bicycle rack and cooperating fastening means on the receptacle and the enclosure for securely and removably joining the receptacle and the enclosure.

4,921,152
COMBINATION STORAGE CONTAINER AND MOTORCYCLE HOLDER

Charles L. Kemming, 862 Orchard Rd., Montrose, Colo. 81401

Filed Aug. 28, 1989, Ser. No. 398,892
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—42.42 5 Claims



1. Apparatus adapted to be positioned adjacent the forward wall of the cargo area of a pick-up truck, said cargo area being further bounded by opposed parallel sidewalls and a rear tailgate, said apparatus comprising:

(a) two storage compartments joined in spaced apart mirror-image relationship about the longitudinal center axis of said cargo area, the space between said compartments defining a receiving zone, said compartments having lockable lids adapted to swing in a vertical path about hinge means adjacent said receiving zone and having axes parallel to said center axes, the interior of said compartments being accessible from the direction of said sidewalls,

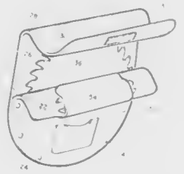
(b) anchoring means disposed within said receiving zone for holding the front wheel of a motorcycle, and

(c) a removable securing shaft horizontally spanning said receiving zone in a manner such that the two extremities of the shaft are releasibly held within said compartments, said shaft being further positioned to pass through the front wheel of said motorcycle.

4,921,153
BLADE BAG FOR BLADES USED WITH A CIRCULAR SAW

Richard Smith, 4171 33rd St., #2, San Diego, Calif. 92104

Filed May 26, 1989, Ser. No. 357,100
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—253 7 Claims



1. A blade bag for blades used with a circular saw comprising:

a rear wall member having a top edge, a bottom edge, a front surface and a rear surface, said rear wall member having a predetermined height and also a perimeter;

said rear wall member having a lower major portion whose top edge is a fold line, a rear wall flap member is formed from said fold line to the top edge of said rear wall member;

a belt loop assembly secured to the rear surface of said rear wall member;

a front wall member having a top edge, a bottom edge, a front surface and a rear surface, said front wall member having a predetermined height and also a perimeter;

said front wall member having a lower major portion whose top edge is a fold line, a front flap member is formed from said fold line to the top edge of said front wall member;

said front and rear wall members being aligned against each other with their respective bottom edges being adjacent each other;

primary fastening means for securing said front and rear wall members together from the opposite ends of the fold line of said front wall member downwardly around their respective lower perimeters that includes their bottom edges to form a pocket between them for removably receiving one or more blades for a circular saw;

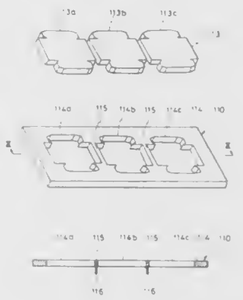
the front flap member of said front wall member in its closed position extends upwardly parallel to the lower major portion of said rear wall member so that its top edge approximates the height of the saw blades stored in said blade bag, said front flap member is folded forwardly and downwardly about its fold line to its open position which exposes the saw blades stored therein thus making them easily removably; and

the rear wall flap member in its closed position extends downwardly over the front surface of the front flap member of said front wall member, in its open position it is folded upwardly about its fold line, thus allowing the flap member of said front wall member to be folded forwardly.

4,921,154
SEPARATING DEVICE IN AN AUTOMATIC STAMPING MACHINE

Sadaji Abe, Koshigaya, and Sakae Suzuki, Sohka, both of Japan, assignors to Sugano Mfg. Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 118,762, Nov. 9, 1987, abandoned, which is a continuation of Ser. No. 7,487, Jan. 28, 1987, abandoned, which is a continuation of Ser. No. 668,013, Nov. 3, 1984, abandoned. This application Mar. 28, 1988, Ser. No. 173,872
Claims priority, application Japan, Nov. 17, 1983, 58-216916; Jun. 30, 1984, 59-136234
Int. Cl.[5] B21K *5/20*; B26F *3/02*
U.S. Cl. 225—97 10 Claims



1 The improvement in the separation station of a machine for die cutting and separating shaped portions from a sheet of paper stock leaving a waste portion of minimal area, said sepa-

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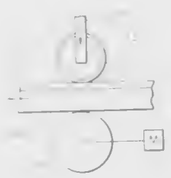
ration station having upper and lower die members, said lower die member being the support for the paper stock during separation, said lower die having a plurality of contiguous die openings therein separated by narrow portions of said lower die, an upper die frame, said upper die member being secured to said frame in vertical alignment with the die openings in said lower die member, said upper and lower die members being cut simultaneously from a single panel of plywood veneer to provide accurately interfitting upper and lower dies and an upper die having a mass characterized by low inertia; said frame being rectangular, rods supporting said frame at each of its corners in parallel relationship to said lower die member, means connected to each of said rods for vertically reciprocating said rods, frame and upper die member such that the upper die members pass at least partially through the openings in said lower die member, synchronizing means connecting said rods for simultaneous reciprocation thereof through an identical stroke length whereby the parallel relationship of said upper and lower die members is always maintained for minimizing the length of time during each reciprocation cycle of the upper die that any portion thereof intersects the plane of the paper stock supported on the lower die member to increase the proportion of each operating cycle during which lineal movement of the paper stock to remove the waste portion of the stock and replace it with new stock from which shaped portions are to be removed can occur, at least substantial portions of said lower die between contiguous die openings being of a width such that said plywood veneer alone cannot withstand the vertical forces resulting from the upper die impacting against the shaped portions of the paper stock during the reciprocation of the upper die, means for reinforcing said portions of said lower die, said reinforcement means being a length of steel rule shaped to substantially follow the centerline of said die portions between contiguous die openings, one edge of said steel rule being bonded at all points throughout its entire length to the lower face of said portions of said lower die, the bond forming a continuous joint throughout the length of said steel rule with the steel rule depending from said lower die to form a T-shaped deflection resistant support for the waste portion of the paper stock thereabove.

4,921,155

TAPE MATERIAL CONVEYING ROLLER AND TAPE MATERIAL CONVEYING METHOD

Takashi Ito, Hachioji, and Norio Sakamoto, Sagamihara, both of Japan, assignors to Konica Corporation, Japan

Filed Dec. 23, 1988, Ser. No. 288,918
Int. Cl.[5] B65H *27/00, 20/02*
U.S. Cl. 226—181 **4 Claims**



1. An apparatus for conveying a tape having first and second opposite sides of different elastic moduli, the apparatus comprising:

a first and second roller for nipping the tape therebetween, said first and second roller being rotatable for conveying the tape, said first roller contacting the first side of the tape and having an elastic modulus greater than the elastic modulus of the first side, said second roller contacting the second side of the tape and having an elastic modulus less than the elastic modulus of the second side.

4,921,156

SOLDERING APPARATUS

Ernst Hohnerlein, Ringstrasse 7, 6983 Kreuzwertheim, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 265,232
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737563
Int. Cl.[5] B23K *3/00*
U.S. Cl. 228—37 **17 Claims**



1. A soldering apparatus for producing soldered connections on at least one side of printed circuit boards carrying electronic components, comprising a soldering tunnel (3) enclosing a soldering chamber (26) between an entry tunnel section (2) and an exit tunnel section (4), a conveyor arrangement (10) for transporting said printed circuit boards through said entry tunnel section (2), through said soldering tunnel (3) and through said exit tunnel section (4) along a conveyor path of said conveyor arrangement, a conduit (41) opening into said soldering chamber (26) for supplying a protective gas into said soldering chamber, a heated tub (19) for holding a pool (20) of molten solder material, said pool being arranged below said path of said conveyor arrangement in the area of said soldering chamber (26), at least one circulating pump for circulating the molten solder material, at least one soldering nozzle (24, 25) within said soldering chamber (26), said soldering nozzle having an upwardly directed nozzle opening for producing a swell of molten solder material, said swell contacting said printed circuit boards moving past and over said nozzle opening, said tub (19) being arranged below a floor (16) of said soldering chamber (26), an opening (17) in said floor (16) of said soldering chamber (26), molten solder supply channel means mounting said soldering nozzle to protrude upwardly out of said tub (19) through said floor opening (17) in said soldering chamber (26), and sealing skirt means (18) enclosing said floor opening (17) and protruding downwardly into said tub (19) sufficiently for immersing into said pool (20) of molten solder material.

4,921,157

FLUXLESS SOLDERING PROCESS

Giora Dishon, Jerusalem, Israel, and Stephen M. Bobbio, Wake Forest, N.C., assignors to Microelectronics Center of North Carolina, Research Triangle Park, N.C.

Filed Mar. 15, 1989, Ser. No. 324,247
Int. Cl.[5] B23K *1/20, 35/38*
U.S. Cl. 228—124 **43 Claims**



1. A method of soldering without the need for fluxing agents, comprising the steps of:

a. depositing solder on a first surface, said solder having a surface oxide layer;

b. performing fluorine-containing plasma excitation on said solder; and

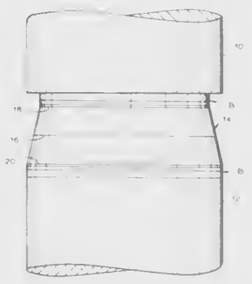
c. reflowing said solder on said first surface.

4,921,158

BRAZING MATERIAL

Kuen-Shyang Hwang, Canoga Park, Calif.; Mohammad Sedigh, Merrick, and Mark Roth, Freeport, both of N.Y., assignors to General Instrument Corporation, New York, N.Y.

Filed Feb. 24, 1989, Ser. No. 314,808
Int. Cl.[5] B23K *1/04*
U.S. Cl. 228—124 **20 Claims**



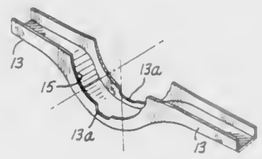
10. A method for forming a mechanical and electrical bond between the surface of a silicon semiconductor body and a metal component, the method comprising the steps of: forming a layer of titanium, forming a layer of silver adjacent the layer of titaniumm forming a layer composed of an aluminum-silicon composite and thereafter heating the assembly to a temperature above the melting point of the formed layers.

4,921,159

METHOD FOR MANUFACTURING A MODIFIED FAST FADE DRIVE AXLE HOUSING

David E. Peck, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 845,144, Mar. 27, 1986, Pat. No. 4,841,802.
This application Jul. 26, 1988, Ser. No. 225,621
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—182 **4 Claims**



1. In a method for manufacturing a forged drive axle housing by hot forming and welding of a steel blank of uniform thickness and having a differential receiving portion of generally convex outer curvature extending in an axial direction with an aperture in each side face thereof, two circular members each secured to an annular zone adjacent one of said apertures and two oppositely extending beam arms of rectangular cross-section which are disposed to form a transition zone at said differential receiving portion wherein said beam arms are formed by welding two half sections of substantially U-shaped cross-section together along a horizontal center line and securing said circular members to said differential receiving portions on each face and at least one of said circular members being secured adjacent one aperture by a continuous weld joint between its radially outer edge and the contiguous side face of the differential receiving portion that improvement consisting of

hot forming at a temperature between 1350° and 2100° F. the axially extending convex curvature of the U-shaped cross-section to shorten the transition zone between the extending beam arms of rectangular cross-section and the differential receiving portion, the shortening measured in terms of

(a) the curvature of the arcuate corner sections of the U-shaped sections forming a wall of the drive axle housing and having a corner section curvature being defined by a plurality of corner radii R_c each of which is struck in a plane normal to the outer surface of said wall,

(b) the axially extending convex curvature of said wall forming the differential receiving portion being defined by a first radius R_1 measured from a true origin at the intersection of the vertical axis of the differential portion of the drive axle housing,

(c) said axially extending curvature of the wall being defined by a second eccentric radius R_2 measured from a displaced origin O',

(d) said displaced origin O' being located at the vertical axis of the differential receiving portion but being displaced in a direction away from said wall,

(e) the axially extending convex curvature of said arcuate carrier defined by R_1 and the curvature of said wall defined by R_2 and R_3 radii both blending concavely in each transition zone into the corner sections and planar outer wall of said rectangular beam arms,

(f) a concave blending curvature of said corner sections being defined by a blending radius R_4,

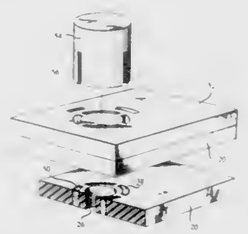
adjusting said radius R_2 to displace the axially extending convexly curved wall outwardly relative to origin O to increase R_c the radii of the corner sections to thereby increase said wall thickness in a direction which is normal to the horizontal center line during the hot forming step and increase the dimensions of the box section forming the beam arms while the length of the blending radii R_3 and R_4 is about 40–60% of the sum of the two radii R_1 and R_2 thereby rapidly shortening the concave transition zone in an axial direction to a value less than ½ of the length of the first radius R_1.

4,921,160

PERSONAL DATA CARD AND METHOD OF CONSTRUCTING THE SAME

Richard M. Flynn, Indianapolis, Ind., and Fred W. Verdi, Lawrenceville, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,515
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—492 **11 Claims**



1. A personal data card comprising:

a body having an opening;

at least one semiconductor chip received within said opening;

a mass of encapsulant admitted into the opening in said body to seal the chip therein; and

a cover overlying the substrate to seal the opening therein, characterized in that:

the body opening has a bottom wall to which the chip is bonded; and

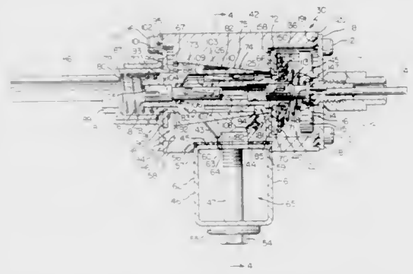
shock absorbing means are provided to substantially circumscribe both the encapsulant and the semiconductor chip sealed therein and thereby substantially isolate the encapsulant and the chip from the body to reduce the stresses transmitted from the body into the encapsulant upon flexing of the substrate.

4,921,161

FUEL CONTROL DEVICE, FUEL CONTROL SYSTEM USING THE DEVICE AND METHOD OF MAKING THE DEVICE

Francis S. Genbauffe, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 192,337, May 10, 1988, Pat. No. 4,813,596.
This application Dec. 22, 1988, Ser. No. 288,761
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] F23N *1/00*
U.S. Cl. 236—15 A 20 Claims



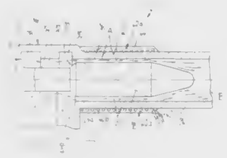
1. In a fuel control device comprising a housing means having an inlet for being interconnected with a fuel source and an outlet for being interconnected to a main burner means, said housing means having a main valve seat between said inlet and said outlet and a thermostatically operated valve member for opening and closing said main valve seat, said housing means having an annular heater pilot valve seat surrounding said main valve seat and being opened and closed by said thermostatically operated valve member at the same time that said thermostatically operated valve member is opening and closing said main valve seat, the improvement wherein said housing means has auxiliary fuel supply means for surrounding said heater pilot valve seat with an auxiliary flow of fuel at the same time that said thermostatically operated valve member is opening said main valve seat and said heater pilot valve seat, said housing means having passage means for interconnecting said inlet to said auxiliary fuel supply means independently of said main valve seat.

4,921,162

ELECTRICALLY CONTROLLED FLUID MIXING FIXTURE, ESPECIALLY FOR MIXING HOT AND COLD WATER

Ernst Blättler, Obfelden, Switzerland, assignor to KWC AG, Unterkulm, Switzerland

Continuation of Ser. No. 246,270, Sep. 19, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,342
Claims priority, application Switzerland, Sep. 29, 1987, 03781/87
Int. Cl.[5] G05D *23/13*
U.S. Cl. 236—12.12 29 Claims



1. An electrically controlled fluid mixing fixture for hot and cold fluids, especially hot and cold water, comprising:

means providing respective inflow openings for a hot fluid and a cold fluid;

means defining a substantially annular flow channel for the hot and cold fluids and flow communicating with said inflow openings;

temperature measuring means arranged at the region of said substantially annular flow channel;

means defining a premixing path for admixing the hot and cold fluids;

said premixing path being arranged upstream of said substantially annular flow channel with respect to a predetermined direction of flow of the hot and cold fluids;

said temperature measuring means serving to measure the temperature of the admixed hot and cold fluids and being distributively arranged at the substantially annular flow channel;

valve means arranged upstream of said inflow openings with respect to said predetermined direction of flow of the hot and cold fluids; and

said valve means serving for controlling the hot and cold fluids as a function of the measured temperature of the admixed hot and cold fluids.

4,921,163

METHOD AND APPARATUS FOR TEMPERATURE CONTROL OF HEATING AND COOLING PLANTS

Hans Viessmann, Im Hain 24, 3559 Battenberg/Eder, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,139
Claims priority, application European Pat. Off., Sep. 17, 1986, 86112825
Int. Cl.[5] F24D *3/00*
U.S. Cl. 236—46 R 61 Claims

1. A Method for controlling temperature of centralized and decentralized heating plants having:

a heat source of variable and adjustable temperature which supplies heat to heat consumers, such as radiators;

by controlling the temperature of the heat source according to a rated temperature which is controlled as a function of a reference temperature which is variable with time, wherein the rated temperature of the heat source is regulated without reference to the actual outside temperature



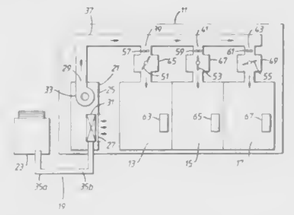
according to a given characteristic corresponding to specific calendar dates.

4,921,164

CENTRAL AIR CONDITIONING SYSTEM WITH DAMPER AND METHOD FOR CONTROLLING THE SAME

Yukifumi Gotou; Hidetoshi Narikiyo, and Yoshihiro Chuma, all of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 12, 1989, Ser. No. 350,892
Claims priority, application Japan, Sep. 14, 1988, 63-230961
Int. Cl.[5] F24F *7/00*
U.S. Cl. 236—49.3 6 Claims



1. A central air conditioning system for supplying conditioned air to a plurality of outlets, comprising:

means for conditioning air from a source thereof;

duct means for channelling the conditioned air from the conditioning means to the plurality of outlets, including means for forcing the conditioned air through the duct means and generating a status pressure in the duct means;

a damper corresponding to each outlet, movable between an open position wherein the conditioned air flows through the outlet and a closed position wherein the flow of conditioned air through the outlet is interrupted, for regulating the flow of conditioned air through the outlet, movement of each damper to the closed position causing changes in the static pressure in the duct means; and

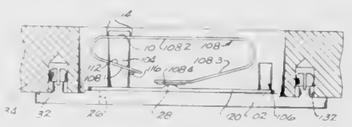
pre-closing control means for automatically reducing the change in the static pressure in the duct means while each damper is moving to the closed position, wherein each damper includes a pre-closed position between the open and closed positions, and the pre-closing control means includes means for maintaining each damper at the pre-closed position for a prescribed time before each damper moves to the closed position and means for reducing the amount of the conditioned air forced from the conditioning means to the duct means when each damper is positioned at the pre-closed position for regulating the static pressure in the duct means to a desirable level.

4,921,165

AUTOMOTIVE OIL LEVEL CONTROL VALVE APPARATUS

Henry Ty, Attleboro; Narendra R. Zaveri, Attleboro Falls, both of Mass., and Alfred J. White, N. Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 14, 1989, Ser. No. 366,904
Int. Cl.[5] G05D *23/08*
U.S. Cl. 236—93 R 15 Claims



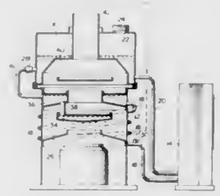
1. An oil level control valve comprising a base, first and second fastening members extending from the base adapted to be received in respective bores formed in a transmission housing, an oil receiving aperture formed through the base, first and second post member extending in parallel relation to one another from the base on opposite sides of the oil receiving aperture, a cover member received over the oil receiving aperture and being adapted to move toward and away from the oil receiving aperture, a generally U-shaped thermostatic strip having a bight portion intermediate a first and a second leg, first and second apertures formed in the bight and first leg respectively, the first leg being compressed by bending it toward the second leg with the apertures in alignment with one another and with the first post member received through the first and second apertures to mount the thermostatic strip thereon, the second leg having a distal end portion engaging the cover member with a preselected force whereby the cover member is biased toward the base with a force which varies with the temperature of the thermostatic strip.

4,921,166

HOT WATER CIRCULATING SYSTEM

Motoki Matsumoto, and Kouichi Watanabe, both of Aichi, Japan, assignors to Toyotomi Kogyo Co., Ltd., Japan

Filed Jul. 29, 1988, Ser. No. 226,094
Claims priority, application Japan, Jul. 31, 1987, 62-192811
Int. Cl.[5] F24D *3/00*
U.S. Cl. 237—60 13 Claims



1. A hot water circulating system comprising:

an open tank;

a water boiler arranged below said open tank and communicating with said open tank through a first connection pipe;

heating means for heating said water boiler;
a radiator in communication with said water boiler through a second connection pipe;
emptiness detecting means for detecting the substantial absence of liquid water in said water boiler; and,
a valve arranged on said first connection pipe and associated with said emptiness detecting means so as to be opened to supply water from said open tank through said first connection pipe to said water boiler when said emptiness detecting means detects a substantial absence of liquid water therein,
said water boiler comprising a heated section heated by said heating means and a hot water receiving section in communication with each other;
said hot water receiving section of said water boiler being in communication with said open tank and said radiator through said first and second connection pipes;
said heated section and said hot water receiving section of said water boiler being arranged so as to cause pressure of water vapor produced in said heated section to forcibly supply hot water in said hot water receiving section to said radiator.

4,921,167

CARRIER SECTION INCLUDING FLANGE MEMBER FOR CONNECTION TO A GUIDE RAIL

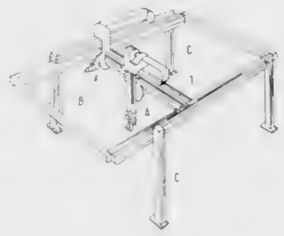
Roland Staggl; Hartwig Sprung, both of Wetter, and Eberhard Becker, Hagen, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 271,035

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3739090

Int. Cl.[5] E01B *25/00*

U.S. Cl. 238—126 **11 Claims**



11. Connection between a flange of a hollow load carrying section and two guide rails comprising:
said flange including a T-shaped insertion groove separating flange parts, each flange part having a narrow, upper clamping surface and a downwardly oriented pair of clamping surfaces separated by an indent;
said two rails each including clamping surface;
clamping parts positioned in said groove and engaging said narrow clamping surfaces in said groove, the pair of clamping surfaces of one of said flange parts engaging one of said rails such that forces acting upon said surfaces run in between portions of the clamping surfaces and through the respective indents which are not in abutment with the rail;
a pair of holding rails;
further clamping parts engaging said holding rails, said holding rails being respectively urged against said rails by the further clamping parts also in two spaced part abutment surfaces each separated by an indent such that clamping forces run through the respective indent in between the latter surfaces of a pair; and
bolt means interconnecting the clamping parts and the further clamping parts to have the rail sandwiched between the flanges and the holding rails.

4,921,168

SUPPORT PLATE FOR MOUNTING RAILS OF RAILROAD TRACKS AND TRACK SWITCHES ON WOODEN SLEEPERS

Armin Heim, Kreuzlingen, Switzerland, assignor to Schwihag Gesellschaft für Eisenbahnoberbau mbH, Tägerwilen, Switzerland

PCT No. PCT/EP87/00781, § 371 Date Aug. 18, 1988, § 102(e) Date Aug. 18, 1988, PCT Pub. No. WO88/04707, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 15, 1987, Ser. No. 249,566

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643742

Int. Cl.[4] E01B *9/40, 9/68*

U.S. Cl. 238—287 **19 Claims**



1. Support plate, particularly a ribbed plate, for fastening rails of railroad tracks and track switches on wooden sleepers, each rail having a flange, the support plate being connected in the vicinity of the ends thereof with the sleeper by means of screws which engage in through-holes defined in the support plate, whereas the rail flange is supported in the area of the plate between the through-holes forming the fastening points to the sleeper, wherein the improvement comprises that shoulders (8 and 28, respectively) are provided at the underside (27) of the plate only in the area of the through-holes (7) for the fastening screws, which shoulders (8 and 28, respectively) project out of the plane of the plate, and that, in the area between the shoulders, the support plate is configured such that tightening of the screws results in a convex elastic curving of the support plate, so that any distance between the underside (27) of the plate and the top surface (9) of the sleeper is eliminated.

4,921,169

METHOD FOR SUPPLYING AN ELECTRICALLY CONDUCTIVE FLOATING MEDIUM AND A DEVICE FOR PERFORMING THE METHOD

Leif Tilly, Blankavägen 15, S-433 02 Partille, Sweden

PCT No. PCT/SE87/00149, § 371 Date Sep. 16, 1988, § 102(e) Date Sep. 16, 1988, PCT Pub. No. WO87/05832, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 23, 1987, Ser. No. 249,565

Claims priority, application Sweden, Mar. 24, 1986, 8601352

Int. Cl.[4] B05B *5/02, 5/08*

U.S. Cl. 239—3 **16 Claims**



1. A method of handling electrically conductive liquid, said method comprising the steps of:
(a) adjusting the volume of a chamber of a pump so that said chamber can contain no more than a desired quantity of electrically conductive liquid;
(b) thereafter accumulating said desired quantity of electrically conductive liquid in said chamber by transferring said electrically conductive liquid form a storage location, through a first valve part and a second valve part, and into said chamber of said pump;
(c) physically disconnecting said first valve part and said second valve part from each other so that static electricity cannot flow from said second valve part to said first valve part; and
(d) while said first valve part and said second valve part are physically disconnected from each other, pumping said electrically conductive liquid form said chamber to a spraying device and electrostatically charging said electrically conductive liquid.

4,921,170

DEVICE FOR PREPARING AND DISPENSING A PRODUCT CONSISTING OF TWO COMPONENTS AND THE CORRESPONDING PROCESS

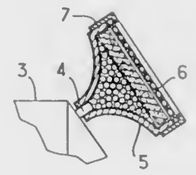
Jean-Francois Grollier, Paris, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 29,539, Mar. 24, 1987, Pat. No. 4,796,812. This application Jul. 26, 1988, Ser. No. 224,354

Claims priority, application Luxembourg, Mar. 24, 1986, 86368

Int. Cl.[5] B05B *7/26*

U.S. Cl. 239—304 **11 Claims**



1. A device for preparing and dispensing a product consisting of first and second components which may be mixed only when the product is being dispensed, said first component being fluid and able to constitute a foam, and said second component being solid, comprising:
(a) a pressurized container containing said first component in the form of a liquid;
(b) an outlet valve of said pressurized container through which the first component is to be dispensed;
(c) an operating device for said outlet valve;
(d) means defining an ejection duct from said outlet valve; said ejection duct having a first end nearer said outlet valve and a second end remote from said outlet valve, the second end of said ejection duct delivering the first component in the form of foam;
(e) a chamber having an inlet connected to said second end of said ejection duct and an outlet, said chamber enclosing said second component in particulate form and maintaining it outside the said pressurized container, said chamber including a side wall which widens gradually outwardly from the ejection duct towards said outlet; and
(f) said device consisting of a single grid closing said outlet of said chamber.

4,921,171

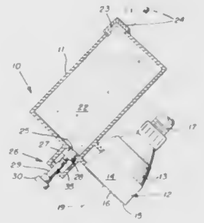
SHOWER HEAD DISPENSER

Jerry D. Cupit, P.O. Box 121904, Nashville, Tenn. 37212

Filed Jul. 13, 1989, Ser. No. 379,060

Int. Cl.[5] B05B *7/24*

U.S. Cl. 239—314 **4 Claims**



1. A shower head dispenser comprising:
(a) a shower head having a water inlet and a water spray discharge outlet,
(b) said shower head having a longitudinal spray axis extending in the direction of the water spray discharged from said outlet,
(c) means mounting said shower head so that said discharge outlet faces downward and said spray axis declines at an acute angle from the horizontal,
(d) a liquid reservoir mounted on said shower head above said longitudinal axis, said reservoir having upper and lower portions, said reservoir having a liquid inlet in said upper portion and a liquid outlet in said lower portion,
(e) valve means in fluid communication with said liquid outlet, comprising a discharge port spaced above said longitudinal axis and alongside the water spray stream discharged from said water spray discharge outlet, and a movable valve adapted to open and close said discharge port, and
(f) an elongated planar mixer surface immediately below and adjacent said discharge port, said mixing surface being substantially parallel to and spaced above said longitudinal spray axis and extending along the edge of and in contiguous contact with the water spray stream discharged from said discharge outlet, whereby the periphery of said water spray mixes with any liquid discharged from said discharge port and adhering to said mixer surface.

4,921,172

ELECTROSTATIC SPRAYER DEVICE FOR SPRAYING PRODUCTS IN POWDER FORM

Daniel Belmain, Uriage; Pierre Chabert, Brignoud; Roger Tholome, La Tronche; Pierre Fabre, Grenoble; Jean-Yves Correard, Glieres, and Michel Gondrand, Villeneuve-Les-Avignon, all of France, assignors to Sames S.A., Meylan, France

Filed Feb. 5, 1988, Ser. No. 152,552

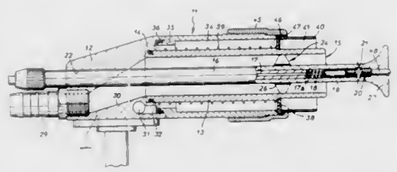
Claims priority, application France, Feb. 12, 1987, 87 01765; Sep. 15, 1987, 87 12765

Int. Cl.[5] B05B *5/02*

U.S. Cl. 239—698 **28 Claims**

1. Electrostatic sprayer device for spraying products in powder form, comprising an air-powder mixture pipe, an ejector orifice at one end of said pipe, a charging electrode adjacent said orifice, a counter-electrode coaxial with and to the rear of said charging electrode relative to the direction in which said mixture is ejected from said pipe, said counter-electrode being external to said pipe and having a surface substantially perpendicular to the longitudinal axis of said pipe whereby an annular space is defined around said pipe and extending from said surface of said counter-electrode, which communicates with said annular space towards said charging electrode, said electrodes being adapted to have a potential

difference applied between them to generate an electric field adapted to attract free ions towards said counter-electrode, and



blower means adjacent said counter-electrode discharging into said annular space.

4,921,173

METHODS OF MINERAL BREAKING AND APPARATUS USED THEREFOR

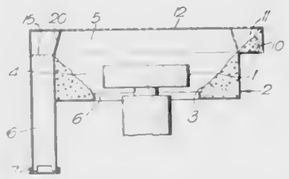
Bryan A. Bartley, 625 Mount Eden Road, Mount Eden, Auckland, New Zealand

Continuation of Ser. No. 135,574, Dec. 21, 1987, abandoned, which is a continuation of Ser. No. 905,629, Sep. 9, 1986, abandoned. This application May 16, 1989, Ser. No. 355,137

Claims priority, application New Zealand, Sep. 17, 1985, 213510

Int. Cl.[5] **B02C** *19/00*

U.S. Cl. 241—5 **9 Claims**



1. A method of obtaining a mixture of coarse broken particles and fines from a feedstock of larger stones, rocks or other frangible material and of separating a stream of at least some of said fines from a resultant mixture of broken pieces, said method comprising the steps of accelerating a stream of said larger particle feedstock into a cyclonic breaking zone in a lower part of a housing where the feedstock is subjected to cyclonic action including multiple collisions and abrading forces, with the action within the breaking zone causing fines to be moved directly upwardly from the breaking zone towards an upper region of the said housing and causing at least some of said upwardly directed fines to be moved outwardly by said cyclonic action for disposal through exits disposed in upper parts of said housing, all of said fines reaching said exits arriving directly from said breaking zone.

4,921,174

SWITCH FOR ELECTRIC FOOD PROCESSOR

Yoshihisa Okada, and Yoshihiro Enya, both of Komaki, Japan, assignors to Sanyei Corporation, Japan

Filed Sep. 1, 1989, Ser. No. 402,130

Claims priority, application Japan, Dec. 19, 1988, 63-164591

Int. Cl.[5] **A47J** *44/00;* **B02C** *18/12;* **B01F** *7/16*

U.S. Cl. 241—37.5 **9 Claims**

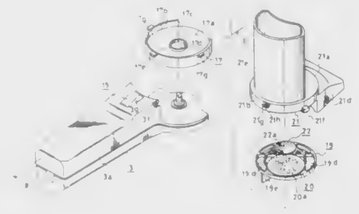
1. An electric switch for a food processor, wherein the food processor comprises a main body, a support on the main body, and a container for processed food, the container being disposed on the support, a shaft from the main body projecting into the container, a rotor for processing food the shaft being removably positionable upon the shaft in the container, and driving means in the body for driving the shaft and the rotor thereon to rotate;

a cover removably positionable over the container and over the rotor and the shaft, the cover also being movable with respect to the container between a first position at which the cover is emplaceable on and removable from the container and a second position at which the cover is to be affixed for closing the container;

a switch supported on the main body and including a switch lever that is movable toward and away from the main body; electric contacts on the main body connected with the driving means; means on the switch lever for engaging the contacts for completing the electric circuit to the driving means when the switch is moved toward the main body;

an element on the switch lever facing toward the main body, the element being movable toward the main body when the switch lever is moved toward the main body;

a regulating member disposed on the main body and movable across the main body and across the direction of that movement of the switch lever that is toward and away from the main body; the regulating member being shaped and being movable to a third position for the regulation member to normally be engaged by the element on the switch lever for blocking the element and thereby blocking the movement of the switch lever toward the main



body and toward engaging the switch contacts; the regulating member being movable to a fourth nonblocking position out of the way of the element on the switch lever, wherein the regulating member permits movement of the switch lever toward the main body to engage the switch contacts;

an operating piece attached on the cover and movable with the cover as the cover is moved to the second position thereof, the operating piece being engageable with the regulating member for moving the regulating member to the fourth nonblocking position as the cover is moved to the second position;

a receptacle defined on the cover, and the receptacle being so placed that when the cover is moved to the second position, the receptacle becomes aligned with the element on the switch lever, and when the switch lever is then moved toward the main body, the element does not engage the regulating member, and the element instead engages in the receptacle, for locking the cover beneath the switch lever and locking the cover to the container for preventing removal of the cover from the container until the switch lever is moved away from the main body, which disengages the switch lever from the switch contacts and also frees the element from the receptacle which frees the cover for being moved to the first position.

4,921,175

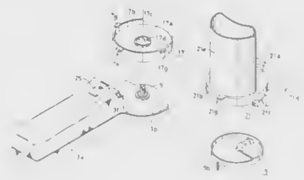
FOOD PROCESSOR

Yoshihisa Okada, and Yoshihiro Enya, both of Komaki, Japan, assignors to Sanyei Corporation, Japan

Filed Sep. 1, 1989, Ser. No. 402,220

Int. Cl.[5] **A47J** *44/00;* **B02C** *18/12;* **B01F** *7/16*

U.S. Cl. 241—37.5 **9 Claims**



1. An electric food processor comprising:

a main body; a graspable handle attached to and extending away from the main body for being grasped;

a blade driving shaft supported in the body for rotation and electric driving means in the body for driving the shaft for rotation; a rotatable blade detachably connected on the driving shaft for being driven to rotate by the driving shaft;

a detachable bottom plate supported in the body, and the shaft extending through the bottom plate; the bottom plate having a peripheral side wall; a discharge cutout in the peripheral side wall for discharge of processed food off the bottom plate and through the discharge cutout;

a cover detachably disposed above the bottom plate and defining a food processing chamber together with the bottom plate and in which chamber the rotary blade is accommodated; the height of the peripheral wall of the bottom plate is selected so that the height of the chamber generally approximates the height of the blade, whereby the blade may be accommodated over the bottom plate in the chamber; the cover having a cover discharge opening generally located around the cover in the area of the discharge cutout of the bottom plate peripheral wall for enabling the discharge of processed food;

a switch connected to the electric driving means for the rotary shaft, the switch being operable between an inoperative position and an operative position for operating the driving means, and means on the switch and on the cover for cooperating to operate the switch to operate the driving means only after the cover has been installed on the bottom plate.

4,921,176

APPARATUS FOR CRUSHING THINGS

Takeshi Kunisada; Susumu Doumen, both of Nishinomiya, and Toshiaki Haga, Kobe, all of Japan, assignors to Kyokuto Kaihatsu Kogyo, Co., Ltd., Hyogo, Japan

Filed May 3, 1988, Ser. No. 191,024

Claims priority, application Japan, May 9, 1987, 62-113202; May 18, 1987, 62-120939; May 18, 1987, 62-120940; Aug. 20, 1987, 62-206799

Int. Cl.[5] **B02C** *19/22*

U.S. Cl. 241—260.1 **4 Claims**

1. An apparatus for crushing things comprising:

a casing having an inlet and an outlet;

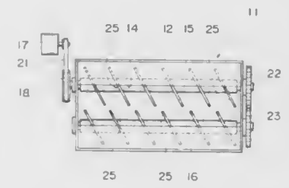
a plurality of rotating members rotatably mounted in the casing, axes of rotation thereof being in parallel with each other;

means for rotating the rotating members;

a plurality of cutting disks obliquely fixed to an outer circumferential surface of at least a first one of the rotating members at predetermined regular intervals so as to have a predetermined inclination other than 90° with respect to the axis of the first rotating member such that the cutting disks are spaced-apart and parallel to each other, each of said cutting disks consisting of an annulus having an entirely circular outer peripheral edge;

a screw fixed to an outer circumferential surface of a second one of the members; and

blades fixed to the outer circumferential surface of the second rotating member extending helically on said second



rotating member about the rotation axis thereof, and intersecting the screw, and a stationary blade having a cutting edge extending parallel to the rotation axis of the second rotating member and being fixed to an inner surface of the casing so as to confront the second rotating member;

whereby a crushing operation is performed by the cutting disks and the screw, followed by a further crushing operation performed by the blades on the second rotating member and the stationary blade.

4,921,177

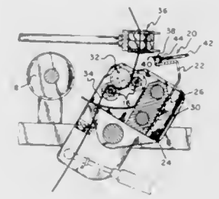
STRING POSITIONING DEVICE AND METHOD

Dale K. Blust, Atco, N.J., assignor to Figgie International Inc., Willoughby, Ohio

Filed Oct. 18, 1988, Ser. No. 259,529

Int. Cl.[5] **B65H** *54/64*

U.S. Cl. 242—3 **24 Claims**



1. A string positioning device to position a free end of a string in alignment with a directional line not enclosed sufficiently to significantly affect air flow directed along the line, the device comprising:

(a) a string holding means to hold the string with the free end of the string positioned proximate the directional line, and

(b) a string end positioning means comprising:

(i) a head member having a wall facing perpendicular to the directional line,

(ii) a plurality of holes through the wall spaced apart from each other, and

(iii) a compressed air supply means to supply compressed air to the head member to flow outwardly through the holes,

wherein the holes are spaced sufficiently apart and the holes are angled sufficiently into the wall to cause the air flow out of the holes to focus at at least one point on the directional line to catch and hold a length of the free end in alignment along the directional line.

4,921,178

MACHINE FOR WINDING A ROTOR FOR A ROTATING ELECTRICAL MACHINE

Roland Holm, Utterstigen, and Josef E. Enhardt, Hundhamravä gen, both of Sweden, assignors to Garphyttan Industrier AB, Norsborg, Sweden

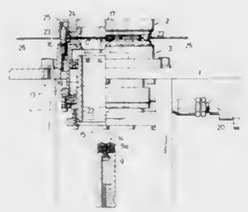
PCT No. PCT/SE87/00449, § 371 Date Apr. 4, 1989, § 102(e) Date Apr. 4, 1989, PCT Pub. No. WO88/02570, PCT Pub. Date Apr. 7, 1988

PCT Filed Oct. 6, 1987, Ser. No. 340,630

Claims priority, application Sweden, Oct. 6, 1986, 8604226

Int. Cl.[5] H02K *15/09, 15/02*

U.S. Cl. 242—7.05 R 7 Claims



1. A machine for winding a rotor for a rotating electrical machine, the rotor comprising a cylindrical rotor core (13) which has a plurality of substantially axially extending winding slots provided on its cylindrical outer surface and which is to be provided with a winding comprising a given number of coils, each coil being located in at least two mutually different winding slots, said machine comprising holding devices (9, 11, 19) for firmly holding the rotor, and an annular wire guide means (16, 24) which is arranged co-axially in relation to the rotor axis and said wire guide means having an inner diameter of which is greater than the outer diameter of the rotor core (13) and which is provided with a number of wire guide channels corresponding to the number of coils in the winding, and further comprising means (10, 12, 20, 21) for axially displacing and peripherally rotating the rotor holding means and the wire guide means in relation to one another, characterized in that the wire guide means comprises two rings (16, 24) which are substantially mirror-images of one another and which are arranged in a manner such that the rings can be brought together and moved apart, and which rings have an inner diameter which is slightly greater than the outer diameter of the rotor core (13), and in that the mutually facing surfaces of the rings (16, 24) which abut one another when the rings are brought together have provided thereon a number of wire guide grooves (17) which extend radially between the outer and inner edges of respective rings and the number of which grooves corresponds to the number of coils each wire guide groove having a mouth portion for receiving a winding; and in that the inner peripheral surface of the ring (16, 24) has provided thereon a radially inwardly projecting lug (18) at the mouth of each wire guide groove 917), said lug having a radial extension which exceeds the play or clearance between the inner surface of the ring (16, 24) and the outer surface of the rotor core (13).

4,921,179

METHOD AND APPARATUS FOR POSITIONING A YARN END FOR UNWINDING

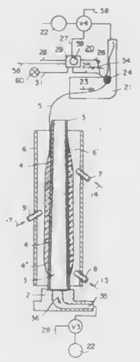
Paul Surkamp, Kempen, and Ulrich Wirtz, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,373

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1988, 3821343

Int. Cl.[5] B65H *54/00, 67/08*

U.S. Cl. 242—18 R 38 Claims



1. A method of unwinding a yarn end of a yarn package, the yarn package being of the type having yarn wound on a tube and having an axis, comprising:

supporting the package in contact with a cooperating member, said cooperating member at least partially circumferentially surrounding the package and the package being supported to permit rotation about its axis; and

moving the package in contact with said cooperating member in a planetary motion while directing a stream of gas in a spiraling direction relative to the package during the planetary motion of the package, thereby unwinding the yarn end from the package into position for subsequent unwinding engagement.

4,921,180

PACKAGE TRANSFERRING MEANS FOR A TEXTILE WINDING MACHINE

Hans Grecksch, Monchengladbach; Josef Bertrams, Wegberg, and Wolfgang Loers, Monchengladbach, all of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 240,743

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729777

Int. Cl.[5] B65H *67/04*

U.S. Cl. 242—35.5 A 16 Claims

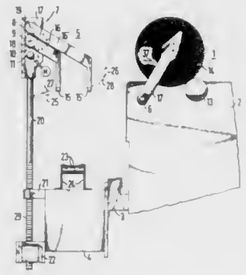
1. In a textile winding machine of the type having a package conveyor, means for transferring wound packages to the conveyor, comprising:

a supporting frame located laterally of the conveyor;

package supporting means including a pair of support arms, each support arm being pivotally mounted to said supporting frame at a pivot point located laterally of the conveyor, said pivot points being vertically spaced from one another, and each support arm having a package supporting member spaced from its respective pivot point, said package supporting members being cooperatively positionable to support a package thereon;

means for pivoting said support arms, said support arms being pivotable to move said package supporting members laterally toward one another into package supporting disposition and being pivotable away from each other in a package release position to move said package supporting members laterally away from one another and thereby release a supported package onto the conveyor; and

means for moving said package supporting means generally vertically on said supporting frame to said package release position for release of a supported package onto the conveyor and for moving said package supporting means subsequently upwardly away from the conveyor,



both of said pivot points of said support arms being offset from the conveyor in the same lateral direction relative to the conveyor when said package supporting means is in said package release position and one of said package supporting members being disposed laterally further from the pivot point of the said support arm to which it is mounted than the other said package supporting member is from the pivot point of the said support arm, when said package supporting members are disposed in package supporting disposition.

4,921,181

YARN TRAVERSE WINDING APPARATUS

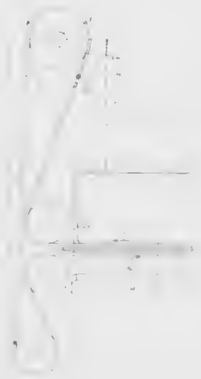
Heinz Kamp, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 25, 1988, Ser. No. 276,057

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739850

Int. Cl.[5] B65H *54/30*

U.S. Cl. 242—43 A 5 Claims



1. Yarn traverse winding apparatus for a textile machine producing cross-wound bobbins, comprising a yarn traversing zone having reversing points defining ends of said yarn traversing zone, guide rollers, a traction mechanism transmission having an endless traction mechanism being diverted outside said traversing zone by said guide rollers between a first belt run movable in a given traversing direction and a second belt run movable parallel to said first belt run in an opposite traversing direction, said belt runs having inner surfaces facing toward each other and outer surfaces facing away from each other while in said traversing zone, yarn drivers mutually spaced apart along said traction mechanism, a yarn guide element transferring yarn at said reversing points from a yarn driver on one of said belt runs to a yarn driver on the other of said belt runs, said guide rollers including two first inner guide rollers both being disposed at one of said ends of said traversing zone and each guiding and contacting said outer surface of a respective belt run and two second outer guide rollers spaced apart from said first guide rollers and each returning and contacting said inner surface of a respective belt run between said first guide rollers, said traction mechanism being moveable between said second guide rollers in the vicinity of said first guide rollers.

4,921,182

MACHINE FOR WINDING CABLE

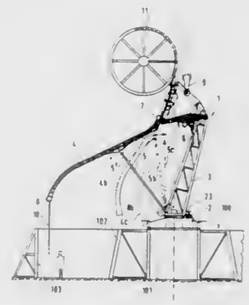
Yves Rerolle, Lyon, France, assignor to Societe Anonyme dite: Les Cables de Lyon, Clichy Cedex, France

Filed Feb. 24, 1984, Ser. No. 583,473

Claims priority, application France, Feb. 25, 1983, 83 03092

Int. Cl.[5] B65H *75/16*

U.S. Cl. 242—54 R 4 Claims



1. A machine for winding a cable within a circular area which cable arrives vertically above the center of said area and is deployed by a deployment wheel, said area being defined by an inner ring wall and an outer ring wall delimiting a winding tank therebetween, said machine comprising:

a stand removably mounted at the center of the inner ring wall of the tank,

a deformable quadrilateral assembly comprising a generally vertical pillar mounted on said stand for rotation about a fixed vertical axis,

a control arm pivotably mounted at one end of the upper end of said pillar,

a rod pivotably mounted at one end to the lower end of said pillar,

a hinged guide arm having a first end and a second end, and means guiding said cable along said hinged guide arm from said first end as it leaves the deployment wheel into said guide arm to said second end where it discharges,

means for pivotably mounting the other end of said rod to said hinged guide arm at a point intermediate of the ends of said hinged guide arm, and

means for pivotably coupling the other end of said control arm to said first end of said hinged guide arm at a position above the connection between the control arm and said hinged guide arm;

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such that said pillar, said control arm, said hinged guide arm and said rod complete said deformable quadrilateral assembly,

whereby, the first end of said hinged guide arm pivotably coupled to said control arm may be maintained in a position beneath said deployment wheel for guiding the cable as it leaves the deployment wheel into said guide arm first end, while the opposite second end of said hinged guide arm may be shifted to adjustable radial positions relative to said stand to enable successive coils to be laid next to one another as the cable is wound over the complete extent of the space between said inner and outer ring walls, and said deformable quadrilateral assembly enables said hinged guide arm to be positioned alongside said pillar with said second end of said hinged guide arm in proximity thereto to facilitate transport of said machine after removal of said machine from the center of the tank.

4,921,183

METHOD AND DEVICE FOR THE REELING OF A WEB

Seppo Saukkonen, Vantaa; Kauko Tomma, Helsinki, and Vesa Raudaskoski, Järvenpää, all of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed May 20, 1988, Ser. No. 197,035

Claims priority, application Finland, May 20, 1987, 872225

Int. Cl.[5] **B65H** *18/16, 18/02, 18/20, 18/22*

U.S. Cl. 242—66 **19 Claims**



1. Method for reeling a web into a roll, comprising the steps of

winding the web about a core between the same and a carrier roll, which forms a reeling nip, and a belt roll, to form a web roll being wound,

continuing said winding of the web about the core between the same and the carrier roll, and additionally, after the web wound upon the core reaches a certain radius, between the core and a belt supporting zone situated as a direct extension of the belt roll,

passing the web over a sector of the carrier roll to the core,

providing nip support to the web roll being wound from underneath by the carrier roll and by the belt roll, and then by the belt supporting zone when the roll reaches a certain radius, and stabilizing the web roll in reeling position by winding the web about the core between the same and an upper press member wherein the upper press member is a press roll,

continuing said winding of the web between the core and said belt supporting zone whereby the radius of the wound roll increases and tension of at least one belt defining said supporting zone is adjusted by means control system,

whereby linear loads in nips formed between the roll being wound and the carrier roll, the upper press member, and the belt zone are maintained within suitable limits, and in the final stages of reeling, supporting the roll being wound by the belt supporting zone after the winding of the web roll is almost completed, such that an outer circumference of the wound roll is placed close to a second belt roll around which the at least one belt forming the supporting zone passes,

thus extending the belt support zone such that the outer circumference of the wound roll forms a nip of low linear load with the second belt roll.

8. Apparatus for reeling of a web, comprising

a carrier roll arranged for supporting a roll of the web as it is being wound,

a support unit arranged for supporting the roll of the web as it is being wound together with said carrier roll,

said support unit comprising a pair of belt rolls and at least one belt passing around the same and arranged to support, on an upper run thereof, the roll being wound after the roll increases past a certain radius in size, and

means for adjusting tensioning of said at least on belt substantially in a direction of a plane passing through axes of rotation of said belt rolls and arranged between said belt rolls which are provided in a vicinity of the roll being formed.

4,921,184

LOCKING MECHANISM FOR WEBBING RETRACTOR

Shinji Mori, Niwa, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Susakusho, Aichi, Japan

Filed Mar. 28, 1989, Ser. No. 329,934

Claims priority, application Japan, Mar. 31, 1988, 63-44158[U]

Int. Cl.[5] **A62B** *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **18 Claims**



1. A locking mechanism of a webbing retractor having a winding shaft to wind a webbing in a laminated manner thereon, said locking mechanism being capable of preventing from rotating said winding shaft at excessive movement more than a predetermined amount of acceleration in a horizontal direction, comprising:

a locking wheel rotated together with said winding shaft;

a locking pawl being engagable with said locking wheel to prevent said winding shaft from rotating; and

an operating body for bringing said locking pawl into engagement with said locking wheel at the excessive movement more than said predetermined amount of acceleration in the horizontal direction, said operating body having a first portion to bring said locking pawl into engagement with said locking wheel when inclined, and a pair of second portions extending from said first portion symmetrically with respect to the axis of said winding shaft and in a direction for approaching an outer periphery of the webbing wound around said winding shaft, said second portions causing said first portion to become inclined at the excessive movement more than said predetermined amount of acceleration in the horizontal direction.

4,921,185

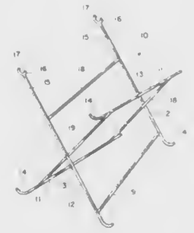
YARN HOLDER AND DISPENSER

Laurna J. Baker, Rt. #1, Box 179, Shady Point, Okla. 74956

Filed Mar. 27, 1989, Ser. No. 329,791

Int. Cl.[5] **B65H** *49/32*

U.S. Cl. 242—129.6 **21 Claims**



1. An assembly for holding and dispensing yarn from a skein of yarn comprising:

a spindle slidably insertable into a skein of yarn;

a cloth basket;

two pairs of crossed legs oppositely faced along parallel planes;

means extending upwardly from said pairs of crossed legs;

means disposed on said extending means for removably and rotatably engaging said spindle in a horizontal attitude between said planes;

means connecting opposite ones of said crossed legs for suspending said basket therebetween;

means connecting opposite ones of said crossed legs cooperable with said suspending means for shaping said basket; and

means for detachably securing said basket to said suspending means with said shaping means disposed in said basket.

4,921,186

APPARATUS FOR USE IN WITHDRAWING YARN FROM A WOUND YARN PACKAGE

Joseph G. Plasky, Kinston, N.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 21, 1989, Ser. No. 384,133

Int. Cl.[5] **B65H** *49/02, 55/00, 59/06*

U.S. Cl. 242—147 R **3 Claims**



1. An apparatus for use in withdrawing yarn from a yarn package wound in layers between exposed ends of a bobbin, said yarn package having at least one end wall over which yarn is withdrawn, said apparatus comprising: a body having a circumferential surface and an annular recess at one end to provide a telescoping snug fit over one end of said bobbin, said circumferential surface being coaxial with said bobbin, touching said end wall of the package at one end and extending beyond the end of the bobbin at its other end.

4,921,187

BAIL INVERTER FOR A SPINNING FISHING REEL AND REEL

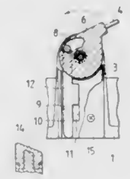
Nobuyuki Yamaguchi, Tokyo, and Akira Yamaguchi, Saitama, both of Japan, assignors to Daiwa Seiko, Inc., Kurume, Japan

Filed Nov. 17, 1988, Ser. No. 272,430

Claims priority, application Japan, Feb. 5, 1988, 63-14392[U]

Int. Cl.[5] **A01K** *89/01*

U.S. Cl. 242—232 **2 Claims**



1. A fishing reel comprising:

a reel body;

a rotor attached to said reel body;

a bail having first and second ends;

first and second bail support members connected to said bail at its first and second ends respectively, said first bail support member including an arcuate elongated groove formed therein;

an operating means including an operating rod slidable in a longitudinal direction, said operating means being disposed to be moved between a first and second position and including means for engaging said first bail support member for moving said bail between a fishline winding position and a fishline unwinding position in response to said operating means being moved between said first and second positions, said engaging means comprising a projection on said rod engaged with said arcuate elongated groove;

means for connecting said first and second bail support members to said rotor, said connecting means including first and second bail support arms, said second bail support arm having a first end connected to said second bail support member and a second end connected to said rotor, said first bail support arm having a first end connected to said first bail support member, a second end connected to said rotor, and a slender opening, said operating rod being disposed in said opening and being slidable therein;

a contact means for contacting said operating rod and providing an operating force on the operating rod, thereby sliding said operating rod toward said bail, said contacting means being disposed on said reel body;

a restrictor means for restricting the sliding of said operating rod with respect to said first bail support arm, comprising a projection disposed on said operating rod and a recess disposed in said first bail support arm, said projection being disposed within said recess; and

a spring means for urging said bail to remain in said fishline winding position when said bail is moved into said fishline winding position, said spring means further urging said bail to remain in said fishline unwinding position when said bail is moved into said fishline unwinding position, said spring means further providing the sole biasing force for urging the operating rod selectively toward its first or second position.

4,921,188

SPINNING-TYPE FISHING REELS WITH IMPROVED LINE HANDLING

Benny E. Smith, 14 Mako Box 115, Sebring, Fla. 33870

Continuation-in-part of Ser. No. 279,339, Nov. 30, 1988, abandoned, which is a continuation of Ser. No. 224,176, Apr. 27, 1988, abandoned, which is a continuation of Ser. No. 103,546, Oct. 1, 1987, abandoned, which is a continuation of Ser. No. 904,291, Sep. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 730,491, May 6, 1985, abandoned. This application Mar. 20, 1989, Ser. No. 326,102

Int. Cl.[5] A01K *89/01*

U.S. Cl. 242—233 18 Claims



1. In an open-face spinning-type fishing reel having a spool onto which line is wound about the longitudinal axis thereof; a rotatable bail unit including a bail and line guide that swing between a closed, line winding position and a fully opened, line casting position wherein the bail and line guide are out of contact with the line; a trigger assembly which swings said bail from said closed to said opened position when the trigger of said trigger assembly is cocked and means that returns the bail to its closed position at the completion of a cast and rotates the bail unit around said longitudinal axis for winding fishing line around the spool, the improvement comprising:

line holding means separate from said bail and line guide supported upon said bail unit for rotation therewith

said line holding means comprising a pin which

engages said fishing line as said bail is moved by said trigger assembly toward said opened position,

retains said fishing line against unreeling while said trigger is cocked, and

releases said line to permit its unreeling from said spool upon release of said trigger during casting of said fishing line, and

means linking said hne holding means to said trigger assembly to cause said line holding means to perform said line engagement, retention and release.

4,921,189

UNIVERSAL OUTER POINT LOCK DEVICE FOR RAILWAY POINT

Ugo Callegari, Bologna, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Nov. 17, 1988, Ser. No. 272,436

Claims priority, application Italy, Dec. 16, 1987, 12601 A/87

Int. Cl.[5] E01B *7/02;* B61L *11/02, 5/00*

U.S. Cl. 246—448 6 Claims

1. A universal outer point lock device for a railway switch having respective blades associated with respective rails at the switchpoint, said outer point lock device comprising:

two point locks, each said point lock associated with a respective blade and comprising:

a box secured to the associated rail and having a box detent,

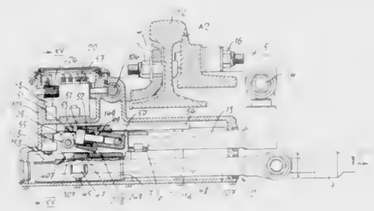
a lock-slide in said box connected to the associated blade and disposed perpendicularly to a vertical plane of the associated rail, said lock-slide having a transverse roller mounted thereto,

a drive-slide adjacent and parallel to said lock-slide in said box,

a guide means for guiding said lock-slide and said drive-slide in a sliding movement in said box,

a coupling means for automatically engaging said lock-slide to said drive-slide with an overlap stroke being provided for movement of said drive-slide relative to said lock-slide during the sliding movement thereof to and from a closed end position where the associated blade is against the associated rail and an open end position where the associated blade is away from the associated rail,

a lock member mounted to said lock-slide, said lock member including a head at one end, a spring-loaded pin mounted in said head and adjacent said transverse roller of said lock-slide, a lock detent on one side of said lock member, a pivot means for pivotally mounting said lock member to said lock-slide about which said lock member is swingably attached for pivoting motion in a direction transverse to the sliding movement of said lock-slide whereby said lock



member is swingable between (a) a first position where said lock detent engages said box detent of said box and said spring-biased pin is adjacent one side of said transverse roller, and (b) a second position where said lock detent is disengaged from said box detent and said spring-biased pin is adjacent an opposite side of said transverse roller after having biasingly engaged said transverse roller in snappingly moving from one side to the opposite side,

a snap lock device which locks said drive-slide to said box at the two end positions of movement of said drive-slide, and

an actuation means for actuating said lock detent of said lock member into engagement with said box detent when said lock-slide is moved by said drive-slide from the open position to the closed position and out of engagement with said box detent when said lock-slide is moved by said drive-slide from the closed position to the open position; and

a drive rod mterconnecting said drive slides of each said point lock so that said drive-slides move together.

4,921,190

DISPLAY CONSTRUCTION

Robert P. Russo, New City, and Randolph J. Russo, Nanuet, both of N.Y., assignors to Mark Philip Promotions, Inc., Nanuet, N.Y.

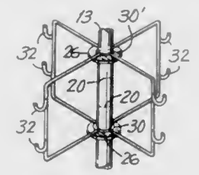
Filed Jan. 30, 1989, Ser. No. 302,878

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—159 5 Claims

1. A display support structure for use with a base and a display for facilitating end user assembly comprising a main display pole, including a plurality of upper and lower segments of given outside peripheral extent with a hollow interior of given inside diameter and an one-piece solid synthetic material insert for each pair of upper and lower segments having upwardly and downwardly extending elements and a central flange, said elements

being cylindrical and having a diameter of approximately same value as said given inside diameter and fitting with the upwardly extending element into the upper of said pair of segments and the downwardly extending element into the lower of said pair of segments, the outside extend of said flange at least equalling said given extent;



wherein the outside extent of said flange is substantially greater than said given outside extent, said display being supported by said flange and being rotatable relative to said flange.

4,921,191

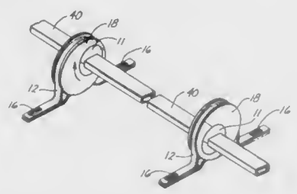
ADJUSTABLE WAVEGUIDE/CONDUIT CLAMP

Wilbert H. Herschler, Lomita, and Stephen R. Nelson, Downey, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 14, 1988, Ser. No. 206,387

Int. Cl.[5] F16L *3/12*

U.S. Cl. 248—70 9 Claims



1. A waveguide/conduit support clamp comprising;

first and second circular support elements and an outer frame having elongated slots in a base portion thereof;

the first of said circular support elements having a circular cutout of the same diameter as that of the second circular support element;

said circular cutout being centered along an axis displaced from, but parallel to, the central axis of said first circular support element;

said second circular support element having a non circular cutout at a center thereof to conform with the periphery of a waveguide/conduit workpiece;

said second circular support element mounted in the circular cutout of said first circular support element, said first and second support elements mounted in said supporting frame attachable to external structure at said base portion through said elongated slots, said slots allowing for transverse displacement of said frame relative to said central axis.

4,921,192

GOLF BAG HAVING INTEGRAL SUPPORT STAND

George H. Jones, Lake Oswego, Oreg., assignor to Jones Sports Co., Portland, Oreg.

Filed Jul. 3, 1989, Ser. No. 374,759

Int. Cl.[5] A63B *55/00*

U.S. Cl. 248—96 4 Claims

1. In a golf bag of the type having an elongtae cylindrical shell which is open at its upper end to receive golf clubs and is enclosed at its base to supprt clubs therein, the improvement comprising:

(a) legs associted with the shell;

(b) means for permitting said legs to be moved between a retractd postion in adjacency with said shell and an extended postion where said legs act in cooperation with the base to supoprt the shell at a predetermined acute angle with resepct to the vertical;

(c) actuation means for moving said legs to their extended positon when said actuation means is positoned against the ground and the shell is urged downwardly;

(d) a portion of said base being relieved to permit downward movement of the shell when said actuation means is in



contact with the ground and the shell is oriented at or near said predetermined actue angle, without said actuation means being in contact with the ground when said shell is vertical and the remainder of said base is resting on the ground; and

(e) the remainder of said base being planar and oriented substantially normal to the elongate axis of said shell so that said shell will be vertical when the remainder of said base is resting on the ground, and said relieved portion being planar and oriented at approximately said predetermined actue angle with respect to the remainder thereof.

4,921,193

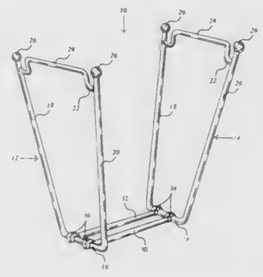
BREAK APART STAND FOR PLASTIC BAGS

Maurice C. Benesch, 7847 Vervain Ct., Springfield, Va. 22152

Filed Jun. 6, 1989, Ser. No. 361,956

Int. Cl.[5] A63B *55/04*

U.S. Cl. 248—97 20 Claims



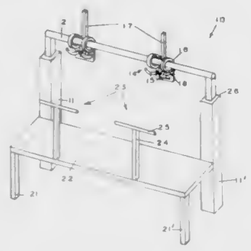
1. A break apart stand apparatus for supporting plastic bags with handles, which comprises:

(a) at least two elongated base portions disposed in parallel spaced alignment, each base portion having a hooking end disposed at each distal end, with an aperture disposed in each hooking end;

(b) opposing upright supports having a bottom portion, with side portions extending from each end of the bottom

portion, and a top portion extending between the side portions and formed with a raised handle portion sized to receive and support the handle of a plastic bag thereon: each opposing upright support further having at least two raised pin portions extending from the bottom portion and sized to be closely received within the aperture disposed in the hooking end of the elongated base portion, wherein the break apart stand is assembled by inserting the raised pin portions extending from the bottom of the opposed upright supports through the apertures provided in the hooking end of the elongated base portions.

4,921,194
MAIL BAG RACK
Roy Libby, 3025 Todd Dr., Madison, Wis. 53713
Continuation-in-part of Ser. No. 207,239, Jun. 16, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 381,362
Int. Cl.[5] A63B *55/04*
U.S. Cl. 248—97 7 Claims



1 A mail bag rack comprising in combination
(a) a first fixed supporting standard having a substantially horizontal axial portion;
(b) at least one bag hook means rotatably mounted on said axial portion of said first supporting standard wherein hook curvature of said bag hook means substantially defines a circumferential arc coaxially with said axial portion, and wherein an extending handle portion is provided for rotative manual biasing of said bag hook means about said axial portion, and further wherein weighting of said hook means and said handle portion in a position of rest is such that said hook means depends below said axial portion with said hook curvature extending at least slightly upwardly tilted;
(c) at least one second fixed standard disposed to operably receive together with said bag hook means the upper extremity portion of an open mail bag for maintaining the bag in open position while it is being filled and for enabling the bag to be removed from said hook means without lifting by manual rotative biasing of said handle portion.

4,921,195
PLASTIC BAG STAND
Emmit S. Clark, 38650 Lexington, #440, Fremont, Calif. 94536, and Leslie Will, P.O. Box 8310, San Jose, Calif. 95155
Filed Jan. 3, 1989, Ser. No. 294,010
Int. Cl.[5] B65B *67/04*
U.S. Cl. 248—97 12 Claims

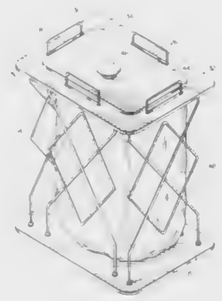
1. A bag stand for supporting one or more limp plastic bags with or without handles and each having an opening at the top thereof in an upright open-mouth condition, comprising:
(a) a pair of parallel mutually facing generally U-shaped frame members, each frame member of the pair including a horizontal support member of predetermined length lying in spaced parallelism in a common plane with the corresponding horizontal support member of the other frame member and having a pair of upright members integral with opposite ends of the horizontal support member, each upright member of each pair thereof at its end remote from said horizontal support member being integral with a horizontal top section extending substantially perpendicular to said associated upright member and said horizontal support member and parallel with the horizontal top section extending integrally from the other upright member of the pair, each said horizontal top section of each frame at its end remote from the associated



upright member terminating in vertical sections perpendicular to the associated horizontal top section and parallel with the associated upright member; and
(b) means connecting the mutually reaching corresponding horizontal top sections of said pair of mutually facing generally U-shaped frame members whereby said frame members are retained in spaced juxtaposed relationship to form a stand on which a limp plastic bag may be supported in upright open-mouth condition when applied to said stand

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4,921,196
GARBAGE CONTAINER
Ted Rudko, #207, 8604 - 103 Street, Edmonton, Alberta, Canada (T6E 4B6)
Filed Jul. 8, 1988, Ser. No. 216,807
Claims priority, application Canada, May 12, 1988, 566576
Int. Cl.[5] B65B *67/04*
U.S. Cl. 248—97 3 Claims



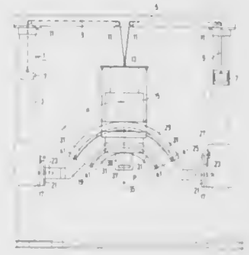
1. A container, comprising:
a. a body comprising a base and a skeletal frame extending therefrom defining an interior cavity with a peripheral upper edge defining an opening which provides access to the cavity;
b. at least one pair of shoulders extending substantially vertically from and being integrally formed on the peripheral edge, at opposed sides of the opening, whereby a bag may be suspended to hang down through the opening into the cavity; and
c. a closure lid comprising:
i. a frame defining a closure opening and having at least one pair of slots such that the shoulders may be received therein to removably couple the closure lid with the body; and
ii. a panel having a hinge on one side secured adjacent the opening for pivotal movement between a closed position in which the opening is obstructed and an open position in which access to the cavity may be obtained through the closure and body openings.

4,921,197
BAG HOLDING, DISPENSING, LOADING AND DISCHARGE SYSTEM
Gordon L. Benoit, Macedon; Lewis E. Sable, Rochester, and Richard A. Wenzel, Pittsford, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 36,599, Apr. 10, 1987, Pat. No. 4,819,898. This application Oct. 27, 1988, Ser. No. 263,291
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[5] B65B *67/12*
U.S. Cl. 248—97 3 Claims



1. Apparatus for holding a supply of flexible bags and for facilitating the opening and loading of individual bags from the supply, which comprises:
a base member;
means adapted for supporting a supply of bags, the bag supply supporting means being mounted on the base; and
means adapted for supporting an individual bag from the supply of bags at portions thereof and for holding the bag in an open, loadable condition, the individual bag supporting means including a pair of support legs mounted on the base and extending upwardly therefrom and spaced from each other and from the bag supply supporting means, each leg having mounted thereon a free-standing hooked end having a bag caming surface, the hooked ends and caming surfaces thereof being adapted to receive a folded down portion of an individual bag and to cause the bag to cam downwardly against the hooked end caming surfaces when the bag is loaded such that the perimeter of the folded down portion returns against the hooked ends under load conditions, wherein the hooked ends are rotatably mounted on the support legs, such that a distance between said hooked ends and said bag supply supporting means may be varied.

4,921,198
HOLDING MECHANISM FOR A MEASURING CRYOSTAT
Georg Naser, Zirndorf; Peter Reichelsdoerfer, Aalen, and Siegfried Schneider, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Dec. 3, 1987, Ser. No. 128,172
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3641945
Int. Cl.[5] A61B *5/05*
U.S. Cl. 248—123.1 16 Claims

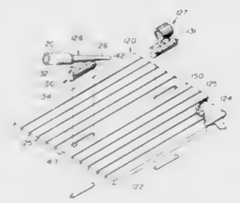


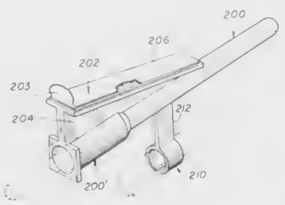
1. A holding mechanism for a measuring cryostat used for acquisition of biomagnetic signals, said mechanism comprising two vertically standing columns, each of said columns having a travelling box telescopically received thereon and displaceable therealong, a shackle extending between the two boxes having means at each end for forming a rotatable connection with the boxes, said shackle having means for mounting a cryostat, said means for mounting enabling pivoting of the cryostat in a shackle plane so that an axis of the cryostat can be rotated around a horizontal axis and pivoted relative to a vertical axis, a cross member connecting an upper end of each of the two vertically standing columns together, and each of the columns being hollow and receiving a counter-weight, said cross member forming a bridge for receiving cables connected to the counter-weights in each of the columns, said cables extending to the means for mounting the cryostat on the shackle so that movement of the shackle and boxes along the columns is counter-balanced by the weights in said columns.

4,921,199
DEVICE FOR AIDING IN PREPARATION OF INTRAVENOUS THERAPY
James W. Villaveces, 88 Fugenia Dr., Ventura, Calif. 93003
Continuation-in-part of Ser. No. 185,963, Apr. 25, 1988, Pat. No. 4,852,844. This application Nov. 8, 1988, Ser. No. 268,427
Int. Cl.[5] A61M *5/32*
U.S. Cl. 248—314 7 Claims

1. A device for aiding a nurse, or the like, in the preparation of intravenous therapy, and the like, comprising:
a backing plate having a substantially planar front surface and rear surface;
at least one means for holding and gripping a needle-cap mounted on said front surface defining a hollow interior into which a needle-cap may be inserted;
said rear surface of said backing plate having securing means thereon for attaching said backing plate to an IV pole, and the like, whereby a needle with its cap may be inserted into said means for holding and gripping to grip the needle-cap, after which the needle proper may be removed from its cap for use in intravenous therapy;
said backing plate being a thin plate that is flexible for wrapping about an IV pole or the like, said backing plate further comprising at least one elongated substantially linear slot formed in said front surface and extending rearwardly to at least a depth directly juxtapositioned adjacent said

rear surface; means for mounting said means for holding and gripping to said backing plate, said means for mounting comprising an elongated substantially linear retaining bead member forcibly insertable into said slot, and web means interconnecting said bead member to said means for





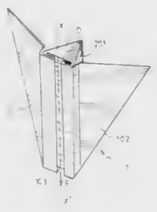
holding and gripping, whereby said thin plate is stamped out from stock to provide a very thin and flexible member, with said means for holding and gripping thereafter being mounted to said thin plate; said means for mounting also comprising means for limiting entrance of said bead member past a pre-selected insertion.

4,921,200

PEG FOR FIXING POSTS OR STAKES IN THE GROUND

Paul Moraly, 168-170, rue Victor Hugo, 93110 Rosny Sous Bois, France

Continuation of Ser. No. 119,252, Nov. 6, 1987, abandoned, which is a continuntion of Ser. No. 717,922, Mar. 29, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 246,030
Claims priority, application France, Aug. 16, 1984, 84 12858
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—545 **8 Claims**



1. A peg for anchoring posts or stakes in the ground, said peg comprising:

i an anchorage piece having an elongate shaped central web, said web extending along a driving direction of the peg and having upper and lower ends and at least two fins extending from said central web and each having an upper edge portion, and first slide assembly means provided on said central web, and

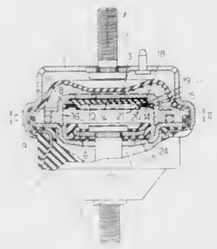
ii an elongate shaped sleeve having first and second opened ends and second assembly means adapted for cooperating with said first assembly means for removably assembling said sleeve on said central web through sliding engagement along said driving direction, with said upper end of the central web, said upper edge portions of the fins and said first opened end of the sleeve being substantially located in a same plane substantially at right angles to said driving direction, and the second end of the sleeve at least reaching the lower end of the central web.

4,921,201

HYDRAULIC ANTIVIBRATORY SUPPORTS

Pierre Jouadé, Chateaudun, France, assignor to Hutchinson, France

Filed Aug. 2, 1988, Ser. No. 227,299
Claims priority, application France, Aug. 3, 1987, 87 11002
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—562 **7 Claims**



1 An antivibratory device intended to be fitted for support and damping purposes between two rigid elements, formed by a sealed case comprising a rigid base able to be fixed to one of the two rigid elements, a rigid ring fixable to the other rigid element, a resilient annular support wall sealingly connecting the base to the ring and a flexible membrane connected sealingly to the ring, the inside of this case being divided by an intermediate dividing wall into two chambers, namely a work chamber on the annular wall side and a compensation chamber on the membrane side, these two chambers communicating with each other permanently through a restricted passage, a liquid mass filling the two chambers as well as the restricted passage, and the intermediate dividing wall comprising a floating valve, two rigid surfaces axially surrounding the periphery of the valve and complementary means for limiting the amplitude of the free movements of the valve, one of the two rigid surfaces being formed by a metal washer, bearing radially against an internal cylindrical face of a rigid annular piece secured to the other surface, said washer being formed by a flat ring extended outwardly by a circle of lugs extending substantially in the form of a truncated cone and dimensioned so that the contact between these lugs and the opposite cylindrical face causes a slight bending thereof and a buttressing effect and wherein said other surface forms part of the rigid annular piece against an internal cylindrical face against which the washer bears.

4,921,202

VERTICAL VIBRATION-DAMPING APPARATUS

Hiraku Miyake; Mitsuo Isbiguro; Yutaka Hayamizu, and Satoru Aizawa, all of Tokyo, Japan, assignors to Takenaka Corporation, Osaka, Japan

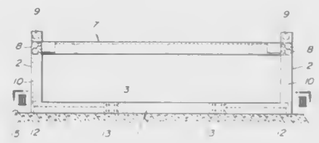
Filed Dec. 13, 1988, Ser. No. 283,810
Claims priority, application Japan, Jan. 6, 1988, 63-821
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—581 **8 Claims**

1. A vertical vibration-damping apparatus characterized in that

(a) a base member includes midair guide props provided perpendicularly at four corners of the base member and midair lateral guide frames each connected with lower end portions of said two opposite guide props;

(b) two movable spring frames are provided between said two lateral guide frames which are provided horizontally in parallel and face each other, said spring frames are movable horizontally along said lateral guide frames, a desired number of tension springs are coupled in parallel between said two movable spring frames, the length and strength of said tension springs are equal to each other;

(c) a vibration-damping floor is set horizontally at a relatively higher position of a space surrounded by said guide



props at said four corner positions, and said floor is supported by roller units which are free to move vertically along each said guide prop, each said roller unit is connected to one end of a flexible coupling member, such as a chain or a rope which is wound round a guide wheel at said upper end of said guide prop and takes a U-turn downward, the other end of each said coupling member is extended through said midair portions of said guide prop and said lateral guide frame and connected to said corresponding movable spring frame; and

(d) means cooperating with said movable spring frames for damping the horizontal movement of said movable spring frames to limit the tension displacement of the springs.

4,921,203

SPRING ELEMENT FOR A SHOCK ISOLATING MOUNT

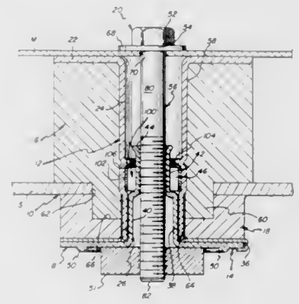
Francis C. Peterson, Woodbury, and Robert J. Despins, Madison, both of Conn., assignors to Buell Industries, Inc., Waterbury, Conn.

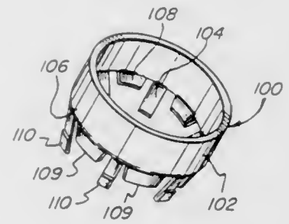
Filed Jan. 30, 1989, Ser. No. 303,816
Int. Cl.[5] B62D *27/04*
U.S. Cl. 248—635 **9 Claims**

1. In an assembly for securing a mounting part of structure onto a support, of the type comprising a rigid spacer member having a spacer flange and a spacer tube integral with the spacer flange and projecting from said spacer flange to extend through apertures in resilient bodies, said spacer tube having a plurality of inwardly directed protrusions; a rigid thimble member having a thimble flange and a thimble tube integral with the thimble flange and projecting from said thimble flange, said thimble tube being receivable inside and displaceable axially relative to said spacer tube, said thimble member and said spacer member having mutually engaging means for limiting rotation of either of them relative to the other, said thimble tube having an enlarged end having a substantially circular cross-section engageable by said inwardly directed protrusions; an elongate fastening device having a shank, a head portion, and an end portion, said shank extending through said spacer tube, and said end portion having means operable by manipulation of said fastening device to draw said thimble tube into said spacer tube and thereby draw said spacer and thimble flanges together and against said bodies, whereby the support is clamped between said bodies and flanges and said mounting part is secured between said head portion of said fastening device and one of said flanges; the improvement wherein said plurality of inwardly directed protrusions are provided by a spring element comprising:

an annular segment having

resilient holding tabs, extending radially inwardly from one end thereof, the tips of which define a substantially circular figure having a radius which is less than the radius of the enlarged end of said thimble; and aligning tabs extending radially inwardly from said one end of said annular segment, said aligning tabs being shorter





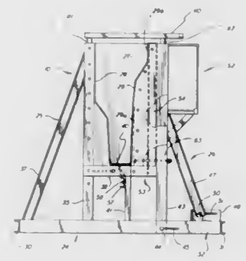
and wider than said holding tabs, the tips of said aligning defining a substantially circular figure having a radius which is greater than the radius of the substantially circular figure defined by the tips of the holding tabs and which is greater than or equal to the radius of the enlarged end of said thimble.

4,921,204

ADJUSTABLE MEDIAN BARRIER MOLD

Nicholas W. Melfi, Manlius, N.Y., assignor to Concrete Pipe & Products Corp., E. Syracuse, N.Y.

Filed Feb. 27, 1989, Ser. No. 315,905
Int. Cl.[5] B28B *7/02*
U.S. Cl. 249—2 **8 Claims**

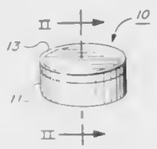


1. A fixture for adjustably supporting a mold of the type used to cast concrete median barrier sections of predetermined length, said fixture including

a horizontally disposed base,

a vertically disposed stationary frame affixed to said base,
a first side wall for said mold that is secured in said stationary frame,
a horizontally disposed bottom wall for said mold mounted in said stationary frame, said bottom wall including a fixed panel secured to said frame so that one side edge of said fixed panel abuts the bottom edge of said first side wall, and a removable panel removably mounted in said stationary frame adjacent to the fixed panel so that one side edge of the removable panel abuts the other side edge of the fixed panel to define the floor of the mold,
a vertically disposed movable frame slidably mounted in said base, said movable frame being arranged to move toward and away from said first side wall mounted in said stationary frame,
a second side wall for said mold that is slidably mounted in said movable frame so that said second side wall can be selectively positioned in a vertical plane said second side wall abutting the other edge of the removable floor panel, and
end wall means removably mounted between the two frames to close the ends of said mold.

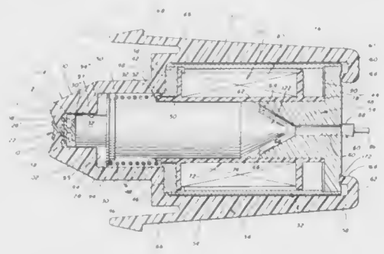
4,921,205
LENS MOLD ASSEMBLY
Arthur J. Drew, Jr., and Donald J. Ratkowski, both of Mesa, Ariz., assignors to Sola USA, Inc., Mesa, Ariz.
Filed May 17, 1988, Ser. No. 195,027
Int. Cl.[5] B29D *11/00*
U.S. Cl. 249—61 22 Claims



1. A mold assembly for producing an integral lens blank-mold cup unit suitable for subsequent finishing into an optical lens comprising: a mold cup having a cylindrical body portion circumscribing and enclosing a cavity defined therein for receiving uncured lens material monomers and a die supporting surface superposed to and disposed upon said body portion around said cavity and adapted to receive a die thereupon for coaction therewith to contain said monomers within said covered cavity while said monomers are cured, said cavity having a lower surface for supporting said lens material monomers before and during curing and firmly adhering to said fully cured lens material, said lower surface having a plurality of spaced concentric grooves defined therein and a radius die positionable upon said die supporting surface while said monomers are cured into adhering engagement with said mold cup and removable therefrom to provide an integral lens blank-mold cup unit.

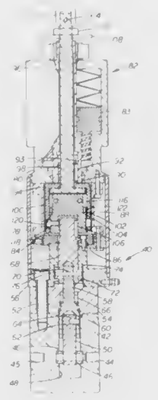
4,921,206
SNAP-TOGETHER SOLENOID OPERATED PINCH VALVE ASSEMBLY
Harvey J. Dunstan, Wheathampstead; Ian D. Gilbert, St. Albans, both of England; Ervin Fayer, Hollywood, Fla.; George G. Dominick, Miramar, Fla., and Avelino De Oliveira, Ft. Lauderdale, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.
Filed Dec. 20, 1988, Ser. No. 287,193
Int. Cl.[5] F16K *7/04*
U.S. Cl. 251—7 21 Claims

1. A solenoid operated pinch valve assembly operable upon at least one flexible conduit capable of carrying a fluid and having longitudinal ear means unitary therewith along a portion of the length thereof; said pinch valve assembly comprising: a housing and a body, means on said body removably securing said body in communicating relationship with said housing, solenoid means within said housing, a first rigid formation unitary with said body and extending axially outwardly thereof in one direction defining a passage therebetween for receiving the flexible conduit therethrough, said body having an axial chamber opening to the opposite ends thereof, linearly reciprocable plunger means disposed within said chamber and housing and having one end disposed within said solenoid



means and an opposite end seated within said chamber, orthogonal slot means of size and configuration capable of accommodating the ear means of the flexible conduit therethrough and across the path of said plunger means, resilient means within said chamber for biasing said plunger means in one direction normally to compress the flexible conduit against said rigid formation to place said flexible conduit in a cease flow compressed condition and said solenoid means capable of being energized to effect linear movement of said plunger means against said bias to pull said conduit from the compressed condition to an open condition permitting flow therethrough.

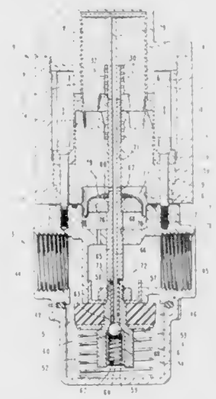
4,921,207
ACTUATED GATE VALVE WITH MANUAL OVERRIDE
Gerald S. Baker, Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.
Filed Aug. 22, 1989, Ser. No. 397,011
Int. Cl.[5] F16K *31/143*
U.S. Cl. 251—14 11 Claims



1. A gate valve comprising
a body having a gate chamber therein with an inlet and an outlet communicating therewith,

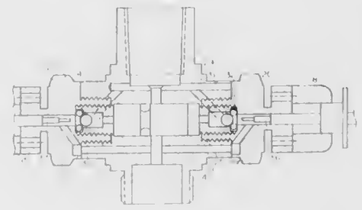
a gate positioned within said gate chamber for reciprocation therein between positions opening and closing flow between the inlet and the outlet,
a gate stem,
a pressure responsive actuator having an actuator stem and providing movement of such actuator stem,
said pressure responsive actuator including an engagement surface,
a manual override stem, and
a drive means connecting said gate stem to both of said actuator stem and said manual override stem for actuation of said gate,
said drive means including an overrunning clutch connection being engageable with said engagement surface,
said clutch connection being operated only by said manual override stem and being selectively moveable into and out of engagement with said engagement surface, and
wherein movement of said gate responsive to movement of said manual override stem being independent of any position and any movement of said actuator and said actuator stem without having to overcome the pressure loading of the actuator.

4,921,208
PROPORTIONAL FLOW VALVE
Drew P. LaMarca, Whippany, N.J., assignor to Automatic Switch Company, Florham Park, N.J.
Filed Sep. 8, 1989, Ser. No. 404,945
Int. Cl.[5] F16K *31/04*
U.S. Cl. 251—30.04 11 Claims



1. A proportional flow valve comprising:
a valve body including an inlet port, an outlet port, and a valve seal between the ports, the valve seal surrounding an orifice,
a valve member movable into and out of engagement with the valve seat to close and open the valve, respectively, the pressure of fluid from the inlet port urging the valve member into engagement with the valve seat when the valve is closed,
a pressure member movable with respect to the valve seat,
means for rigidly interconnecting the pressure member and the valve member,
passageway means through which high pressure fluid from the inlet port can flow to the pressure member, so as to counterbalance the high pressure fluid acting on the valve member, the pressure member thereby opposing the force of fluid pressure from the inlet port tending to close the valve,
support means within the valve body for slidably receiving said passageway means,
vent means carried by the passageway means through which the passageway means can communicate with the outlet port, the vent means moving into the support means to close the vent means when the pilot valve is opened, to permit pressurizing of the pressure member, so as to establish the counterbalancing between the pressure member and the valve member, and the vent means moving out of said support means to open the vent means when the pilot valve is closed, so as to depressurize the pressure member,
resilient means constantly urging the valve member toward the valve seat, and
a solenoid actuator for moving the passageway means to move the valve member out of engagement with the valve seat against the force of the resilient means, the distance which the valve member moves from the seat being proportional to the amount of current applied to the actuator.

4,921,209
WATER CONTROL VALVE
Hubert J. Moineau, Bolton, Mass., assignor to Automatic Specialties, Inc., Marlboro, Mass.
Division of Ser. No. 207,738, Jun. 16, 1988, Pat. No. 4,867,189.
This application May 19, 1989, Ser. No. 354,348
Int. Cl.[5] F16K *31/122*
U.S. Cl. 251—30.01 9 Claims



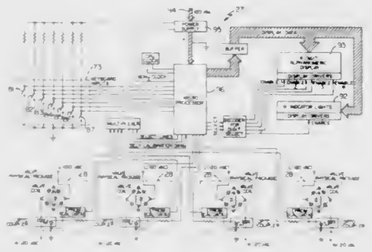
1. A valve for controlling the flow of water which valve comprises:
(a) a valve body having a central longitudinal axis and a water inlet adapted to be connected to a pressurized water source, and a water outlet adapted to be connected to a shower head, the said water inlet and outlet aligned along a transverse axis of the valve body and a flow control chamber along the longitudinal axis of the valve body and connecting the said water inlet and water outlet;
(b) a water control piston slidable in said flow control chamber, said piston having first and second opposite ends, and having an off center conduit for selectively connecting the said water inlet and water outlet;
(c) the valve body having a first passage connecting the said water inlet and the first end of the said piston;
(d) the valve body having a second passage connecting the said water outlet and the second end of said piston;
(e) a first check valve means in said first passage to prevent water from flowing out of said first passage;
(f) a second check valve means in said second passage to prevent water from flowing out of said second passage; and
(g) first solenoid means and second solenoid means at opposite ends of the said flow chamber, the first solenoid means on energizing opening said first check valve means to cause water to flow from said water inlet to said water outlet through the off center conduit of the said piston, and the second solenoid means on energizing opening said second check valve means to prevent the flow of water from the said water inlet to the said water outlet, thereby controlling the flow of water through the valve.

4,921,210

FUEL CONTROL SYSTEM, THROTTLE VALVE UNIT THEREFOR AND METHODS OF MAKING THE SAME

Donald W. Hutchison; Steven A. Kimmel, both of Greensburg; Raymond J. Bonkovich, Mt. Pleasant; James P. Chew, Jeannette, and David J. Rath, Mt. Pleasant, all of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 21, 1988, Ser. No. 260,817
Int. Cl.[5] F16K *31/08*
U.S. Cl. 251—129.08 11 Claims



1. In a fuel control system comprising a burner means, a source of fuel for said burner means, a throttle valve unit for interconnecting said source of fuel to said burner means, said throttle valve unit having a movable valve member and a valve seat controlled by said valve member, said throttle valve unit having electrically operated means operatively associated with said valve member to control the position of said valve member relative to said valve seat so as to control the flame height at said burner means, said electrically operated means comprising a fixed magnet means and a movable magnet means each of which is adapted to provide a magnetic field that will react with the other magnetic field, one of said magnet means having electrical conductor means that is adapted to vary the force of its said magnetic field in relation to the magnitude of an electrical current passing therethrough whereby said valve member is adapted to be positioned relative to said valve seat ian relation to the effect created between said magnetic fields, a source of electrical current, and means for generating an electrical current signal from said source of electrical current and for passing said electrical current signal through said electrical conductor means so as to position said valve member relative to said valve seat in relation to the magnitude of said electrical current signal, said source of electrical current being an alternating current source, said means for generating said signal having means for converting said alternating current to an effective direct current flow and passing that effective direct current flow through said electrical conductor means, the improvement wherein said means for converting comprises a full wave rectifier means that places said electrical conductor means across said alternating current source and a capacitor means in parallel with said electrical conductor means, said means for generating said signal comprising a triac in series with said rectifier means and being adapted to interconnect said rectifier means across said alternating current source each time said triac is turned on and to disconnect said rectifier means from across said alternating current source each time said alternating current source has a zero crossing.

4,921,211

METHOD AND APPARATUS FOR FLOW CONTROL

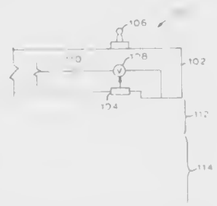
Joel S. Novak, Sudbury; Natan E. Parsons, Brookline, and Kenneth M. Steiner, Sudbury, all of Mass., assignors to Recurrent Solutions Limited Partnership, Cambridge, Mass.

Filed Feb. 24, 1989, Ser. No. 315,921
Int. Cl.[5] F16K *31/06*; E03C *5/10*
U.S. Cl. 251—129.04 6 Claims

1. A flow-control system, adapted for connection to an electrically operated valve that operates between open and closed states in response to electrical control signals applied thereto, for applying control signals to the electrically operated valve, the flow control system comprising:

A a position sensor for repeatedly sensing the distances to objects and for generating distance signals representing the sensed distances; and

B. control means responsive to the distance signals for computing an average-distance value from the sensed distances and for applying control signals to the valve to open and close it in accordance with predetermined criteria applied to the sensed distances, which criteria are different when the sensed distance is greater than the average-distance value from what they are when the sensed distance is less than the average-distance.



4,921,212

HYBRID BUTTERFLY VALVE

Laurence deQuay, Slidell, La., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 7, 1989, Ser. No. 404,292
Int. Cl.[5] F16K *1/22*
U.S. Cl. 251—163 12 Claims



1. A hybrid butterfly valve having a body including an axially extending fluid conduit formed therethrough, a shaft journally mounted within said body and disposed transverse to the axis of said conduit, bracket means loosely disposed on said shaft for movement relative to said shaft in a direction parallel to the axis of said conduit, a valve disk disposed within said conduit, said disk being secured to said bracket means and moveable therewith, a valve seat disposed within said conduit for receiving said disk in sealed relationship therewith for shutting flow of fluid through said conduit, a pair of guide members fastened to said disk and elongated along an axis substantially parallel to said shaft, a guide slot corresponding to each guide member formed in said body for receiving a respective guide member, each guide slot including an arcuate portion spaced from said shaft and having an axis coincident with the axis of said shaft, each arcuate portion terminating at a linear portion substantially parallel to the axis of said conduit extending radially from said shaft toward said valve seat, cam means fastened to said shaft, said cam means having a substantially elliptical configuration having a major axis eccentrically disposed relative to the axis of said shaft so as to have a first distal end on said major axis further from said shaft than a second distal end on said major axis, first and second cam follower means, at least one of said follower means being carried by said bracket means, said cam follower means being disposed for contacting respective first and second distal ends of said cam means when said guide members are disposed in said arcuate portion, and means for turning said shaft to turn said cam means for rotating said bracket means and thus said disk while said guide members are in said arcuate portion and and for therefore forcing said bracket means and said disk linearly with said guide members in said linear portion until said disk is in sealed relationship with said seat.

4,921,213

VALVE SLIDE

Friedrich Geiser, Nüziders, Austria, assignor to Vat Holding AG, Haag/SG, Switzerland

Filed Sep. 8, 1989, Ser. No. 404,897
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1988, 3831249
Int. Cl.[5] F16K *3/18*
U.S. Cl. 251—328 9 Claims



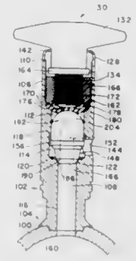
1. In a valve slide including a slide housing and defining a slide passage opening, a closing member slidable in the plane of the slide into a closed position for closing the slide passage opening, a sealing surface being provided surrounding the slide passage opening, wherein, in the closed position of the closing member, a circumferentially closed sealing member whose shape corresponds to the sealing surface rests against the sealing surface, imaginary straight generatrices of the sealing surface extending at a right angle to the plane in which the axis of the slide and the sliding direction of the closing member are located, wherein the improvement comprises that, in the direction of the generatrices of the sealing surface, the sealing surface has an upper portion, a middle portion and a lower portion, each portion defining a plane, the upper portion and the lower portion each including an obtuse angle with the middle portion, the planes of the upper portion and of the lower portion of the sealing surface extending approximately perpendicularly to the sliding direction of the closing member, the circumferentially closed sealing member having components which interact with the sealing surface, wherein at least the components of the sealing member which interact with the middle portion of the sealing surface extend along straight lines and parallel to that plane which includes the axis of the slide and the direction of sliding of the closing member.

4,921,214

NON-REFILLABLE PACKLESS VALVE FOR PRESSURIZED CONTAINERS

Robert H. Jernberg, East Hampton, Conn., assignor to Amtrol Inc., West Warwick, R.I.

Continuation-in-part of Ser. No. 353,611, May 18, 1989, abandoned. This application Jun. 8, 1989, Ser. No. 363,074
Int. Cl.[5] B65D *47/02*
U.S. Cl. 251—335.2 10 Claims



1. Non-refillable valve for a pressure container, comprising:

(a) a housing, having a central bore which has a middle portion, a lower portion that is narrower than the middle portion of said central bore, an upper portion that is narrower than said middle portion of said central bore and an uppermost portion that is wider than said upper portion of said central bore, and having a side port which communicates with the lower region of said middle portion of said central bore, the lower end of said housing being adapted to sealingly engage said pressure container in a manner which provides communication between said pressure container and said lower portion of said central bore;

(b) a nozzle, having a bore therein which communicates with the atmosphere, said nozzle being positioned on the side of said housing and being in communication with said middle portion of said central bore via said side port in said housing;

(c) an insert ring positioned in said uppermost portion of said central bore;

(d) valve stem means positioned in upper portion of said central bore in a rotatable manner by which the valve stem means is advanced back and/or forth in said central bore;

(e) a diaphragm, having a central hemispherical or curved portion and a rim, the convex portion of the central portion facing the valve stem, the end of said insert ring contacting said rim of said diaphragm so as to hold it in position against the interface between said uppermost portion and said upper portion of said central bore; and

(f) a resilient valve sealing member which has a lower body portion, an upper extension portion and a centrally-located bore which does not extend through the top of the valve sealing member, said extension portion having a top hemispherical, curved or flat portion which is in mating relationship with or contacting, respectively, said hemispherical or curved portion of said diaphragm, said body portion having a top rim portion which has a lateral dimension which is larger than the lateral dimension of said upper portion of said central bore of said housing and which is less than the lateral dimension of the middle portion of said central bore of said housing, said body portion having a bottom seating portion which is capable of seating at or on the interface of said middle portion and bottom portion of said central bore of said housing, said top rim portion not containing any indentations, and said body portion not containing any arms, said top rim portion of said valve sealing member being compressingly

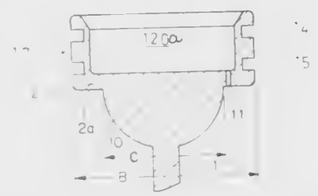
positioned in said upper portion of said central bore when said valve is inactive or being filled, said valve sealing member being pushed into said middle portion by means of said valve stem means via said diaphragm when said valve is placed in the active position, said valve sealing member being seated against said interface between said middle and lower portions of said central bore when said valve is closed, said sealing member being positioned in said middle chamber above a said seating interface with said valve is used for discharge of said container, and said sealing member sealingly engaging said seating interface when refill of said container with pressurized fluid is attempted.

4,921,215

REDUCING VALVE ASSEMBLY WITH SPHERICALLY SHAPED OPERATING PART

Katsuji Fujiwara, Hyogo, Japan, assignor to TLV Co., Ltd.

Continuation-in-part of Ser. No. 917,401, Oct. 10, 1986, abandoned. This application Sep. 29, 1988, Ser. No. 251,187
Int. Cl.[5] F16K *31/122*
U.S. Cl. 251—63.4 6 Claims



1. In a reducing valve assembly, including a fluid inlet port (**112**) and a fluid outlet port (**116**), with a main valve for controlling flow therethrough, wherein said main valve includes a valve member (**118**) movable with respect to a main valve seat (**114**) and actuated by an operating part comprising a piston (**120**) having a piston rod (**1**) extending toward the main valve seat and engageable with the main valve member for moving the main valve member away from the main valve seat, the improvement comprising the piston (**120***a*) being connected in cantilever fashion to only an end of the piston rod, said piston being slidably mounted in a cylinder of the valve assembly to act as the sole guiding mechanism for movement of the piston rod, a movable wall having an approximately circular section through the center of said piston and being spaced from said valve seat, said movable wall extending outwardly in a diametrical direction from said piston rod to said piston, said piston having an outer peripheral wall connected directly to said movable wall, said outer peripheral wall carrying the outer maximum diameter of said piston, said movable wall having a flat annular section (*2a*) directed around said approximately circular section under said piston, with the ratio between the maximum diameter of said approximately circular section to the maximum diameter of the piston being in the range of from about 0.4 to 0.7.

4,921,216

STAPLE REMOVER

Ronald F. Krulich, 8945 Mystic La., Warren, Mich. 48093

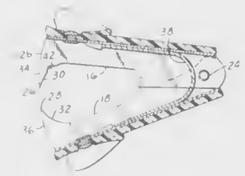
Filed May 4, 1988, Ser. No. 190,005
Int. Cl.[5] B25C *11/00*
U.S. Cl. 254—28 2 Claims

1. A staple remover for removing a staple from stapled material, said staple having a predetermined width, said staple remover comprising:

a first jaw having two first jaw members, each of said two first jaw members having an upper cam surface and a lower cam surface, said upper and lower cam surfaces of each of said two first jaw members conjoining to form a first pointed extremity, said upper and lower surfaces of each of said two first jaw members smoothly diverging from each other with increasing distance from said first pointed extremity, said two first jaw members being mutually separated a distance just less than said width of said staple;

a second jaw having two second jaw members, each of said two second jaw members having an upper cam surface and a lower cam surface, said upper and lower cam surfaces of each of said two second jaw members conjoining to form a second pointed extremity, said upper and lower surfaces of each of said two second jaw members smoothly diverging from each other with increasing distance from said second pointed extremity, said two second jaw members being mutually separated a distance just less than said distance of separation of said two first jaw members such that said two second jaw members may be inserted between said two first jaw members, said first pointed extremity of each of said first two jaw members facing said second pointed extremity of each of said second two jaw members;

pivoting means connected with said first jaw and said second jaw for pivotally connecting said first jaw with said second jaw so that said first extremity of each of said two first jaw members and said second extremity of each of said two second jaw members may be selectively squeezed together so that said two second jaw members may be inserted between said two first jaw members;



resiliency means for resiliently biasing said first extremity away from said second extremity, said resiliency means attaching to each of said first and second jaws on either side respectively of said pivoting means; and

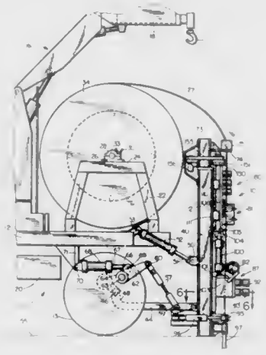
notch means located on each said upper cam surface of said first jaw members for receiving said staple after said first jaw and said second jaw have been squeezed together a predetermined amount, said notch means being located so as to receive said staple before said staple has been freed from said stapled material when said first and second jaws are forced between said staple and said stapled material by squeezing together of said first and second jaw, said staple contacting only each said upper cam surface of said second jaw members when said staple is received by said notch means, said notch means including a first notch surface which is substantially parallel in relation to said lower cam surface of said first jaw members, said notch means further including a second notch surface substantially perpendicular to said first notch surface for engaging said staple when said staple is received by said notch means.

4,921,217

GROUND RODS AND APPARATUS FOR FORMING AND PLACING SUCH RODS

Anton M. Kies, KA Oisterwijk, and Harry C. van den Nieuwelaar, AD Gilze, both of Netherlands, assignors to Erico International Corporation, Solon, Ohio

Continuation-in-part of Ser. No. 925,225, Oct. 31, 1982, abandoned. This application Oct. 19, 1987, Ser. No. 107,798
Int. Cl.[5] E21B *19/22*
U.S. Cl. 254—29 R 26 Claims



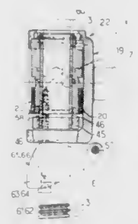
1. A ground rod driver comprising a frame, a coil supply of continuous ground rod feeding said driver, a jaw slide assembly mounted on said frame for movement toward and away from the ground, power means to move said assembly toward and away from the ground, and a power-operated releasable gripping jaw mounted on said slide assembly operative automatically to grip a ground rod when said slide is moved toward the ground, and release such ground rod when said slide is moved away from the ground, whereby such continuous ground rod may be pulled from said coil supply and driven incrementally into the ground.

4,921,218

TRANSLATION NUT TO BE USED IN A LIFTING UNIT

Jean-Luc Andre, Dangolsheim, France, assignor to Lohr, S.A., Hangenbieten, France

Filed Dec. 23, 1988, Ser. No. 289,060
Claims priority, application France, Dec. 23, 1987, 87 18266
Int. Cl.[5] B66F *3/08*
U.S. Cl. 254—98 10 Claims



1. A translation screw-nut system for a lifting unit operatively associated with a support platform to be adjustably moved in a translational manner, comprising:

a sliding block operatively connected to said support platform;

a threaded screw disposed for rotation about a longitudinal axis thereof;

a nut threadedly engaged upon said threaded screw;

means supporting said sliding block upon said nut for permitting said threaded screw and said nut to rotate relative to said sliding block;

first rotational transmission engagement means fixedly mounted upon said nut; and

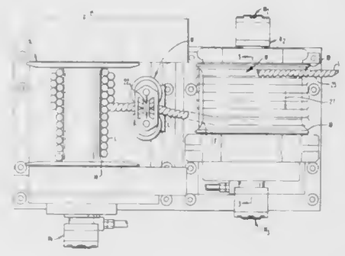
second rotational transmission engagement means movably mounted upon said sliding block between a first position at which said second rotational transmission engagement means is operatively separated from said first rotational transmission engagement means of said nut such that rotation of said threaded screw and said nut is not transmitted to said sliding block, and a second position at which said second rotational transmission engagement means is operatively connected to said first rotational transmission engagement means of said nut such that rotation of said threaded screw relative to said nut and said sliding block causes translational movement of said sliding block and said support platform.

4,921,219

POWERED SAILBOAT WINCH

William C. Ottemann, Fremont, and Richard A. Gabellini, Aptos, both of Calif., assignors to IMI-Barient, Inc., Guilford, Conn.

Continuation of Ser. No. 181,005, Apr. 13, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 403,997
Int. Cl.[5] B66D *1/08*
U.S. Cl. 254—284 6 Claims



1. A winch for bringing in a line having a load on one end with gathering of said line at the other end at high speed and low tension or slow speed and high tension, said winch comprising in combination:

a take-up drum;

said take-up drum attached to the end of said line, said take-up drum defining a reel with sufficient space for the storage of line thereon;

a level wind for feeding said line to said take-up drums;

a single high torque drum having said line wound continuously about said single high torque drum in multiple turns between said level wind to said take-up drum and a load on said line;

said single high torque drum having two end surfaces configured to induce climbing of said line at said multiple turns on said single high torque drum and defining a surface sufficiently smooth to permit climbing of said line at said multiple turns over the surface of said single high torque drum;

a first motor for driving said take-up drum;

a second motor for driving said single high torque drum;

ratchet means for permitting said single high torque drum to spin free of said second motor and feed the line to said take-up drum;

means for running said first motor at low line tension and said first and second motors at high line tension for permitting said take-up drum to take in said line at low line tension and said take-up drum to tail said single high

torque drum at high line tension whereby said line can be brought in;

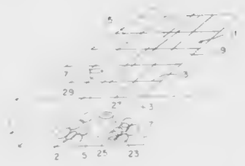
a clutch means operatively connected to said first and second drums for permitting the controlled release of said line.

4,921,220

METAL GRID PERIMETER OBSTACLE TRAP

Steven Arakaki, 927 Laki Road, Honolulu, Hi. 96817

Filed Apr. 26, 1989, Ser. No. 343,416
Int. Cl.[5] E04H *17/00*
U.S. Cl. 256—1 16 Claims



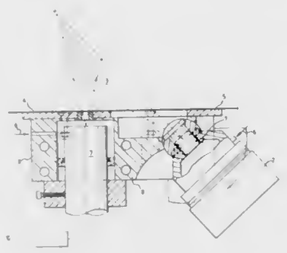
1. A horizontal anti-personnel security fence comprising an elongated trench surrounding an installation, anti-personnel wire at the bottom of the trench, a metal grid covering the trench, having openings of about 3×3 feet, the trench being to about 3 to about 5 feet deep, and being about 12 to about 24 feet across for dropping, trapping and injuring personnel attempting to breach the horizontal fence.

4,921,221

MONITORING PYROGENIC PROCESSES

Douglas S. Flett; Gary Holt, and Peter J. Tily, all of Stevenage, Great Britain, assignors to Secretary of State for Trade and Industry, Minerals and Metals Division, Warren Springs Laboratory, Stevenage-Hertfordshire, United Kingdom

Filed Nov. 1, 1988, Ser. No. 265,708
Claims priority, application United Kingdom, Nov. 3, 1987, 8725741
Int. Cl.[5] C22B *1/00*
U.S. Cl. 75—385 20 Claims



1. Apparatus for monitoring a pyrogenic process utilizing a furnace, combustion chamber, flue, and/or duct containing offgas produced by a pyrogenic reaction, comprising:

a housing adapted for mounting on at least one of the furnace, combustion chamber, flue, and duct;

a primary X-ray source mounted on said housing for producing a beam of X-rays directed into the off-gas;

X-ray detector means mounted on said housing in a position offset from said X-ray source for receiving radiation produced by X-ray fluorescence caused by said X-rays of elements in the offgas;

said X-ray source and detector means being directed at an angle with respect to each other; and

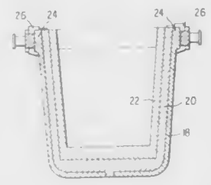
cooling and flushing means for passing cooling and flushing fluids through said housing for protecting said X-ray source and detector means from the environmental conditions of the off-gas.

4,921,222

FIBER COMPOSITE ARTICLE AND METHOD OF MANUFACTURE

John R. Mott, Walkersville, Md., assignor to Advanced Metals Technology Corp., Frederick, Md.

Filed Apr. 5, 1988, Ser. No. 179,745
Int. Cl.[5] C21C *5/45*
U.S. Cl. 266—275 18 Claims



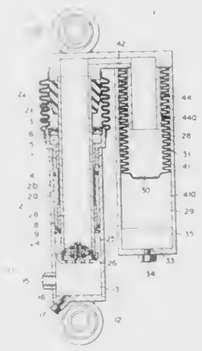
1. An article for use in production of metals comprising a transportable vessel having a concave outer structural wall of inductively transparent fibers and inductively transparent cement means for cementing said fibers together wherein said cement means and said fibers are capable of withstanding high temperatures without substantial degradation and said wall is substantially transparent to a broad range of electromagnetic energy frequencies including frequencies in excess of 200 Hz for heating or stirring said metals and said fibers and said cement means provide the primary structural strength for maintaining the shape of the vessel when containing said metals.

4,921,223

CAR SUSPENSION SYSTEM

Takeo Fukumura, Yokohama; Takeyoshi Shinbori, Yokosuka, and Nobuya Ezure, Zama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jan. 13, 1989, Ser. No. 297,666
Claims priority, application Japan, Jan. 30, 1986, 61-16743; Jun. 13, 1986, 61-90451[U]
Int. Cl.[5] F16F *9/04, 5/00, 9/06, 9/43*
U.S. Cl. 267—64.23 7 Claims



1. A hydro-pneumatic suspension system used in a vehicle, comprising:

a cylindrical, hollow main housing having an open first end and a closed second end, an interior of said main housing defining a first oil chamber filled with oil;

a rod inserted into the interior of said main housing through the open first end, said rod being movable within a predetermined stroke in an axial direction of said main housing and having an inner end portion located inside of said main housing, an outer end portion located outside of said main housing and an oil passage extending in an axial direction of said rod and communicating with the first oil chamber;

damping force-generating means mounted on said rod and including an orifice permitting the oil in said housing to pass therethrough, said damping force-generating means being adapted to damp reciprocation of said rod by utilizing viscous resistance of the oil when said rod moves in the axial direction of said main housing;

a cylindrical, hollow sub housing having a closed first end portion and a second end portion;

connecting means for connecting the oil passage of said rod and the second end portion of said sub housing together, said connecting means having an oil passage;

metal bellows received within said sub housing and arranged coaxial therewith, said bellows having a fixed end fixed to the second end portion of said sub housing in a liquid tight manner and a closed free end, said bellows having an outer diameter smaller than an inner diameter of said sub housing, said bellows being expansible and contractible in an axial direction of said sub housing;

a second oil chamber defined by an inner wall of said metal bellows, said second oil chamber communicating with the first oil chamber of said main housing through both the oil passage of said connecting means and the oil passage of said rod;

a gas chamber defined by both an outer wall of said bellows and an inner wall of said sub housing, said gas chamber containing a high-pressure compressed inert gas which is sealed therein for providing a repulsive force, the repulsive force acting in such a way as to withstand a load applied in a direction in which said rod is pushed into said main housing, said gas chamber having an internal volume large enough to absorb a variation in the degree of insertion of said rod into said main housing when said rod moves within the predetermined stroke; and

a predetermined amount of gas spring constant-adjusting liquid contained in said gas chamber, an effective internal volume of said gas chamber adjusted in accordance with the amount of liquid, and an upper surface of the liquid facing the closed free end of said metal bellows.

4,921,224

CAR SUSPENSION SYSTEM

Takeo Fukumura, Yokohama; Takeyoshi Shinbori, Yokosuka, and Nobuya Ezure, Zama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Division of Ser. No. 5,556, Jan. 20, 1987, Pat. No. 4,828,231.
This application Jan. 13, 1989, Ser. No. 297,662
Claims priority, application Japan, Jan. 30, 1986, 61-16743; Jun. 13, 1986, 61-90451[U]
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] F16F *9/04, 5/00, 9/06, 9/43*
U.S. Cl. 264—64.23 7 Claims

1. A hydro-pneumatic suspension system used in a vehicle, comprising:

a cylindrical, hollow main housing having an open first end and a closed second end, an interior of said main housing defining a first oil chamber filled with oil;

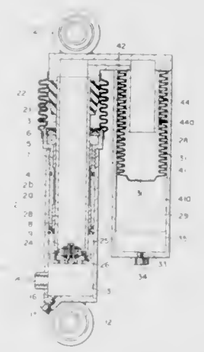
a rod inserted into the interior of said main housing through the open first end, said rod being movable within a predetermined stroke in an axial direction of said main housing and having an inner end portion located inside of said main housing, an outer end portion located outside of said main housing, and an oil passage extending in an axial direction of said rod and communicating with the first oil chamber;

damping force-generating means mounted on said rod and including an orifice permitting the oil in said main housing to pass therethrough, said damping force-generating means being adapted to damp reciprocation of said rod by utilizing viscous resistance of the oil when said rod moves in the axial direction of said main housing;

a cylindrical, hollow sub housing having a closed first end portion and a second end portion;

connecting means for directly connecting the oil passage of said rod and the second end portion of said sub housing together, said connecting means having an oil passage;

a metal bellows received within said sub housing and arranged coaxial therewith, said bellows having a fixed end fixed to the first end portion of said sub housing in a liquid tight manner and a closed free end, said bellows having an outer diameter smaller than an inner diameter of said sub housing, said bellows being expansible and contractible in an axial direction of said sub housing;



a second oil chamber defined by both an outer wall of said metal bellows and an inner wall of said sub housing, said second oil chamber communicating with the first oil chamber of said main housing through both the oil passage of said connecting means and the oil passage of said rod;

a gas chamber defined by an inner wall of said bellows, said gas chamber containing a high-pressure compressed inert gas which is sealed therein for providing a repulsive force, the repulsive force acting in such a way as to withstand a load applied in a direction in which said rod is pushed into said main housing, said gas chamber having an internal volume large enough to absorb a variation in the degree of insertion of said rod into said main housing when said rod moves within the predetermined stroke; and

a predetermined amount of gas spring constant-adjusting liquid contained in said gas chamber, an effective internal volume of said gas chamber being adjusted in accordance with the amount of the liquid, and an upper surface of the liquid facing the closed free end of said metal bellows.

4,921,225

PNEUMATIC SPRING STRUCTURE WITH DUAL OUTPUT FORCE AND PRESSURE DECAY COMPENSATION AND METHOD OF OPERATION

George C. Ludwig, Marion, S.C., assignor to Maremont Corporation, Carol Stream, Ill.

Division of Ser. No. 246,682, Sep. 20, 1988, Pat. No. 4,854,554, which is a division of Ser. No. 946,203, Dec. 19, 1986, Pat. No. 4,788,747. This application May 18, 1989, Ser. No. 353,553
Int. Cl.[5] F16F *5/00, 9/06, 9/36*
U.S. Cl. 267—64.13 11 Claims

1 A pneumatic spring link comprising: a cylinder with a

closed end; a piston assembly in said cylinder having a piston shaft with one end projecting from the other end of said cylinder, bushing means on said shaft, an annular seal means around said shaft, a piston means fixed on the other end of said shaft; said other end of the cylinder having means to retain said bushing means within said cylinder; a shaft seal means providing a seal against the cylinder and a dynamic seal around said shaft; a predetermined quantity of oil being contained in said cylinder; a predetermined accurate quantity of gas under at least several atmospheres of pressure in said cylinder; and



cooperative means at said other end of said cylinder for providing at least a dual output force for said spring link; said cooperative means including: said bushing means; said annular seal means which can be axially shifted in said cylinder from and toward said means to retain said bushing means within said cylinder; and means adjacent said projected end of said shaft that comprises first abutment means adapted to engage and force said bushing means further into said cylinder as the retraction movement of said shaft is deliberately forced beyond a normal retraction limit position.

4,921,226

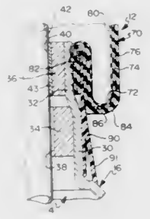
LINED AIR SLEEVE ASSEMBLY FOR AIR SPRING DAMPER

James M. Pees, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1989, Ser. No. 329,047

Int. Cl.[5] F16F *9/32*

U.S. Cl. 267—64.24 **5 Claims**



1 A suspension device for a vehicle, comprising:

(a) a damper having relatively movable telescopic parts including

(i) a rigid tubular member,

(ii) a piston assembly mounted inside the tubular member for stroking movement, and

(iii) a piston rod connected to the piston assembly and extending through one end of the tubular member;

(b) a corded, resilient sleeve member having first and second ends, and inner and outer surfaces;

(c) a resilient liner, formed separately from the sleeve member and having first and second ends, the liner positioned adjacent to and completely covering the inner surface of the sleeve member;

(d) first fastener means for securing the respective first ends of the sleeve member and the liner in an airtight manner with respect to the tubular member; and

(e) second fastener means for securing the respective second ends of the sleeve member and liner in an airtight manner with respect to the piston rod so that the liner forms a closed chamber for receiving and containing a pressurized fluid, wherein the chamber surrounds a portion of the damper to provide an air spring capable of yieldably resisting telescopic movement of the damper.

4,921,227

CAR SUSPENSION SYSTEM

Takeo Fukumura, Yokohama; Takeyoshi Shinbori, Yokosuka, and Nobuya Ezure, Zama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

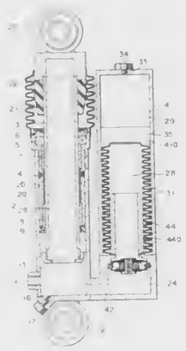
Division of Ser. No. 5,556, Jan. 20, 1987, Pat. No. 4,828,231.

This application Jan. 13, 1989, Ser. No. 297,572

Claims priority, application Japan, Jan. 30, 1986, 61-16743; Jun. 13, 1986, 61-90451

Int. Cl.[5] F16F *9/04*

U.S. Cl. 267—64.23 **8 Claims**



1 A hydro-pneumatic suspension system used in a vehicle, comprising:

a cylindrical, hollow main housing having a first end and a second end, an interior of said main housing defining a first oil chamber filled with oil;

a rod inserted into the interior of said main housing through the first end, said rod being movable within a predetermined stroke in an axial direction of said main housing and having an inner end portion located inside of said main housing, and an outer end portion located outside of said main housing;

a cylindrical, hollow sub housing having a closed first end portion and a second end portion;

connecting means for connecting the first oil chamber of said main housing and the second end portion of said sub housing together, said connecting means having an oil passage;

a metal bellows received within said sub housing and arranged coaxial therewith, said bellows having a fixed end fixed to the second end portion of said sub housing in a liquid tight manner and a closed free end, said bellows having an outer diameter smaller than an inner diameter of said sub housing, said bellows being expansible and contractible in an axial direction of said sub housing;

a second oil chamber defined by an inner wall of said metal bellows, said second oil chamber communicating with the first oil chamber of said main housing through the oil passage of said connecting means;

damping force-generating means disposed within said sub housing and including an orifice permitting the oil in said main and sub housings to pass therethrough, said damping force-generating means being adapted to damp reciprocation of said rod by utilizing viscous resistance of the oil when said rod moves in the axial direction of said main housing;

a gas chamber defined by both an outer wall of said bellows and an inner wall of said sub housing, said gas chamber containing a high-pressure compressed inert gas which is sealed therein for providing a repulsive force, the repulsive force acting in such a way as to withstand a load applied in a direction in which said rod is pushed into said main housing, said gas chamber having an internal volume large enough to absorb a variation in the degree of insertion of said rod into said main housing when said rod moves within the predetermined stroke; and

a predetermined amount of gas spring constant-adjusting liquid contained in said gas chamber, an effective internal volume of said gas chamber being adjusted in accordance with the amount of the liquid, and an upper surface of the liquid is opposite to the closed free end of said metal bellows.

4,921,228

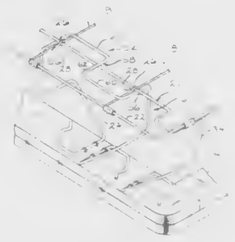
BOX SPRING UNIT WITH INTERLOCKING SPRING AND GRID ASSEMBLY

Mark A. Lowe, Flemingsburg, Ky., assignor to Hoover Group, Inc., Alpharetta

Filed Nov. 4, 1988, Ser. No. 267,378

Int. Cl.[5] A47C *23/02*

U.S. Cl. 267—103 **13 Claims**



1. A box spring assembly comprising:

a generally horizontal frame;

a generally horizontal mattress support deck disposed a predetermined distance above said frame, said deck including a border wire and a plurality of long and cross wire members which extend perpendicular to one another, said long wire members extending lengthwise of said frame and said cross wire members extending crosswise of said frame, each of said long and cross wire members being formed of spring wire and having a plurality of spaced notches, said long wire members and said cross wire members engaging each other at intersections; and

a plurality of deck support springs arranged between said deck and said frame so as to yieldably support said deck on said frame, each of said springs including vertically yieldable portions mounted at their lower ends on said frame and terminating at their upper ends in a deck attaching portion, at least one of said deck attaching portions including a pair of end straight wire sections arranged in a side-by-side relation with a spaced pair of said long wire members and a connecting portion joining said end straight wire sections and passing over said pair of spaced long wire members, said end straight wire sections being arranged in a supporting relation with a pair of spaced portions of said cross wire member that intersects said spaced pair of said long wire members, each of said end straight wire sections having a notch therein engaged with one of said spaced portions of said cross wire member adjacent said intersection of said long wire members interlocking said long and cross wire members and said end straight wire section together adjacent said intersection.

4,921,229

FLUID-FILLED ELASTIC CENTER BEARING MOUNT

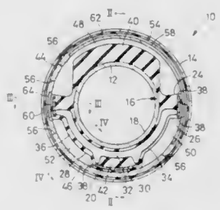
Hiroaki Hori, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Sep. 8, 1989, Ser. No. 404,846

Claims priority, application Japan, Sep. 21, 1988, 63-123918[U]

Int. Cl.[5] F16F *9/10, 1/38*

U.S. Cl. 267—140.1 **13 Claims**



1. A fluid-filled elastic center bearing mount for flexibly supporting a propeller shaft of a motor vehicle on a body of the vehicle through a center bearing, comprising:

an inner sleeve and an outer sleeve disposed radially outwardly of said inner sleeve, said propeller shaft being extending through said inner sleeve, and said outer sleeve being secured to said body;

an elastic body interposed between said inner and outer sleeves for elastically connecting the sleeves;

said elastic body partially defining a pressure-receiving chamber between said inner and outer sleeves, such that said pressure-receiving chamber extends over a predetermined circumferential length of said sleeves, said pressure-receiving chamber being filled with a non-compressible fluid and receiving a vibrational load applied between said sleeves;

said elastic body having a generally arcuate void which extends in an axial direction of the inner and outer sleeves and which is located opposite to said pressure-receiving chamber in a diametrical direction of said inner sleeve in which said vibrational load is primarily received by said pressure-receiving chamber;

means for defining a first and a second variable-volume equilibrium chamber adjacent to circumferentially opposite ends of said pressure-receiving chamber, said means for defining the equilibrium chambers comprising a first and a second flexible diaphragm;

orifice-defining means for defining a first orifice for fluid communication between said pressure-receiving chamber and said first equilibrium chamber, and a second orifice for fluid communication between said pressure-receiving chamber and said second equilibrium chamber; and

an elastic stop disposed within said pressure-receiving chamber and extending from one of said inner and outer sleeves toward the other in said diametrical direction.

4,921,230

SPIRAL WOUND SPRING RETENTION CLIP

H. Jay Thomsen, 10600 Gratiot, Detroit, Mich. 48213, assignor to H. Jay Thomsen, Detroit, Mich.

Filed Mar. 13, 1989, Ser. No. 322,576

Int. Cl.[5] F16F *1/10*

U.S. Cl. 267—156 **9 Claims**

1. A retention claip comprising:

a first member adapted to be secured adjacent a spiral wound spring such that the first member is adapted to be adjacent several of the winds of the spring;

a second member adapted for applying a force on the outer most wind of the spiral wound spring so that in use, said second member abuts the outer most wind of the spiral

wound spring at all times asserting a force on the outer most wind such that each wind of the spiral wound spring



would be substantially concentric with respect to each adjacent wind to provide a substantially equal distance space between adjacent winds.

4,921,231

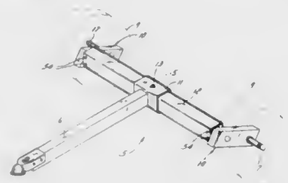
TORSION SPRING CARTRIDGE ASSEMBLY

Norman Reynolds, Franklin, and Wilbur C. Reynolds, Muskego, both of Wis., assignors to Reynolds Torsion System, Inc., Muskego, Wis.

Continuation-in-part of Ser. No. 781,149, Aug. 14, 1985, abandoned. This application Jul. 18, 1986, Ser. No. 888,028

Int. Cl.[5] F16F *13/00*

U.S. Cl. 267—196 **18 Claims**



1. A torsion spring cartridge assembly for an open ended axle tube, said cartridge assembly comprising

a bearing assembly adapted to be removably mounted in a non-rotating relation in the open end of the axle tube,

a torque assembly including a torque hub mounted for rotary motion in said bearing assembly and a draw bar having a screw thread at the inner end,

a counter-torque hub adapted to be positioned in the axle tube in a spaced relation to said torque hub and in a non-rotating relation to the axle tube, said counter-torque hub including a threaded bore corresponding to said screw thread on said draw bar,

two or more torsion bars connected between said torque hub and said counter-torque hub for biasing said torque assembly to a neutral position, said bearing assembly, torque assembly, torsion bars and counter-torque hub being removable as a unit from the axle tube for service, replacement or repair,

whereby the distance between said torque hub and said counter-torque hub can be varied by rotating said counter-torque hub relative to said draw bar to change the bias force of said torsion bars.

4,921,232

HYDRAULIC-DAMPING ENGINE MOUNT HAVING AN OVERFLOW CONDUIT BETWEEN TWO CHAMBERS WITH A FIXED INTERMEDIATE WALL

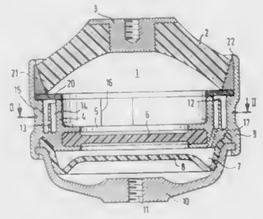
Manfred Hofmann, Hünfelden, Fed. Rep. of Germany, assignor to Metzeler GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 243,432

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730425

Int. Cl.[5] B60G *15/04;* **F16F** *15/04*

U.S. Cl. 267—219 **5 Claims**



1. Hydraulic-damping engine mount, comprising a working chamber, a frustoconical elastomeric support spring surrounding said working chamber, a compensating chamber, a soft-elastic cup-shaped diaphragm bordering said compensating chamber, a partition disposed between said chambers, a circular-annular overflow conduit with a substantially rectangular cross section and a given circumferential length in the vicinity of said partition through which said chambers hydraulically communicate with each another, and at least one rib-like fixed intermediate wall inside said overflow conduit extending in the circumferential direction over said given circumferential length and extending vertically over a portion of the height of said overflow conduit defining at least two partial conduits in continuous mutual communication over said given circumferential length for carrying fluid in parallel and in the same direction.

4,921,233

CLAMPING DEVICE FOR PLATES OR PROFILED ELEMENTS PLACED ONE AGAINST THE OTHER

Goussu Fabrice, Le Chesnay, France, assignor to Genus International, France, a part interest

Filed May 5, 1989, Ser. No. 350,363

Claims priority, application France, May 6, 1988, 88 06176

Int. Cl.[5] B23Q *3/03*

U.S. Cl. 269—32 **11 Claims**

1. A clamping device (1) for at least a set (2) of two plates (3, 4) or of two profiled elements placed one against the other, comprising at least a clamping head (5), said clamping head (5) comprising a body (11), a clamping element (12) suitable for pivoting round a fixed axle (22) integral with the body (11) and provided with a gripping end (13) intended for gripping or clamping said plates (3, 4) together against a buttressing part (14) and means (23) for rotating said clamping element (12) round the fixed axle (22), comprising at least a link (24) one of the ends of which (25) is attached pivotingly to said clamping element (12) round an axle (26) integral with the clamping element (12), parallel to the fixed axle (22), and the other end (27) is fixed pivotingly to a carriage (28) round the axle (29) of at least one roller (30) of said carriage, which is moveable substantially linearly along at least one guiding ramp (31) with a specified shape between a so-called retractable position (32) of the clamping element (12) and a so-called gripping position (33), said ramp (31) being attached to the body (11) of the clamping head (5) on one side of the fixed axle (22) opposite to the side which is occupied by the gripping end (13) when the carriage (23) is in said gripping position (33), and

means for the linear travel (8) of the carriage (28) between these two positions (32, 33),

characterized in that

the guiding ramp (31) features a curved, concave surface (44) of contact with the roller (30) when the carriage comes into the gripping position (33) whose centers of curvature in each of the points of said surface (44) are located on the side of the fixed axle (22) with relation to the plane (45) defined by the central axis (26') of the axle (26) of the link (24), integral with the clamping element



(12) and the central axis (29') of the roller (30) of the carriage (28) when the latter is in said gripping position (33), and

the distance d between the central axis (26') of the axle (26) of the link (24), integral with the clamping element (12) and the central axis (29') of the roller (30) is greater than the distance d' between the central axis (22') of the fixed axle (22), and a plane (51), parallel to the fixed axle (22) passing through the central axis (29') of the roller (30) when the carriage (28) is in said gripping position (33).

4,921,234

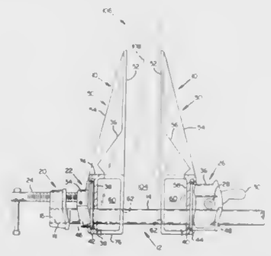
JAW EXTENDER FOR A BEAM CLAMP

Donovan J. Peterson, 2835 N. Watts, Portland, Oreg. 97217

Filed Aug. 8, 1988, Ser. No. 229,306

Int. Cl.[5] B25B *1/02*

U.S. Cl. 269—147 **16 Claims**



1. A jaw adapter for use in combination with a clamp, the clamp including opposing first and second jaws, each of said first and second jaws having a jaw face for at least partial engagement with a workpiece when in operation, and means for relative movement between said jaws so as to grip a workpiece placed between the jaw faces and an elongated guide member extending longitudinally between the jaws, the guide member having a longitudinal axis and guiding and controlling, at least in part, the movement of the jaws relative to each other, each jaw face having a reach in a first direction with respect to the guide member longitudinal axis and, in operation, the jaw adapter being interposed between the jaws and comprising:

a body;

coupling means on the body to removably attach said body to one of said jaws for movement therewith.

means carried by the body for directly engaging the elongated guide member so as to maintain the adapter at a substantially fixed angle with respect to the guide member longitudinal axis; and Ser. No. 07/229/306

a jaw adapter face carried by the body, the adapter being associated with the first jaw and disposed so that in operation the jaw adapter face is towards the jaw face of the second clamp jaw, the jaw adapter face having a reach in a first direction with respect to the guide member longitudinal axis substantially greater than the reach of the jaw face of the first jaw.

wherein in operation, with the jaw adapter imposing a gripping force on the workpiece, a tipping load is imposed on the adapter and said tipping load is resisted, at least in part, by the engagement of the through bore of the adapter body with the elongated beam of the clamp

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4,921,235

APPARATUS AND METHOD FOR FOLDING AND STACKING NAPKINS FROM A CONTINUOUS WEB OF PAPER OR OTHER MATERIAL

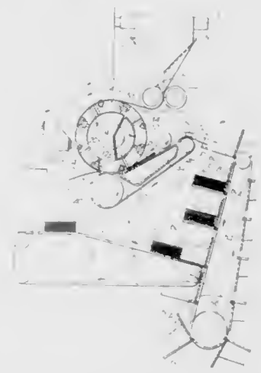
Guglielmo Biagiotti, Via Di Vorno 105, 55012 Capannori (Lucca), and Mauro Ghilardi, Via di Tiglio 108, Pieve S. Paolo, Capannori (Lucca), both of Italy

Filed Jul. 28, 1988, Ser. No. 225,409

Claims priority, application Italy, Jul. 28, 1987, 9443 A/87

Int. Cl.[5] B42C *1/04*

U.S. Cl. 270—47 **26 Claims**



1. An apparatus for the production of paper webs and particularly paper table napkins, including means for folding the paper one or more times, said means including:

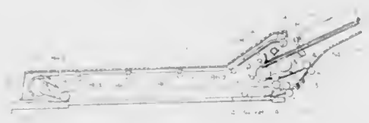
a cylinder for the advancement of the web and for performing a transversal cut, and means for continuously feeding the web to said cylinder,

cutting means on said cylinder, and

retaining means disposed at a distance from said cutting means, and in juxtaposition thereto along a line where a fold is to be carried out so as to obtain, through the rapid advancement of said cylinder, a lifting and reverse turning of the paper in advance of said line,

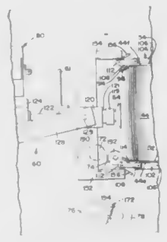
a rotor carrying a plurality of blades disposed in cooperative arrangement with a cutting means on said cylinder, and
a pressing roller acting against said cylinder to complete the folding, and
means for interrupting and retaining said web along said folding line after the folding line has passed the pressing roller, and
means to remove the folded web away from said cylinder,
the pressing roller (40) being associated with a continuous conveyer (42) cooperating with a sucking case (44), to move the pieces pressed and pulled off from the cylinder.

4,921,236
RECYCLING AUTOMATIC DOCUMENT FEEDER
Sirou Saeki; Sunao Ikeda, both of Yokohama; Hirohisa Otsuka, Kawaguchi, and Nobuyuki Yanagawa, Chigasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 58,882, Jun. 5, 1987, abandoned. This application Jan. 4, 1989, Ser. No. 294,904
Claims priority, application Japan, Jun. 5, 1986, 61-129107; Jul. 7, 1986, 61-103085; Jul. 30, 1986, 61-115996; Sep. 1, 1986, 61-205332
Int. Cl.[5] B65H *5/06*
U.S. Cl. 271—3.1 2 Claims



1. A recycling automatic document feeder comprising:
(a) a platform which, in use, is loaded with a stack of documents each of which has a first side which initially faces said platform and a second side which initially faces away from said platform;
(b) a platen having a planar working surface;
(c) first means for sequentially separating the bottom document in a stack of documents located on said platform;
(d) second means for turning over each document received from said first means and for feeding it to an intermediate stop section;
(e) an endless belt sized, shaped, and positioned to feed each document across said platen with a surface in planar contact with said planar working surface of said platen, said endless belt and said platen having a first nip at one end and a second nip at the other end;
(f) third means for feeding each document from said intermediate stop section to said first nip so that the second surface of each document comes into planar surface contact with said planar working surface of said platen;
(g) a reversing roller to which each document is fed from said second nip and about which each document is passed with its second surface facing said reversing roller;
(h) fourth means adjacent said reversing roller for feeding documents received from said reversing roller back to said platform such that the first side of each document faces said platform and for depositing each document on top of the remaining stack of documents or on top of said platform itself; and
(i) fifth means adjacent said reversing roller for feeding each document either to said fourth means or back to said second nip such that the first surface of each document comes into planar surface contact with said planar working surface of said platen.

4,921,237
INPUT HOPPER APPARATUS AND METHOD
Richard C. Nubson, Eden Prairie, and Gary P. Mattila, St. Louis Park, both of Minn., assignors to DataCard Corporation, Minneapolis, Minn.
Continuation of Ser. No. 904,053, Sep. 5, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 256,091
Int. Cl.[5] B65H *3/08*
U.S. Cl. 271—11 18 Claims



1. A method for receiving a stack of cards and for individually feeding the cards into a card transfer path, the method comprising the steps of:
(a) receiving a stack of cards in input hopper receptacle means having a first end and a second end;
(b) exerting a force on the stack of cards in a direction toward the second end of the input hopper receptacle means;
(c) pinching opposing edges of at least a first card closest the second end of the input hopper so as to force the opposing edges of at least the first card toward each other, the pinching step being accomplished by reciprocally moving pinch means between a first position wherein the pinch means is pinching opposing edges of at least the first card and a second position wherein the pinch means is not pinching opposing edges of at least the first card;
(d) fanning at least the first card closest the second end of the input hopper receptacle means by forcing suction means into engagement with a major surface of the first card facing away from the stack of cards such that the first card is bowed between its opposing edges in a direction toward the first end of the input hopper receptacle means and such that a suction force is created between the suction means and the first card;
(e) individually separating the first card from the stack of cards by retracting the suction means away from the stack of cards while the suction means is engaged to the first card; and
(f) transferring the card to a card transfer path.

4,921,238
SHEET FEEDER HAVING PREACTUATED PICKER ROLLER
Donald Lane, Trevose, Pa., assignor to Brandt, Inc., Bensalem, Pa.
Filed Nov. 15, 1988, Ser. No. 271,901
Int. Cl.[5] B65H *1/22*
U.S. Cl. 271—37 9 Claims

2. Apparatus for feeding sheets from an input stack of sheets to an output location including in combination a feed roller, means cooperating with said feed roller to form a nip, means for supporting said input stack of sheets with edges thereof adjacent to said nip, a picker member adapted to engage an end sheet of said stack, drive means adapted to be energized to drive said picker member and said feed roller continuously in the course of a feeding operation to cause said picker member to move sheets from said stack into said nip and to cause said feed roller to move sheets from said nip to said output location, means for energizing said drive means and means responsive to



the initial energization of said drive means for delaying the driving of said feed roller.

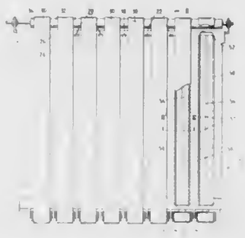
4,921,239
DOCUMENT FEEDING APPARATUS
Susumu Okui; Tsugio Hirabayashi, and Izumi Hamanaka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 879,913, Jun. 27, 1986, abandoned. This application Nov. 1, 1988, Ser. No. 266,342
Claims priority, application Japan, Jul. 2, 1985, 60-146188; Jul. 3, 1985, 60-146941; Sep. 25, 1985, 60-213901; Sep. 25, 1985, 60-213909; Feb. 3, 1986, 61-21854
Int. Cl.[5] B65H *29/20*
U.S. Cl. 271—186 9 Claims



2. A document feeding apparatus comprising a document supply tray on which documents are placed,
separating means for separating said documents one by one,
first feeding means for feeding the separated documents onto a platen,
second feeding means for removing the document from the platen, reversing an inside and outside of the document, and feeding the document to said first feeding means for feeding the reversed document back to the platen, and
a power source for driving at least one of said first and second feeding means wherein said power source is arranged internally of said second feeding means.

4,921,240
PLURAL BELT DOCUMENT FEEDER
Peter R. Watson, Stevenage, United Kingdom, assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 13, 1989, Ser. No. 297,221
Claims priority, application United Kingdom, Jan. 13, 1988, 8800720
Int. Cl.[5] B65H *9/06*
U.S. Cl. 271—245 4 Claims

1. A document feeder for conveying document sheets into and away from an imaging position on a platen of a copier, including a vacuum belt transport system which comprises:
a plurality of spaced-apart and unapertured belts moving between a white backing surface member and the platen, and
a vacuum source for applying a partial vacuum to the inter-belt gap areas from beneath the belts to hold a document sheet against said belts so that the document is conveyed with the movement of the belts, characterized in that;
said backing surface member is entirely planar in at least said inter-belt gap areas in said imaging position,
multiple spaced protrusions which extend out from the backing surface member toward the platen are provided

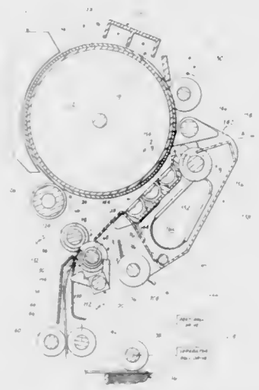


extending above the level of said plane of said backing surface member in said inter-belt gap areas at intervals on said backing member, beneath the belts, against which protrusions the belts ride to hold the belts spaced away from said backing surface member, the interstices between said protrusions providing openings to said inter-belt gaps from beneath the belts for said applying of partial vacuum to said inter-belt gaps, and wherein said protrusions are provided in mutually parallel rows extending in the direction of movement of the belts, with each belt riding on a respective pair of such rows of protrusions.

4,921,241
COPY SHEET REGISTRATION ASSEMBLY FOR ELECTROPHOTOGRAPHIC COPIER
Benzion Landa, 10045 - 118th Street, Apt. 206, Edmonton, Alberta, Canada (T5K 1Y1); Oded Sagiv, 27 Hagefen Street, Ramat-Gan, and Nathan A. Levy, 31 Keren Hayesod Street, Ra'anana, both of Israel
Division of Ser. No. 919,871, Oct. 16, 1986, abandoned, which is a division of Ser. No. 628,611, Jul. 6, 1984, Pat. No. 4,620,699. This application Apr. 11, 1988, Ser. No. 179,605
Int. Cl.[5] B65H *9/06*
U.S. Cl. 271—245 6 Claims

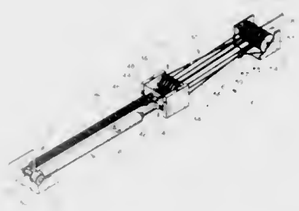
1. Apparatus for registering a sheet at a predetermined location along a path comprising a relatively rigid feed member disposed along the path, a relatively compliant feed member disposed along the path at a position axially aligned with said rigid feed member, first means cooperating with said relatively rigid feed member to form a first nip, second means cooperating with said relatively compliant feed member to form a second nip having a longitudinal extent greater than said first nip, means independent of said feed members for registering the sheet, said registering means including a registration member axially aligned with said rigid feed member and said compliant feed member and mounted for movement into a first position which corresponds to the position of the second nip but which does not correspond to the position of said first nip so as to block the path for registering the sheet with an edge portion thereof extending within said second nip but outside said first nip and into a second position remote from the path for allowing movement of the sheet after registration, means for continuously driving said feed members, said relatively compliant feed member pressing the edge portion of the sheet

within said second nip against said registration member in said first position, and said relatively rigid feed member advancing



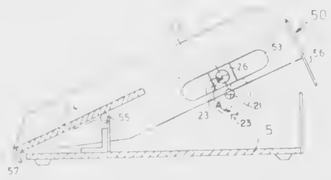
the sheet through said first nip with said registration member in said second position.

4,921,242
EXERCISE APPARATUS RESISTANCE SYSTEM
Scott R. Watterson, River Heights, Utah, assignor to Weslo, Inc., Logan, Utah
Filed Jul. 20, 1988, Ser. No. 221,516
Int. Cl.[5] A63B *21/02, 69/06*
U.S. Cl. 272—72 21 Claims



1. A rowing exercise machine comprising:
track means for supporting a user;
support means attached to said track means to support said track means on a support surface;
seat means slidably adapted to said track means for movement thereon, said seat means being sized to support a sitting user thereon;
operation means positioned and adapted to said track means for grasping and operation by the user sitting on said seat means to perform rowing type exercises;
a resistance system adapted to said track means and to said operation means to resist movement of said operation means, said resistance system including:
resistance means for providing resistance to movement of said operation means, said resistance means having a first end secured to said track means and a second end;
block and tackle means to operate said resistance means, said block and tackle means having a first block adapted to said second end of said resistance means and a second block operably aligned with and interconnected to said first block by line means to obtain a mechanical advantage, one of said first block and second block having multiple pulleys interconnected by said line means to a pulley of the other of said first block and said second block, said line means being laced about said pulley and said multiple pulleys and having a lead extending alternatively and selectively from said first and second blocks to interconnect to said operation means for movement of said first block by said operation means, and said line means connected at only one end to said operation means.

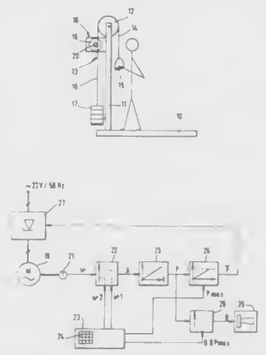
4,921,243
MOTION APPARATUS
Ulrich Weidmann, Steinackerstrasse 9, CH-8302 Kloten, Switzerland
Filed Oct. 7, 1988, Ser. No. 255,098
Claims priority, application Switzerland, Oct. 7, 1987, 3913/87
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—96 9 Claims



1. A motion device for circulatory stimulation and for therapy of vascular diseases of legs, said motion device comprising:
a base plate on which two pedals (**50**) are pivotally mounted in a heel area of said base plate, and a mechanism attached between said pedals (**50**) which forces a positive tilting movement of said pedals (**50**), said mechanism comprising a gear system (**2**), having a shaft (**21**) that is parallel to a pivot axis (**55**) of one of said pedals (**50**), and said shaft (**21**) connected with a transmission gear which drives a flywheel (**42**).

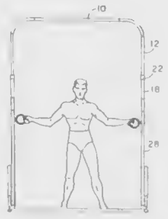
4,921,244
APPARATUS FOR POSITIVE MUSCLE TRAINING
Kurt Berroth, 7141 Schwieberdingen, Nippenburg, Fed. Rep. of Germany
Filed Sep. 30, 1988, Ser. No. 252,374
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732883
Int. Cl.[5] A63B *21/06*
U.S. Cl. 272—117 12 Claims

1. Apparatus for muscle training comprising
means for applying muscle force,
means connected to the muscle force applying means for applying a force that counteracts the muscle force,
a motor driven auxiliary force device connected to the muscle force applying means for applying an auxiliary force in aid of the muscle force, and
a control device to actuate the auxiliary force device,
the control device comprising sensor means for detecting speed of movement of the muscle force applying means, means connected to the sensor means and the auxiliary force device for actuating the auxiliary force device when the speed of movement of the muscle force applying means falls below a predetermined upper speed, and means for gently increasing the auxiliary force from zero



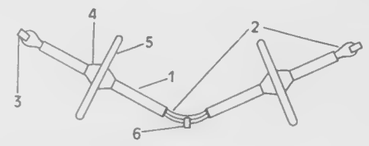
value to a predetermined maximum value as long as the predetermined upper speed is not reached.

4,921,245
EXERCISE DEVICE
William J. Roberts, 46 Browne St., Brookline, Mass. 02146
Continuation of Ser. No. 929,409, Nov. 10, 1986, abandoned. This application Nov. 15, 1988, Ser. No. 274,705
Int. Cl.[5] A63B *1/00*
U.S. Cl. 272—109 9 Claims



1. In an exercise system, including a horizontally disposed bar, a pair of upright support structures disposed on opposite ends of said bar, and a pair of base members to provide structural rigidity to the exercise device, the improvement comprising:
attachment means on the upright support structures and the horizontal bar, including receptacles defining a plurality of fixable locations on both said upright support structures and said horizontal bar for connection of various kinesthetic exercising apparatus in various arrangements suitable for a variety of kinesthetic exercises; and
a plurality of distinct kinesthetic exercise apparatus for performing kinesthetic exercises, including means for quick releasable and replaceable coupling of said kinesthetic exercise apparatus to the exercise system in a freely rotatable manner via said attachment means, such that the exercise system can be employed to accommodate a variety of kinesthic exercises.

4,921,246
FLEXIBLE BARBELL BAR
Richard W. Hornbostel, N53 W34228 Rd. Q, P.O. Box 452, Okauchee, Wis. 53069
Filed Jun. 12, 1989, Ser. No. 365,041
Int. Cl.[5] A63B *21/072*
U.S. Cl. 272—123 1 Claim



1. A flexible barbell comprising:
two equal sections of steel pipe, each pipe section having a weight receiving end and a central end, said weight receiving ends having removable barbell disk retaining collars;
a steel cable strung through both pipe sections such that the cable forms loops at the weight receiving end of each pipe section, and the cable ends extend from the central end of each pipe section;
a ring on each cable loop such that the cable is prevented from slipping through the pipe, said ring being dimensioned such that a barbell disc may pass over the ring and onto the weight receiving end of the barbell; and,
a clamp connecting the cable ends together such that a space is formed between the pipe sections to allow the user to hold and use the barbell in a variety of configurations.

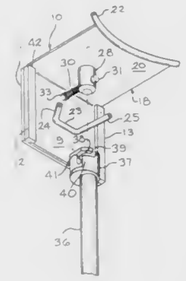
4,921,247
EXERCISE CHAIR
Joseph F. Sterling, 3146 S. Peninsula Dr., Daytona Beach, Fla. 32018
Filed Aug. 11, 1986, Ser. No. 895,142
Int. Cl.[5] A63B *21/04*
U.S. Cl. 272—136 17 Claims



1. An exercising chair apparatus comprising in combination:
a chair having a seat, arms, back, legs, sides and a space beneath the seat;
said chair back having a pair of exercising devices therein and having handles extending from the back and held in cups in the back when not in use, said handles being extendible from said back when pulled by a person seated in said chair;
an exercising device located in each arm of said chair and having a handle extending therefrom and held in a cup in each arm when not in use, each said handle being extendible from said chair when pulled by a person seated in said chair;
an extendible frame attached to said chair legs and extendible from under said chair to the front of said chair;
an exercising device attached to said frame for operation by

a person sitting in said chair when said frame is extending from under said chair;
means to lock said extendible frame in an extended position, whereby a seated person can relax or exercise different muscles while seated in said exercise chair; and
each of said chair arms has a formed resilient hand grip on one end thereof whereby a seated individual can exercise his hands by compressing the hand grips.

4,921,248
BASKETBALL RIM ASSEMBLY
Richard L. Rapp, 205 Rosewood Dr., Lima, Ohio 45805
Filed Oct. 4, 1989, Ser. No. 417,027
Int. Cl.[5] A63B *63/08*
U.S. Cl. 273—1.5 R **9 Claims**



9. A basketball rim assembly for use in removably mounting a basketball rim to a basketball backboard, said rim assembly including a base member for mounting on such basketball backboard, said base member defining a locking hole, a pair of opposed guide channels mounted on said base member, said guide channels defining a locator surface adjacent their upper ends, a support member having first and second perpendicularly extending legs, said first leg being received by said guide channels of said base member, said second leg mounting such basketball rim, said second leg of said support member engaging said locator surface when said basketball rim is in a predetermined vertical position, a post depending from said second leg, said post defining a transverse opening aligned with said locking hole of said base member, a lock pin having first and second ends positioned for movement with said transverse opening, said first end comprising an enlarged cam end, said second end of said lock pin comprising a lock end received by said locking hole of said base member, a stop member on said lock pin adjacent said second end, a spring surrounding said lock pin positioned between said post and said stop member, said spring urging said second end toward said locking hole, said rim assembly including a cam assembly comprising an elongated handle having a cam socket mounted adjacent one end, said cam socket defining a camming slot for receiving said first end of said lock pin, whereby rotation of said cam socket and movement of said first end of said lock pin along said camming slot engages or disengages said second end of said lock pin with respect to said locking hole of said base member.

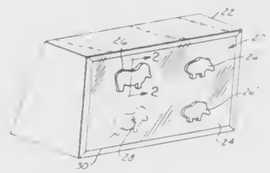
4,921,249
BOARDGAME COMBINING TWO LEVELS OF PLAY
James Kropkowski, Rutherford, N.J., and Jesse L. Colodner, Pearl River, N.Y., assignors to James M. Kropkowski, Rutherford, N.J.
Filed Oct. 24, 1988, Ser. No. 261,411
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—256 **6 Claims**

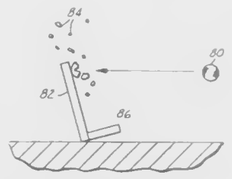
1. A boardgame apparatus comprising
a playing board including a plurality of marked spaces disposed along the periphery of said playing board, said marked spaces being interconnected in a path of progression around said playing board, said playing board further including one or a plurality of casino games disposed in the central portion of said playing board;
a plurality of playing pieces for movement by each player along said path of progression in accordance with the rules of the game;
indicia means on first selected ones of said marked spaces to indicate opportunity to purchase, develop casinos and/or collect token money in accordance with the rules of the game for purpose of gain to a player;
indicia means on second selected ones of said marked spaces to indicate opportunity to purchase, develop parking lots and/or collect token money in accordance with the rules of the game for purpose of gain to a player;
indicia means on a selected one of said marked spaces directing payment of token money to the player when that player's playing piece passes such marked space in accordance with the rules of the game;
indicia means on a second selected one of said marked spaces to indicate opportunity to purchase and/or sell parking lot supplies in accordance with the rules of the game for purpose of gain to a player;
indicia means on a third selected one of said marked spaces directing payment of token money by the player when that player's playing piece occupies such marked space in accordance with the rules of the game;
indicia means on a fourth selected one of said marked spaces to indicate opportunity to purchase and/or sell casino



games in accordance with the rules of the game for purchase of gain to a player;
indicia means on a fifth selected one of said marked spaces entitling a player to move his playing piece to any of said marked spaces on the board when that player's playing piece occupies such marked space;
indicia means on a sixth selected one of said marked spaces to indicate opportunity to purchase rights to lend money to other players and receive interest payments in accordance with the rules of the game;
indicia means on a seventh selected one of said marked spaces to indicate opportunity to purchase and/or sell boardwalk supplies in accordance with the rules of the game for purpose of gain to a player;
indicia means on an eighth selected one of said marked spaces directing payment of token money to the player when that player's playing piece occupies such marked space;
chance means for directing movement of said playing pieces;
token money in various denominations;
a bank including compartments for receipt of token money in various denominations;
a plurality of parking lot supplies;
a plurality of boardwalk supplies;
a pluraity of casino game markers;
a plurality of bid chips color coordinated with each playing piece;
a plurality of proof of purchase keys coordinated with said first selected ones of said marked spaces;
a plurality of proof of purchase discs coordinated with said second selected ones of said marked spaces; and
a shark token indicating possession of rights to lend money.

4,921,250
FRANGIBLE ARTICLE
John A. Ayres, 4679 Lippincott Rd., Lapeer, Mich. 48446
Filed Oct. 17, 1988, Ser. No. 258,373
Int. Cl.[5] A63B *37/00;* **F41J** *5/00, 9/16*
U.S. Cl. 273—58 R **30 Claims**



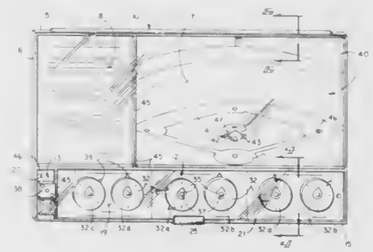


1. A frangible target comprising:
a mixture of sand and a decomposable binder which is formed and cured to a desired target shape, said binder comprising by weight:
20–60% grain flour;
5–30% salt;
½–5% petroleum lubricant; and
water.

19. A frangible projectile comprising a mixture of sand and a decomposable binder which is formed into a projectile shape and cured to create a rigid, durable projectile which will fracture into a plurality of dull pieces upon impact, said decomposable binder comprising:
20–60% grain flour;
5–30% salt;
½–5% lubricant; and
water.

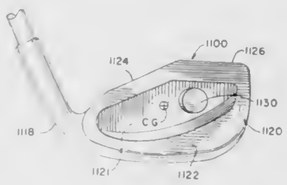
4,921,251
EDUCATIONAL BASEBALL GAME
Albert L. Kanen visher, 4128 E. 12th, Spokane, Wash. 99202
Filed Nov. 14, 1988, Ser. No. 270,364
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—93 R **2 Claims**

1. A method for playing a baseball simulating game utilizing apparatus having a peripherally defined casement formed as a five-sided flat box with septa subdividing a game board area carrying a game board defining a likeness of a baseball field and having a number box associated with each player positioned on the field, said number box having a first larger portion carrying four numbers, one of which is encircled, and a second smaller portion carrying one number, all said numbers constituting a multiplicative product of numbers carried on the faces of at least two dice, and said scorekeeping area carrying scorekeeping apparatus including a plurality of score indicating elements, comprising the steps of:
determining a sequential batting order for two teams and each of nine possible baseball players,
determining the order of play of the two teams,
throwing dice up to four times for each batting player and determining the multiplicative product of the numbers indicated by the dice;



matching the multiplicative products so obtained with the numbers in the number box associated with a batting player to determine the disposition of the batting player;
continuing play in a similar fashion for each batting player in sequential order according to the play of an actual baseball game until at least nine innings have been played and one team has a score greater than the other at the end of the last inning.

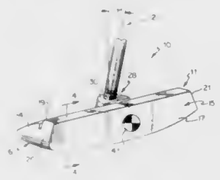
4,921,252
IRON TYPE GOLF CLUB HEAD WITH INTEGRAL SIGHTING AND ALIGNMENT MEANS
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Continuation-in-part of Ser. No. 95,675, Sep. 14, 1987. This application Mar. 30, 1989, Ser. No. 330,821
Int. Cl.[5] A63B *69/36, 53/04*
U.S. Cl. 273—164 **8 Claims**



1. An iron type golf club head comprising:
a main body including a heel, a hosel proximate said heel, a toe, a rear surface, a peripheral weighting means located on said rear surface of said club head defining a cavity on said rear surface, an upper surface, a lower surface including a sole, a ball striking face to hit a ball along an intended line of flight, a center of gravity and a top ridge on said upper surface extending from the hosel to the toe, said top ridge being characterized by a first section extending upwardly and outwardly from said hosel toward said toe at an angle, and a second section extending in a straight line in the heel to toe direction from a first point adjacent said toe to a second point located substantially remote from said toe between said toe and said hosel and substantially spaced from said hosel, said second section forming a sighting and aligning means overlying a portion of said cavity to facilitate proper club head alignment to the intended line of flight, and being further characterized by a mass on said rear surface underlying said sighting and aligning means to replace the additional weight said club

head would have if said first section and toe were extended to a junction located above said sighting and aligning means.

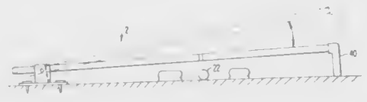
4,921,253
GOLF CLUB
Charles A. Tesori, 432 Lillian Ave., Syracuse, N.Y. 13206
Filed Mar. 9, 1989, Ser. No. 321,627
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—167 B 8 Claims



1. A golf club for striking a ball to impart overspin thereto that includes:
an L-shaped head that is symmetrical about a vertical axis, said head including a vertical wall having a horizontally disposed top surface and a front face defining a flat ball striking surface, and a horizontal wall that extends outwardly behind said vertical wall having a bottom surface defining the sole of the head,
a center flange that is integral with the vertical and horizontal walls of the head, said center flange being centrally located about said vertical axis of the head behind the vertical wall and having a top surface that is substantially co-planar with the top surface of the vertical wall,
a pair of end flanges that are integral with both the vertical and horizontal walls of the head that are located at the toe and heel end thereof, said end flanges being symmetrically positioned about the axis of said head behind the vertical wall so as to equally weight both ends of said head, said end flanges extending upwardly from the horizontal wall to a height about equal to that of the top surface of said vertical wall,
said head further including a vertically disposed slot passing downwardly to a, predetermined depth, said slot passing through the two end flanges and the center flange to separate the flanges from the top section of the blade to move the effective center of mass of the club head below the bottom wall of the slot, the vertical distance from the sole of the head to the bottom wall of the slot being less that the radius of a golf ball and shaft means connected to the center flange of the head whereby the shaft is isolated from the blade of the head.

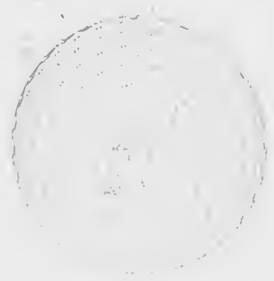
4,921,254
GOLFER'S TRAINING DEVICE AND METHOD
Gerald T. Buckley, 2545 Taraval St., San Francisco, Calif. 94116, and Jamie N. Gonzalez, 2106 Folsom St., San Francisco, Calif. 94110
Filed Jan. 5, 1989, Ser. No. 293,735
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—183 B 23 Claims

1. A golf practice apparatus for practicing swings or for practicing putting on a practice surface, comprising:
an elongate bar member having first and second ends and a length therebetween; and
a pivot mount, pivotally attached to the elongate bar member adjacent the first end, for pivotally holding the first end a first distance above the practice surface;
means for supporting the second end of the elongate bar member at a plurality of chosen distances above the practice surface, a first of the chosen distances being substantially equal to the first distance:
said first distance and a first of the chosen distances being selected to cause a lower surface of the elongate bar member to make tactile contact with and exert a downward force upon an upper toe portion of a golfer's left and right shoes during proper backswing and downstroke portions of a practice swing:
said downward force providing tactile information to the golfer that the backswing and downstroke were proper;



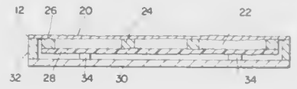
the pivot member permitting the elongate bar member to pivot off the golfer's right shoe upon striking the ball, and during subsequent follow-through:
a second of the chosen distances being greater than the first distance to maintain the elongate bar member a sufficient distance above the practice surface to permit a low putting stroke:
the elongate bar member being maintained by the pivot mount and the means for supporting in alignment with a putting target, the elongate bar member providing thereby an alignment aid for proper putting practice.

4,921,255
GOLF BALL
William W. Taylor, 5300 Hamilton Ave., Suite 103, Cincinnati, Ohio 45224
Continuation-in-part of Ser. No. 232,186, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 204,045, Jun. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 93,281, Sep. 4, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,048
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—232 5 Claims



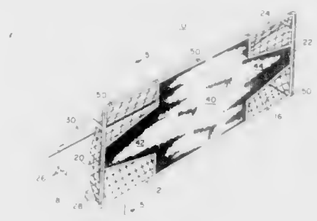
1. A golf ball having a symmetrical dimple pattern on each hemispherical surface wherein the dimples on both hemispherical surfaces are arranged in rows parallel to an equator of the ball and further wherein there are three dimples in each ultimate row, nine dimples in each penultimate row with the three dimples in the ultimate row nestling in the dimples of the penultimate row, a number of dimples within the range of 16 to 92 dimples in the row nearest the equator of the ball and further said number of dimples is a multiple of four, and the number of rows in each hemisphere is equal to the number of the dimples in the row nearest the equator divided by four.

4,921,256
CONTRASTED PROJECTILE TARGET AND METHOD OF MAKING SAME
Laird G. Gearhart, Apartment 10A, Wellington Arms Apartments, 103 Monica Dr., Greensburg, Pa. 15601
Filed Oct. 12, 1988, Ser. No. 256,852
Int. Cl.[5] F41J *5/00*
U.S. Cl. 273—378 42 Claims



12. A projectile target which comprises:
a. a target face for making perforations therein with a projectile and comprised of a paper material having a surface roughness thereon for accepting and retaining a powdered marking material;
b. a marking material comprising a material that produces a powdered substance after impact by a projectile;
c. elastic means behind said marking material for holding said marking material behind said target face;
d. backing means located behind said elastic means.

4,921,257
SOCCER TRAINING DEVICE
Stephen J. Heller, 9111 Windy Crest, Dallas, Tex. 75243
Filed Jul. 19, 1988, Ser. No. 221,271
Int. Cl.[5] A63B *63/00, 69/00*
U.S. Cl. 273—401 14 Claims



10. A soccer training device adapted for use in connection with a soccer goal having first and second vertical uprights and a horizontal cross member connecting the uprights for cooperating with a base surface beneath the goal to define a substantially rectangular goal opening, said device being comprised of:
a frame member for being attached to said first and second uprights and said cross member to circumscribe the perimeter of said goal opening;
a relatively flat member coupled to said frame member, said flat member having a central portion extending along a minor axis of said goal opening from said base surface to said cross member and first and second wing portions extending outwardly along a major surface of said goal opening from said central portion to the respective first and second uprights when said frame member is attached to said soccer goal, said central portions being substantially rectangular and said wing portions being tapered from said central portion to the respective uprights, said flat member for being disposed within perimeter of said goal opening to define selected apertures between said flat member and said frame member representing desired target areas within the goal opening;
a flexible backing member coupled to said frame member for substantially impeding further progress of a soccer ball after the ball has been propelled through one of the target apertures, said backing member being attached along its perimeter to said frame member, said backing member having a greater area than the area of the goal opening so that the backing member fits loosely on the frame member behind the flat member to define a curved surface, said backing member being configured to absorb the impact of the soccer ball after the ball has propelled through one of the target apertures so as to substantially impede the further progress thereof and to prevent the ball from being reflected back through the particular aperture through which the ball was initially propelled, thereby trapping the ball between the flat member and backing member to facilitate retrieval of the ball, said frame member being comprised of a plurality of relatively flat elongated flexible strips connected to define a substantially rectangular frame when said frame member is attached to the soccer goal, said frame member having first and second opposite major surfaces, said backing member being attached to one of said major surfaces; and
means for attaching the device to the uprights and to cross member of the soccer goal.

4,921,258
ADAPTER SEAL
Paul J. E. Fournier, Jackson, and Ernest F. Kulikowski, Marshall, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.
Filed Aug. 8, 1988, Ser. No. 229,445
Int. Cl.[5] F16J *15/16, 15, 32;* F16K *15/14, 24/04*
U.S. Cl. 277—29 6 Claims



1. A vacuum breaking adapter seal for a fluid coupling including a female member having a cylindrical surface bore receiving a male member cylindrical surface probe comprising in combination, an annular groove circumferentially defined in one of said members' cylindrical surface having a base side, spaced opposed first and second sides and an open side adjacent the cylindrical surface of the other member upon the probe being received within the bore, a resilient annular seal ring within said groove, said ring including a base, a first axial end, a second axial end and a seal surface extending toward the cylindrical surface of said other member through said groove open side, first seal means defined on said ring seal surface comprising an annular radially extending projection sealingly engaging said other member cylindrical surface, deformable second seal means defined upon said ring first end having a pressure face disposed toward said other member and an atmospheric face disposed toward said groove base side, said second seal means sealingly engaging said groove first side when said pressure face is exposed to the coupling internal pressure and is deformed from a sealed engagement with said groove first side upon said atmospheric face being exposed to atmospheric pressure and said pressure face is exposed to subatmospheric pressure during withdrawal of the male member from the female member, and passage means defined in said seal ring establishing communication between said second seal means atmospheric face and the atmosphere.

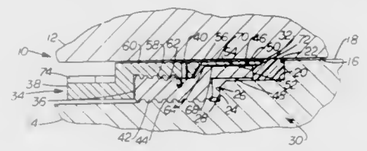
5. A vacuum breaking adapter seal comprising, in combination, an annular body of resilient material having an axis, first and second ends, an outer circumference and a bore, an annular

flexible lip defined on said first end having a free end obliquely extending away from said body and in the direction of said axis, an annular seal ridge defined within said bore extending toward said axis, a first radially extending channel defined in said second end intersecting said bore and said circumference, and a second channel defined in said circumference intersecting said first channel and said first end.

4,921,259
PACKOFF SEAL WITH DUAL MEMBER ENGAGING MEANS

Brian Saunders, Chipping Sodbury, England, assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Feb. 21, 1989, Ser. No. 312,478
Claims priority, application European Pat. Off., Jan. 13, 1989, 89300310.3
Int. Cl.[5] F16J *15/18*
U.S. Cl. 277—112 10 Claims



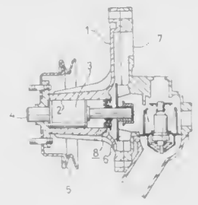
1. A sealing structure comprising
an annular resilient seal positioned in an annulus between inner and outer cylindrical surfaces to be sealed,
means supporting said resilient seal in said annulus to be sealed,
a seal follower structure including
a first follower being in planar engagement with said resilient seal and having means for moving against said seal to urge it into a tightly sealed position,
a second follower having an extension thereof in planar engagement with said resilient seal and means for moving said second follower against said seal by movement relative to said first follower, and
means releasably securing said second follower to said first follower,
the area of engagement of said second follower with said seal being substantially less than the area of engagement of said first follower with said seal,
said releasable securing means being releasable by the seal setting force reaching a preselected maximum force so that said second follower moves further against said seal and said first follower is retained in the position achieved at the point of release of said securing means.

4,921,260
LIP SEAL DEVICE FOR WATER PUMPS

Akira Takenaka, and Masanori Hatanaka, both of Toyota, Japan, assignors to Taiho Kogyo Co.

Filed Jun. 22, 1988, Ser. No. 209,811
Claims priority, application Japan, Jun. 24, 1987, 62-157157
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—153 12 Claims

1. A lip seal device for an automobile water pump comprising: a rotary shaft rotatably supported within a housing; a case fixed to said housing and having a cylindrical main body, a first flange extending radially and outwardly of one end portion of said main body so as to engage with an inner wall of said housing which faces a pump chamber of said water pump and a second flange extending radially and inwardly of the other end portion of said main body, said rotary shaft rotatably passing through an axial section of said case; a sleeve fixed to said rotary shaft; and at least one seal lip whose outside circumferential surface is held in contact with said second flange and said main body of said case and having an inner circumferential



surface which is in sliding contact with an outside circumferential surface of said sleeve.

4,921,261
INFANT CONVERSION STROLLER

Edward L. Sadler, Jr., and Edward L. Sadler, Sr., both of 2804 Plantition Rd., Harrisburg, N.C. 28075

Filed Jan. 9, 1989, Ser. No. 295,140
Int. Cl.[5] B62B *7/06*
U.S. Cl. 280—30 3 Claims

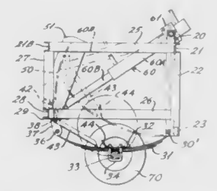
1. An infant conversion stroller apparatus comprising,
an infant seat of unitary construction integrally secured to a surrounding seat framework, said seat framework including lower rails with a plurality of mounting yokes secured surroundingly thereto,
and
a frame assembly including a handle telescopingly mounted within an intermediate framework, and said intermediate framework pivotally mounted to a bottom framework,
and
said bottom framework including receiving slots for receiving each of said mounting yokes,
and
further including locking pegs to secure each yoke to said bottom framework when received within each receiving slot,
and
wherein each mounting yoke further includes a downwardly depending flange with a through-extending flange aperture formed through said flange, and at least one bottom frame aperture formed through said bottom framework proximate each receiving slot wherein said bottom frame aperture and said flange aperture is positioned to receive a locking peg when said flange is positioned within said receiving slot,
and
wherein said receiving slots comprise a plurality of slots wherein each slot is dimensioned to receivingly accept each downwardly depending flange,
and
wherein said bottom framework is pivotally mounted to said intermediate framework proximate terminal end portions

of said bottom and intermediate frameworks, and further including a pivotally mounted collapsing latch wherein said collapsing latch is pivotally mounted at distal ends thereof to respective bottom and intermediate framework portions spaced from the terminal ends of said bottom and intermediate framework wherein said latch comprises a plurality of locking links,
and
wherein said handle comprises a plurality of downwardly depending legs slidably receivable within said intermediate framework, and said intermediate framework further includes a cross member integrally secured between spaced parallel portions of said intermediate framework and further including an elongate spring therewithin biasing outwardly from each end of said cross member a locking boss slidingly positionable within aligned apertures of respective portions of said intermediate framework, and further including a handle aperture formed through each downwardly depending leg of said handle and aligned with said through-extending apertures in a first position when said handle is extended outwardly from said intermediate framework, and misaligned with said through-extending apertures when telescopingly received within said intermediate framework,
and
wherein said bottom framework further includes a plurality of spaced slots for receiving and supporting said infant seat,
and
wherein said infant seat comprises a plurality of recesses spaced downwardly from an upper terminal edge of said infant seat and including guide loops formed within said recesses for receiving and maintaining a safety belt therethrough wherein said safety belt is secured to opposed yokes of said seat framework.

4,921,262
CARRIAGES INCORPORATING VERTICALLY ADJUSTABLE WHEEL ASSEMBLIES

Paul W. Svitak, 6635 Minnesota Ave., Long Beach, Calif. 90805

Filed Sep. 6, 1988, Ser. No. 240,825
Int. Cl.[5] B62D *33/08*
U.S. Cl. 280—43.23 24 Claims



1. A carriage for transporting and raising and lowering vehicles comprising, a frame having upper and lower first and second end frame elements and spaced side elements, a wheel assembly, suspension means for pivotally connecting said wheel assembly to said frame, said suspension means having first and second ends, bearing means, means for connecting said bearing means to said second end of said suspension means, track means mounted to said frame, actuator means mounted to said frame, said actuator means being connected to said means for connecting said bearing means to said second end of said suspension means, said bearing means being selectively moveable along said track means by said actuator means so as to selectively raise or lower said wheel assembly with respect to said frame between a raised position within said frame and a lower position wherein said wheel assembly is extended from said frame.

4,921,263
INCLINABLE VEHICULE

Pierre Patin, 11 Rue Buffon, 75005 Paris, France

Filed Jun. 22, 1987, Ser. No. 65,282
Claims priority, application France, Jun. 27, 1986, 86 09332
Int. Cl.[5] B62D *61/06*
U.S. Cl. 280—62 3 Claims



1. An inclinable multi-wheel vehicle comprising: a vehicle chassis having a longitudinal beam extending along a longitudinal axis; a primary part comprising (1) a hinged parallelogram which is distortable from a first position wherein said parallelogram is a right angle parallelogram to a second position wherein said parallelogram is a rhomboidal parallelogram, said parallelogram having upper and lower transverse arms and vertical arms interconnecting the ends of said transverse arms, each vertical arm having a wheel rotatably attached thereto, wherein said lower transverse arm is connected to said longitudinal beam at a point A through which said longitudinal axis extends, said lower transverse arm extending in a direction perpendicular to said longitudinal axis, and (2) a load bearing member having a lower end rotatably connected to said longitudinal beam and said lower transverse arm at point A, an intermediate portion rotatably connected to said upper transverse arm at a pivot point B, and an upper free end; a secondary part comprising a rotatable arm having a body attached thereto hinged to the free end of said load bearing body at a pivot point C; and means for rotating said rotatable arm with said body attached thereto relative to said load bearing member in response to distortion of said hinged parallelogram from said first position to said second position, said means for rotating comprising first means attached to said upper transverse arm at point B, second means attached to said rotatable arm at point C, and means interconnecting said first and second means for relative movement therebetween, wherein cornering of said vehicle causes a rotary movement of said secondary part with respect to said primary part so as to lift the center of gravity of said secondary part and raise the center of gravity of the whole vehicle thereby stabilizing said vehicle.

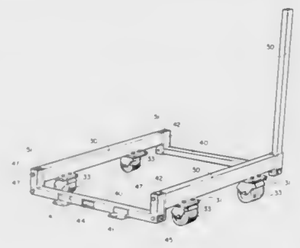
4,921,264
COLLAPSIBLE LIBRARY RANGE DOLLY

James C. Duffy, 9300 Dillion Dr., La Mesa, Calif. 92041

Filed Feb. 13, 1989, Ser. No. 309,735
Int. Cl.[5] B62B *3/02, 11/00*
U.S. Cl. 280—79.11 5 Claims

1. A collapsible library range dolly comprising:
a pair of laterally spaced elongated side frame members having a predetermined length, said side frame members having a front end, a rear end and a bottom surface, said side frame members being made of tubular steel;
at least four swivel casters;
means for securing at least two of said swivel casters to the bottom surface of each of said side frame members;
a pair of cross members made of square tubular steel each of which has a top surface, an outer wall surface, a left end and a right end, four square tubular steel upright members each of which has a bottom end, said upright members being welded to the top surface of said cross members adjacent their respective ends; and

means for detachably securing the respective ends of said side frame members to the ends of said respective cross members so that said side frame members lay in a horizontal plane spaced a predetermined height above the horizontal plane in which said cross members lay comprising four vertically oriented attachment plates each having a top end, a bottom end, a front surface and a rear surface, said attachment plates having their rear surfaces adjacent their top ends welded to the respective ends of said side

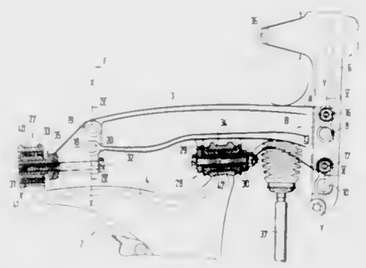


frame members, a nut is also welded to the rear surface of each of said attachment plates adjacent their top and bottom ends, these nuts align with apertures in said attachment plates, said upright members and the ends of said cross members have apertures that align with the respective apertures in said attachment plate and bolts are threadably received in said apertures for detachably securing said cross members to said side frame members through said attachment plates.

4,921,265
FRONT AXLE

Wolfgang Eyb, Leonberg, and Walter Schaible, Hemmingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. H.C.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 12, 1989, Ser. No. 296,127
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801640
Int. Cl.[5] **B60G** *7/02, 3/00;* **B60B** *35/10*
U.S. Cl. 280—96.1 **10 Claims**



1. A front axle for motor vehicles having a relatively fixed body part and used for different track widths, comprising cross bearer means secured at the relatively fixed part and operatively connected at one end with a longitudinal barrier that pivotally supports a wheel guide means through plural joint means, the operative connection of the longitudinal bearer means with the cross bearer being by way of threaded means that can attach the longitudinal bearer means at one of two vehicle track width positions with respect to the cross bearer means.

4,921,266
FIFTH WHEEL HAMMER BALL FOR GOOSENECK TRAILERS

Ralph Beals, Rte. 6, Box 49, Truck Rte. 7T, Russellville, Ark. 72801

Filed Feb. 6, 1989, Ser. No. 306,768
Int. Cl.[5] **B60D** *1/00*
U.S. Cl. 280—415.1 **13 Claims**



1. A fifth wheel trailer hitching system adapted to be fitted to a pickup truck for controlling a gooseneck trailer, said system comprising:

a rigid generally planar frame adapted to be secured to the pickup truck bed, said frame comprising a rigid hammer ball base plate for distributing force, said hammer ball base plate defining a threaded receptor orifice;

a ball coupling adapted to be selectively attached to said frame and coupled to said gooseneck trailer, said ball coupling comprising:

a rigid ball having a base;

a hammer flange rigidly secured to said base, said hammer flange comprising a generally circular central segment welded to said base of said ball and a pair of ears integrally projecting radially outwardly from said central segment; and,

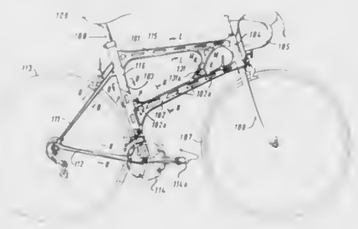
a rigid threaded shaft projecting from said ball and received within said receptor orifice; and,

whereby said ball coupling can be threadably secured to or removed from said frame by forcibly striking said flange ears with a hammer or the like.

4,921,267
BICYCLE AND FRAME THEREFOR

Francis G. Kirk, 12, Kenworthy Road, Braintree, Essex, England

Continuation-in-part of Ser. No. 930,976, Nov. 13, 1986, abandoned, which is a continuation of Ser. No. 654,316, Sep. 25, 1984, abandoned. This application Jul. 5, 1989, Ser. No. 376,939
Int. Cl.[5] **B62K** *19/02, 19/12*
U.S. Cl. 280—281.1 **3 Claims**



1. A cast bicycle open frame including a cross bar, a head and a saddle stem, a lower bar linking the head and the saddle stem, a pair of rear forks having one end of each fork attached to the saddle stem, the lower bar having a longitudinal axis, the saddle stem having an intermediate portion along the length thereof, said pair of rear forks having the other end intersecting in a point of intersection, the improvement comprising the cross bar, the lower bar, the head, the saddle stem and said pair of rear forks being an integrally-formed cast frame member of lightweight metal or alloy, a structural bridge linking the cross bar and the lower bar at a location between the head and the saddle stem, the lower bar joining the saddle stem at the intermediate portion thereof such that the longitudinal axis of the lower bar intersects said point of intersection of said rear pair of forks.

4,921,268
TRANSPORT DOLLY

Ronald Dyer, 2502 NE. Fourth Plain, Vancouver, Wash. 98661

Continuation of Ser. No. 186,612, Apr. 27, 1988, abandoned. This application Sep. 8, 1989, Ser. No. 405,113
Int. Cl.[5] **B60P** *3/12;* **B62D** *13/00*
U.S. Cl. 280—402 **17 Claims**



1. A transport dolly comprising:

(a) a control member,

(b) a pair of mounting pad members,

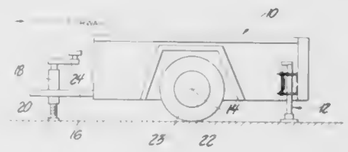
(c) first and second pairs of control arms disposed on opposite lateral sides of the control member, first pivot means securing one end of said first pair of control arms pivotally to the control member, second pivot means securing one end of said second pair of control arms pivotally to the control member, each of said first and second pairs of control arms adapted for pivotal movement of each of said first and second pairs of control arms independently of the other of the said first and second pairs of control arms, third pivot means securing the other end of the control arms of the first pair pivotally to one of the pair of mounting pad members, and fourth pivot means securing the other end of the control arms of the second pair pivotally to the other of the pair of mounting pad members, for moving the mounting pad members independently laterally toward and away from each other, lines extending through the axes of the four pivot means of each pair of control arms forming a parallelogram, whereby the pair of mounting pad members remain parallel to each other throughout the range of said lateral movement, and

(d) supporting wheel means secured for rotation in planes parallel to each mounting pad member.

4,921,269
LANDING GEAR/STABILIZER FOR SMALL TRAILER

Andrew J. Scully, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 25, 1988, Ser. No. 276,252
Int. Cl.[5] **B60S** *9/18*
U.S. Cl. 280—475 **2 Claims**



1. In a utility trailer for off-road travel having a generally rectangular body for holding cargo, the body having a forward end, a rearward end, and two sides connecting the ends, a fender well affixed to the outboard face of each side, a single axle mounted transversely to the body between the ends thereof, a draw bar fixed to the forward end of the body, a screw jack fixed to the draw bar, a ground engagement foot vertically translatable by the screw jack, and a vertical elongate bracket fixed to either side of the trailer at the rear end of the body, the improvement comprising: a pair of elongate flat arms pivotally connected to each bracket and extending forward toward the fender wells, the arms being disposed one above the other and defining holes therein disposed above one another; one arm tilting downward in the forward direction and the other arm tilting upward in the forward direction; a tension spring connected between the free ends of the arms; a generally vertically oriented stanchion passing through the holes, the width of the holes along the longitudinal axis of the arms being slightly greater than the fore-to-aft width of the stanchions, whereby the arms have a limited range of pivotal movement in a fore-to-aft vertical plane; a handle extending normally and forwardly from the upper end of the stanchion; and a ground engagement foot pivotally connected to the lower end of the stanchion; wherein the fender well, the bracket and a portion of the trailer side define a recess into which the stanchion and foot can be retracted.

4,921,270
CONVERTIBLE HAND TRUCK

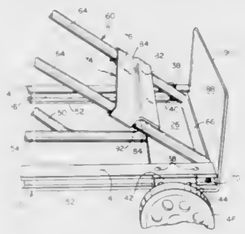
Carl J. Schoberg, Zumbro Falls, Minn., assignor to Liberty Diversified Industries, Minneapolis, Minn.

Filed Aug. 10, 1988, Ser. No. 230,486
Int. Cl.[5] **B62B** *11/00*
U.S. Cl. 280—655.1 **8 Claims**

1. In a hand truck for use by a user in transporting an article, said hand truck comprising a frame which may be oriented in a generally upright position or a generally horizontal position, said frame having a bottom end, said hand truck having two pair of wheels rotatably mounted to said frame and being carried on one said pair of said wheels when in said upright position and by both said pairs of wheels when in said horizontal position, a toe plate extending generally perpendicularly from said frame adjacent said bottom end, a handle member having a pair of legs spaced apart a distance and a handgrip segment, said handle member being pivotably mounted to said frame adjacent said bottom end such that said handle member may pivot between a retracted position proximate to and generally parallel with said frame and an extended position proxi-

mate to and generally parallel with said toe plate, the improvement comprising:

means for selectively and releasably securing the handle member to the toe plate in the extended position, said means including a bracket member having a crosspiece, said crosspiece having a pair of ends and a length measured therebetween approximately equal to the distance the legs of the handle member are spaced apart, a pair of guide means, one of said guide means connected to and associated with each of said ends of said crosspiece for slidably receiving one of the legs of the handle member therein, such that said bracket member may be selectively and completely removed from the handle member, and tang means connected to and extending downwardly from



said crosspiece for engaging said toe plate, said guide means being positioned and disposed so as to permit said crosspiece and said tang means to be completely and selectively removed from said handle member and selectively remounted thereon,

whereby the handle member may be selectively pivoted between the extended position and the retracted position with the frame in the generally upright position for rolling movement of the hand truck on one of said pair of wheels, and the handle member may be pivoted to the extended position with the frame in the generally horizontal position for rolling movement of the hand truck on both of said pair of wheels and with the handle member releasably secured to the toe plate such that the user may grip the handgrip segment of the handle member to propel the hand truck.

4,921,271

METHOD AND APPARATUS FOR ADJUSTING WHEEL ALIGNMENT IN A STEERABLE WHEEL SUSPENSION ASSEMBLY

Jimmy D. Berry, and Robert M. Allman, both of Longmont, Colo., assignors to Specialty Products, Inc., Longmont, Colo.

Filed Feb. 23, 1989, Ser. No. 314,824
Int. Cl.[5] B62D *17/00*
U.S. Cl. 280—661 **14 Claims**

1 A steerable wheel suspension assembly comprising:

fixed axle housing means for pivotally supporting a wheel knuckle means therein;

wheel knuckle means for supporting a wheel spindle thereon;

first ball joint means for pivotally connecting said axle housing means with said wheel knuckle means; said ball joint means comprising a shaft portion mounted in said axle housing means and a ball housing portion mounted in said wheel knuckle means;

bushing means having a central bushing axis and having a bushing bore extending therethrough having a central bore axis positioned in noncoaxial relationship with said central bushing axis; said bushing means being received in a bore in said axle housing means and being rotatable therein about said central bushing axis; said ball joint shaft portion being received in said bushing bore;

bushing head means fixedly attached to said bushing means and projecting radially outwardly therefrom;

annular plate means located between said bushing head means and said axle housing means and rotatably received about said bushing means for facilitating angular adjustment between said bushing means and said axle housing means;

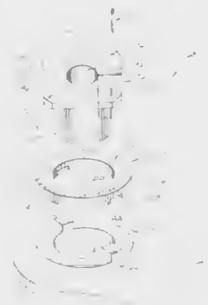


plate locking means for locking said plate means in angularly fixed relationship with said axle housing means;

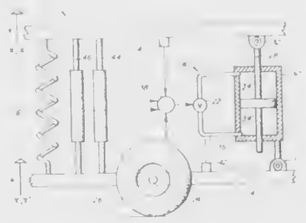
adjustable bushing locking means for locking said bushing means in a selected angular orientation with respect to said annular plate means.

4,921,272

SEMI-ACTIVE DAMPER VALVE MEANS WITH ELECTROMAGNETICALLY MOVABLE DISCS IN THE PISTON

Douglas E. Ivers, Cary, N.C., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 10, 1989, Ser. No. 310,145
Int. Cl.[5] B60G *17/04*
U.S. Cl. 280—707 **12 Claims**



1 Semi-active damper means operative between relatively movable members and switchable between relatively high and relatively low damping states, comprising:

fluid cylinder means interconnecting said movable members having opposing variable volume fluid chambers separated by piston means, wherein relative movement in compression and extension of said movable members provides for a fluid pressure differential and flow of fluid through said piston means between said chambers;

fluid passages through said piston means for communication of fluid between said chambers during compression and extension of said movable members as dictated by said high damping and said low damping states;

electromagnetic actuator means within said piston means for selecting said damping state in response to a control condition;

first and second valve rings movable between flow permitting and flow restricting positions within said passages, respectively operable by said electromagnetic actuator means alternatively between on and off states, such that when one of said valve rings is in said on state it is in a flow permitting position, and the other of said valve rings in said off state is fluid pressure actuated between flow restricting and flow permitting positions to select respectively either said high or low damping state;

said other of said valve means in said off state providing a check valve function for automatically switching said damper means from one to the other of its damping states dependent upon the direction of fluid flow between said opposing chambers, upon transition between extension and compression of said movable members;

said other of said valve means in said off state further providing a switching delay function from high to low damping such that when pressure actuated in said fluid restricting position, actuation of said valve means by said electromagnetic actuator means to said on state will be ineffective for transfer of said valve means to said flow permitting position until the fluid pressure differential of fluid flow rate between said chambers is at a preselected low magnitude.

4,921,273

SHOULDER BELT MINICOVER AND CUSHION

Judy M. Weightman, and Andrew K. Mirikitani, both of 1717 Mott-Smith Dr., No. 1501, Honolulu, Hi. 96822

Continuation of Ser. No. 57,637, Jun. 4, 1987, Pat. No. 4,795,190, Division of Ser. No. 818,319, Jan. 13, 1986, abandoned. This application Dec. 30, 1988, Ser. No. 292,429
Int. Cl.[5] B60R *22/14, 22/28*
U.S. Cl. 280—808 **6 Claims**



1. Shoulder belt minicover and cushion apparatus comprising a neck cushion and minicover having an inner surface and an outer surface for folding medially along a folded edge to juxtapose opposite areas of the inner surface and having fastener strips along free edges opposite the folded edge for fastening the free edges together and leaving a portion of the lower edge and upper edge open for receiving a shoulder belt extending between the juxtaposed areas of the inner surface and extending outward from the upper edge and lower edge whereby the neck cushion and minicover prevents contact of an inner edge of the shoulder belt with the neck or upper body portion of a user.

4,921,274

SKI SEAT STRUCTURE

Daniel R. Holman, 3435 Duncan Ave. NE., Salem, Oreg. 97303

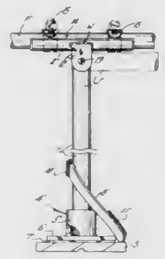
Filed Feb. 21, 1989, Ser. No. 313,039
Int. Cl.[5] A63C *11/00*
U.S. Cl. 280—812 **8 Claims**

1. Seat structure for attachment to a recreational ski to permit a ski pole to be used as a seat by a skier wearing the ski, said seat structure comprising,

a post,

retainer means for attachment to the upper surface of the ski for removably securing a lower end of said post to the ski in an upright manner,

a cross member on said post having a surface on which the ski pole may be horizontally placed to position the ski pole above and crosswise of the ski to enable use of the pole as a seat by the skier while wearing the ski, and



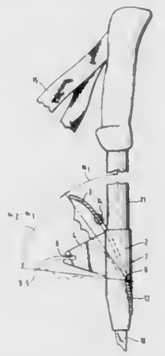
coupling means for attaching said post in parallel fashion to a ski pole to permit normal ski pole use during skiing.

4,921,275

SKI POLE PROVIDED WITH A SNOW RING

Ensio Santanen, Helsinki, and Esko Ranvala, Espoo, both of Finland, assignors to Exel OY, Helsinki, Finland

Filed Dec. 19, 1988, Ser. No. 286,538
Claims priority, application Finland, Dec. 21, 1987, 875614
Int. Cl.[5] A63C *11/24*
U.S. Cl. 280—824 **16 Claims**



1. A ski pole provided with shaft and a snow ring (1) capable of compact, space saving storage, said snow ring being produced as a one-piece plastic moulding comprising a sleeve member and a basket member, the bearing surface of which is formed by a wing portion (3) that can be pivoted downwardly from a storage position adjacent said shaft to its working position generally normal to and rearward of said shaft and locked in said position, characterized in that said wing portion (3), which is integrally attached at its forward portion to said sleeve member (2) can be pivoted between its storage and working positions by bending the plastic material of said wing portion (3), said sleeve member (2) being provided with rearwardly extending, laterally divergent locking and bracing means (4, 8) for locking and supporting said wing portion (3) in its working position, said means extending rearwardly generally normal to said shaft, said wing portion between its point of attachment to said sleeve (2) and its outermost trailing edge portion (9) when in the storage position forming an acute angle relative to the longitudinal axis of said sleeve member (2) and shaft with the portion of said basket member adjacent said sleeve member flexing to permit said pivotal movement.

4,921,276
SPRAY CONTROLLING FENDER
Albert Z. Morin, Apt. 801, 2200 Regent Street, Sudbury, Ontario, P3E 5S2, Canada
Filed May 23, 1988, Ser. No. 197,601
Int. Cl.[5] B62D 25/16
U.S. Cl. 280—848 5 Claims



1. A fender for a wheel or set of wheels for one side of an automotive vehicle, for controlling the wet weather spray and splash generated thereby when travelling on a roadway surface, the fender comprising:
(a) a formed, rigid sheet mounted over and covering the wheels or set of wheels and downwardly curved in streamlined fashion over a small portion of the upper surface of the wheels at its forward and rearward ends;
(b) a downwardly depending skirt extending along each edge of the sheet;
(c) one or more air intake apertures in the upper part of the forward, curved end of the sheet to direct an even flow of air from outside the fender to inside the fender and over the wheel or set of wheels covered thereby during forward movement of the vehicle; the intake aperture or apertures having lower edged that are of upwardly curved, arcuate shape and being positioned and of such a size than an even flow of air from outside the fender to inside the fender, at about the same pressure inside the fender as around the fender on the outside, is achieved during forward movement of the vehicle; and
(d) a spray shield in sheet form adapted to be disposed above the roadway surface vertically depending from the rear of the rigid sheet and spaced rearwardly from the vehicle wheel or wheels in a plane extending transversely to the vehicle, a plurality of rearwardly opening, permanently opened louvers in the shield extending, when the shield is in position, horizontally between its sides over a major portion of the area of the shield, the louvers to permit flow of air and spray through the shield and cause a downward deflection thereof.

4,921,277
METHOD OF LABELING NEEDLE SYRINGES AND MEDICATION VIALS AND NOVEL LABELS THEREFOR
Suellen McDonough, Durham, N.H., assignor to Academy of Applied Science, Inc., Concord, N.H.
Filed Oct. 24, 1988, Ser. No. 261,841
Int. Cl.[5] G09F 3/00; B42D 15/00; A61M 3/00, 5/24
U.S. Cl. 283—81 5 Claims

1. A method of labeling syringes and vials from which the syringes withdraw medication, that comprises, applying a pressure-sensitive adhesively backed removable medicine-identifying label to a vial containing the medicine; inserting a needle syringe into the vial to withdraw the medicine; peeling the medicine-identifying label from the vial; and applying the label as a tag extending to the side of the syringe and secured



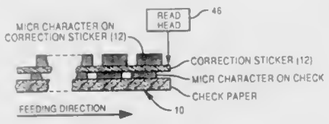
thereto along a narrow strip of the syringe barrel near its upper opening remote from the barrel calibrations.

4,921,278
IDENTIFICATION SYSTEM USING COMPUTER GENERATED MOIRE
Lu P. Sbiang, and Duanfeng He, both of Beijing, China, assignors to Chinese Academy of Sciences, Beijing, China
Continuation of Ser. No. 846,266, Mar. 31, 1986, abandoned. This application Nov. 9, 1988, Ser. No. 270,422
Claims priority, application China, Apr. 1, 1985, 85100700
Int. Cl.[5] B42D 15/00; G06K 9/00, 7/10; G03H 1/02
U.S. Cl. 283—87 5 Claims



1. An identification card wherein an image incorporating identifying information is encoded in an object grid mounted to the identification card, said object grid including a computer-generated pattern of broken lines produced from said image and from a reference grid including a random pattern of broken lines.

4,921,279
MICR PRINTING TECHNIQUE AND APPARATUS TO MINIMIZE REJECTS WITH CORRECTION STICKERS
Peter D. Hanna, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio
Filed Aug. 18, 1988, Ser. No. 234,236
Int. Cl.[5] B42D 15/00
U.S. Cl. 283—67 22 Claims



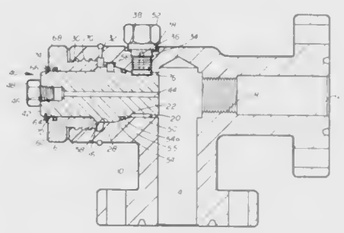
1. A method of correcting MICR data encoded on a document with magnetic ink having a predetermined intensity, comprising the steps of:

(a) placing a correction sticker on the document over the MICR data to be corrected; and
(b) purposely printing the correct MICR data on the correction sticker with magnetic ink having an intensity which is substantially greater than said predetermined intensity.

4,921,280
SECURITY FIBERS AND OTHER MATERIALS MADE LUMINESCENT BY A DYEING PROCESS, PROCESSES FOR THEIR MANUFACTURE AND THEIR APPLICATIONS
Michel Jalon, 19 Avenue du General LeClerc, 75014 Paris, France
Continuation-in-part of Ser. No. 929,487, Nov. 12, 1986, abandoned, which is a continuation of Ser. No. 746,671, Jun. 20, 1985, Pat. No. 4,655,788. This application Jun. 13, 1989, Ser. No. 366,293
Claims priority, application France, Jun. 22, 1984, 84 09807
Int. Cl.[5] B42D 15/00
U.S. Cl. 283—88 5 Claims

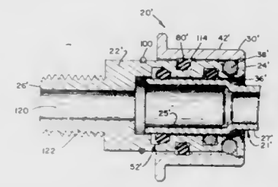
1. Fluorescent fibers and threads comprising:
(a) fibers or threads made from polyester, polyamide, or combinations thereof; and
(b) at least one luminescent rare-earth chelate, the fibers or threads being dyed with the luminescent rare-earth chelate, the dyed fibers or threads exhibiting at least one luminescence emission in a region of the infrared, visible, ultraviolet, or x-ray spectrum under excitation by infrared, ultraviolet or x-rays, the luminescence emission region of the dyed fibers or threads being different than the luminescence emission region of the luminescent rare-earth chelate alone prior to the chelate being used to dye the fibers or threads.

4,921,281
SAFETY CONNECTION INTO PASSAGES IN A TUBULAR BODY
Kennard W. Taylor, Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.
Filed Jan. 25, 1989, Ser. No. 301,629
Int. Cl.[5] F16L 55/10
U.S. Cl. 285—90 6 Claims



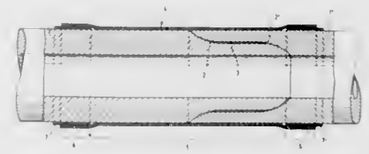
1. An apparatus for connecting into one of the passages of a choke body comprising
a body adapted to fit within the passage of the choke body,
means on said body for sealing between said body and said passage when said body is seated within said passage,
a threaded opening extending radially through said choke body into the interior of said passage,
a groove around the exterior of said body which is axially positioned on said body in registry with said opening when said body is seated within said passage,
a bleed plug threaded through said opening and engaging within said groove during normal operations to retain said body in a sealed position with said passage, and
means for securing said body within said passage.

4,921,282
UNDERMODERATED NUCLEAR REACTOR
Stanlee W. Meisinger, Golden Valley, Minn., assignor to FasTest Incorporated, St. Paul, Minn.
Continuation of Ser. No. 96,392, Sep. 11, 1987. This application May 19, 1989, Ser. No. 356,625
Claims priority, application France, Feb. 16, 1984, 84 02329
Int. Cl.[5] F16L 17/02
U.S. Cl. 285—104 21 Claims



1. An integral attachment means for attaching a coupling body having a bore and first and second ends to an insert upon insertion of the insert into the bore which extends into the first end of the body, the attachment means including spring ring means for distributing a separation force about a perimeter of the insert, a plurality of individually spaced apart point force members, and a latching sleeve member forcing the point force members radially inward into engagement with the spring ring means, forcing said spring ring means radially inward into the bore so as to engage the insert.

4,921,283
CONNECTION OF CARBON OR GRAPHITE TUBES
Kurt Schaffner, Augsburg; Adolf Swozil, Kühlenthal, and Gerhard Ullmann, Gross-Gerau, all of Fed. Rep. of Germany, assignors to SIGRI GmbH, Meitingen, Fed. Rep. of Germany
Filed May 22, 1989, Ser. No. 355,404
Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818067
Int. Cl.[5] F16L 13/04
U.S. Cl. 285—114 6 Claims



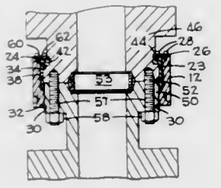
1. Adhesive connection of carbon or graphite tubes, comprising carbon or graphite tubes having ends joined together in a given bonding position by bonding material positioned between the tube ends and a sleeve formed of fibers surrounding the given bonding position of the two carbon or graphite tubes, said sleeve having an intermediate section firmly connected to the tubes by cement and said sleeve having end sections, and enveloping foils disposed between said end sections and the tubes, said foils annularly surrounding the tubes, and said foils being glued to said end sections and being displaceable relative to the tubes.

4,921,284

HIGH STRENGTH SPLIT CLAMP FOR PIPE FLANGES

Shiva P. Singeetham, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 28, 1989, Ser. No. 344,736
Int. Cl.[5] F16L *23/00*
U.S. Cl. 285—415 6 Claims



1. A split clamp apparatus for providing a high strength connection between a pair of pipe flanges, said apparatus comprising

(a) an outer ring having first and second sets of internal threads;

(b) at least two arcuate ring segments which form a split ring when joined together in end-to-end manner, said split ring having a set of external threads engageable with the outer ring second thread set, and means for securing said split ring to a pipe in a pipe flange-surrounding position;

(c) means for securing the arcuate ring segments together in end-to-end manner; and

(d) means for securing the split ring to the outer ring against relative rotation when said outer ring is threaded onto said split ring into proper flange-clamping position.

4,921,285

CONNECTING ROD GEARING

Horst Loos, Freudenberg-Lindenberg, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed May 26, 1988, Ser. No. 198,982
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718173
Int. Cl.[5] E05C *9/12*
U.S. Cl. 292—39 14 Claims



1. A connecting rod gearing for installation into stepped profile slots of wings or frames of windows or doors, having two oppositely shiftable connecting rods under a flat cover rail defining a cover rail plane, in which each rod is provided with a thrust link equipped with an engagement toothing guided in a housing and held in engagement with each other from opposite sides respectively, by a pinion having toothing and crown circle and root circle diameters, in which the housing is formed by the flat cover rail and by a channel of approximately U-shape situated adjacent to the cover rail, wherein the U-shaped channel has a bottom and mutually bent ends in the form of legs having front faces and inside surfaces, the channel having a smaller width than the width of the cover rail, characterized by the fact that: "the cover rail (**12**) of the housing (**11**) has a discontinuity (**14**) spanning the pinion (**15,16**) and toothing of the thrust links (**22** and **23**),"

the pinion with its toothed rim (**16**) is located in the "spaced defined by the discontinuity" of cover rail (**12**),

the discontinuity is bridged by the U-shaped channel (**13**) of housing (**11**) below the plane of the cover rail

said crown circle diameter (**17**) of the pinion toothed rim (**16**) corresponds to the cover rail width; and

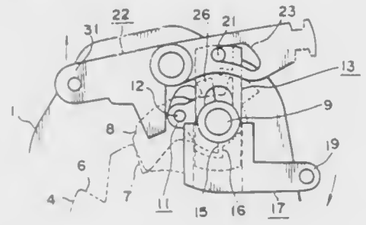
the cover rail discontinuity (distance **14**) is covered on the outside of cover rail (**12**) by a protection cap (**25**).

4,921,286

LOCK DEVICE FOR USE OF VEHICLE DOORS

Shuji Nakamura, 4-3, Midoricho 3-chome, Utsunomiya-shi, Tochigi-ken, Japan

Filed Mar. 28, 1989, Ser. No. 329,609
Claims priority, application Japan, Mar. 28, 1988, 63-73841
Int. Cl.[5] E05C *3/26*
U.S. Cl. 292—216 6 Claims



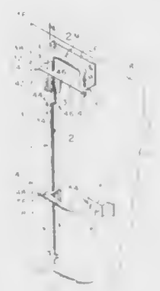
1. A lock device for the use of vehicle doors, including a lock body, a latch engaging a striker and supported to said lock body by a first shaft, a ratchet for preventing said latch from reversing, an open lever for releasing the engagement of said ratchet with said latch, said ratchet and said open lever being supported to said lock body by a second shaft, and a lock lever for changing over the relation between said ratchet and said open lever to the engagement and to the disengagement and supported to said lock body by a third shaft, characterized by supporting a lock piece, which moves with the pivotal motion of said lock lever, to said second shaft.

4,921,287

SECURITY DOOR WINDOW LATCH

Edward Horvath, 1737 Libby Pl., Bronx, N.Y. 10461, and George Spector, 233 Broadway #3815, New York, N.Y. 10007

Filed Sep. 21, 1989, Ser. No. 410,278
Int. Cl.[5] E05C *5/02*
U.S. Cl. 292—106 4 Claims



1. A security latch assembly for a door hinged to a door frame, said assembly comprising:

(a) a lower bracket mounted to jamb of the door frame opposite the hinged portion of the door;

(b) an elongated vertically disposed L-shaped latch rod having a lower horizontal arm which will bear against the door in a locked position and move away from the door in an unlocked position, said latch rod extending through said lower bracket which supports said latch rod for rotation about a vertical axis while allowing said latch rod to move upwardly and downwardly;

(c) an upper L-shaped bracket having a first leg mounted to a lintel of the door frame and a second leg having a pair of spaced apart apertures therethrough with one of said apertures directly above top end of said latch rod;

(d) a C-shaped locking rod having ends carried in both of said apertures in said upper L-shaped bracket;

(e) a spring placed over the end of said locking rod extending through said second leg that is directly above the top end of said latch rod; and

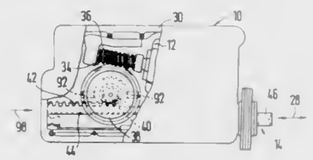
(f) means for adjustably connecting the top end of said latch rod to the end of said locking rod with said spring thereon which will bias said locking rod downwardly allowing the free end of said locking rod to enter said respective aperture in said upper L-shaped bracket in the locked position, whereby a person can push up said horizontal arm of said latch rod to release said locking rod which will go into the unlocked position to open the door.

4,921,288

DRIVING DEVICE FOR SHIFTING A MECHANICAL ELEMENT, PARTICULARLY FOR USE IN A LOCKING SYSTEM OF A MOTOR VEHICLE

Luis Cifuentes; Carlos Sala, and Alfonso Vozmediano, all of Madrid, Spain, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,756
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738416
Int. Cl.[5] E05C *1/06*
U.S. Cl. 292—144 12 Claims



1. A driving device for shifting a mechanical element, comprising a reversible driving motor; a reduction worm gearing connected to the driving motor; an intermediary transmission means operatively connected between the reduction worm gearing and the mechanical element to move the same on a predetermined path; and a clutch arranged between said worm gearing and said intermediary transmission means.

4,921,289

CYLINDRICAL LEVER TYPE LOCK STRUCTURE FOR HANDICAPPED PEOPLE

Chao C. Shen, No. 233, Sec. 2, Hai Tien Road, Tainan, Taiwan

Filed Jan. 13, 1988, Ser. No. 143,521
Int. Cl.[5] E05B *3/00*
U.S. Cl. 292—336.3 3 Claims

1. In a cylindrical lever type lock structure for handicapped people having: outer and inner spindles rotatably received in first and second spindle housings, respectively, said inner spindle having a pair of first protruding plates and said outer spindle having a pair of second protruding plates thereon for urging a fourth bracket to open a door; an encasing and a first bracket engaged with said second and first spindle housing, respectively; a compression spring mounted around said first spindle housing, said first bracket being further engaged to said encasing; a plate and an escutcheons attached at left and right sides of a lock body by screwing a pair of cover rings thereon; and inner and outer handles releasably secured to said inner and outer spindles, respectively; the improvements in said cylindrical lever type lock structure for handicapped people comprising:

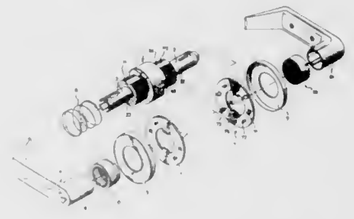
(a) said plate defines a pair of first cutouts, a pair of second cutouts and a pair of triangular protrusions thereon and has a central hole thereat with two opposite protrusions formed thereon, said first cutouts being insertable into a pair of slots formed proximate to a bore on a door for securing said lock body in position, said second cutouts being engageable with said bore to abut against and be supported by an edge of said bore, said triangular protrusions being penetrable into a wood door;

(b) said first and second spindle housings each defining respective first and second central holes, said first hole having a larger diameter than said second hole, said second hole on said first spindle housing defining a first groove and said second hole on said second spindle housing defining a second groove;

(c) first and second bending protrusions formed on the respective inner and outer spindles and aligned with an passable through said second and first grooves;

(d) a torsional spring with two protrusions located within the respective first hole and outside of said inner and outer spindles;

(e) a spring seating having a longitudinal protruding tip formed thereon secured proximate to each of said first holes, said protruding tip being mounted atop said first and second protrusions with said two protrusions of said torsional spring being positioned on opposite sides of said protruding tip;



(f) means for locking said outer spindle relative to said first spindle housing securely mounted inside said outer spindle, said means for locking comprising: a second engaging pin; a second spring; and engaging pin; an annular spring; said second engaging pin rotatably receives a third annular ring; a second spring located within said second engaging pin and being retained therein by a second pin; a second torsional spring, said third annular ring and a second annular ring respectively mounted on a middle portion of said second engaging pin; said third and second annular rings disposed outside said second torsional spring with bending protrusions of said third and second annular rings situated between two free ends of said second torsional spring, said second pin laterally penetrating through said second engaging pin to retain said second annular ring and said second spring in position; said engaging pin received by said second engaging pin with one end thereof receiving said second pin and pressing said second spring; said third annular ring turnable in both a clockwise and a counter-clockwise direction, said annular ring and said engaging pin rotatably secured together, said engaging pin rotatable by said second engaging pin; and,

(g) a bar assembly securely mounted inside said inner spindle by a catch, said bar assembly comprising: a correcting plate; a first container; a bar; a cover; and a first pin; said correcting plate mounted within said first container, said first pin assembly with said first container and a second container, said second container having a protrusion thereon which is bendable so that said bar assembly secured to said inner spindle, said bar engaged with said

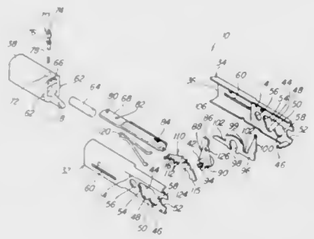
engaging pin, a protruding portion of said annular ring slidable with said engaging pin to engage with both a second opening on said outer spindle and said first groove by pressing said cover so that rotational movement of said first spindle housing relative to said outer spindle is blocked; two indentations defined on said bar engaged to and retained by a third bracket which is urged by a conical spring, said second engaging pin turnable to rotate said engaging pin and said bar, said two indentations thereof disengaging from said third bracket and said second spring simultaneously forcing said engaging pin and said bar back to an original position.

4,921,290

BACKSET ADJUSTABLE DOOR LATCH

Hagen Dietrich, Delta, Canada, assignor to Masco Building Products Corp., Taylor, Mich.

Filed Nov. 4, 1988, Ser. No. 267,200
Int. Cl.[5] E05C *1/16*
U.S. Cl. 292—337 **23 Claims**



1. A latching mechanism mountable within a door and having a rotatable operating handle, the door having an outer edge through which said mechanism extends, said latching mechanism having an adjustable backset distance between the door edge and the rotational axis of the operating handle, said latching mechanism comprising:

a bolt shiftable between extended and retracted positions;

a bolt extension adjustably connected to said bolt and shiftable with said bolt;

an actuating cam operating on said bolt extension for shifting said bolt between the extended and retracted positions, said cam having a pivot hub coaxial with the rotational axis of the operating handle;

a latch housing having an opening to rotatably receive said hub of said actuating cam;

said hub of said actuating cam receivable in a first portion of said opening such that the rotational axis of the operating handle is positioned in a first backset position relative to the door edge, said bolt extension engaging said bolt in a first relative position;

said hub of said actuating cam receivable in a second portion of said opening such that the rotational axis of the operating handle is positioned in a second backset position relative to the door edge, said bolt extension connected to said bolt in a second relative position;

said actuating cam selectively movable between said first and second portions of said housing opening to adjust the backset distance of said latching mechanism; and

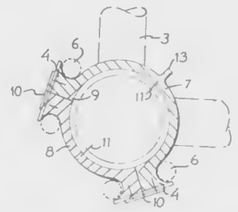
means selectively connecting said bolt to said bolt extension whereby said bolt extension can be adjusted between said first and second positions relative to said bolt, said means operatively engaging said actuating cam such that as said cam is moved between said first and second portions of said housing opening said means disconnects said bolt from said bolt extension for relative adjustment between said first and second positions.

4,921,291

LOAD LIFTING APPARATUS

Anthony M. Wood, Sheffield, England, assignor to River Don Castings Limited, Sheffield, United Kingdom

Filed Jul. 20, 1988, Ser. No. 222,072
Claims priority, application United Kingdom, Jul. 22, 1987, 8717355
Int. Cl.[5] B66C *1/62*
U.S. Cl. 294—90 **8 Claims**



1. A padear for lifting heavy structures, the padear comprising:

two separable padear sections which on assembly define an internal face to embrace a component of the structure to be lifted and an external circumference, and which are separable along two separate, non-coplanar radially extending planes that intersect along a longitudinal centerline of the component of the structure to be lifted; and

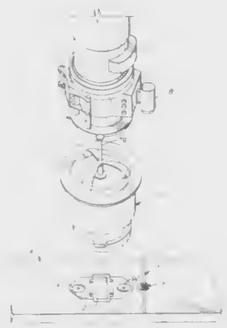
two bollards which project outwardly from the external circumference of the padear, with each bollard having one of the separate planes passing centrally therethrough and with the padear sections being retained in abutting contact by lifting forces applied through the bollards.

4,921,292

MAGNETIC ATTACHMENT MECHANISM

William D. Harwell, and Mitchell B. Wu, both of Houston, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 23, 1988, Ser. No. 248,010
Int. Cl.[5] B66C *1/04*
U.S. Cl. 294—65.5 **5 Claims**



1. A magnetic attachment mechanism adapted for interfacing with the manipulator arm of a remote manipulator system and comprising a pair of permanent magnets arranged in a stator-rotor relationship, one of said magnets constituting a stator magnet having a pair of pole plates extending therefrom in substantially parallel relationship to one another and each of said pole plates includes an adhering surface, the other of said magnets constituting a rotor magnet mounted between said pole plates and journalled for rotation about an axis intermediate its magnetics poles;

wherein said rotor magnet being of elongate form symmetrical about its central longitudinal axis with the magnetic lines of force of its magnetic field passing through the magnet in a direction transverse to said longitudinal axis and having a shaft affixed coaxial with respect thereto and said

actuator means comprises a stepping motor having a motor shaft and a gear transmission coupled to said motor and rotor magnet shafts for selectively rotating the rotor magnet between first and second rotary positions, said first position corresponding to a position wherein each of the poles of the rotor magnet is closely adjacent a one of the said pole plates which is of like polarity whereby the magnetic fields of said rotor and stator magnets are in additive relationship producing a strong magnetic field at said adhering surfaces and a magnetic attractive force for a payload or workpiece having a member of magnetic material;

said second position corresponding to a position wherein each of the poles of the rotor magnet is disposed closely adjacent a one of said pole plates which is of unlike polarity whereby the magnetic fields of said rotor and stator magnets are in canceling relationship at said adhering surfaces; and

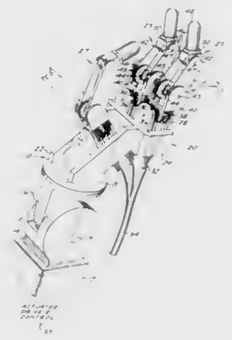
said actuator means being adapted for interfacing connection with an effector end of said manipulator arm.

4,921,293

MULTI-FINGERED ROBOTIC HAND

Carl F. Ruoff, La Crescenta, and J. Kenneth Salisbury, Jr., Palo Alto, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 364,774, Apr. 2, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 680,605
Int. Cl.[5] B25J *15/10*
U.S. Cl. 294—111 **9 Claims**



2. In a mechanical hand having an articulated finger with a first joint positioned along a first axis and a second joint positioned along a second axis with the second joint positioned outboard of the first joint, the improvement comprising:

a first idler pulley positioned along said first axis;

a first drive pulley positioned along said second axis with rotational movement of the first drive pulley causing articulation of the finger at said second joint;

a first cable drive engaging said first idler pulley and said first drive pulley;

said first cable drive producing rotation of said first idler pulley and said first drive pulley, and

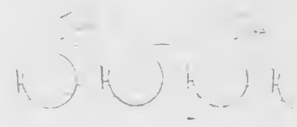
means to fix the position of said first idler pulley such that movement of the first cable drive produces articulation of the finger at said first joint.

4,921,294

SPRING WIRE GRIPPER JAW

Andrew L. Klopfenstein, Dayton, Ohio, assignor to AM International Incorporated, Chicago, Ill.

Filed Jun. 3, 1988, Ser. No. 202,837
Int. Cl.[5] B25B *1/06*
U.S. Cl. 294—99.1 **14 Claims**



10. An apparatus for gripping an article, comprising

a base member;

first and second gripper jaws, said second gripper jaw being fixed to said base member;

means supporting said first jaw for pivotal movement relative to said second jaw between a first position adjacent to said second jaw for gripping the article therebetween, and a second position spaced from said first position and from said second jaw; and

actuator means for moving said first jaw from said first position to said second position;

said first jaw comprising a pair of torsion springs for biasing said first jaw into said first position, two gripping tangs projecting away from said torsion springs for engaging and gripping the article at two spaced apart locations, said two gripping tangs being spaced apart and defining a space between the ends of said gripping tangs in which the article is not engaged by said first jaw when said first jaw engages the article, and a pressing element for pressing the fold of the article to force air out of the fold, said pressing element projecting out of the plane of said gripping tangs from said gripping tangs away from said space toward said torsion springs, said first jaw consisting essentially of a single continuous wire not including the second jaw.

4,921,295

CARRIAGE FOR AN AMBULANCE STRETCHER

Joachim Stollenwerk, Cologne, Fed. Rep. of Germany, assignor to Stollenwerk Fabrik für Sanitätsausrüstungen Hans Stollenwerk & Cie GmbH & Co., Fed. Rep. of Germany

Filed Oct. 12, 1988, Ser. No. 256,751
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734902
Int. Cl.[5] A61G *1/02*
U.S. Cl. 296—20 **15 Claims**

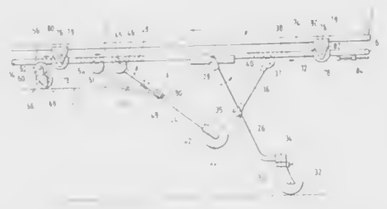
1. A carriage for an ambulance stretcher, said carriage comprising:

(a) a frame, front and rear legs articulated to the frame and adapted to be arrested,

(b) means mounting entry roller means at the front end of the frame,

(c) said mounting means including guide means for displacing the entry roller means in lengthwise direction along

the frame between a front end position and a displaced position, and



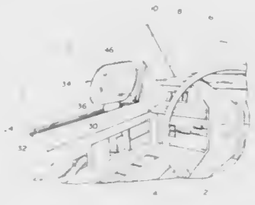
(d) arresting means for locking the entry roller means in a predetermined position with respect to the frame.

4,921,296

GLARE SCREEN DEVICE FOR VEHICLE SIDE DOOR EXTERIOR MIRROR

Carl A. Gruber, 1963 Axtell, Troy, Mich. 48084, assignor to Carl A. Gruber, Troy, Mich.

Continuation-in-part of Ser. No. 181,500, Apr. 14, 1988, abandoned. This application Apr. 3, 1989, Ser. No. 332,582
Int. Cl.[5] B60J *3/00*
U.S. Cl. 296—97.2 13 Claims



1 A glare screen device for use with a vehicle side door having an exterior rear view mirror, a vertically movable window having inner and outer surfaces, and an inboard upper end of the door located adjacent the inner surface of the window, the glare screen device comprising:

a lower mount having a sheet-like construction and a lower tapered end that is insertable between the inner surface of the window and the inboard upper end of the door, the lower mount also having an upper end that projects upwardly from the inboard upper end of the door, the lower mount having an outer surface that faces the inner surface of the door window and having an inner surface that faces the inboard upper end of the door, and the lower mount having texturing on both its inner and outer surfaces; and

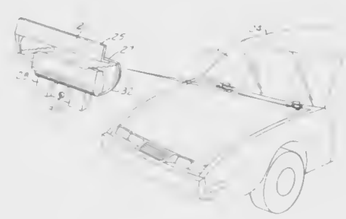
a glare screen of a generally sheet-like construction having inner and outer surfaces and having a lower portion where the outer surface thereof is connected to the inner surface of the lower mount at the upper end thereof such that the glare screen is spaced inwardly from the inner surface of the window, and the glare screen having a sufficient size and shape to screen a vehicle occupant adjacent the door from light glare from the exterior rear view mirror of the door.

4,921,297

ADJUSTABLE SPACERS FOR SUPPORTING FRONT WINDOW GLASS IN AN AUTOMOBILE

William T. Stevens, Rochester Hills, Mich., assignor to Automotive Moulding Company, Warren, Mich.

Filed Nov. 21, 1988, Ser. No. 274,083
Int. Cl.[5] B60F *1/04*
U.S. Cl. 296—96.21 8 Claims



4 An automobile comprising:

a vehicle frame;

a spacer having a bottom portion and a top portion;

a window glass panel;

a molding secured to a bottom edge of said window glass panel;

said spacer bottom portion being formed with means to receive said top portion and allow said top portion to be advanced with respect to said bottom portion;

said bottom portion being fixed to said vehicle frame;

said top portion being formed with a surface that supports said window glass panel;

said top portion being received within said bottom portion at any one of several distinct positions, a first distance being defined as the distance from a point on the bottom portion to said support surface formed on the top portion, said distance being measured along a line extending perpendicular to said support surface, movement of the top portion within the bottom portion allowing the adjustment of said first distance in order to accommodate manufacturing tolerances between the spacer element or the vehicle frame or the window glass;

said top portion of said spacer element being formed with a lateral support member that is integrally moved with said top portion and is received within said molding; and

said molding being generally H-shaped, said window glass panel received in an upper half of said H-shaped molding, said lateral support member being received in a bottom half of said H-shaped molding.

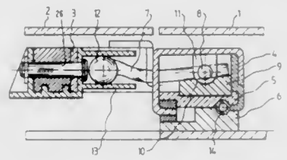
4,921,298

LIFT-UP SUN ROOF, IN PARTICULAR FOR AUTOMOTIVE VEHICLES

Gerhard Reuber, Drolshagen; Achim Braun, Nuembrecht, and Udo Hesseler, Drolshagen, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,755
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810443
Int. Cl.[5] B60J *7/05*
U.S. Cl. 296—221 6 Claims

1. A lift-up sun roof for automotive vehicles comprising a rigid cover which in its closed position closes a roof opening in a roof area and which is guided at lateral guide rails by means of sliding elements and is raisable with one end above the stationary roof area and which can be slidable below the roof area upon lowering of one end, a connection between the said cover and said sliding element being effected through a lever which is pivotable about a longitudinal axis of the said guide



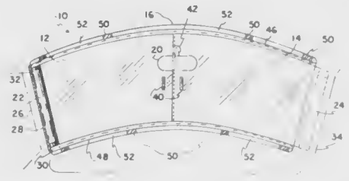
rail, a control ramp supporting said lever wherein an angle of pivoting of said lever is determined by said control ramp.

4,921,299

VEHICLE INTERIOR HEATSHIELD

Joseph R. Herrick, 129 St. Rose Dr., Verona, Pa. 15147

Filed Feb. 3, 1989, Ser. No. 305,777
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—978 6 Claims



1. A heatshield and sunshield for vehicle windows, comprising:

at least one thin, flexible, opaque shield component,

at least one cylindrical container, wherein said at least one shield component may be retracted and coiled for storage,

biasing means retracting said at least one shield component within said at least one cylindrical container,

upper and lower guide track components containing respective upper and lower edges of said at least one shield component when said at least one shield component is extended, and

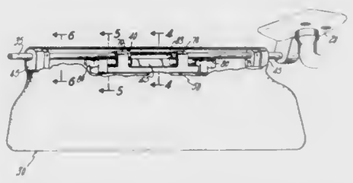
spacing means positioning said guide components from adjacent structure, thereby allowing air flow between said guide components and said structure.

4,921,300

VEHICLE SUN VISOR MOUNTING ARRANGEMENT

Abdi Lawassani, Pontiac; James D. Dowd, Farmington Hills, and David M. Hilborn, Sterling Heights, all of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Nov. 30, 1988, Ser. No. 278,087
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.11 4 Claims



1. In a vehicle sun shade, said sun shade comprising a visor panel longitudinally movable along a mounting rod therefor, the improvement characterized by:

said visor panel including a channel extending the length of said visor panel along an edge thereof; and

a mounting clip disposed within said channel and receiving said mounting rod therethrough, said mounting clip comprising a generally U-shaped base portion including a pair of upstanding flanges connected by a bight portion and including:

a resilient tab integrally extending from one of said flanges and receivable on a flat provided on said mounting rod for maintaining said visor panel in a stored angular position on said mounting rod;

at least one eyelet integrally extending from the other of said flanges and receiving said mounting rod therethrough, in frictionally pivotable surface-to-surface contact therewith for accommodating the angular positioning of said visor about said mounting rod; and

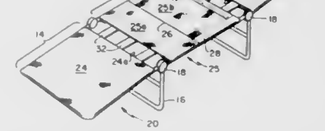
guide means comprising a pair of claw-shaped end extensions, compressively received within said channel to accommodate sliding longitudinal movement of said visor panel over said clip.

4,921,301

MATERNITY LOUNGER

R. Jalaine Haynes, Lot 314, Hillside Colony, Stillwater, N.Y. 12170

Filed Jan. 25, 1988, Ser. No. 148,290
Int. Cl.[5] A47C *13/00*
U.S. Cl. 297—118 12 Claims



1. A portable and foldable maternity lounger comprising:

a folding frame comprising three substantially flat foldably joined sections, a head end section, a foot end section, and a mid-section, said end sections being foldable toward and away from the mid-section for either storage or use and adjustable leg means secured to the frame;

and a frame cover comprising three portions, a head end portion and a foot end portion comprising pockets or envelopes of firm substantially non-stretching material open on sides facing each other for sliding respectively over the head end section and foot end section of the frame, and a mid-portion substantially covering the mid-section of the frame;

said mid-portion of the frame cover comprising a lower panel of firm substantially non-stretching material on the foot end side of the mid-section of the frame for supporting hips, and an upper panel of elastic relatively stretching material on the head end side of the mid-section of the frame for expandable support of the abdomen, said upper and lower panels being joined by a continuous seam in the middle of the mid-portion of the frame cover to form a single continuous mid-portion of the frame cover with firm substantially non-stretching lower support and relatively expandable stretching upper support, and mid-section securing means for securing the mid-portion of the frame cover to the mid-section of the frame;

said frame cover further comprising flexible joining means comprising firm substantially non-stretching material

joining the mid-portion of the frame cover to the end portions for continuous support of a reclining person along the length of the frame cover and frame;

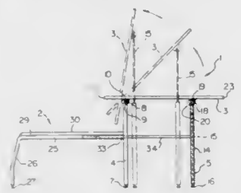
said upper panel of the mid portion of the frame cover which comprises elastic stretching material being formed with a hem or border of firm substantially non-stretching material providing perimeter support around the upper panel for securing to the mid-section of the frame and for more evenly distributing stresses to said upper panel.

4,921,302

TABLE

William E. Godwin, 1012 - 73 Avenue SW., Calgary, Alberta, Canada (T2V 0R8)

Filed Jun. 26, 1989, Ser. No. 371,006
Claims priority, application Canada, Jul. 11, 1988, 513598
Int. Cl.[5] A47B *39/00*
U.S. Cl. 297—170 6 Claims



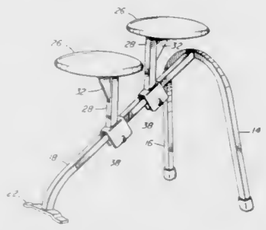
1. A table and bench combination comprising table top means; first leg means pivotally supporting one end of said top means; second, extensible leg means pivotally supporting the other end of said top means; bench means extending outwardly from said first leg means beneath said top means away from said second leg means; track means on said bench means; and rod means on said second leg means slidably engaging said track means, whereby said second leg means can be slid towards or away from said first leg and simultaneously extended or retracted, to move the top means between horizontal and steeply inclined use positions.

4,921,303

STUDIO STOOL

Terrance F. White, P.O. Box 485, Vulcan, Alberta, Canada

Filed Oct. 4, 1988, Ser. No. 252,918
Claims priority, application Canada, May 27, 1988, 568006
Int. Cl.[5] A47C *5/10*
U.S. Cl. 297—338 4 Claims



1. A photographer's studio stool, comprising a support structure including a pair of leg members formed in a generally inverted U-shaped arrangement and an elongated, angularly disposed support member constituting a third leg and connected to and extending downwardly from an upper portion of said inverted U-shaped arrangement to rest on a supporting surface;

at least one seat releasably secured on said elongated seat member so as to be selectively located at any desired elevation thereon, said seat comprising a platform and a vertically oriented post; and

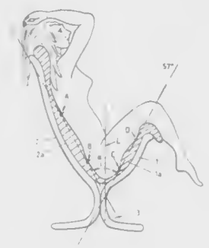
seat securing means for securing said seat onto said support member, said seat securing means comprising a rectangular saddle welded to the lower end of said post and slidably fitted over the support member, a pair of side plates on said saddle extending downwardly below said support member; spring means between said plates urging them apart to loosen said saddle on said support; and tigthtening means for drawing said plates toward one another, against said spring means, to tighten said saddle on said support.

4,921,304

CHAIR

Jens A. Kjersem, Einarvikgaten 1, N-600 Ålesund, Norway

Filed Apr. 7, 1986, Ser. No. 848,964
Claims priority, application Norway, Apr. 10, 1985, 851435
Int. Cl.[5] A47C *7/02*
U.S. Cl. 297—452 2 Claims



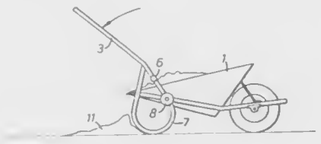
1. A chair comprising a seat and a backrest supported by an underframe, said seat and said backrest forming an acute first angle α with one another, wherein a line bisecting said angle α forms a second angle in the range of 0°–40° with respect to a vertical line and said bisecting line is inclined backwards toward said backrest when said second angle is more than zero degrees, so that a person sitting in said chair is forced to assume a position wherein the person's thighs and body form an acute angle with respect to each other.

4,921,305

WHEEL BARROW

Allen C. Steer, West View, Shere Rd., West Horsley, Leatherhead, Surrey, Great Britain

Continuation of Ser. No. 734,863, Apr. 30, 1985, abandoned.
This application Oct. 11, 1988, Ser. No. 256,201
Claims priority, application United Kingdom, Aug. 30, 1983, 8323252
Int. Cl.[5] B62B *01/18*
U.S. Cl. 298—3 8 Claims



1. A wheelbarrow comprising:

a bin for a load;

a ground wheel disposed at a front end of said bin;

two handles disposed at a rear end of said bin, each said handle being rigidly connected to the other handle and having a hand engageable end and an inner end;

an eccentric-shaped leg means rigidly attached to said inner end of each said handle and pivotably attached to said bin near the rear end of said bin through pivots so that pivotal movement of said handles causes pivotal movement of said eccentric-shaped leg means, said eccentric-shape being in a plane perpendicular to a pivot axis which passes through said pivots;

said handles and said eccentric-shaped leg means being pivotable between a first position in which said handles extend in a direction away from said front end of said bin, said eccentric-shaped leg means are in a position to raise said rear end of said bin above the ground, and said wheelbarrow is in a position for transport, and a second position in which said handles extend in a direction towards said front end of said bin, said eccentric-shaped leg means are in a position to lower said rear end of said bin toward the ground, and said wheelbarrow is in a position for loading and unloading; and

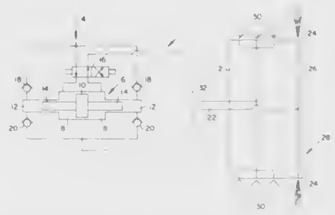
a roller disposed at said rear end of said bin, said roller supporting said rear end of said bin in rolling contact with the ground when said wheelbarrow is in said second position.

4,921,306

MINING MACHINE AND METHOD UTILIZING INTENSIFIER FOR HIGH AND LOW WATER PRESSURE TO CUTTING DRUM

Malcolm G. Tomlin, Swadlincote, England, assignor to Coal Industry (Patents) Limited, United Kingdom

Filed Oct. 20, 1988, Ser. No. 260,122
Claims priority, application United Kingdom, Dec. 10, 1987, 8728919
Int. Cl.[5] E21C *25/60, 35/22*
U.S. Cl. 299—17 7 Claims



1. A method of providing water at the required pressures to a cutting drum of a mineral mining machine including the steps of

feeding a supply of water to an intensifier;

intensifying the pressure of the water in the high pressure side of the intensifier;

feeding the high pressue water to one part of the cutting drum;

exhausting the water from the low pressure side of the intensifier, and

feeding the water from said low pressure side to another part of the cutting drum.

4. A mineral mining machine incorporating a system for carrying out a method of providing water at the required pressures to a cutting drum of a mineral mining machine which feeds a supply of water to an intensifier, intensifies the pressure of water in the high pressure side of the intensifier, feeds the high pressure water to one part of the cutting drum, exhausts the water from the low pressure side of the intensifier, and feeds the water from the said low pressure side to another part of the cutting drum, wherein the system comprises

a feed line;

a control valve;

an intensifier having high pressure and low pressure chambers and means to feed water from the feed line;

a control valve controlling the feed to the low pressure chamber;

a plurality of low pressure water sprays disposed on one part of the drum to which the water exhausting from the low pressure chambers is fed;

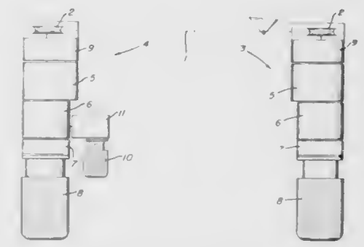
and a plurality of high pressure jets located on another part of the cutting drum to which the water discharged from the high pressure chambers is fed.

4,921,307

MINING APPARATUS FOR MECHANIZED BREAKING-DOWN OF MINERAL MATERIALS, PARTICULARLY COAL, IN UNDERGROUND MINING OPERATIONS

Gert Braun, and Ernst Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun Industrieanlagen, Wuppertal, Fed. Rep. of Germany

Filed Nov. 7, 1988, Ser. No. 268,088
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737664
Int. Cl.[5] E21C *27/34, 29/16*
U.S. Cl. 299—34 9 Claims



1. In a mining apparatus for the mechanized breaking-down of mineral raw materials, particularly coal, in underground mining operations, the mining apparatus including at least one revolving endless chain and chain wheels for the endless chain at the revolving ends of the chain, a main drive being provided for one of the chain wheels and an auxiliary drive being provided for the other chain wheel, the main drive and the auxiliary drive each having a transmission unit including a main transmission stage, an initial transmission stage, a coupling connected to the transmission and a improvement comprising the initial transmission stage of one of the auxiliary drive and of the main drive being a superposed transmission unit, the superposed transmisison unit having a superposed input, a controllable superposed motor having small power being connected to the superposed input of the superposed transmission unit.

4,921,308

MOBILE MACHINE SUSPENSION SYSTEM

Darrell A. Yelton, Lee's Summit, Mo., and Richard S. Norland, Stilwell, Kans., assignors to Target Products Inc., Kansas City, Mo.

Filed Apr. 25, 1988, Ser. No. 186,049
Int. Cl.[5] E01C *23/09*
U.S. Cl. 299—39 21 Claims

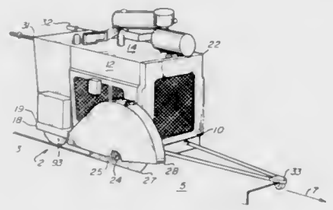
15. In combination with a machine movable on a horizontal surface and having a tool for working a material associated with said horizontal surface and a frame, the improvement of a suspension system which comprises:

means for raising and lowering said machine with respect to said horizontal surface;

support means connected to said frame and for supporting said machine on said horizontal surface;

said support means being associated with said means for raising and lowering said machine and comprising an extendable and retractable axle assembly;

said axle assembly including a transverse rocker bar pivotably mounted on said frame; and an axle subframe interconnecting said rocker bar and said axle;



biasing means associated with said support means; and

said biasing means including spring means for engaging said frame and said axle assembly for selectively biasing said axle assembly downwardly against the horizontal surface in response to a lowered condition of said machine.

4,921,309

MINING MACHINE ADAPTED FOR ATTACHMENT OF CONTINUOUS MINER CUTTER BOOM ASSEMBLY

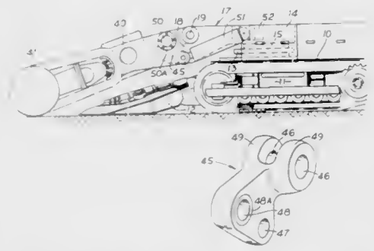
William Harrison, Stirling, Scotland, assignor to Anderson Strathclyde Olc, Glasgow, Scotland

Filed Nov. 21, 1988, Ser. No. 274,282

Claims priority, application United Kingdom, Nov. 25, 1987, 8727607

Int. Cl.[5] **E21C** *25/08*

U.S. Cl. 299—75 **3 Claims**



1. A mining machine comprising a chassis having a main frame, a turret mounted on the main frame and having a forwardly extending overhang which includes two side walls in which aperture means are located, each of the aperture means comprising an upper circular transverse side wall bore and a lower circular transverse side wall bore, the corresponding apertures in each side wall being transversely co-axial, and the lower bore being spaced forwardly and inwardly offset relative to the upper bore, said side wall bores providing means to mount pivotally a roadheader cutter boom assembly about a horizontal axis which is pivotally secured in the upper bores and pivotally actuable by means of hydraulic cylinders which are fixed at one end in the lower bores and at the other end on the body of the boom; the improvement comprising a pair of brackets for attachment to the side walls of the overhang via the upper and lower side wall bores thereof, when the roadheader cutter boom assembly has been removed therefrom, said brackets being mountable pivotally about a horizontal axis, a continuous miner cutter boom assembly, said brackets each having three transverse bracket bores spaced in triangular relation, two of which register co-axially with the upper and lower side wall bores in the respective side wall the other bracket bore of each bracket providing the pivotal mounting for the continuous miner cutting boom assembly, and hydraulic cylinders fixed at one end to the boom and at the other end to the body of the turret for pivotally actuating the continuous miner cutting boom assembly.

4,921,310

TOOL FOR BREAKING, CUTTING OR WORKING OF SOLID MATERIALS

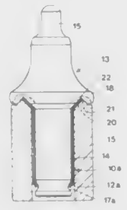
Jan-Gunnar Hedlund, N. Ronngatan 16, S-811 35 Sandviken; Lennart Hansson, Algstigen 19, and Hans-Olay Norman, Starrvagen 3, both of S-952 00 Kalix, all of Sweden

Filed Jun. 13, 1988, Ser. No. 205,634

Claims priority, application Sweden, Jun. 12, 1987, 8702443

Int. Cl.[5] **E21C** *35/18*

U.S. Cl. 299—92 **6 Claims**



1. A tool for breaking, cutting and working solid materials, comprising:

a body including:

a hard material cutting insert disposed at a front end of said body, and

a longitudinally rearwardly extending shaft disposed at a rear end of said body, said shaft being of generally cylindrical shape and including an annular groove disposed in an outer periphery of said shaft adjacent a rearmost end thereof, portions of said outer periphery located longitudinally in front of and behind said groove being of substantially equal diameter, and

a generally cylindrical clip mounted on said outer periphery of said shaft for retaining the tool within a holder, said clip including a slot extending longitudinally completely therethrough, said clip extending around said portion of said outer periphery disposed in front of said groove, a rear free end of said clip being inwardly bent into said groove to oppose longitudinal forward movement of said shaft relative to said clip.

4,921,311

TRAILER BRAKE VALVE FOR UTILITY VEHICLES

Otto Vollmer, Munich, and Wolfgang Rauscher, Massenhausen, both of Fed. Rep. of Germany, assignors to Knorr-Bremse AG, Fed. Rep. of Germany

Filed Apr. 18, 1988, Ser. No. 182,704

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1987, 3713138

Int. Cl.[5] **B60T** *15/12*

U.S. Cl. 303—9.76 **4 Claims**

1. In a utility vehicle trailer comprising a service brake and a spring-loaded brake installation including a service brake valve and a spring-loaded valve contained in a common housing and having outlets connected to a combined service brake/spring-loaded brake double-brake cylinder, a brake valve for providing a controlled compressed air supply, the improvement wherein said service brake valve and said spring-loaded valve have identical components and are arranged in said common housing in a mirror image configuration, and wherein said housing consists of two identical housing halves, a common ventilator insert being provided in a center of said housing



for the ventilation of both said service brake valve and said spring-loaded valve.

4,921,312

VEHICLE ANTI-LOCK BRAKING SYSTEM

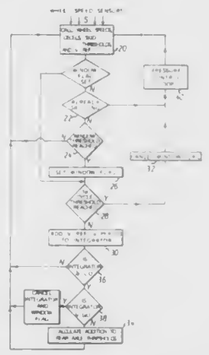
Alan L. Harris, Coventry, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Apr. 28, 1989, Ser. No. 344,572

Claims priority, application United Kingdom, May 7, 1988, 8810861

Int. Cl.[5] **B60T** *8/58*

U.S. Cl. 303—100 **4 Claims**



1. In an anti-lock system for vehicle brakes of the type wherein a computer is used to process data received from wheel speed transducers and to control the release of the brake of a particular wheel when the deceleration of that wheel exceeds predetermined thresholds, the improvement comprising means effective during periods that anti-lock is not currently evoked, to detect the presence of a road bump at the front axle and to cause the rear axle anti-lock system to be temporarily de-sensitised just before it would be expected, on the basis of speed and wheel-base, to reach the same bump.

4,921,313

ANTI-SKID CONTROL APPARATUS FOR VEHICLE BRAKING SYSTEM

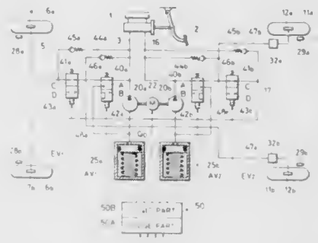
Tetsuro Arikawa, Kanagawa, Japan, assignor to Nippon A.B.S., Ltd., Japan

Filed Oct. 26, 1987, Ser. No. 113,257

Claims priority, application Japan, Oct. 28, 1986, 61-256657

Int. Cl.[5] **B60T** *8/40*

U.S. Cl. 303—116 **4 Claims**



1. In an anti-skid control apparatus for a vehicle braking system including:

(A) a pair of front wheels, and a pair of rear wheels in which wheel cylinders are diagonally connected in conduits;

(B) a first fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of one of said front wheels or rear wheels, arranged between a first fluid pressure generating chamber of a tandem master cylinder and said wheel cylinder of the one front or rear wheel;

(C) a second fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of another of said front wheels or rear wheels, arranged between a second fluid pressure generating chamber of said tandem master cylinder and said wheel cylinder of the other front or rear wheel;

(D) a control unit for measuring or judging the skid conditions of said front and rear wheels and for generating instructions for controlling said first and second fluid pressure control valve devices;

(E) a hydraulic reservoir which, when the brake fluid pressure to said wheel cylinder is decreased with control of said first and/or second fluid pressure control valve device, reserves the brake fluid discharged through said first and/or second fluid pressure control valve device from said wheel cylinder;

(F) a pressure fluid supply conduit connecting said master cylinder with said first and second fluid pressure control valve devices; and

(G) a fluid pump for returning the brake fluid from said hydraulic reservoir into said pressure fluid supply conduit; the improvements in which each of said first and second fluid pressure control valve devices consists of a three-port two-position change-over valve and a two-port two-position change-over valve which are connected in series with each other, the conduit connecting said three-port two-position change-over valve with said two-port two-position change-over valve being connected to the wheel cylinder of said one or other rear or front wheel, said three-port two-position change-over valve having an input port connected to said tandem master cylinder, an output port and a discharge port connected to said hydraulic reservoir, said input and output ports being made to communicate with each other at one position and said input and output ports being intercepted from each other at another position, said output and discharge port being made to communicate with each other at said another

position, and said two-port two-position change-over valve has an input port and an output port, said input and output ports being made to communicate with each other at one position and said input and output ports being intercepted from each other at another position, said control unit combining logically first judging results from relieving the brake of said front and rear wheels and with second judging results for maintaining the brake of said front and rear wheels at constant, for generating instructions to control said change-over valves, whereby said three-port two-position valves are connected to said tandem master cylinder side and said two-port two-position valves are connected to said front wheel cylinder sides, said conduits between said three-port two-position valves and said two-port two-position valves being connected to said rear wheel cylinder sides, and whereby said three-port two-position valves are controlled with first instruction signals AV1 and AV2, respectively as represented by the following logic formulas, and said two-port two-position valves are controlled with second instruction signals EV1 and EV2, respectively as represented by the following logic formulas:

$$AV1 = AVVR + AVHL + AVHR$$

$$AV2 = AVVL + AVHL + AVHR$$

$$EV1 = AVVR \cdot (EVVR + AVHL + AVHR)$$

$$EV2 = AVVL \cdot (EVVL + AVHL + AVHR),$$

where AVVR, AVVL, AVHR and AVHL are the output signals representing the judging results for relieving the brakes of said one (right) front wheel, other (left) front wheel, one rear wheel and other rear wheel, respectively, EVVR and EVVL the output signals representing the judging results for maintaining the brakes of said one front wheel and other front wheel, respectively, and $\overline{AVVR}$ and $\overline{AVVL}$ are negation of the AVVR and AVVL.

4,921,314

ANTI-LOCKING BRAKE CONTROL SYSTEM

Volker Braschel, Heilbronn; Dieter Seitz, Schwieberdingen, and Jöchen Schäfer, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

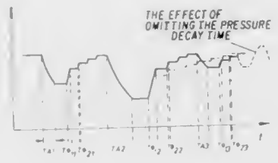
PCT No. PCT/EP87/00168, § 371 Date Sep. 26, 1988, § 102(e) Date Sep. 26, 1988, PCT Pub. No. WO87/05869, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 25, 1987, Ser. No. 274,051

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610185

Int. Cl.[5] B60T *8/64, 8/70*

U.S. Cl. 303—110 **6 Claims**



1. An anti-lock brake control system comprising:

a pickup responsive to wheel movement to produce a signal;

means for detecting instability of a wheel from said pickup signal;

means for producing a brake pressure control signal; and

a brake pressure control means, responsive to said brake pressure control signal for varying the brake pressure, such that after brake pressure decays the brake pressure is first increased in a timed build-up with reference to the brake pressure built up in a preceding control cycle and then the brake pressure is further increased by a sequence of pulses until an instability is again detected, said timed pressure build-up having at least two timed brake pressure build-up phases and said timed build-up phases having respective durations such that the duration of each of said timed build-up phases in a given timed pressure build-up is longer than the length of the subsequent timed pressure build-up phase in said timed pressure build up, if any, the duration of said timed build-up being a function of the preceding pressure decay time, said function reducing the value of longer decay times relative to shorter decay times in the determination of said timed pressure build-up.

4,921,315

REFRIGERATOR DOOR STRUCTURE

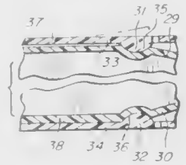
L. D. Metcalfe, Royalton Township, Berrien County; Michael J. Maczuzak, Southfield; Curtis J. Bailey, Birmingham, and Paul R. Deyo, Van Buren Township, Wayne County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 136,026, Dec. 21, 1987, Pat. No. 4,801,182. This application Oct. 18, 1988, Ser. No. 259,330

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[5] N47B *88/00*

U.S. Cl. 312—321.5 **2 Claims**



1. In a refrigeration apparatus having wall means defining a refrigerated space having an access opening, and a door movably mounted to said wall means for selectively closing said opening in a closed position of the door, said door having an inner portion confronting said storage space in said closed position, the improvement comprising:

a storage container having a removable cover;

housing means; and

mounting means for fixedly associating said housing means with said door inner portion selectively in any one of a plurality of different locations, said housing means defining a front opening pocket for removably receiving and fittedly retaining said storage container on said door in said any one of a plurality of different locations, said housing means defining a generally horizontally opening storage space.

4,921,316

INTEGRAL FIBER OPTIC PRINTHEAD

Stephen D. Fantone, Lynnfield; Bennett H. Rockney, Westford; Robert J. Burger, Newton Centre, and Lee M. Cook, Spencer, all of Mass., assignors to Polaroid Corporation, Cambridge and Galileo Electro-Optics Corporation, Sturbridge, both of, Mass.

Filed Mar. 6, 1989, Ser. No. 319,612

Int. Cl.[5] G02B *6/08*; H04N *1/21*; G01D *15/06*

U.S. Cl. 350—96.27 **5 Claims**

1. Apparatus for selectively exposing a plurality of longitudinally spaced areas across the face of a photosensitive medium comprising:

an elongated coherent fiber optic faceplate substrate having a substantially planar light receiving surface oppositely spaced apart with respect to a substantially planar light emitting surface, said light emitting surface being stationed to accommodate the placement of the photosensitive medium in sufficiently close proximity thereto so that the photosensitive medium can receive the light emitted from said light emitting surface;

at least one elongated array comprising a plurality of light emitting diodes each of said light emitting diodes being selectively spaced with respect to an adjacent diode and



having a light emitting surface fixedly stationed in effective light transmitting relation to the light receiving surface of said fiber optic faceplate;

conductive interconnecting lines selectively deposited on the light receiving surface of said fiber optic faceplate in a manner whereby said conductive interconnecting lines accommodate select electrical connection to said light emitting diodes; and

means for electrically connecting said light emitting diodes to selected ones of said conductive interconnecting lines.

4,921,318

LENS SYSTEMS

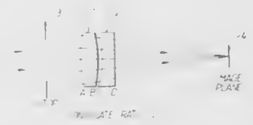
Ronald Szumski, Rayleigh, United Kingdom, assignor to GEC-Marconi Limited, Stanmore, United Kingdom

Filed Jun. 23, 1988, Ser. No. 211,472

Claims priority, application United Kingdom, Jun. 27, 1987, 8715136

Int. Cl.[5] G02B *11/02, 9/10, 1/00*

U.S. Cl. 350—1.4 **5 Claims**



1. A two-lens system comprising a first lens element composed of Zinc Selenide of equi-biconvex structure, and a second lens element composed of Zinc Sulfide of negative optical power, said first and second lens elements being separated by an air-gap which is relatively narrow compared to the thicknesses of said first and second lens elements and configured so as to produce images, at a common image plane, at least over both the 3–5 μm and 8–12 μm optical wavebands.

4,921,317

INFRARED ABSORBENT COMPRISING A METAL COMPLEX COMPOUND CONTAINING TWO THIOLATO BIDENTATE LIGANDS

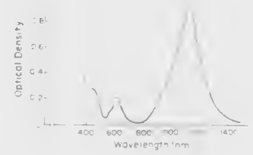
Yoshiaki Suzuki, and Gouichi Hayashi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 754,759, Jul. 15, 1985, Pat. No. 4,763,966. This application Jul. 6, 1988, Ser. No. 198,463

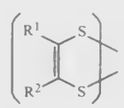
Claims priority, application Japan, Jul. 16, 1984, 59-147393; Aug. 4, 1984, 59-163980; Aug. 28, 1984, 59-177523; Sep. 13, 1984, 59-192412; Sep. 27, 1984, 59-202692

Int. Cl.[5] F21V *9/04*; G02B *5/20*

U.S. Cl. 350—311 **23 Claims**



1. A metal complex compound useful as an infrared absorbent prepared by coordinating two bidentate ligands of the following formula (iii) to a center metal selected from the group consisting of nickel, copper, cobalt, palladium and platinum and neutralizing such a complex with a phosphonium cation



(iii)

wherein, R^1 and R^2 each independently represents a hydrogen atom, cyano group, or a substituted or unsubstituted alkyl, aryl or heterocyclic group, which may be the same or different.

4,921,319

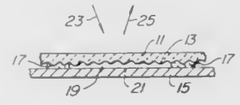
SURFACE RELIEF HOLOGRAM STRUCTURE WITH REFLECTION FROM AN AIR INTERFACE

Donald W. Mallik, North Tarrytown, N.Y., assignor to American Bank Note Holographics, Inc., Elmsford, N.Y.

Filed Jan. 23, 1989, Ser. No. 301,157

Int. Cl.[5] G03H *1/02*

U.S. Cl. 350—3.6 **26 Claims**



1. A combination of a hologram film and a supporting substrate sheet, comprising:

said hologram film characterized by:

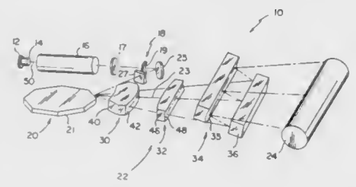
being substantially optically transparent to light in a visible portion of the spectrum in at least a substantial continuous area thereacross,

having a surface relief pattern on a side of said hologram film facing said substrate, said surface relief pattern corresponding to a pattern of light interference fringes formed by an intersection of two coherent light beams,

an absence of a light reflecting opaque layer over at least a portion of said area across said surface relief pattern, thereby providing a substantially transparent hologram thereacross, and

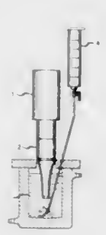
means holding said hologram film and said substrate sheet substantially adjacent to each other for maintaining an air interface between them over a substantial common area including said hologram area, thereby to form an interface at the surface relief pattern of the hologram that reflects light in a visible portion of the spectrum directed through the hologram back away from said substrate.

4,921,320
OPTICAL SCANNER
Donald DeJager, and David Kessler, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 22, 1988, Ser. No. 248,467
Int. Cl.[5] G02B *26/10*
U.S. Cl. 350—6.8 8 Claims



1. An optical scanner for scanning a light beam generated by a light source onto a receiving medium, said scanner comprising:
deflector means for scanning said beam through a predetermined angle; and
optical means interposed between said deflector means and said receiving medium, said optical means comprising a first lens element having two spherical surfaces, a second lens element having two cylindrical surfaces which are oriented perpendicular to each other, and a cylindrical mirror disposed along an optical axis.

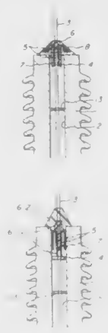
4,921,321
SILICON NETWORK POLYMERS
Timothy W. Weidman, Summit, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.
Filed Apr. 27, 1989, Ser. No. 343,966
Int. Cl.[5] G02B *6/10*
U.S. Cl. 350—96.12 11 Claims



1. A process for producing a device comprising the steps of forming a region of polysilyne and oxidizing at least a portion of said region.

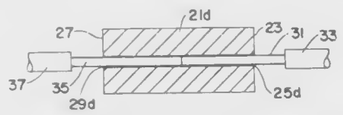
4,921,322
OPTICAL FIBER COMPOSITE INSULATOR
Shoji Seike, Nagoya; Noriyasu Oguri, Hashima, and Isao Nakajima, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Mar. 28, 1989, Ser. No. 329,869
Claims priority, application Japan, Mar. 28, 1988, 63-72029
Int. Cl.[5] G02B *6/36*
U.S. Cl. 350—96.20 5 Claims

4. An optical fiber composite insulator, comprising an insulator body having a through-hole formed in its axis portion; at least one optical fiber extending through the through-hole; a sealing block arranged in at least one end portion of the through-hole, said sealing block consisting of a ceramic hollow cylinder and a sealing glass which is filled in the hollow cylinder and holds and seals the optical fiber such that the optical fiber is extended through the hollow cylinder and the through-hole; and an electroconductive part consisting of metal or electroconductive ceramics and having an annular sealing portion having a dimension larger than the diameter of the through-hole of the insulator body, said electroconductive part being fitted with the outer peripheral portion of the sealing



block; and another sealing glass, which tightly seals a gap between the end portion of the insulator body and the sealing block consisting of a sealing glass and a ceramic hollow cylinder, through which the optical fiber is passed, and a gap between the end portion of the insulator body and the electroconductive part.

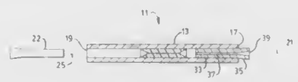
4,921,323
MEMORY POLYMER OPTICAL FIBER SPLICER AND METHODS
Francis T. Delahanty, Bensalem Township, Bucks County, Pa.; Vladimir A. Stoy, Princeton, and Shiu-Bor Tong, Scarborough, Canada, assignors to Kingston Technologies, L.P., Dayton, N.J.
Filed Dec. 22, 1988, Ser. No. 288,629
Int. Cl.[5] G02B *6/38*
U.S. Cl. 350—96.21 36 Claims



1. An optical fiber splicer which comprises: a unistructural mass of inherent shape memory polymer material having a longitudinal dimension with opposite ends which includes a first bore at one end of said opposite ends into the inside of said mass, and a second bore at the other end of said opposite ends into the inside of said mass to and in alignment with said first bore, said mass having a first shape and a second shape:
(a) said first shape being a unique, recoverable, predetermined inherent shape wherein said first bore and said second bore each have a preset diameter to accommodate and tightly hold end segments of denuded optical fibers of predetermined diameter in spliced, butted alignment with one another; and,
(b) said second shape being a deformed shape caused by solvent swelling of said inherent memory polymer material wherein said first bore and said second bore each have a swollen predetermined diameter greater than the diameter of the aforesaid end segments of denuded optical fibers so as to loosely and freely receive said end segments of said denuded optical fibers;

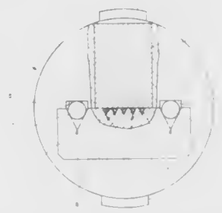
said mass of inherent shape memory polymer material having been initially formed in said first shape (inherent shape) and having been swollen then partially shrunk to said second shape (deformed shape), and capable of being returned to said first shape by application of a non-mechanical stimulus thereto.

4,921,324
OPTICAL FIBER CONNECTOR
John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Continuation of Ser. No. 413,856, Sep. 1, 1982, Pat. No. 4,832,440. This application Apr. 18, 1988, Ser. No. 204,482
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] G02B *6/38*
U.S. Cl. 350—96.21 5 Claims



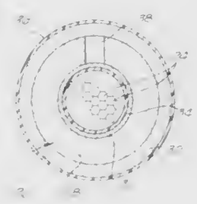
1. A connector for joining a pair of optical fibers in end-to-end relationship along a straight axis comprising an elastomeric fiber receiving member having an opening for expandably receiving an optical fiber dimensioned larger than said opening, a cylindrically shaped glass sleeve mounted about said fiber receiving member having open ends spaced from said receiving member, a pair of glass fiber guides, each guide having a cylindrically shaped section with a centrally aligned orifice extending therethrough, said orifice tapering outwardly to provide an enlarged opening at one end therethrough, each fiber guide being fixedly mounted in a respective open end with the outer surface of each cylindrically shaped section adjacent the inner surface of said sleeve, said orifice being aligned along said straight axis for guiding a respective optical fiber along said straight axis for abutting a pair of fibers in end-to-end relationship in said fiber receiving member.

4,921,325
CONNECTOR FOR OPTICAL FIBER RIBBON AND A METHOD OF ATTACHING THE SAME
Eiji Iri; Yasunari Nobuoka, both of Itami; Nobuo Suzuki; Yoshio Kashima, both of Matsudo; Yuji Kakutani, and Osamu Murata, both of Shiobara, all of Japan, assignors to Mitsubishi Cable Industries, Ltd., Amagasaki and Seiko Instruments, Inc., Tokyo, both of, Japan
Filed Dec. 22, 1988, Ser. No. 288,137
Claims priority, application Japan, Dec. 25, 1987, 62-198736[U]; Jun. 24, 1988, 63-84177[U]; Aug. 5, 1988, 63-104357[U]
Int. Cl.[5] G02B *6/38*
U.S. Cl. 350—96.21 17 Claims



1. A connector for connecting optical fiber ribbons to each other, each of the ribbons including a plurality of optical fibers in a line, comprising:
an alignment member for placing each optical fiber which is exposed by skinning off the sheath of the front end portion of the optical fiber ribbon in grooves formed in parallel therein;
a pressing means for pressing said optical fiber to said alignment member; and
a ferrule which has a space to hold said alignment member and a slot being open at said space and the periphery thereof at the front end portion and retains unexposed portion of the optical fiber ribbon at the rear end portion;
said pressing means being made of metal and being more deformable than said optical fiber and being pressed into said slot.

4,921,326
FIBER OPTIC PROBE
Victor F. Wild, 5797 Honors Dr., San Diego, Calif. 92122; Michael Serrano, Lemon Grove, and Eric J. Burtson, San Diego, both of Calif., assignors to Victor F. Wild, San Diego, Calif.
Filed Mar. 23, 1989, Ser. No. 328,005
Int. Cl.[5] G02B *23/26*; A61B *1/00*
U.S. Cl. 350—96.26 16 Claims



1. A fiber optic probe, comprising:
a generally tubular casing having a fiber optic ring of generally annular cross section extending substantially the length thereof; and
an inner fiber optic cable, said cable extending generally coaxially within said casing to a selected point along the length of said casing, said cable extending at said selected point through a gap formed in said fiber optic ring to the exterior of said casing, said gap extending longitudinally substantially the length of said ring.

4,921,327
METHOD OF TRANSMITTING AN IONIZING RADIATION
Richard R. Zito, 330 N. Mathilda Ave. (#606), Sunnyvale, Calif. 94086
Filed May 24, 1989, Ser. No. 356,115
Int. Cl.[5] G02B *6/20*; G01N *23/00*; G21K *1/06*
U.S. Cl. 350—96.32 3 Claims

1. A method of transmitting an ionizing particle radiation comprising propagation of said ionizing particle radiation by a series of reflections and scatterings through the interior of a hollow core fiber, whose length may vary from several centimeters to many kilometers and whose X-ray absorbing wall is thin enough to allow flexibility but is thick enough to minimize

escape of said ionizing particle radiation through the wall of said hollow core fiber, whereby said ionizing particle radiation



can be used for radiation therapy of tumors and other applications.

4,921,328

POLYCRYSTALLINE FERROELECTRIC FIBER

Vinay K. Seth, Alfred, N.Y., assignor to Alfred University, Alfred, N.Y.

Filed May 26, 1989, Ser. No. 357,763
Int. Cl.[5] G02B *1/02*
U.S. Cl. 350—96.34 **20 Claims**



1. An inorganic, polycrystalline, ferroelectric fiber with a diameter of from about 1 micron to 1 millimeter, a porosity of less than about 40 percent, a density of at least about 60 percent of the theoretical density, and a carbonaceous material content of from about 0 to about 5 percent, wherein:

(a) said fiber consists essentially of grains of which substantially 100 percent are from about 0.01 to about 5.0 microns in size, provided that the ratio of the size of the largest grain in said fiber to the size of the smallest grain in said fiber is no greater than about 10;

(b) at least about 95 weight percent of said fiber consists of crystals of a formula selected from the group consisting of ABO_3, $(A_yA'_z[A''_w]_x)(B_2B'_8)O_{30}$, $A_aB_bO_c$, and mixtures thereof, wherein:

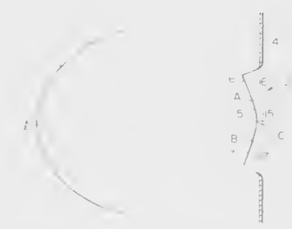
1. A, A', and A'' are each atoms selected from the group consisting of lithium, sodium, potassium, lanthanum, gadolinium, calcium, strontium, barium, lead, bismuth, yttrium, cerium, praseodymium, neodymium, samarium, europium, terbium, dysprosium, holmium, and cadmium atoms, and mixtures thereof, provided that A'' differs from both A and A';
2. x is from 0 to 1;
3. w, y, and z are each positive numbers, wherein w is from 0 to 4, y is from 0 to 5, and z is from 0 to 5;
4. a is from 2 to 9, b is from 1 to 8, and c is from 6 to 27; and
5. B and B' are each atoms selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, magnesium, tantalum, tungsten, molybdenum, tin, manganese, antimony, chromium, nickel, iron, zinc, scandium, silicon, germanium, tellurium, aluminum, and cobalt atoms, and mixtures thereof.

4,921,329

REAR PROJECTION SCREEN

Akira Ito, Atsugi, and Mizuo Okada, Yokohama, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,531
Claims priority, application Japan, Jul. 21, 1987, 62-180122
Int. Cl.[5] G03B *21/60*
U.S. Cl. 350—128 **3 Claims**



1. A rear projection screen comprising a screen member having an entrance surface for receiving red, blue and green rays from projectors on a projection side and formed therein with entrance lenses, said entrance lenses being arranged at predetermined pitches, and an exit surface allowing images synthesized with the red, blue and green light rays to be observed on a viewing side and formed therein with exit lenses corresponding respectively to said entrance lenses, said exit lenses being arranged at predetermined pitches, each of said entrance lenses having a first optical axis and a lens surface in the vicinity of said first optical axis, and each of said exit lenses having a second optical axis and an outward convex surface with an optical curvature so that each entrance lens transmits red, blue and green light rays toward the corresponding exit lens while said entrance lens converge the light rays into a focused beam in the vicinity of a cross point between said outward convex lens surface and the second optical axis, and so that each of said exit lenses diverges the light rays from said focused beam and emits said light rays toward the viewing side over a predetermined viewing angle, wherein each of said outward convex lens surfaces has a flat center part having a width of 1% to 10% of said predetermined pitches of said entrance lenses, and a part outside of said center part having said optical curvature, whereby those of the light rays from said focused beam which are incident upon said part outside of said center part have incident angles smaller than a total reflection angle thereof.

4,921,330

BACK PROJECTION SCREEN IN A VIDEO PROJECTOR

Motoo Takahashi, and Kazuo Tsukagoshi, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,255
Claims priority, application Japan, Oct. 19, 1987, 62-264156
Int. Cl.[5] G03B *21/60*
U.S. Cl. 350—128 **4 Claims**



1. A video projector comprising:

a cabinet having a screen mounting opening defined therein so as to confront the position of a viewer in front of the video projector;

a projector unit housed with the cabinet;

a generally rectangular composite screen mounted to the cabinet so as to cover the screen mounting opening and adapted to receive imagewise rays of light from the projector unit, said composite screen comprising a laminar structure housing a Fresnel lens plate and a lenticular lens plate, the lenticular lens plate having a height smaller than the height of the Fresnel lens plate and an upper edge connected by adhesive tape with an upper edge of the Fresnel lens plate, such that a lower edge of the lenticular lens plate opposite to said upper edge of the lenticular lens plate is offset in an upward direction relative to a lower edge of the Fresnel lens plate to provide a margin extending along the width of the composite screen; and

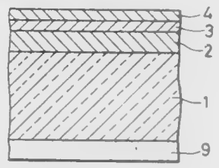
at least first, second, third and fourth clamping fixtures disposed on the top, bottom and side edges of the composite screen, respectively, for securing the composite screen to the cabinet while forming a first gap between the second clamping fixture and the top edge of the composite screen and second and third gaps between the third and fourth clamping fixtures and the associtaed side edges of the composite screen.

4,921,331

MULTI-LAYERED MIRROR

Yuji Nakajima, Tokyo, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,108
Claims priority, application Japan, Dec. 27, 1986, 61-309112
The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.
Int. Cl.[5] G02B *5/08, 5/28*
U.S. Cl. 350—164 **16 Claims**



1. A multi-layered mirror comprising:

a substrate made of one of glass and transparent plastic;

a dielectric multi-layered coating disposed on the front side of said substrate; and

a light-absorbing layer formed on the backside of said substrate,

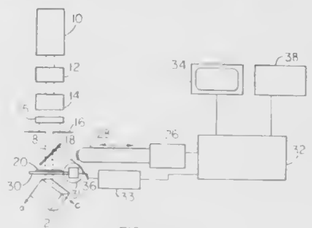
said dielectric multi-layered coating comprising three to six dielectric layers laminated one on top of another and having alternately differing refractive indices, one of said dielectric layers being one of a single high-refractive index layer and single low-refractive index layer having an optical thickness of $\lambda_0/2$, where λ_0 is a wavelength of light used as a reference measurement for design purposes, and each of the remaining layers has an optical thickness of $\lambda_0/4$.

4,921,333

PHASE CONTRAST IMAGE MICROSCOPY USING OPTICAL PHASE CONJUGATION IN A HYBRID ANALOG/DIGITAL DESIGN

Philip S. Brody, Bethesda, and Charles Garvin, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 11, 1989, Ser. No. 296,555
Int. Cl.[5] G02B *27/00;* G03H *1/02*
U.S. Cl. 350—320 **11 Claims**



1. A method for producing an intensity image from details of optical phase retardation in a particular direction from a transparent phase object without spurious background artifacts and speckle from laser illumination comprising the steps of:

producing a beam of collimated coherent light;

directing said beam of collimated coherent light through a transparent phase object substantially located on a plane;

directing said beam of collimated coherent light, after it has passed through said transparent phase object, to real time photorefractive holographic means for producing and recording a hologram of said transparent phase object and for generating a phase conjugate beam of said transparent phase object from said beam of collimated coherent light;

directing said phase conjugate beam back through said transparent phase object to an image forming means;

position said image forming means to observe the image in the back of or forward from said plane, close to the transparent phase object, but not in the plane of the object, sufficiently far back or forward for obtaining an intensity pattern containing coherent artifacts;

recording said intensity pattern;

producing a physical translation in the position of the transparent phase object;

directing said beam of collimated coherent light through said physically translated transparent phase object;

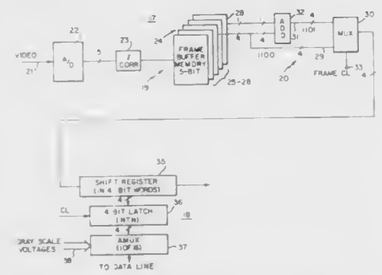
directing said beam of collimated coherent light, after it has passed through said physically translated transparent phase object, to said real time photorefractive holographic means for generating another phase conjugate beam of said transparent phase object;

directing said another phase conjugate beam of said transparent phase object through said physically translated transparent phase object;

directing said another phase conjugate beam of said trans-

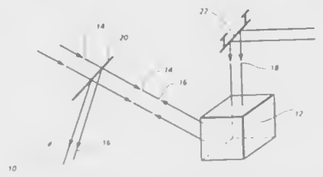
parent phase object, after it has passed through said physically translated transparent phase object, to said image forming means for obtaining an intensity image;
recording said intensity image;
subtracting said intensity pattern from said intensity image forming a difference intensity image; and
viewing said difference intensity image, whereby said difference intensity image is generated without spurious background artifacts and speckle.

4,921,334
MATRIX LIQUID CRYSTAL DISPLAY WITH EXTENDED GRAY SCALE
Boris A. Akodes, Brookline, Mass., assignor to General Electric Company, Wilmington, Mass.
Filed Jul. 18, 1988, Ser. No. 220,660
Int. Cl.[5] G02F *1/13*; G09G *3/36*
U.S. Cl. 350—333 **5 Claims**



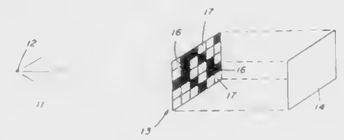
1. A Liquid Crystal Display system comprising:
a Liquid Crystal device having;
(a) a first array of parallel data transmitting conductors and,
(b) a second array of parallel data control conductors, said first and second arrays forming a matrix grid,
(c) a matrix of individual cells including a Liquid Crystal material connected to said first and second arrays of parallel conductors through individual transistor switch means connected between the conductors of said first array and said individual cells for supplying data in the form of gray scale voltage increments to said cells, the gates of said individual transistor switch means being connected to said second array of conductors to recurrently apply gray scale voltage increments to said cells,
(d) a source of n gray scale voltage increments,
(e) line driver means for receiving and recurrently applying said voltage increments to said first array of conductors for controlling the brightness levels of each said cells in response to said gray scale voltage increments,
(f) means for producing 2 n gray scale brightness levels from the n gray scale voltage increments, including
(1) means for time multiplexing the gray scale voltage increments applied to said first array during successive display frames between adjacent values,
(2) analog to digital conversion means for converting an analog video signal to a digital signal having 2 n levels of the analog video signal amplitude and having a number of bit positions representing the desired 2 n brightness levels,
(3) means for processing said digital signals to produce signals representing the selected value of one of the n gray scale voltage increments,
(4) means responsive to the value of the least significant bit of the bits, to establish a digital value which selectively changes values between adjacent gray scale voltage increment values,
(5) means responsive to the digital value for controlling said line driver means to apply selected adjacent voltage increments to the cells during successive frames in accordance with the ditial bit values to produce said intermediate brightness levels as the brightness level is switched between adjacent levels during successive frames whereby 2 n levels of brightness may be achieved with n gray scale voltage increments.

4,921,335
OPTICAL PHASE CONJUGATE BEAM MODULATOR AND METHOD THEREFOR
L. Samuel Ditman, Jr., Westminster, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 1, 1988, Ser. No. 239,498
Int. Cl.[5] G02F *1/35*
U.S. Cl. 350—354 **9 Claims**



1. A phase conjugate beam modulator system, comprising:
phase conjugate reflector means for reflecting a writing beam incident thereupon as a phase conjugate beam, and optical modulating means directing a modulating light beam incident upon the reflector means for modulation of the phase conjugate beam independently of the writing beam.

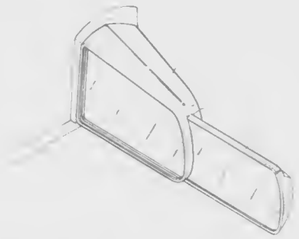
4,921,336
ARRAY OF BISTABLE DEVICES AND APPARATUS AND METHODS FOR CREATING SAME
Mario Dagenais, Wellesley; Wayne F. Sharfin, Lexington; Robert J. Seymour, Wellesley, and Boris S. Elman, Brighton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Dec. 20, 1985, Ser. No. 811,261
Int. Cl.[5] G02F *1/015*
U.S. Cl. 350—354 **7 Claims**



1. An array of bistable devices comprising
a thin cadmium sulfide platelet having a first portion thereof substantially pure, and a second portion thereof rich in bound excitons.

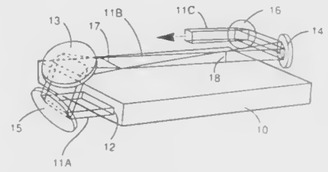
4,921,337
TELESCOPIC SIDE MIRROR
Mei-Wen H. Hou, No. 24, Lane 103, Kun Shan St., Ku Shan Tsun, Yung Kang Hsiang, Taiwan
Filed Apr. 21, 1989, Ser. No. 341,161
Int. Cl.[5] G02B *5/08*
U.S. Cl. 350—604 **1 Claim**

1. A telescopic side mirror for a car comprises:
a first side mirror unit having a vessel-shaped frame having a first side adapted to be secured on a car, a second side opposed to the first side having an opening, a third opening or recessed side, an inner space and parallel grooves extending from the first side to the second side, and terminating in the opening and a first mirror fitted in the third opening or recessed side of the frame;
a second side mirror unit having a frame adapted to telescope within the first side mirror through the opening thereof, having opposed sides adapted to be slidably engaged in the grooves, a driven member having a hole with inner threads, and a second mirror fitted in the frame



thereof and facing a direction the same as the direction of the first mirror;
driving means fixed in the inner space of the first frame having a rotation nut member extending parallel to the grooves, driven to rotate clockwise or counterclockwise by a power unit and engaging the driven member of the second side mirror by means of intermeshable threads; and
control means for controlling said clockwise or counterclockwise rotation of the power unit.

4,921,338
CORRECTIVE OPTICS FOR RECTANGULAR LASER BEAMS
John A. Macken, 3755 Wallace Rd., Santa Rosa, Calif. 95404, and John A. Zuryk, 2144 Coffee La., Sebastopol, Calif. 95472
Filed May 9, 1989, Ser. No. 349,234
Int. Cl.[5] G02B *17/06, 5/10*
U.S. Cl. 350—619 **1 Claim**



1. An apparatus for changing the geometric cross section of a laser beam comprising:
first mirror with a generally spherical curvature of radius R_1 and a second mirror with a generally spherical curvature of radius R_2;
said laser beam can be defined to having an imaginary central ray;
said first and second mirror positioned and oriented such that a said central ray of said laser beam strikes said first mirror at an incidence angle ϕ_1 producing a reflected beam which strikes said second mirror at angle ϕ_2 and producing a reflected beam;
said central ray has a path length of between said first mirror and said second mirror;
said laser beam immediately before it strikes said first reflector has transverse dimensions of d_1 and d_2 where d_2 is at least as larger than as d_1;
said laser beam immediately before it strikes said first reflector has a wavefront with radius of curvature S_2 in a first imaginary plane perpendicular to said dimension d_1;
said laser beam immediately before it strikes said first mirror has a wavefront of radius of curvature S_1 in a second imaginary plane perpendicular to said dimension d_2;
said first mirror is oriented such that said incident and reflected beam striking said first mirror generally lies in a said second imaginary plane;
said second mirror is oriented such that said incident and reflected beam striking said second mirror lies in a third imaginary plane which is generally perpendicular to said second imaginary plane;
said laser beam immediately after it has reflected off said second mirror has transverse dimensions D_1 and D_2;
said laser beam immediately after it has reflected off said second mirror has generally spherical wavefront of radius of curvature equal to S_5;
said first and second mirrors are positioned and configured to generally satisfy the following equations:

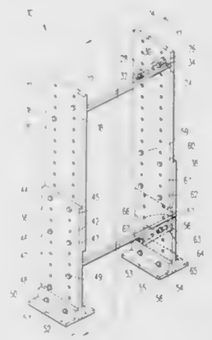
$$R_1 = \frac{2 \cos \phi_1}{\frac{1}{S_2} + \frac{D_2 + d_2}{d_2 L}}$$

$$R_2 = \frac{2 \cos \phi_2}{\frac{1}{S_5} + \frac{D_1 + d_1}{D_1}}$$

$$\cos \phi_1 = \left(\frac{\frac{1}{S_2} + \frac{D_2 + d_2}{d_2 L}}{\frac{1}{S_1} + \frac{D_1 + d_1}{d_1 L}} \right)^{1/2}$$

$$\cos \phi_2 = \left(\frac{\frac{1}{S_5} + \frac{D_1 + d_1}{D_1 L}}{\frac{1}{S_5} + \frac{D_2 + d_2}{D_2 L}} \right)^{1/2}.$$

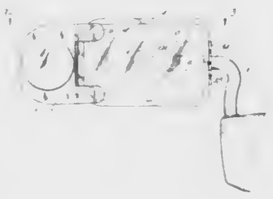
4,921,339
DUAL MIRROR VIEWING SYSTEM
David S. Brischke, 3686 S Granby Way, Aurora, Colo. 80014
Filed Aug. 21, 1989, Ser. No. 396,093
Int. Cl.[5] G02B *5/08, 5/10*
U.S. Cl. 350—623 **5 Claims**



1. A dual mirror viewing system for providing an above ground exterior view through a below ground basement window surrounded by an exterior well, comprising:

a pair of elongated extensible spaced frame members;
each of said extensible frame members including a generally rectangular elongated lower member;
a supporting foot on a bottom end of said lower member;
a generally rectangular elongated upper member;
a pair of laterally spaced columns of axially spaced apertures formed through each of said lower and upper members;
a plurality of threaded fasteners received through selected apertures, securing said upper and lower members in overlapping adjusted positions;
means for supporting said frame members in said exterior well, in alignment with said window;
a pair of mirrors; and
bracket means for adjustably securing said mirrors in axially spaced inclined orientation between said frame members.

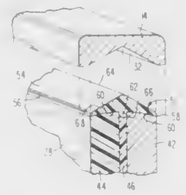
4,921,340
AUXILIARY MIRROR ASSEMBLY FOR VEHICLES
William B. Dyer, 3358 Taylor Rd., Central Point, Oreg. 97502
Filed Jul. 14, 1988, Ser. No. 218,878
Int. Cl.[5] G02B *7/18, 5/10;* **B60R** *1/08*
U.S. Cl. 350—631 **5 Claims**



1 An auxiliary mirror assembly for attachment to an arm supported permanent side view mirror assembly of a vehicle, said auxiliary mirror assembly including a mirror housing having opposite ends, said auxiliary mirror assembly comprising,
a base including bracket components for opposed abutting engagement with said opposite ends of the permanent side view mirror assembly, one of said components including a mirror supporting surface and tabs, said tabs for overlying engagement with said housing, said mirror supporting surface offset from one of said ends of the mirror housing, the other of said components being of bifurcated configuration and including a flange for retentive engagement with the arm of the permanent mirror assembly,
means adapted for urging said bracket components into biased engagement with said opposite ends of the permanent side view mirror assembly.

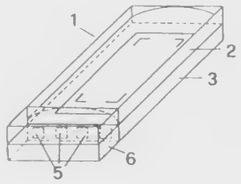
4,921,341
OPTHALMIC LENS SAFETY LINER
Ronald S. Ace, 5200 J. Philadelphia Way, Lanham, Md. 20706
Filed Apr. 19, 1988, Ser. No. 183,078
Int. Cl.[5] G02C *1/00*
U.S. Cl. 351—86 **9 Claims**

1. A system for mounting an eyeglass lens in the rim of an eyeglass frame, comprising:
rim means openable and closable to receive and secure a lens, said rim means defining a lens-receiving opening for receiving the peripheral edge of a lens;
a circumferential, inwardly-opening groove having continuous beveled edges formed in said rim means;
a composite lens having a glass layer and a plastic layer having facing inner surfaces joined by an elastomeric adhesive intermediate layer, said lens having an outer edge which is generally flat and nonbeveled, and which is equal to or smaller in diameter than said lens-receiving opening;
a circumferential, outwardly-opening groove formed on said outer edge of said composite lens, at least a portion of said groove being between said glass and plastic layers;
an elastomeric liner ring having a generally flat base wall and outwardly extending side walls, said ring having a nominal diameter smaller than the outer diameter of said lens and being elastically mounted on said outer edge of said lens with said side walls extending generally radially outwardly from said lens to form an outer peripheral liner edge for said lens, said ring side walls being beveled toward each other to form a liner which is generally



triangular in cross-section, and which includes side walls which correspond to the shape of said rim inwardly-opening groove, said liner ring base wall being shaped to match said lens outer edge;
a continuous, inwardly projecting circumferential tongue formed on the inner circumference of said liner ring base wall and having an inner nominal diameter smaller than the diameter of said lens groove, said tongue being shaped to engage said outwardly-opening groove on said lens when said liner is elastically mounted on said lens, said outer peripheral liner edge engaging said rim groove and said inner tongue engaging said lens groove when said rim is closed to thereby mount and secure said lens in said lens-receiving opening.

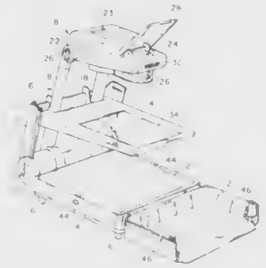
4,921,342
DEVICE FOR PERFORMING CINEMA SHOTS IN CONDITIONS OF LOW VISIBILITY
Helen Pringle, Via L. Gherzi, 8, Rome, Italy
PCT No. PCT/IT86/00089, § 371 Date Jul. 14, 1988, § 102(e) Date Jul. 14, 1988, PCT Pub. No. WO88/04441, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 4, 1986, Ser. No. 229,150
Int. Cl.[5] G03B *1/60*
U.S. Cl. 352—171 **8 Claims**



1. A device for cameras of the kind able to realize cinema shots in low visibility conditions by means of a lighted slide for the determination of the field edge, characterized in that said slide (1) is multiple and comprises of a lens (2) with frosted surface and in a slide (3), showing photoengraved references (4) that limit the field edge, and in that said references (4) are lighted by a series of leds (5), housed in a container (6) placed

in correspondence to the edge of said slide (3), and in that said leds (5) are lighted in synchronism with the rotation of a shutter (O) by means of lighting logics (11, 12 and 13).

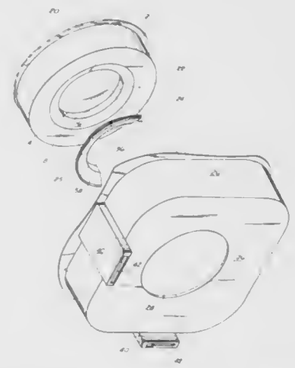
4,921,343
OVERHEAD PROJECTOR
Seimei Ushiro, Tokyo, and Bunsuke Emura, Musashino, both of Japan, assignors to Fuji Photo Film Co., Ltd., Japan
Continuation of Ser. No. 902,168, Aug. 29, 1986, abandoned. This application Sep. 14, 1988, Ser. No. 245,983
Claims priority, application Japan, Sep. 5, 1985, 60-135915[U]; Oct. 24, 1985, 60-238460; Aug. 13, 1986, 61-124380[U]
Int. Cl.[5] G03B *21/132*
U.S. Cl. 353—66 **5 Claims**



1. An overhead film projector comprising, in combination:
a projecting unit including a light source and a projecting lens;
a primary film support having a projecting lens side facing said projecting lens and located in spaced relationship with the projecting unit in position to receive light from said source, said projecting unit forming a projecting luminous beam by lighting the primary film support from the projecting lens side;
an auxiliary film support including a transparent portion;
means for removably positioning the auxiliary film support between the projecting unit and the primary film support;
an auxiliary lens for directing light to the projecting lens from the auxiliary film support;
means for supporting the auxiliary lens for movement between an operative position in juxtaposition with the projecting lens and an inoperative position remote from said projecting lens; and
a housing for said projecting unit and said primary film support, said housing being collapsible into a compact structure while maintaining the projecting unit and the primary film support therein; and
prop means connected to the projection unit for supporting the projection unit;
said housing including a base pivotally connected to the prop means and a lid divided into a pair of half-lid members, each of the half lid members being pivotally connected to the base; and
said means for removably positioning the auxiliary film support including means for hanging said auxiliary support on one of the half-lid members.

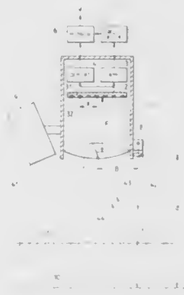
4,921,344
APPARATUS AND METHOD FOR ENHANCING THE IMAGES OF INTRA-ORAL PHOTOGRAPHY
Shannon S. Duplantis, 3701 James Dr., Metairie, La. 70003
Filed Jun. 12, 1985, Ser. No. 743,824
Int. Cl.[5] G03B *15/03, 29/00;* **F21V** *17/02*
U.S. Cl. 354—62 **25 Claims**

1. An apparatus for a camera utilized in intra-oral photography comprising a lens housing means which mounts to said camera; a lens means positioned within said lens housing; a circular flash means with a transparent face and having an inner circumference and an outer circumference in generally circumscribing said lens means and secured to said lens housing means; and a shield means without a rotatable shaft means mounted thereto and having a lens shield section means mov-



ably positioned over a portion of the circular flash means for blocking out a predetermined portion of illumination from the circular flash in order to uniformly convert the flash emanating from the circular flash means from a circular illuminated flash into a directional or point illuminated flash without obstructing a photographic image that passes through the lens means.

4,921,345
SPATIAL FILTER TYPE SPEED MEASURING APPARATUS
Shigeki Tsuchitani, Mito; Seikou Suzuki, Hitachioota, and Masahiro Matsumoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 6, 1988, Ser. No. 240,625
Claims priority, application Japan, Sep. 7, 1987, 62-222123
Int. Cl.[5] G01P *3/36;* **G01C** *3/00*
U.S. Cl. 356—28 **4 Claims**



1. A spatial filter type speed measuring apparatus which detects a velocity by analyzing an optical image of a measuring object using a spatial filter comprising:
a distance measuring means which calculates continuously a distance between an objective lens and said measuring object by optical triangulation; and
a frequency detecting circuit connected to said spatial filter

for obtaining a frequency f which is related to a running velocity V of said measuring object by a formula of

$$f = \frac{M \cdot V}{p},$$

where p is a pitch between each equivalent light receiving element of said spatial filter, and M is a magnification of a projected image of said measuring object,

wherein said distance measuring means is connected to said frequency detecting circuit, for compensating said magnification M by a reciprocal of the distance calculated in said measuring step, and outputting said running speed V in a real time by a calculation of

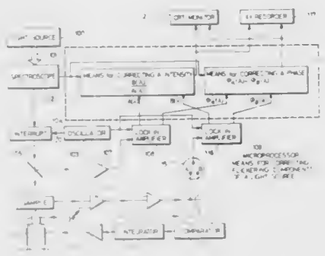
$$V = \frac{f \cdot p}{M}$$

4,921,346

TUNNEL CURRENT DETECTING PHOTO-ACOUSTIC SPECTROMETER

Hiroshi Tokumoto; Hiroshi Bando, both of Tsukuba; Fumiki Sakai, Tokyo; Chikara Miyata, Tokyo, and Shigeru Wakiyama, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology and Seiko Instruments Inc., Japan

Filed Sep. 19, 1988, Ser. No. 246,359
Claims priority, application Japan, Sep. 18, 1987, 62-234040
Int. Cl.[5] G01N *21/00, 23/00*
U.S. Cl. 356—72 **5 Claims**



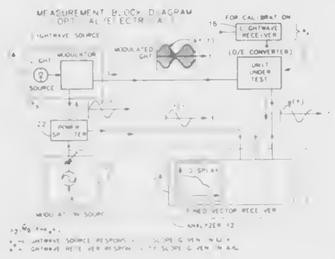
1. A tunnel current detecting photo-acoustic spectrometer comprising: a sample stage for mounting a sample thereon and a detection probe positioned to face the sample; a fine feed mechanism for finely positioning the sample and the detection probe; a coarse feed mechanism for coarsely positioning the distance between the sample and the detection probe; a control system for controlling said fine feed mechanism by generating a tunnel current sensitive to the distance between the sample and the detection probe so that the value of said tunnel current may be kept constant at all times; a control system for scanning the fine feed mechanism in a plane; a measurement system for measuring either the changes in value of the tunnel current flowing between the sample and the detection probe or the amount of changes in the fine feed mechanism caused to keep constant the distance between the sample and the detection probe so as to keep the tunnel current value constant at all times; an indication mechanism for indicating the amount of changes in the fine feed mechanism; an optical control system for controlling interrupted monochromatic light with which the sample is to be irradiated; and a vibration preventing mechanism for preventing the sample, the sample stage, the detection probe, the fine feed mechanism and said coarse feed mechanism from vibrating, whereby the amount of such deformations, e.g., expansions or contractions of a substance as are caused in accordance with the, absorption of the irradiating optical energy is detected as either the changes in the tunnel current flowing through said sample and said detection probe or the amount of changes resulting from deformation of said fine feed mechanism in a manner to keep said tunnel current value constant at all times, so that an absorption spectrum intrinsic to said substance relative to the irradiation energy may be measured to examine the optical characteristics.

4,921,347

METHOD AND APPARATUS FOR CALIBRATING A LIGHTWAVE COMPONENT MEASUREMENT SYSTEM

Roger W. Wong; Hugo Vifian, and Michael G. Hart, all of Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 25, 1988, Ser. No. 148,391
Int. Cl.[5] G01N *21/00*
U.S. Cl. 356—73.1 **20 Claims**



1. A method for calibrating a lightwave component measurement system for performing test measurements on a device under test, comprising the steps of:

providing a lightwave source, the lightwave source having known electro-optical characteristics;

providing a lightwave receiver, the lightwave receiver having known opto-electrical characteristics;

selecting the lightwave source as a calibration reference based on the known characteristics of the lightwave source, when the lightwave component measurement system is to be used to characterize an electro-optical device under test;

alternatively selecting the lightwave receiver as a calibration reference based on the known characteristics of the lightwave reciever, when the lightwave component measurement system is to be used to characterize an opto-electrical device under test;

providing data specifying the known electro-optical response characteristics of the lightwave source, when the lightwave source is selected as the calibration reference;

providing data specifying the known opto-electrical response characteristics of the lightwave receiver, when the lightwave receiver is selected as the calibration reference;

performing a measurement wherein an optical signal produced by the lightwave source in response to a first electrical signal at an output of an electrical signal source included in the lightwave component measurement system is detected by the lightwave receiver which produces a second electrical signal coupled to an input of a tuned receiver included in the lightwave component measurement system;

producing electro-optical error correction data by factoring out of the response represented by the second electrical signal the data specifying the known response characteristics of the lightwave source, when the lightwave source is selected as the calibration reference; and

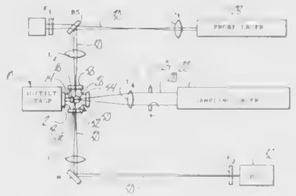
alternatively producing opto-electrical error correction data by factoring out of the response represented by the second electrical signal the data specifying the known response characteristics of the lightwave receiver, when the lightwave receiver is selected as the calibration reference.

4,921,348

METHOD AND MEANS FOR A SPATIAL AND TEMPORAL PROBE FOR LASER-GENERATED PLUMBES BASED ON DENSITY GRADIENTS

Edward S. Yeung, Ames, Iowa, and Guoying Chen, Laramie, Wyo., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 26, 1989, Ser. No. 301,485
Int. Cl.[5] G01N *21/41*
U.S. Cl. 356—128 **23 Claims**



1. A method for deriving spatial and temporal information for laser-generated plumes having a density gradient, comprising:

imposing a first energy source upon a material on a surface to generate a plume of vaporized material;

passing a probe beam from a second energy source through the plume;

detecting refraction of the probe beam as a function of the density gradient of the plume.

4,921,349

PHOTOGRAPHIC METHOD FOR MONITORING VISIBILITY THROUGH MEASUREMENT OF TRANSMITTANCE AND PATH RADIANCE

L. Willard Richards, Santa Rosa, Calif., assignor to Sonoma Technology, Santa Rosa, Calif.

Filed Jun. 30, 1987, Ser. No. 68,265
Int. Cl.[5] G01N *21/49*
U.S. Cl. 356—229 **13 Claims**



1. A method for obtaining quantitative data useful to determine either the transmittance, path radiance, or both, of a sight path toward a target having both relatively light and dark areas using photographic film which comprises the steps of:

(a) at each of at least two stations along a sight path, providing a camera with photographic film, a calibration scale in the camera's field of view, said scale having panels of known reflectances, a light meter for measuring the radiance of one panel of the calibration scale, and means for synchronizing the time of the photographic exposures;

(b) at each station along the sight path, photographing a target having varying light contrast substantially synchronously with all other stations;

(c) at each station along the sight path, at the time the target is photographed per step (b), measuring the radiance of one panel of the calibration scale using the light meter provided in step (a);

(d) calibrating the film at each station using the light meter measurement of the radiance of one of the calibration panels at each station at the time of the target exposure to calculate the radiances of all panels of the calibration scale and to relate photographic film densities to the radiances of the calibration scale panels; and

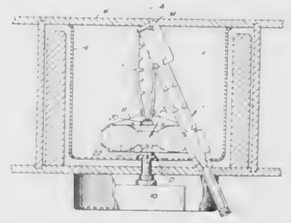
(e) obtaining radiance data for each station along the sight path by using the step (d) radiance calibration obtained by measuring the photographic film densities corresponding to the calibration scale panels and by measuring the film densities for each target photograph for contrasting portions of the target.

4,921,350

MONOCHROMATOR SECOND ORDER SUBTRACTION METHOD

Robert Giebeler, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 10, 1989, Ser. No. 309,502
Int. Cl.[5] G01J *3/42*
U.S. Cl. 356—320 **4 Claims**



1. In an optical system for measuring light absorption of a sample which comprises a monochromator which can selectively output a beam of light having a desired primary component at a first wavelength and an undesired secondary component at a second wavelength; a detector positioned to detect light output from the monochromator through the sample; and a sample cell for holding the sample in the light beam between the monochromator and the detector; a method of subtracting the effect of the secondary component of light from the measurement of the sample absorption at the primary component comprising the steps of:

(a) determining the system sensitivity to light at the second wavelength;

(b) determining the system sensitivity to light at the first wavelength including the effect of the secondary wavelength component of light;

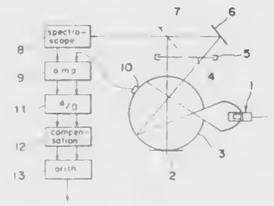
(c) determining the system sensitivity to light at the first wavelength alone using the results of steps (a) and (b);

(d) determining the sample absorption of light at the second wavelength by using the results of steps (a) and (c);

(e) determining the sample absorption of light at the first wavelength including the effect of the secondary component of light; and

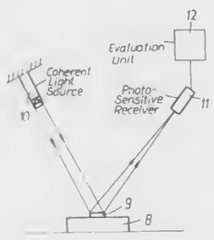
(f) determining the sample absorption of light at the first wavelength alone by using the results of steps (d) and (e).

4,921,351
SPECTROPHOTOMETER COMPRISING A XENON FLASHTUBE AS A LIGHT SOURCE
Taiji Kohigashi, Suita, and Miki Koyama, Sakai, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama, Japan
Filed Sep. 6, 1988, Ser. No. 240,617
Claims priority, application Japan, Sep. 4, 1987, 62-222454
Int. Cl.[5] G01J 3/42; G01N 21/55
U.S. Cl. 356—323 6 Claims



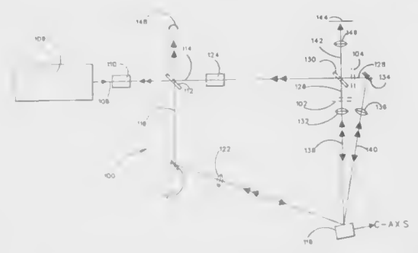
1. A spectrophotometer comprising a pulsatable xenon flashtube for emitting flashes of light when energy is input thereto, energy input means operatively connected to said xenon flashtube for inputting 0.03 to 1.0 joules of energy to said xenon flashtube, and detecting means for detecting the intensity of respective wavelengths of light which has been emitted from said xenon flashtube

4,921,352
CONTACTLESS OPTICAL PROCESS FOR IDENTIFYING OBJECTS
Friedhelm Adolfs, Ratingen; Gerd Bittner, Bottrop; Klaus P. Büsing, Datteln; Stephen Harris, Ratingen; Ulrich Hahn, and Martin Würzburger, both of Essen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany
Filed Nov. 20, 1987, Ser. No. 123,247
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639587; Feb. 12, 1987, 3704313
Int. Cl.[5] G01N 9/02
U.S. Cl. 356—347 28 Claims



1. A contactless optical process for determining a characteristic of an object, comprising the steps of:
fixing at least one optical medium to the object;
changing the light of a coherent light source with the at least one optical medium;
receiving the changed light with a photosensitive receiver, the photosensitive receiver being connected to an image evaluation unit; and
determining the characteristic with the evaluation unit,
wherein the at least one optical medium comprises an acousto-optical transducer, and wherein the step of changing the light comprises modulating the light with the acousto-optical transducer.

4,921,353
HIGH SPEED PHOTOREFRACTIVE IMAGE COMPARATOR
Arthur E. Chiou, Newbury Park; Tallis Y. Chang, Thousand Oaks, and Mohsen Khoshnevisan, Newbury Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jul. 5, 1988, Ser. No. 215,092
Int. Cl.[5] G01B 9/021
U.S. Cl. 356—347 16 Claims

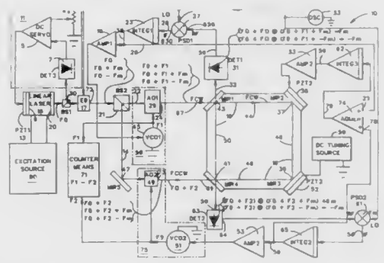


1. A phase conjugate interferometer for combining first and second two dimensional images, comprising:
a source of coherent light;
a first beam splitter for dividing the coherent light into a transmitted beam and a reflected pump beam;
a second beam splitter for dividing the transmitted beam into a reflected first probe beam which traverses the first image, and a transmitted second probe beam which traverses the second image; and
a nonlinear optical medium means for receiving the reflected pump beam, the first probe beam, and the second probe beam,
the medium, the pump beam, and the probe beams being oriented such that self-pumping of the reflected pump beam produces counterpropagating pump beams, four-wave mixing between the counterpropagating pump beams and the first probe beam produces a phase-conjugated first output beam which traverses the first image, and four-wave mixing between the pump beam and the second probe beam produces a phase-conjugated second output beam which traverses the second image,
the second beam splitter, the first output beam, and the second output beam being oriented such that a portion of the first output beam having a first output intensity is transmitted by the second beam splitter and combines with a portion of the second output beam having a second output intensity and reflected by the second beam splitter to produce a combined output beam containing the difference between the first and second output intensities.

4,921,354
IDENTICAL SERVO FREQUENCY MODULATED PASSIVE RING LASER GYROSCOPE
Kie L. SooHoo, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Mar. 23, 1987, Ser. No. 28,833
Int. Cl.[5] G01C 19/64
U.S. Cl. 356—350 10 Claims

1. A phase locked passive ring resonator gyroscope having enhanced stability and sensitivity comprising:
a fixed frequency reference signal generator to provide a reference signal at a fixed reference frequency (Fm);
a single piece body having laser and passive resonator cavities;

a laser means having a power source, using said laser resonator cavity containing a lasing medium, said laser means having a first cavity servo path length adjusting means (PZT1) responsive to a laser control signal from a laser servo for providing a single frequency light source (FO) from a transmitting aperture;
means responsive to said single frequency light source and to said reference signal for frequency modulating at said reference frequency (F_m), said single frequency light source to form a frequency modulated light source having a center frequency equal to said single frequency light source (FO) and having respective upper and lower side bands at frequencies Fo+Fm and at FO−Fm, respectively;
means for splitting said frequency modulated light source into respective first and second frequency modulated rays;
first voltage controlled oscillator means responsive to a first control signal for frequency shifting said first frequency modulated ray center frequency by a first variable offset frequency (F1) to form a propagating light source (FCW), and for coupling said propagating light into said second resonator cavity to form a propagating light beam (FCW);
said second resonator cavity being a passive high Q evacuated cavity having a path length adjusting means responsive to a passive cavity path length servo signal for adjusting its closed optical path length, the sensitive axis of said passive ring resonator gyroscope being essentially normal to the plane of said closed optical path;



second voltage controlled oscillator means responsive to a second control signal for frequency shifting said second frequency modulated ray by a second variable offset frequency (F2) in response to said second control signal to form a counterpropagating light source, and for coupling said counterpropagating light (FCCW) into said second resonator cavity;
a detector means optically coupled to sample said propagating light beam for detecting a first offset frequency error signal at reference signal frequency (Fm) to provide a first offset frequency error signal, and being optically coupled to sample said counterpropagating beam for detecting a second offset frequency error signal at reference signal frequency (Fm) to provide a second phase error signal;
cavity servo means responsive to said reference signal and to said first and second offset frequency error signals from said detector means for providing,
a first control signal to said first voltage controlled oscillator means for frequency shifting said first frequency modulated ray by a first variable offset frequency to maintain said propagating light beam (FCW) in said second resonator at peak resonance by driving the phase difference between said detected first offset frequency error signal and the fixed frequency reference signal to a minimum value, and to provide
a second control signal to said second voltage controlled oscillator means for frequency shifting said second frequency modulated ray by a second variable offset frequency (F2) to control and maintain said counterpropagating light beam (FCCW) at peak resonance by driving the phase difference between said detected second phase error signal and the fixed frequency reference signal to a minimum value;
means responsive to said first and second control signals for providing said passive cavity path length servo signal to said passive cavity path length adjusting means and for constantly adjusting said passive cavity path length servo signal to keep said passive cavity at peak resonance at a frequency substantially mid-range between said propagating and said counterpropagating beams;
output counter means for measuring and outputting the frequency difference between said first variable offset frequency (F1) and said second variable offset frequency (F2), the measured frequency difference representing the difference in frequency due to an input gyro body rate about said gyro sensitive axis.

4,921,355
HEATING AND COOLING ARRANGEMENT PARTICULARLY FOR AN EXTRUSION CYLINDER
Paul Kühler, Bassersdorf, Switzerland, assignor to Gruter Elektroapparate AG., Switzerland
PCT No. PCT/CH86/00154, § 371 Date Jun. 30, 1987, § 102(e) Date Jun. 30, 1987, PCT Pub. No. WO87/02617, PCT Pub. Date May 7, 1987
PCT Filed Nov. 5, 1986, Ser. No. 75,916
Claims priority, application Switzerland, Nov. 5, 1985, 4743/85
Int. Cl.[5] B29C 47/82; B01F 7/08, 15/06; F28F 1/30
U.S. Cl. 366—146 3 Claims

1. A heating and cooling arrangement for use with a cylinder, such as an extrusion cylinder, the cylinder having a periphery, comprising:
at least one flexible cooling element, the cooling element having a middle portion and end regions bent away from the periphery of the cylinder such that there is a transition region disposed between the middle portion and each end region, each transition region being bent back toward the middle portion, forming C-shaped bent sections;
at least one flexible heating element; and
the cooling element flexibly conforming to the periphery of the cylinder and the heating element being disposed over the middle portion of the cooling element.

4,921,356
AUTOMATIC STIRRER
Giovanni Bordenga, 2185 N. Normandy Blvd., Deltona, Fla. 32725
Filed Apr. 28, 1989, Ser. No. 344,957
Int. Cl.[5] B01F 7/16
U.S. Cl. 366—343 7 Claims

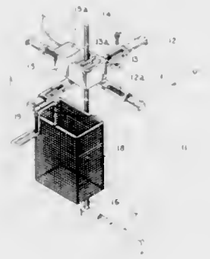
1. An apparatus for stirring substances in a container comprising:
a stirring paddle,
said stirring paddle affixed at a predetermined point along the length of a stirring shaft,
said stirring shaft extending from and through a motor

means providing rotational motion and depth adjustment to said stirring shaft,

said motor means having at least two fixed guide tracks attached thereto,

said fixed guide tracks defining a hollow center region wherein an extensible member may be inserted,

said extensible member being substantially L-shaped allowing for removable engagement of said apparatus with said container,



wherein the slidable engagement of said extensible member with said fixed guide track allows said apparatus to adapt to substantially any diameter of said containers, and

said extensible member having a stop means attached thereto preventing the inadvertent, complete removal of said extensible member from said hollow center region of said fixed guide tracks.

4,921,357

LASER OSCILLATOR DEVICE

Norio Karube, Machida; Akira Egawa, Minamitsuru; Etsuo Yamazaki, Hachioji; Nobuaki Iehisa, Minamitsuru, and Mitsuo Manabe, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

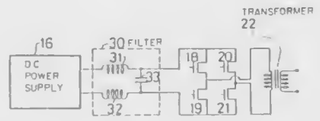
PCT No. PCT/JP88/00425, § 371 Date Dec. 2, 1988, § 102(e) Date Dec. 2, 1988, PCT Pub. No. WO88/08629, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 28, 1988, Ser. No. 283,478

Claims priority, application Japan, Apr. 30, 1987, 62-107826

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—38 **5 Claims**



1. A laser oscillator device for applying a high-frequency voltage to a plurality of discharge regions through a dielectric to produce a high-frequency discharge for laser pumping, comprising:

DC power supply means for providing a DC voltage;

high-frequency power supply means for converting the DC voltage into a high-frequency voltage including a high-frequency signal component; and

filter means for coupling said DC power supply means and said high-frequency power supply and for blocking the high-frequency signal component from being feedback to said DC power supply means to thereby stabilize said DC power supply means.

4,921,358

UNDER SEAL ASSEMBLING STRUCTURE IN LINEAR GUIDE APPARATUS

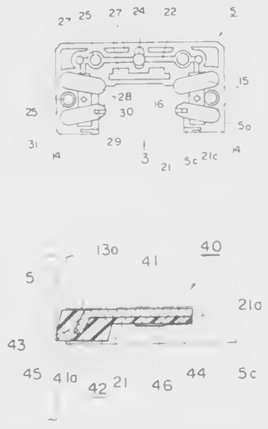
Shinichi Kasuga, Maebashi, and Nobuyuki Osawa, Takasaki, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1989, Ser. No. 360,215

Claims priority, application Japan, Jun. 6, 1988, 63-75177[U]

Int. Cl.[5] F16C *29/06, 33/72*

U.S. Cl. 384—15 **1 Claim**



1. In an under seal assembling structure in a linear guide apparatus, wherein said linear guide apparatus includes a guide rail, a slider having a slider main body and end caps attached to opposite ends of said slider main body respectively, and a pair of under seals respectively provided on lower surfaces of side walls of said slider main body, the improvement in which each of said pair of under seals comprises:

an elongate core metallic plate extending in the axial direction of said slider main body, and a rubber member secured to said core metallic plate and having a lip portion protruding inwardly from an inner edge of said core metallic plate and elastic projections formed at longitudinal opposite end portions of said rubber member protruding slightly outwardly therefrom, and further comprising:

each of said end caps formed with an under seal holding groove in a joining surface of each leg portion of said each end cap, said joining surface being joined to said slider main body, said under seal holding groove receiving one axial end of said under seal inserted thereinto; and

each of the side walls of said slider main body formed with an under seal accommodating stepped portion which is recessed from a lower surface of the side wall so that an upper surface of said core metallic plate abuts against an upper inner surface of said under seal accommodating stepped portion and the lip portion of said under seal is slidingly in contact with a lateral side of said guide rail.

4,921,359

SLIDE RAIL ASSEMBLY

Kazuhiko Sakamoto, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan

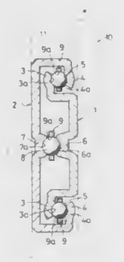
Filed Jun. 14, 1989, Ser. No. 365,570

Int. Cl.[5] F16C *29/04*

U.S. Cl. 384—18 **5 Claims**

1. A slide rail assembly, comprising an elongated inner rail and a similarly elongated outer rail each having a U-shaped section and a pair of rounded lateral edge portions arranged

vis-a-vis with the corresponding respective lateral edge portions of the other rail as well as a plurality of revolving bodies held between the juxtaposed rounded edge portions of the inner and outer rails, wherein the inside of said juxtaposed rounded lateral edge portions have a radius of curvature which is identical with that of the revolving objects so that the latter are arranged freely revolvably between the juxtaposed lateral edge portions with an appropriate space provided between any two neighboring revolving objects and each of the inner and



the outer rails further comprises intermediate rounded grooves running along the longitudinal axis of the rail to hold a number of intermediate revolving objects between the pair of intermediate rounded grooves, the inside of said rounded grooves and said intermediate revolving objects having an identical radius of curvature and said intermediate revolving objects being arranged in such a manner that an appropriate space is provided between any two neighboring objects and hence freely revolve.

4,921,360

LINEAR ROLLER CONTACT BEARING ASSEMBLY

Robert Rottermann, Waedenswil, Switzerland, assignor to Rottermann AG, Waedenswil, Switzerland

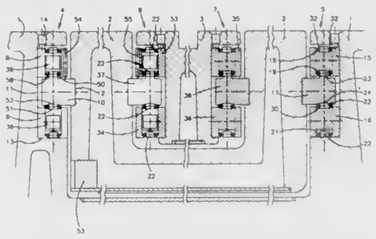
PCT No. PCT/CH88/00044, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/06686, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 25, 1988, Ser. No. 278,950

Claims priority, application Switzerland, Feb. 26, 1987, 729/87

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—44 **11 Claims**



1. A linear roller contact bearing assembly comprising:

at least one pair of elongate support means comprising a first and a second elongate support member, said two support members being displaceable relative to each other in the direction of their longitudinal extension;

said first support member being provided with two parallely running support rails arranged one above the other one;

said second support member being provided with a roller rail running parallel to said two support rails and arranged between said two support rails;

said two support rails and said roller rail extending substantially along the entire length of the associated support means;

a plurality of rolling members held in position relative to each other by cage members linked together to form an endless row;

each of said support rails being provided, at its upper and lower longitudinal surface, with a first track adapted to receive said plurality of rolling members and the roller rail being provided, at its upper and lower longitudinal surface, with a second complementary track;

each of said cage members provided for holding the rolling members in position comprising web members arranged on both sides of the cage members and running parallel to the tracks provided for the rolling members;

whereby each support rail has a longitudinal groove provided in at least one of said upper or lower longitudinal surfaces, the bottom of said longitudinal groove constituting a track for the rolling members and the side surfaces of said longitudinal groove guiding said cage members via said web members in longitudinal direction.

4,921,361

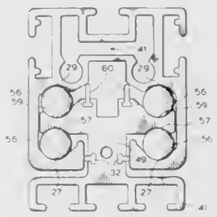
CARRIER IN GUIDE TRACK PRODUCT MOVING SYSTEM

Christopher Steeves, Toronto, Canada, assignor to Balltrax Inc., Toronto, Ontario, Canada

Filed Mar. 27, 1989, Ser. No. 329,191

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—45 **6 Claims**



1. A product moving system comprising a guide member and a carrier member movable along said guide member, said system including a ball race to either side thereof, each said ball race being fitted with rolling balls which recirculate through said ball race as said carrier member moves along said guide member, each said ball race being formed by cooperative race portions of said guide member and said carrier member, said cooperative race portions comprising a pair of back to back first race portions on said carrier member and a pair of second race portions on said guide member and facing said first race portions, the first and second race portions on each side of said system being vertically aligned with one another.

4,921,362

BEARING ASSEMBLY WITH SEAL

Willy Werner, 209 N St., Yale, Mich. 48097

Continuation-in-part of Ser. No. 12,442, Feb. 9, 1987, Pat. No. 4,780,001. This application Oct. 24, 1988, Ser. No. 261,911

Int. Cl.[5] F16C *33/78*

U.S. Cl. 384—482 **10 Claims**

1. A bearing assembly for a display comprising:

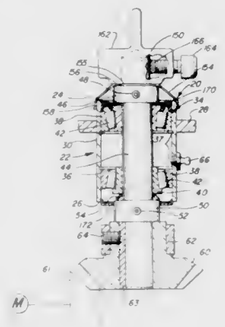
a frame for the display,

a shaft,

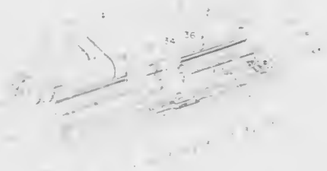
means for rotatably mounting said shaft to said frame, said rotatable mounting means comprising:

a tubular, cylindrical bearing housing said bearing housing

being secured to said frame and said shaft extending axially through said bearing housing,
a plurality of bearing elements disposed between said shaft and said bearing housing,
means for preventing axial movement of said shaft with respect to said bearing housing,
a seal for preventing the introduction of contaminants into one end of said bearing housing, said seal being substantially annular in shape and having a central opening through which said shaft extends, said seal having an annular outer lip which extends over and around one end of said bearing housing, said lip being dimensioned so that an inner periphery of said lip is closely adjacent an outer periphery of said bearing housing, and means for securing said seal to said shaft so that said seal rotates in unison with said shaft.

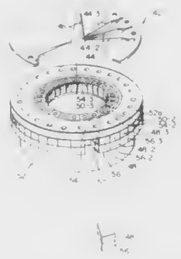


4,921,363
THERMAL TRANSFER PRINTER HAVING INDEPENDENT CARRIAGE SCANNING MECHANISM AND RIBBON WINDING MOTOR
Testuo Nishihara, Osaka; Takashi Watanabe, and Tomotaroh Tohjyoh, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 106,027, Oct. 8, 1987, abandoned, which is a continuation of Ser. No. 818,137, Jan. 13, 1986, abandoned. This application Mar. 27, 1989, Ser. No. 330,930
Claims priority, application Japan, Jan. 26, 1985, 60-12864; Jan. 26, 1985, 60-12865; Jan. 26, 1985, 60-12866; Jan. 26, 1985, 60-12867; Jan. 26, 1985, 60-12868
Int. Cl.[5] B41J *3/20*
U.S. Cl. 400—120 3 Claims



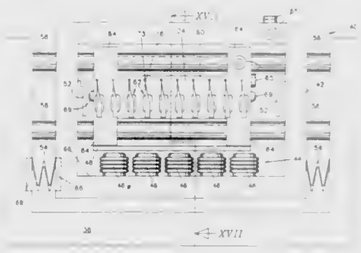
1. A thermal transfer printer comprising:
a carriage having a ribbon supply reel and a ribbon winding reel for supporting a thermal transfer ribbon, and a thermal head for transferring data to a recording medium through said thermal transfer ribbon by heat generation, said carriage being displaced transversely across a recording medium by a carriage motor;
a transfer ribbon cassette detachably mounted on said carriage, said cassette including a ribbon supply spool and a ribbon winding spool respectively engaged with said ribbon supply reel and said ribbon winding reel, the thermal transfer ribbon passing around said supply spool and said winding spool;
cassette detecting means, provided on said carriage, for detecting said transfer ribbon cassette;
a winding motor, provided independently of said carriage motor, for selectively driving said ribbon winding reel in synchronization with said carriage motor, said winding motor being responsive to said cassette detecting means for enabling rotation of said ribbon winding reel only when said transfer ribbon cassette is detected;
means for selectively impressing said thermal head against said recording medium;
said means for selectively impressing said thermal head against said recording medium being operative at the start of recording, and said winding motor beginning rotation of said ribbon winding reel before said means for selectively impressing said thermal head against said recording medium, said carriage motor and said winding motor being driven in synchronization with each other upon impressing said thermal head against said recording medium;
said means for selectively impressing said thermal head being further for spacing said thermal head from said recording medium upon completion of recording, said carriage motor terminating rotation and said winding motor continuously rotating said ribbon winding reel until completion of the spacing of said thermal head from said recording medium and being stopped upon completion of said spacing, said carriage motor being continuously driven thereafter.

4,921,364
DOT MATRIX PRINT HEAD HAVING EASILY REMOVABLE MAGNETS
Makoto Yasunaga, Kawagoe, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Sep. 1, 1988, Ser. No. 240,431
Claims priority, application Japan, Sep. 10, 1985, 60-201339
Int. Cl.[5] B41J *3/12*
U.S. Cl. 400—124 8 Claims



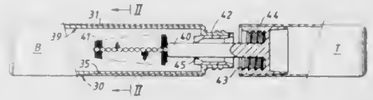
1. A printing head for a dot matrix printer which has a plurality of hammers carrying respective printing wires, a plurality of electromagnets each of which corresponds to one of said plurality of hammers, and a permanent magnet for retaining said hammers at a retracting position thereof, and which is so designed that the magnetic field of said permanent magnet is canceled by exciting said electromagnets so as to release said hammers and drive said printing wires by virtue of the elasticity of said hammers, said printing head comprising:
a annular base having a bottom surface on which a plurality of cores are mounted in ring form, an end portion extending radially of said annular base and forming a hammer disc-mounting portion, and a magnetic path short circuiting portion formed on the sidewall thereof with smaller cross section;
a hammer disc having a plurality of resilient hammers extending toward the center thereof and the outer circumference of which are secured to said hammer disc-mounting portion;
a plurality of printing wires, one end of each of which are fixed on a corresponding one of said plurality of elastic hammers and the other end of each of which form a plurality of printing dots;
a plurality of coils each of which is wound around one of said plurality of cores and which supplies energized magnetic flux to magnetic circuits comprising said annular base and one of each of said plurality of cores and elastic hammers; and
a plurality of divided permanent magnet pieces having a sector form and externally attached on the outer circumference of said base by magnetic attractive force thereof corresponding to each of said hammers, said permanent magnet pieces individually giving pre-load attractive force to the hammers, and collectively form a combined magnet ring on the circumference of the base, said permanent magnet pieces are individually attachable and removable to and from the outer circumference of the base in accordance with the magnetic property of each hammer.

4,921,365
HIGH SPEED SHUTTLE PRINTER
Royden C. Sanders, Jr., P.O. Box 550, Hillsborough Mills/Elm St., Wilton, N.H. 03086; John L. Forsyth, Greenfield, and John P. Conant, Milford, both of N.H., assignors to Royden C. Sanders, Jr., Wilton, N.H.
Filed Aug. 10, 1988, Ser. No. 230,458
Int. Cl.[5] B41J *3/12*
U.S. Cl. 400—322 55 Claims



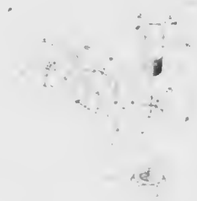
1. In a dot matrix printer of the shuttle variety wherein a plurality of printheads are disposed across the width of a shuttle which in operation is reciprocated substantially, ballistically, linearly at a substantially constant velocity, from side to side within a printer base, the improvement comprising:
(a) the shuttle being operated in conjunction with a ballistic energy transfer device mounted for reciprocal substantially, ballistic, linear substantially constant velocity, movement from side to side in the opposite direction to the instantaneous movement of the shuttle; and,
(b) first means, connected between said ballistic energy transfer device and the shuttle, operable only at the extremes of the side to side movements for exerting a rebounding force against the shuttle and said ballistic energy transfer device to aid them in reversing direction wherein forces resulting from the reversal of the shuttle and ballistic energy transfer device are substantially coincident in time, equal and opposite thereby avoiding the need for counterbalancing means to counterbalance the reciprocatory motion of the shuttle.

4,921,366
COSMETIC CONTAINER WITH ENGAGING RIB STRUCTURE
Edward T. Hurrell, Huntington, N.Y., assignor to Henlopen Manufacturing Co., Inc., Melville, N.Y.
Continuation of Ser. No. 52,462, May 20, 1987, abandoned. This application Feb. 2, 1989, Ser. No. 306,249
Claims priority, application United Kingdom, May 20, 1986, 8612276
Int. Cl.[5] A46B *11/00*; A45D *40/00*
U.S. Cl. 401—126 11 Cl. ims



1. A cosmetic container comprising a tubular inner container of plastic material and a tubular metal outer shell which is fixed substantially immovably to said tubular inner container, and which is formed on its inner surface with a plurality of circumferentially spaced inwardly projecting ribs which extend axially around the shell, said ribs engaging tightly in corresponding grooves which become formed in the outer surface of the tubular inner container by said ribs when, during assembly, the tubular inner container and the tubular outer metal shell are forced together;
wherein said tubular inner container includes a neck portion which projects outwardly from said metal outer shell, and wherein there is further provided a closure which is engagable with said neck portion for closing the container; and
wherein an elongate applicator for applying the cosmetic preparation is attached to said closure so as to project into said inner container when said closure is engaged with said neck.

4,921,367
SHAFT COUPLING
Benjamin H. Everett, II, Saginaw, Mich.; Robert B. Holben, Palm Beach Garden, Fla., and James B. Swanson, Bay City, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 16, 1989, Ser. No. 422,272
Int. Cl.[5] F16B *7/10*
U.S. Cl. 403—106 6 Claims



1. A shaft coupling comprising:
a tubular shaft having an end portion which has flat parallel segments opposite each other which have aligned bolt holes,
a member having a collar which fits over the end portion of

the tubular shaft and which has flat parallel segments abutting the flat parallel segments of the end portion so that torque may be transmitted between the tubular shaft and the member,

the flat parallel segments of the member having bolt holes which are aligned with the bolt holes of the tubular shaft,

pinch bolt means to fixedly attach the member to the end portion of the tubular shaft, the pinch bolt means including a bolt having a shank which passes through the aligned bolt holes of the member and the tubular shaft and a nut which is tightened down on the bolt to squeeze the collar of the connecting member into tight engagement with the end portion of the tubular shaft, and

a spacer which is disposed inside the end portion of the tubular shaft and engages the flat parallel segments of the tubular shaft to reinforce the end portion of the tubular shaft when the nut is tightened down on the bolt.

4,921,368

FASTENING OF A SEALING BELLOWS TO THE JOINT HOUSING OF A BALL JOINT

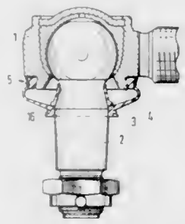
Fritz Busse, Hilden; Hans Hafeneger, Düsseldorf, and Ulrich Mette, Essen, all of Fed. Rep. of Germany, assignors to TRW Ehrenreich GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,834

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1987, 3741347

Int. Cl.[5] F16C *11/00*

U.S. Cl. 403—134 **9 Claims**



1. Fastening for a sealing bellows to the joint housing of the ball joint in which the sealing bellows has a bead located in an L-shaped recess defined by a cylindrical surface and an annular end surface on the outer rim of a housing opening, and a retaining ring comprises an outer annular portion bent radially inward for gripping around the bead, and an inner circular portion lying against the annular end surface of the L-shaped recess, characterized in that a radially extending circumferential ring groove (**11**) is machined in the cylindrical surface (**12**) of the L-shaped opening (**4**) adjacent the end surface (**9**) and the inner circular portion (**7**) of the retaining ring (**5**) has an inner edge (**10**) extending into the ring groove (**11**).

4,921,369

CONNECTOR FOR PORTABLE FURNITURE INCLUDING A BED AND A CHILD ENCLOSURE

Bonnie G. Chew, II, 232 Beech Cir., Birmingham, Ala. 35213, and Third Alabama Bank, executor, P.O. Box 10247, Birmingham, Ala. 35202

Continuation of Ser. No. 771,046, Aug. 30, 1985, abandoned. This application Sep. 12, 1988, Ser. No. 244,637

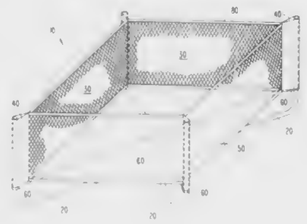
Int. Cl.[5] A47D *7/00;* **F16B** *12/36;* **E04H** *15/42*

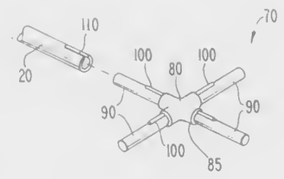
U.S. Cl. 403—171 **29 Claims**

12. A portable bed, comprising:

a disassemblable base frame comprising tubes each having a linear key slot and an end;

a connector for engaging said frame, said connector comprising plural solid rods for slidably engaging said tubes, said rods coupled together and each including a linear metal key engaging the respective key slot and preventing rotating of the respective tube, and having a shoulder abutting the respective end;





a bottom panel having straps for slidably engaging the frame; and

means, coupled between the straps and said frame, for preventing downward movement of said bottom panel along said frame.

4,921,370

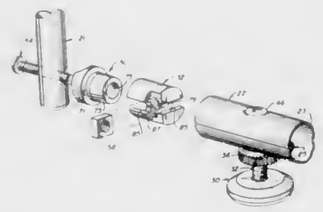
TUBE CONNECTOR

Milton E. Handler, Northbrook, and Herbert Baisch, Palatine, both of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Jun. 27, 1988, Ser. No. 211,986

Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—234 **25 Claims**



1. A connector assembly for connecting a first tube section to a second tube section that has a hollow tubular wall with an inwardly projecting longitudinal seam, said connector assembly comprising:

a base member for being mounted to said first tube section;

a collet member for being received in an open end of said second tube section and recessed completely within said second tube section to engage said second tube section and for being matingly engaged around said base member, said collet member defining a longitudinally oriented slot to receive said seam;

fastener means for engaging said first tube section and having an extending threaded portion;

threaded receiving means for threadingly receiving said fastener means threaded portion and urging said collet member axially into increasing mating engagement with said base member when said fastener means is rotated; and

said base member and said collet member together defining cooperating wedge means for urging at least a portion of said collet member increasingly radially outwardly as said base member and said collet member are increasingly axially engaged to force said collet member into tight engagement with said second tube section.

4,921,371

VIBRATION RESISTANT SECURING MEANS, ESPECIALLY FOR SECURING A BRUSH CARRIER PLATE TO A BEARING CARRIER PLATE OF AN ELECTRIC MOTOR

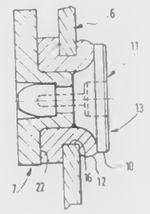
Christian Boiraeu, Guyancourt, and Patrick Larseneur, Courbevoie, both of France, assignors to Valeo, Paris, France

Filed Feb. 24, 1989, Ser. No. 315,146

Claims priority, application France, Feb. 26, 1988, 88 02346

Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—408.1 **9 Claims**



1. A vibration resistant fixing means for fastening a first member, for example a brush carrier plate of an electric motor, to a second member, for example a bearing carrier plate of a said motor, said fixing means comprising a fastening member and a resilient element, said fastening member extending through said resilient element, with the resilient element gripping one of said first and second members and the fastening member being carried by the other, characterised in that the fastening member and the said first member are so shaped as together to constitute a compression stud assembly comprising a male part and a female part which are adapted to be locked together and to extend through an opening formed in the said second member and resilient element, the latter comprising a boss having one free end portion and a radially projecting portion at its other end, and the compression stud assembly having a shoulder and a convergent portion extending from the shoulder and cooperating with it to maintain the said free end portion and radially projecting portion of the resilient element respectively in gripping contact with edges of the said opening in the said second member.

4,921,372

SIDEWALK SCRIBING TOOL

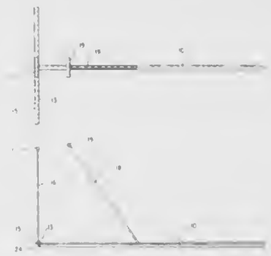
Delmer L. Hybertson, P.O. Box 127, Centerville, S. Dak. 57014

Filed Nov. 6, 1989, Ser. No. 432,382

Int. Cl.[5] E01C *23/09*

U.S. Cl. 404—89 **7 Claims**

1. A tool for striking lines in a newly poured concrete sidewalk comprising blade means having a vertical portion adapted to be pressed into said concrete, guide means perpendicularly attached to and extending in the same plane of said blade means whereby said guide means will locate the position of said blade means, and handles extending upwardly from said



blade means and said guide means whereby said tool may be manually placed in relation to said sidewalk.

4,921,373

BARRIER FOR CONTAINING FLOODS

Robert C. Coffey, 11255 Plainfield Rd., Indian Head Park, Ill. 60525

Filed Dec. 7, 1988, Ser. No. 281,108

Int. Cl.[5] E02B *7/02, 7/20*

U.S. Cl. 405—115 **23 Claims**

15. A barrier for containing floods comprising a plurality of interlocked portable fluid barriers, each said portable fluid barrier of the type having a frame, the improvement comprising: a plurality of flexible containers each supported by each of the frames, each said flexible container having drain means and vent means, each said flexible container capable of holding a liquid; frame interlock means for interlocking adjacent legs of a plurality of legs of each of the frames, and flexible container fastening means for fastening adjacent said flexible containers; and at least two said legs of each of the frames each having downwardly telescoping means for adjusting the frames to an irregular terrain.

4,921,374

METHOD FOR REPAIRING UNDERGROUND SEWER LINES

Henry G. Stutzman, 8397 Euclid Ave., Manassas Park, Va. 22111

Continuation of Ser. No. 233,067, Aug. 17, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 415,455

Int. Cl.[5] F16L *55/175*

U.S. Cl. 405—154 **13 Claims**

9. A process for preventing the infiltration of groundwater into a leaking sewer line comprising determining the location of the leakage into the sewer line, vacuum excavating a bore into the ground using a high velocity jet of air to the sewer line in the vicinity of the leak, depositing a quantity of a water swellable argillaceous material selected from the group consisting of bentonite and attapulgite into the bore to a depth of

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at least about one foot above the sewer line, tamping the argillaceous material in said bore, depositing a quantity of gravel



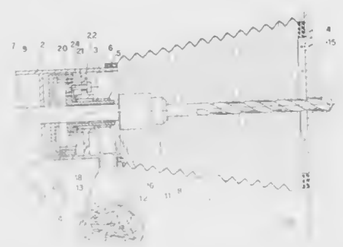
over the argillaceous material in said bore, and backfilling said bore.

4,921,375

ANTISCATTERING DEVICE FOR THE COLLECTION OF WASTE MATERIAL PRODUCED IN THE COURSE OF DRILLING, MILLING AND SIMILAR OPERATIONS, TO BE FITTED ON THE RELEVANT MACHINE TOOLS

Giovanni Famulari, Trieste, Italy, assignor to Tiziana Lenarduzzi, Trieste, Italy

Filed Jun. 7, 1988, Ser. No. 203,161
Claims priority, application Italy, Jun. 12, 1987, 82811 A/87
Int. Cl.[5] B23B *47/00*
U.S. Cl. 408—67 **4 Claims**



1. In combination, an antiscattering device for the collection of waste material produced in the course of drilling and milling, and a machine tool onto which said device is to be fitted, comprising:

means for attaching a drill bit to the tool;

a frustum-conical bellows bell which is fitted on a frame of the tool coaxially with the means for attaching the drill bit and forming a passage for the waste material;

a fan coaxial with the means for attaching the drill bit for providing suction;

a seal ring connected to the wider end of said bell to be placed on a surface of the material to be drilled and having a plurality of holes defined therein for maintaining and controlling air flow produced by the fan;

collecting means mounted on the frame of the tool for collecting the waste material which passes through said bell;

a driving shaft for driving rotation of the drill bit;

a hollow shaft coaxial and surrounding said driving shaft for driving said fan; and

gear means for directly connecting said hollow shaft of said fan to the driving shaft of the tool, for rotating said fan at an angular velocity different than the angular velocity of the drill bit to ensure substantial ideal operation velocities for said fan and the drill bit, and for causing operation of the fan when said tool is operated;

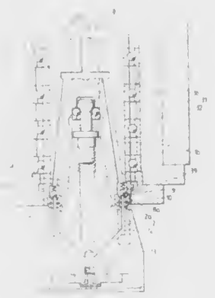
wherein the waste material created by the tool is suctioned through said bell by said fan into said collecting means.

4,921,376

ARBOR FOR MOUNTING A TOOL TO A SPINDLE OF A MACHINE TOOL AND A MACHINING METHOD OF EMPLOYING THE SAME

Naobiko Tani, Nagoya; Masahiro Kouda, Gifu; Atsushi Ito, Owariasahi, and Yuji Miwa, Chita, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Apr. 26, 1989, Ser. No. 343,280
Claims priority, application Japan, Apr. 28, 1988, 63-105695; Oct. 5, 1988, 63-251364
Int. Cl.[5] B23B *27/10*
U.S. Cl. 409—131 **5 Claims**



5. A method for machining an object with a machining apparatus comprising a spindle having therein a first lubricant passageway having an outlet end for passing a lubricant therethrough, a cup-shaped tool having a grinding layer, an arbor detachably and exchangeably mounted to the spindle for mounting the cup-shaped tool to the spindle, the arbor including a tool mounting portion for detachably and exchangeably mounting the cup-shaped tool thereto, a tapered portion fitted removably in the spindle, and a main body located between the tool mounting portion and the tapered portion and including a lubricant receiving member connectable to the outlet end of the first lubricant passageway for receiving the lubricant supplied through the first lubricant passageway and second lubricant passageway extending between the lubricant receiving member and the tool mounting portion for conducting the lubricant from the lubricant receiving member to the tool mounting portion, a nozzle member detachably and exchangeably provided at the center portion of the tool mounting portion for receiving the lubricant supplied through the second lubricant passageway and radially ejecting the lubricant to the edge of the grinding layer, and sealing means provided in the first lubricant passageway for sealing the outlet end of the first lubricant passageway, comprising the step of:

mounting the arbor on the spindle for allowing the first lubricant passageway to be communicated with the second lubricant passageway;

releasing the sealing of the outlet end of the first lubricant passageway; and

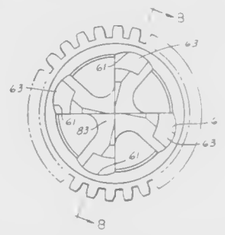
machining an object while the lubricant is supplied from the first lubricant passageway, the lubricant receiving member, the second lubricant passageway, the tool mounting portion and the nozzle to the grinding layer of the cup-shaped tool.

4,921,377

CUTTER AND DRIVE GEAR ASSEMBLY FOR DRESSING WELDING ELECTRODE TIPS

Norman J. Hoch, and Arno Rabin, both of Hi-Tech Industries, Inc., 21850 Wyoming Pl., Oak Park, Mich. 48237

Continuation of Ser. No. 235,217, May 23, 1988, Pat. No. 4,892,448. This application Jun. 19, 1989, Ser. No. 367,986
Int. Cl.[5] B23C *5/02*
U.S. Cl. 409 –140 **6 Claims**



1. A unitary dressing tool cutter assembly comprising a body having a first axis of rotation and four or more axially elongated arcuate drive tangs being receivable and fixed in complementary drive recesses in a hollow power-rotated gear;

said body having a pair of sides through which said first axis extends; and

pairs of symmetrical outwardly opening cutting elements on the sides of said body, each cutting element including a plurality of angularly related inclined cutting edges having a profile corresponding to the contour of a pair of aligned electrode tips adapted for axial projection into and against said cutting elements;

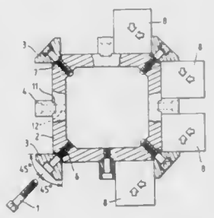
said pairs of cutting elements including a plurality of right angularly related gear blades extending radially and axially of said body and terminating in said drive tangs.

4,921,378

ROTARY-PALLET SYSTEM

Olli Kytölä, Muurame, Finland, assignor to OK-Vise Ky, Muurame, Finland

PCT No. PCT/FI88/00006, § 371 Date Sep. 19, 1988, § 102(e) Date Sep. 19, 1988, PCT Pub. No. WO88/05364, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 22, 1988, Ser. No. 249,563
Claims priority, application Finland, Jan. 23, 1987, 870290
Int. Cl.[5] B23Q *3/06*
U.S. Cl. 409—221 **10 Claims**



1. A device adapted for the multi-directional machining of shaped workpieces (**8,9,10**) comprising:

a rotary-pallet device formed of a body portion (**2**) rotable about a longitudinal axis (A–B) and having an outer surface or guide face characterized by at least one counter-face (**4,13**)

at least one wedge piece (**3**) diagonally attachable to the surface of said body portion (**2**) at one edge thereof spaced from said at least one counter-face (**4,13**)

the space between said counter-face (**4,13**) and a face of said wedge piece (**3**) being adapted to receive a workpiece (**8,9,10**) to be machined, and

a fastening member (**1**) passing in a diagonal direction through said at least one wedge piece into said body portion (**2**),

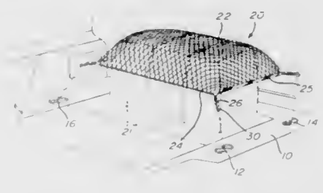
said fastening member when fastened to body portion (**2**) of the rotary-pallet device applies a force to said wedge-piece (**3**) which in turn applies a force via a wedge surface to the workpiece and forces it against said counter-face (**4,13**) to firmly hold said workpiece (**8,9,10**) in place for multi-directional machining.

4,921,379

LOAD RESTRAINT NET

Smith E. Purdy, Mississauga, Canada, assignor to Polytech Netting Industries, L.P., New York, N.Y.

Filed Nov. 14, 1986, Ser. No. 930,571
Int. Cl.[5] B60R *7/00*
U.S. Cl. 410—117 **11 Claims**



11. In combination with the trunk of a vehicle including a rear lamp panel, wheel wells, and a floor, and mounting points provided at spaced locations on at least one wall of said trunk, a load restraint net comprising:

a substantially rectangular meshed fabric;

an elastic cord engaging the peripheral open spaces of said meshed fabric; and

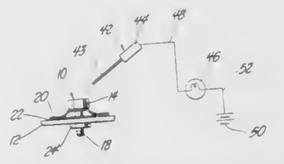
attachment means at the four corners of said meshed fabric for securing said meshed fabric to said mounting points in said trunk, the location of said mounting points being such as to provide a load receiving area when said net is attached to said mounting points; said cord providing resiliency so that said load receiving area may be extended to receive loads therein and said fabric retracted thereon to hold said loads in position in said area.

4,921,380

FASTENER ASSEMBLY

Peter J. Tronetti, Jr., 101 Chippewa St., Royal Oak, Mich. 48073

Filed Apr. 3, 1989, Ser. No. 332,855
Int. Cl.[5] F16B *31/12*
U.S. Cl. 411—8 **7 Claims**



1. bolt having means to indicate the amount of torque

thereon when the bolt is threadingly fastened to a structural member, comprising

a bolt head having one axially oriented surface whose peripheral edges contact the structural member, the one surface and the member defining therebetween a cross-sectionally wedge shaped space tapering in the generally radially outward direction away from the central longitudinal axis of the bolt;

the bolt head having another axially oriented surface faced away from the one surface, the other surface defining therein a set of angularly spaced grooves passing through the central longitudinal axis of the bolt, the depth of the grooves being more than half the axial distance between the axially oriented surfaces of the head, the grooves defining sectors of the bolt head;

wherein increasing clamping force of the bolt head against the structural member pivots the sectors of the bolt head toward the central longitudinal axis of the bolt so that the grooves narrow;

electrically conductive elements on adjacent sectors, the elements extending toward one another over the groove between the adjacent sectors, the conductive elements being electrically insulated from one another except when brought together by pivoting of the adjacent sectors, so that contact between the conductive elements will occur when the bolt exerts a predetermined axial clamping force against the structural member.

4,921,381

EXPANSION DOWEL ASSEMBLY AND METHOD OF ANCHORING THE ASSEMBLY

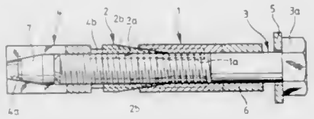
Peter Gschwend, Gamprin, Liechtenstein, and Manfred Breuss, Feldkirch, Austria, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Sep. 12, 1988, Ser. No. 243,464

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730353

Int. Cl.[5] **F16B** *13/04*

U.S. Cl. 411—25 **13 Claims**



1. An expansion dowel assembly for insertion into a borehole formed in a receiving material comprising an axially extending radially expandable member, axially extending first means substantially coaxial and engageable with said expandable member and being axially displaceable relative thereof, said first means arranged for attaching a load thereto for applying the load to said dowel assembly, second means in contact with said expandable member and radially outwardly displaceable by the axial displacement of said first means for securing said expandable member in the borehole prior to radial expansion of said expandable member, said expandable member has a leading end and a trailing end with the leading end inserted first into a borehole, the trailing end of said expandable member has an axially extending sleeve section slotted in the axial direction for facilitating radial expansion, said sleeve section having an axially extending radially inner conical surface converging toward the trailing end, said first means comprises a load engagement part having a leading end and a trailing end with the leading end thereof being formed monolithically with said load engagement part and having an axially extending radially outer conical surface diverging toward the leading end and engageable within said sleeve member in axially displaceable surface contact with the inner conical surface of said sleeve member, and said second means comprises an expansion sleeve engageable with said expandable member between the leading end thereof and said sleeve member.

4,921,382

SCREW LOCK

Bror Fries, and Berit Fries, both of Linghult 2, S-310 21 Hishult, Sweden

Filed Mar. 25, 1988, Ser. No. 173,607

Claims priority, application Sweden, Apr. 29, 1987, 8701781

Int. Cl.[5] **F16B** *13/06*

U.S. Cl. 411—45 **13 Claims**



1. A locking apparatus adapted to be anchored in a bore having a cylindrical surface, and to rotatably receive a mating element having an undercut head, the apparatus comprising:

a substantially cylindrical body having an outer peripheral surface and first and second axial ends;

gripping means on the peripheral surface adjacent the first axial end for gripping the surface of a bore in which the apparatus is to be anchored;

a cavity extending coaxially within the cylindrical body and being tapered inwardly from the second axial end of the body toward the first axial end;

an opening in the first axial end of the body which extends through the first axial end to the cavity;

at least one axial first slit in the body opening to the first axial end, extending toward the second axial end and being spaced from the second axial end, said first axial slit extending along at least a portion of the body through which said cavity extends, whereby the gripping means is forced outwardly in response to an outward force directed against the tapering cavity or the opening; and

a flange extending radially inwardly from the second axial end of the body into the cavity to thereby overlie a portion of the cavity, said flange being formed as a separate portion of spring steel and being adapted to retain the undercut head of the mating element thereunder.

4,921,383

PLASTIC EXPANSIBLE PLUG

Artur Fischer, Tumlingen, Fed. Rep. of Germany, assignor to Fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal/-Tumlingen, Fed. Rep. of Germany

Filed May 15, 1989, Ser. No. 353,071

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1988, 3818652

Int. Cl.[5] **F16B** *13/06*

U.S. Cl. 411—57 **4 Claims**

1. An expansible plug made of a plastic or similar material to be inserted into a drilled hole in masonry for receiving a fastening screw, said expansible plug comprising a tapered bore for receiving the fastening screw; expansible legs having an expansible end portion; and alternate teeth and notches on outer surfaces of said expansible legs, said notches including first notches located at said expansible end portion of said expansible plug and having a first depth, and second notches located on a remaining portion of said expansible legs and having a second depth, the first depth of said first notches being smaller than the second depth of said other notches to increase the thickness of the material at the expansible end portion of the expansible plug and to increase expansion pressure in the drilled hole in the vicinity of the end portion.



4,921,384

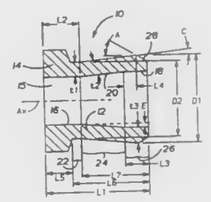
SWAGE FASTENERS WITH A HIGH STAND-OFF COLLAR

Keith D. Nordyke, Irvine, Calif., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jun. 7, 1989, Ser. No. 362,738

Int. Cl.[5] **F16B** *19/08*

U.S. Cl. 411—361 **25 Claims**



1. In a swage type fastener including a pin and a collar adapted to be swaged onto the pin by the application of a relative axial force by an installation tool, the fastener comprising:

the pin having an elongated pin shank portion with a plurality of lockgrooves,

the collar being tubular and having-an inner and outer end and adapted to be located on said pin shank portion and having a collar shank portion adapted to be swaged into said lock grooves by the relative axial force applied between said pin and said outer end of said collar by the installation tool,

said collar having a through bore,

said through bore having a reduced diameter bore portion whereby said collar is generally piloted upon said pin shank,

said collar shank portion being generally frusto conically shaped from said reduced diameter bore portion to an enlarged bore portion at said outer end,

said collar shank portion having a generally uniform wall thickness from said outer end for a distance over its swageable length whereby the frusto conical shape of said collar shank portion provides a high hold-off to resist initiation of swage of said outer end of said collar into said locking grooves of said pin shank.

4,921,385

TRUCK WITH A HAND-OPERATABLE BED

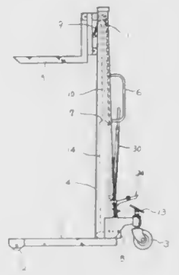
Isamu Okuno, Osaka, Japan, assignor to Kabushiki Kaisha Okudaya Giken, Osaka, Japan

Filed Aug. 11, 1988, Ser. No. 230,952

Claims priority, application Japan, Mar. 29, 1988, 63-42279[U]

Int. Cl.[5] **B66F** *9/06*

U.S. Cl. 414—21 **2 Claims**



1. A truck with a hand-operable hydraulic lift bed supported by a chassis provided with wheels for moving said truck, comprising:

a hydraulic cylinder for lifting or lowering said bed on said chassis;

an oil reservoir;

a plunger pump for feeding oil from said reservoir into said hydraulic cylinder;

a pumping handle for operating the plunger of said plunger pump;

a load sensor for detecting changes in the hydraulic pressure inside said hydraulic cylinder;

overload prevention means including a one-way check valve for permitting oil to be drawn from but not returned to said reservoir by said plunger pump and a spring biased safety valve responsive to the pressure created by said plunger pump for returning oil from said plunger pump to said reservoir when the pressure created by said plunger exceeds a limit set by said spring;

a one-way check valve for coupling said plunger pump to said hydraulic cylinder and isolating said safety valve from said hydraulic cylinder; and

means for indicating said changes detected by said load sensor in terms of the weight of said load.

4,921,386

DEVICE FOR POSITIONING AND STABBING CASING FROM A REMOTE SELECTIVELY VARIABLE LOCATION

James R. McArthur, Tishomingo, Okla., assignor to John Harrel and Charlena Harrel, both of Lindsay, Okla.

Filed Jun. 6, 1988, Ser. No. 203,252

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[5] **B65G** *47/08*

U.S. Cl. 414—22.51 **16 Claims**

1. A casing stabbing apparatus which comprises:

a derrick bracket subassembly adapted for attachment to a structural member of a well derrick;

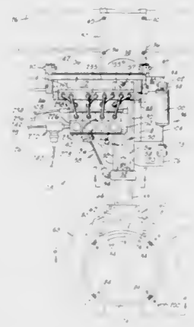
a boom and jaw subassembly detachably connected to said derrick bracket subassembly and including:

an elongated, hollow, extensible boom having one end pivotally connected to said derrick bracket subassembly for pivotation about a vertical axis and about a horizontal axis;

a pair of arcuate casing engaging jaws pivotally mounted

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on the end of said boom opposite its end connected to said derrick bracket subassembly;
means for selectively pivoting said boom about said horizontal axis to raise and lower the end of said boom carrying said jaws;
means for selectively extending and retracting the boom, said means for selectively extending and retracting the boom comprising:
a boom extending piston and cylinder subassembly located in the boom and including:
a piston rod portion connected to one end portion of said boom; and
a cylinder having an end pivotally connected to said derrick bracket subassembly for pivotation about common horizontal and vertical axes with said boom;
a yawing piston and cylinder subassembly extending at an acute angle to the longitudinal axis of the boom and connected to a medial portion of the boom for pivoting the boom about an axis which is substantially vertical at a time when said boom extends substantially horizontally;
radially adjustable roller means carried on said arcuate jaws for selectively adjusting the diametric dimension defined inside said jaws to thereby facilitate stabbing casing sections of varying diametric sizes; and
a piston and cylinder subassembly connected between said jaws for pivoting said jaws in a converging or a diverging movement,



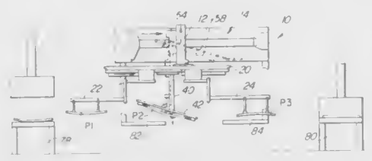
a limit switch subassembly positioned below said boom to be contacted during the downward pivotation of the boom to lower the end of said boom carrying said jaws, and at a time when said boom extends substantially horizontally;
deactivating means connected to said limit switch subassembly and to said means for pivoting the boom to raise and lower the boom for deactivating said pivoting means for raising and lowering the boom in response to a signal from said limit switch subassembly;
a remote control assembly detachably mounted on said boom housing subassembly, said remote control assembly including a plurality of electrically controlled hydraulic valves for selectively supplying hydraulic power fluid to said piston and cylinder subassemblies;
a portable hand control device remote from said hydraulic valves of the remote control assembly and having a plurality of hand maniputable electrical switches thereon;
a control cable connected between the portable hand control device and the remote control assembly for transmitting control signals from the portable hand control device to the remote control assembly;
a power cable connected to the remote control assembly for supplying electrical power thereto;
a hydraulic power fluid supply conduit connected to said remote control assembly for supplying hydraulic power fluid to said electrically controlled hydraulic valves; and
a hydraulic power fluid return conduit connected to said remote control assembly for receiving hydraulic power fluid discharged from said piston and cylinder subassemblies via said electrically controlled hydraulic valves.

4,921,387

COMBINATION TRANSFER/TURNOVER MACHINE

Russell J. Bennington, Rochester Hills, Mich., assignor to The Budd Company, Troy, Mich.

Filed Sep. 16, 1988, Ser. No. 245,720
Int. Cl.[5] B65H *1/00*
U.S. Cl. 414—225 **12 Claims**



1. Apparatus for transferring parts between two machines, said apparatus comprising:
a movable carriage spaced above the floor;
carriage drive means for moving the carriage along generally rectilinear horizontal and vertical paths during transfer of the parts between the two machines;
a horizontal bar connected to the carriage;
first transfer arm means on one end of the bar for picking up a part in a first machine and depositing it at a first deposit station located between the two machines;
second transfer arm means on an opposite end of the bar for picking up a second part in a second deposit station and depositing the part into a second machine; and
third means carried by the bar between the transfer arms for picking up a third part at the first deposit station and depositing it at the second deposit station; and
said carriage drive means being operative to rectilinearly raise, horizontally rectilinearly move, and rectilinearly lower the first transfer arm, second transfer arm and third means during said picking up and depositing of said parts, for the transfer of said parts from the first machine, first deposit station, and second deposit station to the first deposit station, second deposit station, and the second machine, respectively.

4,921,388

ENVELOPE OPENER AND LOAD SEPARATOR

Larry L. Nelson, Sacramento, Calif., assignor to Systems Mailing Research, Inc., Folsom, Calif.

Continuation of Ser. No. 882,333, Jul. 7, 1986, abandoned. This application Aug. 8, 1988, Ser. No. 229,880
Int. Cl.[5] B65H *1/14*
U.S. Cl. 414—412 **3 Claims**

1. An envelope opener comprising: a frame; a receiver on said frame having a pedestal with a bottom wall with an opening therethrough and an upstanding rear wall having a forwardly facing inner surface, a rearwardly facing outer surface, and an upright slot therethrough communicating with said bottom wall opening; and upstanding guide mounted on said frame parallel to said slot and adjacent said rearwardly facing outer surface: an elevator having a boss slidably engaging said guide, a pad adapted to pass through said bottom opening, and a beam adapted to pass through said slot connecting said boss and said pad; means for engaging said elevator and sliding said elevator along said guide, said receiver being adapted releasably to engage an envelope carrier having a carrier base wall and upstanding carrier side and rear walls, said carrier base wall having an opening substantially corresponding to said pedestal bottom wall opening and said carrier rear wall having a carrier slot substantially corresponding to said receiver rear wall upright slot, said carrier base wall opening and said carrier rear wall slot being adapted respectively to register with said pedestal bottom wall opening and said receiver rear wall upright slot when said carrier is disposed on said pedestal bottom wall and against said inner surface of said receiver rear



wall, said elevator pad being lifted by said engaging and sliding means to pass through said bottom opening and said carrier base wall opening to lift an envelope from a lower position to an upper position, envelope opening means, and means for removing the envelope from said upper position and delivering it to said envelope opening means.

4,921,389

LIFTING AND DUMPING APPARATUS

Harold W. O'Daniel, 814 Muirfield, Mansfield, Tex. 76063

Filed Oct. 17, 1988, Ser. No. 259,188
Int. Cl.[5] B65G *65/23*
U.S. Cl. 414—420 **3 Claims**



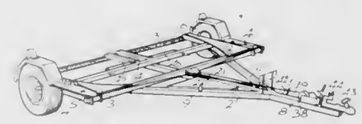
1. A lifting and dumping apparatus for dumping the contents of a refuse container, the container having a pair of longitudinally extending side channels, the lifting and dumping apparatus comprising:
a fixed frame connected to a lifting attachment for moving the fixed frame between a rest position and a vertically elevated position;
a support frame rotatably mounted on said fixed frame by a bearing assembly, said support frame having a pair of fork arms for engaging said container side channels;
wherein said fixed frame has a vertical wall portion with an exterior surface and an interior surface, said vertical wall portion being provided with a central sprocket opening, and wherein said bearing assembly extends between said vertical wall exterior surface and said support frame said support frame having top, bottom and opposing sides which enclose a support plate, said central sprocket being mounted on said support plate and extending horizontally from said support plate through said central sprocket opening of said fixed frame;
a piston actuated chain drive independent of the lifting attachment for rotating the support frame, and hence the refuse container, approximately 180° between a horizontal position and a dumping position at any of a plurality of selected vertically elevated positions of said lifting attachment; and
wherein said piston actuated chain drive includes a double ended piston having opposing ends each of said opposing ends being directly connected to the terminating end of a continuous length of drive chain, said drive chain being engaged with said central sprocket by routing said drive chain about said central sprocket, said continuous length of drive chain running from one of said piston opposing ends to the other for rotating said central sprocket and associated support frame between a horizontal position and a dumping position.

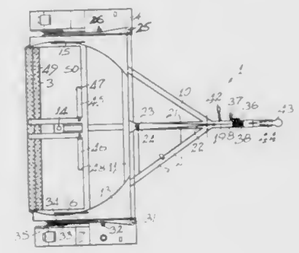
4,921,390

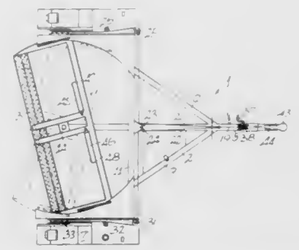
MOTOR VEHICLE TOWING DEVICE

Ronald J. Baines, 12 Moore Avenue, Salisbury East, Adelaide, 5000, Australia

Filed Jun. 10, 1987, Ser. No. 61,123
Claims priority, application Australia, Dec. 11, 1985, PH3827
Int. Cl.[5] B60P *3/12*
U.S. Cl. 414—483 **8 Claims**

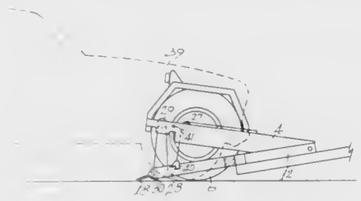






1. A towing aid for wheeled vehicles comprising: a frame assembly havin a pair of transversely spaced-apart rearwardly

extending arms; a pair of ground-engaging wheels rotatably supported by respective ones of the rearwardly extending arms; means mounting the rearwardly extending arms on the frame assembly at a position forward of the ground-engaging wheels for pivotal movement about a substantially transversely orientated horizontal axis; a support frame pivotably mounted on the frame assembly between the ground-engaging wheels



for pivotal movement relative to the frame assembly between a lowered position to engage the front or rear wheels of a vehicle to be towed and a raised position elevated above the lowered position to support the wheels of the vehicle during towing of the vehicle; and means mounting the support frame for pivotal movement about a substantially vertical axis relative to the frame assembly.

4,921,391

FEEDING MECHANISM FOR A PICK-UP TRAILER

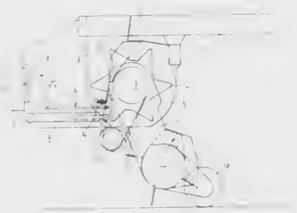
Johannes Schuitemaker, Stationsdwarsweg 65, 7461 AS Rijssen, Netherlands

Filed Dec. 13, 1988, Ser. No. 283,790

Claims priority, application Netherlands, Dec. 16, 1987, 8703050

Int. Cl.[5] **B60P** *1/16;* **A01D** *35/26*

U.S. Cl. 414—505 **5 Claims**



1. A pick-up trailer for travel on the ground and picking up products comprising, a feeding mechanism composed of a pick-up and a rotor which includes a shaft, said rotor being located in front of the pick-up with respect to the normal direction of forward motion of the trailer, said pick-up being attached to said rotor by pick-up plates, said rotor being partly surrounded by a fixed guide plate thereby producing a guide channel between said rotor and said guide plate, said guide channel being bounded from below by a rotary roller when said pick-up is in an operative position and terminating at the top in an opening in a bottom of the trailer, said pick-up comprising means to feed said products toward said guide channel, said rotor and shaft being mounted for rotation inwardly of and between fixed side plates attached to the bottom of the trailer, said rotary roller is mounted for rotation and is attached between suspension arms, said suspension arms are mounted for rotation on the shaft of the rotor for moving said rotary roller, and said suspension arms being movable whereby said roller can be moved from said operative position which bounds said channel from below to a second position away from said channel for greater clearance between said roller and the ground when said pick-up is in operation.

4,921,392

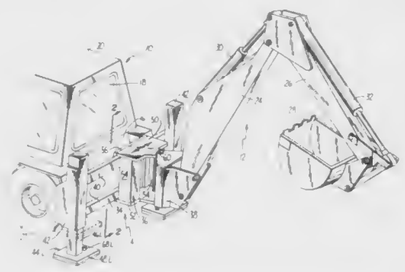
SIDESHIFT MOUNTED BACKHOE LOCKING MECHANISM

Oryn B. Wagner, Bismarck, N. Dak., assignor to Clark Equipment Company, South Bend, Ind.

Filed May 13, 1988, Ser. No. 193,907

Int. Cl.[5] **E02F** *5/02*

U.S. Cl. 414—695 **9 Claims**



1. A loader having a locking sideshift backhoe, including:
a loader having a rear portion and left and right sides;
a backhoe;
a sideshift mount for movably mounting the backhoe to the rear portion of the loader to permit transverse movement of the backhoe between the left and right sides of the loader, and including a first locking member;
a pair of stabilizers mounted to the rear portion of the loader adjacent opposite sides of the sideshift mount and movable between extended and retracted positions;
a stabilizer drive for driving and positioning the stabilizers between their retracted and extended positions; and
a second locking member on at least one of the stabilizers, the second locking member cooperable with the first locking member to engage the sideshift mount to prevent movement of the backhoe on the mount when the stabilizer is driven to its retracted position, and to disengage the sideshift mount and allow backhoe movement when the stabilizer is driven to its extended position.

4,921,393

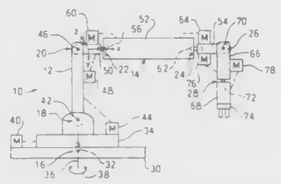
ARTICULATABLE STRUCTURE WITH ADJUSTABLE END-POINT COMPLIANCE

Gerry B. Andeen, Menlo Park, and David M. Auslander, Berkeley, both of Calif., assignors to SRI International, Menlo Park and The Regents of the University of California, Berkeley, both of, Calif.

Filed Mar. 9, 1988, Ser. No. 166,095

Int. Cl.[5] **B25J** *18/00*

U.S. Cl. 414—729 **9 Claims**



1. An articulatable structure for support of end effector means comprising,

base means,
an elongated limb comprising axially aligned first and second interconnected limb sections, said second limb section being elongated, resilient and flexible in at least one direction normal to the longitudinal axis thereof during use thereof, said second limb section being substantially inflexible in a direction orthogonal to said longitudinal axis and said one direction,
rotatable coupling means for rotatably interconnecting said first and second limb sections for relative rotation about said longitudinal axis,
means for connecting said first limb section to said base means,
means for connecting said second limb section to end effector means, and
motor means for rotating said second limb section relative to a reference frame with origin at the first limb section for controlling the passive stiffness matrix of the second limb section relative to said reference frame, which motor means is energized only when the passive stiffness matrix is being changed by said motor means and is deenergized during times that the passive stiffness matrix is not being changed during periods between changes in the passive stiffness matrix.

4,921,394

LOAD HANDLING DEVICE

Norman F. Watson, Chipperfield, United Kingdom, assignor to EKA Limited, Edinburgh, Scotland

Filed Jul. 22, 1988, Ser. No. 223,171

Claims priority, application United Kingdom, Jul. 24, 1987, 8717563

Int. Cl.[5] **B60P** *1/48*

U.S. Cl. 414—546 **32 Claims**



1. A load handling device mountable on a support for transferring a load, comprising:
two spaced lifting arms;
first pivot means pivotally connecting said lifting arms to said support at or adjacent a lower end of each arm;
an exension arm for each lifting arm;
load engagement means attached to the extension arm;
second pivot means pivotally connecting said extension arm to an end of its respective lifting arm remote from said first pivot means;
first means for rocking each of said two lifting arms in a vertical arc comprising:
two first hydraulic rams;
third pivot means connecting the lower ends of each of said first hydraulic rams to said support about pivot axes parallel to said first pivot means, but laterally spaced to either side thereof; and
fourth pivot means connecting the upper ends of said first hydraulic rams to an upper end portion of the respective lifting arm;
second means for rocking each extension arm about its pivotal connection to its said lifting arm through a vertical arc extending to either side of the longitudinal axis of said lifting arm comprising:
two second hydraulic rams, one being located on either side of its respective lifting arm;
fifth pivot means connecting an upper end of each second hydraulic ram to an upper region of its extension arm, each said fifth pivot means being located at or on either side of the longitudinal axis of said extension arm; and
sixth pivot means connecting a lower end of each second hydraulic ram to its respective lifting arm, said sixth pivot means located closer to said first pivot means than is said fourth pivot means.

4,921,395

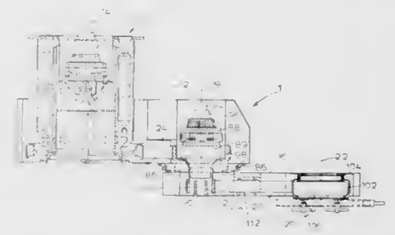
APPARATUS FOR LOADING AND/OR UNLOADING INDUSTRIAL PRESSES

Richard T. Sahlin, Bloomfield Hills, Mich., assignor to Sahlin International, Inc., Birmingham, Mich.

Continuation of Ser. No. 368,914, Apr. 16, 1982. This application Oct. 14, 1986, Ser. No. 918,346

Int. Cl.[5] **B25J** *18/04*

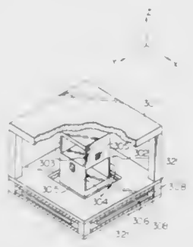
U.S. Cl. 414—744.3 **21 Claims**



1. Heavy duty workpiece handling apparatus for loading and unloading an industrial press or the like comprising a carrier adapted to be mounted on a support surface for the apparatus, a tubular carriage having a longitudinal axis, carriage support means supporting said carriage on the carrier so that said longitudinal axis is vertical and so that said carriage is linearly reciprocable along said vertical longitudinal axis but is constrained against angular movement around said axis and so that substantially all load on the carriage is transmitted into the carrier, power operated means for linearly reciprocating said carriage along said vertical longitudinal axis, said axis defining a first pivot axis, a first horizontally extending cantilever arm, first means pivotally supporting said first arm on said carriage to pivot in a horizontal plane about said first axis and to transfer substantially all load on the first arm into said carriage, a second horizontally extending cantilever arm, second means pivotally supporting said second arm on the end of the first arm to pivot in a horizontal plane about a second vertical pivot axis and to transfer substantially all load on the second arm into the first arm, work-supporting means adjacent the end of the second arm, third means pivotally supporting said work-supporting means on the end of the second arm to pivot in a horizontal plane about a third vertical pivot axis and to transfer substantially all load on it into the second arm said first and third pivot axes being located predetermined fixed distances from said second axis, movement coordinating means supported on and movable with said arms and arranged to so coordinate movement about said pivot axes that said work-supporting means moves in a predetermined horizontal path and with a predetermined angular orientation about said third axis, said coordinating means comprising belt means extending along said arms and pulleys for said belt means disposed about each of said three axes, the pulley around the first pivot axis being affixed to said non-pivotal tubular carriage whereby movement of said belt means causes said first arm to pivot around said first axis, and power operated means coupled to said coordinating means to rotate said arms and work-supporting means relative to each

other whereby said work-supporting means moves along said predetermined path.

4,921,396
SUPPORTING DEVICE
Kazuo Asakawa; Fumiaki Akiya, both of Kawasaki, and Fumio Tabata, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 876,663, Jun. 20, 1986, abandoned, which is a continuation of Ser. No. 533,976, Sep. 20, 1983, abandoned. This application Feb. 16, 1988, Ser. No. 158,041
Claims priority, application Japan, Sep. 21, 1982, 57-163074; Sep. 21, 1982, 57-163067; Sep. 24, 1982, 57-164854; Sep. 28, 1982, 57-167509
Int. Cl.[5] B25J *17/02*
U.S. Cl. 414—751 34 Claims



1. A supporting device, comprising:
a first member;
a second member;
springy means, supported by said first member, for resiliently supporting said second member, said springy means having an elasticity;
detection means, positioned on said springy means, for detecting a displacement of said springy means with respect to said first member, in accordance with the movement of said second member, and for generating a biasing signal in accordance with the detected displacement; and
biasing means for applying a biasing force to said springy means to vary the elasticity of said springy means in accordance with said biasing signal, said biasing means being connected to said first and second members so that said springy means is biased, by said biasing force, with respect to said first member and so that a counterforce of said biasing force acts on said first member,
said springy means comprising first and second pairs of parallel leaf springs, said first pair of parallel leaf springs supporting said second pair of parallel leaf springs so that said first and second pairs of parallel leaf springs can move perpendicularly with respect to each other in first and second directions,
said supporting device supporting an article which applies a load to said supporting device in a third direction which is perpendicular to the first and second directions.

4,921,397
WORK STACKING APPARATUS
Tohru Watanabe, Zama, Japan, assignor to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan
Filed Feb. 2, 1989, Ser. No. 305,012
Claims priority, application Japan, Mar. 18, 1988, 63-35954
Int. Cl.[5] B65G *57/00*
U.S. Cl. 414—788.4 4 Claims

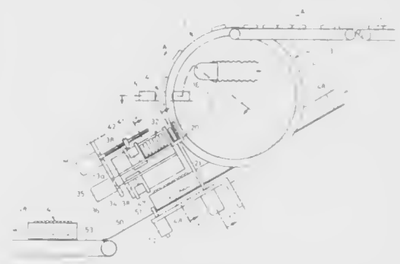
1. A work stacking apparatus for stacking a plurality of different types of works alternately, comprising:
a rotary ring mounted for rotation in a horizontal plane;
first stocking means for stocking a plurality of stacked first works at a first work supply position and at a first stand-by position circumferentially spaced from the first work supply position, said first stocking means comprising first stock rods provided uprightly along a circumferential line on an upper face of said rotary ring at the first work supply position and at the first stand-by position;
second stocking means for stocking a plurality of stacked second works at a second work supply position and at a second stand-by position circumferentially spaced from the second work supply position, said second stocking means comprising second stock rods provided uprightly along a circumferential line on an upper face of said rotary ring at the second work supply position and at the second stand-by position, said first and second stock rods being provided alternately;



means for receiving said first works and said second works alternately;
a stacking arm pivotally mounted for rocking motion about a vertical axis between said first and second work supply positions and said receiving means;
means for rocking said stacking arm;
chuck means mounted on said stacking arm for chucking uppermost ones of said first and second works at the first and second work supply positions alternately and releasing them at said receiving means; and
means for pushing up the stacked first and second works whenever the uppermost one of the first and second works is taken out from said first and second stocking means.

4,921,398
APPARATUS FOR STACKING AND CONVEYING WAFER-LIKE ARTICLES
René Fluck, Schleitheim, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed Mar. 23, 1988, Ser. No. 172,320
Claims priority, application Switzerland, Mar. 23, 1987, 1090/87
Int. Cl.[5] B65B *35/40;* B65G *57/00*
U.S. Cl. 414—798.7 9 Claims

1. An apparatus for forming consecutive groups of face-to-face stacked, flat articles, comprising
(a) an input conveyor for advancing the articles arranged in a flat-lying orientation and in a column of indeterminate length and random spacing; said input conveyor having a discharge end;
(b) a suction wheel having an air-pervious cylindrical peripheral face and a generally horizontally supported rotary shaft, said peripheral face being arranged for receiving the articles from said discharge end of the input conveyor in a random spacing on an upper portion of said suction wheel;
(c) vacuum means for drawing air through said peripheral face for pressing the randomly spaced articles thereagainst during the downwardly sloping advance of the articles carried by said peripheral face;
(d) a stack-forming device arranged for performing stacking steps by consecutively lifting off articles from said peripheral face and mechanically moving each article onto a trough into a face-to-face engagement with an outermost article of a group being under formation on said trough;
(e) a stepping motor connected to said stack-forming device for operating the stack-forming device in steps;
(f) a sensor means arranged at said peripheral face upstream of said stack-forming device as viewed in a direction of article advance on said peripheral face for generating a signal in response to a passage of each article on said peripheral face; said sensor means being connected to said



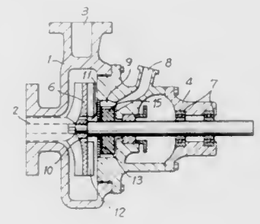
stepping motor for causing the stack-forming device to perform a stacking step when receiving said signal;
(g) a magazine including said trough; said magazine further including means for discharging the article group from said trough when the article group has reached a predetermined quantity characteristic; and
(h) a removal conveyor means including receptacles periodically aligned with said magazine for receiving the article group discharged from the trough of the magazine.

4,921,399
GAS PIPELINE TEMPERATURE CONTROL
Lawrence E. Lew, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Feb. 3, 1989, Ser. No. 305,687
Int. Cl.[5] F04D *29/02*
U.S. Cl. 415—27 13 Claims



1. Apparatus comprising:
compressor means (**10**), having an inlet (**18**) and an outlet (**20**), for compressing gas from a pipeline;
first conduit means (**16**), connected to said inlet (**18**), for providing an inlet stream to said compressor means (**10**);
second conduit means (**22**), connected to said outlet (**20**), for removing compressed gas from said compressor means (**10**) in a compressed gas stream flowing in said second conduit means (**22**);
third conduit means (**23**, **28**, **30**), comprising a first branch (**28**, **30**) and a second branch (**23**) connected to said second conduit means (**22**), for causing a division of said compressed gas stream flowing in said second conduit means (**22**) into a sidestream and a main stream, wherein said sidestream flows in said first branch (**28**, **30**) and said mainstream flows in said second branch (**23**);
cooling means (**48**, **60**), operatively connected in said first branch (**28**, **30**), for receiving said sidestream and for passing chilled compressed gas to a fourth conduit means (**31**) so as to form a cool compressed gas stream;
fifth conduit means, comprising a third branch (**32**) and a fourth branch (**66**), connected to said fourth conduit means (**31**), for dividing said cool compressed gas stream flowing in said fourth conduit means (**31**) so as to form a recycle stream flowing in said third branch (**32**) and a blending stream flowing in said fourth branch (**66**);
sixth conduit means, connected to said first conduit means (**16**), for receiving a decompressed gas stream to be compressed, and for combining said recycle stream flowing in said fourth branch (**32**) and said decompressed gas stream so as to form said inlet stream flowing in said first conduit means (**16**);
first flow rate manipulation means (**34**, **42**) for manipulating the flow rate of said recycle stream flowing in said third branch (**32**) so as to maintain at least a minimum flow rate for said inlet stream flowing in said first conduit means (**16**), thereby preventing surging in said compressor means (**10**);
seventh conduit means (**110**) for combining said blending stream flowing in said fourth branch (**66**) and said mainstream flowing in said second branch (**23**) so as to form a discharge stream flowing in said seventh conduit means (**110**), wherein said discharge stream is supplied to said pipeline; and
second flow rate manipulating means (**82**, **76**) for manipulating the division of said compressed gas stream flowing in said second conduit means (**22**), wherein said first portion flows in conduits (**28**, **30**) and said second portion flows in conduit (**23**), so as to maintain a desired temperature for said discharge stream flowing in said sixth conduit means (**110**).

4,921,400
PUMP AND A METHOD OF SEPARATING GAS BY SUCH FROM A FLUID TO BE PUMPED
Toivo Niskanen, Hamina, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland
Filed Jul. 6, 1988, Ser. No. 216,009
Claims priority, application Finland, Jul. 6, 1987, 872967
Int. Cl.[5] F04D *29/70*
U.S. Cl. 415—169.1 43 Claims



1 An apparatus for pumping a gas containing liquid-solids suspension comprising:
a suspension chamber having a suspension inlet and a suspension outlet;
an impeller mounted for rotation within said suspension chamber for separating said gas from said liquid-solids suspension due to the rotation thereof;
a gas chamber in fluid communication with said suspension chamber, and
means non-rotatably disposed between said suspension chamber and said gas chamber for substantially preventing said solids to pass into said gas chamber, said preventing means comprising a surface having a plurality of open-

ings and at least one groove within said surface for causing turbulence on said surface so as to substantially prevent said fibers from obstructing said openings.

4,921,401

CASTING FOR A ROTARY MACHINE

Theodore W. Hall, Rocky Hill, and Kenneth H. Klapproth, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 23, 1989, Ser. No. 314,535
Int. Cl.[5] F01D *25/24*
U.S. Cl. 415—138 17 Claims



1. A stator assembly for a rotary machine having a flowpath for working medium gases machine, which comprises:
a first case which extends circumferentially with respect to the working medium flow path;
a second case spaced radially from the first case which is radially positioned by the first case and which has at least two circumferentially extending segments which overlap in the circumferential direction and which are relatively slidable in the the circumferential direction, each segment having an end which is radially aligned with the end of the adjacent segment and circumferentially spaced therefrom leaving a circumferential gap therebetween;
wherein the first segment has a circumferentially extending slot in the end of the segment and the second segment has a fastener which extends radially through the slot to permit slidable circumferential movement between the segments and extends in a non-radial direction to position the first segment radially from the second segment and radially with respect to the second segment.

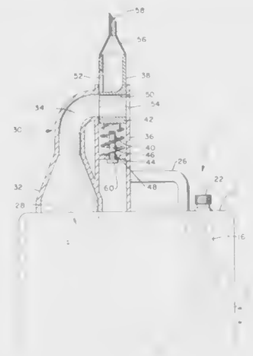
4,921,402

BALLOON INFLATOR VALVE

David C. Nelson, 1585 S. Cleveland-Massillon Rd., Copley, Ohio 44321; William E. Bartasevich, Kent, and Robert L. Waldo, Hiram, both of Ohio, assignors to David C. Nelson, Copley, Ohio

Filed May 1, 1989, Ser. No. 345,458
Int. Cl.[5] F04D *15/00*
U.S. Cl. 415—148 8 Claims

1. A balloon inflator, comprising:
a fan and motor assembly for generating an airflow stream; and
valve means interposed within said airflow stream for directing said airflow stream in a first direction to a balloon nozzle when actuated to a first position, and in a second



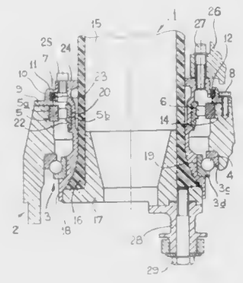
direction to exhaust the airflow stream to atmosphere when actuated to a second position.

4,921,403

PROPELLER BLADE ASSEMBLY

Michael Poucher, and Roger W. Seeley, both of Cheltenham, United Kingdom, assignors to Dowty Rotol Limited, Gloucester, England

Filed Jan. 12, 1989, Ser. No. 296,123
Claims priority, application United Kingdom, Jan. 15, 1988, 8800932
Int. Cl.[5] B64C *11/32*
U.S. Cl. 416—147 3 Claims



1. A propeller blade root assembly for mounting of a propeller blade, said blade root assembly comprising a split hub and an anti-friction bearing arrangement adapted to circumferentially surround and engage a section of a propeller blade received in said assembly, said anti-friction bearing arrangement consisting essentially of
an inner race assembly having a single race; and
an outer race assembly having a single race and spaced longitudinally from the inner race assembly; said inner race being filled with a plurality of angular contact bearings and said outer race being filled with a plurality of roller bearings, each of said plurality of roller bearings having an axis of rotation substantially parallel to the axis of rotation of a propeller blade received in said blade route assembly, wherein said angular contact bearings and said roller bearings of said bearing arrangement are free of any preloading forces.

4,921,404

PROPELLORS FOR WATERCRAFT

Arnold C. V. Holmberg, 29 David Low Highway, Mudjimba, Queensland, 4564, Australia

PCT No. PCT/AU85/00246, § 371 Date Jun. 12, 1986, § 102(e) Date Jun. 12, 1986, PCT Pub. No. WO86/02331, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 14, 1985, Ser. No. 882,936
Claims priority, application Australia, Oct. 12, 1984, PG7616; Jan. 9, 1985, PG8825
Int. Cl.[5] B63H *1/26*
U.S. Cl. 416—223 R 6 Claims



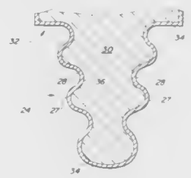
1. A propellor for watercraft including:
a hub connectable to a drive shaft; and
a plurality of blades attached to the hub, each blade having a leading portion, a central portion and a trailing portion, wherein:
the line of junction between at least the central and trailing portions of the blades with the hub is of increasing pitch along the hub;
the leading portion of each blade is inclined forwardly relatively to the hub;
the trailing portion of each blade is inclined rearwardly relatively to the hub;
the central portion extends substantially radially to the hub; and
the blades are substantially coextensive along the length of the hub and are disposed in relatively inverted, overlapping relationship wherein the leading portion of one blade partially overlaps the trailing portion of the other blade to form a divergent throat between the blades along the propellor to prevent the propellor from choking with water.

4,921,405

DUAL STRUCTURE TURBINE BLADE

Lloyd W. Wilson, Scottsdale, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 10, 1988, Ser. No. 269,505
Int. Cl.[5] F01D *5/28*
U.S. Cl. 416—241 R 17 Claims



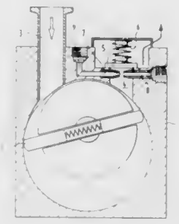
1. A composite turbine blade structure, comprising:
a single crystal body having an airfoil section and an attachment section; and
a layer of a polycrystalline alloy bonded onto at least a portion of said attachment section.

4,921,406

MECHANICAL PRIMARY VACUUM PUMP INCLUDING A SPRING-LOADED NON-RETURN FLAP VALVE

Heinz-Dieter Bürger, Wertheim, Fed. Rep. of Germany, assignor to Alcatael Hochvakuumtechnik GmbH, Wertheim, Fed. Rep. of Germany

Filed Jan. 4, 1989, Ser. No. 293,775
Int. Cl.[5] F04B *41/06*
U.S. Cl. 417—87 2 Claims



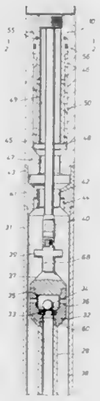
1. A mechanical primary vacuum pump including a casing which comprises an inlet channel on the suction side and an outlet channel on the discharge side, a displacement member rotating in the casing, a spring-loaded non-return flap valve associated to the outlet channel, and a gas jet pump incorporated in said outlet channel upstream of the flap valve.

4,921,407

PRODUCTION PUMP FOR HIGH GRAVITY OR SAND LADEN OIL

Mack Ponder, c/o Box 2229, Alice, Tex. 78333

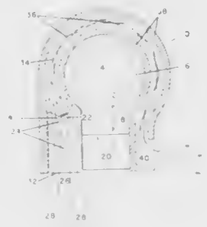
Filed May 22, 1989, Ser. No. 354,859
Int. Cl.[5] F16K *21/10*; F04B *47/12*
U.S. Cl. 417—553 10 Claims



1. A plunger type reciprocating pump for a producing oil well comprising:
(a) an elongate pump housing having an open upper end and a reciprocating part therein;
(b) tubing connector means for said open upper end for connection to a production tubing string assembled by threading together tubing joints to produce oil into the string and wherein said connector means includes;
(i) means telescoping relative to said tubing string to form an oil flow path therewith;

(ii) fastening means operative to secure said tubing string and said pump housing at the open upper end thereof, said fastening means releasing said tubing string on relative motion other than threading motion involved in threading together said tubing string;
(iii) first and second telescoping concentric sleeves and sacrificial shear means joining said sleeves to prevent telescoping movement; and
(c) sucker rod connector means connecting a sucker rod string assembled of sucker rods threaded together by threading in a conventional direction, said connector means comprising:
(i) first means selectively holding said reciprocating part against rotation to enable threading said sucker rod string to said reciprocating part; and
(ii) second means selectively holding said reciprocating part against rotation to enable unthreading of said sucker rod string by rotation opposite the conventional direction.

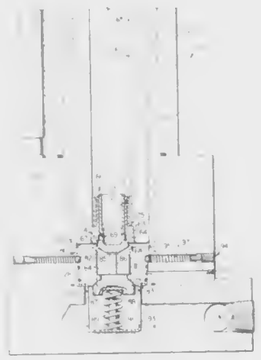
4,921,408
NON-ICING QUIET AIR-OPERATED PUMP
Daniel J. Kyinge, St. Louis Park; Frederick A. Powers, and Kenneth E. Lehrke, both of Maple Grove, all of Minn., assignors to Graco Inc., Minneapolis, Minn.
Filed Nov. 28, 1988, Ser. No. 277,022
Int. Cl.[5] F04B *39/02*
U.S. Cl. 417—368 **9 Claims**



1. An air motor comprising:
a valve controlling the flow of air in and out of said air motor;
an exhaust passage connected to said valve; and
areas cooled by cold exhaust air,
the improvement comprising means for inducing the flow of ambient atmospheric air over said cold areas, said flow inducing means being operated by exhaust flow through said exhaust passage and mixing said ambient atmospheric air with said exhaust flow to provide an above freezing mixture.

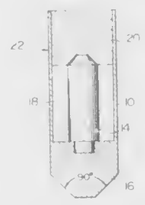
4,921,409
HIGH PRESSURE RECIPROCATING PUMP
Dragan Besic, West Caldwell, N.J., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Jun. 21, 1988, Ser. No. 209,698
Int. Cl.[5] F04B *21/00*
U.S. Cl. 417—552 **8 Claims**

1. In a reciprocating pump having a plunger and a pumping chamber, the improvement comprising:
the plunger having a bore communicating with an intersecting opening and wherein the plunger includes a central axis;
a suction valve and a discharge valve, each having an axis of actuation parallel to a central axis of the plunger;
said suction valve comprising a cylindrical core having a central passageway, and said core is slidably received by a seating member and resiliently biased to said seating member, said core having one or more radially disposed openings which communicate with the central passageway, and said suction valve being attached to said plunger and cooperating with the plunger bore; and



said discharge valve includes an element having a tapered sealing shoulder and projecting guides.

4,921,410
METHOD OF PRODUCING A COMPACT OF AMORPHOUS ALLOYS
Yoshihito Kawamura, Obu; Masashi Akai, Aichi, and Makoto Takagi, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Jul. 28, 1988, Ser. No. 225,215
Claims priority, application Japan, Jul. 29, 1987, 62-189803
Int. Cl.[5] G22F *7/00*
U.S. Cl. 419—8 **9 Claims**

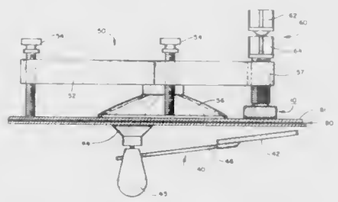


1. A method of producing a compact of amorphous alloy, comprising the steps of: preparing a billet by filling a container made of a ductile metal with powder of the amorphous alloy; working plastically the billet at a temperature higher than plasticity transition temperature of the amorphous alloy but less than the crystallization temperature of said amorphous alloy so that both a shear strain of not less than about 0.7 but less than 1.8 and a stress not less than about 90 Kgf/mm^2 but less than 400 Kgf/mm^2 are applied to the amorphous alloy powder filled in the container.

4,921,411
GLASS REPAIR INJECTOR TUBE NOZZLE ADAPTER
Charles J. Ottenheimer, 1128 Ala Napunani, Suite #1105, Honolulu, Hi. 96818
Filed Jun. 13, 1989, Ser. No. 365,299
Int. Cl.[5] B32B *35/00*; B29C *45/14*
U.S. Cl. 425—12 **20 Claims**

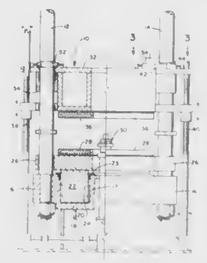
1. A guide for an injector nozzle for injecting fluid under pressure into cracks in a glass surface comprises

a block guide member having an upper surface and a generally flat bottom surface,
a centrally located conduit extending from the bottom surface to the top surface,



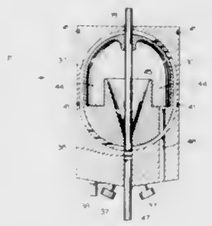
seal means mounted on a lower portion of the guide member for retaining fluid injected by the nozzle and
a plurality of regular markings on the bottom surface of the guide member.

4,921,412
TIRE CURING PRESS
Joe F. Scantland, Akron, and Frederick J. Huffman, Tallmadge, both of Ohio, assignors to Scantland Industries, Inc., Copley, Ohio
Filed Oct. 11, 1988, Ser. No. 255,591
Int. Cl.[5] B29C *35/02*
U.S. Cl. 425—28.1 **4 Claims**



3. A tire curing press comprising a pair of parallel upright support posts,
an upper platen slidably mounted on said support posts,
a lower platen slidably carried by said support posts, each of said platens having means to carry a mold section secured thereto,
a base means associated with said support posts and secured thereto,
pressure applying means operatively secured to said lower platen to move it upwardly and cause any mold section thereon to engage any mold section on said upper plate, and
lock devices operatively engaging said support posts above said upper platen to prevent upward movement of said upper platen,
wherein said base means has an upper end and said pressure applying means comprise an annular piston slidably mounted on said base means at said upper end thereof, said base means having an annular chamber therein receiving said annular piston and fluid pressure supply means connecting to said annular chamber to move said annular piston, and wherein said annular piston has a greater surface area than any tire to be cured, and means to apply the same pressure to actuate the annular piston as to the tire being cured.

4,921,413
APPARATUS FOR CONTROLLING EXCESS FIBER LENGTH IN A LOOSE TUBE OPTICAL FIBER BUFFER TUBE
Douglas J. Blew, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.
Filed Feb. 16, 1989, Ser. No. 310,961
Int. Cl.[5] B29C *47/90*
U.S. Cl. 425—71 **6 Claims**



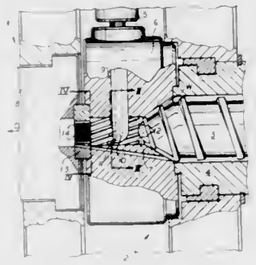
1. A cooling apparatus comprising:
(a) a tubular member, having upper and lower terminal portions;
(b) a water block device, disposed in the lower terminal portion of said tubular member and forming a water tight seal therebetween, comprising a chamber having outlet and inlet ports delimiting a path of travel, a conical-shaped portion circumscribing said path of travel, an annulus-shaped portion circumscribing said conical-shaped portion, a device disposed near the outlet port for providing a stream of gas directed at said path of travel and a device for removing liquid from an object in said path of travel and the interior of said chamber; and,
(c) an inlet port in said tubular member for supplying water thereto.

4,921,414
EXTRUSION APPARATUS FOR PRODUCING MARBELEIZED THERMOPLASTIC EXTRUSIONS
Wolf D. Schliebe, Dorsten, and Mathias Eschbach, Haltern, both of Fed. Rep. of Germany, assignors to W. Dollken & Co. GmbH, Essen, Fed. Rep. of Germany
Filed Mar. 14, 1988, Ser. No. 167,633
Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717967
Int. Cl.[5] B29C *47/04, 47/66*
U.S. Cl. 425—131.1 **3 Claims**

1. An extrusion apparatus for making a marbled extrusion from a thermoplastic base material having one color mixed with a thermoplastic marbling material having another color, said apparatus comprising:
a screw press having at least one screw;
a housing having a central passage for receiving said thermoplastic base material, said central passage having a first end and a second end remote from said first end, said first end enclosing at least part of said screw, and said housing having an injector cavity;
means in said housing defining a shaping outlet communicating with said second end;
at least one injection finger for feeding said thermoplastic marbling material into said base material mounted in said injector cavity and extending approximately transverse to an extrusion direction of said thermoplastic base material through said passage from said first end to said second end, and said injection finger having therewithin a plural-

ity of injector ducts which open in said central passage so as to distribute said thermoplastic marbling material through said thermoplastic base material;

a plurality of generally helical ribs generally oriented in a direction of flow of said thermoplastic base material positioned all around on an inner wall defining said central



passage to form a rifled section in said central passage directly into which said injection finger extends; and

a perforated plate positioned between said second end and said outlet, said plate having a plurality of perforations which provide communication between said central chamber and said shaping outlet.

4,921,415

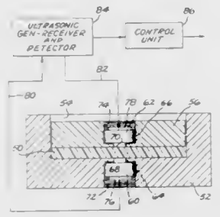
CURE MONITORING APPARATUS HAVING HIGH TEMPERATURE ULTRASONIC TRANSDUCERS

Lewis J. Thomas, III, Schenectady; Robert S. Gilmore, Burnt Hills, and Homer H. Glascock, II, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 126,138, Nov. 27, 1987, Pat. No. 4,825,117. This application Nov. 15, 1988, Ser. No. 272,358

Int. Cl.[5] B29C *35/02*

U.S. Cl. 425—135 **1 Claim**



1. Apparatus for monitoring a process for curing a composite plastic in which the plastic is cured under pressure and at an elevated temperature in a mold, comprising a mold, a first transducer assembly secured to the mold for transmitting acoustic energy through the plastic; a second transducer assembly secured to the mold receiving the acoustic energy transmitted through the plastic; means connected to the first and second transducer assemblies of measuring the velocity and attenuation of the acoustic energy through the plastic to determine the state of cure of the plastic; and means responsive to the measuring means for controlling the pressure and temperature of the curing process; each transducer assembly comprising a housing having a cylindrical hollow annular cap and a stepped-diameter annular base threaded to the cap for contact with the plastic in the mold; and a piezoelectric transducer element within the housing, the transducer element being mounted on the base by an intermediate compliant layer of structured metal;

said first and second transfer assemblies being respectively disposed in first and second parts of said mold with the bases of the transducer elements flush with surfaces of the mold parts which contact and press the plastic therebetween;

each base including a projecting portion with a smaller diameter than the housing, the projecting portion contacting the plastic, and wherein the transducer assemblies are received within stepped-diameter holes in the mold parts and fixed in position by threaded rings.

4,921,416

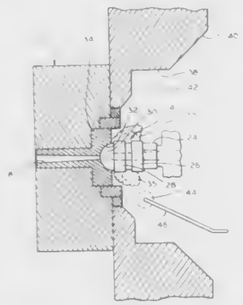
INJECTION MOLDING MACHINE HAVING A SYSTEM FOR DETECTING A NOZZLE LEAK CONSTRUCTION

Thomas M. Green, 9153 Lincoln Lake Rd., NE. Greenville, Mich. 48838

Filed Aug. 3, 1989, Ser. No. 389,330

Int. Cl.[5] B29C *45/78*

U.S. Cl. 425—143 **10 Claims**



1. An injection molding machine, comprising in combination:

a mold including a sprue;

a platen mounted to said mold, said platen including an opening generally coaxial with said sprue;

a nozzle mounted in said opening of said platen with an annular clearance space around at least a portion of the nozzle proximate an end thereof, said nozzle including an outlet disposed coaxial with said sprue from which a molten plastic is discharged into said sprue;

means for delivering a molten plastic to said nozzle;

means for detecting a leak condition including thermocouple means disposed in said clearance space at a predetermined location for generating signals representing an instantaneous temperature at said predetermined location, and

control means coupled to said thermocouple means for receiving said signals and for actuating an alarm when said signals correspond to a predetermined temperature corresponding to a leak condition.

4,921,417

MOLDING APPARATUS FOR MOLDING A CLAY PIGEON

Akiyoshi Sato, Nagano, Japan, assignor to Sato Factory Co., Ltd., Nagano, Japan

Division of Ser. No. 104,259, Oct. 5, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,541

Int. Cl.[5] B29C *45/77*

U.S. Cl. 425—145 **1 Claim**

1. A molding apparatus for molding a clay pigeon comprising

a tank for accommodating a molding material mixture of at least sand and hardening agent,

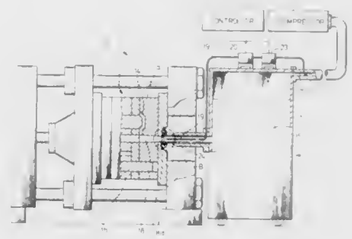
a compressor for supplying compressed air to

a duct connected to an upper portion of said tank,

a mold having a cavity in the form of the clay pigeon,

a blow orifice for connecting said mold and a lower portion of said tank,

a bypass tube having a front end disposed in said blow orifice in parallel with said blow orifice and a rear end disposed in the duct in parallel with said duct a diameter of said



bypass tube being smaller than that of said duct and said blow orifice, a part of the compressed air from said compressor passing through said bypass tube to lead blowing of the molding material in the blow orifice, and a pressure regulating valve and/or a flow rate regulating valve disposed in the way of said bypass tube.

4,921,418

CONTINUOUSLY WORKING PRESS

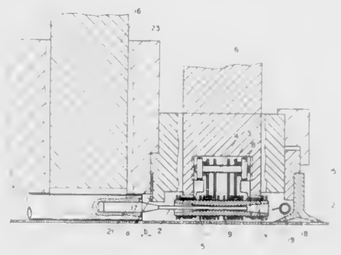
Friedrich B. Bielfeldt, Eppingen, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 288,389

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743665

Int. Cl.[5] B30B *3/00*

U.S. Cl. 425—371 **14 Claims**



1. A continuously working press comprising:

a table member;

a press member disposed thereover defining a horizontal pressing plane therebetween;

first and second flexible bands disposed about said table member and press member, respectively;

rotating means which rotates said bands about said table member and press member;

a plurality of roller rod conveyor assemblies disposed between said table and press members and said flexible bands;

each of said roller rod conveyor assemblies comprising:

(a) a plurality of roller rods extending perpendicular to the direction of rotation of said flexible bands,

(b) a lead-in wheel which derives said roller rods onto said horizontal pressing plane,

(c) a guide chain means connected to said roller rods via resilient connecting means and extending beyond the pressing plane, each of said resilient connecting means having a first portion located within said guide chain means and a second portion disposed within one of said roller rods,

(d) an entering wheel coaxial with said lead-in wheel and which drives said guide chain onto said horizontal pressing plane with the same arc and secant dimensions as the path of said roller rods, and

(e) a plurality of supporting wheels which support and guide chain means beyond the pressing plane;

said guide chain means defining a tapered bore for receiving said first portion of said resilient connecting means and absorbing forces from the resilient connecting means.

4,921,419

HYDRAULIC PRESS

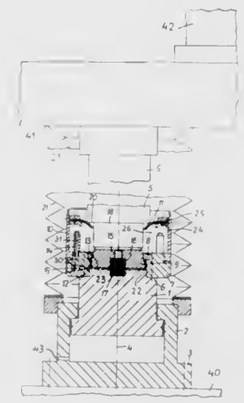
Richard Brüssel, Sulzfeld, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,458

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805004

Int. Cl.[5] B30B *15/16*

U.S. Cl. 425—406 **13 Claims**



1. In a hydraulic press including

a press plate mounted for executing working strokes and return strokes;

hydraulic power means connected to said press plate for driving said press plate in execution of said working strokes;

a hydraulic countersupport braking cylinder means supported at an end zone of the working stroke for operatively engaging said press plate at an end portion of the working stroke to cause deceleration of the press plate by said hydraulic countersupport braking cylinder means;

the improvement comprising

a hydraulic shock absorber having an expanded state and a compressed state; said hydraulic shock absorber being interposed between said press plate and said hydraulic countersupport braking cylinder means, whereby said hydraulic shock absorber is moved from the expanded state into the compressed state by said press plate in an end zone of said working strokes; said hydraulic shock absorber having

(a) means defining a shock absorber chamber containing hydraulic fluid;

(b) throttle means for setting a braking force in said shock absorber chamber to a magnitude smaller than a braking

force of said hydraulic countersupport braking cylinder means; and

(c) resetting means for returning said shock absorber into said expanded state.

4,921,420

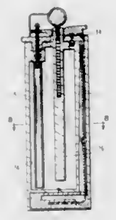
CHILD RESISTANT DISPOSABLE LIGHTER

James A. Johnston, 1711 Poudre Canyon, Bellvue, Colo. 80512

Filed Jul. 5, 1988, Ser. No. 214,752

Int. Cl.[5] F23D *11/36*

U.S. Cl. 431—153 **23 Claims**



1. A child resistant disposable safety lighter comprising:

a. a body to contain a suitable flammable substance and having top and bottom ends and inner sides;

b. a means for controlling the release of said substance said controlling mens having an actuation lever at the top end of said body; and

c. a means for preventing the operation of said lighter which is molded into said body wherein said preventing means is accomplished at a point at least 3⅛ inches from said actuation lever.

4,921,421

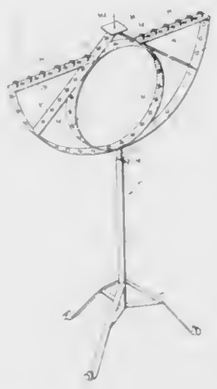
CANDELABRUM

Carol E. Little, P.O. Box 758, Plains, Kans. 67869

Filed Oct. 6, 1989, Ser. No. 418,236

Int. Cl.[5] F23D *3/16*

U.S. Cl. 431—295 **6 Claims**



1. A candelabra comprising a first open end steel strap bent into a semicircular form to form a candle support, the upper free ends of said first steel strap being bent toward one another to form a candle support ledge, a pair of second steel straps each of which is secured at one end to the inside of said first semicircular formed steel strap and being secured together at their other ends to form an inverted open based triangle, one of a heart and ring means formed from closed perforated flat steel straps connectable to said first and second steel straps, mount means for connecting said heart and ring means to said first and second steel straps forming the candelabra, a vertically adjustable slidable support having an inner member and an outer member, connected to a base support for raising and lowering the candle support ledges, the inner member of which is secured to the base of said semicircular steel strap, the free ends of the bent portions of said first open ended steel strap being welded to the upper portions of said inverted open based triangle, said first steel strap ends being bent toward one another and being secured to the outside of said second steel straps forming the inverted open based triangle, candle cup supports secured at spaced distances along the upper surfaces of said candle support ledges of said first steel strap which are bent toward one another, said first and second steel straps having cross openings therethrough at evenly spaced distances, said heart and ring mount means carried by said first and second steel straps, at least one of said ring or heart being formed of flat steel straps having uniformly spaced cross openings therethrough and being secured to said mount means, and said a support base for said candelabra being secured to the outside member of said vertical adjustable slidable support.

4,921,422

METHOD FOR CONTROLLING THE PREHEATING ZONE OF A TUNNEL KILN

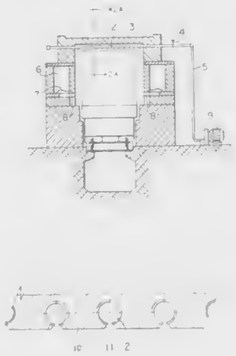
Tatsuhiro Kosugi; Takeshi Ogawa, both of Kitakyushu, and Norio Tanaka, Tokyo, all of Japan, assignors to Toto, Ltd., Fukuoka, Japan

Continuation-in-part of Ser. No. 36,199, Apr. 8, 1987, abandoned, which is a continuation of Ser. No. 745,012, Jun. 14, 1985, abandoned. This application May 3, 1989, Ser. No. 347,261

Claims priority, application Japan, Jun. 14, 1984, 59-122217

Int. Cl.[5] F27D *7/00;* **F27B** *9/02*

U.S. Cl. 432—24 **1 Claim**



1. In the method of controlling the temperature gradient of a preheating zone of a tunnel kiln having a combustion gas therein, the steps of:

heating air to a temperature higher than the dew point of said combustion gas;

forcedly blowing said heated air through a plurality of perforated hollow pipes that extend generally perpendicularly to the longitudinal direction of said kiln, said pipes being disposed at a plurality of longitudinal intervals in an upper portion of said preheating zone;

partially protecting said pipes with refractories having slits formed therein that expose said pipes; and

regulating the blowing of said heated air from said upper portion to a lower portion of said preheating zone to diffuse any of said combustion gas in said upper portion and reduce the temperature gradient between said upper and lower portions.

4,921,423

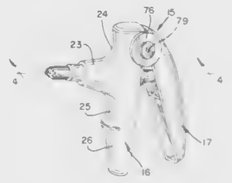
ORTHODONTIC LIGATURE GUN

Peter C. Kesling, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.

Filed Feb. 28, 1989, Ser. No. 317,220

Int. Cl.[5] A61C *3/00*

U.S. Cl. 433—3 **18 Claims**



1. A device for applying elastic ligatures to an orthodontic bracket, said device having a first member with an elongated guide bore, a plunger slidably mounted in the bore, at least two longitudinally extending flexible wire members guidably retained by the plunger and guide bore, each having an intermediate portion extending along the plunger and guide bore and one end anchored to said first member, and the other end disposed beyond the free end of the plunger and formed to coact with the like end of the other wire member so that the two ends form jaws that can enter into an opening in an elastic ligature when in substantial abutting relation with each other, and a second member for actuating the plunger wherein the plunger when slidably actuated separates the jaws for expanding a ligature received thereon and thereafter pushes or discharges the ligature from the free ends of the jaws, whereby the device will function to first engage and grip an elastic ligature and thereafter expand the ligature for application to an orthodontic system and then push or shoot the ligature from the jaws and around the bracket.

4,921,424

DENTAL HANDPIECE

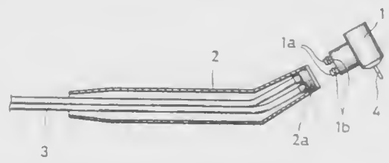
Hiroshi Kimura, Osaka, Japan, assignor to G-C Dental Industrial Corp., Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,924

Claims priority, application Japan, Sep. 2, 1987, 62-218060

Int. Cl.[5] A61C *1/05*

U.S. Cl. 433—114 **11 Claims**



1. A dental handpiece including a detachable head having an air turbine therein and connecting pipes extending sideways therefrom and a synthetic resin grip having at its end a connecting portion provided therein with connecting holes into which said connecting pipes of the head are fitted, wherein:

a tube for fluid passage formed of a flexible synthetic resin and having a fibrous reinforcing material embedded in its wall is to be connected at its one end to a dental unit body, and passes at least through said grip and is caused to communicate at its other end with said connecting hole in said connecting portion.

4,921,425

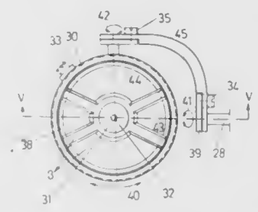
MODEL OPERATING INSTRUMENT FOR UPPER JAW OSTEOTOMY

Georg Lixl, Untereching 72, A-5110 Oberndorf, and Christian Krenkel, Moosstrasse 126, A-5020 Salzburg, both of Austria

Filed Apr. 27, 1988, Ser. No. 186,931

Int. Cl.[5] A61C *11/00*

U.S. Cl. 433—62 **3 Claims**



1. A model operating instrument for measuring the effects of upper jaw osteotomy on the temporo-maxillary joints of a model jaw assembly having articulator heads, said instrument comprising: a basic frame having means for adjustably defining and storing the position of two temporo-maxillary joint cups and thus the desired position of the articulator heads of a lower jaw model; and a disc, horizontally mounted on the basic frame for location in the osteotomy plane of the upper jaw, rotatable in its own plane and adapted for displacement in three directions at right-angles to one another, said disc being universally mounted so as to be rotatable about two horizontal axes which are perpendicular to one another and which intersect the center of the disc, a model of the upper jaw keyed to a model of the lower jaw being capable of being fixed on said disc.

4,921,426

POWER-CONNECTION/CAR-MOUNTING DEVICE AND CONNECTION SYSTEM FOR A CAR-MOUNTABLE APPARATUS

Nobuhiko Kawasaki, Nara; Kouichi Ikeda, Kashiwara, and Shinichi Kimura, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 875,583, Jun. 18, 1986, Pat. No. 4,767,337. This application Apr. 20, 1988, Ser. No. 183,986

Claims priority, application Japan, Jun. 18, 1985, 60-93264; Sep. 10, 1985, 60-138938; Sep. 10, 1985, 60-138939; Sep. 12, 1985, 60-140215; Mar. 25, 1986, 61-44604

Int. Cl.[5] H01R *13/631*

U.S. Cl. 439—34 **5 Claims**



1. A power-source connection device for a car-mounted apparatus, comprising:

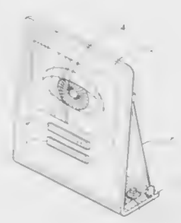
a substrate secured to a car body;

a car-side connector movably supported on said substrate;

an apparatus-side connector installed on the bottom of said car-mounted apparatus;

means for mating said car-side connector with said apparatus-side connector, thereby mounting said apparatus-side connector in relation to said substrate;
means for electrically connecting said car-side connector to said apparatus-side connector; and
means for supplying power to said car-mounted apparatus when said car-side connector and said apparatus-side connector are electrically connected;
wherein said car-side connector freely moves with respect to the car body and wherein said car-side connector and said apparatus-side connector integrally vibrate together in response to vibrations of said car body.

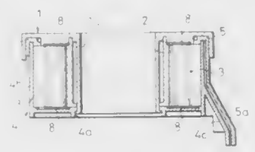
4,921,427
EDUCATIONAL DEVICE
Jeffery W. Dunn, 738 E. Osceola Ave., Lake Wales, Fla. 33853
Filed Aug. 21, 1989, Ser. No. 396,095
Int. Cl.[5] G09B *5/00*
U.S. Cl. 434—340 9 Claims



1. An educational device, comprising:
a visual blocking stand having a vertical portion for obstructing visual contact between two individuals;
a plurality of cards, each having a question relating to a particular curriculum on a first side and a multiple choice group of answers on an opposite side;
at least one slot formed in said vertical portion of said stand for conveying information on one of said cards;
a representation of a human eye on one side of said vertical portion of said stand;
two different colored electrical light sources disposed for illuminating said eye;
a power source for supplying electrical current to said light sources; and
switch means on said stand for selectively illuminating said light sources to indicate a correct or wrong answer.

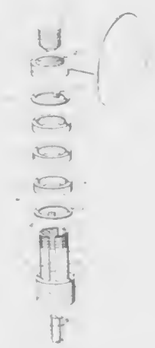
4,921,428
CABLE REEL
Kunihiko Sasaki; Yuichi Ida; Tsumoru Oka, and Mituaki Shinroaku, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Jan. 25, 1989, Ser. No. 301,914
Claims priority, application Japan, Mar. 31, 1988, 63-42050[U]
Int. Cl.[5] H01R *39/02*
U.S. Cl. 439—15 8 Claims

1. A cable reel device, comprising:
a stationary fixture including a substantially planar surface;
a rotatable mover mounted on said stationary fixture, said rotatable mover including a planar surface;
a cylindrical holder member supported on said rotatable mover;
a sheet of low friction material attached to said substantially planar surface of said stationary fixture; and



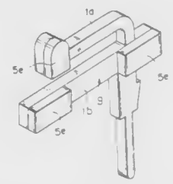
a flat cable wound around said cylindrical holder member with said flat cable positioned such that one edge of said flat cable contacts said sheet of low friction material.

4,921,429
ROTATABLE BULB SOCKET ASSEMBLY
Mark Brown, #1711 - 420 Gloucester St., Ottawa, Ontario, Canada (K1R 7T7)
Filed Aug. 14, 1989, Ser. No. 401,927
Int. Cl.[5] H01R *39/00*
U.S. Cl. 439—26 6 Claims



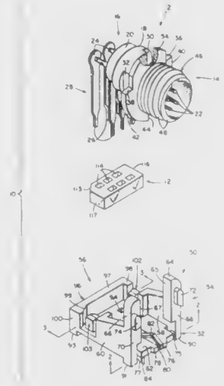
1. A rotatable bulb socket assembly comprising:
a non-conductive base having a generally cylindrical configuration with a bottom portion and a top portion, said top portion having a hollow cross-sectional configuration of smaller diameter than said bottom portion for receiving a base portion of a light bulb;
first and second annular electrically conductive current carrying members disposed on said top portion and separated by an annular insulating element disposed on said top portion, said current carrying members having inwardly projecting tabs adapted to contact terminals of a light bulb secured in said top portion;
first and second electrically conductive brushes secured for slidable engagement with said first and second current carrying members and connectable to a source of electrical power;
a retaining element secured to said top portion for retaining said current carrying members and said insulating element on the top portion of said base; and
means for rotating said base.

4,921,430
CONNECTOR FOR THE USE OF ELECTRONIC PARTS
Noriyuki Matsuoka, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 200,375, May 31, 1988, abandoned.
This application Sep. 13, 1989, Ser. No. 406,829
Claims priority, application Japan, Jun. 26, 1987, 62-159070
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—72 15 Claims



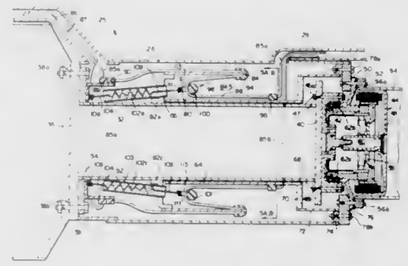
1. A connector for connecting electronic devices, comprising:
a connector body; and
a plurality of electric contacts for arrangement in said connector body in parallel at relatively small intervals from each other, each said electric contact comprising:
a supporting member;
a resilient contact member cantilevered at one end thereof to said supporting member, said resilient contact member having a contact portion integral therewith on a free end thereof;
a leg member extending from said supporting member;
a first insulating material portion attached to one side surface of said supporting member; and
a second insulating material portion attached to one side surface of said free end of said resilient contact member.

4,921,431
CONNECTOR ADAPTER ASSEMBLY
Antonio A. Garay, Roselle; Tedford H. Spaulding, Chicago, and Robert L. Valleau, Des Plaines, all of Ill., assignors to Switchcraft, Inc., Chicago, Ill.
Filed Jan. 23, 1989, Ser. No. 300,455
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—79 6 Claims



1. A connector adaptor housing comprising:
a trough-like frame made of resilient dielectric material and having a bottom wall with opposing longitudinal edge portions integrally joined to respective first and second orthogonal side wall means for receiving therebetween a recumbent cylindrical connector;
connector retainer means disposed integrally in said frame for retaining said connector in predetermined positional relationship to said frame independently of extraneous fastener devices;
said connector retainer means including first and second resilient posts terminating said first and second wall means, respectively, adjacent one end of said bottom wall and having respective first and second distal end portion means extended beyond said first and second side wall means for resiliently engaging respective adjacent portions of said recumbent cylindrical connector and preventing axial movement thereof relative to said frame;
said connector retainer means further including an opposing end portion of said bottom wall having extended through its thickness an array of mutually spaced aperture means for receiving respective terminal members extended from said connector and for retaining said terminal members in predetermined positional relationship relative to said frame; and
said connector retainer means further including a slab of ferromagnetic material latchingly secured over said array of mutually spaced aperture means and having extended through its thickness a similar array of mutually spaced holes, each of said holes being disposed in registration with a respective one of said aperture means.

4,921,432
WIRE CONDUCTING ROTARY COUPLING EMPLOYING PROTECTIVE SKIRT
Herbert E. Ferree, Hempfield Twp., Westmoreland Co., Pa., assignor to Space Industries Partnership, L.P., Webster, Tex.
Filed Oct. 14, 1988, Ser. No. 257,919
Int. Cl.[5] H01R *35/04*
U.S. Cl. 439—164 30 Claims



1 A rotary coupling for allowing rotational movement across a plurality of electrical wire means while applying a minimum amount of stress on said wire means, comprising:
first and second coupling members rotatably connected together,
a skirt member circumscribing one of said coupling members for defining a wire receiving recess around said one coupling member, and
a plurality of flexible electrical wire means traversing said first and second coupling members, each said wire means including a slack portion disposed in said wire receiving recess,
wherein said slack portions are extended into and retracted out of said recess as said coupling members are rotated relative to one another in first and second directions, respectively.

4,921,433
VARIABLE PORTABLE FEEDTHRU DEVICE
Theodore M. Biren, Osseo, Minn., assignor to Cooper Power Systems, Inc., Houston, Tex.
Continuation of Ser. No. 15,844, Feb. 17, 1987, abandoned. This application Dec. 29, 1988, Ser. No. 292,647
Int. Cl.[5] H01R *13/60*
U.S. Cl. 439—534 17 Claims



1. A feedthru device adapted to be mounted on an accessory bracket which includes a bracket plate and which is adapted to be mounted on the wall of an electrical apparatus, said feedthru device comprising a first plate, feedthru means mounted on said first plate, and means for fixedly securing said first plate to the accessory bracket plate by engaging only said first plate and the accessory plate so as to substantially prevent pivotal movement of said feedthru device relative to the accessory bracket plate.

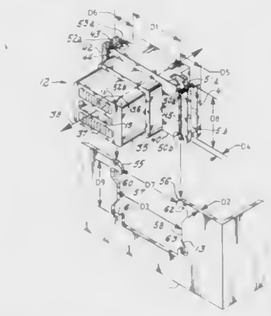
4,921,434
APPARATUS FOR MAKING CONNECTIONS IN LIQUIDS USING PRESSURIZED GAS
Hajime Kataoka, and Minoru Gunji, both of Oarai, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan
Division of Ser. No. 123,010, Nov. 19, 1987, Pat. No. 4,815,989. This application Dec. 9, 1988, Ser. No. 281,735
Claims priority, application Japan, Nov. 27, 1986, 61-282658
Int. Cl.[5] H01R *13/523*
U.S. Cl. 439—198 15 Claims

1. An apparatus for making a connection in a liquid, comprising:
a vertically movable protecting tube which is open at its lower end and which is compressedly fed with a gas to form a gaseous space therein within said liquid;
a first connector which is held vertically movable inside said protecting tube and which includes a fluid nozzle and a fluid recovery port in its front end; and
a second connector to be connected with said first connector, which is normally held in said liquid and which includes drain ports that are exposed to said gaseous space formed in said protecting tube and can discharge portions



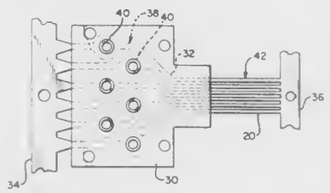
of said liquid contained in said second connector when the first and second connectors are joined.

4,921,435
BLIND MATING CONNECTOR HAVING SELF-LOCATING FEATURE
Thomas J. Kane, Dearborn, Mich.; John M. Myer, Millersville, and Richard W. Grzybowski, Lebanon, both of Pa., assignors to Ford Motor Company, Dearborn, Mich. and AMP Incorporated, Harrisburg, Pa.
Filed Jun. 2, 1989, Ser. No. 360,812
Int. Cl.[5] H01R *13/631*
U.S. Cl. 439—248 17 Claims



1. Apparatus for mechanically and electrically connecting a device to a panel comprising:
a carrier panel having an aperture therein;
a floating connector block received in said aperture, said block including a main body and including at least two pairs of longitudinally spaced flanges extending from said main body in planes parallel with the plane of said aperture, said carrier panel being disposed between the flanges of each of said pairs of flanges, said floating connector block further including a plurality of terminal means within said main body oriented substantially perpendicular to said flanges for establishing electrical connections;
a plurality of resilient support strips extending between the flanges of each of said pairs of flanges such that said strips are tensioned under contact with said carrier panel to locate said floating connector block at a desired position within said aperture;
a device-end connector including a plurality of pin means arranged for connection with said terminal means; and
guide means for aligning said terminal means and said pin means when said device-end connector and said floating connector block are brought together.

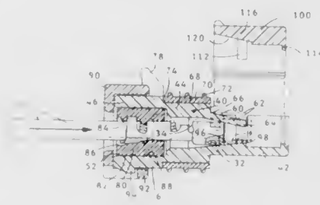
4,921,436
MODULAR JACK ASSEMBLY
Xavier C. Sole, Premia De Mar, and Luis B. Roses, Mataro, both of Spain, assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jun. 2, 1989, Ser. No. 360,961
Claims priority, application Spain, Aug. 9, 1988, 8802492
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—395 4 Claims



1. A jack type electrical connector adapted for splicing wires for a communication system, comprising an insulative base modular, a plurality of through holes, a like plurality of terminal receiving means in communication with said base module, a plurality of metal circuits within aid base module, where each said metal circuit has a free end projecting from one side thereof for resilient engagement with electrical contacts of a plug type electrical connector terminated electrically to said communication system, wherein said metal circuits comprise a plurality of elongated metal spring contacts where each said contact includes an aperture in registry with one of said holes for receiving a terminal receiving means, said aperture being elastically expanded upon insertion therein of a terminal receiving means to exert a retention force thereon while electrically connecting said terminal receiving means to said metal circuits.

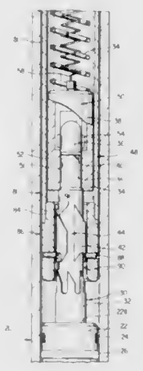
4,921,437
SEALED ELECTRICAL CONNECTOR ASSEMBLY WITH TERMINAL RETAINER
Ralph M. Cooper, Clemmons; Dana Hollingsworth, Kernersville; John P. Kunkle, Clemmons, and Donald G. Stillie, Winston-Salem, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 29, 1989, Ser. No. 331,418
Int. Cl.[5] H01R *13/422*
U.S. Cl. 439—275 25 Claims

1. An electrical connector having a plurality of electrically conductive terminals disposed within chambers in an insulative housing, each terminal being retained within a respective chamber by a resilient latch engaging the terminal in a fully seated position, the resilient latch being outwardly deflectable from the fully seated position, the connector being characterized in that a portion of each chamber comprises a channel exposed on one external side of the housing, the resilient latch being exposed on the one external side of the housing, the connector further including a housing cover engagable with



the housing to enclose the otherwise exposed channel, the housing cover having an inner profile abuttable with the resilient latch when the resilient latch is outwardly deflected from the fully seated position, so that the housing cover is engagable with the housing only when the resilient latch is in the fully seated position.

4,921,438
WET CONNECTOR
Craig W. Godfrey, Richardson; Mark A. Schnatzmeyer, Lewisville, and Henry P. Arendt, Dallas, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.
Filed Apr. 17, 1989, Ser. No. 340,450
Int. Cl.[5] E21B *23/02*
U.S. Cl. 439—190 20 Claims



1 A wet connector device for releasably connecting an electric cable to an electrically powered well tool for transmitting electrical energy or signals to or from the same, said wet connector assembly comprising, in combination:
(A) a male connector comprising:
(a) body means having a longitudinal bore therethrough enlarged at its lower end and provided with means for attachment to said electrically powered tool, said male connector body further including:
(i) electrical contact means for engagement by said electrical contact means of said wet connector, and
(ii) latch means below said electrical contact means engageable by said latch means of said wet connector to latch said wet connector to said electrically powered tool; and
(b) means for conducting electrical energy or signals from

said electrical contact means to said electrically powered tool; and

(B) a female connector comprising:

(a) tubular housing means, said housing means having means on its upper end for attachment to said electrical cable and having a bore open at its lower end;

(b) electrical contact means in said housing means and surrounding said housing bore and having means connecting it to said electric cable;

(c) plug means slidably disposed in said housing means and closing said housing bore adjacent said contact means;

(d) a body of non-conducting liquid in said housing bore above said plug means; and

(e) latching means carried by said housing means engageable with said latch means on said well tool to releasably latch said housing means to said electrically powered well tool with the electrical contact means of the well tool thereof engaged with the contact means of the connector.

4,921,439

CENTER WIRE TRAP TERMINAL AND CONNECTOR

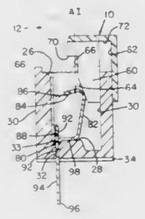
Pedro D. Bofill, Badalaona, and Xavier C. Sole, Premia De Mar, both of Spain, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 5, 1989, Ser. No. 375,804

Claims priority, application Spain, Oct. 27, 1988, 8803279

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—417 **11 Claims**



1. An electrical connector assembly for connecting the conductors of a flat flexible multi-conductor cable to another circuit member, comprising a housing having a plurality of cavities formed therein, means for receiving said cable, wherein exposed cable conductors are received in each said cavity, a formed electrical terminal in each said cavity for electrical contact with said exposed conductors, and a cover engageable with said housing, whereby said formed electrical terminal comprises a first arm angled to the vertical direction, a flanged portion at one end thereof defining a second arm having an end thereof adapted to engage said exposed conductor, and said cover includes projections to be received in said cavities, where said each projection is provided with a cam surface to engage said first arm as said cover is brought into engagement with said housing operable to bring each said flange portion into electrical contact with a corresponding exposed conductor.

4,921,440

CONNECTOR AGGREGATE

Masatsugu Matsumoto, Tokyo, Japan, assignor to Create System Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1988, Ser. No. 291,742

Claims priority, application Japan, Mar. 12, 1988, 63-32874[U]

Int. Cl.[5] H01R *4/24*

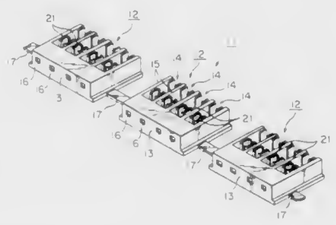
U.S. Cl. 439—421 **11 Claims**

1. A connector aggregate, comprising: a plurality of connectors, each connector comprising:

a socket housing having a plurality of connecting sections; and

a plurality of terminals corresponding in number to the number of connecting sections, a respective terminal being mounted in each connecting section; and

linking members for linking said connectors together in a belt-like fashion, said linking members being provided on opposite side portions of each of said socket housings and



being readily separable to separate said linked connectors from each other;

said terminals comprising insulation displacement terminals mounted in said respective connecting sections prior to connection of a wire thereto, whereby respective wires are directly connectable to said insulation displacement terminals while said terminals are mounted in said connecting sections and while said connectors are connected together via said linking members.

4,921,441

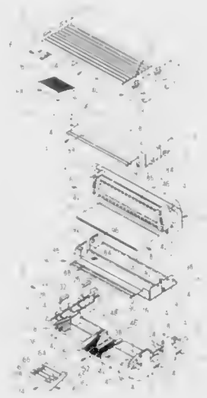
SHIELDED BACKSHELL SYSTEM HAVING STRAIN RELIEF AND SHIELD CONTINUITY

Jay S. Sauder, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 31, 1989, Ser. No. 401,365

Int. Cl.[5] H01R *13/58, 13/648*

U.S. Cl. 439—460 **14 Claims**



1. A shielding assembly for providing strain relief and electrical continuity to a shielded cable received therein, the shielded cable having a portion of the shield exposed, said shielding assembly comprising:

shield means defining a cavity for receiving a portion of the shielded cable, said shield means having a cable exit and an extension proximate the cable exit;

insert means having first and second surfaces, said insert means adapted to be received in the shielding assembly, the first surface adapted to slide along a ramped surface of the shielding assembly, the second surface adapted to engage the cable and extension as the insert means is slid along the ramped surface, thus compressing the cable and pressing the extension into engagement with the cable shield, whereby strain relief for the cable and electrical continuity between the cable shield and the shield means are simultaneously achieved as the second surface of the insert means presses the cable and extension in the same direction.

4,921,442

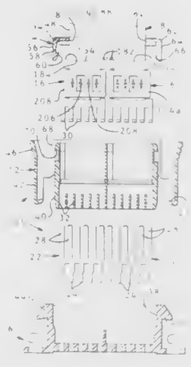
HOUSING FOR FLAT POWER CABLE CONNECTOR

Dean A. Puerner, Maricopa, Ariz., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 338,790, Apr. 14, 1989, abandoned. This application Jul. 28, 1989, Ser. No. 386,536

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—499 **16 Claims**



1. A housing assembly for terminations of terminal means to an end of flat power cable, comprising

an integral housing member having upper and lower cover sections and a mating face and a terminal-receiving rearward end, and including terminal-receiving cavity means extending forwardly from said terminal-receiving rearward end to rearwardly facing stop surfaces said cavity means being adapted to receive said terminal means thereinto to adjacent said rearwardly facing stop surfaces from rearwardly of said housing member, and further including passageway means extending forwardly from said cavity means through which contact means of said terminal means extend after insertion to matingly engage corresponding contact means of another electrical article; and

a rearward member securable onto said terminal-receiving rearward housing end after insertion of said terminal means into said terminal-receiving cavity means, said rearward member including a slot between upper and lower strut members, said slot having a width approximately equal to the width of the flat power cable and having a height at least after being secured to said terminal-receiving rearward housing end approximately equal to the thickness of the flat cable, and said rearward member defining forwardly facing stop surfaces corresponding to rearwardly facing stop surfaces of said terminal means,

whereby after being secured to the housing member, the rearward member retains the terminal means terminated to the flat cable within the cavity means of the housing member, provides dielectric material closing the terminal-receiving rearward housing end, and the slot thereof defines a cable exit which is spaced rearwardly from terminations of the terminal means to flat cable which protects the terminations from cable torque relative to the housing member.

4,921,443

WATERPROOFING ASSEMBLY FOR TERMINAL AREA OF ELECTRIC WIRE

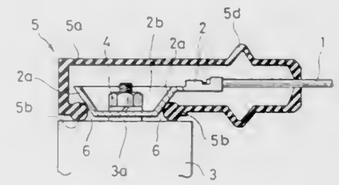
Kenichi Sato, Shimada, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jun. 7, 1989, Ser. No. 362,515

Claims priority, application Japan, Jun. 9, 1988, 63-75791[U]

Int. Cl.[5] H01R *13/52*

U.S. Cl. 439—521 **1 Claim**



1. A waterproofing assembly for a terminal area of an electric wire comprising: a terminal fixedly secured to an apparatus body, and a cap made of a flexible elastic material for covering the terminal and a part of the electric wire cord connected therewith, wherein said terminal is formed in the shape of a dish whose outer peripheral portion is inclined; said cap has an opening formed therein whose edge is formed in the shape of an "O" ring, and a bellows-shaped portion formed in the vicinity of the electric wire covering portion thereof, the arrangement being made such that the edge of the opening of said cap is fitted resiliently into a wedge-shaped space formed between the inclined portion of said terminal and the apparatus body.

4,921,444

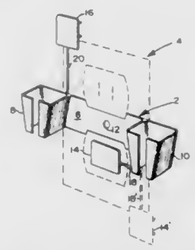
ELECTRIC PLUG ORGANIZER

Christopher C. Cama, East Northport, N.Y., assignor to C.C.C. Trading, Inc., East Northport, N.Y.

Filed Oct. 12, 1988, Ser. No. 256,734

Int. Cl.[5] H01R *13/60*

U.S. Cl. 439—528 **16 Claims**



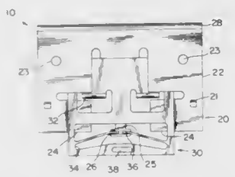
1. A device for storing an electrical plug comprising:

at least one storage compartment including a front wall, a rear wall and a pair of opposed sidewalls defining a receptacle having an open top and an open bottom, said at least one storage compartment being formed from a resilient material, said at least one storage compartment adapted to surround and engage the periphery of an electrical plug receivable therein,

at least one slot defined in one of said walls, and

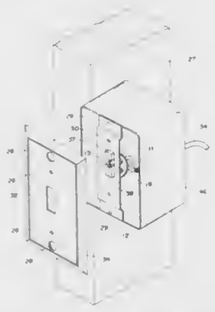
means for mounting said plug storage compartment proximate to an electrical outlet.

4,921,445
RAIL MOUNTING APPARATUS FOR ELECTRICAL COMPONENTS
William G. Herbert, Ellisville, Md., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Apr. 14, 1989, Ser. No. 337,805
Int. Cl.[5] H01R *13/73*
U.S. Cl. 439—532 6 Claims



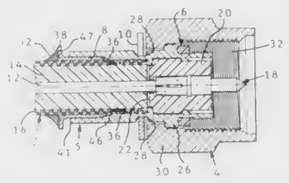
1. A rail mounting assembly for a fuse holder comprising:
a spring clamp holder comprising;
a main surface;
a rail clamp for gripping a rail;
two side flat areas at a level lower than the main surface of said spring clamp holder;
a center flat area lower than the main surface of said spring clamp holder;
a tang on said center flat area;
a spring clamp which rests in said side flat areas and said center flat area of said spring clamp holder, said spring clamp comprising;
a rail clamp for gripping said rail;
spring arms which rest against said tang of said center flat area;
said spring clamp being slideably mounted in said spring clamp holder so that movement of said spring clamp flexes said arms against said tang to return said rail clamps for gripping said rail.

4,921,446
TELEPHONE JACK APPARATUS
Lauralee DePatie, Surrey, and Edward Gaglardi, Mission, both of Canada, assignors to British Columbia Telephone Company, Burnaby, Canada
Filed Mar. 6, 1989, Ser. No. 318,918
Int. Cl.[5] H01R *13/60*
U.S. Cl. 439—536 4 Claims



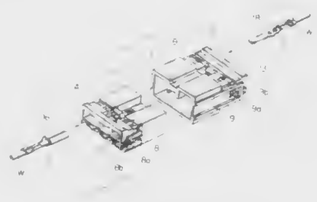
1. A telephone jack apparatus, comprising a jack body having a plug socket with a plurality of contacts therein, the socket opening to a front face of said body, electrical terminals on a rear face of said body each conductively connected to a corresponding one of said contacts in the plug socket and a mounting plate affixed to said body and attachable to a wall mounted support, a portion of the front face of said jack body enclosing the socket dimensioned to fit through an opening in a cover plate and means for attaching the cover plate to said mounting plate, wherein wires from a telephone cable are attachable to said rear face terminals prior to installation of wall board on said wall and wherein said mounting plate is dimensioned to be substantially narrower than said cover plate so that said plate does not interfere with the application of wall board and/or plaster up to a point underlying said cover plate and wherein said front face is dimensioned so as to fit through a standard electrical switch cover plate.

4,921,447
TERMINATING A SHIELD OF A MALLEABLE COAXIAL CABLE
Randolph E. Capp, Mechanicsburg, and William D. Couper, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 17, 1989, Ser. No. 353,290
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—585 17 Claims



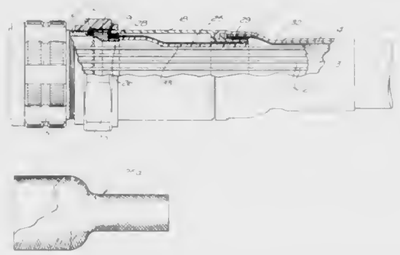
11. A coaxial electrical connector comprising in combination, a malleable coaxial cable having a malleable external shield; a tubular connector body; and a shield gripping tubular member having a peripheral flange surrounding one end thereof, said cable extending through said connector body and said shield gripping member, said shield gripping member being interposed between said cable and said connector body in force fitting relationship therewith with said flange proximate to one end of said connector body and positioned externally thereof, said connector further comprising a solder fillet extending about said cable and rigidly connecting said flange to said external shield on the opposite side of said flange to said connector body.

4,921,448
CONNECTOR TERMINAL RETAINER CONSTRUCTION
Takayoshi Endo; Sakai Yagi; Hitoshi Sakai, and Hitoshi Saito, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Apr. 28, 1989, Ser. No. 344,563
Claims priority, application Japan, May 6, 1988, 63-59414[U]
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—595 10 Claims



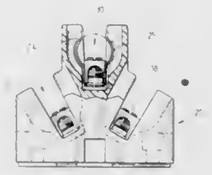
1. A connector terminal retaining structure of the type including a connector housing having a plural number of terminal compartments, terminal members inserted in said terminal compartments, and a connector retainer fittingly interlockable with a rear portion of said connector housing through two stages of provisional interlocking and final interlocking, wherein said connector terminal retainer comprises;
a frame-like body internally provided with openings for insertion therethrough of wires with said terminal members, and a plural number of resilient terminal anchoring fingers extending forwardly into said terminal compartments in said connector housing;
said resilient anchoring fingers being capable of restoring an original form by the resiliency thereof when said retainer is advanced into said final interlocking stage, and in the restored original form holding said terminal members securely in position in said terminal compartments in said connector housing.

4,921,449
SHIELD CONNECTIONS FOR ELECTRICAL CABLE CONNECTOR
Ray F. Fish, Chatsworth, Calif., assignor to Electro Adapter, Inc., Chatsworth, Calif.
Filed Apr. 3, 1989, Ser. No. 331,748
Int. Cl.[5] H01R *9/03*
U.S. Cl. 439—610 19 Claims



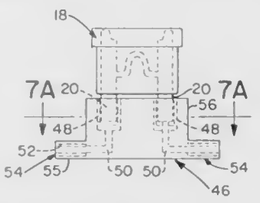
1. In an assembly for connecting the external electrical shield of an electrical cable to an electrical connector, the combination of:
an electrically conducting ferrule having a first annular sleeve;
electrically non-conducting sleeve means including a rigid back shell and a second annular sleeve formed integral with said backshell;
an electrically non-conducting coupling nut for attachment to said electrical connector, with said coupling nut and ferrule having interengaging means for urging said ferrule into electrical contact with said electrical connector, and with said coupling nut and ferrule interengaging means including said backshell with said coupling nut and backshell in direct engagement over said ferrule;
an internal electrical shield having inner and outer ends;
first compressible clamp means for clamping said internal electrical shield outer end to said first annular sleeve; and
second compressible clamp means for clamping said internal electrical shield inner end to said second annular sleeve and to said electrical cable external electrical shield, providing an enclosed electrical conducting path from said electrical cable external electrical shield through said internal electrical shield to said ferrule.

4,921,450
SPACE SAVING MULTIPOLE FUSE BLOCK
William G. Herbert, Ellisville, Mo., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Mar. 16, 1989, Ser. No. 324,135
Int. Cl.[5] H01R *13/68*
U.S. Cl. 439—621 7 Claims



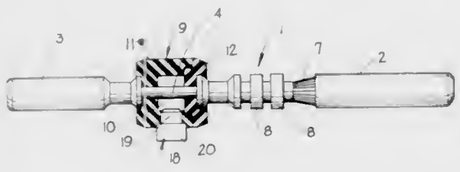
1. In a fuse block for mounting cylindrical fuses, the improvements comprising:
said fuse block having a bottom surface;
a center pole having a first fuse clip and a second fuse clip adapted to receive therein a first end and a second end, respectively, of a said fuse, said center pole being mounted on said fuse block; and
a first side pole having a first fuse clip and a second fuse clip adapted to receive therein a first end and a second end, respectively, of a said fuse, said first side pole being mounted on said fuse block at a level closer to said bottom surface than said center pole and angled outwardly from said center pole.

4,921,451
IN-LINE FUSE HOLDER
Russell L. Carlson, 68 Minwood Dr., Tallmadge, Ohio 44278
Filed Jul. 8, 1988, Ser. No. 222,059
Int. Cl.[5] H01R *13/68*
U.S. Cl. 439—621 3 Claims



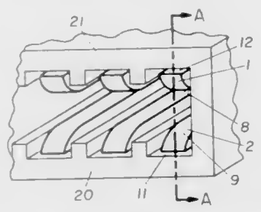
1. An in-line fuse holder comprising:
an insulative body member adapted to receive inserted electrical wires;
two blade slots extending from the outer surface of said body member to a location therein, wherein said blade slots include metal blade connectors adapted to receive the flag blades of a double-bladed fuse, and said blade slots permit each of said blades to effect electrical contact with one of the wires;
and further wherein said metal blade connectors are spaced from each other and each of said blades connectors is connected to a respective metal liner tube of a respective wire connector by means of a respective metal strip, said wire connectors being unitary with said body member and comprising crimpable, hollow cylindrical tubes each having a said metal liner tube disposed on the interior thereof, said wire connectors being adapted to receive and to crimp thereto the wires when inserted therein, wherein when the double-bladed fuse is inserted in said fuse holder, an electrical connection is completed between the wires and the fuse.

4,921,452
BREAKAWAY HERMETICALLY SEALED ELECTRICAL TERMINAL
Hilliard Dozier, Stubbs Mill Rd., Lebanon, Ohio 45036
Continuation-in-part of Ser. No. 235,027, Aug. 22, 1988, Pat. No. 4,830,630. This application Apr. 10, 1989, Ser. No. 335,711
Int. Cl.[5] H01R *13/68*
U.S. Cl. 439—622 18 Claims



15. A terminal pin assembly for use in an hermetically sealed terminal, said assembly comprising:
a first pin part,
a second pin part lying in axially spaced relation to said first pin part,
a fuse link interconnecting said first and second pin parts, and
a protective capsule surrounding said fuse link and engaging the adjoining ends of said first and second pin parts, the surrounding walls of said capsule being spaced from said fuse link to define an expansion chamber, a vent port in a wall of said capsule, a blow-out plug in said vent port, said blow out plug being adapted to be expelled outwardly from said capsule upon the build-up of pressure in said expansion chamber caused by rapid disintegration of said fuse link.

4,921,453
MOLDED COMPLAINT SPRINGS
John F. O'Brien, Downingtontown, Pa., assignor to ICI Americas Inc., Wilmington, Del.
Filed Apr. 13, 1989, Ser. No. 336,950
Int. Cl.[5] H01R *11/00*
U.S. Cl. 439—630 13 Claims



1. An electrical connector for connecting separable electrically conductive members comprising:
a rigid housing-barrier having at least one receptacle opening;
said receptacle opening having interior thereto at least one electrically conductive cantilevered compliant spring member for engaging with an electrically conductive complementary mating member;
said compliant spring being molded as an integral interior part of said housing-barrier and being closely spatially disposed away from said housing-barrier interior.

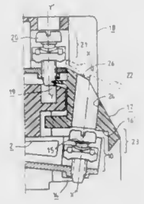
4,921,454
CLUSTER BLOCK ASSEMBLY
Charles G. Atherton, Mechanicsburg, and John C. Swartz, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jun. 20, 1989, Ser. No. 368,506
Int. Cl.[5] H01R *21/00*
U.S. Cl. 439—685 1 Claim



1. Components for use in a cluster block assembly of the type having a base member consisting of a base section and a pair of spaced apart feet extending forwardly therefrom, said components comprising:
a cover housing having a front portion and a rear portion with center walls there between, said front portion having a pair of spaced apart cavities and three parallel slots extending through a front face with two outer slots intersecting said cavities and the middle slot being shrouded from said outer slots, said rear portion having an opening extending vertically there through, said cover housing receiving a base member with a base section thereof being received in the vertical opening and spaced apart feet on the base member being beneath said front portion;
terminals disposed in said cavities in said front portion and having wire barrels for being attached to wires entering the cluster block assembly and receptacles facing said outer slots for slidingly receiving post terminals;
a cap covering said cover housing, said cap having a front section covering said front portion and a rear section covering said rear portion; and
latch means securing said cap to said cover housing together.

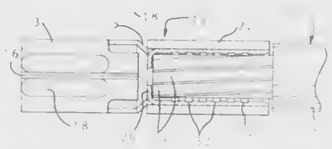
4,921,455
ELECTRIC CONNECTION TERMINAL WITH BRAKED SCREW
Philipe Marie, Rouen, and Pierre J. Decelle, Val De Reuil, both of France, assignors to La Telemecanique Electrique, France
Filed Apr. 14, 1989, Ser. No. 337,985
Claims priority, application France, Apr. 15, 1988, 88 04991
Int. Cl.[5] H01R *9/24*
U.S. Cl. 439—709 4 Claims

1. A connection terminal for an electric apparatus, comprising a conducting part which is associated with an insulating support and which is provided with a tapped hole, and a first screw which passes through a tightening stirrup and which is engaged in said tapped hole, abutment means being provided on said support, above said tapped hole, on which said head comes into abutment in a maximum unscrewed position of the screw, wherein said screw has a length such that, when it is in said maximum unscrewed position, it presents an end portion opposite the head which projects from the tapped hole, and said connection terminal further comprises a transverse resilient tongue secured to said support and extending under said



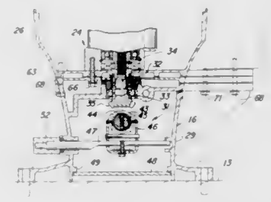
tapped hole so as to engage said end portion when said screw is in said maximum unscrewed position to prevent turning of said screw.

4,921,456
ELECTRICAL ASSEMBLIES INCLUDING FEMALE ELECTRICAL TERMINAL
Jay L. French, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jul. 29, 1988, Ser. No. 225,990
Int. Cl.[5] H01R *11/00*
U.S. Cl. 439—851 24 Claims



1. An electrical assembly, comprising:
a male electrical terminal;
a cooperating female electrical terminal adapted to slidably receive the male electrical terminals and including a generally-cylindrical first sleeve portion having a longitudinal slot formed therein, such that the first sleeve may flex radially outwardly when the male electrical terminal is slidably received within the first sleeve portion of the female electrical terminal, said first sleeve being generally cylindrical and free of outwardly extending protrusions, so that the effective outer diameter thereof is only slightly larger than the inner diameter thereof;
the first sleeve portion having four longitudinally-extending inwardly-directed substantially convex lobes formed thereon at respective selected locations; and
the four lobes being arranged in two pairs of lobes, including a first lobe pair on respective slides of the longitudinal slot in the first sleeve portion of the female electrical terminal, and further including a second lobe pair disposed substantially diametrically opposite to the longitudinal slot;
wherein, when the male electrical terminal is slidably received into the female electrical terminal, the male electrical terminal engages the four lobes and makes electrical contact with the four lobes substantially along the entire length thereof.

4,921,457
MARINE PROPULSION DEVICE
Shinji Yoshida, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Continuation of Ser. No. 106,050, Oct. 7, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 314,239
Claims priority, application Japan, Oct. 8, 1986, 61-239831
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—111 4 Claims



1. A power device comprised of an internal combustion engine contained within a protective cowling and having its output shaft rotatable about a generally vertically extending axis, a propulsion unit positioned beneath said protective cowling and having an outer casing containing a transmission driven by said engine output shaft and driving a propulsion shaft, the driving connection between said engine output shaft and said transmission affording removal of said transmission and said outer casing as a unit, a connector plate affixed to said engine by a first set of fasteners positioned about the axis of said output shaft approximately at a first distance, said fasteners of said first set being accessible from beneath said engine and only accessible from externally of engine when said engine, said protective cowling and said connect plate are all connected together and are removed from said propulsion unit outer casing, and a second set of fasteners positioned about the axis of said output shaft approximately at a second distance greater than said first distance, said second set of fasteners affixing said propulsion unit to said connector plate and being accessible from beneath said engine and accessible from externally of engine and externally of said outer casing of said transmission when said engine, said protective cowling and said transmission are all connected together for removing said connector plate, said engine and said protective cowling as a unit from said propulsion unit out casing and said transmission without necessitating disassembly of said transmission.

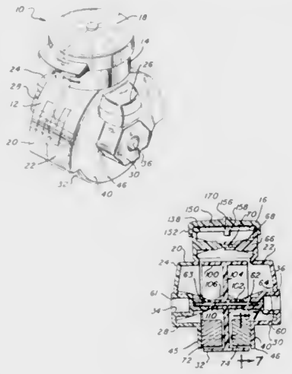
4,921,458
UPRIGHT ROLLING TOY ASSEMBLY
Donald L. Greenwood, 3117 Lakeshore Dr., Longmont, Colo. 80501
Filed Feb. 3, 1989, Ser. No. 306,707
Int. Cl.[5] A63H *3/16, 7/00, 11/10, 13/18*
U.S. Cl. 446—101 19 Claims

1. An upright, rolling toy figure which can be pushed or pulled across a supporting surface and which is self-righting, said toy figure having an outside configuration resembling a common object, the figure comprising:
(a) a hollow body means, having an inside surface and an outside surface, said body means being formed in two separate halves and said body means has front, back and bottom portions;
(b) at least two weight means for counterbalancing said figure, at least one weight means being mounted inside a bottom portion of each half of said body means;
(c) a wheel having a relatively wide, flat rim and hollow on each side, said wheel being rotatable mounted on an axle within said body means when said halves are assembled, said wheel rim having an inside and outside surface, said body means being arranged to enclose the sides of the

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wheel while leaving the bottom portion and the front and back portions contiguous to said bottom portion open so that the wheel will contact and roll on a support surface without the body means contacting said support surface;

(d) said weights being mounted on said body means halves so



that they will extend within the hollow sides of said wheel and are positioned slightly spaced from the inside surface of said rim and adjacent to the portion of the outside surface of the rim in contact with a support surface whereby the body means will produce a self-righting force to maintain the figure in an upright position.

4,921,459

MULTICHARACTER DOLL

Bertha B. Cook, 18503 Nadal Dr., Southfield, Mich. 48075, and Betty J. Smith, 22801 Timberline Rd., Southfield, Mich. 48034

Filed Apr. 14, 1988, Ser. No. 181,519
Int. Cl.[5] A63H *3/00*
U.S. Cl. 446—321 **5 Claims**



1. A doll comprising:

a central body portion;

at least three simulated figures, each figure including a head and a torso, each torso extending radially from the central body portion to a free end, each head being disposed at said free end, each torso extending between first and second adjacent torsos; and

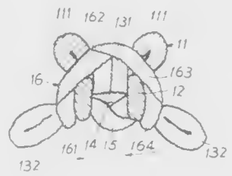
a skirt garment covering the central body portion including a plurality of skirts extending from the central body portion and being capable of draping over several simulated figures so that a single figure remains undraped and all other figures are hidden from view.

4,921,460

ASSEMBLED ARTICLES COMPRISING STRETCH KNITTED RINGS

Ping-Chia Lin, P.O. Box 10160, Taipei, Taiwan

Filed Jun. 26, 1989, Ser. No. 371,624
Int. Cl.[5] A63H *3/36, 3/02*
U.S. Cl. 446—385 **6 Claims**





1. An assembled article comprising: a plurality of rings which are tied, wound bound, bonded or assembled with one another for assembling an article of a doll, an animal, an ornamental or decorative article having three dimensional configuration, the improvement which comprises:

said rings being stretchable knitted rings each said knitted ring made of knitting material having terry surface reinforced by rubber yarn forming a seamless stretchable ring; said assembled article including a head portion having at least a first horizontal ring wound around two vertical rings to form two loops of said first horizontal ring for serving as a face of said assembled article, and a body portion formed by winding a central vertical ring on two second horizontal rings to form double loops of said central vertical ring, an upper ring of said second horizontal rings of said body portion having two upper side loops protruding laterally from the central vertical ring serving as two arms of said assembled article and a lower ring of said second horizontal rings of said body portion having two lower side loops protruding laterally from said central vertical ring serving as two legs of said assembled article.

4,921,461

HAIRDRESSING TOY

Tsuneo Fujikawa, Tokyo, Japan, assignor to Tohokako Co., Ltd., Japan

Filed Apr. 10, 1989, Ser. No. 335,228
Claims priority, application Japan, Jun. 14, 1988, 63-77745[U]
Int. Cl.[5] A63H *3/44*
U.S. Cl. 446—296 **6 Claims**

1. A hairdressing toy comprising a doll head having a peripheral surface comprising a front, a rear, a left and right side a plurality of first fasteners affixed respectively to the front, the rear and to both sides of the head at the peripheral surface thereof, a plurality of hair models comprising cooperating second fasteners, the hair models being removably affixed to

the peripheral surface of the head at the said first fasteners and a play pair of scissors, the play scissors being adapted to re-



move the hair models from the head of the doll by severing the parts at the interconnection of the said first and second fasteners.

4,921,462

BALLOON SCULPTURING METHODS, APPARATUS AND PRODUCTS

Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240

Division of Ser. No. 183,720, Apr. 19, 1988, Pat. No. 4,850,926.
This application Jun. 21, 1989, Ser. No. 370,235
Int. Cl.[5] A63H *3/06;* **A45B** *19/00*
U.S. Cl. 446—221 **11 Claims**



1. The method of forming a balloon sculpture from a plurality of balloons of the type having a constricted neck portion terminating at one end in an inflation aperture and at the other end in an imperforate inflatable sidewall, said method comprising the steps of:

(a) establishing a plurality of rigid rod-like balloon formers each having: (i) a first end; (ii) a second end; and (iii), means defining at least one (1) axially extending diametric slot formed in at least one (1) of the first and second former ends;

(b) partially inflating a plurality of balloons;

(c) passing the uninflated constricted neck portion of at least one partially inflated balloon through the slot defining means in each of the plurality of rigid rod-like balloon formers;

(d) securing at least one (1) of the inflation aperture and/or the constricted neck portion of each partially inflated balloon to the rigid rod-like former through which that balloon's constricted neck portion passes;

(e) grasping a portion of the sidewall of each partially inflated balloon and stretching the partially inflated balloon sidewall along the unslotted length of the particular rigid rod-like former to which that balloon is secured;

(f) stretching the grasped portion of each partially inflated balloon over and about the other of the first and second ends of the particular rigid rod-like former to which that balloon is secured; and,

(g) coupling the plurality of rigid rod-like balloon formers together to form a balloon sculpture having a desired configuration;

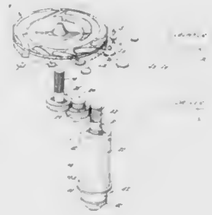
wherein each rigid rod-like former and each partially inflated balloon secured thereto constitute a basic balloon building block used in the composite balloon sculpture and wherein each partially inflated balloon is characterized by: (i) having a first generally flat axially extending sidewall in juxtaposition to the axial length of the particular former to which it is attached; (ii) having upper and lower tapered pointed extremities; and (iii), having an at least partially ovate configuration in all other axial planes bisecting that balloon and that rigid rod-like former.

4,921,463

COIN SORTER WITH COUNTER AND BRAKE MECHANISM

Richard D. Primdahl, Hoffman Estates, and Donald E. Raterman, Deerfield, both of Ill., assignors to Cummins-Allison Corporation, Mt. Prospect, Ill.

Filed Oct. 27, 1987, Ser. No. 113,869
Int. Cl.[5] G07D *3/16*
U.S. Cl. 453—3 **3 Claims**



1. In a coin sorter having a rotatable disc with a resilient surface and a stationary guide plate positioned adjacent said resilient surface for guiding coins on said resilient surface as said disc is rotated,

counting means for counting coins of at least one denomination as the coins are processed by said sorter,

and electric motor having an output shaft for driving said rotatable disc,

a speed reducing gear train connected between the output shaft of said electric motor and said rotatable disc, and

a braking means responsive to said counting means for stopping said rotatable disc when a preselected number of coins have been counted, said braking means being connected to the output shaft of said motor and including a stationary electromagnetic actuating assembly and an axially movable armature mounted on said motor shaft for a movement into and out of engagement with said actuating assembly in response to energization and de-energization of said actuating assembly, and a helical pinion gear on said motor shaft for connecting said shaft to said gear train, said pinion gear having helical teeth pitched in a direction to urge said shaft axially away from said actuating assembly in response to a driving torque from said motor., so that the application of a braking torque to said shaft urges said shaft axially toward said actuating assembly.

4,921,464

RADIO CHANNEL SEARCH SYSTEM

Koichi Ito, and Isao Sasaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1988, Ser. No. 167,232
Claims priority, application Japan, Mar. 12, 1987, 62-57409
Int. Cl.[5] H04Q 7/00
U.S. Cl. 455—34 3 Claims



1. A radio channel search system in use with a communication system based on a multi-channel access system in which a plurality of moving units and at least one master station arranged as a counterpart of each of said moving units are provided, a plurality of radio channels are assigned to each of said plurality of moving units, in a speech mode the moving unit selects an idle channel from those radio channels, to set up a radio communication path between said moving unit and said master station; wherein said master station and each moving unit include means for storing data of numbers representing priority channels which are selected from all radio channels, with the number of the priority channels being smaller than that of the radio channels; control means for controlling a receive-ready mode by using said priority channel, and connection control means coupled to said priority channel numbers storing means and said control means, and wherein in the receive-ready mode, said control means sequentially and repeatedly makes the reception search of said selected priority channels according to the priority channel numbers stored in said priority channel number storing means and step supply of electric power to a receiving circuit section during the period that no reception search is performed, said connection control means detects in idle channel by said receive search when a calling moving unit sends a speech path formation request to a called moving unit in the receive-ready mode, and make a connection control between one of said units and said master station by using said idle channel, and when receiving a connection request in said receive search mode, said connection control means stop the receive search operation, and a predetermined connection control between one of said units and said master station by a radio channel through which said connection request is received.

4,921,465

VARACTOR TUNED UHF RF SIGNAL INPUT CIRCUIT

Alexander W. Hietala, Schaumburg, Ill., and Max W. Muterspaugh, Indianapolis, Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Mar. 31, 1988, Ser. No. 175,832
Int. Cl.[4] H04J 3/18; H04B 1/18
U.S. Cl. 455—193 9 Claims

1. In a tuner, UHF tuning apparatus comprising:

a UHF antenna input;

a RF amplifier having an input and an output;

antenna coupling means including a first inductance element for coupling said UHF antenna input to the input of said amplifier;

a series-tuned circuit including a varactor diode and said first inductance element connected in series, in the order named, between a point of reference potential and the input of said amplifier;

a first capacitance element connected between the input of said amplifier and said point of reference potential; and



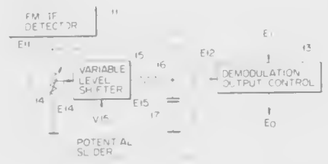
a second capacitance element connected in parallel with said varactor diode.

4,921,466

OUTPUT PROCESSING CIRCUIT FOR RADIO FREQUENCY RECEIVER

Yutaka Matsumoto, Yokohama, and Tadaharu Shimazu, Tokyo, both of Japan, assignors to Kabushiki Kiasha Toshiba, Kawasaki, Japan

Filed Aug. 24, 1988, Ser. No. 235,868
Claims priority, application Japan, Aug. 25, 1987, 62-210770
Int. Cl.[5] H04B 1/16, 1/10
U.S. Cl. 455—214 32 Claims



1. An output processing circuit for a receiver for receiving a radio frequency signal at various intensities of an electric field, comprising:

first circuit means for generating a first signal having a signal level corresponding to the intensity of the electric field of the received radio frequency signal;

second circuit means, connected to said first circuit means via the first signal, for continuously changing a potential slide voltage of the first signal in accordance with a predetermined control potential and generating a second signal which varies in response to the intensity of the electric field of the received radio frequency signal and having a DC level corresponding to the predetermined control potential; and

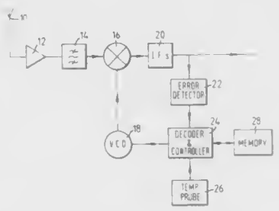
third circuit means, connected to said second circuit means via the second signal, for performing predetermined signal processing of information included in the radio frequency signal on the basis of the second signal and generating an output signal corresponding to the information.

4,921,467

LOCAL OSCILLATORS FOR RADIO RECEIVERS

Alexander P. Lax, Freienbach, Switzerland, assignor to Multitone Electronics PLC, United Kingdom

Filed May 31, 1988, Ser. No. 200,598
Claims priority, application United Kingdom, Jun. 2, 1987, 8712856
Int. Cl.[5] H03B 1/00; G04B 17/12
U.S. Cl. 455—264 18 Claims



1. A local oscillator for a radio receiver, said local oscillator comprising:

a voltage controlled oscillator for generating an oscillating signal at a nominal required frequency;

a memory for storing data;

temperature sensing means for providing a temperature-dependent signal;

control means responsive to the temperature-dependent signal to select data from said memory in accordance with the temperature-dependent signal and to generate a control voltage for said voltage controlled oscillator according to the selected data; and

error detecting means for detecting an error in the frequency of the oscillating signal from said voltage controlled oscillator on the basis of a received signal which has been mixed with the oscillating signal in the radio receiver; and

wherein said control means is connected to said error detecting means and is operable when said error detecting means detects a frequency error (a) to adjust the control voltage to said voltage controlled oscillator so as to compensate for the frequency error and (b) to store data relating to the adjusted control voltage and to the respective temperature-dependent signal in said memory for subsequent use in temperature compensation, thereby to compensate for ageing effects in said voltage controlled oscillator.

4,921,468

SPACE TRANSMISSION OPTICAL COMMUNICATION SYSTEM

Naomasa Miwa, Tokyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Mar. 21, 1988, Ser. No. 171,093
Claims priority, application Japan, Mar. 20, 1987, 62-064090; Mar. 20, 1987, 62-064092
Int. Cl.[5] H04B 9/00
U.S. Cl. 455—617 4 Claims

1. A space transmission optical communication system for a road traffic system between a transmitting station to send out coded optical pulse signals carrying traffic information and a receiving station disposed on a vehicle to receive the coded optical pulse signals sent through space from the transmitting station and to display said information:

said transmitting station comprising a base station having an input device to feed in data to be transmitted and a signal encoder to convert the data fed into the input device into corresponding coded signals; and a plurality of local stations connected to said base station and at given intervals along a road, each local station having an optical pulse signal generator to deliver said coded optical pulse signals corresponding to the coded signals encoded by the signal encoder, and a space transmitting path setter to set a path having an adjustable width along which the coded optical pulse signals from the optical pulse signal generator are transmitted through space,

said space transmitting path setter having a lens for passing said optical pulse signals therethrough, said lens being disposed so that the distance between the lens and the optical pulse signal generator can be varied by means of a lens driving mechanism comprising a pulse motor and a gear system, to vary the width of the path for sending out the optical pulse signals through the lens,

said receiving station disposed on a vehicle comprising a receiving space path setter to set a path along which the coded optical pulse signals transmitted along the space



transmitting path are received, a receiving device to receive the coded optical pulse signals, a signal decoder to decode the output from the receiving device into the coded signals, and a data display to display the data in visible form based on the output from the signal decoder, and

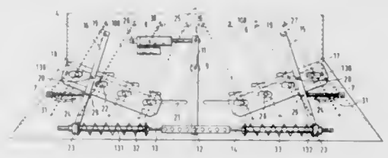
said receiving space path setter comprising at least two lenses disposed so that the optical axes thereof are aligned with each other and a sheet of shading material having a slit interposed between said lens so as to be slidable in a direction transverse to the optical axis, to pass only the optical pulse signals through said slit and prevent disturbing lights from reaching the receiving device.

4,921,469

DISTRIBUTING DEVICE FOR CHAFF CHOPPERS

Alois Scharf, Melle, Fed. Rep. of Germany, assignor to BISO Bitter, GmbH & Co., Rodinghausen-Bruchmuhlen, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 271,869
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3739067
Int. Cl.[4] A01F 12/44
U.S. Cl. 460—10 17 Claims



1. Distributing device for a chaff chopper for a mowing-and-threshing machine having a top cover plate or casing, beneath which a right and a left group of baffles are arranged next to one another at an angle, said baffles, at their ends facing the chopper, being spaced from and supported for swinging around axles being rigidly connected with guide bolts to the cover plate or casing, said guide bolts penetrating guide slots in

the cover plate or in the casing; and a set bar associated with each of the two groups of baffles;

whereby the baffles are rotatably connected with the guide bolts in fixed bearings by the set bars and, at their ends facing the chopper, rotatably and displaceably arranged on the cover plate, or casing in the axles;

whereby the guide slots of each group extend in a transverse direction and are substantially parallel with one another and with a line drawn through each of the axles;

whereby the set bars of each group are arranged with an outward inclination relative to the line through each of said axles in a way such that the spacing of the guide bolts from the axles is reduced from one baffle to the next baffle in correspondence with the outward displacement of the guide slots;

whereby a set lever is connected articulatedly to each set bar, each said lever being articulated on said cover plate in each case or casing at a point spaced from the point of articulation thereof on said set bar; and

whereby a coupling rod connects each said set lever with another set lever of like configuration; characterized in that the set levers are connected with the coupling rods which are connected to each other and slideable lengthwise, and the lengthwise movement of said coupling rods is limited by inner and outer stops.

4,921,470

UNIVERSAL JOINT

Hiroshi Kotani; Yoshiyuki Inoue; Yasushi Kadota; Hidekazu Sakakibara; Kazuo Ide, all of Osaka, and Kanichi Sumida, Yao, all of Japan, assignors to Koyo Seiko Co., Japan

Filed Jun. 19, 1987, Ser. No. 63,957

Claims priority, application Japan, Jun. 23, 1986, 61-96227[U]; Dec. 12, 1986, 61-297314

Int. Cl.[5] F16D *3/50*

U.S. Cl. 464—151 17 Claims



1 A universal joint including an intermediate joint member having a spherical portion as assembled and four ridges formed on the outer surface of the spherical portion and defining four guide furrows therebetween, and two shafts each having one end bifurcating into two arms, the two arms of one of the shafts being fitted in the two guide furrows included in the four furrows of the joint member and positioned symmetrically, the two arms of the other shaft being fitted in the other two guide furrows positioned symmetrically, the universal joint being characterized in that the entire intermediate joint member comprises two divided half segments arranged in combination axially of the joint member, a biasing member provided between the two half segments inside the contour of the spherical portion as assembled biasing the half segments circumferentially thereof out of register with each other prior to assembly of the spherical portion with said shafts and axially biasing the half segments away from each other.

4,921,471

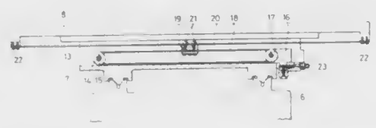
APPARATUS FOR SETTING A TABLE FOR A BELT-DRIVEN MACHINE TOOL

Mutsuo Hosoi, Kanagawa, and Akira Ishibashi, Saitama, both of Japan, assignors to Okamoto Machine Tool Works, Ltd., Kanagawa, Japan

Filed Aug. 17, 1989, Ser. No. 394,809

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—101 4 Claims



1 In a machine tool provided with a table set on a saddle and driven to make reciprocating sliding movement by means of a drive of a belt, an apparatus for setting the table on the belt-driven machine tool comprising a connecting member attached to said belt, said connecting member being arranged between said belt and said table so as to face the belt virtually in parallel therewith and both ends of said connecting member being connected to said table on its underside at both ends in the sliding direction.

4,921,472

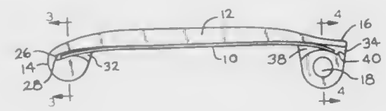
CHAIN TENSIONER

James D. Young, Chesaning, Mich., assignor to Borg-Warner Automotive Transmission & Engine Components Corporation, Troy, Mich.

Filed Jun. 12, 1989, Ser. No. 364,279

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—111 20 Claims



1 A chain tensioner comprising.

a blade spring, and,

a shoe adapted to contact said chain to be tensioned, said shoe being of a synthetic plastic material that will creep under load and elevated temperature, said shoe having a first end and a second end, said first end defining a chamber for receiving one end of said blade spring, said second end of shoe defining a passageway for receiving an end of said blade spring, said passageway having a means for engaging said end of said blade spring, said engagement means acting to limit movement of said blade spring, said engagement means being disposed to maintain said end of said blade spring in engagement with said chamber and said passageway to mechanically interlock said blade spring to said shoe by the geometric configuration of said blade spring and said shoe so as to place said shoe under stress and maintain tension on said chain.

4,921,473

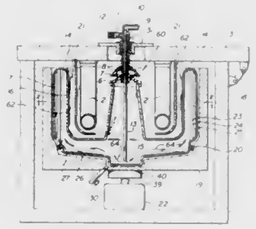
MULTICOMPONENT FLUID SEPARATION AND IRRADIATION SYSTEM

Kyu H. Lee, Bryn Mawr, and Livingston B. Morris, Devon, both of Pa., assignors to Therakos, Inc., Westchester, Pa.

Filed Feb. 2, 1989, Ser. No. 305,339

Int. Cl.[5] B04B *11/00, 5/10*

U.S. Cl. 494—27 33 Claims



1 A system for separating and irradiating blood comprising:

a housing;

a rotatable member located within said housing;

a disposable separation/irradiation chamber suitable for mounting in said rotatable member and including a vertical cylindrical outer compartment in fluid communication with an inner compartment extending between said outer compartment and the center of said chamber, and a first passageway accessing said inner compartment;

a dynamic seal having a rotating member and a stationary member, said rotating member being connected to said inner compartment of said chamber, and said first passageway passing through said dynamic seal; and

a source of radiant energy connected to said housing and located within said separation/irradiation chamber so at to oppose the inner wall of said outer compartment, wherein said inner wall of said outer compartment is transmissive of radiant energy of a given wavelength.

4,921,474

SANITARY TAMPON APPLICATOR

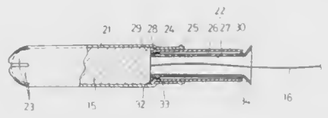
Migaku Suzuki, and Yamamoto Masamitsu, both of Kawanoe, Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Continuation of Ser. No. 163,803, Mar. 3, 1988, abandoned, which is a continuation of Ser. No. 919,100, Oct. 15, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 259,895

Claims priority, application Japan, Oct. 18, 1985, 60-234283

Int. Cl.[5] A61F *13/20*

U.S. Cl. 604—16 9 Claims



1 A sanitary tampon applicator basically comprising a plastic outer sleeve to accommodate a tampon and a plastic inner sleeve slidably telescoped into said outer sleeve to extrude said tampon through a front open end of said outer sleeve, said outer sleeve being provided adjacent its rear end with a first stopper directed radially inwards, said inner sleeve comprising a first inner sleeve member and a second inner sleeve member slidably inserted into said first inner sleeve member, said first inner sleeve member being provided at its front open end with a second stopper directed radially outwards so as to be engaged with said first stopper and at its rear open end with a third stopper directed radially inwards, said second inner sleeve member being provided at its front open end with a fourth stopper and a fifth stopper both directed radially outwards, said fourth stopper being brought into engagement with said third stopper as said second inner sleeve member is pulled rearwards and said fifth stopper being so spaced axially behind said fourth stopper that said third stopper may be interposed between these both stoppers when said second inner sleeve member has been completely pulled rearwards, characterized by that said first inner sleeve member is provided at its front open end with a sixth stopper directed radially inwards to retain said second inner sleeve member against moving towards the axial direction of said first inner sleeve member; that said fifth stopper is stationarily provided with a height equal to or less than that of said fourth stopper and gradually slopes down rearwards; and that the rear open end of said second inner sleeve member includes a diameter-enlarged portion of which the diameter is at least larger than that of the rear open end of said first inner sleeve member.

4,921,475

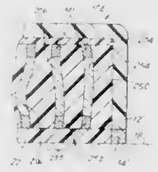
TRANSDERMAL DRUG PATCH WITH MICROTUBES

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Division of Ser. No. 922,296, Oct. 23, 1986, abandoned, which is a division of Ser. No. 839,050, Mar. 12, 1986, Pat. No. 4,640,689, which is a continuation of Ser. No. 702,486, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723. This application May 20, 1988, Ser. No. 196,664

Int. Cl.[5] A61N *1/30*

U.S. Cl. 604—20 20 Claims



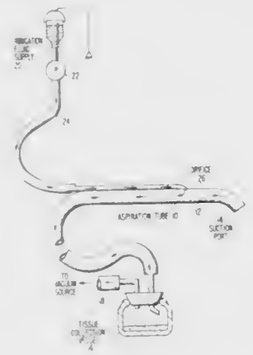
1 A transdermal drug patch for delivering at least one drug to a patient through the skin, comprising:

(a) at least two electrodes forming the patch and separated from each other by an insulator, each electrode containing a conductive element;

(b) a circuit including an electrical power source for supplying power to and electrically connected to the electrodes at said conductive elements; and

(c) drug reservoir means in at least one of said electrodes in the form of a plurality of microtubes separated from and insulated from each other extending from said conductive element at one end of the microtube to a surface of the patch adapted for interfacing with the patient at the other end of the microtube.

4,921,476
METHOD FOR PREVENTING CLOGGING OF A SURGICAL ASPIRATOR
David G. Wuchinich, New York, N.Y., assignor to Cavitron, Inc., Stamford, Conn.
Continuation of Ser. No. 57,732, Jun. 2, 1987, abandoned, which is a continuation of Ser. No. 733,700, May 13, 1985, abandoned, which is a division of Ser. No. 617,176, Jun. 5, 1984, Pat. No. 4,516,398, which is a continuation of Ser. No. 195,205, Oct. 8, 1980, abandoned, which is a continuation of Ser. No. 34,717, Apr. 30, 1979, abandoned, which is a division of Ser. No. 895,217, Apr. 10, 1978, abandoned. This application May 2, 1988, Ser. No. 191,730
Int. Cl.[5] A61B *17/20*
U.S. Cl. 604—22 5 Claims



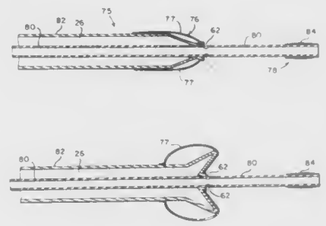
1. A method for preventing clogging of a surgical aspirator with fragmented tissue and blood removed from a surgical site by aspiration through a passage of the surgical aspirator, comprising the steps of:
providing a surgical aspirator comprising an ultrasonically-vibratable tool having a longitudinal axis and a free end adapted to ultrasonically vibrate along said longitudinal axis, a suction passage extending at least partially through said tool and generally parallel to said axis, said suction passage defining a suction port at said free end portion, said axis passing generally through said suction port, a sleeve coaxially surrounding said tool and spaced therefrom and extending substantially to said free end of said tool to define an annular fluid supply passage having an annular orifice surrounding said tool, said free end of said tool passing out of the distal tip of said sleeve and thereby being exposed for direct contact with tissue, blood or other matter at the surgical site, and at least one adjacent orifice passing through said tool from said fluid supply passage to said suction passage, and being disposed adjacent to said free end of said tool;
supplying anticoagulating and irrigating fluid to said fluid supply passage,
introducing substantially all of said fluid into said suction passage which extends at least partially through said tool through said adjacent orifice which passes through said tool from said fluid supply passage to said suction passage;
diluting the tissue and blood with said fluid;
preventing substantially all of said fluid from contacting said free end of said ultrasonic tool so as to minimize the atomization of said fluid with said free end of said ultrasonic tool when it is ultrasonically vibrating; and
positioning said exposed free end of said tool at the surgical site, and applying a suction pressure to said suction passage and thereby aspirating fragmented tissue or blood away from the surgical site through said suction passage and thereby at least partially through said tool;
said at least one adjacent orifice comprises a first adjacent orifice and a second adjacent orifice spaced from said first adjacent orifice, both said orifices passing through said tool from said fluid supply passage to said suction passage and disposed adjacent to said free end of said tool, and said introducing step comprising introducing said fluid through said first and second adjacent orifices.

4,921,477
SURGICAL IRRIGATION AND ASPIRATION SYSTEM WITH DAMPENING DEVICE
Rickey P. Davis, Chino, Calif., assignor to The Cooper Companies, Inc., Palo Alto, Calif.
Continuation of Ser. No. 108,219, Oct. 14, 1987, abandoned. This application Jun. 21, 1989, Ser. No. 368,898
Int. Cl.[5] A61B *17/20*
U.S. Cl. 604—22 35 Claims



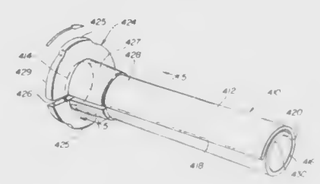
1. A surgical irrigation and aspiration system for aspirating fluid from a surgical site comprising:
a surgical tool having irrigation and aspiration functions,
an irrigation fluid means for providing irrigation fluid to said surgical tool,
a peristaltic pumping means for pumping aspiration fluid from the surgical site generally through and away from said surgical tool,
an aspiration fluid flow conduit providing a fluid connection between said surgical tool and said peristaltic pumping means for aspiration fluid,
a dampening means for dampening the oscillations of the aspiration fluid flow at the surgical site caused at least in part by said peristaltic pumping means, in said aspiration fluid flow conduit,
pressure equalization means for equalizing the pressure in said aspiration fluid flow conduit when said tool becomes occluded, wherein said equalization means is a liquid venting means, and
said dampening means comprising a fluid connector in fluid communication with said aspiration fluid flow conduit, a fluid chamber fillable with fluid and communicatable through said fluid connector with said aspiration fluid flow conduit so as to increase fluidic capacitance of the system, and a flexible diaphragm extending across at least part of a side of said fluid chamber, said flexible diaphragm by its flexure movement caused by the fluid in said fluid chamber absorbing at least a portion of the fluctuations in pressure of the fluid in said fluid chamber and thereby, through said fluid connector, dampening the fluid flow oscillations in said aspiration fluid flow conduit and at the surgical site, said dampening means to prevent oscillating turbulence in the eye and prevent the iris from flutter and the posterior capsule from bouncing during aspiration.

4,921,478
CEREBRAL BALLOON ANGIOPLASTY SYSTEM
Scott J. Solano, Lowell, Mass.; Myles L. Saunders, Beverly Hills, Calif., and James Crittenden, Hollis, N.H., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Filed Feb. 23, 1988, Ser. No. 159,539
Int. Cl.[5] A61M *25/02*
U.S. Cl. 604—53 45 Claims



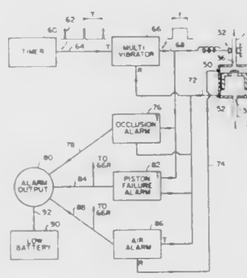
1. A blood vessel occlusion catheter for use during therapeutic intervention of a blood vessel for flushing away fluid and debris from the area of the therapeutic intervention comprising,
an elongated shaft sized to be introduced into the blood vessel lumen,
occlusion means secured to the shaft at or near the distal end of the shaft, the occlusion means capable of forming a funnel with the larger end of the funnel facing distally on the shaft and contacting the vessel walls to form a seal against the vessel walls,
an inflation lumen carried by the shaft and communicating with the interior of the occlusion means enabling the occlusion means to be inflated into the shape of said funnel, wherein the occlusion means when inflated defines surfaces capable of channeling all fluid and debris contacting the surfaces continuously in a proximal direction to an efflux means,
efflux means enabling fluid and debris to be carried within the shaft toward and out of the proximal end of the shaft, and
intervention means located on the shaft distal to the inflatable means for treating a site along the blood vessel.

4,921,479
CATHETER SHEATH WITH LONGITUDINAL SEAM
Joseph Grayzel, 262 Fountain Rd., Englewood, N.J. 07631
Filed Oct. 2, 1987, Ser. No. 104,279
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—53 20 Claims



11. A method for inserting and adjusting a sheath for use in conjunction with the introduction of catheters into the body comprising the steps of:
disposing a sheath formed of a flexible material with memory to return to an original configuration and when enlarged to maintain a closely conforming relationship to a cylindrical body for receiving a catheter therein having a longitudinal seam extending along its length and overlapping portions at said seam about a catheter to move with the catheter;
the disposing of the sheath about the catheter including the step of spreading a connecting fitting attached to the sheath along a slit in the connecting fitting to allow for insertion of the catheter through the wall of the fitting and thereby into the sheath;
inserting the catheter into a passage formed in the body;
advancing the catheter until the distal end of the sheath is fully entered into the passage formed in the body; and
adjusting the diameter of the sheath within the passage formed in the body by enlarging or reducing the diameter of the space occupied by the catheter and allowing the resilience of the sheath to conform to the space occupied by the catheter by rotating the sheath to allow said overlapping portions of the sheath to be enlarged or reduced in accordance with the direction of rotation.

4,921,480
FIXED VOLUME INFUSION DEVICE
Andrew I. Sealfon, Rte. #3, Box 61, Middletown, N.Y. 10940
Filed Nov. 21, 1988, Ser. No. 274,327
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—65 16 Claims



1. For use with a gravitational intravenous fluid system of the type in which intravenous fluid from an elevated source flows by gravity through tubing defining a flow passage under a pressure gradient to a vascular system of a patient, said pressure gradient being a higher static pressure of said intravenous fluid source in relation to a lower pressure of said patient vascular system, a fixed volume metering valve for providing incremental flow of said intravenous fluid comprising a housing bounding a chamber for a piston having an inlet at an upper end thereof in communication with said intravenous fluid source and at a lower opposite end an outlet in communication with said patient vascular system, an inverted U-shaped piston having three legs cooperating to bound therebetween a compartment and operatively disposed for opposite direction sliding movement in said chamber between an upper position of movement established by a horizontally oriented leg of said piston being adJacent said inlet and a lower position of movement established by the vertically oriented other two legs thereof being adJacent said outlet, a piston return spring disposed in said piston compartment so as to bias said piston in ascending movement from said lower to said upper position of movement, said ascending piston movement being normally prevented by said pressure gradient urging said piston in descending movement from said upper to said lower position of movement, and a normally open clamp operatively arranged to cyclically clamp closed said tubing so as to remove said pressure gradient from said flow system, whereby in response to said open condition of said clamp, said pressure gradient urges said piston in descending movement causing the dispensing of a selected fixed volume of intravenous fluid by said piston and in response to said closed clamp condition, said spring urges

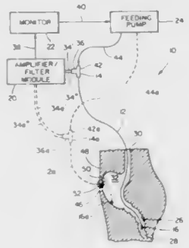
said piston in ascending movement, incident to repeating the fluid dispensing functioning thereof to thereby enable said metering valve to provide successive incremental intravenous fluid flow in selected fixed amounts through said gravitational intravenous fluid system.

4,921,481

ENTERAL FEEDING SYSTEM UTILIZING GASTROINTESTINAL MYOELECTROGRAPHY

Roger G. Danis, Westerville; Ronald M. Isaac, Worthington, and Harry A. Puryear, Jr., Dublin, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 23, 1988, Ser. No. 172,055
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—67 **18 Claims**



1. In a feeding tube of the type having distal and proximal ends and a nutrient exit port for supplying nutrient at its distal end, apparatus adjacent said nutrient exit port for determining the location thereof in and/or changes in the functioning of different areas of the gastrointestinal tract of a patient, said apparatus comprising, means provided on said distal end for detecting myoelectric signals developed by the surrounding area of the astrointestinal tract in which it is located, said detecting means comprises one or more electrodes around spaced apart portions of said distal end, and means for monitoring said signals.

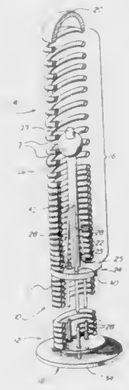
4,921,482

STEERABLE ANGIOPLASTY DEVICE

Julius G. Hammerslag, 27011 Calle Esperanza, San Juan Capistrano, Calif. 92675, and Gary R. Hammerslag, 33171 Elisa Drive, Dana Point, Calif. 92624

Filed Jan. 9, 1989, Ser. No. 295,124
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—95 **22 Claims**

1. A steerable guidewire for percutaneous transluminal insertion into the coronary vascular system and controlled negotiation of branches and turns therein to guide an angioplasty catheter to an arterial stenosis or other treatment site, said guidewire comprising:
an elongate flexible shaft having a proximal and a distal end and a central lumen extending therethrough, said distal end being provided with a floppy, resilient tip;
an axially extending steering post disposed within a steering region on the distal end of said flexible shaft, said steering post secured at its proximal end to substantially prevent axial displacement thereof while permitting lateral deflection of the steering post out of parallel with the axis of the flexible shaft;
at least three deflection wires axially movably disposed within the lumen of said flexible shaft and extending from a distal point of attachment to the steering post throughout the length of the flexible shaft to the proximal end thereof;
a radial support secured within the flexible shaft at the proximal end of said steering region, said support radially outwardly displacing each of the deflection wires from the axis of said flexible shaft; and
wherein axial movement of any one of said deflection wires in a proximal direction displaces the axis of the steering



post in a unique lateral direction, and through combinations of proximal axial displacement of said deflection wires, said steering region is caused to deflect laterally and rotate throughout a full 360° range of motion about the axis of the flexible shaft.

4,921,483

ANGIOPLASTY CATHETER

Bandula Wijay, Webster, and Paolo Angelini, Houston, both of Tex., assignors to Leocor, Inc., Webster, Tex.

Continuation-in-part of Ser. No. 811,162, Dec. 19, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 100,363
Int. Cl.[5] A61M *29/02*
U.S. Cl. 604—96 **85 Claims**



1. A low profile catheter for dilating stenotic lesions in the vascular system and other body cavities, insertable over a guide comprising:
an elongated body having a proximal and distal segment, said body defining at least one lumen extending therethrough;
an elongated tip segment connected adjacent to the distal end of said distal segment of said body, said tip defining at least one substantially smooth bore lumen therethrough, said lumen in said body in flow communication with said lumen in said tip thereby allowing the catheter to be advanced over a guide extending through said lumen in said body in said tip;
said body being made of a harder material than the material of said tip;
a balloon mounted in close proximity to the outer surface of said distal segment of said body defining a balloon cavity therebetween, said balloon having a proximal and distal neck, said balloon disposed substantially proximally to said tip, juncture means for providing a transition between said tip and said distal segment of said body, said distal neck of said balloon mounted adjacent to the juncture

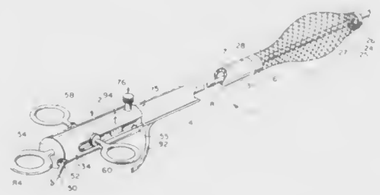
between said elongated tip segment and said distal end of said distal segment of said body;
said proximal neck of said balloon mounted to said elongated body;
said distal segment of said body being substantially nondistensible as the balloon is inflated to substantially its full normal operating inflation pressure; and
means within said body for selectively inflating and deflating said balloon through said cavity.

4,921,484

MESH BALLOON CATHETER DEVICE

Richard A. Hillstead, Hollywood, Fla., assignor to Cordis Corporation, Miami Lakes (Hialeah), Fla.

Filed Jul. 25, 1988, Ser. No. 223,870
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604 104 **14 Claims**



1. A mesh balloon catheter device comprising:
a catheter having a distal end and a proximal end;
a tube of woven interlaced filaments forming a tubular mesh and having a proximal end connected to the distal end of said catheter and a distal end;
a flush tube extending through said catheter and said tubular mesh and fixed to the distal end of said tubular mesh;
means located within said catheter and connected to said distal end of said tubular mesh for moving said distal end of said tubular mesh toward said proximal end of said tubular mesh to cause said tubular mesh to balloon laterally outwardly to the shape of a mesh balloon; and
a fluid coupling from said tubular mesh to the proximal end of said catheter for draining fluid from the catheter which may have entered the catheter through said tubular mesh.

4,921,485

CATHETER FOR USE IN THE SURGICAL CORRECTION OF A NASOLACRIMAL DUCT OBSTRUCTION

John D. Griffiths, 1738 S. 85th St., Omaha, Nebr. 68124

Filed Sep. 28, 1988, Ser. No. 250,164
Int. Cl.[5] A61M *25/00*
U.S. Cl. 604—104 **6 Claims**



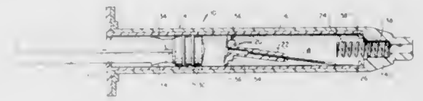
1. In combination,
a flexible tube having ends for extending downwardly, through the puncta, canaliculi, nasolacrimal sac and nasal cavity of a person's nasolacrimal system,
a catheter having upper and lower ends,
the inside diameter of said catheter being such that the free ends of the flexible tube may be extended therethrough,
the length of said catheter being such that said catheter may be extended into the upper end of the nasal cavity with the upper end thereof positioned in the nasolacrimal sac,
said catheter having a flexible, enlarged head portion provided on its upper end for positioning in the nasolacrimal sac.

4,921,486

DISPOSABLE SYRINGE WITH RETRACTING NEEDLE

Francis M. DeChellis, and Deborah K. DeChellis, both of 654 Bayou DuLarge Rd., Houma, La. 70363

Filed Jun. 23, 1989, Ser. No. 369,758
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **20 Claims**



1. Hypodermic syringe apparatus having a completely retractable needle comprising, in combination:
(a) a hollow barrel formed with a needle support opening at a first end;
(b) a reservoir body formed with a needle support carrier at a first end;
(c) said reservoir body being retained against longitudinal movement within said barrel member while permitting rotational movement of said reservoir body within said barrel member;
(d) said needle support carrier being retained against rotational movement within said barrel member while permitting longitudinal movement of said needle support carrier within said needle support opening;
(e) an elastic member mounted in stressed relation between said needle support opening and said needle support carrier for urging said needle support member out of said needle support opening into said reservoir body;
(f) disconnectable connection means connecting said needle support carrier to said reservoir body disconnection by torque applied between said barrel member and said reservoir body;
(g) said elastic member forcing said needle carrier and said needle into said reservoir body when said connection means is disconnected; and
(h) a liquid plunger mounted within said reservoir body for sucking liquid through said needle into said reservoir body and discharging liquid through said needle out of said reservoir body.

4,921,487

EXTERNAL DEVICE FOR INJECTING MEDICINE

Jacques Buffet, Villemomble; Jean-Paul Buffet, Le Raincy; Jean Piani, and Francois Paravisini, both of Ajaccio, all of France, assignors to Compagnie Financiere Saint. Nicolas, Le Raincy, France

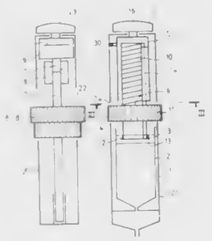
Filed Sep. 21, 1988, Ser. No. 247,271
Int. Cl.[5] A61M *5/20*
U.S. Cl. 609—135 **6 Claims**

1. An external device for injecting a medicament such as insulin into a human body comprising:
a casing for receiving a syringe to be fixed therein, said syringe comprising a housing containing the medicament and provided with an outlet part connected to a catheter for linking said housing to a human body, said syringe further comprising an internal plunger adapted for motion along said housing,
means held by said casing and energized by a spiral spring

VOL
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for actuating forwardly said internal plunger of said syringe;

a clockwork movement held by said casing regulated by a step electrical motor for regulating the motion of said internal plunger, and



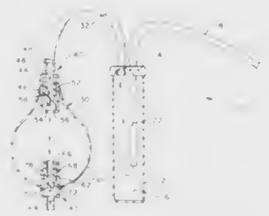
means held by the casing for producing movement of said internal plunger additional to the electric motor regulated motion for instantaneous injection of doses of medicament.

4,921,488

ASPIRATOR DEVICE FOR BODY FLUIDS

Carlos A. Maitz, 16451 Dapple Gray Ct., Chesterfield, Mo. 63017, and George M. Hauser, 29 Chieftan Dr., St. Louis, Mo. 63146

Filed Jan. 15, 1988, Ser. No. 144,375
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—153 **15 Claims**



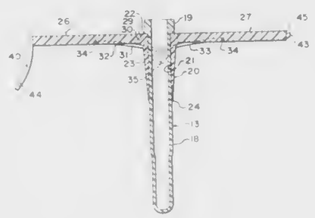
1. An aspirator device for removing body fluids comprising a fluid collector having an air-tight chamber for receiving body fluids, an elongated flexible tube connected to said collector and including a first sealed passageway communicating with said air-tight chamber, said elongated flexible tube having a free end adapted to be inserted into a body cavity for fluid communication with body fluids, a squeeze bulb connected to said collector and associated with a second sealed passageway communicating with the air-tight chamber of said collector, said squeeze bulb being operatively associated with first and second one-way valve means which open in the same direction, said first one-way valve means being operatively connected relative to said second sealed passageway to permit air to be withdrawn in one direction through the first sealed passageway, air-tight chamber and second sealed passageway upon compression and release of said squeeze bulb for establishing a vacuum through said passageways to remove body fluids for deposit in said collector, and said second one-way valve means being operatively connected to said squeeze bulb to allow air to be expelled therethrough to atmosphere as well as permit fluids overflowing the collector to be drawn through the first one-way valve means for discharge through said second one-way valve means and removal of overflowing fluids from said squeeze bulb, said squeeze bulb being operatively associated relative to the other components of said aspirator device to facilitate one-handed gripping, lifting and operation of the aspirator device by the squeeze bulb.

4,921,489

HYPODERMIC NEEDLE SHIELD

John B. H. Frizzell, Box 938, Didsbury, Alberta, Canada (T0M 0W0)

Filed Jul. 20, 1988, Ser. No. 221,869
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **11 Claims**



1. A shield device for use in sheathing a medical needle of the type comprising an elongate hollow needle and a base on which the needle is mounted, said shield device comprising a central body including a hollow cylindrical body portion defining an open mouth at one end into which the needle can be inserted so that it extends axially along the interior of the body portion with the base of the needle outside the open mouth, a shield members having a central strip portion with two parallel sides and having a width between the sides at least equal to the width of the cylindrical body portion and a length such that the strip portion extends outwardly from the central body to respective sides thereof and two flat flap members each mounted on the central strip portion for pivotal movement about a hinge line along a respective side of the central strip portion adjacent to the open mouth from a first retracted position in which the flap members lie substantially parallel on opposed sides of said cylindrical body portion to a second deployed position in which the flap members project outwardly from the central strip portion, the two flap members and the central strip portion being shaped to define in cooperating a protective plate fully surrounding said open mouth, and means for latching the flap members in the retracted position.

4,921,490

SAFETY HYPODERMIC NEEDLE SYRINGE

I. Martin Spier, 50 Park Ave., New York, N.Y. 10016, and Martin F. Sturman, 7315 Granite Rd., Melrose Park, Pa. 19126

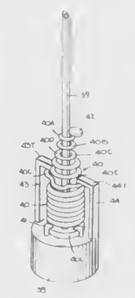
Continuation-in-part of Ser. No. 235,466, Aug. 24, 1988, Pat. No. 4,863,435. This application Jul. 10, 1989, Ser. No. 377,275
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **7 Claims**

1. In combination with a standard syringe whose fluid chamber has a piston slidable therein and is provided at its front end with a projecting nozzle and a cylindrical, internally-threaded socket concentric therewith; a safety hypodermic needle and shield assembly adapted to prevent accidental stick by the point of the needle after the needle has been injected into a patient and then withdrawn, said assembly comprising:

(a) a hub to support the needle provided with a hollow base threadably receivable in the socket of the syringe whereby the nozzle is then inserted in the hollow base to communicate with the needle to conduct fluid from the chamber into the needle or to conduct fluid from the needle into the chamber;

(b) a compressible helical spring anchored on top of the hub which serves as a pedestal therefor and surrounding the needle;

(c) a shield supported at the upper end of the spring whose normal length is such as to place the shield protectively in front of the point of the needle, said shield being capable of permitting compression of the spring and the exposure of the needle; and



(d) releasable latching means supported on the pedestal which in a retracted mode of the assembly when the spring is compressed and the shield is retracted to hold the spring in its compressed state at which the needle is exposed for use, and in an extended mode of the assembly when the spring is released, to cause the shield to assume its place in front of the point to prevent accidental stick.

4,921,491

DISPOSABLE NEEDLE SYSTEM WITH CHEMICAL DISINFECTANT MEANS

Raynido A. Champ, 4205 Cedar La. #7, Portsmouth, Va. 23703

Filed Apr. 3, 1989, Ser. No. 332,594
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—199 **20 Claims**



1. A disposable needle system for use by an operator in obtaining blood from a patient comprising, in combination:

needle means having a first open end for insertion into the vein of a patient and having a second open end for transferring the patient blood to a collection device,

means for protecting the operator from accidental injury and contamination during and after use of said disposable needle system, and

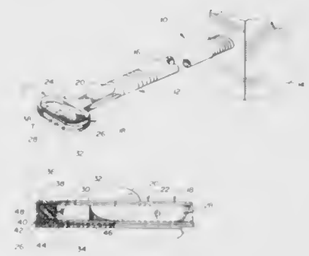
chemical disinfectant means connectable to said needle system after use to disinfect said needle means and prevent subsequent accidental contamination during and after disposal of said needle system.

4,921,492

END EFFECTOR FOR SURGICAL PLUME EVACUATOR

Leonard S. Schultz, Minneapolis, Minn.; Jay F. Gold, Yonkers, N.Y., and Rodney V. Erdman, Princeton, Minn., assignors to Laser Technologies Group, Inc., Minneapolis, Minn.

Filed May 31, 1988, Ser. No. 200,405
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—315 **10 Claims**



1. An apparatus for removing smoke, airborne particulates gaseous or like by-products of operating procedures producing such by-products from a surgical or other site, comprising:

a plenum having a top wall, a bottom wall spaced apart from said top wall, a side wall extending between said top and bottom walls and presenting an outer periphery of said plenum, and structure defining a generally open facing presenting an inner periphery of said plenum, said top, bottom, and side walls defining an internal plenum chamber in fluid communication with said open facing;

vacuum means operably coupled to said plenum for creating a reduced pressure within said plenum chamber, thereby drawing said by-products through said open facing; and

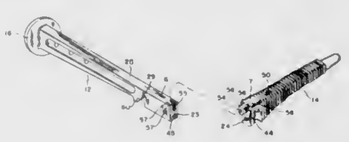
diffuser means carried within said plenum chamber for maintaining said top and bottom walls in spaced apart relationship and distributing said reduced pressure along the inner periphery of said plenum whereby said by-products are drawn through said open facing from spaced points about said site.

4,921,493

RASP TOOL

John D. Webb, Jr., Etna Green, and James J. Morr, Leesburg, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Aug. 11, 1986, Ser. No. 895,563
Int. Cl.[5] A61F *5/00*
U.S. Cl. 606—85 **5 Claims**

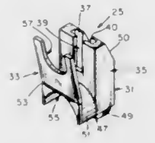


1. A rasp tool for contouring a bone or the like comprising a handle, a cutter and a releasable locking assembly for enabling selective interconnection of the handle and cutter, the cutter adapted to contour the bone, the handle including a proximal end and a distal end and the cutter including a proximal end and a distal end, the releasable locking assembly including a raised post extending from the proximal end of the cutter and a corresponding recess extending into the distal end of the handle for fitting about the raised post, the releasable locking assembly further including a slideable locking pin in the handle and the proximal end of the cutter including a blind bore aligned longitudinally with the locking pin to enable the

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locking pin to be selectively engaged in the blind bore such that when the locking pin is engaged in the bore while the raised post is captured in the corresponding recess, the cutter will be securely attached to the handle, the raised post and the corresponding recess being spaced apart from the slideable locking pin and blind bore such that the locking pin and blind bore are not directly contacting the raised post and recess.

4,921,494
ONE-PIECE EARRING CARRIER
Vladimir Neil, Rancho Palos Verdes, Calif., assignor to Studex Corp.
Filed Jun. 3, 1988, Ser. No. 201,697
Int. Cl.[5] A61B *17/34*
U.S. Cl. 606—188 **9 Claims**



1. A one-piece disposable earring component carrier for association with the barrel portion of a stud gun having an upstanding protuberance upon its end for holding an earring clasp for attachment to an earring stud and guide the forward movement of the stud into the clasp comprising:

an unitary member having a clasp carrying portion, an alignment portion, a tab portion, and a barrel cap portion, wherein said clasp carrying portion includes a inferiorly positioned slot to quickly associate or dissociate said unitary member from the upstanding protuberance of the stud gun, said clasp portion including a superiorly positioned slot to receive the earring clasp, and wherein said alignment portion is positioned between said tab portion and said clasp carrying portion, said alignment portion includes a curved undersurface for alignment and engagement to the barrel portion of the stud gun, and wherein said tab portion is flexible and aligned with said clasp carrying portion to allow the stud holder to engage and flex said tab portion when the stud holder is moved toward said clasp carrying portion, and wherein said barrel cap portion extends below said clasp carrying portion to engage the barrel end of the stud gum and provides means to hygienically hold the unitary member.

4,921,495
POROUS ARTIFICIAL VESSEL
Kazuaki Kira, Kobe, Japan, assignor to Kanegafachi Kagaku Kogyo Kabushiki Kaisha, Japan
Continuation-in-part of Ser. No. 617,401, Jun. 5, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 842,956
Claims priority, application Japan, Jun. 6, 1983, 58-101520; Feb. 29, 1984, 59-39077; Mar. 1, 1984, 59-39971; Mar. 7, 1984, 59-44396; Mar. 7, 1984, 59-44397
The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.
Int. Cl.[5] A61F *2/00*
U.S. Cl. 623—1 **6 Claims**

1. An artificial vessel comprising a vessel wall made of a thermoplastic elastomer, wherein said vessel wall comprises

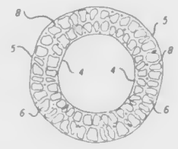
(1) a skin layer which forms the inner surface of the vessel wall,

(2) an outer surface, and

(3) an interior region between said inner surface and said outer surface, said interior region having a spongy structure characterized by cells, each cell being a void space surrounded by partition walls,

wherein said vessel wall is prepared from a solution of said thermoplastic elastomer in a good solvent for said thermoplastic elastomer, and said inner surface, outer surface, and partition walls contain:

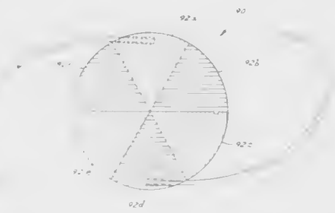
(a) small pores of less than 1 μm in diameter formed by replacement of said good solvent with a coagulating liquid for said thermoplastic elastomer in said coagulating liquid,



(b) large pores of 1 to 50 μm in diameter which are in continuous communication with each other throughout the interior region of the vessel wall, thereby communicating the inner surface of the vessel wall to the outer surface of the vessel wall, said large pores being formed by elution of pore-forming particles contained in said solution of thermoplastic elastomer,

wherein the porosity of the artificial vessel is 75 to 87.5% by volume, and the compliance of the artificial vessel is 0.1 to 0.8.

4,921,496
RADIALLY SEGEMENTED ZONE OF FOCUS ARTIFICIAL HYDROGEL LENS
Dennis T. Grendahl, 2070 Shoreline Dr., Orono, Minn.
Continuation-in-part of Ser. No. 88,249, Aug. 24, 1987, Pat. No. 4,798,609. This application Oct. 17, 1988, Ser. No. 258,029
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 **18 Claims**



1 A zone of focus hydrogel lens for use with an eye comprising:

a. a plurality of pie-shaped optical hydrogel elements joined at the sides to form a unitary lens structure having a front surface, a rear surface and a circular periphery;

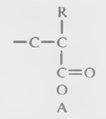
b. each of said pie-shaped hydrogel elements serving to create an image on a distinct portion of the retina; and

c. at least two of said hydrogel elements having different powers whereby objects at different distances from the eye are simultaneously brought to a focus on distinct portions of the retina; and

(d) at least two of said pie-shaped elements are of different colors.

4,921,497
METHOD FOR THE FORMATION OF THIN HYDROPHILIC LAYERS ON THE SURFACE OF OBJECTS MADE FROM NON-HYDROPHILIC METHACRYLATE AND ACRYLATE POLYMERS
Jiří Sulc, and Zuzana Krcová, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia
Filed Dec. 7, 1988, Ser. No. 281,204
Claims priority, application Czechoslovakia, Dec. 9, 1987, 9009-87
Int. Cl.[5] A61F *2/16*
U.S. Cl. 623—6 **2 Claims**

I. A novel intraocular lens or contact lens article having good optical, geometry and mechanical properties comprising (a) a core of hydrophobic polymer of a nitrile, an ester of acrylic acid, or an ester of methacrylic acids; (b) a relatively thin surface layer on said article comprised of a water-swellable, water-insoluble, inert, biocompatible, hydrophilic polymer characterized by a recurring unit:



wherein R is hydrogen or methyl, and wherein A is hydrogen, alkali metal, or a monovalent polyhydric group characterized by two or more primary and/or secondary hydroxyl groups, (c) said hydrophilic layer and said hydrophobic core being chemically and integrally united to form said lens or intraocular lens; and (d) wherein said hydrophilic layer is made by hydrolyzing the surface of the object made from said non-hydrophilic polymer, by immersing said object into a heated bath containing a strong acid and having dissolved therein an electrolyte, said electrolyte being capable of controlling the swelling and solubility of the hydrophilic polymer in said acid.

4,921,498
METAL CORE OSSICULAR REPLACEMENT PROSTHESIS
F. Barry Bays, Seminole, Fla., and Sam R. Marchand, Memphis, Tenn., assignors to Richards Medical Company, Memphis, Tenn.
Continuation of Ser. No. 486,268, Apr. 18, 1983, Pat. No. 4,871,364. This application Aug. 21, 1989, Ser. No. 396,059
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] A61F *2/18*
U.S. Cl. 623—10 **4 Claims**

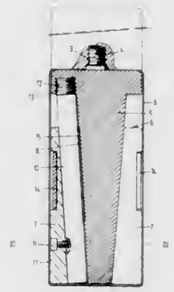


1. An ossicular replacement implant comprising:

(a) a body including elongated shaft and enlarged head portions, said shaft and head portions being formed of a biocompatible porous material;

(b) a core encased within said head and shaft portions of said body, the core being formed of a length of bendable metal and including an elongated core shaft located within said elongated shaft of said body portion and further including a first end forming a head extending substantially radially from the axis of the elongated shaft and engaging the head portion of the body, the core extending continuously from the shaft portion to the head portion of the body for connecting them together and allowing them to be oriented at a selected angle relative to each other by bending the bendable metal.

4,921,499
ADJUSTABLE PROSTHESIS
Erik L. Hoffman, HL Roosendaal, and Antonius L. J. Hopstaken, PW Roosendaal en Nispen, both of Netherlands, assignors to Ordev B.V., Netherlands
Filed Oct. 5, 1988, Ser. No. 253,730
Claims priority, application Netherlands, Oct. 5, 1987, 8702371
Int. Cl.[5] A61F *2/28*
U.S. Cl. 623—16 **6 Claims**



1. A fixation element for securing a prosthesis in a bone, said element comprising:

a tapered core adapted to be secured to a prosthesis;

a substantially cylindrical sleeve configured to surround said core, said sleeve defining a plurality of discrete segments, each of said segments having an inner surface complementary tapered to engage the tapered core;

a plurality of shape memory metal rods each having a transition temperature and being capable of changing shape in response to a change in temperature above or below the transition temperature; and

said rods extending between and interconnecting the core and each of the segments, whereby a change in shade of the rods is converter into an increase in diameter of the fixation element so as to effect a secure fixation of the prosthesis in the bone.

4,921,500
FEMORAL HEAD ADAPTOR FOR INTEROPERATIVE ASSEMBLY
Robert G. Averill, Ringwood; Paul Serekian, Glen Rock, and Scott K. Taylor, Ridgewood, all of N.J., assignors to Osteonics Corp., Allendale, N.J.
Filed Feb. 28, 1989, Ser. No. 316,855
Int. Cl.[5] A61F *5/04*
U.S. Cl. 623—22 **14 Claims**

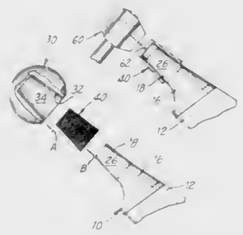
1. An adaptor for use in assembling and securing together a ceramic femoral head component of a prosthetic hip joint and a femoral stem component of the prosthetic hip joint, the femoral stem component including a post having an outer seating surface tapered at a first taper, and the ceramic femoral head including a socket having an inner seating surface tapered at a second taper steeper than the first taper, the adaptor comprising:

a cup-like body member constructed of a biocompatible metal and having a frusto-conical wall extending axially

between a first end and a second end, the diameter of the body member being larger at the first end than the diameter of the body member at the second end;

the body member being open at the first end thereof and including a frusto-conical inner surface extending inside the body member, along the wall thereof, from the open first end toward the second end, the inner surface having a taper complementary to the first taper and the relative dimensions of the inner surface of the body member and the outer seating surface of the post being such that the post is receivable within the body member for seating of the body member upon the post in secured relationship therewith;

a frusto-conical outer surface on the body member, the outer surface extending outside the body member, along the



wall thereof, between the first end and the second end and having a taper complementary to the second taper such that the thickness of the wall varies axially along the wall from a greater thickness adjacent the first end to a lesser thickness adjacent the second end, the relative dimensions of the outer surface of the body member and the inner seating surface of the socket being such that the body member is receivable within the socket for seating of the ceramic femoral head component upon the body member in secured relationship therewith; and

a web extending transversely across the body member at the second end thereof for reinforcing the wall of the body member adjacent the second end against forces exerted on the body member, adjacent the second end thereof, during assembly.

4,921,501

STEM FOR A PROSTHETIC FEMORAL HEAD

Roberto Giacometti, Milan, Italy, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 23, 1989, Ser. No. 315,437

Claims priority, application Switzerland, Feb. 26, 1988, 720/88

Int. Cl.[5] A61F *2/32*

U.S. Cl. 623—23 **6 Claims**

1. A stem for a prosthetic femoral head comprising

a distal zone of round cross-sectional shape disposed on a longitudinal axis;

a series of stepped bores extending from a distal end of said zones towards a proximal zone of the stem, each bore having a diameter of decreasing size towards said proximal zone and an axle increasingly offset from and parallel to said longitudinal axis; and



a longitudinal slot communicating said bores with a medial side of the stem.

4,921,502

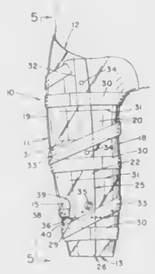
ARTICLE AND METHOD FOR FITTING A PROSTHETIC, ISCHIAL CONTAINMENT SOCKET TO AN ABOVE-KNEE AMPUTEE

Daniel L. Shamp, Akron, Ohio, assignor to Prosthetic Consultants Inc., Akron, Ohio

Filed Jul. 29, 1988, Ser. No. 226,128

Int. Cl.[5] A61F *2/78*

U.S. Cl. 623—33 **5 Claims**



1. A module for preparing an exact negative impression of a residual lower limb from which a positive casting of the residual limb can be made in order to fit the interface portion of an ischial containment socket for an above-knee amputee comprising:

a sleeve-like body portion having proximal and distal ends, said proximal and distal ends both being open;

a single peripheral discontinuity;

said peripheral discontinuity extending along the entire longitudinal extent of said sleeve-like body portion between said proximal and said distal ends to permit adjustment of the peripheral dimension of said module along the full longitudinal extent thereof so that it will circumscribe and engage said residual limb to the desired degree;

said body portion of the module being sufficiently transparent to permit visual observation as to the conformity between said body portion and the residual limb received therein;

said body portion being made of a deformably shapable polymeric material so that it may be selectively modelled to the configuration of the residual limb received therein.

4,921,503

NOVEL DYEING SYSTEM

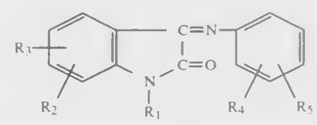
James S. Anderson, Danbury, Conn., and Thomas M. Schultz, Highland Mills, N.Y., assignors to Clairol Incorporated, New York, N.Y.

Filed Sep. 12, 1988, Ser. No. 243,525

Int. Cl.[5] A61K *7/13;* **C07D** *209/36*

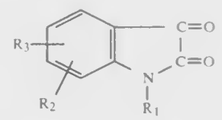
U.S. Cl. 8—408 **13 Claims**

1. A process for dyeing a keratinaceous substrate comprising the step of contacting it with a formulation containing at least one compound of formula:



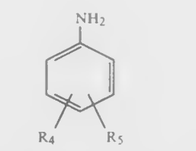
(III)

R_1 through R_5 being defined below wherein the compound is produced via the reaction of (a) at least one compound of formula I:



(I)

wherein R_1 is independently H, alkyl, acetyl, benzoyl or phenyl; and R_2 and R_3 are each independently H, alkyl, OH, NH_2, halogen, NO_2, alkylphenyl, phenyl, alkoxy, hydroxyalkoxy, polyhydroxyalkyl, alkylamino, hydroxyalkylamino or polyhydroxyalkylamino wherein all alkyl groups contain from about 1 to about 6 carbon atoms; with (b) at least one reactant which is of formula II:



(II)

wherein R_4 and R_5 are independently H, alkyl, phenyl, substituted phenyl, hydroxy, alkoxy, trifluoromethyl, nitro, amino monoalkylamino, dialkylamino, monohydroxyalkyl amino, polyhydroxyalkyl amino, anilino bis(monohydroxy-alkyl)amine bis(monohydroxyalkyl)amino, bis(monohydroxyalkyl-)amino or carboxyaldehyde, wherein all alkyl groups contain from about 1 to about 6 carbon atoms; wherein the contacting step involves the use of (a) and (b) either simultaneously or sequentially.

4,921,504

4-(N-ETHYL-N-2-HYDROXYETHYL)-AMINO-1-(2 HYDROXYETHYL)-AMINO-2-NITROBENZENE AND COMPOSITIONS FOR DYEING HAIR CONTAINING THE SAME

Thomas Clausen, Alsbach, and Eugen Konrad, Darmstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 24,898, Mar. 11, 1987, abandoned, which is a continuation of Ser. No. 801,619, Nov. 25, 1985, abandoned. This application Sep. 12, 1988, Ser. No. 244,534

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1984, 3442861

Int. Cl.[5] C09B *51/00;* **C07C** *91/40*

U.S. Cl. 8—415 **6 Claims**

1. A composition for dyeing human hair, in the form of an aqueous or aqueous alcoholic solution, creme, gel or emulsion, which comprises a cosmetically effective amount of 4-(N-ethyl-N-2'-hydroxyethyl)-amino-1-(2''-hydroxyethyl)-amino-2-nitrobenzene and a cosmetically acceptable non-toxic carrier or diluent.

6. 4-(N-ethyl-N-2'-hydroxyethyl)-amino-1-(2''-hydroxethyl)-amino-2-nitrobenzene.

4,921,505

PROCESS FOR THE PREPARATION OF NEW CRYSTAL MODIFICATION OF AN AZO DYESTUFF

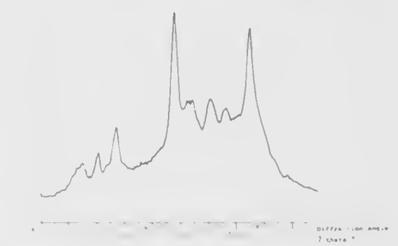
Gunther Effenberger, Bad Vilbel, and Hubert Kruse, Kelkheim, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,470

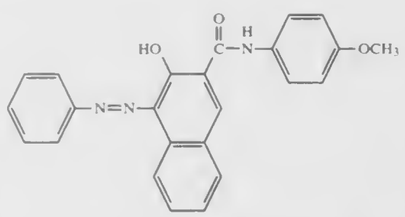
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3743349

Int. Cl.[5] C09B *29/20, 67/10;* **D06P** *1/18*

U.S. Cl. 8—526 **12 Claims**



1. Process for the preparation of the β-modification of the dyestuff of the formula I

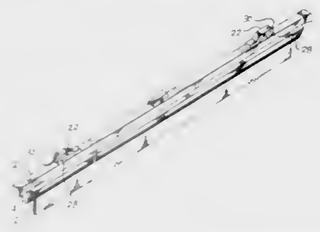


(I)

by coupling diazotized aniline to N-(p-methoxyphenyl)-3-hydroxyhthalene-2-carboxamide in an aqueous phase and then isolating the dyestuff, characterized in that the suspension present when the coupling has ended is heated to temperatures of 50° C. up to the boiling point of the aqueous phase in the presence of a dispersing agent for 0.25 to 10 hours or of several dispersing agents.

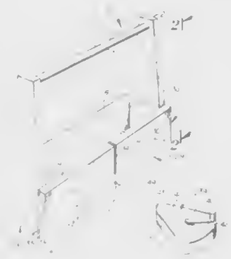
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4,921,506
CLAMP ASSEMBLY
Richard G. Poulton, Olympia, Wash., assignor to David A. Clayton, Bothell, Wash.
Continuation of Ser. No. 551,088, Nov. 14, 1983, Pat. No. 4,836,389, which is a continuation-in-part of Ser. No. 354,237, Mar. 3, 1982, abandoned. This application Jun. 5, 1989, Ser. No. 361,589
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[5] B42F *1/00*
U.S. Cl. 24—67.1 1 Claim



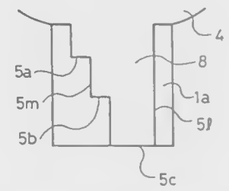
1 A system for vertically filing sheet material, comprising:
a clamp including:
a top member comprising an elongated narrow web, and
a pair of elongated narrow flanges integrated therewith and extending downwardly from the opposite sides of the web which with the web form a channel having an essentially U-shaped cross-sectional shape,
said web including a pair of longitudinally spaced apart openings and surface regions immediately surrounding said openings,
two elongated narrow clamping members each having a first edge and a second edge, said clamping members being hinged together at their first edges,
a pair of spaced apart pull members for closing the clamp by pulling the clamping members upwardly into the channel and against the flanges, to pivot the clamping members into clamping engagement with each other,
means for biasing the clamping members away from each other and the clamp into an open position, and each said pull member including a threaded shaft that projects upwardly through one of the openings in the web; and
a separate cam lever for activating each of the pull members, each said cam lever comprising:
a rotary cam member having a peripheral surface disposed about a pivot axis, and
a cylindrical hole extending axially therethrough,
said cylindrical hole having an axis that coincides with the pivot axis of the cam member and which is perpendicular to the longitudinal axis of the threaded shaft on the pull member,
said peripheral surface including a first portion that is a first radial distance from the pivot axis, a second portion that is a second radial distance from the pivot axis, a third portion that is a third radial distance from the pivot axis, a flattened area that surrounds and includes said first portion, and a rounded area that is adjacent to the flattened area and which includes said third portion,
said first radial distance being greater than said second radial distance and less than said third radial distance, and
said third portion being positioned circumferentially between said first portion and said second portion,
said cam member having an open position in which said second portion contacts the web surface region about its opening in the web, and a closed position in which said flattened area contacts said web surface region, and
said cam member comprises a self-lubricated plastic to form a non-abrasive peripheral surface,
said non-abrasive peripheral surface contacting said surface region of the web surrounding the opening in the web,
a handle for pivoting said cam member back and forth between its open and closed positions and for rotating the cam member about said longitudinal axis, and
means for engaging said pull member and for pulling it along said longitudinal axis to close the clamp when said clamp member is pivoted into its closed position,
said means for engaging including a barrel nut rotatably received in said cylindrical hole and threadedly engaging said shaft of the pull member,
wherein said handle projects from a portion of the peripheral surface of the cam member substantially circumferentially opposite the third portion of said peripheral surface, and
said handle is dimensioned to be sufficiently long to provide the leverage required to close the clamp but not long enough to provide excessive leverage that would strip the threaded connection between the shaft and barrel nut during normal hand rotation of the handle and the nut for purposes of effecting final clamping pressure.

4,921,507
LAYOUT DEVICE
Bruce R. Beyer, 1572 Payne Ave., St. Paul, Minn. 55101-3058
Filed May 3, 1989, Ser. No. 358,253
Int. Cl.[5] B44D *3/38*; B43L *7/00*
U.S. Cl. 33—413 5 Claims



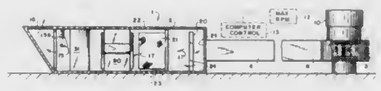
1. A layout tool for snapping various types of layout chalk lines on a work area surface, such as construction sites or the like, comprising:
a container having elongate generally rectangular front and rear walls, opposed end walls, and a horizontal bottom wall,
means extending between and connected with opposed walls of said container and defining a handle,
said front wall having an opening in the mid-portion thereof adjacent said bottom wall, said opening extending into and upwardly through said bottom wall, said front wall having a linear scale on the exterior surface thereof extending throughout the length of said front wall adjacent the lower edge thereof, said scale having a zero point at said opening and having line and number indicia extending in opposite directions therefrom,
an elongate flexible chalk line having one end thereof extending therefrom through the opening in the front and bottom walls,
a weight member positioned interiorly of said housing upon said bottom wall, said weight member having length and width dimensions corresponding to and only slightly less than the length and width dimensions of the interior of said container, said weight member clamping said one end of the chalk line string within the container, and stabilizing the container against movement from a preset position relative to said scale to permit said chalk line string to be pulled tight and snapped to form a layout chalk line on the surface of a work area.

4,921,508
METHOD OF MANUFACTURING MAGNETIC HEAD
Takashi Nonaka, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 28, 1989, Ser. No. 372,655
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 3 Claims



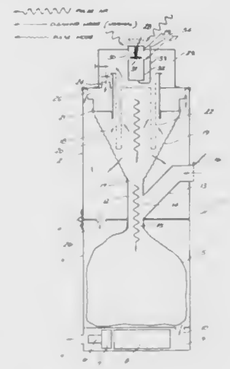
1. A method of manufacturing a magnetic head comprising the steps of: providing upper and lower cores projecting from respective core bodies and extending parallel with each other thereby defining therebetween a transducing gap, said upper and lower cores having free ends spaced from the point where the cores joint their respective core bodies, at least one of said cores having at least one step shaped profile extending between said point and its free end; and machining said cores from the free ends toward the core bodies to obtain a predetermined desired throat height for said transducing gap using at least one step of said profile as a reference point.

4,921,509
AIR FILTRATION SYSTEM FOR DUCTED RANGE HOODS
Austin Maclin, Middleton, Mass., assignor to Micro-Technology Licensing Corporation, Tequesta, Fla.
Continuation of Ser. No. 114,778, Oct. 0, 1987, abandoned. This application Aug. 26, 1988, Ser. No. 236,945
Int. Cl.[5] B03C *3/66, 3/72*
U.S. Cl. 55—104 6 Claims



1. An air filtration system for ducted range hoods comprising:
(a) a housing having an inlet and an outlet;
(b) motor means having a variable speed range and attached to said housing
(c) a fan attached to said housing near said motor means and driven by said motor means for forcing air containing cooking effluents through said air filtration system;
(d) an air impingement plate having a surface area larger than a surface area of said inlet and positioned behind said inlet in said housing;
(e) an oil mist filter bag system having a high loft surface area positioned between said impingement plate and said outlet in said housing to remove coarse cooking effluents from the air drawn through said system;
(f) an electronic filter section means positioned between said oil mist bag filter system and said outlet of the housing for causing an electrostatic action to remove fine particles from the cooling effluent of the air drawn through the system;
(g) a high efficiency particle arrestor filter section means positioned between said electronic filter section and said outlet for removing substantially all of said fine particles from the cooking effluent of the air drawn through the system;
(h) sail switch means positioned between said high efficiency arrestor filter section means and said outlet of the housing, said sail switch means controlling the variable speed of said motor means whereby said flow quantity of said air is maintained at a substantially constant volume within a control range of said motor means; and
(i) indicator means attached to said motor means for indicating a maximum speed of said motor means.

4,921,510
VACUUM CLEANER SYSTEM
Arnold Plooy, Chippendale, Sydney 2008, Australia
Continuation of Ser. No. 159,414, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 878,376, May 23, 1986, abandoned. This application May 12, 1989, Ser. No. 355,098
Claims priority, application Australia, Oct. 3, 1984, PG7467; Nov. 6, 1984, PG7996; Mar. 25, 1985, PG9895
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—288 7 Claims

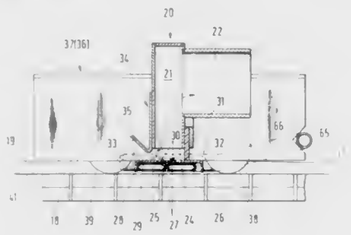


1. A vacuum cleaning system comprising a flexible bag receptacle of substantially non-porous material having a neck of the bag gathered about a suction pipe communicating with the receptacle, an inlet pipe communicating with the receptacle, an intermediate chamber having a lesser volume than the capacity of the flexible bag receptacle communicating with the suction pipe, a suction chamber communicating with the intermediate chamber by way of a filter, suction means arranged to apply suction to the suction chamber via a suction conduit, and a control valve arranged to admit atmospheric air into the suction chamber when actuated under predetermined conditions to direct air through the filter, intermediate chamber, and into the receptacle to clean the filter and clear any blockage in the suction pipe.

4,921,511
DEVICE FOR CLEANING FLUFF SCREENS OF AN APPARATUS FOR SMOOTHING ARTICLES OF CLOTHING

Wilfried Dreischmeier, Vlotho, Fed. Rep. of Germany, assignor to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,379
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710636; May 30, 1987, 3718257
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—294 **15 Claims**



1. Device for cleaning a fluff-collecting, stationary fluff screen of a treatment chamber of an apparatus for smoothing articles of clothing, comprising:

a fluff screen **17**

a cleaning unit (**20**), movable over the fluff screen (**17**), for sucking off fluff, from time to time, from the top side of the longitudinal horizontal fluff screen (**17**);

a suction nozzle (**21**) disposed in the cleaning unit (**20**) and extending transversely over the fluff screen (**17**) at the top side of the fluff screen;

a blowing air unit (**24–30**), disposed in the cleaning unit (**20**) and on a side opposite the suction nozzle (**21**) directly underneath the fluff screen (**17**), for directing blowing air against the underside of the fluff screen (**17**);

said blowing air unit (**24–30**) comprising at least one blowing pipe (**25, 26**) extending parallel to the suction nozzle (**21**) and having a plurality of blowing nozzles (**27**) which are distributed in the transverse direction of the screen (**17**), and through which blowing air is guided in the direction of the suction nozzle (**21**); and

driving means (**37, 42, 45**) for moving said cleaning unit (**20**), containing said suction nozzle (**21**) and said blowing air unit (**24–30**), over the fluff screen (**17**).

4,921,512
FILTER ELEMENT

Richard D. Maryyanek, Northbridge, and June E. Brissette, Oxford, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

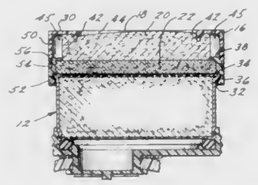
Filed Mar. 30, 1989, Ser. No. 331,686
Int. Cl.[5] B01D *39/06, 46/12*
U.S. Cl. 55—488 **13 Claims**

1. A filter for filtration of air entering a chemical cartridge of a gas mask, the filter comprising:

a filter element for filtration of particulate contaminants from an air stream, said filter element including:

(1) a prefilter having a plurality of spaced perforations therethrough; and

(2) a secondary filter bonded to said prefilter;

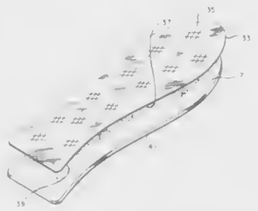


filter housing means for housing said filter element, said filter housing including mounting means for mounting onto a chemical cartridge of a gas mask.

4,921,513
METHOD OF MANUFACTURING A SKATEBOARD

Keith Parten, Ft. Worth, Tex., assignor to Nash Manufacturing Company, Fort Worth, Tex.

Filed Feb. 6, 1989, Ser. No. 306,391
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—280 **10 Claims**



1. A method of manufacturing a skateboard of the type having an upper surface on which the user stands and having a contoured lower surface provided with rollers which support the board to permit the board to travel with the user thereon, the lower surface also having a decorative marking applied thereto, the method comprising the steps of:

applying a label to the board lower surface by means of a suitable adhesive, the label having an outer periphery which matches the contours of the board lower surface so that the label substantially covers the board lower surface when applied thereto; and

applying a sealant coating to the label and board to protect the label.

4,921,514
MIXED REFRIGERANT/EXPANDER PROCESS FOR THE RECOVERY OF C3+ HYDROCARBONS

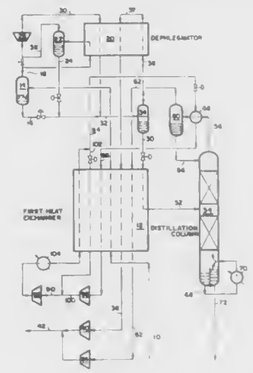
Howard C. Rowles, Center Valley, and Calvin L. Ayres, New Tripoli, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 15, 1989, Ser. No. 351,732
Int. Cl.[5] F25J *3/02*
U.S. Cl. 62—24 **11 Claims**

1. In a process for the recovery and purification of C_3^+ hydrocarbons from a high pressure feed gas stream comprising C_3^+ hydrocarbons and light gases wherein the C_3^+ hydrocarbons are recovered from the feed gas stream by cooling the feed gas stream in heat exchange against a combination of refrigeration sources thereby condensing out the C_3^+ hydrocarbons and wherein the recovered C_3^+ hydrocarbons are purified by distillation, the improvement for providing energy efficient refrigeration comprises:

(a) cooling the feed gas stream whereby a major portion of the C_3^+ hydrocarbons are condensed and removed from the feed gas stream thus producing a high pressure, C_3^+ lean gas stream and a first C_3^+ hydrocarbon liquid stream; wherein refrigeration for cooling the feed gas stream and condensing the major portion of the C_3^+ hydrocarbons is provided in part by heat exchange with a multi-component, closed-loop, refrigerant fluid;

(b) further cooling the high pressure, C_3^+ lean gas stream whereby a second portion of the C_3^+ hydrocarbons is condensed and removed from the high pressure, C_3^+ lean gas stream thus producing an essentially C_2^- gas stream and a second C_3^+ hydrocarbon liquid stream; wherein at



least a portion of the refrigeration for the further cooling of the high pressure, C_3^+ lean gas stream and condensing the second portion of the C_3^+ hydrocarbons is provided by work expanding the essentially C_2^- gas stream, phase separating the expanded, essentially C_2^- gas stream thereby producing a third C_3^+ hydrocarbon liquid stream and a light gas overhead stream and heat exchanging the light gas overhead stream against the high pressure, C_3^+ lean gas stream; and

(c) combining the first, second and third C_3^+ hydrocarbon liquid streams to form a distillation column feed stream, warming and at least partially vaporizing the distillation column feed stream and introducing the distillation column feed stream into an intermediate location of the distillation column.

4,921,515
ADVANCED REGENERATIVE ABSORPTION REFRIGERATION CYCLES

Kim Dao, 14 Nace Ave., Piedmont, Calif. 94611

Filed Oct. 20, 1988, Ser. No. 260,430
Int. Cl.[5] F25B *7/00*
U.S. Cl. 62—335 **12 Claims**

1. An absorber-coupled multi-effect regenerative cycle comprising:

(a) a single-effect absorption cycle having

(i) a boiler having an inlet and liquid and vapor outlets,

(ii) a condenser having an inlet connected to said boiler vapor outlet and having an outlet,

(iii) an evaporator having an inlet and an outlet,

(iv) means for connecting and reducing the pressure from said condenser outlet to said evaporator inlet,

(v) an absorber having inlets connected to said evaporator outlet and the said boiler liquid outlet and having an outlet,

(vi) means for pumping fluid from said absorber outlet to said boiler inlet,

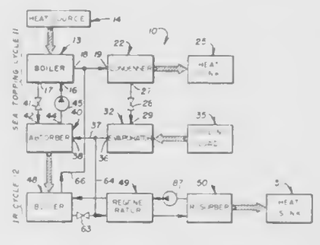
(b) a single-effect regenerative cycle having

(i) a multistage boiler having a plurality of boiling stages each with an inlet and liquid and vapor outlets, means for serially connecting said boiler stages with the liquid outlet of one connected to the inlet of the next, and means for progressively reducing the internal pressure of the successive boiling stages,

(ii) a multistage resorber having a plurality of absorber stages each having liquid and vapor inlets and an outlet, means for serially connecting the absorber stages with the outlet of one connected to the liquid inlet of the next, and means for progressively increasing the internal pressure of the successive absorber stages,

(iii) means for cooling and maintaining said resorber stages at a substantially constant temperature,

(iv) a multi-section regenerator having a shell, liquid and vapor inlets, an outlet, and means forming a plurality of serially connected sections within said shell for flow of fluid from said inlet to said outlet,



(v) means for connecting the liquid outlet of the lowest pressure boiler stage to said regenerator liquid inlet,

(vi) means for connecting the outlet of said regenerator to the inlet of the lowest pressure resorber stage,

(vii) means for individually connecting the vapor outlets of all but the highest pressure boiling stage to the vapor inlets of all but the lowest pressure resorber stages,

(viii) means for connecting the outlet of the highest pressure resorber stage through said serially connected sections of said regenerator and in heat exchange relation with fluid flowing through said sections, and then to the inlet of said highest pressure boiler stage,

(ix) means for connecting the vapor outlet of the highest pressure boiler stage to said condenser inlet,

(x) means for connecting said evaporator outlet to the vapor inlet of said regenerator,

(c) means for coupling said absorber of said single-effect absorption cycle and said multistage boiler of said single-effect regenerative cycle for transfer of heat from said absorber to said multistage boiler.

4,921,516
METHOD OF MANUFACTURING OPTICAL FIBERS WITH ELIMINATION OF PARAXIAL REFRACTIVE-INDEX DIP

Giacomo Roba, Genova-Cogoleto, Italy, assignor to Cselt-Centro Studi E Laboratori Telecommunicazioni S.p.A., Turin, Italy

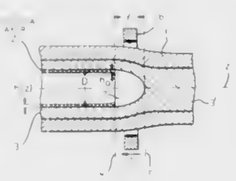
Continuation of Ser. No. 562,466, Dec. 16, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,651
Claims priority, application Italy, Dec. 16, 1982, 68476 A/82
Int. Cl.[5] C03B *37/018*
U.S. Cl. 65—3.12 **4 Claims**

1. A method of producing a preform for an optical fiber to be drawn therefrom, comprising the steps of:

(a) building up a tubular core matrix of selected refractive-

index profile by vapor deposition of silica and a dopant on the inner surface of a supporting tube of silica glass;

(b) thereafter and upon completion of the buildup of the core matrix, applying thereto a layer consisting essentially and substantially exclusively of said dopant at a reaction temperature, said reaction temperature being lower than a predetermined collapsing temperature, to generate upon subsequent evaporation an internal gas pressure of said dopant substantially balancing the vapor pressure of the dopant upon collapse of said tube and heating of said core



matrix to prevent the formation of a paraxial dip in the refractive-index profile of the fiber to be drawn by evaporation of said layer of said dopant preformed upon said core matrix;

(c) varying the thickness of said dopant layer during the application thereof to said core matrix by a progressive change in a flow of vaporized reactants from which the dopant layer is deposited at said reaction temperature, wherein the thickness h(z) of said dopant layer is a function of distance along the axis varying according to the formula

$$h(z) = \frac{h_0}{2\pi}\left\{\pi \cdot \left[1 - \frac{z}{\pi D} \cdot k \cdot K(k)\right] + 2\operatorname{arctg}\frac{D}{2z}\right\}$$

wherein

$$k = D \cdot (z^2 + D^2)^{-\frac{1}{2}}$$

$$K(k) = \int_0^{\pi/2} (1 - k^2 \sin^2\theta)^{-\frac{1}{2}}\, d\theta$$

$$h_0 = \frac{1}{\pi\rho D}\,\frac{m^*}{y}$$

m^* is the mass needed to generate the balancing gas pressure given by $pV/RT \cdot M$ where p is the vapor pressure of the dopant in a state of collapse of the preform caused by said predetermined collapsing temperature, V is the volume encompassed by an internal meniscus formed during collapse of the preform, R is the universal gas constant, T is absolute value of said collapsing temperature and M is the molar mass of the dopant, y is the axial depth of the meniscus, z is the axial distance from said one end, ρ is the density of the deposited dopant, D is the diameter of the inner surface of the core matrix before collapse, and θ is an angle included between a given diameter of the inner cross-section of the core matrix and a chord of said inner cross-section extending from an end of said diameter; and

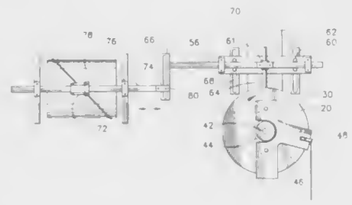
(d) subjecting said tube to a progressive collapse on an axis of said tube by exposing successive zones thereof from one end to the other to said predetermined collapsing temperature, thereby giving rise to an internal meniscus advancing from said one end along the axis.

4,921,517

METHOD AND APPARATUS FOR DIRECTING GLASS FIBER STRANDS FOR FABRICATING CONTINUOUS STRAND, NONWOVEN MAT

Steven A. Sholl, Lancaster, Ohio, assignor to Superior Glass Fibers, Inc., Bremen, Ohio

Filed Feb. 13, 1989, Ser. No. 309,301
Int. Cl.[5] C03B *37/02*
U.S. Cl. 65—4.4 10 Claims



1. A method for directing a continuous glass fiber onto a support surface for forming a non-woven mat, the method comprising:

(a) directing the fiber onto a pulling wheel which is rotating at an orientation in which tangents to the wheel intersect the support surface; and

(b) stripping the fiber from the wheel by reciprocating an edge of a stripping body, which is oriented transverse to the fiber travel direction, along a circular path adjacent the periphery of the wheel within an angular range at which tangents to the wheel intersect the support surface;

whereby the fiber is projected substantially tangential to the wheel to the support surface along an oscillating trajectory.

4,921,518

METHOD OF MAKING SHORT FIBER REINFORCED GLASS AND GLASS-CERAMIC MATRIX COMPOSITES

Roger A. Allaire, and Kishor P. Gadkaree, both of Big Flats, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 23, 1988, Ser. No. 288,990
Int. Cl.[5] C03C *14/00*
U.S. Cl. 65—18.1 8 Claims

1. A method of making short fiber reinforced glass matrix composites which comprises:

impregnating a continuous length of fibers with glass;

at least partially consolidating said length of fibers and the glass by at least partially wetting or coating the fibers with the glass and forming a fiber-glass matrix system encompassing said continuous length of fibers;

cutting said continuous length fiber reinforced glass matrix into a plurality of short fiber reinforced composites;

heating said short fiber reinforced composites to form a short fiber and glass matrix composite batch with the matrix in a molten condition having the short fibers suspended therein; and

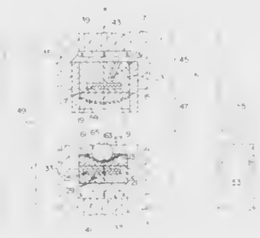
molding a gob of said composite molten batch to form a consolidated desired shape fiber reinforced glass composite article with uniform random distribution of short fibers.

4,921,519

MANUFACTURING MOLDED GLASS-ARTICLES FOR PRECISION-OPTICAL PURPOSES

Martin Schinker, Merzhausen; Johannes Brormann, Bötzingen; Dieter Stahn, Stegen; Walter Döll, Reute; Günter Kleer, Buchenbach, and Peter Manns, Freiburg, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,471
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729281
Int. Cl.[5] C03B *11/08*
U.S. Cl. 65—39 31 Claims



1. A method for manufacturing a press-finished glass article for precision optical purposes comprising:

(a) providing a press mold having at least one structureless function layer adapted to be contacted with the glass article to be produced,

said function layer being adhered to a stable basis wherein said stable basis is made of a amorphous, monocrystalline or polycrystalline material with a grain size of less than 0.5 um and said material comprises at least one of the elements Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Al, Si, Ge and C, at least one of said elements being present as a compound with nitrogen or oxygen,

said basis comprising a molding surface conforming to the shape of the glass article to be produced, said molding surface having been finished to a grade higher than the minimum requirement concerning the optical surfaces of the glass article to be produced and corresponding to the specification 5/2×0.040 of German Standard DIN 3140,

said function layer having been deposited on said molding surface of said stable basis to a thickness of less than 5 um and having been left in its unwrought state, said function layer comprising at least one of said elements of said basis and a compound containing carbon, nitrogen, or carbon and nitrogen;

(b) producing a glass preform which has a surface quality corresponding to at least that of fire polished glass in the areas destined to be the optical surfaces;

(c) placing that preform into said mold while said mold is held in a non-oxidizing atmosphere with an oxygen partial pressure of less than 10^{-3} mbar;

(d) pressing at an elevated temperature and pressure to form the produced glass article, wherein at the beginning of the pressing process the preform and at least one function layer of the mold have a temperature difference of at least 30 degrees K and less than a value where inhomogeneities or surface defects in the glass preform will be present; and

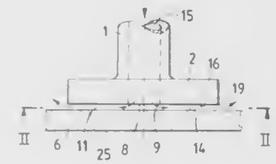
(e) cooling said produced glass article in the mold until a sufficient rigidity is achieved, removing the resultant produced glass article from the mold and annealing said resultant glass to form said glass article suitable for precision optical surfaces.

4,921,520

PROCESS FOR APPLYING FORCES TO GLASS SHEETS, IN PARTICULAR AT A HIGH TEMPERATURE

Giovanni M. Carlomagno, Via Cintia, 38, Naples, Italy

Filed Jan. 28, 1988, Ser. No. 149,400
Claims priority, application Italy, Feb. 3, 1987, 40404 A/87
Int. Cl.[5] C03B *25/035*
U.S. Cl. 65—111 7 Claims



1. A method of handling a sheet without physical contact therewith, using at least one device for handling having a first surface extending to a perimeter and a bore directed therethrough and intersecting the first surface, each device being bounded along at least part of its periphery by a space disposed at ambient pressure, the sheet having at least a second, lower surface, said method comprising the steps of:

(a) disposing the sheet approximate of and above each handling device so that the first and second surfaces oppose each other and a gap is formed therebetween;

(b) directing upward a stream of fluid under pressure through the bore of each handling device and towards the second surface of the sheet to push the sheet upwards;

(c) directing the pressurized fluid away from the fluid stream of each handling device as an outward fluid flow through each gap formed by each handling device and the sheet, towards its perimeter;

(d) permitting each outward fluid flow to escape from its gap into its bounded space; and

(e) setting the pressure of each fluid stream sufficiently greater than the ambient pressure and the width of each gap sufficiently small such that the pressure and velocity of each fluid flow as it initially enters each gap respectively decreases and increases and, thereafter, increases and decreases as a function of the distances of each fluid flow from its fluid stream, whereby a pressure negative with respect to the ambient pressure is created within the gap due to a venturi effect caused by the relatively high velocity of the fluid flow through the gap so that the integral of the pressure over the whole of the second surface develops a net attracting force directing the sheet towards the first surface.

4,921,521

METHOD AND FURNACE FOR MELTING INORGANIC MATERIALS

Yury D. Kremenets, Apt. 11 B-2 Mt. Vernon Gardens, 885 N. Easton Rd., Glenside, Pa. 19038

Filed Oct. 31, 1988, Ser. No. 264,816
Int. Cl.[5] C03B *5/04*
U.S. Cl. 65—135 36 Claims

1. A furnace for melting inorganic materials comprising:

(a) a bottom,

(b) first and second spaced-apart side walls;

(c) first and second spaced-apart end walls;

(d) a furnace interior bounded by said bottom, said side walls and said end walls;

(e) spaced-apart inner walls extending between said end walls and dividing said furnace interior into a plurality of chambers each having a top and a bottom, each of said chambers having two sides, one of said sides being defined by one of said inner walls and the other of said sides being

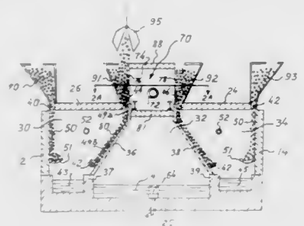
defined by another of said inner walls or by one of said side walls, at least one of said chambers being a liquefying chamber and at least one being a secondary chamber located adjacent said liquefying chamber;

(f) a curved crown for each said liquefying chamber covering said liquefying chamber and having two edges extending along the sides of said liquefying chamber adjacent a top portion of the sides of said liquefying chamber;

(g) a plurality of charge ports for each said liquefying chamber through which batch material is fed into said liquefying chamber for melting therein, said charge ports being located between said edges of the crown covering said liquefying chamber and the adjacent top portion of said sides of said liquefying chamber;

(h) means comprising at least one burner for each said liquefying chamber for developing heat-supplying flame that is directed longitudinally of said liquefying chamber between said end walls;

(i) said inner wall that defines a side of each said liquefying chamber being configured so that each said liquefying chamber is wider at the top of said liquefying chamber



than at the bottom of said liquefying chamber and so that batch material entering said liquefying chamber through a charge port of said plurality of charge ports that is located adjacent said side defined by said inner wall moves down a surface of said inner wall where it is heated by the flame in said liquefying chamber;

(j) each said liquefying chamber having space inside for liquefied batch to collect at its bottom and for hot gases from said flame to collect above the liquefied batch;

(k) passage means leading from said liquefying chamber (i) for providing one or more passages between said liquefying chamber and adjacent secondary chamber through which liquefied batch that has collected on the bottom of said liquefying chamber can flow into said adjacent secondary chamber and collect on the bottom of said secondary chamber and (ii) through which hot gases developed by said burner in said liquefying chamber can exit the liquefying chamber, and

(l) an outlet in said secondary chamber through which liquefied batch can be removed from said secondary chamber.

4,921,522

METHOD AND APPARATUS FOR FORMING A MICROPIPETTE WITH UNIFORM APPLICATION OF HEAT

Dale G. Flaming, 2165-G Francisco Blvd., San Rafael, Calif. 94901

Continuation-in-part of Ser. No. 342,177, Apr. 24, 1989, Pat. No. 4,869,745. This application Jul. 10, 1989, Ser. No. 377,044

Int. Cl.[5] C03B *23/11*

U.S. Cl. 65—108 **3 Claims**

1. A micropipette puller comprising:

a pair of gripping members for gripping a length of glass tubing at spaced points along the length thereof;

means for applying pulling forces to separate said gripping means;

a laser device for directing a laser beam against the near side of a length of said tubing between said spaced points; and

a concave mirror disposed beyond said tubing to reflect a portion of said beam against the far side of said length of tubing.

3. The method of pulling micropipettes comprising the steps of:

providing means for gripping a length of glass tubing at spaced points along the length thereof and applying forces to pull said gripping means apart;



providing a laser device for directing a laser beam;

providing a concave mirror and positioning same beyond a length of glass tubing held by said gripping means;

pulling said gripping means apart; and

directing a laser beam wider than said tubing against said length of said tubing so that a portion of said beam is reflected by said concave mirror back against the far side of said tubing.

4,921,523

MECHANISM FOR OPENING AND CLOSING AT LEAST ONE MOULD OF A GLASSWARE FORMING MACHINE

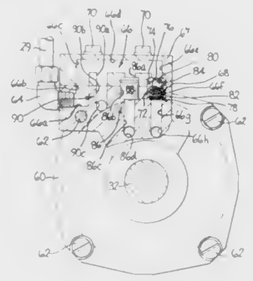
Hermann H. Nebelung, Winsen/Luhe, and Rune Andersson, Dusseldorf, both of Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Hartford, Conn.

Filed Mar. 16, 1989, Ser. No. 324,159

Claims priority, application United Kingdom, Mar. 31, 1988, 8807736

Int. Cl.[5] C03B *9/34, 9/353*

U.S. Cl. 65—172 **2 Claims**



1. A mechanism for opening and closing a mold of an individual section glass forming machine comprising a piston and cylinder assembly including manifold means for delivering pressurized air from an external source into the assembly and for exhausting air from the assembly to the atmosphere including

an end cap having a first surface and a second surface, a first intake air conduit communicating with said first surface and a second intake air conduit extending between said first and second surfaces,

air supply means including a fitting secured within said second intake air conduit at said second surface,

a cover member having an air conduit for connecting said second intake air conduit at said first surface with said first intake air conduit at said first surface,

means for securing said cover member on said end cap,

a check valve,

said cover member air conduit having a portion selectively sized proximate the first intake air conduit at said first surface to receive said check valve and means for removably securing said check valve within the check valve receiving portion of said cover member conduit so that the check valve can be replaced by taking the cover member off of said end cap and removing said check valve from said cover member.

4,921,524

OXIMINO ETHER COMPOUNDS

Terence Gilkerson, Canterbury; Robert W. Shaw, and David C. Jennens, both of Sittingbourne, all of England, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

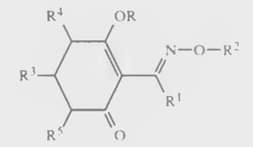
Filed Apr. 14, 1988, Ser. No. 181,410

Claims priority, application United Kingdom, May 15, 1987, 8711525

Int. Cl.[5] A01N *43/30*

U.S. Cl. 71—88 **9 Claims**

1. A compound of the general formula



(I)

wherein

R represents a hydrogen atom, or an optionally substituted alkyl group, or an acyl, an alkenyl or alkynyl group or an inorganic or organic cation;

R^1 represents an alkyl, haloalkyl, alkenyl, alkynyl or phenyl group;

R^2 represents an optionally substituted alkyl group or a phenylalkyl, cycloalkyl, alkenyl, haloakenyl, alkynyl or haloalkynyl group;

R^3 represents a hydrogen atom or an alkyl group; and

one of R^4 and R^5 represents a hydrogen atom or an alkyl group, while the other of R^4 and R^5 represents an optionally substituted phenyl group; and

said cation being selected from the group consisting of alkali and alkaline earth metal ions, transition metal ions, and ammonium ions, said ammonium ions being optionally substituted by 1–4 groups independently selected from otpionally substituted alkyl groups, optionally substituted phenyl groups and phenylalkyl groups; and

the optional substitution on alkyl group of R and R^2 and on alkyl group optionally substituted on ammonium ion being by one or more moieties independently selected from halogen atoms and C_{1-6} alkoxy, C_{1-6} alkylthio, (C_{1-6} alkoxy)carbonyl, and optionally substituted phenyl groups; and

the optional substitution on phenyl group of R^4 or R^5, on phenyl group optionally substituted on alkyl of R and on phenyl group optionally substituted on alkyl of R^2 and on phenyl group optionally substituted on ammonium ion being by one or more moieties independently selected from halogen atoms and nitro, cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{2-6} alkenylthio and alkynylthio, C_{3-6} cycloalkylthio, benzylthio optionally substituted by 1–3 atoms of halogen, and C_{1-6} alkyl, alkoxy, alkenyloxy, alkynyloxy, and haloalkyl; and amino, acetamido, mono (C_{1-4}) alkylamino and di(C_{1-4}-alkyl-)amino groups, and

8. A herbicidal composition, comprising from 0.5% to 95% by weight of a compound of formula I, as claimed in claim 1 or 6, together with at least one carrier.

4,921,525

THIODIAZOLYLUREA-CONTAINING AGENT FOR DEFOLIATING PLANTS

Klaus Grossman, Neuhofen; Johann Jung, Limburgerhof; Guenter Schulz, Ludwigshafen; Hubert Sauter, Mannheim; Peter Hofmeister, Neustadt, and Wolfgang Tuerk, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

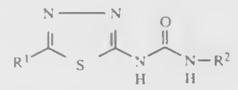
Continuation of Ser. No. 35,892, Apr. 8, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 258,058

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 3612830

Int. Cl.[5] A01D *43/28*

U.S. Cl. 71—73 **8 Claims**

1. A method of defoliating plants which comprises: applying to the plants an effective amount of a composition containing a liquid or solid carrier and as the active agent at least one 1,3,4-thiadiazol-2-ylurea of the formula I



I

where

R^1 is hydrogen or methyl and

R^2 is phenyl which is unsubstituted or substituted by one or two chlorine or fluorine atoms, methyl groups, trifluoromethyl groups or methoxy groups.

4,921,526

SUBSTITUTED BICYCLOAKLY-1,3-DIONES

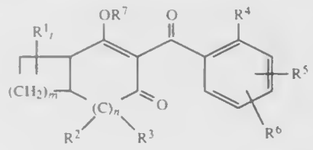
Shy-Fuh Lee, Sunnyvale; Gary W. Luehr, Mountain View; Carol R. Scott, Newark, all of Calif., and Werner Trueb, Therwil, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Nov. 27, 1987, Ser. No. 125,843

Int. Cl.[5] A01N *57/00*

U.S. Cl. 71—86 **12 Claims**

1. A compound of the following formula (I):



(I)

wherein,

R^1 is C_{1-8}alkyl;

each of R^2 and R^3 is, independently, hydrogen, C_{1-8}alkyl or $COOR^8$;

R^4 is C_{1-8}alkyl, optionally substituted with one to six halogen atoms; C_{1-8}alkoxy, optionally substituted with one to six halogen atoms; $S(O)_nR^{10}$; halogen; or nitro;

each of R^5 and R^6 is, independently, hydrogen; halogen; C_{1-8}alkyl, optionally substituted with one to six halogen atoms; C_{1-8}alkoxy, optionally substituted with one to six halogen atoms; C_{1-8}alkylcarbonyl; C_{1-8}alkoxycarbonyl; NR^8R^9; $SO_2NR^8R^9$; $S(O)_nR^{10}$; nitro; or cyano; with the proviso that neither of R^5 nor R^6 is attached to the 6 position;

R^7 is hydrogen, C_{1-8}alkyl. C_{1-8}alkylcarbonyl, C_{1-8}alkoxycar-

bonyl, $C(O)NR^8R^9$, C_{1-8}alkylsulfonyl, $P(O)-(OR^{11})_2$ or $R^8P(O)OR^{11}$;
each of R^8 and R^9 is, independently, hydrogen or C_{1-8}alkyl;
R^{10} is C_{1-8}alkyl, optionally substituted with one to six halogen atoms;
R^{11} is C_{1-8}alkyl;
m is zero to three
n is zero or one;
n' is zero, one or two; and
t is zero to six.

12. A compound according to claim **1** wherein m is 2, n is 1, t is 0, R_2, R_3, R_6 and R_7 are hydrogen, R_4 is nitro and R_5 is 4-chloro.

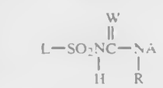
4,921,527

HERBICIDAL SULFONAMIDES

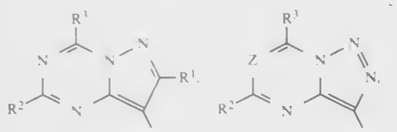
Chi-Ping Tseng, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 80,471, Jul. 31, 1987, abandoned. This application May 4, 1988, Ser. No. 190,242
Int. Cl.[5] **A01N** *43/54 43/58, 43/60, 43/90, 43/713, 43/707;* **C07D** *471/04, 487/04*
U.S. Cl. 71—90 **38 Claims**

1. A compound of the formula

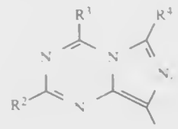


wherein
L is

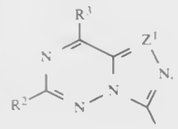


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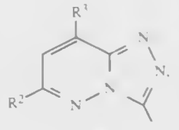
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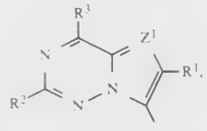
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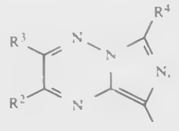
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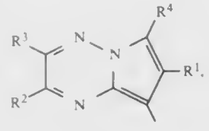
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L-5

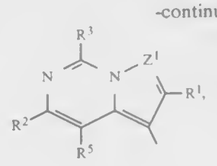


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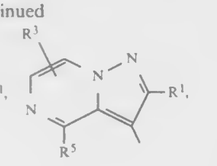


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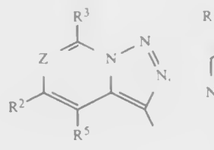
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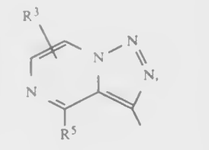
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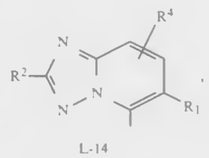
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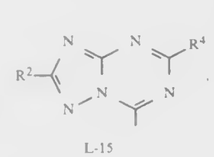
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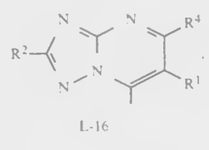
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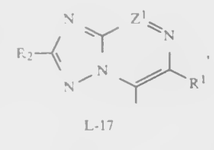
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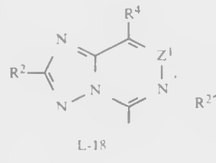
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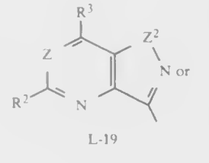
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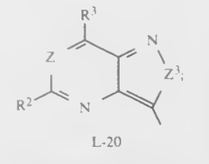
L-17



L-18



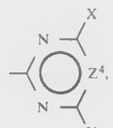
L-19



L-20

R^1 is H, halogen, C_1–C_3 alkyl, C_1–C_3 haloalkyl, OR^6, SR^6, $S(O)R^6$, $S(O)_2R^6$, CO_2R^7, $C(O)NR^8R^9$, $S(O)_2NR^{10}R^{11}$, C_2–C_3 alkenyl, C_2–C_3 haloalkenyl, C_2–C_3 alkynyl, NO_2, CN, $C(O)R^{12}$, $C(R^{13})$=NOR^{14} or C_1–C_2 alkyl substituted by C_1–C_2 alkoxy, C_1–C_2 alkylthio or CN;
R^2 is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_2 haloalkoxy or C_1–C_2 alkyl substituted with OCH_3, SCH_3 or CN;
R^3 is H, CH_3 or OCH_3;
R^4 is H or CH_3;
R^5 is H, halogen, C_1–C_3 alkyl, C_1–C_3 haloalkyl, OR^6, SR^6, $S(O)R^6$, $S(O)_2R^6$, CO_2R^7, $C(O)NR^8R^9$, $S(O)_2NR^{10}R^{11}$, C_2–C_3 alkenyl, C_2–C_3 haloalkenyl, C_2–C_3 alkynyl, NO_2, CN, $C(O)R^{12}$, or C_1–C_2 alkyl substituted by C_1–C_2 alkoxy, C_1–C_2 alkylthio or CN;
R^6 is C_1–C_3 alkyl, C_1–C_3 haloalkyl, C_3 alkenyl, C_2–C_3 haloalkenyl, propargyl, cyclopropyl, cyclopropylmethyl or —CH_2CH_2— substituted by OH, C_1–C_2 alkoxy, SH, C_1—C_2 thioalkyl or CN;

R^7 is C_1–C_4 alkyl, C_2–C_3 haloalkyl, allyl, propargyl, cyclopropyl, cyclopropylmethyl, or —CH_2CH_2— substituted by OH, OCH_3, SCH_3 or CN;
R^8 is H or C_1–C_2 alkyl;
R^9 is C_1–C_3 alkyl, C_1–C_3 alkoxy, allyl, propargyl, cyclopropyl, CH_2CN, CH_2CH_2CN or $CH_2CH_2OCH_3$;
R^{10} is H or C_1–C_3 alkyl;
R^{11} is C_1–C_3 alkyl, C_1–C_3 alkoxy, allyl, propargyl, cyclopropyl, cyclopropylmethyl, CH_2CN, CH_2CH_2CN or $CH_2CH_2OCH_3$;
R^{10} and R^{11} can be taken together to form a ring consisting of (—CH_2—)$_4$, (—CH_2—)$_5$ or (—CH_2CH_2—)$_2$O;
R^{12} is H, C_1–C_3 alkyl or cyclopropyl;
R^{13} is H, C_1–C_3 alkyl, cyclopropyl, Cl, CN, OCH_3, SCH_3 or $N(CH_3)_2$;
R^{14} is H or C_1–C_3 alkyl;
Z is N or CH;
Z^1 is N, CH or CCH_3;
Z^2 is O, S or NCH_3;
Z^3 is O, S or N—R^{15};
R^{15} is H, C_1–C_2 alkyl, C_1–C_2 haloalkyl, $CH_2CH_2OCH_3$, $CH_2CH_2SCH_3$, CH_2CN or CO_2CH_3;
W is O or S;
R is H or CH_3;
A is



A-1



(4) when the total number of carbon atoms of X and Y is greater than four, then the greatest combined number of carbons of any two substituents on an L, selected from R^1, R^2, R^3, R^4, R^5 and R^{15} is less than or equal to six;
(5) the total of carbon atoms of R^{10} and R^{11} is less than or equal to five.

19. An agriculturally suitable composition for controlling the growth of undesired vegetation comprising an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid diluent or liquid diluent.

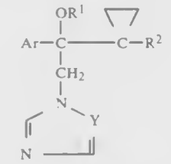
4,921,528

SUBSTITUTED AZOLYLMETHYL-CYCLOPROPYL-CARBINOL DERIVATIVES

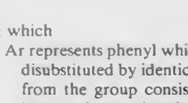
Klaus Böckmann, Cologne; Erik Regel, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Bergisch Gladbach; Jörg Konze, Cologne, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 792,088, Oct. 28, 1985, abandoned. This application Oct. 19, 1988, Ser. No. 260,212
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440116; Jun. 22, 1985, 3522440; Sep. 26, 1985, 3534310
Int. Cl.[5] **A01N** *43/653;* **C07D** *249/08*
U.S. Cl. 71—92 **5 Claims**

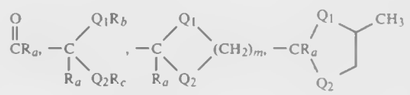
1. A substituted azolylmethyl-cyclopropyl-carbinol derivative of the formula



in which
Ar represents phenyl which is optionally monosubstituted or disubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, methyl, isopropyl, tert.-butyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, and phenyl or phenoxy, each of which is optionally substituted by flourine, chlorine and/or methyl;
R^2 represents fluorine, chlorine, bromine, —X—R^3 or —NR^4R^5,
wherein
R^3 represents straight-chain or branched alkyl having 1 to 12 carbon atoms, cycloalkyl having 5 to 7 carbon atoms, straight-chain or branched alkenyl having 2 to 12 carbon atoms, hydroxyalkyl having 1 to 12 carbon atoms, alkylthioalkyl having 1 to 4 carbon atoms in the alkylthio part and 1 to 4 carbon atoms in the alkyl part, alkoxycarbonylalkyl having 1 to 4 carbon atoms in the alkyl part, and phenyl or benzyl, each of which is optionally monosubstituted or disubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, methyl, isopropyl, tert.-butyl, methoxy, methylthio, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, and phenyl or phenoxy, each of which is optionally substituted by fluorine, chlorine and/or methyl; or

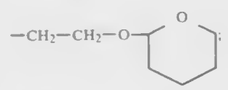


in which
X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkyl thioalkyl, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl, C_1–C_4 haloalkyl, C_2–C_4 alkynyl, C_3–C_5 cycloalkyl, azido, cyano,



or $N(OCH_3)CH_3$;
m is 2 or 3;
Q_1 and Q_2 are independently O or S;
R_a is H or C_1–C_3 alkyl;
R_b and R_c are independently C_1–C_3 alkyl; and
Z^4 is CH, CCH_3, CC_2H_5, CCl or CBr;
and their agriculturally suitable salts; provided that
(1) when X is halogen, then Z^4 is CH and Y is OCH_3, OC_2H_5, NH_2, $NHCH_3$, $N(CH_3)_2$, OCF_2H, OCF_2Br or $N(OCH_3)CH_3$;
(2) when X or Y is C_1 haloalkoxy, then Z^4 is CH;
(3) when W is S, then R is H, Z^4 is CH, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, OCH_2CH=CH_2, OCH_2C≡CH, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or

R^3 represents the radical of the formula



R^4 and R^5 together with the nitrogen atom to which they are bonded represent piperidinyl, piperazinyl or morpholinyl, each of which is optionally substituted by methyl, ethyl, methylcarbonyl or ethylcarbonyl, and

X represents oxygen, sulphur, and SO group or an SO_2 group, and

Y represents nitrogen,

or an addition product thereof with an acid or metal salt.

4,921,529

2-HYDROXYETHYL-AZOLE DERIVATIVES

Reinhard Lantzsch, Wuppertal; Brandes Wilhelm, Leichlingen; Gerd Hänsler; Paul Reinecke, both of Leverkusen, and Klaus Lürssen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

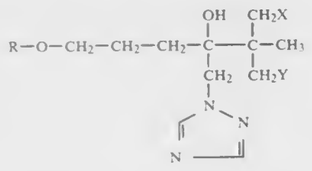
Filed Feb. 25, 1987, Ser. No. 18,658

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607286; Jan. 28, 1987, 3702301

Int. Cl.[5] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 71—92 **11 Claims**

1. A 2-Hydroxyethyl-azole derivative of the formula



in which

R is phenyl or mono- or di-substituted phenyl, the substituents being selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkylthio with 1 to 4 carbon atoms, and cycloalkyl with 3 to 7 carbon atoms,

X represents hydrogen and

Y represents hydrogen, and an acid addition salt or a metal salt complex thereof.

4,921,530

CERTAIN 3,5-PYRIDINE DICARBOXYLATES, THEIR THIO ANALOGUES HAVING HERBICIDAL ACTIVITY

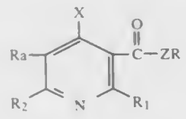
Len F. Lee, St. Charles, and Maria L. Miller, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 768,659, Aug. 27, 1985, Pat. No. 4,698,093, which is a continuation-in-part of Ser. No. 668,929, Nov. 6, 1984, abandoned. This application Jun. 22, 1987, Ser. No. 64,647

Int. Cl.[5] C07D *213/55;* **A01N** *43/40*

U.S. Cl. 71—94 **39 Claims**

1. A compound represented by the formula



wherein:

R is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyanoalkyl, alkoxyalkyl, haloalkyl, haloalkenyl, benzyl, and a cation, and Z is selected from O and S;

R_1 and R_2 are independently selected from fluorinated methyl, chlorofluorinated methyl, fluorinated ethyl, and lower alkyl provided that R_1 and R_2 cannot both be lower alkyl radicals;

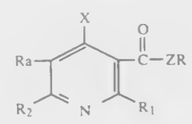
Ra is selected from:



radicals wherein R′ is selected from hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyanoalkyl, alkoxyalkyl, haloalkyl, haloalkenyl, benzyl and a cation; and;

X is $—S(O)_nR_6$ in which n is an integer from 0–2 inclusive and R_6 is selected from lower alkyl, lower alkenyl, lower alkynyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylalkyl, haloalkyl, phenyl and phenylalkyl optionally substituted with one or more of halogen, nitro, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy, and carboalkoxy radicals.

35. A method of controlling undesired vegetation comprising applying to the plant locus an effective amount of a compound represented by the formula



wherein:

R is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, cyanoalkyl, alkoxyalkyl, haloalkyl, and haloalkenyl; and Z is selected from O and S;

R_1 and R_2 are independently selected from fluorinated methyl, chlorofluorinated methyl, fluorinated ethyl, and lower alkyl provided that R_1 and R_2 cannot both be lower alkyl radicals;

Ra is selected from:

radicals wherein R′ is selected from lower alkyl, lower alkenyl, lower alkynyl, cyanoalkyl, alkoxyalkyl, haloalkyl, haloalkenyl and a cation; and;

X is $—S(O)_nR_6$ is which n is an integer from 0–2 inclusive and R_6 is selected from lower alkyl, lower alkenyl, lower alkynyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylalkyl, haloalkyl, phenyl and phenylalkyl optionally substituted with one or more of halogen, nitro, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy, and carboalkoxy radicals.

4,921,531

PROCESS FOR FORMING FINE CERAMIC POWDERS

Dennis C. Nagle, Ellicott City; John M. Brupbacher, Catonsville, and Leontios Christodoulou, Baltimore, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation of Ser. No. 126,328, Nov. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 943,899, Dec. 19, 1986, Pat. No. 4,710,348, which is a continuation of Ser. No. 662,928, Oct. 19, 1984, abandoned. This application Aug. 30, 1989, Ser. No. 401,480

The portion of the term of this patent subsequent to Dec. 1, 2006, has been disclaimed.

Int. Cl.[5] B22F *9/00*

U.S. Cl. 75—351 **47 Claims**

1. A method for the production of fine second phase powders, the method comprising steps of:

(a) preparing a mixture comprising powders of reactive second phase-forming reactants and a substantially nonreactive solvent metal in which the second phase-forming reactants are more soluble than the second phase;

(b) heating the mixture to a reaction initiation temperature approximating the melting point of the solvent metal to initiate an exothermic reaction;

(c) permitting the exothermic reaction to further heat the mixture, consuming the second phase-forming reactants to form a composite comprising a distribution of second phase particles in a solvent metal matrix;

(d) substantially separating the second phase particles from the solvent metal matrix; and

(e) recovering a powder comprising the second phase particles.

4,921,532

IRONMAKING BY MEANS OF A SMELTING SHAFT FURNACE

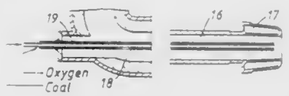
Martin J. Corbett, and Richard B. Smith, both of Guisborough, England, assignors to British Steel Corporation, London, England

Continuation of Ser. No. 939,128, Nov. 14, 1986, abandoned. This application May 12, 1989, Ser. No. 352,654

Claims priority, application United Kingdom, Mar. 14, 1985, 8506655

Int. Cl.[5] C21B *5/00*

U.S. Cl. 75—460 **15 Claims**



1. A method of ironmaking by means of a smelting shaft furnace including the steps of supplying iron ore and coke to the top of the furnace; and injecting coal and oxygen into the smelting zone of the furnace to promote combustion, to control reaction temperature and provide heat for smelting, the quantities of coal and oxygen injections being within the range of 0.7 to 1.7 of stochiometric conditions with respect to combustion to carbon monoxide and hydrogen.

4,921,533

FERRO-ALUMINUM COMPOSITE PIG

Edward S. Jackson, North Canton, Ohio, assignor to Galt Industries, Inc., Canton, Ohio

Filed Jun. 5, 1989, Ser. No. 361,232

Int. Cl.[5] C21C *7/02*

U.S. Cl. 75—315 **9 Claims**

1. As an article of manufacture, a ferro-aluminum addition agent for ferrous metals in the form of a composite pig,

said composite pig comprising a matrix of a ferro-aluminum alloy containing by weight of over 55% and ranging up to about 75% aluminum and the balance essentially iron,

said matrix alloy having distributed therethrough pieces of iron or steel in an amount sufficient to provide an overall pig composition of about 25% to 55% aluminum and the balance essentially iron,

said composite pig being produced by casting said matrix alloy about said pieces of iron or steel.

4,921,534

SECURITY MARKINGS, MATERIAL PROVIDED WITH SECURITY MARKS, AND APPARATUS TO DETECT THE SECURITY MARK

Michel Jalon, Paris, France, assignor to Petrel, Paris, France

Division of Ser. No. 325,935, Mar. 20, 1989, which is a division of Ser. No. 74,351, Jul. 16, 1987, Pat. No. 4,833,311. This application Oct. 27, 1989, Ser. No. 427,784

Int. Cl.[5] C09D *11/00*

U.S. Cl. 106—20 **6 Claims**

1. A printing varnish comprising at least one marking product, the marking product comprising rare-earth chelates or substrates including rare-earth chelates, the rare-earth ion present in the chelates arising from at least two different rare-earths, an energy transfer taking place between the two rare-earths and causing a change in fluoroscence wavelength of the chelates when exposed to ultraviolet radiation as a function of the temperature of the chelate so made and/or of the substrate including the chelate,

the varnish being colorless in solar or artificial light and changing in its fluorescence wavelength when under UV radiation as a function of temperature.

4,921,535

HEAT-SENSITIVE RECORDING MATERIAL

Hermann Nächbur, Reinach, and Rosalinde Braun, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 13, 1988, Ser. No. 205,877

Claims priority, application Switzerland, Jun. 24, 1987, 2378/87

Int. Cl.[5] C09D *11/00*

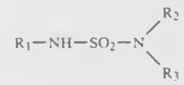
U.S. Cl. 106—21 **6 Claims**

1. A heat-sensitive recording material having a color reactant system which comprises

(1) a color former,

(2) a developer for the color former selected from the group consisting of a metal-free phenolic compound and a zinc thiocyanate complex, and

(3) a sulfamide compound of the formula



wherein

R_1, R_2 and R_3 are each independently lower alkyl, cyano-lower alkyl, cyclohexyl, phenyl, naphthyl, benzyl or phenethyl, or $—NR_2R_3$ is pyrrolidino, piperidino or morpholino.

4,921,536
NON-CALCAREOUS CASTABLE BINDER
Harold L. Rechter, Country Club Hills, Ill., assignor to Chicago Fire Brick Company, Chicago, Ill.
Continuation of Ser. No. 1,573, Jan. 8, 1987, Pat. No. 4,780,142.
This application Oct. 21, 1988, Ser. No. 260,624
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.[5] C04B *12/04*
U.S. Cl. 106—74 7 Claims

1. A workable binder which when mixed with water can be poured or vibrated in place and will set to a hard mass at normal atmospheric temperatures comprising a fumed silica binding agent, an alkali metal phosphate tempering agent, and a particulate alkali metal silicate hardening agent, said alkali metal silicate being selected from a group consisting of anhydrous sodium silicate having a molar ratio of SiO_2:Na_2O of 1:1 to 4:1, hydrated sodium silicate having molar ratio of SiO_2:Na_2O of 3:1 to 4:1, an anhydrous potassium silicate having a molar ratio of SiO_2:K_2O of at least 3:1, and mixtures thereof.

4. A workable binder for use in conjunction with aggregate and filler material to produce a hard setting castable composition, said binder comprising a binding agent of silica fume, a hardening agent of alkali metal silicate, and a tempering agent of alkali metal phosphate, said agents comprising a mixture in the following dry weight proportions on a basis of 100 parts of said binding agent: about 2 to about 25 parts of said hardening agent, and about 1 to about 3 parts of said tempering agent.

4,921,537
SHRINKAGE COMPENSATED MORTAR MATERIAL
Kazuo Horiguchi, Hiratsuka; Kazuyoshi Hosaka, Chigasaki, and Akira Yosbizumi, Kanagawa, all of Japan, assignors to Sandoz Ltd., Basel, Switzerland
Filed Apr. 19, 1984, Ser. No. 601,832
Claims priority, application Japan, May 14, 1983, 58-84692
Int. Cl.[5] C04B *7/02, 7/19*
U.S. Cl. 106—90 3 Claims

1. A shrinkage compensated mortar having about 40 to 60% by weight of fine aggregate and correspondingly 40 to 60% by weight of hydraulic mixture composition consisting of: 60 to 80% by weight of rapid hardening cement and correspondingly 20 to 40% by weight of portland cement; and, based on the weight of the hydraulic mixture composition, 5 to 8% by weight of lime-based expanding material comprising baked lime clinker powder comprising CaO crystal grains predominantly composed of the three components $3CaO.SiO_2$, CaO and $CaSO_4$; 5 to 8% by weight of silica powder; 0.2 to 0.4% by weight of hydroxycarboxylic acid or a salt thereof: and 2 to 3% by weight of a high performance water reducer comprising formaldehyde condensate of sulfonated melamine, sodium salt.

4,921,538
METHOD FOR RECYCLE AND USE OF CONTAMINATED SOIL AND SLUDGE
Fred A. Lafser, Jr., St. Louis, and Robert J. Schreiber, Jr., Ashland, both of Mo., assignors to Industrial Waste Management, Inc., St. Louis, Mo.
Filed Jun. 16, 1988, Ser. No. 207,637
Int. Cl.[5] C04B *7/02*
U.S. Cl. 106—100 15 Claims

1. A method for recycle and reuse of contaminated earthen mineral matter in the manufacture of cement clinker, the earthen mineral matter comprising at least about 16 wt % Fe_2O_3 or about 0.76 wt. % magnesia, the contaminated earthen mineral matter containing at least about 5 ppm arsenic, about 100 ppm barium, about 1 ppm cadmium, about 5 ppm chromium, about 5 ppm lead, about 0.2 ppm mercury, about 1 ppm selenium, or about 5 ppm silver, the method comprising
analyzing the contaminated earthen mineral matter to determine the constituents thereof,
mixing the contaminated matter with an amount of inorganic constituents and water to form a raw material slurry having a chemical composition suitable for the manufacture of Portland cement,
charging the slurry to a cement kiln,



heating the slurry in the kiln to a temperature sufficient to form cement clinker, and
removing the cement clinker from the kiln.

4,921,539
MODIFIED PITCH SPECIALLY ADAPTED TO BIND COAL PARTICLES
Jean-Pierre Harlin, Rousen; Jean-Pierre Giorgetti, Montfort sur Risle; Bernard Ruquier, Petit-Couronne, and Robert Herment, Montreuil, all of France, assignors to Shell Oil Company, Houston, Tex.
Filed Oct. 12, 1988, Ser. No. 256,526
Claims priority, application France, Oct. 30, 1987, 87 15071
Int. Cl.[5] C08L *95/00*
U.S. Cl. 106—284.03 7 Claims

1. A modified pitch composition specially adapted for binding coal particles comprising pitch derived from petroleum and having a softening point falling between 30 and 80? C., which pitch is reacted at a temperature from 150 to 200° C. with maleic anhydride to obtain a reacted pitch having a percentage of maleic anhydride groups corresponding to a reaction of 1 to 20 Kg of maleic anhydride with 100 Kg of pitch, and is further reacted with both a crosslinking agent selected from inorganic hydroxides of a Group I metal and a second crosslinking agent selected from polyamines having from 2 to 10 carbon atoms wherein the weight ratio of reacted pitch to crosslinking agents is in the range from about 1:1 to 10:1.

4,921,540
CORROSION INHIBITING PIGMENTS BASED ON ZINC SILICATE THEIR PRODUCTION AND THEIR USE
Manfred Gawol, Clausthal-Zellerfeld, and Gerhard Adrian, Goslar, both of Fed. Rep. of Germany, assignors to Dr. Hans Heubach GmbH & Co. KG, Langelsheim, Fed. Rep. of Germany
PCT No. PCT/EP86/00505, § 371 Date Mar. 13, 1987, § 102(e) Date Mar. 13, 1987, PCT Pub. No. WO87/01714, PCT Pub. Date Mar. 26, 1987
PCT Filed Aug. 28, 1986, Ser. No. 26,694
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532806
Int. Cl.[5] C03C *3/066*
U.S. Cl. 106—287.34 4 Claims

1. A lead-free corrosion inhibiting zinc silicate based pigment obtained by melting together the composition consisting essentially of
(a) between about 35 and 65 weight percent of ZnO,
(b) between about 15 and 35 weight percent of SiO_2,
(c) between about 5 and 20 weight percent of B_2O_3, and
(d) between about 1 and 20 weight percent of an oxide selected from the group consisting of WO_3, MoO_3, SnO_2 and combinations thereof.

4,921,541
ORTHORHOMBIC GREENISH-TINGED LEAD CHROMATE PIGMENTS
Leonardus J. H. Erkens, Maastricht; Herman J. J. M. Geurta, Kerkrade, both of Netherlands; Jean L. G. M. Vandevenne, Bilzen, Belgium, and Gerben P. Algra, Maastricht, Netherlands, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed May 25, 1988, Ser. No. 198,268
Claims priority, application Switzerland, Jun. 4, 1987, 2115/87
Int. Cl.[5] C09C *1/20*
U.S. Cl. 106—433 13 Claims

1. An orthorhombic greenish-tinged lead chromate pigment containing lead chromate and lead sulfate in a weight ratio of 91:9 to 100:0, which has a tinctorial strength of 0.066 to 0.053 with a standard depth of color of 1/25 in accordance with DIN 53235 and is obtainable by mixing an aqueous solution of a lead-salt with an aqueous solution of a chromate and, if necessary, of a sulfate under high turbulence in the presence of an aluminum salt and in the absence of zinc salts, by using an excess of lead ions of 0.003–0.12 mol per liter above the stoichiometric amount being present during or after the pigment is formed.

4,921,542
FINELY DIVIDED IRON OXIDE BLACK PIGMENTS, A PROCESS FOR THEIR PREPARATION AND THEIR USE
Jakob Rademachers; Karl-Werner Ganter; Wolfgang Rambold, and Günter Linde, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany
Filed Sep. 28, 1988, Ser. No. 250,076
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1987, 3734342
Int. Cl.[5] C01G *49/00*
U.S. Cl. 106—456 10 Claims

1. In an improved process for the preparation of finely divided iron oxide black pigments by precipitation from iron oxide black suspensions or the oxidation of metallic iron, then filtered, washed, dried and ground,
the improvement comprises carrying out the grinding of the dried iron oxide pigment in a jet mill with air as the grinding medium and with a water content of from about 1 to 6% by weight based on the iron oxide black pigment input to the process.

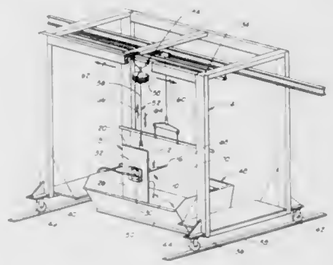
4,921,543
NOVEL LIQUIFIERS AND THEIR PREPARATION
Jafar Omran, Castrop-Rauxel, and Arnold Alscher, Essen, both of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany
Filed Aug. 24, 1988, Ser. No. 236,511
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730532
Int. Cl.[5] C08G *16/00*
U.S. Cl. 106—500 7 Claims

1. A process for the preparation of a liquifier for mineral binding agents comprising condensing by heating a member of the group consisting of naphthalene sulfonic acid and alkyl naphthalene sulfonic acids with formaldehyde or a formaldehyde precursor in highly acidic solution until a viscosity of 4,000 to 8,000 mPas is reached, adding water periodically to reduce the viscosity of the mixture until the condensation is complete and neutralizing the mixture to obtain a water-soluble condensation product.

4,921,544
ELECTROPHORETIC CLEANER AND STERLIZER
Anthony J. Cowle; Paul J. Cowle; Gregory J. Cowle, and Joffre B. Cowle, all of Chatswood, Australia, assignors to Baremek Pty. Limited, Willoughby, Australia
Division of Ser. No. 755,610, Jul. 16, 1985, Pat. No. 4,732,185.
This application Dec. 30, 1987, Ser. No. 140,152
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—1 3 Claims

1. A method of decontaminating and sterilizing a contact by electrophoresis, said method comprising the steps of:
(i) establishing a unidirectional electric field between two electrodes in a buffer solution, and
(ii) inserting a perforated holder containing said lens in the buffer solution in the electric field between the electrodes for a predetermined time, wherein said buffer solution has a pH between 8 and 9.

4,921,545
HARVESTER FOR REMOVING A SUBSTANCE FROM A PLATE
Gerardo A. Salas, Las Vegas, Nev., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.
Filed Jan. 25, 1989, Ser. No. 301,405
Int. Cl.[5] B08B *7/02*
U.S. Cl. 134—16 12 Claims



1. A method for harvesting manganese dioxide deposited on a surface of a plate using a tool having a strike end which is repeatedly movable, comprising the steps of:
supporting the plate from a frame assembly;
supporting the tool from the frame assembly near the plate with the strike end being disposed generally near the surface of the plate;
operating the tool so the strike end repeatedly strikingly engages the manganese dioxide deposited on the surface of the plate for breaking the deposited manganese dioxide to remove the deposited manganese dioxide from the surface of the plate;
moving the tool to various positions over the surface of the plate for repeatedly strikingly engaging the deposited manganese dioxide at various positions over substantially the entire surface of the plate whereby the manganese dioxide is removed from the surface of the plate; and
receiving the manganese dioxide removed from the surface of the plate.

4,921,546
METHOD AND APPARATUS FOR CLEANING CONDUITS

Christopher J. Bloch, Kingwood, Tex., assignor to Naylor Industrial Services, Inc., Pasadena, Tex.

Division of Ser. No. 78,127, Jul. 27, 1987, Pat. No. 4,853,014. This application Jul. 15, 1988, Ser. No. 219,647
Int. Cl.[5] B08B *9/02*
U.S. Cl. 134—22.12 22 Claims



13. A method of removing deposits from the internal surfaces of a conduit having a discharge opening, comprising:

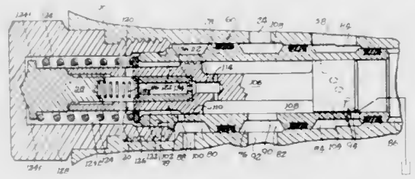
(a) passing gas through said conduit from a source of gas having a pressure sufficient for development of a sonic pressure wave at the discharge of said conduit; and

(b) contacting a dispersion of a decelerating fluid with said gas upstream of the discharge outlet of said conduit and in sufficient volume to reduce the pressure and velocity of said gas at said discharge opening, thus preventing the development of a sonic pressure wave at said discharge opening and permitting the flow of said gas in said conduit at sufficient velocity for inducing cavitation of said gas on the inner wall of said conduit to clean said inner wall.

4,921,547
PROPORTIONAL PRIORITY FLOW REGULATOR

Constantine Kosarzecki, Iverness, Ill., assignor to Vickers Incorporated, Troy, Mich.

Filed Jul. 26, 1989, Ser. No. 385,736
Int. Cl.[5] G05D *11/13*; F16K *31/363*
U.S. Cl. 137—115 14 Claims



1. In a valve structure, a body defining a plurality of cavities adapted for receiving cartridge type valve elements therewithin, and flow passages interconnecting said cavities and said valve elements, said valve body having fluid inlet port means for delivery of pressurized fluid into one of said valve elements, a regulated outlet port, a by-pass port and a drain port, the improvement comprising: valve means in a first cavity of said valve body for controlling pressure to a pressure compensated priority flow divider valve in a second cavity for directing a controlled primary fluid flow, on a priority basis, through said regulated outlet port of said valve body, and for directing any excess fluid to said by-pass port, said valve means comprising a modulated orifice double-spool valve including an elongated cage-like housing secured coaxially within said first cavity of said valve body, said housing defining between a stepped bounding wall thereof and said valve body a plurality of axially spaced, annular channels, first port means extending radially through said bounding wall of said housing and communicating with a first of said annular channels, a conduit communicating between said first of said annular channels and a fluid drain port in said valve body, a pressure port axially spaced from said first port means and extending radially through said bounding wall of said housing and communicating with a second of said annular channels and with said fluid entry port means, an axially-extending, reciprocally-shiftable, fluid-pressure-responsive, piston-like outer spool within said cage-like housing, said outer spool having upper and lower radially enlarged piston like body portions each in contiguous, fluid-sealing and reciprocally-sliding abutment with said bounding wall of said valve housing, said outer spool defining a longitudinally extending core intermediate of and connecting said upper and said lower body portions, said core being of a reduced diameter with respect to said body portions for defining with said housing an annular passageway in fluid-flow communication with said pressure port, radially-extending fluid transmission aperture means in a lower sector of said housing bounding wall for establishing fluid-flow communication between a lower annular channel of said valve and through said annular passageway with said pressure port upon displacement of said outer spool and said lower enlarged body portion from a retracted position to expose said aperture means, internal pressure-compensated flow regulatory means in said valve for establishing constant pilot fluid-flow in said valve, said pressure-compensating flow regulatory means including a central bore formed in an end portion of said outer spool and defining a sleeve, said central bore communicating with said annular passageway through a radial passageway extending from said central bore, radially extending through port means formed in said sleeve and communicating with an axially extending annular upper passageway between an upper end of said outer spool and said housing which in turn communicates with said drain port through discharge orifice means, a flow regulator inner spool slidably disposed in said central bore, said inner spool having a floor and an elongated, upwardly opening internal cavity, a flow controlling restricted inlet orifice in said floor of said flow regulator inner spool and communicating with said central bore and with said internal cavity, first spring means biasing said inner spool downwardly to open said radial through port means in opposition to fluid pressure applied to said inner spool through said passageway communicating with said annular passage, plug means surmounting said inner spool for restraining said inner spool and for sealing said central bore at an upper end thereof, second spring means for biasing said outer spool upwardly, and cap means for sealing an outer end of said first cavity and providing a stop for locating said outer spool in said retracted position.

4,921,548
ALUMINUM-LITHIUM ALLOYS AND METHOD OF MAKING SAME

Chul W. Cho, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 927,058, Nov. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 793,260, Oct. 31, 1985, Pat. No. 4,844,750. This application Jul. 1, 1988, Ser. No. 214,858
Int. Cl.[5] C22F *1/04*
U.S. Cl. 148—12.7 A 17 Claims

1. A method of producing an unrecrystallized, thin gauge cold rolled aluminum-lithium sheet product having improved levels of strength and fracture toughness, the method comprising the steps of:

(a) providing a body of a lithium containing aluminum base alloy;

(b) heating the body to a hot rolling temperature;

(c) hot rolling the body to a first intermediate gauge product;

(d) cold rolling to a second intermediate sheet product;

(e) reheating and hot rolling the second intermediate sheet product to a sheet product while avoiding substantial recrystallization thereof, the hot rolling adapted to relieve stored energy capable of initiating recrystallization during a subsequent heat treating step;

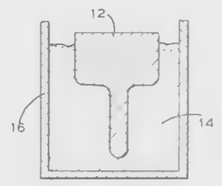


(f) solution heat treating, quenching and aging said sheet product to provide a substantially unrecrystallized product having improved levels of strength and fracture toughness.

4,921,549
PROMOTING DIRECTIONAL GRAIN GROWTH IN OBJECTS

Curtiss M. Austin, Warwick, N.Y., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Mar. 19, 1984, Ser. No. 591,206
Int. Cl.[5] C21D *1/74*
U.S. Cl. 148—13.1 2 Claims



1. A furnacing method for generating and controlling the velocity of an advancing isotherm within an object so as to promote directional recrystallization throughout the entire object, the method comprising:

(a) surrounding the object in a stationary heat insulator so that a substantial portion of the object is enveloped by the insulator leaving only a remaining portion exposed,

(b) placing the object and insulator in the furnace so that the heat of the furance is directly directed at the exposed portion of the object so as to propagate the isotherm throughout the entire object, and

(c) modulating the temprature of the furnace to advance the isotherm through the entire object to cause directional recrystallization therein.

4,921,550
DELAYED REFLOW ALLOY MIX SOLDER PASTE

Neil R. McLellan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 134,394, Dec. 17, 1987, Pat. No. 4,865,654. This application Jul. 21, 1989, Ser. No. 384,182
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—24 5 Claims

1. A process for delaying solder melt and for minimizing the number and size of voids in a solder joint, comprising the steps of:

prebaking a circuit board with solder paste on the circuit board footpads, and then soldering surface mount devices to the board in a vapor phase furnace.

4,921,551
PERMANENT MAGNET MANUFACTURE FROM VERY LOW COERCIVITY CRYSTALLINE RARE EARTH-TRANSITION METAL-BORON ALLOY

Peter Vernia, Rochester, and Robert W. Lee, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 823,785, Jan. 29, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 246,953
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—101 9 Claims

1. A method of processing alloys based on rare earth elements, iron and boron to make permanent magnets, the method comprising hot working a magnetically soft crystalline material consisting essential of grains of $RE_2TM_{14}B$ where RE is one or more rare earth elements at least 60 percent of which is neodymium and/or praseodymium, TM is a transition metal at least 60 percent of which is iron, and B is the element boron, which grains have an average length greater than about 5 microns in the direction of the crystallographic c-axis and are separated by an intergranular layer of a material richer in rare earth elements than the $RE_2TM_{14}B$ grains, the material initially having no more than 500 Oe coercivity, said working being carried out at an elevated temperature above the melting temperature of the intergranular phase and at a pressure such that material acquires coercivity in excess of 1000 Oe.

4,921,552
COMPOSITION AND METHOD FOR NON-CHROMATE COATING OF ALUMINUM

Lothar S. Sander, Princeton, N.J.; Edward M. Musingo, Roslyn, and William J. Neill, Wyndmoor, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 3, 1988, Ser. No. 189,567
Int. Cl.[5] C23C *22/34*
U.S. Cl. 14.8—247 9 Claims

1. An aqueous acidic solution which is effective in forming a dried in place non-chromate conversion coating on the surface of aluminum or alloys thereof, consisting essentially of:

(a) from greater than 10 to about 16 grams per liter of a polymer selected from the group consisting of polyacrylic acid and homopolymers thereof;

(b) from greater than 12 to about 19 grams per liter dihydrohexafluozirconic acid; and

(c) from about 0.17 to about 0.3 grams per liter hydrofluoric acid wherein the ratio of a:b:c is in the range of about 0.84 to about 0.89:1: up to about 0.02.

4,921,553
MAGNETICALLY ANISOTROPIC BOND MAGNET, MAGNETIC POWDER FOR THE MAGNET AND MANUFACTURING METHOD OF THE POWDER

Masatoki Tokunga, Fukaya; Yasuto Nozawa, and Katsunori Iwasaki, both of Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 17, 1987, Ser. No. 26,969
Claims priority, application Japan, Mar. 20, 1986, 61-62174; May 9, 1986, 61-106187
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—302 30 Claims

1. Magnetically anisotropic bond magnet consisting essentially of 15–40 vol % of resin binder and the balance alloy powder of the R-TM-B-M system, wherein R is at least one of the rare earth elements including Y, TM is Fe or Fe a part of which has been substituted with Co., B is boron, and M is at least one additive selected from the group consisting of Si, Al, Nb, Zr, P and C; wherein the R-TM-B-M system alloy powder has an average crystal size of 0.01–0.5 μm, an average grain size of 1–1,000 μm, a flattened grain structure with (c) greater

than (a) in which (c) is the average size of the grain in the direction perpendicular to the C-axis and (a) is the average size of the grain in the C-axis direction, and is magnetically anisotropic; and wherein the R-TM-B-M system alloy powder's easy magnetizing axes have been directed to a given direction.

4,921,554

JOINING OF POROUS SILICON CARBIDE BODIES

Carl H. Bates; John T. Coubig, both of Worcester, Mass., and Paul J. Pelletier, Thompson, Conn., assignors to Norton Company, Worcester, Mass.

Filed Sep. 27, 1988, Ser. No. 250,018
Int. Cl.[5] B32B *18/00*
U.S. Cl. 156—89 20 Claims

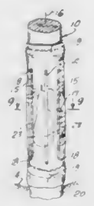
1. A method of joining two porous sinterable silicon carbide bodies to each other which comprises (i) forming an aqueous slip having a silicon carbide composition which is essentially the same as that used to form the bodies to be joined in combination with at least one sintering aid and a binder which during sintering will burn out and leave essentially no residues, (ii) placing the two bodies to be joined in close proximity to each other to form an interstice there between and filling the interstice with said slip to form a composite structure, (iii) subjecting the composite structure to cold isostatic pressing to form a joint having good handling strength, and (iv) sintering the pressed structure to densify it to at least 90% of theoretical density.

4,921,555

PROCESS FOR REINFORCING UTILITY POLES

Russell A. Skiff, 15170 Avenue 260, Visalia, Calif. 93277

Filed May 25, 1989, Ser. No. 356,411
Int. Cl.[5] B32B *35/00*
U.S. Cl. 156—98 19 Claims



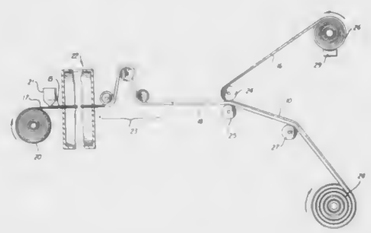
1. A process for reinforcing utility poles and the like of the type having an area of decomposition or damage, comprising a length to be repaired comprising the steps of:
removing any decomposed or damaged material from the exterior of the pole in the area to be repaired;
coating the periphery of a length of the pole below the area to be repaired with an uncured but curable resin to form a lower ring;
coating the periphery of a length of the pole above the area to be repaired with an uncured but curable resin to form an upper ring;
covering the outer surface of the pole between the upper ring and the lower ring with a porous reinforcing material to a depth of at least one-sixteenth of an inch;
wrapping a resin impervious layer over the porous reinforcing material at least as low as the lower ring and at least as high as near the upper ring;
injecting a liquid, curable injecting resin below the surface of the resin impervious layer to an extent to saturate the porous reinforcing material; and
permitting the curable resin to cure.

4,921,556

WRINKLE FREE LAMINATION METHOD FOR RELEASABLY LAMINATED, STRETCHED WEBS

Zbigniew Hakiel, Webster; Gerald G. Reafler; Robert W. Schrader, both of Rochester, and James R. Scbuler, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1988, Ser. No. 272,271
Int. Cl.[5] B32B *31/08*
U.S. Cl. 156—164 5 Claims



1. A method of releasably laminating a first stretchable web which has been coated with an adhesive layer and drawn through a heated drying zone, whereby said first web is at least slightly stretched, to a second web to protect the adhesive coating of the first web, which comprises:
(a) continuously drawing the first web through a nip formed by a resilient and a non-resilient roller, with the adhesive coating facing toward the non-resilient roller,
(b) continuously drawing a second stretchable web having relatively higher tensile strain than the first web around the partial periphery of the non-resilient roller into the nip on the adhesive-coated side of the first web,
(c) pressing the first and second webs at moderate pressure into laminating contact in the nip to form a releasably laminated web, and
(d) winding up the laminated web as a roll with the second web on the outside of the roll, said laminated web being wrinkle-free and resistant to partial delamination and wrinkling when unwound,
the stretchable second web being continuously unwound from a supply roll having a web tension controlling means,
and the surface of the non-resilient roller having a lower coefficient of friction than the surface of the resilient roller so that the tensile strain applied to the second web is transmitted to the nip.

5. A method of manufacturing a thermoformable paint-coated film web having a paint layer coated on one side of a stretchable thermoplastic carrier film web and a pressure-sensitive adhesive layer on the other side, which comprises
coating said adhesive layer on said carrier film web and drawing the adhesive-coated web through a heated drying zone to dry the adhesive layer, whereby said web is at least slightly stretched,
continuously drawing the adhesive-coated web through a nip formed by a resilient and a non-resilient roller, with the adhesive coating facing toward the non-resilient roller,

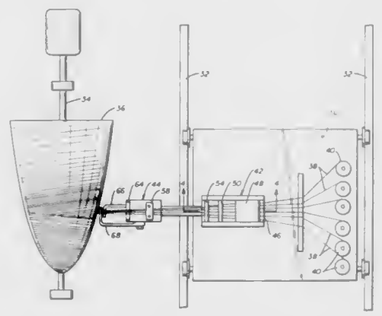
applying a tensile strain to a second and thinner stretchable web and continuously drawing said web around part of the periphery of the non-resilient roller into said nip in contact with the adhesive layer of the adhesive-coated web, said second web having a release coating on its side in contact with the adhesive layer,
pressing the webs at moderate pressure into laminating contact in the nip to form a releasably laminated web,
winding up the laminated web as a roll with the second web on the outside of the roll, and
wherein the surface of the non-resilient roller has a lower coefficient of friction than the surface of the resilient roller, whereby the tensile strain applied to the second web is transmitted to the nip, and
wherein the laminated web is wrinkle-free when thereafter unwound, is resistant to partial delamination and wrinkling of the second web and is free of visible patterns in the paint layer resulting from such partial delamination.

4,921,557

FABRICATION BY FILAMENT WINDING WITH AN ELASTOMERIC MATERIAL

Wayne H. Nakamura, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 13, 1988, Ser. No. 209,143
Int. Cl.[5] B65H *81/00, 81/02*
U.S. Cl. 156—169 11 Claims



1. A method for fabricating a conical shaped flexible fiber-reinforced membrane for providing an inflatable, deployable or expandable structure which is able to sustain high structural loads, which comprises the steps of:
(a) applying a first coat of an elastomeric silicone rubber material on a conical shaped mandrel;
(a_1) eliminating surface irregularities in said first coat of said elastomeric material on said conical mandrel by smoothing said first coat of said elastomeric material, and then partially curing the smooth coat of elastomeric material to a tacky state; and,
(b) impregnating yarns of high modulus organic filaments with a resin formed from said elastomeric silicone rubber material and applying a first ply of said impregnated yarns to said conical mandrel using a steep helical winding method;
(c) applying a second coat of said elastomeric silicone rubber material over said first ply;
(c_1) eliminating surface irregularities in said second coat of said elastomeric material on said conical mandrel by smoothing said second coat of said elastomeric material, and then partially curing the smooth coat of elastomeric material to a tacky state; and,
(d) impregnating yarns of said high modulus organic filaments with said resin formed from said elastomeric material of step (b) and applying a second ply of said impregnated yarns to said conical mandrel;
(e) applying a third coat of said elastomeric silicone rubber material over said second ply;
(e_1) eliminating surface irregularities in said third coat of said elastomeric material on said conical mandrel by smoothing said third coat of said elastomeric material, and then partially curing the smooth coat of elastomeric material to a tacky state; and,
(f) impregnating yarns of said high modulus organic filaments with said resin formed from said silicone rubber elastomeric material of step (b) and applying a third ply of said impregnated yarns to said conical mandrel using a steep helical winding method;
(g) applying an insulating layer of said elastomeric silicone rubber material; and
(h) curing said elastomeric material in said fabricated structure; said method being further characterized by said steep helical winding method providing for a plurality of index winding steps in which said impregnated yarns are laid on said conical mandrel in one direction of carriage movement, each index winding step being followed by a dead winding step in which the carriage movement is reversed and returned to its original position without laying fibers on said conical mandrel, said index winding steps continuing until said mandrel is covered.

4,921,558

POLY(ARYLENE SULFIDE) COMPOSITES

Timothy W. Johnson, and Don G. Brady, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 121,494, Nov. 16, 1987. This application Jan. 26, 1989, Ser. No. 301,966
Int. Cl.[5] C08K *3/20*
U.S. Cl. 156—181 5 Claims

1. A process for forming an article having a poly(arylene sulfide) resin matrix, long carbon fiber reinforcement embedded in the matrix and a crack inhibiting agent uniformly dispersed throughout the matrix in finely divided form comprising:
(a) mixing particles of a poly(arylene sulfide) resin and particles of a crack inhibiting agent with a liquid carrier to form an aqueous polymer slurry, wherein the particles in said slurry have an average particle size in the range of from about 2 microns to about 50 microns and said slurry contains in the range of from about 20 to about 500 parts by weight of said poly(arylene sulfide) resin for each part by weight of said crack inhibiting agent and said crack inhibiting agent being selected from the group consisting of polyethylene, polypropylene, and copolymers of ethylene or propylene with up to about 10 percent by weight based on total copolymer weight of other monomers.
(b) agitating said aqueous polymer slurry;
(c) pulling at least one roving of carbon fibers having a length of at least two centimeters through said aqueous polymer slurry in such a manner as to pick up a mixture of particles of said poly(arylene sulfide) and said crack inhibiting agent from said slurry and form an impregnated wet roving;
(d) at least partially drying said impregnated wet roving to form an at least partially dried impregnated roving;
(e) pulling said at least partially dried impregnated roving through a die having a temperature sufficiently high to soften the poly(arylene sulfide) particles impregnated in the roving; and
(f) applying sufficient pressure to fuse the poly(arylene sulfide) particles into a continuous resin matrix.

4,921,559
PROCESS OF MAKING AN ACOUSTIC CARBON DIAPHRAGM
Hideo Odajima, Fujioka, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan
Filed Mar. 7, 1989, Ser. No. 319,705
Int. Cl.[5] B29C *65/54;* C01B *31/02*
U.S. Cl. 156—242 10 Claims

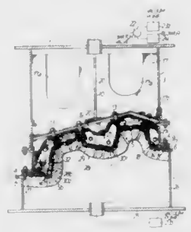
1. A process of making an acoustic carbon diaphragm comprising the steps of:
mixing and kneading an organic composition containing at least one monomer, prepolymer or low polymer of a polymerizable thermosetting resin exhibiting high carbon residual yield after calcining and a carbon powder,
preliminarily molding the organic composition into a film or sheet shape, thereby producing a sheet-like molding,
calcining a diaphragm molding molded into a desired diaphragm shape and a voice coil bobbin molding molded into a desired voice coil bobbin shape from the sheet-like molding and
bonding the calcined diaphragm molding to the calcined voice coil bobbin by means of an organic liquid composition to form a bonded assembly, then forming an integral structure of the diaphragm and the voice coil bobbin by calcining the bonded assembly in an inert gas atmosphere.

4,921,560
METHOD FOR FIXING PERMANENT MAGNETS TO COVER OF BEDCLOTHING
Tomoyoshi Yamaguchi, Tokyo, Japan, assignor to J. L. S. Corp., Tokyo, Japan
Filed Oct. 6, 1987, Ser. No. 105,336
Claims priority, application Japan, Jun. 18, 1987, 62-152101
Int. Cl.[5] A61B *17/52;* B29C *53/02, 65/18*
U.S. Cl. 156—213 5 Claims



1 A method for fixing a permanent magnet to a cover of bedclothing, comprising the steps of:
provided a patch of material;
applying a bonding-agent sheet to said patch;
fixing temporarily a permanent magnet to a center portion of said bonding-agent sheet to prepare an assembly consisting of said patch, said bonding-agent sheet and said permanent magnet;
placing said assembly on the cover of said bedclothing so that said permanent magnet of said assembly abuts on said cover of said bedclothing;
placing a platen having a hole for receiving said permanent magent of said assembly therein on said assembly; and
heating said platen to melt said bonding-agent sheet of said assembly so as to bond said patch of said assembly to said cover of said bedclothing.

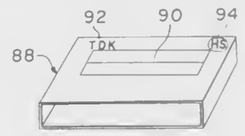
4,921,561
PROCESS FOR MANUFACTURING EMBOSSED ARTICLES OF SYNTHETIC RESIN
Toshiyuki Kinugasa; Tamio Furuya, both of Hidaka; Yoshiki Ishige, Tokorozawa; Nobuo Kikuchi, Sakado, and Shoji Takahashi, Iruma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 15, 1985, Ser. No. 787,773
Claims priority, application Japan, Oct. 18, 1984, 59-219174; May 27, 1985, 60-113831
Int. Cl.[5] B29C *51/10*
U.S. Cl. 156—219 13 Claims



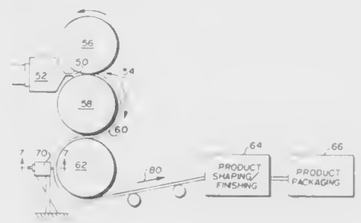
1. A process for manufacturing an embossed article of synthetic resin, comprising the steps of:
applying an adhesive on one surface of a core layer;
placing said core layer on a press die with the adhesive facing outwardly;
heating a synthetic resin sheet to a softening temperature;
pressing the heated synthetic resin sheet against an embossing die by the press die to shape the resin sheet and adhesively secure the sheet to the core layer, said embossing die being made by electro-chemical molding to have an embossing surface with an embossing pattern thereon for imparting to the resin sheet a surface finish corresponding to the surface of a particular product, said embossing die being formed with a multitude of fine vacuum pores distributed uniformly over the entire embossing surface of sufficiently small size so as not to affect the embossing pattern;
forcing said synthetic resin sheet against said embossing surface by applying a vacuum through said fine vacuum pores to imprint said embossing pattern onto the surface of said synthetic resin sheet; and
applying blowing pressure to said synthetic resin sheet through said fine vacuum pores, after the embossing of the sheet, to release said synthetic resin sheet from said embossing surface while urging said sheet against said core layer to insure adhesive bonding therebetween.

4,921,562
PROCESS OF PREPARING A CASING FOR MAGNETIC RECORDING MEDIUM
Tatsuo Fujii, Saku, Japan, assignor to TDK Corporation, Tokyo, Japan
Division of Ser. No. 839,534, Mar. 14, 1986, Pat. No. 4,796,753.
This application Sep. 22, 1988, Ser. No. 247,520
Claims priority, application Japan, Apr. 5, 1985, 60-51179; Apr. 8, 1985, 60-74129; Jan. 7, 1986, 61-000500; Jan. 8, 1986, 61-001890
Int. Cl.[5] B32B *31/16*
U.S. Cl. 156—224 8 Claims

1. A process for preparing a casing for magnetic recording medium comprising forming a raw semi-dried plastic sheet from a molten plastic material, embossing one surface of said plastic sheet with a lattice-like arrangement, bonding a printed transparent or semi-transparent plastic film on the other surface of said raw plastic sheet to form a laminated sheet, punching and stamping said laminated sheet to obtain a blank, and bending the blank into the box form.

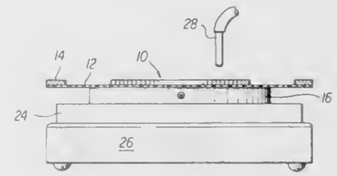


4,921,563
METHOD FOR MAKING FOLDABLE PLASTIC PRODUCTS
Gary T. Schwertner, St. Joseph, Tenn., and Edward S. Robbins, III, 459 N. Court, Florence, Ala. 35630, assignors to Edward S. Robbins, III, Florence, Ala.
Division of Ser. No. 82,142, Aug. 6, 1987, Pat. No. 4,784,888.
This application Jul. 19, 1988, Ser. No. 221,367
Int. Cl.[5] B29C *47/06, 59/04;* B32B *3/10, 31/30*
U.S. Cl. 156—303.1 22 Claims



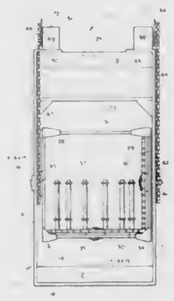
1. A process for making a foldable plastic product comprising the steps of:
(a) forming a shaped body of plastic material; and
(b) slitting said body so as to create a hinge in said body about which adjacent sections of said body may be folded by forming a slit that extends, when viewed in profile, in a first direction from one surface of said plastic product towards another surface of said plastic product to a first location within said body between said one and another surfaces, and extends in a second direction, different from said first direction, from said first location to a second location which is also within said body between said one and another surfaces thereof but laterally offset relative to said first location; wherein
(c) said slitting step (b) includes forming, by means of said slit, cooperating elongate bridge and platform portions such that said bridge portion is connected at each of its opposing ends to a respective one of said adjacent body sections so as to establish said hinge about which said adjacent body sections may be folded, and said platform portion is connected at one of its ends to one of said adjacent body sections and extends towards, but is unconnected to, another of said adjacent body sections to thereby support said bridge portion when said adjacent body sections are unfolded.

4,921,564
METHOD AND APPARATUS FOR REMOVING CIRCUIT CHIPS FROM WAFER HANDLING TAPE
Arthur H. Moore, Fillmore, Calif., assignor to Semiconductor Equipment Corp., Moorpark, Calif.
Filed May 23, 1988, Ser. No. 197,306
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—344 16 Claims



1. In a method for handling a semiconductor wafer adhesively mounted on a wafer handling tape by means of an adhesive material, the wafer having circuit elements formed on an exposed surface thereof, the circuit elements being separated from each and formed into circuit chips by sawing or scribing while the wafer is mounted on the tape, a method of removing the individual circuit chips from the tape, comprising:
subjecting portions of the surface of the tape opposite that surface bearing the circuit chips to a vacuum, thereby to pull said portions of the tape away from the circuit chips;
heating the tape to reduce adhesion between the circuit chips and the adhesive material; and,
removing the circuit chips from the tape and the adhesive material adhering to the tape.

4,921,565
PARTS ORBITER FOR CHEM-MILLING VAT
Paul Slysh, 3047 Ducommun Ave., San Diego, Calif. 92122
Filed Apr. 28, 1989, Ser. No. 344,688
Int. Cl.[5] B44C *1/22;* C23F *1/00*
U.S. Cl. 156—345 8 Claims



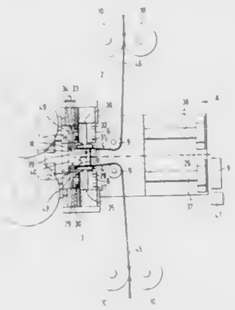
1 An improved parts orbiter for a chem-milling vat comprising:
a major frame assembly having a pair of laterally spaced upright side members, a bottom cross member and a top cross member;
a minor frame assembly having a pair of laterally spaced side members each having a top end and a bottom end, a top cross member connecting said respective top ends and a bottom cross member connecting said respective bottom ends;
a planetary gear journaled on a shaft extending upwardly

from the bottom cross member of said minor frame assembly;
means for rotating said minor frame assembly about a horizontal axis that passes through the respective upright side members of said major frame assembly, said minor frame assembly being located within said major frame assembly; and
means for rotating said planetary gear on its shaft.

4,921,566
APPARATUS FOR THE LAMINATING AND CUTTING OF PHOTORESIST WEBS

Martin Stork, Muehlheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,530
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736509
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—354 12 Claims

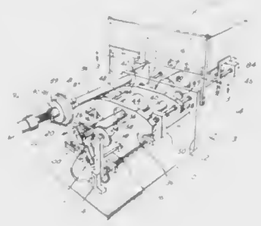


1 Apparatus for the laminating and cutting of photoresist webs, comprising:
a pair of laminating rolls;
means for moving a base along a path in a running direction toward the laminating rolls;
a feed carriage;
means for moving said feed carriage back and forth along the path;
a pair of opposed cutting units, each cutting unit mounted on opposite sides of the path and movable toward and away from each other and each including a vacuum bar and a cutting band;
means on both sides of the path for transporting and guiding a photoresist web to be laminated to the base, each web being guided adjacent a respective one of the vacuum bars;
means for sensing a front and rear edge of the base moving along the path and for generating a signal indicative of passage of each of the front and rear edges of the base;
control means for controlling movement of said cutting units toward and away from each other, said control means being connected to the sensing and signal generating means for controlling movement to the cutting units in response to said signals; and
wherein the control means includes first pistons connected to the vacuum bars, wherein first proximity switches are disposed adjacent the first pistons, and wherein switching pulses of the first proximity switches further control the presence of vacuum in and movement of the vacuum bars.

4,921,567
MACHINE FOR WRAPPING TAPE ON BOBBIN

James F. Criswell, Jr., Burbank, Ill., assignor to Guardian Electric Manufacturing Co., Chicago, Ill.

Filed Apr. 21, 1988, Ser. No. 184,441
Int. Cl.[4] B65H *54/28*
U.S. Cl. 156—361 9 Claims

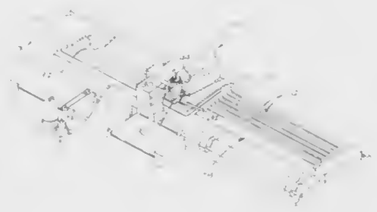


1 A machine for spirally wrapping ribbon-like insulating adhesive tape on flanged spools wound with coils of wire to insulate the wire, said spools being of various sizes, with one winding of tape overlapping an adjacent winding comprising
a chuck detachably secured to a rotatably and axially movable shaft,
a spindle comprising part of said chuck and rotatable therewith for mounting the spool,
means for locking said spool against rotation with respect to the spindle,
a first motor for rotating said shaft,
a second motor for moving said shaft axially a predetermined distance,
control means for adjusting the speed of the first motor relative to the speed of the second motor to control the amount of said overlap,
a fixed shaft disposed parallel to and spaced from said spindle for rotatably mounting a supply roll of said tape,
a tape guide roll interposed between said fixed shaft and said spindle,
a knife mounted between said tape guide roll and said spindle to cut off the tape from the supply roll, and
means for actuating said knife.

4,921,568
MOVING HEAD HIGH FREQUENCY RESISTANCE WELDING SYSTEM

E. L. Whiffen, Fullerton, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 31, 1988, Ser. No. 200,223
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—379.8 4 Claims

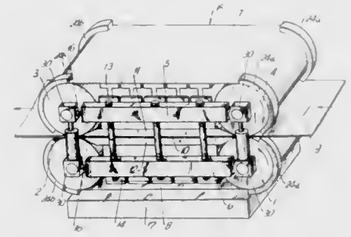


1 A high frequency resistance welding system for joining support stringers to a large structural panel, comprising:
a panel support table;
a stringer supply magazine;
stringer shaping equipment;
a high frequency resistance weld head;
gantry means with a horizontal span greater than the width of said large structural panels;
said gantry means being movable on fixed guide means with a range of travel greater than the length of said large panel;
a high frequency resistance welding head with stringer shaping equipment coupled to a carriage movably mounted on the gantry means;
said stringer shaping equipment comprising means for maintaining a stringer lower surface at an angle between 4 and 7 degrees to said large structural panel at an area of fusion near said welding head;
said carriage being movable in increments in a direction transverse to said gantry guide means;
said stringer supply magazine providing support stringers to the surface of said large panel through said stringer shaping equipment for welding to said panel as said gantry moves along its guide means; and
means to move said welding head and stringer shaping equipment in incremental steps in a direction transverse to the direction of travel of said gantry on said guide means.

4,921,569
DOUBLE BAND PRESS INCLUDING ELECTRIC CURRENT MEANS

Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,410
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717308
Int. Cl.[5] B30B *5/06, 15/34*
U.S. Cl. 156—380.6 16 Claims



1. A double band press for the continuous production of endless material webs, comprising: a rigid press stand; bearing bracket means connected to said press stand; a plurality of reversing drums each having a radius and rotatably mounted to said bearing bracket means; an upper and a lower heatable endless press band guided over said reversing drums, said press bands having outer surfaces which are movable adjacent each other to define a reaction zone having an inlet and an outlet end for receiving and pressing a material web therebetween; pressure means connected to said press stand and engaging against inner surfaces of said bands for applying pressure to the reaction zone between said bands; said pressure means comprises a pressure plate connected to said press stand for each band, each pressure plate defining a horizontally extending pressure chamber bounded by said pressure plate and an inner surface of one of said bands, an annular sliding surface seal connected to each pressure plate extending around each pressure chamber and fluid means operatively connected to said pressure plates for passing pressurizing fluid to each said pressure chamber to pressurize said pressure chambers to exert forces on said bands to pressurize said reaction zone, and electric current means operatively connected to said bands for inducing a flow of electric current in said bands to produce electrically induced heating of said bands at least in said reaction zone, said electric current means comprises a source of DC voltage having positive and negative poles, two of said reversing drums forming a first pair of reversing drums at the inlet end of said reaction zone for initially receiving the material web and two of said reversing drums forming a second pair of reversing drums at the outlet end of said reaction zone for discharging the material web, a slip ring transmitter operatively connected to each of said reversing drums of said first and second pairs, said negative pole of said source being connected to the slip ring transmittance near one of said first and second pairs of reversing drums and said positive pole of said source being connected to the slip transmitters adjacent the other of said first and second pairs of reversing drums for passing direct current through said bands for heating said press bands at least in the reaction zone due to the electrical resistance of said press bands, each said slip ring transmitter comprises an arc-shaped mounting plate having a radius which is larger than the radius of the adjacent said reversing drum, each said arc-shaped mounting plate being mounted to and insulated from said press stand, each said arc-shaped mounting plate being spaced outwardly from the adjacent said reversing drum, a plurality of brush mountings connected to each of said arc-shaped mounting plates, and a brush connected to each mounting and slidably engaged against one of said bands, each brush being electrically connected to one pole of said source, an insert connected to each brush mounting, a brush holder connected to each brush and a linkage connected between each insert and a respective brush holder for displaceably mounting each brush holder to one of said inserts, and each said brush holder is adjustable so that said brush therein contacts the outer surface of one of said press bands in a sliding manner.

4,921,570
APPARATUS FOR MANUFACTURING A WELDED CONNECTION OF TUBULAR COMPONENTS OF THERMOPLASTIC MATERIAL

Peter Kunz, Schaffhausen, Switzerland, assignor to Georg Fisher AG

Filed Aug. 15, 1988, Ser. No. 232,480
Claims priority, application Switzerland, Aug. 28, 1987, 3323/87
Int. Cl.[5] B29C *65/26, 65/18*
U.S. Cl. 156—503 3 Claims

1. An apparatus for manufacturing a welded connection between end faces of two tubular components of thermoplastic material, comprising a bracing device and a heating device, the bracing device configured to brace against the outer circumference of the tubular components to hold the tubular components in position, such that the end faces of the tubular components are in contact with each other, the heating devices having a hollow body insertable in the tubular components, the hollow body being a casing of a heat-resisting elastomer and having an interior, an electric heating element and a thermally expandable liquid medium arranged in the interior which is capable of expanding the hollow body, and electric cables for connecting the heating element to a current source, wherein the hollow body has a cylindrical portion and rounded-off ends, a traction strand being connected to one of the ends, the cables being arranged inside of the traction strand, and wherein the bracing device has clamping jaws of thermally poorly conductive material.

4,921,571

INHIBITED COMPOSITION AND METHOD FOR STRIPPING TIN, LEAD OR TIN-LEAD ALLOY FROM COPPER SURFACES

Peter E. Kukanskis, Woodbury, and Bryan Whitmore, New Haven, both of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Filed Jul. 28, 1989, Ser. No. 386,887
Int. Cl.[5] B44C *1/22*; C23F *1/00*; C03C *15/00, 25/06*
U.S. Cl. 156—656 17 Claims

12. A method for stripping tin, lead or tin-lead alloy, and any underlying copper-tin alloy, from a copper surface, comprising contacting said surface with a composition comprised of an aqueous solution of an alkane sulfonic acid, an inorganic nitrate, and an inhibitor effective to minimize attack of the copper surface while not substantially slowing the speed of stripping of said tin, lead or tin-lead alloy and any underlying copper-tin alloy as compared to that obtained without said inhibitor, for a time sufficient to strip said tin, lead or tin-lead alloy, and any underlying copper-tin alloy, from said copper surface.

4,921,572

ETCHANT SOLUTIONS CONTAINING HYDROGEN FLUORIDE AND A POLYAMMONIUM FLUORIDE SALT

Thomas Roche, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed May 4, 1989, Ser. No. 347,129
Int. Cl.[5] C09K *13/08*
U.S. Cl. 156—653 10 Claims

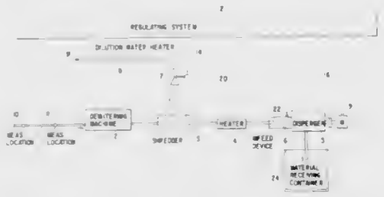
1. An aqueous etchant solution comprising water, hydrogen fluoride and a polyammonium fluoride salt selected from the group consisting of ethylenediammonium difluoride and diethylenetriammonium trifluoride.

4,921,573

METHOD OF REGULATING THE SPECIFIC DISPERSION WORK FOR WASTE PAPER STOCK PREPARATION FOR PAPERMAKING

Dietmar Beier, Ravensburg-Obereschach; Jürgen Gutzeit, Ravensburg, and Harald Selder, Schlier, all of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 234,675
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728890
Int. Cl.[5] D21C *5/02*
U.S. Cl. 162—4 15 Claims



1. A method of dispersing a waste paper containing material in an installation provided with dewatering means for dewatering the material arranged upstream of dispersing means for dispersing the material viewed with respect to a predetermined direction of flow of the material through the installation, comprising the steps of:

dewatering the material in said dewatering means to a greater extent then would be required for dispersing the material in the dispersing means;

dispersing said material at a predetermined specific dispersing work in the dispersing means; and

prior to said step of dispersing said material and after said dewatering step, adding diluting water to the material as a function of said predetermined specific dispersing work in said dispersing means and thereby adjusting the stock density of said material upstream of said dispersing means, in order to thereby maintain essentially constant said predetermined specific dispersing work of said dispersing means so as to achieve a desired quality of the dispersed material.

4,921,574

PROCESS FOR CONTROLLING PROPERTIES OF TRAVELLING SHEETS WITH SCAN WIDTHS LESS THAN THE SHEET WIDTH

Hung-Tzaw Hu, Cupertino, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Jan. 27, 1989, Ser. No. 303,478
Int. Cl.[5] D21F *1/06, 7/06*
U.S. Cl. 162—198 7 Claims



1. A method for controlling a highspeed sheetmaking machine following abrupt process changes and during start-up periods, comprising:

operating a scanning sensor to periodically traverse back and forth across a moving sheet in the cross direction to detect values of a selected sheet property along each scan, said scanning sensor having a normal cross-directional speed and a normal rate at which measurements of the sheet property are made when the scanning sensor traverses the full width of the sheet;

immediately following an abrupt process change or during the start-up periods, controlling the cross-directional width of each scan to be substantially less than the width of the sheet being scanned; and

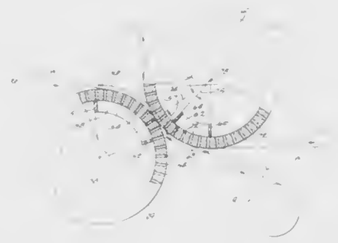
then progressively increasing the cross-directional width of each scan until each of the scans encompass the full width of the moving sheet.

4,921,575

COUCH PRESS TRANSFER APPARATUS

Robert E. Page, Davis, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Sep. 25, 1989, Ser. No. 411,804
Int. Cl.[5] D21F *2/00*
U.S. Cl. 162—306 3 Claims



1. In a web pick-up in a papermaking machine including a looping forming fabric for carrying a paper web, a couch roll having a foraminous shell within the looped forming fabric, a looped web pick-up felt and a transfer roll having a framinous shell within the looped pick-up felt, the combination comprising:

the couch roll and transfer roll each include a suction box having longitudinally extending, angularly positioned leading and trailing seals which define a vacuum zone on the surface of each of their respective foraminous roll shells;

the transfer roll is nipped with the couch roll with the pick-up felt pressing the web over the forming fabric;

a fabric turning roll within the looped forming fabric downstream of the couch roll, said fabric turning roll cooperating with the couch roll to direct the forming fabric to partially wrap the transfer roll downstream of the nip with the web and pick-up felt therebetween;

the trailing seal in the couch roll and the leading seal in the transfer roll are positioned downstream of the nip, the trailing seal in the couch roll is also positioned downstream of where the forming fabric and web leave the couch roll in order to partially wrap, with the pick-up felt, the transfer roll;

whereby the web is subjected to dewatering forces through the forming fabric upstream of the trailing seal in the couch roll and water is urged away from the web and forming fabric downstream of the nip.

4,921,576

METHOD FOR IMPROVING SWEEP EFFICIENCY IN CO_2 OIL RECOVERY

Billy G. Hurd, Coppell, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 20, 1989, Ser. No. 340,741
Int. Cl.[5] E21B *33/138, 43/22, 47/06*
U.S. Cl. 166—252 46 Claims

1. A method for improving the vertical and/or horizontal sweep efficiency of a subterranean oil and brine containing formation having at least one relatively high permeability zone and at least one relatively low permeability zone, the formation being penetrated by at least one injection well and a spaced apart production well in fluid communication with the formation, the method comprising:

(a) determining the formation temperature and properties of the oil and brine contained within the formation;

(b) injecting a predetermined amount of a surfactant solution into the formation via the injection well that perferentially enters the relatively high permeability zone or zones and forms a surfactant/brine/oil microemulsion when said surfactant mixes with the oil and brine in the formation at the temperature, pressure and salinity within the formation;

(c) injecting CO_2 at a predetermined pressure into the formation via the injection well that preferentially enters the relatively high permeability zone or zones and upon contact with the microemulsion causes the surfactant to precipitate into a gel under the temperature, salinity, oil composition and CO_2 pressure conditions within the formation, which substantially plugs the relatively high permeability zone or zones of the formation; and

(d) injecting a predetermined amount of CO_2 into the formation capable of forming a miscible bank with the oil in the relatively low permeability zones which miscibly displaces CO_2 and oil through the relatively low permeability zones of the formation toward the production well and recovering oil via the production well; and

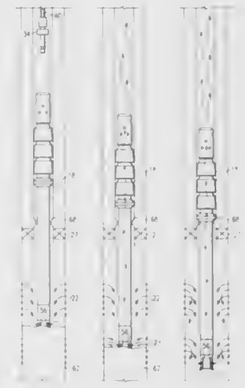
(e) injecting a displacing fluid into the formation to displace CO_2 and oil through the relatively low permeability zones of the formation toward the production well from which oil is recovered.

4,921,577

METHOD FOR OPERATING A WELL TO REMOVE PRODUCTION LIMITING OR FLOW RESTRICTIVE MATERIAL

Dennis R. Eubank, 8639 Richardson Branch Trail, Dallas, Tex. 75243

Filed Aug. 2, 1988, Ser. No. 227,148
Int. Cl.[5] E21B *37/00, 21/00*
U.S. Cl. 166—311 27 Claims



1. In a method for the operation of a well penetrating a subterranean formation and having a production interval open to said formation through which gaseous fluids may be produced from said formation into said well and which is subject to the accumulation of particulate material within said well, said well having a tubing string extending to said production interval, the steps comprising:

(a) forming a production stinger by providing a nose sub having a longitudinal passage and at least one inflow opening providing ingress to said passage, securing an assemblage of a plurality of tubing joints having lengths of at least thirty feet to said nose sub, and securing a landing section including an annular seal slidable within the internal bore of said well tubing string to said assemblage of tubing stands to produce said production stinger,

(b) lowering said production stinger through said tubing string until a portion of said stinger including said nose sub having said inflow opening protrudes from said well tubing string, said stinger establishing a longitudinal flow passage within said well extending to said production interval through said seal in said tubing string above said production interval;

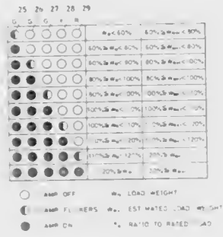
(c) establishing a pressure gradient from said production interval into said longitudinal flow passage through said inflow opening placing said longitudinal flow passage in fluid communication with said production interval at a location adjacent the upper surface of a column of particulate material accumulated in said production interval;

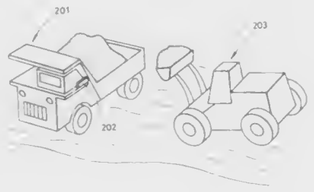
(d) flowing gaseous formation fluid under said pressure gradient from said production interval into said longitudinal flow passage through said inflow opening, said fluid entraining particulate material from said accumulated particulate material and carrying said particulate material through said inflow passage and into said longitudinal passage to produce a fluid stream having particulate material entrained therein; and

(e) flowing said fluid containing said entrained particulate material through said longitudinal flow passage and into said well tubing string above said seal as said production stinger is lowered through said tubing string seal.

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4,921,578
APPARATUS FOR REPRESENTING A LOAD TO BE CARRIED BY A DUMP TRUCK
Takao Shiraishi, Takasaki, and Satoki Kondo, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jun. 5, 1989, Ser. No. 361,072
Int. Cl.[5] G01G *19/40, 19/08*
U.S. Cl. 177—25.19 **9 Claims**

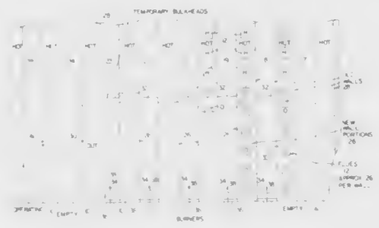




1. An apparatus for representing a load to be carried by a dump truck for which representing is effected on the basis of said load which has been measured by a load meter of the type mounted on said dump truck, wherein said apparatus comprises;
calculating means for calculating the number of loading operations by addition at every time when said load is stepwise increased so as to allow a load to be carried by the dump truck during a next loading operation to be estimated with reference to the number of loading operations and the load which has been loaded on the dump truck till now, and
representing means for representing an estimative load to be carried by the dump truck, said estimative load being calculated by said calculating means.

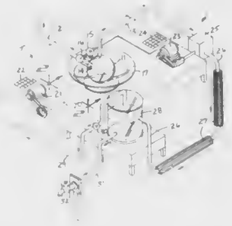
4,921,579
METHOD OF PRE-HEATING A COKE OVEN
Norman W. Severin, Lexington, Ky., assignor to Hotwork, Inc., Lexington, Ky.
Continuation of Ser. No. 474,847, Mar. 14, 1983, abandoned. This application Apr. 23, 1985, Ser. No. 726,122
Int. Cl.[5] C10B *17/00*
U.S. Cl. 201—41 **4 Claims**

1. In an operating battery of coke ovens in which at least a substantially common portion of more than three successive walls separating adjacent ovens of a group in the battery are unheated at least for a time sufficient that the unheated walls defining at least one oven of the group reach ambient temperature, a method of heat conditioning the unheated walls of the group of coke ovens, comprising:
at least temporarily enclosing at least substantially so much of each oven of the group as is delimited by facing unheated walls;
injecting into the each oven a flow of hot gas from a non-radiant burner at a velocity sufficient to circulate the hot gas therethroughout; and



controlling the temperature of the hot gas such that the walls thereabout are heated without differential thermal expansion damage.

4,921,580
SOLAR WATER DISTILLER
Providencio Martes, and Miguel A. Villalobos, both of Calle José de Diego 95, Ciales, P.R. 00638
Filed Aug. 10, 1988, Ser. No. 230,527
Int. Cl.[5] B01D *3/10, 3/42*
U.S. Cl. 202—205 **1 Claim**



1. A solar powered water distilling apparatus comprising,
a spherical boiler including a water input conduit and a water vapor output conduit;
a valve positioned within said water input conduit;
a level control means operatively associated with said valve for controlling water flow within said spherical boiler from said input conduit to maintain water within said boiler at substantially half the volume of said boiler;
a solar energy directing means underlying said spherical boiler for directing solar energy to said boiler to create pressurized water vapor within said boiler and direct said water vapor to said output conduit;
a vacuum pump means operatively associated with said output conduit for evacuating water vapor from said boiler;
a condensing means including a condensing conduit positioned between said pump means and a storage tank, and said condensing conduit is formed with cooling fins thereabout for condensing water vapor within said condensing conduit;
a pressure sensing means operatively associated with said spherical boiler for controlling water pressure within said boiler by controlling operation of said valve and said vacuum pump means in response to pressure limits set within said pressure sensing means;
a rack and pinion underlying said solar energy directing means for continuously manipulating said directing means to maintain constant orientation with solar rays;
a reflective convex lens underlying said spherical boiler including a reversing electrical motor for manipulating said reflective convex lens;
a first solar panel operatively actuating said reversing electrical motor;
a sun sensor means positioned between said first solar panel and said reversing motor for selectively operating said motor to maintain association of said reflective convex lens with said solar rays;
a solar powered non-reversing motor operatively associated with said pump means to actuate said pump means;
and a relief pipe formed at an uppermost surface of said storage tank wherein said relief pipe is formed with a relief valve for minimizing pressure buildup within said storage tank wherein the pressure sensing means and the level control means operate in concert to maintain a constant pressure within the spherical boiler such that efficiency in boiler water vapor production is maintained.

4,921,581
EXTRACTIVE DISTILLATION OF HYDROCARBONS EMPLOYING SOLVENT MIXTURE
Fu M. Lee, and Ronald E. Brown, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed May 26, 1989, Ser. No. 357,568
Int. Cl.[5] B01D *3/40*
U.S. Cl. 203—56 **17 Claims**

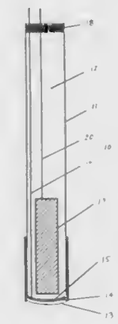


1. In a process for separating at least one cycloalkane containing 5-10 carbon atoms per molecule from at least one close-boiling alkane by extractive distillation of a feed comprising said at least one cycloalkane and said at least one alkane, the improvement which comprises employing a solvent consisting essentially of
(a) at least one saturated alcohol selected from the group consisting of alkanols and cycloalkanols, wherein said alcohol contains 5-9 carbon atoms and one OH group per molecule, and
(b) at least one glycol compound having the general chemical formula of

$$HO—[CHR^1—CHR^2—O]_n—CHR^1—CHR^2—OH,$$

wherein n can be 0, 1, 2, 3 or 4, and R^1 and R^2 are independently selected from the group consisting of hydrogen and a methyl group;
wherein said process produces (i) an overhead product which contains a smaller volume percentage of said at least one cycloalkane and a larger volume percentge of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one cycloalkane and a smaller volume percentage of said at least one alkane than said feed; and wherein said at least one cycloalkane is separated from said solvent and recovered from said bottoms product.

4,921,582
DISSOLVED OXYGEN MEASURING METHOD
Henry Y. Wang, 2488 Bunker Hill Rd., Ann Arbor, Mich. 48105, and Xiang M. Li, Research Inst. of Chem. Eng., SCIT, Guangzhou, China
Filed Sep. 4, 1987, Ser. No. 93,340
Int. Cl.[5] G01N *27/46*
U.S. Cl. 204—153.1 **12 Claims**

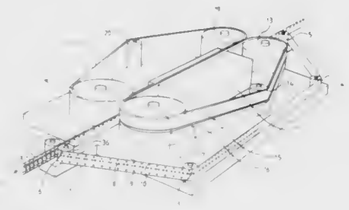


1. A method of measuring dissolved oxygen in a test fluid having a concentration of dissolved oxygen desired to be measured, the method comprising the steps of:
residual sampling in a transient mode of operation a residual signal responsive to a residual current in a galvanic electrode arrangement for obtaining characteristic data corresponding to a characteristic of said galvanic electrode arrangement;
calibrating said galvanic electrode arrangement with respect to said characteristic data;
inserting said galvanic electrode arrangement into the test fluid, said galvanic electrode arrangement having anode and cathode electrodes for producing an output potential therebetween responsive to an oxygen flux which communicates with said cathode electrode via an oxygen-permeable membrane interposed between said cathode electrode and the test fluid;
coupling intermittently said galvanic electrode arrangement via a coupling circuit to an electrical monitoring system, whereby an intermittent electric current which is generated in said galvanic electrode arrangement is caused to flow in said coupling circuit; and
producing a sample signal corresponding to a sample of at least a transient characteristic of said intermittent electric current in said coupling circuit.

4,921,583
BELT PLATING METHOD AND APPARATUS
Beverley Sewell, Alton; David J. Hill, Lightwater, and Edgar C. Martin, Kingston, all of United Kingdom, assignors to Twickenham Plating & Enamelling Co., Ltd., Twickenham
Filed Jan. 27, 1989, Ser. No. 303,616
Claims priority, application United Kingdom, Feb. 11, 1988, 8803186
Int. Cl.[5] C25D *5/02, 5/08, 17/00*
U.S. Cl. 204—15 **24 Claims**

24. A method of continuously electroplating an elongate substrate, the method comprising providing a thin plastic elongate mask having location features including dimples, moulded inserts of plastic, stamped-in metal studs, pins or rivets, aper-

tures all adapted to engage with corresponding features on an elongate substrate to be plated, or pin holes spaced at regular intervals such that each adjacent pin hole is engageable with an adjacent spoke of a pin wheel, mating an elongate substrate



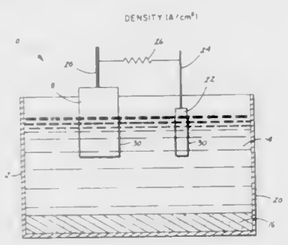
with the mask so that only given areas of the substrate are exposed by the mask, feeding the mated substrate mask through an electroplating zone so that the given areas are electroplated, and releasing the electroplated substrate from the mask.

4,921,584

ANODE FILM FORMATION AND CONTROL

Oscar Koski, and Steven C. Marschman, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Nov. 3, 1987, Ser. No. 116,560
Int. Cl.[5] C25C *3/06*
U.S. Cl. 204—67 16 Claims



1. An electrolytic process for producing aluminum, the process including an anode and a cathode suspended in a cryolitic electrolyte containing dissolved alumina, the anode having a working surface through which an effective amount of current flows into the electrolyte and to the cathode, the process comprising:

creating a desired protective film over the total working surface of the anode within the electrolyte during electrolytic reduction of alumina to produce aluminum to minimize corrosion of the working surface of the anode by the cryolitic electrolyte and thereby extend the life of the anode;

reducing the dissolved alumina and producing aluminum metal by passing an effective amount of current through the anode working surface and the protective film into the electrolyte and to the cathode; and

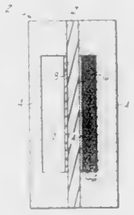
controlling operating parameters of the electrolytic process to maintain the desired protective film over the total working surface of the anode intact in a protective condition throughout the elelctrolytic reduction of alumina to produce aluminum.

4,921,585

ELECTROLYSIS CELL AND METHOD OF USE

Trent M. Molter, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 31, 1989, Ser. No. 331,466
Int. Cl.[5] C25B *3/00, 9/00*
U.S. Cl. 204—72 9 Claims



1. An improved electrolysis cell for the reduction of carbon dioxide having an anode, a cathode and a solid polymer electrolyte the improvement comprising a cathode containing a metal phthalocyanine resulting in the suppression of the formation of hydrogen gas and subsequent improvement in the reduction of carbon dioxide efficiency.

4,921,586

ELECTROLYSIS CELL AND METHOD OF USE

Trent M. Molter, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 31, 1989, Ser. No. 331,454
Int. Cl.[5] C25B *3/00, 9/00*
U.S. Cl. 204—72 27 Claims



1. An improved electrolysis cell for the reduction of carbon dioxide having an anode, a cathode and a solid polymer electrolyte, the improvement comprising a primary carbon dioxide reducing cathode containing a catalytic material having a hydrogen overvoltage greater than platinum and a secondary carbon dioxide reducing cathode having a hydrogen overvoltage greater than platinum thereby resulting in the suppression of the formation of hydrogen gas and improved efficiency for the reduction of carbon dioxide.

4,921,587

POROUS DIAPHRAGM FOR ELECTROCHEMICAL CELL

Dennis F. Dong, Kingston, and Arthur L. Clifford, Harrowsmith, both of Canada, assignors to H-D Tech, Inc., Woodbridge, Canada

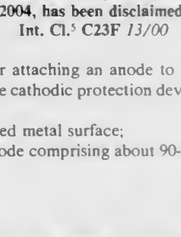
Continuation of Ser. No. 777,483, Sep. 19, 1985, Pat. No. 4,891,107. This application Mar. 21, 1989, Ser. No. 326,774
Int. Cl.[5] C25B *1/30*
U.S. Cl. 204—84 26 Claims

20. In a method for electrochemically reacting a liquid electrolyte with a gas in an electrochemical cell having as electrodes at least one anode and one cathode contained respectively in an anolyte compartment and a catholyte compartment and separated by a plural layered electrolyte permeable diaphragm, at least one of said electrodes characterized as porous and self-draining and contacting said diaphragm; the improvement comprising:

(a) recirculating a liquid electrolyte through said anolyte compartment;

(b) flowing a gas into at least a portion of the pores of a porous self-draining cathode;

(c) flowing said liquid electrolyte from said anolyte compartment through a substantially uniform electrolyte flow rate producing diaphragm into said catholyte compartment so as to fill at least a portion of the pores of said porous self-draining cathode, whereby portions of said diaphragm which are exposed to the full head of said



liquid electrolyte as compared with portions of said diaphragm which are exposed to little or no head of said liquid electrolyte pass substantially the same amount of said liquid electrolyte to said catholyte compartment and the flow of said electrolyte being at a rate about equal to the drainage rate of said cathode, said substantially uniform electrolyte flow rate producing diaphragm comprising a plurality of layers of a microporous polyolefin film or a plurality of layers of a composite of said microporous polyolefin film and a support fabric resistant to degradation upon exposure to said liquid electrolyte and electrolysis products thereof; and

(d) reacting electrochemically said liquid electrolyte with said gas to form at least one nonvolatile product; and

(e) removing the products of the reaction from said self-draining cathode.

4,921,588

CATHODIC PROTECTION USING CARBOSIL ANODES

David F. McCready, P.O. Box 1971, Altoona, Pa. 16603

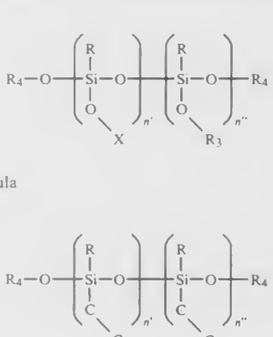
Continuation of Ser. No. 880,875, Jul. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 817,556, Oct. 10, 1985, Pat. No. 4,647,353. This application Feb. 18, 1988, Ser. No. 205,038
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.[5] C23F *13/00*
U.S. Cl. 204—147 9 Claims

1. A method for attaching an anode to a car body for use with an automotive cathodic protection device, comprising the steps of:

cleaning a painted metal surface;

providing an anode comprising about 90-99% carbon, about 1-9% silica gel, and about 0.1-1% inert binders, wherein the anode is provided with a hole;

aligning an electrical lead with the hole in the anode;



holding the lead in contact with the anode;

placing the carbon anode on said painted metal surface; and

bonding the anode to the painted metal surface.

4,921,589

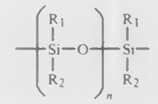
POLYSILOXANE BOUND PHOTOSENSITIZER FOR PRODUCING SINGLET OXYGEN

Stephen F. Yates, Arlington Heights, Ill.; Mary L. Good, Convent Station, N.J., and Inara M. Brubaker, Des Plaines, Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 20, 1988, Ser. No. 287,315
Int. Cl.[5] B01J *19/08, 31/00;* B05D *3/02*
U.S. Cl. 204—157.5 28 Claims

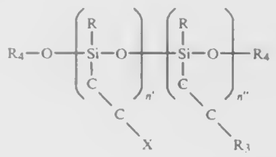
1. A supported photosensitizer coating comprising a network of polysiloxanes crosslinked by a copolymer having bound to it a photosensitizier supported on a solid substrate, the polysiloxanes having the formula

(1)



one or both ends of the polysiloxane covalently bound at the position designated X of a copolymer having the formula,

or the formula



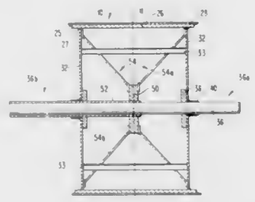
where R, R_1, R_2 and R_4 are individually an alkyl, aryl, alkaryl, or aralkyl group having from 1 to about 20 carbon atoms, n is an integer from 200 to about 2000, R_3 is a photosensitizer and n′ and n″ are integers each having a value of at least one and the sum of n′ and n″ being an integer from about 20 to about 100.

4,921,590

PRODUCTION OF METAL FOIL HAVING IMPROVED WEIGHT DISTRIBUTION ACROSS THE WIDTH OF THE FOIL

Joseph M. Khalid, East Windsor, and David G. Plagge, Mount Holly, both of N.J., assignors to Yates Industries, Inc., Bordentown, N.J.

Filed Mar. 27, 1989, Ser. No. 319,296
Int. Cl.[5] C25A *17/10*
U.S. Cl. 204—216 **8 Claims**



1. A drum cathode for use in the .electrolytic production of metal foil comprising:
(a) a rotatable cylindrical metal drum having an outer surface on which said foil is deposited, said drum having a rotational axis;
(b) current collection means electrically connected to said outer surface for collecting electric current from said outer surface substantially symmetrically on either side of the transverse centerplane of said drum and conducting the collected electric current to approximately said rotational axis; and
(c) current conductor means having an end exterior of said drum and extending from the interior of said drum along said rotational axis to the exterior of said drum and being electrically connected to said current collection means;
(d) said drum, said current collection means and said current conductor means being adapted to permit electric current to flow from said outer surface, during use of said drum cathode, substantially uniformly and symmetrically on either side of said transverse centerplane.

4,921,591

ION SENSORS AND THEIR DIVIDED PARTS

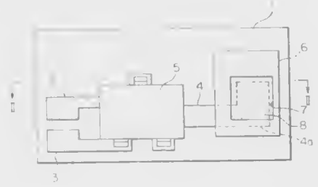
Akihiko Mochizuki, and Hideyo Iida, both of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Japan

Filed Oct. 13, 1988, Ser. No. 257,439
Claims priority, application Japan, Oct. 13, 1987, 62-155625[U]; Jan. 25, 1988, 63-7103[U]; May 9, 1988, 63-110440; Jul. 1, 1988, 63-162571
Int. Cl.[5] G01N *27/30*
U.S. Cl. 204—412 **17 Claims**

1. An ion sensor designed to determine an ion concentration of a sample liquid under examination with an ion sensitive membrane using a field-effect type transistor, said ion sensor comprising:
a first substrate provided with a field-effect type transistor including a gate electrode;
a second substrate including an extended gate electrode arranged in opposition to a reference electrode; said extended gate electrode being connected to said gate electrode; and
said ion sensitive membrane being provided with said extended gate electrode and comprising a film containing a vinyl polymer based compound having a hydroxyl and/or carboxyl group.

10. A divided part for an ion sensor, comprising:
a substrate;
an extended gate on said substrate; and
an ion sensitive membrane provided on said extended gate electrode wherein a vinyl polymer based compound containing a hydroxyl and/or carboxyl group is incorporated into said ion sensitive membrane.

16. A divided part for an ion sensor, comprising:



a substrate;
a plurality of extended gate electrodes and reference electrodes on said substrate; and
ion sensitive membranes provided on said extended gate electrodes;
each of said extended gate electrodes being of a multi-layered structure including an upper layer composed mainly of silver chloride and a lower layer composed mainly of silver; and wherein each of said ion sensitive membranes comprises a film containing a vinyl polymer based compound having a hydroxyl and/or carboxyl group.

4,921,592

PROCESS FOR CONTROLLING FOULING OF CATALYST BEDS

Lynn M. Allen, Navasota; Don M. Taylor, League City, and Charles D. Roberts, Conroe, all of Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Jul. 11, 1988, Ser. No. 217,582
Int. Cl.[5] C10G *21/00*
U.S. Cl. 208—48 AA **25 Claims**

1. In a process wherein a hydrocarbon-containing feedstock is contacted with a fixed bed of particulate catalyst, a process for reducing the fouling of a catalyst bed by deposits in or on the catalyst bed, comprising contacting the catalyst bed with an effective amount of an antifoulant composition included in the hydrocarbon feedstock, the antifoulant composition comprising at least one alkarylsulfonic acid or salt thereof, comprising a C_5 to C_{18} alkyl group and an organic compound of nitrogen consisting essentially of at least one amine soluble in the hydrocarbon containing feedstock.

4,921,593

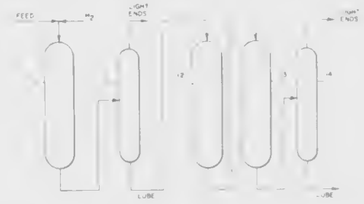
CATALYTIC DEWAXING PROCESS

Fritz A. Smith, New Hope, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 20, 1987, Ser. No. 87,198
Int. Cl.[5] C10G *47/16*
U.S. Cl. 208—59 **30 Claims**

1. A process for catalytically dewaxing a waxy hydrocarbon lubricant feed having an initial boiling point of at least 650° F. and a wax content of at least 25 weight percent, which comprises:
(i) catalytically dewaxing the feed by contacting the feed in the presence of hydrogen with a dewaxing catalyst at an elevated temperature which is maintained at a substantially constant reactor inlet temperature value during a dewaxing cycle to produce a partly dewaxed product,

(ii) further dewaxing the partly dewaxed product by contacting it in the presence of hydrogen with a dewaxing



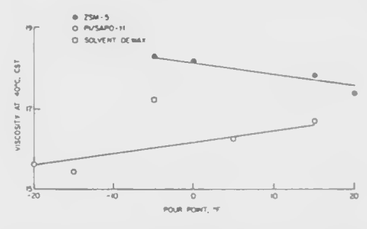
catalyst at an elevated temperature which is progressively increased during the dewaxing cycle to produce a dewaxed product having a predetermined pour point.

4,921,594

PRODUCTION OF LOW POUR POINT LUBRICATING OILS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 70,492, Jul. 6, 1987, which is a continuation of Ser. No. 750,388, Jun. 20, 1985, abandoned. This application Aug. 17, 1987, Ser. No. 86,118
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.[5] C10G *47/16*
U.S. Cl. 208—58 **7 Claims**



1. A process for preparing a lubricating oil which comprises:
(a) hydrocracking in a hydrocracking zone a hydrocarbonaceous feedstock to obtain an effluent comprising a hydrocracked oil; and
(b) catalytically dewaxing at a temperature of from about 200° C. to 475° C., a pressure of about 200 psig to about 3000 psig, a liquid hourly space velocity of from about 0.1 hr^{-1} to about 20 $hr.^{-1}$ and a hydrogen circulation rate of from about 500 to about 30,000 SCF/bbl in a catalytic dewaxing zone, the hydrocracked oil with a catalyst comprising a crystalline silicoaluminophosphate SAPO-11 and a metal selected from platinum or palladium.

4,921,595

PROCESS FOR REFRACTORY COMPOUND CONVERSION IN A HYDROCRACKER RECYCLE LIQUID

Adrian J. Gruia, Lake Bluff, Ill., assignor to UOP, Des Plaines, Ill.

Filed Apr. 24, 1989, Ser. No. 342,263
Int. Cl.[5] C10G *65/10*
U.S. Cl. 208—59 **18 Claims**

1. A catalytic hydrocracking process which comprises:
(a) contacting a hydrocarbonaceous feedstock having a propensity to form 11^+ ring heavy polynuclear aromatic compounds and a liquid recycle stream in a hydrocracking zone with added hydrogen and a metal promoted hydrocracking catalyst at elevated temperature and pressure sufficient to gain a substantial conversion to lower boiling products;
(b) partially condensing the hydrocarbon effluent from said hydrocracking zone and separating the same into a lower boiling hydrocarbon product stream and an unconverted hydrocarbon stream boiling above about 400° F. (204° C.) and comprising trace quantities of 11^+ ring heavy polynuclear aromatic compounds;
(c) introducing at least a portion of said unconverted hydrocarbon stream boiling above about 400° F. (204° C.) and comprising trace quantities of 11^+ ring heavy polynuclear aromatic compounds into a 11^+ ring heavy polynuclear aromatic compound conversion zone containing a zeolitic hydrogenation catalyst having pore openings in the range from about 8 to about 15 Angstroms (10^{-10} meters) and a hydrogenation component operated at conditions to selectively reduce the concentration of 11^+ ring heavy polynuclear aromatic compounds;
(d) condensing at least a portion of the resulting effluent from said conversion zone to produce a liquid stream comprising hydrogenated hydrocarbonaceous compounds and having a reduced concentration of 11^+ ring heavy polynuclear aromatic compounds; and
(e) recycling at least a portion of said liquid stream comprising hydrogenated hydrocarbonaceous compounds recovered in step (d) to said hydrocracking zone in step (a) as at least a portion of said liquid recycle stream.

4,921,596

CATALYTIC CRACKING PROCESS WITH REDUCED PRESSURE STRIPPING

Tai-Sheng Chou, Pennington, N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 89,657, Aug. 26, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 301,768
Int. Cl.[5] C10G *11/18*
U.S. Cl. 208—113 **9 Claims**

1. A process for the fluidized catalytic cracking of a heavy hydrocarbon feed by contacting the feed with a source of hot, regenerated catalyst at catalytic cracking conditions in an upflow, riser reactor to form a mixture of cracked products and spent catalyst containing coke and strippable hydrocarbons, which mixture is discharged from the riser reactor at a riser outlet pressure and separated into a cracked product vapor phase and a spent catalyst phase comprising a dense phase fluidized bed, and said spent catalyst is stripped in a primary stripper by contact with a stripping gas at spent catalyst stripping conditions including a primary stripping pressure to produce a stripped catalyst with a reduced content of strippable hydrocarbons, and said stripped catalyst is charged to a catalyst regeneration zone operating at catalyst regeneration conditions including a regenerator pressure to produce hot, regenerated catalyst which is recycled to the base of the riser to crack said feed characterized in that a secondary stripper is provided intermediate said primary stripper and said regenerator, and said secondary stripper is operated at a reduced pressure relative to both said primary stripper and said regenerator pressure and said second stripper removes additional strippable hydrocarbons from said catalyst by contacting said stripped catalyst with a stripping gas stream at stripping conditions including said reduced pressure.

4,921,597

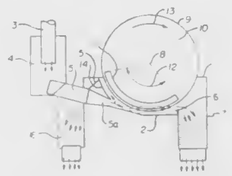
MAGNETIC SEPARATORS

Walter Lurie, Pittsburgh, Pa., assignor to CLI International Enterprises, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 219,722, Jul. 15, 1988, abandoned. This application Sep. 8, 1989, Ser. No. 405,039

Int. Cl.[5] B03C *1/14, 1/30*

U.S. Cl. 209—223.2 5 Claims



1. A wet drum counterrotation magnetic separator for separation of magnetically attractable solid particles from a slurry which comprises a tank having a bottom and sidewalls for retention of the slurry, a rotatable drum including a cylindrical wall positioned with a segment of the drum beneath the surface of the slurry, the drum rotating through a circular path having a first lower arc in close proximity to the bottom of the tank, said circular path also having a second lower arc through which the cylindrical wall of the drum rotates, magnet means positioned within the drum and extending around at least the second lower arc of the cylindrical wall of the drum solid particle discharge means at a first side of the tank, slurry inlet means to the first side of the tank for feeding the slurry and solid particles at a relatively high velocity, a low velocity slurry settling zone on a second side of the tank opposite to the first side and in juxtaposition to at least part of the second lower arc, and slurry outlet means from the low velocity settling zone for discharge from the separator of substantially all the slurry which passes through the slurry inlet means, the position of the low velocity settling zone relative to the magnetic means being such that all solid particles in the slurry which are not first attracted to the drum are exposed to magnetic attraction in the low velocity settling zone.

4,921,598

SELECTOR VALVE, ESPECIALLY A CENTRAL CONTROL VALVE FOR A WATER TREATMENT DEVICE

Kurt M. Desch, Karl Merkenschlager Strasse 1, 8220 Traunstein, Fed. Rep. of Germany

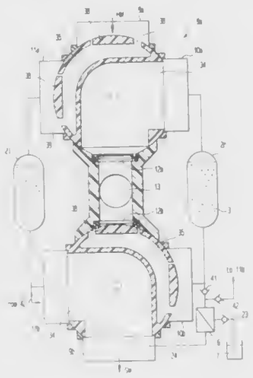
Filed Jul. 15, 1988, Ser. No. 219,524

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723696; May 7, 1988, 3815729

Int. Cl.[5] B01D *35/12*

U.S. Cl. 210—136 20 Claims

11 A central control valve arrangement for a water treatment system including a water container with a filter for the conversion of hard water into soft water and a regenerating means container for regenerating the filter, the central control valve comprising: two four-way ball valves each having a ball-shaped valve body, each valve body having at least one L-shaped borehole, valve body actuation means operatively connected with each of the valve bodies for independently turning the respective valve bodies, wherein the central control valve can be set in several different positions, for causing in at least one first valve position the removal of soft water from the water container, for causing in a second valve position the introduction of regenerating means into the water container for regeneration of the filter, and for causing in a third valve position the rinsing of the water container after the regeneration of the filter with draining of the rinse water into a drain channel, wherein each ball valve includes four connections, of which one is a drain channel connection, and that at



least the drain channel connection has a reduced cross section in comparison to the other connections.

4,921,599

DOUBLE-RACK GRATING FOR USE IN WASTEWATER

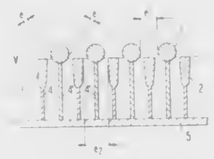
Bertram Botsch, Karlsruhe, Fed. Rep. of Germany, assignor to Maschinenfabrik Hellmut Geiger GmbH. & Co. KG, Karlruhe, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 190,820

Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715020

Int. Cl.[5] B01D *39/10*

U.S. Cl. 210—155 8 Claims



1. A double screen device for use in extra-fine screening of liquids, said device comprising:

first and second rows of rods respectively forming first and second screens, said second row of rods being positioned downstream of said first row of rods, with respect to a direction of flow of a liquid to be screened, said rods of said first and second rows being staggered laterally relative to said direction of flow;

each said rod of said first row having a substantially rotationally symmetrical transverse cross section;

each said rod of said second row including a thickened head portion having a hydrodynamic transverse cross section;

said rods of both said first and second rows having web portions connected to at least one transverse retaining member, said web portions of said rods of said first row of rods extending between said web portions of adjacent said rods of said second row of rods; and

the spacing between said first and second rows being such that said rods of said first row at least control a common plane connecting the upstreammost edges of said rods of said second row, whereby said rods of said first and second rows define therebetween clearances effective for extra-fine screening.

4,921,600

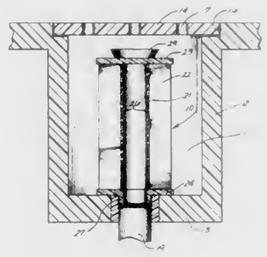
FILTER CARTRIDGE FOR SWIMMING POOLS AND SPAS

Paul J. Meissner, Camarillo, Calif., assignor to Meissner Mfg. Co., Inc., Burbank, Calif.

Continuation of Ser. No. 839,647, Mar. 12, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 210,197

Int. Cl.[5] B01D *35/02*

U.S. Cl. 210—169 4 Claims



1. A filtration assembly comprising

means for forming a chamber comprising an inlet opening through which liquid may enter the chamber and an outlet port comprising an outlet opening through which liquid may exit the chamber, said outlet port being threaded;

a filter cartridge mounted in the chamber and comprising

a pleated generally cylindrical filter element having top and bottom ends and comprising at least one layer of porous filter media;

a generally rigid, perforated cylindrical plastic core having top and bottom ends extending through the interior of the filter element;

an annular plastic lower end cap having an outer diameter at least as great as the outer diameter of the filter element and an inner diameter no more than the inner diameter of the core sealed to the bottom ends of the filter cartridge and core;

a hollow externally threaded cylindrical plastic nipple, open at both ends, extending downwardly from and coaxially with the lower end cap, the interior of the threaded nipple being continuous with the interior of the core, the nipple being made of a softer material than the outlet port of the chamber;

a circular plastic upper end cap having a diameter at least as great as the outer diameter of the filter element sealed to the top ends of the filter element and core; and

a handle extending upwardly from the upper end cap; and

wherein the nipple is threaded into the outlet opening.

4,921,601

COMPONENT PART OF FILTER CASING

Bryan R. Bentley, No. 2 Randa Road, Craigavon, Sandton, Transvaal Province, South Africa

Continuation of Ser. No. 39,178, Apr. 17, 1987. This application Aug. 10, 1988, Ser. No. 230,658

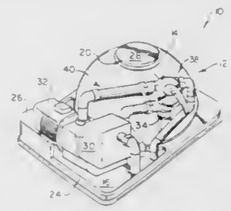
Int. Cl.[5] B01D *35/08*

U.S. Cl. 210—169 8 Claims

1. A filter casing comprising

two component parts mounted together in a region spaced from both the top and the bottom of the casing;

one of the component parts including an integral, generally planar support flange extending horizontally outwardly on one side of the casing to form tray means having an upper support surface, said tray means being sufficiently large for supporting accessories including a pump and



motor thereon wherein said casing extends in approximately equal amounts both above and below the flange.

4,921,602

FILTER FOR LIQUIDS

Ingemar Fröderberg, and Per-Oskar Persson, both of Helsingborg, Sweden, assignors to Ingenjorsfirman Per-Oskar Persson AB, Helsingborg, Sweden

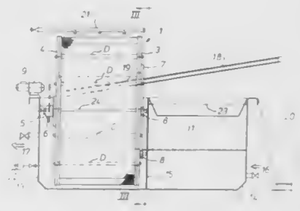
PCT No. PCT/SE87/00600, § 371 Date Jun. 6, 1989, § 102(e) Date Jun. 6, 1989, PCT Pub. No. WO88/04570, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 14, 1987, Ser. No. 375,023

Claims priority, application Sweden, Dec. 15, 1986, 8605380

Int. Cl.[5] B01D *33/18*

U.S. Cl. 210—232 10 Claims



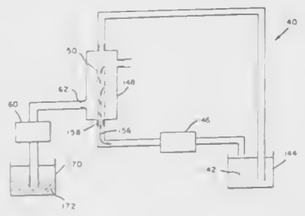
1. A filter for separating particles from a flow of liquid, comprising a filter drum (**1**) rotatably mounted about a substantially horizontal shaft and partially immersed into filtered liquid, said drum comprising a filter cloth (**2**) forming the circumference of said drum and having a plurality of radially extending sections (**27**) positioned between two drum end plates (**3, 4**), one of said end plates (**3**) is provided with a central opening (**10**) through which the unfiltered liquid enters the interior of said drum; a drive means (**9**) for slowly rotating said drum; and a device (**18**) projecting through said one end plate opening into said drum above a surface (**23**) of the filtered liquid for removing particles carried along by the filter cloth out of the liquid and falling down from said filter cloth in an area around the highest point of said drum, wherein side edges of said filter cloth (**2**) are clamped in grooves (**26**) formed on the inside of said end plates (**3, 4**), and said end plates (**3, 4**) are fixed to each other by means of spacer members (D) spaced inwardly from said filter cloth.

4,921,603

ANTI-CLOGGING APPARATUS AND METHOD FOR MAXIMAL FLUX AND PROLONGED FILTRATION TIME

Richard C. K. Yen, 4261 Chase Ave., Los Angeles, Calif. 90066

Filed Sep. 14, 1989, Ser. No. 407,360
Int. Cl.[5] B01D *13/00, 41/00*
U.S. Cl. 210—106 9 Claims



1. An apparatus for filtering a suspension and increasing the concentration of retainable matter in the retentate, comprising:
a. a suspension holding means;
b. a suspension including particulate matter retained within said suspension holding means;
c. means for capturing permeate;
d. a filter means further comprising a housing having an inlet port, an exit port, at least one sidewall opening, and a filter membrane within the housing;
e. a first pump means;
f. a second pump means;
g. an interchangeable valve means;
h. means for interconnecting said first pump means, said second pump means, and said interchangeable valve means to said filter means, to said suspension holding means, and to said means for capturing permeate;
i. said first pump means and said second pump means each located downstream of said filter means;
j. means for enabling said interchangeable valve means to be set wherein said first pump means causes a portion of said suspension to be drawn out of said suspension holding means and run through said filter means without passing through said filter membrane and recirculated back into the suspension holding means while said second pump means causes a portion of said suspension to pass through said filter membrane to form permeate from the fluid phase of the suspension which has passed through said filter membrane and be drawn through said at least one sidewall opening in the filter housing and directed to said means for capturing permeate; and
k. means for enabling said first pump means and said second pump means to be adjusted relative to each other such that the second pump means exerts a positive pressure on the suspension relative to the filter membrane to cause a portion of the suspension to flow through the filter membrane and the first pump means exerts a negative pressure on the suspension relative to the filter membrane to cause a portion of the suspension to flow through the filter without passing through the filter membrane, such that as the portion of suspension passing through the filter membrane clogs a location of the filter membrane with particulate matter, the flow of the suspension which does not pass through the filter membrane creates a negative pressure relative to the filter membrane to pull the particulate matter away from the filter membrane and unclog it.

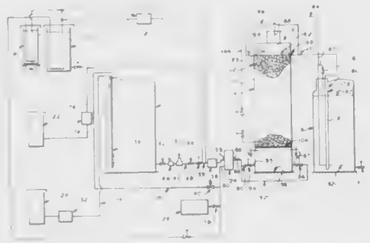
5. An apparatus for filtering a suspension including particulates and increasing the retainable matter in the retentate, comprising:
a. means for retaining said suspension;
b. means for filtering said suspension including a filter membrane;
c. means for drawing suspension out of the means for retaining said suspension and causing the suspension to pass through said means for filtering said suspension, wherein the means exerts a negative pressure on the suspension relative to the filter membrane and causes the suspension to be drawn away from the filter membrane and pass through the filter means for recirculation back to the means for retaining said suspension;
d. means for exerting a positive pressure on the suspension relative to the filter membrane as the suspension is passed through the filter means to thereby cause a portion of the suspension to pass through the filter membrane and create a permeate; and
e. means for adjusting the means for exerting a negative pressure on the suspension and the means for exerting a positive pressure on the suspension relative to each other such that as the portion passing through the filter membrane clogs a location of the filter membrane with particulate matter, the flow of the suspension which does not pass through the filter member creates a negative pressure relative to the filter membrane to pull the particulate matter away from the filter membrane and unclogs it.

4,921,604

UPFLOW BIOLOGICAL REATOR WASTE WATER TREATMENT SYSTEM

Albert J. Moellenbeck, Sante Fe, N. Mex., assignor to Biotech Industries Incorporated, Wyckoff, N.J.

Filed Mar. 21, 1989, Ser. No. 326,272
Int. Cl.[5] B01D *33/34*
U.S. Cl. 210—151 5 Claims



5. In a waste water treatment system including an influent waste tank for preconditioning waste liquid which contains organic or inorganic wastes, an upflow biological reactor tower (UBR), adapted to receive said preconditioned waste liquid, for biological reduction of the wastes contained in said preconditioned waste liquid, said UBR having a base and tower portion of predetermined height and cross-sectional area, filled with packing media to which are affixed suitable bacterial cultures selected specifically to accomplish the biological reduction of the particular wastes contained in said waste liquid, and an effluent waste tank for temporary storage of the liquid treated waste received from said UBR wherein the improvement comprises:
a separate vessel means for enriching preconditioned waste liquid with dissolved oxygen, said enriched, preconditioned waste liquid thereafter supplied to said UBR, whereby enhancement of any remaining biodegradation of wastes in said UBR is accomplished,
said separate vessel means including,
(a) a container member having a side and bottom portion;
(b) a screen member secured to the side of said container portion;
(c) column packing material disposed in said container member, and above said screen member;
(d) first entrance pipe means secured in the side of the container member near the top thereof;
(e) a second entrance pipe means secured on the side of the container near the bottom thereof;

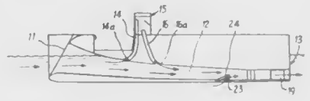
(f) an exit pipe means secured in the side of the container between the bottom and top thereof;
wherein said preconditioned waste liquid enters said separate vessel through said first entrance pipe means then trickles down over said column packing material and through said screen member, collecting at the bottom portion of said container member, said second entrance pipe directing pressurized oxygen containing gas towards the bottom portion of the container whereby said collected preconditioned waste is blown back up through said screen and column packing material, whereby said preconditioned waste liquid is enriched with dissolved oxygen, said exit pipe means collecting and carrying the enriched preconditioned waste liquid to said UBR.

4,921,605

APPARATUS TO DEPOLLUTE BODIES OF WATER

Lucien Chastan-Bagnis, 21, Avenue Isola-Bella, and Alain Chastan-Bagnis, 20, Avenue de Vallauris, both of 06400 Cannes, France

Continuation of Ser. No. 874,713, Jun. 16, 1986, abandoned. This application May 26, 1988, Ser. No. 199,299
Claims priority, application France, Jun. 14, 1985, 85 09195
Int. Cl.[5] C02F *1/40*
U.S. Cl. 210—115 7 Claims



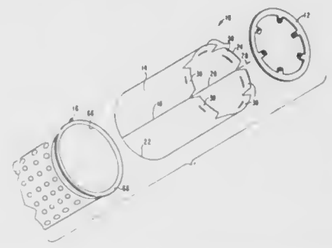
1. A decontamination apparatus incorporating a skimmer body including a front end and a rear end suitable for cleaning a body of water having liquid waste floating thereon, said apparatus comprising:
means defining at least one water stream channel having an inlet for receiving a stream of water from said body of water at the front end of the skimmer body and a discharge outlet at the rear end of the body,
propeller means for drawing said water stream into said inlet and for discharging said water stream from said discharge outlet,
means defining a closed decanting chamber constructed and arranged so as to be located above the surface of the body of water, rearwardly of the inlet of said water stream channel means,
means defining a skimming channel having a closed section for collecting an upper part of the water stream containing said floating liquid wastes, said skimming channel having an inlet connected to the upper part of said water stream channel means constructed and arranged so as to be located at a point beneath the level of the body of water surrounding said decontamination apparatus, said skimming channel being inclined upwardly and having an outlet located near the upper part of said closed decanting chamber, whereby floating wastes can accumulate in the upper part of said chamber,
a discharging duct means for discharging floating wastes from the top of said decanting chamber, and
means defining a closed descending evacuation duct for the water,, said duct having an inlet located in the decanting chamber beneath the outlet of said skimming channel, and having an outlet connected to said water stream channel downstream from the inlet of said skimming channel, at a location constructed and arranged such that the water stream speed is higher than at the location of said skimming channel inlet, so that the decanting chamber is kept full of liquid, the water flowing through the skimming channel being continuously evacuated through said evacuation duct.

4,921,606

SEAMLESS FILTER BAGS WITH A REMOVABLE, REFUSABLE RING

Sidney Goldman, Coral Springs, Fla., assignor to Mechanical Manufacturing Corporation, Sunrise, Fla.

Filed Jun. 30, 1989, Ser. No. 386,192
Int. Cl.[5] B01D *23/06, 29/10*
U.S. Cl. 210—238 7 Claims



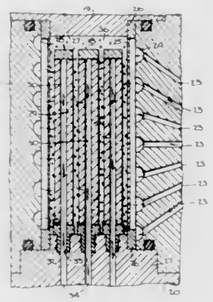
1. A seamless filter bag having a removable, reusable ring comprises, in combination:
(a) a filter bag having;
(i) heat sealed closed end;
(ii) at least one heat sealed side edge;
(iii) an open end, said open end being provided with a plurality of notches, and
(iv) a plurality of openings, each one of said openings being disposed about the circumference between said notches proximate said open end; and
(b) removable filter ring means, said ring means having a plurality of inwardly extending protrusions each one of said protrusion being adapted to be received into one of said openings, the diameter of said ring means being selected to maintain said filter bag open end fully opened.

4,921,607

FILTER ASSEMBLY FOR MOLTEN POLYMERIC MATERIAL

Isaac L. Langley, Greenville, S.C., assignor to Hoeganaes Corporation, Riverton, N.J.

Filed Feb. 25, 1988, Ser. No. 160,029
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[5] B01D *29/26*
U.S. Cl. 210—266 11 Claims



1. A prefilter assembly for molten polymeric material comprising:
a housing having an inlet for receiving a flow of molten polymeric material, a cavity communicating with said inlet to receive the flow of polymeric material therefrom,

and an outlet for expelling a filtered flow of polymeric material,

a first filter in said housing between said inlet and said cavity to to initially filter the flow of polymeric material;

a plurality of tubular porous metal filter elements mounted in said housing within said cavity to receive and filter polymeric material passing therethrough, each said tubular porous metal filter element having a closed end, an opposite open end in communication with said outlet and a passage between said open and closed ends for conveying filtered polymeric material to said open end; and

a mass of shattered metal particles, retained by said first filter about said tubular porous metal filter elements and filling the remainder of said cavity, to filter micro-gels from the polymeric material passing therethrough prior to passage of the polymeric material into said tubular porous metal filter elements.

4,921,608

FILTRATION APPARATUS HAVING BELTS FOR TREATING WASTE PRODUCT

Chung Yup Lee, 375-21, Daebang-Dong, Dongjak-Ku, Seoul, Rep. of Korea

Filed Feb. 2, 1989, Ser. No. 305,403
Int. Cl.[5] B01D *35/16*
U.S. Cl. 210—393 **5 Claims**



1. A filtration apparatus having filter belts for treating waste product from surfaces of the moving belts which comprises:

housing means,

a pair of guiding rollers and a pair of driving rollers disposed in said housing means,

a plurality of hollow rollers disposed along a serpentine line for closely rotating in conjunction with each other, said hollow rollers including pressured filtration rollers and a heavy pressured filtration roller for accelerating the filtration of the waste product and an entrance tube which contains an inlet tube and an U-shaped outlet tube for supplying hot water, hot steam, or hot air thereinto and discharging water therefrom,

waste product inlet means operatively associated with said housing means for supplying waste product,

waste product outlet means operatively associated with said housing means for discharging solid waste product,

a pair of filter belts for containing said waste product which travel between and over said rollers for squeezing and filtrating the waste product so as to separate liquid and the solid waste product, and

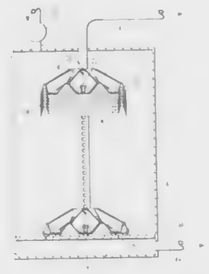
a plurality of hot water sprayers disposed over said pair of filter belts for coagulating protein in the waste product whereby the waste product is easily treated by the moving filter belts of the filtration apparatus.

4,921,609

CIRCULAR LAMELLA CLARIFIER

Robert E. Fromson, 3603 Ridgewood Dr., Pittsburgh, Pa. 15235

Filed Jun. 26, 1989, Ser. No. 371,338
Int. Cl.[5] B01D *21/02*
U.S. Cl. 210—521 **15 Claims**



1. A circular lamella clarifier comprising an input means, an output means, a pump means in fluid communication with said input means and said output means, lamella means comprising a plurality of vertically stacked thin-walled hollow frusto-conical spaced-apart convoluted lamella members, each of said lamella members having a central opening in vertical alignment with the central openings of the said other lamella members, a plurality of circumferentially distributed inclined V-shaped troughs which divert downwardly, each of said troughs including oppositely disposed trough walls, a plurality of conical peak sections, each of said peak sections separating adjacent pairs of said trough walls, each of said troughs having a sludge port extending therethrough at the lower most portion thereof and in vertical alignemnt with the sludge ports of said other lamella members, said sludge ports including sludge port walls extending below said lower most portions of said troughs, said troughs including integral dam means, said dam means surrounding a predetermined portion of each of said sludge ports, said dam means including a lowermost dam portion at the outer periphery of said lamella member and a pair of oppositely disposed sidewall members adjacent said lower most dam portion, integral flow-straightening radially-extending lip members extending from each of said trough walls at the outer periphery of lamella member, a containment means for housing said lamella means, said containment means in fluid communication with said input means and said output means, integral spacer and support means for providing a predetermined gap separation between said lamella members, sludge removal means for removing sludge collected from said lamella members.

4,921,610

CLEANING OF HOLLOW FIBRE FILTERS

Douglas L. Ford, Eastwood, and Noel Barton, West Pymble, both of Australia, assignors to Memtec Limited, Parramatta, Australia

PCT No. PCT/AU87/00301, § 371 Date May 4, 1988, § 102(e) Date May 4, 1988, PCT Pub. No. WO88/01529, PCT Pub. Date Mar. 10, 1988
PCT Filed Sep. 4, 1987, Ser. No. 236,711
Claims priority, application Australia, Sep. 4, 1986, PH7847; Jan. 19, 1987, PH9928
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—636 **5 Claims**

1. A method of operating a microporous hollow fibre filter comprising the steps of:

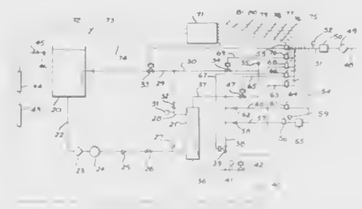
(i) applying a liquid feedstock to be filtered to the outer surface of the filters whereby:

(a) some of the liquid passes through the walls of the fibres to be drawn off as clarified liquid or filtrate from the fibre lumens,

(b) at least some of the solids are retained on or in the fibres with the non-retained solids being removed from the filter with the remainder of the liquid

(ii) discharging the retained solids by applying a pressurised liquid and/or gas backwash,

(iii) calculating from the rate of diminution of flow of filtrate after each application of pressurised liquid and/or gaseous



backwash an equation expressing the relationship between filtrate flow and time, and,

(iv) allowing for the time lost in each backwash cycle and the amount of filtrate lost in each backwash cycle,

(v) calculating from the filtrate loss, the time loss and the the relationship between filtrate flow and time, the optimum time and pattern of application of sequential liquid or gaseous backwashes, and,

(vi) effecting the backwash at the optimum time.

4,921,611

THIN FILM COMPOSITE MEMBRANE PREPARED BY DEPOSITION FROM A SOLUTION

Robert C. Schucker, 10532 Mollylea Dr., Baton Rouge, La. 70815

Division of Ser. No. 108,820, Oct. 14, 1987, Pat. No. 4,837,054. This application Feb. 9, 1989, Ser. No. 308,703
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—644 **4 Claims**

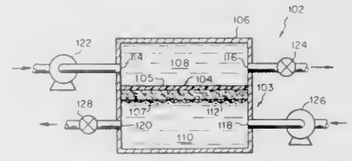
1. A method for separating aromatic hydrocarbons from a feed mixture of aromatic and nonaromatic hydrocarbons consisting of providing a composite membrane consisting of a thin active layer of polyurea/urethane on a porous backing, said membrane being made by the steps of producing a solution of polyurea/urethane polymer in a multicomponent solvent system consisting of (a) an aprotic solvent, (b) a cyclic ether, (c) cellosolve acetate or methyl cellosolve and (d) a wetting agent wherein the components in the solvent are used in a parts per hundred ratio of a/b/c/d in the range about 3–27/94–33/2–33/1–7, depositing a thin film of the polymer in solvent onto the microporous support, evaporating said solvent to produce the thin film polyurea/urethane on support membrane and wherein the polyurea/urethane copolymer is characterized by possessing a urea index of at least about 20% but less than 100%, an aromatic carbon content of at least about 15 mole percent, a functional group density of at least about 10 per 1000 grams and a C=O/NH ratio of at least about 8 and contacting said feed mixture under pervaporation or perstraction conditions with said composite membrane.

4,921,612

ASYMMETRICALLY-WETTABLE POROUS MEMBRANE PROCESS

Kamalesh K. Sirkar, Scotch Plains, N.J., assignor to The Trustees of Stevens Institute of Technology, Hoboken, N.J.

Continuation of Ser. No. 789,992, Oct. 22, 1985, abandoned. This application Jun. 15, 1988, Ser. No. 208,869
Int. Cl.[5] B01D *11/04, 13/00, 13/01;* **C12N** *11/04*
U.S. Cl. 210—644 **11 Claims**



1. A process for transferring solute from a liquid feed solution to a liquid extractant, the feed solution and the extractant being substantially immiscible when in direct contact with each other, one of the feed solution and the extractant being substantially miscible with water to define a water-miscible liquid, the other of the feed solution and the extractant being substantially immiscible with water to define a water-immiscible liquid, the process comprising the steps of:

(a) contacting a first side of an asymmetrically-wettable, porous membrane with the water-miscible liquid, the first side being hydrophilic, the membrane having a second side opposing the first side, the second side being hydrophobic, the membrane having pores which pass through the membrane providing liquid-phase communication between the first side and the second side; and

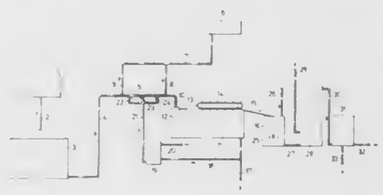
(b) contacting the second side of the membrane with the water-immiscible liquid so that the feed solution and the extractant can come into liquid/liquid interfacial contact through the pores of the membrane, the interface between the feed solution and the extractant being substantially immobilized at the porous membrane.

4,921,613

METHOD FOR PURIFYING RESIN-CONTAINING WASTE LIQUOR IN THE MANUFACTURE OF CELLULOSE PULPS

Cecilia M. Nordberg, Örnsköldsvik; Thomas B. Engström, Vallakra; Thomas Pinzke, Helsingborg; Owe Sänneskog, Helsingborg, and Jan Öhlund, Helsingborg, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Dec. 23, 1988, Ser. No. 288,932
Claims priority, application Sweden, Dec. 23, 1987, 8705141
Int. Cl.[5] C02F *1/24*
U.S. Cl. 210—651 **14 Claims**



1. A method for purifying resin-containing waste liquor obtained in the manufacture of cellulose pulp,

the resin-containing waste liquor having been removed from cellulose pulp and the pH of the waste liquor being within the pH range of 1 to 7.

supplying a water-soluble organic polymer to the waste liquor which is in the form of a forwardly flowing liquid stream of the waste liquor, wherein the polymer is divided into portions,

adding the thus divided portions of polymer to the forwardly flowing liquid steam of waste liquor at at least two separate and different times and locations along the direction of flow of the forwardly flowing liquid stream of waste liquor;

subjecting the liquid stream to a shearing and/or turbulent treatment process to thereby agglomerate the resin; and

then separating the agglomerated resin from the waste liquor.

4,921,614

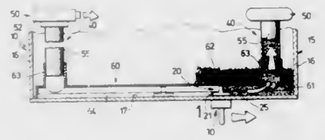
AQUARIUM CLEANING AND FILTERING SYSTEM AND METHOD

Jay P. Frickman, 2365 Madison Rd., #209, Cincinnati, Ohio 45208; William E. Kissick, Jr., 911 Cramer Ave., Apt. 1, Lexington, Ky. 40502, and Kevin R. McMahon, 41 W. Villa Pl., Ft. Thomas, Ky. 41075

Filed Aug. 29, 1988, Ser. No. 237,930

Int. Cl.[5] A01K *63/04*

U.S. Cl. 210—695 **27 Claims**



20. A method for removing waste and debris collected in a lower compartment of an aquarium tank defined by a perforated grid arranged adjacent a bottom wall of the aquarium tank, comprising:

directing water upwardly away from a location adjacent said bottom wall of said tank; and

moving said waste and debris generally toward said location to permit said waste and debris to be expelled from said lower compartment,

said moving and said directing steps including the step of moving a barrier structure along the bottom wall by mechanical means arranged externally of the tank to dislodge said waste and debris collected on the bottom wall and to direct said waste and debris generally toward said location and upwardly away from said location.

4,921,615

SEPARATION OF SOLID PARTICLES OF VARIOUS SIZES FROM VISCOUS LIQUIDS

Walter Lindoerfer, Kassel; Kai-Udo Sewe, Barnstorf; Wilhelm Jahn-Held, Stanfenberg; Burkhard Ziebolz, Braunschweig, and Fritz Wagner, Braunschweig-Stoeckheim, all of Fed. Rep. of Germany, assignors to Wintershall AG, Kassel, Fed. Rep. of Germany

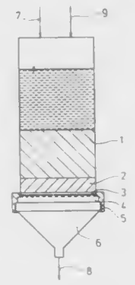
Filed May 27, 1988, Ser. No. 199,863

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717902

Int. Cl.[5] B01D *37/08*

U.S. Cl. 210—729 **23 Claims**

1. A process for separating solid particles of various sizes from viscous liquids by pressure filtration whereby solid particles of various sizes are retained, according to size, in superposed or juxtaposed filter stages (**1**), (**2**) and (**3**) on filter layers of various depths and on filter surfaces comprising subjecting an inhomogeneous or a homogenized suspension to pressure filtration thereby separating solid particles according to size in a filter stage (**1**) comprising a filter layer of a 3-dimensional network of a metal wire, synthetic cloth or a cellulose material having an average pore width of from 1 to 3 mm, in a filter stage (2) comprising a filter layer of an open-pored polyurethane foam having an average pore width of from 0.2 to 0.8



mm and in a filter stage (3) comprisinga filter cloth of natural or synthetic material having a pore size of from 0.006 to 0.2 mm from the viscous liquid.

4,921,616

ALVEOLAR CERAMIC FILTERS FOR HIGH MELTING METALS

Louis Minjolle, Tarbes, France, assignor to Ceramiques et Composites, Courbevoie, France

Continuation of Ser. No. 26,898, Mar. 17, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 271,356

Claims priority, application France, Mar. 19, 1986, 86 03888

Int. Cl.[5] C04B *35/10*

U.S. Cl. 210—767 **10 Claims**

1. A shaped, porous filter member having a size and shape adapted for the filtration of liquid metals, which comprises a porous alveolar ceramic material including from 10 to 20% SiO_2, from 50 to 60% Al_2O_3 and from 20 to 40% ZrO_2, each percentage being by weight with respect to the total weight of said oxides, said Al_2O_3 and SiO_2 being present in the form of mullite, $3Al_2O_3/2SiO_2$, and the combined weight of the zirconia and mullite comprising at least 90% by weight of said alveolar ceramic material wherein said porous alveolar ceramic material has a coefficient of linear expansion of less than 6.5×10^{-6}/° C. at a temperature of from 20° C. to 1,000° C., an open porosity of 0 to 30% and an apparent density of about 2.6 to 3.8.

4,921,617

BACKWASHER ADAPTOR FOR SWIMMING POOL FILTER SYSTEM

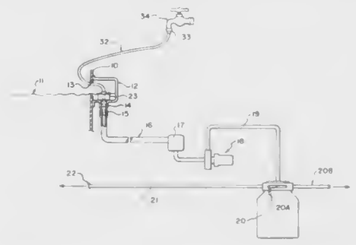
Douglas J. Antoine, 109 Bank Avenue, Winnipeg, Manitoba, Canada (R2M 0N3), and Arthur J. Antoine, 237 Stuart Avenue, Winnipeg, Manitoba, Canada (R2G 0Y6)

Filed Nov. 17, 1988, Ser. No. 273,056

Int. Cl.[5] E04H *3/20*

U.S. Cl. 210—776 **10 Claims**

1. A method of filtering a swimming pool comprising the steps of withdrawing water from the pool into a skimmer, pumping the water through a discharge opening of the skimmer through a filter in a filtering direction to form filtered water leaving filtered materials in the filter, returning the filtered water to the pool, inserting a plug member into the discharge opening of the skimmer to temporarily halt flow of water from the skimmer to the filter, while the flow from the skimmer is halted injecting fresh water from a source of fresh water separate from the pool through the plug member so as to travel to the filter, pumping the fresh water through the filter in a backwash direction opposite to said filtering direction so that the fresh water strips said filtered materials from the filter, discharging separately from the pool the fresh water and filtered materials, halting the fresh water from said separate source and removing the plug member to restore the flow of



water from the skimmer through said filter in said filter direction.

4,921,618

INVERTED SEPARATION AND TRANSFER DEVICE, AND PROCESS FOR USING SAME

Jack A. Hamlin, Proctorville, Ohio, assignor to BASF Corporation, Parsippany, N.J.

Filed Jul. 1, 1987, Ser. No. 68,305

Int. Cl.[5] B01D *45/02*

U.S. Cl. 210—780 **11 Claims**



1. A process for separating a mixture, the mixture comprising a liquid, the process comprising the steps of:

(a) filling a container tube with a desired quantity of the mixture;

(b) inserting a tubular plunger into the container tube, the plunger forming a liquid-tight seal with the container tube:

(c) inverting the tube-plunger assembly so that most of the liquid is above the plunger;

(d) placing the lowermost end of the plunger within a collection cup container, a junction between the container cup and the lowermost end of the plunger providing a means for ensuring that substantially all of the liquid passing completely through the hollow plunger is deposited directly into a collection cup; and

(e) forcing the hollow plunger along the axis of and further into the container tube, the junction between the collection cup and the plunger also permitting a gas which is initially within the liquid receiver container and collection cup to easily escape during passage of liquid through the tubular plunger and during deposition of the liquid into the collection cup, whereby simultaneous separation and transfer occur.

4,921,619

ENHANCED OIL RECOVERY THROUGH CYCLIC INJECTION OF FLUOROCHEMICALS

Athanasios Karydas, Brooklyn, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 12, 1988, Ser. No. 180,412

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[5] E21B *43/22*

U.S. Cl. 252—8.554 **31 Claims**

1. A method of cyclic oil production consisting of

(a) cleaning the injection bore of asphaltenes, sand or both by injecting into said bore (i) a solubilizer or solvent for said asphaltenes and a carrier for said sand or (ii) a hot aqueous solution as a carrier for said sand and said asphaltenes, or (iii) both (i) and (ii), and if said formation is heated to above 210° F., the formation is permitted to cool to not in excess of 210° F.;

(b) contacting a composition consisting essentially of an effective amount of a compound selected from fluorochemicals of formula I

$$[(R_f)_n(R')_p]_mZ \qquad (I)$$

wherein

R_f is an inert, stable oleophobic and hydrophobic fluoroaliphatic group having up to about 20 carbon atoms;

n is an integer of 1 to 3;

R' is a direct bond or an organic group having a valency of n+1 and is covalently bonded to both R_f and Z;

m is an integer of from 1 to about 5000;

Z is a hydrocarbyl containing residue of valency m; or mixtures thereof; and

p is 0 or 1 provided that when p is 0, n is 1, and an effective amount for dispersing crude oil in water of at least one hydrocarbon surfactant in solution or suspension with a deposit containing crude oil by injection thereof through an injection bore thereby lifting oil and leaving the sand water wet and otherwise not altering the formation; and

(c) extracting said oil from said deposit via said injection bore; while maintaining the temperature of said formation at from ambient temperature up to and including 210° F.

4,921,620

CHROME HUMATES AS DRILLING MUD ADDITIVES

William C. Firth, Jr., Robbinsville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 699,642, Feb. 2, 1985. This application Nov. 13, 1985, Ser. No. 797,511

Int. Cl.[5] C09K *7/02*

U.S. Cl. 252—8.513 **17 Claims**

1. In a water-based drilling fluid which comprises an aqueous suspension of solids, the improvement which comprises;

the presence of a viscosity and/or fluid loss reducing proportion of a chrome humate dispersed in the drilling fluid, said chrome humate being one obtained upon reaction or complexation of a humate which has been obtained from association with a titanium mineral deposit, and an inorganic chromium compound;

said humate having a compositional make-up of a carbon to hydrogen with a ratio (weight to weight) of 9.5–17.5:1.0; a carbon to oxygen (weight to weight) ratio of 1.0–2.3:1.0; an aluminum content of 2.8–8.4 percent by weight; a titanium content of 0.5–3.5 percent by weight and a calcium content of less than 0.5 percent by weight.

8. A method of reducing the viscosity and/or fluid loss of a water-based drilling mud which comprises an aqueous suspension of solids, which comprises:

dispersing a viscosity and/or fluid loss reducing proportion of a chrome humate in the water-based drilling mud;

said chrome humate being one obtained upon reaction or

complexation of a humate which has been obtained from association with a titanium mineral deposit, and an inorganic chromium compound;

said humate having a compositional make-up of a carbon to hydrogen ratio (weight to weight) of 9.5–17.5:1.0; a carbon to oxygen (weight to weight) ratio of 1.0–2.3:1.0; an aluminum content of 2.8–8.4 percent by weight; a titanium content of 0.5–3.5 percent by weight and a calcium content of less than 0.5 percent by weight.

4,921,621

HYDROLYZED CO-POLYMERS OF N-VINYLAMIDE AND ACRYLAMIDE FOR USE AS WATERLOSS CONTROL ADDITIVES IN DRILLING MUD

Christine A. Costello, Easton; Robert K. Pinschmidt, Jr., Allentown, both of Pa., and Ta-Wang Lai, Novato, Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 164,356, Mar. 4, 1988, Pat. No. 4,804,793, which is a continuation-in-part of Ser. No. 914,046, Oct. 1, 1986, abandoned. This application Nov. 7, 1988, Ser. No. 268,329

The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.[5] **C09K** *7/00*

U.S. Cl. 252—8.513 **14 Claims**

1. An aqueous clay-based drilling mud containing as a waterloss control additive a copolymer of acrylamide and an N-vinylamide, said copolymer having at least about 5 percent of the N-vinylamide units hydrolyzed to N-vinylamine units wherein said copolymer, before hydrolysis, contains from 10 to 95 mole percent acrylamide units and from 5 to 90 mole percent N-vinylformamide units.

4,921,622

FLUID-PERMEABLE AGENT FOR NON-WOVEN SHEETS OF POLYOLEFIN FIBERS AND METHOD OF APPLICATION THEREOF: N,N-DI-HYDROXYETHYL AMIDE AND POLYOXYALKYLENE-MODIFIED SILICONE

Tomohiro Kato; Yoshio Takasu, and Makoto Minafuji, all of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

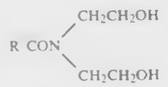
Filed Nov. 17, 1988, Ser. No. 272,730

Claims priority, application Japan, Dec. 2, 1987, 62-305326

Int. Cl.[5] **D06M** *13/40, 15/64*

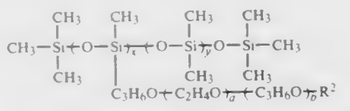
U.S. Cl. 252—8.9 **12 Claims**

1. A fluid-permeable agent for providing fluid-permeability to non-woven sheets of polyolefin fibers, said agent being characterized as containing 50–95 wt% of aliphatic diethanol amide shown by Formula (A) given below and 5–50 wt% of polyoxyalkylene modified silicone shown by Formula (B) given below:



(A)

where R^1 is alkyl or alkenyl group with 11–17 carbon atoms; and



(B)

where x is an integer in the range of 1–10, y is an integer in the range of 7–100, a is an integer equal to or greater than 5, b is an integer equal to or less than 95, (a+b) is an integer equal to or less than 100 and R^2 is H or alkyl group with 1–12 carbon atoms.

4,921,623

COPPER CONDUCTIVE COATING COMPOSITION

Shoji Yamaguchi; Kimiko Yamada; Katsuyoshi Yada; Koichi Sakaguchi, and Hiromu Inoue, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,532

Claims priority, application Japan, Jul. 24, 1987, 62-185280; Sep. 14, 1987, 62-230751

Int. Cl.[5] **H01B** *1/06*

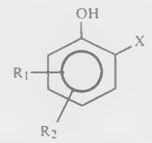
U.S. Cl. 252—512 **8 Claims**

1. A copper conductive coating composition which comprises:

(A) from 10 to 90% by weight of a copper powder,

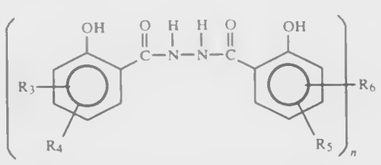
(B) from 10 to 90% by weight of a coating binder resin, and

(C) from 0.01 to 5% by weight of at least one member selected from the group consisting of salicylic acid or its derivatives represented by the formula:



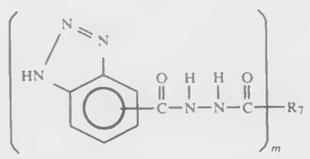
(I)

wherein each of R_1 and R_2 is a hydrogen atom or a C_{1-4} alkyl group, and X is a —COOH group, a —COH=NOH group, —$CONHNH_2$ group, a —$CONH_2$ group or a —CH=NOH group, salicyclic acid dreivatives represented by the formula:



(II)

wherein each of R_3 to R_5 is a hydrogen atom or a C_{1-8} alkyl group, R_6 is a hydrogen atom or a C_{1-8} hydrocarbon group having a valency of n, and n is an integer of from 1 to 4, and benzotriazolecarboxylic acid hydrazides represented by the formula:



(III)

wherein R_7 is a carboxylic acid residue having a valency of m, and m is an integer of from 1 to 4.

4,921,624

MODIFIED FATTY AMIDES AND SULFURIZED FATTY OILS AS LUBRICANT ADDITIVES

Karl P. Kammann, Jr., Crown Point, Ind., assignor to Ferro Corporation, Cleveland, Ohio

Filed Jun. 3, 1988, Ser. No. 202,736

Int. Cl.[5] **C10M** *129/00, 133/00*

U.S. Cl. 252—48.6 **17 Claims**

15. The lubricating oil composition of claim 12, additionally comprising a minor amount, from about 0.1 to about 10 wt. % of the lubricating oil composition, of a sulfurized triglyceride, wherein the acid component of said triglycercide comprises from about 35 to about 65 mole % unsaturated fatty acids and the sulfur content is within the range from about 4 to about 14 weight %.

4,921,625

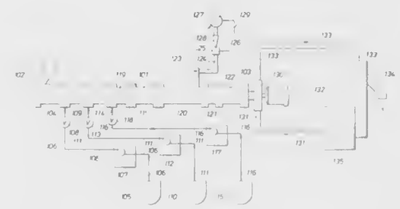
METHOD FOR PREPARING FUNCTIONALIZED BLOCK COPOLYMERS

John E. Gorman, Houston, and John A. Morris, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 27, 1988, Ser. No. 211,748

Int. Cl.[5] **C10M** *107/02, 145/10*

U.S. Cl. 252—56 D **12 Claims**



1. A method for functionalizing hydrocarbon polymers comprising the steps of:

(a) contacting 100 parts by weight of a hydrocarbon polymer with a carboxylic acid reagent in the presence of between about 5 and about 400 parts by weight of a suitable diluent and int he presence of a free radical initiator in a blending apparatus selected from the group consisting of extruder, Banbury mixer and sigma blade mixer; and

(b) recovering a functionalized hydrocarbon polymer.

4,921,626

GLASS ETCHING COMPOSITION AND METHOD OF MAKING

Thomas A. Rhodenbaugh, Cincinnati, Ohio, assignor to Automark Corporation, Louisville, Ky.

Filed Aug. 23, 1989, Ser. No. 397,277

Int. Cl.[5] **C09K** *13/06, 13/08;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 252—79.4 **9 Claims**

1. An etching composition for etching glass comprising:

from about 16% to about 30% by weight of ammonium bifluoride;

from about 2% to about 4% by weight of xanthum gum;

from about 45% to about 60% by weight of water; and,

from about 20% to about 24% by weight of propylene glycol.

4,921,627

DETERSIVE SYSTEM AND LOW FOAMING AQUEOUS SURFACTANT SOLUTIONS CONTAINING A MONO(C_{1-4} ALKYL)-DI(C_{6-20}) ALKYLAMINE OXIDE COMPOUND

James L. Copeland, Burnsville, and Daniel J. Donovan, St. Paul, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation of Ser. No. 931,398, Nov. 14, 1986, abandoned. This application Sep. 23, 1988, Ser. No. 250,975

Int. Cl.[5] **C11D** *1/75, 3/10*

U.S. Cl. 252—99 **12 Claims**

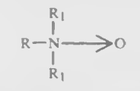
1. A warewashing detersive system comprising:

(a) about 1 to 80 wt-% of a source of alkalinity;

(b) 1 to 80 wt-% of a hardness sequestering agent;

(c) 1 to 10 wt-% of a source of active halogen; and

(d) 0.01 to 10 wt-% of a surfactant of the formula:



wherein R is C_{1-4} aliphatic group and each R_1 is independently a linear or branched aliphatic hydrocarbon group having an average of about 6 to 20 carbon atoms.

4,921,628

CLEANING COMPOSITION FOR REMOVAL OF PCBS

James E. Nash, Dellwood, and Kurt E. Heikkila, Circle Pines, both of Minn., assignors to Integrated Chemistries, Incorporated, St. Paul, Minn.

Continuation-in-part of Ser. No. 123,373, Nov. 20, 1987, Pat. No. 4,792,413, which is a continuation of Ser. No. 920,275, Oct. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 689,336, Jan. 7, 1985, abandoned. This application Dec. 1, 1988, Ser. No. 256,738

Int. Cl.[5] **C11D** *9/24*

U.S. Cl. 252—111 **13 Claims**

1. A composition for PCB cleanup comprising:

an aromatic hydrocarbon solvent fraction containing an alkyl group having between C_9 and C_{12} the solvent fraction comprising a predominant amount of the overall composition;

a wetting agent fraction ranging in amount in the overall composition from about 10 to about 40 weight percent, and being formed by combining a component selected from the group consisting of synthetic carboxylic acids and fatty acid oils of chain length C_{10} to C_{20}, and mixtures thereof in an amount in the fraction ranging from about 30 to about 86 weight percent with a component in an amount in the fraction ranging from about 14 to 70 weight percent and being selected from the group consisting of ammonia, ethylamine, methylamine, ethyleneamine, diethyleneamine, dimethylamine, monoethanolamine, diethanolamine, triethanolamine, and mixtures thereof, and

the composition further including benzene sulfonic acid as an additional ingredient in a weight percent range of greater than 0 and up to about 20 weight percent.

4,921,629

HEAVY DUTY HARD SURFACE LIQUID DETERGENT

Farrokh B. Malihi, Kendall Park, and Nicholas J. Sparacio, Edison, both of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Apr. 13, 1988, Ser. No. 181,022

Int. Cl.[5] **C11D** *3/43*

U.S. Cl. 252—170 **8 Claims**

1. A single phase liquid detergent composition especially effective in removing greasy soils from hard surfaces consisting essentially of a mixture of:

a. from about 1 to 5% of at least one surfactant selected from the group consisting of nonionic, polar nonionic, and amphoteric surfactants or mixtures thereof;

b. about 1-6% of a builder;
c. from about 1-5% of an alkanolamine selected from the group consisting of monoethanolamine, diethanolamine, and triethanolamine;
d. from about 2 to 8% of at least one organic solvent, said solvent selected from the group consisting of water soluble glycol ethers and alkyl acetates; and
e. water, wherein the pH of the composition ranges from 9 to 13.

4,921,630

CONTACT LENS CLEANING COMPOSITIONS CONTAINING AN ENZYME AND A CARBOXY VINYL POLYMER

Rajkumar P. Bhatia, Arlington, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 945,998, Dec. 24, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 229,767
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[5] C11D *3/14*
U.S. Cl. 252—174.12 **5 Claims**

1. A method of cleaning a contact lens which comprises:
applying to the lens a small amount of a composition comprising an ophthalmically acceptable enzyme in an amount sufficient to facilitate chemical decomposition and removal of deposits from the lens, an abrasive component consisting essentially of a carboxy vinyl polymer having a molecular weight of from about 1,000,000 to about 6,000,000 in an amount sufficient to facilitate physical removal of deposits and debris present on the lens by forming an abrasive precipitate when the composition is rubbed over the surface of the lens, and an ophthalmically acceptable carrier for the enzyme and the abrasive component;
rubbing the composition over the surface of the lens to form an abrasive precipitate of the carboxy vinyl polymer, said abrasive precipitate acting to physically remove deposits and debris present on the surface of the lens; and
rinsing the lens to resolubilize the abrasive precipitate and remove the remaining composition and debris from the surface of the lens.

4,921,631

BLEACH ACTIVATOR COMPOSITIONS

Anthony J. Gradwell, and John D. Withenshaw, both of Holywell, England, assignors to Warwick International Limited, England

Filed May 12, 1988, Ser. No. 194,030
Int. Cl.[5] D06L *3/02*; C11D *3/39*
U.S. Cl. 252—186.38 **17 Claims**

1. A bleach activator body said body having an average diameter of between 300 and 2000 microns and a longitudinal dimension in the range of 1 to 6 mm comprising:
(a) 50 to 97.5% of particulate bleach activator,
(b) 0.5 to 40% of a particulate water-soluble disintegration aid, and
(c) 2 to 45% of a binder selected from nonionic surfactants, polyethylene glycols, non-ionic, film-forming polymers, and mixtures thereof, said binder having a melting point of at least 20° C., wherein the components are substantially evenly distributed throughout the body, in which the bleach activator is a mixture of first and second activators, the first activator being a relatively surface active bleach activator which, in an aqueous solution containing a peroxygen bleaching compound, produces peroxy acids and diacids having hydrocarbyl groups containing 5 to 20 carbon atoms, and the second activator being a relatively non-surface active bleach activator which, in an aqueous solution containing a peroxygen bleaching compounds, produces a C_{1-4} aliphatic carboxyperacid.

4,921,632

LIQUID CRYSTAL COMPOUNDS AND COMPOSITIONS

Toyokazu Nakamura; Yuzi Kato; Shobei Naemura; Chizuka Tani, all of Tokyo; Masahiro Satoh, Kyoto; Kunikiyo Yoshio, Ohmihachiman; Hiroshi Kishiki, Takatsuki, and Hiroshi Hoshino, Hirakata, all of Japan, assignors to NEC Corporation, Tokyo and Sanyo Chemical Industries, Ltd., Kyoto, both of, Japan

Filed Aug. 19, 1988, Ser. No. 234,107
Claims priority, application Japan, Aug. 26, 1987, 62-213974
Int. Cl.[5] C09K *19/34, 19/30, 19/12, 19/22, 19/00, 19/32*; C09F *19/06, 19/20*
U.S. Cl. 252—299.1 **22 Claims**

1. A liquid crystal compound represented by the general formula (1):

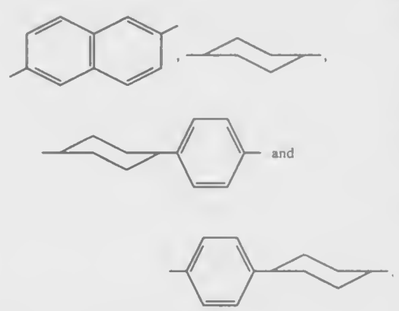


(1)

wherein R and R' are independently selected from alkyl groups containing 1~20 carbon atoms; X is —O—, —O—CO—O— or direct bond; A_1 and A_2 are independently cyclic groups selected from the group consisting of

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-continued



said cyclic groups may be substituted with 1~4 fluorine, chlorine or bromine atoms, or 1 or 2 substituent groups selected from the group consisting of cyano, nitro and trifluoromethyl groups; and Y is —CO—O—, —O—CO—, —C≡C—, —CH$_2$O—, —OCH$_2$—, —CH=N—, —N=CH—, —N=N—, —CH$_2$S—, —SCH$_2$—; and * represents asymmetric atom providing optical activity.

4,921,633

METHOD OF HETEROGENEOUS REACTION

Tadashi Funada, Hyogo; Jiro Hirano, Kanagawa; Shiro Ishida; Kensuke Morioka, both of Hyogo, and Sachiko Murakami, Osaka, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 596,790, Apr. 4, 1984, abandoned. This application Aug. 28, 1986, Ser. No. 902,010
Claims priority, application Japan, Apr. 4, 1983, 58-57839
Int. Cl.[5] B01J *13/02*
U.S. Cl. 252—314 **22 Claims**

1. A method of carrying out a heterogeneous reaction, in the absence of an emulsifier, in which a water-soluble component is reacted with an oil-soluble component, the improvement which comprises, dispersing the oil-soluble component in the water-soluble component or in an aqueous medium containing the water-soluble component by passing the oil-soluble component through micropores of a disperser fabricated from a hydrophilic material as it enters the water-soluble component or the aqueous medium, aggregating the oil-soluble component after reaction, and separating the oil-soluble component from the water-soluble component or the aqueous medium containing said water-soluble component.

4,921,634

EMULSIONS OF FLUORINATED PRODUCTS

Jacques Poulenard; Louis Gavet, both of Lyons; Roger Chatelin, Lissieu per Lozanne, and Annie Giorgio, Villeurbanne, all of France, assignors to Institut Textile de France, Cedex, France

Filed Apr. 14, 1988, Ser. No. 181,727
Claims priority, application France, Apr. 14, 1987, 87 05307
Int. Cl.[5] C09K *13/02*
U.S. Cl. 252—312 **9 Claims**

1. An emulsion comprising a fluorinated ingredient, at least one surface-active agent and morpholine.

4,921,635

CO_2 GELS AND METHODS FOR MAKING

Robert M. Enick, Bethel Park, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Nov. 22, 1988, Ser. No. 275,430
Int. Cl.[5] B01J *13/00*; E21B *43/22*
U.S. Cl. 252—315.1 **12 Claims**

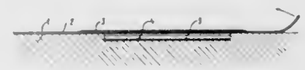
1. A method for increasing the viscosity of CO_2 comprising the steps of:
mixing semi-fluorinated alkane in liquid CO_2 until the liquid CO_2 becomes supersaturated with semi-fluorinated alkane;
heating the liquid CO_2 that is supersaturated with semi-fluorinated alkane; and
cooling the liquid CO_2 that is supersaturated with semi-fluorinated alkane.

4,921,636

TIME DURATION INDICATOR SYSTEMS, AND ALSO PRODUCTS CONTAINING SUCH INDICATOR SYSTEMS HAVING A LIMITED DURATION OF USE OR LIFE

Petrus C. Traas, Naarden, Netherlands, assignor to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Dec. 3, 1986, Ser. No. 939,521
Claims priority, application Netherlands, Dec. 16, 1985, 8503456
Int. Cl.[5] B66D *3/04*
U.S. Cl. 252—408.1 **10 Claims**



1. A time duration indicator, which comprises
a layer of a porous inert carrier material having two major surfaces, that is substantially opague when dry,
a colorless, volatile liquid impregnated in the carrier material and selected such that the carrier material becomes transparent or translucent when impregnated with the liquid, the liquid being capable of evaporating from the carrier material, and
an inert layer attached to one major surface of the carrier material, the inert layer having a color different from that of the carrier material, wherein the inert layer can be seen through the carrier material when the carrier material is impregnated with the liquid, and the inert layer cannot be seen through the carrier material when substantially all of the liquid has evaporated from the carrier material, the amount and volatility of the liquid being chosen such that, on expiration of a specified amount of time, the carrier material conceals the inert layer.

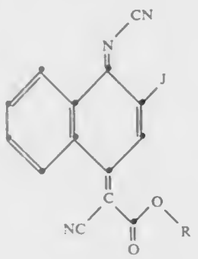
4,921,637

NAPHTHOQUINONE DERIVATIVES

Teh-Ming Kung, Rochester; William B. Vreeland, Webster, and Ralph H. Young, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1988, Ser. No. 287,946
Int. Cl.[5] C07C *121/48*
U.S. Cl. 552—295 **2 Claims**

1. A chemical compound having the structure

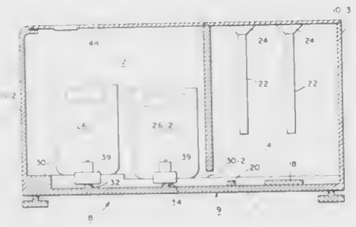


wherein:
J is alkyl having 1 to 6 carbon atoms, and
R is normal alkyl having 1 to 6 carbon atoms.

4,921,638
17β-CYANO-9α,17α-DIHYDROXYANDROST-4-EN-3-ONE
Douglas A. Livingston, Oshteme Township, Kalamazoo County; Bruce A. Pearlman, Kalamazoo, both of Mich.; Scott Denmark, Urbana, Ill., and Joel E. Huber, Boston, Mass., assignors to The Upjohn Company, Kalamazoo, Mich.
Continuation-in-part of Ser. No. 20,457, Mar. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 927,633, Nov. 5, 1986, abandoned. This application Oct. 3, 1988, Ser. No. 252,639
Int. Cl.[5] C07J *1/00*
U.S. Cl. 552—610 **1 Claim**

1. 17β-Cyano-9α,17α-dihydroxyandrost-4-en-3-one.

4,921,639
ULTRASONIC HUMIDIFIER
Bernard Chiu, 29 Davis Farm Rd., Ashland, Mass. 01721
Filed Nov. 9, 1988, Ser. No. 268,712
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—67 **5 Claims**



1. A humidifier comprising:
(a) a housing having a bottom wall, the bottom wall including a portion defining a reservoir,
(b) a pair of removable water tanks, said water tanks being situated within said humidifier for supplying water to said reservoir, each tank having an opening at the bottom for the passage of water,
(c) each water tank including valve means, the valve means in one water tank being slightly higher than the valve means of the other water tank relative to said reservoir,
(d) each of said valve means comprising a cap encompassing said opening in said water storage tank, said cap having an opening, a movable spring biased plunger situated within said opening, a circumferential wall surrounding a portion of said plunger and extending from the bottom of said cap and a pair of notches on opposed sides of said circumferential wall, said pair of notches of said cap associated with one water storage tank being dimensioned of a larger height than said pair of notches associated with said cap of said other water storage tank so that water will flow therefrom in a staggered sequence, and
(e) means for converting water in the reservoir into a mist.

4,921,640
VENTURI-TUBE BUBBLE-FORMING CONTAINER
Tsann-Kuen Wu, No. 140-10, Che-Lu-Chien, Pau-An Tsun, Jen-Te Hsiang, Tainan Hsien, Taiwan
Filed May 8, 1989, Ser. No. 348,718
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—76 **5 Claims**

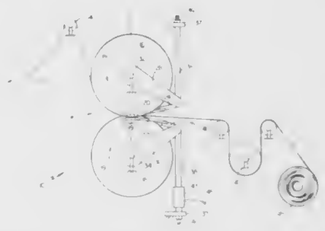


1. A bubble-forming container including a body with an interior chamber formed in said body, a venturi-tube type inlet unit and a discharge pipe unit, said inlet unit including a main pipe with a throat for passage of a high-pressure gas therethrough, a branch pipe communicated with said throat of said main pipe so as to draw a liquid into said throat, and an inlet formed through an upper wall of said body in communication with said main pipe so that a fluid combined from said gas and said liquid can flow quickly downward into said chamber, said discharge pipe unit including a discharge pipe extending through a lower wall of said body in such a manner that a liquid-tight seal is established between said body and said discharge pipe, a blocking plate sealing an upper end of said discharge pipe, and an opening formed through said discharge pipe intercommunicating said chamber and said discharge pipe, said blocking plate being positioned so that a stream of said fluid can flow from said inlet to pound on an upper surface of said blocking plate, whereby, when said blocking plate disperses said fluid so that a turbulence is created in said liquid in said chamber, bubbles are formed in said liquid and flow out of said chamber through said opening.

4,921,641
LIQUID-VAPOR CONTACT COLUMNS
John T. Lavin, Guildford, United Kingdom, assignor to The BOC Group, Inc., New Providence, N.J.
Filed Feb. 6, 1989, Ser. No. 306,958
Claims priority, application United Kingdom, Feb. 5, 1988, 8802627
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—112.2 **9 Claims**

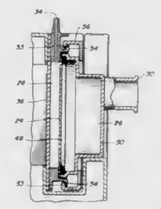
1. A packing for a liquid-vapor contact column, comprising at least one array of liquid-vapor contact members each defining liquid-vapor passages therethrough and having a wettable surface, wherein each member is comprised of a metallic sheet having at least one wettable surface including a multiplicity of open pores, wherein said surface is formed by spraying a particulate mixture of metal and a plastics material onto a surface of the metallic sheet to form a coating comprising particles of plastics embedded in metal, and heating the coating to volatilize or otherwise remove the plastics material, thereby forming the pores in the metal coating.

4,921,643
WEB PROCESSING WITH TWO MATED ROLLS
Richard R. Walton, Ten W. Hill Pl., Boston, Mass. 02114, and George E. Munchbach, Roslindale, Mass., assignors to Richard R. Walton, Boston, Mass.
Filed Jun. 24, 1988, Ser. No. 211,385
Int. Cl.[5] B31F *1/12*
U.S. Cl. 264—282 **16 Claims**



10. A method for processing a selected web of material comprising
providing two side-by-side sets of spaced apart driven disks rotatable respectively in opposite directions about two spaced apart parallel axes, the axes being sufficiently close that peripheral margins of the disks of one set run between the peripheral margins of the disks of the other set in a mated relationship,
the peripheries of the sets of disks mutually defining a series of web driving regions spaced apart in a direction parallel with said axes, with successive web driving regions offset from one another,
open channels between said disks providing, with said driving regions, a width-wise continuous, non-linear cross-section corridor through which said web passes,
leading a web lengthwise into said corridor in a manner to cause said driving regions to impart crosswise tension in said web, pulling said web about the edges of said rotating disks, said tension enabling said disks to apply forward driving force to said web and
providing retarding means in the form of two sets of retarding fingers, one set disposed on each side of the web with fingers interposed in the spaces between respective disks, whereby the fingers in one set are laterally offset with respect to fingers in the other set, said fingers being closely disposed to said driving regions, and located and constructed to apply retarding forces on said web in the region of said corridor over a short distance relative to the radius of said disks, said retarding forces opposing said driving forces to produce immediate, continual longitudinal shortening of said web.

4,921,642
HUMIDIFIER MODULE FOR USE IN A GAS HUMIDIFICATION ASSEMBLY
Gary J. LaTorraca, San Diego, Calif., assignor to Puritan-Bennett Corporation, Carlsbad, Calif.
Continuation-in-part of Ser. No. 139,962, Dec. 3, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 290,032
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—142 **35 Claims**

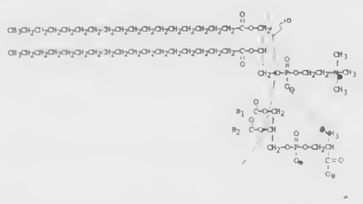


1. A humidifier module for use in a gas humidification assembly having a heat source, a water supply source and an enclosure for receiving said module, wherein said module comprises:
(a) a housing forming a hollow shell adapted to be received in said enclosure;
(b) a water-vapor-permeable, liquid-water impermeable membrane disposed within said housing dividing said hollow shell into a first chamber and a second chamber and forming a common wall between said first and second chambers;
(c) said first chamber comprising a humidification chamber having a gas inlet port and gas outlet port; and
(d) said second chamber comprising a water heating chamber for receiving and containing heated liquid water, said water heating chamber having a water inlet port and a heat exchange member for indirectly heating said liquid water, said heat exchange member being formed of material capable of high heat transfer, said heat exchange member being adapted to receive heat from said heat source of said gas humidifier assembly, and said membrane forming a liquid water retaining wall of said water heating chamber for permitting water vapor generated from said heated liquid water to pass from said water heating chamber to said humidification chamber, while preventing liquid water from passing from said water heating chamber to said humidification chamber.

4,921,644
MUCIN DIRECTED LIPSOME
John R. Lau, and W. Blair Gebo, both of Wooster, Ohio, assignors to Technology Unlimited, Inc., Wooster, Ohio
Filed Feb. 29, 1988, Ser. No. 162,275
Int. Cl.[5] A61J *5/00;* **B32B** *5/16;* **A01N** *25/00*
U.S. Cl. 264—4.1 **4 Claims**

1. A liposome having a wall structure comprising:
first and second amphipathic lipid molecules,
said first lipid molecule having a hydrophilic head-group and lipophilic hydrocarbon tails,
said head group of the first lipid molecule having a negative charge moiety proximate to said tails and a positive charge moiety distal to said tails,
said negative and positive charged moieties together resulting in a substantially neutral effective charge with respect to the head group, and,

said second lipid molecule having only a positive charged hydrophilic head moiety, and lipohilic hydrocarbon tails, said second molecule positive charged head moiety extending substantially adjacent to the position of the negative



charge moiety of the first lipid and neutralizing the negative charge moiety of said first lipid molecule, whereby the said distal moiety of said first molecule is free to exhibit its positive charge to the environment and will bind to mucin.

4,921,645

PROCESS OF FORMING MICROWEBS AND NONWOVEN MATERIALS CONTAINING MICROWEBS

Thomas I. Insley, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 91,730, Sep. 1, 1987, Pat. No. 4,813,948. This application Jan. 4, 1989, Ser. No. 293,503

Int. Cl.[5] D04H *3/16*

U.S. Cl. 264—6 **13 Claims**



1. A method for producing microfiber microwebs comprising

(a) forming a microfiber web by melt blowing a thermoplastic fiber forming polymer; and

(b) divellicating said microfiber web to form said microfiber microwebs, said microfiber microwebs having relatively dense microfiber nuclei with individual fibers and/or bundles protruding therefrom.

5. A method for producing nonwoven webs comprising melt blow microfibers and microfiber microwebs, comprising the steps of

(a) forming a first web of melt blown microfibers;

(b) divellicating said first melt blow microfiber web to form microfiber microwebs, said microfiber microwebs having relatively dense microfiber nuclei with individual fibers and/or fiber bundles protruding therefrom;

(c) forming a primary stream of melt blown carrier fibers;

(d) forming a secondary stream of said microfiber microwebs;

(e) merging said primary and secondary streams under turbulent conditions such that said microfiber microwebs are distributed throughout said melt blow carrier fibers of said primary stream;

(f) forming a web of said melt blow carrier fibers and said microfiber microwebs; and

(g) collecting said web of said melt blow carrier fibers and said microfiber microwebs.

4,921,646

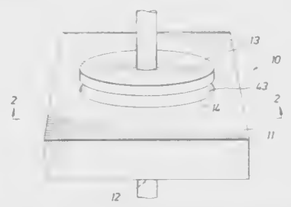
FORMING LAMINATED BILLETS FROM INDIVIDUAL BILLETS

David R. Stewart, Richmond, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 31, 1988, Ser. No. 239,103

Int. Cl.[5] B29B *13/08*

U.S. Cl. 264—26 **3 Claims**



1. A continuous process of forming a thermoplastic laminated billet comprising:

providing a mold conveyor belt on which a plurality of mold bodies are attached, each mold body having a mold cavity defined downwardly therein, said mold body having a bottom side electrode,

providing a stamping means indexed with the movement of the mold conveyor belt so that a stack of individual billets cut from a stack of individual thermoplastic sheets falls into said mold cavity,

providing a top electrode conveyor belt having top side electrodes, the movement of the top electrode conveyor belt and the mold conveyor belt being indexed such that a top electrode may be positioned over a mold cavity,

simultaneously extruding a plurality of said individual thermoplastic sheets, cooling the below their softening points, and bringing sheets together to form the sheets into a stack of individual sheets not bound to one another, said stack comprising one or more dielectrically heatable sheets, and one or more dielectrically non-heatable sheets; and each sheet is located in a flat planar manner relative to one another,

simultaneously cutting a stack of said individual billets from the stack of unbound individual sheets and dropping said billets downward into said mold cavity to form a stack of individual billets having the same sequence of individual billets as the individual sheets, and a stack of individual webs;

separating the webs from each other and recycling each web to its respective sheet extrusion step;

positioning the top electrode over the stack of billets carried in the mold cavity,

applying a RF field to the billets located between the top electrode and bottom electrode and dielectrically heating the heatable billets with one or more frequencies of radiation between about 0.1 MH_z and about 3000 MH_z so that the heatable billet melts and only the surface of the non-heatable billet closest to the heatable billet melts; and

applying pressure to said stack of billets to cause them to adhere to each other and form a laminated billet.

4,921,647

METHOD OF SHAPING A LAMINATED THERMOPLASTIC BILLET

David R. Stewart, Richmond, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 27, 1988, Ser. No. 263,227

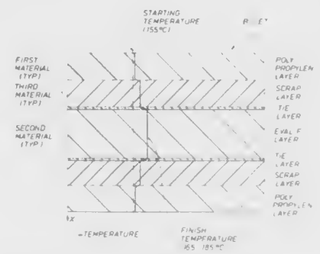
Int. Cl.[5] B29B *13/08*

U.S. Cl. 264—26 **2 Claims**

1. A process for forming a shaped article of manufacture from a pre-assembled laminate having a dielectrically non-heatable first material and a dielectrically-heatable second material and a dielectrically-heatable third material, said process comprising the steps of;

bringing said first material, second material, and third material to a starting temperature,

dielectrically heating said second material to a first finish temperature,



dielectrically heating said third material to a second finish temperature higher than said first finish temperature,

shaping said article of manufacture before the temperature of said second material or the temperature of said third material decreases below said starting temperature.

4,921,648

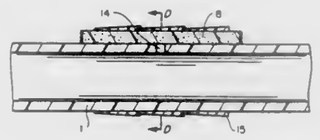
METHOD OF JOINING AN ARTICLE COMPRISING A CONDUCTIVE POLYMER COMPOSITION TO A POLYMERIC SUBSTRATE

Pravin L. Soni, Union City, and Nachum Rosenzweig, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 720,117, Apr. 2, 1983, Pat. No. 4,775,501, and a continuation-in-part of Ser. No. 596,761, Apr. 4, 1984, abandoned. This application May 17, 1988, Ser. No. 194,780

Int. Cl.[5] B29C *61/02*

U.S. Cl. 264—27 **29 Claims**



1. A method of joining together

(A) a substrate having an outer surface composed of a first composition which is a heat-softenable composition comprising an organic polymer, and

(B) an article which is not heat-recoverable and which comprises an element composed of a second composition which

(a) is compatible with the first composition,

(b) has a Melt Flow Index of less than 0.3 g/10 min. at a temperature 50° C. above its softening point and at a loading of 5 kg and has a Melt Flow Index of less than 3.0 g/10 min. at a temperature 50° C. above its softening point and at a loading of 15 kg; and

(c) comprises

(a) a matrix consisting essentially of organic polymer particles which have been sintered together so that the particles have coalesced without losing their identity, and

(b) a particulate conductive filler which is dispersed in said matrix but is present substantially only at or near the boundaries of the coalesced particles;

which method comprises

(1) placing the article in direct contact with the outer surface of the substrate; and

(2) generating heat within the conductive polymer element by passing electrical current therethrough while maintaining the article in direct contact with the substrate, until there is fusion between the article and the outer surface of the substrate.

4,921,649

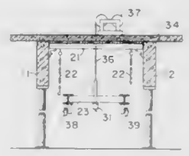
METHOD FOR POURING CONCRETE SLABS

Logan C. Greeson, 1286 Marine Dr., West Palm Beach, Fla. 33409

Division of Ser. No. 99,079, Sep. 21, 1987, Pat. No. 4,768,938. This application Jun. 10, 1988, Ser. No. 205,173

Int. Cl.[5] E04B *1/16*

U.S. Cl. 264—33 **8 Claims**



1. The method of constructing a plurality of concrete building slabs comprising the steps of:

(A) at a first location on a floor aligning spaced-apart beams for supporting one of said slabs,

(B) affixing temporary means to be borne by said beams, for supporting a combined truck and concrete-form deck, said deck having a central opening extending between an upper flat forming surface and an oppositely directed bottom surface and said truck having an upwardly projection tubular post means rigidly affixed at a center of gravity thereof,

(C) lowering said combined truck and deck down upon said temporary support means,

(D) affixing tensile reinforcing members on said deck,

(E) pouring concrete to form one of said slabs onto said deck and said reinforcing members,

(F) setting said concrete forming said slab and constructing a central opening therethrough,

(G) affixing a cable to said truck through said central openings in said slab and said deck, and removing said temporary support means from said beams, and lowering said truck and said deck to said floor beneath said slab by means of said cable,

(H) rolling said truck with said deck to an edge of said slab,

(I) at a second location aligning spaced-apart beams for supporting another of said slabs,

(J) at said second location affixing temporary support means to be borne by said beams, and

(K) attaching a cable to said truck through said central opening in said deck to thereby raise said truck and deck, and then lower said truck and deck upon said temporary support means at said second location.

4,921,650

METHOD AND APPARATUS FOR LIQUID TREATMENT OF PULP

Kjell G. Eriksson, Spanga; Bo R. Ek, Stockholm; Stig G. Wallin, Alnö, and Nils L. Eriksson, Sundsvall, all of Sweden, assignors to Sunds Defibrator Aktiebolag, Sweden

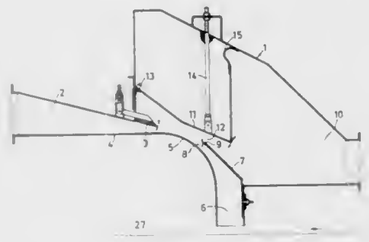
PCT No. PCT/SE86/00521, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/03626, PCT Pub. Date Jun. 18, 1987

PCT Filed Nov. 13, 1986, Ser. No. 85,630

Claims priority, application Sweden, Dec. 13, 1985, 8505918

Int. Cl.[5] D01G *7/00, 21/00;* D04H *1/00*

U.S. Cl. 264—37 15 Claims



1. A method of dry forming a fibrous web of fibrous material having a substantially uniform thickness, comprising the steps of, defibration of said fibrous material, dispersion of said defibrated fibrous material in a flow of air so that said defibrated fibrous material is carried by said flow of air, deflecting said flow of air carrying said defibrated fibrous material along a convex surface so as to subject said defibrated fibrous material to centrifugal forces and shearing gradients and thereby vary the degree of deflection of different portions of said defibrated fibrous material, separating said deflected flow of air carrying fibrous material into a first portion and second portion, said first portion having a lower degree of deflection than said second portion and being at a first predetermined pressure, said first portion comprising a reject flow portion, and said second portion being at a second predetermined pressure, said second portion comprising an accept flow portion, depositing said accept flow portion on an air-pervious support to form a fibrous web on said support, said second predetermined pressure being independent upon the thickness of said fibrous web on said air-pervious support, whereby as said thickness of said fibrous web increases said second predetermined pressure increases, thereby increasing said first portion of said deflected flow of air-carrying fibrous material and concomitantly reducing said second portion of said defibrated flow of air carrying fibrous material, and providing a substantially uniform thickness for said fibrous web on said support.

9. A device for dry forming a web of fibrous material having a uniform thickness comprising, a forming head having an interior and inlet means for delivering a flow of air carrying said fibrous material to said interior, a convex surface for deflecting said flow of air carrying said fibrous material so as to subject said fibrous material to centrifugal forces and shearing gradients and thereby vary the degree of deflection of different portions of said fibrous material, separating means for separating said deflected flow of air carrying said fibrous material into a first portion and a second portion, said separating means comprising a separating screen having a leading edge which is located beyond the crest of said convex surface in the direction of said flow, said first portion having a lower degree of deflection than said second portion, said first portion comprising a reject flow portion having a first predetermined pressure, and said second portion comprising an accept flow portion having a second predetermined pressure, a reject outlet for receiving said reject flow portion, an adjustable wall member, said reject outlet being defined by said adjustable wall member and said separating screen whereby distribution between accept and reject flows can be adjusted, an accept outlet for receiving said accept flow portion, and an air-pervious support cooperatively situated relative to said accept outlet for receiving said accept flow portion from said accept outlet so as to provide said web of fibrous material on said air-pervious support, said second predetermined pressure being dependent upon the thickness of said web of fibrous material on said air-pervious support, whereby as said thickness of said fibrous web increases said second predetermined pressure increases, thereby increasing said first portion of said deflected flow of air carrying said fibrous material and concomitantly reducing said second portion of said deflected flow of air carrying said fibrous material, and providing a uniform thickness for said fibrous web on said support.

4,921,651

THIN FILM POLYMER BLEND MEMBRANES

Anthony J. Polak, Lake Zurich, and Ping Young, Hoffman Estates, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 753,753, Jul. 11, 1985, Pat. No. 4,714,482.

This application Aug. 17, 1987, Ser. No. 85,827

Int. Cl.[5] B29C *41/12, 67/20;* B29D *7/01*

U.S. Cl. 264—41 8 Claims

1. A method for the preparation of a thin film polymer blend membrane comprised of a solution blend of (1) a component selected from the group consisting of (i) about 50 to about 95 mole percent of an organic polymer selected from the group consisting of polyvinyl alcohol, polyvinylfluoride, polyethylamine, polyethylene glycol, cellulose acetate, polyvinylmethylethyl ether and phenolformaldehyde resins and (ii) copolymers thereof, (2) about 1 to about 49 mole percent of a component selected from the group consisting of (i)' a polymer selected from the group consisting of polyacrylic acid, polymethacrylic acid and polystyrene sulfonic acid and (ii)' copolymers thereof, and (3) about 1 to about 49 mole percent of an inorganic compound selected from the group consisting of phosphoric acid, sulfuric acid, sulfonic acid, heteropoly acids and salts of heteropoly acids, said method of preparation comprising the steps of dissolving said components (1), (2(and (3) in water at solution conditions for a period of time sufficient to form a solution blend of said components, casting said solution blend of said components on a solid casting surface, removing said solvent therefrom and recovering the resultant membrane where said heteropoly acids and salts of heteropoly acids have the generic formula:

$$A_m[X_xY_yO_z].n\ H_2O$$

in which X and Y may be selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, and the first, second, third and fourth transitional metal series, said series including scandium, yttrium, lanthanum, actinium, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten, X and Y being dissimilar in nature, Y being at least one metal selected from the first, second, third or fourth transitional metal series above named, A is selected from the group consisting of hydrogen, ammonium, sodium, potassium, lithium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium, subscript m is an integer of from 1 to 10, subscript y is an integer of from 6 to 12 based on subscript x taken as 1, subscript z is an integer of from 30 to 80 and n is an integer of from 3 to 100, or uranyl compounds having the generic formula:

$$A'[UO_2]X'O_4.n\ H_2O$$

in which A' is selected from the group consisting of hydrogen, lithium, sodium, potassium, ammonium, copper, magnesium, calcium, barium, strontium, lead, iron, cobalt, nickel, manganese and aluminum, X' is selected from the group consisting of phosphorus and arsenic and n' is an integer of from 1 to 4.

4,921,652

PROCESS FOR PRODUCING A POROUS FILM

Syoichi Tsuji; Syoichi Ito; Shuji Matsumura; Hisatosi Suzuki, all of Aichi, and Michiyasu Ito, Mie, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 945,706, Dec. 23, 1986, abandoned.

This application Aug. 8, 1988, Ser. No. 229,797

Claims priority, application Japan, Dec. 23, 1985, 60-287909

Int. Cl.[5] B29C *67/20, 55/04*

U.S. Cl. 264—41 2 Claims

1. A process for producing a porous film which consists essentially of blending 30 to 80 parts by weight of an inorganic fine powder having a specific surface area of 15 m^2/g or less, an average particle size of 0.4 to 4 μm and a spherical particle shape, selected from the group consisting of precipitated calcium carbonate, barium sulfate, precipitated barium sulfate, magnesium carbonate, magnesium oxide, silica, aluminum hydroxide and alumina with 20 to 70 parts by weight of a polyolefin resin, these parts by weight being based on 100 parts by weight of the blend, followed by melt-molding the resulting blend into a film and then stretching the film to 2 to 7 times the original length at least in the uniaxial direction.

4,921,653

METHOD OF FORMING A POROUS POLYOLEFIN FILM

Mari Aoyama, Okazaki; Michiyasu Ito, Kuwana; Syoichi Tsuji, Nagoya; Toshiyuki Ishii, Kasugai, and Tomohide Tanaka, Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 5,099, Jan. 20, 1987, Pat. No. 4,814,124. This application Nov. 2, 1988, Ser. No. 266,134

Claims priority, application Japan, Jan. 21, 1986, 61-8888; May 28, 1986, 61-121300; Dec. 26, 1986, 61-308723; Dec. 26, 1986, 61-308724

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[5] B29C *55/02, 67/20*

U.S. Cl. 264—41 12 Claims

1. In a process for preparing a gas-permeable, porous film which comprises the steps of (a) mixing a polyolefin resin and an inorganic filler, (b) forming a film from the mixture and (c) stretching the resulting film to form the porous film, the combination of the step of embossing said film prior to stretching it, so as to produce a rugged pattern thereon having peaks and valleys with a depth therebetween of from 2 microns to 3 millimeters.

4,921,654

LOW PROTEIN BINDING MEMBRANE

Chung-Jen Hou, So. Windsor; James Disbrow, Meriden, and Kenneth C. Hou, Glastonbury, all of Conn., assignors to Cuno, Incorporated, Meriden, Conn.

Filed Sep. 18, 1989, Ser. No. 408,737

Int. Cl.[5] E01D *13/04*

U.S. Cl. 264—45.5 13 Claims

1. A method of producing a modified microporous membrane having microporous surfaces comprising causing said surfaces to have properties sufficient to substantially preclude binding thereto of protenaceous when in use by applying to an organic polymeric microporous membrane having hydroxyl, mercapto carboxyl or amino functionality on the microporous surfaces thereof a reactive modifying polymer having a polymer chain and having along the polymer chain epoxy or epithio groups for reacting with the functionality of the membrane and terminal neutral chemical functionality.



4,921,655

PREPARATION OF COMPACT, CRYSTALLINE AND PORE-FREE MOLDINGS FROM OXIDE CERAMIC

Hans-Josef Sterzel, Dannstadt-Schauernheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 188,417

Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715278

Int. Cl.[5] C04B *35/64*

U.S. Cl. 264—66 3 Claims

1. A process for the preparation of a compact, crystalline and pore-free molding from an oxide ceramic which comprises: compressing an amorphous oxide powder containing a gel structure of aluminum, zirconium or silicon or a mixed oxide of silicon, in which a portion of the oxygen has been replaced by nitrogen which is chemically bonded in the gel structure of the amorphous oxide, at a temperature above the glass transition temperature and below the crystallization temperature and then heating the resulting glassy compact molding to above the crystallization temperature of the oxide or oxide mixture at atmospheric pressure.

4,921,656

FORMATION OF MELT-SPUN ACRYLIC FIBERS WHICH ARE PARTICULARLY SUITED FOR THERMAL CONVERSION TO HIGH STRENGTH CARBON FIBERS

Gene P. Daumit; Yoon S. Ko; Christopher R. Slater, all of Charlotte; Jozef G. Venner, Mathews, and Chi C. Young, Charlotte, all of N.C., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,177

Int. Cl.[6] D01D *5/10;* D01F *6/18, 9/22*

U.S. Cl. 264—85 81 Claims



1. An improved process for the formation of an acrylic

multifilamentary material which is particularly suited for thermal conversion to high strength carbon fibers comprising:

(a) forming at an elevated temperature a substantially homogeneous melt consisting essentially of (i) an acrylic polymer containing at least 85 weight percent of recurring acrylonitrile units, (ii) approximately 5 to 20 percent by weight of acetonitrile based upon said polymer, (iii) approximately 1 to 8 percent by weight of C_1 to C_4 monohydroxy alkanol based upon said polymer, and (iv) approximately 12 to 28 percent by weight of water based upon said polymer,

(b) extruding said substantially homogeneous melt while at a temperature within the range of 140° to 190° C. through an extrusion orifice containing a plurality of openings into a filament-forming zone provided with a substantially non-reactive gaseous atmosphere provided at a temperature within the range of approximately 25° to 250° C. while under a longitudinal tension wherein substantial portions of said acetonitrile, monohydroxy alkanol, and water are evolved and an acrylic multifilamentary material is formed,

(c) drawing said substantially homogeneous melt and acrylic multifilamentary material subsequent to passage through said extrusion orifice at a draw ratio of approximately 0.6 to 6.0:1,

(d) passing said resulting acrylic multifilamentary material following steps (b) and (c) in the direction of its length through a heat treatment zone provided at a temperature of approximately 90° to 200° C. while at a relatively constant length wherein the evolution of substantially all of the residual acetonitrile, monohydroxy alkanol, and water present therein takes place, and

(e) drawing said acrylic multifilamentary material resulting from step (d) while at an elevated temperature at a draw ratio of at least 3:1 to form an acrylic multifilamentary material having a mean single filament denier of approximately 0.3 to 5.0.

4,921,657

METHOD FOR DENSIFICATION OF AMORPHOUS CERAMIC MATERIAL

James A. Rabe; Jonathan Lipowitz, and Richard E. Jones, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 13, 1987, Ser. No. 120,108
Int. Cl.[5] B28B *1/26*
U.S. Cl. 264—86 13 Claims

1. A method for increasing the density of an amorphous, ceramic article derived from a resinous organosilicon polymer and having a composition consisting essentially of silicon, nitrogen and carbon, said method comprising the step of:

heat treating said article at an elevated temperature and superatmospheric pressure to increase its density while avoiding crystallization;

said heat treating step comprising controlling at least some of the conditions of time, temperature, heating rate, cooling rate, pressure and atmosphere to minimize erosion of said article which could otherwise occur due to the loss to the surrounding atmosphere, as a gas or gaseous component, of at least one of nitrogen, silicon and carbon;

said article having essentially the same composition after said heat treating step as before.

4,921,658

METHOD FOR PREPARING REINFORCED THERMOSET ARTICLES

Donald W. Pennington, Baton Rouge, La., and Jane K. McLemore, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 740,676, Jun. 3, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 125,741
Int. Cl.[5] B29C *67/00*
U.S. Cl. 264—86 6 Claims

1. A process for preparing reinforced thermoset article comprising

(a) preparing a heat-fusible reinforced polymer sheet by forming a dilute aqueous slurry of

(i) from about 19 to about 79 percent of solid heat-fusible organic polymer particles,

(ii) from about 10 to about 80 percent of reinforcing fibers, and

(iii) from about 1 to about 10 percent of a latex binder of a substantially water-insoluble organic polymer having either anionic or cationic bound charges, the percentages being by weight based on a dry solids basis;

(b) flocculating the slurry during agitation with a polymeric flocculant opposite in charge to that of the latex binder;

(c) collecting the solids in the form of a mat;

(d) dewatering the mat;

(e) drying the mat;

(f) densifying and consolidating the mat with heat and pressure to a densified composite;

(g) permitting the densified composite to loft to a predetermined shape;

(h) impregnating said formed lofted composite with a thermoset resin composition; and

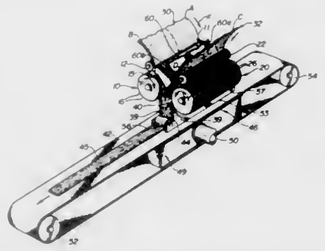
(i) curing said thermoset resin composition.

4,921,659

METHOD OF FORMING A FIBROUS WEB USING A VARIABLE TRANSVERSE WEBBER

Gerald M. Marshall, Somerville, and Allan P. Farrington, Englishtown, both of N.J., assignors to Chicopee, New Brunswick, N.J.

Division of Ser. No. 99,877, Sep. 22, 1987. This application Jan. 17, 1989, Ser. No. 297,728
Int. Cl.[5] D04H *1/72*
U.S. Cl. 264—510 9 Claims



1. A method of forming a web of fibers comprising the steps of: feeding at least one source of fibrous material into engagement with one of two lickerins and feeding at least one other source of fibrous material of different composition into engagement with the other lickerin, said lickerins rotating toward each other about parallel axes such that the fibrous material is opened to form individualized fibers; doffing the fibers form the lickerins in the form of fiber streams;

directing the fiber streams toward each other and into a mixing zone;

selectively intercepting and redirecting at least part of each fiber stream within the mixing zone with at least two independently vertically movable baffle segments, each said baffle segment corresponding to a longitudinal segment along the operating length of said lickerins, at least one of said baffle segments being at a different vertical height;

receiving and accumulating the fiber streams on a conveying belt, after they have passed through the mixing zone, to form a web of material; and

moving the conveying belt parallel to the axes of the lickerins.

5. A method of forming a cylindrical web of fibers comprising the steps of:

feeding a first source of fibrous material into engagement with a first lickerin;

feeding a second source of fibrous material into engagement with a second lickerin arranged with its axis parallel to the axis of said first lickerin;

rotating said first and second lickerins toward each other about their axes such that the fibrous material is opened so as to form individualized fibers;

doffing the fibers from the first and second lickerins in the form of two fiber streams directed toward each other and a mixing zone;

forming a foraminous flat conveying belt into a U-shape as it enters a condensing zone beyond the mixing zone in the direction of travel of the fiber streams;

intercepting the streams of fibers, after they have passed through the mixing zone, with the U-shaped conveying belt;

moving the conveying belt parallel to the axes of the lickerins;

accumulating the fibers from the fiber streams on the conveying belt to form a web of material;

guiding the U-shaped conveying belt into a cylindrical shape to form the cylindrical web;

fixing said cylindrical web in the cylindrical shape;

releasing the conveying belt back to a flat shape from said cylindrical shape; and

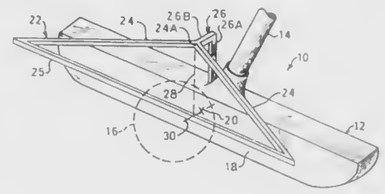
separating the resulting cylindrical web product from the conveying belt.

4,921,660

GOLF CLUB WITH STROKE GUIDING DEVICE

Karl D. Kryter, Borrego Springs, Calif., assignor to Acousis Company, Borrego Springs, Calif.

Filed Jul. 17, 1989, Ser. No. 380,669
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—164 13 Claims



12. In combination with a golf club having an upwardly extending shaft and a head at the lower end of the shaft which head includes a bottom surface and a substantially flat ball-striking surface having a sweet-spot, guide means comprising,

an isosceles triangular shaped member comprising visible line segments in the shape of a triangle having a vertex and opposite base leg,

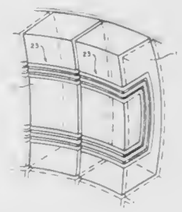
means for attaching said guide means to the golf club with the vertex located at a point on a vertical plane that is normal to the ball-striking surface of the head at the sweet-spot and with the base leg extending normal to said vertical plane and located forward of the plane of the ball-striking surface, said guide means being generally horizontally positioned at a height above the bottom surface of the club head that is greater than the diameter of a golf ball to allow striking of the golf ball by the striking surface.

4,921,661

SEGMENTED SADDLE-SHAPED PASSIVE STABILIZATION CONDUCTORS FOR TOROIDAL PLASMAS

James A. Leuer, Encinitas, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1989, Ser. No. 431,365
Int. Cl.[5] G21B *1/00*
U.S. Cl. 376—136 5 Claims



1. In a toroidal plasma chamber lined with an annular array of shielding modules, said annular array being oriented in a plane perpendicular to the axis of said toroidal chamber and centered on said axis, and each module being centered on a midplane perpendicular to said axis, a passive stabilization system consisting of a saddle-shaped conductor loop on each module of said annular array of modules, each saddle-shaped conductor loop consisting of at least two conductive bars on the face of a module, said conductive bars being arrayed in parallel and perpendicular to said axis with one bar spaced above said midplane and one bar equally spaced below said midplane, said conductive bars being affixed to said face of said module, and two conductive legs, one conductive leg on each side of said module parallel to said axis for connecting ends of said two conductive bars to complete a conductive loop for induced current due to motion of plasma in said chamber in a direction parallel to said axis, with current in one conductive bar in a direction that tends to retard motion of said plasma, and current in the other conductive bar in a direction opposite current in said one conductive bar, and return current from each conductive bar to the other through said conductive legs.

4,921,662

PRESSURE PULSE CLEANING METHOD

Richard D. Franklin, Jeannette; Gregg D. Auld, Trafford; David E. Murray, Greensburg; John J. Lescisin, Pittsburgh; Albert R. Vala, Export, and Thomas E. Dunn, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1988, Ser. No. 183,874
Int. Cl.[5] F22B *37/48*
U.S. Cl. 376—316 39 Claims

31. A method for loosening and removing sludge, debris and dissolved matter from the secondary side of a steam generator of the type containing a plurality of heat exchanger tubes mounted in a tubesheet at one end and supported along their length by a plurality of vertically spaced support plates, comprising the steps of:

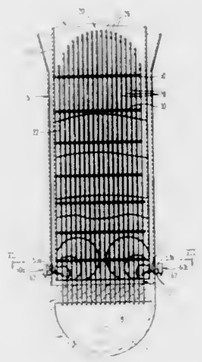
a. introducing a flow of water into the secondary side of the steam generator;

b. commencing the generation of a plurality of pressure pulses in the water in the secondary side of the steam generator when said water submerges said tubesheet and

said heat exchanger tubes, wherein each of said pulses is generated by introducing between 60 and 100 cubic inches of an inert gas into water surrounding the heat exchanger tubes that is pressurized to between about 350 and 450 pounds per square inch, wherein said pressure pulses are generated at uniform time intervals of between about 5 and 12 seconds,

c. continuing the flow of water into the secondary side of the steam generator until the level of the water within the secondary side thereof is sufficiently high to immerse all of the support plates therein;

d. continuing the generation of pressure pulses at uniform intervals at a time between 5 and 12 seconds while the



level of the water in the secondary side is raised to immerse all of the support plates, wherein the pressure of the pressurized gas used to generate the pressure pulses is increased from between about 350 to 450 psi to between about 750 to 850 psi;

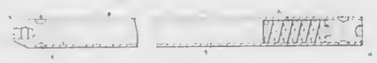
e. draining water out of the secondary side of the steam generator while continuing to generate pulses at uniform intervals anywhere between about 5 and 12 seconds by lowering the level of the water in the secondary side from the upper support plates down to a level which immerses only the tubesheet, wherein the pressure of the gas used to generate the pressure pulses is lowered as the level of the water is lowered from between about 750 to 850 psi to between about 350 to 450 psi.

4,921,663

END PLUG WELD FOR NUCLEAR FUEL ROD

David A. Boatwright, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1988, Ser. No. 202,650
Int. Cl.[5] G21C *3/10*
U.S. Cl. 376—451 11 Claims



1. A nuclear fuel rod comprising:

a. a tube having a wall, a hollow interior portion and at least one end portion;

b. an end plug having a cylindrical body portion with a pair of opposing plug end portions substantially perpendicular therewith, substantially all of said end plug being disposed within said tube hollow interior portion so that one of said end plug end portions is substantially flush with said tube end portion; and

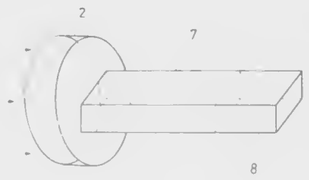
c. a girth weld defining a melt zone and extending circumferentially around said tube and said end plug for sealingly connecting said end plug within said tube hollow interior portion, said girth weld being spaced from said tube end portion by a distance L sufficient to provide that said melt zone extends arcuately through said tube wall and into said end plug at said end plug cylindrical body portion.

4,921,664

METHOD FOR PRODUCING A HEAT-RESISTANT ALUMINUM-ALLOY WORKPIECE HAVING HIGH TRANSVERSE DUCTILITY WHICH IS MANUFACTURED FROM A COMPACT PRODUCED BY POWDER METALLURGY

Malcolm Couper, Siggenthal-Station, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Feb. 8, 1989, Ser. No. 307,496
Claims priority, application Switzerland, Feb. 8, 1988, 429/88
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—1 8 Claims



1. A method for producing a heat-resistant aluminum alloy workpiece having high transverse ductility, comprising the steps of:

(a) compacting by means of compressive force an aluminum alloy powder having the final composition of said workpiece or a mixture of prealloy powders, by cold-isostatically pressing, hot-pressing or a combination of cold-isostatically pressing and hot-pressing said powder or powders to produce an extrusion billet,

(b) extruding said billet to form a compact bar having a rectangular cross-section, by applying compressive force to said billet in a direction parallel to the longitudinal axis of said bar and parallel to the direction of compressive force in said compacting step,

(c) separating from said bar a disk-shaped prismatic bar section, and

(d) machining said prismatic bar section to obtain said workpiece.

4,921,665

PROCESS FOR PREPARING POWDER METAL PARTS WITH DYNAMIC PROPERTIES

Erhard Klar, Beachwood; Mark Svilar, Orange Village, and David F. Berry, Westlake, all of Ohio, assignors to SCM Metal Products, Inc., Cleveland, Ohio

Filed Mar. 11, 1988, Ser. No. 166,879
Int. Cl.[5] C22F *1/00*
U.S. Cl. 419—23 7 Claims

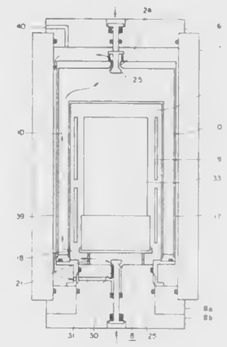
1. A process of manufacturing powder metal parts by powder metallurgical technique, comprising the use of iron powders having a particle size small enough to pass through a 140 U.S. mesh screen whereby said metal parts have improved impact and fatigue strength.

4,921,666

PROCESS FOR HIGH EFFICIENCY HOT ISOSTATIC PRESSING

Takahiko Ishii, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 29, 1984, Ser. No. 676,294
Claims priority, application Japan, Nov. 29, 1983, 58-226155
Int. Cl.[5] C04B *35/64*
U.S. Cl. 419—25 1 Claim



1. A process for high efficiency hot isostatic pressing in a hot isostatic pressing treatment for sintering or densifying a ceramic or metallic workpiece in a high temperature and high pressure gas atomsphere, which process comprises preheating the workpiece outside a high pressure vessel prior to said hot isostatic pressing treatment, transferring the preheated workpiece as surrounded with the gas in a hot state into the high pressure vessel, treating the workpiece at a high temperature and under a pressure of at least 500 atm in a gas atomsphere, commencing convective cooling of the workpiece with convective gas at a pressure of at least 500 atm until the temperature of the workpiece is about 300° C., depressuring the atomsphere within said vessel; and removing the workpiece from said high pressure vessel.

4,921,667

METHOD FOR AUGMENTING IMMUNE RESPONSE

Richard F. Coico, Larchmont, and G. J. Thorbecke, Douglaston, both of N.Y., assignors to New York University, New York, N.Y.

PCT No. PCT/US86/00939, § 371 Date Feb. 2, 1987, § 102(e) Date Feb. 2, 1987, PCT Pub. No. WO86/06490, PCT Pub. Date Nov. 6, 1986
Continuation-in-part of Ser. No. 726,089, Apr. 23, 1985, abandoned. This PCT application Apr. 23, 1986, Ser. No. 15,074
Int. Cl.[5] A61K *39/00;* C07K *13/00*
U.S. Cl. 424—85.8 21 Claims

1. A method for enhancing the ability of a mammal in need of such treatment to mount a 7S humoral response the method comprising:

obtaining lymphocytes histocompatible with the lymphocytes of said mammal;

at a location outside the body of the mammal to be treated, exposing said obtained T-lymphocytes to the presence of previously isolated, essentially purified polymeric or aggregated delta-immunoglobulin preparation at a concentration higher than that at which said lymphocytes would have been exposed while in the lymph or bloodstream of said mammal and for a time sufficient to induce the production of helper T-cells capable of stimulating the immune system of said mammal to produce IgG;

separating said lymphocytes from said IgD; and

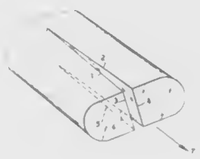
introducing said separated IgD-exposed lymphocytes to the bloodstream or lymph of said mammal.

4,921,668

A PROCESS FOR FLAME TREATING

Robert K. Anderson, Signal Mountain, and Michael H. Mainz, Chattanooga, both of Tenn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 13, 1987, Ser. No. 106,653
Int. Cl.[5] D01F *6/60;* D01D *5/12, 10/02*
U.S. Cl. 264—80 8 Claims



1. In a process including the steps of spinning, quenching and drawing a heavy denier thermoplastic monofilament in at least two draw stages to a total draw ratio of at least 5.0X, liquid quenching the monofilament, advancing the quenched monofilament in at least one draw stage, wherein it is orientation-stretched at a ratio of at least 3.0X, and then advancing the monofilament through a zone heated with a radiant heater at a temperature of 600°–1300° C. and drawing the monofilament wherein the monofilament is orientation-stretched at a ratio of at least 1.3X, the improvement comprising:

drying the monofilament surface after quenching the monofilament and heating the quenched, surface dried monofilament by flame before the last at least 1.3X increment of draw ratio.

4,921,669

METHOD FOR COATING A CONTINUOUS TRAIN OF SYNTHETIC RESIN WITH A SCRATCH RESISTANT COATING

Heinz Vetter, Rossdorf, and Werner Siol, Darmstadt-Eberstadt, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 26, 1988, Ser. No. 262,883
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736280
Int. Cl.[5] B29C *47/88*
U.S. Cl. 264—134 15 Claims

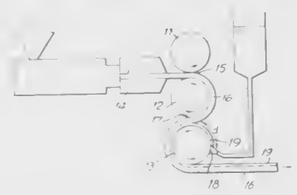
1. A method for providing a scratch resistant coating on a continuous synthetic resin web, which method comprises

(a) shaping a thermoplastic synthetic resin molding composition into said continuous web in a polishing roll stack;

(b) supplying a material forming said scratch resistant coating to at least one of the rolls of said stack to form a film of said material on said roll, said material being a liquid mixture of (1) at least one monomer susceptible of free radical polymerization and having more than one poly-

merizable double bond and of (2) an initiator which forms free radicals under ultraviolet radiation or at a temperature at or above the temperature of said coating roll and at or below the temperature of said thermoplastic synthetic resin molding composition;

(c) contacting said continuous web of thermoplastic synthetic resin molding composition and said film of material formed on said roll when the monomer or monomers in the film on said roll has been partially polymerized;



(d) wrapping said web, in contact with said film of material, partially around the circumference of said roll;

(e) curing said film, in contact with said web and said roll, until said web has cooled to a temperature below the softening point of said thermoplastic synthetic resin molding composition; and

(f) removing said cooled web, having said cured film thereon, from the surface of said roll.

4,921,670

PROCESS FOR PRODUCING POLYESTER FILM CONTAINING A SLIP AGENT

Hermann Dallmann, Wiesbaden; Lothar Bothe, Mainz-Gonsenheim; Guenther Crass, Taunusstein, and Werner Schaefer, Hofheim-Diedenbergen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,140

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1987, 3725568

Int. Cl.[5] **B29C** *47/00, 55/04, 55/12;* **C08G** *77/04*

U.S. Cl. 264—141 **11 Claims**

1. Process for the production of an oriented, heat-set polyester film containing an amount of a polydiorganosiloxane a quantity of from 0.0001 to 2% by weight,

the process

comprising the steps of: melting the polyester in an extruder; extruding the polyester through

a die to give a cast film; quenching the extruded film; reheating the quenched film; stretch-orienting the film; and heat-setting the film,

wherein the polydiorganosiloxane is added to the polyester, which is free from polydiorganosiloxane, in the form of a masterbatch.

4,921,671

METHOD FOR MOLDING ARTICLES TO A WEB

Edward O. Staheli, 12711 Beverly Park Rd., Lynwood, Wasb. 98037

Filed Jul. 15, 1988, Ser. No. 219,925

Int. Cl.[5] **B28B** *11/14, 11/18;* **B29C** *45/14, 45/40*

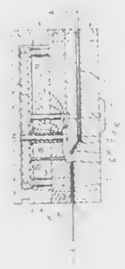
U.S. Cl. 264—145 **7 Claims**

1. A process for molding parts onto portions of a continuous web of flexible material with a mold having separable sides defining a mold cavity comprising the steps of:

separating the mold sides a distance equal to the desired distance between molded parts and thereby, drawing a portion of the web to extend between the separated mold sides by pulling the web through one side of the mold, such pulling being accomplished by the separation of the mold sides because the web is attached to one side of the mold and free to move through the other side of the mold;

ejecting a previously molded part from the mold; then

closing the mold while positioning said portion of the web in the mold cavity; then



injecting into the mold cavity and onto the web a liquid material which hardens into the shape of the mold cavity; and then

repeating said process steps until the desired number of parts are produced.

4,921,672

METHOD FOR THE PRODUCTION OF A PROTECTIVE GLOVE

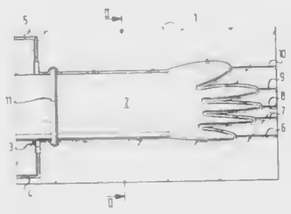
Manfred Bock, Kunzell, Fed. Rep. of Germany, assignor to Kachele-Cama Latex GmbH, Eichenzell, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,100

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807092

Int. Cl.[5] **B29C** *37/00, 45/22, 45/27*

U.S. Cl. 264—161 **5 Claims**



1. A method for the production of a protective glove, in which plastic material is injected under high pressure into a mold having a core hand, comprising providing an injection mold including a core hand having a glove cuff at a first end and fingertips at an opposite end supported therein in overhung position on the first end and a sprue flange connected to the glove cuff, feeding the material to the sprue flange at at least two opposite points via sprue channels and distributing the material uniformly in the injection mold as far as the fingertips, and cutting the sprue flange from the protective glove.

4,921,673

METHOD OF MANUFACTURE OF TIRES AND APPARATUS THEREFORE

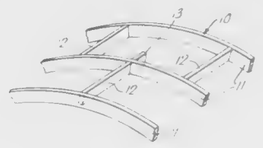
Eric Holroyd, High Legh Park/Knutsford, and Colin Holroyd, Crossens, both of England, assignors to Apsley Metals Limited, United Kingdom

Filed May 25, 1988, Ser. No. 198,520

Claims priority, application United Kingdom, Jul. 14, 1987, 8716494

Int. Cl.[5] **B29C** *35/04, 31/04;* **B29D** *30/60*

U.S. Cl. 264—254 **5 Claims**



1. A method of manufacture of a cured tire having a tread with grooves therein and a ground contacting outer surface, said method comprising:

forming a removable cylindrical grid comprising an open network of ribs and/or lugs for forming grooves in a tread;

locating the removable grid within a close fitting tread mold having an inner surface corresponding to the contour of the outer surface of the tread of the cured tire and accurately locating said grid by location means on said inner surface without attachment of the grid to the mold surface of said tread mold;

filling the mold and grid with uncured tread rubber compound to fully form a tread and forming the outer surface of said tread against said inner surface with the grooves in the tread being formed by the grid;

locating a tire carcass concentrically within the mold and grid with the uncured tread compound in situ to assemble the tread to the carcass;

curing the carcass and tread assembly in a tire curing mold including said tread mold, and with the grid in situ in the mold;

removing the cured carcass and tread assembly from the curing mold together with the grid;

and stripping the grid from the cured tread and carcass assembly.

4,921,674

GRAVITY FEED APPARATUS AND METHOD FOR FUMIGATION, DETOXIFICATION AND NUTRIFICATION OF PLANT SEED

Quentin M. Enos, 8832 Elk Grove Way, No. 203, Las Vegas, Nev. 89117

Filed Sep. 6, 1988, Ser. No. 240,996

Int. Cl.[5] **A61L** *2/16*

U.S. Cl. 422—28 **16 Claims**

1. A plant seed apparatus, comprising.

a substantially vertical treatment chamber having a seed inlet at the top thereof and a seed outlet at the bottom thereof, a plurality of angled baffles disposed on opposing walls of said treatment chamber and a plurality of treatment means for applying at least one of a plurality of treatment chemicals to a flow of plant seed in said treatment chamber, wherein each of said plurality of said treatment means is paired with a respective one of said plurality of angled baffles and disposed underneath each respective one of said plurality of angled baffles, wherein said treatment means further comprises a plurality of spray nozzles coupled to a source of said at least of a plurality of treatment chemicals, wherein a flow of said at least one of a plurality of treatment chemicals into said plurality of spray nozzles is regulated by control means for sensing a pressure in said treatment chamber;

first conveyor means for conveying the plant seed to said seed inlet of said treatment chamber; and

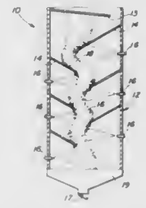
second conveyor means for conveying the plant seed away from said seed outlet to storage.

7. A method for treating plant seed, comprising the steps of:

transporting the seed to a treatment chamber inlet;

introducing the seed from said treatment chamber inlet into said treatment chamber;

establishing a wave-form flow of the seed in the treatment



chamber by providing a plurality of angled baffles on opposing walls of the treatment chamber for deflecting and dispersing the flow of seed in the treatment chamber;

treating the plant seed with at least one of a plurality of treatment chemicals, by spraying one of said plurality of treatment chemicals into an upper portion of said treatment chamber;

spraying a different and distinct one of said plurality of treatment chemicals into a lower portion of said treatment chamber;

flowing the treated seed out of the treatment chamber; and

transporting the treated plant seed to a storage area.

4,921,675

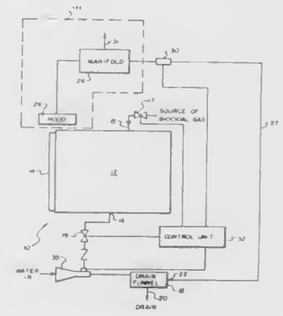
BIOCIDAL GAS STERILIZER

Kenneth A. Johnson, Wayne, N.Y., assignor to MDT Corporation, Rochester, N.Y.

Filed Apr. 28, 1987, Ser. No. 43,610

Int. Cl.[5] **A61L** *2/20, 2/24*

U.S. Cl. 422—34 **13 Claims**



1. A system for sterilizing articles with a biocidal gas, comprising:

a sterilizing apparatus situated within an enclosed working space and including a sterilization chamber, gas supply means for introducing biocidal gas into said sterilization chamber and exhaust means for removing biocidal gas from said sterilization chamber;

a venting system, operably associated with said sterilizing

apparatus for evacuating gas from said working space, including from said exhaust means, said venting system including means for introducing the flow of gas therethrough from within to outside said working space;

monitoring means operably associated with the venting system for detecting the flow of gas through said venting system; and

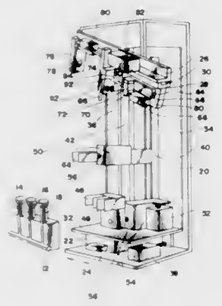
control means, responsive to said monitoring means, to prevent the operation of either said gas supply means or said exhaust means, except when gas is detected to be flowing through said venting system.

4,921,676

SHAKING APPARATUS FOR AGITATING AND WITHDRAWING A SPECIMEN IN A SEALED VESSEL

Masanori Otani, Kakogawashi, Japan, assignor to Toa Medical Electronics Co., Ltd., Kobe, Japan

Filed Jul. 28, 1987, Ser. No. 78,718
Claims priority, application Japan, Jan. 29, 1987, 62-019314
Int. Cl.[5] B01L *3/02*; B01F *11/00*
U.S. Cl. 422—100 7 Claims



1. A shaking apparatus for agitating and withdrawing a liquid specimen in at least one sealed vessel having a plug on one end, said apparatus comprising:

a frame means having upper and lower ends;

vessel holding means supported by said frame means and displaceable between said upper and lower ends of said frame means for holding at least one vessel by spring means, said vessel holding means being movable in a forward direction, in a backward direction substantially opposite to said forward direction, in an upward direction substantially transverse to said forward and backward directions and in a downward direction substantially opposite to said upward direction;

first driving means supported by said frame means for moving said vessel holding means in said forward direction and in said backward direction;

second driving means supported by said frame means for moving said vessel holding means in said upward direction and in said downward direction;

third driving means supported by said frame means for reciprocally rotating said vessel holding means in a predetermined angular range;

tilting means supported by said frame means in an area of said upper end of said frame means for tilting said vessel holding means such that a vessel plug accommodating end thereof faces toward said downward direction;

specimen withdrawing means supported by said frame means adjacent said tilting means and including two needles adapted to be stabbed through a plug of a vessel held in the vessel holding means, one of said needles allowing air to pass into said vessel and the other needle allowing said liquid specimen to pass out of said vessel; and

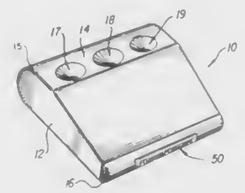
a needle cleansing tank for cleaning the needles, said needle cleansing tank including apertures therein through which said needles are inserted for cleansing, said needle cleansing means being positioned between the specimen withdrawing means and the tilting means.

4,921,677

SLIDING VALVE FOR VENT OF LIQUID COLLECTING COMPARTMENT

Charles C. Hinckley, Pittsford, and Lewis T. Del Plato, Jr., Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 98,248, Sep. 18, 1987. This application Sep. 6, 1988, Ser. No. 240,179
Int. Cl.[5] B01L *11/00*
U.S. Cl. 422—103 16 Claims



1. In a liquid-collecting device comprising at least one liquid-collecting compartment, means in said at least one compartment defining a vent aperture fluidly connecting said compartment to the atmosphere, said aperture-defining means including a portion of a wall in which said aperture is located, and closure means for shutting off said vent aperture;

the improvement wherein (a) said closure means comprise a slide valve, (b) one of said slide valve and said wall portion comprises an elastomeric member, and (c) further comprising means for slidably mounting said slide valve and said wall portion relative to each other to move said slide valve between a first position covering said aperture and a second position which uncovers said aperture,

said member being formed of an elastomer having a durometer, cold flow and a static coefficient of friction with respect to the other of said slide valve and said wall portion, that are effective to allow said slide valve to be slid between said positions, when a relative compression is provided between said member and said wall of about 0.15 mm, with a sliding force that is between about 0.15 newtons and about 20 newtons,

whereby the slide valve is readily manually movable on said device.

4,921,678

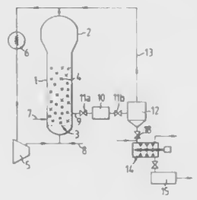
APPARATUS FOR DEGASSING AND PELLETING POLYOLEFINS

Charles Raufast, Saint Julien les Martigues, France, assignor to BP Chemicals Limited, London, United Kingdom

Division of Ser. No. 44,442, Apr. 30, 1987, Pat. No. 4,820,463. This application Nov. 21, 1988, Ser. No. 273,794
Claims priority, application France, May 6, 1986, 8606548
Int. Cl.[5] B01J *8/20*
U.S. Cl. 422—110 6 Claims

1. In apparatus in which alpha-olefins are polymerized in the gas phase in a reactor containing a catalyst, said reactor having a reactor outlet through which solid polyolefin particles and gases pass, a primary degasser connected to said reactor outlet for receiving solid polyolefin particles and said gases passing through said reactor outlet and for separating said solid polyolefin particles from said gases, said primary degasser having an outlet through which solid polyolefin particles with accompanying gases pass, and a secondary degasser connected to said outlet of said primary degasser for receiving the solid polyolefin particles and gases passing through said outlet of said primary degasser and for separating the last-mentioned solid polyolefin particles from the last-mentioned gasses, said secondary degasser having an outlet, and an extruder connected to said outlet of said secondary degasser for receiving solid polyolefin particles from the outlet of said secondary degasser and for pelleting the last-mentioned solid polyolefin particles, wherein the improvement comprises:

a secondary degasser with a housing having an inlet connected to said outlet of said primary degasser without



intervening apparatus for preventing said particles of solid polyolefin passing through said outlet of said primary degasser from entering said secondary degasser is particles and said secondary degasser having a mechanical stirrer within said housing and means connected to said mechanical stirrer and driving said mechanical stirrer at a rate which heats said particles of solid polyolefin to a temperature close to the minimum sintering temperature of said particles of solid polyolefin but less than the melting temperature of said particles.

4,921,679

EXHAUST SYSTEM FOR LASER SURGERY

Juan N. Martin, and John K. Martin, both of 2514 Old Fort Rd., Sugarland, Tex. 77479-1774

Filed Feb. 21, 1989, Ser. No. 313,013
Int. Cl.[5] B01D *50/00*
U.S. Cl. 422—169 3 Claims

1. Apparatus for treating an aerosol laden smoke stream generated during laser surgery to render it harmless for release to the ambient comprising:

(a) a closed, fluid tight circuit having an inlet and outlet;

(b) means for maintaining said circuit under negative pressure;

(c) said circuit including between said inlet and outlet the following elements serially connected in the order named:

a container at least partially filled with a sterilizing fluid, to retain and destroy the larger aerosol particles;

a heating chamber having means maintaining said chamber at a temperature sufficient to incinerate smaller unfilterable aerosol particles which pass through said container;

means for oxygen enrichment of the atmosphere in said chamber;

heat exchange means for cooling the stream exiting from said chamber; and

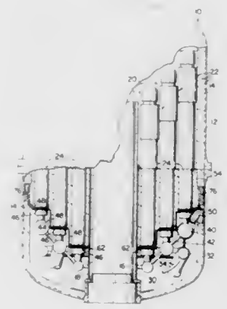
means for releasing the thus treated stream to ambient.

4,921,680

REFORMER SEAL PLATE ARRANGEMENT

Stanley P. Bonk, West Willington; George F. Morganthaler, Windsor, both of Conn., and Yoshiharu Miura, Yokohama, Japan, assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Sep. 12, 1989, Ser. No. 406,399
Int. Cl.[5] B01J *8/06*
U.S. Cl. 422—197 8 Claims



1. A fired gas reformer seal plate arrangement comprising:

an internally insulated pressure vessel having a wall;

a rigid reformer gas outlet header system centered within said pressure vessel and supported and spaced from said pressure vessel walls;

a vertical central firing tube structure within said pressure vessel supported from said pressure vessel;

an annular support and seal plate in the space between said firing tube structure and said pressure vessel wall, located above said header system;

a plurality of vertical bayonet reformer gas tubes supported from said outlet header system and extending through openings in said support and seal plate, with an annular flow path around each bayonet tube of said plurality of bayonet tubes at each opening of said openings;

a plurality of support lugs on each bayonet tube of said plurality of bayonet tubes for supporting said support and seal plate in spaced relationship from each bayonet tube of said plurality of bayonet tubes;

a plurality of gas confining sleeves supported on said support and seal plate, surrounding each bayonet tube of said plurality of bayonet tubes, and with an annular space between each sleeve of said sleeves and each bayonet tube of said plurality of bayonet tubes in fluid communication with a plenum below said support and seal plate via the annular flow paths between each bayonet tube of said plurality of bayonet tubes and the support and seal plate;

a bolted gasket seal between each sleeve of said sleeves and said support and seal plate;

an axially compressed and radially deformable inner seal between said support and seal plate and said firing tube structure; and

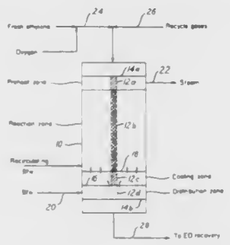
a diagonal movement outer seal between said support and seal plate and said pressure vessel wall.

4,921,681

ETHYLENE OXIDE REACTOR

Brian J. Ozero, New York, and Stanley D. Becker, Hewlett, both of N.Y., assignors to Scientific Design Company, Inc., Little Ferry, N.J.

Division of Ser. No. 75,227, Jul. 17, 1987, abandoned. This application Apr. 7, 1988, Ser. No. 178,928
Int. Cl.[5] B01J 8/06
U.S. Cl. 422—197 10 Claims



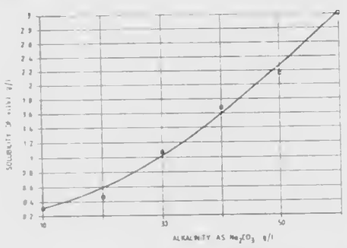
1. In a process for the catalytic oxidation of ethylene with molecular oxygen to ethylene oxide in a fixed bed reactor wherein a supported silver catalyst is disposed in multiple tubes surrounded by a fluid which removes the exothermic heat of reaction and said tubes have a contiguous cooling gas cooling zone containing inert particles disposed downstream of said catalyst having a first overall heat transfer coefficient to provide rapid cooling of the effluent gases, the improvement comprising providing a contiguous coolant distribution zone downstream of said cooling zone in which the effluent gases are in low-turbulence flow to provide a second overall heat transfer coefficient substantially lower than said first overall heat transfer coefficient which prevents the temperature of the coolant entering said distribution zone from increasing substantially as it passes over said tubes before flowing into said cooling zone.

4,921,682

PROCESS FOR REMOVING HYDROGEN SULPHIDE FROM GAS STREAMS

Robert De Haan; Mark E. Dry; Flemming H. Dressler, all of Sasolburg; Horst J. F. A. Hesse, Vanderbijlpark, and Sonet Vermaire, Sasolburg, all of South Africa, assignors to Sasol Operations (Pty) Ltd., Johannesburg, South Africa

Filed Jun. 13, 1988, Ser. No. 205,890
Int. Cl.[5] C01B 17/16, 31/20, 17/02
U.S. Cl. 423—225 10 Claims



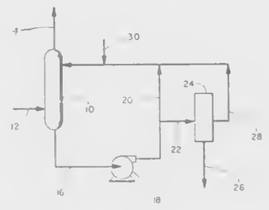
1. A continuous process for removing hydrogen sulphide from a sour gas stream comprising hydrogen sulphide and carbon dioxide, including a step of contacting the gas stream with a scrubbing liquor comprising dissolved five-valent oxovanadium and a concentration of total alkalinity greater than a concentration required to maintain in solution any four-valent oxovanadium formed as a result of such contacting step,the alkalinity being present in the form of mainly bicarbonate ions and such concentrations of hydroxyl and carbonate ions as would be sufficient to maintain the pH of the liquor between 7.4 and 9 during the contacting step, the carbonate ion concentration, expressed as carbonate ions, being below 12.5 grams per liter, and the bicarbonate ion concentration expressed as sodium bicarbonate, being in excess of 30 grams per liter, the carbon dioxide concentration in the sour gas being sufficiently high to maintain the pH of the liquor below 9.

4,921,683

NITRIC OXIDE ABATEMENT WITH POLYMERIC COBALT(III) CHELATES

Stephen A. Bedell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 20, 1989, Ser. No. 368,613
Int. Cl.[5] C01B 21/00; C02F 1/68, 1/72
U.S. Cl. 423—235 19 Claims



1. A method for abating nitric oxide in a fluid stream, comprising the steps of:

(A) contacting a fluid stream containing nitric oxide with an aqueous solution of a polymeric cobalt(II) diamine dioxygen complex, wherein said complex is obtained by (a) complexing (i) a cobalt(II) salt with (ii) a water soluble, basic polymer comprising polyethyleneimine containing secondary amine groups, wherein the molar ratio of said amine groups to cobalt(II) is from 3 to 6, and (b) oxygenating the resulting polymeric cobalt(II) diamine complex;

(B) recovering aqueous solution resulting from said contact with said fluid stream in step (A);

(C) purifying said recovered aqueous solution to remove low molecular weight reaction products; and

(D) recycling the purified solution from step (C) for reuse in the aqueous solution of step (A).

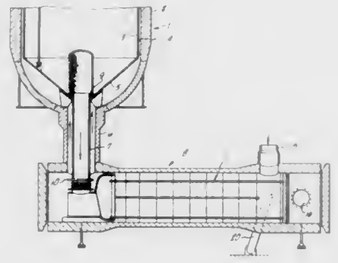
4,921,684

AMMONIA CONVERSION PROCESS

Bernard J. Grotz, Pasadena; Fiske O. Parnkopf, Arcadia, and G. Robert Prescott, Newport Beach, all of Calif., assignors to C F Braun, Inc., Alhambra, Calif.

Continuation of Ser. No. 24,845, Mar. 18, 1987, abandoned, which is a continuation of Ser. No. 799,035, Nov. 18, 1985, abandoned, which is a continuation of Ser. No. 444,749, Nov. 26, 1982, Pat. No. 4,554,135. This application Apr. 28, 1988, Ser. No. 188,187
Int. Cl.[5] B01J 8/02; C01C 1/04
U.S. Cl. 423—360 4 Claims

1. An improved process for synthesizing ammonia from a synthesis feed gas in an upright ammonia synthesis converter in which the improvement comprises passing the feed gas through a horizontally disposed shell and tube heat exchanger connected at a tube side with a conduit extending through a channel at one end of ammonia synthesis converter which is close coupled to the heat exchanger, passing the feed gas through the channel about the conduit and into the synthesis converter, and passing a synthesis effluent from the synthesis converter, through the conduit to a tube side of the heat exchanger, wherein the conduit is connected to the heat exchanger through an expansion means and a spring-loaded rocker arm supports the end of the heat exchanger opposite the converter, said rocker arm being provided to allow for longitudinal movement of the heat exchanger shell due to thermal



expansion from the anchored end of said heat exchanger, whereby ammonia synthesis feed gas may pass through the heat exchanger and the channel above the conduit and into the synthesis converter at a temperature between approximately 700° F. to about 750° F. and the synthesis effluent passes through the conduit to the tube side of the heat exchanger at a temperature between approximately 950° F. to about 1000° F.

4,921,685

METHOD FOR METHANE CONVERSION

William A. Peters, Lexington, and Jack B. Howard, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 12, 1988, Ser. No. 283,401
Int. Cl.[5] C01B 31/30
U.S. Cl. 423—439 15 Claims

1. A method for carbon densification of methane, said method comprising reacting a mixture comprising methane and a magnesium oxide at a reaction temperature of about 1400° C. or more to form magnesium tricarbide and by-product gas comprising hydrogen.

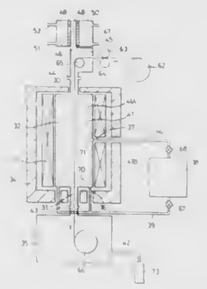
4,921,686

METHOD OF CARBONIZING AND ACTIVATING FIBER MATERIALS

Akibiko Yoshida; Atsushi Nishino; Ichiro Tanahashi, and Yasuhiro Takeuchi, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 868,655, May 29, 1986, Pat. No. 4,814,145. This application May 31, 1988, Ser. No. 204,957
Int. Cl.[5] C09C 1/56
U.S. Cl. 423—447.6 5 Claims

1. A method for continuously carbonizing and activating continuous fiber materials, which comprises the steps of contacting a continuous fiber material in a first zone of a furnace chamber with an activating gas from opposite sides of the fiber material while passing in a vertical direction at a temperature of from about 800° to 1200° C. for a time sufficient to permit the carbonization and activation of the fiber material, and thermally treating the resulting product in a second zone of the furnace chamber in an inert gas atmosphere substantially free of activating gas immediately and continuously after the carbonization and activation, wherein said fiber material is carbonated and activated in the first zone which is wholly filled with said activating gas, wherein said first zone is established by inert gas curtains at upper and lower portions of said first



zone, so that the temperature and a concentration of oxygen in the zone is stably controlled.

4,921,687

METHOD OF MAKING HIGH-ORIENTATION SHEET-LIKE GRAPHITE BY USING LAMINAR COMPOUND

Akira Tomita, Sendai; Takashi Kyotani, Izumi, and Naohiro Sonobe, Sendai, all of Japan, assignors to Tohoku University, Sendai, Japan

Filed Jul. 26, 1988, Ser. No. 224,331
Claims priority, application Japan, Nov. 28, 1987, 62-298901
Int. Cl.[5] C01B 31/04
U.S. Cl. 423—448 8 Claims

1. A method of making high-orientation sheet-like graphite by inserting monomer of high molecular compound between layers of laminar compound, polymerizing the monomer, preliminarily carbonizing the thus formed polymer through thermal decomposition at 500°~900° C., removing the laminar compound through acid treatment so as to expose carbon formed between said layers, and graphitizing the thus exposed carbon at a temperature higher than 2,500° C.

4,921,688

PROCESS FOR PREPARING AMMINE SALTS OF ALUMINUM IODIDE

Dieter Peters, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 240,088
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731456
Int. Cl.[5] C01C 1/16; C01F 7/48
U.S. Cl. 423—463 12 Claims

1. A process for preparing ammine salts of aluminum iodide by a reaction of aluminum, an iodine compound and ammonia, which comprises reacting the reactants without mercury as a catalyst in the ammonia, wherein the ammonia is in the liquid

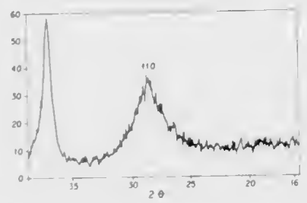
phase, at a temperature from 20° to 600° C. and a pressure from 8 to 2,000 bar and evaporating excess ammonia after the reaction is completed.

4,921,689

PROCESS FOR PRODUCING BETA MANGANESE DIOXIDE

Andre Walker, Lexington, Mass., and Terrence F. Reise, Winston-Salem, N.C., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 24, 1988, Ser. No. 211,309
Int. Cl.[5] C01G *45/02;* H01M *4/50*
U.S. Cl. 423—605 17 Claims



1. An improved process for producing beta manganese dioxide comprising feeding particulate gamma manganese dioxide into a chamber, continuously changing the relative positions of the MnO_2 particles in said chamber while heating the gamma manganese dioxide to at least 450° C., holding the temperature of the manganese dioxide at at least 450° C. for a time to convert a majority of the manganese dioxide to a beta crystal phase without forming detrimental amounts of lower oxides, and removing the heat treated manganese dioxide from the chamber.

4,921,690

METHOD OF ENHANCING THE BIODISTRIBUTION OF ANTIBODY FOR LOCALIZATION IN LESIONS

John D. Beatty; Barbara G. Beatty, both of Arcadia, Calif., and Rosemary B. Duda, Chicago, Ill., assignors to City of Hope, Duarte, Calif.

Continuation-in-part of Ser. No. 946,950, Dec. 29, 1986, abandoned. This application Apr. 12, 1988, Ser. No. 180,447
Int. Cl.[5] A61K *49/02, 39/395*
U.S. Cl. 424—1.1 17 Claims

1 A method for enhancing targeting of a lesion near the liver or spleen of a mammalian subject by administration of a labeled monoclonal antibody specific for a marker substance for said lesion which comprises:

preselecting a combination of unlabeled and detectably labeled lesion marker substance specific monoclonal antibodies,

the relative proportion of said unlabeled monoclonal antibodies in said combination being sufficient to substantially clear said lesion marker substance form the bold in circulation in said subject and to provide labeled monoclonal antibody for accumulation is said lesion, and

administering said combination of labeled and unlabeled monoclonal antibodies to said mammalian subject in an amount at least sufficient to provide enhanced targeting of said lesion by accumulation of said labeled monoclonal antibody in said lesion.

4,921,691

SPRAY ON WOUND DRESSING COMPOSITIONS

Richard F. Stockel, 475 Rolling Hills Rd., Bridgewater, N.J. 08807

Filed Aug. 22, 1985, Ser. No. 768,422
Int. Cl.[5] A61L *9/04*
U.S. Cl. 424—45 16 Claims

1. A spray on wound dressing composition comprising

(a) 2–30% by weight of an anti-bacterial, film-forming compound which is the reaction product of

(i) 2 to 30% by weight of an organo-silicon quaternary ammonium salt which includes a hydrolyzable silane group, and

(ii) 70 to 98% by weight of an organic polymer reactive with said hydrolyzable group, and

(b) the rest being a propellant solvent.

4,921,692

ANTICALCULUS ORAL COMPOSITION

Abdul Gaffar, Princeton, and Thomas G. Polefka, Somerset, both of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 938,948, Dec. 8, 1986, Pat. No.
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[5] A61K *7/16, 7/18*
U.S. Cl. 424—52 20 Claims

1. In an anticalculus oral composition containing in an orally acceptable vehicle one or a mixture of water soluble alkali metal hexametaphosphate salts as essential anticalculus agents, and an amount of a fluoride ion source sufficient to supply about 25 ppm. to about 2,000 ppm. of fluoride ions, the improvement wherein salivary hydrolysis of P—O—P bonds in said hexametaphosphate salt by phosphatase enzymes is inhibited consisting essentially of including in said composition an effective inhibiting amount therefor within the range of about 0.05 to about 3 wt. % of a water soluble alkali metal or ammonium synthetic anionic linear polymeric polycarboxylate.

4,921,693

ANTICALCULUS ORAL COMPOSITION

Abdul Gaffar, Princeton, and Thomas G. Polefka, Somerset, both of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 911,607, Jun. 25, 1986, Pat. No. 4,806,342, which is a continuation of Ser. No. 775,851, Sep. 13, 1985, Pat. No. 4,627,977. This application Feb. 8, 1989, Ser. No. 307,807
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[5] A61K *7/16, 7/18*
U.S. Cl. 424—52 18 Claims

1. In an anticalculus mouthwash composition containing in an orally acceptable vehicle one or a mixture of linear molecularly dehydrated polyphosphate salts selected from the group consisting of water soluble alkali metal pyrophosphates, tripolyphosphates and hexametaphosphates as essential anticalculus agents, and an amount of a fluoride ion source sufficient to supply about 25 ppm. to about 2,000 ppm. of fluoride ions, the improvement wherein salivary hydrolysis of P—O—P bonds in said polyphosphate salt by phosphatase enzymes is inhibited consisting essentially of including in said composition an effective inhibiting amount therefor within the range of about 0.05 to about 3 wt. % of a water soluble alkali metal or ammonium synthetic anionic linear polymeric polycarboxylate.

4,921,694

DEODORIZING AND ANTIMICROBIAL COMPOSITION FOR USE IN COSMETIC OR TOPICAL FORMULATIONS

Udo Hoppe; Ulrich Eigener, both of Hamburg; Gerhard Sauermann, Wiemersdorf; Walter Engel, Pinneberg, and Wolfgang Pape, Hamburg, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 197,949
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720831; Nov. 27, 1987, 3740186
Int. Cl.[5] A61K *7/32, 7/46, 7/50, 9/12*
U.S. Cl. 424—65 6 Claims

1. A synergistic deodorizing and antibacterial composition consisting essentially of, based on the total amount of the composition of

(a) 32–36% by weight of at least one 3,7,11-trimethyl-2,6,10-dodecatrien-1-ol,

(b) 51–55% by weight of a phenoxyethanol, and

(c) 9–15% by weight of glycerol monolaurate.

4,921,695

ANTIANGINAL PLATE FOR TREATING ISCHEMIC HEART DISEASE

Eduard A. Babaian, ulitsa Novatorov 36, Korpus 9, kv. 12; Galina A. Gerasimova, ulitsa Shepilovskaya 36, Korpus 2, kv. 131; Anatoly B. Davydov, ulitsa Krasny Kazanets 19, Korpus 1, kv. 283; Rustam I. Utyamyshev, Prospekt Mira 118, kv. 222; Gennady L. Khromov, 2 Frunzenskaya ulitsa 10, kv. 100; Vladimir I. Metelitsa, Khimki, Jubileiny prospekt, 35, kv. 186; Anatoly M. Vikhert, ulitsa Burdenko 11, kv. 8-a; Konstantin L. Savvateev, ulitsa Chusovskaya 15, kv. 75; Vladimir K. Piotrovsky, ulitsa Akademika Skryabina, 3, korpus 1, kv. 59, and Elizaveta B. Novikova, Petrovsko-Razumovskaya alleya 18, kv. 25, all of, Moscow, U.S.S.R.

Division of Ser. No. 50,526, May 13, 1987, Pat. No. 4,842,854, which is a continuation-in-part of Ser. No. 799,210, Nov. 19, 1985, Pat. No. 4,713,239, which is a continuation of Ser. No. 42,874, May 29, 1979, abandoned. This application Mar. 9, 1989, Ser. No. 320,976
Int. Cl.[5] A61K *9/20, 31/79*
U.S. Cl. 424—81 7 Claims

1. A method for treating ischemic heart disease in a patient subject to anginal pectoris comprising the step of adhering to a chosen site of the mouth mucosa an antianginal film composition in plate form useful for treating ischemic heart diseases in patients subject to anginal pectoris and which is capable of adherence to a selected site of the mouth mucosa for rapid arresting or prevention of anginal pectoris attacks whereby said composition when highly adhered remains fixed and glued to a chosen site of the mouth mucosa and insures immediate, uniform and sustained delivery of an antianginal nitrate, in an amount effective for an average of about 5 hours per plate, directly into the blood circulation system through the mouth mucosa, with the great advantage that it is possible to control and easily discontinue the nitrate uptake by removing the unresolved film in cases where it becomes necessary or, on the contrary, to renew the therapy, said antianginal composition comprising from about 3 to 30 weight percent of an antianginal nitrate in a complex labile bond with from about 70 to 97 weight percent of a mouth mucosa soluble, swellable and resolvable polymeric film-forming carrier, in which solutions of the biologically resolvable soluble polymer carrier and the active substance were mixed, and a film cast and dried until the residual amount of the solvent does not exceed about 10 percent by weight;

said film-forming carrier having the ability to:

(a) form labile complex bonds with said anti-anginal coronary vasodilating nitrate;

(b) remain highly adhered to the mouth mucosa, but can be removed to interrupt or discontinue treatment; and

(c) release the active principle of said coronary vasodilator nitrate immediately, and thereafter at such a sustained rate and for a period of time that the pharmacodynamic effects as expressed by the mean data of the repeated individual selected standard physical loads with treadmill in combination with ECG-monitoring

(i) are detectable practically instantaneously after affixing to the mouth mucosa,

(ii) confirm the presence of a continuous therapeutic concentration of said active principle in the patient's blood during resolution of said carrier, and

(iii) confirm a bioavailability of said active principle in an amount substantially greater than that obtained with a sublingual nitroglycerin tablet as the standard.

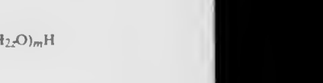
4,921,696

METHOD FOR THE CONTROL OF INSECTS

Robert K. Vander Meer; Clifford S. Lofgren, and David F. Williams, all of Gainsville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C. and Southern Research Institute, Inc., Birmingham, Ala.

Continuation of Ser. No. 758,856, Jul. 26, 1985, abandoned, which is a continuation of Ser. No. 455,727, Jan. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 598,908, Apr. 16, 1984, abandoned, which is a continuation of Ser. No. 361,501, Mar. 25, 1982, abandoned. This application Oct. 11, 1988, Ser. No. 256,237
Int. Cl.[5] A01N *25/00, 37/06, 41/06, 55/02*
U.S. Cl. 424—84 49 Claims

1. A method for the control of a population of arthropods comprising the step of treating said arthropods with an effective amount of a toxicant substance or mixture of substances having the structural formula:



$$CF_3(CF_2)_x-\overset{\overset{O}{\|}}{S}-N-(C_yH_{2y}O)_n(C_zH_{2z}O)_mH$$

wherein x=4 to 19, y=1 to 4, z=1 to 4 and n+m=1 to 20.

4,921,697

IFN-GAMMA AS AN ACTIVE SUBSTANCE FOR INHIBITING AND PREVENTING DEGRADATION PROCESSES IN BONE

Meinrad Peterlik, and Oskar Hoffmann, both of Vienna, Austria, assignors to Boehringer Ingelheim International GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 868,524
Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519361
Int. Cl.[5] A61K *45/02;* C07K *15/26*
U.S. Cl. 424—85.5 11 Claims

1. A method for inhibiting, preventing, or controlling bone loss in a patient comprising administering a pharmaceutical composition to said patient comprising gamma-interferon in an amount effective to inhibit, prevent, or control said bone loss.

4,921,698

POLYPEPTIDE HAVING GAMMA-INTERFERON ACTIVITY LACKING AMINO ACIDS CODED BY EXON 4

Takashi Shirai, Arcadia, and R. Bruce Wallace, West Covine, both of Calif., assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 614,130, May 25, 1984, abandoned. This application Sep. 30, 1987, Ser. No. 105,473
Int. Cl.[5] A61K *45/02;* C07K *15/26;* C12P *21/00*
U.S. Cl. 424—85.5 2 Claims

1. A polypeptide having human gamma-interferon activity having the amino acid sequence

Cys Tyr Cys Gln Asp Pro Tyr Val Lys Glu Ala Glu Asn Leu

-continued

Lys Lys Tyr Phe Asn Ala Gly His Ser Asp Val Ala Asp Asn

Gly Thr Leu Phe Leu Gly Ile Leu Lys Asn Trp Lys Glu Glu

Ser Asp Arg Lys Ile Met Gln Ser Gln Ile Val Ser Phe Tyr Phe

Lys Leu Phe Lys Asn Phe Lys Asp Asp Gln Ser Ile Gln Lys Ser

Val Glu Thr Ile Lys Glu Asp Met Asn Val Lys Phe Phe Asn Ser

Asn Lys Lys Lys Arg Asp Asp Phe Glu Lys Leu Thr Asn Tyr

Ser Val Thr Asp His His Asp Ile Ser Arg Ile Ser

4,921,699

POLYPEPTIDES HAVING INTERFERON ACTIVITY

Thomas M. DeChiara, Bloomfield, and Stanley J. Tarnowski, Jr., Nutley, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 827,674, Feb. 10, 1986, Pat. No. 4,816,566, which is a continuation of Ser. No. 499,964, Jun. 1, 1983, abandoned. This application Oct. 14, 1988, Ser. No. 257,900

Int. Cl.[5] **A61K** *45/02;* **C12N** *15/00;* **C07H** *21/04*

U.S. Cl. 424—85.7 **17 Claims**

3. A double-stranded DNA comprising a coding strand and a complementary strand, which coding strand comprises a series of nucleotide triplets encoding a biologically active recombinant or hybrid recombinant human IFN-α in which at least one cysteine residue at position 1, 98, 99 or 100 has been replaced by an amino acid residue that is incapable of forming a disulfide bond.

4,921,700

BBM-1675C AND D ANTITUMOR ANTIBIOTICS

Jerzy Golik, Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 770,335, Aug. 27, 1985, abandoned. This application May 28, 1987, Ser. No. 55,209

Int. Cl.[5] **A61K** *35/74;* **C12P** *1/04*

U.S. Cl. 424—117 **4 Claims**

1. The antitumor antibiotic BBM-1675D which in substantially pure form:

(a) appears as an amorphous solid;

(b) is soluble in methanol, ethanol, acetone and tetrahydrofuran, and slightly soluble in chloroform;

(c) exhibits in silica gel thin-layer chromatography an R_f value of 0.22 with the solvent system chloroform:methanol (5:0.5, v/v) and exhibits in reverse phase silica gel thin layer chromatography an R_f value of 0.37 with the solvent system methanol:water (70:30, v/v);

(d) has an apparent molecular weight of 695 as determined by high resolution FAB mass spectroscopy;

(e) has an ultraviolet absorption spectrum in methanol solution substantially as shown in FIG. 2 exhibiting ultraviolet absorption maxima and absorptivities at 214 nm (a=27,000), 274 nm (a=12,800), and 325 nm (a=5,400) with no significant change upon addition of acid or base;

(f) has an infrared absorption spectrum (KBr, film) substantially as shown in FIG. 4 exhibiting principal absorption peaks at

735, 755, 910, 960, 1000, 1020, 1085, 1150, 1195, 1250, 1310, 1335, 1365, 1385, 1445, 1510, 1685, 1720, 1735, 2880, 2930, 2960, and 3400 reciprocal centimeters;

(g) has a low resolution mass spectrum substantially as shown in FIG. 6 exhibiting a molecular ion $[M+H]^+$ of 696;

(h) has a 360 MHz proton magnetic resonance spectrum in $CDCl_3$+10% CD_3OD substantially as shown in FIG. 8 exhibiting signals at 6.43 (1H, dd, J=4.4, 10.3); 6.13 (1H, s); 5.81 (1H, d, J=8.8); 5.70 (1H, d, J=8.8); 5.48 (1H, 6 brs); 4.48 (1H, d, J=8.1); 4.02 (1H, d, J=2.0); 3.95-3.80 (solvent background); 3.77 (1H, t, J=9.0); 3.70-3.40 (11H, brm); 3.35 (1H, m); 3.28 (3H, s); 3.22 (3H, brs); 2.66-2.55 (2H, m); 2.38 (3H, s); 2.23-2.12 (2H, m); 1.42 (1H, brdt); 1.22 (3H, d, J=5.9); 0.94 (3H, d, J=6.6); and 0.87 (3H, d, J=5.9) parts per million downfield from tetramethylsilane;

(i) has a 90.6 MHz carbon-13 magnetic resonance spectrum in $CDCl_3$+10% $CD_{30}OD$ substantially as shown in FIG. 10 (FIG. 10A+10B) exhibiting signals at 17.5, 21.6, 22.2, 23.0, 33.4, 39.2, 46.4, 52.3, 55.8, 62.1, 67.8, 69.8, 70.1, 71.3, 75.8, 77.1, 78.1, 82.4, 83.3, 88.2, 97.4, 99.6, 122.6, 124.8, 130.1, 130.8, 134.3, 148.7, and 192.8 parts per million downfield from tetramethylsilane.

4,921,701

ANTIMICROBIAL WATER SOLUBLE SUBSTRATES

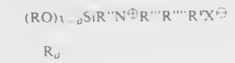
Lynne M. Blehm Blank, Brighton, N.Y., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 11, 1988, Ser. No. 230,945

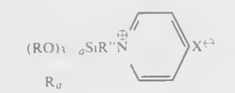
Int. Cl.[5] **A61K** *6/00, 7/32, 7/34, 7/36*

U.S. Cl. 424—401 **2 Claims**

1. A composition comprising a water-soluble antiperspirant salt having chemically bonded thereto an organosilane having the general formula selected from the group consisting of



and



wherein, in each formula,

R is an alkyl radical of 1 to 4 carbon atoms or hydrogen;

a has a value of 0, 1 or 2;

R' is a methyl or ethyl radical;

R'' is an alkylene group of 1 to 4 carbon atoms;

R''', R'''' and R^v are each independently selected from a group consisting of alkyl radicals of 1 to 18 carbon atoms, $-CH_2CH_6H_5$, $-CH_2CH_2OH$, $-CH_2Oh$, and $-(CH_2)_xNHC(O)R^{vi}$, wherein x has a value of from 2 to 10 and R^{vi} is a perfluoroalkyl radical having from 1 to 12 carbon atoms;

X is chloride, bromide, fluoride, iodide, acetate or tosylate, the salt being aluminum chlorohydrate powder.

4,921,702

SHEET MATERIAL FOR TREATING WOUNDS IN PLANT MATTER

Nigel H. Banks, Palmerston North, New Zealand; Colin A. Borton, Gros-Islet; Francis S. Leonce, Castries, both of , assignors to Haircloth Weaving & Finishing Company Limited, Lancashire; Geest Industries Limited, Lincolnshire, both of, England and The Windward Islands Banana Grower's Association, St. Lucia,

Filed Apr. 21, 1988, Ser. No. 184,291

Claims priority, application United Kingdom, Apr. 24, 1987, 8709802

Int. Cl.[5] **A01N** *25/34*

U.S. Cl. 424—404 **17 Claims**

1. An absorbent sheet material for application to plant wounds, which comprises a flexible laminate of a sheet material (the distal layer) and a permeable layer (the proximal layer), the layers being bonded together with the laminate containing in the proximal layer or between the layers, liquid absorbing solid particles and/or fibrous absorbent material and the laminate containing or having its proximal surface coated



with a biologically active material which is a biostat or a biocide.

4,921,703

VERMIN EXTERMINATING ELEMENT AND VERMIN EXTERMINATING METHOD USING IT

Toshio Higuchi; Ken Hibino; Rikako Yoshli; Takayuki Hiyori; Yoshinori Miyamoto; Eiichiro Fukusaki; Takeo Matsumura; Yoshiko Hashimoto; Michiko Kikuma; Yuko Sahashi, and Takeshi Okada, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 21, 1987, Ser. No. 99,262

Claims priority, application Japan, Sep. 19, 1986, 61-222479; Sep. 19, 1986, 61-222480; May 14, 1987, 62-117399

Int. Cl.[5] **A61K** *39/00*

U.S. Cl. 424—419 **31 Claims**

1. A vermin exterminating element comprising a culture carrier having culture medium components containing entomogenous fungi and/or the spores of the entomogenous fungi cultivated therein, wherein said culture carrier is a foam matrix selected from the group consisting of a polyurethane foam, a polystyrene foam, a polyvinyl chloride foam, polyethylene foam, and a polyether foam.

4,921,704

WOUND DRESSING

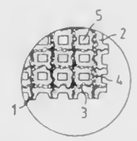
Tomas Fabo, Mölnlycke, Sweden, assignor to Molnlycke AB, Goteborg, Sweden

Continuation of Ser. No. 126,141, Nov. 3, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 313,363

Claims priority, application Sweden, Mar. 10, 1986, 8601098

Int. Cl.[5] **A61F** *13/02;* **A61L** *15/06;* **C08K** *5/06;* **C08L** *75/04*

U.S. Cl. 424—446 **7 Claims**



1. A wound dressing for use with exuding wounds comprising a porous hydrophoboc layer adapted to directly contact the wound during use and an adjacent absorbent layer attached to said hydrophobic layer, said hydrophobic layer comprised of an elastic net-like porous reinforcing component of fibers substantially completely encapsulated by a soft and elastic hydrophobic silicone gel with only a strictly limited number of fiber ends being allowed to penetrate the silicone gel and project out of the dressing surface, while preserving the porosity of said reinforcing component, said hydrophobic layer thus including openings which permit wound exudate to pass through said hydrophobic layer to be absorbed by said outer absorbent layer.

4,921,705

LIPID POWDER HAVING CROSS-LINKED COATING THEREON AND PROCESS FOR PREPARING SAME

Motoharu Arai, and Masatsugu Ito, both of Tokyo, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,887

Claims priority, application Japan, Jul. 14, 1987, 62-173825

Int. Cl.[5] **A61K** *9/48*

U.S. Cl. 424—450 **11 Claims**

1. In a lipid powder having a cross-linked coating thereon comprising a core lipid powder and a water-soluble coating agent coating said core lipid powder, said water-soluble coating agent containing cross-linked protein, an wherein the improvement comprises said protein is crosslinked by tannic acid and is selected from the group consisting of milk protein, egg protein and mixtures thereof.

4,921,706

UNILAMELLAR LIPID VESICLES AND METHOD FOR THEIR FORMATION

Mary P. Roberts, Newton, and Nancy E. Gabriel, Wellesley, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 20, 1984, Ser. No. 673,357

Int. Cl.[5] **A61K** *9/66, 37/22;* **B01J** *13/02*

U.S. Cl. 424—450 **37 Claims**

1. A method of forming unilamellar lipid vesicles, comprising the steps of:

(a) forming a solution of short-chain phospholipids having fatty acids with 6 to 8 carbon atoms and long chain phospholipids having fatty acids with at least 12 carbon atoms in an organic solvent;

(b) removing organic solvent from the solution to form a residue;

(c) dispersing the residue in an aqueous medium; and

(d) equilibrating the resulting dispersion until unilamellar lipid vesicles have formed.

33. A composition for the delivery of a substance comprising a unilamellar lipid vesicle of short-chain phospholipids comprised of fatty acids having 6–8 carbon atoms and long-chain phospholipids comprised of fatty acids having at least 12 carbon atoms, said unilamellar lipid vesicle encapsulating the substance.

34. A unilamellar lipid vesicle of claim 33 in which the encapsulated substance is a drug.

4,921,707

PROCEEDING FOR THE PRODUCTION OF PHARMACEUTICAL PREPARATIONS OF HIGH GASTRIC ACID BINDING CAPACITY, OF RETARDED EFFECT AND OF INCREASED BIOAVAILABILITY

István Rácz, N. 1165 Nebancsvirag, 3 Budapest; János Plachy, N. 1025 Mandula, 18 Budapest, and Péter Szentmiklósi, N. 1064 Rudas L, 25 Budapest, all of Hungary

PCT No. PCT/HU87/00026, § 371 Date Mar. 28, 1988, § 102(e) Date Mar. 28, 1988, PCT Pub. No. WO88/00051, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 24, 1987, Ser. No. 165,102

Claims priority, application Hungary, Apr. 21, 1987, 2643/86

Int. Cl.[5] **A61K** *33/10, 33/08*

U.S. Cl. 424—690 **8 Claims**

1. A process for the preparation of a pharmaceutical preparation of high acid neutralizing capacity, of increased bioavailability, and of delayed action, and in given cases characterized by other actions developed in the gastrointestinal tract, which comprises the steps of

(a) reacting 100 parts by weight of a powdered basic magnesium compound or a powdered mixture comprising a basic magnesium compound and a basic aluminum compound with 2 to 2500 parts by weight of a therapeutically acceptable, dry of water-swollen, water-soluble organic acid of polymeric character selected from the group consisting of

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cellulose-glycolic acid, starch glycolic acid, and polymerized acrylic or methacrylic acids to form a powdered composition;

(b) wetting the powdered composition with 50 to 500 parts by weight of water;

(c) maintaining the wet powdered composition at 20° to 80° C. for 1 to 24 hours to permit the antacid and the polymeric organic acid to react thereby giving the wet powdered composition a high swelling capacity and viscosity as well as ability to react slowly in the stomach with gastric acid to exert a sustained-release acid effect;

(d) granulating the wet powdered composition treated during step (c) and drying the granules;

(e) adding 5 to 60 parts by weight of a smoothing agent or other pharmaceutical excipients; and

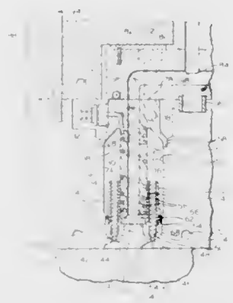
(f) either preparing tablets or other solid pharmaceutical preparations, or preparing liquid suspensions.

4,921,708

INJECTION MOLDING NOZZLE HAVING CIRCUMFERENTIALLY SPACED CONDUCTIVE PROBES

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada (L7G 2X1)

Filed Mar. 1, 1989, Ser. No. 317,741
Claims priority, application Canada, Feb. 10, 1989, 590793
Int. Cl.[5] B29C *45/20*
U.S. Cl. 425—548 **8 Claims**



1. In a heated injection molding nozzle to be seated in a well in a cavity plate to convey melt through the nozzle from a nozzle inlet towards a plurality of spaced gates extending through the cavity plate adjacent the nozzle, the nozzle having a central portion, a rear end and a collar portion adjacent the rear end, the central portion having a forward end and a cylindrical outer surface extending from the collar portion, the nozzle having a central melt bore which extends from the inlet at the rear end to the forward end of the central portion, the nozzle having an electrically insulated heating element with a rear end portion and a spiral portion which is integrally brazed in a channel in the cylindrical outer surface of the central portion of the nozzle, the rear end portion of the heating element extending out through the collar portion to an electrical terminal, the improvement wherein;

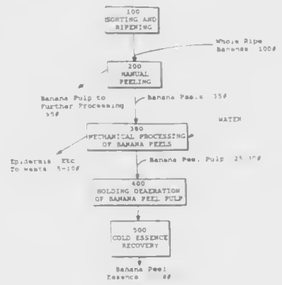
the nozzle has an outer sleeve portion which encircles the cylindrical outer surface of the central portion of the nozzle adjacent the forward end of the central portion, the sleeve portion having a plurality of longitudinal conductive probes spaced around the sleeve portion, the probes each having a forward portion which extends a predetermined distance forwardly of the forward end of the central portion of the nozzle to provide additional heat to the melt which flows past the forward portion to one of the gates.

4,921,709

BANANA PEEL PROCESSING

Pedro Solé, Cincinnati, Ohio, assignor to Chiquita Brands, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 128,633, Dec. 4, 1987, Pat. No. 4,874,617. This application Sep. 7, 1989, Ser. No. 405,143
Int. Cl.[5] A23L *2/02*
U.S. Cl. 426—49 **13 Claims**



1. A process for obtaining banana peel essence from a banana, said method comprising:

providing whole, ripe bananas, each said banana comprising a banana pulp and, disposed about said banana pulp, a banana peel;

peeling said banana by hand to remove said banana pulp from within said banana peel, said banana peel comprising an outer epidermis, a chlorenchyma, and banana peel parenchyma;

separating said banana peel parenchyma from said chlorenchyma and said outer epidermis by means of a mechanical processing device;

digesting said banana peel parenchyma with an enzyme to cause said parenchyma to evolve into a liquid portion and a solid portion; and,

during said digestion, recovering, by suction and condensation, from said banana peel parenchyma, volatile components comprising said banana essence from said banana peels.

4,921,710

METHOD OF CONVERTING CHOLESTEROL IN FOOD TO COPROSTANOL

Donald C. Beitz; Jerry W. Young, and Shangara S. Dehal, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 21, 1988, Ser. No. 222,016
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—56 **8 Claims**

1. A method of decreasing cholesterol concentration in animal origin foods, consisting essentially of: treating cholesterol-containing, animal origin foods

with a reductase organism

cell-free, cholesterol reductase-enriched preparation in an amount effective to reduce cholesterol to coprostanol and to substantially lower the cholesterol concentration of the foods.

4,921,711

ANIMAL FEED OR DRINKING WATER CONTAINING PROPANEDIOL FORMATES

Hans Kiefer, Wachenheim; Hansjoerg Bipp; Fritz Fink, both of Limburgerhof; Hagen Jaedicke, Ludwigshafen, and Dieter M. Poralla, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 14, 1986, Ser. No. 930,527
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540771
Int. Cl.[5] A23K *3/00*
U.S. Cl. 426—66 **7 Claims**

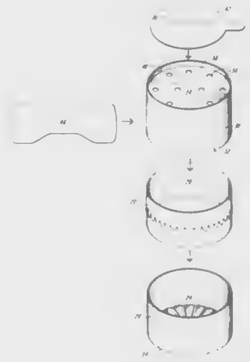
1. An animal feed or drinking water which contains a biocidally or biostatically active amount of one or more formic acid esters of 1,2-propanediol.

4,921,712

AUTOMATIC LOW VOLUME BEVERAGE BREWING SYSTEM

Neil A. Malmquist, 14 Kinsman La., Topsfield, Mass. 01983

Filed Aug. 19, 1988, Ser. No. 234,202
Int. Cl.[5] B65B *29/02;* **B65D** *85/00;* **A47G** *19/16*
U.S. Cl. 426—77 **16 Claims**



1. A disposable cartridge for use with a drip type beverage brewing machine comprising:

a. a first cup having an open upper end, a side wall, and a substantially closed lower end, the lower end being penetrated by at least one port;

b. a filter containing a charge of infusible beverage material and shaped substantially congruent with said first cup and coextensive with said first cup, said filter resting inside said first cup and having a closed end adjacent to and spaced away from said closed end of said first cup and an upper end above said closed end thereof;

c. a closure member having an open lower end, a side wall, and a substantially closed upper end, said closure member being concentric with and secured to said first cup, said side wall of said closure member being in face-to-face engagement with the exterior of said side wall of said first cup, said closed upper end of said closure member closing said open upper end of said first cup, and said closed upper end of said closure member being penetrated by a plurality of holes; and

d. a shallow receptacle defined at least in part by said closed upper end of said closure member, said receptacle being on the side of said closed upper end of said closure member opposite said beverage material and being arranged to be in fluid communication with said beverage material through said plurality of holes in said closed upper end of said closure member.

4,921,713

VERSATILE CONTROLLED FLAVOR STRAW ASSEMBLY

Daniel L. Fowler, Hospital Dr. North #23, Ordfino, Id. 83544

Filed Jun. 5, 1987, Ser. No. 58,386
Int. Cl.[5] A23L *2/00*
U.S. Cl. 426—85 **9 Claims**



1. A straw assembly for imparting flavor to an otherwise neutral liquid such as milk or water, comprising:

a first section of straw for immersion in the neutral liquid;

a second section of straw for the user to draw on;

means intercoupling said sections of straw for supplying flavor to the neutral liquid passing through the two sections of straw;

said means including a chamber having side walls, and flavor imparting material located within said chamber, with the surface area of the flavor imparting material being greater than that of the chamber within which it is enclosed, whereby a relatively high concentration of flavor is applied to the neutral liquid:

said flavor imparting material including at least two distinctly different flavors; and

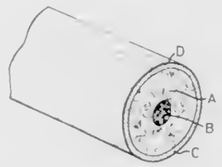
coating means on at least one of said flavors imparting materials for delaying the dissolving of one of said flavors until the other flavor is substantially dissolved.

4,921,714

COEXTRUDED MEAT BASED PRODUCT

Bernard T. Matthews, Norwich; David J. Joll, Holt; Habeeb M. Ziauddin, and David N. Wilson, both of Norwich, all of England, assignors to Bernard Matthews PLC, Norfolk, England

Division of Ser. No. 156,758, Feb. 18, 1988, Pat. No. 4,834,999. This application Mar. 22, 1989, Ser. No. 327,105
Claims priority, application United Kingdom, Jul. 1, 1987, 8715409
Int. Cl.[5] A23L *1/31, 1/317*
U.S. Cl. 426—90 **2 Claims**



1. A whole-muscle meat product comprising an inner body of whole-muscle meat, an annular outer layer of fatty material coextruded around said inner body, a flexible outer casing enclosing said outer layer and a continuous inner stuffing core coextruded through said inner body and comprised of stuffing worked into a thick fluid formulation in admixture with a fatty base.

VOL 114 ISS 1 MY 1 1990 UMI

4,921,715

METHOD FOR PROTECTING CITRUS FRUIT FROM CHILLING INJURY, AND FRUIT PROTECTED THEREBY

Harold E. Nordby, 804 Lake Jessie Dr., Winter Haven, Fla. 33881, and Roy E. McDonald, 344 Cypress Landing Dr., Longwood, Fla. 32779

Filed Jan. 3, 1989, Ser. No. 292,832
Int. Cl.[5] A23B *7/16*
U.S. Cl. 426—102 6 Claims

1. A method for protecting whole citrus fruit from chilling injury, comprising the step of treating the outer surface of the skin of the fruit with a medium containing effective levels of squalene or a squalene-derivative composition to prevent the chilling injury.

4,921,716

AROMA COMPOSITION CONTAINING ALPHA-ACETOLACTIC ACID

Jan Kuiper, Vlaardingen; Walter M. Verhue, Oostvoorne, and Pieter M. Klapwijk, Capelle a/d Ijssel, all of Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Continuation of Ser. No. 39,069, Apr. 16, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,523
Claims priority, application Netherlands, Apr. 25, 1986, 8601078
Int. Cl.[5] A23L *1/226*
U.S. Cl. 426—534 4 Claims

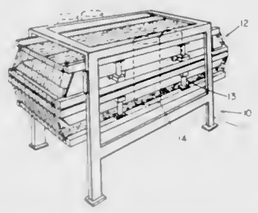
1. Powdery aroma composition comprising not more than 10% by weight of water wherein the sum of the contents of alpha-acetolactic acid and diacetyl lies between 0.01 and 5% by weight, the weight ratio between alpha-acetolactic acid and diacetyl being greater than 2 and of which the rest of the composition consists mainly of edible carrier material.

4,921,717

UHT CONCENTRATED MILK AND PRODUCT AND PROCESS OF MAKING

Heva M. P. Ranjith, Reading, England, assignor to Milk Marketing Board, Thames Ditton, United Kingdom

PCT No. PCT/GB87/00316, § 371 Date Dec. 22, 1987, § 102(e) Date Dec. 22, 1987, PCT Pub. No. WO87/06797, PCT Pub. Date Nov. 19, 1987
PCT Filed May 11, 1987, Ser. No. 138,387
Claims priority, application United Kingdom, May 9, 1986, 8611310
Int. Cl.[5] A23C *1/12;* A23L *3/34*
U.S. Cl. 426—587 19 Claims



1. A process for producing a sterilized, concentrated milk product consisting essentially of the steps of:
(a) partially concentrating milk or a milk product to form a partially concentrated milk product containing up to about 16% w/w of solids not fat,
(b) sterilizing said partially concentrated milk product by indirect or ohmic heating, and
(c) further concentrating the sterilized product of step (b) under sterile conditions.

4,921,718

METHOD FOR PRODUCING QUICK COOKING PROCESSED RICE

Susumu Ohtsu, Fujisawa, Japan, assignor to Ishimoto Food Industry Kabushikikaisha, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,795
Claims priority, application Japan, Dec. 3, 1987, 62-304483
Int. Cl.[5] A23L *1/182*
U.S. Cl. 426—618 15 Claims

1. A method for producing quick-cooking, processed rice, comprising the steps of:
pounding brown rice until a cleaned rice is obtained having a whiteness of at least 39 to 41 per cent;
washing said cleaned rice in water for a period of about 2 to 3 minutes, said period being too short to swell said cleaned rice;
removing all water from the surface of said cleaned rice;
soaking said cleaned rice in an about 4 mol to 13 mol aqueous solution of ethanol for a time adequate to permit absorption of a portion of said solution throughout said cleaned rice and thereby yield ethanol-absorbed rice;
removing all ethanol solution from the surface of said ethanol-absorbed rice while retaining in said ethanol-absorbed rice said portion of said ethanol solution absorbed; and
packaging said ethanol-absorbed rice in a container sealed adequately to retain said portion of said ethanol solution absorbed in said ethanol-absorbed rice.

4,921,719

METHOD AND APPARATUS FOR THE CONTINUOUS PRESERVATION OF LUMPY PRODUCTS SUCH AS FOOD PRODUCT IN LUMP FORM

Friedrich R. Kohlbach, Greifenberg, Fed. Rep. of Germany, assignor to Bowater Packaging Limited, London, England

Filed Jun. 10, 1988, Ser. No. 205,430
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719526
Int. Cl.[5] A23L *3/16;* B01F *15/02*
U.S. Cl. 426—521 19 Claims

1. A method for the continuous preservation of lumpy product comprising:
feeding said lumpy product without pressure and under aseptic conditions into a drum;
maintaining said drum partially filled with a liquid at a constant, adjustable level, and a selected temperature, said liquid being selected to ensure that the lumpy product remains suspended in said liquid for ensuring overall heat treatment; subjecting said lumpy product to heat treatment from said liquid;
continuously conveying said lumpy product upwardly through said liquid;
separating said lumpy product from said liquid;
passing said lumpy product to a product outlet in said drum for subsequent packaging; and
continuously taking excess liquid in said drum from said drum, pasteurising or sterilising said excess liquid, and passing said excess liquid back into said drum under aseptic conditions.

4,921,720

METHOD FOR PREPARING FOOD ITEMS FROM PIG SNOUTS AND OTHER SIMILAR MATERIAL

Edward E. Davis, 4265 San Francisco Ave., St. Louis, Mo. 63115

Filed Feb. 27, 1989, Ser. No. 315,495
Int. Cl.[5] A23L *1/312*
U.S. Cl. 426—641 5 Claims

1. A method of preparing food items from material selected from the group consisting of pig snouts, pig ears, pig skins and beef tripe, consisting essentially of: trimming excess fat from the material; boiling the trimmed material in water; seasoning the boiled material and continuing to boil the seasoned material for about two hours; withdrawing the seasoned material from the boiling water; allowing the material to cool; placing the material on a platter and into a freezer and freezing it from about four to six hours; and after freezing is completed, wrapping and packaging the material to avoid freezer burn, then placing it back into the freezer to be preserved.

4,921,721

SILICON CARBIDE SINTERED MEMBERS

Minoru Matsui, Nagoya City, and Tomonori Takahashi, Chita, both of Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 113,351, Oct. 29, 1987, which is a continuation of Ser. No. 905,142, Sep. 9, 1986, abandoned. This application Oct. 20, 1988, Ser. No. 260,027
Claims priority, application Japan, Sep. 26, 1985, 60-213494
Int. Cl.[5] B05D *1/08*
U.S. Cl. 427—34 5 Claims

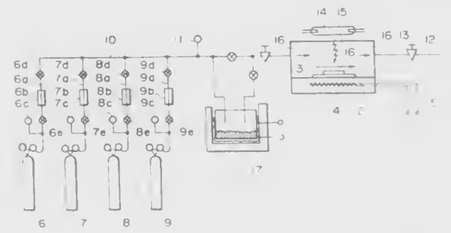
1. A method of producing a silicon carbide sintered member having reduced thermal conductivity, comprising:
providing a silicon carbide sintered body;
roughening or activating a surface of said body; and
providing a heat insulating layer on said surface, said layer consisting essentially of zirconia, and having a thickness of not greater than 100 microns.

4,921,722

METHOD FOR FORMING DEPOSITED FILM

Yoshiyuki Osada, Yokosuka; Hisanori Tsuda, Atsugi; Masafumi Sano, Kawasaki; Satoshi Omata, Tokyo; Katsuji Takasu, Asaka, and Yutaka Hirai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,700
Claims priority, application Japan, Oct. 11, 1984, 59-211460
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—39 5 Claims



1. A method for forming a deposited film comprising: forming a gaseous atmosphere of a hydrogenated silicon compound of the general formula Si_nH_m wherein n is an integer of 1 or more, and m is an integer of 2 or more, in a chamber housing a substrate therein; introducing a gaseous CCl_4 radical polymerization initiator into said chamber and utilizing light energy to thereby excite said compound to effect formation of a deposited film containing silicon on said substrate.

4. A method for forming a deposited film comprising: forming a gaseous atmosphere of a hydrogenated silicon compound of the general formula Si_nH_m wherein n is an integer of 1 or more, and m is an integer of 2 or more, in a chamber housing a substrate therein; introducing a gaseous azo compound radical polymerization initiator into said chamber and utilizing light energy to thereby excite said compound to effect formation of a deposited film containing silicon on said substrate.

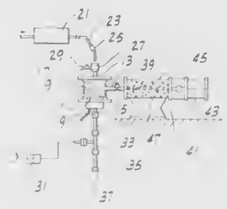
5. A method for forming a deposited film comprising: forming a gaseous atmosphere of a hydrogenated silicon compound of the general formula Si_nH_m wherein n is an integer of 1 more more, and m is an integer of 2 or more, in a chamber housing a substrate therein; introducing a gaseous radical polymerization initiator into said chamber and utilizing light energy to thereby excite said compound to effect formation of a deposited film containing silicon on said substrate; said radical polymerization initiator being selected from the group consisting of a hydrogen peroxide, R—OOH; a dialkyl peroxide, R—OO—R'; a diacyl peroxide, $(R—COO)_2$ and an ester peroxide, R—COO—R' in which R and R' are each independently alkyl or phenyl.

4,921,723

PROCESS FOR APPLYING A COMPOSITE INSULATIVE COATING TO A SUBSTRATE

Michael F. Nichols, and Allen W. Hahn, both of Columbia, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Oct. 16, 1987, Ser. No. 109,079
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—41 29 Claims



1. A process for applying an adherent electrically insulative moisture-resistant composite coating to a substrate, the process comprising the steps of:
providing a thin, adherent, highly cross-linked, substantially liquid moisture-impervious primer coating on said substrate by glow discharge polymerization of a low molecular weight hydrocarbon monomer in a low pressure chamber containing said substrate, said monomer being selected from the group consisting of methane, ethane, propane, ethylene, and propylene; and
providing a second polymeric coating layer over said primer coating by glow discharge polymerization of a second precursor compound in a low pressure chamber, said second precursor comprising a hydrocarbon or substituted hydrocarbon, said precursor exhibiting a hydrogen yield of not greater than about 0.75 hydrogen atoms per molecule under the glow discharge polymerization conditions under which said second layer is deposited, whereby said second polymeric coating layer is substantially resilient and strongly bonded to said primer coating and said second layer comprises a high concentration of surface and bulk free radicals.

4,921,724

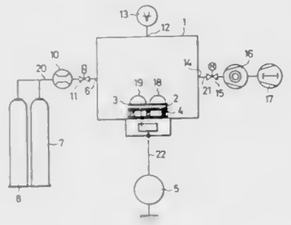
PROCESS FOR COATING A SUBSTRATE WITH AN ORGANIC COATING HAVING GRADATED HARDNESS

Peter Hubert, Alzenau; Barbara Kussel, Rodgau, and Peter Wirz, Waldernbach, all of Fed. Rep. of Germany, assignors to Leybold-Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,627
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719616
Int. Cl.[5] B05D *3/06;* C07C *3/24*
U.S. Cl. 427—41 3 Claims

1. A process for coating a substrate with an organic coating, comprising the following steps
placing the substrate in an evacuable coating chamber having a cathode system equipped with magnets,
introducing a hydrocarbon gas into said chamber,
producing a plasma in the area of the substrate by applying a radiofrequency voltage to said cathode system, and
varying the pressure of hydrocarbon gas in the coating

chamber and the power applied to the cathode system so that a coating derived from said hydrocarbon gas and



having a gradated hardness is formed on the substrate, a relatively hard protective coating being formed first, followed by a softer surface coating.

4,921,725

PROCESS FOR COATING CARBON FIBERS WITH A CARBIDE

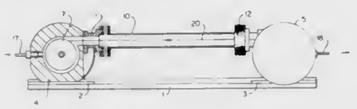
Jean Bouix, Lyons; Jean C. Viala, Villeurbanne; Henri Vincent; Christiane Vincent, both of Lyons; Jean L. Ponthenier, Champagne Au Mont D'or, and Jacques Dazord, Villeurbanne, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Continuation-in-part of Ser. No. 128,333, Dec. 2, 1987, Pat. No. 4,959,503. This application Apr. 17, 1989, Ser. No. 339,108

Claims priority, application France, Dec. 14, 1986, 86 17157

Int. Cl.[5] B05D *3/02, 3/14;* **C23C** *16/32*

U.S. Cl. 427—45.1 **13 Claims**



1. A self-regulating reactive chemical vapor deposition (R.CVD) process for producing a protective passivation overlayer upon individual carbon filaments in a multi-filament strand that includes the steps of

placing one or more multi-filament strands of carbon in a reaction chamber,

exposing the strands in the chamber to a carbon-free gas mixture containing hydrogen and a volatile compound which is capable of reacting with each carbon filament to form a carbide passivation overlayer on said filament,

maintaining the total pressure within the reaction chamber at about atmospheric pressure,

heating the strands to a desired reaction temperature at which the gas phase of the volatile compound reacts with each filament to form a thin homogeneous carbide passivation overlayer over the filament surface, said reaction temperature being below the temperature at which the gas phase reacts to form brittle crystals on said filaments,

controlling the time that the strands are exposed to the gas mixture to prevent carbon from diffusing through the protective passivation overlayer and further reacting with the gas mixture so that each filament retains substantially its original characteristics.

4,921,726

UV CURABLE COATINGS CONTAINING OXALANILIDE STABILIZERS, METHOD OF CURING, AND COATED SUBSTRATES THEREFROM

James E. Poole, Gibsonia, and Mildred L. McKinley, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 168,068, Mar. 14, 1988, Pat. No. 4,833,038. This application Jan. 17, 1989, Ser. No. 297,377

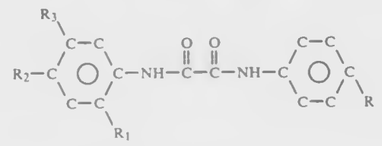
Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—54.1 **14 Claims**

8. A method of coating comprising:

(I) applying to the metallized surface of a metallized, plastic substrate a film of coating composition which crosslinks upon exposure to ultraviolet radiation to form a transparent coating, said coating composition containing:

(A) from 4 to 10 percent of an oxalanilide ultraviolet light stabilizer dissolved in said coating composition, said stabilizer corresponding to the formula



in which

R is C_{6-22} alkyl or C_{6-22} alkoxy,

R_1 and R_2 are independently hydrogen, C_{1-8} alkyl, C_{1-12} alkoxy, C_{1-12} alkylthio, phenoxy or phenylthio, provided that R_1 and R_2 may not both be selected from alkylthio, phenoxy and phenylthio, and

R_3 is hydrogen or C_{1-8} alkyl;

(B) from 20 to 80 percent of a radiation sensitive monomer having at least two addition polymerizable unsaturated bonds;

(C) from 0.1 to 5.0 percent of a photopolymerization initiator; and

(D) from 80 to 20 percent of an acrylic addition polymer having at least one amino group and having a number average molecular weight of about 8,000–70,000, said addition polymer being derived from a mixture of copolymerizable ethylenically unsaturated monomers containing a monomeric ethylenically unsaturated amine,

wherein said percentages of (A), (B), (C) and (D) are by weight based on nonvolatile components of said coating composition; and

(II) curing said film by exposing the film to ultraviolet radiation.

4,921,727

SURFACE TREATMENT OF SILICA-COATED PHOSPHOR PARTICLES AND METHOD FOR A CRT SCREEN

Pabitra Datta, West Windsor Twp., Mercer County, and Ronald N. Friel, Hamilton Twp., Mercer County, both of N.J., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Dec. 21, 1988, Ser. No. 287,355

Int. Cl.[5] B05D *3/12*

U.S. Cl. 427—57 **3 Claims**

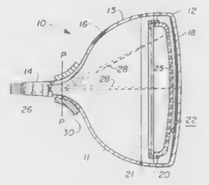
1. A method of surface-treating dry-powdered phosphor particles for use in manufacturing a viewing screen for a CRT to control the triboelectric charge characteristics of said phosphor particles including the steps of

providing said phosphor particles with a first coating of silica,

dissolving a coupling agent selected from the group consisting of silanes and titanates in a suitable solvent to form a mixture,

surface-treating said silica-coated phosphor particles with said mixture to provide a second coating of said coupling agent thereon,

filtering the surface-treated phosphor particles,



rinsing the filtered surface-treated particles in said solvent, and

drying said surface-treated phosphor particles.

4,921,728

PROCESS OF MAKING A LIQUID CRYSTAL ELEMENT

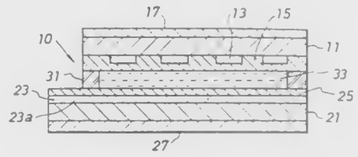
Yasuyuki Takiguchi, Kawasaki; Akihiko Kanemoto, Yokohama; Kiyohiro Uehara; Yoshio Imai, both of Tokyo; Taro Hino, Yokohama; Mitsumasa Iwamoto, Tokyo; Masaaki Kakimoto, Yokohama, and Masaaki Suzuki, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 86,782, Aug. 19, 1987, abandoned. This application Aug. 28, 1989, Ser. No. 399,335

Claims priority, application Japan, Aug. 22, 1986, 61-196531; Mar. 31, 1987, 62-78893

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—58 **4 Claims**



1. In a process of producing a liquid crystal element comprising opposed substrates, a liquid crystal nipped between said opposed substrates, and an aligning film formed on the surface of at least one of said substrates to effect substantially horizontal alignment of the liquid crystal molecules relative to said surface, the improvements which comprise forming said aligning film by (a) the Langmuir-Brodgett's technique, comprising transferring said amphipathic substance spread on a subphase onto said substrate surface, whereby a monomolecular or multimolecular layer of said amphipathic substance is directly formed as said aligning film on said substrate surface or (b) the Langmuir-Brodgett's technique, comprising transferring an amphipathic substance spread on a subphase onto said substrate surface, whereby a monomolecular or multimolecular layer of said amphipathic substance is formed on said substrate surface, followed by converting in situ of said amphipathic substance forming the resulting monomolecular or multimolecular layer thereof to the corresponding nonamphipathic substance as said aligning film.

4,921,729

TWO-LAYER COATING METHOD

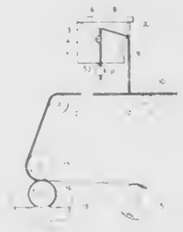
Nobuyoshi Kaneko, and Yasuhito Naruse, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 6, 1987, Ser. No. 104,919

Claims priority, application Japan, Oct. 6, 1986, 61-236178

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—131 **11 Claims**



1. In a coating system, a coating method for applying at least two coating compositions onto a moving web comprising the steps of:

moving a continuous web;

a first step of applying one of said at least two coating compositions onto said moving web at a first location within said coating system to form a coating layer on said web; and

a second step, subsequent to said first step, of applying the other one of said at least two coating compositions onto said coating layer of said moving web at a second location, separate from said first location, within said coating system in the form of a freely falling coating composition thin film before said coating layer has been completely dried, substantially all of said freely falling coating composition thin film being continuously deflected in a moving direction of said web and adhering to said coating layer.

7. A coating method as recited in claim 1, wherein at least one of said one and said other of said at least two coating compositions is a selectively magnetizable material.

4,921,730

METHOD OF PRODUCING A RECYCLED ASPHALT MIXTURE

Hideo Sasaki, Ageo, Japan, assignor to Taisei Road Construction Co., Ltd., Tokyo, Japan

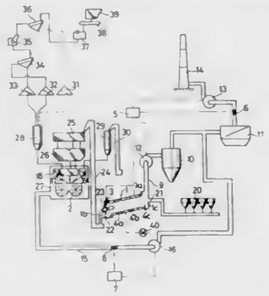
Division of Ser. No. 87,792, Aug. 21, 1987, Pat. No. 4,802,139. This application Apr. 25, 1988, Ser. No. 186,087

Int. Cl.[5] B05D *5/10;* **E01C** *5/12*

U.S. Cl. 427—138 **1 Claim**

1. A method of producing a heated, recycled asphalt mixture, wherein a base material to be recycled and a new aggregate are mixed together in a mixer to produce a heated, recycled asphalt mixture, the base material being prepared by crushing a waste asphalt pavement material composed of filler bitumen and aggregate material, and the new aggregate being composed of crushed or broken stones, sands, asphalt and normal-temperature filler, said new aggregate being heated by a dryer up to an optimum temperature and introduced into the mixer, the method comprising the steps of selectively determining the mixing ratio of new aggregate to the base material to be recycled from the ranges of (90 to 40):(10 to 60) in terms of weight, setting the heating temperature for the new aggregate such that when the weight of the new aggregate is selected to be 90 percent, it is set at approximately 90° C. and that, as the selected weight of the new aggregate approaches 40 percent, the temperature is sequentially raised from 190° C. toward 350° C., the base material being maintained at all times at normal temperature while its water content is suppressed

substantially 2 percent, mixing the new aggregate and the base material to be recycled in the mixer while both the new aggregate and base material are maintained to have a temperature ranging from 150° C. to 350° C. by way of heat exchange therebetween, thereby causing part of the filler bitumen in the base material to be recycled to be transferred onto the surfaces



of the new aggregate to thereby form a primary coating, subsequently introducing new filler and new heated asphalt into the mixer, and kneading together the new aggregate, base material to be recycled, new filler, and new asphalt, thereby forming a new filler bitumen to be transferred onto the surfaces of the new aggregate to be recycled to thereby form a secondary coating.

4,921,731

DEPOSITION OF CERAMIC COATINGS USING SOL-GEL PROCESSING WITH APPLICATION OF A THERMAL GRADIENT

David E. Clark; William J. Dalzell, Jr., and Brenda L. Adams, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 841,088, Feb. 25, 1986, abandoned. This application Apr. 28, 1987, Ser. No. 45,786

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—314 **8 Claims**

1. A method of thermophoretically depositing a ceramic coating onto a substrate, comprising the steps of:

(a) hydrolyzing and peptizing a metal oxide precursor in an aqueous medium in the presence of an acidic peptizing agent at a temperature and for a time effective to produce a sol having a colloid particle size of between about 0.0005 and about 10 microns, said aqueous medium having a pH of between about 0.01 and about 7 comprising a member selected from the group consisting of water and a mixture of water and an organic solvent having a water:solvent ratio of between 10,000:1 and 2:1, and said metal oxide precursor being selected from the group consisting of aluminum, silicon, hafnium, lanthanum, titanium, magnesium, thorium, uranium, tantalum, germanium, and zirconium alkoxides, organo orthosilicates and mixtures thereof;

(b) partially dewatering said sol by reducing the volume of water in said sol to between 10 weight % and about 90 weight %;

(c) depositing particles from said partially dewatered sol onto the surface of a substrate, said substrate and said so being maintained at a temperature differential of between about 10° C. and about 1500° C., thereby producing a coated substrate; and then

(d) drying said coated substrate.

4,921,732

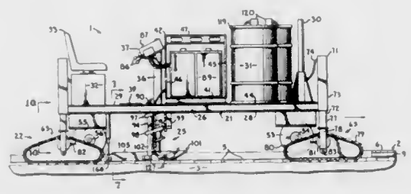
RAILROAD TIE SERVICE VEHICLE AND METHOD FOR SPRAY APPLICATION OF A PRESERVATIVE

Ivan E. Bounds, St. Joseph, Mo., assignor to Herzog Contracting Corporation, St. Joseph, Mo.

Filed May 31, 1988, Ser. No. 200,529

Int. Cl.[5] B05D *3/12*

U.S. Cl. 427—325 **41 Claims**



41. A method of applying preservative to railroad ties in a railroad track including a pair of parallel rails each connected to a plurality of transversely-extending railroad ties at connection areas adjacent to the railroad tie ends, which comprises the steps of:

(a) removing the rail along one side of the railroad track whereby the connection areas along said one side are exposed;

(b) providing a vehicle with a quantity of preservative, front and back pairs of wheels and a pair of extendable and retractable drive track assemblies;

(c) engaging the wheels on one side of said vehicle with said remaining railroad track;

(d) extending the drive track assemblies on the other side of the vehicle:

(e) driving said vehicle along said railroad track with said drive track assemblies;

(f) providing said vehicle with an actuating subassembly;

(g) engaging a railroad tie with said actuating subassembly;

(h) opening a discharge valve for said preservative in response to the engagement of said railroad tie with said actuating subassembly;

(i) discharging preservative through said open discharge valve;

(j) disengaging said actuating subassembly from said railroad tie; and

(k) closing said discharge valve in response to disengagement of said actuating subassembly from said railroad tie.

4,921,733

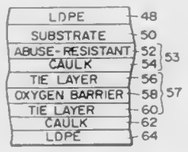
OXYGEN IMPERMEABLE LEAK FREE CONTAINER

Charles E. Gibbons; Gerald A. Marano; James M. Kittrell; Allan A. Whillock; Robert L. Lanham, all of Mobile, and Donald Evans, South Mobile, all of Ala., assignors to International Paper Company, Purchase, N.Y.

Filed May 9, 1988, Ser. No. 191,992

Int. Cl.[5] B65D *5/56, 25/14;* **B32B** *23/06*

U.S. Cl. 428—34.2 **24 Claims**



1. An oxygen barrier laminate structure for producing an oxygen impermeable leak free container comprising:

(a) a mechanically stable structural substrate;

(b) an outer layer of a heat-sealable low density polyethylene polymer coated on the outer surface of said mechanically stable structural substrate;

(c) a first sandwich layer of an abuse-resistant polymer resin and a first caulking polymer resin coated in the sequence listed on the inner surface of said mechanically stable structural substrate;

(d) a second inner sandwich layer of: a first adhesive tie layer, an oxygen barrier material, a second adhesive tie layer, all coated in the sequence listed on the inner surface of the inner surface of the first sandwich layer.

(e) a layer of a second caulking polymer resin coated on the inner surface of the second inner sandwich layer; and

(f) a heat-sealable product contact layer of low density polyethylene polymer extrusion coated on the inner surface of said caulking polymer resin layer, which is heat-sealable with the outer layer of low density polyethylene polymer on conventional equipment at temperatures ranging from 250° F. to 500° F. and wherein said first and second caulking polymer resins are selected from the group consisting of zinc salts of ethylene methacrylic acid copolymers, sodium salts of ethylene methacrylic acid copolymers, ethylene acrylic acid copolymers, ethylene methacrylic acid copolymers, ethylene vinyl acetate copolymers, and ethylene methacrylate copolymers.

4,921,734

CYLINDER LINERS

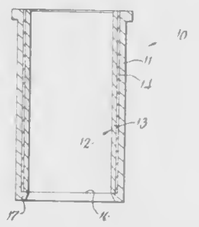
William A. Thorpe, Leicestershire, and David C. Evans, Chesterfield, both of United Kingdom, assignors to AE PLC, Warwickshire, United Kingdom

Filed May 11, 1988, Ser. No. 192,711

Claims priority, application United Kingdom, May 16, 1987, 8711605

Int. Cl.[5] F02F *1/18;* **F16J** *10/04;* **F02B** *77/02*

U.S. Cl. 428—34.4 **9 Claims**



1. A cylinder liner for an internal combustion engine, the liner comprising a steel outer sleeve having therein a composite ceramic sleeve extending over at least a part of the length of the liner, said composite ceramic sleeve being held by compressive hoop stresses under all normal engine operating conditions, said hoop stresses being imposed by said steel outer sleeve, wherein said composite ceramic sleeve comprises an inner sleeve of a first ceramic material having deposited on the outer surface thereof, by plasma spraying, a layer of a second ceramic material, said layer having a thickness additional to that of said inner sleeve and said second ceramic material having a lower coefficient of thermal conductivity than said first ceramic.

4,921,735

AIR BAG FOR MOTOR VEHICLES

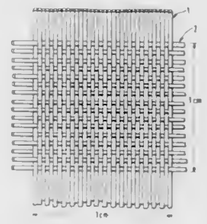
Klaus Bloch, Schwalbenweg 17, 5205 Augustin 1, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,661

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 8714595[U]

Int. Cl.[5] B60R *21/16*

U.S. Cl. 428—34.9 **12 Claims**



1. An air bag for motor vehicles which is comprised of a synthetic fabric of superfilled weave, said fabric being shrunk, heat set, and calendered at a temperature of between 60° and 225° C., a pressure of between 10 and 100 t, and a calendering speed between 5 and 25 m/min.

4,921,736

LOW FRICTION, WEAR RESISTANT PLASTIC PARTS

George T. Miller, Lewiston, and Russell J. Morgan, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 12, 1988, Ser. No. 256,422

Int. Cl.[5] B32B *17/02;* **F16J** *1/00*

U.S. Cl. 428—36.4 **7 Claims**

1. A molded plastic vehicular brake piston containing a silicon based filer wherein the surfaces of said piston have been treated with an aqueous solution consisting essentially of an inorganic fluoride.

4,921,737

CONTAINER FOR PHOTOGRAPHIC FILM CARTRIDGE

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 30, 1988, Ser. No. 213,600

Claims priority, application Japan, Jul. 2, 1987, 62-164077

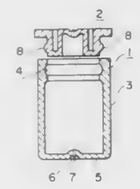
Int. Cl.[5] B27N *5/02*

U.S. Cl. 428—36.92 **11 Claims**

1. A container body for photographic film cartridge composed of a resin comprising more than 70 wt. % of polypropylene resin, 0.01 to 2 wt. % of a fatty acid amide lubricant, 0 to 1 wt. % of an antioxidant and 0.01 to 1 wt. % of an organic nucleating agent wherein more than 30% of the surface of the

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organic nucleating agent is coated with a stabilizer selected from the group consisting of metal salts of fatty acids metal salts of condensates of lactic acid and a fatty acid and metal salts of lactic acid.

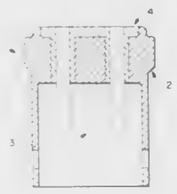


4,921,738

LI_2O-AL_2O_3-SIO_2 GLASS CERAMIC-ALUMINUM CONTAINING AUSTENITIC STAINLESS STEEL COMPOSITE BODY AND A METHOD OF PRODUCING THE SAME

Roger T. Cassidy, Monroe, Ohio, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 9, 1988, Ser. No. 281,729
Int. Cl.[5] B32B *15/00, 17/00*
U.S. Cl. 428—34.6 **9 Claims**



1. A hermetically sealed glass ceramic-metal composite body, comprising:
- a substantially cylindrical metal member consisting essentially of an austenitic stainless steel containing 4.0–5.5 wt % Al;
- a glass ceramic member fixed within said metal member, consisting essentially of a crystallized Li_2O-Al_2O_3-SiO_2 glass ceramic substantially free from amorphous material and having a thermal expansion coefficient substantially matching that of said metal member;
- an interfacial layer consisting essentially of Al_2O_3 between said metal member and said glass ceramic member, wherein the Al_2O_3 region consists of constituents of said metal member and constituents of said glass ceramic member.

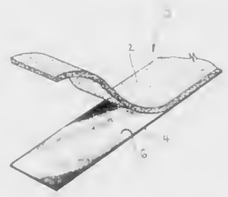
4,921,739

SELF-ADHERENT FOAM STRIP

Lawrence A. Cascino, South Bend, Ind., assignor to Gaska Tape, Inc., Elkhart, Ind.

Filed Nov. 13, 1989, Ser. No. 434,446
Int. Cl.[5] B32B *7/04*
U.S. Cl. 428—40 **4 Claims**

1. A foam strip for positioning about a smooth surfaced object, said strip comprising a unitary tackified layer formed of a foamable resin having quantities of plasticizer incorporated therein which exceed the minimum amount of plasticizer required to soften the resin, said tackified layer cast on a glossy surface of a release liner wherein the tackified layer adheres to a smooth surfaced object without a separate adhesive.



4. The foam strip of claim 1 wherein said tackified layer includes no backing layer other than said release liner.

4,921,740

MASKING FILMS

Stuart A. Falconer, Oxon; David J. Foster, Swindon, and John Steel, Wantage, all of England, assignors to Autotype International Limited, Wantage, Oxfordshire, United Kingdom

Filed Jan. 5, 1989, Ser. No. 293,328
Int. Cl.[5] B32B *7/06, 7/12*
U.S. Cl. 428—40 **10 Claims**

1. A masking film comprising a transparent base and a masking layer removably attached to the base by means of an intermediate layer of adhesive, characterised in that the masking layer comprises:
- (a) a cellulose ester component,
- (b) an aliphatic polyester-based polyurethane and
- (c) one or more colourants selected from dyes and pigments.

4,921,741

RECREATION SURFACE AND TILE FASTENING SCHEME

Paul A. Mullen, Loysville, Pa., assignor to Carlisle Tire & Rubber Company, Carlisle, Pa.

Filed Jun. 21, 1988, Ser. No. 209,580
Int. Cl.[5] B32B *3/16*
U.S. Cl. 428—48 **4 Claims**



1. A recreation surface comprising:
- a liquid-porous sheet having an upper and lower surface;
- a plurality of liquid-porous resilient tiles, each said tile having a substantially uniform overall thickness, as measured in the vertical direction, and defined by upper and lower surfaces and front, rear, right and left side edge surfaces, said liquid-porous tiles and said liquid-porous sheet promote drainage to avoid accumulation of water on said upper surface of said tiles; and
- adhesive means securing said tiles to said sheet in edge-to-edge, abutting relationship.

4,921,742

FLOOR MAT RETENTION SYSTEM FOR AUTOMOTIVE VEHICLES

Mark Altus, Huntington Woods, Mich., assignor to The 2500 Corporation, Farmington Hills, Mich.

Filed May 27, 1988, Ser. No. 199,600
Int. Cl.[5] B32B *3/06;* **B60J** *9/00*
U.S. Cl. 428—81 **39 Claims**

1. A positive floor mat retention system for automotive vehicles including:

(a) a first retainer portion fixedly attached to said automotive vehicle;
(b) a first piece of carpet covering said first retainer portion;



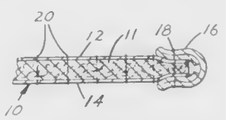
(c) a second retainer portion removably attached to said first retainer portion; and
(d) a floor mat construction removably attached to said second retainer portion.

4,921,743

USE OF SORBENT SHEET MATERIALS AS EVAPORATIVE COOLANTS

Paul E. Hansen; Thomas I. Insley, both of Lake Elmo, Minn., and Christopher J. Libbey, St. Joseph, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 100,914, Sep. 25, 1987. This application Jul. 31, 1989, Ser. No. 387,010
Int. Cl.[5] B32B *3/06*
U.S. Cl. 428—102 **19 Claims**



1. A reusable, sorbent sheet material for providing evaporative cooling, comprising
- (a) a sheet comprising a web comprising fibers having an average diameter of about 1–20 microns with a solid high-sorbency liquid-sorbent polymeric material contained within said web; and
- (b) a water and water-vapor permeable cover sheet on each of the two exposed surfaces of said web, said cover sheets being through-bonded together through said web in an intermittent pattern over substantially the entire area of said sorbent sheet material and functioning to substantially prevent migration of said polymer from said web of said sorbent sheet material when said sorbent sheet material is wetted with a volatile liquid for which said polymeric material exhibits high-sorbency.

4,921,744

HONEYCOMB STRUCTURE OF AROMATIC POLYIMIDE

Kazuhiko Mitsui; Kazuo Kumamoto, and Keiichirou Koyashiki, all of Yamaguchi, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jan. 27, 1989, Ser. No. 302,944
Claims priority, application Japan, Jan. 27, 1988, 63-16487
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—116 **12 Claims**

1. A honeycomb structure of aromatic polyimide comprising plural aromatic polyimide sheets wherein the adjoining aromatic polyimide sheets are prepared from an aromatic tetracarboxylic acid or its derivative and an aromatic diamine and having a second-order transition temperature in the range of 250° C. to 400° C. and are combined to each other by welding the adjoining sheets in regions apart from each other at equal intervals, the welding regions on one side of any aromatic polyimide sheet being located at positions shifted from the welding regions on another side of said sheet, said plural aromatic polyimide sheets extending in the direction vertical to the plane of the polyimide sheets to form a honeycomb structure.

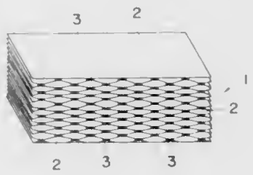


4,921,745

HONEYCOMB STRUCTURE OF AROMATIC POLYIMIDE

Kazuhiko Mitsui; Kazuo Kumamoto, and Keiichirou Koyashiki, all of Yamaguchi, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Dec. 27, 1988, Ser. No. 290,461
Claims priority, application Japan, Dec. 25, 1987, 62-328904; Mar. 8, 1988, 63-55805
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—118 **9 Claims**



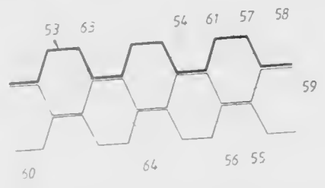
1. A honeycomb structure of aromatic polyimide comprising plural aromatic polyimide sheets wherein adjoining sheets of an aromatic polyimide prepared from an aromatic tetracarboxylic acid or its derivative and an aromatic diamine are combined to each other with a heat resistant adhesive at adhesive regions arranged between the two sheets at equal intervals and the adhesive regions on one side of any aromatic polyimide sheet are located at positions shifted from positions of adhesive regions arranged on the opposite side of said sheet and wherein the aromatic polyimide sheets are extended in the direction vertical to the plane of the polyimide sheets to form a honeycomb structure.

4,921,746

CELLULAR, MULTI-LAYER MATERIAL FOR FORMING A HEAT-INSULATING BAG

Stig Patriksson, Lilla Edet, Sweden, assignor to Patriksson Inventing AB, Älvängen, Sweden

Division of Ser. No. 914,179, Oct. 1, 1986, Pat. No. 4,759,743.
This application Apr. 20, 1988, Ser. No. 183,885
Claims priority, application Sweden, Oct. 3, 1985, 8504567; Jul. 14, 1986, 8603105
Int. Cl.[5] B65D *81/02, 81/38*
U.S. Cl. 428—178 1 Claim



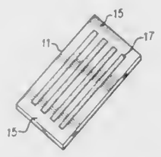
1. A sheet piece consisting of at least three material layers of paper, forming together an encasing wall encasing a space in which objects can be enclosed, said layers including one outer layer, facing the outside of the container, one inner layer, facing the inside of the container, and at least one intermediate layer, positioned between said outer and inner layers, wherein the material layers are provided with a large number of localized impressions distributed uniformly over the surfaces of the layers with spaces in between the impressions, said impressions being in rows extending in a first direction and also in a second, transverse direction, said impressions extending from a principle plane of each layer, wherein the impressions in adjacent layers are displaced relative to one another as viewed in a direction which is normal to their principle planes by a distance greater than the separation between the impressions, said displacement being accomplished in said first direction as well as in said second direction so that the impressions in one layer are located directly in front of the spaces in adjacent layers and wherein each of the layers is joined with its adjacent layers by means of an adhesive, whereby a large number of closed cells are created, so that at most two layers are directly joined together with each other.

4,921,747

STAMP HINGE

Benjamin A. Studley, 460 Ridge St., Lewiston, N.Y. 14092

Filed Jun. 6, 1988, Ser. No. 202,511
Int. Cl.[5] B32B *7/06, 7/10, 7/14*
U.S. Cl. 428—195 9 Claims



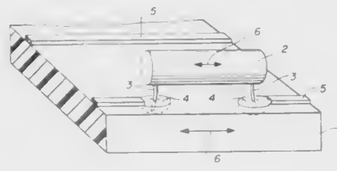
1. An improved postage stamp hinge comprised of a flexible paper or plastic backing material having a width ranging from about ¼ to about ½ inch and a length ranging from about ½ to about ¾ inch, said backing material having a pressure-sensitive, low tack, water-insoluble adhesive coating on a contact surface thereof, said backing material having a non-coated area extending along at least one edge thereof, said non-coated area comprising from about 5 to about 95 percent of said contact surface, said hinge being manually removable from a gum layer of a postage stamp without damaging or leaving a noticeable residue thereon, and having a peel adhesion between about 0.5 and 3.0 ounces/inch.

4,921,748

FLUORHECTORITE LAMINATE PRINTED CIRCUIT SUBSTRATE

Walter J. Bohrn; William D. DeSantis, and Shelly N. Garman, all of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Nov. 28, 1988, Ser. No. 276,819
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 13 Claims



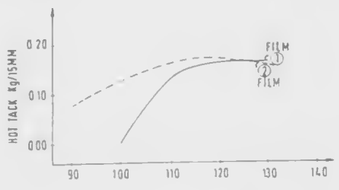
1. A nonconductive substrate for electrical circuitry comprising laminated films of potassium fluorhectorite impregnated with thermally cured polyimide resin, wherein the substrate has a thermal coefficient of expansion of 5–12 ppm/°C.

4,921,749

SEALABLE FILMS

Bernard L. L. Bossaert; Stefan B. Ohlsson, both of Brussels, and William F. M. J. Willems, Keerbergen, all of Belgium, assignors to Exxon Chemical Patents Inc., Linden, N.J.

PCT No. PCT/GB87/00374, § 371 Date Mar. 17, 1988, § 102(e) Date Mar. 17, 1988, PCT Pub. No. WO87/07215, PCT Pub. Date Dec. 3, 1987
PCT Filed May 29, 1987, Ser. No. 150,408
Claims priority, application United Kingdom, May 30, 1986, 8613161
Int. Cl.[5] B32B *27/08, 27/32, 31/30*
U.S. Cl. 428—216 14 Claims



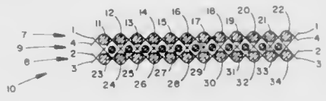
1. A film comprising a base layer which comprises 70 to 97 weight % of a polyolefin and 3 to 30 weight % of a hydrogenated resin having a molecular weight lower than that of the polyolefin, said layer having on at least one surface thereof 1 to 20 weight % based on the weight of the base layer, of a one component film layer of a copolymer of 80 to 99 weight % of propylene and 1 to 20 weight % of ethylene.

4,921,750

PAPERMAKER'S THRU-DRYER EMBOSSING FABRIC

Jeffrey L. Todd, Summerville, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Filed May 25, 1988, Ser. No. 198,475
Int. Cl.[5] D03D *3/00*
U.S. Cl. 428—225 2 Claims



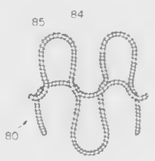
1. A papermaker's substrate for combination with a resinous, patterned paper contacting surface to produce an embossing fabric, said substrate comprised of at least top and bottom machine direction yarn systems, each machine direction yarn system being formed of a plurality of yarns which defines a respective horizontal plane of machine direction yarns, said systems being vertically aligned with each other and said respective horizontal planes being parallel; a cross machine direction yarn system which is interwoven with said machine direction yarn systems, and maintains the respective machine direction yarns substantially within their respective planes and in vertical alignment; and an open area of at least 40% in the top plane with a substrate air permeability of at least 900 CFM.

4,921,751

CONDUCTIVE FABRIC AND A METHOD FOR THE MANUFACTURE OF THE CONDUCTIVE FABRIC, AND A CONDUCTIVE SHEET AND FILM MADE USING THE CONDUCTIVE FABRIC

Hideki Wakahara, Ohtsu; Yoshihiro Matsuo, Moriyama, and Minoru Kawamura, Hirakata, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 23, 1987, Ser. No. 41,779
Claims priority, application Japan, Apr. 24, 1986, 61-95799
Int. Cl.[5] B32B *5/04, 5/08;* D03D *15/04;* D06C *29/00*
U.S. Cl. 428—229 14 Claims



1. A conductive fabric comprising conductive fibers and thermoplastic fibers with a higher heat shrinkage before heat treatment than that of said conductive fibers, said conductive and thermoplastic fibers being in twisted engagement, wherein said conductive fibers have been drawn about said thermoplastic fibers and crimped as a consequence of heat-shrinking said thermoplastic fibers.

3. A method for the manufacture of a conductive fabric from conductive fibers and thermoplastic fibers with a higher heat shrinkage than the conductive fibers comprising:

giving the conductive fibers and the thermoplastic fibers, respectively, a first twist;

twisting both the conductive fibers and the thermoplastic fibers into single threads;

weaving or knitting said single threads twisted together to continuously form a textile or a knit;

gathering the textile or the knit to continuously form gathers of size predetermined by the degree of conductive fiber crimping desired by a gathering apparatus; and

heating the gathered textile or knit to heat shrink the thermoplastic fibers, causing the conductive fibers to draw and crimp about the thermoplastic fibers.

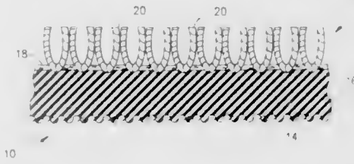
12. A conductive sheet or film comprising a conductive fabric composed of conductive fibers and thermoplastic fibers with a higher heat shrinkage before heat treatment than that of the conductive fibers, said conductive and thermoplastic fibers being in twisted engagement wherein said conductive fibers have been drawn about said thermoplastic fibers and crimped as a consequence of heat-shrinking said thermoplastic fibers, and a base on which said conductive fabric is disposed, said conductive fabric and said base being laminated together and fused into one piece as a result of having been heated at a temperature above the melting point of the thermoplastic fibers.

4,921,752

LAMINATED SEAT FABRIC

Paul W. Eschenbach, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 11, 1988, Ser. No. 230,874
Int. Cl.[5] B32B *7/00*
U.S. Cl. 422—247 4 Claims



1. A trilaminated fabric for use in car seats comprising: a polyurethane core fabric, a plush fabric laminated to one side of said core fabric and an elastic scrim fabric laminated to the other side of said core fabric, said elastic scrim fabric having an elasticity at least equal to 100% in both the warp and fill directions of the fabric.

4,921,753

COMPOSITE ARTICLE WITH THERMODYNAMICALLY UNSTABLE COATING

Bruce Harrison, St. Louis, Mo., assignor to United Technologies Automotive Inc., Dearborn, Mich.

Filed Oct. 8, 1987, Ser. No. 105,748
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—251 12 Claims



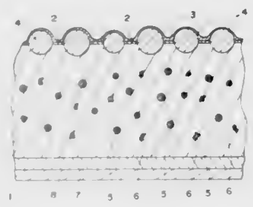
1. A composite article comprising a layer of reinforcing material having opposing first and second surfaces, said first surface in contact with a porous reinforcing layer wherein the reinforcing material comprises a thermodynamically unstable solution of an elastomer, a thermosetting resin and a curing agent for said thermosetting resin wherein said thermodynamically unstable solution has formed thermosetting resin rich layers on said first surface and second surfaces.

4,921,754

HIGH-DURABILITY PAVEMENT MARKING SHEET MATERIAL

Yuji Ishihara, Tochigi, Japan, assignor to Seibu Polymer Kasei Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1985, Ser. No. 688,872
Claims priority, application Japan, Jan. 13, 1984, 59-3512
Int. Cl.[5] B32B *25/02, 7/02;* E01F *9/04*
U.S. Cl. 428—325 3 Claims



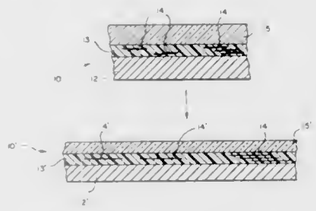
1. A high-durability pavement marking sheet material comprising a laminate of a base layer containing unvulcanized synthetic rubber as a main ingredient and a colored layer of unvulcanized synthetic rubber containing a coloring agent and glass microspheres dispersed over the surface of the colored layer of the laminate, the surfaces of the lower portions of the microspheres being embedded in the base layer of the laminate and the remaining surfaces of the glass microspheres and the surface of the laminate being covered integrally with a surface layer of a thin film consisting of a transparent and colorless synthetic resin.

4,921,755

COATING COMPOSITION AND COATED ARTICLE

John F. Carroll, Jr., and David A. Feindel, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 23, 1988, Ser. No. 171,975
Int. Cl.[5] B32B *5/16*
U.S. Cl. 428—328 14 Claims



1. A fluid paint composition for forming a dried paint film useful in a thermoforming process in which the film is stretched and bonded to a three-dimensional substrate to form a decorative coating having a high degree of geometric metamerism, said composition comprising

(a) a liquid medium,

(b) a film-forming polymer, and

(c) dispersed in said liquid medium,

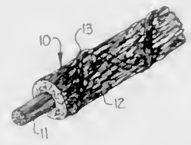
low-melting reflective flakes of an alloy having a melting point between about 50 degrees C. higher than the thermoforming temperature and about 5 degrees C. higher than the highest temperature to which the bonded film is subjected in normal use and wherein the melting point of the alloy is from about 95 to 200 degrees C.

4,921,756

FIRE RESISTANT BALANCED FINE CORESPUN YARN AND FABRIC FORMED THEREOF

Thomas W. Tolbert, Fort Mill, S.C.; William M. Cooke, Charlotte, N.C., and James E. Hendrix, Spartanburg, S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Mar. 3, 1989, Ser. No. 318,239
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—373 9 Claims



1. A fire resistant nonlively corespun yarn for use in forming fire resistant fabrics and lightweight substrates for coated fabrics, said nonlively corespun yarn comprising an air jet spun unplied yarn without any appreciable S or Z twist and having

a core of high temperature resistant continuous filament fiberglass, and

a sheath of low temperature resistant staple fibers surrounding and covering said core.

4,921,757

SYSTEM FOR DELAYED AND PULSED RELEASE OF BIOLOGICALLY ACTIVE SUBSTANCES

Margaret A. Wheatley, Arlington; Robert S. Langer, Somerville, and Herman N. Eisen, Waban, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 727,803, Apr. 26, 1985, abandoned. This application Sep. 3, 1987, Ser. No. 92,554
Int. Cl.[5] A61K *9/66, 37/22;* B01J *13/02*
U.S. Cl. 428—402.2 4 Claims

1. A composition of for controlled release of entrapped substances comprising:

a permeable polymeric matrix,

liposomes located within said matrix, and

a first substance entrapped within said liposomes, and

a phospholipase located in said matrix exterior to said liposomes and bound to said matrix.

4,921,758

MOLDED PRODUCT OF POLYARYLENE THIOETHER AND THE USE THEREOF

Kiyoshi Tagaya; Satoshi Hirose; Takao Iwasaki; Toshitaka Kouyama, and Yasuo Sakaguchi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 140,997
Claims priority, application Japan, Feb. 24, 1987, 62-40949
Int. Cl.[5] B29C *47/02, 55/06, 71/00;* B32B *1/08*
U.S. Cl. 428—419 9 Claims

1. A molded product, having an elongation not less than 100%, produced by the process comprising the steps of (1) curing a substantially linear polyarylene thioether which has repeating units of —Ar—S—(Ar represents an arylene group) as a main constituent, and has a melt viscosity of 1,000 to 15,000 poise at a temperature of 310° C. and a shearing rate of 200 second^{-1} to obtain a polyarylene thioether resin having a melt viscosity, at 310° C. and a shearing rate of 200 second^{-1}, of about 5,000 to 16,000 poise and a non-Newtonian coefficient, n, of about 1.5 to 2.1, (2) melt extruding the polyarylene thioether resin, (3) taking off the extruded polyarylene thioether resin at an R_1 (ratio of a taking-off speed to an extruding speed at a nozzle of a melt extruded product) of about 10 to 1,000 and (4) crystallizing the taken off material until a crystallization degree (measured by a density method) of the material is not less than 20 wt%.

4,921,759

HIGH OPTICAL QUALITY TRANSPARENT SHEET OF PLASTIC WHICH IS SCRATCH- AND ABRASION-RESISTANT, METHOD OF MANUFACTURING THE SAME AND GLAZINGS USING THE SAME

Roger Orain, Garches; Jean-Louis Bravet, Thourotte; Gerard Dimier, Talence; Philippe Dagaut, and Gerard Daude, both of Villenave D'Ornon, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Dec. 21, 1987, Ser. No. 135,391
Claims priority, application France, Dec. 19, 1986, 86 17804
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—424.4 12 Claims

1. A high optical quality transparent plastic sheet comprising a polyurethane layer formed by reactive pouring or reactive pulverization onto a flat horizontal support of a reaction mixture comprising a polyol component and an isocyanate component, wherein the surface of the polyurethane layer which faces the support during the formation of the layer contains an acrylic polymer resulting from contacting, during deposition of the reaction mixture, said reaction mixture with a[6] thin acrylic layer deposited in advance on said support, wherein said acrylic polymer and the polyurethane of said surface of said polyurethane layer are interpenetrated.

4,921,760

ANTI-REFLECTION COATING OF OPTICAL PART MADE OF SYNTHETIC RESIN

Hakuzo Tani, Takatsuki, and Masaru Okumura, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1987, Ser. No. 100,953
Claims priority, application Japan, Sep. 26, 1986, 61-228684; Sep. 26, 1986, 61-228683; Sep. 26, 1986, 61-228682
Int. Cl.[5] B32B *27/06;* G02B *1/10*
U.S. Cl. 428—446 5 Claims

1. An anti-reflection coating of three layers for a synthetic resin substrate having a refractive index in the approximate range of 1.49 to 1.58, comprising:

a first layer, at the air side, of silicon dioxide;

a second layer having an index of refraction of n_2;

a third layer, adjacent the substrate, of ceric oxide, having an index of refraction of n_3, and

the second layer and the third layer satisfying the following conditions, respectively:

$1.50 \leqq n_2 \leqq 1.62$,

$0.04\lambda_0 \leqq n_2 d_2 \leqq 0.15\lambda_0$,

$1.92 \leqq n_3 \leqq 2.10$,

$0.02\lambda_0 \leqq n_3 d_3 \leqq 0.50\lambda_0$,

wherein $n_2 d_2$ and $n_3 d_3$ are the optical thickness of the second layer and the third layer, respectively, and λ_0 is the dominant design wavelength.

4,921,761

POLYESTER IMIDE RESINS

Shigeru Yamada, Tokyo, and Setsuo Terada, Kounosu, both of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicals Mfg. Co., Ltd., both of Tokyo, Japan

Filed May 4, 1988, Ser. No. 190,072
Claims priority, application Japan, May 8, 1987, 62-110678
Int. Cl.[5] B32B *27/08, 15/08*
U.S. Cl. 428—473.5 12 Claims

1. A polyester imide resin obtained by reacting in the presence of an organic solvent (A) a dicarboxylic acid containing a 5-membered cyclic imido group or a derivative thereof, or a mixture thereof, (B) a tricarboxylic acid or a derivative thereof, or a mixture thereof, (C) a dihydric alcohol and (D) a trihydric aliphatic alcohol in a proportion of 5–20 equivalent %, 10–30 equivalent %, 25–60 equivalent % and 10–40 equivalent %, respectively.

4,921,762

PROCESS FOR PRODUCING A CHEMICAL BOND BETWEEN MOLDING MATERIALS BASED ON POLYPHENYLENE ETHERS ON THE ONE HAND AND PEROXIDE VULCANIZED EP(D)M RUBBERS ON THE OTHER HAND

Hans Jadamus, Marl; Thomas Grosse-Puppendahl, Haltern, and Klaus-Peter Richter, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 240,191
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737891
Int. Cl.[5] B32B *27/32*
U.S. Cl. 428—521 12 Claims

1. A process for bonding a thermoplastic PPE-containing polymer and a rubber by vulcanization, comprising the steps of:

heating said PPE-containing polymer and vulcanizing said rubber in contact with said thermoplastic polymer, wherein said rubber comprises:

(a) 100 parts by weight of a mixture comprising 100–20 wt.% of an EP(D)M rubber and 0–80 wt.% of a styrene-butadiene rubber obtained by emulsion polymerization,

(b) 100–300 parts by weight of loading material,

(c) 1–10 parts be weight of a peroxidic vulcanization agent, and

(d) 0.5–4 parts by weight of a vulcanization activator, wherein a vulcanization bond is formed between said PPE-containing thermoplastic polymer and said rubber.

4,921,763

SOFT MAGNETIC THIN FILM

Hideaki Karamon, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 116,252, Nov. 3, 1987, abandoned. This application Dec. 1, 1988, Ser. No. 279,244
Claims priority, application Japan, Nov. 6, 1986, 61-264698
Int. Cl.[5] H01F *10/00*
U.S. Cl. 428—692 7 Claims

1. A soft magnetic thin film having a composition MxLyJz, wherein

M is at least one element selected from the group consisting of Fe, Co and Ni,

L and J are elements selected from the group consisting of B, C and Si and that are different from one another,

and X, Y, Z are the percentages of the respective elements in atomic percent and $x+y+z=100$, $y+z \geqq 10$, $x \neq 0$, $y \neq 0$, $z \neq 0$,

and said film consists essentially of first regions of an M-based amorphous phase percipitated in second regions of an L-J amorphous phase having high electrical resistivity.

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4,921,764

POLYESTER FILM COATED WITH METAL ADHESION PROMOTING COATING AND HAVING SUPERIOR WINDING PERFORMANCE

David Rudd, Naples, N.C., and Sandra W. Rice, Greer, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 138,228, Dec. 28, 1987, Pat. No. 4,845,189.
This application Feb. 6, 1989, Ser. No. 306,115
Int. Cl.[5] B32B *27/06*
U.S. Cl. 428—480 12 Claims

1. An oriented thermoplastic film having a metal adhesion promoting coating on at least one side, said coating having been applied as an aqueous coating composition comprising

(i) from 1 to 10 weight percent, based upon the total weight of the coating composition, of a sulfonated copolyester consisting essentially of the polyester condensation product of the following monomers or their polyester-forming equivalents:

(A) about 65 to 95 mole percent of isophthalic acid;

(B) about 0 to 30 mole percent of at least one aliphatic dicarboxylic acid of the formula $HOOC(CH_2)_n$—COOH, wherein n ranges from about 1–11;

(C) about 5 to about 15 mole percent of at least one sulfomonomer containing an alkali metal sulfonate group attached to a dicarboxylic aromatic nucleus; and

(D) stoichiometric quantities of about 100 mole percent of at least one copolymerizable aliphatic or cycloaliphatic alkylene glycol having about from 2 to 11 carbon atoms,

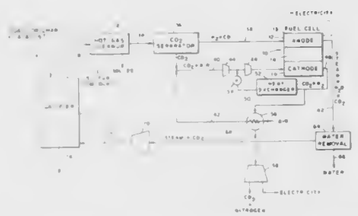
(ii) from 0.05 to 3 weight percent, based upon the total weight of the coating composition, of at least one water soluble alkali metal salt of a fatty acid having from 10 to 18 carbon atoms.

4,921,765

COMBINED GOAL GASIFIER AND FUEL CELL SYSTEM AND METHOD

Frank D. Gmeindl, Morgantown, W. Va., and Rodney A. Geisbrecht, New Alexandria, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 26, 1989, Ser. No. 371,144
Int. Cl.[5] H01M *8/06*
U.S. Cl. 429—16 22 Claims



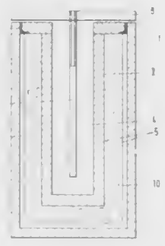
1. A coal gasification and fuel cell system, comprising in combination coal gasification means for endothermically reacting coal or coal char in the presence of a catalyst, an external source of heat and steam for producing a stream of gaseous products containing carbon dioxide and hydrogen at a temperature in the range of about 1150° to 1050° F., a molten carbonate fuel cell means having anode means and cathode means, conduit means connecting the gasification means to the fuel cell means, gas separating means in said conduit means for separating the carbon dioxide from the hydrogen, said conduit means comprising a first conduit means coupling said gas separating means and said anode means for conveying hydrogen separated in said gas separating means to said anode means and second conduit means coupling said gas separating means and said cathode means for conveying carbon dioxide separated in said gas separating means to said cathode means with said carbon dioxide and hydrogen effecting an electrochemical reaction in said fuel cell for producing an electrical output while generating steam at said anode means, and further conduit means coupling said anode means to said gasification means for conveying the steam produced in the fuel cell means to said gasification means for providing heat and the steam utilized for said endothermic reaction.

4,921,766

ELECTROCHEMICAL STORAGE CELL

Reinhard Knödler, Sandhausen, and Karl Reiss, Mühlhausen-Rettigheim, both of Fed. Rep. of Germany, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,702
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742608
Int. Cl.[5] H01M *10/39*
U.S. Cl. 429—104 3 Claims



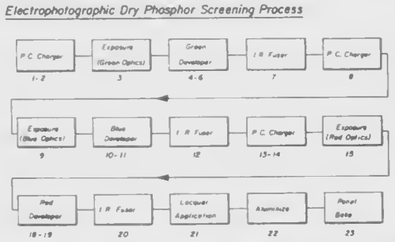
1. A sodium-sulfur electrochemical storage cell, comprising a metallic housing and containing said cell within said housing, said cell comprising an anode, a cathode and a solid electrolyte separating said anode from said cathode and capable of conducting alkali metal ions therebetween, said metallic housing being coated on its inner surface with a layer of corrosion-protective ternary alloy coating, essentially consisting of about 9 to 13% by weight of aluminum, about 20 to 30% by weight of chromium, the balance being iron.

4,921,767

METHOD OF ELECTROPHOTOGRAPHICALLY MANUFACTURING A LUMINESCENT SCREEN ASSEMBLY FOR A CATHODE-RAY-TUBE

Pabitra Datta, Cranbury, and Ronald N. Friel, Hamilton Square, both of N.J., assignors to RCA Licensing Corp., Princeton, N.J.

Filed Dec. 21, 1988, Ser. No. 287,356
Int. Cl.[5] G03C *5/00*
U.S. Cl. 430—23 10 Claims



1. In a method of electrophotographically manufacturing a luminescent screen assembly on an interior surface of a faceplate panel for a color CRT comprising the steps of:

(a) coating said surface of said panel with a volatilizable conductive layer;

(b) overcoating said conductive layer with a volatilizable photoconductive layer including a dye sensitive to visible light;

(c) establishing a substantially uniform electrostatic charge on said photoconductive layer;

(d) exposing selected areas of said photoconductive layer to visible light to affect the charge thereon;

(e) applying a triboelectrically charged first color-emitting phosphor onto said exposed, selected areas of said photoconductive layer;

(f) fixing said first color-emitting phosphor to said photoconductive layer;

(g) repeating steps c, d, e and f, consecutively, for a triboelectrically charged second and third color-emitting phosphors to form a luminescent screen comprising picture elements of triads of color-emitting phosphors;

(h) aluminizing said luminescent screen; and

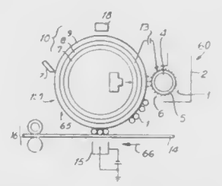
(i) baking said faceplate panel to remove the volatilizable constituents from said luminescent screen to form said luminescent screen assembly, the improvement wherein said phosphor materials comprise dry-powdered particles having at least a surface charge control agent thereon to control the triboelectrical charging thereof.

4,921,768

ELECTROPHOTOGRAPHIC IMAGE FORMING

Masanao Kunugi; Hajime Kurihara, and Teruyuki Mizumoto, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,514
Claims priority, application Japan, Oct. 6, 1987, 62-252034; Feb. 22, 1988, 63-38818; Apr. 18, 1988, 63-95116
Int. Cl.[5] G03G *13/01, 13/22*
U.S. Cl. 430—45 11 Claims



1. A photoconductive image forming method, comprising:

charging a quantity of photoconductive toner in which resistivity is reduced on exposure and forming a thin layer of the charged toner with electroconductive charge carriers on an electroconductive transport support;

contacting the charged photoconductive toner on the electroconductive transport support to a transparent insulating image forming substrate and applying a DC bias voltage between the transparent insulating image forming substrate and the electroconductive support, the voltage insufficient to reverse the charge of unexposed toner but high enough to reverse the charge of exposed toner;

exposing the photoconductive toner on the electroconductive transport support and in contact with the transparent insulating image forming substrate through the substrate to reduce the resistance of the exposed toner so that the bias voltage will selectively reverse the charge of exposed toner on the electroconductive transport support and cause charges to flow from the charge carriers to the toner to selectively transfer and adhere the exposed toner from the electroconductive transport support to the image forming substrate in the form of the image; and

transferring the exposed toner adhering to the image forming substrate in the form of the image to a transfer medium.

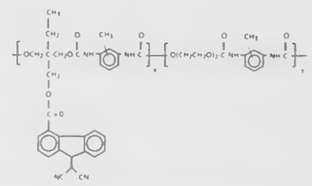
2. The photoconductive image forming method of claim 1, wherein the toner is a mixture of differently colored toners, each color toner sensitized to a different exposure wavelength and the exposure is a combination of these different wavelengths corresponding to the sensitivity of the toners so that a single multiple wavelength exposure will adhere as many as each differently colored toner to form multicolor images.

4,921,769

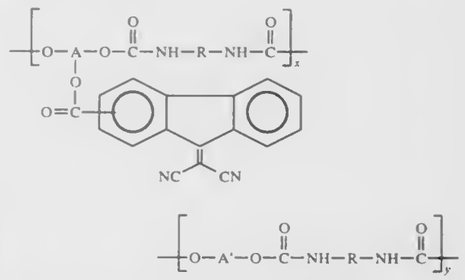
PHOTORESPONSIVE IMAGING MEMBERS WITH POLYURETHIANE BLOCKING LAYERS

Huoy-Jen Yuh, Pittsford, N.Y.; Beng S. Ong, Mississauga, Canada; John W. Splewak, Webster, and Constance J. Thornton, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1988, Ser. No. 252,959
Int. Cl.[5] G03G *5/14*
U.S. Cl. 430—64 39 Claims



1. An imaging member comprised of an optional supporting substrate; a ground plane layer; a blocking layer; an optional adhesive layer; a photogenerator layer; and a charge transport layer, wherein the blocking layer is comprised of a polyurethane of the formula:



wherein A is a trivalent group; A′ is a bivalent group; R is selected from the group consisting of alkylene, substituted alkylene, arylene, and substituted arylene; x and y are number mole fractions the sum of which is equal to 1.0.

4,921,770

PHOTORECEPTOR FOR ELECTROPHOTOGRAPHY

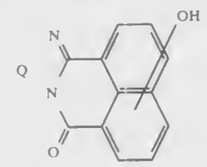
Tetsuo Murayama, 8-15 Tamagawa-Gakuen, and Shinji Aramaki, 10-201 Popuragaoka-Koopu, 2-10-1 Naruse, both of Machida-shi, Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,684
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—76 4 Claims

1. A photoreceptor for electrophotography comprising a conductive substrate and a photosensitive layer thereon containing an azo compound represented by the formula (I):

$$A-N=N-D-N=N-B \quad (I)$$

wherein A represents a coupling component derived from the following formula (II):



(II)

wherein Q represents a divalent group derived from an aromatic hydrocarbon which may have one or more substituents or a divalent group derived from a heterocyclic compound which may have one or more substituents, B represents a different coupling component having a phenolic hydroxyl group from said A, and D represents a divalent group in which the carbon atoms bonded to the azo groups are SP^2 carbon atoms forming double bonds.

4,921,771

TONER FOR USE IN DEVELOPING ELECTROSTATIC IMAGES CONTAINING POLYPROPYLENE

Makoto Tomooo, Hino; Noriyoshi Tarumi, Tama, and Masayuki Sato, Ohtsuki, all of Japan, assignors to Konishiroku Photo Industry C. , Ltd., Tokyo, Japan

Continuation of Ser. No. 65,093, Jun. 18, 1987, abandoned, which is a cootinuation of Ser. No. 801,376, Nov. 22, 1985, abandoned, which is a continuation of Ser. No. 550,992, Nov. 14, 1983, abandoned, which is a continuation of Ser. No. 279,673, Jul. 1, 1981, abandoned. This application Jan. 19, 1988, Ser. No. 147,024

Claims priority, application Japan, Oct. 21, 1972, 47-104865; Oct. 23, 1972, 47-105289

Int. Cl.[5] G03G *11/00*

U.S. Cl. 430—110 11 Claims

1. A toner for developing latent electrostatic images comprising

(a) a coloring agent,

(b) a styrene homopolymer or copolymer of styrene with at least one acrylic comonomer,

(c) polypropylene having a number average molecular weight of about 3,000 to about 4,000 in an amount of between about 1 to 10 parts by weight per 100 parts by weight of the styrene homopolymer or copolymer, and

(d) a charge control agent.

4,921,772

TWO DIRECTIONALLY OPERATING IMAGING SYSTEM

David P. Bujese, Butler, N.J., assignor to Olin Corporation, Cheshire, Conn.

Filed Apr. 7, 1988, Ser. No. 178,652

Int. Cl.[5] G03G *13/14;* B32B *27/08*

U.S. Cl. 430—126 37 Claims

23. A method of electrostatically transferring a developed latent image from a master with a permanent latent image exposed therein to a receiving surface, the master being supported by carrier means comprising the steps of:

a. transporting the master in a first generally horizontal direction while charging and developing the image on the master;

b. transferring the developed image on the master to the receiving surface by transfer means traveling in an opposing second direction; and

c. transporting a carrier means backing means in the first direction to effect cleaning of the master while the master is transported on the carrier means in the opposing second direction.

4,921,773

PROCESS FOR PREPARING AN ELECTROPHOTOGRAPHIC IMAGING MEMBER

Andrew R. Melnyk, Rochester; Richard H. Nealey, Penfield; Paul J. Brach, Rochester, and Leon A. Teuscher, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1988, Ser. No. 292,032

Int. Cl.[5] G03G *5/087, 5/06, 5/05, 5/14*

U.S. Cl. 430—132 18 Claims

1. A process for preparing an electrophotographic imaging member comprising a substrate having an electrically conductive surface, a charge generating layer and a charge transport layer contiguous to said charge generating layer, said process comprising preparing a dispersion of finely divided photoconductive particles in a fugitive liquid in which said particles are substantially insoluble, said liquid comprising at least 0.25 percent by weight of an alcohol, based on the total weight of said liquid, said dispersion being substantially free of any film forming polymer, applying a thin coating of said dispersion on a substrate, evaporating substantially all of said liquid from said coating, and embedding said particles in a film forming polymer matrix to form said charge generating layer.

4,921,774

PHOTO AND PRESSURE SENSITIVE RECORDING MEDIUM

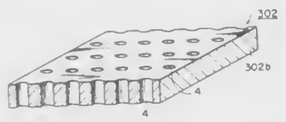
Shunichi Higashiyama, Nagoya, Japan, assignor to Brother Kogyo Kabushika Kaisha, Japan

Filed Mar. 14, 1989, Ser. No. 323,337

Claims priority, application Japan, Feb. 3, 1987, 62-24358; Mar. 20, 1987, 62-66286; Apr. 28, 1987, 62-105842

Int. Cl.[5] G03C *1/72*

U.S. Cl. 430—138 9 Claims



1. A photo and pressure sensitive recording medium comprising a sheet-formed carrier and a plurality of photo-sensitive microcapsules each containing a first component to develop or change a color when reacted with another component and a second component to change rupturing strength of said microcapsule when light is exposed thereto, said microcapsules being coated on one surface of said carrier, the improvement which comprises in that a plurality of light permeable portions are provided on said carrier while the remaining portion on said carrier being light-shielded.

4,921,775

ELEMENTS HAVING LAYERS CONTAINING MIXTURES WHICH CAN BE CROSSLINKED BY PHOTOPOLYMERIZATION

Peter Richter, Frankenthal; Hoffmann Gerhard, Otterstadt; Klaus Bronstert, Carlsberg; Wolfgang F. Mueller, Neustadt, and Karl Gerberding, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 5,699, Jan. 22, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 249,339

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601802.3

Int. Cl.[5] G03C *1/68*

U.S. Cl. 430—281 4 Claims

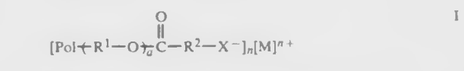
1. A light sensitive recording element comprising

a dimensionally stable support layer and

a photopolymerizable recording layer having a thickness of

0.01 to 7 mm, said photopolymerizable recording layer consisting essentially of

(i) from 40 to 99% by weight, based on the photopolymerizable recording layer, of one or more polymers of the formula I as binders



I

where

Pol is a radical of a block copolymer prepared by sequential anionic polymerization of conjugated dienes and vinylaromatics,

R^1 is a vicinal alkanediyl group,

R^2 is a divalent hydrocarbon group of 2 to 20 carbon atoms,

X^- is an acid anion,

M is a metal cation, a metal cation complex or a cation of an amine, and

a and n are each an integer from 1 to 10,

(ii) one or more ethylenically unsaturated photopolymerizable monomers which are compatible with said polymers of the formula I, and

(iii) one or more photoinitiators.

4,921,776

METHOD OF PROVIDING LOWER GLOSS PROTECTIVE COVERING FOR PRE-PRESS COLOR PROOF

Harvey W. Taylor, Jr., Sayre, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 31,613, Mar. 30, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 285,312

Int. Cl.[5] G03C *1/66*

U.S. Cl. 430—293 43 Claims

1. A method of providing a pre-press color proof with a lower-gloss protective covering, comprising in the stated order the steps of:

(a) providing an element which comprises a thin, substantially transparent, nonphotosensitive, integral polymeric film having a thickness not greater than 0.002 cm on a removable substrate, said polymeric film consisting essentially of a mixture of at least two slightly incompatible polymers, said mixture of slightly incompatible polymers having been dissolved in an essentially organic solvent system, coated on the substrate, and dried, so that said polymeric film exhibits a 20° specular gloss that is at least 5% lower than a film prepared in the same manner from any one of said polymer constituents;

(b) laminating the element to the surface of the prepress color proof, and,

(c) removing the removable substrate, whereby the polymeric film becomes the outermost layer of the pre-press color proof.

4,921,777

METHOD FOR MANUFACTURE OF MULTILAYER PRINTED CIRCUIT BOARDS

Howard A. Fraenkel, Lebanon; Joseph M. Hardi, Sparta; Bruce E. Kurtz, Lebanon, all of N.J., and Frank A. Spicciati, Liverpool, N.Y., assignors to Allied-Signal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 80,932, Aug. 3, 1987, abandoned. This application Aug. 1, 1988, Ser. No. 225,671

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] G03C *5/16*

U.S. Cl. 430—314 21 Claims

1. A process for manufacturing a printed circuit board which comprises the steps of:

(a) applying a first layer of a radiation curable dielectric material to a given area of a substrate;

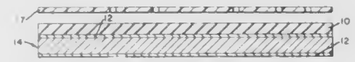
(b) placing a photomask defining a first conductor circuit pattern adjacent to the surface of said first layer of said curable dielectric material;

(c) exposing said material to a source of radiation and developing said material to expose those regions of said substrate where a first conductor circuit pattern is to be formed;

(d) forming a first conductor circuit pattern on the surface of said substrate by sputtering a metal coating over those regions of said substrate covered by said exposed first layer of said curable material to provide a printed circuit board of which the first layer of said dielectric material is a structural element, aid forming step (d) comprising steps (e) to (i);

(e) sputtering a metal coating onto the exposed surfaces of said substrate where said first conductor circuit pattern is to be formed thereby forming a portion of said first circuit pattern, and sputtering said coating onto the surface of said first layer of said dielectric material;

(f) applying a first layer of a plating resist to said coating;







(g) placing a photomask defining said first conductor circuit pattern adjacent to the surface of said first layer of said resist;

(h) exposing said resist to a source of radiation and developing said resist to expose those regions of said substrate where a first conductor circuit pattern is to be formed;

(i) plating a second metal coating onto those regions of said sputtered metal coating where said circuit pattern is to be formed forming the remainder of said first conductor circuit pattern;

(j) forming a second conductor circuit pattern on the surface of said first layer of said radiation curable material, said second conductor circuit pattern forming step (j) comprising steps (k) to (o);

(k) removing the remainder of said first plating resist and applying a second layer of plating resist to the surface of said sputtered coating and to said first conductor circuit pattern;

(l) placing a photomask defining a second conductor circuit pattern adjacent to the surface of said second layer of said resist;

(m) exposing said second layer of said plating resist to a source of radiation and developing said resist to expose

those regions of said sputtered coating and/or said first conductor circuit pattern where said second conductor circuit pattern is to be formed;
(n) forming said second conductor circuit pattern by plating a metal coating onto the exposed regions of sputtered metal coating and/or said first conductor circuit pattern; and
(o) removing plating resist from the surface of the sputtered metal layer which does not form a part of said second conductor circuit pattern, and removing said metal layer to expose the surface of said first layer of radiation curable dielectric material.

4,921,778

PHOTORESIST PATTERN FABRICATION EMPLOYING CHEMICALLY AMPLIFIED METALIZED MATERIAL

James W. Thackeray, Braintree, and Stephen A. Fine, Peabody, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Jul. 29, 1988, Ser. No. 226,282
Int. Cl.[5] G03C 5/16
U.S. Cl. 430—326 32 Claims



1. A method of forming a patterned layer on a substrate comprising:
(a) coating the substrate with a polymeric photoresist composition containing one or more photoacid generating agents or photoacid components;
(b) drying the coating to form a resist film;
(c) coating the resist film with a thin layer of an organometallic reagent;
(d) exposing selected portions of the coated film with a source of radiation, thereby producing strong acids which convert the organometallic reagent to a hydrolyzed by-product product;
(e) baking the exposed film to drive off the hydrolzed organometallic reagent; and
(f) dry developing the film to remove the remaining reactive portions by etching in an oxygen plasma.

4,921,779

BLEACH-ACCELERATING COMPOSITIONS CONTAINING A DYE-STABILIZING AGENT AND USE THEREOF IN PHOTOGRAPHIC COLOR PROCESSING

Ann M. Cullinan, Henrietta, and Paul A. Schwartz, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,005
Int. Cl.[5] G03C 7/42, 7/40
U.S. Cl. 430—379 10 Claims

1. A method for processing a silver halide color photographic element including, in succession, the steps of color developing, conditioning and bleaching, wherein said conditioning step is carried out with a composition comprising a bleach-accelerating agent and a dye-stabilizing amount of a formaldehyde precursor.

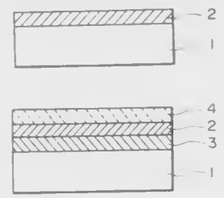
4,921,780

OPTICAL RECORDING MEDIUM

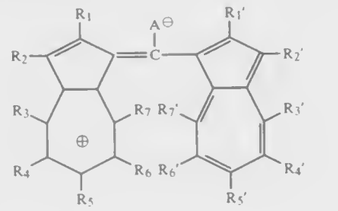
Yoshihiro Oguchi, Kawasaki, and Tsuyoshi Santoh, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,255
Int. Cl.[5] G03G 5/06
U.S. Cl. 430—495 9 Claims

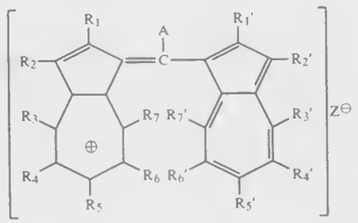
1. An optical recording media having a recording layer provided on a substrate, said recording layer comprising an organic thin film containing at least one diazulenium salt com-



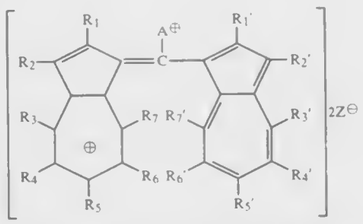
pound represented by the formula [I], [II] or [III] shown below:



(I)



(II)



(III)

wherein R_1–R_7 and R_1'–R_7' each represent hydrogen atom, a halogen atom or monovalent organic residue, or at least one combination of the combinations of R_1 and R_2, R_2 and R_3, R_3 and R_4, R_4 and R_5, R_5 and R_6, R_6 and R_7, R_1' and R_2', R_2' and R_3', R_3' and R_4', R_4' and R_5', R_5' and R_6', R_6' and R_7' may form a substituted or an unsubstituted fused ring; A represents a monovalent organic residue conjugated with the diazulenium salt nucleus and $z^{\ominus}$ represents an anion residue.

4,921,781

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yasuhiko Takamuki, and Yutaka Uesawa, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,776
Claims priority, application Japan, Sep. 18, 1987, 62-233997; Oct. 8, 1987, 62-254118
Int. Cl.[5] G03C 1/86
U.S. Cl. 430—496 21 Claims

1. A silver halide photographic material that has a photographic emulsion layer formed on a support comprising paper

base coated with a resin on both sides wherein a hydrophilic colloidal layer containing a material that has an absorption in the wavelength region in which the photographic emulsion layer has sensitivity is provided between the emulsion layer and the support, and that the surface of the support on the side where the hydrophilic colloidal layer is to be coated has a center-line-average roughness, Ra, of 0.3–1.5 μm, the thickness of this hydrophilic colloidal layer being at least one half the center-line-average roughness, Ra, of the surface of said support.

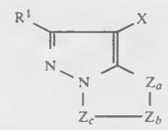
4,921,782

MAGNETA COUPLER MONOMER, A POLYMERIC MAGENTA COUPLER AND A COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING THE POLYMERIC MAGNETA COUPLER

Günter Helling, Odenthal-Gloebusch, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

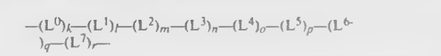
Filed May 31, 1988, Ser. No. 200,541
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719401; Jul. 8, 1987, 3722497
Int. Cl.[5] G03C 7/38
U.S. Cl. 430—548 3 Claims

1. A color photographic recording material comprising at least one photosensitive silver halide emulsion layer and at least one polymeric magenta coupler, said magenta coupler containing at least one structural unit capable of color coupling corresponding to the following formula



I

wherein R^1 is H, alkyl, aralkyl or aryl; X is H or a group releasable by coupling; Z_a, Z_b, Z_c represent an optionally substituted methine group, =N— or —NH—, either the bond Z_a—Z_b or the bond Z_b—Z_c being a double bond and the other bond a single bond; wherein at least R^1 or X or a substituent at a methine group represented by Z_a, Z_b or Z_c contains an ethylenically unsaturated polymerizable group in polymerized form, bonded to the coupler group through



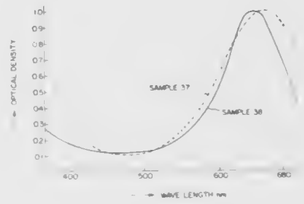
in which L^0 represents that part of the bond situated adjacent the coupler group while L^7 represents that part of the bond situated adjacent the ethylenically unsaturated group and in which L^0, L^2, L^4, L^6 (same or different) represent —O—, —NR—, —NRCO—, —CONR—, —$NRSO_2$—, —SO_2NR—, —COO—, —O—CO—, —NR—CO—NR—, —O—CO—NR—, —NR—COO— (with R=H or alkyl optionally substituted by carboxyl); L^1, L^3, L^5, L^7 (same or different) represent alkylene, aralkylene, arylene, optionally substituted by carboxy; and k, l, m, n, o, p, q, r are each 0 or 1 with l−m+n−o+p−q=0; and wherein at least one of said L^0, L^2, L^4 and L^6 contains a nitrogen atom substituted with carboxy alkyl or at least one of the carbon atoms of said ethylenically unsaturated group is substituted with carboxyl or carboxy alkyl.

4,921,783

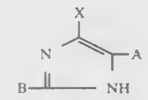
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Noritaka Nakayama, and Toyoaki Masukawa, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 280,001, Dec. 5, 1988, abandoned. This application Jun. 20, 1989, Ser. No. 571,831
Claims priority, application Japan, Dec. 10, 1987, 62-312672; Apr. 18, 1988, 63-96332
Int. Cl.[5] G03C 7/38
U.S. Cl. 430—558 24 Claims

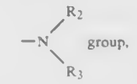


1. A silver halide photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer, wherein said silver halide emulsion layer contains a cyan dye-forming coupler represented by the following Formula I:



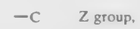
Formula I

wherein A is an organic group combined with the imidazole ring by a carbon atom, a nitrogen atom, an oxygen atom or a sulfur atom of said group; B is an



group,

an —L—R_4 group or a



Z group,

in which R_2 and R_3 are each a hydrogen or halogen atom, an alkyl group, or an aryl group, provided that said R_2 and R_3 are allowed to continue to complete a ring; L is an oxygen atom or a sulfur atom and R_4 is a hydrogen atom or a substituent; and Z is a group of non-metal atoms necessary to form a five- to seven-member heterocyclic ring together with the carbon atom bound to the imidazole ring, said heterocyclic ring contains an oxygen atom, a sulfur atom or a nitrogen atom,; X is a hydrogen atom or a group capable of being split off upon reaction with the oxidized product of a color developing agent.

4,921,784

SILVER HALIDE EMULSION CONTAINING A THIOCYANATE COMPOUND HAVING SPECIFIC ABSORBANCE IN IR SPECTROSCOPY

Hideo Ikeda, and Ryoichi Nemori, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 16, 1986, Ser. No. 886,052
Claims priority, application Japan, Jul. 18, 1985, 60-158891
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] G03C *1/08*
U.S. Cl. 430—567 4 Claims

1. A thiocyanate-containing silver halide emulsion characterized in that a disc tablet of 2.5 mm in diameter formed of 10 mg of silver halide contained in the silver halide emulsion shows an absorbance of 0.015 or higher of thiocyanate ion at 2052 cm^{-1}, measured by Infra red spectroscopy.

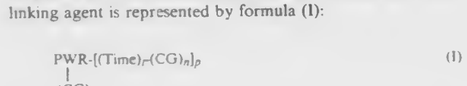
4,921,785

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Koki Nakamura, and Ichizo Toya, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 29, 1988, Ser. No. 188,562
Claims priority, application Japan, Apr. 30, 1987, 62-106890
Int. Cl.[5] G03C *1/30, 1/04*
U.S. Cl. 430—621 10 Claims

1. A silver halide photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer, at least one layer of said material comprising gelatin crosslinked with a crosslinking agent, wherein said crosslinks are cleaved on reduction, and wherein said crosslinking agent is represented by formula (I):



(I)

wherein PWR represents a group capable of releasing $[(Time)_t-(CG)_n]_p$ on reduction; Time represents a group capable of releasing $-(CG)_n$ after $-[(Time)_t-(CG)_n]_p$ is released from PWR; CG represents a group capable of bonding with gelatin; n, m, and p each is an integer of 1 to 3; and t is 0 or 1.

4,921,786

NOVEL NAD SYNTHETASE, ASSAY METHOD USING SAID NOVEL NAD SYNTHETASE AND A PROCESS FOR PRODUCTION THEREOF

Mamoru Takahashi; Hideo Misaki; Shigeyuki Imamura, and Kazuo Matsuura, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 10, 1987, Ser. No. 94,813
Claims priority, application Japan, Sep. 10, 1986, 61-213679; Jul. 30, 1987, 62-191018
Int. Cl.[5] C12Q *1/00*
U.S. Cl. 435—4 19 Claims

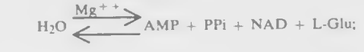
1. NAD synthetase that selectively catalyzes in the presence of Mg++ or Mn++ ion the following reaction:

ATP + deamide-NAD +

without catalyzing in the presence of Mg++ ion the following reaction:

ATP + deamide-NAD + L-Gln +

-continued



and utilizes ammonia including ammonium ion as a substrate without utilizing glutamine or asparagine as a substrate.

4. Method for assaying a component in a specimen, said component being selected from ATP, deamide-NAD, ammonia and ammonium ion; said method comprising:

incubating a specimen containing at least one of ATP, deamide-NAD, ammonia and ammonium ion with NAD synthetase that selectively catalyzes in the presence of Mg++ or Mn++ ion the following reaction:

ATP + deamide-NAD +



without catalyzing in the presence of Mg++ ion the following reaction:

ATP + deamide-NAD + L-Gln +

utilizes ammonia including ammonium ion as a substrate without utilizing glutamine or asparagine as a substrate, in the presence of ATP, deamide-NAD, ammonia or ammonium ion, and Mg++ ion or Mn++ ion to generate NAD;

subjecting said generated NAD to a coenzyme cycling reaction comprising reducing said generated NAD to reduced NAD, and oxidizing thus-generated reduced NAD to NAD; and

measuring a compound consumed or generated in said cycling reaction.

4,921,787

DETECTION OF ANTIBODIES TO HUMAN IMMUNODEFICIENCY VIRUS BY AGGLUTINATION OF ANTIGEN COATED LATEX

Charles H. Riggin, Hopedale, and Dante J. Marciani, Hopkinton, both of Mass., assignors to Cambridge Bioscience Corporation, Worcester, Mass.

Filed May 1, 1987, Ser. No. 44,665
Int. Cl.[5] G01N *33/569*
U.S. Cl. 435—5 9 Claims

1. An assay for determining the presence of antibodies in a sample to human immunodeficiency virus comprising contacting a sample suspected of containing antibodies to human immunodeficiency virus (HIV) with hydroxylated microbeads coated with HIV-specific antigen having hydrophobic domains, evaluating whether agglutination occurs, and determining therefrom the presence of antibodies in said sample.

4,921,788

COMPETITIVE NUCLEIC ACID IMMUNOASSAY FOR THE DETECTION OF ANALYTES

Dale G. Deutsch, Stony Brook, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Apr. 12, 1988, Ser. No. 180,543
Int. Cl.[5] C12Q *1/68;* G01N *33/535, 33/545*
U.S. Cl. 435—6 26 Claims

9. A method for performing a competitive nucleic acid immunoassay for detection of analytes in a sample comprising the steps of:

(a) obtaining a sample to be analyzed for the presence of an analyte;

(b) combining an antibody specific for an analogue of said analyte with said sample, said analogue competes with said analyte for binding with said antibody;

(c) combining an analogue of said analyte-oligonucleotide complex with said sample, said analogue-oligonucleotide complex competes with said analyte for binding to said antibody;

(d) combining a complementary oligonucleotide chain to said analogue-oligonucleotide complex for conjugating with said sample;

(e) combining a labelling means, having an affinity for a nucleic-acid duplex formed from said analogue-oligonucleotide complex and said complementary oligonucleotide chain, with said sample; and,

(f) detecting the presence of the labelling means in said nucleic acid duplex,

whereby the presence of the label in said nucleic acid duplex indicates the presence of the analyte in the sample.

4,921,789

MARKER FOR COLORECTAL CARCINOMA AND METHODS OF DETECTING THE SAME

Ronald R. Salem, Brookline; Peter Thomas, Pembroke, and Glenn Steele, Swampscott, all of Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.

Filed Apr. 20, 1988, Ser. No. 184,079
Int. Cl.[5] G01N *33/53, 33/566, 33/563;* C12M *15/00*
U.S. Cl. 435—7 4 Claims

1. A method of detecting human colorectal carcinoma comprising the steps of:

(a) contacting a biological sample with an antibody or portion thereof which reacts with CC glycoprotein, analogs, or fragments thereof, CC glycoprotein having a molecular weight of approximately 160,000 daltons, and not cross-reacting with antibodies to any of carcinoembryonic antigen, CA 19.9, alpha-1-acid glycoprotein, nonspecific cross-reacting antigen, or to any of blood group substances A, B, or H; and

(b) observing whether said antibody reacts with said sample, an observation of a reaction with said sample indicating the presence of human colorectal carcinoma.

4,921,790

TUMOR SPECIFIC ASSAY FOR CA125 OVARIAN CANCER ANTIGEN

Timothy J. O'Brien, Little Rock, Ark., assignor to Research Corporation, New York, N.Y.

Filed Apr. 24, 1987, Ser. No. 42,498
Int. Cl.[5] G01N *33/53, 33/543;* C07K *15/14;* C12N *1/00*
U.S. Cl. 435—7 9 Claims

1. An isolated subunit of serous cystadinocarcinoma ovarian tumor associated CA125 antigen having a molecular weight of about 40 kDa.

4,921,791

METHOD FOR MEASURING SPECIFIC COMPONENT USING PEROXIDASE ENZYME REACTION

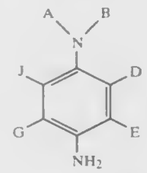
Masahiko Yamasaki, and Satoshi Kawakatsu, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1987, Ser. No. 66,186
Claims priority, application Japan, Jun. 26, 1986, 61-150723; Sep. 12, 1986, 61-216299
Int. Cl.[5] C12Q *1/00, 1/28;* G01N *53/00;* C12N *11/00*
U.S. Cl. 435—28 6 Claims

1. A method for measuring a specific component, said method comprising the steps of

forming and providing a complex conjugate comprising a specific component to be measured and a peroxidase labelled ligand carried on a support; and

forming and depositing a water-insoluble dye on said complex conjugate through the enzyme reaction or peroxidase with hydrogen peroxide, a p-phenylenediamine type aromatic primary amine compound and either one of an active methylene compound or a phenol compound, wherein said aromatic primary amine compound is represented by the formula:



Formula [I]

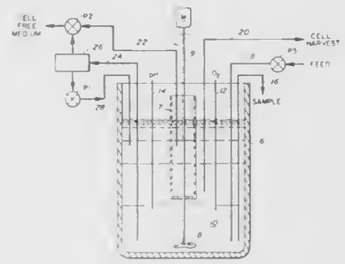
wherein A and B each represents a hydrogen atom, an alkyl group, or A and B may form a heterocyclic ring together with a nitrogen atom; D, E, G and J each represents a substituent selected from the group consisting of a hydrogen atom, a halogen atom, a hydroxy group, an amino group, an alkoxy group, an acylamide group, an aryl-sulfonamide group, an alkylsulfonamide group and an alkyl group, or a salt of said compound.

4,921,792

CONTINUOUS CELL DISPERSION, CULTIVATION AND SUBSTANCE RECOVERY PROCESS

Jurgen Trawinski, El Sobrante, and Detmar Redeker, Emeryville, both of Calif., assignors to Miles Inc., Elkhart, Ind.

Filed Nov. 27, 1987, Ser. No. 126,049
Int. Cl.[5] C12P *3/00, 21/00;* C12N *5/02*
U.S. Cl. 435—41 14 Claims



1. A method of continuously producing and separating a biological substance comprising the steps of:

(a) introducing into a reactor a dispersed cell culture and incubation fluid which includes a cell population capable of expressing the substance and maintaining the reactor under conditions to assure the expression of the substance;

(b) continuously moving a portion of the fluid, including dispersed cells and the substance, through a separation device located outside said reactor and continuously separating therein at least some of the substance from the fluid while allowing the majority of the moving fluid and substantially all of the dispersed cells to pass through the separation device, the volume of culture fluid outside of the reactor being less than about 5% of the total culture fluid volume and a given dispersed cell being outside the reactor for less than about two minutes, as determined by the following relationship

$$\frac{\text{Volume outside (ml)}}{\text{flow rate (ml/min.)}} \leq 2 \text{ minutes.}$$

4,921,793
BACTERIAL PROCESS FOR THE PRODUCTION OF DISPERSANTS

Eugene Rosenberg, 9 Habrosh Street, Raanana, and Eliora Z. Ron, 36 Yehuda Hanassi Street, Tel Aviv, both of Israel

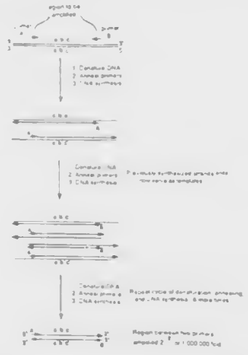
Filed Nov. 7, 1986, Ser. No. 927,716
Claims priority, application Israel, Nov. 7, 1985, 76981
Int. Cl.[5] C12P *19/26, 19/04;* **C12N** *1/20;* **C07G** *17/00*
U.S. Cl. 435—84 **12 Claims**

1. A polymeric substance, useful as dispersing agent for water-insoluble finely divided solids in an aqueous medium, consisting essentially of the purified fermentation product of a bacteria, consisting of a polysaccharide containing carboxy groups, salts thereof, as well as amino- or acylamino monosaccharide moieties, and acid addition salts of these, having an average molecular weight of the polysaccharide molecules of 45,000 to 57,000 determined by sedimentation analysis and about 55,000 to 68,000 determined by measurements of intrinsic viscosity.

4,921,794
T7 DNA POLYMERASE

Stanley Tabor, Cambridge, and Charles C. Richardson, Chestnut Hill, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 3,227, Jan. 14, 1987, Pat. No. 4,795,699. This application Dec. 5, 1988, Ser. No. 279,990
Int. Cl.[5] C12P *19/34;* **C12N** *15/00, 9/12;* **C07H** *15/12*
U.S. Cl. 435—91 **24 Claims**



1. A method of amplification of a DNA sequence comprising annealing a first and second primer to opposite strands of a double stranded DNA sequence and incubating the annealed mixture with a T7- type DNA polymerase having less than 500 units of exonuclease activity per mg of polymerase, wherein said first and second primers anneal to opposite strands of said DNA sequence with their 3′ ends directed towards each other after annealing, and with the DNA sequence to be amplified located between the two annealed primers.

4,921,795
METHOD FOR PRODUCING HIGH SOLIDS DEXTRIN ADHESIVES

Frank A. Bozich, Jr., Clarendon Hills, Ill., assignor to North American Adhesive Company, Berkeley, Ill.

Filed Mar. 20, 1987, Ser. No. 28,655
Int. Cl.[5] C12P *19/20, 19/14;* **C12N** *9/28, 9/32, 9/34;* **C09J** *3/06*
U.S. Cl. 435—96 **9 Claims**

1. A method for the preparation of high solids dextrin adhesives from raw starch comprising the steps of:
preparing an aqueous reaction slurry comprising water, raw starch, and a hydrolytically effective amount of the enzymes alpha-amylase and glucoamylase in combination at a ratio from about 33 to about 73 with respect to their relative activities, said water having a pH suitable for enzymatic hydrolysis;
heating said aqueous reaction slurry with stirring to a temperature suitable for enzymatic hydrolysis of said raw starch;
maintaining said hyrolysis temperature until the viscosity of said reaction slurry is reduced to a viscosity betwen about 1000–2000 centipoise as determined by a Brookfield viscometer at 20 rpm, 110° F., and at 45–55% solids; and
adjusting the pH of said aqueous reaction slurry sufficient to inactivate both said alpha-amylase and said glucoamylase enzymes, thereby preventing further enzymatic reduction of the viscosity of said aqueous reaction slurry.

4,921,796
IMMOBILIZED CYCLODEXTRIN GLUCOSYLTRANSFERASE COMPOSITION FOR THE PRODUCTION OF CYCLODEXTRINS

J. David Rozzell, Cambridge, Mass., assignor to Genetics Institute, Inc., Cambridge, Mass.

Filed Apr. 19, 1988, Ser. No. 183,193
Int. Cl.[5] C12P *19/18;* **C12N** *9/10*
U.S. Cl. 435—97 **1 Claim**

1. A method for the production of cyclodextrins which comprises contacting
(a) an immobilized cyclodextrin glucosyltransferase composition prepared by contacting a solution containing an enzyme having cyclodextrin glucosyltransferase (CGTase) activity with a support bearing pendant aldehyde groups in the presence of a source of divalent calcium ion at a concentration of at least 1 mM under conditions such that at least a portion of the enzyme is bound covalently to the support with
(b) a solution containing starch, amylose, glycogen, degraded or partially degraded starch or starch derivatives, or maltodextrins.

4,921,797
C-TERMINAL ALPHA-AMIDATING ENZYME AND PROCESS FOR PRODUCTION AND USE THEREOF

Hisayuki Matsuo, and Kensaku Mizuno, both of Miyazaki, Japan, assignors to Hisayuki Matsuo, Miyazaki, Japan

Filed Jun. 5, 1987, Ser. No. 58,919
Claims priority, application Japan, Jun. 7, 1986, 61-131089
Int. Cl.[5] C12P *13/02, 21/00;* **C12N** *9/02, 9/80*
U.S. Cl. 435—129 **12 Claims**



1. A substantially purified C-terminal α-amidating enzyme product from skins of *Xenopus laevis* characterized by the following properties:
(1) converting a peptide having a glycine residue at its C-terminal to a C-terminal amidated peptide lacking said glycine residue;
(2) having a molecular weight of about 39,000 as determined by SDS-polyacrylamide gel electrophoresis; and

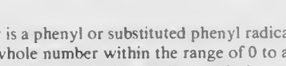
(3) having an N-terminal amino acid sequence represented by Ser-Leu-Ser-.

4,921,798
SYNTHESIS OF (ARYL OR ARYLALKYL)-3-HYDROXY PROPIONIC ACIDS AND ARYL ALKANEDIOLS HAVING HIGH OPTICAL PURITY

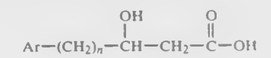
Neil W. Boaz, Waterloo, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 25, 1989, Ser. No. 412,260
Int. Cl.[5] C12P *7/42;* **C12R** *1/39;* **C07P** *41/00*
U.S. Cl. 435—146 **7 Claims**

1. A process for the separation of the optical isomers in a racemic carboxylic acid ester having the formula:



wherein Ar is a phenyl or substituted phenyl radical, n is equal to a small whole number within the range of 0 to about 4, and R is a lower alkyl or substituted alkyl radical;
said process comprising hydrolyzing said racemate in the presence of lipase from *Pseudomonas fluorescens* to obtain a mixture of the S-isomer of the acid,

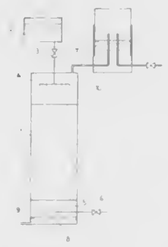


and the unreacted R-isomer of said ester.

4,921,799
FERMENTATION METHOD

Shinko Kitaura; Yoshimasa Takahara, both of Kobe; Shiro Nagai, Hiroshima, and Naomichi Nishio, Higashihiroshima, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

PCT No. PCT/JP87/00156, § 371 Date Jul. 17, 1987, § 102(e) Date Jul. 17, 1987
PCT Filed Mar. 13, 1987, Ser. No. 93,497
Claims priority, application Japan, Mar. 14, 1986, 61-54696; Mar. 14, 1986, 61-54697
Int. Cl.[5] C12P *5/02*
U.S. Cl. 435—167 **5 Claims**



1. A method for causing the fermentive transformation of a gaseous substrate into a product, comprising:
(i) passing an aqueous solution through a reactor over microbial cells fixed onto a carrier held in said reactor, said aqueous solution being passed in an amount sufficient to moisten at least part of the surface of said microbial cells and in an amount of at most that amount needed to moisten the whole surface of said microbial cells;
(ii) forcing a gaseous substrate through interstices between said moistened microbial cells; and
(iii) obtaining a fermentation product.

4,921,800
MICROBIAL PROCESS FOR PHOTOHYDROGEN PRODUCTION FROM CELLULOSE IN HIGH SALINE WATER MEDIUM

T. M. Vatsala, Shri A.M.M. Murugappa Chettiar Research Centre, Tharamani, Madras 600 013, India

Filed Jan. 19, 1988, Ser. No. 145,617
Int. Cl.[5] C12P *3/00;* **C12R** *1/01*
U.S. Cl. 435—168 **16 Claims**

1. A process for photogeneration of hydrogen, the process comprising:
repeatedly selecting a particular population of *Rhodospirillum salinarum* in a saline water medium;
combining said mineral medium with a solid substrate of carbonanceous substances;
culturing said *Rhodospirillum salinarum* in the saline water medium and substrate;
illuminating said *Rhodospirillum salinarum*, saline water medium and substrate with light in a wavelength range between 360 nm and 900 nm, the bacteria producing a rich fuel gas comprising hydrogen and carbon dioxide.

4,921,801
NOVEL RECOMBINANT DNA COSMID SHUTTLE VECTORS

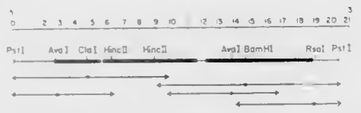
R. Nagaraja Rao, Indianapolis, and Richard K. Stanzak, Poland, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 742,172, Jun. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 655,178, Sep. 27, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 842,102
Int. Cl.[5] C12N *15/00, 1/20, 7/00*
U.S. Cl. 435—172.3 **58 Claims**



1. A recombinant double standard DNA cosmid shuttle vector comprising:
(a) a replicon that is functional in *E. coli*,
(b) a replicon that is functional in Streptomyces,
(c) a double stranded DNA segment that contains two or more cos sequences of bacteriophage lambda, and
(d) one or more DNA segments that convey resistance to at least one antibiotic when transformed into a sensitive restrictionless host cell.

4,921,802
PLANT VIRUS CDNA
Timothy C. Hall, Madison; L. Sue Loesch-Fries, Stoughton; Nancy P. Jarvis, and Richard F. Barker, both of Madison, all of Wis., assignors to Pioneer Hi-Bred International, Inc., Johnston, Iowa
Continuation of Ser. No. 492,582, May 5, 1983. This application Jan. 13, 1988, Ser. No. 144,692
Int. Cl.[5] C12N *15/00, 7/00;* C07H *15/12;* C12R *1/41*
U.S. Cl. 435—172.3 7 Claims



1. A double-stranded DNA segment comprising the sequence of a complete cDNA derived by reverse transcription of an RNA of alfalfa mosaic virus selected from the group consisting of RNA3 and RNA4.

4,921,803
IMMOBILIZED BLUE-GREEN ALGAE
Ronald S. Nohr, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Mar. 17, 1987, Ser. No. 26,927
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] C12N *11/12, 11/08;* C12M *1/40;* C05F *11/08*
U.S. Cl. 435—179 7 Claims

1. A composite which comprises a substantially water-insoluble support having a surface energy of from about 30 dynes per cm to about 115 dynes per cm to which nitrogen-fixing filamentous blue-green algal heterocyst cells are attached, said support being polypropylene or a cellulosic which is particulate or fibrous and which is substantially free of substances which have a significant deleterious effect on the viability of the attached algae, which attached algal heterocyst cells, when allowed to grow in nitrogen-deficient environment, fix nitrogen at a rate which is substantially greater than that of such cells not so attached.

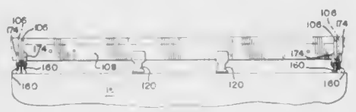
4,921,804
METHOD FOR EXTRACTING BILIRUBIN-SPECIFIC ENZYME PREPARATION
Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 528,486, Sep. 1, 1983, Pat. No. 4,701,411. This application Jun. 12, 1987, Ser. No. 60,803
Int. Cl.[5] C12N *9/02, 9/14;* A61K *37/50, 35/78*
U.S. Cl. 435—189 6 Claims

1. A method for the extraction of a bilirubin-specific enzyme preparation comprising:
(a) blending the fruit of a plant selected from the group of plant families consisting of Solanaceae, Musaceae and Liliaceae with an aqueous buffer solution having a pH of from about 6.8 to about 7.8 to form a homogeneous aqueous mixture,
(b) separating insoluble solids from said aqueous mixture to obtain an aqueous liquid supernatant,
(c) treating said supernatant with acetone or a water-miscible alcohol chilled to a temperature between −10° to +4° C. to produce a first precipitate from the resulting mixture,
(d) separating said first precipitate from said mixture and resuspending said first precipitate in a second aqueous mixture containing acetone or a water-miscible alcohol to produce a second precipitate from said second mixture,
(e) separating said second precipitate from the resulting supernatant,
(f) repeating steps (d) and (e) at least one time using as said precipitate in said repeat of step (d) the precipitate produced in step (e), and
(g) collecting the supernatant produced in steps (d) through (f).

4,921,805
NUCLEIC ACID CAPTURE METHOD
Gulilat Gebeyehu, Silver Spring; Leonard Klevan, Derwood, and John D. Harding, Potomac, all of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.
Continuation of Ser. No. 78,991, Jul. 29, 1987, abandoned. This application Sep. 29, 1989, Ser. No. 414,728
Int. Cl.[5] C12N *1/08*
U.S. Cl. 435—270 10 Claims

1. A method of separating nucleic acids from an unpurified biological sample comprising:
(a) contacting an unpurified biological sample with a capture reagent, wherein said capture reagent comprises:
(i) a solid support;
(ii) a linker molecule comprising spermine or spermidine bound to said solid support; and
(iii) a methidium moiety, bound to said linker; wherein said methidium moiety is able to bind to the nucleic acids in said biological sample independent of the salt concentration of said sample;
and wherein a sample-capture reagent mixture is formed thereby;
(b) insulating said sample-capture reagent mixture for a time and under conditions sufficient to allow said capture reagent to bind to nucleic acids in said sample to form a capture reagent-nucleic acid complex; and
(c) isolating said complex from said mixture.

4,921,806
TRAY ASSEMBLY FOR GERMINATION FLOOR
Norman Andreasen, 1520 W. Norwood Ave., Itasca, Ill. 60143
Division of Ser. No. 248,312, Sep. 19, 1988. This application Sep. 29, 1989, Ser. No. 414,330
Int. Cl.[5] E01H *5/07*
U.S. Cl. 435—302 5 Claims



1. The tray assemblies for the floor of a germination compartment comprising:
a plurality of frame means having a top surface and a lower surface, said frame means including a pair of spaced side members interconnected with a pair of cross members,
said frame means further including a plurality of spaced rib members extending parallel to said side members, said rib members being attached at each end to said cross members,
a perforated tray sheet being affixed to the top of each of said plurality of said frame means,
said lower surface being arranged to be carried by cross supporting beams located beneath said cross member,
riser means positioned between said frame means and the supporting beams to raise said plurality of frame means above the supporting beams,
said riser means having a base disposed in contacting relationship beneath one of said cross members of said frame means and one of said cross members of a said adjacent frame means, and
said riser means further having means contacting said frame means and said adjacent frame means at a position above said base.

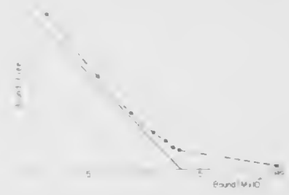
4,921,807
METHOD AND APPARATUS FOR MAINTAINING URINE SPECIMENS
Charles Y. C. Pak, Dallas, Tex., assignor to Mission Pharmacal Company, San Antonio, Tex.
Continuation of Ser. No. 787,059, Oct. 15, 1985, abandoned. This application Jan. 26, 1988, Ser. No. 148,148
Int. Cl.[5] G01N *1/28*
U.S. Cl. 436—18 57 Claims

1. A method for maintaining a timed urine specimen for subsequent laboratory analysis from the time of collection of said specimen until said specimen is analyzed, said method comprising the steps of:
a. Providing a collection container having sufficient volume to accommodate the total volume of urine specimens to be accumulated from each voiding during a timed interval, said collection container having disposed therein predetermined amounts of thymol and lithium chloride;
b. Pouring the urine specimen collected from each voiding during said interval into said collection container so as to accumulate the specimens collected from each voiding;
c. Maintaining the accumulated urine specimens collected from each voiding during said interval in said collection container until the conclusion of said interval;
d. Providing a second container having substantially less volume than said collection container, said second container having disposed therein predetermined amounts of boric acid and hydrochloric acid;
e. Transferring a first aliquot of the total volume of urine specimens collected during said interval into said second container;
f. Providing a third container having substantially less volume than said collection container;
g. Transferring a second aliquot of the total volume of urine specimens collected during said interval into said third container; and
h. Transporting said second container, containing said first aliquot, and said third container, containing said second aliquot, to said laboratory for analysis.

32. Apparatus for receiving and maintaining a timed urine specimen for subsequent laboratory analysis from the time of collection of said specimen until said specimen is analyzed, said apparatus comprising:
a. A collection container having sufficient volume to accommodate the total volume of urine specimens to be accumulated from each voiding during a timed interval, said collection container having disposed therein predetermined amounts of thymol and lithium chloride;
b. A second container having substantially less volume than said collection container, said second cintainer having disposed therein predetermined amounts of boric acid and hydrochloric acid; and
c. A third container having substantially less volume than said collection container.

4,921,808
METHOD FOR DETERMINING FOLLICLE STIMULATING HORMONE
Alan L. Schneyer, Delmar; Patrick M. Sluss, East Greenbush; Bosukonda Dattatreyamurty, Albany, and Leo E. Reichert, Jr., Loudinville, all of N.Y., assignors to The Albany Medical College of Union University, Albany, N.Y.
Filed Jun. 25, 1986, Ser. No. 878,159
Int. Cl.[5] G01N *33/567*
U.S. Cl. 436—503 9 Claims

1. In a method for the determination of follicle stimulating hormone in a sample, comprising the steps of:
(a) contacting said sample with a purified follicle stimulating hormone receptor preparation capable of selectively binding said hormone;
(b) providing a signalling entity for signalling whether said binding has taken place; and
(c) observing said signalling entity to determine the presence of said hormone in said sample,
the improvement comprising said signalling entity being a substantially pure follicle stimulating hormone labeled with a detectable label, in which labeled hormone the ratio of specific binding to non-specific binding is at least about 5 when measured using a partially purified calf testes plasma membrane preparation containing from about 5 to about 25 fmol of receptors per milligram of membrane wet weight, and said purified follicle stimulating hormone receptor preparation having at least about 600 fmol/mg protein of high affinity receptors for follicle stimulating hormone.



4,921,809
POLYMER COATED SOLID MATRICES AND USE IN IMMUNOASSAYS
Robert Schiff, Caldwell; Gary Lehnus, Blairestown, both of N.J.; Charles J. Wasserman, Muskego, and Henrietta M. Garlock, Oconomowoc, both of Wis., assignors to Findley Adhesives, Inc., Wauwatosa, Wis.
Filed Sep. 29, 1987, Ser. No. 105,136
Int. Cl.[5] G01N *33/545*
U.S. Cl. 436—531 22 Claims

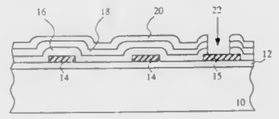
1. In an immunoassay solid support carrying a capture molecule directly or through an interposing layer of a material facilitating covalent or adsorptive bonding of the capture molecule to the support, the improvement which comprises a layer of a polyethyleneimine on said support intermediate said support and said capture molecule and wherein there is a blocking agent present on the polyethyleneimine capture antibody composite comprising a mixture of ovalbumin and dithiothreitol.

9. In a method for producing a solid support substrate useful in performing an immunoassay wherein a capture molecule is attached to said solid support directly or through an interposing layer of a material facilitating covalent or adsorptive bonding of the capture molecule to said layer, the improvement which comprises applying a layer of a polyethyleneimine onto said support intermediate said support and said capture molecule and then treating the resulting product with a mixture comprising ovalbumin and dithiothreitol sufficient in amount to provide a blocking layer of the polyethyleneimine layer.

4,921,810
METHOD FOR TESTING SEMICONDUCTOR DEVICES
Shin-ichi Kunieda, Sacramento, and Masahide Ozawa, Citrus Heights, both of Calif., assignors to NEC Electronics Inc., Mountain View, Calif.
Filed Jun. 22, 1988, Ser. No. 209,758
Int. Cl.[5] H01L *21/66*
U.S. Cl. 437—8 7 Claims

1. A method for testing an integrated circuit comprising the steps of:
applying a layer of material to a surface of said integrated circuit, said layer of material having a dielectric constant greater than 1;

electrically testing said integrated circuit, the electrical test including effects of capacitive coupling;



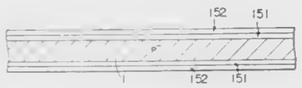
removing said layer of material from said surface of said integrated circuit; and
packaging said integrated circuit.

4,921,811

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND A METHOD FOR MANUFACTURING THE SAME

Atsuo Watanabe, Hitachiota; Takahide Ikeda, Tokorozawa; Kiyoshi Tsukuda, Hitachi; Mitsuru Hirao, Naka; Touji Mukai, Sanda, and Tatsuya Kamei, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 159,956, Feb. 24, 1988, which is a continuation of Ser. No. 554,794, Nov. 23, 1983, abandoned. This application Mar. 31, 1988, Ser. No. 176,284
Claims priority, application Japan, Nov. 24, 1982, 57-204671
Int. Cl.[5] **H01L** *21/265*
U.S. Cl. 437—31 **42 Claims**



1. A method for manufacturing a semiconductor integrated circuit device comprising the steps of:
(A) forming a first buried region of a second conductivity type at a predetermined position on a surface of a semiconductor substrate of a first conductivity type;
(b) forming a second buried region of a first conductivity type in substantial contact with said first buried region on the surface of said semiconductor substrate to surround said first buried region;
(c) forming a semiconductor layer of a predetermined conductivity type on said semiconductor substrate;
(d) forming a first well region of the second conductivity type at a position corresponding to said first buried region at the surface of said semiconductor layer;
(e) forming a second well region of the first conductivity type at a position corresponding to said second buried region at the surface of said semiconductor layer, in contact with said first w-11 region and to surround said first well region, and
(f) forming at least MOSFETs in the first and second well regions.

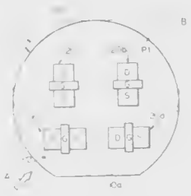
4,921,812

PROCESS OF FABRICATING FIELD EFFECT TRANSISTOR DEVICE

Taku Nagai, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 3, 1989, Ser. No. 305,771
Claims priority, application Japan, Feb. 5, 1988, 63-24986
Int. Cl.[5] **H01L** *21/265*
U.S. Cl. 437—35 **4 Claims**

4. A process of fabricating a semiconductor integrated circuit device, comprising the steps of
(a) forming on a semiconductor wafer a plurality of active areas which are electrically isolated from each other,
(b) forming on said semiconductor wafer a gate insulator layer located within each of said active areas, said gate insulator layer defining source-forming and drain-forming regions to form source and drain regions, respectively, on both sides of the gate insulator layer,
(c) forming a gate electrode layer on said gate insulator layer within each of said active areas, and
(c) introducing dopant ions selectively into said source-forming and drain-forming regions with said gate electrode layer used as a mask for thereby forming said source and drain regions, respectively, within each of said active areas, wherein said dopant ions are selectively introduced into said source-forming and drain-forming regions in consecutive two steps which consist of
(d/1) a first step of introducing dopant ions into said source-forming and drain-forming regions within each of said active areas in a first direction inclined through a predetermined angle from normal to the surface of the semiconductor wafer, the first direction having on a plane parallel with the surface of the semiconductor wafer a projective component angled to the direction of length of the gate electrode layer in each of said active areas, the dopant ions being introduced into said source-



forming and drain-forming regions in said first direction with a dose substantially equal to one half of the total dose required for the formatior of the source and drain regions, and
(d/2) a second step of introducing dopant ions into said source-forming and drain-forming regions within each of said active areas in a second direction inclined through said predetermined angle from normal to the surface of the semiconductor wafer, the second direction having on said plane parallel with the surface of the semiconductor wafer a projective component angled to the direction of length of the gate electrode layer in each of said active areas and diametrically opposite to the projective component of said first direction, the dopant ions being introduced into said source forming and drain-forming regions in said second direction with a dose substantially equal to the remaining half of said total dose required for the formation of the source and drain regions, wherein the projective component of each of said first and second directions is inclined a predetermined angle greater than zero from the direction of length of the gate electrode layer in each of said active areas.

4,921,813

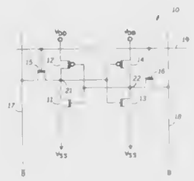
METHOD FOR MAKING A POLYSILICON TRANSISTOR

Sudhir K. Madan, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 17, 1988, Ser. No. 258,545
Int. Cl.[5] **H01L** *29/78, 21/82*
U.S. Cl. 437—46 **3 Claims**

1. A process for making a first transistor and a second transistor on a semiconductor substrate having an active region surrounded by field oxide, said active region having a middle region and first and second region separated by the middle region, comprising;

forming a first insulator layer over the active region;
forming a first layer of polysilicon over the insulator layer and the
field oxide;
forming a second insulator layer over the first layer of polysilicon;
forming a second layer of polysilicon over the second insulator layer;
forming a third insulating layer over the second layer of polysilicon;
selectively etching the third insulator layer and the second polysilicon layer to form a first strip comprised of an an unetched portion of the third insulator layer, and an unetched portion of the second polysilicon layer, said etching including etching over the first and second region of the active region so that said first strip has a portion over the middle region of the active region;
forming first sidewall spacers on the first strip;
selectively forming masks over portions of the first polysilicon layer;
etching the first layer of polysilicon in areas not covered by the first strip, the first sidewall spacers, and said masks to expose portions of the first and second regions of the active region leaving an unetched portion of first polysilicon;



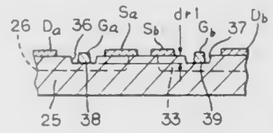
doping the exposed portions of the first and second regions of the active region to form a first source in the first region and a first drain in the second region whereby a first channel is formed between said doped portions of the first and second regions;
forming second sidewall spacers on the unetched portion of the first polysilicon layer to cover portions of the doped portions of the first and second regions adjacent to the first channel;
further doping the doped portions of the first and second regions which are not covered by the second sidewall spacers; and
doping two non-adjoining portions of the unetched portion of the second polysilicon layer to form therein a second source and a second drain whereby a second channel is formed therebetween;
whereby the first transistor is comprised of the first source and the first drain formed in the active region and a gate formed from a portion of the unetched portion of the first polysilicon layer which overlies the active region and the second transistor is comprised of the second source and second drain formed in the unetched portion of the second polysilicon layer and a gate formed from a portion of the unetched portion of the first polysilicon layer which is under the second channel formed in the unetched portion of the second polysilicon layer.

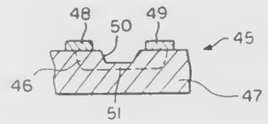
4,921,814

METHOD OF PRODUCING AN MMIC

Takahide Ishikawa, and Kazuhiko Nakahara, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 289,210
Claims priority, application Japan, Dec. 28, 1987, 62-335886
Int. Cl.[5] **H01L** *21/00, 21/02, 29/80, 27/08*
U.S. Cl. 437—47 **4 Claims**





1. A method of producing a plurality of MMIC's, each having a MESFET amplifier with a reproducible quiescent operating point from lot to lot under the same bias conditions, the method comprising the steps, for each MMIC, of:
selectively ion implanting impurities into a semi-insulative substrate to form a first doped region for a MESFET and a second doped region for a compensated resistor, the first doped region having source and drain regions connected by a channel, the second doped region having at least a diffusion channel,
producing spaced apart source and drain electrodes on the source and drain regions, producing electrodes at either end of the diffusion channel,
selectively etching a gate recess over the channel of the MESFET while simultaneously trimming the resistance of the compensated resistor by means of a recess etched over the channel thereof, thereby rendering the resistance of the compensated resistor a function of the depth of the gate recess of the MESFET,
forming a gate electrode in the gate recess of the MESFET, and
forming interconnections between said electrodes and other elements on the MMIC such that the MESFET is connected as the MESFET amplifier and the compensated resistor is connected as a compensated gate bias source for the amplifier MESFET, the compensated gate bias source having a resistance which varies inversely with the drain to source saturation current of the MESFET amplifier.

4,921,815

METHOD OF PRODUCING A SEMICONDUCTOR MEMORY DEVICE HAVING TRENCH CAPACITORS

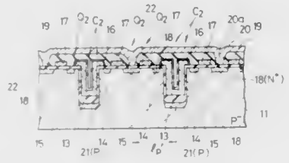
Hiroyuki Miyazawa, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 751,557, Jul. 3, 1985, abandoned. This application Jun. 8, 1988, Ser. No. 203,931
Claims priority, application Japan, Jul. 4, 1984, 59-137189
Int. Cl.[5] **H01L** *27/10, 29/78*
U.S. Cl. 437—52 **17 Claims**

1. A method of producing a semiconductor memory device equipped with memory cells, each memory cell comprising a series circuit of a capacitor and MISFET, so as to form a

plurality of said memory cells each having said series circuit, said method comprising:

a step of forming trenches on a main surface of a semiconductor substrate, each of said trenches having a bottom and at least two side walls on the sides of the bottom, and a step of forming element isolation regions to isolate those elements which are to be formed on said side walls, respectively, said element isolation regions being provided at the bottoms of the trenches and including thick oxide films, the steps of forming element isolation regions and of forming trenches including selectively forming said thick oxide films at the locations of the trenches, said thick oxide films forming the element isolation regions, and



forming an epitaxial semiconductor layer on the main surface of the substrate except on said thick oxide films, so as to form the trenches at the location of the thick oxide films; and

a step of forming insulating films on said side walls of said trench and conductive layers on said insulating films;

wherein each of said capacitors comprise a respective one of said side walls of a trench of said semiconductor substrate, said insulating film and said conductive layer, and said capacitors formed on respective side walls of a trench are isolated from each other by said element isolation regions at the bottom of the trenches and are used as the capacitors of different memory cells.

4,921,816

METHOD OF MAKING A TRENCH DRAM

Masayoshi Ino, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 108,795, Oct. 15, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 281,998

Claims priority, application Japan, Oct. 22, 1986, 61-249436

Int. Cl.[5] H01L *21/72, 21/285*

U.S. Cl. 437—52 **8 Claims**

1. A process for manufacturing a semiconductor memory device, comprising the steps of:

(a) providing a semiconductor substrate having a surface which includes a cell area for a plurality of memory cells, and a peripheral transistor area;

(b) forming a trench in a surface of the semiconductor substrate in the cell area, the trench having an inner wall including a side wall and a bottom wall and an edge where the side wall meets the surface of the semiconductor substrate, the trench for each memory cell being isolated from the trenches for other memory cells;

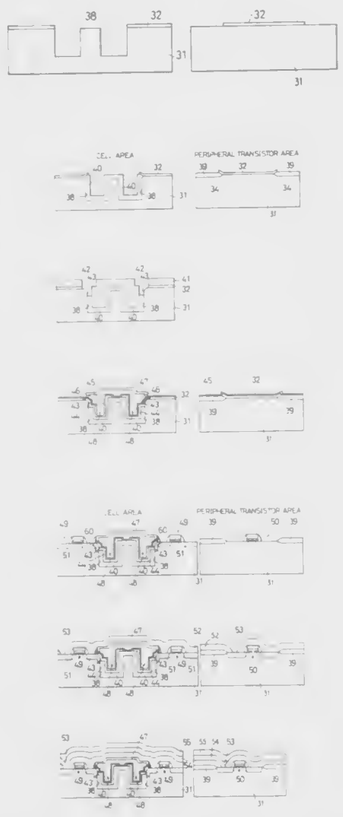
(c) partially oxidizing the surface of the semiconductor substrate to simultaneously form an inner wall oxide layer on the side wall and the bottom wall of the trench and an isolation oxide layer in the peripheral transistor area;

(d) removing the inner wall oxide layer from the side wall in the vicinity of the edge of the trench to expose the substrate forming the edge of the trench;

(e) forming a lower capacitor plate on the exposed substrate at the edge of the trench and on the inner wall oxide layer disposed on the side wall and the bottom wall of the trench, the part of the lower capacitor plate on the side wall and the part of the lower capacitor plate on the bottom wall being continuous with each other;

(f) forming a dielectric layer on the surface of the lower capacitor plate;

(g) forming an upper capacitor plate on the dielectric layer; and



(h) forming a cell transfer transistor having a source region and a drain region in the cell area adjacent to the trench and a peripheral transistor in the peripheral transistor area, such that the cell transfer transistor is in electrical contact with the lower capacitor plate on the exposed portion.

4,921,817

SUBSTRATE FOR HIGH-INTENSITY LED, AND METHOD OF EPITAXIALLY GROWING SAME

Masahiro Noguchi, Ushiku, Japan, assignor to Mitsubishi Monsanto Chemical Co., Tokyo and Mitsubishi Kasei Corp., Ushiku, both of, Japan

PCT No. PCT/JP88/00677, § 371 Date Mar. 8, 1989, § 102(e) Date Mar. 8, 1989, PCT Pub. No. WO89/00769, PCT Pub. Date Jan. 26, 1989

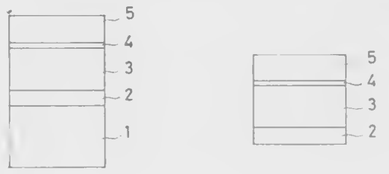
PCT Filed Jul. 6, 1988, Ser. No. 353,652

Claims priority, application Japan, Jul. 9, 1987, 62-171839

Int. Cl.[5] H01L *21/20*

U.S. Cl. 437—127 **4 Claims**

1. A method of epitaxially growing a substrate for a high-intensity LED, comprising a first step of forming a p-type $Al_xGa_{1-x}As$ layer ($x>0.3$) having a carrier concentration of more than 5×10^{17} cm^{-3} on a GaAs substrate to a thickness of 3-7 μm by gas-phase epitaxy, a second step of forming a hetero



structure epitaxial layer by liquid-phase epitaxy, and a third step of removing the GaAs substrate.

4,921,818

METHOD OF MAKING CERAMIC COMPOSITES

Harold D. Lesher, Wilmington; Christopher R. Kennedy, Newark, both of Del.; Danny R. White, Elkton, Md., and Andrew W. Urquhart, Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 70,006, Jul. 6, 1987, Pat. No. 4,847,220, which is a continuation-in-part of Ser. No. 908,473, Sep. 17, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 169,203

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] C04B *35/10*

U.S. Cl. 501—89 **8 Claims**

1. A method for producing a self-supporting ceramic composite comprising (1) an oxidation reaction product of a parent metal and an oxidant and (2) at least one filler material, said method comprising the steps of:

(a) orienting said parent metal and a permeable mass of said at least one filler material relative to each other so that formation of the oxidation reaction product will occur in a direction towards and into said mass of filler material, said filler material having a coating of a silicon source on at least a portion of said filler during formation of said oxidation reaction product, said coating (1) being different in composition from a primary composition of said filler, and (2) possessing intrinsic doping properties;

(b) heating said parent metal to a temperature above its melting point but below the melting point of the oxidation reaction product to form a body of molten parent metal;

(c) reacting the molten parent metal with an oxidant at said temperature to form said oxidation reaction product, and at said temperature maintaining at least a portion of said oxidation reaction product in contact with and between said body of molten metal and said oxidant, to progressively draw molten metal through the oxidation reaction product towards the oxidant and the filler material so that the oxidation reaction product continues to form within said filler at an interface between the oxidant and previously formed oxidation reaction product; and

(d) continuing said oxidation reaction for a time sufficient to infiltrate at least a portion of said mass of filler material with said oxidation reaction product to form said self-supporting ceramic composite which contains at least a portion of said silicon source.

4,921,819

HAFNIA MODIFIED ALUMINA FIBERS

Seshadri Ramachandran, Hockessin, Del., assignor to E. I. Dupont de Nemours and Company, Wilmington, Del.

Filed Sep. 24, 1987, Ser. No. 100,760

Int. Cl.[5] C03C *6/00*

U.S. Cl. 501—127 **13 Claims**

1. A polycrystalline ceramic shaped article or fiber of from 10 to 125 microns in diameter comprising 50 to 99 volume percent alpha-alumina and from 1 to 49 volume percent hafnia.

4,921,820

LIGHTWEIGHT PROPPANT FOR OIL AND GAS WELLS AND METHODS FOR MAKING AND USING SAME

David S. Rumpf, and Paul R. Lemieux, both of Ft. Smith, Ark., assignors to Norton-Alcoa Proppants, Fort Smith, Ark.

Filed Jan. 17, 1989, Ser. No. 297,876

Int. Cl.[5] C04B *35/10*

U.S. Cl. 501—128 **21 Claims**

1. A low density proppant comprising solid sintered ceramic pellets which prior to sintering consist essentially of a mixture of a kaolin clay and amorphous to microcrystalline silica, said clay being substantially free of quartz and, prior to sintering, having been maintained at a temperature low enough to prevent a phase transformation of said kaolin clay to mullite and crystobalite, said pellets having specific gravity of less than 2.70, such proppant having a conductivity of at least 3,000 md-ft after 50 hours at 8,000 psi and 275° F. in the presence of deoxygenated aqueous 2% solution of KCl as measured by the Stim-Lab Technique using sandstone shims.

4,921,821

LIGHTWEIGHT OIL AND GAS WELL PROPPANTS AND METHODS FOR MAKING AND USING SAME

David S. Rumpf, and Paul R. Lemieux, both of Ft. Smith, Ark., assignors to Norton-Alcoa Proppants, Fort Smith, Ark.

Continuation-in-part of Ser. No. 227,258, Aug. 2, 1988, abandoned. This application Jan. 17, 1989, Ser. No. 297,877

Int. Cl.[5] C04B *35/10*

U.S. Cl. 501—128 **23 Claims**

1. A method for making a low density, high strength proppant comprising the steps of:

pelletizing a comminuted powder consisting essentially of kaolin clay by simultaneously mixing and compacting said powder while adding water at a controlled rate and adding additional amounts of said powder while continuing said simultaneous mixing and compacting, to form pellets in a selected size range; and

drying and sintering said pellets to form proppant particles having a dry specific gravity of 3.0 or less.

4,921,822
CERAMIC COMPOSITE
Krishan L. Luthra, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Nov. 7, 1988, Ser. No. 267,879
Int. Cl.[5] C04B *35/02, 35/08*
U.S. Cl. 501—95 14 Claims

1. A composite comprised of coated ceramic oxide fibrous material and ceramic oxide matrix, said fibrous material and oxide matrix having a melting point or a softening point above 1100° C, said fibrous material being coated with a noble metal selected from the group consisting of platinum, iridium, rhodium, ruthenium and any combinations or alloys thereof, said composite having a porosity of less than about 30% by volume of the composite, said coated fibrous material comprising at least about 10% by volume of the solid portion of said composite, said oxide matrix comprising at least about 30% by volume of the solid portion of said composite.

4,921,823
POROUS ANODIC ALUMINIUM OXIDE MEMBRANE CATALYST SUPPORT
Robin C. Furneaux, Shenington; Alexander P. Davidson, Shipston-on-Stour, both of England, and Melville D. Ball, Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada
Continuation of Ser. No. 39,612, Apr. 16, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 304,921
Claims priority, application United Kingdom, Apr. 16, 1986, 8609249
Int. Cl.[5] B01J *21/04, 35/04*
U.S. Cl. 502—4 11 Claims

1. An inorganic membrane having first and second surfaces with pores extending through the membrane from one surface to the other, wherein a deposit of a catalytically active material is present within the pores, the deposit being concentrated in the ends of the pores adjacent one surface of the membrane.

4,921,824
METAL PASSIVATING CATALYST COMPOSITION FOR CRACKING HYDROCARBONS
Arthur A. Chin, Cherry Hill, and Michael S. Sarli, Haddonfield, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.
Filed Jun. 30, 1988, Ser. No. 213,802
Int. Cl.[5] B01J *21/00, 29/06*
U.S. Cl. 502—65 12 Claims

7. A composition suitable for use as a catalyst in a hydrocarbon cracking process comprising a cracking catalyst and separate and discrete particles comprising lanthanum oxide in a size and amount sufficient to significantly passivate metal contaminants on or in the catalyst during the cracking process.

11. The composition according to claim 7 wherein the lanthanum oxide is bound to a matrix that is inert with respect to cracking hydrocarbons.

12. The composition according to claim **11** wherein the matrix comprises a clay, silica, a metal oxide or mixtures thereof

4,921,825
SOLID CATALYST FOR OLEFIN POLYMERIZATION AND PROCESSES FOR ITS PRODUCTION
Mamoru Kioka, and Norio Kashiwa, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
PCT No. PCT/JP87/01047, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO88/05058, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 28, 1987, Ser. No. 245,399
Claims priority, application Japan, Dec. 30, 1986, 61-311286; Dec. 30, 1986, 61-311287
Int. Cl.[5] C08F *4/64*
U.S. Cl. 502—104 26 Claims

1. A process for forming a solid catalyst for olefin polymerization from an aluminoxane, a compound of a transition metal of Group IVB of the Periodic Table and a particulate organic or inorganic compound carrier, which comprises: at least a step comprising contacting a solution of said aluminoxane in a first solvent with a second solvent in which said aluminoxane is insoluble or sparingly soluble, in the presence of said particulate organic or inorganic compound carrier, to deposit said aluminoxane on said particulate organic or inorganic compound carrier.

4,921,826
PROCESS FOR PRODUCING AN ACTIVE CARBON CATALYST
Harald Jüntgen; Karl Knoblauch; Ekkehard Richter, and Helmut Kübl, all of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany
PCT No. PCT/EP87/00269, § 371 Date Dec. 7, 1988, § 102(e) Date Dec. 7, 1988, PCT Pub. No. WO87/07852, PCT Pub. Date Dec. 30, 1987
PCT Filed May 22, 1987, Ser. No. 294,490
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, 3620425
Int. Cl.[5] B01J *21/18;* B01D *53/36*
U.S. Cl. 502—180 2 Claims

1. A process for the production of an active carbon catalyst by ammonia treatment at high temperatures, comprising the steps of: impregnating the active carbon or the active coke with an aqueous solution of ammonium sulfate; drying the impregnated active carbon or active coke at 120° C.; and subsequently heating the dried impregnated active carbon or active coke to temperatures above 350° C. in an inert-gas stream, until no SO_2-development occurs.

4,921,827
SENSITIZED PHOTOINITIATOR SYSTEM FOR ADDITION POLYMERIZATION
Mohammad Z. Ali, Woodbury, and Stanley C. Busman, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 23, 1988, Ser. No. 275,515
Int. Cl.[5] C08F *4/00*
U.S. Cl. 502—167 17 Claims

1. A free radical photopolymerization initiator composition comprising
(a) an initiator having a reduction potential in the range 0.0 to −1.5 eV selected from the group consisting of photosensitive iodonium salts, sulfonium salts, and halomethylstriazines, and
(b) at least one merocyanine sensitizer containing a constrained alkylamino group.

4,921,828
ANTIMONY PROMOTED BISMUTH CERIUM MOLYBDATE CATALYSTS
James F. Brazdil, Mayfield Village; Linda C. Glaeser, Middleburg Hts., and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Continuation of Ser. No. 781,547, Sep. 10, 1985, abandoned, which is a continuation of Ser. No. 671,267, Nov. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 391,785, Jun. 24, 1982, abandoned. This application Jun. 24, 1988, Ser. No. 212,048
Int. Cl.[5] B01J *23/10, 23/18, 23/30*
U.S. Cl. 502—205 2 Claims

1. An antimony promoted bismuth cerium molybdate oxide catalyst free of Phosphorus having the formula:

$$A_aD_bSb_cBi_dCe_eW_fMo_gO_x$$

wherein
A is Fe, Mn, Pb, Co, Ni, Cu, Sn, U, or mixtures thereof,
D is Ge, As, B, Se, a Group IIA element or mixtures thereof, and
wherein
a is 0 to about 1,
b is 0 to 24,
a+b is greater than 0,
c is greater than 0 to 16,
d is 0.01 to 24,
e is 0.01 to 24,
d+e is 5 to 10,
a+b+c+d is 6 to 10,
d/e is 1/4 to 4/1,
f is 0 to 8,
g is 8 to 16,
f+g is 8 to 16, and
x is a number of oxygen atoms required to satisfy the valence requirements of the other elements.

4,921,829
CATALYST FOR PURIFING EXHAUST GASES
Masakuni Ozawa; Mareo Kimura, and Akio Isogai, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan
Filed Dec. 21, 1988, Ser. No. 287,019
Claims priority, application Japan, Dec. 22, 1987, 62-325048
Int. Cl.[5] B01J *21/06, 23/10, 23/58*
U.S. Cl. 502—302 9 Claims

1. A catalyst for purifying exhaust gases comprising:
(a) at least one heat resistant complex oxide selected from the group consisting of compounds represented by one of ABO_3, $LnAlO_3$ and $Ln_2B_2O_7$, wherein A represents at least one alkaline earth metal, B represents at least one of Ti, Zr and Hf, and Ln represents at least one rare earth metal;
(b) a perovskite complex oxide in an amount of from 1 to 80 wt.%, said perovskite complex oxide being represented by the general formula $Ln_{1-x}A_xMO_3$, wherein Ln represents at least one rare earth metal, A represents at least one alkaline earth metal and M represents at least one transition metal, and $0<x<1$; and
(c) at least one precious metal in an amount of from 0.01 to 2 wt.%.

4,921,830
CATALYST FOR THE OXIDATION OF CARBON MONOXIDE
John H. Kolts, Ochelata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 13, 1988, Ser. No. 181,021
Int. Cl.[5] B01J *21/06, 23/42, 23/44, 23/89*
U.S. Cl. 502—326 80 Claims

1. A composition of matter consisting essentially of (i) a support material consisting essentially of zirconia, (ii) at least one noble metal selected from the group consisting of platinum and palladium, and (iii) iron oxide;
wherein said composition of matter is active as a catalyst for the oxidation of carbon monoxide with free oxygen to carbon dioxide at a temperature of about 25°–30° C., and said composition of matter contains components (ii) and (iii) in such amounts that component (iii) is effective as compromoter for component (ii) on said support material in said oxidation at said temperature.

4,921,831
METHOD FOR PREPARING ACTIVE CARBONS
Masayuki Nakai; Takeshi Yoshida, and Katsumi Tomura, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan
Filed Oct. 19, 1988, Ser. No. 259,592
Claims priority, application Japan, Nov. 10, 1987, 62-282152
Int. Cl.[5] C01R *31/10, 31/02;* B01J *20/20*
U.S. Cl. 502—418 14 Claims



1. A method for preparing granular active carbon having a hardness of at least 90% based on a method of measurement designated as JIS K 1474, which comprises:
(a) a pulverization step of pulverizing a coal composition containing a coal consisting of a non-caking coal to form pulverized coal particles having an average particle size of not larger than 10 μm;
(b) a granulation step of granulating the resulting pulverized coal particles to form spherical coal granules having a particle size of not less than 0.1 mm and a maximum of 10 mm;
(c) a carbonization step of carbonizing the resulting coal granules; and
(d) an activation step of activating the resulting carbonized coal granules.

8. A method for preparing granular active carbon having a hardness of at least 90% based on a method of measurement designated as JIS K 1474, which comprises:
(a) a pulverization step of pulverizing a coal composition consisting of a non-caking coal and a caking coal whose content in the coal composition is not higher than 40% by weight to form pulverized coal particles having an average particle size of not larger than 10 μm;
(b) a granulation step of granulating the resulting pulverized coal particles to form spherical coal granules having a particle size of not less than 0.1 mm and a maximum of 10 mm;
(c) a carbonization step of carbonizing the resulting coal granules; and
(d) an activation step of activating the resulting carbonized coal granules.

4,921,832

DEVELOPER COMPOSITIONS HAVING REDUCED YELLOWING

Paul C. Adair, 8307 Bunnel Hill Rd., Springboro, Ohio 45066; Cheryl L. Moore, and Robert A. Landis, all c/o The Mead Corporation, Courthouse Plaza Northeast, Dayton, Ohio 45463

Filed Apr. 22, 1988, Ser. No. 184,735
Int. Cl.[5] B41M *5/22;* G03C *1/68, 5/54*
U.S. Cl. 503—201 18 Claims

10. A process for producing images which comprises imagewise exposing to actinic radiation an imaging sheet including a support having a layer of microcapsules on the surface thereof, said microcapsules including a photohardenable or photosoftenable photosensitive composition as the internal phase and having a color precursor material associates therewith;

subjecting said imaging sheet to a uniform rupturing force such that said microcapsules rupture and release said internal phase in accordance with said imagewise exposure;

contacting said imaging sheet with a developer sheet including a support having a layer on the surface of said support of a finely divided thermoplastic phenolic developer material and an anti-yellowing agent comprising an optical brightener, said developer material being capable of reacting with said color precursor to produce a visible image and said developer material forming an essentially transparent film upon the application of heat, said contacting being conducted at the same time or immediately after subjecting said imaging sheet to said rupturing force; and

fusing said developer material to form an essentially transparent film.

4,921,833

SUPERCONDUCTING MEMBER

Satoshi Takano, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 25, 1988, Ser. No. 198,261
Claims priority, application Japan, May 26, 1987, 62-128587
Int. Cl.[5] B32B *3/02*
U.S. Cl. 505—1 16 Claims



1. A superconducting member comprising:

a substrate of a base material having a major surface;

a first film, including at least a single layer between 0.02 μm and 2 μm thick of a ceramic material which is non-water-soluble and which does not absorb water, formed on said major surface of said substrate; and

a second film containing an oxide superconductor formed on said first film.

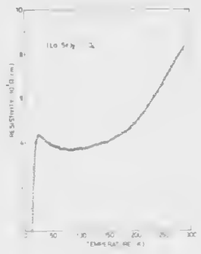
4,921,834

FLUX METHOD OF GROWING OXIDE SUPERCONDUCTORS

Haruhiro Hasegawa, Kokubunji; Ushio Kawabe, Tokyo; Yoshinobu Tarutani, Yamanashi; Tokuumi Fukazawa, Tachikawa; Toshiyuki Aida, Chofu, and Kazumasa Takagi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,557
Claims priority, application Japan, Jan. 30, 1987, 62-18392; Feb. 27, 1987, 62-42559; Mar. 20, 1987, 62-63782; Apr. 8, 1987, 62-84740
Int. Cl.[5] C30B *9/06;* C01F *17/00*
U.S. Cl. 505—1 11 Claims

1. A process for preparing an oxide-superconductor which comprises preparing a starting material composed of at least one member selected from among a polycrystal of an La-M-Cu oxide system or a Y-M-Cu oxide system (wherein M is Sr, Ba or Ca) which is a composite oxide of a K_2NiF_4 crystalline structure or a perovskite-like crystalline structure having a copper ion in the body center of the oxygen octahedron and a mixture having a stoichiometric composition ratio similar to that of the constituent elements of said composite oxide and a flux comprised of CuO having a melting point lower than that



of said composite oxide, dissolving said starting material in said flux while maintaining the dissolution temperature at a value which is lower than the melting point of said composite oxide and causes said composite oxide to be dissolved in said flux, and growing a single crystal of said composite oxide from the resulting saturated flux solution which have been prepared by dissolution of said starting material.

4,921,835

METHOD OF TREATING ASTHMA

Geoffrey Allan; John J. Adcock, and Terence W. Smith, all of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 95,817, Sep. 11, 1987, Pat. No. 4,833,126. This application Mar. 7, 1989, Ser. No. 319,972
Claims priority, application United Kingdom, Sep. 12, 1986, 8622090
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] A61K *37/02;* C07K *5/08*
U.S. Cl. 514—18 7 Claims

1. A method of treating asthma in a human being suffering from same, which comprises administering to said human being a non-toxic, antiasthmatic amount of the peptide



or a pharmacologically acceptable salt thereof.

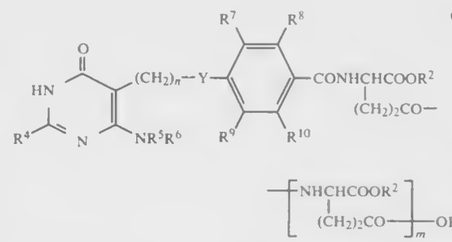
4,921,836

SUBSTITUTED GLUTAMIC ACIDS

Eric C. Bigham, Chapel Hill, and Stephen J. Hodson, Durham, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 17, 1989, Ser. No. 354,633
Int. Cl.[5] C07D *239/48;* A61K *37/02, 31/505;* C07K *5/02*
U.S. Cl. 514—19 11 Claims

1. A compound of formula (I):



wherein

Y is sulfur; R^2 and R^3 are the same or different and are hydrogen or C_{1-4} alkyl; R^4 is $NR^{11}R^{12}$; R^{11}, R^{12}, R^5 and R^6 are the same or different and are hydrogen, C_{1-4} alkyl or C_{1-6} acyl; R^7, R^8, R^9 and R^{10} are the same or different and are hydrogen, halo, C_{1-4} haloalkyl, C_{1-4} alkyl and C_{1-4} alkoxy; and n is 2, 3, 4 or 5; m is 0 or an integer from 1 to 5; or a salt thereof.

10. A pharmaceutical formulation which comprises a compound according to claim 1 or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier therefor.

4,921,837

TREATMENT OF AIDS-TYPE DISEASE

Robert E. Donahue, Littleton, Mass., assignor to Genetics Institute Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 802,553, Nov. 27, 1985, abandoned. This application Jul. 24, 1987, Ser. No. 81,489
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—2 1 Claim

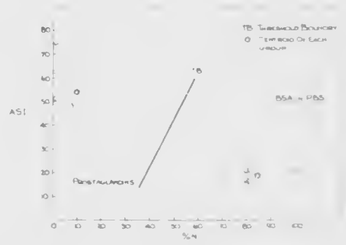
1. In the method of treating a patient suffering from AIDS or ARC by administering 3'-azido-3'-deoxythymidine, the improvement to obtain a higher therapeutic ratio comprising co-administering an effective amount of GM-CSF to said patient.

4,921,838

ANGIOGENIC AND BLOOD PERFUSION INDUCING PROPERTIES OF AMPHIPHILIC COMPOUNDS

Nicholas Catsimpoolas; Ann L. Griffith, both of Newton Centre, Mass., and Robert S. Sinn, New York, N.Y., assignors to Trustees of Boston University, Boston, Mass. and Angio-Medical Corp., New York, N.Y.

Filed Jun. 16, 1987, Ser. No. 62,962
Int. Cl.[5] A61K *31/70;* A01N *43/04, 57/00;* C07J *00/00*
U.S. Cl. 514—25 8 Claims



1. Method for enhancing angiogenesis or vascular perfusion in a mammal comprising:

administering an amount of at least one angiogenically active non-ionic amphiphilic compound selected from the group consisting of digitonin, n-octylglucoside, polyoxyethylene p't'octyl phenol, polyoxyethylene alcohol, n-dodecyl glucoside and dodecyl-beta-D-maltoside to a mammal in need of enhanced angiogenesis or vascular perfusion in an amount sufficient to enhance angiogenesis or vascular perfusion.

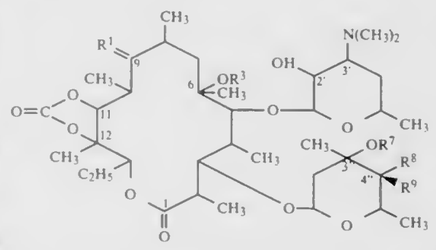
4,921,839

ERYTHROMYCIN A 11,12-CARBONATE 9-OXIME DERIVATIVES

Edward G. Brain; Eric Hunt, and Andrew K. Forrest, all of Betchworth, England, assignors to Beecham Group p.l.c., England

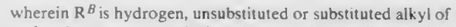
Filed Feb. 22, 1988, Ser. No. 158,543
Claims priority, application United Kingdom, Feb. 24, 1987, 8704212; Mar. 11, 1987, 8705794; Aug. 25, 1987, 8719990
Int. Cl.[5] A61K *31/70;* C07H *17/08*
U.S. Cl. 514—29 6 Claims

5. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof an antibacterially effective amount of a compound of the formula I,



I

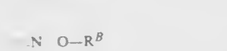
a pharmaceutically acceptable ester thereof or a pharmaceutically acceptable acid addition salt thereof wherein R^1 is unsubstituted or substituted oxime of the formula II



wherein R^B is hydrogen, unsubstituted or substituted alkyl of 1 to 6 carbon atoms, unsubstituted or substituted alkenyl of 2 to 6 carbon atoms, unsubstituted or substituted alkynyl of 2 to 6 carbon atoms, unsubstituted or substituted cycloalkyl of 3 to 7 carbon atoms, unsubstituted or substituted aryl, unsubstituted or substituted cycloalkyl alkyl of 3 to 7 carbon atoms in the cycloalkyl moiety and 1 to 6 carbon atoms in the alkyl moiety, unsubstituted or substituted arylalkyl of 1 to 6 carbon atoms in the alkyl moiety, unsubstituted or substituted alkylcycloalkyl of 1 to 6 carbon atoms in the alkyl moiety and 3 to 7 carbon atoms in the cycloalkyl moiety or unsubstituted or substituted alkylaryl of 1 to 6 carbon atoms in the alkyl moiety wherein the aryl moiety is phenyl or naphthyl and wherein the substituents are selected from the group consisting of heterocyclyl, amino, mono-, di- or tri- alkyl amino of 1 to 6 carbon atoms in each alkyl moiety, alkanoyl amino of 1 to 6 carbon atoms in the alkyl moiety, hydroxy, alkoxy of 1 to 6 carbon atoms, alkoxyalkoxy of 1 to 6 carbon atoms in each alkoxy moiety, alkenyloxy of 2 to 6 carbon atoms, alkynyloxy of 2 to 6 carbon atoms, aryloxy wherein aryl is as above defined, aralkyloxy wherein the aryl moiety is as above defined and the alkyl moiety is of 1 to 6 carbon atoms, mercapto, alkylthio of 1 to 6 carbon atoms, alkenylthio of 2 to 6 carbon atoms, alkynylthio of 2 to 6 carbon atoms, arylthio wherein aryl is as above defined, aralkylthio wherein the aryl moiety is above defined and the alkyl moiety is of 1 to 6 carbon atoms, heterocyclylthio, sulphamoyl, carbamoyl, amidino, guanidino, nitro, oxo, formyl, chloro, bromo, fluoro, cyano, thiocyanato, carboxy, a carboxyl salt, a carboxyl ester, alkanoyloxy of 1 to 6 carbon atoms, acyl, arylcarbonyloxy wherein aryl is as above defined, and heterocyclylcarbonyloxy, or R^B is acyl; or R^1 is imino;

R^3 is hydrogen or alkyl of 1 to 6 carbon atoms unsubstituted or substituted by heterocyclyl, amino, mono-, di- or tri-alkyl amino of 1 to 6 carbon atoms in each alkyl moiety, alkanoyl amino of 1 to 6 carbon atoms in the alkyl moiety, hydroxy, alkoxy of 1 to 6 carbon atoms, alkoxyalkoxy of 1 to 6 carbon atoms in each alkoxy moiety, alkenyloxy of 2 to 6 carbon atoms, alkynyloxy of 2 to 6 carbon atoms, aryloxy wherein aryl is as above defined, aralkyloxy wherein the aryl moiety is as above defined and the alkyl moiety is of 1 to 6 carbon atoms, mercapto, alkylithio of 1 to 6 carbon atoms, alkenylthio of 2 to 6 carbon atoms, alkynylthio of 2 to 6 carbon atoms, arylthio wherein aryl is as above defined, aralkylthio wherein the aryl moiety is above defined and the alkyl moiety is of 1 to 6 carbon atoms, heterocyclylthio, sulphamoyl, carbamoyl, amidino, guanidino, nitro, oxo, formyl, chloro, bromo, fluoro, cyano, thiocyanato, carboxy, a carboxyl salt, a carboxyl ester, alkanoyloxy of 1 to 6 carbon atoms, acyl, arylcarbonyloxy wherein aryl is as above define, and heterocyclylcarbonyloxy; R^7 is hydrogen or methyl; one of R^8 and R^9 is hydrogen, hydroxy, alkoxy of 1 to 6 carbon atoms, alkanoyloxy of 1 to 6 carbon atoms, amino or R^A—SO_2—O—wherein R^A is unsubstituted or substituted alkyl of 1 to 6 carbon atoms, unsubstituted or substituted alkenyl of 2 to 6 carbon atoms, unsubstituted or substituted aryl wherein aryl is as above defined, unsubstituted or substituted aralkyl wherein aryl is as above defined and the alkyl moiety is of 1 to 6 carbon atoms, unsubstituted or substituted aryloxyalkyl of 1 to 6 carbon atoms in the alkyl moiety wherein aryl is as above defined and wherein the substituent is selected from the group consisting of heterocyclyl, amino, mono-, di- or tri- alkyl amino of 1 to 6 carbon atoms in each alkyl moiety, alkanoyl amino of 1 to 6 carbon atoms in the alkyl moiety, hydroxy, alkoxy of 1 to 6 carbon atoms, alkoxyalkoxy of 1 to 6 carbon atoms in each alkoxy moiety, alkenyloxy of 2 to 6 carbon atoms, alkynyloxy of 2 to 6 carbon atoms, aryloxy as above defined, aralkyloxy wherein the aryl moiety is as above defined and the alkyl moiety is of 1 to 6 carbon atoms, mercapto, alkylthio of 1 to 6 carbon atoms, alkenylthio of 2 to 6 carbon atoms, alkynylthio of 2 to 6 carbon atoms, arylthio wherein aryl is as above defined, aralkylthio wherein the aryl moiety is above defined and the alkyl moiety is of 1 to 6 carbon atoms, heterocyclylthio, sulphamoyl, carbamoyl, amidino, guanidino, nitro, oxo, formyl, chloro, bromo, fluoro, cyano, thiocyanato, carboxy, a carboxyl salt, a carboxyl ester, alkanoyloxy of 1 to 6 carbon atoms, acyl, arylcarbonyloxy wherein aryl is as above defined, and heterocyclylcarbonyloxy; or R^A is R^G—CH_2—CH_2—SO_2—O—wherein R^G is amino, carbamoyl, sulphamoyl, ureido, thioureido, alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, aryloxy wherein the aryl moiety is as above defined, arylthio wherein the aryl moiety is as above defined, or benzyloxy, and the other of R^8 and R^9 is hydrogen, or

R^8 and R^9 together are oxo, oxime, or substituted oxime of the formula II



II

wherein R^B is as above defined, in combination with a pharmaceutically acceptable carrier.

4,921,840

METHOD FOR THE PREPARATION OF LOW MOLECULAR WEIGHT ALKALI METAL HUMINATES

Bernhard Seubert, Edingen-Neckarhausen; Helmut Beilharz, Schriesheim; Werner Fickert, Mannheim; Gunter Jeromin, Heidelberg, and Ulrich Spitaler, Freinsheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,802

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707910

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—33 13 Claims

1. A method of preparing low molecular weight alkali metal huminates wherein a reaction mixture comprising multi-valent phenols in a weak alkali metal aqueous medium are oxidized at a pH range from 8.8 to 9 and at a temperature ranging from 15° to 40° C., said reaction mixture is adjusted to a pH value ranging from 6.2 to 7.2 and/or buffered, the low molecular weight alkali metal huminates are purified, and undesirable by-products are separated therefrom.

4,921,841

IMMUNOAFFINITY PURIFICATION OF PHYTOLACCIN PROTEINS AND THEIR USE IN TREATING HERPES SIMPLEX VIRUS TYPE II

Thomas G. Obrig, 23 Burhans Pl., Delmar, N.Y. 12054

Division of Ser. No. 449,769, Dec. 14, 1982, Pat. No. 4,672,053. This application Nov. 13, 1986, Ser. No. 929,878

Int. Cl.[5] A61K *37/48, 37/00*

U.S. Cl. 514—8 11 Claims

1. An antiherpetic composition for the treatment of systematic Herpes Simplex Virus type II infection in mammals, comprising as an active ingredient, a therapeutically effective amount of phytolaccin protein, or fragment thereof, and a pharmaceutical carrier that is suitable for administration in vivo.

4,921,842

PROCESS FOR THE PRODUCTION OF AQUEOUS POLYURETHANE DISPERSIONS

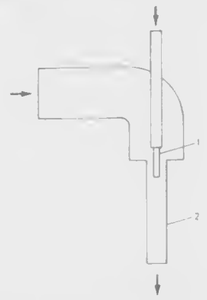
Wolfgang Henning, Kuerten; Harald Petersen, Dormagen, and Gerhard Moormann, Rommerskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengessellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 230,278

Claims priority, application Fed. Rep. of Germany, Aug. 15, 1987, 3727252

Int. Cl.[5] C08L *75/04*

U.S. Cl. 524—839 18 Claims



1. A process for the continuous production of an aqueous polyurethane dispersion from

(a) a first stream comprising a polyisocyanate reaction product prepared by the reaction of a polyisocyanate with a compound having a molecular weight of 400 to about 10,000 and containing at least two isocyanate-reactive groups and

(b) a second stream comprising water which comprises

(c) compressing one of the two streams to a pressure of about 20 to 500 bar and expanding said stream through a nozzle which is coaxially arranged in a short residence time mixing tube,

(d) introducing the other component directly into the short residence time mixing tube and

(e) mixing the two streams in the short residence time mixing tube.

4,921,843

CONTRACEPTION SYSTEM AND METHOD

Samuel A. Pasquale, 5 Normandy Ct., Basking Ridge, N.J. 07920

Filed Oct. 20, 1988, Ser. No. 260,447

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—170 28 Claims

1. A method of contraception comprising:

(a) administering to a human female of child-bearing age, daily from about Day 2 to about Day 7 of her menstrual cycle, wherein Day 1 is the first day of menses, a first composition containing as sole contraceptively active ingredient an estrogenic compound at a daily dosage equivalent in estrogenic activity in the range of about 0.01 to about 0.04 milligrams of 17-alpha-ethinyl estradiol; and thereafter

(b) administering to said female, daily through Day 28 of her menstrual cycle, at least one follow-up composition containing a contraceptively effective daily dosage of a progestin.

4,921,844

FUNGICIDAL COMPOSITIONS AND METHOD

Janet C. Onishi, Mountainside, and Arthur A. Patchett, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1988, Ser. No. 182,601

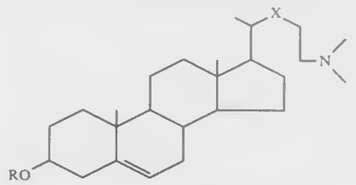
The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.

Int. Cl.[5] A61K *31/56, 31/335*

U.S. Cl. 514—171 5 Claims

1. A fungicidal composition comprising

(1) a 25-azasterol compound having the formula



wherein R is hydrogen or lower acyl, X is CH, CH_2 or O; and the on the side chain indicates that the bond may be a single or a double bond provided that when X is O, or CH_2, it is a single bond; and

(2) a β-ketothiolase inhibitor compound in admixture with a pharmaceutically acceptable carrier.

4,921,845

11-ARYLSTEROID COMPOUNDS

Heodrick Paul de Jongh, Hw Oss, and Nicolaas P. van Vliet, Rhenen, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

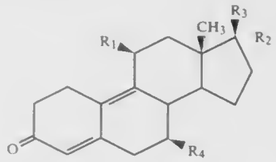
Filed Dec. 8, 1988, Ser. No. 281,582

Claims priority, application Netherlands, Dec. 12, 1987, 8703008

Int. Cl.[5] A61K *31/58, 31/585, 31/56;* C07J *1/00*

U.S. Cl. 514—172 11 Claims

1. An 11-Arylsteroid, characterized in that said steroid have the following structure:



in which

R_1 is an aryl group with a



group as substituent, X and Y each being separately H or a (1–4 C) hydrocarbyl group or together a (2–6 C) hydrocarbyl group which forms a 3- to 7-membered ring together with the nitrogen atom;

R_2 is hydrogen, hydroxyl, an acyloxy or an alkoxy group or a saturated or unsaturated hydrocarbyl group containing 1–8 carbon atoms, which hydrocarbyl group is provided with at least one hydroxyl, oxo, azido, cyano or halogen group,

R_3 is hydroxyl, an acyloxy or an alkoxy group or an acyl group optionally substituted by a hydroxyl alkoxy, acyloxy or halogen group; or R_2 and R_3 together form a ring system, with the proviso that if R_3 is hydroxyl, R_2 is not hydrogen or hydroxyl; and

R_4 is a methyl or ethyl group;

and the α- and β-bonds are indicated by dashed ( ) and wedged ( ) lines respectively.

4,921,846

NOVEL 17-HETERO SUBSTITUTED STEROIDS

Lucien Nedelec, Le Raincy; André Claussner, Villemomble; Daniel Philibert, La Varenne Saint-Hilaire, and Martine Moguilewsky, Paris, all of France, assignors to Roussel Uclaf, Paris, France

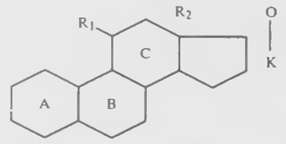
Filed Sep. 16, 1988, Ser. No. 245,750

Claims priority, application France, Sep. 18, 1987, 87 12937

Int. Cl.[5] A61K *31/58;* C07J *71/00*

U.S. Cl. 514—173 22 Claims

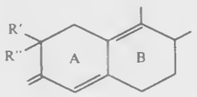
1. A compound of the formula



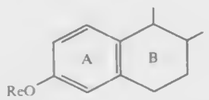
I

wherein R_1 is selected from the group consisting of phenyl, benzyl, thienyl, furyl, isothienyl, isofuryl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thiadiazolyl, pyridinyl and piperidinyl unsubstituted or substituted with at least one member of the

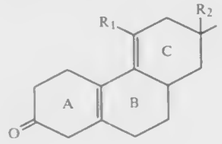
group consisting of (a) haloalkyl, alkyl and alkoxy of 1 to 8 carbon atoms, alkenyloxy of 2 to 8 carbon atoms, all unsubstituted or substituted with at least one halogen, (b) —OH, (c) $—CF_3$ (d) acyl of 1 to 6 carbon atoms, (e) carboxy, (f) esterified carboxy, (g) alkylthio and oxidized alkylthio of 1 to 8 carbon atoms, (h) $—NH_2$, (i) mono- and dialkylamino of 1 to 8 carbon atoms and oxidized amino mono- or dialkylamino, (j) morpholino, (k) piperidino, (l) piperazino, (m) dimethylaminomethyl dimethylaminomethyl, dimethylamino ethyl and dimethylamino ethoxy and (n) trimethylsilyl or N-methyl-2,3-dihydro-1H-indol-5-yl, R_2 is a hydrocarbon of 1 to 8 carbon atoms in the α- or β-position, the wavy line of the spiro ether indicates the oxygen is α- or β-, X is selected from the group consisting of $—CH=CH—CH_2—CH_2—$ and $—(CH_2)_n$, n is 1, 2 or 4, the rings have a structure selected from the group consisting of



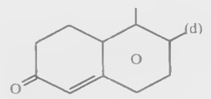
(a)



(b)

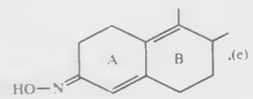


(c)



(d)

and



(e)

R' and R'' are individually hydrogen or alkyl of 1 to 4 carbon atoms, R_e is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and acyl, and non-toxic,k pharmaceutically acceptable acid addition salts of said compound.

4,921,847

TRIHALO(AMINE)GOLD(III) ANTI-TUMOR COMPLEXES

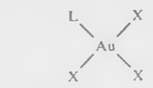
Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 198,656, May 23, 1988, abandoned, which is a continuation of Ser. No. 726,453, Apr. 24, 1985, abandoned, which is a continuation of Ser. No. 392,820, Jun. 28, 1982, abandoned. This application Feb. 27, 1989, Ser. No. 316,555

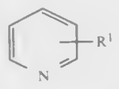
Int. Cl.[5] **A61K** *31/21;* **C07F** *1/12*

U.S. Cl. 514—188 **13 Claims**

1. A compound having the formula:



wherein Au is gold in its trivalent state; L is a substituted pyridine of the formula:

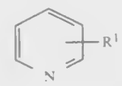


wherein R^1 is selected from the group consisting of C_{1-6} alkyl, carboxy, C_{2-6} alkanoyl, $-C_nH_{2n}$ COOH wherein n is 1 to 6, hydroxy, carbinol and C_{1-6} alkoxy; and wherein X is chlorine or bromine with the proviso that when L represents 3-pyridylacetic acid X is chlorine.

10. A pharmaceutical composition comprising a compound of the formula:



wherein Au represents gold in its trivalent state; L is a pyridine of the formula:



wherein R^1 is selected from the group consisting of hydrogen, C_{1-6} alkyl, carboxy, C_{2-6} alkanoyl, carbinol,$—C_nH_{2n}$ COOH wherein n is 1 to 6, hydroxy, and C_{1-6} alkoxy; and wherein X is chlorine or bromine, with the proviso that when L represents 3-pyridylacetic acid, X is chlorine; in combination with a non-toxic pharmaceutically acceptable inert carrier or diluent.

4,921,848

BILIARY ACID DERIVATIVES, PROCESSES FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Giuliano Frigerio, Milan; Roberto Pellicciari, Perugia, and Aldo Roda, Bologna, all of Italy, assignors to Gipharmex S.P.A., Milan, Italy

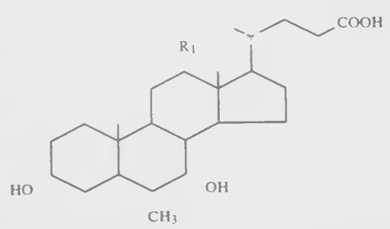
Filed Oct. 19, 1988, Ser. No. 259,870

Claims priority, application Italy, Oct. 20, 1987, 22343 A/87

Int. Cl.[5] **A61K** *31/56;* **C07J** *1/00*

U.S. Cl. 514—182 **5 Claims**

3. A compound of formula 1



(1)

wherein R_1 is hydrogen or hydroxy, and the methyl and hydroxy groups in the 6- and 7-positions respectively are either in α or β configuration.

4,921,849

INJECTION CONTAINING 3-BENZOYLOXY-1,3,5(10)-ESTRATRIENE-17-[4-{P-(BIS(2-CHLOROETHYL)AMINO)PHENYL} BUTANOYLOXY)ACETATE AS AN ACTIVE INGREDIENT

Kiro Asano, Kukizaki; Satoshi Mitsuhashi, Hino; Kenji Bannai, Toda; Hisayuki Wada, Abiko, and Humio Tamura, Kukizaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,596

Claims priority, application Japan, Jul. 22, 1987, 62-182842

Int. Cl.[5] **A61K** *31/56*

U.S. Cl. 514—182 **6 Claims**

1. An injectable compositiin prepared by dissolving 0.1 to 10% by weight of 3-benzoyloxy-1,3,5(10)-estratriene-17-[4-{p-(bis(2-chloroethyl)amino)phenyl}butanoyloxy]acetate as an active ingredient in an ester of iodinated poppy oil fatty acid.

4,921,850

3-PROPENYLCEPHEM DERIVATIVE

Takashi Kamiya; Toshihiko Naito; Shigeto Negi; Yuuki Komatu; Yasunobu Kai, all of Ibaraki; Takaharu Nakamura, Chiba; Isao Sugiyama, Ibaraki; Yoshimasa Machida, Ibaraki; Seiichiro Nomoto, Ibaraki; Kyosuke Kitoh, Ibaraki; Kanemasa Katsu, Ibaraki, and Hiroshi Yamauchi, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

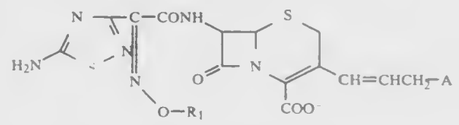
Filed Oct. 13, 1987, Ser. No. 107,631

Claims priority, application Japan, Oct. 13, 1986, 61-241480; Nov. 6, 1986, 61-262799; Dec. 10, 1986, 61-292574; Feb. 3, 1987, 62-21866; Sep. 3, 1987, 62-219230; Sep. 7, 1987, 62-222147

Int. Cl.[5] **C07D** *501/24;* **A61K** *31/545*

U.S. Cl. 514—202 **11 Claims**

1. A 3-propenylcephem derivative of the formula

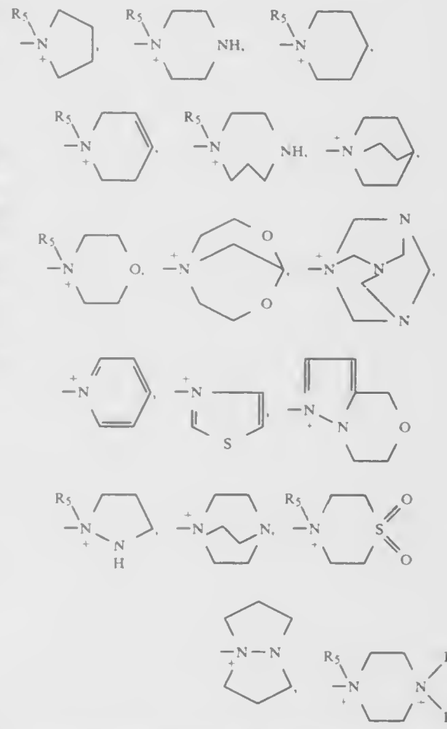


wherein R_1 represents monofluoromethyl, and A represents (1) an acylic ammonio group of the formula:



wherein R_2, R_3 and R_4 are the same or different and are individually a member selected from the group consisting of lower alkyl, hydroxyl-substituted lower alkyl, carbamoyl-substituted lower alkyl, cyano-substituted lower alkyl, amino, (lower alkyl)carbonylamino-substituted lower alkyl, aminosulfonylaminocarbonyl-substituted lower alkyl, (lower alkyl)sulfonylaminocarbonyl-substituted lower alkyl, (lower alkyl)amino-carbonyl-substituted lower alkyl, hydroxyl-and carbamoyl-substituted lower alkyl, hydroxyl- and hydroxy(lower alkyl)aminocarbonyl-substituted lower alkyl, (lower alkyloxy)aminocarbonyl-substituted lower alkyl, hydroxyaminocarbonyl-substituted lower alkyl, carbamoyl(lower alkyl)aminocarbonyl-substituted lower alkyl, hydroxy(lower alkyl)aminocarbonyl-substituted lower alkyl, (lower alkyl)amino-substituted lower alkyl, carboxylate(lower alkyl)di(lower alkyl)ammonio-substituted lower alkyl, di-(lower alkyl)amino- and hydroxyl-substituted lower alkyl, ureido, hydroxyl, carboxyl-substituted lower alkyl, hydroxyl- and carbamoyl-substituted lower alkyl, lower alkyloxy-substituted lower alkyl, di(lower alkyl-)aminocarbonyl-substituted lower alkyl, dicarbamoyl-substituted lower alkyl, bis[hydroxy(lower alkyl]aminocarbonyl-substituted lower alkyl, dihydroxy-substituted lower alkyl, trihydroxyl-substituted lower alkyl, bis[hydroxy(-lower alkyl)amino-substituted lower alkyl, amino-substituted lower alkyl, oxo-substituted lower alkyl, di-lower alkylamino-substituted lower alkyl, 5-membered heterocycle-substituted lower alkyl wherein said heterocycle stands for pyrazolyl, imidazolyl, oxadiazolyl or tetrazolyl, or

(2) A represents a cyclic ammonio group of one of the following formulas:



wherein R_5 is a member selected from the group consisting of lower alkyl, carbamoyl-substituted lower alkyl, amino-substituted lower alkyl, hydroxyl-substituted lower alkyl, carboxyl-substituted lower alkyl, cyano-substituted lower alkyl, dihydroxyl-substituted lower alkyl and ureido-substituted lower alkyl groups,

said cyclic ammonio group optionally containing on the ring thereof one or more substituents selected from hydroxy-substituted lower alkyl, hydroxyl, formyl, sulfonic, carboxyl-substituted lower alkyl, carbamoyl, sulfamoyl, carboxyl, hydroxyimino-substituted lower alkyl, imino-substituted lower alkyl, bis[hydroxy(lower alkyl)]aminocarbonyl, hydroxy(lower alkyl)aminocarbonyl, amino, morpholinocarbonyl, carboxy(-lower alkyloxy)-substituted lower alkyl, carboxy lower alkylthio, and lower alkyl groups, or a pharmaceutically acceptable salt thereof.

4,921,851

CEPHEM COMPOUNDS, THEIR PRODUCTION AND USE

Shoji Kishimoto, Hyogo; Kiminori Tomimatsu, Osaka; Akio Miyake, Osaka, and Yoshinobu Yoshimura, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

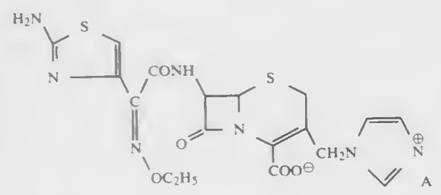
Continuation of Ser. No. 309,952, Feb. 9, 1989, abandoned, which is a continuation of Ser. No. 59,952, Jun. 9, 1987, abandoned. This application Aug. 22, 1989, Ser. No. 396,758

Claims priority, application Japan, Jun. 9, 1986, 61-133134; Jul. 10, 1986, 61-162610; Aug. 22, 1986, 61-197961; May 28, 1987, 62-132971

Int. Cl.[5] A61K *31/545*; C07D *501/46*

U.S. Cl. 514—203 8 Claims

1. A compound of the formula:



wherein ring A is a pyridine or pyridazine ring which is substituted at the ring constituting carbon atom by a group of the formula

$$-E-(CH_2)_2-NH_2$$

in which E is sulfur or NH, or a pharmaceutically acceptable salt thereof.

4,921,852

3-PYRROLIDINYLTHIO-1-AZABICYCLO[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID COMPOUNDS

Masayoshi Murata, Osaka; Hideo Tsutsumi, Toyonaka; Keiji Matsuda, Takatsuki; Kohji Hattori, Sakai, and Takashi Nakajima, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

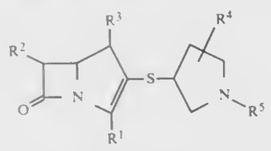
Filed Nov. 24, 1987, Ser. No. 124,603

Claims priority, application United Kingdom, Nov. 24, 1986, 8628060; Jul. 6, 1987, 8715825

Int. Cl.[5] C07D *487/04*; A61K *31/40*

U.S. Cl. 514—210 12 Claims

1. A compound of the formula:



in which

R^1 is carboxy or protected carboxy,

R^2 is hydroxy(lower)alkyl or protected hydroxy(lower)alkyl,

R^3 is hydrogen or lower alkyl,

R^4 is pyrrolyl, pyrrolinyl, imidazolyl, imidazolinyl, pyrazolyl, pyrazolinyl, pyridyl, pyridyl N-oxide, pyridinio, dihydropyridyl, tetrahydropyridyl, pyrimidinyl, pyrimidinio, pyrazinyl, pyrazinio, pyridazinyl, pyridazinio, triazinyl, tetrahydrotriazinyl, triazinio, triazolyl, triazolio, tetrazinyl, tetrazinio, tetrazolyl, tetrazolio, thiazolyl, thiazolio, isothiazolyl, thiadiazolyl, thiadizolio, thiazolinyl, dihydrothiazinyl, oxadiazolyl, dioxolanyl, dioxanyl, dithiolanyl, or dithianyl, each of which is unsubstituted or substituted by one to three substitutent(s) selected from the group consisting of amino, protected amino, lower alkylamino, ureido(lower)alkyl), carbamoyl, lower alkyl, amino(lower)alkyl, protected amino(lower)alkyl, hydroxy(lower)alkyl, protected hydroxy(lower)alkyl, azido(lower)alkyl, halo(lower)alkyl and imino-protective group, and

R^5 is hydrogen or imino-protected group, and pharmaceutically acceptable salts thereof.

4,921,853

METHOD FOR PRODUCING ANALGESIA IN MAMMALS

Patrick H. LeBlanc, Okemos, Mich., assignor to Michigan State University, East Lansing, Mich.

Filed Nov. 14, 1988, Ser. No. 271,128

Int. Cl.[6] A61K *31/54*

U.S. Cl. 514—227.2 12 Claims

1. A method for achieving analgesia in a mammal comprising injecting an effective dose of xylazine in the caudal epidural space of the mammal or in the subarachnoid space of the mammal.

4,921,854

CONDENSED THIAZOLOPYRIMIDINE, PYRIMIDO-THIAZINE OR THIAZEPINE PYRIMIDINE COMPOUNDS

Dániel Bózsing; Györgyi née Lax Koványi; Edit née Poldermann Berényi; Károly Magyar; Sándor Tuboly, and Atti la Mándi, all of Budapest, Hungary, assignors to Egis Gyogyszergyar, Budapest, Hungary

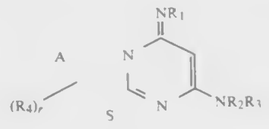
Filed Dec. 22, 1987, Ser. No. 136,420

Claims priority, application Hungary, Dec. 30, 1986, 5512/86; Dec. 30, 1986, 5514/86

Int. Cl.[5] A61K *31/54*; C07D *513/06*

U.S. Cl. 514—224.2 13 Claims

1. A condensed pyrimidine compound of the formula I



(I)

wherein

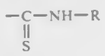
A is $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2$, $-CH_2-CH_2-CH_2-CH_2-$, $-CH=CH-$, or one of said groups in which a hydrogen is replaced by R_4;

R_4 is C_{1-4} alkyl or unsubstituted or halo, nitro, lower alkyl or lower alkoxy substituted phenyl;

r is 0, 1, 2, 3 or 4;

R_1 is hydrogen or C_{1-5} alkanoyl;

R_2 is hydrogen, C_{1-5} alkanoyl or a group of the formula (a)



(a)

wherein

R is hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl, phenyl or phenyl-C_{1-3} alkyl and

R_3 is hydrogen or a pharmaceutically acceptable acid addition salt thereof or a hydrate of a compound of the formula I or a acid addition salt thereof.

8. A method of stimulating the immunosystem of a patient in need thereof which comprises: administering to the patient an effective amount of a compound of the formula I as defined in claim 1

4,921,855

NEW HISTIDYL AMINO ACID DERIVATIVES, AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Keiji Hemmi; Masahiro Neya; Hiroshi Marusawa, all of Tsukuba; Keisuke Imai, Sapporo; Natsuko Kayakiri, and Masashi Hashimoto, both of Tsukuba, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

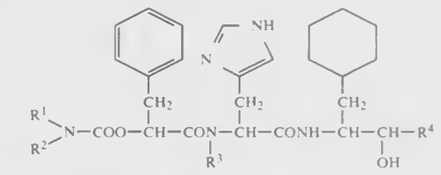
Filed Jun. 9, 1988, Ser. No. 204,549

Claims priority, application United Kingdom, Jun. 22, 1987, 8714597; Oct. 30, 1987, 8725511; Mar. 7, 1988, 8805389

Int. Cl.[5] A61K *31/415*, *31/535*; C07D *233/64*, *413/12*

U.S. Cl. 514—235.8 12 Claims

1. A compound of the formula:



wherein R^1 is lower alkyl; lower alkyl substituted with a substituent selected from the group consisting of acyl, hydroxy, lower alkoxy, aryl, lower alkylthio and a group of formula:



in which R^5 is hydrogen or acyl and

R^6 is hydrogen or lower alkyl; aryl; amino; or amino substituted with substituent(s) selected from the group consisting of lower alkyl and acyl; and

R^2 is hydrogen or lower alkyl; or

R^1 and R^2 are taken together with the attached nitrogen atom to form a heterocyclic group selected from the group consisting of morpholino, thiomorpholino, its 1-oxide or 1,1-dioxide, pyrrolidin-1-yl, pyrazolidin-1-yl, piperidino, piperazin-1-yl, pyrrolin-1-yl, thiazolilin-3-yl, its 1-oxide or 1,1-dioxide, oxazolidin-3-yl, perhydropyridazin-1-yl, 1,4-dihydropyrdin-1-yl, 1,2,3,6-tetrahydropyridin-1-yl, 1,2,3,4,-tetrahydroisoquinolin-2-yl, 1,2,3,4-tetrahydroquinolin-1yl, hexamethyleneimino and 1,4-diazbicyclononan-4-yl, or the above groups substituted with substitutent(s) selected from the group consisting of lower alkyl, hydroxy(lower)alkyl, lower alkoxy(-lower)alkyl, acyl(lower)alkyl, oxo and acyl;

R^3 is hydrogen or lower alkyl; and

R^4 is lower alkyl; and its pharmaceutically acceptable salt.

4,921,856

DIHYDROPYRIDAZINONE DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL PREPARATIONS CONTAINING THESE COMPOUNDS

Helmut Schickaneder, Eckental; Peter Mörsdorf, Langenzenn; Volker Pfahlert, Nuremberg; Heidrun Engler, Cadolzburg, and Kurt H. Abrens, Nuremberg, all of Fed. Rep. of Germany, assignors to Heumann Pharma GmbH & Company, Nuremberg, Fed. Rep. of Germany

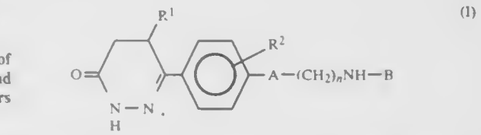
Filed Apr. 1, 1988, Ser. No. 176,689

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728491

Int. Cl.[5] C07D *237/04*; A61K *31/50*

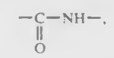
U.S. Cl. 514—252 13 Claims

1. Dihydropyridazinone derivatives corresponding to formula I

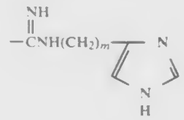


(1)

wherein R^1 denotes a hydrogen atom or a straight chained or branched C_1 to C_4 alkyl group, R^2 denotes a hydrogen atom, a straight chained or branched C_1 to C_4 alkyl group, a C_1 to C_4 alkoxy group, a halogen atom, a nitro group or an amino group, A denotes an oxygen atom, the group NH or



an imidazole ring attached to positions 1 and 4 or a single bond, and B denotes a group of the formula



4,921,857

4-OXO-4H-QUINOLIZINE-3-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

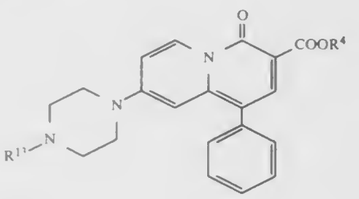
James V. Heck, Scotch Plains, and Eugene D. Thorsett, Fanwood, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 18, 1987, Ser. No. 98,117

Int. Cl.[5] C07D *455/02*

U.S. Cl. 514—254 8 Claims

1. A method for treating bacterial infections comprising administering to a patient in need of such treatment a pharmaceutically effective amount of at least one compound having the formula:



wherein R^4 is:

(a) hydrogen; or

(b) C_1-C_6-alkyl; and

R^{13} is C_1-C_6-alkyl.

4,921,858

7-DEAZAGUANINES AS IMMUNOMODULATORS

Thomas C. Malone, Canton, and Jagadish C. Sircar, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

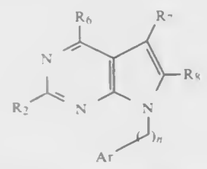
PCT No. PCT/US87/02727, § 371 Date Mar. 13, 1989, § 102(e) Date Mar. 13, 1989, PCT Pub. No. WO88/03142, PCT Pub. Date May 5, 1988

Continuation of Ser. No. 86,231, Aug. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 923,521, Oct. 24, 1986, abandoned. This PCT application Oct. 19, 1987, Ser. No. 354,312

Int. Cl.[4] A61K *31/505;* C07D *487/04*

U.S. Cl. 514—258 8 Claims

1. A compound of the formula (I)



I

wherein R_6 is OH or SH, R_2 is hydrogen or NH_2, R_7 and R_8 are independently hydrogen or NH_2 with the proviso that both cannot be NH_2 at once, n is an integer of from one through four, Ar is (i) 2- or 3-thienyl, or (ii) 2- or 3-furanyl; or a pharmaceutically acceptable base or acid addition salt thereof.

4,921,859

PURINE DERIVATIVES

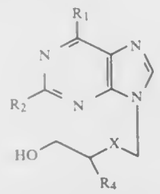
Jagadish C. Sircar, Ann Arbor, Mich.; Charles F. Schwender, Gladstone, N.J., and Mark J. Suto, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 22,467, Mar. 6, 1987, which is a continuation of Ser. No. 657,211, Oct. 5, 1984, which is a continuation-in-part of Ser. No. 547,297, Oct. 31, 1983. This application Sep. 29, 1988, Ser. No. 251,153

Int. Cl.[4] C07D *473/18;* A61K *31/52*

U.S. Cl. 514—262 22 Claims

1. A compound of the formula



wherein R_1 is OH or SH; R_2 is hydrogen or NHR in which R is hydrogen or COR_6 where R_6 is alkyl of one to four carbon atom, aryl or arylalkyl; X is O or S, and R_4 is arylalkyl or phenyl substituted by halo, hydroxy, alkoxy of 1–4 carbon atoms or trifluoromethyl, arylalkyl, or a pharmaceutically acceptable acid or base addition salt thereof.

4,921,860

QUINUCLIDYL- AND TROPANYL-PYRIDYL ETHERS AS 5-HT$_3$ RECEPTOR ANTAGONISTS

Ian A. Cliffe, Cippenham, England, assignor to John Wyeth and Brother, Limited, Maidenhead, England

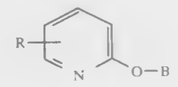
Filed Aug. 1, 1988, Ser. No. 226,637

Claims priority, application United Kingdom, Aug. 4, 1987, 8718445

Int. Cl.[5] C07D *451/06, 453/00;* A61K *31/46*

U.S. Cl. 514—304 3 Claims

1. A method for the treatment of conditions in warm blooded animals which respond to antagonism of 5-HT$_3$ receptors which method comprises administering to the warm blooded animal an amount effective to alleviate such condition of a pyridyl ether comprising a compound of formula



wherein R represents hydrogen or 1 to 4 same or different substitutes selected from hydroxy, C_{1-6}-alkyl, C_{1-6}-alkoxy, amino, C_{1-4}-alkylamino, di(C_{1-4}-alkyl)-amino, halogen, trifluoromethyl, phenyl, halophenyl, C_{1-4}-alkylphenyl, C_{1-4}-alkoxyphenyl, carboxy, carboxamido, nitro, thiol and C_{1-4}-alkylthio and B represents quinuclidyl or tropanyl or a N-oxide thereof or a pharmaceutically acceptable acid addition salt of the compound of formula (II) or the N-oxide.

4,921,861

PHARMACEUTICAL COMPOSITIONS

József Knoll; né Simonyi Budai; Edit Berényi né Poldermann; Ildikó Miklya; Márton Fekete; Gabriella Zsilla; Berta Knoll; Attila Mándi; Lujza Petocz; István Gyertyán, and István Gacsályi, all of Budapest, Hungary, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 185,049

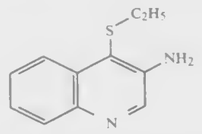
Claims priority, application Hungary, Apr. 24, 1987, 1777/87

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] C07D *215/36;* A61K *31/47*

U.S. Cl. 514—312 4 Claims

1 A pharmaceutical composition having anxiolytic and narcosis potentiating effect comprising as active ingredient 3-amino-4-ethylthio-quinoline of the formula I



(I)

or a pharmaceutically acceptable acid addition salt thereof in admixture with suitable inert solid or liquid pharmaceutical carriers.

4,921,862

CARBOSTYRIL DERIVATIVES AS COMBINED THROMBOXANE SYNTHETASE AND CYCLIC-AMP PHOSPHODIESTERASE INHIBITORS

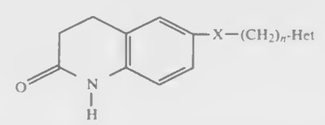
Keith A. M. Walker, Los Altos Hills; John J. Bruno, Redwood City, and Gregory R. Martinez, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 868,845, May 29, 1986, Pat. No. 4,792,561. This application Sep. 21, 1988, Ser. No. 247,134

Int. Cl.[5] A61K *31/47;* C07D *401/06, 401/10, 401/12*

U.S. Cl. 514—312 9 Claims

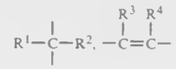
1. A compound of the formula:



(I)

or a pharmaceutically acceptable acid addition salt or ester thereof, wherein:

X is chosen from the group consisting of:



in which

R^1 is H or alkyl having 1–6 carbon atoms when R^2 is OH, or R^1 is phenyl or phenyl lower alkyl when R^2 is H or OH, wherein the phenyl radical is optionally monosubstituted with lower alkyl, lower alkoxy, hydroxy, trifluoromethyl or halogen, or R^1 and R^2 taken together represents oxo, alkylidene having 1–6 carbon atoms or benzylidene wherein the phenyl radical of the benzylidene group is optionally monosubstituted with lower alkyl, lower alkoxy, hydroxy, trifluoromethyl or halogen;

R^3 is H or alkyl having 1–6 carbon atoms, R^4 is H and R^3 and R^4 are either cis or trans to each other, or R^3 and R^4 taken together represent a covalent bond;

n is an integer from 0–3;

Het is 3-pyridyl; and the dotted line represents an optional covalent bond.

4,921,863

CYCLIC AMINE DERIVATIVES

Hachiro Sugimoto, Ushiku; Takaharu Nakamura, Abiko; Norio Karibe, Yatabe; Isao Saito, Sakura; Kunizou Higurashi, Tokyo; Masahiro Yonaga, Tsuchiura; Takeru Kaneko, Yatabe; Takahiro Nakazawa, Fujishiro; Masataka Ueno, Yatabe, and Kiyomi Yamatsu, Kamakura, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

PCT No. PCT/JP86/00502, § 371 Date Feb. 17, 1988, § 102(e) Date Feb. 17, 1988, PCT Pub. No. WO88/02365, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 30, 1986, Ser. No. 177,662

Int. Cl.[5] A61K *31/445;* C07D *211/00*

U.S. Cl. 514—319 32 Claims

21. Cyclic amine derivatives and pharmacologically acceptable salts thereof according to claim 1, wherein X is a group of the formula: —CHOH— and n is 1.

4,921,864

4-PHENYL-4-(N-(PHENYL)AMIDO) PIPERIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS AND METHOD EMPLOYING SUCH COMPOUNDS

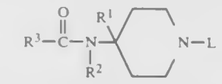
Linas V. Kudzma, North Bergen; H. Kenneth Spencer, Chatham, and Sherry A. Severnak, Plainfield, all of N.J., assignors to BOC, Inc., New Providence, N.J.

Division of Ser. No. 115,284, Nov. 2, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 255,180

Int. Cl.[5] C07D *409/12;* A61K *31/445*

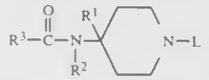
U.S. Cl. 514—326 8 Claims

1. A compound of the formula



optically active isomeric forms thereof, or pharmaceutically acceptable acid addition salts thereof, in which formula: R^1 is phenyl; R^2 is phenyl unsubstituted or substituted with one or more halogens; R^3 is a lower alkyl, lower cycloalkyl or a lower alkoxy lower alkyl; and L is thienyl lower alkyl which can be substituted in the 4-position with a lower alkyl group.

5. A narcotic antagonistic or analgesic composition comprising a non-toxic pharmaceutically acceptable carrier and therapeutically effective amount of a compound of the formula



optically active isomeric forms thereof, or pharmaceutically acceptable acid addition salts thereof, in which formula: R^1 is phenyl; R^2 is phenyl unsubstituted or substituted by one or more halogens; R^3 is a lower alkyl, lower cycloalkyl or a lower alkyl; and L is a thienyl lower alkyl group which can be substituted in the 4-position with a lower alkyl group.

4,921,865

AMINOACYLATES OF GLYCEROL ACETAL

Colette Broquet, Boulogne, and Pierre Braquet, Garches, both of France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), France

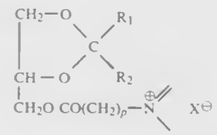
Filed Jun. 7, 1988, Ser. No. 203,733

Claims priority, application United Kingdom, Jun. 12, 1987, 8713745

Int. Cl.[5] C07D *216/16, 407/12*

U.S. Cl. 514—336 6 Claims

1. Aminoacylates of glycerol acetal of the formula I



I

wherein

R_1 represents trimethoxy phenyl or a straight or branched chain alkyl group of the formula C_mH_{2m+1}, m being an integer of from 9 to 25, R_2 represents a hydrogen atom, a phenyl group or a group of the formula C_nH_{2n+1}, n being an integer of from 1 to 10,

p is an integer of from 3 to 10,



represents pyridinium and $X^{\ominus}$ means the anion of a pharmaceutically acceptable inorganic or organic acid.

VOL 114 ISS 1 MY 1 1990 UMI

4,921,866

1,3-DIOXANES

Andrew G. Brewster, Macclesfield; George R. Brown, Wilmslow; Reginald Jessup, Sandbach, and Michael J. Smithers, Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries plc, London, England

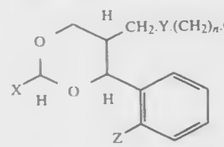
Filed Apr. 25, 1988, Ser. No. 185,873

Claims priority, application United Kingdom, Apr. 24, 1987, 8709794

Int. Cl.[5] C07D *401/04, 40/06:* A61K *31/44*

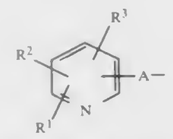
U.S. Cl. 514—336 15 Claims

1. A 1,3-dioxane alkanoic acid derivative of the formula I



I

wherein Y is ethylene or vinylene; n is the integer 1, 2, 3 or 4; Z is hydrogen or hydroxy; X is a pyridine containing group of the formula II



in which A is a linking group selcted from (1-6C)alkylene and (2-6C)alkenylene, either of which may optionally be branched and may optionally contain an oxy link in place of one linking carbon atom, provided that the terminal atom in A attached to the 1,3-dioxane ring is always carbon, or A is a direct link to the 1,3-dioxane ring, and R^1, R^2 and R^3 are independently selected from hydrogen, halogeno, trifluoromethyl, (1-6C)alkoxy and (1-10C)alkyl optionally bearing a carboxy or (1-6C-)alkoxy.carbonyl substituent; and wherein the groups at positions 2, 4 and 5 of the 1,3-dioxane ring have cis-relative stereochemistry; or a pharmaceutically acceptable salt thereof.

4,921,867

PYRIDINE COMPOUNDS USEFUL FOR THERAPY OR PROPHYLAXIS OF A DISEASE ASOCIATED WITH AIRWAY OBSTRUCTION

Lawrence H. C. Lunts, Broxbourne, England, assignor to Glaxo Group Limited, London, England

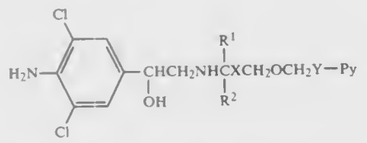
Filed Feb. 9, 1988, Ser. No. 153,938

Claims priority, application United Kingdom, Feb. 10, 1987, 8703007

Int. Cl.[5] A61K *31/13;* C07C *93/08*

U.S. Cl. 514—345 9 Claims

1. A Compound of formula (I)



(I)

wherein

X represents a bond, or a C_{1-6}alkylene, C_{2-6}alkenylene or C_{2-6}alkynylene chain, and

Y represents a bond, or a C_{1-6}alkylene, C_{2-6}alkenylene or C_{2-6}alkynylene chain with the proviso that the sum total of carbon atoms in X and Y is not more than 10;

R^1 and R^2 each represent a hydrogen atom or a C_{1-3}alkyl group, with the proviso that the sum total of carbon atoms in R^1 and R^2 is not more than 4; and

Py represents a pyridyl group substituted by one or two substituents selected from nitro, $-(CH_2)_rR^3$, $-NR^4R^5$, $-(CH_2)_rSO_2NR^4R^5$, $-NR^6COR^3$, $-NR^6SO_2R^7$, $-(CH_2)_rCOR^3$, $-OCH_2COR^3$ and $-O(CH_2)_qR^3$; where

R^3 represents a hydroxy, C_{1-3}alkoxy or $-NR^4R^5$ group,

R^4 and R^5 each represent a hydrogen atom or a C_{1-4}alkyl group;

R^6 represents a hydrogen atom or a C_{1-4}alkyl group;

R^7 represents a C_{1-4}alkyl, phenyl or $-NR^4R^5$ group;

q represents an integer 2 or 3;

r represents an integer from 0 to 3; and

t represents an integer 1, 2 or 3;

or a physiologically acceptable salt or solvate thereof.

4,921,868

CARBAMATE DERIVATIVES OF THE OXIME OF 1,2,5,6-TETRAHYDROPYRIDIN-3-CARBOXALDEHYDE, THEIR USE AS MEDICAMENTS AND COMPOSITIONS CONTAINING THEM

Giulio Galliani; Fernando Barzaghi, both of Monza; Carla Bonetti, Fontanella, and Emilio Toja, Milan, all of Italy, assignors to Roussel Uclaf, Paris, France

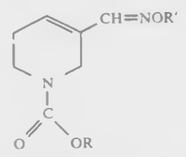
Filed Aug. 22, 1988, Ser. No. 234,632

Claims priority, application Italy, Aug. 21, 1987, 21687 A/87

Int. Cl.[5] C07D *211/70:* A61K *31/44*

U.S. Cl. 514—354 14 Claims

1. A compound of the formula (I):



in which R' represents hydrogen, a linear, branched or cyclic alkyl, alkenyl or alkynyl, containing up to 8 carbon atoms, and R represents a linear, branched or cyclic alkyl unsubstituted or substituted by alkylsulphonyl containing up to 18 carbon atoms or the radical Si—Alk_3 wherein Alk represents alkyl containing up to 4 carbon atoms, alkenyl or alkynyl, containing up to 18 carbon atoms, aryl containing up to 14 carbon atoms, unsubstituted or substituted by one or more of halogen, linear or branched alkyl or linear or branched alkoxy, aralkyl containing up to 18 carbon atoms, unsubstituted or substituted by one or more of halogen, linear or branched alkyl or linear or branched alkoxy, or an addition salt with an organic or a mineral acid thereof.

4,921,869

AMINOMETHYL OXOOXAZOLIDINYL CYCLOALKYLBENZENE DERIVATIVES USEFUL AS ANTIBACTERIAL AGENTS

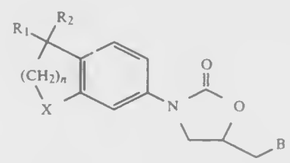
Chia-Lin J. Wang, and Mark A. Wuonola, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 106,358, Oct. 9, 1987, Pat. No. 4,801,600. This application Aug. 19, 1988, Ser. No. 233,828

Int. Cl.[5] C07D *263/24;* A61K *31/42*

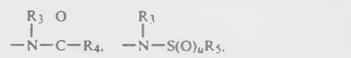
U.S. Cl. 514—376 18 Claims

1. A compound having the formula



(I)

wherein for the I isomer or racemic mixtures containing it B is NH_2,



or N_3;

u is 1 or 2;

R_3 is H, alkyl of 1-10 carbon atoms, or cycloalkyl of 3-8 carbon atoms;

R_4 is H, alkyl of 1-4 carbon atoms, alkenyl of 2-4 carbon atoms, cycloalkyl of 3-4 carbon atoms, or OR_5;

R_5 is alkyl of 1-4 carbon atoms;

X is O, or S;

n is 1-3; and

R_1 and R_2 taken together are H_2, H and OH, =O,

or a pharmaceutically suitable salt thereof; provided that:

(1) when n is 2, then X is not S; and

(2) when n is 3, then X is not O.

4,921,870

FUNGICIDAL NOVEL SUBSTITUTED PHENETHYL-TRIAZOLYL DERIVATIVES

Wolfgang Krämer; Hans-Joachim Knops, both of Wuppertal; Karl H. Büchel, Burscheid, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

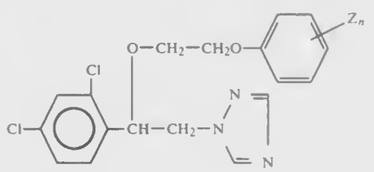
Divisiom of Ser. No. 589,225, Mar. 13, 1984, Pat. No. 4,771,065. This application May 5, 1988, Ser. No. 190,744

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310830

Int. Cl.[5] C07D *249/08;* A01N *43/653*

U.S. Cl. 514—383 5 Claims

1. A substituted phenethyl-triazolyl derivative of the formula



in which

Z is chlorine or methyl, and

n is 1 or 2,

or an addition product thereof with an acid.

4,921,871

ENOLAMIDES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE THEREOF FOR TREATING INFLAMMATION

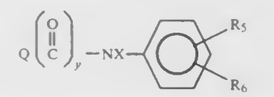
Mary E. Carethers, Cincinnati, Ohio; Wiaczeslaw A. Cetenko; David T. Connor, both of Ann Arbor, Mich.; Elizabeth A. Johnson, Corte Madera, Calif.; John S. Kiely, Ann Arbor, Mich.; Charles F. Schwender, Califon, N.J.; Jagadish C. Sircar, Ann Arbor, Mich.; Roderick J. Sorenson, Ann Arbor, Mich.; Paul C. Unangst, Ann Arbor, Mich., and Robert F. Bruns, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 782,623, Oct. 1, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 121,264

Int. Cl.[5] A61K *31/38;* C07D *335/06, 335/08*

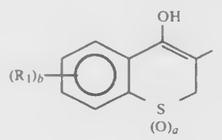
U.S. Cl. 514—432 80 Claims

1. A compound having the formula



I

and pharmaceutically acceptable salts thereof, wherein (1) y is one or two; (2) Q is a substituent selected from the group consisting of the formula



I_1

or keto form thereof; wherein a is zero, one, or two; b is zero, one, two, three, or four, X is independently hydrogen or lower alkyl; R^1 may be the same or different if b is two or more, selected from a group consisting of alkyl of from one to four carbons, inclusive; alkoxy of from one to four carbons, inclusive; hydroxy, halogen, nitro, amino, mono- and di- alkylamino having each alkyl the same or different of from one to four carbons, inclusive; carbalkoyamido, of from one to four carbons, inclusive; alkylsulfonyl of from one to four carbons, inclusive; alkylsulfonyl of from one to four carbons, inclusive; and —CH=CH—CH=CH)— when b is two wherein the R_1s taken together with adjacent ring carbons form a benzo radical; (3) R^5 is hydrogen; alkyl of from one to four carbons, inclusive; alkoxy of from one to four carbons, inclusive; carbalkoxy of from two to four carbons, inclusive; hydroxy; halogen; or —CH=CH—CH=CH— taken together with adjacent carbons to form a benzo radical; (4) R^6 is alkyl of from six to twenty carbons, —CH=CH—R_4, $-(CH_2)_nCOR_4$, or $-(CH_2)_n-R_4$ wherein n is zero to four, inclusive; and R_4 is phenyl optionally substituted at the two through six positions by hydrogen, carboalkoxy, having alkoxy of from one to four carbons, inclusive; alkoxy, or thioalkoxy of from one to four carbons, inclusive; phenalkoxy of from one to four carbons, inclusive; amino, monoalkyl and dialkyl amino having the alkyl of from one to four carbons, inclusive: alkanoylamino of from one to six carbons, inclusive; carboxyl, benzo, halogen, hydroxy, hydroxyalkyl of from one to four carbons, inclusive; alkanoyl of from one to four carbons, inclusive; nitro alkanesulonamido of from one to four carbons, or phenyl; with the proviso that when Q is I_1 having y as one, then R_6 cannot be alkyl, R_4 cannot be phenyl in $(CH_2)_nR_4$ and R_5 cannot be —(CH=CH—CH=CH)—.

79. A pharmaceutical composition comprising an antiinflammatory effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

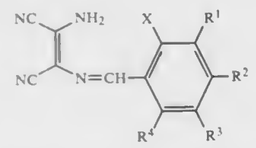
4,921,872

ACARICIDAL AGENTS BASED ON AZOMETHINES OF 2,3-DIAMINOMALEIC ACID NITRILE

Holger Heidenreich, Koden, and Benedikt Becker, Mettmann, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 27, 1988, Ser. No. 149,244
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704154; Aug. 6, 1987, 3726044
Int. Cl.[5] C07C *121/45*; A01N *37/34, 41/10*
U.S. Cl. 514—523 12 Claims

1. An azomethine of 2,3-diaminomaleic acid nitrile of the formula

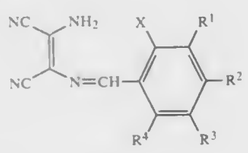


in which

X and R^4 each independently is fluorine, chlorine, bromine, iodine, CF_3 or CN, and

R^1 and R^2 and R^3 each independently is hydrogen, alkyl(C_1-C_4), halogenoalkyl(C_1-C_4), alkoxy(C_1-C_4), halogenalkoxy(C_1-C_4), halogen, CN, NO_2, dialkyl(C_1-C_4)amino, alkoxy(C_1-C_4)carbonyl, alkyl(C_1-C_4)thio, alkyl(C_1-C_4)thionyl, dihalogenoalkyl(C_1-C_4) amino, alkyl(C_1-C_4)sulphonyl, OH, SH or NH and at least one of R^1, R^2 and R^3 is haloalkoxy, alkoxycarbonyl, dihaloalkylamine or SH.

5. A method of combating acarids which comprises applying to such acarids or to an acarid habitat an acaricidally effective amount of an azomethine of 2,3-diaminomaleic acid nitrile of the formula



(I)

in which

X and R^4 each independently is fluorine, chlorine, bromine, iodine, CF_3 or CN, and

R^1, R^2 and R^3 each independently is hydrogen, alkyl(C_1-C_4), halogenoalkyl(C_1-C_4), alkoxy(C_1-C_4), halogenoalkoxy(C_1-C_4), halogen, CN, NO_2, dialkyl(C_1-C_4)amino, alkoxy(C_1-C_4)carbonyl, alkyl(C_1-C_4)thio, alkyl(C_1-C_4)thionyl, dihalogenoalkyl(C_1-C_4)amino, alkyl(C_1-C_4)sulphonyl, OH, SH or NH_2.

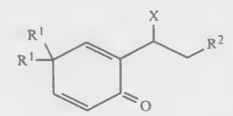
4,921,873

ANTIVIRAL AND ANTITUMOR CYCLOHEXADIENONE COMPOSITIONS

Tatsuo Higa, Okinawa, and Kenneth M. Snader, Vero Beach, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Continuation-in-part of Ser. No. 682,278, Dec. 17, 1984, abandoned. This application Jun. 14, 1985, Ser. No. 744,620
Int. Cl.[5] A61K *31/12, 35/80*; C07C *49/597*
U.S. Cl. 514—546 20 Claims

1. A composition of the general formula:



wherein both R^1 groups are the same or different and are hydrogen or a lower alkyl group, X is a lower alkyl, hydroxy, lower alkoxy, lower acyloxy, fluoro, chloro, bromo or iodo group, and R^2 is hydroxy, a lower acyloxy group or halogen.

4,921,874

MEDICINAL BATH OILS

Rolf Franke, Reinbek, and Peter Schmersahl, Willinghusen, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 722,089, Apr. 11, 1985, abandoned. This application Aug. 17, 1987, Ser. No. 86,181
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413563
Int. Cl.[5] A61K *7/48, 7/50, 9/10*
U.S. Cl. 514—552 23 Claims

1. A medicinal bath oil for effecting an antipruritic effect in a bath of water, consisting of about 68–95% by weight of at least one physiologically acceptable oil and about 30–5% by weight of at least three physiologically acceptable fatty alcohol polyglycol ether emulsifiers, the amount of said emulsifiers being sufficient to induce an improved local anesthetic and antipruritic effect.

4,921,875

USE OF AMINO-SUBSTITUTED BENZOIC ACIDS AS REMEDIES FOR DIARRHEA, AND MEDICAMENTS BASED ON THESE COMPOUNDS

Heinrich C. Englert, Hofheim am Taunus; Max Hropot, Flörsheim am Main; Hans-Jochen Lang, Hofheim am Taunus, and Rainer Greger, Heitersheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main and Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften, Gottingen, both of, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,580
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3608726
Int. Cl.[5] A61K *31/195, 31/44, 31/40*
U.S. Cl. 514—567 2 Claims

1. A method of treating diarrhea in a patient which comprises the step of administering thereto an effective amount of a compound selected from the group consisting of

4'-ethoxydiphenylamine-2-carboxylic acid,
2-(1-naphthylamino)benzoic acid,
2'-aminodiphenylamine-2-carboxylic acid,
4'-anilino-5-nitrodiphenylamine-2-carboxylic acid,
4'-trifluoromethyl-4-nitrodiphenylamine-2-carboxylic acid,
2-cyclooctylamino-5-nitrobenzoic acid,
2-cyclohexylamino-5-nitrobenzoic acid, diphenylamine-2-carboxylic acid,
4'-methyldiphenylamine-2-carboxylic acid,
4'-chlorodiphenylamine-2-carboxylic acid,
4'-nitrodiphenylamine-2-carboxylic acid,
4'-bromodiphenylamine-2-carboxylic acid,
3',4'-dichlorodiphenylamine-2-carboxylic acid,
2'-hydroxydiphenylamine-2-carboxylic acid,
2'-methoxydiphenylamine-2-carboxylic acid,
5-chlorodiphenylamine-2-carboxylic acid,
3',5-dichlorodiphenylamine-2-carboxylic acid,
3'-trifluoromethyl-5-chlorodiphenylamine-2-carboxylic acid,
4-methyl-3-N-pyrrolidinobenzoic acid,
4-chloro-3-N-pyrrolidinobenzoic acid,

4-chloro-3-N-pyrrolobenzoic acid and
4-chloro-3-anilinobenzoic acid
together with a pharmaceutically acceptable carrier.

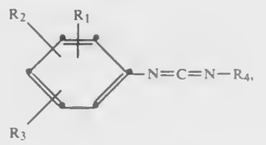
4,921,876

SUBSTITUTED CARBODIIMIDES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Josef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 115,633, Oct. 26, 1987, Pat. No. 4,812,466. This application Dec. 22, 1988, Ser. No. 288,396
Claims priority, application Switzerland, Sep. 19, 1984, 4479/84; Aug. 15, 1985, 3526/85
Int. Cl.[5] A61K *31/13*
U.S. Cl. 514—638 14 Claims

1. A compound of formula I



(I)

wherein

R_1 is hydrogen, halogen, C_1-C_{10}alkyl, C_1-C_5alkoxy, C_1-C_5alkoxy which is substituted by 1 to 7 halogen atoms, or is C_1-C_5alkylthio;

R_2 is hydrogen, halogen, C_1-C_{10}alkyl or C_1-C_5alkoxy;

R_3 is phenoxy, or is phenoxy mono- or disubstituted by a member selected from the group consisting of halogen, methyl, ethyl, C_1-C_3haloalkyl containing 1 to 7 halogen atoms and cyano,

R_4 is C_1-C_{12}alkyl, alkoxyalkyl containing a total of 2 to 10 carbon atoms, C_3-C_{10}cycloalkyl, C_3-C_{10}cycloalkylmethyl, C_3-C_{10}cycloalkyl which is substituted by 1 to 3 C_1-C_3alkyl groups, or is C_1-C_5-alkyl which is substituted by 1 or 2 C_3-C_{10}cycloalkyl groups, or is a polycyclic alkyl group containing 7 to 10 carbon atoms, phenyl(C_1-C_5)alkyl or phenyl(C_1-C_5)alkyl which is mono- or disubstituted at the phenyl nucleus by halogen, trifluoromethyl, methoxy or ethoxy.

11. A pesticidal composition which contains as active ingredient a compound according to claim 1, together with suitable carriers and/or other adjuvants.

4,921,877

LIQUID NUTRITIONAL FORMULA FOR GLUCOSE INTOLERANCE

Karen A. Cashmere, and Elizabeth M. Besozzi, both of Columbus, Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 923,525, Oct. 27, 1986, abandoned. This application Dec. 16, 1987, Ser. No. 132,501
Int. Cl.[5] A61K *31/195, 31/20, 31/70*; B29D *19/00*
U.S. Cl. 514—866 8 Claims

1. A liquid nutritionally complete enteral formula for the dietary management of patients with glucose intolerance characterized in that:

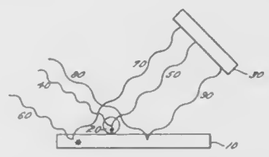
(a) 8–25% of total caloric value is obtained from protein;
(b) 20–37% of total caloric value is obtained from a carbohydrate blend wherein said carbohydrate blend comprises corn starch, fructose and soy polysaccharide;
(c) 45–60% of total caloric value is obtained from a fat blend and wherein less than 10% of total formula calories is derived from saturated fatty acids, up to 10% of total formula calories from polyunsaturated fatty acids and the balance of fat calories from monounsaturated fatty acids;
(d) at least the minimum U.S. RDA for vitamins and minerals;
(e) effective amounts of the ultratrace minerals chromium, selenium, and molybdenum; and
(f) effective amounts of carnitine, taurine and myoinositol.

4,921,878

NON-FLUORESCING, NON-REFLECTIVE POLYAMIDE FOR USE IN DIAGNOSTIC TESTING

Isaac Rothman, Brooklyn, and Peter J. Degeo, Huntington, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Division of Ser. No. 58,843, Jun. 5, 1987. This application Jul. 1, 1988, Ser. No. 214,285
Int. Cl.[5] C08J *9/36*
U.S. Cl. 521—53 8 Claims



1. An optically passive microporous polyamide membrance comprising a microporous polyamide membrane substrate dyed with a metallic or non-metallic acid reactive azo dye of the formula Ar—N=N—Ar', wherein Ar and Ar' independently represent an aromatic ring system having substituents selected from the group consisting of hydrogen, C_1-C_4 alkyl, carboxyl, hydroxyl, amino, amino substituted with 1 or 2 C_1-C_4 alkyl groups, C_1-C_4 alkoxy, nitro, halo, sulfate, sulfonyl, sulfonamide, C_1-C_4 sulfate or sulfonyl ester, and substituted or unsubstituted aromatic groups, capable of absorbing light at substantially all wave lengths from about 250 to about 400 nm.

4,921,879

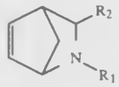
NOVEL BICYCLIC AMINE CATALYSTS

Karl-Heniz Gluzek, Alpen, and Heiko Humbert, Hamburg, both of Fed. Rep. of Germany, assignors to Duetshe Texaco Aktiengesellshaft, Hamburg, Fed. Rep. of Germany

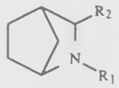
Divisioo of Ser. No. 165,855, Mar. 9, 1988, abandoned. This application Jul. 13, 1989, Ser. No. 378,463
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707911
Int. Cl.[5] C08G *18/20*
U.S. Cl. 521—129 25 Claims

1. In a process for producing polyurethanes by reacting a polyol with a diisocyanate in the presence of a catalyst, the improvement comprising carrying out the reaction in the presence of a catalyst comprising:

substituted 2-aza-bicyclo[2.2.1]hept-5-ene derivatives of the formula



and of the corresponding 2-azabicycloheptane derivatives of the formula



wherein
R_1 is a (C_1–C_8) alkyl group, a (C_2–C_8) alkenyl group, a (C_5–C_9) cycloalkyl or alkylcycloalkyl group, benzyl or a (C_3–C_{10}) alkylbenzyl group with one or more of the heteroatoms N, O or S;

$$-(CH_2)_a-P,\ -(CH_2)_b-T-(CH_2)_c-U,$$

or

$$-(CH_2)_d-V-(CH_2)_e-W-(CH_2)_f-X;$$

wherein a through f are 2, 3 or 4;
P, U, X are each the same or different and are OH, O-acyl, N-acyl, N-(C_1–C_4) alkyl, N-di(C_1–C_4) alkyl, or are 2-azibicyclo-heptyl;
T, V, W are each equal or different and are O, NH, or N-(C_1–C_4) alkyl and
R_2 is hydrogen or a (C_1–C–4) alkyl group.

4,921,880

ADHESION PROMOTER FOR UV CURABLE SILOXANE COMPOSITIONS AND COMPOSITIONS CONTAINING SAME

Chi-Long Lee, and Michael A. Lutz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 15, 1988, Ser. No. 232,204
Int. Cl.[5] **C08G** *77/12, 77/28*
U.S. Cl. 522—12 **23 Claims**

1. An ultraviolet radiation curable siloxane composition comprising
(I) a mixture comprising (a) a vinyl functional polydiorganosiloxane in which there is at least two vinyl functional groups per molecule, there is also present (b) a mercapto functional compound having at least two mercapto groups per molecule, and there is a total of at least five vinyl functional groups plus mercapto groups per combination of (a) and (b), and a photoinitiator which is activated by ultraviolet radiation, and
(II) an adhesion promoter for ultraviolet radiation curable compositions, a combination consisting of
(A) an alkoxysilicon compound having a general formula

$$(RO)_3Si-X-Si(OR)_3$$

in which R is methyl or ethyl and X is a divalent radical selected from the group consisting of $-(CH_2)_n-$ where n has a value of from 1 to 10 inclusive and $-O(R'_2SiO)_m-$ where each R' is independently selected from a group consisting of RO—, an aliphatic hydrocarbon radical, and an aromatic hydrocarbon radical, where m has a value of from 0 to 10 inclusive, and
(B) a compound capable of catalyzing a reaction between two ≡SiOR groups in the presence of atmospheric moisture or between ≡SiOR and a hydroxyl group on a substrate.

17. An ultraviolet radiation curable siloxane composition comprising
(I) a mixture comprising (c) a vinyl functional polydiorganosiloxane in which there is at least two vinyl functional groups per molecule, there is also present (d) a silicon-bonded hydrogen compound having at least two silicon-bonded hydrogen atoms per molecule, and there is a total of at least five vinyl functional groups and silicon-bonded hydrogen atoms per combination of (c) and (d), and a photoinitiator which is activated by ultraviolet radiation, and
(II) an adhesion promoter for ultraviolet radiation curable compositions, a combination consisting of
(A) an alkoxysilicon compound having a general formula

$$(RO)_3Si-X-Si(OR)_3$$

in which R is methyl or ethyl and X is a divalent radical selected from the group consisting of $-(CH_2)_n-$ where n has a value of from 1 to 10 inclusive and $-O(R'_2SiO)_m-$ where each R' is independently selected from a group consisting of RO—, an aliphatic hydrocarbon radical, and an aromatic hydrocarbon radical, where m has a value of from 0 to 10 inclusive, and
(B) a compound capable of catalyzing a reaction between two ≡SiOR groups in the presence of atmospheric moisture or between ≡SiOR and a hydroxyl group on a substrate.

4,921,881

RADIATION-HARDENABLE AGENT FOR THE SCRATCH-RESISTANT COATING OF ORGANIC GLASSES

Gerhard Morlock, Hanau, and F. Werner Weigelt, Lampertheim, both of Fed. Rep. of Germany, assignors to Degussa Akteingesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 7, 1988, Ser. No. 203,100
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1987, 3720671
Int. Cl.[5] **C08G** *77/20, 77/40;* **C08F** *283/12*
U.S. Cl. 522—99 **6 Claims**

1. A radiation-hardenable agent for the scratch-resistant coating of organic glasses, consisting essentially of
(A) 82 to 64% by weight of a cocondensate prepared by the cocondensation of
(A1) 90 to 65% by weight of a member of the group consisting of vinyl trimethoxysilane, vinyl triethoxysilane and mixtures of these two silanes and
(A2) 10 to 35% by weight of a member of the group consisting of tetramethoxysilane, tetraethoxysilane and mixtures of these two silanes
(B) 9 to 27% by weight of at least one reactive diluent comprising at least 2 vinyl, acrylic or methacrylic groups per molecule and
(C) 0 to 9% by weight of at least one known photoinitiator, the total amount of components (A), (B) and (C) being 100% by weight.

4,921,882

ELECTRON BEAM IRRADIATED RELEASE FILM

George A. Senich, Malvern, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 106,686, Oct. 8, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 207,407
Int. Cl.[5] **C08G** *77/32, 77/50;* **C08F** *8/00, 10/06*
U.S. Cl. 522—99 **12 Claims**

1. An electron beam irradiated release film having a peak release force of from about 6 grams/inch of width to about 115 grams/inch of width using pressure sensitive adhesive tape, comprising:
a film formed from a melt processible composition, said composition comprising (i) a silicone component having an alkylene containing silicone portion and a hydride containing portion and (ii) a polymeric thermoplastic component, said silicone component being crosslinked in the presence of said polymeric thermoplastic component by the reaction of the hydride-containing silicone portion and the alkylene containing silicone portion under the influence of heat in the presence of a siloxane platinum complex catalyst to form a silicone pseudointerpenetrating polymer network, said crosslinking of said silicone component being initiated during thermoplastic melt-mixing and film forming of said components, and irradiating said network with an electron beam with a dose of from about 50 rad to about 50 Mrad to form the release film, said film having a thickness of from 0.000005 to 0.2 inch.

4,921,883

UNSATURATED POLYESTER RESINS, A PROCESS FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THESE POLYESTER RESINS

Jürgen Meixner, Krefeld; Wolfgang Kremer, Kerken, and Manfred Müller, Erkelenz, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 169,967
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710428
Int. Cl.[5] **C08F** *2/50, 283/01;* **C08G** *63/54*
U.S. Cl. 522—107 **2 Claims**

2. Compositions which can be cured under the influence of UV radiation, containing
(a) 40 to 80 parts by weight of at least one ethylenically unsaturated plyester resin,
(b) 20 to 60 parts by weight of styrene,
(c) 0.1 to 5 parts by weight of at least one photoinitiator and
(d) optionally known auxiliary agents and additives,
characterised in that component a) is a polyester resin with an acid number of from 0 to 50 and a hydroxyl number from 10 to 150 and consists of
0.6 to 0.8 ol of maleic acid groups, fumaric acid groups or a mixture thereof,
0.2 to 0.4 mol of norbornene dicarboxylic acid groups,
0.6 to 0.8 mol of ethylene glycol groups, propylene glycol groups or a mixture thereof,
0.2 to 0.4 mol of diethylene glycol groups
0.1 to 0.2 mol of benzyl alcohol groups benzoic acid groups or a mixture thereof an
0 to 0.2 mol of monohydric or dihydric alcohol groups or a mixture thereof.

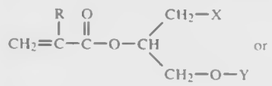
4,921,884

HYDROXY-SUBSTITUTED POLYMERIC SHAPED HYDROGEL ARTICLE

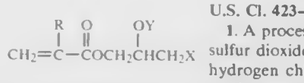
W. James Hammer, and Ronald F. Ofstead, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 19,068, Feb. 26, 1987, Pat. No. 4,786,446, which is a division of Ser. No. 735,379, May 17, 1985, Pat. No. 4,673,539, which is a continuation-in-part of Ser. No. 500,784, Jun. 3, 1983, abandoned. This application Aug. 17, 1988, Ser. No. 233,219
Int. Cl.[5] **G02B** *1/04;* **C08F** *16/06, 18/20*
U.S. Cl. 523—106 **21 Claims**

1. An ophthalmic device prepared by a process comprising the steps:
a. thermoforming an uncrosslinked polymer having a softening temperature of at least 100° C. comprising the product of at least 95 weight percent of an ethylenically-unsaturated monomer bearing at least one trihaloacetoxy-substituent group, said ethylenically unsaturated monomer being
(1) a compound having a formula



or



wherein R is hydrogen or methyl, X is fluoro, chloro, bromo, iodo, perhaloacetoxy or perfluoroalkylsulfonoxy of one to three carbon atoms, and Y is trichloroacetyl or trifluoroacetyl, or
(2) vinyl trihaloacetate, by heating said uncrosslinked polymer in a mold or pressing into sheets or films at a temperature in the range of 150° to 400° C. for 5 seconds to 15 minutes, and then cooling the resulting thermoformed polymer, to provide a thermoplastic, hydrogel precursor ophthalmic device.
b. solvolyzing the hydrogel precursor ophthalmic device by reacting with a nucleophile which causes displacement of said trihaloacetoxy group to provide a hyroxy-substituted polymeric ophthalmic device, said solvolyzing step taking place in the presence of a diluent which is not a solvent for said thermoformed polymer, wherein when said polymer is derived from vinyl trihaloacetate it has a syndiotactic stereochemical configuration.

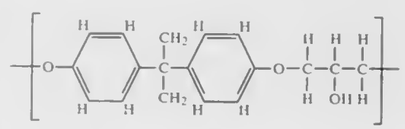
4,921,885

LOW WARPED FILLED POLYOXYMETHYLENE COMPOSITIONS

Derrick B. McKie, Brooklyn, N.Y., and Andris Olukalns, Cincinnati, Ohio, assignors to Hoechst Celanese Corporation, Bridgewater, N.J.

Division of Ser. No. 940,471, Dec. 19, 1986, Pat. No. 4,786,659. This application Jul. 12, 1988, Ser. No. 217,777
Int. Cl.[5] **C08K** *7/20*
U.S. Cl. 523—220 **8 Claims**

1. A low warp, filled oxymethylene polymer composition comprising an oxymethylene polymer in an amount of from about 40 to 99 wt.% of the total composition, glass beads in an amount of from a about 1 to 60 wt.% of the total composition, said glass beads being present in a bimodal distribution of said glass beads containing relatively large glass beads having a mean diameter of from about 65 to about 2,800 microns and relatively small glass beads having a mean diameter from about 5 to about 200 microns, the ratio of mean diameters of said relatively large glass beads to said relatively small glass beads being about 6:1 to about 550:1, the weight ratio of said relatively large glass beads to said relatively small glass beads comprising 2:1 to about 15:1, and from about 0.1 to about 5 wt.% of the total composition of a thermoplastic phenoxy resin having a repeating structure:



and an average molecular weight range of from about 15,0000 to about 75,000.

4,921,886

PROCESS FOR THE DRY REMOVAL OF POLLUTING MATERIAL FROM GAS STREAMS

Thomas K. Ewan, Daingerfield; Thomas W. Musslewhite, Arp; Charles R. Barden, Austin; Thomas J. Weber, Perryton; Andrew D. Burnette; Adel Hedfi, both of Austin; Heather E. Cole, Red Oak, all of Tex.; James C. Moore, Texarkana, Ark., and Mark R. Jacubec, Brecksville, Ohio, assignors to Aerological Research Systems, Inc., Daingerfield, Tex.

Filed Nov. 14, 1988, Ser. No. 270,528
Int. Cl.[5] **C01B** *21/00, 7/00, 17/00*
U.S. Cl. 423—235 **31 Claims**

1. A process for removal of acidic gases comprising gaseous sulfur dioxide, hydrogen sulfide, sulfurous acid, sulfuric acid, hydrogen chloride or nitrogen oxides from a first stream of carrier gas comprising providing a finely divided alkaline sorbent material, introducing said finely divided alkaline sorbent material into said first stream to form a second stream, passing said second stream through a first free jet nozzle to initiate mixing thereof, regulating the flow of said second stream through a mixing duct to provide further mixing, forming a third stream of vapor and liquid droplets, introducing said third stream into said second stream to form a fourth stream,

regulating the flow of said fourth stream through a second free jet nozzle to mix said fourth stream and to condense at least a portion of said vapor, reacting at least a portion of said acidic gases with at least a portion of said finely divided alkaline sorbent material in a first reaction duct to form products of reaction and separating the remaining portion of said finely divided alkaline sorbent material and said products of reaction from said fourth stream.

4,921,887

THIAZOLE COMPOUNDS AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Masaaki Matsuo, Toyonaka; Takashi Manabe, Osaka; Shinji Shigenaga, Kobe, and Hiroshi Matsuda, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

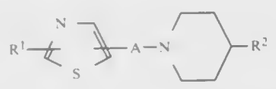
Filed Nov. 14, 1988, Ser. No. 270,628

Claims priority, application United Kingdom, Nov. 16, 1987, 8726763

Int. Cl.[5] **A61K** *31/445, 31/455*

U.S. Cl. 514—326 **11 Claims**

1 A thiazole compound of the formula:



wherein

R^1 is amino, lower alkanoylamino, lower alkanoylamino, mono- or di- or tri-halo(lower)alkanoylamino, cyclo(-lower)alkylcarbonylamino, lower alkoxycarbonylamino, hydroxy(lower)alkanoylamino, lower alkanoyloxy(lower-)alkanoylamino, lower alkylureido, ureido, benzoylamino, toluoylamino, xyloylamino, naphthoylamino, furoylamino, thenoylamino, nicotinoylamino, isonicotinoylamino, phenylacetylamino, tolylacetylamino, naphthylacetylamino, 2-phenylpropionylamino, 3-phenylpropionylamino, 4-phenylbutyrylamino, tritylcarbonylamino, lower alkylsulfonylamino, tosylamino or phenylsulfonylamino,

R^2 is benzyloxy, phenethyloxy, diphenylethoxy, diphenylpropoxy, trityloxy or diphenylmethoxy, and

A is lower alkylene, or a pharmaceutically acceptable salt thereof.

7 A method for the therapeutic treatment of allergic disease which comprises administering an effective amount of a compound of claim 1 in human beings or animals.

4,921,888

LOW TEMPERATURE CURE EMULSIONS

Barbara L. Kunz, Bay Village, and Kenneth G. Hahn, Jr., Hinckley, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Filed Jan. 19, 1988, Ser. No. 144,937

Int. Cl.[5] **C08L** *13/02*

U.S. Cl. 523—310 **4 Claims**

1. An aqueous, thermosetting coating composition substantially free of acid cure catalysts, the coating comprising on a weight basis:

a polymeric blend of between about 20 and 95 parts of functionally reactive emulsion polymer and between 5 and 80 parts of glycoluril adapted to crosslink with said functionally reactive emulsion polymer, where said emulsion polymer and glycoluril are ion-exchange treated with a protonated cation exchange resin to reduce the pH of the polymeric blend to less than 1.8;

said emulsion polymer being free of amine groups and comprising copolymerized ethylenically unsaturated monomers, between 20% and 95% acrylate or methacrylate monomers, between 1% and 20% functionally reactive monomers selected from a carboxyl monomer, a hydroxyl monomer or an acryrlamide monomer, and between 0% and 20% other ethylenically unsaturated monomer, said monomers being polymerized in an aqueous medium to produce the emulsion polymer; and

said ion-exchanged emulsion polymer and glycoluril having added thereto at least 0.05% by weight cation salt selected from $mCaHPO_4 2H_2O$, Fe_3 - acetyl acetonante, $K_2Cr_2O_7$, $KH_2PO_4Na(CrO_3)_2$, $(NH_4)_2\ CO_3$, $(NH_4)_2\ HPO_4$, and $NH_4F.HF$ and the pH of the resulting mixture is between 2 and 5.

4,921,889

THERMOPLASTIC MOLDING MATERIALS BASED ON NYLONS AND POLYARYL ETHER KETONES

Dietrich Lausberg, and Erhard Seiler, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 127,238

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641497

Int. Cl.[5] **C08L** *23/00, 61/18, 63/00, 77/02*

U.S. Cl. 523—400 **10 Claims**

1. A thermoplastic molding material containing, as essential components,

(A) from 2 to 97.9% by weight of a nylon,

(B) from 2 to 97.9% by weight of a polyaryl ether ketone and

(C) from 0.1 to 30% by weight of a polymeric component containing essentially free available hydroxyl groups with the proviso that components A and B are stable to component C, said polymeric component being selected from the group consisting of:

(1) a polycondensate of aliphatic or aromatic diols with eiphalohydrins,

(2) a polymer selected from the group consisting of polyolefins, polystyrene or rubber elastomers or mixtures thereof having hydroxyl groups,

(3) a polymer or copolymer or mixtures thereof containing up to 100 mol% of vinylphenylcarbinols or vinylphenyldimethylcarbinols or mixtures thereof, and

(4) a non-crosslinked and soluble phenol/formaldehyde polycondensate, and in addition

(D) from 0 to 50% by weight of an impact-modifying rubber and

(E) from 0 to 60% by weight of fibrous or particulate fillers or mixtures thereof.

4,921,890

PROCESS FOR IMPROVING POLYMER SUBSTRATE PROPERTIES, AND FLAME RETARDANCY MODIFIED POLYMERS PRODUCED THEREBY

Katsumi Hayashi, Kirtland, and Gregory A. Lentz, Twinsburg, both of Ohio, assignors to Intera Company, Ltd., Cleveland, Tenn.

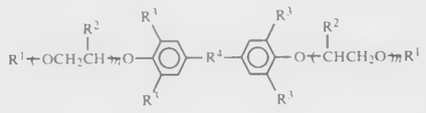
Filed Apr. 24, 1987, Ser. No. 42,278

Int. Cl.[5] **C08L** *67/00;* **C08K** *5/13;* **D06M** *13/16*

U.S. Cl. 523—507 **14 Claims**

1. A process for improving the flame retardancy, hygroscopic, dye receptive and other surface properties of a polymer substrate comprising:

(a) contacting the substrate with a flame retarding effective amount of an aqueous emulsion of an organic hydrophobic halogen-containing carrier compound, said carrier compound having the formula:



wherein n is an integer from 0 to 10 inclusive, R^1 is a hydrogen, alkyl, halogenated alkyl, aryl, epoxyalkyl, aralkyl, or saturated acyl group

R^2 is hydrogen, alkyl or aryl; R^3 is F, Cl, Br or I; and R^4 is an alkylidene, alkylene, —O—, —S—, —CO—, or $—SO_2$**13** group, at a temperature between about 40° C. and 100° C.;

(b) adding an amount of a water-soluble monomer to the emulsion effective to improve the hygroscopic, antistatic, dye-receptive or water-wetting properties of said substrate; and

(c) initiating polymerization of said water-soluble monomer to form a polymer on the substrate whereby the improvement in flame retardancy and surface properties of the substrate persists for at least 20 cycles of laundering in a conventional home washing machine.

4,921,891

WOOD COATING COMPOSITION AND PROCESS OF USE THEREOF

Carroll W. Cope, Marion, Va., assignor to Di Giorgio Corporation, San Francisco, Calif.

Continuation of Ser. No. 940,904, Dec. 10, 1986, abandoned. This application Feb. 9, 1989, Ser. No. 308,970

Int. Cl.[5] **C08K** *11/00*

U.S. Cl. 524—15 **1 Claim**

1. A composition for coating wood surfaces comprising:

	% volume
alkyd resins	5.18
suspension agent (liq.)	5.18
anti-mar agent	4.21
tripentaerythritol	4.72
wetting agent	0.27
deodorant	0.28
thickener	8.96
pecan shell flour (solid)	1.12
toluene	1.41
flow agent	0.05
suspension agent	0.12
methyl ethyl ketone	4.94
acetone	3.57
vinyl resins	1.47
cellulose acetate	1.07
dioctyl phthalate	0.71
solid pigment	13.98
other solvents	36.25
other vehicle resins	6.52
	100.00

4,921,892

SETTING ASPHALT EMULSIONS

Richard B. Moore, Richmond, Tex.; Paul L. Fitzgerald, Hixson, Tenn., and Ernest G. Pole, Sarnia, Canada, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 102,840

Int. Cl.[5] **C08L** *95/00*

U.S. Cl. 524—61 **6 Claims**

1. A process for destabilizing a polymer modified anionic aqueous emulsion comprising, per 100 parts by weight of bitumen, coal tar or a mixture thereof, from 1 to 50 parts, by dry weight, of a polymer or a latex of a polymer selected from the group consisting of:

(a) polymers comprising:

(i) from 80 to 20 weight percent of a $C_{8\text{-}12}$ vinyl or vinylidine aromatic monomer which may be unsubstituted or substituted by a $C_{1\text{-}4}$ alkyl radical or a chlorine atom; and

(ii) from 20 to 80 weight percent of a $C_{4\text{-}6}$ conjugated diolefin which may be unsubstituted or substituted by a chlorine atom;

said emulsion and said latex, when present, being stabilized with an emulsifier selected from the groups consisting of soaps of $C_{12\text{-}18}$ long chain fatty acids, rosin, hydrogenated rosin and tall oil; which comprises contacting, per 100 parts by dry weight, of said emulsion with a destabilization system comprising:

at least about 0.5 parts, dry weight, of a compound which releases or produces a divalent metal ion and a sufficient amount of a compound selected from the group consisting of ammonium salts of $C_{1\text{-}6}$ organic acids, and $C_{1\text{-}4}$ alkyl and hydroalkyl amines, to provide at least 0.05 parts, by dry weight, of ammonia or ammonium ion.

4,921,893

STABILIZING POLYMERS

Lajos Ávár, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 712,345, Mar. 15, 1985, Pat. No. 4,716,187, which is a continuation-in-part of Ser. No. 590,506, Mar. 16, 1984, abandoned. This application Dec. 3, 1987, Ser. No. 128,363

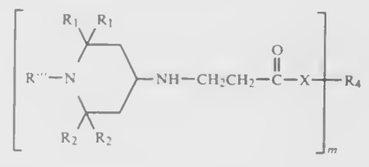
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310100

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[5] **C08K** *5/34, 5/35;* **C07D** *211/58, 401/12*

U.S. Cl. 524—99 **25 Claims**

1. A compound of the formula



(Ia)

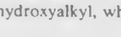
in which

R''', is hydrogen, methyl or CH_3CO—;

both R_1's are CH_3 or together form $—(CH_2)_5$;

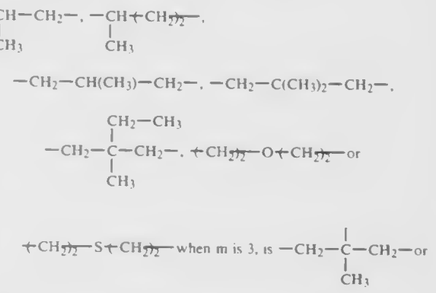
both R_2's are CH_3 or together form $—(CH_2)_5$;

X is a —O—, —NH— or



m is an integer from 1 to 4, inclusive;

R_4, when m is 1, is $C_{8\text{-}18}$alkyl, $C_{1\text{-}8}$alkoxy $C_{1\text{-}12}$alkyl or $C_{1\text{-}6}$ hydroxyalkyl, when m is 2, is $—(CH_2)_n$,



when m is 4, is $C—(CH_2)_4$; and n is 2 to 14.

4,921,894

NOVEL, HIGH TEMPERATURE RESISTANT INSULATION

Monroe W. Shumate, Littleton, Colo., assignor to Manville Corporation, Denver, Colo.

Filed Apr. 18, 1988, Ser. No. 182,539
Int. Cl.[5] C08K *3/34*
U.S. Cl. 524—377 11 Claims

1. An insulation material comprising about:
(a) 35–75 wt% inorganic fiber;
(b) 15–35 wt% inorganic binder;
(c) 4–10 wt% hydrophilic fumed particulate material having a surface area greater than about 100 m^2/g;
(d) 0.5–5 wt% of at least one polymer selected from the group consisting of polyalkylene oxides; cellulose ethers; polyalkylene glycols; and copolymers of vinyl amides and acrylic acids;
(e) 0–6 wt% setting agent; and
(f) 0–15 wt% opacifier.

4,921,895

PREPARATION FOR FINISHING TEXTILE FIBERS AND PRODUCTS AND TEXTILE PRODUCTS HAVING IMPROVED HANDLE

Dietmar Schaefer, Essen, and Friedhelm Nickel, Bremen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG

Filed Jan. 17, 1989, Ser. No. 298,123
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802622
Int. Cl.[5] C08K *5/05*
U.S. Cl. 524—379 12 Claims

1. A preparation suitable for finishing textile fibers and products, comprising
(a) between about 0.5 to 80% by weight of a mixture of first and second modified organopolysiloxanes in a weight ratio of first to second organopolysiloxane of 10:1 to 1:1, wherein the first organopolysiloxane is a linear siloxane with polyether groups and having at least 40 dialkylsiloxy units, to which are linked at least 2 polyether groups, each of which has a molecular weight of about between 600 to 4,000 and comprises 40 to 100 mole percent of oxyethylene units, the remainder being oxypropylene units, the ratio of the number of dialkylsiloxy units to the number of polyether groups being greater than or equal to 8,
said second organopolysiloxane being a linear siloxane containing quaternary ammonium groups with at least 20 dialkylsiloxy units, to which at least 2 quaternary ammonium groups are linked through carbon atoms, the ratio of the number of dialkylsiloxy units to the number of quaternary ammonium groups being greater than or equal to 10, and
(b) a solvent vehicle selected from the group consisting of water and water miscible solvents.

4,921,896

FIREPROOFED POLYAMIDE COMPOSITIONS

Yves Bonin, Brignais, and Jack LeBlanc, St Genis-Laval, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 12, 1988, Ser. No. 256,921
Claims priority, application France, Oct. 12, 1987, 87 14268
Int. Cl.[5] C08K *3/30, 3/22*
U.S. Cl. 524—403 16 Claims

1. A fireproofed polyamide-containing composition of matter having reduced blooming effects, comprising (i) a moldable polyamide, (ii) a fireproofing amount of a red phosphorus, (iii) at least one lanthanide compound in and amount of from about 0.1×10^{-3} gram-atoms per 100 g of polyamide, and (iv) a stabilizer comprising talc in an amount of from about 0.5 to about 5% by weight of the polyamide and either zinc sulfide or zinc oxide, or admixture thereof in a total amount of from about 0.1 to about 5% by weight relative to the weight of the polyamide, wherein the stabilizer reduces blooming effects when said composition is exposed to high temperature and moisture.

4,921,897

FLAME RETARDANT COMPOSITION CONTAINING ZINC BORATE

Richard L. Danforth, Missouri City, and Darlene G. Smith, Bellville, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 31, 1989, Ser. No. 332,249
Int. Cl.[5] C08G *3/26, 67/02*
U.S. Cl. 524—405 18 Claims

1. A flame retardant polymer composition comprising a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and a flame retarding quantity of a zinc borate.

4,921,898

VINYL ACETATE-ETHYLENE COPOLYMER EMULSIONS PREPARED IN THE PRESENCE OF A STABILIZING SYSTEM OF A LOW MOLECULAR WEIGHT POLYVINYL ALCOHOL AND A SURFACTANT

William E. Lenney, and John G. Iacoviello, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 762,096, Aug. 2, 1985, abandoned. This application Feb. 17, 1987, Ser. No. 15,194
Int. Cl.[5] C08F *2/16*
U.S. Cl. 524—459 28 Claims

1. In a vinyl acetate-ethylene copolymer emulsion prepared by the aqueous emulsion copolymerization of vinyl acetate and ethylene monomers in the presence of a polyvinyl alcohol and a surfactant, the improvement which comprises a stable vinyl acetate-ethylene copolymer emulsion, the copolymer containing 60–95 wt% vinyl acetate and 5–40 wt% ethylene, the emulsion being about 65–70% solids, having a viscosity of less than about 3500 cps at 65% solids and prepared by aqueous emulsion copolymerization in the presence of a stabilizing system consisting essentially of 2–4 wt%, based on vinyl acetate monomer, of low molecular weight polyvinyl alcohol which has a 100–600 degree of polymerization and 1–4 wt%, based on vinyl acetate monomer, of a nonionic surfactant which is a polyethoxylated derivative of about 30–40 ethylene oxide units of (a) an alkyl phenol, the alkyl group containing 7–18 carbon atoms, or (b) a hydrophobic base formed by condensing propylene oxide with propylene glycol.

4,921,899

INK COMPOSITION CONTAINING A BLEND OF A POLYESTER, AN ACRYLIC POLYMER AND A VINYL POLYMER

Hieu D. Phan, and Gary T. Clark, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1988, Ser. No. 256,344
Int. Cl.[5] C08L *67/02, 27/06, 33/06*
U.S. Cl. 524—513 14 Claims

1. A polymer blend comprising:
(A) about 10 to 65 weight percent, based on the weight of (A) plus (B) plus (C) of one or more linear water-dissipatable polymers having carbonyloxy linking groups in the linear molecular structure wherein up to 80% of the linking groups are carbonylamido linking groups, the polymer having an inherent viscosity of from about 0.1 to about 1.0 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of 0.25 gram of polymer in 100 mL of the solvent, the polymer containing substantially equimolar proportions of acid equivalents (100 mole %) to hydroxy and amino equivalents (100 mole %), the polymer comprising the reaction products of reactants selected from (1), (2), (3), and (4), or the ester forming or esteramide forming derivatives thereof, as follows, wherein all stated mole percentages

are based on the total of all acid, hydroxyl and amino equivalents being equal to 200 mole %:
(1) at least one difunctional dicarboxylic acid;
(2) from about 4 to about 25 mole % of at least one difunctional sulfomonomer containing at least one metallic sulfonate group or nitrogen-containing non-metallic sulfonate group attached to an aromatic or cycloaliphatic nucleus wherein the functional groups are hydroxy, carboxyl or amino;
(3) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two $—CH_2—OH$ groups of which
(a) at least 15 mole % is a poly(ethylene glycol) having the structural formula

$$H(OCH_2—CH_2—)_nOH,$$

n being an integer of from 2 to about 20, or
(b) of which from about 0.1 to less than about 15 mole % is a poly(ethylene glycol) having the structural formula

$$H(OCH_2—CH_2—)_nOH,$$

n being an integer of between 2 and about 500, and with the proviso that the mole % of said poly(ethylene glycol) within said range is inversely proportional to the quantity of n within said range; and
(4) from none to about 40 mole % of difunctional reactant selected from hydroxycarboxylic acids having one $—C(R)_2—OH$ group, aminocarboxylic acids having one —NRH group, and amino-alcohols having one $—C(R)_2—OH$ group and one —NRH group, or mixtures of said difunctional reactants;
wherein each R in the (3) and (4) reactants is a hydrogen atom or an alkyl group of 1 to 4 carbons;
(B) an acrylic polymer in an amount of about 15 to 30 percent, based on the total weight of Components (A) and (B), said acrylic polymer being compatible with the water-dissipatable polyester at an acrylic polymer concentration of about 30 weight percent of the total acrylic/polyester polymer solids, and
(C) a water-dissipatable vinyl polymer in an amount of about 20 to 60 weight percent, based on the weight of (A) plus (B) plus (C), said vinyl polymer being compatible with the water-dissipatable polyester at a vinyl polymer concentration of about 30 weight percent of the total vinyl/polyester polymer solids, and wherein said vinyl polymer comprises repeating units of the formula

$$+CH_2—\underset{\displaystyle X}{CH}+$$

wherein X is halo.

4,921,900

STABLE SOLUTIONS OF POLY(PARAPHENYLENE TEREPHTHALAMIDE) ACID CRUMB

James E. Van Trump, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 14, 1988, Ser. No. 284,423
Int. Cl.[5] C08L *79/00*
U.S. Cl. 524—744 8 Claims

1. A process for preparing a stable liquid solution of poly(paraphenylene terephthalamide) crumb comprising the steps of:
(a) placing terephthaloyl chloride in reactive contact with para-phenylene diamine in a substantially anhydrous solution of an N-alkyl-pyrrolidone and at least one of a substantially anhydrous alkali metal salt and alkaline earth metal salt under agitation forces to yield a damp acidic crumb reaction product of poly(paraphenylene terephthalamide); and
(b) combining the acidic crumb reaction product, under agitating forces, with:
(i) a base selected from the group consisting of potassium and sodium hydroxide, and potassium and sodium alkoxide of less than five carbon atoms, the base being present in the amount of from 2.6–5.9 moles per mole of —NH— in the poly(paraphenylene terephthalamide);
(ii) a co-solvent of the formula

$$X—OH$$

wherein X is; H, an alkyl of less than 5 carbon atoms or a combination thereof, the co-solvent being present in the amount of from 10.0–38.0 moles per mole of —NH— in the poly(paraphenylene terephthalamide); and
(iii) dimethyl sulfoxide being present in an amount sufficient to effect solution of the poly(paraphenylene terephthalamide) crumb; to yield the stable liquid solution.

4,921,901

BLOCK COPOLYMERS HAVING ETHYLENE-PROPYLENE COPOLYMER BLOCKS AND METHACRYLATE ESTER POLYMER BLOCKS

Satoshi Ueki, Saitama, and Chihiro Imai, Kanagawa, both of Japan, assignors to Toa Nenryo Kogyo KK, Tokyo, Japan

Continuation of Ser. No. 61,116, Jun. 12, 1987, abandoned, which is a division of Ser. No. 738,069, May 24, 1985, Pat. No. 4,704,433. This application Jul. 5, 1988, Ser. No. 214,780
Claims priority, application Japan, May 29, 1984, 59-107617
Int. Cl.[5] C08F *297/06, 297/08, 293/00*
U.S. Cl. 525—244 28 Claims

1. A block copolymer having a number-average molecular weight of about 1,000 to about 600,000 and a molecular weight distribution of 1.05 to 1.40 in which a random copolymer segment (A) is bonded to a polymer segment (B), with the ratio of (A) to (B) being 15/85 to 97/3 by weight, said random copolymer segment (A) being composed of the constitutional units represented by the formulas I and II below:

$$+CH_2—CH_2+ \quad \text{I}$$

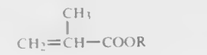
$$+CH_2—\underset{\displaystyle CH_3}{CH}+ \quad \text{II}$$

wherein the amount of I in said segment (A) is from 30 to 80 wt% and the amount of II in said segment (A) is from 70 to 20 wt%, and said polymer segment (B) being composed of the constitutional units represented by the formula

$$\left(\begin{array}{l} CH_3 \\ | \\ C—CH_2 \\ | \\ COOR \end{array}\right)$$

wherein R is a hydrocarbyl of 1 to 20 carbon atoms, said block copolymer formed by a process which comprises the steps of:
(a) performing living polymerization of ethylene and propylene in a polymerization zone at a temperature of less than −50° C. in the presence of a catalyst comprising beta-diketone vanadium chelate and an organoaluminum compound, to provide a living ethylene-propylene random copolymer;
(b) reacting said ethylene-propylene copolymer with a halogen to provide an ethylene-propylene random copolymer having halogenated terminal groups;
(c) contacting said halogenated copolymer produced in step (b) with metallic magnesium; and

(d) polymerizing the product of step (c) with a methacrylate ester of the formula



wherein R is as defined above, to form said block copolymer.

4,921,902

HYDROPHOBIE ASSOCIATIVE COMPOSITION CONTAINING A POLYMER OF A WATER-SOLUBLE MONOMER AND AN AMPHIPHILIC MONOMER

Syamalarao Evani, and K. Van Phung, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1984, Ser. No. 576,250
Int. Cl.[5] C08F *220/56*
U.S. Cl. 524—555 14 Claims

1. An aqueous-soluble hydrophobe associative copolymer of an ethylenically unsaturated, water-soluble monomer having a hydrophobic group, said copolymer thus having hydrophobic groups, derived from said amphiphilic monomer, that are capable of associating with each other in an aqueous medium containing a water-soluble electrolyte thereby causing an increase in the viscosity of the aqueous medium, wherein said copolymer is composed of from about 40 to about 99.9 mole percent of acrylamide, from 0 to about 50 mole percent of acrylic acid and from about 0.1 to about 10 mole percent of higher alkyl poly(oxyethylene)$_x$ methacrylate or acrylate wherein alkyl has from 8 to 16 carbon atoms and x is a number from 5 to 40, said copolymer having a weight average molecular weight in the range from 800,000 to about 3 million as determined from intrinsic viscosity.

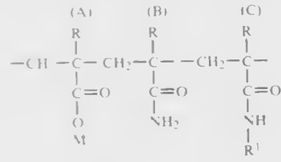
4,921,903

PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT HYDROPHOBIC ACRYLAMIDE POLYMERS

Dodd W. Fong, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 11, 1988, Ser. No. 256,339
Int. Cl.[4] C08L *39/00*
U.S. Cl. 524—555 6 Claims

1. A process of making a water-in-oil emulsion which contains from 5-60% by weight of a hydrophobic acrylamide terpolymer composed of the random repeating units:



where:

R is methyl or hydrogen,

M is hydrogen, alkali metal, ammonia, or amine,

R^1 is a hydrophobic radical,

with the mol ratio of A:B:C being A(2-50):B(50-98):C(0.1-15), which comprises reacting a 5-60% by weight water-in-oil emulsion of an acrylamide polymer with a hydrophobic amine at a temperature above 120° C. for a period of time sufficient to transamidate the acrylamide groups in the acrylamide polymer with the hydrophobic amine.

4,921,904

SUPERABSORBENT POLYMERS

John W. Sparapany, Bolingbrook, and Dennis P. Bakalik, Woodridge, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Dec. 19, 1988, Ser. No. 286,106
Int. Cl.[5] C08F *8/32*
U.S. Cl. 525—329.9 2 Claims

1. A substantially water-insoluble, slightly cross-linked, partially neutralized, hydrogel-forming polymer composition consisting essentially of

(a) from about 50 mole percent to 99.999 mole percent of polymerizable acid group-containing monomers;

(b) from about 0.001 mole percent to 10 mole percent of a water-soluble polyamine; and

(c) from about 0.01 to about 8 mole percent of a water-soluble aliphatic or substituted aliphatic primary or secondary monoamine;

said hydrogel-forming polymer composition having been formed by reacting a water-soluble acid group-containing vinyl polymer with the water-soluble polyamine and the monoamine at a temperature sufficient to convert a substantial portion of the amino groups of the water-soluble polyamine and monoamine into amido groups.

4,921,905

PROCESS FOR THE PRODUCTION OF BLOCK COPOLYMER OF PROPYLENE AND ETHYLENE

Ichiro Fujio; Kaneo Ito, and Tadashi Asanuma, all of Takaishi, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 943,701, Dec. 19, 1986, abandoned. This application Jun. 1, 1988, Ser. No. 205,484
Claims priority, application Japan, Jan. 28, 1986, 61-14722
Int. Cl.[4] C08F *2/00, 293/00, 297/08*
U.S. Cl. 525—53 7 Claims



1. In a process for the production of a block copolymer of propylene by conducting continuous polymerization of substantially propylene alone at first in a continuous polymerization system to the extent that the amount of propylene polymerized in this continuous step ranges from 50 to 95 wt.% of the entire monomer polymerized in the process, receiving for a predetermined period of time a first polymer slurry, which has been discharged continuously from the polymerization system, in either one of two or more batchwise polymerization tanks provided in parallel to each other and upon a lapse of the predetermined period of time, changing the delivery of the first polymer slurry to the other batchwise polymerization tank or either one of the remaining batchwise polymerization tanks, feeding at least ethylene to each of the batchwise polymerization tanks after completion of the reception of the first polymer slurry therein so as to conduct batchwise polymerization of

ethylene and propylene successively in the polymerization tanks such that the ratio of ethylene to propylene ranges from 20/80 to 95/5 on a weight basis, and then discharging a second polymer slurry to a deactivation tank from each of the batchwise polymerization tanks upon completion of the batchwise polymerization therein while allowing a predetermined amount of unreacted ethylene to remain in the batchwise polymerization tanks,

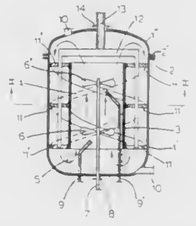
the improvement wherein the supply of fresh ethylene is halted to each of the batchwise polymerization tanks until completion of reception of the first polymer slurry from the continuous polymerization system, and a deactivator is charged into each of the batchwise polymerization tanks at the same time as the reception of the first polymer slurry therein while controlling the charging rate of the deactivator in such a way that the partial pressure of ethylene in the vapor phase of each of the batchwise polymerization tanks reaches a predetermined value at the same time as the completion of reception of the first polymer slurry therein, wherein the charging rate of the deactivator is not constant.

4,921,906

PROCESS FOR THE PREPARATION OF A HOMOGENEOUS THERMOPLASTIC POLYMER

Peter J. N. Meyer, Munstergeleen, and Reinard J. M. Steeman, Elsloo, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 858,748, May 2, 1986, abandoned. This application May 27, 1988, Ser. No. 203,544
Claims priority, application Netherlands, May 3, 1985, 8501255
Int. Cl.[5] C08F *2/02, 2/06*
U.S. Cl. 525—53 15 Claims



1. A process for preparing a homogeneous thermoplastic polymer comprising:

(a) introducing a reaction mixture composed of an alkenyl aromatic monomer, an unsaturated dicarboxylic anhydride monomer and, optionally, a rubber into a reaction vessel; and

(b) polymerizing the reaction mixture, while sequentially and repeatedly conveying the mixture through a first reaction zone in the vessel and mixing the mixture in a second reaction zone in the vessel, wherein said reaction zones each have a top and a bottom, and wherein the respective tops of the reaction zones are confluent and the respective bottoms of the reaction zones are confluent, wherein said reaction vessel comprises:

a circumferential outer wall member having a top and a bottom;

a guide tube having a top, a bottom, an inner wall and an outer wall, disposed generally coaxially within the circumferential outer wall member, defining said first reaction zone between the outer wall member and the outer wall, and defining said second reaction zone within the inner wall;

wherein the top and bottom of the guide tube are disposed within the top and bottom of the wall member so that the first and second reaction zones are confluent at the top and bottom of the guide tube;

a rotating screw ribbon conveying device including one or more screw ribbons and disposed in the first reaction zone; and

a rotating shaft mixing device disposed in said second reaction zone.

4,921,907

RESIN COMPOSITION AND MULTILAYERED STRUCTURE

Taichi Negi, Kurashiki; Nobuo Tanaka, Nishinomiya, and Kiyoshi Yonezu, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Dec. 30, 1987, Ser. No. 139,871
Claims priority, application Japan, Dec. 30, 1986, 61-310773
Int. Cl.[5] C08L *29/02, 29/04*
U.S. Cl. 525—57 12 Claims

1. A resin composition comprising from about 95 to about 30 parts by weight of a saponified product of an ethylene-vinyl acetate copolymer (A), comprising ethylene units in an amount of from about 20 to about 55 mole percent, and exhibiting a degree of saponification of the vinyl acetate component of at least 90 mole percent, and from about 5 to about 70 parts be weight of a saponified product of a modified ethylene-vinyl acetate copolymer (B) comprising pyrrolidone-ring containing units in an amount of from about 0.1 to about 10 mole percent, and ethylene units in an amount of from about 20 to about 55 mole percent, and exhibiting a degree of saponification of the vinyl acetate component of at least 90 mole percent, wherein the difference between the amount of ethylene units of copolymer (A) and copolymer (B) is at least about 4 mole percent.

4,921,908

COPOLYMERS OF POLY(VINYL TRIFLUOROACETATE) OR POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 63,589, Jun. 17, 1987, Pat. No. 4,840,992, which is a continuation of Ser. No. 891,852, Sep. 3, 1986, Pat. No. 4,693,939, which is a division of Ser. No. 731,915, May 8, 1985, Pat. No. 4,618,649, which is a continuation-in-part of Ser. No. 500,785, Jun. 3, 1983, Pat. No. 4,528,325. This application Mar. 28, 1989, Ser. No. 329,685
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—61 8 Claims

1. A process for preparing a polymer hydrogel comprising the steps:

a. admixing

(1) vinyl trifluoroacetate monomer, and

(2) up to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and copolymerizable disubstituted ethylenes,

b. allowing said admixture to react so as to form a poly(vinyl trifluoroacetate) polymer, and

c. Solvolyzing said poly(vinyl trifluoroacetate) polymer in a mild base in a non-aqueous diluent so as to produce a poly(vinyl alcohol) polymer, said base in a non-aqueous diluent being selected so that the poly(vinyl trifluoroacetate) polymer and the polymeric poly(vinyl alcohol) solvolysis products are insoluble therein, and

d. hydrating said poly(vinyl alcohol) polymer in aqueous liquid to produce said polymer hydrogel.

4,921,909

METHOD FOR PRODUCING THERMOPLASTIC RESINS

Teruhiko Sugimori, Otake; Noriyuki Tajiri, Toyohashi, and Yutaro Fukuda, Otake, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,057

Claims priority, application Japan, Dec. 25, 1985, 60-295370; Dec. 26, 1985, 60-293953

Int. Cl.[5] C08L *51/00*

U.S. Cl. 525—64 8 Claims

1. A method for producing a thermoplastic resin, which comprises:

(a) substantially removing an aqueous phase from a two-phase mixture comprising:

(i) a latex of a polymer (1), produced by emulsion polymerization,

(ii) a water-soluble coagulating agent (2) in an amount of about 10% by weight or less of said first polymer, and

(iii) an organic agent (3), in an amount of 0.1 to 6 times the weight of said polymer (1), which agent is capable of dissolving uncrosslinked polymer of said polymer (1), and which agent has a solubility in water of 5% by weight or less at 25° C.;

(b) subjecting the resulting mixture, which substantially comprises the polymer (1) and said organic agent (3), and which is substantially free of an aqueous phase, to a devolatization treatment by heating to form a molten polymer, thereby removing said organic agent (3) and remaining water; and then

(c) melt-mixing said molten polymer with a thermoplastic polymer (4').

4,921,910

TOUGHENED THERMOPLASTICS

James Lunt, Bright's Grove; Susan A. M. May, Sarnia, and Patricia A. Leivo, Wyoming, all of Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Apr. 19, 1989, Ser. No. 340,284

Int. Cl.[5] C08L *51/06, 35/06, 15/02, 9/00*

U.S. Cl. 525—74 15 Claims

1. A polymeric blend comprising:

(A) per 100 parts by weight of a polymer selected from the group consisting of:

(i) C_{2-3} poly alpha olefins which have been grafted with from 0.1 to 10 weight percent of a C_{4-8} anhydride of a dicarboxylic acid; and

(ii) polymers comprising:

(a) from 50 to 99 weight percent of one or more C_{8-12} vinyl aromatic monomers which are unsubstituted or substituted by a chlorine atom or a C_{1-4} alkyl radical;

(b) from 1 to 20 weight percent of one or more anhydrides of a C_{4-8} dicarboxylic acid; and

(c) optionally up to 15 weight percent of one or more C_{1-8} alkyl ester of a C_{3-6} ethylenically unsaturated carboxylic acid;

(B) from 20 to 80 parts by weight of a copolymer of isoprene and isobutylene in a molar ratio of 1:99 to 3:97, which polymer has been halogenated with from 0.5 to 3 weight percent of chlorine or bromine; and

(C) from 0.5 to 1.5 parts by weight of one or more compatibilizing agents selected from the group consisting of

(i) C_{2-10} aminoalkanols which are substituted at the nitrogen atom by two radicals selected from the group consisting of C_{1-4} alkyl and hydroxyalkyl radicals;

(ii) C_{6-10} aromatic ethers of C_{2-10} aminoalkanols which are substituted at the nitrogen atom by two radicals selected from the group consisting of C_{1-4} alkyl and hydroxyalkyl radicals;

(iii) C_{4-10} aminoalkenols which are substituted at the nitrogen atom by two radicals selected from the group consisting of C_{1-4} alkyl and alkanol radicals provided that the ethylenic unsaturation is not adjacent the nitrogen atom or a hydroxyl radical; and

(iv) C_{6-10} aromatic ethers of C_{4-10} aminoalkenols which are substituted at the nitrogen atom by two radicals selected from the group consisting of C_{1-4} alkyl and alkanol radicals provided that the ethylenic unsaturation is not adjacent the nitrogen atom or a hydroxyl radical.

4,921,911

BLENDS OF LINEAR LOW DENSITY ETHYLENE COPOLYMERS

Pradeep P. Shirodkar, Somerset, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 266,957, Nov. 3, 1988, and a continuation-in-part of Ser. No. 295,430, Jan. 10, 1989. This application Jul. 25, 1989, Ser. No. 384,361

Int. Cl.[5] C08L *23/18, 23/20, 51/04*

U.S. Cl. 525—86 16 Claims

1. A polymer blend comprising a linear low density copolymer of ethylene with an olefin containing 4 to 10 carbon atoms and minor amounts of an at least partially isotactic, partially crystalline butene-1 polymer comprising at least about 80 wt. % of polymerized butene-1, and an ABS resin, based on the total polymer content of the blend.

4,921,912

EPOXY RESIN COMPOSITION CONTAINING ACRYLIC OLIGOMER, AMINE AND AMINE-TERMINATED NITRILE RUBBER

Hirotoshi Sagawa, and Seiji Yamaguchi, both of Hyogo, Japan, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 8,881, Jan. 30, 1987, abandoned. This application Aug. 1, 1988, Ser. No. 231,665

Claims priority, application Japan, Feb. 3, 1986, 61-20156

Int. Cl.[5] C08L *9/02, 63/10*

U.S. Cl. 525—112 8 Claims

1. An epoxy resin composition, useful as an adhesive, coating or electrical insulating material, which comprises

(a) an epoxy resin or mixture of epoxy resins,

(b) 3–20 parts by weight, per 100 parts by weight of component (a) of any acrylic oligomer having an acrylate functionality of 3 to 6 in one molecule,

(c) 5–150 parts by weight per 100 parts by weight of component (a) of an amine selected from the group consisting of diethylenetriamine, triethylenetetramine, tetraethylenepentamine, pentaethylenehexamine, hexamethylenediamine, bis-hexamethylene-triamine, diethylaminopropylamine, trimethylhexamethylenediamine, oleylamine, dipropylenetriamine, 1,3,6-tris-aminomethylhexane, 3,9-bis(3-aminopropyl)-2,4,8,10-texraoxaspiro[5.5]undecane, xylenediamine, 1,3-bisaminomethylcyclohexane, bis(4-aminocyclohexyl)methane, bis(4-amino-3-methylcyclohexyl)-methane, isophoronediamine, N-aminoethylpiperazine, menthene-diamine, di(aminophenyl)methane, anilineformaldehyde low molecular weight condensate, m-phenylenediamine, diaminodiphenyl sulfone, dimethylaminomethylphenol, tris(dimethyl)-aminomethylphenol, a polyamidoamine of the formula $NH_2—R'—NH-(OC—R—CONH—R'—NH)_n—H$ where R and R' are alkylene, and mixtures of said amines, and

(d) 10–200 parts by weight per 100 parts by weight of component (a) of a nitrile rubber having a terminal amine group.

4,921,913

POWDER COATING COMPOSITIONS OF POLYEPOXIDES AND ACRYLIC COPOLYMERS

Paul H. Pettit, Jr., Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 763,377, Aug. 7, 1985. This application Mar. 26, 1987, Ser. No. 31,293

Int. Cl.[5] C08L *33/02*

U.S. Cl. 525—119 11 Claims

1. A thermosetting powder coating composition comprising a coreactable particulate mixture of:

(A) 40 to 80 percent by weight of an acid group-containing acrylic polymer having a glass transition temperature in the range of 40° to 100° C. and a number average molecular weight of 1500 to 20,000,

(B) 5 to 30 percent by weight of an epoxy novolac resin having a number average molecular weight of 500 to 1400 which is compatible with (A), and

(C) 5 to 30 percent by weight of an epoxy resin which has a number average molecular weight of at least 1000 and which is incompatible with (A),

the percentage by weight of (A), (B) and (C) based on weight of resin solids.

4,921,914

THERMOPLASTIC RUBBER COMPOSITIONS OF CARBOXYL ETHYLENE POLYMER AND BLENDS WITH POLYAMIDE

Anne C. Udding, Cm Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 21, 1989, Ser. No. 341,191

Claims priority, application United Kingdom, Apr. 28, 1988, 8810101

Int. Cl.[5] C08L *77/00;* C08F *8/00*

U.S. Cl. 525—184 24 Claims

1. A composition comprising:

(a) an at least partially neutralized carboxylated ethylene-propylene rubber copolymer which is the reaction product of (i) a non-carboxylated ethylene-propylene rubber, (ii) at least 0.5 parts by weight of an azidosulfonylbenzoic acid per 100 parts by weight of non-carboxylated ethylene-propylene rubber, and (iii) a metal based neutralizing agent, wherein:

(1) the carboxylated copolymer is substantially free of olefinic unsaturation;

(2) the degree of neutralization of the carboxyl groups of the carboxylated copolymer is at least 50 percent; the metal or (iii) is selected from the group consisting of magnesium, sodium and zinc;

(b) at least about 6 pbw per 100 pbw of the carboxylated copolymer of a zinc carboxylate based on an acid compound selected from the group consisting of linear and branched monocarboxylic acids having at least 12 carbon atoms.

4,921,915

DISPERSION POLYMERS, BIOLOGICALLY ACTIVE DISPERSION POLYMERS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE AS DIAGNOSTIC AIDS

Michael Dengler; Wolfgang Kapmeyer, both of Marburg, and Helmut Rinno, Hofheim, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

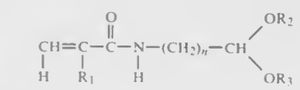
Filed Jul. 7, 1987, Ser. No. 70,543

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3622993

Int. Cl.[5] C08F *265/10, 271/02, 273/00*

U.S. Cl. 525—279 7 Claims

1. A dispersion polymer composed of latex particles on whose surface is located a copolymer which is formed of monomers of the formula I



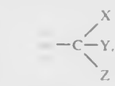
Formula I

in which

n = 1–6;

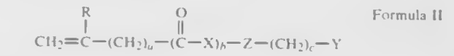
R_1 = H or CH_3, and

R_2 and R_3 are identical or different with R_2 and R_3 = $—(CH_2)_m—CH_3$ m = 0–7 or



X, Y and Z being $(CH_2)_p—CH_3$ and p being 1–3, with X, Y, Z being identical or different,

and monomers of the formula II



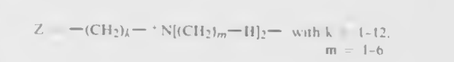
Formula II

with

R = H or CH_3,

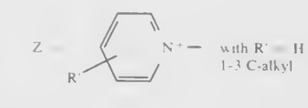
X = —NH or —O,

$Y = SO_3^-$ or COO^-



Z = $—(CH_2)_k—$ ' $N[(CH_2)_m—H]_2—$ with k = 1–12, m = 1–6

or



Z = $N^+—$ with R' = H or 1–3 C-alkyl

a = 0–6,

b = 0–1,

c = 1–12.

4,921,916

FLAME-RETARDANT FILLERS IN SILANE-GRAFTED ETHYLENE POLYMER PROCESS

Barry G. Howell, High Wycombe; Diane E. M. Ness, London, and Ronald A. Harvey, Leatherhead, all of England, assignors to BICC plc, London, England

Continuation of Ser. No. 901,534, Aug. 11, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 222,400

Claims priority, application United Kingdom, Feb. 5, 1985, 8502928

Int. Cl.[5] C08K *3/22, 3/30*

U.S. Cl. 525—423 7 Claims

1. A process for making a halogen-free fire-retardant cross-linked extruded product comprising first forming a halogen-free composition whose essential ingredients are:

at least one filler;

a compatible ethylene polymer base in which the filler is dispersed;

a hydrolysable unsaturated silane;

a free-radical grafting initiator;

and a silanol condensation catalyst; said filler being a flame-retardant filler of the class that evolve substantial amounts of bound water on heating at temperatures above a value T_d which value lies in the range 120°–250° C.; the ratio of filler to polymer being in the range of 3:1 to 1:2 by weight; and said initiator having a half-life of less than 10 minutes at a temperature 25° C. below the T_d of said filler as deter-

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mined by Differential Thermal Analysis using chlorobenzene as a solvent,

second, and only after said ingredients have been mixed together, raising the temperature to a grafting temperature below said T_d but at which said initiator decomposes to generate free-radicals that effect grafting of said silanes to said polymer;

third extruding the mixture containing the grafted polymer from an extrusion die to form a shaped product;

and fourth exposing said shaped product to water until it is crosslinked by hydrolytic condensation reactions of the grafted silane.

4,921,917

PRE-CERAMIC METHYLPOLYSILANES

Gary T. Burns, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 1, 1987, Ser. No. 103,275
Int. Cl.[5] C08F *283/00*
U.S. Cl. 525—479 21 Claims

1. A method for improving the properties of methylpolysilanes useful in the production of silicon carbide ceramics, said method comprising the steps of:

providing a solution of at least one methylpolysilane polymer having silicon-silicon bonds;

inserting an unsaturated moiety into silicon-silicon bonds present in said methylpolysilane polymer by reacting said methylpolysilane polymer, in the presence of a catalyst, with at least one multiple-unsaturated compound which is capable of entering into insertion reactions with disilane monomers; and

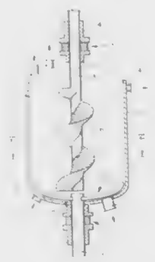
isolating the reaction product.

4,921,918

PROCESS FOR UTILIZING VERTICAL AUTOCLAVE IN POLYMERIZATION OF VINYL CHLORIDE

Yves Pommier, Lyon, and Yves Legrand, Saint-Priest, both of France, assignors to Atochem, Paris la Defense, France

Division of Ser. No. 850,286, Apr. 10, 1986, Pat. No. 4,729,878.
This application Oct. 5, 1987, Ser. No. 104,480
Claims priority, application France, Apr. 11, 1985, 85 05429
Int. Cl.[5] C08F *2/02*
U.S. Cl. 526—88 2 Claims



1. A process for the bulk polymerization of a vinyl chloride-based monomer reaction medium to form a vinyl chloride-based polymer or copolymer comprising carrying out said polymerization in two stages, the initial stage being carried out with high-turbulence stirring until a degree of conversion of the monomer reaction medium of about 3% to 15% is obtained, and the final stage completing the polymerization or copolymerization to the degree desired being carried out at a low stirring rate in an autoclave comprising a concave shaped autoclave bottom, a shaft along a vertical axis of said autoclave, said shaft passing through said bottom of said autoclave, and at least one stirrer arm attached to said vertical shaft for driving said medium with a centripetal motion about said concave autoclave bottom said stirrer arm having a shape matching the shape of said concave bottom of said autoclave and being attached so that said arm is adjacent said concave bottom and said final stage having two stirring zones, a first stirring zone around the axis of the autoclave and a second stirring zone in the lower portion of the autoclave in which the monomer reaction medium partially converted into polymer is driven in a centripetal motion.

4,921,919

METHOD AND APPARATUS FOR MINIMIZING POLYMER AGGLOMERATE OR LUMP FORMATION IN A GAS-PHASE POLYPROPYLENE POLYMERIZATION REACTOR

Chi-Hung Lin, Wheaton; Jack F. Stevens, Naperville; Benjamin S. Tovrog, Naperville, and Philip M. Rose, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 3, 1988, Ser. No. 202,092
Int. Cl.[5] C08F *2/34*
U.S. Cl. 526—88 3 Claims



1. In a process for quench-cooled, vapor-phase polymerization of olefin monomer in a horizontally disposed reactor vessel comprising contacting olefin monomer, or a mixture of olefin monomers, with a polymerization catalyst system in the presence of hydrogen in a reactor vessel to form a polymer product, the improvement comprising introducing a high activity titanium-containing catalyst component of the catalyst system into the top side of the reactor vessel onto a polymer bed at a point as close as possible to the upstream end of the reactor vessel, mixing the catalyst component with the polymer product in the reactor vessel and introducing a cocatalyst plus modifier component of the catalyst system into the top side of the reactor vessel onto the polymer bed at a distance downstream of the point of introduction of the catalyst, the downstream distance being equal to at least 25% of the inside diameter of the reactor vessel.

4,921,920

PROCESS FOR THE POLYMERIZATION OR COPOLYMERIZATION OF ALPHA-OLEFINS IN A FLUIDIZED BED, IN THE PRESENCE OF A ZIEGLER-NATTA CATALYST SYSTEM

Joelle Collomb-Ceccarini, Marseille, and Pierre Crouzet, Matrigues, both of France, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 833,391, Feb. 19, 1986, abandoned.
This application Nov. 3, 1987, Ser. No. 117,399
Claims priority, application France, Jun. 28, 1984, 84 10215
Int. Cl.[5] C08F *2/34, 10/00*
U.S. Cl. 526—125 9 Claims

1. Process for the polymerisation or copolymerisation of alpha-olefins comprising from 2 to 8 carbon atoms in a fluidized bed, by means of a catalyst system of the Ziegler-Natta type consisting of

a catalyst (a) comprising atoms of magnesium, halogen titanium and/or vanadium, and of

a cocatalyst (b) consisting of an organometallic compound selected from the group consisting of organoaluminium and organozinc compounds,

the catalyst system being converted into a prepolymer by bringing one or several alpha-olefins into contact with the catalyst system in such quantities that the prepolymer contains per gram from 2×10^{-3} to 10^{-1} milligram of atoms of titanium and/or vanadium, and

the atomic ratio of the quantity of metal of the cocatalyst (b) to the quantity of titanium and/or vanadium is comprised between 0.5 and 50,

the process being characterized in that the prepolymer is

(i) previously subjected to a treatment by carbon monoxide or carbon dioxide, in the absence of alpha-olefin, in such a quantity that the ratio of the number of grams of molecules of carbon monoxide or dioxide to the number of grams of atoms of titanium and/or vanadium is comprised between 0.001 and 0.1, and

(ii) then brought into contact with one or several alpha-olefin(s) under polymerisation or copolymerisation conditions in a fluidized bed, in the presence of a cocatalyst (c);

said cocatalyst (c) consisting of an organometallic compound selected amongst organoaluminum and organozinc compounds, which is identical to or different from cocatalyst (b), in a quantity such that the atomic ratio of the quantity of metal in the said cocatalyst (c) to the quantity of titanium and/or vanadium is comprised between 0.5 and 100.

4,921,921

MELTABLE AEROBICALLY CURED PLASTIC COMPOSITIONS

Wolfgang Ritter, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 23, 1986, Ser. No. 868,368
Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518965
Int. Cl.[5] C08C *33/00*
U.S. Cl. 526—195 38 Claims

1. A solid composition comprising a mixture of

(a) a reactive component containing at least one compound having at least one polymerizable ethylenic double bond;

(b) a component for initiating polymerization containing at least one organoboron compound; and

(c) one or more polymers having a melting or softening temperature in the range of from about 50 to about 350° C.,

wherein the composition is solid at room temperature, stable on storage in solid form even in the presence of air, becoming spreadable or fluid under the influence of heat, aerobically curable by polymerization in such heated spreadable or fluid condition and has a glass transition temperature T_g above about 45° C.

4,921,922

PRODUCTION OF TETRAFLUOROETHYLENE POLYMERS

Terence E. Attwood, Blackpool, and Richard F. Bridges, Near Blackpool, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 118,253, Nov. 9, 1987, Pat. No. 4,766,188.
This application Jun. 2, 1988, Ser. No. 201,209
Claims priority, application United Kingdom, Nov. 26, 1986, 8628291
Int. Cl.[5] C08F *14/18*
U.S. Cl. 526—255 2 Claims

1. A coagulated dispersion grade tetrafluoroethylene homo- or copolymer produced by a process which comprises emulsion polymerising tetrafluoroethylene, or tetrafluorethylene with one or more comonomers, in an aqueous medium in the presence of a surfactant(s) as emulsifying agent and a water-soluble initiator system comprising disuccinic acid peroxide and ammonium sulphite, the ammonium sulphit- being added to the aqueous reaction medium after the start of polymerisation, namely at a conversion within the range 1 to 95%, and the amount of ammonium sulphite employed being within the range 25 to 300% by weight, based on the weight of the disuccinic acid peroxide used.

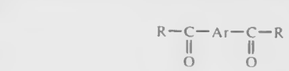
4,921,923

ETHERS OF OLIGOMERIC PHENOL-DIKETONE CONDENSATION PRODUCTS AND A VINYL-BENZYL COMPOUND

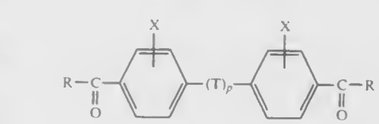
Joseph J. Zupancic, Bensenville, Ill.; Jean M. J. Frechet, Ithaca, N.Y.; Andrew M. Zweig, Schaumburg, and Jeffrey P. Conrad, Chicago, both of Ill., assignors to Allied Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 126,313, Nov. 30, 1987, Pat. No. 4,816,498. This application Nov. 18, 1988, Ser. No. 272,954
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] C08G *2/02, 2/34, 8/02, 8/36*
U.S. Cl. 526—313 28 Claims

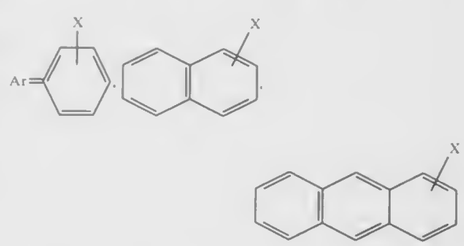
1. A thermosetting resin of an ether of the oligomeric condensation product of 1 molar proportion of a diketone, said diketone selected from the group consisting of cyclopentanediones, cyclohexanediones, cycloheptanediones, cyclooctanediones, bicyclo[2.2.1]heptanediones, bicyclo[3.3.0]cyclooctanediones, and acyclic ketones of formulae



1



2



R = CH_2, CH_3CH_2, $CH_3CH_2CH_2$

where

X = halogen or alkyl containing up to about 10 carbon atoms;

p = 0 or 1;

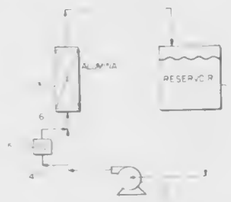
T = O, S, CH_2, $(CH_3)_2C$, SO_2, C_6H_4, or $(CH_3)_2CC_6H_4C(CH_3)_2$;

with from about 3 to about 4 molar proportions of a phenol of structure $R_1C_6H_4OH$ where R_1 is hydrogen or an alkyl group containing from 1 to about 10 carbon atoms, and where the ether moiety is randomly selected from the group consisting of vinylbenzyl, alkyl moieties containing from 1 to 10 carbon atoms, cycloalkyl moieties of 5 to 10 carbon atoms, and benzyl, with the ratio of vinylbenzyl to other moieties being at least 1:1.

4,921,924
ISOPRENE RECOVERY IN THE BUTYL RUBBER PROCESS

Harvey E. Atwood, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 814,097, Dec. 27, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 922,679
Int. Cl.[5] C08F 6/10
U.S. Cl. 526—339 14 Claims



1 In a methyl chloride slurry polymerization process for preparing butyl rubber from a monomer mixture which comprises an isoolefin and conjugated multiolefin, wherein the methyl chloride and unreacted monomer are separated from the butyl rubber by flashing in hot water and the recovered methyl chloride-monomer mixture is subsequently dried over alumina, thereby forming t-butyl chloride from the isoolefin, the dried methyl chloride and monomers being separated from one another by fractionation, the improvement which comprises treating the unreacted dried monomer to remove the said t-butyl chloride by again contacting the unreacted monomer with alumina for a time sufficient to remove the said t-butyl chloride.

4,921,925
ORGANOBOROSILAZANE POLYMERS

Leonard M. Niebylski, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 213,839, Jun. 30, 1988, abandoned. This application Nov. 17, 1988, Ser. No. 272,481
Int. Cl.[5] C08G 77/04, 77/26
U.S. Cl. 528—5 25 Claims

1 A process which comprises reacting about 0.25–20 parts by weight of a triaryloxyboroxine with one part by weight of a polysilazane to form an organoborosilazane polymer.

4,921,926
CURABLE POLYORGANOSILOXANE COMPOSITION

Tsuneo Motegi; Yasuji Matsumoto; Kiyoshi Takeda, and Shuji Chiba, all of Gunma, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,985
Claims priority, application Japan, Nov. 18, 1987, 62-291540
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—17 6 Claims

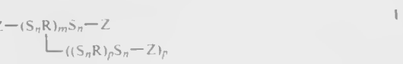
1 A curable polyorganosiloxane composition comprising:
(A) 100 parts by weight of polyorganosiloxane having at least two hydroxyl groups or hydrolyzable groups bonded to a silicon atom in the molecule thereof and having a viscosity at 25° C. of 10 to 1,000,000 cSt;
(B) 0 to 2,000 parts by weight of polyorganosiloxane having at least two alkenyl groups bonded to a silicon atom in the molecule thereof and having a viscosity at 25° C. of 10 to 1,000,000 cSt;
(C) 0.5 to 20 parts by weight of an organosilicon compound having more than 2, on the average, hydrolyzable groups bonded to a silicon atom in the molecule thereof;
(D) 0 to 10 parts by weight of a catalyst for a condensation reaction; and
(E) 0.1 to 5 parts by weight of an organic peroxide,
wherein at least 0.01 mol % of all organic groups bonded to a silicon atom as contained in (A) to (C) is an alkenyl group.

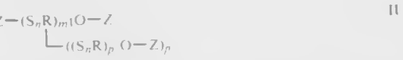
4,921,927
SULFIDE CONTAINING ALIPHATIC EPOXY RESINS

Robert E. Hefner, Jr., and Paul L. Wykowski, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 234,238, Aug. 19, 1988, Pat. No. 4,829,133, which is a division of Ser. No. 65,533, Jun. 23, 1987, Pat. No. 4,816,546. This application Jan. 23, 1989, Ser. No. 300,461
Int. Cl.[5] C08G 59/02
U.S. Cl. 528—87 12 Claims

1. A thermosettable (curable) composition comprising
(I) an epoxy resin composition resulting from dehydrohalogenating the reaction product of one or more polysulfides with an epihalohydrin which polysulfides are represented by the following formulas I or II or a combination of such polysulfides


I

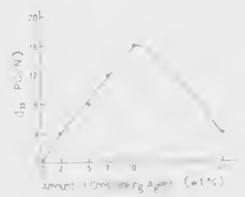

II

wherein each R is independently a polyvalent organic radical with each valence residing on a carbon atom and having from one to about 18 carbon atoms; each Z is independently a hydroxyalkyl or inertly substituted hydroxyalkyl monovalent radical having from 1 to about 36 carbon atoms; p and m are independently zero or a positive integer having a value from 1 to about 40; p'' and m[1] are independently a positive integer having a value from 1 to about 40; n is a number from 1 to about 8 and p' is zero or a positive integer which is the difference between the valence of R and two; and
(II) a curing quantity of at least one suitable curing agent and/or curing catalyst therefor.

4,921,928
PIEZOELECTRIC POLYMER MATERIALS FROM EPOXY RESINS AND POLYTETRAMETHYLENEOXIDE-DI-P-AMINOBENZOATE

Katsumi Tanino, and Morihito Kakada, both of Toyama, Japan, assignors to Toyokako Kabushiki Kaisha, Namerikawa, Japan

Filed Jun. 17, 1988, Ser. No. 208,063
Claims priority, application Japan, Sep. 7, 1987, 62-223722
Int. Cl.[5] C08G 59/42, 59/50, 59/56
U.S. Cl. 528—111 5 Claims



1 A piezoelectric polymer material which comprises: a cured product made from (1) an epoxy resin having at least two epoxy groups; (2) a compound having, at least two amino groups, at least two benzene rings, at least two carbonyl groups and at least 52 methylene groups and having a molecular weight not less than 1200; and (3) a crosslinking agent for the epoxy resin, said cured product having dipolarly oriented microcrystals therein.

4,921,929
PROCESS FOR THE SYNTHESIS OF A COPOLYESTER ADHESIVE RESIN

John R. Wilson, Hartville; Marian M. Rousek, Akron, and Fred L. Massey, Uniontown, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 229,688, Aug. 8, 1988, Pat. No. 4,835,247. This application Mar. 28, 1989, Ser. No. 329,615
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[5] C08G 63/02
U.S. Cl. 528—272 20 Claims

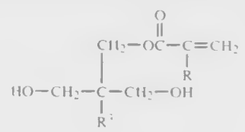
1. In a process for the synthesis of polyester resins having repeat units which are derived from isophthalic acid by reacting at least one dicarboxylic acid or diester thereof with at least one diol in the presence of at least one metallic catalyst, wherein one of the dicarboxylic acids is isophthalic acid; the improvement which comprises conducting the reaction in the presence of at least one protonic acid selected from the group consisting of sulfuric acid, phosphoric acid, sulphurous acid, trichloroacetic acid, para-toluene sulfonic acid and meta-toluene sulfonic acid which is present in an amount which is effective to substantially inhibit the formation of cyclic dimer.

4,921,930
ACRYLOYLOXY AND METHACRYLOYLOXY GROUP-CONTAINING CONDENSATION POLYMERS

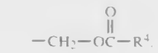
Gilbert C. Johnson, Lino Lakes, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 99,612, Sep. 22, 1987. This application Sep. 22, 1989, Ser. No. 411,543
Int. Cl.[5] C08G 63/52, 63/56, 18/67
U.S. Cl. 528—306 18 Claims

1. A condensation polymer comprising the reaction product of
(1) diols, at least one of which is an acryloyloxyalkanediol or methacrylayloxyalkanediol of the formula



in which
R is hydrogen or methyl,
R^3 is



and
R^4 is hydrogen or one or more of monovalent saturated or unsaturated linear, branched, or cyclic aliphatic groups having 1 to 24 carbon atoms, or aromatic groups having 6 to 18 carbon atoms, all of which can be optionally substituted by groups unreactive in esterification reactions, that is uncontaminated by hydroxyl group-containing compounds having one, three, or more hydroxyl groups and compounds in which the acryloyloxy and methacryloyloxy group is attached to a secondary carbon atom, and
(2) an organic dicarboxylic acid halide, said reaction product being a linear polymer.

4,921,931
THERMOSETTING RESIN COMPOSITIONS

Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 17, 1989, Ser. No. 324,866
Int. Cl.[5] C08G 73/10
U.S. Cl. 528—322 25 Claims

1. A curable thermosetting resin composition comprising (a) an arylcyclobutenealkyl ether of a-1,6-diaza[4.4]spirodilactam having a hydroxyaryl substituent on each spiro ring nitrogen atom, and (b) at least one additional polymerizable monomer of up to 30 carbon atoms inclusive having at least two functional substituents each of said substituents having multiple bonds between adjacent atoms.

4,921,932
POLYAMIDE RESIN

Mitsuhiko Tamura; Masaaki Miyamoto; Hidemi Nakanishi, and Takayoshi Tanaka, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,515
Claims priority, application Japan, Aug. 12, 1987, 62-201564
Int. Cl.[5] C08G 69/34
U.S. Cl. 528—339.3 14 Claims

1. A copolyamide resin containing a dimerized fatty acid as a copolymer component, which has (1) at least 25 equivalent %, based on the total number of terminal groups, of hydrocarbon groups having from 6 to 22 carbon atoms at its terminals, (2) a content of a dimerized fatty acid of from 0.1 to 40% by weight based on the total amount of the resin, and (3) a melt viscosity as measured at 240° C. of from 2,000 to 15,000 poise.

4,921,933
AROMATIC POLYAMIDE MOLDED ARTICLE HAVING STORAGE MODULUS

Masanori Osawa, Yokohama; Kohei Shizuka, Fujisawa; Masahiro Kouno, Ashigarashimo; Akio Matsuyama, Kamakura; Hirotoshi Katsuoka, and Kazumi Mizutani, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,910
Claims priority, application Japan, Jun. 9, 1987, 62-142301
Int. Cl.[5] C08G 69/32
U.S. Cl. 528—348 7 Claims

1 A molded article of an aromatic polyamide, having a glass transition temperature ranging from not less than 250° C. to not more than 400° C. and having a storage modulus of said molded article, at a temperature not less than the glass transition temperature, defined by the formula (I):

$$E'(Tg)/E'(Tg+100°\ C.)<3 \qquad (I)$$

wherein Tg is the glass transition temperature ° C., E'(Tg) is the storage modulus in gigapascals at the glass transition temperature, and E'(Tg+100° C.) is the storage modulus in gigapascals at the temperature of Tg + 100° C

4,921,934
ALKALI-SOLUBLE POLYMERS AND PROCESS FOR PRODUCING SAME

Kathleen J. Bixler, and Kevin M. Scholsky, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 137,119, Dec. 23, 1987, abandoned. This application May 12, 1989, Ser. No. 353,202
Int. Cl.[5] C08G 61/00
U.S. Cl. 528—355 18 Claims

1. A process for producing an alkali-soluble graft polymer having at least one main chain and a plurality of side chains attached thereto, the process comprising the steps of:
combining, in a solvent contained within an agitated reaction zone, (1) at least one vinylic monomer that is capable of forming free radicals, (2) at least one ethylenically-

unsaturated carboxylic acid monomer that is capable of addition-copolymerizing with the vinylic monomer in the presence of the thus-formed free radicals, and (3) cyclic ester molecules that are capable of ring-opening in the presence of the carboxylic acid monomer, thereby producing a reactant-initiatable polymerizable mixture; and

subjecting the reactant-initiatable polymerizable mixture to a preselected temperature and pressure effective to cause the vinylic monomer and the ethylenically-unsaturated carboxylic acid monomer to free-radically addition-copolymerize to form the graft polymer one main chain and to cause the cyclic ester molecules to ring-open at the inner ester bonds thereof and to graft onto the polymer main chain, thereby forming the side chains of the graft polymer,

the process being characterized in that the main-chain and side-chain formations of the graft polymer occur substantially simultaneously, the process further being characterized in that the graft polymer is formed expressly excluding utilization of a polymerization catalyst for the cyclic ester molecule.

4,921,935

PREPARATION OF POLYARYLENE SULPHIDES WITH KETONE OR PINACONE

Ernst-Ulrich Dorf; Franz Alfes, and Hans-Joachim Traenckner, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,502

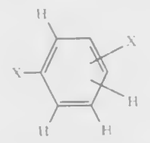
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738142

Int. Cl.[5] **C08G** *75/14*

U.S. Cl. 528—388 **12 Claims**

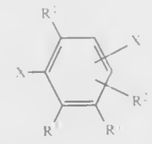
1 Process for the preparation of optionally branched polyarylene sulphides by reaction of the following compounds:

(a) 50 to 100 mol % of dihalogenated aromatic compounds corresponding to formula (I)



(I)

and 0 to 50 mol % of dihalogenated aromatic compounds corresponding to formula (II)



(II)

wherein

X denotes a halogen atom in the meta or para position to one another and

R^1 and R^2 are identical or different and denote hydrogen, C_1 to C_4 alkylaryl, C_5 to C_{10} cycloalkyl, C_6 to C_{10} and C_7 to C_{10} alkylaryl or C_7 to C_{14} arylalkyl or two groups R^1 in the ortho position to one another are joined together to form an aromatic or heterocyclic ring containing up to 3 hetero atoms and one of the groups denoted by R^1 is always different from hydrogen,

(b) 0 to 50 mol %, based on the sum of the dihalogenated aromatic compounds of formulae I and II, of a tri- or tetrahalogenated aromatic compound corresponding to formula (III)

$$ArX_n \quad \text{(III)}$$

wherein

Ar denotes an aromatic C_6 to C_{14} group or a heterocyclic group containing 5 to 14 ring atoms in which up to 3 ring carbon atoms are replaced by hetero atoms,

X denotes a halogen atom and

n denotes the number 3 or 4,

and

(c) 50 to 100 mol % of alkali metal sulphide or mixtures thereof, optionally together with small quantities of alkali metal hydroxides and from 0 to 50 mol % of alkali metal bisulphide or mixtures thereof,

in which the molar ratio of (a+b):c is in the range of from 0.75:1 to 1.25:1,

(d) optionally in the presence of reaction accelerators selected from alkali metal carboxylates, alkali metal phosphates, alkali metal phosphonates, alkali metal fluorides or alkali metal alkyl sulphonates or in the presence of N,N-dialkylcarboxylic acid amides, lactams, anhydrides or esters of carboxylic acids in a polar organic solvent,

characterised in that from 0.05 to 3% by weight, based on the quantity of polyarylene sulphide obtained, of one or more ketones corresponding to formula (IV) or one or more pinacones corresponding to formula (V)

$$R^1—C(O)—R^2 \quad \text{(IV)}$$

$$R^1R^2C(OH)—C(OH)R^1R^2 \quad \text{(V)}$$

wherein R^1 and R^2 stand for C_1 to C_{10} alkyl, C_6 to C_{24} aryl or mixtures thereof are present during the reaction of said compounds.

4,921,936

PROCESS FOR DESTRUCTION OF TOXIC ORGANIC CHEMICALS AND THE RESULTANT INERT POLYMER BY-PRODUCT

Harold W. Adams, Monroe, Conn., assignor to Sultech, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 644,545, Aug. 27, 1984, Pat. No. 4,581,442. This application Apr. 1, 1986, Ser. No. 846,916

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.[5] **C08J** *11/00, 11/02, 11/04*

U.S. Cl. 528—389 **56 Claims**



1 A process for the substantial destruction of a carbonaceous chemical to produce a chemically inert, solid composition of matter comprising the following steps:

(a) Reacting sulfur vapor and said carbonaceous chemical together in a reactor under a substantially oxygen-free atmosphere at a temperature above the vaporization temperature of sulfur in the range of 500 degrees C. to 1500 degrees C. and at a pressure of about one to two atmospheres, so as to form a chemically inert, solid composition of matter composed substantially of sulfur and carbon, which resulting solid composition has little or no remaining residues of said carbonaceous chemical, and

(b) Separating the resulting formed solid composition from any vapor phases in the reactor.

4,921,937

TERPOLYMER FROM OLEFIN AND CARBON MONOXIDE AND PREPARATION THEREOF

Eit Drent, Cm Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 4, 1988, Ser. No. 267,142

Claims priority, application Netherlands, Nov. 4, 1987, 8702633

Int. Cl.[5] **C08G** *67/02*

U.S. Cl. 528—392 **19 Claims**

1. The process of producing a linear, alternating polymer by polymerizing carbon monoxide, at least one α-olefin, and at least one compound selected from a group consisting of 2-butene, 2-pentene, 2-hexene, 2octene, 2,7-dimethyl-4-octene, cyclopentene, cyclohexene, crotonic acid, methylcrontonate, methyl-3-pentenoate, maleic acid, fumaric acid, dimethylmaleate, dimethylfumarate, dimethyl-3-hexenedioate or maleic anhydride, in the presence of a catalyst composition formed by contacting a palladium compound, the anion of an acid having a pKa less than 4, and a bidentate nitrogen ligand.

4,921,938

CATALYTIC, DILUENT PREPARATION OF POLY KETONE HAVING UNSATURATED TERMINAL GROUP

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 14, 1988, Ser. No. 271,130

Claims priority, application Netherlands, Nov. 12, 1987, 8702705

Int. Cl.[5] **C08G** *69/02*

U.S. Cl. 528—392 **10 Claims**

1. The process of producing a linear, alternating polymer by polymerizing carbon monoxide and at least one α-olefin in a diluent that comprises more than 50% by volume of one or more compounds selected from the group consisting of dimethyl sulfoxide, N-methyl-2-pyrrolidone, N,N-dimethyl acetamide or acetonitrile in the presence of a catalyst composition formed by contacting a palladium compound, the anion of an acid having a pKa less than 4, and a bidentate ligand of phosphorus.

4,921,939

SWEETENING AGENTS

Claude Nofre, Lyon; Jean M. Tinti, Meyzieu, and Farroudja Ouar Chatzopoulos, Saint Etienne, all of France, assignors to Universite Claude Bernard -Lyon 1, France

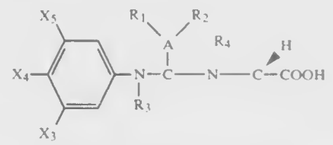
Continuation-in-part of Ser. No. 836,071, Mar. 4, 1986, Pat. No. 4,877,895. This application Mar. 3, 1987, Ser. No. 21,359

Claims priority, application France, Mar. 19, 1985, 85 04242; European Pat. Off., Mar. 13, 1986, 86420071; France, Apr. 10, 1986, 86 05320; Nov. 7, 1986, 86 15788; Dec. 23, 1986, 86 18233

Int. Cl.[5] **C07C** *127/19, 129/12;* **A23L** *1/236, 1/18*

U.S. Cl. 558—414 **37 Claims**

1. A sweetening agent having the formula,



including tautomeric forms thereof and physiologically acceptable salts thereof;

wherein X_3, X_4 and X_5 are the same or different and are selected from the group consisting of

H,

Br,

CF_3,

CF_2CH_3,

CH_2CF_3,

C_1–C_4 alkyl,

$CH{=}NOC_3$,

$CH{=}NOH$,

CHO,

CH_2OCH_3,

CH_2OH,

Cl,

CN,

$COCF_3$,

COC_1–C_3 alkyl,

$CONH_2$,

$CONHC_1$–C_3 alkyl,

$CN(C_1$–C_3 alkyl$)_2$,

$COOC_1$–C_3 alkyl,

COOH,

F,

I,

NH_2,

NHC_1–C_3 alkyl,

$N(C_1$–C_3 alkyl$)_2$,

NHCHO,

$NHCOCH_3$,

$NHCONH_2$,

$NHSO_2CH_3$,

NO_2,

OC_1C_3 alkyl,

$OCOCH_3$,

OH,

SC_1–C_3 alkyl,

SOC_1–C_3 alkyl,

SO_2C_1–C_3 alkyl,

SO_2NH_2,

SO_2NHC_1–C_3 alkyl,

$SO_2N(C_1$–C_3 alkyl$)_2$, and

SO_3H;

wherein A is selected from the group consisting of N and C;

wherein R_1 is an atom of hydrogen or R_1 is a C_1 to C_4 saturated, unsaturated, acyclic, cyclic or mixed hydrocarbyl or modified hydrocarbyl group and wherein, in the modified hydrocarbyl group,

1 to 2 atoms of carbon may be replaced by 1 to 2 of the same or different heteroatoms selected from the group consisting of N, O, S, Cl, Br and I,

and 1 to 3 atoms of hydrogen may be replaced by 1 to 3 atoms of fluorine;

wherein R_2 is a C_2 to C_{13} saturated, unsaturated, acyclic, cyclic or mixed hydrocarbyl or modified hydrocarbyl group and wherein, in the modified hydrocarbyl group,

1 to 4 atoms of carbon may be replaced by 1 to 4 of the same or different heteroatoms selected from the group consisting of N, O, S, Cl, Br and I,

and 1 to 5 atoms of hydrogen may be replaced by 1 to 5 atoms of fluorine;

wherein R_1 and R_2 are different unless fused as a single moiety;

wherein R_3 is selected from the group consisting of H and C_1–C_3 alkyl; and

wherein R_4 is selected from the group consisting of H and CH_3;

with the proviso that, when X_3, X_5, R_3 and R_4 are atoms of hydrogen,

and when X_4 is CN or NO_2, that R_1 and R_2 are not CN or OCH_3;

and when X_4 is H, Cl, CN, $COCH_3$, F or NO_2, that R_1 is not NO_2, and that R_2 is not NO_2 or SO_2R,

R being an alkyl, cycloalkyl, or aryl group having up to 10 atoms of carbon, or such a group wherein 1 or 2

carbon atoms are substituted by 1 or 2 atoms of sulfur or oxygen.

4,921,940

PROCESS FOR THE PURIFICATION OF TI CONTAINING POLYCARBONATE WITH SOLVENT, COMPLEXING AGENT AND WATER

Peter G. Odell; Giuseppa Baranyi, both of Mississauga, and Lupu Alexandru, Toronto, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 15, 1988, Ser. No. 232,089
Int. Cl.[5] C08G *63/62*
U.S. Cl. 528—486 21 Claims

1. A process for the purification of polycarbonates containing titanium catalyst residues, which comprises mixing a polycarbonate with a solvent; adding to the formed solution mixture a complexing component; admixing the resulting mixture with water; and subsequently separating the polycarbonate product therefrom.

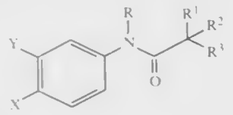
4,921,941

ORALLY ACTIVE ANTIANDROGENS

Tattanahalli L. Nagabhushan, Parsippany; Martin F. Haslanger, Ridgewood, and Michael F. Czarniecki, Westfield, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jul. 1, 1987, Ser. No. 68,509
Int. Cl.[5] C07K *5/08*
U.S. Cl. 530—331 16 Claims

1. A compound represented by the formula



wherein

X is CN, NO_2, CF_3, Cl, Br or I;

Y is F, Cl, Br, I, NO_2, NH_2, CF_3 or CN;

R is H or lower alkyl;

R_1 and R_2 are independently straight or branched alkyl radicals having up to eight carbon atoms, R_1 and R_2 together with the carbon to which they are attached form a cyclopropyl or cyclobutyl ring, or one of R_1 and R_2 is alkyl as defined above and the other is aryl, arylalkyl or aryl-$S(O)_{0-2}$alkyl, wherein the aryl group is unsubstituted or is substituted by 1–3 substituents selected from the group consisting of H, halogen, NO_2, CO_2H, $CONH_2$, CN, lower alkyl, alkoxy, alkanoyl, lower alkylsulfenyl, lower alkylsulfinyl, lower alkylsulfonyl, perfluoro lower alkylsulfinyl, perfluoro lower alkylsulfonyl, alkoxycarbonyl, phenyl, phenylsulfenyl, phenylsulfinyl and phenylsulfonyl;

R_3 is a tri-peptidyl group selected from the group consisting of alanyl-glycyl-sarcosyl, lysyl-glycyl-sarcosyl and lysyl-glycyl-prolyl, which peptidyl group is joined to the molecule by a C-terminal amino acid residue; and the pharmaceutically acceptable salts thereof.

4,921,942

ORGANOMETALLIC COMPOUNDS

Randal J. Bernhardt, Mundelein; Melvin L. Loeb, Northbrook, both of Ill., and James W. Kay, Durham Township, Bucks County, Pa., assignors to Stepan Company, Northfield, Ill.

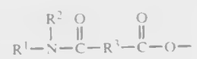
Continuation of Ser. No. 23,207, Mar. 9, 1987, Pat. No. 4,724,174, which is a continuation of Ser. No. 790,486, Oct. 23, 1985, Pat. No. 4,675,422. This application Jan. 19, 1988, Ser. No. 145,092
Int. Cl.[5] A61K *7/42*; C07F *5/06*
U.S. Cl. 424—59 10 Claims

1. An organotitanium compound having the general formula:



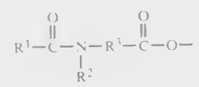
wherein

R represents an amido carboxyl moiety selected from the group consisting of:



(a)

or



(b)

wherein

R^1 and R^2 may be the same or different and are selected from the group consisting of hydrogen, an alkyl radical of from 1 to about 20 carbon atoms, an aryl or aralkyl radical of from 6 to about 20 carbon atoms, and an alkenyl radical of from 3 to about 20 carbon atoms;

R^3 is a hydrocarbyl radical of from 1 to about 6 carbon atoms; and

the sum of the carbon atoms in R^1 and R^2 is in the range of from 0 to about 40, and the sum of the carbon atoms in R^1, R^2 and R^3 is at least 2;

R′, which may be the same or different from R and R″, comprises an active moiety, said active moiety being bonded to the titanium by a linkage selected from the groups consisting of carboxylate, sulfonate, phosphate, phosphite, oxa and thia linkages; and

R″ is a modifier moiety selected from the groups consisting of hydroxyl, an alkoxy radical of from 1 to about 6 carbon atoms, or a carboxyl radical of 1 to about 6 carbon atoms.

4,921,944

METHOD OF PHARMACEUTIC PRODUCTION

Krystyna Samochocka, and Janusz J. Szymendera, both of Warsaw, Poland, assignors to Uniwersytet Warszawski, Warsaw, Poland

Continuation-in-part of Ser. No. 55,550, May 27, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 223,792
Claims priority, application Poland, Jun. 10, 1986, 259998
Int. Cl.[5] C07F *5/00*; A61K *49/02*
U.S. Cl. 534—10 5 Claims

1. A method for producing a compound for use in the diagnosis of tumors comprising:

(a) adding methionine to a solution of sodium chloride and tetrachloroplatinate in a molar ratio of tetrachloroplatinate to methionine of 2:1–4:1,

(b) thoroughly mixing the mixture of (a) for about 30 minutes,

(c) purifying the resulting dichlorodimethionineplatinate,

(d) adding a radioactive lanthanide salt,

(e) mixing the components (c) and (d),

(f) bringing the solution of (e) to a pH of about 6.5, and (g) filtering the solution with a filter.

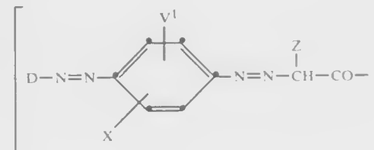
4,921,945

DISAZO DYES CONTAINING AN ACETOACETABUKUBE COUPLING COMPONENT AND A QUATERNIZED AMINOALKYLENE AMINOCARBONYL GROUP BOUND TO IT

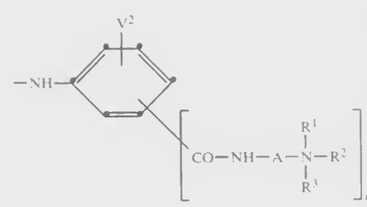
Willy Stingelin, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 25, 1988, Ser. No. 198,266
Claims priority, application Switzerland, Jun. 3, 1987, 2095/87
Int. Cl.[5] C09B *44/02*, *44/08*; D06P *1/41*; D21H *1/46*
U.S. Cl. 534—614 13 Claims

1. A disazo dye of the formula

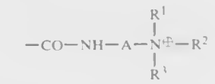


(I)



wherein

D is a diazo radical selected from the group consisting of thienyl, thiazolyl, isothiazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl, benzothiazolyl, benzoisothiazolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, pyridyl and phenyl, said radical being unsubstituted or further substituted by C_1–C_4-alkyl; C_1–C_4-alkyl substituted by hydroxyl, C_1–C_4-alkoxy, cyano, phenyl, halogen or —CO—U in which U is C_1–C_6-alkyl or phenyl; C_1–C_4-alkoxy, halogen, trifluoromethyl, cyano, nitro, acyl, benzoyl, carboalkoxy, C_1–C_4alkylsulfonyl, phenylsulfonyl, sulfonamide, arylazo or



wherein

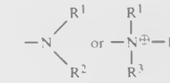
R_1, R_2 and R_3 are independently of one another C_1–C_6-alkyl or C_1–C_6-alkyl substituted by hydroxyl, phenyl, alkoxy, cyano, halogen or —CO—U in which U is C_1–C_6-alkyl or phenyl, or R_1, R_2 and the nitrogen linking them are a heterocyclic radical selected from the group consisting of pyrrolidine, piperidine, morpholine and piperazine, or R_1, R_2, R_3 and the nitrogen linking them are monoquaternized triethylenediamine or pyridinium,

V^1 and V^2 independently of one another are hydrogen, C_1–C_4-alkoxy or C_1–C_4-alkoxy substituted by hydroxyl, halogen, cyano or C_1–C_4-alkoxy, halogen, cyano, C_1–C_4-alkyl or C_1–C_4-alkyl substituted by hydroxyl, cyano, C_1–C_4-alkoxy or halogen,

X is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, cyano or a group of the formula —NH—CHO, —NH—CO—NH_2, —NH—CO—NH—Q or —NH—CO—$(O)_m$—Q in which

m is zero or 1 and

Q is C_1–C_4alkyl or C_1–C_4-alkyl substituted by halogen,



or phenyl or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or nitro,

Z is C_1–C_4alkyl—CO—, —CN, —COO—C_1–C_4alkyl, —$CONH_2$ or —CO—C_6H_5,

A is alkylene of 2 to 6 carbon atoms,

n is 1 or 2 and

$An^{\ominus}$ is an anion.

4,921,946

HYDROCARBON CONVERSION PROCESS

Joseph A. Kocal, Gurnee; David C. Martindale, Roselle, and Paul J. Kuchar, Hinsdale, all of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 90,480, Aug. 28, 1987, Pat. No. 4,783,566. This application Nov. 1, 1988, Ser. No. 265,729
Int. Cl.[5] C10G *2/64*
U.S. Cl. 585—444 6 Claims

1. A hydrocarbon conversion process selected from the group consisting of dehydrogenation, oligomerization, and alkylation comprising reducing the fluoride content of a fluoride-containing hydrocarbon feed to below 100 ppb and catalytically converting the hydrocarbon feed in the presence of a catalyst comprising a regenerable crystalline zeolite at hydrocarbon conversion conditions where the crystalline zeolite catalyst is regenerated by a procedure which comprises the combustion of carbonaceous material thereon with an oxygen-containing gas.

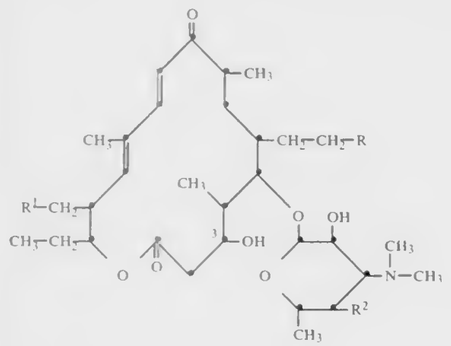
4,921,947

PROCESS FOR PREPARING MACROLIDE DERIVATIVES

Eddie V. P. Tao, and Jeffrey T. Vicenzi, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 31, 1986, Ser. No. 846,446
Int. Cl.[5] C07M *1/00*
U.S. Cl. 536—7.1 19 Claims

1. In the process for preparing a C-20-amino-substituted derivative of formula 1:



wherein R is a group of formula:



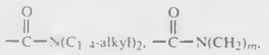
and

(i) R^3 and R^4 independently represent hydrogen, C_{1-8} alkyl, C_{3-10} cycloalkyl, or a $-(CH_2)_nPh$ group, except that R^3 and R^4 cannot both be hydrogen;

n is 0, 1 or 2; and

Ph is phenyl optionally substituted by halo, C_{1-4} alkyl or C_{1-4} alkoxy; or

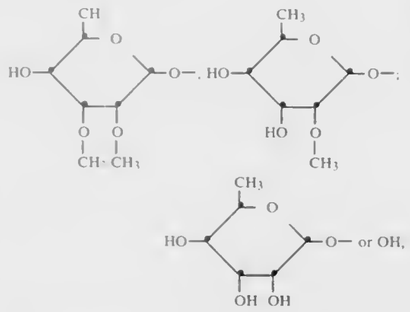
(ii) R^3 and R^4 taken together with the adjacent nitrogen atom, form a monocyclic ring containing from 5 to 12 ring atoms or a bicyclic or tricyclic ring system containing from 8 to 20 ring atoms, wherein one of the other ring atoms can be oxygen, sulfur or nitrogen and one or more of the carbon atoms may be substituted by C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, hydroxyl, halo, halo-C_{1-4} alkyl, $-N(C_{1-4}$ alkyl$)_2$, $-N(CH_2)_m$,



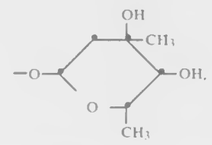
cyano, ethylenedioxy, benzyl, phenyl, or phenyl substituted by from 1 to 3 substituents selected from halo, C_{1-4}-alkyl or C_{1-4} alkoxy;

m is an integer from 4 through 7;

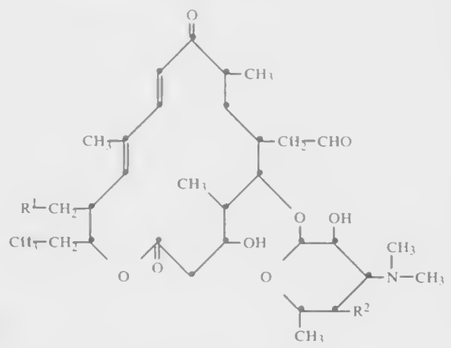
R^1 is



R^2 is hydrogen, hydroxyl or



or its acid addition salt, by reductively aminating an aldehyde of formula 2:



using an aminating agent of formula 3:



wherein R_3 and R_4 are as previously defined and a reducing agent,

the improvement which comprises using from about one to about two equivalents of formic acid as the reducing agent and carrying out the reaction in an inert, polar organic solvent at a temperature of from about 35° to about 80° C.

4,921,948

SIALOSYL GLYCERIDE AND PROCESS FOR PRODUCING THE SAME

Shoji Yoshimura, Iruma; Yuzi Matsuzaki, Kawagoe; Mamoru Sugimoto, Tokyo; Masayoshi Ito, Kunitachi, and Tomoya Ogawa, Musashino, all of Japan, assignors to Mect Corporation, Tokyo, Japan

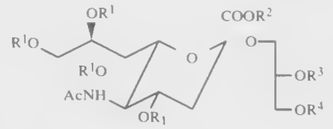
Filed Mar. 6, 1989, Ser. No. 319,064

Claims priority, application Japan, Mar. 10, 1988, 63-56884

Int. Cl.[5] **C07H** *15/00;* **C07G** *3/00, 17/00*

U.S. Cl. 536—18.2 **9 Claims**

1. A sialosyl glyceride having the following general formula:



wherein R^1 represents a hydrogen atom or XCH_2CO- (X being a halogen atom), R^2 represents an alkali metal, a hydrogen atom or a lower alkyl group, R^3 represents a hydrogen atom or $-CO(CH_2)mCH_3$, R^4 represents $-CO(CH_2)nCH_3$ and m and n each represents a whole number of 0 to 30.

4,921,949

PROCESS FOR MAKING QUATERNARY CHITOSAN DERIVATIVES FOR COSMETIC AGENTS

Günther Lang, Reinheim; Harald Wendel, Ober-Ramstadt, and Eugen Konrad, Darmstadt, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 634,100, Jul. 20, 1984, Pat. No. 4,822,598. This application Mar. 8, 1989, Ser. No. 298,514

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245784

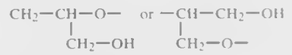
Int. Cl.[5] **C08B** *37/08;* **C07G** *17/00;* **A61K** *7/06, 31/73*

U.S. Cl. 536—20 **10 Claims**

1. A process for making a quaternary macromolecular polymer compound derived from chitosan of the general formula I

$$HO[C_6H_{11}{}_mNO_4(R^1)_m(R^2)_n(R^3)_q]_pH,$$

wherein m denotes any given numerical value from 0 to 0.5, n denotes any given numerical value from 0 to 6, q is a given numerical value from 0.005 to 3.0, p denotes a whole number from 10 to 50,000, R^1 is an acetyl residue, R^2 represents a bivalent residue $-CH_2CH(OH)-CH_2-O-$,



and R^3 is a bivalent residue



with $R^4 = C_1$- to C_4 alkyl and X = Cl, Br, I or CH_3SO_4 comprising the step of reacting a chitosan, consisting of 50 to 100% deacetylized chitin, with a glycidyl trialkyl ammonium halogenide.

4,921,950

PREPARATION OF 3'AZIDO-3-'-DEOXYTHYMIDINE

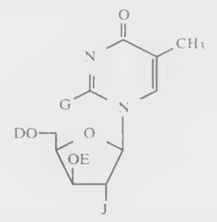
Jeffrey D. Wilson, Durham, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 9, 1988, Ser. No. 204,496

Int. Cl.[4] **C07H** *17/00, 15/04*

U.S. Cl. 536—23 **6 Claims**

1. A compounds of formula (A)



(A)

wherein D represents a methoxycarbonyl group, E represents a mesyl group and J represents a hydrogen atom, hydroxy group, an acetate or a trifluoromethyl benzoate group and G represents a hydroxy group or G and J together represent an —O— linkage between the 2 and 2'-positions of the compound of formula (A).

6. A compound selected from methyl 3-O-mesyl-5-O-(methoxycarbonyl)-2-O-(m-trifluoromethylbenzoyl)-D-xylofuranoside and 1-O-acetyl-3-O-mesyl-5-O-(methoxycarbonyl)-2-O-(m-trifluorobenzoyl)-D-xylofuranose.

4,921,951

NUCLEOSIDE-PHOSPHOLIPID CONJUGATE

Satoshi Shuto; Hiromichi Itoh; Kiyofumi Fukukawa, and Masatoshi Tsujino, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizouka, Japan

Filed Sep. 28, 1987, Ser. No. 102,043

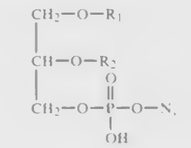
Claims priority, application Japan, Sep. 27, 1986, 61-229203; Sep. 27, 1986, 61-229204

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.[5] **C07H** *19/10, 19/20;* **C07D** *473/00*

U.S. Cl. 536—27 **2 Claims**

1. A compound of the formula:



wherein R_1 is C_{14-24} long chain aliphatic acyl, R_2 is C_{2-10} aliphatic acyl and N_1 is neplanocin A-6'-yl, and pharmacologically acceptable salts thereof.

4,921,952

NUCLEIC ACID ISOLATION PROCESS

Jonathan L. Longmire, Los Alamos, N. Mex.; Annette K. Lewis, La Jolla, Calif., and Carl E. Hildebrand, Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 146,557, Jan. 21, 1988, abandoned. This application Apr. 20, 1989, Ser. No. 341,281

Int. Cl.[4] **C07H** *21/00, 21/02, 21/04*

U.S. Cl. 536—27 **5 Claims**

1. In a process for preparing DNA from cellular materials for use in genetic studies of eukaryotic systems, a process for isolating DNA fragments from proteolytic digestion products and detergent products in a solution with said DNA fragments produced in stripping undesired cellular constituents from said DNA, wherein the improvement comprises the step of dialyzing a solution containing said DNA fragments, detergent products, and proteolytic digestion products against a solution containing PEG for a time effective to yield DNA sufficiently pure for said genetic studies.

4,921,953

CEPHALOSPORIN DERIVATIVES

Chihiro Yokoo, Gyoda; Akira Onodera, Kuki; Hiroshi Fukushima, Saitama; Yoshiaki Watanabe, Kodaira, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

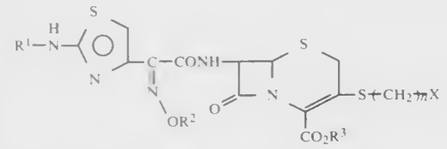
Filed Feb. 13, 1989, Ser. No. 309,160

Claims priority, application Japan, Feb. 18, 1988, 63-36257

Int. Cl.[4] **C07D** *501/36;* **A61K** *31/545*

U.S. Cl. 540—227 **10 Claims**

1. A cephalosporin derivative represented by the formula



wherein R^1 is a hydrogen atom or a protecting group of the amino group, R^2 is a hydrogen atom or a protecting group of the hydroxyl group, R^3 is a hydrogen atom or a protecting group of the carboxyl group, X is a halogen atom, a cyano group, a vinyl group, a lower alkoxy group having 1 to 4 carbon atoms or a lower alkylthio group having 1 to 4 carbon atoms and n is an integer of 1 to 3, and a non-toxic salt thereof.

4,921,954

PROCESS FOR THE PREPARATION OF CEPHEM COMPOUNDS

Hendrik A. Witkamp, Pijnacker; Jan Verweij, Leiden; Jan J. DeKoning, Rijswijk; Herman H. Grootveld, Benthuizen, and Everardus J. A. M. Leenderts, Rhoon, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

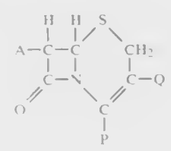
Filed Jul. 8, 1988, Ser. No. 216,877

Claims priority, application European Pat. Off., Jul. 10, 1987, 87201316.4

Int. Cl. C07D *501/04*; A61K *31/545*

U.S. Cl. 540—222 **2 Claims**

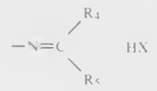
1 A process for the preparation of 3-substituted methyl-3-cephem-4-carboxylic acid derivatives of formula I



I

wherein

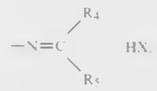
A is $—NH_2$,



or $—NH_2.HX$,

P is —COOH, or $—COO\ominus$ when Q is $—CH_2\oplus R_2$,

Q is $—CH_2R_1$ and A is NH_2; or Q is CH_2X and A is $—NH_2$, $NH_2.HX$ or



or Q is $—CH_2{}^{+}R_2$ and A is $—NH_2$; or Q is $—CH_2\oplus R_2.X\ominus$ and A is $—NH_2$ or $—NH_2.HX$,

R_1 is (lower)alkoxy, (lower)alkylthio, (lower)alkanoyloxy, (lower)alkanoylthio or $S—R_3$ where R_3 is selected from the group consisting of pyridine, pyrimidine, pyridazine, pyrrole, imidazole, pyrazole, isoxazole, isothiazole, thiazole, triazole, oxadiazole, thiadiazole, triazine, thiatriazole and tetrazole linked by a ring carbon atom to the sulfur atom, unsubstituted or substituted on a ring carbon atom of a heterocyclic ring by lower alkyl, cyano, chloro, di(lower)alkylamino, (lower)alkoxy, (lower) alkoxycarbonyl, di(lower)alkylcarbamoyl, hydroxy, sulfo and carboxy, while ring nitrogen atoms of the heterocyclic thio group can have attached thereto a lower alkyl group, and attached to the first or the second carbon atom of a lower alkyl group attached to a carbon or a nitrogen atom of a heterocyclic ring di(lower)alkylamino, chloro, cyano, methoxy, (lower)alkyloxycarbonyl, N,N-dimethylcarbamoyl, hydroxy, carboxy and sulfo,

X is halogen or a mixture thereof when A is



or X is bromo or chloro or a mixture thereof when A is $—NH_2$ or $—NH_2.HX$,

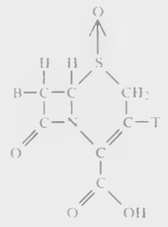
R_2 is a

group,

R_4 is alkyl of 1 to 8 carbon atoms,

R_5 is alkyl of 1 to 8 carbon atoms,

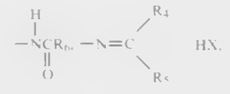
whereby R_4 and R_5 are the same or different or R_4 and R_5 together with the carbon atom to which they are attached form cycloalkylidene of 3 to 8 carbon atoms; starting from 3-methyl-3-cephem-4-carboxylic acid 1β-oxide derivatives of the formula II



II

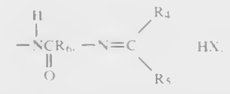
wherein

B is

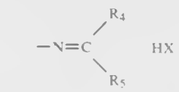


$—NH_2$ or $—NH_2.HX$,

T is $—CH_3$ when B is



or T is $—CH_2X$ when X is halogen or a mixture thereof when B is



HX

or X is bromo or chloro or a mixture thereof when B is $—NH_2$ or $—NH_2.HX$,

R_4 and R_5 are as defined above,

R_6 is $—CH_2R_7$ wherein R_7 is hydrogen, aryl, alkyl, cycloalkyl, alkenyl, aryloxy, alkyloxy, arylthio, alkylthio, or R_6 is an aryl group; characterized by carrying out subsequently the following reactions without isolation of the intermediate products: when A is $—NH_2$, Q is $—CH_2R_1$, or $CH_2\oplus R_2$ or $—CH_2—\oplus R_2X\ominus$, and P, $R_{1\text{-}3}$ and X are as described above, and B is



and T, R_6 and R_7 are as defined above:

(a) silylation of the carboxy group

(b) light-induced bromination of the 3-methyl group of a compound of formula II to obtain the corresponding 3-bromomethyl compound using a N-bromo-amide or a N-bromo-imide as brominating agent,

(c) replacement of any bromine introduced in step (b) in the methylene group adjacent to the sulfur atom in the dihydrothiazine ring by hydrogen by reaction with a trialkyl or triaryl phosphite,

(d) deoxygenation of the sulfoxy group by reaction with phosphorus pentachloride in the presence of an olefinic compound having at least one carbon-carbon double bond with no more than two hydrogen atoms attached thereto in the presence or absence of added or already present catalyst or additive,

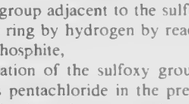
(e) an imide chloride forming reaction splitting the 7β-acylamino substituent by adding sequentially N,N-dimethylaniline or other suitable tertiary amine and phosphorus pentachloride,

(f) a reaction of the imide chloride with an alcohol to form the corresponding imino ether and/or the 7-amino-cephem derivatives,

(f') addition or not of sodium iodide,

(f'') formation or not of a 7β-(cyclo) alkylidene-imino/ammonio derivative by adding a ketone and

(g) introduction of R_1 or R_2 by replacement of the bromine in the 3-bromomethyl group, introduced in step (b) water for hydrolysis of the ammonium group; when A is



and P, Q, $R_{1\text{-}5}$ and X are as defined B above and B is



and T, R_6 and R_7 are as defined above

by carrying out reactions a-f as described above, and adding a ketone $R_4CO—R_5$;

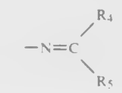
when A is $—NH_2$ or $—NH_2.HX$, Q is $—CH_2X$ and P and X are as defined above, and B is



and T, R_6 and R_7 are as defined above:

by carrying out reactions a-f as described above,

and if necessary, adding water for hydrolysis of the ammonio group; when A is



Q is $—CH_2Br$ and P, X, R_4 and R_5 are as defined above, and B is

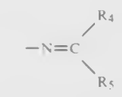


and T, R_6 and R_7 are as defined above:

by carrying out reactions a-f as described above,

and adding a ketone R_4R_5CO in the presence of an acid other than HCl;

when A is



Q is $—CH_2Cl$ and P, X, R_4 and R_5 are defined above and B is

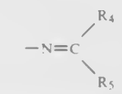


and T, R_6 and R_7 are as defined above:

by carrying out reactions a-f as described above,

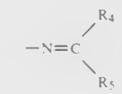
and adding a ketone R_4R_5CO in the presence of hydrogen chloride or in the presence of a chloride providing agent together with a nitrogen containing base;

when A is $—NH_2$ or $—NH_2.HX$, Q is $—CH_2R_1$ or $—CH_2{}^{-}\oplus R_2$ or $—CH_2\oplus R_2X\ominus$ and P, $R_{1\text{-}3}$ and X are as defined above, and B is

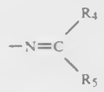


and T, R_4 and R_5 are as defined above:

introduction of R_1 or R_2 by replacement of halogen in the halomethyl group and, if necessary water for hydrolysis of the ammonio group; when A is

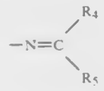


Q is $-CH_2X$, and P, X, R_4 and R_5 are as defined above, and B is



another one than being prepared or B is $-NH_2.HX$, and T, X, R_4 and R_5 are as defined above:

addition of a suitable ketone R_4R_5CO, corresponding with B; when A is $-NH_2$ or $-NH_2.HX$, Q is $-CH_2X$ and P and X are as defined above, and B is



and T, X, R_4 and R_5 are as defined above:

water for hydrolysis of the ammonio group.

4,921,955

PROCESS FOR THE SYNTHESIS OF 1-SUBSTITUTED IMIDAZOLE-5-CARBOXYLIC ACIDS AND CARBOXYLIC ACID DERIVATIVES

Werner Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

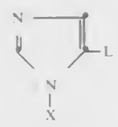
Filed Dec. 18, 1987, Ser. No. 136,167

Claims priority, application Switzerland, Nov. 6, 1987, 4331/87

Int. Cl.[5] **C07D** *413/00, 211/40, 401/00, 417/00, 417/02, 417/04, 403/00, 213/00*

U.S. Cl. 544—60 **3 Claims**

1 A process for the preparation of imidazoles of the formula I



(I)

in which

L and X represent L^1 and X^1; L^2 and X^2; L^3 and X^3; or L^4 and X^4; respectively, and

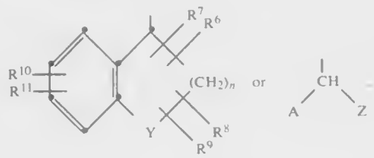
L^1 represents $COOR^1$; $CONR^2R^3$; $CONR^4NHR^3$; or CN;

R^1 represents hydrogen; C_1–C_7-alkyl; C_3–C_7-alkenyl; C_3–C_7-alkynyl; C_3–C_7-cycloalkyl; C_1–C_7-alkoxy-C_1–C_7-alkyl; or aryl-C_1–C_5-alkyl; the radicals R^2, R^3 and R^4, independently of one another, each represents hydrogen; C_1–C_5-alkyl; C_3–C_5-alkenyl; C_3–C_5-alkynyl; C_3–C_7-cycloalkyl; aryl; or C_1–C_5-alkyl substituted by aryl, C_3–C_7-cycloalkyl, C_3–C_7-cycloalkoxy, C_1–C_5-alkoxy, hydroxy, carboxy or by C_1–C_5-alkoxycarbonyl; or

R^2 and R^3, together with the nitrogen atom to which they are bonded, represent a piperidinyl, pyrrolidinyl, 2-oxopiperidinyl, 2-oxopyrrolidinyl, morpholinyl, thiomorpholinyl, piperazinyl or 4-(C_1–C_4)-alkylpiperazinyl ring that is unsubstituted or is substituted by from 1 to 3 C_1–C_5-alkyl groups;

X^1 represents 1-indanyl, 1-tetrahydronaphthalenyl, 5-benzocycloheptanyl, 4-tetrahydrobenzothienyl, 4-tetrahydrobenzofuranyl, 5-tetrahydroquinolinyl, 5-tetrahydroisoquinolinyl, 8-tetrahydroquinolinyl, 8-tetrahydroisoquinolinyl, 9,10-dihydro-9-anthracenyl, 9H-fluoren-9-yl, 5-dibenzo(a,d)cycloheptenyl, 5-dibenzo(a,d)cycloheptanyl or 1-dihydornaphthalenyl, each of which is unsubstituted or is substituted up to six times by the same or different substituents selected from C_1–C_5-alkyl, aryl-C_1–C_5-alkyl, diaryl-C_1–C_5-alkyl, C_1–C_5-alkoxy, halogen, C_3–C_7-alkenyl, amino, nitro, C_1–C_5-alkylcarbonylamino, trifluoromethyl and difluoromethoxy, or in which two geminally bonded substituents, together with the carbon atom to which they are bonded, form a C_3–C_7-spirocycloalkyl group, or in which two substituents together represent a C_1–C_5-alkylene or C_5–C_7-cycloalkylene group, it being possible for this alkylene or cycloalkylene group in turn optionally to be substituted up to twice by the same or different substituents selected from C_1–C_5-alkyl, aryl-C_1–C_5-alkyl, diaryl-C_1–C_5-alkyl, C_1–C_5-alkoxy, halogen, C_3–C_7-alkenyl, trifluoromethyl, difluoromethoxy and aryl; or

X^1 represents the group



n represents 0; 1; or 2;

Y represents a group $-CH_2S(O)_m-$ or $-CH_2-N(R^{12})-$ in which the hetero atom is bonded to the benzene ring carbon atom and in which m represents 0, 1 or 2;

R^6, R^7, R^8 and R^9, independently of one another, each represents hydrogen; C_1–C_5-alkyl; aryl-C_1–C_5-alkyl; diaryl-C_1–C_5-alkyl; C_1–C_5-alkoxy; halogen; C_3–C_7-alkenyl; trifluoromethyl; difluoromethoxy; or aryl; or

R^6 and R^7 together represent a fused benzene radical which can optionally be substituted up to twice by C_1–C_5-alkyl, C_1–C_5-alkoxy, halogen, mono- to tri-halo-substituted C_1–C_5-alkyl, mono- to tri-halo-substituted C_1–C_5-alkoxy, nitro, amino or by —NH—CO—M; or

R^6 and R^7, together with the carbon atom to which they are geminally bonded, represent a spirocyclic C_3–C_7-ring; or

R^6 and R^7 together represent a C_1–C_5-alkylene or C_5–C_7-cycloalkylene group which can optionally be substituted up to twice by the same or different substituents selected from C_1–C_5-alkyl, aryl-C_1–C_5-alkyl, C_1–C_5-alkoxy, halogen, C_3–C_7-alkenyl, trifluoromethyl, difluoromethoxy and aryl; and

R^{10} and R^{11}, independently of one another, each represents hydrogen; C_1–C_5-alkyl; C_1–C_5-alkoxy; halogen; trifluoromethyl; difluoromethoxy; cyano; nitro; amino; mono-C_1–C_5-alkylamino; di-C_1–C_5-alkylamino; or —NH—CO—M; and

R^{12} represent hydrogen; C_1–C_5-alkyl; C_1–C_5-alkanoyl; or 4-methylphenylsulphonyl; and

A represents hydrogen; C_3–C_7-cycloalkyl optionally substituted up to twice by C_1–C_5-alkyl; C_1–C_7-alkyl optionally substituted by C_1–C_7-alkoxy or by aryl; C_1–C_7-alkyl substituted by a C_1–C_7-alkoxy and by an aryl radical; or pyridinyl, pyrimidinyl, naphthalenyl, furanyl or thiophenyl, each of which is unsubstituted or is substituted up to twice by the same or different substituents selected from C_1–C_5-alkyl, C_1–C_5-alkoxy, halogen, nitro, amino, mono-C_1–C_5-alkylamino, di-C_1–C_5-alkylamino, —NH—CO—M, cyano, trifluoromethyl and difluoromethoxy;

and within the scope of the definition of A, aryl represents phenyl, pyridinyl, pyrimidinyl, naphthalenyl, furanyl or thiophenyl, and this radical can be substituted up to twice, or in the case when aryl is phenyl up to three times, by the same or different substituents selected from C_1–C_5-alkyl, C_1–C_5-alkoxy, halogen nitro, amino, mono-C_1–C_5-alkyl amino, di-C_1–C_5-alkylamino, —NH—CO—M, cyano, trifluoromethyl and difluoromethoxy; and

Z represents naphthalenyl, thiophenyl, furanyl, pyrimidinyl, phenyl or pyridinyl, each of which is unsubstituted or is substituted up to three times by the same or different substituents selected from C_1–C_5-alkyl, C_1–C_5-alkoxy, halogen, cyano, nitro, amino, mono-C_1–C_5-alkylamino, di-C_1–C_5-alkylamino, —NH—CO—M, trifluoromethyl and difluoromethoxy; and

M represents C_1–C_5-alkyl; and

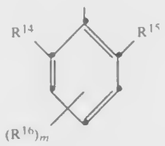
aryl within the scope of the above definitions of the radicals X and L may also represent a phenyl radical that is unsubstituted or is substituted up to three times by the same or different substituents selected from C_1–C_5-alkyl, C_1–C_5-alkoxy and halogen; and

L^2 represents CO—D—R^{13};

D represents O; or NR^{13};

R^{13} represents hydrogen; phenyl; C_3–C_6-alkenyl; or C_1–C_{12}-alkyl that is unsubstituted or is substituted up to three times by the same or different substituents selected from C_1–C_6-alkoxy, C_1–C_3-dialkylamino and halogen; and R^{13}, when D is O, additionally represents a cation of a metal of group I, II or VII of the Periodic Table or of ammonium; and

X^2 represents a radical



m represents 0, 1, 2 or 3; and

R^{14} and R^{15}, independently of one another, each represents C_1–C_4-alkyl;

R^{16} represents the same or different radicals selected from the group comprising C_1–C_4-alkyl, C_1–C_4-alkoxy and halogen;

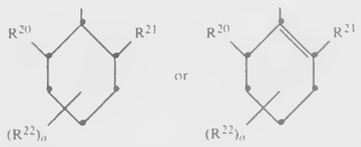
L^3 represents CN; $COOR^{17}$; or $CONR^{18}R^{19}$; and

R^{17} represents unsubsituted or halo-substituted C_1–C_7-alkyl, C_3–C_7-alkenyl, C_3–C_7-alkynyl, C_1–C_7-alkoxy-C_1–C_7-alkyl, C_3–C_7-cycloalkyl or aryl-C_1–C_5-alkyl; and

R^{18} and R^{19}, which may be the same or different, represent hydrogen; C_1–C_4-alkyl; C_3–C_7-alkenyl; C_3–C_7-alkynyl; or C_1–C_7-alkoxy-C_1–C_7-alkyl; or

R^{18} and R^{19}, together with the nitrogen atom to which they are bonded, represent a saturated or unsaturated three- to seven-membered ring that contains up to three hetero atoms selected from the group comprising O, N and S and that is unsubstituted or is substituted by (C_1–C_4)-alkyl or by halogen and may contain a carbonyl group; and

X^3 represents a radical



o represents from 0 to 6;

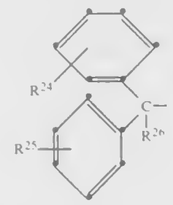
R^{20} and R^{21}, independently of one another, each represents hydrogen or C_1–C_4-alkyl; and

R^{22} represents, independently of any other, C_1–C_4-alkyl; C_1–C_4alkoxy; C_1–C_4-hydroxyalkyl, C_1–C_4-alkoxy-C_1–C_4-alkyl; or halogen; and

L^4 represents CO—R^{23}; or CN;

R^{23} represents hydroxy; C_1–C_6-alkoxy; hydroxy-(C_2–C_6)-alkoxy; (C_2–C_6)-alkoxyalkoxy; amino; C_1–C_6-alkylamino; di-(C_1–C_6)-alkylamino; di-(C_1–C_6)-alkylamino-(C_1–C_3)-alkylamino; C_1–C_3-alkoxyamino; anilino; N-pyrrolidino; N-piperidino; N-morpholino; hydrazino; N'-(C_1–C_3)-alkylhydrazino; N,N'-dimethylhydrazino; or N'-phenylhydrazino; and

X^4 represents the radical



and

R^{24} and R^{25}, which may be the same or different, represent hydrogen; halogen; C_1–C_3-alkyl; trifluoromethyl; hydroxy; C_1–C_3-alkoxy; halo-(C_1–C_3)-alkoxy; C_1–C_3-alkylthio; cyano; nitro; or acetamido; and

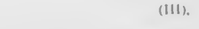
R^{26} represents hydrogen; or phenyl;

wherein an N-cyanoformamidine of the formula II



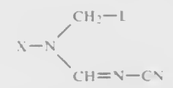
(II),

in which X has the definition given above, is N-alkylated with a compound of the formula III



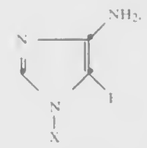
(III),

in which L has the definition given above and Z represents a nucleofugal group, to form a compound of the formula IV



(IV)

and IV is cyclised under the action of bases to form a 4-aminoimidazole of the formula V



(V)

and the aminoimidazole V is reduced to form an imidazole of the formula I.

4,921,956

HYDROPHILIC MODIFIER MONOMERS

Frank Molock, Lawrenceville; J. Richard Robertson, Jr., and Kai C. Su, both of Alpharetta, all of Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 160,623, Feb. 26, 1988, Pat. No. 4,859,780. This application Jun. 21, 1989, Ser. No. 369,429

Int. Cl.[5] **C07D** *295/14*

U.S. Cl. 544—165 **6 Claims**

1. A compound of the formula

wherein

X is vinyl, 1-lower alkyl vinyl, 2-lower alkyl vinyl or 1,2-di-lower alkyl vinyl,

T is alkylene of 2 to 6 carbon atoms terminated on one side by carbonyloxy, the carbonyl group being bound to X, with T being interrupted once by —NHCOO—; or

T is a divalent aliphatic-arylene-aliphatic group wherein each aliphatic group is alkylene of 1 to 6 carbon atoms and

is terminated on the side bound to the arylene by —NH-COO— the nitrogen of each being bound to the arylene, one aliphatic group being terminated on the other end by carbonyloxy with the carbonyl group being bound to X, and where the arylene is of 6 to 10 carbon atoms and is optionally substituted by alkyl of 1 to 4 carbon atoms; and G is morpholino unsubstituted or substituted by 1 to 4 lower alkyl groups.

4,921,957

NOVEL FLUORINATED COMPOUNDS AND PROCESS FOR PREPARING THEM

Alessandro Malacrida, Sovico, Italy, and Darryl D. Desmarteau, Clemson, S.C., assignors to Ausimont S.r.l., Milan, Italy

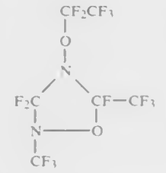
Filed Jul. 6, 1989, Ser. No. 375,948

Claims priority, application Italy, Jul. 7, 1988, 21266 A/88

Int. Cl.[5] **C07D** *251/00, 271/06, 271/12*

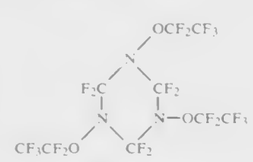
U.S. Cl. 544—217 **3 Claims**

1. 3,3,5-trifluoro-2,5-di(trifluoromethyl)-4-(1,1,2,2,2-pentafluoroethoxy)-1,2,4-oxadiazolidine:



(II)

2. 2,2,4,4,6,6-hexafluoro-1,3,5-tris(1,1,2,2,2-pentafluoroethoxy)-1,3,5-triazine:



(III)

3. N,N-bis(trifluoromethyl)-N-(1,1,2,2,2-pentafluoroethoxy)-amine:

$(CF_3)_2N—O—CF_2CF_3$

4,921,958

PIPERAZINYLALKYLCARBOXYLIC ACID ADAMANTYLAMIDES

Magid A. Abou-Gharbia, Glen Mills; John P. Yardley, Gulph Mills; Wayne E. Childers, Jr., Yardley, all of Pa., and Ian A. Cliffe, Slough, England, assignors to American Home Products Corporation, New York, N.Y. and John Wyeth & Brother Limited, Maidenhead, England

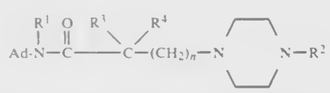
Continuation-in-part of Ser. No. 297,509, Jan. 13, 1989, abandoned. This application Sep. 27, 1989, Ser. No. 413,407

Claims priority, application United Kingdom, Apr. 22, 1989, 8909209

Int. Cl.[5] **C07D** *403/04, 295/10, 295/12*

U.S. Cl. 544—295 **5 Claims**

1. A compound of the formula:



wherein

Ad is 1-adamantyl, 2-adamantyl or 3-noradamantyl;

n is 1, 2, 3, 4, or 5;

R^1 is hydrogen, alkyl of 1 to 3 carbon atoms, phenyl, benzyl, or substituted phenyl or benzyl in which the substituent is alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, halo, cyano, nitro or trifluoromethyl;

R^2 is phenyl, benzyl or substituted phenyl or benzyl in which the substituent is alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, halo, nitro, cyano or perhalomethyl, 2-, 3- or 4-pyridinyl, 2-, 4- or 5-pyrimidinyl or 2- or 3-pyrazinyl;

and

R^3 and R^4 are, independently, hydrogen, methyl, phenyl or benzyl; or a pharmaceutically acceptable salt thereof.

4,921,959

ANTHRAQUINONE COMPOUNDS AND POLARIZING FILM CONTAINING THE SAME

Konoe Miura, Yokohama; Tetsuo Ozawa, Hadano; Seigo Okumura, Machida, and Shinji Kubo, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

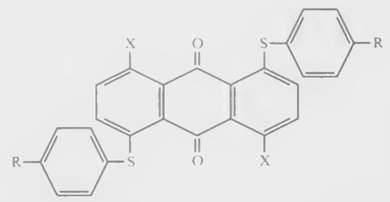
Division of Ser. No. 143,366, Jan. 12, 1988, Pat. No. 4,891,057. This application Apr. 27, 1989, Ser. No. 344,204

Claims priority, application Japan, Jan. 13, 1987, 62-5569; Feb. 10, 1987, 62-28696

Int. Cl.[5] **C07C** *143/36;* **C07D** *413/00, 265/30*

U.S. Cl. 546—152 **3 Claims**

1 An anthraquinone compound represented by formula:



(I)

wherein two R, which may be the same or different, each represents a hydrogen atom, —NHCOR[1], or —CONHR[1], wherein R[1] represents an alkyl group, a substituted or unsubstituted aryl group, or a substituted cycloalkyl group; and two X, which may be the same or different, each represents a hydrogen atom or an amino group, provided that X and R are not simultaneously a hydrogen atom.

4,921,960

QUINOLINE THIOETHERS

József Knoll; Katalin Budai née Simonyi; Edit Berényi née Poldermann; Ildikó Miklya; Márton Fekete; Gabriella Zsilla; Berta Knoll; Attila Mándi; Lujza Petöcz; István Gyertyán, and István Gacsályi, all of Budapest, Hungary, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,796

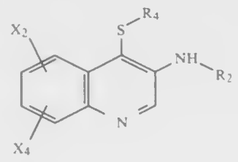
Claims priority, application Hungary, Apr. 24, 1987, 1778/87

The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.

Int. Cl.[5] **C07D** *215/36;* **A61K** *31/47*

U.S. Cl. 546—153 **6 Claims**

1. A compound of the formula I



(I)

wherein

R_1 stands for C_{1-5} alkyl, C_{2-5} alkenyl, C_{2-5} alkinyl, C_{3-7} cycloalkyl or unsubstituted or halo, alkoxy, alkyl, nitro, amino or hydroxy substituted phenyl or C_1–C_4-alkylphenyl;

R_2 represents hydrogen or C_{1-5} alkanoyl;

X_1 and X_2 can be identical or different and each stands for hydrogen, halogen, trifluoromethyl or C_{1-4} alkoxy;

with the proviso that if R_1 stands for ethyl, at least one of R_2, X_1 and X_2 is different from hydrogen, and pharmaceutically acceptable acid addition salts thereof.

4,921,961

2-CARBAMOYL-3-QUINOLINECARBOXYLIC ACIDS AND SALTS AS INTERMEDIATES FOR THE PREPARATION OF HERBICIDAL 2-(5-ISOPROYL-5-METHYL-4-OXO-2-IMIDAZOLIN-2-YL)-3-QUINOLINECARBOXYLIC ACIDS

Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 860,205, May 6, 1986, Pat. No. 4,769,462, which is a continuation-in-part of Ser. No. 382,041, May 25, 1982, Pat. No. 4,638,068, which is a continuation-in-part of Ser. No. 252,704, Apr. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 155,909, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,910, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,867, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,908, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,865, Jun. 2, 1980, abandoned. This application Jul. 18, 1988, Ser. No. 222,449

Int. Cl.[5] **C07D** *215/14*

U.S. Cl. 546—169 **4 Claims**

1. The compound 2-amino-2,3-dimethylbutyramide 2-[(1-carbamoyl-1,2-dimethylpropyl)carbamoyl]-6-(difluoromethoxy)-3-quinolinecarboxylate.

4,921,962

PROCESS FOR PREPARING N-HYDROCARBYLOXY DERIVATIVES OF STERICALLY HINDERED AMINES

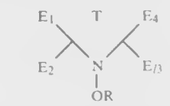
James P. Galbo, Hartsdale, and Michael H. Ackerman, New York, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 19, 1988, Ser. No. 259,949

Int. Cl.[5] **C07D** *211/94*

U.S. Cl. 546—184 **11 Claims**

1. A process for the preparation of an N-hydrocarbyloxy compound of the formula



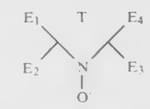
wherein

the nitrogen atom is flanked by two quaternary carbon atoms where E_1 and E_3 are independently alkyl of 1 to 5 carbon atoms or phenyl, E_2 and E_4 are independently alkyl of 1 to 5 carbon atoms, or E_1 and E_2 together or E_3 and E_4 together or both E_1 and E_2 together and E_3 and E_4 together are tetramethylene or pentamethylene,

R is a hydrocarbyl radical, and

T is a divalent group required to form a cyclic 5- or 6-membered ring, T being inert to chemical change in the presence of hydroperoxide, which comprises

dissolving a highly colored N-oxyl compound of the formula



where E_1, E_2, E_3, E_4 and T have the meanings given above, in a hydrocarbon organic solvent, said hydrocarbon having at least one labile hydrogen atom and no ethylenic unsaturation, in the presence of a hydroperoxide and 0.001 to 0.1 mole percent, based on the hydroperoxide, of a catalyst selected from the group consisting of the metal carbonyls, the metal oxides, the metal acetylacetonates and the metal alkoxides where the metal is selected from groups IVb, Vb, VIb, VIIb and VIII of the periodic table, with the mole ratio of hydroperoxide to N-oxyl compound being 50:1 to 2:1, and

heating the reaction mixture at a temperature of 50° to 200° C. for a period of time sufficient to discharge the color associated with the presence of N-oxyl compound and to form concomitantly the desired N-hydrocarbyloxy product.

4,921,963

PLATINUM COMPLEXES WITH ONE RADIOSENSITIZING LIGAND

Kirsten A. Skov, Vancouver, Canada; Nicholas P. Farrell, Winooski, Vt., and David J. Chaplin, Richmond, Canada, assignors to British Columbia Cancer Foundation, Vancouver, Canada

Filed Apr. 13, 1987, Ser. No. 37,498

Int. Cl.[5] **C07F** *17/02*

U.S. Cl. 548—101 **13 Claims**

1. A compound of the formula:

$$PtX_n(NR_2H)(L) \qquad (I)$$

wherein n is 1 or 2, and

wherein when n is 2, X is a monovalent biologically acceptable anion, and when n is 1, X is a divalent biologically acceptable anion;

each R is independently H or alkyl, or both Rs together are a piperidino or morpholino residue; and

L is a radiosensitizing ligand selected from a mononitro-substituted imidazole, a mononitro-substituted pyrazole, a mononitro-substituted thiazole and a mononitro-substituted isothiazole.

4,921,964

PROCESS FOR THE PREPARATION OF STILBENE DERIVATIVES

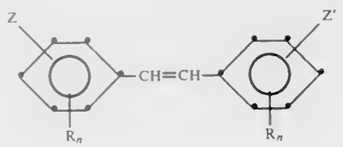
Joseph S. Bowers, Jr., Easley, S.C., and Gerald L. Mayberry, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 1, 1989, Ser. No. 317,383

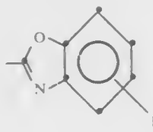
Int. Cl.[5] **C07D** *413/04*

U.S. Cl. 548—219 **22 Claims**

1. A process for preparing stilbene compounds of the formula:



wherein each of Z and Z' is independently of one another



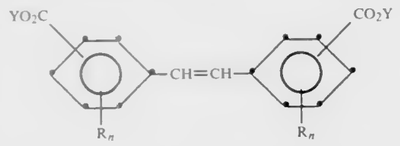
, or



each of R, R', and R'' is independently of one another halo, C_1–C_{12} alkyl, cyano, C_1–C_4 alkylsulfonyl, C_7–C_9 alkylaryl, or C_6–C_{10} aryl; each of n and m is independently of one another an integer of 0–4; and q is an integer of 0–6; provided that:

the R substituents on one ring are the same as on the other ring; the substitution pattern of the R, Z and Z' substituents on one ring is symmetrical to the other ring; and each n is the same;

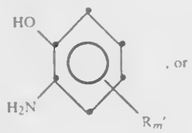
said process comprising contacting a stilbenedicarboxylate compound of the formula



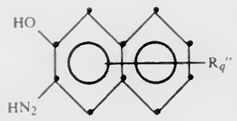
wherein each R and n has the same meaning as defined above; and each Y is a C_1–C_8 alkyl; provided that

the substitution pattern of the R and $—CO_2Y$ substituents on one ring is symmetrical to the other ring; the R and Y substituents on one ring are the same as on the other ring; and each n is the same;

with one or two ortho-aminohydroxy aromatic compounds of the formula:



, or



wherein R', R'', m, q have the same meaning as defined above;

in an organic solvent that boils above about 200° C., in the presence of a catalytic amount of a compound of tin or titanium, and at a reaction temperature and for a reaction time sufficient to promote the formation of the desired product.

4,921,965

METHOD OF PRODUCING ALKYL SUBSTITUTED 5-AMIDOTETRAZOLES

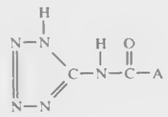
Eugene F. Rothgery, North Branford, and Steven A. Manke, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 276,585, Nov. 28, 1988. This application Oct. 2, 1989, Ser. No. 415,940

Int. Cl.[5] C07D *257/06*

U.S. Cl. 548—251 **16 Claims**

1. A process for producing alkyl substituted 5-amidotetrazole compounds represented by the formula:



(1)

wherein

A represents NHX or NRR',

X represents an alkyl group having from 1 to 6 carbon atoms, and R and R' are individually selected alkyl groups having from 1 to about 6 carbon atoms;

the process which comprises reacting 5-amino-tetrazole with an alkyl isocyanate or a dialkyl-carbamoyl halide in a polar solvent to form a reaction mixture containing the alkyl substituted 5-aminotetrazole.

4,921,966

PROCESS FOR THE PREPARATION OF LIQUID MIXTURES OF ALKYLATED 2-(2-HYDROXYPHENYL)BENZOTRIAZOLES

Werner Stegmann, Liestal, and Reto Luisoli, Hölstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 14, 1988, Ser. No. 284,265

Claims priority, application Switzerland, Dec. 23, 1987, 5034/87

Int. Cl.[5] C07D *249/20*

U.S. Cl. 548—260 **16 Claims**

1. An improved process for the preparation of a mixture of 2-(2-hydroxyphenyl)-benzotriazoles which is liquid at room temperature by alkylating 2-(2-hydroxy-5-methylphenyl)-benzotriazole with a C_8–C_{14}-alpha-olefin in the melt at elevated temperature, in the presence of a sulfonic acid catalyst, wherein the improvement consists essentially of

(i) employing not less than 0.5 mol of acid catalyst and only 1.5 to 3 moles of alpha-olefin per each mole of 2-(2-hydroxy-5-methylphenyl)-benzotriazole,

(ii) carrying out the alkylation reaction in the temperature range from 165° to 190° C.,

(iii) separating the upper crude product phase from the lower sulfonic acid phase, and

(iv) isolating the final product mixture by working up said crude product phase by distillation using a thin-film evaporator, a thin-film evaporator fitted with a distillation column or a short-path distillation apparatus.

4,921,967

NOVEL ALKYLCYCLOALKYL TRIAZOLYLMETHYL KETONES AS FUNGICIDE INTERMEDIATES

Wolfgang Krämer, Wuppertal; Manfred Jautelat, Burscheid, and Eckart Kranz, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

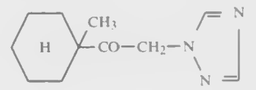
Continuation of Ser. No. 438,086, Nov. 1, 1982, abandoned. This application May 27, 1987, Ser. No. 54,551

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145857

Int. Cl.[5] C07D *249/08*

U.S. Cl. 548—267.8 **1 Claim**

1. 1-Methylcyclohexyl (1,2,4-triazol-1-yl)-methyl ketone of the formula



4,921,968

PYRAZOLOAZOLEAZOMETHINE DYES

Shigeki Yokoyama; Tadahisa Sato; Keizo Kimura; Nobuo Furutachi, and Osamu Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

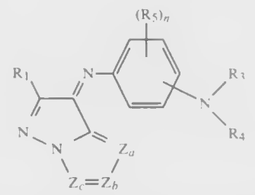
Filed Dec. 9, 1987, Ser. No. 130,489

Claims priority, application Japan, Dec. 9, 1986, 61-292751

Int. Cl.[5] C07D *487/04*

U.S. Cl. 548—262.4 **12 Claims**

1. A pyrazoloazoleazomethine dye represented by formula (1)



(I)

wherein, said dye is a blue or cyan dye having a maximum absorption wavelength of more than 600 nm, R_1 represents a substituent having a Hammett's substituent constant value of at least 0.6; Za represents =N—; and Zb and Zc each represents =N— and



respectively, or Zb and Zc each represents



and =N—, respectively (wherein R_2 represents a hydrogen atom or a substituent), R_3, R_4 and R_5 each represents a hydrogen atom or a substituent; and n represents 1 or 2; and dimers thereof formed by combining two of said dye with each other through a divalent group at R_1, Za, Zb, or Zc and polymers thereof formed by combining at least three of said dye with each other through a divalent group at R_1, Za, Zb, or Zc.

4,921,969

METHOD FOR THE PREPARATION OF IMIDAZOLES

Wei-Yang Su, and George P. Speranza, both of Austin, Tex., assignors to Texaco Chemical Co., White Plains, N.Y.

Filed Dec. 15, 1988, Ser. No. 284,883

Int. Cl.[5] C07D *233/58*

U.S. Cl. 548—335 **15 Claims**

1. An improved method for preparation of imidazoles not requiring isolation of the imidazoline intermediate which comprises:

reacting a diamine with a compound from the group consisting of nitriles and organic acids, heating the mixture at a temperature of 140°–300° C. at a pressure of subatmospheric to about 10 atm, forming an amide and passing the amide over a nickel-containing catalyst selected from the group consisting of nickel-copper, nickel-chromium and nickel-copper-chromium and isolating the imidazole.

4,921,970

NITRATION REACTIONS WITH ACID ANHYDRIDE PROMOTERS

Roy R. Odle, Schuylerville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 567,485, Jan. 1, 1984, abandoned. This application Feb. 9, 1987, Ser. No. 12,318

Int. Cl.[5] C07D *209/50*

U.S. Cl. 548—480 **16 Claims**

1. An improved process for the nitration of an N-(C_1–C_{10}) alkyl phthalimide, which comprises (a) forming a solution of the N-(C_1–C_{10}) alkyl phthalimide in a solvent of at least about 95% nitric acid, (b) allowing the solution to react at a temperature of from about −20° C. to about the boiling point of nitric acid to produce a nitrated N-(C_1–C_{10}) alkyl phthalimide, and (3) recovering the nitrated N-(C_1–C_{10}) alkyl phthalimide; wherein the improvement comprises adding a nitration-enhancing effective amount of a nitration-promoting acid anhydride to the reaction solution of step (a).

4,921,971

METHOD OF PREPARING ALKALINE EARTH METAL SALTS OF 2-PYRROLIDONE-5-CARBOXYLIC ACID

Hans-Peter Krimmer, Frankfurt; Karlheinz Drauz, Freigericht, and Silvia Werner, Kahl, all of Fed. Rep. of Germany, assignors to Degussa Akteingesellschaft, Frankfurt am Main, Fed. Rep. of Germany

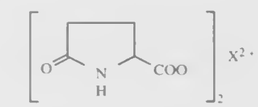
Filed Oct. 17, 1988, Ser. No. 258,739

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735264

Int. Cl.[5] C07D *207/28*

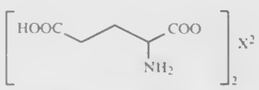
U.S. Cl. 548—534 **5 Claims**

1. A method for preparing alkaline earth metal salts of 2-pyrrolidone-5-carboxylic acid of the formula



(I)

in which X^{2+} signifies an alkaline earth metal ion said method comprising heating a monobasic alkaline earth metal salt of glutamic acid of the formula



(II)

in which X^{2+} signifies the corresponding alkaline earth metal ion in bulk and in the solid state, to a temperature between 120°

C. and 250° C. until the water liberated by the intramolecular condensation has been completely eliminated.

4,921,972

PROCESS FOR OPTICALLY ACTIVE 3-THIOLANYL SULFONATE ESTERS

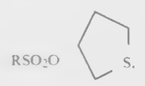
Robert A. Volkmann, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 353,374, May 17, 1989, abandoned, Division of Ser. No. 308,868, Feb. 9, 1989, Pat. No. 4,864,046. This application Jul. 12, 1989, Ser. No. 378,888

Int. Cl.[5] C07D *333/32*

U.S. Cl. 549—66 20 Claims

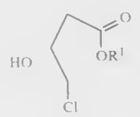
1. A process for the preparation of an optically active compound of the formula



(I)

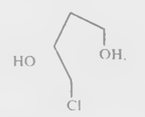
wherein R is $(C_1$–$C_3)$alkyl, phenyl or tolyl, which comprises the steps of:

(a) hydride reduction of an optically active ester of the formula



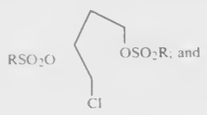
(II)

wherein R^1 is $(C_1$–$C_3)$alkyl with an amount of a hydride reducing agent capable of reducing an ester to an alcohol in a reaction-inert solvent to form an optically active diol of the formula



(III)

(b) reacting said diol in the same or another reaction-inert solvent with at least 2 molar equivalents of an activated form of a sulfonic acid of the formula RSO_2OH in the presence of at least 2 equivalents of a tertiary amine to form an optically active disulfonate of the formula



(IV)

(c) reacting said disulfonate with a sulfide salt in the same or another reaction-inert solvent to form the compound of the formula (I).

4,921,973

PLATINUM COMPLEXES AND THE LIKE

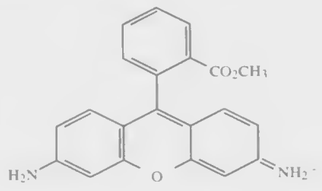
Beverly A. Teicher, Boston, Mass.; Robert C. Richmond, Hanover, N.H., and Lan B. Chen, Boston, Mass., assignors to Johnson Matthey Inc., Forge, Pa.

Division of Ser. No. 680,044, Dec. 10, 1984, abandoned. This application Apr. 26, 1988, Ser. No. 186,177

Int. Cl.[5] C07D *311/88*

U.S. Cl. 549—212 2 Claims

1. A complex obtained by reacting (1) alkali metal tetrahaloplatinate or cis-bis(acetonitrile)dichloro-platinum and (2) rhodamine-123 of the formula:



4,921,974

INTERMEDIATES AND PROCESSES IN THE PREPARATION OF 5-OXYGENATED HMG-COA REDUCTASE INHIBITORS

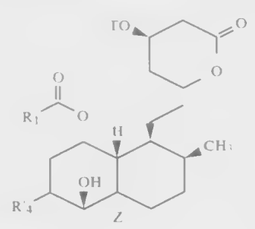
Mark E. Duggan, Wynnewood, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 29, 1988, Ser. No. 250,646

Int. Cl.[5] C07F *7/18*

U.S. Cl. 549—214 8 Claims

1. A compound of structural formula (3):



(3)

wherein:

Z is Cl or Br;

T is H, tert-butyldimethylsilyl, tert-butyldiphenylsilyl, trimethylsilyl, triethylsilyl, triiospropylsilyl, or tetrahydropyranyl;

R_1 is selected from:

(1) C_{1-10} alkyl;

(2) substituted C_{1-10} alkyl in which one or more substituent(s) is selected from

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y,

(i) C_{1-10} alkyl$S(O)_n$ in which n is 0 to 2,

(j) C_{3-8} cycloalkyl$S(O)_n$,

(k) phenyl$S(O)_n$,

(l) substituted phenyl$S(O)_n$ in which the substituents are X and Y, and

(m) oxo;

(3) C_{1-10} alkoxy;

(4) C_{2-10} alkenyl;

(5) C_{3-8} cycloalkyl;

(6) substituted C_{3-8} cycloalkyl in which one substituent is selected from

(a) C_{1-10} alkyl

(b) substituted C_{1-10} alkyl in which the substituent is selected from

(i) halogen,

(ii) hydroxy,

(iii) C_{1-10} alkoxy,

(iv) C_{1-5} alkoxycarbonyl,

(v) C_{1-5} acyloxy,

(vi) phenyl,

(vii) substituted phenyl in which the substituents are X and Y

(viii) C_{1-10} alkyl$S(O)_n$,

(ix) C_{3-8} cycloalkyl$S(O)_n$,

(x) phenyl$S(O)_n$,

(xi) substituted phenyl$S(O)_n$ in which the substituents are X and Y, and

(xii) oxo,

(c) C_{1-10} alkyl$S(O)_n$,

(d) C_{3-8} cycloalkyl$S(O)_n$,

(e) phenyl$S(O)_n$,

(f) substituted phenyl$S(O)_n$ in which the substituents are X and Y,

(g) halogen,

(h) hydroxy,

(i) C_{1-10} alkoxy,

(j) C_{1-5} alkoxycarbonyl,

(k) C_{1-5} acyloxy,

(l) phenyl, and

(m) substituted phenyl in which the substituents are X and Y;

(7) phenyl;

(8) substituted phenyl in which the substituents are X and Y;

(9) amino;

(10) C_{1-5} alkylamino;

(11) di(C_{1-5} alkyl)amino;

(12) phenylamino;

(13) substituted phenylamino in which the substituents are X and Y;

(14) phenyl C_{1-10} alkylamino;

(15) substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y;

(16) a member selected from

(a) piperidinyl,

(b) pyrrolidinyl,

(c) piperazinyl,

(d) morpholinyl, and

(e) thiomorpholinyl; and

(17) R_5S in which R_5 is selected from

(a) C_{1-10} alkyl,

(b) phenyl, and

(c) substituted phenyl in which the substituents are X and Y;

R'_4 is CH_3, CH_2TO or H;

X and Y are independently selected from:

(a) OH,

(b) halogen,

(c) trifluoromethyl,

(d) C_{1-3}alkoxy,

(e) C_{1-3}alkylcarbonyloxy,

(f) phenylcarbonyloxy,

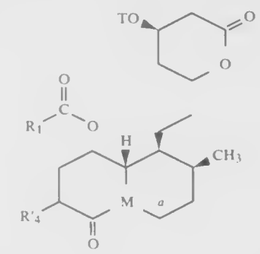
(g) C_{1-3}alkoxycarbonyl,

(h) phenyloxycarbonyl,

(i) hydrogen;

(j) C_{1-5}alkyl.

5. A compound of structural formula (4–11):



(4-11)

wherein:

M is



Z is Cl or Br;

T is H, tert-butyldimethylsilyl, tert-butyldiphenylsilyl, trimethylsilyl, triethylsilyl, triiospropylsilyl, or tetrahydropyranyl;

R_1 is selected from:

(1) C_{1-10} alkyl;

(2) substituted C_{1-10} alkyl in which one or more substituent(s) is selected from

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y,

(i) C_{1-10} alkyl$S(O)_n$ in which n is 0 to 2,

(j) C_{3-8} cycloalkyl$S(O)_n$,

(k) phenyl$S(O)_n$,

(l) substituted phenyl$S(O)_n$ in which the substituents are X and Y, and

(m) oxo;

(3) C_{1-10} alkoxy;

(4) C_{2-10} alkenyl;

(5) C_{3-8} cycloalkyl;

(6) substituted C_{3-8} cycloalkyl in which one substituent is selected from

(a) C_{1-10} alkyl

(b) substituted C_{1-10} alkyl in which the substituent is selected from

(i) halogen,

(ii) hydroxy,

(iii) C_{1-10} alkoxy,

(iv) C_{1-5} alkoxycarbonyl,

(v) C_{1-5} acyloxy,

(vi) phenyl,

(vii) substituted phenyl in which the substituents are X and Y

(viii) C_{1-10} alkyl$S(O)_n$,

(ix) C_{3-8} cycloalkyl$S(O)_n$,

(x) phenyl$S(O)_n$,

(xi) substituted phenyl$S(O)_n$ in which the substituents are X and Y, and

(xii) oxo,

(c) C_{1-10} alkyl$S(O)_n$,

(d) C_{3-8} cycloalkyl$S(O)_n$,

(e) phenyl$S(O)_n$,

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(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,
(g) halogen,
(h) hydroxy,
(i) C_{1-10} alkoxy,
(j) C_{1-5} alkocycarbonyl,
(k) C_{1-5} acyloxy,
(l) phenyl, and
(m) substituted phenyl in which the substituents are X and Y;
(7) phenyl;
(8) substituted phenyl in which the substituents are X and Y;
(9) amino;
(10) C_{1-5} alkylamino;
(11) di(C_{1-5} alkyl)amino;
(12) phenylamino;
(13) substituted phenylamino in which the substituents are X and Y;
(14) phenyl C_{1-10} alkylamino;
(15) substituted phenylC_{1-10}alkylamino in which the substituents are X and Y;
(16) a member selected from
(a) piperidinyl,
(b) pyrrolidinyl,
(c) piperazinyl,
(d) morpholinyl, and
(e) thiomorpholinyl; and
(17) R_5S in which R_5 is selected from
(a) C_{1-10} alkyl,
(b) phenyl, and
(c) substituted phenyl in which the substituents are X and Y;
R'_4 is CH_3, CH_2TO or H;
X and Y are independently selected from:
(a) OH,
(b) halogen,
(c) trifluoromethyl,
(d) C_{1-3}alkoxy,
(e) C_{1-3}alkylcarbonyloxy,
(f) phenylcarbonyloxy,
(g) C_{1-3}alkoxycarbonyl,
(h) phenyloxycarbonyl,
(i) hydrogen;
(j) C_{1-5}alkyl;
a is a single bond or a double bond provided that when M is C–Z, a is a single bond.

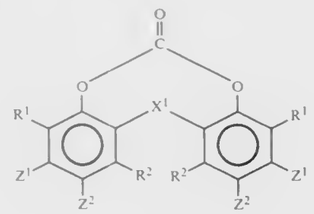
4,921,975

CYCLIC MONOCARBONATE BISHALOFORMATES

Thomas G. Shannon, Schenectady, and Daniel J. Brunelle, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

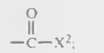
Division of Ser. No. 164,593, Mar. 7, 1988, abandoned, which is a division of Ser. No. 29,515, Mar. 24, 1987, Pat. No. 4,767,840.
This application May 24, 1989, Ser. No. 356,156
Int. Cl.[5] **C07D** *321/12, 327/10*
U.S. Cl. 549—228 **5 Claims**

1. A cyclic monocarbonate bishalofomate having the formula



(I)

wherein:
X^1 is R^3CH, S, SO or SO_2;
R^1 is C_{1-4} alkyl or halo;
R^2 is hydrogen, C_{1-4} alkyl or halo;
R^3 is hydrogen or an alkyl, cycloalkyl or aryl radical;
one of Z^1 and Z^2 is hydrogen, C_{1-4} alkyl or halo and the other is



and
X^2 is chlorine or bromine.

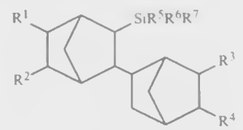
4,921,976

VINYL-CONTAINING UNSATURATED ORGANOSILICON COMPOUND AND PROCESS FOR PREPARING THE SAME

Keiji Kabeta, Gunma, Japan, assignor to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 272,032
Claims priority, application Japan, Nov. 18, 1987, 62-291541
Int. Cl.[5] **C07F** *9/08, 7/18*
U.S. Cl. 556—482 **7 Claims**

1. A silicon compound represented by formula (I):



(I)

wherein either one of R^1 and R^2 represents a vinyl group with the other representing a hydrogen atom; either one of R^3 and R^4 represents a vinyl group with the other representing a hydrogen atom; and R^5, R^6, and R^7, which may be the same or different, each represents a substituted or unsubstituted monovalent hydrocarbon group, an alkoxy group or a halogen atom.

4,921,977

OBTAINING MALEIC ANHYDRIDE NOT PRONE TO DISCOLOR

Gerhard Michl, Ludwigshafen; Rolf Seubert, Frankenthal, and Johannes E. Schmidt, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 4, 1989, Ser. No. 293,448
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800308
Int. Cl.[5] **C07D** *307/60*
U.S. Cl. 549—256 **3 Claims**

1. In a process for obtaining maleic anhydride that is not prone to discolor from crude maleic anhydride by fractional distillation wherein the crude maleic anhydride is recovered from waste water arising from the production of phthalic anhydride by air oxidation of o-xylene or naphthalene, the improvement which comprises: treating the crude maleic anhydride with air, either before or during the distillation.

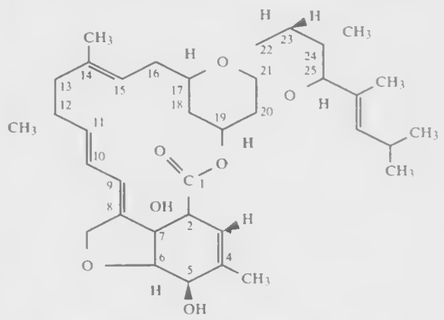
4,921,978

PROCESS FOR THE PREPARATION OF A MACROLIDE COMPOUND

Michael V. J. Ramsay, South Harrow, and Simon C. Dolan, Harrow, both of United Kingdom, assignors to American Cyanamid Company, Stamford, Conn.

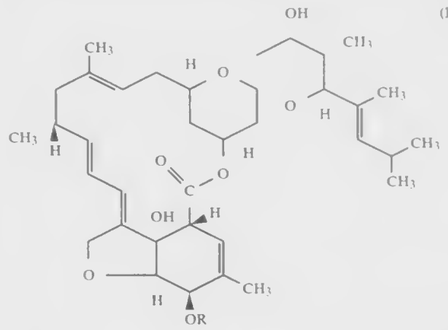
Filed Sep. 9, 1988, Ser. No. 242,227
Claims priority, application United Kingdom, Sep. 11, 1987, 8721378
Int. Cl.[5] **C07D** *313/00*
U.S. Cl. 549—264 **5 Claims**

1. A process for preparing the compound of formula (I)



(I)

which comprises treating a compound of formula (II)



(II)

(wherein R represents a hydrogen atom or a protecting group) sequentially with (i) oxalyl chloride and (ii) 2-mercaptopyridine-N-oxide, a catalytic amount of a tertiary amine, and a thiol, followed if necessary by removal of the 5-hydroxy protecting group.

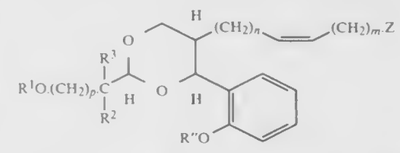
4,921,979

1,3-DIOXANE ETHERS

Michael J. Smithers, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries plc, London, United Kingdom

Division of Ser. No. 861,590, May 9, 1986, Pat. No. 4,775,684. This application Jul. 13, 1988, Ser. No. 218,263
Claims priority, application United Kingdom, May 10, 1985, 8511893; Nov. 12, 1985, 8527862
Int. Cl.[5] **C07D** *319/06*
U.S. Cl. 549—375 **1 Claim**

1. A compound of the formula VI



wherein R^1 is (1-6C)alkyl, (3-8C)cycloalkyl, (3-8C)cycloalkyl-(1-4C)alkyl, phenyl or phenyl-(1-4C)alkyl, the latter two of which may optionally bear one or two substituents selected from halogeno, (1-4C)alkyl, (1-4C)alkoxy, hydroxy, trifluoromethyl, nitro and cyano;
R^2 and R^3 are independently hydrogen or (1-4C)alkyl, or together form (3-6C)polymethylene optionally bearing one or two (1-4C)alkyl substituents; R″ is (1-6C)alkyl, p is 0, 1 or 2, n is 1, m is 2 or 3 and Z is carboxy, and the groups at positions 2, 4 and 5 of the dioxane ring have cis-relative stereochemistry or a salt thereof.

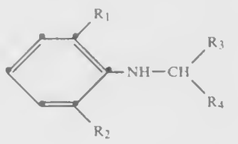
4,921,980

PROCESS FOR THE PREPARATION OF N-ALKYLANILINES

Milos Rusek, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

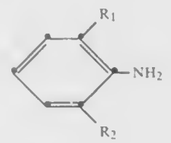
Continuation-in-part of Ser. No. 822,971, Jan. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 696,235, Jan. 29, 1985, abandoned. This application May 22, 1987, Ser. No. 53,245
Int. Cl.[5] **C07D** *315/00;* **C07C** *149/42*
U.S. Cl. 549—426 **16 Claims**

1. A process for the preparation of an N-alkyl-aniline of the formula I



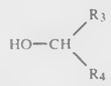
(I)

wherein
R_1 and R_2 are each independently halogen, C_1–C_6alkyl, C_1–C_6alkoxy or hydrogen,
R_3 is C_1–C_6alkyl, C_3–C_6cycloalkyl, C_1–C_4alkoxy, C_1–C_4alkoxy-C_1–C_4alkyl, phenyl or hydrogen,
R_4 is C_1–C_6alkyl, C_1–C_4alkoxy, furfuryl, tetrahydrofurfuryl or hydrogen, and R_3 and R_4 together with the carbon atom to which they are attached can form a 4- to 7-membered isocyclic ring which is unsubstituted or substituted by one or two C_1–C_4alkyl groups or a pyran or a tetrahydropyran ring, with the proviso that at least one of R_1 or R_2 is hydrogen when R_3 and R_4 form a 4 to 7 membered isocyclic ring which ring is disubstituted in the α- and α′-position by a C_1–C_4alkyl group
by reacting an aniline of the formula II



(II)

wherein R_1 and R_2 are as defined for formula I, with an alcohol of the formula III



(III)

wherein R_3 and R_4 are as defined for formula I, in the presence of hydrogen and a catalyst, which process comprises carrying out the reaction in the temperature range from 150° to 300° C. and under a pressure of 0,5 to 6 bar, in the presence of a catalyst consisting of silica gel as carrier and 0.2 to 10% of platinium and 0.05 to 3% of a compound of a metal of the groups Ia and/or IIa of the Periodic Table, and catalyst additionally containing at least one compound of an element of the groups IVa, IVb, Vb and VIIb in an amount such that the atomic ratio of platinium to the sum of these elements is 1 to 6.

4,921,982

5-HALO-2,3-DIHYDRO-2,2-DIMETHYLBENZOFURAN-7-CARBOXYLIC ACIDS USEFUL AS INTERMEDIATES FOR 5-HT$_3$ ANTAGONISTS

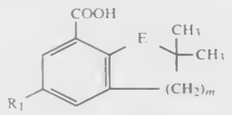
Marlene L. Cohen; William B. Lacefield, both of Indianapolis, and David W. Robertsch, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 222,466, Jul. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 94,360, Sep. 8, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 366,343

Int. Cl.[5] C07D *307/78*

U.S. Cl. 549—462 2 Claims

1 A compound of the formula



wherein m is 1; E is O; and R_1 is halo.

4,921,983

METHOD FOR THE CONTINUOUS EPOXIDATION OF OLEFINS

Rainer Siegmeier, Bad Homburg; Willi Hofen, Rodenbach; Günter Prescher, Hanau, and Helmut Maurer, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 133,629, Dec. 16, 1987, abandoned. This application Jul. 26, 1989, Ser. No. 384,923

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643207

Int. Cl.[5] C07D *307/14*

U.S. Cl. 549—525 7 Claims

1. In a continuous method for the epoxidation of one or more olefins containing inert components, primarily alkanes with a percarboxylic acid which is present in aqueous solution or in an organic solvent in a reactor and in which method the olefins are used in excess in relation to the percarboxylic acid and the non-converted olefin component which contains inert components, primarily alkanes, is recirculated.

the improvement for removing or reducing the amount of inert components, primarily alkanes, which are present as admixtures in the recycled olefins, without using chemicals not normally present in the reaction, said improvement comprising separating a partial stream from the recirculating olefin, essentially completely epoxidizing the unreacted olefins in the partial stream with a solution of percarboxylic acid, separating the resulting epoxidized product from any unreacted olefins and the inert components in said epoxidized partial stream and introducing the epoxidized product from said partial stream without the inert components therein into the reactor.

4,921,984

NOVEL PLATINUM COMPLEXES

Hiroyoshi Nowatari, Takasaki; Hiroshi Hayami, Takasaki; Yasuo Kuroda, Gunma; Sumio Yoda, Takasaki, and Katsutoshi Takahashi, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

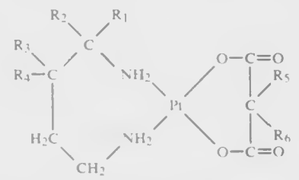
Division of Ser. No. 87,045, Aug. 19, 1987, Pat. No. 4,864,043, which is a continuation of Ser. No. 893,108, Aug. 4, 1986, Pat. No. 4,737,589. This application Jun. 27, 1989, Ser. No. 372,248

Claims priority, application Japan, Aug. 27, 1985, 69-187710; Feb. 12, 1986, 61-26799; Feb. 12, 1986, 61-26800; Apr. 25, 1986, 61-94626; Jul. 1, 1986, 61-152635

Int. Cl.[5] C07F *15/00*

U.S. Cl. 556—40 18 Claims

11. A diamine platinum (II) complex represented by the general formula.



wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom or a lower alkyl group; and R_5 and R_6 are each a hydrogen atom or a lower alkyl group.

4,921,985

WATER-SOLUBLE ANTIMONY (V) COMPOUNDS

Charles J. Besecker, Cleveland, and William A. Marritt, Cleveland Hts., both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 135,206, Dec. 21, 1987. This application Oct. 21, 1988, Ser. No. 260,634

Int. Cl.[5] C07F *9/90, 9/92*

U.S. Cl. 556—76 10 Claims

1. A method of making a tri- or tetrahydrocarbylammonium hexahydroxyantimonate,

$$[R_3R'N]Sb(OH)_6.xH_2O \qquad \text{formula (1)}$$

containing 3 to 30 C atoms, which process comprises the steps of (1) contacting a compound selected from

R_3N and R_4NOH

with the H^+ form of a solid cation exchange resin, and allowing the amine or the tetrahydrocarbylammonium hydroxide to react with the cation exchange resin, and thereafter (2) contacting the reacted resin with an aqueous solution of $KSb(OH)_6$,

wherein each R contains 1–10 C atoms and is independently selected from alkyl, aralkyl and alkylaralkyl, R' is H or R, and wherein x is an indeterminate number of moles of H_2O.

4,921,986

METHOD AND APPARATUS FOR PRODUCING COBALT ACETATE FROM COBALT CHIP

Robert Fox, Arab, Ala., assignor to Hall Chemical Company, Arab, Ala.

Filed Dec. 30, 1987, Ser. No. 139,793

Int. Cl.[5] C07F *15/06*

U.S. Cl. 556—149 2 Claims

1. The method of producing an aqueous cobalt acetate solution which comprises the steps of providing a bed of cobalt chips of approximate size 1¼ inch by ⅛ inch in a closed reactor vessel, establishing a circulating stream of aqueous acetic acid, introducing oxygen gas into the aqueous acid stream and thereby establishing an oxygen atmosphere in the vessel, repeatedly flowing the resulting oxygen-containing stream through the cobalt chip bed, and introducing additional oxygen gas into the circulating stream to maintain the pressure of the oxygen atmosphere between 20 and 60 pounds per square inch gauge.

4,921,987

AQUEOUS SOLUTIONS OF ALKYLTRIALKOXYSILANES HAVING AN EXTENDED SHELF LIFE

Reiner Hitze, and Hans-Jürgen Hass, both of Troisdorf, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 17, 1989, Ser. No. 395,345

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 3829510

Int. Cl.[5] C07F *7/08, 7/18*

U.S. Cl. 556—401 5 Claims

1. An aqueous solution of at least one alkyltrialkoxysilane of the formula

$$R—Si(OR')_3$$

wherein R is an aliphatic moiety of 1 to 8 carbon atoms and R' is an aliphatic moiety of 1 to 4 carbon atoms, said solution comprising an alkali metal aluminate and an alkali metal hydroxide as stabilizers.

4,921,988

PROCESS FOR PREPARING AMINOPROPYL SILANES

Kazutoshi Takatsuna, Iruma, Japan; Mamoru Tachikawa, Midland, Mich.; Kouji Shinozawa, Hiki, Japan; Masashi Nakajima, Sendai, Japan; Akihito Shinohara, Kamifukuoka, Japan, and Yoshiharu Okumura, Tokyo, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

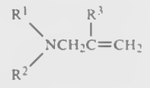
Filed Dec. 6, 1988, Ser. No. 280,727

Claims priority, application Japan, Dec. 14, 1987, 62-316530; Jul. 20, 1988, 63-181418

Int. Cl.[5] C07F *7/10*

U.S. Cl. 556—413 7 Claims

1. A process for preparing aminopropyl silanes which comprises reacting an allylamine of the formula



[1]

wherein R^1 and R^2, each represents hydrogen, alkyl having from 1 to 10 carbon atoms, alkenyl having from 2 to 10 carbon atoms, phenyl, substituted phenyl, $—CH_2CH_2NHCH_2CH_2NH_2$ or $—CH_2CH_2NH_2$, and R^3 is hydrogen or alkyl having from 1 to 6 carbon atoms with a hydrosilane in the presence of a catalyst comprising (i) metallic rhodium or a rhodium compound and (ii) a basic material which is (a) an alkali metal, an alkaline earth metal or a basic compound thereof or (b) a basic compound containing at least one nitrogen atom.

4,921,989

ΩSILYLALKYNYL SILANE COMPOUND AND METHOD FOR PREPARATION THEREOF

Toshinobu Ishihara; Mikio Endo; Tohru Kubota, all of Niigata, and Yasuhisa Tanaka, Kanagawa, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 359,897

Claims priority, application Japan, Jun. 2, 1988, 63-136006

Int. Cl.[5] C07F *7/08, 7/18*

U.S. Cl. 556—431 10 Claims

1. An ω-silylalkynyl silane compound represented by the general formula

$$R_3SiC{\equiv}C(CH_2)_nSi(CH_3)_mX_{3-m}.$$

in which each of the groups denoted by R is, independently from the others, a hydrogen atom, lower alkyl group or aryl group, X is a halogen atom or a lower alkoxy group, the subscript m is 0, 1 or 2 and the subscript n is an integer in the range from 10 to 30.

4,921,990

DIRECT ESTERIFICATION OF O-PHOSPHORIC ACID

Guenter Uphues, Monheim, and Uwe Ploog, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 133,600, Dec. 16, 1987, abandoned. This application Aug. 8, 1989, Ser. No. 393,082

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643763

Int. Cl.[5] C07F *9/141*

U.S. Cl. 558—104 12 Claims

1. A process for the preparation of phosphoric acid alkyl ester mixtures comprising the steps of:

A. contacting o-phosphoric acid with an alcohol which is one or more of the following:

(i) a C_6–C_{18} fatty alcohol

(ii) an adduct of a C_6–C_{18} fatty alcohol with from 1 to 20 moles of one or both of ethylene oxide and propylene oxide,

(iii) an adduct of an alkyl phenol having from 8 to 15 carbon atoms in the alkyl group or groups with from 1 to 20 moles of one or both of ethylene oxide and propylene oxide,

in the presence of from about 0.05 to about 0.2 mole equivalent, based on the quantity of phosphorus atoms in the reaction mixture, of at least one basic inorganic or organic compound, and a water-entraining agent in an amount sufficient to entrain the resulting water of reaction, wherein the ratio of o-phosphophosphoric acid to alcohol is from about 1:1 to about 1:5; and

B. carrying out a direct esterification reaction at a temperature sufficient to remove the water of reaction with the entraining agent to form a mixture of phosphoric acid alkyl esters.

4,921,991

PREPARATION OF ESTERS OF THE N-PHOSPHONOMETHYLGLYCINE AND THE N-PHOSPHONOMETHYL GLYCINES

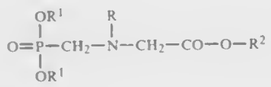
Guy Lacroix, 332 F Balmont-Law Duchère, 69009 - Lyon, France

Division of Ser. No. 704,239, Feb. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 635,225, Jul. 27, 1984, abandoned. This application Dec. 31, 1986, Ser. No. 947,980

Int. Cl.[5] C07F *9/38, 9/40*

U.S. Cl. 558—135 19 Claims

1. A phosphonic ester having the formula

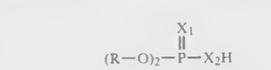


in which
R denotes an arylalkyl group,
R′ is selected from the alkyl and aryl groups of 1 to 12 carbon atoms which are opionally substituted by one or more of the groups halogen, phenyl, cyano, alkoxy, and alkylcarboxylate,
R^2 denotes a hydrogen or R^1.

15. A process for preparing compounds according to claim **1**, in which a phosphonic ester of the formula $(R^1O)_2P(O)H$ is reacted with formaldehyde and a compound of the formula $R—NH—CH_2—COOR^2$.

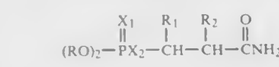
4,921,992
PROCESS FOR MANUFACTURING AMIDES
Paul E. Adams, and Darryl W. Kinzer, both of Willoughby Hills, Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio
Continuation of Ser. No. 54,172, May 22, 1987. This application Dec. 16, 1988, Ser. No. 285,484
Int. Cl.[5] C07F *9/09, 9/165*
U.S. Cl. 558—145 **16 Claims**

1. A process for producing bis-amide compounds comprising the steps of:
reacting an aqueous acrylamide (I) and a phosphorus-containing acid having the following general structural formula: (II)



(II)

wherein R is hydrocarbyl and X_1 and X_2 are independently selected from the group consisting of sulfur and oxygen, the reacting being carried out by simultaneously combining substantially stoichometrically equal amounts of acrylamide present in the aqueous acrylamide (I) and phosphorus-containing acid (II);
obtaining a reaction product in the form of an amide having the following general structural formula: (III)

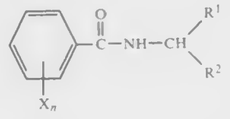


(III)

wherein R is a hydrocarbyl, R_1 and R_2 are independently hydrogen or methyl and X_1 and X_2 are independently selected from the group consisting of sulfur and oxygen; and
reacting the amide of formula (III) with a sufficient amount of a coupling agent to form a bis-amide.

4,921,993
SUBSTITUTED BENZAMIDE FUNGICIDES
Herbert Gayer, Monheim; Klaus Jelich, Wuppertal; Wolfgang Krämer, Burscheid, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Nov. 23, 1987, Ser. No. 123,822
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642450
Int. Cl.[5] A01N *33/08*
U.S. Cl. 558—392 **12 Claims**

1. A substituted benzamide of the formula



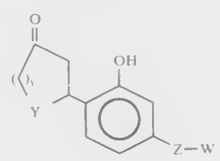
in which
R^1 represents alkoxy, alkenyloxy, alkinyloxy or a heterocyclyl radical,
R^2 represents cyano, a carbamoyl radical or a thiocarbamoyl radical,
X represents an alkanoyl radical or an alkoximinoalkyl radical, and
n represents a number 1, 2 or 3.

9. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim **1** and a diluent.

10. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim **1**.

4,921,994
PHARMACOLOGICALLY ACTIVE 2-HYDROXY-4-(SUBSTITUTED) PHENYL CYCLOALKANES AND DERIVATIVES THEREOF
Michael R. Johnson, and Lawrence S. Melvin, Jr., both of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.
Division of Ser. No. 159,013, Feb. 23, 1988, Pat. No. 4,831,059, which is a division of Ser. No. 691,619, Jan. 15, 1985, abandoned, which is a division of Ser. No. 425,366, Sep. 28, 1982, abandoned, which is a division of Ser. No. 286,661, Jan. 28, 1981, Pat. No. 4,371,720, which is a continuation-in-part of Ser. No. 188,795, Sep. 19, 1980, abandoned. This application Feb. 28, 1989, Ser. No. 317,223
Int. Cl.[5] C07C *121/66, 49/403, 49/413*
U.S. Cl. 558—426 **9 Claims**

1. A compound having the formula

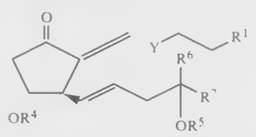


wherein
s is 1 or 2;
W is hydrogen and Z is (C_{7-11})alkylene or —O—(C_{7-9})alkylene, or W is phenyl and Z is (C_{4-7})alkylene or —O—(C_{4-5})alkylene;
Y is $—CH_2CH(R_2)—$ or $—CH(R_3)CH_2—$;
R_2 is ω-hydroxy(C_{1-6})alkyl or ω-methoxy(C_{1-6})alkyl; and
R_3 is cyano, hydroxy(C_{1-3})alkyl or methoxy(C_{1-3})alkyl.

4,921,995
PROCESS FOR PRODUCING 16-SUBSTITUTED PROSTAGLANDINES
Toshio Tanaka; Atsuo Hazato; Seizi Kurozumi, all of Tokyo, and Masahiro Koga, Yamaguchi, all of Japan, assignors to Teijin Limited, Osaka, Japan
Division of Ser. No. 913,889, Sep. 29, 1986, Pat. No. 4,841,091. This application Feb. 9, 1988, Ser. No. 153,881
Claims priority, application Japan, Jan. 29, 1985, 60-13527; Oct. 29, 1985, 60-240439
Int. Cl.[5] C07C *177/00*
U.S. Cl. 558—441 **1 Claim**

1. 16-Substituted prostaglandin Es comprising compounds

expresses by formula (II), their enantiomers, or their mixtures of arbitrary mixing ratio,

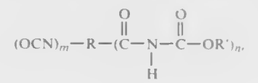


(II)

wherein R^1 indicates $COOR^2$, CH_2OR^3, in which R^2 represents a hydrogen atom, a substituted or unsubstituted C_1-C_{10} alkyl group, a substituted or unsubstituted C_3-C_{10} cycloalkyl group, or a substituted or unsubstituted phenyl group, and R^3 represents a hydrogen atom, a tri$(C_1$-$C_7)$ hydrocarbon silyl group, a group which forms an acetal bond together with the oxygen atom of a hydroxyl group, or a C_2-C_7 acyl group; R^4 and R^5 are identical or different, each representing a hydrogen atom, a tri$(C_1$-$C_7)$ hydrocarbon silyl group, or a group which forms an acetal bond together with the oxygen atom of a hydroxyl group; R^6 indicates a hydrogen atom, a C_1-C_4 alkyl group, or a vinyl group; R^7 represents a linear or branched C_3-C_8 alkyl group, an alkenyl group, or an alkynyl group, a phenyl group or a C_3-C_{10} cycloalkyl group, which may be substituted; or a linear or branched C_1-C_5 alkyl group which is substituted by a C_1-C_6 alkoxy group, a phenyl group, a phenoxy group, or a C_3-C_{10} cycloalkyl group, which may be substituted; and Y represents CH_2X or XCH_2, in which X represents an ethylene group, a cis- or trans-vinylene group, or an ethynylene group wherein the substituent of R^2 and R^7 is selected from the group consisting of a halogen atom, a hydroxy group, a C_2-C_7 acyloxy group, a C_1-C_4 alkyl group which may be substituted by a halogen atom, a C_1-C_4 alkoxy group which may be substituted by a halogen atom, a nitrile group, a carboxyl group and a $(C_1$-$C_6)$ alkoxycarbonyl group.

4,921,996
ISOCYANATO-ACYLURETHANES, A PROCESS FOR THEIR PREPARATION AND THEIR USE
Walter Schäfer, Leichlingen; Hanns P. Müller, Bergisch-Gladbach, and Tillmann Hassel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany
Filed Aug. 2, 1988, Ser. No. 227,980
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726050
Int. Cl.[5] C07C *125/06, 125/04*
U.S. Cl. 560—25 **2 Claims**

1. An isocyanato-acylurethane corresponding to formula I

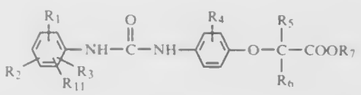


(I)

wherein
R has a valency of (m+n) and represents an aliphatic hydrocarbon group having 1 to 18 carbon atoms, a cycloaliphatic hydrocarbon group having 4 to 15 carbon atoms, an aromatic hydrocarbon group having 6 to 15 carbon atoms or an araliphatic hydrocarbon group having 7 to 13 carbon atoms,
R′ represents an aliphatic hydrocarbon group optionally containing ether bridges and having 1 to 18 carbon atoms, a cycloaliphatic hydrocarbon group having 4 to 15 carbon atoms, an aromatic hydrocarbon group having 6 to 15 carbon atoms or an araliphatic hydrocarbon group having 7 to 13 carbon atoms and
m and n, may be identical or different, and each have a value of 1 or 2.

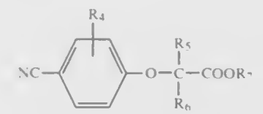
4,921,997
METHOD OF SYNTHESIS AND NOVEL COMPOUNDS FOR PHARMACEUTICAL USES
Iraj Lalezari, and Parviz Lalezari, both of Scarsdale, N.Y., assignors to Montefiore Medical Center, Bronx, N.Y.
Filed Jun. 15, 1988, Ser. No. 207,098
Int. Cl.[5] C07C *127/19*
U.S. Cl. 560—34 **5 Claims**

1. A process for the production of a compound of formula I:

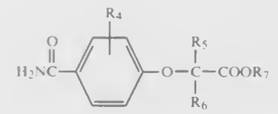


(I)

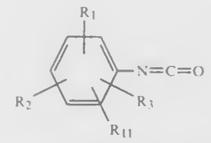
wherein R_1, R_2, R_3, R_4, R_5, R_6 and R_{11} are the same or different and are independently selected from the group consisting of hydrogen, halogen, straight and branched alkyl of from 1 to 6 carbon atoms, aryl cycloalkyl of 3 to 7 carbon atoms; and alkoxy of 1 to 6 carbon atoms; R_5 and R_6 may be the same or different and are selected from the group consisting of hydrogen, halogen, straight and branched chain alkyl groups of from 1 to 6 carbon atoms; aralkyl groups wherein the alkyl portion has from 1 to 6 carbon atoms, cycloalkyl of from 3 to 7 carbon atoms and aryl; R_7 is hydrogen or a straight or branched chain alkyl group of 1 to 6 carbon atoms and the pharmaceutically acceptable salts thereof said process comprising
(a) contacting a compound of the formula:



wherein R_4, R_5, R_6 and R_7 are as above defined with a sufficient amount of a peroxide and alkali to form a carboxamide compound of the formula:



wherein R_4, R_5, R_6 and R_7 are as above defined;
(b) contacting said carboxamide with a hypobromite to form the corresponding amino compound;
(c) contacting said amino compound with a compound of the formula



wherein R_1, R_2, R_3 and R_{11} are as above defined in the presence of dry pyridine to form a reaction product; and
(d) recovering from said reaction product a compound of formula I.

4,921,998

SUBSTITUTED AMINO-5,6,7,8-TETRAHYDRONAPHTHYL-OXYACETIC ACIDS, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Ulrich Niewohner, Wermelskirchen; Franz-Peter Hoever, Cologne; Bodo Junge, Wuppertal; Elisabeth Perzborn, Wuppertal; Friedel Seuter, Wuppertal, and Volker-Bernd Fiedler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

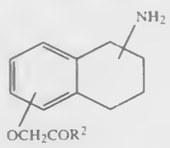
Divisioo of Ser. No. 68,002, Jun. 29, 1987. This application May 15, 1989, Ser. No. 352,073

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623941

Int. Cl.[5] **C07C** *101/72*

U.S. Cl. 560—45 **1 Claim**

I. A compound of the formula



R^2 represents OH, alkoxy, phenoxy, benzoxy or NR^5R^6, wherein

R^5 and R^6 are identical or different and each represents hydrogen or alkyl, or one of the radicals R^5 or R^6 represents benzyl.

4,921,999

METHOD FOR MAKING TERTIARY BUTYL ESTERS

Michael J. O'Brien, Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1988, Ser. No. 235,088

Int. Cl.[5] **C07C** *69/76;* **C07J** *00/00*

U.S. Cl. 560—52 **4 Claims**

I. A method for making tertiary butyl-esters, which comprises effecting reaction at atmospheric pressure and at a temperature of less than about −7° C., between

(1) an organic carboxylic acid and isobutylene, in the presence of a substantially inert organic solvent and an effective amount of trifluoromethane sulfonic acid and

(2) adding an acid acceptor to the mixture of (1) and thereafter effecting the removal of organic solvent.

4,922,000

PRODUCTION OF DIALKYL (PHENYLENEDIOXY) DIACETATES

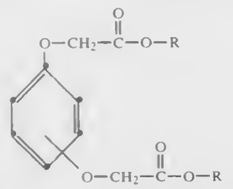
Theodore R. Walker, Jr., and W. Carl Wooten, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,229

Int. Cl.[5] **C07C** *69/76*

U.S. Cl. 560—061 **20 Claims**

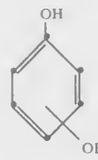
2. A process for preparing a compound of the formula:



I

wherein R is phenyl or a straight chain, branched chain, or cyclic alkyl moiety of 1 to 12 carbon atoms, comprising the steps of

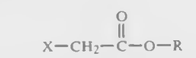
(a) contacting a diol compound of the formula:



IV

with a strong base in the presence of a suitable solvent to obtain an intermediate reaction product, and

(b) adding the intermediate reaction product in solvent obtained by step (a) to a reaction medium comprising a compound of the formula:



III

wherein R is as defined hereinabove and X is halogen, the addition occurring over a period of time greater than about 30 minutes, said process occurring under conditions such that greater than 70% of the maximum theoretical yield of Compound I is formed.

4,922,001

CHIRAL SYNTHESIS UNITS FROM PROCHIRAL GLYCEROL

Manfred Schneider; Kurt Laumen; Detlef Breitgoff, all of Wuppertal; Dieter Wullbrandt, Hofheim am Taunus; Merten Schilingmann, Königstein/Taunus, and Reinhold Keller, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

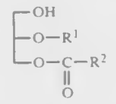
Filed Jul. 20, 1987, Ser. No. 75,761

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1986, 3624703

Int. Cl.[5] **C07C** *69/76*

U.S. Cl. 560—112 **6 Claims**

1. A process for the preparation of an R- or S-enantiomer of a compound of the formula I



I

in which R^1 is an ether-forming protective group and R^2 represents a branched or, preferbly, straight-chain alkyl group which has 1 to 18 carbon atoms and can optionally be substituted by halogen, hydroxyl, alkoxy with 1 to 3 carbon atoms, phenyl, phenoxy, and/or thienyl, it being possible for a phenyl or phenoxy group to be substituted by alkyl, amine, hydroxyl, halogen or alkoxy, which comprises selectively esterifying a hydroxyl group from the compound of the formula II



II

in which R^1 has the above-mentioned meaning and R^3 is hydrogen or



in which R^2 likewise has the above-mentioned meaning, by incubation with a hydrolase, if R^3 is hydrogen, with the compound of the formula



in which R^2 has the above-mentioned meaning and R^4 denotes C_1 to C_6 alkyl or alkenyl which is straight-chain or branched and can be substituted by halogen, hydroxyl, alkoxy or nitro, or which comprises selectively splitting off an ester group by incubation with a hydrolase if R^3 denotes the group



in which R^2 has the above meaning.

4,922,002

LINEAR, LOW-MOLECULAR-WEIGHT POLYESTER-BASED POLYOL

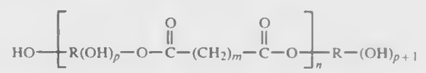
Leonard J. Calbo, Jr., Bethel, and Lawrence V. Gallacher, East Norwalk, both of Conn., assignors to King Industries, Inc., Norwalk, Conn.

Continuation of Ser. No. 684,737, Dec. 21, 1984, Pat. No. 4,888,441, which is a continuation-in-part of Ser. No. 453,222, Dec. 27, 1982. This application May 22, 1989, Ser. No. 355,164

Int. Cl.[5] **C07C** *69/34*

U.S. Cl. 560—193 **10 Claims**

1. A linear, low-molecular-weight polyester-based polyol having at least two hydroxyl groups, low viscosity, high solids content and having the structural formula:



wherein R is a moiety derived from saturated aliphatic polyhydric alcohol; n is 1 or 2, and at least about 50% by weight of n is n=1; p is 0 to 4 inclusive and m is 2 to 10 inclusive; said polyol being substantially free of any unreacted polyhydric alcohol.

4,922,003

BISACRYLATE MONOMERS AND POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

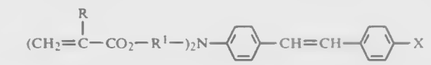
Ronald N. DeMartino, Wayne; Anthony J. East, Madison, and Gordon W. Calundann, North Plainfield, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 21, 1987, Ser. No. 135,764

Int. Cl.[5] **C07C** *69/52*

U.S. Cl. 560—221 **3 Claims**

I. A bisacrylate composition corresponding to the formula:



where R is a C_1-C_4 alkyl substituent, R^1 is a divalent C_2-C_{12} alkylene radical, and X is $—NO_2$, —CN or $—CF_3$.

4,922,004

COPOLYMERIZABLE PHOTOINITIATORS

Manfred Köhler, Darmstadt; Jörg Ohngemach, Reinheim, and Eike Poetsch, Mühltal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

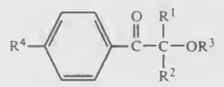
Filed Sep. 29, 1986, Ser. No. 912,473

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534645

Int. Cl.[5] **C07C** *67/30, 49/76*

U.S. Cl. 560—221 **11 Claims**

I. A compound of the general formula



(I)

in which

R^1 and R^2 are each C_1-C_6-alkyl,

R^3 is H, C_1-C_6-alkyl, C_1-C_6-alkanoyl or the group Z,

R^4 is H, halogen, C_1-C_{12}-alkyl, C_1-C_{12}-alkoxy, C_1-C_{12}-alkylthio,

or the group $—X[(CH_2—CH_2—O)_n—Z]_m$ and

X is O, S or N

n is an integer from 0 to 4,

m is the integer 1 for X=O and S or the integer 1 or 2 for X=N,

Z is the group —CO—CR=CR′R″

with R, R′, and R″ each being H or CH_3, with the proviso that at least one of the R^3 and R^4 groups contains the group Z.

4,922,005

PREPARATION PROCESS OF HEXAMETHYLENE

Masanobu Ajioka; Makoto Aiga; Masafumi Kataita, and Akihiro Tamaki, all of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Nov. 13, 1985; Ser. No. 797,457

Int. Cl.[5] **C07C** *119/04*

U.S. Cl. 560—347 **1 Claim**

I. Process for preparing hexamethylene diisocyanate, which comprises:

charging a slurry of hexamethylenediamine hydrochloride in an inert organic solvent into the first of two stages, each composed of a tank-shaped reactor which are maintained under a pressure above atmospheric pressure and below 3 kg/cm^2G;

controlling the conversion of hexamethylenediamine hydrochloride into hexamethylene diisocyanate in the first stage within the range of from 70 to 95 percent;

subjecting the slurry to a phosgenation reaction by controlling the amount of phosgene at a level which is 5 to 12 molar times per hour the total amount of hexamethylenediamine hydrochloride and hexamethylene diisocyanate in the corresponding reaction mixture;

exhausting unreacted phosgene which contains by-produced HCl; said unreacted phosgene being recycled after separating said HCl; and

controlling the overall residence time in the phosgenation reaction at from 9 to 15 hours and the reaction temperature at from 130° to 170° C.

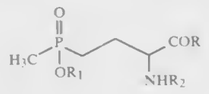
4,922,006

PROCESS FOR THE PREPARATION OF L-PHOSPHINOTHRICINE (DERIVATIVES) AND ALSO OF THEIR ALKYL ESTERS

Hans-Joachim Zeiss, Sulzbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,231
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609818
Int. Cl.[5] C07F *9/30, 9/32*
U.S. Cl. 562—11 8 Claims

1. A process for preparing a compound of formula I, or a salt thereof formed from an inorganic or an organic acid or base,



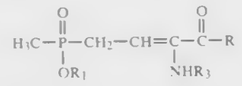
I

wherein

R is hydroxy, (C_1-C_6)alkoxy, Ala-Ala(—OH), Ala-Leu(OH),

R_1 is hydrogen or (C_1-C_6)alkyl, and

R_2 is hydrogen or an acyl, alkoxycarbonyl or aryloxycarbonyl radical, comprising hydrogenating a compound of formula II

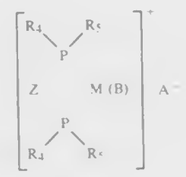


II

wherein

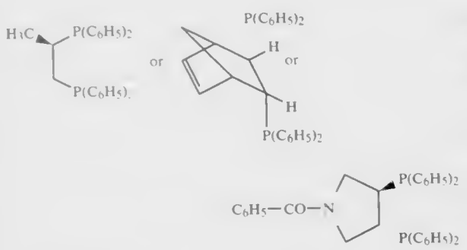
R and R_1 have the same meaning as in formula I, and

R_3 is an acyl, alkoxycarbonyl or aryloxycarbonyl radical, in the presence of a complex of formula III



III

which is suitable for homogeneous asymmetric hydrogenation, where, in formula III, the R_4R_5P-Z-PR_4R_5 moiety is



M is rhodium,

B is norbornadiene or cyclooctadiene and

A^- is an anion equivalent, and the compound of formula I, wherein $R_2 = R_3$, so obtained is not saponified or is saponified by acidic hydrolysis into an amine hydrochloride of formula I in which R_2 is hydrogen.

8. A process as claimed in claim 7, wherein the product obtained after hydrogenation is saponified by refluxing in 6N hydrochloric acid solution.

4,922,007

PROCESS FOR PREPARING 4-AMINO-1-HYDROXYBUTYLIDENE-1,1-BISPHOSPHONIC ACID OR SALTS THEREOF

Gerard R. Kieczykowski, Westfield; David G. Melillo, Scotch Plains, and Ronald B. Jobson, East Brunswick, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 9, 1989, Ser. No. 363,820
Int. Cl.[5] C07F *9/38*
U.S. Cl. 562—13 5 Claims

1. A process for the preparation of 4-amino-1-hydroxybutylidene-1,1-bisphosphonic acid or salts thereof which comprises:

(a) reacting 4-aminobutyric acid with a mixture of phosphorous acid and PCl_3 in the presence of methanesulfonic acid; and

(b) recovering said 4-amino-1-hydroxybutylidene-1,1-bisphosphonic acid or salts thereof.

4,922,008

PROCESS FOR THE PRODUCTION OF 4-NITROTOLUENE-2-SULFONIC ACID

Gottfried Seifert; Sebastian Stäubli, both of Magden, Switzerland; Josef H. Wieland, Bad Säckingen, Fed. Rep. of Germany; Willy Regenass, Muttenz; Martin Buerli, Magden, both of Switzerland; John G. Lee, Saraland, and Richard B. Lund, Jackson, both of Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 807,387, Dec. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 672,034, Nov. 16, 1984, abandoned. This application Apr. 29, 1987, Ser. No. 45,734
Claims priority, application Switzerland, Nov. 28, 1983, 6350/83
Int. Cl.[5] C07C *143/24*
U.S. Cl. 562—58 15 Claims

1. A process for the preparation of 4-nitrotoluene-2-sulfonic acid by sulfonating 4-nitrotoluene, which comprises carrying out the sulfonation continuously with oleum of 50–85% SO_3 content while maintaining the conversion in the reaction mixture, to which 4-nitrotoluene and said sulfonation source are added, at ≧90% during the entire reaction course.

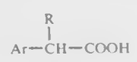
4,922,009

STEREOCONVERGENT PROCESS FOR PREPARING OPTICALLY ACTIVE CARBOXYLIC ACIDS

Marco Villa, Milan; Claudio Giordano, Monza; Graziano Castaldi, Briona, and Silvia Cavicchioli, Costermano, all of Italy, assignors to Zambon SpA, Vicenza, Italy

Filed Dec. 23, 1987, Ser. No. 137,000
Claims priority, application Italy, Dec. 23, 1986, 22822 A/86
Int. Cl.[5] C07C *51/09*
U.S. Cl. 562—466 16 Claims

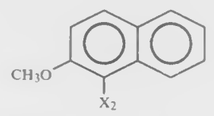
1. A stereoconvergent process for preparing optically active alpha-arylalkanoic acids of formula preparing optically active alpha-arylalkanoic acids of formula



IV

in which

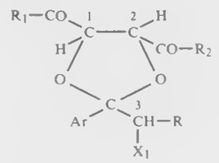
Ar represents a group of the formula



in which

X_2 represents a hydrogen, chlorine, bromine or iodine atom, and R represents a linear or branched C_1-C_4, comprising

(A) treating a diastereoisomeric mixture of ketals of formula



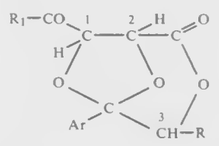
I-A

in which

Ar and R have the aforesaid meanings;

R_1 and R_2, which can be equal or different, represent a hydroxyl, and O—M— group, OR_3 or NR_4R_5 in which R_3 represents a C_1-C_{24} alkyl, a C_3-C_6 cycloalkyl, phenyl or benzyl; M^+ represents a cation of an alkaline metal; R_4 and R_5, which can be equal or different, represent a hydrogen atom, a C_1-C_4 alkyl, a C_5-C_6 cycloalkyl, a $(CH_2)n$—CH_2OG groupo wherein n=1, 2 or 3, or R_4 and R_5 together form $(CH_2)_m$ group where M=4 or 5, a —CH_2—CH_2—R-$_6$—CH_2—CH_2— group in which R_6 represents an oxygen atom, a NH group or a C_1-C_4 N-alkyl group;

X represents a chlorine, bromine or iodine atom; the ring carbon atoms marked with a 1 or 2 both having either R or S configuration, and the other carbon atom marked with a 3 having any configuration; with a dipolar aprotic solvent or a solvent selected from the group consisting of of a low polarity solvent in the presence of a quaternary ammonium salt or phosphonium salt or crown ether, at a temperature between ambient and the boiling point of the reaction mixture, to convert one of the two diastereoisomers into the corresponding compound of formula V



V

(in which Ar, R and R_1 have the aforesaid meanings) with configuration inversion at the new centre of asymmetry which is formed,

(B) rearranging the unreacted diastereisomer I-A, to obtain the corresponding alpha-aryl-alkanoic acid in the form of a single enantiomer;

(C) hydrolysing the compound V to obtain the corresponding alpha-hydroxy-ketal with configuration retention;

(D) rearranging the alpha-hydroxy-ketal, to obtain the corresponding alphaarylalkanoic acid in the form of the same enantiomer as obtained in step B.

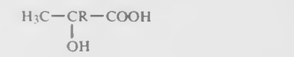
4,922,010

PROCESSES FOR PREPARING 2-SUBSTITUTED PROPIONIC ACID AND DERIVATIVES THEREOF

Mikito Kashima, Ichihara; Hideo Ishikawa, Minoo; Kouichi Kashiwagi, and Yumiki Noda, both of Ichihara, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

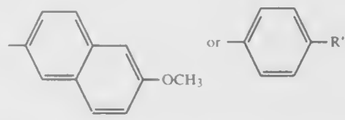
Filed Dec. 7, 1988, Ser. No. 282,024
Claims priority, application Japan, Dec. 18, 1987, 62-318678; Dec. 18, 1987, 62-318679; Sep. 27, 1988, 63-239839
Int. Cl.[5] C07C *59/48, 59/64*
U.S. Cl. 562—470 12 Claims

1. A process for preparing 2-hydroxy-2-(6-methoxy-2-naphthyl)propionic acid or 2-hydroxy-2-(4-substituted phenyl)propionic acid derivatives represented by the following formula (I):



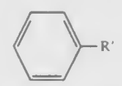
I

wherein R represents



where R' represents a phenoxy group or a phenoxy group substituted by a halogen atom or a straight or branched alkyl group having 1 to 5 carbon atoms,

which comprises reacting 2-methoxynaphthalene or a substituted benzene derivatives represented by the formula (II):



II

wherein R' has the same meaning as defined above, with pyruvic acid or pyruvic acid ester derivatives in the presence of a Lewis acid and then hydrolyzing the obtained product when the pyruvic acid ester derivatives are used.

4,922,011

METHOD FOR PURIFYING ASPARTIC ACID

Satoji Takahashi, Mieken, and Masao Nakamura, Kawasaki, both of Japan, assignors to Ajinomoto Company, Ltd., Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,113
Claims priority, application Japan, Mar. 20, 1987, 067671
Int. Cl.[5] C07C *99/12*
U.S. Cl. 562—554 6 Claims

1. A method for purifying aspartic acid which comprises suspending impure aspartic acid crystals containing as an impurity at least chloride ion, in an aqueous solution at a temperature of 50° C. or higher to form a suspension, maintaining said suspension for at least 5 minutes and separating purified aspartic acid crystals from said aqueous solution.

4,922,012

COMPOSITIONS OF MATTER COMPRISING DIALKYL-(N,N-DIALKYLCARBAMOYLMETHYL) PHOSPHINE OXIDES

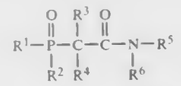
Kenneth M. Kem, San Juan Capistrano, Calif., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 295,300, Aug. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 239,731, Mar. 2, 1981, Pat. No. 4,396,556. This application Jan. 12, 1984, Ser. No. 570,181

Int. Cl.[5] C07F *9/28, 9/02*

U.S. Cl. 564—15 9 Claims

1. Actinide extraction Compounds of the following formula



wherein R^1 and R^2 are the same or different and are selected from primary alkyl groups of 4 to 12 carbon atoms; R^3 and R^4 are hydrogen or only one of R^3 and R^4 is hydrogen and the other is selected from alkyl groups of 1 to 18 carbon atoms; and R^5 and R^6 are the same or different and are selected from primary alkyl groups of 1 to 12 carbon atoms or where one of R^5 and R^6 is hydrogen and the other is selected from primary alkyl groups of 1 to 12 carbon atoms, or where R^5 and R^6 are in connection forming a heterocyclic ring structure comprised of about 5 to 7 members including the amide nitrogen atom.

4,922,013

PROCESS FOR THE RACEMIZATION OF OPTICALLY ACTIVE D-2-N-PHENACETYLAMINO-4-METHYLPHOSPHINOBUTYRIC ACID

Rainer Schütze, Kelkheim, and Harald Knorr, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

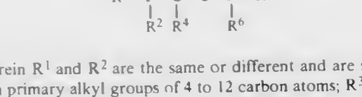
Filed May 18, 1989, Ser. No. 353,613

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817191

Int. Cl.[5] C07F *9/30*

U.S. Cl. 562—15 10 Claims

1. A process for the racemization of D-2-N-phenacetylamino-4-methylphosphinobutyric acid



(I)

which comprises carrying out the racemization in glacial acetic acid and in the presence of at least 1 percent by weight of acetic anhydride based on the weight of the compound of the formula I.

4,922,014

PROCESS FOR THE PREPARATION OF OXETHYLMERCAPTOBENZALDEHYDES AND THEIR OXIDATION PRODUCTS

Theodor Papenfuhs, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

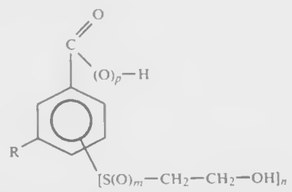
Filed Sep. 20, 1988, Ser. No. 246,802

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731763

Int. Cl.[5] C07C *51/285*

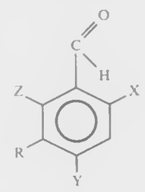
U.S. Cl. 562—418 12 Claims

1. A process for the preparation of an oxethylmercaptobenzaldehyde of the formula (1)



(I)

in which R denotes a hydrogen, fluorine, chlorine, bromine or iodine atom, m denotes the number 0, n denotes the number 1 or 2 and p denotes the number 0, and the side-chain $—S(O)_m—CH_2—CH_2—OH$ is in the ortho and para, or ortho or para position to the aldehyde group, which comprises condensing 1 mole of a halobenzaldehyde of the formula (II),



(II)

in which R, X, Y and Z represent hydrogen, fluorine, chlorine, bromine or iodine atoms, with the proviso that R, X, Y and Z can be in total 1, 2 or 3 halogen atoms, where R is a halogen atom, if R, X, Y and Z together represent 3 halogen atoms, in aqueous medium with about 1.0 to 15 moles of mercaptoethanol, per halogen atom to be exchanged, in the presence of an acid-binding agent at a temperature of about 70° C. to about 150° C., to give the corresponding oxethylmercaptobenzaldehyde.

4,922,015

SYNTHESIS OF PEPTIDE AMIDES BY MEANS OF A SOLID PHASE METHOD USING ACID-LABILE ANCHORING GROUPS

Gerhard Breipohl, Frankfurt am Main; Jochen Knolle, Kriftel, and Werner Stüber, Lahntal, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

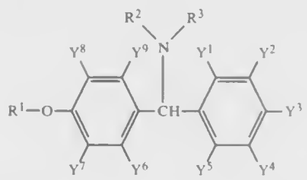
Filed Apr. 6, 1988, Ser. No. 178,232

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711866

Int. Cl.[5] C07C *101/30*

U.S. Cl. 562—451 12 Claims

1. A compound of the formula I



(I)

in which

R^1 denotes (C_1-C_8)-alkyl, (C_6-C_{14})-aryl or substituted (C_6-C_{14})-aryl,

R^2 denotes hydrogen or an amino acid residue which is protected by an amino protective group which can be cleaved off with weak acid or base,

R^3 denotes hydrogen or (C_1-C_4)-alkyl,

Y^1, Y^2, Y^3, Y^4, Y^5, Y^6, Y^7, Y^8 and Y^9 denote hydrogen, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy or $—O—(CH_2)_n—COOH$, it being possible for the radicals to be identical or different but a singles radical being $—O—(CH_2)_n—COOH$, and

n denotes an integer from 1 to 6.

4,922,016

PROCESS FOR THE PREPARATION OF N-(SULFONYLMETHYL) FORMAMIDE COMPOUNDS

Nicolaas C. M. E. Barendse, Den Hoorn, Netherlands, assignor to Gist-Brocades N.V., Delft, Netherlands

Continuation of Ser. No. 29,746, Mar. 24, 1987, abandoned. This application Jul. 26, 1989, Ser. No. 385,583

Claims priority, application European Pat. Off., Apr. 16, 1986, 86200653.3

Int. Cl.[5] C07C *103/44*

U.S. Cl. 564—219 9 Claims

1. Process for the preparation of N-(sulfonylmethyl) formamides having an organic group R substituted on the sulfonyl moiety, comprising the reaction of a sulfinic acid having the group R, formaldehyde and formamide and a second acid R being selected from the group consisting of alkyl of 1 to 6 carbon atoms, phenyl, naphthyl and phenyl and naphthyl substituted with 1 to 3 members of the group consisting of halogen, nitro and alkyl of 1 to 4 carbon atoms, characterized in that the reaction medium contains 0 to 35% (w/w) of water.

4,922,017

PROCESS FOR PRODUCTION OF AROMATIC ALDOXIMES

Chempolil T. Mathew, Randolph, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 20, 1988, Ser. No. 208,438

Int. Cl.[5] C07C *131/00*

U.S. Cl. 564—265 12 Claims

1. A process for preparing an aromatic aldoxime from the corresponding aromatic α,α-dihalide comprising:

(a) reacting said aromatic α,α-dihalide with a hydroxylamine salt in the presence of sufficient aqueous sodium hydroxide to form the corresponding aromatic aldoxime and to maintain said oxime in solution:

(b) phase separating an organic phase if present and leaving an aqueous phase containing the oxime formed in (a);

(c) neutralizing the aqueous phase of (b) and thereby forming a separate phase comprising said oxime;

(d) recovering the oxime from the separate layer formed in (c).

4,922,018

PHOTOCONDUCTIVE IMAGING MEMBERS WITH UNSYMMETRICAL SQUARAINE COMPOSITIONS

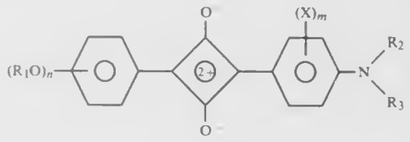
Kock-Yee Law, Fairport, and F. Courtney Bailey, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 187,777, Apr. 29, 1988, Pat. No. 4,886,722. This application Aug. 31, 1989, Ser. No. 401,598

Int. Cl.[5] C07C *87/45*

U.S. Cl. 564—307 4 Claims

1. Unsymmetrical squaraine compositions of the formula



wherein R_1, R_2 and R_3 are independently C_1-C_{25} alkyl; X is selected from hydrogen, hydroxy, C_1-C_{25} alkyl, C_1-C_{10} alkoxy, or halogen n is a number of 1 to about 3; and m is a number of from 0 to about 2.

4,922,019

DERIVATIVES OF 2,2-BIS-(3-AMINOPHENYL)HEXAFLUOROPROPANE AND PROCESS FOR THE PREPARATION OF 2,2-BIS-(3,4-DIAMINOPHENYL)HEXAFLUOROPROPANE

Jürgen Lau, and Günter Siegemund, both of Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

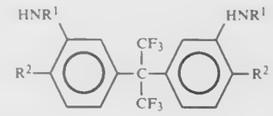
Filed Jun. 29, 1988, Ser. No. 212,953

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721839

Int. Cl.[5] C07C *87/50*

U.S. Cl. 564—332 16 Claims

1. A compound of the formula



wherein R^1 is hydrogen or an acyl group in which a nonaromatic hydrocarbon group of 1 to 6 carbon atoms is attached to the CO-group and R^2 is H or NO_2 if R^1 is an acyl group, and is NO_2, if R^1 is hydrogen.

4,922,020

1,1,5,5-TETRA(4-AMINOPHENYL)-PENTADI-1,4-ENE COMPOUNDS

Peter Gregory, Bolton, and Nigel Hughes, Oldham, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

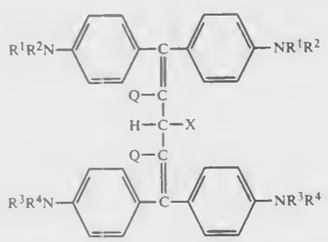
Filed Mar. 17, 1988, Ser. No. 169,573

Claims priority, application United Kingdom, Mar. 27, 1987, 8707348

Int. Cl.[5] C07C *87/50*; C09B *11/02*; C07D *277/28, 275/02*

U.S. Cl. 564—330 5 Claims

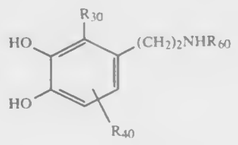
1. A compound of the formula:



wherein
X is selected from thiazol-5-yl, phenyl, para substituted phenyl, naphthyl, substituted naphthyl, in which the substituents are selected from NR^7R^8 and NO_2;
each Q is independently selected from H, C_{1-4}-alkyl, phenyl and benzyl;
each R^1 and R^2 is independently H, C_{1-4}-alkyl, trimethylene or C_{1-4}-alkyl-substituted trimethylene which is also attached to an ortho carbon atom of the adjacent benzene ring;
each R^3 and R^4 is independently H, C_{1-4}-alkyl, trimethylene or C_{1-4}-alkyl-substituted trimethylene which is also attached to an othro carbon atom of the adjacent benzene ring;
each R^7 and R^8 is independently selected from H, aryl, C_{1-4}-alkyl, substituted C_{1-4}-alkyl, trimethylene and C_{1-4}-alkylsubstituted trimethylene which is also attached to an ortho carbon atom of the adjacent benzene ring;
and wherein each benzene ring has no further substituents.

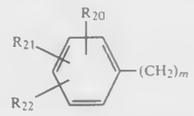
4,922,021
NEW ALKYLENE DIAMINE DERIVATIVES
Zoltan Zubovics; Lajos Toldy; Gyorgy Rabloczky; Andras Varro; Ferene Andrasi; Sandor Elek, and Istvan Elekes, all of Budapest, Hungary, assignors to BASF Aktiensellschaft, Ludwigshafen, Fed. Rep. of Germany
Cootinuation of Ser. No. 772,199, Sep. 4, 1985. This application Sep. 14, 1988, Ser. No. 246,028
Claims priority, application Hungary, Mar. 4, 1981, 539/81
Int. Cl.[5] A61K *31/135;* C07C *87/28*
U.S. Cl. 564—367 2 Claims
1. 1-(2,6-Dimethylphenyl-amino)-2-dimethylamino-propane dihydrochloride.

4,922,022
SUBSTITUTED 3,4-DIHYDROXY PHENYLETHYLAMINO COMPOUNDS
John Dixon, Nr Melton Mowbray; Brian Springthorpe, Shepshed, and Francis Ince, Loughborough, all of England, assignors to Fisons plc, Leicestershire, England
Continuation-in-part of Ser. No. 932,473, Nov. 19, 1986, Pat. No. 4,883,804. This application May 18, 1988, Ser. No. 195,722
Claims priority, application United Kingdom, May 19, 1987, 8711779; May 19, 1987, 8711780; May 19, 1987, 8711781; May 19, 1987, 8711784; May 19, 1987, 8711785; Dec. 29, 1987, 8730254; Dec. 29, 1987, 8730255; Dec. 29, 1987, 8730256
The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.
Int. Cl.[5] C07C *87/28*
U.S. Cl. 564—367 13 Claims
1. Compounds of formula I.



I

in which
one of R_{30} and R_{40} represents a group Ra,



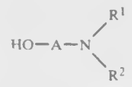
Ra

and the other of R_{30} and R_{40} represents hydrogen or halogen,
R_{60} represents a group Rb,

$$CH_2XCH_2YCHER_{15}ZR_{10} \qquad \text{Rb}$$

wherein X represents a C2 to C8 alkylene chain optionally interrupted by a double bond or by $S(O)_n$, wherein n is 0, 1 or 2, Z represents a C1 to C3 alkylene chain, each of X and Z being optionally substituted by OH or one or more alkyl C1 to C6,
Y represents NR_{70},
NR_{70} represents hydrogen, alkyl C1 to C6 or $(CH_2)_qR_{11}$,
R_{10} and R_{11} independently represent phenyl substituted by one or more substituents R_{23}, which may be the same or different; or R_{10} represents a saturated carbocyclic group,
R_{15} represents hydrogen, alkyl C1 to C6, or together with R_{23} forms a $(CH_2)p$ chain, wherein p represents 0, 1 or 2,
R_{20}, R_{21}, R_{22} and R_{23} independently represent hydrogen, alkyl C1 to C6, NHR_{25}, SH, NO_2, halogen, CF_3, SO_2R_{26}, $CH_{20}H$ or OH, wherein R_{25} represents hydrogen, alkyl C1 to C6 or alkanoyl C1 to C6 and R_{26} represents alkyl C1 to C6 or NH_2,
m represents 2, 3 or 4,
q represents an integer from 1 to 6 inclusive, provided that
(a) when R_{15}, R_{21}, R_{22}, R_{23}, R_{40}, and R_{70} represent hydrogen, m represents 2, X represents unsubstituted and uninterrupted $(CH_2)_4$, Z represents CH_2, R_{10} represents phenyl, then R_{20} does not represent hydrogen or 4-OH, and
(b) when R_{40} represents hydrogen, then in addition Y may represent 0 or NH and R_{10} may represent pyridyl, alkyl C1 to C6 or hydrogen,
and pharmaceutically acceptable salts and solvates thereof.

4,922,023
PREPARATION OF ALIPHATIC N,N-DIALKYL-SUBSTITUTED AMINO ALCOHOLS
Roman Fischer, Mutterstadt; Hans J. Mercker, Mannheim, and Herbert Mueller, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jul. 6, 1988, Ser. No. 215,736
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724239
Int. Cl.[5] C07C *85/06*
U.S. Cl. 564—479 17 Claims
1. In a process for the preparation of an aliphatic N,N-dialkyl-substituted amino alcohol of the formula



(I)

from a diol of the formula

HO—A—OH (II)

and a secondary amine of the formula



(III)

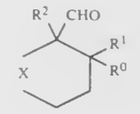
where A is an aliphatic chain of at least 2 up to 12 carbon atoms and R^1 and R^2 are alkyl of from 1 to 6 carbon atoms, which may be joined to form a five-membered or six-membered ring, by reaction of said diol and said amine in the liquid phase with hydrogen at elevated temperature and pressure and in the presence of a hydrogenation/dehydrogenation catalyst and a basic alkali-metal or alkaline-earth-metal compound, the improvement which comprises:
carrying out said reaction at a temperature of from 150° C. to 250° C. and at a total pressure of from 40 bar to 250 bar with the hydrogen partial pressure being from 2 bar to 50 bar while using a hydrogenation/dehydrogenation catalyst which is based on copper; and
maintaining a mass of water present during the reaction such that the mass of said water is from 1% to 20% of the mass of the reaction mixture.

4,922,024
AMINATION PROCESS EMPLOYING GROUP VIB METAL CATALYSTS
Robert G. Bowman; Marvin H. Tegen, and George E. Hartwell, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Apr. 14, 1988, Ser. No. 181,622
Int. Cl.[5] C07C *85/06;* C07D *295/02, 295/12*
U.S. Cl. 564—480 21 Claims
1. A process for preparing an amine comprising contacting an alcohol with a reactant amine in the presence of hydrogen and a catalyst selected from the group consisting of:
(1) Binary compounds consisting essentially of an element of Group VIB and a non-metallic element selected form Groups IIIA, IVA, or VA;
(2) Ternary compounds consisting essentially of an element of Group VIB and two non-metallic elements selected from Groups IIIA, IVA, and VA; and
(3) Ternary compounds consisting essentially of an element of Group VIB, oxygen, and one non-metallic element selected from Groups IIIA, IVA, or VA, such that the oxygen content of the compound is less than about 10 mole percent of the total moles of non-metals,
the contacting occurring under conditions such that a hydroxyl moiety of the alcohol is replaced by the reactant amine to form an amine product.

4,922,025
PREPARATION OF ORGANOPHOSPHORUS COMPOUNDS
Hoelderich, Frankenthal; Michael Hesse, Ludwigshafen, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jul. 8, 1988, Ser. No. 216,612
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724238
Int. Cl.[5] C07F *9/53*
U.S. Cl. 568—14 6 Claims
1. A process for the preparation of an organophosphorus compound which comprises: subjecting an olefinically unsaturated compound, selected from the group consisting of an unsaturated straight-chain, branched or cyclic olefin, a diene having conjugated or nonconjugated double bonds and mixtures thereof, to an addition reaction with a phosphine-containing compound selected from the group consisting of phosphine, primary or secondary phosphines, diphosphanes, polyphosphanes, organophosphorus oxides and mixtures thereof, by contacting the loefinically unsaturated compound and the phosphine-containing compound in a molar ratio of from 6:1 to 1:20, in the presence of a zeolite catalyst and mixtures thereof in acidic form, at a temperature of b 100° C. to 500° C., and isolating the organophosphorous compound produced by the addition reaction.

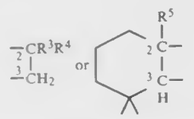
4,922,026
ACYLATION PROCESS TO FORM DIKETONES
Robert B. Baker, Jr.; R. Garth Pews; Eric W. Otterbacher, and James A. Gall, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 27, 1988, Ser. No. 290,723
Int. Cl.[5] C07C *45/46*
U.S. Cl. 568—322 14 Claims
1. A process for preparing aromatic diketones comprising contacting at least one acylatable aromatic compound selected from the group consisting of benzene, toluene or anisole with at least one aromatic diacyl halide in the presence of a catalytic amount of ferric chloride or ferric oxide at an elevated temperature in the range of 50° to 300° C. and at superatomspheric pressure in the range from 10 to 1,000 psig.

4,922,027
PROCESS FOR THE PREPARATION OF CYCLOALIPHATIC ALDEHYDES
Dana P. Simmons, Jamestown, N.C., and Christian Chapuis, Petit-Saconnex, Switzerland, assignors to Firmenich SA, Geneva, Switzerland
Filed Jan. 4, 1989, Ser. No. 293,731
Claims priority, application Switzerland, Jan. 14, 1988, 13388
The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.
Int. Cl.[5] C07C *45/45*
U.S. Cl. 568—445 5 Claims
1. A process for the preparation of cycloaliphatic aldehyde of formula

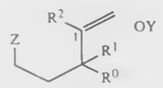


(I)

wherein R^o, R^1 and R^2 represent independently a hydrogen atom or a lower alkyl from C_1 to C_6 and X stands for a group of formula

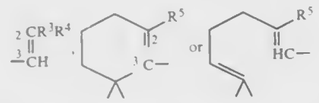


wherein R^3 and R^4 represent independently a lower alkyl radical from C_1 to C_3 and R^5 represents a lower alkyl radical or hydrogen, provided that R^1, R^3 and R^4 do not represent simultaneously a methyl radical whenever R^o and R^2 represent each a hydrogen atom, which comprises cyclising by means of an acidic cyclisation agent an enol ester of formula



(II)

wherein the wavy line stands for a —C—O— bond of cis or transconfiguration, Y represents an acyl group or $P(O)(OR)_2$, wherein R stands for a lower alkyl monovalent radical or an aryl, and Z defines a group of formula



wherein R^3, R^4 and R^5 are defined as above.

4,922,028

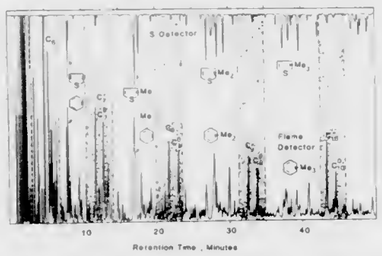
PROCESS FOR THE HYDROFORMYLATION OF SULFUR-CONTAINING THERMALLY CRACKED PETROLEUM RESIDUE AND NOVEL PRODUCTS THEREOF

Alexis A. Oswald, Annandale, N.J.; Ram N. Bhatia, Baton Rouge, La.; Edmund J. Mozeleski, Califon, N.J.; Alexandr P. Glivicky, Sarnia, Canada; Barry G. Brueggeman, Baton Rouge, La.; John R. Hooton, Baton Rouge, La.; Charles M. Smith, Baton Rouge, La., and Chang S. Hsu, Bridgewater, N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Division of Ser. No. 105,171, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 914,802, Oct. 3, 1986, Pat. No. 4,711,968. This application Mar. 10, 1989, Ser. No. 323,070

Int. Cl.[5] **C07C** *47/02*

U.S. Cl. 568—448 **7 Claims**



1. A semilinear, isomeric C_5 to C_{21} aldehyde mixture having less than one branch per molecule comprising 15 to 50 weight % of normal aldehyde, 3 to 20% of 3-methyl branched aldehyde, 3 to 20% of 2-methyl branched aldehyde and 3 to 20% of 2-ethyl and higher 2-n-alkyl branched aldehydes, the mixture being prepared by hydroformylation of thermally cracked olefinic petroleum distillates containing 20% or more olefins and 1-n-olefins being present in a major amount.

4,922,029

ETHERIFICATION OF POLYOXYALKYLENE DERIVATIVES

Stefan Birnbach, Ludwigshafen; Josef Mueller, Grosskarlbach; Klaus Wulz, Lambsheim, and Jochen Houben, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

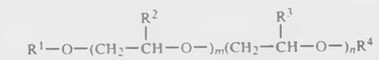
Filed Aug. 5, 1988, Ser. No. 228,488

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726121

Int. Cl.[5] **C07C** *41/01*

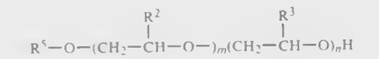
U.S. Cl. 568—616 **7 Claims**

1. A process for the preparation of an etherified polyoxyalkylene derivative of the formula I



(I)

Where R^1 is hydrogen, C_1-alkyl or C_3 -C_5-alkenyl, R^2 *and* R^3 are identical or different and independently of one another are each hydrogen, methyl or ethyl, R^4 *is* C_2–C_4-alkyl and m and n are identical or different and are each greater than or equal to 0, with the proviso that the sum of m and n is from 3 to 300, by reacting a polyoxyalkylene compound of the formula II



(II)

where R^5 is hydrogen, C_1-C_{20} -alkyl or C_3-C_5-alkenyl and R^2, and R^3, m and n each have the above meanings, with a dialkyl sulfate of the formula III



(III)

where R^4 has the above meanings, in the presence of an alkali metal hydroxide, wherein the reaction is carried out at from 20° to 60° C. in the presence of an aqueous solution of an alkali metal hydroxide, the concentration of alkali metal hydroxide during the entire duration of the reaction being not less than 35% by weight, based on the aqueous phase, and not less than 1 mole of dialkyl sulfate of the formula III and not less than one mole of alkali metal hydroxide are used per mole equivalent of organic hydroxyl groups.

4,922,030

METHOD OF PREPARING HALOGENATED NITROALCOHOLS

Vincent Nocito, Buffalo Grove; Louis J. Bedell, Mt. Prospect, and Matthew I. Levinson, Chicago, all of Ill., assignors to Angus Chemical Company, Northbrook, Ill.

Filed Dec. 5, 1988, Ser. No. 279,525

Int. Cl.[5] **C07C** *79/18, 79/16*

U.S. Cl. 568—713 **12 Claims**

1. A method of preparing a halonitroalcohol of the formula



where R_1 is H, lower alkyl or R_2, R_2 is R_3CHOH in which R_3 is H, lower alkyl or phenyl, and X is chloro or bromo, which comprises reacting at a temperature between about 20° C. and 60° C. a halonitroalkane with a substantially nonaqueous solution of an aldehyde of the formula R_3CHO where R_3 is as noted above, in the presence of an alkaline catalyst and recovering the resultant halonitroalcohol.

4,922,031

PREPARATION OF 4,4'-DIHYDROXYBIPHENYL

Ulrich Eichenauer, Frankfurt, and Peter Neumann, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,476

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 3801943

Int. Cl.[5] **C07C** *39/14, 37/04*

U.S. Cl. 568—730 **5 Claims**

1. A process for the preparation of 4,4'-dihydroxybiphenyl by treating biphenyl-4,4'-disulfonic acid or one of its alkali metal salts in an alkali metal hydroxide melt, wherein the treatment is carried out in a melt which contains from 7 to 14 moles of potassium hydroxide and from 0 to 8 moles of sodium hydroxide, based in each case on 1 mole of biphenyl-4,4'-disulfonic acid, in the presence of an alkali metal carbonate at from 280 to 360° C.

4,922,032

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE 2-METHYL-1,2-HEXANEDIOLS

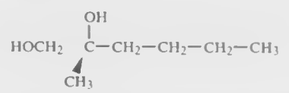
Pedro Joseph-Nathan, and Humberto Cervantes-Cuevas, both of Mexico City, Mexico, assignors to Centro De Investigacion Y De Estudios Avanzados Del Instituto Politecnico Nacional, Mexico City, Mexico

Filed Apr. 26, 1989, Ser. No. 343,272

Int. Cl.[5] **C07C** *29/136, 31/20*

U.S. Cl. 568—862 **10 Claims**

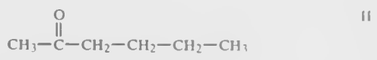
1. A process for preparing the optically active compound having Formula I:



I

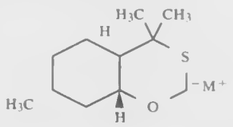
comprising the steps of:

(a) reacting the compound having Formula II:



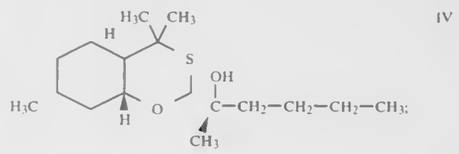
II

with a compound having Formula III:



III

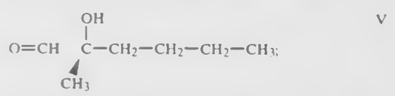
where M^+ is an alkali metal cation, in a suitable solvent at temperatures in the range of from about −80° C. to 25° C. and acidifying the solution to produce the compound having Formula IV:



IV

(b) separating Compound IV from the reaction mass;

(c) reacting the compound having Formula IV with an oxidizing agent selected from the group consisting of N-chlorosuccinimide and N-bromosuccinimide in the presence of an inorganic salt selected from the group consisting of silver S nitrate, cadmium nitrate, cupric chloride, mercuric chloride and silver perchlorate in a suitable solvent at temperatures of from about −10° C. to 0° C. to provide the compound having Formula V:

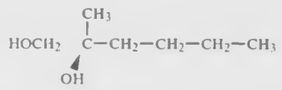


V

(d) reacting the compound having Formula V with a reducing agent selected from the group consisting of sodium borohydride and lithium borohydride in a suitable solvent at temperature of from about 0° C. to 30° C. to provide the desired compound having Formula I above; and

(e) isolating the desired product having Formula I above from the reaction mass.

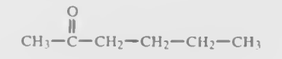
6. A process for preparing the optionally active compound having Formula VI:



VI

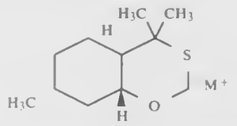
comprising the steps of:

(a) reacting the compound having Formula II:



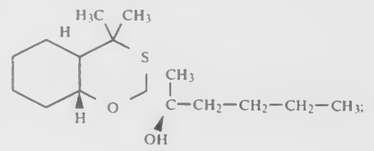
II

with a compound having Formula III:



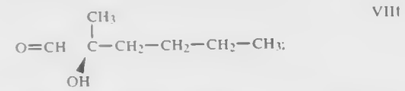
III

where M^+ is an alkali metal cation, in a suitable solvent at temperatures in the range of from about −80° C. to 25° C. and acidifying the solution to produce the compound having Formula VII:



VII

(b) separating Compound VII from the reaction mass;
(c) reacting the compound having Formula VII with an oxidizing agent selected from the group consisting of N-chlorosuccinimide and N-bromosuccinimide in the presence of an inorganic salt selected from the group consisting of silver nitrate, cadmium nitrate, cupric chloride, mercuric chloride and silver perchlorate in a suitable solvent at temperatures of from about −10° C. to 0° C. to provide the compound having Formula VIII:



VIII

(d) reacting the compound having Formula VIII with a reducing agent selected from the group consisting of sodium borohydride and lithium borohydride in a suitable solvent at temperatures of from about 0° C. to 30° C. to provide the desired compound having Formula VI above; and
(e) isolating the desired product having Formula VI above from the reaction mass.

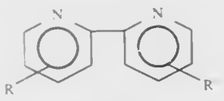
4,922,033

PREPARATION OF TERTIARY BUTYL ALCOHOL BY THE CATALYTIC DECOMPOSITION OF TERTIARY BUTYL HYDROPEROXIDE

John R. Sanderson, Leander; John F. Knifton, and Edward T. Marquis, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,171
Int. Cl.[5] C07C *31/12, 29/132, 29/88, 27/04*
U.S. Cl. 568—909.8 **7 Claims**

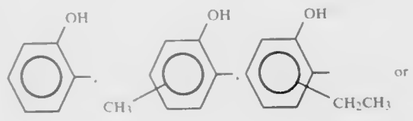
1. In a method wherein a t-butyl hydroperoxide charge stock is brought into contact with a catalytically effective amount of a hydroperoxide decomposition catalyst in a hydroperoxide decomposition reaction zone in liquid phase with agitation to convert said t-butyl hydroperoxide to decomposition products, principally t-butyl alcohol, the improvement which comprises:
(a) using, as said hydroperoxide decomposition catalyst, a soluble ruthenium catalyst compound promoted with a bidentate ligand,
(b) recovering said t-butyl alcohol from the products of said hydroperoxide decomposition reaction, and
(c) said bidentate ligand having the formula:



wherein R and R' may be the same or different and are selected from the group consisting of hydrogen, methyl, ethyl, propyl, phenyl and chlorophenyl or

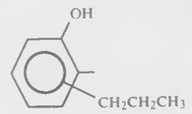


wherein R and R' may be the same or different and are selected from the group consisting of hydrogen, methyl, ethyl, propyl, phenyl, chlorophenyl,



or

-continued



4,922,034

CATALYZED CONVERSION OF TERTIARY BUTYL HYDROPEROXIDE TO TERTIARY BUTYL ALCOHOL

John R. Sanderson, Leander; Edward T. Marquis, and Mark A. Mueller, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,172
Int. Cl.[5] C07C *31/12, 29/132, 29/88, 27/04*
U.S. Cl. 568—909.8 **17 Claims**

1. In a method wherein a t-butyl hydroperoxide charge stock is brought into contact with a catalytically effective amount of a decomposition catalyst in a hydroperoxide decomposition zone under hydroperoxide decomposition conditions in liquid phase with agitation to convert said t-butyl hydroperoxide to decomposition products, principally t-butyl alcohol, the improvement which comprises:
(a) using a metal porphine compound as said decomposition catalyst, and optionally conducting the hydroperoxide decomposition in the additional presence of a C_1–C_{18} alkyl thiol or a heterocyclic amine selected from the group consisting of pyridine, quinoline, isoquinoline, imidazole, 1-alkyl imidazoles and 2-alkyl imidazoles, wherein the alkyl group contains 1 to 4 carbon atoms, or a mixture thereof and
(b) recovering said t-butyl alcohol from the products of said reaction,
(c) said metal of said metal porphine compound being selected from the group consisting of iron, manganese, nickel, palladium, ruthenium, vanadium and zinc.

4,922,035

CATALYTIC PREPARATION OF TERTIARY BUTYL ALCOHOL BY DECOMPOSITION OF TERTIARY BUTYL HYDROPEROXIDE

John R. Sanderson, Leander, and Edward T. Marquis, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,352
Int. Cl.[5] C07C *31/12, 29/132, 29/88, 27/04*
U.S. Cl. 568—909.8 **6 Claims**

1. In a method wherein t-butyl hydroperoxide charge stock is brought into contact with a catalytically effective amount of a hydroperoxide decomposition catalyst in a hydroperoxide decomposition reaction zone in liquid phase with agitation to convert said t-butyl hydroperoxide to decomposition products, principally t-butyl alcohol, the improvement which comprises:
(a) using, as said hydroperoxide decomposition catalyst, a metal phthalocyanine catalyst promoted with a phenol, an amine or a quinine free radical inhibitor and a C_1–C_{18} alkyl thiol,
(b) recovering said t-butyl alcohol from the products of said hydroperoxide decomposition reaction, and
(c) said metal being selected from Group IB, Group VIIB or Group VIIIB of the Periodic Table.

4,922,036

TERTIARY BUTYL HYDROPEROXIDE DECOMPOSITION

John R. Sanderson, Leander; Edward T. Marquis, and John F. Knifton, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,175
The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.
Int. Cl.[5] C07C *31/12, 29/132, 29/88, 27/04*
U.S. Cl. 568—909.8 **15 Claims**

1. In a method wherein a t-butyl hydroperoxide charge stock is brought into contact with a catalytically effective amount of a hydroperoxide decomposition catalyst in a hydroperoxide decomposition reaction zone in liquid phase with agitation to convert said t-butyl hydroperoxide to decomposition products, principally t-butyl alcohol, the improvement which comprises:
(a) using, as said hydroperoxide decomposition catalyst, a borate-promoted metal phthalocyanine catalyst,
(b) recovering said t-butyl alcohol from the products of said hydroperoxide decomposition reaction, and
(c) said metal of said metal phthalocyanine catalyst being a heavy metal selected from the group consisting of heavy metals of Groups IB, VIIB or VIIIB of the Periodic Table,
(d) said borate of said borate-promoted metal phthalocyanine catalyst being a borate selected from the group consisting of ammonium borate and metal borates of metals of Group IA alkali metal, Group IIA alkaline earth metal and Group IIB of the Periodic Table.

4,922,037

GAS-PHASE FLUORINATION PROCESS

Leo E. Manzer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 160,003, Feb. 24, 1988, abandoned.
This application May 19, 1989, Ser. No. 355,867
Int. Cl.[5] C07C *17/20, 19/02*
U.S. Cl. 570—168 **13 Claims**

1. A process for the preparation of 1,1,1,2-tetrafluoroethane by fluorination of 1,1,1-trifluorochloroethane, which process comprises
contacting in the gaseous phase at about 300° C. to about 500° C. said 1,1,1-trifluorochloroethane with HF and a catalyst comprising at least one metal,
said metal selected from a group consisting of a metal from Groups VIII, VIIB, IIIB, IB and/or a metal having an atomic number of 58 through 71,
said metal on aluminum fluoride or carbon,
said metal having an oxidation state greater than zero,
said HF and 1,1,1-trifluorochloroethane present in a mole ratio of about 3/1 to about 30/1,
said contacting producing a product stream containing 1,1,1,2-tetrafluoroethane and, thereafter,
separating the 1,1,1,2-tetrafluoroethane from the product stream.

4,922,038

PREPARATION OF 1,1,1,2-TETRAFLUORODICHLOROETHANE

Carl G. Krespan, and Bruce E. Smart, both of Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1989, Ser. No. 303,152
Int. Cl.[5] C07C *17/00, 17/04*
U.S. Cl. 570—175 **7 Claims**

1. A process for the preparation of 1,1,1,2-tetrafluorodichloroethane comprising reacting CF_2=$CFCl$ in a polar aprotic solvent with a source of fluoride ion selected from at least one alkali metal fluoride and/or at least one tetraalkylammonium fluoride and with a source of chlorine selected from at least one of CCl_4, CCl_3CCl_3, and $CCl_3CCl_2CCl_3$ at a temperature from about 25° C. to about 150° C., and recovering said 1,1,1,2-tetrafluorodichloroethane from the reaction mixture.

4,922,039

PROCESS FOR SEPARATING DICHLOROCUMENE ISOMER

Bunshi Yamada; Michio Kimura, and Yoshio Noguchi, all of Aichi, Japan, assignors to Toray Industries, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,023
Claims priority, application Japan, Dec. 28, 1987, 62-335015
Int. Cl.[5] C07C *17/38*
U.S. Cl. 570—211 **5 Claims**

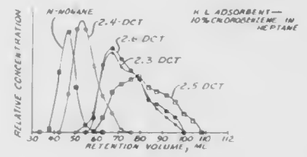
1. A process for separate 3,5-dichlorocumene isomer from a mixture consisting substantially of dichlorocumene isomers by absorptive separation, which comprises contacting the isomer mixture with a zeolite adsorbent having a silica/alumina molar ratio of at least 2 and a pore size of 0.6 to 1.0 nm, and eluting the adsorbed isomer by contacting the zeolite adsorbent with a desorbent selected from the group consisting of halogenated benzene and halogenated alkyl benzene.

4,922,040

PROCESS FOR EXTRACTING 2,5-DICHLOROTOLUENE FROM ISOMER MIXTURES WITH SODIUM-L ZEOLITE ADSORBENTS

Beth McCulloch, Barrington, and Anil R. Oroskar, Downers Grove, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Dec. 28, 1988, Ser. No. 291,012
Int. Cl.[5] C07C *17/38, 25/02*
U.S. Cl. 570—211 **16 Claims**



1. A process for separating 2,5 dichlorotoluene from feed mixtures of 2,5-dichlorotoluene and at least one other isomer of dichlorotoluene which process comprises contacting said feed mixture at adsorption conditions, with an adsorbent comprising an L-type zeolite at least partially exchanged with sodium or lithium ions at cation exchange sites, selectively adsorbing said 2,5-dichlorotoluene to the substantial exclusion of said other isomers, removing the relatively non-adsorbed portion of the feed mixture from contact with the adsorbent, and thereafter recovering the adsorbed isomer from the adsorbent by contacting said adsorbent, at desorption conditions, with a desorbent.

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4,922,041

METHOD FOR PRODUCING CF_3I

Dieter Naumann, Dortmund; Wieland Tyrra, Herne; Birgit Kock, Münster; Werner Rudolph, Hannover, and Bernd Wilkes, Laatzen, all of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hannover, Fed. Rep. of Germany

Filed May 19, 1988, Ser. No. 195,797

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717358

Int. Cl.[5] C07C *17/20, 17/22*

U.S. Cl. 570—141 17 Claims

1. A method of producing CF_3I, comprising the steps of:

(a) reacting in an unreactive solvent comprising at least one polar aprotic solvent selected from the group consisting of cyclic ethers, acyclic ethers, unsubstituted and substituted carboxylic acid amides, unsubstituted and substituted lactams, nitriles, sulfoxides, amines and pyridines, a compound corresponding to the formula CF_3X, wherein X represents Cl or Br, with a metal selected from the group consisting of magnesium, zinc, cadmium, bismuth and tin; and

(b) reacting the resulting organometallic reaction product with a compound corresponding to the formula I-Y, wherein Y represents iodine or a ligand which is more electronegative than iodine, to produce CF_3I.

4,922,042

PRODUCTION OF 1,2-DICHLOROETHANE

Keith M. Hoos, Cheshire, England, and Jack Wolstenholme, Ontario, Canada, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 565,993, Dec. 27, 1983, abandoned. This application Jan. 30, 1986, Ser. No. 824,307

Claims priority, application United Kingdom, Dec. 24, 1982, 8236851; Apr. 18, 1983, 8310408

Int. Cl.[5] C07C *17/02, 19/045*

U.S. Cl. 570—247 9 Claims

1 Process for the production of 1,2-dichloroethane by the reaction between ethylene and chlorine in the vapour phase in the presence of a catalyst consisting essentially of alumina or alumina impregnated with an alkaline earth metal halide, wherein the reaction is carried out using a fluidised bed consisting essentially of fluidisable, substantially spherical particles of said alumina or said alumina impregnated with alkaline earth metal halide, the surface area of said particles not exceeding 10 $m^2 \cdot g^{-1}$

4,922,043

MANUFACTURE OF METHYL CHLORIDE BY HYDROCHLORINATING METHANOL, USING A SPLIT METHANOL FEED

Jimmy T. Petrosky, Wiebita, Kans., assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Dec. 2, 1988, Ser. No. 279,093

Int. Cl.[5] C07C *17/16*

U.S. Cl. 570—258 5 Claims

1. In a process for making methyl chloride by reacting methanol and hydrogen chloride in aqueous liquid phase in the presence of a catalyst in a reaction system comprising at least two reaction stages in series, said methanol and hydrogen chloride being introduced into the process in total amounts corresponding to an overall ratio of between about 0.65 and 1.0 mol of methanol per mol of hydrogen chloride, the improvement which comprises

(a) introducing from about 5 to about 95 percent of the total amount of methanol and substantially all of the hydrogen chloride into a first reaction stage containing a metal chloride catalyst in a first aqueous liquid phase, and intimately contacting said introduced methanol and hydrogen chloride with said first liquid phase, thereby producing methyl chloride, dimethyl ether and water,

(b) withdrawing from said first reaction stage a first product vapor stream comprising unreacted hydrogen chloride and substantially all the water, dimethyl ether and methyl chloride produced in said first reaction stage and introducing said vapor stream into at least one successive reaction stage containing a metal chloride catalyst in a second aqueous liquid phase, also introducing the balance of the total amount of methanol into said at least one successive reaction stage, and intimately contacting said first product vapor stream and said additional methanol with said second liquid phase,

(c) withdrawing from the last of said series of successive reaction stages a second product vapor stream comprising methyl chloride admixed with hydrogen chloride, dimethyl ether and water vapor, and

(d) separating and recovering methyl chloride from said withdrawn product vapor stream.

4,922,044

PURIFICATION OF CHLOROFORM

Stephen F. Yates, Arlington Heights, and Hermann A. Zinnen, Evanston, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County

Filed Nov. 4, 1988, Ser. No. 267,058

Int. Cl.[5] C07L *17/38*

U.S. Cl. 570—263 9 Claims

1. A process for removing impurities from chloroform comprising up to about 1000 wt ppm each of cis-1,2-dichloroethylene, bromochloromethane, and amylenes comprising:

(a) contacting said chloroform with an 80 to 100 wt.% aqueous solution of sulfuric acid to remove substantially all of the amylenes therefrom and phase separating said chloroform; and,

(b) passing the chloroform after the separation of (a) over an effective amount of a zeolite having an average pore diameter between about 3 to 6 Angstroms and a Si/Al atomic ratio of about 1.6/1 to 3/1 to remove substantially all of said cis-1,2-dichloroethylene and bromochloromethane.

4,922,045

DIESEL LUBRICATING OIL CONSUMPTION CONTROL ADDITIVES

William R. White, Wappingers Falls; Mary A. Dahlstrom, Hopewell Junction, and Scott O. Lindholm, Newburgh, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 3, 1987, Ser. No. 81,268

Int. Cl.[5] C07C *7/20*

U.S. Cl. 585—10 6 Claims

1. A heavy duty diesel engine lubricating oil composition comprising:

(a) a major portion of a single-grade SAE30 oil or SAE50 oil, heavy duty diesel engine lubricating oil and

(b) a minor portion of, as an oil consumption controlling additive, a polymer dissolved in a diluent oil, said polymer being selected from the group consisting of polyethylene, polypropylene, polybutylene, polyisoprene, ethylene-propylene copolymer, polymethyacrylate, ethylene-butylene copolymer, styrene-isoprene copolymer, ethylene-propylene diene third monomer, ethylene-propylene terpolymer and styrene-butadiene copolymer, and wherein monomers are grafted onto said copolymers, said monomers being selected from the group consisting of N-vinylpyrrolidone, N-vinyl imidazole, an alkyl amine, an alkyl amide, an alkyl imide and N-vinyl pyridine.

4,922,046

LIQUID POLYMER COMPOSITION AND USE THEREOF

Tatsuo Kinoshita, Yamaguchi; Shuji Minami, Otake, and Ryousuke Kaneshige, Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00500, § 371 Date Mar. 10, 1988, § 102(e) Date Mar. 10, 1988, PCT Pub. No. WO88/00612, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 11, 1987, Ser. No. 178,055

Claims priority, application Japan, Jul. 11, 1986, 61-162013

Int. Cl.[5] C10M *1/16*

U.S. Cl. 585—11 12 Claims

1. A liquid polymer composition comprising:

(A) a liquid low molecular weight ethylene-α-olefin copolymer comprising 30 to 70 mol% of ethylene component units and 30 to 70 mol% of α-olefin component units, having a number average molecular weight ($\overline{Mn}$) in the range of 150 to 5,000, with a Q-value (i.e., weight average molecular weight/number average molecular weight) of 3 or less, and

(B) a high molecular weight polymer which is in an amount of 0.05 to 100 parts by weight based on 100 parts by weight of the liquid low molecular weight polymer (A), having a number average molecular weight ($\overline{Mn}$) of 20000 or higher, with a Q-value of 6 or less, and is soluble in the liquid low molecular weight polymer (A).

4,922,047

PROCESS FOR PRODUCTION OF TRACTION FLUIDS FROM BICYCLIC AND MONOCYCLIC TERPENES WITH ZEOLITE CATALYST

Catherine S. H. Chen, Berkeley Heights, N.J., and Thomas R. Forbus, Jr., Newtown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,191

Int. Cl.[5] C07C *13/00, 175/00;* C10M *165/00*

U.S. Cl. 585—12 20 Claims

1. A process for the production of a 600° F.+ lube oil traction fluid from bicyclic or monocyclic terpene which comprises reacting said bicyclic or monocyclic terpene over medium pore acid zeolite catalyst at elevated temperature and obtaining a high boiling liquid product comprising dimer or trimer, respectively, of said bicyclic or monocyclic terpene.

4,922,048

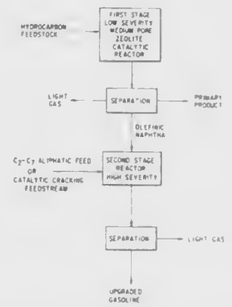
MEDIUM-PORE ZEOLITE OLEFINIC NAPHTHA BY-PRODUCT UPGRADING

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Filed Oct. 14, 1988, Ser. No. 257,894

Int. Cl.[5] C07C *2/12*

U.S. Cl. 585—310 34 Claims



1. An olefin interconversion process for upgrading a predominately C_5- aliphatic feedstream to a primary product stream containing tertiary C_4-C_5 olefins and for producing upgraded gasoline comprising the steps of:

(a) contacting said predominately C_5- aliphatic feedstream with a first zeolite catalyst having a Constraint Index of between about 1 and 12 under a first set of conversion conditions including pressure between about 240 and 2170 kPa, temperature between about 230° and 385° C. and weight hourly space velocity (WHSV) between about 0.1 and 250 hr^{-1} to form a primary product containing tertiary C_4-C_5 olefins and a secondary gasoline boiling range stream;

(b) separating said secondary gasoline boiling range stream from said primary product; and

(c) contacting said secondary gasoline boiling range stream with a second acidic catalyst in a fluid catalytic cracking process riser reactor under a second set of conversion conditions including a catalyst to feedstock weight ratio of about 0.5 to 20, a catalyst contact time of about 1 to 50 seconds and a reaction temperature of about 420° to 600° C., to produce a gasoline product suitable for use a motor fuel blending stock.

4,922,049

SYNTHESIS OF CIS-OLEFINS

Jim D. Byers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 13, 1989, Ser. No. 297,640

Int. Cl.[5] C07C *1/20, 1/253*

U.S. Cl. 585—327 21 Claims

12. A process for the synthesis of a cis-olefin from a cis-olefinic alcohol consisting essentially of the following steps:

(a) reacting a cis-olefinic alcohol with an alkyllithium wherein the temperature ranges are from about −70° C. to about 50° C. to form a first reaction product

(b) then contacting said thus formed first reaction product with a sulfonyl halide compound wherein the sulfonyl halide compound is selected from the group consisting of an alkyl sulfonyl halide and an aryl sulfonyl halide wherein the halide of said sulfonyl halide compound is selected from the group consisting of chloride and bromide wherein the temperature ranges are from about 0° C. to about 70° C. to form a second reaction product,

(c) then contacting said thus formed second reaction product with a cuprous salt and an alkylmagnesium compound selected from the group consisting of dialkylmagnesium and alkylmagnesium halide wherein the halide of said alkylmagnesium halide is selected from the group consisting of iodide, bromide, and chloride wherein the temperature ranges are from about −70° C. to about 10° C. to form a third reaction product comprising a cis-olefin wherein the steps are carried out in a suitable organic solvent selected from the group consisting of diethylether, methylpropyl ether, ethylpropyl ether, 2-methoxyethyl ether, and tetrahydrofuran.

19. A process according to claim 12 wherein the third reaction product is cis-9-tricosene.

4,922,050

CATALYTIC DEHYDROGENATION OF HYDROCARBONS OVER INDIUM-CONTAINING CRYSTALLINE MICROPOROUS MATERIALS

Ralph M. Dessau, Edison; Randall D. Partridge, Trenton, both of N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 138,430, Dec. 28, 1987, Pat. No. 4,849,567. This application May 18, 1989, Ser. No. 353,584

Int. Cl.[5] C07C *5/333*

U.S. Cl. 585—379 5 Claims

1. A process for producing an unsaturated analog from a hydrocarbon containing an aliphatic moiety of 2 to 5 carbon atoms, comprising contacting said compound with a catalyst,

VOL 114 ISS 1 MY 1 1990 UMI

under dehydrogenation conditions, wherein said catalyst consists of 0.01 to 30 weight percent platinum and a non-acidic crystalline microporous material, said material exhibiting the X-ray diffraction pattern of a zeolite selected from the group consisting of ZSM-11, ZSM-12, ZSM-23, ZSM-48 and ZSM-50, and containing indium, the indium content of said material ranging from 0.01 to 20 weight percent; and thereby producing as a product said analog,

wherein said dehydrogenation conditions include elevated temperatures ranging from 400° C. to 700° C. and a pressure of 0.1 atmosphere to 500 psig.

4,922,051

PROCESS FOR THE CONVERSION OF C_2–C_{12} PARAFFINIC HYDROCARBONS TO PETROCHEMICAL FEEDSTOCKS

Margaret Nemet-Mavrodin, Cherry Hill, and Jorge L. Soto, Sewell, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Mar. 20, 1989, Ser. No. 325,735
Int. Cl.[5] C07C *5/393, 5/32*
U.S. Cl. 585—418 19 Claims

1. A process for converting a hydrocarbon feedstock comprising at least 75 percent by weight of a mixture of at least two different paraffins having from 2 to 12 carbon atoms comprising the steps of contacting said hydrocarbon feedstock under conversion conditions with a composite catalyst comprising (1) a binder and (2) a zeolite having a Constraint Index of between about 1 and about 12, said zeolite being an aluminosilicate, said composite catalyst having an alpha value of greater than 5 and less than 33, whereby at least 90 percent by weight of said paraffins are converted to a hydrocarbon product mixture.

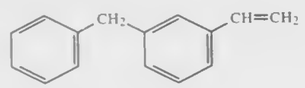
4,922,052

(VINYLPHENYL)PHENYLMETHANE AND METHOD FOR PRODUCING (BENZOYLPHENYL) PROPIONIC ACID

Isoo Shimizu; Yasuo Matsumura, both of Yokohama, and Yutaka Arai, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 169,853
Claims priority, application Japan, Mar. 20, 1987, 62-66463
Int. Cl.[5] C07C *15/12*
U.S. Cl. 585—25 1 Claim

1. (3-Vinylphenyl)phenylmethane which is represented by the following formula (I):



(I)

4,922,053

PROCESS FOR ETHYLBENZENE PRODUCTION

James N. Waguespack, and James R. Butler, both of Houston, Tex., assignors to Fina Technology, Inc., Dallas, Tex.

Filed May 24, 1989, Ser. No. 357,381
Int. Cl.[5] C07C *2/64, 2/68*
U.S. Cl. 585—449 11 Claims

1. A process for producing ethylbenzene comprising contacting benzene and ethylene under alkylation reaction conditions over a catalyst in a multibed reactor to form reaction products which include polyethylbenzenes and ethylbenzene, distilling the polyethylbenzenes from said reaction products, and recycling said polyethylbenzenes back to said reactor; wherein a first portion of said recycled polyethylbenzene is recycled to the top of said reactor and a second portion is recycled into a different section of said reactor.

4,922,054

COUPLING PROCESS

R. Scott Smith, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 135,318, Dec. 21, 1987, abandoned, and a continuation-in-part of Ser. No. 276,533, Nov. 28, 1988, abandoned. This application May 24, 1989, Ser. No. 356,186
Int. Cl.[5] C07C *2/64, 15/067*
U.S. Cl. 585—452 15 Claims

1 In a process for coupling an alkene selected from ethene, propene, and mixtures thereof with an aromatic hydrocarbon having an active hydrogen on a saturated α-carbon in the presence of a supported potassium or potassium alloy as a catalyst, the improvement which comprises conducting the reaction in the presence of sodium oxide, potassium oxide, rubidium oxide, or a mixture of any two or all three thereof as a co-catalyst, the catalyst composition containing about 200–1500 weight % of support and about 4–40 mol % of co-catalyst, based on the amount of potassium or potassium alloy catalyst; the support being a material which is chemically different from the co-catalyst.

4,922,055

TOLUENE DISPROPORTIONATION CATALYZED BY A ZEOLITE CONTAINING FRAMEWORK GALLIUM

Cynthia T-W. Chu, Princeton Junction, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,614
Int. Cl.[5] C07C *6/12*
U.S. Cl. 585—470 5 Claims

1. A catalytic process for toluene disproportionation comprising

contacting a toluene containing feedstock with a catalyst comprising a crystalline silicate exhibiting the X-ray diffraction pattern of ZSM-5 wherein said crystalline silicate comprises 0.1 to 5 weight percent gallium, wherein said gallium is a framework element in said crystalline silicate, said contacting being undertaken under conditions effective to convert toluene to toluene disproportionation products; and

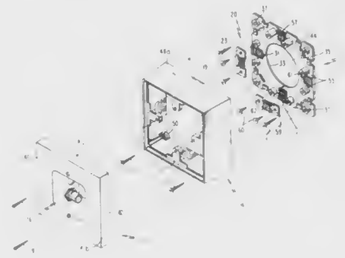
converting said toluene to said products in a conversion which exceeds that effected by ZSM-5 containing non-framework gallium under identical conditions.

4,922,056

SURFACE MOUNTED BOX

Arne Larsson, Orebro, Sweden, assignor to Network Communications, Inc., Orange, Va.

Filed Feb. 10, 1988, Ser. No. 154,574
Int. Cl.[5] H05K *5/00*
U.S. Cl. 174—65 R 35 Claims



1. A connection box for securing a sheathed cable extending along a support structure to a connector to be mounted to the connection box, comprising:

(a) a mounting base;

(b) a cover plate having means for supporting the connector;

(c) connection box means, separate from both the mounting base and cover plate, for mounting the cover plate to the base in assembled relationship to the support structure to form the connection box with the cable extending through an opening formed between the mounting base and cover plate to terminate in connection with said connector; and

(d) means for clamping the cable to the mounting base to prevent movement of the cable within the box relative to said opening.

4,922,057

ELECTRICAL BOX FOR WIRING DEVICES

Dan E. Ross, 308 Almaville Rd., Smyrna, Tenn. 37167

Filed Dec. 8, 1988, Ser. No. 281,442
Int. Cl.[5] H02G *3/08*
U.S. Cl. 174—65 R 3 Claims



1. An electrical box for receiving a wiring device and having means for the reception of a conductor for connection to the wiring device,

a generally planar conductor retaining member,

opposed tracks provided in the box for slidably containing the edges of said planar member,

said member being adapted to secure the conductor in the box when slidably moved to engage the conductor, and for releasing the conductor by simple sliding movement from the conductor,

said member being held against said conductor by a wiring device secured in the electrical box.

4,922,058

CONNECTOR FOR ELECTRICAL CONDUCTORS HAVING SIMILAR OR DIFFERENT CROSS-SECTIONAL SHAPES

Julio Rodrigues, Somerville, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Apr. 20, 1989, Ser. No. 340,740
Int. Cl.[5] H01R *4/18*
U.S. Cl. 174—94 R 10 Claims



8. An electrical connector for connecting a first conductor to a second conductor comprising:

an elongate conductive body having a connection nest for accommodating said first and second conductors therein;

a bottom wall of said nest configured to support said first and second conductors;

said bottom wall including a channel therein; and

a channel plug removably insertable into said channel;

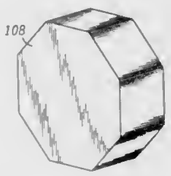
said nest capable of supporting said first and second conductors along said bottom wall with said channel plug inserted into said channel or alternately supporting said first conductor in said channel with said channel plug removed.

4,922,059

ORIGAMI COMPOSITE EMI/TEMPEST PROOF ELECTRONICS MODULE

John S. Walker, Scottsdale, and Scott E. Jenkins, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1988, Ser. No. 290,480
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—254 20 Claims



1. An electronics module comprising:

circuit board means:

at least one dielectric layer means for supplying flexible support to said circuit board means;

at least one conducting layer means for supplying a signal connection for said circuit board means;

said at least one dielectric layer means and said at least one conducting layer means bonded in an alternating layered fashion:

said bonded at least one dielectric layer means and said at least one conducting layer means (bonded DLM/CLM) coupled to a bottom portion of said circuit board means;

groove means for supplying a plurality of folds within said circuit board means:

said groove means secured in a predetermined pattern on and upper portion of said circuit board means: and

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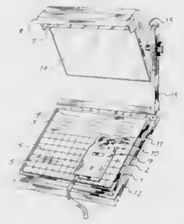
said circuit board means and said bonded DLM/CLM folded along said groove means to form an enclosure.

4,922,060

ENHANCED INFORMATION OVERLAY FOR USE WITH A DIGITIZING PAD AND COMPUTER

James McJunkin, 9252 Chesapeake Dr., San Diego, Calif. 92123

Filed Jul. 20, 1989, Ser. No. 382,416
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 12 Claims



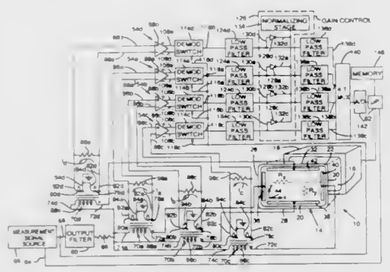
1. In combination with a computer input device of the type using a digitizing pad, information overlay, and an input selector with which the operator enters information into the computer the improvement comprises:
characters and symbols applied to the information overlay in a luminescent medium; and
a means for illuminating said luminescent medium with the corresponding preferred adsorption wavelength.

4,922,061

CAPACITIVE TOUCH PANEL SYSTEM WITH RANDOMLY MODULATED POSITION MEASUREMENT SIGNAL

R. David Meadows, Beaverton, and Roger J. McCoy, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 205,896, Jun. 13, 1988, Pat. No. 4,853,498. This application Jul. 20, 1989, Ser. No. 383,113
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—19 22 Claims



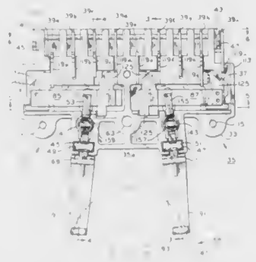
1. In a display system including a display surface positioned adjacent an optically transparent, electrically conductive layer having a first resistivity and first and second opposed side margins of preselected lengths, a position address encoder for generating an address signal indicative of a location on the conductive layer in contact with a stylus that is electrically connected to a reference potential, comprising:
signal generating means for generating a time-varying position measurement signal of a preselected magnitude and a frequency that varies in a substantially random manner;
first and second electrodes positioned along the lengths of the respective first and second opposed side margins and receiving the position measurement signal generated by the signal generating means, the resistivity of the conductive layer establishing an effective total resistance between the first and second electrodes; and
current measuring means for measuring currents corresponding to the position measurement signal and drawn through the first and second electrodes whenever a stylus contacts the conductive layer, whereby the stylus contacting the conductive layer divides the total resistance into first and second resistances that cause currents to be drawn through the respective first and second electrodes in proportion to the separation between the electrodes and the location.

4,922,062

SWITCH AND TERMINAL ASSEMBLY

James P. Frank, Rock Falls, Ill., and James L. King, Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 156,581, Feb. 16, 1988, Pat. No. 4,834,679, which is a division of Ser. No. 849,915, Apr. 9, 1986, Pat. No. 4,757,604, which is a division of Ser. No. 496,524, May 20, 1983, Pat. No. 4,594,773. This application Dec. 12, 1988, Ser. No. 283,539
Int. Cl.[5] H01H *35/10*
U.S. Cl. 200—80 R 18 Claims



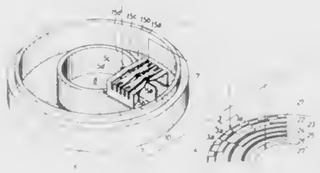
1. A switch and terminal assembly comprising:
a casing having a plurality of wall means for defining chamber means within said casing;
a plurality of sets of terminals disposed in said casing along only one of said wall means thereof, said terminals in one of said terminal sets including a pair of electrical connector sections arranged generally in planar and angular relation with dissimilar configurations and extending generally in row formation with each other exteriorly of said casing, one of said electrical connector sections of said terminals in said one terminal set extending the row formation thereof only beyond said one wall means of said casing and the other of said electrical connector sections of said terminals in said one terminal set extending in the row formation thereof beyond both said one wall means and another of said wall means of said casing generally adjacent said one wall means, respectively, said terminals in another of said terminal sets including only another one electrical connector section having a configuration similar to that of said one electrical connector section of said terminals in said one terminal set and arranged so as to extend in the row formation therewith only beyond said one wall means of said casing, respectively, at least one terminal in a third one of said terminal sets including only a third one electrical connector section having a configuration similar to that of said other electrical connector sections of said terminals in said one terminal set and arranged so as to extend in the row formation therewith beyond both said one wall means and said another wall means of said casing, respectively;
a plurality of switch means supporting sections on preselected ones of said terminals in said one terminal set, said another terminal set and said third one terminal set and extending from said one wall means interiorly of said casing into said chamber means thereof, respectively;
a pair of switch means associated with at least a pair of said switch means supporting sections and operable generally for movement between switching modes with respect thereto, respectively; and
a pair of means pivotally arranged with said casing for controlling said switch means, respectively, said controlling means including a pair of actuating arms pivotally movable within said casing and extending into said chamber means, a pair of means on said actuating arms for engagement with said switch means to effect the operation of said switch means from one of the switching modes to another of the switching modes thereof in response to the pivotal movement of said actuating arms, a pair of driving arms associated with said actuating arms so as to be generally conjointly pivotally movable therewith and extending exteriorly of said casing through a third one of said wall means thereof generally opposite said one wall means and generally adjacent said another wall means of said casing, and a pair of means on said driving arms for receiving an applied force to effect the generally conjoint pivotal movement of said actuating arms and said driving arms and the operation of said switch means by said engagement means on said actuating arms, respectively.

4,922,063

ELECTRIC DATA SWITCH THAT SELECTS DATA BY MOVING ALONG TRACKS OF ELECTRODES

Seiji Shimizu, and Tuyoshi Nagae, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 9, 1989, Ser. No. 321,286
Claims priority, application Japan, Mar. 15, 1988, 63-34270[U]
Int. Cl.[5] H01H *19/58, 9/00*
U.S. Cl. 200—11 R 8 Claims



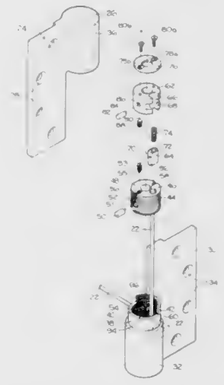
1. An electric switch for selecting data, comprising:
a contact base having at least one contact portion, said contact base being mounted to a member, said contact base being located adjacent at least one printed circuit board for movement relative thereto; and
electrodes printed on said at least one printed circuit board, said at least one contact portion being movable along said electrodes upon relative movement between said circuit board and contact base, each electrode having a plurality of terminals connected by leads that are arranged to avoid touching any said contact portion upon movement of said at least one contact portion along said electrodes;
said at least one contact portion being arranged to conduct current to at least two of said plurality of terminals of said electrodes by touching said at least two terminals simultaneously.

4,922,064

DOOR POSITION INDICATOR

Dean C. Price, Kerrville, and Quentin H. Young, San Antonio, both of Tex., assignors to Adtec Incorporated, San Antonio, Tex.

Filed Mar. 8, 1989, Ser. No. 320,702
Int. Cl.[5] H01H *3/16;* G08B *13/08*
U.S. Cl. 200—61.7 14 Claims



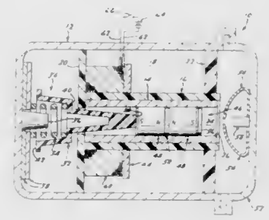
1. A device for indicating the opened and closed position of a door relative to its associated jamb which comprises:
a frame leaf formed with an extention, said frame leaf being fixedly mounted on said jamb;
a proximity switch changeable between an ON and an OFF condition and fixedly positioned on said frame leaf;
a door leaf fixedly mounted on said door; and
an actuator adjustably mounted on said door leaf for movement therewith into proximity with said switch to activate said switch into an ON condition when said actuator is in proximity with said switch and for adjustable movement on said door leaf into alignment with said switch upon contact of said actuator with said extension.

4,922,065

TEMPERATURE-COMPENSATING ACCELEROMETER

Leonard W. Behr, Pontiac; Robert B. Colten, Bloomfield Hills, and Donald A. Duda, Novi, all of Mich., assignors to Automotive System Laboratory, Inc., Farmington Hills, Mich.

Filed Mar. 9, 1989, Ser. No. 320,974
Int. Cl.[5] H01H *35/14;* H01F *3/00*
U.S. Cl. 200—61.45 M 16 Claims



1. An accelerometer comprising
a housing having a passage extending therein:
stop means defining a first end of the passage, said stop means moving longitudinally of the passage in response to temperature;

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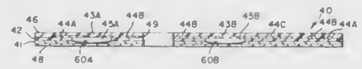
a magnetically-permeable element secured to said housing proximate with the passage;
a magnetic sensing mass in the passage, said sensing mass being magnetically biased towards said magnetically-permeable element so as to remain in a first position against the stop means until said magnetic bias is overcome by acceleration of said housing, whereupon said sensing mass is displaced in response to such acceleration from said first position towards a second position in the passage, said magnetic bias being sufficient to return said sensing mass to said first position from any other position in the passage short of said second position; and
switch means operable by said sensing mass when said sensing mass is displaced to said second position.

4,922,066
ENVIRONMENTALLY PROTECTED SWITCH FOR DYNAMOELECTRIC MACHINES
William D. Crow, St. Louis County, and Ronald D. Williams, St. Charles County, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Mar. 13, 1989, Ser. No. 322,524
Int. Cl.[5] H01H *35/10*
U.S. Cl. 200—80 R **20 Claims**



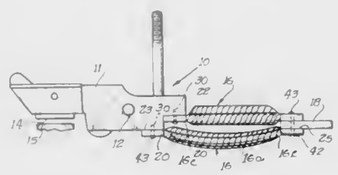
19. A switch assembly for a dynamoelectric machine, comprising.
a terminal board having a first side, a second side and a material thickness in between;
at least one conductive post having its bottom affixed to the first side of said terminal board and its top accessible above said first side, said post constituting one side of said switch assembly for connection to one of two open connections in an electrical circuit required to be linked;
an electrically conductive, flexible switch arm having a fixed end attached to the first side of said terminal board and a free end cantilevered at an angle above horizontal and the first side of said terminal board, directly above the top of said post, said switch arm constituting the second side of said switch assembly for connection to the other of two open connections in an electrical circuit required to be linked;
an electrical contact affixed to said switch arm between said free and fixed ends directly above and facing the top of said post;
a conductive, protective cap having an open top and a closed bottom, and having a portion of said contact affixed to said arm extending through a central point in said closed bottom to affix said cap to said arm;
a stop having a first end rigidly attached to the first side of said terminal board and a second end which rises up and over said arm above said cap to adjustably limit the travel of said arm away from the first side of said terminal board when no external force is applied to the free end of said arm to cause its movement away from said stop towards said terminal board, said second end causing the contact attached to said arm to move closer to the top of said post when said second stop end is rotatably moved towards the fixed end of said arm, and causing said contacts to move apart when said second stop end is rotatably moved towards the free end of said arm; and
a flexible, bellows-like boot having one end sized for and mounted snugly about and enclosing said post; and
an opposite end sized for and mounted snugly about said cap to enclose the open end of said cap.

4,922,067
FLUID PRESSURE SWITCH HAVING VENTING MEANS FOR DISPERSING BACK PRESSURE
Henry L. West, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 1, 1988, Ser. No. 176,538
Int. Cl.[5] H01H *35/34*
U.S. Cl. 200—83 P **7 Claims**



1. A fluid pressure switch comprising:
a first electrically insulating layer having at least one vent hole therethrough;
at least one set of electrical switch conductors affixed to said electrically insulating layer proximate said vent hole;
a second electrically insulating layer sandwiching said electrical switch contacts to said first electrically insulating layer and having at least one opening therethrough in an area where electrical contact with switch conductors is to take place;
a spring-like conductive material positioned over said at least one opening; and
a flexible layer of electrically insulating material sandwiching said spring-like conductive material to said second electrically insulating layer and forming a fluid proof seal for said conductive material and said electrical switch conductors, fluid pressure flexing the flexible layer against the spring-like conductive material to cause said conductive material to project into the at least one opening in said second electrically insulating layer to electrically connect said switch conductors, said movement venting air through said at least one vent hole; and
a semi-rigid backing plate having at least one air chamber, said backing plate affixed to said first electrically insulating layer with said at least one vent hole aligned with said at least one air chamber to provide a reservoir for displaced air so as to minimize the pressure rise in said air chamber when said spring-like conductive material moves into said at least one opening.

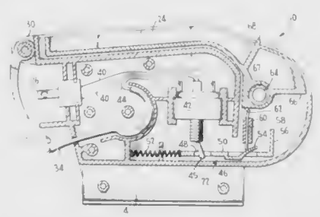
4,922,068
DENSIFIED BRAIDED SWITCH CONTACT
Edmund R. Bangs, 6438 Pontiac Dr., Indian Head Park, Ill. 60525
Filed May 26, 1988, Ser. No. 199,120
Int. Cl.[5] H01H *1/20*
U.S. Cl. 200—271 **7 Claims**



1. In a switch assembly, the combination comprising:

a braided, electrical conductor formed of strands of copper wire to provide a flexible electrical conductor,
a switch element for connection to the flexible, electrical conductor,
a densified end on the braided conductor for connection to the switch element, said densified end having a solder material therein to provide a reduced porosity from the braided conductor, and
a solder layer formed between the densified end and the switch element.

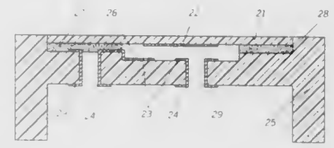
4,922,069
ELECTRICAL CONTROL SWITCH MECHANISM
Michael K. Huizenga, Manning, S.C., assignor to Aircap Industries Corporation, Manning, S.C.
Filed Sep. 7, 1988, Ser. No. 241,371
Int. Cl.[5] H01H *9/20*
U.S. Cl. 200—334 **18 Claims**



1. A switch mechanism adapted for use in controlling the operation of an electrically powered tool, the mechanism comprising a housing containing a toggle-type electrical switch having an outwardly-extending actuating arm, means for introducing an electrical current to said switch, electrical output means from said switch to the tool adapted to be controlled by said mechanism, and switch actuating means within the housing for moving the actuating arm of said electrical switch between open and closed positions, said switch actuating means comprising an elongated biased handle pivotably mounted within said housing, said handle having an engaging surface and a boss, a slider mounted within the housing adapted for sliding movement and having an aperture receiving the actuating arm of the switch and having a ramp, sliding movement of said slider causing said switch to change between the open and closed positions, said slider being biased in one direction of said sliding movement by biasing means; said handle being positioned within said housing such that the engaging surface of said handle, upon rotation of the handle against its bias, causes sliding movement in a direction opposite provided by the slider biasing means so as to change the position of said switch, said actuating means further including an elongated member within guide means having one end against the ramp on said slider, the member being mounted within said housing such that upon return of said handle to a biased position of the handle, the boss carried by the handle contacts the other end of said member and forces the member against the ramp of the slider to assist in movement of the slider caused by the biasing means.

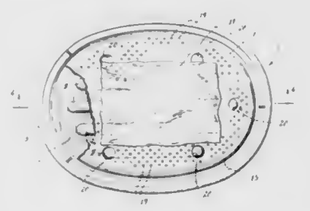
4,922,070
SWITCH ASSEMBLY
Dale W. Dorinski, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 16, 1988, Ser. No. 285,568
Int. Cl.[5] H01H *1/10*
U.S. Cl. 200—512 **5 Claims**

1. A switch assembly comprising:
a housing member having first and second recessed areas, the first recessed area being located within the second recessed area;
conductive traces providing contacts on the housing member within the first recessed area;
the housing member including plated through holes connected to said contacts; and



a flexible sheet affixed to the housing member, within the second recessed area and over the first recessed area, the sheet including a conductive area located over said contacts and engageable with the contacts when the flexible sheet is depressed.

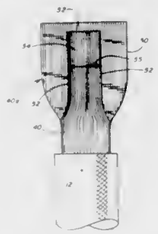
4,922,071
COOKING UTENSIL USEFUL FOR ASSURING DESTRUCTION OF HARMFUL BACTERIA DURING MICROWAVE COOKING OF POULTRY AND OTHER FOODS
Dean A. Samford, Chrisman, Ill., assignor to General Housewares Corporation, Stamford, Conn.
Continuation of Ser. No. 288,465, Dec. 22, 1988, Pat. No. 4,871,892. This application Jul. 27, 1989, Ser. No. 385,394
The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E **2 Claims**



1. A rack structure for supporting poultry in a microwave reflective container having sides and a bottom, said rack structure being adapted to kill Salmonella organisms, said rack structure including
a surface for holding said poultry in said vessel, means to support said surface on said bottom and to thereby form a closed chamber beneath said surface to receive cooking liquids and steam from poultry being cooked,
a set of apertures in said surface, said set of apertures being large enough to permit the passage therethrough and into said chamber of microwave energy coming from above said surface, said set of apertures having a total area large enough to permit passage of sufficient microwave energy, during a normal cooking cycle, to pasteurize Salmonella bacteria present in said cooking liquids, and said set of apertures having a total area small enough so that the microwave energy passing therethrough is not great enough to prevent condensation of said steam within said chamber.

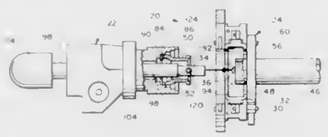
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4,922,072
WIRE CONNECTING METHOD
Edward C. Topel, Worth, and Mario Garritano, Oak Lawn, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.
Filed Jun. 22, 1988, Ser. No. 210,000
Int. Cl.[5] B23K *11/16, 11/00*
U.S. Cl. 219—56.1 **16 Claims**



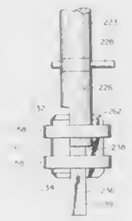
1. The method of connecting a relatively large diameter, multistrand wire with a relatively small diameter wire, which comprises:
flattening a portion of said large diameter, multistrand wire into a body of reduced first transverse dimension and an increased second transverse dimension, and heat welding the strands of said body into a unitary, coherent mass;
cutting away outer portions of said unitary, coherent mass to reduce the increased second transverse dimension of said mass produced by said flattening step; and
heat welding said unitary, coherent mass to said relatively small diameter wire.

4,922,073
THICK TUBE WELDER
David J. Weir, Burbank, Calif., assignor to Astro ARC Company, Sun Valley, Calif.
Filed Aug. 15, 1989, Ser. No. 393,940
Int. Cl.[5] B23K *9/225*
U.S. Cl. 219—60 A **4 Claims**



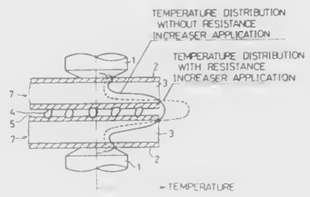
1. A thick tube welder for welding a tubular end fitting onto a tube, said welder comprising:
an end fitting mounting housing having a receiving chamber, said receiving chamber having a seat, said seat for locating the end fitting in a fixed position;
an inner welding electrode assembly mounted on said end fitting mounting housing, said inner welding electrode assembly having an inner welding electrode, said inner welding electrode to be located within the end fitting in a spaced relationship from the interior wall of the end fitting;
a welding head housing having an interior welding chamber, housing clamping means mounted on said welding head housing, said end fitting mounting housing to connect with said welding head housing with said housing clamping means fixing said end fitting mounting housing to said welding head housing;
tube clamping means mounted on said welding head housing, said tube clamping means for fixing in position the tube to be welded in axial abutting alignment with the end fitting, the abutting of the tube and the end fitting forming a welding joint; and
an outer welding electrode assembly mounted on said welding head housing, said outer welding electrode assembly having an outer welding electrode, said outer welding electrode to be located exteriorly of said welding joint.

4,922,074
V-BLOCK HOLDER FOR EDM ELECTRODE
Jack Sebzda, Sr., 7 Schuyler Ave., Pequannock, N.J. 07440
Filed May 3, 1988, Ser. No. 189,844
Int. Cl.[5] B23P *1/08*
U.S. Cl. 219—69.15 **20 Claims**



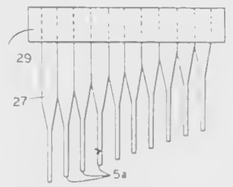
1. A clamp assembly for an EDM electrode, said clamp assembly comprising:
an elongated electrode holder having an end face and two flat surfaces extending from said end face perpendicular to each other and perpendicular to said end face,
a block having two flat faces extending perpendicular to each other to form a V notch,
first securing means for securing said flat faces of said block against said two flat surfaces of said electrode holder, and
second securing means for securing an electrode against said two flat faces of said block and against said end face of said electrode holder,
whereby precise positioning of the electrode is maintained relative to said electrode holder when replacing the electrode.

4,922,075
ELECTRIC RESISTANCE WELDING FOR ZINC PLATED STEEL PLATE
Tadashi Sofue, Obu, and Toichi Watanabe, Kagamihara, both of Japan, assignors to Kabushi Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan
Filed Nov. 3, 1987, Ser. No. 117,913
Claims priority, application Japan, Jul. 11, 1986, 61-265810
Int. Cl.[5] B23K *9/28*
U.S. Cl. 219—92 **3 Claims**



1. A spot welding method for welding steel plates having at least one surface covered with a plated layer composed mainly of zinc, comprising the steps of:
interposing a spacer sheet made of non-electric conductive material and having a hole therethrough for forming a space between mating surfaces of said steel plates wherein at least one of the mating surfaces is a surface covered with said plating layer;
pressing together said steel plates and said spacer sheet having said hole therethrough by means of a pair of opposing electrodes contacting outer surfaces of said steel plates aligned with said hole in said spacer sheet; and
applying a voltage between said pair of electrodes, whereby said steel plates are welded together.

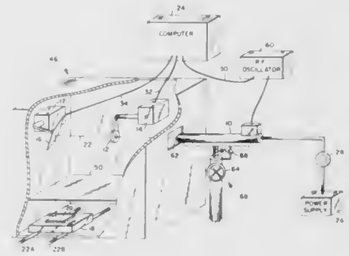
4,922,076
ELECTRO-DISCHARGE MACHINING ELECTRODE
Jack A. Cross, Cincinnati, and Cletis M. Jackson, West Chester, both of Ohio, assignors to Technical Manufacturing Systems, Inc., Mason, Ohio
Division of Ser. No. 57,120, Jun. 1, 1987, Pat. No.
Int. Cl.[5] B23P *1/08*
U.S. Cl. 219—69.15 **10 Claims**



1. An electrode suitable for use in electro-discharge machining, said electrode having at least one tooth, each said tooth having a straight forward section, the cross-section of said forward section being substantially circular, and a cone-like head-section diverging from said forward-section and being connected to a body section, said electrode being formed from a thin ribbon of malleable electro-conductive material by the steps which comprise;
removing elongated sections of said material from said ribbon transverse to the length of said ribbon to leave a series of spaced teeth extending between a body strip and a base strip,
said teeth being narrow for a length at the forward section which connects with said base strip, and being triangular-shape at the head section which connects with the said body strip,
compressing said teeth to reduce the thickness of said forward section to a desired thickness and to taper the thickness of said triangular-shape head section from the full thickness where it connects with said body strip to the compressed thickness of said forward section,
trimming said teeth to a desired width along said forward section,
coining said forward section of said teeth to a substantially circular cross-section shape,
coining said head section of said teeth to a cone-like shape, and
cutting electrodes from said ribbon.

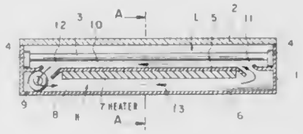
4,922,077
METHOD OF LASER MARKING METAL PACKAGES
Larry E. Gordon, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Jan. 31, 1989, Ser. No. 304,976
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.68 **11 Claims**

1. An improved process for marking metal packages using a laser marking apparatus of the type having:
(i) a laser with an adjustable current input and a Q-switching frequency which can be controlled;
(ii) means for directing a beam from the laser at portions of the metal package, said directing means being controllable to direct the laser beam to trace out a line on the package at a controllable speed, said directing means also being controllable to oscillate the beam perpendicular to the line with a controllable amplitude, the process comprising the steps of:
(a) measuring the power in the laser beam and adjusting the current input of the laser until the beam has a predetermined power;



(b) making a first pass with the laser beam across the regions of the package where markings are desired;
(c) making a second pass with the laser beam across the regions of the package where markings are desired, said second pass comprising the step of oscillating the beam perpendicular to the direction of travel; and
(d) making a third pass with the laser beam across the regions of the package where markings are desired.

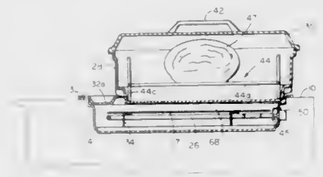
4,922,078
PROCESS FOR OPERATING AN EXPOSURE APPARATUS AND EXPOSURE APPARATUS FOR CONDUCTING THIS PROCESS
Peter Ulrich, Rodgau, and Hans P. Weihe, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Aug. 24, 1988, Ser. No. 235,400
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734767
Int. Cl.[5] F27D *7/04;* **H05B** *3/20*
U.S. Cl. 219—216 **12 Claims**



1. An apparatus for exposing a photopolymerizable material comprising:
(a) a housing, said housing including a base, upright members, and a support member and for said photopolymerizable material, said support member capable of transmitting light without undue attenuation;
(b) a plurality of fluorescent light tubes arranged in a parallel fashion within said housing and positioned adjacent said support member;
(c) a means for producing heat located within said housing, said means for for producing heat comprising a heat transmitting partition connected to the upright members and a heating member positioned adjacent and underneath said partition; and
(d) means, located within the housing, for circulating the heat produced by said heating means, said means for circulating comprising a blower positioned beneath said

partition, said blower circulating heat produced by said heating member through openings in said partition and about said fluorescent light tubes to heat said tubes to a temperature above ambient temperature.

4,922,079
COMBINATION COOKING CARTRIDGE
Robert F. Bowen, Burlington, and Joseph C. Maiellano, Jr., Chelmsford, both of Mass., assignors to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 170,195, Mar. 18, 1988, abandoned.
This application Sep. 13, 1989, Ser. No. 407,673
Int. Cl.[5] F24C *15/18*
U.S. Cl. 219—415 19 Claims



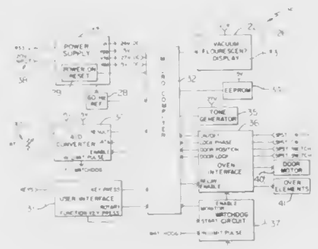
1 An apparatus comprising:
a counter cooktop frame having a top surface with an aperture formed therein;
a second pan having a floor, said second pan being supported by said counter cooktop frame and extending downwardly therefrom wherein said floor of said second pan is located below said top surface;
a heat source supported by said second pan;
a first pan having a floor and a plurality of walls forming a cavity therein, said first pan being supported by said second pan wherein said cavity of said first pan is heated by said heat source, said first pan having an indentation on its perimeter
covering means for covering said first pan to contain heat generated by said heat source; and
cooling means for venting air between said first pan and said second pan wherein said cooling means comprises groove means formed between said second pan and said first pan for enabling hot air to circulate through said indentation on the perimeter of said first pan to prevent heat from building up below said first pan.

4,922,080
COOKER PLATE
Robert Kicherer, and Felix Schreder, both of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany
Filed Aug. 25, 1988, Ser. No. 236,769
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728535
Int. Cl.[5] H05B *3/70*
U.S. Cl. 219—457 22 Claims



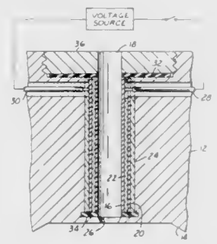
1. A cooker plate, comprising:
a mounting plate having a top surface, an underside and at least one plate opening;
at least one electric hotplate to be received in one said at least one plate opening, said hotplate being a preassembled unit provided to engage against said top surface of said mounting plate and having an underside;
at least one holding means having an outside, an upper inside and being provided to be supported against the mounting plate and said hotplate for securing said hotplate with respect to said mounting plate;
electrical terminal connecting members of said hotplate, said connecting members being provided in a vicinity of the underside of the hotplate, said holding means having at least one window opening open in a connecting state for providing access to said connecting members, said window opening being provided for receiving external connection means to be connected to said connecting members, for electrical supply of power via power supply lines, wherein at least one closure means is provided for at least partially closing at least one of said window openings in a post-connecting state, said closure means
providing at least one passage for the external connection means for said connecting members, said closure means at least partially shielding said terminal connecting members on said outside of said holding means.

4,922,081
CONTROL SYSTEM AND METHOD OF MAKING THE SAME
Brian J. Kadwell, Ringgold, Ga., and Daniel L. Fowler, Kentwood, Mich., assignors to RobertShaw Controls Company, Richmond, Va.
Filed Sep. 23, 1988, Ser. No. 248,395
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—506 9 Claims



1 In a control system comprising a high energy control circuit means having an output relay driver transistor for operating a heating means of said system, manually operated means for initiating the operation of said high energy control circuit means, microcomputer means for operating said high energy control circuit means after said manually operated means has initiated the operation thereof, and supervisory circuit means for detecting failure of said system and disabling said high energy control circuit means if said system is not operating in a normal mode thereof, said supervisory circuit means having means requiring the manual operation of said manually operated means before permitting power to reach said high energy control circuit means whereby said high energy control circuit means is disabled unless said manual operation of said manually operated means has taken place and said system is operating in said normal mode thereof, said supervisory circuit means having a supervisory transistor therein that is in series with said relay driver transistor and that must be switched on to enable said relay driver transistor, said supervisory circuit means having a capacitor therein for sustaining the on condition of said supervisory transistor, said manually operated means comprising means for initially charging said capacitor and switching on said supervisory transistor when said manually operated means has been manually operated to inititate the operation of said high energy control circuit means, said system having means for continuing the charging of said capacitor after the initial manual operation of said manually operated means if said system is operating in a normal mode thereof, the improvement wherein said means for continuing the charging of said capacitor comprises temperature sensing means that is disposed intermediate said microcomputer means and said supervisory circuit means and continues the charging of said capacitor only as long as said temperature sensing means is sensing an output temperature effect of said heating means that is below a predetermined high temperature limit for said system and that terminates the charging of said capacitor when said sensed temperature is above said predetermined high temperature limit.

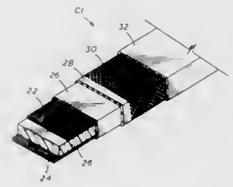
4,922,082
THERMAL VALVE GATE FOR PLASTIC MOLDING APPARATUS
James F. Bredt, Watertown; Nam P. Suh, Sudbury, and Francis A. Waldman, Stoneham, all of Mass., assignors to Axiomatics Corporation, Cambridge, Mass.
Filed Mar. 17, 1989, Ser. No. 325,160
Int. Cl.[5] B29C *45/30*
U.S. Cl. 219—541 7 Claims



1. An electrical resistive heater device comprising:
first and second spaced apart electrically conductive electrodes adapted to be connected to different electrical potentials;
a heating element located between and in intimate physical contact with each of said electrodes;
said heating element being formed from a mixture of a powdered material which is relatively highly conductive electrically and a ceramic which is relatively highly conductive thermally but relatively highly resistive electrically, said ceramic forming a binder for the particles of said powder;
whereby the application of an electrical potential gradient across the thickness of said heating element by means of said first and second electrodes causes heat to be generated at points of contact between adjacent particles of said powder where electrical current conducting paths are established, said heat being conducted and distributed throughout said heating element by the matrix of powder and ceramic.

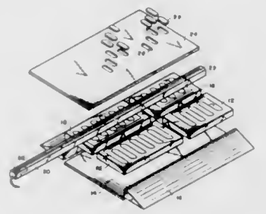
4,922,083
FLEXIBLE, ELONGATED POSITIVE TEMPERATURE COEFFICIENT HEATING ASSEMBLY AND METHOD
Daniel R. Springs, Martindale, and Jesse Hinojosa, San Marcos, both of Tex., assignors to Thermon Manufacturing Company, San Marcos, Tex.
Filed Apr. 22, 1988, Ser. No. 185,155
Int. Cl.[5] H05B *3/34*
U.S. Cl. 219—549 11 Claims

1. An electrical heating cable, comprising:
first and second substantially flat, generally planar, elongated electrical conductor means each having two generally parallel faces and being substantially free of through openings, said conductor means superimposed with respect to each other but spaced from each other along the length of the cable for conveying electrical current and for conducting heat; and
heating means comprising a positive temperature coefficient polymeric material disposed between and in contact with said conductor means and filling the space therebetween and also disposed externally of said conductor means for



encapsulating said first and second conductor means, said polymeric material producing heat when current flows therethrough, said polymeric material substantially increasing in resistance when a temperature limit is reached to reduce the current flowing through said heating means and control the heat output of the cable,
wherein each of said conductor means has a sufficient thermal conductivity so as to conduct substantial amounts of heat relative to said heating means.

4,922,084
UNI-DIRECTIONAL HEATING APPARATUS
Gerhard Hutter, 993 Lake Ave., Greenwich, Conn. 06830
Filed Aug. 28, 1989, Ser. No. 399,266
Int. Cl.[5] H05B *3/18*
U.S. Cl. 219—549 6 Claims



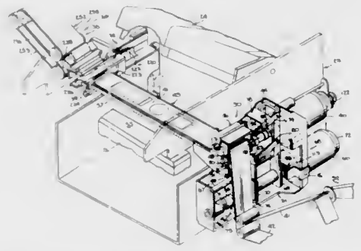
1. An uni-directional indirect heating apparatus comprising a base, at least a pair of carrier means mounted on said base having a space therebetween, said carrier means being constituted of a heat insulating material, an elongated mounting bar having an open top, said bar being positioned in said space between said carrier means and having conducting wires mounted in the open top thereof, a flat heating coil on the upper surface of said carrier means, at least one bridging electrical connecting device for electrically connecting said conducting wire to said heating coil, and a heat transmitting cover plate for said carrier means and said mounting bar wherein said heat generated by said heating coil is propelled substantially in one direction.

4,922,085

MAILING MACHINE TAPE MODULE AND TAPE DRIVE THEREOF

Hugh St. L. Dannatt, Bethel, and Carl A. Miller, Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1988, Ser. No. 291,469
Int. Cl.[5] B41J *3/20;* G06F *1/00*
U.S. Cl. 235—101 20 Claims



19. In a postage meter including a printing device, a dual tape drive system for selectively advancing first and second tapes for imprinting by said printing device, said dual tape drive system comprising:

a first frame;

a second frame;

first means mounting said first frame to said second frame for movement in two orthogonal directions relative to said second frame and said printing device;

a first drive motor mounted to said first frame for advancing said first and said second tapes by said printing device;

means mounted in said first frame coupling said first drive motor to selectively advance said first and second tapes;

control means for adjusting said coupling means to advance either said first tape or said second tape;

means guiding said first and said second tapes in a parallel, facing relationship by said printing device;

a second drive motor mounted in said first frame;

second means coupling said second motor to said second frame for moving said second frame in a first of said orthogonal directions to a printing position with said tapes adjacent said printing device;

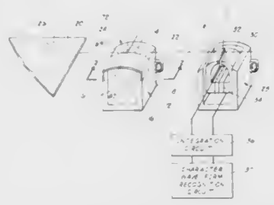
means moving said second frame in a second of said orthogonal directions to move an exposed one of said tapes closer to said printing device for imprinting thereon by said printing device.

4,922,086

WRITE HEAD APPARATUS FOR RECOGNIZING MAGNETIC CHARACTERS AND METHOD THEREFOR

Richard E. Milford, Oklahoma City, Okla., assignor to Banc-Tec, Inc., Oklahoma City, Okla.

Filed Oct. 19, 1987, Ser. No. 110,119
Int. Cl.[5] G06K *7/08*
U.S. Cl. 235—449 9 Claims



1. A system for recognizing a sequence of characters printed in magnetic ink on a document moving along a preselected document travel path, comprising:

a write head having a document engagement surface formed thereon to extend along said path, wherein the write head comprises means for producing a magnetic field at the document engagement surface characterized in that the component of the magnetic induction normal to the document engagement surface at said surface varies along the direction of travel for the document from a peak value in the range of 450 to 650 gauss on one side of a null line, at which the normal component of the magnetic induction vanishes, to a peak value of opposite sign in the range of 200 gauss to 340 gauss whereby ink on the document is magnetized by traversal of the write head;

read head means positioned along said document travel path downstream of the write head for generating electrical signals in response to passage of magnetized ink across the read head means; and

integrating means electrically connected to the read head means for producing electrical waveforms indicative of the magnetization of the ink in which the characters is printed; and

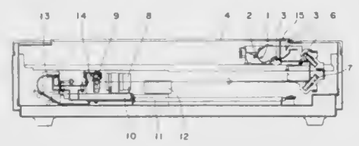
means connected to the integrating means for determining the sequence of characters printed on the document from said electrical waveforms.

4,922,087

IMAGE READER CAPABLE OF CALCULATING THE REAL FOCAL LENGTH OF A PROJECTING LENS

Akio Nakajima, and Hirofumi Hasegawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1988, Ser. No. 242,688
Claims priority, application Japan, Sep. 10, 1987, 62-227481
Int. Cl.[5] G01J *1/20;* H04N *1/40*
U.S. Cl. 250—201.4 7 Claims



7. A method of positioning an image sensor and a projection lens for projecting an image onto the image sensor in order to obtain a desired magnification in an image reader, said method comprising the steps of:

providing a pattern element having two black or white patterns for defining respective edges in the vicinity of a plane on which the document is to be placed;

positioning the image sensor and the projection lens at specific positions corresponding to a predetermined magnification;

projecting the image of said patterns on the image sensor at the specific position;

measuring a distance between two edges of said patterns on the basis of outputs from said image sensor;

calculating a real focal distance of the projection lens on the basis of the measured distance;

storing the real focal distance calculated; and

calculating respective positions of the image sensor and the projection lens in order to obtain a desired magnification on the basis of the real focus distance stored; and

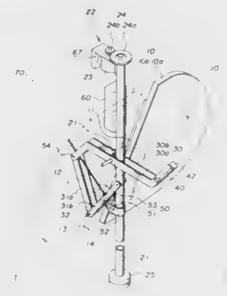
positioning the image sensor and the projection lens at the respective positions calculated.

4,922,088

AUTOMATIC SOLAR LIGHTING APPARATUS HAVING A SOLAR FOLLOWING SENSOR

Satoshi Kasuya, Yokohama, Japan, assignor to Technology Network, Inc., Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,391
Claims priority, application Japan, Sep. 21, 1987, 62-236612; Sep. 21, 1987, 62-236613; Sep. 21, 1987, 62-236614
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—203.4 9 Claims



9. An automatic solar lighting apparatus comprising:

a solar following sensor comprised of an X-shape cross member having four side grooves, a light shielding top plate disposed on said X-shape cross member, and photosensors each located on the inner part of the respective side grooves of said X-shape cross member, said photosensors all being completely shaded with said light shielding top plate to be brought into its no-output state when said solar following sensor is directed toward the sun;

a reflecting means for reflecting the sunlight;

driving link means by which said reflecting means is connected with said solar following sensor so as to allow said reflecting means to rotate at half the rotating angle of said solar following sensor;

a vertical direction means for rotating said reflecting means in one direction; and

a horizontal drive means for rotating said reflecting means in a direction perpendicular to the direction in which said reflecting means is rotated by said vertical drive means.

4,922,089

CONSTANT COLOR TEMPERATURE AND INTENSITY ILLUMINATION SOURCE

Kevin P. McGuire, and James D. McKay, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,628
Int. Cl.[5] G05D *25/00*
U.S. Cl. 250—205 6 Claims

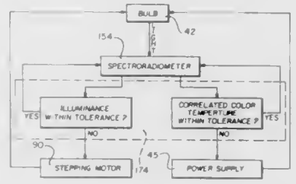
1. A source of illumination of constant color temperature and intensity, including:

a generator of light the color temperature of which is dependent on the power applied to the generator;

a device for measuring the intensity of selected portions of the spectrum of light produced by the generator and for producing signals indicative of those intensities;

first means responsive to said signals for adjusting the power applied to said generator, whereby a selected color temperature may be achieved; and

second means responsive to said signals for adjusting the intensity of the light emitted by the generator without varying the power applied to the generator, whereby the



intensity may be changed without changing the color temperature.

4,922,090

DEVICE FOR CHECKING CONDITIONS OF A STRIP OF WRAPPING MATERIAL TO A USER MACHINE

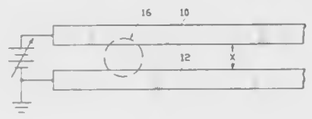
Mario Turra, and Armando Neri, both of Bologna, Italy, assignors to G.D. S.p.A., Bologna, Italy

Filed Dec. 7, 1988, Ser. No. 280,788
Claims priority, application Italy, Dec. 15, 1987, 3729 A/87
Int. Cl.[5] G01J *1/32;* G01N *21/86*
U.S. Cl. 250—205 9 Claims



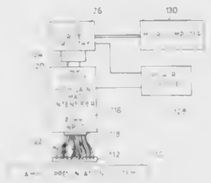
1. A device for checking feed conditions of a continuous strip of wrapping material, comprising an optoelectronic device including a light-emitting means and a light-detecting means, arranged on opposite sides of said continuous strip, a negative feedback circuit means connected between said light detecting means and said light emitting means for causing said optoelectronic device to operate in a linear manner, current detecting means connected in series with said light emitting means and generating an output signal correlated to a current flowing through said light emitting means, and means for detecting interruptions and thickened portions of the continuous strip according to the amplitude of said output signal, said means for detecting being connected to said current detecting means and receiving said output signal therefrom.

4,922,091
DIRECT GENERATION OF ULTRAFAST ELECTRICAL PULSES
Daniel R. Grischkowsky, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 9, 1988, Ser. No. 230,213
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—211 J 17 Claims



1. A method of generating a subpicosecond electrical pulse comprising the steps of:
providing a transmission line on a substrate of an electro-optic material; and
focussing a laser pulse across said transmission line to generate a subpicosecond electrical pulse directly on the transmission line by an optical rectification effect exhibited by said substrate which is coupled to said transmission line to produce said electrical pulse.

4,922,092
HIGH SENSITIVITY OPTICAL IMAGING APPARATUS
John Rushbrooke, Girton; Adrian Lyons; Patricia Tomkins, both of Turnbridge Wells, and Richard Ansorge, Cambridge, all of England, assignors to Image Research Limited, England
PCT No. PCT/GB87/00824, § 371 Date Jul. 7, 1988, § 102(e) Date Jul. 7, 1988, PCT Pub. No. WO88/04045, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 20, 1987, Ser. No. 216,713
Claims priority, application United Kingdom, Nov. 26, 1986, 8628285; Oct. 4, 1987, 8708615
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—213 VT 27 Claims



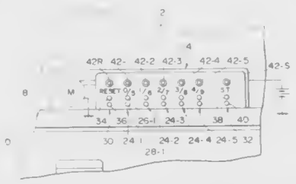
1. A high resolution optical imaging apparatus comprising a sample holder for carrying one or more samples, an image intensifier having an input face plate means adapted to be optically coupling the sample holder to the image intensifier so that said intensifier simultaneously receives on distinct regions of its input faceplate photon emission respectively emanating from differing sites on the sample holder, photo-electric detecting means coupled to the output of the image intensifier simultaneously to detect the respective photon emissions, and electronic means coupled to the photo-electric means to produce electrical output signals dependent on the photon emission received at the respective distinct regions of the faceplate, and a signal processing means for relating the respective output signals to the originating sites of photo emission by the sample or samples carried out by the sample holder.

4,922,093
METHOD AND A DEVICE FOR DETERMINING THE NUMBER OF PEOPLE PRESENT IN A DETERMINED SPACE BY PROCESSING THE GREY LEVELS OF POINTS IN AN IMAGE
Michel G. J. Fardeau, Les Milles; Yves F. C. Guern, Pourriéres; Jean P. Dignac, Velaux, and Jean M. Drevon, Venelles, all of France, assignors to Bertin & Cie, Cedex, France
PCT No. PCT/FR88/00282, § 371 Date Feb. 2, 1989, § 102(e) Date Feb. 2, 1989, PCT Pub. No. WO88/09978, PCT Pub. Date Dec. 15, 1988
PCT Filed Jun. 3, 1988, Ser. No. 331,664
Claims priority, application France, Jun. 5, 1987, 87 07922
Int. Cl.[5] G01V *9/04*; G06M *7/00*; G06K *9/74*
U.S. Cl. 250—221 14 Claims



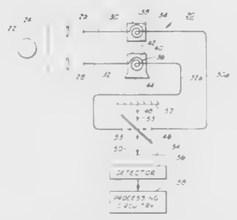
1. A method of determining the number of people present in a determined space, the method being characterized in that it consists in forming an image of said space on a strip or set (**14**) of photodetectors (**16**), in reading the gray levels of the points in said image at a determined read frequency, in comparing the gray levels of the same points in successive images, in determining the variations in gray levels which are caused by the movements of a person, and in deducing the number of people present in said space therefrom.

4,922,094
AUTOMOBILE ELECTRONIC LIGHT-ACTIVATED KEY DEVICE
Toshihiko Hatanaka, Wakayama; Akira Enomoto, and Kouji Matsushita, both of Mie, all of Japan, assignors to Navic Co., Ltd., Mie, Japan
Filed Oct. 27, 1988, Ser. No. 263,608
Claims priority, application Japan, Nov. 6, 1987, 62-170319[U]; Nov. 6, 197, 62-170322[U]; May 31, 1988, 63-133825; May 31, 1988, 63-133826
Int. Cl.[5] G01V *9/04*
U.S. Cl. 250—221 3 Claims



1. An electronic key device for keylessly unlocking an automobile door lock from an exterior, comprising:
a non-contact ID sensor including a plurality of pairs of light emission elements and light receiving elements with light emission and reception surfaces thereof being directed externally of and provided adjacent to an inner surface of a window glass of the automobile, said non-contact ID sensor for detecting an ID signal generated by externally stroking an outer surface of the window glass over ones of said plurality of light emitting-receiving element pairs;
a light emission controlling circuit for supplying AC signals to said light emitting element at a predetermined frequency;
a non-contact operation start triggering means for causing said AC signals to be supplied to said non-contact ID sensor from said light emission controlling circuit when said non-contact operation start triggering means is actuated;
a received light processing circuit which synchronously processes the AC signals from the light emission controlling circuit together with the reflected signal captured by said light receiving elements upon the ID signal being inputted; and
an unlocking device which unlocks the vehicle when a correctly inputted ID signal is determined by comparing said processed ID signal with a predetermined registered number.

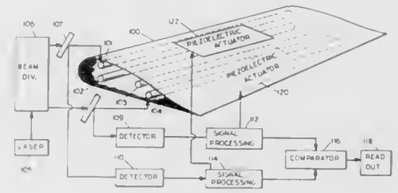
4,922,095
METHOD AND APPARATUS FOR SENSING DISTURBANCE USING FIBER-OPTIC POLARIZATION ROTATION
John S. Gergely, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed May 11, 1989, Ser. No. 351,147
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.17 25 Claims



1. A method for sensing a physical disturbance, comprising:
directing circularly polarized light through a coil of fiber optic cable confined in an environment sensitive to external pressure variations resulting from a disturbance;
receiving said circularly polarized light on a polarizer having a predetermined axis of polarization; and
determining the change in light passing through the polarizer which change is proportional to the change in length of said coil caused by said physical disturbance.

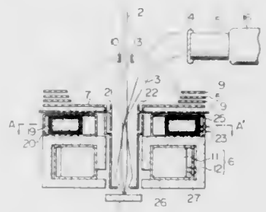
4,922,096
SYSTEM FOR MONITORING AND CONTROLLING PHYSICAL MOVEMENT
Brian W. Brennan, Burlington, Vt., assignor to Simmonds Precision Products, Inc., Wilmington, Del.
Continuation of Ser. No. 154,767, Feb. 11, 1988, Pat. No. 4,845,357. This application Mar. 8, 1989, Ser. No. 320,668
Int. Cl.[5] H01J *5/16*
U.S. Cl. 244—3.16 20 Claims

1. An aircraft system, comprising:
an aircraft, said aircraft comprising an actuation system and a body member, said body member having an exterior surface,
said actuation system comprising a piezoelectric actuator member and an optical fiber,
said actuator member and said fiber being supported by said body member,



said actuator member being adapted to be actuated in response to movement of said optical fiber.

4,922,097
POTENTIAL MEASUREMENT DEVICE
Hideo Todokoro, Tokyo; Hiroyuki Shinada, Chofu, and Shigemitsu Seitoh, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 16, 1988, Ser. No. 232,655
Claims priority, application Japan, Aug. 24, 1987, 62-208116
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—310 8 Claims



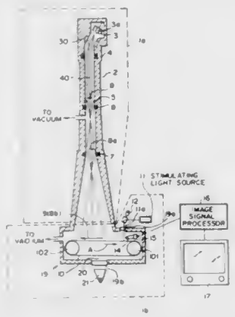
1. A potential measurement device comprising:
means for irradiating a sample with an electron beam;
an extracting electrode disposed above said sample and extracting secondary electrons emitted by irradiation of said sample with said electron beam;
a hemi-spherical grid analyzing the energy of said extracted secondary electrons; grid and said sample and focusing both said electron beam and said secondary electrons;
a deflector disposed between said lens and said hemi-spherical grid and producing electric and magnetic fields crossing perpendicularly to each other, which don't deflect said electron beam, but deflect only said secondary electrons; and
means for detecting said secondary electrons having passed through said grid.

4,922,098
ELECTRON MICROSCOPE
Nobufumi Mori; Yuichi Hosoi, and Junji Miyahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 787,094, Oct. 15, 1985, abandoned. This application Oct. 11, 1988, Ser. No. 259,427
Claims priority, application Japan, Oct. 18, 1984, 59-218858
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] H01J *37/147, 37/26*
U.S. Cl. 250—311 2 Claims

1. An electron microscope of the transmission type in combination with a two-dimensional sensor for recording an electron

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beam image, comprising: a two-dimensional sensor located on an image-formation plane, said two-dimensional sensor comprising a stimulable phosphor sheet which stores electron beam energy and where the sensitivity of the stimulable phosphor sheet to said electron beam is greater than that of a photographic film such that a lower amount of the electron beam can



be used to minimize damage to a specimen in the electron microscope and where, upon exposure to stimulating light, the stored energy of the electron beam image is released as light to be photo-electrically detected, and an electron microscope having a filament for emitting thermoelectrons, said filament being located at a position displaced from the principal optical axis of the electron beam.

4,922,099

ELECTRIC FIELD DEVICE

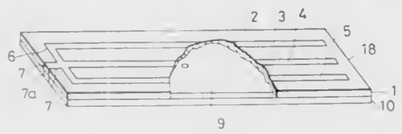
Senichi Masuda, Tokyo, and Isamu Fukuura, Nagoya, both of Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Continuation of Ser. No. 177,442, Apr. 4, 1988, which is a continuation of Ser. No. 528,854, Sep. 2, 1983, abandoned. This application Jan. 3, 1988, Ser. No. 293,757

Claims priority, application Japan, Sep. 7, 1982, 57-155618

Int. Cl.[5] H01T *19/00*

U.S. Cl. 250—324 **18 Claims**



1. An electric field device comprising:

an upper and a lower sheet;

said sheets made of the fine ceramic material and joined in a unitary body;

an elongated corona discharge electrode provided on an upper surface of said upper sheet;

a planar induction electrode provided between said upper sheet and said lower sheet subjacent said corona discharge electrode;

surface means defining a hole through said lower sheet remote from the lateral edges thereof;

a contacting conductor comprising a film-like coating of an electrically-conducting material formed concentrically with said hole on the upper surface of said lower sheet;

a terminal conductor comprising a film-like coating of an electrically-conductive material formed concentrically with said hole on the lower surface of said lower sheet;

conductor comprising an electrically-conductive material extending from said planar induction electrode through said hole to said terminal conductor, said conductor being integrally bonded to said planar induction electrode, said contacting conductor and said terminal conductor;

wherein the electrically-conductive material of said contacting conductor, said terminal conductor and said conductor is the same, and said electrically-conductive material has a coefficient of expansion which is reasonably compatible with the coefficient of expansion of said fine ceramic material; and

a power supply connected between said terminal and said corona discharge electrode.

4,922,100

METHOD FOR READING A RADIOGRAPHIC IMAGE

Mikio Takeuchi, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 838,310, Mar. 10, 1986, abandoned. This application Jun. 19, 1989, Ser. No. 371,682

Claims priority, application Japan, Mar. 13, 1985, 60-51140; Apr. 24, 1985, 60-89165

Int. Cl.[5] G03B *42/00*

U.S. Cl. 250—327.2 **26 Claims**



2. A radiation image read-out method for scanning a stimulable phosphor sheet, having a radiation image stored thereon by imagewise exposure, with stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to stored radiation energy, and detecting the emitted light by a photoelectric read-out means,

the radiation image read-out method comprising the steps of

i) determining the decrease with time of the amount of light emitted by said stimulable phosphor sheet having a predetermined level of radiation energy stored thereon when said stimulable phosphor sheet is exposed to a predetermined amount of stimulating rays, and

ii) compensating for the decrease with time of said amount of emitted light, which arises within read-out time for said radiation image, by calculating a compensation coefficient as a function of time based on said decrease with time for selected portions of said stimulable phosphor sheet exposed to stimulating rays, and multiplying a signal proportional to the light emitted by each selected portion of the stimulable phosphor sheet upon exposure to stimulating rays by the compensation coefficient for the respective selected portion of the stimulable phosphor sheet.

4,922,101

RADIATION IMAGE-READING METHOD

Masakazu Hashiue, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 10, 1989, Ser. No. 308,592

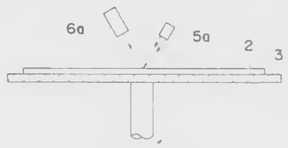
Claims priority, application Japan, Feb. 10, 1988, 63-29840

Int. Cl.[5] G03B *42/00*

U.S. Cl. 250—327.2 **5 Claims**

1. A method of photoelectrically reading out a radiation image of one or more spots which is stored and recorded on a stimulable phosphor sheet, to determine position of the spot on the phosphor sheet, comprising the steps of:

scanning the stimulable phosphor sheet under rotation twice with stimulating rays giving a linear irradiation area on a surface of the phosphor sheet to form, in total, an irradiated area in the form of a ring in such manner that the linear irradiation area of one scanning forms an angle other than 0° with the linear irradiation area of another scanning;



detecting stimulated emissions which are produced in response to a series of the irradiations of stimulating rays separately for each scanning, for obtaining information as to whether the spot is present or absent on the irradiated linear area; and

locating the position of the spot on the phosphor sheet by combining the informations of the spot obtained in the twice scanning.

4,922,102

RADIATION-IMAGE READING APPARATUS

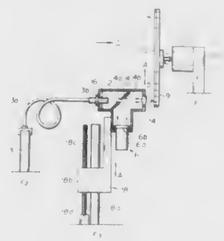
Chuji Katayama, Hachioji, Japan, assignor to Mac Science Co., Ltd., Tokyo, Japan

Filed May 19, 1988, Ser. No. 196,624

Claims priority, application Japan, May 25, 1987, 62-127856; May 25, 1987, 62-127857

Int. Cl.[5] G03B *41/16; G03C 5/16*

U.S. Cl. 250—327.2 **6 Claims**



1. A radiation-image reading apparatus, comprising:

a radiation-image recording member having a phosphor layer having a property of emitting light from a point previously irradiated with radiation when being irradiated at said point with excitation light, the intensity of light emitted from said phosphor layer being determined in accordance with the intensity of said radiation;

a light source for generating excitation light with which said phosphor layer of said radiation-image recording member is irradiated; and

light detecting means for detecting light emitted from said phosphor layer of said radiation-image recording member when said phosphor layer is irradiated with said excitation light, said detecting means performing said detecting at a position deviated from an optical axis of said excitation light, said radiation-image reading apparatus reading a radiation image recorded on said radiation-image recording member by scanning said phosphor layer with said excitation light along a scanning line and detecting, by means of said light detecting means, light emitted from respective points of said phosphor layer along the scanning line, said radiation-image recording member being formed of a support plate in the form of a disk capable of rotating about an axis passing said disk at the center thereof perpendicularly thereto, and a phosphor layer having said property and formed on said support plate, said radiation-image reading apparatus further comprising:

condenser means for condensing said excitation light emitted from said light source to a point on said phosphor layer of said radiation-image recording member while changing divergent rays of light coming from said point on said phosphor layer, to which said excitation light is condensed, into parallel rays;

driving means for moving said position of said point on said phosphor layer of condensation effected by said condenser means so that said point moves relative to said disk-like support body in the radial direction of said disk; and

a light reflecting member for allowing excitation light emitted from said light source to pass, for leading said excitation light to the optical axis of said condenser means, for reflecting light emitted from said phosphor layer and changed into parallel rays by said condenser means, and for leading said parallel rays to said light detecting means, said light reflecting member including a member which serves as a total reflection mirror, having an aperture formed at a center of said light reflecting member, for transmitting said excitation light, at which said reflecting member intersects the path of said excitation light, a total reflection surface for reflecting light in a total reflection manner being formed on a surface of said reflecting member facing said phosphor layer.

4,922,103

RADIATION IMAGE READ-OUT APPARATUS

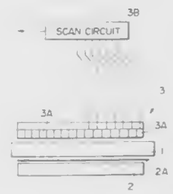
Kazuhiro Kawajiri; Hiroshi Sunagawa; Nobuharu Nozaki; Yuichi Hosoi, and Kenji Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 19, 1984, Ser. No. 673,235

Claims priority, application Japan, Nov. 21, 1983, 58-219313

Int. Cl.[5] G03C *5/16*

U.S. Cl. 250—327.2 **11 Claims**



1. A radiation image read-out apparatus comprising:

(i) a stimulating ray source for emitting stimulating rays linearly impinging upon a portion of a stimulable phosphor sheet carrying a radiation image stored therein by stored radiation energy, said stimulating ray source being positioned on a first side of said stimulable phosphor sheet,

(ii) a line sensor comprising many solid state photoelectric conversion devices for receiving and photoelectrically converting light emitted by said radiation image stored in said stimulable phosphor sheet in proportion to said stored radiation energy when said stimulable phosphor sheet is exposed to the stimulating rays, said line sensor being positioned on a second side of said stimulable phosphor

sheet opposite said stimulating ray source such that said stimuable phosphor sheet is positioned between said stimulating ray source and said line sensor, said line sensor extending at least over the length of said portion of said stimulable phosphor sheet exposed linearly to the stimulating rays so as to stand face to face with said linearly exposed portion of said stimulable phosphor sheet,

(iii) scanning drive means for moving said portion exposed linearly to stimulating rays and said line sensor with respect to said stimulable phosphor sheet along the surface of said stimulable phosphor sheet, and

(iv) read-out means for sequentially reading out the outputs of said line sensor in accordance with the movement of said portion exposed linearly to stimulating rays and said line sensor with respect to said stimulable phosphor sheet.

4,922,104

INFRARED MICROSPECTROMETER

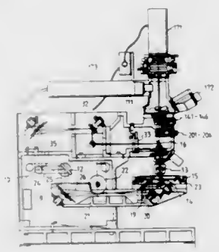
Kinya Eguchi, Fujisawa; Kikue Niitsuma, Yokohama; Shigeru Wakena, and Masayoshi Ezawa, both of Mobara, all of Japan, assignors to 501 Hitachi, Ltd., Chiyoda, Japan

Filed Nov. 30, 1988, Ser. No. 277,964

Claims priority, application Japan, Nov. 30, 1987, 62-300226; Mar. 12, 1988, 63-59158

Int. Cl.[5] **G01J** *3/42;* **G01W** *21/35;* **G02B** *21/00*

U.S. Cl. 250—339 **8 Claims**



1 An infrared microspectrometer for spectral measurement in a transmission or reflection mode comprising: a spectrophotometer; a microscope; a detector; and a vertically movable sample stage having a first optical means for converting analyzing rays into parallel rays between the light source of said spectrophotometer and said sample stage and a second optical means for receiving said rays from said first optical means and projecting said rays to a sample.

4,922,105

RADIATION IMAGE STORAGE PANEL

Yuichi Hosoi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 3, 1989, Ser. No. 306,318

Claims priority, application Japan, Feb. 5, 1988, 63-26322

Int. Cl.[5] **G01N** *23/04*

U.S. Cl. 250—484.1 **10 Claims**

1. A radiation image storage panel comprising a support and a phosphor layer provided thereon which comprises an agglomerate of a stimulable phosphor, in which a strain-reducing layer is provided between the phosphor layer and the support.

4,922,106

ION BEAM SCANNING METHOD AND APPARATUS

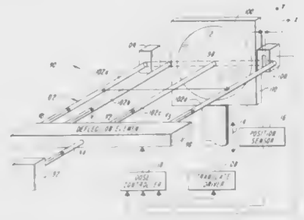
Donald W. Berrian, Topsfield; Robert E. Kaim, Brookline, and John W. Vanderpot, Rockport, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

PCT No. PCT/US87/00804, § 371 Date Nov. 6, 1987, § 102(e) Date Nov. 6, 1987, PCT Pub. No. WO87/06391, PCT Pub. Date Oct. 22, 1987

Continuation-in-part of Ser. No. 849,786, Apr. 9, 1986, abandoned, and a continuation-in-part of Ser. No. 25,860, Mar. 16, 1987, abandoned. This PCT application Apr. 8, 1987, Ser. No. 138,925

Int. Cl.[5] **H01J** *37/304, 37/317*

U.S. Cl. 250—492.2 **10 Claims**



1. In apparatus for producing an accelerated scanning ion beam and having (i) ion beam accelerator means and (ii) a scanning beam source for producing an ion beam and directing said beam along a beam axis and through said accelerator for exiting therefrom, said scanning beam source producing said beam with a lineal scan having a scan width that is a multiple of the scan height at least at the exit of the beam from said accelerator the improvement wherein

A. said accelerator means has at least first and second electrode means spaced apart along the beam axis and for supporting a beam-accelerating axial field therebetween,

B. each electrode means forming a passage therethrough for the passage of said scanning beam,

C. at least a second of said electrode means proximal to the exit of the beam from said accelerator forming said passage with a slot-like configuration that has a slot length that is a multiple of the slot width and that is oriented for receiving said scanning beam with said scanning width aligned with said slot length and for subjecting said scanning beam to electrostatic fringe field having substantially uniform magnitude and direction at each instantaneous trajectory of said scanning beam.

4,922,107

APPARATUS EMITTING AN ELECTROMAGNETIC RADIATION, IN PARTICULAR INFRARED, COMPRISING A PLANE SOURCE OF RAYS AND A REFLECTOR

Ari Rabl, Montgeron; Denis Clodic, Paris, and Robert Dehausse, Joinville le Pont, all of France, assignors to A.R.M.I.N.E.S., Paris, France

Filed Nov. 22, 1988, Ser. No. 275,002

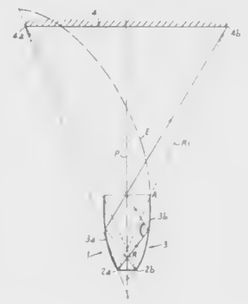
Claims priority, application France, Nov. 25, 1987, 87 16361

Int. Cl.[5] **F21J** *7/12*

U.S. Cl. 250—504 R **9 Claims**

1. In an apparatus emitting infrared radiation, comprising a plane source of infrared rays and a reflector for reflecting these infrared rays emitting in the direction of a target defined as extending between two ends, the source, the reflector and the target being symmetrical with respect to the same plane of symmetry of the emitter apparatus, so that the reflector is constituted by two halves of the same cross section located on either side of the plane of symmetry and that the plane source, perpendicular to the plane of symmetry, comprises first and second ends located on either side of this plane,

the cross section of each half-reflector, located on one side of the plane of symmetry, has the form of an arc of ellipse of which the two foci are constituted respectively by the first end of the plane source and a first end of the target



which are both located on the other side of the plane of symmetry, this arc of ellipse extending between the second end of the plane source located on the first side of the plane of symmetry or a point located in the immediate proximity of this second end and the point of intersection of the ellipse with the direct ray going from the first end of the plane source to a second end of the target.

4,922,108

INFRARED RADIATION SOURCE, ESPECIALLY FOR A MULTI-CHANNEL GAS ANALYZER

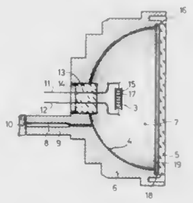
Ulrich Modlinski, Alzenau-Albstadt, and Gerhard Wiegleb, Geiselbach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,654

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809160

Int. Cl.[5] **G01N** *21/59;* **F21V** *31/00*

U.S. Cl. 250—504 R **4 Claims**



1. Infrared radiation source for a multi-channel gas analyzer, comprising: a radiant body; a reflector disposed in back of the radiant body; a window of material permeable to radiation at least partially disposed in front of the radiant body; and a case partially surrounding the radiant body on its rear; said case being hermetically sealed by the window, and forming the reflector; said case further having a sealable passage, which at one end leads into a chamber containing the radiant body; said radiant body being located between the window and the reflector, and the other end of said sealable passage forming with the case a tube connection, and whose end remote from the chamber is closed, through which passage the chamber is filled with gas before being closed, the gas comprising in the range of 100–200 mbar absolute pressure of an oxidizing atmosphere.

4,922,109

DEVICE FOR RECOGNIZING AUTHENTIC DOCUMENTS USING OPTICAL MODULAS

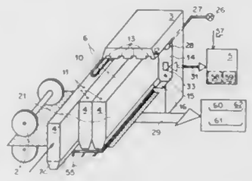
Christian Bercovitz, Bonne, France, and Alexandre Feyjoo, Avanchet-parc, Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Apr. 14, 1989, Ser. No. 339,249

Claims priority, application Switzerland, Apr. 18, 1988, 1413/88

Int. Cl.[5] **G06K** *5/00, 9/74*

U.S. Cl. 250—556 **11 Claims**



1. A device for authenticating documents comprising

a reading head for optically scanning a document, said reading head including at least two substantially identical modules each of which is provided with a line of photosensors, and means for determining the spectral sensitivity of said modules,

evaluation means for correlating signals provided by, said photosensors when said photosensors are illuminated with light from a light source with prestored values,

conveying means for providing relative movement between said reading head and said documents, and

sorting means controlled by said evaluation means in accordance with a correlation value.

4,922,110

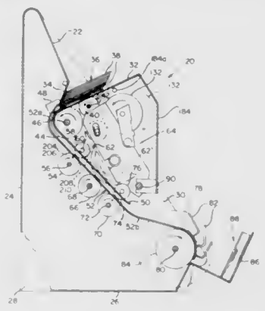
DOCUMENT COUNTER AND ENDORSER

Richard A. Melcher, Croydon, Pa., assignor to Brandt, Inc., Bensalem, Pa.

Filed Apr. 15, 1988, Ser. No. 182,482

Int. Cl.[5] **G06K** *5/00;* **G01N** *9/04*

U.S. Cl. 250—556 **17 Claims**



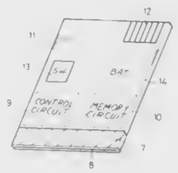
13. A method of detecting the simultaneous multiple feeding of sheets of predetermined average optical density along a path including the steps of generating a signal representing the optical density of a sheet portion passing a predetermined location along said path, comparing said optical density signal

with a threshold signal representing an optical density greater than said average optical density, and integrating said optical density signal only when the optical density represented by said signal exceeds the optical density represented by said threshold signal.

4,922,111
CARD TYPE IMAGE READER WITH MEANS FOR RELIEVING BENDING STRESS

Yukinori Kuwano; Noriyuki Mori; Shoichi Nakano; Hisao Uehara; Mitsugu Kobayasbi, all of Osaka; Kaneo Watanabe, Kyoto, and Shigeru Noguchi, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 7, 1988, Ser. No. 268,086
Claims priority, application Japan, Nov. 20, 1987, 62-294941
Int. Cl.[5] G06K *7/10, 9/22*
U.S. Cl. 250—566 9 Claims



7. A card type image reader to be moved on a surface of an original, comprising:

a card base which has a peripheral portion and an area away from said peripheral portion that is bendable;

photodetector means;

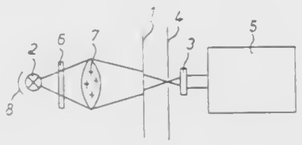
reading means for reading information of the original through said photodetector means, said reading means being on said card base; and

means for relieving bending stresses at said peripheral portion of said card base so as to avoid propagation of the bending stresses to said photodetector means, said relieving means including a reinforcing member on the peripheral portion of said card base, said photodetector means being arranged on said reinforcing member.

4,922,112
APPARATUS FOR DETERMINING THE THICKNESS OF LAYER SUPPORTS

Richard Zierl, Eicheoau; Erwin Kreuzer, Grafing, and Alfred Zuckermayr, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,117
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728704
Int. Cl.[5] G01J *1/00*
U.S. Cl. 250—372 6 Claims



1. Apparatus for on-line measurement of the layer thickness of layer supports by transmitted light using optoelectronic means, in which the layer support (1) moves in relation to the apparatus and the light source (2) emits modulated light, the photoelectric receiver (3) preferably being a diode which records the transmitted light and an electronic evaluation mechanism (5) comprising means for amplifying to keep the amplifier output voltage at zero, and thereby determining the layer thickness of the layer support from the recorded signal from the photoelectric receiver, characterized on that

the source of light (2) emits UV light in a range of wavelengths in at least a part of which the layer support has a high absorption,

the source of light illuminates the layer support with parallel or slightly convergent light,

at least one perforated screen (4) is arranged between the layer support and the photoelectric receiver in such a manner that when there is a slight change in the distance between the layer support and the photoelectric receiver the latter always records the same quantity of light,

a zero point controlled voltage convertor circuit in the electronic evaluation mechanism (5) converts the current signal produced in the receiver (3) into a voltage signal which is subsequently amplified by a voltage amplifier, and an electronic filter frees the amplified signal from the modulation frequency and the signal is then rectified by a rectifier and optionally antilogged by a further electronic stage.

4,922,113
PROCESS FOR FLUORIMETRIC MONITORING OF FUNCTIONAL COATINGS AND COMPOSITIONS AND FLUORESCENT AGENTS THEREFOR

Kurt C. Melancon, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 883,926, Jul. 10, 1986. This application Mar. 7, 1988, Ser. No. 165,014
Int. Cl.[5] G01N *21/64*
U.S. Cl. 250—372 31 Claims

1. A process for monitoring functional coating compositions applied to a substrate comprising the steps:

(a) providing a functional coating composition comprising an effective amount of a uvescer that absorbs radiant energy of a wavelength range centered around λ_1 and emits radiant energy of a wavelength range centered around λ_2, λ_1 and λ_2 each being a wavelength up to 400 nm within the ultraviolet portion of the electromagnetic spectrum; and the mean of the range of λ_1 being be low the mean of the range of λ_2;

(b) coating a substrate with a layer of said functional coating composition;

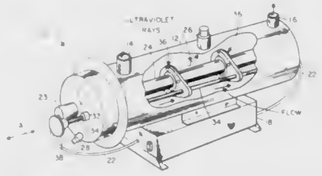
(c) scanning the resulting coating with radiant energy of a wavelength range centered around λ_1; and

(d) detecting the radiant energy of a wavelength range centered around λ_2 emitted by said coating.

4,922,114
WIPER MECHANISM

Hilary Boehme, 250 N. Fehr Way, Bay Shore, N.Y. 11706

Filed Jun. 1, 1989, Ser. No. 360,098
Int. Cl.[5] A61L *2/10*
U.S. Cl. 250—436 8 Claims



1. In liquid purification apparatus comprising housing means having inlet and outlet means for the liquid to be purified to enter and leave said housing means, source means mounted within said housing to produce ultraviolet radiation, extended sleeve means of ultraviolet-transmissive material surrounding said source means to permit the transmission of ultraviolet radiation into said liquid flowing around said sleeve means, rod means extending along the length of and spaced from said sleeve means, said rod means extending out of said housing means and mounted for movement along its length, the improvement comprising assembly means mounted on said rod means within said housing means for cleaning the outer surface of said sleeve means as said rod means is reciprocated, said assembly means comprising:

a. wiper support means attached adjacent one end to said rod means and having an opening through which said sleeve means passes, said opening being sufficiently large so as to be spaced from said sleeve means around the outer surface of the latter;

b. wiper means mounted on one side of said wiper support means surrounding said sleeve means and making stretch to fit contact with the outer surface of said sleeve means;

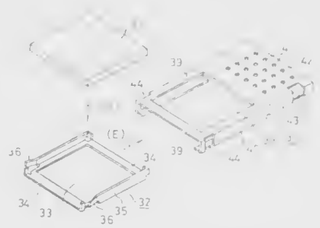
c. back up ring means mounted on said wiper means so that said back up ring means and said wiper support means sandwich said wiper means; and

d. a plurality of readily releasable means mounted through a plurality of holes arranged around said sleeve means aligned through said wiper support means, wiper means, and back up ring means to secure said wiper means in continuous contact with said sleeve means during reciprocal movement of said rod means to effect the cleaning of the surface of said sleeve means.

4,922,115
FLUORESCENT GLASS DOSIMETER

Yasushi Mawatari, Shizuoka; Toru Ikegami, Shimada; Motoyuki Sato, Shizuoka, all of Japan; Bertram Burgkhardt, Karlsruhe; Ernst Piesch, Eggenstein-Leopoldshafen, and Hans-Gerd Röber, Karlsruhe, all of Fed. Rep. of Germany, assignors to Toshiba Glass Co., Ltd., Shizuoka, Japan and Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,931
Claims priority, application Japan, Dec. 28, 1987, 62-334649
Int. Cl.[5] H05B *33/00;* G01J *1/58*
U.S. Cl. 250—484.1 5 Claims



1. A fluorescent glass dosimeter comprising:

a fluorescent glass element having both a fluorescence detection surface and chamfers at a periphery of each surface, in which radiophoto-luminescence is emitted through excitation by means of ultraviolet rays; and

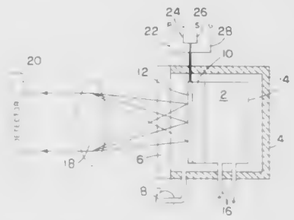
a glass element holder including an inner holder which has a mask frame for covering the chamfers of one fluorescence detection surface of said fluorescent glass element, and externally holds said fluorescent glass element while at least an ultraviolet ray incident surface is left uncovered, and an outer holder in which said inner holder is slidably fitted, has a mask frame for covering the chamfers of the other fluorescence detection surface at a side of generating the fluorescence of said fluorescent glass element;

said outer holder having a hole and said inner holder having a pawl for engaging with the hole, thereby the inner holder being fixed to the outer holder when the inner holder is completely fitted in the outer holder.

4,922,116
FLICKER FREE INFRARED SIMULATOR WITH RESISTOR BRIDGES

Jan Grinberg, Los Angeles, and Murray S. Welkowsky, Chatsworth, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 228,630, Aug. 4, 1988, abandoned. This application Jun. 21, 1989, Ser. No. 370,109
Int. Cl.[5] H05B *3/26*
U.S. Cl. 250—495.1 38 Claims



1. An infrared (IR) simulator, comprising:

a substrate formed from an insulative material, and

an array of pixel cells on said substrate, each of said cells comprising:

a resistor bridge spanning a portion of the cell and contacting the substrate at spaced apart contact locations within the cell, said bridge being shaped to form a thermally insulative gap between the bridge and substrate between said contact locations,

a semiconductor drive circuit on said substrate for enabling a desired amount of current flow through said resistor bridge in response to an input control signal for heating the bridge and thereby producing IR radiation therefrom, and

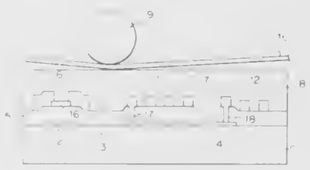
control, actuating and power lead lines for respectively delivering control and actuating signals to said drive circuit, and an electrical power signal to said resistor bridge

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4,922,117
PHOTOELECTRIC CONVERSION DEVICE HAVING A CONSTANT POTENTIAL WIRING AT THE SIDES OF THE COMMON WIRING

Toshihiro Saika, and Noriyuki Kaifu, both of Hiratsuka, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,260
Claims priority, application Japan, Jun. 12, 1987, 62-146373
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—578.1 7 Claims



1. A photoelectric conversion device comprising:

a substrate;

M common lines, M being a predetermined positive integer;
a matrix N× M of photoelectric conversion elements arranged in a one-dimensional array disposed on said substrate and connected to said M common lines forming a matrix wiring, wherein N is a predetermined positive integer;
a transparent protective layer disposed on said photoelectric conversion elements and said M common lines of the matrix wiring; and
at least one constant potential wiring maintained at a constant potential disposed at least on both sides of said common lines of the matrix wiring.

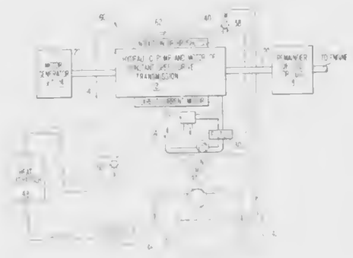
4,922,118
APPARATUS FOR INCREASING NUMBER OF SCANNING LINES
Kazuya Maeshima, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 18, 1989, Ser. No. 353,526
Claims priority, application Japan, Jul. 8, 1988, 63-168980
Int. Cl.[5] H04N *11/06*
U.S. Cl. 358—140 **6 Claims**



1 An apparatus for increasing a number of scanning lines, comprising:
a video memory for reading/writing a video signal of a television signal,
a double-speed horizontal synchronizing signal producing circuit for producing a double-speed horizontal synchronizing signal from a horizontal synchronizing signal extracted from said television signal,
a master clock oscillator for generating master clock pulses as a reference signal independent of both the horizontal synchronizing signal and the double-speed horizontal synchronizing signal,
a first differentiating circuit and a second differentiating circuit for differentiating said horizontal synchronizing signal and said double-speed horizontal synchronizing signal, respectively, with respect to said master clock pulses,
a frequency demultiplying counter and a double-speed frequency demultiplying counter being preset with respective differentiating pulses obtained from said first and second differentiating circuit, for outputting write-clock-pulses and read-clock-pulses, respectively, in synchronism with said master clock pulses.

4,922,119
INTEGRATED STARTING SYSTEM
Bernard A. Raad, and Tyrone A. Johnsen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Nov. 29, 1988, Ser. No. 277,542
Int. Cl.[5] F02N *11/04*
U.S. Cl. 290—31 **17 Claims**

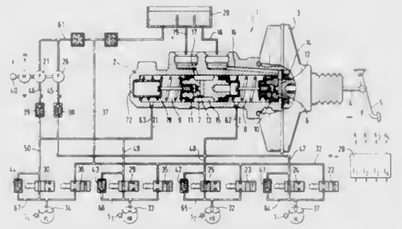
1. A system for starting an engine comprising:
a constant speed drive transmission having a drive shaft for connection to the engine with the drive shaft being coupled to a first hydraulic unit and an output shaft being coupled to a second hydraulic unit with the output shaft being coupled to a motor-generator set, the output shaft being driven at a constant rotational velocity during the generation of electrical power and the drive shaft being driven during starting of the engine, the first hydraulic unit functioning as a hydraulic pump and the second hydraulic unit functioning as a hydraulic motor during generation of electrical power and the first hydraulic unit functioning as a hydraulic motor and the second hydraulic unit functioning as a hydraulic pump during starting of the engine;
the hydraulic units being disposed within a case which is full of hydraulic fluid during operation;
an electric motor disposed within the case having a rotor coupled to at least the output shaft and a stator for applying torque to the rotor;



the electric motor having a stall torque which is insufficient to rotate the output shaft initially during starting of the engine when the hydraulic fluid in the case has a temperature below a stall temperature, the electric motor during stall of the rotor caused by hydraulic fluid temperature within the case transferring heat to the hydraulic fluid to lower viscosity of the hydraulic fluid to a level at which torque developed by the electric motor is sufficient to initiate rotation of the output shaft and the motor-generator set and accelerate the output shaft and motor-generator set to a rotational velocity at which the motor-generator set may be operated as a synchronous motor to apply torque through the constant speed drive transmission to the drive shaft for starting the engine.

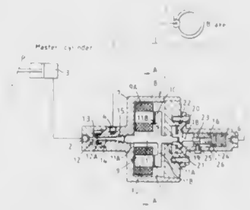
4,922,120
BRAKE SYSTEM WITH SLIP CONTROL
Horst-Peter Becker, Frankfurt am Main; James Remfrey, Oberursel, and Gottfried Dehio, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Aug. 26, 1988, Ser. No. 237,587
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728783; Sep. 4, 1987, 3729543
Int. Cl.[5] B60T *8/44, 15/12, 11/20*
U.S. Cl. 303—114 **11 Claims**

1. A brake system including slip control means comprising a pedal-actuated, braking pressure generator including a master cylinder having a longitudinal bore, a primary piston and a secondary piston in said bore; wheel brakes hydraulically connected by main brake lines to said braking pressure generator; at least one auxiliary-pressure hydraulic pump; wheel sensor means and electronic circuit means for determining wheel rotational behavior and for generating electric braking-pressure control signals which, for the purpose of slip control, control electromagnetically actuatable pressure-fluid inlet valves and outlet valves in the brake lines; a first and a second central control valve in said master cylinder actuated in a direction opposite to an actuating direction of the master cylinder; each central control valve having a valve-opening mechanism which, in a brake release position, opens pressure-fluid connections between a pressure fluid supply reservoir and a primary and a secondary pressure chamber of said master cylinder and closes said pressure-fluid connections in a braking position; the valve-opening mechanism of the second central control valve being supported on a bottom portion of the longitudinal bore of the master cylinder and the valve-opening mechanism of the first central control valve being supported on the secondary piston, and hydraulic means generating a force component acting on said valve opening mechanisms to effect opening of the central control valves during a slip con-



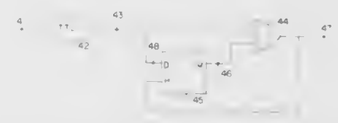
trol action, in the presence of a predetermined travel of the primary and secondary pistons of the master cylinder, wherein the valve-opening mechanism of the second central control valve is supported by a stop sleeve engaged with a housing of the master cylinder, wherein the stop sleeve is attached to a threaded portion which penetrates the bottom of the longitudinal bore of the master cylinder and is secured to the housing with a lock nut, and, wherein the threaded portion comprises a radial flange including an axial recess a seal being arranged in the recess to seal the stop sleeve relative to the bottom of the longitudinal bore.

4,922,121
MODULATOR ASSEMBLY
Philip A. Taft, Solihull, Great Britain, assignor to Lucas Industries Public Limited Company, Birmingham, England
Filed Nov. 17, 1988, Ser. No. 272,440
Claims priority, application United Kingdom, Nov. 20, 1987, 8727292
Int. Cl.[5] B60T *8/42;* **B61L** *7/00*
U.S. Cl. 303—115 **20 Claims**



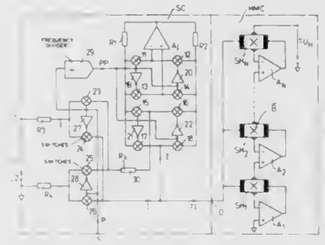
1. A modulator assembly for use in a hydraulic vehicle braking system comprising:
valve means operable, in use, to isolate a pressure source from a brake actuator upon the occurrence of an incipient wheel slip condition at a wheel braked by the actuator;
pressure modifying means operable to vary the pressure in the actuator in such a manner as to effect a correction of said wheel slip condition; and
a single electrical drive device having a rotatable and axially movable armature which moves axially for actuating said valve means and rotationally for simultaneously actuating said pressure modifying means.

4,922,122
CIRCUIT FOR THE DETECTION OF ADDRESS TRANSITIONS
Bruno Dubujet, Le Tholonet, France, assignor to SGS-Thomson Microelectronics, SA, Gentilly, France
Filed Aug. 23, 1988, Ser. No. 235,324
Claims priority, application France, Sep. 1, 1987, 87 12155
Int. Cl.[5] H03K *19/017*
U.S. Cl. 307—480 **9 Claims**



1. A circuit for the detection of address transitions in an integrated circuit wherein an output pulse is generated as soon as there is an address change at an input terminal, said detection circuit comprising:
an input terminal to which is applied an input logic signal,
means connected to the input terminal for memorizing the state of the input logic signal and providing an output signal,
comparison means having a first input terminal connected to the logic signal input terminal and a second input terminal connected to the output terminal of the memorizing means, said comparison means having an output terminal which is at a first logic signal level when its input terminals receive the same logic signal levels and at a second logic signal level when its input terminals receive different logic levels.

4,922,123
SUPPLY CIRCUIT FOR A HALL SENSOR MULTIPLICATION CIRCUIT
Miro Rozman, Lesce, Yugoslavia, assignor to Iskra-Sozd Elektrokovinske Industrije N.Sol.O., Ljubljana, Yugoslavia
Filed Mar. 16, 1989, Ser. No. 324,414
Claims priority, application Yugoslavia, Mar. 18, 1988, 556/88
Int. Cl.[5] G01R *21/08, 21/00, 21/06*
U.S. Cl. 307—309 **2 Claims**



1 Supply circuit for a Hall sensor multiplication circuit, characterized in
that a load terminal (L1) is through a resistor (R3) connected, through a switch (23) to the first terminal of an adjustable resistor (Rk), and through a switch (24) to the output terminal (O) and through a switch (26) to the first terminal of a resistor (R4), whose second terminal is con-

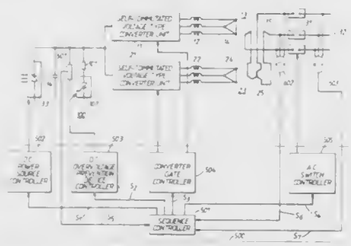
nected to a grounded load terminal (L2), and through a switch (25) to the first terminal of the resistor (Rk),
that the second terminal of the resistor (Rk) is connected to a common terminal of switches (15,16), whose second terminal is connected to the common terminal of switches (11,13;12,14, resp.) and to the first terminal of resistors (R1,R2, resp.) the second terminal of these resistors being connected to the output of an operational amplifier (A1), whose inverting input is connected to the second terminal of the switches (11,12) and whose noninverting input is connected to the second terminal of the switches (13,14),
that the output terminal (O) is connected through switches (17,18) to the first terminal of the resistors (R1,R2, resp.),
that the signal input terminal (SI) is connected to the control terminal of the switches (23,26), and through inverters (27,28) to the control terminal of the switches (24,25, resp.) and to the input of a frequency divider (29),
and that the output of the frequency divider (29) is connected to the control terminal of the switches (11,14,15,18) and through inverters (19,20,21,22) to the control terminal of the switches (13,12,17,16, resp.).

4,922,124

ARRANGEMENT FOR CONNECTING PLURAL SELF-COMMUTATED VOLTAGE TYPE INVERTERS TO A UTILITY GRID

Nagataka Seki, and Shunich Hirose, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 279,277, Dec. 21, 1988, which is a continuation-in-part of Ser. No. 198,851, May 26, 1988, abandoned. This application Dec. 28, 1988, Ser. No. 291,160
Claims priority, application Japan, Dec. 28, 1987, 62-330084
Int. Cl.[5] H02M *7/48*
U.S. Cl. 307—87 15 Claims



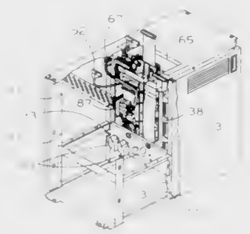
1 A power converter device, comprising.
a plurality of self-commutated voltage type converters, each connected to a common d.c. circuit;
a plurality of transformers, each having d.c. windings and a.c. windings, each of the d.c. windings being connected to an a.c. output terminal of a respective one of the converters and each of the a.c. windings being connected in series;
an a.c. switch means, through which the serially connected a.c. windings of said transformers are adapted to be connected to a utility power system;
a capacitor provided in said common d.c. circuit;
a d.c. overvoltage suppression means connected in parallel with said common d.c. circuit and including a series circuit of a resistor element and an interrupter switch means;
wherein said converters are started and said interrupter switch means is opened before closing said a.c. switch means,
said a.c. switch means is closed when the amplitude and phase of the resultant voltage of a.c. windings of said transformers approximately coincide with the amplitude and phase of the voltage of the utility power system,
the operation of said converters is stopped and said interrupter switch means is closed when a temporary stopping of the device is required, and
said interrupter switch means is opened when the device is restarted.

4,922,125

SYSTEM CABLE ASSEMBLY AND COMPONENT PACKAGING

Wayne J. Casanova; Roger F. Dimmick; William A. Hall; Lester C. Homan; Frank J. Lukes, all of Rochester; Bradley L. Martin, Byron; Claude J. Mosley; Arthur P. Reckinger, Jr., both of Rochester; Paul W. Schaefer; Zanti D. Squillace, both of Rochester; Gordon W. Westphal, and Stephen E. Wheeler, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1988, Ser. No. 169,515
Int. Cl.[5] H02B *1/20*
U.S. Cl. 307—149 12 Claims



1 A mechanical and electrical packaging structure for a multiple component system wherein such components are disposed in two stacks or towers comprising
an enclosure frame;
cable carrier means for electrically interconnecting components in said stacks which is fabricated and merged into said enclosure;
said cable carrier means carrying electrical connectors and component alignment means facing toward each component stack; and
means for guiding system components toward a latched, installed position in said enclosure and with said system with the electrical connection being completed at said latched position.

4,922,126

CIRCUIT FOR SHAPING A MEASUREMENT-SIGNAL VOLTAGE INTO A SQUARE-WAVE SIGNAL

Helmut Löwel, Nuremberg, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 30, 1988, Ser. No. 175,496
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710871
Int. Cl.[5] H03K *17/90, 17/72, 19/18*
U.S. Cl. 307—261 9 Claims

1 A circuit for shaping a measurement-signal voltage having a DC component and an AC component, into a square-wave signal, comprising a first voltage divider having a low end grounded through a load resistor, said load resistor being shunted by a series combination including a resistor and a grounded capacitor, the low end of said first voltage divider being connected through the resistor to a negative input of a comparator and an additional resistor to the positive input of the comparator, said positive input being connected through a feedback resistor to the output of the comparator, and the low end of said first voltage divider being connected to the supply voltage through a second voltage divider, said second voltage divider having a controllable, temperature-stabilized zener diode forming a first resistor, said diode being connected through a second resistor of the second voltage divider to the supply voltage and having a control electrode subjected to the



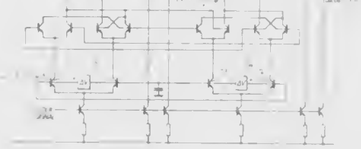
measurement-signal voltage obtained from a tap of the first voltage divider.

4,922,127

PHASE SHIFT ARRANGEMENT

Paul A. Denny, Kent, United Kingdom, assignor to Plessey Overseas Limited, Ilford, England

Filed Sep. 16, 1988, Ser. No. 245,154
Claims priority, application United Kingdom, Sep. 17, 1987, 8721882
Int. Cl.[5] H03K *5/00, 3/01*
U.S. Cl. 307—262 7 Claims



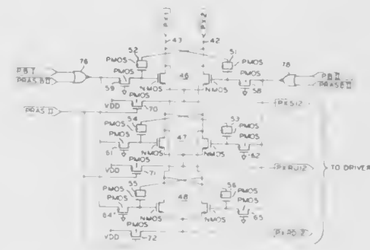
1. A phase shift arrangement arranged to be coupled to a clock pulse source, said clock pulse source being arranged to provide clock pulse signals, the phase shift arrangement including bi-stable means, said bi-stable means comprising a first bi-stable device and a second bi-stable device, said bi-stable means being coupled to said clock pulse source to allow said first bi-stable device and said second bi-stable device to be triggered by a predetermined level of said clock pulse signal from said clock pulse source, said triggered first bi-stable device being arranged to provide first output signals, said triggered second bi-stable device being arranged to provide second output signals, said first output signals, having a specified phase relation with said second output signals, said first bi-stable device and said second bi-stable device respectively each including bias means, said bias means being arranged to adjust the said predetermined level of clock pulse signal at which said first bi-stable device and said second bi-stable device are triggered such that said specified phase relation between said first output signals and said second output signals is determinable.

4,922,128

BOOST CLOCK CIRCUIT FOR DRIVING REDUNDANT WORDLINES AND SAMPLE WORDLINES

Sang H. Dhong, Mahopac; Wei Hwang, Armonk, and Nicky C. Lu, Yorktown Heights, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Jan. 13, 1989, Ser. No. 296,995
Int. Cl.[5] H03K *19/096, 5/13*
U.S. Cl. 307—269 9 Claims



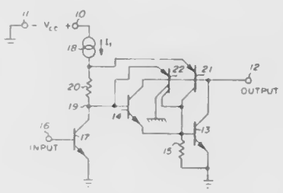
1. A boost clock signal generator which provides a boost clock signal from a pair of phase clock signals which synchronize reading of memory locations comprising:
a pair of differentially connected FET transistors for generating said boost clock signal, each of said transistors having a drain connection connected to one of said clock signals, and commonly connected source forming an output terminal;
a series pass FET transistor in series with each gate of said differentially connected transistors for maintaining each gate at a floating voltage potential;
a pair of capacitive coupling elements coupling the drain of each transistor of said pair of differentially connected FET transistors to the gate of an opposite transistor of said pair;
a first logic circuit connected to one of said series pass FET transistors; and,
a second logic circuit connected to a remaining one of said series pass FET transistors, whereby one or the other of said differentially connected transistors is gated on by one of said logic circuits in response to an enable signal, and said transistor is driven into non-conduction by a signal coupled by one of said capacitive coupling elements.

4,922,129

FEED FORWARD DARLINGTON CIRCUIT WITH REDUCED NPN REVERSE BETA SENSITIVITY

Michael E. Wright, Berkeley, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 26, 1989, Ser. No. 302,502
Int. Cl.[5] H03K *19/088*
U.S. Cl. 307—315 3 Claims



1. A Darlington transistor circuit stage having a pair of like conductivity transistors coupled together as output and driver

devices with their collectors commonly connected, means coupling the emitter of said driver transistor to the base of said output transistor and means coupling the base of said driver transistor to an input terminal, said circuit comprising:

a transistor, of complementary construction to that of said driver transistor, having a base coupled to said commonly connected collectors, a collector coupled to said emitter of said driver transistor and an emitter coupled to said base of said driver transistor;

a resistor providing the means for coupling said emitter of said complementary transistor to said base of said driver transistor; and

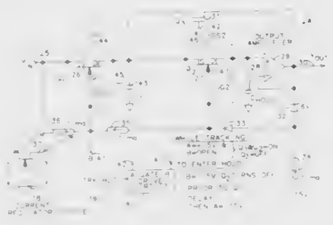
a constant current device connected to the juncture of said emitter of said complementary transistor and said resistor.

4,922,130

HIGH PERFORMANCE TRACK/HOLD FOR A DIGITAL MULTIMETER

Ronald L. Swerlein, Longmont, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 26, 1988, Ser. No. 198,941
Int. Cl.[5] H03K *5/159*; **H03L** *5/00*
U.S. Cl. 307—353 **6 Claims**



1. A circuit for tracking an applied input while in a track mode and subsequently capturing an instantaneous value of the applied input and during a hold mode replicating that captured value as an output, the circuit comprising:

a first switch having conditions of on and off, a first terminal for receiving an applied input referenced to a signal ground, and a second terminal;

A second switch having conditions of on and off, a first terminal, and a second terminal;

a capacitor having a first terminal and also a second terminal that is connected to the signal ground;

an amplifier of non-inverting unity gain having an input and also an output producing an output voltage;

a third switch having conditions of on and off and having first and second terminals;

the second terminal of the first switch being connected to the first terminal of the second switch and also to the first terminal of the third switch;

the second terminal of the second switch being connected to the input of the amplifier and also connected to the first terminal of the capacitor;

the output of the amplifier being coupled to the second terminal of the third switch; and

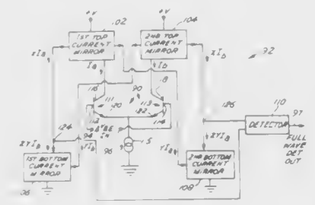
switch control means coupled to the first, second and third switches for implementing a track mode by causing the first and second switches to be on and the third switch to be off and also for immplementing the hold mode by, in sequential order, causing the second switch to be off, then causing the first switch to be off, and then causing the third switch to be on.

4,922,131

DIFFERENTIAL VOLTAGE THRESHOLD DETECTOR

James R. Anderson, Chicago, and Richard Brander, Cicero, both of Ill., assignors to Beltone Electronics Corporation, Chicago, Ill.

Division of Ser. No. 838,924, Mar. 14, 1986, Pat. No. 4,829,270.
This application Nov. 14, 1988, Ser. No. 270,619
Int. Cl.[5] H03K *5/24*
U.S. Cl. 307—355 **4 Claims**



1. A differential voltage threshold detector for sensing that the positive and negative values of the difference between voltages on a first input terminal and a second input terminal exceed a substantially predetermined threshold, comprising, in combination:

a differential transconductance stage, with first and second differential outputs, for sensing said voltages on said first and second input terminals and responsively issuing first and second output currents;

a first top current mirror, interconnected to said first differential output, for sensing said first output current and responsively issuing first and second mirrored currents respectively from first and second mirror outputs, said first and second mirrored currents respectively being in substantially predetermined first and second ratios to said first output current;

a second top current mirror, interconnected to said second differential output, for sensing said second output current and responsively issuing third and fourth mirrored currents respectively from third and fourth mirror outputs, said third and fourth mirrored currents respectively being in substantially predetermined third and fourth ratios to said second output current;

a first bottom current mirror, interconnected to said second top current mirror, for receiving said fourth mirrored current and for drawing a fifth current from a fifth output said fifth current being in a substantially predetermined fifth ratio to said fourth mirrored current;

a second bottom current mirror, interconnected to said first top current mirror, for receiving said second mirrored current and for drawing a sixth current from a sixth output, said sixth current being in a substantially predetermined sixth ratio to said second mirrored current;

detector means, interconnected to said top and bottom current mirrors, for issuing an output signal upon sensing that

(1) said first mirrored current from said first top current mirror exceeds said fifth current from said first bottom current mirror, and for issuing an output signal upon sensing that

(2) said third mirrored current from said second top current mirror exceeds said sixth current from said second bottom current mirror.

4,922,132

RADIO FREQUENCY ENERGY DETECTION CIRCUITRY

Charles S. Horvitz, Westwood, and Michael L. Miceli, Hingham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 1, 1989, Ser. No. 317,398
Int. Cl.[5] H03K *5/153, 5/24*
U.S. Cl. 307—359 **4 Claims**



1. Radio frequency energy detection circuitry comprising:

(a) means, including a diode detector having a first terminal fed by the received radio frequency energy and a second terminal connected to a reference potential, for producing an output voltage across the diode detector, such output voltage varying in accordance with the power of the received radio frequency energy, the voltage produced across the diode also varying with temperature variations over a predetermined operating range of temperatures;

(b) means for producing a nominal threshold voltage including:

temperature compensating circuitry means, disposed in thermal communication with the diode detector, for varying the nominal threshold voltage in accordance with the temperature produced variations in the voltage across the diode detector;

(c) means, including:

(i) a comparator having a pair of inputs and an output, a first one of the inputs being coupled to the diode detector;

(ii) a feedback resistor, coupled between the output of the comparator and a second one of the pair of inputs of the comparator,

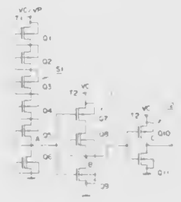
for producing at the output of the comparator an output signal in one of two logic states, in an initial state in the absence of received radio frequency energy and for changing the initial state to a second state in response to the received radio frequency energy exceeding a first predetermined power level, the second state of the output signal being combined with the temperature compensated threshold level produced by the temperature compensating circuit to reduce the voltage at the second one of the pair of inputs of the comparator to a lower threshold voltage representative of a second, lower predetermined power level to prevent the second state of the output signal from reverting to the initial state until the power level of the received radio frequency energy falls below the second, lower predetermined power level.

4,922,133

VOLTAGE DETECTING CIRCUIT

Hiroshi Iwahashi, Yokohama; Hiroto Nakai, Kawasaki, and Masamichi Asano, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1988, Ser. No. 226,097
Claims priority, application Japan, Jul. 31, 1987, 62-191547
Int. Cl.[5] H03K *5/153*
U.S. Cl. 307—363 **10 Claims**



1. A voltage detecting circuit which comprises:

a voltage-input terminal;

first and second nodes;

switch means connected between the voltage-input terminal and the first node, the switch means being turned on when a potential at the voltage-input terminal is higher than a predetermined value which is between a first voltage and a second voltage which is higher than the first voltage, and being turned off when the potential at the voltage-input terminal is lower than the predetermined value;

a first power-source potential terminal;

a second power-source potential terminal;

an inverter circuit having an input terminal connected to the first node and an output terminal connected to the second node, and including a first transistor having a source-drain path connected between the first power-source potential terminal and the second node, and a second transistor having a source-drain path connected between the second node and the second power-source potential terminal and a gate connected to the first node; and

current control means for causing the current flowing through the source-drain path of the first transistor to be substantially controlled, whereby to maintain the threshold voltage of the inverter circuit substantially constant irrespective of a potential at the first power-source potential terminal, said current control means including a current-source, the current control means and the first transistor being connected in series between the first power-source potential terminal and the second node.

4,922,134

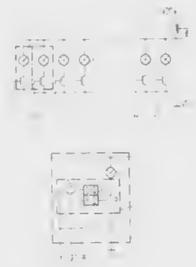
TESTABLE REDUNDANCY DECODER OF AN INTEGRATED SEMICONDUCTOR MEMORY

Kurt Hoffmann, Taufkirchen; Oskar Kowarik, Grafing; Rainer Kraus; Bernhard Lustig, both of Munich, and Hans-Dieter Oberle, Puchheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 309,386
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3804065
Int. Cl.[5] H03K *19/003*
U.S. Cl. 307—441 **8 Claims**

1. A redundancy decoder of an integrated semiconductor memory having a plurality of decoder stages containing a switching transistor and a separable connection having respective conditionns inn which the separable connection is severed and intact, as well as at least one charging transistor, comprising, in each of the decoder stages, an addressing circuit connected to and between the switching transistor and the separa-

ble connection of the respective decoder stages, said severed condition of said separable connection being electrically



simulatable by said addressing circuit when the respective separable connection is in the intact condition thereof.

4,922,135

GAAS MESFET LOGIC CIRCUITS INCLUDING PUSH PULL OUTPUT BUFFERS

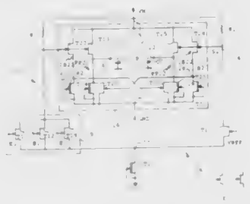
Pierre Mollier, Boissise Le Roi, and Pascal Tannhof, Perthes, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1988, Ser. No. 271,124

Claims priority, application European Pat. Off., Apr. 29, 1988, 88480011.1

Int. Cl.[5] H03K *19/017*

U.S. Cl. 307—450 21 Claims



1. A high speed logic circuit with improved output driving capability and reduced power consumption, comprising:

a determining logic block (DA) having a plurality of logic input terminals (I1, . . .) driven by corresponding input logic signals (E1, . . .) to perform a determined logical function (F); said logic block (DA) being coupled between at least first and second supply voltages (VH, VD) and supplying first and second output signals (S1, S2) complementary and substantially simultaneous to each other, at first and second output nodes (13, 14); and

a first output buffer (PP21) coupled between third and fourth supply voltages;

said first output buffer (PP21) including active pull up means (T13) and active pull down means (T20) connected in series and to a common node therebetween; said pull up means being driven by said first output signal (S1) and said pull down means being driven by said second output signal (S2) and through an intermediate buffer (IB22) of the source follower type coupled between said third and fourth supply voltages (PP21), to ensure a push pull operation of said first output buffer and to supply a first circuit output signal (A1) at the common node between said pull up and pull down means.

4,922,136

MASTER SLICE INTEGRATED CIRCUIT HAVING HIGH AND LOW SPEED UNIT CELLS

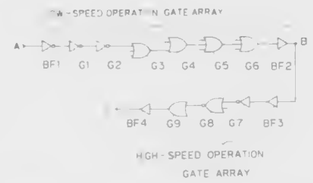
Masahiro Ueda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1988, Ser. No. 232,091

Claims priority, application Japan, Sep. 8, 1987, 62-225031

Int. Cl.[5] H03K *19/013, 19/177*

U.S. Cl. 307—465.1 3 Claims



1. A semiconductor integrated circuit of the master slice system, comprising:

a semiconductor chip;

a first internal cell group formed on said semiconductor chip, said first internal cell group including a plurality of first internal cells having a first operating speed;

a second internal chip group formed on said semiconductor chip, said second internal cell group including a plurality of second internal cells having a second operating speed which is different from said first operating speed, wherein said first and second internal cells are arranged in the form of arrays, respectively wherein first operating speed of said first internal cells is relatively high and said second operating speed of said second internal cells is relatively low and wherein the numbers of said first internal cells and said second internal cells are in the ratio of 1:10.

4,922,137

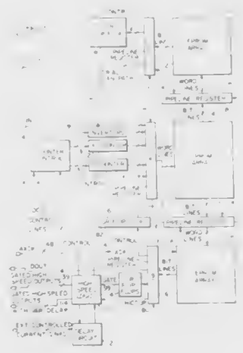
PROGRAMMABLE SEQUENCE GENERATOR

Jeffrey A. Small; Mark D. Brown, and John A. Vincent, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 194,778, May 17, 1988, abandoned. This application Jun. 6, 1989, Ser. No. 362,293

Int. Cl.[5] H03K *19/00, 19/02*

U.S. Cl. 307—480 4 Claims



1. A programmable integrated circuit for generating timing signals for use with an area image sensor or the like, comprising:

(a) a clocked pipeline register responsive to a plurality of external signals for providing word line signals;

(b) at least one EPROM array responsive to the word line signals for selectively providing a plurality of different functions of the word lines to produce output signals; and

(c) high speed logic responsive to these output signals and a clock signal at a first rate, said high speed logic producing a second clock signal at an integer divisor of the first clock signal rate to clock the pipeline register, and also producing additional clock signals which are derived at the first rate or integer divisors of the first rate which are selectively controlled by the output signals of the EPROM array.

4,922,138

SCAN CIRCUIT USING A PLURAL BOOTSTRAP EFFECT FOR FORMING SCAN PULSES

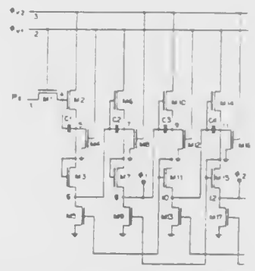
Seiji Hashimoto, Yokohama, and Tadanori Harada, Tokorozawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,479

Claims priority, application Japan, May 25, 1987, 62-125925; May 25, 1987, 62-125926

Int. Cl.[5] H03K *19/096*

U.S. Cl. 307—482 19 Claims



1. A scan circuit comprising a plurality of stages of interconnected unit circuits, in which scan pulses are sequentially output from said unit circuits in response to drive pulses;

a first one of said unit circuits including a first input terminal, a first output terminal and first bootstrap means, and a second one of said unit circuits including a second input terminal, a second output terminal and second bootstrap means;

wherein a first potential at said first output terminal is raised by said first bootstrap means when a drive pulse is input to said first input terminal of said first unit circuit, said first output terminal of said first unit circuit being connected to said second input terminal of said second unit circuit so as to apply said first potential thereto; and

wherein the raised first potential at the first output terminal is further raised by raising a second potential at said second output terminal of said second unit circuit by said second bootstrap means in response to a further drive pulse, the further raised first potential being output as one of said scan pulses.

4,922,139

FILTER CIRCUIT FOR GENERATING A VCO CONTROL VOLTAGE RESPONSIVE TO THE OUTPUT SIGNALS FROM A FREQUENCY/PHASE DISCRIMINATOR

Burkhard Giebel, Denzlingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 312,263

Claims priority, application European Pat. Off., Mar. 30, 1988, 88105166

Int. Cl.[5] H03K *5/00;* H03B *1/00*

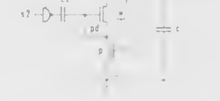
U.S. Cl. 307—520 6 Claims

1. A filter circuit for a digital phase-locked loop (PLL) circuit, said filter circuit receiving first and second digital signals from a digital frequency/phase discriminator responsive to the phase relationship between two periodic input signals applied to said digital frequency/phase discriminator, said filter circuit providing a smoothed output voltage on an output terminal for controlling a voltage controlled oscillator, said filter circuit comprising:

a first n-conducting transistor having a control terminal and a current path controlled by said control terminal, said controlled current path having first and second ends, said first end of said controlled current path of said first n-conducting transistor connected to the plus pole of a source of supply voltage;

a first p-conducting transistor having a control terminal and a current path controlled by said control terminal, said controlled current path having first and second ends, said second end of said controlled current path of said first p-conducting transistor connected to the minus pole of said source of supply voltage;

a second n-conducting transistor having a control terminal and a current path controlled by said control terminal, said controlled current path having first and second ends, said first end of said controlled current path of said second n-conducting transistor connected to said second end of said controlled current path of said first n-conducting transistor, said second end of said controlled current path of said second n-conducting transistor connected to said output terminal of said filter circuit, said control terminal of said second n-conducting transistor connected to said second end of said controlled current path of said first n-conducting transistor and to said first end of said controlled current path of said second n-conducting transistor so that said second n-conducting transistor operates as a diode;



a second p-conducting transistor having a control terminal and a current path controlled by said control terminal, said controlled current path having first and second ends, said second end of said controlled current path of said second p-conducting transistor connected to said first end of said controlled current path of said first p-conducting transistor, said first end of said controlled current path of said second p-conducting transistor connected to said output terminal of said filter circuit, said control terminal of said second p-conducting transistor connected to said first end of said controlled current path of said first p-conducting transistor and to said second end of said controlled current path of said second p-conducting transistor so that said second p-conducting transistor operates as a diode;

a series RC circuit comprising a resistor and a capacitor each having respective first and second terminals, said first terminal of said resistor connected to said output terminal of said filter circuit, said second terminal of said resistor connected to said first terminal of said capacitor, said second terminal of said capacitor connected to said minus pole of said source of supply voltage, said second terminal of said resistor and said first terminal of said capacitor connected to said control terminals of said first n-conducting transistor and said first p-conducting transistor;

a first input terminal for receiving said first digital signal

from said frequency/phase discriminator indicative of a first phase relationship between said periodic input signals applied to said frequency/phase discriminator;

a second input terminal for receiving a second digital signal from said frequency/phase discriminator indicative of a second phase relationship between said periodic input signals applied to said frequency/phase discriminator;

a capacitor connected between said first input terminal and said control terminal of said second n-conducting transistor to provide a signal responsive to said first digital signal to said control terminal of said second n-conducting transistor, said second n-conducting transistor conducting current to increase the voltage on said output terminal of said filter circuit in response to said first phase relationship; and

an inverter and a capacitor connected in series between said second input terminal and said control terminal of said second p-conducting transistor to provide a signal responsive to said second digital signal to said control terminal of said second p-conducting transistor, said second p-conducting transistor conducting current to decrease the voltage on said output terminal of said filter circuit in response to said second phase relationship.

4,922,140

CMOS/NMOS INTEGRATED CIRCUIT WITH SUPPLY VOLTAGE DELAY VARIATION COMPENSATION

Hans-Jurgen Gahle, and Arnold Uhlenhoff, both of Emmendingen, Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Mar. 17, 1989, Ser. No. 324,865

Claims priority, application European Pat. Off., Mar. 31, 1988, 88105243.5

Int. Cl.[5] H03K *17/14*

U.S. Cl. 307—591 **20 Claims**



1. A CMOS/NMOS integrated circuit for implementing given functions each of which function is implemented with a single basic circuit type with said given function implemented by a first subnumber p of basic circuits required for said function as CMOS basic circuits (C) and a remaining subnumber (q) implemented as enhancement-mode NMOS basic circuits (n) where the subnumber p is selected so that the supply voltage dependence of the propagation delay in the CMOS basic circuits (C) is compensated for by the supply voltage dependence of the propagation delay in the NMOS basic circuits (n).

4,922,141

PHASE-LOCKED LOOP DELAY LINE

Karl M. J. Lofgren, Long Beach; Gerald W. Shearer, Orange, and Kenneth W. Ouyang, Huntington Beach, all of Calif., assignors to Western Digital Corporation, Calif.

Continuation of Ser. No. 916,404, Oct. 7, 1986. This application Jun. 3, 1988, Ser. No. 205,517

Int. Cl.[5] H03K *5/159, 3/01*

U.S. Cl. 307—595 **31 Claims**

1. A circuit for providing a signal having a precise delay with respect to a digital input signal, comprising:

a single reference frequency source for generating a periodic input signal of constant period;

a variable delay circuit for receiving the input signal and generating an output signal which is delayed with respect to the input signal, herein the delay circuit includes a control voltage input to control the amount of delay;

control means for comparing the phase between the input signal and the output signal and varying the amount of delay provided by the delay circuit to achieve and maintain a desired delay equal to an integer multiple of said constant period, wherein the control means includes:

means for generating the control voltage as a function of the phase difference between the input signal and output signal, and



means, coupled to the means for generating, for determining whether the phase of the input signal leads or lags the phase of the output signal,

wherein the means for generating the control voltage includes a charge pump having a capacitor which is charged or discharged, wherein the voltage across the capacitor is the control voltage, and

wherein the means for determining generates a first signal causing the charge pump to charge the capacitor in a first direction when the phase of the input signal leads the phase of the output signal and generates a second signal causing the charge pump to charge the capacitor in the opposite direction when the phase of the input signal lags the phase of the output signal.

4,922,142

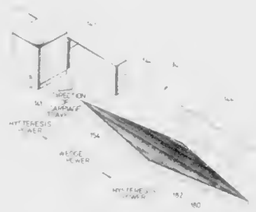
METHOD AND APPARATUS FOR CONTROLLING THE CARRIAGE OF A LINEAR MOTOR

Paul W. Givler, Jr., Coatesville, Pa.; William J. Hommes, Hockessin, Del.; Cobern V. Peterson, West Grove, Pa., and Madison A. Culver, Grove City, Ohio, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1988, Ser. No. 209,909

Int. Cl.[5] H02K *41/02*

U.S. Cl. 310—12 **13 Claims**



1. A method of controlling the movement of a carriage having synchronous linear motor secondary attached, the carriage travelling along an elongated track, comprising the steps of:

propelling the carriage at two discontinuous portions along the track by a propulsion means;

propelling the carriage between the discontinuous portions by exposing the synchronous secondary to a controlled volume of ferromagnetic material spaced from the secondary, wherein the controlled volume is first increasing and then decreasing in the direction of travel.

4,922,143

LINEAR UNIT

Gerhard Gosdowski, Bietigheim-Bissingen, and Andreas Kettner, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

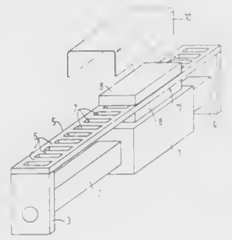
PCT No. PCT/DE87/00201, § 371 Date Jan. 13, 1988, § 102(e) Date Jan. 13, 1988, PCT Pub. No. WO87/07453, PCT Pub. Date Dec. 3, 1987

PCT Filed May 6, 1987, Ser. No. 155,718

Claims priority, application Japan, May 30, 1986, 3618194

Int. Cl.[5] H02K *41/03*

U.S. Cl. 310—12 **6 Claims**



1. Linear unit comprising a carriage; a holder, said carriage being guided longitudinally displaceably in said holder; and an electromagnetically operated linear motor including two mutually opposite stators and a rotor connected to the carriage and arranged in a pole gap between said two mutually opposite stators, said rotor incuding a strip having a tooth structure consisting of magnetic metal, said stators having guide surfaces bounding said pole gap, said strip being flexible and fixed self-supportingly on the carriage only at two ends thereof and guided on both sides on said surfaces of the stators.

4,922,144

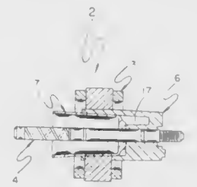
ROTOR ASSEMBLY STRUCTURE

Gerald N. Baker, and Ray E. Bushor, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 222,033, Jul. 21, 1988, Pat. No. 4,843,705. This application Mar. 20, 1989, Ser. No. 325,398

Int. Cl.[5] H02K *7/08*

U.S. Cl. 310—42 **13 Claims**



1. A rotor assembly for an electric motor comprising:

a rotor core including a stack of annular laminations of suitable ferro-magnetic materials with a pair of annular end rings in fixed and molded relation with opposed faces of said stack of annular laminations to define a longitudinally extending rotor core opening therethrough and provide a longitudinal axis of rotation about which said rotor core is rotatable;

a rotor shaft extending through said rotor core opening along said longitudinal axis of rotation;

a rotor hub molded within said rotor core opening in fixed relation to said stack of annular laminations and said rotor shaft with one end of said molded rotor hub having a cup-like opening therein with the base of said cup-like opening being molded in fast relation around said rotor shaft; and,

a tubular, open-ended oil return member cooperatively disposed relative and in alignment with said cup-like opening of said rotor hub to surround said rotor shaft in spaced relation thereto.

4,922,145

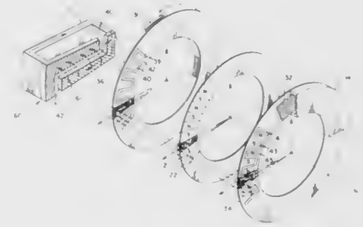
STEPPER MOTOR

Boris A. Shtipelman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1988, Ser. No. 272,370

Int. Cl.[5] H02K *37/12*

U.S. Cl. 310—49 R **6 Claims**



1. A stepper motor comprising:

an disc-shaped rotor disposed in said motor for rotation about an axis, said rotor including a plurality of discrete permanent magnets evenly distributed around the periphery thereof;

means for mounting said rotor for rotation, said mounting means including a cylindrical element having a central opening therein along said axis for receiving a driven element;

a stator which includes a generally planar first coil mounted on one side to said rotor and a generally planar second coil mounted on an opposite side thereof;

generally planar annular pole plates mounted on opposite sides of said rotor, a first pole plate being located between said first coil and said rotor, a second pole plate being located between said second coil and said rotor, each of said pole plates including a plurality of circumferentially spaced radially extending teeth; and

a first housing which extends around said first coil and is in contact with said first pole plate and a second housing which extends around said second coil and is in contact with said second pole plate, said housings being formed of a magnetizable material, and said housings supporting said mounting means and rotor for rotation.

4,922,146

COOLING ARRANGEMENT FOR A DC MOTOR

Martin Vanduyn, Peterborough, Canada, assignor to General Electric Canada Inc., Mississauga, Canada

Filed Mar. 22, 1989, Ser. No. 327,447

Claims priority, application Canada, May 19, 1988, 567253

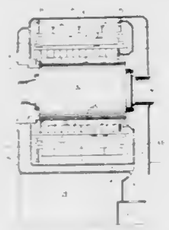
Int. Cl.[5] H02K *9/00*

U.S. Cl. 310—59 **5 Claims**

1. A cooling arrangement for a commutator type dynamo-

electric machine having at one end thereof a commutator, a rotor mounted for rotation within a stator, axially extending cooling passage means in said rotor communicating with inlet gas cooling means at a drive end of said machine opposite the commutator end of said machine and with spaced radially extending ducts in said rotor, the spaced radially extending ducts in said rotor communicating with an air gap between said rotor and said stator, said arrangement comprising

a first collecting chamber at said commutator end communicating with said air gap, and a second collecting chamber at said drive end communicating with said air gap, and



chamber means communicating with both said first and second collecting chambers for receiving gas therefrom and discharging said gas, the main flow of gas from said inlet gas cooling means being through said axially extending cooling passage means, said radially extending ducts in said rotor, and to the air gap, the flow in the air gap being in both axial directions to a respective nearer one of said first and second collecting chambers and into said chamber means for providing a shorter path and a reduced velocity for the flow of cooling gas.

4,922,147

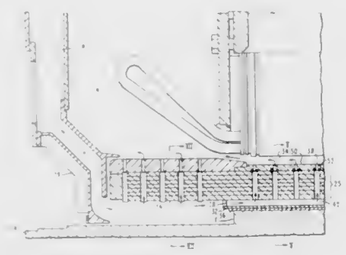
APPARATUS AND METHOD FOR THERMAL BALANCING OF THE ROTOR OF A DYNAMO-ELECTRIC MACHINE

Albert C. Sismour, Jr., Casselberry; Robert T. Hagaman, Oviedo, and Sui-Chun Ying, Winter Springs, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 25, 1988, Ser. No. 275,852

Int. Cl.[5] H02K *1/32*

U.S. Cl. 310—61 **16 Claims**



1 A dynamo-electric machine comprising:

(a) a stator;

(b) a rotor centrally disposed within said stator and having a body portion;

(c) a housing encasing said stator and rotor;

(d) a fluid coolant circulating within said housing and flowing through said stator and rotor;

(e) a plurality of axially extending rotor body slots in said body portion of said rotor, each of said rotor body slots containing a plurality of field winding conductors, each of said rotor body slots containing an axial passageway and a plurality of radial passageways, said coolant flowing through said axial and said radial passageways; and

(f) means for finely and individually regulating said coolant flow in any one of said rotor body slots, thereby enabling modification of the temperature distribution in said rotor, wherein said regulating means further comprises

i. a baffle disposed in said axial passageway in said rotor body slot in which said coolant flow is to be regulated, thereby restricting the flow area of said axial passageway, the size of said baffle being variable depending on the amount of regulation of said coolant flow desired, and

ii. an orifice means forming a portion of one of said radial passageways in said rotor body slot in which said coolant flow is to be regulated, the effect of said orifice means on the flow area of said radial passageway being variable

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4,922,148

WATER-COOLED ALTERNATOR FOR VEHICLE

Yutaka Kitamura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,593

Claims priority, application Japan, Apr. 25, 1988, 63-101725

Int. Cl.[5] H02K *5/24;* **F16F** *15/22*

U.S. Cl. 310—68 D **1 Claim**



1 An alternator for a vehicle, comprising a rotor magnetic core fixedly secured to a rotary shaft and adapted to be magnetized by an exciting coil, a stator core surrounding said rotor magnetic core and having a stator coil mounted thereon, a front bracket supporting a bearing and a rear bracket supporting a bearing, said front and said rear bracket supporting said stator core and said rotary shaft through said respective bearings, a fan mounted on a front end portion of said magnetic core, for supplying cooling air into said front bracket, a rectifier and a voltage regulator, a cooling cover mounted liquid-tightly on a rear end of said rear bracket and having an outer surface on which said rectifier and said voltage regulator are mounted and a coolant passage provided between said rear end portion of said rear bracket and said cooling cover for circulating liquid coolant supplied from outside of said alternator, a portion of said rear bracket being in direct contact with an engine block, and a passage liquid-tightly constituted for communicating said coolant passage of said rear bracket with a coolant circulation system of an engine through said direct contact portion.

4,922,149

ELECTRIC MOTOR DEVICE

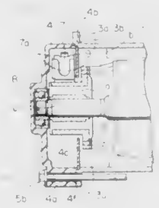
Shuzoo Isozumi, and Keiichi Konishi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,516

Claims priority, application Japan, Dec. 18, 1987, 62-322012; Dec. 18, 1987, 62-193240[U]; Jun. 13, 1988, 63-78107[U]

Int. Cl.[5] H02K *5/04, 5/14*

U.S. Cl. 310—89 **13 Claims**



1 An electric motor device comprising:

a hollow cylindrical yoke made of a metallic material;

a front frame coupled to a front end of said yoke to accomodate an output portion of said electric motor device;

field magnets secured to the inner circumferential surface of said yoke;

an armature mounted an a shaft to oppose said field magnets over a radia gap formed therebetween;

a cup-shaped bracket coupled to an end portion thereof to a rear end of said yoke and rotatably supporting a rear end portion of said shaft of the armature, wherein said cup-shaped bracket is made of a resin and includes a boss formed integrally at a side portion of said cup-shaped bracket to extend radially outwardly therefrom, said boss having an axially extending central through bore formed therein;

power supply means, including a brush disposed within said cup-shaped bracket in slidable contact with a commutator of said armature, for supplying an electric power to said armature;

a through bolt extending through said central bore of said boss at one end thereof and fastened to said front frame at the other end thereof, thereby securing said cup-shaped bracket to said yoke by a fastening force of said bolt; and

an abutment member extending radially outwardly from said rear end of said cylindrical yoke at a circumferential position at which said boss of the bracket is formed, said abutment member including a rear surface against which a front end surface of said boss of the bracket abuts.

4,922,150

VERTICAL-AXIS ELECTRICAL MACHINE OF UMBRELLA DESIGN

Mihailo Starcevic, Mellingen, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Apr. 11, 1989, Ser. No. 336,083

Claims priority, application Switzerland, Apr. 26, 1988, 1556/88

Int. Cl.[5] H02K *7/08*

U.S. Cl. 310—90 **11 Claims**

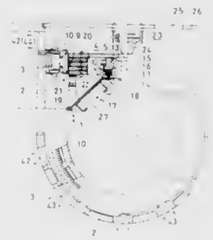
1. A vertical axis electrical machine of unbrella design, comprising:

a stator mounted stationary with respect to a foundation;

a rotor rotatably mounted adjacent said stator;

thrust and journal bearing means supporting said rotor for rotation with respect to said stator; and

a bearing support structure comprising a truncated cone having an upper, smaller end supporting said thrust and journal bearing means, and a lower, larger end supported directly on the foundation, wherein said bearing support structure comprises means for supporting thrust and journal loads from said thrust and journal bearing means and for transferring said loads to the foundation via the plane of said truncated cone,



whereby said rotor is rigidly radially supported while thermally caused dimensional variances in the length of the bearing support structure result in axial movements of said rotor.

4,922,151

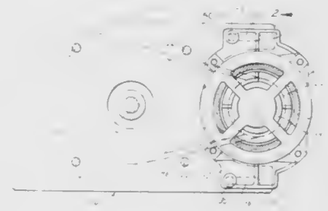
ELECTRIC MOTOR MOUNTING ASSEMBLY

John G. Lewis, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 2, 1988, Ser. No. 227,162

Int. Cl.[5] H02K *5/26;* **F16H** *7/14*

U.S. Cl. 310—91 **5 Claims**



1. A two point motor mounting assembly for mounting a motor used in a household appliance within the appliance, the motor being connected to a transmission system comprising:

a mounting plate installed within the appliance and having a yoke-shaped section at one end thereof defining a pair of spaced apart yoke arms between which the motor is received;

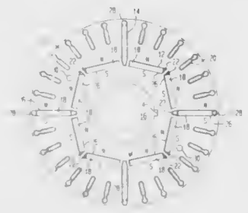
an end shield attached to one end of the motor and having a pair of opposed mounting ears extending outwardly from the sides thereof, the spacing between said mounting ears being such that each ear respectively overlays one of the yoke arms when the motor is fitted therebetween, each yoke arm and its overlaying mounting ear having corresponding openings therethrough for attaching the end-shield to the mounting plate;

fastening means fitting through each set of openings to mount the motor to the plate; and,

stiffening means on the end of each mounting ear, the opening in each ear being at one end of the ear and the stiffening means being at the opposite end thereof, said stiffening means strengthening the mounting ear and enabling it to withstand the forces applied by the yoke arm against the mounting ear to thereby help balance the forces between the motor and the transmission system.

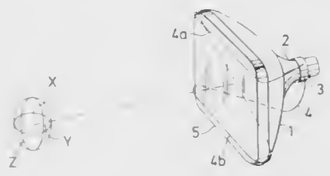
VOL 114 ISS 1 MY 1 1990 UMI

4,922,152
SYNCHRONOUS MACHINE ROTOR LAMINATION
R. Linn Gleghorn, Lansdale, Pa., and Paul D. Wagner, Little Rock, Ark., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.
Continuation of Ser. No. 224,642, Jul. 27, 1988, abandoned. This application Jun. 7, 1989, Ser. No. 364,543
Int. Cl.[5] H02K *15/02, 21/12*
U.S. Cl. 310—156 14 Claims



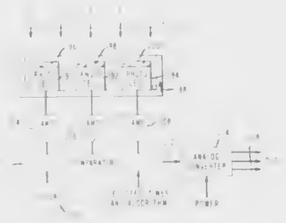
1. A universal rotor lamination for a synchronous machine comprising a circular piece of lamination material defining:
a periphery;
a shaft opening adapted to accept the machine shaft, the opening being centrally disposed within the circular piece;
at least four radially extending openings each defining a longitudinal axis and adapted to contain a magnet, the radially extending openings being disposed intermediate the periphery and the shaft opening, wherein the longitudinal axes of two of the radially extending openings coincide and are substantially perpendicular to the longitudinal axes of the other two radially extending openings; and
at least eight interior openings each adapted to contain a magnet, each opening defining a longitudinal axis, wherein the longitudinal axis of each interior opening intersects with the longitudinal axis of the interior openings it is adjacent to, and the eight interior openings are disposed intermediate the periphery and the shaft opening;
the lamination being universally useable in any of synchronous machines having two, four, and eight poles.

4,922,153
METHOD OF, AND DEVICE FOR, REDUCING MAGNETIC STRAY FIELDS
Bruno Kevius, Spånga, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 21,869, Mar. 4, 1987, abandoned. This application Sep. 7, 1988, Ser. No. 241,751
Claims priority, application Sweden, Mar. 7, 1986, 8601072
Int. Cl.[5] H01J *29/06*
U.S. Cl. 315—8 8 Claims



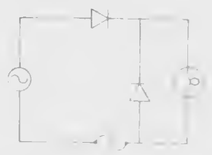
1. A device for reducing a magnetic stray field which is produced over a distance in front of the faceplate of a cathode ray tube and originates from deflection currents applied to deflection coils of the tube by a deflection circuit during operation of the tube; such faceplate having upper, lower, left and right edges; such deflection current varying with time in accordance with a time function; characterized in that such device comprises: a current conductor which is arranged on or in close proximity to said faceplate of said cathode ray tube; and circuit means for supplying to said current conductor a current which has a time function substantially the same as the time function of the stray field generating deflection currents supplied to said deflection coils, so that said current conductor continuously produces a magnetic field over said distance in front of the faceplate of said cathode ray tube substantially equal to but opposing said stray field.

4,922,154
CHROMATIC LIGHTING DISPLAY
Alain Cacoub, 94 Rue de Sevres, 75007 Paris, France
Filed Jan. 11, 1988, Ser. No. 142,015
Int. Cl.[5] H05B *37/02*
U.S. Cl. 315—149 12 Claims



1. A chromatic lighting display comprising at least one of a plurality of housings, said at least one housing having an exterior portion and an interior portion, at least one opening, said at least one opening communicating between said exterior portion and said interior portion of said at least one housing, means to detect the primary colors of ambient light present at said exterior portion of said at least one housing, means to detent the intensity of each of said primary colors present at said exterior portion of said at least one housing, at least three photocells, each of said at least three photocells producing output signals, said at least three photocells being secured to said interior portion of said at least one housing and exposed to said ambient light light entering said at least one housing through said at least one opening, at least three differently colored filters, said at least three colored filters being positioned to filter said ambient light passing through said at least one opening and through each of said at least three colored filters and impinging upon each of said at least three photocells, at least three amplifiers, each of said at least three photocells having output terminals, each of said at least three amplifiers having input terminals, each of said amplifier input terminals connected independently to each of said photocell output terminals, a comparator, said comparator having output terminals, means whereby said comparator produces output signals at said comparator output terminals, each of said at least three amplifiers having output terminals, means whereby each of said at least three amplifiers amplifies each of said at least three photocell output signals, means whereby said output terminals of each of said at least three amplifiers are coupled to said comparator, an algorithm of programmed preselected adjustable time intervals and programmed preselected adjustable color patterns of programmed varying color intensities and programmed varying durations being programmed into said comparator, at least one lighting display, said at least one lighting display having means to produce light signals, means whereby said comparator output terminals are coupled to said at least one lighting display whereby said light signals produced by said at least one lighting display will be energized and controlled by said output signals produced by said comparator output terminals for said preselected adjustable time intervals and said preselected adjustable color patterns of said varying color intensities and said varying durations responsive to said algorithm by said output signals produced by said comparator output terminals and responsive to the output signals produced by said at least three amplifiers.

4,922,155
PROTECTIVE CIRCUIT FOR REDUCED VOLTAGE LAMPS
Merle E. Morris; George B. Kendrick, both of Lexington, and John M. Boyd, Nicholasville, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.
Filed Jun. 22, 1988, Ser. No. 209,789
Int. Cl.[5] H05B *37/04*
U.S. Cl. 315—205 13 Claims



13. A reduced voltage lamp with a protective circuit comprising:
(a) an electric lamp having an input lead and output lead as parts of a lamp circuit,
(b) voltage reduction diode connected to the input lead in series with the lamp for reducing the root mean square voltage,
(c) a shunt diode connected between the input lead and output in parallel with the lamp and responsive to the voltage reduction diode for allowing substantial voltage to be supplied to the lamp while the voltage reduction diode substantially reduces the voltage supplied to the lamp, and for shunting current around the lamp while the voltage reduction diode fails to substantially reduce the voltage supplied to the lamp, and
(d) a circuit interrupt fuse connected in series with the lamp and responsive to the shunt diode for interrupting the lamp circuit on failure of the voltage reduction diode.

4,922,156
INTEGRATED POWER CAPACITOR AND INDUCTORS/TRANSFORMERS UTILIZING INSULATED AMORPHOUS METAL RIBBON
David E. Turcotte; Waseem A. Roshen, and Dale F. Regelman, all of Tucson, Ariz., assignors to ITT Corporation, New York, N.Y.
Filed Apr. 8, 1988, Ser. No. 179,342
Int. Cl.[5] H05B *41/14*
U.S. Cl. 315—244 20 Claims



1. An integrated electrical device for independently providing a capacitive and inductive function comprising:
a plurality of insulated amorphous metal ribbons each ribbon characterized by a longitudinal length, said plurality of insulated ribbons disposed in proximity to each other in a stacked relationship, said plurality of stacked amorphous metal ribbons wound on themselves to form a compact configuration, at least one of said ribbons having an exposed edge at least at a plurality of points along said longitudinal length;
at least one conductive winding having at least one loop wound about said compact configuration of said plurality of ribbons; and
at least one electrical connector disposed in proximity to said compact configuration of said plurality of ribbons and electrically coupled to said plurality of points along said longitudinal edge of said at least one ribbon,
whereby said device independently and simultaneously performs said capacitive and inductive functions with minimized electrical series resistance for said device.

4,922,157
ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP WITH THERMALLY ISOLATED MAGNETIC CORE
Pieter G. Van Engen, and Anthony Kroes, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Jun. 8, 1988, Ser. No. 204,143
Claims priority, application Netherlands, Jun. 26, 1987, 8701495
Int. Cl.[4] H05B *41/16*
U.S. Cl. 315—248 14 Claims



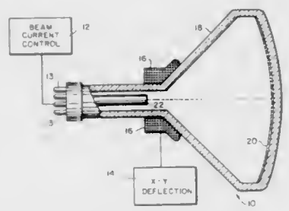
1. An electrodeless low-pressure discharge lamp comprising a discharge vessel sealed in a vacuum-tight manner and having a discharge space containing ionizable vapor and rare gas, the discharge vessel having an inwardly extending protuberance for receiving a body of soft magnetic material cooperating with an electrical coil surrounding said body, characterized in that
the discharge vessel is surrounded by an evacuated outer bulb for thermally isolating the discharge vessel,
the outer bulb has a protuberance projecting into the protuberance of the discharge vessel, and
said body of soft magnetic material is disposed in said protuberance of the outer bulb and external to said outer bulb for being thermally isolated from said discharge vessel.

4,922,158
POLYCHROMATIC CRT WITH CRYSTALLINE SEMICONDUCTOR SCREEN
Selami Colak, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.
Continuation of Ser. No. 565,681, Dec. 27, 1983, abandoned. This application May 1, 1987, Ser. No. 48,484
Int. Cl.[4] H01J *29/52, 29/10*; H04N *9/27*
U.S. Cl. 315—383 19 Claims

1. A polychromatic cathode ray tube system comprising:
(a) a cathode ray tube including an envelope having a faceplate, a screen disposed on the faceplate's inner surface, and an electron gun situated in the envelope for producing an electron beam directed at the screen,

said screen comprising a layer consisting essentially of a crystalline semiconductor material which luminesces at a wavelength which varies continuously in the visible light spectrum with a corresponding variation in an electron-beam-excitation-controlled temperature; and

(b) beam control means coupled to the tube for controlling the deflection and the current of the beam to excite selected areas of the screen,



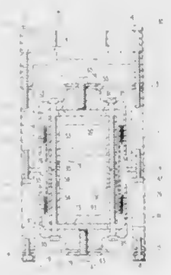
said beam control means being adapted to respond to a color control signal representing predefined colors of the areas to effect heating of the selected areas to temperatures at which they luminesce in the predefined colors, and being adapted to respond to a brightness signal representing predefined brightness levels of the areas to effect luminescence of the selected areas at the predefined brightness levels.

4,922,159

LINEAR PRECISION ACTUATOR WITH ACCELEROMETER FEEDBACK

Douglas J. Phillips, Melbourne; Keith E. Kessler; John W. Shipley, both of Palm Bay, and Dave Hyland, Melbourne Beach, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed May 9, 1988, Ser. No. 191,368
Int. Cl.[5] H02K *5/24*; F16K *31/08*
U.S. Cl. 318—128 10 Claims



1. An actuator comprising:

a housing, adapted to be to be attached to a structure, vibration of which is to be compensated;

a displaceable proof mass supported within said housing by elastically deformable means for constraining the displacement of said proof mass;

means, coupled to said housing, for causing an acceleration of said proof mass against which said housing and any structure attached thereto react;

force measurement means, integrally coupled with said proof mass, for measuring characteristics of the force produced in the course of the acceleration of said proof mass, and generating an output signal representative thereof; and

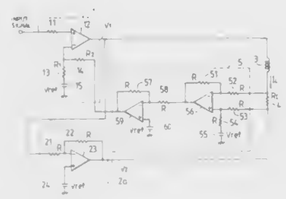
means, responsive to said output signal, for controlling the manner in which said acceleration causing means causes the acceleration of said proof mass.

4,922,160

IMPEDANCE LOAD DRIVING CIRCUIT

Yoichi Ogawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 312,852
Claims priority, application Japan, Aug. 15, 1988, 63-202825
Int. Cl.[5] G05B *11/00*
U.S. Cl. 318—135 9 Claims



1. A load driving circuit for supplying a load current proportional to an input signal in order to drive an impedance load, said load driving circuit comprising:

current detecting means for generating a load current signal representing a magnitude of a load current flowing through said impedance load;

voltage supply means for producing a voltage signal corresponding to a difference between said load current signal and said input signal, and for supplying said voltage signal to a first end of said impedance load; and

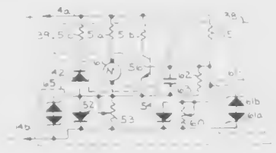
inverting voltage supply means for inverting said voltage signal, and for supplying an inverted said voltage signal to an opposite end of said impedance load.

4,922,161

METHOD AND APPARATUS FOR IMPROVING THE REGULATION OF THE SPEED OF A MOTOR

Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30067, and Charles L. Warner, II, Stone Mountain, Ga., assignors to Malcolm T. Gilliland, Peachtree City, Ga.

Filed Mar. 31, 1989, Ser. No. 332,340
Int. Cl.[5] H02P *3/12*
U.S. Cl. 318—269 27 Claims



1. For use with a controller and a device driven by an electric motor, said controller regulating the speed of said device by changing a drive signal provided between a first output terminal and a second output terminal of said controller, said electric motor having at least a first motor terminal and a second motor terminal for receiving said drive signal, an apparatus for improving the regulation of said speed by said controller, comprising:

means connecting said first output terminal to said first motor terminal;

a first diode connected between said second output terminal and said second motor terminal, said first diode being forward biased when said drive signal is sufficient to cause said motor to drive said device;

a first load resistor having a first end and a second end, said first end being connected to said first motor terminal;

switching means responsive to a control signal for connecting said second end of said first load resistor to said second motor terminal;

a resistor connected between said first motor terminal and a node; and

a second diode connected between said second output terminal and said node, said second diode being forward biased when said drive signal is sufficient;

wherein said node provides said control signal for said switching means.

7. For use with a controller and a device driven by an electric motor, said controller regulating the speed of said device by changing a drive signal provided to said electric motor, said electric motor having at least a first motor terminal and a second motor terminal for receiving said drive signal, an apparatus for improving the regulation of said speed by said controller, comprising:

first means responsive to said motor being driven by said device for providing a control signal;

second means responsive to said control signal for connecting a load between said first motor terminal and said second motor terminal;

means for providing a first signal responsive to a direction of current flow through said motor; and

means for providing a second signal responsive to a polarity of voltage developed across said motor;

whereby said first means is responsive to said first signal and said second signal for providing said control signal.

14. For use with a controller and a device driven by an electric motor, said controller regulating the speed of said device by changing a drive signal provided to said electric motor, said electric motor having at least a first motor terminal and a second motor terminal for receiving said drive signal, an apparatus for improving the regulation of said speed by said controller, comprising:

first means responsive to said motor being driven by said device for providing a control signal;

second means responsive to said control signal for connecting a load between said first motor terminal and said second motor terminal;

wherein said first means comprises a first resistor connected in series with said motor to form a first series circuit, a junction of said first resistor and said motor forming a first node, and a second series circuit, connected in parallel with said first series circuit, comprising a diode, a second node, and a second resistor, said control signal being a voltage difference between said first node and said second node.

17. For use with a controller and a device driven by an electric motor, said controller regulating the speed of said device by changing a drive signal provided to said electric motor, said electric motor having at least a first motor terminal and a second motor terminal for receiving said drive signal, a method for improving the regulation of said speed by said controller, comprising the steps of;

(a) providing a first signal responsive to a direction of current flow through said motor;

(b) providing a second signal responsive to a polarity of voltage developed across said motor; and

(c) responding to said first signal and said second signal by providing a control signal; and

(d) responding to said control signal by connecting a load between said first motor terminal and said second motor terminal.

21. For use with a controller and a device driven by an electric motor, said controller regulating the speed of said device by changing a drive signal provided to said electric motor, said electric motor having at least a first motor terminal and a second motor terminal for receiving said drive signal, a method for improving the regulation of said speed by said controller, comprising the steps of:

(a) connecting a first resistor in series with said motor to form a first series circuit, a junction of said first resistor and said motor forming a first node;

(b) providing a second series circuit of a second resistor, a second node, and a diode;

(c) connecting said second series circuit in parallel with said first said series circuit; and

(d) providing a control signal as a voltage difference between said first node and said second node; and

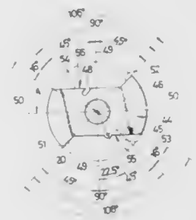
(e) responding to said control signal by connecting a load between said first motor terminal and said second motor terminal.

4,922,162

DISK-TYPE SINGLE-PHASE BRUSHLESS MOTOR

Manabu Shiraki, and Sumio Ishii, both of Kanagawa, Japan, assignors to Shicoh Engineering Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 161,118, Feb. 26, 1988, abandoned. This application Aug. 29, 1989, Ser. No. 401,479
Claims priority, application Japan, Oct. 23, 1987, 62-267944
Int. Cl.[5] H02K *1/22*
U.S. Cl. 310—268 18 Claims



1. A disk-type single-phase brushless motor, comprising a rotor supported for rotation and including a field magnet having 2P alternate north and south poles of essentially equal circumferential pole width θ, P being an integer greater than 1, a coreless stator armature including a stator yoke provided stationarily in an opposing relationship to said rotor with an axial air gap left therebetween, a printed circuit board secured to one surface of said stator yoke, and at least one coreless armature coil disposed at the same-phase positions on a surface of said stator yoke or said printed circuit, a single position-detecting element provided on said coreless stator armature for detecting a position of said rotor, and a driving circuit provided on said printed circuit board for driving said coreless stator armature, said stator yoke having at least one cutaway portion formed therein for enabling self-starting of said disk-type single-phase brushless motor, said cutaway portion of said stator yoke being defined by a first radially extending edge formed on an imaginary line passing the center of said stator yoke at an angular position of said stator yoke spaced by an angular distance of about $\theta/2$ in the direction opposite the direction of rotation of said rotor from an imaginary Y axis line which perpendicularly crosses an imaginary X axis line at the center of said stator yoke in a plane of said stator yoke to divide said stator yoke into four imaginary sections, and a second edge formed in another imaginary line which extends substantially in a parallel relationship to said imaginary X axis line from an inner radial end of said first edge to an outer circumferential periphery of said stator yoke such that said cutaway portion has an angular width of $\theta+\alpha$ at the outer ends of said first and second edges of said cutaway portion of said stator yoke, α being an angle smaller than $\theta/2$, said stator yoke being positioned relative to said coreless armature coil such that said first radially extending edge of said cutaway portion thereof is located at a position spaced by an angular distance of an angle

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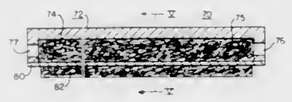
between $\theta/6$ and $\theta/3$ from a position at which a maximum starting torque is produced.

4,922,163

ACTIVELY COOLED BRUSH BOX ASSEMBLY

Bobby D. McKee, San Jose, and Alvin H. Nakagawa, Campbell, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1988, Ser. No. 281,138
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—239 **9 Claims**



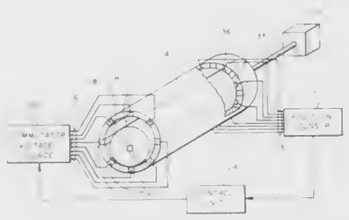
1. A brush box assembly for a dynamoelectric machine having a rotor, comprising:
(A) an electrically conducting brush box housing having a top, bottom, side and end walls defining an interior with wall surfaces;
(B) a metallic foam disposed within said interior and in bonded contact with said wall surfaces;
(C) said housing having fluid inlet and outlet ports in fluid communication with said interior;
(D) said metallic foam being disposed in the fluid path between said inlet and outlet ports;
(E) means for supplying a fluid coolant to said inlet port;
(F) a brush portion at the bottom of said housing and operable to make contact with the rotor of said machine;
(G) said brush portion being in both thermal and electrical contact with said metallic foam such that heat generated at the rotor surface is conducted to said metallic foam and electrical current carried by said brush portion is conducted by said metallic foam as well as by said housing.

4,922,164

ECCENTRIC MOTION MOTOR

Stephen C. Jacobsen; John E. Wood, and Richard H. Price, all of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah

Filed Oct. 3, 1988, Ser. No. 251,774
Int. Cl.[5] H02N *1/00*
U.S. Cl. 310—309 **45 Claims**



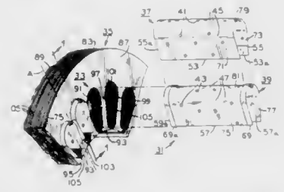
1. An eccentric-motion motor for driving a utilization mechanism comprising
a stator defining a continuous closed surface pathway,
an armature composed at least in part of an electroattractable material and rollably disposed on the closed surface pathway, said armature having an exterior surface which maintains contact with the pathway as the armature rolls,
a series of electroattractive elements disposed in the stator at the closed surface, said elements being successively energizable to attract and cause the armature to roll along the closed surface pathway,
means for successively energizing the electroattractive elements, and
means for coupling the armature to the utilization mechanism.

4,922,165

CORE AND SLOT LINER

Delmar E. Crawford, Holland, Mich., and Harold T. Fields, Ft. Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 173,929, Jun. 6, 1988. This application Jan. 13, 1989, Ser. No. 296,630
Int. Cl.[5] H02K *23/60*
U.S. Cl. 310—215 **28 Claims**



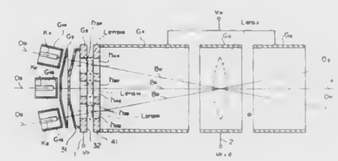
1. A core for a dynamoelectric machine comprising:
a pair of generally opposite end faces on the core;
a circumferential yoke between said opposite end faces;
at least a pair of adjacent teeth extending on preselected pitch axes from said yoke and between said opposite end faces, respectively, and each adjacent tooth including a tip end spaced from said yoke;
at least one winding receiving slot in the core disposed between said yoke and said adjacent teeth and intersecting with said opposite end faces, said at least one slot including a pair of generally opposed sidewalls on said adjacent teeth, an end wall on said yoke interposed between said opposed sidewalls, and an opening extending between said tip ends of said adjacent teeth and said opposite end faces and arranged generally opposite said end wall;
a first sheet of generally thin dielectric material disposed at least in part within said at least one slot and including a pair of first opposite side portions disposed in confronting relation at least adjacent said opposed sidewalls, a first end portion interposed between said first opposite side portions and disposed in confronting relation at least adjacent said end wall, a plurality of first apertures in said first end and opposite side portions, said first apertures having a pair of opposite ends with at least some of one of said first opposite ends being disposed at least adjacent said end wall and opposite sidewalls, and a plurality of first non-apertured sections in said first end and opposite side portions and interconnected between said first apertures, respectively;
a second sheet of generally thin dielectric material disposed at least in part within said at least one slot in overlaying relation with said first sheet, said second sheet including a pair of second opposite side portions disposed in confronting relation at least adjacent said first opposite side portions, a second end portion interposed between said second opposite side portions and disposed in confronting relation at least adjacent said first end portion, a plurality of second apertures in said second end and opposite side portions and arranged in non-aligned relation with said first apertures, said second apertures having a pair of second opposite ends with at least some of one of said second opposite ends being disposed in overlaying relation at least adjacent at least some of said first non-apertured sections, a plurality of second non-apertured sections in said second end and opposite side portions and interconnected between said second apertures, at least some of said second non-apertured sections being disposed in overlaying relation at least adjacent at least some of the other of said first opposite ends, and a pair of generally opposite cuffs on said second end and opposite side portions and disposed at least adjacent said opposite end faces generally at the intersections of said at least one slot with said opposite end faces, respectively.

4,922,166

ELECTRON GUN FOR MULTIGUN CATHODE RAY TUBE

Koji Ichida; Yoshifumi Nakayama, and Hiromu Inoue, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 67,979, Jun. 30, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 338,372
Claims priority, application Japan, Jun. 30, 1986, 61-153312; Jun. 30, 1986, 61-153313; Jun. 30, 1986, 61-153314
Int. Cl.[5] H01J *29/51*
U.S. Cl. 313—414 **3 Claims**



1. An electron gun for a multigun cathode ray tube comprising, three cathodes mounted side by side so as to define a center cathode and two side cathodes, three first electrodes which are generally cylindrical-shaped and are formed with beam emitting apertures mounted so as to respectively, surround said three cathodes, a second electrode formed with three beam apertures mounted adjacent said three first electrodes, a third electrode mounted adjacent said said electrode and having a first portion adjacent said second electrode formed with a center and two side beam apertures and said first portion being curved so that its beam apertures do not lie in the same plane and having a second portion spaced from said first portion add formed with a center and two side beam apertures which are larger than said beam apertures in said first portion and the outer edges of said first and second portions connected together to form an enclosed space and the distance between the center beam apertures in said first and second portions being greater than the distances between said side beam apertures, a fourth electrode mounted adjacent said third electrode and having a planar portion with three beam apertures and a tubular portion attached to said planar portion, a fifth tubular shaped electrode of large diameter adjacent said fourth electrode, a sixth tubular shaped electrode mounted adjacent said fifth electrode, means for applying fixed focusing voltages to said first, second, third, fourth and sixth electrodes, and means for applying a dynamic voltage to said fifth electrode.

4,922,167

PICTURE DISPLAY DEVICE HAVING MEANS FOR COMPENSATING LINE STRAY FIELDS

Albertus A. S. Sluyterman; Gerrit Bosch; Fransiscus M. P. P. Doomernik, and Adriaan J. Groothoff, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 145,651, Jan. 13, 1988, which is a continuation of Ser. No. 919,910, Oct. 16, 1986, abandoned. This application Feb. 11, 1988, Ser. No. 154,811
Claims priority, application Netherlands, Oct. 25, 1985, 8502918; Sep. 23, 1986, 8602397; Feb. 24, 1987, 8700449
Int. Cl.[5] H01J *29/70*
U.S. Cl. 313—431 **5 Claims**



1. A picture display device having a display tube the rear part of which consists of a cylindrical neck accommodating a device for gnerating electron beams and the front part of which is funnel-shaped with the widest part being present on the front side, and a picture display phosphor screen, said display device also being provided with an electromagnetic deflection unit mounted around the display tube for deflecting electron beams across the display screen and comprising a line deflection coil and a field deflection coil which, when energized, generate magnetic fields having at least a dipole component, characterized in that the device is further provided with a compensation coil system which is oriented in such manner and in operation is energizable in such manner that, measured at a predetermined distance from the picture display device, at least the strength of the local magnetic dipole field is below a desired standard, said compensation coil system comprising a first set of compensation coils arranged symmetrically relative to the plane of symmetry of the line deflection coil on the outer side of the deflection unit, and extending with main portions of their lengths in the axial direction, and a second set of compensation coils arranged symmetrically relative to the plane of symmetry of the line deflection coil on the outer side of the deflection unit and extending at least substantially parallel to the display screen.

4,922,168

UNIVERSAL DOOR SAFETY SYSTEM

Dennis W. Waggamon, North Canton, and Louis G. Whitaker, Alliance, both of Ohio, assignors to Genie Manufacturing, Inc., Akron, Ohio

Filed May 1, 1989, Ser. No. 346,230
Int. Cl.[5] E05F *15/14, 15/20;* **G05D** *3/12*
U.S. Cl. 318—286 **27 Claims**

1. A safety system for universal attachment to existing garage door openers having a door operator with a main control circuit, an electric motor and a reversible drive train connected from the motor to the door, the main control circuit providing any one of four modes of operation of door opening, door stopped open, door closing, and door stopped closed, comprising, in combination:
a safety control circuit;
monitor means responsive to an obstruction to door closing movement and connected to said safety control circuit;
an output from said safety control circuit for connection to

the main control circuit of the existing garage door opener;

door movement responsive means including a flexible member connectable for movement with actual movement of the door and connected to said safety control circuit; and

determining means in said safety control circuit connected to be responsive to actual movement of said flexible member to determine if the door is closing and connected to said monitor means to be responsive to an obstruction to door closing movement to apply a signal to the main control circuit to at least stop the door in its closing movement.

26. A safety system for universal attachment to existing garage door openers having a door operator with a main control circuit, an electric motor and a reversible drive train connected to provide opening and closing movement to the door relative to a door frame opening, comprising, in combination:



monitor means responsive to an obstruction to door closing movement;

a safety control circuit responsive to said monitor means to be responsive to an obstruction to door closing movement;

controllable switch means normally connected to the main control circuit to initiate at least two of four modes of operation of door opening, door stopped open, door closing, and door stopped closed;

means to disconnect said controllable switch means from said main control circuit; and

means connecting said safety control circuit between said controllable switch means and the main control circuit, whereby said safety control circuit is adapted to stop the door in its closing movement upon said monitor means determining the presence of an obstruction to door closing movement.

4,922,169

METHOD AND APPARATUS FOR DRIVING A BRUSHLESS MOTOR

John J. Freeman, Longmont, Colo., assignor to MiniScribe Corporation, Longmont, Colo.

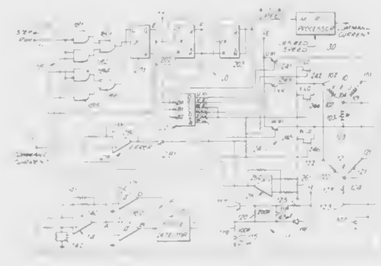
Filed Oct. 4, 1988, Ser. No. 253,245
Int. Cl.[5] H02K *29/00*; H02P *1/18*
U.S. Cl. 318—254 5 Claims

1. Apparatus for driving an n-phase, m-pole (n and m are integers) brushless motor without use of physical rotary position detectors, such as Hall elements, comprising: harmonic detecting means for detecting an harmonic component of back emf induced in the phases of said motor; first and second comparator means exhibiting first and second different hysteresis characteristics, respectively, for generating first and second rectangular waveforms when said harmonic component crosses a reference level; counting means including an input stage whose state is determined by the polarity of one of said rectangular waveforms at a time determined by transitions in the other of said rectangular waveforms; decoding means for decoding the count of said counting means to produce a sequence of phase energizing signals to energize selected phases of said motor; and drive current means for supplying drive current to those phases energized by said phase energizing signals.

3. Apparatus for driving an n-phase, m-pole (n and m are integers) brushless motor without use of physical rotary position detectors, such as Hall elements, comprising:

harmonic detecting means for detecting an harmonic component of back emf induced in the phases of said motor;

phase energizing means responsive to said harmonic compo-



nent for generating phase energizing signals to energize selected phases of said motor;

drive current means for supplying drive current to those phases energized by said phase energizing signals; and

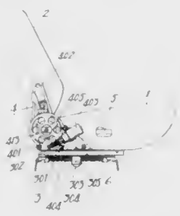
start-up means coupled to said phase energizing means for controlling the phase energizing signals generated to start up the rotation of said motor, said start-up means including means for supplying a clock signal at a relatively low frequency to said phase energizing means for a first predetermined time period, means for increasing the frequency of said clock signal for a second predetermined time period, and means for terminating the clock signal supplied to said phase energizing means at the completion of said second predetermined time period.

4,922,170

AUTOMOTIVE POWER SEAT ASSEMBLY

Shinzo Kawasaki, Tajimi; Kaoru Umeda, and Norimasa Kitoh, both of Inuyama, all of Japan, assignors to Kabushiki Kaisha Imasen Denki Seisakusho, Inuyama and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan, a part interest to each

Filed Jan. 5, 1988, Ser. No. 141,088
Int. Cl.[5] H02P *7/00*
U.S. Cl. 318—434 1 Claim



1. An automotive power seat assembly for adjustably operating a reclining mechanism and seat rail means by motors,

wherein said automotive power seat assembly comprises motors for rotating at at least 8,000 rpm with torque constrained to 2.5 kg-cm at no load, a current control circuit and reducing gears for decelerating the rotation output of said motors, whereby current to be consumed by said motors is controlled to a value below a predetermined maximum value by said current control circuit and said motors are operated at an efficiency of at least 50%.

4,922,171

MOTOR ACTUATOR WITH AIR-MIX DOOR OPENING-LIMITER AND BUILT-IN SWITCHING UNIT

Shinichi Ohi, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1989, Ser. No. 406,969
Claims priority, application Japan, Sep. 17, 1988, 63-121838; Oct. 14, 1988, 63-134292
Int. Cl.[5] B60H *1/00*
U.S. Cl. 318—471 5 Claims



3. A motor actuator for an air-mix door of an automobile air-conditioner, comprising:

(a) a motor for driving the air-mix door;

(b) a driver circuit for said motor, said driver circuit being operative to energize said motor based on the combination of two input signals and also to de-energize said motor when said two input signals are identical to one another;

(c) a stop switch for supplying a stop signal to said driver circuit for causing said driver circuit to stop energizing said motor, said stop switch including

(c-i) a movable contact adapted to be turned through a predetermined angular distance simultaneously with operation of said motor,

(c-ii) a first fixed electrode disposed at one end of said predetermined angular distance and engageable with. with said movable contact, and

(c-iii) a second fixed electrode disposed at the other end of said predetermined angular distance and engageable with said movable contact;

(d) a position sensor for detecting the position of said movable contact; and

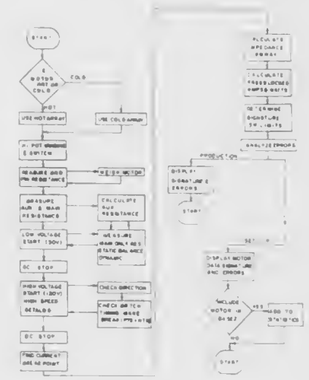
(e) a comparator circuit for detecting a predetermined output signal from said position sensor while the air-conditioner is operating in a vent mode and equalizing the potential of one of said first and second fixed electrodes and the potential of the other fixed electrode to thereby limiting rotation of said motor toward said other fixed electrode.

4,922,172

MOTOR TEST APPARATUS, SYSTEM AND METHOD

Joseph T. Roddy; David A. Felt, and David D. Eisenbraun, all of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 23, 1988, Ser. No. 211,445
Int. Cl.[5] G01R *31/02*
U.S. Cl. 318—490 39 Claims



1. A method of testing an electric motor having a frame and motor windings, comprising the steps of:

sensing the phase of an alternating current waveform to be applied to the windings of an electric motor to be tested,

applying the alternating current waveform to the windings in response to the phase of the waveform reaching a preselected value to start the motor;

sampling the voltage and current applied by the alternating current waveform to the motor windings during shorting at predetermined times measured from the application of the waveform to the motor until a predetermined number of voltage and current samples are obtained;

generating parameter samples from the voltage and current samples, said parameter being a function of the applied voltage and current;

comparing the parameter samples with a previously obtained set of reference parameter sample values, said reference sample values having error limits for each reference sample value; and

rejecting the motor if at least a predetermined number of the parameter samples fall outside the error limits for those particular samples.

4,922,173

MACHINE DRIVE SYSTEM

Anthony J. Lawler, Burgess Hill, England, assignor to The Kemble Instrument Company Limited, Burgess Hill, England

Filed Sep. 23, 1988, Ser. No. 248,791
Claims priority, application United Kingdom, Sep. 25, 1987, 8722575
Int. Cl.[5] B66C *23/16*
U.S. Cl. 318—568.2 4 Claims

1. A drive system for a machine which provides independent translational motion in at least two different directions comprising:

a first carrier supported for motion in a first of said directions;

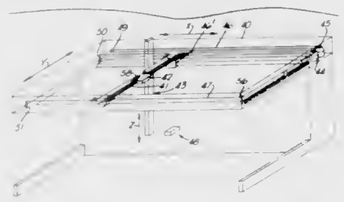
two second carriers supported by said first carrier for motion in the second of said directions;

first motor means;

first drive means for transmitting power from said first motor means to said first carrier;

second motor means; and

two second drive means for transmitting power from said second motor means to said second carriers, each of said second drive means comprising a belt having two portions, each of said belt portions extending between points on the first carrier and on a respective second carrier, each said belts being arranged to be driven by said second motor means such that one portion thereof may be lengthened and the other shortened when said first motor means is stopped so that the respective second carrier moves relative to the said first carrier, but when said first motor



means is driven and said second motor means is stopped said two belt portions remain the same length so that the respective second carrier does not move relative to said first carrier as said first carrier moves;

said second motor means comprising a single second motor and at least a first additional motor, said single second motor driving both said second drive means belts whereby said second carriers move together relative to said first carrier, at least one of said second drive means also being driven by said first additional motor of said second motor means to enable variable drive to be provided to its belt so as to enable relative motion between said second carriers.

4,922,174

SEAM TRACKING BETWEEN MATING PARTS

Kenneth A. Pietrzak, Uncasville; Scott M. Packer, Manchester, and Kenneth C. Dunne, Somers, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 20, 1989, Ser. No. 325,427
Int. Cl.[5] G05B *19/33;* B23K *9/12*
U.S. Cl. 318—577 13 Claims



1. A method of automatically seam-tracking the seam between mating parts by a programmed robot comprising:

establishing a programmed tentative track approximating the path of the seam;

focusing a matrix camera on said parts at initial location on said tentative track of an area to include said seam;

establishing an electronic image of said initial location;

determining the tentative directional orientation of said tentative track at said initial location;

electronically rotating only a portion of said image representing a wide rectangle perpendicular to said tentative directional orientation;

detecting the seam location in said electronic image;

determining the offset of the seam location detected in said image from said location;

stepping along said tentative track in increments and determining the offset of the seam detected in said image from each subsequent location; and

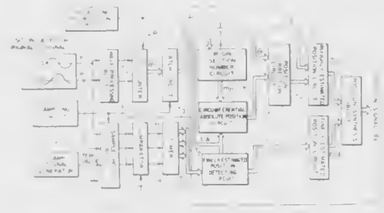
modifying said tentative track by said offsets and thereby determining a true track.

4,922,175

POSITION/SPEED DETECTION METHOD AND APPARATUS

Yasuyuki Sugiura, Takahagi; Mitsuru Watabe, Katsuta; Shigeki Morinaga; Kunio Miyashita, both of Hitachi, and Hiroshi Sugai, Sakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,688
Int. Cl.[5] G05B *1/02*
U.S. Cl. 318—592 5 Claims



1. A position detecting method using a moving body which moves relative to a stationary or moving body, and a position detector for generating two-phase periodic waves having a phase difference smaller than one period in accordance with the relative moving position of said moving body, whereby the position of said moving body is detected on the basis of said two-phase periodic waves generated from said position detector, said method comprising the steps of:

comparing at least one of said two-phase periodic waves with a predetermined reference value having hysteresis to thereby obtain a roughly estimated position for every period which is 1/n (n is integer) as long as the period of said one periodic wave;

analog-to-digital converting said two-phase periodic waves and a zero-cross value for every sampling period to thereby obtain a finely estimated position; and

detecting the position of said moving body on the basis of said roughly estimated position and said finely estimated position while correcting an error due to said hysteresis at the zero-cross point of said roughly estimated position, by use of the relationship between said roughly estimated position and said finely estimated position.

4,922,176

ELECTRONIC ABSOLUTE COORDINATE ENCODER FOR POSITIONAL CONTROL DEVICES

Chul K. Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Sep. 16, 1988, Ser. No. 245,332
Claims priority, application Rep. of Korea, Sep. 17, 1987, 1987-15851
Int. Cl.[5] G05B *19/29*
U.S. Cl. 318—602 2 Claims

1. An electronic absolute coordinate encoder for a positional control device having a motor, comprising:

an encoder for sensing the current position of the positioning system and generating a first pulse train and a second pulse train which is advanced or delayed for a predetermined phase difference relative to the first pulse train in dependence upon the rotational direction of said motor;

a detector for detecting the rotational direction of said motor according to the phase delay or phase advance of the second pulse train relative to the first pulse train, and generating a first control signal and a clock pulse train;

a counter for performing forward or reverse counting of said clock pulse train in dependence upon the logic state of the



first control signal, and outputting current position data of said positioning system; and

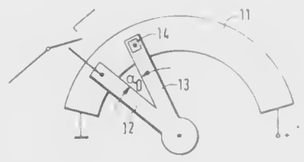
a back-up power source supplying a subsidiary power supply having a predetermined voltage level to said encoder, detector and counter for continuous detection of the current position of said positioning system in case of main power interruption.

4,922,177

DEVICE FOR THE ELECTRICAL TRANSMISSION OF A MECHANICAL VARIABLE

Eberhard Mausner, Bad Soden, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,989
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739613
Int. Cl.[5] G05B *1/06*
U.S. Cl. 318—663 7 Claims



1. A device for the electrical transmission of a mechanical variable, particularly an electric gas pedal for automotive vehicles, the device comprising

a control unit;

a first potentiometer system serving as desired-value transmitter from which an electric desired-value signal is fed to the electric control unit;

a second potentiometer system;

a controlling element which is controlled by electric signals from the control unit, the second potentiometer system being operative over an adjustment range of the controlling element, the second potentiometer system serving as actual-value transmitter connected to the control unit; and wherein

each potentiometer system has a first wiper which passes over a part of the length of a resistance path;

at least one of the two potentiometer systems has, in addition to the first wiper which passes over a part of the length of the resistance path, a second wiper with a wiper contact set at a predetermined fixed distance from a wiper contact of the first wiper; and

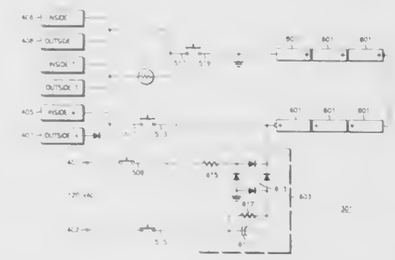
the second wiper contact lies at an electric potential which is different from an electric potential of the wiper contact of the first wiper.

4,922,178

DUAL SOURCE RECHARGEABLE BATTERY

Gerald Matuszewski, Hoffman Estates, and William J. Mashek, La Grange Park, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1987, Ser. No. 91,799
Int. Cl.[5] H02J *7/00;* H01M *10/46*
U.S. Cl. 320—2 19 Claims



1. A rechargeable battery assembly for a handheld radio, comprising:

at least one electrochemical energy storage cell;

first means, including a first connector, for charging said storage cell from an external direct current (DC) source;

second means, including an AC to DC converter and at least one moveable conductive prong as a second connector used to connect to an alternating current (AC) source, for charging said storage cell from said (AC) source, said at least one moveable conductive prong having first and second positions, said first position enabling said at least one moveable conductive prong to mate with an AC source receptacle whereby power from said AC source may be coupled to said AC to DC converter; and

third means, responsive to use of said second connector and switchably coupled to said first means and switchably coupled to said second means, for interrupting said coupling between said AC source and said AC to DC converter when said moveable conductive prong is in said second position thereby preventing said AC source at said second means from presenting an electrical hazard at said first means.

4,922,179

POWER FEEDING SYSTEM FOR A ROTOR

Shinji Nishimura, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,745
Claims priority, application Japan, Dec. 10, 1987, 62-314637; Dec. 10, 1987, 62-314638
Int. Cl.[5] H02J *7/24*
U.S. Cl. 322—25 1 Claim

1. A power feeding system for a rotor, comprising:

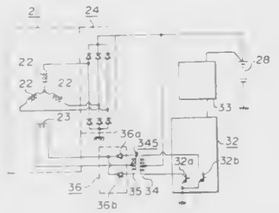
an inverter for converting a d.c. voltage into a multi-phase a.c. voltage;

a plurality of primary windings, one for each phase of said a.c. voltage, connected to output terminals of said inverter;

a plurality of cylindrical stationary iron cores, one for each of said primary windings;

a secondary winding magnetically coupled with said primary windings during rotation;

a rotary iron core attached to a rotary shaft at a central bore thereof, said secondary winding being wound on said rotary iron core, said stationary iron cores being disposed adjacent said rotary cores with axes of said stationary iron cores being parallel to a central axis of said stationary core



with said primary windings being non-coaxial with respect to said secondary winding; and

a rectifier for rectifying an a.c. output from said secondary winding to produce a d.c. voltage which is applied to a field winding.

4,922,180

CONTROLLED MICROWAVE SAMPLE IRRADIATION SYSTEM

Jeffrey D. Saffer, and Louis A. Profenno, both of Ellsworth, Me., assignors to The Jackson Laboratory, Bar Harbor, Me.

Filed May 4, 1989, Ser. No. 347,066

Int. Cl.[5] **G01R** *27/04;* **H03H** *5/00*

U.S. Cl. 324—639 **24 Claims**



1 A microwave antenna structure for coupling electromagnetic microwave energy from a microwave transmission line into a sample contained in a sample container comprising:

a bifilar helix of conducting first and second helical elements, said first and second helical elements being arranged in parallel relationship defining a double helix with alternating spaced apart helical turns from the respective first and second helical elements, said turns of the first and second helical elements turning in the same direction with a substantially constant phase relationship, said double helix forming a receptacle for receiving and holding a sample container within the turns of the double helix;

coupling means for coupling the first and second helical elements to opposite polarity conductors of a microwave transmission line whereby electromagnetic microwave energy may be coupled into a sample within the sample container;

and a sample container containing a sample for microwave energy irradiation, said sample container being seated in the receptacle formed by the bifilar helix, said winding substantially surrounding the sample containers thereby providing a sample loaded antenna structure termination.

4,922,181

APPARATUS FOR MONITORING THE DIELECTRIC CONSTANT OF AN ARTICLE

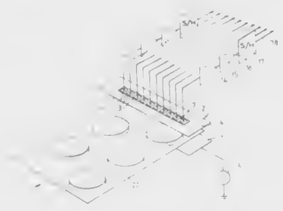
Brian R. Pullan, Stockport, England, assignor to Laetus Systems Limited, Cambridge, England

Filed Aug. 2, 1988, Ser. No. 227,274

Claims priority, application United Kingdom, Aug. 6, 1987, 8718606

Int. Cl.[5] **G01R** *27/26*

U.S. Cl. 324—664 **14 Claims**



1 Monitoring apparatus comprising an amplifying circuit which generates an output signal, said amplifying circuit including a capacitor defined by two electrodes between which an article is moved in use and in which the gain of said amplifying circuit varies with the capacitance of said capacitor so that the peak value of said output signal from said amplifying circuit varies with the dielectric constant of said article between said capacitor electrodes; and further comprising a peak detecting circuit which receives said output signal from said amplifying circuit and outputs a signal representing said peak values of said output signal generated by said amplifying circuit; and means for monitoring said signal from said peak detecting circuit so as to enable the magnitude of the dielectric constant of said article to be monitored.

4,922,182

AUTO REACTANCE COMPENSATED NON-CONTACTING RESISTIVITY MEASURING DEVICE

Mason F. Cox, Medina, N.Y., assignor to Monroe Electronics, Inc., Lyndonville, N.Y.

Filed Aug. 3, 1988, Ser. No. 228,176

Int. Cl. G01R *27/26*

U.S. Cl. 324—682 **11 Claims**



1 An apparatus for non-invasively, non-destructively measuring a resistivity of a buried conductive layer surrounded by an outer layer, said apparatus comprising:

a series resonant circuit including:

a first capacitor including a driven electrode and operative when positioned adjacent the buried layer,

a second capacitor including a pickup electrode and operative when positioned adjacent the buried layer,

inductor means connected to said first capacitor;

frequency adjustment means, connected to said first and second capacitors and to said inductor means, for automatically generating a signal having a series resonant frequency causing said circuit to resonate, said circuit having said series resonant frequency generated using a feedback signal and nullifying the effect of capacitive reactance of the first and second capacitors;

measuring means for measuring a voltage output from said circuit; and

means for determining the resistivity of the buried layer when said circuit is resonating, responsive to the measured voltage of said measuring means.

4,922,183

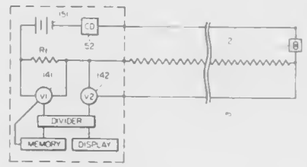
METHODS, SYSTEMS AND APPARATUS FOR DETECTING CHANGES IN VARIABLES

Peter Kamas, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jun. 3, 1988, Ser. No. 202,278

Int. Cl.[5] **G01R** *27/02*

U.S. Cl. 324—694 **12 Claims**



1 A system for detecting a liquid leak

(1) which comprises

(a) a central unit which comprises

(i) a power source,

(ii) means for observing a current signal, and

(iii) means for identifiably connecting the central unit to each of a plurality of sub-units; and

(b) a plurality of sub-units, each of which consumes only power supplied by the power source in the central unit, each of which comprises

(i) an elongate electrically conductive locating member which extends from a near end to a far end,

(ii) an elongate electrically conductive source member which is adjacent to the locating member and extends from the near end to the far end,

(iii) a voltage-measuring device, and

(iv) a converting device for converting a voltage measured by the voltage-measuring device into a current signal;

and in each of which, when a liquid leak occurs, an electrical connection is made between the locating member and the source member at the location of the leak, and the sub-unit can be powered from an external power source to provide a test system in which the voltage-measuring device measures the voltage drop across a defined part of the system, and the converting device converts that voltage drop into a current signal;

and

(2) in which, when the central unit is connected to a sub-unit, and an event has occured along that sub-unit, power is supplied to the sub-unit from the power source, and the current signal is transmitted from the sub-unit to the central unit and is observed by the central unit.

4,922,184

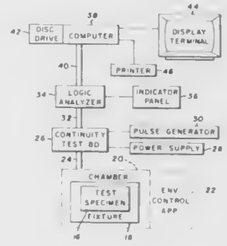
APPARATUS AND PROCESS FOR THE SIMULTANEOUS CONTINUITY SENSING OF MULTIPLE CIRCUITS

Leo M. Rosenstein, Lakeville, and Glenn J. Gulbranson, Burnsville, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 29, 1988, Ser. No. 237,438

Int. Cl.[5] **G01R** *19/00, 19/165*

U.S. Cl. 324—72.5 **20 Claims**



1 A process for simultaneously testing a plurality of electrical circuits in a circuit configuration to detect an error condition with respect to one or more of the electrical test circuits, including the steps of:

providing a plurality of electrical test circuits, each having a test circuit input and a test circuit output; and providing a plurality of comparator means, one associated with each test circuit, each comparator means including first and second comparator inputs;

biasing each of said test circuit inputs and its associated one of said first comparator input to a first voltage level;

generating a second voltage level corresponding to the voltage level at said test circuit output and less than said first voltage level, and providing said second voltage level to the associated one of said second comparator inputs;

connecting each of said test circuit outputs and associated second comparator inputs to a low voltage terminal through a sensor resistor having a resistance substantially greater than a nominal resistance of its associated test circuit, and biasing said low voltage terminals to a third voltage level less than said second voltage;

generating a comparator output for each comparator comprising a first logic state whenever the voltage at the first comparator input exceeds the voltage at the second comparator input by a prerdetermined thershold level, and further comprising a second logic state whenever the voltage at the first comparator input does not exceed the voltage at the second comparator input by at least the predetermined threshold; and

simultaneously sensing the logic state outputs of the comparator means.

4,922,185

DIAGNOSTIC METER BASE

Gordon O. Davidson, 467 Mooney Crescent, Orillia, Ontario; Barry C. Mitchell, Purvis Street, R.R. #1, Stroud, Ontario, and Larry A. White, 34 Murray Street, Barrie, Ontario, all of Canada

Filed Feb. 3, 1989, Ser. No. 306,301

Int. Cl.[5] **G01R** *31/08, 1/38;* **G08B** *21/00*

U.S. Cl. 324—74 **3 Claims**

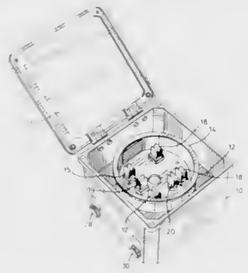
1 A device for testing the connections of a detachable instrument installation of the kind in which the detachable instrument provides a set of line contacts and a set of load contacts positioned to engage respective contacts of a support socket providing connections to a polyphase electrical supply and a load circuit connected to the supply, the device comprising:

an insert providing a pair of opposite end faces configured

respectively to engage the support socket and to receive the instrument in supporting relation thereto,

one end face providing a first set of contacts positioned to engage respective contacts of the support socket and the other end face providing a second set of contacts positioned to engage respective contacts of the instrument,

said insert housing a network of circuit elements interconnecting the contacts of said first and second sets in pairs, each said circuit element including a current-responsive

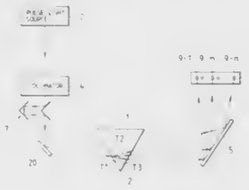


visual indicator, and said indicators being physically arranged in a predetermined configuration such that, when the insert is installed between the support socket and the instrument the pattern of indicator responses is determined by the pattern of connections of the installation wherein the insert comprises a box-like casing with one end formed as a well having a floor defining said one end face of the insert, said one end of the casing having a hinged cover, and wherein the visual indicators are mounted in the floor of the well.

4,922,186
VOLTAGE DETECTOR

Yutaka Tsuchiya; Shinichiro Aoshima, and Takuya Nakamura, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 6, 1988, Ser. No. 240,641
Claims priority, application Japan, Sep. 7, 1987, 223583
Int. Cl.[5] G01R *15/07, 31/28*
U.S. Cl. 324—96 **11 Claims**



1. A voltage detector for detecting a waveform of a periodic voltage developing in a selected area of an object, comprising:

a pulse light source for emitting a pulse light beam in synchronism with the waveform of said voltage in said object;

delay means for gradually delaying said pulse light beam;

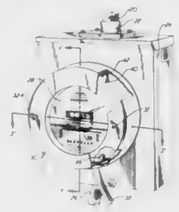
optical path changing means including an electro-optic material, for changing an optical path of said pulse light beam received from said delay means responsive to a change of refractive index of said electro-optic material, said change of refractive index being caused by an electric field produced to said voltage in said object; and

detection means for detecting an output pulse light beam emerging from said optical path changing means and determining said waveform of said voltage.

4,922,187
PULSE INITIATOR CIRCUIT

William C. Beverly, II, Charlotte, N.C., assignor to Appalachian Technologies Corporation, Charlotte, N.C.

Filed Feb. 13, 1987, Ser. No. 14,401
Int. Cl.[5] G01R *21/00, 35/04*
U.S. Cl. 324—96 **15 Claims**



1. An instrument attachable to an electric utility meter for generating a pulsed signal having a predetermined relationship to parameters measured by said utility meter, comprising in combination:

a. a signal source for providing a signal modulated in accordance with a first function;

b. a signal detector responsive to said modulated signal;

c. enclosure means having an interior and including first and second spaced apart end portions, an edge portion extending between the outer periphery of said first and second end portions, each of said end portions also including an opening therein;

d. means for mating said enclosure with said utility meter such that the rotor of said utility meter is positioned at a predetermined location with respect to the interior of said enclosure;

e. means for supporting said signal source at a predetermined location outside the cover of said utility meter and within the interior of said enclosure such that said utility meter interacts with said modulated signal to further modulate said modulated signal in accordance with a function having a predetermined relationship to the parameters measured by said electric utility meter; and

f. means for supporting said sensor at a predetermined location outside the cover of said utility meter and within the interior of said enclosure such that said modulated signal interacts therewith to produce said pulsed signal having a predetermined relationship to the parameters measured by said utility meter.

4,922,188
ELECTRICAL PEAK VALUE MEASURING AND EVALUATING APPARATUS

Giorgetta Mario, Winterthur, Switzerland, assignor to Kistler Instrumente AG, Winterthur, Switzerland

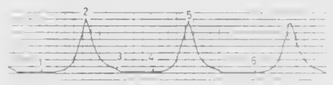
Continuation of Ser. No. 158,364, Jun. 11, 1980, abandoned. This application Aug. 20, 1984, Ser. No. 642,741
Claims priority, application Switzerland, Jun. 22, 1979, 2925483
Int. Cl.[5] G01R *1/02, 19/16*
U.S. Cl. 324—130 **16 Claims**

1. An apparatus for minimizing zero drift in measuring the peak value of each cycle of a signal pulse of an electrical alternating voltage signal with respect to a predetermined reference value to enable also evaluation of the peak values over a defined number of N cycles, comprising:

circuit means normally transmitting the peak value of each

cycle of the signal pulse of said alternating voltage to an output terminal;

means for restoring the level of said alternating voltage signal in said circuit means to a substantially constant and known value after reaching the peak value of a respective signal pulse and including further means connected to said circuit means and having first and second output signal levels constituting switch-on and switch-off levels;



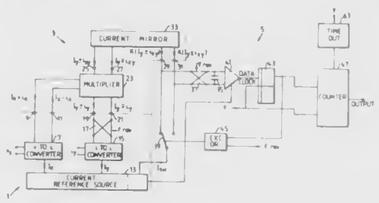
means for retaining the signal level of said output terminal at substantially said value until the alternating voltage waveform of the signal pulse of the next cycle rises again above a predetermined level at which time said circuit means becomes operable again to transmit the signal pulse of the next cycle to said output terminal; and

means connected to said output terminal for measuring the peak value of said alternating voltage with respect to said substantially constant and known value.

4,922,189
ELECTRIC POWER MEASURING DEVICES

Trevor R. Dunn, Harrow; David R. S. Lucas, Wembley; Ben B. North, Barnes, and Timothy R. Joyce, Stone, all of England, assignors to The General Electric Company, p.l.c., United Kingdom

Filed Oct. 14, 1987, Ser. No. 108,369
Claims priority, application United Kingdom, Oct. 17, 1986, 8624926
Int. Cl.[5] G01R *21/00, 21/06*
U.S. Cl. 324—142 **11 Claims**

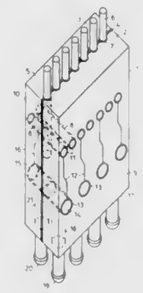


1. An electric power measuring device comprising: input means for producing first and second analogue signals respectively representative of the insntantaneous vaues of a voltage and current supplied to a load; multiplier means for producing in response to said first and second signals a third analogue signal representative of the product of said first and second signals; converter means for producing in response to said third signal an outputpulsel signal having a pulse rate representative of the product of said voltge and current; and means for compensating for offset errors in said multiplier means comprising means for periodically reversing at regular intervals the polarity of one of said first and second signals at the input to said multiplier means and means effecting corresponding reversals at the input of said converter means.

4,922,190
ADAPTOR DEVICE FOR AN ARRANGEMENT FOR TESTING PRINTED-CIRCUIT BOARDS

Rnbby Reinholz, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 28, 1989, Ser. No. 317,012
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 3806793
Int. Cl.[5] G01R *1/06*
U.S. Cl. 324—158 F **8 Claims**



1. An adaptor device for an arrangement for testing printed-circuit boards having an electric contact panel connected to an evaluator arrangement whereby a test printed circuit board can be connected by the adaptor device to said contact panel, the adaptor device comprising at least two printed-circuit boards, lying side-by-side and at a right angle to the surface of the test printed-circuit board and having input side contacts arranged in rows on an input side directed toward the test printed-circuit board, said input side contacts being connected by circuit-board conductors to output side contact elements directed toward the contact panel on an output side of the adaptor device, opposite the input side, the two printed circuit boards comprising basic adaptor elements, each basic adaptor element supporting a single row of the input side contacts and having a first plated through-hole disposed below each input side contact, the input side contacts extending to a contact surface of said first through-hole, further comprising an additional through-hole having back-to-back insulated contact surfaces arranged below two consecutive through-holes, respective contact surfaces of the additional through-hole being connected to the respective contact surfaces of two consecutive first through-holes in the area of both printed-circuit boards, the output side contact elements extending to the contact surfaces of the additional through-holes.

4,922,191
ELECTRONIC TESTING EQUIPMENT INTERCONNECTION ASSEMBLY

Philip Conover, San Diego, Calif., assignor to General Dynamics Corporation, Electronics Division, San Diego, Calif.

Filed Nov. 30, 1988, Ser. No. 278,654
Int. Cl.[5] G01R *1/04*
U.S. Cl. 324—158 F **14 Claims**

1. Electronic testing equipment interconnection assembly, comprising:

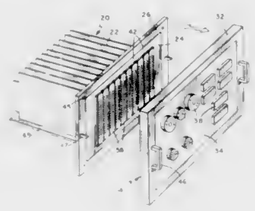
an electronic testing unit including a plurality of spaced, parallel circuit cards each having a row of flat connector pads positioned adjacent a first, outermost edge;

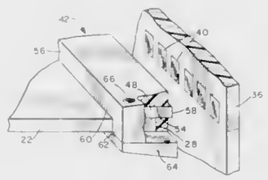
an interface unit for electrically connecting the testing unit to a device under test, the interface unit having connecting means for connection to the device under test, and a series of spaced rows of connector pads on an outer face of the unit for connection to the testing unit;

VOL 114 ISS 1 MY 1 1990 UMI

coupling means for releasably coupling the interface unit with the testing unit with the circuit cards perpendicular to the outer face of the interface unit;

interface connecting means for electrically connecting the contact pads on the testing unit to corresponding contact pads on the interface unit, the interface connecting means comprising a series of elongate strips secured to a first one of the units, each strip having alternating conductive and non-conductive areas on at least two of its faces, each conductive area on one face being connected to a corresponding conductive area on the other face, and comprising conductive means for electrically contacting each connector pad on said one unit and the corresponding connector pad on the other unit, and biassing means for biassing said conductive means into contact with said





respective terminal, each strip extending across a respective row of contact pads of said first unit with each pad in face to face contact with at least one of the conductive areas on one face of the strip;

said coupling means further comprising positioning means for positioning said other unit with each row of contact pads extending parallel to and in alignment with a respective one of said strips; and

said connecting means further comprising biassing means for biassing the conductive areas on the other face of each strip into electrical connection with contact pads on said other unit, said contact pads on said other unit each being connected to at least one of the conductive areas which is in contact with the corresponding contact pad on said first unit.

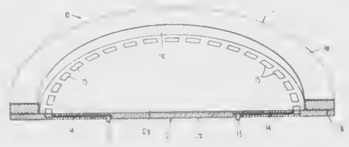
4,922,192
ELASTIC MEMBRANE PROBE

Hal D. Gross, San Diego, Calif., and Gerard M. Hudon, St. Paul, Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 6, 1988, Ser. No. 240,798
Int. Cl.[5] G01R *1/02, 1/04*
U.S. Cl. 324—158 P **12 Claims**

9. An electro-mechanical probe for testing conductive paths in an interconnect module; said probe comprising. a frame having an upward-facing surface, a downward-facing surface, and an aperture therethrough; an elastic transparent membrane attached to said downward-facing surface and traversing said aperture; and a plurality of conductive bumps on said membrane outside of said aperture; wherein said probe further includes:

a first set of conductors on said membrane which are smaller in number than the number of bumps in said plurality, each conductor of said first set connecting a respective one of said bumps to a corresponding bonding pad on the perimeter of said membrane;



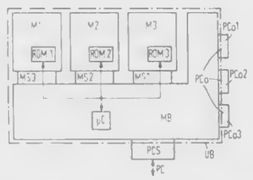
a second set of conductors on said membrane, each of which connects a respective pair of said bumps to each other; and,

said second set of conductors and respective pairs of bumps being disposed on said membrane such that they, together with said conductive paths in said module, form serial interconnections between the conductors of said first set and their corresponding bumps.

4,922,193
PRINTED CIRCUIT CARD FOR A PERSONAL COMPUTER

Thomas Bunata, Bad Aibling; Robert Hollfelder, Munich; Reiner Zieglmeier, Rottenburg, and Thomas Steuer, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 235,570
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R **4 Claims**



1. A printed circuit card composed of a main board (MB) and at least one module board (M1) connected to said main board (MB), and having contact terminals PCS for connection to a control device, such as a personal computer (PC), whereby said module board (MB) includes means for identification, characterized by: said module board (M1) contains at least one memory means (ROM1); and an identifiedr of the module board (M1) is stored in said memory means (ROM1), in that said identifier is composed of an identification code of said module board (M1) and of additional information about the circuits mounted on said module board (M1), and in that said identifier is stored under an address in the memory means (ROM1) which is identical for every module board (M1).

4,922,194
PROCESS SENSOR SIMULATORS

William P. Gaussa, Monroeville; David G. Theriault, Plum Borough; William W. Wassel, Murrysville; John A. Skoncey, Delmont, and Ronald R. Havelka, West Mifflin, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1989, Ser. No. 330,545
Int. Cl.[5] G01R *19/03*
U.S. Cl. 324—158 R **18 Claims**



1. A circuit device for simulating a selected one of a plurality of process transducers, comprising:

means defining signal input and output terminals connectable to external conductors;

means defining a plurality of circuit components connectable between said signal input and output terminals;

coupling means connected between two of said circuit components for conducting a signal between said two components;

selective connecting means including connector terminals connected to at least one of said circuit components, and connector elements for establishing conductive connections between selected ones of said connector terminals for configuring said circuit device to apply to said signal output terminal a signal corresponding to the output signal of a selected transducer;

wherein said circuit components include:

a differential amplifier having a first input connected to said signal input terminal, a second input and an output; and

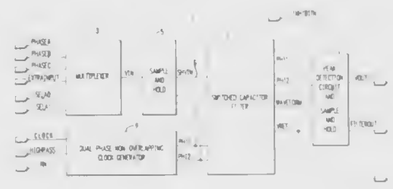
voltage/current converting means having an input for receiving a voltage and an output for supplying a current proportional to the voltage applied to the input; and

said coupling means are connected between said amplifier output and said converting means input for applying to said converting means input a voltage corresponding to the voltage at said amplifier output.

4,922,195
EXTRANEOUS FREQUENCY DETECTOR

Roger W. Cox, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 19, 1988, Ser. No. 286,391
Int. Cl.[5] G01R *23/165*
U.S. Cl. 324—158 MG **14 Claims**



1. Apparatus for detecting extraneous frequencies in an electrical signal with a preset fundamental frequency, said apparatus comprising:

sample-and-hold means for sampling and holding as an amplitude sample, the amplitude of said electrical signal at a selected sampling rate;

a discrete time, analog, highpass filter including switching means;

means applying said amplitude sample held by said sample-and-hold means to said discrete time analog highpass filter;

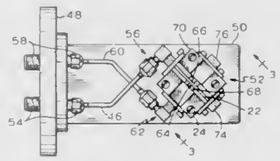
control means controlling the sampling rate of said sample-and-hold means and the switch means of said discrete time analog, highpass filter, and including means to set the sampling rate of the sample-and-hold means and to switch the switching means of said discrete time analog highpass filter at said fundamental frequency to alias the fundamental frequency and harmonics thereof; and

output means generating an output signal representative of the amplitude of frequencies passed by said highpass filter.

4,922,196
BEAM-BLANKING APPARATUS FOR STROBOSCOPIC ELECTRON BEAM INSTRUMENTS

Philip R. Rigg, Mountain View, Calif., assignor to Amray, Inc., Bedford, Mass.

Continuation of Ser. No. 240,427, Sep. 2, 1988, abandoned, which is a continuation of Ser. No. 129,859, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 857,720, Mar. 10, 1986, abandoned. This application Apr. 19, 1989, Ser. No. 342,629
Int. Cl.[5] G01R *1/00, 31/02*
U.S. Cl. 324—158 R **2 Claims**



1. For determining the voltage on a node in a circuit at predetermined points in the cycle of operation of the circuit, an apparatus comprising:

A. a source of electrons;

B. means for driving the electrons along an electron path from the source to a test point on a circuit under test disposed in a target region;

C. a stop plate between the source and the target region, the stop plate forming a beam-limiting aperture for passage therethrough of electrons passing from the source to the target region;

D. a transmission line having a substantially uniform characteristic impedance and being terminated at one end in that characteristic impedance, the transmission line including a coaxial section, a stripline section, and a coaxial-to-stripline coupler coupling the coaxial section to the stripline section, the center conductor and one of the outer conductors of the stripline section forming a pair of deflection plates disposed on opposite sides of the electron path between the source and the target region to permit electrons passing from the source to the target region to pass therebetween and be deflected by any electric field therebetween;

E. a pulse generator, connected to the other end of the transmission line and adapted to receive a trigger signal that occurs at a predetermined point in the cycle of operation of a device under test, for generating a voltage pulse at a time determined by the trigger signal, the voltage applied by the pulse generator during a pulse being such

that the electric field between the plates permits the electron beam to pass through the aperture in the stop plate and thereby hit the target region, the voltage applied by the pulse generator between pulses being such that the electric field between the plates prevents the electron beam from passing through the aperture in the stop plate and thereby from reaching the target; and

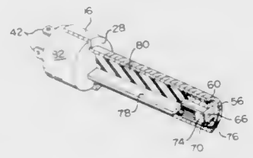
F. means for collecting electrons emitted from an object in the target region, generating an indication of the rate of electron emission from the object, and thereby indicating the voltage at the test point.

4,922,197

HIGH RESOLUTION PROXIMITY DETECTOR EMPLOYING MAGNETORESISTIVE SENSOR DISPOSED WITHIN A PRESSURE RESISTANT ENCLOSURE

Mark A. Juds, New Berlin, and Bruce C. Beihoff, Glendale, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 1, 1988, Ser. No. 226,499
Int. Cl.[5] G01B *7/30*
U.S. Cl. 324—207.21 **33 Claims**



1. A proximity sensor adapted for detecting the presence of a target within a sensing region, said sensor comprising:

housing means including a generally tubular elongate probe portion defining a closed cavity therein;

an annular permanent magnet coaxially disposed within said cavity at an end of said probe portion proximate said sensing region;

means including at least one ferrous member disposed concentrically within said magnet and coacting therewith to establish a focused magnetic field within said region;

magnetoresistive sensor means disposed within said magnet to detect distortion of said magnetic field effected by said target; and

means in circuit with said sensor means operative to generate an output signal as a function of said sensed magnetic field distortion,

said field focusing means comprising an elongated pin formed of ferrous material disposed coaxially within said magnet and selectively axially positionable with respect to said magnet and sensor means.

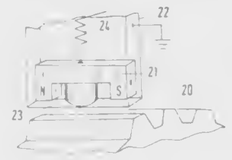
4,922,198

DISPLACEMENT SENSOR INCLUDING A PIEZOELECTRIC ELEMENT AND A MAGNETIC MEMBER

Jürgen Sandhagen, Adenbüttel, and Udo Renger, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Feb. 8, 1989, Ser. No. 308,095
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3894027
Int. Cl.[4] G01B *7/30;* **G01P** *3/48;* **H01L** *41/08;* **F02P** *17/00*
U.S. Cl. 324—207.13 **3 Claims**

1. Apparatus for generating signals in response to relative motion between two parts comprising magnetic means associated with a first part providing a defined sequence of magnetic asymmetries in the direction of relative motion of the parts, piezoelectric transducer means associated with a second part to generate an electric signal in response to an applied force, and mounting means for the piezoelectric transducer means responsive to the magnetic asymmetries resulting from relative motion of the first and second parts to apply varying force to the piezoelectric transducer means wherein the mounting means comprises a permanent magnet generating a magnetic



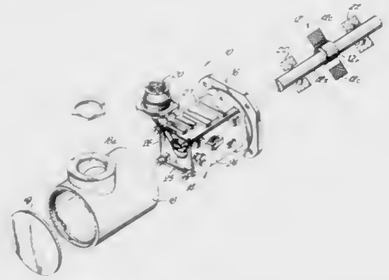
field and arranged to transmit force to the piezoelectric transducer means and a ferromagnetic bridge arranged to transmit force to the piezoelectric transducer and including at least one permanent magnet on each side of the piezoelectric transducer to generate a magnetic field.

4,922,199

ROTARY POSITION TRANSDUCER HAVING HINGED CIRCUIT BOARDS

Ronald D. Fukui, Portage, Mich.; Wataru Ichikawa, Fuchu, and Kazuya Sakamoto, Akishima, all of Japan, assignors to Enprotech Corp., New York, N.Y.

Filed May 27, 1988, Ser. No. 199,384
Int. Cl.[5] G01B *7/29;* **G01P** *3/44;* **H05K** *11/14, 7/16*
U.S. Cl. 324—207.17 **2 Claims**



1. A position transducer comprising:

a rotary variable inductance sensor having an input shaft adapted to be connected to a device whose position is to be measured;

power supply circuits and an electronic converter coupled to the output of the sensor to provide a digitally encoded signal representative of a rotary position of said input shaft to provide a measurement of the position of the device to which said shaft of said sensor is connected,

a plurality of rigid circuit boards, said electronic converter and power supply circuits being mounted on said plurality of rigid boards;

a single track board having flexible portions;

each of said rigid circuit boards being laminated to said track board,

said track board having electrical tracks thereon and said rigid circuit boards having circuit components mounted thereon, said tracks connecting components on the various boards to components on other ones of said boards,

the individual ones of said plurality of circuit boards being hinged to adjacent circuit boards by said flexible portions of said track board and forming a multi-sided tube,

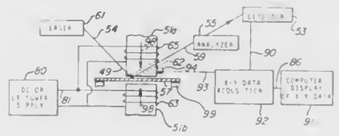
said sensor being positioned within said multi-sided tube.

4,922,200

APPARATUS FOR MEASURING THE HYSTERESIS LOOP OF MAGNETIC FILM

Leon D. Jackson, Bloomfield Hills; Dan O. Morris, Troy, and Thomas J. Nagi, Drayton Plains, all of Mich., assignors to LDJ Electronics, Inc., Troy, Mich.

Filed Aug. 25, 1989, Ser. No. 398,407
Int. Cl.[5] G01R *33/12, 33/14*
U.S. Cl. 324—223 **19 Claims**



1. An apparatus for the nondestructive hysteretic testing of magnetic layers on a surface of a product, said apparatus comprising:

electromagnetic means having a pair of pole-pieces of the same magnetic polarity, each having oppositely disposed faces with a gap therebetween, said electromagnetic means producing a region of uniform flux density with flux lines in the gap running substantially parallel to the faces of the pole-pieces, the flux path having a sufficiently high magnetic field strength to saturate a thin magnetic layer spot on a surface of said product;

supporting means for positioning said spot on the product adjacent the gap;

laser means for directing a high polarization laser beam onto said spot on the product; and

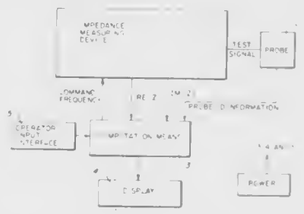
receiver means for receiving the beam reflected from the spot and determining the magnetic characteristics of the product as a function thereof.

4,922,201

EDDY CURRENT METHOD FOR MEASURING ELECTRICAL RESISTIVITY AND DEVICE FOR PROVIDING ACCURATE PHASE DETECTION

Susan N. Vernon, Annandale, Va., and Paul M. Gammell, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 9, 1989, Ser. No. 294,622
Int. Cl.[5] G01N *27/72;* **G01R** *27/02, 33/12*
U.S. Cl. 324—236 **19 Claims**



17. An eddy current device for determining resistivities in conductive materials comprising:

a means for measuring absolute impedance capable of measuring impedance over a wide range of frequencies; in electrical connection with

an eddy current probe of effective radius r that is at least 1.67 times the thickness of said material over which resistivity measurements are desired; and

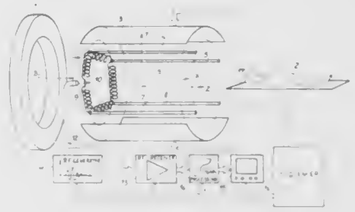
a computation means in electrical connection with said impedance measuring device; outputting signals to a means for inputting command signals in electrical connection with said computation means.

4,922,202

METHOD FOR MEASURING FLOWS IN A NUCLEAR MAGNETIC RESONANCE EXPERIMENT

Patrick Le Roux, Gyf sur Yvette, France, assignor to General Electric CGR S.A., Issy les Moulineaux, France

Filed May 11, 1988, Ser. No. 192,526
Claims priority, application France, May 12, 1987, 87 06650
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—306 **3 Claims**



1. A method for detecting flows in an NMR procedure, wherein:

a body to be examined, comprising parts in motion, is subjected to an orienting magnetic field,

two parallel slices of this body are simultaneously excited in phase opposition selectively so as to flip the orientation of magnetic moments of the parts of said body located in said slices,

a resonance signal resulting from this flipping excitation is received, and

said resonance signal is processed in order to extract a motion artifact relating to the parts in motion,

the method comprising, after the flipping excitation but before the reception, subjecting the body to at least one spin echo excitation, the effect of which is limited in space to at least one slice of the body, said at least one slice being adjacent to both the two parallel slices, so as to discriminate the direction of the movement of the moving parts in the received signal.

4,922,203

POLARIZATION TRANSFER NMR IMAGING

Laurel O. Sillerud, Los Alamos, and David B. van Hulsteyn, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 31, 1989, Ser. No. 305,211
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—307 **14 Claims**

1. A method for generating NMR images containing chemical information, comprising the steps of:

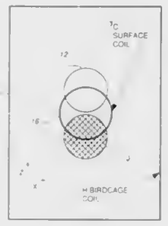
selecting a chemical compound with a functional element related to said chemical information and a transfer element for generating an NMR imaging signal, with nuclei of said functional element and said transfer element spin-coupled and covalently bound to define two NMR response peaks separated by a coupling constant under NMR excitation at a first frequency related to said transfer element in said compound;

exciting a volume containing said compound with first pulses at said first frequency;

applying electromagnetic gradients to said volume effective to spatially separate a response of said compound to said first frequency;

exciting said volume with a second pulse at a second frequency corresponding to said functional element at a time

after said first pulse which is the inverse of said coupling constant;
said second pulse being applied only in the absence of said gradients; and



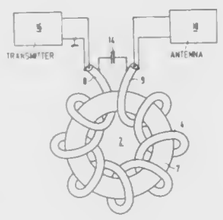
acquiring spatial data from said transfer element having chemical data modulated by said functional element.

4,922,204

ARRANGEMENT FOR OPERATING A SYMMETRICAL RADIO-FREQUENCY ANTENNA IN A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

Wilhelm Duerr, Erlangen, and Ralph Oppelt, Weiher, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich

Filed Mar. 29, 1989, Ser. No. 330,110
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3811983
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 **5 Claims**



1. In a nuclear magnetic resonance tomography apparatus having a symmetrical radio-frequency antenna and an asymmetrical line for carrying signals to and from said antenna, the improvement of a sheath wave trap connected between said antenna and said line, said sheath wave trap comprising an inductor in the shape of a toroid.

4,922,205

APPARATUS FOR DETECTING CONTAMINATION ON PROBE SURFACE

Kazuo Shimizu, Kashiwa; Hiroshi Amemiya, Kawagoe, and Yuichi Sakamoto, Tokyo, all of Japan, assignors to Rikagaku Kenkyusho, Saitama, Japan

Filed Jun. 8, 1989, Ser. No. 363,157
Int. Cl.[5] G01N *27/60*
U.S. Cl. 324—454 **1 Claim**

1. An apparatus for detecting contamination on probe surface comprising:
a sweep voltage generator for generating sweep voltage which is applied to a probe or probes in plasma,
a probe current detection circuit for detecting probe current which flows in accordance with the sweep voltage applied,
an amplitude discriminator for comparing the probe current with a predetermined threshold and generating an output signal when the probe current becomes equal to the predetermined threshold,
a first sample-hold circuit for sampling and holding the sweep voltage upon reception of the output signal from



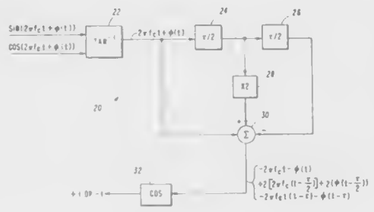
the amplitude discriminator while the sweep voltage is increasing,
a second sample-hold circuit for sampling and holding the sweep voltage upon reception of the output signal from the amplitude discriminator while the sweep voltage is decreasing, and
a subtracter for providing a difference between the sweep voltages held in the first and second sample-hold circuit.

4,922,206

METHOD OF DEMODULATION USING SPLIT DELAY LINE

David C. Nicholas, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 28, 1989, Ser. No. 373,833
Int. Cl.[5] H04L *27/22*
U.S. Cl. 329—304 **15 Claims**



1. A method of demodulation, comprising the steps of:
providing a modulated signal having a carrier component and a data component;
inputting said modulated signal to a delay element;
generating first and second delayed signals; and
combining said delayed signals and said modulated signal to produce a combined output comprising a function of said data component independent of said carrier component.

4,922,207

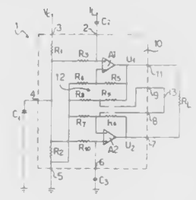
SO-CALLED BRIDGE AUDIO AMPLIFIER

Edoardo Botti, Strada Milanese - 27036 Mortara, Pavia, Italy

Filed Apr. 12, 1988, Ser. No. 180,386
Claims priority, application Italy, Apr. 30, 1987, 20337 A/87
Int. Cl.[5] H03F *3/68*
U.S. Cl. 330—84 **17 Claims**

1. An integrated circuit bridge audio amplifier, said integrated circuit having terminals, said circuit comprising:
(a) a first power amplifier in a non-inverting configuration having an inverting input, a non-inverting input, and an output,
(b) a first feedback resistor connected between the output and the inverting input of the first amplifier,

(c) a second resistor connected between said first amplifier inverting input and a first terminal,
(d) a second amplifier having an inverting input, a non-inverting input, and an output,
(e) a first pair of resistors forming a bridge circuit with said first and second resistors of said first amplifier,
(f) a second pair of resistors connected together between a second terminal and the first terminal, said first and second amplifiers having their respective non-inverting inputs connected between said second resistor pair,
(g) the output of said first amplifier connected to a third terminal and the output of said second amplifier connected to a fourth terminal,



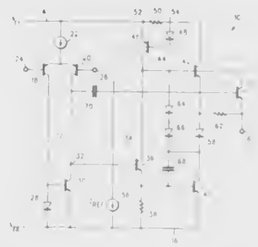
(h) one node of the bridge circuit being constituted by the connection of the first amplifier output to the first resistor,
(i) the opposite node of the bridge circuit being constituted by the connection of the second resistor to the first terminal,
(j) one side node of the bridge circuit being connected to the inverting input of the first amplifier and the opposite side node of the bridge circuit being connected to a fifth terminal,
(k) the inverting input of the second amplifier being connected to a sixth terminal,
(l) the connection between the second pair of resistors being connected to a seventh terminal.

4,922,208

OUTPUT STAGE FOR AN OPERATIONAL AMPLIFIER

David M. Susak, Chandler, and Robert L. Vyne, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 7, 1989, Ser. No. 334,430
Int. Cl.[5] H03F *3/26, 3/45*
U.S. Cl. 330—255 **4 Claims**



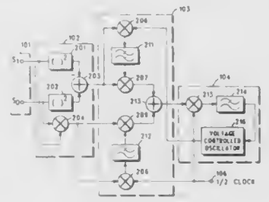
1. An output stage for an operational amplifier for providing load current to an output terminal in response to a drive signal supplied to the input thereof, comprising:
an output driver stage including first and second NPN transistors each having a base, collector and an emitter, said emitter of said first NPN transistor being coupled to the output terminal for sourcing current thereto and said collector of said second NPN transistor being coupled to the output terminal for sinking current therefrom, said emitter of said second NPN transistor being coupled to a first power supply conductor;
an emitter follower configured transistor coupled between the input of the output stage and said bases of said first and second NPN transistors; and
circuit means coupled between a second power supply conductor and said collector of said first NPN transistor for supplying base current drive thereto the magnitude of which is a function of the collector current flowing through said first transistor and which increases as the load current supplied by said first transistor to the output terminal increases.

4,922,209

CLOCK RECOVERY DEVICE

Henry L. Kazecki, Des Plaines, and Steven H. Goode, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 28, 1989, Ser. No. 345,135
Int. Cl.[5] H03L *7/08*
U.S. Cl. 331—12 **10 Claims**



1. A clock recovery device for recovering a clock signal from an information signal having in-phase and quadrature components, wherein the clock signal is offset at least in part by an error offset related at least in part to a carrier frequency for the information signal, comprising:
(A) input means for receiving the information signal,
(B) clock extraction means for receiving a signal having a corrected clock component and providing the clock signal in response thereto; and
(C) frequency correction means coupled:
to the input means for receiving an input signal at least related to the information signal; and
to the clock extraction means for receiving the clock signal;
for substantially removing the error offset from the clock signal in response thereto and providing the signal having a corrected clock component.

4,922,210

FEEDBACK-COUPLED HIGH-FREQUENCY POWER OSCILLATOR

Gerhard Flachenecker, Ottobrunn; Karl Fastenmeier, Munich, and Heinz Lindenmeier, Planegg, all of Fed. Rep. of Germany, assignors to Erbe Elektromedizin GmbH, Tubingen, Fed. Rep. of Germany

Filed Jul. 18, 1989, Ser. No. 381,492
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1988, 3824970
Int. Cl.[5] H03B *1/02, 5/08*
U.S. Cl. 331—167 **22 Claims**

1. A feedback-coupled high frequency power oscillator comprising a power amplifier connected as a complementary or quasicomplementary semiconductor stage for operation in a switching mode, an output filter including a series-resonant circuit and a parallel-resonant circuit, each tuned approximately to a midfrequency of operation, said series resonant circuit constituting the first element of said output filter as seen from said power amplifier, and a feedback circuit branch for

providing a driving voltage to an input of said power amplifier, said feedback circuit branch comprising:

voltage feedback means for deriving, from a voltage present in said parallel-resonant circuit, a first component of said driving voltage;

current inverse feedback means for deriving, from a current flowing in said series resonant circuit, a second component of said driving voltage;



algebraic addition means (5) having inputs respectively connected to said voltage feedback means and said current feedback means, to produce a resultant feedback voltage, and

pulse converting means (6) for converting said resultant feedback voltage into said driving voltage.

4,922,211

MICROWAVE OSCILLATOR IN WHICH THE DIELECTRIC RESONATOR IS HERMETICALLY SEALED

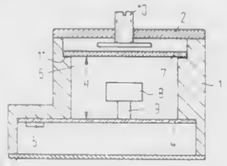
Klaus Otremba, Munich, and Volker Sartorius, Puchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Siemens Aktiengesellschaft, Berlin and Munich, both of, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 318,969

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1988, 3812669

Int. Cl.[5] H03B *5/18*

U.S. Cl. 331—68 13 Claims



1 A microwave oscillator comprising, a dielectric resonator, an electrical circuit on a printed circuit board electromagnetically coupled to said dielectric resonator, said dielectric resonator mounted in a hermetically sealed air tight space inside a metal housing to which said circuit board is mounted, and dielectric resonator coupling elements to couple energy between said resonator and said electrical circuit formed on said printed circuit board which has one side upon which components are formed and which has a second side which is metallized over its entire surface so as to form a ground plane and wherein said space is laterally surrounded by the side walls of said metal housing and said space is terminated by said printed circuit board on one end and by a glass plate on the second end, and wherein the insides of said metal housing are formed with step-shaped offset shoulders which are spaced a distance apart which corresponds to the height of said space and said printed circuit board and said glass plate are mounted on said shoulders.

4,922,212

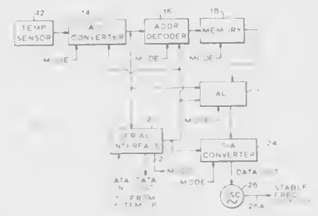
OSCILLATOR TEMPERATURE COMPENSATING CIRCUIT USING STORED AND CALCULATED VALUES

Glyn Roberts; Gordon Paynter, both of Calgary, and Remesh B. Krishnasastry, Ottawa, all of Canada, assignors to NovAtel Communications, Ltd., Calgary, Canada

Filed Jun. 5, 1989, Ser. No. 361,551

Int. Cl.[5] H03L *1/02*

U.S. Cl. 331—176 13 Claims



1 A voltage-controlled crystal oscillator, said oscillator including:

A. an oscillator crystal having an output signal whose frequency varies with temperature;

B. a temperature sensor for sensing ambient temperature and producing a signal related to the temperature;

C. a memory for storing for each of a predetermined number of ambient temperatures a temperature offset value equal to the difference between the oscillator frequency at the ambient temperature and the oscillator frequency at a known different temperature, said temperature offset values being stored at memory locations associated with the ambient temperatures;

D. an address decoder connected between said temperature sensor and said memory, said address decoder receiving the output of said temperature sensor and addressing locations in said memory associated with the ambient temperature;

E. a function calculator connected to receive the contents of the memory locations addressed by said address decoder and the output of said temperature sensor for calculating a compensating signal value depending on the retrieved temperature offset values and directly related to the ambient temperature; and

F. a converter connected to receive the calculated compensating signal value for converting the signal value to a compensating signal and applying the signal to the controlling input of the crystal oscillator.

4,922,213

POLARIZERS WITH ALTERNATINGLY CIRCULAR AND RECTANGULAR WAVEGUIDE SECTIONS

Subir Ghosh, Kitchener, Canada, assignor to Com Dev. Ltd., Cambridge, Canada

Fited Oct. 11, 1988, Ser. No. 255,637

Claims priority, application Canada, Jul. 5, 1988, 571188

Int. Cl.[5] H01P *1//16*

U.S. Cl. 333—21 A 13 Claims

1 A waveguide polarizer for controlling the state of polarization of signal carrier modes in a waveguide, said polarizer comprising a waveguide housing having a longitudinal axis, with a plurality of short waveguide sections, each section being centered on said longitudinal axis, said waveguide sections being arranged in a first set and a second set so that the sections of the first set alternate with the sections of the second set throughout the housing, all sections of the first set having a circular cross-section and all sections of the second set having a rectangular cross-section with two transverse dimensions, said transverse dimensions being at least as large as a minimum diameter of the sections of the first set, the waveguide housing

having two ends with a section from the first set being located at each end, the waveguide housing having a circular port at each end, successive sections of the second set having at least



one transverse dimension that progressively changes from section to section towards a centre point of the longitudinal axis, all of said sections being symmetrical about said centre point.

4,922,214

APPARATUS TO COUPLE LASER RADIATION AND MICROWAVE ENERGY USING A MICROWAVE WAVEGUIDE

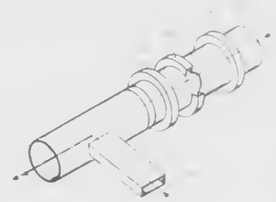
Peter Kalkert, Jülich, Fed. Rep. of Germany, assignor to URANIT GmbH, Jülich, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,723

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722850

Int. Cl.[5] H01P *1/213*

U.S. Cl. 333—135 20 Claims



1 A coupling device for coupling laser radiation and microwave radiation and directing the coupled laser radiation and microwave along a predetermined path, said coupling device comprising:

microwave waveguide means for guiding the microwave radiation along substantially said predetermined path, said microwave waveguide means having a microwave entry aperture and a common exit aperture for both the microwave radiation and the laser radiation, said common exit aperture having a predetermined cross-sectional dimension;

laser entry aperture means provided in said microwave waveguide means for admitting the laser radiation into the interior of said microwave waveguide means, said laser entry aperture means having a cross-sectional dimension comparable to said predetermined cross-sectional dimension of said common exit aperture and

bandstop filter means positioned in said microwave waveguide means between said laser entry aperture means and said microwave entry aperture for substantially reducing any emission of the microwave radiation through said laser entry aperture means.

4,922,215

POWER DIVIDER IN WAVEGUIDE FORM

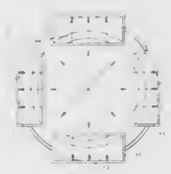
Jean-Pierre Bergero, Limeil Brevannes, and Claude Couasnard, Meudon La Foret, both of France, assignors to Thomson-CSF, Paris, France

Filed Feb. 21, 1989, Ser. No. 312,604

Claims priority, application France, Feb. 23, 1988, 88 02127

Int. Cl.[5] H01P *5/12*

U.S. Cl. 333—137 4 Claims



1. A power divider in waveguide form for microwave power transmission circuits, working at high power in the rectangular TE_{10} mode, said power divider comprising:

a rectangular, input waveguide working in its fundamental mode, receiving the power to be divided through one of its ends, and having another closed end;

a circular waveguide propagating the TM_{01} mode, having a first input connected to the rectangular, input waveguide by a lateral opening, placed on the large side of the rectangular waveguide, near its closed end, in such a way that the axes of the two guides are perpendicular; said divider further comprising a group of n output waveguides, working in the rectangular TE_{10} mode, distributed in a ring before a second end of the circular waveguide, so at least one of their large sides is cut in a substantially perpendicular direction by a radius of the cross-section of the circular guide, and so that they each transmit, in the TE_{10} mode, a fraction of the power introduced into the rectangular, input waveguide.

4,922,216

ELECTROMAGNETIC SWITCHING DEVICE

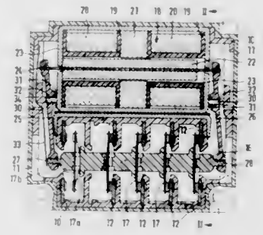
Bernhard Dietrich, Eichenau, Fed. Rep. of Germany, assignor to SDS - Relais AG, Deisenhofen, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 281,786

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743122

Int. Cl.[5] H01H *67/02*

U.S. Cl. 335—128 8 Claims



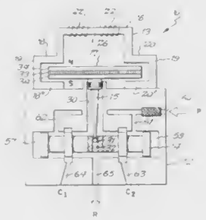
1. An electromagnetic switching device, comprising:

a contact arrangement including at least one stationary contact disposed in a housing member and a contact slider inserted in said housing member and carrying a contact movable relative to the stationary contact;

a solenoid actuator inserted in said housing member and including a bobbin, at least one coil and an armature mov-

able substantially parallel to the direction of movement of the contact slider;
two levers disposed on opposite sides of said solenoid actuator to constitute a parallelogram linkage together with said contact slider and said armature, said contact slider and armature having stepped ends extending through openings formed in the arms of both levers and being supported by said levers to constitute operative connections of said parallelogram linkage;
bearing locations for said levers comprising guide members which project from the outside of said solenoid actuator substantially parallel to the direction of movement of said armature and extend through recesses formed in said levers, and
bearing surfaces formed on said housing member for supporting outer surfaces of said levers in the vicinity of said recesses.

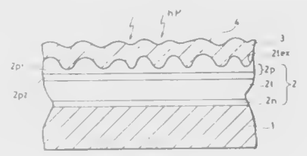
4,922,217
TORQUE MOTOR WITH MAGNET ARMATURE
John H. Buscher, East Amherst, N.Y., assignor to HSC Controls, Inc., Buffalo, N.Y.
Filed Jun. 17, 1988, Ser. No. 208,991
Int. Cl.[5] H01F 7/08
U.S. Cl. 335—229 33 Claims



1. A torque motor comprising a frame of magnetic material, spaced first end portions on said frame, an armature which is a laminate of a magnet with strips of magnetic material on both opposite sides of said magnet, spaced second end portions on said armature, mounting means for mounting said armature for movement relative to said frame, each of said second end portions including a north pole and a south pole, gap means between said first end portions of said frame and said second end portions of said armature, means for positioning said armature in a neutral position wherein said gap means exist between all parts of said first and second end portions, and coil means operatively associated with at least one of said frame and said armature for providing magnetic circuits for selectively positively moving said armature in opposite directions from said neutral position.

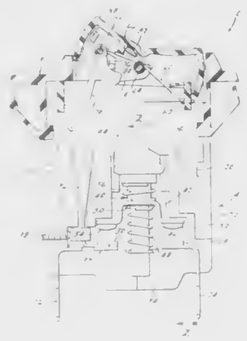
4,922,218
PHOTOVOLTAIC DEVICE
Kaneo Watanabe, Kyoto; Masayuki Iwamoto, Hyogo, and Koji Minami, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Sep. 2, 1988, Ser. No. 241,004
Claims priority, application Japan, Sep. 14, 1987, 62-229982
Int. Cl.[5] H01L 27/14, 45/00, 29/161
U.S. Cl. 357—30 25 Claims

1. A photovoltaic device comprising a photoactive layer for generating optical carriers when light is applied thereto, and a window layer containing at least silicon and hydrogen and located on a light incidence side of said photoactive layer, wherein hydrogen concentration in said window layer is



higher in a portion on a light incidence side than in a portion facing said photoactive layer.

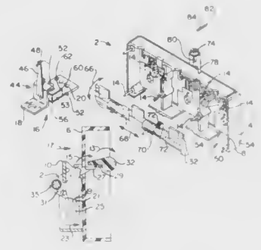
4,922,219
CIRCUIT BREAKER
Kenneth C. Bakhaus, Jackson, and Bruce C. Sdunek, Howell, both of Mich., assignors to Mechanical Products, Inc., Jackson, Mich.
Filed Jul. 17, 1989, Ser. No. 380,807
Int. Cl.[5] H01H 71/16
U.S. Cl. 337—74 9 Claims



1. An electrical circuit breaker comprising a plunger-contact subassembly and a manual actuator-latch subassembly wherein said plunger-contact subassembly comprises
a housing having means for removably engaging said manual actuator-latch subassembly;
a pair of terminals disposed internally of said housing and protruding externally therefrom for connection to a source of electrical current;
a first fixed contact disposed internally of said housing and connected to one of said terminals;
a second fixed contact disposed internally of said housing;
an elongated bimetallic element assembly connected to the other of said terminals and to said second fixed contact;
a plunger shaft located intermediate said first and second fixed contacts and moveable relative thereto;
a contact bridge supported by said plunger shaft and moveable therewith;
first and second moveable contacts mounted at opposite ends of said contact bridge and aligned with said first and second fixed contacts, respectively;
a contact pressure spring supported by said plunger shaft providing a constant bias on said moveable contacts towards said fixed contacts;
a plunger shaft release spring intermediate said contact bridge and said housing providing a constant bias on said plunger shaft away from said housing;
said actuator-latch subassembly comprising

a manual actuator frame having means engageable with the engagement means of said plunger-contact subassembly for joining said subassemblies, said manual actuator frame having a first latch pin control slot;
a manual actuator supported for rotation by said manual actuator frame and having a second latch pin control slot;
an inner rocker supported for rotation by said manual actuator and having a third latch pin control slot;
a trip lever supported for rotation by said inner rocker and engageable with said plunger shaft and with said bimetallic element, deflection of said bimetallic element due to an overload condition in an electrical circuit containing said circuit breaker effecting disengagement of said trip lever from said plunger shaft whereby said moveable contacts disengage from said fixed contacts; and
a latch pin extending through each of the first, second and third latch pin control slots in said manual actuator frame, manual actuator, and inner rocker, respectively, wherein said control slots direct the latch pin travel in response to manual operation or circuit overload and provide a cradling means whereby said latch pin is retained under the bias of said plunger shaft release spring to effect latching.

4,922,220
ADJUSTABLE CIRCUIT BREAKER THERMAL TRIP UNIT
John K. Livesey, Carnegie, and James N. Altenhof, Jr., West Bridgewater Boro., both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 22, 1989, Ser. No. 327,221
Int. Cl.[5] H01H 71/16
U.S. Cl. 337—82 18 Claims



1. A circuit breaker, comprising:
separable main contacts for opening to interrupt electrical current flowing through an interconnected load;
rotatable trip bar means rotatable about an axis and translatable along said axis, said trip bar means having a face portion capable of being abutted by another member for the purpose of causing rotation of said trip bar means;
operating means interconnected mechanically between said separable main contacts and said rotatable trip bar means for causing said separable main contacts to open in relationship to the rotation of said rotatable trip bar means;
trip means angularly movable relative to said face portion along a predetermined path of travel as a function of said electrical current to abut said face portion at a predetermined location along said path of travel to cause said trip bar means to rotate to cause said separable main contacts to open at a predetermined magnitude of said electrical current; and
adjustment means cooperable with said trip bar means for adjustment of the translational disposition of said trip bar means relative to said trip means within a range of adjustment to cause said face portion to be abutted by said trip means at a different location along said path of travel of said trip means to cause said trip bar means to rotate to cause said separable main contacts to open at a different magnitude of said electrical current.

4,922,221
PAGER RECEIVER FOR GIVING AT LEAST ONE OF EXTRAORDINARY TONES AND EXTRAODINARY DISPLAYS
Yukio Sato, and Toshio Ichikawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Division of Ser. No. 876,021, Jun. 19, 1986, Pat. No. 4,758,834, which is a division of Ser. No. 885,736, Jul. 21, 1986, Pat. No. 4,704,608, which is a continuation of Ser. No. 465,065, Feb. 8, 1983, abandoned. This application Jan. 29, 1988, Ser. No. 150,271
Claims priority, application Japan, Feb. 9, 1982, 57-18107; Mar. 29, 1982, 57-50787; Aug. 17, 1982, 57-142541; Dec. 27, 1982, 57-196808
Int. Cl.[5] H04Q 1/30
U.S. Cl. 340—311.1 1 Claim



1. A pager receiver having first and second preassigned call numbers preassigned thereto and responding to a present call signal carrying a call number to produce first and second audible signals when said call number of the present call signal is coincident with said first and second preassigned call numbers, respectively, said first and second preassigned call numbers being different from each other, said pager receiver comprising:
a processing circuit responsive to said present call signal for processing said present call signal into first and second processed signals which are representative of first and second patterns, respectively, when the call number of said present call signal is coincident with said first and said second preassigned call numbers, respectively, said first and said second patterns being for specifying said first and said second preassigned call numbers, respectively; and
display means responsive to said first and said second processed signals for selectively displaying said first and said second patterns.

4,922,222
HOLE IN ONE ALARM
Ronald D. Baker, R.R. #2, Crawfordsville, Ind. 47933
Filed Jun. 30, 1988, Ser. No. 213,765
Int. Cl.[5] A63B 63/00
U.S. Cl. 340—323 R 8 Claims



1. A Hole in One Alarm for detecting the event of sinking of a ball by a golf player in a target cup with a single stroke from

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a remote golf tee, said event defined as a hole-in-one, said Hole in One Alarm comprising:

tee sensor means for sensing the presence of said ball upon said remote golf tee;

cup sensor means for sensing the presence of said ball in said target cup;

ball transit logic means coupled to said tee sensor means and to said cup sensor means, said ball transit logic means for determining that said ball has been sunk in said target cup after being struck from said remote golf tee;

transit timing means coupled to said ball transit logic means, said transit timing means for determining that a time sequence of events regarding emplacement, striking and sinking of said ball falls within predetermined time limits;

reset means coupled to said ball transit logic means, said reset means for placing said Hole in One Alarm in initialized condition; and

signal means coupled to said ball transit logic means, said signal means for signaling that a Hole in One has been achieved.

4,922,223

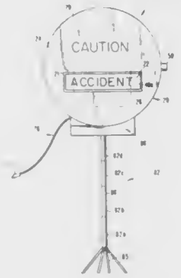
EMERGENCY IDENTIFIER FOR VEHICLES

Roderick Q. Prevot, 5035 Marks La., Indianapolis, Ind. 46226

Filed Aug. 22, 1988, Ser. No. 234,587

Int. Cl.[5] B60Q *7/00*

U.S. Cl. 340—473 **16 Claims**



1. An emergency-identifying apparatus for vehicles, comprising:

a housing having a first opening positioned in at least one side thereof;

flexible belt means carried on a plurality of rollers within said housing, said belt means having a plurality of message plates affixed thereto, each of said message plates bearing a different message indicia thereon;

a rotatable member positioned externally of said housing and coupled to at least one of said plurality of rollers, said rotatable member being adapted to rotate said at least one roller to drive said belt means to position a selected one of said message plates in alignment with said first opening to render the message indicia thereon visible through said first opening;

a first source means supported within said housing for illuminating said selected message plate from behind;

means for providing power to said first light source means;

first support means for supporting said housing at an elevated position above the ground; and

second support means for supporting said housing on a vehicle.

4,922,224

ELECTRONIC VEHICLE SECURITY SYSTEM

Ze'ev Drori, Chatsworth, and Amir Abrishami, Granada Hills, both of Calif., assignors to Clifford Electronics, Inc., Chatsworth, Calif.

Continuation-in-part of Ser. No. 138,828, Dec. 28, 1987, **abandoned. This application** Aug. 11, 1988, Ser. No. 231,159

Int. Cl.[5] B60R *25/00*

U.S. Cl. 340—428 **29 Claims**



1. An electronic vehicle security system, comprising:

means for sensing an attempted unauthorized intrusion event and providing an intrusion signal when the event is sensed;

at least one controlled device to be activated in the event of a detected unauthorized intrusion event, said controlled device activated by an output device responsive to an alarm signal;

a digital controller for controlling the operation of the security system, said digital controller comprising:

(i) means responsive to said intrusion signal for generating said alarm signal to activate said controlled device after an unauthorized intrusion event is detecting;

(ii) means for monitoring said output device to detect undesired high current flow through said device and for turning off said alarm signal when said undesired current flow is detected.

4,922,225

AUTOMOBILE WARNING LIGHT IMPROVEMENT

Norman H. Dankert, 221 Decatur, Michigan City, Ind. 46360

Filed Mar. 20, 1987, Ser. No. 28,677

Int. Cl.[5] B60Q *1/44*

U.S. Cl. 340—467 **10 Claims**



1. A signal light system for use in an automobile having a conventional rear window "third" brake light, accelerator linkage, a brake light control line, right and left turn signal control lines, a reverse light control line, and a source of electrical energy, by extending the conventional automobile "third" brake light to signal not only while braking but also during other adverse conditions, comprising:

a roller activated switch for developing an accelerator motion signal;

means for operably mounting the roller activated switch to the accelerator linkage in the automobile:

a logic circuit having an output terminal and at least an input for a brake signal and an input for a reverse signal, which when properly connected produce an output on the output terminal, the logic circuit including means for latching the output on the output terminal when the accelerator motion signal from the roller activated switch is energized in conjunction with the brake signal input or the reverse signal input;

means for inter-connecting the accelerator motion signal, the brake light control line, the reverse light control line, the turn signal control lines, and the source of electrical current with the logic circuit;

means for connecting the logic circuit output to the "third" brake light so as to control it to be "on" or "off" depending on the output from the logic circuit.

4,922,226

WATER LEVEL AND TEMPERATURE DETECTOR ALARM DEVICE

Sheng-Shun Hsieh, and Ting-Chih Liu, both of 2F, 8, Lane 73, Chinshan S. Rd.-Sec. 1, Taipei, Taiwan

Filed Jun. 22, 1989, Ser. No. 369,860

Int. Cl.[5] G08B *19/00;* **G01F** *23/36*

U.S. Cl. 340—521 **1 Claim**



1. A water level and temperature detector alarm device, including:

an alarm device comprised of a volume adjustable buzzer and a control switch;

a detector comprising a sleeve having both ends respectively connected with a water proof jacket and having a circuit board set therein, said circuit board comprising a thermo-switch, an upper reed switch and a lower reed switch;

a buoy being movably mounted on said sleeve and having a circular magnet set therein, and a disc bottom disposed to the water;

a conduit having one fixed end connected to said alarm device and having the other end expansibly connected to said detector to adjustably control the level position of said detector; and

a positioning rack movably mounted on said conduit for positioning of the whole assembly;

wherein said buoy floats upward during the rising of water level, to let said magnet attract either one of said upper and lower reed switches to turn on said circuit board so as to further drive said alarm device to provide audio alarm signal through said buzzer, and wherein said thermo-switch is turned on at the time water temperature reaches the predetermined range, to drive said alarm device to provide audio alarm signal through said buzzer.

4,922,227

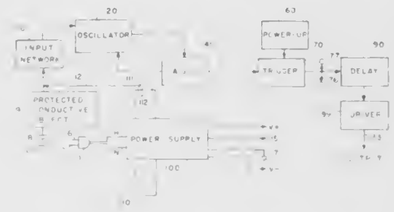
TOUCH-CONTROLLED SWITCH AND ALARM SYSTEM

Bryce L. Hesterman, P.O. Box 472, Orem, Utah 84059

Filed Jan. 24, 1989, Ser. No. 301,871

Int. Cl.[5] G08B *23/00;* **H01H** *35/00*

U.S. Cl. 340—527 **4 Claims**



1. Touch switch means adapted to operate an electric circuit when an initial value of capacitance to earth ground of at least one ungrounded electrically conductive object connected to said touch switch means rapidly changes by a predetermined amount, said touch switch means comprising:

power supply means for supplying power to said touch switch means, said power supply means having a signal ground coupled to earth ground;

oscillator means comprising an amplifier, positive feedback means, and negative feedback means, said amplifier having a terminal connected to said signal ground, said amplifier having at least one input terminal and at least one output terminal, said positive feedback means being connected between an output terminal and an input terminal of said amplifier, said positive feedback means comprising resistive and capacitive means interconnected to form a phase shifting network which determines the frequency of oscillations of said oscillator means, said negative feedback means being connected between an output terminal and an input terminal of said amplifier so as to control the gain of said amplifier, thereby controlling the amplitude of said oscillations;

an input network comprising an input conductor adapted for connection to electrically conductive objects, a network output terminal, voltage limiting means for limiting the voltage at said network output terminal, and reactance means connected between said input conductor and said network output terminal, said network output terminal further connected to an intermediate point in said positive feedback means such that said reactance means forms a highpass filter for signals entering said oscillator means;

automatic gain control means for regulating the amplitude of oscillations of said oscillator means, said automatic gain control means having a delayed, underdamped response;

trigger means having an output capable of operating an electrical load when said trigger means detects a rapid change in the amplitude of oscillations of said oscillator;

power-up means for ensuring that said output of said trigger means is off when power is first applied to said touch switch means.

4,922,228

RAILING

Amnon Jacobson, Tel Aviv, Israel, assignor to Ispra Israel Products Research Co., Ltd., Israel

Filed Aug. 11, 1988, Ser. No. 231,198

Claims priority, application Israel, Aug. 25, 1987, 83634

Int. Cl.[5] G08B *13/18*

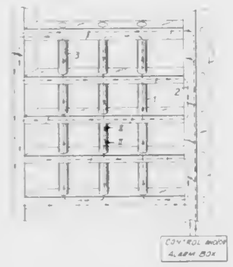
U.S. Cl. 340—550 **2 Claims**

1. A railing in which a continuous sensor made of an optical fibre extends,

which railing is filled with a suitable filling material bounding said sensor fibre, and

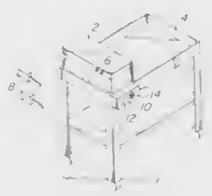
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a binder surrounding said filling material, said binder additionally comprising a material from among an irritating material and a dye,



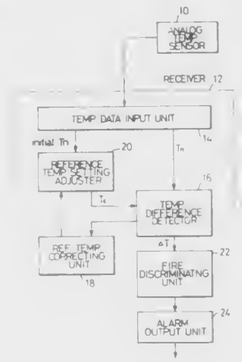
said sensor fibre being connected to an outside control or alarm unit to form a complete circuit whereby the control or alarm unit is activated upon a predetermined change in the sensor output.

4,922,229
SYSTEM FOR RETRIEVING AND PREVENTING THE LOSS OR THEFT OF KEYS
Gary Guenst, 4110 Colonial Ct., P.O. Box 744, Skippack, Pa. 19474
Filed May 11, 1989, Ser. No. 350,492
Int. Cl.[5] G08B *13/18, 21/00*
U.S. Cl. 340—572 23 Claims



1. A system for retrieving and preventing loss or theft of keys comprising:
A. a strong box;
B. a means for opening and locking said strong box comprising:
(1) at least one key slot; and
(2) at least one key, each of said at least one keys associated with, and operable with, one of each of said at least one key slots;
C. a means for transmitting a signal to each one of said keys; and
D. a retrieval means responsive to said signal associated with each one of said keys for alerting the holder of each one of said keys to return said key to said strong box.

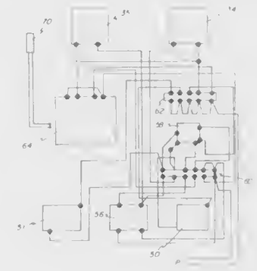
4,922,230
FIRE DISCRIMINATING APPARATUS
Shigeru Ohtani, Hiratsuka, and Yukio Yamauchi, Atsugi, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan
Filed Aug. 25, 1988, Ser. No. 236,503
Claims priority, application Japan, Aug. 26, 1987, 62-211740
Int. Cl.[5] G08B *17/00*
U.S. Cl. 340—577 4 Claims



1. A fire discriminating apparatus comprising:
a temperature sensor for detecting a temperature in an area under surveillance to generate a detected temperature output signal proportional thereto;
sampling means for intermittently sampling said detected temperature data detected by said temperature sensor at a predetermined period;
temperature difference detecting means whereby each time said detected temperature data is sampled by said sampling means, an output corresponding to a temperature difference between said sampled detected temperature and a predetermined reference temperature is generated;
fire discriminating means whereby when said temperature difference is greater than a predetermined threshold value, the outbreak of a fire is determined and an alarm command signal is generated; and
reference temperature correcting means whereby a correction value is produced by multiplying a value of said temperature difference obtained upon each said sampling by a predetermined factor smaller than 1 and said correction value is added to said reference temperature to correct the same for the purpose of temperature difference detection during the next sampling.

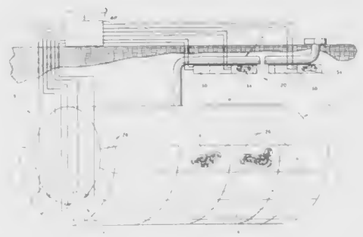
4,922,231
IDLE/NO-IDLE LIGHT SYSTEM
George A. Williams, Jr., 3417 Birch St., Grove City, Ohio 43123
Filed Sep. 9, 1988, Ser. No. 242,939
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—584 20 Claims

1. A temperature responsive signaling device for use at locations where diesel powered trucks congregate comprising:
a light source, including at least first and second lights, and means for supporting said light source outdoors, said light source being supported at a height greater than the height of a tractor-trailer truck,
a temperature sensing means positioned outdoors,
temperature responsive means connected to said temperature sensing means, said temperature responsive means responsive to the temperature of the ambient air adjacent said temperature sensing means being greater than a preselected temperature for closing the electrical circuit which controls said first light, and responsive to the temperature of the ambient air being equal to or less than said preselected temperature for closing the electrical circuit which controls said second light and opening said circuit which controls said first light,



a control box, said control box including at least two indicator lights, and a switch for the selection of an operating mode for said signaling device, and
circuit means connecting said light source, said temperature sensing means, said temperature responsive means and said control box.

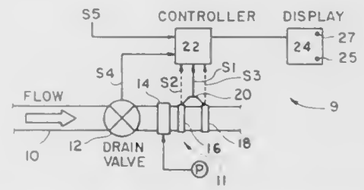
4,922,232
LEAKAGE CONTAINMENT AND DETECTION SYSTEMS
Joseph F. Bosich, 9405 Brakemao Rd., Chardon, Ohio 44024
Filed Oct. 21, 1988, Ser. No. 261,173
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—605 51 Claims



1. An apparatus comprising receiver means for receiving a liquid, means for at least partially containing liquid which may leak from said receiver means, said means for containing liquid which may leak from said receiver means including an absorbent material capable of at least partially absorbing the liquid in said receiver means and casing material which is dissolvable in the liquid disposed in said receiver means, said casing material at least partially enclosing said absorbent material, said casing material being dissolvable by liquid which leaks from said receiver means to expose said absorbent material to the liquid which leaks from said receiver means.

4,922,233
FLOW SENSOR AND SYSTEM INCORPORATING THE SAME FOR MONITORING STEAM TURBINE DRAIN VALVES
Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 5, 1988, Ser. No. 190,323
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—606 17 Claims

1. A monitoring system for monitoring at least one drain valve disposed in a fluid conduit having a temperature affected by the presence of fluid flow, and producing a diagnosis of the condition of each drain valve as functional, clogged or stuck shut, stuck open, or cold fluid flow through the drain valve, comprising:
at least one flow sensor, each flow sensor including a heater attached to an exterior surface of the fluid conduit downstream of the drain valve, the heater, when energized, producing a thermal gradient along the fluid conduit which varies as a function of fluid flow, a first temperature sensing element attached to the exterior surface of the fluid conduit at a position spaced downstream of the heater and producing an output indicative of the temperature of the fluid conduit at the position of the first temperature sensing element, a second temperature sensing element attached to the exterior surface of the fluid conduit at a position spaced downstream of the first temperature sensing element, and producing an output indicative of the temperature of the fluid conduit at the position of the second temperature sensing element, and means responsive to the outputs of the first and second temperature

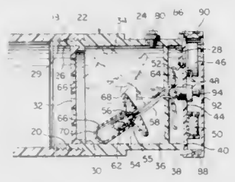


sensing elements for producing a differential temperature output signal based on a difference between the temperature sensed at the first temperature sensing element and the temperature sensed at the second temperature sensing element, the differential temperature output signal having relatively greater and lesser values responsive to and thereby indicative of the presence and absence of fluid flow,
drain valve position indicator means for producing and outputting a signal indicative of a selected position for each corresponding drain valve,
operating condition indicator means for producing and outputting a signal indicative of an operating condition of the steam turbine, and
control means responsive to the output signals of the operating condition indicator means, the differential temperature producing means, and the drain valve position indicator means, for outputting a signal indicative of a diagnosis of the drain valve, and
display means, responsive to the output signal of the control means, for displaying the diagnosis of the drain valve.

4,922,234
SEWER ALARM
Paul J. Murphy, 25 Garland Ave., Pittsfield, Mass. 01201
Filed Nov. 23, 1988, Ser. No. 275,371
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—608 10 Claims

1. A sewer drain pipe alarm assembly for replacing the plug closure of an access opening for a sewer drain pipe, said assembly including a hollow main body having opposite ends, one of said ends being open and including mounting means for mounting said open one end from said access opening with said open one end opening inwardly of said access opening, said hollow body defining a central, generally cylindrical cavity therewithin having first and second ends, said cavity opening, at said first end thereof, outwardly of said one open end and being closed at its opposite other end by a fluid impervious partition extending across the interior of said body and spaced there-

along from said open one end toward said opposite other end, an elongated tiltable switch body including first and second ends and a pair of spaced contacts at said switch body first end, said switch body including means operative to electrically connect and disconnect said contacts when said switch body first end is lowered and elevated, respectively, relative to said switch body second end, an elongated float body in which said switch body is longitudinally disposed and including large and small transverse width ends corresponding to said switch body first and second ends, respectively, a pair of relatively electrically insulated conductor means extending through a central portion of said partition in fluid sealed engagement therewith and including thin, flexible elongated conductor portions ex-



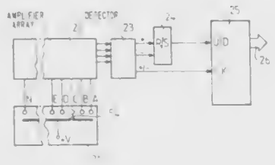
tending from said partition central portion into said float body large transverse width end and electrically connected to said contacts, said conductor portions being of effective length, outwardly of said large transverse width end, greater than one-half the width of said large transverse width end and less than the spacing of said central portion of said partition from the interior surfaces of said cavity, said conductor portions comprising flexible tether means for said float body within said cavity, the combined effective length of said flexible tether means and said float body being less than the spacing of said partition inwardly of said first end of said body, the portions of said conductor means on the side of said partition remote from said cavity being serially connected in an alarm circuit for control of said circuit by said tiltable switch body.

4,922,235

ENCODING DEVICE FOR MULTIPLE CONSECUTIVE POSITION DETECTION

Gilbert Petitjean, Igny, and Michel Lebourg, Clamart, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1989, Ser. No. 295,715
Claims priority, application France, Jan. 15, 1988, 88 00431
Int. Cl.[5] G08B *21/00*; H01H *9/06*
U.S. Cl. 340—686 20 Claims



1. Device for providing a value indicating the position of an object which can occupy at least three consecutive positions, comprising an arrangement with several terminals each of which corresponds to one of the positions, the application of a DC voltage at each instant to one and only one of said terminals indicating the presence of an object in the corresponding position, characterized in that:

the device comprises a series of operational amplifiers with specified gain, each operational amplifier having an inverting input and a non-inverting input and working over a range of voltages situated between a more positive limit voltage and a more negative limit voltage with respect to an intermediate voltage, and

means for taking respective terminals, which do not correspond to the momentary position of the object, to the intermediate voltage, and also characterized in that

the difference between said DC voltage on a terminal of the arrangement and the intermediate voltage is large enough for the application of this difference between the two inputs of an amplifier to practically take the output of the latter to one of the limit voltages, and each amplifier has its inverting input connected to one of said terminals corresponding to one position, and its non-inverting input connected to the terminal corresponding to the next position, and

the outputs of the amplifiers are connected to a detection circuit for detecting on one of them any transition whose amplitude exceeds a determined threshold and, in response to said detecting, then delivering a signal indicating the direction of the transition; and this signal is used to control a count-up/count-down device whose output value is incremented or decremented on each signal depending on the direction of the transition, this output value constituting an indication of the position of the object.

4,922,236

FIBER OPTICAL MOUSE

Richard Heady, 3140 Emerson St., San Diego, Calif. 92106

Filed Apr. 25, 1988, Ser. No. 185,973
Int. Cl.[5] G09G *1/00*
U.S. Cl. 340—710 14 Claims



1. In a relative-motion cursor control system having

a motion detector,

an electronically passive surface bearing a static referent image over which image said motion detector operates to detect motion, and

a receiving means

which receives information from said motion detector so as to drive a cursor or other video image on a video display,

an optical mouse comprising said motion detector, said optical mouse comprising:

(a) an elongated body dimensioned to be hand-held and used in the manner of a pen;

(b) a tip at one end of said body for bearing against said surface, with said tip having a nib oriented said referent image when said tip so bears; and

(c) a plurality of individual sensory optical fibers operating as independent light guides and extending through at least a portion of said body, with

(i) the proximate ends of said fibers fixed in said nib to sense a pattern of light from a small area of said referent image immediately beneath said nib, and

(ii) the distant ends of said fibers fixed so that each sensory fiber illuminates a photodetector cell to produce an electronic signal for said receiving means.

4,922,237

FLAT PANEL DISPLAY CONTROL APPARATUS

Akifumi Inoue, Fussa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 69,216, Jul. 2, 1987, abandoned. This application Jan. 18, 1989, Ser. No. 298,852
Claims priority, application Japan, Jul. 3, 1986, 61-156596
Int. Cl.[5] G09G *1/06*
U.S. Cl. 340—723 9 Claims



1 A flat panel display control apparatus, comprising:

a video memory for storing character codes and associated attribute code data relating to a color CRT display,

a character generator connected to the video memory and for generating a character font data correspondent to the character code,

an attribute connected to the video memory and for latching the attribute codes, and

an attribute control means for providing an output for the display from the output of the character generator under the control of the attribute data, the attribute control means including:

an attribute classify means for classifying the color assigned state of the foreground and the background among the display attributes latched on the attribute register into categories,

an attribute supplementary means for setting the data according to the necessary for externally changing the displayed attribute previously assigned,

an attribute processing means for the character font which is output from the character generator according to supplementary data which is output from the attribute supplementary means and classified data which is output from the attribute classify means and for generating said output for the display suitable for the color CRT display,

and an arithmetic means for executing and OR operation for converting said output for the color CRT display from said attribute processing means which operates in conjunction with the display control apparatus.

4,922,238

METHOD AND SYSTEM FOR SMOOTH SCROLLING OF A DISPLAYED IMAGE ON A DISPLAY SCREEN

Takaaki Aoki; Hiroyasu Iida, both of Ebina, and Katsuyuki Nojima, Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

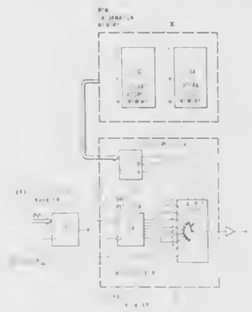
Continuation of Ser. No. 868,928, May 29, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,309
Claims priority, application Japan, May 30, 1985, 60-115503
Int. Cl.[5] G09G *1/16*
U.S. Cl. 340—726 8 Claims

7. A method of displaying a plurality of lines of information, each line of information comprising one or more lines of pixels, said method comprising the steps of:

producing a serial video signal, said serial video signal comprising a series of pixel-line signals, each pixel-line signal representing a line of pixels;

storing a plurality of lateral offset values, each offset value corresponding to one line of information; and

laterally shifting each pixel-line signal by a number of pixels



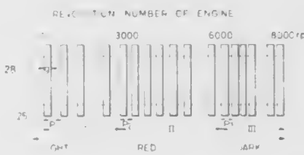
equal to the offset value corresponding to the line of information comprising the line of pixels represented by the pixel-line signal to produce a shifted serial video signal.

4,922,239

MULTI-SHADE COLOR LIQUID CRYSTAL DISPLAY APPARATUS

Masaru Kugo, Ogawa, and Hiroshi Ito, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuda, both of, Japan

Filed Jan. 28, 1988, Ser. No. 149,478
Claims priority, application Japan, Feb. 2, 1987, 62-20547
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—753 4 Claims



1. A multi-shade color liquid crystal display apparatus comprising a number of striped color liquid crystal element portions formed by striped light transparent control portions having color filters of the same predetermined color which cover the striped light transparent control portions, respectively, and which are arranged in parallel with a pitch in one direction, wherein ratios of widths of said color filters to said pitch are different in respective ones of at least two blocks of said striped color liquid crystal element portions a one of the widths of said color filters and said pitch being constant in said at least two blocks, and light and dark shades of said predetermined color to be displayed are effected by the difference in said ratios in different ones of said blocks.

4,922,240

THIN FILM ACTIVE MATRIX AND ADDRESSING CIRCUITRY THEREFOR

Arne L. Duwaer, Ossining, N.Y., assignor to North American Philips Corp., New York, N.Y.

Filed Dec. 29, 1987, Ser. No. 139,872
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 19 Claims

1. A matrix display device comprising a plurality of display

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elements arranged in an array of row and column conductors, each of which display elements comprises opposed electrodes with electro-optical material therebetween and is associated with switching means operable to control the application of data signals to the display element via the column conductors in response to switching signals being applied thereto via the row conductors and with addressing circuitry being provided to apply the data signals and the switching signals to their



respective column and row conductors, characterized in that the addressing circuits for at least one of the row and column conductors includes one primary transistor connected to one end of the even-numbered conductors and one primary transistor connected to the opposite end of the odd-numbered conductors, and means connected to each of the primary transistors for simultaneously supplying the same signals to the next adjacent conductor

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4,922,241

DISPLAY DEVICE FOR FORMING A FRAME ON A DISPLAY WHEN THE DEVICE OPERATES IN A BLOCK OR LINE ACCESS MODE

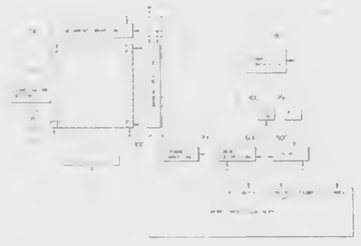
Hiroshi Inoue, Yokohama, and Atsushi Mizutome, Fujisawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,341

Claims priority, application Japan, Mar. 31, 1987, 62-76355; Mar. 31, 1987, 62-76359; Mar. 31, 1987, 62-76361

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 10 Claims



1 A display device comprising:

display means including:

a group of scanning electrodes disposed in a horizontal direction;

a group of signal electrodes disposed in a vertical direction, said group of scanning electrodes and said group of signal electrodes being opposed and spaced apart by a predetermined spacing; and

a liquid crystal with a memory function disposed between said scanning electrodes and said signal electrodes;

mode memory means for storing data relating to the selection of a block access mode, in which said scanning electrodes are driven for every block, each block comprising a plurality of scanning electrodes, and a line access mode in which said scanning electrodes are driven for every one line of said scanning electrodes;

supply means for supplying access data to designate a line of said scanning electrodes to be accessed;

frame data memory means for storing data to form a frame on said display means when the block access mode or the line access mode is selected;

signal electrode drive means for driving said signal electrodes;

scanning electrode drive means, in response to the supplying of access data from said supply means, for driving said scanning electrodes of said display means in accordance with the data stored in said memory means; and

frame drive means, in response to the selection of the block access mode or the line access mode, for forming a frame in accordance with the data stored in said frame data memory means.

4,922,242

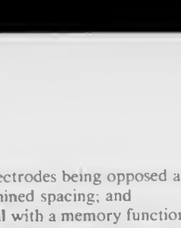
APPARATUS EXHIBITING PTC BEHAVIOR USEFUL FOR DISPLAYING INFORMATION

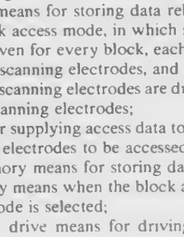
Robert Parker, Alamo, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 12, 1987, Ser. No. 119,618

Int. Cl.[5] G09G *3/04*

U.S. Cl. 340—786 23 Claims





1 An electrically controlled display apparatus suitable for generating heat in a selected pattern in order to display information, said apparatus comprising

(1) a resistive element at least a part of which exhibits PTC behavior with a switching temperature, T_s, and which has a first surface and second surface;

(2) a first electrode attached to the first surface of the resistive element;

(3) a plurality of second electrodes which are attached to the second surface of the resistive element and which are not electrically connected to each other on said second surface;

(4) a first electrical lead which is connected to the first electrode and can be connected to a power supply; and

(5) a plurality of second electrical leads each of which is connected to one of the second electrodes and can be connected to a power supply so that, when the first electrical lead and at least one selected second electrical lead are connected to a suitable power, supply, current flows through the resistive element and thus selectively generates heat therein in a pattern which (a) is determined by the selection of the second electrical leads and (b) is used to display information.

4,922,243

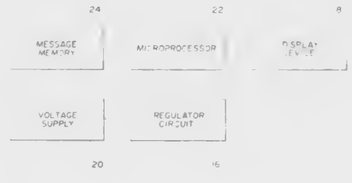
VOLTAGE REGULATOR CIRCUIT FOR USE IN A PROGRAMMABLE MESSAGE DISPLAY

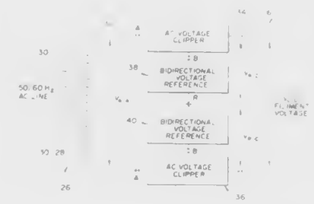
Andrzej Kozicki, Milan, Ill., and Leo C. Brower, Davenport, Iowa, assignors to Uticor Technology, Inc., Bettendorf, Iowa

Filed Apr. 26, 1988, Ser. No. 186,382

Int. Cl.[5] G09G *3/00*

U.S. Cl. 340—813 12 Claims





1 A voltage regulator circuit for maintaining the AC RMS drive voltage of electronic display elements in a programmable message display within an acceptable range, the message display including a microprocessor for providing control signals, a message memory for storing multiple messages in a binary digit code and an electronic display device having the electronic display elements, the microprocessor being responsive to the output of the memory for causing the display device to display a message corresponding to the coded signal provided by the memory, the circuit comprising:

a step-down transformer having a primary winding and a secondary winding, the primary winding being adapted to be coupled to an AC input supply voltage, the supply voltage being allowed to vary so that the AC secondary voltage is outside the acceptable range;

AC voltage clipping means coupled to the secondary winding for clipping opposite phases of the transformer AC secondary voltage as a function of a predetermined reference voltage which defines the acceptable range and provides a clipped AC output drive voltage for driving the display elements;

wherein said clipping means includes a pair of voltage clipper circuits coupled to the secondary winding and reference voltage means coupled to each of the clipper circuits for providing the reference voltages to each of the clipper circuits; and

wherein the secondary winding has a center tap and wherein said reference voltage means includes a pair of bidirectional voltage reference circuits, each of said voltage reference circuits being coupled to its respective voltage clipper circuit and to the center tap to provide the reference voltage to its respective clipper circuit.

4,922,244

QUEUEING PROTOCOL

John L. Hullett, Daglish, and Robert M. Newman, Duncraig, both of Australia, assignors to The University of Western Australia, Western Australia, Australia

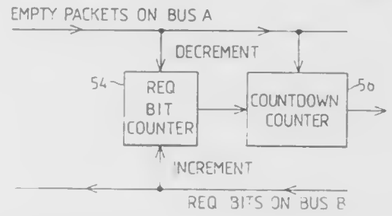
PCT No. PCT/AU85/00304, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/03639, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 3, 1985, Ser. No. 899,223

Claims priority, application Australia, Dec. 3, 1984, PG8394

Int. Cl.[5] H04Q *9/00*

U.S. Cl. 340—825.5 28 Claims



1 A method of transmitting data on a communications network having first and second unidirectional buses (A, B) which are oppositely directed and a plurality of access units (4) coupled between the buses, said method including the step of arranging the data to be transmitted from the access units in data packets (38), determining according to destination upon which one of the first and second buses a data packet is to be transmitted from one access unit, transmitting a request flag (REQ) from said one access unit on the other of said first and second buses, said access units being responsive to received request flags to establish a distributed queue in the network to control the order of data packet transmissions from said access units.

4,922,245

REARRANGEABLE MULTICONNECTION SWITCHING NETWORKS CONSTRUCTED USING COMBINATORIAL DESIGNS

Frank K. Hwang, Warren, N.J., and Gaylord W. Richards, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 946,431, Dec. 23, 1986. This application Jul. 19, 1989, Ser. No. 382,510

Int. Cl.[5] H04Q *1/00, 3/00*

U.S. Cl. 340—825.08 14 Claims

1 A switching network for selectively connecting N_1 input channels to n_2 output channels such that none of said n_2 output channels is connected to more than one of said N_1 input channels at any time, N_1 and n_2 being positive integers each greater than one, n_2 being at most equal to N_1, said switching network comprising

v first stage switches each having at most r inlets and at least one outlet and each comprising means for selectively connecting any one of the inlets of said each first stage switch to the at least one outlet of said each first stage switch, v being a positive integer at least equal to n_2, r being a positive integer greater than one,

a second stage switch having n_2 outlets each connected to a

different one of said output channels and having a plurality of inlets each associated with a different one of said first stage switches and each being connected to the at least one outlet of the associated first stage switch, said second stage switch comprising means for selectively connecting said outlets of said second stage switch to said inlets of said second stage switch and

connection means for connecting each of said inlets of said plurality of first stage switches to only an associated predetermined one of said input channels in accordance with a Mu×r connection matrix, where each of said input channel has a unique channel designation, where said matrix has Mu rows comprising M sets, $s_0, s_1, \ldots s_{M-1}$,



each having u rows, where the channel designation of each of said input channels occurs exactly once in set s_0, where for any integer i,

$1 \leqq i \leqq M-1$, for any integer j,

$0 \leqq j \leqq r-1$, and for $M-1(u,r,w)$ difference sets

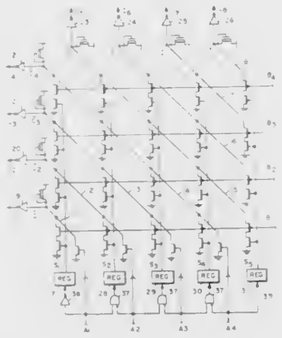
$D_j = \{a_0^j, \ldots a_{r-1}^j\}$, column j of set s_i is obtained by rotating column j of set s_0 by aj positions, and having the channel designations occurring in a given row of said matrix define the ones of said input channels connected to the inlets of a given first stage switch associated with said given row, where w is a positive integer, where M and u are positive integers each greater than one, where ur is at least equal to N_1, and where Mu is at least equal to v.

4,922,246

MESSAGE MERGING DEVICE

Thomas H. Cormen, Cambridge, and Charles E. Leiserson, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 25, 1986, Ser. No. 934,830
Int. Cl.[5] H04Q *1/00, 3/04*
U.S. Cl. 340—825.90 14 Claims



1. A message merging device for controlling the routing of messages comprising

a first set of n input terminals and a second set of m input terminals, one group of said n input terminals receiving valid input messages and one group of said m input terminals receiving valid input messages, the remaining groups of said n and said m terminals not receiving valid input messages;

a plurality of (n+m) output terminals;

switching means for controlling the directing of valid messages from said n and said m input terminals to said (n+m) output terminals;

switch control means which, when responsive to the messages received at said m and n input terminals, controls the setting of said switching means as a function only of the presence or absence of valid messages at said input terminals; and

means responsive to the setting of said switching means for substantially simultaneously directing the valid input messages received at said n and said m input terminals to the first ones of said output terminals according to a predetermined sequence of said output terminals, said message directing means including

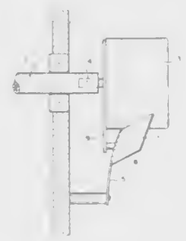
a plurality of gates controllably enabled by the setting of said switching means, each gate comprising one or more pull-down circuit having no more than a fixed number of active elements in series, said number being independent of the values of n and m.

4,922,247

ENCODER MOUNT

Kevin C. Koek, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,561
Int. Cl.[4] F16C *1/26*
U.S. Cl. 341—2 2 Claims



1 In apparatus including

a frame,

a component shaft rotatable with respect to the frame about an axis,

an encoder for monitoring the angular displacement of the shaft, the encoder having a housing and an encoder shaft rotatable with respect to the housing;

the improvement wherein:

(1) the encoder shaft is rigidly fixed to and rotatable with the component shaft, and

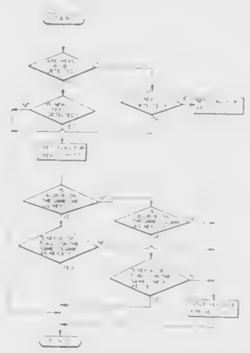
(2) a rotational motion preventing means is provided which prevents substantial rotational motion of the encoder housing about the axis while permitting motion of the housing with the component shaft transverse to the axis, said rotational motion preventing means including a first member having a slot which member is fixed to the frame and a second member having a protrusion slidable within said slot which second member is fixed to the encoder housing, motion of the encoder housing transverse to the axis being permitted by sliding movement of the protrusion in the slot and slight rotational movement of the housing about the protrusion.

4,922,248

KEY OUTPUT METHOD FOR KEYBOARDS

Sadakazu Shiga, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 81,529, Aug. 3, 1987, which is a continuation of Ser. No. 758,523, Jul. 24, 1985, abandoned. This application Nov. 23, 1988, Ser. No. 275,697
Claims priority, application Japan, Jul. 24, 1984, 59-153784
Int. Cl.[5] G06F *3/02*
U.S. Cl. 341—25 2 Claims



1. A method of controlling the issuance of keyboard signals from a keyboard system having a matrix of rows and columns of lines which can be electrically interconnected by a corresponding key at each intersection of the rows and columns, the system also having a memory with a plurality of memory locations each corresponding to a respective key, said method comprising the steps of:

(1) detecting whether two keys of said keyboard system are concurrently depressed by determining the number of flags in said memory, each of said flags being an indication in a memory location that a particular key is currently being depressed, each memory location being associated with a predetermined key;

(2) upon detection in step 1 of two keys not being concurrently depressed, detecting whether a key has been newly depressed since the detecting step of step 1;

(2a) upon detection in step 2 of a key being newly depressed, setting a flag in a memory location associated with said key being newly depressed and issuing a key code representing said key being newly depressed;

(2b) upon detection in step 2 of no key being newly depressed, returning to step 1;

(3) upon detection in step 1 of two keys being concurrently depressed, detecting whether a key has been newly depressed since the detecting step of step 1;

(3a) upon detection in step 3 of a key being newly depressed, setting a flag in a memory location associated with said key being newly depressed and determining, by checking flagged memory locations, whether a condition exists which gives rise to a false indication of a key depression;

(3b) upon determination in step 3a that said condition giving rise to a false indication of a key depression does exist, returning to step 1 without issuing a key code representing said key detected as being newly depressed in step 3;

(3c) upon determination in step 3a that said condition-giving rise to a false indication of a key depression does not exist, issuing a key code representing said key detected as being newly depressed in step 3; and

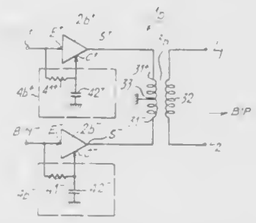
(3d) upon detection in step 3 of no key being newly depressed, returning to step 1.

4,922,249

BINARY-TO-BIPOLAR CONVERTER

Denis F. Cointot, Paris, and Andre H. Cauderlier, Lieusaint, both of France, assignors to S. A. T. Societe Anonyme de Telecommunications, Paris, France

Filed Jan. 20, 1988, Ser. No. 146,179
Claims priority, application France, Jan. 20, 1987, 87 00568
Int. Cl.[5] H03M *5/18*
U.S. Cl. 341—57 16 Claims



1. A binary-to-bipolar converter for receiving first and second binary signals, a first logic state being present in only one of said binary signals at any one time, said converter comprising:

(a) first and second means for receiving said first and second binary signals and for delaying the drop from said first logic state to a second logic state in said first and second binary signals, respectively, thereby producing first and second delayed signals;

(b) first and second transfer gates for receiving said first and second binary signals via inputs and said first and second delayed signals via control inputs for converting said first logic state of said first and second binary signals into first and second current bipolar pulses responsive to said first logic state of said first and second delayed signals, respectively, each of said first and second transfer gates being at a low output impedance state and a high output impedance state when the respective delayed signal is at the first and second logic states, respectively; and

(c) means for transforming said first and second pulses into opposite polarity pulses of a bipolar signal transmitted in a transmission line.

4,922,250

SUPERCONDUCTING ANALOG-TO-DIGITAL CONVERTER WITH BIDIRECTIONAL COUNTER

Richard R. Phillips, Gardena; Robert D. Sandell, Manhattan Beach, and Arnold H. Silver, Rancho Palos Verdes, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 648,868, Sep. 7, 1984, Pat. No. 4,646,060. This application Feb. 19, 1987, Ser. No. 16,997
The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.
Int. Cl.[5] H03M *1/12*
U.S. Cl. 341—133 13 Claims



1. A superconducting analog-to-digital converter, comprising:

a double-junction superconducting quantum interference device (SQUID) having first and second Josephson junctions and a center-tapped load inductance;

means for applying a constant gate current to the center of the load inductance;

means for applying a varying analog signal current to the load inductance, wherein positive incremental changes in the analog signal current result in the generation of voltage pulses across the first junction, and negative incremental changes in the analog current signal result in the generation of voltage pulses of the same polarity across the second junction; and

means for counting the voltage pulses generated across the first and second juctions, to determine the corresponding digital equivalents of the changes in the analog signal current.

4,922,251

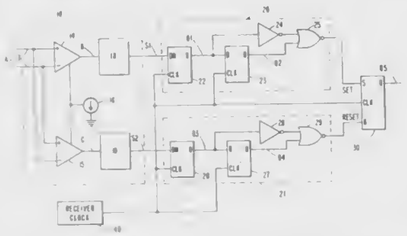
ANALOG TO DIGITAL INTERFACE CIRCUIT

Gary B. Ollendick, Mundelein, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Nov. 30, 1988, Ser. No. 277,834

Int. Cl.[5] H03M *1/06*

U.S. Cl. 341—155 **13 Claims**



1. An analog to digital interface circuit for transforming an incoming analog signal to a digital signal, the analog signal having a plurality of cells each represented by a wave form having a rising edge (X) and a falling edge (Y) defining a time interval, the interface circuit including:

a first differential amplifier receiving said incoming signal (A) and providing a first output signal (B) varying in relation to said incoming signal such that the rising edges (X) of the incoming signal corresponds to rising edges (X) of the output signal (B);

a second differential amplifier receiving said incoming signal (A) and providing a second output signal (C) varying in relation opposite to said incoming signal, said second output signal (C) being identical to said first output signal (B) but 180° out of phase with said first output signal (B), such that the falling edges (Y) of the incoming signal corresponds to rising edges (Y) of said second output signal (C); and

means responsive to the first and second output signals for generating first and second control signals off the rising edges (X) and (Y) of said first and second output signals signals wherein a time interval between said first and second control signals is substantially equal to the time interval between said rising and falling edges (X) and (Y) of said analog signal (A).

4,922,252

ANALOG/DIGITAL CONVERTER WITH CAPACITOR NETWORK

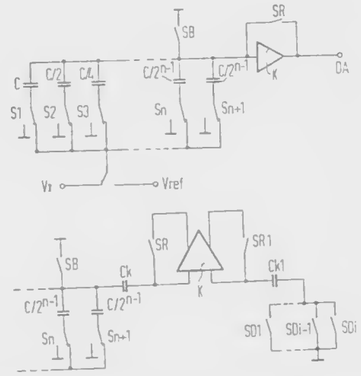
Dieter Draxelmayr, and Gerold Schrittesser, both of Villach, Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,537

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1986, 3629737

Int. Cl.[5] H03M *1/36*

U.S. Cl. 341—172 **5 Claims**



1. Analog/digital converter operating on the principle of charge distribution, comprising a capacitor network having dual-weighted capacitors including two smallest capacitors, said capacitors each having two terminals, a comparator having a first input and a second input, a reference switch connected between each of one of said two terminals and a first reference potential, other switches each selectively connecting the other one of said two terminals of a respective one of said capacitors to an input analog potential and the first reference potential; and including a second reference potential, and including a coupling capacitor connected between said one of said terminals of each of said capacitors and said first input of said comparator and another coupling capacitor connected in series with said second input of said comparator.

4,922,253

HIGH ATTENUATION BROADBAND HIGH SPEED RF SHUTTER AND METHOD OF MAKING SAME

Harvey C. Nathanson, Pittsburgh; Michael C. Driver, McKeesport, and Regis J. Betsch, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 3, 1989, Ser. No. 292,983

Int. Cl.[5] H04B *1/38*; H01P *1/10*

U.S. Cl. 342—5 **6 Claims**

4. An electrostatic switch, comprising:

a first insulating substrate layer;

a first high resistivity conductive layer, said

first high resistivity conductive layer deposited upon said first insulating substrate layer;

a first support layer, said first support layer deposited upon said first high resistivity conductive layer;

a first highly conductive patterned layer, said first highly conductive layer deposited upon said first support layer;

a multiplicity of photolithographically displaced regions having a circular configuration, said multiplicity of photolithographically displaced regions positioned predetermined distance apart from each other;

a multiplicity of planar, linear conductive members, said planar, linear conductive members intersecting at right angles upon said second, resistivity conductive layer; and

a multiplicity of electrical contact means positioned within said photolithographically displaced regions, said electrical contact means operable to pull into contact said planar; linear conductive members.

6. A radar protection system, comprising:

a radio frequency transmitting and receiving means mounted behind a conformal surface; and

a high attenuation, broadband, high speed, radio frequency shutter, said high attenuation, broadband, high speed, radio frequency shutter mounted upon said conformal



surface directly over said radio frequency transmitting and receiving means, said high attenuation, broadband, high speed, radio frequency shutter further comprising a multiplicity of electrostatic switches positioned upon said conformal surface a predetermined distance apart, said electrostatic switches operable to be interconnected by conductive beam members, said distance being less than the shortest wavelength of a radio frequency signal emitted or received by said radio frequency transmitting and receiving means.

4,922,254

TOPOGRAPHIC MAPPING

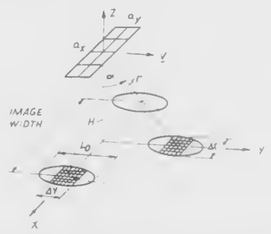
Harald Schuessler, Daisendorf, and Oswald Bender, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 180,209

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712065

Int. Cl.[5] G01S *13/90*

U.S. Cl. 342—25 **7 Claims**



1. Method for topographic mapping at least portions of the surface of the earth under utilization of altitude measurement by means of radar having a synthetic aperture using an electronically controlled antenna lobe, comprising the steps of:

pivoting the antenna lobe in a conical pattern around the nadir by means of orthogonal phase control;

maintaining the total transit time of a radar pulse for search and echo path constant; and

determining the average altitude within a resolution cell, established by and through the center of gravity of the echo power profile.

4,922,255

ARRANGEMENT FOR MEASURING SPEEDS

Eilert Berglind, Täby, Sweden, assignor to Stiftelsen Institutet för Mikrovågsteknik vid Tekniska Högskolan i Stockholm, Kista, Sweden

PCT No. PCT/SE88/00149, § 371 Date Dec. 1, 1988, § 102(e) Date Dec. 1, 1988, PCT Pub. No. WO88/07686, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 25, 1988, Ser. No. 285,879

Claims priority, application Sweden, Apr. 2, 1987, 8701390

Int. Cl.[5] G01S *13/58*

U.S. Cl. 342—104 **6 Claims**



1. An arrangement for measuring speeds between a first and a second object with the aid of microwave signals and including a microwave generator which is connected to a transmitter antenna for transmitting a continuous unmodulated signal, and two receiver antenna which are preferably placed on respective sides of the transmitter antenna for receiving continuous microwave signals reflected against an object and each of which receiver antenna is connected to send said continuous signal to a respective receiver channel, a correlator connecting said receiver channels for correlating the signals received by the receiver antennae, the mutual time difference of said signals corresponding to the relative speed between the objects, wherein said microwave generator (**11**) is also connected to a respective mixer (**13**, **14**, **15**, **16**; **42**, **43**) in each of the receiver channels, to which respective mixers (**13**–**16**; **42**, **43**), respective ones of said receiver antenna (**6**,**7**) are connected; and wherein the outputs of the respective mixers; (**13**–**16**; **42**, **43**) for each receiver antenna are connected to an envelope detector (**19**, **20**; **46**, **47**) which is intended to detect the envelope of respective signals, there being formed as outputs of the envelope detectors, simultaneous phase independent signals which are compared in the correlator (**12**; **48**).

4,922,256

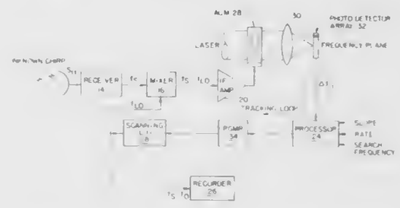
TRACKING RECEIVER FOR BROADBAND CHIRP EMISSIONS

Robert W. Brandstetter, Levittown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 18, 1988, Ser. No. 273,465

Int. Cl.[5] G01S *13/66*

U.S. Cl. 342—132 **6 Claims**



1. A tracking receiver which utilizes optical processing for

detecting and tracking an input broadband chirp like signal, comprising:

a. a scanning local oscillator for producing a local oscillator output signal, which is caused to be scanned in frequency;

b. a mixer for mixing the input signal and the local oscillator output signal to produce an intermediate frequency, frequency difference signal;

c. an optical spectrum analyzer comprising an acousto-optical modulator for modulating a beam of radiation with the intermediate frequency, frequency difference signal, optical means for producing a spatial frequency distribution of the intermediate frequency spectrum in a fourier plane, and a photodetector means for detecting the spatial frequency distribution of the intermediate frequency spectrum in the Fourier plane;

d. a processor means for processing the output of said photodetector means for a temporally stable grouped intensity pattern caused by an input spectra signal varying in frequency near the scan rate of the local oscillator, and being responsive thereto to control the frequency of the local oscillator to cause the frequency of the local oscillator to track the frequency of the input spectra signal.

4,922,257

CONFORMAL ARRAY ANTENNA

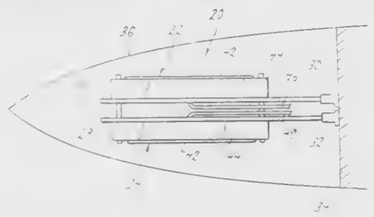
Jun Saito; Tetsuo Haruyama; Nobutake Orime, and Takashi Katagi, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tnkyo, Japan

Filed Jan. 25, 1988, Ser. No. 147,721

Claims priority, application Japan, Jan. 27, 1987, 62-10010[U]; Feb. 6, 1987, 62-25865; Feb. 6, 1987, 62-25866

Int. Cl.[5] H01Q *3/00*

U.S. Cl. 342—377 23 Claims



1 A conformal array antenna system comprising:

a plurality of element antennas disposed on a three-dimensional surface of a structural body;

a plurality of analog-to-digital conversion means, each operable to receive an analog electrical signal from a corresponding one of said element antennas to convert the received analog electrical signal to a digital electrical signal of a serial form:

a plurality of serial-to-parallel conversion means, each operable to receive the digital electrical signal from a corresponding one of said analog-to-digital conversion means to convert the received digital electrical signal to a parallel digital electrical signal;

a plurality of phase detection means, each operable to receive the parallel electrical signal from a corresponding one of said serial-to-parallel conversion means to convert the received parallel electrical signal to real and imaginary components thereof; and

digital beam forming means operable to receive the real and imaginary components from said phase detection means to synthesize these real and imaginary components so as to form a multiplicity of beams.

4,922,258

METHOD FOR DETERMINING AIRCRAFT FLIGHT ALTITUDE

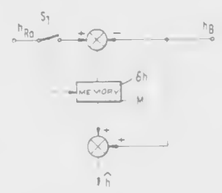
Wolfgang Hassenpflug, Freiburg i. Br., Fed. Rep. of Germany, assignor to LITEF GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,576

Claims priority, application European Pat. Off., Nov. 12, 1986, 86 710 007

Int. Cl.[5] G01S *3/02*

U.S. Cl. 342—462 2 Claims



1. A method for determining the altitude above ground (h) of an aircraft that is equipped with a radar altimeter and a flight-altitude measuring device comprising the steps of:

(a) intermittently repeating the high-frequency signal for obtaining radar altitude (h_{RO});

(b) the intermission intervals between repetitions of said high-frequency signal being substantially longer than the transmission time required to obtain a valid radar altimeter measurement whereby said high-frequency repeated signals are relatively brief and the time interval between successive repetitions of said high-frequency signal is controlled to be a random variable having a given statistical distribution between predetermined minimum and maximum durations; then

(c) subtracting the current value of radar altitude h_{RO} from the altitude value (h_B) that is supplied by said flight-altitude measuring device; and

(d) storing the difference (δh) for at least the duration of the following transmission interval; and then

(e) providing the current valid altitude h as an altitude value h_B corrected by the amount of said stored difference δh.

4,922,259

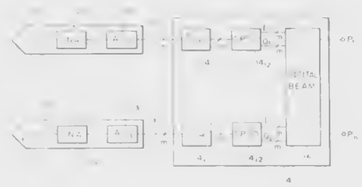
MICROSTRIP PATCH ANTENNA WITH OMNI-DIRECTIONAL RADIATION PATTERN

Edward A. Hall, Florissant; Thomas H. B. Cranor, Richmond Heights, and Gilbert J. Schmitt, St, Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 4, 1988, Ser. No. 152,245

Int. Cl.[5] H01Q *1/38, 21/24*

U.S. Cl. 343—700 MS 13 Claims



1. A substantially omni-directional radiating antenna comprised of a pair of antenna elements, each antenna element having a substantially hemispherical radiation pattern and an associated ground plane, said ground planes being substantially adjacent to their associated antenna element, means for feeding said antenna elements so that their radiation patterns add constructively at their ground planes and means for feeding each of said antenna elements for opposite senses of circular polarization such that the fields are in-phase across the ground planes.

4,922,260

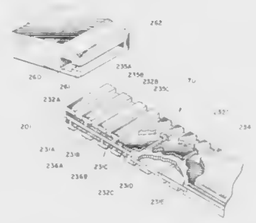
ADJUSTABLE WATCHBAND WITH EMBEDDED ANTENNA

Garold B. Gaskill, Tualatin; Michael Miles, Aloha, and Clifford B. Schrock, Portland, all of Oreg., assignors to AT & E Corporation, San Francisco, Calif.

Filed Jan. 18, 1989, Ser. No. 298,523

Int. Cl.[5] H05G *1/14*

U.S. Cl. 343—718 12 Claims



5. In an adjustable length longitudinal watchband comprising a dielectric substrate having an upper major surface and a lower major surface, an antenna having a predetermined tuning frequency comprising:

(a) upper electrical conductive means disposed on the upper major surface of said substrate and forming one capacitor plate; and

(b) lower electrical conductive means disposed on the lower major surface of said substrate and forming another capacitor plate.

4,922,261

AERIAL SYSTEMS

Kevin O'Farrell, Cambridge, United Kingdom, assignor to Cotag International Ltd., Cambridge, United Kingdom

PCT No. PCT/GB87/00096, § 371 Date Nov. 27, 1987, § 102(e) Date Nov. 27, 1987, PCT Pub. No. WO87/04865, PCT Pub. Date Aug. 13, 1987

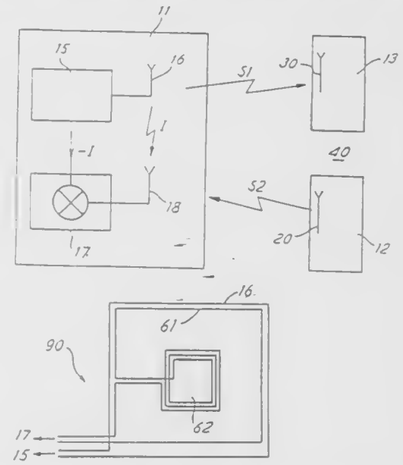
PCT Filed Feb. 6, 1987, Ser. No. 121,970

Claims priority, application United Kingdom, Feb. 6, 1986, 8602913

Int. Cl.[5] H01Q *1/52, 7/00*

U.S. Cl. 343—742 8 Claims

1. An aerial array for a communication system including transmit means and receive means, said array comprising a transmit aerial coil connected to said transmit means and a receive aerial coil connected to said receive means, said aerial coils being fixed relative to each other, and being in mutual communication whereby a signal transmitted by the transmit aerial coil in use is received by the receive aerial coil, wherein said aerial coils constitute a first aerial coil and a second aerial coil, said first aerial coil having a first part and second part, said first part having at least one turn, and said second part having at least one different turn, said first part being relatively close to said second aerial coil to provide a mutual inductive coupling with said second aerial coil, said second part being relatively remote from said second aerial coil, whereby said first part constitutes signal cancelling means, and whereby said transmitted signal is substantially cancelled by a signal generated by said mutual inductive coupling between said first part and said second aerial coil.



4,922,262

LOG-PERIODIC SLOT ANTENNAS

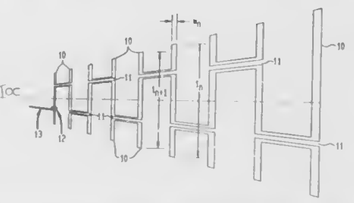
Yung L. Chow, Waterloo, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jan. 13, 1989, Ser. No. 296,565

Claims priority, application Canada, Jan. 18, 1988, 556718

Int. Cl.[5] H01Q *11/10*

U.S. Cl. 343—770 11 Claims

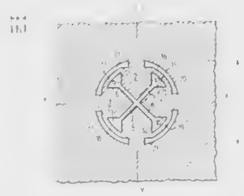


1. A log periodic slot antenna comprising an array of spaced, parallel radiating slots of increasing length, said parallel. radiating slots having a common center line in the direction running perpendicular to parallel planes of the slots, a plurality of coplanar guides, each guide connecting one pair of adjacent slots along the antenna array, the coplanar guides being arranged alternately on opposite sides of the common center line of the antenna, each pair of adjacent slots being connected by said guide at a distance approximately one quarter of the slots' lengths from the respective ends of the slots and a feed connection to a radiating slot at one end of the antenna, the connection being at the side of the slot opposite to its coplanar guide connection and at a distance from the respective end of the slot approximately one quarter of the slot length.

4,922,263
PLATE ANTENNA WITH DOUBLE CROSSED POLARIZATIONS

Gérard Dubost, Rennes, and Roger Frin, Liffre, both of France, assignors to L'Etat Francais, represente par le Ministre des PTT, Centre National d'Etudes des Telecommunications (CNET), Paris Cedex, France

Continuation of Ser. No. 41,705, Apr. 22, 1987, abandoned. This application Apr. 25, 1989, Ser. No. 344,412
Claims priority, application France, Apr. 23, 1986, 86 05990
Int. Cl.[5] H01Q *21/26, 1/38*
U.S. Cl. 343—797 13 Claims

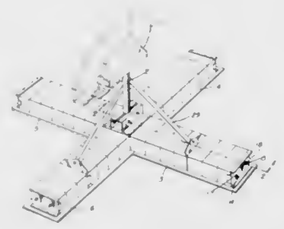


1. A plate antenna module with double crossed polarizations, the radiating part of which comprises two similar thick element folded radiating doublets (1,3; 2,4) characterized by the fact that two doublets are located in a common plane in orthogonal relation to each other, and slots are defined of comparatively narrow width so as to operatively effect a common doublet gap between the driven elements of the doublets intersecting one another at the center (C) of the unit antenna.

4,922,264
SATELLITE ANTENNA MOUNTING APPARATUS WITH BALLAST MEANS

Robert M. Fitzgerald, 3545 Saxon Way, Marietta, Ga. 30062, and Eugene O. Gresens, 5266 Westhill Dr., Norcross, Ga. 30071

Filed Apr. 24, 1989, Ser. No. 341,846
Int. Cl.[5] H01Q *1/12;* E04H *12/18*
U.S. Cl. 343—878 9 Claims

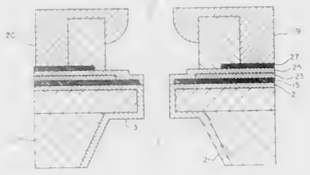


1. Antenna mounting apparatus comprising a base assembly, said base assembly comprising an inner end plate, ballast means disposed generally adjacent said base assembly and in abutting relationship with said inner end plate, an outer end plate disposed in abutting relationship with said ballast means remote from said base assembly, a tie rod interconnected to said inner and outer end plates and extending generally adjacent said ballast means, and means to secure said end plates on said tie rod so as to place a compression force on said ballast means.

4,922,265
INK JET PRINTHEAD WITH SELF-ALIGNED ORIFICE PLATE AND METHOD OF MANUFACTURE

Alfred I. T. Pan, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 125,433, Nov. 25, 1987, Pat. No. 4,894,664, which is a continuation-in-part of Ser. No. 856,740, Apr. 28, 1986, abandoned. This application May 30, 1989, Ser. No. 357,915
Int. Cl.[5] G01D *15/16;* B41J *3/04*
U.S. Cl. 346—1.1 3 Claims



3. An ink jet printhead characterized by the precise alignment of an orifice plate disposed on top of a thin film substrate and comprising:

a. a transducer element located within said substrate and having electrical conductors connected thereto for providing energizing pulses to said transducer element during an ink jet printing operation,

b. a seed layer having an opening therein disposed on said substrate,

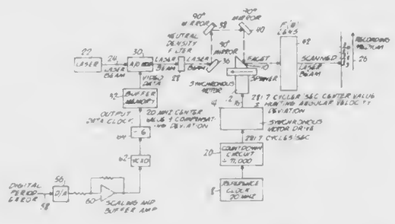
c. a barrier layer disposed on said thin film substrate and located adjacent to said opening in said seed layer, said barrier layer having an opening therein aligned with said transducer element, and

d. a metal orifice layer plated up from said seed layer and over said barrier layer and having an orifice opening therein located within and aligned to said opening in said barrier layer, whereby said opening in said orifice plate is also aligned to said transducer element in said thin film substrate.

4,922,266
METHOD FOR PLACING INFORMATION ON A MEDIUM WHILE COMPENSATING FOR DEVIATIONS FROM A CHARACTERISTIC TIME PERIOD

Harvey Bidner, Plainview, and James J. Zuber, Mastic, both of N.Y., assignors to Bidco Inc., Hicksville, N.Y.

Division of Ser. No. 891,535, Jul. 29, 1986. This application Jul. 13, 1988, Ser. No. 218,669
Int. Cl.[5] G01D *15/14, 9/00*
U.S. Cl. 346—1.1 6 Claims



1. A method comprising generating a laser beam, causing the laser beam to scan a medium in sequential scan lines to effect a processing thereof, the scanning being effected at a rate which is subject to deviation from scan line to next sequential scan line, modulating the laser beam during each scan line at a rate to control the processing of said medium, and responding to the deviation in each scan line to control the rate of modulating the laser beam for the next sequential scan line to compensate for the deviation in scanning of said medium, the laser beam being caused to scan said medium by the use of a synchronous motor, the method further comprising mechanically loading the motor with an auxiliary inertia weight to reduce the frequency of said deviations.

4,922,267
RECORDER HAVING A RECORDING DEVICE AND A RELATIVELY MOVABLE STACKER FOR STACKING RECORDED PAPER

Masakazu Ozawa, Ebina; Kunitaka Ozawa, Isehara; Katsunori Hatanaka, Yokohama; Tetsuo Suzuki; Tetsuzo Mori, both of Hirtsuka; Tadashi Shiina, Hiratsuka, and Ryuichi Ebinuma, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo

Continuation of Ser. No. 3,049, Jan. 13, 1987, abandoned, which is a division of Ser. No. 733,389, May 13, 1985, Pat. No. 4,651,173. This application Nov. 14, 1988, Ser. No. 273,139
Claims priority, application Japan, May 19, 1984, 59-101508; May 19, 1984, 59-101509; May 19, 1984, 59-101510; May 19, 1984, 59-101511; May 19, 1984, 59-101512
Int. Cl.[5] G01D *15/30;* B41J *3/04*
U.S. Cl. 346—136 2 Claims



1. A recording apparatus comprising:

recording means for recording on recording paper;

a recording means housing accommodating said recording means;

a conveying system having paper deck means for storing unrecorded recording paper and stacker means for stacking recorded recording papers, said stacker means having an opening for allowing removal of the stacked recorded recording papers; and

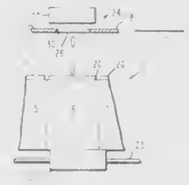
a conveying system housing accommodating said conveying system and attached to said recording means housing for movement between open and closed positions with respect thereto,

wherein said stacker means has a convex portion at a bottom surface thereof, said convex portion being located at a position spaced toward said opening from a central portion of said stacker means in a depth direction of said bottom surface and extending in a direction perpendicular to the depth direction, whereby the stacked recorded recording papers are inhibited from moving toward said opening by the shock of opening or closing said recording means and conveying system housings.

4,922,268
PIEZOELECTRIC DETECTOR FOR DROP POSITION DETERMINATION IN MULTI-PEN THERMAL INK JET PEN PRINTING SYSTEMS

William S. Osborne, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 31, 1989, Ser. No. 304,544
Int. Cl.[5] G01D *18/00;* B41J *3/04*
U.S. Cl. 346—140 R 5 Claims



2. Apparatus for providing inter-pen offset determination in a thermal jet printer having multiple ink jet pens, comprising:

(a) carriage means for scanning along a print zone in a scan direction;

(b) a plurality of pens carried by said carriage means and being adapted to fire drops of ink on demand;

(c) position sensing means for indicating the position of said carriage means as it scans in the scan direction;

(d) piezoelectric detector means having a piezoelectric film for detecting the impact of a drop of ink and being disposed in a coplanar relationship with said print zone;

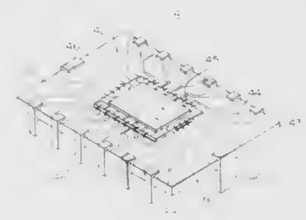
(e) an opening in said piezoelectric detector means such that ink drops pass therethrough and are not detected until said carriage means scans beyond said opening;

(f) the detect/no detect measurement of drops impacting and not impacting said piezoelectric drop detector means, as the carriage means scans, providing measurement of spacing between pens in the pen scan direction.

4,922,269
LIQUID JET RECORDING HEAD UNIT, METHOD OF MAKING SAME AND LIQUID JET RECORDING APPARATUS INCORPORATING SAME

Masami Ikeda, Tokyo, and Hirokazu Komuro, Hiratsuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 251,971, Sep. 26, 1988, abandoned, which is a continuation of Ser. No. 935,092, Nov. 24, 1986, abandoned, which is a continuation of Ser. No. 739,715, May 31, 1985, abandoned. This application Mar. 23, 1989, Ser. No. 327,383
Claims priority, application Japan, Jun. 11, 1984, 59-118332
Int. Cl.[5] G01D *15/16;* B41J *3/04*
U.S. Cl. 346—140 R 25 Claims



1. A liquid jet recording head unit comprising:

a recording head for discharging liquid from an orifice by

the action of energy generated by energy generating means provided on a substrate and connected to electrode means on said substrate for supplying an electrical signal to said energy generating means; and

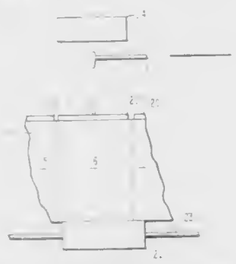
a support member having thereon electrode means for supplying an electrical signal to said electrode means on said substrate and a plurality of connectors electrically connected to said electrode means on said support member and projecting from said support member for electrically and mechanically connecting the recording head unit with a recording apparatus, wherein said electrode means on said substrate and said electrode means on said support member are electrically connected to each other and said substrate is mechanically connected to said support member.

4,922,270

INTER PEN OFFSET DETERMINATION AND COMPENSATION IN MULTI-PEN THERMAL INK JET PEN PRINTING SYSTEMS

Keith E. Cobbs; Robert D. Haselby, and William S. Osborne, all of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 31, 1989, Ser. No. 304,980
Int. Cl.[5] G01D *18/00*; B41J *3/04*
U.S. Cl. 346—140 R 6 Claims



1 Apparatus for providing inter-pen offset determination and compensation in a multi-pen thermal ink jet printer, said apparatus comprising

(a) drop detector means for measuring the time of flight of ink drops between a selected pen and the detector means;

(b) an aperture plate disposed at the print media plane; and

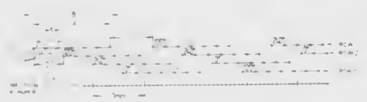
(c) high resolution carriage position sensor means for determining carriage location when the time of flight exceeds a predetermined threshold value, whereby the sensed carriage positions for respective pens provides information indicative of inter-pen offset.

4,922,271

MATRIX PRINTER MEANS

Kenth Nilsson, Akersberga; Bengt Jofs, Spanga, and Goeran Skog, Stockholm, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich

Filed Sep. 14, 1988, Ser. No. 244,508
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1987, 3730844
Int. Cl.[5] G01D *15/00, 15/16*; B41J *3/04*
U.S. Cl. 346—140 R 11 Claims



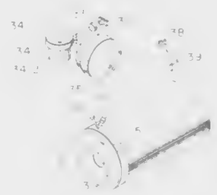
1 A matrix printer means comprising a plurality of stationary write heads, each of said write heads having a limited number of printer elements per unit of length and having an edge region that is greater than half the spacing between neighboring printer elements, said write heads being arranged phase-shifted side-by-side in at least three rows and at least in three of said rows the write heads being parallel and arranged phase-shifted relative to one another.

4,922,272

HIGH PRECISION IMAGE RECORDING APPARATUS

Kazuhiro Wakamatsu; Seiji Yonekura; Mitsuo Suzuki; Hiroyuki Tadokoro, and Atsuo Suzuki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Setsubi Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Jul. 31, 1989, Ser. No. 386,695
Claims priority, application Japan, Aug. 5, 1988, 63-194440
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—160 30 Claims



1 A high precision image recording apparatus comprising, electrophotographic means having at least a cylindrical photosensitive drum rotatively supported, and exposure means, for forming a toner image on the surface of said photosensitive drum;

a recording sheet feed/transport unit for feeding and transporting a recording sheet to which said toner image formed on the surface of said photosensitive drum is transferred;

transfer means for transferring said toner image on said photosensitive drum to said recording sheet fed and transported by said recording sheet feed/transport unit; and

a drive unit for driving said photosensitive drum and recording sheet feed/transport unit; wherein

said drive unit is provided with a motor coupled to said photosensitive drum via a rotation transmission mechanism having a speed reduction ratio of 1/integer number (inclusive of 1/1); and

said exposure means is provided with recording start position control means for starting recording image information from a predetermined fixed reference position on said photosensitive drum

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4,922,273

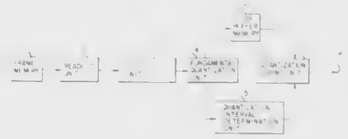
COMPRESSION METHOD OF HALFTONE IMAGE DATA

Hisashi Yonekawa, and Hiroshi Takeuchi, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 176,769
Claims priority, application Japan, Apr. 2, 1987, 62-79774; Apr. 2, 1987, 62-79775
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—429 16 Claims

1 A halftone image data compression method wherein digital halftone image data is divided into a plurality of blocks, orthogonal transformation is performed in units of blocks to obtain transform coefficients, and the transform coefficients

are quantized and coded, characterized in that a final quantization interval is determined in units of blocks using a frequency



of generation of AC components of transform coefficients quantized to zero of each block as a parameter

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4,922,274

MOTOR DRIVEN EXPOSURE ADJUSTING DEVICE

Hiroshi Yamamoto, Kanagawa; Shigeru Yoshida, Saitama; Katumi Yoshida, Saitama; Ryuji Suzuki, Kanagawa; Tadashi Arai, Saitama; Masachika Nishimura, Saitama; Hiroaki Seino, Kanagawa, and Takehiko Ando, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha/Canon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1989, Ser. No. 368,935
Claims priority, application Japan, Nov. 21, 1986, 61-179139; Dec. 16, 1986, 61-194283; Dec. 22, 1986, 61-197212; Dec. 26, 1986, 61-309396
Int. Cl.[5] G03B *9/02*
U.S. Cl. 354—271.1 15 Claims

1 A motor driven exposure adjusting device comprising:

(a) an annular rotary member having an optical path hole provided in a central portion of said member and arranged to be opened and closed by means of a plurality of light shielding blades, the opening and closing action of said blades being controlled by the rotation of said rotary member;

(b) a stepping motor having an axis thereof eccentrically located relative to a rotating center of said rotary member and disposed outside of the optical path hole, said stepping motor being arranged to serve as a drive source for the rotation of said rotary member;

(c) a gear device for transmitting the output rotation of a rotor shaft of said stepping motor to said rotary member; and

(d) aperture position detecting means for detecting whether the optical path hole is opened by said light shielding blades to a given maximum aperture position, said detecting means being formed as a detecting switch device for detecting the following states:

(i) a stopped down aperture state wherein said detecting switch device is in a first switching condition,

(ii) a maximum usable aperture state wherein said detecting switch is at a change-over point from a first switching condition to a second switching condition, and

(iii) a state of an aperture greater than the optical path hole wherein said detecting switch device is in a second switching condition, said states being established as a function of the rotating angle position of said rotary member, wherein

said detecting switch device of said detecting means is arranged such that the change-over point between the maximum aperture detection state and the stopped down aperture detection state is set between two stabilizing points of the stepping motor within which said stepping motor stabilizes under a non-energizing condition.

4,922,275

AUTOMATIC PANORAMIC CAMERA MOUNT

Larry M. Hughes, Largo, Fla., assignor to Burle Technologies, Inc., Wilmington, Del.

Filed Sep. 25, 1989, Ser. No. 412,212
Int. Cl.[5] G03B *17/00*
U.S. Cl. 354—293 4 Claims



1 A camera panning control apparatus comprising:

a moveable table to which a camera can be attached;

first, second, third and fourth limit stops mechanically coupled to the movement of the table;

a rotatable star cam located so that its outer cam surface is contacted by each of the limit stops in sequence as the table moves through its entire range of permitted motion, the star cam being shaped to have five lobes on its outer cam surface, the first lobe being centered among the others, the second and third lobes being located on opposite sides of the first lobe and being equidistant from the first lobe, and the fourth and fifth lobes being located on opposite sides of the first lobe, more remote from the first lobe than the second and third lobes, and also being equidistant from the first lobe, with the first lobe located and oriented so that the second and third limit stops contact its opposite surface as the table moves;

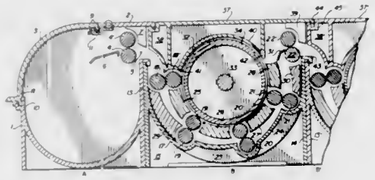
a second cam mechanically interconnected with the star cam and having a cam surface which comprises a central plateau with a higher plateau at one end of the central plateau and a lower plateau at the other end of the central plateau;

an electrical motor mechanically coupled to and moving the table;

a motor control means connected to the motor and controlling the direction of movement of the motor and the table; and

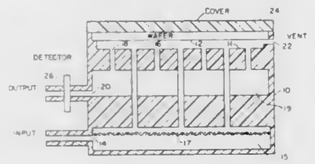
an electrical limit switch connected to the motor control means and including an actuator which is located so that it is in contact with the cam surface of the second cam, the characteristic of the electrical limit switch being such that it will change its condition when it moves from the central plateau to either the higher plateau or the lower plateau, but will not change its condition as it moves from the lower plateau or the higher plateau to the central plateau, the electrical limit switch operating to reverse the motion of the motor when its condition changes.

4,922,276
CONTINUOUS PROCESSING MACHINE FOR PHOTOGRAPHIC SHEET MATERIAL
Philipp Lamprecht, Brixen; Richard Piock, Bruneck, and Siegfried Tasser, Brixen, all of Italy, assignors to Durst Phototechnik GmbH, Bozen, Italy
Filed Jul. 21, 1989, Ser. No. 383,972
Claims priority, application Italy, Jul. 25, 1988, 4844 A88
Int. Cl.[5] G03B *3/04, 3/08*
U.S. Cl. 354—299 13 Claims



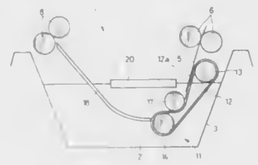
1. A continuous modular processing machine for processing exposed sheet-shaped photographic paper or other photographic material, comprising in combination:
a. an input unit for inserting the exposed sheet material;
b. a plurality of treatment units of identical construction, each treatment unit including a bath receptacle for accommodating different treatment baths;
c. each of said treatment units having coupling means adapted to couple each said treatment unit to another treatment unit arranged therebehind, said coupling means of each said treatment unit also being adapted to couple a first one of said treatment units to said input unit, said coupling means allowing said processing machine to be constructed as a modular system including said input unit and said plurality of treatment units arranged behind one another for accommodating different treatment baths; and
d. each of said treatment units including conveying means for conveying the sheet material through a treatment bath, said conveying means including a set of rollers for conveying the sheet material to be treated, each of said treatment units further including an electric drive for turning said set of rollers, the electric drive of a first of said treatment units being supplied with the electricity by said input unit, and the electric drives of succeeding treatment units being supplied with electricity by the preceding treatment unit.

4,922,277
SILICON WAFER PHOTORESIST DEVELOPER
Robert J. Carlson, Brooklyn Park, and Michael D. Grimm, Minneapolis, both of Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Nov. 28, 1988, Ser. No. 277,082
Int. Cl.[5] G03D *3/02*
U.S. Cl. 354—317 4 Claims



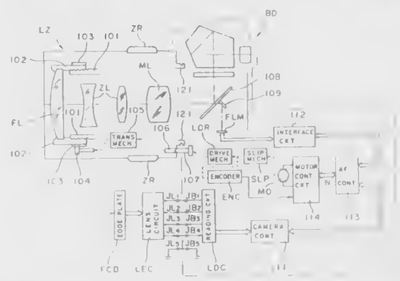
1. Apparatus for developing resist on an integrated circuit wafer comprising
a chuck having a surface with a plurality of inlet holes and a plurality of outlet holes, an outer wall with means adapted to receive said wafer so that it is spaced adjacent to said surface to form a chamber, inlet means for supplying developer through said inlet holes into the chamber, outlet means for removing used developer from the chamber via said outlet holes; and
detector means located at said outlet means for performing endpoint detection to determine completion of development of the resist.

4,922,278
DEVELOPING APPARATUS
Morihiro Takeda; Eiji Miyasaka, and Masayuki Handa, all of Hikone, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan
Filed May 26, 1988, Ser. No. 199,208
Claims priority, application Japan, May 27, 1987, 62-81623[U]
Int. Cl.[5] G03D *3/12*
U.S. Cl. 354—320 13 Claims



1. A developing apparatus for developing a presensitized plate comprising:
a developer tank having one end portion and the other end portion for storing a developer;
feeding roller means provided on an upper portion of the one end portion of said developer tank for feeding said presensitized plate into said developer tank;
discharger roller means provided on an upper portion of the other end portion of said developer tank for discharging said presensitized plate;
belt means provided in alignment with said feeding roller means, said belt means having a portion extending from the surface of said developer into the developer and rotates for guiding said presensitized plate;
pressing roller means which presses the presensitized plate fed by said feeding roller means onto said belt means;
belt holding roller means for holding and rotating said belt means; and
guide means, including a guide plate which is separate from said guide belt means, for guiding a presensitized plate pressed by said pressing roller means from said pressing roller means to said discharging roller means; said belt means including a delivering portion for delivering said presensitized plate to said guide plate, said guide plate including one end for receiving said presensitized plate and another end for delivering said presensitized plate to said discharging roller; one end of said guide plate being aligned with said delivering portion of said belt means, and the other end of said guide plate being aligned with said discharging roller.

4,922,279
AUTOMATIC FOCUS ADJUSTING APPARATUS
Masataka Hamada, Minamikawachi; Tokuji Ishida, Osaka, and Yasuaki Akada, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 186,882, Apr. 27, 1988, which is a continuation of Ser. No. 819,865, Jan. 16, 1986, abandoned. This application Jun. 19, 1989, Ser. No. 367,979
Claims priority, application Japan, Jan. 14, 1985, 60-11250; Jan. 17, 1985, 60-7179
Int. Cl.[5] G03B *3/00*
U.S. Cl. 354—400 2 Claims



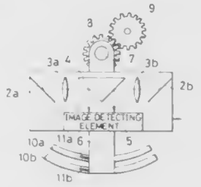
1. An automatic focusing apparatus for automatically moving an objective lens comprising:
driving means for moving said objective lens along an optical axis to effecting the focusing;
end judging means for judging whether or not said objective lens is located at the end of a movable distance range; and
control means for controlling said objective lens such that:
when said end judging means judges that said objective lens is moved to the end for the first time, the objective lens is temporarily stopped and then, the objective lens is again moved by said driving means; and
when said end judging means judges that said objective lens is moved to the end for the second time, the objective lens is stopped again.

4,922,280
INFRARED FILTER COVER PLATE FOR AUTOFOCUS CAMERA
Susumu Koshino, and Yuji Ogawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 89,451, Aug. 26, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 328,744
Int. Cl.[5] G03B *3/00*
U.S. Cl. 354—403 8 Claims



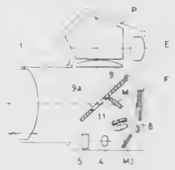
1. A camera, comprising:
a camera body;
an infrared range finding system enclosed in said body; and
a filter plate having a generally front surface and fixed on an exterior surface of said camera body in a light path of said infrared range finding system and preferentially passing infrared radiation and blocking visible radiation,
wherein said range finding system comprises an infrared emitter and an optical detector, said filter plate is a one-piece filter having two lens portions formed on an interior surface of said filter cooperating with said infrared emitter and detector, said filter covering said emitter and detector, said filter and said two lens portions being formed of the same material.

4,922,281
DISTANCE MEASURING DEVICE FOR AUTOMATIC FOCUSING CAMERA
Tomoya Kitajima, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed May 4, 1989, Ser. No. 347,031
Claims priority, application Japan, May 7, 1988, 63-109874; Jul. 5, 1988, 63-88440[U]; Mar. 10, 1989, 1-58795
Int. Cl.[5] G03B *3/00*
U.S. Cl. 354—404 10 Claims



1. A distance measuring device of a triangulation system type for an automatic focusing camera having a photographing optical system, comprising:
a distance measuring unit for measuring a distance to an object to be focused through said photographing optical system, said unit being comprised of a pair of image detecting elements each for detecting an image of the object, and a pair of distance-measuring optical systems each for imaging the object onto one of said image detecting elements;
a drive means for pivotally moving said distance-measuring optical systems and said image detecting elements of said unit integrally in a plane parallel to an optical axis of said distance-measuring optical systems without causing any relative movement of said distance-measuring optical systems and said image detecting elements with respect to each other; and
a control means for controlling said drive means such as to stop pivotal movement of said unit at each of at least two or more different pivotal angular positions thereof to thereby enable measurement of distance to each of at least two or more different points appearing in a field of view of said camera.

4,922,282
OPTICAL APPARATUS FOR LEADING LIGHT FLUXES TRANSMITTED THROUGH LIGHT DIVIDING SURFACE WHICH IS OBLIQUELY PROVIDED TO FOCUS DETECTING APPARATUS
Takeshi Koyama, Tokyo, and Keiji Ohtaka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 6, 1989, Ser. No. 375,992
Claims priority, application Japan, Jul. 7, 1988, 63-169867
Int. Cl.[5] G03B *3/00, 19/12;* G01J *1/20;* G02B *5/22*
U.S. Cl. 354—406 8 Claims



1. An optical system to detect a focus adjusting state of an objective lens, comprising:
a focus detecting apparatus for receiving light intensity

distributions regarding an object which are respectively formed by light fluxes which passed through different areas on a pupil of said objective lens, and for forming a signal indicative of the focus adjusting state of the objective lens with respect to the relative positional relation of said light intensity distributions;

an optical apparatus; and

a light dividing device, obliquely arranged with respect to said pupil areas, for distributing the light fluxes which passed through the objective lens to both of the focus detecting apparatus and the optical apparatus, said light dividing device having a dielectric multilayer film such that spectral characteristics of a wavelength area in which the focus detecting apparatus has a sensitivity are substantially flat

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4,922,283

OPTICAL INSTRUMENT

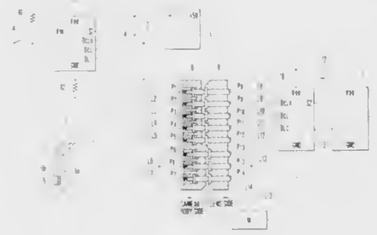
Hajime Fukui, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,014

Claims priority, application Japan, Feb. 12, 1988, 63-030633; Apr. 11, 1988, 63-088642

Int. Cl.[5] G03B 7/26

U.S. Cl. 354—484 34 Claims



17 An optical accessory instrument attachable to and detachable from an optical instrument body having electric power supply means and a body side circuit for performing digital information communication, comprising:

(a) electric power receiving means for receiving an electric power from said electric power supply means when attached to said optical instrument body;

(b) an accessory side circuit for performing digital information communication with said body side circuit, said accessory side circuit being arranged to change over between a first state of consumption of electric current and a second state of a lower consumption of electric current than in said first state; and

(c) a control circuit for controlling said state concerning the consumption of electric current of said accessory side circuit, said control circuit being arranged to change said state from said first state to said second state when said body side circuit and said accessory side circuit do not perform digital communication for more than a predetermined time.

4,922,284

FILM PRINTING/READING SYSTEM

Eugene J. Dwyer, Morristown, N.J., assignor to Silhouette Technology, Inc., Morristown, N.J.

Continuation of Ser. No. 54,294, May 26, 1987, Pat. No. 4,829,339. This application May 4, 1989, Ser. No. 347,071

Int. Cl.[5] G03B 27/72, 27/80

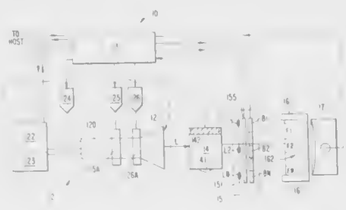
U.S. Cl. 355—20 51 Claims

1. An apparatus for recording an image on a light recording medium comprising:

a light source which emits light at a position which is moveable over an area of the light source controlled by a controller, the position of the light being subject to deviation from a desired position on the area of the light source which corresponds to a recording position to be recorded on the recording medium which has recording position coordinates:

a light transmitting device, disposed between the light source and the recording medium, for transmitting the light from the image source to the recording medium:

a light position sensor having a target area optically coupled to light emitted from a plurality of positions within the



area of the light source used for recording for detecting the position of the light intersecting the target area of the sensor from the area of the light source and generating at least one signal dependent upon the position of the light intersecting the target area; and wherein

the controller, responsive to the signal, produces at least one correction parameter and controls the position of the light on the area of the light source as a function of the at least one correction parameter to cause the light to move to coordinates on the area of the light source to cause the light to intersect the recording medium at the recording position coordinates.

4,922,285

METHOD OF AND APPARATUS FOR PHOTOGRAPHING AN IMAGE

Nobuyuki Torisawa; Hirokazu Okutsu, and Katsuhiro Auki, all of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 10, 1988, Ser. No. 230,806

Claims priority, application Japan, Aug. 11, 1987, 62-201197; Oct. 19, 1987, 62-264288; Nov. 6, 1987, 62-281863

Int. Cl.[5] G03B 27/72

U.S. Cl. 355—20 9 Claims

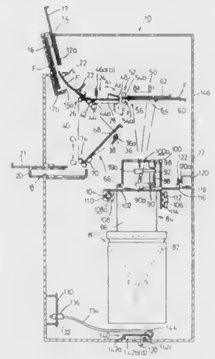
1. An apparatus for photographing images displayed by a display unit on a photosensitive medium, comprising

a first feed mechanism for feeding the photosensitive medium to a predetermined position;

an image-focusing optical mechanism for photographing the images on the photosensitive medium fed by said first feed mechanism;

an image positioning mechanism for positioning the photosensitive medium and delivering the photosensitive medium at predetermined intervals while the images are successively photographed on the photosensitive medium by said optical mechanism, said image positioning mechanism comprising a constant feed roller pair for feeding the photosensitive medium in a predetermined length and a pair of guide members, said feed roller pair being disposed in confronting relation to said first feed mechanism, one of said guide members facing said optical mechanism and having an opening defined therein for passage therethrough of light from the displayed images, said image positioning mechanism being arranged to deliver the photosensitive medium toward said first feed mechanism while holding one end of the photosensitive medium with said feed roller pair to allow said optical mechanism to

photograph the images on the photosensitive medium in at least two frames thereon; and



a, second feed mechanism for feeding the photosensitive medium after the images have been photographed thereon.

4,922,286

COLOR IMAGE RECORDING APPARATUS

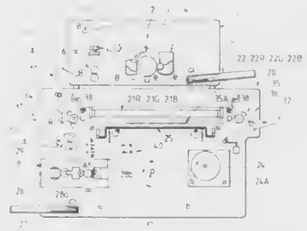
Kazunori Tanabe, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 16, 1988, Ser. No. 271,660

Claims priority, application Japan, Nov. 27, 1987, 62-301104

Int. Cl.[5] G03B 27/32

U.S. Cl. 355—27 11 Claims



1. A color image recording apparatus for recording an image corresponding to an original image on an image recording medium, said image recording medium comprising a photosensitive pressure sensitive image recording medium and a developer medium, said photosensitive pressure sensitive image recording medium traveling in a normal feeding direction, said apparatus comprising:

exposure unit for exposing to light said photosensitive pressure sensitive image recording medium to form a latent image thereon;

pressure developing unit disposed at downstream side of said exposure unit for superposing said photosensitive pressure sensitive image recording medium with said developer medium and for pressing together, said pressure developer unit being in inoperative position for pressure development during travel of said photosensitive pressure sensitive image recording medium in said normal feeding direction and being in operative position for pressure developing operation during travel of the photosensitive pressure sensitive image recording medium and the developer medium in a direction opposite said normal feeding direction;

reversal feeding means disposed downstream of said exposure unit for reversal feeding said photosensitive pressure sensitive image recording medium in the direction opposite said normal feeding direction for pressure developing said photosensitive pressure sensitive image recording medium, to thereby form a visible image on said developer medium during said reversal feeding; and

buffer means provided between said exposure unit and said pressure developing unit for temporarily absorbing slack of said photosensitive pressure sensitive image recording medium said slack being provided by said reversal feeding of said photosensitive pressure sensitive image recording medium.

4,922,287

EXPOSURE DEVICE IN IMAGE RECORDING APPARATUS

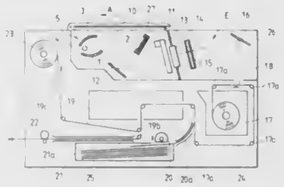
Yoichi Horaguchi, Nagoya; Takashi Tomizawa, Aichi; Shigeyuki Hayashi, Nagoya; Motoshi Ohno, Nagoya, and Takashi Nakata, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 11, 1988, Ser. No. 255,399

Claims priority, application Japan, Oct. 14, 1987, 62-156916

Int. Cl.[5] G03B 27/32

U.S. Cl. 355—27 3 Claims



1. An exposure device in an image recording apparatus in which an image is formed on an image recording medium which image corresponds to an image of an original, said exposure device comprising:

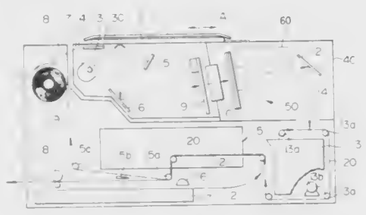
a light source having a back peripheral surface,

a reflector means surrounding said back surface of said light source for reflecting a light from said light source onto an original, said reflector means comprising first and second separate bisected reflector members, and at least one of said first and second reflector members being disposed movable toward and away from remaining reflector member, whereby open space is provided for facilitating handling of said light source; and

a side plate which constitutes a machine main body, said side plate being formed with an elongated slot and an arcuate guide groove, and wherein one of said reflector members comprises a main reflector plate member, a holder fixedly secured to an edge of said main reflector plate member, first protrusion extending from said holder and being engageable with said elongated slot, and a second protrusion extending from said holder and being engageable with said arcuate guide groove.

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4,922,288
IMAGE RECORDING APPARATUS
Michitosbi Akao, Nagoya; Kenji Sakakibara, Ichinomiya; Tokunori Katoh, Ichinomiyashi, and Yukichi Sawaki, Gifu, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Sep. 14, 1988, Ser. No. 244,681
Claims priority, application Japan, Sep. 24, 1987, 62-239246
Int. Cl.[5] G03B *27/32, 27/52*
U.S. Cl. 355—27 14 Claims



1. An image recording apparatus utilizing a photo and pressure sensitive recording medium, which comprises:
exposure means for emitting light to shine upon an original and for directing the light reflected from the original, toward the recording medium to expose an area of the same thereby forming a latent image corresponding to an image on said original;
pressure developing means for pressurizing the exposed recording medium to develop the latent image thereon;
transport means for transporting the recording medium from said exposure means to said pressure developing means; and
regular reflection means for regular-reflecting the light from said exposure means to expose an area of the recording medium other than the area exposed by said exposure means to the regular reflection light, thereby curing the recording medium.

4,922,289
PHOTOGRAPHIC FILM CARRIER
Mikio Kogane, and Tsutomu Kimura, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 3, 1989, Ser. No. 331,992
Claims priority, application Japan, Apr. 1, 1988, 63-80336
Int. Cl.[5] G03B *29/00*
U.S. Cl. 355—29 8 Claims



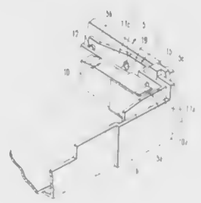
1. A film carrier used in a photographic apparatus for placing picture frames of a photographic film at a predetermined position of the photographic apparatus where each picture frame is projected, said film carrier comprising:
film carrier means, having a framing mask opening, for holding a picture frame of said photographic film firm and flat in said framing mask opening;
film transporting means, mounted on said film carrier means, for transporting said photographic film held by said carrier means;
marking means, disposed downstream of said framing mask opening, for applying a cut-mark to one side margin of said photographic film, said photographic film being cut transversely at said cut-mark;
detecting means, mounted on said film carrier, for detecting a transported length of said photographic film; and
control means for actuating said marking means to apply a cut-mark when said detecting means detects a predetermined length of said photographic film.

4,922,290
SEMICONDUCTOR EXPOSING SYSTEM HAVING APPARATUS FOR CORRECTING CHANGE IN WAVELENGTH OF LIGHT SOURCE
Yasuhiro Yoshitake, Yokohama, and Yoshitada Oshida, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 5, 1988, Ser. No. 253,562
Claims priority, application Japan, Oct. 6, 1987, 62-250585
Int. Cl.[5] G03B *27/42, 27/52*
U.S. Cl. 355—53 7 Claims



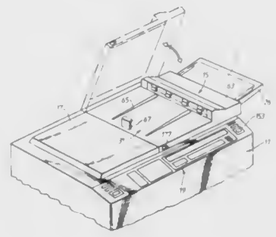
1. An exposure apparatus for exposing a circuit pattern of a mask onto a surface of a substrate by an excimer laser beam comprising:
an excimer laser source for generating the excimer laser beam;
an illumination optical system for illuminating the circuit pattern of the mask with the excimer laser beam from said excimer laser source;
a reduction projection lens for projecting the circuit pattern of the mask onto the substrate with said illuminating excimer laser beam, said illuminating excimer laser beam being passed through the circuit pattern of the mask so as to focus onto a pupil surface of the reduction projection lens, said reduction projection lens being formed by a material incapable of correcting chromatic aberration;
a measuring means for measuring a change amount $\Delta\lambda$ of a wavelength of the excimer laser beam emitted from said excimer laser source; and
control means for controlling position of an image plane on which said circuit pattern of the mask is projected through said reduction projection lens by said illuminating excimer laser beam and an image magnification of said circuit pattern of the mask projecting through said reduction projection lens in accordance with said change amount $\Delta\lambda$.

4,922,291
SHEET FEED DEVICE
Nobukazu Adachi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 309,960, Feb. 9, 1989, abandoned, which is a continuation of Ser. No. 160,191, Feb. 25, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,824
Claims priority, application Japan, Feb. 27, 1987, 62-046467
Int. Cl.[5] G03B *27/58*
U.S. Cl. 355—72 45 Claims

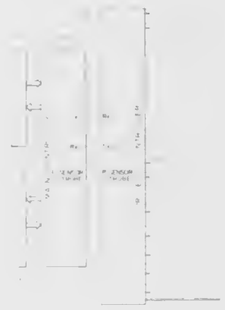


1. A sheet feed device comprising:
sheet containing means for containing sheets, said sheet containing means being movable in a predetermined direction from a predetermined position;
feed means for sending out the sheets contained in said sheet containing means disposed in said predetermined position; and
movement limiting means for limiting said sheets from making a relative movement to a direction reverse to said predetermined direction relative to said sheet containing means only when said sheet containing means is moved from the predetermined position.

4,922,292
IMAGE FORMING DEVICE
Junji Watanabe, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 25, 1989, Ser. No. 342,813
Claims priority, application Japan, Jun. 30, 1988, 63-160776
Int. Cl.[5] G03B *27/62*
U.S. Cl. 355—75 25 Claims



1. Document feeding apparatus for transporting a document onto a platen glass comprising:
means for receiving a stack of documents;
means for sequentially moving said documents from said receiving means to a portion of said platen glass;
means, covering said portion of said platen glass, for holding each of said documents moved by said moving means; and
means for covering said platen glass except said portion, said covering means being mounted to be opened from or closed against said platen glass.



1. A control system for an image forming apparatus for energizing in a predetermined sequence control units for image forming including a main charger for charging a surface of a photoconductive element, an exposing light source for exposing the charged surface of said photoconductive element to imagewise light, developing means for developing an electrostatic latent image formed on the charged surface of said photoconductive element by toner, and a transfer charger for transferring a toner image to a recording medium, reading at predetermined timings output signals of sensor means including current/voltage sensing means responsive to voltages/currents of said control units, document image density sensing means, and developed image density sensing means responsive to toner density in a predetermined area on said drum outside of a recording medium transfer area, and adjusting the voltages or currents of said control units in response to the output signals of said sensor means, said system comprising:
main control means for producing signals for commanding energization/deenergization of said control units in a predetermined sequence, producing digital signals representative of target values for energizing said control units, and transmitting the signals for commanding energization/deenergization and digital signals representative of the target values; and
process control means for receiving the signals commanding

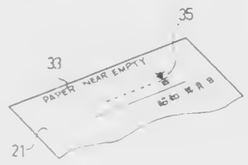
energization/deenergization which are sent from said main control means and energizing/deenergizing said control units based on the signals, receiving the digital signals representative of the target values from said main control means, converting the output signals of said sensor means, and setting voltages/currents for energizing said control units on the basis of the digital signals representative of the target values and the digital signals associated with the output signals of said sensor means.

4,922,294

IMAGE FORMING APPARATUS

Hidekazu Nakagami; Masashi Sakamoto, and Hiroshi Ozawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 3, 1988, Ser. No. 266,848
Claims priority, application Japan, Nov. 5, 1987, 62-280678
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—209 6 Claims



1. An image forming apparatus, comprising:
a first image forming means for forming a first image corresponding to an original or image information to be copied on a sheet;
a detecting means for detecting a specific condition of the image forming apparatus;
a second image forming means for forming a second image indicative of said specific condition; and
a control means for controlling said first and second image forming means to form the second image together with the first image on the sheet in accordance with the detection of said specific condition by said detecting means.

4,922,295

COPYING APPARATUS HAVING A DISPLAY WARNING

Yoshiaki Takano, and Tsuneo Kitagawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1988, Ser. No. 209,897
Claims priority, application Japan, Jun. 25, 1987, 62-158581
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—209 12 Claims



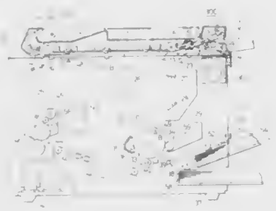
1. A copying apparatus comprising:
copying means for copying an original image on a copy paper;
parameter setting means for setting conditions on a copying operation to be performed by said copying means;
displaying means for displaying setting states corresponding to the conditions set by said parameter setting means;
copy end detecting means for detecting the end of the copying operation performed by said copying means;
storing means for storing standard setting states corresponding to the conditions on a standard copying operation; and
controlling means for making said displaying means display the setting states corresponding to the conditions set by said parameter setting means in a first display form, and for making said displaying means display the setting states different from the standard states stored in said storing means in a second display form different from said first display form when the end of copying operation has been detected by said copy end detecting means.

4,922,296

IMAGE REPRODUCING APPARATUS CONTROLLED IN RESPONSE TO DETECTED DENSITY OF AN ORIGINAL IMAGE

Yukio Kasuya, Inagi; Masahiro Tomosada, and Hideki Adachi, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 62,381, Jun. 15, 1987, abandoned, which is a continuation of Ser. No. 582,881, Feb. 23, 1984, abandoned. This application Feb. 13, 1989, Ser. No. 309,975
Claims priority, application Japan, Feb. 28, 1983, 58-33219; Feb. 28, 1983, 58-33220; Feb. 28, 1983, 58-33221; Feb. 28, 1983, 58-33222; Feb. 28, 1983, 58-33223; Feb. 28, 1983, 58-33224; Feb. 28, 1983, 58-33225
Int. Cl.[5] G03G *15/00, 15/04;* G03B *27/80*
U.S. Cl. 355—208 29 Claims



1. An image reproducing apparatus having a driven photosensitive body onto which an image is scanned, comprising:
means for detecting a density of an original image during prescanning of the original image, and for producing a detection signal; and
means for controlling an imaging process in accordance with a detection signal from said detecting means, said control means having means for performing an operation in response to a value of said detection signal, means for resetting said performing means prior to a start of an image reproducing operation, means for suspending a said image operation, and means for inhibiting an operation of said resetting means during suspension of a said image reproducing operation, wherein said original image is scanned and said photosensitive body is driven, and wherein an operational constant, associated with integration, of said performing means is changed in accordance with a change in a selected one of a scanning speed of the original image and a drive speed of said photosensitive body.

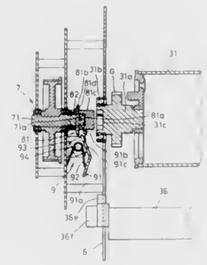
18. A document scanning apparatus comprising:
reciprocating means for scanning an image of an original;
illuminating means for intermittently exposing the original;
first control means for controlling a scan distance of said reciprocating means; and
second control means adapted to turn off said illuminating means after the end of illumination of the original and to control a timing for turning on said illuminating means in a next scanning cycle in accordance with a movement distance of said reciprocating means, wherein said second control means includes count means for counting a time period after the end of forward movement of said reciprocating means, and turns on said illuminating means when said count means has counted a value corresponding to said movement distance.

4,922,297

MOUNTING STRUCTURE OF PHOTOSENSITIVE DRUM

Akihiro Kondo, Sakai, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 28, 1988, Ser. No. 276,576
Claims priority, application Japan, Nov. 30, 1987, 62-301863
Int. Cl.[5] G03G *5/00, 15/048, 15/056*
U.S. Cl. 355—211 4 Claims



1. A mounting structure for a photosensitive drum in an image forming apparatus having a main body, comprising
a support shaft for supporting the photosensitive drum, said support shaft being supported by a bearing and being detachable from the main body by movement in a radial direction;
a drive shaft for driving the photosensitive drum;
a joint means between the support shaft and the drive shaft, said joint means having an engaged position where it is rotatably linked to both of said shafts and being movable from said engaged position to a disengaged position where it is rotationally disconnected from one of said shafts,
a specified device disposed along the outer circumference of the photosensitive drum, said specified device being normally in an attached position on said main body of the apparatus and being detachable from the main body, and
a joint operating means for operating the joint means, said joint operating means being engaged with said joint means and being operable in response to movement of the specified device to and from its attached position, said joint operating means being operable to move the joint means to its engaged position when the specified device is moved to its attached position.

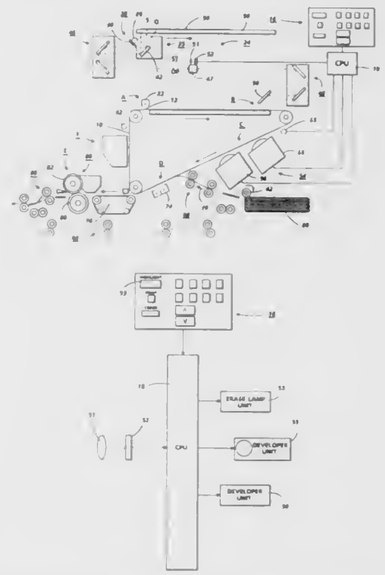
4,922,298

AUTOMATIC COLOR SEPARATION SYSTEM

Jeffrey J. Folkins, Rochester, N.Y.; Robert N. Goren, Palasides, Calif., and James D. Rees, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 6, 1988, Ser. No. 202,346
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—218 4 Claims

1. A color printing machine for printing faithful color output copies of an original document having at least two discrete colored areas, said machine including:
a xerographic imaging system comprising a photoconductor member, means for charging the surface of said member, optical means for forming successive latent electrostatic images of said original on the surface of said member, means for erasing selected portions of said latent image, means for developing the latent image in at least two colors, means for transferring said developed image to a copy sheet and means for fusing said transferred image, said imaging system further comprising:
sensing means enabled essentially simultaneously with the forming of said electrostatic image for discriminating between colored areas of said original document and areas outside said colored areas and for generating electrical signals representative of said colored and noncolored



areas, control means adapted to operate upon said sensing means output signals so as to generate and store electronic signal representing coordinates of said colored areas, said control means further adapted to operate said erase means so as to erase areas, during at least a first and second pass, of at least a first and second latent image, and to operate said developer means so as to develop the remaining latent image, following each said erase operation, with a desired color or black toner.

4,922,299

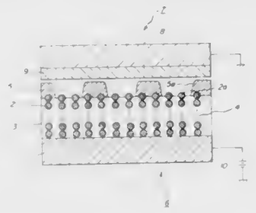
ELECTROSTATIC CHARGE EMITTING APPARATUS

Yoshihiro Uchimoto, Habikino, and Hirofumi Nakagawa, Osaka, both of Japan, assignors to Unico Co., Ltd., Japan

Filed Apr. 6, 1989, Ser. No. 334,138
Claims priority, application Japan, Apr. 7, 1988, 63-84141
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—219 17 Claims

1. An electrostatic charge emitting apparatus comprising:
a discharging member comprising an electrode member and an insulating layer having a number of fine apertures formed therein and being applied on at least a part of a surface of said electrode member;
a supporting member for supporting said discharging member in an insulated manner; and

an electric power source means for applying to said electrode member a voltage for generating discharge in the



apertures of said insulating layer to emit electrostatic charge toward a member to be charged or de-charged.

4,922,300

IMAGE FORMING APPARATUS AND DEVELOPING DEVICE THEREFOR

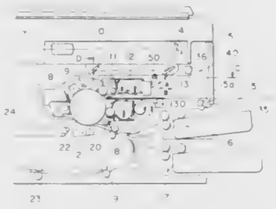
Nobukazu Sasaki; Toshirou Kasamura, both of Yokohama; Masashi Ohashi, Tokyo; Naoki Okuda, Kawasaki, and Toshihiko Kusomoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 71,316, Jul. 9, 1987, abandoned. This application Sep. 6, 1989, Ser. No. 403,005

Claims priority, application Japan, Jul. 11, 1986, 61-163477

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—245 22 Claims



1. An image forming apparatus for forming a developed image, comprising:

a developing device for developing an image on an image bearing member;

a passage along which said developing device is movable between an inside position where said developing device is inside said apparatus and an outside position where said developing device is at least partly outside said apparatus;

a movable cover for covering an opening to said passage; and

means for moving said developing device along said passage, said moving means including a driving source for outputting a driving force and transmission means for transmitting the driving force to said developing device to move it, wherein said moving means is responsive to an opening operation of said movable cover to move said developing device from the inside position to the outside position.

4,922,301

ROTARY MULTICOLOR DEVELOPING APPARATUS

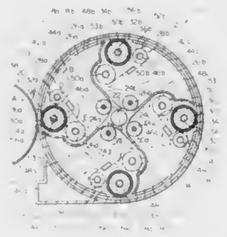
Shunji Katob, Sagamihara; Noriyuki Kimura, Kawasaki; Yoshihiro Sakai, Kawasaki, and Sigekazu Enoki, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 39,741, Apr. 20, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,247

Claims priority, application Japan, Apr. 24, 1986, 61-95771; May 15, 1986, 61-111170; May 15, 1986, 61-111171; Jun. 13, 1986, 61-137730; Jul. 10, 1986, 61-106193[U]; Oct. 6, 1986, 61-153608[U]; Oct. 20, 1986, 61-249301[U]

Int. Cl.[5] G03G *15/09*

U.S. Cl. 355—251 17 Claims



1. A rotary multicolor developing apparatus comprising:

(a) a latent image carrier;

(b) a rotatable developing drum with developing units which is disposed near to and facing said latent image carrier for carrying an electrostatic latent image therewith, said rotatable developing drum being indexed about a shaft thereof by predetermined angles so that, during use of said apparatus, the latent image is developed in a predetermined developing region by toner of different colors which are fed from said developing units of said rotatable developing drum, said developing units each comprising:

(i) developing brush means for forming a magnetic brush which is sequentially transported between a toner supply region, said developing region, and a toner recovery region and which, in said developing region, makes contact with the latent image;

(ii) toner supply means for conveying the toner which is charged in said toner supply region to the magnetic brush of said developing brush means; and

(iii) toner recovery means for recovering in said toner recovery region the toner which is remaining on the magnetic brush after development;

(c) imperforate first partition members disposed in said developing drum to define developing chambers which, during use of said apparatus, each store toner of a respective one of said colors;

(d) a toner supply drum for storing supplementary toner of different colors, said toner supply drum being mounted on a shaft and rotatabie with said shaft, said shaft being coaxial with said shaft of said developing drum;

(e) imperforate second partition members disposed in said toner supply drum to define toner chambers each storing, during use of said apparatus, supplementary toner of a respective one of said different colors;

wherein:

(f) each of said developing chambers extends radially from said shaft of said developing drum;

(g) each of said developing units is disposed in a corresponding one of said developing chambers for developing the latent image with the toner;

(h) each of said toner chambers extends radially from said shaft of said toner supply drum; and

(i) said developing apparatus further comprises a plurality of toner conveyor means, each one of said plurality of toner conveyor means connecting one of said toner chambers to a corresponding one of said developing chambers to convey a supplementary amount of toner from said one of said toner chambers to said corresponding one of said developing chambers, each one of said plurality of toner conveyor means extending from a point in the corresponding one of said toner chambers located radially outwardly from said shaft of said toner supply drum in parallel to said shaft of said toner supply drum to a corresponding point in the corresponding one of said developing chambers located radially outwardly from said shaft of said developing drum.

4,922,302

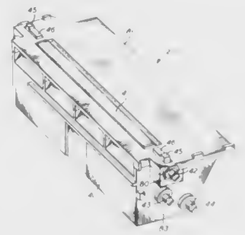
DEVICE FOR DEVELOPING ELECTROSTATIC IMAGES ON A FILM BELT

Lawrence A. Hill, Rochester; Michael E. Jacobs, Henrietta; Arthur S. Kroll, Brighton, and Ralph E. Williams, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 7, 1988, Ser. No. 216,671

Int. Cl.[5] G03G *15/08, 15/09*

U.S. Cl. 355—251 10 Claims



1. A device for developing electrostatic images, which device is usable in apparatus of the type in which a film belt carrying an electrostatic image moves through a path past said device, the apparatus including a film belt assembly including at least two rollers for supporting the belt in the path and frame members on opposite edges of the path for supporting the rollers, each frame member including an apparatus location surface, said device comprising:

device location surfaces adjacent opposite edges of the path for engaging the apparatus location surfaces of a film belt assembly when in operative relation therewith, to control the location of the device with respect to the assembly,

film support surfaces adjacent opposite edges of the path for engaging opposite edges of a film belt forming part of the assembly, and for supporting the film belt in a fixed location with respect to said device, and

developer application means located generally between said film support surfaces and having an applicator surface facing said path and in operative relation with said path which applicator surface is fixed in location with respect to said film support surfaces and therefor fixed with respect to the film belt.

4,922,303

IMAGE FORMING APPARATUS WITH CORONA DISCHARGE DEVICE FOR TRANSFERRING TONER IMAGE

Katsuhiko Takeda, and Hisashi Myochin, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 16, 1988, Ser. No. 232,646

Claims priority, application Japan, Aug. 21, 1987, 62-208695

Int. Cl.[5] G03G *15/16*

U.S. Cl. 355—274 13 Claims

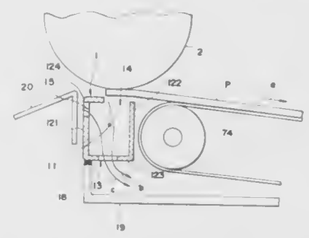
1. An image forming apparatus for transferring a toner image onto a paper transported in a paper transport direction, comprising:

a tone image carrier for carrying a toner image thereon;

a corona discharge device for transferring a toner image from said toner image carrier to a paper, said corona discharge device comprising:

a wire electrode disposed adjacent said toner image carrier such that said toner image carrier is on one side of said wire electrode,

a shield member surrounding said wire electrode, said shield member including a lower portion disposed on the side of said wire electrode opposite said toner image carrier and a pair of side portions extending from respective side edges of said lower portion toward said toner image carrier, and said shield member having a first opening in said lower portion, a second opening in one of said side portions adjacent said toner image



carrier, and an open space facing said toner image carrier, and

a cover member between said wire electrode and said toner image carrier, said cover member extending downstream from the upstream side of said wire electrode with respect to the direction of transport of the paper to cover a first part of said open space of said shield member to partially block said wire electrode from the toner image carrier while leaving a second part of said open space open for corona discharge by said wire electrode for transferring a toner image from said toner image carrier to a paper; and

means for sucking air from the interior space of said shield member connected to said first opening for sucking air therethrough and causing outside air to flow into the interior space of said shield member through said second opening and said second part of said open space of said shield member.

4,922,304

REPRODUCTION MACHINE FUSER BELT

Laura M. Gilbert, Vestal, and David Vermaat, Port Crane, both of N.Y., assignors to Imagitek, Binghamton, N.Y.

Filed Mar. 11, 1988, Ser. No. 167,037

Int. Cl.[5] B65G *15/42*

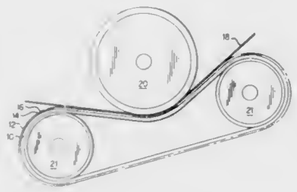
U.S. Cl. 355—282 6 Claims

1. In a fixing device of the type comprising a fixing roller heated by heating means, and a fuser belt for fixing a toner image formed on a copying medium while the same is being clamped between said heated fixing roller and said fuser belt and conveyed in contact with said heated fixing roller and said fuser belt, the improvement wherein:

said fuser belt comprising an inner and outer surface, said

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outer surface having a mechanical texture thereon comprising ridges and interstices perpendicular to the direc-



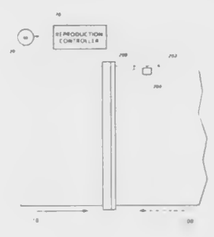
tion of travel of the fuser belt thereby allowing steam to escape freely from media.

4,922,305

APPARATUS FOR RELEASE OF DEBRIS TRAPPED BETWEEN A BLADE AND CHARGE RETENTIVE SURFACE

Vinod K. Agarwal, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 14, 1989, Ser. No. 407,182
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—299 12 Claims



1 In an imaging device having a belt-type member with a charge retentive surface moved along an endless path past a plurality of processing stations with a frictionally engaging drive arrangement; a motor coupled to the drive arrangement providing a motive force to move the charge retentive surface along the endless path in either of forward and reverse directions; a latent image forming station; a developing station developing the latent image with toner; a transfer station for transferring the developed latent image to a substrate; and a cleaning station including a cleaning blade for releasing residual toner and debris from the charge retentive surface after transfer, and a back tracking arrangement for releasing toner and debris entrapped between the cleaning blade and the charge retentive surface including:

a controller for selectively controlling the motor to move the charge retentive surface along either of forward and reverse directions along the endless path;

at least first and second sensor detectable indicia on the charge retentive surface, spaced at an interval therealong equivalent to a desired back tracking device; and

a sensor arrangement located at a fixed position relative to the moving charge retentive surface for detecting the passing of each indicia thereby, and producing a signal indicative thereof to the controller.

4,922,306

COPYING APPARATUS WITH DOCUMENT FEEDER

Kazuhiro Araki, and Masazumi Ito, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1988, Ser. No. 165,016
Claims priority, application Japan, Mar. 10, 1987, 62-54395
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—313 20 Claims





1. A copying apparatus comprising;

a document exposure means for exposing a document,

an image forming means for forming an image of a document on a copy sheet,

a first document supply means which accommodates a first document, transports this first document to the document exposure means, causes the first document to draw back automatically after an image of the first document is formed by the image forming means and accommodates again the first document,

a second document supply means which accommodates plural second documents, transports these second documents one by one to the document exposure means and discharges each second document after an image of that second document is formed by the image forming means, and

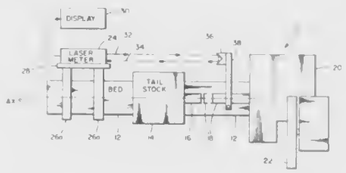
means for alternatively operating the first document supply means and the second document supply means in such a manner that the first document is supplied to the exposing means every time one of the second documents is discharged.

4,922,307

METHOD AND APPARATUS FOR IMPROVING THE MEASURING ACCURACY OF A MICROMETER

Michael J. Schaffer, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 30, 1988, Ser. No. 213,852
Int. Cl.[5] G01C *3/08*; G01B *11/14*
U.S. Cl. 356—5 9 Claims



1. A micrometer apparatus for measuring a dimension of an object, the apparatus having at least one movable component for contacting the object, the distance that the movable component is moved along an axis relative to a reference position being indicative of the dimension of the object, the apparatus comprising means for measuring the distance that the movable component moves along the axis relative to the reference position, said distance measuring means comprising:

laser means for transmitting chirped laser radiation in a direction substantially parallel to the axis and towards the movable component;

means, coupled to the movable component and movable therewith, for reflecting the transmitted radiation in a direction substantially parallel to the axis;

means for detecting the reflected radiation;

phase demodulator means, having an input coupled to the detecting means, for determining a distance that the reflecting means and movable component have moved, if any, relative to the reference position, the distance being indicative of the dimension of the object; and

coupling means including means for magnetically coupling said laser means to the micrometer apparatus.

second illuminating means for illuminating a position on a rear surface of said photo-mask with a light spot having a second predetermined light wavelength different from the first predetermined light wavelength of said laser beam spot, said second illuminating means including a second light source, a diaphragm having an aperture for converting light from said light source to the light spot, and focusing means for focusing the light spot onto the rear surface of said photo-mask;

light system means for condensing scattered light reflected from said photo-mask by said laser beam spot and transmitted light transmitted through said photo-mask by said light spot and for dividing said scattered reflected and transmitted light, said light system means including an objective lens for condensing said scattered light and said transmitted light, relay lens means for relaying an image of the objective lens, and dividing element means for dividing said scattered reflected light and transmitted light having different wavelengths;

first light detection means including shielding means for intercepting scattered reflected light generated from an edge of the circuit pattern and passing other scattered reflected light indicative of a massive foreign substance and relay lens means and image pick-up means for converting the passed scattered reflected light to a first signal;

massive foreign substance judging means for providing a massive foreign substance signal indicative of the presence of a massive foreign substance on said photo-mask in accordance with said first signal;

second light detection means including a phase plate for delaying scattered transmitted light scattered by a filmy foreign substance, relay lens means and image pick-up means for converting a phase contrast of the transmitted light to a second signal;

filmy foreign substance judging means for providing a filmy substance signal indicative of the presence of a filmy foreign substance on said photo-mask in accordance with said second signal; and

output means for outputting massive foreign substance information determined by said massive foreign substance judging means and filmy foreign substance information determined by said filmy foreign substance judging means by effecting relative scanning of said photo-mask and the laser beam spot and said light spot.

4,922,308

METHOD OF AND APPARATUS FOR DETECTING FOREIGN SUBSTANCE

Minori Noguchi; Mitsuyoshi Koizumi; Hiroaki Shishido; Sachio Uto, and Yoshimasa Ohshima, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1987, Ser. No. 67,136
Claims priority, application Japan, Jun. 27, 1986, 61-149516; Jun. 27, 1986, 61-149517; Jun. 27, 1986, 61-149519; Jun. 27, 1986, 61-149520
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—237 12 Claims

1. An apparatus for detecting foreign substances on a photo-mask having a circuit pattern comprising:

stage means for holding said photo-mask thereon;

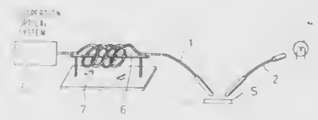
first illuminating means for obliquely illuminating a position on a front surface of said photo-mask with a laser beam spot of a first predetermined light wavelength at an oblique angle with respect to the front surface of said photo-mask, said first illuminating means including a first light source;

4,922,309

SPECTROSCOPE

Mitsunao Sekiwa, Hirakata, and Tomohiro Akada, Kadoma, both of Japan, assignors to Otsuka Electronics Co., Ltd., Osaka, Japan

Filed Nov. 7, 1988, Ser. No. 267,884
Claims priority, application Japan, Nov. 9, 1987, 62-282769
Int. Cl.[5] G01J *3/02*
U.S. Cl. 356—300 2 Claims



1. A spectroscope for analyzing a sample, comprising:

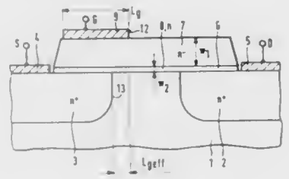
means for irradiating light on said sample;
means for receiving and depolarizing reflected light from said sample, said depolarizing means comprising an optical wave guide in the form of a spiral such that light is multiply reflected in said wave guide so as to depolarize said light; and
a dispersion optical system having a grating for emitting said depolarized light at every wavelength when said light is impinged thereto.

4,922,310

FIELD-EFFECT TRANSISTOR

Alexander Colquhoun, Heilbronn-Frankenbach, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Oct. 1, 1986, Ser. No. 914,540
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3535002
Int. Cl.[5] **H01L** *29/80*
U.S. Cl. 357—22 **21 Claims**



1. In a Schottky-gate field-effect transistor having spaced highly doped drain and source regions of one conductivity type located in a common plane at a surface of a highly resistive substrate, a doped semiconductor layer of said one conductivity type disposed on said surface between said source and drain regions and at least partially extending over said drain and said source regions to form a conductive channel region extending between and connecting said drain and source regions, coplanar drain and source electrodes for said drain and source regions respectively disposed on said common plane, and a Schottky-gate electrode for influencing said channel region to provide pinch-off, arranged on said doped semiconductor layer and at most only partially overlapping the channel region between said drain and source regions; the improvement wherein said source region and said gate electrode are arranged one above the other such that, when projected onto the plane of said channel region, any overlap in the direction of said drain region of the outside edge of said source region facing said drain region by the edge of said gate electrode facing said drain electrode is less than 1 μm, whereby a small effective channel length (L_{geff}) from said outside edge of said source region in the direction of said drain region is achieved.

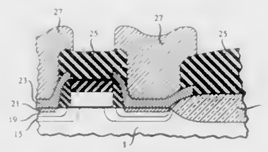
4,922,311

FOLDED EXTENDED WINDOW FIELD EFFECT TRANSISTOR

Kuo-Hua Lee; Chih-Yuan Lu, both of Lower Macungie Township, Lehigh County, and David S. Yaney, Bethlehem, all of Pa., assignors to American Telephone and Telegraph Company, New York, N.Y.

Division of Ser. No. 128,834, Dec. 4, 1987, Pat. No. 4,844,776. This application Apr. 11, 1989, Ser. No. 336,197
Int. Cl.[5] **H01L** *29/78, 29/34*
U.S. Cl. 357—23.1 **9 Claims**

1. An integrated circuit comprising:
a gate electrode structure, including a gate oxide and an insulating top layer;
insulating sidewall spacers on the sides of said gate electrode;
source and drain regions, said source and said drain regions being on opposite sides of said gate electrode;
a conductive window pad layer, at least portions of said window pad layer contacting at least portions of said



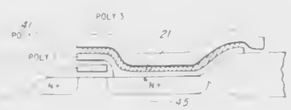
source or drain regions and covering at least portions of said sidewall spacers;
a patterned dielectric layer having windows exposing portions of said layer, said windows being substantially above said source and drain regions; and electrical contacts to said source, gate and drain, said electrical contacts to said source region and drain being through said windows.

4,922,312

DRAM PROCESS WITH IMPROVED POLYSILICON-TO-POLYSILICON CAPACITOR AND THE CAPACITOR

Donald J. Coleman, Plano, and Roger A. Haken, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 858,850, Apr. 30, 1986, which is a continuation of Ser. No. 468,921, Feb. 23, 1983, abandoned. This application Mar. 28, 1988, Ser. No. 172,995
Int. Cl.[5] **H01L** *29/78*
U.S. Cl. 357—23.6 **13 Claims**



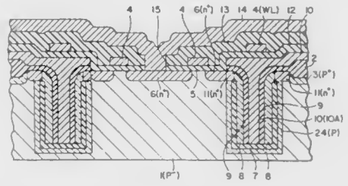
1. An integrated circuit including an array of memory cells, comprising:
(a) a monocrystalline substrate,
(b) a field oxide formed on said substrate defining said array of memory cells,
(c) each memory cell having:
(i) a pair of spaced implanted regions disposed in said substrate,
(ii) a gate electrode spaced from said substrate,
(iii) a first capacitor electrode on said substrate contacting one of said implanted regions and extending over and spaced from said gate electrode and over a portion of said field oxide, and
(d) a second capacitor electrode extending substantially over said array, said gate electrode and said first capacitor electrode and spaced therefrom and extending over said field oxide beyond said first capacitor electrode.

4,922,313

PROCESS FOR MANUFACTURING SEMICONDUCTOR MEMORY DEVICE AND PRODUCT FORMED THEREBY

Osamu Tsuchiya, Ohme, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 862,638, May 13, 1986, Pat. No. 4,734,384. This application Dec. 9, 1987, Ser. No. 130,679
Claims priority, application Japan, May 13, 1985, 60-99575
Int. Cl.[5] **H01L** *29/78, 27/02, 29/06*
U.S. Cl. 357—23.6 **13 Claims**



1. A semiconductor integrated circuit device equipped with memory cells, each memory cell comprising a series circuit of a capacitor and an MISFET, the MISFET having source and drain regions, each said capacitor comprising:
a moat in a surface of a semiconductor substrate, wherein said moat is adjacent to, but does not surround, said
a first electrode annularly formed on the side wall surface of said moat;
a first semiconductor region in said semiconductor substrate which is formed along the entire periphery of the side wall surface of the upper end portion of said moat and connected to said first electrode;
a first insulator film formed on said first electrode; and
a second electrode formed on said first insulator film, wherein one of the source and drain regions of said MISFET is connected to said first semiconductor region, whereby said one of the source and drain regions of said MISFET is connected to said first electrode via said first semiconductor region.

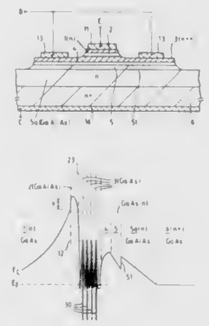
4,922,314

HOT CHARGE-CARRIER TRANSISTORS

John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 53,767, May 22, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 270,374
Claims priority, application United Kingdom, May 23, 1986, 8612604
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[5] **H01L** *29/205, 29/72*
U.S. Cl. 357—34 **8 Claims**

1. A hot charge-carrier transistor comprising a base region through which current flow is by hot majority charge-carriers of one conductivity type, barrier forming means which forms with the base region an emitter-base barrier for injection of the hot-carriers of said one conductivity type into the base region, and a base-collector barrier of a second conductivity type opposite to that of said first for collecting the hot charge-carriers of said one conductivity type from the base region, the transistor having a collector connection and a semiconductor collector region of said one conductivity type between the base-collector region of said one conductivity type between the base-collector barrier and the collector connection, the collector region being separated from the base region by the base-collector barrier, a region of semiconductor material of a wider bandgap being present within the collector region, said region of semiconductor material of wider bandgap being of said one conductivity type, located between the base-collector barrier of the second conductivity type and the collector connection, and forming in the collector region in the vicinity of the base-collector barrier a heterojunction at a surface of said wider bandgap material nearest said base-collector barrier, the heterojunction in operation providing an electric field which



retards hot charge-carriers within the collector region in the vicinity of the base-collector barrier before these charge-carriers pass through the remainder of the collector region to the collector connection.

4,922,315

CONTROL GATE LATERAL SILICON-ON-INSULATOR BIPOLAR TRANSISTOR

Duy-Phach Vu, Taunton, Mass., assignor to Kopin Corporation, Taunton, Mass.

Filed Nov. 13, 1987, Ser. No. 120,036
Int. Cl.[5] **H01L** *29/72*
U.S. Cl. 357—35 **10 Claims**



1. A gated lateral bipolar transistor comprising:
a semiconductor substrate;
an insulator over a surface of said substrate;
a first doped semiconductor region on the insulator having one type of conductivity;
a second doped semiconductor region on the insulator and laterally contacting the first region on one side having an opposite type of conductivity and lower doping concentration relative to the first region;
a third doped semiconductor region on the insulator and laterally contacting the second region on a side opposite the first region having the type of conductivity as the first region and lower doping concentration relative to the first region;
a fourth doped semiconductor region on the and laterally contacting the third region on a side opposite said second region having the same type of conductivity as the first region and the same doping concentration as that of said first region;
an insulating cover on the first, second, third, and fourth semiconductor regions;
a doped semiconductor zone, positioned inside of and along a surface of the second region that contacts the insulating

cover, and having the same type of conductivity and a higher doping concentration than the second region such that the zone does not contact the first region; and

a gate region on the insulating cover and positioned over the second and third regions.

4,922,316

INFANT PROTECTION DEVICE

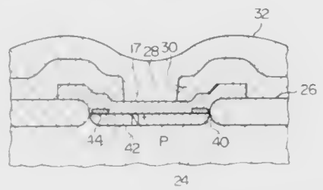
Yoshinori Sato, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 864,091, May 16, 1986, abandoned. This application Dec. 29, 1988, Ser. No. 290,847

Claims priority, application Japan, May 17, 1985, 60-105517

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—41 **4 Claims**



1. An input protection device for a semiconductor integrated circuit having an input transistors, said device comprising;

(a) a semiconductor substrate of a first conductivity type;

(b) a first insulator layer on saiid substrate, the first insulator layer having a first opening extending to the surface of said substrate;

(c) a doped region formed in the surface portion of said substrate and open at said first opening, the doped region being of a second conductivity type which is opposite to said first conductivity type and forming a p-n junction at its interface with said substrate;

(d) a patterned input protection resistor region having one end portion contacting said doped region through said first opening and a portion overlapping said first insulator layer so that the patterned input protection resistor region is wider than the first opening, said patterned input protection resistor region having the other end portion coupled to a gate electrode of said input transistor;

(e) a second insulator layer having a portion covering said input protection resistor region, said portion of the second insulator layer having a second opening extending to the surface of the resistor region, the second opening in the second insulator layer being arranged to be nested in the first opening in said first insulator layer, thereby exposing a central zone of the surface of said one end portion of said patterned input protection resistor region; and

(f) a metallized input wiring layer on said second insulator layer, the metallized input wiring layer having a region extending through said second opening in said second insulator layer to the central zone of the surface of said one end portion of said input protection resistor region contacting said doped region, said wiring layer being located over said doped region, a diode formed by said p-n junction being located in the vicinity of said one end portion of said patterned input protection resistor for protecting said patterned input protection resistor between the diode and said input transistor from an abnormal voltage supplied through said metallized input wiring layer.

4,922,317

CMOS DEVICE HAVING SCHOTTKY DIODE FOR LATCH-UP PREVENTION

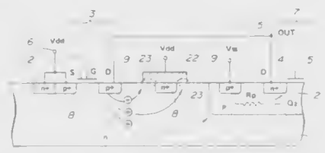
Teruyoshi Mihara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 4, 1987, Ser. No. 81,391

Claims priority, application Japan, Aug. 6, 1986, 61-183476

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—42 **20 Claims**



1. A CMOS device comprising:

an n-type substrate region and a p-type substrate region which are both located in a single semiconductor substrate body,

a p-type pair of source and drain regions located in said n-type substrate region to form a p-channel MOSFET with a first insulated gate,

an n-type pair of source and drain regions located in said p-type substrate region to form an n-channel MOSFET with a second insulated gate, and

a metal electrode joined with said n-type substrate region to form a Schottky junction between said p-channel MOSFET and said n-channel MOSFET, said Schottky junction collecting minority carriers in said n-type substrate region,

wherein said CMOS device further comprises first conductor means for connecting both of said first and second insulated gates to an input terminal, second conductor means for connecting said p-type and n-type drain regions to an output terminal, third conductor means for applying a second supply voltage to said n-type source region of said n-channel MOSFET, and fifth conductor means for applying one of said first and second supply voltages to said metal electrode.

4,922,318

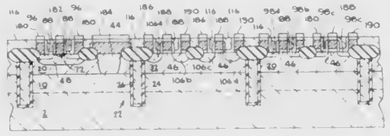
BIPOLAR AND MOS DEVICES FABRICATED ON SAME INTEGRATED CIRCUIT SUBSTRATE

Mammen Thomas, San Jose, and Matthew Weinberg, Mountain View, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 18, 1985, Ser. No. 777,149

Int. Cl.[5] H01L *27/02, 29/04, 27/12, 23/48*

U.S. Cl. 357—43 **1 Claim**



1. An improved integrated circuit structure having one or more bipolar devices formed therein and one or more MOS devices formed therein comprising:

(a) a P type silicon substrate having an N+ buried layer formed therein, an N type epitaxial silicon layer grown over said buried layer, and oxide isolation regions formed in said epitaxial layer and extending into said structure sufficiently to provide isolation between adjacent devices and between the collector region and the base/emitter region of said one or more bipolar devices formed therein;

(b) an intrinsic base region formed in said epitaxial layer;

(c) a raised emitter contact on said epitaxial layer over said intrinsic base region and constructed using polysilicon to provide high gain;

(d) an emitter region formed in the surface of said intrinsic base region by diffusing dopant from said raised polysilicon emitter contact into said intrinsic base region;

(e) oxide spacer means on the sidewall of said raised polysilicon emitter contact;

(f) a polysilicon collector contact on said epitaxial layer raised to approximately the same level as said raised polysilicon emitter contact and separated from said intrinsic base region by one of said isolation oxide regions and in electrical communication with said buried layer through sinker means in said epitaxial layer;

(g) a polysilicon base contact on said epitaxial layer raised to approximately the same level as said raised polysilicon emitter contact;

(h) a first metal silicide conductive layer formed on said epitaxial layer over at least a portion of said intrinsic base region and over the top and sides of said raised polysilicon base contact to thereby provide a horizontal conductive path extending from said oxide spacer means on said raised polysilicon emitter contact to said raised polysilicon base contact and a vertical conductive path from said horizontal conductive path up the sides of said raised polysilicon base contact to the metal silicide on the top of said raised polysilicon base contact, whereby the speed of said device is enhanced by decreasing the resistance of the horizontal and vertical conductive paths between the intrinsic base under said emitter and the metal silicide on the top of said raised polysilicon base contact to which metal contact will subsequently be formed;

(i) a polysilicon gate having a raised contact portion formed over a gate oxide layer on said epitaxial layer overlying a channel region formed in said epitaxial layer;

(j) oxide spacer means on the sidewall of said raised gate contact portion;

(k) source and drain regions formed in said epitaxial layer contiguous with said channel region and separated from adjacent devices in said structure by said isolation oxide regions;

(l) polysilicon source and drain contacts on said epitaxial layer raised to approximately the same level as said raised polysilicon gate contact;

(m) second metal silicide conductive layer portions respectively overlying said source and drain regions in said epitaxial layer and over the sides and tops of said raised polysilicon source and drain contacts to thereby provide horizontal conductive paths extending from said oxide spacer means on the sidewalls of said raised polysilicon gate contact to said raised polysilicon source and drain contacts, and vertical conductive paths from said respective horizontal conductive paths up the sides of said raised polysilicon source and drain contacts to decrease the resistance of the horizontal and vertical conductive paths respectively between the source and drain regions in said epitaxial layer and the metal silicide on the top of said raised polysilicon source and drain contacts to which metal contacts will subsequently be formed;

(n) a layer of insulating material over said structure which has been planarized to expose the upper surface of said raised base, emitter, collector, source, gate, and drain contacts;

whereby said structure comprises a highly planarized surface with self-aligned contacts and low resistance paths respectively between the tops of said raised base, source, and drain contacts and said base, source, and drain regions in said epitaxial layer.

4,922,319

SEMICONDUCTOR PROGRAMMABLE MEMORY DEVICE

Toshitaka Fukushima, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

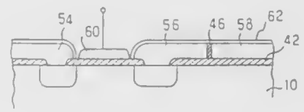
Continuation of Ser. No. 905,122, Sep. 9, 1986, abandoned. This application Jul. 5, 1989, Ser. No. 374,589

Claims priority, application Japan, Sep. 9, 1985, 60-198760

Int. Cl.[5] H01L *27/02, 29/78, 27/12*

U.S. Cl. 357—51 **19 Claims**





1. A semiconductor programmable device having a memoy cell including a word line and a bit line, comprising:

a semiconductor substrate;

a buried layer formed in said semiconductor substrate, said buried layer having a n^+-type high impurity concentration;

an n-type silicon layer, formed on said buried layer, having a lower impurity concentration than that of said buried layer;

a p-type silicon layer formed on said n-type silicon layer for forming a diode;

an insulation layer, formed in said n-type silicon layer, dividing said n-type silicon layer into an upper layer and a lower layer, said insulation layer, and said upper and lower n-type silicon layers forming a capacitor;

an isolation region formed of silicon dioxide and surrounding a portion of said n-type silicon layer, said insulation layer, and said p-type silicon layer, said diode and said capacitor being connected in series between the word line and bit line of the memory cell;

the memory cell being programmable by applying a high voltage to said capacitor and forming a by-pass circuit in said insulation layer by dielectric breakdown of said insulation layer, said by-pass circuit being formed of doped silicon and including materials substantially the same as those of said upper and lower layers.

4,922,320

INTEGRATED CIRCUIT METALLIZATION WITH REDUCED ELECTROMIGRATION

James M. McDavid, Dallas, and Dirk N. Anderson, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 710,346, Mar. 11, 1985, Pat. No. 4,744,858. This application Feb. 16, 1988, Ser. No. 156,132

Int. Cl.[5] H01L *23/54, 21/441, 21/469*

U.S. Cl. 357—67 **7 Claims**

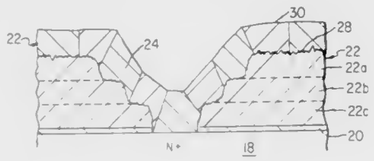
1. A semiconductor integrated circuit with reduced electromigration in lead metallization, comprising:

A. a body of semiconductor material having a circuit element formed on a face thereof;

B. an insulating layer formed on said face over said circuit element, said insulating layer including an aperture formed therethrough to provide access to said underlying

circuit element, and said insulating layer having a roughened surface; and

C. a conductive metal strip formed over said insulating layer and into said aperture to contact said circuit element, said



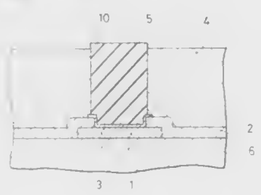
roughened surface of said insulating layer causing said metal strip to have increased interior grain structure and a roughened surface, which provide improved electromigration characteristics.

4,922,321

SEMICONDUCTOR DEVICE AND A METHOD OF PRODUCING SAME

Hajime Arai; Isao Furuta; Hidefumi Kuroki; Junichi Arima; Yoshihiro Hirata, and Shigeru Harada, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1987, Ser. No. 6,922
Claims priority, application Japan, Jan. 27, 1986, 61-16162
Int. Cl.[5] H01L *23/54, 23/14, 21/283*
U.S. Cl. 357—68 **10 Claims**



1. A semiconductor device comprising:
a wafer;
an electrode portion formed on said wafer;
a passivation film deposited on said wafer except for said electrode portion;
an insulating film deposited only on said passivation film so as to have a predetermined thickness and so as to include a concave portion over said electrode portion; and
conductive material embedded in said concave portion at least up to the height of said insulating film, wherein said conductive material is used for bonding to a substrate.

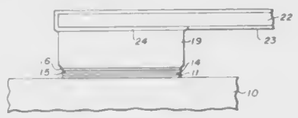
4,922,322

BUMP STRUCTURE FOR REFLOW BONDING OF IC DEVICES

Ranjan J. Mathew, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 9, 1989, Ser. No. 308,704
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—69 **1 Claim**

1. A tape assembly bonded semiconductor device comprising:
a semiconductor device having at least one aluminum bonding pad;
layers of aluminum, nickel-vanadium alloy and gold successively overlying said aluminum bonding pad;
a gold bump located on said semiconductor device over said gold layer, said gold bump having an outer surface;
a copper tape finger associated with an assembly tape; and



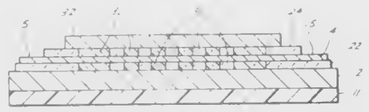
a gold-tin eutectic solder joining said copper tape finger to said outer surface of said gold bump wherein there is a complete absence of metallic tin in said bonded semiconductor device.

4,922,323

HERMETICALLY SEALED MULTILAYER ELECTRICAL FEEDTHRU

Curtis N. Potter, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Division of Ser. No. 36,404, Apr. 9, 1987. This application Feb. 1, 1988, Ser. No. 151,146
Int. Cl.[5] H01L *23/48, 29/46, 23/30, 29/62*
U.S. Cl. 357—71 **1 Claim**



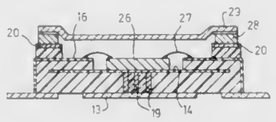
1 A hermetically sealed multilayered electrical connector for high-density substrates comprising,
multiple vertical layers of electrical molybdenum conductors electrically separated from each other and including ends for input and output electrical connections, and at least some of the multiple layers having multiple conductors,
said layers supported by a plurality of anisotropically etched anodized aluminum dielectric support pillars which are separated providing spaces between the pillars,
said conductors and said spaces sealed by glass enclosing said conductors and pillars forming a hermetic glass-to-metal seal, and
said conductors having contact portions at each end providing input and output connections to other conductors.

4,922,324

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Toshio Sudo, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jan. 19, 1988, Ser. No. 145,305
Claims priority, application Japan, Jan. 20, 1987, 62-10338
Int. Cl.[5] H01L *23/14, 23/10, 23/36, 23/52*
U.S. Cl. 357—74 **16 Claims**



1. A semiconductor integrated circuit device comprising:
a package base having a cavity;
a ground electrode layer formed on the cavity;

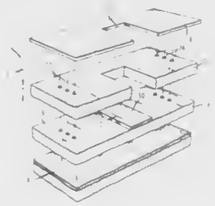
a semiconductor integrated circuit chip provided on the ground electrode layer;
de-coupling capacitors provided on the cavity;
bonding wires directly connecting the semiconductor integrated circuit chip to the de-coupling capacitors;
a ground metal plate provided on the bottom surface of the package base;
a metal connection means provided through the package base to connect the ground electrode layer and the ground metal plate; and
outer leads provided on the bottom surface of the package base.

4,922,325

MULTILAYER CERAMIC PACKAGE WITH HIGH FREQUENCY CONNECTIONS

Palmer D. Smeltz, Jr., Ruscombmanor Township, Berks County, Pa., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 2, 1987, Ser. No. 104,719
Int. Cl.[5] H01L *23/02, 23/12*
U.S. Cl. 357—74 **20 Claims**



1. A ceramic package including a high frequency connector, said high frequency connector comprising
a signal conductor including a first end and a second end for providing a signal path between a first device, respectively;
ceramic material disposed to surround the signal conductor such that the first and the second ends remain exposed;
a plurality of vias formed through the ceramic material so as to enclose said signal conductor; and
grounding means coupled to the plurality of vias to form, in combination with said plurality of vias, a ground plane insulator for said signal conductor.

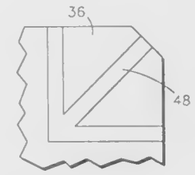
4,922,326

CERAMIC SEMICONDUCTOR PACKAGE HAVING CRACK ARRESTOR PATTERNS

Kent M. Blumenshine; Harris L. Marcus, and Kathleen A. Long-Daugherty, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1988, Ser. No. 220,292
Int. Cl.[5] H01L *23/14*
U.S. Cl. 357—80 **14 Claims**

1. A ceramic semiconductor package comprising:
a layer of ceramic material, said layer of ceramic material having a first surface and a second surface;
a plurality of metal interconnect lines disposed on said first surface of said layer of ceramic material; and
a plurality of metal crack arrestor patterns disposed on said first surface of said layer of ceramic material, said plurality



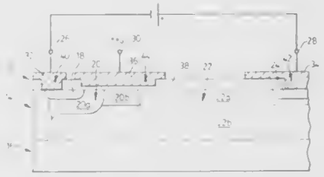
of metal crack arrestor patterns to serve as a barrier to cracks in said ceramic material.

4,922,327

SEMICONDUCTOR LDMOS DEVICE WITH UPPER AND LOWER PASSAGES

José G. Mena, Wyomissing, Pa., and C. Andre T. Salama, Toronto, Canada, assignors to University of Toronto Innovations Foundation, Toronto, Canada

Filed Dec. 24, 1987, Ser. No. 137,882
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.4 **11 Claims**

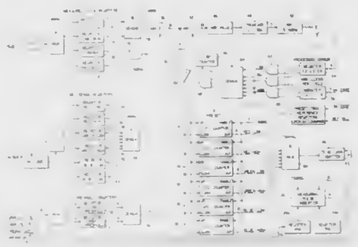


1. A semiconducting device comprising:
gate, source and drain nodes disposed on one side of a semiconducting layer, said source and drain nodes being located on either side of said gate node;
an insulation layer disposed on the other side of said semiconducting layer, said semiconducting layer including a channel region located adjacent said gate node and being formed from one conductivity type of semiconductive material;
a drift region formed from the opposite conductivity type of semiconductive material, said drift region including a pair of parallel upper and lower conductive passages, one of said conductive passages having a lower doping concentration than the other of said conductive passages, said channel region including first and second zones, each of said zones being respectively adjacent one of said passages to define a pair of pn junctions, the doping concentration of each of said zones being chosen so that each of said pn junctions has a substantially similar breakdown voltage; and
source and drain regions formed from said opposite conductivity type of semiconductive material, said source and drain regions being located adjacent said respective nodes and having a higher doping concentration than said other passage, said first zone being adjacent said source region and said second zone being disposed between said first zone and said upper passage.

4,922,328
VELOCITY CONTROLLED CRT AUTO TRACKING SYSTEM

Christopher M. Engel, and Khosro M. Rabii, both of Arlington Heights, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 23, 1989, Ser. No. 327,937
Int. Cl.[5] H04N *17/04*
U.S. Cl. 358—10 8 Claims

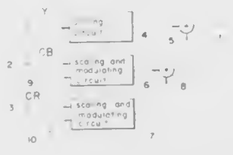


1. An auto tracking system for a cathode ray tube comprising:
operating means for controlling a display characteristic of a cathode ray tube;
means for applying a test signal to sample said display characteristic;
means for storing a reference for said display characteristic;
comparison means for comparing said reference with said sample of said display characteristic;
means coupled to said comparison means for adjusting said operating means for changing said display characteristic as a function of the difference between said sampled display characteristic and said reference; and
means for varying the rate of adjustment of said operating means.

4,922,329
APPARATUS FOR CODING A DIGITAL COMPONENT VIDEO SIGNAL

James H. Wilkinson, Tadley, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,387
Claims priority, application Japan, Jul. 31, 1987, 62-192226
Int. Cl.[5] H04N *11/06*
U.S. Cl. 358—12 6 Claims



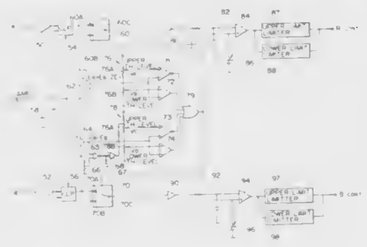
1. Apparatus for coding a digital component video signal having first and second component chrominance signals and a component luminance signal having a predetermined bandwidth, comprising:
first means for modulating a first carrier signal with the first component chrominance signal to generate a first modulated chrominance signal, said first carrier signal having a frequency approximately at the upper end of said bandwidth and a four-field sequence such that the phase of the first carrier signal is inverted at every line interval;
second means for modulating a second carrier signal with the second component chrominance signal to generate a second modulated chrominance signal, said second carrier signal having substantially the same frequency as said first carrier signal and a two-field sequence such that the phase of the second carrier signal is inverted at every field interval; and
means for combining the luminance signal with the first and second modulated chrominance signals to generate a combined component video signal of reduced overall bandwidth substantially equivalent to said predetermined bandwidth of the component luminance signal wherein said first and second modulated chrominance signals have substantially no frequency components that exceed the frequency of the first and second carrier signals

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4,922,330
METHOD AND APPARATUS FOR AUTOMATICALLY ADJUSTING WHITE BALANCE

Kenji Saito; Yoshiaki Nakayama, and Yukihiro Kawada, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1989, Ser. No. 378,941
Claims priority, application Japan, Jul. 18, 1988, 63-179589
Int. Cl.[5] H04N *9/64, 5/14*
U.S. Cl. 358—29 2 Claims

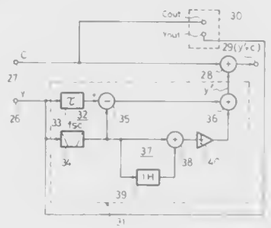


1. In a method of automatically adjusting white balance in which color difference signals (E_R-E_Y) and (E_B-E_Y) are respectively generated from signals obtained by photographing an object, the respective color difference signals are integrated over an entire screen, and the gains of red and blue signals are controlled so that the integration average values of the respective color difference signals are equal to their predetermined reference levels, the improvement comprising that color signals ($E_R+E_B-2E_Y$) and (E_R-E_B) respectively obtained by means of addition and subtraction of said two color difference signals are generated in accordance with signals obtained by photographing said object, that, in threshold levels for removal of a chromatic color respectively set correspondingly to said respective color signals generated, threshold levels corresponding to said color signal (E_R-E_B) are set in accordance with an integration average value obtained by integrating said color signal (E_R-E_B) or an I signal over the entire screen, and that, while at least one of said respective color signals exceeds said threshold levels set, the integration of said respective color difference signals is prohibited and the color difference signals during such period can be removed.

4,922,331
COLOR VIDEO SIGNAL REPRODUCING APPARATUS HAVING TRAP CIRCUIT AND COMB-FILTER FOR FILTERING A CHROMINANCE SIGNAL BAND OF A WIDE BAND LUMINANCE SIGNAL

Tadashi Ezaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 209,189
Claims priority, application Japan, Jun. 23, 1987, 62-156060; Nov. 18, 1987, 62-291284
Int. Cl.[5] H04N *9/79*
U.S. Cl. 358—31 18 Claims



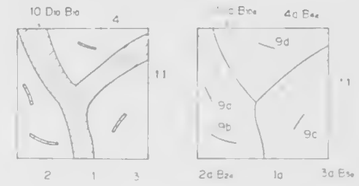
1. A video signal reproducing apparatus for obtaining a composite color video signal from a reproduced carrier chrominance signal and a reproduced luminance signal of a wide frequency band containing at least a band of said carrier chrominance signal comprising:
means defining a transmission path for said reproduced luminance signal;
adding means for adding an output of said transmission path to said chrominance signal so as to provide a composite color video signal as a first output signal;
filter means interposed in said transmission path for preventing interference between said chrominance signal and the portion of said frequency band of the reproduced luminance signal corresponding to said band of the carrier chrominance signal when said output of the transmission path is added to said chrominance signal;
means for separately deriving said reproduced luminance signal from a point in said transmission path in advance of said filter means as a second output signal; and
means for separately deriving said carrier chrominance signal in advance of said adding of the chrominance signal to said output of the transmission path as a third output signal.

4,922,332
METHOD OF AND APPARATUS FOR GENERATING TINT PATTERN DATA

Hisayuki Taniguchi, and Masaaki Yamamura, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jan. 13, 1989, Ser. No. 297,072
Claims priority, application Japan, Jan. 14, 1988, 63-4698
Int. Cl.[5] H04N *1/395, 1/415*
U.S. Cl. 358—77 22 Claims

1. A method of generating tint pattern data used for producing tint patterns by which a color print of an image is reproduced, said method comprising the steps of:
(a) preparing first image data dpicting a first image including a first area, a second area and a line having finite width separating said first and second areas,
(b) executing a thinning process on said first image data in order to reduce the width of said line to form a thinned line having a uniform width, thereby to obtain second image data representing a second image including said thinned line, an enlarged first area and an enlarged second area, where said enlarged first and second areas are separated from each other by said thinned line,
(c) generating third and fourth image data depicting said enlarged first and second areas, respectively,
(d) executing an expansion process on said third and fourth image data in order to expand said enlarged first and second areas by a constant width to form first and second expanded areas, respectively,

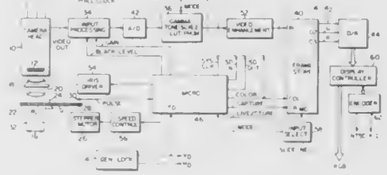


(e) generating fifth and sixth image data depicting said first and second expanded areas, respectively, and
(f) generating tint pattern data which represents said first and second expanded areas with respective prescribed colors as a function of said fifth and sixth image data.

4,922,333
VIDEO COPYING APPARATUS SPECTRALLY-RESPONSIVE TO SLIDES OR NEGATIVES

Thomas C. Nutting, Fairport; King A. Lucas, Spencerport, and Andrew D. Arnold, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 15, 1988, Ser. No. 284,647
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—78 22 Claims



1. Video apparatus for generating a color video signal from an image of an original, said apparatus comprising:
means for generating an input mode signal separately identifying at least two different input modes corresponding to at least two types of originals having different spectral characteristics;
video imaging means for generating a color video signal from the image of the original, said imaging means including image sensing means responsive to image light from the original for producing a plurality of image signals, a signal processing section for generating a color video signal from the image signals, and color filter means comprising a plurality of color filters for modifying the image light, including one combination of filters having spectral characteristics appropriate for the first type of original and a second combination of filters having spectral characteristics appropriate for the second type of original; and
means responsive to the input mode signal for operating said video imaging means to generate a color video signal from image signals corresponding to the combination of filters appropriate for the identified input mode.

VOL
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4,922,334

COLOR FILTER ARRANGEMENT FOR AN IMAGE PICKUP DEVICE HAVING COMPLEMENTARY COLOR ELEMENTS WHICH OVERLAP AT BOUNDARIES BETWEEN PICTURE ELEMENTS

Seiji Hashimoto, Kanagawa; Takao Kinoshita, Tokyo; Tsutomu Takayama, and Toshio Kaji, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 946,117, Dec. 23, 1986, abandoned, which is a continuation of Ser. No. 857,528, Apr. 23, 1986, abandoned, which is a continuation of Ser. No. 482,159, Apr. 15, 1983, abandoned. This application Oct. 17, 1988, Ser. No. 259,428

Claims priority, application Japan, Apr. 12, 1982, 57-60819; Apr. 12, 1982, 57-60820

Int. Cl.[5] H04N *9/077*

U.S. Cl. 358—44 19 Claims



1. An image pickup device comprising:
(a) image pickup means for converting an optical image into electrical image information, said image pickup means having a plurality of picture elements and including channel stop means for separating said picture elements; and
(b) a plurality of complementary color filters arranged on said image pickup means to transmit light of predetermined spectral characteristics to each of said picture elements, said plurality of complementary color filters overlapping on the channel stop means in widths wider than said channel stop means.

3. An image pickup device comprising:
(a) image pickup means for converting an optical image into electrical image information, said means having a plurality of picture elements; and
(b) a plurality of complementary color filters arranged on said image pickup means to transmit light to respective elements of said plurality of picture elements, adjacent filters of said plurality of complementary color filters fully overlapping on every boundary of respective elements of said plurality of picture elements.

8. A device comprising:
(a) a substrate; and
(b) a plurality of complementary color filters arranged on said substrate, at least one filter of said plurality of complementary color filters overlapping with two adjacent filters of said plurality of complementary color filters.

15. An image pickup device comprising:
(a) image pickup means for converting an optical image into electrical image information, said means having a plurality of picture elements including first and second picture elements; and
(b) color filter means at least consisting of a first part which is provided for the first picture element of said plurality of picture elements and is arranged to transmit a light of a first color, second parts which are provided for the second picture element and are arranged to transmit a light of the first color, and third parts which are provided also for the second picture element and are arranged to transmit a light of a second color differing from the first color, wherein said second and third parts are arranged for said second picture element in a prescribed repeating pattern.

4,922,335

COLOR FILM READING APPARATUS PROVIDING HIGH-GRADATION COLOR SIGNALS

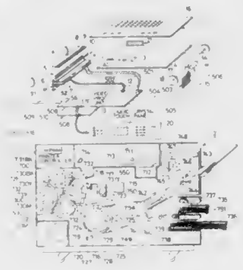
Kenichi Outa, Yokohama; Yasumichi Suzuki, and Yoshinori Ikeda, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 119,906, Nov. 12, 1987, abandoned. This application Sep. 12, 1989, Ser. No. 406,175

Claims priority, application Japan, Nov. 14, 1986, 61-271449

Int. Cl.[5] G03F *3/08*; H04N *1/40, 1/46*

U.S. Cl. 358—80 14 Claims



1. A film reading apparatus comprising:
setting means for setting a type of film to be read;
holding means for holding a film to be read therein;
illuminating means for projecting illumination light onto the film held by said holding means;
reading means for reading image data of the film illuminated by said illuminating means;
shading correcting means for performing shading correction of the image data read by said reading means on the basis of correction data; and
controlling means for setting the correction data used for the shading correction wherein, when the film to be read is a negative film, said controlling means sets the correction data on the basis of data obtained by reading an unexposed portion of a film corresponding to the negative film to be read, while in the case of a positive film, said controlling means sets the correction data on the basis of data obtained from the illumination light.

5. A film reading apparatus comprising:
setting means for setting a type of film to be read;
holding means for holding a film to be read;
illuminating means for projecting illumination light onto the film held by said holding means;
reading means for reading image data of the film illuminated by said illuminating means;
detecting means for detecting from the image data output by said reading means a lightness characteristic of the film read by said reading means; and
controlling means for causing a quantity of light projected by said illuminating means to vary in accordance with a detection output of said detecting means and the type of film set by said setting means.

9. A color film reading apparatus comprising:
illuminating means for projecting illumination light onto a color film;
photoelectric conversion means for converting the illumination light from the color film into an electrical signal; and
shading correction means for effecting shading correction of the electrical signal from said photoelectric conversion means on the basis of correction data,
wherein, in the case of a color negative film, the correction data is obtained by employing the illumination light projected onto an unexposed portion of a film corresponding to the color negative film, while, in the case of a color positive film, the correction data is obtained by directly employing the illumination light.

12. A film reading apparatus comprising:
holding means for holding a film to be read;
illuminating means for projecting illuminating light onto the film held by said holding means;
reading means for reading image data from the film illuminated by said illuminating means;
shading correction means for performing shading correction of the image data from said reading means on the basis of correction data; and
controlling means for setting the correction data used by said shading correction means, and controlling a quantity of light projected by said illuminating means,
wherein said controlling means sets the correction data on the basis of data read by said reading means in a state where the film is not held in said holding means, and controls the quantity of light on the basis of the image data read by said reading means in a state where the film is held in said holding means.

4,922,336

THREE DIMENSIONAL DISPLAY SYSTEM

Roger R. A. Morton, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 11, 1989, Ser. No. 405,253

Int. Cl.[5] H04N *13/04*

U.S. Cl. 358—88 32 Claims



1. A system for generating a three-dimensional display of an object to a viewer comprising:
a helical reflector adapted for rotation about its central axis;
an anamorphic lens coaxially aligned with and adapted for rotation in unison with said helical reflector;
a two-dimensional display arranged to project light therefrom through said anamorphic lens onto said helical reflector; and
a display generator means comprising:
means, responsive to a database of stored information which contains a three-dimensional description of an object, for determining each successive one in a series of incrementally spaced pre-defined helical sections taken through said object;
means, responsive to a current position of a viewer and to said database, for ascertaining those surfaces of the object which, if displayed, would be visible to the viewer;
means for determining a series of intersecting segments, wherein each segment in said series occurs as an intersection between a corresponding one of the helical sections and at least one of said visible surfaces of the object; and
means for successively and selectively projecting each intersecting segment in said series onto the two-dimensional display in response to a current position of said helical reflector, whereby as said helical reflector rotates the segments projected thereon sweep out a focused three-dimensional volume that depicts the object.

4,922,337

TIME DELAY AND INTEGRATION OF IMAGES USING A FRAME TRANSFER CCD SENSOR

Robert P. Hunt, Palo Alto, and David L. Gilblom, Los Altos, both of Calif., assignors to Picker International, Inc., Highland Hts, Ohio

Continuation-in-part of Ser. No. 186,446, Apr. 26, 1988. This application Sep. 26, 1988, Ser. No. 249,385

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—101 19 Claims



1. A method of quality control comprising the steps of:
(a) moving an object to be examined through an examination region;
(b) monitoring the movement of the object;
(c) illuminating the object as the object moves through the examination region;
(d) shifting lines of data values indicative of portions of the object along a sensor array in coordination with the monitored object movement;
(e) integrating the data values indicative of the same portion of the object as the lines of data values are shifted along the sensor array;
(f) reading the integrated data values from the sensor array to produce an image output representing a continuous view of the object; and,
(g) determining at least one characteristic of the object from the image output.

4,922,338

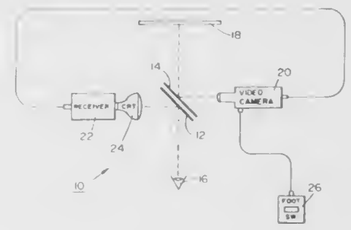
LINE-OF-SIGHT INSPECTION SYSTEM

Ronald G. Arpino, 25 Damien Rd., Branford, Conn. 06405

Filed Mar. 2, 1989, Ser. No. 317,751

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—106 9 Claims



1. An inspection system for inspection of an object by an inspector, comprising:

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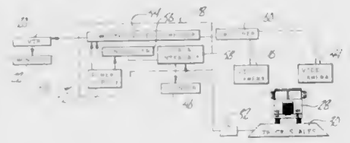
(a) display means disposed in the line of sight between said inspector and said object; and
(b) image processing means to selectively cause either:
(i) an unmagnified image of at least a portion of said object to be displayed on said display means, such that said image and said at least said portion of said object are correctly spacially oriented with respect to said line of sight; or
(ii) a magnified image of part of said at least a portion of said object to be displayed on said display means, such that said magnified image of part of said at least a portion of said object is corectly spacially oriented with respect to said line of sight.

4,922,339

MEANS AND METHOD FOR VISUAL SURVEILLANCE AND DOCUMENTATION

Glen R. Stout, Cedar Rapids, and Dennis Herrick, Toddville, both of Iowa, assignors to Stout Video Systems, Cedar Rapids, Iowa

Filed Mar. 31, 1988, Ser. No. 176,258
Int. Cl.[5] H04N *7/18, 5/04*
U.S. Cl. 358—108 **7 Claims**



1 A surveillance system for monitoring a remote external event comprising:
transducer means positionable at or near the remote external event for deriving information from the external event and converting the information into a remotely generated first signal representing the information;
camera means for visually recording at least a portion of the remote external event and converting the visual recording into a remotely generated second signal representing the visual recording;
first and second cable means for connecting the transducer means and camera means to a tamper-proof, unalterable combined signal producing means, the first and second cable means being of variable and not necessarily corresponding lengths;
the combined signal producing means including,
controller means for controlling operation of the tamper-proof and unalterable combined signal-producing means including input means for receiving the first signal from the transducer means, conversion means for converting the first signal from the transducer means into a format which is integratable with a format of the second signal, processing means for processing information in the first signal, directing transfer, recognition, and storage of information regarding the first signal, and software means for facilitating such operation, and memory means for storing information;
combiner means for combining the first and second signals to produce a composite third signal including the information and the visual recording regarding the external event, the combiner means including input means for receiving the second signal from the camera means and for receiving information from the controller means; and
a composite third video signal output means for facilitating output of the third signal to at least one of the set comprising a video signal display and a video signal recording means.

4,922,340

METHOD AND AN APPARATUS OF COMPRESSING INFORMATION CONTENT OF MULTILEVEL DIGITAL IMAGE DATA

Kiyoshi Iwai, Tokyo, Japan, assignor to Nippon Board Computer Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 293,884
Int. Cl.[5] H04N *1/41, 7/13*
U.S. Cl. 358—135 **1 Claim**



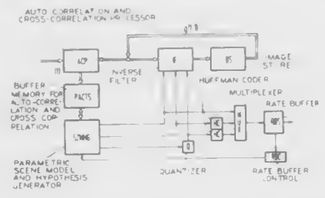
1. An apparatus of compressing multilevel image data having picture cells of multilevel gradation values, characterized by comprising;
means to determine difference values between gradation values of adjacent picture cells from the input multilevel gradation image data of a predetermined image component;
means to store said determined difference values sequentially;
means to count an occurrence number of individual difference values from said determined difference values in the image component;
means to arrange said difference values in order of the occurrence frequency and assign codes of smaller bit number as said difference values have higher occurrence frequency whereby codes corresponding to the difference values are prepared;
and means to convert said difference values into codes by sequentially reading out the difference values from said storage means.

4,922,341

METHOD FOR SCENE-MODEL-ASSISTED REDUCTION OF IMAGE DATA FOR DIGITAL TELEVISION SIGNALS

Peter Strobach, Roehrbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich

Filed Sep. 26, 1988, Ser. No. 249,371
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3733021
Int. Cl.[5] H04N *7/137*
U.S. Cl. 358—136 **2 Claims**



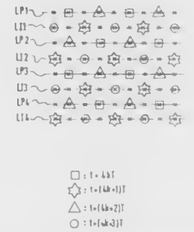
1. A method for scene-model-assisted reduction of image data for digital television signals, whereby a picture signal supplied at time t is to be coded, whereby a predecessor picture from a scene already coded at time t − 1 is present in an image store, and whereby the frame-to-frame information is composed of an amplification factor, a shift factor and an adaptively acquired quad-tree division structure, comprising the steps of, writing in the same manner upon initialization of the system, a uniformly prescribed gray scale value or picture half-tone expressed as a defined luminance value into the image store of a coder at a transmitter and into the image store of a decoder at a receiver, for all picture elements (pixels); and reading out of the coder and decoder the contents of the image store in blocks of variable size, and both the image store in the coder and the image storer in the decoder are each operated with feed back, amplifying the luminance with a factor greater than or less than 1 and writing it back into the image store and addressing it in a shifted manner, and organizing the blocks of variable size according to a known quad-tree data structure.

4,922,342

SYSTEM OF TRANSMITTING HIGH-DEFINITION TELEVISION PICTURES VIA A NARROW-PASSBAND CHANNEL

Frédéric L. J. Fonsalas, Grigny; Jeans-Yves L. Lejard, Paris; Pascal F. P. Hayet, Chatenay Malabry, and Marcel R. Le Queau, Ozoir la Ferriere, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1988, Ser. No. 173,687
Claims priority, application France, Mar. 24, 1987, 87 04070
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—138 **18 Claims**



1. A system for the transmission of high-definition television pictures via a narrow passband channel, the system comprising a transmission part formed by an arrangement for providing said pictures which are constituted by a plurality of picture samples distributed over even and odd lines, a filter member for filtering said samples, a sampling circuit for taking certain samples of said filter samples from the output of the filter member and a transmission circuit for transmitting said certain samples via the channel, said system further comprising at least one receiving part formed by a receiving circuit for receiving said certain samples, an interpolation member for recovering samples on the basis of said received certain samples and a first display circuit for converting the recovered and certain samples into a restored high-definition picture, characterized in that the sampling circuit comprises means for sampling sequences of at least first and second consecutive and colinear samples on lines of equal parity to obtain said first samples during first field periods, said second samples during second field periods, said first and said second samples forming said certain samples.

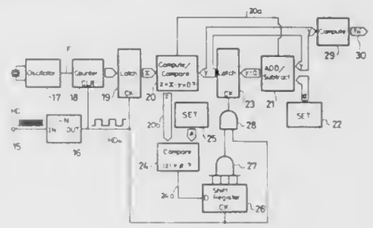
4,922,343

APPARATUS FOR DETECTING FREQUENCY OF INPUT SIGNAL WITH A DIGITAL SCANNING G-CONVERTER

Naotaka Ando, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 24, 1989, Ser. No. 314,877
Claims priority, application Japan, Mar. 14, 1988, 63-059974
Int. Cl.[5] H04N *5/04*
U.S. Cl. 358—148 **7 Claims**

1. A frequency detector comprising:
means for producing a cyclical reference clock signal;
means for receiving an input signal having a frequency to be measured;
a counter for counting cycles of said reference clock signal repetitively during successive intervals of time derived from said input signal;
means for establishing a setting cycle; and
a computing circuit connected to said counter and to said means for establishing a setting cycle for adding or subtracting a first constant to or from said setting cycle in response to a difference between a count value of said counter and said setting cycle;
wherein, when said difference between said count value of said counter and said setting cycle exceeds a second constant during a predetermined number of said successive intervals, said setting cycle is adjusted by an output from said computing circuit and an approximate value of a cycle of said input signal is computed, thereby detecting the approximate frequency of said input signal.

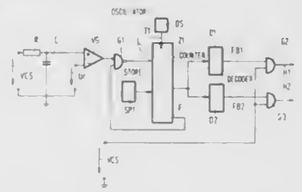


4,922,344

CIRCUIT ARRANGEMENT FOR EVALUATING A VIDEO SYNCHRONIZING SIGNAL

Maximilian Riegel, Nuremberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1989, Ser. No. 316,391
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809676
Int. Cl.[5] H04N *5/04*
U.S. Cl. 358—152 **3 Claims**



1. A circuit arrangement for evaluating a video synchronizing signal formed by line synchronizing pulses whose regular sequence is interrupted between two fields by a field synchronizing pulse and in which the time interval between the edges of a field synchronizing pulse and the edges of the subsequent line synchronizing pulse is characteristic of each field, characterized by
1.1 a detector for detecting the field synchronizing pulse in the video synchronizing signal,
1.2 a first logic circuit which is connected to the output of the detector for controlling the operation of a counter clocked by an oscillator,
1.3 two decoders (D1, D2) connected to the counting stages of the counter for supplying a output pulse, as long as the counter position cycles through a counting range which is predetermined for each decoder,

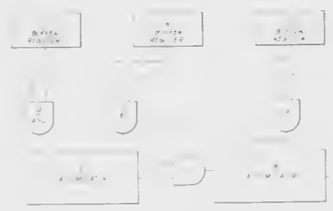
1.4 a second logic circuit connected to the decoders, to which also the video synchronizing signal is applied and from whose output variables it can be recognized whether one of the two decoders and which one of the two decoders has supplied an output pulse during a pulse in the video synchronizing signal.

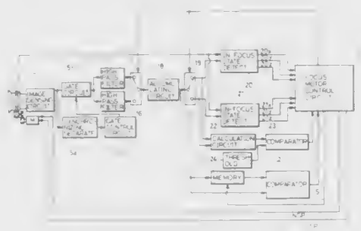
4,922,345

PROCESSING OF VIDEO IMAGE SIGNALS

Nicholas Barton, Wokingham; Robert Billing, Crowthorne, and Hugh K. Littlejohn, Barkham, all of Great Britain, assignors to Hugh Kendal Littlejohn Questech Limited, Wokingham, England

Filed Jan. 26, 1988, Ser. No. 148,611
Int. Cl.[5] H04N *5/265, 5/275*
U.S. Cl. 358—183 **12 Claims**





1 An edge signal generating circuit for use in generating a control signal which varies in timed relation to synchronising signals defining a raster of a digital video image to define a rectilinear edge to appear within an image frame, comprising means for storing values corresponding to the perpendicular distance between a point, not necessarily within the image frame, on a corresponding rectilinear line and the origin of the video raster, horizontal rate of change of said distance and vertical rate of change of said distance, respectively, a first accumulator associated with means for loading said first accumulator with said perpendicular distance value in response to field synchronising pulses and means for incrementing said first accumulator by said vertical rate of change value in response to line synchronising pulses, and a second accumulator associated with means for loading said second accumulator with a signal at the output of the first accumulator in response to line synchronising signals and means for incrementing said second accumulator by said horizontal rate of change value in response to pulses at the pixel repetition rate for generating said control signal.

4,922,346

AUTOMATIC FOCUSING APPARATUS HAVING A VARIABLE FOCUSING SPEED AND PARTICULARLY SUITED FOR USE WITH INTERLACED SCANNING

Masaru Hidaka, Nara; Hirotsugu Murashima, Yamatotakada; Masao Takuma, Toyonaka; Toshinobu Haruki, Shijonawate, and Kenichi Kikuchi, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Jun. 24, 1988, Ser. No. 211,434
Claims priority, application Japan, Jun. 30, 1987, 62-164382; Apr. 20, 1988, 63-97312
Int. Cl.[5] H04N *5/232*
U.S. Cl. 358—227 **22 Claims**

1. An automatic focusing apparatus for automatically matching the focus relative to an object in response to a video signal obtained from image sensing means having a focusing lens (1) and an image sensor, comprising:

relative position changing means (2,3) for changing the relative position in the direction of an optical axis of said focusing lens relative to said image sensor,

first focus evaluating value detecting means (5a', 5b', 5c', 15, 17, 18) for detecting every constant time period a level of a first high frequency component of the video signal obtained from said image sensing means and converting the level into a first focus evaluating value which changes in response to the change of the relative position of said focusing lens,

second focus evaluating value detecting means (5a', 5b', 5c', 16, 17, 18) for detecting every constant time period a level of a second high frequency component including said first high frequency component and a component at a level which is lower than the level of said first high frequency component of the video signal obtained from said image sensing means and converting the level into a second focus evaluating value which changes at a lesser rate than said first focus evaluating value in response to the change of the relative position of said focusing lens,

both said first and second focus evaluating values being respective focus evaluating values which reach corresponding maximum values in an in-focus position,

control means (6, 7, 8, 9, 10, 13, 14, 20, 21) for controlling said relative position changing means such that the relative position of said focusing lens is driven to the in-focus position,

means (22) for calculating a relative ratio of said first focus evaluating value to said second focus evaluating value,

means (23, 24) for comparing said relative ratio with a predetermined value,

means (10) responsive to an output of said comparing means for setting the speed of movement of the relative position of the focusing lens.

4,922,347

APPARATUS FOR RECORDING DISPLAYED VIDEO DATA

Louis V. Galetto, and Charles O. Ross, both of Endicott, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

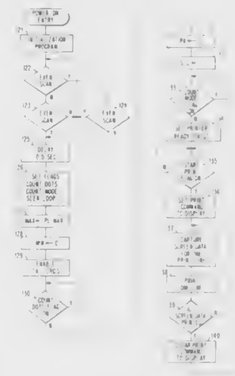
Filed Jun. 9, 1981, Ser. No. 271,911
Int. Cl.[5] H04N *1/21*
U.S. Cl. 358—296 **18 Claims**

1. Apparatus for recording on a record member a selected frame of video data appearing on a display device as a plurality of repetitively regenerated scan lines of data bit positions comprising:

a plurality of recording elements moveable relative to said record member, each being selectively energizable according to data bit information supplied thereto for producing corresponding marks on said record member during a recording pass;

means connected to said display device for storing the bit information of those bit positions within a predetermined portion of each of said scan lines from said frame of video data; and

readout means for supplying bit information from said storing means and a selected bit position in each said predetermined portion to a corresponding one of said recording elements during a said recording pass thereof.

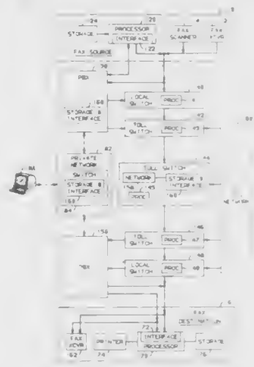


4,922,348

FACSIMILE SERVICE

Alexander C. Gillon, Bedminster; Adam V. Reed, Morganville, and John M. Scanlon, Mendham, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,586
Int. Cl.[5] H04N *1/32, 1/21*
U.S. Cl. 358—407 **25 Claims**



1. In a switched communications network connectable to a plurality of facsimile sources and facsimile destinations, the network comprising storage, a method of transmitting facsimile image signals, comprising the steps of:

in response to receiving, from a facsimile source, an identification of a facsimile destination, establishing a connection from said source to said storage;

responsive to establishing said connection, transmitting the image signals over the connection from the facsimile source to the storage; and

transmitting the image signals over the network from the storage to the identified destination.

2. In a switched communications network connectable to a plurality of facsimile sources and facsimile destinations, the network comprising storage, a method of transmitting facsimile image signals, comprising the steps of:

in response to receiving from a communication source an identification of a communication destination, determining that the communication source is a source of facsimile image signals;

in response to said determining, establishing a connection in the switched communications network from said source to said storage;

responsive to establishing said connection, transmitting the image signals over the connection from the facsimile source to the storage; and

transmitting the image signals over the network from the storage to the identified destination.

15. A communications network comprising:

a first switch, comprising means for storing facsimile signals, for receiving and transmitting facsimile signals;

a second switch for connection to a source of facsimile signals;

the second switch controlled by a program for transmitting a destination indication and facsimile signals received from said source to said first switch in response to determining that the source is a source of facsimile signals and to receiving signaling information from the source representing said destination indication;

the first switch storing the facsimile signals for subsequent transmission to a third switch connected to a destination for the facsimile signals, said destination specified by said destination indication.

19. In a public switched communications network connectable to a plurality of facsimile sources and facsimile destinations, the network comprising storage, a method of transmitting facsimile image signals comprising the steps of:

dialing a number for identifying a facsimile destination, from a facsimile source into the network;

determining that the source is a source of facsimile image signals;

establishing a connection from the facsimile source to the storage;

transmitting the image signals from the facsimile source to the storage;

transmitting a number representing the destination to the storage;

transmitting a number representing the source of the facsimile image signal to the storage;

transmitting a first message to a switch connected to the destination, the message comprising a facsimile message received indication;

responsive to reception of a second message from the switch connected to the destination, deferring transmission of the image signals from storage;

responsive to reception of a third message from the switch connected to the destination, transmitting the image signals from storage to the facsimile destination; and

transmitting a fourth message from the storage to the source, identified by the number representing the source, the fourth message comprising data confirming the transmitting to the destination.

22. A method of transmitting a facsimile message over a communication network comprising the step of:

responsive to receipt of an identification of a facsimile destination from a facsimile communication path, establishing a connection over said network from said path to said storage system for storage of said message.

4,922,349

DATA COMMUNICATION APPARATUS

Shintaro Abe, Fuzisawa, and Kaoru Nakamura, Hachiouzi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00310, § 371 Date Jan. 13, 1988, § 102(e) Date Jan. 13, 1988, PCT Pub. No. WO87/07107, PCT Pub. Date Nov. 19, 1987

PCT Filed May 16, 1987, Ser. No. 150,659

Claims priority, application Japan, May 16, 1986, 61-112063; Nov. 1, 1986, 61-261128

Int. Cl.[5] H04N *1/40, 1/46*

U.S. Cl. 358—443 27 Claims



1. A data communication apparatus comprising:

generating means for generating data comprising, in at least one page, character code data and plural kinds of image data;

dividing means for dividing said plural kinds of image data and said character code data as respective different block areas and for further dividing the block area corresponding to said image data into plural block areas in accordance with characteristics of the image data; and

communication means for communicating data of the block areas divided by said dividing means.

4,922,350

DOCUMENT RECOGNITION WITH FORWARD DIRECTION SCAN FOR DETECTING THE BOUNDARIES OF AN ORIGINAL DOCUMENT AND REVERSE DIRECTION SCAN FOR PRODUCING RECORDED IMAGE ON THE ORIGINAL DOCUMENT

Gregory Rombola, Churchville; Frank L. Muster, Fairport, and Lawrence B. Telle, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,065

Int. Cl.[5] H04N *1/12, 1/17*

U.S. Cl. 358—488 5 Claims

1. Scanning apparatus comprising:

means for optically scanning a platen in forward and reverse intrack directions, and for creating an electrical information signal characteristic of the optical densities scanned;

document recognition means responsive to the electrical information signal produced during the forward direction scan for detecting the boundaries or an original document on the platen; and

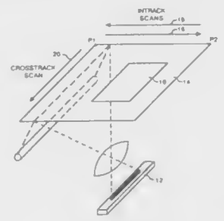


image capture means responsive to the electrical information signal produced during the reverse direction scan for producing a record of the image on the original document.

4,922,351

OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS

Kenichi Suzuki, Yokohama; Satoshi Shikichi; Fumiaki Kawaguchi, both of Tokyo; Masayuki Usui, Yokohama; Hiroshi Matsuoka, Kawasaki; Kazuhiko Matsuoka; Hideki Hosoya, both of Yokohama; Akio Aoki, Tokyo; Masahiko Enari, and Kazuo Minoura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 139,139, Dec. 23, 1987, abandoned, which is a continuation of Ser. No. 814,774, Dec. 30, 1985, abandoned. This applicatioo Jun. 28, 1988, Ser. No. 213,516

Claims priority, application Japan, Dec. 31, 1984, 59-28144; Jan. 17, 1985, 60-006282

Int. Cl.[5] H04M *1/04*

U.S. Cl. 358—494 29 Claims



1. An optical information recording apparatus comprising:

an optical head for recording information on a card-shaped optical recording medium, said head including an object lens for converging a light beam onto the recording medium, means for controlling the amount of irradiation on the recording medium in accordance with the information to be written and focusing means for controlling the objective lens so as to keep a distance between the recording medium and the objective lens constant;

first means for reciprocally moving the optical head relatively to the recording medium;

second means for moving the optical head relative to the recording medium transversely to a direction of the relative movement by said first means; and

control means for controlling a relative speed of the relative movement between the recording medium and the optical head by said first means, said control means keeping the relative speed constant in a record area of the recording medium in which the information is to be recorded and changing the relative speed, outside of the record area, to reverse the direction of the relative movement between the recording medium and the optical read by said first means outside of the record area.

4,922,352

BLOCK PATTERN DETECTION CIRCUITRY

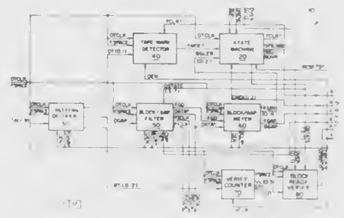
Bradfred W. Culp, Greeley, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 933,704, Nov. 21, 1976, Pat. No. 4,758,906. This application May 9, 1988, Ser. No. 192,066

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—39 1 Claim



1. Block pattern detection circuitry comprising:

a pattern detector for providing a pattern detection signal, said pattern detection signal nominally discriminating between data pattern types including at least a first pattern type and a second pattern type;

a thresholding means for providing qualified and unqualified pattern determination signals is response to thresholds attained as predetermined statistical functions over time of a received pattern detection signal, said thresholding means including input means for receiving pattern detection signals provided by said pattern detector, said thresholding means including means for receiving a qualifying input, and

a state machine for providing a qualifying input to said thresholding means, said state machine being arranged to receive plural control input signals including a signal which is derived according to a predetermined function from said unqualified pattern determination signals from said thresholding means, said state machine being designed to progress through a network of states as a function of previous state and received control signals, said qualifying signal being a function of the state of said state machine so that the response of said qualified pattern determination signal to thresholds attained by said thresholding means can be qualified as a function of the state of said state machine.

4,922,353

APPARATUS FOR LOADING A TAPE CARTRIDGE FOR A MAGNETIC INSTRUMENT

Yoshihisa Inoue, Hannou, Japan, assignor to Nakamichi Corporation, Kodaira, Japan

Filed May 25, 1988, Ser. No. 198,932

Claims priority, application Japan, May 27, 1987, 62-80125[U]

Int. Cl.[5] G11B *15/00*

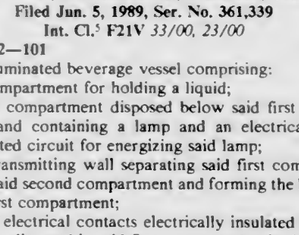
U.S. Cl. 360—96.5 4 Claims

1. An apparatus for loading a tape cartridge for a magnetic instrument in which a holder containing said tape cartridge is moved between a cartridge operative position and a cartridge loading/unloading position, said apparatus comprising:

means to detect an insertion of said tape cartridge into said holder;

means to manually move said holder from said cartridge loading/unloading position to said cartridge operative position;

means to lock said holder in said cartridge operative position;



and means to control said means to lock said holder in response to said means to detect an insertion of said tape cartridge whereby said holder is locked only when said tape cartridge is loaded into said holder.

4,922,354

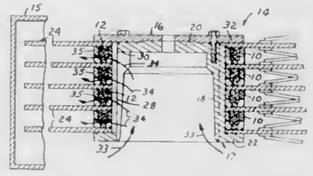
DISK DRIVE AIR FILTER

William J. Edwards, 1404 N. McMillan, Oklahoma City, Okla. 73127

Continuation-in-part of Ser. No. 112,198, Oct. 26, 1987, Pat. No. 4,819,105. This application Nov. 16, 1987, Ser. No. 121,695

Int. Cl.[5] G11B *5/012*

U.S. Cl. 360—97.03 11 Claims



1. In a data access and storage hard disk drive having a pair of disks surrounding and angularly rotated by a central hub and having an annular disk spacer surrounding the hub and interposed between said pair of disks, said spacer having an annular recess and transverse apertures communicating with the recess, the improvement comprising:

an annular ring of air filter media disposed in the recess.

4,922,355

ILLUMINATED BEVERAGE VESSEL

M. David Dietz, 9 Dogwood La., Westport, Conn. 06880, and Nathaniel Silver, 55 Glendale Rd., Glenbrook, Conn. 06906

Filed Jun. 5, 1989, Ser. No. 361,339

Int. Cl.[5] F21V *33/00, 23/00*

U.S. Cl. 362—101 6 Claims

1. An illuminated beverage vessel comprising:

a first compartment for holding a liquid;

a second compartment disposed below said first compartment and containing a lamp and an electrical battery generated circuit for energizing said lamp;

a light transmitting wall separating said first compartment from said second compartment and forming the bottom of said first compartment;

a pair of electrical contacts electrically insulated from one another disposed in said first compartment for being contacted by liquid disposed in said first compartment, and

further contact means disposed for coupling said pair of electrical contacts to said electrical circuit for causing said electrical circuit to energize said lamp for transmitting

light through said wall into said first compartment responsive to liquid in said first compartment bridging the insulation between said pair of contacts and thereby lowering the electrical impedance between said contacts.

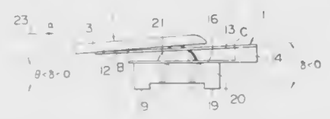


4,922,356

TRANSDUCER SUPPORTING APPARATUS AND DISK STORAGE UNIT

Yuzo Yamaguchi, Tsuchiura; Yoshinori Takeuchi, Ibaraki; Yokuo Saitoh, Kanagawa; Hiroshi Daito; Hiroyasu Nakajima, both of Odawara; Yoshiakira Karakama, Hadano; Yukimori Umakoshi; Kazunori Hori, both of Odawara, and Mikio Tokuyama, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1987, Ser. No. 8,259
Claims priority, application Japan, Jan. 29, 1986, 61-15681
Int. Cl.[5] G11B *5/48*
U.S. Cl. 360—104 16 Claims



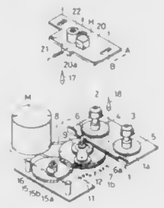
1. A transducer supporting apparatus comprising a rigid arm portion which is connected to an access mechanism; a substantially rigid structural support which is provided on said rigid arm portion and comprises an elastic portion adjacent to said rigid arm portion and a load beam portion extending from said elastic portion and serving to apply a load force proximate to a free end thereof; a flexible structural support provided proximate to said free end of said substantially rigid structural support, said flexible structural support comprising two flexible fingers attached at one end portion thereof to said substantially rigid structural support and extending in a direction along the length of said substantially rigid structural support so as to terminate in free ends, a frame member connecting said two flexible fingers at the free ends thereof, and a mounting tongue portion having a surface connected to and extending from said frame member in one of a direction toward and away from said rigid arm portion at a position spaced below a plane in which said two flexible fingers lie and terminating in a free end, said flexible structural support being configured so that the one end portion of said flexible fingers is closer to a plane formed by said surface of said mounting tongue portion than the free ends of said flexible fingers proximate to said frame member; and a load transmitting projection interposed between said substantially rigid structural support and said mounting tongue portion of said flexible structural support and which serves to transmit a load force to said mounting tongue portion from said free end of said substantially rigid structural support.

4,922,357

MECHANISM FOR DRIVING THE REELS OF A TAPE PLAYER

Norimasa Komatsu, and Asashi Miyazaki, both of Kakuda, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,888
Claims priority, application Japan, Nov. 19, 1987, 62-293821; Feb. 8, 1988, 63-28354
Int. Cl.[5] G11B *5/54*
U.S. Cl. 360—105 5 Claims



1. A tape player comprising
a capstan rotatably driven by a motor and a driving gear rotated integrally with the capstan,
a planetary gear circulating around the driving gear in response to the rotating direction of the driving gear always in engagement with the driving gear,
a pair of reel gears, one of the reel gears disposed at a position to be engaged with the planetary gear circulated in one direction of the driving gear, the other of the reel gears disposed at a position to be engaged with the planetary gear circulated in the reverse rotation of the driving gear and a pair of reel spools rotated by the reel gears,
a mode switching gear disposed to be engaged with the planetary gear on a circulating trace moving from a position where the planetary gear is engaged with one of the reel gears to a position where the planetary gear is engaged with the other of the reel gears and partly formed with teeth to be rotated at a predetermined angle by the planetary gear,
a switching cm rotated together with the mode switching gear, and
a head base pressed by said switching cam while the mode switching gear is rotated by the planetary gear to be moved toward the reel spool and having a pinch roller opposed to the capstan and having
a magnetic head.

4,922,358

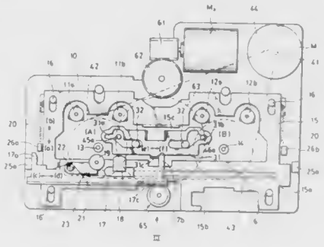
DOUBLE-CASSETTE TAPE PLAYER

Norimasa Komatsu, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Tnkyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,397
Claims priority, application Japan, Oct. 26, 1987, 62-271255; Oct. 26, 1987, 62-271256
Int. Cl.[5] G11B *15/68, 5/54*
U.S. Cl. 360—105 2 Claims

1. In a double-cassette tape player including first and second cassette receiving areas each having reel bases and a capstan and both loaded with cassettes thereon in alignment so as to face their tape-exposed portions in the same direction; a slide member extending to the full length between both said cassette receiving areas; a head base supporting a magnetic head thereon and provided on said slide member for alternative reciprocal movement to positions opposed to said tape-exposed portions of said cassettes; and a changed gear driven by a motor in forward and reverse directions to transmit its rotating power to a rack of said head base via a slip mechanism, said change gear having a cam which urges said slide member toward one of said cassette receiving areas after said head base moves to one of said positions opposed to said tape-exposed portions of said cassettes, an improvement further including a mode detection apparatus consisting of a detection pattern provided on said change gear and a pair of detectors opposed to said detection pattern, said detection pattern having a configuration satisfying the following conditions (a) through (c):

(a) detected points detected by said detectors being common in whichever direction toward said first cassette receiving area or toward said second cassette receiving area said head base is moving when said slide member is lifted up toward said cassette receiving areas by said cam of said change gear,



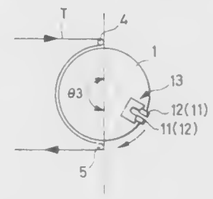
(b) a detection level changing point upon a forward rotation of said change gear and a detection level changing point upon a reverse rotation of said change gear being located at identical angular positions with respect to said common detection point in (a) above, and (c) combinations of detection point in (a) above, and (c) combinations of detection level changes of said detectors being different between those upon a forward rotation of said change gear and those upon a reverse direction of said change gear as far as said detection level changing points of (b) above are concerned.

4,922,359

ROTARY HEAD TYPE DIGITAL AUDIO TAPE RECORDER

Tokuo Nakamura, Niigata, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 206,453
Claims priority, application Japan, Aug. 27, 1987, 62-213895
Int. Cl.[5] G11B *5/52, 21/18*
U.S. Cl. 360—107 3 Claims



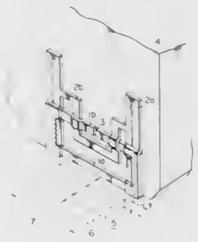
1. In a rotary digital audio tape recorder where a pair of recording/reproducing heads are disposed on a rotary cylinder of a predetermined diameter driven at a predetermined rotation rate, and a magnetic tape is kept in contact with the peripheral surface of said rotary cylinder through a predetermined lap angle, so that a recording or reproducing operation is performed on said magnetic tape with the rotation of said cylinder and the relative motion of said magnetic tape;
wherein the improvement comprises said pair of recording-/reproducing heads being disposed in a proximity of less than 90° to each other on said rotary cylinder, and the rotation rate of said cylinder and the lap angle of said magnetic tape thereto are so selectively set as to retain the inter-changeability with any magnetic tape recorded or reproduced by a rotary cylinder equipped with a pair of recording/reproducing heads disposed opposite to each other at an angular interval of 180°; and
wherein no other recording/reproducing heads are disposed on the rotary cylinder.

4,922,360

MAGNETIC HEAD

Hisashi Takano, Hachioji; Naoki Koyama, Kokubunji; Isamu Yuito, Hachioji; Kazuo Shiiki, Kanagawa, and Hideo Tanabe, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 249,306
Claims priority, application Japan, Sep. 24, 1987, 62-237135
Int. Cl.[5] G11B *5/39*
U.S. Cl. 360—113 5 Claims



1. A magnetic head comprising:
a magnetoresistance element having the form of a loop, a gap being formed in a first portion of the magnetoresistance element opposite to a second portion confronting a magnetic recording medium;
a coil conductor formed around the first portion of the magnetoresistance element for applying a bias magnetic field to the second portion of the magnetoresistance element in the direction of width of a track on the magnetic recording medium; and
a lead conductor for causing a current to flow through the second portion of the magnetoresistance element, the current being used for detecting a signal recorded in the magnetic recording medium, the lead conductor and the coil conductor being united in one body so that a part of a current supplied to the lead conductor flows through the coil conductor.

4,922,361

PRESSURE PAD, PARTICULARLY FOR MAGNETIC TAPES

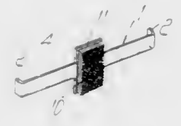
Abramo Bordignon, Via Palmiro Togliatti, 32, 20030 Senago (Milano), Italy

Filed May 16, 1988, Ser. No. 194,601
Claims priority, application Italy, Jun. 1, 1987, 20742 A/87
Int. Cl.[5] G11B *15/60;* B65H *23/04, 27/00*
U.S. Cl. 360—130.31 3 Claims

1. In combination, a pressure pad particularly for magnetic tapes, and a magnetic tape, said pressure pad comprising;
a support body locatable proximate to said magnetic tape,
at least one portion defined on said support body and being elastically pressed towards said magnetic tape by said support body,
a plurality of monofilaments,
at least one end defined by each monofilament in said plural-

ity of monofilaments and being fixed to said one portion of said support body,

at least one other end defined by each monofilament in said plurality of monofilaments and being in contact engagement said magnetic tape,



wherein said monofilaments have a diameter comprised between 15 microns and 32 microns, a length comprised between 0.6 mm and 1.6 mm and a monofilament density comprised between 400 and 100 monofilaments per mm^2.

4,922,362

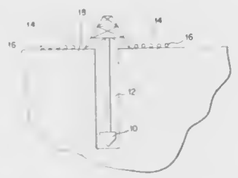
METHODS FOR DECONVOLUTION OF UNKNOWN SOURCE SIGNATURES FROM UNKNOWN WAVEFORM DATA

Douglas Miller, Newtown, and Jakob Haldorsen, Ridgefield, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 164,080, Mar. 4, 1988, abandoned. This application Jun. 1, 1989, Ser. No. 360,185

Int. Cl.[5] **G01V** *1/36*

U.S. Cl. 367—46 **21 Claims**



1. In a process for obtaining a vertical seismic profile from seismic data obtained from a source located in a borehole and a plurality of receivers located above the source, the source having an unknown, time-extended signature, a method of estimating said source signature, said method comprising the steps of:

activating the source so as to produce said source signature;

receiving, at the plurality of receivers, seismic waveforms generated as a result of said source signature;

calculating a dominating moveout of said received seismic waveforms based on local coherency analysis;

calculating a time-shift value for each received waveform based on said calculated moveout;

applying said time-shift values to said received waveforms, thereby aligning a dominating copy of said source signature; and

stacking said time-shifted waveforms, thereby producing an estimation of said source signature.

4,922,363

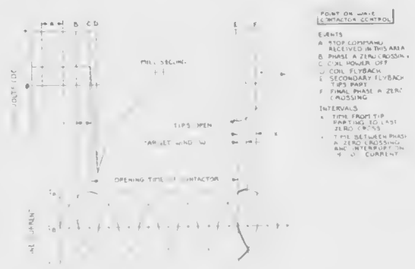
CONTACTOR CONTROL SYSTEM

Edward A. Long, Durham, and James W. Hamilton, Jr., Mebane, both of N.C., assignors to General Electric Company, Plainville, Conn.

Continuation of Ser. No. 788,361, Oct. 17, 1985, abandoned. This application Apr. 18, 1988, Ser. No. 182,904

Int. Cl.[5] **H02H** *3/033*

U.S. Cl. 361—3 **14 Claims**



1. A control system used with an electromagnetic contactor having contact tips connected intermediate a source of alternating current and a load, the contact tips opening in response to removal of electrical power from an actuating coil of the contactor, the system comprising:

(a) regulating means for supplying electrical power to the actuating coil, said regulating means including means for interrupting power to the coil;

(b) means for monitoring the wave form of the alternating current for providing a signal indicative of each zero crossing;

(c) control means for receiving a contactor open command and for interrupting power to the coil, said control means being responsive to a contactor open command and to a first subsequently occurring zero crossing signal for interrupting the coil power a predetermined non-zero time interval prior to a second subsequently occurring zero crossing signal, said predetermined non-zero time interval being automatically adjusted such that the contact tips open a selected non-zero time interval before another predetermined subsequently occurring zero crossing signal and after a zero crossing signal immediately preceding said another subsequently occurring zero crossing signal.

4,922,364

SERIES CAPACITOR EQUIPMENT

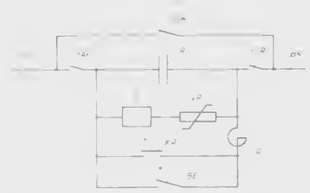
Lars Paulsson, Västerås, Sweden, assignor to Asea Brown Boveri AB, Västerås, Sweden

Filed Feb. 6, 1989, Ser. No. 306,173

Claims priority, application Japan, Feb. 15, 1988, 8800497

Int. Cl.[4] **H02H** *7/16*

U.S. Cl. 361—16 **19 Claims**



1. Series capacitor equipment for distribution networks with a capacitor bank for connection into a power line, comprising: a voltage-dependent resistor, a connected in parallel with

the capacitor bank, for protection of the capacitor bank against overvoltages;

first and second bypass means for bypassing the capacitor and the resistor during an overcurrent through the equipment, said first bypass means including a high-speed circuit-closer connected in parallel with said voltage-dependent resistor for bypassing said resistor;

said second bypass means including a switch, connected in parallel with said high-speed circuit-closer; and

tripping members for controlling the closing of said high-speed circuit-closer and of said switch at an overcurrent in the power line, and said high-speed circuit-closer being a mechanical switching device.

4,922,365

OVERVOLTAGE SUPPRESSING CIRCUIT FOR SEMICONDUCTOR DEVICE

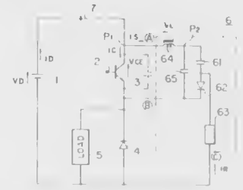
Haruyoshi Mori, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,420

Claims priority, application Japan, Apr. 15, 1988, 63-93872

Int. Cl.[5] **H02H** *7/10*

U.S. Cl. 361—18 **13 Claims**



1. A circuit for suppressing an overvoltage of a semiconductor device connected between the poles of a DC power source and adapted to effect a switching operation, said circuit comprising:

a serial circuit connected in parallel with a semiconductor device and including an overvoltage suppressing capacitor, an oscillation suppressing diode, and an impedance regulating means connected in series with each other, said oscillation suppressing diode being turned off due to the switching operation of said semiconductor device, said impedance regulating means being operable to change into a state of high impedance for suppressing a reverse current flowing into said oscillation suppressing diode when said oscillation suppressing diode is turned off; and

discharging means connected between a DC power source and said overvoltage suppressing capacitor for discharging to said DC power source a charge accumulated in said overvoltage suppressing capacitor when said oscillation suppressing diode is off.

4,922,366

MELTABLE CONDUCTOR TO BE USED IN SERIES WITH VOLTAGE SUPPRESSORS

Robert C. Van Dick, Aloha, Oreg., assignor to Transnational Energy Systems, Inc., dba TESCO, Wilsonville, Oreg.

Filed May 12, 1988, Ser. No. 193,040

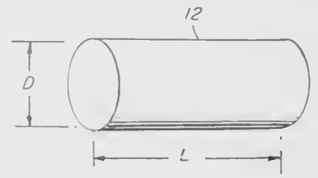
Int. Cl.[5] **H02H** *3/20*

U.S. Cl. 361—56 **17 Claims**

1. A circuit device to be used with an AC power line having a steady state line voltage comprising:

a voltage surge suppressor; and

a wire link in series with said voltage surge suppressor for detecting a short circuit condition resulting from breakdown of said voltage surge suppressor, said wire link having a length not greater than two inches, having a resistance between 0.8 milliohms and 14 milliohms, dose not substantially reduce the life-span of said voltage surge suppressor, and can also withstand repeated transient surge conditions, two times momentary line overvoltage condition lasting one full cycle and will also melt when



subjected to said steady state line voltages applied for greater than a predetermined time.

4,922,367

CIRCUIT FOR PREVENTING LATCH-UP OF PARASITIC THYRISTOR FORMED IN CMOS INTEGRATED CIRCUIT

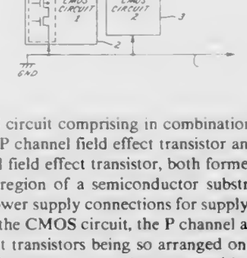
Hideto Hidaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 9, 1988, Ser. No. 165,802

Claims priority, application Japan, Jul. 21, 1987, 62-182697

Int. Cl.[5] **H02H** *9/02*

U.S. Cl. 361—58 **13 Claims**



1. A CMOS circuit comprising in combination:

at least one P channel field effect transistor and at least one N channel field effect transistor, both formed on a predetermined region of a semiconductor substrate; first and second power supply connections for supplying operating power to the CMOS circuit, the P channel and N channel field effect transistors being so arranged on the semiconductor substrate as to produce a parasitic thyristor between said power supply connections, said parasitic thyristor having a holding current level above which said thyristor is maintained in the latched-up condition after being turned on and below which said thyristor is off, and protection means for preventing the latch-up of said parasitic thyristor in said CMOS circuit,

said protection means comprising variable resistance conductor means interposed in series with said power supply connections for passing current to the CMOS circuit and having a critical current level above which the variable resistance conductor means exhibits a sharply increased resistance,

the variable resistance conductor means being so constructed and arranged as to establish the critical current level above the current level normally drawn by the CMOS circuit but below said holding current level thereby to provide power for operation of said CMOS circuit but to prevent latch-up of the parasitic thyristor, the sharply increased resistance characteristic of the variable resistance conductor means responding with sufficient speed to the triggering of the parasitic thyristor as to

reach said sharply increased resistance to prevent parasitic thyristor latch-up.

4,922,368
METHOD AND APPARATUS FOR DETECTING AND DISCRIMINATING FAULTS IN TRANSMISSION CIRCUITS
Allan T. Johns, Swindon, England, assignor to National Research Development Corporation, London, England
Filed Nov. 23, 1988, Ser. No. 275,723
Claims priority, application United Kingdom, Nov. 24, 1987, 8727490
Int. Cl.[5] H01H 3/00
U.S. Cl. 361—62 41 Claims



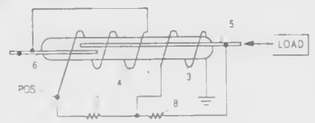
27. Apparatus for detecting and discriminating faults in a transmission circuit, said apparatus comprising first detector means coupled to said transmission circuit to detect the existence of signals in the circuit having a frequency within a predetermined frequency range, second detector means associated with said transmission circuit and arranged to generate locative signals in response to the occurrence of faults, and discriminating means coupled to said first and second detector means, said discriminating means being arranged to output a fault signal only when said discriminating means receives one or more selected locative signals within a time period in which the existence of signals within said predetermined frequency range is detected.

4,922,369
CIRCUIT PROTECTOR
Michael J. Sakatos, Union, N.J., assignor to Inresco, Inc., Manasquan, N.J.
Continuation-in-part of Ser. No. 878,358, Jun. 25, 1986, Pat. No. 4,811,153. This application Mar. 6, 1989, Ser. No. 319,751
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[5] H02H 3/20; H01H 1/66
U.S. Cl. 361—88 16 Claims



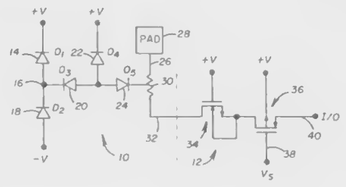
1. A magnetically operated circuit protector having trip and reset action comprising: at least two electromagnetic coil windings for generating aiding magnetic fields; at least two magnetizable elements each of which has a contacting portion thereon; means for supporting said elements so that the contact portions overlap; means including one of said coil windings for inducing lines of flux through said elements to cause said elements to initiate a switching function; means including another of said coil windings to complete said switching function causing said elements to assume a switched state and to release said elements from the switched state; said switching being induced on the occurrence of a predetermined condition.

4,922,370
AUTOMATICALLY RESETTING CIRCUIT PROTECTOR
James P. Mulshine, Pt. Pleasant, and Michael J. Sakatos, Union, both of N.J., assignors to Inresco, Inc., Manasquan, N.J.
Continuation-in-part of Ser. No. 878,358, Jun. 25, 1986, Pat. No. 4,811,153. This application Mar. 6, 1989, Ser. No. 320,279
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[5] H02H 3/20; H01H 1/66
U.S. Cl. 361—88 7 Claims



1. A automatically resetting circuit protector comprising:
a first terminal for connecting said protector to a power source; a second terminal for connecting said protector to a load; magnetic switching means having two moveable elements; a primary electromagnetic coil winding connected in series with one of said moveable elements and said first terminal; a secondary electromagnetic coil winding connected to said load and to said second terminal; a first resistance connected between said first terminal and said secondary coil; a second resistance connected between said second terminal and said secondary coil; said secondary electromagnetic coil causing said moveable elements to close as a function of the voltage level to said load.

4,922,371
ESD PROTECTION CIRCUIT FOR MOS INTEGRATED CIRCUITS
Richard L. Gray, Cupertino; Raymond Chan-Man Yan, Daly City, and Bruce Rosenthal, Los Gatos, all of Calif., assignors to Teledyne Semiconductor, Mountain View, Calif.
Filed Nov. 1, 1988, Ser. No. 265,572
Int. Cl.[5] H02H 9/04
U.S. Cl. 361—91 12 Claims



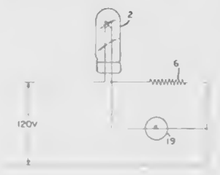
1. A circuit for limiting the voltage potential at a contact point of an integrated device relative to first and second predetermined voltage source potentials, said circuit comprising:
(a) clamp means for limiting the voltage potential at a clamp point to a first voltage range approximately defined by the first and second predetermined voltage source potentials, said, clamp means including first and second clamp diode junctions directly coupled in series between and non-conductively reversed biased with respect to the first and second predetermined voltage source potentials when the voltage potential at said clamp point is within a subrange of said first predetermined voltage range, the series connection between said first and second clamp diode junctions forming said clamp point; and
(b) voltage offset means, coupled between said clamp point and said contact point, for establishing a second voltage range encompassing said first voltage range, said voltage offset means conducting current between said clamp point and said contact point to limit the voltage potential at said contact point to said second voltage range, said voltage offset means including a first diode junction provided in the current path between said clamp point and said contact point and wherein said first diode junction is reversed biased to a conductive state when the voltage potential at said contact point is at a first extreme of said second voltage range and said first or second clamp diode junction is conductively forward biased with respect to the first or second predetermined voltage source potential and said clamp point voltage potential is within said first predetermined voltage range exclusive of said subrange.

4,922,372
SOLID STATE OVERCURRENT PROTECTION SYSTEM FOR CIRCUIT BREAKERS
Edward R. O'Brien, III, Wayne, Pa., assignor to SPD Technologies Inc., Philadelphia, Pa.
Filed Apr. 12, 1989, Ser. No. 336,471
Int. Cl.[5] H02H 3/08
U.S. Cl. 361—97 19 Claims



1. A device for detecting a primary fault current in a three phase current system and converting said detected fault current into mechanical action for breaking a circuit in which said primary fault current occurred, comprising:
a. means for receiving said three phases of primary current, providing corresponding phases of secondary current within a predetermined desired amperage metering range, choosing the largest magnitude secondary current and providing said largest magnitude secondary current as output therefrom;
b. means for providing voltage proportional to said largest magnitude secondary current;
c. means for storing a peak value of said voltage which is proportional to said largest magnitude secondary current;
d. means, connected between output of said proportional voltage providing means and said peak value storing means, for moving a trip member and thereby providing said mechanical action, in response to current exceeding a predetermined level passing therethrough;
e. means for directing said largest magnitude secondary output current through said trip member moving means;
f. means for actuating said largest magnitude secondary output current directing means upon said voltage proportional to said largest magnitude secondary current substantially instantaneously rising to a predetermined first level; and
g. means for actuating said largest magnitude secondary output current directing means upon said voltage proportional to said largest magnitude secondary current reaching a second level and remaining at said second level for a preselected time interval.

4,922,373
OVERTEMPERATURE PROTECTOR FOR INCANDESCENT LAMP
Robert L. Ekowicki, Westbrook, Me., assignor to GTE Products Corporation, Stamford, Conn.
Continuation of Ser. No. 131,258, Dec. 7, 1988, Pat. No. 4,837,655, which is a continuation of Ser. No. 514,439, Jul. 18, 1983, abandoned. This application Mar. 2, 1989, Ser. No. 318,110
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[5] H02H 5/04
U.S. Cl. 361—105 7 Claims



1. The combination of an overtemperature protector and a housing containing an electric lamp, the overtemperature protector comprising:
a circuit breaker disposed within a glass envelope; an electrical heater in proximate heat transfer relationship with the circuit breaker, said electrical heater consisting of insulated heater wire wrapped around the glass envelope; the heater being in series with the circuit breaker so that when the circuit breaker is open there can be no current flow through the heater; the heater being electrically in parallel with the electric lamp; the overtemperature protector being in heat transfer relationship with the electric lamp housing, so that when the electric lamp housing overheats, the circuit breaker opens and shuts off current flow to the electric lamp.

4,922,374
LIGHTNING PROTECTOR ASSEMBLY
Scott Mueller, South Barrington; Richard Heidorn, Lombard, and E. Grant Swick, Bartlett, all of Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.
Filed Feb. 10, 1989, Ser. No. 309,303
Int. Cl.[5] H02H 1/00
U.S. Cl. 361—119 21 Claims



1. A lightning protector assembly for telephone circuitry and the like, comprising:
housing means formed of a lower necked termimal section and an upper expanded ground section;
component-mounting means, having a front surface and a rear surface, disposed within said housing means for

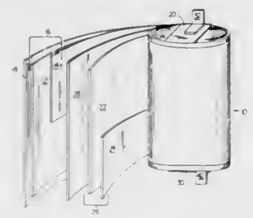
mounting a first pair of voltage limiting component means and a first pair of impedance component means;
a lower part of said component-mounting means having cavity means defined therein for receipt of a plurality of terminal contacts;
said upper section of said housing means having a pair of top recesses defined therein which are separated by means of a central bridging portion;
plug-in fuse means being disposed within said top recesses of said housing means; and
side ground contact means, including an elongated horizontal member extending inside and across the width of said housing means along only one of said front and rear surfaces of said component-mounting means for connection to said first pair of voltage limiting means, and a terminal contact portion thereof extending externally of said housing means, wherein said elongated horizontal member and said terminal contact portion comprises a single-piece member.

4,922,375

ELECTRICAL CAPACITOR

Frederick W. MacDougall, Marion, and Paul Winsor, IV, Somerset, both of Mass., assignors to Aerovox Incorporated, New Bedford, Mass.

Filed Jan. 3, 1989, Ser. No. 293,749
Int. Cl.[5] H01G *1/005, 1/017*
U.S. Cl. 361—273 **8 Claims**



1. An electrical capacitor comprising
a first dielectric layer;
a first metallized electrode adjacent to and in contact with said first dielectric layer, said first metallized electrode comprising a second dielectric layer having two surfaces coated with metal;
a first metal electrode adjacent to and in contact with said first metallized electrode;
a third dielectric layer adjacent to and in contact with said first metal electrode;
a second metallized electrode adjacent to and in contact with said third dielectric layer, said second metallized electrode comprising a forth dielectric layer having two surfaces coated with metal; and
a second metal electrode adjacent to and in contact with said second metallized electrode,
wherein said first and second metal electrodes are configured such that a line normal to said first metal electrode does not intersect with said second metal electrode.

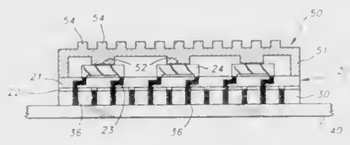
4,922,376

SPRING GRID ARRAY INTERCONNECTION FOR ACTIVE MICROELECTRONIC ELEMENTS

Richard J. Pommer, El Toro, and John Chiechi, Irvine, both of Calif., assignors to UniStructure, Inc., Irvine, Calif.

Filed Apr. 10, 1989, Ser. No. 335,802
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 **9 Claims**

1. A mechanical pressure contact providing electrical communication between an active circuit element and a passive substrate, comprising:
a module including at least one active element;
a contact retainer adapted to cooperatively align with said active element, said retainer including an aperture, said aperture exposed to an electrical contact on said active element upon cooperative alignment of said active element and said retainer;
a passive substrate having a surface terminal exposed to said aperture upon cooperative alignment of said retainer between said active element and said passive substrate;



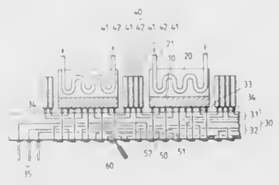
a conductive resilient element disposed within said aperture, said element providing an electrical path through said retainer;
a lid sized to engage said module and enclose said active elements; and
a fastener cooperatively aligning said retainer relative to said active element, said passive substrate, and said lid to deform said resilient element within its elastic limit and to secure said lid and said passive substrate.

4,922,377

MODULE AND A SUBSTRATE FOR THE MODULE

Kunio Matsumoto; Takanobu Noro, and Naoya Kanda, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,677
Claims priority, application Japan, Nov. 16, 1987, 62-287391; Mar. 4, 1988, 63-49663
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—387 **15 Claims**



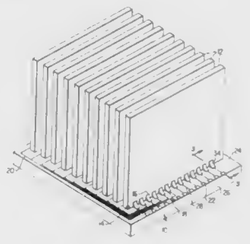
1. A module comprising:
a multi-layer wiring substrate having signal input/output terminals, power supply terminals, and testing and engineering change pads; and a plurality of large-scale integrated (LSI) circuit semiconductor chips mounted on the substrate, the LSI chips having cooling means on the back; wherein the semiconductor LSI chips are mounted on and electrically connected to the top surface of the multi-layer wiring substrate through chip joints, power supply terminals are arranged on the top surface of the substrate around the chips through power bus joints, and on the underside of the multi-layer wiring substrate input-/output terminals and a pattern of testing and engineering change pads, both connected to the semiconductor LSI chips, are installed.

4,922,378

BASEBOARD FOR ORTHOGONAL CHIP MOUNT

Satwinder S. Malhi, Garland, and Kenneth E. Bean, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 1, 1986, Ser. No. 893,770
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—387 **41 Claims**



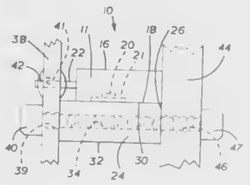
1. An integrated circuit packaging apparatus comprising:
a baseboard constructed of a semiconductor material, having a planar face, having a channel disposed at said planar face for receiving therewithin an edge of an integrated circuit chip;
a plurality of baseboard pads disposed adjacent said channel and at said planar face for providing electrical connections to pads of an integrated circuit chip received by said channel; and
a plurality of connector pads located on said planar face adjacent an edge of said baseboard, and including interconnect conductors connecting said connector pads to ones of said baseboard pads, wherein said interconnect conductors are disposed below the surface of said planar face.

4,922,379

POWER SEMICONDUCTOR PACKAGE

Earl M. Estes, Jr., Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 18, 1989, Ser. No. 381,559
Int. Cl.[5] H01L *23/36;* **H05K** *7/20*
U.S. Cl. 361—388 **10 Claims**



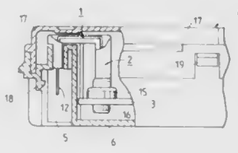
9. A power semiconductor device mounting arrangement comprising:
a printed wiring board having a plurality of openings therein for receiving pins of a power semiconductor device package;
a heatsink having a plurality of mounting openings therein;
a power semiconductor device package having a body with two opposing major surfaces and two opposite end surfaces with pins extending from one end surface; said semiconductor device package further including a relatively thick metal back having a pair of opposing major surfaces and a pair of end surfaces, one major surface of the semiconductor body being mounted to a major surface of the back so that an end surface of the body is substantially flush with an end surface of the back, each end surface of the back having mounting holes therein;
first fasteners extending through the openings in the printed wiring board into the mounting holes in one end surface of the back, said pins extending through the pin receiving openings in the printed wiring board for making electrical connection thereto, and second fasteners extending through the mounting openings in the heatsink into the mounting holes in the opposite end surface of the back; and
whereby the back is in direct contact with the heatsink thereby eliminating intermediate heatsinks for cooling and wherein the arrangement is compact and permits easy replacement of the semiconductor package if necessary.

4,922,380

JUNCTION BOX CONTAINING A PRINTED CIRCUIT BOARD

Heiji Kuki, and Naoya Kurimoto, both of Osaka, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Aug. 22, 1988, Ser. No. 234,634
Claims priority, application Japan, Aug. 20, 1987, 62-126837
Int. Cl.[5] H05K *1/14*
U.S. Cl. 361—399 **10 Claims**



1. A junction box containing a printed circuit board, comprising:
at least one U-shaped electrode having a first end portion soldered to said printed circuit board and a second end portion exposed outside said junction box via a hole in a portion of said junction box;
electrode containing means within said junction box and separable therefrom containing and physically contacting and supporting said electrode, said electrode containing means being secured to said printed circuit board on the side of said first end portion of said electrode, said electrode containing means including a surface having at least one groove into which a base of said electrode is fitted;
an inserting hole in said junction box for inserting a connector, said second end portion of said electrode being extended in said inserting hole to couple said second end portion to said connector.

4,922,381

STACKED CIRCUIT CARDS AND GUIDED CONFIGURATIONS

Ernest P. Longerich, Chatsworth, and Saverio A. D'Agostino, Camarillo, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 25, 1986, Ser. No. 843,965
Int. Cl.[5] H05K *1/11, 1/14*
U.S. Cl. 361—414 **1 Claim**

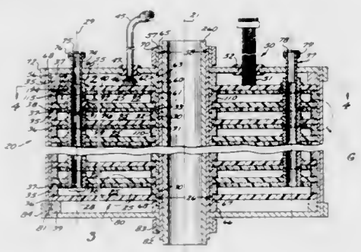
1. A stacked electrical circuit card configuration, comprising:
a plurality of electrical circuit cards, each having an outer periphery defining the outer edge thereof and an inner periphery defining an inner edge surrounding an interior opening in each circuit card;
said circuit cards comprising an electrically conductive

pattern for electrical connection of electrical components mounted to the card, said conductive pattern comprising a plurality of conductive elements disposed adjacent said outer periphery;

first support means for supporting said outer periphery of said circuit cards in an aligned relationship;

second support means for supporting said inner peripheries of said circuit cards in an aligned relationship;

first interconnection means for selectively electrically connecting predetermined ones of the conductive elements adjacent said outer periphery of adjacent circuit cards; and



a plurality of key members each key member extending from a respective card, each key member located at a unique location on the card relative to the center axis, and a corresponding key opening formed in the appropriate adjacent card at the appropriate location relative to the center axis of said interior opening, to receive the key member in the adjacent card, so that only one of the plurality of the cards is adapted to be stacked directly above any other card with the key members received in said key opening in said other card.

4,922,382

LINE PROTECTION DEVICE

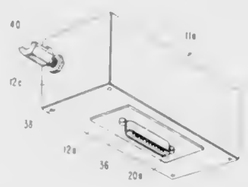
Kenneth A. W. Hobbins, Grantham, England, assignor to Rainford Racks Limited, St. Helenes, England

Filed Sep. 9, 1988, Ser. No. 242,202

Claims priority, application United Kingdom, Sep. 12, 1987, 8721496

Int. Cl.[5] H05K *9/00*

U.S. Cl. 361—424 **2 Claims**



1. Line protection apparatus which comprises a modular unit including input and output sockets and at least one two-stage protection circuit housed therein within an electromagnetically shielded enclosure to protect against radiated interference, wherein

the output socket of the modular unit comprises at least one multi-way screened connector;

said enclosure comprises a closed metal box;

external electromagnetic gasket means are disposed around said output socket;

the box is adapted to be fitted to an external surface of an equipment cabinet having an aperture therein, such that the output socket of the box extends into the cabinet via said aperture in said external surface, the gasket then lying between the box and said external surface of the cabinet in order to provide electromagnetic shielding around the socket; and

said input and output sockets are located on different sides of said box, with circuit board means carrying said at least one two-stage protection circuit located substantially in between said input and output sockets.

4,922,383

PHOTOGRAPHIC ILLUMINATION APPARATUS

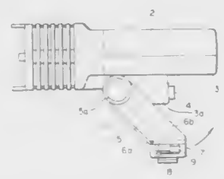
Ryuichiro Aoyama, Tokyo, Japan, assignor to Kabushiki Kaisha Tocad (Tocad Corporation), Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,797

Claims priority, application Japan, Oct. 30, 1987, 62-165293[U]

Int. Cl.[5] G03B *15/02*

U.S. Cl. 362—10 **11 Claims**



1. An illumination apparatus for use with a motion picture or television camera or the like, comprising: a case including a built-in light-emitting unit, a power switch mounted on said case and including an actuating member for engagement by the user to control energization of said light-emitting unit, and protection means connected to said case for movement between a stored position in proximity to said case and an unstored position protruding away from said case, said actuating member of said power switch being accessible for engagement by the user when said protection means is in said unstored position and being protected against engagement when said protection means is in said stored position so as to prevent inadvertent energization of said light-emitting unit, wherein said case further includes a built-in power unit for supplying power to said light-emitting unit under control of said power switch.

4,922,384

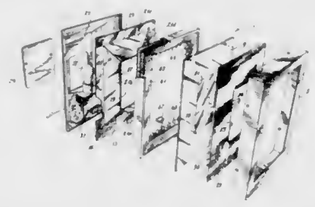
ILLUMINATED DISPLAY WITH HALF-SILVERED MIRRORS AND DISCRETE REFRACTOR PLATES

Arthur L. Torrence, Newtown, Conn., assignor to Mechtronics Corporation, Stamford, Conn.

Filed Jun. 8, 1989, Ser. No. 363,129

Int. Cl.[5] F21V *8/00*

U.S. Cl. 362—31 **24 Claims**



1. An illuminated display for displaying a transparency, said display including

a housing, a half-silvered mirror mounted at the front of said housing,

a second mirror mounted within said housing behind said half-silvered mirror and spaced therefrom, an unsilvered opening in said second mirror,

a plurality of light sources mounted within said housing between said mirrors and about the periphery thereof, and

means, within said housing and behind said opening, to illuminate said transparency,

whereby said transparency will produce an image visible at said half-silvered mirror and the light from said plurality of light sources will be multiply-reflected between said mirrors to produce multiple images thereof.

4,922,385

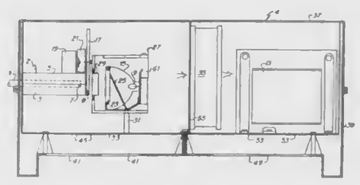
COOLED LIGHTING APPARATUS AND METHOD

George K. Awai, Haleiwa, Hi., assignor to Fiberstars, Inc., Fremont, Calif.

Division of Ser. No. 121,906, Nov. 17, 1987. This application Oct. 31, 1988, Ser. No. 264,778

Int. Cl.[5] F21V *7/04*

U.S. Cl. 362—32 **16 Claims**



1. A lighting apparatus for optical fibers comprising:

a case having an aperture for admitting optical fibers and a means for positioning optical fibers;

an airflow means for inducing a flow of air through and within said case;

a light source disposed to supply light to an end of an optical fiber;

exhaust holes communicating the interior with the exterior of said case whereby the flow of air induced by said airflow means may be exhausted from the interior of said case;

a first air intake means adapted to admit a stream of ambient air from the exterior of said case to the interior of said case and additionally to direct said stream of air across said light source; and

a second air intake means adapted to admit ambient air into the interior of said case there to mix with said stream of air which has been directed across said light source.

4,922,386

DIMMED VEHICLE HEADLIGHT

Franz-Josef Böckeler, Soest; Wolfgang Gobmann, Kamen-Methler; Axel Buchborn, Bad Sassendorf; Horst Jackenkroll, Hamm; Hubert Marks, Geseke; Karl Witte, Lippstadt, and Diethard Schnelle, Erwitte, all of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Aug. 10, 1989, Ser. No. 392,064

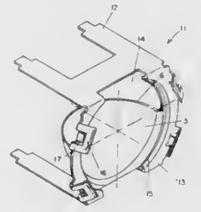
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827594

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **10 Claims**

1. In a dimmed vehicle headlight of the type having a reflector, a light source located at an inside focus position of the reflector, a lens, and a lens frame in which the lens is set, the lens frame being part of a sheet metal support which has arms at an outer periphery of the lens frame attached to the reflector and which has, molded of one piece with the rest of the sheet metal support, a light shield edge located approximately at an internal focus area of the lens that determines a bright/dark border of a light bundle exiting the headlight, the improvement wherein:

the light shield is a bulge toward the light source drawn out of material of the sheet metal support located at areas inside the lens frame, the light shield edge being defined



by an opening in an upper half of the bulge, with the size of the periphery of the bulge, being at least slightly smaller than the outside periphery of the lens, at least a central portion of the shield edge extending across an interior focus area of the lens, with the side of the lens facing the reflector lying on a lens-support surface at the lens frame.

4,922,387

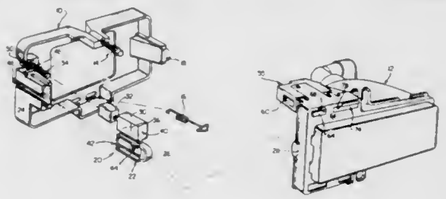
HORIZONTAL ZERO ADJUSTMENT FOR AUTOMOTIVE HEADLAMP

Francis E. Ryder, and Stephen P. Lisak, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala. and Textron Inc., Providence, R.I.

Filed Feb. 21, 1989, Ser. No. 313,093

Int. Cl.[5] B60Q *1/00;* **G01B** *5/24*

U.S. Cl. 362—61 **12 Claims**



1. A headlight aiming apparatus for attachment to an automotive headlamp assembly comprising a frame member which is rigidly mountable to an automotive vehicle and a headlamp which is mounted to the frame member for pivotal motion about at least one of a horizontal axis and a vertical axis of the headlamp for aiming of the headlamp beam, said aiming apparatus comprising: aim-indicating means including a housing, means for mounting said housing for movement in unison with a given surface of said headlamp as said headlamp moves pivotally relative to said frame member such that said housing is movable with said headlamp to a desired aimed condition; headlamp adjusting means operatively coupled with said housing for producing movement of both said housing and said headlamp relative to said frame member for achieving said aimed condition; indicator adjusting means for adjustment of the aim-indicating means to indicate an aimed condition of the associated headlamp; said indicator adjusting means being adjustable to provide said indication of said aimed condition by said aim-indicating means while the headlamp is in a condition wherein the beam is aimed as desired responsive to adjustment by said headlamp adjusting means; whereby said headlamp adjusting means may be thereafter adjusted as necessary until said aim-indicating means indicates said aimed condition to thereby assure proper subsequent aiming of the headlamp beam; wherein said aim-indicating means comprises a transpar-

ent portion of said housing, an elongate cavity generally defined within said transparent portion, an indicator member mounted for slidable movement along said cavity and aim-indicating indicia means on said transparent portion and overlying a portion of said cavity; said indicator member being mounted to said housing and to said indicator adjusting means such that the headlamp adjusting means will operate to bidirectionally move the cavity relative to the indicator member and said indicator adjusting means will operate to move the indicator member relative to the cavity, such that said indicator member may be moved into registry with said indicia by adjustment of either of said headlamp adjusting means or said indicator adjusting means.

4,922,388

VEHICLE HEADLIGHT

Erwin Freudenreich, Lippstadt, Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Jul. 20, 1989, Ser. No. 382,285

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1988, 3826106

Int. Cl.[5] B60Q *1/04*

U.S. Cl. 362—61 **22 Claims**



1. In a vehicle headlight of the type having a bowl shaped reflector with an opening in an apex area of the bowl, there being a light bulb mounted in the opening from a rear, convex, side of the headlight by means of a twisting movement of less than 180 degrees, the light bulb having a plate shaped support with radially projecting support tongues at an outer periphery thereof for being gripped between the rear side of the reflector and a ring formed element; the improvement wherein:

the ring formed element is constructed of spring wire to have the shape of a polygon with the same number of sides and angles corresponding to the number of radially projecting support tongues, the ring formed element being attached to the reflector at its angle areas, with sides of the polygon-shaped ring formed element being biased to engage support tongues.

4,922,389

HEADLIGHT DEVICE FOR VEHICLE

Naohi Nino, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Shizuoka, Japan

Filed Apr. 7, 1989, Ser. No. 334,618

Claims priority, application Japan. Apr. 8, 1988, 63-86437

Int. Cl.[5] F21V *13/10*

U.S. Cl. 362—61 **5 Claims**

1. A headlight having a reflector with the optical axis thereof being inclined relative to the optical axis of the headlight, a light source provided on a focus of the reflector and on the optical axis thereof, a projector lens in front of the reflector, and a shade plate provided nearly on a focus of the projector lens, wherein the reflector comprises a reflective surface



which reflects the light emitted from the light source and converges the reflected light into a curved line on a plane parallel to a plane including the optical axis of the headlight.

4,922,390

HEAD LAMP FOR MOTOR-BICYCLE WITH SLANT ANGLE CORRECTION

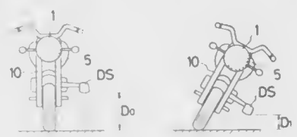
Yoshihiro Nakazawa; Hajime Tabata; Tooru Hasegawa, all of Wako, and Hideyuki Tanabe, Yokohama, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo and Stanley Electric Co., Ltd., Tokyo, Japan

Filed May 22, 1989, Ser. No. 355,648

Claims priority, application Japan, May 27, 1988, 63-70238

Int. Cl.[5] B62J *6/00*

U.S. Cl. 362—72 **15 Claims**



1. A motor-bicycle head lamp for mounting to a body of a motor-bicycle, comprising:

a reflector formed in a spheroidal shape, and having an optical axis;

a convex lens disposed in front of said reflector;

a shade disposed near a focal point of said convex lens between said reflector and said convex lens; and

means for rotatably mounting said shade so that said shade is rotatable about said optical axis, relative to said reflector and lens, in accordance with a slant angle of the body of said motor-bicycle.

4,922,391

VANITY MIRROR PACKAGE

Steven P. Dykstra, Zeeland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Jan. 12, 1989, Ser. No. 296,069

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—144 **12 Claims**

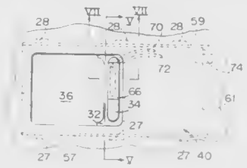
1. A visor including an illuminated vanity mirror assembly comprising:

a visor body;

a mirror and cover frame including guide means for receiving a slidable cover therein and a mirror support structure for supporting a mirror behind said cover;

a cover slidably mounted within said guide means and including a handle projecting outwardly from an edge of said cover to extend through a rectangular opening in said frame;

illumination means positioned within said handle of said cover to be exposed for all positions of said cover and for



projecting illumination outwardly therefrom when actuated; and

means for mounting said frame within said visor body.

4,922,392

AN ORIGINAL READING APPARATUS WITH SHIELDING

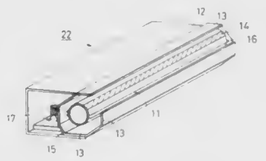
Hidemi Egami, Zama; Katsuo Saito, Yokohama; Hiroshi Satomura, Hatogaya, and Katsuya Oikawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 944,863, Dec. 22, 1986, abandoned. This application Nov. 29, 1988, Ser. No. 279,235

Claims priority, application Japan, Dec. 25, 1985, 60-201741[U]; Mar. 28, 1986, 61-71976; Aug. 8, 1986, 61-122313[U]

Int. Cl.[5] F21S *3/00*

U.S. Cl. 362—217 **19 Claims**



1. An original reading apparatus comprising:

a discharge tube for exposing an original, said discharge tube being adapted to emit light by a high frequency electromagnetic field being applied thereto from outside thereof;

high frequency oscillating means for converting a low frequency wave to a high frequency wave of 10^6 to 10^8 Hz;

a high frequency electrode disposed adjacent to an outer wall of said discharge tube for receiving the high frequency wave from said high frequency oscillating means and applying the high frequency electromagnetic field to said discharge tube;

said discharge tube, high frequency oscillating means and high frequency electrode forming an unit of integral structure, said unit having shield means for shielding said unit from leakage into said unit of a high frequency noise from outside said unit; and

drive means for reciprocally moving said unit along a predetermined path.

4,922,393

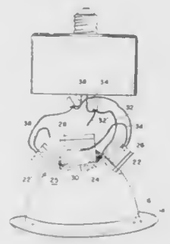
LAMP APPARATUS

Rhett McNair, Anaheim, Calif., assignor to Scientific Component Systems, Inc., Anaheim, Calif.

Continuation-in-part of Ser. No. 645,288, Aug. 29, 1984, Pat. No. 4,641,228, which is a continuation-in-part of Ser. No. 479,059, Mar. 25, 1983, Pat. No. 4,520,436. This application Dec. 7, 1984, Ser. No. 679,281

Int. Cl.[5] F21V *21/02*

U.S. Cl. 362—225 **20 Claims**



1. Recessed ceiling lighting apparatus comprising:

an electrical connector means for connecting to an electrical outlet, reflector means connected to the electrical connector for reflecting light generated by the lighting apparatus, lamp receptacle means connected to the reflector means for holding lamp apparatus, power supplying means connected to the reflector means and to the electrical connector means for supplying power from the electrical connector means to the lamp receptacle means, whereby heat is transferred directly from the power supplying means and the receptacle means to the reflector means, lamp means connected to the lamp receptacle menas for providing light within the reflector, connection means connected to the electrical connector means and to the reflector means for holding the reflector means upward with the electrical connector means.

4,922,394

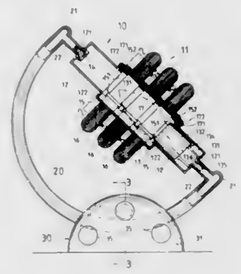
GLASS DESK LAMP

C. H. Liu, No. 8, Lane 244, Swc. 5, Yen-Ping N. Rd., Tapiei, Taiwan

Filed Oct. 20, 1988, Ser. No. 261,023

Int. Cl.[5] F21V *21/26*

U.S. Cl. 362—269 **5 Claims**



1. A glass desk lamp, comprising:

a lamp;

a support and:

a base, comprising a plurality of cooperating base plates;

wherein said lamp comprises a plurality of rings and a plural-

ity of glass discs joined together by screws so as to form a transparent hood, two caps disposed on the two ends of the transparent hood for receiving a bulb and a fixing stand,

said support comprising a C-shaped member having an L-shaped connector at each end thereof for fixing the bulb therebetween,

said base plates each having three holes for the passage of connecting rods therethrough, each of said connecting rods passing through a sleeve disposed between adjacent base plates to keep a selected distance therebetween, both ends of each connecting rod being provided with threads for engaging with bolts or nuts, said support extending between an uppermost connecting rod and the other, lower, connecting rods and being disposed between two of the base plates, the bolts or nuts being applied to the connecting rods to force said base plates closer to clamp the support tightly.

4,922,395

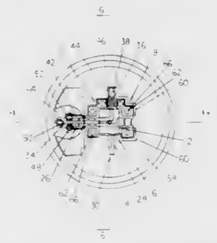
ELECTRICALLY CONDUCTIVE TRACK CIRCUIT FOR SHOCK MOUNTING A BULB, A BLANK FOR SUCH A TRACK CIRCUIT, METHOD OF MAKING SAME, AND A LAMP ASSEMBLY HAVING SAME

Troy L. Roney, 239 Sunrise Dr., Madison, Ind. 47250

Filed Jan. 12, 1989, Ser. No. 296,067

Int. Cl.[5] F21V *15/04*

U.S. Cl. 362—390 **19 Claims**



1. An electrically conductive bracket for shock mounting a cartridge light bulb and the like in a lamp housing comprising:

(a) a plurality of electrical conductor tracks in spaced apart juxtaposition;

(b) each of the conductor tracks comprising:

a mounting flange portion to be fastened to the lamp housing to hold the conductor track in position in the lamp housing;

means for attaching the mounting flange portion to the lamp housing;

an electrical terminal strip member integrally attached to and extending outwardly from one side edge of the mounting flange portion;

a shock absorbing resilient arm having a predetermined spring constant integrally attached to and extending upwardly from the mounting flange portion; and,

bulb securing means at the distal end of the arm for attachment to one end of the cartridge bulb.

4,922,396

DC-DC CONVERTER

Gert G. Niggemeyer, Steinbecker Mühlenweg 95, D-2110 Buchholz i.d.N, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 223,518

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724590

Int. Cl.[5] H02M *3/335*

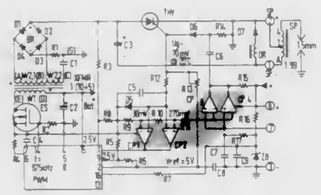
U.S. Cl. 363—21 **18 Claims**

1. A DC-DC converter fed by a pulse generator, comprising:

a transformer having a primary winding connected to the pulse generator and a secondary winding;

a charging capacitor;

rectifier means having an input connected to said secondary winding and an output connected to said charging capacitor;



said converter being operable in single-ended operation and said secondary winding connected to said rectifier means providing demagnetization of said transformer; and

capacitor means for defining a capacitance and connecting said secondary winding to a circuit connection of low potential, said capacitor means having a capacitance that is very small as compared with the capacitance of said charging capacitor.

4,922,397

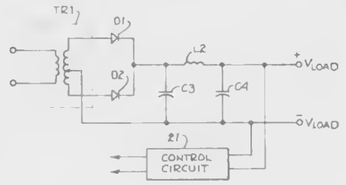
APPARATUS AND METHOD FOR A QUASI-RESONANT DC TO DC BRIDGE CONVERTER

Albert M. Heyman, Bedford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 158,117, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 892,595, Aug. 1, 1986, abandoned. This application Feb. 6, 1989, Ser. No. 307,138

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—17 **14 Claims**



1. A DC to DC converter for driving a load impedance, said DC to DC converter comprising:

a transformer having a primary winding and a center-tapped secondary winding;

pulse means for applying alternately positive and negative current pulses to said primary transformer winding, each of said current pulses having a generally constant duration;

a first diode coupled to a first transformer secondary winding terminal;

a second diode coupled to a second secondary transformer winding terminal;

a first capacitor having a first terminal coupled to said first and second diodes and a second terminal coupled to said center-tap of said secondary winding, wherein said first capacitor and one half of a transformer secondary leakage inductance provide a resonance frequency having a period less than twice said constant duration;

an inductor having a first terminal coupled to said first terminal of said first capacitor and a second terminal coupled to a first terminal of a load impedance; wherein a second terminal of said load impedance is coupled to said second terminal of said first capacitor;

a second capacitor coupled in parallel with said load impedance; and

control means responsive to said load impedance for controlling said pulse means, wherein power to said load impedance is controlled by varying an interval between said constant duration pulses, wherein said second capacitor and said inductor have values chosen in conjunction with said load impedance and said first capacitor to provide conduction through said first diode and said second diode during said interval.

4,922,398

AUTOMOTIVE LAMP ASSEMBLY

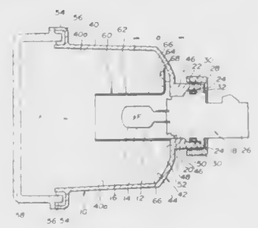
Masakazu Muto, Atsugi, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 175,982

Claims priority, application Japan, Mar. 31, 1987, 62-46662

Int. Cl.[5] F21V *7/00*

U.S. Cl. 302—296 **2 Claims**



1. A replaceable light assembly comprising:

a lamp housing having a reflector having a curved surface with an apex formed integrally therewith;

a lamp unit provided with a lamp holder and a lamp bulb attached to said lamp holder, which is inserted through an opening formed at a portion including the apex of said reflector so that a filament of said lamp bulb is positioned near a focal spot of a reflective surface of said reflector;

a portion of said reflective surface around said opening being positively formed as a flat surface contiguous to said curved surface and substantially perpendicular to the optical axis of said reflector and having a given area; and

a shade provided in relation to the area of said flat surface for preventing the light emitted from said filament from being incident upon said flat surface and for directing the light emitted from said filament toward other portions of said reflective surface, whereby the reflector can accommodate differently sized lamp units.

4,922,399

DC-TO-DC CONVERTER HAVING IMPROVED POWER SUPPLY ARRANGEMENT

Kuniyuki Tsuzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 319,790

Claims priority, application Japan, Mar. 7, 1988, 63-53957

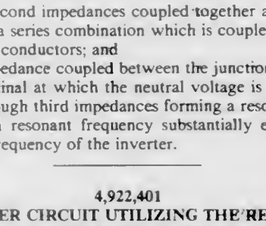
Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—21 **3 Claims**

1. In a dc-to-dc converter

a series circuit, said series circuit being connected between first and second input terminals of said dc-to-dc converter and defined by a resistor and first and second constant voltage diodes, said series circuit including first and second junctions, said first junction being defined between said first and second constant voltage diodes and said second junction being defined between said first constant voltage diode and said resistor;

a transistor switching controller, said transistor switching controller having first and second terminals, said first and second terminals being coupled across said first and second constant voltage diodes;



a transformer; and

a three terminal voltage regulator, said three terminal voltage regulator having an input coupled to a coil of said transformer, a ground terminal coupled to said first junction and an output terminal coupled to said second junction.

4,922,400

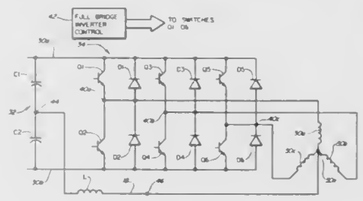
NEUTRAL FORMING CIRCUIT

Alexander Cook, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 3, 1989, Ser. No. 388,852

Int. Cl.[5] H02M *5/458*

U.S. Cl. 363—37 **5 Claims**



1. A neutral forming circuit which develops a neutral voltage relative to an AC voltage produced at an output frequency by an inverter coupled to first and second DC link conductors, comprising:

first and second impedances coupled together at a junction to form a series combination which is coupled across the DC link conductors; and

a third impedance coupled between the junction and a neutral terminal at which the neutral voltage is formed, the first through third impedances forming a resonant circuit having a resonant frequency substantially equal to the output frequency of the inverter.

4,922,401

INVERTER CIRCUIT UTILIZING THE REVERSE VOLTAGE CAPABILITIES OF SYMMETRICAL GATE TURN OFF THYRISTORS

Kenneth Lipman, West Hartford, Conn., assignor to International Fuel Cells, South Windsor, Conn.

Filed May 22, 1989, Ser. No. 355,488

Int. Cl.[5] H02H *7/122*

U.S. Cl. 363—58 **11 Claims**

1. A method of restoring energy associated with transient signal compensation in a portion of a power conversion circuit to a power supply providing a power supply signal having a

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voltage magnitude following commutation of said circuit portion, said circuit portion including first and second switching devices configured to receive and transmit signals of a selected polarity, said devices coupled in series with a first reactive element therebetween and associated shunt capacitive and reactive elements, said first reactive element divided by a tap into first and second portions each configured with an associated one of said shunt reactive elements, said first reactive element for providing signals at said tap to a first electrode of a second, regenerative reactive element having first and second sections serially connected at a junction, with a first diode and a second diode anti-parallel therewith configured at said



junction and further having a first regenerative diode and a second regenerative diode anti-parallel therewith configured with a second electrode of said second regenerative reactive element, said method comprising the steps of:

generating energy from said signal commutation;

storing energy in said capacitive and first reactive elements; and

transferring said stored energy to said power supply including the step of providing signals of a reverse polarity to said first and second switching devices by generating across said first and second shunt reactive elements signals having a voltage reduced in magnitude from said power supply signal voltage magnitude.

4,922,402

CMOS VOLTAGE MULTIPLIER

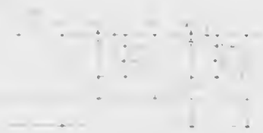
Marco Olivo, Bergamo; Luigi Pascucci, Sesto S. Giovanni, and Corrado Villa, Sovico, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Italy

Filed Jun. 28, 1989, Ser. No. 372,493

Claims priority, application Italy, Jun. 28, 1988, 83645 A/88

Int. Cl.[5] H02M *7/19*

U.S. Cl. 363—60 3 Claims



1. A wholly integrated, multistage, CMOS voltage multiplier comprising a plurality of diodes or equivalent integrated structures functionally connected in series between a supply terminal and an output terminal through which a current may be delivered at a voltage having an absolute value higher than the absolute value of a supply voltage applied to said supply terminal and at least a stage output capacitor connected between each intermediate node between any two diodes of said series of diodes and between said output terminal and alternately a first and a second rail to which are respectively applied two square-wave switching signals, in phase opposition to each other and having a high absolute value which is substantially equal to the absolute value of said supply voltage and a substantially nil low absolute value, wherein at least one of said diode equivalent integrated structures comprises

a first enhancement-type CMOS transistor of a first type of polarity, having a source and a drain functionally connected respectively to a first intermediate node and to a successive second intermediate node of said series or to said output terminal, a body electrically short-circuited to said drain and a gate which is coupled through a coupling capacitor to the one of said first and second rails to which said stage output capacitor, connected to said successive second intermediate node of the series or to said output terminal is connected;

a second enhancement-type CMOS transistor, having the same polarity and a threshold voltage identical to said first enhancement-type CMOS transistor and having a drain and a body connected in common to said successive second intermediate node of the series and a gate and a source connected in common to the gate of said first CMOS transistor;

said coupling capacitor charging through said second transistor, for determining the cut-off of said first transistor during a conducting phase of the latter, at a maximum voltage having an absolute value lower than the absolute value of the voltage of said successive intermediate node by a quantity equal to the absolute value of the threshold voltage of said second transistor, and allowing electric charge transfer from said first intermediate node to said successive second intermediate node or to said output terminal through said first transistor under a null threshold condition.

4,922,403

VOLTAGE MULTIPLIER CIRCUIT WITH REDUCED BACK-GATE BIAS EFFECT

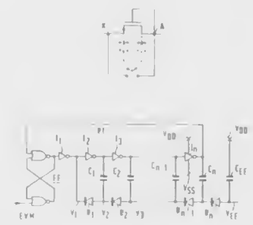
Ernst Feller, Brunaustrasse 66, CH-8002 Zürich, Switzerland

Filed Nov. 7, 1988, Ser. No. 268,108

Claims priority, application Netherlands, Nov. 17, 1987, 8702734

Int. Cl.[5] H02M *7/25*

U.S. Cl. 363—60 20 Claims



1. An integrated voltage multiplier circuit comprising a high-voltage output connected to a series connection of rectifier elements each of which comprises a first field effect transistor, a buffer capacitance for charge storage being connected between the high-voltage output and a power supply terminal, a junction point of every pair of neighboring rectifier elements being connected to one side of a respective booster capacitance to which clock signals are applied such so that two booster capacitances connected to respective sides of one rectifier element receive clock signals of mutually opposed polarity, characterized in that the field effect transistors of the elements on a substrate comprise separate regions of a conductivity type other than that of the substrate, at least the rectifier elements situated closest electrically to a high-voltage side of the circuit comprising respective switching means which connect internal diodes, formed in the respective first field effect transistor by p-n junctions between a source and a drain, respectively, on the one side and the region on the other side, to the source in the conductive state and to the drain in the blocked state of the first field effect transistor, so that said internal diodes remain blocked.

4,922,404

METHOD AND APPARATUS FOR GATING OF SYNCHRONOUS RECTIFIER

Gerald W. Ludwig, Scotia, and Gerhard A. Franz, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 15, 1989, Ser. No. 323,639

Int. Cl.[5] H02M *7/217*

U.S. Cl. 363—89 13 Claims



1. A synchronous rectifier circuit, comprising:

a transformer including a primary winding for receiving an input voltage and a secondary winding having first and second transformer output terminals and a center tap;

first and second switch means;

means coupling said first and second switch means to said first and second transformer output terminals respectively;

means for developing first and second current signals representative of current in said first and second switch means respectively;

means for deriving a timing signal having a predetermined time relationship to said input signal;

control means responsive to said first and second current signals and said timing signal;

means coupling said control means to said first and second switch means to render said switch means conductive or nonconductive in accordance with said first and second current signals and said timing signal;

a first synchronous rectifier circuit output terminal coupled to said first and second switch means;

a second synchronous rectifier circuit output terminal; and

means coupling said center tap to said second synchronous rectifier circuit output terminal.

4,922,405

HIGH VOLTAGE TRANSFORMER

Föll, Eberhard, Nehren; Gustav Guth; Joachim Guth, both of Salach; Peter Holl, Tübingen, and Alexander van Raaij, Tübingen, all of Fed. Rep. of Germany, assignors to Polymer-Physik GmbH & Co. KG, Lemforde, Fed. Rep. of Germany

Filed Aug. 22, 1983, Ser. No. 525,391

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231166

Int. Cl.[5] H02M *7/00*

U.S. Cl. 363—126 4 Claims

1. High voltage transformer consisting essentially of a magnetic iron core, yokes and primary and secondary coils, with high voltage rectifier and fine control element for the energy supply of single and multistage electron accelerators, wherein the primary coil is such a distance from the secondary coil that



a large stray field results, the ratios of yoke to limb lengths being from 1:1 to 2:1.

4,922,406

LABYRINTH SEAL IN DISK STORAGE DRIVE

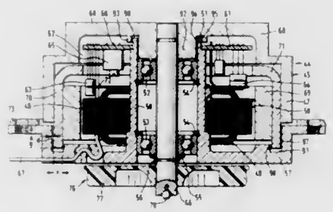
Bernhard Schuh, Baindt, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 16,469, Feb. 17, 1987, abandoned, which is a continuation of Ser. No. 765,376, Aug. 13, 1985, abandoned, which is a continuation of Ser. No. 335,483, Dec. 29, 1981, Pat. No. 4,535,373, which is a continuation-in-part of Ser. No. 127,404, Mar. 5, 1980, abandoned. This application Jun. 15, 1988, Ser. No. 208,864

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049334

Int. Cl.[5] G11B *5/012*

U.S. Cl. 360—97.03 27 Claims



1. A disk storage device comprising:

a contaminant-free environment accommodating at least one rotary storage disk;

a brushless d.c. motor adjacent the contaminant-free environment having a bearing tube with an integral radially extending base flange, a bearing system contained within said bearing tube, an annular stator with an axial dimension surrounding the bearing tube, a rotor shaft journalled in said rotor bearing system in said tube, and an outer rotor including a rotor casing, said rotor having a permanent magnet on the inner surface thereof, said rotor surrounding the stator with the permanent magnet opposing the stator to provide a magnetic field therearound and spaced therefrom and defining a cylindrical air-gap between the magnet and the stator with at least a portion of

the rotor extending axially beyond the axial extent of the stator, the motor being mounted with the rotor located in the contaminant-free environment;

means connecting the storage disk directly to the rotor of the motor for rotation therewith; and

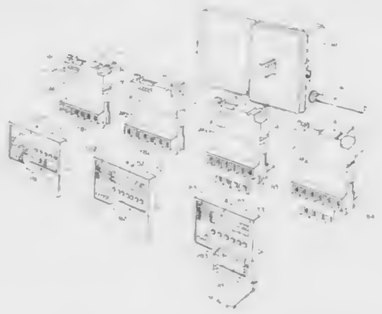
a labyrinth seal defined between a stationary element and an element rotatable with the rotor and located between the rotor bearing system and the contaminant-free environment to prevent contaminant particles from leaving the rotor bearing system and entering the contaminant-free environment.

4,922,407

MODULAR ELECTRONIC TIMER SWITCH SYSTEM

Daniel J. Birk, Aurora; Kenneth R. Fenne, Glen Ellyn, and Michael T. Mantzke, Aurora, all of Ill., assignors to Pittway Corporation, Northbrook, Ill.

Filed Mar. 2, 1988, Ser. No. 163,521
Int. Cl.[5] G05D *7/06*
U.S. Cl. 364—145 21 Claims



1 A modular system for switching a load comprising:

programmable control means including manually actuatable means for entry of selected information, electro-optical display means having first and second parts with said first part coupled to said control means for displaying visual, operator assisting indicia in response to manual actuation of selected of said entry means, with said second part coupled to said control means for displaying operator visible indicia related to said entered information, said control means further including means for generating at least one electrical signal having a plurality of time varying states related to selected of said entered information; and

modular means, for receiving said one electrical signal, and couplable to said control means for switching the load in response to said signal

said modular switching means having load connector means and removably engageable with the load with

said modular switching means selected from a class containing at least a single pole single throw switch function; a double pole single throw switch function; and a double pole double throw switch function.

4,922,408

APPARATUS FOR MULTI-PROCESSOR COMMUNICATIONS

Alan L. Davis; Shane V. Robison, both of Half Moon Bay, and Kenneth S. Stevens, Union City, all of Calif., assignors to Schlumberger Technology Corporation, San Jose, Calif.

Continuation of Ser. No. 781,265, Sep. 27, 1985, abandoned. This application May 12, 1988, Ser. No. 195,465
Int. Cl.[5] G06F *15/16*
U.S. Cl. 364—200 12 Claims

1. In a data processing system including a plurality of data processors, each said data processor including memory means for storing messages to be sent to or received from other data processors in said data processing system, a communication network for sending messages between any two data processors in said data processing system comprising:

a hexagonal array of communication processors, having E communication processors on each side of said hexagonal array, each said communication processor being operatively connected to a said data processor, each said communication processor comprising:

means for exchanging messages with the data processor coupled to said communication processor; and

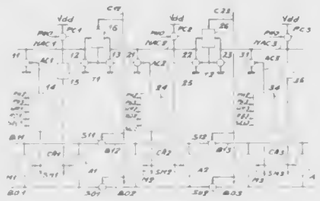
port means for communicating with the adjacent said communication processors, each said communication comprising sending a message to or receiving a message from a communication processor adjacent to said communication processor in said hexagonal array, said port means being adapted for simultaneous asynchronous communication with the six communication processors adjacent to said communication processor, said port means including six discrete ports, each said port in said port means being operatively connected to a corresponding port of a different one of a plurality of communication processors where such other communication processors are adjacent to said communication processor, said port means further comprising means for selecting a said discrete port for transmitting said message, said port being selected with reference to the final destination of said message in said hexagonal array.

4,922,409

BUS CONTROL DEVICE COMPRISING A PLURALITY OF ISOLATABLE SEGMENTS

Jean-Pierre Schoellkopf, Grenoble, and Yann Boyer-Chammard, Boulogne-Billancourt, both of France, assignors to Bull S.A., Paris, France

Filed Oct. 22, 1987, Ser. No. 111,260
Claims priority, application France, Oct. 23, 1986, 86 14717
Int. Cl.[5] G06F *13/40*
U.S. Cl. 364—200 21 Claims



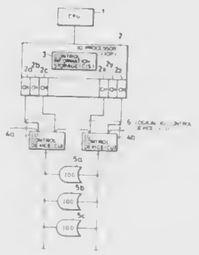
1. A control device comprising a plurality of isolatable bus segments, which permits the transfer of data from one bus segment to another, two adjacent bus segments being connected with one another via switches (S01, S11, S02, S12) controlled by a selection signal (C12, C23), an amplifier (A1, A2, A3) controlled by an actuation signal (CA1, CA2, CA3) being associated with one of said bus segments to which the amplifier is connected for amplifying voltages that appear on lines (B01, B11, B02, B12, B03, B13) of the last mentioned bus segment, said control device being characterized in that it includes slaving means (12, 13, 16, 22, 23, 26) for actuating the amplifier of any one bus segment in response to the actuation of the amplifier of a bus segment adjacent to said any one bus segment and in response to the selection signal (C12, C23) for the switches that connect said any one bus segment to said adjacent bus segment, at least one readable circuit connected with each segment, triggering means (14, 11, 24, 21, 34, 31) associated with at least one of the bus segments for actuating the amplifier (A1, A2, A3) associated with said last mentioned bus segment in response to a reading control signal (RD1, RD2, RD3) for the readable circuit or one of the readable circuits connected with said bus segment, and further characterized in that said slaving means include control lines (NAC1, NAC2, NAC3), each control line (NAC2) being assigned to one of the bus segments, the control device further including precharging means (PC2) connected to said control line (NAC2) for pre-charging said control line to a predetermined voltage during a pre-charging phase, said slaving means includes first means (13) for discharging said control line being controlled by a transfer device (16) associated with said one of the bus segments and an adjacent one of said bus segments and responsive to the voltage of the control line (NAC1) assigned to a bus segment adjacent to said one bus segment and to the selection signal (C12) of the switches connecting said segment with said adjacent segment, the discharge of a line (NAC1, NAC2, NAC3) causing the actuation of the amplifier (A1, A2, A3) of the associated segment.

4,922,410

INPUT/OUTPUT SYSTEM CAPABLE OF ALLOTTING ADDRESSES TO A PLURALITY OF INPUT/OUTPUT DEVICES

Takashi Morikawa; Tetuji Ogawa, both of Hadano; Akio Sasaki, Odawara, and Kiichi Sato, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1987, Ser. No. 86,279
Claims priority, application Japan, Sep. 10, 1986, 61-211608
Int. Cl.[5] G06F *13/12*
U.S. Cl. 364—200 1 Claim



1. An input/output system connected to a central processing unit comprising:

a plurality of input/output devices, each of the plurality of input/output devices being assigned to a plurality of first device addresses;

a plurality of input/output control devices for controlling the plurality of input/output devices by using a selected one of the first device addresses; and

an input/output processor including,

a plurality of channels for performing data transmission between any one of the plurality of input/output control devices and the central processing unit,

memory means for storing at least one of the first device addresses from the input/output devices,

the memory means including means for storing a plurality of codes corresponding to the channels, each of the plurality of codes representing a relationship between one of the first device addresses stored in the memory means and a second device address, wherein the second device address is utilized in an event wherein a corresponding channel is already selected,

means for selecting one of the channels pursuant to a start request of the input/output device received from the central processing unit,

means for reading out the first device address of the input-/output device from the memory means,

means for reading out from the memory means one of the codes corresponding to the selected channel, and

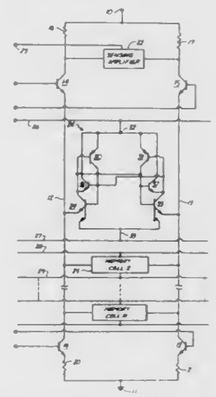
means for generating a complete address by using one of the first device addresses and one of the codes, whereby the generated address is used to access the input/output device through the selected channel.

4,922,411

MEMORY CELL CIRCUIT WITH SUPPLEMENTAL CURRENT

James B. Hobbs, Minneapolis, Minn., assignor to Atmel Corporation, San Jose, Calif.

Filed Dec. 27, 1988, Ser. No. 290,386
Int. Cl.[5] G11C *11/40, 7/00*
U.S. Cl. 365—155 9 Claims



1. A memory cell circuit for electrical connection between a word line and a standby line to selectively provide electrical activation thereof, and for electrical connection between a pair of bit lines to permit selectively storing therein of, and retrieving therefrom, information, said memory cell circuit comprising:

a pair of load bipolar transistors each having an emitter electrically connected to said word line;

a pair of control bipolar transistors each having a collector thereof electrically connected to a base of one of said pair of load bipolar transistors and each having a base thereof electrically connected to a collector of that same one of said pair of load bipolar transistors, said pair of control bipolar transistors each having its said base electrically connected to that other's said collector and its emitter electrically connected to said standby line; and

a pair of supplementary bipolar transistors each having a

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collector electrically connected to said word line, said pair of supplementary bipolar transistors each having a base electrically connected to a base of one of said pair of control bipolar transistors and each having an emitter electrically connected to a collector of that same one of said pair of control bipolar transistors.

4,922,412

APPARATUS AND METHOD USING ADAPTIVE GAIN SCHEDULING

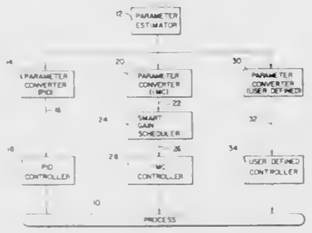
John D. Lane, McLean, Va., and Thomas J. Scheib, Chesterland, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 62,252, Jun. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 916,775, Oct. 9, 1986, Pat. No. 4,768,143. This application Feb. 21, 1989, Ser. No. 313,369

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[5] G06F *7/00*

U.S. Cl. 364—157 1 Claim



1. A self-tuning system for controlling a process having at least one measured parameter comprising:

a modular parameter estimator for receiving the measured parameter and for calculating an estimated parameter using an estimation algorithm;

a modular PID parameter converter connected to said estimator for applying a porportional plus integral plus derivative algorithm to the estimated parameter to produce a PID control signal;

a PID controller connected to said PID parameter converter for controlling the process in a conventional manner;

a modular IMC parameter converter containing an internal model algorithm and connected to the estimator for applying the internal model algorithm in said IMC parameter converter to the estimated parameter to generate in said IMC parameter converter an internal model control signal;

an IMC controller connected to said IMC converter for receiving the internal model control signal for controlling the process;

a modular user defined parameter converter connected to the estimator for receiving the estimated parameter and for generating an estimated parameter control signal; and

a user defined controller connected to said user defined parameter converter for receiving the user defined control signal to control the process according to a user defined control signal

4,922,413

METHOD FOR CONCURRENT EXECUTION OF PRIMITIVE OPERATIONS BY DYNAMICALLY ASSIGNING OPERATIONS BASED UPON COMPUTATIONAL MARKED GRAPH AND AVAILABILITY OF DATA

John W. Stoughton, and Roland V. Mielke, both of Virginia Beach, Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Mar. 24, 1987, Ser. No. 29,665

Int. Cl.[5] G06F *15/16, 9/38*

U.S. Cl. 364—200 2 Claims



1. A method for concurrent execution of primitive operations in an algorithm by a data processing system having a data-driven architecture comprising an assignment manager, a plurality of functional units connected to the assignment manager and a global data memory connected to the functional units, said method comprising the steps of:

(a) inputting an algorithm defined in terms of primitive operations and data flow between the primitive operations, including the steps of

(ai) generating an algorithm directed graph containing nodes representing primitive operations and data flow arcs representing data flow in the algorithm;

(aii) generating a node marked graph for each of the nodes in the algorithm directed graph generated in step (ai), the node marked graph including at least one input edge and at least one output edge corresponding to the data flow arcs associated with the corresponding node in the algorithm directed graph, and data status edges, each of the data status edges corresponding to one of the input and output edges;

(aiii) generating a computational marked graph corresponding to the algorithm directed graph generated in step (ai) by combining the node marked graphs generated in step (aii), each output edge of a predecessor node being associated with an input edge of the successor node; and

(aiv) storing data representing the computational marked graph in the data processing system;

(b) automatically providing definitions of the algorithm and the primitive operations to the assignment manager;

(c) assigning each primitive operation to an available function unit in dependence upon the definitions previously defined as the data for that primitive operation becomes available, said assigning performed by the assignment manager; and

(d) monitoring in the assignment manager completion of each primitive operation to determine data availability.

4,922,414

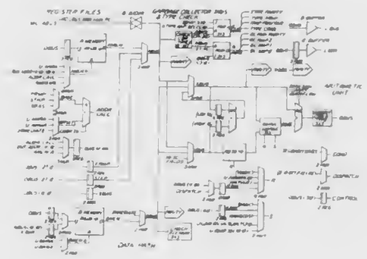
SYMBOLIC LANGUAGE DATA PROCESSING SYSTEM

John T. Holloway, Belmont; David A. Moon, Cambridge; Howard I. Cannon, Lexington; Thomas F. Knight; Bruce E. Edwards, both of Belmont, and Daniel L. Weinreb, Somerville, all of Mass., assignors to Symbolics Inc., Cambridge, Mass.

Division of Ser. No. 450,600, Dec. 17, 1982. This application Sep. 8, 1987, Ser. No. 78,724

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—200 6 Claims



1. In a data processor programmable in a symbolic processing language and having a main memory wherein each location has a multi-bit actual address comprising a page nummber and an offset number, central processing means for operating on data and for storing data in the main memory with an associated virtual address comprising a virtual page number and an offset number and means for converting the virtual address to the actual address, the improvement wherein the converting means comprises: a first cache memory having a table of actual addresses for a plurality of virtual addresses, means for performing a first hash function on a given virtual page number to reduce the number of bits thereof to form a map address corresponding to the hashed virtual page number; at least one addressable map converter for storing the actual page number and the given virtual page number corresponding thereto in the map address corresponding to the hashed virtual page number; means for indicating that a given virtul address is not in the first cache memory; means responsive to an indication that a given virtual addresses is not in the first cache memory for hashing the given virtual page number and applying same to the at least one addressable map converter; means for comparing the given virtual page number with the virtual page number from the at least one addressable map converter whereby a favorable comparison indicates that the stored actual page number is in the at least one addressable map converter; and means for applying the accessed actual page number and the original offset number to the main memory when there is a favorable comparison to thereby access the location corresponding to said access actual page number and on final offset number.

4,922,415

DATA PROCESSING SYSTEM FOR CONVERTING VIRTUAL TO REAL ADDRESSES WITHOUT REQUIRING INSTRUCTION FROM THE CENTRAL PROCESSING UNIT

Goran A. H. Hemdal, 10 Sabha Court, Parkland Grove, Ashford, Middlesex, United Kingdom (TW15 2JN)

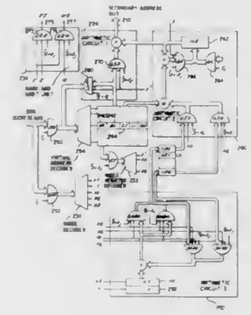
PCT No. PCT/GB85/00084, § 371 Date Dec. 11, 1985, § 102(e) Date Dec. 11, 1985, PCT Pub. No. WO85/04031, PCT Pub. Date Sep. 12, 1985

PCT Filed Mar. 1, 1985, Ser. No. 798,891

Claims priority, application United Kingdom, Mar. 2, 1984, 8405491

Int. Cl.[5] G06F *12/10, 13/00*

U.S. Cl. 364—200 12 Claims



1. A computer comprising

central processor means which operates upon and issues commands using virtual addresses;

main memory means for storing information in binary form as data elements, the elements being accessed by the use of real addresses; and

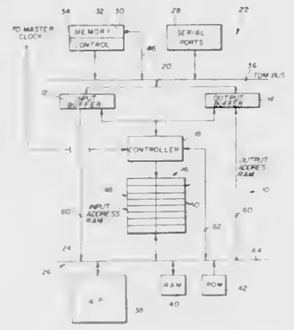
master controller means coupled to the processor means and the main memory means, the controller comprising a plurality of internal index register means and a data descriptor table means, the table means having at least one table entry means for each individually accessible data element in the main memory, each table entry means having at least three elements for translating virtual addresses to real addresses, the first of which elements indicates which, if any, of the index register means is needed for a translation, the second element of which permits either the starting address in the main memory to be specified when no index register means participates in the address translation or a secondary table entry to be indicated when an index register means participates in the address translation, the third element permitting either the size of the element to be accessed to be specified when no index register means participates in the address translation or the size of the element to participate in an index multiplication to be specified when an index register means does participate, the controller means translating virtual addresses received from the processor means to real addresses for use by the memory means without instructions from the processor means using address calculation or index multiplication.

4,922,416

INTERFACE DEVICE WITH END MESSAGE STORING REGISTER AND INTERRUPT SERVICE REGISTERS FOR DIRECTING SEGMENTED MESSAGE TRANSFER BETWEEN INTELLIGENT SWITCH AND MICROCOMPUTER

Iyengar N. Krishnan, Milford, and Herbert J. Toegel, Middlebury, both of Conn., assignors to Alcatel USA, Corp., New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 682,034
Int. Cl.[5] G06F *13/00, 13/28, 13/14*
U.S. Cl. 364—200 4 Claims



1. An interface for effecting direct data transfer between an intelligent switch and a storage medium of a microcomputer, said microcomputer having a local bus connected to said storage medium and a microprocessor, said interface comprising:

an input buffer for accepting data from said intelligent switch, said nput buffer transferring data to said local bus via a data bus;

an output buffer for presenting data to said intelligent switch, said output buffer receiving data from said local bus via said data bus, said data is a segmented message and said input and output buffers are sized to accept one complete message segment each, the last segment of said segmented message including an end of message signal;

means for storing an address, said address being provided by said microprocessor and pointing to a location in said storage medium of said microprocessor, said address storing means being connected to said local bus via an address bus, whereby direct data transfer over said data bus between said addressed location in said storage medium and either one of said data accepting means or said data presenting means is performed by said microprocessor latching to said address and executing a read or write;

means, connected to said data bus and responsive to an end of message signal from one of said intelligent switch and said microcomputer, for registering an end of said segmented message, so that the microcomputer can detect when a message is complete by reading the register means, said end of message registering means including separate means for registering the end of a message from said intelligent switch, and means for registering the end of a message to said intelligent switch;

first means, responsive to said means for registering the end of a message from said intelligent switch, for requesting an interrupt signal to said microcomputer;

second means, reponsive to said means for registering the end of a messaged to said intelligent switch, or requesting an interrupt signal to said microcomputer, said first and second means being separate bits in an interrupt request register, said interrupt request register being connected to said means for registering the end of a message from said intelligent switch, and said means for registering the end of a message to said intelligent switch;

an interrupt mask register connected to said microcomputer and having bit positions set by said microcomputer; and

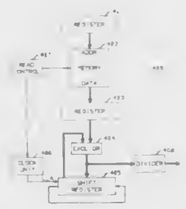
an interrupt service register connected to said interrupt request register and said interrupt mask register for receiving bits therefrom, said interrupt service register having bit positions, said bit positions being set as a logical AND of the setting of corresponding bits in said interrupt request register, and the inverse of the setting of corresponding bits in said interrupt mask register, said interrupt service register providing an inerrupt signal in response to the settings of the bit positions, whereby said microcomputer can selectively prevent an interrupt signal by setting bit positions in said interrupt mask register.

4,922,417

METHOD AND APPARATUS FOR DATA HASHING USING SELECTION FROM A TABLE OF RANDOM NUMBERS IN COMBINATION WITH FOLDING AND BIT MANIPULATION OF THE SELECTED RANDOM NUMBERS

Brian R. Churm, Wheaton, and Michael E. Diesel, Newark, both of Ill., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 24, 1986, Ser. No. 922,875
Int. Cl.[5] G06F *15/40*
U.S. Cl. 364—200 10 Claims



1. In a computer system including a database, a hashing method for accessing a data item in said database, said data item comprising N data units, N being a positive integer greater than one, said method comprising the steps of

selecting random numbers from a predefined table of random numbers at locations of said table each determined from a different one of said N data units, wherein each of said selected numbers comprises a plurality of bits, each of said data units comprises a plurality of bits, and each of said selected numbers comprises more bits than any of said data units,

combining said selected numbers to form a hashing result, wherein said combining step comprises:

(A) initializing a register for storing a plurality of bits,

(B) reordering said bits in said register,

(C) generating a combination of one of said selected numbers with bits in said register,

(D) storing said combination in said register, and

(E) repeating steps (B), (C), and (D) for other ones of said selected numbers to form said hashing result in said register, said method further comprising the steps of

deriving a database address as a predetermined function of said hashing result, and

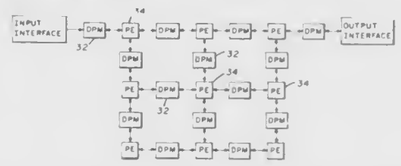
accessing said data item in said database using said derived database address.

4,922,418

METHOD FOR CONTROLLING PROPOGATION OF DATA AND TRANSFORM THROUGH MEMORY-LINKED WAVEFRONT ARRAY PROCESSOR

Quentin E. Dolecek, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation of Ser. No. 777,112, Sep. 17, 1985, Pat. No. 4,720,780. This application Jan. 15, 1988, Ser. No. 144,193
Int. Cl.[5] G06F *15/16, 13/38*
U.S. Cl. 364—200 10 Claims



1. A method for controlling propagation of data and transforms through a linear array of multiple processing elements interspersed with linking dual port memories where each dual port memory can be accessed simultaneously and without contention by processing elements located on its left and right and where each processing element can be locally controlled by at least one flow control flag corresponding to each particular dual port memory located adjacent thereto and said flow control flag is selectively controlled by processing elements to the right and left of the dual port memory, said method comprising the steps of:

propagating data and transforms through the array by performing the following steps with each processing element, (a) selectively accessing data from one of its adjacent dual-port memories; (b) transforming the data and (c) storing the transformed data in the other adjacent dual port memory; all as required by a program sequence stored in that processing element; and,

controlling the propagation of data transforms through the array by performing the following steps with each processing element, (a) testing said at least one flow control flag as part of a program sequence instruction if required by the program sequence stored in that processing element; however, if such testing is not required by the program sequence, going directly to step (d) below; (b) suspending operation of the program sequence at that instruction if a tested flow control flag is false; (c) automatically and without further testing completing the instruction when all tested flow control flags are true; (d) continuing the program sequence to perform memory access, data transformation and propagation; and (e) changing a state of at least one flow control flag associated with that processing element's adjacent dual port memory as required by the program sequence stored in that processing element.

4,922,419

SYSTEM FOR PERFORMING BANKING TRANSACTIONS

Kunio Ohashi, and Yoshihiro Fukutani, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

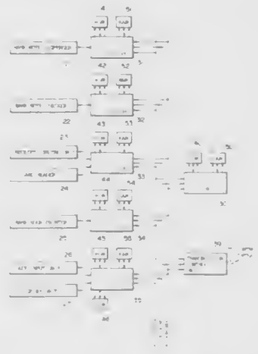
Continuation-in-part of Ser. No. 210,588, Nov. 26, 1980, abandoned. This application Jun. 27, 1983, Ser. No. 507,913
Int. Cl.[5] G06F *15/30*
U.S. Cl. 364—408 4 Claims

1. A transaction performing system for executing, upon operation by a customer, one of a plurality of predetermined banking transactions, each of said transactions comprising a plurality of sequential steps required to be executed in order by said customer and requiring the performance of a physical manipulative procedure by said customer,

said system comprising a console having mounted therein an electronic visual display unit and a plurality of physically manipulative functions units required to be operated selectively by said customer;

display control means operatively connected to said display unit;

means for causing said display control means to present on said display unit, simultaneously, a procedure specifying selected transaction and a procedure specifying graphic illustration that both visually indicates the proper function unit to be manipulated and pictorially depicts the physical manipulative procedure to be performed by said customer to execute said step; and



wherein said function units include an input unit for receipt of an object to be inserted into said console and an output unit for delivery of an object to be withdrawn from said console; and

wherein said procedure specifying textual message directs the insertion of an object into said input unit, and said procedure specifying graphic illustration pictorially depicts the insertion of such an object into said input unit; and

wherein said graphic illustration pictorially depicts a human hand inserting said object into said input unit.

4,922,420

VIDEO GAME SOFTWARE SELECTION DATA PROCESSING SYSTEM

Katsuya Nakagawa; Kunihiro Tanaka; Masayuki Yukawa, and Masaki Nomura, all of Kyoto, Japan, assignors to Nintendo Company Limited, Kyoto, Japan

Filed Jul. 23, 1987, Ser. No. 76,792
Claims priority, application Japan, Jul. 23, 1986, 61-173372; Oct. 30, 1986, 61-167400
Int. Cl.[5] G06F *12/06, 15/44;* A63F *9/22;* G07F *17/32*
U.S. Cl. 364—410 14 Claims

1. A game software service system connected to a monitor to display an image for games to be played on the monitor, comprising:

a plurality of game memory means, each memory means for storing at least one game program, said plurality of game memory mean being divided into a plurality of blocks;

a plurality of bus buffer means for buffering information for said plurality of game memory means, a respective one of said bus buffer means being connected to a corresponding one of said plurality of blocks;

first operation means by which a game can be played by a player;

processing means, coupled to said first operation means, for processing a game program in accordance with the operation of said first operation means, said processing means being connected to respective ones of said plurality of bus

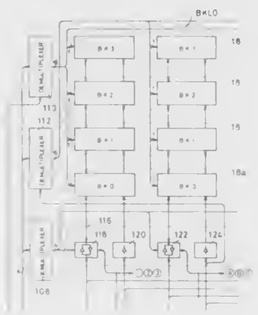
buffer means through a common address bus and a common data bus;

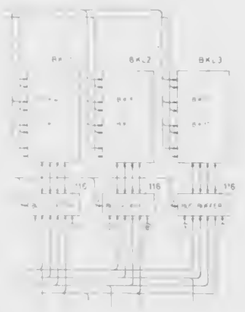
each of said bus buffer means for buffering information for said plurality of game memory means includes a bidirectional data buffer means connected to the said common data bus and an address buffer means connected to the said common address bus;

second operation means by which the player is able to select any one of said plurality of game memory means by inputting selection information;

said processing means including means responsive to said selection information for generating block selecting data, and for generating bus buffer means selecting data;

block selecting means for selecting a block from said plurality of blocks based upon said block selecting data generated by said processing means in accordance with said selection information, whereby the block is enabled to permit the execution of a game program stored in an identified game memory means; and





bus buffer selecting means for selecting a bus buffer means of said plurality of bus buffer means based upon said bus buffer means selecting data which is generated by said processing means in accordance with said selection information, whereby the game program stored in the game memory means included in the selected block can be accessed by said processing means through the common address bus and the common data bus, and the selected bus buffer means.

14. A coin-operated game software service system connected to a monitor to display an image for games to be played on the monitor, comprising:

a plurality of game memory means, each memory means for storing at least one game program, said plurality of game memory means being divided into a plurality of blocks;

a plurality of bus buffer means for buffering information for said plurality of game memory means, a respective one of said bus buffer means being connected to a corresponding one of said plurality of blocks;

first operation means by which a game can be played by a player;

processing means, coupled to said first operation means, for processing a game program in accordance with the operation of said first operation means, said processing means being connected to respective ones of said plurality of bus buffer means through a common address bus and a common data bus;

second operation means by which the player is able to select any one of said plurality of game memory means by inputting selection information;

said processing means including means responsive to said selection information for generating block selecting data, and for generating bus buffer means selecting data;

block selecting means for selecting a block from said plurality of blocks based upon said block selecting data generated by said processing means in accordance with said selection information, whereby the block is enabled to permit the execution of a game program stored in an identified game memory means;

bus buffer selecting means for selecting a bus buffer means of said plurality of bus buffer means based upon said bus buffer means selecting data which is generated by said processing means in accordance with said selection information, whereby the gate program stored in the game memory means included in the selected block can be accessed by said processing means through the common address bus and the common data bus, and the selected bus buffer means; and

a valuable medium insertion means for receiving a valuable medium,

detecting means for detecting if a valuable medium has been inserted in said valuable medium insertion means,

displaying means for displaying an image for a game on a screen when the insertion of a valuable medium is detected by said detecting means,

timer means for counting a time related to the value of the valuable medium detected by said detecting means, and

changing means responsive to said timer means and said processing means for changing a level of luminance of a screen of said monitor when a predetermined remaining time is identified by said timer means.

4,922,421

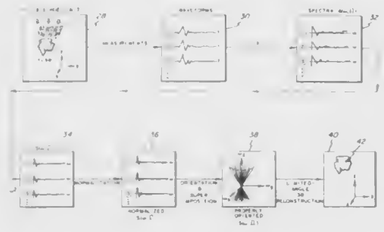
FLAW CHARACTERIZATION BY MULTIPLE ANGLE INSPECTION

Kwok C. Tam, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 941,875, Dec. 15, 1986. This application Nov. 14, 1988, Ser. No. 270,973

Int. Cl.[5] G06F *15/42*

U.S. Cl. 364—413.25 **3 Claims**



1. A method of flaw characterization for three-dimensional flaws of general shape and uniform density, said method comprising the steps of:

(a) obtaining echo waveforms from pulses of ultrasound incident on a flaw in an object, the ultrasound pulses being incident on the flaw at a plurality of angles within an allowed limited angular range;

(b) Fourier transforming said echo waveforms and generating a plurality of lines of known Fourier components of a flaw characteristic function which specifies the shape of the flaw, the Fourier components being defined in object space as having a value of 1.0 inside the flaw and zero outside the flaw, each of said lines corresponding to one of said angles within the allowed limited angular range;

(c) orienting the lines of known Fourier components at their corresponding angles and superimposing the lines to form a three-dimensional Fourier transform based on limited-angle information of the flaw characterization function; and

(d) recovering missing information about the flaw characteristic function and providing a three-dimensional object space representation of the uniform density flaw by an iterative limited-angle reconstruction procedure including repeated transformations of iterates of the flaw characteristic function between the object space and Fourier space, the reconstruction procedure correcting values of the flaw characteristic function in the object space based on a priori information including that the flaw characteristic function must be 1.0 or zero, said reconstruction procedure comprising the steps of resetting to zero those values outside a known extent of the flaw, resetting to 1.0 those values of the flaw characteristic function which are higher than 1.0, resetting to zero those values which are negative, resetting to zero those values which are between zero and 0.5, and resetting to 1.0 those values which are between 0.5 and 1.0; and the reconstruction procedure correcting the Fourier components of the flaw characteristic function in the Fourier space based on information from the echo waveforms.

4,922,422

METHOD AND APPARATUS FOR SELECTIVE SUPPRESSION OF PORTIONS OF AN ECHOGRAPHIC SIGNAL TO IMPROVE IMAGE RECONSTRUCTION

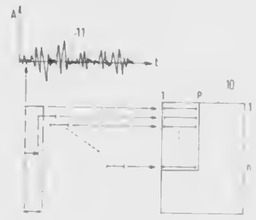
Jean Pergrale, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1988, Ser. No. 183,204

Claims priority, application France, Apr. 21, 1987, 87 05605

Int. Cl.[5] G06F *15/42*

U.S. Cl. 364—413.16 **3 Claims**



1. In a method of scanning objects by means of ultrasonic echography, which includes the transmission of ultrasonic waves to the object to be scanned by means of a transducer array which is for this purpose excited with a given transmission frequency, duration and rhythm, and the reception and processing of the echographic signals which correspond to the echoes returned to said transducer array by the obstacles encountered in the object scanned, which processing of the echographic signs associated with each echographic line of the cross-section in the object scanned includes amplification of said signals, their correction for attenuation effects as a function of time or scanning depth, and their display in order to form a reference image, the improvement wherein said processing also includes the successive steps of, for each echographic line or for spatially neighbouring segments of a group of juxtaposed echographic lines:

(a) analog/digital conversion of the corrected echographic signals including storage of the signals thus digitized in a first buffer memory;

(b) transformation of the echographic signals, which operation successively includes for each echographic line its sub-division into n elements of p points, said n×p points being rearranged in a matrix X comprising n rows and p columns and the storage of this matrix, the calculation and the storage of the matrix product of X and its transposed matrix X', after determination of the mean value of each column of X and subtraction of each term of the matrix from the mean value corresponding to its column, the calculation and storage of the eigenvalues and eigenvectors of said matrix product, including the arrangement of the eigenvalues in an ascending or descending order and, the reconstruction of the elements of the echographic lines by selection of principal factors, which imply a reconstruction of the matrix sum of the series of unit matrix products relating to said selected principal factors;

(c) digital/analog conversion after storage of the signals thus reconstructed;

(d) display of the converted signals in a way similar to that of the reference image.

4,922,423

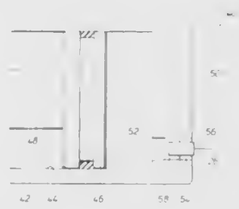
POSITION AND SEAL WEAR INDICATOR FOR VALVES AND BLOWOUT PREVENTERS

Paul C. Koomey, 5917 Crab Orchard Rd., Houston, Tex. 77057; George M. Savage, 342 Westminster, Houston, Tex. 77024, and James T. Stewart, 17923 Fireside Dr., Spring, Tex. 77379

Filed Dec. 10, 1987, Ser. No. 130,938

Int. Cl.[5] G01S *15/88*

U.S. Cl. 364—422 **7 Claims**



1. An ultrasonic position indicator and wear indicator system for blowout preventer stacks having linearly movable blowout preventer elements therein which are movable by a fluid substance contained therein and wherein each blowout preventer stack forms housing means having wall means forming an inner surface oppositely located with respect to internal linearly movable blowout preventer elements thereof, said wall means forming a port extending therethrough, comprising:

(a) a precision plug forming a fluid interface surface at the forward end thereof and being disposed in sealed relationship within said port, said plug being composed of a material permitting higher velocity propagation of ultrasonic waves therethrough as compared with said fluid substance such that ultrasonic wave reflection through said plug develops a reflection signal interference band projecting a predetermined distance forwardly of said fluid interface surface, said plug being recessed within said port such that said fluid interface surface is positioned greater than said predetermined distance rearwardly of said inner surface of said wall and said reflection signal interference band is

thus located rearwardly of said inner surface of said wall; and

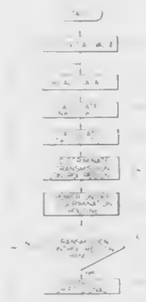
(b) ultrasonic sensor means being spaced from said inner surface of said wall means and being positioned to transmit ultrasonic waves forwardly through said plug and to receive ultrasonic waves reflected from a respective one of said blowout preventer elements and propagated rearwardly through said plug, upon excitation by said reflected ultrasonic waves said ultrasonic sensor means developing electrical signals accurately reflecting the distance of said internal linearly movable blowout preventer elements from said ultrasonic sensor means and thus accurately reflecting the position of said internal linearly movable blowout preventer elements within said housing means.

4,922,424

CONTROL METHOD FOR A DRIVING SYSTEM PROVIDED IN A VEHICLE

Takeo Hiramatsu, Nagaokakyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 180,291
Claims priority, application Japan, Apr. 20, 1987, 62-97019; Apr. 20, 1987, 62-97022
Int. Cl.[5] F16H *11/02*; B60K *41/12*
U.S. Cl. 364—424.1 11 Claims



1. A control method of controlling a driving system provided in a vehicle, said vehicle having a drivit g force transmission apparatus interposed between an internal combustion engine and wheels, said driving force transmission apparatus having an input shaft connected to said engine and an output shaft connected to said wheels, and being capable of detecting a transmission torque transmitted from the input-shaft side of said driving force transmission apparatus to the output-shaft side thereof, said method comprising the steps of:

detecting the changing rate of the rotational speed of said engine;

detecting the transmission torque of said driving force transmission apparatus;

adding said detected transmission torque and the product of said detected engine speed changing rate and a predetermined value to produce a sum; and

controlling the operation of said driving system in accordance with said sum resulting from said adding step.

4,922,425

METHOD FOR CONTROLLING AMT SYSTEM INCLUDING THROTTLE POSITION SENSOR SIGNAL FAULT DETECTION AND TOLERANCE

William J. Mack, Clarkston, and William F. Cote, Farmington Hills, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 853,577, Apr. 18, 1986, Pat. No. 4,833,613. This application Nov. 2, 1987, Ser. No. 115,959
Int. Cl.[5] B60K *41/04*; G06F *15/20*
U.S. Cl. 364—424.1 6 Claims



1. A self-diagnostic and control method for an automatic transmission system for devices having a an operator controlled throttle device, throttle-controlled engine, a transmission having a plurality of gear ratio combinations selectively engageable between a transmission input shaft and a transmission output shaft, said automatic transmission system comprising an information processing unit having means for receiving a plurality of input signals indicative of the operator's setting of said throttle device, said input signals including (1) a first throttle position signal having a magnitude indicative of the operator's setting of said throttle device, (2) a second throttle safety switch signal providing a signal indicative of the operator moving said throttle device to a position at least slightly greater than the engine idle throttle device position and (3) a third kickdown switch signal providing a signal indicative of the operator moving said throttle device to at least a substantially maximum throttle position, said processing unit including means for processing said input signals in accordance with a program for generating output signals whereby said transmission system is operated in accordance with said program, and means associated with said transmission system effective to actuate said transmission system in response to said output signals from said processing unit, the self-diagnostic method including:

sensing the presence or absence of faulty first, second and third input signals indicative of the operator's setting of said throttle device;

then, if the presence of faulty first, second or third input signals is sensed, until determination that only a known one of said first, second and third input signals as faulty, setting the engine throttle control to its engine idle speed position; and

if only a known one of said first, second and third input signals indicative of operator setting of said throttle device is determined to be faulty, modifying said program by defining logic rules for processing the other of said first, second and third input signals to determine an acceptable value for the operator's setting of said throttling device; the self-diagnostic and control method characterized by:

if THD_C is less than or equal to THD_I, and THPS equals 1 the throttle control is set to engine idle fuel supply and thereafter:

if THD_C is equal to or greater than THD_K and RTDS = 1, the second input signal is considered faulty and is ignored, THD_C is considered correct and is utilized for all throttle device position input values and a fault indicator is set; and

if RTDS = 1 while THD_C is less than or equal to THD_I, the first input signal is considered faulty and is ignored and a fault indicator is set;

where:

THD_C = the current value of the first input signal,

THD_I = the value of the first input signal at engine idle position,

THD_K = the value of the first input signal at kickdown position,

THPS = said second input signal having the value of ϕ if the throttle device is set at less than an idle reference value and a value of 1 if the throttle device is set at a value equal to or greater than said idle reference value, and

RTDS = said third input signal having the value of ϕ if the throttle device is set to less than said kickdown position and a value of 1 if the throttle device setting is equal to or greater than said kickdown position.

4,922,426

CONTROL SYSTEM FOR VEHICLE EQUIPMENT

Hideo Obara, Tokyo, and Takayuki Yanagishima, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Tokyohama, Japan

Filed Apr. 28, 1988, Ser. No. 187,198
Claims priority, application Japan, May 22, 1987, 62-76138[U]
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—424.05 15 Claims



14 A vehicle equipment control arrangement comprising:

means for memorizing an ingress/egress seat position wherein ingress and egress from a vehicle is facilitated;

means for memorizing a driving seat position suited to driving in said vehicle;

means for memorizing an ingress/egress position for a piece of vehicle equipment, said equipment's ingress/egress position being selected to facilitate ingress and egress from said vehicle;

means for memorizing a driving position for said piece of equipment, said equipment's driving position being suited to driving the vehicle;

means for moving said piece of equipment from its said driving position toward its said ingress/egress position in response to a first signal, said first signal being indicative of the vehicle in which said vehicle equipment is disposed having assumed a condition suitable for ingress and egress from the vehicle;

means for moving said seat from said driving seat position toward said seat ingress/egress position in response to said first signal; and

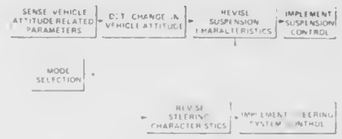
means for terminating the movement of said seat and said piece of equipment toward their respective ingress/egress positions in response to one of said seat and said piece of equipment reaching its ingress/egress position.

4,922,427

COMBINED POWER STEERING AND VARIABLE SUSPENSION CONTROL ARRANGEMENT

Masatsugu Yokote, Yokohama; Hideo Ito, Zushi; Kenji Kawagoe, Yokosuka, and Junsuke Kuroki, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 27, 1987, Ser. No. 125,952
Claims priority, application Japan, Nov. 28, 1986, 61-283210
Int. Cl.[5] B60G *17/00*
U.S. Cl. 364—424.05 9 Claims



1. A vehicle system comprising:

a power assisted steering system, said steering system including a valve for varying a degree of steering assist produced;

a suspension including a damper, said damper selectively producing a first damping characteristic and a second harder damping characteristic;

sensor means for sensing parameters which effect the vehicle suspension and an attitude of the vehicle;

a mode selector, said mode selector being selectively adjustable to:

produce a first signal indicative of a demand for a first mode wherein the steering power assist is raised to a level at which a first steering characteristic is produced and wherein the suspension is set to produce said first suspension characteristic, and

produce a second signal indicative of a demand that the steering power assist be lowered from the level at which said first steering characteristic is produced to a level whereat a second steering characteristic, which is heavier than the first steering characteristic produced, and for the suspension to be conditioned to produce said second suspension characteristic; and

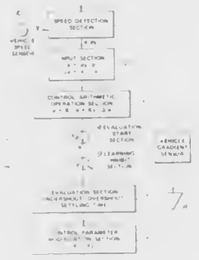
a control device responsive to said sensor means and said mode selector, said control device including a circuit which senses the change in vehicle attitude and which, in the event that the mode selector is set to produce said first signal and the sensor means indicates that the attitude of the vehicle is subject to a tendency to change beyond a predetermined amount, said circuit temporarily conditions the suspension to produce said second suspension characteristic until the tendency of the vehicle attitude to change beyond more than said predetermined amount disappears.

4,922,428

SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING CRUISING SPEED OF VEHICLES

Hiroshi Takahashi, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Dec. 9, 1987, Ser. No. 130,473
Claims priority, application Japan, Dec. 10, 1986, 61-294418
Int. Cl.[5] B60K *31/00*
U.S. Cl. 364—426.04 12 Claims



1 A self-adapting universal system for automatically controlling a vehicle speed of a particular vehicle to a desired cruising speed, comprising:

(a) first means for optimizing control parameters K_1 and K_2 of an operating variable u for an engine driving force adjusting mechanism of the vehicle required for a vehicle speed to reach the desired cruising speed through a learning operation during vehicle operation to derive values of the control parameters K_1 and K_2 defining the operating variable u of the engine driving force adjusting mechanism using the optimized control parameters wherein the operating variable u is defined as $u=K_1e+K_2\Delta e$, wherein K_1 and K_2 represent the control parameters, e represents a difference between a present vehicle speed and a target vehicle cruising speed, and Δe represents a step difference between the control difference e and that of an e' of a prior control period ($\Delta e=e'-e$);

(b) second means for detecting an occurrence of a predetermined disturbance known to affect the engine driving force required to reach and maintain a predetermined vehicle speed; and

(c) third means for inhibiting the learning of the control parameters K_1 and K_2 when the second means detects the occurrence of said predetermined disturbance.

4,922,429

METHOD FOR CONTROLLING AN AIR/FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE

Toyohei Nakajima; Yasushi Okada; Toshiyuki Mieno, and Nobuyuki Oono, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1987, Ser. No. 21,334
Claims priority, application Japan, Mar. 4, 1986, 61-047546
Int. Cl.[4] F02B *51/02, 3/04*
U.S. Cl. 364—431.06 10 Claims

1 In a method for feedback controlling an air/fuel ratio of a mixture supplied to an internal combustion engine to a target air/fuel ratio, the engine having a three-way catalytic converter in an exhaust gas passage, and an oxygen concentration sensor which produces an output signal substantially proportional to the oxygen concentration in exhaust gas of the engine and which is disposed in the exhaust gas passage upstream from the three-way catalytic converter, the supplied air/fuel ratio of the mixture being feedback controlled towards the target air/fuel ratio in accordance with the output of the oxygen concentration sensor, comprising the steps of:

(a) detecting the air/fuel ratio of the mixture in accordance with the output of the oxygen concentration sensor;

(b) determining if the target air/fuel ratio is equal to a stoichiometric air/fuel ratio;

(c) detecting if the detected air/fuel ratio is within a predetermined air/fuel ratio range when the target air/fuel ratio



is equal to the stoichiometric air/fuel ratio, the predetermined air/fuel ratio range including the stoichiometric air/fuel ratio; and

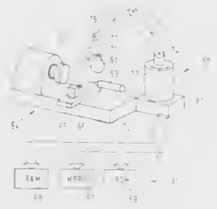
(d) compulsorily varying the air/fuel ratio around the stoichiometric air/fuel ratio at predetermined intervals so long as it is detected in said detecting step (c) that the detected air/fuel ratio falls within the predetermined air/fuel ratio range.

4,922,430

METHOD AND APPARATUS FOR CONTROLLING THE MOVEMENT OF A GUIDED OBJECT

Peter R. Wavish, West Hoathly, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 30, 1987, Ser. No. 115,476
Int. Cl.[4] B25J *9/00;* G06F *15/50*
U.S. Cl. 364—461 10 Claims



1 A method for controlling a movement of a first object with respect to a second object, said method comprising the steps of:

(a) first representing at least part of a geometrical outline of said second object by a first set of interpenetrating spherical bubbles that each contain a fraction of said part and which together contain all of said part;

(b) second representing said first set by a second set of spherical bubbles that contains the bubbles of said first set and have larger diameters than the bubbles of said first set, so that said second set contains less bubbles than said first set; and

(c) calculating the movement of said first object for predicting an impending collision with said second object comprising:

(i) first determining whether there is an impending penetration of any bubble of said second set; and

(ii) in case of a positive outcome of said first determining step, second determining whether there is a further impending penetration of any bubble of said first set,

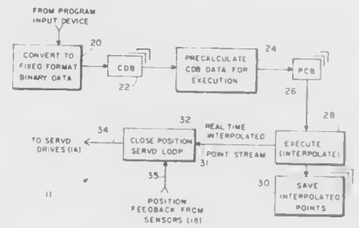
whereby a number of calculations is reduced in case of a negative outcome of said second determining step.

4,922,431

METHOD AND APPARATUS OF TOOL CONTROL IN ARBITRARY PLANE OPERATIONS

Woodward C. Carter, II, Maitland, Fla., assignor to Automation Intelligence, Inc., Orlando, Fla.

Filed Nov. 16, 1988, Ser. No. 271,943
Int. Cl.[5] G05B *19/403*
U.S. Cl. 364—474.18 7 Claims



1. A method of controlling a cutting tool to move in an arbitrary plane utilizing a computerized numerical controller having a computer program input device, a processor, machine tool servo drives, a cutting tool, and sensor and operator controls, comprising the steps of:

(a) processing a block of data from the computer program input device to fixed format binary data;

(b) storing the fixed format binary data in converted data buffers;

(c) precalculating into an expanded form the data from the converted data buffers that affect motion of the machine tool, said precalculation including establishment of a new cutter compensation arbitrary plane;

(d) storing the precalculated data;

(e) repeating step (c) in coordination with additional inputs from the converted data buffers to produce a trajectory of motion;

(f) producing a real time data stream from the stored precalculated data defining the trajectory; and

(g) combining the real time data stream with feedback data from machine tool position sensors to produce outputs to the servo drives.

4,922,432

KNOWLEDGE BASED METHOD AND APPARATUS FOR DESIGNING INTEGRATED CIRCUITS USING FUNCTIONAL SPECIFICATIONS

Hideaki Kobayashi, Columbia, S.C., and Masahiro Shindo, Osaka, Japan, assignors to International Chip Corporation, Columbia, S.C. and Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 13, 1988, Ser. No. 143,821
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—490 20 Claims

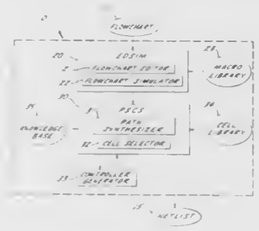
1. A computer-aided design system for designing an application specific integrated circuit directly from architecture independent functional specifications for the integrated circuit, comprising

a macro library defining a set of architecture independent operations comprised of actions and conditions;

input specification means operable by a user for defining architecture independent functional specifications for the integrated circuit, said functional specifications being comprised of a series of operations comprised of actions and conditions, said input specification means including means to permit the user to specify for each operation a macro selected from said macro library;

a cell library defining a set of available integrated circuit hardware cells for performing the available operations defined in said macro library;

cell selection means for selecting from said cell library for each macro specified by said input specification means, appropriate hardware cells for performing the operation



defined by the specified macro, said cell selection means comprising an expert system including a knowledge base containing rules for selecting hardware cells from said cell library and inference engine means for selecting appropriate hardware cells from said cell library in accordance with the rules of said knowledge base; and

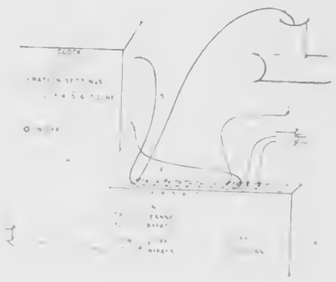
netlist generator means cooperating with said cell selection means for generating as output from the system a netlist defining the hardware cells which are needed to achieve the functional requirements of the integrated circuit and the connections therebetween.

4,922,433

AUTOMATIC IRRIGATION WATER CONSERVATION CONTROLLER

Arnold Mark, 2485 Malibu Rd., Bellmore, N.Y. 11710

Filed Dec. 23, 1987, Ser. No. 137,457
Int. Cl.[5] G06F *15/46;* A01G *25/16*
U.S. Cl. 364—510 15 Claims



1. A water conservation apparatus for controlling duration of irrigation watering cycles of a timed irrigation system having control valves that deliver water to preselected ground zones comprising:

moisture sensing means disposed in contact with at least one ground zone for detecting moisture content of the at least one ground zone;

central processing means coupled to said sensing means for

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processing data on the moisture content of the at least one ground zone;

solid state memory means coupled to said central processing means and having a stored applications program for sampling the ground moisture content detected by said sensor means;

means for initializing said solid state memory means to take a plurality of samples of dry and wet moisture readings, and averaging and storing resultant dry and wet readings in said memory means;

control means coupled to said central processing means, said control means sensing by means of said moisture sensing means moisture content in the at least one ground zone and scaling back the amount of water distributed by the irrigation system in proportion to the moisture content in at least one ground zone, as determined by the stored wet and dry readings in said memory means, said control means thereby shortening or shutting off the water cycles of the irrigation system as the ground moisture content increases.

4,922,434

LINEAR INTERPOLATION FOR A COMPONENT PLACEMENT ROBOT

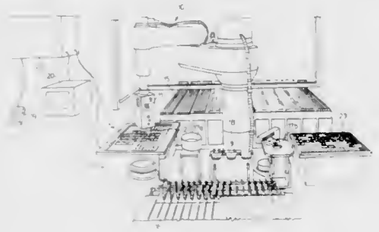
Andras G. Fule, Mississauga, Canada, assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 16, 1988, Ser. No. 207,691

Claims priority, application Canada, May 25, 1988, 567596

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—513 **4 Claims**



1. A component placement system for use with a component board of the type having component sites and at least two registration marks comprising:

(a) a robot arm;

(b) optical means associated with said robot arm for selectively generating signals;

(c) a component board mounting station for mounting a component board of the type having component sites and at least two registration marks;

(d) storage means for storing registration mark nominal position data representing the nominal location of said at least two registration marks, nominal distance data representing the nominal distance between at least one pair of registration marks, and nominal component site data representing the nominal position of said component sites on said component board;

(e) optical control means for retrieving said registration mark nominal position data from said storage means, for moving said robot arm in response to said registration mark nominal position data so that said optical means is positioned over the nominal position of consecutive ones of said at least two registration marks when said component baord is mounted on said component board mounting station, and for causing said optical means to generate a signal at the nominal position of consecutive ones of said at least two registration marks;

(f) interpolation determination means responsive to said signals from said optical means and said storage means for determining a measured distance between said at least one pair of registration marks and for comparing said measured distance with the corresponding nominal distance from said distance data for each of said at least one pair of registration marks in order to develop at least one interpolation factor;

(g) robot arm control means for, for each component site on said board, applying said at last one interpolation factor to the nominal component site data associated with a particular component site in order to generate corrected component site data representing the actual position of said particular component site on said component board and for controlling said robot arm to pick up a particular component intended for said particular component site and to place said particular component on said component board at the position indicated by said corrected component site data for said particular component site.

4,922,435

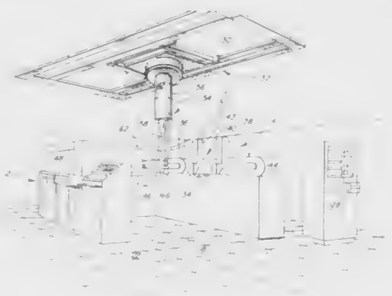
FOOD PREPARATION ROBOT

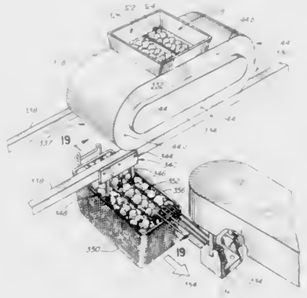
Robert L. Cahlander, Red Wing; David W. Carroll, Cannon Falls; Robert A. Hanson, Inver Grove Heights, all of Minn.; Al Hollingsworth, Naperville, and John O. Reinertsen, Glen Ellyn, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Apr. 1, 1988, Ser. No. 176,568

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—513 **118 Claims**





1. A robotized system for cooking food products comprising:

(a) a robot capable of working in an area that determines a work area;

(b) dispensing means for dispensing uncooked food products into a moveable container located in said work area comprising at least one bulk uncooked food dispenser;

(c) cooking means for cooking food products comprising at least one cooking station is said work area;

(d) storage means adjacent said work area for receiving and storing cooked food;

(e) dump means for dumping into said storage means food products cooked by said cooking means and delivered to said dump means by said robot via said container; and

(f) an end of arm robot tool for said robot, said robot capable of, in conjunction with said end of arm tool, selectively engaging, disengaging and moving said container to desired locations in said work area while said food products are contained in said container, said desired locations including an uncooked food dispensing location for receiving food products into said container from said food dispenser, a cooking location at said cooking station for cooking said food products and a dumping location where cooked food products are unloaded from said container.

4,922,436

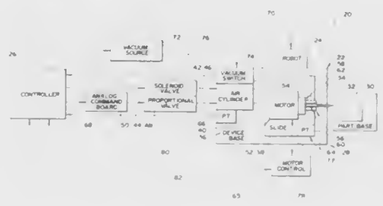
METHOD AND SYSTEM FOR THE AUTOMATED DRIVING OF PARTS AND DEVICE USED THEREIN

Loring J. Dohm, Troy; Lawrence B. Judge, Sterling Heights, and Dwight M. Morgan, Pontiac, all of Mich., assignors to GMF Robotics Corporation, Auburn Hills, Mich.

Filed May 26, 1988, Ser. No. 199,048

Int. Cl.[5] B25B *23/151*

U.S. Cl. 364—513 **53 Claims**



1. A method for the automated driving of a first part at a work station, the method utilizing a robot system which includes a robot having an arm provided with a device movable relative to at least one control axis, the device including a driver for driving the first part relative to a second part positioned at a part location in the work station, the method including the steps of: automatically moving the device through a predetermined motion relative to the at least one control axis to a position adjacent the part location; and automatically controlling the device so that the driver drives the first part relative to the second part, wherein the improvement comprises:

the step of automatically controlling includes the step of controlling the driver so that the driver applies a variable programmed axial force and a variable programmed torque at a variable programmed rotary speed to the first part.

4,922,437

IMAGE INFORMATION PROCESSING APPARATUS

Yoshio Sakata, and Masami Taoda, both of Yokobama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1987, Ser. No. 137,863

Claims priority, application Japan, Dec. 25, 1986, 61-311514; Apr. 30, 1987, 62-106842

Int. Cl.[5] G06F *15/20, 3/12*

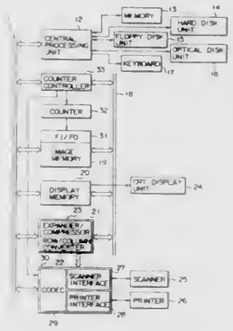
U.S. Cl. 364—514 **9 Claims**

1. An image information processing apparatus comprising:

image memory means for storing image information;

codec means, connected to said image memory means, for coding the image information stored in said image memory means and decoding the image information read out from said image memory means;

said image memory means including first-in first-out memory means, provided between said image memory means and said codec means, for sequentially storing the image information read out from said image memory means and sequentially supplying the image information to said codec means in a first-in first-out manner, and for sequentially storing the image information output from said codec means and transferring the image information to said image memory means in the first-in first-out manner;



detecting means connected to said first-in first-out memory means, for detecting the storage state of said first-in first-out memory means;

control means, connected to said detecting means and said first-in first-out means, for controlling the operation of said first-in first-out memory means in accordance with the storage state of said first-in first-out memory means; and

buffer memory means, provided integrally with said first-in first-out memory means, for storing the decoded image information supplied from said codec means.

4,922,438

METHOD AND APPARATUS FOR READING PACKET-ORIENTED DATA SIGNALS INTO AND OUT OF A BUFFER

Adolf Ballweg, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 19, 1987, Ser. No. 122,834

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642392

Int. Cl.[5] H04L *7/00*

U.S. Cl. 370—85.15 **17 Claims**

3. Apparatus for controlling the write-in and read-out of series or parallel packet-oriented data transmissions in a station in a ring network, each of said packet oriented data transmissions having a packet start bit combination and a packet termination bit combination and further having a data transmission rate, said station having a processing clock having a processing clock rate approximately corresponding to said data clock rate, said apparatus comprising:

a buffer having a plurality of addressable memory locations equal in number to account for a known maximum deviation between said data transmission rate and said processing clock rate and further to account for a maximum occurring jitter, said buffer having data inputs for receiving said packet-oriented data transmissions, data outputs for providing said packet-oriented data transmissions for further processing at a rate corresponding to said process-

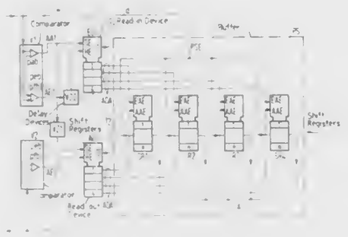
ing clock rate, and write-in address inputs and read-out address inputs;

first comparator means connected to said data inputs of said buffer, having first and second outputs, and data corresponding to said packet start bit and said packet termination bit combinations supplied thereto, said first comparator means operable to provide a first signal at said first output in response to recognition of said packet start bit combination at said data inputs of said buffer and a second signal at said second output in response to recognition of said packet termination bit combination at said data inputs of said buffer;

write-in address generating means having a start input, a stop input, a data clock input and write-in address outputs, said start input connected to said first output of said first comparator means, said write-in addressing generating means operable in response to said first signal to cyclically produce memory location addresses at said write-in address outputs to said write-in address inputs of said buffer;

read-out address generating means having a start input, a stop input, a processing clock input and read-out address outputs;

second comparator means including an input connected to said data outputs of said buffer, and an output, said second comparator means having data corresponding to said packet termination bit combination supplied thereto and



operable in response to equality between said data outputs of said buffer and said packet termination bit combination to provide a stop signal at said output of said second comparator, said output of said second comparator means connected to said stop input of said read-out address generating means for terminating cyclic generation of read-out address outputs by said read-out address generating means to said read-out address inputs of said buffer in response to said stop signal;

first delay means, having a first predetermined time delay, connecting said second output of said first comparator to said stop input of said write-in address generating means for terminating cyclic generation write-in address generation after said first predetermined time delay after generation of said second signal, said first predetermined time delay corresponding to a time interval necessary to write-in said packet termination bit combination to said buffer after recognition of said packet termination bit combination by said first comparator; and

second delay means, having a second predetermined delay time, connecting said first output of said first comparator means to said start input of said read-out address generating means to initiate read-out address generation after said second predetermined time after generation of said second signal, said second predetermined time delay corresponding to corresponding to a time interval approximately equal to one-half of a buffer cycle.

4,922,439

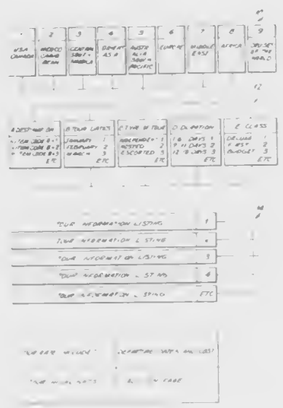
OPERATIONAL SYSTEM FOR TRAVEL AGENTS

Nathan Greenblatt, Vacations International Inc., 1112 Ave. V, Brooklyn, N.Y. 11223

Continuation of Ser. No. 51,613, May 20, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 281,967

Int. Cl.[5] G06F *15/26*

U.S. Cl. 364—407 **7 Claims**



1 A method of visually providing travel-related data in direct access fashion using a computer, a keyboard and a video display screen, comprising the steps of:

assembling a list of destinations;

assembling travel-related data of different generic components, including locales, dates, types of tours, durations, and classes of services relating to each of said destinations;

assembling specific data for each said generic component;

assigning an individual code number to each destination and to each different generic component of data;

assigning an individual code number to each piece of said specific data;

entering all of the destinations and the generic and specific data along with the respective code numbers into a storage medium of the computer;

displaying the generic components stored in said storage medium;

requesting specific data for the generic component relating to a selected destination from the storage medium using a respective one of said code numbers from the displayed generic components relating to destinations and the keyboard, and providing a visual display on the video display screen of a plurality of specific data categories related to the requested selected destination along with the respective code numbers;

selecting and assembling an information retrieval command number and requesting directly any number of specific data relating to the requested destination using the specific data code numbers and the keyboard; and

displaying on the video screen the requested specific data.

4,922,440

TOOL PROFILE AUTOMATIC GRAPHIC DISPLAY SYSTEM

Hideaki Kawamura; Teruyuki Matsumura, both of Hachioji, and Takashi Iwagaya, Hino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

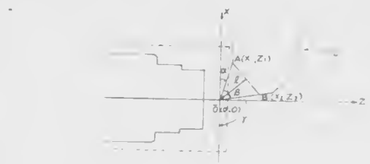
PCT No. PCT/JP86/00320, § 371 Date Feb. 9, 1987, § 102(e) Date Feb. 9, 1987, PCT Pub. No. WO87/00106, PCT Pub. Date Jan. 15, 1987

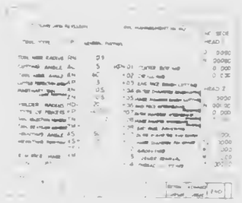
PCT Filed Jun. 24, 1986, Ser. No. 26,446

Claims priority, application Japan, Jun. 27, 1985, 60-140793

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—474.22 **1 Claim**





1. A tool profile automatic graphic display system for automatically displaying a profile of a tool used when a workpiece is to be machined into a predetermined shape based on a conversational-type machining program, said system comprising:

memory means for storing a conversational-type machining program and a tooling file containing tool data, including a mounting angle and a tool nose angle for all tools, a cutting angle and a tool nose radius for button tools, the cutting angle, a groove width and a cutting surface length for grooving and corner removing tools and a drill radius and the cutting surface length for drilling tools, all relating to profiles of respective tools;

data input means for inputting machining data, including a machined profile of the workpiece, and tool identification data;

control means for selecting an optimum tool in dependence upon the tool data in the tooling file together with specific machining data relating to a machining region of the machined profile of the workpiece;

calculating means for calculating tool profile graphic display data in dependence upon the tool data relating to the profile and the mounting angle of the tool contained in the tooling file stored in said memory means; and

graphic display means for graphically displaying the machined profile of the workpiece simultaneously with the profile of the optimum tool in dependence upon the tool data in the tooling file.

4,922,441

GATE ARRAY DEVICE HAVING A MEMORY CELL/INTERCONNECTION REGION

Toshihiro Tsukagoshi, Nishinomiya; Masanobu Fukushima, Osaka; Keiichi Yoshioka, Nishinomiya, and Takashi Yasui, Kobe, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 143,715

Claims priority, application Japan, Jan. 19, 1987, 62-11057; Jan. 19, 1987, 62-11058; Feb. 18, 1987, 62-36187

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—491 **4 Claims**



1. A gate array device comprising:

a plurality of basic cell regions spaced apart from one another to thereby define a plurality of intermediate regions between any two adjacent ones of said plurality of basic cell regions, at least part of each of said plurality of intermediate regions being defined as a memory region when constructing memory cells and as an interconnection region when constructing basic cells;

a logic circuit defined by a first part of said plurality of basic cell regions;

at least one input/output buffer which includes mode setting means for setting a mode of operation by outputting a mode set signal and at least one input terminal to which a signal is input; and

switching means defined by a second part of said plurality of basic cell regions, said switching means causing said input terminal of memory cell to be coupled to said memory region through said logic circuit, thereby establishing a normal operating mode, or directly to said memory region while bypassing said logic circuit, thereby establishing a test mode, in accordance with a status of said mode set signal.

4,922,442

ARRANGEMENT FOR MEASURING RADIATION QUANTA, PULSE DISCRIMINATION DEVICE SUITABLE FOR USE IN SUCH AN ARRANGEMENT AND SPECTROMETER PROVIDED WITH SUCH AN ARRANGEMENT

Hendrik J. J. Bolk, and Georges C. P. Zieltjens, both of Almelo, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1988, Ser. No. 183,573

Claims priority, application Netherlands, Apr. 22, 1987, 8700949

Int. Cl.[5] G06F *15/52, 15/20*

U.S. Cl. 364—550 **13 Claims**

1. An arrangement for measuring radiation quanta comprising:

(a) detection means for detecting radiation quanta and for converting said radiation quanta into pulse signals,

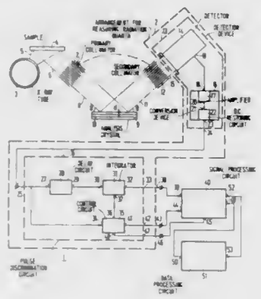
(b) pulse discrimination means for mutually discriminating said pulse signals, said pulse discrimination means having an input coupled to an output of said detection means,

said pulse discrimination means including

(i) delay circuit means coupled to said input for delaying said pulse signals,

(ii) integrator means coupled to an output of said delay circuit means for integrating said pulse signals,

(iii) control means separately coupled to said input for



controlling said integrator means, said control means driving said integrator means to integrate a succession of delayed pulse signals within a dead time during detection of said radiation quanta, and

(c) signal processing means coupled to said integrator means and being driven by said control means for processing output signals from said integrator means using a succession of pulse signals outside said dead time, said control means also driving said integrator means to reset said output signals to a reference signal.

4,922,443

DATA ACQUISITION AND PROCESSING EQUIPMENT FOR TESTING AUTOMOTIVE VEHICLES

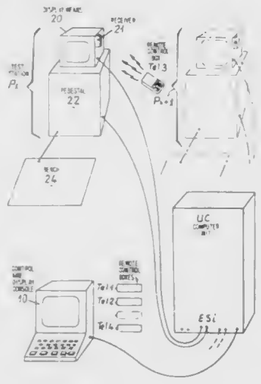
Paul Coetsier, and Denis Douine, both of Lagny, France, assignors to Etablissements M. Muller & Cie., Chelles, France

Filed Jul. 26, 1988, Ser. No. 224,399

Claims priority, application France, Aug. 7, 1987, 8711265

Int. Cl.[5] **G06F** *15/74;* **G01M** *17/00*

U.S. Cl. 364—551.01 **9 Claims**



1. Data acquisition and processing equipment for simultaneous testing of a plurality of vehicles located at different test stations in a technical test center, a repair shop, or at an exit of a vehicle production line, comprising

(a) remote control boxes each provided with a keyboard and an adjustable means for defining an identity for each control box, each box being capable of emitting a signal comprising a first portion which represents the identity of the control box and a second portion containing an item of information which can be a code corresponding to one key of the keyboard,

(b) a control and display console enabling an operator to assign a remote control box to each vehicle which arrives at the technical test center and to establish a correspondence between the vehicle and the control box which is assigned thereto,

(c) display means placed in proximity to each of the test stations, said display means being capable of displaying data relating to the test as well as a menu of operations proposed to the operator, each operation being presented on a screen with a selection code which corresponds to the codes of the different keys of the keyboard of the control boxes,

(d) remote control receivers placed in proximity to the display means, said receivers being capable of receiving the signal emitted by the control boxes, and

(e) a computerized central unit connected to the display console, to the different test stations, to the display means and to the remote control receivers.

4,922,444

APPARATUS FOR DETERMINING DISTANCE COORDINATES

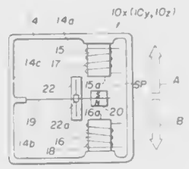
Mitsuru Baba, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 14, 1987, Ser. No. 132,012

Claims priority, application Japan, Dec. 16, 1986, 61-299609

Int. Cl.[5] **G01P** *15/12;* **G09G** *3/02*

U.S. Cl. 364—566 **2 Claims**



2. An apparatus for determining distance coordinates for a computer system, said coordinates representing a position of a cursor on a screen of a display unit of said computer system, said apparatus comprising:

(a) at least two acceleration detecting means for detecting accelerations thereof along at least two orthogonal axes of a rectangular reference coordinate system, each of said acceleration detecting means producing an output acceleration signal representative of detected accelerations along one of said at least two orthogonal axes, wherein each of said acceleration detecting means comprises:

(i) a hollow case;

(ii) one pair of electromagnets which are respectively attached to mutually opposed inner planes of said hollow case, each of said electromagnets comprising a core wound by a coil, the coil of one electromagnet being wound reverse to that of the other electromgnet, and said coils being connected in series;

(iii) a permanent magnet movable between said electromagnets;

(iv) means for outputting an output voltage which is varied in response to movements of said permanent magnet, said permanent magnet moving nearer to one of said electromagnets and further apart from the other of said electromagnets when the acceleration detecting means is moved in acceleration; and

(v) means for producing an output current having a direction and an amplitude corresponding respectively to the direction and magnitude of the acceleration of the acceleration detecting means, said output current flowing through said coils in series so as to magnetize said electromagnets in response to accelerations of the acceleration detecting means, said permanent magnet being located at a balanced position under a magnetic field produced between said electromagnets, said output current comprising the output acceleration signal of the acceleration detecting means;

(b) analog-to-digital converter means for respectively converting said at least two output acceleration signals to at least two sets of digital acceleration data; and

(c) operating means for calculating the distance coordinates along said at least two orthogonal axes based on said at least two sets of digital acceleration data.

4,922,445

LOGIC CIRCUIT SIMULATION METHOD

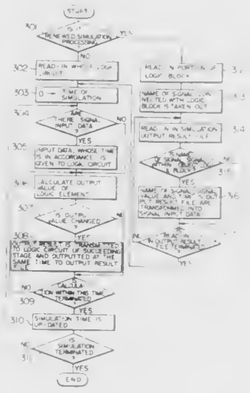
Yoshito Mizoue, and Yoshiharu Kazama, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 4, 1987, Ser. No. 128,584

Claims priority, application Japan, Dec. 9, 1986, 61-293058

Int. Cl.[5] **G01R** *31/28;* **G06F** *11/00*

U.S. Cl. 364—578 **6 Claims**



1. A logic circuit simulation method for simulating a logic circuit including a plurality of interconnected logic blocks, comprising the steps of:

simulating operation of said logic circuit including said plurality of interconnected logic blocks, outputting connection information of connections between said logic blocks and signal variation information occurring on said connections between said logic blocks at different simulation times and storing said information in an output result file; and

extracting only signal variation information, related to a specific erroneously operating logic block to be resimulated, from said signal variation information stored in said output resut file and resimulating said logic circuit by simulating operation of each of said logic blocks relative to said specific erroneously operating logic block to be resimulated using said extracted signal variation information at each simulation time as an input signal source to said specific erroneously operating logic block to be resimulated

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4,922,446

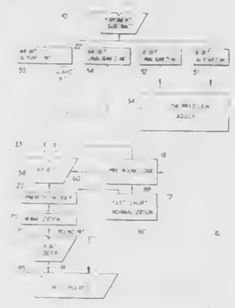
APPARATUS AND METHOD FOR FLOATING POINT NORMALIZATION PREDICTION

John H. Zurawski, Stow, and Kathleen P. Harrington, Groton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 1, 1988, Ser. No. 176,612

Int. Cl.[5] **G06F** *7/50*

U.S. Cl. 364—748 **11 Claims**



1 An arithmetic logic device, which comprises:

(a) a first addition and subtraction device operating to perform a first arithmetic function on operands to obtain a first result;

(b) a second addition and subtraction device operating to perform a second arithmetic function on the n-most significant bits of each of said operands to obtain a second result; and

(c) an evaluation circuit coupled to the second addition and subtraction device to evaluate the second result in respect of a first predetermined condition to determine a normalization amount for the first result of said first addition and subtraction device when the first predetermined condition is detected;

(d) the evaluation circuit being coupled to the first addition and subtraction device to input the normalization amount.

4,922,447

DEVICE FOR MEASURING THE DISTANCE TRAVELLED AND THE SPEED OF A RAIL VEHICLE

Friedbert Reichel, Stuttgart, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Oct. 9, 1986, Ser. No. 917,345

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536019

Int. Cl.[5] **G01C** *22/62;* **G01P** *3/54;* **B60T** *8/32*

U.S. Cl. 364—561 **4 Claims**

2. A device for measuring the distance travelled by and the speed of a rail vehicle comprising:

a source of clock pulses of high repetition rate;

a first divider coupled to said source of high repetition rate clock pulses and having a preset division ratio to produce clock pulses having a reduced repetition rate;

a coding switch connected to said first divider which changes the preset division ratio in accordance with an input identifying a change in a wheel diameter;

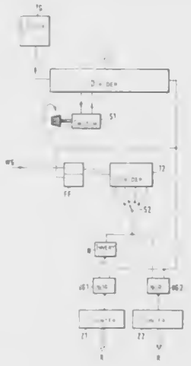
at least one wheel-coupled distance-pulse generator;

a first counter;

a second counter independent of said first counter;

alternating means response to distance pulses from the distance-pulse generator for alternately supplying each of said two counters with all count pulses from said first divider arriving within successive predetermined distance-pulse intervals each corresponding to a predetermined number of distance pulses;

an evaluating circuit which calculates the speed of and the distance travelled by the vehicle during the distance-time interval immediately prior to the current predetermined distance from the number of clock pulses of reduced repetition rate counted by the counter that was supplied by count pulses during such immediately prior distance-time interval;



synchronizing means for synchronizing the clock pulses of reduced repetition rate with said distance pulses; and

selection means responsive to the synchronizing means for coupling the output of the first divider to a particular one of said first counter and said second counter in response to a signal applied to a control input of the selection means.

4,922,448

WORD PROCESSING SYSTEM HAVING SMALL-SIZED AND LARGE-SIZED DISPLAYS FOR SIMULTANEOUS DISPLAY AND AUTOMATIC POWER SHUT-OFF CIRCUIT

Yoshio Kunieda; Toshishige Okamoto, both of Nagoya, and Satoshi Furukawa, Suzuka, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 882,386, Jul. 7, 1986, abandoned. This application Oct. 3, 1988, Ser. No. 253,335

Claims priority, application Japan, Jul. 10, 1985, 60-152751; Jul. 11, 1985, 60-152944; May 30, 1986, 61-126949

Int. Cl.[5] G06F *3/14*

U.S. Cl. 364—900 **6 Claims**



1 A portable word processor, comprising:

a main unit including input means for entering character data representative of characters, memory means for storing the character data entered through said input means, and a small-sized display having a first display capacity for displaying a first group of successive characters corresponding to the character data which are entered through said input means;

a connector for disconnectably connecting said main unit to a large-sized display which has a second display capacity larger than said first display capacity of said small-sized display;

said main unit further including large-display control means disconnectable connecting to said large-sized display through said connector, for controlling said large-sized display so as to display thereon a second group of successive characters corresponding to said character data stored in said memory means, and including the characters in said first group of characters, while said small-sized display is also displaying said first group of characters;

power shut-off means for automatically disconnecting a power supply to said large-display control means when said large-sized display and said large-display control means of said main unit are not connected to each other through said connector; and

said power-shut off means comprising a switch disposed adjacent to said connector, said switch being closed when said large-sized display and said main unit are connected to each other by said connector, and opened when said large-sized display and said main unit are disconnected, said switch being connected in a power supply line for supplying power to said large-display control means.

4,922,449

BACKPLANE BUS SYSTEM INCLUDING A PLURALITY OF NODES

Darrel D. Donaldson, Lancaster, and Richard B. Gillett Jr., Westford, both of Mass., assignors to Digital Electric Corporation, Maynard, Mass.

Continuation of Ser. No. 44,479, May 1 1987, abandoned. This application Jun. 13, 1989, Ser. No. 368,956

Int. Cl.[5] G06F *13/40*

U.S. Cl. 364—900 **18 Claims**



1. A system for transmitting and receiving data between a plurality of nodes via a bus, comprising:

a bus having a current source;

a plurality of nodes, more than one node being capable of driving the bus simultaneously to transfer data, the nodes supplying together with the current source of the bus current for the transfer of data such that during such transfer of data the state of the bus transitions between one predetermined voltage level and another predetermined voltage level;

means for individually connecting each of said nodes to the bus;

a driver in each node designed to supply current to the bus in parallel with the current source for the transfer of data;

coupling resistor means in each node for coupling its driver to the connecting means for such node, and during occasions when such node is driving the bus to one predetermined voltage level simultaneously with at least another of the plurality of nodes driving the bus to another predetermined voltage level, for limiting the current flowing through its driver and avoiding damage to said driver.

4,922,450

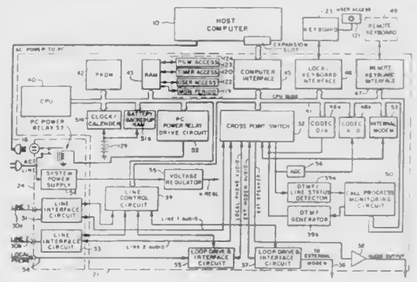
COMMUNICATIONS MANAGEMENT SYSTEM HAVING MULTIPLE POWER CONTROL MODES

Frederick A. Rose, Rte. 3, Box 529, and Christopher P. DeWitt, Rte. 3, Koshkonong Lake Rd., both of Fort Atkinson, Wis. 53538

Filed Oct. 8, 1987, Ser. No. 106,184

Int. Cl.[5] G06F *1/00*

U.S. Cl. 364—900 **3 Claims**



1. A communications management system for use in conjunction with an externally-powered host computer for responding to communications signals on a communications line, comprising:

a power source independent of the host computer;

power control means responsive to applied control signals for applying operating power to the host computer;

first control circuit means responsive to the presence of a communications signal on said communications line and operable from said independent power source for applying a first control signal to said power control means to power-up the computer during a predetermined operating period;

second control circuit means including timer means defining a predetermined monitoring period for developing a second control signal for application to said power control means to control the application of power to the computer during said monitoring period; and

mode control means responsive to said first and second control signals for automatically preventing said power control means from powering-down the computer in response to said first control signal during said predetermined monitoring period, and for preventing said power control means from powering-down the computer in response to said second control signal during said predetermined operating period.

4,922,451

MEMORY RE-MAPPING IN A MICROCOMPUTER SYSTEM

Yuan-Chang Lo, San Jose, Calif.; Dennis L. Moeller, Delray Beach, and John J. Szarek, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

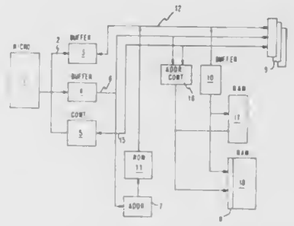
Continuation of Ser. No. 29,013, Mar. 23, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 391,634

Int. Cl.[5] G06F *11/00*

U.S. Cl. 364—900 **5 Claims**

1. A microcomputer circuit including first memory means, first connector means for removably coupling second memory means to said microcomputer circuit, and address and control means coupled to said first memory means and to said first connector means for addressing memory, said address and control means including: logic means for selecting the first or second memory means; and first storing means for storing an indication of a fault detected in said first memory means, said logic means being coupled to said first storing means; wherein said logic means disables said first memory means by directing all memory addresses to said first connector means in response to a fault indication stored in said first storing means;

said microcomputer circuit further comprising second connector means for removably coupling third memory means having addresses that overlap the addresses for said second memory means; said address and control means further including second storing means, coupled to said logic means, for storing the detected presence of at least one block of memory coupled to said second connector means, wherein said logic means redirects memory addresses to blocks of memory connected to said second connector means that overlap corresponding blocks of memory connected to said first connector means.



4,922,452

10 GIGASAMPLE/SEC TWO-STAGE ANALOG STORAGE INTEGRATED CIRCUIT FOR TRANSIENT DIGITIZING AND IMAGING OSCILLOGRAPHY

Raymond S. Larsen, Menlo Park, and James T. Walker, Palo Alto, both of Calif., assignors to Analytek, Ltd., Cupertino, Calif.

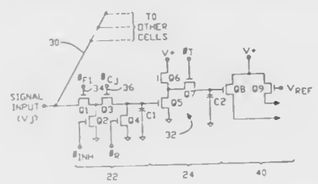
Filed Nov. 16, 1987, Ser. No. 120,669

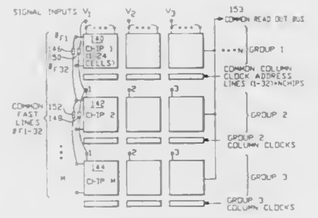
Int. Cl.[5] G11C *27/00*

U.S. Cl. 365—45 **18 Claims**

1. A high speed data acquisition system for storing a succession of sampled values of an analog signal comprising analog signal input means and analog signal output means, a first analog bus connected to said input means and a second analog bus connected to said output means, a storage array comprising a plurality of cells arranged in rows and columns, row clock means coupled to said array for selectively activating each row of said array, column clock means coupled to said array for selectively activating each column of said array, said analog signal being directly coupled to said array to supplying said signal to the cells of said array, each of said cells comprising a first, capture section responsive to said row and column clock means for capturing one of said sample values at high speed, a storage section for holding said captured sample value for a relatively longer period than said capture section, an output buffer for transferring said captured sample to said analog signal output means, and transfer means for transferring said

captured sample from said capture section to said storage section, whereby a very high speed sample of said analog





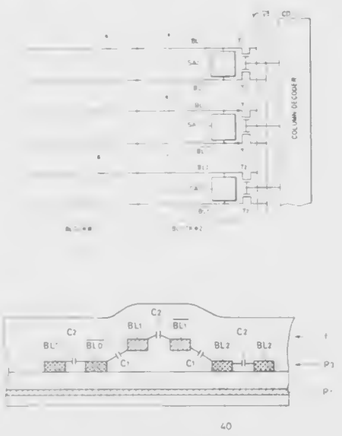
signal may be taken by said capture section, said sample thereafter being transferred to said storage section.

4,922,453

BIT LINE STRUCTURE OF DYNAMIC TYPE SEMICONDUCTOR MEMORY DEVICE

Hideto Hidaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,373
Claims priority, application Japan, Feb. 2, 1987, 62-22676
Int. Cl.[5] G11C *5/06*
U.S. Cl. 365—63 15 Claims



1. An improvement of a bit line structure in a semiconductor memory device having a folded bit line structure, comprising:
a substrate;
a plurality of bit line pairs each divided into a plurality of blocks of bit line pairs along a longitudinal direction of said substrate;
wherein each divided bit line pair within a common block is formed by an interconnection layer at a level above said substrate which is different from the level of an adjacent divided bit line pair in the same block and different from the level of the same bit line pair in an adjacent block.

4,922,454

MAGNETO-OPTICAL MEMORY MEDIUM AND APPARATUS FOR WRITING AND READING INFORMATION ON AND FROM THE MEDIUM

Kazunari Taki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 29, 1985, Ser. No. 792,591
Claims priority, application Japan, Oct. 30, 1984, 59-228741; Oct. 30, 1984, 59-228742; Oct. 30, 1984, 59-228743; Oct. 30, 1984, 59-228744
Int. Cl.[5] G11C *13/06*
U.S. Cl. 365—122 15 Claims



1. A magneto-optical memory medium, consisting of a laminar structure comprising:
a plurality of magneto-optical storage layers formed of a magneto-optical material, and including at least a first and a second magneto-optical storage layer;
a first non-magnetic layer interposed between said first and second magneto-optical storage layers;
a second non-magnetic layer formed on said second magneto-optical storage layer; and
a reflector layer formed on said second non-magnetic layer and capable of reflecting a light beam which has passed through said first and second magneto-optical storage layers and said first and second non-magnetic layers,
information being written on and read from each of said plurality of magneto-optical storage layers, information being written on said first and second magneto-optical storage layers through magnetization thereof in one of opposite directions normal to their surfaces, the information written on said first and second storage layers being read out through detection of changes in the Kerr rotation angles of a first and a second beam of light of different wavelengths applied to the medium, respectively, said Kerr rotation angles of said first and second beams of light being changed depending upon the direction of magnetization of said first and second storage layers,
one of said first and second magneto-optical storage layers having a thickness determined so that the change in the Kerr rotation angle of a corresponding one of said first and second beams of light represents the direction of magnetization of said one of said first and second storage layers, irrespective of the direction of magnetization of said one of said first and second storage layers, irrespective of the direction of magnetization of the other of said first and second storage layers while the change in the Kerr rotation angle of the other of said first and second beams of light represents the direction of magnetization of said other storage layer, irrespective of the direction of magnetization of said one storage layer.

4,922,455

MEMORY CELL WITH ACTIVE DEVICE FOR SATURATION CAPACITANCE DISCHARGE PRIOR TO WRITING

William B. Chin, Wappingers Falls; Rudolph D. Dussault, Hopewell Junction; Ronald W. Knepper, Lagrangeville, all of N.Y.; Friedrich C. Wernicke, Schoenaich, Fed. Rep. of Germany, and Robert C. Wong, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,465
Int. Cl.[5] G11C *11/00*
U.S. Cl. 365—154 19 Claims



1. A transistor memory cell array of the type wherein each of a plurality of memory cells includes data storage transistors connected to a given word line, each of the data storage transistors being driven into saturation thereby charging respective saturation capacitance when storage data, comprising:
a first word line;
a second word line;
each memory cell comprising two unclamped transistors with their current emitting terminals coupled to said second word line and with the control terminal for each transistor coupled to the current-collecting terminal of the other transistor, with one of said transistors conducting in saturation to store data;
a pair of diodes each having a cathode connected to said first word line and an anode connected to the current-collecting terminal of a respective one of said two transistors, each said diode discharging in its forward bias direction the transistor saturation capacitance associated with the current-collecting terminal of said respective transistor prior to writing new data; and
means for applying potentials to said first word line to cause the conduction of current in the forward bias direction to said diode prior to writing new data into each cell, and to cause nonconduction in the forward bias direction of said diodes at other times.

4,922,456

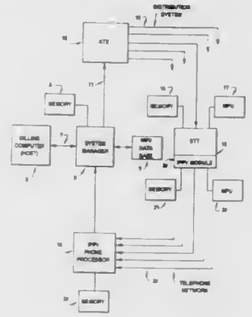
METHOD OF REDUCING WEAROUT IN A NON-VOLATILE MEMORY WITH DOUBLE BUFFER

David J. Naddor, Doraville, and Randolph J. Schaubs, Stone Mountain, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Apr. 29, 1988, Ser. No. 187,979
Int. Cl.[5] G11C *7/00, 11/40*
U.S. Cl. 365—185 20 Claims

1. A method of writing data to a non-volatile memory including memory locations $A_1 \ldots A_n$, the method comprising the steps of:
(a) storing information in a double buffer comprising at least two memory locations A_a, A_b of the memory locations $A_1 \ldots A_n$, the stored information at least including (1) the data to be written to said non-volatile memory and (2) at least one memory location A_i of the memory locations $A_1 \ldots A_n$ into which the data is to be written;
(b) writing the data to the at least one memory location A_i; and
(c) moving the double buffer from memory locations A_a, A_b to at least two memory locations A_c, A_d of the memory locations $A_1 \ldots A_n$ at a predetermined time.

9. A method of moving a double buffer from memory locations A_a, A_b of a non-volatile memory including memory locations $A_1 \ldots A_n$ to memory locations A_b, A_c of memory locations $A_1 \ldots A_n$, the double buffer storing information at least including (1) data to be written to a memory location of said non-volatile memory and (2) a memory location A_i of the memory locations $A_1 \ldots A_n$ into which the data is to be written, the data being written to memory location A_i in accordance with the information stored in the double buffer if power fails during the writing of the data to said non-volatile memory and if the information stored in the double buffer is determined to be valid, the method comprising the steps of:
clearing the information contained in memory locations A_a and A_b such that the information is invalid; and
writing data contained in memory location A_c to memory location A_a.



4,922,457

SERIAL ACCESS MEMORY SYSTEM PROVIDED WITH IMPROVED CASCADE BUFFER CIRCUIT

Takeshi Mizukami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 6, 1989, Ser. No. 306,607
Claims priority, application Japan, Feb. 4, 1988, 63-24893
Int. Cl.[5] G11C *7/00, 11/42*
U.S. Cl. 365—189.01 3 Claims



1. A serial access memory system comprising a serial access memory section to be accessed serially, a first external terminal receiving an input control signal assuming one of first and second levels, a second external terminal outputting one of said first and second levels, and a cascade buffer circuit coupled to said memory section, said first external and said second external terminals for operatively allowing said memory section to perform one of read and write operations, said cascade buffer circuit including first means for detecting a first change in said input control signal from said first level to said second level to generate a first detection signal, second means for detecting a second change in said input control signal from said second level to said first level to generate a second detection signal,

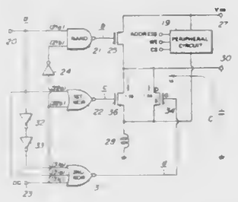
third means coupled to said first means and said memory section for operatively enabling said memory section to perform write operation in response to said first detection signal, fourth means coupled to said memory section and said second means for operatively enabling said memory section to perform read operation in response to said second detection signal, and fifth means coupled to said memory section and said second external terminal, said fifth means operatively causing at said second external terminal said first change when said memory section completes write operation and second change when said memory section completes read operation.

4,922,458

OUTPUT BUFFER CIRCUIT

Kazuo Watanabe, and Yoshinori Sato, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 883,119, Jul. 8, 1986. This application Sep. 26, 1988, Ser. No. 249,302
Claims priority, application Japan, Jul. 12, 1985, 60-153686
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—189.05 19 Claims



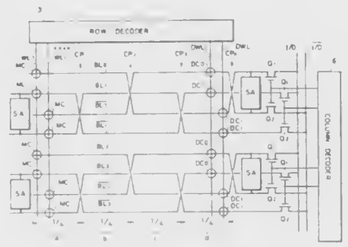
1. An output buffer circuit of a memory, comprising:
a pair of reference voltage source terminals each having a lead inductance, and a TTL circuit connected between said pair of reference voltage source terminals,
a pair of complementarily-connected switching means connected in series between said pair of reference voltage source terminals for receiving a data signal at respective input terminals thereof and for deriving an output data signal at a common connection point between output terminals thereof to be connected to a load capacitance, wherein:
either of said pair of complementarily-connected switching means comprises first and second switching means connected to each other in parallel between said common connection of said output terminals of said pair of complementarily-connected switching means and one of said pair of reference voltage source terminals, and
delay means cooperating with one of said first and second switching means, so that the data signal is applied to an input terminal of one of said first and second switching means and on a delayed basis to an input terminal of the other of said first and second switching means through said delay means, whereupon the load capacitance charges or discharges through the parallel paths respectively defined by said first and second switching means and said lead inductance in a way that the charge or discharge through one is delayed relative to the other in response to the delayed data signal.

4,922,459

DYNAMIC SEMICONDUCTOR MEMORY DEVICE

Hideto Hidaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1988, Ser. No. 236,361
Claims priority, application Japan, Aug. 28, 1987, 62-215915
Int. Cl.[5] G11C *11/34*
U.S. Cl. 365—206 8 Claims



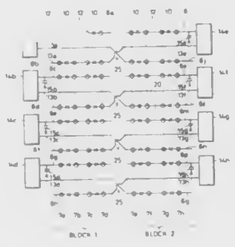
1. A semiconductor memory device, comprising:
a plurality of paired bit lines,
a plurality of sense amplifiers each coupled to a respective pair of said plurality of paired bit lines for detecting the potential difference between said paired bit lines,
at least one bit line of each of said plurality of paired bit lines having at least one portion intersecting with and overlapping a bit line of an adjacent paired bit line,
a plurality of word lines arranged intersecting with said plurality of paired bit lines,
a plurality of memory cells located at intersections of said plurality of paired bit lines and said plurality of word lines, respectively, and
cancelling means comprising the overlapping bit lines at said at least one portion for cancelling noises of capacitive coupling between said paired bit lines.

4,922,460

SEMICONDUCTOR MEMORY DEVICE WITH FOLDED BIT LINE STRUCTURE SUITABLE FOR HIGH DENSITY

Kiyohiro Furutani, and Kazutami Arimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 146,687, Jan. 20, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,516
Claims priority, application Japan, Jan. 26, 1987, 62-15705
Int. Cl.[5] G11C *13/00, 11/40*
U.S. Cl. 365—207 9 Claims



1. An improved integrated circuit memory cell array structure of a dynamic random access memory for high density, the improvement comprising:
a first subarray block;

first bit lines included in said first block, each said first bit line having a plurality of memory cells connected thereto,
second bit lines included in said first block, each said second said bit line comprising a conductive layer having no memory cells connected thereto,
third bit lines included in said first block, each said third bit line having a plurality of memory cells connected thereto,
said first block having a structure in which said first bit lines, said second bit lines and said third bit lines are repeatedly and periodically arranged in this order and are parallel with each other,
a second subarray block,
fourth bit lines included in said second block, each said fourth bit line having a plurality of memory cells connected thereto,
fifth bit lines include in said second block, each said fifth bit line comprising a conductive layer having no memory cells connected thereto,
sixth bit lines included in said second block, each said sixth bit line having a plurality of memory cells connected thereto,
said second block further comprising a structure in which said fourth bit lines, said fifth bit lines and said sixth bit lines are repeatedly and periodically arranged in this order and are parallel with each other,
first connecting means provided between said first block and said second block for connecting said second bit lines to said sixth bit lines,
second connecting means provided between said first block and said second block for connecting said third bit lines to said fifth bit lines,
first detecting means provided in said first block for differentially amplifying the difference in signal levels on said first bit lines, said second bit lines and said sixth bit lines,
second detecting means provided in said second block for differentially amplifying the difference in signal levels on said fourth bit lines, said third bit lines and said fifth bit lines wherein
said first detecting means is provided in an end opposite to said first and second connecting means in the first block, and
wherein said second detecting means is provided in an end opposite to said first and second connecting means in the second block.

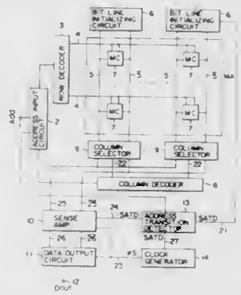
4,922,461

STATIC RANDOM ACCESS MEMORY WITH ADDRESS TRANSITION DETECTOR

Shigeyuki Hayakawa, Yokohama, and Masataka Matsui, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1989, Ser. No. 329,717
Claims priority, application Japan, Mar. 30, 1988, 63-74518; Mar. 30, 1988, 63-74519
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—230.08 12 Claims

1. A static random access memory comprising:
a memory cell array containing a plurality of static memory cells for storing data in a matrix fashion;
a plurality of word lines for selecting rows of the memory cells in said memory cell array, said word lines being arranged in respect to the rows of said memory cell array;
a plurality of bit line pairs being arranged in respect to columns of the memory cells in said memory cell array, each of said bit line pairs selecting a different one of the columns of said memory cells for transferring data to and from one of the memory cells coupled to said selected column;
address inputting means for providing an address signal corresponding to a different one of said memory cells of said memory cell array;
row decoder means for providing a row address signal in response to said address inputting means to selectively drive said word lines;
column decoder means for providing a column address signal in response to said address inputting means to select one of said bit line pairs;
address transition detector means for detecting transition of said address signal in response to said address inputting means and providing a corresponding address transition detect signal;
bit line initializing means for setting said plurality of paired bit lines to an initial potential in response to said address transition detect signal;
means for generating a clock signal in a read mode at a predetermined time in response to said address transition detect signal;
sense amplifier means coupled to said paired bit lines for amplifying data transmitted from a selected one of the memory cells to a respective one of the said bit line pairs,



said sense amplifier means including a differential amplifier means for differentially amplifying potentials sensed from said respective bit line pair, a differential amplifier initializing means for setting the output nodes of said differential amplifier means to an initial potential in response to said address transition detector means, and control means for activating and deactivating said differential amplifier means in response to said generated clock signal, said sense amplifier means being set to an initial potential in response to said address transition detect signal set to a neutral potential in response to said generated clock signal; and
data output means for transmitting said amplified data in response to said generated clock signal, said data output means being placed in a high impedance state in response to said sense amplifier means being set to the initial potential, retaining the amplified data at times when said clock signal generating means is inoperative, and transmitting a signal corresponding to said amplified data.

4,922,462

REVERSIBLE MEMORY STRUCTURE FOR OPTICAL READING AND WRITING AND WHICH IS CAPABLE OF ERASURE

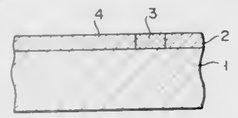
Sumio Ikegawa, Tokyo; Yoshiaki Terashima, Yokosuka; Nobuaki Yasuda, Zushi; Katsutarou Ichihara, Tokyo; Shuichi Komatsu, Yokohama, and Shinji Arai, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 815,035, Dec. 30, 1985, abandoned. This application Nov. 9, 1988, Ser. No. 270,445
Claims priority, application Japan, Dec. 28, 1984, 59-276098; Nov. 7, 1985, 60-247963; Nov. 7, 1985, 60-247964
Int. Cl.[5] G11C *13/04*
U.S. Cl. 365—113 13 Claims

1. A reversible memory system comprising:
a substrate having an upper surface;

a recording metal layer formed on said upper surface and adhering thereto of said substrate and essentially consisting of;

a recording medium made of an alloy which undergoes martensitic transformation from a first martensitic to a second martensitic phase at a predetermined temperature and which undergoes a stress-induced transformation in a region in which a pressure is applied at a temperature less than or equal to a predetermined characteristic temperature, the region in which the pressure is applied undergoing a transformation from the first to the second phase and



which remains adhered and non-deformed to said surface of said substrate in both first and second phases;

means for generating a pulsed laser beam;

means for directing the laser beam toward said recording layer in a recording mode, so as to allow the region in said recording layer irradiated with the laser beam to undergo said stress-induced transformation;

means for converting a portion of said recording layer from the second martensitic phase to the first martensitic phase by a martensitic reverse transformation; and

detecting means for detecting the phase state of the region in said recording layer.

4,922,463

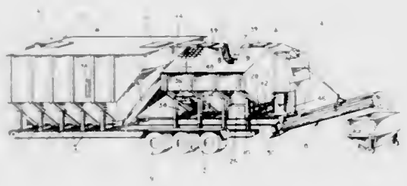
PORTABLE VOLUMETRIC CONCRETE MIXER/SILO

William Del Zotto, Ocala, Fla., and Jerry Lewis, Duluth, Minn., assignors to Del Zotto Manufacturing Co., Duluth, Minn.

Filed Aug. 22, 1988, Ser. No. 234,908

Int. Cl.[5] **B28C** *7/06;* **B01F** *13/02, 15/00, 15/02*

U.S. Cl. 366—21 **15 Claims**



1. A storage silo comprising:

(a) an enclosure having front and rear end walls, a top and a bottom wall, and vertical side walls defining an interior cavity and a channelway extending along the bottom and front end wall;

(b) an endless chain trained about a plurality of sprockets rotatively supported from ones of the enclosure walls and extending along said channelway;

(c) a plurality of vertical paddle members extending from opposite lateral sides of said chain;

(d) an enclosed vent housing having a plate member including a plurality of apertures separating an interior of said vent housing into upper and lower portions and including a plurality of bag members each having an open end in communication with one of said apertures and a closed end secured to a vibrating means, means in communication with the interior of said enclosure for passively conveying dust to the lower portion and further including means coupled in communication with the lower portion for collecting dust from said dust conveying means and matter vibrated from said plurality of bags;

(e) means for admitting pressurized air through the bottom of said storage enclosure; and

(f) means for driving said chain to convey stored contents to a discharge port.

4,922,464

PORTABLE MIXER FOR PROCESSING FOOD

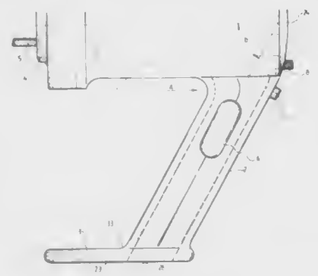
Karl-Heinz Kamprath, Wiesbaden, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Apr. 6, 1989, Ser. No. 334,682

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815177

Int. Cl.[5] **B01F** *15/06*

U.S. Cl. 366—349 **29 Claims**



1. An electrically powered portable mixer for processing food, including a housing (1) accommodating a motor (19), a gear box (20) and a receptacle means (21) connected to the gear box (20) for the fastening of processing tools (5), said housing having a longitudinal axis (24) a handle (2) for holding the portable mixer formed on said housing and extending transversely to said longitudinal axis (24) of said housing (1), at least one air duct (22) in said handle (2) to direct said cooling air towards said housing (1) from the outside and/or away from said housing (1), and air vent structure (11) on said handle (2) in communication with said air duct (22) for the passage of cooling air through the housing (1) for cooling the motor (19).

4,922,465

INTERPOLATION OF SEVERELY ALIASED EVENTS

Andrew W. Pieprzak, and James W. McClean, both of Houston, Tex., assignors to GECO A/S, Norway

Filed May 30, 1989, Ser. No. 358,426

Int. Cl.[5] **G01V** *1/36*

U.S. Cl. 367—38 **12 Claims**

1. A method of interpolating spatially aliased seismic data traces comprising the steps of:

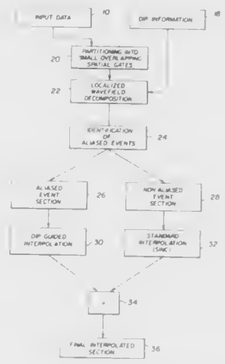
separating by wave field decomposition composite wavelets of a section of seismic data traces into their component wavelets,

identifying spatially aliased component wavelets to form a first class of wavelets,

identifying non-aliased component wavelets to form a second class of wavelets,

interpolating the wavelets in said second class with conventional interpolation techniques,

interpolating the wavelets in said first class in accordance with dip guided interpolation to provide the same number of traces as those comprising said second class of wavelets, and



summing said interpolated first and second classes of wavelets to provide a section of seismic data substantially free of spatial aliasing.

4,922,466

METHOD AND APPARATUS FOR PRESENTING SEISMIC TRACES

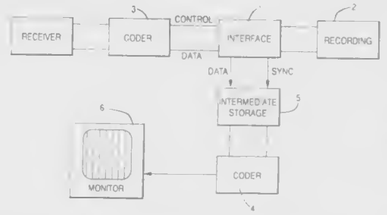
Burkhard Schmidt, Hanover, Fed. Rep. of Germany, assignor to Prakla-Seismos AG, Hanover, Fed. Rep. of Germany

Filed Sep. 29, 1988, Ser. No. 250,736

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3733470

Int. Cl.[5] **G01V** *1/34*

U.S. Cl. 367—68 **8 Claims**



1. A method for immediate display of seismic traces on a data output device in which the time-dependent received signals received substantially simultaneously from a large number of seismic detectors are converted into a standard digital data transmission format for transmission to a recording apparatus, each detector comprising a single receiver or a group of receivers, the data transmission format having first signal portions corresponding to exponents of the signals and second signal portions corresponding to mantissas of the signals, the method comprising

separating from the digital signal format signal portions corresponding to the exponent of the signal,

temporarily storing the separated signal exponent portions,

converting the temporarily stored signal portions into representational signal elements and

displaying the signal elements from each detector along a time line, each of the signal elements being displayed as a generally straight line, with the elements representative of signals received from various detectors being arranged in side-by-side relationship and generally perpendicular to the time line.

4,922,467

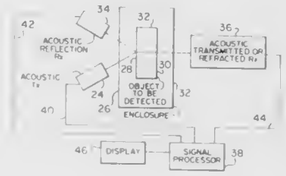
ACOUSTIC DETECTION APPARATUS

David D. Caulfield, 193 East Whitecroft, Sherwood Park, Alberta, Canada (T8B 1B7)

Filed Mar. 23, 1989, Ser. No. 327,720

Int. Cl.[5] **G01S** *15/00*

U.S. Cl. 367—87 **15 Claims**



1. An apparatus for use in detecting the substance of an object contained within an enclosure, said apparatus comprising:

acoustic transmitter means for transmitting a pulse of acoustic energy at a first side of said enclosure;

first acoustic receiver means for receiving acoustic energy reflected from the object to produce a reflected acoustic energy signal;

second acoustic receiver means for receiving acoustic energy which has been transmitted or refracted through said object to produce a transmitted or refracted acoustic energy signal;

signal processor means connected to said transmitter means and to said first and second receiver means, said signal processor means processing said transmitted pulse of acoustic energy, said reflected acoustic energy signal and said transmitted or refracted acoustic energy signal to produce an object signature indicative of said object; and

comparator means for comparing said object signature with the signature of known objects to determine the substance of said object.

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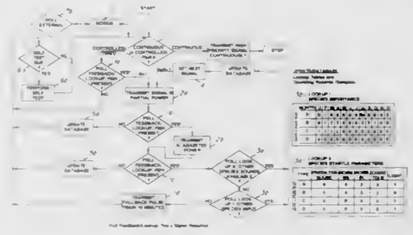
METHOD AND APPARATUS FOR CONTROLLING AQUATIC POPULATION IN DEFINED AREAS

John K. Menezes, East Lyme, Conn., assignor to Sonalysts, Inc., Waterford, Conn.

Filed Jun. 2, 1989, Ser. No. 360,478

Int. Cl.[5] **H04B** *1/02*

U.S. Cl. 367—139 **25 Claims**



1. A method for controlling the population of marine and aquatic creatures in limited areas comprising:

(a) detecting the presence of marine and aquatic creatures in the water in an area to be controlled; and

(b) generating in the water within said area stimuli to which species of marine and aquatic creatures are responsive to affect the population of said species in said area;

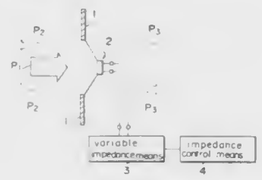
(c) dynamically monitoring the population of detected species in said area to determine the effectiveness of generated stimuli upon said species; and
(d) varying the generated stimuli based upon the feedback from such monitoring until the desired effect is obtained upon said monitored species.

4,922,469

ACOUSTIC CHARACTERISTICS CHANGING DEVICE HAVING VARIABLE CHARACTERISTICS

Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 3, 1989, Ser. No. 347,175
Claims priority, application Japan, May 6, 1988, 63-110944; Jun. 7, 1988, 63-140161
Int. Cl.[5] G10K *11/00*
U.S. Cl. 367—140 **4 Claims**



1 An acoustic characteristics changing device comprising:
a frame member of said device disposed in an acoustic energy field;
an electro-acoustic conversion means attached to said frame member to constitute at least a portion of said device;
a negative impedance means, connected as an electrical load to said electro-acoustic conversion means, for generating a negative impedance component for equivalently eliminating or invalidating an internal impedance inherent in said electro-acoustic conversion means;
a variable impedance means which has a reactance component connected in series with said negative impedance means and can vary said reactance component; and
an impedance control means which can arbitrarily control a decrease frequency of an acoustic impedance of said electro-acoustic conversion means with respect to an acoustic energy of the acoustic energy field by changing said reactance component of said variable impedance means.

4,922,470

BARREL STAVE PROJECTOR

Garfield W. McMahon, Dartmouth, and Dennis F. Jones, Halifax, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Nov. 15, 1988, Ser. No. 271,466
Int. Cl.[5] H01V *7/00*
U.S. Cl. 367—163 **20 Claims**



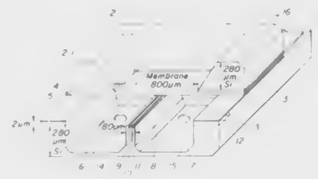
1 An underwater acoustical projector, comprising a spaced apart pair of polygonal shaped end plates, a ceramic driver of smaller cross-sectional size than each end plate, positioned between the end plates, and a set of staves secured from one end plate to the other, each stave being bent concavely inwardly towards the driver and being separated from each other stave by a gap.

4,922,471

CAPACITIVE SOUND TRANSDUCER

Wolfgang Kuehnel, Darmstadt, Fed. Rep. of Germany, assignor to Sennheiser Electronic KG, Wedemark, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 319,602
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807251
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—181 **6 Claims**



1. Capacitive sound transducer comprising
a first and a second semiconductor chip, the first semiconductor chip comprising a membrane unit and the second semiconductor chip comprising a counter-electrode structure, the first semiconductor chip being affixed to the second semiconductor chip;
an acoustic active portion of the membrane unit being separated from the counter-electrode structure by means of an air gap;
said membrane unit comprising semiconductive ground material and said acoustic active portion of said membrane unit having an electrically conductive surface confronting said counter-electrode structure;
said counter-electrode structure comprising a channel defining a source-drain arrangement operating according to field effect principle, whereby said acoustic active portion of the membrane unit and said counter-electrode structure form a sound transducer system;
said channel having a geometric width measurement and said acoustic active portion of said membrane unit having a geometric width, the width of the channel being on the order of magnitude of a tenth of the width of the acoustic active portion of the membrane unit.

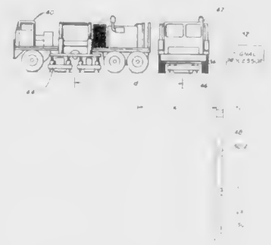
4,922,472

APPARATUS FOR INDUCING ELLIPTICALLY POLARIZED SHEAR WAVES IN AN EARTH MEDIUM

Jack H. Cole; John S. Gergely; Robert T. Baumel, all of Ponca City, and John E. Strecker, Tonkawa, all of Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 102,277, Sep. 28, 1987, abandoned, which is a continuation of Ser. No. 897,442, Aug. 18, 1986, abandoned. This application May 31, 1988, Ser. No. 205,623
Int. Cl.[5] G01V *1/09*
U.S. Cl. 367—189 **6 Claims**

1. Apparatus for generating elliptically polarized shear waves in an earth medium, comprising:
first mobile shear wave vibrator means to be positioned in engagement with said earth medium at a first position;
second mobile shear vibrator means to be positioned in engagement with said earth medium adjacent said first position and in cross-polarity to said first mobile shear wave vibrator; and
control means for driving said first and second vibrator means at frequencies that are phase-displaced by a preselected amount to produce a resultant wave propagation in the earth medium that is an elliptically polarized shear wave.

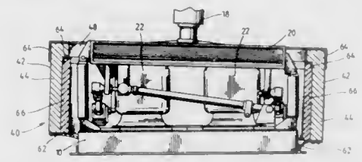


4,922,473

ENCLOSURE FOR SUPPRESSION OF AIR-COUPLED NOISE PRODUCED BY SEISMIC VIBRATORS

John J. Sallas, Plano; Richard H. Luce, Garland, and Michael A. Corrigan, Carrollton, all of Tex., assignors to Halliburton Geophysical Services, Inc., Dallas, Tex.

Filed Apr. 4, 1989, Ser. No. 333,295
Int. Cl.[5] H04R *11/00*
U.S. Cl. 367—189 **11 Claims**



1. Apparatus for suppressing the propagation of sound waves in air resulting from the vibration of a baseplate on a seismic vibrator, said baseplate having a predefined perimeter surface, comprising:
(a) a substantially rigid sound reducing enclosure surrounding at least an upper portion of the baseplate;
(b) means for flexibly sealing the sound reducing enclosure to the predefined perimeter surface of the baseplate;
(c) means for vibrationally isolating the sound reducing enclosure from the baseplate; and
(d) means for vibrationally isolating the sound reducing enclosure from the ground.

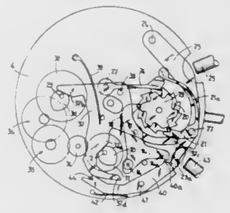
4,922,474

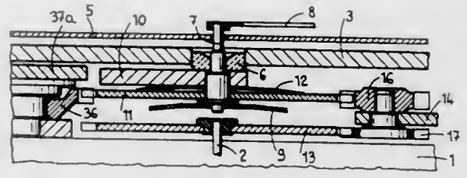
TIMEPIECE AND METHOD FOR ITS REALIZATION

Michiel Groothuis, Saint-Imier, Switzerland, assignor to Conseilray S.A., Switzerland

Filed May 6, 1988, Ser. No. 190,708
Claims priority, application Switzerland, May 12, 1987, 1815/87
Int. Cl.[5] G04F *8/00*; G04B *27/02*
U.S. Cl. 368—113 **10 Claims**

1. A timepiece having at least one indicating member the driving of which is able to be interrupted by uncoupling a driving mechanism thereof, comprising a base clockwork driving at least one time indicator mounted on a shaft on a base frame to which is secured a frame of an auxiliary mechanism carrying the indicating member, said indicating member including a shaft coaxial with said base clockwork shaft, said base clockwork shaft carrying, situated on the side of the auxiliary mechanism, a base clock-work drive wheel which is coaxial with a drive wheel carried by said indicating member shaft, a driving mechanism of said indicating member including a double sliding pinion able to occupy two positions, a coupling position meshing with both said two coaxial drive wheels to connect said drive wheels together, said base clockwork





drive wheel driving said indicating drive wheel member, and a second uncoupling position not meshing with said wheels so that said indicating member drive wheel is not driven to drive said indicating member.

4,922,475

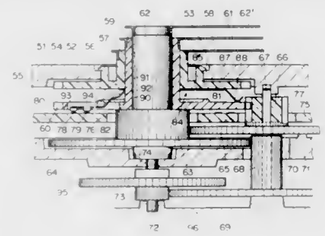
ALARM CLOCK HAVING MEANS FOR BRIDGING TWO CIRCULAR CONDUCTING PATHS VIA AN ADJUSTABLE CONTACT MEANS THEREBY CAUSING GENERATION OF AN ACOUSTIC ALARM SYSTEM

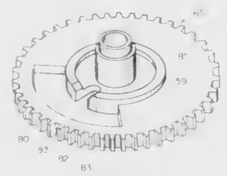
Matthias Scholer, Lengacker 119b, 4938 Rohrbach b. Huttwil, Switzerland

PCT No. PCT/CH87/00069, § 371 Date Feb. 16, 1988, § 102(e) Date Feb. 16, 1988, PCT Pub. No. WO87/07966, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 17, 1987, Ser. No. 162,327
Claims priority, application Switzerland, Jun. 18, 1986, 2464/86
Int. Cl.[5] G04C *21/16, 23/16*
U.S. Cl. 368—252 **10 Claims**

1. An alarm clock comprising: a movement;
a printed circuit board for receiving electronic components;
an alarm signal device for generating an acoustic alarm signal;
an adjustable electrical contact means for putting the alarm signal device in operation;
means for setting said adjustable electrical contact means in a presclected alarm time position;
switch means for shutting off the alarm signal generation;
said printed circuit board (**14** or **75**) having an opening through which a pipe (**7** or **59**) of a movable hour-wheel of the movement extends, characterized in that on the printed circuit board (**14** or **75**) there are two circular conductor paths (**17** and **18** or **78** and **79**) disposed concentrically with the hour-wheel pipe (**7** or **59**);
said adjustable electrical contact means including a portion for bridging and contacting said circular conductor paths;
means for mounting said adjustable electrical contact means so that said bridging and contacting portion is spaced from the circular conducting paths and from said hour-wheel; and
means for bridging and contacting the circular conducting

paths when said hour-wheel reaches said preselected alarm time position thereby initiating generation of the acoustic alarm signal, said means for bridging and contacting including said adjustable electrical contact means.





4,922,476

PLAYING METHOD FOR DISK PLAYER

Kazuhiro Kiyoura; Fumio Endo; Toshiyuki Kimura; Yoshio Aoyagi, and Kazunari Nakamura, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 103,314, Oct. 1, 1987, Pat. No. 4,841,506. This application Feb. 21, 1989, Ser. No. 312,155

Claims priority, application Japan, Oct. 1, 1986, 61-233723; Oct. 1, 1986, 61-233724; Oct. 1, 1986, 61-233725; Oct. 1, 1986, 61-233726; Oct. 1, 1986, 61-233727; Oct. 1, 1986, 61-233728

Int. Cl.[5] G11B *7/00, 7/095*

U.S. Cl. 369—47 2 Claims



1. A playback method for a multidisk player having means for holding a plurality of disks, each of the disks having recorded thereon identifying data which uniquely identifies that disk, the method comprising the steps of:

selecting one of the disks for playback;

reading and storing the identifying data recorded on the selected disk;

playing back information recorded on the selected disk;

storing, in a location corresponding to the stored identifying data of the selected disk, information representing playing characteristics of the player which are manually adjusted by a user during playback of the selected disk, whereby the information representing the manually adjusted playing characteristics of the player is used for controlling the player during subsequent playback of the selected disk.

4,922,477

OPTICAL HEAD UNIT

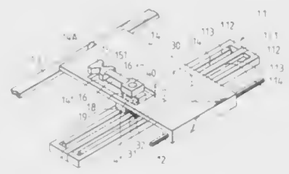
Masafumi Miura, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed May 27, 1988, Ser. No. 200,052

Claims priority, application Japan, May 30, 1987, 62-84602[U]; May 31, 1987, 62-84840[U]

Int. Cl.[5] G11B *7/12;* G02B *7/02*

U.S. Cl. 369—221 4 Claims



1. An optical head unit comprising:

a housing having a chassis base;

a single magnetic circuit provided on said chassis base in such a manner as to be parallel to a radial direction of a disk to be read by said optical head unit;

a head base provided over said magnetic circuit in such a manner that said head base can be reciprocated in said radial direction of said disk;

first and second elastic supporting members;

an objective lens holder supported by said head base in such a manner that said objective lens holder is rockable in said radial direction of said disk through said first elastic supporting member;

a head feeding coil secured to said head base; and

a focusing coil and a tracking coil mounted on said objective lens holder,

said head feeding coil, focusing coil and tracking coil being coupled to said single magnetic circuit in such a manner as to be movable in said radical direction of said disk.

4,922,478

DEVICE FOR SUPPORTING A SUB-FRAME OF A DISC RECORD PLAYER ON A FRAME, AND DISC RECORD PLAYER COMPRISING SUCH A DEVICE

Johannes P. C. M. Verhagen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1988, Ser. No. 178,703

Claims priority, application Netherlands, Apr. 24, 1987, 8700969

Int. Cl.[5] G11B *25/04*

U.S. Cl. 369—247 8 Claims

1. A device for supporting a sub-frame (1) of a disc record player on a frame (2), comprising a plurality of supporting elements (10) arranged between the frame and the sub-frame for damping vibrations or shocks exerted on the sub-frame via the frame, the sub-frame carrying parts, including a turn-table (3) and a scanning arm (4) with a scanning element (6), which arm is pivotable about a pivotal axis (5), characterized in that the supporting elements (10) are connected to the sub-frame by means of pivotal joints (20; 25), the pivotal axis (21) of said joints (20; 25) being oriented radially or substantially radially of the mass centre (M) of the sub-frame (1) including the parts carried by said sub-frame.

4,922,479

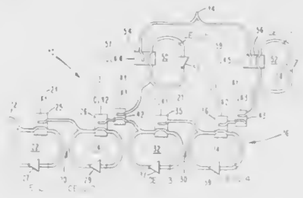
OPTICAL TIME SLOT INTERCHANGER USING ONE-BIT MEMORY CELLS

Shing-Fong Su, Southboro, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 23, 1988, Ser. No. 289,637

Int. Cl.[5] H04J *14/00, 14/08;* H04B *10/00*

U.S. Cl. 370—1 6 Claims



1. An optical time slot interchanger for interchanging optical pulses in a bit-interleaved format, comprising:

an N bit optical serial-to-parallel converter serving as input means to said time slot interchanger, said N bit optical serial-to-parallel converter comprising:

N single bit optical shift registers, each of said shift registers having an input port adapted to receive optical pulses and an output port adapted to output optical pulses responsive to control signals;

means to optically couple said N optical shift registers in cascade such that the output port of one optical shift register is optically coupled to the input port of the next sequential optical shift register in said cascade, and the input port of the first optical shift register in said cascade serves as the input port of said converter;

means to load and shift each pulse of a frame of N optical pulses received serially at the input port of the first optical shift register of said cascade into said cascaded optical shift registers until each of said N optical shift registers has stored one of said N optical pulses;

N first optical switching means, each of which has an input end optically coupled to an output of one of said optical shift registers, and a first output end optically coupled to the input port of the next sequential optical shift register in said cascade, and a second output end serving as an output port of said serial-to-parallel converter;

such that said serial-to-parallel converter is adapted to receive serially and store temporarily each frame of N optical pulses, having an input port adapted to receive optical pulses serially and N output ports adapted to output said N optical pulses in parallel, responsive to control signals; said converter serving as input means to said time slot interchanger;

N single-bit optical memory cells each of which is optically coupled to one of said output ports of said optical serial-to-parallel converter; said optical memory cells serving as optical storage means to store N optical pulses of a frame as outputted from said optical serial-to-parallel converter;

optical output means optically coupled to said optical storage means adapted to output said N optical pulses serially, interchanging the positions of said optical pulses in said frame, whereby the time slots of said optical pulses in said frame are interchanged in a bit-interleaved format; and

control means to load and shift each of said N serial optical pulses received at the input of said optical converter into said converter, from said converter into said optical storage means, and from said optical storage means to said optical output means; said control means adapted to provide signals to control the input, storage and output of said optical pulses.

4,922,480

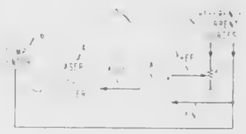
TECHNIQUE FOR IMPROVING THE PERCENTAGE OF SEMICONDUCTOR LASERS USABLE WITH A PREDETERMINED WAVELENGTH SPECIFICATION

Fridolin L. Bosch, Bethlehem, Pa., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Dec. 2, 1987, Ser. No. 127,843

Int. Cl.[5] H04B *9/00*

U.S. Cl. 370—3 6 Claims



1. A method of manufacturing laser transmitters to meet a predefined wavelength specification of $\lambda_o \pm \Delta\lambda$, comprising the following steps performed prior to installation of the transmitters in a communication system:

(a) providing a plurality of semiconductor lasers which have a distribution of natural wavelengths which exceed the specification $\lambda_o \pm \Delta\lambda$;

(b) installing the lasers in control circuits which enable the operating temperature of the lasers to be changed;

(c) operating the lasers in the control circuits to identify those lasers which fall within a first band below the speci-

fication and those which fall within a second band above the specification;

(d) adjusting the control circuits of those lasers which fall within the first band so as to heat the lasers until the operating wavelengths are within the specification; and

(e) adjusting the control circuits of those lasers which fall within the second band so as to cool the lasers until the operating wavelengths are within the specification,

wherein in performing steps (d) and (e), thermoelectric means are utilized to head and cool the lasers and the following steps are performed:

(1) providing from the control circuit an output signal of a known polarity (V_{out}) to the thermoelectric means, the output signal being of a first polarity when heating is desired and a second, opposite polarity when cooling is desired; and

(2) adjusting the magnitude of said output signal to provide the required heating and cooling of steps (d) and (e).

4,922,481

OPTICAL COMMUNICATION SYSTEMS ENABLING MINIMAL SUBSCRIBER COMPONENTS

John W. Hicks, 312 Howard St., Northboro, Mass. 01532

Continuation-in-part of Ser. No. 908,362, Sep. 17, 1986, and a continuation-in-part of Ser. No. 761,366, Aug. 1, 1985, Pat. No. 4,778,238. This application Sep. 21, 1987, Ser. No. 99,004

Int. Cl.[5] H04B *9/00*

U.S. Cl. 370—4 3 Claims



1 An optical communication system comprising:

(a) means for receiving incoming communication signals from a transmission side of said system;

(b) means for converting said incoming signals to a train of time-divided optical multiplexed signals at a common optical frequency;

(c) means for transmitting said multiplexed signals to a street line on a receiver side of said system, said street line servicing a plurality of receiver stations; and

(d) means for demultiplexing said time-divided multiplexed train of optical signals and delivering a component of said signals to a receiver station preset to receive a signal from one said time slot in said train, said demultiplexing means comprising:

(e) means to provide a heterodyne pulse;

(f) partial achromatic tap means for removing a portion of the power each of

(1) said multiplexed signals; and

(2) said heterodyne pulse;

(g) means to combine the partial taps of said heterodyne and said multiplexed signal power into a single optical fiber for transmission to a plurality of receiver stations along a street line and for each receiver station along said street line;

(h) means to detect the combined heterodyne and multiplexed signal portion;

(i) electronic means for monitoring said detected signal and selectively passing a beat frequency corresponding to the difference in frequency between said heterodyne and multiplexed signal portions;

(j) means to coordinate synchronicity of heterodyne pulse with said time slot of said signal pulse which is to be selected for a receiver station; and

means between receiving stations to produce a shift in synchronicity such that said heterodyne pulse is synchronous with the time slot to be selected for transmissions to another receiver station further down said street line.

4,922,482

APPARATUS AND METHOD FOR CREATING A DATA BUS ACCESS CONTEST

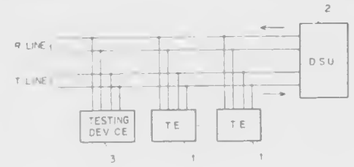
Keitaro Tanahashi, Shizuoka, and Yuzuru Murata, Yokosuka, both of Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 226,096

Claims priority, application Japan, Jul. 29, 1987, 62-189755

Int. Cl.[5] H04L *11/12*

U.S. Cl. 370—13 3 Claims



1 A method for creating a contest among a plurality of terminal equipment units coupled to a digital service unit by a data bus in an Integrated Service Digital Network-compatible network for access to the data bus, the terminal equipment units intermittently transmitting a digital control data in a D channel to request access to the data bus, said method comprising:

using a testing device to transmit the digital control data in the D channel through the data bus to the digital service unit for a first selected time to cause the testing device to gain access to the data bus, the first selected time being of a sufficient duration that the terminal equipment units assume a call demand state; and

terminating transmission of the digital control data from the testing device for a second selected time of duration sufficient that the terminal equipment units simultaneously transmit the digital control data and enter into a contest among the terminal equipment units for access to the data bus.

4,922,483

MULTI-CHANNEL PCM MUSIC BROADCASTING SYSTEM

Hirokazu Kobayashi, Urawa, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,721

Claims priority, application Japan, Oct. 2, 1987, 62-247994

Int. Cl.[5] H04J *4/00*

U.S. Cl. 370—50 6 Claims

1 A music broadcasting system comprising:

a transmitter including,

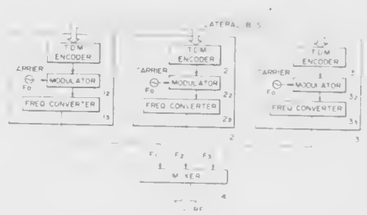
(a) a plurality of time division multiplex (TDM) units, each unit accommodating music source channels and multiplexing signals from the music source channels in TDM channels to produce a TDM signal; and

(b) a frequency division multiplex (FDM) unit for multiplexing the TDM signals from said plurality of TDM units in assigned frequency bands to produce a FDM signal for transmission,

wherein the TDM signal in each frequency band includes music data for music source channels accommodated by the TDM unit corresponding to the same frequency band and header data for music source channels accommodated by all the TDM units in the transmitter, and the header data includes operation mode information representative of association of the music source channel with the frequency band for every music source channel;

a receiver including,

(a) means for receiving the transmitted FDM signal for the selected frequency band;



(b) means for reproducing the TDM signal in the selected frequency band;

(c) means for detecting the header data in the selectively received TDM signal; and

(d) control means responsive to the designation of the music source channel by an operator for identifying the frequency band associated with the designated music source by referring to the detected header data and controlling said receiving means to receive the transmitted FDM signal for the identified frequency band.

4,922,484

ISDN REMOTE SWITCHING UNIT FOR ACCOMMODATING ANALOG AND DIGITAL LINES

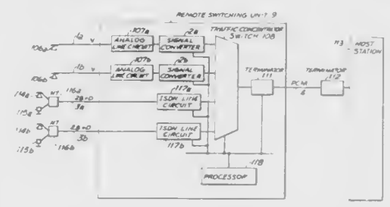
Yoshinori Yoshida; Akira Arutaki; Masao Hashimoto, and Suminori Yoshikawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,595

Claims priority, application Japan, Jul. 22, 1987, 62-181147; Jul. 24, 1987, 62-182221; Jul. 24, 1987, 62-182222

Int. Cl.[5] H04J *3/12*

U.S. Cl. 370—68.1 4 Claims



1. An ISDN remote switching unit accommodating analog telephone subscribers and ISDN digital subscribers and disposed separately from a host station and connected thereto via a PCM line, the switching unit comprising:

at least one analog telephone line circuit for terminating an analog telephone subscriber line;

at least one ISDN digital line circuit for terminating a digital terminal;

a traffic concentrator switch connected to said telephone line circuit and said ISDN digital line circuit for concentrating traffics on said PCM line;

processing means for controlling the remote switching unit; and

signal converter means connected to said analog telephone line circuit and to said processing means and including a detector for detecting an on and off of a direct current in said subscriber line, a multifrequency signal receiver, a ring set circuit for transmitting a ringing signal to an analog telephone subscriber, a tone circuit for transmitting an audible tone signal to said analog telephone subscriber, and a controller;

said converter means converting an off-hook signal, an on-hook signal, dial pulses and a multifrequency signal of said analog telephone subscribers into an ISDN-D channel protocol message to be transmitted to said processing means, and said converter means converting the ISDN-D channel protocol message from said processing means into the ringing signal and the audible tone signal for said analog telephone subscribers, wherein

said processing means multiplexes the ISDN-D channel protocol messages from said ISDN digital line circuit and said converter means and transmits the messages to said host station via said PCM line, and said processing means demultiplexes the ISDN-D channel protocol messages received from said host station and transmits the ISDN-D channel protocol messages to said ISDN digital line circuit and said converter means.

4,922,485

SYSTEM FOR CHANGING PRIORITY OF PACKETS OF DATA

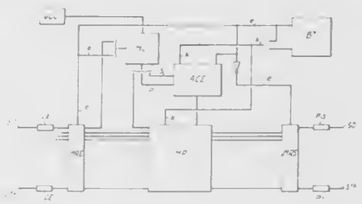
Jean-Paul Quinquis, Perros-Guirec; Michel Servel, and Joël Francois, both of Lannion, all of France, assignors to L'Etat Francais, France

Filed Jun. 24, 1988, Ser. No. 211,381

Claims priority, application France, Jul. 16, 1987, 87 10255

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—60 17 Claims



1. A system for switching information packets having two assigned levels of semantic priorities, said system comprising entering time multiplex lines, outgoing time multiplex lines, information packet switching means coupled between said entering and outgoing lines, a queueing file associated with each outgoing line, buffer memory means for storing a read address of a packet in said queueing file associated with an outgoing line which is to be used to transmit the packet, the read address being accompanied by a bit which defines a priority level of the packet, each of said queueing files comprising two zones coupled in series between an input and an output, means for writing only high priority level packets into the first zone only when the second zone is full, said writing occurring between the readings of said queueing files, and means for overwriting the read addresses of low priority level packets which were stored earlier than the oldest read address of high priority level packets which are present in the queueing file, the number of low priority packets being overwritten being equal, at a maximum, to the number of read addresses stored in the first zone.

VOL 1114 ISS 1 MY 1 1990 UMI

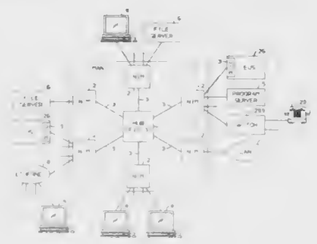
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4,922,486

USER TO NETWORK INTERFACE PROTOCOL FOR PACKET COMMUNICATIONS NETWORKS

William P. Lidinsky, Naperville; Gary A. Roediger, Downers Grove; Scott B. Steele, Naperville, and Ronald C. Weddige, Western Springs, all of Ill., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Mar. 31, 1988, Ser. No. 175,693
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—60 6 Claims



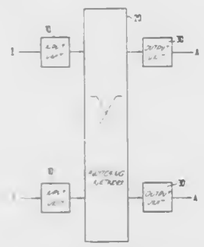
1. A protocol for a data network, comprising:
a data packet header comprising an identification of a source and a destination;
wherein said data network comprises means for checking for each data entity that transmission from said source to said destination is authorized prior to transmitting said each data entity to said destination if network transmission capacity is available.

4,922,487

PACKET-SWITCHING FACILITIES

Gert Eilenberger, Kirchheim; Karl Schrodi, Heimsheim, and Stefan Wahl, Hemmingen, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Dec. 16, 1988, Ser. No. 286,305
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3742941
Int. Cl.[5] H04L *11/20;* H04Q *11/04*
U.S. Cl. 370—60 4 Claims



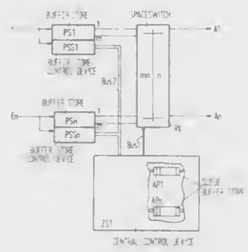
1. Packet-switching apparatus comprising
a plurality of inputs for receiving packets,
a plurality of outputs for transmitting packets,
a switching network for transferring packets between selected inputs and selected outputs,
a plurality of input units, each coupled between a respective one of the inputs and the switching network and further comprising
first means for dividing each packet into a respective plurality of subpackets and
second means for distributing the associated subpackets together with subpackets of other packets over a period of time longer than that of a single packet according to a predetermined pattern, and
a plurality of output units, each coupled between the switching network and a respective one of the outputs and further comprising
third means for recombining each of the respective plurality of subpackets into a respective packet on the basis of the predetermined pattern,
wherein
the subpackets are transferred through the switching network separately,
a plurality of packets are combined by each input unit into a frame,
all packets are divided by said first means into a plurality of subpackets of equal length,
the subpackets are re-sorted in time by said second means such that each frame is divided into a plurality of subframes,
the number of subpackets within a subframe is equal to the number of packets within a frame,
the subpackets belonging to the same packet occupy the same position within each subframe,
time-division-multiplex channels through the switching network are determined by the first subpackets of the respective packets,
the subpackets following the first subpackets use the thus-determined time-division-multiplex channels, and
the subpackets belonging to each packet are recombined by the third means in the respective output unit.

4,922,488

SWITCHING NODE FOR SWITCHING DATA SIGNALS TRANSMITTED IN DATA PACKETS

Gerd Niestegge, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 10, 1988, Ser. No. 269,520
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738334
Int. Cl.[5] H04L *11/20*
U.S. Cl. 370—60 3 Claims



1. A switching node for switching data signals transmitted in data packets including address signals, comprising:
a space switch having a plurality m×n of input terminals and a plurality n of output terminals with m≦n;
at least one coupling element including a plurality n of input lines and a plurality n of output lines selectably coupled to the input lines via said space switch;
a plurality of buffer stores being respectively associated with the input lines, in each of which a plurality k of data packets with m≦k occurring on the particular input line are storable before being routed to the output line identified by the address signals contained in the particular data packet, and having a plurality m of output terminals via which, simultaneously, m data packets stored in the particular buffer store and to be routed to m different output lines are suppliable to the space switch;

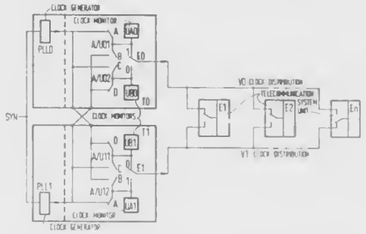
a plurality of control devices, respectively associated with the buffer stores, which, upon the reception of a data packet into a free storage space of the particular buffer store, makes available a storage address identifying the particular storage area, the particular buffer store, and the address signals contained in the particular data packet identifying one of the output lines;
a queue buffer store assigned to the output lines in which, according to the address signals made available by the control devices, the storage addresses occurring together with them can be written, wherein the queue buffer stores are cyclically accessible by an associated central control device in given successive time intervals each time for the output of one storage address; wherein
the central control device, on the basis of the storage addresses made available by the queue buffer storages, controls the control of the space switch and, for the control of the output of data packets from the possible buffer stores, supplies the available storage addresses and information regarding the output terminal of the particular buffer store to be used for the particular output of a data packet, to the control devices associated with them.

4,922,489

CIRCUIT CONFIGURATION FOR ROUTINE TESTING OF THE CLOCK SUPPLY OF A LARGE NUMBER OF UNITS OPERATED WITH THE SAME CLOCK

Wolfram Ernst, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,219
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3736000
Int. Cl.[5] H04J *3/06*
U.S. Cl. 370—100.1 1 Claim



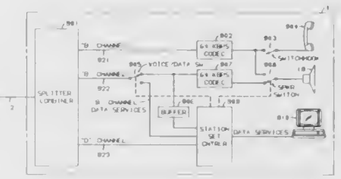
1. A circuit configuration for routine testing of the clock supply of a large number of digital time division multiplex telecommunication system units operated by the same clock, in which two clock generators are operated synchronously with respect to frequency, but not phase-locked with respect to each other, depending on the switching position of a change-over switching device, function alternatively as an active clock generator via a first and a second distribution system to which the individual telecommunications system units are connected, to supply a common clock for the units, or as a stand-by for taking over the clock supply in the event of replacement switching, and with each of said telecommunication system units having a monitor device responding in the event of failure of their individual clock supply as provided by a selected one of said clock generators, the improvement comprising:
pairs of additional monitor devices in which one of said additional monitor devices monitors one of said clock generators supplying said first distribution system and also monitors one of said clock generators supplying said second distribution system and including other monitor devices to monitor the other clock generator through two pairs of on/alter switches which are each respectively connected between one of the clock generators and a corresponding change-over switch of said switchover arrangement, with each of the on/alter switches of the pairs in the change-over switching position establishing a connection to the other clock generator and thereby, depending on the switching position of the particular alter switch of the change-over switching device, couple or decouple the clock as provided by said clock generators to said first or second distribution system and with each of the on/alter switches in its switching off position cutting off another of the monitor devices in pairs from one of the clock generators.

4,922,490

TELEPHONE STATION SET

James R. Blakley, Chicago, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Aug. 8, 1988, Ser. No. 230,281
Int. Cl.[5] H04J *3/12;* H04Q *11/04*
U.S. Cl. 370—110.1 4 Claims



1. An ISDN speakerphone station set connectable to a digital subscriber line comprising first and second B-channels and a D-channel, said station set comprising
switch-hook means having on-hook and off-hook states,
splitter/combiner means for digitally interfacing said first and second B-channels and said D-channel of said line with a first B-channel path, a second B-channel path, and a D-channel path, respectively,
a first coder/decorder for converting between digital voice signals, received from said first B-channel via said splitter/combiner means and said first B-channel path, and analog voice signals,
a second coder/decoder for converting between digital voice signals, received from said second B-channel via said splitter/combiner means and said second B-channel path, and analog voice signals,
a station set speaker,
speaker switch means having a first position for connecting said first coder/decoder with said speaker and having a second position for connecting said second coder/decoder with said speaker, and
station set controller means responsive to receipt, during the on-hook state of said switch-hook means, of a message from said D-channel via said splitter/combiner means and saidi D-channel path for placing said speaker switch means in said second position to couple a voice announcement on said second B-channel via said splitter/combiner means and said second coder/decoder to said speaker.

4,922,491

INPUT/OUTPUT DEVICE SERVICE ALERT FUNCTION

Jerry L. Coale, Aptos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1988, Ser. No. 239,154
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—16.1 11 Claims

1. In a computer peripheral subsystem connected to a host computer system, a method of automatically detecting and analyzing exception events occurring in said peripheral subsystem comprising:
maintaining a Subsystem Environment data base comprising information relating to the current configuration of said

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computer peripheral subsystem and usage and error information relating to said peripheral subsystem;

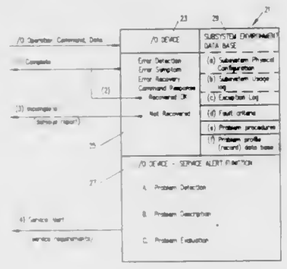
conditionally invoking a Problem Description procedure when the data in said Subsystem Environment data base reflects an exception event that indicates either a clear or a probable need for service attention to said peripheral subsystem, said Problem Description procedure comprising:

creating from stored rules a view of said Subsystem Environment data base relevant to said exception event;

developing a current Problem Profile record describing said exception event;

scanning a Problem Profile data base comprising Problem Profile records of previously occurring exception events to relate said current Problem Profile record to a Problem Profile record that already exists in said Problem Profile data base;

if said current Problem Profile record matches an existing Problem Profile record in said Problem Profile data base, and said existing Problem Profile record indicates that a service action is pending for the covered problem, updating said existing Problem Profile record;



if said current Problem Profile record matches an existing Problem Profile record in said Problem Profile data base, and said existing Problem Profile record indicates that a service action is not pending for the covered problem, updating said existing Problem Profile record and invoking a Problem Evaluation procedure;

if said current Problem Profile record does not match an existing Problem Profile record in said Problem Profile data base, adding said current Problem Profile record to said Problem Profile data base;

wherein said Problem Evaluation procedure comprises:

examining said current Problem Profile record in view of stored rules relating to acceptable subsystem performance; and

if operations of said peripheral subsystem have been disrupted or degraded beyond the limits of acceptable subsystem performance, generating a service alert message, and inserting said service alert message into said Problem Profile record, updating said existing Problem Profile record in said Problem Profile data base, and transmitting said service alert message to said host system.

4,922,492

ARCHITECTURE AND DEVICE FOR TESTABLE MIXED ANALOG AND DIGITAL VLSI CIRCUITS

Patrick P. Fasang, Saratoga, and Daryl E. Mullins, Pleasanton, both of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed May 13, 1988, Ser. No. 193,623
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—22.1 **23 Claims**

1. A mixed analog/digital ASIC chip

an analog circuit, including:

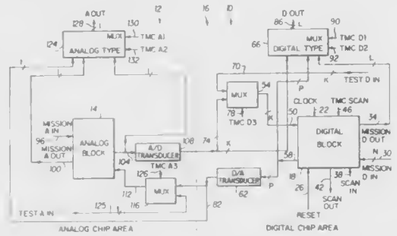
an analog input terminal for receiving analog information derived from a digital circuit; and

a first analog output terminal for providing analog information to the digital circuit;

a digital circuit, including:

a digital input terminal for receiving digital information derived from the analog circuit; and

a first digital output terminal for providing digital information to the analog circuit; and



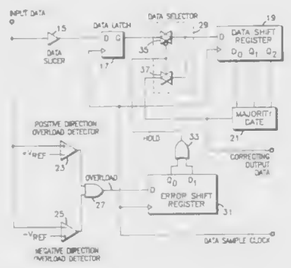
a first analog multiplexer, coupled to the first digital output terminal, to the analog input terminal, and to an analog test signal source, for selectively providing signals from one of the first digital output terminal or the analog test signal source to the analog input terminal.

4,922,493

ERROR DETECTION AND CORRECTION CIRCUIT

Kiyoshi Kase, Chiba, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1988, Ser. No. 232,191
Claims priority, application Japan, Sep. 10, 1987, 62-225197
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—31 **4 Claims**



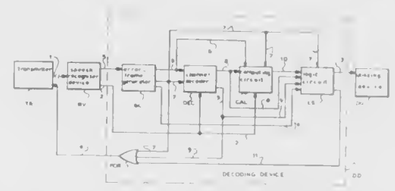
1. An error detection and correction circuit comprising an overload detector which detects when an input signal level goes beyond a predetermined range of change and develops an overload signal, an error correction period setting part connected to receive the overload signal and providing an error correction signal for a specified period after the overload signal is provided from the overload detector, a data memory which sequentially stores a predetermined amount of input signal data, a majority gate connected to said data memory for developing a majority signal determined by the majority rule of the predetermined amount of data stored in said data memory, and a switch circuit connected to said data memory, said correction period setting part, and said majority gate for providing an output of said majority gate in place of the signal corresponding to the input signal data to said data memory while the error correction signal exists.

4,922,494

METHOD OF AND CIRCUIT FOR DECODING BLOCK-CODED MESSAGES AFFECTED BY SYMBOL SUBSTITUTIONS, INSERTIONS AND DELETIONS

Giancarlo Pirani, and Giorgio Taricco, both of Turin, Italy, assignors to CSELT (Centro Studi e Laboratori Telecomunicazioni S.p.A.), Turin, Italy

Filed May 6, 1988, Ser. No. 191,206
Claims priority, application Italy, May 20, 1987, 67438 A/87
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—35 **10 Claims**



1. A method of decoding received messages coded as blocks of a fixed number of symbols and affected by symbol substitutions, deletions and insertions, said method comprising the steps of:

(a) generating for each message received of a length lying in a predetermined range, a sequence of words forming error frames and comprised of all combinations of positions of possible deletions and insertions of a message of the said length, each said word being composed of a number of symbols equal to said fixed number, each symbol indicating at least one of the states:

(a_1) deletion error, (a_2) insertion error, and (a_3) reception of a symbol in correspondence with a transmitted symbol;

(b) decoding said words of each message received, using said error frames, to obtain a decoded word for each error frame;

(c) calculating a value of a probability that each decoded word of step (b) is actually a word transmitted as the respective message; and

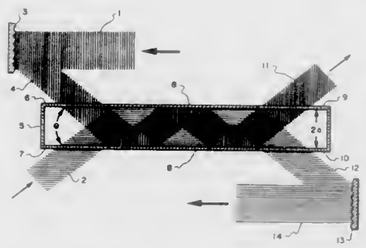
thereafter selectively emitting as a decoded message the decoded word of step (b) whose probability calculated in step (c) satisfies predetermined criteria as to freedom from error and, if no word satisfies said criteria, generating a request for retransmission of the respective message.

4,922,495

BROAD BAND CROSSED-BEAM RAMAN AMPLIFIER

Bradley L. Bobbs, Granada Hills, and Jeffrey A. Goldstone, Newbury Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 7, 1989, Ser. No. 390,131
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—3 **10 Claims**



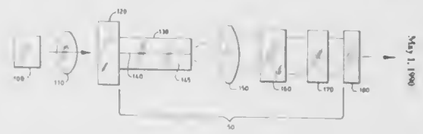
1. A crossed-beam Raman amplifier having an input pump beam and a Stokes seed beam introduced into a Raman cell at wide angles providing a crossed-beam geometry in which said pump beam has plural pump lines each angle-tuned at a phase matching angle relative to a Stokes seed line, whereby the ratio of amplification to cell length is maximized.

4,922,496

ARMONIC GENERATION IN OPTICAL FIBERS

Hong Po, Sherborn, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 17, 1987, Ser. No. 134,016
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—6 **10 Claims**



1. Apparatus for providing second harmonic generated radiation which comprises:

an optical fiber disposed in a laser cavity, the optical fiber having a substantially single-mode core which is doped with an active laser material, the laser material being self-organizable to produce radiation by second harmonic generation, the laser material further being substantially transparent to the second harmonic generated radiation; and

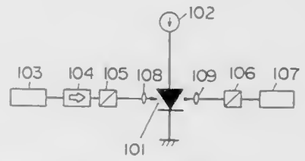
means for pumping the core of the optical fiber to produce laser radiation therein and said laser cavity further comprising means for extracting at least a portion of the second harmonic generated radiation.

4,922,497

OPTICAL LOGIC CIRCUIT

Yoshihiro Mori, Hirakata, and Jun Shibata, Kawachinagano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 94,404, Sep. 8, 1987, abandoned. This application Feb. 7, 1989, Ser. No. 309,919
Claims priority, application Japan, Sep. 8, 1986, 61-210928
Int. Cl.[5] H01S *3/30*
U.S. Cl. 372—8 **11 Claims**



1. An optical logic circuit comprising:

a semiconductor laser having an optical resonator and emitting laser light;

a first means disposed in front of one output surface of said semiconductor laser for separating polarization components;

a current source coupled to said semiconductor laser;

a light source disposed in front of another output surface of said semiconductor laser for injecting a light signal into said semiconductor laser;

a second means disposed between said semiconductor laser and said light source for rotating a polarization plane of said light signal;

a third means disposed between second means and said semiconductor laser for selectively passing only a specific polarization component of said light signal.

4,922,498

LASERS

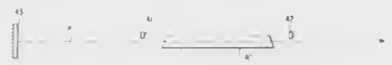
Andrew J. Kearsley, 11, Eaton Court, Water Eaton Road; Richard R. Lewis, 8 Boulter Street, both of Oxford, and Graham A. Naylor, 40 Great Close Road, Yarnton, Oxfordshire, all of United Kingdom

Continuation of Ser. No. 153,279, Feb. 5, 1988, abandoned. This application Dec. 6, 1988, Ser. No. 285,315

Claims priority, application United Kingdom, Jun. 6, 1986, 8613872

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—25 6 Claims



1. A pulsed laser system for generating light pulses of variable duration, comprising:

an elongate member defining a laser discharge chamber having first and second ends;

a gain medium disposed within said discharge chamber;

means for stimulating pulsed laser emission of said gain medium within said discharge chamber, said pulsed laser emission producing light pulses which travel toward the first and second ends of said discharge chamber;

a first reflector means positioned off the centerline of the laser and adjacent the first end of said discharge chamber for reflecting some of said light pulses back into said gain medium; and

a second reflector positioned at a variable distance from the second end of said discharge chamber, said variable distance being greater than the distance said first reflector is positioned from the first end of said discharge chamber such that adjusting a position of said second reflector means varies the amount of the pulse which receives amplification and the amount of the pulse which is attenuated thereby producing short duration high gain pulses.

4,922,499

SEMICONDUCTOR LASER DEVICE AND THE MANUFACTURING METHOD THEREOF

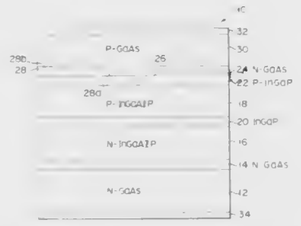
Koichi Nitta, Kawasaki; Yukie Nishikawa, Narashino; Masayuki Ishikawa, Tokyo; Yasuhiko Tsuburai, Sagamihara, and Yoshihiro Kokubun, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 9, 1989, Ser. No. 307,927

Claims priority, application Japan, Feb. 9, 1988, 63-26490; May 13, 1988, 63-116704; Jul. 11, 1988, 63-172312

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—46 10 Claims



1. A semiconductor laser device comprising:

(a) a semiconductive substrate having a first conductivity type;

(b) a double-heterostructure disposed above said substrate, said structure including

an active layer, and

first and second cladding layers sandwiching said active layer and having different conductivity types, said first cladding layer consisting of a semiconductive material having the first conductivity type, said second cladding layer consisting of a semiconductive material having a second conductivity type;

(c) a semiconductive layer provided on said second cladding layer;

(d) a current-blocking layer having the first conductivity type provided on said semiconductive layer, said current-blocking layer having an elongated opening; and

(e) a contact layer having the second conductivity type provided to cover said current blocking layer and said opening, said semiconductive layer having an intermediate band gap between band gaps of said second cladding layer and said contact layer and functioning as an intermediate band-gap layer, the improvement wherein

said intermediate band-gap layer has a carrier concentration, in a first region defining said opening, substantially high enough to cause a current injected in an oscillation mode of said device to concentrate on said region, and has a carrier density, in a second region as the remaining portion, low enough to suppress or prevent the injected current from spreading into said second region.

4,922,500

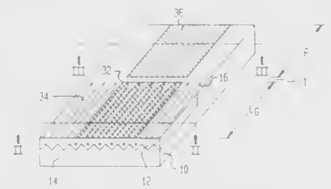
CROSS-COUPLED QUANTUM-WELL STRIPE LASER ARRAY

Constance J. Chang-Hasnain, Edison, and Elyahou Kapon, Old Bridge, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 21, 1989, Ser. No. 341,634

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—50 15 Claims



1. An optical integrated circuit, comprising:

a crystalline substrate having a first portion with a first cross section along a first optical axis and a second portion with a second cross section different from said first cross section and along a second optical axis; and

an optical confining structure formed epitaxially vertically over and continuous between said first and second portions, said optical confining structure including at least one quantum well layer having a first thickness and a first bandgap in a first region overlying said first portion and a second thickness and a second bandgap different from said first thickness and said first bandgap respectively in a second region overlying said second portion, said quantum well layer acting as an active layer in one of said first and second regions.

4,922,501

MIRROR TRANSLATION APPARATUS FOR ALTERING FOCAL POINT POSITION IN A LASER

Stephen Wolgast, Fremont, Calif., assignor to Spectra Physics, Inc., San Jose, Calif.

Filed Sep. 30, 1987, Ser. No. 103,074

Int. Cl.[5] H01S *3/20*

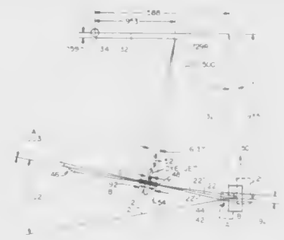
U.S. Cl. 372—54 15 Claims

1. An apparatus comprising:

a frame;

a dye laser connected to said frame and having a dye jet, a cavity defined by a plurality of mirrors that cause light emitted from said dye jet to resonate in said cavity and pass through said dye jet thereby defining an intersection volume in said dye jet, and including an excitation light source means for supplying incoming excitation light source means for supplying incoming excitation light;

a mirror means for reflecting substantially all said incoming



excitation light to a focal point within said intersection volume; and

pivot means for pivotally attaching said mirror means to said frame such that said mirror means can be pivoted about a pivot point far enough from said mirror means such that said focal point moves along approximately a straight line through said intersection volume at least over a predetermined range of movement of said pivot means.

4,922,502

SOLID-STATE LASER DEVICE COMPRISING A PLURALITY OF EXCITATION UNITS SELECTIVELY ENERGIZED

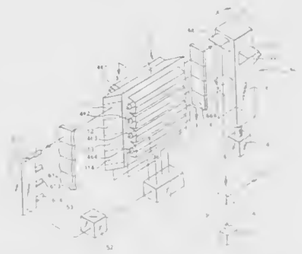
Josef F. Unternahrer, and Hiroshi Sekiguchi, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 212,956

Claims priority, application Japan, Jun. 30, 1987, 62-163162

Int. Cl.[5] H01S *3/06*

U.S. Cl. 372—66 9 Claims



1. A solid-state laser device comprising:

a slab-shaped laser medium having first and second principal surfaces parallel to each other, first and second end surfaces opposite to and contiguous to said first and said second principal surfaces, and a pair of side surfaces opposite to each other and contiguous to said first and said second principal surfaces and said first and said second end surfaces, said slab-shaped laser medium being divisible into first through n-th partial zones extended between said first and said second end surfaces along said side surfaces, where n is a natural number greater than unity;

first through n-th controllable exciting means for individually and locally exciting said first through n-th partial zones to selectively produce first through n-th laser beams through said first and said second end surfaces;

beam directing means optically coupled to said first through said n-th laser beams for directing each of said first through n-th laser beams to a predetermined position as an output laser beam; and

driving means for selectively driving said first through n-th controllable exciting means in synchronism with said beam directing means by optically coupling said first through n-th controllable exciting means to said beam directing means.

4,922,503

LOCAL AREA NETWORK BRIDGE

Mario J. Leone, Cinnaminson, N.J., assignor to Infotron Systems Corporation, Cherry Hill, N.J.

Filed Oct. 28, 1988, Ser. No. 264,134

Int. Cl.[5] H04J *3/00*

U.S. Cl. 370—85.13 17 Claims



1. In a data communications system in which communication takes place by the transmission of message frames, each frame including a destination address portion, the system comprising a first local area network interconnected with a network set, said set comprising at least one local area network, and all of the networks of said set being networks other than said first network, bridge means associated with said first local area network for interconnecting the first local area network with each local area network of said set and transmitting message frames, originating in said first local area network, from said first local area network to one or more of the local area networks of said set, said bridge means comprising:

memory means storing data indicating whether each address in a set of addresses corresponds to a device active on a local area network of said network set;

means responsive to the destination address portions of message frames originating in said first local area network for addressing said memory means; and

means responsive to the addressed data in said memory means for preventing each frame originating in said first local area network from being transmitted to any of the networks of said network set when the destination address of said frame does not correspond to a device active on a network of said network set.

4,922,504

LASER APPARATUS

Gil Teva, 7 Havazelet Street, Jerusalem, Israel

Filed Dec. 23, 1988, Ser. No. 290,284

Int. Cl.[5] H01S *3/097*

U.S. Cl. 372—87 5 Claims

1. A gas discharge laser comprising:

a. a plurality of identical tubular parallel hollow electrodes arranged in a honey comb array of configurations, said honey comb array being centered around at least two axes, each of said axes being surrounded by a number of electrodes equal to the members of said configurations, each electrode being equidistant from said axes and equidistant from each adjacent electrode;

b. means for confining a gaseous medium in a space sur-

rounding said electrodes, said medium being capable of lasing upon electrical excitation;
c. means for supplying a polyphase of radio frequency potentials equal to the number of the members of said configuations phase shifted in relation to each other by 360 degrees divided by said number for each electrode;
d cooling fluid means for cooling said electrodes upon passing a fluid through said hollow of each electrode; and



e. means for establishing an optical resonant cavity, for radiation of an excited gas between said electrodes comprising two parallel mirrors on the same optical axis, wherein said axis is parallel to said electrodes, and wherein one of said mirrors is an output coupler which acts as a phase locking mirror to obtain high power output.

4,922,505

PLANT FOR UTILIZATION OF EXHAUST GASES OF AN ELECTRIC STEEL FURNACE

Paul van Ackeren, Duisburg; Karl-Heinz Schmitz, Tönisvorst; Bernfried Stache, Krefeld; Günter Kleff, Straelen, and Heinrich Becker, Moers, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,669
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723783
Int. Cl.[5] F27D *17/00*
U.S. Cl. 373—9 25 Claims



1. A plant for the use of waste gases of an electric melting furnace for steel, comprising
an electric melting furnace;
a protective housing, where the electric melting furnace is surrounded by a protective housing;
a blower station;
an exhaust gas line, where the protective housing is connected with the exhaust gas line to the blower station;
an adjustable first valve;
a bag filter plant for cleaning of the furnace gas, where the blower station and the bag filter plant form an exhaust device for the furnace gas, which exhaust device is connected to the protective housing <electric melting furnace, >; a first bypass disposed to run in series to the exhaust device and having a return location and where the adjustable first valve is disposed between the connection location and the return location of the exhaust device; <a first bypass disposed to run in series to the exhaust device and having a return location;>
a preheating <drying> station for starting materials to be charged to the electric melting furnace, disposed in the first bypass of the exhaust device;
a branch disposed between the return location of the first bypass and the exhaust line;
a second valve;
a third valve;
a first auxiliary blower, which can be switched on or, respectively, switched off, is disposed within the exhaust device in the branch between the return location of the first bypass and the exhaust line via second and third valves;
a second bypass connected in series to the first bypass;
a drying line wherein the drying station is connected to the second bypass or, respectively, to the exhaust device ahead of the connection location or after the return location via the drying line, thus forming the second bypass, which drying line can be switched on or off via a seventh valve;
a second auxiliary blower placed into the drying line of the drying station for feeding back of the exhaust air into the exhaust device ahead of a withdrawal location.

4,922,506

COMPENSATING FOR DISTORTION IN A COMMUNICATION CHANNEL

Ronald D. McCallister, and Daniel D. Shearer, III, both of Scottsdale, Ariz., assigners to Sicom Corporation, Scottsdale, Ariz.

Filed Jan. 11, 1988, Ser. No. 142,707
Int. Cl.[5] H04B *15/00;* G06F *15/34*
U.S. Cl. 375—1 63 Claims



29 In the method of recovering a baseband signal from a spread spectrum signal received from a propagation medium, said spread spectrum signal being generated by modulating the baseband signal with a reference spreading signal, the steps of:
generating a plurality of estimator signals, each of which is representative of a spectrally discrete portion of a correlation of said received signal;
providing a representation of an assumed set of values of coefficients of an equation of the transfer function of a model that is an estimate of the transfer characteristics of the medium;
generating a plurality of model signals, respectively corresponding to said estimator signals, in accordance with a relationship between a discrete portion of the correlation of the output of said model and the transfer function of said model;
iteratively adjusting said values to reduce differences between said estimator signals and said respectively corresponding model signals; and
providing a local spreading signal synchronized to said reference spreading signal, that is modified in accordance with the estimated transfer function.

4,922,507

MULTIPLE TRELLIS CODED MODULATION

Marvin K. Simon, La Canada, and Dariush Divsalar, Pacific Palisades, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 1, 1987, Ser. No. 127,117
Int. Cl.[5] H04B *14/06*
U.S. Cl. 375—26 8 Claims



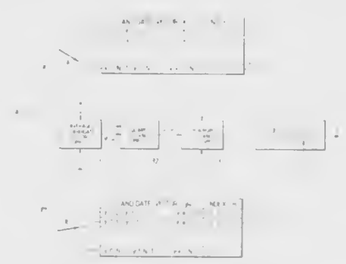
1. The method of multiple trellis coded modulation comprising the steps of:
(a) coding b bits of input data into s intermediate outputs;
(b) grouping said s intermediate outputs into k groups of s_i intermediate outputs each where the summation of all s_i's is equal to s and k is equal to at least 2;
(c) mapping each of said k groups of intermediate outputs into one of a plurality of symbols in accordance with a plurality of modulation schemes, one for each group such that the first group is mapped in accordance with a first modulation scheme and the second group is mapped in accordance with a second modulation scheme; and
(d) outputting each of said symbols to provide k output symbols for each b bits of input data.

4,922,508

METHOD AND APPARATUS FOR MULTIPLEXED VECTOR QUANTIZATION

Takehiro Moriya, Kodaira, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,859
Claims priority, application Japan, Oct. 30, 1987, 62-275388
Int. Cl.[5] H04B *1/10, 14/04*
U.S. Cl. 375—34 35 Claims



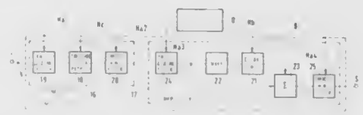
1. A multiplexed vector quantizer comprising:
a plurality of codebook storage means, each having prestored therein a predetermined number of candidate vectors;
selection means for selecting a set of candidate vectors each from one of the plurality of codebook storage means;
averaging means for averaging the set of candidate vectors and producing an averaged vector;
distortion calculating means whereby a distortion between an input vector and the averaged vector of the set of candidate vectors is calculated for each of a plurality of different sets of candidate vectors;
minimum distortion determining means for determining the set of candidate vectors whose averaged vector provides the smallest distortion; and
multiplexing means for multiplexing and outputting the codes representing the candidate vectors of the sets determined by the minimum distortion determining means.

4,922,509

METHOD OF IMPLEMENTING PROGRAMMABLE MATCHED FILTERS, AND CORRESPONDING FILTERS AND FILTER BANKS

Alain Tresset, Saint Michel Sur Orge; Francois Fontenelle, Antony, and Gérard Javard, Savigny Sur Orge, all of France, assignors to CGEE Alsthom, Perret, France

Filed Jun. 27, 1988, Ser. No. 212,386
Claims priority, application France, Jun. 26, 1987, 87 09040
Int. Cl.[5] H04B *1/10*
U.S. Cl. 375—103 9 Claims



1. A method of implementing a matched filter suitable for being programmed on request, for a receiver of information transmitted telegraphically by manipulating amplitude, frequency, or phase, said method comprising the steps of:
providing at least one high-selectivity resonator which is organized around a multipath filter and which has a resonance frequency controlled by a first clock signal,
providing at least one comb filter which is organized about a delay line of the charge transfer type and which has a lobe width controlled by a second clock signal, and
coupling said resonator and comb filter in cascade; and
selecting said resonator clock signal and said comb filter clock signal such that resonance frequency of the resonator equal to an integer multiple of the comb filter lobe width, whereby a center frequency of said matched filter is fixed by said first clock signal and a lobe width of the matched filter is fixed by said second clock signal.

4,922,510

METHOD AND MEANS FOR VARIABLE LENGTH CODING

Harald Brusewitz, Farsta, Sweden, assignor to Televerket, Farsta, Sweden

Filed Feb. 17, 1988, Ser. No. 156,683
Claims priority, application Sweden, Feb. 20, 1987, 8700725
Int. Cl.[5] H04N *1/413*
U.S. Cl. 375—122 6 Claims

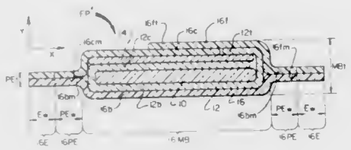


1. A method of transmitting in variable length coding a block with uncoded information, the information having a structure including information carrying non-zero words being concentrated in the beginning of the block and terminated by a continuous succession of zero words, the method comprising the steps of:
detecting the last non-zero word;
using a first code tree to code the first part of the block up to and including the word before the last non-zero word, and to code an end of the block character (EOB) for indicating the end of the block; and
switching to a second code tree not having any zero or EOB codes to code the last non-zero word.

4,922,511
DENTAL FILM PACKET

George C. Gay, Ontario, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1988, Ser. No. 273,765
Int. Cl.[5] A61B *19/04*
U.S. Cl. 378—169 7 Claims

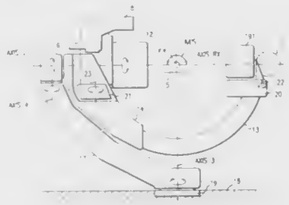


1. A comfort-enhancing improvement upon an intraoral dental radiographic film packet having sensitized film and protective opaque sheets enclosed by a light-tight envelope that includes an opposed pair of generally parallel walls covering the sheets, said walls being joined togehter along facing marginal areas thereof surrounding the sheets, thereby defining a main body portion and a perimetric edge portion of the envelope, said improvement comprising a deflectable lateral extension of substantially all of said perimetric edge portion, said extension projecting outwardly therefrom by an amount rendering said substantially all of said edge portion and said extension thereof sufficiently flexible to be readily deflected, so as to form a comfort-enhancing yieldable cushion where so deflected, when the packet is operatively positioned for effecting an intraoral radiographic exposure, said main body portion of the envelope having an overall thickness as measured perpendicular to said walls, said amount by which said extension projects outwardly from said substantially all of said perimetric edge portion being at least twice said overall thickness.

4,922,512
ISOCENTRIC X-RAY EQUIPMENT STAND HAVING FOUR AXES OF ROTATION

Pierre Lajus, Meudon, and Jean Caugant, Chevilly Larue, both of France, assignors to General Electric CGR SA, Paris, France

Filed Jun. 2, 1989, Ser. No. 360,608
Claims priority, application France, Jun. 3, 1988, 88 07442
Int. Cl.[5] H05G *1/02*
U.S. Cl. 378—197 6 Claims

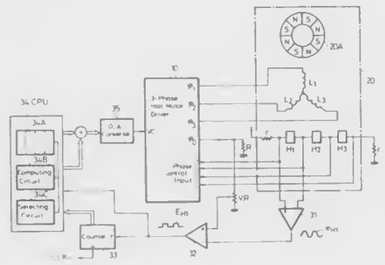


1. An isocentric x-ray equipment stand, comprising:
an X-ray source;
an X-ray detector;
an arcuate member carrying said source and said detector wherein said arcuate member defines an imaging chain axis which passes through an isocenter, said arcuate member being displaceably mounted for rotation about a first axis perpendicular to the plane of said arcuate member and passing through the isocenter wherein said arcuate member is also displaceably positioned for rotation about a second axis in the plane of the arcuate member or in a parallel plane perpendicular to said first axis and also passing through said isocenter;
a rigid structure supporting said arcuate member wherein said rigid structure is pivotably mounted about a third axis perpendicular to said first and second axis and passing through said isocenter; and
rotation means for causing said isocenter to rotate about a fourth axis perpendicular to said second axis and parallel to said third axis.

4,922,513
ROTATION CONTROL CIRCUIT FOR A HALL MOTOR

Yoshiro Joichi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 22, 1989, Ser. No. 410,983
Claims priority, application Japan, Sep. 29, 1988, 63-242282
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 5 Claims

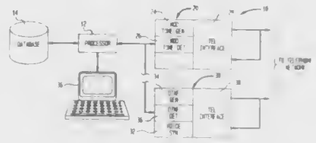


1. A rotation control circuit for a Hall motor of the type having a rotor magnet having a plurality of magnetic poles, a plurality of stator coils, and a Hall element which is positioned for detecting changes of the magnetic field of the rotor magnet which is rotated in an opposing relation to the plurality of stator coils and outputs a signal, wherein the control circuit comprises:
(a) a motor drive circuit for supplying a drive current to the plurality of stator coils;
(b) comparing means for comparing the signal detected by the Hall element with a predetermined reference level;
(d) counter means for receiving and counting a reference clock signal from an external source and which is reset in response to an output from the comparing means;
(e) computing means supplied with the count of the counter for computing irregular rotation data information on the basis of the count value corresponding to at least one revolution of the rotor magnet;
(f) memory means for storing the irregular rotation data information obtained by the computing means; and
(g) control means for supplying the irregular rotation data stored in the memory means to the motor drive circuit in synchronism with the rotational phase of the rotor magnet, wherein the drive current supplied from the motor drive circuit to the plurality of stator coils is controlled by the irregular rotation information signal sequentially derived from the control circuit to thereby reduce irregular rotation of the rotor magnet.

4,922,514
METHOD AND APPARATUS FOR DISPATCHING SERVICES

Lawrence E. Bergeron, Trumbull; John D. Goldson, West Haven, and David A. Ellis, Wallingford, all of Conn., assignors to Dictaphone Corporation, Stratford, Conn.

Filed Dec. 29, 1988, Ser. No. 290,403
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—6 45 Claims

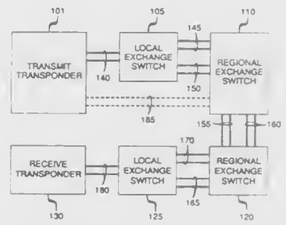


1. A system for dispatching services, comprising:
(a) means for receiving alarm signals from a plurality of remote sites;
(b) a database of resources for providing said services designated for each of said sites;
(c) control means responsive to said receiving means for:
(c1) identifying a particular site in response to an alarm signal from said particular site;
(c2) accessing said database to determine an ordered list of resources designated for said particular site;
(c3) sequentially attempting to establish, in said order, communications with said resources designated for said particular site;
(c4) cyclically repeating step (c3) until communications are established with one of said resources designated for said particular site, or until operation is otherwise terminated.

4,922,515
COMMUNICATION NETWORK CUT-OFF DETECTION ARRANGEMENT

Raymond A. Simpson, Jr., Marietta, Ga., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Jul. 25, 1989, Ser. No. 384,952
Int. Cl.[5] H04M *3/24*
U.S. Cl. 379—6 17 Claims



8. A circuit arrangement for detecting connection cut-off in a communication network comprising:
a communication network including at least first and second terminals;
means for establishing a connection through the network between the first terminal and the second terminal;
means for generating a sequence of first signals at the first terminal and for applying the first signals to the established network connection;
means at the second terminal responsive to receipt of a first signal from the estabished connection for generating a second signal and for applying the second signal to the established network connection;
means at the first terminal responsive to the first signals and the second signals received from the established connection for producing a signal corresponding to the difference between the number of first signals generated at the first terminal and the number of second signals received from the established connection, and
means responsive to the difference signal exceeding a predetermined number for maintaining the established connection.

4,922,516
TELEPHONE TECHNICIAN'S TERMINALS WITH AUTO-SELECTION OF DIAL PULSE ON DTMF SIGNALLING

Myron C. Butler, Edmond, Okla., and Christopher Madore, Cypress, Calif., assignors to Communications Technology Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 148,427, Jan. 25, 1988, Pat. No. 4,837,811. This application Jun. 2, 1989, Ser. No. 360,469
Int. Cl.[5] H04M *1/24, 3/30*
U.S. Cl. 379—21 11 Claims



1. Apparatus for determining the type of customer signalling, whether dial pulse or dual tone multi-frequency, when randomly connecting into a subscriber line of a telephone system, comprising:
means for seizing a selected telephone subscriber line and receiving dial tone;
means for outpulsing the first digit of a selected telephone number in dual tone multi-frequency signal;
means for selectively sensing absence and presence of said dial tone;
means responsive to absence of dial tone for outpulsing all remaining digits of the selected telephone number in dual tone multi-frequency signals to complete the call; and
means responsive to presence of dial tone for outpulsing the first and all remaining digits of the selected telephone number in dial pulse signals to complete the call.

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4,922,517

SYSTEM FOR INTERFACING A STANDARD TELEPHONE SET WITH A RADIO TRANSCEIVER

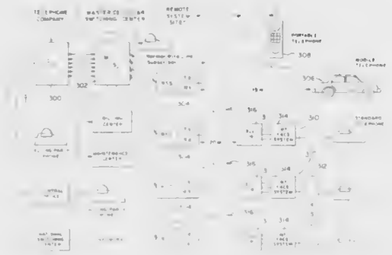
William L. West, Jr., and James E. Shafer, both of Jackson, Miss., assignors to Metrofone, Inc., Wilmette, Ill.

Continuation of Ser. No. 35,898, Apr. 8, 1987, Pat. No. 4,775,997. This application Sep. 15, 1988, Ser. No. 245,138

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[5] H01Q *7/04*

U.S. Cl. 379—58 2 Claims



1. A system for interfacing a telephone communications-type device which is capable of providing touch-tone/rotary dial-type telephone signals with a cellular radio transceiver used in a telephone communication system wherein the cellular transceiver is capable of radio communication with a remote cellular radio transmitter-receiver system that is part of a telephone network, wherein the system comprises:

telephone-coupling means for providing a two-way communication link with the telephone communications-type device;

transceiver-coupling means for providing a two-way communication link with the cellular radio transceiver;

telephone number digital conversion means for receiving a group of touch-tone or rotary-dialed telephone digits from the telephone coupling means, and converting the group of telephone digits into digital data, and providing the digital data to the transceiver coupling means;

determination-means coupled with the telephone number digital conversion means for automatically determining the last digit of the group of telephone digits provided at the transceiver coupling means; and

send signal means coupled with said determination means for providing a send signal to the cellular transceiver in response to said determination means' determination that the last digit of the telephone number has been input.

4,922,518

SELECTIVE DISSEMINATION OF INFORMATION

Alastair T. Gordon, 61 Dalewood Road, Toronto, Ontario, Canada (M4P 2N4), and Michael H. Reichmann, 137 Blantyre Avenue, Toronto, Ontario, Canada (M1N 2R6)

Filed Apr. 29, 1988, Ser. No. 187,908

Int. Cl.[5] H04Q *7/00*

U.S. Cl. 379—57 9 Claims

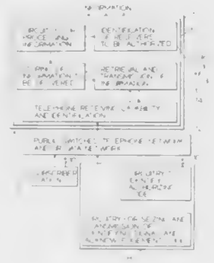
1. An automated method for delivering selective information to individual receivers, comprising:

receiving information not specifically addressed to any individual receivers,

processing the received information according to individual predetermined requirements of the receivers to provide a reduced amount of information customized for each of the receivers according to the individual predetermined requirements of the receivers,

producing a non-telephone link signal authorizing each of the receivers for which a reduced amount of information is to be delivered,

each receiver upon receiving its non-telephone authorizing signal automatically seizing, when available, a non-dedicated telephone channel which is available from time to time and dialing a predetermined telephone number to complete a telephone channel, through which channel the reduced amount of information is delivered; each receiver, when authorized and connected with the telephone channel, produce an identifying signal transmitted



through the telephone channel identifying the receiver, and thereafter

determining by means of the identifyng signals the reduced amount of information for each authorized receiver to be transmitted through the telephone channel to the respective receiver, and

transmitting the reduced amount of information to the respective receiver.

4,922,519

AUTOMATED OPERATOR ASSISTANCE CALLS WITH VOICE PROCESSING

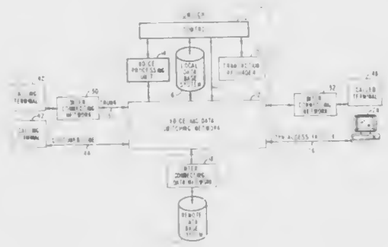
Abraham N. Daudelin, Colts Neck, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.

Continuation of Ser. No. 860,651, May 7, 1986. This application Sep. 30, 1988, Ser. No. 251,262

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.[5] H04M *3/50, 15/12;* **H04Q** *3/78*

U.S. Cl. 379—67 14 Claims



1. In a telecommunications switch offering operator assistance services, a method of setting up a collect call from a calling customer terminal to a called customer terminal, comprising the steps of:

receiving a request comprising data identifying said called customer terminal and data identifying said call as a collect call, to set up said call;

transmitting a request to an interconnection network to set up a connection from said telecommunications switch to said called customer terminal;

detecting an answer by said called customer terminal; and

after said answer has been detected, connecting an operator position to the call connection.

8. In a telecommunications switch offering operator assistance services, a method of setting up a collect call from a calling customer terminal to a called customer terminal, comprising the steps of:

receiving a request, comprising data identifying said called customer terminal and data identifying said call as a collect call, to set up said call;

prompting a customer at said calling customer terminal to speak a calling identity;

recording the response to said prompt;

transmitting a request to an interconnection network to set up a connection from said telecommunications switch to said called customer terminal;

detecting an answer by said called customer terminal;

connecting an announcement to said called customer terminal, said announcement comprising said recorded response to said prompt;

connecting an automatic voice processing system to said called customer terminal for detecting a positive response; and

setting up a connection between said calling customer terminal and said called customer terminal in response to said detection of said positive response.

4,922,520

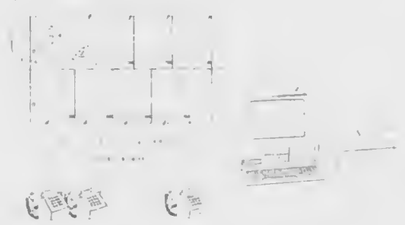
AUTOMATIC TELEPHONE POLLING SYSTEM

John K. Bernard, Pompano Beach; Hunt K. Brand, Lantana, and Richard L. Walker, Boca Raton, all of Fla., assignors to M. A. Kempner, Inc., Deerfield Beach, Fla.

Continuation of Ser. No. 948,145, Dec. 31, 1986, abandoned. This application Jan. 31, 1989, Ser. No. 304,704

Int. Cl.[5] H04M *1/276, 11/00*

U.S. Cl. 379—88 13 Claims



1. In an automatic telephone polling system having numbers of telephone interface units, each connected to a different line and each having a digitally-driven speech synthesis system, means for programming said units including a master unit having the same type speech synthesis system, whereby all telephone interface units can be easily simultaneously and initially programmed with the same messages from the master unit, and whereby all polling from the telephone interface units will have a uniformity dictated by the speech synthesis generated by the master unit.

2. A system for conducting simultaneous information exchange over a number of telephone lines, including both DTMF and rotary/pulse signals, comprising:

a number of individually-programmed telephone interface units for transmitting microphone-recorded predetermined voice messages over respective telephone lines and for receiving live information transmitted over the corresponding telephone line from an individual at the other end of a telephone line, each telephone interface unit operating independently once connected to a telephone line; and

computer means connected to each telephone interface unit for programming said unit prior to its connection to a telephone line;

each said telephone interface unit including means for storing responses received from said individual as ASCII characters, said computer means including means for collecting said responses in each telephone interface unit.

4,922,521

SYSTEM FOR PROVIDING SECURE TELECOMMUNICATION ACCESS TO A COMPUTER

Germen K. Krikke, and Hendrik Teule, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 91,677, Aug. 31, 1987, abandoned. This application Mar. 8, 1989, Ser. No. 320,728

Claims priority, application Netherlands, Sep. 5, 1986, 8602245

Int. Cl.[4] H04M *1/66, 11/00*

U.S. Cl. 379—95 5 Claims



5. A process for use in a telephone exchange for controlling the interconnection of an external computer connection thereto to any of a plurality of terminals also connected thereto over telephone lines, interconnection of the computer with a terminal requesting access thereto only being established if such terminal transmits an authorized identification code and has an authorized address in accordance with a predetermined list of authorized identification codes and authorized terminal addresses corresponding thereto; such process comprising:

receiving and storing in a receive memory in said exchange the identification code transmitted by a requesting terminal;

storing in an authorization memory in said exchange said list of authorized identification codes and authorized terminal addresses corresponding thereto;

comparing whether an identification code received from a requesting terminal and stored in the receive memory matches an authorization code stored in the authorization memory, and if there is such a match identifying the authorized terminal address corresponding to such authorized identification code; and

controlling a switching network in said exchange to

(i) transmit a confirm signal to the requesting terminal to signify to a user thereof to release its line,

(ii) after the calling terminal line is released, transmit a ringing signal to the authorized terminal address corresponding to said authorized identification code to signify to a user of such authorization terminal to engage its line, and

(iii) after said authorized terminal has engaged its line, interconnect such terminal with said computer.

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4,922,522
TELECOMMUNICATIONS ACCESS TO LOTTERY SYSTEMS

John M. Scanlon, Mendham, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Jun. 7, 1988, Ser. No. 203,668
Int. Cl.[5] H04M *11/00*; G06F *15/28, 15/44*
U.S. Cl. 379—95 5 Claims

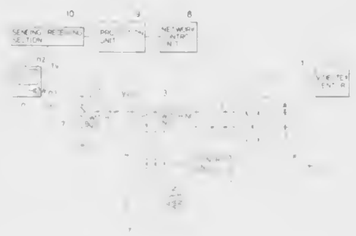


1. A method of operating a lottery comprising the steps of:
responsive to reception of a lottery access number from a purchaser's customer telephone station, establishing a connection from a switcing system of a publicly accessible common carrier telephone network having a mass announcement means for processing a large number of lottery entries simultaneously, for accessing a lottery entry data base to said customer station;
receiving lottery entry data from said customer station in said switching system over said connection for storage in said lottery entry data base,
receiving data in said switching system for identifying a purchaser of a lottery entry for storage in said lottery entry data base, said receiving data for identifying a purchaser comprising receiving, from another switching system, data identifying said customer station;
transmitting said lottery entry data and said data identifying a purchaser to a centralized lottery data base for searching said centralized lottery data base to identify a purchaser of a winning lottery entry in response to receipt of identified lottery winner numbers established in a periodic lottery drawing,
wherein said data identifying said customer station comprises a customer station number;
further comprising;
sorting lottery entries by customer station numbers, said numbers sorted by telephone number office codes and numbering plan area codes of said customer station numbers, for generating reports identifying how many lottery entries were purchased by each of a plurality of blocks of customer station numbers.

4,922,523
VIDEOTEX WITH TELEPHONE CALL SCREENING SYSTEM

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Continuation of Ser. No. 129,938, Dec. 3, 1987, abandoned, which is a continuation of Ser. No. 815,072, Dec. 30, 1985, abandoned. This application Aug. 7, 1989, Ser. No. 396,721
Claims priority, application Japan, Dec. 29, 1984, 59-276744
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—96 2 Claims



1. A telephone call screening apparatus incorporated within a videotex system wherein a first telephone line carries a videotex data call between a videotex center and a user station and a second telephone line carries incoming telephone calls from a general calling party to the user station, comprising:
a telephone exchange providing a call waiting receiving means on the second telephone line;
switching means for selectively connecting one of a user telephone and a videotex display at said user station to said call waiting receiving means to initially receive videotex data on said first telephone line for display thereof on said videotex display, then to receive a call incoming on said second telephone line to said user telephone without terminating the videotex call and thereafter, when the user finishes talking over the user telephone, to receive again said videotex data on said first telephone line; and
means for displaying at the videotex display an indication that a call is incoming on said second telephone line when said user station is connected to said first telephone line through said switching means and said call waiting receiving means.

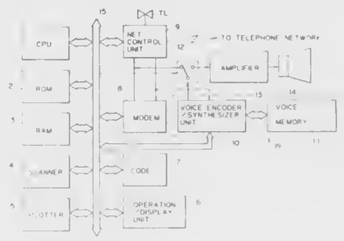
4,922,524
FACSIMILE SYSTEM WITH A VOICE TRANSMISSION FUNCTION

Keizn Baba, and Masato Nishikawa, both of Atsugi, Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,614
Claims priority, application Japan, May 20, 1987, 62-121402; Mar. 18, 1988, 63-63595
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—100 3 Claims

1 A facsimile communication method, comprising the steps of:
(a) transmitting a voice message of an operator of a transmitter, together with a telephone number of an individual entity to whom the image information is to be addressed, to a receiver which temporarily stores said voice message and said telephone number;
(b) transmitting image information from said transmitter to said receiver over the same connection medium as said first transmitting step; and

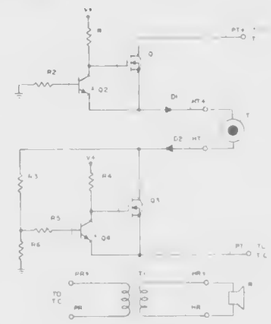
(c) transmitting said voice message stored in said receiver to a telephone unit of said individual entity having said stored telephone number during the transmission in step (b) over internal lines.



4,922,525
PAYSTATION THEFT INHIBITING CIRCUIT

John J. Dernovsek, Madison, Ala., assignor to Palco Telecom Inc., Nashville, Tenn.

Filed Jul. 3, 1989, Ser. No. 374,784
Int. Cl.[5] H04M *17/02*
U.S. Cl. 379—145 6 Claims

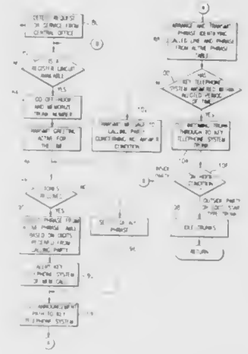


1. In a telephone paystation, a paystation housing, including a telephone circuit, a handset, including a transmitter and a receiver, a first plurality of circuit conductors connecting said telephone receiver to said telephone circuit, a second plurality of telephone conductors, connecting said transmitter to said telephone circuit, a metallic sheath extending from said telephone housing to said handset and including internal thereto said first and second plurality of circuit conductors, said telephone circuit further including circuit connections to a telephone central office and a circuit ground, and circuit ground also including a connection to said metallic sheath, the improvement comprising:
a paystation theft inhibiting circuit, including a transformer, including a first winding connected to said receiver via said first plurality of circuit conductors and a second winding connected to said telephone circuit;
first and second switch means normally operated to connect said second plurality of circuit conductors connected to said transmitter, to said telephone circuit;
and third or in the alternative fourth switching means operated in response to the establishment of a conductive circuit connection between at least one of said second plurality of circuit conductors in said metallic sheath, to said sheath, to render said first or in the alternative second switch means inoperative, whereby said transmitter is disconnected from said telephone circuit.

4,922,526
AUTOMATED ACCESS FACILITIES FOR USE WITH KEY TELEPHONE SYSTEMS

Sanford J. Morganstein, Elgin; Bakulesh A. Mehta, Downers Grove, and Herbert B. Krakau, Elmhurst, all of Ill., assignors to Dytel Corporation, Schaumburg, Ill.

Continuation of Ser. No. 133,318, Dec. 16, 1987, Pat. No. 4,850,012. This application May 24, 1989, Ser. No. 356,742
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[5] H04M *3/50*
U.S. Cl. 379—157 52 Claims



1. A call processor adapted for use with a multiline key telephone system, comprising:
a detector for detecting requests for service directed to the key telephone system;
a message storage unit for generating and transmitting a message to a calling party initiating the request for service, said message including a content for associating called parties with respective digits;
a transmitter for transmitting a request for service to the key telephone system;
said message storage unit providing a message for transmission to the key telephone system for announcing to whom the call is directed and which line to utilize for communications; and
said call processor causing the calling party to be connected to the called party.

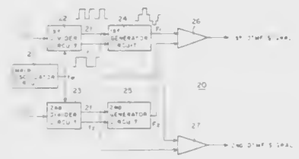
4,922,527
SMALL ELECTRONIC APPARATUS

Takyuki Nonami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 306,945
Claims priority, application Japan, Jul. 15, 1988, 63-175230
Int. Cl.[5] H04M *1/00*
U.S. Cl. 379—361 19 Claims

1. A portable telephone comprising:
key input means having a plurality of keys for dialing a selected telephone number;
sound generator means for generating sounds of distinguishable tones related to the identity of actuated keys of the key input means in response to control signals in a predetermined frequency range;
means for generating dual-tone multi-frequency key identification signals in response to the actuation of each respective key of said key input means, said dual-tone multi-fre-

quency signals having a frequency range within a standard telephone service band outside of the predetermined frequency range to which said sound generator means is responsive; and



converter means for frequency shifting said dual-tone multi-frequency signals into control signals within said predetermined frequency range, and for applying said frequency-shifted control signals to said sound generator means.

4,922,528

CIRCUITRY FOR RECOGNIZING TWO-TONE COMPOUND SIGNALS IN TELEPHONE INSTALLATIONS

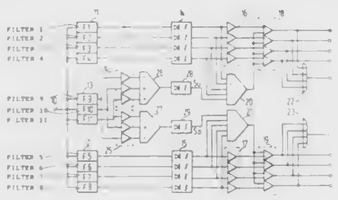
Christian Hubert, and Rainer Janssen, both of Paderborn, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,510

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710695

Int. Cl.[5] H04M *1/50*

U.S. Cl. 379—386 **6 Claims**



1. A circuit for recognizing two-tone compound signals formed of first and second tones respectively selected from first and second pluralities of tones which respectively lie in upper and lower frequency ranges in telephone installations having a limited transmission band width, with a bandpass filter corresponding to each of the tones in said first and second pluralities thereof and where the first and second tones which are output from the bandpass filters are added up in a summation circuit and weighted individually to form a pair of weighted output signals, and wherein the weighted output signals are each compared to the sum of the signals output from the bandpass filters of the corresponding frequency range in order to signal the occurrence of a valid single tone input to said circuit, said circuit comprising:

at least a pair of summing means; and,

at least first and second additional bandpass filters (**13**) having mid-band frequencies (**F9** to **F11**) outside said upper and lower frequency ranges (**F1** to **F4**, **F5** to **F8**), said additional bandpass filters having outputs respectively connected to said pair of summing means, said summing means having outputs coupled with said summation circuit for delivering a summand to said summation circuit.

4,922,529

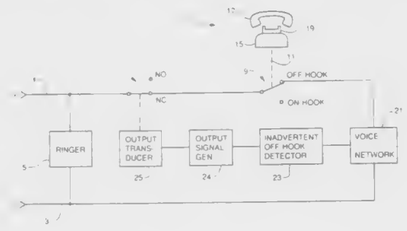
AUTOMATIC HANGUP APPARATUS FOR RESTORING SERVICE TO OFF-HOOK TELEPHONES

David J. Kiel, 11107 Flowering Pear, Cupertino, Calif. 95014

Filed Dec. 6, 1988, Ser. No. 280,663

Int. Cl.[5] H04M *1/74*

U.S. Cl. 379—387 **27 Claims**



1. An automatic telephone hangup apparatus for use with a telephone connected to the telephone lines of a telephone system of the type which provides an audible off-hook alert signal which is characterized by containing at least one prearranged identifying frequency to warn the user that his telephone has been left off-hook, wherein the telephone has a voice network and a hookswitch, and wherein the hookswitch is connected between the voice network and the telephone lines so as to connect the voice network to the telephone lines when the hookswitch is closed, and so as to disconnect the voice network from the telephone lines when the hookswitch is open, said automatic telephone hangup apparatus comprising:

frequency-discriminating off-hook alert signal detecting means for coupling to said telephone lines for detecting signals within a pass band including said identifying frequency and for generating in response thereto an automatic hangup signal;

automatic hangup means for coupling to said telephone and to said alert signal detecting means, for responding to said automatic hangup signal by disconnecting said voice network from said lines.

4,922,530

ADAPTIVE FILTER WITH COEFFICIENT AVERAGING AND METHOD

John B. Kenney; Charles E. Rohrs, both of South Bend, Ind., and Wayne E. Walters, Naperville, Ill., assignors to Tellabs, Inc., Lisle, Ill.

Continuation of Ser. No. 170,008, Mar. 18, 1988, abandoned. This application May 3, 1989, Ser. No. 348,156

Int. Cl.[5] H04B *3/23*

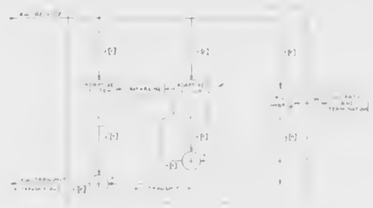
U.S. Cl. 379—411 **31 Claims**

17. An adaptive transversal filter, comprising:

an adaptive filter for being supplied with an input signal and being responsive to an error signal for generating and periodically adjusting the values of a plurality of estimated impulse response coefficients representing an impulse response to a transmission path;

averaging circuit means coupled with said adaptive filter for generating a plurality of average estimated impulse response coefficients having value in accordance with the average values over a most recent time interval of associated ones of said estimated impulse response coefficients; and

signal processing means for being supplied with the input signal and coupled with said averaging circuit means for receiving said average estimated impulse response coefficients, for generating an estimate of a signal correlated to the input signal.



4,922,531

LINE INTERFACE CIRCUIT

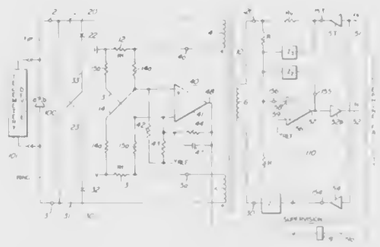
Mihail S. Moisin, Toronto, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 1, 1989, Ser. No. 359,551

Claims priority, application Canada, Apr. 19, 1989, 597217

Int. Cl.[5] H04B *3/03*

U.S. Cl. 379—413 **5 Claims**



1. A line interface circuit for energizing tip and ring leads of a communication line with direct current from a power source and for coupling alternating current signals between the communication line and a telephone facility, comprising:

tip and ring terminals for connection to the tip and ring leads;

first and second battery terminals for connection to the power source;

tip and ring feed resistors (Rf) each connected to a respective one of the battery terminals, the tip and ring feed resistors being of similar ohmic values;

a transformer including tip and ring primary windings connected in series between the tip terminal and the tip feed resistor and the ring terminal and the ring feed resistor respectively, and a secondary winding having first and second ends;

an electronic hybrid circuit including transmit and receive ports for connection to the telephone facility, a pair of voltage outputs and an input;

a first resistance (Ro) being connected in series between one of the pair of voltage outputs and the first end of the secondary winding;

a first impedance (Z1) being connected in series between another of the pair of voltage outputs and the second end of the secondary winding;

a pair of resistances being connected in series between the first end and other end of the pair of voltage outputs, each (R) of the pair of resistances being of similar ohmic values one with respect to another;

an amplifier including an input being connected to the junction of the pair of resistances, an output being connected to the input of the hybrid circuit, and a negative feedback path;

a second impedance (Z2) being connected in series with the negative feedback path; and

a third impedance (Z3) being connected in series between said one voltage output and said junction.

4,922,532

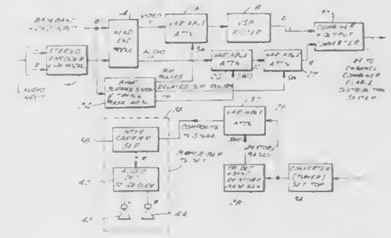
SYNC SUPPRESSION SCRAMBLING AND DESCRAMBLING OF TELEVISION SIGNALS FOR SUBSCRIPTION TV

James O. Farmer, Lilburn, and Luis A. Rovira, Norcross, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Jul. 29, 1988, Ser. No. 226,006

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—15 **13 Claims**



1. In the method of sync suppression scrambling of composite TV signals having a video signal component with horizontal and vertical synchronizing signals in horizontal and vertical intervals thereof and an aural signal component and wherein the video signal component is processed for synchronizing signal suppression prior to transmission and the composite signal is processed after transmission for synchronizing signal restoration, the improvement which comprises the step of processing said audio component prior to transmission in a sense opposite to the processing thereof for synchronizing signal restoration after transmission whereby distortion of said aural component of said composite signal is compensated and audible noise components therein due to said restoration are minimized.

4,922,533

HIGH SECURITY EVOLUTIVE CODING PROCESS AND DEVICE FOR CARRYING OUT THIS PROCESS

Patrick Philippe, Jambville, France, assignor to Neiman, Courbevoie, France

Filed Oct. 29, 1987, Ser. No. 114,005

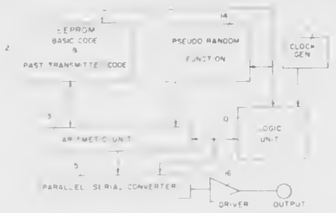
Claims priority, application France, Oct. 31, 1986, 86 15170

Int. Cl.[5] H04L *9/02*

U.S. Cl. 380—46 **4 Claims**

1. An evolutive code process using a pseudo-random discontinuous function, wherein a message containing at least two

pseudo-random values calculated by said function is transmitted and wherein further the message contains, in addition, a



code calculated by calculation of a continuous function of a specific base code for each system.

4,922,534

INTELLIGENT SYNCHRONOUS MODEM AND COMMUNICATION SYSTEM INCORPORATING THE SAME

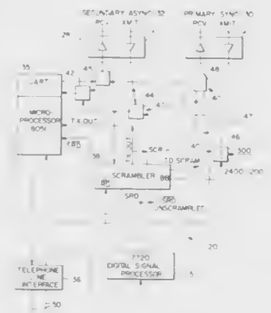
Andrew M. Gorniak, Oxford, Conn., and Michael J. Fargano, Silverton, N.J., assignors to General DataComm, Inc., Middlebury, Conn.

Continuation of Ser. No. 798,897, Nov. 18, 1985, Pat. No. 4,817,147. This application Jan. 30, 1989, Ser. No. 303,896

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[5] H04L *9/02*

U.S. Cl. 380—49 **12 Claims**



1. An intelligent synchronous modem comprising:

(a) at least one connector having a first and a second port for primary and secondary channels of communication with a host computer, wherein the primary communication channel is for communication of data mode data and the secondary communication channel is for communication of command mode data;

(b) a microprocessor for receiving, recognizing, and executing commands of said host computer, wherein said command mode data are in the form of asynchronous data received over said secondary communication channel; and

(c) interface means for interfacing said microprocessor with a telephone line, wherein said data mode data received by said microprocessor are sent to said interface means, and wherein said data mode data are in the form of synchronous data.

4,922,535

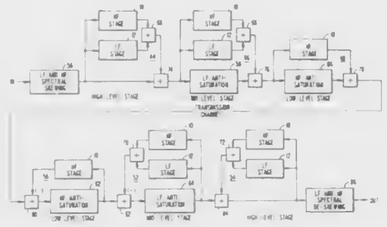
TRANSIENT CONTROL ASPECTS OF CIRCUIT ARRANGEMENTS FOR ALTERING THE DYNAMIC RANGE OF AUDIO SIGNALS

Ray M. Dolby, 3340 Jackson St., San Francisco, Calif. 94118

Filed Mar. 3, 1986, Ser. No. 835,243

Int. Cl.[5] H04B *1/66*; **H03G** *7/00*

U.S. Cl. 381—29 **72 Claims**



1. A circuit for modifying the dynamic range of an input signal comprising

means for modifying the dynamic range of said input signal in response to a control signal to provide an output signal, and

means for generating said control signal, said control signal generating means including

capacitance means for smoothing the control signal,

means for deriving a first signal from a signal point substantially the same dynamically as said output signal, the rate of change of amplitude with time of said first signal being less than the rate of change of amplitude with time of said output signal,

means for charging said capacitance means with said first signal in response to steady-state conditions,

means for deriving a second signal from a point substantially the same dynamically as said output signal, the rate of change of amplitude with time of said second signal being substantially similar to that of said output signal,

means for charging said capacitance means very rapidly with said second signal in response to transient input signal conditions, and

means for deriving said control signal from the charge on said capacitance means.

4,922,536

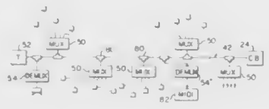
DIGITAL AUDIO TRANSMISSION FOR USE IN STUDIO, STAGE OR FIELD APPLICATIONS

Tareq I. Hoque, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 14, 1988, Ser. No. 271,109

Int. Cl.[5] H04H *5/00*

U.S. Cl. 381—2 **10 Claims**



1. A quiet high fidelity audio transmission system for use in stage, field, and studio applications for long distance transmission of multiple channels of high fidelity audio between spaced apart locations with reduced degradation and noise, in which multiple sources of audio signals are available from different points at one location, comprising a digital snake including:

means for multiplexing said multiple sources of audio signals

at said one location so as to provide a digital data stream with a digital format corresponding to separate audio channels;

a transmission line having a suitably wide bandwidth exceeding 1 MHz/channel for transmitting said digital data stream from said one location to a remote location; and,

means for demultiplexing the transmitted signals at said remote location so as to produce analog audio signals in multiple high fidelity audio channels, whereby problems associated with analog transmission of audio signals over long distances are eliminated by using the multiplexed digital transmission format, said system being a distributed system including a number of MUX units tapped along said transmission line, thereby to minimize analog cabling requirements and complexity at said one location.

4,922,537

METHOD AND APPARATUS EMPLOYING AUDIO FREQUENCY OFFSET EXTRACTION AND FLOATING-POINT CONVERSION FOR DIGITALLY ENCODING AND DECODING HIGH-FIDELITY AUDIO SIGNALS

Jeffery E. Frederiksen, Arlington Heights, Ill., assignor to Frederiksen & Shu Laboratories, Inc., Arlington Heights, Ill.

Filed Jun. 2, 1987, Ser. No. 57,370

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—31 **46 Claims**



1. A method for digitally encoding an audio signal represented by an initial series of pulse-code modulated (PCM) data values occurring at a first rate, said audio signal including low frequency components of high amplitude and high frequency components of relatively low amplitude, said method comprising the steps of:

(a) extracting from said PCM data values a series of representative values occurring at a second rate substantially lower than said first rate, half of said second rate being at an intermediate frequency in the audio spectrum,

(b) offsetting said PCM data values in accordance with corresponding values in said series of representative values to obtain a series of adjusted PCM data values, and

(c) converting the adjusted PCM data values to a series of floating-point data values by extracting exponents, so that the combination of said series of representative values and said series of floating-point data values encode said audio signal at a substantially lower data rate than said initial series of PCM data values, and thereby preventing the low frequency components of high amplitude from having a destructive effect upon the high frequency components of relatively low amplitude.

4,922,538

MULTI-USER SPEECH RECOGNITION SYSTEM

Kazimierz Tchorzewski, Ipswich, England, assignor to British Telecommunications public limited company, Great Britain

Filed Feb. 5, 1988, Ser. No. 152,924

Claims priority, application United Kingdom, Feb. 10, 1987, 8702910

Int. Cl.[5] G10L *5/00*

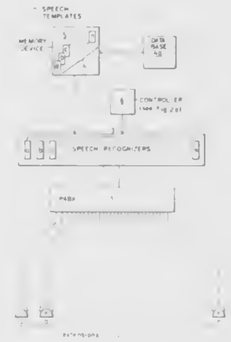
U.S. Cl. 381—42 **4 Claims**

1. A speech recognition system comprising:

a plurality of user terminals connected to a plurality of single-speaker dependent speech recognisers, there being a smaller number of speech recognisers than there are user terminals,

the speech recognisers being arranged such that, when a user terminal is activated, one of the recognisers is assigned to deal with voiced instructions input via that user terminal;

a database containing respective single-speaker dependent templates for each of the user terminals, the database being arranged, in use, to send a copy of one of said templates corresponding to a particular user terminal to a recogniser assigned to deal with instructions input via that user terminal; and



control means connected to the speech recognisers and arranged, in use, to control the transfer of copies of templates from the database to the recognisers;

wherein the control means is arranged, in use, to receive a request for a copy of one of said templates from one of the recognisers, and to instruct the database to send a complete copy of the requested template without interruption by another such request from another terminal.

4,922,539

METHOD OF ENCODING SPEECH SIGNALS INVOLVING THE EXTRACTION OF SPEECH FORMANT CANDIDATES IN REAL TIME

Periagaram K. Rajasekaran, and George R. Doddington, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 743,189, Jun. 10, 1985, abandoned. This application Jan. 26, 1989, Ser. No. 302,159

Int. Cl.[5] G10L *9/02*, *9/04*

U.S. Cl. 381—50 **8 Claims**



1. A method of encoding an analog speech signal via speech analysis, said method comprising the steps of:

providing an analog speech signal;

digitizing the analog speech signal to provide a plurality of samples of digital speech data;

arranging the plurality of digital speech data samples in successive frames of digital speech data, each frame containing a plurality of digital speech data samples;

analyzing the frames of digital speech data utilizing a linear predictive coding technique to determine a set of linear predictive coding speech parameters for each frame defining the linear prediction polynomial;

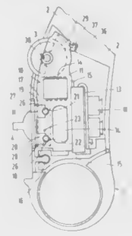
subjecting respective frames of linear predictive coding

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speech parameters defining the linear prediction polynomial to a root factoring procedure involving
initially determining a first quadratic factor indicative of a root of the prediction polynomial for a first current frame of digital speech data by deflating the prediction polynomial to a reduced order polynomial,
successively determining the next quadratic factor for the first current frame of digital speech data in a continuing sequence until the prediction polynomial is reduced to a remaining quadratic polynomial factor,
sorting the respective quadratic factors in the order of increasing bandwidth of the roots indicated thereby, and
extracting roots based upon the sequence of the order of increasing bandwidth such that roots are removed in the order of decreasing significance as speech formant candidates;
continuing the root factoring procedure with subsequent successive frames of digital speech data by
estimating a first quadratic factor indicative of a root of the prediction polynomial for the next successive current frame of digital speech data based upon the roots as extracted from the previous frame of digital speech data,
determining the first quadratic factor beginning with the estimation thereof by deflating the prediction polynomial to a reduced order polynomial,
successively determining the next quadratic factor for said next successive current frame of digital speech data by initially estimating said next quadratic factor for said next successive current frame of digital speech data based upon the roots as extracted from the previous frame of digital speech data, and thereafter determining the next quadratic factor for said next successive current frame of digital speech data beginning with the estimation thereof in a continuing sequence until the prediction polynomial is reduced to a remaining quadratic polynomial factor,
sorting the respective quadratic factors for said next successive current frame of digital speech data in the order of increasing bandwidth of the roots indicated thereby, and
extracting roots for said next successive current frame of digital speech data based upon the sequence of the order of increasing bandwidth;
utilizing the extracted roots as speech formant candidates; and
determining the speech formants from the extracted roots as speech formant candidates in representing the analog speech signal as a compressed encoded form of digital speech signals.

4,922,540
HEARING AID COMPRISING A PRINTED CIRCUIT FILM
Ehrenfried Erbe, Effeltrich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich
Filed Jun. 6, 1988, Ser. No. 202,828
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 8708894[U]
Int. Cl.[5] **H04R** *25/00*
U.S. Cl. 381—69 **9 Claims**

1. A hearing aid comprising:
a hearing aid housing;
a flexible printed circuit film retained in the hearing aid housing and having at least two bent printed circuit wings;
at least one operating element being secured to the housing of the hearing aid;
said at least one operating element having means associated therewith both for holding at least one of the printed circuit wings of the printed circuit film against dislocation relative to the housing and also for maintaining a spacing between the two printed circuit wings;
said means associated with the operating element comprising a stopper and eyelet connection between the operating element and one of the printed circuit film wings; and



said stopper being positioned against anti-dislocation means on the housing.

4,922,541
ACOUSTIC HORN AUDIO REPRODUCER
Benjamin L. Walker, P.O. Box 1763, San Diego, Calif. 92112
Continuation-in-part of Ser. No. 232,855, Aug. 16, 1988, abandoned. This application Aug. 7, 1989, Ser. No. 390,153
Int. Cl.[5] **G10K** *11/02*; **H04R** *9/06, 11/00*; **H04B** *13/00*
U.S. Cl. 381—156 **5 Claims**



1. An audio transducer comprising:
an elongate horn having both ends thereof open to the atmosphere, the opening in the end of said horn through which sound waves pass being larger in diameter than the opening at the other end of said horn;
first and second magnets spaced along the length of said horn;
a collar positioned in the interior of said horn between said first and second magnets and having a voice coil wound therearound, the diameter of said collar being sized so that the outer surface thereof closely approximates the inside surface of the walls of said horn;
third and fourth magnets mounted to said collar for suspending said collar in the magnetic field of said first magnets and positioning said collar exactly midway therebetween; and
a rigid diaphragm mounted across the inside of said collar and dividing said horn for moving the air within the interior of said horn when current is applied to said voice coil, causing said collar to reciprocate within said horn to produce sound waves out the larger diameter opening

thereof, the opening at the other end of said horn equalizing the air pressure on either side of said diaphragm.

4,922,542
HEADPHONE COMFORT
Roman Sapiejewski, The Mountain, Framingham, Mass. 01701
Filed Dec. 28, 1987, Ser. No. 138,095
Int. Cl.[5] **H04R** *1/10*; **H04M** *1/05*
U.S. Cl. 381—187 **14 Claims**



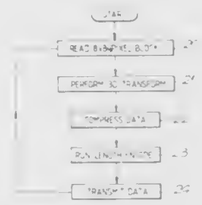
1 Headphone apparatus comprising,
a baffle,
a driver supported by said baffle for converting an input electrical signal into an acoustical output signal and having a vibratile diaphragm with a front and a rear,
a structure bounding a front cavity receiving acoustic energy from the front of said diaphragm and said structure bounding a portion of a rear cavity which rear cavity is for receiving acoustic energy from the rear of said diaphragm,
said structure comprising means for controlling the transmission of acoustic energy between said rear and front cavities,
a headphone cup attached to said structure and bounding the remainder of said rear cavity and comprising means for controlling transmission of acoustic energy between the diaphragm rear and air outside said apparatus,
and a cushion having an opening large enough to encompass the outer ear, mounted on the headphone cup for establishing a seal between the front cavity and a region outside said apparatus.

4,922,543
IMAGE PROCESSING DEVICE
Sten Hugo Nils Ahlbom, Gamla Vägen 4-6, S-421 77 Västra Frölunda; Bo E. Kennedy, Thujagatan 28, S-230 44 Vintrie, and Bo N. Akerlind, Box 2068, S-125 02 Älvsjö, all of Sweden
PCT No. PCT/SE85/00522, § 371 Date Jan. 2, 1987, § 102(e) Date Jan. 2, 1987, PCT Pub. No. WO86/03866, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 13, 1985, Ser. No. 916,969
Claims priority, application Sweden, Dec. 14, 1984, 84063866; May 10, 1985, 85023422
Int. Cl.[5] **G06K** *9/00*
U.S. Cl. 382—48 **31 Claims**



1. An image processing device for identifying characteristics of an object or a part of an object such as shape, location or orientation using a digitalized video signal from a TV-camera directed at said object or at a location where said object is placeable comprising:
a window memory (**6**;**27**), in which a plurality of predetermined windows having predetermined shapes are stored, each window having a shape and location independent of the shape and location of said object as viewed by said TV-camera, and each window covering a part of the image obtained from said TV-camera,
a window result memory (**9**;**28**) having at least one memory cell for each window, said memory being addressable from said window memory,
an adding circuit (**10**;**22**) which receives a digital gray scale pixel value based on the signal from said TV-camera into a first input and the content of the memory cell in said window result memory (**9**;**28**) related to the window, which contains the picture point in question in the signal from said TV-camera, into a second input, and which circuit, after the adding operation, is adapted to store the result in the same memory cell in said window result memory, the contents of which were provided to said second input before the adding operation, and
a comparator device (**8**;**25**), which, after every image recording of said TV-camera, compares the recorded values in the window result memory with a stored set of values recorded for a reference object or a reference object part and determines at least one parameter regarding the shape, location or orientation.

4,922,544
IMAGE PROCESSING
Peter W. Stansfield, Hatfield, and Alastair Reed, Buzzard, both of England, assignors to Crosfield Electronics Limited, London, England
Filed Sep. 10, 1987, Ser. No. 94,773
Claims priority, application United Kingdom, Sep. 12, 1986, 8621994
Int. Cl.[5] **G06K** *9/36*
U.S. Cl. 382—56 **11 Claims**



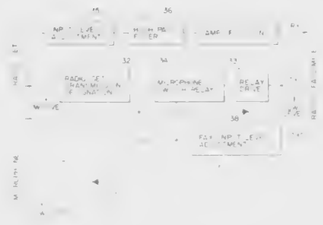
1. A method of processing data defining the values of pixels of an original coloured image represented in the spatial domain by at least two colour separations, each colour separation defining the respective colour component content of pixels arranged in a 2 dimensional array extending in X and Y directions, the method comprising performing a three dimensional transformation on said data to generate transformed data defining said original image in three dimensional frequency space, two of said three dimensions representing the variation in pixel value in said X direction and in said Y direction respectively, and wherein said transformed data has a single zero order frequency term.

4,922,545
FACSIMILE IMAGE ENCODING METHOD
Toshiaki Endoh, Tanashi, and Yasuhiro Yamazaki, Hiratsuka, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 31,149, Mar. 25, 1987, abandoned, which is a continuation of Ser. No. 736,464, May 21, 1985, abandoned. This application Feb. 10, 1989, Ser. No. 310,026
Claims priority, application Japan, May 31, 1984, 59-109639
Int. Cl.[5] G06K *9/00*
U.S. Cl. 382—56 2 Claims



1. A facsimile image encoding method comprising the steps of: receiving at an input terminal means binary facsimile image signals obtained by scanning an output image;
temporarily storing the received binary facsimile image signals in an output image memory;
sequentially extracting, from the input image memory, matching patterns obtained by blocking the binary facsimile image signals of the input image memory for a predetermined image block;
comparing each one of the extracted matching patterns with previously extracted matching patterns one after another, and registering each one of the matching patterns, in a patterns library, as a new one of library patterns to be used for subsequently effecting said comparison each time when an instant one of the matching patterns is nonidentical with one of the previously extracted matching patterns;
registering, in a code registration circuit, a pair of positional coordinates of an instant one of the matching patterns on the input image and an identification code specifying the instant one of the matching patterns each time when it is decided by said comparison that the instant one of the matching patterns is identical with any one of the library patterns, and erasing, from the input image memory, the instant one of the matching patterns decided as identical with one of the library patterns;
sequentially encoding the binary facsimile image signals remaining without said erasing in the input image memory, the sizes and the identification codes of the library patterns having a plurality of occurrences in the pattern library and the contents of the code registration representative of said positional coordinates, after completion of said extracting the matching patterns from the input image memory.

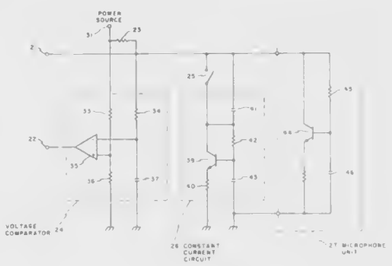
4,922,546
RADIO AUDIO/FACSIMILE COMMUNICATION DEVICE
Shuichi Takahashi; Kunihiro Yamanaka, and Masanao Horiki, all of Sagamihara, Japan, assignors to Ricoh Company, Ltd., Tokyo and Marantz Japan, Inc., Sagamihara, both of, Japan
Continuation of Ser. No. 64,694, Jun. 22, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 251,922
Claims priority, application Japan, Jun. 20, 1986, 61-144203; Aug. 20, 1986, 61-192879
Int. Cl.[5] H04B *1/40;* H04N *1/32*
U.S. Cl. 455—74 9 Claims



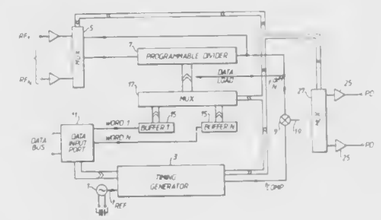
1. A radio facsimile interface unit connectable between a radio set and a facsimile machine and having both audio and facsimile communication modes, comprising:
first adjusting means for adjusting a level of a signal when it is supplied from said radio set to said facsimile machine;
second adjusting means for adjusting a level of a signal when it is supplied from said facsimile machine to said radio set;
mode designating means for designating a mode of operation of said interface unit in response to a mode designation signal supplied thereto exteriorily of said interface unit;
supplying means for supplying an audio signal from a microphone to said radio set when audio information is applied to said microphone by an operator;
inhibiting means coupled to said mode designating means for temporarily inhibiting the operation of said supplying means in response to said mode designating signal when said mode designating signal designates said facsimile communication mode; and
means for providing said second adjusted level signal to said radio set and for providing said first adjusted level signal to said facsimile machine.

4,922,547
MICROPHONE CIRCUIT
Yukio Murata, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Dec. 14, 1987, Ser. No. 132,480
Claims priority, application Japan, Dec. 15, 1986, 61-299246
Int. Cl.[5] H04B *1/46*
U.S. Cl. 455—79 5 Claims

1. A microphone circuit comprising:
microphone unit means operated by a DC bias voltage fed via an impedance means from a power source for providing a microphone output signal superposed on said DC bias voltage in response to a speech signal;
constant current source means connectable in parallel with said microphone unit;
switch means connected to said constant current source for manually controlling the parallel connection and disconnection of said constant current source means with said microphone unit means to change a current flowing through said impedance means, thereby changing said DC bias voltage; and
voltage comparator means connected in parallel with said microphone unit means for comparing said bias with a predetermined reference voltage, thereby producing a control signal which is indicative of a voltage status of said switch means.



4,922,548
FREQUENCY SIGNAL SYNTHESISER
Nicholas P. Cowley, Wiltshire, England, assignor to Plessey Overseas Limited, Ilford, England
Filed May 30, 1989, Ser. No. 358,796
Claims priority, application United Kingdom, May 31, 1988, 8812895
Int. Cl.[5] H04J *1/08*
U.S. Cl. 455—183 7 Claims



1. A frequency signal synthesiser comprising a comparison frequency generating element to provide a comparison frequency signal, a multiplexer element for selecting one of a plurality of generated radio frequency signals, a frequency divider element, a frequency mixer element and control means, the frequency synthesiser, in operation, being arranged whereby the multiplexer element is coupled, to feed a selected one of the plurality of radio frequency to the frequency divider element whilst the control means is coupled to the divider element such that a respective one of a series of divider words are fed to the divider element and each radio frequency signal is divided by its respective divided word to provide a common dividend frequency signal, the comparison frequency signal and the dividend frequency signal being fed to the frequency mixer element to provide a control signal indicative of frequency difference between the comparison frequency signal and the dividend frequency signal, the control signal being arranged to control it's respective radio frequency signal.

4,922,549
DIGITAL FM SQUELCH DETECTOR
Mark J. Johnson, Algonquin; Francis R. Yester, Jr., Arlington Heights, and Steven C. Jasper, Hoffman Estates, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 27, 1988, Ser. No. 265,367
Int. Cl.[5] H04B *1/10*
U.S. Cl. 455—212 24 Claims



1. A method of determining when a frequency-modulated expected information signal resides at a predetermined channel comprising the steps of:
(a) providing a received IF signal from said predetermined channel, said received IF signal being frequency-modulated;
(b) determining a value for said received IF signal based at least in part on the frequency deviation of said received IF signal; and
(c) comparing said value with a threshold based at least in part on a characteristic of said expected information signal.
wherein said received IF signal includes quadrature components and said step of determining a value for said received IF signal includes determining the number of times at least one quadrature component of said received IF signal at least substantially equals a first predetermined number.

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DESIGN PATENTS

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For CLASS	See PATENT NO.
D03-030	307,521
D11-164	307,566

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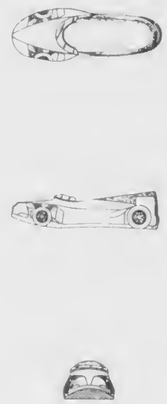
307,505
SPORTSMAN'S UNDERGARMENT
Bruce R. Schiff, and Joseph E. Ducey, both of 2098 Alta Vista Dr., Vista, Calif. 92084
Filed Jan. 7, 1988, Ser. No. 141,681
Term of patent 14 years
U.S. Cl. D2—6



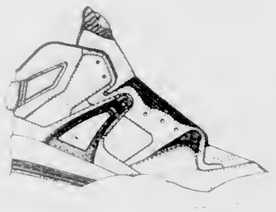
307,506
T-SHIRT
Jeffrey M. Keates, Cairns, Australia, assignor to Top Heavy Pty. Ltd., Newtown, Australia
Filed Jan. 26, 1988, Ser. No. 149,064
Term of patent 14 years
U.S. Cl. D2—215



307,507
SNEAKER OR SIMILAR ARTICLE
Frank A. Del Vecchio, Jr., 65 Riverside Dr., Trumbull, Conn. 06611, and Richard A. Mansfield, 1601 Sand Dollar Ct., Kurre Beach, N.C. 28449
Filed Jul. 27, 1987, Ser. No. 78,182
Term of patent 14 years
U.S. Cl. D2—279



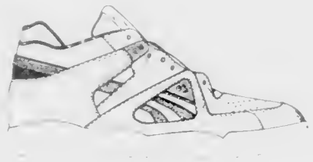
307,508
SHOE UPPER
David E. Miller, Carver; Paul D. Brown, Hingham; Andrew R. Jones, Roslindale, and Eric D. Cohen, Boston, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 23, 1989, Ser. No. 370,291
Term of patent 14 years
U.S. Cl. D2—314



VOL
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307,509
SHOE UPPER
Christopher Kittle, Cohasset, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 23, 1989, Ser. No. 370,294
Term of patent 14 years
U.S. Cl. D2—314



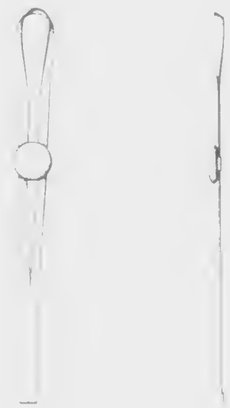


307,510
SHOE SOLE
James E. Issler, Westport, Conn., assignor to H. H. Brown Shoe Company, Inc., New York, N.Y.
Filed Aug. 24, 1987, Ser. No. 88,842
Term of patent 14 years
U.S. Cl. D2—320

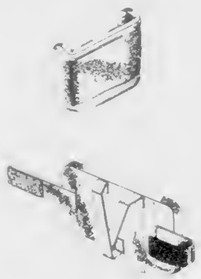




307,511
NECKTIE
Walter W. Haines, Sr., 1511 W. Oakdale St., Philadelphia, Pa. 19132
Filed Sep. 14, 1987, Ser. No. 95,995
Term of patent 14 years
U.S. Cl. D2—605



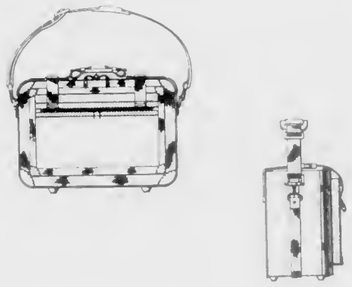
307,512
BELT BUCKLE COVER
Cephia Woods, 219 N. Lakeland Ave., Orlando, Fla. 32805
Filed Feb. 19, 1987, Ser. No. 16,235
Term of patent 14 years
U.S. Cl. D2—639



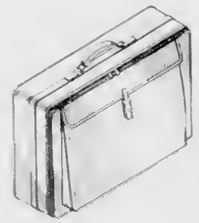
307,513
FILE SHEET FOR MAGNETIC RECORDING CARRIERS
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed Jul. 3, 1986, Ser. No. 881,720
Claims priority, application Japan, Feb. 14, 1986, 4,741/86
Term of patent 14 years
U.S. Cl. D3—35



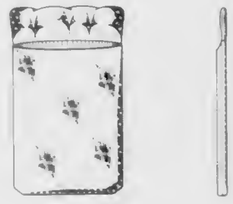
307,514
LUGGAGE HANDBAG
Richard B. Gibbs, 11548 Thurston Cir., Los Angeles, Calif. 90049
Filed Nov. 4, 1986, Ser. No. 926,995
Term of patent 14 years
U.S. Cl. D3—48



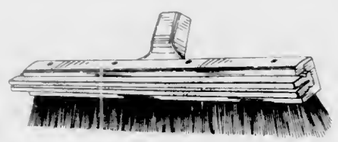
307,515
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 18, 1986, Ser. No. 886,886
Term of patent 14 years
U.S. Cl. D3—71



307,516
FASHION POCKET INSERT
Jeri D. Lesch, 3013 Owen Ave., Marina, Calif. 93933
Filed Aug. 19, 1986, Ser. No. 898,265
Term of patent 14 years
U.S. Cl. D3—106



307,517
COMBINED FLOOR BRUSH HEAD AND SQUEEGEE
John W. R. Mallory, Chatham; Edward W. Adair, and William F. Mallory, both of Blenheim, all of Canada, assignors to Mallory Industries Inc., Blenheim, Canada
Filed Sep. 17, 1987, Ser. No. 97,914
Claims priority, application Canada, Apr. 30, 1987, 30-04-87-2
Term of patent 14 years
U.S. Cl. D4—116

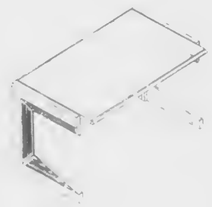




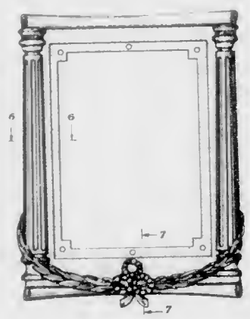
307,518
UPHOLSTERY BRUSH HANDLE
William C. Bryant, Bell Arthur, N.C., assignor to Empire Brushes, Inc., Greenville, N.C.
Filed Jul. 20, 1987, Ser. No. 75,313
Term of patent 14 years
U.S. Cl. D4—138



307,519
DESK
David Wright, Droitwitch, England, assignor to Remisystem (UK) Ltd., Worchestershire, United Kingdom
Filed Feb. 4, 1987, Ser. No. 10,891
Claims priority, application South Africa, Aug. 14, 1986, 86/0678
Term of patent 14 years
U.S. Cl. D6—484



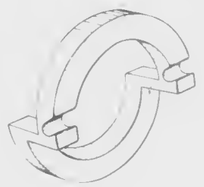
307,520
DECORATIVE FRAME
Peter V. Ilaria, East Hanover, and William Macowski, Caldwell, both of N.J., assignors to Tropar Mfg. Co., Inc., Florham Park, N.J.
Filed Mar. 7, 1988, Ser. No. 164,636
Term of patent 14 years
U.S. Cl. D6—300



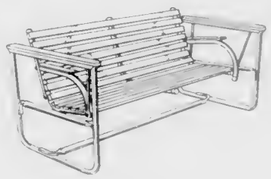
307,521
ICE TRAY HOLDER
Hassel T. Rogers, Rte. #3, Box 9, Ridgeway, Va. 24148
Filed Aug. 29, 1988, Ser. No. 237,554
Term of patent 14 years
U.S. Cl. D3—30.1



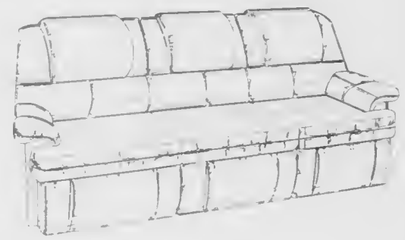
307,522
COAT HOOK
Mario Bellini, Corso Venezia, 11, 20121 Milan, Italy
Filed Feb. 26, 1987, Ser. No. 19,498
Claims priority, application Italy, Sep. 2, 1986, 22870/86[U]
Term of patent 14 years
U.S. Cl. D6—323



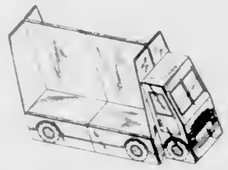
307,523
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Jul. 26, 1985, Ser. No. 759,227
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—347



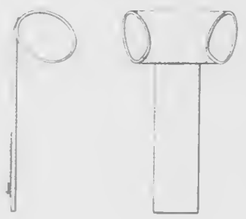
307,524
SEAT
Sammy L. Owen, New Albany, Miss., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Nov. 13, 1986, Ser. No. 930,386
Term of patent 14 years
U.S. Cl. D6—381



307,525
DISPLAY STAND
Irving Smith, Bronx, N.Y., assignor to Arrow Art Finishers Co., Bronx, N.Y.
Filed Aug. 26, 1987, Ser. No. 93,894
Term of patent 14 years
U.S. Cl. D6—451

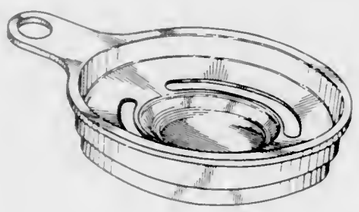


307,526
ADJUSTABLE NECK SUPPORT FOR ATTACHMENT TO AN AUTOMOBILE HEADREST
Jonothon M. W. McIntyre, 13535 Valerio St., Apt. #113, Van Nuys, Calif. 91405, and Kenneth A. Alley, 1020 Riverside Dr., Apt. #48, Burbank, Calif. 91506
Filed Feb. 9, 1987, Ser. No. 12,304
Term of patent 14 years
U.S. Cl. D6—601

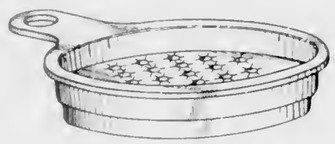


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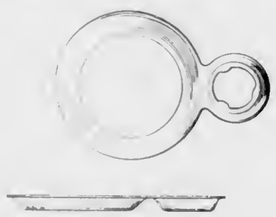
307,527
EGG SEPARATOR
Pieter K. J. DeCoster, Aalst, Belgium, assignor to Dart Industries Inc., Deerfield, Ill.
Filed Aug. 10, 1987, Ser. No. 83,768
Term of patent 14 years
U.S. Cl. D7—667



307,528
FOOD GRATER
Pieter K. J. DeCoster, Aalst, Belgium, assignor to Dart Industries Inc., Deerfield, Ill.
Filed Aug. 10, 1987, Ser. No. 83,770
Term of patent 14 years
U.S. Cl. D7—678



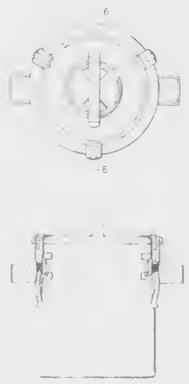
307,529
COMBINED PICNIC PLATE AND CUP HOLDER
Omer R. Baetens, 1355 Shipman, Birmingham, Mich. 48009
Filed May 23, 1988, Ser. No. 197,417
Term of patent 14 years
U.S. Cl. D7—505



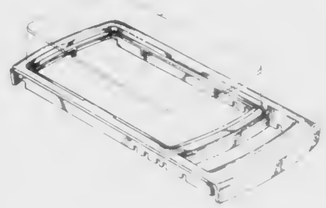
307,530
COMBINED NUT HOLDER AND NUT CRACKER
Gloria Suraci, Evergreen Hills Farms, R.D. #1 - 84A, Forest City, Pa. 18421
Filed Sep. 17, 1987, Ser. No. 97,923
Term of patent 14 years
U.S. Cl. D7—508



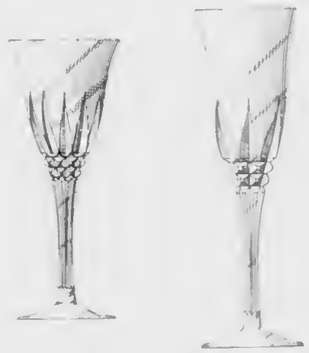
307,531
BROTH MAKING COOKER
Nobumichi Ishida, No. 501, TOKYO LATSUOBUSHI CENTER, No. 4-9, 3-chome, Harumi, Chuo-ku, Tokyo, Japan
Filed Mar. 31, 1987, Ser. No. 32,822
Term of patent 14 years
U.S. Cl. D7—360



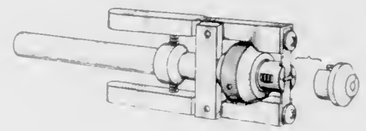
307,532
HOLDER FOR FOOD SLICING AND GRATING BLADE
Victor J. J. Cautereels, Borsbeek, and Robert H. C. M. Daenen, Erembodegem, both of Belgium, assignors to Dart Industries, Deerfield, Ill.
Filed Aug. 10, 1987, Ser. No. 83,992
Term of patent 14 years
U.S. Cl. D7—641



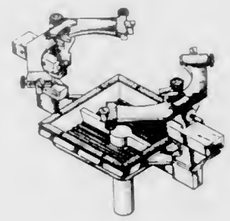
307,533
WINE GLASS OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Dec. 7, 1987, Ser. No. 129,100
Term of patent 14 years
U.S. Cl. D7—526



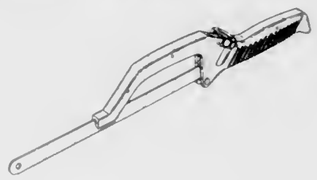
307,534
FIBER-OPTIC CABLE STRIPPER
Zdzislaw Bieganski, 'Brushwood' Kinsbourne Green, Harpenden, Hertfordshire, England
Filed Mar. 17, 1986, Ser. No. 845,007
Claims priority, application United Kingdom, Sep. 18, 1985, 1029274
Term of patent 14 years
U.S. Cl. D8—51



307,535
CLAMP FOR REPAIRING A TENNIS RACKET OR THE LIKE
Ching-Lien Hsu, No. 48, Lung Chiang Street, San Min Dist., Kaohsiung, Taiwan
Filed Nov. 28, 1986, Ser. No. 935,804
Term of patent 14 years
U.S. Cl. D8—71



307,536
MINI HACK SAW
Sture Alm, Lidkoping, Sweden, assignor to Sandvik AB, Sandviken, Sweden
Filed Sep. 22, 1987, Ser. No. 99,518
Claims priority, application Sweden, Apr. 6, 1987, 870766
Term of patent 14 years
U.S. Cl. D8—95



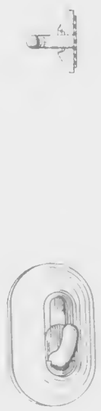
307,537
HANDLE FOR A COMPASS SAW
Tord Englund, Edsbyn, Sweden, assignor to Sandvik AB, Sandviken, Sweden
Filed Jun. 1, 1987, Ser. No. 55,865
Claims priority, application Sweden, Dec. 3, 1986, 86-2848
Term of patent 14 years
U.S. Cl. D8—97



307,538
COMBINED WALL PLATE AND SAFETY COVER
Kenneth W. Tyree, 7304 Timberlake Rd., Lynchburg, Va. 24502
Filed Feb. 19, 1988, Ser. No. 157,522
Term of patent 14 years
U.S. Cl. D8—351



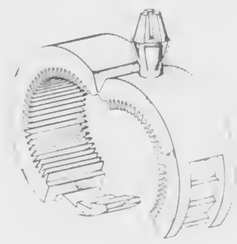
307,539
HOOK
Sheldon Goodman, 4079 Princeton Blvd., South Euclid, Ohio 44121, and Steven E. Greenhut, 2781 Belgrave Rd., Pepper Pike, Ohio 44124
Filed Nov. 21, 1986, Ser. No. 933,680
Term of patent 14 years
U.S. Cl. D8—367



307,540
CLIP FOR UNITING AN ELECTRONIC DEVICE WITH AN EXTRUDED HEAT SINK
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Mar. 12, 1987, Ser. No. 24,803
Term of patent 14 years
U.S. Cl. D8—395



307,541
COMBINED CLIP AND MOUNTING STUD
Paul A. Tres, Birmingham, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 12, 1988, Ser. No. 143,148
Term of patent 14 years
U.S. Cl. D8—396



307,542
CONTAINER FOR SCENTED LIQUIDS OR THE LIKE
W. Desazars De Montgailhard, Paris, France, assignor to Bic Corporation, Milford, Conn.
Filed Feb. 8, 1988, Ser. No. 153,390
Claims priority, application France, Jul. 10, 1987, 875860
Term of patent 14 years
U.S. Cl. D9—300



307,543
COMBINED PACKAGE AND DISPENSER
George Mileos, Riverdale, N.Y., and Robert H. Brainard, Danburry, Conn., assignors to General Foods Corporation, White Plains, N.Y.
Filed Sep. 2, 1986, Ser. No. 903,058
Term of patent 14 years
U.S. Cl. D9—302



307,544
PACKAGING CONTAINER
Audri J. Conner, Niles, and Christopher P. Guzowski, Hoffman Estates, both of Ill., assignors to Kraft, Inc., Glenview, Ill.
Filed Jun. 24, 1987, Ser. No. 66,393
Term of patent 14 years
U.S. Cl. D9—352



307,545
BOTTLE WITH CAP
John L. Hibbert, Norwich, United Kingdom, assignor to Reckitt & Colman Products Limited, London, United Kingdom
Filed Feb. 11, 1987, Ser. No. 13,388
Claims priority, application United Kingdom, Aug. 15, 1986, 1036118
Term of patent 14 years
U.S. Cl. D9—352



307,546
BOTTLE
Gerard E. Lyons, Burlington, Canada, assignor to Boyle-Midway Household Products, Inc., New York, N.Y.
Filed Aug. 10, 1987, Ser. No. 83,991
Term of patent 14 years
U.S. Cl. D9—373



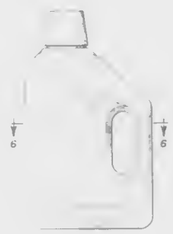
307,547
CONTAINER
Romilly H. Humphries, Leominster, Mass., assignor to S.A.Y. Industries, Inc., Leominster, Mass.
Filed Apr. 6, 1987, Ser. No. 35,152
Term of patent 14 years
U.S. Cl. D9—375



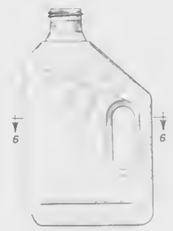
307,548
BOTTLE
Donald D. Cochran, Bartlett, Ill., assignor to American National Can Company, Chicago, Ill.
Filed Mar. 27, 1987, Ser. No. 30,479
Term of patent 14 years
U.S. Cl. D9—375



307,549
BOTTLE AND CAP THEREFOR
Theodore L. Beaver, Roselle, Ill., and G. Edward Campbell, Pleasanton, Calif., assignors to The Clorox Company, Oakland, Calif.
Filed Aug. 4, 1986, Ser. No. 893,755
Term of patent 14 years
U.S. Cl. D9—376



307,550
BOTTLE
Theodore L. Beaver, Roselle, Ill., and G. Edward Campbell, Pleasanton, Calif., assignors to The Clorox Company, Oakland, Calif.
Filed Aug. 4, 1986, Ser. No. 893,523
Term of patent 14 years
U.S. Cl. D9—376



307,551
BOTTLE OR SIMILAR ARTICLE
Richard L. Platte, Sr., Ann Arbor, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Feb. 27, 1986, Ser. No. 838,046
Term of patent 14 years
U.S. Cl. D9—378



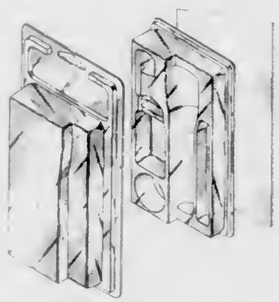
307,552
COMBINED BOTTLE AND STOPPER
Bijan Pakzad, New York, N.Y., assignor to Fashion World, Inc., Beverly Hills, Calif.
Filed Jul. 7, 1987, Ser. No. 70,835
Term of patent 14 years
U.S. Cl. D9—384



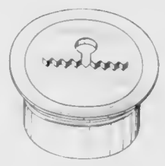
307,553
CONTAINER FOR LIQUIDS
Walter A. Matthews, Rothesay, and Edward B. MacDormand, New Brunswick, both of Canada, assignors to Irving Oil Limited, New Brunswick, Canada
Filed Aug. 7, 1987, Ser. No. 83,052
Claims priority, application Canada, Mar. 9, 1987, 09-03-87-6
Term of patent 14 years
U.S. Cl. D9—403



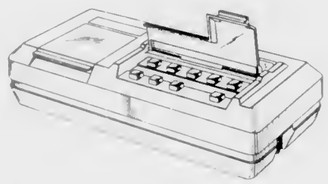
307,554
BLISTER PACKAGE
Fred R. McAlister, Sr., Chino, Calif., assignor to Mag Instrument, Inc., Ontario, Calif.
Filed Oct. 13, 1987, Ser. No. 108,040
Term of patent 14 years
U.S. Cl. D9—415



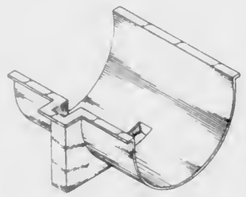
307,555
DISPENSING NOZZLE FOR PLASTIC BAGS
Edwin W. Haenni, and Mickey M. Wilkes, both of Hartsville, S.C., assignors to Sonoco Products Co., Hartsville, S.C.
Filed Apr. 7, 1987, Ser. No. 35,695
Term of patent 14 years
U.S. Cl. D9—447



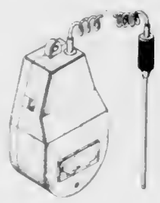
307,556
REFLECTANCE METER
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.
Filed Feb. 22, 1988, Ser. No. 159,059
Term of patent 14 years
U.S. Cl. D10—46



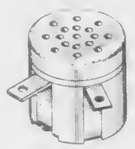
307,557
LEAK SENSOR HOUSING
Bradley K. Frahm, 2101 Cedar Ridge Dr., Stockton, Calif. 95201
Filed Jan. 4, 1988, Ser. No. 140,835
Term of patent 14 years
U.S. Cl. D10—46



307,558
ELECTRONIC THERMOMETER FOR USE WITH ANIMALS
John B. J. Messina, East Williston; John H. Sondericker, Middle Island, and Anthony J. Casella, East Williston, all of N.Y., assignors to Advanced Animal Instrumentation, Inc., Williston, N.Y.
Filed Oct. 1, 1986, Ser. No. 914,595
Term of patent 14 years
U.S. Cl. D10—57



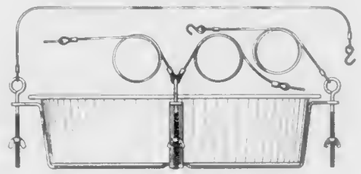
307,559
OXYGEN SENSOR
Frederick A. Parker, Gwynedd Valley, and Mark P. Grady, Norristown, both of Pa., assignors to Seatronics Company, Inc., Hatboro, Pa.
Filed Feb. 26, 1987, Ser. No. 20,671
Term of patent 14 years
U.S. Cl. D10—81

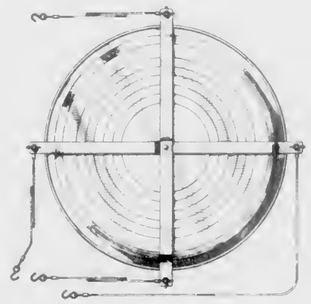


307,560
HOUSING FOR AN INFRARED SIGNAL DETECTOR
Arlan K. Andrews; David M. Dickson, both of Indianapolis, Ind.; John N. McGarvey, Drexel Hill, Pa., and Michael P. Zambelli, Livingston, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Oct. 28, 1987, Ser. No. 114,264
Term of patent 14 years
U.S. Cl. D10—106



307,561
CHRISTMAS TREE HOLDER
John Chulick, 305 East Street, Winters, Calif. 95694
Filed Jun. 29, 1987, Ser. No. 67,092
Term of patent 14 years
U.S. Cl. D11—130.1

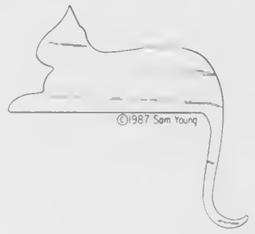




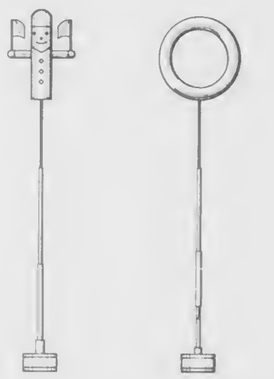
307,562
DOOR FRAME PLAQUE
Samuel W. Young, 135 N. Walnut, Yellow Springs, Ohio 45387
Filed Apr. 10, 1987, Ser. No. 36,848
Term of patent 14 years
U.S. Cl. D11—134



307,563
DOOR FRAME PLAQUE
Samuel W. Young, 135 N. Walnut, Yellow Springs, Ohio 45387
Filed Apr. 10, 1987, Ser. No. 36,847
Term of patent 14 years
U.S. Cl. D11—134



307,564
TRAILER CONNECTING GUIDE UNIT
Steven M. Mabry, 38037 Tupelo St., Gonzales, La. 70737
Filed Jun. 22, 1988, Ser. No. 210,303
Term of patent 14 years
U.S. Cl. D12—162



307,565
FRONT BUMPER FOR AN AUTOMOBILE
Ryoichi Sasaoka, Yokosuka, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 48,917
Term of patent 14 years
U.S. Cl. D12—169



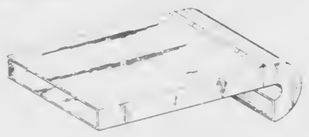
307,566
COLUMN FOR A TROPHY
Raymond H. Pierce, Gravenhurst, Canada, assignor to Tromar Corporation Ltd., Mississauga, Canada
Filed Sep. 3, 1986, Ser. No. 903,616
Term of patent 14 years
U.S. Cl. D11—164



307,567
AERODYNAMIC BUMPER FOR A TRUCK
Robert F. Fingerle, Fremont, Calif., assignor to Superstill Technology, Inc., Redwood City, Calif.
Filed Dec. 10, 1987, Ser. No. 130,961
Term of patent 14 years
U.S. Cl. D12—169



307,568
VEHICLE ROOF MOUNTED AIR REVERSING UNIT
Guadalupe A. Lopez, 31 Clark St., Pontiac, Mich. 48058
Continuation-in-part of Ser. No. 116,752, Nov. 4, 1987, abandoned. This application Sep. 11, 1989, Ser. No. 406,136
Term of patent 14 years
U.S. Cl. D12—181



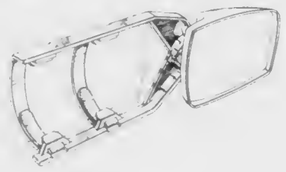
307,569
DEFLECTOR SHIELD FOR MOTOR VEHICLES
John H. Ziegler, Longmont; Gerald R. Oakley, Berthoud, and Daniel F. Krause, Sr., Loveland, all of Colo., assignors to Autotron Products, Inc., Longmont, Colo.
Filed Oct. 13, 1987, Ser. No. 107,153
Term of patent 14 years
U.S. Cl. D12—181



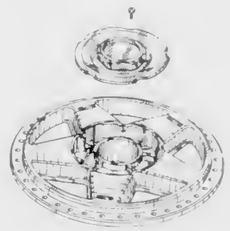
307,570
FRONT FENDER MOUNTED AUTOMOBILE REAR VIEW MIRROR
Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025
Filed Aug. 3, 1989, Ser. No. 388,914
Term of patent 14 years
U.S. Cl. D12—187



307,571
TOWING MIRROR OR SIMILAR ARTICLE
Roderick L. Owen, Solihull, and George J. Wyers, Coseley, both of England, assignors to Blazer International Corporation, Franklin Park, Ill.
Filed Jul. 21, 1988, Ser. No. 222,225
Term of patent 14 years
U.S. Cl. D12—187



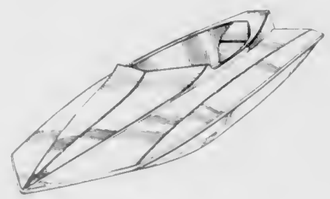
307,572
COMBINED VEHICLE WHEEL CENTER AND HUB COVER
Philippe de Lespinay, 14371 Brenan Way, Tustin, Calif. 92680
Filed Feb. 17, 1987, Ser. No. 15,870
Term of patent 14 years
U.S. Cl. D12—211

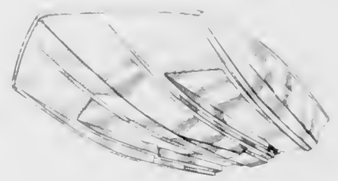


307,573
CATAMARAN SAILBOAT
D. Kirk Fuller, 31 Breakwater, Santa Barbara, Calif. 93109, assignor to D. Kirk Fuller and T. Felkay, both of Santa Barbara, Calif., a part interest to each
Filed Aug. 25, 1986, Ser. No. 899,711
Term of patent 14 years
U.S. Cl. D12—304

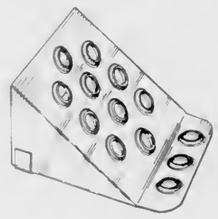


307,574
BOAT HULL
Howard W. Pipkorn, 1622 Lake Johanna Blvd., Arden Hills, Minn. 55112
Filed Jan. 11, 1988, Ser. No. 141,894
Term of patent 14 years
U.S. Cl. D12—314



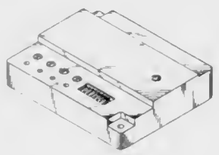


307,575
WHEEL CHOCK BLOCK
David A. Gano, Salem, Ohio, assignor to Ganeaux Industries, Inc., Salem, Ohio
Filed Jun. 1, 1987, Ser. No. 56,746
Term of patent 14 years
U.S. Cl. D12—217

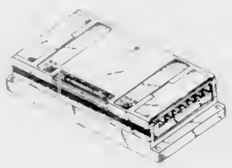


VOL
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307,576
PROGRAMMABLE CONTROLLER
Yoshinori Abe, Karagawa; Muneaki Inoue, Hyogo; Kazuhiro Hata, Hyogo, and Jiro Takahashi, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 139,059
Claims priority, application Japan, Aug. 31, 1987, 62-35760
Term of patent 14 years
U.S. Cl. D13—164



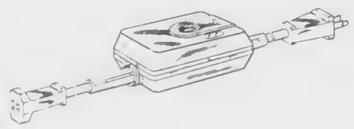
307,577
PROGRAMMABLE CONTROLLER
Yoshinori Abe, Kanagawa; Muneaki Inoue, and Kazuhiro Hata, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 139,058
Claims priority, application Japan, Sep. 10, 1987, 62-37297
Term of patent 14 years
U.S. Cl. D13—164



307,578
COMBINED ESCUTCHEON AND POWER SWITCH
Steven R. Carson, Upper Saddle River, N.J.; Raymond T. Griffin, and Scott A. Spear, both of San Antonio, Tex., assignors to Lightolier, Inc., San Antonio, Tex.
Filed Feb. 4, 1988, Ser. No. 152,357
Term of patent 14 years
U.S. Cl. D13—158



307,579
IN LINE CORD SWITCH
Clifford J. Layne, 7 Markdale Avenue, Apt. 4, Toronto, Ontario, Canada (M6C 1S8), and Aldo F. Balatti, 5 Massey Square, Apt. 2703, Toronto, Ontario, Canada (M4C 5L6)
Filed Aug. 23, 1988, Ser. No. 235,246
Term of patent 14 years
U.S. Cl. D13—140



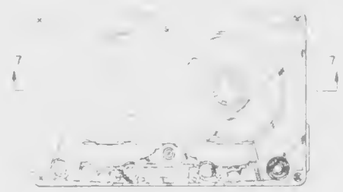
307,580
MARINE POWER SOURCE MOUNTED ON A PEDESTAL
Patrick J. Reali, Bay Village, Ohio, assignor to Central Systems & Controls Corporation, Westlake, Ohio
Filed Feb. 2, 1988, Ser. No. 151,261
Term of patent 14 years
U.S. Cl. D13—133



307,581
PORTABLE COMPUTER
Yuriko Ooshima, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Feb. 29, 1988, Ser. No. 162,380
Claims priority, application Japan, Aug. 31, 1987, 62-35467
Term of patent 14 years
U.S. Cl. D14—106

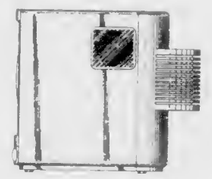


307,582
TAPE CASSETTE
James P. Elliott, and Vincent E. Landry, both of Saco, Me., assignors to Shape Inc., Biddeford, Me.
Filed Mar. 4, 1986, Ser. No. 841,696
Term of patent 14 years
U.S. Cl. D14—121

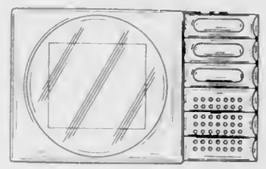


307,583
TELEVISION SET
Tomitaro Saito; Ryunosuke Kitagawa, and Tohru Ohtani, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 18, 1987, Ser. No. 16,054
Claims priority, application Japan, Aug. 21, 1986, 61-32824
Term of patent 14 years
U.S. Cl. D14—126



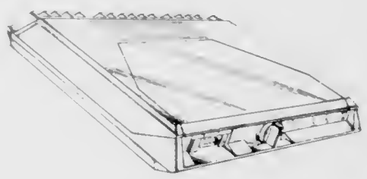


307,584
TELEVISION SET
Taisuke Saeki; Yoshito Fujii, and Tohru Ohtani, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 10, 1988, Ser. No. 166,168
Claims priority, application Japan, Sep. 11, 1987, 62-37404
Term of patent 14 years
U.S. Cl. D14—126

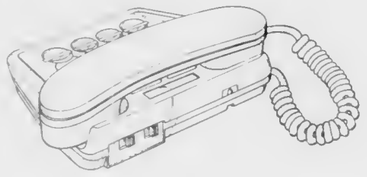




307,585
TWO-WAY MOBILE RADIO
Douglas M. Dickson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Feb. 3, 1987, Ser. No. 10,110
Term of patent 14 years
U.S. Cl. D14—137

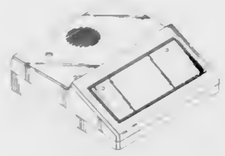


307,586
TELEPHONE
Lau P. Sbun, Kennedy Town, Hong Kong, assignor to Galant Electronc Products Ltd., New Territories, Hong Kong
Filed Jun. 19, 1989, Ser. No. 368,429
Claims priority, application United Kingdom, Dec. 20, 1988, 1055821
Term of patent 14 years
U.S. Cl. D14—150

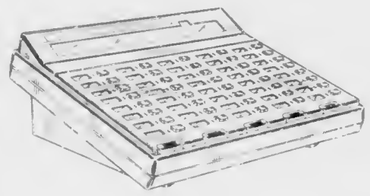


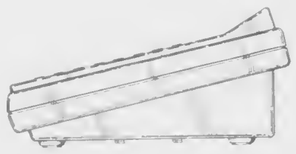


307,587
BASE STATION
Benjamin F. Marcune, 1231 School La., Rydal, Pa. 19046
Filed Feb. 18, 1987, Ser. No. 16,164
Term of patent 14 years
U.S. Cl. D14—159

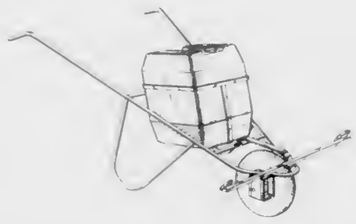


307,588
KEY UNIT HOUSING FOR A TELEPHONE CALL PROCESSOR
William C. Barker, Scottsdale; Pathukotta K. Desikan, Phoenix; Ross E. Fraser; Michael W. Pflueger, both of Glendale, and Kamal S. Sethia, Phoenix, all of Ariz., assignors to AG Communications Systems Corporation, Phoenix, Ariz.
Filed May 23, 1988, Ser. No. 197,797
Term of patent 14 years
U.S. Cl. D14—241





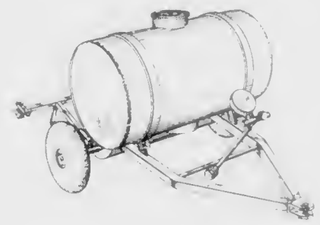
307,589
SPRAYER
Paul W. Ridgeon, Haslingfield, England, assignor to Walkkover Sprayers Limited, Cambridge, England
Filed Nov. 30, 1987, Ser. No. 127,011
Term of patent 14 years
U.S. Cl. D15—13



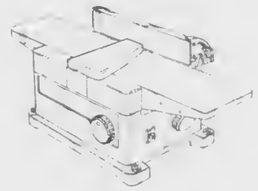
307,590
SPRAYER
Paul W. Ridgeon, Haslingfield, England, assignor to Walkover Sprayers Limited, Cambridge, England
Filed Nov. 30, 1987, Ser. No. 127,005
Term of patent 14 years
U.S. Cl. D15—13



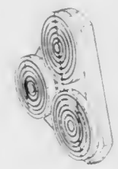
307,591
SPRAYER
Paul W. Ridgeon, Haslingfield, England, assignor to Walkover Sprayers Limited, Cambridge, England
Filed Nov. 30, 1987, Ser. No. 127,006
Term of patent 14 years
U.S. Cl. D15—13



307,592
ELECTRIC PLANER
Juzaburo Monobe, Hiroshima, and Kiyoshi Hoshino, Tokyo, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Oct. 22, 1987, Ser. No. 111,837
Claims priority, application Japan, Apr. 24, 1987, 62-16272
Term of patent 14 years
U.S. Cl. D15—127



307,593
VACUUM CHUCK FOR A LATHE FOR MAKING OPTICALLY-SMOOTH SURFACES
Aqeel M. Chishty, and Roy K. Valdez, both of 913 Delbert Way, #2, San Jose, Calif. 95126
Filed Feb. 26, 1987, Ser. No. 19,141
Term of patent 14 years
U.S. Cl. D15—130



307,594
CALCULATOR OR SIMILAR ARTICLE
Ray Chen, Taipei, Taiwan, assignor to Cal-Comp Electronics, Inc., Taipei, Taiwan
Filed Dec. 21, 1987, Ser. No. 135,748
Term of patent 14 years
U.S. Cl. D18—7

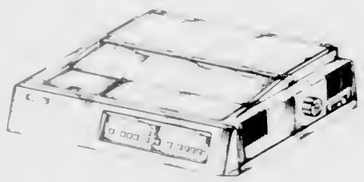


VOL
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307,595
ELECTRONIC CALCULATOR
Takahisa Yubisui; Hiroshi Sakaguchi, and Mieko Harada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 10, 1986, Ser. No. 917,826
Claims priority, application Japan, Apr. 11, 1986, 61-13464
Term of patent 14 years
U.S. Cl. D18—7



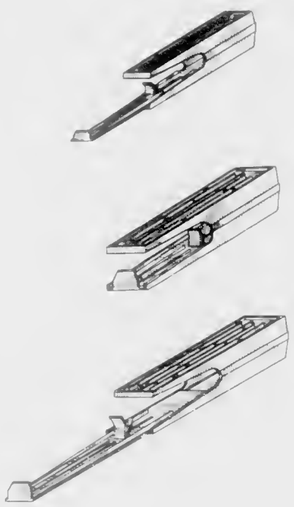
307,596
PRINTER FOR COMPUTER
Hiroshi Hashira, Tamayama, and Koichi Dobashi, Morioka, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Nov. 13, 1986, Ser. No. 930,819
The portion of the term of this patent subsequent to Feb. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—13



307,597
HAND-HELD LAMINATING ROLLER
Peter A. Levine, 19 Madison St., Pequannock, N.J. 07440
Filed Aug. 14, 1986, Ser. No. 896,630
Term of patent 14 years
U.S. Cl. D18—14



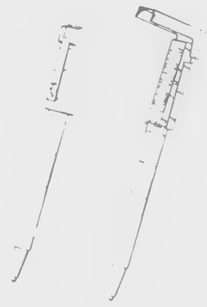
307,598
COMPUTER SUPPORT LEG WITH SLIDING KEYBOARD SHELF
Thomas W. Judd, and Edward L. Hames, both of Peterborough, N.H., assignors to Curtis Manufacturing Company, Inc., Jaffrey, N.H.
Filed Jan. 19, 1989, Ser. No. 299,749
Term of patent 14 years
U.S. Cl. D18—23



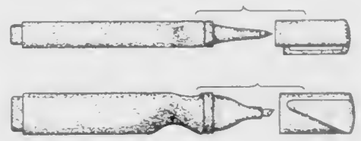
307,599
NUMERAL FONT
Ted A. Stahl, Mt. Clemens, Mich., assignor to Stahls' Inc., Mt. Clemens, Mich.
Filed Feb. 22, 1988, Ser. No. 158,364
Term of patent 14 years
U.S. Cl. D18—24



307,600
COMBINED WRITING INSTRUMENT AND STAMP
Franziska Singer, Mullergassle 1, 7741 Konigsfeld, Fed. Rep. of Germany
Filed Jun. 30, 1987, Ser. No. 67,784
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 87 00 113.6
Term of patent 14 years
U.S. Cl. D19—36



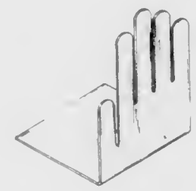
307,601
MARKING INSTRUMENT
Norman D. Poisson, Andover; Scott G. Searle, Sudbury; Robert D. Warren, Wellesley, all of Mass.; Jeffrey Kapec, Westport, and Kazuna Tanaka, Cos Cob, both of Conn., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 9, 1987, Ser. No. 12,710
Term of patent 14 years
U.S. Cl. D19—43



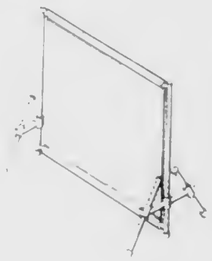
307,602
TWIN-NIBBED CRAYON
Genius Lee, No. 25, Lane 380, Sec. 2, Chung-Shan Road, Chung-ho city, Taipei, Taiwan
Filed Dec. 16, 1986, Ser. No. 943,318
Term of patent 14 years
U.S. Cl. D19—49



307,603
BOOKEND
Sheldon Goodman, 4079 Princeton Blvd., South Euclid, Ohio 44121, and Steven E. Greenhut, 2781 Belgrave Rd., Pepper Pike, Ohio 44124
Filed Nov. 21, 1986, Ser. No. 933,690
Term of patent 14 years
U.S. Cl. D19—34.5



307,604
SIGN
Harry W. Banniza, 314 Ave. I, SE., Winter Haven, Fla. 33880, and Robert D. Bowlin, 1153 Cephia St., Lake Wales, Fla. 32883
Filed Apr. 4, 1988, Ser. No. 176,999
Term of patent 14 years
U.S. Cl. D20—10



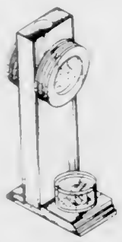
307,605
PARKING LOT LOCATION INDICATOR
Robert Podall, Scottsdale, Ariz., assignor to Janey Products, Inc., Scottsdale, Ariz.
Filed May 26, 1987, Ser. No. 54,009
Term of patent 14 years
U.S. Cl. D20—18



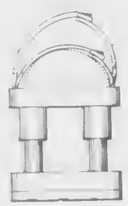
307,606
SIGN FOR ADVERTISING OR SIMILAR USE
Donald L. Jervis, Sr., 6017 Atlantic Blvd., Maywood, Calif. 90270
Filed Apr. 18, 1988, Ser. No. 183,037
Term of patent 14 years
U.S. Cl. D20—31

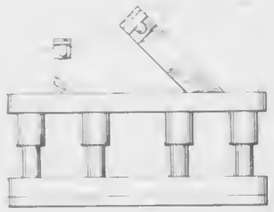


307,607
KALEIDOSCOPE
Carolyn L. Bennett, Media, Pa., assignor to C. Bennett Scopes, Inc., Media, Pa.
Filed Feb. 8, 1988, Ser. No. 153,205
Term of patent 14 years
U.S. Cl. D21—60

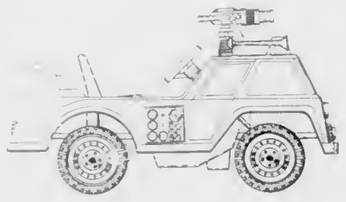


307,608
SPRING SHOE
Bruce J. Shure, 6958 Topeka Dr., Reseda, Calif. 91335
Filed Aug. 14, 1987, Ser. No. 85,611
Term of patent 14 years
U.S. Cl. D21—72



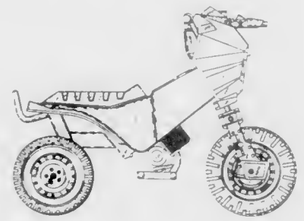


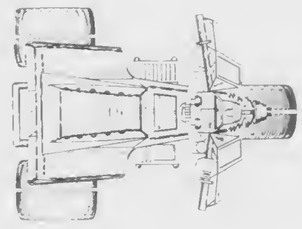
307,609
FIRE TRUCK TOY VEHICLE
Lawrence R. Harrod, Fort Wayne, Ind., assignor to Kransco, San Francisco, Calif.
Filed Jul. 29, 1988, Ser. No. 226,215
Term of patent 14 years
U.S. Cl. D21—78



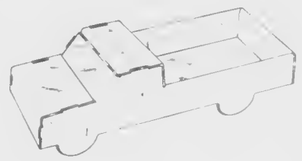


307,610
THREE WHEEL ATV TOY
Lawrence R. Harrod, Fort Wayne, Ind., assignor to Kransco, San Francisco, Calif.
Filed Jul. 29, 1988, Ser. No. 226,394
Term of patent 14 years
U.S. Cl. D21—80





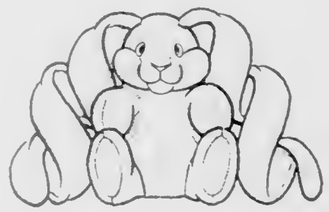
307,611
TOY TRUCK
Donald L. Bradshaw, Mebane, N.C., assignor to Brevda Container Corporation, Burlington, N.C.
Filed Jan. 12, 1987, Ser. No. 2,555
Term of patent 14 years
U.S. Cl. D21—134



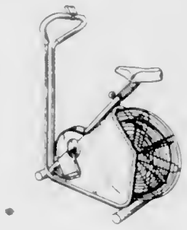
307,612
TOY FIGURE
Kevork Cholakian, 111 W. 11th St., New York, N.Y. 10011
Filed Mar. 11, 1987, Ser. No. 24,404
Term of patent 14 years
U.S. Cl. D21—148



307,613
PLUSH STUFFED RABBIT
Susan Sona, 20200 Cantara, No. 105, Canoga Park, Calif. 91306
Filed Mar. 23, 1987, Ser. No. 29,471
Term of patent 14 years
U.S. Cl. D21—187

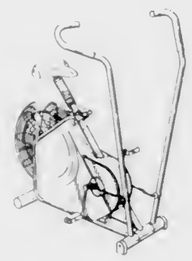


307,614
EXERCISE CYCLE
Curt G. Bingham; William T. Dalebout, and Richard B. Ellis, all of Logan, Utah, assignors to Proform Fitness Products, Inc., Logan, Utah
Filed Jun. 2, 1988, Ser. No. 201,129
Term of patent 14 years
U.S. Cl. D21—194



VOL
1114
ISS
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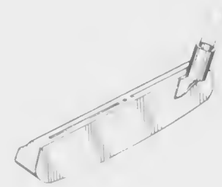
307,615
EXERCISE CYCLE
Curt G. Bingham; William T. Dalebout, and Richard B. Ellis, all of Logan, Utah, assignors to Proform Fitness Products, Inc., Logan, Utah
Filed Jun. 2, 1988, Ser. No. 201,130
Term of patent 14 years
U.S. Cl. D21—194



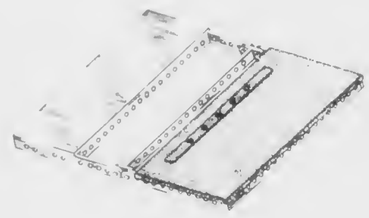
307,616
BALL GAME GOAL
Joseph Kelly, 4253 Brookside Blvd., Cleveland, Ohio 44135
Filed Oct. 3, 1986, Ser. No. 915,338
Term of patent 14 years
U.S. Cl. D21—200



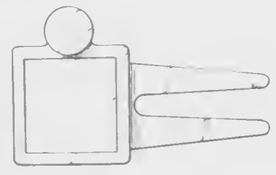
307,617
GOLF CLUB PUTTER HEAD
David D. Boone, El Toro, Calif., assignor to Lynx Golf, Inc., City of Industry, Calif.
Filed Apr. 20, 1987, Ser. No. 34,580
Term of patent 14 years
U.S. Cl. D21—219



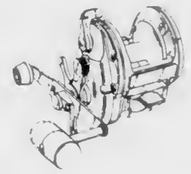
307,618
GOLF SWING PRACTICE MAT
Theodore Croghan, 4545 Baker Dr., Oak Harbor, Wash. 98277
Filed Sep. 21, 1987, Ser. No. 99,841
Term of patent 14 years
U.S. Cl. D21—234



307,619
GREEN FORK
Polis P. Kuutroukides, 161 Empangeni Street, Paulshof, Sandton, Transvaal, South Africa
Filed Aug. 31, 1987, Ser. No. 113,669
Claims priority, application South Africa, Mar. 2, 1987, 87/0142
Term of patent 14 years
U.S. Cl. D21—234



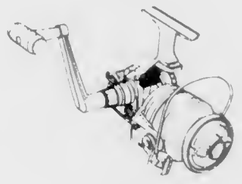
307,620
REEL FOR FISHING
Yasuhisa Kameda, Musashino; Michiki Kawai, and Kaoru Masubuchi, both of Higashikurume, all of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jan. 4, 1988, Ser. No. 140,413
Claims priority, application Japan, Jul. 10, 1987, 60-28200
Term of patent 14 years
U.S. Cl. D22—140



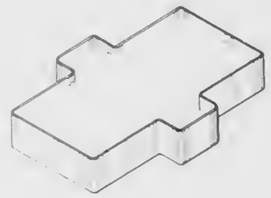
307,621
FISHING REEL
Robert J. Peterson, Claremore, Okla., assignor to Swede Industries, Inc., Tulsa, Okla.
Filed Jul. 27, 1987, Ser. No. 78,478
Term of patent 14 years
U.S. Cl. D22—140



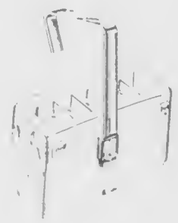
307,622
FISHING REEL
Etsuo Hiraishi, and Teruhisa Numata, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Oct. 13, 1987, Ser. No. 106,833
Claims priority, application Japan, Apr. 13, 1987, 62-14579
Term of patent 14 years
U.S. Cl. D22—141



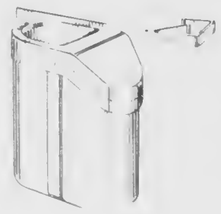
307,623
VEHICLE OIL DRIP PAN OR THE LIKE
Leonard Carbonell, P.O. Box 370, Kaneohe, HI. 96744
Filed Oct. 13, 1987, Ser. No. 108,030
Term of patent 14 years
U.S. Cl. D23—200



307,624
TOILET BOWL DEODORANT HOLDER
Mark E. Wefler, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Oct. 22, 1987, Ser. No. 111,527
Term of patent 14 years
U.S. Cl. D23—208



307,625
DISPENSER FOR TOILET TANKS
Stephen King, Sylvania Heights; Bryan H. Marshall, Glebe, and Graham A. Paver, Coal Point, all of Australia, assignors to R & C Products Pty. Limited, Ermington, Australia
Filed Jul. 19, 1988, Ser. No. 221,188
Claims priority, application Australia, Jan. 19, 1988, 0177/88
Term of patent 14 years
U.S. Cl. D23—208



VOL
1114
ISS
1
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1
1990
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307,626
AQUARIUM FILTER CARTRIDGE
Allan Willinger, Oakland, N.J., assignor to Willinger Brothers, Inc., Oakland, N.J.
Filed Oct. 30, 1987, Ser. No. 116,263
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—210



307,627
YARD HYDRANT
Stephen J. Anderson, Storm Lake, Iowa, assignor to Merrill Manufacturing Company, Inc., Storm Lake, Iowa
Filed Sep. 11, 1989, Ser. No. 405,852
Term of patent 14 years
U.S. Cl. D23—214





307,628
HAND SPRAYER
Patrick J. Ballu, Reims, France, assignor to Tecnoma, France
Filed Jul. 13, 1988, Ser. No. 218,080
Claims priority, application France, Jan. 25, 1988, 88 0423; Jan. 25, 1988, 88 0424
Term of patent 14 years
U.S. Cl. D23—225



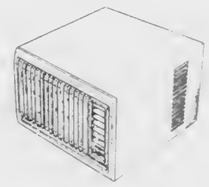
307,629
AUXILIARY TOILET SEAT FOR A CHILD
Takehiko Takahashi; Yoshiyasu Ishii; Susumu Matsumoto, and Jun Sekine, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Dec. 16, 1987, Ser. No. 134,473
Claims priority, application Japan, Jul. 2, 1987, 62-26735
Term of patent 14 years
U.S. Cl. D23—296



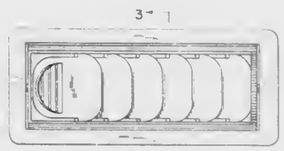
307,630
COMBINED SOAP HOLDING CAVITY AND COVER FOR BATHTUBS
Harvey E. Diamond, Studio City, Calif., assignor to Oasis Industries, Inc., Batavia, Ill.
Continuation-in-part of Ser. No. 572,626, Jan. 20, 1984. This application Apr. 14, 1987, Ser. No. 38,345
Term of patent 14 years
U.S. Cl. D23—304



307,631
AIR CONDITIONER
Sang Y. Shin, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Mar. 4, 1988, Ser. No. 163,884
Term of patent 14 years
U.S. Cl. D23—353



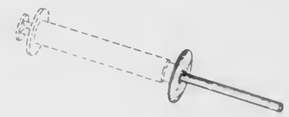
307,632
AIR FLOW DIRECTING AND CONTROLLING FIXTURE FOR HEATING AND VENTILATING DEVICES
Joachim Schulz, Amorbach, Fed. Rep. of Germany, assignor to AURORA Konrad G. Schulz GmbH & Co., Mudau, Fed. Rep. of Germany
Filed Apr. 24, 1987, Ser. No. 42,415
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, MR II 517/BU
Term of patent 14 years
U.S. Cl. D23—392



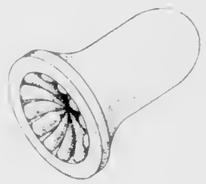
307,633
COILED TUBING COVER
Marlin F. Cline, Montrose, Colo., assignor to Clinetex, Inc., Montrose, Colo.
Filed Feb. 19, 1988, Ser. No. 158,362
Term of patent 14 years
U.S. Cl. D24—16



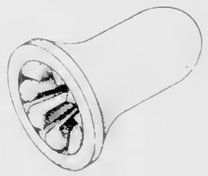
307,634
NEEDLE COVER
June C. Cook, Rte. 1, Box 260, Altus, Ark. 72821
Filed Nov. 9, 1987, Ser. No. 118,422
Term of patent 14 years
U.S. Cl. D24—25



307,635
EARPLUG OR SIMILAR ARTICLE
Ross Gardner, Jr., Indianapolis, Ind., assignor to Cabot Corporation, Waltham, Mass.
Filed Nov. 5, 1987, Ser. No. 117,700
The portion of the term of this patent subsequent to Apr. 17, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—67



307,636
EARPLUG OR SIMILAR ARTICLE
Ross Gardner, Jr., Indianapolis, Ind., assignor to Cabot Corporation, Waltham, Mass.
Filed Nov. 5, 1987, Ser. No. 117,730
Term of patent 14 years
U.S. Cl. D24—67



VOL
1114
ISS
1
MY
1
1990
UMI

307,637
EXTRUSION
Paul A. Kennedy, Ft. Wright, Ky.; Richard D. Herzog, Cincinnati, Ohio, and Thomas E. Lachenman, Lawrenceburg, Ind., assignors to Amazing Ventures, Inc., Cincinnati, Ohio
Filed Dec. 22, 1988, Ser. No. 288,111
Term of patent 14 years
U.S. Cl. D25—119



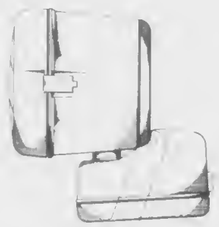
307,638
OIL LAMP
David R. Perkins, Manchester, Mass., assignor to Glass Dimensions, Inc., Essex, Mass.
Filed Dec. 31, 1987, Ser. No. 140,311
Term of patent 14 years
U.S. Cl. D26—11

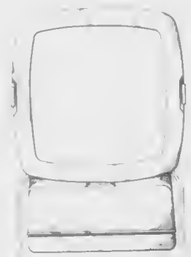


307,639
LIGHTING FIXTURE
Horst Lettenmayer, Korbinianstr. 2, Munich 40, Fed. Rep. of Germany (8000)
Filed Aug. 12, 1986, Ser. No. 895,758
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1986, 16563
Term of patent 14 years
U.S. Cl. D26—24



307,640
LUMINAIRE
Brian V. Titmarsh, Barrington, R.I., assignor to GTE Products Corporation, Danvers, Mass.
Filed Mar. 5, 1987, Ser. No. 22,706
Term of patent 14 years
U.S. Cl. D26—24

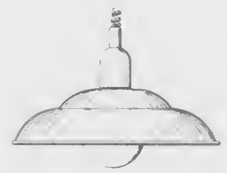




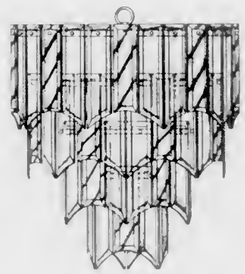
307,641
LIGHT FIXTURE OR THE LIKE
Robert De'Armond, Louisville, Ky., assignor to Thomas Industries, Inc., Louisville, Ky.
Filed Jul. 6, 1987, Ser. No. 69,946
Term of patent 14 years
U.S. Cl. D26—85



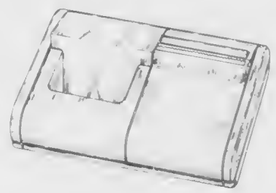
307,642
LIGHT FIXTURE OR THE LIKE
Vince DiCola, Louisville, Ky., assignor to Thomas Industries Inc., Louisville, Ky.
Filed Jul. 6, 1987, Ser. No. 69,954
Term of patent 14 years
U.S. Cl. D26—85



307,643
LIGHTING FIXTURE
William Segill, Newton; Mark E. Segill, Framingham, and Michael Dangelo, Seekonk, all of Mass., assignors to American Lighting Fixture Corp., Tauton, Mass.
Filed May 20, 1988, Ser. No. 196,961
Term of patent 14 years
U.S. Cl. D26—91

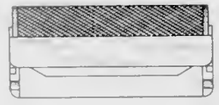


307,644
STAND FOR WAX-APPLICATOR
Hans T. Meelen, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 15, 1987, Ser. No. 62,819
Claims priority, application Int'l Pat. Institute, Dec. 18, 1986, 61692-02
Term of patent 14 years
U.S. Cl. D28—9

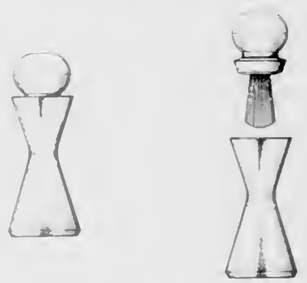


307,645
CARTRIDGE AND FOIL FOR A DRY SHAVER
Gotthard C. Mahlich, Kronberg, and Florian Sieffert, Wiesbaden, both of Fed. Rep. of Germany, assignors to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Jun. 19, 1987, Ser. No. 64,773
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 5MR9745
Term of patent 14 years
U.S. Cl. D28—49





307,646
COSMETIC POWDER CONTAINER
Ted I. Kingsford, Memphis, Tenn., assignor to Schering Corporation, Kenilworth, N.J.
Division of Ser. No. 37,758, Apr. 13, 1987, Pat. No. 4,832,060.
This application Sep. 4, 1987, Ser. No. 94,486
Term of patent 14 years
U.S. Cl. D9—76



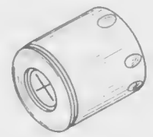
307,647
AUTOMATIC FIRE EXTINGUISHER
Yasuo Yamamura; Yukio Akatsu, and Tetsuyuki Sugimoto, all of Tokyo, Japan, assignors to FS Manufacturing Co., Ltd.; Tokyo Bosai Setsubi Co., Ltd. and Marubeni Construction Material Lease Co., Ltd., all of Tokyo, Japan
Filed Nov. 29, 1988, Ser. No. 277,215
Claims priority, application Japan, Jun. 8, 1988, 63-22429
Term of patent 14 years
U.S. Cl. D29—2



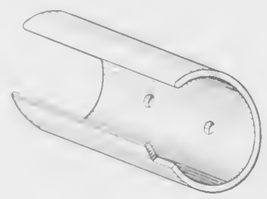
307,648
FIRE EXTINGUISHER
Richard C. Arrington, 2585 King Cir., Conyers, Ga. 30208
Filed May 1, 1987, Ser. No. 45,123
Term of patent 14 years
U.S. Cl. D29—2



307,649
FIRE PROTECTION PORT FOG NOZZLE
Ricky L. Henry, 34126 Selva Rd., #298, Laguna Niguel, Calif. 92677
Filed Jan. 14, 1988, Ser. No. 143,692
Term of patent 14 years
U.S. Cl. D29—5



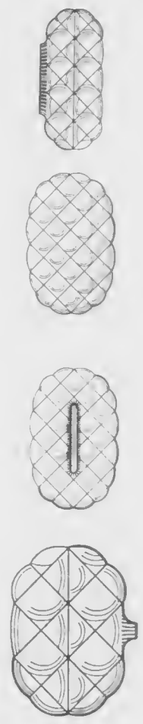
307,650
FIRE EXTINGUISHER CLAMP
Brian K. Murdock, 1818 Ewing Ave., Charlotte, N.C. 28203
Filed Dec. 14, 1988, Ser. No. 284,477
Term of patent 14 years
U.S. Cl. D29—5



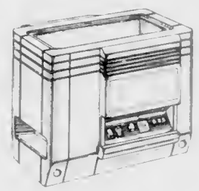
307,651
FIRE EXTINGUISHER CHARGING CYLINDER GUARD
Arthur R. Dooley, Jr., Beaumont, Tex.; Timothy A. Garrett, Baton Rouge, La., and Louis S. Matjasko, Houston, Tex., assignors to Dooley Tacklaberry, Inc., Deer Park, Tex.
Filed Apr. 3, 1987, Ser. No. 35,167
Term of patent 14 years
U.S. Cl. D29—5



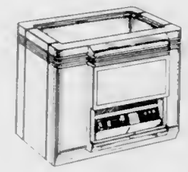
307,652
EAR CAP
Tonya C. Johnson, 2280 Jennings St., Gary, Ind. 46404
Filed May 18, 1988, Ser. No. 195,537
Term of patent 14 years
U.S. Cl. D29—19



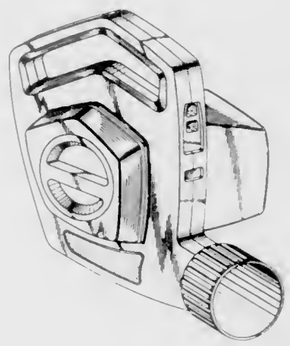
307,653
ULTRASONIC CLEANER
William Weirsman, Woodbridge; Peter D. Spaine, Stratford; Tomasz Migurski, New Haven, and George Rahgo, Milford, all of Conn., assignors to Branson Ultrasonics Corporation, Danbury, Conn.
Filed Apr. 28, 1986, Ser. No. 858,248
Term of patent 14 years
U.S. Cl. D32—1



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William Weirsman, Woodbridge; Peter D. Spaine, Stratford; Tomasz Migurski, New Haven, and George Rahgo, Milford, all of Conn., assignors to Branson Ultrasonics Corporation, Danbury, Conn.
Filed Apr. 28, 1986, Ser. No. 858,247
Term of patent 14 years
U.S. Cl. D32—1



307,655
CONVERTIBLE BLOWER AND VACUUM
Darrell W. Hinklin, Richfield, and Edward A. Rogers, Minneapolis, both of Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Jul. 18, 1986, Ser. No. 886,898
Term of patent 14 years
U.S. Cl. D32—15



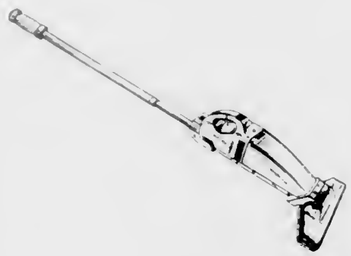
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307,656
RECHARGEABLE VACUUM CLEANER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Mar. 19, 1987, Ser. No. 27,675
Claims priority, application United Kingdom, Sep. 22, 1986, 1036 898
Term of patent 14 years
U.S. Cl. D32—22



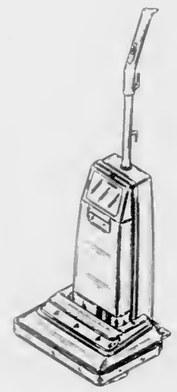


307,657
VACUUM CLEANER
Benny Li, 702 Tung Wai Commercial Bldg. 111, Gloucester Road, Wanchai, Hong Kong
Filed Jul. 9, 1987, Ser. No. 71,281
Term of patent 14 years
U.S. Cl. D32—22



307,658
VACUUM CLEANER
Matafumi Ikeda; Chikashi Kuriya, and Mika Nakajima, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 30, 1987, Ser. No. 79,334
Claims priority, application Japan, Apr. 24, 1987, 62-16393
Term of patent 14 years
U.S. Cl. D32—22





307,659
LEVER HOIST
Eikichi Kobayashi, Izumiohtsu, and Yoshio Ueno, Sakai, both of Japan, assignors to Elephant Chain Block Company Limited, Osaka, Japan
Filed Jul. 10, 1987, Ser. No. 71,728
Claims priority, application Japan, Apr. 2, 1987, 62-12866
Term of patent 14 years
U.S. Cl. D34—33



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TO WHOM

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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Niskanen, Toivo, 4,921,400, Cl. 415-169.100.
A. Monforts GmbH & Co.: *See*—
Metzen, Heinz, 4,920,621, Cl. 26-18.600.
A. O. Smith Corporation: *See*—
Cole, Robert L., 4,920,634, Cl. 29-598.000.
A.R.M.I.N.E.S.: *See*—
Rabl, Ari; Clodic, Denis; and Dehausse, Robert, 4,922,107, Cl. 250-504.00R.
A.W.A.X. Progettazione E Ricerca S.r.l.: *See*—
Rimondi, Renato; and Cappi, Angelo, 4,920,731, Cl. 53-556.000.
AB Akerlund & Rausing: *See*—
Duvander, Patrik; and Johansson, Kent, 4,921,121, Cl. 220-270.000.
AB Tetra Pak: *See*—
Andersson, Sven A., 4,921,021, Cl. 141-103.000.
Abbott, Kenneth C.: *See*—
Provest, Phillip B.; and Van Dal, David J., 4,920,763, Cl. 62-378.000.
Abbott Laboratories: *See*—
Cashmere, Karen A.; and Besozzi, Elizabeth M., 4,921,877, Cl. 514-866.000.
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Drori, Ze'ev; and Abrishami, Amir, 4,922,224, Cl. 340-428.000.
Academy of Applied Science, Inc.: *See*—
McDonough, Suellen, 4,921,277, Cl. 283-81.000.
Ace, Ronald S. Opthalmic lens safety liner. 4,921,341, Cl. 351-86.000.
Ackerman, Michael H.: *See*—
Galbo, James P.; and Ackerman, Michael H., 4,921,962, Cl. 546-184.000.
Acousis Company: *See*—
Kryter, Karl D., 4,921,660, Cl. 273-164.000.
Actronics Kabushiki Kaisha: *See*—
Akachi, Hisateru, 4,921,041, Cl. 165-104.290.
Adachi, Hideki: *See*—
Kasuya, Yukio; Tomosada, Masahiro; and Adachi, Hideki, 4,922,296, Cl. 355-208.000.
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Allan, Geoffrey; Adcock, John J.; and Smith, Terence W., 4,921,835, Cl. 514-18.000.
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Gawol, Manfred; and Adrian, Gerhard, 4,921,540, Cl. 106-287.340.
Adtec Incorporated: *See*—
Price, Dean C.; and Young, Quentin H., 4,922,064, Cl. 200-61.700.
Advanced Metals Technology Corp.: *See*—
Mott, John R., 4,921,222, Cl. 266-275.000.
Advanced Micro Devices, Inc.: *See*—
Thomas, Mammen; and Weinberg, Matthew, 4,922,318, Cl. 357-43.000.
AE PLC: *See*—
Thorpe, William A.; and Evans, David C., 4,921,734, Cl 428-34.400.
Aerological Research Systems, Inc.: *See*—
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R.; Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C.; and Jacubec, Mark R., 4,921,886, Cl. 423-235.000.
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Fournier, Paul J. E.; and Kulikowski, Ernest F., 4,921,258, Cl. 277-29.000.
Spalink, Robert D.; Knowles, Steven M ; and Kosztowny, John T., 4,921,013, Cl. 137-614.050.
Aerospatiale-Societe Nationale Industrielle: *See*—
Garcia, Alain; Tchavdarev, Jean-Claude; and Porte, Alain, 4,920,744, Cl. 60-226.100.
Aerovox Incorporated: *See*—
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Tokumoto, Hiroshi; Bando, Hiroshi; Sakai, Fumiki; Miyata, Chikara; and Wakiyama, Shigeru, 4,921,346, Cl. 356-72.000.
Agfa-Gevaert Aktiengesellschaft: *See*—
Helling, Gunter, 4,921,782, Cl. 430-548.000.
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Pack, Roger N.; and Ahmad, Eddress, 4,920,665, Cl. 36-117.000
Ahrens, Kurt H.: *See*—
Schickaneder, Helmut; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; and Ahrens, Kurt H., 4,921,856, Cl. 514-252.000.
Aida, Toshiyuki: *See*—
Hasegawa, Haruhiro; Kawabe, Ushio; Tarutani, Yoshinobu; Fukazawa, Tokuumi; Aida, Toshiyuki; and Takagi, Kazumasa, 4,921,834, Cl. 505-1.000.
Aiga, Makoto: *See*—
Ajioka, Masanobu; Aiga, Makoto; Kataita, Masafumi; and Tamaki, Akihiro, 4,922,005, Cl. 560-347.000.
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Air Products and Chemicals, Inc.: *See*—
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Lenney, William E.; and Iacoviello, John G., 4,921,898, Cl. 524-459.000.
Rowles, Howard C.; and Ayres, Calvin L., 4,921,514, Cl. 62-24.000.
Aircap Industries Corporation: *See*—
Huizenga, Michael K., 4,922,069, Cl. 200-334.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Miwa, Naomasa, 4,921,468, Cl. 455-617.000.
Aizawa, Satoru: *See*—
Miyake, Hiraku; Ishiguro, Mitsuo; Hayamizu, Yutaka; and Aizawa, Satoru, 4,921,202, Cl. 248-581.000.
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Takahashi, Satoji; and Nakamura, Masao, 4,922,011, Cl. 562-554.000.
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Akada, Yasuaki: *See*—
Hamada, Masataka; Ishida, Tokuji; and Akada, Yasuaki, 4,922,279, Cl. 354-400.000.

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Akai, Masashi: *See*—
Kawamura, Yoshihito; Akai, Masashi; and Takagi, Makoto, 4,921,410, Cl. 419-8.000.
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Asakawa, Kazuo; Akiya, Fumiaki; and Tabata, Fumio, 4,921,396, Cl. 414-751.000.
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Strom, Hans I.; and Petersson, Ulf J. G., 4,920,649, Cl. 30-382.000.
Akutsu, Yukio: *See*—
Murahashi, Hiroyuki; Akutsu, Yukio; and Koyama, Shinichi, 4,920,700, Cl. 51-124.00L.
Akzo N.V.: *See*—
de Jongh, Hendrick Paul; and van Vliet, Nicolaas P., 4,921,845, Cl. 514-172.000.
Albany Medical College of Union University, The: *See*—
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Furneaux, Robin C.; Davidson, Alexander P.; and Ball, Melville D., 4,921,823, Cl. 502-4.000.
Alcatael Hochvakuumtechnik GmbH: *See*—
Burger, Heinz-Dieter, 4,921,406, Cl. 417-87.000
Alcatel N.V.: *See*—
Eilenberger, Gert; Schrodi, Karl; and Wahl, Stefan, 4,922,487, Cl. 370-60.000.
Lowel, Helmut, 4,922,126, Cl. 307-261.000.
Reichel, Friedbert, 4,922,447, Cl. 364-561.000.
Alcatel USA, Corp.: *See*—
Krishnan, Iyengar N.; and Toegel, Herbert J., 4,922,416, Cl. 364-200.000.
Alcon Laboratories, Inc.: *See*—
Bhatia, Rajkumar P., 4,921,630, Cl. 252-174.120.
Aldon Company, The: *See*—
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Alexandru, Lupu: *See*—
Odell, Peter G.; Baranyi, Giuseppa; and Alexandru, Lupu, 4,921,940, Cl. 528-486.000.
Alfa Lancia Industriale S.p.A.: *See*—
Lanati, Paolo; Piccone, Alessandro; and D'Angelo, Domenico, 4,920,944, Cl. 123-638.000.
Pasquali, Renato; Verga, Luigi; and Mendicino, Franco, 4,920,865, Cl. 98-2.180.
Alfatechnic AG: *See*—
Dubach, Werner F., 4,921,113, Cl. 215-253.000.
Alfes, Franz: *See*—
Dorf, Ernst-Ulrich; Alfes, Franz; and Traenckner, Hans-Joachim, 4,921,935, Cl. 528-388.000.
Alfred Karcher GmbH & Co.: *See*—
Vetter, Kurt; Schulze, Werner; Krautter, Jurgen; and Hafner, Kurt, 4,920,997, Cl. 134-57.00R.
Alfred Teves GmbH: *See*—
Becker, Horst-Peter; Remfrey, James; and Dehio, Gottfried, 4,922,120, Cl. 303-114.000.
Klimt, Ulrich, 4,921,077, Cl. 188-73.450.
Reuber, Gerhard, Braun, Achim; and Hesseler, Udo, 4,921,298, Cl. 296-221.000.
Alfred University: *See*—
Seth, Vinay K., 4,921,328, Cl. 350-96.340.
Algra, Gerben P.: *See*—
Erkens, Leonardus J. H.; Geurta, Herman J. J. M.; Vandevenne, Jean L. G. M.; and Algra, Gerben P., 4,921,541, Cl. 106-433.000.
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Allan, Geoffrey; Adcock, John J.; and Smith, Terence W., to Burroughs Wellcome Co. Method of treating asthma. 4,921,835, Cl. 514-18.000.
Allen, C. Cameron, Jr.: *See*—
Lagergren, Peter J.; Allen, C. Cameron, Jr.; and Lance, Lacy C., 4,921,150, Cl. 222-639.000.
Allen, Christopher M.: *See*—
Moskaliuk, Wiktor; Allen, Christopher M.; and Robbie, Roderick G., 4,920,707, Cl. 52-6.000.
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Fraenkel, Howard A.; Ilardi, Joseph M.; Kurtz, Bruce E.; and Spicciati, Frank A., 4,921,777, Cl. 430-314.000.
Mathew, Chempolil T., 4,922,017, Cl. 564-265.000.
Polak, Anthony J., and Young, Ping, 4,921,651, Cl. 264-41.000.
Wilson, Lloyd W., 4,921,405, Cl. 416-241.00R.
Yates, Stephen F.; Good, Mary L.; and Brubaker, Inara M., 4,921,589, Cl. 204-157.500.
Yates, Stephen F.; and Zinnen, Hermann A., 4,922,044, Cl. 570-263.000.
Zupancic, Joseph J.; Frechet, Jean M. J.; Zweig, Andrew M.; and Conrad, Jeffrey P., 4,921,923, Cl. 526-313.000.
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Berry, Jimmy D.; and Allman, Robert M., 4,921,271, Cl. 280-661.000.
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Alpha Maschinenbau AG: *See*—
Post, Friedheim, 4,920,779, Cl. 72-7.000.
Alps Electric Co., Ltd.: *See*—
Komatsu, Norimasa; and Miyazaki, Asashi, 4,922,357, Cl 360-105.000.
Komatsu, Norimasa, 4,922,358, Cl. 360-105.000.
Nakamura, Tokuo, 4,922,359, Cl. 360-107.000.
Sasaki, Kunihiko; Ida, Yuichi; Oka, Tsumoru; and Shinroaku, Mituaki, 4,921,428, Cl. 439-15.000.
Shiga, Sadakazu, 4,922,248, Cl. 341-25.000.
Alscher, Arnold: *See*—
Omran, Jafar; and Alscher, Arnold, 4,921,543, Cl. 106-500.000.
Altenhof, James N., Jr.: *See*—
Livesey, John K.; and Altenhof, James N., Jr., 4,922,220, Cl. 337-82.000.
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Aluminum Company of America. *See*—
Cho, Chul W., 4,921,548, Cl. 148-12.70A
Alverez-Avila, Carlos: *See*—
Schwarz, Manfred; Braun, Wolfgang; and Alverez-Avila, Carlos, 4,920,938, Cl. 123-373.000.
AM International Incorporated: *See*—
Klopfenstein, Andrew L., 4,921,294, Cl. 294-99.100.
Amemiya, Hiroshi: *See*—
Shimizu, Kazuo; Amemiya, Hiroshi; and Sakamoto, Yuichi, 4,922,205, Cl. 324-454.000.
American Bank Note Holographics, Inc.: *See*—
Mallik, Donald W., 4,921,319, Cl. 350-3.600.
American Cyanamid Company: *See*—
Los, Marinus, 4,921,961, Cl. 546-169.000.
Ramsay, Michael V. J.; and Dolan, Simon C., 4,921,978, Cl. 549-264.000.
American Home Products Corporation: *See*—
Abou-Gharbia, Magid A.; Yardley, John P.; Childers, Wayne E., Jr.; and Cliffe, Ian A., 4,921,958, Cl. 544-295.000.
American Optical Corporation: *See*—
Maryyanek, Richard D.; and Brissette, June E., 4,921,512, Cl. 55-488.000.
American Telephone and Telegraph Company: *See*—
Blakley, James R., 4,922,490, Cl. 370-110.100.
Blundy, Robert F.; and Dunbar, Charles E., 4,920,899, Cl. 110-336.000.
Bosch, Fridolin L., 4,922,480, Cl. 370-3.000.
Churm, Brian R.; and Diesel, Michael E., 4,922,417, Cl. 364-200.000.
Daudelin, Abraham N., 4,922,519, Cl. 379-67.000.
Flynn, Richard M.; and Verdi, Fred W., 4,921,160, Cl. 235-492.000.
Gillon, Alexander C.; Reed, Adam V.; and Scanlon, John M., 4,922,348, Cl. 358-407.000.
Lee, Kuo-Hua; Lu, Chih-Yuan; and Yaney, David S., 4,922,311, Cl. 357-23.100.
Lidinsky, William P., Roediger, Gary A.; Steele, Scott B.; and Weddige, Ronald C., 4,922,486, Cl. 370-60.000.
Ollendick, Gary B., 4,922,251, Cl. 341-155.000.
Scanlon, John M., 4,922,522, Cl. 379-95.000.
Simpson, Raymond A., Jr., 4,922,515, Cl. 379-6.000.
Smeltz, Palmer D., Jr., 4,922,325, Cl. 357-74.000.
Weidman, Timothy W., 4,921,321, Cl. 350-96.120.
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Amity Leather Products Company: *See*—
Scheunemann, Roy, 4,921,027, Cl. 150-147.000.
Amoco Corporation: *See*—
Allen, Lynn M.; Taylor, Don M.; and Roberts, Charles D., 4,921,592, Cl. 208-48.0AA.
Lin, Chi-Hung; Stevens, Jack F.; Tovrog, Benjamin S.; and Rose, Philip M., 4,921,919, Cl. 526-88.000.
AMP Incorporated: *See*—
Atherton, Charles G.; and Swartz, John C., 4,921,454, Cl 439-685.000.
Bofill, Pedro D., and Sole, Xavier C., 4,921,439, Cl. 439-417.000.
Capp, Randolph E.; and Couper, William D., 4,921,447, Cl. 439-585.000.
Cooper, Ralph M.; Hollingsworth, Dana; Kunkle, John P.; and Stillie, Donald G., 4,921,437, Cl. 439-275.000.
French, Jay L., 4,921,456, Cl. 439-851.000.

Kane, Thomas J.; Myer, John M.; and Grzybowski, Richard W., 4,921,435, Cl. 439-248.000.
Puerner, Dean A., 4,921,442, Cl. 439-499.000.
Sauder, Jay S., 4,921,441, Cl. 439-460.000.
Sole, Xavier C.; and Roses, Luis B., 4,921,436, Cl. 439-395.000.
Amray, Inc.: *See*—
Rigg, Philip R., 4,922,196, Cl. 324-158.00R.
Amtrol Inc.: *See*—
Jernberg, Robert H., 4,921,214, Cl. 251-335.200.
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Larsen, Raymond S.; and Walker, James T., 4,922,452, Cl. 365-45.000.
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Andersen, Erik: *See*—
Quinn, David G.; Edwards, Robert B., II; and Andersen, Erik, 4,921,138, Cl. 222-85.000.
Anderson, Dirk N.: *See*—
McDavid, James M.; and Anderson, Dirk N., 4,922,320, Cl. 357-67.000.
Anderson, Edward M. Method and apparatus for cooking and advertising food products. 4,920,874, Cl. 99-403.000.
Anderson, James R.; and Brander, Richard, to Beltone Electronics Corporation. Differential voltage threshold detector. 4,922,131, Cl. 307-355.000.
Anderson, James S.; and Schultz, Thomas M., to Clairol Incorporated. Novel dyeing system. 4,921,503, Cl. 8-408.000.
Anderson, Kenneth D. Water kite and method of using the same. 4,920,689, Cl..43-43.130.
Anderson, Robert K.; Mainz, Michael H.; and Rackley, Robert L., to Du Pont de Nemours, E. I., and Company. A process for flame treating. 4,921,668, Cl. 264-80.000.
Anderson, Roger N.: *See*—
Adams, David V.; Anderson, Roger N.; and Deacon, Thomas E., 4,920,918, Cl. 118-724.000.
Anderson Strathclyde Olc: *See*—
Harrison, William, 4,921,309, Cl. 299-75.000.
Andersson, Rune: *See*—
Nebelung, Hermann H.; and Andersson, Rune, 4,921,523, Cl. 65-172.000.
Andersson, Sven A., to AB Tetra Pak. Filler pipe for a packing machine. 4,921,021, Cl. 141-103.000.
Anderton, John J., to GTE Products Corporation. Optical fiber connector. 4,921,324, Cl. 350-96.210.
Ando Electric Co., Ltd.: *See*—
Tanahashi, Keitaro; and Murata, Yuzuru, 4,922,482, Cl. 370-13.000.
Ando, Masakatsu; Kawaguchi, Minori; and Yamakawa, Susumu, to Mitsuboshi Belting Ltd. Rotation variation testing machine. 4,920,788, Cl. 73-118.100.
Ando, Naotaka, to Sony Corporation. Apparatus for detecting frequency of input signal with a digital scanning G-converter. 4,922,343, Cl. 358-148.000.
Ando, Takehiko: *See*—
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, 4,922,274, Cl. 354-271.100.
Andrasi, Ferene: *See*—
Zubovics, Zoltan; Toldy, Lajos; Rabloczky, Gyorgy; Varro, Andras; Andrasi, Ferene; Elek, Sandor; and Elekes, Istvan, 4,922,021, Cl. 564-367.000.
Andre, Jean-Luc, to Lohr, S.A. Translation nut to be used in a lifting unit. 4,921,218, Cl. 254-98.000.
Andreasen, James E.; Childre, Casey J.; and Peed, David B., to Lew Childre & Sons, Inc. One-piece integral fishing rod handle. 4,920,682, Cl. 43-22.000.
Andreasen, Norman. Tray assembly for germination floor. 4,921,806, Cl. 435-302.000.
Andrene Associates: *See*—
Asbra, Martin R.; Asbra, Andrew F.; and Bovis, Nicholas J., 4,920,999, Cl. 137-38.000.
Angelini, Paolo: *See*—
Wijay, Bandula; and Angelini, Paolo, 4,921,483, Cl. 604-96.000.
Angio-Medical Corp.: *See*—
Catsimpoolas, Nicholas; Griffith, Ann L.; and Sinn, Robert S., 4,921,838, Cl. 514-25.000.
Angus Chemical Company: *See*—
Nocito, Vincent; Bedell, Louis J.; and Levinson, Matthew I., 4,922,030, Cl. 568-713.000.
Annen, Osamu, to Kabushiki Kaisha Tonami Seisakusho. Green refresher. 4,921,051, Cl. 172-21.000.
Anson, James H.; Kates, James L.; Brewer, Alan W.; and Friedrich, Brent R., to Bunn-O-Matic Corporation. Beverage making appliance. 4,920,871, Cl. 99-295.000.
Ansorge, Richard: *See*—
Rushbrooke, John; Lyons, Adrian; Tomkins, Patricia; and Ansorge, Richard, 4,922,092, Cl. 250-213.0VT.
Antoine, Arthur J.: *See*—
Antoine, Douglas J.; and Antoine, Arthur J., 4,921,617, Cl. 210-776.000.
Antoine, Douglas J.; and Antoine, Arthur J. Backwasher adaptor for swimming pool filter system. 4,921,617, Cl. 210-776.000.
Antonious, Anthony J. Iron type golf club head with integral sighting and alignment means. 4,921,252, Cl. 273-164.000.
Antrim, James K.: *See*—
Grassi, David; and Antrim, James K., 4,920,909, Cl. 114-344.000.
Aoki, Akio: *See*—
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.
Aoki, Katsuhiro: *See*—
Torisawa, Nobuyuki; Okutsu, Hirokazu; and Aoki, Katsuhiro, 4,922,285, Cl. 355-20.000.
Aoki, Takaaki; Iida, Hiroyasu; and Nojima, Katsuyuki, to International Business Machines Corporation. Method and system for smooth scrolling of a displayed image on a display screen. 4,922,238, Cl. 340-726.000.
Aoki, Tsunetaka; and Ishii, Susumu, to Yoshida Kogyo K. K. Slide fastener slider with detachable pull tab. 4,920,615, Cl. 24-429.000.
Aoshima, Shinichiro: *See*—
Tsuchiya, Yutaka; Aoshima, Shinichiro; and Nakamura, Takuya, 4,922,186, Cl. 324-96.000.
Aoyagi, Yoshio: *See*—
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,922,476, Cl. 369-47.000.
Aoyama, Kunitoshi: *See*—
Kato, Tsugiji; Aoyama, Kunitoshi; and Kozakai, Motokazu, 4,921,095, Cl. 206-328.000.
Aoyama, Mari; Ito, Michiyasu; Tsuji, Syoichi; Ishii, Toshiyuki; and Tanaka, Tomohide, to Mitsui Toatsu Chemicals, Inc. Method of forming a porous polyolefin film. 4,921,653, Cl. 264-41.000.
Aoyama, Ryuichiro, to Kabushiki Kaisha Tocad (Tocad Corporation). Photographic illumination apparatus. 4,922,383, Cl. 362-10.000.
Appalachian Technologies Corporation: *See*—
Beverly, William C., II, 4,922,187, Cl. 324-96.000.
Applied Magnetic Lab. Co., Ltd.: *See*—
Kuromatsu, Akio, 4,920,946, Cl. 125-11.010.
Applied Materials, Inc.: *See*—
Adams, David V.; Anderson, Roger N.; and Deacon, Thomas E., 4,920,918, Cl. 118-724.000.
Applied Technologies Associates: *See*—
Van Steenwyk, Donald H., 4,920,655, Cl. 33-304.000.
Appropriate Technology Corporation: *See*—
May, David A., 4,921,032, Cl. 160-84.100.
Apsley Metals Limited: *See*—
Holroyd, Eric; and Holroyd, Colin, 4,921,673, Cl. 264-254.000.
Arai, Hajime; Furuta, Isao; Kuroki, Hidefumi; Arima, Junichi; Hirata, Yoshihiro; and Harada, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and a method of producing same. 4,922,321, Cl. 357-68.000.
Arai, Michio. Shield mounting assembly for a safety helmet. 4,920,585, Cl. 2-424.000.
Arai, Motoharu; and Ito, Masatsugu, to Nippon Oil and Fats Co., Ltd. Lipid powder having cross-linked coating thereon and process for preparing same. 4,921,705, Cl. 424-450.000.
Arai, Shinji: *See*—
Ikegawa, Sumio; Terashima, Yoshiaki; Yasuda, Nobuaki; Ichihara, Katsutarou; Komatsu, Shuichi; and Arai, Shinji, 4,922,462, Cl. 365-113.000.
Arai, Tadashi: *See*—
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, 4,922,274, Cl. 354-271.100.
Arai, Yutaka: *See*—
Shimizu, Isoo; Matsumura, Yasuo; and Arai, Yutaka, 4,922,052, Cl. 585-25.000.
Arakaki, Steven. Metal grid perimeter obstacle trap. 4,921,220, Cl. 256-1.000.
Araki, Kazuhiro; and Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Copying apparatus with document feeder. 4,922,306, Cl. 355-313.000.
Aramaki, Shinji: *See*—
Murayama, Tetsuo; and Aramaki, Shinji, 4,921,770, Cl. 430-76.000.
Arendt, Henry P.: *See*—
Godfrey, Craig W.; Schnatzmeyer, Mark A.; and Arendt, Henry P., 4,921,438, Cl. 439-190.000.
Arikawa, Tetsuro, to Nippon A.B.S., Ltd. Anti-skid control apparatus for vehicle braking system. 4,921,313, Cl. 303-116.000.
Arima, Junichi: *See*—
Arai, Hajime; Furuta, Isao; Kuroki, Hidefumi; Arima, Junichi; Hirata, Yoshihiro; and Harada, Shigeru, 4,922,321, Cl. 357-68.000.
Arimoto, Kazutami: *See*—
Furutani, Kiyohiro; and Arimoto, Kazutami, 4,922,460, Cl. 365-207.000.
Armstrong World Industries, Inc.: *See*—
Bohrn, Walter J.; DeSantis, William D.; and Garman, Shelly N., 4,921,748, Cl. 428-209.000.
Shaub, Melvin H.; and Herr, J. Robert, 4,920,719, Cl. 52-488.000.
Arnold, Andrew D.: *See*—
Nutting, Thomas C.; Lucas, King A.; and Arnold, Andrew D., 4,922,333, Cl. 358-78.000.
Arpino, Ronald G. Line-of-sight inspection system. 4,922,338, Cl. 358-106.000.

VOL
1114
ISS
1
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Artwick, Kert E.; and Wilkening, Steven R., to ODL, Incorporated. Integral door light and related door construction. 4,920,718, Cl. 52-476.000.

Arutaki, Akira: *See—*
Yoshida, Yoshinori, Arutaki, Akira; Hashimoto, Masao; and Yoshikawa, Suminori, 4,922,484, Cl. 370-68.100.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Shirai, Takashi; and Wallace, R. Bruce, 4,921,698, Cl. 424-85.500.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Koshino, Susumu; and Ogawa, Yuji, 4,922,280, Cl. 354-403.000.

Asakawa, Kazuo; Akiya, Fumiaki; and Tabata, Fumio, to Fujitsu Limited. Supporting device. 4,921,396, Cl. 414-751.000.

Asano, Hiroaki, to Toyoda Koki Kabushiki Kaisha. Electric power steering apparatus. 4,921,061, Cl. 180-79.100.

Asano, Kiro; Mitsuhashi, Satoshi; Bannai, Kenji; Wada, Hisayuki; and Tamura, Humio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Injection containing 3-benzoyloxy-1,3,5(10)-estratriene-17-[4-(p-(bis(2-chloroethyl)amino)phenyl}butanoyloxy)acetate as an active ingredient. 4,921,849, Cl. 514-182.000.

Asano, Masamichi: *See—*
Iwahashi, Hiroshi; Nakai, Hiroto; and Asano, Masamichi, 4,922,133, Cl. 307-363.000.

Asanuma, Tadashi: *See—*
Fujio, Ichiro; Ito, Kaneo; and Asanuma, Tadashi, 4,921,905, Cl. 525-53.000.

Asbra, Andrew F.: *See—*
Asbra, Martin R.; Asbra, Andrew F.; and Bovis, Nicholas J., 4,920,999, Cl. 137-38.000.

Asbra, Martin R.; Asbra, Andrew F.; and Bovis, Nicholas J., to Andrene Associates; and Asbra, Martin R., a part interest. Air actuated valve system with seismic controller. 4,920,999, Cl. 137-38.000.

Aschberger, Matthias; Farber, Karlheinz; and Deininger, Anton, to Coca-Cola Company, The; and Bosch-Siemens Hausgerate GmbH. Circuit arrangement for regulating the filling and refilling of containers with liquids. 4,921,134, Cl. 222-64.000.

Asea Brown Boveri AB: *See—*
Paulsson, Lars, 4,922,364, Cl. 361-16.000.

Asea Brown Boveri Aktiengesellschaft: *See—*
Knodler, Reinhard; and Reiss, Karl, 4,921,766, Cl. 429-104.000.

Asea Brown Boveri Ltd.: *See—*
Couper, Malcolm, 4,921,664, Cl. 419-1.000.
Starcevic, Mihailo, 4,922,150, Cl. 310-90.000.

Ashikawa, Noboru: *See—*
Hamada, Tetsuro; Noro, Yoshiki; and Ashikawa, Noboru, 4,921,065, Cl. 180-245.000.

Asten Group, Inc.: *See—*
Todd, Jeffrey L., 4,921,750, Cl. 428-225.000.

Astro ARC Company *See—*
Weir, David J., 4,922,073, Cl. 219-60.00A.

AT & E Corporation: *See—*
Gaskill, Garold B.; Miles, Michael; and Schrock, Clifford B., 4,922,260, Cl. 343-718.000.

AT&T Bell Laboratories: *See—*
Hwang, Frank K.; and Richards, Gaylord W., 4,922,245, Cl. 340-825.080.

Atherton, Charles G. and Swartz, John C., to AMP Incorporated. Cluster block assembly 4,921,454, Cl. 439-685.000.

Atmel Corporation: *See—*
Hobbs, James B., 4,922,411, Cl. 365-155.000.

Atochem: *See—*
Pommier, Yves; and Legrand, Yves, 4,921,918, Cl. 526-88.000.

Attwood, Terence E. and Bridges, Richard F., to Imperial Chemical Industries PLC. Production of tetrafluoroethylene polymers. 4,921,922, Cl. 526-255.000.

Atwood, Harvey E., to Exxon Chemical Patents Inc. Isoprene recovery in the butyl rubber process. 4,921,924, Cl. 526-339.000.

Auld, Gregg D.: *See—*
Franklin, Richard D.; Auld, Gregg D.; Murray, David E.; Lescisin, John J.; Vaia, Albert R.; and Dunn, Thomas E., 4,921,662, Cl. 376-316.000.

Ausimont S.r.l.: *See—*
Malacrida, Alessandro; and Desmarteau, Darryl D., 4,921,957, Cl. 544-217.000.

Auslander, David M. *See—*
Andeen, Gerry B.; and Auslander, David M., 4,921,393, Cl. 414-729.000.

Austin, Curtiss M., to Inco Alloys International, Inc. Promoting directional grain growth in objects. 4,921,549, Cl. 148-13.100.

Automark Corporation: *See—*
Rhodenbaugh, Thomas A., 4,921,626, Cl. 252-79.400.

Automatic Specialties, Inc.: *See—*
Moineau, Hubert J., 4,921,209, Cl. 251-30.010.

Automatic Switch Company: *See—*
LaMarca, Drew P., 4,921,208, Cl. 251-30.040.

Automation, Inc.: *See—*
Wales, R. Langdon; and Crowley, H. W., 4,921,132, Cl. 222-57.000.

Automation Industries, Inc.: *See—*
Culbreth, Keith C., 4,921,105, Cl. 206-626.000.

Automation Intelligence, Inc.: *See—*
Carter, Woodward C., II, 4,922,431, Cl. 364-474.180.

Automotive Moulding Company: *See—*
Stevens, William T., 4,921,297, Cl. 296-96.210.

Automotive System Laboratory, Inc.: *See—*
Behr, Leonard W.; Colten, Robert B.; and Duda, Donald A., 4,922,065, Cl. 200-61.45M.

Autotype International Limited: *See—*
Falconer, Stuart A.; Foster, David J.; and Steel, John, 4,921,740, Cl. 428-40.000.

Autra-Bike Co., Inc.: *See—*
Chilcote, Keith C., 4,921,081, Cl. 188-344.000.

Avar, Lajos, to Sandoz Ltd. Stabilizing polymers. 4,921,893, Cl. 524-99.000.

Averill, Robert G.; Serekian, Paul; and Taylor, Scott K., to Osteonics Corp. Femoral head adaptor for interoperative assembly. 4,921,500, Cl. 623-22.000.

Awai, George K., to Fiberstars, Inc. Cooled lighting apparatus and method. 4,922,385, Cl. 362-32.000.

Axiomatics Corporation: *See—*
Bredt, James F.; Suh, Nam P.; and Waldman, Francis A., 4,922,082, Cl. 219-541.000.

Ayres, Calvin L.: *See—*
Rowles, Howard C.; and Ayres, Calvin L., 4,921,514, Cl. 62-24.000.

Ayres, John A. Frangible article. 4,921,250, Cl. 273-58.00R.

Baba, Keizo; and Nishikawa, Masato, to Ricoh Company Ltd. Facsimile system with a voice transmission function. 4,922,524, Cl. 379-100.000.

Baba, Mitsuru, to Yamaha Corporation. Apparatus for determining distance coordinates. 4,922,444, Cl. 364-566.000.

Baba, Susumu: *See—*
Sasaki, Nobuyoshi; and Baba, Susumu, 4,921,038, Cl. 164-516.000.

Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B. Antianginal plate for treating ischemic heart disease. 4,921,695, Cl. 424-81.000.

Babcock & Wilcox Company, The: *See—*
Lane, John D.; and Scheib, Thomas J., 4,922,412, Cl. 364-157.000.

Babel, Werner, to MAHO Aktiengesellschaft. Auxiliary magazine for electronically-driven machine tools. 4,920,632, Cl. 29-568.000.

Bailey, Curtis J. *See—*
Metcalfe, L. D.; Maczuzak, Michael J.; Bailey, Curtis J.; and Deyo, Paul R., 4,921,315, Cl. 312-321.500.

Bailey, F. Courtney: *See—*
Law, Kock-Yee; and Bailey, F. Courtney, 4,922,018, Cl. 564-307.000.

Bailey, Gilber D.; and Bailey, James C. Operational carrier for wheel-type hay rake. 4,920,735, Cl. 56-14.900.

Bailey, James C.: *See—*
Bailey, Gilber D.; and Bailey, James C., 4,920,735, Cl. 56-14.900.

Baines, Ronald J. Motor vehicle towing device. 4,921,390, Cl. 414-483.000.

Baisch, Herbert: *See—*
Handler, Milton E.; and Baisch, Herbert, 4,921,370, Cl. 403-234.000.

Bakalik, Dennis P.: *See—*
Sparapany, John W.; and Bakalik, Dennis P., 4,921,904, Cl. 525-329.900.

Baker, Gerald N.; and Bushor, Ray E., to Emerson Electric Co. Rotor assembly structure. 4,922,144, Cl. 310-42.000.

Baker, Gerald S., to Cameron Iron Works USA, Inc. Actuated gate valve with manual overrride 4,921,207, Cl. 251-14.000.

Baker, Laurna J. Yarn holder and dispenser 4,921,185, Cl. 242-129.600.

Baker Oil Tools, Inc.: *See—*
Richardson, Downie S., 4,921,045, Cl. 166-134.000.

Baker, Robert B., Jr.; Pews, R. Garth; Otterbacher, Eric W.; and Gall, James A., to Dow Chemical Company, The. Acylation process to form diketones. 4,922,026, Cl. 568-322.000.

Baker, Ronald D. Hole in one alarm. 4,922,222, Cl. 340-323.00R.

Bakhaus, Kenneth C.; and Sdunek, Bruce C., to Mechanical Products, Inc. Circuit breaker. 4,922,219, Cl. 337-74.000.

Baldwin-Japan Limited: *See—*
Hara, Akira; and Ochiai, Minoru, 4,920,880, Cl. 101-425.000.

Ball, Melville D.: *See—*
Furneaux, Robin C.; Davidson, Alexander P.; and Ball, Melville D., 4,921,823, Cl. 502-4.000.

Balltrax Inc.: *See—*
Steeves, Christopher, 4,921,361, Cl. 384-45.000.

Ballweg, Adolf, to Siemens Aktiengesellschaft. Method and apparatus for reading packet-oriented data signals into and out of a buffer. 4,922,438, Cl. 370-85.150.

BancTec, Inc.: *See—*
Milford, Richard E., 4,922,086, Cl. 235-449.000.

Bando, Hiroshi: *See—*
Tokumoto, Hiroshi; Bando, Hiroshi; Sakai, Fumiki; Miyata, Chikara; and Wakiyama, Shigeru, 4,921,346, Cl. 356-72.000.

Bando, Toshiro, to Ricoh Company, Ltd. Control system for an image forming apparatus. 4,922,293, Cl. 355-200.000.

Bandy, Lee R.: *See—*
Aikins, Robert D.; Bandy, Lee R.; Davis, William P.; Delaney, Robert E.; Guyer, Michael E.; Lovera, Edward D.; and Scamuffa, Thomas A., 4,920,627, Cl. 29-402.080.

Bangs, Edmund R. Densified braided switch contact. 4,922,068, Cl. 200-271.000.

Banks, George: *See—*
Suzuki, Arata; Tyberg, William T.; Banks, George; and Suzuki, Marcia, 4,920,969, Cl. 128-659.000.

Banks, Nigel H.; Borton, Colin A.; Leonce, Francis S.; Lomax, Terence J.; Meier, Antony R. H.; and Skiba, Christopher J., to Haircloth Weaving & Finishing Company Limited; Geest Industries Limited; and Windward Islands Banana Grower's Association, The. Sheet material for treating wounds in plant matter. 4,921,702, Cl. 424-404.000.

Bannai, Kenji: *See—*
Asano, Kiro; Mitsuhashi, Satoshi; Bannai, Kenji; Wada, Hisayuki; and Tamura, Humio, 4,921,849, Cl. 514-182.000.

Baptista, John: *See—*
Ty, Henry; Baptista, John; and DeAmaral, George, 4,920,624, Cl. 29-173.000.

Baranyi, Giuseppa: *See—*
Odell, Peter G.; Baranyi, Giuseppa; and Alexandru, Lupu, 4,921,940, Cl. 528-486.000.

Barber, Gerald L. Amusement ride. 4,920,890, Cl. 104-53.000.

Barden, Charles R.: *See—*
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R.; Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C.; and Jacubec, Mark R., 4,921,886, Cl. 423-235.000.

Baremek Pty. Limited: *See—*
Cowle, Anthony J.; Cowle, Paul J.; Cowle, Gregory J.; and Cowle, Joffre B., 4,921,544, Cl. 134-1.000.

Barendse, Nicolaas C. M. E., to Gist-Brocades N.V. Process for the preparation of N-(sulfonylmethyl) formamide compounds. 4,922,016, Cl. 564-219.000.

Barker, James M., to Halliburton Logging Services, Inc. Detonation transfer methods and apparatus 4,920,883, Cl. 102-202.500.

Barker, Richard F.: *See—*
Hall, Timothy C.; Loesch-Fries, L. Sue; Jarvis, Nancy P., and Barker, Richard F., 4,921,802, Cl. 435-172.300.

Barnett, Jimmy: *See—*
Doster, John; Barnett, Joe; and Barnett, Jimmy, 4,920,729, Cl. 53-523.000.

Barnett, Joe: *See—*
Doster, John; Barnett, Joe; and Barnett, Jimmy, 4,920,729, Cl. 53-523.000.

Barnett, O. Lynn. Rotating fishing lure spreader for use while trolling 4,920,687, Cl. 43-42.740.

Bartasevich, William E.: *See—*
Nelson, David C.; Bartasevich, William E., and Waldo, Robert L., 4,921,402, Cl. 415-148.000.

Bartasis, James E.; and McIntire, Richard L., to Bodigard Technologies, Inc. Protective garment material and construction. 4,920,575, Cl 2-2.000.

Bartkowiak, Peter: *See—*
Abdulally, Iqbal F.; Touma, Alfred S.; and Bartkowiak, Peter, 4,920,924, Cl. 122-4.00D.

Bartley, Bryan A. Methods of mineral breaking and apparatus used therefor. 4,921,173, Cl. 241-5.000.

Barton, Nicholas; Billing, Robert; and Littlejohn, Hugh K., to Hugh Kendal Littlejohn Questech Limited. Processing of video image signals. 4,922,345, Cl. 358-183.000.

Barton, Noel: *See—*
Ford, Douglas L.; and Barton, Noel, 4,921,610, Cl 210-636.000.

Barzaghi, Fernando: *See—*
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 4,921,868, Cl. 514-354 000.

BASF Aktiengesellschaft: *See—*
Birnbach, Stefan; Mueller, Josef; Wulz, Klaus, and Houben, Jochen, 4,922,029, Cl. 568-616.000.
Daumit, Gene P.; Ko, Yoon S.; Slater, Christopher R.; Venner, Jozef G.; and Young, Chi C., 4,921,656, Cl. 264-85.000.
Eichenauer, Ulrich; and Neumann, Peter, 4,922,031, Cl. 568-730.000.
Fischer, Roman; Mercker, Hans J.; and Mueller, Herbert, 4,922,023, Cl. 564-479.000.
Grossman, Klaus, Jung, Johann; Schulz, Guenter; Sauter, Hubert; Hofmeister, Peter; and Tuerk, Wolfgang, 4,921,525, Cl 71-73.000.
Hoelderich; Hesse, Michael; and Schwarzmann, Matthias, 4,922,025, Cl. 568-14.000.
Kiefer, Hans; Bipp, Hansjoerg; Fink, Fritz; Jaedicke, Hagen, and Poralla, Dieter M., 4,921,711, Cl. 426-66.000.
Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.
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Lausberg, Dietrich; and Seiler, Erhard, 4,921,889, Cl. 523-400.000.
Michl, Gerhard; Seubert, Rolf; and Schmidt, Johannes E., 4,921,977, Cl. 549-256.000.
Moore, Richard B.; Fitzgerald, Paul L. and Pole, Ernest G., 4,921,892, Cl. 524-61.000.
Richter, Peter; Hoffmann Gerhard; Bronstert, Klaus; Mueller, Wolfgang F.; and Gerberding, Karl, 4,921,775, Cl. 430-281.000.
Sterzel, Hans-Josef, 4,921,655, Cl. 264-66.000.

BASF Aktiensellschaft: *See—*
Zubovics, Zoltan; Toldy, Lajos; Rabloczky, Gyorgy; Varro, Andras; Andrasi, Ferenc; Elek, Sandor; and Elekes, Istvan, 4,922,021, Cl. 564-367.000.

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Hamlin, Jack A., 4,921,618, Cl. 210-780.000.

Bates, Carl H.; Couhig, John T.; and Pelletier, Paul J., to Norton Company. Joining of porous silicon carbide bodies 4,921,554, Cl. 156-89.000.

Battelle Memorial Institute: *See—*
Koski, Oscar; and Marschman, Steven C., 4,921,584, Cl. 204-67.000.

Baudouin, Jacques. Vegetable or fruit peeler. 4,920,645, Cl. 30-162.000.

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Cole, Jack H.; Gergely, John S.; Baumel, Robert T.; and Strecker, John E., 4,922,472, Cl. 367-189.000.

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Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 4,921,528, Cl. 71-92.000.
Dorf, Ernst-Ulrich; Alfes, Franz; and Traenckner, Hans-Joachim, 4,921,935, Cl. 528-388.000.
Gayer, Herbert; Jelich, Klaus; Kramer, Wolfgang; and Brandes, Wilhelm, 4,921,993, Cl. 558-392.000.
Heidenreich, Holger; and Becker, Benedikt, 4,921,872, Cl. 514-523.000.
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; and Reinecke, Paul, 4,921,870, Cl. 514-383.000.
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 4,921,967, Cl. 548-267.800.
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Rademachers, Jakob; Ganter, Karl-Werner; Rambold, Wolfgang; and Linde, Gunter, 4,921,542, Cl. 106-456.000.
Schafer, Walter; Muller, Hanns P.; and Hassel, Tillmann, 4,921,996, Cl. 560-25.000.

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Henning, Wolfgang; Petersen, Harald, and Moormann, Gerhard, 4,921,842, Cl. 524-839.000.

Bays, F. Barry; and Marchand, Sam R., to Richards Medical Company. Metal core ossicular replacement prosthesis. 4,921,498, Cl 623-10.000.

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Bean, Kenneth E.: *See—*
Malhi, Satwinder S.; and Bean, Kenneth E., 4,922,378, Cl. 361-387.000.

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Beatty, John D.; Beatty, Barbara G.; and Duda, Rosemary B., 4,921,690, Cl. 424-1.100.

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Berthold, Heinz; Beck, Josef, and Lotter, Manfred, 4,920,856, Cl 91-6.500.

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Staggl, Roland; Sprung, Hartwig; and Becker, Eberhard, 4,921,167, Cl. 238-126.000.

Becker, Heinrich: *See—*
van Ackeren, Paul; Schmitz, Karl-Heinz; Stache, Bernfried; Kleff, Gunter; and Becker, Heinrich, 4,922,505, Cl. 373-9.000.

Becker, Horst-Peter; Remfrey, James; and Dehio, Gottfried, to Alfred Teves GmbH Brake system with slip control. 4,922,120, Cl. 303-114.000.

Becker, Stanley D.: *See—*
Ozero, Brian J.; and Becker, Stanley D., 4,921,681, Cl 422-197.000

Beckman Instruments, Inc.: *See—*
Giebeler, Robert, 4,921,350, Cl. 356-320.000.

Beckstead, Gary K.; and Fleming, Dennis L. Cryogenic target and method and apparatus for making same. 4,920,762, Cl. 62-353.000.

Becton, Dickinson and Company: *See—*
Haynes, John L., 4,920,977, Cl. 128-770.000.

Bedell, Louis J.: *See—*
Nocito, Vincent; Bedell, Louis J.; and Levinson, Matthew I., 4,922,030, Cl. 568-713.000.

Bedell, Stephen A., to Dow Chemical Company, The Nitric oxide abatement with polymeric cobalt(III) chelates 4,921,683, Cl. 423-235.000.

Beecham Group p.l.c.: *See—*
Brain, Edward G.; Hunt, Eric; and Forrest, Andrew K., 4,921,839, Cl. 514-29.000

Beers, David G. *See—*
McCauley, Michael J.; Beers, David G.; and Raymond, John P., 4,920,765, Cl 62-408.000.

Behr, Leonard W.; Colten, Robert B.; and Duda, Donald A., to Automotive System Laboratory, Inc. Temperature-compensating accelerometer. 4,922,065, Cl. 200-61.45M.

Behrens, Robert N. *See—*
Lee, Michael C.; Behrens, Robert N.; Dobberpuhl, Dale R.; Wykhuis, Lloyd A.; and Montgomery, Dix S., 4,920,732, Cl 56-10.200.

Behringwerke Aktiengesellschaft *See—*
Dengler, Michael; Kapmeyer, Wolfgang; and Rinno, Helmut, 4,921,915, Cl. 525-279.000.

Beier, Dietmar; Gutzeit, Jurgen; and Selder, Harald, to Sulzer-Escher Wyss GmbH. Method of regulating the specific dispersion work for

waste paper stock preparation for papermaking. 4,921,573, Cl. 162-4.000.

Beiersdorf Aktiengesellschaft: *See*—
Hoppe, Udo; Eigener, Ulrich; Sauermann, Gerhard; Engel, Walter; and Pape, Wolfgang, 4,921,694, Cl. 424-65.000.

Beihoff, Bruce C.: *See*—
Juds, Mark A., and Beihoff, Bruce C., 4,922,197, Cl. 324-207.210.

Beilharz, Helmut: *See*—
Seubert, Bernhard; Beilharz, Helmut; Fickert, Werner; Jeromin, Gunter; and Spitaler, Ulrich, 4,921,840, Cl. 514-33.000.

Beitz, Donald C.; Young, Jerry W.; and Dehal, Shangara S., to Iowa State University Research Foundation, Inc. Method of converting cholesterol in food to coprostanol. 4,921,710, Cl. 426-56.000.

Belcham, Robert D. J., to IMI Cornelius (UK) Limited. Bar gun with selectable outlets. 4,921,140, Cl. 222-144.500.

Belcher, James: *See*—
Harpold, Charles W.; and Belcher, James, 4,920,878, Cl. 101-115.000.

Bell Communications Research, Inc.: *See*—
Chang-Hasnain, Constance J.; and Kapon, Elyahou, 4,922,500, Cl. 372-50.000.

Belmain, Daniel; Chabert, Pierre; Tholome, Roger; Fabre, Pierre; Correard, Jean-Yves; and Gondrand, Michel, to Sames S.A. Electrostatic sprayer device for spraying products in powder form. 4,921,172, Cl. 239-698.000.

Beloit Corporation: *See*—
Page, Robert E., 4,921,575, Cl. 162-306.000.

Beltone Electronics Corporation: *See*—
Anderson, James R.; and Brander, Richard, 4,922,131, Cl 307-355.000.

Bender, Oswald: *See*—
Schuessler, Harald; and Bender, Oswald, 4,922,254, Cl. 342-25.000.

Bender, Richard; and Bretfeld, Anton, to Dynamit Nobel Aktiengesellschaft. Safety belt with integrated lock release. 4,920,619, Cl. 24-602.000.

Benesch, Maurice C. Break apart stand for plastic bags. 4,921,193, Cl 248-97.000.

Bennington, Russell J., to Budd Company, The. Combination transfer/-turnover machine. 4,921,387, Cl. 414-225.000.

Benoit, Gordon L.; Sable, Lewis E.; and Wenzel, Richard A., to Mobil Oil Corporation. Bag holding, dispensing, loading and discharge system. 4,921,197, Cl. 248-97.000.

Benoit, Marcell N.: *See*—
Woodle, Allan S., IV; and Benoit, Marcell N., 4,921,059, Cl. 177-211.000.

Bentley, Andrew C. *See*—
Newman, Alex T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,920,870, Cl. 99-289.00R.

Bentley, Bryan R. Component part of filter casing. 4,921,601, Cl 210-169.000.

Bercovitz, Christian; and Feyjoo, Alexandre, to LGZ Landis & Gyr Zug AG. Device for recognizing authentic documents using optical modulas. 4,922,109. Cl. 250-556.000.

Berenyi, Edit nee Poldermann: *See*—
Bozsing, Daniel; Kovanyi, Gyorgyi nee Lax; Berenyi, Edit nee Poldermann; Magyar, Karoly; Tuboly, Sandor; and Mandi, Attila, 4,921,654, Cl. 514-224.200.

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Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan, and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.

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Bergero, Jean-Pierre, and Couasnard, Claude, to Thomson-CSF. Power divider in waveguide form. 4,922,215, Cl. 333-137.000.

Bergeron, Lawrence E., Goldson, John D.; and Ellis, David A., to Dictaphone Corporation. Method and apparatus for dispatching services. 4,922,514, Cl. 379-6.000.

Bergeron, Norman J.; Wood, J. F. B., and Hazelett, R. W., to Hazelett Strip-Casting Corporation. Method and apparatus for introducing differential stresses in endless flexible metallic casting belts for enhancing belt performance in continuous metal casting machines. 4,921,037, Cl. 164-432.000.

Bergkvist, Hakan: *See*—
Juhlin, Sven-Eric; Bergkvist, Hakan, Norberg, Astrid, and Winblad, Bengt, 4,921,112, Cl. 215-11.400.

Berglind, Eilert, to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm. Arrangement for measuring speeds. 4,922,255, Cl. 342-104.000.

Bergwerksverband GmbH: *See*—
Juntgen, Harald; Knoblauch, Karl; Richter, Ekkehard; and Kuhl, Helmut, 4,921,826, Cl. 502-180.000.

Bernard, John K., Brand, Hunt K.; and Walker, Richard L., to M A Kempner, Inc. Automatic telephone polling system. 4,922,520, Cl. 379-88.000.

Bernard Matthews PLC: *See*—
Matthews, Bernard T.; Joll, David J., Ziauddin, Habeeb M., and Wilson, David N., 4,921,714, Cl. 426-90.000.

Bernhardt, Randal J., Loeb, Melvin L.; and Kay, James W., to Stepan Company. Organometallic compounds. 4,921,942, Cl. 424-59.000.

Berrian, Donald W.; Kaim, Robert E.; and Vanderpot, John W., to Varian Associates, Inc. Ion beam scanning method and apparatus. 4,922,106, Cl. 250-492.200.

Berrios, Joseph E. Self-propelled, walk-behind, hydraulic motor-operated mower. 4,920,733, Cl. 56-10.900.

Berroth, Kurt. Apparatus for positive muscle training. 4,921,244, Cl. 272-117.000.

Berry, David F.: *See*—
Klar, Erhard; Svilar, Mark; and Berry, David F., 4,921,665, Cl. 419-23.000.

Berry, Jimmy D.; and Allman, Robert M., to Specialty Products, Inc. Method and apparatus for adjusting wheel alignment in a steerable wheel suspension assembly. 4,921,271, Cl. 280-661.000.

Berta, Norbert I., to McNeilab, Inc. Apparatus for gelatin coating caplets. 4,921,108, Cl. 209-625.000.

Berthold, Heinz; Beck, Josef; and Lotter, Manfred, to Brueninghaus Hydraulik GmbH. Axial piston machine of the swashplate or bent axis type having slot control and pressure balancing passages. 4,920,856, Cl. 91-6.500.

Bertin & Cie: *See*—
Fardeau, Michel G. J., Guern, Yves F. C.; Dignac, Jean P.; and Drevon, Jean M., 4,922,093, Cl. 250-221.000.

Bertrams, Josef: *See*—
Grecksch, Hans; Bertrams, Josef; and Loers, Wolfgang, 4,921,180, Cl. 242-35.50A

Besecker, Charles J.; and Marritt, William A., to Standard Oil Company, The. Water-soluble antimony (V) compounds. 4,921,985, Cl 556-76.000.

Besic, Dragan, to Dresser Industries, Inc. High pressure reciprocating pump. 4,921,409, Cl. 417-552.000.

Besozzi, Elizabeth M.: *See*—
Cashmere, Karen A.; and Besozzi, Elizabeth M., 4,921,877, Cl. 514-866.000.

Betsch, Regis J.: *See*—
Nathanson, Harvey C.; Driver, Michael C.; and Betsch, Regis J., 4,922,253, Cl. 342-5.000.

Betz Laboratories, Inc.: *See*—
Sander, Lothar S.; Musingo, Edward M., and Neill, William J., 4,921,552, Cl. 148-247.000.

Beverly, William C., II, to Appalachian Technologies Corporation. Pulse initiator circuit. 4,922,187, Cl. 324-96.000.

Beyer, Bruce R. Layout device. 4,921,507, Cl. 33-413.000.

Bhatia, Rajkumar P., to Alcon Laboratories, Inc. Contact lens cleaning compositions containing an enzyme and a carboxy vinyl polymer. 4,921,630, Cl. 252-174.120.

Bhatia, Ram N.: *See*—
Oswald, Alexis A., Bhatia, Ram N., Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M.; and Hsu, Chang S., 4,922,028, Cl 568-448.000.

Biagiotti, Guglielmo; and Ghilardi, Mauro. Apparatus and method for folding and stacking napkins from a continuous web of paper or other material. 4,921,235. Cl. 270-47.000

BICC plc: *See*—
Howell, Barry G., Ness, Diane E. M., and Harvey, Ronald A., 4,921,916, Cl. 525-423.000.

Bidco Inc.: *See*—
Bidner, Harvey; and Zuber, James J., 4,922,266, Cl. 346-1.100.

Bidner, Harvey; and Zuber, James J., to Bidco Inc. Method for placing information on a medium while compensating for deviations from a characteristic time period. 4,922,266, Cl. 346-1.100.

Bielfeldt, Friedrich B., to Maschinenfabrik J. Dieffenbacher GmbH & Co. Continuously working press. 4,921,418, Cl. 425-371.000.

Bigham, Eric C.; and Hedson, Stephen J., to Burroughs Wellcome Co. Substituted glutamic acids. 4,921,836, Cl. 514-19.000.

Billet, Robert L., to Thirst Aid, Inc. Portable beverage dispenser. 4,921,143, Cl. 222-175.000

Billing, Robert: *See*—
Barton, Nicholas; Billing, Robert, and Littlejohn, Hugh K., 4,922,345, Cl. 358-183.000.

Biltgen, Gary L.: *See*—
Tipton, Sheryl A., Keil, Gary D., Holloway, Gregory S.; Gromer, David R.; and Biltgen, Gary L., 4,921,025, Cl. 148-16.500.

Binder, Rolf; Hanselmann, Daniel; Schlepfer, Walter; and Staeheli, Christoph, to Rieter Machine Works, Ltd. Flock delivery system. 4,920,613, Cl. 19-80.00B.

Binderbauer, Horst, and Binderbauer, Michl. Liquid dispenser. 4,921,131, Cl. 222-52.000.

Binderbauer, Michl: *See*—
Binderbauer, Horst, and Binderbauer, Michl, 4,921,131, Cl. 222-52.000.

Biomedical Polymers, Inc.: *See*—
Fay, John E., 4,920,975, Cl. 128-760.000.

Biotech Industries Incorporated. *See*—
Moellenbeck, Albert J., 4,921,604, Cl. 210-151.000.

Bipp, Hansjoerg: *See*—
Kiefer, Hans; Bipp, Hansjoerg; Fink, Fritz; Jaedicke, Hagen; and Poralla, Dieter M., 4,921,711. Cl. 426-66.000.

Biren, Theodore M., to Cooper Power Systems, Inc. Variable portable feedthru device. 4,921,433, Cl. 439-534.000.

Birk, Daniel J.; Fenne, Kenneth R., and Mantzke, Michael T., to Pittway Corporation. Modular electronic timer switch system. 4,922,407, Cl. 364-145.000.

Birnbach, Stefan; Mueller, Josef; Wulz, Klaus; and Houben, Jochen, to BASF Aktiengesellschaft. Etherification of polyoxyalkylene derivatives. 4,922,029, Cl. 568-616.000.

Bishop, Edward T., to Jaguar Cars Limited. Variable speed coupling system for cooling an engine. 4,920,929, Cl. 123-41.490.

BISO Bitter, GmbH & Co.: *See*—
Scharf, Alois, 4,921,469, Cl. 460-10.000.

Biswas, Nicholas, to Zedlani Pty. Limited. Urinary incontinence device. 4,920,986, Cl. 128-885.000.

Bittner, Gerd: *See*—
Adolfs, Friedhelm; Bittner, Gerd; Busing, Klaus P.; Harris, Stephen; Hahn, Ulrich; and Wurzburger, Martin, 4,921,352, Cl. 356-347.000.

Bitzel, Michael E.: *See*—
Gerke, Burton E., Jr.; Bitzel, Michael E.; Kubicko, Robert; and Krasznai, Charles Z., 4,920,606, Cl. 15-338.000.

Bixler, Kathleen J.; and Scholsky, Kevin M., to S. C. Johnson & Son, Inc. Alkali-soluble polymers and process for producing same. 4,921,934, Cl. 528-355.000.

Black & Decker, Inc.: *See*—
Gerke, Burton E., Jr.; Bitzel, Michael E.; Kubicko, Robert; and Krasznai, Charles Z., 4,920,606, Cl. 15-338.000.

Blakley, James R., to American Telephone and Telegraph Company. Telephone station set. 4,922,490, Cl. 370-110.100.

Blanchette, Richer. Miter box for portable circular saw. 4,920,845, Cl. 83-574.000.

Blattler, Ernst, to KWC AG. Electrically controlled fluid mixing fixture, especially for mixing hot and cold water. 4,921,162, Cl. 236-12.120.

Blehm Blank, Lynne M., to Dow Corning Corporation. Antimicrobial water soluble substrates. 4,921,701, Cl. 424-401.000.

Blessinger, Martin W. Pneumatic vein inflation device. 4,920,971, Cl. 128-679.000.

Blew, Douglas J., to Siecor Corporation. Apparatus for controlling excess fiber length in a loose tube optical fiber buffer tube. 4,921,413, Cl. 425-71.000.

Bloch, Christopher J., to Naylor Industrial Services, Inc. Method and apparatus for cleaning conduits. 4,921,546, Cl. 134-22.120.

Bloch, Klaus. Air bag for motor vehicles. 4,921,735, Cl. 428-34.900.

Blount, Inc.: *See*—
Scott, Lewis A.; Hoffman, Francis E.; and Bolkan, Kenneth R., 4,920,947, Cl. 125-21.000.
Wiemeri, Ronald W.; and Mitchell, James N., 4,921,024, Cl. 144-336.000.

Blumensaadt, Hans C.: *See*—
Borresen, Bjarne; and Blumensaadt, Hans C., 4,920,713, Cl. 52-200.000.

Blumenshine, Kent M.; Marcus, Harris L.; and Long-Daugherty, Kathleen A., to Motorola, Inc. Ceramic semiconductor package having crack arrestor patterns. 4,922,326, Cl. 357-80.000.

Blundy, Robert F.; and Dunbar, Charles E., to American Telephone and Telegraph Company. Modular furnace and methods of repairing same. 4,920,899, Cl. 110-336.000.

Blust, Dale K., to Figgie International Inc. String positioning device and method. 4,921,177, Cl. 242-3.000.

Boatwright, David A., to Westinghouse Electric Corp. End plug weld for nuclear fuel rod. 4,921,663, Cl. 376-451.000.

Boaz, Neil W., to Eastman Kodak Company. Synthesis of (aryl or arylalkyl)-3-hydroxy propionic acids and aryl alkanediols having high optical purity. 4,921,798, Cl. 435-146.000.

Bobbio, Stephen M.: *See*—
Dishon, Giora; and Bobbio, Stephen M., 4,921,157, Cl. 228-124.000.

Bobbs, Bradley L.; and Goldstone, Jeffrey A., to Rockwell International Corporation. Broad band crossed-beam raman amplifier. 4,922,495, Cl. 372-3.000.

BOC Group, Inc., The: *See*—
Lavin, John T., 4,921,641, Cl. 261-112.200.

BOC, Inc.: *See*—
Kudzma, Linas V.; Spencer, H. Kenneth; and Severnak, Sherry A., 4,921,864, Cl. 514-326.000.

Bock, Manfred, to Kachele-Cama Latex GmbH. Method for the production of a protective glove. 4,921,672, Cl. 264-161.000.

Bockeler, Franz-Josef; Gobmann, Wolfgang; Buchhorn, Axel; Jackenkroll, Horst; Marks, Hubert; Witte, Karl; and Schnelle, Diethard, to Hella KG Hueck & Co. Dimmed vehicle headlight. 4,922,386, Cl. 362-61.000.

Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Substituted azolylmethyl-cyclopropyl-carbinol derivatives. 4,921,528, Cl. 71-92.000.

Bodigard Technologies, Inc.: *See*—
Bartasis, James E.; and McIntire, Richard L., 4,920,575, Cl. 2-2.000.

Boehme, Hilary. Wiper mechanism. 4,922,114, Cl. 250-436.000.

Boehringer Ingelheim International GmbH: *See*—
Peterlik, Meinrad; and Hoffmann, Oskar, 4,921,697, Cl. 424-85.500.

Boeing Company, The: *See*—
White, James C.; and Pinson, George T., 4,920,738, Cl. 57-62.000.

Bofill, Pedro D.; and Sole, Xavier C., to AMP Incorporated. Center wire trap terminal and connector. 4,921,439, Cl. 439-417.000.

Bogendorfer, Hans: *See*—
Svagr, Alexadr; Bogendorfer, Hans; and Igelhorst, Wolfgang, 4,920,778, Cl. 72-237.000.

Boger, Manfred; and Drabek, Josef, to Ciba-Geigy Corporation. Substituted carbodiimides. 4,921,876, Cl. 514-638.000.

Bohrn, Walter J.; DeSantis, William D.; and Garman, Shelly N., to Armstrong World Industries, Inc. Fluorhectorite laminate printed circuit substrate. 4,921,748, Cl. 428-209.000.

Boiraeu, Christian; and Larseneur, Patrick, to Valeo. Vibration resistant securing means, especially for securing a brush carrier plate to a bearing carrier plate of an electric motor. 4,921,371, Cl. 403-408.100.

Boliden Aktiebolag: *See*—
Nordberg, Cecilia M.; Engstrom, Thomas B.; Pinzke, Thomas; Sanneskog, Owe; and Ohlund, Jan, 4,921,613, Cl. 210-651.000.

Bolk, Hendrik J. J.; and Zieltjens, Georges C. P., to U.S. Philips Corporation. Arrangement for measuring radiation quanta, pulse discrimination device suitable for use in such an arrangement and spectrometer provided with such an arrangement. 4,922,442, Cl. 364-550.000.

Bolkan, Kenneth R.: *See*—
Scott, Lewis A.; Hoffman, Francis E.; and Bolkan, Kenneth R., 4,920,947, Cl. 125-21.000.

Bonetti, Carla: *See*—
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 4,921,868, Cl. 514-354.000.

Bonin, Yves; and LeBlanc, Jack, to Rhone-Poulenc Chimie. Fireproofed polyamide compositions. 4,921,896, Cl. 524-403.000.

Bonk, Stanley P.; Morganthaler, George F.; and Miura, Yoshiharu, to International Fuel Cells Corporation. Reformer seal plate arrangement. 4,921,680, Cl. 422-197.000.

Bonkovich, Raymond J.: *See*—
Hutchison, Donald W.; Kimmel, Steven A.; Bonkovich, Raymond J.; Chew, James P.; and Rath, David J., 4,921,210, Cl. 251-129.080.

Boozer, John F., III: *See*—
Parsons, James H.; McLain, Philippe H.; Boozer, John F., III; and Lewis, John R., Jr., 4,920,715, Cl. 52-298.000.

Bordenga, Giovanni. Automatic stirrer. 4,921,356, Cl. 366-343.000.

Bordignon, Abramo. Pressure pad, particularly for magnetic tapes. 4,922,361, Cl. 360-130.310.

Borg-Warner Automotive Transmission & Engine Components Corporation: *See*—
Young, James D., 4,921,472, Cl. 474-111.000.

Bornstein, Marvin; Ewert, Corney J.; Saenger, John D.; and Reyes, Vincent, to Metal Box Corporation. Slide bar locking arrangement. 4,921,122, Cl. 220-326.000.

Borresen, Bjarne; and Blumensaadt, Hans C., to V. Kann Rasmussen Industri A/S. Prefabricated window for installation in an inclined roof. 4,920,713, Cl. 52-200.000.

Borton, Colin A.: *See*—
Banks, Nigel H.; Borton, Colin A.; Leonce, Francis S.; Lomax, Terence J.; Meier, Antony R. H.; and Skiba, Christopher J., 4,921,702, Cl. 424-404.000.

Bosch, Fridolin L., to American Telephone and Telegraph Company. Technique for improving the percentage of semiconductor lasers usable with a predetermined wavelength specification. 4,922,480, Cl. 370-3.000.

Bosch, Gerrit: *See*—
Sluyterman, Albertus A. S.; Bosch, Gerrit; Doomernik, Fransiscus M. P. P.; and Groothoff, Adriaan J., 4,922,167, Cl. 313-431.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Aschberger, Matthias; Farber, Karlheinz; and Deininger, Anton, 4,921,134, Cl. 222-64.000.

Bosi, Giulio, to Europlast S.p.A. Composable well. 4,920,722, Cl. 52-591.000.

Bosich, Joseph F. Leakage containment and detection systems. 4,922,232, Cl. 340-605.000.

Bossaert, Bernard L. L.; Ohlsson, Stefan B.; and Willems, William F. M. J., to Exxon Chemical Patents Inc. Sealable films. 4,921,749, Cl. 428-216.000.

Bossert, Clayton E.: *See*—
LaVelle, Richard E.; Wood, Gary L.; Morrey, Kevin P.; and Bossert, Clayton E., 4,920,589, Cl. 5-61.000.

Boston University, Trustees of: *See*—
Catsimpoolas, Nicholas; Griffith, Ann L.; and Sinn, Robert S., 4,921,838, Cl. 514-25.000.

Bothe, Lothar: *See*—
Dallmann, Hermann; Bothe, Lothar; Crass, Guenther; and Schaefer, Werner, 4,921,670, Cl. 264-141.000.

Botsch, Bertram, to Maschinenfabrik Hellmut Geiger GmbH. & Co. KG. Double-rack grating for use in wastewater. 4,921,599, Cl. 210-155.000.

Botti, Edoardo. So-called bridge audio amplifier. 4,922,207, Cl. 330-84.000.

Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, to Centre National de la Recherche Scientifique (CNRS). Process for coating carbon fibers with a carbide. 4,921,725, Cl. 427-45.100.

Bounds, Ivan E., to Herzog Contracting Corporation. Railroad tie service vehicle and method for spray application of a preservative. 4,921,732, Cl. 427-325.000.

Boura, Andre, to Societe Francaise d'Equipements pour la Navigation Aerienne. Accelerometric sensor with plane pendulum structure. 4,920,800, Cl. 73-517.00R.

Bovis, Nicholas J.: *See*—
Asbra, Martin R.; Asbra, Andrew F.; and Bovis, Nicholas J., 4,920,999, Cl. 137-38.000.

Bowater Packaging Limited: *See*—
Kohlbach, Friedrich R., 4,921,719, Cl. 426-521.000.

Bowen, Robert F.; and Maiellano, Joseph C., Jr., to Raytheon Company. Combination cooking cartridge. 4,922,079, Cl. 219-415.000.

Bowers, Joseph S., Jr.; and Mayberry, Gerald L., to Eastman Kodak Company. Process for the preparation of stilbene derivatives. 4,921,964, Cl. 548-219.000.

Bowman, Edward W., and Storimans, Franciscus J. A. Explosive charge containing magazine for RAM setting gun. 4,920,885, Cl. 102-281.000.

Bowman, Robert G.; Tegen, Marvin H.; and Hartwell, George E., to Dow Chemical Company, The. Amination process employing group vib metal catalysts. 4,922,024, Cl. 564-480.000.

Boyd, John M.: *See—*
Morris, Merle E.; Kendrick, George B.; and Boyd, John M., 4,922,155, Cl. 315-205.000.

Boyer-Chammard, Yann: *See—*
Schoellkopf, Jean-Pierre; and Boyer-Chammard, Yann, 4,922,409, Cl. 364-200.000

Boyles, Ralph D. Climbing device. 4,921,069, Cl. 182-135.000.

Bozich, Frank A., Jr., to North American Adhesive Company. Method for producing high solids dextrin adhesives. 4,921,795, Cl. 435-96.000.

Bozsing, Daniel; Kovanyi, Gyorgyi nee Lax; Berenyi, Edit nee Poldermann; Magyar, Karoly; Tuboly, Sandor; and Mandi, Atti la, to Egis Gyogyszergyar. Condensed thiazolopyrimidine, pyrimido-thiazine or thiazepine pyrimidine compounds. 4,921,854, Cl. 514-224.200.

BP Chemicals Limited: *See—*
Collomb-Ceccarini, Joelle; and Crouzet, Pierre, 4,921,920, Cl. 526-125.000.
Raufast, Charles, 4,921,678, Cl. 422-110.000.

Brach, Paul J.: *See—*
Melnyk, Andrew R.; Nealey, Richard H.; Brach, Paul J.; and Teuscher, Leon A., 4,921,773, Cl. 430-132.000.

Brader, Eric W. Apparatus for preventing brain damage during cardiac arrest, CPR or severe shock. 4,920,963, Cl. 128-402.000.

Brady, Don G.: *See—*
Johnson, Timothy W.; and Brady, Don G., 4,921,558, Cl 156-181.000.

Brain, Edward G.; Hunt, Eric; and Forrest, Andrew K., to Beecham Group p.l.c. Erythromycin a 11,12-carbonate 9-oxime derivatives. 4,921,839, Cl. 514-29.000.

Bramley, Frank: *See—*
Flanders, James R.; Bramley, Frank; Sharp, Francis B.; Newton, Robert A.; and Mansfield, Graham J., 4,920,594, Cl. 12-7.000.

Brand, Hunt K.: *See—*
Bernard, John K.; Brand, Hunt K.; and Walker, Richard L., 4,922,520, Cl. 379-88.000.

Brander, Richard: *See—*
Anderson, James R.; and Brander, Richard, 4,922,131, Cl 307-355.000.

Brandes, Wilhelm: *See—*
Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 4,921,528, Cl 71-92.000.
Gayer, Herbert; Jelich, Klaus; Kramer, Wolfgang; and Brandes, Wilhelm, 4,921,993, Cl. 558-392.000.
Lantzsch, Reinhard; Brandes Wilhelm; Hansller, Gerd; Reinecke, Paul; and Lurssen, Klaus, 4,921,529, Cl. 71-92.000.

Brandstetter, Robert W., to Grumman Aerospace Corporation. Tracking receiver for broadband chirp emissions. 4,922,256, Cl. 342-132.000.

Brandt, Inc.: *See—*
Lane, Donald, 4,921,238, Cl. 271-37.000.
Melcher, Richard A., 4,922,110, Cl. 250-556.000.

Brandt, Nils G. L.; and Thelin, Anders G., to Sandvik AB. Method of cutting with ceramic cutting tool having improved toughness behavior. 4,920,838, Cl. 82-1.110.

Branum, William E., to Lush Lid, Inc. Two-layered hat. 4,921,141, Cl. 222-146.600.

Braquet, Pierre: *See—*
Broquet, Colette; and Braquet, Pierre, 4,921,865, Cl. 514-336.000.

Braschel, Volker; Seitz, Dieter; and Schafer, Jochen, to Robert Bosch GmbH. Anti-locking brake control system. 4,921,314, Cl. 303-110.000.

Bratten, David R. Automatic water shut-off apparatus for building protection. 4,921,012, Cl. 137-599.000.

Braun, Achim: *See—*
Reuber, Gerhard; Braun, Achim; and Hesseler, Udo, 4,921,298, Cl. 296-221.000.

Braun Aktiengesellschaft: *See—*
Kamprath, Karl-Heinz, 4,922,464, Cl. 366-349.000.

Braun, Ernst: *See—*
Braun, Gert; and Braun, Ernst, 4,921,307, Cl. 299-34.000.

Braun, Gert; and Braun, Ernst, to Halbach & Braun Industrieanlagen. Mining apparatus for mechanized breaking-down of mineral materials, particularly coal, in underground mining operations. 4,921,307, Cl. 299-34.000.

Braun, Rosalinde: *See—*
Nachbur, Hermann; and Braun, Rosalinde, 4,921,535, Cl. 106-21.000.

Braun, Wolfgang: *See—*
Schwarz, Manfred; Braun, Wolfgang; and Alverez-Avila, Carlos, 4,920,938, Cl. 123-373.000.

Bravet, Jean-Louis: *See—*
Orain, Roger; Bravet, Jean-Louis; Dimier, Gerard; Dagaut, Philippe; and Daude, Gerard, 4,921,759, Cl. 428-424.400.

Brazdil, James F.; Glaeser, Linda C.; and Grasselli, Robert K., to Standard Oil Company, The. Antimony promoted bismuth cerium molybdate catalysts. 4,921,828, Cl. 502-205.000.

Bredt, James F.; Suh, Nam P.; and Waldman, Francis A., to Axiomatics Corporation. Thermal valve gate for plastic molding apparatus. 4,922,082, Cl. 219-541.000.

Breipohl, Gerhard; Knolle, Jochen; and Stuber, Werner, to Hoechst Aktiengesellschaft. Synthesis of peptide amides by means of a solid phase method using acid-labile anchoring groups. 4,922,015, Cl. 562-451.000.

Breitgoff, Detlef: *See—*
Schneider, Manfred; Laumen, Kurt; Breitgoff, Detlef; Wullbrandt, Dieter; Schilingmann, Merten; and Keller, Reinhold, 4,922,001, Cl. 560-112.000.

Brennan, Brian W., to Simmonds Precision Products, Inc. System for monitoring and controlling physical movement. 4,922,096, Cl. 244-3.160.

Bretfeld, Anton: *See—*
Bender, Richard; and Bretfeld, Anton, 4,920,619, Cl. 24-602.000.

Breuss, Manfred: *See—*
Gschwend, Peter; and Breuss, Manfred, 4,921,381, Cl. 411-25.000.

Brewer, Alan W.: *See—*
Anson, James H.; Kates, James L.; Brewer, Alan W.; and Friedrich, Brent R., 4,920,871, Cl. 99-295.000.

Brewster, Andrew G.; Brown, George R.; Jessup, Reginald; and Smithers, Michael J., to Imperial Chemical Industries plc. 1,3-dioxanes. 4,921,866, Cl. 514-336.000.

Bridges, Richard F.: *See—*
Attwood, Terence E.; and Bridges, Richard F., 4,921,922, Cl. 526-255.000.

Bridgestone Cycle Co., Ltd.: *See—*
Takamiya, Kikuzo; Tamura, Yoshitaka; Shibayama, Yoichi; Nishimura, Ritsuo; Hirai, Kiyofumi; and Serizawa, Hiromitsu, 4,920,827, Cl. 475-166.000.

Brischke, David S. Dual mirror viewing system. 4,921,339, Cl 350-623.000.

Brissette, June E.: *See—*
Maryyanek, Richard D.; and Brissette, June E., 4,921,512, Cl. 55-488.000.

Bristol-Myers Company: *See—*
Golik, Jerzy, 4,921,700, Cl. 424-117.000.

British Columbia Cancer Foundation: *See—*
Skov, Kirsten A.; Farrell, Nicholas P.; and Chaplin, David J., 4,921,963, Cl. 548-101.000.

British Columbia Telephone Company: *See—*
DePatie, Lauralee; and Gaglardi, Edward, 4,921,446, Cl. 439-536.000.

British Petroleum Company p.l.c., The: *See—*
Hopper, Hans P., 4,920,811, Cl. 74-2.000.

British Steel Corporation: *See—*
Corbett, Martin J.; and Smith, Richard B., 4,921,532, Cl. 75-460.000.

British Telecommunications public limited company: *See—*
Tchorzewski, Kazimierz, 4,922,538, Cl. 381-42.000.

British United Shoe Machinery Ltd.: *See—*
Flanders, James R.; Bramley, Frank; Sharp, Francis B.; Newton, Robert A.; and Mansfield, Graham J., 4,920,594, Cl. 12-7.000.

Brody, Philip S.; and Garvin, Charles, to United States of America, Army. Phase contrast image microscopy using optical phase conjugation in a hybrid analog/digital design. 4,921,333, Cl. 350-320.000.

Bronstert, Klaus: *See—*
Richter, Peter; Hoffmann Gerhard; Bronstert, Klaus; Mueller, Wolfgang F.; and Gerberding, Karl, 4,921,775, Cl. 430-281.000.

Broquet, Colette; and Braquet, Pierre, to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.). Aminoacylates of glycerol acetal. 4,921,865, Cl. 514-336.000.

Brormann, Johannes: *See—*
Schinker, Martin; Brormann, Johannes; Stahn, Dieter; Doll, Walter; Kleer, Gunter; and Manns, Peter, 4,921,519, Cl. 65-39.000.

Brors, Daniel L.; Fair, James A.; and Monnig, Kenneth A., to Genus, Inc. Method and apparatus for deposition of tungsten silicides. 4,920,908, Cl. 427-255.200.

Brother Kogyo Kabushika Kaisha: *See—*
Higashiyama, Shunichi, 4,921,774, Cl. 430-138.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; and Sawaki, Yukichi, 4,922,288, Cl. 355-27.000.
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,922,287, Cl. 355-27.000.
Kunieda, Yoshio; Okamoto, Toshishige; and Furukawa, Satoshi, 4,922,448, Cl. 364-900.000.
Shimizu, Seiji; and Nagae, Tuyoshi, 4,922,063, Cl. 200-11.00R.
Taki, Kazunari, 4,922,454, Cl. 365-122.000.
Tanabe, Kazunori, 4,922,286, Cl. 355-27.000.
Tani, Naohiko; Kouda, Masahiro; Ito, Atsushi; and Miwa, Yuji, 4,921,376, Cl. 409-131.000.

Brower, Leo C.: *See—*
Kozicki, Andrzej; and Brower, Leo C., 4,922,243, Cl. 340-813.000.

Brown, George R.: *See—*
Brewster, Andrew G.; Brown, George R.; Jessup, Reginald; and Smithers, Michael J., 4,921,866, Cl. 514-336.000.

Brown, James W.: *See—*
Friese, Donald E.; Brown, James W.; MacEwen, Frank; LeVan, E. G.; and Smith, Michael, 4,920,698, Cl. 49-380.000.

Brown, Mark. Rotatable bulb socket assembly. 4,921,429, Cl. 439-26.000.

Brown, Mark D.: *See—*
Small, Jeffrey A.; Brown, Mark D.; and Vincent, John A., 4,922,137, Cl. 307-480.000.

Brown, Michael W. Conversion kit for semiautomatic weapons. 4,920,678, Cl. 42-25.000.

Brown, Ronald E.: *See—*
Lee, Fu M.; and Brown, Ronald E., 4,921,581, Cl. 203-56.000.

Brown, Warren D.: *See—*
Hough, Thomas W.; and Brown, Warren D., 4,920,583, Cl. 4-237.000.

Brown, Wayne J. Plant extractor and cultivating apparatus. 4,921,050, Cl. 171-51.000.

Brubaker, Inara M.: *See—*
Yates, Stephen F.; Good, Mary L.; and Brubaker, Inara M., 4,921,589, Cl. 204-157.500.

Bruderer AG: *See—*
Hellwig, Waldemar, 4,920,782, Cl. 72-451.000.

Brueggeman, Barry G.: *See—*
Oswald, Alexis A.; Bhatia, Ram N.; Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M.; and Hsu, Chang S., 4,922,028, Cl. 568-448.000.

Brueninghaus Hydraulik GmbH: *See—*
Berthold, Heinz; Beck, Josef; and Lotter, Manfred, 4,920,856, Cl. 91-6.500.

Brunelle, Daniel J.: *See—*
Shannon, Thomas G.; and Brunelle, Daniel J., 4,921,975, Cl. 549-228.000.

Bruno, John J.: *See—*
Walker, Keith A. M.; Bruno, John J.; and Martinez, Gregory R., 4,921,862, Cl. 514-312.000.

Bruns, Robert F.: *See—*
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.

Brunson, Welton K.: *See—*
Hubbard, Vance M.; Brunson, Welton K.; and Caldwell, Darrell S., 4,920,960, Cl. 128-206.120.

Brunswick Corporation: *See—*
Lonnborg, Thomas S.; and Meisenburg, Gary L., 4,921,071, Cl. 184-6.400.
Slattery, Gordon C., 4,920,936, Cl. 123-196.00S.

Brupbacher, John M.: *See—*
Nagle, Dennis C.; Brupbacher, John M.; and Christodoulou, Leontios, 4,921,531, Cl. 75-351.000.

Brusewitz, Harald, to Televerket. Method and means for variable length coding. 4,922,510, Cl. 375-122.000.

Brussel, Richard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hydraulic press. 4,921,419, Cl. 425-406.000.

Buchel, Karl H.: *See—*
Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 4,921,528, Cl. 71-92.000.
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; and Reinecke, Paul, 4,921,870, Cl. 514-383.000.

Buchhorn, Axel: *See—*
Bockeler, Franz-Josef; Gobmann, Wolfgang; Buchhorn, Axel; Jackenkroll, Horst; Marks, Hubert; Witte, Karl; and Schnelle, Diethard, 4,922,386, Cl. 362-61.000.

Buckley, Gerald T.; and Gonzalez, Jamie N. Golfer's training device and method. 4,921,254, Cl. 273-183.00B.

Budai, ne Simonyi; Katalin: *See—*
Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.

Budai nee Simonyi, Katalin: *See—*
Knoll, Jozsef; Budai nee Simonyi, Katalin; Berenyi nee Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,960, Cl. 546-153.000.

Budd Company, The: *See—*
Bennington, Russell J., 4,921,387, Cl. 414-225.000.

Buell Industries, Inc.: *See—*
Peterson, Francis C.; and Despins, Robert J., 4,921,203, Cl. 248-635.000.

Buerli, Martin: *See—*
Seifert, Gottfried; Staubli, Sebastian; Wieland, Josef H.; Regenass, Willy; Buerli, Martin; Lee, John G.; and Lund, Richard B., 4,922,008, Cl. 562-58.000.

Buffet, Jacques; Buffet, Jean-Paul; Piani, Jean; and Paravisini, Francois, to Compagnie Financiere Saint. Nicolas. External device for injecting medicine. 4,921,487, Cl. 609-135.000

Buffet, Jean-Paul: *See—*
Buffet, Jacques; Buffet, Jean-Paul; Piani, Jean; and Paravisini, Francois, 4,921,487, Cl. 609-135.000.

Bujese, David P., to Olin Corporation. Two directionally operating imaging system. 4,921,772, Cl. 430-126.000.

Bukoschek, Romuald L.; Ramusch, Wolfgang; and Schroder, Johann, to U.S. Philips Corp. Ice-cream maker. 4,920,761, Cl. 62-342.000.

Bull S.A.: *See—*
Schoellkopf, Jean-Pierre; and Boyer-Chammard, Yann, 4,922,409, Cl. 364-200.000.

Bullara, Leo A., to Huntington Medical Research Institute. Bidirectional helical electrode for nerve stimulation. 4,920,979, Cl. 128-784.000.

Bunata, Thomas; Hollfelder, Robert; Zieglmeier, Reiner; and Steuer, Thomas, to Siemens Aktiengesellschaft. Printed circuit card for a personal computer. 4,922,193, Cl. 324-158.00R.

Bunn-O-Matic Corporation: *See—*
Anson, James H.; Kates, James L.; Brewer, Alan W.; and Friedrich, Brent R., 4,920,871, Cl. 99-295.000.

Burger, Heinz-Dieter, to Alcatael Hochvakuumtechnik GmbH. Mechanical primary vacuum pump including a spring-loaded non-return flap valve. 4,921,406, Cl. 417-87.000.

Burger, Robert J.: *See—*
Fantone, Stephen D.; Rockney, Bennett H.; Burger, Robert J.; and Cook, Lee M., 4,921,316, Cl. 350-96.270.

Burgess, William H.; Kaufman, Kenneth; and Lane, Archie B., Jr., to Scott Paper Company. Embossed paper having alternating high and low strain regions. 4,921,034, Cl. 162-109.000.

Burgkhardt, Bertram: *See—*
Mawatari, Yasushi; Ikegami, Toru; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Rober, Hans-Gerd, 4,922,115, Cl. 250-484.100.

Burke, Edward H.: *See—*
Garries, Ray W.; Burke, Edward H.; Mueller, Kevin D.; and Leone, Joseph D., 4,920,709, Cl. 52-85.000.

Burke, John; and Kraljic, John. Drafting device for the convenient containment of eraser shavings. 4,920,895, Cl. 108-26.000.

Burle Technologies, Inc.: *See—*
Hughes, Larry M., 4,922,275, Cl. 354-293.000.

Burnette, Andrew D.: *See—*
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R.; Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C.; and Jacubec, Mark R., 4,921,886, Cl. 423-235.000.

Burns, Gary T., to Dow Corning Corporation. Pre-ceramic methylpolysilanes. 4,921,917, Cl. 525-479.000.

Burroughs Wellcome Co.: *See—*
Allan, Geoffrey; Adcock, John J.; and Smith, Terence W., 4,921,835, Cl. 514-18.000.
Bigham, Eric C.; and Hodson, Stephen J., 4,921,836, Cl. 514-19.000.
Wilson, Jeffrey D., 4,921,950, Cl. 536-23.000.

Burtson, Eric J.: *See—*
Wild, Victor F.; Serrano, Michael; and Burtson, Eric J., 4,921,326, Cl. 350-96.260.

Buscher, John H., to HSC Controls, Inc. Torque motor with magnet armature. 4,922,217, Cl. 335-229.000.

Bushor, Ray E.: *See—*
Baker, Gerald N.; and Bushor, Ray E., 4,922,144, Cl. 310-42.000.

Busing, Klaus P.: *See—*
Adolfs, Friedhelm; Bittner, Gerd; Busing, Klaus P.; Harris, Stephen; Hahn, Ulrich; and Wurzburger, Martin, 4,921,352, Cl. 356-347.000.

Buslepp, Kenneth J.: *See—*
Gomez, Aparicio J.; Trombley, Douglas E.; and Buslepp, Kenneth J., 4,920,789, Cl. 73-118.200.

Busman, Stanley C.: *See—*
Ali, Mohammad Z.; and Busman, Stanley C., 4,921,827, Cl. 502-167.000.

Busse, Fritz; Hafeneger, Hans; and Mette, Ulrich, to TRW Ehrenreich GmbH & Co. KG. Fastening of a sealing bellows to the joint housing of a ball joint. 4,921,368, Cl. 403-134.000.

Butler, James R.: *See—*
Waguespack, James N.; and Butler, James R., 4,922,052, Cl. 585-449.000.

Butler, Myron C.; and Madore, Christopher, to Communications Technology Corporation. Telephone technician's terminals with autoselection of dial pulse on DTMF signalling. 4,922,516, Cl. 379-21.000.

Byers, Jim D., to Phillips Petroleum Company. Synthesis of cis-olefins. 4,922,049, Cl. 585-327.000.

C.C.C. Trading, Inc.: *See—*
Cama, Christopher C., 4,921,444, Cl. 439-528.000.

C. & E. Fein GmbH & Co.: *See—*
Kloss, Gunter; Schuhmacher, Gustav; and Gramm, Fritz, 4,920,702, Cl. 51-170.00R.

C F Braun, Inc.: *See—*
Grotz, Bernard J.; Parnkopf, Fiske O.; and Prescott, G. Robert, 4,921,684, Cl. 423-360.000.

C. R. Bard, Inc.: *See—*
Solano, Scott J.; Saunders, Myles L.; and Crittenden, James, 4,921,478, Cl. 604-53.000.

Cacoub, Alain. Chromatic lighting display. 4,922,154, Cl. 315-149.000.

Caffrey, Stephen F.: *See—*
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., 4,920,604, Cl. 15-302.000.

Cahlander, Robert L.; Carroll, David W.; Hanson, Robert A.; Hollingsworth, Al; and Reinertsen, John O., to Restaurant Technology, Inc. Food preparation robot. 4,922,435, Cl. 364-513.000.

Calbo, Leonard J., Jr.; and Gallacher, Lawrence V., to King Industries, Inc. Linear, low-molecular-weight polyester-based polyol. 4,922,002, Cl. 560-193.000.

Caldwell, Darrell S.: *See—*
Hubbard, Vance M.; Brunson, Welton K.; and Caldwell, Darrell S., 4,920,960, Cl. 128-206.120.

Caldwell, Richard J.: *See—*
Jones, K. Tom; and Caldwell, Richard J., 4,921,129, Cl. 222-23.000.

California Institute of Technology: *See—*
Simon, Marvin K.; and Divsalar, Dariush, 4,922,507, Cl. 375-26.000.

Callegari, Ugo, to Sasib S.p.A. Universal outer point lock device for railway point. 4,921,189, Cl. 246-448.000.

Callsen, Hans; and Richert, Wilhelm. Method for mechanically removing the wings from poultry bodies and apparatus therefor. 4,920,610, Cl. 17-11.000.

VOL
1114
ISS
1
MY
1
1990
UMI

Calundann, Gordon W.: *See—*
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., 4,922,003, Cl. 560-221.000.
Calzaturificio Tecnica Spa: *See—*
Marega, Antonello, 4,920,666, Cl. 36-119.000.
Calzi, Claudio; and Zaccai, Gianfranco, to Instrumentation Laboratory, S.p.A. Single-use devices for collecting and holding blood samples. 4,920,976, Cl. 128-764.000.
Cama, Christopher C., to C.C.C. Trading, Inc. Electric plug organizer. 4,921,444, Cl. 439-528.000.
Cambridge Bioscience Corporation: *See—*
Riggin, Charles H.; and Marciani, Dante J., 4,921,787, Cl. 435-5.000.
Cameron Iron Works USA, Inc.: *See—*
Baker, Gerald S., 4,921,207, Cl. 251-14.000.
Saunders, Brian, 4,921,259, Cl. 277-112.000.
Taylor, Kennard W., 4,921,281, Cl. 285-90.000.
Camp, Ronnie W.: *See—*
Orr, Cyde, Jr.; and Camp, Ronnie W., 4,920,810, Cl. 73-865.500.
Campbell, John W.: *See—*
McGahee, Welbourne D.; and Campbell, John W., 4,920,686, Cl. 43-42.240.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Chow, Yung L., 4,922,262, Cl. 343-770.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See—*
McMahon, Garfield W.; and Jones, Dennis F., 4,922,470, Cl. 367-163.000.
Cancellara, Enzo. Safety ashtray. 4,920,988, Cl. 131-242.000.
Cannon, Howard I.: *See—*
Holloway, John T.; Moon, David A.; Cannon, Howard I.; Knight, Thomas F.; Edwards, Bruce E.; and Weinreb, Daniel L., 4,922,414, Cl. 364-200.000.
Cannondale Corporation: *See—*
Duvall, Anna E., 4,921,151, Cl. 224-32.00R.
Canon Kabushiki Kaisha: *See—*
Abe, Shintaro; and Nakamura, Kaoru, 4,922,349, Cl. 358-443.000.
Adachi, Nobukazu, 4,922,291, Cl. 355-72.000.
Egami, Hidemi; Saito, Katsuo; Satomura, Hiroshi; and Oikawa, Katsuya, 4,922,392, Cl. 362-217.000.
Fukui, Hajime, 4,922,283, Cl. 354-484.000.
Hashimoto, Seiji; and Harada, Tadanori, 4,922,138, Cl. 307-482.000.
Hashimoto, Seiji; Kinoshita, Takao; Takayama, Tsutomu; and Kaji, Toshio, 4,922,334, Cl. 358-44.000.
Ikeda, Masami; and Komuro, Hirokazu, 4,922,269, Cl. 346-140.00R.
Inoue, Hiroshi; and Mizutome, Atsushi, 4,922,241, Cl. 340-784.000.
Kasuya, Yukio; Tomosada, Masahiro; and Adachi, Hideki, 4,922,296, Cl. 355-208.000.
Koyama, Takeshi. and Ohtaka, Keiji, 4,922,282, Cl. 354-406.000.
Oguchi, Yoshihiro; and Santoh, Tsuyoshi, 4,921,780, Cl. 430-495.000.
Osada, Yoshiyuki. Tsuda, Hisanori; Sano, Masafumi; Omata, Satoshi; Takasu, Katsuji; and Hirai, Yutaka, 4,921,722, Cl. 427-39.000.
Outa, Kenichi; Suzuki, Yasumichi; and Ikeda, Yoshinori, 4,922,335, Cl. 358-80.000.
Ozawa, Masakazu; Ozawa, Kunitaka; Hatanaka, Katsunori; Suzuki, Tetsuo; Mori, Tetsuzo; Shiina, Tadashi; and Ebinuma, Ryuichi, 4,922,267, Cl. 346-136.000.
Saika, Toshihiro; and Kaifu, Noriyuki, 4,922,117, Cl. 250-578.100.
Sasaki, Nobukazu; Kasamura, Toshirou; Ohashi, Masashi; Okuda, Naoki; and Kusomoto, Toshihiko, 4,922,300, Cl. 355-245.000.
Sasaki, Shosuke; and Kitano, Yasuyuki, 4,920,753, Cl. 62-51.300.
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.
Canon Kabushiki Kaisha/Canon Denshi Kabushiki Kaisha: *See—*
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, 4,922,274, Cl. 354-271.100.
Capintec, Inc.: *See—*
Suzuki, Arata; Tyberg, William T.; Banks, George; and Suzuki, Marcia, 4,920,969, Cl. 128-659.000.
Capp, Randolph E.; and Couper, William D., to AMP Incorporated. Terminating a shield of a malleable coaxial cable. 4,921,447, Cl. 439-585.000.
Cappi, Angelo: *See—*
Rimondi, Renato; and Cappi, Angelo, 4,920,731, Cl. 53-556.000.
Cares, Georges; Cares, Paul; and Cares, Louis G., to GPL Partnership. Vapor retaining clothes transfer system. 4,920,768, Cl. 68-18.00R.
Cares, Louis G.: *See—*
Cares, Georges; Cares, Paul; and Cares, Louis G., 4,920,768, Cl. 68-18.00R.
Cares, Paul: *See—*
Cares, Georges; Cares, Paul; and Cares, Louis G., 4,920,768, Cl. 68-18.00R.
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., to Warner-Lambert Company. Enolamides, pharmaceutical compositions and methods of use thereof for treating inflammation. 4,921,871, Cl. 514-432.000.
Carlisle Tire & Rubber Company: *See—*
Mullen, Paul A., 4,921,741, Cl. 428-48.000.
Carlomagno, Giovanni M. Process for applying forces to glass sheets, in particular at a high temperature. 4,921,520, Cl. 65-111.000.
Carlson, Robert J.; and Grimm, Michael D., to United States of America, Air Force. Silicon wafer photoresist developer. 4,922,277, Cl. 354-317.000.
Carlson, Russell L. In-line fuse holder. 4,921,451, Cl. 439-621.000.
Carrier Corporation: *See—*
Zohler, Steven R., 4,921,042, Cl. 165-179.000.
Carroll, David W.: *See—*
Cahlander, Robert L.; Carroll, David W.; Hanson, Robert A.; Hollingsworth, Al; and Reinertsen, John O., 4,922,435, Cl. 364-513.000.
Carroll, John F., Jr.; and Feindel, David A., to Eastman Kodak Company. Coating composition and coated article. 4,921,755, Cl. 428-328.000.
Carter, Woodward C., II, to Automation Intelligence, Inc. Method and apparatus of tool control in arbitrary plane operations. 4,922,431, Cl. 364-474.180.
Cartwright, Richard V., to Hercules Incorporated. Crash bag propellant composition and method for generating nitrogen gas. 4,920,743, Cl. 60-205.000.
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., to International Business Machines Corporation. System cable assembly and component packaging. 4,922,125, Cl. 307-149.000.
Cascino, Lawrence A., to Gaska Tape, Inc. Self-adherent foam strip. 4,921,739, Cl. 428-40.000.
Caserta, Richard T.; and Zimmerman, Roy E., to Red Hill Grinding Wheel Corporation. Grinding wheel containing dissolvable granular material. 4,920,704, Cl. 51-302.000.
Cashmere, Karen A.; and Besozzi, Elizabeth M., to Abbott Laboratories. Liquid nutritional formula for glucose intolerance. 4,921,877, Cl. 514-866.000.
Casio Computer Co., Ltd.: *See—*
Matsumoto, Naoaki; and Tsutsumi, Kenichi, 4,920,850, Cl. 84-622.000.
Caskey, Kenneth D., to Halliburton Company Horizontal hole cleanup tool. 4,921,046, Cl. 166-170.000.
Cassella Aktiengesellschaft: *See—*
Effenberger, Gunther; and Kruse, Hubert, 4,921,505, Cl. 8-526.000.
Cassidy, Roger T., to United States of America, Energy. Li_2O-Al_2O_3-SiO_2 glass ceramic-aluminum containing austenitic stainless steel composite body and a method of producing the same. 4,921,738, Cl. 428-34.600.
Castaldi, Graziano: *See—*
Villa, Marco; Giordano, Claudio; Castaldi, Graziano; and Cavicchioli, Silvia, 4,922,009, Cl. 562-466.000.
Castellari, Angelo, to Lombardini Fabbrica Italiana Motori S.p.A. Cover for the valve rocker compartment of internal combustion engines, with a lubricating oil anti-sucking device. 4,920,943, Cl. 123-572.000.
Caterpillar Inc.: *See—*
Lorimor, Larry W., 4,920,861, Cl. 91-446.000.
Tipton, Sheryl A.; Keil, Gary D.; Holloway, Gregory S.; Gromer, David R.; and Biltgen, Gary L., 4,921,025, Cl. 148-16.500.
Catsimpoolas, Nicholas; Griffith, Ann L.; and Sinn, Robert S., to Boston University, Trustees of; and Angio-Medical Corp. Angiogenic and blood perfusion inducing properties of amphiphilic compounds. 4,921,838, Cl. 514-25.000.
Cauderlier, Andre H.: *See—*
Cointot, Denis F.; and Cauderlier, Andre H., 4,922,249, Cl 341-57.000.
Caugant, Jean: *See—*
Lajus, Pierre; and Caugant, Jean, 4,922,512, Cl. 378-197.000.
Caulfield, David D. Acoustic detection apparatus. 4,922,467, Cl. 367-87.000.
Cavicchioli, Silvia: *See—*
Villa, Marco; Giordano, Claudio; Castaldi, Graziano; and Cavicchioli, Silvia, 4,922,009, Cl. 562-466.000.
Cavitron, Inc.: *See—*
Wuchinich, David G., 4,921,476, Cl. 604-22.000.
Cempel, Czeslaw: *See—*
Dobry, Marian W.; Cempel, Czeslaw; and Garbatowski, Wieslaw, 4,921,053, Cl. 173-162.200.
Center for Innovative Technology: *See—*
Stoughton, John W.; and Mielke, Roland V., 4,922,413, Cl 364-200.000.
Centre National de la Recherche Scientifique (CNRS): *See—*
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L., and Dazord, Jacques, 4,921,725, Cl. 427-45.100.
Centro De Investigacion Y De Estudios Avanzados Del Instituto Politecnico Nacional: *See—*
Joseph-Nathan, Pedro; and Cervantes-Cuevas, Humberto, 4,922,032, Cl. 568-862.000.
Century International Corporation: *See—*
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., 4,920,604, Cl. 15-302.000.
Ceramiques et Composites: *See—*
Minjolle, Louis, 4,921,616, Cl. 210-767.000.
Ceretech Limited: *See—*
Garden, Jeffrey S. S., 4,920,695, Cl. 47-83.000.

Cervantes-Cuevas, Humberto: *See—*
Joseph-Nathan, Pedro; and Cervantes-Cuevas, Humberto, 4,922,032, Cl. 568-862.000.
Ceskoslovenska akademie ved: *See—*
Sulc, Jiri; and Krcova, Zuzana, 4,921,497, Cl. 623-6.000.
Cetenko, Wiaczeslaw A.: *See—*
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.
CGEE Alsthom: *See—*
Tresset, Alain; Fontenelle, Francois; and Javard, Gerard, 4,922,509, Cl. 375-103.000.
Chabert, Pierre: *See—*
Belmain, Daniel; Chabert, Pierre; Tholome, Roger; Fabre, Pierre; Correard, Jean-Yves; and Gondrand, Michel, 4,921,172, Cl. 239-698.000.
Champ, Raynido A. Disposable needle system with chemical disinfectant means. 4,921,491, Cl. 604-199.000.
Chang, Fu-Long. Numerical control apparatus for a mechanical hydraulic servo valve. 4,920,858, Cl. 91-380.000.
Chang-Hasnain, Constance J.; and Kapon, Elyahou, to Bell Communications Research, Inc. Cross-coupled quantum-well stripe laser array. 4,922,500, Cl. 372-50.000.
Chang, Tallis Y.: *See—*
Chiou, Arthur E.; Chang, Tallis Y.; and Khoshnevisan, Mohsen, 4,921,353, Cl. 356-347.000.
Chaplin, David J.: *See—*
Skov, Kirsten A.; Farrell, Nicholas P.; and Chaplin, David J., 4,921,963, Cl. 548-101.000.
Chapuis, Christian: *See—*
Simmons, Dana P.; and Chapuis, Christian, 4,922,027, Cl. 568-445.000.
Chart Industries Ltd.: *See—*
Horan, Gerald P.; Wickmann, John T.; and McNamee, Stanislaus, 4,920,781, Cl. 72-447.000.
Chastan-Bagnis, Alain: *See—*
Chastan-Bagnis, Lucien; and Chastan-Bagnis, Alain, 4,921,605, Cl. 210-115.000.
Chastan-Bagnis, Lucien; and Chastan-Bagnis, Alain. Apparatus to depollute bodies of water. 4,921,605, Cl. 210-115.000.
Chatelin, Roger: *See—*
Poulenard, Jacques; Gavet, Louis; Chatelin, Roger; and Giorgio, Annie, 4,921,634, Cl. 252-312.000.
Chen, Catherine S. H.; and Forbus, Thomas R., Jr., to Mobil Oil Corporation. Process for production of traction fluids from bicyclic and monocyclic terpenes with zeolite catalyst. 4,922,047, Cl. 585-12.000.
Chen, Guoying: *See—*
Yeung, Edward S.; and Chen, Guoying, 4,921,348, Cl. 356-128.000.
Chen, Lan B.: *See—*
Teicher, Beverly A.; Richmond, Robert C.; and Chen, Lan B., 4,921,973, Cl. 549-212.000.
Chevron Research Company: *See—*
Miller, Stephen J., 4,921,594, Cl. 208-58.000.
Chew, Bonnie G., II; and Third Alabama Bank, executor. Connector for portable furniture including a bed and a child enclosure. 4,921,369, Cl. 403-171.000.
Chew, James P.: *See—*
Hutchison, Donald W.; Kimmel, Steven A.; Bonkovich, Raymond J.; Chew, James P.; and Rath, David J., 4,921,210, Cl. 251-129.080.
Chiba, Shuji: *See—*
Motegi, Tsuneo; Matsumoto, Yasuji; Takeda, Kiyoshi; and Chiba, Shuji, 4,921,926, Cl. 528-17.000.
Chicago Fire Brick Company: *See—*
Rechter, Harold L., 4,921,536, Cl. 106-74.000.
Chicopee: *See—*
Marshall, Gerald M.; and Farrington, Allan P., 4,921,659, Cl. 264-510.000.
Chiechi, John: *See—*
Pommer, Richard J.; and Chiechi, John, 4,922,376, Cl. 361-386.000.
Chilcote, Keith C., to Autra-Bike Co., Inc. Hydraulic brake apparatus for bicycles. 4,921,081, Cl. 188-344.000.
Childers, Wayne E., Jr.: *See—*
Abou-Gharbia, Magid A.; Yardley, John P.; Childers, Wayne E., Jr.; and Cliffe, Ian A., 4,921,958, Cl. 544-295.000.
Childre, Casey J.: *See—*
Andreasen, James E.; Childre, Casey J.; and Peed, David B., 4,920,682, Cl. 43-22.000.
Chin, Arthur A.; and Sarli, Michael S., to Mobil Oil Corp. Metal passivating catalyst composition for cracking hydrocarbons. 4,921,824, Cl. 502-65.000.
Chin, William B.; Dussault, Rudolph D.; Knepper, Ronald W.; Wernicke, Friedrich C.; and Wong, Robert C., to International Business Machines Corporation. Memory cell with active device for saturation capacitance discharge prior to writing. 4,922,455, Cl. 365-154.000.
Chinese Academy of Sciences: *See—*
Shiang, Lu P.; and He, Duanfeng, 4,921,278, Cl. 283-87.000.
Chiou, Arthur E.; Chang, Tallis Y.; and Khoshnevisan, Mohsen, to Rockwell International Corporation. High speed photorefractive image comparator. 4,921,353, Cl. 356-347.000.
Chiquita Brands, Inc.: *See—*
Sole, Pedro, 4,921,709, Cl. 426-49.000.
Chiu, Bernard. Ultrasonic humidifier. 4,921,639, Cl. 261-67.000.
Cho, Chul W., to Aluminum Company of America. Aluminum-lithium alloys and method of making same. 4,921,548, Cl. 148-12.70A.
Chou, Tai-Sheng; and Schipper, Paul H., to Mobil Oil Corporation. Catalytic cracking process with reduced pressure stripping. 4,921,596, Cl. 208-113.000.
Chow, Yung L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Log-periodic slot antennas. 4,922,262, Cl. 343-770.000.
Christodoulou, Leontios: *See—*
Nagle, Dennis C.; Brupbacher, John M.; and Christodoulou, Leontios, 4,921,531, Cl. 75-351.000.
Christon, Thomas M.; Richards, Martin A.; and Scholz, Eric H., to Rain Matic Corporation. Automatic watering zone switcher. 4,921,002, Cl. 137-119.000.
Chrysler Corporation: *See—*
Gatt, Edward W., 4,921,101, Cl. 206-451.000.
Krause, Duane K., 4,921,100, Cl. 206-448.000.
Chu, Cynthia T-W., to Mobil Oil Corporation. Toluene disproportionation catalyzed by a zeolite containing framework gallium. 4,922,055, Cl. 585-470.000.
Chuma, Yoshihiro: *See—*
Gotou, Yukifumi; Narikiyo, Hidetoshi; and Chuma, Yoshihiro, 4,921,164, Cl. 236-49.300.
Church, Peter D., to Marconi Company Limited, The. Accelerometer. 4,920,801, Cl. 73-517.00R.
Churm, Brian R.; and Diesel, Michael E., to American Telephone and Telegraph Company. Method and apparatus for data hashing using selection from a table of random numbers in combination with folding and bit manipulation of the selected random numbers. 4,922,417, Cl. 364-200.000.
Ciba-Geigy Corporation: *See—*
Boger, Manfred; and Drabek, Josef, 4,921,876, Cl. 514-638.000.
Erkens, Leonardus J. H.; Geurta, Herman J. J. M.; Vandevenne, Jean L. G. M.; and Algra, Gerben P., 4,921,541, Cl. 106-433.000.
Galbo, James P.; and Ackerman, Michael H., 4,921,962, Cl. 546-184.000.
Karydas, Athanasios, 4,921,619, Cl. 252-8.554.
Molock, Frank; Robertson, J. Richard, Jr.; and Su, Kai C., 4,921,956, Cl. 544-165.000.
Nachbur, Hermann; and Braun, Rosalinde, 4,921,535, Cl. 106-21.000.
Rusek, Milos, 4,921,980, Cl. 549-426.000.
Sagawa, Hirotoshi; and Yamaguchi, Seiji, 4,921,912, Cl. 525-112.000.
Seifert, Gottfried; Staubli, Sebastian; Wieland, Josef H.; Regenass, Willy; Buerli, Martin; Lee, John G.; and Lund, Richard B., 4,922,008, Cl. 562-58.000.
Stegmann, Werner; and Luisoli, Reto, 4,921,966, Cl. 548-260.000.
Stingelin, Willy, 4,921,945, Cl. 534-614.000.
Topfl, Werner, 4,921,955, Cl. 544-60.000.
Cieplinski, Daniel: *See—*
Grenier, Michel; de la Gorge, Jean-Etienne; Cieplinski, Daniel; Leturgie, Gerard; Thurin, Yves; Meret, Laurent; and Doireau, Christian, 4,921,076, Cl. 188-12.600.
Ciervo, Donald J.: *See—*
Alliger, Howard M.; and Ciervo, Donald J., 4,920,954, Cl. 128-24.00A.
Cifuentes, Luis; Sala, Carlos; and Vozmediano, Alfonso, to Robert Bosch GmbH. Driving device for shifting a mechanical element, particularly for use in a locking system of a motor vehicle. 4,921,288, Cl. 292-144.000.
Circon Corporation: *See—*
Grossi, Benedetto; Muller, Richard P.; and O'Hare, Richard J., 4,920,961, Cl. 606-14.000.
Citizen Watch Co., Ltd.: *See—*
Yasunaga, Makoto, 4,921,364, Cl. 400-124.000.
City of Hope: *See—*
Beatty, John D.; Beatty, Barbara G.; and Duda, Rosemary B., 4,921,690, Cl. 424-1.100.
Clairol Incorporated: *See—*
Anderson, James S.; and Schultz, Thomas M., 4,921,503, Cl. 8-408.000.
Clark, David E.; Dalzell, William J., Jr.; and Adams, Brenda L., to University of Florida. Deposition of ceramic coatings using sol-gel processing with application of a thermal gradient. 4,921,731, Cl. 427-314.000.
Clark, Emmit S.; and Will, Leslie. Plastic bag stand. 4,921,195, Cl. 248-97.000.
Clark Equipment Company: *See—*
Wagner, Oryn B., 4,921,392, Cl. 414-695.000.
Clark, Gary T.: *See—*
Phan, Hieu D.; and Clark, Gary T., 4,921,899, Cl. 524-513.000.
Clausen, Thomas; and Konrad, Eugen, to Wella Aktiengesellschaft. 4-(N-ethyl-N-2-hydroxyethyl)-amino-1-(2 hydroxyethyl)-amino-2-nitrobenzene and compositions for dyeing hair containing the same. 4,921,504, Cl. 8-415.000.
Claussner, Andre: *See—*
Nedelec, Lucien; Claussner, Andre; Philibert, Daniel; and Moguilewsky, Martine, 4,921,846, Cl. 514-173.000.
Clayton, David A.: *See—*
Poulton, Richard G., 4,921,506, Cl. 24-67.100.
Clemens, Bernard. Planting device attachable to an agricultural vehicle. 4,920,900, Cl. 111-115.000.
CLI International Enterprises, Inc.: *See—*
Lurie, Walter, 4,921,597, Cl. 209-223.200.
Cliffe, Ian A., to John Wyeth and Brother, Limited. Quinuclidyl- and tropanyl-pyridyl ethers as 5-HT_3 receptor antagonists. 4,921,860, Cl. 514-304.000.

Cliffe, Ian A.: *See—*
Abou-Gharbia, Magid A.; Yardley, John P.; Childers, Wayne E., Jr.; and Cliffe, Ian A., 4,921,958, Cl. 544-295.000.

Clifford, Arthur L.: *See—*
Dong, Dennis F.; and Clifford, Arthur L., 4,921,587, Cl. 204-84.000.

Clifford Electronics, Inc.: *See—*
Drori, Ze'ev; and Abrishami, Amir, 4,922,224, Cl. 340-428.000.

Clodic, Denis: *See—*
Rabl, Ari; Clodic, Denis; and Dehausse, Robert, 4,922,107, Cl. 250-504.00R.

Coal Industry (Patents) Limited: *See—*
Tomlin, Malcolm G., 4,921,306, Cl. 299-17.000.

Coale, Jerry L., to International Business Machines Corporation. Input-/output device service alert function. 4,922,491, Cl. 371-16.100.

Cobbs, Keith E.; Haselby, Robert D.; and Osborne, William S., to Hewlett-Packard Company. Inter pen offset determination and compensation in multi-pen thermal ink jet pen printing systems. 4,922,270, Cl. 346-140.00R.

Coca-Cola Company, The: *See—*
Aschberger, Matthias; Farber, Karlheinz; and Deininger, Anton, 4,921,134, Cl. 222-64.000.
Fischer, Wolfgang; Kennedy, Richard T.; and Wiley, Ronald L., 4,921,139, Cl. 222-129.100.

Codazzi, Daniel; Mioque, Jean-Yves; and Montaron, Bernard, to Dowell Schlumberger Incorporated. Electromagnetic flowmeter for conductive or dielectric fluids and its applications in particular oilfield. 4,920,795, Cl. 73-195.000.

Coetsier, Paul; and Douine, Denis, to Etablissements M. Muller & Cie. Data acquisition and processing equipment for testing automotive vehicles. 4,922,443, Cl. 364-551.010.

Coffey, Jess R. Veneer construction and method of achieving same. 4,920,716, Cl. 52-386.000.

Coffey, Robert C. Barrier for containing floods. 4,921,373, Cl. 405-115.000.

Coflexip: *See—*
Dridi, Hamadi; and Dewimille, Bernard, 4,921,018, Cl. 138-149.000.

Cohen, Marlene L.; Lacefield, William B.; and Robertsch, David W., to Eli Lilly and Company. 5-halo-2,3-dihydro-2,2-dimethylbenzofuran-7-carboxylic acids useful as intermediates for 5-HT_3 antagonists. 4,921,982, Cl. 549-462.000.

Cohen, Wayne E., to Latin Percussion, Inc. Ventilated rack case. 4,921,103, Cl. 206-523.000.

Coico, Richard F.; and Thorbecke, G. J., to New York University. Method for augmenting immune response. 4,921,667, Cl. 424-85.800.

Cointot, Denis F.; and Cauderlier, Andre H., to S. A. T. Societe Anonyme de Telecommunications. Binary-to-bipolar converter. 4,922,249, Cl. 341-57.000.

Colak, Selami, to North American Philips Corporation. Polychromatic CRT with crystalline semiconductor screen. 4,922,158, Cl. 315-383.000.

Cole, Heather E.: *See—*
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R.; Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C.; and Jacubec, Mark R., 4,921,886, Cl. 423-235.000

Cole, Jack H.; Gergely, John S.; Baumel, Robert T.; and Strecker, John E., to Conoco Inc. Apparatus for inducing elliptically polarized shear waves in an earth medium. 4,922,472, Cl. 367-189.000.

Cole, Joanne H.: *See—*
Vail, Curtis F.; Dietze, Robert H.; Kracht, Thomas F.; Cole, Joanne H.; and Hewko, Marc D., 4,920,697, Cl. 49-348.000.

Cole, Robert L., to A. O. Smith Corporation. Permanent magnet rotor with magnet retention band. 4,920,634, Cl. 29-598.000.

Coleman, Donald J.; and Haken, Roger A., to Texas Instruments Incorporated. DRAM process with improved polysilicon-to-polysilicon capacitor and the capacitor. 4,922,312, Cl. 357-23.600.

Colgate-Palmolive Company: *See—*
Gaffar, Abdul; and Polefka, Thomas G., 4,921,692, Cl. 424-52.000.
Gaffar, Abdul; and Polefka, Thomas G., 4,921,693, Cl. 424-52.000.
Malihi, Farrokh B.; and Sparacio, Nicholas J., 4,921,629, Cl. 252-170.000.
McGregor, Rob R.; Misevich, Kenneth W.; and Mintel, Thomas E., 4,920,664, Cl. 36-11.500.
Stevens, Kenneth V., 4,920,873, Cl. 99-339.000.

Collingborn, Peter A. G.: *See—*
Harris, Kenneth M.; Felton, George N.; Collingborn, Peter A. G.; Stringfellow, Christopher; and Greeves, Godfrey, 4,920,940, Cl. 123-450.000.

Collins, Richard B.: *See—*
Tartaglia, Peter A.; Collins, Richard B.; and Smolen, Robert S., 4,921,014, Cl. 137-625.300.

Collins, Warwick I. Keel structures for sailing vessels. 4,920,906, Cl. 114-140.000.

Collomb-Ceccarini, Joelle; and Crouzet, Pierre, to BP Chemicals Limited. Process for the polymerization or copolymerization of alpha-olefins in a fluidized bed, in the presence of a Ziegler-Natta catalyst system. 4,921,920, Cl. 526-125.000.

Colodner, Jesse L.: *See—*
Kropkowski, James; and Colodner, Jesse L., 4,921,249, Cl. 273-256.000.

Colquhoun, Alexander, to Telefunken Electronic GmbH. Field-effect transistor. 4,922,310, Cl. 357-22.000.

Colten, Robert B.: *See—*
Behr, Leonard W.; Colten, Robert B.; and Duda, Donald A., 4,922,065, Cl. 200-61.45M.

Colvin, David P., to Triangle Research and Development Corporation. Method and apparatus for the endoscopic treatment of deep tumors using RF hyperthermia. 4,920,978, Cl. 128-784.000.

Com Dev. Ltd.: *See—*
Ghosh, Subir, 4,922,213, Cl. 333-21.00A.

Combier, Charles M.; Taylor, Archie E., Jr.; and Paquette, Marc, to J. B. Martin Company, Inc. Hanger for displaying textile material and package thereof. 4,921,098, Cl. 206-408.000.

Combustion Engineering, Inc.: *See—*
McMullin, Craig W.; and Rosenberger, John E., 4,920,802, Cl. 73-597.000.

Communications Technology Corporation: *See—*
Butler, Myron C.; and Madore, Christopher, 4,922,516, Cl. 379-21.000.

Compagnie Financiere Saint. Nicolas: *See—*
Buffet, Jacques; Buffet, Jean-Paul; Piani, Jean; and Paravisini, Francois, 4,921,487, Cl. 609-135.000.

Compton, Ira. Method and apparatus for lubricating the shaker heads of a tree shaking harvester. 4,921,073, Cl. 184-11.200.

Conant, John P.: *See—*
Sanders, Royden C., Jr.; Forsyth, John L.; and Conant, John P., 4,921,365, Cl. 400-322.000.

Concrete Pipe & Products Corp.: *See—*
Melfi, Nicholas W., 4,921,204, Cl. 249-2.000.

Conklin, Harold A., Jr. Tuning pin for pianos. 4,920,847, Cl. 84-202.000.

Conley, Challie, to Refuse Trucks, Inc. Dual control driving system. 4,921,066, Cl. 180-322.000.

Conley, George E.: *See—*
Pressutti, Joseph E.; and Conley, George E., 4,920,721, Cl. 52-518.000.

Connor, David T.: *See—*
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.

Conoco Inc.: *See—*
Cole, Jack H.; Gergely, John S.; Baumel, Robert T.; and Strecker, John E., 4,922,472, Cl. 367-189.000.
Gergely, John S., 4,922,095, Cl. 250-227.170.
Summers, Laine E.; and Jurinak, Jeff J., 4,921,047, Cl. 166-276.000.

Conover, Philip, to General Dynamics Corporation, Electronics Division. Electronic testing equipment interconnection assembly. 4,922,191, Cl. 324-158.00F.

Conrad, Jeffrey P.: *See—*
Zupancic, Joseph J.; Frechet, Jean M. J.; Zweig, Andrew M.; and Conrad, Jeffrey P., 4,921,923, Cl. 526-313.000.

Conseilray S.A.: *See—*
Groothuis, Michiel, 4,922,474, Cl. 368-113.000.

Continental Installers Corporation: *See—*
Seiz, Carl G.; and Robinson, Clyde G., 4,920,995, Cl. 134-15.000.

Control Data Corporation: *See—*
Fule, Andras G., 4,922,434, Cl. 364-513.000.
Rosenstein, Leo M.; and Gulbranson, Glenn J., 4,922,184, Cl. 324-72.500.

Cook, Alexander, to Sundstrand Corporation. Neutral forming circuit. 4,922,400, Cl. 363-37.000.

Cook, Bertha B.; and Smith, Betty J. Multicharacter doll. 4,921,459, Cl. 446-321.000.

Cook, Lee M.: *See—*
Fantone, Stephen D.; Rockney, Bennett H.; Burger, Robert J.; and Cook, Lee M., 4,921,316, Cl. 350-96.270.

Cooke, William M.: *See—*
Tolbert, Thomas W.; Cooke, William M.; and Hendrix, James E., 4,921,756, Cl. 428-373.000.

Cooksey, Andrew G., to Otis Engineering Corporation. Well injection systems. 4,921,044, Cl. 166-116.000.

Cooper Companies, Inc., The: *See—*
Davis, Rickey F., 4,921,477, Cl. 604-22.000.

Cooper Industries, Inc.: *See—*
Herbert, William G., 4,921,445, Cl. 439-532.000.
Herbert, William G., 4,921,450, Cl. 439-621.000.

Cooper Power Systems, Inc.: *See—*
Biren, Theodore M., 4,921,433, Cl. 439-534.000.

Cooper, Ralph M.; Hollingsworth, Dana; Kunkle, John P.; and Stillie, Donald G., to AMP Incorporated. Sealed electrical connector assembly with terminal retainer. 4,921,437, Cl. 439-275.000.

Cope, Carroll W., to Di Giorgio Corporation. Wood coating composition and process of use thereof. 4,921,891, Cl. 524-15.000.

Copeland, James L.; and Donovan, Daniel J., to Ecolab Inc. Detersive system and low foaming aqueous surfactant solutions containing a mono(C_{1-4} alkyl)-di(C_{6-20}) alkylamine oxide compound. 4,921,627, Cl. 252-99.000.

Corbett, Martin J.; and Smith, Richard B., to British Steel Corporation Ironmaking by means of a smelting shaft furnace. 4,921,532, Cl. 75-460.000.

Cordis Corporation: *See—*
Hillstead, Richard A., 4,921,484, Cl. 604-104.000.
Jackowski, Stefan A., 4,920,980, Cl. 128-786.000.

Cormen, Thomas H.; and Leiserson, Charles E., to Massachusetts Institute of Technology. Message merging device. 4,922,246, Cl. 340-825.900.

Corning Incorporated: *See—*
Allaire, Roger A.; and Gadkaree, Kishor P., 4,921,518, Cl. 65-18.100.

Corpak, Inc.: *See—*
Quinn, David G.; Edwards, Robert B., II; and Andersen, Erik, 4,921,138, Cl. 222-85.000.

Correard, Jean-Yves: *See—*
Belmain, Daniel; Chabert, Pierre; Tholome, Roger; Fabre, Pierre; Correard, Jean-Yves; and Gondrand, Michel, 4,921,172, Cl. 239-698.000.

Corrigan, Michael A.: *See—*
Sallas, John J.; Luce, Richard H.; and Corrigan, Michael A., 4,922,473, Cl. 367-189.000.

Costello, Christine A.; Pinschmidt, Robert K., Jr.; and Lai, Ta-Wang, to Air Products and Chemicals, Inc. Hydrolyzed co-polymers of N-vinylamide and acrylamide for use as waterloss control additives in drilling mud. 4,921,621, Cl. 252-8.513.

Cotag International Ltd.: *See—*
O'Farrell, Kevin, 4,922,261, Cl. 343-742.000.

Cote, William F.: *See—*
Mack, William J.; and Cote, William F., 4,922,425, Cl. 364-424.100.

Cottonaro, Cliff N.; Evans, Scott M.; Pflueger, David R.; and Millar, Huntly D., to Pfizer Hospital Products Group, Inc. Doppler tip wire guide. 4,920,967, Cl. 128-662.060.

Couasnard, Claude: *See—*
Bergero, Jean-Pierre; and Couasnard, Claude, 4,922,215, Cl. 333-137.000.

Couhig, John T.: *See—*
Bates, Carl H.; Couhig, John T.; and Pelletier, Paul J., 4,921,554, Cl. 156-89.000.

Coulter Electronics, Inc.: *See—*
Dunstan, Harvey J.; Gilbert, Ian D.; Fayer, Ervin; Dominick, George G.; and De Oliveira, Avelino, 4,921,206, Cl. 251-7.000.

Couper, Malcolm, to Asea Brown Boveri Ltd. Method for producing a heat-resistant aluminum-alloy workpiece having high transverse ductility which is manufactured from a compact produced by powder metallurgy. 4,921,664, Cl. 419-1.000.

Couper, William D.: *See—*
Capp, Randolph E.; and Couper, William D., 4,921,447, Cl. 439-585.000.

Cowle, Anthony J.; Cowle, Paul J.; Cowle, Gregory J.; and Cowle, Joffre B., to Baremek Pty. Limited. Electrophoretic cleaner and sterlizer. 4,921,544, Cl. 134-1.000.

Cowle, Gregory J.: *See—*
Cowle, Anthony J.; Cowle, Paul J.; Cowle, Gregory J.; and Cowle, Joffre B., 4,921,544, Cl. 134-1.000.

Cowle, Joffre B.: *See—*
Cowle, Anthony J.; Cowle, Paul J.; Cowle, Gregory J.; and Cowle, Joffre B., 4,921,544, Cl. 134-1.000.

Cowle, Paul J.: *See—*
Cowle, Anthony J.; Cowle, Paul J.; Cowle, Gregory J.; and Cowle, Joffre B., 4,921,544, Cl. 134-1.000.

Cowley, Nicholas P., to Plessey Overseas Limited. Frequency signal synthesiser. 4,922,548, Cl. 455-183.000.

Cox, Mason F., to Monroe Electronics, Inc. Auto reactance compensated non-contacting resistivity measuring device. 4,922,182, Cl. 324-682.000.

Cox, Roger W., to Westinghouse Electric Corp. Extraneous frequency detector. 4,922,195, Cl. 324-158.0MG.

Craig, Joe D.: *See—*
Devereaux, Chuck; and Craig, Joe D., 4,920,688, Cl. 43-42.390.

Crank, John T.: *See—*
Toliver, Joseph, Jr.; and Crank, John T., 4,920,681, Cl. 43-21.200.

Cranor, Thomas H. B.: *See—*
Hall, Edward A.; Cranor, Thomas H. B.; and Schmitt, Gilbert J., 4,922,259, Cl. 343-700.0MS.

Crass, Guenther: *See—*
Dallmann, Hermann; Bothe, Lothar; Crass, Guenther; and Schaefer, Werner, 4,921,670, Cl. 264-141.000.

Crawford, Delmar E.; and Fields, Harold T., to General Electric Company. Core and slot liner. 4,922,165, Cl. 310-215.000.

Crawford, Donald C.; Ross, Jeffrey L.; and Krueger, James W., to FMC Corporation. Computer controlled non-contact feeder with space-control device responsive to item-sensing device. 4,921,092, Cl. 198-460.000.

Create System Co., Ltd.: *See—*
Matsumoto, Masatsugu, 4,921,440, Cl. 439-421.000.

Criswell, James F., Jr., to Guardian Electric Manufacturing Co. Machine for wrapping tape on bobbin. 4,921,567, Cl. 156-361.000.

Crittenden, James: *See—*
Solano, Scott J.; Saunders, Myles L.; and Crittenden, James, 4,921,478, Cl. 604-53.000.

Crosfield Electronics Limited: *See—*
Stansfield, Peter W.; and Reed, Alastair, 4,922,544, Cl. 382-56.000.

Cross, Gregory L., to Sun Company, Inc. Compass assembly with dial biasing disk. 4,920,656, Cl. 33-355.00R.

Cross, Jack A.; and Jackson, Cletis M., to Technical Manufacturing Systems, Inc. Electro-discharge machining electrode. 4,922,076, Cl. 219-69.150.

Crouzet, Pierre: *See—*
Collomb-Ceccarini, Joelle; and Crouzet, Pierre, 4,921,920, Cl. 526-125.000.

Crow, Robert W.; Holloman, Ricky M.; and Pruden, James B., to Otis Engineering Corporation. Well production optimizing system. 4,921,048, Cl. 166-372.000.

Crow, William D.; and Williams, Ronald D., to Emerson Electric Co. Environmentally protected switch for dynamoelectric machines. 4,922,066, Cl. 200-80.00R.

Crowley, H. W.: *See—*
Wales, R. Langdon; and Crowley, H. W., 4,921,132, Cl. 222-57.000.

Cruse, Harry R. Refuse compactor. 4,920,876, Cl. 100-48.000.

Cselt-Centro Studi E Laboratori Telecommunicazioni S.p.A.: *See—*
Roba, Giacomo, 4,921,516, Cl. 65-3.120.

CSELT (Centro Studi e Laboratori Telecomunicazioni S.p.A.): *See—*
Pirani, Giancarlo; and Taricco, Giorgio, 4,922,494, Cl. 371-35.000.

Culbreth, Keith C., to Automation Industries, Inc. Shipping, storage and dispensing container for flexible duct and the like. 4,921,105, Cl. 206-626.000.

Cullinan, Ann M.; and Schwartz, Paul A., to Eastman Kodak Company. Bleach-accelerating compositions containing a dye-stabilizing agent and use thereof in photographic color processing. 4,921,779, Cl. 430-379.000.

Culp, Bradfred W., to Hewlett-Packard Company. Block pattern detection circuitry. 4,922,352, Cl. 360-39.000.

Culver, Madison A.: *See—*
Givler, Paul W., Jr.; Hommes, William J.; Peterson, Cobern V.; and Culver, Madison A., 4,922,142, Cl. 310-12.000.

Cummins-Allison Corporation: *See—*
Primdahl, Richard D.; and Raterman, Donald E., 4,921,463, Cl. 453-3.000.

Cuno, Incorporated: *See—*
Hou, Chung-Jen; Disbrow, James; and Hou, Kenneth C., 4,921,654, Cl. 264-45.500.

Cupit, Jerry D. Shower head dispenser. 4,921,171, Cl. 239-314.000.

Cutter, Barry C.: *See—*
Duginske, Mark A.; and Cutter, Barry C., 4,920,846, Cl. 83-820.000.

Czarniecki, Michael F.: *See—*
Nagabhushan, Tattanahalli L.; Haslanger, Martin F.; and Czarniecki, Michael F., 4,921,941, Cl. 530-331.000.

Dagaut, Philippe: *See—*
Orain, Roger; Bravet, Jean-Louis; Dimier, Gerard; Dagaut, Philippe; and Daude, Gerard, 4,921,759, Cl. 428-424.400.

Dagenais, Mario; Sharfin, Wayne F.; Seymour, Robert J.; and Elman, Boris S., to GTE Laboratories Incorporated. Array of bistable devices and apparatus and methods for creating same. 4,921,336, Cl. 350-354.000.

D'Agostino, Saverio A.: *See—*
Longerich, Ernest P.; and D'Agostino, Saverio A., 4,922,381, Cl. 361-414.000.

Dahlstrom, Mary A.: *See—*
White, William R.; Dahlstrom, Mary A.; and Lindholm, Scott O., 4,922,045, Cl. 585-10.000.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See—*
Yamada, Shigeru; and Terada, Setsuo, 4,921,761, Cl. 428-473.500.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Takeda, Morihiro; Miyasaka, Eiji; and Handa, Masayuki, 4,922,278, Cl. 354-320.000.
Taniguchi, Hisayuki; and Yamamura, Masaaki, 4,922,332, Cl. 358-77.000.

Daito, Hiroshi: *See—*
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi, Yukimori; Hori, Kazunori; and Tokuyama, Mikio, 4,922,356, Cl. 360-104.000.

Daiwa Seiko, Inc.: *See—*
Yamaguchi, Nobuyuki; and Yamaguchi, Akira, 4,921,187, Cl. 242-232.000.

Dallmann, Hermann; Bothe, Lothar; Crass, Guenther; and Schaefer, Werner, to Hoechst Aktiengesellschaft. Process for producing polyester film containing a slip agent. 4,921,670, Cl. 264-141.000.

Dalzell, William J., Jr.: *See—*
Clark, David E.; Dalzell, William J., Jr.; and Adams, Brenda L., 4,921,731, Cl. 427-314.000.

Dana Corporation: *See—*
Stokes, Richard S.; and Muldowney, Robert M., 4,920,807, Cl. 73-808.000.
Willford, George A., 4,920,813, Cl. 74-11.000.

Danforth, Richard L.; and Smith, Darlene G., to Shell Oil Company. Flame retardant composition containing zinc borate. 4,921,897, Cl. 524-405.000.

D'Angelo, Domenico: *See—*
Lanati, Paolo; Piccone, Alessandro; and D'Angelo, Domenico, 4,920,944, Cl. 123-638.000.

Danielson, Ricky E. Method of retrofitting existing fuel tanks. 4,920,786, Cl. 73-49.200.

Danis, Roger G.; Isaac, Ronald M.; and Puryear, Harry A., Jr., to Abbott Laboratories. Enteral feeding system utilizing gastrointestinal myoelectrography. 4,921,481, Cl. 604-67.000.

Dankert, Norman H. Automobile warning light improvement. 4,922,225, Cl. 340-467.000.

Dannatt, Hugh St. L.; and Miller, Carl A., to Pitney Bowes Inc. Mailing machine tape module and tape drive thereof. 4,922,085, Cl. 235-101.000.

Dao, Kim. Advanced regenerative absorption refrigeration cycles. 4,921,515, Cl. 62-335.000.

DataCard Corporation: *See—*
Nubson, Richard C.; and Mattila, Gary P., 4,921,237, Cl. 271-11.000.

Datta, Pabitra; and Friel, Ronald N., to RCA Licensing Corporation. Surface treatment of silica-coated phosphor particles and method for a CRT screen. 4,921,727, Cl. 427-57.000.

Datta, Pabitra; and Friel, Ronald N., to RCA Licensing Corp. Method of electrophotographically manufacturing a luminescent screen assembly for a cathode-ray-tube. 4,921,767, Cl. 430-23.000.

VOL
1114
ISS
1
MY
1
1990
UMI

Dattatreyamurty, Bosukonda: *See—*
Schneyer, Alan L.; Sluss, Patrick M.; Dattatreyamurty, Bosukonda; and Reichert, Leo E., Jr., 4,921,808, Cl. 436-503.000.

Daude, Gerard: *See—*
Orain, Roger; Bravet, Jean-Louis; Dimier, Gerard; Dagaut, Philippe; and Daude, Gerard, 4,921,759, Cl. 428-424.400.

Daudelin, Abraham N., to American Telephone and Telegraph Company. Automated operator assistance calls with voice processing. 4,922,519, Cl. 379-67.000.

Daumit, Gene P.; Ko, Yoon S.; Slater, Christopher R.; Venner, Jozef G.; and Young, Chi C., to BASF Aktiengesellschaft. Formation of melt-spun acrylic fibers which are particularly suited for thermal conversion to high strength carbon fibers. 4,921,656, Cl. 264-85.000.

Davidson, Alexander P.: *See—*
Furneaux, Robin C.; Davidson, Alexander P.; and Ball, Melville D., 4,921,823, Cl. 502-4.000.

Davidson, Gordon O.; Mitchell, Barry C.; and White, Larry A. Diagnostic meter base. 4,922,185, Cl. 324-74.000.

Davis, Alan L.; Robison, Shane V.; and Stevens, Kenneth S., to Schlumberger Technology Corporation. Apparatus for multi-processor communications. 4,922,408, Cl. 364-200.000.

Davis, Edward E. Method for preparing food items from pig snouts and other similar material 4,921,720, Cl. 426-641.000.

Davis, Rickey P., to Cooper Companies, Inc., The. Surgical irrigation and aspiration system with dampening device. 4,921,477, Cl. 604-22.000.

Davis, William P.: *See—*
Aikins, Robert D.; Bandy, Lee R.; Davis, William P.; Delaney, Robert E.; Guyer, Michael E.; Lovera, Edward D.; and Scamuffa, Thomas A., 4,920,627, Cl. 29-402.080.

Davydov, Anatoly B.: *See—*
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,921,695, Cl. 424-81.000.

Dawson, Howard J *See—*
Flagella, Robert N., and Dawson, Howard J., 4,921,026, Cl. 148-33.000.

Dazord, Jacques: *See—*
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,921,725, Cl. 427-45.100.

de la Gorge, Jean-Etienne: *See—*
Grenier, Michel; de la Gorge, Jean-Etienne; Cieplinski, Daniel; Leturgie, Gerard; Thurin, Yves; Meret, Laurent; and Doireau, Christian, 4,921,076, Cl. 188-12.600

Deacon, Thomas E.: *See—*
Adams, David V.; Anderson, Roger N.; and Deacon, Thomas E., 4,920,918, Cl. 118-724.000

DeAmaral, George: *See—*
Ty, Henry; Baptista, John; and DeAmaral, George, 4,920,624, Cl. 29-173.000.

Dean, Robert W., Jr., to Stonewall Landscape Systems, Inc. Concrete retaining wall block, retaining wall and method of construction therefore. 4,920,712, Cl. 52-169.400.

Decelle, Pierre J.: *See—*
Marie, Philipe; and Decelle, Pierre J., 4,921,455, Cl. 439-709.000.

DeChellis, Deborah K.: *See—*
DeChellis, Francis M.; and DeChellis, Deborah K., 4,921,486, Cl. 604-110.000.

DeChellis, Francis M.; and DeChellis, Deborah K. Disposable syringe with retracting needle. 4,921,486, Cl. 604-110.000.

DeChiara, Thomas M. and Tarnowski, Stanley J., Jr., to Hoffman-La Roche Inc. Polypeptides having interferon activity. 4,921,699, Cl. 424-85.700.

Dederer, Jeffrey T., and Hackworth, Donald T., to Westinghouse Electric Corp. System for dumping cryogens in a superconducting solenoid installation. 4,920,754, Cl. 62-53.100.

Deere & Company: *See—*
Lee, Michael C.; Behrens, Robert N.; Dobberpuhl, Dale R.; Wykhuis, Lloyd A.; and Montgomery, Dix S., 4,920,732, Cl. 56-10.200.

Degen, Peter J. *See—*
Rothman, Isaac; and Degen, Peter J., 4,921,878, Cl. 521-53.000

Degussa Aktiengesellschaft: *See—*
Morlock, Gerhard; and Weigelt, F. Werner, 4,921,881, Cl. 522-99.000.

Degussa Aktiengesellschaft: *See—*
Siegmeier, Rainer; Hofen, Willi; Prescher, Gunter; and Maurer, Helmut, 4,921,983, Cl. 549-525.000

De Haan, Robert; Dry, Mark E.; Dressler, Flemming H.; Hesse, Horst J. F. A.; and Vermaire, Sonet, to Sasol Operations (Pty) Ltd. Process for removing hydrogen sulphide from gas streams. 4,921,682, Cl. 423-225.000

Dehal, Shangara S. *See—*
Beitz, Donald C.; Young, Jerry W.; and Dehal, Shangara S., 4,921,710, Cl. 426-56.000.

Dehausse, Robert *See—*
Rabl, Ari; Clodic, Denis; and Dehausse, Robert, 4,922,107, Cl. 250-504.00R.

Dehio, Gottfried: *See—*
Becker, Horst-Peter; Remfrey, James; and Dehio, Gottfried, 4,922,120, Cl. 303-114.000.

Deininger, Anton: *See—*
Aschberger, Matthias; Farber, Karlheinz; and Deininger, Anton, 4,921,134, Cl. 222-64.000.

Deitrick, Bernard E.; Murzyn, Patrick J.; Nowotarski, Mark S.; and Roberge, Raymond P., to Union Carbide Industrial Gases Technology Corporation. Method and apparatus for controlling flow bias in a multiple zone process. 4,920,998, Cl. 137-3.000.

DeJager, Donald; and Kessler, David, to Eastman Kodak Company. Optical scanner. 4,921,320, Cl. 350-6.800.

de Jongh, Hendrick Paul; and van Vliet, Nicolaas P., to Akzo N.V. 11-arylsteroid compounds. 4,921,845, Cl. 514-172.000.

DeKoning, Jan J.: *See—*
Witkamp, Hendrik A.; Verweij, Jan; DeKoning, Jan J.; Grootveld, Herman H.; and Leenderts, Everardus J. A. M., 4,921,954, Cl. 540-222.000.

Del Zotto Manufacturing Co.: *See—*
Del Zotto, William; and Lewis, Jerry, 4,922,463, Cl. 366-21.000.

Delahanty, Francis T.; Stoy, Vladimir A.; and Tong, Shiu-Bor, to Kingston Technologies, L.P. Memory polymer optical fiber splicer and methods. 4,921,323, Cl. 350-96.210.

Delaney, Robert E.: *See—*
Aikins, Robert D.; Bandy, Lee R.; Davis, William P.; Delaney, Robert E.; Guyer, Michael E.; Lovera, Edward D.; and Scamuffa, Thomas A., 4,920,627, Cl. 29-402.080.

Del Plato, Lewis T., Jr.: *See—*
Hinckley, Charles C.; and Del Plato, Lewis T., Jr., 4,921,677, Cl. 422-103.000.

Del Zotto, William; and Lewis, Jerry, to Del Zotto Manufacturing Co. Portable volumetric concrete mixer/silo. 4,922,463, Cl. 366-21.000.

DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., to Hoechst Celanese Corp. Bisacrylate monomers and polymers exhibiting nonlinear optical response. 4,922,003, Cl. 560-221.000.

Den norske stats olkeselskap: *See—*
Horvei, Knut, 4,921,003, Cl. 137-315.000.

Dengler, Michael; Kapmeyer, Wolfgang; and Rinno, Helmut, to Behringwerke Aktiengesellschaft. Dispersion polymers, biologically active dispersion polymers, a process for their preparation, and their use as diagnostic aids. 4,921,915, Cl. 525-279.000.

Denison, Robert. Bicycle lock. 4,920,772, Cl. 70-53.000.

Denmark, Scott: *See—*
Livingston, Douglas A.; Pearlman, Bruce A.; Denmark, Scott, and Huber, Joel E., 4,921,638, Cl. 552-610.000.

Denny, Paul A., to Plessey Overseas Limited. Phase shift arrangement 4,922,127, Cl. 307-262.000.

Denzler, Emil, to H. A. Schlatter AG. Process and apparatus for the intermittent straightening of wire. 4,920,776, Cl. 72-79.000.

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Dunstan, Harvey J.; Gilbert, Ian D.; Fayer, Ervin; Dominick, George G., and De Oliveira, Avelino, 4,921,206, Cl. 251-7.000.

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deQuay, Laurence, to United States of America, National Aeronautics and Space Administration. Hybrid butterfly valve. 4,921,212, Cl. 251-163.000.

Dequssa Aktiengesellschaft: *See—*
Krimmer, Hans-Peter; Drauz, Karlheinz; and Werner, Silvia, 4,921,971, Cl. 548-534.000.

Dernovsek, John J., to Palco Telecom Inc. Paystation theft inhibiting circuit. 4,922,525, Cl. 379-145.000.

Dervieux, Dominique, to Societe Anatomia - La Boutique du Dos. Apparatus for relief of pain and contractions using discharges of sparks adjustable in intensity of piezo-electric origin with a bipolar electrode of which one of the poles is in direct contact with the skin and the other spaced therefrom. 4,920,981, Cl. 128-800.000.

DeSantis, William D.: *See—*
Bohrn, Walter J.; DeSantis, William D.; and Garman, Shelly N., 4,921,748, Cl. 428-209.000.

Desch, Kurt M. Selector valve, especially a central control valve for a water treatment device. 4,921,598, Cl. 210-136.000.

Desmarteau, Darryl D.: *See—*
Malacrida, Alessandro; and Desmarteau, Darryl D., 4,921,957, Cl. 544-217.000.

Despins, Robert J.: *See—*
Peterson, Francis C.; and Despins, Robert J., 4,921,203, Cl. 248-035.000.

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Gahle, Hans-Jurgen; and Uhlenhoff, Arnold, 4,922,140, Cl. 307-591.000.
Giebel, Burkhard, 4,922,139, Cl. 307-520.000.

Devereaux, Chuck; and Craig, Joe D., to Hart Tackle Company, Inc. Swivel jig fishing lure. 4,920,688, Cl. 43-42.390.

Dewimille, Bernard: *See—*
Drdi, Hamadi; and Dewimille, Bernard, 4,921,018, Cl. 138-149.000.

DeWitt, Christopher P.: *See—*
Rose, Frederick A.; and DeWitt, Christopher P., 4,922,450, Cl. 364-900.000.

Deyo, Paul R.: *See—*
Metcalfe, L. D.; Maczuzak, Michael J.; Bailey, Curtis J.; and Deyo, Paul R., 4,921,315, Cl. 312-321.500.

Dhong, Sang H.; Hwang, Wei; and Lu, Nicky C., to International Business Machines Corporation. Boost clock circuit for driving redundant wordlines and sample wordlines. 4,922,128, Cl. 307-269.000.

Di Giorgio Corporation: *See—*
Cope, Carroll W., 4,921,891, Cl. 524-15.000.

Dictaphone Corporation: *See—*
Bergeron, Lawrence E.; Goldson, John D.; and Ellis, David A., 4,922,514, Cl. 379-6.000.

Di Domenico, John: *See—*
Gennodie, James; and Di Domenico, John, 4,920,628, Cl. 29-402.080.

Diesel Kiki Co., Ltd.: *See—*
Fujimori, Kyoichi; and Sano, Masaki, 4,920,942, Cl. 123-497.000.
Ohi, Shinichi, 4,922,171, Cl. 318-471.000.
Tadahiro, Takahashi, 4,920,755, Cl. 62-171.000.

Diesel, Michael E.: *See—*
Churm, Brian R.; and Diesel, Michael E., 4,922,417, Cl. 364-200.000.

Dietrich, Bernhard, to SDS - Relais AG. Electromagnetic switching device. 4,922,216, Cl. 335-128.000.

Dietrich, Hagen, to Masco Building Products Corp. Backset adjustable door latch. 4,921,290, Cl. 292-337.000.

Dietz, M. David; and Silver, Nathaniel. Illuminated beverage vessel. 4,922,355, Cl. 362-101.000.

Dietze, Robert H.: *See—*
Vail, Curtis F.; Dietze, Robert H.; Kracht, Thomas F.; Cole, Joanne H.; and Hewko, Marc D., 4,920,697, Cl. 49-348.000.

DiFoggio, Rocco, to Shell Oil Company. Method for determining the amount of fluid in a core. 4,920,792, Cl. 73-153.000.

Digital Electric Corporation: *See—*
Donaldson, Darrel D.; and Gillett Jr., Richard B., 4,922,449, Cl. 364-900.000.

Digital Equipment Corporation: *See—*
Heyman, Albert M., 4,922,397, Cl. 363-17.000.
Zurawski, John H.; and Harrington, Kathleen P., 4,922,446, Cl. 364-748.000.

Dignac, Jean P.: *See—*
Fardeau, Michel G. J.; Guern, Yves F. C.; Dignac, Jean P.; and Drevon, Jean M., 4,922,093, Cl. 250-221.000.

Dimier, Gerard: *See—*
Orain, Roger; Bravet, Jean-Louis; Dimier, Gerard; Dagaut, Philippe; and Daude, Gerard, 4,921,759, Cl. 428-424.400.

Dimmick, Roger F.: *See—*
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.

Disbrow, James: *See—*
Hou, Chung-Jen; Disbrow, James; and Hou, Kenneth C., 4,921,654, Cl. 264-45.500.

Dishon, Giora; and Bobbio, Stephen M., to Microelectronics Center of North Carolina. Fluxless soldering process. 4,921,157, Cl. 228-124.000.

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Divsalar, Dariush: *See—*
Simon, Marvin K.; and Divsalar, Dariush, 4,922,507, Cl. 375-26.000.

Dixon, James W. Snow removal device. 4,920,667, Cl. 37-285.000.

Dixon, John; Springthorpe, Brian; and Ince, Francis, to Fisons plc. Substituted 3,4-dihydroxy phenylethylamino compounds. 4,922,022, Cl. 564-367.000.

Djorup, Robert S. Directional thermal anemometer transducer. 4,920,793, Cl. 73-189.000.

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Lee, Michael C.; Behrens, Robert N.; Dobberpuhl, Dale R.; Wykhuis, Lloyd A.; and Montgomery, Dix S., 4,920,732, Cl. 56-10.200.

Dobry, Marian W.; Cempel, Czeslaw; and Garbatowski, Wieslaw, to Politechnika Poznanska. Vibro-isolation of connections of structural units of hand tools. 4,921,053, Cl. 173-162.200.

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Gawol, Manfred; and Adrian, Gerhard, 4,921,540, Cl. 106-287.340.

Dr. Ing. H.C.F. Porsche Aktiengesellschaft: *See—*
Eyb, Wolfgang; and Schaible, Walter, 4,921,265, Cl. 280-96.100.

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Rajasekaran, Periagaram K.; and Doddington, George R., 4,922,539, Cl. 381-50.000.

Dohm, Loring J.; Judge, Lawrence B.; and Morgan, Dwight M., to GMF Robotics Corporation. Method and system for the automated driving of parts and device used therein. 4,922,436, Cl. 364-513.000.

Doireau, Christian: *See—*
Grenier, Michel; de la Gorge, Jean-Etienne; Cieplinski, Daniel; Leturgie, Gerard; Thurin, Yves; Meret, Laurent; and Doireau, Christian, 4,921,076, Cl. 188-12.600.

Dolan, Simon C.: *See—*
Ramsay, Michael V. J.; and Dolan, Simon C., 4,921,978, Cl. 549-264.000.

Dolby, Ray M. Transient control aspects of circuit arrangements for altering the dynamic range of audio signals. 4,922,535, Cl. 381-29.000.

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Schinker, Martin; Brormann, Johannes; Stahn, Dieter; Doll, Walter; Kleer, Gunter; and Manns, Peter, 4,921,519, Cl. 65-39.000.

Dom Holdings PLC: *See—*
Phillips, John A., 4,920,837, Cl. 81-463.000.

Dominick, George G.: *See—*
Dunstan, Harvey J.; Gilbert, Ian D.; Fayer, Ervin; Dominick, George G.; and De Oliveira, Avelino, 4,921,206, Cl. 251-7.000.

Donahue, Robert E., to Genetics Institute Inc. Treatment of AIDS-type disease. 4,921,837, Cl. 514-2.000.

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Donlee Technologies Inc.: *See—*
Korenberg, Jacob; and Khinkis, Mark, 4,920,925, Cl. 122-149.000.

Donovan, Daniel J.: *See—*
Copeland, James L.; and Donovan, Daniel J., 4,921,627, Cl. 252-99.000.

Dooley, Eddie W.; and Noland, Joseph R., to General Electric Company. Variable arc agitator system. 4,920,770, Cl. 68-133.000.

Doomernik, Fransiscus M. P. P.: *See—*
Sluyterman, Albertus A. S.; Bosch, Gerrit; Doomernik, Fransiscus M. P. P.; and Groothoff, Adriaan J., 4,922,167, Cl. 313-431.000.

Dorf, Ernst-Ulrich; Alfes, Franz; and Traenckner, Hans-Joachim, to Bayer Aktiengesellschaft. Preparation of polyarylene sulphides with ketone or pinacone. 4,921,935, Cl. 528-388.000.

Dorinski, Dale W., to Motorola, Inc. Switch assembly. 4,922,070, Cl. 200-512.000.

Dornier System GmbH: *See—*
Fussinger, Reinhold; and Graf, Friedrich, 4,920,595, Cl. 14-2.400.
Schuessler, Harald; and Bender, Oswald, 4,922,254, Cl. 342-25.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Kataoka, Hajime; and Gunji, Minoru, 4,921,434, Cl. 439-198.000.

Doster, John; Barnett, Joe; and Barnett, Jimmy. Apparatus and process for more efficient shipment of tires. 4,920,729, Cl. 53-523.000.

Douine, Denis: *See—*
Coetsier, Paul; and Douine, Denis, 4,922,443, Cl. 364-551.010.

Doumen, Susumu: *See—*
Kunisada, Takeshi; Doumen, Susumu; and Haga, Toshiaki, 4,921,176, Cl. 241-260.100.

Dow Chemical Company, The: *See—*
Baker, Robert B., Jr.; Pews, R. Garth; Otterbacher, Eric W.; and Gall, James A., 4,922,026, Cl. 568-322.000.
Bedell, Stephen A., 4,921,683, Cl. 423-235.000.
Bowman, Robert G.; Tegen, Marvin H.; and Hartwell, George E., 4,922,024, Cl. 564-480.000.
Evani, Syamalarao; and Van Phung, K., 4,921,902, Cl. 524-555.000.
Hefner, Robert E., Jr.; and Wykowski, Paul L., 4,921,927, Cl. 528-87.000.
Pennington, Donald W.; and McLemore, Jane K., 4,921,658, Cl. 264-86.000.

Dow Corning Corporation: *See—*
Blehm Blank, Lynne M., 4,921,701, Cl. 424-401.000.
Burns, Gary T., 4,921,917, Cl. 525-479.000.
Lee, Chi-Long; and Lutz, Michael A., 4,921,880, Cl. 522-12.000.
Rabe, James A.; Lipowitz, Jonathan; and Jones, Richard E., 4,921,657, Cl. 264-86.000.

Dowd, James D.: *See—*
Lawassani, Abdi; Dowd, James D.; and Hilborn, David M., 4,921,300, Cl. 296-97.110.

Dowell Schlumberger Incorporated: *See—*
Codazzi, Daniel; Mioque, Jean-Yves; and Montaron, Bernard, 4,920,795, Cl. 73-195.000.

Dowty Fuel Systems Limited: *See—*
Scales, Christopher, 4,921,125, Cl. 220-426.000.

Dowty Rotol Limited: *See—*
Poucher, Michael; and Seeley, Roger W., 4,921,403, Cl. 416-147.000.

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Dozier, Hilliard. Breakaway hermetically sealed electrical terminal. 4,921,452, Cl. 439-622.000.

Drabek, Josef: *See—*
Boger, Manfred; and Drabek, Josef, 4,921,876, Cl. 514-638.000.

Drauz, Karlheinz: *See—*
Krimmer, Hans-Peter; Drauz, Karlheinz; and Werner, Silvia, 4,921,971, Cl. 548-534.000.

Draxelmayr, Dieter; and Schrittesser, Gerold, to Siemens Aktiengesellschaft. Analog/digital converter with capacitor network. 4,922,252, Cl. 341-172.000.

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Drent, Eit, to Shell Oil Company. Catalytic, diluent preparation of poly ketone having unsaturated terminal group. 4,921,938, Cl. 528-392.000.

Dresser Industries, Inc.: *See—*
Besic, Dragan, 4,921,409, Cl. 417-552.000.

Dressler, Flemming H.: *See—*
De Haan, Robert; Dry, Mark E.; Dressler, Flemming H.; Hesse, Horst J. F. A.; and Vermaire, Sonet, 4,921,682, Cl. 423-225.000.
Drevon, Jean M.: *See—*
Fardeau, Michel G. J.; Guern, Yves F. C.; Dignac, Jean P.; and Drevon, Jean M., 4,922,093, Cl. 250-221.000.
Drew, Arthur J., Jr.; and Ratkowski, Donald J., to Sola USA, Inc. Lens mold assembly. 4,921,205, Cl 249-61.000.
Dridi, Hamadi; and Dewimille, Bernard, to Coflexip. Heat insulated line for the transport of fluids. 4,921,018, Cl. 138-149.000.
Driver, Michael C.: *See—*
Nathanson, Harvey C.; Driver, Michael C.; and Betsch, Regis J., 4,922,253, Cl. 342-5.000.
Dropsa S.p.A.: *See—*
Divisi, Gualtiero, 4,921,072, Cl. 184-7.400.
Drori, Ze'ev; and Abrishami, Amir, to Clifford Electronics, Inc. Electronic vehicle security system. 4,922,224, Cl. 340-428.000.
Drube, John V.: *See—*
Goad, Eugine W.; and Drube, John V., 4,921,119, Cl. 220-212.000.
Drug Delivery Systems Inc.: *See—*
Sibalis, Dan, 4,921,475, Cl. 604-20.000.
Dry, Mark E.: *See—*
De Haan, Robert; Dry, Mark E.; Dressler, Flemming H.; Hesse, Horst J. F. A.; and Vermaire, Sonet, 4,921,682, Cl. 423-225.000.
Dual, Jurg; Sayir, Mahir; and Goodbread, Joseph. Viscometer. 4,920,787, Cl. 73-54.000.
Dubach, Werner F., to Alfatechnic AG Snap closure with original seal safety. 4,921,113, Cl. 215-253.000.
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Dubujet, Bruno, to SGS-Thomson Microelectronics, SA Circuit for the detection of address transitions. 4,922,122, Cl. 307-480.000.
Duckart, Anton; Hauler, Peter; and Zabler, Erich, to Robert Bosch GmbH. Tank level meter. 4,920,796, Cl. 73-290.00V.
Duda, Donald A.: *See—*
Behr, Leonard W.; Colten, Robert B.; and Duda, Donald A., 4,922,065, Cl. 200-61.45M.
Duda, Rosemary B.: *See—*
Beatty, John D Beatty, Barbara G.; and Duda, Rosemary B., 4,921,690, Cl 424-1.100.
Duebi S.R.L.: *See—*
Pizzicara, Marco, 4,920,934, Cl. 123-80.0BA.
Duerr, Wilhelm; and Oppelt, Ralph, to Siemens Aktiengesellschaft. Arrangement for operating a symmetrical radio-frequency antenna in a nuclear magnetic resonance tomography apparatus. 4,922,204, Cl. 324-322.000.
Duetshe Texaco Aktiengesellshaft: *See—*
Gluzek, Karl-Heniz; and Humbert, Heiko, 4,921,879, Cl. 521-129.000.
Duffy, James C. Collapsible library range dolly. 4,921,264, Cl. 280-79.110.
Duggan, Mark E., to Merck & Co., Inc. Intermediates and processes in the preparation of 5-oxygenated HMG-COA reductase inhibitors. 4,921,974, Cl. 549-214.000.
Duginske, Mark A.; and Cutter, Barry C. Guide blocks for bandsaw blade. 4,920,846, Cl. 83-820.000.
Duna Elelmiszer Es Vegyiaru Kereskedelmi Vallalat *See—*
Pamper, Viktor, 4,921,020, Cl. 141-20.000.
Dunbar, Charles E.: *See—*
Blundy, Robert F.; and Dunbar, Charles E., 4,920,899, Cl. 110-336.000.
Dunn, Jeffery W Educational device. 4,921,427, Cl. 434-340.000.
Dunn, Thomas E.: *See—*
Franklin, Richard D.; Auld, Gregg D.; Murray, David E.; Lescisin, John J.; Vaia, Albert R.; and Dunn, Thomas E., 4,921,662, Cl 376-316.000.
Dunn, Trevor R.; Lucas, David R. S.; North, Ben B.; and Joyce, Timothy R., to General Electric Company, p.l.c., The. Electric power measuring devices. 4,922,189, Cl. 324-142.000.
Dunne, Kenneth C.: *See—*
Pietrzak, Kenneth A.; Packer, Scott M.; and Dunne, Kenneth C., 4,922,174, Cl. 318-577.000.
Dunstan, Harvey J.; Gilbert, Ian D.; Fayer, Ervin; Dominick, George G.; and De Oliveira, Avelino, to Coulter Electronics, Inc. Snap-together solenoid operated pinch valve assembly. 4,921,206, Cl 251-7.000.
Duplantis, Shannon S. Apparatus and method for enhancing the images of intra-oral photography. 4,921,344, Cl. 354-62.000.
Du Pont de Nemours, E. I., and Company: *See—*
Anderson, Robert K.; Mainz, Michael H.; and Rackley, Robert L., 4,921,668, Cl. 264-80.000.
Eck, Michael P., 4,920,636, Cl. 29-747.000.
Givler, Paul W., Jr.; Hommes, William J.; Peterson, Cobern V.; and Culver, Madison A., 4,922,142, Cl. 310-12.000.
Krespan, Carl G.; and Smart, Bruce E., 4,922,038, Cl. 570-175.000.
Manzer, Leo E., 4,922,037, Cl. 570-168.000.
Plasky, Joseph G., 4,921,186, Cl. 242-147.00R.
Ramachandran, Seshadri, 4,921,819, Cl. 501-127.000.
Taylor, Harvey W., Jr., 4,921,776, Cl. 430-293.000.
Tseng, Chi-Ping, 4,921,527, Cl. 71-90.000.
Ulrich, Peter; and Weihe, Hans P., 4,922,078, Cl. 219-216.000.
Van Trump, James E., 4,921,900, Cl. 524-744.000.
Wang, Chia-Lin J.; and Wuonola, Mark A., 4,921,869, Cl 514-376.000.
Duracell Inc.: *See—*
Walker, Andre; and Reise, Terrence F., 4,921,689, Cl. 423-605.000.
Durst Phototechnik GmbH: *See—*
Lamprecht, Philipp; Piock, Richard; and Tasser, Siegfried, 4,922,276, Cl. 354-299.000.
Dussault, Rudolph D.: *See—*
Chin, William B.; Dussault, Rudolph D.; Knepper, Ronald W.; Wernicke, Friedrich C.; and Wong, Robert C., 4,922,455, Cl. 365-154.000.
Dutz, Karl-Heinz: *See—*
Linke, Adolf; Dutz, Karl-Heinz; Niermann, Hans; and Wilmer, Gerhard, 4,920,926, Cl. 122-379.000.
Duvall, Anna E., to Cannondale Corporation. Bicycle rear carrier pack. 4,921,151, Cl. 224-32.00R.
Duvander, Patrik; and Johansson, Kent, to AB Akerlund & Rausing. End closure for a packaging container. 4,921,121, Cl. 220-270.000.
Duwaer, Arne L., to North American Philips Corp. Thin film active matrix and addressing circuitry therefor. 4,922,240, Cl. 340-784.000.
Dwyer, Eugene J., to Silhouette Technology, Inc. Film printing/reading system. 4,922,284, Cl. 355-20.000.
Dyer, Ronald. Transport dolly. 4,921,268, Cl. 280-402.000.
Dyer, William B. Auxiliary mirror assembly for vehicles. 4,921,340, Cl. 350-631.000.
Dykstra, Steven P., to Prince Corporation. Vanity mirror package. 4,922,391, Cl. 362-144.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Bender, Richard; and Bretfeld, Anton, 4,920,619, Cl. 24-602.000.
Dytel Corporation: *See—*
Morganstein, Sanford J.; Mehta, Bakulesh A.; and Krakau, Herbert B., 4,922,526, Cl. 379-157.000.
E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Kicherer, Robert, and Schreder, Felix, 4,922,080, Cl. 219-457.000.
East, Anthony J.: *See—*
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., 4,922,003, Cl. 560-221.000.
Eastman Kodak Company: *See—*
Boaz, Neil W., 4,921,798, Cl. 435-146.000.
Bowers, Joseph S., Jr., and Mayberry, Gerald L., 4,921,964, Cl. 548-219.000.
Carroll, John F., Jr., and Feindel, David A., 4,921,755, Cl. 428-328.000.
Cullinan, Ann M., and Schwartz, Paul A., 4,921,779, Cl. 430-379.000.
DeJager, Donald, and Kessler, David, 4,921,320, Cl. 350-6.800.
Gay, George C., 4,922,511, Cl. 378-169.000.
Hakiel, Zbigniew: Reafler, Gerald G.; Schrader, Robert W.; and Schuler, James R., 4,921,556, Cl. 156-164.000.
Hill, Lawrence A.; Jacobs, Michael E.; Kroll, Arthur S.; and Williams, Ralph E., 4,922,302, Cl. 355-251.000.
Hinckley, Charles C.; and Del Plato, Lewis T., Jr., 4,921,677, Cl. 422-103.000.
Koek, Kevin C., 4,922,247, Cl. 341-2.000.
Kung, Teh-Ming, Vreeland, William B.; and Young, Ralph H., 4,921,637, Cl. 552-295.000.
McGuire, Kevin P.; and McKay, James D., 4,922,089, Cl 250-205.000.
Morton, Roger R A, 4,922,336, Cl. 358-88.000.
Nutting, Thomas C.; Lucas, King A.; and Arnold, Andrew D., 4,922,333, Cl. 358-78.000.
Orlicki, David M.; Gropp, David B.; and VanValkenburgh, Thomas E., 4,920,842, Cl. 83-308.000.
Phan, Hieu D.; and Clark, Gary T., 4,921,899, Cl. 524-513.000.
Rombola, Gregory; Muster, Frank L.; and Telle, Lawrence B., 4,922,350, Cl. 358-488.000.
Shtipelman, Boris A., 4,922,145, Cl. 310-49.00R.
Small, Jeffrey A.; Brown, Mark D.; and Vincent, John A., 4,922,137, Cl. 307-480.000.
Walker, Theodore R., Jr.; and Wooten, W. Carl, Jr., 4,922,000, Cl 560-061.000.
West, Henry L., 4,922,067, Cl. 200-83.00P.
Wu, Tai-Wing, 4,921,804, Cl. 435-189.000.
Eaton Corporation: *See—*
Juds, Mark A.; and Beihoff, Bruce C., 4,922,197, Cl. 324-207.210.
Mack, William J.; and Cote, William F., 4,922,425, Cl. 364-424.100.
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Smart, Steven T.; Puls, William M.; and Hansen, David L., 4,920,859, Cl 91-497.000.
Ebata, Yoshikazu: *See—*
Takenoya, Hideaki; Nomoto, Reishi; and Ebata, Yoshikazu, 4,920,902, Cl. 112-103.000.
Ebinuma, Ryuichi: *See—*
Ozawa, Masakazu; Ozawa, Kunitaka; Hatanaka, Katsunori; Suzuki, Tetsuo; Mori, Tetsuzo; Shiina, Tadashi; and Ebinuma, Ryuichi, 4,922,267, Cl. 346-136.000.
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Copeland, James L.; and Donovan, Daniel J., 4,921,627, Cl. 252-99.000.
Edlund, Dag H., to Aktiebolaget Electrolux. Tension arrangement. 4,920,650, Cl. 30-386.000.
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Holloway, John T.; Moon, David A.; Cannon, Howard I.; Knight, Thomas F.; Edwards, Bruce E.; and Weinreb, Daniel L., 4,922,414, Cl. 364-200.000.

Edwards, Robert B., II. *See—*
Quinn, David G.; Edwards, Robert B., II; and Andersen, Erik, 4,921,138, Cl. 222-85.000.
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Egami, Hidemi; Saito, Katsuo; Satomura, Hiroshi; and Oikawa, Katsuya, to Canon Kabushiki Kaisha. An original reading apparatus with shielding. 4,922,392, Cl. 362-217.000.
Egawa, Akira: *See—*
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, 4,921,357, Cl. 372-38.000.
Egis Gyogyszergyar: *See—*
Bozsing, Daniel; Kovanyi, Gyorgyi nee Lax; Berenyi, Edit nee Poldermann; Magyar, Karoly; Tuboly, Sandor; and Mandi, Attila, 4,921,854, Cl. 514-224.200.
Eguchi, Kinya; Niitsuma, Kikue; Wakena, Shigeru; and Ezawa, Masayoshi, to 501 Hitachi, Ltd. Infrared microspectrometer. 4,922,104, Cl. 250-339.000.
Ehrsam, Christian, to Sulzer Brothers Limited Apparatus and process for storing hydrate-forming gaseous hydrocarbons. 4,920,752, Cl. 62-46.100.
Eichenauer, Ulrich; and Neumann, Peter, to BASF Aktiengesellschaft. Preparation of 4,4'-dihydroxybiphenyl. 4,922,031, Cl. 568-730.000
Eigener, Ulrich: *See—*
Hoppe, Udo; Eigener, Ulrich; Sauermann, Gerhard; Engel, Walter, and Pape, Wolfgang, 4,921,694, Cl. 424-65.000.
Eilenberger, Gert; Schrodi, Karl; and Wahl, Stefan, to Alcatel N.V. Packet-switching facilities. 4,922,487, Cl. 370-60.000.
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Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki, Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl. 514-319.000.
Eisen, Herman N.: *See—*
Wheatley, Margaret A.; Langer, Robert S.; and Eisen, Herman N., 4,921,757, Cl. 428-402.200.
Eisenbraun, David D.: *See—*
Roddy, Joseph T.; Felt, David A.; and Eisenbraun, David D., 4,922,172, Cl. 318-490.000.
Ek, Bo R.: *See—*
Eriksson, Kjell G.; Ek, Bo R.; Wallin, Stig G.; and Eriksson, Nils L., 4,921,650, Cl. 264-37.000.
EKA Limited: *See—*
Watson, Norman F., 4,921,394, Cl. 414-546.000.
Ekdahl, Sune: *See—*
Alm, Filip; Gulbrandsen, Sven; Larsson, Bo; and Ekdahl, Sune, 4,920,860, Cl. 91-504.000.
Ekowicki, Robert L., to GTE Products Corporation. Overtemperature protector for incandescent lamp. 4,922,373, Cl. 361-105.000.
Elco Corporation: *See—*
Yanai, Masami; and Maeda, Hiroki, 4,920,642, Cl. 29-860.000
Electro Adapter, Inc.: *See—*
Fish, Ray F., 4,921,449, Cl. 439-610.000.
Elek, Sandor: *See—*
Zubovics, Zoltan; Toldy, Lajos; Rabloczky, Gyorgy; Varro, Andras; Andrasi, Ferene; Elek, Sandor; and Elekes, Istvan, 4,922,021, Cl. 564-367.000
Elekes, Istvan: *See—*
Zubovics, Zoltan; Toldy, Lajos; Rabloczky, Gyorgy; Varro, Andras; Andrasi, Ferene; Elek, Sandor; and Elekes, Istvan, 4,922,021, Cl. 564-367.000.
Eli Lilly and Company: *See—*
Cohen, Marlene L.; Lacefield, William B.; and Robertsch, David W., 4,921,982, Cl. 549-462.000.
Rao, R. Nagaraja; and Stanzak, Richard K., 4,921,801, Cl 435-172.300.
Tao, Eddie V. P.; and Vicenzi, Jeffrey T., 4,921,947, Cl. 536-7.100
Ellis, David A.: *See—*
Bergeron, Lawrence E.; Goldson, John D.; and Ellis, David A., 4,922,514, Cl. 379-6.000.
Elman, Boris S.: *See—*
Dagenais, Mario; Sharfin, Wayne F.; Seymour, Robert J.; and Elman, Boris S., 4,921,336, Cl. 350-354.000
Emerson Electric Co.: *See—*
Baker, Gerald N.; and Bushor, Ray E., 4,922,144, Cl. 310-42.000.
Crow, William D.; and Williams, Ronald D., 4,922,066, Cl. 200-80.00R.
Hult, David R.; and Tomasiak, Mark J., 4,920,608, Cl. 15-339.000
Lewis, John G., 4,922,151, Cl. 310-91.000.
Roddy, Joseph T.; Felt, David A., and Eisenbraun, David D., 4,922,172, Cl. 318-490.000.
Emhart Industries, Inc.: *See—*
Nebelung, Hermann H.; and Andersson, Rune, 4,921,523, Cl 65-172.000.
Emura, Bunsuke: *See—*
Ushiro, Seimei; and Emura, Bunsuke, 4,921,343, Cl. 353-66.000.
Enari, Masahiko: *See—*
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.
Endo, Fumio: *See—*
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki, Aoyagi, Yoshio; and Nakamura, Kazunari, 4,922,476, Cl. 369-47.000
Endo, Mikio: *See—*
Ishihara, Toshinobu; Endo, Mikio; Kubota, Tohru; and Tanaka, Yasuhisa, 4,921,980, Cl. 556-431.000.
Endo, Takayoshi; Yagi, Sakai; Sakai, Hitoshi; and Saito, Hitoshi, to Yazaki Corporation. Connector terminal retainer construction. 4,921,448, Cl. 439-595.000.
Endoh, Toshiaki; and Yamazaki, Yasuhiro, to Kokusai Denshin Denwa Kabushiki Kaisha. Facsimile image encoding method. 4,922,545, Cl. 382-56.000.
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Roth, Alex T.; and Soderstrom, Richard M., 4,920,974, Cl. 128-759.000.
Engel, Christopher M.; and Rabii, Khosro M., to Zenith Electronics Corporation Velocity controlled CRT auto tracking system. 4,922,328, Cl. 358-10.000.
Engel, Georg: *See—*
Kosak, Dietmar; and Engel, Georg, 4,920,777, Cl. 72-225.000.
Engel, Walter: *See—*
Hoppe, Udo; Eigener, Ulrich; Sauermann, Gerhard; Engel, Walter; and Pape, Wolfgang, 4,921,694, Cl. 424-65.000.
Engelhard Corporation: *See—*
Amundsen, Alan R.; and Stern, Eric W., 4,921,847, Cl. 514-188.000.
Engler, Heidrun: *See—*
Schickaneder, Helmut; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; and Ahrens, Kurt H., 4,921,856, Cl. 514-252.000.
Englert, Heinrich C.; Hropot, Max; Lang, Hans-Jochen; and Greger, Rainer, to Hoechst Aktiengesellschaft, and Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften. Use of amino-substituted benzoic acids as remedies for diarrhea, and medicaments based on these compounds. 4,921,875, Cl. 514-567.000.
Engstrom, Thomas B.: *See—*
Nordberg, Cecilia M.; Engstrom, Thomas B.; Pinzke, Thomas, Sanneskog, Owe; and Ohlund, Jan, 4,921,613, Cl. 210-651.000.
Enhardt, Josef E.: *See—*
Holm, Roland; and Enhardt, Josef E., 4,921,178, Cl. 242-7.05R
Enick, Robert M., to University of Pittsburgh. CO_2 gels and methods for making. 4,921,635, Cl. 252-315.100.
Enloe, Jack H.; Lau, John W., Lundsager, Christian B.; and Rice, Roy W., to W R. Grace & Co.-Conn. Hot pressing dense ceramic sheets for electronic substrates and for multilayer electronic substrates. 4,920,640, Cl. 29-852.000.
Ennis, Melvyn S. J. Hammer drills for making boreholes. 4,921,056, Cl 175-92.000.
Enoguchi, Yuji: *See—*
Mizuno, Hiroshi; Natasuhara, Toshiya; Enoguchi, Yuji; Ikegawa, Akihito; Yamamoto, Masasi; and Murasaki, Hiroshi, 4,920,916, Cl. 118-653.000.
Enoki, Sigekazu: *See—*
Katoh, Shunji; Kimura, Noriyuki; Sakai, Yoshihiro; and Enoki, Sigekazu, 4,922,301, Cl. 355-251.000.
Enomoto, Akira: *See—*
Hatanaka, Toshihiko; Enomoto, Akira; and Matsushita, Kouji, 4,922,094, Cl. 250-221.000.
Enos, Quentin M. Gravity feed apparatus and method for fumigation, detoxification and nutrification of plant seed 4,921,674, Cl. 422-28.000.
Enprotech Corp.: *See—*
Fukui, Ronald D. Ichikawa, Wataru; and Sakamoto, Kazuya, 4,922,199, Cl. 324-207.170.
Enya, Yoshihiro: *See—*
Okada, Yoshihisa; and Enya, Yoshihiro, 4,921,174, Cl. 241-37.500
Okada, Yoshihisa; and Enya, Yoshihiro, 4,921,175, Cl. 241-37.500.
Erbe, Ehrenfried, to Siemens Aktiengesellschaft. Hearing aid comprising a printed circuit film. 4,922,540, Cl. 381-69.000.
Erbe Elektromedizin GmbH: *See—*
Flachenecker, Gerhard; Fastenmeier, Karl; and Lindenmeier, Heinz, 4,922,210, Cl. 331-167.000.
Erdman, Rodney V.: *See—*
Schultz, Leonard S.; Gold, Jay F.; and Erdman, Rodney V., 4,921,492, Cl. 604-315.000.
Erhardt & Leimer GmbH: *See—*
Mair, Franz; and Lonner, Wolfgang, 4,920,622, Cl 26-75.000
Erico International Corporation: *See—*
Kies, Anton M.; and van den Nieuwelaar, Harry C., 4,921,217, Cl 254-29.00R.
Eriksson, Kjell G.; Ek, Bo R.; Wallin, Stig G.; and Eriksson, Nils L., to Sunds Defibrator Aktiebolag. Method and apparatus for liquid treatment of pulp. 4,921,650, Cl. 264-37.000.
Eriksson, Nils L.: *See—*
Eriksson, Kjell G.; Ek, Bo R.; Wallin, Stig G.; and Eriksson, Nils L., 4,921,650, Cl. 264-37.000.
Erkens, Leonardus J. H.; Geurta, Herman J. J. M.; Vandevenne, Jean L. G. M.; and Algra, Gerben P., to Ciba-Geigy Corporation. Orthorhombic greenish-tinged lead chromate pigments. 4,921,541, Cl. 106-433.000.
Ernst, Wolfram, to Siemens Aktiengesellschaft. Circuit configuration for routine testing of the clock supply of a large number of units operated with the same clock. 4,922,489, Cl. 370-100.100
Eschbach, Mathias: *See—*
Schliehe, Wolf D.; and Eschbach, Mathias, 4,921,414, Cl. 425-131.100.

Eschenbach, Paul W., to Milliken Research Corporation. Laminated seat fabric. 4,921,752, Cl. 422-247.000.
Espy, Isaac P. Apparatus for operating a shaft. 4,920,814, Cl. 74-89.150.
Estes, Earl M., Jr., to Hughes Aircraft Company. Power semiconductor package. 4,922,379, Cl. 361-388.000.
Etablissements M. Muller & Cie.: *See*—
Coetsier, Paul; and Douine, Denis, 4,922,443, Cl. 364-551.010.
Etat Francais: *See*—
Luther, Hans W.; Winkelmann, Juergen; Sauvestre, Jean-Claude; and Montier, Patrick, 4,920,888, Cl. 102-518.000.
Etess, Edward, to Web Technology, Inc. Hermeticity testing method and system. 4,920,785, Cl. 73-40.700.
Ethyl Corporation: *See*—
Niebylski, Leonard M., 4,921,925, Cl. 528-5.000.
Smith, R. Scott, 4,922,054, Cl. 585-452.000.
Etscheidt, Ronald J.; and Ophaug, Darrell P., to Square D Company. Clutch module with predetermined torque. 4,921,083, Cl. 192-20.000.
Eubank, Dennis R. Method for operating a well to remove production limiting or flow restrictive material. 4,921,577, Cl. 166-311.000.
Europlast S.p.A.: *See*—
Bosi, Giulio, 4,920,722, Cl. 52-591.000.
Evani, Syamalarao; and Van Phung, K., to Dow Chemical Company, The. Hydrophobic associative composition containing a polymer of a water-soluble monomer and an amphiphilic monomer. 4,921,902, Cl. 524-555.000.
Evans, David C.: *See*—
Thorpe, William A.; and Evans, David C., 4,921,734, Cl. 428-34.400.
Evans, Donald: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,921,733, Cl. 428-34.200.
Evans, John R., to R. J. Fullwood & Bland Limited. Vacuum regulator apparatus. 4,921,006, Cl. 137-554.000.
Evans, Scott M.: *See*—
Cottonaro, Cliff N.; Evans, Scott M.; Pflueger, David R.; and Millar, Huntly D., 4,920,967, Cl. 128-662.060.
Everett, Benjamin H., II; Holben, Robert B.; and Swanson, James B., to General Motors Corporation. Shaft coupling. 4,921,367, Cl. 403-106.000.
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R.; Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C.; and Jacubec, Mark R., to Aerological Research Systems, Inc. Process for the dry removal of polluting material from gas streams. 4,921,886, Cl. 423-235.000.
Ewert, Corney J.: *See*—
Bornstein, Marvin; Ewert, Corney J.; Saenger, John D.; and Reyes, Vincent, 4,921,122, Cl. 220-326.000.
Exel OY: *See*—
Santanen, Ensio; and Rauvala, Esko, 4,921,275, Cl. 280-824.000.
Exxon Chemical Patents Inc.: *See*—
Atwood, Harvey E., 4,921,924, Cl. 526-339.000.
Bossaert, Bernard L. L.; Ohlsson, Stefan B.; and Willems, William F. M. J., 4,921,749, Cl. 428-216.000.
Exxon Research & Engineering Company: *See*—
Oswald, Alexis A., Bhatia, Ram N.; Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M., and Hsu, Chang S., 4,922,028, Cl. 568-448.000.
Eyb, Wolfgang; and Schaible, Walter, to Dr. Ing. H.C.F. Porsche Aktiengesellschaft. Front axle. 4,921,265, Cl. 280-96.100.
Ezaki, Tadashi, to Sony Corporation. Color video signal reproducing apparatus having trap circuit and comb-filter for filtering a chrominance signal band of a wide band luminance signal. 4,922,331, Cl. 358-31.000.
Ezawa, Masayoshi: *See*—
Eguchi, Kinya; Nitsuma, Kikue; Wakena, Shigeru; and Ezawa, Masayoshi, 4,922,104, Cl. 250-339.000.
Ezure, Nobuya: *See*—
Fukumura, Takeo, Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,223, Cl. 267-64.230.
Fukumura, Takeo, Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,224, Cl. 264-64.230.
Fukumura, Takeo, Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,227, Cl. 267-64.230.
Fabo, Tomas, to Molnlycke AB. Wound dressing. 4,921,704, Cl. 424-446.000.
Fabre, Pierre: *See*—
Belmain, Daniel; Chabert, Pierre; Tholome, Roger; Fabre, Pierre; Correard, Jean-Yves; and Gondrand, Michel, 4,921,172, Cl. 239-698.000.
Fabrice, Goussu, to Genus International, a part interest. Clamping device for plates or profiled elements placed one against the other. 4,921,233, Cl. 269-32.000.
Fabrique Nationale Herstal Societe Anonyme, en abrege "FN": *See*—
Gabriels, A., 4,920,886, Cl. 102-476.000.
Fainman, Morton Z. Fuel additive. 4,920,691, Cl. 44-57.000.
Fair, James A.: *See*—
Brors, Daniel L.; Fair, James A.; and Monnig, Kenneth A., 4,920,908, Cl. 427-255.200.
Falconer, Stuart A.; Foster, David J.; and Steel, John, to Autotype International Limited. Masking films. 4,921,740, Cl. 428-40.000.
Famulari, Giovanni, to Tiziana Lenarduzzi. Antiscattering device for the collection of waste material produced in the course of drilling, milling and similar operations, to be fitted on the relevant machine tools. 4,921,375, Cl. 408-67.000.
Fantone, Stephen D.; Rockney, Bennett H.; Burger, Robert J.; and Cook, Lee M., to Polaroid Corporation; and Galileo Electro-Optics Corporation. Integral fiber optic printhead. 4,921,316, Cl. 350-96.270.
Fanuc Ltd.: *See*—
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, 4,921,357, Cl. 372-38.000.
Fanuc Ltd: *See*—
Kawamura, Hideaki; Matsumura, Teruyuki; and Iwagaya, Takashi, 4,922,440, Cl. 364-474.220.
Farber, Karlheinz: *See*—
Aschberger, Matthias; Farber, Karlheinz; and Deininger, Anton, 4,921,134, Cl. 222-64.000.
Fardeau, Michel G. J.; Guern, Yves F. C.; Dignac, Jean P.; and Drevon, Jean M., to Bertin & Cie. Method and a device for determining the number of people present in a determined space by processing the grey levels of points in an image. 4,922,093, Cl. 250-221.000.
Fargano, Michael J.: *See*—
Gorniak, Andrew M.; and Fargano, Michael J., 4,922,534, Cl. 380-49.000.
Farmer, James O.; and Rovira, Luis A., to Scientific-Atlanta, Inc. Sync suppression scrambling and descrambling of television signals for subscription TV. 4,922,532, Cl. 380-15.000.
Farrell, Nicholas P.: *See*—
Skov, Kirsten A.; Farrell, Nicholas P.; and Chaplin, David J., 4,921,963, Cl. 548-101.000.
Farrington, Allan P.: *See*—
Marshall, Gerald M.; and Farrington, Allan P., 4,921,659, Cl. 264-510.000.
Fasang, Patrick P.; and Mullins, Daryl E., to National Semiconductor Corp. Architecture and device for testable mixed analog and digital VLSI circuits. 4,922,492, Cl. 371-22.100.
Fastenmeier, Karl: *See*—
Flachenecker, Gerhard; Fastenmeier, Karl; and Lindenmeier, Heinz, 4,922,210, Cl. 331-167.000.
FasTest incorporated: *See*—
Meisinger, Stanlee W., 4,921,282, Cl. 285-104.000.
Fay, John E., to Biomedical Polymers, Inc. Biological fluid collection apparatus with the cap on the cover. 4,920,975, Cl. 128-760.000.
Fayer, Ervin: *See*—
Dunstan, Harvey J.; Gilbert, Ian D.; Fayer, Ervin; Dominick, George G.; and De Oliveira, Avelino, 4,921,206, Cl. 251-7.000.
Federal-Mogul Corporation: *See*—
Nordyke, Keith D., 4,921,384, Cl. 411-361.000.
Feindel, David A.: *See*—
Carroll, John F., Jr.; and Feindel, David A., 4,921,755, Cl. 428-328.000.
Fekete, Marton: *See*—
Knoll, Jozsef; Budai, ne Simonyi; Katalin, Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.
Knoll, Jozsef; Budai nee Simonyi, Katalin; Berenyi nee Poldermann, Edit; Miklya, Ildiko ; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,960, Cl. 546-153.000.
Feller, Ernst. Voltage multiplier circuit with reduced back-gate bias effect. 4,922,403, Cl. 363-60.000.
Felt, David A.: *See*—
Roddy, Joseph T.; Felt, David A.; and Eisenbraun, David D., 4,922,172, Cl. 318-490.000.
Felton, George N.: *See*—
Harris, Kenneth M.; Felton, George N.; Collingborn, Peter A. G.; Stringfellow, Christopher; and Greeves, Godfrey, 4,920,940, Cl. 123-450.000.
Fenne, Kenneth R.: *See*—
Birk, Daniel J.; Fenne, Kenneth R.; and Mantzke, Michael T., 4,922,407, Cl. 364-145.000.
Ferree, Herbert E., to Space Industries Partnership, L.P. Wire conducting rotary coupling employing protective skirt. 4,921,432, Cl. 439-164.000.
Ferris Industries, Inc.: *See*—
Wenzel, Philip H., 4,920,734, Cl. 56-11.100.
Ferro Corporation: *See*—
Kammann, Karl P., Jr., 4,921,624, Cl. 252-48.600.
Feyjoo, Alexandre: *See*—
Bercovitz, Christian; and Feyjoo, Alexandre, 4,922,109, Cl. 250-556.000.
Fiberstars, Inc.: *See*—
Awai, George K., 4,922,385, Cl. 362-32.000.
Fickert, Werner: *See*—
Seubert, Bernhard; Beilharz, Helmut; Fickert, Werner; Jeromin, Gunter; and Spitaler, Ulrich, 4,921,840, Cl. 514-33.000.
Fiedler, Volker-Bernd: *See*—
Niewohner, Ulrich; Hoever, Franz-Peter; Junge, Bodo; Perzborn, Elisabeth; Seuter, Friedel; and Fiedler, Volker-Bernd, 4,921,998, Cl. 560-45.000.
Fields, Grethel C., III, to Ray Treadwell Contractors, Inc. Method and system for secondary containment. 4,921,115, Cl. 220-18.000.
Fields, Harold T.: *See*—
Crawford, Delmar E.; and Fields, Harold T., 4,922,165, Cl. 310-215.000.
Figgie International Inc.: *See*—
Blust, Dale K., 4,921,177, Cl. 242-3.000.
Fina Technology, Inc.: *See*—
Waguespack, James N.; and Butler, James R., 4,922,053, Cl. 585-449.000.

Finch, Harry E.; and Szayer, Geza J. Security door system. 4,921,033, Cl. 160-133.000.
Findley Adhesives, Inc.: *See*—
Schiff, Robert; Lehnus, Gary; Wasserman, Charles J.; and Garlock, Henrietta M., 4,921,809, Cl. 436-531.000.
Fine, Stephen A.: *See*—
Thackeray, James W.; and Fine, Stephen A., 4,921,778, Cl. 430-326.000.
Fink, Fritz: *See*—
Kiefer, Hans; Bipp, Hansjoerg; Fink, Fritz; Jaedicke, Hagen; and Poralla, Dieter M., 4,921,711, Cl. 426-66.000.
Fink, Richard. Apparatus for trimming fabric covered articles. 4,920,840, Cl. 83-140.000.
Finke, Malcolm K.; Weinstein, Marshall; and Muderlak, Kenneth J., to Specialty Store Services, Inc. Display case for a jacketed cassette. 4,921,097, Cl. 206-387.000.
Finn, Patrick W. Combination tool. 4,920,593, Cl. 7-127.000.
Firmenich SA: *See*—
Simmons, Dana P.; and Chapuis, Christian, 4,922,027, Cl. 568-445.000.
Firth, William C., Jr., to Union Camp Corporation. Chrome humates as drilling mud additives. 4,921,620, Cl. 252-8.513.
Fischer, Artur, to Fischerwerke Artur Fischer GmbH & Co. KG. Plastic expansible plug. 4,921,383, Cl. 411-57.000.
Fischer, Roman; Mercker, Hans J.; and Mueller, Herbert, to BASF Aktiengesellschaft. Preparation of aliphatic N,N-dialkyl-substituted amino alcohols. 4,922,023, Cl. 564-479.000.
Fischer, William H., to Presray Corporation, The. Pneumatically inflatable roof seal. 4,920,706, Cl. 52-2.00B.
Fischer, Wolfgang; Kennedy, Richard T.; and Wiley, Ronald L., to Coca-Cola Company, The. Refrigeration system for a beverage dispenser. 4,921,139, Cl. 222-129.100.
Fischerwerke Artur Fischer GmbH & Co. KG: *See*—
Fischer, Artur, 4,921,383, Cl. 411-57.000.
Fish, Ray F., to Electro Adapter, Inc. Shield connections for electrical cable connector. 4,921,449, Cl. 439-610.000.
Fisons plc: *See*—
Dixon, John; Springthorpe, Brian; and Ince, Francis, 4,922,022, Cl. 564-367.000.
Fitzgerald, Paul L.: *See*—
Moore, Richard B.; Fitzgerald, Paul L.; and Pole, Ernest G., 4,921,892, Cl. 524-61.000.
Fitzgerald, Robert M.; and Gresens, Eugene O. Satellite antenna mounting apparatus with ballast means. 4,922,264, Cl. 343-878.000.
Flachenecker, Gerhard; Fastenmeier, Karl; and Lindenmeier, Heinz, to Erbe Elektromedizin GmbH. Feedback-coupled high-frequency power oscillator. 4,922,210, Cl. 331-167.000.
Flagella, Robert N.; and Dawson, Howard J., to Union Carbide Chemicals and Plastics Company Inc. Polycrystalline silicon capable of yielding long lifetime single crystalline silicon. 4,921,026, Cl. 148-33.000.
Flaming, Dale G. Method and apparatus for forming a micropipette with uniform application of heat. 4,921,522, Cl. 65-108.000.
Flanders, James R.; Bramley, Frank; Sharp, Francis B.; Newton, Robert A.; and Mansfield, Graham J., to British United Shoe Machinery Ltd. Apparatus for lasting toe, side and heel seat portions of a shoe. 4,920,594, Cl. 12-7.000.
Flanner, Lloyd T. Process for cleaning fuel injectors. 4,920,996, Cl. 134-22.110.
Fleming, Dennis L.: *See*—
Beckstead, Gary K.; and Fleming, Dennis L., 4,920,762, Cl. 62-353.000.
Flemming, Udo, to PUMA Aktiengesellschaft Rudolf Dassler Sport. Athletic shoe, particularly a tennis shoe, and process for producing such a shoe. 4,920,663, Cl. 36-73.000.
Flett, Douglas S., Holt, Gary; and Tily, Peter J., to Secretary of State for Trade and Industry, Minerals and Metals Division, Warren Springs Laboratory. Monitoring pyrogenic processes. 4,921,221, Cl. 75-385.000.
Flora, Bruno: *See*—
Klutz, Hans J.; Flora, Bruno; Gilles, Gerard, and Wies, Georges, 4,921,086, Cl. 193-3.000.
Floy Tag & Mfg., Inc.: *See*—
Amick, Russell D., 4,920,670, Cl. 40-300.000.
Fluck, Rene, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for stacking and conveying wafer-like articles. 4,921,398, Cl. 414-798.700.
Flynn, Richard M.; and Verdi, Fred W., to American Telephone and Telegraph Company. Personal data card and method of constructing the same. 4,921,160, Cl. 235-492.000.
FMC Corporation: *See*—
Crawford, Donald C.; Ross, Jeffrey L.; and Krueger, James W., 4,921,092, Cl. 198-460.000.
Gregor, Vaughn, 4,921,090, Cl. 198-761.000.
Singeetham, Shiva P., 4,921,284, Cl. 285-415.000.
Folkins, Jeffrey J.; Goren, Robert N.; and Rees, James D., to Xerox Corporation. Automatic color separation system. 4,922,298, Cl. 355-218.000.
Foll, Eberhard; Guth, Gustav; Guth, Joachim; Holl, Peter, and Van Raaij, Alexander, to Polymer-Physik GmbH & Co. KG. High voltage transformer. 4,922,405, Cl. 363-126.000.
Fong, Dodd W., to Nalco Chemical Company. Process for preparing high molecular weight hydrophobic acrylamide polymers. 4,921,903, Cl. 524-555.000.
Fonsalas, Frederic L. J.; Lejard, Jeans-Yves L., Hayet, Pascal F. P., and Le Queau, Marcel R., to U.S. Philips Corporation. System of transmitting high-definition television pictures via a narrow-passband channel. 4,922,342, Cl. 358-138.000.
Fontenelle, Francois: *See*—
Tresset, Alain; Fontenelle, Francois; and Javard, Gerard, 4,922,509, Cl. 375-103.000.
Forbus, Thomas R., Jr.: *See*—
Chen, Catherine S. H.; and Forbus, Thomas R., Jr., 4,922,047, Cl. 585-12.000.
Ford, Douglas L.; and Barton, Noel, to Memtec Limited. Cleaning of hollow fibre filters. 4,921,610, Cl. 210-636.000.
Ford Motor Company: *See*—
Gale, Allan R., 4,920,939, Cl. 123-399.000.
Kane, Thomas J.; Myer, John M.; and Grzybowski, Richard W., 4,921,435, Cl. 439-248.000.
Forrest, Andrew K.: *See*—
Brain, Edward G.; Hunt, Eric; and Forrest, Andrew K., 4,921,839, Cl. 514-29.000.
Forsyth, John L.: *See*—
Sanders, Royden C., Jr., Forsyth, John L., and Conant, John P., 4,921,365, Cl. 400-322.000.
Foster, David J.: *See*—
Falconer, Stuart A.; Foster, David J.; and Steel, John, 4,921,740, Cl. 428-40.000.
Foster, Geoffrey F., to Premier-Fosters (Australia) Limited. Automatic fluid flow shutoff device. 4,921,008, Cl. 137-557.000.
Foster, Stephen R.; and Oschmann, Thomas R. Wringer device. 4,920,877, Cl. 100-171.000.
Foster Wheeler Energy Corporation: *See*—
Abdullally, Iqbal F.; Touma, Alfred S.; and Bartkowiak, Peter, 4,920,924, Cl. 122-4.00D.
Fournier, Paul J. E.; and Kulikowski, Ernest F., to Aeroquip Corporation. Adapter seal. 4,921,258, Cl. 277-29.000.
Fowler, Daniel L. Versatile controlled flavor straw assembly. 4,921,713, Cl. 426-85.000.
Fowler, Daniel L.: *See*—
Kadwell, Brian J.; and Fowler, Daniel L., 4,922,081, Cl. 219-506.000.
Fox, Robert, to Hall Chemical Company. Method and apparatus for producing cobalt acetate from cobalt chip. 4,921,986, Cl. 556-149.000.
Fraenkel, Howard A.; Hardi, Joseph M.; Kurtz, Bruce E.; and Spieciati, Frank A., to Allied-Signal Inc. Method for manufacture of multilayer printed circuit boards. 4,921,777, Cl. 430-314.000.
Francis, Sam E., Jr., to Jack Frost Laboratories, Inc. Microwavable thermal compress and method and use thereof. 4,920,964, Cl. 128-403.000.
Francois, Joel: *See*—
Quinquis, Jean-Paul; Servel, Michel; and Francois, Joel, 4,922,485, Cl. 370-60.000.
Frank J. Martin Company: *See*—
Martin, Frank J., 4,920,774, Cl. 70-367.000.
Frank, James P.; and King, James L., to General Electric Company. Switch and terminal assembly. 4,922,062, Cl. 200-80.00R.
Frank, Thomas P., Nicholson, Warren B., and Pfouts, Mark D., to Medex, Inc. Gel-filled blood pressure transducer. 4,920,972, Cl. 128-675.000.
Franke, Rolf, and Schmersahl, Peter, to Merck Patent Gesellschaft mit Beschrankter Haftung. Medicinal bath oils. 4,921,874, Cl. 514-552.000.
Franklin, Richard D., Auld, Gregg D., Murray, David E.; Lescisin, John J.; Vaia, Albert R.; and Dunn, Thomas E., to Westinghouse Electric Corp. Pressure pulse cleaning method. 4,921,662, Cl. 376-316.000.
Franz, Gerhard A.: *See*—
Ludwig, Gerald W.; and Franz, Gerhard A., 4,922,404, Cl. 363-89.000.
Frechet, Jean M. J.: *See*—
Zupancic, Joseph J.; Frechet, Jean M. J.; Zweig, Andrew M.; and Conrad, Jeffrey P., 4,921,923, Cl. 526-313.000.
Frederiksen, Jeffery E., to Frederiksen & Shu Laboratories, Inc. Method and apparatus employing audio frequency offset extraction and floating-point conversion for digitally encoding and decoding high-fidelity audio signals. 4,922,537, Cl. 381-31.000.
Frederiksen & Shu Laboratories, Inc.: *See*—
Frederiksen, Jeffery E., 4,922,537, Cl. 381-31.000.
Freeman, John J., to MiniScribe Corporation. Method and apparatus for driving a brushless motor. 4,922,169, Cl. 318-254.000.
Frehaut, Jean-Pierre; Magnaudet, Eric; and Pineau, Jean-Pierre, to Thomson-Brandt Armements. System for maintaining multiple warheads placed in a missile rotating on its longitudinal axis. 4,920,887, Cl. 102-489.000.
French, Jay L., to AMP Incorporated. Electrical assemblies including female electrical terminal. 4,921,456, Cl. 439-851.000.
Freudenreich, Erwin, to Hella KG Hueck & Co. Vehicle headlight. 4,922,388, Cl. 362-61.000.
Frickman, Jay P.; Kissick, William E., Jr.; and McMahon, Kevin R. Aquarium cleaning and filtering system and method. 4,921,614, Cl. 210-695.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Adolfs, Friedhelm; Bittner, Gerd; Busing, Klaus P., Harris, Stephen; Hahn, Ulrich; and Wurzburger, Martin, 4,921,752, Cl. 356-347.000.
Brussel, Richard, 4,921,419, Cl. 425-406.000.
Friedrich, Brent R.: *See*—
Anson, James H.; Kates, James L.; Brewer, Alan W.; and Friedrich, Brent R., 4,920,871, Cl. 99-295.000.

VOL
1114
ISS
1
MY
1
1990
UMI

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See*—
Gnauert, Werner; and Titze, Horst, 4,921,016, Cl. 137-625.170.
Friel, Ronald N.: *See*—
Datta, Pabitra; and Friel, Ronald N., 4,921,727, Cl. 427-57.000.
Datta, Pabitra; and Friel, Ronald N., 4,921,767, Cl. 430-23.000.
Fries, Berit: *See*—
Fries, Bror; and Fries, Berit, 4,921,382, Cl. 411-45.000.
Fries, Bror; and Fries, Berit. Screw lock. 4,921,382, Cl. 411-45.000.
Friese, Donald E.; Brown, James W.; MacEwen, Frank; LeVan, E. G.; and Smith, Michael, to Noran. Powered sliding truck cab window. 4,920,698, Cl. 49-380.000.
Frigerio, Giuliano; Pellicciari, Roberto; and Roda, Aldo, to Gipharmex S.P.A. Biliary acid derivatives, processes for the preparation thereof and pharmaceutical compositions containing them. 4,921,848, Cl. 514-182.000.
Frin, Roger: *See*—
Dubost, Gerard; and Frin, Roger, 4,922,263, Cl. 343-797.000.
Frizzell, John B. H. Hypodermic needle shield. 4,921,489, Cl. 604-192.000.
Froderberg, Ingemar; and Persson, Per-Oskar, to Ingenjorsfirman Per-Oskar Persson AB. Filter for liquids. 4,921,602, Cl. 210-232.000.
Frohbieter, Edwin H.: *See*—
Janke, Donald E.; and Frohbieter, Edwin H., 4,920,758, Cl. 62-187.000.
Fromson. Robert E. Circular lamella clarifier. 4,921,609, Cl. 210-521.000.
Frye, Ricky J. Tape feeding method and apparatus. 4,920,904, Cl. 112-262.100.
Fuchs, Karl-Heinz: *See*—
Graf, Lothar; and Fuchs, Karl-Heinz, 4,921,142, Cl. 222-162.000.
Fuji Electric Co., Ltd.: *See*—
Nakamura, Katsunari, 4,921,087, Cl. 198-350.000.
Fuji Photo Film Co., Ltd.: *See*—
Akao, Mutsuo, 4,921,737 Cl. 428-36.920.
Hashiue, Masakazu, 4,922,101, Cl. 250-327 200.
Hosoi, Yuichi, 4,922,105, Cl. 250-484.100.
Ikeda, Hideo; and Nemori, Ryoichi, 4,921,784, Cl. 430-567.000.
Kaneko, Nobuyoshi; and Naruse, Yasuhito, 4,921,729, Cl. 427-131.000.
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,922,103, Cl. 250-327.200.
Kogane, Mikio; and Kimura, Tsutomu, 4,922,289, Cl. 355-29.000.
Mori, Nobufumi; Hosoi, Yuichi; and Miyahara, Junji, 4,922,098, Cl. 250-311.000.
Nakamura, Koki; and Toya, Ichizo, 4,921,785, Cl. 430-621.000.
Saito, Kenji; Nakayama, Yoshiaki; and Kawada, Yukihiro, 4,922,330, Cl. 358-29.000.
Suzuki, Yoshiaki; and Hayashi, Gouichi, 4,921,317, Cl. 350-311.000.
Torisawa, Nobuyuki; Okutsu, Hirokazu; and Aoki, Katsuhiro, 4,922,285, Cl. 355-20.000.
Ushiro, Seimei; and Emura, Bunsuke, 4,921,343, Cl. 353-66.000.
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 4,921,968, Cl. 548-262.400.
Fuji Valve Co., Ltd.: *See*—
Shida, Toshimitsu, 4,920,935, Cl. 123-90.510.
Fujii, Tatsuo, to TDK Corporation. Process of preparing a casing for magnetic recording medium. 4,921,562, Cl. 156-224.000.
Fujikawa, Satoshi: *See*—
Kameda, Osamu; Fujikawa, Satoshi; and Shinmoto, Toshiharu, 4,920,828, Cl. 475-299.000.
Fujikawa, Tsuneo, to Tohokako Co., Ltd. Hairdressing toy. 4,921,461, Cl. 446-296.000.
Fujimori, Kyoichi; and Sano, Masaki, to Diesel Kiki Co., Ltd. Method and apparatus for supplying fuel to internal combustion engines 4,920,942, Cl. 123-497.000.
Fujio, Ichiro; Ito, Kaneo; and Asanuma, Tadashi, to Mitsui Toatsu Chemicals, Incorporated. Process for the production of block copolymer of propylene and ethylene. 4,921,905, Cl. 525-53.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Hemmi, Keiji; Neya, Masahiro; Marusawa, Hiroshi; Imai, Keisuke; Kayakiri, Natsuko; and Hashimoto, Masashi, 4,921,855, Cl. 514-235.800.
Matsuo, Masaaki; Manabe, Takashi; Shigenaga, Shinji; and Matsuda, Hiroshi, 4,921,887, Cl. 514-326.000.
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,921,852, Cl. 514-210.000.
Fujita, Motohiro: *See*—
Tsusaka, Haruo; Ishikawa, Hirohisa; Shinoda, Akihisa; and Fujita, Motohiro, 4,920,927, Cl. 123-41.430.
Fujitsu Limited: *See*—
Asakawa, Kazuo; Akiya, Fumiaki; and Tabata, Fumio, 4,921,396, Cl. 414-751.000.
Fukushima, Toshitaka, 4,922,319, Cl. 357-51.000.
Fujitsu Ten Limited: *See*—
Masuda, Jiro, 4,921,063, Cl. 180-178.000.
Fujiwara, Katsuji, to TLV Co., Ltd. Reducing valve assembly with spherically shaped operating part 4,921,215, Cl. 251-63.400.
Fukazawa, Tokuumi: *See*—
Hasegawa, Haruhiro; Kawabe, Ushio; Tarutani, Yoshinobu; Fukazawa, Tokuumi; Aida, Toshiyuki; and Takagi, Kazumasa, 4,921,834, Cl. 505-1.000.
Fukuda, Yutaro: *See*—
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,921,909, Cl. 525-64.000.
Fukui, Hajime, to Canon Kabushiki Kaisha. Optical instrument. 4,922,283, Cl. 354-484.000.
Fukui, Ronald D.; Ichikawa, Wataru; and Sakamoto, Kazuya, to Enprotech Corp. Rotary position transducer having hinged circuit boards. 4,922,199, Cl. 324-207.170.
Fukui, Toyoaki; Omori, Shogo; and Uchinami, Masanobu, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection control apparatus. 4,920,941, Cl. 123-492.000.
Fukukawa, Kiyofumi: *See*—
Shuto, Satoshi; Itoh, Hiromichi; Fukukawa, Kiyofumi; and Tsujino, Masatoshi, 4,921,951, Cl. 536-27.000.
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, to NHK Spring Co., Ltd. Car suspension system. 4,921,223, Cl. 267-64.230.
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, to NHK Spring Co., Ltd. Car suspension system. 4,921,224, Cl. 264-64.230.
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, to NHK Spring Co., Ltd. Car suspension system. 4,921,227, Cl. 267-64.230.
Fukusaki, Eiichiro: *See*—
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.
Fukushima, Hiroshi: *See*—
Yokoo, Chihiro; Onodera, Akira; Fukushima, Hiroshi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,921,953, Cl. 540-227.000.
Fukushima, Masanobu: *See*—
Tsukagoshi, Toshihiro; Fukushima, Masanobu; Yoshioka, Keiichi; and Yasui, Takashi, 4,922,441, Cl. 364-491.000.
Fukushima, Toshitaka, to Fujitsu Limited. Semiconductor programmable memory device. 4,922,319, Cl. 357-51.000.
Fukutani, Yoshihiro: *See*—
Ohashi, Kunio; and Fukutani, Yoshihiro, 4,922,419, Cl. 364-408.000.
Fukuura, Isamu: *See*—
Masuda, Senichi; and Fukuura, Isamu, 4,922,099, Cl. 250-324.000.
Fukuzawa, Sooichi; and Shikamori, Tamotu, to Hitachi, Ltd. Dehydrating machine. 4,920,661, Cl. 34-58.000.
Fule, Andras G., to Control Data Corporation. Linear interpolation for a component placement robot. 4,922,434, Cl. 364-513.000.
Fulkerson, David W.; and Smith, Lawrence W., to Shear Wave Technology. Self-propelled percussion unit and method of using same. 4,921,067, Cl. 181-121.000.
Fulton Manufacturing Corporation: *See*—
Richter, Karl E., 4,920,907, Cl. 114-219.000.
Funada, Tadashi; Hirano, Jiro; Ishida, Shiro; Morioka, Kensuke; and Murakami, Sachiko, to Nippon Oil and Fats Co., Ltd. Method of heterogeneous reaction 4,921,633, Cl. 252-314.000.
Funke, Hermann D.; and Lodewyk, Jozef H. to Medtronic, Inc. Dual chamber pacemaker with adaptive atrial escape interval. 4,920,965, Cl. 128-419.0PG.
Furneaux, Robin C.; Davidson, Alexander P.; and Ball, Melville D., to Alcan International Limited. Porous anodic aluminium oxide membrane catalyst support. 4,921,823, Cl. 502-4.000.
Furukawa, Satoshi: *See*—
Kunieda, Yoshio; Okamoto, Toshishige; and Furukawa, Satoshi, 4,922,448, Cl. 364-900.000.
Furumichi, Hiroshi; and Makishima, Takao, to Sunstar Kabushiki Kaisha. Mouthpiece and method for producing the same 4,920,984, Cl. 128-861.000.
Furuta, Isao: *See*—
Arai, Hajime; Furuta, Isao; Kuroki, Hidefumi; Arima, Junichi Hirata, Yoshihiro; and Harada, Shigeru, 4,922,321, Cl. 357-68.000.
Furutachi, Nobuo: *See*—
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 4,921,968, Cl. 548-262.400.
Furutani, Kiyohiro; and Arimoto, Kazutami, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with folded bit line structure suitable for high density. 4,922,460, Cl. 365-207.000.
Furuya, Tamio: *See*—
Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Kikuchi, Nobuo; and Takahashi, Shoji, 4,921,561, Cl. 156-219.000.
Fussinger, Reinhold; and Graf, Friedrich, to Dornier System GmbH. Solid bridge kit. 4,920,595, Cl. 14-2.400.
G-C Dental Industrial Corp.: *See*—
Kimura, Hiroshi, 4,921,424, Cl. 433-114.000.
G D. Societa per Azioni: *See*—
Spatafora, Mario; and Gamberini, Antonio, 4,921,106, Cl. 209-539.000.
Turra, Mario; and Neri, Armando, 4,922,090, Cl. 250-205.000.
Gabellini, Richard A.: *See*—
Ottemann, William C.; and Gabellini, Richard A., 4,921,219, Cl. 254-284.000.
Gabriel, Nancy E.: *See*—
Roberts, Mary P.; and Gabriel, Nancy E., 4,921,706, Cl. 424-450.000.
Gabriels, A., to Fabrique Nationale Herstal Societe Anonyme, en abrege "FN". Anti-vehicle grenade. 4,920.886, Cl. 102-476.000.
Gacsalyi, Istvan: *See*—
Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan. 4,921,861, Cl. 514-312.000.
Knoll, Jozsef; Budai nee Simonyi, Katalin; Berenyi nee Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,960, Cl. 546-153.000.

Gadkaree, Kishor P.: *See*—
Allaire, Roger A.; and Gadkaree, Kishor P., 4,921,518, Cl. 65-18.100.
Gaffar, Abdul; and Polefka, Thomas G., to Colgate-Palmolive Company. Anticalculus oral composition. 4,921,692, Cl. 424-52.000.
Gaffar, Abdul; and Polefka, Thomas G., to Colgate-Palmolive Company. Anticalculus oral composition. 4,921,693, Cl. 424-52.000.
Gaglardi, Edward: *See*—
DePatie, Lauralee; and Gaglardi, Edward, 4,921,446, Cl. 439-536.000.
Gahle, Hans-Jurgen; and Uhlenhoff, Arnold, to Deutsche ITT Industries GmbH. CMOS/NMOS integrated circuit with supply voltage delay variation compensation. 4,922,140, Cl. 307-591.000.
Galbo, James P.; and Ackerman, Michael H., to Ciba-Geigy Corporation. Process for preparing N-hydrocarbyloxy derivatives of sterically hindered amines. 4,921,962, Cl. 546-184.000.
Gale, Allan R., to Ford Motor Company. Position sensor monitoring system. 4,920,939, Cl. 123-399.000.
Galetto, Louis V.; and Ross, Charles O., to International Business Machines Corp. Apparatus for recording displayed video data. 4,922,347, Cl. 358-296.000.
Galileo Electro-Optics Corporation: *See*—
Fantone, Stephen D.; Rockney, Bennett H.; Burger, Robert J.; and Cook, Lee M., 4,921,316, Cl. 350-96.270.
Gall, James A.: *See*—
Baker, Robert B., Jr.; Pews, R. Garth; Otterbacher, Eric W.; and Gall, James A., 4,922,026, Cl. 568-322.000.
Gallacher, Lawrence V.: *See*—
Calbo, Leonard J., Jr.; and Gallacher, Lawrence V., 4,922,002, Cl. 560-193.000.
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, to Roussel Uclaf. Carbamate derivatives of the oxime of 1,2,5,6-tetrahydropyridin-3-carboxaldehyde, their use as medicaments and compositions containing them. 4,921,868, Cl. 514-354.000.
Galt Industries, Inc.: *See*—
Jackson, Edward S., 4,921,533, Cl. 75-315.000.
Gamberini, Antonio: *See*—
Spatafora, Mario; and Gamberini, Antonio, 4,921,106, Cl. 209-539.000.
Gammell, Paul M.: *See*—
Vernon, Susan N.; and Gammell, Paul M., 4,922,201, Cl. 324-236.000.
Ganter, Karl-Werner: *See*—
Rademachers, Jakob; Ganter, Karl-Werner; Rambold, Wolfgang; and Linde, Gunter, 4,921,542, Cl. 106-456.000.
Garay, Antonio A.; Spaulding, Tedford H.; and Valleau, Robert L., to Switchcraft, Inc. Connector adapter assembly. 4,921,431, Cl. 439-79.000.
Garbatowski, Wieslaw: *See*—
Dobry, Marian W.; Cempel, Czeslaw; and Garbatowski, Wieslaw, 4,921,053, Cl. 173-162.200.
Garber, Eduard A.: *See*—
Lipukhin, Jury V.; Garber, Eduard A.; Orlov, Boris Y.; Ponosov, Viktor N.; Novikov, Vladimir M.; and Rumako, Gennady N., deceased, 4,920,705, Cl. 51-318.000.
Garcia, Alain; Tchavdarov, Jean-Claude; and Porte, Alain, to Aerospatiale-Societe Nationale Industrielle. Ducted fan turbine engine. 4,920,744, Cl. 60-226.100.
Garcia, Michel. Device for extending and retracting a wardrobe from and into a false ceiling. 4,921,110, Cl. 211-1.300.
Garden, Jeffrey S. S., to Ceretech Limited. Container system for growing plants. 4,920,695, Cl. 47-83.000.
Garlock, Henrietta M.: *See*—
Schiff, Robert; Lehnus, Gary; Wasserman, Charles J.; and Garlock, Henrietta M., 4,921,809, Cl. 436-531.000.
Garman, Shelly N.: *See*—
Bohrn, Walter J.; DeSantis, William D.; and Garman, Shelly N., 4,921,748, Cl. 428-209.000.
Garphyttan Industrier AB: *See*—
Holm, Roland; and Enhardt, Josef E., 4,921,178, Cl. 242-7.05R.
Garries, Ray W.; Burke, Edward H.; Mueller, Kevin D.; and Leone, Joseph D., to Webb Mfg., Inc. J-channel member for siding. 4,920,709, Cl. 52-85.000.
Garritano, Mario: *See*—
Topel, Edward C.; and Garritano, Mario, 4,922,072, Cl. 219-56.100.
Garvin, Charles: *See*—
Brody, Philip S.; and Garvin, Charles, 4,921,333, Cl. 350-320.000.
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Gaskill, Garold B.; Miles, Michael; and Schrock, Clifford B., to AT & E Corporation. Adjustable watchband with embedded antenna. 4,922,260, Cl. 343-718.000.
Gass, Helmut G., to Grover, Courtney P., III. Manufacture of filling material. 4,921,118, Cl. 220-88.00A.
Gatt, Edward W., to Chrysler Corporation. Rack for sun roof modules. 4,921,101, Cl. 206-451.000.
Gaussa, William P.; Theriault, David G.; Wassel, William W.; Skoncey, John A.; and Havelka, Ronald R., to Westinghouse Electric Corp. Process sensor simulators. 4,922,194, Cl. 324-158.00R.
Gavet, Louis: *See*—
Poulenard, Jacques; Gavet, Louis; Chatelin, Roger; and Giorgio, Annie, 4,921,634, Cl. 252-312.000.
Gawol, Manfred; and Adrian, Gerhard, to Dr. Hans Heubach GmbH & Co. KG. Corrosion inhibiting pigments based on zinc silicate their production and their use. 4,921,540, Cl. 106-287.340.
Gay, George C., to Eastman Kodak Company. Dental film packet. 4,922,511, Cl. 378-169.000.
Gayer, Herbert; Jelich, Klaus; Kramer, Wolfgang; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Substituted benzamide fungicides. 4,921,993, Cl. 558-392.000.
Gazes, Jimmy; and Mixson, Dewey. Geothermal heating and air conditioning system. 4,920,757, Cl. 62-181.000.
Gearhart, Laird G. Contrasted projectile target and method of making same. 4,921,256, Cl. 273-378.000.
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Szumski, Ronald, 4,921,318, Cl. 350-1.400.
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Pieprzak, Andrew W.; and McClean, James W., 4,922,465, Cl. 367-38.000.
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Banks, Nigel H.; Borton, Colin A.; Leonce, Francis S.; Lomax, Terence J.; Meier Antony R. H.; and Skiba, Christopher J., 4,921,702, Cl. 424-404.000.
Geho, W. Blair: *See*—
Lau, John R.; and Geho, W. Blair, 4,921,644, Cl. 264-4.100.
Gehrmann, Alfred, to Robert Krups Stiftung & Co. KG. Electrically operated machine for making hot beverages. 4,920,868, Cl. 99-279.000.
Geisbrecht, Rodney A.: *See*—
Gmeindl, Frank D.; and Geisbrecht, Rodney A., 4,921,765, Cl. 429-16.000.
Geiser, Friedrich, to Vat Holding AG. Valve slide. 4,921,213. Cl 251-328.000.
Gellert, Jobst U. Injection molding nozzle having circumferentially spaced conductive probes. 4,921,708, Cl. 425-548.000.
Genbauffe, Francis S., to Robertshaw Controls Company. Fuel control device, fuel control system using the device and method of making the device. 4,921,161, Cl. 236-15.00A.
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Gorniak, Andrew M.; and Fargano, Michael J., 4,922,534, Cl 380-49.000.
General Dynamics Corporation: *See*—
Johnson, Christopher L., 4,920,841, Cl. 83-177.000
General Dynamics Corporation, Convair Division: *See*—
Griffin, Stanley A., 4,920,791, Cl. 73-147.000.
General Dynamics Corporation, Electronics Division: *See*—
Conover, Philip, 4,922,191, Cl. 324-158.00F.
General Electric Canada Inc.: *See*—
Vanduyn, Martin, 4,922,146, Cl. 310-59.000.
General Electric CGR SA: *See*—
Lajus, Pierre; and Caugant, Jean, 4,922,512, Cl. 378-197.000
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Le Roux, Patrick, 4,922,202, Cl. 324-306.000.
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Akodes, Boris A., 4,921,334, Cl. 350-333.000
Crawford, Delmar E.; and Fields, Harold T., 4,922,165, Cl. 310-215.000
Dooley, Eddie W.; and Noland, Joseph R., 4,920,770, Cl. 68-133.000.
Frank, James P.; and King, James L., 4,922,062, Cl. 200-80.00R.
Long, Edward A.; and Hamilton, James W., Jr., 4,922,363, Cl 361-3.000.
Ludwig, Gerald W.; and Franz, Gerhard A., 4,922,404, Cl 363-89.000.
Luthra, Krishan L., 4,921,822, Cl. 501-95.000.
McCauley, Michael J.; Beers, David G.; and Raymond, John P., 4,920,765, Cl. 62-408.000.
Nash, Dudley O.; and Quinn, Ronald E., 4,920,742, Cl. 60-39.320.
O'Brien, Michael J., 4,921,999, Cl. 560-52.000.
Odle, Roy R., 4,921,970, Cl. 548-480.000.
Shannon, Thomas G.; and Brunelle, Daniel J., 4,921,975, Cl 549-228.000.
Tam, Kwok C., 4,922,421, Cl. 364-413.250.
Thomas, Lewis J., III; Gilmore, Robert S.; and Glascock, Homer H., II, 4,921,415, Cl. 425-135.000.
General Electric Company, p.l.c., The: *See*—
Dunn, Trevor R.; Lucas, David R. S.; North, Ben B.; and Joyce, Timothy R., 4,922,189, Cl. 324-142.000.
General Foods Limited: *See*—
Newman, Alex T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,920,870, Cl. 99-289.00R.
General Housewares Corporation: *See*—
Samford, Dean A., 4,922,071, Cl. 219-10.55E.
General Instrument Corporation: *See*—
Hwang, Kuen-Shyang; Sedigh, Mohammad; and Roth, Mark, 4,921,158, Cl. 228-124.000.
General Motors Corporation: *See*—
Everett, Benjamin H., II; Holben, Robert B.; and Swanson, James B., 4,921,367, Cl. 403-106.000.
Gomez, Aparicio J.; Trombley, Douglas E.; and Buslepp, Kenneth J., 4,920,789, Cl. 73-118.200.
Klomp, Edward D., 4,920,931, Cl. 123-65.0PE.
Lederman, Frederick E., 4,921,084, Cl. 192-45.000.
Pees, James M., 4,921,226, Cl. 267-64.240.

Stiles, Steven D.; Reinke, Paul E.; and Gomez, Aparicio J., 4,920,790, Cl. 73-118.200.
Vernia, Peter; and Lee, Robert W., 4,921,551, Cl. 148-101.000.

Genetics Institute Inc.: *See—*
Donahue, Robert E., 4,921,837, Cl. 514-2.000.
Rozzell, J. David, 4,921,796, Cl. 435-97.000.

Genie Manufacturing, Inc.: *See—*
Waggamon, Dennis W.; and Whitaker, Louis G., 4,922,168, Cl. 318-286.000.

Gennodie, James; and Di Domenico, John. Replacement method for a railroad car brake tread unit using removable lift fixture. 4,920,628, Cl. 29-402.080.

Genus, Inc.: *See—*
Brors, Daniel L.; Fair, James A.; and Monnig, Kenneth A., 4,920,908, Cl. 427-255.200.

Genus International: *See—*
Fabrice, Goussu, 4,921,233, Cl. 269-32.000.

Georg Fischer AG: *See—*
Leutwiler, Hans, 4,921,035, Cl. 164-37.000.

Georg Fisher AG: *See—*
Kunz, Peter, 4,921,570, Cl. 156-503.000.

Gerasimova, Galina A.: *See—*
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Gerberding, Karl: *See—*
Richter, Peter; Hoffmann Gerhard; Bronstert, Klaus; Mueller, Wolfgang F.; and Gerberding, Karl, 4,921,775, Cl. 430-281.000.

Gergely, John S., to Conoco Inc. Method and apparatus for sensing disturbance using fiber-optic polarization rotation. 4,922,095, Cl. 250-227.170.

Gergely, John S.: *See—*
Cole, Jack H.; Gergely, John S.; Baumel, Robert T.; and Strecker, John E., 4,922,472, Cl. 367-189.000.

Gerke, Burton E., Jr.; Bitzel, Michael E.; Kubicko, Robert; and Kraszнai, Charles Z., to Black & Decker, Inc. Electrical power circuit for a vacuum cleaner. 4,920,606, Cl. 15-338.000.

Geurta, Herman J. J. M.: *See—*
Erkens, Leonardus J. H.; Geurta, Herman J. J. M.; Vandevenne, Jean L. G. M.; and Algra, Gerben P., 4,921,541, Cl. 106-433.000.

Ghilardi, Mauro: *See—*
Biagiotti, Guglielmo; and Ghilardi, Mauro, 4,921,235, Cl. 270-47.000.

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Ghosh, Subir, to Com Dev. Ltd. Polarizers with alternatingly circular and rectangular waveguide sections. 4,922,213, Cl. 333-21.00A.

Giacometti, Roberto, to Sulzer Brothers Limited. Stem for a prosthetic femoral head. 4,921,501, Cl. 623-23.000.

Giallourakis, Anthony M. Seat handle attachment. 4,920,586, Cl. 4-251.000.

Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, to International Paper Company. Oxygen impermeable leak free container. 4,921,733, Cl. 428-34.200.

Gibbs, Andrew R.: *See—*
Newman, Alex T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,920,870, Cl. 99-289.00R.

Giebel, Burkhard, to Deutsche ITT Industries GmbH. Filter circuit for generating a VCO control voltage responsive to the output signals from a frequency/phase discriminator. 4,922,139, Cl. 307-520.000.

Giebeler, Robert, to Beckman Instruments, Inc. Monochromator second order subtraction method. 4,921,350, Cl. 356-320.000.

Gilbert, Ian D.: *See—*
Dunstan, Harvey J.; Gilbert, Ian D.; Fayer, Ervin; Dominick, George G.; and De Oliveira, Avelino, 4,921,206, Cl. 251-7.000.

Gilbert, Laura M.; and Vermaat, David, to Imagitek. Reproduction machine fuser belt. 4,922,304, Cl. 355-282.000.

Gilbert, Wayne Ross, to Orbital Engine Company Proprietary Limited. Internal combustion engines. 4,920,745, Cl. 60-273.000.

Gilblom, David L.: *See—*
Hunt, Robert P.; and Gilblom, David L., 4,922,337, Cl. 358-101.000.

Gilkerson, Terence; Shaw, Robert W.; and Jennens, David C., to Shell Internationale Research Maatschappij B.V. Oximino ether compounds. 4,921,524, Cl. 71-88.000.

Gilles, Gerard: *See—*
Klutz, Hans J.; Flora, Bruno; Gilles, Gerard; and Wies, Georges, 4,921,086, Cl. 193-3.000.

Gillett Jr., Richard B.: *See—*
Donaldson, Darrel D.; and Gillett Jr., Richard B., 4,922,449, Cl. 364-900.000.

Gilliland, Malcolm T.; and Warner, Charles L., II, to Gilliland, Malcolm T. Method and apparatus for improving the regulation of the speed of a motor. 4,922,161, Cl. 318-269.000.

Gillon, Alexander C.; Reed, Adam V.; and Scanlon, John M., to American Telephone and Telegraph Company. Facsimile service. 4,922,348, Cl. 358-407.000.

Gilmore, Robert S.: *See—*
Thomas, Lewis J., III; Gilmore, Robert S.; and Glascock, Homer H., II, 4,921,415, Cl. 425-135.000.

Giordano, Claudio: *See—*
Villa, Marco; Giordano, Claudio; Castaldi, Graziano; and Cavicchioli, Silvia, 4,922,009, Cl. 562-466.000.

Giorgetti, Jean-Pierre: *See—*
Harlin, Jean-Pierre; Giorgetti, Jean-Pierre; Ruquier, Bernard; and Herment, Robert, 4,921,539, Cl. 106-284.030.

Giorgio, Annie: *See—*
Poulenard, Jacques; Gavet, Louis; Chatelin, Roger; and Giorgio, Annie, 4,921,634, Cl. 252-312.000.

Gipharmex S.P.A.: *See—*
Frigerio, Giuliano; Pellicciari, Roberto; and Roda, Aldo, 4,921,848, Cl. 514-182.000.

Gist-Brocades N.V.: *See—*
Barendse, Nicolaas C. M. E., 4,922,016, Cl. 564-219.000.
Witkamp, Hendrik A.; Verweij, Jan; DeKoning, Jan J.; Grootveld, Herman H.; and Leenderts, Everardus J. A. M., 4,921,954, Cl. 540-222.000.

Givler, Paul W., Jr.; Hommes, William J.; Peterson, Cobern V.; and Culver, Madison A., to Du Pont de Nemours, E. I., and Company. Method and apparatus for controlling the carriage of a linear motor. 4,922,142, Cl. 310-12.000.

Glaeser, Linda C.: *See—*
Brazdil, James F.; Glaeser, Linda C.; and Grasselli, Robert K., 4,921,828, Cl. 502-205.000.

Glascock, Homer H., II: *See—*
Thomas, Lewis J., III; Gilmore, Robert S.; and Glascock, Homer H., II, 4,921,415, Cl. 425-135.000.

Glatt, Herbert: *See—*
Mattesky, Henry, 4,920,669, Cl. 38-140.000.

Glaxo Group Limited: *See—*
Lunts, Lawrence H. C., 4,921,867, Cl. 514-345.000.

Gleghorn, R. Linn; and Wagner, Paul D., to Siemens Energy & Automation, Inc. Synchronous machine rotor lamination. 4,922,152, Cl. 310-156.000.

Glidden Company, The: *See—*
Kunz, Barbara L.; and Hahn, Kenneth G., Jr., 4,921,888, Cl. 523-310.000.

Glivicky, Alexandr P.: *See—*
Oswald, Alexis A.; Bhatia, Ram N.; Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M.; and Hsu, Chang S., 4,922,028, Cl. 568-448.000.

Gluzek, Karl-Heniz; and Humbert, Heiko, to Duetshe Texaco Aktiengesellshaft. Novel bicyclic amine catalysts. 4,921,879, Cl. 521-129.000.

Gmeindl, Frank D.; and Geisbrecht, Rodney A., to United States of America, Energy. Combined goal gasifier and fuel cell system and method. 4,921,765, Cl. 429-16.000.

GMF Robotics Corporation: *See—*
Dohm, Loring J.; Judge, Lawrence B.; and Morgan, Dwight M., 4,922,436, Cl. 364-513.000.

Gnauert, Werner; and Titze, Horst, to Friedrich Grohe Armaturenfabrik GmbH & Co. Water mixing valve. 4,921,016, Cl. 137-625.170.

Goad, Eugine W.; and Drube, John V., to Industrial Design & Engineering Associates. Food warmer and lifting frame. 4,921,119, Cl. 220-212.000.

Gobmann, Wolfgang: *See—*
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Godfrey, Craig W.; Schnatzmeyer, Mark A.; and Arendt, Henry P., to Otis Engineering Corporation. Wet connector 4,921,438, Cl. 439-190.000.

Godwin, William E. Table. 4,921,302, Cl. 297-170.000.

Gold, Jay F.: *See—*
Schultz, Leonard S.; Gold, Jay F.; and Erdman, Rodney V., 4,921,492, Cl. 604-315.000.

Goldman, Sidney, to Mechanical Manufacturing Corporation. Seamless filter bags with a removable, refusable ring. 4,921,606, Cl. 210-238.000.

Goldson, John D.: *See—*
Bergeron, Lawrence E.; Goldson, John D.; and Ellis, David A., 4,922,514, Cl. 379-6.000.

Goldstein, Marc, to Vastech Medical Products Inc. Percutaneous vasectomy method. 4,920,982, Cl. 128-842.000.

Goldstone, Jeffrey A.: *See—*
Bobbs, Bradley L.; and Goldstone, Jeffrey A., 4,922,495, Cl. 372-3.000.

Golik, Jerzy, to Bristol-Myers Company. BBM-1675c and d antitumor antibiotics. 4,921,700, Cl. 424-117.000.

Gomez, Aparicio J.; Trombley, Douglas E.; and Buslepp, Kenneth J., to General Motors Corporation. Method and means for determining air mass in a crankcase scavenged two-stroke engine. 4,920,789, Cl. 73-118.200.

Gomez, Aparicio J.: *See—*
Stiles, Steven D.; Reinke, Paul E.; and Gomez, Aparicio J., 4,920,790, Cl. 73-118.200.

Gondrand, Michel: *See—*
Belmain, Daniel; Chabert, Pierre; Tholome, Roger; Fabre, Pierre; Correard, Jean-Yves; and Gondrand, Michel, 4,921,172, Cl. 239-698.000.

Gonsior, Wolfgang, to Gulde Regelarmaturen GmbH & Co. KG. Apparatus with an initiator. 4,920,784, Cl. 73-1.00E.

Gonzalez, Jamie N.: *See—*
Buckley, Gerald T.; and Gonzalez, Jamie N., 4,921,254, Cl. 273-183.00B.

Good, Mary L.: *See—*
Yates, Stephen F.; Good, Mary L.; and Brubaker, Inara M., 4,921,589, Cl. 204-157.500.

Goodbread, Joseph: *See—*
Dual, Jurg; Sayir, Mahir; and Goodbread, Joseph, 4,920,787, Cl. 73-54.000.

Goode, Steven H.: *See—*
Kazecki, Henry L.; and Goode, Steven H., 4,922,209, Cl. 331-12.000.

Goodyear Tire & Rubber Company, The: *See—*
Wilson, John R.; Rousek, Marian M.; and Massey, Fred L., 4,921,929, Cl. 528-272.000.

Gordon, Alastair T.; and Reichmann, Michael H. Selective dissemination of information. 4,922,518, Cl. 379-57.000.

Gordon, Larry E., to Raytheon Company. Method of laser marking metal packages. 4,922,077, Cl. 219-121.680.

Gore, Charles E., to Truswal Systems Corporation. Self-gripping hanger device. 4,920,725, Cl. 52-702.000.

Goren, Robert N.: *See—*
Folkins, Jeffrey J.; Goren, Robert N.; and Rees, James D., 4,922,298, Cl. 355-218.000.

Gorman, John E.; and Morris, John A., to Shell Oil Company. Method for preparing functionalized block copolymers. 4,921,625, Cl. 252-56.00D.

Gorniak, Andrew M.; and Fargano, Michael J., to General DataComm, Inc. Intelligent synchronous modem and communication system incorporating the same. 4,922,534, Cl. 380-49.000.

Gosdowski, Gerhard; and Kettner, Andreas, to Robert Bosch GmbH. Linear unit. 4,922,143, Cl. 310-12.000.

Gotou, Yukifumi; Narikiyo, Hidetoshi; and Chuma, Yoshihiro, to Kabushiki Kaisha Toshiba. Central air conditioning system with damper and method for controlling the same. 4,921,164, Cl. 236-49.300.

Gould, Kenneth E.; and Hamilton, Eugene A., to Peterson American Corporation. Apparatus for high pressure impact coating. 4,920,911, Cl. 118-301.000.

Gounder, Ponnusami K.; Raskin, Neil R.; and Kauranen, Timo M., to Pyropower Corporation. System and method for reheat steam temperature control in circulating fluidized bed boilers. 4,920,751, Cl. 60-679.000.

GPL Partnership: *See—*
Cares, Georges; Cares, Paul; and Cares, Louis G., 4,920,768, Cl. 68-18.00R.

Graber Industries, Inc.: *See—*
Wagner, John S.; and Morris, John E., 4,921,031, Cl. 160-38.000.

Graco Inc.: *See—*
Kyinge, Daniel J.; Powers, Frederick A.; and Lehrke, Kenneth E., 4,921,408, Cl. 417-368.000.

Gradwell, Anthony J.; and Withenshaw, John D., to Warwick International Limited. Bleach activator compositions. 4,921,631, Cl. 252-186.380.

Graf, Friedrich: *See—*
Fussinger, Reinhold; and Graf, Friedrich, 4,920,595, Cl. 14-2.400.

Graf, Lothar; and Fuchs, Karl-Heinz, to Ing. Erich Pfeiffer GmbH & Co. KG. Manually operable fluid dispenser. 4,921,142, Cl. 222-162.000.

Gramm, Fritz: *See—*
Kloss, Gunter; Schuhmacher, Gustav; and Gramm, Fritz, 4,920,702, Cl. 51-170.00R.

Gran, Carl H.: *See—*
Reed, Ross; Reed, Charles; and Gran, Carl H., 4,920,897, Cl. 108-150.000.

Granbom, Bo. Ball screw with screw cage in raceway ring of nut. 4,920,817, Cl. 74-424.8NA.

Grant, Jerry L. Replaceable adjustment mechanism. 4,920,646, Cl. 30-162.000.

Grasselli, Robert K.: *See—*
Brazdil, James F.; Glaeser, Linda C.; and Grasselli, Robert K., 4,921,828, Cl. 502-205.000.

Grassi, David; and Antrim, James K. Boat with rotatable wheel keel for resistance to leeward movement in water and for sand transport. 4,920,909, Cl. 114-344.000.

Gray, Richard L.; Yan, Raymond Chan-Man; and Rosenthal, Bruce, to Teledyne Semiconductor. ESD protection circuit for MOS integrated circuits. 4,922,371, Cl. 361-91.000.

Gray, Ruben L. Waistband reducer for pants. 4,920,581, Cl. 2-237.000.

Grayzel, Joseph. Catheter sheath with longitudinal seam. 4,921,479, Cl. 604-53.000.

Greaves, Brian; and Jenkins, Hugh M., to Wyko Equipments Ltd. Hydraulic press. 4,920,783, Cl. 72-454.000.

Grecksch, Hans; Bertrams, Josef; and Loers, Wolfgang, to W. Schlafhorst & Co. Package transferring means for a textile winding machine. 4,921,180, Cl. 242-35.50A.

Green, Thomas M. Injection molding machine having a system for detecting a nozzle leak construction. 4,921,416, Cl. 425-143.000.

Greenblatt, Nathan. Operational system for travel agents. 4,922,439, Cl. 364-407.000.

Greenwood, Donald L. Upright rolling toy assembly. 4,921,458, Cl. 446-101.000.

Greeson, Logan C. Method for pouring concrete slabs. 4,921,649, Cl. 264-33.000.

Greeves, Godfrey: *See—*
Harris, Kenneth M.; Felton, George N.; Collingborn, Peter A. G.; Stringfellow, Christopher; and Greeves, Godfrey, 4,920,940, Cl. 123-450.000.

Greger, Rainer: *See—*
Englert, Heinrich C.; Hropot, Max; Lang, Hans-Jochen; and Greger, Rainer, 4,921,875, Cl. 514-567.000.

Gregor, Vaughn, to FMC Corporation. Vibratory conveyor 4,921,090, Cl. 198-761.000.

Gregory, Peter; and Hughes, Nigel, to Imperial Chemical Industries PLC. 1,1,5,5-tetra(4-aminophenyl)-pentadi-1,4-ene compounds. 4,922,020, Cl. 564-330.000.

Grendahl, Dennis T. Radially segemented zone of focus artificial hydrogel lens. 4,921,496, Cl. 623-6.000.

Grenier, Michel; de la Gorge, Jean-Etienne; Cieplinski, Daniel; Leturgie, Gerard; Thurin, Yves; Meret, Laurent; and Doireau, Christian, to Wabco Westinghouse Equipements Ferroviaries; and Regie Autonome des Transports Parisiens. Vehicle park braking system. 4,921,076, Cl. 188-12.600.

Gresens, Eugene O.: *See—*
Fitzgerald, Robert M.; and Gresens, Eugene O., 4,922,264, Cl 343-878.000.

Griffin, Stanley A., to General Dynamics Corporation, Convair Division. Wind tunnel model support and attitude control. 4,920,791, Cl. 73-147.000.

Griffith, Ann L.: *See—*
Catsimpoolas, Nicholas; Griffith, Ann L.; and Sinn, Robert S., 4,921,838, Cl. 514-25.000.

Griffiths, John D. Catheter for use in the surgical correction of a nasolacrimal duct obstruction. 4,921,485, Cl. 604-104.000.

Grimm, Michael D.: *See—*
Carlson, Robert J.; and Grimm, Michael D., 4,922,277, Cl 354-317.000.

Grinberg, Jan; and Welkowsky, Murray S., to Hughes Aircraft Company. Flicker free infrared simulator with resistor bridges. 4,922,116, Cl. 250-495.100.

Grischkowsky, Daniel R., to International Business Machines Corporation. Direct generation of ultrafast electrical pulses. 4,922,091, Cl. 250-211.00J.

Grollier, Jean-Francois, to L'Oreal. Device for preparing and dispensing a product consisting of two components and the corresponding process. 4,921,170, Cl. 239-304.000.

Gromer, David R.: *See—*
Tipton, Sheryl A.; Keil, Gary D.; Holloway, Gregory S.; Gromer, David R.; and Biltgen, Gary L., 4,921,025, Cl. 148-16.500.

Groothoff, Adriaan J.: *See—*
Sluyterman, Albertus A. S.; Bosch, Gerrit; Doomernik, Fransiscus M. P. P.; and Groothoff, Adriaan J., 4,922,167, Cl. 313-431.000.

Groothuis, Michiel, to Conseilray S.A. Timepiece and method for its realization. 4,922,474, Cl. 368-113.000.

Grootveld, Herman H.: *See—*
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Orlicki, David M.; Gropp, David B.; and VanValkenburgh, Thomas E., 4,920,842, Cl. 83-308.000.

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Gass, Helmut G., 4,921,118, Cl. 220-88.00A.

Gruber, Carl A., to Gruber, Carl A. Glare screen device for vehicle side door exterior mirror. 4,921,296, Cl. 296-97.200.

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Brandstetter, Robert W., 4,922,256, Cl. 342-132.000.

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Kuhler, Paul, 4,921,355, Cl. 366-146.000.

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Su, Shing-Fong, 4,922,479, Cl. 370-1.000.

GTE Products Corporation: *See—*
Anderton, John J., 4,921,324, Cl. 350-96.210.
Ekowicki, Robert L., 4,922,373, Cl. 361-105.000.
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Trauschke, William F., 4,921,099, Cl. 206-418.000.
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Criswell, James F., Jr., 4,921,567, Cl. 156-361.000.
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Guern, Yves F. C.: *See*—
Fardeau, Michel G J.; Guern, Yves F. C.; Dignac, Jean P., and Drevon, Jean M., 4,922,093, Cl. 250-221.000.
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Guigan, Jean; and Guigan, Franck, 4,921,128, Cl. 221-75.000.
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Guilbert-Express: *See*—
Le Marchand, Alain; and Moumaneix, Francis, 4,920,951, Cl. 126-403.000.
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Alm, Filip; Gulbrandsen, Sven; Larsson, Bo; and Ekdahl, Sune, 4,920,860, Cl. 91-504.000.
Gulbranson, Glenn J.: *See*—
Rosenstein, Leo M.; and Gulbranson, Glenn J., 4,922,184, Cl. 324-72.500.
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Gonsior, Wolfgang, 4,920,784, Cl. 73-1.00E.
Gunji, Minoru: *See*—
Kataoka, Hajime; and Gunji, Minoru, 4,921,434, Cl. 439-198.000.
Guth, Gustav: *See*—
Foll, Eberhard; Guth, Gustav; Guth, Joachim; Holl, Peter; and van Raaij, Alexander, 4,922,405, Cl. 363-126.000.
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Foll, Eberhard; Guth, Gustav; Guth, Joachim; Holl, Peter; and van Raaij, Alexander, 4,922,405, Cl. 363-126.000.
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Beier, Dietmar; Gutzeit, Jurgen; and Selder, Harald, 4,921,573, Cl. 162-4.000.
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Aikins, Robert D.; Bandy, Lee R.; Davis, William P.; Delaney, Robert E.; Guyer, Michael E.; Lovera, Edward D.; and Scamuffa, Thomas A., 4,920,627, Cl. 29-402.080.
Gyertyan, Istvan: *See*—
Knoll, Jozsef; Budai nee Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.
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H. A. Schlatter AG.: *See*—
Denzler, Emil, 4,920,776, Cl. 72-79.000.
H-D Tech, Inc.: *See*—
Dong, Dennis F. and Clifford, Arthur L., 4,921,587, Cl. 204-84.000.
H. Krantz GmbH & Co.: *See*—
Kehlenbach, Gunther, 4,921,091, Cl. 198-782.000.
Hackworth, Donald T. *See*—
Dederer, Jeffrey T.; and Hackworth, Donald T., 4,920,754, Cl. 62-53.100.
Hafeneger, Hans: *See*—
Busse, Fritz; Hafeneger, Hans; and Mette, Ulrich, 4,921,368, Cl. 403-134.000.
Hafner, Kurt: *See*—
Vetter, Kurt; Schulze, Werner; Krautter, Jurgen; and Hafner, Kurt, 4,920,997, Cl. 134-57.00R.
Haga, Toshiaki: *See*—
Kunisada, Takeshi; Doumen, Susumu; and Haga, Toshiaki, 4,921,176, Cl. 241-260.100.
Hagaman, Robert T.: *See*—
Sismour, Albert C., Jr.; Hagaman, Robert T.; and Ying, Sui-Chun, 4,922,147, Cl. 310-61.000.
Haglund, Stephen A.; and Van Sloun, Peter H., to Honeywell Inc. Selectable lightweight attack munition. 4,920,884, Cl. 102-215.000.
Hahn, Allen W.: *See*—
Nichols, Michael F.; and Hahn, Allen W., 4,921,723, Cl. 427-41.000.
Hahn, Kenneth G., Jr.: *See*—
Kunz, Barbara L.; and Hahn, Kenneth G., Jr., 4,921,888, Cl. 523-310.000.
Hahn, Norbert, to Rite-Hite Corporation. Dock leveler with automatic vehicle barrier. 4,920,598, Cl. 14-71.100.
Hahn, Ulrich: *See*—
Adolfs, Friedhelm; Bittner, Gerd; Busing, Klaus P.; Harris, Stephen; Hahn, Ulrich; and Wurzburger, Martin, 4,921,352, Cl. 356-347.000.
Haircloth Weaving & Finishing Company Limited: *See*—
Banks, Nigel H.; Borton, Colin A.; Leonce, Francis S.; Lomax, Terence J.; Meier, Antony R. H.; and Skiba, Christopher J., 4,921,702, Cl. 424-404.000.
Haken, Roger A.: *See*—
Coleman, Donald J.; and Haken, Roger A., 4,922,312, Cl. 357-23.600.
Hakiel, Zbigniew; Reafler, Gerald G.; Schrader, Robert W.; and Schuler, James R., to Eastman Kodak Company. Wrinkle free lamination method for releasably laminated, stretched webs. 4,921,556, Cl. 156-164.000.
Halbach & Braun Industrieanlagen: *See*—
Braun, Gert; and Braun, Ernst, 4,921,307, Cl. 299-34.000.
Haldorsen, Jakob: *See*—
Miller, Douglas; and Haldorsen, Jakob, 4,922,362, Cl. 367-46.000.
Hall Chemical Company: *See*—
Fox, Robert, 4,921,986, Cl. 556-149.000.
Hall, Edward A.; Cranor, Thomas H. B.; and Schmitt, Gilbert J., to McDonnell Douglas Corporation. Microstrip patch antenna with omni-directional radiation pattern. 4,922,259, Cl. 343-700.0MS.
Hall, Theodore W.; and Klapproth, Kenneth H., to United Technologies Corporation. Casting for a rotary machine. 4,921,401, Cl. 415-138.000.
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Hall, William A.: *See*—
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.
Halliburton Company: *See*—
Caskey, Kenneth D., 4,921,046, Cl. 166-170.000.
Halliburton Geophysical Services, Inc.: *See*—
Sallas, John J.; Luce, Richard H.; and Corrigan, Michael A., 4,922,473, Cl. 367-189.000.
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Barker, James M., 4,920,883, Cl. 102-202.500.
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Hamamatsu Photonics Kabushiki Kaisha: *See*—
Tsuchiya, Yutaka; Aoshima, Shinichiro; and Nakamura, Takuya, 4,922,186, Cl. 324-96.000.
Hamanaka, Izumi: *See*—
Okui, Susumu; Hirabayashi, Tsugio; and Hamanaka, Izumi, 4,921,239, Cl. 271-186.000.
Hamilton, Eugene A: *See*—
Gould, Kenneth E.; and Hamilton, Eugene A., 4,920,911, Cl. 118-301.000.
Hamilton, Harold F., to Hein-Werner Corporation. Drive-on vehicle supporting arrangement. 4,920,597, Cl. 14-69.500.
Hamilton, James W., Jr.: *See*—
Long, Edward A.; and Hamilton, James W., Jr., 4,922,363, Cl. 361-3.000.
Hamlin, Jack A., to BASF Corporation. Inverted separation and transfer device, and process for using same. 4,921,618, Cl. 210-780.000.
Hammer, W. James; and Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Hydroxy-substituted polymeric shaped hydrogel article. 4,921,884, Cl. 523-106.000.
Hammerslag, Gary R.: *See*—
Hammerslag, Julius G.; and Hammerslag, Gary R., 4,921,482, Cl. 604-95.000.
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Hammett, Robert B. Momentum engine. 4,920,928, Cl. 123-46.0SC.
Hamot, Theodore: *See*—
Peters, Arnold; Hamot, Theodore; and Ver Hoven, Leonard, 4,921,093, Cl. 198-471.100.
Handa, Masayuki: *See*—
Takeda, Morihiro; Miyasaka, Eiji; and Handa, Masayuki, 4,922,278, Cl. 354-320.000.
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Haney, Billy L. Header dump assembly. 4,920,747, Cl. 60-324.000.
Hanna, Peter D., to NCR Corporation. MICR printing technique and apparatus to minimize rejects with correction stickers. 4,921,279, Cl. 283-67.000.
Hanselmann, Daniel: *See*—
Binder, Rolf; Hanselmann, Daniel; Schlepfer, Walter; and Staeheli, Christoph, 4,920,613, Cl. 19-80.00B
Hansen, David L.: *See*—
Smart, Steven T.; Puls, William M.; and Hansen, David L., 4,920,859, Cl. 91-497.000.
Hansen, Paul E.; Insley, Thomas I.; and Libbey, Christopher J., to Minnesota Mining and Manufacturing Company. Use of sorbent sheet materials as evaporative coolants. 4,921,743, Cl. 428-102.000.
Hansller, Gerd: *See*—
Lantzsch, Reinhard; Brandes Wilhelm; Hansller, Gerd; Reinecke, Paul; and Lurssen, Klaus, 4,921,529, Cl. 71-92.000.
Hanson, Robert A.: *See*—
Cahlander, Robert L.; Carroll, David W.; Hanson, Robert A.; Hollingsworth, Al; and Reinertsen, John O., 4,922,435, Cl. 364-513.000.
Hansson, Lennart: *See*—
Hedlund, Jan-Gunnar; Hansson, Lennart; and Norman, Hans-Olay, 4,921,310, Cl. 299-92.000.
Hara, Akira; and Ochiai, Minoru, to Baldwin-Japan Limited. Cleaning machine for a printer. 4,920,880, Cl. 101-425.000.
Hara, Kazumasa; Koike, Mikio; Nishijima, Mitsuru; and Okutani, Koji, to Janome Sewing Machine Co. Ltd. Device for adjusting a lower thread in a sewing machine. 4,920,903, Cl. 112-229.000.

Harada, Shigeru: *See*—
Arai, Hajime; Furuta, Isao; Kuroki, Hidefumi; Arima, Junichi; Hirata, Yoshihiro; and Harada, Shigeru, 4,922,321, Cl. 357-68.000.
Harada, Tadanori: *See*—
Hashimoto, Seiji; and Harada, Tadanori, 4,922,138, Cl. 307-482.000.
Harandi, Mohsen N., to Mobil Oil Corp. Medium-pore zeolite olefinic naphtha by-product upgrading. 4,922,048, Cl. 585-310.000.
Harbor Branch Oceanographic Institution, Inc.: *See*—
Higa, Tatsuo; and Snader, Kenneth M., 4,921,873, Cl. 514-546.000.
Harco Graphic Products Inc.: *See*—
Harpold, Charles W.; and Belcher, James, 4,920,878, Cl. 101-115.000.
Harding, John D.: *See*—
Gebeyehu, Gulilat; Klevan, Leonard; and Harding, John D., 4,921,805, Cl. 435-270.000.
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Harrel, Charlena: *See*—
McArthur, James R., 4,921,386, Cl. 414-22.510
Harrel, John: *See*—
McArthur, James R., 4,921,386, Cl. 414-22.510.
Harrington, Kathleen P.: *See*—
Zurawski, John H.; and Harrington, Kathleen P., 4,922,446, Cl. 364-748.000.
Harris, Alan L., to Lucas Industries public limited company. Vehicle anti-lock braking system. 4,921,312, Cl. 303-100.000.
Harris Corporation: *See*—
Phillips, Douglas J.; Kessler, Keith E.; Shipley, John W.; and Hyland, Dave, 4,922,159, Cl. 318-128.000.
Harris, Kenneth M.; Felton, George N.; Collingborn, Peter A. G.; Stringfellow, Christopher; and Greeves, Godfrey, to Lucas Industries Public Limited Company. Fuel pumping apparatus. 4,920,940, Cl. 123-450.000.
Harris, Stephen: *See*—
Adolfs, Friedhelm; Bittner, Gerd; Busing, Klaus P.; Harris, Stephen; Hahn, Ulrich; and Wurzburger, Martin, 4,921,352, Cl. 356-347.000.
Harrison, Bruce, to United Technologies Automotive Inc. Composite article with thermodynamically unstable coating. 4,921,753, Cl. 428-251.000.
Harrison, William, to Anderson Strathclyde Olc. Mining machine adapted for attachment of continuous miner cutter boom assembly. 4,921,309, Cl. 299-75.000.
Hart, Michael G.: *See*—
Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., 4,921,347, Cl. 356-73.100.
Hart Tackle Company, Inc.: *See*—
Devereaux, Chuck; and Craig, Joe D., 4,920,688, Cl. 43-42.390.
Hartwell, George E.: *See*—
Bowman, Robert G.; Tegen, Marvin H.; and Hartwell, George E., 4,922,024, Cl. 564-480.000.
Hartzell, Rolf R.: *See*—
Ristimaki, Mikko V.; Lehtinen, Matti J.; Lindstrom, Krister J.; and Hartzell, Rolf R., 4,920,727, Cl. 53-252.000.
Haruki, Toshinobu: *See*—
Hidaka, Masaru; Murashima, Hiroisugu; Takuma, Masao; Haruki, Toshinobu; and Kikuchi, Kenichi, 4,922,346, Cl. 358-227.000.
Haruyama, Tetsuo: *See*—
Saito, Jun; Haruyama, Tetsuo; Orime, Nobutake, and Katagi, Takashi, 4,922,257, Cl. 342-377.000.
Harvey, Ronald A.: *See*—
Howell, Barry G.; Ness, Diane E. M.; and Harvey, Ronald A., 4,921,916, Cl. 525-423.000.
Harwell, William D.; and Wu, Mitchell B., to United States of America, National Aeronautics and Space Administration. Magnetic attachment mechanism. 4,921,292, Cl. 294-65.500.
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Hasegawa, Hirofumi: *See*—
Nakajima, Akio; and Hasegawa, Hirofumi, 4,922,087, Cl. 250-201.400.
Hasegawa, Tooru: *See*—
Nakazawa, Yoshihiro; Tabata, Hajime; Hasegawa, Tooru; and Tanabe, Hideyuki, 4,922,390, Cl. 362-72.000.
Haseiby, Robert D.: *See*—
Cobbs, Keith E.; Haselby, Robert D.; and Osborne, William S., 4,922,270, Cl. 346-140.00R.
Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 4,922,523, Cl. 379-96.000.
Hashimoto, Kazuo, to Hashimoto Corporation. Videotex with telephone call screening system. 4,922,523, Cl. 379-96.000.
Hashimoto, Masao: *See*—
Yoshida, Yoshinori; Arutaki, Akira; Hashimoto, Masao; and Yoshikawa, Suminori, 4,922,484, Cl. 370-68.100.
Hashimoto, Masashi: *See*—
Hemmi, Keiji; Neya, Masahiro; Marusawa, Hiroshi; Imai, Keisuke; Kayakiri, Natsuko; and Hashimoto, Masashi, 4,921,855, Cl. 514-235.800.
Hashimoto, Seiji; and Harada, Tadanori, to Canon Kabushiki Kaisha. Scan circuit using a plural bootstrap effect for forming scan pulses. 4,922,138, Cl. 307-482.000.
Hashimoto, Seiji; Kinoshita, Takao; Takayama, Tsutomu; and Kaji, Toshio, to Canon Kabushiki Kaisha. Color filter arrangement for an image pickup device having complementary color elements which overlap at boundaries between picture elements. 4,922,334, Cl. 358-44.000.
Hashimoto, Yoshiko: *See*—
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.
Hashiue, Masakazu, to Fuji Photo Film Co., Ltd. Radiation image-reading method. 4,922,101, Cl. 250-327.200.
Haslanger, Martin F.: *See*—
Nagabhushan, Tattanahalli L.; Haslanger, Martin F.; and Czarniecki, Michael F., 4,921,941, Cl. 530-331.000.
Hass, Hans-Jurgen: *See*—
Hitze, Reiner; and Hass, Hans-Jurgen, 4,921,987, Cl. 556-401.000.
Hassel, Tillmann: *See*—
Schafer, Walter; Muller, Hanns P.; and Hassel, Tillmann, 4,921,996, Cl. 560-25.000.
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Ozawa, Masakazu; Ozawa, Kunitaka; Hatanaka, Katsunori, Suzuki, Tetsuo; Mori, Tetsuzo; Shiina, Tadashi; and Ehinuma, Ryuichi, 4,922,267, Cl. 346-136.000
Hatanaka, Masanori: *See*—
Takenaka, Akira; and Hatanaka, Masanori, 4,921,260, Cl. 277-153.000.
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Hattori, Kohji: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,921,852, Cl. 514-210.000.
Hauler, Peter: *See*—
Duckart, Anton; Hauler, Peter; and Zabler, Erich, 4,920,796, Cl. 73-290.00V.
Hauser, George M.: *See*—
Maitz, Carlos A.; and Hauser, George M., 4,921,488, Cl. 604-153.000.
Havelka, Ronald R.: *See*—
Gaussa, William P.; Theriault, David G.; Wassel, William W.; Skoncey, John A.; and Havelka, Ronald R., 4,922,194, Cl. 324-158.00R.
Hayakawa, Shigeyuki; and Matsui, Masataka, to Kabushiki Kaisha Toshiba. Static random access memory with address transition detector. 4,922,461, Cl. 365-230.080.
Hayami, Hiroshi: *See*—
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,921,984, Cl. 556-40.000
Hayamizu, Yutaka: *See*—
Miyake, Hiraku; Ishiguro, Mitsuo; Hayamizu, Yutaka; and Aizawa, Satoru, 4,921,202, Cl. 248-581.000.
Hayashi, Gouichi: *See*—
Suzuki, Yoshiaki; and Hayashi, Gouichi, 4,921,317, Cl. 350-311.000
Hayashi, Katsumi; and Lentz, Gregory A., to Intera Company, Ltd. Process for improving polymer substrate properties, and flame retardancy modified polymers produced thereby. 4,921,890, Cl. 523-507.000.
Hayashi, Shigeyuki: *See*—
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,922,287, Cl. 355-27.000.
Hayet, Pascal F. P.: *See*—
Fonsalas, Frederic L. J.; Lejard, Jeans-Yves L.; Hayet, Pascal F. P.; and Le Queau, Marcel R., 4,922,342, Cl. 358-138.000.
Haynes, John L., to Becton, Dickinson and Company. Blood collection assembly with lancet and microcollection tube. 4,920,977, Cl. 128-770.000.
Haynes, R. Jalaine. Maternity lounger. 4,921,301, Cl. 297-118.000.
Hazato, Atsuo: *See*—
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,921,995, Cl. 558-441.000.
Hazelett, R. W.: *See*—
Bergeron, Norman J.; Wood, J. F. B.; and Hazelett, R. W., 4,921,037, Cl. 164-432.000.
Hazelett Strip-Casting Corporation: *See*—
Bergeron, Norman J.; Wood, J. F. B.; and Hazelett, R. W., 4,921,037, Cl. 164-432.000
He, Duanfeng: *See*—
Shiang, Lu P.; and He, Duanfeng, 4,921,278, Cl. 283-87.000.
Heady, Richard. Fiber optical mouse. 4,922,236, Cl. 340-710.000.
Heck, James V.; and Thorsett, Eugene D., to Merck & Co., Inc. 4-Oxo-4h-quinolizine-3-carboxylic acids and derivatives thereof. 4,921,857, Cl. 514-254.000.
Hedfi, Adel: *See*—
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R.; Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole,

Heather E.; Moore, James C.; and Jacubec, Mark R., 4,921,886, Cl. 423-235.000.
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Heidorn, Richard: *See*—
Mueller, Scott; Heidorn, Richard; and Swick, E. Grant, 4,922,374, Cl. 361-119.000.
Heijenga, Berend, to HSM. Dispensing container for a liquid or paste-like substance. 4,921,137, Cl. 222-107.000.
Heikkila, Kurt E.: *See*—
Nash, James E.; and Heikkila, Kurt E., 4,921,628, Cl. 252-111.000.
Heim, Armin, to Schwihag Gesellschaft fur Eisenbahnoberbau mbH. Support plate for mounting rails of railroad tracks and track switches on wooden sleepers. 4,921,168, Cl. 238-287.000.
Hein-Werner Corporation: *See*—
Hamilton, Harold F., 4,920,597, Cl. 14-69.500.
Held, Kurt. Double band press including electric current means. 4,921,569, Cl. 156-380.600.
Hella KG Hueck & Co.: *See*—
Bockeler, Franz-Josef; Gobmann, Wolfgang; Buchhorn, Axel; Jackenkroll, Horst; Marks, Hubert; Witte, Karl; and Schnelle, Diethard, 4,922,386, Cl. 362-61.000.
Freudenreich, Erwin, 4,922,388, Cl. 362-61.000.
Heller, Stephen J. Soccer training device. 4,921,257, Cl. 273-401.000.
Helling, Gunter, to Agfa-Gevaert Aktiengesellschaft. Magneta coupler monomer, a polymeric magenta coupler and a color photographic recording material containing the polymeric magneta coupler. 4,921,782, Cl. 430-548.000.
Hellwig, Waldemar, to Bruderer AG. Press drive. 4,920,782, Cl. 72-451.000.
Hemdal, Goran A. H. Data processing system for converting virtual to real addresses without requiring instruction from the central processing unit. 4,922,415, Cl. 364-200.000.
Hemmi, Keiji; Neya, Masahiro; Marusawa, Hiroshi; Imai, Keisuke; Kayakiri, Natsuko; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Co., Ltd. New Histidyl amino acid derivatives, and pharmaceutical composition comprising the same. 4,921,855, Cl. 514-235.800.
Hendricks, Donald R. Wrench for removal of double nut assembly. 4,920,835, Cl. 81-462.000.
Hendrix, James E.: *See*—
Tolbert, Thomas W.; Cooke, William M.; and Hendrix, James E., 4,921,756, Cl. 428-373.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Ritter, Wolfgang, 4,921,921, Cl. 526-195.000.
Uphues, Guenter; and Ploog, Uwe, 4,921,990, Cl. 558-104.000.
Henlopen Manufacturing Co., Inc.: *See*—
Hurrell, Edward T., 4,921,366, Cl. 401-126.000.
Henneberger, Gerd; and Reiss, Gerald, to Rowenta-Werke GmbH. Steam iron with pressure equalization conduit. 4,920,668, Cl. 38-77.810.
Henning, Wolfgang; Petersen, Harald; and Moormann, Gerhard, to Bayer Aktiengessellschaft. Process for the production of aqueous polyurethane dispersions. 4,921,842, Cl. 524-839.000.
Henry, Peter M. J. Apparatus for cooking corn on the cob. 4,920,872, Cl. 99-339.000.
Herbert Kannegiesser GmbH & Co.: *See*—
Dreischmeier, Wilfried, 4,921,511, Cl. 55-294.000.
Herbert, William G., to Cooper Industries, Inc. Rail mounting apparatus for electrical components. 4,921,445, Cl. 439-532.000.
Herbert, William G., to Cooper Industries, Inc. Space saving multipole fuse block. 4,921,450. Cl. 439-621.000.
Hercules Incorporated: *See*—
Cartwright, Richard V., 4,920,743, Cl. 60-205.000.
Senich, George A., 4,921,882, Cl. 522-99.000.
Herment, Robert: *See*—
Harlin, Jean-Pierre; Giorgetti, Jean-Pierre; Ruquier, Bernard; and Herment, Robert, 4,921,539, Cl. 106-284.030.
Herr, J. Robert: *See*—
Shaub, Melvin H.; and Herr, J Robert, 4,920,719, Cl. 52-488.000.
Herrick, Dennis: *See*—
Stout, Glen R.; and Herrick, Dennis, 4,922,339, Cl. 358-108.000.
Herrick, Joseph R. Vehicle interior heatshield. 4,921,299, Cl. 296-978.000.
Herschler, Wilbert H.; and Nelson, Stephen R., to Rockwell International Corporation. Adjustable waveguide/conduit clamp. 4,921,191, Cl. 248-70.000.
Herzog Contracting Corporation: *See*—
Bounds, Ivan E., 4,921,732, Cl. 427-325.000.
Hesse, Horst J. F. A.: *See*—
De Haan, Robert; Dry, Mark E; Dressler, Flemming H.; Hesse, Horst J. F. A.; and Vermaire, Sonet, 4,921,682, Cl. 423-225.000.
Hesse, Michael: *See*—
Hoelderich; Hesse, Michael; and Schwarzmann, Matthias, 4,922,025, Cl. 568-14.000.
Hesseler, Udo: *See*—
Reuber, Gerhard; Braun, Achim; and Hesseler, Udo, 4,921,298, Cl. 296-221.000.
Hesterman, Bryce L. Touch-controlled switch and alarm system. 4,922,227, Cl. 340-527.000.
Heumann Pharma GmbH & Company: *See*—
Schickaneder, Helmut; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; and Ahrens, Kurt H., 4,921,856, Cl. 514-252.000.
Hewko, Marc D.: *See*—
Vail, Curtis F.; Dietze, Robert H.; Kracht, Thomas F.; Cole, Joanne H.; and Hewko, Marc D., 4,920,697, Cl. 49-348.000.
Hewlett-Packard Company: *See*—
Cobbs, Keith E.; Haselby, Robert D.; and Osborne, William S., 4,922,270, Cl. 346-140.00R.
Culp, Bradfred W., 4,922,352, Cl. 360-39.000.
Osborne, William S., 4,922,268, Cl. 346-140.00R.
Pan, Alfred I. T., 4,922,265, Cl. 346-1.100.
Swerlein, Ronald L., 4,922,130, Cl. 307-353.000.
Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., 4,921,347, Cl. 356-73.100.
Heyman, Albert M., to Digital Equipment Corporation. Apparatus and method for a quasi-resonant DC to DC bridge converter. 4,922,397, Cl. 363-17.000.
Hibino, Ken: *See*—
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.
Hicks, John W. Optical communication systems enabling minimal subscriber components. 4,922,481, Cl. 370-4.000.
Hidaka, Hideto, to Mitsubishi Denki Kabushiki Kaisha. Circuit for preventing latch-up of parasitic thyristor formed in CMOS integrated circuit. 4,922,367, Cl. 361-58.000.
Hidaka, Hideto, to Mitsubishi Denki Kabushiki Kaisha. Bit line structure of dynamic type semiconductor memory device. 4,922,453, Cl. 365-63.000.
Hidaka, Hideto, to Mitsubishi Denki Kabushiki Kaisha. Dynamic semiconductor memory device. 4,922,459, Cl. 365-206.000.
Hidaka, Masaru; Murashima, Hirotsugu; Takuma, Masao; Haruki, Toshinobu; and Kikuchi, Kenichi, to Sanyo Electric Co., Ltd. Automatic focusing apparatus having a variable focusing speed and particularly suited for use with interlaced scanning. 4,922,346, Cl. 358-227.000.
Hietala, Alexander W.; and Muterspaugh, Max W., to RCA Licensing Corporation. Varactor tuned UHF RF signal input circuit. 4,921,465, Cl. 455-193.000.
Higa, Tatsuo; and Snader, Kenneth M., to Harbor Branch Oceanographic Institution, Inc. Antiviral and antitumor cyclohexadienone compositions. 4,921,873, Cl. 514-546.000.
Higa, Teruo, to Saken Co., Ltd.; and Ryoko Co., Ltd. Method and apparatus for culturing plants. 4,920,694, Cl. 47-58.000.
Higashinaka, Yukitoshi, to Kuraray Company, Ltd. Separable fastener. 4,920,617, Cl. 24-442.000.
Higashiyama, Shunichi, to Brother Kogyo Kabushika Kaisha. Photo and pressure sensitive recording medium. 4,921,774, Cl. 430-138.000.
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, to Nitto Electric Industrial Co., Ltd. Vermin exterminating element and vermin exterminating method using it. 4,921,703, Cl. 424-419.000.
Higurashi, Kunizou: *See*—
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl. 514-319.000.
Hilborn, David M.: *See*—
Lawassani, Abdi; Dowd, James D.; and Hilborn, David M., 4,921,300, Cl. 296-97.110.
Hildebrand, Carl E.: *See*—
Longmire, Jonathan L.; Lewis, Annette K.; and Hildebrand, Carl E., 4,921,952, Cl. 536-27.000.
Hile, Jeffrey B. Collapsable framing square. 4,920,658, Cl. 33-499.000.
Hill, David J.: *See*—
Sewell, Beverley; Hill, David J.; and Martin, Edgar C., 4,921,583, Cl. 204-15.000.
Hill, Lawrence A.; Jacobs, Michael E.; Kroll, Arthur S.; and Williams, Ralph E., to Eastman Kodak Company. Device for developing electrostatic images on a film belt. 4,922,302, Cl. 355-251.000.
Hillstead, Richard A., to Cordis Corporation. Mesh balloon catheter device. 4,921,484, Cl. 604-104.000.
Hilti Aktiengesellschaft: *See*—
Gschwend, Peter; and Breuss, Manfred, 4,921,381, Cl. 411-25.000.
Hinckley, Charles C.; and Del Plato, Lewis T., Jr., to Eastman Kodak Company. Sliding valve for vent of liquid collecting compartment. 4,921,677, Cl. 422-103.000.
Hino, Taro: *See*—
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Uehara, Kiyohiro; Imai, Yoshio; Hino, Taro; Iwamoto, Mitsumasa; Kakimoto, Masaaki; and Suzuki, Masaaki, 4,921,728, Cl. 427-58.000.
Hinojosa, Jesse: *See*—
Springs, Daniel R.; and Hinojosa, Jesse, 4,922,083, Cl. 219-549.000.
Hioki, Toshimichi: *See*—
Sekido, Hiroshi; and Hioki, Toshimichi, 4,920,591, Cl. 5-455.000.
Hirabayashi, Tsugio: *See*—
Okui, Susumu; Hirabayashi, Tsugio; and Hamanaka, Izumi, 4,921,239, Cl. 271-186.000.
Hirai, Kiyofumi: *See*—
Takamiya, Kikuzo; Tamura, Yoshitaka; Shibayama, Yoichi; Nishimura, Ritsuo; Hirai, Kiyofumi; and Serizawa, Hiromitsu, 4,920,827, Cl. 475-166.000.

Hirai, Yutaka: *See*—
Osada, Yoshiyuki; Tsuda, Hisanori; Sano, Masafumi; Omata, Satoshi; Takasu, Katsuji; and Hirai, Yutaka, 4,921,722, Cl. 427-39.000.
Hiramatsu, Takeo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Control method for a driving system provided in a vehicle. 4,922,424, Cl. 364-424.100.
Hirano, Jiro: *See*—
Funada, Tadashi; Hirano, Jiro; Ishida, Shiro; Morioka, Kensuke; and Murakami, Sachiko, 4,921,633, Cl. 252-314.000.
Hirao, Mitsuru: *See*—
Watanabe, Atsuo; Ikeda, Takahide; Tsukuda, Kiyoshi; Hirao, Mitsuru; Mukai, Touji; and Kamei, Tatsuya, 4,921,811, Cl. 437-31.000.
Hirata, Yoshihiro: *See*—
Arai, Hajime; Furuta, Isao; Kuroki, Hidefumi; Arima, Junichi; Hirata, Yoshihiro; and Harada, Shigeru, 4,922,321, Cl. 357-68.000.
Hirato, Ko: *See*—
Inabe, Shinya; and Hirato, Ko, 4,920,816, Cl. 74-424.80A.
Hirose, Satoshi: *See*—
Tagaya, Kiyoshi; Hirose, Satoshi; Iwasaki, Takao; Kouyama, Toshitaka; and Sakaguchi, Yasuo, 4,921,758, Cl. 428-419.000.
Hirose, Shunich: *See*—
Seki, Nagataka; and Hirose, Shunich, 4,922,124, Cl. 307-87.000.
Hirsch Armbander Gesellschaft m.b.H.: *See*—
Hirsch, Hermann, 4,921,111, Cl. 211-13.000.
Hirsch, Hermann, to Hirsch Armbander Gesellschaft m.b.H. Device for displaying merchandise. 4,921,111, Cl. 211-13.000.
Hirsh Company: *See*—
Handler, Milton E.; and Baisch, Herbert, 4,921,370, Cl. 403-234.000.
Hisayuki Matsuo: *See*—
Matsuo, Hisayuki; and Mizuno, Kensaku, 4,921,797, Cl. 435-129.000.
Hise, Tony: *See*—
Womack, Kent; and Hise, Tony, 4,920,834, Cl. 81-165.000.
Hitachi Automotive Engineering Co., Ltd.: *See*—
Kugo, Masaru; and Ito, Hiroshi, 4,922,239, Cl. 340-753.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
Nagasawa, Kiyoshi; Ono, Kozo; Ogata, Kojiro; Murayama, Ken; and Hoshino, Yoshihiro, 4,920,660, Cl. 33-568.000.
Hitachi, Ltd.: *See*—
Fukuzawa, Sooichi; and Shikamori, Tamotu, 4,920,661, Cl. 34-58.000.
Hasegawa, Haruhiro; Kawabe, Ushio; Tarutani, Yoshinobu; Fukazawa, Tokuumi; Aida, Toshiyuki; and Takagi, Kazumasa, 4,921,834, Cl. 505-1.000.
Kugo, Masaru; and Ito, Hiroshi, 4,922,239, Cl. 340-753.000.
Matsumoto, Kunio; Noro, Takanobu; and Kanda, Naoya, 4,922,377, Cl. 361-387.000.
Miyazawa, Hiroyuki, 4,921,815, Cl. 437-52.000.
Mizoue, Yoshito; and Kazama, Yoshiharu, 4,922,445, Cl. 364-578.000.
Morikawa, Takashi; Ogawa, Tetuji; Sasaki, Akio; and Sato, Kiichi, 4,922,410, Cl. 364-200.000.
Noguchi, Minori; Koizumi, Mitsuyoshi; Shishido, Hiroaki; Uto, Sachio; and Ohshima, Yoshimasa, 4,922,308, Cl. 356-237.000.
Sugiura, Yasuyuki; Watabe, Mitsuru; Morinaga, Shigeki; Miyashita, Kunio; and Sugai, Hiroshi, 4,922,175, Cl. 318-592.000.
Takano, Hisashi; Koyama, Naoki; Yuito, Isamu; Shiiki, Kazuo; and Tanabe, Hideo, 4,922,360, Cl. 360-113.000.
Todokoro, Hideo; Shinada, Hiroyuki; and Seitoh, Shigemitsu, 4,922,097, Cl. 250-310.000.
Tsuchitani, Shigeki, Suzuki, Seikou; and Matsumoto, Masahiro, 4,921,345, Cl. 356-28.000.
Tsuchiya, Osamu, 4,922,313, Cl. 357-23.600.
Wakamatsu, Kazuhiro; Yonekura, Seiji; Suzuki, Mitsuo; Tadokoro, Hiroyuki; and Suzuki, Atsuo, 4,922,272, Cl. 346-160.000.
Watanabe, Atsuo; Ikeda, Takahide; Tsukuda, Kiyoshi; Hirao, Mitsuru; Mukai, Touji; and Kamei, Tatsuya, 4,921,811, Cl. 437-31.000.
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi, Yukimori; Hori, Kazunori; and Tokuyama, Mikio, 4,922,356, Cl. 360-104.000.
Yoshitake, Yasuhiro; and Oshida, Yoshitada, 4,922,290, Cl. 355-53.000.
Hitachi Metals, Ltd.: *See*—
Tokunga, Masatoki; Nozawa, Yasuto; and Iwasaki, Katsunori, 4,921,553, Cl. 148-302.000.
Hitachi Setsubi Engineering Co., Ltd.: *See*—
Wakamatsu, Kazuhiro; Yonekura, Seiji; Suzuki, Mitsuo; Tadokoro, Hiroyuki; and Suzuki, Atsuo, 4,922,272, Cl. 346-160.000.
Hitze, Reiner; and Hass, Hans-Jurgen, to Huels Aktiengeselischaft. Aqueous solutions of alkyltrialkoxysilanes having an extended shelf life. 4,921,987, Cl. 556-401.000.
Hiyori, Takayuki: *See*—
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.
Hoban, Michael. Anti back draft device for flue. 4,920,866, Cl. 98-45.000.
Hobbins, Kenneth A. W., to Rainford Racks Limited. Line protection device. 4,922,382, Cl. 361-424.000.
Hobbs, James B., to Atmel Corporation. Memory cell circuit with supplemental current. 4,922,411, Cl. 365-155.000.
Hoch, Norman J.; and Rabin, Arno. Cutter and drive gear assembly for dressing welding electrode tips. 4,921,377, Cl. 409-140.000.
Hochiki Corporation: *See*—
Ohtani, Shigeru; and Yamauchi, Yukio, 4,922,230, Cl. 340-577.000.
Hodson, Stephen J.: *See*—
Bigham, Eric C.; and Hodson, Stephen J., 4,921,836, Cl. 514-19.000.
Hoechst Aktiengesellschaft: *See*—
Breipohl, Gerhard; Knolle, Jochen; and Stuber, Werner, 4,922,015, Cl. 562-451.000.
Dallmann, Hermann; Bothe, Lothar; Crass, Guenther; and Schaefer, Werner, 4,921,670, Cl. 264-141.000.
Englert, Heinrich C.; Hropot, Max; Lang, Hans-Jochen; and Greger, Rainer, 4,921,875, Cl. 514-567.000.
Lau, Jurgen; and Siegemund, Gunter, 4,922,019, Cl. 564-332.000.
Papenfuhs, Theodor, 4,922,014, Cl. 562-418.000.
Peters, Dieter, 4,921,688, Cl. 423-463.000.
Schneider, Manfred; Laumen, Kurt; Breitgoff, Detlef; Wullbrandt, Dieter; Schilingmann, Merten; and Keller, Reinhold, 4,922,001, Cl. 560-112.000.
Schutze, Rainer; and Knorr, Harald, 4,922,013, Cl. 562-15.000.
Stork, Martin, 4,921,566, Cl. 156-354.000.
Zeiss, Hans-Joachim, 4,922,006, Cl. 562-11.000.
Hoechst Celanese Corp.: *See*—
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., 4,922,003, Cl. 560-221.000.
McKie, Derrick B.; and Olukalns, Andris, 4,921,885, Cl. 523-220.000.
Rudd, David; and Rice, Sandra W., 4,921,764, Cl. 428-480.000.
Hoeganaes Corporation: *See*—
Langley, Isaac L., 4,921,607, Cl. 210-266.000.
Hoelderich; Hesse, Michael; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Preparation of organophosphorus compounds. 4,922,025, Cl. 568-14.000.
Hoever, Franz-Peter: *See*—
Niewohner, Ulrich; Hoever, Franz-Peter; Junge, Bodo, Perzborn, Elisabeth; Seuter, Friedel; and Fiedler, Volker-Bernd, 4,921,998, Cl. 560-45.000.
Hofen, Willi: *See*—
Siegmeier, Rainer; Hofen, Willi; Prescher, Gunter; and Maurer, Helmut, 4,921,983, Cl. 549-525.000.
Hofer, John A., to Pitney Bowes Inc. Mail sortation system. 4,921,107, Cl. 209-546.000.
Hoffman, Erik L.; and Hopstaken, Antonius L. J., to Ordev B.V. Adjustable prosthesis. 4,921,499, Cl. 623-16.000.
Hoffman, Francis E.: *See*—
Scott, Lewis A.; Hoffman, Francis E.; and Bolkan, Kenneth R., 4,920,947, Cl. 125-21.000.
Hoffman-La Roche Inc.: *See*—
DeChiara, Thomas M.; and Tarnowski, Stanley J., Jr., 4,921,699, Cl. 424-85.700.
Hoffmann Gerhard: *See*—
Richter, Peter; Hoffmann Gerhard; Bronstert, Klaus; Mueller, Wolfgang F.; and Gerberding, Karl, 4,921,775, Cl. 430-281.000.
Hoffmann, Kurt; Kowarik, Oskar; Kraus, Rainer; Lustig, Bernhard; and Oberle, Hans-Dieter, to Siemens Aktiengesellschaft Testable redundancy decoder of an integrated semiconductor memory. 4,922,134, Cl. 307-441.000.
Hoffmann, Oskar: *See*—
Peterlik, Meinrad; and Hoffmann, Oskar, 4,921,697, Cl. 424-85.500.
Hofmann, Manfred, to Metzeler GmbH. Hydraulic-damping engine mount having an overflow conduit between two chambers with a fixed intermediate wall. 4,921,232, Cl. 267-219.000.
Hofmeister, Peter: *See*—
Grossman, Klaus; Jung, Johann; Schulz, Guenter; Sauter, Hubert, Hofmeister, Peter; and Tuerk, Wolfgang, 4,921,525, Cl. 71-73.000.
Hohuerlein, Ernst. Soldering apparatus 4,921,156, Cl. 228-37.000.
Holben, Robert B.: *See*—
Everett, Benjamin H., II; Holben, Robert B.; and Swanson, James B., 4,921,367, Cl. 403-106.000.
Holden, Virginia. Portable game table arm cushion. 4,920,896, Cl. 108-90.000.
Holl, Peter: *See*—
Foll, Eberhard, Guth, Gustav; Guth, Joachim; Holl, Peter; and van Raaij, Alexander, 4,922,405, Cl. 363-126.000.
Hollberg, Virginia R. Viscous material dispensing apparatus. 4,921,130, Cl. 222-46.000.
Hollfelder, Robert: *See*—
Bunata, Thomas; Hollfelder, Robert; Zieglmeier, Reiner, and Steuer, Thomas, 4,922,193, Cl. 324-158.00R.
Hollingsworth, Al: *See*—
Cahlander, Robert L.; Carroll, David W.; Hanson, Robert A.; Hollingsworth, Al; and Reinertsen, John O., 4,922,435, Cl. 364-513.000.
Hollingsworth, Dana: *See*—
Cooper, Ralph M.; Hollingsworth, Dana; Kunkle, John F., and Stillie, Donald G., 4,921,437, Cl. 439-275.000.
Holloman, Ricky M. *See*—
Crow, Robert W.; Holloman, Ricky M.; and Pruden, James B., 4,921,048, Cl. 166-372.000.
Holloway, Gregory S. *See*—
Tipton, Sheryl A.; Keil, Gary D.; Holloway, Gregory S., Gromer, David R.; and Biltgen, Gary L., 4,921,025, Cl. 148-16.500.

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Holm, Roland; and Enhardt, Josef E., to Garphyttan Industrier AB. Machine for winding a rotor for a rotating electrical machine. 4,921,178, Cl. 242-7.05R.

Holman, Daniel R. Ski seat structure. 4,921,274, Cl. 280-812.000.

Holmberg, Arnold C. V. Propellors for watercraft. 4,921,404, Cl. 416-223.00R.

Holmes, Gordon W., to Professional Packaging Limited. Package with reclosable pouring spout. 4,921,104, Cl. 206-621.400.

Holroyd, Colin: *See*—
Holroyd, Eric; and Holroyd, Colin, 4,921,673, Cl. 264-254.000.

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Holt, Gary: *See*—
Flett, Douglas S.; Holt, Gary; and Tily, Peter J., 4,921,221, Cl. 75-385.000.

Homan, Lester C.: *See*—
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W., Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.

Hommes, William J.: *See*—
Givler, Paul W., Jr.; Hommes, William J.; Peterson, Cobern V.; and Culver, Madison A., 4,922,142, Cl. 310-12.000.

Hon, Edward D.: *See*—
Hon, Edward H.; Hon, Edward D.; and Hon, Robert W., 4,920,966, Cl. 128-662.030.

Hon, Edward H.; Hon, Edward D.; and Hon, Robert W. Ultrasound transducer holder. 4,920,966, Cl. 128-662.030.

Hon, Robert W.: *See*—
Hon, Edward H.; Hon, Edward D.; and Hon, Robert W., 4,920,966, Cl. 128-662.030.

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Okazaki, Kouji; Ikeda, Tsugio; and Inagaki, Takashi, 4,920,825, Cl. 74-606.00R.

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Hamada, Tetsuro; Noro, Yoshiki; and Ashikawa, Noboru, 4,921,065, Cl. 180 245.000
Horiuchi, Makoto; Miyakawa, Yoshitaka; and Sakurai, Kazuya, 4,920,857, Cl. 91-373.000.
Kawasaki, Shinzo; Umeda, Kaoru; and Kitoh, Norimasa, 4,922,170, Cl. 318-434.000.
Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Kikuchi, Nobuo; and Takanashi, Shoji, 4,921,561, Cl. 156-219.000.
Nakajima, Toyohei; Okada, Yasushi; Mieno, Toshiyuki; and Oono, Nobuyuki, 4,922,429, Cl. 364-431.060.
Tsusaka, Haruo; Ishizawa, Hirohisa; Shinoda, Akihisa; and Fujita, Motohiro, 4,920,927, Cl. 123-41.430
Wazaki, Yoshio; Oono, Tetsuya; and Narisawa, Nobuyuki, 4,921,064, Cl. 180-197.000.

Honda Motor Co., Ltd *See*—
Nakazawa, Yoshihiro; Tabata, Hajime; Hasegawa, Tooru; and Tanabe, Hideyuki, 4,922,390, Cl. 362-72.000.

Honeywell Inc.: *See*—
Haglund, Stephen A.; and Van Sloun, Peter H., 4,920,884, Cl. 102-215.000.

Hooper, William J., Jr., to Kawneer Company, Inc. Ornamental handrail system. 4,920,717, Cl. 52-400.000.

Hoos, Keith M., and Wolstenholme, Jack, to Imperial Chemical Industries PLC. Production of 1,2-dichloroethane. 4,922,042, Cl. 570-247.000.

Hooton, John R.: *See*—
Oswald, Alexis A.; Bhatia, Ram N.; Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M.; and Hsu, Chang S., 4,922,028, Cl. 568-448.000.

Hoover Group, Inc.: *See*—
Lowe, Mark A., 4,921,228, Cl. 267-103.000.
Waltke, David L.; and Thomas, Larry D., 4,921,126, Cl. 220-855.000.

Hoover Universal Inc.: *See*—
Vail, Curtis F.; Dietze, Robert H.; Kracht, Thomas F.; Cole, Joanne H.; and Hewko, Marc D., 4,920,697, Cl. 49-348.000.

Hoppe, Udo; Eigener, Ulrich; Sauermann, Gerhard; Engel, Walter; and Pape, Wolfgang, to Beiersdorf Aktiengesellschaft. Deodorizing and antimicrobial composition for use in cosmetic or topical formulations 4,921,694, Cl. 424-65.000

Hopper, Hans P., to British Petroleum Company p.l.c., The Fail-safe release actuator mechanism. 4,920,811, Cl. 74-2.000

Hopstaken, Antonius L. J.: *See*—
Hoffman, Erik L.; and Hopstaken, Antonius L. J., 4,921,499, Cl. 623-16.000

Hoque, Tareq I., to Massachusetts Institute of Technology Digital audio transmission for use in studio, stage or field applications. 4,922,536, Cl. 381-2.000.

Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata Takashi, to Brother Kogyo Kabushiki Kaisha. Exposure device in image recording apparatus. 4,922,287, Cl. 355-27.000

Horan, Gerald P.; Wickmann, John T.; and McNamee, Stanislaus, to Chart Industries Ltd. Vehicle repair rack system. 4,920,781, Cl. 72-447.000.

Hori, Hiroaki, to Tokai Rubber Industries, Ltd. Fluid-filled elastic center bearing mount. 4,921,229, Cl. 267-140.100.

Hori, Kazunori: *See*—
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi, Yukimori; Hori, Kazunori; and Tokuyama, Mikio, 4,922,356, Cl. 360-104.000.

Horiguchi, Kazuo; Hosaka, Kazuyoshi; and Yoshizumi, Akira, to Sandoz Ltd. Shrinkage compensated mortar material. 4,921,537, Cl. 106-90.000.

Horiki, Masanao: *See*—
Takahashi, Shuichi; Yamanaka, Kunihiro; and Horiki, Masanao, 4,922,546, Cl. 455-74.000.

Horiuchi, Makoto; Miyakawa, Yoshitaka; and Sakurai, Kazuya, to Nissin Kogyo Kabushiki Kaisha; and Honda Giken Kogyo Kabushiki Kaisha. Hydraulic pressure booster. 4,920,857, Cl. 91-373.000.

Hornbostel, Richard W. Flexible barbell bar. 4,921,246, Cl. 272-123.000.

Horvath, Edward; and Spector, George. Security door window latch. 4,921,287, Cl. 292-106.000.

Horvei, Knut, to Den norske stats olkeselskap. Shut-down valve. 4,921,003, Cl. 137-315.000.

Horvitz, Charles S.; and Miceli, Michael L., to Raytheon Company. Radio frequency energy detection circuitry. 4,922,132, Cl. 307-359.000.

Hosaka, Kazuyoshi: *See*—
Horiguchi, Kazuo; Hosaka, Kazuyoshi; and Yoshizumi, Akira, 4,921,537, Cl. 106-90.000.

Hoshina, Yoshikazu: *See*—
Uchida, Tatsumi; Hoshina, Yoshikazu; and Nishimura, Seiichi, 4,920,819, Cl. 74-480.00B.

Hoshino, Hiroshi: *See*—
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, 4,921,632, Cl. 252-299.100.

Hoshino, Yoshihiro: *See*—
Nagasawa, Kiyoshi; Ono, Kozo; Ogata, Kojiro; Murayama, Ken; and Hoshino, Yoshihiro, 4,920,660, Cl. 33-568.000.

Hosoi, Mutsuo; and Ishibashi, Akira, to Okamoto Machine Tool Works, Ltd. Apparatus for setting a table for a belt-driven machine tool. 4,921,471, Cl. 474-101.000.

Hosoi, Yuichi, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,922,105, Cl. 250-484.100.

Hosoi, Yuichi: *See*—
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,922,103, Cl. 250-327.200.
Mori, Nobufumi; Hosoi, Yuichi; and Miyahara, Junji, 4,922,098, Cl. 250-311.000.

Hosoya, Hideki: *See*—
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.

Hosoya, Minoru Poultry breeding method. 4,920,923, Cl. 119-51.020.

Hosoya, Norio, to Koganei Seiki Seisakusho. Method and apparatus for finishing a tooth surface of a gear. 4,920,703, Cl. 51-287.000.

Hotwork, Inc.: *See*—
Severin, Norman W., 4,921,579, Cl. 201-41.000.

Hou, Chung-Jen; Disbrow, James; and Hou, Kenneth C., to Cuno, Incorporated Low protein binding membrane. 4,921,654 Cl. 264-45.500.

Hou, Kenneth C.: *See*—
Hou, Chung-Jen; Disbrow, James; and Hou, Kenneth C., 4,921,654, Cl. 264-45.500.

Hou, Mei-Wen H. Telescopic side mirror. 4,921,337, Cl. 350-604.000.

Houben, Jochen: *See*—
Birnbach, Stefan; Mueller, Josef; Wulz, Klaus; and Houben, Jochen, 4,922,029, Cl. 568-616.000.

Hough, Thomas W.; and Brown, Warren D Vibrating toilet seat. 4,920,583, Cl. 4-237.000.

Howard, Jack B.: *See*—
Peters, William A.; and Howard, Jack B., 4,921,685, Cl. 423-439.000.

Howell, Barry G.; Ness, Diane E. M.; and Harvey, Ronald A., to BICC plc. Flame-retardant fillers in silane-grafted ethylene polymer process. 4,921,916, Cl. 525-423.000.

Howland, Leland L.; and Taylor, David H., to Thermo King Corporation. Transport refrigeration system with dehumidifier mode. 4,920,756, Cl. 62-173.000.

Hoya Corporation: *See*—
Matsudaira, Takeo; and Suzuki, Hisanori, 4,920,919, Cl. 118-725.000.
Murahashi, Hiroyuki; Akutsu, Yukio; and Koyama, Shinichi, 4,920,700, Cl. 51-124.00L.
Nakajima, Yuji, 4,921,331, Cl. 350-164.000.
Unternahrer, Josef F.; and Sekiguchi, Hiroshi, 4,922,502, Cl. 372-66.000.

Hoyt, Steven D., to W. H. Brady Co. Electronic labeler with printhead and web sensor combined for concurrent travel, and assemblies of identification devices therefor 4,920,882, Cl. 400-708.000.

Hropot, Max: *See*—
Englert, Heinrich C.; Hropot, Max; Lang, Hans-Jochen; and Greger, Rainer, 4,921,875, Cl. 514-567.000.

HSC Controls, Inc.: *See*—
Buscher, John H., 4,922,217, Cl. 335-229.000.

Hsieh, Sheng-Shun; and Liu, Ting-Chih. Water level and temperature detector alarm device. 4,922,226, Cl. 340-521.000.

HSM: *See*—
Heijenga, Berend, 4,921,137, Cl. 222-107.000.

Hsu, Chang S.: *See*—
Oswald, Alexis A.; Bhatia, Ram N.; Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M.; and Hsu, Chang S., 4,922,028, Cl. 568-448.000.

Hu, Hung-Tzaw, to Measurex Corporation. Process for controlling properties of travelling sheets with scan widths less than the sheet width. 4,921,574, Cl. 162-198.000.

Huang, Chan S., to Huang, Dora Hsiao Ling. Vehicle-carrying purpose wrench. 4,920,831, Cl. 81-54.000.

Huang, Dora Hsiao Ling: *See*—
Huang, Chan S., 4,920,831, Cl. 81-54.000.

Hubbard, Vance M.; Brunson, Welton K.; and Caldwell, Darrell S., to Tecnol, Inc. Body fluids barrier mask. 4,920,960, Cl. 128-206.120.

Huber, Joel E.: *See*—
Livingston, Douglas A.; Pearlman, Bruce A.; Denmark, Scott; and Huber, Joel E., 4,921,638, Cl. 552-610.000.

Hubert, Christian; and Janssen, Rainer, to Nixdorf Computer AG Circuitry for recognizing two-tone compound signals in telephone installations. 4,922,528, Cl. 379-386.000.

Hubert, Peter; Kussel, Barbara; and Wirz, Peter, to Leybold-Aktiengesellschaft. Process for coating a substrate with an organic coating having gradated hardness. 4,921,724, Cl. 427-41.000.

Hudon, Gerard M.: *See*—
Gross, Hal D.; and Hudon, Gerard M., 4,922,192, Cl. 324-158.00P.

Huels Aktiengesellschaft: *See*—
Hitze, Reiner; and Hass, Hans-Jurgen, 4,921,987, Cl. 556-401.000.
Jadamus, Hans; Grosse-Puppendahl, Thomas; and Richter, Klaus-Peter, 4,921,762, Cl. 428-521.000.

Huffman, Frederick J.: *See*—
Scantland, Joe F.; and Huffman, Frederick J., 4,921,412, Cl. 425-28.100.

Hugh Kendal Littlejohn Questech Limited: *See*—
Barton, Nicholas; Billing, Robert; and Littlejohn, Hugh K., 4,922,345, Cl. 358-183.000.

Hughes Aircraft Company: *See*—
Estes, Earl M., Jr., 4,922,379, Cl. 361-388.000.
Grinberg, Jan; and Welkowsky, Murray S., 4,922,116, Cl. 250-495.100.
Longerich, Ernest P.; and D'Agostino, Saverio A., 4,922,381, Cl. 361-414.000.
Schaffer, Michael J., 4,922,307, Cl. 356-5.000.

Hughes, Larry M., to Burle Technologies, Inc. Automatic panoramic camera mount. 4,922,275, Cl. 354-293.000.

Hughes, Nigel: *See*—
Gregory, Peter; and Hughes, Nigel, 4,922,020, Cl. 564-330.000.

Huhtamaki Oy: *See*—
Ristimaki, Mikko V.; Lehtinen, Matti J.; Lindstrom, Krister J.; and Hartzell, Rolf R., 4,920,727, Cl. 53-252.000.

Huizenga, Michael K., to Aircap Industries Corporation. Electrical control switch mechanism. 4,922,069, Cl. 200-334.000.

Hullett, John L.; and Newman, Robert M., to University of Western Australia, The. Queueing protocol. 4,922,244, Cl. 340-825.500.

Hult, David R.; and Tomasiak, Mark J., to Emerson Electric Co. Portable hand held vacuum cleaner. 4,920,608, Cl. 15-339.000.

Humbert, Heiko: *See*—
Gluzek, Karl-Heniz; and Humbert, Heiko, 4,921,879, Cl. 521-129.000.

Hunt, Eric: *See*—
Brain, Edward G.; Hunt, Eric; and Forrest, Andrew K., 4,921,839, Cl. 514-29.000.

Hunt, Robert P.; and Gilblom, David L., to Picker International, Inc. Time delay and integration of images using a frame transfer CCD sensor. 4,922,337, Cl. 358-101.000.

Huntington Medical Research Institute: *See*—
Bullara, Leo A., 4,920,979, Cl. 128-784.000.

Hurd, Billy G., to Mobil Oil Corporation. Method for improving sweep efficiency in CO_2 oil recovery. 4,921,576, Cl. 166-252.000.

Hurrell, Edward T., to Henlopen Manufacturing Co., Inc. Cosmetic container with engaging rib structure. 4,921,366, Cl. 401-126.000.

Hutchinson: *See*—
Jouade, Pierre, 4,921,201, Cl. 248-562.000.

Hutchison, Donald W.; Kimmel, Steven A.; Bonkovich, Raymond J.; Chew, James P.; and Rath, David J., to Robertshaw Controls Company. Fuel control system, throttle valve unit therefor and methods of making the same. 4,921,210, Cl. 251-129.080.

Hutter, Gerhard. Uni-directional heating apparatus. 4,922,084, Cl. 219-549.000.

Hwang, Frank K.; and Richards, Gaylord W., to AT&T Bell Laboratories. Rearrangeable multiconnection switching networks constructed using combinatorial designs. 4,922,245, Cl. 340-825.080.

Hwang, Kuen-Shyang; Sedigh, Mohammad; and Roth, Mark, to General Instrument Corporation. Brazing material. 4,921,158, Cl. 228-124.000.

Hwang, Wei: *See*—
Dhong, Sang H.; Hwang, Wei; and Lu, Nicky C., 4,922,128, Cl. 307-269.000.

Hybertson, Delmer L. Sidewalk scribing tool. 4,921,372, Cl. 404-89.000.

Hyland, Dave: *See*—
Phillips, Douglas J.; Kessler, Keith E.; Shipley, John W.; and Hyland, Dave, 4,922,159, Cl. 318-128.000.

Hyster Company: *See*—
Ingham, David C.; and Schwab, Delmar G., 4,920,820, Cl. 74-491.000.

Iacoviello, John G.: *See*—
Lenney, William E.; and Iacoviello, John G., 4,921,898, Cl. 524-459.000.

Ichida, Koji; Nakayama, Yoshifumi; and Inoue, Hiromu, to Sony Corporation. Electron gun for multigun cathode ray tube. 4,922,166, Cl. 313-414.000.

Ichihara, Katsutarou: *See*—
Ikegawa, Sumio; Terashima, Yoshiaki; Yasuda, Nobuaki; Ichihara, Katsutarou; Komatsu, Shuichi; and Arai, Shinji, 4,922,462, Cl. 365-113.000.

Ichikawa, Toshio: *See*—
Sato, Yukio; and Ichikawa, Toshio, 4,922,221, Cl. 340-311.100.

Ichikawa, Wataru: *See*—
Fukui, Ronald D.; Ichikawa, Wataru; and Sakamoto, Kazuya, 4,922,199, Cl. 324-207.170.

Ichikoh Industries Limited: *See*—
Muto, Masakazu, 4,922,398, Cl. 302-296.000.

ICI Americas Inc.: *See*—
O'Brien, John F., 4,921,453, Cl. 439-630.000.

Ida, Yuichi: *See*—
Sasaki, Kunihiko; Ida, Yuichi; Oka, Tsumoru; and Shinroaku, Mituaki, 4,921,428, Cl. 439-15.000.

Ide, Kazuo: *See*—
Kotani, Hiroshi; Inoue, Yoshiyuki; Kadota, Yasushi; Sakakibara, Hidekazu; Ide, Kazuo; and Sumida, Kanichi, 4,921,470, Cl 464-151.000.

Idemitsu Kosan Co., Ltd.: *See*—
Nakai, Masayuki; Yoshida, Takeshi; and Tomura, Katsumi, 4,921,831, Cl. 502-418.000.

Iehisa, Nobuaki: *See*—
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, 4,921,357, Cl. 372-38.000.

Igarashi, Yoshiaki: *See*—
Sugimoto, Tadakatsu; Igarashi, Yoshiaki; Saito, Shiro; Wada, Eiichi; and Murai, Keiji, 4,920,836, Cl. 81-463.000.

Igelhorst, Wolfgang: *See*—
Svagr, Alexadr; Bogendorfer, Hans; and Igelhorst, Wolfgang, 4,920,778, Cl. 72-237.000.

Iguchi, Tatsuya, to Nifco, Inc. Fastening clip. 4,920,618, Cl. 24-453.000.

Iida, Hideyo: *See*—
Mochizuki, Akihiko; and Iida, Hideyo, 4,921,591, Cl 204-412.000.

Iida, Hiroyasu: *See*—
Aoki, Takaaki; Iida, Hiroyasu; and Nojima, Katsuyuki, 4,922,238, Cl. 340-726.000.

Ishiki, Naotsugu; Okano, Shigetou; and Mishima, Shiro, to Yamato Kosan Co., Ltd. Heat exchanging system for power generation. 4,920,750, Cl. 60-671.000.

Ikeda, Hideo; and Nemori, Ryoichi, to Fuji Photo Film Co., Ltd. Silver halide emulsion containing a thiocyanate compound having specific absorbance in IR spectroscopy. 4,921,784, Cl. 430-567.000.

Ikeda, Kouichi: *See*—
Kawasaki, Nobuhiko; Ikeda, Kouichi; and Kimura, Shinichi, 4,921,426, Cl. 439-34.000.

Ikeda, Masami; and Komuro, Hirokazu, to Canon Kabushiki Kaisha. Liquid jet recording head unit, method of making same and liquid jet recording apparatus incorporating same. 4,922,269, Cl. 346-140.00R.

Ikeda, Sunao: *See*—
Saeki, Sirou; Ikeda, Sunao; Otsuka, Hirohisa; and Yanagawa, Nobuyuki, 4,921,236, Cl. 271-3.100.

Ikeda, Takahide: *See*—
Watanabe, Atsuo; Ikeda, Takahide; Tsukuda, Kiyoshi; Hirao, Mitsuru; Mukai, Touji; and Kamei, Tatsuya, 4,921,811, Cl. 437-31.000.

Ikeda, Tsugio: *See*—
Okazaki, Kouji; Ikeda, Tsugio; and Inagaki, Takashi, 4,920,825, Cl. 74-606.00R.

Ikeda, Yoshinori: *See*—
Outa, Kenichi; Suzuki, Yasumichi; and Ikeda, Yoshinori, 4,922,335, Cl. 358-80.000.

Ikegami, Toru: *See*—
Mawatari, Yasushi; Ikegami, Toru; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Rober, Hans-Gerd, 4,922,115, Cl. 250-484.100.

Ikegawa, Akihito: *See*—
Mizuno, Hiroshi; Natasuhara, Toshiya; Enoguchi, Yuji; Ikegawa, Akihito; Yamamoto, Masasi; and Murasaki, Hiroshi, 4,920,916, Cl. 118-653.000.

Ikegawa, Sumio; Terashima, Yoshiaki; Yasuda, Nobuaki; Ichihara, Katsutarou; Komatsu, Shuichi; and Arai, Shinji, to Kabushiki Kaisha Toshiba. Reversible memory structure for optical reading and writing and which is capable of erasure. 4,922,462, Cl. 365-113.000.

Ilardi, Joseph M.: *See*—
Fraenkel, Howard A.; Ilardi, Joseph M.; Kurtz, Bruce E.; and Spicciati, Frank A., 4,921,777, Cl. 430-314.000.

Illinois Tool Works, Inc.: *See*—
Mueller, Scott; Heidorn, Richard; and Swick, E. Grant, 4,922,374, Cl. 361-119.000.

Image Research Limited: *See*—
Rushbrooke, John; Lyons, Adrian; Tomkins, Patricia; and Ansorge, Richard, 4,922,092, Cl. 250-213.0VT.

VOL
1114
ISS
1
MY
1990
UMI

Imagitek: *See—*
Gilbert, Laura M.; and Vermaat, David, 4,922,304, Cl. 355-282.000.
Imai, Chihiro: *See—*
Ueki, Satoshi; and Imai, Chihiro, 4,921,901, Cl. 525-244.000.
Imai, Keisuke: *See—*
Hemmi, Keiji; Neya, Masahiro; Marusawa, Hiroshi; Imai, Keisuke; Kayakiri, Natsuko; and Hashimoto, Masashi, 4,921,855, Cl. 514-235.800.
Imai, Yoshio: *See—*
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Uehara, Kiyohiro; Imai, Yoshio; Hino, Taro; Iwamoto, Mitsumasa; Kakimoto, Masaaki; and Suzuki, Masaaki, 4,921,728, Cl. 427-58.000.
Imamura, Shigeyuki: *See—*
Takahashi, Mamoru; Misaki, Hideo; Imamura, Shigeyuki; and Matsuura, Kazuo, 4,921,786, Cl. 435-4.000.
Imaseki, Takashi; and Kobari, Yuji, to Nissan Motor Co., Ltd. Integrated roll rigidity and differential slip control system. 4,921,060, Cl. 180-41.000.
IMI-Barient, Inc.: *See—*
Ottemann, William C.; and Gabellini, Richard A., 4,921,219, Cl. 254-284.000.
IMI Cornelius (UK) Limited: *See—*
Belcham, Robert D. J., 4,921,140, Cl. 222-144.500.
Imperial Chemical Industries PLC: *See—*
Attwood, Terence E.; and Bridges, Richard F., 4,921,922, Cl. 526-255.000.
Brewster, Andrew G.; Brown, George R.; Jessup, Reginald; and Smithers, Michael J., 4,921,866, Cl. 514-336.000.
Gregory, Peter; and Hughes, Nigel, 4,922,020, Cl. 564-330.000.
Hoos, Keith M., and Wolstenholme, Jack, 4,922,042, Cl. 570-247.000.
Smithers, Michael J., 4,921,979, Cl. 549-375.000.
Inabe, Shinya; and Hirato, Ko, to Niles Parts Co., Ltd. Actuator with a clutch mechanism. 4,920,816, Cl. 74-424.80A.
Inagaki, Takashi: *See—*
Okazaki, Kouji; Ikeda, Tsugio; and Inagaki, Takashi, 4,920,825, Cl. 74-606.00R.
Ince, Francis: *See—*
Dixon, John; Springthorpe, Brian; and Ince, Francis, 4,922,022, Cl. 564-367.000.
Inco Alloys International, Inc.: *See—*
Austin, Curtiss M., 4,921,549, Cl. 148-13.100.
Industrial Design & Engineering Associates: *See—*
Goad, Eugine W.; and Drube, John V., 4,921,119, Cl. 220-212.000.
Industrial Waste Management, Inc.: *See—*
Lafser, Fred A., Jr.; and Schreiber, Robert J., Jr., 4,921,538, Cl. 106-100.000.
Infotron Systems Corporation: *See—*
Leone, Mario J., 4,922,503, Cl. 370-85.130.
Ing. Erich Pfeiffer GmbH & Co. KG: *See—*
Graf, Lothar; and Fuchs, Karl-Heinz, 4,921,142, Cl. 222-162.000.
Ingenjorsfirman Per-Oskar Persson AB: *See—*
Froderberg, Ingemar; and Persson, Per-Oskar, 4,921,602, Cl. 210-232.000.
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., to Century International Corporation. Automatic vacuum bowling lane stripper. 4,920,604, Cl. 15-302.000.
Ingham, David C.; and Schwab, Delmar G., to Hyster Company Vehicle steering control. 4,920,820, Cl. 74-491.000.
Ingman, Dov, to Select Corporation. Fluid flow meter. 4,920,794, Cl. 73-269.000.
Ino, Masayoshi, to Oki Electric Industry Co., Ltd Method of making a trench dram. 4,921,816, Cl. 437-52.000.
Inopak Ltd.: *See—*
Roggenburg, Stanley L., Jr., 4,921,136, Cl. 222-95.000.
Inoue, Akifumi, to Kabushiki Kaisha Toshiba. Flat panel display control apparatus. 4,922,237, Cl. 340-723.000.
Inoue, Hiromu: *See—*
Ichida, Koji; Nakayama, Yoshifumi; and Inoue, Hiromu, 4,922,166, Cl. 313-414.000.
Yamaguchi, Shoji; Yamada, Kimiko; Yada, Katsuyoshi; Sakaguchi, Koichi; and Inoue, Hiromu, 4,921,623, Cl. 252-512.000.
Inoue, Hiroshi; and Mizutome, Atsushi, to Canon Kabushiki Kaisha. Display device for forming a frame on a display when the device operates in a block or line access mode. 4,922,241, Cl. 340-784.000.
Inoue, Mitsuyoshi; Nakanishi, Shuji; and Uemizo, Yoshiaki, to Nihon Kinsen Kikai Kabushiki Kaisha. Coin wrapping apparatus. 4,920,730, Cl. 53-532.000.
Inoue, Yoshihisa, to Nakamichi Corporation. Apparatus for loading a tape cartridge for a magnetic instrument. 4,922,353, Cl. 360-96.500.
Inoue, Yoshiyuki: *See—*
Kotani, Hiroshi; Inoue, Yoshiyuki; Kadota, Yasushi; Sakakibara, Hidekazu; Ide, Kazuo; and Sumida, Kanichi, 4,921,470, Cl. 464-151.000.
Inresco, Inc.: *See—*
Mulshine, James P.; and Sakatos, Michael J., 4,922,370, Cl. 361-88.000.
Sakatos, Michael J., 4,922,369, Cl. 361-88.000.
Insley, Thomas I., to Minnesota Mining and Manufacturing Company. Process of forming microwebs and nonwoven materials containing microwebs. 4,921,645, Cl. 264-6.000.
Insley, Thomas I.: *See—*
Hansen, Paul E.; Insley, Thomas I.; and Libbey, Christopher J., 4,921,743, Cl. 428-102.000.
Institut National de Recherche sur les Transports et leur Securite: *See—*
Maupu, Jean-Louis, 4,920,893, Cl. 104-242.000.
Institut Textile de France: *See—*
Poulenard, Jacques; Gavet, Louis; Chatelin, Roger; and Giorgio, Annie, 4,921,634, Cl. 252-312.000.
Instrumentation Laboratory, S.p.A.: *See—*
Calzi, Claudio; and Zaccai, Gianfranco, 4,920,976, Cl. 128-764.000.
Integrated Chemistries, Incorporated: *See—*
Nash, James E.; and Heikkila, Kurt E., 4,921,628, Cl. 252-111.000.
Integrated Design Corp.: *See—*
Leanna, Gregory D., 4,920,630, Cl. 29-521.000.
Intera Company, Ltd.: *See—*
Hayashi, Katsumi; and Lentz, Gregory A., 4,921,890, Cl 523-507.000.
International Business Machines Corporation: *See—*
Aoki, Takaaki; Iida, Hiroyasu; and Nojima, Katsuyuki, 4,922,238, Cl. 340-726.000.
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.
Chin, William B.; Dussault, Rudolph D.; Knepper, Ronald W.; Wernicke, Friedrich C.; and Wong, Robert C., 4,922,455, Cl. 365-154.000.
Coale, Jerry L., 4,922,491, Cl. 371-16.100.
Dhong, Sang H.; Hwang, Wei; and Lu, Nicky C., 4,922,128, Cl. 307-269.000.
Galetto, Louis V.; and Ross, Charles O., 4,922,347, Cl. 358-296.000.
Grischkowsky, Daniel R., 4,922,091, Cl. 250-211.00J.
Lo, Yuan-Chang; Moeller, Dennis L.; and Szarek, John J., 4,922,451, Cl. 364-900.000.
Mollier, Pierre; and Tannhof, Pascal, 4,922,135, Cl. 307-450.000.
International Chip Corporation: *See—*
Kobayashi, Hideaki; and Shindo, Masahiro, 4,922,432, Cl. 364-490.000.
International Fuel Cells: *See—*
Lipman, Kenneth, 4,922,401, Cl. 363-58.000.
International Fuel Cells Corporation: *See—*
Bonk, Stanley P.; Morganthaler, George F.; and Miura, Yoshiharu, 4,921,680, Cl. 422-197.000.
International Marine Industries, Inc.: *See—*
Low, Douglas W., 4,920,799, Cl. 73-431.000.
International Paper Company: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whitlock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,921,733, Cl. 428-34.200.
Iowa State University Research Foundation, Inc.: *See—*
Beitz, Donald C.; Young, Jerry W.; and Dehal, Shangara S., 4,921,710, Cl. 426-56.000.
Yeung, Edward S.; and Chen, Guoying, 4,921,348, Cl. 356-128.000.
Ireco Incorporated: *See—*
Miller, Kenneth A., 4,920,852, Cl. 86-1.100.
Iri, Eiji; Nobuoka, Yasunari; Suzuki, Nobuo; Kashima, Yoshio; Kakutani, Yuji; and Murata, Osamu, to Mitsubishi Cable Industries, Ltd.; and Seiko Instruments, Inc. Connector for optical fiber ribbon and a method of attaching the same. 4,921,325, Cl. 350-96.210.
Irwin, Robert D.: *See—*
Troughton, Thomas D.; and Irwin, Robert D., 4,921,116, Cl. 220-72.000.
Isaac, Ronald M.: *See—*
Danis, Roger G.; Isaac, Ronald M.; and Puryear, Harry A., Jr., 4,921,481, Cl. 604-67.000.
Ishibashi, Akira: *See—*
Hosoi, Mutsuo; and Ishibashi, Akira, 4,921,471, Cl. 474-101.000.
Ishida, Shiro: *See—*
Funada, Tadashi; Hirano, Jiro; Ishida, Shiro; Morioka, Kensuke; and Murakami, Sachiko, 4,921,633, Cl. 252-314.000.
Ishida, Tokuji: *See—*
Hamada, Masataka; Ishida, Tokuji; and Akada, Yasuaki, 4,922,279, Cl. 354-400.000.
Ishige, Yoshiki: *See—*
Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Kikuchi, Nobuo; and Takahashi, Shoji, 4,921,561, Cl. 156-219.000.
Ishiguro, Mitsuo: *See—*
Miyake, Hiraku; Ishiguro, Mitsuo; Hayamizu, Yutaka; and Aizawa, Satoru, 4,921,202, Cl. 248-581.000.
Ishihara, Toshinobu; Endo, Mikio; Kubota, Tohru; and Tanaka, Yasuhisa, to Shin-Etsu Chemical Co., Ltd. ßsilylalkynyl silane compound and method for preparation thereof. 4,921,989, Cl. 556-431.000.
Ishihara, Yuji, to Seibu Polymer Kasei Kabushiki Kaisha. High-durability pavement marking sheet material. 4,921,754, Cl. 428-325.000.
Ishii, Sumio: *See—*
Shiraki, Manabu; and Ishii, Sumio, 4,922,162, Cl. 310-268.000.
Ishii, Susumu: *See—*
Aoki, Tsunetaka; and Ishii, Susumu, 4,920,615, Cl. 24-429.000.
Ishii, Takahiko, to Kabushiki Kaisha Kobe Seiko Sho. Process for high efficiency hot isostatic pressing. 4,921,666, Cl. 419-25.000.
Ishii, Toshiyuki: *See—*
Aoyama, Mari; Ito, Michiyasu; Tsuji, Syoichi; Ishii, Toshiyuki; and Tanaka, Tomohide, 4,921,653, Cl. 264-41.000.
Ishikawa, Hideo: *See—*
Kashima, Mikito; Ishikawa, Hideo; Kashiwagi, Kouichi; and Noda, Yumiki, 4,922,010, Cl. 562-470.000.
Ishikawa, Hirohisa: *See—*
Tsusaka, Haruo; Ishikawa, Hirohisa; Shinoda, Akihisa; and Fujita, Motohiro, 4,920,927, Cl. 123-41.430.

Ishikawa, Masayuki: *See—*
Nitta, Koichi; Nishikawa, Yukie; Ishikawa, Masayuki; Tsuburai, Yasuhiko; and Kokubun, Yoshihiro, 4,922,499, Cl. 372-46.000.
Ishikawa, Takahide; and Nakahara, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Method of producing an MMIC. 4,921,814, Cl. 437-47.000.
Ishimoto Food Industry Kabushikikaisha: *See—*
Ohtsu, Susumu, 4,921,718, Cl. 426-618.000.
Ishino, Renshiro: *See—*
Yoshimura, Shigeo; Ishino, Renshiro; Takada, Shiro; and Kimura, Hitoshi, 4,920,809, Cl. 75-862.360.
Iskra-Sozd Elektrokovinske Industrije N.Sol.O.: *See—*
Rozman, Miro, 4,922,123, Cl. 307-309.000.
Isogai, Akio: *See—*
Ozawa, Masakuni; Kimura, Mareo; and Isogai, Akio, 4,921,829, Cl. 502-302.000.
Isozumi, Shuzoo; and Konishi, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Electric motor device. 4,922,149, Cl. 310-89.000.
Ispra Israel Products Research Co., Ltd.: *See—*
Jacobson, Amnon, 4,922,228, Cl. 340-550.000.
Isuzu Motors Limited: *See—*
Kuwahara, Toru, 4,921,036, Cl. 164-76.100.
Ito, Akira; and Okada, Mizuo, to Mitsubishi Rayon Co., Ltd. Rear projection screen. 4,921,329, Cl. 350-128.000.
Ito, Atsushi: *See—*
Tani, Naohiko; Kouda, Masahiro; Ito, Atsushi; and Miwa, Yuji, 4,921,376, Cl. 409-131.000.
Ito, Hideo: *See—*
Yokote, Masatsugu; Ito, Hideo; Kawagoe, Kenji; and Kuroki, Junsuke, 4,922,427, Cl. 364-424.050.
Ito, Hiroshi: *See—*
Kugo, Masaru; and Ito, Hiroshi, 4,922,239, Cl. 340-753.000.
Ito, Kaneo: *See—*
Fujio, Ichiro; Ito, Kaneo; and Asanuma, Tadashi, 4,921,905, Cl. 525-53.000.
Ito, Koichi; and Sasaki, Isao, to Kabushiki Kaisha Toshiba. Radio channel search system. 4,921,464, Cl. 455-34.000.
Ito, Masatsugu: *See—*
Arai, Motoharu; and Ito, Masatsugu, 4,921,705, Cl. 424-450.000.
Ito, Masayoshi: *See—*
Yoshimura, Shoji; Matsuzaki, Yuzi; Sugimoto, Mamoru; Ito, Masayoshi; and Ogawa, Tomoya, 4,921,948, Cl. 536-18.200.
Ito, Masazumi: *See—*
Araki, Kazuhiro; and Ito, Masazumi, 4,922,306, Cl. 355-313.000.
Ito, Michiyasu: *See—*
Aoyama, Mari; Ito, Michiyasu; Tsuji, Syoichi; Ishii, Toshiyuki; and Tanaka, Tomohide, 4,921,653, Cl. 264-41.000.
Tsuji, Syoichi; Ito, Syoichi; Matsumura, Shuji; Suzuki, Hisatosi; and Ito, Michiyasu, 4,921,652, Cl. 264-41.000.
Ito, Syoichi: *See—*
Tsuji, Syoichi; Ito, Syoichi; Matsumura, Shuji; Suzuki, Hisatosi; and Ito, Michiyasu, 4,921,652, Cl. 264-41.000.
Ito, Takashi; and Sakamoto, Norio, to Konica Corporation. Tape material conveying roller and tape material conveying method. 4,921,155, Cl. 226-181.000.
Itoh, Hiromichi: *See—*
Shuto, Satoshi; Itoh, Hiromichi; Fukukawa, Kiyofumi; and Tsujino, Masatoshi, 4,921,951, Cl. 536-27.000.
Itoh, Hiroshi: *See—*
Takada, Mitsuru; Itoh, Hiroshi; and Takahashi, Tokuyuki, 4,920,829, Cl. 74-868.000.
ITT Corporation: *See—*
Turcotte, David E.; Roshen, Waseem A.; and Regelman, Dale F., 4,922,156, Cl. 315-244.000.
Ivers, Douglas E., to Lord Corporation. Semi-active damper valve means with electromagnetically movable discs in the piston. 4,921,272, Cl. 280-707.000.
Iwagaya, Takashi: *See—*
Kawamura, Hideaki; Matsumura, Teruyuki; and Iwagaya, Takashi, 4,922,440, Cl. 364-474.220.
Iwahashi, Hiroshi; Nakai, Hiroto; and Asano, Masamichi, to Kabushiki Kaisha Toshiba. Voltage detecting circuit. 4,922,133, Cl. 307-363.000.
Iwai, Kiyoshi, to Nippon Board Computer Co., Ltd. Method and an apparatus of compressing information content of multilevel digital image data. 4,922,340, Cl. 358-135.000.
Iwai, Tomio; and Takahashi, Masanori, to Sanshin Kogyo Kabushiki Kaisha. V-shaped two cycle engine for outboard. 4,920,933, Cl. 123-73.00A.
Iwamoto, Keiichi; and Torichigai, Masaaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Insert type ultrasonic crack hunting apparatus. 4,920,804, Cl. 73-623.000.
Iwamoto, Masayuki: *See—*
Watanabe, Kaneo; Iwamoto, Masayuki; and Minami, Koji, 4,922,218, Cl. 357-30.000.
Iwamoto, Mitsumasa: *See—*
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Uehara, Kiyohiro; Imai, Yoshio; Hino, Taro; Iwamoto, Mitsumasa; Kakimoto, Masaaki; and Suzuki, Masaaki, 4,921,728, Cl. 427-58.000.
Iwasaki, Katsunori: *See—*
Tokunga, Masatoki; Nozawa, Yasuto; and Iwasaki, Katsunori, 4,921,553, Cl. 148-302.000.
Iwasaki, Takao: *See—*
Tagaya, Kiyoshi; Hirose, Satoshi; Iwasaki, Takao; Kouyama, Toshitaka; and Sakaguchi, Yasuo, 4,921,758, Cl. 428-419.000.
Iwata, Hideo: *See—*
Solbes, Albert; and Iwata, Hideo, 4,920,898, Cl. 110-265.000.
J. B. Martin Company, Inc.: *See—*
Combier, Charles M.; Taylor, Archie E., Jr.; and Paquette, Marc, 4,921,098, Cl. 206-408.000.
J. L. S. Corp.: *See—*
Yamaguchi, Tomoyoshi, 4,921,560, Cl. 156-213.000.
Jablonski, Thaddeus M.: *See—*
Miller, Benjamin D.; and Jablonski, Thaddeus M., 4,921,149, Cl. 222-639.000.
Jack Frost Laboratories, Inc.: *See—*
Francis, Sam E., Jr., 4,920,964, Cl. 128-403.000.
Jackenkroll, Horst: *See—*
Bockeler, Franz-Josef; Gobmann, Wolfgang; Buchhorn, Axel; Jackenkroll, Horst; Marks, Hubert; Witte, Karl; and Schnelle, Diethard, 4,922,386, Cl. 362-61.000.
Jackowski, Stefan A., to Cordis Corporation. Catheter with controllable tip. 4,920,980, Cl. 128-786.000.
Jackson, Cletis M.: *See—*
Cross, Jack A.; and Jackson, Cletis M., 4,922,076, Cl. 219-69.150.
Jackson, Edward S., to Galt Industries, Inc. Ferro-aluminum composite pig. 4,921,533, Cl. 75-315.000.
Jackson Laboratory, The: *See—*
Saffer, Jeffrey D.; and Profenno, Louis A., 4,922,180, Cl. 324-639.000.
Jackson, Leon D.; Morris, Dan O.; and Nagi, Thomas J., to LDJ Electronics, Inc. Apparatus for measuring the hysteresis loop of magnetic film. 4,922,200, Cl. 324-223.000.
Jacobs, Michael E.: *See—*
Hill, Lawrence A.; Jacobs, Michael E.; Kroll, Arthur S.; and Williams, Ralph E., 4,922,302, Cl. 355-251.000.
Jacobsen, Stephen C.; Wood, John E.; and Price, Richard H., to Sarcos Group. Eccentric motion motor. 4,922,164, Cl. 310-309.000.
Jacobson, Amnon, to Ispra Israel Products Research Co., Ltd. Railing. 4,922,228, Cl. 340-550.000.
Jacubec, Mark R.: *See—*
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R.; Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C.; and Jacubec, Mark R., 4,921,886, Cl. 423-235.000.
Jadamus, Hans; Grosse-Puppendahl, Thomas; and Richter, Klaus-Peter, to Huels Aktiengesellschaft. Process for producing a chemical bond between molding materials based on polyphenylene ethers on the one hand and peroxide vulcanized EP(D)M rubbers on the other hand. 4,921,762, Cl. 428-521.000.
Jaedicke, Hagen: *See—*
Kiefer, Hans; Bipp, Hansjoerg; Fink, Fritz; Jaedicke, Hagen; and Poralla, Dieter M., 4,921,711, Cl. 426-66.000.
Jagenberg Aktiengesellschaft: *See—*
Knop, Reinhard; Sommer, Herbert; and Muller, Georg, 4,920,913, Cl. 118-410.000.
Jaguar Cars Limited: *See—*
Bishop, Edward T., 4,920,929, Cl. 123-41 490.
Jahn-Held, Wilhelm: *See—*
Lindoerfer, Walter; Sewe, Kai-Udo; Jahn-Held, Wilhelm; Ziebolz, Burkhard; and Wagner, Fritz, 4,921,615, Cl. 210-729.000.
Jalon, Michel. Security fibers and other materials made luminescent by a dyeing process, processes for their manufacture and their applications. 4,921,280, Cl. 283-88.000.
Jalon, Michel, to Petrel. Security markings, material provided with security marks, and apparatus to detect the security mark. 4,921,534, Cl. 106-20.000.
Janke, Donald E.; and Frohbieter, Edwin H., to Whirlpool Corporation. Refrigerator temperature responsive air outlet baffle. 4,920,758, Cl. 62-187.000.
Janome Sewing Machine Co. Ltd.: *See—*
Hara, Kazumasa; Koike, Mikio; Nishijima, Mitsuru; and Okutani, Koji, 4,920,903, Cl. 112-229.000.
Takenoya, Hideaki; Nomoto, Reishi; and Ebata, Yoshikazu, 4,920,902, Cl. 112-103.000.
Janssen, Rainer: *See—*
Hubert, Christian; and Janssen, Rainer, 4,922,528, Cl. 379-386.000.
Janzen, Bertha; and Janzen, Virginia. Patient's gown. 4,920,578, Cl 2-114.000.
Janzen, Virginia: *See—*
Janzen, Bertha; and Janzen, Virginia, 4,920,578, Cl. 2-114.000
Japan Tobacco Inc.: *See—*
Okumoto, Yutaka, 4,920,987, Cl. 131-84.300.
Jarvik, Murray E.: *See—*
Rose, Jed E.; Jarvik, Murray E.; and Rose, Karce D., 4,920,989, Cl. 131-270.000.
Jarvis, Nancy P.: *See—*
Hall, Timothy C.; Loesch-Fries, L. Sue; Jarvis, Nancy P., and Barker, Richard F., 4,921,802, Cl. 435-172.300.
Jasper, Steven C.: *See—*
Johnson, Mark J.; Yester, Francis R., Jr.; and Jasper, Steven C., 4,922,549, Cl. 455-212.000.
Jautelat, Manfred: *See—*
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 4,921,967, Cl. 548-267.800.
Javard, Gerard: *See—*
Tresset, Alain; Fontenelle, Francois; and Javard, Gerard, 4,922,509, Cl. 375-103.000.
Jelich, Klaus: *See—*
Gayer, Herbert; Jelich, Klaus; Kramer, Wolfgang; and Brandes, Wilhelm, 4,921,993, Cl. 558-392.000.
Jenkins, Hugh M.: *See—*
Greaves, Brian; and Jenkins, Hugh M., 4,920,783, Cl. 72-454.000.

Jenkins, Scott E.: *See*—
Walker, John S.; and Jenkins, Scott E., 4,922,059, Cl. 174-254.000.
Jennens, David C.: *See*—
Gilkerson, Terence; Shaw, Robert W.; and Jennens, David C., 4,921,524, Cl. 71-88.000.
Jernberg, Robert H., to Amtrol Inc. Non-refillable packless valve for pressurized containers. 4,921,214, Cl. 251-335.200.
Jernberg, Robert H.: *See*—
Lane, Joseph A.; and Jernberg, Robert H., 4,921,004, Cl. 137-318.000.
Jeromin, Gunter: *See*—
Seubert, Bernhard; Beilharz, Helmut; Fickert, Werner; Jeromin, Gunter; and Spitaler, Ulrich, 4,921,840, Cl. 514-33.000.
Jessup, Reginald: *See*—
Brewster, Andrew G.; Brown, George R.; Jessup, Reginald; and Smithers, Michael J., 4,921,866, Cl. 514-336.000.
Jiang, Jy-Chang. Case lock. 4,920,771, Cl. 70-4.000.
Jimenez, Francisco G.; and Spector, George. Phosphorescent prophilactic. 4,920,983, Cl. 128-844.000.
Jobson, Ronald B.: *See*—
Kieczykowski, Gerard R.; Melillo, David G.; and Jobson, Ronald B., 4,922,007, Cl. 562-13.000.
Jofs, Bengt: *See*—
Nilsson, Kenth; Jofs, Bengt; and Skog, Goeran, 4,922,271, Cl. 346-140.00R.
Johansson, Kent: *See*—
Duvander, Patrik; and Johansson, Kent, 4,921,121, Cl. 220-270.000.
John Crane, Inc.: *See*—
Sedy, Josef, 4,921,015, Cl. 137-625.110.
John Wyeth & Brother Limited: *See*—
Abou-Gharbia, Magid A.; Yardley, John P.; Childers, Wayne E., Jr.; and Cliffe, Ian A., 4,921,958, Cl. 544-295.000.
Cliffe, Ian A., 4,921,860, Cl. 514-304.000.
Johns, Allan T., to National Research Development Corporation. Method and apparatus for detecting and discriminating faults in transmission circuits 4,922,368, Cl. 361-62.000.
Johns Hopkins University, The: *See*—
Dolecek, Quentin E., 4,922,418, Cl. 364-200.000.
Johnsen, Tyrone A.: *See*—
Raad, Bernard A.; and Johnsen, Tyrone A., 4,922,119, Cl. 290-31.000.
Johnson, Bobby G.: *See*—
Perdue, Thad A.; and Johnson, Bobby G., 4,920,629, Cl. 29-428.000.
Johnson, Christopher L., to General Dynamics Corporation. Energy dissipating receptacle. 4,920,841, Cl. 83-177.000.
Johnson, Elizabeth A.: *See*—
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.
Johnson, Gilbert C., to Minnesota Mining and Manufacturing Company. Acryloyloxy and methacryloyloxy group-containing condensation polymers. 4,921,930, Cl. 528-306.000.
Johnson, James D. Double sided hack-saw blade. 4,920,652, Cl. 30-504.000.
Johnson, Jimmy D. Camp stove. 4,920,950, Cl. 126-29.000.
Johnson, Kenneth A., to MDT Corporation. Biocidal gas sterilizer. 4,921,675, Cl. 422-34.000.
Johnson, Mark J.; Yester, Francis R., Jr.; and Jasper, Steven C., to Motorola, Inc. Digital FM squelch detector. 4,922,549, Cl. 455-212.000.
Johnson Matthey Inc.: *See*—
Teicher, Beverly A.; Richmond, Robert C.; and Chen, Lan B., 4,921,973, Cl. 549-212.000.
Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. Pharmacologically active 2-hydroxy-4-(substituted) phenyl cycloalkanes and derivatives thereof. 4,921,994, Cl. 558-426.000.
Johnson, Timothy W.; and Brady, Don G., to Phillips Petroleum Company. Poly(arylene sulfide) composites. 4,921,558, Cl. 156-181.000.
Johnston, James A. Child resistant disposable lighter. 4,921,420, Cl. 431-153.000.
Joichi, Yoshiro, to Sony Corporation. Rotation control circuit for a hall motor. 4,922,513, Cl. 318-254.000.
Joll, David J.: *See*—
Matthews, Bernard T.; Joll, David J.; Ziauddin, Habeeb M.; and Wilson, David N., 4,921,714, Cl. 426-90.000.
Joly, Danforth O. Chimney screen. 4,920,867, Cl. 98-67.000.
Jones, Dennis F.: *See*—
McMahon, Garfield W.; and Jones, Dennis F., 4,922,470, Cl. 367-163.000.
Jones, George H., to Jones Sports Co. Golf bag having integral support stand. 4,921,192, Cl. 248-96.000.
Jones, Gerald L. Swivel grip arrangement for combat knives. 4,920,648, Cl. 30-298.000.
Jones, K. Tom; and Caldwell, Richard J., to Pacific BioSystems, Inc. Liquid dispensing module. 4,921,129, Cl. 222-23.000.
Jones, Richard E.: *See*—
Rabe, James A.; Lipowitz, Jonathan; and Jones, Richard E., 4,921,657, Cl. 264-86.000.
Jones Sports Co.: *See*—
Jones, George H., 4,921,192, Cl. 248-96.000.
Joseph-Nathan, Pedro; and Cervantes-Cuevas, Humberto, to Centro De Investigacion Y De Estudios Avanzados Del Instituto Politecnico Nacional. Process for the preparation of optically active 2-methyl-1,2-hexanediols. 4,922,032, Cl. 568-862.000.
Jouade, Pierre, to Hutchinson. Hydraulic antivibratory supports. 4,921,201, Cl. 248-562.000.
Joyce, Timothy R.: *See*—
Dunn, Trevor R.; Lucas, David R. S.; North, Ben B.; and Joyce, Timothy R., 4,922,189, Cl. 324-142.000.
JPI Transportation Products, Inc.: *See*—
Skingle, Thomas J.; and Toaz, Milton W., 4,920,864, Cl. 92-213.000.
Judge, Lawrence B.: *See*—
Dohm, Loring J.; Judge, Lawrence B.; and Morgan, Dwight M., 4,922,436, Cl. 364-513.000.
Juds, Mark A.; and Beihoff, Bruce C., to Eaton Corporation. High resolution proximity detector employing magnetoresistive sensor disposed within a pressure resistant enclosure. 4,922,197, Cl. 324-207.210.
Juenthner, Kurt: *See*—
Plath, Ernst-Dieter; and Juenthner, Kurt, 4,920,767, Cl. 66-13.000.
Juhlin, Sven-Eric; Bergkvist, Hakan; Norberg, Astrid; and Winblad, Bengt. Mug with insert for dispensing measured quantity. 4,921,112, Cl. 215-11.400.
Jung, Johann: *See*—
Grossman, Klaus; Jung, Johann; Schulz, Guenter; Sauter, Hubert; Hofmeister, Peter; and Tuerk, Wolfgang, 4,921,525, Cl. 71-73.000.
Junge, Bodo: *See*—
Niewohner, Ulrich; Hoever, Franz-Peter; Junge, Bodo; Perzborn, Elisabeth; Seuter, Friedel; and Fiedler, Volker-Bernd, 4,921,998, Cl. 560-45.000.
Juntgen, Harald; Knoblauch, Karl; Richter, Ekkehard; and Kuhl, Helmut, to Bergwerksverband GmbH. Process for producing an active carbon catalyst. 4,921,826, Cl. 502-180.000.
Jurinak, Jeff J.: *See*—
Summers, Laine E.; and Jurinak, Jeff J., 4,921,047, Cl. 166-276.000.
Kabeta, Keiji, to Toshiba Silicone Co., Ltd. Vinyl-containing unsaturated organosilicon compound and process for preparing the same. 4,921,976, Cl. 556-482.000.
Kabushi Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Sofue, Tadashi; and Watanabe, Toichi, 4,922,075, Cl. 219-92.000.
Kabushiki Kaisha Imasen Denki Seisakusho: *See*—
Kawasaki, Shinzo; Umeda, Kaoru; and Kitoh, Norimasa, 4,922,170, Cl. 318-434.000.
Kabushiki Kaisha Kenwood: *See*—
Kobayashi, Hirokazu, 4,922,483, Cl. 370-50.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Ishii, Takahiko, 4,921,666, Cl. 419-25.000.
Kitaura, Shinko; Takahara, Yoshimasa; Nagai, Shiro; and Nishio, Naomichi, 4,921,799, Cl. 435-167.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Shiraishi, Takao; and Kondo, Satoki, 4,921,578, Cl. 177-25.190.
Kabushiki Kaisha Okudaya Giken: *See*—
Okuno, Isamu, 4,921,385, Cl. 414-21.000.
Kabushiki Kaisha Tocad (Tocad Corporation): *See*—
Aoyama, Ryuichiro, 4,922,383, Cl. 362-10.000.
Kabushiki Kaisha Tokai-Rika-Denki-Susakusho: *See*—
Mori, Shinji, 4,921,184, Cl. 242-107.40A.
Kabushiki Kaisha Tominaga Jyushi Kogyosho: *See*—
Tominaga, Kazutoshi, 4,920,922, Cl. 119-5.000.
Kabushiki Kaisha Tonami Seisakusho: *See*—
Annen, Osamu, 4,921,051, Cl. 172-21.000.
Kabushiki Kaisha Toshiba: *See*—
Gotou, Yukifumi; Narikiyo, Hidetoshi; and Chuma, Yoshihiro, 4,921,164, Cl. 236-49.300.
Hayakawa, Shigeyuki; and Matsui, Masataka, 4,922,461, Cl. 365-230.080.
Ikegawa, Sumio; Terashima, Yoshiaki; Yasuda, Nobuaki; Ichihara, Katsutarou; Komatsu, Shuichi; and Arai, Shinji, 4,922,462, Cl. 365-113.000.
Inoue, Akifumi, 4,922,237, Cl. 340-723.000.
Ito, Koichi; and Sasaki, Isao, 4,921,464, Cl. 455-34.000.
Iwahashi, Hiroshi; Nakai, Hiroto; and Asano, Masamichi, 4,922,133, Cl. 307-363.000.
Nitta, Koichi; Nishikawa, Yukie; Ishikawa, Masayuki; Tsuburai, Yasuhiko; and Kokubun, Yoshihiro, 4,922,499, Cl. 372-46.000.
Obama, Masao; and Kikuchi, Masaaki, 4,920,806, Cl. 73-779.000.
Sakata, Yoshio; and Taoda, Masami, 4,922,437, Cl. 364-514.000.
Seki, Nagataka; and Hirose, Shunich, 4,922,124, Cl. 307-87.000.
Sudo, Toshio, 4,922,324, Cl. 357-74.000.
Watanabe, Junji, 4,922,292, Cl. 355-75.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kawabata, Susumu; Yoshida, Kazunori; and Suzuki, Fujio, 4,921,019, Cl. 139-452.000.
Ozawa, Masakuni; Kimura, Mareo; and Isogai, Akio, 4,921,829, Cl. 502-302.000.
Kabushiki Kaishma Tokai-Rika-Denki-Seisakusho: *See*—
Shinto, Hiroaki; Nakamura, Syuji; Yamaguchi, Terumoto; Oguri, Tomoji; and Terashima, Tuneo, 4,920,821, Cl. 74-552.000.
Kabushiki Kiasha Toshiba: *See*—
Matsumoto, Yutaka; and Shimazu, Tadaharu, 4,921,466, Cl. 455-214.000.
Kachele-Cama Latex GmbH: *See*—
Bock, Manfred, 4,921,672, Cl. 264-161.000.
Kadokura, Takamitsu: *See*—
Hasuo, Shigetsuyo; Kanazawa, Shigeru; Kenmochi, Teruo; and Kadokura, Takamitsu, 4,921,109, Cl. 209-552.000.

Kadota, Yasushi: *See*—
Kotani, Hiroshi; Inoue, Yoshiyuki; Kadota, Yasushi; Sakakibara, Hidekazu; Ide, Kazuo; and Sumida, Kanichi, 4,921,470, Cl. 464-151.000.
Kadwell, Brian J.; and Fowler, Daniel L., to RobertShaw Controls Company. Control system and method of making the same. 4,922,081, Cl. 219-506.000.
Kai, Yasunobu: *See*—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.
Kaifu, Noriyuki: *See*—
Saika, Toshihiro; and Kaifu, Noriyuki, 4,922,117, Cl. 250-578.100.
Kaim, Robert E.: *See*—
Berrian, Donald W.; Kaim, Robert E.; and Vanderpot, John W., 4,922,106, Cl. 250-492.200.
Kaines, John L.: *See*—
Leach, Christopher B.; and Kaines, John L., 4,920,724, Cl. 52-685.000.
Kaisei Koguy Corporation: *See*—
Tanaka, Isamu; and Tanitomi, Fuminao, 4,920,973, Cl. 128-736.000.
Kaiser, Franz-Josef; and Sauer, Wolfgang, to Metzeler GmbH. Hydraulic-damping two-chamber engine mount. 4,921,049, Cl. 267-140.100.
Kaji, Toshio: *See*—
Hashimoto, Seiji; Kinoshita, Takao; Takayama, Tsutomu; and Kaji, Toshio, 4,922,334, Cl. 358-44.000.
Kakada, Morihito: *See*—
Tanino, Katsumi; and Kakada, Morihito, 4,921,928, Cl. 528-111.000.
Kakimoto, Masaaki: *See*—
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Uehara, Kiyohiro; Imai, Yoshio; Hino, Taro; Iwamoto, Mitsumasa; Kakimoto, Masaaki; and Suzuki, Masaaki, 4,921,728, Cl. 427-58.000.
Kakutani, Yuji: *See*—
Iri, Eiji; Nobuoka, Yasunari; Suzuki, Nobuo; Kashima, Yoshio; Kakutani, Yuji; and Murata, Osamu, 4,921,325, Cl. 350-96.210.
Kali-Chemie AG: *See*—
Naumann, Dieter; Tyrra, Wieland; Kock, Birgit; Rudolph, Werner; and Wilkes, Bernd, 4,922,041, Cl. 570-141.000.
Kalkert, Peter, to URANIT GmbH. Apparatus to couple laser radiation and microwave energy using a microwave waveguide. 4,922,214, Cl. 333-135.000.
Kamas, Peter, to Raychem Corporation. Methods, systems and apparatus for detecting changes in variables. 4,922,183, Cl. 324-694.000.
Kameda, Osamu; Fujikawa, Satoshi; and Shinmoto, Toshiharu, to Mazda Motor Corporation. Planetary gear type transmission. 4,920,828, Cl. 475-299.000.
Kamei, Tatsuya: *See*—
Watanabe, Atsuo; Ikeda, Takahide; Tsukuda, Kiyoshi; Hirao, Mitsuru; Mukai, Touji; and Kamei, Tatsuya, 4,921,811, Cl. 437-31.000.
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, to Eisai Co., Ltd. 3-propenylcephem derivative. 4,921,850, Cl. 514-202.000.
Kammann, Karl P., Jr., to Ferro Corporation. Modified fatty amides and sulfurized fatty oils as lubricant additives. 4,921,624, Cl. 252-48.600.
Kamp, Heinz, to W. Schlafhorst & Co. Yarn traverse winding apparatus. 4,921,181, Cl. 242-43.00A.
Kamprath, Karl-Heinz, to Braun Aktiengesellschaft. Portable mixer for processing food. 4,922,464, Cl. 366-349.000.
Kanazawa, Shigeru: *See*—
Hasuo, Shigetsuyo; Kanazawa, Shigeru; Kenmochi, Teruo; and Kadokura, Takamitsu, 4,921,109, Cl. 209-552.000.
Kanda, Naoya: *See*—
Matsumoto, Kunio; Noro, Takanobu; and Kanda, Naoya, 4,922,377, Cl. 361-387.000.
Kane, Thomas J.; Myer, John M.; and Grzybowski, Richard W., to Ford Motor Company; and AMP Incorporated. Blind mating connector having self-locating feature. 4,921,435, Cl. 439-248.000.
Kanegafachi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kira, Kazuaki, 4,921,495, Cl. 623-1.000.
Kaneko, Nobuyoshi; and Naruse, Yasuhito, to Fuji Photo Film Co., Ltd. Two-layer coating method. 4,921,729, Cl. 427-131.000.
Kaneko, Takeru: *See*—
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl. 514-319.000.
Kanemoto, Akihiko: *See*—
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Uehara, Kiyohiro; Imai, Yoshio; Hino, Taro; Iwamoto, Mitsumasa; Kakimoto, Masaaki; and Suzuki, Masaaki, 4,921,728, Cl. 427-58.000.
Kanenwisher, Albert L. Educational baseball game. 4,921,251, Cl. 273-93.00R.
Kaneshige, Ryousuke: *See*—
Kinoshita, Tatsuo; Minami, Shuji; and Kaneshige, Ryousuke, 4,922,046, Cl. 585-11.000.
Kang, Byung K.; and So, Jin C. Fluid control cylinder assembly for automobile brake system. 4,921,082, Cl. 192-13.00A.
Kapmeyer, Wolfgang: *See*—
Dengler, Michael; Kapmeyer, Wolfgang; and Rinno, Helmut, 4,921,915, Cl. 525-279.000.
Kapon, Elyahou: *See*—
Chang-Hasnain, Constance J.; and Kapon, Elyahou, 4,922,500, Cl. 372-50.000.
Karakama, Yoshiakira: *See*—
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi, Yukimori; Hori, Kazunori; and Tokuyama, Mikio, 4,922,356, Cl. 360-104.000.
Karaki, Kouichi; Sakai, Mitsugu; and Sasaki, Yasuo, to Olympus Optical Co., Ltd. Ultrasonic microscope apparatus. 4,920,803, Cl. 73-606.000.
Karamon, Hideaki, to Sony Corporation. Soft magnetic thin film. 4,921,763, Cl. 428-692.000.
Karibe, Norio: *See*—
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl. 514-319.000.
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, to Fanuc Ltd. Laser oscillator device. 4,921,357, Cl. 372-38.000.
Karydas, Athanasios, to Ciba-Geigy Corporation. Enhanced oil recovery through cyclic injection of fluorochemicals. 4,921,619, Cl. 252-8.554.
Kasamura, Toshirou: *See*—
Sasaki, Nobukazu; Kasamura, Toshirou; Ohashi, Masashi; Okuda, Naoki; and Kusomoto, Toshihiko, 4,922,300, Cl. 355-245.000.
Kase, Kiyoshi, to Motorola, Inc. Error detection and correction circuit. 4,922,493, Cl. 371-31.000.
Kashima, Mikito; Ishikawa, Hideo; Kashiwagi, Kouichi; and Noda, Yumiki, to Ube Industries, Ltd. Processes for preparing 2-substituted propionic acid and derivatives thereof. 4,922,010, Cl. 562-470.000.
Kashima, Yoshio: *See*—
Iri, Eiji; Nobuoka, Yasunari; Suzuki, Nobuo; Kashima, Yoshio; Kakutani, Yuji; and Murata, Osamu, 4,921,325, Cl. 350-96.210.
Kashiwa, Norio: *See*—
Kioka, Mamoru; and Kashiwa, Norio, 4,921,825, Cl. 502-104.000.
Kashiwagi, Kouichi: *See*—
Kashima, Mikito; Ishikawa, Hideo; Kashiwagi, Kouichi; and Noda, Yumiki, 4,922,010, Cl. 562-470.000.
Kasuga, Shinichi; and Osawa, Nobuyuki, to Nippon Seiko Kabushiki Kaisha. Under seal assembling structure in linear guide apparatus. 4,921,358, Cl. 384-15.000.
Kasuya, Satoshi, to Technology Network, Inc. Automatic solar lighting apparatus having a solar following sensor. 4,922,088, Cl. 250-203.400.
Kasuya, Yukio; Tomosada, Masahiro; and Adachi, Hideki, to Canon Kabushiki Kaisha. Image reproducing apparatus controlled in response to detected density of an original image. 4,922,296, Cl. 355-208.000.
Katagi, Takashi: *See*—
Saito, Jun; Haruyama, Tetsuo; Orime, Nobutake; and Katagi, Takashi, 4,922,257, Cl. 342-377.000.
Kataita, Masafumi: *See*—
Ajioka, Masanobu; Aiga, Makoto; Kataita, Masafumi; and Tamaki, Akihiro, 4,922,005, Cl. 560-347.000.
Kataoka, Hajime; and Gunji, Minoru, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Apparatus for making connections in liquids using pressurized gas. 4,921,434, Cl. 439-198.000.
Katayama, Chuji, to Mac Science Co., Ltd. Radiation-image reading apparatus. 4,922,102, Cl. 250-327.200.
Katchka, Jay R.: *See*—
Kelly, Samuel T.; and Katchka, Jay R., 4,921,011, Cl. 137-595.000.
Kates, James L.: *See*—
Anson, James H.; Kates, James L.; Brewer, Alan W.; and Friedrich, Brent R., 4,920,871, Cl. 99-295.000.
Kato, Tomohiro; Takasu, Yoshio; and Minafuji, Makoto, to Takemoto Yushi Kabushiki Kaisha. Fluid-permeable agent for non-woven sheets of polyolefin fibers and method of application thereof: N,N-dihydroxyethyl amide and polyoxyalkylene-modified silicone. 4,921,622, Cl. 252-8.900.
Kato, Tsugiji; Aoyama, Kunitoshi; and Kozakai, Motokazu, to NGK Insulators, Ltd. Cratings for insulator. 4,921,095, Cl. 206-328.000.
Kato, Yuzi: *See*—
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, 4,921,632, Cl. 252-299.100.
Katoh, Shunji; Kimura, Noriyuki; Sakai, Yoshihiro; and Enoki, Sigekazu, to Ricoh Company, Ltd. Rotary multicolor developing apparatus. 4,922,301, Cl. 355-251.000.
Katoh, Tokunori: *See*—
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; and Sawaki, Yukichi, 4,922,288, Cl. 355-27.000.
Katsu, Kanemasa: *See*—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.
Katsuoka, Hirotoshi: *See*—
Osawa, Masanori; Shizuka, Kohei; Kouno, Masahiro; Matsuyama, Akio; Katsuoka, Hirotoshi; and Mizutani, Kazumi, 4,921,933, Cl. 528-348.000.

VOL
1114
ISS
1
MY
1
1990
UMI

Kaufman, Kenneth: *See—*
Burgess, William H.; Kaufman, Kenneth; and Lane, Archie B., Jr., 4,921,034, Cl. 162-109.000.

Kauranen, Timo M.: *See—*
Gounder, Ponnusemi K.; Raskin, Neil R.; and Kauranen, Timo M., 4,920,751, Cl. 60-679.000.

Kawabata, Susumu; Yoshida, Kazunori; and Suzuki, Fujio, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Weft insertion in jet loom. 4,921,019, Cl. 139-452.000.

Kawabe, Ushio: *See—*
Hasegawa, Haruhiro; Kawabe, Ushio; Tarutani, Yoshinobu; Fukazawa, Tokuumi; Aida, Toshiyuki; and Takagi, Kazumasa, 4,921,834, Cl. 505-1.000.

Kawada, Yukihiro: *See—*
Saito, Kenji; Nakayama, Yoshiaki; and Kawada, Yukihiro, 4,922,330, Cl. 358-29.000.

Kawagoe, Kenji: *See—*
Yokote, Masatsugu; Ito, Hideo; Kawagoe, Kenji; and Kuroki, Junsuke, 4,922,427, Cl. 364-424.050.

Kawaguchi, Fumiaki: *See—*
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.

Kawaguchi, Minori: *See—*
Ando, Masakatsu, Kawaguchi, Minori; and Yamakawa, Susumu, 4,920,788, Cl. 73-118.100.

Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,922,103, Cl. 250-327.200.

Kawakatsu, Satoshi: *See—*
Yamasaki, Masahiko; and Kawakatsu, Satoshi, 4,921,791, Cl. 435-28.000.

Kawamura, Hideaki; Matsumura, Teruyuki; and Iwagaya, Takashi, to Fanuc Ltd. Tool profile automatic graphic display system. 4,922,440, Cl. 364-474.220.

Kawamura, Minoru: *See—*
Wakahara, Hideki; Matsuo, Yoshihiro; and Kawamura, Minoru, 4,921,751, Cl. 428-229.000.

Kawamura, Yoshihito, Akai, Masashi; and Takagi, Makoto, to Nippon-denso Co., Ltd. Method of producing a compact of amorphous alloys. 4,921,410, Cl. 419-8.000.

Kawasaki, Nobuhiko; Ikeda, Kouichi; and Kimura, Shinichi, to Sharp Kabushiki Kaisha. Power-connection/car-mounting device and connection system for a car-mountable apparatus. 4,921,426, Cl. 439-34.000.

Kawasaki, Shinzo; Umeda, Kaoru; and Kitoh, Norimasa, to Kabushiki Kaisha Imasen Denki Seisakusho; and Honda Giken Kogyo Kabushiki Kaisha, a part interest to each. Automotive power seat assembly 4,922,170, Cl. 318-434.000.

Kawneer Company, Inc.: *See—*
Hooper, William J., Jr., 4,920,717, Cl. 52-400.000

Kay, James W.: *See—*
Bernhardt, Randal J.; Loeb, Melvin L.; and Kay, James W., 4,921,942, Cl. 424-59.000.

Kayakiri, Natsuko: *See—*
Hemmi, Keiji; Neya, Masahiro; Marusawa, Hiroshi; Imai, Keisuke; Kayakiri, Natsuko; and Hashimoto, Masashi, 4,921,855, Cl. 514-235.800.

Kayes, Allan G. Soil displacement hammer. 4,921,055, Cl. 175-45.000.

Kazama, Yoshiharu: *See—*
Mizoue, Yoshito; and Kazama, Yoshiharu, 4,922,445, Cl. 364-578.000.

Kazecki, Henry L.; and Goode, Steven H., to Motorola, Inc. Clock recovery device. 4,922,209, Cl. 331-12.000.

Kearsley, Andrew J.; Lewis, Richard R.; and Naylor, Graham A. Lasers. 4,922,498, Cl. 372-25.000.

Kehlenbach, Gunther, to H. Krantz GmbH & Co. Adjustable draw roller assembly. 4,921,091, Cl. 198-782.000.

Keil, Gary D.: *See—*
Tipton, Sheryl A.; Keil, Gary D.; Holloway, Gregory S.; Gromer, David R.; and Biltgen, Gary L., 4,921,025, Cl. 148-16.500.

Keim, Kenneth J.; and Pattison, William R. Industrial-type washing machine. 4,920,603. Cl. 15-302.000.

Keller, Reinhold: *See—*
Schneider, Manfred; Laumen, Kurt; Breitgoff, Detlef; Wullbrandt, Dieter; Schilingmann, Merten; and Keller, Reinhold, 4,922,001, Cl. 560-112.000.

Kelly, Samuel T.; and Katchka, Jay R., to Robertshaw Controls Company. Fuel control valve construction, parts therefor and methods of making the same. 4,921,011, Cl. 137-595.000.

Kem, Kenneth M., to Occidental Chemical Corporation. Compositions of matter comprising dialkyl-(N,N-dialkylcarbamoylmethyl) phosphine oxides. 4,922,012, Cl. 564-15.000.

Kemble Instrument Company Limited, The: *See—*
Lawler, Anthony J., 4,922,173, Cl. 318-568.200.

Kemming, Charles L. Combination storage container and motorcycle holder. 4,921,152, Cl. 224-42.420.

Kendrick, George B: *See—*
Morris, Merle E.; Kendrick, George B.; and Boyd, John M., 4,922,155, Cl. 315-205.000.

Kenmochi, Teruo: *See—*
Hasuo, Shigetsuyo; Kanazawa, Shigeru; Kenmochi, Teruo; and Kadokura, Takamitsu, 4,921,109, Cl. 209-552.000.

Kennedy, Bo E.: *See—*
Ahlbom, Sten Hugo Nils; Kennedy, Bo E.; and Åkerlind, Bo N., 4,922,543, Cl. 382-48.000.

Kennedy, Christopher R.: *See—*
Lesher, Harold D.; Kennedy, Christopher R.; White, Danny R.; and Urquhart, Andrew W., 4,921,818, Cl. 501-89.000.

Kennedy, Richard T.: *See—*
Fischer, Wolfgang; Kennedy, Richard T.; and Wiley, Ronald L., 4,921,139, Cl. 222-129.100.

Kenney, John B.; Rohrs, Charles E.; and Walters, Wayne E., to Tellabs, Inc. Adaptive filter with coefficient averaging and method. 4,922,530, Cl. 379-411.000.

Åkerlind, Bo N.: *See—*
Ahlbom, Sten Hugo Nils; Kennedy, Bo E.; and Åkerlind, Bo N., 4,922,543, Cl. 382-48.000.

Kernforschungszentrum Karlsruhe GmbH: *See—*
Mawatari, Yasushi; Ikegami, Toru; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Rober, Hans-Gerd, 4,922,115, Cl. 250-484.100.

Kerr, Harry D. Bedside toilet. 4,920,587, Cl. 4-480.000.

Kerr-McGee Chemical Corporation: *See—*
Salas, Gerardo A., 4,921,545, Cl. 134-16.000.

Kesling, Peter C., to TP Orthodontics, Inc. Orthodontic ligature gun. 4,921,423, Cl. 433-3.000.

Kessler, David: *See—*
DeJager, Donald; and Kessler, David, 4,921,320, Cl. 350-6.800.

Kessler, Keith E.: *See—*
Phillips, Douglas J.; Kessler, Keith E.; Shipley, John W.; and Hyland, Dave, 4,922,159, Cl. 318-128.000.

Kettner, Andreas: *See—*
Gosdowski, Gerhard; and Kettner, Andreas, 4,922,143, Cl. 310-12.000.

Kevius, Bruno, to U.S. Philips Corporation. Method of, and device for, reducing magnetic stray fields. 4,922,153, Cl. 315-8.000.

Khalid, Joseph M.; and Plagge, David G., to Yates Industries, Inc. Production of metal foil having improved weight distribution across the width of the foil. 4,921,590, Cl. 204-216.000.

Khinkis, Mark: *See—*
Korenberg, Jacob; and Khinkis, Mark, 4,920,925, Cl. 122-149.000.

Khoshnevisan, Mohsen: *See—*
Chiou, Arthur E.; Chang, Tallis Y.; and Khoshnevisan, Mohsen, 4,921,353, Cl. 356-347.000.

Khromov, Gennady L.: *See—*
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,921,695, Cl. 424-81.000.

Kicherer, Robert; and Schreder, Felix, to E.G.O. Elektro-Gerate Blanc u. Fischer. Cooker plate. 4,922,080. Cl. 219-457.000.

Kieczykowski, Gerard R., Melillo, David G.; and Jobson, Ronald B., to Merck & Co., Inc. Process for preparing 4-amino-1-hydroxybutylidene-1,1-bisphosphonic acid or salts thereof. 4,922,007, Cl. 562-13.000.

Kiefer, Hans; Bipp, Hansjoerg; Fink, Fritz; Jaedicke, Hagen; and Poralla, Dieter M., to BASF Aktiengesellschaft. Animal feed or drinking water containing propanediol formates. 4,921,711, Cl. 426-66.000.

Kiel, David J. Automatic hangup apparatus for restoring service to off-hook telephones. 4,922,529, Cl. 379-387.000.

Kiely, John S.: *See—*
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.

Kies, Anton M.; and van den Nieuwelaar, Harry C., to Erico International Corporation. Ground rods and apparatus for forming and placing such rods. 4,921,217, Cl. 254-29.00R.

Kikuchi, Kenichi: *See—*
Hidaka, Masaru; Murashima, Hirotsugu; Takuma, Masao; Haruki, Toshinobu; and Kikuchi, Kenichi, 4,922,346, Cl. 358-227.000.

Kikuchi, Masaaki: *See—*
Obama, Masao; and Kikuchi, Masaaki, 4,920,806, Cl. 73-779.000.

Kikuchi, Nobuo: *See—*
Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Kikuchi, Nobuo; and Takahashi, Shoji, 4,921,561, Cl. 156-219.000.

Kikuma, Michiko: *See—*
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.

Kim, Chul K., to Samsung Electronics Co., Ltd. Electronic absolute coordinate encoder for positional control devices. 4,922,176, Cl. 318-602.000.

Kimberly-Clark Corporation: *See—*
Nohr, Ronald S., 4,921,803, Cl. 435-179.000.
Vardar, Naci, 4,921,144, Cl. 222-336.000.

Kimmel, Steven A.: *See—*
Hutchison, Donald W.; Kimmel, Steven A.; Bonkovich, Raymond J.; Chew, James P.; and Rath, David J., 4,921,210, Cl. 251-129.080.

Kimura, Hiroshi, to G-C Dental Industrial Corp. Dental handpiece. 4,921,424, Cl. 433-114.000.

Kimura, Hitoshi: *See—*
Yoshimura, Shigeo; Ishino, Renshiro; Takada, Shiro; and Kimura, Hitoshi, 4,920,809, Cl. 75-862.360.

Kimura, Keizo: *See—*
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 4,921,968, Cl. 548-262.400.

Kimura, Mareo: *See—*
Ozawa, Masakuni; Kimura, Mareo; and Isogai, Akio, 4,921,829, Cl. 502-302.000.

Kimura, Michio: *See—*
Yamada, Bunshi; Kimura, Michio; and Noguchi, Yoshio, 4,922,039, Cl. 570-211.000.

Kimura, Noriyuki: *See—*
Katoh, Shunji; Kimura, Noriyuki; Sakai, Yoshihiro; and Enoki, Sigekazu, 4,922,301, Cl. 355-251.000.

Kimura, Shinichi: *See—*
Kawasaki, Nobuhiko; Ikeda, Kouichi; and Kimura, Shinichi, 4,921,426, Cl. 439-34.000.

Kimura, Toshiyuki: *See—*
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,922,476, Cl. 369-47.000.

Kimura, Tsutomu: *See—*
Kogane, Mikio; and Kimura, Tsutomu, 4,922,289, Cl. 355-29.000.

King, Christine A.: *See—*
Newman, Alex T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,920,870, Cl. 99-289.00R.

King, Frank E.; and Lang, Reginald W. Break-away coupling for hoselines. 4,921,000, Cl. 137-68.100.

King Industries, Inc.: *See—*
Calbo, Leonard J., Jr.; and Gallacher, Lawrence V., 4,922,002, Cl. 560-193.000.

King, James L.: *See—*
Frank, James P.; and King, James L., 4,922,062, Cl. 200-80.00R.

Kingston Technologies, L.P.: *See—*
Delahanty, Francis T., Stoy, Vladimir A.; and Tong, Shiu-Bor, 4,921,323, Cl. 350-96.210.

Kinoshita, Takao: *See—*
Hashimoto, Seiji; Kinoshita, Takao; Takayama, Tsutomu; and Kaji, Toshio, 4,922,334, Cl. 358-44.000.

Kinoshita, Tatsuo; Minami, Shuji; and Kaneshige, Ryousuke, to Mitsui Petrochemical Industries, Ltd. Liquid polymer composition and use thereof. 4,922,046, Cl. 585-11.000.

Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Kikuchi, Nobuo; and Takahashi, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Process for manufacturing embossed articles of synthetic resin. 4,921,561, Cl. 156-219.000.

Kinugawa Rubber Industrial Co., Ltd.: *See—*
Nagata, Nobuyoshi; Sugiyama, Hideki; Uemura, Kiyotaka; and Takebayashi, Mikio, 4,920,699, Cl. 49-441.000.

Kinzer, Darryl W.: *See—*
Adams, Paul E.; and Kinzer, Darryl W., 4,921,992, Cl. 558-145.000.

Kioka, Mamoru; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Solid catalyst for olefin polymerization and processes for its production. 4,921,825, Cl. 502-104.000.

Kira, Kazuaki, to Kanegafachi Kagaku Kogyo Kabushiki Kaisha. Porous artificial vessel. 4,921,495, Cl. 623-1.000.

Kirk, Francis G. Bicycle and frame therefor. 4,921,267, Cl. 280-281.100.

Kirkling, William C. Time dial for pharmaceutical containers. 4,920,912, Cl. 116-308.000.

Kishiki, Hiroshi: *See—*
Nakamura, Toyokazu; Kato, Yuzi; Nacmura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, 4,921,632, Cl. 252-299.100.

Kishimoto, Shoji; Tomimatsu, Kiminori; Miyake, Akio; and Yoshimura, Yoshinobu, to Takeda Chemical Industries, Ltd. Cephem compounds, their production and use. 4,921,851, Cl. 514-203.000.

Kissick, William E., Jr.: *See—*
Frickman, Jay P.; Kissick, William E., Jr.; and McMahon, Kevin R., 4,921,614, Cl. 210-695.000.

Kistler Instrumente AG: *See—*
Mario, Giorgetta, 4,922,188, Cl. 324-130.000.

Kitagawa, Tsuneo: *See—*
Takano, Yoshiaki; and Kitagawa, Tsuneo, 4,922,295, Cl. 355-209.000.

Kitajima, Tomoya, to Ricoh Company, Ltd. Distance measuring device for automatic focusing camera. 4,922,281, Cl. 354-404.000.

Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Kume, Takanori; and Negawa, Hideo, to Sumitomo Chemical Company, Limited. Mulching film for repelling insect pests. 4,920,692, Cl. 47-9.000.

Kitamura, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Water-cooled alternator for vehicle. 4,922,148, Cl. 310-68.00D.

Kitano, Yasuyuki: *See—*
Sasaki, Shosuke; and Kitano, Yasuyuki, 4,920,753, Cl. 62-51.300.

Kitaura, Shinko; Takahara, Yoshimasa; Nagai, Shiro; and Nishio, Naomichi, to Kabushiki Kaisha Kobe Seiko Sho. Fermentation method. 4,921,799, Cl. 435-167.000.

Kitoh, Kyosuke: *See—*
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.

Kitoh, Norimasa: *See—*
Kawasaki, Shinzo; Umeda, Kaoru; and Kitoh, Norimasa, 4,922,170, Cl. 318-434.000.

Kittrell, James M.: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,921,733, Cl. 428-34.200.

Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, to Pioneer Electronic Corporation. Playing method for disk player. 4,922,476, Cl. 369-47.000.

Kjersem, Jens A. Chair. 4,921,304, Cl. 297-452.000.

Klapproth, Kenneth H.: *See—*
Hall, Theodore W.; and Klapproth, Kenneth H., 4,921,401, Cl. 415-138.000.

Klapwijk, Pieter M.: *See—*
Kuiper, Jan; Verhue, Walter M., and Klapwijk, Pieter M., 4,921,716, Cl. 426-534.000.

Klar, Erhard; Svilar, Mark; and Berry, David F., to SCM Metal Products, Inc. Process for preparing powder metal parts with dynamic properties. 4,921,665, Cl. 419-23.000.

Kleer, Gunter: *See—*
Schinker, Martin; Brormann, Johannes; Stahn, Dieter; Doll, Walter; Kleer, Gunter; and Manns, Peter, 4,921,519, Cl. 65-39.000.

Kleff, Gunter: *See—*
van Ackeren, Paul; Schmitz, Karl-Heinz; Stache, Bernfried; Kleff, Gunter; and Becker, Heinrich, 4,922,505, Cl. 373-9.000.

Klevan, Leonard: *See—*
Gebeyehu, Gulilat; Klevan, Leonard; and Harding, John D., 4,921,805, Cl. 435-270.000.

Klimt, Ulrich, to Alfred Teves GmbH. Inwardly straddling disc brake, in particular for automotive vehicles. 4,921,077, Cl. 188-73.450.

Klomp, Edward D., to General Motors Corporation. Two cycle engine with vaned diffusing exhaust port. 4,920,931, Cl. 123-65.0PE.

Klopfenstein, Andrew L., to AM International Incorporated. Spring wire gripper jaw. 4,921,294, Cl. 294-99.100.

Kloss, Gunter; Schuhmacher, Gustav; and Gramm, Fritz, to C. & E. Fein GmbH & Co. Portable grinder. 4,920,702, Cl. 51-170.00R.

Klutz, Hans J.; Flora, Bruno; Gilles, Gerard; and Wies, Georges, to Paul Wurth S.A.; and Rheinische Braunkohlenwerke AG. Device and method for uniformly distributing materials on a circular surface. 4,921,086, Cl. 193-3.000.

Knepper, Ronald W.: *See—*
Chin, William B.; Dussault, Rudolph D.; Knepper, Ronald W.; Wernicke, Friedrich C.; and Wong, Robert C., 4,922,455, Cl. 365-154.000.

Knifton, John F.: *See—*
Sanderson, John R.; Knifton, John F.; and Marquis, Edward T., 4,922,033, Cl. 568-909.800.
Sanderson, John R.; Marquis, Edward T.; and Knifton, John F., 4,922,036, Cl. 568-909.800.

Knight, Thomas F.: *See—*
Holloway, John T.; Moon, David A.; Cannon, Howard I.; Knight, Thomas F.; Edwards, Bruce E.; and Weinreb, Daniel L., 4,922,414, Cl. 364-200.000.

Knoblauch, Karl: *See—*
Juntgen, Harald; Knoblauch, Karl; Richter, Ekkehard; and Kuhl, Helmut, 4,921,826, Cl. 502-180.000.

Knodler, Reinhard; and Reiss, Karl, to Asea Brown Boveri Aktiengesellschaft. Electrochemical storage cell. 4,921,766, Cl. 429-104.000.

Knoll, Berta: *See—*
Knoll, Jozsef; Budai, ne Simonyi; Katalin: Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.
Knoll, Jozsef; Budai nee Simonyi, Katalin; Berenyi nee Poldermann, Edit; Miklya, Ildiko ; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,960, Cl. 546-153.000.
Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan, and Gacsalyi, Istvan, to BASF Aktiengesellschaft. Pharmaceutical compositions. 4,921,861, Cl. 514-312.000.
Knoll, Jozsef; Budai nee Simonyi, Katalin; Berenyi nee Poldermann, Edit; Miklya, Ildiko ; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, to BASF Aktiengesellschaft. Quinoline thioethers. 4,921,960, Cl. 546-153.000.

Knolle, Jochen: *See—*
Breipohl, Gerhard; Knolle, Jochen; and Stuber, Werner, 4,922,015, Cl. 562-451.000.

Knop, Reinhard; Sommer, Herbert; and Muller, Georg, to Jagenberg Aktiengesellschaft. Device for coating a web of material. 4,920,913, Cl. 118-410.000.

Knops, Hans-Joachim: *See—*
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; and Reinecke, Paul, 4,921,870, Cl. 514-383.000.

Knorr-Bremse AG: *See—*
Vollmer, Otto; and Rauscher, Wolfgang, 4,921,311, Cl. 303-9.760.

Knorr, Harald: *See—*
Schutze, Rainer; and Knorr, Harald, 4,922,013, Cl. 562-15.000.

Knowles, Steven M.: *See—*
Spalink, Robert D.; Knowles, Steven M.; and Kosztowny, John T., 4,921,013, Cl. 137-614.050.

Ko, Yoon S.: *See—*
Daumit, Gene P.; Ko, Yoon S.; Slater, Christopher R.; Venner, Jozef G.; and Young, Chi C., 4,921,656, Cl. 264-85.000.

Kobari, Yuji: *See—*
Imaseki, Takashi; and Kobari, Yuji, 4,921,060, Cl. 180-41.000.

Kobayashi, Hideaki; and Shindo, Masahiro, to International Chip Corporation; and Ricoh Company, Ltd. Knowledge based method and apparatus for designing integrated circuits using functional specifications. 4,922,432, Cl. 364-490.000.

VOL
1114
ISS
1
MY
1990
UMI

Kobayashi, Hirokazu, to Kabushiki Kaisha Kenwood. Multi-channel PCM music broadcasting system. 4,922,483, Cl. 370-50.000.
Kobayashi, Mitsugu: *See*—
Kuwano, Yukinori; Mori, Noriyuki; Nakano, Shoichi; Uehara, Hisao; Kobayashi, Mitsugu; Watanabe, Kaneo; and Noguchi, Shigeru, 4,922,111, Cl. 250-566.000.
Kocal, Joseph A.; Martindale, David C.; and Kuchar, Paul J., to UOP. Hydrocarbon conversion process. 4,921,946, Cl. 585-444.000.
Kock, Birgit: *See*—
Naumann, Dieter; Tyrra, Wieland; Kock, Birgit; Rudolph, Werner; and Wilkes, Bernd, 4,922,041, Cl. 570-141.000.
Koek, Kevin C., to Eastman Kodak Company. Encoder mount. 4,922,247, Cl. 341-2.000.
Koether, Bernard G.; and Pasquini, Mario, to Micro-Technology Licensing Corporation. Parameter control system for an oven. 4,920,948, Cl. 126-21.00A.
Koga, Masahiro: *See*—
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,921,995, Cl. 558-441.000.
Kogane, Mikio; and Kimura, Tsutomu, to Fuji Photo Film Co., Ltd. Photographic film carrier. 4,922,289, Cl. 355-29.000.
Koganei Seiki Seisakusho: *See*—
Hosoya, Norio, 4,920,703, Cl. 51-287.000.
Koglin, Gunter W. W.: *See*—
Mohr, Michael A.; and Koglin, Gunter W. W., 4,920,823, Cl. 74-553.000.
Kohigashi, Taiji; and Koyama, Miki, to Kurashiki Boseki Kabushiki Kaisha. Spectrophotometer comprising a xenon flashtube as a light source. 4,921,351, Cl. 356-323.000.
Kohlbach, Friedrich R., to Bowater Packaging Limited. Method and apparatus for the continuous preservation of lumpy products such as food product in lump form. 4,921,719, Cl. 426-521.000.
Kohler, Manfred; Ohngemach, Jorg; and Poetsch, Eike, to Merck Patent Gesellschaft mit beschrankter Haftung. Copolymerizable photoinitiators. 4,922,004, Cl. 560-221.000.
Kohn, Siegfried W., to Aktiebolaget Electrolux. Arrangement in a vacuum cleaner. 4,920,607, Cl. 15-339.000.
Koike, Mikio: *See*—
Hara, Kazumasa; Koike, Mikio; Nishijima, Mitsuru; and Okutani, Koji, 4,920,903, Cl. 112-229.000.
Koito Seisakusho Co., Ltd.: *See*—
Nino, Naohi, 4,922,389, Cl. 362-61.000.
Koizumi, Mitsuyoshi: *See*—
Noguchi, Minori; Koizumi, Mitsuyoshi; Shishido, Hiroaki; Uto, Sachio; and Ohshima, Yoshimasa, 4,922,308, Cl. 356-237.000.
Kokubun, Yoshihiro: *See*—
Nitta, Koichi; Nishikawa, Yukie; Ishikawa, Masayuki; Tsuburai, Yasuhiko; and Kokubun, Yoshihiro, 4,922,499, Cl. 372-46.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Endoh, Toshiaki, and Yamazaki, Yasuhiro, 4,922,545, Cl. 382-56.000.
Kolts, John H., to Phillips Petroleum Company. Catalyst for the oxidation of carbon monoxide. 4,921,830, Cl. 502-326.000.
Komatsu, Norimasa; and Miyazaki, Asashi, to Alps Electric Co., Ltd. Mechanism for driving the reels of a tape player. 4,922,357, Cl. 360-105.000.
Komatsu, Norimasa, to Alps Electric Co., Ltd. Double-cassette tape player. 4,922,358, Cl. 360-105.000.
Komatsu, Shuichi: *See*—
Ikegawa, Sumio; Terashima, Yoshiaki; Yasuda, Nobuaki; Ichihara, Katsutarou; Komatsu, Shuichi; and Arai, Shinji, 4,922,462, Cl 365-113.000.
Komatu, Yuuki: *See*—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.
Komuro, Hirokazu: *See*—
Ikeda, Masami; and Komuro, Hirokazu, 4,922,269, Cl. 346-140.00R.
Kondo, Akihiro, to Mita Industrial Co., Ltd. Mounting structure of photosensitive drum. 4,922,297, Cl. 355-211.000.
Kondo, Satoki: *See*—
Shiraishi, Takao; and Kondo, Satoki, 4,921,578, Cl. 177-25.190.
Konica Corporation: *See*—
Ito, Takashi; and Sakamoto, Norio, 4,921,155, Cl. 226-181.000.
Nakayama, Noritaka; and Masukawa, Toyoaki, 4,921,783, Cl. 430-558.000.
Takamuki, Yasuhiko; and Uesawa, Yutaka, 4,921,781, Cl. 430-496.000.
Yonekawa, Hisashi; and Takeuchi, Hiroshi, 4,922,273, Cl. 358-429.000.
Konishi, Keiichi: *See*—
Isozumi, Shuzoo; and Konishi, Keiichi, 4,922,149, Cl. 310-89.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Okui, Susumu; Hirabayashi, Tsugio; and Hamanaka, Izumi, 4,921,239, Cl. 271-186.000.
Takeuchi, Mikio, 4,922,100, Cl. 250-327.200.
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, 4,921,771, Cl. 430-110.000.
Yamasaki, Masahiko; and Kawakatsu, Satoshi, 4,921,791, Cl. 435-28.000.
Konrad, Eugen: *See*—
Clausen, Thomas, and Konrad, Eugen, 4,921,504, Cl. 8-415.000.
Lang, Gunther; Wendel, Harald; and Konrad, Eugen, 4,921,949, Cl. 536-20.000.
Konze, Jorg: *See*—
Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 4,921,528, Cl. 71-92.000.
Koomey, Paul C.; Savage, George M.; and Stewart, James T. Position and seal wear indicator for valves and blowout preventers. 4,922,423, Cl. 364-422.000.
Kopin Corporation: *See*—
Vu, Duy-Phach, 4,922,315, Cl. 357-35.000.
Kordak, Rolf; Nikolaus, Heinrich; and Metzner, Frank, to Mannesmann Rexroth GmbH. Hydraulic drive system. 4,920,748, Cl. 60-414.000.
Korenberg, Jacob; and Khinkis, Mark, to Donlee Technologies Inc. Boiler with cyclonic combustion. 4,920,925, Cl. 122-149.000.
Kosak, Dietmar; and Engel, Georg, to SMS Schloemann-Siemag Aktiengesellschaft. Method and reversing mill train for rolling particularly sheet piles. 4,920,777, Cl. 72-225.000.
Kosarzecki, Constantine, to Vickers Incorporated. Proportional priority flow regulator. 4,921,547, Cl. 137-115.000.
Koshino, Susumu; and Ogawa, Yuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Infrared filter cover plate for autofocus camera. 4,922,280, Cl. 354-403.000.
Koski, Oscar; and Marschman, Steven C., to Battelle Memorial Institute. Anode film formation and control. 4,921,584, Cl. 204-67.000.
Kosugi, Tatsuhiro; Ogawa, Takeshi; and Tanaka, Norio, to Toto, Ltd. Method for controlling the preheating zone of a tunnel kiln. 4,921,422, Cl. 432-24.000.
Kosztowny, John T.: *See*—
Spalink, Robert D.; Knowles, Steven M.; and Kosztowny, John T., 4,921,013, Cl. 137-614.050.
Kotani, Hiroshi; Inoue, Yoshiyuki; Kadota, Yasushi; Sakakibara, Hidekazu; Ide, Kazuo; and Sumida, Kanichi, to Koyo Seiko Co. Universal joint. 4,921,470, Cl. 464-151.000.
Kotani, Kozo: *See*—
Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Kume, Takanori; and Negawa, Hideo, 4,920,692, Cl. 47-9.000.
Kouda, Masahiro: *See*—
Tani, Naohiko; Kouda, Masahiro; Ito, Atsushi; and Miwa, Yuji, 4,921,376, Cl. 409-131.000.
Kouno, Masahiro: *See*—
Osawa, Masanori; Shizuka, Kohei; Kouno, Masahiro; Matsuyama, Akio; Katsuoka, Hirotoshi; and Mizutani, Kazumi, 4,921,933, Cl. 528-348.000.
Kouyama, Toshitaka: *See*—
Tagaya, Kiyoshi; Hirose, Satoshi; Iwasaki, Takao; Kouyama, Toshitaka; and Sakaguchi, Yasuo, 4,921,758, Cl. 428-419.000.
Kovanyi, Gyorgyi nee Lax: *See*—
Bozsing, Daniel; Kovanyi, Gyorgyi nee Lax; Berenyi, Edit nee Poldermann; Magyar, Karoly; Tuboly, Sandor; and Mandi, Attila, 4,921,854, Cl. 514-224.200.
Kowarik, Oskar: *See*—
Hoffmann, Kurt; Kowarik, Oskar; Kraus, Rainer; Lustig, Bernhard; and Oberle, Hans-Dieter, 4,922,134, Cl. 307-441.000.
Koyama, Miki: *See*—
Kohigashi, Taiji; and Koyama, Miki, 4,921,351, Cl. 356-323.000.
Koyama, Naoki: *See*—
Takano, Hisashi; Koyama, Naoki; Yuito, Isamu; Shiiki, Kazuo; and Tanabe, Hideo, 4,922,360, Cl. 360-113.000.
Koyama, Shinichi: *See*—
Murahashi, Hiroyuki; Akutsu, Yukio; and Koyama, Shinichi, 4,920,700, Cl. 51-124.00L.
Koyama, Takeshi; and Ohtaka, Keiji, to Canon Kabushiki Kaisha. Optical apparatus for leading light fluxes transmitted through light dividing surface which is obliquely provided to focus detecting apparatus. 4,922,282, Cl. 354-406.000.
Koyashiki, Keiichirou: *See*—
Mitsui, Kazuhiko; Kumamoto, Kazuo; and Koyashiki, Keiichirou, 4,921,744, Cl. 428-116.000.
Mitsui, Kazuhiko; Kumamoto, Kazuo; and Koyashiki, Keiichirou, 4,921,745, Cl. 428-118.000.
Koyo Seiko Co.: *See*—
Kotani, Hiroshi; Inoue, Yoshiyuki; Kadota, Yasushi; Sakakibara, Hidekazu; Ide, Kazuo; and Sumida, Kanichi, 4,921,470, Cl. 464-151.000.
Kozakai, Motokazu: *See*—
Kato, Tsugiji; Aoyama, Kunitoshi; and Kozakai, Motokazu, 4,921,095, Cl. 206-328.000.
Kozicki, Andrzej; and Brower, Leo C., to Uticor Technology, Inc. Voltage regulator circuit for use in a programmable message display. 4,922,243, Cl. 340-813.000.
Kracht, Thomas F.: *See*—
Vail, Curtis F.; Dietze, Robert H.; Kracht, Thomas F.; Cole, Joanne H.; and Hewko, Marc D., 4,920,697, Cl. 49-348.000.
Krakau, Herbert B.: *See*—
Morganstein, Sanford J.; Mehta, Bakulesh A.; and Krakau, Herbert B., 4,922,526, Cl. 379-157.000.
Kraljic, John: *See*—
Burke, John; and Kraljic, John, 4,920,895, Cl. 108-26.000.
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; and Reinecke, Paul, to Bayer Aktiengesellschaft. Fungicidal novel substituted phenethyl-triazolyl derivatives. 4,921,870, Cl. 514-383.000.
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, to Bayer Aktiengesellschaft. Novel alkylcycloalkyl triazolylmethyl ketones as fungicide intermediates. 4,921,967, Cl. 548-267.800.
Kramer, Wolfgang: *See*—
Gayer, Herbert; Jelich, Klaus; Kramer, Wolfgang; and Brandes, Wilhelm, 4,921,993, Cl. 558-392.000.

Kranz, Eckart: *See*—
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 4,921,967, Cl. 548-267.800.
Krasznai, Charles Z.: *See*—
Gerke, Burton E., Jr.; Bitzel, Michael E.; Kubicko, Robert; and Krasznai, Charles Z., 4,920,606, Cl. 15-338.000.
Kraus, Rainer: *See*—
Hoffmann, Kurt; Kowarik, Oskar; Kraus, Rainer; Lustig, Bernhard; and Oberle, Hans-Dieter, 4,922,134, Cl. 307-441.000.
Krause, Duane K., to Chrysler Corporation. Rack latch assembly. 4,921,100, Cl. 206-448.000.
Krautter, Jurgen: *See*—
Vetter, Kurt; Schulze, Werner; Krautter, Jurgen; and Hafner, Kurt, 4,920,997, Cl. 134-57.00R.
Krcova, Zuzana: *See*—
Sulc, Jiri; and Krcova, Zuzana, 4,921,497, Cl. 623-6.000.
Kremenets, Yury D. Method and furnace for melting inorganic materials. 4,921,521, Cl. 65-135.000.
Kremer, Wolfgang: *See*—
Meixner, Jurgen; Kremer, Wolfgang; and Muller, Manfred, 4,921,883, Cl. 522-107.000.
Krenkel, Christian: *See*—
Lixl, Georg; and Krenkel, Christian, 4,921,425, Cl. 433-62.000.
Krespan, Carl G.; and Smart, Bruce E., to Du Pont de Nemours, E. I., and Company. Preparation of 1,1,1,2-tetrafluorodichloroethane. 4,922,038, Cl. 570-175.000.
Kreuzer, Erwin: *See*—
Zierl, Richard; Kreuzer, Erwin; and Zuckermayr, Alfred, 4,922,117, Cl. 250-372.000.
Krikke, Germen K.; and Teule, Hendrik, to U.S. Philips Corporation. System for providing secure telecommunication access to a computer. 4,922,521, Cl. 379-95.000.
Krimmer, Hans-Peter; Drauz, Karlheinz; and Werner, Silvia, to Degussa Akteingesellschaft. Method of preparing alkaline earth metal salts of 2-pyrrolidone-5-carboxylic acid. 4,921,971, Cl. 548-534.000.
Krishnan, Iyengar N.; and Toegel, Herbert J., to Alcatel USA, Corp. Interface device comprising end message storing and interrupt service registers for directing segmented message transfer between intelligent switch and microcomputer. 4,922,416, Cl. 364-200.000.
Krishnasastry, Remesh B.: *See*—
Roberts, Glyn; Paynter, Gordon; and Krishnasastry, Remesh B., 4,922,212, Cl. 331-176.000.
Kroes, Anthony: *See*—
Van Engen, Pieter G.; and Kroes, Anthony, 4,922,157, Cl. 315-248.000.
Kroll, Arthur S.: *See*—
Hill, Lawrence A.; Jacobs, Michael E.; Kroll, Arthur S.; and Williams, Ralph E., 4,922,302, Cl. 355-251.000.
Kropkowski, James; and Colodner, Jesse L., to Kropkowski, James M. Boardgame combining two levels of play. 4,921,249, Cl. 273-256.000.
Kropkowski, James M.: *See*—
Kropkowski, James; and Colodner, Jesse L., 4,921,249, Cl. 273-256.000.
Krueger, James W.: *See*—
Crawford, Donald C.; Ross, Jeffrey L.; and Krueger, James W., 4,921,092, Cl. 198-460.000.
Krulich, Ronald F. Staple remover. 4,921,216, Cl. 254-28.000.
Krupp Koppers GmbH: *See*—
Linke, Adolf; Dutz, Karl-Heinz; Niermann, Hans; and Wilmer, Gerhard, 4,920,926, Cl. 122-379.000.
Kruse, Hubert: *See*—
Effenberger, Gunther; and Kruse, Hubert, 4,921,505, Cl. 8-526.000.
Kryter, Karl D., to Acousis Company. Golf club with stroke guiding device. 4,921,660, Cl. 273-164.000.
Kubicko, Robert: *See*—
Gerke, Burton E., Jr.; Bitzel, Michael E.; Kubicko, Robert; and Krasznai, Charles Z., 4,920,606, Cl. 15-338.000.
Kubo, Shinji: *See*—
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,921,959, Cl. 546-152.000.
Kubota Limited: *See*—
Sakano, Kenji; Nakashima, Hideyuki; Sakanaka, Hiroo; and Okamoto, Kazutoshi, 4,920,930, Cl. 123-41.860.
Yoshimura, Shigeo; Ishino, Renshiro; Takada, Shiro; and Kimura, Hitoshi, 4,920,809, Cl. 75-862.360.
Kubota, Tohru: *See*—
Ishihara, Toshinobu; Endo, Mikio; Kubota, Tohru; and Tanaka, Yasuhisa, 4,921,989, Cl. 556-431.000.
Kuchar, Paul J.: *See*—
Kocal, Joseph A.; Martindale, David C.; and Kuchar, Paul J., 4,921,946, Cl. 585-444.000.
Kudzma, Linas V.; Spencer, H. Kenneth; and Severnak, Sherry A., to BOC, Inc. 4-Phenyl-4-(N-(phenyl)amido) piperidine derivatives and pharmaceutical compositions and method employing such compounds. 4,921,864, Cl. 514-326.000.
Kuehbauch, Gerd, to Robert Bosch GmbH. Window washer apparatus for a motor vehicle window. 4,920,602, Cl. 15-250.040.
Kuehnel, Wolfgang, to Sennheiser Electronic KG. Capacitive sound transducer. 4,922,471, Cl. 367-181.000.
Kugo, Masaru; and Ito, Hiroshi, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Multi-shade color liquid crystal display apparatus. 4,922,239, Cl. 340-753.000.
Kuhl, Helmut: *See*—
Juntgen, Harald; Knoblauch, Karl; Richter, Ekkehard; and Kuhl, Helmut, 4,921,826, Cl. 502-180.000.
Kuhler, Paul, to Gruter Elektroapparate AG. Heating and cooling arrangement particularly for an extrusion cylinder. 4,921,355, Cl. 366-146.000.
Kuiper, Jan; Verhue, Walter M.; and Klapwijk, Pieter M., to Unilever Patent Holdings B.V. Aroma composition containing alpha-acetolactic acid. 4,921,716, Cl. 426-534.000.
Kukanskis, Peter E.; and Whitmore, Bryan, to MacDermid, Incorporated. Inhibited composition and method for stripping tin, lead or tin-lead alloy from copper surfaces. 4,921,571, Cl. 156-656.000.
Kuki, Heiji; and Kurimoto, Naoya, to Sumitomo Wiring Systems, Ltd.; and Sumitomo Electric Industries, Ltd. Junction box containing a printed circuit board. 4,922,380, Cl. 361-399.000.
Kulikowski, Ernest F.: *See*—
Fournier, Paul J. E.; and Kulikowski, Ernest F., 4,921,258, Cl. 277-29.000.
Kumamoto, Kazuo: *See*—
Mitsui, Kazuhiko; Kumamoto, Kazuo; and Koyashiki, Keiichirou, 4,921,744, Cl. 428-116.000.
Mitsui, Kazuhiko; Kumamoto, Kazuo; and Koyashiki, Keiichirou, 4,921,745, Cl. 428-118.000.
Kume, Takanori: *See*—
Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Kume, Takanori; and Negawa, Hideo, 4,920,692, Cl. 47-9.000.
Kung, Teh-Ming; Vreeland, William B.; and Young, Ralph H., to Eastman Kodak Company. Naphthoquinone derivatives. 4,921,637, Cl. 552-295.000.
Kunieda, Shin-ichi; and Ozawa, Masahide, to NEC Electronics Inc. Method for testing semiconductor devices. 4,921,810, Cl. 437-8.000.
Kunieda, Yoshio; Okamoto, Toshishige; and Furukawa, Satoshi, to Brother Kogyo Kabushiki Kaisha. Word processing system having small-sized and large-sized displays for simultaneous display and automatic power shut-off circuit. 4,922,448, Cl. 364-900.000.
Kunisada, Takeshi; Doumen, Susumu; and Haga, Toshiaki, to Kyokuto Kaihatsu Kogyo, Co., Ltd. Apparatus for crushing things. 4,921,176, Cl. 241-260.100.
Kunkle, John P.: *See*—
Cooper, Ralph M.; Hollingsworth, Dana; Kunkle, John P.; and Stillie, Donald G., 4,921,437, Cl. 439-275.000.
Kunugi, Masanao; Kurihara, Hajime; and Mizumoto, Teruyuki, to Seiko Epson Corporation. Electrophotographic image forming. 4,921,768, Cl. 430-45.000.
Kunz, Barbara L.; and Hahn, Kenneth G., Jr., to Glidden Company, The. Low temperature cure emulsions. 4,921,888, Cl. 523-310.000.
Kunz, Peter, to Georg Fisher AG. Apparatus for manufacturing a welded connection of tubular components of thermoplastic material. 4,921,570, Cl. 156-503.000.
Kuraray Company, Ltd.: *See*—
Higashinaka, Yukitoshi, 4,920,617, Cl. 24-442.000.
Negi, Taichi; Tanaka, Nobuo; and Yonezu, Kiyoshi, 4,921,907, Cl. 525-57.000.
Kurashiki Boseki Kabushiki Kaisha: *See*—
Kohigashi, Taiji; and Koyama, Miki, 4,921,351, Cl. 356-323.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Asano, Kiro; Mitsuhashi, Satoshi; Bannai, Kenji; Wada, Hisayuki; and Tamura, Humio, 4,921,849, Cl. 514-182.000.
Tagaya, Kiyoshi; Hirose, Satoshi; Iwasaki, Takao; Kouyama, Toshitaka; and Sakaguchi, Yasuo, 4,921,758, Cl. 428-419.000.
Kurihara, Hajime: *See*—
Kunugi, Masanao; Kurihara, Hajime; and Mizumoto, Teruyuki, 4,921,768, Cl. 430-45.000.
Kurimoto, Naoya: *See*—
Kuki, Heiji; and Kurimoto, Naoya, 4,922,380, Cl. 361-399.000.
Kuroda, Yasuo: *See*—
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,921,984, Cl. 556-40.000.
Kuroki, Hidefumi: *See*—
Arai, Hajime; Furuta, Isao; Kuroki, Hidefumi; Arima, Junichi; Hirata, Yoshihiro; and Harada, Shigeru, 4,922,321, Cl. 357-68.000.
Kuroki, Junsuke: *See*—
Yokote, Masatsugu; Ito, Hideo; Kawagoe, Kenji; and Kuroki, Junsuke, 4,922,427, Cl. 364-424.050.
Kuromatsu, Akio, to Applied Magnetic Lab. Co., Ltd. Blade cutting apparatus for hard brittle material. 4,920,946, Cl. 125-11.010.
Kurozumi, Seizi: *See*—
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,921,995, Cl. 558-441.000.
Kurtz, Bruce E.: *See*—
Fraenkel, Howard A.; Ilardi, Joseph M.; Kurtz, Bruce E.; and Spicciati, Frank A., 4,921,777, Cl. 430-314.000.
Kusomoto, Toshihiko: *See*—
Sasaki, Nobukazu; Kasamura, Toshirou; Ohashi, Masashi; Okuda, Naoki; and Kusomoto, Toshihiko, 4,922,300, Cl. 355-245.000
Kussel, Barbara: *See*—
Hubert, Peter; Kussel, Barbara; and Wirz, Peter, 4,921,724, Cl. 427-41.000.
Kussmaul, Ernest A. Fabric marking system. 4,920,653, Cl. 33-18.100.
Kuwahara, Toru, to Isuzu Motors Limited. Methods of manufacturing a rear axlecase. 4,921,036, Cl. 164-76.100.
Kuwano, Yukinori; Meri, Noriyuki; Nakano, Shoichi; Uehara, Hisao; Kobayashi, Mitsugu; Watanabe, Kaneo; and Noguchi, Shigeru, to Sanyo Electric Co., Ltd. Card type image reader with means for relieving bending stress. 4,922,111, Cl. 250-566.000.
KWC AG: *See*—
Blattler, Ernst, 4,921,162, Cl. 236-12.120.

VOL
114
ISS
1
MY
1
1990
UMI

Kyinge, Daniel J.; Powers, Frederick A.; and Lehrke, Kenneth E., to Graco Inc. Non-icing quiet air-operated pump. 4,921,408, Cl. 417-368.000.

Kyokuto Kaihatsu Kogyo, Co., Ltd.: *See*—
Kunisada, Takeshi; Doumen, Susumu; and Haga, Toshiaki, 4,921,176, Cl. 241-260.100.

Kyotani, Takashi: *See*—
Tomita, Akira; Kyotani, Takashi; and Sonobe, Naohiro, 4,921,687, Cl. 423-448.000.

Kytola, Olli, to OK-Vise Ky. Rotary-pallet system. 4,921,378, Cl. 409-221.000.

L.S. Starrett Company, The: *See*—
Porter, Douglas R., 4,920,723, Cl. 52-606.000.

La Telemecanique Electrique: *See*—
Marie, Philipe; and Decelle, Pierre J., 4,921,455, Cl. 439-709.000.

LaBianca, Michael H., to Tarkett Inc. Flooring composite and method for making same. 4,920,720, Cl. 52-506.000.

Lacefield, William B: *See*—
Cohen, Marlene L.; Lacefield, William B.; and Robertsch, David W., 4,921,982, Cl. 549-462.000.

Lacroix, Guy. Preparation of esters of the N-phosphonomethylglycine and the N-phosphonomethyl glycines. 4,921,991, Cl. 558-135.000.

Laetus Systems Limited: *See*—
Pullan, Brian R., 4,922,181, Cl. 324-664.000.

Lafser, Fred A., Jr.; and Schreiber, Robert J., Jr., to Industrial Waste Management, Inc. Method for recycle and use of contaminated soil and sludge. 4,921,538, Cl. 106-100.000.

LaGattuta, Milton. Disposable straight razor and/or blade holder therefor. 4,920,644, Cl. 30-53.000.

Lagergren, Peter J.; Allen, C. Cameron, Jr.; and Lance, Lacy C., to Pandel Instruments, Inc. Automatic dispensing apparatus having low power consumption. 4,921,150, Cl. 222-639.000.

Lai, Ta-Wang: *See*—
Costello, Christine A.; Pinschmidt, Robert K., Jr.; and Lai, Ta-Wang, 4,921,621, Cl. 252-8.513.

Lajus, Pierre; and Caigant, Jean, to General Electric CGR SA. Isocentric x-ray equipment stand having four axes of rotation. 4,922,512, Cl. 378-197.000.

Lalezari, Iraj; and Lalezari, Parviz, to Montefiore Medical Center. Method of synthesis and novel compounds for pharmaceutical uses. 4,921,997, Cl. 560-34.000.

Lalezari, Parviz: *See*—
Lalezari, Iraj; and Lalezari, Parviz, 4,921,997, Cl. 560-34.000.

LaMarca, Drew P., to Automatic Switch Company. Proportional flow valve. 4,921,208, Cl. 251-30.040.

Lamprecht, Philipp; Piock, Richard; and Tasser, Siegfried, to Durst Phototechnik GmbH. Continuous processing machine for photographic sheet material. 4,922,276, Cl. 354-299.000.

Lanati, Paolo; Piccone, Alessandro; and D'Angelo, Domenico, to Alfa Lancia Industriale S.p.A. Ignition device for an internal combustion engine with two spark plugs per cylinder. 4,920,944, Cl. 123-638.000.

Lance, Lacy C.: *See*—
Lagergren, Peter J.; Allen, C. Cameron, Jr.; and Lance, Lacy C., 4,921,150, Cl. 222-639.000.

Landa, Benzion; Sagiv, Oded; and Levy, Nathan A. Copy sheet registration assembly for electrophotographic copier. 4,921,241, Cl. 271-245.000.

Landais, Francis, P. J., to Moulinex, Societe Anonyme. Household coffeemaker. 4,920,869, Cl. 99-283.000.

Landis, Robert A: *See*—
Adair, Paul C., Moore, Cheryl L.; and Landis, Robert A., 4,921,832, Cl. 503-201.000.

Landis, Timothy J. Visor-type mask for dentists. 4,920,576, Cl. 2-9.000.

Landuydt, Louis J. Fishing spinner. 4,920,685, Cl. 43-42.040.

Lane, Archie B., Jr.: *See*—
Burgess, William H.; Kaufman, Kenneth; and Lane, Archie B., Jr., 4,921,034, Cl. 162-109.000.

Lane, Donald, to Brandt, Inc. Sheet feeder having preactuated picker roller. 4,921,238, Cl. 271-37.000.

Lane, John D.; and Scheib, Thomas J., to Babcock & Wilcox Company, The. Apparatus and method using adaptive gain scheduling. 4,922,412, Cl. 364-157.000.

Lane, Joseph A.; and Jernberg, Robert H., to Amtrol Inc. Piercing surge regulator valve and apparatus. 4,921,004, Cl. 137-318.000.

Lang, Gunther; Wendel, Harald; and Konrad, Eugen, to Wella Aktiengesellschaft. Process for making quaternary chitosan derivatives for cosmetic agents. 4,921,949, Cl. 536-20.000.

Lang, Hans-Jochen: *See*—
Englert, Heinrich C.; Hropot, Max; Lang, Hans-Jochen; and Greger, Rainer, 4,921,875, Cl. 514-567.000.

Lang, Reginald W: *See*—
King, Frank E.; and Lang, Reginald W., 4,921,000, Cl. 137-68.100.

Langer, Robert S.: *See*—
Wheatley, Margaret A.; Langer, Robert S.; and Eisen, Herman N., 4,921,757, Cl. 428-402.200.

Langlet, Jean: *See*—
Leguillochet, Pierre; and Langlet, Jean, 4,920,879, Cl. 101-219.000.

Langley, Isaac L., to Hoeganaes Corporation. Filter assembly for molten polymeric material. 4,921,607, Cl. 210-266.000.

Lanham, Robert L.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whitlock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,921,733, Cl. 428-34.200.

Lantzsch, Reinhard; Brandes Wilhelm; Hansller, Gerd; Reinecke, Paul; and Lurssen, Klaus, to Bayer Aktiengesellschaft. 2-Hydroxyethylazole derivatives. 4,921,529, Cl. 71-92.000.

Lanxide Technology Company, LP: *See*—
Lesher, Harold D.; Kennedy, Christopher R.; White, Danny R.; and Urquhart, Andrew W., 4,921,818, Cl. 501-89.000.

Larsen, Raymond S.; and Walker, James T., to Analytek, Ltd. 10 Gigasample/sec two-stage analog storage integrated circuit for transient digitizing and imaging oscillography. 4,922,452, Cl. 365-45.000.

Larseneur, Patrick *See*—
Boiraeu, Christian; and Larseneur, Patrick, 4,921,371, Cl. 403-408.100.

Larsson, Arne, to Network Communications, Inc. Surface mounted box. 4,922,056, Cl. 174-65.00R.

Larsson, Bo: *See*—
Alm, Filip; Gulbrandsen, Sven; Larsson, Bo; and Ekdahl, Sune, 4,920,860, Cl. 91-504.000.

Larsson, Rolf A.: *See*—
Stromberg, Sven A. R.; and Larsson, Rolf A., 4,920,843, Cl. 83-346.000.

Laser Technologies Group, Inc.: *See*—
Schultz, Leonard S.; Gold, Jay F.; and Erdman, Rodney V., 4,921,492, Cl. 604-315.000.

Latin Percussion, Inc.: *See*—
Cohen, Wayne E., 4,921,103, Cl. 206-523.000.

LaTorraca, Gary J., to Puritan-Bennett Corporation. Humidifier module for use in a gas humidification assembly. 4,921,642, Cl. 261-142.000.

Lau, John R.; and Geho, W. Blair, to Technology Unlimited, Inc. Mucin directed lipsome. 4,921,644, Cl. 264-4.100.

Lau, John W.: *See*—
Enloe, Jack H.; Lau, John W.; Lundsager, Christian B.; and Rice, Roy W., 4,920,640, Cl. 29-852.000.

Lau, Jurgen; and Siegemund, Gunter, to Hoechst Aktiengesellschaft. Derivatives of 2,2-bis-(3-aminophenyl)hexafluoropropane and process for the preparation of 2,2-bis-(3,4-diaminophenyl)hexafluoropropane. 4,922,019, Cl. 564-332.000.

Laumen, Kurt: *See*—
Schneider, Manfred; Laumen, Kurt; Breitgoff, Detlef; Wullbrandt, Dieter; Schilingmann, Merten; and Keller, Reinhold, 4,922,001, Cl. 560-112.000.

Lausberg, Dietrich; and Seiler, Erhard, to BASF Aktiengesellschaft. Thermoplastic molding materials based on nylons and polyaryl ether ketones. 4,921,889, Cl. 523-400.000.

LaVelle, Richard E.; Wood, Gary L.; Morrey, Kevin P.; and Bossert, Clayton E., to Thomas J. Ring. Therapeutic table. 4,920,589, Cl. 5-61.000.

Lavin, John T., to BOC Group, Inc., The. Liquid-vapor contact columns. 4,921,641, Cl. 261-112.200.

Law, Kock-Yee; and Bailey, F. Courtney, to Xerox Corporation. Photoconductive imaging members with unsymmetrical squaraine compositions. 4,922,018, Cl. 564-307.000.

Lawassani, Abdi; Dowd, James D.; and Hilborn, David M., to United Technologies Automotive, Inc. Vehicle sun visor mounting arrangement. 4,921,300, Cl. 296-97.110.

Lawler, Anthony J., to Kemble Instrument Company Limited, The. Machine drive system. 4,922,173, Cl. 318-568.200.

Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M. L., to R. J. Reynolds Tobacco Company. Cigarette. 4,920,990, Cl. 131-359.000.

Lax, Alexander P., to Multitone Electronics PLC. Local oscillators for radio receivers. 4,921,467, Cl. 455-264.000.

LDJ Electronics, Inc.: *See*—
Jackson, Leon D.; Morris, Dan O., and Nagi, Thomas J., 4,922,200, Cl. 324-223.000.

Leach, Christopher B.; and Kaines, John L. Spacer for concrete reinforcing fabric. 4,920,724, Cl. 52-685.000.

Leanna, Gregory D., to Integrated Design Corp. Method of making parts for a magnetic cylinder. 4,920,630, Cl. 29-521.000.

LeBlanc, Jack: *See*—
Bonin, Yves; and LeBlanc, Jack, 4,921,896, Cl. 524-403.000.

LeBlanc, Patrick H., to Michigan State University. Method for producing analgesia in mammals. 4,921,853, Cl. 514-227.200.

Lebourg, Michel: *See*—
Petitjean, Gilbert; and Lebourg, Michel, 4,922,235, Cl. 340-686.000.

Lederman, Frederick E., to General Motors Corporation. Low friction roller control car. 4,921,084, Cl. 192-45.000.

Lee, Chi-Long; and Lutz, Michael A., to Dow Corning Corporation. Adhesion promoter for UV curable siloxane compositions and compositions containing same. 4,921,880, Cl. 522-12.000.

Lee, Chung Yup. Filtration apparatus having belts for treating waste product. 4,921,608, Cl. 210-393.000.

Lee, Fu M.; and Brown, Ronald E., to Phillips Petroleum Company. Extractive distillation of hydrocarbons employing solvent mixture. 4,921,581, Cl. 203-56.000.

Lee, John G.: *See*—
Seifert, Gottfried; Staubli, Sebastian; Wieland, Josef H.; Regenass, Willy; Buerli, Martin; Lee, John G.; and Lund, Richard B., 4,922,008, Cl. 562-58.000.

Lee, Kuo-Hua; Lu, Chih-Yuan; and Yaney, David S., to American Telephone and Telegraph Company. Folded extended window field effect transistor. 4,922,311, Cl. 357-23.100.

Lee, Kyu H.; and Morris, Livingston B., to Therakos, Inc. Multicomponent fluid separation and irradiation system. 4,921,473, Cl. 494-27.000.

Lee, Len F.; and Miller, Maria L., to Monsanto Company. Certain 3,5-pyridine dicarboxylates, their thio analogues having herbicidal activity. 4,921,530, Cl. 71-94.000.

Lee, Michael C.; Behrens, Robert N.; Dobberpuhl, Dale P.; Wykhuis, Lloyd A.; and Montgomery, Dix S., to Deere & Company. Hydraulic lift with weight transfer. 4,920,732, Cl. 56-10.200.

Lee, Robert W.: *See*—
Vernia, Peter; and Lee, Robert W., 4,921,551, Cl. 148-101.000.

Lee, Shy-Fuh; Luehr, Gary W.; Scott, Carol R.; and Trueb, Werner, to Sandoz Ltd. Substituted bicycloakly-1,3-diones. 4,921,526, Cl. 71-86.000.

Leenderts, Everardus J. A. M.: *See*—
Witkamp, Hendrik A.; Verweij, Jan; DeKoning, Jan J.; Grootveld, Herman H.; and Leenderts, Everardus J. A. M., 4,921,954, Cl. 540-222.000.

Legrand, Yves: *See*—
Pommier, Yves; and Legrand, Yves, 4,921,918, Cl. 526-88.000.

Leguillochet, Pierre; and Langlet, Jean, to Sermatec. Printing apparatus having an integral speed pickup wheel. 4,920,879, Cl. 101-219.000.

Lehnus, Gary: *See*—
Schiff, Robert; Lehnus, Gary; Wasserman, Charles J.; and Garlock, Henrietta M., 4,921,809, Cl. 436-531.000.

Lehrke, Kenneth E.: *See*—
Kyinge, Daniel J.; Powers, Frederick A., and Lehrke, Kenneth E., 4,921,408, Cl. 417-368.000.

Lehtinen, Matti J.: *See*—
Ristimaki, Mikko V.; Lehtinen, Matti J., Lindstrom, Krister J., and Hartzell, Rolf R., 4,920,727, Cl. 53-252.000.

Leiserson, Charles E.: *See*—
Cormen, Thomas H.; and Leiserson, Charles E., 4,922,246, Cl. 340-825.900.

Leivo, Patricia A.: *See*—
Lunt, James; May, Susan A. M.; and Leivo, Patricia A., 4,921,910, Cl. 525-74.000.

Lejard, Jeans-Yves L.: *See*—
Fonsalas, Frederic L. J.; Lejard, Jeans-Yves L.; Hayet, Pascal F. P.; and Le Queau, Marcel R., 4,922,342, Cl. 358-138.000.

Le Marchand, Alain; and Moumaneix, Francis, to Guilbert-Express. Gas-fired heating device. 4,920,951, Cl. 126-403.000.

Lemieux, Paul R.: *See*—
Rumpf, David S.; and Lemieux, Paul R., 4,921,820, Cl. 501-128.000.
Rumpf, David S.; and Lemieux, Paul R., 4,921,821, Cl. 501-128.000.

Lenney, William E.; and Iacoviello, John G., to Air Products and Chemicals, Inc. Vinyl acetate-ethylene copolymer emulsions prepared in the presence of a stabilizing system of a low molecular weight polyvinyl alcohol and a surfactant. 4,921,898, Cl. 524-459.000.

Lentz, Gregory A.: *See*—
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Landa, Benzion; Sagiv, Oded; and Levy, Nathan A., 4,921,241, Cl. 271-245.000.

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Kearsley, Andrew J.; Lewis, Richard R.; and Naylor, Graham A., 4,922,498, Cl. 372-25.000.

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Hubert, Peter; Kussel, Barbara; and Wirz, Peter, 4,921,724, Cl. 427-41.000.
Modlinski, Ulrich; and Wiegleb, Gerhard, 4,922,108, Cl. 250-504.00R.

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Bercovitz, Christian; and Feyjoo, Alexandre, 4,922,109, Cl. 250-556.000.

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Wang, Henry Y.; and Li, Xiang M., 4,921,582, Cl. 204-153.100.

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Rademachers, Jakob; Ganter, Karl-Werner; Rambold, Wolfgang; and Linde, Gunter, 4,921,542, Cl. 106-456.000.

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Flachenecker, Gerhard; Fastenmeier, Karl; and Lindenmeier, Heinz, 4,922,210, Cl. 331-167.000.

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White, William R.; Dahlstrom, Mary A.; and Lindholm, Scott O., 4,922,045, Cl. 585-10.000.

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Ryder, Francis E.; and Lisak, Stephen P., 4,922,387, Cl. 362-61.000.

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Hassenpflug, Wolfgang, 4,922,258, Cl. 342-462.000.
Little, Carol E. Candelabrum. 4,921,421, Cl. 431-295.000.
Littlejohn, Hugh K.: *See—*
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Lo mer, Weston R., 4,920,891, Cl. 104-102.000.
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Hsieh, Sheng-Shun; and Liu, Ting-Chih, 4,922,226, Cl. 340-521.000.
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Woodle, Allan S., IV; and Benoit, Marcell N., 4,921,059, Cl. 177-211.000.
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Funke, Hermann D.; and Lodewyk, Jozef H., 4,920,965, Cl. 128-419.0PG.
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Bernhardt, Randal J.; Loeb, Melvin L.; and Kay, James W., 4,921,942, Cl. 424-59.000.
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Grecksch, Hans; Bertrams, Josef; and Loers, Wolfgang, 4,921,180, Cl. 242-35.50A
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Hall, Timothy C.; Loesch-Fries, L. Sue; Jarvis, Nancy P.; and Barker, Richard F., 4,921,802, Cl. 435-172.300.
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Vander Meer, Robert K.; Lofgren, Clifford S.; and Williams, David F., 4,921,696, Cl. 424-84.000.
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Andre, Jean-Luc, 4,921,218, Cl. 254-98.000.
Lomax, Terence J.: *See—*
Banks, Nigel H.; Borton, Colin A.; Leonce, Francis S.; Lomax, Terence J.; Meier, Antony R. H.; and Skiba, Christopher J., 4,921,702, Cl. 424-404.000.
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Castellari, Angelo, 4,920,943, Cl. 123-572.000.
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Blumenshine, Kent M.; Marcus, Harris L.; and Long-Daugherty, Kathleen A., 4,922,326, Cl. 357-80.000.
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Mair, Franz; and Lonner, Wolfgang, 4,920,622, Cl. 26-75.000.
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McGahee, Welbourne D., and Campbell, John W. (said Welbourne D. McGahee assors. to), 4,920,686, Cl. 43-42.240.
Loos, Horst, to Siegenia-Frank KG Connecting rod gearing. 4,921,285, Cl. 292-39.000.
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Ivers, Douglas E., 4,921,272, Cl. 280-707.000.
L'Oreal: *See—*
Grollier, Jean-Francois, 4,921,170, Cl. 239-304.000.
Lorimor, Larry W., to Caterpillar Inc. Load piston reset control mechanism. 4,920,861, Cl. 91-446.000.
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Berthold, Heinz; Beck, Josef; and Lotter, Manfred, 4,920,856, Cl. 91-6.500.
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Aikins, Robert D.; Bandy, Lee R., Davis, William P.; Delaney, Robert E.; Guyer, Michael E.; Lovera, Edward D.; and Scamuffa, Thomas A., 4,920,627, Cl. 29-402.080.
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Lowel, Helmut, to Alcatel N.V. Circuit for shaping a measurement-signal voltage into a square-wave signal. 4,922,126, Cl. 307-261.000.
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Lee, Kuo-Hua; Lu, Chih-Yuan; and Yaney, David S., 4,922,311, Cl. 357-23.100.
Lu, Nicky C.: *See—*
Dhong, Sang H.; Hwang, Wei; and Lu, Nicky C., 4,922,128, Cl. 307-269.000.
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Adams, Paul E.; and Kinzer, Darryl W., 4,921,992, Cl. 558-145.000.
Lucas, David R. S.: *See—*
Dunn, Trevor R.; Lucas, David R. S.; North, Ben B.; and Joyce, Timothy R., 4,922,189, Cl. 324-142.000.
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Harris, Alan L., 4,921,312, Cl. 303-100.000.
Harris, Kenneth M.; Felton, George N.; Collingborn, Peter A. G.; Stringfellow, Christopher; and Greeves, Godfrey, 4,920,940, Cl. 123-450.000.
Taft, Philip A., 4,922,121, Cl. 303-115.000.
Lucas, King A.: *See—*
Nutting, Thomas C.; Lucas, King A.; and Arnold, Andrew D., 4,922,333, Cl. 358-78.000.
Luce, Richard H.: *See—*
Sallas, John J.; Luce, Richard H.; and Corrigan, Michael A., 4,922,473, Cl. 367-189.000.
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Lee, Shy-Fuh; Luehr, Gary W.; Scott, Carol R.; and Trueb, Werner, 4,921,526, Cl. 71-86.000.
Luisoli, Reto: *See—*
Stegmann, Werner; and Luisoli, Reto, 4,921,966, Cl. 548-260.000.
Lukes, Frank J.: *See—*
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D., Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.
Lund, Richard B.: *See—*
Seifert, Gottfried; Staubli, Sebastian; Wieland, Josef H.; Regenass, Willy; Buerli, Martin; Lee, John G.; and Lund, Richard B., 4,922,008, Cl. 562-58.000.
Lundsager, Christian B.: *See—*
Enloe, Jack H., Lau, John W.; Lundsager, Christian B.; and Rice, Roy W., 4,920,640, Cl. 29-852.000.
Lunt, James; May, Susan A. M.; and Leivo, Patricia A., to Polysar Limited. Toughened thermoplastics. 4,921,910, Cl. 525-74.000.
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Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 4,921,528, Cl. 71-92.000.
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Lush Lid, Inc.: *See—*
Branum, William E., 4,921,141, Cl. 222-146.600.
Lustig, Bernhard: *See—*
Hoffmann, Kurt; Kowarik, Oskar; Kraus, Rainer; Lustig, Bernhard; and Oberle, Hans-Dieter, 4,922,134, Cl. 307-441.000.
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Lee, Chi-Long; and Lutz, Michael A., 4,921,880, Cl. 522-12.000.
Lyons, Adrian: *See—*
Rushbrooke, John; Lyons, Adrian; Tomkins, Patricia; and Ansorge, Richard, 4,922,092, Cl. 250-213.0VT.
M. A. Kempner, Inc.: *See—*
Bernard, John K.; Brand, Hunt K.; and Walker, Richard L., 4,922,520, Cl. 379-88.000.
Mac Science Co., Ltd.: *See—*
Katayama, Chuji, 4,922,102, Cl. 250-327.200.
MacDermid, Incorporated: *See—*
Kukanskis, Peter E.; and Whitmore, Bryan, 4,921,571, Cl. 156-656.000.
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MacEwen, Frank: *See—*
Friese, Donald E.; Brown, James W.; MacEwen, Frank; LeVan, E. G.; and Smith, Michael, 4,920,698, Cl. 49-380.000.

Machida, Yoshimasa: *See—*
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.
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Maclin, Austin, to Micro-Technology Licensing Corporation. Air filtration system for ducted range hoods. 4,921,509, Cl. 55-104.000.
MacMahon, Alistair J.: *See—*
Newman, Alex T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,920,870, Cl. 99-289.00R.
Maczuzak, Michael J.: *See—*
Metcalfe, L. D.; Maczuzak, Michael J.; Bailey, Curtis J.; and Deyo, Paul R., 4,921,315, Cl. 312-321.500.
Madan, Sudhir K., to Motorola, Inc. Method for making a polysilicon transistor. 4,921,813, Cl. 437-46.000.
Madore, Christopher: *See—*
Butler, Myron C.; and Madore, Christopher, 4,922,516, Cl. 379-21.000.
Maeda, Hiroki: *See—*
Yanai, Masami; and Maeda, Hiroki, 4,920,642, Cl. 29-860.000.
Maeshima, Kazuya, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for increasing number of scanning lines. 4,922,118, Cl. 358-140.000.
Magill, Alan R. Temporary suspended access equipment - a builder's cradle. 4,921,070, Cl. 182-142.000.
Magnaudet, Eric: *See—*
Frehaut, Jean-Pierre; Magnaudet, Eric; and Pineau, Jean-Pierre, 4,920,887, Cl. 102-489.000.
Magyar, Karoly: *See—*
Bozsing, Daniel; Kovanyi, Gyorgyi nee Lax; Berenyi, Edit nee Poldermann; Magyar, Karoly; Tuboly, Sandor; and Mandi, Attila, 4,921,854, Cl. 514-224.200.
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MAHO Aktiengesellschaft: *See—*
Babel, Werner, 4,920,632, Cl. 29-568.000.
Maiellano, Joseph C., Jr.: *See—*
Bowen, Robert F.; and Maiellano, Joseph C., Jr., 4,922,079, Cl. 219-415.000.
Mainiero, John W., to MRM Security Systems, Inc. Apparatus for making barbed tape. 4,920,775, Cl. 72-10.000.
Mainz, Michael H.: *See—*
Anderson, Robert K.; Mainz, Michael H.; and Rackley, Robert L., 4,921,668, Cl. 264-80.000.
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Maitz, Carlos A.; and Hauser, George M. Aspirator device for body fluids. 4,921,488, Cl. 604-153.000.
Maja-Maschinenfabrik Herman Schill GmbH: *See—*
Schill, Hermann, 4,920,875, Cl. 99-589.000.
Makishima, Takao: *See—*
Furumichi, Hiroshi; and Makishima, Takao, 4,920,984, Cl. 128-861.000.
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Malhi, Satwinder S.; and Bean, Kenneth E., to Texas Instruments Incorporated. Baseboard for orthogonal chip mount. 4,922,378, Cl. 361-387.000.
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Malmquist, Neil A. Automatic low volume beverage brewing system. 4,921,712, Cl. 426-77.000.
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Manabe, Mitsuo: *See—*
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Ichisa, Nobuaki; and Manabe, Mitsuo, 4,921,357, Cl. 372-38.000.
Manabe, Takashi: *See—*
Matsuo, Masaaki; Manabe, Takashi; Shigenaga, Shinji; and Matsuda, Hiroshi, 4,921,887, Cl. 514-326.000.
Mandi, Atti la: *See—*
Bozsing, Daniel; Kovanyi, Gyorgyi nee Lax; Berenyi, Edit nee Poldermann; Magyar, Karoly; Tuboly, Sandor; and Mandi, Atti la, 4,921,854, Cl. 514-224.200.
Mandi, Attila: *See—*
Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.
Knoll, Jozsef; Budai nee Simonyi, Katalin; Berenyi nee Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,960, Cl. 546-153.000.
Manke, Steven A.: *See—*
Rothgery, Eugene F.; and Manke, Steven A., 4,921,965, Cl. 548-251.000.
Mannesmann AG: *See—*
Staggl, Roland; Sprung, Hartwig; and Becker, Eberhard, 4,921,167, Cl. 238-126.000.
Mannesmann Aktiengesellschaft: *See—*
van Ackeren, Paul; Schmitz, Karl-Heinz; Stache, Bernfried; Kleff, Gunter; and Becker, Heinrich, 4,922,505, Cl. 373-9.000.
Mannesmann Rexroth GmbH: *See—*
Kordak, Rolf; Nikolaus, Heinrich; and Metzner, Frank, 4,920,748, Cl. 60-414.000.
Manns, Peter: *See—*
Schinker, Martin; Brormann, Johannes; Stahn, Dieter; Doll, Walter; Kleer, Gunter; and Manns, Peter, 4,921,519, Cl. 65-39.000.
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Flanders, James R.; Bramley, Frank; Sharp, Francis B.; Newton, Robert A.; and Mansfield, Graham J., 4,920,594, Cl. 12-7.000.
Mantzke, Michael T.: *See—*
Birk, Daniel J.; Fenne, Kenneth R.; and Mantzke, Michael T., 4,922,407, Cl. 364-145.000.
Manville Corporation: *See—*
Shumate, Monroe W., 4,921,894, Cl. 524-377.000.
Manzer, Leo E., to Du Pont de Nemours, E. I., and Company. Gas-phase fluorination process. 4,922,037, Cl. 570-168.000.
Marano, Gerald A.: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L., and Evans, Donald, 4,921,733, Cl. 428-34.200.
Marantz Japan, Inc.: *See—*
Takahashi, Shuichi; Yamanaka, Kunihiro; and Horiki, Masanao, 4,922,546, Cl. 455-74.000.
Marchand, Sam R.: *See—*
Bays, F. Barry; and Marchand, Sam R., 4,921,498, Cl. 623-10.000.
Marciani, Dante J.: *See—*
Riggin, Charles H.; and Marciani, Dante J., 4,921,787, Cl. 435-5.000.
Marconi Company Limited, The: *See—*
Church, Peter D., 4,920,801, Cl. 73-517.00R.
Marcus, Harris L.: *See—*
Blumenshine, Kent M.; Marcus, Harris L.; and Long-Daugherty, Kathleen A., 4,922,326, Cl. 357-80.000.
Marega, Antonello, to Calzaturificio Tecnica Spa. Dynamic inner lining shoe for boots. 4,920,666, Cl. 36-119.000.
Maremont Corporation: *See—*
Ludwig, George C., 4,921,225, Cl. 267-64.130.
Marie, Philipe; and Decelle, Pierre J., to La Telemecanique Electrique. Electric connection terminal with braked screw. 4,921,455, Cl. 439-709.000.
Mario, Giorgetta, to Kistler Instrumente AG. Electrical peak value measuring and evaluating apparatus. 4,922,188, Cl. 324-130.000.
Mark, Arnold. Automatic irrigation water conservation controller. 4,922,433, Cl. 364-510.000.
Mark Philip Promotions, Inc.: *See—*
Russo, Robert P.; and Russo, Randolph J., 4,921,190, Cl. 248-159.000.
Marks, Hubert: *See—*
Bockeler, Franz-Josef; Gobmann, Wolfgang; Buchhorn, Axel; Jackenkroll, Horst; Marks, Hubert; Witte, Karl; and Schnelle, Diethard, 4,922,386, Cl. 362-61.000.
Marlowe, Huston, to PACCAR Inc. Cab-over-engine truck including integrated nose hood. 4,921,062, Cl. 180-89.140.
Marotta Scientific Controls, Inc.: *See—*
Tartaglia, Peter A.; Collins, Richard B.; and Smolen, Robert S., 4,921,014, Cl. 137-625.300.
Marquis, Edward T.: *See—*
Sanderson, John R.; Knifton, John F.; and Marquis, Edward T., 4,922,033, Cl. 568-909.800.
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Marritt, William A.: *See—*
Besecker, Charles J.; and Marritt, William A. 4,921,985, Cl. 556-76.000.
Marschman, Steven C.: *See—*
Koski, Oscar; and Marschman, Steven C., 4,921,584, Cl. 204-67.000.
Marshall, Gerald M.; and Farrington, Allan P., to Chicopee. Method of forming a fibrous web using a variable transverse webber. 4,921,659, Cl. 264-510.000.
Martes, Providencio; and Villalobos, Miguel A. Solar water distiller. 4,921,580, Cl. 202-205.000.
Martin, Bradley L.: *See—*
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.
Martin, Edgar C.: *See—*
Sewell, Beverley; Hill, David J.; and Martin, Edgar C., 4,921,583, Cl. 204-15.000.

Martin, Ernest N. Refrigeration unit for vending machines. 4,920,764, Cl. 62-259.100.
Martin, Frank J., to Frank J. Martin Company. Self-aligning re-keyable pin tumbler cabinet door lock. 4,920,774, Cl. 70-367.000.
Martin, John K.: *See*—
Martin, Juan N.; and Martin, John K., 4,921,679, Cl. 422-169.000.
Martin, Juan N.; and Martin, John K. Exhaust system for laser surgery. 4,921,679, Cl. 422-169.000.
Martin Marietta Corporation: *See*—
Nagle, Dennis C.; Brupbacher, John M.; and Christodoulou, Leontios, 4,921,531, Cl. 75-351.000.
Martindale, David C.: *See*—
Kocal, Joseph A.; Martindale, David C.; and Kuchar, Paul J., 4,921,946, Cl. 585-444.000.
Martinez, Gregory R.: *See*—
Walker, Keith A. M.; Bruno, John J.; and Martinez, Gregory R., 4,921,862, Cl. 514-312.000.
Marusawa, Hiroshi: *See*—
Hemmi, Keiji; Neya, Masahiro; Marusawa, Hiroshi; Imai, Keisuke; Kayakiri, Natsuko; and Hashimoto, Masashi, 4,921,855, Cl. 514-235.800.
Maryyanek, Richard D.; and Brissette, June E., to American Optical Corporation. Filter element. 4,921,512, Cl. 55-488.000.
Masamitsu, Yamamoto *See*—
Suzuki, Migaku; and Masamitsu, Yamamoto, 4,921,474, Cl. 604-16.000.
Maschinenfabrik Hellmut Geiger GmbH. & Co. KG: *See*—
Botsch, Bertram, 4,921,599, Cl. 210-155.000.
Maschinenfabrik J. Dieffenbacher GmbH & Co.: *See*—
Bielfeldt, Friedrich B., 4,921,418, Cl. 425-371.000.
Maschinenfabrik Sulzer-Burckhardt: *See*—
Muller, Eduard, 4,920,862, Cl. 92-158.000.
Masco Building Products Corp.: *See*—
Dietrich, Hagen, 4,921,290, Cl. 292-337.000.
Mashek, William J.: *See*—
Matuszewski, Gerald; and Mashek, William J., 4,922,178, Cl. 320-2.000.
Mashimo, Norio, to Sony Corporation. Advertisement tool. 4,920,675, Cl. 40-492.000.
Massachusetts Institute of Technology: *See*—
Cormen, Thomas H.; and Leiserson, Charles E., 4,922,246, Cl. 340-825.900.
Hoque, Tareq I., 4,922,536, Cl. 381-2.000.
Peters, William A.; and Howard, Jack B., 4,921,685, Cl. 423-439.000.
Roberts, Mary P.; and Gabriel, Nancy E., 4,921,706, Cl. 424-450.000.
Wheatley, Margaret A.; Langer, Robert S.; and Eisen, Herman N., 4,921,757, Cl. 428-402.200.
Massey, Fred L.: *See*—
Wilson, John R.; Rousek, Marian M.; and Massey, Fred L., 4,921,929, Cl. 528-272.000.
Masuda, Jiro, to Fujitsu Ten Limited. Fail-safe circuit for constant speed drive apparatus. 4,921,063, Cl. 180-178.000.
Masuda, Senichi; and Fukuura, Isamu, to NGK Spark Plug Co., Ltd Electric field device. 4,922,099, Cl. 250-324.000.
Masukawa, Toyoaki: *See*—
Nakayama, Noritaka; and Masukawa, Toyoaki, 4,921,783, Cl. 430-558.000.
Mathew, Chempolil T., to Allied-Signal Inc. Process for production of aromatic aldoximes. 4,922,017, Cl. 564-265.000.
Mathew, Ranjan J., to National Semiconductor Corporation. Bump structure for reflow bonding of IC devices. 4,922,322, Cl. 357-69.000.
Matra Transport: *See*—
Maupu, Jean-Louis, 4,920,893, Cl. 104-242.000.
Matsuda, Hiroshi: *See*—
Matsuo, Masaaki; Manabe, Takashi; Shigenaga, Shinji; and Matsuda, Hiroshi, 4,921,887, Cl. 514-326.000.
Matsuda, Keiji: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,921,852, Cl. 514-210.000.
Matsudaira, Takeo; and Suzuki, Hisanori, to Hoya Corporation. Method and device for depositing a lubricant layer to manufacture a magnetic recording medium. 4,920,919, Cl. 118-725.000.
Matsui, Masataka: *See*—
Hayakawa, Shigeyuki; and Matsui, Masataka, 4,922,461, Cl. 365-230.080.
Matsui, Minoru; and Takahashi, Tomonori, to NGK Insulators, Ltd. Silicon carbide sintered members. 4,921,721, Cl. 427-34.000.
Matsumoto, Kunio; Noro, Takanobu; and Kanda, Naoya, to Hitachi, Ltd. Module and a substrate for the module. 4,922,377, Cl. 361-387.000.
Matsumoto, Masahiro: *See*—
Tsuchitani, Shigeki; Suzuki, Seikou; and Matsumoto, Masahiro, 4,921,345, Cl. 356-28.000.
Matsumoto, Masatsugu, to Create System Co., Ltd. Connector aggregate. 4,921,440, Cl. 439-421.000.
Matsumoto, Motoki; and Watanabe, Kouichi, to Toyotomi Kogyo Co., Ltd. Hot water circulating system. 4,921,166, Cl. 237-60.000.
Matsumoto, Naoaki; and Tsutsumi, Kenichi, to Casio Computer Co., Ltd. Electronic musical instrument with data modification means for modifying output sound. 4,920,850, Cl. 84-622.000.
Matsumoto, Yasuji: *See*—
Motegi, Tsuneo; Matsumoto, Yasuji; Takeda, Kiyoshi; and Chiba, Shuji, 4,921,926, Cl. 528-17.000.
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Matsumura, Shuji: *See*—
Tsuji, Syoichi; Ito, Syoichi; Matsumura, Shuji; Suzuki, Hisatosi; and Ito, Michiyasu, 4,921,652, Cl. 264-41.000.
Matsumura, Takeo: *See*—
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.
Matsumura, Teruyuki: *See*—
Kawamura, Hideaki; Matsumura, Teruyuki; and Iwagaya, Takashi, 4,922,440, Cl. 364-474.220.
Matsumura, Yasuo: *See*—
Shimizu, Isoo; Matsumura, Yasuo; and Arai, Yutaka, 4,922,052, Cl. 585-25.000.
Matsuo, Hisayuki; and Mizuno, Kensaku, to Hisayuki Matsuo. C-terminal alpha-amidating enzyme and process for production and use thereof. 4,921,797, Cl. 435-129.000.
Matsuo, Masaaki; Manabe, Takashi; Shigenaga, Shinji; and Matsuda, Hiroshi, to Fujisawa Pharmaceutical Company, Ltd. Thiazole compounds and pharmaceutical composition comprising the same. 4,921,887, Cl. 514-326.000.
Matsuo, Yoshihiro: *See*—
Wakahara, Hideki; Matsuo, Yoshihiro; and Kawamura, Minoru, 4,921,751, Cl. 428-229.000.
Matsuoka, Hiroshi: *See*—
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.
Matsuoka, Kazuhiko: *See*—
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.
Matsuoka, Noriyuki, to Yamaichi Electric Mfg. Co., Ltd. Connector for the use of electronic parts. 4,921,430, Cl. 439-72.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Mori, Yoshihiro; and Shibata, Jun, 4,922,497, Cl. 372-8.000.
Takashima, Yoshinori, 4,920,605, Cl. 15-319.000.
Yoshida, Akihiko; Nishino, Atsushi; Tanahashi, Ichiro; and Takeuchi, Yasuhiro, 4,921,686, Cl. 423-447.600.
Matsushita, Kouji: *See*—
Hatanaka, Toshihiko; Enomoto, Akira; and Matsushita, Kouji, 4,922,094, Cl. 250-221.000.
Matsuura, Kazuo: *See*—
Takahashi, Mamoru; Misaki, Hideo; Imamura, Shigeyuki; and Matsuura, Kazuo, 4,921,786, Cl 435-4.000.
Matsuyama, Akio: *See*—
Osawa, Masanori; Shizuka, Kohei; Kouno, Masahiro; Matsuyama, Akio; Katsuoka, Hirotoshi; and Mizutani, Kazumi, 4,921,933, Cl. 528-348.000.
Matsuzaki, Yuzi: *See*—
Yoshimura, Shoji; Matsuzaki, Yuzi; Sugimoto, Mamoru; Ito, Masayoshi; and Ogawa, Tomoya, 4,921,948, Cl. 536-18.200.
Mattesky, Henry, to Glatt, Herbert. Ironing board cover coating with sole iron sole lubricant. 4,920,669, Cl. 38-140.000.
Matthews, Bernard T.; Joll, David J.; Ziauddin, Habeeb M.; and Wilson, David N., to Bernard Matthews PLC. Coextruded meat based product. 4,921,714, Cl. 426-90.000.
Mattila, Gary P.: *See*—
Nubson, Richard C.; and Mattila, Gary P., 4,921,237, Cl. 271-11.000.
Matuszewski, Gerald; and Mashek, William J., to Motorola, Inc. Dual source rechargeable battery. 4,922,178, Cl. 320-2.000.
Maupu, Jean-Louis, to Matra Transport; and Institut National de Recherche sur les Transports et leur Securite. Axle with magnetic guidance for railroad vehicles. 4,920,893, Cl. 104-242.000.
Maurer, Helmut: *See*—
Siegmeier, Rainer; Hofen, Willi; Prescher, Gunter; and Maurer, Helmut, 4,921,983, Cl. 549-525.000.
Mausner, Eberhard, to VDO Adolf Schindling AG. Device for the electrical transmission of a mechanical variable. 4,922,177, Cl. 318-663.000.
Mawatari, Yasushi; Ikegami, Toru; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Rober, Hans-Gerd, to Toshiba Glass Co., Ltd.; and Kernforschungszentrum Karlsruhe GmbH. Fluorescent glass dosimeter. 4,922,115, Cl. 250-484.100.
Mawby, Harold S.; and Weaver, Douglas E., to While Consolidated Industries, Inc. Refrigeration compressor mount. 4,920,696, Cl. 312-214.000.
Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften: *See*—
Englert, Heinrich C.; Hropot, Max; Lang, Hans-Jochen; and Greger, Rainer, 4,921,875, Cl. 514-567.000.
May, David A., to Appropriate Technology Corporation. Roman shades. 4,921,032, Cl. 160-84.100.
May, Steven J.: *See*—
Walt, Michael J.; Van Kampen, Craig L.; and May, Steven J., 4,920,958, Cl. 606-96.000.
May, Susan A. M.: *See*—
Lunt, James; May, Susan A. M.; and Leivo, Patricia A., 4,921,910, Cl. 525-74.000.

Mayberry, Gerald L.: *See*—
Bowers, Joseph S., Jr.; and Mayberry, Gerald L., 4,921,964, Cl. 548-219.000.
Mazda Motor Corporation: *See*—
Kameda, Osamu; Fujikawa, Satoshi; and Shinmoto, Toshiharu, 4,920,828, Cl. 475-299.000.
McArthur, James R., to Harrel, John; and Harrel, Charlena. Device for positioning and stabbing casing from a remote selectively variable location. 4,921,386, Cl. 414-22.510.
McCallister, Ronald D.; and Shearer, Daniel D., III, to Sicom Corporation. Compensating for distortion in a communication channel. 4,922,506, Cl. 375-1.000.
McCauley, Michael J.; Beers, David G.; and Raymond, John P., to General Electric Company. Refrigerator cabinet having air flow control means. 4,920,765, Cl. 62-408.000.
McClean, James W.: *See*—
Pieprzak, Andrew W.; and McClean, James W., 4,922,465, Cl. 367-38.000.
McCoy, Roger J.: *See*—
Meadows, R. David; and McCoy, Roger J., 4,922,061, Cl. 178-19.000.
McCready, David F. Cathodic protection using carbosil anodes. 4,921,588, Cl. 204-147.000.
McCulloch, Beth; and Oroskar, Anil R., to UOP. Process for extracting 2,5-dichlorotoluene from isomer mixtures with sodium-L zeolite adsorbents. 4,922,040, Cl. 570-211.000.
McDavid, James M.; and Anderson, Dirk N., to Texas Instruments Incorporated. Integrated circuit metallization with reduced electromigration. 4,922,320, Cl. 357-67.000.
McDonald, Norman J. Paper fueled cooker. 4,920,949, Cl. 126-25.00R.
McDonald, Roy E.: *See*—
Nordby, Harold E.; and McDonald, Roy E., 4,921,715, Cl. 426-102.000.
McDonnell Douglas Corporation: *See*—
Hall, Edward A.; Cranor, Thomas H. B.; and Schmitt, Gilbert J., 4,922,259, Cl. 343-700.0MS.
McDonough, Suellen, to Academy of Applied Science, Inc. Method of labeling needle syringes and medication vials and novel labels therefor. 4,921,277, Cl. 283-81.000.
McFarlane, Richard, to Taut, Inc. Package assembly. 4,921,096, Cl. 206-349.000.
McGahee, Welbourne D.; and Campbell, John W., to Loop-A-Line, Inc., by said Welbourne D. McGahee. Side stepper worms with rattle and sinker. 4,920,686, Cl. 43-42.240.
McGown, George P. Dual channel cap for endoscope. 4,920,953, Cl. 128-4.000.
McGregor, Rob R.; Misevich, Kenneth W.; and Mintel, Thomas E., to Colgate-Palmolive Company. Longitudinal support sling. 4,920,664, Cl. 36-11.500.
McGuire, Kevin P.; and McKay, James D., to Eastman Kodak Company. Constant color temperature and intensity illumination source 4,922,089, Cl. 250-205.000.
McIntire, Richard L.: *See*—
Bartasis, James E.; and McIntire, Richard L., 4,920,575, Cl. 2-2.000.
McJunkin, James. Enhanced information overlay for use with a digitizing pad and computer. 4,922,060, Cl. 178-18.000.
McKay, James D.: *See*—
McGuire, Kevin P.; and McKay, James D., 4,922,089, Cl. 250-205.000.
McKee, Bobby D.; and Nakagawa, Alvin H., to Westinghouse Electric Corp. Actively cooled brush box assembly. 4,922,163, Cl. 310-239.000.
McKie, Derrick B.; and Olukalns, Andris, to Hoechst Celanese Corporation. Low warped filled polyoxymethylene compositions. 4,921,885, Cl. 523-220.000.
McKinley, Mildred L.: *See*—
Poole, James E.; and McKinley, Mildred L., 4,921,726, Cl. 427-54.100.
McLain, Philippe H.: *See*—
Parsons, James H.; McLain, Philippe H.; Boozer, John F., III; and Lewis, John R., Jr., 4,920,715, Cl. 52-298.000.
McLellan, Neil R., to Texas Instruments Incorporated. Delayed reflow alloy mix solder paste. 4,921,550, Cl. 148-24.000.
McLemore, Jane K.: *See*—
Pennington, Donald W.; and McLemore, Jane K., 4,921,658, Cl. 264-86.000.
McMahon, Garfield W.; and Jones, Dennis F., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Barrel stave projector. 4,922,470, Cl. 367-163.000.
McMahon, Kevin R.: *See*—
Frickman, Jay P.; Kissick, William E., Jr.; and McMahon, Kevin R., 4,921,614, Cl. 210-695.000.
McMullin, Craig W.; and Rosenberger, John E., to Combustion Engineering, Inc. Ultrasonic check valve inspection. 4,920,802, Cl. 73-597.000.
McNair, Rhett, to Scientific Component Systems, Inc. Lamp apparatus. 4,922,393, Cl. 362-225.000.
McNamee, Stanislaus: *See*—
Horan, Gerald P.; Wickmann, John T.; and McNamee, Stanislaus, 4,920,781, Cl. 72-447.000.
McNeilab, Inc.: *See*—
Berta, Norbert J., 4,921,108, Cl. 209-625.000.
MDT Corporation: *See*—
Johnson, Kenneth A., 4,921,675, Cl. 422-34.000.
Meade, Phyllis; and Spector, George. Flower pot. 4,920,693, Cl. 47-41.120.
Meadows, R. David; and McCoy, Roger J., to Tektronix, Inc. Capacitive touch panel system with randomly modulated position measurement signal. 4,922,061, Cl. 178-19.000.
Measurex Corporation: *See*—
Hu, Hung-Tzaw, 4,921,574, Cl. 162-198.000.
Mechanical Manufacturing Corporation: *See*—
Goldman, Sidney, 4,921,606, Cl. 210-238.000.
Mechanical Products, Inc.: *See*—
Bakhaus, Kenneth C.; and Sdunek, Bruce C., 4,922,219, Cl. 337-74.000.
Mechtronics Corporation: *See*—
Torrence, Arthur L., 4,922,384, Cl. 362-31.000.
Mect Corporation: *See*—
Yoshimura, Shoji; Matsuzaki, Yuzi; Sugimoto, Mamoru; Ito, Masayoshi; and Ogawa, Tomoya, 4,921,948, Cl. 536-18.200.
Medex, Inc.: *See*—
Frank, Thomas P.; Nicholson, Warren B.; and Pfouts, Mark D., 4,920,972, Cl. 128-675.000.
Medi-Quip, Inc.: *See*—
Scott, Frederick W., Jr.; and Santi, Joseph P., 4,920,672, Cl. 40-363.000.
Medtronic, Inc.: *See*—
Funke, Hermann D.; and Lodewyk, Jozef H., 4,920,965, Cl. 128-419.0PG.
Mehta, Bakulesh A.: *See*—
Morganstein, Sanford J.; Mehta, Bakulesh A.; and Krakau, Herbert B., 4,922,526, Cl. 379-157.000.
Meier, Antony R. H.: *See*—
Banks, Nigel H.; Borton, Colin A.; Leonce, Francis S.; Lomax, Terence J.; Meier, Antony R. H.; and Skiba, Christopher J., 4,921,702, Cl. 424-404.000.
Meisenburg, Gary L.: *See*—
Lonnborg, Thomas S.; and Meisenburg, Gary L., 4,921,071, Cl 184-6.400.
Meisinger, Stanlee W., to FasTest Incorporated. Undermoderated nuclear reactor. 4,921,282, Cl. 285-104.000.
Meissner Mfg. Co., Inc.: *See*—
Meissner, Paul J., 4,921,600, Cl. 210-169.000.
Meissner, Paul J., to Meissner Mfg. Co., Inc. Filter cartridge for swimming pools and spas. 4,921,600, Cl. 210-169.000.
Meixner, Erwin: *See*—
Pally, Roland; and Meixner, Erwin, 4,921,058, Cl. 177-181.000.
Meixner, Jurgen; Kremer, Wolfgang; and Muller, Manfred, to Bayer Aktiengesellschaft. Unsaturated polyester resins, a process for their preparation and compositions containing these polyester resins. 4,921,883, Cl. 522-107.000.
Melancon, Kurt C., to Minnesota Mining and Manufacturing Company. Process for fluorimetric monitoring of functional coatings and compositions and fluorescent agents therefor. 4,922,113, Cl. 250-372.000.
Melcher, Richard A., to Brandt, Inc. Document counter and endorser. 4,922,110, Cl. 250-556.000.
Melfi, Nicholas W., to Concrete Pipe & Products Corp. Adjustable median barrier mold. 4,921,204, Cl 249-2.000.
Melillo, David G.: *See*—
Kieczykowski, Gerard R.; Melillo, David G.; and Jobson, Ronald B., 4,922,007, Cl. 562-13.000.
Melnyk, Andrew R.; Nealey, Richard H.; Brach, Paul J.; and Teuscher, Leon A., to Xerox Corporation. Process for preparing an electrophotographic imaging member. 4,921,773, Cl. 430-132.000.
Melvin, Lawrence S., Jr.: *See*—
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,921,994, Cl. 558-426.000.
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Duggan, Mark E., 4,921,974, Cl. 549-214.000.
Heck, James V.; and Thorsett, Eugene D., 4,921,857, Cl. 514-254.000.
Kieczykowski, Gerard R.; Melillo, David G.; and Jobson, Ronald B., 4,922,007, Cl. 562-13.000.
Onishi, Janet C.; and Patchett, Arthur A., 4,921,844, Cl. 514-171.000.
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Kohler, Manfred; Ohngemach, Jorg; and Poetsch, Eike, 4,922,004, Cl. 560-221.000.
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Franke, Rolf; and Schmersahl, Peter, 4,921,874, Cl. 514-552.000.
Mercker, Hans J.: *See*—
Fischer, Roman; Mercker, Hans J.; and Mueller, Herbert, 4,922,023, Cl. 564-479.000.
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Grenier, Michel; de la Gorge, Jean-Etienne; Cieplinski, Daniel; Leturgie, Gerard; Thurin, Yves; Meret, Laurent; and Doireau, Christian, 4,921,076, Cl. 188-12.600.

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Bornstein, Marvin; Ewert, Corney J.; Saenger, John D., and Reyes, Vincent, 4,921,122, Cl. 220-326.000.

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Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,921,695, Cl. 424-81.000.

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Topel, Edward C.; and Garritano, Mario, 4,922,072, Cl. 219-56.100.

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West, William L., Jr.; and Shafer, James E., 4,922,517, Cl. 379-58.000.

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Busse, Fritz; Hafeneger, Hans; and Mette, Ulrich, 4,921,368, Cl. 403-134.000.

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Hofmann, Manfred, 4,921,232, Cl. 267-219.000
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Horvitz, Charles S.; and Miceli, Michael L., 4,922,132, Cl. 307-359.000.

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Maclin, Austin, 4,921,509, Cl. 55-104.000.

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Dishon, Giora; and Bobbio, Stephen M., 4,921,157, Cl. 228-124.000.

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Potter, Curtis N., 4,922,323, Cl. 357-71.000.
Yee, Ian Y. K., 4,920,639, Cl. 29-846.000.

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Orr, Cyde, Jr.; and Camp, Ronnie W., 4,920,810, Cl. 73-865.500.

Microwave Development Laboratories: *See—*
Wilson, Ronald A., 4,920,643, Cl. 29-876.000.

Mielke, Roland V.: *See—*
Stoughton, John W., and Mielke, Roland V., 4,922,413, Cl. 364-200.000.

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Nakajima, Toyohei; Okada, Yasushi; Mieno, Toshiyuki, and Oono, Nobuyuki, 4,922,429, Cl. 364-431.060

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Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann. Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan, and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.
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Miles Inc.: *See—*
Trawinski, Jurgen, and Redeker, Detmar, 4,921,792, Cl. 435-41.000.

Miles, Michael: *See—*
Gaskill, Garold B.; Miles, Michael; and Schrock, Clifford B., 4,922,260, Cl. 343-718.000.

Milford, Richard E., to BancTec, Inc. Write head apparatus for recognizing magnetic characters and method therefor. 4,922,086, Cl. 235-449.000.

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Ranjith, Heva M. P., 4,921,717, Cl. 426-587.000.

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Dannatt, Hugh St. L., and Miller, Carl A., 4,922,085, Cl. 235-101.000.

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Lee, Len F.; and Miller, Maria L., 4,921,530, Cl. 71-94.000.

Miller, Stephen J., to Chevron Research Company. Production of low pour point lubricating oils. 4,921,594, Cl. 208-58.000.

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Eschenbach, Paul W., 4,921,752, Cl. 422-247.000.

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Kato, Tomohiro; Takasu, Yoshio; and Minafuji, Makoto, 4,921,622, Cl. 252-8.900

Minami, Koji: *See—*
Watanabe, Kaneo; Iwamoto, Masayuki; and Minami, Koji, 4,922,218, Cl. 357-30.000.

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Kinoshita, Tatsuo; Minami, Shuji; and Kaneshige, Ryousuke, 4,922,046, Cl. 585-11.000.

MiniScribe Corporation: *See—*
Freeman, John J., 4,922,169, Cl. 318-254.000.

Minjolle, Louis, to Ceramiques et Composites. Alveolar ceramic filters for high melting metals. 4,921,616, Cl. 210-767.000.

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Ali, Mohammad Z.; and Busman, Stanley C., 4,921,827, Cl. 502-167.000.
Hammer, W. James; and Ofstead, Ronald F., 4,921,884, Cl. 523-106.000.
Hansen, Paul E.; Insley, Thomas I.; and Libbey, Christopher J., 4,921,743, Cl. 428-102.000.
Insley, Thomas I., 4,921,645, Cl. 264-6.000.
Johnson, Gilbert C., 4,921,930, Cl. 528-306.000.
Melancon, Kurt C., 4,922,113, Cl. 250-372.000.
Ofstead, Ronald F., 4,921,908, Cl. 525-61.000.
Roeser, John O., 4,921,133, Cl. 222-63.000.
Walt, Michael J.; Van Kampen, Craig L.; and May, Steven J., 4,920,958, Cl. 606-96.000.
Windorski, David C., 4,921,127, Cl. 221-45.000.

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Araki, Kazuhiro; and Ito, Masazumi, 4,922,306, Cl. 355-313.000
Hamada, Masataka; Ishida, Tokuji, and Akada, Yasuaki, 4,922,279, Cl. 354-400.000.
Mizuno, Hiroshi; Natasuhara, Toshiya; Enoguchi, Yuji; Ikegawa, Akihito; Yamamoto, Masasi; and Murasaki, Hiroshi, 4,920,916, Cl. 118-653.000.
Nakagami, Hidekazu, Sakamoto, Masashi; and Ozawa, Hiroshi, 4,922,294, Cl. 355-209.000
Nakajima, Akio; and Hasegawa, Hirofumi, 4,922,087, Cl. 250-201.400.
Takano, Yoshiaki; and Kitagawa, Tsuneo, 4,922,295, Cl. 355-209.000.
Takeda, Katsuhiko; and Myochin, Hisashi, 4,922,303, Cl. 355-274.000.
Tani, Hakuzo; and Okumura, Masaru, 4,921,760, Cl. 428-446.000.

Minoura, Kazuo: *See—*
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi, Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.

Mintel, Thomas E.: *See—*
McGregor, Rob R.; Misevich, Kenneth W.; and Mintel, Thomas E., 4,920,664, Cl. 36-11.500.

Mioque, Jean-Yves: *See—*
Codazzi, Daniel; Mioque, Jean-Yves; and Montaron, Bernard, 4,920,795, Cl. 73-195.000.

Mirikitani, Andrew K.: *See—*
Weightman, Judy M.; and Mirikitani, Andrew K., 4,921,273, Cl. 280-808.000.

Misaki, Hideo: *See—*
Takahashi, Mamoru; Misaki, Hideo; Imamura, Shigeyuki; and Matsuura, Kazuo, 4,921,786, Cl. 435-4.000.

Misevich, Kenneth W.: *See—*
McGregor, Rob R.; Misevich, Kenneth W.; and Mintel, Thomas E., 4,920,664, Cl. 36-11.500.

Mishima, Shiro: *See—*
Iishiki, Naotsugu; Okano, Shigetou; and Mishima, Shiro, 4,920,750, Cl. 60-671.000.

Mission Pharmacal Company: *See—*
Pak, Charles Y. C., 4,921,807, Cl. 436-18.000.

Misteli, Roland: *See—*
Provest, Phillip B.; and Van Dal, David J., 4,920,763, Cl. 62-378.000.

Mita Industrial Co., Ltd.: *See—*
Kondo, Akihiro, 4,922,297, Cl. 355-211.000.

Mitchell, Barry C.: *See—*
Davidson, Gordon O.; Mitchell, Barry C.; and White, Larry A., 4,922,185, Cl. 324-74.000.

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Wiemeri, Ronald W.; and Mitchell, James N., 4,921,024, Cl. 144-336.000.

Mitchell, Richard F., Sr. Building construction system. 4,920,711, Cl. 52-169.200.

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Iri, Eiji; Nobuoka, Yasunari; Suzuki, Nobuo; Kashima, Yoshio; Kakutani, Yuji; and Murata, Osamu, 4,921,325, Cl. 350-96.210.

Mitsubishi Chemical Industries Limited: *See—*
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,921,959, Cl. 546-152.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Arai, Hajime; Furuta, Isao; Kuroki, Hidefumi; Arima, Junichi; Hirata, Yoshihiro; and Harada, Shigeru, 4,922,321, Cl. 357-68.000.
Fukui, Toyoaki; Omori, Shogo; and Uchinami, Masanobu, 4,920,941, Cl. 123-492.000.
Furutani, Kiyohiro; and Arimoto, Kazutami, 4,922,460, Cl. 365-207.000.
Hidaka, Hideto, 4,922,367, Cl. 361-58.000.
Hidaka, Hideto, 4,922,453, Cl. 365-63.000.
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Ishikawa, Takahide; and Nakahara, Kazuhiko, 4,921,814, Cl. 437-47.000.
Isozumi, Shuzoo; and Konishi, Keiichi, 4,922,149, Cl. 310-89.000.
Kitamura, Yutaka, 4,922,148, Cl. 310-68.00D.
Maeshima, Kazuya, 4,922,118, Cl. 358-140.000.
Mori, Haruyoshi, 4,922,365, Cl. 361-18.000.
Nakamura, Takashi; and Yamaura, Yutaka, 4,920,905, Cl. 112-275.000.
Nishimura, Shinji, 4,922,179, Cl. 322-25.000.
Nonaka, Takashi, 4,921,508, Cl. 29-603.000.
Nonami, Takyuki, 4,922,527, Cl. 379-361.000.
Okamoto, Kyoichi; Tanaka, Noriyuki; and Shiroyama, Shigeru, 4,920,812, Cl. 74-6.000.
Saito, Jun; Haruyama, Tetsuo; Orime, Nobutake; and Katagi, Takashi, 4,922,257, Cl. 342-377.000.
Shigeki, Susumu, 4,920,920, Cl. 118-725.000.
Takahashi, Motoo; and Tsukagoshi, Kazuo, 4,921,330, Cl. 350-128.000.
Ueda, Masahiro, 4,922,136, Cl. 307-465.100.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Hiramatsu, Takeo, 4,922,424, Cl. 364-424.100.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Iwamoto, Keiichi; and Torichigai, Masaaki, 4,920,804, Cl. 73-623.000.

Mitsubishi Kasei Corp.: *See—*
Noguchi, Masahiro, 4,921,817, Cl. 437-127.000.
Tamura, Mitsuhiko; Miyamoto, Masaaki; Nakanishi, Hidemi; and Tanaka, Takayoshi, 4,921,932, Cl. 528-339.300.

Mitsubishi Monsanto Chemical Co.: *See—*
Noguchi, Masahiro, 4,921,817, Cl. 437-127.000.

Mitsubishi Pencil Co., Ltd.: *See—*
Odajima, Hideo, 4,921,559, Cl. 156-242.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Yamaguchi, Shoji; Yamada, Kimiko; Yada, Katsuyoshi; Sakaguchi, Koichi; and Inoue, Hiromu, 4,921,623, Cl. 252-512.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Ito, Akira; and Okada, Mizuo, 4,921,329, Cl. 350-128.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,921,909, Cl. 525-64.000.

Mitsuboshi Belting Ltd.: *See—*
Ando, Masakatsu; Kawaguchi, Minori; and Yamakawa, Susumu, 4,920,788, Cl. 73-118.100.

Mitsuhashi, Satoshi: *See—*
Asano, Kiro; Mitsuhashi, Satoshi; Bannai, Kenji; Wada, Hisayuki; and Tamura, Humio, 4,921,849, Cl. 514-182.000.

Mitsui & Co., Ltd.: *See—*
Taga, Jun, 4,920,863, Cl. 92-86.000.

Mitsui, Kazuhiko; Kumamoto, Kazuo; and Koyashiki, Keiichirou, to Ube Industries, Ltd. Honeycomb structure of aromatic polyimide. 4,921,744, Cl. 428-116.000.

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Kinoshita, Tatsuo; Minami, Shuji; and Kaneshige, Ryousuke, 4,922,046, Cl. 585-11.000.
Kioka, Mamoru; and Kashiwa, Norio, 4,921,825, Cl. 502-104.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Ajioka, Masanobu; Aiga, Makoto; Kataita, Masafumi; and Tamaki, Akihiro, 4,922,005, Cl. 560-347.000.
Aoyama, Mari; Ito, Michiyasu; Tsuji, Syoichi; Ishii, Toshiyuki; and Tanaka, Tomohide, 4,921,653, Cl. 264-41.000.
Fujio, Ichiro; Ito, Kaneo; and Asanuma, Tadashi, 4,921,905, Cl. 525-53.000.
Osawa, Masanori; Shizuka, Kohei; Kouno, Masahiro; Matsuyama, Akio; Katsuoka, Hirotoshi; and Mizutani, Kazumi, 4,921,933, Cl. 528-348.000.
Tsuji, Syoichi; Ito, Syoichi; Matsumura, Shuji; Suzuki, Hisatosi; and Ito, Michiyasu, 4,921,652, Cl. 264-41.000.

Mitsuyama, Masuhiro. Card holder. 4,920,673, Cl. 40-405.000.

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Miura, Masafumi, to NEC Home Electronics Ltd. Optical head unit. 4,922,477, Cl. 369-221.000.

Miura, Yoshiharu: *See—*
Bonk, Stanley P.; Morganthaler, George F.; and Miura, Yoshiharu, 4,921,680, Cl. 422-197.000.

Miwa, Naomasa, to Aisin Seiki Kabushiki Kaisha. Space transmission optical communication system. 4,921,468, Cl. 455-617.000.

Miwa, Yuji: *See—*
Tani, Naohiko; Kouda, Masahiro; Ito, Atsushi; and Miwa, Yuji, 4,921,376, Cl. 409-131.000.

Mixson, Dewey: *See—*
Gazes, Jimmy; and Mixson, Dewey, 4,920,757, Cl. 62-181.000.

Miyahara, Junji: *See—*
Mori, Nobufumi; Hosoi, Yuichi; and Miyahara, Junji, 4,922,098, Cl. 250-311.000.

Miyakawa, Yoshitaka: *See—*
Horiuchi, Makoto; Miyakawa, Yoshitaka; and Sakurai, Kazuya, 4,920,857, Cl. 91-373.000.

Miyake, Akio: *See—*
Kishimoto, Shoji; Tomimatsu, Kiminori; Miyake, Akio; and Yoshimura, Yoshinobu, 4,921,851, Cl. 514-203.000.

Miyake, Hiraku; Ishiguro, Mitsuo; Hayamizu, Yutaka; and Aizawa, Satoru, to Takenaka Corporation. Vertical vibration-damping apparatus. 4,921,202, Cl. 248-581.000.

Miyamoto, Masaaki: *See—*
Tamura, Mitsuhiko; Miyamoto, Masaaki; Nakanishi, Hidemi; and Tanaka, Takayoshi, 4,921,932, Cl. 528-339.300.

Miyamoto, Yoshinori: *See—*
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.

Miyasaka, Eiji: *See—*
Takeda, Morihiro; Miyasaka, Eiji; and Handa, Masayuki, 4,922,278, Cl. 354-320.000.

Miyashita, Kunio: *See—*
Sugiura, Yasuyuki; Watabe, Mitsuru; Morinaga, Shigeki; Miyashita, Kunio; and Sugai, Hiroshi, 4,922,175, Cl. 318-592.000.

Miyata, Chikara: *See—*
Tokumoto, Hiroshi; Bando, Hiroshi; Sakai, Fumiki; Miyata, Chikara; and Wakiyama, Shigeru, 4,921,346, Cl. 356-72.000.

Miyazaki, Asashi: *See—*
Komatsu, Norimasa; and Miyazaki, Asashi, 4,922,357, Cl. 360-105.000.

Miyazawa, Hiroyuki, to Hitachi, Ltd. Method of producing a semiconductor memory device having trench capacitors. 4,921,815, Cl. 437-52.000.

Mizioch, Gregory J. Debris cap. 4,921,120, Cl. 220-254.000.

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Mizoue, Yoshito; and Kazama, Yoshiharu, to Hitachi, Ltd. Logic circuit simulation method. 4,922,445, Cl. 364-578.000.

Mizukami, Takeshi, to NEC Corporation. Serial access memory system provided with improved cascade buffer circuit. 4,922,457, Cl. 365-189.010.

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Kunugi, Masanao; Kurihara, Hajime; and Mizumoto, Teruyuki, 4,921,768, Cl. 430-45.000.

Mizuno, Hiroshi; Natasuhara, Toshiya; Enoguchi, Yuji; Ikegawa, Akihito; Yamamoto, Masasi; and Murasaki, Hiroshi, to Minolta Camera Kabushiki Kaisha. Electrostatic latent image developing device. 4,920,916, Cl. 118-653.000.

Mizuno, Kensaku: *See—*
Matsuo, Hisayuki; and Mizuno, Kensaku, 4,921,797, Cl. 435-129.000.

Mizuno, Kotaro, to Yamaha Corporation. Automatic performance apparatus for an electronic musical instrument. 4,920,849, Cl. 84-613.000.

Mizutani, Kazumi: *See—*
Osawa, Masanori; Shizuka, Kohei; Kouno, Masahiro; Matsuyama, Akio; Katsuoka, Hirotoshi; and Mizutani, Kazumi, 4,921,933, Cl. 528-348.000.

Mizutome, Atsushi: *See—*
Inoue, Hiroshi; and Mizutome, Atsushi, 4,922,241, Cl. 340-784.000

Moates, Robert F.: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M L., 4,920,990, Cl. 131-359.000.

Mobil Oil Corporation: *See—*
Benoit, Gordon L.; Sable, Lewis E.; and Wenzel, Richard A., 4,921,197, Cl. 248-97.000.
Chen, Catherine S. H.; and Forbus, Thomas R., Jr., 4,922,047, Cl. 585-12.000.
Chin, Arthur A.; and Sarli, Michael S., 4,921,824, Cl. 502-65.000.
Chou, Tai-Sheng; and Schipper, Paul H., 4,921,596, Cl. 208-113.000.
Chu, Cynthia T-W., 4,922,055, Cl. 585-470.000.
Dessau, Ralph M.; Partridge, Randall D.; and Valyocsik, Ernest W., 4,922,050, Cl. 585-379.000.
Harandi, Mohsen N., 4,922,048, Cl. 585-310.000.
Hurd, Billy G., 4,921,576, Cl. 166-252.000.
Nemet-Mavrodin, Margaret; and Soto, Jorge L., 4,922,051, Cl. 585-418.000.
Shirodkar, Pradeep P., 4,921,911, Cl. 525-86.000.
Smith, Fritz A., 4,921,593, Cl. 208-59.000.

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Modlinski, Ulrich; and Wiegleb, Gerhard, to Leybold Aktiengesellschaft. Infrared radiation source, especially for a multi-channel gas analyzer. 4,922,108, Cl. 250-504.00R.

Moellenbeck, Albert J., to Biotech Industries Incorporated. Upflow biological reator waste water treatment system. 4,921,604, Cl. 210-151.000.

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Lo, Yuan-Chang; Moeller, Dennis L.; and Szarek, John J., 4,922,451, Cl. 364-900.000.

Moguilewsky, Martine: *See*—
Nedelec, Lucien; Claussner, Andre ; Philibert, Daniel; and Moguilewsky, Martine, 4,921,846, Cl. 514-173.000.

Mohr, Michael A.; and Koglin, Gunter W. W., to U.S. Philips Corporation. Rotary knob for control devices or the like. 4,920,823, Cl. 74-553.000.

Moineau, Hubert J., to Automatic Specialties, Inc. Water control valve. 4,921,209, Cl. 251-30.010.

Moisin, Mihail S., to Northern Telecom Limited. Line interface circuit. 4,922,531, Cl. 379-413.000.

Mollier, Pierre; and Tannhof, Pascal, to International Business Machines Corporation. GaAs MESFET logic circuits including push pull output buffers. 4,922,135, Cl. 307-450.060.

Molnlycke AB: *See*—
Fabo, Tomas, 4,921,704, Cl. 424-446.000.

Molock, Frank; Robertson, J. Richard, Jr.; and Su, Kai C., to Ciba-Geigy Corporation. Hydrophilic modifier monomers. 4,921,956, Cl. 544-165.000.

Molter, Trent M., to United Technologies Corporation. Electrolysis cell and method of use. 4,921,585, Cl. 204-72.000.

Molter, Trent M., to United Technologies Corporation. Electrolysis cell and method of use. 4,921,586, Cl. 204-72.000.

Monnig, Kenneth A.: *See*—
Brors, Daniel L.; Fair, James A.; and Monnig, Kenneth A., 4,920,908, Cl. 427-255.200.

Monroe Electronics, Inc.: *See*—
Cox, Mason F., 4,922,182, Cl. 324-682.000.

Monsanto Company: *See*—
Lee, Len F.; and Miller, Maria L., 4,921,530, Cl. 71-94.000.

Montaron, Bernard: *See*—
Codazzi, Daniel; Mioque, Jean-Yves; and Montaron, Bernard, 4,920,795, Cl. 73-195.000.

Montefiore Medical Center: *See*—
Lalezari, Iraj; and Lalezari, Parviz, 4,921,997, Cl. 560-34.000.

Montgomery, Dix S.: *See*—
Lee, Michael C.; Behrens, Robert N., Dobberpuhl, Dale R.; Wykhuis, Lloyd A.; and Montgomery, Dix S., 4,920,732, Cl. 56-10.200.

Montier, Patrick: *See*—
Luther, Hans W., Winkelmann, Juergen; Sauvestre, Jean-Claude, and Montier, Patrick, 4,920,888, Cl. 102-518.000.

Moon, David A.: *See*—
Holloway, John T.; Moon, David A.; Cannon, Howard I.; Knight, Thomas F.; Edwards, Bruce E., and Weinreb, Daniel L., 4,922,414, Cl. 364-200.000.

Moore, Arthur H., to Semiconductor Equipment Corp. Method and apparatus for removing circuit chips from wafer handling tape. 4,921,564, Cl. 156-344.000.

Moore, Cheryl L.: *See*—
Adair, Paul C.; Moore, Cheryl L.; and Landis, Robert A., 4,921,832, Cl. 503-201.000.

Moore, George A. Fish fillet knife. 4,920,612, Cl. 17-56.000.

Moore, James C.: *See*—
Ewan, Thomas K.; Musslewhite, Thomas W., Barden, Charles R., Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C.; and Jacubec, Mark R., 4,921,886, Cl. 423-235.000.

Moore, Richard B.; Fitzgerald, Paul L.; and Pole, Ernest G., to BASF Aktiengesellschaft. Setting asphalt emulsions. 4,921,892, Cl. 524-61.000.

Moormann, Gerhard: *See*—
Henning, Wolfgang, Petersen, Harald, and Moormann, Gerhard, 4,921,842, Cl. 524-839.000.

Moraly, Paul. Peg for fixing posts or stakes in the ground. 4,921,200, Cl. 248-545.000.

Morgan, Dwight M.: *See*—
Dohm, Loring J.; Judge, Lawrence B.; and Morgan, Dwight M., 4,922,436, Cl. 364-513.000.

Morgan, Russell J.: *See*—
Miller, George T.; and Morgan, Russell J., 4,921,736, Cl. 428-36.400.

Morganstein, Sanford J.; Mehta, Bakulesh A., and Krakau, Herbert B., to Dytel Corporation. Automated access facilities for use with key telephone systems. 4,922,526, Cl. 379-157.000.

Morganthaler, George F.: *See*—
Bonk, Stanley P.; Morganthaler, George F.; and Miura, Yoshiharu, 4,921,680, Cl. 422-197.000.

Mori, Haruyoshi, to Mitsubishi Denki Kabushiki Kaisha. Overvoltage suppressing circuit for semiconductor device. 4,922,365, Cl. 361-18.000.

Mori, Nobufumi; Hosoi, Yuichi; and Miyahara, Junji, to Fuji Photo Film Co., Ltd. Electron microscope. 4,922,098, Cl. 250-311.000.

Mori, Noriyuki: *See*—
Kuwano, Yukinori; Mori, Noriyuki; Nakano, Shoichi; Uehara, Hisao; Kobayashi, Mitsugu; Watanabe, Kaneo; and Noguchi, Shigeru, 4,922,111, Cl. 250-566.000.

Mori, Shinji, to Kabushiki Kaisha Tokai-Rika Denki-Susakusho. Locking mechanism for webbing retractor. 4,921,184, Cl. 242-107.40A.

Mori, Tetsuzo: *See*—
Ozawa, Masakazu; Ozawa, Kunitaka; Hatanaka, Katsunori; Suzuki, Tetsuo; Mori, Tetsuzo; Shiina, Tadashi; and Ebinuma, Ryuichi, 4,922,267, Cl. 346-136.000.

Mori, Yoshihiro; and Shibata, Jun, to Matsushita Electric Industrial Co., Ltd. Optical logic circuit. 4,922,497, Cl. 372-8.000.

Morikawa, Takashi; Ogawa, Tetuji; Sasaki, Akio; and Sato, Kiichi, to Hitachi, Ltd. Input/output system capable of allotting addresses to a plurality of input/output devices. 4,922,410, Cl. 364-200.000.

Morin, Albert Z. Spray controlling fender. 4,921,276, Cl. 280-848.000.

Morinaga, Shigeki: *See*—
Sugiura, Yasuyuki; Watabe, Mitsuru; Morinaga, Shigeki; Miyashita, Kunio; and Sugai, Hiroshi, 4,922,175, Cl. 318-592.000.

Morioka, Kensuke: *See*—
Funada, Tadashi; Hirano, Jiro; Ishida, Shiro; Morioka, Kensuke; and Murakami, Sachiko, 4,921,633, Cl. 252-314.000.

Moriya, Takehiro, to Nippon Telegraph and Telephone Corporation. Method and apparatus for multiplexed vector quantization. 4,922,508, Cl. 375-34.000.

Morlock, Gerhard; and Weigelt, F. Werner, to Degussa Akteingesellschaft. Radiation-hardenable agent for the scratch-resistant coating of organic glasses. 4,921,881, Cl. 522-99.000.

Morr, James J.: *See*—
Webb, John D., Jr., and Morr, James J., 4,921,493, Cl. 606-85.000.

Morrey, Kevin P.: *See*—
LaVelle, Richard E.; Wood, Gary L.; Morrey, Kevin P.; and Bossert, Clayton E., 4,920,589, Cl. 5-61.000.

Morris, Dan O.: *See*—
Jackson, Leon D.; Morris, Dan O.; and Nagi, Thomas J., 4,922,200, Cl. 324-223.000.

Morris, John A.: *See*—
Gorman, John E.; and Morris, John A., 4,921,625, Cl. 252-56.00D

Morris, John E.: *See*—
Wagner, John S.; and Morris, John E., 4,921,031, Cl. 160-38.000.

Morris, Livingston B.: *See*—
Lee, Kyu H.; and Morris, Livingston B., 4,921,473, Cl. 494-27.000.

Morris, Merle E.; Kendrick, George B.; and Boyd, John M., to GTF Products Corporation. Protective circuit for reduced voltage lamps. 4,922,155, Cl. 315-205.000.

Morsdorf, Peter: *See*—
Schickaneder, Helmut, Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; and Ahrens, Kurt H., 4,921,856, Cl. 514-252.000.

Morton, Roger R. A., to Eastman Kodak Company. Three dimensional display system. 4,922,336, Cl. 358-88.000.

Moskaliuk, Wiktor; Allen, Christopher M.; and Robbie, Roderick G. Interior canopy for stadium. 4,920,707, Cl. 52-6.000.

Mosley, Claude J.: *See*—
Casanova, Wayne J.; Dimmick, Roger F., Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D., Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.

Motegi, Tsuneo; Matsumoto, Yasuji; Takeda, Kiyoshi; and Chiba, Shuji, to Toshiba Silicone Co., Ltd. Curable polyorganosiloxane composition. 4,921,926, Cl. 528-17.000.

Motoren-Werke Mannheim AG: *See*—
Ueruenduel, Celal; and Zacharias, Friedemann, 4,921,040, Cl. 165-51.000.

Motorola, Inc.: *See*—
Blumenshine, Kent M.; Marcus, Harris L.; and Long-Daugherty, Kathleen A., 4,922,326, Cl. 357-80.000.
Dorinski, Dale W., 4,922,070, Cl. 200-512.000.
Johnson, Mark J., Yester, Francis R., Jr.; and Jasper, Steven C., 4,922,549, Cl. 455-212.000.
Kase, Kiyoshi, 4,922,493, Cl. 371-31.000.
Kazecki, Henry L.; and Goode, Steven H., 4,922,209, Cl. 331-12.000.
Madan, Sudhir K., 4,921,813, Cl. 437-46.000.
Matuszewski, Gerald; and Mashek, William J., 4,922,178, Cl. 320-2.000.
Susak, David M.; and Vyne, Robert L., 4,922,208, Cl. 330-255.000.
Walker, John S.; and Jenkins, Scott E., 4,922,059, Cl. 174-254.000.

Mott, John R., to Advanced Metals Technology Corp. Fiber composite article and method of manufacture. 4,921,222, Cl. 266-275.000.

Moulinex, Societe Anonyme: *See*—
Landais, Francis, P. J., 4,920,869, Cl. 99-283.000.

Moumaneix, Francis: *See*—
Le Marchand, Alain; and Moumaneix, Francis, 4,920,951, Cl. 126-403.000.

Mozeleski, Edmund J.: *See*—
Oswald, Alexis A., Bhatia, Ram N.; Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M.; and Hsu, Chang S., 4,922,028, Cl. 568-448.000.

MRM Security Systems, Inc.: *See*—
Mainiero, John W., 4,920,775, Cl. 72-10.000.

MTU Motoren-UND Turbinen-Union Munchen GmbH: *See*—
Liebl, Josef, 4,920,741, Cl. 60-39.070.

Mucciarone, Domenick. Pop-art tumbler. 4,921,117, Cl. 220-85.00H

Muderlak, Kenneth J.: *See*—
Finke, Malcolm K.; Weinstein, Marshall; and Muderlak, Kenneth J., 4,921,097, Cl. 206-387.000.

Mueller, Herbert: *See*—
Fischer, Roman; Mercker, Hans J.; and Mueller, Herbert, 4,922,023, Cl. 564-479.000.

Mueller, Josef: *See*—
Birnbach, Stefan; Mueller, Josef; Wulz, Klaus; and Houben, Jochen, 4,922,029, Cl. 568-616.000.

Mueller Kevin D.: *See*—
Garries, Ray W.; Burke, Edward H.; Mueller, Kevin D.; and Leone, Joseph D., 4,920,709, Cl. 52-85.000

Mueller, Mark A.: *See*—
Sanderson, John R.; Marquis, Edward T.; and Mueller, Mark A., 4,922,034, Cl. 568-909.800.

Mueller, Scott; Heidorn, Richard; and Swick, E. Grant, to Illinois Tool Works, Inc. Lightning protector assembly. 4,922,374, Cl. 361-119.000.

Mueller, Wolfgang F.: *See*—
Richter, Peter; Hoffmann Gerhard; Bronstert, Klaus; Mueller, Wolfgang F.; and Gerberding, Karl, 4,921,775, Cl. 430-281.000.

Muhlack, Horst. Display booth. 4,920,760, Cl. 62-255.000.

Mukai, Touji: *See*—
Watanabe, Atsuo; Ikeda, Takahide; Tsukuda, Kiyoshi; Hirao, Mitsuru; Mukai, Touji; and Kamei, Tatsuya, 4,921,811, Cl. 437-31.000.

Muldowney, Robert M.: *See*—
Stokes, Richard S.; and Muldowney, Robert M., 4,920,807, Cl. 73-808.000.

Mullen, Paul A., to Carlisle Tire & Rubber Company. Recreation surface and tile fastening scheme. 4,921,741, Cl. 428-48.000.

Muller, Eduard, to Maschinenfabrik Sulzer-Burckhardt. Trunk piston compressor. 4,920,862, Cl. 92-158.000.

Muller, Georg: *See*—
Knop, Reinhard; Sommer, Herbert; and Muller, Georg, 4,920,913, Cl. 118-410.000.

Muller, Hanns P.: *See*—
Schafer, Walter; Muller, Hanns P.; and Hassel, Tillmann, 4,921,996, Cl. 560-25.000.

Muller, Hans, to Stoping Aktiengesellschaft. Adjustable housing assembly for sliding closure unit. 4,921,148, Cl. 222-597.000.

Muller, Karl H.: *See*—
Witzel, Ulrich; and Muller, Karl H., 4,920,959, Cl. 606-53.000.

Muller, Manfred: *See*—
Meixner, Jurgen; Kremer, Wolfgang; and Muller, Manfred, 4,921,883, Cl. 522-107.000.

Muller, Richard P.: *See*—
Grossi, Benedetto; Muller, Richard P.; and O'Hare, Richard J., 4,920,961, Cl. 606-14.000.

Muller Textil GmbH: *See*—
Rickerl, Peter, 4,920,769, Cl. 66-176.000

Mullins, Daryl E.: *See*—
Fasang, Patrick P.; and Mullins, Daryl E., 4,922,492, Cl. 371-22.100.

Mulshine, James P.; and Sakatos, Michael J., to Inresco, Inc. Automatically resetting circuit protector. 4,922,370, Cl. 361-88.000.

Multitone Electronics PLC: *See*—
Lax, Alexander P., 4,921,467, Cl. 455-264.000.

Munchbach, George E.: *See*—
Walton, Richard R.; and Munchbach, George E., 4,921,643, Cl. 264-282.000.

Munich, Steinmann, Schiller: *See*—
Wieneke, Franz, 4,920,737, Cl. 56-249.000.

Murahashi, Hiroyuki; Akutsu, Yukio; and Koyama, Shinichi, to Hoya Corporation. Process for finishing optical lenses and apparatus therefor. 4,920,700, Cl. 51-124.00L.

Murai, Keiji: *See*—
Sugimoto, Tadakatsu; Igarashi, Yoshiaki; Saito, Shiro; Wada, Eiichi; and Murai, Keiji, 4,920,836, Cl. 81-463.000.

Murakami, Sachiko: *See*—
Funada, Tadashi; Hirano, Jiro; Ishida, Shiro; Morioka, Kensuke; and Murakami, Sachiko, 4,921,633, Cl. 252-314.000.

Murasaki, Hiroshi: *See*—
Mizuno, Hiroshi; Natasuhara, Toshiya; Enoguchi, Yuji; Ikegawa, Akihito; Yamamoto, Masasi; and Murasaki, Hiroshi, 4,920,916, Cl. 118-653.000.

Murashima, Hirotsugu: *See*—
Hidaka, Masaru; Murashima, Hirotsugu; Takuma, Masao; Haruki, Toshinobu; and Kikuchi, Kenichi, 4,922,346, Cl. 358-227.000.

Murata Manufacturing Co., Ltd.: *See*—
Nakamura, Takeshi, 4,920,641, Cl. 29-856.000.
Senda, Atsuo; Numata, Toshi; Ushiro, Tomoaki; Nakagawa, Takuji; and Taniguchi, Masaaki, 4,920,915, Cl. 118-503.000.

Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, to Fujisawa Pharmaceutical Company, Ltd. 3-pyrrolidinylthio-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid compounds. 4,921,852, Cl. 514-210.000.

Murata, Osamu: *See*—
Iri, Eiji; Nobuoka, Yasunari; Suzuki, Nobuo, Kashima, Yoshio; Kakutani, Yuji; and Murata, Osamu, 4,921,325, Cl. 350-96.210.

Murata, Yukio, to NEC Corporation. Microphone circuit. 4,922,547, Cl. 455-79.000.

Murata, Yuzuru: *See*—
Tanahashi, Keitaro; and Murata, Yuzuru, 4,922,482, Cl. 370-13.000.

Murayama, Ken: *See*—
Nagasawa, Kiyoshi; Ono, Kozo; Ogata, Kojiro; Murayama, Ken; and Hoshino, Yoshihiro, 4,920,660, Cl. 33-568.000.

Murayama, Tetsuo; and Aramaki, Shinji. Photoreceptor for electrophotography. 4,921,770, Cl. 430-76.000.

Murphy, Paul J. Sewer alarm. 4,922,234, Cl. 340-608.000.

Murray, David E.: *See*—
Franklin, Richard D.; Auld, Gregg D.; Murray, David E.; Lescisin, John J.; Vaia, Albert R.; and Dunn, Thomas E., 4,921,662, Cl. 376-316.000.

Murzyn, Patrick J.: *See*—
Deitrick, Bernard E.; Murzyn, Patrick J.; Nowotarski, Mark S. and Roberge, Raymond P., 4,920,998, Cl. 137-3.000.

Musingo, Edward M.: *See*—
Sander, Lothar S.; Musingo, Edward M.; and Neill, William J., 4,921,552, Cl. 14.8-247.000.

Musslewhite, Thomas W.: *See*—
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R., Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C.; and Jacubec, Mark R., 4,921,886, Cl. 423-235.000.

Muster, Frank L.: *See*—
Rombola, Gregory; Muster, Frank L.; and Telle, Lawrence B., 4,922,350, Cl. 358-488.000.

Muterspaugh, Max W.: *See*—
Hietala, Alexander W.; and Muterspaugh, Max W., 4,921,465, Cl. 455-193.000.

Muto, Masakazu, to Ichikoh Industries Limited. Automotive lamp assembly. 4,922,398, Cl. 302-296.000.

Myer, John M.: *See*—
Kane, Thomas J.; Myer, John M.; and Grzybowski, Richard W., 4,921,435, Cl. 439-248.000.

Myochin, Hisashi: *See*—
Takeda, Katsuhiko; and Myochin, Hisashi, 4,922,303, Cl. 355-274.000.

Naarden International N.V.: *See*—
Traas, Petrus C., 4,921,636, Cl. 252-408.100.

Nachbar, Henry D., to United States of America, Energy. Laser removal of sludge from steam generators. 4,920,994, Cl. 134-1.000.

Nachbur, Hermann; and Braun, Rosalinde, to Ciba-Geigy Corporation. Heat-sensitive recording material. 4,921,535, Cl. 106-21.000.

Naddor, David J.; and Schaubs, Randolph J., to Scientific-Atlanta, Inc. Method of reducing wearout in a non-volatile memory with double buffer. 4,922,456, Cl. 365-185.000.

Naemura, Shohei: *See*—
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi, and Hoshino, Hiroshi, 4,921,632, Cl. 252-299.100.

Nagabhushan, Tattanahalli L.; Haslanger, Martin F.; and Czarniecki, Michael F., to Schering Corporation. Orally active antiandrogens. 4,921,941, Cl. 530-331.000.

Nagae, Tuyoshi: *See*—
Shimizu, Seiji; and Nagae, Tuyoshi, 4,922,063, Cl. 200-11.00R

Nagai, Shiro: *See*—
Kitaura, Shinko; Takahara, Yoshimasa; Nagai, Shiro; and Nishio, Naomichi, 4,921,799, Cl. 435-167.000.

Nagai, Taku, to Yamaha Corporation. Process of fabricating field effect transistor device. 4,921,812, Cl. 437-35.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Speed control device for a bicycle. 4,920,818, Cl. 74-475.000.

Nagasawa, Kiyoshi; Ono, Kozo; Ogata, Kojiro; Murayama, Ken; and Hoshino, Yoshihiro, to Hitachi Construction Machinery Co., Ltd. Fine positioning device and displacement controller therefor. 4,920,660, Cl. 33-568.000.

Nagata, Nobuyoshi; Sugiyama, Hideki; Uemura, Kiyotaka; and Takebayashi, Mikio, to Kinugawa Rubber Industrial Co., Ltd. Structure of a weatherstrip member for sealing an end of a pane of window glass applicable to a vehicular door. 4,920,699, Cl. 49-441.000.

Nagata, Zenji, to Sanyo Shokuhin Kabushiki Kaisha. Apparatus for cutting bean curd into pieces of the fixed size and packing them. 4,920,844, Cl. 83-404.300.

Nagi, Thomas J.: *See*—
Jackson, Leon D.; Morris, Dan O.; and Nagi, Thomas J., 4,922,200, Cl. 324-223.000.

Nagle, Dennis C.; Brupbacher, John M.; and Christodoulou, Leontios, to Martin Marietta Corporation. Process for forming fine ceramic powders. 4,921,531, Cl. 75-351.000.

Naito, Toshihiko: *See*—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.

Nakae, Kiyohiko: *See*—
Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Kume, Takanori; and Negawa, Hideo, 4,920,692, Cl. 47-9.000.

Nakagami, Hidekazu; Sakamoto, Masashi; and Ozawa, Hiroshi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 4,922,294, Cl. 355-209.000.

Nakagawa, Alvin H.: *See*—
McKee, Bobby D.; and Nakagawa, Alvin H., 4,922,163, Cl. 310-239.000.

Nakagawa, Hirofumi: *See*—
Uchimoto, Yoshihiro; and Nakagawa, Hirofumi, 4,922,299, Cl. 355-219.000.

Nakagawa, Katsuya; Tanaka, Kunihiro; Yukawa, Masayuki; and Nomura, Masaki, to Nintendo Company Limited. Video game software selection data processing system. 4,922,420, Cl. 364-410.000.

VOL
1114
ISS
1
MY
1
1990
UMI

Nakagawa, Takuji: *See—*
Senda, Atsuo; Numata, Toshi; Ushiro, Tomoaki; Nakagawa, Takuji; and Taniguchi, Masaaki, 4,920,915, Cl. 118-503.000.
Nakahara, Kazuhiko: *See—*
Ishikawa, Takahide; and Nakahara, Kazuhiko, 4,921,814, Cl. 437-47.000.
Nakai, Hiroto: *See—*
Iwahashi, Hiroshi; Nakai, Hiroto; and Asano, Masamichi, 4,922,133, Cl. 307-363.000.
Nakai, Masayuki; Yoshida, Takeshi; and Tomura, Katsumi, to Idemitsu Kosan Co., Ltd. Method for preparing active carbons. 4,921,831, Cl. 502-418.000.
Nakajima, Akio; and Hasegawa, Hirofumi, to Minolta Camera Kabushiki Kaisha. Image reader capable of calculating the real focal length of a projecting lens. 4,922,087, Cl. 250-201.400.
Nakajima, Hiroyasu: *See—*
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi, Yukimori; Hori, Kazunori; and Tokuyama, Mikio, 4,922,356, Cl. 360-104.000.
Nakajima, Isao: *See—*
Seike, Shoji; Ogari, Noriyasu; and Nakajima, Isao, 4,921,322, Cl. 350-96.200.
Nakajima, Masahiko Heat processing apparatus using liquified gas. 4,920,952, Cl. 126-414.000.
Nakajima, Masashi: *See—*
Takatsuna, Kazutoshi; Tachikawa, Mamoru; Shinozawa, Kouji; Nakajima, Masashi; Shinohara, Akihito; and Okumura, Yoshiharu, 4,921,988, Cl. 556-413.000.
Nakajima, Takashi: *See—*
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,921,852, Cl. 514-210.000.
Nakajima, Toyohei; Okada, Yasushi; Mieno, Toshiyuki; and Oono, Nobuyuki, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling an air/fuel ratio of an internal combustion engine 4,922,429, Cl. 364-431.060.
Nakajima, Yuji, to Hoya Corporation Multi-layered mirror 4,921,331, Cl. 350-164.000.
Nakamichi Corporation: *See—*
Inoue, Yoshihisa, 4,922,353, Cl. 360-96.500.
Nakamura, Kaoru: *See—*
Abe, Shintaro; and Nakamura, Kaoru, 4,922,349, Cl. 358-443.000.
Nakamura, Katsunari, to Fuji Electric Co., Ltd Picking apparatus 4,921,087, Cl. 198-350.000.
Nakamura, Kazunari: *See—*
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,922,476, Cl. 369-47.000.
Nakamura, Koki; and Toya, Ichizo, to Fuji Photo Film Co., Ltd. Silver halide photographic material 4,921,785, Cl. 430-621.000.
Nakamura, Masao: *See—*
Takahashi, Satoji; and Nakamura, Masao, 4,922,011, Cl. 562-554.000.
Nakamura, Shuji Lock device for use of vehicle doors. 4,921,286, Cl. 292-216.000.
Nakamura, Syuji: *See—*
Shinto, Hiroaki; Nakamura, Syuji; Yamaguchi, Terumoto; Oguri, Tomoji; and Terashima, Tuneo, 4,920,821, Cl. 74-552.000
Nakamura, Takaharu: *See—*
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl 514-202.000.
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl 514-319.000.
Nakamura, Takashi, and Yamaura, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Detector for use on sewing machines. 4,920,905, Cl. 112-275.000.
Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Method of manufacturing an electronic part. 4,920,641, Cl. 29-856.000.
Nakamura, Takuya *See—*
Tsuchiya, Yutaka; Aoshima, Shinichiro; and Nakamura, Takuya, 4,922,186, Cl 324-96.000.
Nakamura, Tokuo, to Alps Electric Co., Ltd. Rotary head type digital audio tape recorder. 4,922,359, Cl. 360-107.000.
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, to NEC Corporation; and Sanyo Chemical Industries, Ltd. Liquid crystal compounds and compositions. 4,921,632, Cl. 252-299.100.
Nakamura, Wayne H., to United States of America, Navy. Fabrication by filament winding with an elastomeric material. 4,921,557, Cl. 156-169.000.
Nakanishi, Hidemi: *See—*
Tamura, Mitsuhiko; Miyamoto, Masaaki; Nakanishi, Hidemi; and Tanaka, Takayoshi, 4,921,932, Cl. 528-339.300.
Nakanishi, Shuji: *See—*
Inoue, Mitsuyoshi; Nakanishi, Shuji; and Uemizo, Yoshiaki, 4,920,730, Cl. 53-532.000.
Nakano, Shoichi: *See—*
Kuwano, Yukinori; Mori, Noriyuki; Nakano, Shoichi; Uehara, Hisao; Kobayashi, Mitsugu; Watanabe, Kaneo; and Noguchi, Shigeru, 4,922,111, Cl. 250-566.000.
Nakashima, Hideyuki: *See—*
Sakano, Kenji; Nakashima, Hideyuki; Sakanaka, Hiroo; and Okamoto, Kazutoshi, 4,920,930, Cl. 123-41.860.
Nakasuji, Norikazu: *See—*
Shibahashi, Yutaka; and Nakasuji, Norikazu, 4,920,991, Cl. 132-73.000.
Nakata, Takashi: *See—*
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,922,287, Cl. 355-27.000.
Nakatani, Kenji; Okaniwa, Hiroshi; and Yano, Mitsuaki, to Teijin Limited. Reactor for depositing a layer on a moving substrate. 4,920,917, Cl. 118-718.000.
Nakayama, Noritaka; and Masukawa, Toyoaki, to Konica Corporation. Silver halide photographic light-sensitive material. 4,921,783, Cl. 430-558.000.
Nakayama, Yoshiaki: *See—*
Saito, Kenji; Nakayama, Yoshiaki; and Kawada, Yukihiro, 4,922,330, Cl. 358-29.000.
Nakayama, Yoshifumi: *See—*
Ichida, Koji; Nakayama, Yoshifumi; and Inoue, Hiromu, 4,922,166, Cl. 313-414.000.
Nakazawa, Takahiro: *See—*
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl. 514-319.000.
Nakazawa, Yoshihiro; Tabata, Hajime; Hasegawa, Tooru; and Tanabe, Hideyuki, to Honda Motor Co., Ltd.; and Stanley Electric Co., Ltd. Head lamp for motor-bicycle with slant angle correction. 4,922,390, Cl. 362-72.000.
Nalco Chemical Company: *See—*
Fong, Dodd W., 4,921,903, Cl 524-555.000.
Sparapany, John W.; and Bakalik, Dennis P., 4,921,904, Cl 525-329.900.
Narikiyo, Hidetoshi. *See—*
Gotou, Yukifumi; Narikiyo, Hidetoshi; and Chuma, Yoshihiro, 4,921,164, Cl. 236-49.300
Narisawa, Nobuyuki: *See—*
Wazaki, Yoshio; Oono, Tetsuya; and Narisawa, Nobuyuki, 4,921,064, Cl. 180-197.000.
Naruse, Yasuhito: *See—*
Kaneko, Nobuyoshi; and Naruse, Yasuhito, 4,921,729, Cl. 427-131.000.
Naser, Georg; Reichelsdoerfer, Peter; and Schneider, Siegfried, to Siemens Aktiengesellschaft. Holding mechanism for a measuring cryostat. 4,921,198, Cl. 248-123.100.
Nash, Dudley O.; and Quinn, Ronald E., to General Electric Company. Heat shield for gas turbine engine frame. 4,920,742, Cl. 60-39.320.
Nash, James E.; and Heikkila, Kurt E., to Integrated Chemistries, Incorporated. Cleaning composition for removal of PCBs. 4,921,628, Cl. 252-111.000.
Nash Manufacturing Company: *See—*
Parten, Keith, 4,921,513, Cl. 156-280.000.
Natasuhara, Toshiya: *See—*
Mizuno, Hiroshi; Natasuhara, Toshiya; Enoguchi, Yuji; Ikegawa, Akihito; Yamamoto, Masasi; and Murasaki, Hiroshi, 4,920,916, Cl. 118-653.000.
Nathanson, Harvey C.; Driver, Michael C.; and Betsch, Regis J., to Westinghouse Electric Corp. High attenuation broadband high speed RF shutter and method of making same. 4,922,253, Cl. 342-5.000.
National Research Development Corporation: *See—*
Johns, Allan T., 4,922,368, Cl. 361-62.000.
National Semiconductor Corp.: *See—*
Fasang, Patrick P.; and Mullins, Daryl E., 4,922,492, Cl. 371-22.100.
Mathew, Ranjan J., 4,922,322, Cl. 357-69.000.
Wright, Michael E., 4,922,129, Cl. 307-315.000.
Naumann, Dieter; Tyrra, Wieland; Kock, Birgit; Rudolph, Werner; and Wilkes, Bernd, to Kali-Chemie AG. Method for producing CF_3I. 4,922,041, Cl. 570-141.000.
Navic Co., Ltd.: *See—*
Hatanaka, Toshihiko; Enomoto, Akira; and Matsushita, Kouji, 4,922,094, Cl. 250-221.000.
Naylor, Graham A.: *See—*
Kearsley, Andrew J.; Lewis, Richard R.; and Naylor, Graham A., 4,922,498, Cl. 372-25.000.
Naylor Industrial Services, Inc.: *See—*
Bloch, Christopher J., 4,921,546, Cl. 134-22.120.
NCR Corporation: *See—*
Hanna, Peter D., 4,921,279, Cl. 283-67.000.
Nealey, Richard H.: *See—*
Melnyk, Andrew R.; Nealey, Richard H.; Brach, Paul J.; and Teuscher, Leon A., 4,921,773, Cl. 430-132.000.
Nebelung, Hermann H.; and Andersson, Rune, to Emhart Industries, Inc. Mechanism for opening and closing at least one mould of a glassware forming machine. 4,921,523, Cl. 65-172.000.
NEC Corporation: *See—*
Mizukami, Takeshi, 4,922,457, Cl. 365-189.010.
Murata, Yukio, 4,922,547, Cl. 455-79.000.
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, 4,921,632, Cl. 252-299.100.
Sato, Yoshinori, 4,922,316, Cl. 357-41.000.
Sato, Yukio; and Ichikawa, Toshio, 4,922,221, Cl. 340-311.100.
Tsuzuki, Kuniyuki, 4,922,399, Cl. 363-21.000.
Yoshida, Yoshinori; Arutaki, Akira; Hashimoto, Masao; and Yoshikawa, Suminori, 4,922,484, Cl. 370-68.100.

NEC Electronics Inc.: *See—*
Kunieda, Shin-ichi; and Ozawa, Masahide, 4,921,810, Cl. 437-8.000
NEC Home Electronics Ltd.: *See—*
Miura, Masafumi, 4,922,477, Cl 369-221.000.
Nedelec, Lucien; Claussner, Andre ; Philibert, Daniel; and Moguilewsky, Martine, to Roussel Uclaf. Novel 17-hetero substituted steroids. 4,921,846, Cl. 514-173.000.
Negawa, Hideo: *See—*
Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Kume, Takanori; and Negawa, Hideo, 4,920,692, Cl. 47-9.000.
Negi, Shigeto: *See—*
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.
Negi, Taichi; Tanaka, Nobuo; and Yonezu, Kiyoshi, to Kuraray Co., Ltd. Resin composition and multilayered structure. 4,921,907, Cl. 525-57.000.
Neil, Vladimir, to Studex Corp. One-piece earring carrier. 4,921,494, Cl. 606-188.000.
Neill, William J.: *See—*
Sander, Lothar S.; Musingo, Edward M.; and Neill, William J., 4,921,552, Cl. 14.8-247.000.
Neiman: *See—*
Philippe, Patrick, 4,922,533, Cl. 380-46.000.
Nelson, David C.; Bartasevich, William E.; and Waldo, Robert L., to Nelson, David C. Balloon inflator valve. 4,921,402, Cl. 415-148.000.
Nelson, Larry L., to Systems Mailing Research, Inc. Envelope opener and load separator. 4,921,388, Cl. 414-412.000.
Nelson, Stephen R.: *See—*
Herschler, Wilbert H.; and Nelson, Stephen R., 4,921,191, Cl. 248-70.000.
Nemet-Mavrodin, Margaret; and Soto, Jorge L., to Mobil Oil Corp. Process for the conversion of C_2-C_{12} paraffinic hydrocarbons to petrochemical feedstocks. 4,922,051, Cl. 585-418.000.
Nemori, Ryoichi: *See—*
Ikeda, Hideo; and Nemori, Ryoichi, 4,921,784, Cl 430-567.000.
Neri, Armando: *See—*
Turra, Mario; and Neri, Armando, 4,922,090, Cl 250-205.000.
Ness, Diane E. M.: *See—*
Howell, Barry G.; Ness, Diane E. M.; and Harvey, Ronald A., 4,921,916, Cl. 525-423.000.
Neste Oy: *See—*
Suvanto, Erkki, 4,921,030, Cl. 152-210.000.
Network Communications, Inc.: *See—*
Larsson, Arne, 4,922,056, Cl. 174-65.00R.
Neuhoffer, Hans-Friedrich; and Vomhoff, Erich, to Schwabische Hüttenwerke GmbH. Heatable glazing or calendering roll. 4,920,623, Cl. 29-129.000.
Neumann, Peter: *See—*
Eichenauer, Ulrich; and Neumann, Peter, 4,922,031, Cl. 568-730.000.
New England Deaconess Hospital Corporation: *See—*
Salem, Ronald R.; Thomas, Peter; and Steele, Glenn, 4,921,789, Cl. 435-7.000.
New York University: *See—*
Coico, Richard F.; and Thorbecke, G. J., 4,921,667, Cl 424-85.800.
Newman, Alex T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., to General Foods Limited. Method for preparing beverages and beverage preparing machines. 4,920,870, Cl. 99-289.00R
Newman, Robert M.: *See—*
Hullett, John L.; and Newman, Robert M., 4,922,244, Cl. 340-825.500.
Newton, Robert A.: *See—*
Flanders, James R.; Bramley, Frank; Sharp, Francis B. Newton, Robert A.; and Mansfield, Graham J., 4,920,594, Cl. 12-7.000.
Neya, Masahiro: *See—*
Hemmi, Keiji; Neya, Masahiro; Marusawa, Hiroshi; Imai, Keisuke; Kayakiri, Natsuko; and Hashimoto, Masashi, 4,921,855, Cl. 514-235.800.
NGK Insulators, Ltd.: *See—*
Kato, Tsugiji; Aoyama, Kunitoshi; and Kozakai, Motokazu, 4,921,095, Cl. 206-328.000.
Matsui, Minoru; and Takahashi, Tomonori, 4,921,721, Cl. 427-34.000.
Seike, Shoji; Oguri, Noriyasu; and Nakajima, Isao, 4,921,322, Cl. 350-96.200.
Yajima, Yasuhito, 4,920,635, Cl. 29-612.000.
Yajima, Yasuhito; Watanabe, Yasushi; and Shibata, Kazuyoshi, 4,920,805, Cl. 73-706.000.
NGK Spark Plug Co., Ltd.: *See—*
Masuda, Senichi; and Fukuura, Isamu, 4,922,099, Cl. 250-324.000.
NHK Morse Co., Ltd.: *See—*
Uchida, Tatsumi; Hoshina, Yoshikazu; and Nishimura, Seiichi, 4,920,819, Cl. 74-480.00B.
NHK Spring Co., Ltd.: *See—*
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,223, Cl. 267-64.230.
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,224, Cl. 264-64.230.
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,227, Cl. 267-64.230.
Nicholas, David C., to Rockwell International Corporation. Method of demodulation using split delay line. 4,922,206, Cl. 329-304.000.
Nichols, Michael F.; and Hahn, Allen W., to University of Missouri, The Curators of the. Process for applying a composite insulative coating to a substrate. 4,921,723, Cl 427-41.000.
Nicholson, Warren B.: *See—*
Frank, Thomas P.; Nicholson, Warren B.; and Pfouts, Mark D., 4,920,972, Cl. 128-675.000
Nickel, Friedhelm: *See—*
Schaefer, Dietmar; and Nickel, Friedhelm, 4,921,895, Cl 524-379.000.
Niebylski, Leonard M., to Ethyl Corporation. Organoborosilazane polymers. 4,921,925, Cl. 528-5.000.
Niermann, Hans: *See—*
Linke, Adolf; Dutz, Karl-Heinz; Niermann, Hans; and Wilmer, Gerhard, 4,920,926, Cl. 122-379.000.
Niestegge, Gerd, to Siemens Aktiengesellschaft. Switching node for switching data signals transmitted in data packets. 4,922,488, Cl. 370-60.000.
Niewohner, Ulrich; Hoever, Franz-Peter; Junge, Bodo; Perzborn, Elisabeth; Seuter, Friedel; and Fiedler, Volker-Bernd, to Bayer Aktiengesellschaft. Substituted amino-5,6,7,8-tetrahydronaphthyloxyacetic acids, processes for their preparation and their use as medicaments. 4,921,998, Cl. 560-45.000.
Nifco, Inc.: *See—*
Iguchi, Tatsuya, 4,920,618, Cl. 24-453.000.
Niggemeyer, Gert G. DC-DC converter. 4,922,396, Cl 363-21.000.
Nihon Kinsen Kikai Kabushiki Kaisha: *See—*
Inoue, Mitsuyoshi; Nakanishi, Shuji; and Uemizo, Yoshiaki, 4,920,730, Cl. 53-532.000.
Niitsuma, Kikue: *See—*
Eguchi, Kinya; Niitsuma, Kikue; Wakena, Shigeru; and Ezawa, Masayoshi, 4,922,104, Cl. 250-339.000.
Nikolaus, Heinrich: *See—*
Kordak, Rolf; Nikolaus, Heinrich; and Metzner, Frank, 4,920,748, Cl. 60-414.000.
Niles Parts Co., Ltd.: *See—*
Inabe, Shinya; and Hirato, Ko, 4,920,816, Cl. 74-424.80A
Nilsson, Kenth; Jofs, Bengt; and Skog, Goeran, to Siemens Aktiengesellschaft. Matrix printer means. 4,922,271, Cl. 346-140.00R.
Nimberger, Spencer M., to Precision General, Inc. Stabilized connector flange for interconnecting an instrument manifold with an orifice plate assembly. 4,920,626, Cl. 29-282.000.
Nino, Naohi, to Koito Seisakusho Co., Ltd. Headlight device for vehicle. 4,922,389, Cl. 362-61.000.
Nintendo Company Limited: *See—*
Nakagawa, Katsuya; Tanaka, Kunihiro; Yukawa, Masayuki, and Nomura, Masaki, 4,922,420, Cl. 364-410.000.
Nippon A.B.S., Ltd.: *See—*
Arikawa, Tetsuro, 4,921,313, Cl. 303-116.000
Nippon Board Computer Co., Ltd.: *See—*
Iwai, Kiyoshi, 4,922,340, Cl. 358-135.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,921,984, Cl. 556-40.000.
Nippon Oil and Fats Co., Ltd.: *See—*
Arai, Motoharu; and Ito, Masatsugu, 4,921,705, Cl. 424-450.000.
Funada, Tadashi; Hirano, Jiro; Ishida, Shiro; Morioka, Kensuke; and Murakami, Sachiko, 4,921,633, Cl. 252-314.000.
Nippon Petrochemicals Company, Limited: *See—*
Shimizu, Isoo; Matsumura, Yasuo; and Arai, Yutaka, 4,922,052, Cl 585-25.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Kasuga, Shinichi; and Osawa, Nobuyuki, 4,921,358, Cl. 384-15.000.
Yamamoto, Shigemi; and Seto, Toshiaki, 4,920,620. Cl. 24-641.000.
Nippon Telegraph and Telephone Corporation: *See—*
Moriya, Takehiro, 4,922,508, Cl. 375-34.000.
Nippondenso Co., Ltd.: *See—*
Kawamura, Yoshihito; Akai, Masashi; and Takagi, Makoto, 4,921,410, Cl. 419-8.000.
Nishihara, Testuo; Watanabe, Takashi; and Tohjyoh, Tomotaroh, to Sharp Kabushiki Kaisha. Thermal transfer printer having independent carriage scanning mechanism and ribbon winding motor. 4,921,363, Cl. 400-120.000.
Nishijima, Mitsuru: *See—*
Hara, Kazumasa; Koike, Mikio; Nishijima, Mitsuru; and Okutani, Koji, 4,920,903, Cl. 112-229.000.
Nishikawa, Masato: *See—*
Baba, Keizo; and Nishikawa, Masato, 4,922,524, Cl. 379-100.000.
Nishikawa, Yukie: *See—*
Nitta, Koichi; Nishikawa, Yukie; Ishikawa, Masayuki; Tsuburai, Yasuhiko; and Kokubun, Yoshihiro, 4,922,499, Cl. 372-46.000.
Nishimura, Masachika: *See—*
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, 4,922,274, Cl. 354-271.100.
Nishimura, Ritsuo: *See—*
Takamiya, Kikuzo; Tamura, Yoshitaka; Shibayama, Yoichi; Nishimura, Ritsuo; Hirai, Kiyofumi; and Serizawa, Hiromitsu, 4,920,827, Cl. 475-166.000.
Nishimura, Seiichi: *See—*
Uchida, Tatsumi; Hoshina, Yoshikazu; and Nishimura, Seiichi, 4,920,819, Cl. 74-480.00B.
Nishimura, Shinji, to Mitsubishi Denki Kabushiki Kaisha Power feeding system for a rotor. 4,922,179, Cl. 322-25.000.
Nishino, Atsushi: *See—*
Yoshida, Akihiko; Nishino, Atsushi; Tanahashi, Ichiro; and Takeuchi, Yasuhiro, 4,921,686, Cl. 423-447.600.

Nishio, Naomichi: *See—*
Kitaura, Shinko; Takahara, Yoshimasa; Nagai, Shiro; and Nishio, Naomichi, 4,921,799, Cl. 435-167.000.

Niskanen, Toivo, to A. Ahlstrom Corporation. Pump and a method of separating gas by such from a fluid to be pumped. 4,921,400, Cl. 415-169.100.

Nissan Motor Co., Ltd.: *See—*
Imaseki, Takashi; and Kobari, Yuji, 4,921,060, Cl. 180-41.000.
Mihara, Teruyoshi, 4,922,317, Cl. 357-42.000.
Obara, Hideo; and Yanagishima, Takayuki, 4,922,426, Cl. 364-424.050.
Takahashi, Hiroshi, 4,922,428, Cl. 364-426.040.
Takemura, Toji; and Okubo, Takashi, 4,921,085, Cl. 192-60.000.
Tanaka, Masakazu; and Ohashi, Toshio, 4,920,759, Cl. 62-244.000.
Yokote, Masatsugu; Ito, Hideo; Kawagoe, Kenji; and Kuroki, Junsuke, 4,922,427, Cl. 364-424.050.

Nissin Kogyo Kabushiki Kaisha: *See—*
Horiuchi, Makoto; Miyakawa, Yoshitaka; and Sakurai, Kazuya, 4,920,857, Cl. 91-373.000.

Nitta, Koichi; Nishikawa, Yukie; Ishikawa, Masayuki; Tsuburai, Yasuhiko; and Kokubun, Yoshihiro, to Kabushiki Kaisha Toshiba. Semiconductor laser device and the manufacturing method thereof. 4,922,499, Cl. 372-46.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.

Nixdorf Computer AG: *See—*
Hubert, Christian; and Janssen, Rainer, 4,922,528, Cl. 379-386.000.

Nobuoka, Yasunari: *See—*
Iri, Eiji; Nobuoka, Yasunari; Suzuki, Nobuo; Kashima, Yoshio; Kakutani, Yuji; and Murata, Osamu, 4,921,325, Cl. 350-96.210.

Nocito, Vincent; Bedell, Louis J.; and Levinson, Matthew I., to Angus Chemical Company. Method of preparing halogenated nitroalcohols 4,922,030, Cl. 568-713.000.

Noda, Yumiki: *See—*
Kashima, Mikito; Ishikawa, Hideo; Kashiwagi, Kouichi; and Noda, Yumiki, 4,922,010, Cl. 562-470.000.

Nofre, Claude; Tinti, Jean M.; and Ouar Chatzopoulos, Farroudja, to Universite Claude Bernard -Lyon 1. Sweetening agents. 4,921,939, Cl. 558-414.000.

Noguchi, Masahiro, to Mitsubishi Monsanto Chemical Co., and Mitsubishi Kasei Corp. Substrate for high-intensity led, and method of epitaxially growing same. 4,921,817, Cl. 437-127.000.

Noguchi, Minori; Koizumi, Mitsuyoshi; Shishido, Hiroaki; Uto, Sachio; and Ohshima, Yoshimasa, to Hitachi, Ltd. Method of and apparatus for detecting foreign substance. 4,922,308, Cl. 356-237.000.

Noguchi, Shigeru: *See—*
Kuwano, Yukinori; Mori, Noriyuki; Nakano, Shoichi; Uehara, Hisao; Kobayashi, Mitsugu; Watanabe, Kaneo; and Noguchi, Shigeru, 4,922,111, Cl. 250-566.000.

Noguchi, Yoshio: *See—*
Yamada, Bunshi; Kimura, Michio; and Noguchi, Yoshio, 4,922,039, Cl. 570-211.000.

Nohr, Ronald S., to Kimberly-Clark Corporation. Immobilized blue-green algae. 4,921,803, Cl. 435-179.000.

Nojima, Katsuyuki: *See—*
Aoki, Takaaki; Iida, Hiroyasu; and Nojima, Katsuyuki, 4,922,238, Cl. 340-726.000.

Noland, Joseph R.: *See—*
Dooley, Eddie W.; and Noland, Joseph R., 4,920,770, Cl. 68-133.000.

Nomoto, Reishi: *See—*
Takenoya, Hideaki; Nomoto, Reishi; and Ebata, Yoshikazu, 4,920,902, Cl. 112-103.000.

Nomoto, Seiichiro: *See—*
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.

Nomura, Masaki: *See—*
Nakagawa, Katsuya; Tanaka, Kunihiro; Yukawa, Masayuki; and Nomura, Masaki, 4,922,420, Cl. 364-410.000.

Nonaka, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing magnetic head. 4,921,508, Cl. 29-603.000.

Nonami, Takyuki, to Mitsubishi Denki Kabushiki Kaisha. Small electronic apparatus. 4,922,527, Cl. 379-361.000.

Noran: *See—*
Friese, Donald E.; Brown, James W.; MacEwen, Frank; LeVan, E G.; and Smith, Michael, 4,920,698, Cl. 49-380.000.

Norberg, Astrid: *See—*
Juhlin, Sven-Eric; Bergkvist, Hakan; Norberg, Astrid; and Winblad, Bengt, 4,921,112, Cl. 215-11.400.

Nordberg, Cecilia M.; Engstrom, Thomas B.; Pinzke, Thomas; Sanneskog, Owe; and Ohlund, Jan, to Boliden Aktiebolag. Method for purifying resin-containing waste liquor in the manufacture of cellulose pulps. 4,921,613, Cl. 210-651.000.

Nordby, Harold E.; and McDonald, Roy E. Method for protecting citrus fruit from chilling injury, and fruit protected thereby. 4,921,715, Cl. 426-102.000.

Nordyke, Keith D., to Federal-Mogul Corporation. Swage fasteners with a high stand-off collar. 4,921,384, Cl. 411-361.000.

Norland, Richard S.: *See—*
Yelton, Darrell A.; and Norland, Richard S., 4,921,308, Cl. 299-39.000.

Norman, Hans-Olay. *See—*
Hedlund, Jan-Gunnar; Hansson, Lennart; and Norman, Hans-Olay, 4,921,310, Cl. 299-92.000.

Noro, Masao, to Yamaha Corporation. Acoustic characteristics changing device having variable characteristics. 4,922,469, Cl. 367-140.000.

Noro, Takanobu: *See—*
Matsumoto, Kunio; Noro, Takanobu; and Kanda, Naoya, 4,922,377, Cl. 361-387.000.

Noro, Yoshiki: *See—*
Hamada, Tetsuro; Noro, Yoshiki; and Ashikawa, Noboru, 4,921,065, Cl. 180-245.000.

North American Adhesive Company: *See—*
Bozich, Frank A., Jr., 4,921,795, Cl. 435-96.000.

North American Philips Corporation: *See—*
Colak, Selami, 4,922,158, Cl. 315-383.000
Duwaer, Arne L., 4,922,240, Cl. 340-784.000.

North, Ben B.: *See—*
Dunn, Trevor R.; Lucas, David R. S.; North, Ben B., and Joyce, Timothy R., 4,922,189, Cl. 324-142.000.

Northern Telecom Limited: *See—*
Moisin, Mihail S., 4,922,531, Cl. 379-413.000.

Norton-Alcoa Proppants: *See—*
Rumpf, David S.; and Lemieux, Paul R., 4,921,820, Cl. 501-128.000.
Rumpf, David S.; and Lemieux, Paul R., 4,921,821, Cl. 501-128.000.

Norton Company: *See—*
Bates, Carl H.; Couhig, John T.; and Pelletier, Paul J., 4,921,554, Cl. 156-89.000.

Novak, Joel S.; Parsons, Natan E.; and Steiner, Kenneth M., to Recurrent Solutions Limited Partnership. Method and apparatus for flow control. 4,921,211, Cl. 251-129.040.

Novak, Peter, to Starrfraschmachinen, AG. Tool rack for machine tools. 4,920,631, Cl. 29-568.000.

NovAtel Communications, Ltd.: *See—*
Roberts, Glyn; Paynter, Gordon; and Krishnasastry, Remesh B., 4,922,212, Cl. 331-176.000.

Novikov, Vladimir M.: *See—*
Lipukhin, Jury V.; Garber, Eduard A., Orlov, Boris Y.; Ponosov, Viktor N.; Novikov, Vladimir M., and Rumako, Gennady N., deceased, 4,920,705, Cl. 51-318.000.

Novikova, Elizaveta B.: *See—*
Babaian, Eduard A.; Gerasimova, Galina A., Davydov, Anatoly B. Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,921,695, Cl. 424-81.000.

Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, to Nippon Kayaku Kabushiki Kaisha. Novel platinum complexes. 4,921,984, Cl. 556-40.000.

Nowotarski, Mark S.: *See—*
Deitrick, Bernard E.; Murzyn, Patrick J.; Nowotarski, Mark S.; and Roberge, Raymond P., 4,920,998, Cl. 137-3.000.

Nozaki, Nobuharu: *See—*
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,922,103, Cl. 250-327.200.

Nozawa, Yasuto: *See—*
Tokunaga, Masatoki; Nozawa, Yasuto; and Iwasaki, Katsunori, 4,921,553, Cl. 148-302.000.

Nubson, Richard C.; and Mattila, Gary P., to DataCard Corporation. Input hopper apparatus and method. 4,921,237, Cl. 271-11.000.

Numata, Toshi: *See—*
Senda, Atsuo; Numata, Toshi; Ushiro, Tomoaki; Nakagawa, Takuji; and Taniguchi, Masaaki, 4,920,915, Cl. 118-503.000.

Nutting, Thomas C.; Lucas, King A.; and Arnold, Andrew D., to Eastman Kodak Company. Video copying apparatus spectrally responsive to slides or negatives. 4,922,333, Cl. 358-78.000.

Obama, Masao; and Kikuchi, Masaaki, to Kabushiki Kaisha Toshiba. Strain gage. 4,920,806, Cl. 73-779.000.

Obara, Hideo; and Yanagishima, Takayuki, to Nissan Motor Co., Ltd. Control system for vehicle equipment. 4,922,426, Cl. 364-424.050.

Oberle, Hans-Dieter: *See—*
Hoffmann, Kurt; Kowarik, Oskar; Kraus, Rainer; Lustig, Bernhard; and Oberle, Hans-Dieter, 4,922,134, Cl. 307-441.000.

O'Brien, Edward R., III, to SPD Technologies Inc. Solid state overcurrent protection system for circuit breakers. 4,922,372, Cl. 361-97.000.

O'Brien, John F., to ICI Americas Inc. Molded complaint springs. 4,921,453, Cl. 439-630.000.

O'Brien, Michael J., to General Electric Company. Method for making tertiary butyl esters. 4,921,999, Cl. 560-52.000.

O'Brien, Timothy J., to Research Corporation. Tumor specific assay for CA125 ovarian cancer antigen. 4,921,790, Cl. 435-7.000.

Obrig, Thomas G. Immunoaffinity purification of phytolaccin proteins and their use in treating Herpes Simplex virus type II. 4,921,841, Cl 514-8.000.

Occidental Chemical Corporation: *See—*
Kem, Kenneth M., 4,922,012, Cl. 564-15.000.
Miller, George T.; and Morgan, Russell J., 4,921,736, Cl. 428-36.400.

Ochiai, Minoru: *See—*
Hara, Akira; and Ochiai, Minoru, 4,920,880, Cl. 101-425.000.

Ochs, Eckhard. Vehicle lifting platform attachment. 4,921,074, Cl. .87-8.710.

Ochs, Gordon M. Modular aquaculture fish pen assembly with slidable divider. 4,920,921, Cl. 119-3.000.

Odajima, Hideo, to Mitsubishi Pencil Co., Ltd. Process of making an acoustic carbon diaphragm. 4,921,559, Cl. 156-242.000.

O'Daniel, Harold W. Lifting and dumping apparatus. 4,921,389, Cl. 414-420.000.

Odell, Peter G.; Baranyi, Giuseppa; and Alexandru, Lupu, to Xerox Corporation. Process for the purification of Ti containing polycarbonate with solvent, complexing agent and water 4,921,940, Cl. 528-486.000.

ODL, Incorporated: *See—*
Artwick, Kert E.; and Wilkening, Steven R., 4,920,718, Cl. 52-476.000.

Odle, Roy R., to General Electric Company. Nitration reactions with acid anhydride promoters. 4,921,970, Cl. 548-480.000.

Odom, Joel M. Shot measure for shell reloader accessory. 4,920,853, Cl 86-33.000.

O'Farrell, Kevin, to Cotag International Ltd. Aerial systems. 4,922,261, Cl. 343-742.000.

Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Copolymers of poly(vinyl trifluoroacetate) or poly(vinyl alcohol). 4,921,908, Cl. 525-61.000.

Ofstead, Ronald F.: *See—*
Hammer, W. James; and Ofstead, Ronald F., 4,921,884, Cl. 523-106.000.

Ogata, Kojiro: *See—*
Nagasawa, Kiyoshi; Ono, Kozo; Ogata, Kojiro; Murayama, Ken; and Hoshino, Yoshihiro, 4,920,660, Cl. 33-568.000.

Ogawa, Takeshi: *See—*
Kosugi, Tatsuhiro; Ogawa, Takeshi; and Tanaka, Norio, 4,921,422, Cl. 432-24.000.

Ogawa, Tetuji: *See—*
Morikawa, Takashi; Ogawa, Tetuji; Sasaki, Akio; and Sato, Kiichi, 4,922,410, Cl. 364-200.000.

Ogawa, Tomoya: *See—*
Yoshimura, Shoji; Matsuzaki, Yuzi; Sugimoto, Mamoru; Ito, Masayoshi; and Ogawa, Tomoya, 4,921,948, Cl. 536-18.200.

Ogawa, Yoichi, to Pioneer Electronic Corporation. Impedance load driving circuit. 4,922,160, Cl. 318-135.000.

Ogawa, Yuji: *See—*
Koshino, Susumu; and Ogawa, Yuji, 4,922,280, Cl. 354-403.000.

Oguchi, Yoshihiro; and Santoh, Tsuyoshi, to Canon Kabushiki Kaisha Optical recording medium. 4,921,780, Cl. 430-495.000.

Oguri, Noriyasu: *See—*
Seike, Shoji; Oguri, Noriyasu; and Nakajima, Isao, 4,921,322, Cl. 350-96.200.

Oguri, Tomoji: *See—*
Shinto, Hiroaki; Nakamura, Syuji; Yamaguchi, Terumoto; Oguri, Tomoji; and Terashima, Tuneo, 4,920,821, Cl. 74-552.000.

O'Hare, Richard J.: *See—*
Grossi, Benedetto; Muller, Richard P.; and O'Hare, Richard J., 4,920,961, Cl. 606-14.000.

Ohashi, Kunio; and Fukutani, Yoshihiro, to Omron Tateisi Electronics Co. System for performing banking transactions. 4,922,419, Cl. 364-408.000.

Ohashi, Masashi: *See—*
Sasaki, Nobukazu; Kasamura, Toshirou; Ohashi, Masashi; Okuda, Naoki; and Kusomoto, Toshihiko, 4,922,300, Cl. 355-245.000.

Ohashi, Toshio: *See—*
Tanaka, Masakazu; and Ohashi, Toshio, 4,920,759, Cl. 62-244.000.

Ohi, Shinichi, to Diesel Kiki Co., Ltd. Motor actuator with air-mix door opening-limiter and built-in switching unit. 4,922,171, Cl. 318-471.000.

Ohlsson, Stefan B.: *See—*
Bossaert, Bernard L. L.; Ohlsson, Stefan B.; and Willems, William F. M. J., 4,921,749, Cl. 428-216.000.

Ohlund, Jan: *See—*
Nordberg, Cecilia M.; Engstrom, Thomas B.; Pinzke, Thomas; Sanneskog, Owe; and Ohlund, Jan, 4,921,613, Cl. 210-651.000.

Ohmi, Tadahiro; Mihira, Hiroshi; and Satoh, Kiyoshi. Mass flow controller. 4,921,005, Cl. 137-486.000.

Ohngemach, Jorg: *See—*
Kohler, Manfred; Ohngemach, Jorg; and Poetsch, Eike, 4,922,004, Cl. 560-221.000.

Ohno, Motoshi: *See—*
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,922,287, Cl. 355-27.000.

Ohshima, Yoshimasa: *See—*
Noguchi, Minori; Koizumi, Mitsuyoshi; Shishido, Hiroaki; Uto, Sachio; and Ohshima, Yoshimasa, 4,922,308, Cl. 356-237.000.

Ohtaka, Keiji: *See—*
Koyama, Takeshi; and Ohtaka, Keiji, 4,922,282, Cl. 354-406.000.

Ohtani, Shigeru; and Yamauchi, Yukio, to Hochiki Corporation. Fire discriminating apparatus. 4,922,230, Cl. 340-577.000.

Ohtsu, Susumu, to Ishimoto Food Industry Kabushikikaisha. Method for producing quick cooking processed rice. 4,921,718, Cl. 426-618.000.

Oikawa, Katsuya: *See—*
Egami, Hidemi; Saito, Katsuo; Satomura, Hiroshi; and Oikawa, Katsuya, 4,922,392, Cl. 362-217.000.

OK-Vise Ky: *See—*
Kytola, Olli, 4,921,378, Cl. 409-221.000.

Oka, Tsumoru: *See—*
Sasaki, Kunihiko; Iida, Yuichi; Oka, Tsumoru; and Shinroaku, Mituaki, 4,921,428, Cl. 439-15.000.

Okada, Mizuo: *See—*
Ito, Akira; and Okada, Mizuo, 4,921,329, Cl. 350-128.000.

Okada, Takeshi: *See—*
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.

Okada, Yasushi: *See—*
Nakajima, Toyohei; Okada, Yasushi; Mieno, Toshiyuki; and Oono, Nobuyuki, 4,922,429, Cl. 364-431.060.

Okada, Yoshihisa; and Enya, Yoshihiro, to Sanyei Corporation. Switch for electric food processor. 4,921,174, Cl. 241-37.500.

Okada, Yoshihisa; and Enya, Yoshihiro, to Sanyei Corporation. Food processor. 4,921,175, Cl. 241-37.500.

Okamoto, Kazutoshi: *See—*
Sakano, Kenji; Nakashima, Hideyuki; Sakanaka, Hiroo; and Okamoto, Kazutoshi, 4,920,930, Cl. 123-41.860.

Okamoto, Kyoichi; Tanaka, Noriyuki; and Shiroyama, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Engine starter structure. 4,920,812, Cl. 74-6.000.

Okamoto Machine Tool Works, Ltd.: *See—*
Hosoi, Mutsuo; and Ishibashi, Akira, 4,921,471, Cl. 474-101.000.

Okamoto, Toshishige: *See—*
Kunieda, Yoshio; Okamoto, Toshishige; and Furukawa, Satoshi, 4,922,448, Cl. 364-900.000.

Okaniwa, Hiroshi: *See—*
Nakatani, Kenji; Okaniwa, Hiroshi; and Yano, Mitsuaki, 4,920,917, Cl. 118-718.000.

Okano, Shigetou: *See—*
Iishiki, Naotsugu; Okano, Shigetou; and Mishima, Shiro, 4,920,750, Cl. 60-671.000.

Okazaki, Kouji; Ikeda, Tsugio; and Inagaki, Takashi, to Honda Giken Kabushiki Kaisha. Vehicle engine 4,920,825, Cl. 74-606.00R

Oki Electric Industry Co., Ltd.: *See—*
Ino, Masayoshi, 4,921,816, Cl. 437-52.000.

Okubo, Takashi: *See—*
Takemura, Toji; and Okubo, Takashi, 4,921,085, Cl. 192-60.000.

Okuda, Naoki: *See—*
Sasaki, Nobukazu; Kasamura, Toshirou; Ohashi, Masashi; Okuda, Naoki; and Kusomoto, Toshihiko, 4,922,300, Cl. 355-245.000.

Okui, Susumu; Hirabayashi, Tsugio; and Hamanaka, Izumi, to Konishiroku Photo Industry Co., Ltd. Document feeding apparatus. 4,921,239, Cl. 271-186.000.

Okumoto, Yutaka, to Japan Tobacco Inc. Device for controlling the content of tobacco on a cigarette manufacturing machine. 4,920,987, Cl. 131-84.300.

Okumura, Masaru: *See—*
Tani, Hakuzo; and Okumura, Masaru, 4,921,760, Cl. 428-446.000.

Okumura, Seigo: *See—*
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,921,959, Cl. 546-152.000.

Okumura, Yoshiharu: *See—*
Takatsuna, Kazutoshi; Tachikawa, Mamoru; Shinozawa, Kouji, Nakajima, Masashi; Shinohara, Akihito; and Okumura, Yoshiharu, 4,921,988, Cl. 556-413.000.

Okuno, Isamu, to Kabushiki Kaisha Okudaya Giken. Truck with a hand-operatable bed. 4,921,385, Cl. 414-21.000.

Okutani, Koji: *See—*
Hara, Kazumasa; Koike, Mikio; Nishijima, Mitsuru; and Okutani, Koji, 4,920,903, Cl. 112-229.000.

Okutsu, Hirokazu: *See—*
Torisawa, Nobuyuki; Okutsu, Hirokazu; and Aoki, Katsuhiro, 4,922,285, Cl. 355-20.000.

Olecko, Ray. Cable trap. 4,920,690, Cl. 43-87.000.

Olin Corporation: *See—*
Bujese, David P., 4,921,772, Cl. 430-126.000.
Roche, Thomas, 4,921,572, Cl. 156-653.000.
Rothgery, Eugene F.; and Manke, Steven A., 4,921,965, Cl. 548-251.000.

Olivo, Marco; Pascucci, Luigi; and Villa, Corrado, to SGS-Thomson Microelectronics S.r.l. CMOS voltage multiplier 4,922,402, Cl. 363-60.000.

Ollendick, Gary B., to American Telephone and Telegraph Company. Analog to digital interface circuit. 4,922,251, Cl. 341-155.000.

Olukalns, Andris: *See—*
McKie, Derrick B.; and Olukalns, Andris, 4,921,885, Cl. 523-220.000.

Olympus Optical Co., Ltd.: *See—*
Karaki, Kouichi; Sakai, Mitsugu; and Sasaki, Yasuo, 4,920,803, Cl. 73-606.000.

Omata, Satoshi: *See—*
Osada, Yoshiyuki; Tsuda, Hisanori; Sano, Masafumi; Omata, Satoshi; Takasu, Katsuji; and Hirai, Yutaka, 4,921,722, Cl. 427-39.000.

Omori, Shogo: *See—*
Fukui, Toyoaki; Omori, Shogo; and Uchinami, Masanobu, 4,920,941, Cl. 123-492.000.

Omran, Jafar; and Alscher, Arnold, to Rutgerswerke AG Novel liquifiers and their preparation. 4,921,543, Cl. 106-500.000

Omron Tateisi Electronics Co.: *See—*
Ohashi, Kunio; and Fukutani, Yoshihiro, 4,922,419, Cl. 364-408.000.

Ong, Beng S.: *See—*
Yuh, Huoy-Jen; Ong, Beng S.; Spiewak, John W.; and Thornton, Constance J., 4,921,769, Cl. 430-64.000.

Onishi, Janet C.; and Patchett, Arthur A., to Merck & Co., Inc. Fungicidal compositions and method. 4,921,844, Cl 514-171.000.

Ono, Kozo: *See—*
Nagasawa, Kiyoshi; Ono, Kozo, Ogata, Kojiro; Murayama, Ken; and Hoshino, Yoshihiro, 4,920,660, Cl. 33-568.000.

Onodera, Akira: *See—*
Yokoo, Chihiro; Onodera, Akira; Fukushima, Hiroshi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,921,953, Cl. 540-227.000.

Oono, Nobuyuki: *See—*
Nakajima, Toyohei; Okada, Yasushi; Mieno, Toshiyuki; and Oono, Nobuyuki, 4,922,429, Cl. 364-431.060.

Oono, Tetsuya: *See—*
Wazaki, Yoshio; Oono, Tetsuya; and Narisawa, Nobuyuki, 4,921,064, Cl. 180-197.000.

Ophaug, Darrell P.: *See—*
Etscheidt, Ronald J. and Ophaug, Darrell P., 4,921,083, Cl. 192-20.000.

Oppelt, Ralph: *See—*
Duerr, Wilhelm; and Oppelt, Ralph, 4,922,204, Cl. 324-322.000.

Orain, Roger; Bravet, Jean-Louis; Dimier, Gerard; Dagaut, Philippe; and Daude, Gerard, to Saint-Gobain Vitrage. High optical quality transparent sheet of plastic which is scratch- and abrasion-resistant, method of manufacturing the same and glazings using the same. 4,921,759, Cl. 428-424.400.

Orbital Engine Company Proprietary Limited: *See—*
Gilbert, Wayne Ross, 4,920,745, Cl. 60-273.000.

Orbital Engine Company Pty. Ltd.: *See—*
Schlunke, Christopher K., 4,920,932, Cl. 123-65.0PE.

Ordev B.V.: *See—*
Hoffman, Erik L.; and Hopstaken, Antonius L. J., 4,921,499, Cl. 623-16.000.

Orime, Nobutake: *See—*
Saito, Jun; Haruyama, Tetsuo; Orime, Nobutake; and Katagi, Takashi, 4,922,257, Cl. 342-377.000.

Orlicki, David M.; Gropp, David B.; and VanValkenburgh, Thomas E., to Eastman Kodak Company. Passive web cutter. 4,920,842, Cl. 83-308.000.

Orlov, Boris Y.: *See—*
Lipukhin, Jury V.; Garber, Eduard A., Orlov, Boris Y.; Ponosov, Viktor N.; Novikov, Vladimir M.; and Rumako, Gennady N., deceased, 4,920,705, Cl. 51-318.000.

Oroskar, Anil R.: *See—*
McCulloch, Beth; and Oroskar, Anil R., 4,922,040, Cl. 570-211.000.

Orr, Cyde, Jr.; and Camp, Ronnie W., to Micromeritics Instrument Corporation. Sample warming device for surface area analyzer. 4,920,810, Cl. 73-865.500.

Osada, Yoshiyuki; Tsuda, Hisanori; Sano, Masafumi; Omata, Satoshi; Takasu, Katsuji; and Hirai, Yutaka, to Canon Kabushiki Kaisha. Method for forming deposited film. 4,921,722, Cl. 427-39.000.

Osawa, Masanori; Shizuka, Kohei; Kouno, Masahiro; Matsuyama, Akio; Katsuoka, Hirotoshi; and Mizutani, Kazumi, to Mitsui Toatsu Chemicals, Incorporated. Aromatic polyamide molded article having storage modulus. 4,921,933, Cl. 528-348.000.

Osawa, Nobuyuki: *See—*
Kasuga, Shinichi; and Osawa, Nobuyuki, 4,921,358, Cl. 384-15.000.

Osborne, William S., to Hewlett-Packard Company. Piezoelectric detector for drop position determination in multi-pen thermal ink jet pen printing systems. 4,922,268, Cl. 346-140.00R.

Osborne, William S.: *See—*
Cobbs, Keith E.; Haselby, Robert D.; and Osborne, William S., 4,922,270, Cl. 346-140.00R.

Oschmann, Thomas R.: *See—*
Foster, Stephen R.; and Oschmann, Thomas R., 4,920,877, Cl. 100-171.000.

Oshida, Yoshitada: *See—*
Yoshitake, Yasuhiro; and Oshida, Yoshitada, 4,922,290, Cl. 355-53.000.

Osteonics Corp.: *See—*
Averill, Robert G.; Serekian, Paul; and Taylor, Scott K., 4,921,500, Cl. 623-22.000.

Oswald, Alexis A.; Bhatia, Ram N.; Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M.; and Hsu, Chang S., to Exxon Research & Engineering Company. Process for the hydroformylation of sulfur-containing thermally cracked petroleum residue and novel products thereof. 4,922,028, Cl. 568-448.000.

Otani, Masanori, to Toa Medical Electronics Co., Ltd. Shaking apparatus for agitating and withdrawing a specimen in a sealed vessel. 4,921,676, Cl. 422-100.000.

Otis Engineering Corporation: *See—*
Cooksev, Andrew G., 4,921,044, Cl. 166-116.000.
Crow, Robert W.; Holloman, Ricky M.; and Pruden, James B., 4,921,048, Cl. 166-372.000.
Godfrey, Craig W.; Schnatzmeyer, Mark A.; and Arendt, Henry P., 4,921,438, Cl. 439-190.000.

Otremba, Klaus; and Sartorius, Volker, to Siemens Aktiengesellschaft; and Siemens Aktiengesellschaft. Microwave oscillator in which the dielectric resonator is hermetically sealed. 4,922,211, Cl. 331-68.000.

Otsuka Electronics Co., Ltd.: *See—*
Sekiwa, Mitsunao; and Akada, Tomohiro, 4,922,309, Cl. 356-300.000.

Otsuka, Hirohisa: *See—*
Saeki, Sirou; Ikeda, Sunao; Otsuka, Hirohisa; and Yanagawa, Nobuyuki, 4,921,236, Cl. 271-3.100.

Ottemann, William C.; and Gabellini, Richard A., to IMI-Barient, Inc. Powered sailboat winch. 4,921,219, Cl. 254-284.000.

Ottenheimer, Charles J. Glass repair injector tube nozzle adapter. 4,921,411, Cl. 425-12.000.

Otterbacher, Eric W.: *See—*
Baker, Robert B., Jr.; Pews, R. Garth; Otterbacher, Eric W.; and Gall, James A., 4,922,026, Cl. 568-322.000.

Ouar Chatzopoulos, Farroudja: *See—*
Nofre, Claude; Tinti, Jean M.; and Ouar Chatzopoulos, Farroudja, 4,921,939, Cl. 558-414.000.

Outa, Kenichi; Suzuki, Yasumichi; and Ikeda, Yoshinori, to Canon Kabushiki Kaisha. Color film reading apparatus providing high-gradation color signals. 4,922,335, Cl. 358-80.000.

Ouyang, Kenneth W.: *See—*
Lofgren, Karl M. J.; Shearer, Gerald W.; and Ouyang, Kenneth W., 4,922,141, Cl. 307-595.000.

Ozawa, Hiroshi: *See—*
Nakagami, Hidekazu; Sakamoto, Masashi; and Ozawa, Hiroshi, 4,922,294, Cl. 355-209.000.

Ozawa, Kunitaka: *See—*
Ozawa, Masakazu; Ozawa, Kunitaka; Hatanaka, Katsunori; Suzuki, Tetsuo; Mori, Tetsuzo; Shiina, Tadashi; and Ebinuma, Ryuichi, 4,922,267, Cl. 346-136.000.

Ozawa, Masahide: *See—*
Kunieda, Shin-ichi; and Ozawa, Masahide, 4,921,810, Cl. 437-8.000.

Ozawa, Masakazu; Ozawa, Kunitaka; Hatanaka, Katsunori; Suzuki, Tetsuo; Mori, Tetsuzo; Shiina, Tadashi; and Ebinuma, Ryuichi, to Canon Kabushiki Kaisha. Recorder having a recording device and a relatively movable stacker for stacking recorded paper. 4,922,267, Cl. 346-136.000.

Ozawa, Masakuni; Kimura, Mareo; and Isogai, Akio, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Catalyst for purifing exhaust gases. 4,921,829, Cl. 502-302.000.

Ozawa, Tetsuo: *See—*
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,921,959, Cl. 546-152.000.

Ozero, Brian J.; and Becker, Stanley D., to Scientific Design Company, Inc. Ethylene oxide reactor. 4,921,681, Cl. 422-197.000.

PACCAR Inc.: *See—*
Marlowe, Huston, 4,921,062, Cl. 180-89.140.

Pacific BioSystems, Inc.: *See—*
Jones, K. Tom; and Caldwell, Richard J., 4,921,129, Cl. 222-23.000.

Pacific Rim Packaging Corporation: *See—*
Troughton, Thomas D.; and Irwin, Robert D., 4,921,116, Cl. 220-72.000.

Pack, Roger N.; and Ahmad, Eddress. Pivoting ski boot. 4,920,665, Cl. 36-117.000.

Packer, Scott M.: *See—*
Pietrzak, Kenneth A.; Packer, Scott M. and Dunne, Kenneth C., 4,922,174, Cl. 318-577.000.

Page, Robert E., to Beloit Corporation. Couch press transfer apparatus. 4,921,575, Cl. 162-306.000.

Paine, David L. Retractable column and method of forming. 4,920,710, Cl. 52-108.000.

Pajtas, Scott R.: *See—*
Palinkas, Richard L.; and Pajtas, Scott R., 4,921,029, Cl. 152-11.000.

Pak, Charles Y. C., to Mission Pharmacal Company. Method and apparatus for maintaining urine specimens. 4,921,807, Cl. 436-18.000.

Palco Telecom Inc.: *See—*
Dernovsek, John J., 4,922,525, Cl. 379-145.000.

Palinkas, Richard L.; and Pajtas, Scott R., to Uniroyal Goodrich Tire Company, The. Trapezoidal non-pneumatic tire with supporting and cushioning members. 4,921,029, Cl. 152-11.000.

Pall Corporation. *See—*
Rothman, Isaac; and Degen, Peter J., 4,921,878, Cl. 521-53.000.

Pally, Roland; and Meixner, Erwin. Weighing apparatus with protective wind screen means. 4,921,058, Cl. 177-181.000.

Pamper, Viktor, to Duna Elelmiszer Es Vegyiaru Kereskedelmi Vallalat. Apparatus for filling and refilling of containers with flowable material and pressurized propellant. 4,921,020, Cl. 141-20.000.

Pan, Alfred I. T., to Hewlett-Packard Company. Ink jet printhead with self-aligned orifice plate and method of manufacture. 4,922,265, Cl. 346-1.100.

Pandel Instruments, Inc.: *See—*
Lagergren, Peter J.; Allen, C. Cameron, Jr.; and Lance, Lacy C., 4,921,150, Cl. 222-639.000.

Panetti, Romolo, to Speno International S.A. Device for the reprofiling of the rails of a railway track. 4,920,701, Cl. 51-165.710.

Pape, Wolfgang: *See—*
Hoppe, Udo; Eigener, Ulrich; Sauermann, Gerhard; Engel, Walter; and Pape, Wolfgang, 4,921,694, Cl. 424-65.000.

Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of oxethylmercaptobenzaldehydes and their oxidation products. 4,922,014, Cl. 562-418.000.

Papst-Motoren GmbH & Co. KG: *See—*
Schuh, Bernhard, 4,922,406, Cl. 360-97.030.

Paquette, Marc: *See—*
Combier, Charles M.; Taylor, Archie E., Jr.; and Paquette, Marc, 4,921,098, Cl. 206-408.000.

Paravisini, Francois: *See—*
Buffet, Jacques; Buffet, Jean-Paul; Piani, Jean; and Paravisini, Francois, 4,921,487, Cl. 609-135.000.

Parker, Robert, to Raychem Corporation. Apparatus exhibiting PTC behavior useful for displaying information. 4,922,242, Cl. 340-786.000.

Parnkopf, Fiske O.: *See—*
Grotz, Bernard J.; Parnkopf, Fiske O.; and Prescott, G. Robert, 4,921,684, Cl. 423-360.000.

Parsons, James H.; McLain, Philippe H.; Boozer, John F., III; and Lewis, John R., Jr., to Shakespeare Company. Breadaway utility pole. 4,920,715, Cl. 52-298.000.

Parsons, Natan E.: *See—*
Novak, Joel S.; Parsons, Natan E.; and Steiner, Kenneth M., 4,921,211, Cl. 251-129.040.

Parten, Keith, to Nash Manufacturing Company. Method of manufacturing a skateboard. 4,921,513, Cl. 156-280.000.

Partridge, Randall D.: *See—*
Dessau, Ralph M.; Partridge, Randall D.; and Valyocsik, Ernest W., 4,922,050, Cl. 585-379.000.

Pascouet, Adrien P. Internal bubble-suppression method and apparatus. 4,921,068, Cl. 181-115.000.

Pascucci, Luigi: *See—*
Olivo, Marco; Pascucci, Luigi; and Villa, Corrado, 4,922,402, Cl. 363-60.000.

Pasquale, Samuel A. Contraception system and method. 4,921,843, Cl. 514-170.000.

Pasquali, Renato; Verga, Luigi; and Mendicino, Franco, to Alfa Lancia Industriale S.p.A. Device for extracting air from an automobile interior. 4,920,865, Cl. 98-2.180.

Pasquini, Mario: *See—*
Koether, Bernard G.; and Pasquini, Mario, 4,920,948, Cl. 126-21.00A.

Patchett, Arthur A.: *See—*
Onishi, Janet C.; and Patchett, Arthur A., 4,921,844, Cl. 514-171.000.

Patin, Pierre. Inclinable vehicule. 4,921,263, Cl. 280-62.000.

Patriksson Inventing AB: *See—*
Patriksson, Stig, 4,921,746, Cl. 428-178.000.

Patriksson, Stig, to Patriksson Inventing AB. Cellular, multi-layer material for forming a heat-insulating bag. 4,921,746, Cl. 428-178.000.

Pattison, William R.: *See—*
Keim, Kenneth J.; and Pattison, William R., 4,920,603, Cl. 15-302.000.

Paul Wurth S.A.: *See—*
Klutz, Hans J.; Flora, Bruno; Gilles, Gerard; and Wies, Georges, 4,921,086, Cl. 193-3.000.

Paulsson, Lars, to Asea Brown Boveri AB. Series capacitor equipment 4,922,364, Cl. 361-16.000.

Paynter, Gordon: *See—*
Roberts, Glyn; Paynter, Gordon; and Krishnasastry, Remesh B., 4,922,212, Cl. 331-176.000.

Pearlman, Bruce A.: *See—*
Livingston, Douglas A.; Pearlman, Bruce A.; Denmark, Scott; and Huber, Joel E., 4,921,638, Cl. 552-610.000.

Peck, David E., to Rockwell International Corporation. Method for manufacturing a modified fast fade drive axle housing. 4,921,159, Cl 228-182.000.

Peed, David B.: *See—*
Andreasen, James E.; Childre, Casey J.; and Peed, David B., 4,920,682, Cl. 43-22.000.

Pees, James M., to General Motors Corporation. Lined air sleeve assembly for air spring damper. 4,921,226, Cl. 267-64.240.

Pelletier, Paul J.: *See—*
Bates, Carl H.; Couhig, John T.; and Pelletier, Paul J., 4,921,554, Cl. 156-89.000.

Pellicciari, Roberto: *See—*
Frigerio, Giuliano; Pellicciari, Roberto; and Roda, Aldo, 4,921,848, Cl. 514-182.000.

Peltor AB: *See—*
Tindberg, N Bertil E., 4,920,985, Cl. 128-864.000.

Pempek, George J. Router guide attachment. 4,921,023, Cl. 144-136.00C.

Pennington, Donald W.; and McLemore, Jane K., to Dow Chemical Company, The. Method for preparing reinforced thermoset articles. 4,921,658, Cl. 264-86.000.

Perdue, Thad A.; and Johnson, Bobby G., to Robbins Tire & Rubber Co., Inc. Method of securing a retreading tube to a retreading rim section. 4,920,629, Cl. 29-428.000.

Perfetti, Thomas A.: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A., Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M L., 4,920,990, Cl. 131-359.000.

Pergrale, Jean, to U.S. Philips Corporation. Method and apparatus for selective suppression of portions of an echographic signal to improve image reconstruction. 4,922,422, Cl. 364-413.160.

Persson, Per-Oskar: *See—*
Froderberg, Ingemar; and Persson, Per-Oskar, 4,921,602, Cl. 210-232.000.

Perzborn, Elisabeth: *See—*
Niewohner, Ulrich; Hoever, Franz-Peter; Junge, Bodo; Perzborn, Elisabeth; Seuter, Friedel; and Fiedler, Volker-Bernd, 4,921,998, Cl. 560-45.000.

Pesek, Roman. Portable rope tow. 4,920,892, Cl. 104-173.200.

Peterlik, Meinrad; and Hoffmann, Oskar, to Boehringer Ingelheim International GmbH. IFN-gamma as an active substance for inhibiting and preventing degradation processes in bone. 4,921,697, Cl. 424-85.500.

Peters, Arnold; Hamot, Theodore; and Ver Hoven, Leonard, to Sequa Corporation. Infeed means for high speed continuous motion can decorator. 4,921,093, Cl. 198-471.100.

Peters, Dieter, to Hoechst Aktiengesellschaft. Process for preparing ammine salts of aluminum iodide. 4,921,688, Cl. 423-463.000.

Peters, Franz-Josef. Pistol with an interchangeable barrel 4,920,676, Cl. 42-25.000.

Peters, William A.; and Howard, Jack B., to Massachusetts Institute of Technology. Method for methane conversion. 4,921,685, Cl. 423-439.000.

Petersen, Harald: *See—*
Henning, Wolfgang; Petersen, Harald; and Moormann, Gerhard, 4,921,842, Cl. 524-839.000.

Peterson American Corporation: *See—*
Gould, Kenneth E.; and Hamilton, Eugene A., 4,920,911, Cl. 118-301.000.

Peterson, Cobern V.: *See—*
Givler, Paul W., Jr.; Hommes, William J.; Peterson, Cobern V.; and Culver, Madison A., 4,922,142, Cl. 310-12.000.

Peterson, Donovan J. Jaw extender for a beam clamp. 4,921,234, Cl. 269-147.000.

Peterson, Francis C.; and Despins, Robert J., to Buell Industries, Inc. Spring element for a shock isolating mount. 4,921,203, Cl. 248-635.000.

Petersson, Ulf J. G.: *See—*
Strom, Hans I.; and Petersson, Ulf J. G., 4,920,649, Cl. 30-382.000.

Petitjean, Gilbert; and Lebourg, Michel, to U.S. Philips Corporation Encoding device for multiple consecutive position detection. 4,922,235, Cl. 340-686.000.

Petocz, Lujza: *See—*
Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza, Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.
Knoll, Jozsef; Budai nee Simonyi, Katalin; Berenyi nee Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,960, Cl. 546-153.000.

Petrel: *See—*
Jalon, Michel, 4,921,534, Cl. 106-20.000.

Petrosky, Jimmy T., to Vulcan Materials Company. Manufacture of methyl chloride by hydrochlorinating methanol, using a split methanol feed. 4,922,043, Cl. 570-258.000.

Pettit, Paul H., Jr., to PPG Industries, Inc. Powder coating compositions of polyepoxides and acrylic copolymers 4,921,913, Cl. 525-119.000.

Pews, R. Garth: *See—*
Baker, Robert B., Jr.; Pews, R. Garth; Otterbacher, Eric W.; and Gall, James A., 4,922,026, Cl. 568-322.000.

Pfahlert, Volker: *See—*
Schickaneder, Helmut; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; and Ahrens, Kurt H., 4,921,856, Cl. 514-252.000.

Pfizer Hospital Products Group, Inc.: *See—*
Cottonaro, Cliff N.; Evans, Scott M.; Pflueger, David R.; and Millar, Huntly D., 4,920,967, Cl. 128-662.060.

Pfizer Inc.: *See—*
Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,921,994, Cl. 558-426.000.
Volkmann, Robert A., 4,921,972, Cl. 549-66.000.

Pflueger, David R.: *See—*
Cottonaro, Cliff N.; Evans, Scott M.; Pflueger, David R.; and Millar, Huntly D., 4,920,967, Cl. 128-662.060.

Pfouts, Mark D.: *See—*
Frank, Thomas P.; Nicholson, Warren B.; and Pfouts, Mark D., 4,920,972, Cl. 128-675.000.

Phan, Hieu D.; and Clark, Gary T., to Eastman Kodak Company. Ink composition containing a blend of a polyester, an acrylic polymer and a vinyl polymer. 4,921,899, Cl. 524-513.000.

Philibert, Daniel: *See—*
Nedelec, Lucien; Claussner, Andre; Philibert, Daniel; and Moguilewsky, Martine, 4,921,846, Cl. 514-173.000.

Philippe, Patrick, to Neiman High security evolutive coding process and device for carrying out this process. 4,922,533, Cl. 380-46.000.

Phillips, Douglas J.; Kessler, Keith E.; Shipley, John W.; and Hyland, Dave, to Harris Corporation. Linear precision actuator with accelerometer feedback. 4,922,159, Cl. 318-128.000.

Phillips, John A., to Dom Holdings PLC. Tool. 4,920,837, Cl 81-463.000.

Phillips Petroleum Company: *See—*
Byers, Jim D., 4,922,049, Cl. 585-327.000.
Johnson, Timothy W.; and Brady, Don G., 4,921,558, Cl. 156-181.000.
Kolts, John H., 4,921,830, Cl. 502-326.000.
Lee, Fu M.; and Brown, Ronald E., 4,921,581, Cl. 203-56.000.
Lew, Lawrence E., 4,921,399, Cl. 415-27.000.

Phillips, Richard R.; Sandell, Robert D.; and Silver, Arnold H., to TRW Inc. Superconducting analog-to-digital converter with bidirectional counter. 4,922,250, Cl. 341-133.000.

Piani, Jean: *See—*
Buffet, Jacques; Buffet, Jean-Paul; Piani, Jean; and Paravisini, Francois, 4,921,487, Cl. 609-135.000.

Piccone, Alessandro: *See—*
Lanati, Paolo; Piccone, Alessandro; and D'Angelo, Domenico, 4,920,944, Cl. 123-638.000.

Picker International, Inc.: *See—*
Hunt, Robert P.; and Gilblom, David L., 4,922,337, Cl. 358-101.000.

Pieprzak, Andrew W.; and McClean, James W., to GECO A/S Interpolation of severely aliased events. 4,922,465, Cl. 367-38.000.

Piesch, Ernst: *See—*
Mawatari, Yasushi; Ikegami, Toru; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Rober, Hans-Gerd, 4,922,115, Cl. 250-484.100.

Pietrzak, Kenneth A.; Packer, Scott M.; and Dunne, Kenneth C., to United Technologies Corporation. Seam tracking between mating parts. 4,922,174, Cl. 318-577.000.

Pilot Ink Co., Ltd.: *See—*
Shibahashi, Yutaka; and Nakasuji, Norikazu, 4,920,991, Cl. 132-73.000.

Pineau, Jean-Pierre: *See—*
Frehaut, Jean-Pierre; Magnaudet, Eric; and Pineau, Jean-Pierre, 4,920,887, Cl. 102-489.000.

Pinschmidt, Robert K., Jr.: *See—*
Costello, Christine A.; Pinschmidt, Robert K., Jr.; and Lai, Ta-Wang, 4,921,621, Cl. 252-8.513.

Pinson, George T.: *See—*
White, James C.; and Pinson, George T., 4,920,738, Cl. 57-62.000.

Pinzke, Thomas: *See—*
Nordberg, Cecilia M.; Engstrom, Thomas B.; Pinzke, Thomas; Sanneskog, Owe; and Ohlund, Jan, 4,921,613, Cl. 210-651.000.

Piock, Richard: *See—*
Lamprecht, Philipp; Piock, Richard; and Tasser, Siegfried, 4,922,276, Cl. 354-299.000.

Pioneer Electronic Corporation: *See—*
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,922,476, Cl. 369-47.000.
Ogawa, Yoichi, 4,922,160, Cl. 318-135.000.

Pioneer Hi-Bred International, Inc.: *See—*
Hall, Timothy C.; Loesch-Fries, L. Sue; Jarvis, Nancy P.; and Barker, Richard F., 4,921,802, Cl. 435-172.300.

Piotrovsky, Vladimir K.: *See—*
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,921,695, Cl. 424-81.000.

Pirani, Giancarlo; and Taricco, Giorgio, to CSELT (Centro Studi e Laboratori Telecomunicazioni S.p.A.). Method of and circuit for decoding block-coded messages affected by symbol substitutions, insertions and deletions. 4,922,494, Cl. 371-35.000.

Pitney Bowes Inc.: *See—*
Dannatt, Hugh St. L.; and Miller, Carl A., 4,922,085, Cl. 235-101.000.
Hofer, John A., 4,921,107, Cl. 209-546.000.

Pittsinger, Stephen D., to Tri-Phase, Inc. Apparatus and method for adapting sensors to an irrigation controller. 4,921,001, Cl. 137-78.200.

Pittway Corporation: *See—*
Birk, Daniel J.; Fenne, Kenneth R.; and Mantzke, Michael T., 4,922,407, Cl. 364-145.000.

Pizzicara, Marco, to Duebi S.R.L. Rotary valve internal combustion engine. 4,920,934, Cl. 123-80.0BA.

Plachy, Janos: *See—*
Racz, Istvan; Plachy, Janos; and Szentmiklosi, Peter, 4,921,707, Cl. 424-690.000.

Plagge, David G.: *See—*
Khalid, Joseph M.; and Plagge, David G., 4,921,590, Cl. 204-216.000.

Plasky, Joseph G., to Du Pont de Nemours, E. I., and Company. Apparatus for use in withdrawing yarn from a wound yarn package. 4,921,186, Cl. 242-147.00R.

Plath, Ernst-Dieter; and Juenthner, Kurt, to Sipra Patententwicklungs- und Beteiligungsges. dmbH. Annular knitting machine with slide needles. 4,920,767, Cl. 66-13.000.

Pleet, Lawrence. Pressurized beverage container dispensing system. 4,921,135, Cl. 222-82.000.

Plessey Overseas Limited: *See—*
Cowley, Nicholas P., 4,922,548, Cl. 455-183.000.
Denny, Paul A., 4,922,127, Cl. 307-262.000.

Ploog, Uwe: *See—*
Uphues, Guenter; and Ploog, Uwe, 4,921,990, Cl. 558-104.000.

Plooy, Arnold. Vacuum cleaner system. 4,921,510, Cl. 55-288.000.

Po, Hong, to Polaroid Corporation. Armonic generation in optical fibers. 4,922,496, Cl. 372-6.000.

Poetsch, Eike: *See—*
Kohler, Manfred; Ohngemach, Jorg; and Poetsch, Eike, 4,922,004, Cl. 560-221.000.

Pogrow, Renee M.: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M. L., 4,920,990, Cl. 131-359.000.

Poiner, Michel. Pouring spout. 4,921,147, Cl. 222-527.000.

Polak, Anthony J.; and Young, Ping, to Allied-Signal Inc. Thin film polymer blend membranes. 4,921,651, Cl. 264-41.000.

Polaroid Corporation: *See—*
Fantone, Stephen D.; Rockney, Bennett H.; Burger, Robert J.; and Cook, Lee M., 4,921,316, Cl. 350-96.270.
Po, Hong, 4,922,496, Cl. 372-6.000.

Pole, Ernest G.: *See—*
Moore, Richard B.; Fitzgerald, Paul L.; and Pole, Ernest G., 4,921,892, Cl. 524-61.000.

Polefka, Thomas G.: *See—*
Gaffar, Abdul; and Polefka, Thomas G., 4,921,692, Cl. 424-52.000.
Gaffar, Abdul; and Polefka, Thomas G., 4,921,693, Cl. 424-52.000.

Politechnika Poznanska: *See—*
Dobry, Marian W.; Cempel, Czeslaw; and Garbatowski, Wieslaw, 4,921,053, Cl. 173-162.200.

Polymer-Physik GmbH & Co. KG: *See—*
Foll, Eberhard; Guth, Gustav; Guth, Joachim; Holl, Peter; and van Raaij, Alexander, 4,922,405, Cl. 363-126.000.

Polysar Limited: *See—*
Lunt, James; May, Susan A. M.; and Leivo, Patricia A., 4,921,910, Cl. 525-74.000.

Polytech Netting Industries, L.P.: *See—*
Purdy, Smith E., 4,921,379, Cl. 410-117.000.

POM Incorporated: *See—*
Ward, Seth, II, 4,920,824, Cl. 74-553.000.

Pommer, Richard J.; and Chiechi, John, to UniStructure, Inc. Spring grid array interconnection for active microelectronic elements. 4,922,376, Cl. 361-386.000.

Pommier, Yves; and Legrand, Yves, to Atochem. Process for utilizing vertical autoclave in polymerization of vinyl chloride. 4,921,918, Cl. 526-88.000.

Ponder, Mack. Production pump for high gravity or sand laden oil. 4,921,407, Cl. 417-553.000.

Ponosov, Viktor N.: *See—*
Lipukhin, Jury V.; Garber, Eduard A.; Orlov, Boris Y.; Ponosov, Viktor N.; Novikov, Vladimir M.; and Rumako, Gennady N., deceased, 4,920,705, Cl. 51-318.000.

Ponthenier, Jean L.: *See—*
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,921,725, Cl. 427-45.100.

Poole, James E.; and McKinley, Mildred L., to PPG Industries, Inc. UV curable coatings containing oxalanilide stabilizers, method of curing, and coated substrates therefrom. 4,921,726, Cl. 427-54.100.

Pooltec Establishment: *See—*
Rief, Dieter J., 4,920,599, Cl. 15-1.700.

Poralla, Dieter M.: *See—*
Kiefer, Hans; Bipp, Hansjoerg; Fink, Fritz; Jaedicke, Hagen; and Poralla, Dieter M., 4,921,711, Cl. 426-66.000.

Porta Systems Corp.: *See—*
Meyerhoefer, Carl; and Visconti, Peter, 4,920,637, Cl. 29-764.000.

Porte, Alain: *See—*
Garcia, Alain; Tchavdarov, Jean-Claude; and Porte, Alain, 4,920,744, Cl. 60-226.100.

Porter, Douglas R., to L.S. Starrett Company, The. Hollow granite box beam and method of forming. 4,920,723, Cl. 52-606.000.

Post, Friedheim, to Alpha Maschinenbau AG. Bending apparatus. 4,920,779, Cl. 72-7.000.

Potter, Curtis N., to Microelectronics and Computer Technology Corporation. Hermetically sealed multilayer electrical feedthru. 4,922,323, Cl. 357-71.000.

Poucher, Michael; and Seeley, Roger W., to Dowty Rotol Limited. Propeller blade assembly. 4,921,403, Cl. 416-147.000.

Poulenard, Jacques; Gavet, Louis; Chatelin, Roger; and Giorgio, Annie, to Institut Textile de France. Emulsions of fluorinated products. 4,921,634, Cl. 252-312.000.

Poulton, Richard G., to Clayton, David A. Clamp assembly. 4,921,506, Cl. 24-67.100.

Pounds Motor Company, Inc.: *See—*
Pounds, Rice H., 4,920,901, Cl. 111-164.000.

Pounds, Rice H., to Pounds Motor Company, Inc. Double disc seed drill with V-shaped frame. 4,920,901, Cl. 111-164.000.

Powell, Robert H.: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M. L., 4,920,990, Cl. 131-359.000

Powers, Frederick A.: *See—*
Kyinge, Daniel J.; Powers, Frederick A.; and Lehrke, Kenneth E., 4,921,408, Cl. 417-368.000.

PPG Industries, Inc.: *See—*
Pettit, Paul H., Jr., 4,921,913, Cl. 525-119.000.
Poole, James E.; and McKinley, Mildred L., 4,921,726, Cl. 427-54.100.

Prakla-Seismos AG: *See—*
Schmidt, Burkhard, 4,922,466, Cl. 367-68.000.

Precision General, Inc.: *See—*
Nimberger, Spencer M., 4,920,626, Cl. 29-282.000.

Preciutti, Roberto. Dental flossing apparatus. 4,920,992, Cl. 132-323.000.

Premier-Fosters (Australia) Limited: *See—*
Foster, Geoffrey F., 4,921,008, Cl. 137-557.000.

Prescher, Gunter: *See—*
Siegmeier, Rainer; Hofen, Willi; Prescher, Gunter; and Maurer, Helmut, 4,921,983, Cl. 549-525.000.

Prescott, G. Robert: *See—*
Grotz, Bernard J.; Parnkopf, Fiske O.; and Prescott, G. Robert, 4,921,684, Cl. 423-360.000.

President and Fellows of Harvard College: *See—*
Tabor, Stanley; and Richardson, Charles C., 4,921,794, Cl. 435-91.000.

Presray Corporation, The: *See—*
Fischer, William H., 4,920,706, Cl. 52-2.00B.

Pressutti, Joseph E.; and Conley, George E. High profile fiberglass shingle. 4,920,721, Cl. 52-518.000.

Prevot, Roderick Q. Emergency identifier for vehicles. 4,922,223, Cl. 340-473.000.

Price, Dean C.; and Young, Quentin H., to Adtec Incorporated. Door position indicator. 4,922,064, Cl. 200-61.700.

Price, Richard H.: *See—*
Jacobsen, Stephen C.; Wood, John E.; and Price, Richard H., 4,922,164, Cl. 310-309.000.

Primdahl, Richard D.; and Raterman, Donald E., to Cummins-Allison Corporation. Coin sorter with counter and brake mechanism. 4,921,463, Cl. 453-3.000.

Prince Corporation: *See—*
Dykstra, Steven P., 4,922,391, Cl. 362-144.000.

Pringle, Helen. Device for performing cinema shots in conditions of low visibility. 4,921,342, Cl. 352-171.000.

Profenno, Louis A.: *See—*
Saffer, Jeffrey D.; and Profenno, Louis A., 4,922,180, Cl. 324-639.000.

Professional Packaging Limited: *See—*
Holmes, Gordon W., 4,921,104, Cl. 206-621.400.

Prosthetic Consultants Inc.: *See—*
Shamp, Daniel L., 4,921,502, Cl. 623-33.000.

Proulx, Claude. Splint-like element for use in end-to-end nerve suture. 4,920,962, Cl. 606-152.000.

Provest, Phillip B.; and Van Dal, David J., to Provest, Phillip B., Van Dal, David J.; Abbott, Kenneth C.; and Misteli, Roland. Chilling apparatus. 4,920,763, Cl. 62-378.000.

Pruden, James B.: *See—*
Crow, Robert W.; Holloman, Ricky M.; and Pruden, James B., 4,921,048, Cl. 166-372.000.

Puerner, Dean A., to AMP Incorporated. Housing for flat power cable connector. 4,921,442, Cl. 439-499.000.

Pullan, Brian R., to Laetus Systems Limited. Apparatus for monitoring the dielectric constant of an article. 4,922,181, Cl. 324-664.000.

Puls, William M.: *See—*
Smart, Steven T.; Puls, William M., and Hansen, David L., 4,920,859, Cl. 91-497.000.

PUMA Aktiengesellschaft Rudolf Dassler Sport: *See—*
Flemming, Udo, 4,920,663, Cl. 36-73.000.

Purdy, Smith E., to Polytech Netting Industries, L.P. Load restraint net. 4,921,379, Cl. 410-117.000.

Puritan-Bennett Corporation: *See—*
LaTorraca, Gary J., 4,921,642, Cl. 261-142.000.

Puryear, Harry A., Jr.: *See—*
Danis, Roger G.; Isaac, Ronald M.; and Puryear, Harry A., Jr., 4,921,481, Cl. 604-67.000.

Pyropower Corporation: *See—*
Gounder, Ponnusami K.; Raskin, Neil R.; and Kauranen, Timo M., 4,920,751, Cl. 60-679.000.

Quinn, David G.; Edwards, Robert B., II; and Andersen, Erik, to Corpak, Inc. Device for administration of enteral fluids from pre-filled shape retentive containers. 4,921,138, Cl. 222-85.000.

Quinn, Ronald E.: *See—*
Nash, Dudley O.; and Quinn, Ronald E., 4,920,742, Cl. 60-39.320.

Quinquis, Jean-Paul; Servel, Michel; and Francois, Joel, to L'Etat Francais. System for changing priority of packets of data. 4,922,485, Cl. 370-60.000.

R. J. Fullwood & Bland Limited: *See—*
Evans, John R., 4,921,006, Cl. 137-554.000.

R. J. Reynolds Tobacco Company: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M. L., 4,920,990, Cl. 131-359.000.

Raad, Bernard A.; and Johnsen, Tyrone A., to Sundstrand Corporation Integrated starting system. 4,922,119, Cl. 290-31.000.

Raasch, Hans, to W. Schlafhorst & Co. Method and apparatus for reestablishing the spinning operation. 4,920,739, Cl. 57-263.000.

Rabe, James A.; Lipowitz, Jonathan; and Jones, Richard E., to Dow Corning Corporation. Method for densification of amorphous ceramic material. 4,921,657, Cl. 264-86.000.

Rabii, Khosro M.: *See—*
Engel, Christopher M.; and Rabii, Khosro M., 4,922,328, Cl. 358-10.000.

Rabin, Arno: *See—*
Hoch, Norman J.; and Rabin, Arno, 4,921,377, Cl. 409-140.000.

Rabl, Ari; Clodic, Denis; and Dehausse, Robert, to A.R.M.I.N.E.S. Apparatus emitting an electromagnetic radiation, in particular infrared, comprising a plane source of rays and a reflector. 4,922,107, Cl. 250-504.00R.

Rabloczky, Gyorgy: *See—*
Zubovics, Zoltan; Toldy, Lajos; Rabloczky, Gyorgy; Varro, Andras; Andrasi, Ferenc; Elek, Sandor; and Elekes, Istvan, 4,922,021, Cl. 564-367.000.

Rackley, Robert L.: *See—*
Anderson, Robert K.; Mainz, Michael H.; and Rackley, Robert L., 4,921,668, Cl. 264-80.000.

Racz, Istvan; Plachy, Janos; and Szentmiklosi, Peter. Proceeding for the production of pharmaceutical preparations of high gastric acid binding capacity, of retarded effect and of increased bioavailability. 4,921,707, Cl. 424-690.000.

Rademachers, Jakob; Ganter, Karl-Werner; Rambold, Wolfgang; and Linde, Gunter, to Bayer Aktiengesellschaft. Finely divided iron oxide black pigments, a process for their preparation and their use. 4,921,542, Cl. 106-456.000.

Railcar Specialties, Inc.: *See—*
Thoman, Mell R., 4,920,894, Cl. 105-378.000.

Rain Matic Corporation: *See—*
Christon, Thomas M.; Richards, Martin A.; and Scholz, Eric H., 4,921,002, Cl. 137-119.000.

Rainford Racks Limited: *See—*
Hobbins, Kenneth A. W., 4,922,382, Cl. 361-424.000.

Rajasekaran, Periagaram K.; and Doddington, George R., to Texas Instruments Incorporated. Method of encoding speech signals involving the extraction of speech formant candidates in real time. 4,922,539, Cl. 381-50.000.

Ramachandran, Seshadri, to Du Pont de Nemours, E. I., and Company. Hafnia modified alumina fibers. 4,921,819, Cl. 501-127.000.

Rambold, Wolfgang: *See—*
Rademachers, Jakob; Ganter, Karl-Werner; Rambold, Wolfgang; and Linde, Gunter, 4,921,542, Cl. 106-456.000.

Ramsay, Michael V. J.; and Dolan, Simon C., to American Cyanamid Company. Process for the preparation of a macrolide compound. 4,921,978, Cl. 549-264.000.

Ramusch, Wolfgang: *See—*
Bukoschek, Romuald L.; Ramusch, Wolfgang; and Schroder, Johann, 4,920,761, Cl. 62-342.000.

Ranjith, Heva M. P., to Milk Marketing Board. UHT concentrated milk and product and process of making. 4,921,717, Cl. 426-587.000.

Rao, R. Nagaraja; and Stanzak, Richard K., to Eli Lilly and Company. Novel recombinant DNA cosmid shuttle vectors. 4,921,801, Cl. 435-172.300.

Rapp, Richard L. Basketball rim assembly. 4,921,248, Cl. 273-1.50R.

Raskin, Neil R.: *See—*
Gounder, Ponnusami K.; Raskin, Neil R.; and Kauranen, Timo M., 4,920,751, Cl. 60-679.000.

Raterman, Donald E.: *See—*
Primdahl, Richard D.; and Raterman, Donald E., 4,921,463, Cl. 453-3.000.

Rath, David J.: *See—*
Hutchison, Donald W.; Kimmel, Steven A.; Bonkovich, Raymond J.; Chew, James P.; and Rath, David J., 4,921,210, Cl. 251-129.080.

Ratkowski, Donald J.: *See—*
Drew, Arthur J., Jr.; and Ratkowski, Donald J., 4,921,205, Cl. 249-61.000.

Rattner, Manfred: *See—*
Mahler, Mathias; and Rattner, Manfred, 4,920,955, Cl. 128-24.00A

Raudaskoski, Vesa: *See—*
Saukkonen, Seppo; Tomma, Kauko; and Raudaskoski, Vesa, 4,921,183, Cl. 242-66.000.

Raufast, Charles, to BP Chemicals Limited. Apparatus for degassing and pelleting polyolefins. 4,921,678, Cl. 422-110.000.

Rauscher, Wolfgang: *See—*
Vollmer, Otto; and Rauscher, Wolfgang, 4,921,311, Cl. 303-9.760

Rauvala, Esko: *See—*
Santanen, Ensio; and Rauvala, Esko, 4,921,275, Cl. 280-824.000.

Ray Treadwell Contractors, Inc.: *See—*
Fields, Grethel C., III, 4,921,115, Cl. 220-18.000.

Raychem Corporation: *See—*
Kamas, Peter, 4,922,183, Cl. 324-694.000.
Parker, Robert, 4,922,242, Cl. 340-786.000.
Soni, Pravin L.; and Rosenzweig, Nachum, 4,921,648, Cl. 264-27.000.

Raymond, John P.: *See—*
McCauley, Michael J.; Beers, David G.; and Raymond, John P., 4,920,765, Cl. 62-408.000.

Raytheon Company: *See—*
Bowen, Robert F.; and Maiellano, Joseph C., Jr., 4,922,079, Cl. 219-415.000.
Gordon, Larry E., 4,922,077, Cl. 219-121.680.
Horvitz, Charles S.; and Miceli, Michael L., 4,922,132, Cl. 307-359.000.

RCA Licensing Corporation: *See—*
Datta, Pabitra; and Friel, Ronald N., 4,921,727, Cl. 427-57.000.
Datta, Pabitra; and Friel, Ronald N., 4,921,767, Cl. 430-23.000.
Hietala, Alexander W.; and Muterspaugh, Max W., 4,921,465, Cl. 455-193.000.

Reafler, Gerald G.: *See—*
Hakiel, Zbigniew; Reafler, Gerald G.; Schrader, Robert W.; and Schuler, James R., 4,921,556, Cl. 156-164.000.

Rear, Ian G. Downhole recirculating hammer. 4,921,052, Cl. 173-78.000.

Rechter, Harold L., to Chicago Fire Brick Company. Non-calcareous castable binder. 4,921,536, Cl. 106-74.000.

Reckinger, Arthur P., Jr.: *See—*
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.

Recurrent Solutions Limited Partnership: *See—*
Novak, Joel S.; Parsons, Natan E.; and Steiner, Kenneth M., 4,921,211, Cl. 251-129.040.

Red Hill Grinding Wheel Corporation: *See—*
Caserta, Richard T.; and Zimmerman, Roy E., 4,920,704, Cl. 51-302.000.

Redding, Jerry W.: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M. L., 4,920,990, Cl. 131-359.000.

Redeker, Detmar: *See—*
Trawinski, Jurgen; and Redeker, Detmar, 4,921,792, Cl. 435-41.000.

Reed, Adam V.: *See—*
Gillon, Alexander C.; Reed, Adam V.; and Scanlon, John M., 4,922,348, Cl. 358-407.000.
Reed, Alastair: *See—*
Stansfield, Peter W.; and Reed, Alastair, 4,922,544, Cl. 382-56.000.
Reed, Charles: *See—*
Reed, Ross; Reed, Charles; and Gran, Carl H., 4,920,897, Cl. 108-150.000.
Reed, Ross; Reed, Charles; and Gran, Carl H., to Lil Twister Inc. Beach and lawn table with umbrella holder. 4,920,897, Cl. 108-150.000.
Rees, James D.: *See—*
Folkins, Jeffrey J.; Goren, Robert N.; and Rees, James D., 4,922,298, Cl. 355-218.000.
Refuse Trucks, Inc.: *See—*
Conley, Challie, 4,921,066, Cl. 180-322.000.
Regel, Erik: *See—*
Bockmann, Klaus; Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; Konze, Jorg; and Brandes, Wilhelm, 4,921,528, Cl. 71-92.000.
Regelman, Dale F.: *See—*
Turcotte, David E.; Roshen, Waseem A.; and Regelman, Dale F., 4,922,156, Cl. 315-244.000.
Regenass, Willy: *See—*
Seifert, Gottfried; Staubli, Sebastian; Wieland, Josef H.; Regenass, Willy; Buerli, Martin; Lee, John G.; and Lund, Richard B., 4,922,008, Cl. 562-58.000.
Regie Autonome des Transports Parisiens: *See—*
Grenier, Michel; de la Gorge, Jean-Etienne; Cieplinski, Daniel; Leturgie, Gerard; Thurin, Yves; Meret, Laurent; and Doireau, Christian, 4,921,076, Cl. 188-12.600.
Reichel, Friedbert, to Alcatel N.V. Device for measuring the distance travelled and the speed of a rail vehicle. 4,922,447, Cl. 364-561.000.
Reichelsdoerfer, Peter: *See—*
Naser, Georg; Reichelsdoerfer, Peter; and Schneider, Siegfried, 4,921,198, Cl. 248-123.100.
Reichert, Leo E., Jr.: *See—*
Schneyer, Alan L.; Sluss, Patrick M.; Dattatreyamurty, Bosukonda; and Reichert, Leo E., Jr., 4,921,808, Cl. 436-503.000.
Reichmann, Michael H.: *See—*
Gordon, Alastair T.; and Reichmann, Michael H., 4,922,518, Cl. 379-57.000.
Reinecke, Paul: *See—*
Kramer, Wolfgang; Knops, Hans-Joachim; Buchel, Karl H.; and Reinecke, Paul, 4,921,870, Cl. 514-383.000.
Lantzsch, Reinhard; Brandes Wilhelm; Hansller, Gerd; Reinecke, Paul; and Lurssen, Klaus, 4,921,529, Cl. 71-92.000.
Reinertsen, John O.: *See—*
Cahlander, Robert L.; Carroll, David W.; Hanson, Robert A.; Hollingsworth, Al; and Reinertsen, John O., 4,922,435, Cl. 364-513.000.
Reinhart, Pietro, to Reinhart S. A. Pipe cleaner. 4,920,600, Cl. 15-104.061.
Reinhart S. A.: *See—*
Reinhart, Pietro, 4,920,600, Cl. 15-104.061.
Reinholz, Robby, to Siemens Aktiengesellschaft. Adaptor device for an arrangement for testing printed-circuit boards. 4,922,190, Cl. 324-158.00F.
Reinke, Paul E.: *See—*
Stiles, Steven D.; Reinke, Paul E.; and Gomez, Aparicio J., 4,920,790, Cl. 73-118.200.
Reise, Terrence F.: *See—*
Walker, Andre; and Reise, Terrence F., 4,921,689, Cl. 423-605.000.
Reiss, Gerald: *See—*
Henneberger, Gerd; and Reiss, Gerald, 4,920,668, Cl. 38-77.810.
Reiss, Karl: *See—*
Knodler, Reinhard; and Reiss, Karl, 4,921,766, Cl. 429-104.000.
Remcor Products Company: *See—*
Miller, Benjamin D.; and Jablonski, Thaddeus M., 4,921,149, Cl. 222-639.000.
Remfrey, James: *See—*
Becker, Horst-Peter; Remfrey, James; and Dehio, Gottfried, 4,922,120, Cl. 303-114.000.
Renger, Udo: *See—*
Sandhagen, Jurgen; and Renger, Udo, 4,922,198, Cl. 324-207.130.
Rerolle, Yves, to Societe Anonyme dite: Les Cables de Lyon. Machine for winding cable. 4,921,182, Cl. 242-54.00R.
Research Corporation: *See—*
O'Brien, Timothy J., 4,921,790, Cl. 435-7.000.
Research Foundation of State University of New York, The: *See—*
Deutsch, Dale G., 4,921,788, Cl. 435-6.000.
Resinoid Engineering Corporation: *See—*
Wojcik, Thaddeus, 4,920,633, Cl. 29-597.000.
Restaurant Technology, Inc.: *See—*
Cahlander, Robert L.; Carroll, David W.; Hanson, Robert A.; Hollingsworth, Al; and Reinertsen, John O., 4,922,435, Cl. 364-513.000.
Reuber, Gerhard; Braun, Achim; and Hesseler, Udo, to Alfred Teves GmbH. Lift-up sun roof, in particular for automotive vehicles. 4,921,298, Cl. 296-221.000.
Reyes, Vincent: *See—*
Bornstein, Marvin; Ewert, Corney J.; Saenger, John D.; and Reyes, Vincent, 4,921,122, Cl. 220-326.000.
Reynolds, Joseph D., to Eaton Corporation. Single shaft shifting mechanism. 4,920,815, Cl. 74-335.000.
Reynolds, Norman; and Reynolds, Wilbur C., to Reynolds Torsion System, Inc. Torsion spring cartridge assembly. 4,921,231, Cl. 267-196.000.
Reynolds Torsion System, Inc.: *See—*
Reynolds, Norman; and Reynolds, Wilbur C., 4,921,231, Cl. 267-196.000.
Reynolds, Wilbur C.: *See—*
Reynolds, Norman; and Reynolds, Wilbur C., 4,921,231, Cl. 267-196.000.
Rheinische Braunkohlenwerke AG: *See—*
Klutz, Hans J.; Flora, Bruno; Gilles, Gerard; and Wies, Georges, 4,921,086, Cl. 193-3.000.
Rheinmetall GmbH: *See—*
Luther, Hans W.; Winkelmann, Juergen; Sauvestre, Jean-Claude; and Montier, Patrick, 4,920,888, Cl. 102-518.000.
Luther, Hans W., 4,920,889, Cl. 102-521.000.
Rhodenbaugh, Thomas A., to Automark Corporation. Glass etching composition and method of making. 4,921,626, Cl. 252-79.400.
Rhone-Poulenc Chimie: *See—*
Bonin, Yves; and LeBlanc, Jack, 4,921,896, Cl. 524-403.000.
Rice, Roy W.: *See—*
Enloe, Jack H.; Lau, John W.; Lundsager, Christian B.; and Rice, Roy W., 4,920,640, Cl. 29-852.000.
Rice, Sandra W.: *See—*
Rudd, David; and Rice, Sandra W., 4,921,764, Cl. 428-480.000.
Richards, Gaylord W.: *See—*
Hwang, Frank K.; and Richards, Gaylord W., 4,922,245, Cl. 340-825.080.
Richards, L. Willard, to Sonoma Technology. Photographic method for monitoring visibility through measurement of transmittance and path radiance. 4,921,349, Cl. 356-229.000.
Richards, Martin A.: *See—*
Christon, Thomas M.; Richards, Martin A.; and Scholz, Eric H., 4,921,002, Cl. 137-119.000.
Richards Medical Company: *See—*
Bays, F. Barry; and Marchand, Sam R., 4,921,498, Cl. 623-10.000.
Richardson, Charles C.: *See—*
Tabor, Stanley; and Richardson, Charles C., 4,921,794, Cl. 435-91.000.
Richardson, Downie S., to Baker Oil Tools, Inc. Slip retention mechanism for subterranean well packer. 4,921,045, Cl. 166-134.000.
Richert, Wilhelm: *See—*
Callsen, Hans; and Richert, Wilhelm, 4,920,610, Cl. 17-11.000.
Richmond, Robert C.: *See—*
Teicher, Beverly A.; Richmond, Robert C.; and Chen, Lan B., 4,921,973, Cl. 549-212.000.
Richter, Ekkehard: *See—*
Juntgen, Harald; Knoblauch, Karl; Richter, Ekkehard; and Kuhl, Helmut, 4,921,826, Cl. 502-180.000.
Richter, Karl E., to Fulton Manufacturing Corporation. Boat dock bumper. 4,920,907, Cl. 114-219.000.
Richter, Klaus-Peter: *See—*
Jadamus, Hans; Grosse-Puppendahl, Thomas; and Richter, Klaus-Peter, 4,921,762, Cl. 428-521.000.
Richter, Peter; Hoffmann Gerhard; Bronstert, Klaus; Mueller, Wolfgang F.; and Gerberding, Karl, to BASF Aktiengesellschaft. Elements having layers containing mixtures which can be crosslinked by photopolymerization. 4,921,775, Cl. 430-281.000.
Rickerl, Peter, to Muller Textil GmbH. Warp knitted V-shaped briefs. 4,920,769, Cl. 66-176.000.
Ricoh Company Ltd.: *See—*
Baba, Keizo; and Nishikawa, Masato, 4,922,524, Cl. 379-100.000.
Bando, Toshiro, 4,922,293, Cl. 355-200.000.
Katoh, Shunji; Kimura, Noriyuki; Sakai, Yoshihiro; and Enoki, Sigekazu, 4,922,301, Cl. 355-251.000.
Kitajima, Tomoya, 4,922,281, Cl. 354-404.000.
Kobayashi, Hideaki; and Shindo, Masahiro, 4,922,432, Cl. 364-490.000.
Saeki, Sirou; Ikeda, Sunao; Otsuka, Hirohisa; and Yanagawa, Nobuyuki, 4,921,236, Cl. 271-3.100.
Takahashi, Shuichi; Yamanaka, Kunihiro; and Horiki, Masanao, 4,922,546, Cl. 455-74.000.
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Uehara, Kiyohiro; Imai, Yoshio; Hino, Taro; Iwamoto, Mitsumasa; Kakimoto, Masaaki; and Suzuki, Masaaki, 4,921,728, Cl. 427-58.000.
Tsukagoshi, Toshihiro; Fukushima, Masanobu; Yoshioka, Keiichi; and Yasui, Takashi, 4,922,441, Cl. 364-491.000.
Rief, Dieter J., to Pooltec Establishment. Automatic swimming pool cleaner. 4,920,599, Cl. 15-1.700.
Riegel, Maximilian, to U.S. Philips Corporation. Circuit arrangement for evaluating a video synchronizing signal. 4,922,344, Cl. 358-152.000.
Rieter Machine Works, Ltd.: *See—*
Binder, Rolf; Hanselmann, Daniel; Schlepfer, Walter; and Staeheli, Christoph, 4,920,613, Cl. 19-80.00B.
Rigg, Philip R., to Amray, Inc. Beam-blanking apparatus for stroboscopic electron beam instruments. 4,922,196, Cl. 324-158.00R.
Riggin, Charles H.; and Marciani, Dante J., to Cambridge Bioscience Corporation. Detection of antibodies to human immunodeficiency virus by agglutination of antigen coated latex. 4,921,787, Cl. 435-5.000.
Rikagaku Kenkyusho: *See—*
Shimizu, Kazuo; Amemiya, Hiroshi; and Sakamoto, Yuichi, 4,922,205, Cl. 324-454.000.
Riley, Michael D. Devices for the removal of caulk from existing caulked joints. 4,920,647, Cl. 30-169.000.
Rimondi, Renato; and Cappi, Angelo, to A.W.A.X. Progettazione E Ricerca S.r.l. Machine for packaging plural types of articles within a stretchable plastic film. 4,920,731, Cl. 53-556.000.

Rinno, Helmut. *See—*
Dengler, Michael; Kapmeyer, Wolfgang; and Rinno, Helmut, 4,921,915, Cl. 525-279.000.
Ristimaki, Mikko V.; Lehtinen, Matti J.; Lindstrom, Krister J.; and Hartzell, Rolf R., to Huhtamaki Oy. Cassette system and apparatus for manufacturing an active agent liberating capsule for subcutaneous use. 4,920,727, Cl. 53-252.000.
Rite-Hite Corporation: *See—*
Hahn, Norbert, 4,920,598, Cl. 14-71.100.
Ritter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Meltable aerobically cured plastic compositions. 4,921,921, Cl 526-195.000.
River Don Castings Limited: *See—*
Wood, Anthony M., 4,921,291, Cl. 294-90.000.
Roba, Giacomo, to Cselt-Centro Studi E Laboratori Telecommunicazioni S.p.A. Method of manufacturing optical fibers with elimination of paraxial refractive-index dip. 4,921,516, Cl. 65-3.120.
Robbie, Roderick G.: *See—*
Moskaliuk, Wiktor; Allen, Christopher M.; and Robbie, Roderick G., 4,920,707, Cl. 52-6.000.
Robbins, Edward S., III: *See—*
Schwertner, Gary T.; and Robbins, Edward S., III, 4,921,563, Cl. 156-303.100.
Robbins Tire & Rubber Co., Inc.: *See—*
Perdue, Thad A.; and Johnson, Bobby G., 4,920,629, Cl. 29-428.000.
Rober, Hans-Gerd: *See—*
Mawatari, Yasushi; Ikegami, Toru; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Rober, Hans-Gerd, 4,922,115, Cl. 250-484.100.
Roberge, Raymond P.: *See—*
Deitrick, Bernard E.; Murzyn, Patrick J.; Nowotarski, Mark S.; and Roberge, Raymond P., 4,920,998, Cl. 137-3.000.
Robert Bosch GmbH: *See—*
Braschel, Volker; Seitz, Dieter; and Schafer, Jochen, 4,921,314, Cl. 303-110.000.
Cifuentes, Luis; Sala, Carlos; and Vozmediano, Alfonso, 4,921,288, Cl. 292-144.000.
Duckart, Anton; Hauler, Peter; and Zabler, Erich, 4,920,796, Cl. 73-290.00V.
Gosdowski, Gerhard; and Kettner, Andreas, 4,922,143, Cl. 310-12.000.
Kuehbauch, Gerd, 4,920,602, Cl. 15-250.040.
Schwarz, Manfred; Braun, Wolfgang; and Alverez-Avila, Carlos, 4,920,938, Cl. 123-373.000.
Stammler, Kurt; and Ruttkowski, Lothar, 4,921,124, Cl. 220-367.000.
Zirps, Wilhelm, 4,921,007, Cl. 137-543.210.
Robert Krups Stiftung & Co. KG.: *See—*
Gehrmann, Alfred, 4,920,868, Cl. 99-279.000.
Roberts, Charles D.: *See—*
Allen, Lynn M.; Taylor, Don M.; and Roberts, Charles D., 4,921,592, Cl. 208-48.0AA.
Roberts, Glyn; Paynter, Gordon; and Krishnasastry, Remesh B., to NovAtel Communications, Ltd. Oscillator temperature compensating circuit using stored and calculated values. 4,922,212, Cl. 331-176.000.
Roberts, Mary P.; and Gabriel, Nancy E., to Massachusetts Institute of Technology. Unilamellar lipid vesicles and method for their formation. 4,921,706, Cl. 424-450.000.
Roberts, William J. Exercise device. 4,921,245, Cl. 272-109.000.
Robertsch, David W.: *See—*
Cohen, Marlene L.; Lacefield, William B.; and Robertsch, David W., 4,921,982, Cl. 549-462.000.
Robertshaw Controls Company: *See—*
Genbauffe, Francis S., 4,921,161, Cl. 236-15.00A.
Hutchison, Donald W.; Kimmel, Steven A.; Bonkovich, Raymond J.; Chew, James P.; and Rath, David J., 4,921,210, Cl. 251-129.080.
Kadwell, Brian J.; and Fowler, Daniel L., 4,922,081, Cl. 219-506.000.
Kelly, Samuel T.; and Katchka, Jay R., 4,921,011, Cl. 137-595.000.
Robertson, J. Richard, Jr.: *See—*
Molock, Frank; Robertson, J. Richard, Jr.; and Su, Kai C., 4,921,956, Cl. 544-165.000.
Robinson, Clyde G.: *See—*
Seiz, Carl G.; and Robinson, Clyde G., 4,920,995, Cl. 134-15.000.
Robison, Shane V.: *See—*
Davis, Alan L.; Robison, Shane V.; and Stevens, Kenneth S., 4,922,408, Cl. 364-200.000.
Roche, Thomas, to Olin Corporation. Etchant solutions containing hydrogen fluoride and a polyammonium fluoride salt. 4,921,572, Cl. 156-653.000.
Rockney, Bennett H.: *See—*
Fantone, Stephen D.; Rockney, Bennett H.; Burger, Robert J.; and Cook, Lee M., 4,921,316, Cl. 350-96.270.
Rockwell International Corporation: *See—*
Bobbs, Bradley L.; and Goldstone, Jeffrey A., 4,922,495, Cl. 372-3.000.
Chiou, Arthur E.; Chang, Tallis Y.; and Khoshnevisan, Mohsen, 4,921,353, Cl. 356-347.000.
Herschler, Wilbert H.; and Nelson, Stephen R., 4,921,191, Cl. 248-70.000.
Nicholas, David C., 4,922,206, Cl. 329-304.000.
Peck, David E., 4,921,159, Cl. 228-182.000.
SooHoo, Kie L., 4,921,354, Cl. 356-350.000.
Voss, Forrest L.; and Witherell, Donald R., 4,921,054, Cl. 174-255.000.
Whiffen, E. L., 4,921,568, Cl. 156-379.800.
Roda, Aldo: *See—*
Frigerio, Giuliano; Pellicciari, Roberto; and Roda, Aldo, 4,921,848, Cl. 514-182.000.
Roddy, Joseph T.; Felt, David A.; and Eisenbraun, David D., to Emerson Electric Co. Motor test apparatus, system and method. 4,922,172, Cl. 318-490.000.
Rodrigues, Julio, to Thomas & Betts Corporation. Connector for electrical conductors having similar or different cross-sectional shapes. 4,922,058, Cl. 174-94.00R.
Roediger, Gary A.: *See—*
Lidinsky, William P.; Roediger, Gary A.; Steele, Scott B.; and Weddige, Ronald C., 4,922,486, Cl. 370-60.000.
Roeser, John O., to Minnesota Mining and Manufacturing Company. Method and apparatus for precision pumping, ratioing and dispensing of work fluids. 4,921,133, Cl. 222-63.000.
Roggenburg, Stanley L., Jr., to Inopak Ltd. Fixture for bag-type liquid dispenser. 4,921,136, Cl. 222-95.000.
Rohm GmbH: *See—*
Vetter, Heinz; and Siol, Werner, 4,921,669, Cl. 264-134.000.
Rohrs, Charles E.: *See—*
Kenney, John B.; Rohrs, Charles E.; and Walters, Wayne E., 4,922,530, Cl. 379-411.000.
Rombola, Gregory; Muster, Frank L.; and Telle, Lawrence B., to Eastman Kodak Company. Document recognition with forward direction scan for detecting the boundaries of an original document and reverse direction scan for producing recorded image on the original document. 4,922,350, Cl. 358-488.000.
Rome, Brenda J. L. Child's snack carrier. 4,921,114, Cl. 220-4.00B.
Ron, Eliora Z.: *See—*
Rosenberg, Eugene; and Ron, Eliora Z., 4,921,793, Cl. 435-84.000.
Roney, Troy L. Electrically conductive track circuit for shock mounting a bulb, a blank for such a track circuit, method of making same, and a lamp assembly having same. 4,922,395, Cl. 362-390.000.
Rose, Frederick A.; and DeWitt, Christopher P. Communications management system having multiple power control modes. 4,922,450, Cl. 364-900.000.
Rose, Jed E.; Jarvik, Murray E.; and Rose, Karce D., to University of California, Regents of the. Method and apparatus for aiding in the reduction of incidence of tobacco smoking. 4,920,989, Cl. 131-270.000.
Rose, Karce D.: *See—*
Rose, Jed E.; Jarvik, Murray E.; and Rose, Karce D., 4,920,989, Cl. 131-270.000.
Rose, Philip M.: *See—*
Lin, Chi-Hung; Stevens, Jack F.; Tovrog, Benjamin S.; and Rose, Philip M., 4,921,919, Cl. 526-88.000.
Rosenberg, Eugene; and Ron, Eliora Z. Bacterial process for the production of dispersants. 4,921,793, Cl. 435-84.000.
Rosenberger, John E.: *See—*
McMullin, Craig W.; and Rosenberger, John E., 4,920,802, Cl. 73-597.000.
Rosenstein, Leo M.; and Gulbranson, Glenn J., to Control Data Corporation. Apparatus and process for the simultaneous continuity sensing of multiple circuits. 4,922,184, Cl. 324-72.500.
Rosenthal, Bruce: *See—*
Gray, Richard L.; Yan, Raymond Chan-Man; and Rosenthal, Bruce, 4,922,371, Cl. 361-91.000.
Rosenthal, Eric. Blind setting rivet. 4,920,833, Cl. 87-124.100.
Rosenzweig, Nachum: *See—*
Soni, Pravin L.; and Rosenzweig, Nachum, 4,921,648, Cl. 264-27.000.
Roses, Luis B.: *See—*
Sole, Xavier C.; and Roses, Luis B., 4,921,436, Cl. 439-395.000.
Roshen, Waseem A.: *See—*
Turcotte, David E.; Roshen, Waseem A.; and Regelman, Dale F., 4,922,156, Cl. 315-244.000.
Ross, Charles O.: *See—*
Galetto, Louis V.; and Ross, Charles O., 4,922,347, Cl. 358-296.000.
Ross, Dan E. Electrical box for wiring devices. 4,922,057, Cl. 174-65.00R.
Ross, Jeffrey L.: *See—*
Crawford, Donald C.; Ross, Jeffrey L.; and Krueger, James W., 4,921,092, Cl. 198-460.000.
Roth, Alex T.; and Soderstrom, Richard M., to EndoTherapeutics. Method of obtaining cervical culture specimens and device and kit therefor. 4,920,974, Cl. 128-759.000.
Roth, Mark: *See—*
Hwang, Kuen-Shyang; Sedigh, Mohammad; and Roth, Mark, 4,921,158, Cl. 228-124.000.
Rothgery, Eugene F.; and Manke, Steven A., to Olin Corporation. Method of producing alkyl substituted 5-amidotetrazoles. 4,921,965, Cl. 548-251.000.
Rothman, Isaac; and Degen, Peter J., to Pall Corporation. Non-fluorescing, non-reflective polyamide for use in diagnostic testing. 4,921,878, Cl. 521-53.000.
Rottermann AG: *See—*
Rottermann, Robert, 4,921,360, Cl. 384-44.000.
Rottermann, Robert, to Rottermann AG. Linear roller contact bearing assembly. 4,921,360, Cl. 384-44.000.
Rousek, Marian M.: *See—*
Wilson, John R.; Rousek, Marian M.; and Massey, Fred L., 4,921,929, Cl. 528-272.000.

Roussel Uclaf: *See—*
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 4,921,868, Cl. 514-354.000.
Nedelec, Lucien; Claussner, Andre ; Philibert, Daniel; and Moguilewsky, Martine, 4,921,846, Cl. 514-173.000.

Rovira, Luis A.: *See—*
Farmer, James O.; and Rovira, Luis A., 4,922,532, Cl. 380-15.000.

Rowenta-Werke GmbH: *See—*
Henneberger, Gerd; and Reiss, Gerald, 4,920,668, Cl. 38-77.810.

Rowles, Howard C., and Ayres, Calvin L., to Air Products and Chemicals, Inc. Mixed refrigerant/expander process for the recovery of C3+ hydrocarbons. 4,921,514, Cl. 62-24.000.

Rozman, Miro, to Iskra-Sozd Elektrokovinske Industrije N.Sol.O. Supply circuit for a hall sensor multiplication circuit. 4,922,123, Cl. 307-309.000.

Rozzell, J. David, to Genetics Institute,Inc. Immobilized cyclodextrin glucosyltransferase composition for the production of cyclodextrins. 4,921,796, Cl. 435-97.000.

Rudd, David; and Rice, Sandra W., to Hoechst Celanese Corporation. Polyester film coated with metal adhesion promoting coating and having superior winding performance. 4,921,764, Cl. 428-480.000.

Rudko, Ted. Garbage container. 4,921,196, Cl. 248-97.000.

Rudolph, Werner: *See—*
Naumann, Dieter; Tyrra, Wieland; Kock, Birgit; Rudolph, Werner; and Wilkes, Bernd, 4,922,041, Cl. 570-141.000.

Rumako, Gennady N., deceased: *See—*
Lipukhin, Jury V.; Garber, Eduard A.; Orlov, Boris Y.; Ponosov, Viktor N.; Novikov, Vladimir M.; and Rumako, Gennady N., deceased, 4,920,705, Cl. 51-318.000.

Rumako, Tamara A., Administrator: *See—*
Lipukhin, Jury V.; Garber, Eduard A., Orlov, Boris Y.; Ponosov, Viktor N.; Novikov, Vladimir M.; and Rumako, Gennady N., deceased, 4,920,705, Cl. 51-318.000.

Rumpf, David S.; and Lemieux, Paul R., to Norton-Alcoa Proppants. Lightweight proppant for oil and gas wells and methods for making and using same. 4,921,820, Cl. 501-128.000.

Rumpf, David S., and Lemieux, Paul R., to Norton-Alcoa Proppants. Lightweight oil and gas well proppants and methods for making and using same. 4,921,821, Cl. 501-128.000.

Ruoff, Carl F.; and Salisbury, J. Kenneth, Jr., to United States of America, National Aeronautics and Space Administration. Multi-fingered robotic hand. 4 921,293. Cl. 294-111.000.

Ruquier, Bernard: *See* -
Harlin, Jean-Pierre; Giorgetti, Jean-Pierre; Ruquier, Bernard; and Herment, Robert, 4,921,539, Cl. 106-284.030.

Rusek, Milos, to Ciba-Geigy Corporation Process for the preparation of N-Alkylanilines. 4,921,980, Cl. 549-426.000.

Rushbrooke, John; Lyons, Adrian; Tomkins, Patricia: and Ansorge, Richard, to Image Research Limited. High sensitivity optical imaging apparatus. 4,922,092, Cl 250-213.0VT

Russo, Randolph J.. *See—*
Russo, Robert P and Russo, Randolph J. 4,921,190, Cl 248-159.000

Russo, Robert P.; and Russo, Randolph J., to Mark Philip Promotions, Inc. Display construction. 4,921,190, Cl. 248-159.000.

Rutgerswerke AG: *See—*
Omran, Jafar; and Alscher, Arnold, 4,921,543, Cl. 106-500.000.
Seubert, Bernhard; Beilharz, Helmut; Fickert, Werner; Jeromin, Gunter; and Spitaler, Ulrich, 4,921,840, Cl. 514-33.000.

Ruttkowski, Lothar *See—*
Stammler, Kurt; and Ruttkowski, Lothar, 4,921,124, Cl. 220-367.000.

Ryder, Francis E.; and Lisak, Stephen P., to Ryder International Corporation; and Textron Inc. Horizontal zero adjustment for automotive headlamp. 4,922,387, Cl. 362-61.000.

Ryder International Corporation: *See—*
Ryder, Francis E.; and Lisak, Stephen P., 4,922,387, Cl. 362-61.000.

Ryoko Co., Ltd.: *See—*
Higa, Teruo, 4,920,694, Cl. 47-58.000.

S. A. T. Societe Anonyme de Telecommunications: *See—*
Cointot, Denis F.; and Cauderlier, Andre H., 4,922,249, Cl. 341-57.000.

S. C. Johnson & Son, Inc.: *See—*
Bixler, Kathleen J.; and Scholsky, Kevin M., 4,921,934, Cl. 528-355.000.

Sable, Lewis E.: *See—*
Benoit, Gordon L.; Sable, Lewis E.; and Wenzel, Richard A., 4,921,197, Cl. 248-97.000.

Sadler, Edward L., Jr., and Sadler, Edward L., Sr Infant conversion stroller. 4,921,261, Cl. 280-30.000.

Sadler, Edward L., Sr.. *See—*
Sadler, Edward L., Jr ; and Sadler, Edward L., Sr., 4,921,261, Cl. 280-30.000.

Saeki, Sirou; Ikeda, Sunao; Otsuka, Hirohisa; and Yanagawa, Nobuyuki, to Ricoh Company, Ltd. Recycling automatic document feeder. 4,921,236, Cl. 271-3.100.

Saenger, John D.: *See—*
Bornstein, Marvin, Ewert, Corney J.; Saenger, John D.; and Reyes, Vincent, 4,921,122, Cl. 220-326.000.

Saffer, Jeffrey D.; and Profenno, Louis A., to Jackson Laboratory, The. Controlled microwave sample irradiation system. 4,922,180, Cl. 324-639.000.

Sagawa, Hirotoshi; and Yamaguchi, Seiji, to Ciba-Geigy Corporation. Epoxy resin compesition containing acrylic oligomer, amine and amine-terminated nitrile rubber. 4,921,912, Cl. 525-112.000

Sagiv, Oded: *See—*
Landa, Benzion; Sagiv, Oded; and Levy, Nathan A., 4,921,241, Cl. 271-245.000.

Sahashi, Yuko: *See—*
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.

Sahlin International, Inc.: *See—*
Sahlin, Richard T., 4,921,395, Cl. 414-744.300.

Sahlin, Richard T., to Sahlin International, Inc. Apparatus for loading and/or unloading industrial presses. 4,921,395, Cl. 414-744.300.

Saika, Toshihiro; and Kaifu, Noriyuki, to Canon Kabushiki Kaisha. Photoelectric conversion device having a constant potential wiring at the sides of the common wiring. 4,922,117, Cl. 250-578.100.

Saint-Gobain Vitrage: *See—*
Orain, Roger; Bravet, Jean-Louis; Dimier, Gerard; Dagaut, Philippe; and Daude, Gerard, 4,921,759, Cl. 428-424.400.

Saito, Hitoshi: *See—*
Endo, Takayoshi; Yagi, Sakai; Sakai, Hitoshi; and Saito, Hitoshi, 4,921,448, Cl. 439-595.000.

Saito, Isao: *See—*
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl. 514-319.000.

Saito, Jun; Haruyama, Tetsuo; Orime, Nobutake; and Katagi, Takashi, to Mitsubishi Denki Kabushiki Kaisha Conformal array antenna 4,922,257, Cl. 342-377.000.

Saito, Katsuo: *See—*
Egami, Hidemi; Saito, Katsuo; Satomura, Hiroshi; and Oikawa, Katsuya, 4,922,392, Cl. 362-217.000.

Saito, Kenji; Nakayama, Yoshiaki; and Kawada, Yukihiro, to Fuji Photo Film Co., Ltd. Method and apparatus for automatically adjusting white balance. 4,922,330, Cl. 358-29.000.

Saito, Shiro: *See—*
Sugimoto, Tadakatsu; Igarashi, Yoshiaki; Saito, Shiro; Wada, Eiichi; and Murai. Keiji, 4,920,836, Cl. 81-463.000.

Saitoh, Yokuo: *See—*
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi, Yukimori; Hori, Kazunori; and Tokuyama, Mikio, 4,922,356, Cl. 360-104.000.

Sakaguchi, Koichi: *See—*
Yamaguchi, Shoji; Yamada, Kimiko; Yada, Katsuyoshi; Sakaguchi, Koichi; and Inoue, Hiromu, 4,921,623, Cl. 252-512.000.

Sakaguchi, Yasuo: *See—*
Tagaya, Kiyoshi; Hirose, Satoshi; Iwasaki, Takao; Kouyama, Toshitaka; and Sakaguchi, Yasuo, 4,921,758, Cl. 428-419.000.

Sakai, Fumiki: *See—*
Tokumoto, Hiroshi; Bando, Hiroshi; Sakai, Fumiki; Miyata, Chikara; and Wakiyama, Shigeru, 4,921,346, Cl. 356-72.000.

Sakai, Hitoshi: *See—*
Endo, Takayoshi; Yagi, Sakai; Sakai, Hitoshi; and Saito, Hitoshi, 4,921,448, Cl. 439-595.000

Sakai, Mitsugu: *See—*
Karaki, Kouichi; Sakai, Mitsugu; and Sasaki, Yasuo, 4,920,803, Cl. 73-606.000.

Sakai, Yoshihiro: *See—*
Katoh, Shunji; Kimura, Noriyuki; Sakai, Yoshihiro; and Enoki, Sigekazu, 4,922,301, Cl. 355-251.000.

Sakakibara, Hidekazu: *See—*
Kotani, Hiroshi; Inoue, Yoshiyuki; Kadota, Yasushi; Sakakibara, Hidekazu; Ide, Kazuo; and Sumida, Kanichi, 4,921,470, Cl. 464-151.000.

Sakakibara, Kenji: *See—*
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; and Sawaki, Yukichi, 4,922,288, Cl. 355-27.000.

Sakamoto, Kazuhiko, to Sugatsune Industrial Co., Ltd. Slide rail assembly. 4,921,359, Cl. 384-18.000.

Sakamoto, Kazuya: *See—*
Fukui, Ronald D.; Ichikawa, Wataru; and Sakamoto, Kazuya, 4,922,199, Cl. 324-207.170.

Sakamoto, Masashi: *See—*
Nakagami, Hidekazu; Sakamoto, Masashi; and Ozawa, Hiroshi, 4,922,294, Cl. 355-209.000.

Sakamoto, Norio: *See—*
Ito, Takashi; and Sakamoto, Norio, 4,921,155, Cl. 226-181.000.

Sakamoto, Yuichi: *See—*
Shimizu, Kazuo; Amemiya, Hiroshi; and Sakamoto, Yuichi, 4,922,205, Cl. 324-454.000.

Sakanaka, Hiroo: *See—*
Sakano, Kenji; Nakashima, Hideyuki; Sakanaka, Hiroo; and Okamoto, Kazutoshi, 4,920,930, Cl. 123-41.860.

Sakano, Kenji; Nakashima, Hideyuki; Sakanaka, Hiroo; and Okamoto, Kazutoshi, to Kubota Limited. System for blow-by gas return to the combustion chamber of an engine. 4,920,930, Cl. 123-41.860.

Sakata, Yoshio; and Taoda, Masami, to Kabushiki Kaisha Toshiba. Image information processing apparatus. 4,922,437, Cl. 364-514.000.

Sakatos, Michael J., to Inresco, Inc. Circuit protector. 4,922,369, Cl. 361-88.000.

Sakatos, Michael J.: *See—*
Mulshine, James P.; and Sakatos, Michael J., 4,922,370, Cl. 361-88.000.

Saken Co., Ltd.: *See—*
Higa, Teruo, 4,920,694, Cl. 47-58.000.

Sakurai, Kazuya: *See—*
Horiuchi, Makoto; Miyakawa, Yoshitaka; and Sakurai, Kazuya, 4,920,857, Cl. 91-373.000.

Sala, Carlos: *See—*
Cifuentes, Luis; Sala, Carlos; and Vozmediano, Alfonso, 4,921,288, Cl. 292-144.000.

Salama, C. Andre T.: *See—*
Mena, Jose G.; and Salama, C. Andre T., 4,922,327, Cl. 357-23.400.

Salas, Gerardo A., to Kerr-McGee Chemical Corporation. Harvester for removing a substance from a plate. 4,921,545, Cl 134-16.000.

Salem, Ronald R.; Thomas, Peter; and Steele, Glenn, to New England Deaconess Hospital Corporation. Marker for colorectal carcinoma and methods of detecting the same. 4,921,789, Cl. 435-7.000.

Salisbury, J. Kenneth, Jr.: *See—*
Ruoff, Carl F.; and Salisbury, J. Kenneth, Jr., 4,921,293, Cl. 294-111.000.

Sallas, John J.; Luce, Richard H.; and Corrigan, Michael A., to Halliburton Geophysical Services, Inc. Enclosure for suppression of air-coupled noise produced by seismic vibrators. 4,922,473, Cl. 367-189.000.

Salzmann, Ferdinand F., to Traex Corporation. Server top with snap-fit push lever. 4,921,146, Cl. 222-473.000.

Sames S.A.: *See—*
Belmain, Daniel; Chabert, Pierre; Tholome, Roger; Fabre, Pierre; Correard, Jean-Yves; and Gondrand, Michel, 4,921,172, Cl. 239-698.000.

Samford, Dean A., to General Housewares Corporation. Cooking utensil useful for assuring destruction of harmful bacteria during microwave cooking of poultry and other foods. 4,922,071, Cl. 219-10.55E.

Samochocka, Krystyna; and Szymendera, Janusz J., to Uniwersytet Warszawski. Method of pharmaceutic production. 4,921,944, Cl 534-10.000.

Samsung Electronics Co., Ltd.: *See—*
Kim, Chul K., 4,922,176, Cl. 318-602.000.

Sandell, Robert D.: *See—*
Phillips, Richard R.; Sandell, Robert D.; and Silver, Arnold H., 4,922,250, Cl. 341-133.000.

Sander, Lothar S.; Musingo, Edward M.; and Neill, William J , to Betz Laboratories, Inc. Composition and method for non-chromate coating of aluminum. 4,921,552, Cl. 14.8-247.000.

Sanders, Ronald J. Viewing apparatus. 4,920,654, Cl. 33-252.000.

Sanders, Royden C., Jr.; Forsyth, John L.; and Conant, John P., to Sanders, Royden C., Jr. High speed shuttle printer. 4,921,365, Cl. 400-322.000.

Sanderson, John R.; Knifton, John F.; and Marquis, Edward T., to Texaco Inc. Preparation of tertiary butyl alcohol by the catalytic decomposition of tertiary butyl hydroperoxide. 4,922,033, Cl. 568-909.800.

Sanderson, John R.; Marquis, Edward T.; and Mueller, Mark A., to Texaco Inc. Catalyzed conversion of tertiary butyl hydroperoxide to tertiary butyl alcohol. 4,922,034, Cl. 568-909.800.

Sanderson, John R.; and Marquis, Edward T., to Texaco Inc. Catalytic preparation of tertiary butyl alcohol by decomposition of tertiary butyl hydroperoxide. 4,922,035, Cl. 568-909.800.

Sanderson, John R.; Marquis, Edward T.; and Knifton, John F., to Texaco Inc. Tertiary butyl hydroperoxide decomposition. 4,922,036, Cl. 568-909.800.

Sandhagen, Jurgen; and Renger, Udo, to Volkswagen AG. Displacement sensor including a piezoelectric element and a magnetic member. 4,922,198, Cl. 324-207.130.

Sandoz Ltd.: *See—*
Avar, Lajos, 4,921,893, Cl. 524-99.000.
Horiguchi, Kazuo; Hosaka, Kazuyoshi; and Yoshizumi, Akira, 4,921,537, Cl. 106-90.000.
Lee, Shy-Fuh; Luehr, Gary W.; Scott, Carol R., and Trueb, Werner, 4,921,526, Cl. 71-86.000.

Sandvik AB: *See—*
Brandt, Nils G. L.; and Thelin, Anders G., 4,920,838, Cl. 82-1.110.

Sanneskog, Owe: *See—*
Nordberg, Cecilia M.; Engstrom, Thomas B.; Pinzke, Thomas; Sanneskog, Owe; and Ohlund, Jan, 4,921,613, Cl. 210-651.000.

Sano, Masafumi: *See—*
Osada, Yoshiyuki; Tsuda, Hisanori; Sano, Masafumi; Omata, Satoshi; Takasu, Katsuji; and Hirai, Yutaka, 4,921,722, Cl. 427-39.000.

Sano, Masaki: *See—*
Fujimori, Kyoichi; and Sano, Masaki, 4,920,942, Cl. 123-497.000.

Sanshin Industries Co., Ltd.: *See—*
Uchida, Tatsumi; Hoshina, Yoshikazu; and Nishimura, Seiichi, 4,920,819, Cl. 74-480.00B.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Iwai, Tomio; and Takahashi, Masanori, 4,920,933, Cl. 123-73.00A
Yoshida, Shinji, 4,921,457, Cl. 440-111.000.

Santanen, Ensio; and Rauvala, Esko, to Exel OY. Ski pole provided with a snow ring. 4,921,275, Cl. 280-824.000.

Santi, Joseph P.: *See—*
Scott, Frederick W., Jr.; and Santi, Joseph P., 4,920,672, Cl 40-363.000.

Santoh, Tsuyoshi: *See—*
Oguchi, Yoshihiro; and Santoh, Tsuyoshi, 4,921,780, Cl. 430-495.000.

Sanyei Corporation: *See—*
Okada, Yoshihisa; and Enya, Yoshihiro, 4,921,174, Cl. 241-37.500.
Okada, Yoshihisa; and Enya, Yoshihiro, 4,921,175, Cl 241-37.500.

Sanyo Chemical Industries, Ltd.: *See—*
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, 4,921,632, Cl. 252-299.100.

Sanyo Electric Co., Ltd.: *See—*
Hidaka, Masaru; Murashima, Hirotsugu; Takuma, Masao; Haruki, Toshinobu; and Kikuchi, Kenichi, 4,922,346, Cl. 358-227.000.
Kuwano, Yukinori; Mori, Noriyuki; Nakano, Shoichi; Uehara, Hisao; Kobayashi, Mitsugu; Watanabe, Kaneo; and Noguchi, Shigeru, 4,922,111, Cl. 250-566.000.
Watanabe, Kaneo; Iwamoto, Masayuki; and Minami, Koji, 4,922,218, Cl. 357-30.000.

Sanyo Shokuhin Kabushiki Kaisha: *See—*
Nagata, Zenji, 4,920,844, Cl. 83-404.300.

Sapiejewski, Roman. Headphone comfort. 4,922,542, Cl 381-187.000.

Sarcos Group: *See—*
Jacobsen, Stephen C.; Wood, John E.; and Price, Richard H., 4,922,164, Cl. 310-309.000.

Sarles, J. Stephen; and Thompson, L. P., Jr Firearm with detachable barrel. 4,920,679, Cl. 42-75.020.

Sarli, Michael S.: *See—*
Chin, Arthur A.; and Sarli, Michael S., 4,921,824, Cl. 502-65.000.

Sartorius, Volker: *See—*
Otremba, Klaus; and Sartorius, Volker, 4,922,211, Cl. 331-68.000.

Sasaki, Akio: *See—*
Morikawa, Takashi; Ogawa, Tetuji; Sasaki, Akio; and Sato, Kiichi, 4,922,410, Cl. 364-200.000.

Sasaki, Hideo, to Taisei Road Construction Co., Ltd. Method of producing a recycled asphalt mixture. 4,921,730, Cl. 427-138.000.

Sasaki, Isao: *See—*
Ito, Koichi; and Sasaki, Isao, 4,921,464, Cl. 455-34.000.

Sasaki, Kunihiko; Ida, Yuichi; Oka, Tsumoru; and Shinroaku, Mituaki, to Alps Electric Co., Ltd. Cable reel. 4,921,428, Cl. 439-15.000.

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Sasaki, Nobuyoshi; and Baba, Susumu. Process for preparing mold for investment casting. 4,921,038, Cl. 164-516.000.

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Sasaki, Yasuo: *See—*
Karaki, Kouichi; Sakai, Mitsugu; and Sasaki, Yasuo, 4,920,803, Cl. 73-606.000.

Sasib S.p.A.: *See—*
Callegari, Ugo, 4,921,189, Cl. 246-448.000.

Sasol Operations (Pty) Ltd.: *See—*
De Haan, Robert; Dry, Mark E.; Dressler, Flemming H.; Hesse, Horst J. F. A.; and Vermaire, Sonet, 4,921,682, Cl. 423-225.000.

Sato, Akiyoshi, to Sato Factory Co., Ltd. Molding apparatus for molding a clay pigeon. 4,921,417, Cl. 425-145.000.

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Sato, Akiyoshi, 4,921,417, Cl. 425-145.000.

Sato, Kenichi, to Yazaki Corporation. Waterproofing assembly for terminal area of electric wire. 4,921,443, Cl. 439-521.000

Sato, Kiichi: *See—*
Morikawa, Takashi; Ogawa, Tetuji; Sasaki, Akio; and Sato, Kiichi, 4,922,410, Cl. 364-200.000.

Sato, Masayuki: *See—*
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, 4,921,771, Cl 430-110.000.

Sato, Motoyuki: *See—*
Mawatari, Yasushi; Ikegami, Toru; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Rober, Hans-Gerd, 4,922,115, Cl. 250-484.100.

Sato, Tadahisa: *See—*
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 4,921,968, Cl. 548-262.400.

Sato, Yoshinori, to NEC Corporation. Infant protection device. 4,922,316, Cl. 357-41.000.

Sato, Yoshinori: *See—*
Watanabe, Kazuo; and Sato, Yoshinori, 4,922,458, Cl 365-189.050.

Sato, Yukio; and Ichikawa, Toshio, to NEC Corporation. Pager receiver for giving at least one of extraordinary tones and extraodinary displays. 4,922,221, Cl. 340-311.100.

Satoh, Kiyoshi: *See—*
Ohmi, Tadahiro; Mihira, Hiroshi; and Satoh, Kiyoshi, 4,921,005, Cl. 137-486.000.

Satoh, Masahiro: *See—*
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, 4,921,632, Cl 252-299.100.

Satomura, Hiroshi: *See—*
Egami, Hidemi; Saito, Katsuo; Satomura, Hiroshi, and Oikawa, Katsuya, 4,922,392, Cl. 362-217.000.

Sauder, Jay S., to AMP Incorporated. Shielded backshell system having strain relief and shield continuity. 4,921,441, Cl. 439-460.000.

Sauer, Wolfgang: *See—*
Kaiser, Franz-Josef; and Sauer, Wolfgang, 4,921,049, Cl. 267-140.100.

Sauermann, Gerhard: *See—*
Hoppe, Udo; Eigener, Ulrich; Sauermann, Gerhard; Engel, Walter; and Pape, Wolfgang, 4,921,694, Cl. 424-65.000.
Saukkonen, Seppo; Tomma, Kauko; and Raudaskoski, Vesa, to Valmet Paper Machinery Inc. Method and device for the reeling of a web. 4,921,183, Cl. 242-66.000.
Saunders, Brian, to Cameron Iron Works USA, Inc. Packoff seal with dual member engaging means. 4,921,259, Cl. 277-112.000.
Saunders, Myles L.: *See—*
Solano, Scott J.; Saunders, Myles L.; and Crittenden, James, 4,921,478, Cl. 604-53.000.
Sauter, Hubert: *See—*
Grossman, Klaus; Jung, Johann; Schulz, Guenter; Sauter, Hubert; Hofmeister, Peter; and Tuerk, Wolfgang, 4,921,525, Cl. 71-73.000.
Sauvestre, Jean-Claude: *See—*
Luther, Hans W.; Winkelmann, Juergen; Sauvestre, Jean-Claude; and Montier, Patrick, 4,920,888, Cl. 102-518.000.
Savage, George M.: *See—*
Koomey, Paul C.; Savage, George M.; and Stewart, James T., 4,922,423, Cl. 364-422.000.
Savvateev, Konstantin L.: *See—*
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,921,695, Cl. 424-81.000.
Sawaki, Yukichi: *See—*
Akao, Michitoshi; Sakakibara, Kenji; Katoh, Tokunori; and Sawaki, Yukichi, 4,922,288, Cl. 355-27.000.
Sayir, Mahir: *See—*
Dual, Jurg; Sayir, Mahir; and Goodbread, Joseph, 4,920,787, Cl. 73-54.000.
Scales, Christopher, to Dowty Fuel Systems Limited. Support assembly. 4,921,125, Cl. 220-426.000.
Scamuffa, Thomas A.: *See—*
Aikins, Robert D.; Bandy, Lee R.; Davis, William P.; Delaney, Robert E.; Guyer, Michael E.; Lovera, Edward D.; and Scamuffa, Thomas A., 4,920,627, Cl. 29-402.080.
Scanlon, John M., to American Telephone and Telegraph Company. Telecommunications access to lottery systems. 4,922,522, Cl. 379-95.000.
Scanlon, John M.: *See—*
Gillon, Alexander C.; Reed, Adam V.; and Scanlon, John M., 4,922,348, Cl. 358-407.000.
Scanlon, Michael V., to United States of America, Army. Fluidic noise suppressor and stabilizer 4,920,854, Cl. 89-14.400.
Scantland Industries, Inc.: *See—*
Scantland, Joe F.; and Huffman, Frederick J., 4,921,412, Cl. 425-28.100.
Scantland, Joe F.; and Huffman, Frederick J., to Scantland Industries, Inc. Tire curing press. 4,921,412, Cl. 425-28.100.
Schaefer, Dietmar; and Nickel, Friedhelm, to Th. Goldschmidt AG. Preparation for finishing textile fibers and products and textile products having improved handle. 4,921,895, Cl. 524-379.000.
Schaefer, Paul W.: *See—*
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.
Schaefer, Werner: *See—*
Dallmann, Hermann; Bothe, Lothar; Crass, Guenther; and Schaefer, Werner, 4,921,670, Cl. 264-141.000.
Schaevitz Sensing Systems, Inc.: *See—*
Swartz, Harold L.; and Stansberry, Warren W., 4,920,797, Cl. 73-309.000.
Schafer, Jochen: *See—*
Braschel, Volker; Seitz, Dieter; and Schafer, Jochen, 4,921,314, Cl. 303-110.000.
Schafer, Walter; Muller, Hanns P.; and Hassel, Tillmann, to Bayer Aktiengesellschaft. Isocyanato-acylurethanes, a process for their preparation and their use. 4,921,996, Cl. 560-25.000.
Schaffer, Michael J., to Hughes Aircraft Company. Method and apparatus for improving the measuring accuracy of a micrometer. 4,922,307, Cl. 356-5.000.
Schaffner, Kurt; Swozil, Adolf, and Ullmann, Gerhard, to SIGRI GmbH. Connection of carbon or graphite tubes. 4,921,283, Cl. 285-114.000.
Schaible, Walter: *See—*
Eyb, Wolfgang, and Schaible, Walter, 4,921,265, Cl. 280-96.100.
Scharf, Alois, to BISO Bitter, GmbH & Co. Distributing device for chaff choppers. 4,921,469, Cl. 460-10.000.
Scharf, Gary W. Work pants. 4,920,577, Cl. 2-24.000.
Schaubs, Randolph J.: *See—*
Naddor, David J.; and Schaubs, Randolph J., 4,922,456, Cl. 365-185.000.
Scheib, Thomas J.: *See—*
Lane, John D.; and Scheib, Thomas J., 4,922,412, Cl. 364-157.000.
Schering Corporation: *See—*
Nagabhushan, Tattanahalli L.; Haslanger, Martin F.; and Czarniecki, Michael F., 4,921,941, Cl. 530-331.000.
Scheunemann, Roy, to Amity Leather Products Company. Billfold and multi-pocket liner therefor. 4,921,027, Cl. 150-147.000.
Schickaneder, Helmut; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; and Ahrens, Kurt H., to Heumann Pharma GmbH & Company. Dihydropyridazinone derivatives, a process for their preparation and pharmaceutical preparations containing these compounds. 4,921,856, Cl. 514-252.000.
Schiedegger, Charles E.: *See—*
MacLeod, Richard J.; and Schiedegger, Charles E., 4,920,708, Cl. 52-60.000.
Schiff, Robert; Lehnus, Gary; Wasserman, Charles J.; and Garlock, Henrietta M., to Findley Adhesives, Inc. Polymer coated solid matrices and use in immunoassays. 4,921,809, Cl. 436-531.000.
Schilingmann, Merten: *See—*
Schneider, Manfred; Laumen, Kurt; Breitgoff, Detlef; Wullbrandt, Dieter; Schilingmann, Merten; and Keller, Reinhold, 4,922,001, Cl. 560-112.000.
Schill, Hermann, to Maja-Maschinenfabrik Herman Schill GmbH. Machine for skinning or slicing bacon or the like. 4,920,875, Cl. 99-589.000.
Schinker, Martin; Brormann, Johannes; Stahn, Dieter; Doll, Walter; Kleer, Gunter; and Manns, Peter, to Schott Glaswerke. Manufacturing molded glass-articles for precision-optical purposes. 4,921,519, Cl. 65-39.000.
Schipper, Paul H.: *See—*
Chou, Tai-Sheng; and Schipper, Paul H., 4,921,596, Cl. 208-113.000.
Schlepfer, Walter: *See—*
Binder, Rolf; Hanselmann, Daniel; Schlepfer, Walter; and Staeheli, Christoph, 4,920,613, Cl. 19-80.00B.
Schliehe, Wolf D.; and Eschbach, Mathias, to W. Dollken & Co. GmbH. Extrusion apparatus for producing marbeleized thermoplastic extrusions. 4,921,414, Cl. 425-131.100.
Schlumberger Technology Corporation: *See—*
Davis, Alan L.; Robison, Shane V.; and Stevens, Kenneth S., 4,922,408, Cl. 364-200.000.
Miller, Douglas; and Haldorsen, Jakob, 4,922,362, Cl. 367-46.000.
Schlunke, Christopher K., to Orbital Engine Company Pty. Ltd. Relating to controlling emissions from two stroke engines. 4,920,932, Cl. 123-65.0PE.
Schmersahl, Peter: *See—*
Franke, Rolf; and Schmersahl, Peter, 4,921,874, Cl. 514-552.000.
Schmidt, Burkhard, to Prakla-Seismos AG. Method and apparatus for presenting seismic traces. 4,922,466, Cl. 367-68.000.
Schmidt, Douglas W. Sheetrock beveling apparatus. 4,920,651, Cl. 30-475.000.
Schmidt, Johannes E.: *See—*
Michl, Gerhard; Seubert, Rolf; and Schmidt, Johannes E., 4,921,977, Cl. 549-256.000.
Schmitt, Gilbert J.: *See—*
Hall, Edward A.; Cranor, Thomas H. B.; and Schmitt, Gilbert J., 4,922,259, Cl. 343-700.0MS.
Schmitz, Karl-Heinz: *See—*
van Ackeren, Paul; Schmitz, Karl-Heinz; Stache, Bernfried; Kleff, Gunter; and Becker, Heinrich, 4,922,505, Cl. 373-9.000.
Schnatzmeyer, Mark A.: *See—*
Godfrey, Craig W.; Schnatzmeyer, Mark A.; and Arendt, Henry P., 4,921,438, Cl. 439-190.000.
Schneider, Manfred; Laumen, Kurt; Breitgoff, Detlef; Wullbrandt, Dieter; Schilingmann, Merten; and Keller, Reinhold, to Hoechst Aktiengesellschaft. Chiral synthesis units from prochiral glycerol. 4,922,001, Cl. 560-112.000.
Schneider, Siegfried: *See—*
Naser, Georg; Reichelsdoerfer, Peter; and Schneider, Siegfried, 4,921,198, Cl. 248-123.100.
Schnelle, Diethard: *See—*
Bockeler, Franz-Josef; Gobmann, Wolfgang; Buchhorn, Axel, Jackenkroll, Horst; Marks, Hubert; Witte, Karl; and Schnelle, Diethard, 4,922,386, Cl. 362-61.000.
Schneyer, Alan L.; Sluss, Patrick M.; Dattatreyamurty, Bosukonda; and Reichert, Leo E., Jr., to Albany Medical College of Union University, The. Method for determining follicle stimulating hormone. 4,921,808, Cl. 436-503.000.
Schoberg, Carl J., to Liberty Diversified Industries. Convertible hand truck. 4,921,270, Cl. 280-655.100.
Schoellkopf, Jean-Pierre; and Boyer-Chammard, Yann, to Bull S.A. Bus control device comprising a plurality of isolatable segments. 4,922,409, Cl. 364-200.000.
Scholer, Matthias. Alarm clock having means for bridging two circular conducting paths via an adjustable contact means thereby causing generation of an acoustic alarm system. 4,922,475, Cl. 368-252.000.
Scholsky, Kevin M.: *See—*
Bixler, Kathleen J.; and Scholsky, Kevin M., 4,921,934, Cl. 528-355.000.
Scholz, Eric H.: *See—*
Christon, Thomas M.; Richards, Martin A.; and Scholz, Eric H., 4,921,002, Cl. 137-119.000.
Schott Glaswerke: *See—*
Schinker, Martin; Brormann, Johannes; Stahn, Dieter; Doll, Walter; Kleer, Gunter; and Manns, Peter, 4,921,519, Cl. 65-39.000.
Schrader, Robert W.: *See—*
Hakiel, Zbigniew; Reafler, Gerald G.; Schrader, Robert W.; and Schuler, James R., 4,921,556, Cl. 156-164.000.
Schreder, Felix: *See—*
Kicherer, Robert; and Schreder, Felix, 4,922,080, Cl. 219-457.000.
Schreiber, Robert J., Jr.: *See—*
Lafser, Fred A., Jr.; and Schreiber, Robert J., Jr., 4,921,538, Cl. 106-100.000.
Schrittesser, Gerold: *See—*
Draxelmayr, Dieter; and Schrittesser, Gerold, 4,922,252, Cl. 341-172.000.

Schrock, Clifford B.: *See—*
Gaskill, Garold B.; Miles, Michael; and Schrock, Clifford B., 4,922,260, Cl. 343-718.000.
Schroder, Johann: *See—*
Bukoschek, Romuald L.; Ramusch, Wolfgang; and Schroder, Johann, 4,920,761, Cl. 62-342.000.
Schrodi, Karl: *See—*
Eilenberger, Gert; Schrodi, Karl; and Wahl, Stefan, 4,922,487, Cl. 370-60.000.
Schucker, Robert C. Thin film composite membrane prepared by deposition from a solution. 4,921,611, Cl. 210-644.000.
Schuerman, Dale E. Bolt action rifle. 4,920,677, Cl. 42-16.000.
Schuessler, Harald; and Bender, Oswald, to Dornier System GmbH. Topographic mapping. 4,922,254, Cl. 342-25.000.
Schuh, Bernhard, to Papst-Motoren GmbH & Co. KG. Labyrinth seal in disk storage drive. 4,922,406, Cl. 360-97.030.
Schuhmacher, Gustav: *See—*
Kloss, Gunter; Schuhmacher, Gustav; and Gramm, Fritz, 4,920,702, Cl. 51-170.00R.
Schuitemaker, Johannes. Feeding mechanism for a pick-up trailer. 4,921,391, Cl. 414-505.000.
Schuler, James R.: *See—*
Hakiel, Zbigniew; Reafler, Gerald G.; Schrader, Robert W.; and Schuler, James R., 4,921,556, Cl. 156-164.000.
Schultz, Leonard S.; Gold, Jay F.; and Erdman, Rodney V., to Laser Technologies Group, Inc. End effector for surgical plume evacuator. 4,921,492, Cl. 604-315.000.
Schultz, Thomas M.: *See—*
Anderson, James S.; and Schultz, Thomas M., 4,921,503, Cl. 8-408.000.
Schulz, Guenter: *See—*
Grossman, Klaus; Jung, Johann; Schulz, Guenter; Sauter, Hubert; Hofmeister, Peter; and Tuerk, Wolfgang, 4,921,525, Cl. 71-73.000.
Schulze, Werner: *See—*
Vetter, Kurt; Schulze, Werner; Krautter, Jurgen; and Hafner, Kurt, 4,920,997, Cl. 134-57.00R.
Schumacher, Kenneth E.; and Thompson, Thomas K., to Teledyne Princeton, Inc. Fork lift. 4,921,075, Cl. 187-9.00E.
Schutze, Rainer; and Knorr, Harald, to Hoechst Aktiengesellschaft. Process for the racemization of optically active D-2-N-phenacetylamino-4-methylphosphinobutyric acid. 4,922,013, Cl. 562-15.000.
Schwab, Delmar G.: *See—*
Ingham, David C.; and Schwab, Delmar G., 4,920,820, Cl. 74-491.000.
Schwabische Huttenwerke GmbH: *See—*
Neuhoffer, Hans-Friedrich; and Vomhoff, Erich, 4,920,623, Cl. 29-129.000.
Schwartz, Nathan H. Door hardware cover. 4,921,028, Cl. 150-155.000.
Schwartz, Paul A.: *See—*
Cullinan, Ann M.; and Schwartz, Paul A., 4,921,779, Cl. 430-379.000.
Schwarz, Manfred; Braun, Wolfgang; and Alverez-Avila, Carlos, to Robert Bosch GmbH. Governor for fuel injection pumps. 4,920,938, Cl. 123-373.000.
Schwarzmann, Matthias: *See—*
Hoelderich; Hesse, Michael; and Schwarzmann, Matthias, 4,922,025, Cl. 568-14.000.
Schwender, Charles F.: *See—*
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.
Sircar, Jagadish C.; Schwender, Charles F.; and Suto, Mark J., 4,921,859, Cl. 514-262.000.
Schwertner, Gary T.; and Robbins, Edward S., III, to Robbins, Edward S., III. Method for making foldable plastic products. 4,921,563, Cl. 156-303.100.
Schwihag Gesellschaft fur Eisenbahnoberbau mbH: *See—*
Heim, Armin, 4,921,168, Cl. 238-287.000.
Scientific-Atlanta, Inc.: *See—*
Farmer, James O.; and Rovira, Luis A., 4,922,532, Cl. 380-15.000.
Naddor, David J.; and Schaubs, Randolph J., 4,922,456, Cl. 365-185.000.
Scientific Component Systems, Inc.: *See—*
McNair, Rhett, 4,922,393, Cl. 362-225.000.
Scientific Design Company, Inc.: *See—*
Ozero, Brian J.; and Becker, Stanley D., 4,921,681, Cl. 422-197.000.
SCM Metal Products, Inc.: *See—*
Klar, Erhard; Svilar, Mark; and Berry, David F., 4,921,665, Cl. 419-23.000.
Scott, Carol R.: *See—*
Lee, Shy-Fuh; Luehr, Gary W.; Scott, Carol R.; and Trueb, Werner, 4,921,526, Cl. 71-86.000.
Scott, Frederick W., Jr.; and Santi, Joseph P., to Medi-Quip, Inc. Medical pendant with enhanced visibility. 4,920,672, Cl. 40-363.000.
Scott, Lewis A.; Hoffman, Francis E.; and Bolkan, Kenneth R., to Blount, Inc. Chain saw components and system for cutting masonry and the like. 4,920,947, Cl. 125-21.000.
Scott Paper Company: *See—*
Burgess, William H.; Kaufman, Kenneth; and Lane, Archie B., Jr., 4,921,034, Cl. 162-109.000.
Scott, Robert S. Combination hood support, jack crank, lug wrench and wheel cover removal apparatus. 4,920,592, Cl. 7-100.000.
Scully, Andrew J., to United States of America, Army. Landing gear/-stabilizer for small trailer. 4,921,269, Cl. 280-475.000.
SDS - Relais AG: *See—*
Dietrich, Bernhard, 4,922,216, Cl. 335-128.000.
Sdunek, Bruce C.: *See—*
Bakhaus, Kenneth C.; and Sdunek, Bruce C., 4,922,219, Cl. 337-74.000.
Sealfon, Andrew I. Fixed volume infusion device. 4,921,480, Cl. 604-65.000.
Sease, R. Gregg. Assembly of molding strips adapted to mount flexible coverings on support surfaces. 4,920,714, Cl. 52-222.000.
Sebzda, Jack, Sr. V-block holder for EDM electrode. 4,922,074, Cl 219-69.150.
Secretary of State for Trade and Industry, Minerals and Metals Division, Warren Springs Laboratory: *See—*
Flett, Douglas S.; Holt, Gary; and Tily, Peter J., 4,921,221, Cl. 75-385.000.
Sedigh, Mohammad: *See—*
Hwang, Kuen-Shyang; Sedigh, Mohammad; and Roth, Mark, 4,921,158, Cl. 228-124.000.
Sedy, Josef, to John Crane, Inc. Rotary vacuum valve. 4,921,015, Cl. 137-625.110.
Seeburger, James W. Lint remover for tumble-dryer 4,920,662, Cl. 34-60.000.
Seeley, Roger W.: *See—*
Poucher, Michael; and Seeley, Roger W., 4,921,403, Cl. 416-147.000.
Seibu Polymer Kasei Kabushiki Kaisha: *See—*
Ishihara, Yuji, 4,921,754, Cl. 428-325.000.
Seifert, Gottfried; Staubli, Sebastian; Wieland, Josef H., Regenass, Willy; Buerli, Martin; Lee, John G.; and Lund, Richard B., to Ciba-Geigy Corporation. Process for the production of 4-nitrotoluene-2-sulfonic acid. 4,922,008, Cl. 562-58.000.
Seike, Shoji; Oguri, Noriyasu; and Nakajima, Isao, to NGK Insulators, Ltd. Optical fiber composite insulator. 4,921,322, Cl. 350-96.200.
Seiko Epson Corporation *See—*
Kunugi, Masanao; Kurihara, Hajime; and Mizumoto, Teruyuki, 4,921,768, Cl. 430-45.000.
Seiko Instruments, Inc.: *See—*
Iri, Eiji; Nobuoka, Yasunari; Suzuki, Nobuo; Kashima, Yoshio; Kakutani, Yuji; and Murata, Osamu, 4,921,325, Cl. 350-96.210.
Tokumoto, Hiroshi; Bando, Hiroshi; Sakai, Fumiki; Miyata, Chikara; and Wakiyama, Shigeru, 4,921,346, Cl. 356-72.000.
Seiler, Erhard: *See—*
Lausberg, Dietrich; and Seiler, Erhard, 4,921,889, Cl. 523-400.000.
Seino, Hiroaki: *See—*
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, 4,922,274, Cl. 354-271.100.
Seitoh, Shigemitsu: *See—*
Todokoro, Hideo; Shinada, Hiroyuki; and Seitoh, Shigemitsu, 4,922,097, Cl. 250-310.000.
Seitz, Dieter: *See—*
Braschel, Volker; Seitz, Dieter; and Schafer, Jochen, 4,921,314, Cl. 303-110.000.
Seiz, Carl G.; and Robinson, Clyde G., to Continental Installers Corporation. Process for continuous strip pickling. 4,920,995, Cl. 134-15.000.
Seki, Nagataka; and Hirose, Shunich, to Kabushiki Kaisha Toshiba. Arrangement for connecting plural self-commutated voltage type inverters to a utility grid. 4,922,124, Cl. 307-87.000.
Sekido, Hiroshi; and Hioki, Toshimichi. Air support for chair and method for manufacturing chair utilizing the air support. 4,920,591, Cl. 5-455.000.
Sekiguchi, Hiroshi: *See—*
Unternahrer, Josef F.; and Sekiguchi, Hiroshi, 4,922,502, Cl. 372-66.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Wakahara, Hideki; Matsuo, Yoshihiro; and Kawamura, Minoru, 4,921,751, Cl. 428-229.000.
Sekiwa, Mitsunao; and Akada, Tomohiro, to Otsuka Electronics Co., Ltd. Spectroscope. 4,922,309, Cl. 356-300.000.
Selder, Harald: *See—*
Beier, Dietmar; Gutzeit, Jurgen; and Selder, Harald, 4,921,573, Cl. 162-4.000.
Select Corporation: *See—*
Ingman, Dov, 4,920,794, Cl. 73-269.000.
Semiconductor Equipment Corp.: *See—*
Moore, Arthur H., 4,921,564, Cl. 156-344.000.
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Sequa Corporation: *See—*
Peters, Arnold; Hamot, Theodore; and Ver Hoven, Leonard, 4,921,093, Cl. 198-471.100.
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Averill, Robert G.; Serekian, Paul; and Taylor, Scott K., 4,921,500, Cl. 623-22.000.
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Takamiya, Kikuzo; Tamura, Yoshitaka; Shibayama, Yoichi; Nishimura, Ritsuo; Hirai, Kiyofumi; and Serizawa, Hiromitsu, 4,920,827, Cl. 475-166.000.

Sermatec: *See—*
Leguillochet, Pierre; and Langlet, Jean, 4,920,879, Cl. 101-219.000.
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Wild, Victor F.; Serrano, Michael; and Burtson, Eric J., 4,921,326, Cl. 350-96.260.
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Yamamoto, Shigemi, and Seto, Toshiaki, 4,920,620, Cl. 24-641.000.
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Michl, Gerhard; Seubert, Rolf; and Schmidt, Johannes E., 4,921,977, Cl. 549-256.000.
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Lindoerfer, Walter; Sewe, Kai-Udo; Jahn-Held, Wilhelm; Ziebolz, Burkhard; and Wagner, Fritz, 4,921,615, Cl. 210-729.000.
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Dagenais, Mario; Sharfin, Wayne F.; Seymour, Robert J.; and Elman, Boris S., 4,921,336, Cl. 350-354.000.
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Olivo, Marco; Pascucci, Luigi; and Villa, Corrado, 4,922,402, Cl. 363-60.000.
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West, William L., Jr.; and Shafer, James E., 4,922,517, Cl. 379-58.000.
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Parsons, James H.; McLain, Philippe H.; Boozer, John F., III; and Lewis, John R., Jr., 4,920,715, Cl. 52-298.000.
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Dagenais, Mario; Sharfin, Wayne F.; Seymour, Robert J.; and Elman, Boris S., 4,921,336, Cl. 350-354.000.
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Sanders, James R.; Bramley, Frank; Sharp, Francis B.; Newton, Robert A.; and Mansfield, Graham J., 4,920,594, Cl. 12-7.000.
Sharp Kabushiki Kaisha: *See—*
Kawasaki, Nobuhiko; Ikeda, Kouichi; and Kimura, Shinichi, 4,921,426, Cl. 439-34.000.
Nishihara, Testuo; Watanabe, Takashi; and Tohjyoh, Tomotaroh, 4,921,363, Cl. 400-120.000.
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Gilkerson, Terence; Shaw, Robert W.; and Jennens, David C., 4,921,524, Cl. 71-88.000.
Shear Wave Technology: *See—*
Fulkerson, David W.; and Smith, Lawrence W., 4,921,067, Cl. 181-121.000.
Shearer, Daniel D., III: *See—*
McCallister, Ronald D.; and Shearer, Daniel D., III, 4,922,506, Cl. 375-1.000.
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Lofgren, Karl M. J.; Shearer, Gerald W.; and Ouyang, Kenneth W., 4,922,141, Cl. 307-595.000.
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Gilkerson, Terence; Shaw, Robert W.; and Jennens, David C., 4,921,524, Cl. 71-88.000.
Shell Oil Company: *See—*
Danforth, Richard L.; and Smith, Darlene G., 4,921,897, Cl. 524-405.000.
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Gorman, John E.; and Morris, John A., 4,921,625, Cl. 252-56.00D.
Harlin, Jean-Pierre; Giorgetti, Jean-Pierre; Ruquier, Bernard; and Herment, Robert, 4,921,539, Cl. 106-284.030.
Stewart, David R., 4,921,646, Cl. 264-26.000.
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Mori, Yoshihiro; and Shibata, Jun, 4,922,497, Cl. 372-8.000.
Shibata, Kazuyoshi: *See—*
Yajima, Yasuhito; Watanabe, Yasushi; and Shibata, Kazuyoshi, 4,920,805, Cl. 73-706.000.
Shibayama, Yoichi: *See—*
Takamiya, Kikuzo; Tamura, Yoshitaka; Shibayama, Yoichi; Nishimura, Ritsuo; Hirai, Kiyofumi; and Serizawa, Hiromitsu, 4,920,827, Cl. 475-166.000.
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Hasuo, Shigetsuyo; Kanazawa, Shigeru; Kenmochi, Teruo; and Kadokura, Takamitsu, 4,921,109, Cl. 209-552.000.
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Shiraki, Manabu; and Ishii, Sumio, 4,922,162, Cl. 310-268.000.
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Matsuo, Masaaki; Manabe, Takashi; Shigenaga, Shinji; and Matsuda, Hiroshi, 4,921,887, Cl. 514-326.000.
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Takano, Hisashi; Koyama, Naoki; Yuito, Isamu; Shiiki, Kazuo; and Tanabe, Hideo, 4,922,360, Cl. 360-113.000.
Shiina, Kanichi: *See—*
Yamamoto, Yuji, Shiina, Kanichi; and Tokutake, Toshinori, 4,920,766, Cl. 62-474.000.
Shiina, Tadashi: *See—*
Ozawa, Masakazu; Ozawa, Kunitaka; Hatanaka, Katsunori; Suzuki, Tetsuo; Mori, Tetsuzo; Shiina, Tadashi; and Ebinuma, Ryuichi, 4,922,267, Cl. 346-136.000.
Shikamori, Tamotu: *See—*
Fukuzawa, Sooichi; and Shikamori, Tamotu, 4,920,661, Cl. 34-58.000.
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Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.
Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,920,818, Cl. 74-475.000.
Shimazu, Tadaharu: *See—*
Matsumoto, Yutaka; and Shimazu, Tadaharu, 4,921,466, Cl. 455-214.000.
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Watanabe, Tohru, 4,921,397, Cl. 414-788.400.
Shin-Etsu Chemical Co., Ltd.: *See—*
Ishihara, Toshinobu; Endo, Mikio; Kubota, Tohru; and Tanaka, Yasuhisa, 4,921,989, Cl. 556-431.000.
Shinada, Hiroyuki: *See—*
Todokoro, Hideo; Shinada, Hiroyuki; and Seitoh, Shigemitsu, 4,922,097, Cl. 250-310.000.
Shinbori, Takeyoshi: *See—*
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,223, Cl. 267-64.230.
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,224, Cl. 264-64.230.
Fukumura, Takeo; Shinbori, Takeyoshi; and Ezure, Nobuya, 4,921,227, Cl. 267-64.230.
Shindo, Masahiro: *See—*
Kobayashi, Hideaki; and Shindo, Masahiro, 4,922,432, Cl. 364-490.000.
Shinmoto, Toshiharu: *See—*
Kameda, Osamu; Fujikawa, Satoshi; and Shinmoto, Toshiharu, 4,920,828, Cl. 475-299.000.
Shinoda, Akihisa: *See—*
Tsusaka, Haruo; Ishikawa, Hirohisa; Shinoda, Akihisa; and Fujita, Motohiro, 4,920,927, Cl. 123-41.430.

Shinohara, Akihito: *See—*
Takatsuna, Kazutoshi; Tachikawa, Mamoru; Shinozawa, Kouji; Nakajima, Masashi; Shinohara, Akihito; and Okumura, Yoshiharu, 4,921,988, Cl. 556-413.000.
Shinozawa, Kouji: *See—*
Takatsuna, Kazutoshi; Tachikawa, Mamoru; Shinozawa, Kouji; Nakajima, Masashi; Shinohara, Akihito; and Okumura, Yoshiharu, 4,921,988, Cl. 556-413.000.
Shinroaku, Mituaki: *See—*
Sasaki, Kunihiko; Ida, Yuichi; Oka, Tsumoru; and Shinroaku, Mituaki, 4,921,428, Cl. 439-15.000.
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Thackeray, James W.; and Fine, Stephen A., 4,921,778, Cl. 430-326.000.
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Phillips, Douglas J.; Kessler, Keith E.; Shipley, John W.; and Hyland, Dave, 4,922,159, Cl. 318-128.000.
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Okamoto, Kyoichi; Tanaka, Noriyuki; and Shiroyama, Shigeru, 4,920,812, Cl. 74-6.000.
Shishido, Hiroaki: *See—*
Noguchi, Minori; Koizumi, Mitsuyoshi; Shishido, Hiroaki; Uto, Sachio; and Ohshima, Yoshimasa, 4,922,308, Cl. 356-237.000.
Shizuka, Kohei: *See—*
Osawa, Masanori; Shizuka, Kohei; Kouno, Masahiro; Matsuyama, Akio; Katsuoka, Hirotoshi; and Mizutani, Kazumi, 4,921,933, Cl. 528-348.000.
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Yamamoto, Yuji; Shiina, Kanichi; and Tokutake, Toshinori, 4,920,766, Cl. 62-474.000.
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Sibalis, Dan, to Drug Delivery Systems Inc. Transdermal drug patch with microtubes. 4,921,475, Cl. 604-20.000.
Sicom Corporation: *See—*
McCallister, Ronald D.; and Shearer, Daniel D., III, 4,922,506, Cl. 375-1.000.
Siecor Corporation: *See—*
Blew, Douglas J., 4,921,413, Cl. 425-71.000.
Siegemund, Gunter: *See—*
Lau, Jurgen; and Siegemund, Gunter, 4,922,019, Cl. 564-332.000.
Siegenia-Frank KG: *See—*
Loos, Horst, 4,921,285, Cl. 292-39.000.
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Ballweg, Adolf, 4,922,438, Cl. 370-85.150.
Bunata, Thomas; Hollfelder, Robert; Zieglmeier, Reiner; and Sreuer, Thomas, 4,922,193, Cl. 324-158.00R.
Draxelmayr, Dieter; and Schrittesser, Gerold, 4,922,252, Cl. 341-172.000.
Duerr, Wilhelm; and Oppelt, Ralph, 4,922,204, Cl. 324-322.000.
Erbe, Ehrenfried, 4,922,540, Cl. 381-69.000
Ernst, Wolfram, 4,922,489, Cl. 370-100.100.
Hoffmann, Kurt; Kowarik, Oskar; Kraus, Rainer; Lustig, Bernhard; and Oberle, Hans-Dieter, 4,922,134, Cl. 307-441.000.
Mahler, Mathias; and Rattner, Manfred, 4,920,955, Cl. 128-24.00A.
Naser, Georg; Reichelsdoerfer, Peter; and Schneider, Siegfried, 4,921,198, Cl. 248-123.100.
Niestegge, Gerd, 4,922,488, Cl. 370-60.000.
Nilsson, Kenth; Jofs, Bengt; and Skog, Goeran, 4,922,271, Cl. 346-140.00R.
Otremba, Klaus; and Sartorius, Volker, 4,922,211, Cl. 331-68.000.
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Reinholz, Robby, 4,922,190, Cl. 324-158.00F.
Strobach, Peter, 4,922,341, Cl. 358-136.000.
Siemens Energy & Automation, Inc.: *See—*
Gleghorn, R. Linn; and Wagner, Paul D., 4,922,152, Cl 310-156.000.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Fluck, Rene, 4,921,398, Cl. 414-798.700.
SIGRI GmbH: *See—*
Schaffner, Kurt; Swozil, Adolf; and Ullmann, Gerhard, 4,921,283, Cl. 285-114.000.
Silhouette Technology, Inc.: *See—*
Dwyer, Eugene J., 4,922,284, Cl. 355-20.000.
Sillerud, Laurel O.; and van Hulsteyn, David B., to United States of America, Energy. Polarization transfer NMR imaging. 4,922,203, Cl. 324-307.000.
Silver, Arnold H.: *See—*
Phillips, Richard R.; Sandell, Robert D.; and Silver, Arnold H., 4,922,250, Cl. 341-133.000.
Silver, Nathaniel: *See—*
Dietz, M. David; and Silver, Nathaniel, 4,922,355, Cl. 362-101.000.
Simmonds Precision Products, Inc.: *See—*
Brennan, Brian W., 4,922,096, Cl. 244-3.160.
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Sinn, Robert S.: *See—*
Catsimpoolas, Nicholas; Griffith, Ann L.; and Sinn, Robert S., 4,921,838, Cl. 514-25.000.
Siol, Werner: *See—*
Vetter, Heinz; and Siol, Werner, 4,921,669, Cl. 264-134.000.
Sipra Patententwicklungs-und Beteiligungsges. dmbH: *See—*
Plath, Ernst-Dieter; and Juenthner, Kurt, 4,920,767, Cl. 66-13.000.
Sircar, Jagadish C.; Schwender, Charles F.; and Suto, Mark J., to Warner-Lambert Company. Purine derivatives. 4,921,859, Cl. 514-262.000.
Sircar, Jagadish C.: *See—*
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.
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Skiba, Christopher J.: *See—*
Banks, Nigel H.; Borton, Colin A.; Leonce, Francis S.; Lomax, Terence J.; Meier, Antony R. H.; and Skiba, Christopher J., 4,921,702, Cl. 424-404.000.
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Skog, Goeran: *See—*
Nilsson, Kenth; Jofs, Bengt; and Skog, Goeran, 4,922,271, Cl. 346-140.00R.
Skoncey, John A.: *See—*
Gaussa, William P.; Theriault, David G.; Wassel, William W.; Skoncey, John A.; and Havelka, Ronald R., 4,922,194, Cl. 324-158.00R.
Skov, Kirsten A.; Farrell, Nicholas P.; and Chaplin, David J., to British Columbia Cancer Foundation. Platinum complexes with one radiosensitizing ligand. 4,921,963, Cl. 548-101.000.
Slater, Christopher R.: *See—*
Daumit, Gene P.; Ko, Yoon S.; Slater, Christopher R.; Venner, Jozef G.; and Young, Chi C., 4,921,656, Cl. 264-85.000.
Slattery, Gordon C., to Brunswick Corporation. Marine outboard drive with oil tank draw tube and indicator. 4,920,936, Cl. 123-196.00S.
Sluss, Patrick M.: *See—*
Schneyer, Alan L.; Sluss, Patrick M.; Dattatreyamurty, Bosukonda; and Reichert, Leo E., Jr., 4,921,808, Cl. 436-503.000.
Sluyterman, Albertus A. S.; Bosch, Gerrit; Doomernik, Fransiscus M. P. P.; and Groothoff, Adriaan J., to U.S. Philips Corporation. Picture display device having means for compensating line stray fields. 4,922,167, Cl. 313-431.000.
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Smart, Bruce E.: *See—*
Krespan, Carl G.; and Smart, Bruce E., 4,922,038, Cl. 570-175.000.
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Cook, Bertha B.; and Smith, Betty J., 4,921,459, Cl. 446-321.000.
Smith, Charles M.: *See—*
Oswald, Alexis A.; Bhatia, Ram N.; Mozeleski, Edmund J.; Glivicky, Alexandr P.; Brueggeman, Barry G.; Hooton, John R.; Smith, Charles M.; and Hsu, Chang S., 4,922,028, Cl. 568-448.000.
Smith, Darlene G.: *See—*
Danforth, Richard L.; and Smith, Darlene G., 4,921,897, Cl. 524-405.000.
Smith, Fritz A., to Mobil Oil Corporation. Catalytic dewaxing process. 4,921,593, Cl. 208-59.000.
Smith, Lawrence W.: *See—*
Fulkerson, David W.; and Smith, Lawrence W., 4,921,067, Cl. 181-121.000.
Smith, Mark A. Arrowhead extractor. 4,920,625, Cl. 29-264.000.
Smith, Michael: *See—*
Friese, Donald E.; Brown, James W.; MacEwen, Frank; LeVan, E. G.; and Smith, Michael, 4,920,698, Cl. 49-380.000.
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Corbett, Martin J.; and Smith, Richard B., 4,921,532, Cl. 75-460.000.
Smith, Ronald L.: *See—*
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., 4,920,604, Cl. 15-302.000.
Smith, Terence W.: *See—*
Allan, Geoffrey; Adcock, John J.; and Smith, Terence W., 4,921,835, Cl. 514-18.000.
Smithers, Michael J., to Imperial Chemical Industries plc. 1,3-dioxane ethers. 4,921,979, Cl. 549-375.000.
Smithers, Michael J.: *See—*
Brewster, Andrew G.; Brown, George R.; Jessup, Reginald; and Smithers, Michael J., 4,921,866, Cl. 514-336.000.
Smolen, Robert S.: *See—*
Tartaglia, Peter A.; Collins, Richard B.; and Smolen, Robert S., 4,921,014, Cl. 137-625.300.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Kosak, Dietmar; and Engel, Georg, 4,920,777, Cl. 72-225.000.
Svagr, Alexadr; Bogendorfer, Hans; and Igelhorst, Wolfgang, 4,920,778, Cl. 72-237.000.
Snader, Kenneth M.: *See—*
Higa, Tatsuo; and Snader, Kenneth M., 4,921,873, Cl. 514-546.000.
So, Jin C.: *See—*
Kang, Byung K.; and So, Jin C., 4,921,082, Cl. 192-13.00A.
Societe Anatomia - La Boutique du Dos: *See—*
Dervieux, Dominique, 4,920,981, Cl. 128-800.000.
Societe Anonyme dite: Les Cables de Lyon: *See—*
Rerolle, Yves, 4,921,182, Cl. 242-54.00R.
Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.): *See—*
Broquet, Colette; and Braquet, Pierre, 4,921,865, Cl. 514-336.000.
Societe Francaise d'Equipements pour la Navigation Aerienne: *See—*
Boura, Andre, 4,920,800, Cl. 73-517.00R.
Soderstrom, Richard M.: *See—*
Roth, Alex T.; and Soderstrom, Richard M., 4,920,974, Cl. 128-759.000.
Sofue, Tadashi; and Watanabe, Toichi, to Kabushi Kaisha Toyoda Jidoshokki Seisakusho. Electric resistance welding for zinc plated steel plate. 4,922,075, Cl. 219-92.000.
Sola USA, Inc.: *See—*
Drew, Arthur J., Jr.; and Ratkowski, Donald J., 4,921,205, Cl. 249-61.000.
Solano, Scott J.; Saunders, Myles L.; and Crittenden, James, to C. R. Bard, Inc. Cerebral balloon angioplasty system. 4,921,478, Cl. 604-53.000.
Solbes, Albert; and Iwata, Hideo, to TRW Inc. Gas turbine slagging combustion system. 4,920,898, Cl. 110-265.000.
Sole, Pedro, to Chiquita Brands, Inc. Banana peel processing. 4,921,709, Cl. 426-49.000.
Sole, Xavier C.; and Roses, Luis B., to AMP Incorporated. Modular jack assembly. 4,921,436, Cl. 439-395.000.
Sole, Xavier C.: *See—*
Bofill, Pedro D.; and Sole, Xavier C., 4,921,439, Cl. 439-417.000.
Solid Well International Corp.: *See—*
Lin, Chun-Hsien. 4,920,609, Cl. 16-66.000.
Sommer Company: *See—*
Sommer, Gordon M., 4,921,078, Cl. 188-171.000.
Sommer, Gordon M., to Sommer Company. Electro-shear brake. 4,921,078, Cl. 188-171.000.
Sommer, Herbert: *See—*
Knop, Reinhard; Sommer, Herbert; and Muller, Georg, 4,920,913, Cl. 118-410.000.
Sommer, Roland. Device and method for measuring the flow velocity of a free flow in three dimensions. 4,920,808, Cl. 73-861.420.
Sonalysts, Inc.: *See—*
Menezes, John K., 4,922,468, Cl. 367-139.000.
Soni, Pravin L.; and Rosenzweig, Nachum, to Raychem Corporation. Method of joining an article comprising a conductive polymer composition to a polymeric substrate. 4,921,648, Cl. 264-27.000.
Sonic Needle Corporation: *See—*
Alliger, Howard M.; and Ciervo, Donald J., 4,920,954, Cl. 128-24.00A.
Sonobe, Naohiro: *See—*
Tomita, Akira; Kyotani, Takashi; and Sonobe, Naohiro, 4,921,687, Cl. 423-448.000.
Sonoma Technology: *See—*
Richards, L. Willard, 4,921,349, Cl. 356-229.000.
Sony Corporation: *See—*
Ando, Naotaka, 4,922,343, Cl. 358-148.000.
Ezaki, Tadashi, 4,922,331, Cl. 358-31.000.
Ichida, Koji; Nakayama, Yoshifumi; and Inoue, Hiromu, 4,922,166, Cl. 313-414.000.
Joichi, Yoshiro, 4,922,513, Cl. 318-254.000.
Karamon, Hideaki, 4,921,763, Cl. 428-692.000.
Mashimo, Norio, 4,920,675, Cl. 40-492.000.
Watanabe, Kazuo; and Sato, Yoshinori, 4,922,458, Cl. 365-189.050.
Wilkinson, James H., 4,922,329, Cl. 358-12.000.
SooHoo, Kie L., to Rockwell International Corporation. Identical servo frequency modulated passive ring laser gyroscope. 4,921,354, Cl. 356-350.000.
Sorenson, Roderick J.: *See—*
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.
Sota, Kaoru: *See—*
Yokoo, Chihiro; Onodera, Akira; Fukushima, Hiroshi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,921,953, Cl. 540-227.000.
Soto, Jorge L.: *See—*
Nemet-Mavrodin, Margaret; and Soto, Jorge L., 4,922,051, Cl. 585-418.000.
Southern Research Institute, Inc.: *See—*
Vander Meer, Robert K.; Lofgren, Clifford S.; and Williams, David F., 4,921,696, Cl. 424-84.000.
Space Industries Partnership, L.P.: *See—*
Ferree, Herbert E., 4,921,432, Cl. 439-164.000.
Spalink, Robert D.; Knowles, Steven M.; and Kosztowny, John T., to Aeroquip Corporation. Coupling adapter. 4,921,013, Cl. 137-614.050.
Sparacio, Nicholas J.: *See—*
Malihi, Farrokh B.; and Sparacio, Nicholas J., 4,921,629, Cl. 252-170.000.
Sparapany, John W.; and Bakalik, Dennis P., to Nalco Chemical Company. Superabsorbent polymers. 4,921,904, Cl. 525-329.900.
Spatafora, Mario; and Gamberini, Antonio, to G.D. Societa per Azioni. Selection device for sweet confections. 4,921,106, Cl. 209-539.000.
Spaulding, Tedford H.: *See—*
Garay, Antonio A.; Spaulding, Tedford H.; and Valleau, Robert L., 4,921,431, Cl. 439-79.000.
SPD Technologies Inc.: *See—*
O'Brien, Edward R., III, 4,922,372, Cl. 361-97.000.
Specialty Products, Inc.: *See—*
Berry, Jimmy D.; and Allman, Robert M., 4,921,271, Cl. 280-661.000.
Specialty Store Services, Inc.: *See—*
Finke, Malcolm K.; Weinstein, Marshall; and Muderlak, Kenneth J., 4,921,097, Cl. 206-387.000.
Spector, George: *See—*
Horvath, Edward; and Spector, George, 4,921,287, Cl. 292-106.000.
Jimenez, Francisco G.; and Spector, George, 4,920,983, Cl. 128-844.000.
Meade, Phyllis; and Spector, George, 4,920,693, Cl. 47-41.120.
Spectra Physics, Inc.: *See—*
Wolgast, Stephen, 4,922,501, Cl. 372-54.000.
Spencer, H. Kenneth: *See—*
Kudzma, Linas V.; Spencer, H. Kenneth; and Severnak, Sherry A., 4,921,864, Cl. 514-326.000.
Speno International S.A.: *See—*
Panetti, Romolo, 4,920,701, Cl. 51-165.710.
Speranza, George P.: *See—*
Su, Wei-Yang; and Speranza, George P., 4,921,969, Cl. 548-335.000.
Spicciati, Frank A.: *See—*
Fraenkel, Howard A.; Ilardi, Joseph M.; Kurtz, Bruce E.; and Spicciati, Frank A., 4,921,777, Cl. 430-314.000.
Spier, I. Martin; and Sturman, Martin F. Safety hypodermic needle syringe. 4,921,490, Cl. 604-192.000.
Spiewak, John W.: *See—*
Yuh, Huoy-Jen; Ong, Beng S.; Spiewak, John W.; and Thornton, Constance J., 4,921,769, Cl. 430-64.000.
Spirer, Steve, to Unex Corporation. Swivel connector. 4,921,010, Cl. 137-580.000.
Spitaler, Ulrich: *See—*
Seubert, Bernhard; Beilharz, Helmut; Fickert, Werner; Jeromin, Gunter; and Spitaler, Ulrich, 4,921,840, Cl. 514-33.000.
Springs, Daniel R.; and Hinojosa, Jesse, to Thermon Manufacturing Company. Flexible, elongated positive temperature coefficient heating assembly and method. 4,922,083, Cl. 219-549.000.
Springs Industries, Inc.: *See—*
Tolbert, Thomas W.; Cooke, William M.; and Hendrix, James E., 4,921,756, Cl. 428-373.000.
Springthorpe, Brian: *See—*
Dixon, John; Springthorpe, Brian; and Ince, Francis, 4,922,022, Cl. 564-367.000.
Sprung, Hartwig: *See—*
Staggl, Roland; Sprung, Hartwig; and Becker, Eberhard, 4,921,167, Cl. 238-126.000.

Square D Company: *See—*
Etscheidt, Ronald J.; and Ophaug, Darrell P., 4,921,083, Cl. 192-20.000.
Squillace, Zanti D.: *See—*
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.
SRI International: *See—*
Andeen, Gerry B.; and Auslander, David M., 4,921,393, Cl. 414-729.000.
Stache, Bernfried: *See—*
van Ackeren, Paul; Schmitz, Karl-Heinz; Stache, Bernfried; Kleff, Gunter; and Becker, Heinrich, 4,922,505, Cl. 373-9.000.
Staeheli, Christoph: *See—*
Binder, Rolf; Hanselmann, Daniel; Schlepfer, Walter; and Staeheli, Christoph, 4,920,613, Cl. 19-80.00B.
Staggl, Roland; Sprung, Hartwig; and Becker, Eberhard, to Mannesmann AG. Carrier section including flange member for connection to a guide rail. 4,921,167, Cl. 238-126.000.
Staheli, Edward O. Method for molding articles to a web. 4,921,671, Cl. 264-145.000.
Stahlecker, Fritz, to Stahlecker, Hans. Arrangement for interrupting the operation of an individual drafting frame at a spinning machine. 4,920,736, Cl. 57-84.000.
Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,920,736, Cl. 57-84.000.
Stahn, Dieter: *See—*
Schinker, Martin; Brormann, Johannes; Stahn, Dieter; Doll, Walter; Kleer, Gunter; and Manns, Peter, 4,921,519, Cl. 65-39.000.
Stamicarbon B.V.: *See—*
Meyer, Peter J. N.; and Steeman, Reinard J. M., 4,921,906, Cl. 525-53.000.
Stammler, Kurt; and Ruttkowski, Lothar, to Robert Bosch GmbH. Pressure compensating element for electronic device enclosure. 4,921,124, Cl. 220-367.000.
Standard Oil Company, The: *See—*
Besecker, Charles J.; and Marritt, William A., 4,921,985, Cl. 556-76.000.
Brazdil, James F.; Glaeser, Linda C.; and Grasselli, Robert K., 4,921,828, Cl. 502-205.000.
Stanley Electric Co., Ltd.: *See—*
Nakazawa, Yoshihiro; Tabata, Hajime; Hasegawa, Tooru; and Tanabe, Hideyuki, 4,922,390, Cl. 362-72.000.
Stansberry, Warren W.: *See—*
Swartz, Harold L.; and Stansberry, Warren W., 4,920,797, Cl. 73-309.000.
Stansfield, Peter W.; and Reed, Alastair, to Crosfield Electronics Limited. Image processing. 4,922,544, Cl. 382-56.000.
Stanzak, Richard K.: *See—*
Rao, R. Nagaraja; and Stanzak, Richard K., 4,921,801, Cl. 435-172.300.
Starcevic, Mihailo, to Asea Brown Boveri Ltd. Vertical-axis electrical machine of umbrella design. 4,922,150, Cl. 310-90.000.
Starrfraschmachinen, AG.: *See—*
Novak, Peter, 4,920,631, Cl. 29-568.000.
Staubli, Sebastian: *See—*
Seifert, Gottfried; Staubli, Sebastian; Wieland, Josef H.; Regenass, Willy; Buerli, Martin; Lee, John G.; and Lund, Richard B., 4,922,008, Cl. 562-58.000.
Steel, John: *See—*
Falconer, Stuart A.; Foster, David J.; and Steel, John, 4,921,740, Cl. 428-40.000.
Steele, Glenn: *See—*
Salem, Ronald R.; Thomas, Peter; and Steele, Glenn, 4,921,789, Cl. 435-7.000.
Steele, Scott B.: *See—*
Lidinsky, William P.; Roediger, Gary A.; Steele, Scott B.; and Weddige, Ronald C., 4,922,486, Cl. 370-60.000.
Steeman, Reinard J. M.: *See—*
Meyer, Peter J. N.; and Steeman, Reinard J. M., 4,921,906, Cl. 525-53.000.
Steer, Allen C. Wheel barrow. 4,921,305, Cl. 298-3.000.
Steeves, Christopher, to Balltrax Inc. Carrier in guide track product moving system. 4,921,361, Cl. 384-45.000.
Stegmann, Werner; and Luisoli, Reto, to Ciba-Geigy Corporation. Process for the preparation of liquid mixtures of alkylated 2-(2-hydroxyphenyl)benzotriazoles. 4,921,966, Cl. 548-260.000.
Steiner, Kenneth M.: *See—*
Novak, Joel S.; Parsons, Natan E.; and Steiner, Kenneth M., 4,921,211, Cl. 251-129.040.
Steinhoff, Lonney J.: *See—*
Ingermann, Donald E.; Smith, Ronald L.; Caffrey, Stephen F.; and Steinhoff, Lonney J., 4,920,604, Cl. 15-302.000.
Stepan Company: *See—*
Bernhardt, Randal J.; Loeb, Melvin L.; and Kay, James W., 4,921,942, Cl. 424-59.000.
Stepan, Jiri. Rotary wire stripper. 4,920,830, Cl. 81-9.510.
Sterling, Joseph F. Exercise chair. 4,921,247, Cl. 272-136.000.
Stern, Eric W.: *See—*
Amundsen, Alan R.; and Stern, Eric W., 4,921,847, Cl. 514-188.000.
Sterzel, Hans-Josef, to BASF Aktiengesellschaft. Preparation of compact, crystalline and pore-free moldings from oxide ceramic. 4,921,655, Cl. 264-66.000.
Steuer, Thomas: *See—*
Bunata, Thomas; Hollfelder, Robert; Zieglmeier, Reiner; and Steuer, Thomas, 4,922,193, Cl. 324-158.00R.
Stevens Institute of Technology, The Trustees of: *See—*
Sirkar, Kamalesh K., 4,921,612, Cl. 210-644.000.
Stevens, Jack F.: *See—*
Lin, Chi-Hung; Stevens, Jack F.; Tovrog, Benjamin S.; and Rose, Philip M., 4,921,919, Cl. 526-88.000.
Stevens, Kenneth S.: *See—*
Davis, Alan L.; Robison, Shane V.; and Stevens, Kenneth S., 4,922,408, Cl. 364-200.000.
Stevens, Kenneth V., to Colgate-Palmolive Company. Stackable chafer assembly. 4,920,873, Cl. 99-339.000.
Stevens, Michael L. Vehicle wheel elevating device. 4,920,596, Cl. 14-69.500.
Stevens, William T., to Automotive Moulding Company. Adjustable spacers for supporting front window glass in an automobile. 4,921,297, Cl. 296-96.210.
Stewart, Cynthia A.: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M L., 4,920,990, Cl. 131-359.000.
Stewart, David R., to Shell Oil Company. Forming laminated billets from individual billets. 4,921,646, Cl. 264-26.000.
Stewart, David R., to Shell Oil Company. Method of shaping a laminated thermoplastic billet. 4,921,647, Cl. 264-26.000.
Stewart, James T.: *See—*
Koomey, Paul C.; Savage, George M.; and Stewart, James T., 4,922,423, Cl. 364-422.000.
Stewart Warner Instrument Corporation: *See—*
Weaver, Frank C., 4,920,798, Cl. 73-313.000.
Stiftelsen Institutet for Mikrovågsteknik vid Tekniska Hogskolan i Stockholm: *See—*
Berglind, Eilert, 4,922,255, Cl. 342-104.000.
Stiles, Steven D.; Reinke, Paul E.; and Gomez, Aparicio J., to General Motors Corporation. Method and means for determining air mass in a crankcase scavenged two-stroke engine. 4,920,790, Cl. 73-118.200.
Stillie, Donald G.: *See—*
Cooper, Ralph M.; Hollingsworth, Dana; Kunkle, John P.; and Stillie, Donald G., 4,921,437, Cl. 439-275.000.
Stingelin, Willy, to Ciba-Geigy Corporation. Disazo dyes containing an acetoacetabukube coupling component and a quaternized aminoalkylene aminocarbonyl group bound to it. 4,921,945, Cl. 534-614.000.
Stockel, Richard F. Spray on wound dressing compositions. 4,921,691, Cl. 424-45.000.
Stokes, Richard S.; and Muldowney, Robert M., to Dana Corporation. Method for predicting the fatigue life of a vehicle suspension component. 4,920,807, Cl. 73-808.000.
Stollenwerk Fabrik fur Sanitatsausrustungen Hans Stollenwerk & Cie GmbH & Co.: *See—*
Stollenwerk, Joachim, 4,921,295, Cl. 296-20.000.
Stollenwerk, Joachim, to Stollenwerk Fabrik fur Sanitatsausrustungen Hans Stollenwerk & Cie GmbH & Co. Carriage for an ambulance stretcher. 4,921,295, Cl. 296-20.000.
Stonewall Landscape Systems, Inc.: *See—*
Dean, Robert W., Jr., 4,920,712, Cl. 52-169.400.
Stoping Aktiengesellschaft: *See—*
Muller, Hans, 4,921,148, Cl. 222-597.000.
Storimans, Franciscus J. A.: *See—*
Bowman, Edward W.; and Storimans, Franciscus J. A., 4,920,885, Cl. 102-281.000.
Stork, Martin, to Hoechst Aktiengesellschaft. Apparatus for the laminating and cutting of photoresist webs. 4,921,566, Cl. 156-354.000.
Stoughton, John W.; and Mielke, Roland V., to Center for Innovative Technology. Method for concurrent execution of primitive operations by dynamically assigning operations based upon computational marked graph and availability of data. 4,922,413, Cl. 364-200.000.
Stout, Glen R.; and Herrick, Dennis, to Stout Video Systems. Means and method for visual surveillance and documentation. 4,922,339, Cl. 358-108.000.
Stout Video Systems: *See—*
Stout, Glen R.; and Herrick, Dennis, 4,922,339, Cl. 358-108.000
Stoy, Vladimir A.: *See—*
Delahanty, Francis T.; Stoy, Vladimir A.; and Tong, Shiu-Bor, 4,921,323, Cl. 350-96.210.
Strecker, John E.: *See—*
Cole, Jack H.; Gergely, John S.; Baumel, Robert T.; and Strecker, John E., 4,922,472, Cl. 367-189.000.
Stringfellow, Christopher: *See—*
Harris, Kenneth M.; Felton, George N.; Collingborn, Peter A. G.; Stringfellow, Christopher; and Greeves, Godfrey, 4,920,940, Cl 123-450.000.
Strobach, Peter, to Siemens Aktiengesellschaft. Method for scene-model-assisted reduction of image data for digital television signals. 4,922,341, Cl. 358-136.000.
Strom, Hans I.; and Petersson, Ulf J. G., to Aktiebolaget Electrolux. Arrangement in a chain saw. 4,920,649, Cl. 30-382.000.
Stromberg, Sven A. R.; and Larsson, Rolf A. Device for retaining knife blade for cutting a paper web. 4,920,843, Cl. 83-346.000.
Stuber, Werner: *See—*
Breipohl, Gerhard; Knolle, Jochen; and Stuber, Werner, 4,922,015, Cl. 562-451.000.
Studex Corp.: *See—*
Neil, Vladimir, 4,921,494, Cl. 606-188.000.
Studley, Benjamin A. Stamp hinge. 4,921,747, Cl. 428-195.000.

VOL 1114 ISS 1 MY 1990 UMI

Sturman, Martin F.: *See*—
Spier, I. Martin; and Sturman, Martin F., 4,921,490, Cl. 604-192.000.
Stutzman, Henry G. Method for repairing underground sewer lines. 4,921,374, Cl. 405-154.000.
Su, Kai C.: *See*—
Molock, Frank; Robertson, J. Richard, Jr.; and Su, Kai C., 4,921,956, Cl. 544-165.000.
Su, Shing-Fong, to GTE Laboratories Incorporated. Optical time slot interchanger using one-bit memory cells. 4,922,479, Cl. 370-1.000.
Su, Wei-Yang; and Speranza, George P., to Texaco Chemical Co. Method for the preparation of imidazoles. 4,921,969, Cl. 548-335.000.
Sudo, Toshio, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit device. 4,922,324, Cl. 357-74.000.
Sugai, Hiroshi: *See*—
Sugiura, Yasuyuki; Watabe, Mitsuru; Morinaga, Shigeki; Miyashita, Kunio; and Sugai, Hiroshi, 4,922,175, Cl. 318-592.000.
Sugano Mfg. Co., Ltd.: *See*—
Abe, Sadaji; and Suzuki, Sakae, 4,921,154, Cl. 225-97.000.
Sugatsune Industrial Co., Ltd.: *See*—
Sakamoto, Kazuhiko, 4,921,359, Cl. 384-18.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, to Mitsubishi Rayon Company, Ltd. Method for producing thermoplastic resins. 4,921,909, Cl. 525-64.000.
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, to Eisai Co., Ltd. Cyclic amine derivatives. 4,921,863, Cl. 514-319.000.
Sugimoto, Mamoru: *See*—
Yoshimura, Shoji. Matsuzaki, Yuzi; Sugimoto, Mamoru; Ito, Masayoshi; and Ogawa, Tomoya, 4,921,948, Cl. 536-18.200.
Sugimoto, Tadakatsu; Igarashi, Yoshiaki; Saito, Shiro; Wada, Eiichi; and Murai, Keiji, to Yokota Industrial Co., Ltd. Two blade type impulse wrench. 4,920,836, Cl. 81-463.000.
Sugiura, Yasuyuki; Watabe, Mitsuru; Morinaga, Shigeki; Miyashita, Kunio; and Sugai, Hiroshi, to Hitachi, Ltd. Position/speed detection method and apparatus. 4,922,175, Cl. 318-592.000.
Sugiyama, Hideki: *See*—
Nagata, Nobuyoshi; Sugiyama, Hideki; Uemura, Kiyotaka; and Takebayashi, Mikio, 4,920,699, Cl. 49-441.000.
Sugiyama, Isao: *See*—
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.
Suh, Nam P.: *See*—
Bredt, James F.; Suh, Nam P.; and Waldman, Francis A., 4,922,082, Cl. 219-541.000.
Sulc, Jiri ; and Krcova, Zuzana, to Ceskoslovenska akademie ved Method for the formation of thin hydrophilic layers on the surface of objects made from non-hydrophilic methacrylate and acrylate polymers. 4,921,497, Cl. 623-6.000.
Sultech, Inc.: *See*—
Adams, Harold W., 4,921,936, Cl. 528-389.000.
Sulzer Brothers Limited: *See*—
Ehrsam, Christian, 4,920,752, Cl. 62-46.100.
Giacometti, Roberto, 4,921,501, Cl. 623-23.000.
Sulzer-Escher Wyss GmbH: *See*—
Beier, Dietmar; Gutzeit, Jurgen; and Selder, Harald, 4,921,573, Cl. 162-4.000.
Sumida, Kanichi: *See*—
Kotani, Hiroshi; Inoue, Yoshiyuki; Kadota, Yasushi; Sakakibara, Hidekazu; Ide, Kazuo; and Sumida, Kanichi, 4,921,470, Cl. 464-151.000.
Sumitomo Chemical Company, Limited: *See*—
Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Kume, Takanori; and Negawa, Hideo, 4,920,692, Cl. 47-9.000.
Sumitomo Electric Industries, Ltd.: *See*—
Kuki, Heiji; and Kurimoto, Naoya, 4,922,380, Cl. 361-399.000.
Takano, Satoshi, 4,921,833, Cl. 505-1.000.
Sumitomo Wiring Systems, Ltd.: *See*—
Kuki, Heiji; and Kurimoto, Naoya, 4,922,380, Cl. 361-399.000.
Summers, Laine E.; and Jurinak, Jeff J., to Conoco Inc. Composition and method for sealing permeable subterranean formations. 4,921,047, Cl. 166-276.000.
Sun Company, Inc.: *See*—
Cross, Gregory L., 4,920,656, Cl. 33-355.00R.
Sunagawa, Hiroshi: *See*—
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,922,103, Cl. 250-327.200.
Sunds Defibrator Aktiebolag: *See*—
Eriksson, Kjell G.; Ek, Bo R.; Wallin, Stig G.; and Eriksson, Nils L., 4,921,650, Cl. 264-37.000.
Sundstrand Corporation: *See*—
Cook, Alexander, 4,922,400, Cl. 363-37.000.
Raad, Bernard A.; and Johnsen, Tyrone A., 4,922,119, Cl. 290-31.000.
Shekleton, Jack R., 4,920,740, Cl. 60-39.141.
Sunstar Kabushiki Kaisha: *See*—
Furumichi, Hiroshi; and Makishima, Takao, 4,920,984, Cl. 128-861.000.
Superior Glass Fibers, Inc.: *See*—
Sholl, Steven A., 4,921,517, Cl. 65-4.400.
Surkamp, Paul; and Wirtz, Ulrich, to W. Schlafhorst & Co. Method and apparatus for positioning a yarn end for unwinding. 4,921,179, Cl. 242-18.00R.
Surko, Walter E., Jr., to Yale Security Inc. Door lock having disengages outer lever handle when in the locked condition and means to bias the handle toward horizontal position. 4,920,773, Cl. 70-224.000.
Susak, David M.; and Vyne, Robert L., to Motorola, Inc. Output stage for an operational amplifier 4,922,208, Cl. 330-255.000.
Sutherland, W. Don. Scalp kneader. 4,920,957, Cl. 128-52.000.
Suto, Mark J.: *See*—
Sircar, Jagadish C.; Schwender, Charles F.; and Suto, Mark J., 4,921,859, Cl. 514-262.000.
Suvanto, Erkki, to Neste Oy. Sleeve-mounted spike fitted on a vehicle tire. 4,921,030, Cl. 152-210.000.
Suzuki, Arata; Tyberg, William T.; Banks, George; and Suzuki, Marcia, to Capintec, Inc. Ambulatory physiological evaluation system including cardiac monitoring. 4,920,969, Cl. 128-659.000.
Suzuki, Atsuo: *See*—
Wakamatsu, Kazuhiro; Yonekura, Seiji; Suzuki, Mitsuo; Tadokoro, Hiroyuki; and Suzuki, Atsuo, 4,922,272, Cl. 346-160.000.
Suzuki, Fujio: *See*—
Kawabata, Susumu; Yoshida, Kazunori; and Suzuki, Fujio, 4,921,019, Cl. 139-452.000.
Suzuki, Hideo, to Yamaha Corporation. Musical wear. 4,920,848, Cl. 84-600.000.
Suzuki, Hisanori: *See*—
Matsudaira, Takeo; and Suzuki, Hisanori, 4,920,919, Cl. 118-725.000.
Suzuki, Hisatosi: *See*—
Tsuji, Syoichi; Ito, Syoichi; Matsumura, Shuji; Suzuki, Hisatosi; and Ito, Michiyasu, 4,921,652, Cl. 264-41.000.
Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Optical information recording and reproducing apparatus. 4,922,351, Cl. 358-494.000.
Suzuki, Marcia: *See*—
Suzuki, Arata; Tyberg, William T., Banks, George; and Suzuki, Marcia, 4,920,969, Cl. 128-659.000.
Suzuki, Masaaki: *See*—
Takiguchi, Yasuyuki; Kanemoto, Akihiko; Uehara, Kiyohiro; Imai, Yoshio; Hino, Taro; Iwamoto, Mitsumasa; Kakimoto, Masaaki; and Suzuki, Masaaki, 4,921,728, Cl. 427-58.000.
Suzuki, Migaku; and Masamitsu, Yamamoto, to Uni-Charm Corporation. Sanitary tampon applicator. 4,921,474, Cl. 604-16.000.
Suzuki, Mitsuo: *See*—
Wakamatsu, Kazuhiro; Yonekura, Seiji; Suzuki, Mitsuo; Tadokoro, Hiroyuki; and Suzuki, Atsuo, 4,922,272, Cl. 346-160.000.
Suzuki, Nobuo: *See*—
Iri, Eiji; Nobuoka, Yasunari; Suzuki, Nobuo; Kashima, Yoshio; Kakutani, Yuji; and Murata, Osamu, 4,921,325, Cl. 350-96.210.
Suzuki, Ryuji: *See*—
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, 4,922,274, Cl. 354-271.100.
Suzuki, Sakae: *See*—
Abe, Sadaji; and Suzuki, Sakae, 4,921,154, Cl. 225-97.000.
Suzuki, Seikou: *See*—
Tsuchitani, Shigeki; Suzuki, Seikou; and Matsumoto, Masahiro, 4,921,345, Cl. 356-28.000.
Suzuki, Tetsuo: *See*—
Ozawa, Masakazu; Ozawa, Kunitaka; Hatanaka, Katsunori; Suzuki, Tetsuo; Mori, Tetsuzo; Shiina, Tadashi; and Ebinuma, Ryuichi, 4,922,267, Cl. 346-136.000.
Suzuki, Yasumichi: *See*—
Outa, Kenichi; Suzuki, Yasumichi; and Ikeda, Yoshinori, 4,922,335, Cl. 358-80.000.
Suzuki, Yoshiaki; and Hayashi, Gouichi, to Fuji Photo Film Co., Ltd. Infrared absorbent comprising a metal complex compound containing two thiolato bidentate ligands. 4,921,317, Cl. 350-311.000.
Svagr, Alexadr; Bogendorfer, Hans; and Igelhorst, Wolfgang, to SMS Schloemann-Siemag Aktiengesellschaft. Roll stand with roll rings placed from one side on a pair of roll support shafts supported on two sides. 4,920,778, Cl. 72-237.000.
Svilar, Mark: *See*—
Klar, Erhard; Svilar, Mark; and Berry, David F., 4,921,665, Cl. 419-23.000.
Svitak, Paul W. Carriages incorporating vertically adjustable wheel assemblies. 4,921,262, Cl. 280-43.230.
Swain, Eugene D. Apparatus to restrain neck tie tails. 4,920,579, Cl 2-145.000.
Swanson, James B.: *See*—
Everett, Benjamin H., II; Holben, Robert B.; and Swanson, James B., 4,921,367, Cl 403-106.000.
Swartz, Harold L.; and Stansberry, Warren W., to Schaevitz Sensing Systems, Inc. Fluid level sensor. 4,920,797, Cl. 73-309.000.
Swartz, John C.: *See*—
Atherton, Charles G.; and Swartz, John C., 4,921,454, Cl 439-685.000.
Swerlein, Ronald L., to Hewlett-Packard Company. High performance track/hold for a digital multimeter. 4,922,130, Cl. 307-353.000.
Swick, E. Grant: *See*—
Mueller, Scott; Heidorn, Richard; and Swick, E. Grant, 4,922,374, Cl. 361-119.000.
Switchcraft, Inc.: *See*—
Garay, Antonio A.; Spaulding, Tedford H.; and Valleau, Robert L., 4,921,431, Cl. 439-79.000.
Switzer, Ralph V., to Aldon Company, The. Hydraulic ram rail bender. 4,920,780, Cl. 72-389.000.

Swozil, Adolf: *See*—
Schaffner, Kurt; Swozil, Adolf; and Ullmann, Gerhard, 4,921,283, Cl. 285-114.000.
Symbolics Inc.: *See*—
Holloway, John T.; Moon, David A.; Cannon, Howard I.; Knight, Thomas F.; Edwards, Bruce E.; and Weinreb, Daniel L., 4,922,414, Cl. 364-200.000.
Syntex (U.S.A.) Inc.: *See*—
Walker, Keith A. M.; Bruno, John J.; and Martinez, Gregory R., 4,921,862, Cl. 514-312.000.
Systems Mailing Research, Inc.: *See*—
Nelson, Larry L., 4,921,388, Cl. 414-412.000.
Szarek, John J.: *See*—
Lo, Yuan-Chang; Moeller, Dennis L.; and Szarek, John J., 4,922,451, Cl. 364-900.000.
Szayer, Geza J.: *See*—
Finch, Harry E.; and Szayer, Geza J., 4,921,033, Cl. 160-133.000.
Szentmiklosi, Peter: *See*—
Racz, Istvan; Plachy, Janos; and Szentmiklosi, Peter, 4,921,707, Cl. 424-690.000.
Szumski, Ronald, to GEC-Marconi Limited. Lens systems. 4,921,318, Cl. 350-1.400.
Szymendera, Janusz J.: *See*—
Samochocka, Krystyna; and Szymendera, Janusz J., 4,921,944, Cl. 534-10.000.
Tabata, Fumio: *See*—
Asakawa, Kazuo; Akiya, Fumiaki; and Tabata, Fumio, 4,921,396, Cl. 414-751.000.
Tabata, Hajime: *See*—
Nakazawa, Yoshihiro; Tabata, Hajime; Hasegawa, Tooru; and Tanabe, Hideyuki, 4,922,390, Cl. 362-72.000.
Tabor, Stanley; and Richardson, Charles C., to President and Fellows of Harvard College. T7 DNA polymerase. 4,921,794, Cl. 435-91.000.
Tachikawa, Mamoru: *See*—
Takatsuna, Kazutoshi; Tachikawa, Mamoru; Shinozawa, Kouji; Nakajima, Masashi; Shinohara, Akihito; and Okumura, Yoshiharu, 4,921,988, Cl. 556-413.000.
Tada, Atsushi. Check valve. 4,921,017, Cl. 137-843.000.
Tadahiro, Takahashi, to Diesel Kiki Co., Ltd. Control apparatus for automobile air-conditioners. 4,920,755, Cl. 62-171.000.
Tadokoro, Hiroyuki: *See*—
Wakamatsu, Kazuhiro; Yonekura, Seiji; Suzuki, Mitsuo; Tadokoro, Hiroyuki; and Suzuki, Atsuo, 4,922,272, Cl. 346-160.000.
Tafel, Leonard I., to Webquip Corporation. Method of cooling hot webs. 4,920,881, Cl. 101-488.000.
Taft, Philip A., to Lucas Industries Public Limited Company. Modulator assembly. 4,922,121, Cl. 303-115.000.
Taga, Jun, to Mitsui & Co., Ltd. Plunger pump. 4,920,863, Cl. 92-86.000.
Tagaya, Kiyoshi; Hirose, Satoshi; Iwasaki, Takao; Kouyama, Toshitaka; and Sakaguchi, Yasuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Molded product of polyarylene thioether and the use thereof. 4,921,758, Cl. 428-419.000.
Taiho Kogyo Co.: *See*—
Takenaka, Akira; and Hatanaka, Masanori, 4,921,260, Cl. 277-153.000.
Taisei Road Construction Co., Ltd.: *See*—
Sasaki, Hideo, 4,921,730, Cl. 427-138.000.
Taisho Pharmaceutical Co., Ltd.: *See*—
Yokoo, Chihiro; Onodera, Akira; Fukushima, Hiroshi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,921,953, Cl. 540-227.000.
Taiyo Yuden Co., Ltd.: *See*—
Mochizuki, Akihiko; and Iida, Hideyo, 4,921,591, Cl. 204-412.000.
Tajiri, Noriyuki: *See*—
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,921,909, Cl. 525-64.000.
Takabatake, Hideo, to Yoshida Kogyo K.K. Slider for a slide fastener. 4,920,616, Cl. 24-418.000.
Takada, Mitsuru; Itoh, Hiroshi; and Takahashi, Tokuyuki, to Toyota Jidosha Kabushiki Kaisha. Hydraulic pressure control device for automatic transmission for vehicle including reverse stage and lock-up clutch control systems. 4,920,829, Cl. 74-868.000.
Takada, Shiro: *See*—
Yoshimura, Shigeo; Ishino, Renshiro; Takada, Shiro; and Kimura, Hitoshi, 4,920,809, Cl. 75-862.360.
Takagi, Kazumasa: *See*—
Hasegawa, Haruhiro; Kawabe, Ushio; Tarutani, Yoshinobu; Fukazawa, Tokuumi; Aida, Toshiyuki; and Takagi, Kazumasa, 4,921,834, Cl. 505-1.000.
Takagi, Makoto: *See*—
Kawamura, Yoshihito; Akai, Masashi; and Takagi, Makoto, 4,921,410, Cl. 419-8.000.
Takahara, Yoshimasa: *See*—
Kitaura, Shinko; Takahara, Yoshimasa; Nagai, Shiro; and Nishio, Naomichi, 4,921,799, Cl. 435-167.000.
Takahashi, Hiroshi, to Nissan Motor Company, Limited. System and method for automatically controlling cruising speed of vehicles. 4,922,428, Cl. 364-426.040.
Takahashi, Katsutoshi: *See*—
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,921,984, Cl. 556-40.000.
Takahashi, Kenji: *See*—
Kawajiri, Kazuhiro; Sunagawa, Hiroshi; Nozaki, Nobuharu; Hosoi, Yuichi; and Takahashi, Kenji, 4,922,103, Cl. 250-327.200.
Takahashi, Mamoru; Misaki, Hideo; Imamura, Shigeyuki; and Matsuura, Kazuo, to Toyo Jozo Kabushiki Kaisha. Novel NAD synthetase, assay method using said novel NAD synthetase and a process for production thereof. 4,921,786, Cl. 435-4.000.
Takahashi, Masanori: *See*—
Iwai, Tomio; and Takahashi, Masanori, 4,920,933, Cl. 123-73.00A.
Takahashi, Motoo; and Tsukagoshi, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Back projection screen in a video projector. 4,921,330, Cl. 350-128.000.
Takahashi, Osamu: *See*—
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 4,921,968, Cl. 548-262.400.
Takahashi, Satoji; and Nakamura, Masao, to Ajinomoto Company, Ltd. Method for purifying aspartic acid. 4,922,011, Cl. 562-554.000.
Takahashi, Shoji: *See*—
Kinugasa, Toshiyuki; Furuya, Tamio; Ishige, Yoshiki; Kikuchi, Nobuo; and Takahashi, Shoji, 4,921,561, Cl. 156-219.000.
Takahashi, Shuichi; Yamanaka, Kunihiro; and Horiki, Masanao, to Ricoh Company, Ltd.; and Marantz Japan, Inc. Radio audio/facsimile communication device. 4,922,546, Cl. 455-74.000.
Takahashi, Tokuyuki: *See*—
Takada, Mitsuru; Itoh, Hiroshi; and Takahashi, Tokuyuki, 4,920,829, Cl. 74-868.000.
Takahashi, Tomonori: *See*—
Matsui, Minoru; and Takahashi, Tomonori, 4,921,721, Cl. 427-34.000.
Takamiya, Kikuzo; Tamura, Yoshitaka; Shibayama, Yoichi; Nishimura, Ritsuo; Hirai, Kiyofumi; and Serizawa, Hiromitsu, to Bridgestone Cycle Co., Ltd. Stepless speed change device. 4,920,827, Cl. 475-166.000.
Takamuki, Yasuhiko; and Uesawa, Yutaka, to Konica Corporation. Silver halide photographic material. 4,921,781, Cl. 430-496.000.
Takano, Hisashi; Koyama, Naoki, Yuito, Isamu; Shiiki, Kazuo; and Tanabe, Hideo, to Hitachi, Ltd. Magnetic head. 4,922,360, Cl. 360-113.000.
Takano, Satoshi, to Sumitomo Electric Industries, Ltd. Superconducting member. 4,921,833, Cl. 505-1.000.
Takano, Yoshiaki; and Kitagawa, Tsuneo, to Minolta Camera Kabushiki Kaisha. Copying apparatus having a display warning. 4,922,295, Cl. 355-209.000.
Takase, Haruo. Needle base with plural needles for subcutaneously applying electric current. 4,920,968, Cl. 128-639.000.
Takashima, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Electric cleaner. 4,920,605, Cl. 15-319.000.
Takasu, Katsuji: *See*—
Osada, Yoshiyuki; Tsuda, Hisanori; Sano, Masafumi; Omata, Satoshi; Takasu, Katsuji; and Hirai, Yutaka, 4,921,722, Cl. 427-39.000.
Takasu, Yoshio: *See*—
Kato, Tomohiro; Takasu, Yoshio; and Minafuji, Makoto, 4,921,622, Cl. 252-8.900.
Takatsuna, Kazutoshi; Tachikawa, Mamoru; Shinozawa, Kouji; Nakajima, Masashi; Shinohara, Akihito; and Okumura, Yoshiharu, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for preparing aminopropyl silanes. 4,921,988, Cl. 556-413.000.
Takayama, Tsutomu: *See*—
Hashimoto, Seiji; Kinoshita, Takao; Takayama, Tsutomu; and Kaji, Toshio, 4,922,334, Cl. 358-44.000.
Takebayashi, Mikio: *See*—
Nagata, Nobuyoshi; Sugiyama, Hideki; Uemura, Kiyotaka; and Takebayashi, Mikio, 4,920,699, Cl. 49-441.000.
Takeda Chemical Industries, Ltd.: *See*—
Kishimoto, Shoji; Tomimatsu, Kiminori; Miyake, Akio; and Yoshimura, Yoshinobu, 4,921,851, Cl. 514-203.000.
Takeda, Katsuhiko; and Myochin, Hisashi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus with corona discharge device for transferring toner image. 4,922,303, Cl. 355-274.000.
Takeda, Kiyoshi: *See*—
Motegi, Tsuneo; Matsumoto, Yasuji; Takeda, Kiyoshi; and Chiba, Shuji, 4,921,926, Cl. 528-17.000.
Takeda, Morihiro; Miyasaka, Eiji; and Handa, Masayuki, to Dainippon Screen Mfg. Co., Ltd. Developing apparatus. 4,922,278, Cl. 354-320.000.
Takemoto Yushi Kabushiki Kaisha: *See*—
Kato, Tomohiro; Takasu, Yoshio; and Minafuji, Makoto, 4,921,622, Cl. 252-8.900.
Takemura, Toji; and Okubo, Takashi, to Nissan Motor Company, Limited. Rotational speed differential responsive type joint. 4,921,085, Cl. 192-60.000.
Takenaka, Akira; and Hatanaka, Masanori, to Taiho Kogyo Co. Lip seal device for water pumps. 4,921,260, Cl. 277-153.000.
Takenaka Corporation: *See*—
Miyake, Hiraku; Ishiguro, Mitsuo; Hayamizu, Yutaka; and Aizawa, Satoru, 4,921,202, Cl. 248-581.000.
Takenoya, Hideaki; Nomoto, Reishi; and Ebata, Yoshikazu, to Janome Sewing Machine Co. Ltd. Automatic pattern sewing machine. 4,920,902, Cl. 112-103.000.
Takeuchi, Hiroshi: *See*—
Yonekawa, Hisashi; and Takeuchi, Hiroshi, 4,922,273, Cl. 358-429.000.
Takeuchi, Mikio, to Konishiroku Photo Industry Co., Ltd. Method for reading a radiographic image. 4,922,100, Cl. 250-327.200
Takeuchi, Yasuhiro: *See*—
Yoshida, Akihiko; Nishino, Atsushi; Tanahashi, Ichiro; and Takeuchi, Yasuhiro, 4,921,686, Cl. 423-447.600.
Takeuchi, Yoshinori: *See*—
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi,

VOL 1114 ISS 1 MY 1 1990 UMI

VOL
1114
ISS
1
MY
1
1990
UMI

Yukimori; Hori, Kazunori; and Tokuyama, Mikio, 4,922,356, Cl. 360-104.000.

Taki, Kazunari, to Brother Kogyo Kabushiki Kaisha. Magneto-optical memory medium and apparatus for writing and reading information on and from the medium. 4,922,454, Cl. 365-122.000.

Takiguchi, Yasuyuki; Kanemoto, Akihiko; Uehara, Kiyohiro; Imai, Yoshio; Hino, Taro; Iwamoto, Mitsumasa; Kakimoto, Masaaki; and Suzuki, Masaaki, to Ricoh Company, Ltd. Process of making a liquid crystal element. 4,921,728, Cl. 427-58.000.

Takuma, Masao: *See*—
Hidaka, Masaru; Murashima, Hirotsugu; Takuma, Masao; Haruki, Toshinobu; and Kikuchi, Kenichi, 4,922,346, Cl. 358-227.000.

Tam, Kwok C., to General Electric Company. Flaw characterization by multiple angle inspection. 4,922,421, Cl. 364-413.250.

Tamaki, Akihiro: *See*—
Ajioka, Masanobu; Aiga, Makoto; Kataita, Masafumi; and Tamaki, Akihiro, 4,922,005, Cl. 560-347.000.

Tamaki, Yoshiyuki: *See*—
Sasaki, Shizuo; and Tamaki, Yoshiyuki, 4,920,937, Cl. 123-305.000.

Tamura, Humio: *See*—
Asano, Kiro; Mitsuhashi, Satoshi; Bannai, Kenji; Wada, Hisayuki; and Tamura, Humio, 4,921,849, Cl. 514-182.000.

Tamura, Mitsuhiko; Miyamoto, Masaaki; Nakanishi, Hidemi; and Tanaka, Takayoshi, to Mitsubishi Kasei Corporation. Polyamide resin. 4,921,932, Cl. 528-339.300.

Tamura, Yoshitaka: *See*—
Takamiya, Kikuzo; Tamura, Yoshitaka; Shibayama, Yoichi; Nishimura, Ritsuo; Hirai, Kiyofumi; and Serizawa, Hiromitsu, 4,920,827, Cl. 475-166.000.

Tanabe, Hideo: *See*—
Takano, Hisashi; Koyama, Naoki; Yuito, Isamu; Shiiki, Kazuo; and Tanabe, Hideo, 4,922,360, Cl. 360-113.000.

Tanabe, Hideyuki: *See*—
Nakazawa, Yoshihiro; Tabata, Hajime; Hasegawa, Tooru; and Tanabe, Hideyuki, 4,922,390, Cl. 362-72.000.

Tanabe, Kazunori, to Brother Kogyo Kabushiki Kaisha. Color image recording apparatus. 4,922,286, Cl. 355-27.000.

Tanahashi, Ichiro: *See*—
Yoshida, Akihiko; Nishino, Atsushi; Tanahashi, Ichiro; and Takeuchi, Yasuhiro, 4,921,686, Cl. 423-447.600.

Tanahashi, Keitaro; and Murata, Yuzuru, to Ando Electric Co., Ltd. Apparatus and method for creating a data bus access contest. 4,922,482, Cl. 370-13.000.

Tanaka, Isamu; and Tanitomi, Fuminao, to Kaisei Koguy Corporation. Skin temperature measuring apparatus for diagnosing disturbance of peripheral circulation. 4,920,973, Cl. 128-736.000.

Tanaka, Kunihiro: *See*—
Nakagawa, Katsuya; Tanaka, Kunihiro; Yukawa, Masayuki; and Nomura, Masaki, 4,922,420, Cl. 364-410.000.

Tanaka, Masakazu; and Ohashi, Toshio, to Nissan Motor Co., Ltd. Radiant heat control apparatus for automotive vehicle. 4,920,759, Cl. 62-244.000.

Tanaka, Nobuo: *See*—
Negi, Taichi, Tanaka, Nobuo; and Yonezu, Kiyoshi, 4,921,907, Cl. 525-57.000.

Tanaka, Norio: *See*—
Kosugi, Tatsuhiro; Ogawa, Takeshi; and Tanaka, Norio, 4,921,422, Cl. 432-24.000.

Tanaka, Noriyuki: *See*—
Okamoto, Kyoichi; Tanaka, Noriyuki; and Shiroyama, Shigeru, 4,920,812, Cl. 74-6.000.

Tanaka, Takayoshi: *See*—
Tamura, Mitsuhiko; Miyamoto, Masaaki; Nakanishi, Hidemi; and Tanaka, Takayoshi, 4,921,932, Cl. 528-339.300.

Tanaka, Tomohide: *See*—
Aoyama, Mari; Ito, Michiyasu; Tsuji, Syoichi; Ishii, Toshiyuki; and Tanaka, Tomohide, 4,921,653, Cl. 264-41.000.

Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, to Teijin Limited. Process for producing 16-substituted prostaglandines. 4,921,995, Cl. 558-441.000.

Tanaka, Yasuhisa: *See*—
Ishihara, Toshinobu; Endo, Mikio; Kubota, Tohru; and Tanaka, Yasuhisa, 4,921,989, Cl. 556-431.000.

Tani, Chizuka: *See*—
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, 4,921,632, Cl. 252-299.100.

Tani, Hakuzo; and Okumura, Masaru, to Minolta Camera Kabushiki Kaisha. Anti-reflection coating of optical part made of synthetic resin. 4,921,760, Cl. 428-446.000.

Tani, Naohiko; Kouda, Masahiro; Ito, Atsushi; and Miwa, Yuji, to Brother Kogyo Kabushiki Kaisha. Arbor for mounting a tool to a spindle of a machine tool and a machining method of employing the same. 4,921,376, Cl. 409-131.000.

Taniguchi, Hisayuki; and Yamamura, Masaaki, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for generating tint pattern data. 4,922,332, Cl. 358-77.000.

Taniguchi, Masaaki: *See*—
Senda, Atsuo; Numata, Toshi; Ushiro, Tomoaki; Nakagawa, Takuji; and Taniguchi, Masaaki, 4,920,915, Cl. 118-503.000.

Tanino, Katsumi; and Kakada, Morihito, to Toyokako Kabushiki Kaisha. Piezoelectric polymer materials from epoxy resins and polytetramethyleneoxide-di-p-aminobenzoate. 4,921,928, Cl. 528-111.000.

Tanitomi, Fuminao: *See*—
Tanaka, Isamu; and Tanitomi, Fuminao, 4,920,973, Cl. 128-736.000.

Tannhof, Pascal: *See*—
Mollier, Pierre; and Tannhof, Pascal, 4,922,135, Cl. 307-450.000.

Tansley, Robert W.: *See*—
Newman, Alex T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,920,870, Cl. 99-289.00R.

Tao, Eddie V. P.; and Vicenzi, Jeffrey T., to Eli Lilly and Company. Process for preparing macrolide derivatives. 4,921,947, Cl. 536-7.100.

Taoda, Masami: *See*—
Sakata, Yoshio; and Taoda, Masami, 4,922,437, Cl. 364-514.000.

Tapco Products Company, Inc.: *See*—
MacLeod, Richard J.; and Schiedegger, Charles E., 4,920,708, Cl. 52-60.000.

Target Products Inc.: *See*—
Yelton, Darrell A.; and Norland, Richard S., 4,921,308, Cl. 299-39.000.

Taricco, Giorgio: *See*—
Pirani, Giancarlo; and Taricco, Giorgio, 4,922,494, Cl. 371-35.000.

Tarkett Inc.: *See*—
LaBianca, Michael H., 4,920,720, Cl. 52-506.000.

Tarnowski, Stanley J., Jr.: *See*—
DeChiara, Thomas M.; and Tarnowski, Stanley J., Jr., 4,921,699, Cl. 424-85.700.

Tartaglia, Peter A.; Collins, Richard B.; and Smolen, Robert S., to Marotta Scientific Controls, Inc. Noise-reducing valve construction. 4,921,014, Cl. 137-625.300.

Tarumi, Noriyoshi: *See*—
Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, 4,921,771, Cl. 430-110.000.

Tarutani, Yoshinobu: *See*—
Hasegawa, Haruhiro; Kawabe, Ushio; Tarutani, Yoshinobu; Fukazawa, Tokuumi; Aida, Toshiyuki; and Takagi, Kazumasa, 4,921,834, Cl. 505-1.000.

Tasser, Siegfried: *See*—
Lamprecht, Philipp; Piock, Richard; and Tasser, Siegfried, 4,922,276, Cl. 354-299.000.

Taut, Inc.: *See*—
McFarlane, Richard, 4,921,096, Cl. 206-349.000.

Taylor, Archie E., Jr.: *See*—
Combier, Charles M., Taylor, Archie E., Jr.; and Paquette, Marc, 4,921,098, Cl. 206-408.000.

Taylor, David H.: *See*—
Howland, Leland L.; and Taylor, David H., 4,920,756, Cl 62-173.000.

Taylor, Don M.: *See*—
Allen, Lynn M.; Taylor, Don M.; and Roberts, Charles D., 4,921,592, Cl. 208-48.0AA.

Taylor, Harvey W., Jr., to Du Pont de Nemours, E. I., and Company. Method of providing lower gloss protective covering for pre-press color proof. 4,921,776, Cl. 430-293.000.

Taylor, Kennard W., to Cameron Iron Works USA, Inc. Safety connection into passages in a tubular body. 4,921,281, Cl. 285-90.000.

Taylor, Scott K.: *See*—
Averill, Robert G.; Serekian, Paul; and Taylor, Scott K., 4,921,500, Cl. 623-22.000.

Taylor, William W. Golf ball. 4,921,255, Cl. 273-232.000.

Tchavdarov, Jean-Claude: *See*—
Garcia, Alain; Tchavdarov, Jean-Claude; and Porte, Alain, 4,920,744, Cl. 60-226.100.

Tchorzewski, Kazimierz, to British Telecommunications public limited company. Multi-user speech recognition system. 4,922,538, Cl. 381-42.000.

TDK Corporation: *See*—
Fujii, Tatsuo, 4,921,562, Cl. 156-224.000.

Technical Manufacturing Systems, Inc.: *See*—
Cross, Jack A.; and Jackson, Cletis M., 4,922,076, Cl. 219-69.150.

Technology Network, Inc.: *See*—
Kasuya, Satoshi, 4,922,088, Cl. 250-203.400.

Technology Unlimited, Inc.: *See*—
Lau, John R.; and Geho, W. Blair, 4,921,644, Cl. 264-4.100.

Tecnol, Inc.: *See*—
Hubbard, Vance M.; Brunson, Welton K.; and Caldwell, Darrell S., 4,920,960, Cl. 128-206.120.

Tegen, Marvin H.: *See*—
Bowman, Robert G.; Tegen, Marvin H.; and Hartwell, George E., 4,922,024, Cl. 564-480.000.

Teicher, Beverly A.; Richmond, Robert C.; and Chen, Lan B., to Johnson Matthey Inc. Platinum complexes and the like. 4,921,973, Cl. 549-212.000.

Teijin Limited: *See*—
Nakatani, Kenji; Okaniwa, Hiroshi; and Yano, Mitsuaki, 4,920,917, Cl. 118-718.000.
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,921,995, Cl. 558-441.000.

Tektronix, Inc.: *See*—
Meadows, R. David; and McCoy, Roger J., 4,922,061, Cl. 178-19.000.

Teledyne Princeton, Inc.: *See*—
Schumacher, Kenneth E.; and Thompson, Thomas K., 4,921,075, Cl. 187-9.00E.

Teledyne Semiconductor: *See*—
Gray, Richard L.; Yan, Raymond Chan-Man; and Rosenthal, Bruce, 4,922,371, Cl. 361-91.000.

Telefunken Electronic GmbH: *See*—
Colquhoun, Alexander, 4,922,310, Cl. 357-22.000.

Televerket: *See*—
Brusewitz, Harald, 4,922,510, Cl. 375-122.000.

Tellabs, Inc.: *See*—
Kenney, John B.; Rohrs, Charles E.; and Walters, Wayne E., 4,922,530, Cl. 379-411.000.

Telle, Lawrence B.: *See*—
Rombola, Gregory; Muster, Frank L.; and Telle, Lawrence B., 4,922,350, Cl. 358-488.000.

Terada, Setsuo: *See*—
Yamada, Shigeru; and Terada, Setsuo, 4,921,761, Cl. 428-473.500.

Terashima, Tuneo: *See*—
Shinto, Hiroaki; Nakamura, Syuji; Yamaguchi, Terumoto; Oguri, Tomoji; and Terashima, Tuneo, 4,920,821, Cl. 74-552.000.

Terashima, Yoshiaki: *See*—
Ikegawa, Sumio; Terashima, Yoshiaki; Yasuda, Nobuaki; Ichihara, Katsutarou; Komatsu, Shuichi; and Arai, Shinji, 4,922,462, Cl. 365-113.000.

Ter Horst, Gerrit H. F., to Thomassen & Drijver-Verblifa N.V. Device for forming a batch consisting of a predetermined number of discs. 4,921,088, Cl. 198-418.700.

Teske, Lothar. Trough-type chain conveyor for bulk material. 4,921,089, Cl. 198-534.000.

Tesori, Charles A. Golf club. 4,921,253, Cl. 273-167.00B.

Teule, Hendrik: *See*—
Krikke, Germen K.; and Teule, Hendrik, 4,922,521, Cl. 379-95.000.

Teuscher, Leon A.: *See*—
Melnyk, Andrew R.; Nealey, Richard H.; Brach, Paul J.; and Teuscher, Leon A., 4,921,773, Cl. 430-132.000.

Teva, Gil. Laser apparatus. 4,922,504, Cl. 372-87.000.

Texaco Chemical Co.: *See*—
Su, Wei-Yang; and Speranza, George P., 4,921,969, Cl. 548-335.000.

Texaco Inc.: *See*—
Sanderson, John R.; Knifton, John F.; and Marquis, Edward T., 4,922,033, Cl. 568-909.800.
Sanderson, John R.; Marquis, Edward T.; and Mueller, Mark A., 4,922,034, Cl. 568-909.800.
Sanderson, John R.; and Marquis, Edward T., 4,922,035, Cl. 568-909.800.
Sanderson, John R.; Marquis, Edward T.; and Knifton, John F., 4,922,036, Cl. 568-909.800.
White, William R.; Dahlstrom, Mary A.; and Lindholm, Scott O., 4,922,045, Cl. 585-10.000.

Texas Instruments Incorporated: *See*—
Coleman, Donald J.; and Haken, Roger A., 4,922,312, Cl. 357-23.600.
Malhi, Satwinder S.; and Bean, Kenneth E., 4,922,378, Cl. 361-387.000.
McDavid, James M.; and Anderson, Dirk N., 4,922,320, Cl. 357-67.000.
McLellan, Neil R., 4,921,550, Cl. 148-24.000.
Rajasekaran, Periagaram K.; and Doddington, George R., 4,922,539, Cl. 381-50.000.
Ty, Henry; Baptista, John; and DeAmaral, George, 4,920,624, Cl. 29-173.000.
Ty, Henry; Zaveri, Narendra R.; and White, Alfred J., 4,921,165, Cl. 236-93.00R.

Textron Inc.: *See*—
Ryder, Francis E.; and Lisak, Stephen P., 4,922,387, Cl. 362-61.000.

Th. Goldschmidt AG: *See*—
Schaefer, Dietmar; and Nickel, Friedhelm, 4,921,895, Cl. 524-379.000.

Thackeray, James W.; and Fine, Stephen A., to Shipley Company Inc. Photoresist pattern fabrication employing chemically amplified metalized material. 4,921,778, Cl. 430-326.000.

Thelin, Anders G.: *See*—
Brandt, Nils G. L.; and Thelin, Anders G., 4,920,838, Cl. 82-1.110.

Therakos, Inc.: *See*—
Lee, Kyu H.; and Morris, Livingston B., 4,921,473, Cl. 494-27.000.

Theriault, David G.: *See*—
Gaussa, William P.; Theriault, David G.; Wassel, William W.; Skoncey, John A.; and Havelka, Ronald R., 4,922,194, Cl. 324-158.00R.

Theriault, Leonard A. Transmission apparatus. 4,920,826, Cl. 475-52.000.

Thermo King Corporation: *See*—
Howland, Leland L.; and Taylor, David H., 4,920,756, Cl. 62-173.000.

Thermon Manufacturing Company: *See*—
Springs, Daniel R.; and Hinojosa, Jesse, 4,922,083, Cl. 219-549.000.

Third Alabama Bank, executor: *See*—
Chew, Bonnie G., II; and Third Alabama Bank, executor, 4,921,369, Cl. 403-171.000.

Thirst Aid, Inc.: *See*—
Billet, Robert L., 4,921,143, Cl. 222-175.000.

Tholome, Roger: *See*—
Belmain, Daniel; Chabert, Pierre; Tholome, Roger; Fabre, Pierre; Correard, Jean-Yves; and Gondrand, Michel, 4,921,172, Cl. 239-698.000.

Thoman, Mell R., to Railcar Specialties, Inc. Modular anti-spin unit for railway car door. 4,920,894, Cl. 105-378.000.

Thomas & Betts Corporation: *See*—
Rodrigues, Julio, 4,922,058, Cl. 174-94.00R.

Thomas J. Ring: *See*—
LaVelle, Richard E.; Wood, Gary L.; Morrey, Kevin P.; and Bossert, Clayton E., 4,920,589, Cl. 5-61.000.

Thomas, Larry D.: *See*—
Waltke, David L.; and Thomas, Larry D., 4,921,126, Cl. 220-855.000.

Thomas, Lewis J., III; Gilmore, Robert S.; and Glascock, Homer H., II, to General Electric Company. Cure monitoring apparatus having high temperature ultrasonic transducers. 4,921,415, Cl. 425-135.000.

Thomas, Mammen; and Weinberg, Matthew, to Advanced Micro Devices, Inc. Bipolar and MOS devices fabricated on same integrated circuit substrate. 4,922,318, Cl. 357-43.000.

Thomas, Peter: *See*—
Salem, Ronald R.; Thomas, Peter; and Steele, Glenn, 4,921,789, Cl. 435-7.000.

Thomassen & Drijver-Verblifa N.V.: *See*—
Ter Horst, Gerrit H. F., 4,921,088, Cl. 198-418.700.

Thompson, L. P., Jr.: *See*—
Sarles, J. Stephen; and Thompson, L. P., Jr., 4,920,679, Cl. 42-75.020.

Thompson, Thomas K.: *See*—
Schumacher, Kenneth E.; and Thompson, Thomas K., 4,921,075, Cl. 187-9.00E.

Thomsen, H. Jay, to Thomsen, H. Jay. Spiral wound spring retention clip. 4,921,230, Cl. 267-156.000.

Thomson-Brandt Armements: *See*—
Frehaut, Jean-Pierre; Magnaudet, Eric; and Pineau, Jean-Pierre, 4,920,887, Cl. 102-489.000.

Thomson-CSF: *See*—
Bergero, Jean-Pierre; and Couasnard, Claude, 4,922,215, Cl. 333-137.000.

Thorbecke, G. J.: *See*—
Coico, Richard F.; and Thorbecke, G. J., 4,921,667, Cl. 424-85.800.

Thornton, Constance J.: *See*—
Yuh, Huoy-Jen; Ong, Beng S.; Spiewak, John W.; and Thornton, Constance J., 4,921,769, Cl. 430-64.000.

Thorpe, William A.; and Evans, David C., to AE PLC. Cylinder liners. 4,921,734, Cl. 428-34.400.

Thorsett, Eugene D.: *See*—
Heck, James V.; and Thorsett, Eugene D., 4,921,857, Cl. 514-254.000.

Thurin, Yves: *See*—
Grenier, Michel; de la Gorge, Jean-Etienne; Cieplinski, Daniel; Leturgie, Gerard; Thurin, Yves; Meret, Laurent; and Doireau, Christian, 4,921,076, Cl. 188-12.600.

Tilly, Leif. Method for supplying an electrically conductive floating medium and a device for performing the method. 4,921,169, Cl. 239-3.000.

Tily, Peter J.: *See*—
Flett, Douglas S.; Holt, Gary; and Tily, Peter J., 4,921,221, Cl. 75-385.000.

Tindberg, N Bertil E., to Peltor AB. Device for closing a curved duct. 4,920,985, Cl. 128-864.000.

Tinti, Jean M.: *See*—
Nofre, Claude; Tinti, Jean M.; and Ouar Chatzopoulos, Farroudja, 4,921,939, Cl. 558-414.000.

Tipton, Sheryl A.; Keil, Gary D.; Holloway, Gregory S.; Gromer, David R.; and Biltgen, Gary L., to Caterpillar Inc. Carburized low silicon steel article and process. 4,921,025, Cl. 148-16.500.

Titze, Horst: *See*—
Gnauert, Werner; and Titze, Horst, 4,921,016, Cl. 137-625.170.

Tiziana Lenarduzzi: *See*—
Famulari, Giovanni, 4,921,375, Cl. 408-67.000.

TLV Co., Ltd.: *See*—
Fujiwara, Katsuji, 4,921,215, Cl. 251-63.400.

Toa Medical Electronics Co., Ltd.: *See*—
Otani, Masanori, 4,921,676, Cl. 422-100.000.

Toa Nenryo Kogyo KK: *See*—
Ueki, Satoshi; and Imai, Chihiro, 4,921,901, Cl. 525-244.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Takatsuna, Kazutoshi; Tachikawa, Mamoru; Shinozawa, Kouji; Nakajima, Masashi; Shinohara, Akihito; and Okumura, Yoshiharu, 4,921,988, Cl. 556-413.000.

Toaz, Milton W.: *See*—
Skingle, Thomas J.; and Toaz, Milton W., 4,920,864, Cl. 92-213.000.

Todd, Jeffrey L., to Asten Group, Inc. Papermaker's thru-dryer embossing fabric. 4,921,750, Cl. 428-225.000.

Todokoro, Hideo; Shinada, Hiroyuki; and Seitoh, Shigemitsu, to Hitachi, Ltd. Potential measurement device. 4,922,097, Cl. 250-310.000.

Toegel, Herbert J.: *See*—
Krishnan, Iyengar N.; and Toegel, Herbert J., 4,922,416, Cl. 364-200.000.

Tohjyoh, Tomotaroh: *See*—
Nishihara, Testuo; Watanabe, Takashi; and Tohjyoh, Tomotaroh, 4,921,363, Cl. 400-120.000.

Tohokako Co., Ltd.: *See*—
Fujikawa, Tsuneo, 4,921,461, Cl. 446-296.000.

Tohoku University: *See*—
Tomita, Akira; Kyotani, Takashi; and Sonobe, Naohiro, 4,921,687, Cl. 423-448.000.

Toja, Emilio: *See*—
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 4,921,868, Cl. 514-354.000.

Tokai Rubber Industries, Ltd.: *See*—
Hori, Hiroaki, 4,921,229, Cl. 267-140.100.

Tokumoto, Hiroshi; Bando, Hiroshi; Sakai, Fumiki; Miyata, Chikara; and Wakiyama, Shigeru, to Agency of Industrial Science and Technology; and Seiko Instruments Inc. Tunnel current detecting photoacoustic spectrometer. 4,921,346, Cl. 356-72.000.

Tokunga, Masatoki; Nozawa, Yasuto; and Iwasaki, Katsunori, to Hitachi Metals, Ltd. Magnetically anisotropic bond magnet, magnetic powder for the magnet and manufacturing method of the powder. 4,921,553, Cl. 148-302.000.

Tokutake, Toshinori: *See*—
Yamamoto, Yuji; Shiina, Kanichi; and Tokutake, Toshinori, 4,920,766, Cl. 62-474.000.

Tokuyama, Mikio: *See*—
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi, Yukimori; Hori, Kazunori; and Tokuyama, Mikio, 4,922,356, Cl. 360-104.000.

Tolbert, Thomas W.; Cooke, William M.; and Hendrix, James E., to Springs Industries, Inc. Fire resistant balanced fine corespun yarn and fabric formed thereof. 4,921,756, Cl. 428-373.000.

Toldy, Lajos: *See*—
Zubovics, Zoltan; Toldy, Lajos; Rabloczky, Gyorgy; Varro, Andras; Andrasi, Ferenc; Elek, Sandor; and Elekes, Istvan, 4,922,021, Cl. 564-367.000.

Toliver, Joseph, Jr.; and Crank, John T. Fishing pole holder apparatus. 4,920,681, Cl. 43-21.200.

Tomasiak, Mark J.: *See*—
Hult, David R.; and Tomasiak, Mark J., 4,920,608, Cl. 15-339.000.

Tomimatsu, Kiminori: *See*—
Kishimoto, Shoji; Tomimatsu, Kiminori; Miyake, Akio; and Yoshimura, Yoshinobu, 4,921,851, Cl. 514-203.000.

Tominaga, Kazutoshi, to Kabushiki Kaisha Tominaga Jyushi Kogyosho. Aquarium lid. 4,920,922, Cl. 119-5.000.

Tomita, Akira; Kyotani, Takashi; and Sonobe, Naohiro, to Tohoku University. Method of making high-orientation sheet-like graphite by using laminar compound. 4,921,687, Cl. 423-448.000.

Tomizawa, Takashi: *See*—
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,922,287, Cl. 355-27.000.

Tomkins, Patricia: *See*—
Rushbrooke, John; Lyons, Adrian; Tomkins, Patricia; and Ansorge, Richard, 4,922,092, Cl. 250-213.0VT.

Tomlin, Malcolm G., to Coal Industry (Patents) Limited. Mining machine and method utilizing intensifier for high and low water pressure to cutting drum. 4,921,306, Cl. 299-17.000.

Tomma, Kauko: *See*—
Saukkonen, Seppo; Tomma, Kauko; and Raudaskoski, Vesa, 4,921,183, Cl. 242-66.000.

Tomono, Makoto; Tarumi, Noriyoshi; and Sato, Masayuki, to Konishiroku Photo Industry Co., Ltd. Toner for use in developing electrostatic images containing polypropylene. 4,921,771, Cl. 430-110.000.

Tomosada, Masahiro: *See*—
Kasuya, Yukio; Tomosada, Masahiro; and Adachi, Hideki, 4,922,296, Cl. 355-208.000.

Tomura, Katsumi: *See*—
Nakai, Masayuki; Yoshida, Takeshi; and Tomura, Katsumi, 4,921,831, Cl. 502-418.000.

Tong, Shiu-Bor: *See*—
Delahanty, Francis T.; Stoy, Vladimir A.; and Tong, Shiu-Bor, 4,921,323, Cl. 350-96.210.

Topel, Edward C.; and Garritano, Mario, to Methode Electronics, Inc. Wire connecting method. 4,922,072, Cl. 219-56.100.

Topfl, Werner, to Ciba-Geigy Corporation. Process for the synthesis of 1-substituted imidazole-5-carboxylic acids and carboxylic acid derivatives. 4,921,955, Cl. 544-60.000.

Toray Industries: *See*—
Yamada, Bunshi; Kimura, Michio; and Noguchi, Yoshio, 4,922,039, Cl. 570-211.000.

Torichigai, Masaaki: *See*—
Iwamoto, Keiichi; and Torichigai, Masaaki, 4,920,804, Cl. 73-623.000.

Torisawa, Nobuyuki; Okutsu, Hirokazu; and Aoki, Katsuhiro, to Fuji Photo Film Co., Ltd. Method of and apparatus for photographing an image. 4,922,285, Cl. 355-20.000.

Torrence, Arthur L., to Mechtronics Corporation. Illuminated display with half-silvered mirrors and discrete refractor plates. 4,922,384, Cl. 362-31.000.

Toshiba Glass Co., Ltd.: *See*—
Mawatari, Yasushi; Ikegami, Toru; Sato, Motoyuki; Burgkhardt, Bertram; Piesch, Ernst; and Rober, Hans-Gerd, 4,922,115, Cl. 250-484.100.

Toshiba Silicone Co., Ltd.: *See*—
Kabeta, Keiji, 4,921,976, Cl. 556-482.000.
Motegi, Tsuneo; Matsumoto, Yasuji; Takeda, Kiyoshi; and Chiba, Shuji, 4,921,926, Cl. 528-17.000.

Toto, Ltd.: *See*—
Kosugi, Tatsuhiro; Ogawa, Takeshi; and Tanaka, Norio, 4,921,422, Cl. 432-24.000.

Touma, Alfred S.: *See*—
Abdulally, Iqbal F.; Touma, Alfred S.; and Bartkowiak, Peter, 4,920,924, Cl. 122-4.00D.

Tovrog, Benjamin S.: *See*—
Lin, Chi-Hung; Stevens, Jack F.; Tovrog, Benjamin S.; and Rose, Philip M., 4,921,919, Cl. 526-88.000.

Townsend Engineering Company: *See*—
Townsend, Ray T., 4,920,611, Cl. 17-49.000.

Townsend, Ray T., to Townsend Engineering Company. Method and means for encasing meat products. 4,920,611, Cl. 17-49.000.

Toya, Ichizo: *See*—
Nakamura, Koki; and Toya, Ichizo, 4,921,785, Cl. 430-621.000.

Toyo Jozo Kabushiki Kaisha: *See*—
Shuto, Satoshi; Itoh, Hiromichi; Fukukawa, Kiyofumi; and Tsujino, Masatoshi, 4,921,951, Cl. 536-27.000.
Takahashi, Mamoru; Misaki, Hideo; Imamura, Shigeyuki; and Matsuura, Kazuo, 4,921,786, Cl. 435-4.000.

Toyoda Gosei Co., Ltd.: *See*—
Abiko, Toru, 4,920,822, Cl. 74-552.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Asano, Hiroaki, 4,921,061, Cl. 180-79.100.

Toyokako Kabushiki Kaisha: *See*—
Tanino, Katsumi; and Kakada, Morihito, 4,921,928, Cl. 528-111.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Sasaki, Shizuo; and Tamaki, Yoshiyuki, 4,920,937, Cl. 123-305.000.
Shinto, Hiroaki; Nakamura, Syuji; Yamaguchi, Terumoto; Oguri, Tomoji; and Terashima, Tuneo, 4,920,821, Cl. 74-552.000.
Takada, Mitsuru; Itoh, Hiroshi; and Takahashi, Tokuyuki, 4,920,829, Cl. 74-868.000.

Toyotomi Kogyo Co., Ltd.: *See*—
Matsumoto, Motoki; and Watanabe, Kouichi, 4,921,166, Cl. 237-60.000.

TP Orthodontics, Inc.: *See*—
Kesling, Peter C., 4,921,423, Cl. 433-3.000.

Traas, Petrus C., to Naarden International N.V. Time duration indicator systems, and also products containing such indicator systems having a limited duration of use or life. 4,921,636, Cl. 252-408.100.

Traenckner, Hans-Joachim: *See*—
Dorf, Ernst-Ulrich; Alfes, Franz; and Traenckner, Hans-Joachim, 4,921,935, Cl. 528-388.000.

Traex Corporation: *See*—
Salzmann, Ferdinand F., 4,921,146, Cl. 222-473.000.

Transnational Energy Systems, Inc., dba TESCO: *See*—
Van Dick, Robert C., 4,922,366, Cl. 361-56.000.

Trauschke, William F., to GTE Products Corporation. Lamp carton with false, angled trap. 4,921,099, Cl. 206-418.000.

Trawinski, Jurgen; and Redeker, Detmar, to Miles Inc. Continuous cell dispersion, cultivation and substance recovery process. 4,921,792, Cl. 435-41.000.

Tresset, Alain; Fontenelle, Francois; and Javard, Gerard, to CGEE Alsthom. Method of implementing programmable matched filters, and corresponding filters and filter banks. 4,922,509, Cl. 375-103.000.

Tri-Phase, Inc.: *See*—
Pittsinger, Stephen D., 4,921,001, Cl. 137-78.200.

Triangle Research and Development Corporation: *See*—
Colvin, David P., 4,920,978, Cl. 128-784.000.

Trombley, Douglas E.: *See*—
Gomez, Aparicio J.; Trombley, Douglas E.; and Buslepp, Kenneth J., 4,920,789, Cl. 73-118.200.

Tronetti, Peter J., Jr. Fastener assembly. 4,921,380, Cl. 411-8.000.

Troughton, Thomas D.; and Irwin, Robert D., to Pacific Rim Packaging Corporation. Steel drum. 4,921,116, Cl. 220-72.000.

Trueb, Werner: *See*—
Lee, Shy-Fuh; Luehr, Gary W.; Scott, Carol R.; and Trueb, Werner, 4,921,526, Cl. 71-86.000.

Truswal Systems Corporation: *See*—
Gore, Charles E., 4,920,725, Cl. 52-702.000.

TRW Ehrenreich GmbH & Co. KG: *See*—
Busse, Fritz; Hafeneger, Hans; and Mette, Ulrich, 4,921,368, Cl. 403-134.000.

TRW Inc.: *See*—
Phillips, Richard R.; Sandell, Robert D.; and Silver, Arnold H., 4,922,250, Cl. 341-133.000.
Solbes, Albert; and Iwata, Hideo, 4,920,898, Cl. 110-265.000.

Tseng, Chi-Ping, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,921,527, Cl. 71-90.000.

Tsuburai, Yasuhiko: *See*—
Nitta, Koichi; Nishikawa, Yukie; Ishikawa, Masayuki; Tsuburai, Yasuhiko; and Kokubun, Yoshihiro, 4,922,499, Cl. 372-46.000.

Tsuchitani, Shigeki; Suzuki, Seikou; and Matsumoto, Masahiro, to Hitachi, Ltd. Spatial filter type speed measuring apparatus. 4,921,345, Cl. 356-28.000.

Tsuchiya, Osamu, to Hitachi, Ltd. Process for manufacturing semiconductor memory device and product formed thereby. 4,922,313, Cl. 357-23.600.

Tsuchiya, Yutaka; Aoshima, Shinichiro; and Nakamura, Takuya, to Hamamatsu Photonics Kabushiki Kaisha. Voltage detector. 4,922,186, Cl. 324-96.000.

Tsuda, Hisanori: *See*—
Osada, Yoshiyuki; Tsuda, Hisanori; Sano, Masafumi; Omata, Satoshi; Takasu, Katsuji; and Hirai, Yutaka, 4,921,722, Cl. 427-39.000.

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Takahashi, Motoo; and Tsukagoshi, Kazuo, 4,921,330, Cl. 350-128.000.

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Matsumoto, Naoaki; and Tsutsumi, Kenichi, 4,920,850, Cl. 84-622.000.

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Sewell, Beverley; Hill, David J.; and Martin, Edgar C., 4,921,583, Cl. 204-15.000.

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Kashima, Mikito; Ishikawa, Hideo; Kashiwagi, Kouichi; and Noda, Yumiki, 4,922,010, Cl. 562-470.000.
Mitsui, Kazuhiko; Kumamoto, Kazuo; and Koyashiki, Keiichirou, 4,921,744, Cl. 428-116.000
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Takamuki, Yasuhiko; and Uesawa, Yutaka, 4,921,781, Cl. 430-496.000.

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Gahle, Hans-Jurgen; and Uhlenhoff, Arnold, 4,922,140, Cl. 307-591.000.

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Yamada, Shigeru; and Terada, Setsuo, 4,921,761, Cl. 428-473.500.

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Schaffner, Kurt; Swozil, Adolf; and Ullmann, Gerhard, 4,921,283, Cl. 285-114.000.

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Kawasaki, Shinzo; Umeda, Kaoru; and Kitoh, Norimasa, 4,922,170, Cl. 318-434.000.

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Spirer, Steve, 4,921,010, Cl. 137-580.000.

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Suzuki, Migaku; and Masamitsu, Yamamoto, 4,921,474, Cl. 604-16.000.

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Uchimoto, Yoshihiro; and Nakagawa, Hirofumi, 4,922,299, Cl. 355-219.000.

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Kuiper, Jan; Verhue, Walter M.; and Klapwijk, Pieter M., 4,921,716, Cl. 426-534.000

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Firth, William C., Jr., 4,921,620, Cl. 252-8.513.

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Flagella, Robert N.; and Dawson, Howard J., 4,921,026, Cl. 148-33.000.

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Deitrick, Bernard E., Murzyn, Patrick J.; Nowotarski, Mark S.; and Roberge, Raymond P., 4,920,998, Cl. 137-3.000

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Pommer, Richard J.; and Chiechi, John, 4,922,376, Cl. 361-386.000.

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Gross, Hal D.; and Hudon, Gerard M., 4,922,192, Cl. 324-158.00P

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Vander Meer, Robert K.; Lofgren, Clifford S.; and Williams, David F., 4,921,696, Cl. 424-84.000.
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Carlson, Robert J.; and Grimm, Michael D., 4,922,277, Cl. 354-317.000.
Army: *See*—
Brody, Philip S.; and Garvin, Charles, 4,921,333, Cl. 350-320.000
Scanlon, Michael V., 4,920,854, Cl. 89-14.400.
Scully, Andrew J., 4,921,269, Cl. 280-475.000.
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Cassidy, Roger T., 4,921,738, Cl. 428-34.600.
Gmeindl, Frank D.; and Geisbrecht, Rodney A., 4,921,765, Cl. 429-16.000.
Leuer, James A., 4,921,661, Cl. 376-136.000.
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Nachbar, Henry D., 4,920,994, Cl. 134-1.000.
Sillerud, Laurel O.; and van Hulsteyn, David B., 4,922,203, Cl. 324-307.000.
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deQuay, Laurence, 4,921,212, Cl. 251-163.000.
Harwell, William D.; and Wu, Mitchell B., 4,921,292, Cl. 294-65.500.
Ruoff, Carl F.; and Salisbury, J. Kenneth, Jr., 4,921,293, Cl. 294-111.000.
Navy: *See*—
Ditman, L. Samuel, Jr., 4,921,335, Cl. 350-354.000.
Nakamura, Wayne H., 4,921,557, Cl. 156-169.000.
Vernon, Susan N.; and Gammell, Paul M., 4,922,201, Cl. 324-236.000.

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Bolk, Hendrik J. J.; and Zieltjens, Georges C. P., 4,922,442, Cl. 364-550.000.
Bukoschek, Romuald L.; Ramusch, Wolfgang; and Schroder, Johann, 4,920,761, Cl. 62-342.000.
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Kevius, Bruno, 4,922,153, Cl. 315-8.000.
Krikke, Germen K.; and Teule, Hendrik, 4,922,521, Cl. 379-95.000.
Mohr, Michael A.; and Koglin, Gunter W. W., 4,920,823, Cl. 74-553.000.

Pergrale, Jean, 4,922,422, Cl. 364-413.160.
Petitjean, Gilbert; and Lebourg, Michel, 4,922,235, Cl. 340-686.000.
Riegel, Maximilian, 4,922,344, Cl. 358-152.000.
Shannon, John M., 4,922,314, Cl. 357-34.000.
Sluyterman, Albertus A. S.; Bosch, Gerrit; Doomernik, Fransiscus M. P. P.; and Groothoff, Adriaan J., 4,922,167, Cl. 313-431.000.
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Verhagen, Johannes P. C. M., 4,922,478, Cl. 369-247.000.
Wavish, Peter R., 4,922,430, Cl. 364-461.000.

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Harrison, Bruce, 4,921,753, Cl. 428-251.000.
Lawassani, Abdi; Dowd, James D.; and Hilborn, David M., 4,921,300, Cl. 296-97.110.

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Hall, Theodore W.; and Klapproth, Kenneth H., 4,921,401, Cl. 415-138.000.
Molter, Trent M., 4,921,585, Cl. 204-72.000.
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Pietrzak, Kenneth A.; Packer, Scott M.; and Dunne, Kenneth C., 4,922,174, Cl. 318-577.000.

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Nofre, Claude; Tinti, Jean M.; and Ouar Chatzopoulos, Farroudja, 4,921,939, Cl. 558-414.000.

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Andeen, Gerry B.; and Auslander, David M., 4,921,393, Cl. 414-729.000.
Rose, Jed E.; Jarvik, Murray E.; and Rose, Karce D., 4,920,989, Cl. 131-270.000

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Clark, David E., Dalzell, William J., Jr.; and Adams, Brenda L., 4,921,731, Cl. 427-314.000.

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Nichols, Michael F., and Hahn, Allen W., 4,921,723, Cl. 427-4..000.

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Enick, Robert M., 4,921,635, Cl. 252-315.100.

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Mena, Jose G., and Salama, C. Andre T., 4,922,327, Cl. 357-23.400

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Hullett, John L.; and Newman, Robert M., 4,922,244, Cl 340-825.500.

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Gruia, Adrian J., 4,921,595, Cl. 208-59.000.
Kocal, Joseph A., Martindale, David C.; and Kuchar, Paul J., 4,921,946, Cl. 585-444.000.
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Livingston, Douglas A.; Pearlman, Bruce A., Denmark, Scott; and Huber, Joel E., 4,921,638, Cl. 552-610.000.

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Kalkert, Peter, 4,922,214, Cl. 333-135.000.

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Lesher, Harold D.; Kennedy, Christopher R.; White, Danny R.; and Urquhart, Andrew W., 4,921,818, Cl. 501-89.000.

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Suzuki, Kenichi; Shikichi, Satoshi; Kawaguchi, Fumiaki; Usui, Masayuki; Matsuoka, Hiroshi; Matsuoka, Kazuhiko; Hosoya, Hideki; Aoki, Akio; Enari, Masahiko; and Minoura, Kazuo, 4,922,351, Cl. 358-494.000.

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Kozicki, Andrzej; and Brower, Leo C., 4,922,243, Cl. 340-813.000.

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Noguchi, Minori; Koizumi, Mitsuyoshi; Shishido, Hiroaki; Uto, Sachio; and Ohshima, Yoshimasa, 4,922,308, Cl. 356-237.000.

Utyamyshev, Rustam I.: *See*—
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,921,695, Cl. 424-81.000.

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Borresen, Bjarne; and Blumensaadt, Hans C., 4,920,713, Cl 52-200.000.

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Franklin, Richard D.; Auld, Gregg D.; Murray, David E.; Lescisin, John J.; Vaia, Albert R.; and Dunn, Thomas E., 4,921,662, Cl. 376-316.000.

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Valeo: *See*—
Boiraeu, Christian; and Larseneur, Patrick, 4,921,371, Cl. 403-408.100.

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Garay, Antonio A.; Spaulding, Tedford H.; and Valleau, Robert L., 4,921,431, Cl. 439-79.000.

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Saukkonen, Seppo; Tomma, Kauko; and Raudaskoski, Vesa, 4,921,183, Cl. 242-66.000.

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Dessau, Ralph M.; Partridge, Randall D.; and Valyocsik, Ernest W., 4,922,050, Cl. 585-379.000.

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Provest, Phillip B.; and Van Dal, David J., 4,920,763, Cl. 62-378.000.

van den Akken, Koos. Product/card combination. 4,921,094, Cl. 206-232.000.

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Kies, Anton M.; and van den Nieuwelaar, Harry C., 4,921,217, Cl. 254-29.00R.

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Bernan, Donald W.; Kaim, Robert E.; and Vanderpot, John W., 4,922,106, Cl. 250-492.200.

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Sillerud, Laurel O. and van Hulsteyn, David B., 4,922,203, Cl. 324-307.000.

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Walt, Michael J.; Van Kampen, Craig L.; and May, Steven J., 4,920,958, Cl. 606-96.000

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Evani, Syamalarao; and Van Phung, K., 4,921,902, Cl. 524-555.000.

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Foll, Eberhard; Guth, Gustav; Guth, Joachim; Holl, Peter; and van Raaij, Alexander, 4,922,405, Cl. 363-126.000.

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Orlicki, David M.; Gropp, David B., and VanValkenburgh, Thomas E., 4,920,842, Cl. 83-308.000.

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de Jongh, Hendrick Paul; and van Vliet, Nicolaas P., 4,921,845, Cl. 514-172.000.

Vardar, Naci, to Kimberly-Clark Corporation. Spot seeder. 4,921,144, Cl. 222-336.000.

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Berrian, Donald W.; Kaim, Robert E.; and Vanderpot, John W., 4,922,106, Cl. 250-492.200.

Varro, Andras: *See*—
Zubovics, Zoltan; Toldy, Lajos; Rabloczky, Gyorgy; Varro, Andras; Andrasi, Ferenc; Elek, Sandor; and Elekes, Istvan, 4,922,021, Cl. 564-367.000.

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Goldstein, Marc, 4,920,982, Cl. 128-842.000.

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Geiser, Friedrich, 4,921,213, Cl. 251-328.000.

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Mausner, Eberhard, 4,922,177, Cl. 318-663.000.

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Flynn, Richard M., and Verdi, Fred W., 4,921,160, Cl. 235-492.000.

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Peters, Arnold; Hamot, Theodore; and Ver Hoven, Leonard, 4,921,093, Cl. 198-471.100.

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Kuiper, Jan; Verhue, Walter M.; and Klapwijk, Pieter M., 4,921,716, Cl. 426-534.000.

Vermaat, David: *See*—
Gilbert, Laura M.; and Vermaat, David, 4,922,304, Cl. 355-282.000.

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Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,921,725, Cl. 427-45.100.

Vicenzi, Jeffrey T.: *See*—
Tao, Eddie V. P.; and Vicenzi, Jeffrey T., 4,921,947, Cl. 536-7.100.

Vickers Incorporated: *See*—
Kosarzecki, Constantine, 4,921,547, Cl. 137-115.000.

Viessmann, Hans. Method and apparatus for temperature control of heating and cooling plants. 4,921,163, Cl. 236-46.00R.

Vifian, Hugo: *See*—
Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., 4,921,347, Cl. 356-73.100.

Vikhert, Anatoly M.: *See*—
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,921,695, Cl. 424-81.000.

Villa, Corrado: *See*—
Olivo, Marco; Pascucci, Luigi; and Villa, Corrado, 4,922,402, Cl. 363-60.000.

Villa, Marco; Giordano, Claudio; Castaldi, Graziano; and Cavicchioli, Silvia, to Zambon SpA. Stereoconvergent process for preparing optically active carboxylic acids. 4,922,009, Cl. 562-466.000.

Villalobos, Miguel A.: *See*—
Martes, Providencio; and Villalobos, Miguel A., 4,921,580, Cl. 202-205.000.

Villaveces, James W. Device for aiding in preparation of intravenous therapy. 4,921,199, Cl. 248-314.000.

Vincent, Christiane: *See*—
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,921,725, Cl. 427-45.100.

Vincent, Henri: *See*—
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,921,725, Cl. 427-45.100.

Vincent, John A.: *See*—
Small, Jeffrey A.; Brown, Mark D.; and Vincent, John A., 4,922,137, Cl. 307-480.000.

Vincent, Ogden W. Throw-away casting bag. 4,920,684, Cl. 43-41.200.

Visconti, Peter: *See*—
Meyerhoefer, Carl; and Visconti, Peter, 4,920,637, Cl. 29-764.000.

Vogelsang, Klaus, to Voith Turbo GmbH. Hydrodynamic retarder. 4,921,079, Cl. 188-296.000.

Voith Turbo GmbH: *See*—
Vogelsang, Klaus, 4,921,079, Cl. 188-296.000.

Volkmann, Robert A., to Pfizer Inc. Process for optically active 3-thiolanyl sulfonate esters. 4,921,972, Cl. 549-66.000.

Volkswagen AG: *See*—
Sandhagen, Jurgen; and Renger, Udo, 4,922,198, Cl. 324-207.130.

Vollmer, Otto; and Rauscher, Wolfgang, to Knorr-Bremse AG. Trailer brake valve for utility vehicles. 4,921,311, Cl. 303-9.760.

Volvo Hydraulik AB: *See*—
Alm, Filip; Gulbrandsen, Sven; Larsson, Bo; and Ekdahl, Sune, 4,920,860, Cl. 91-504.000.

Vomhoff, Erich: *See*—
Neuhoffer, Hans-Friedrich; and Vomhoff, Erich, 4,920,623, Cl. 29-129.000.

Voss, Forrest L.; and Witherell, Donald R., to Rockwell International Corporation. Wiring board. 4,921,054, Cl. 174-255.000.

Vozmediano, Alfonso: *See*—
Cifuentes, Luis; Sala, Carlos; and Vozmediano, Alfonso, 4,921,288, Cl. 292-144.000.

Vreeland, William B.: *See*—
Kung, Teh-Ming; Vreeland, William B.; and Young, Ralph H., 4,921,637, Cl. 552-295.000.

Vu, Duy-Phach, to Kopin Corporation. Control gate lateral silicon-on-insulator bipolar transistor. 4,922,315, Cl. 357-35.000.

Vulcan Materials Company: *See*—
Petrosky, Jimmy T., 4,922,043, Cl. 570-258.000.

Vyne, Robert L.: *See*—
Susak, David M.; and Vyne, Robert L., 4,922,208, Cl. 330-255.000.

W. Dollken & Co. GmbH: *See*—
Schliehe, Wolf D.; and Eschbach, Mathias, 4,921,414, Cl. 425-131.100.

W. H. Brady Co.: *See*—
Hoyt, Steven D., 4,920,882, Cl. 400-708.000.

W. R. Grace & Co.-Conn.: *See*—
Enloe, Jack H.; Lau, John W.; Lundsager, Christian B.; and Rice, Roy W., 4,920,640, Cl. 29-852.000.

W. Schlafhorst & Co.: *See*—
Grecksch, Hans; Bertrams, Josef; and Loers, Wolfgang, 4,921,180, Cl. 242-35.50A.
Kamp, Heinz, 4,921,181, Cl. 242-43.00A.
Raasch, Hans, 4,920,739, Cl. 57-263.000.
Surkamp, Paul; and Wirtz, Ulrich, 4,921,179, Cl. 242-18.00R.

Wabco Westinghouse Equipements Ferroviaries: *See*—
Grenier, Michel; de la Gorge, Jean-Etienne; Cieplinski, Daniel; Leturgie, Gerard; Thurin, Yves; Meret, Laurent; and Doireau, Christian, 4,921,076, Cl. 188-12.600.

Wada, Eiichi: *See*—
Sugimoto, Tadakatsu; Igarashi, Yoshiski; Saito, Shiro; Wada, Eiichi; and Murai, Keiji, 4,920,836, Cl. 81-463.000.

Wada, Hisayuki: *See*—
Asano, Kiro; Mitsuhashi, Satoshi; Bannai, Kenji; Wada, Hisayuki; and Tamura, Humio, 4,921,849, Cl. 514-182.000.

Waggamon, Dennis W.; and Whitaker, Louis G., to Genie Manufacturing, Inc. Universal door safety system. 4,922,168, Cl. 318-286.000.

Wagner, Fritz: *See*—
Lindoerfer, Walter; Sewe, Kai-Udo; Jahn-Held, Wilhelm; Ziebolz, Burkhard; and Wagner, Fritz, 4,921,615, Cl. 210-729.000.

Wagner, John S.; and Morris, John E., to Graber Industries, Inc. Decorative valance. 4,921,031, Cl. 160-38.000.

Wagner, Oryn B., to Clark Equipment Company. Sideshift mounted backhoe locking mechanism. 4,921,392, Cl. 414-695.000.

Wagner, Paul D.: *See*—
Gleghorn, R. Linn; and Wagner, Paul D., 4,922,152, Cl 310-156.000.

Waguespack, James N.; and Butler, James R., to Fina Technology, Inc. Process for ethylbenzene production. 4,922,053, Cl. 585-449.000.

Wahl, Stefan: *See*—
Eilenberger, Gert; Schrodi, Karl; and Wahl, Stefan, 4,922,487, Cl. 370-60.000.

Wakahara, Hideki; Matsuo, Yoshihiro; and Kawamura, Minoru, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Conductive fabric and a method for the manufacture of the conductive fabric, and a conductive sheet and film made using the conductive fabric. 4,921,751, Cl. 428-229.000.

Wakamatsu, Kazuhiro; Yonekura, Seiji; Suzuki, Mitsuo; Tadokoro, Hiroyuki; and Suzuki, Atsuo, to Hitachi, Ltd.; and Hitachi Setsubi Engineering Co., Ltd. High precision image recording apparatus. 4,922,272, Cl. 346-160.000.

Wakena, Shigeru: *See*—
Eguchi, Kinya; Niitsuma, Kikue; Wakena, Shigeru; and Ezawa, Masayoshi, 4,922,104, Cl. 250-339.000.

Wakiyama, Shigeru: *See*—
Tokumoto, Hiroshi; Bando, Hiroshi; Sakai, Fumiki; Miyata, Chikara; and Wakiyama, Shigeru, 4,921,346, Cl. 356-72.000.

Waldman, Francis A.: *See*—
Bredt, James F.; Suh, Nam P.; and Waldman, Francis A., 4,922,082, Cl. 219-541.000.

Waldo, Robert L.: *See*—
Nelson, David C.; Bartasevich, William E.; and Waldo, Robert L., 4,921,402, Cl. 415-148.000.

Wales, R. Langdon; and Crowley, H. W., to Automation, Inc. Ink motor system. 4,921,132, Cl. 222-57.000.

Walker, Andre; and Reise, Terrence F., to Duracell Inc. Process for producing beta manganese dioxide. 4,921,689, Cl. 423-605.000.

Walker, Benjamin L. Acoustic horn audio reproducer. 4,922,541, Cl. 381-156.000.

Walker, James T.: *See*—
Larsen, Raymond S.; and Walker, James T., 4,922,452, Cl. 365-45.000.

Walker, John S.; and Jenkins, Scott E., to Motorola, Inc. Origami composite EMI/TEMPEST proof electronics module. 4,922,059, Cl. 174-254.000.

Walker, Keith A. M.; Bruno, John J.; and Martinez, Gregory R., to Syntex (U.S.A.) Inc. Carbostyril derivatives as combined thromboxane synthetase and cyclic-amp phosphodiesterase inhibitors. 4,921,862, Cl. 514-312.000.

Walker, Richard L.: *See*—
Bernard, John K.; Brand, Hunt K.; and Walker, Richard L., 4,922,520, Cl. 379-88.000.

Walker, Theodore R., Jr.; and Wooten, W. Carl, Jr., to Eastman Kodak Company. Production of dialkyl (phenylenedioxy) diacetates. 4,922,000, Cl. 560-061.000.

Wallace, R. Bruce: *See*—
Shirai, Takashi; and Wallace, R. Bruce, 4,921,698, Cl. 424-85.500.

VOL
1114
ISS
1
MY
1
1990
UMI

Wallin, Stig G.: *See—*
Eriksson, Kjell G; Ek, Bo R.; Wallin, Stig G.; and Eriksson, Nils L., 4,921,650, Cl. 264-37.000.
Walt, Michael J.; Van Kampen, Craig L.; and May, Steven J., to Minnesota Mining and Manufacturing Company. Drill guide assembly 4,920,958, Cl. 606-96.000.
Walters, Wayne E.: *See—*
Kenney, John B., Rohrs, Charles E.; and Walters, Wayne E., 4,922,530, Cl. 379-411.000.
Waltke, David L.; and Thomas, Larry D., to Hoover Group, Inc. Liquid supply system utilizing stacked tanks. 4,921,126, Cl. 220-855.000.
Walton, Richard R.; and Munchbach, George E., to Walton, Richard R. Web processing with two mated rolls. 4,921,643, Cl. 264-282.000.
Wang, Chia-Lin J.; and Wuonola, Mark A., to Du Pont de Nemours, E. I., and Company. Aminomethyl oxooxazolidinyl cycloalkylbenzene derivatives useful as antibacterial agents. 4,921,869, Cl. 514-376.000.
Wang, Henry Y.; and Li, Xiang M. Dissolved oxygen measuring method. 4,921,582, Cl. 204-153.100.
Wang, Pen C., to Shell Oil Company. Thermosetting resin compositions. 4,921,931, Cl. 528-322.000.
Ward, Seth, II, to POM Incorporated. Slip clutch handle for parking meter system. 4,920,824, Cl. 74-553.000.
Warner, Charles L., II: *See—*
Gilliland, Malcolm T.; and Warner, Charles L., II, 4,922,161, Cl. 318-269.000.
Warner-Lambert Company: *See—*
Carethers, Mary E.; Cetenko, Wiaczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,921,871, Cl. 514-432.000.
Malone, Thomas C.; and Sircar, Jagadish C., 4,921,858, Cl. 514-258.000.
Sircar, Jagadish C.; Schwender, Charles F.; and Suto, Mark J., 4,921,859, Cl. 514-262.000.
Warwick International Limited: *See—*
Gradwell, Anthony J.; and Withenshaw, John D., 4,921,631, Cl. 252-186.380.
Wassel, William W.: *See—*
Gaussa, William P.; Theriault, David G.; Wassel, William W.; Skoncey, John A.; and Havelka, Ronald R., 4,922,194, Cl. 324-158.00R.
Wasserman, Charles J.: *See—*
Schiff, Robert; Lehnus, Gary; Wasserman, Charles J.; and Garlock, Henrietta M., 4,921,809, Cl. 436-5. 1.000.
Watabe, Mitsuru: *See—*
Sugiura, Yasuyuki; Watabe, Mitsuru; Morinaga, Shigeki; Miyashita, Kunio; and Sugai, Hiroshi, 4,922,175, Cl. 318-592.000.
Watanabe, Atsuo; Ikeda, Takahide; Tsukuda, Kiyoshi; Hirao, Mitsuru; Mukai, Touji; and Kamei, Tatsuya, to Hitachi, Ltd. Semiconductor integrated circuit device and a method for manufacturing the same. 4,921,811, Cl. 437-31.000.
Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming device. 4,922,292, Cl. 355-75.000.
Watanabe, Kaneo; Iwamoto, Masayuki; and Minami, Koji, to Sanyo Electric Co., Ltd. Photovoltaic device. 4,922,218, Cl. 357-30.000.
Watanabe, Kaneo: *See—*
Kuwano, Yukinori; Mori, Noriyuki; Nakano, Shoichi; Uehara, Hisao; Kobayashi, Mitsugu; Watanabe, Kaneo; and Noguchi, Shigeru, 4,922,111, Cl. 250-566.000.
Watanabe, Kazuo; and Sato, Yoshinori, to Sony Corporation. Output buffer circuit. 4,922,458, Cl. 365-189.050.
Watanabe, Kouichi: *See—*
Matsumoto, Motoki; and Watanabe, Kouichi, 4,921,166, Cl. 237-60.000.
Watanabe, Takashi: *See—*
Nishihara, Testuo; Watanabe, Takashi; and Tohjyoh, Tomotaroh, 4,921,363, Cl. 400-120.000.
Watanabe, Tohru, to Shin Caterpillar Mitsubishi Ltd. Work stacking apparatus. 4,921,397, Cl. 414-788.400.
Watanabe, Toichi: *See—*
Sofue, Tadashi; and Watanabe, Toichi, 4,922,075, Cl. 219-92.000.
Watanabe, Yasushi: *See—*
Yajima, Yasuhito; Watanabe, Yasushi; and Shibata, Kazuyoshi, 4,920,805, Cl. 73-706.000.
Watanabe, Yoshiaki: *See—*
Yokoo, Chihiro; Onodera, Akira; Fukushima, Hiroshi; Watanabe, Yoshiaki; and Sota, Kaoru, 4,921,953, Cl. 540-227.000.
Waters, Frank E. Bolt assembly for self-loading gun. 4,920,855, Cl. 89-172.000.
Watkins, Jonathan. Means providing moving water stream ejecting into spa tank. 4,920,588. Cl. 4-542.000.
Watson, Norman F., to EKA Limited. Load handling device. 4,921,394, Cl. 414-546.000.
Watson, Peter R., to Xerox Corporation. Plural belt document feeder. 4,921,240, Cl. 271-245.000.
Watterson, Scott R., to Weslo, Inc. Exercise apparatus resistance system. 4,921,242, Cl. 272-72.000.
Wavish, Peter R., to U.S. Philips Corporation. Method and apparatus for controlling the movement of a guided object. 4,922,430, Cl. 364-461.000.
Wazaki, Yoshio; Oono, Tetsuya; and Narisawa, Nobuyuki, to Honda Giken Kogyo Kabushiki Kaisha. Driving wheel slip control system for vehicles. 4,921,064, Cl. 180-197.000.
Weaver, Douglas E.: *See—*
Mawby, Harold S.; and Weaver, Douglas E., 4,920,696, Cl. 312-214.000.
Weaver, Frank C., to Stewart Warner Instrument Corporation. Liquid level sender with linear float. 4,920,798, Cl. 73-313.000.
Web Technology, Inc.: *See—*
Etess, Edward, 4,920,785, Cl. 73-40.700.
Webb, John D., Jr.; and Morr, James J., to Zimmer, Inc. Rasp tool. 4,921,493, Cl. 606-85.000.
Webb Mfg., Inc.: *See—*
Garries, Ray W.; Burke, Edward H.; Mueller, Kevin D.; and Leone, Joseph D., 4,920,709, Cl. 52-85.000.
Weber, Jimmie L. Fishing bait and lure holder. 4,920,683, Cl. 43-25.200.
Weber, Thomas J.: *See—*
Ewan, Thomas K.; Musslewhite, Thomas W.; Barden, Charles R.; Weber, Thomas J.; Burnette, Andrew D.; Hedfi, Adel; Cole, Heather E.; Moore, James C., and Jacubec, Mark R., 4,921,886, Cl. 423-235.000.
Webquip Corporation: *See—*
Tafel, Leonard I., 4,920,881, Cl. 101-488.000.
Weddige, Ronald C.: *See—*
Lidinsky, William P.; Roediger, Gary A.; Steele, Scott B., and Weddige, Ronald C., 4,922,486, Cl. 370-60.000.
Wedeniwski, Horst J. Method for dressing grinding wheels. 4,920,945, Cl. 125-11.030.
Weidman, Timothy W., to American Telephone and Telegraph Company. Silicon network polymers. 4,921,321, Cl. 350-96.120.
Weidmann, Ulrich. Motion apparatus. 4,921,243, Cl. 272-96.000.
Weigelt, F. Werner: *See—*
Morlock, Gerhard; and Weigelt, F. Werner, 4,921,881, Cl. 522-99.000.
Weightman, Judy M.; and Mirikitani, Andrew K. Shoulder belt mini-cover and cushion. 4,921,273, Cl. 280-808.000.
Weihe, Hans P.: *See—*
Ulrich, Peter; and Weihe, Hans P., 4,922,078, Cl. 219-216.000.
Weinberg, Matthew: *See—*
Thomas, Mammen, and Weinberg, Matthew, 4,922,318, Cl. 357-43.000.
Weiner, Rudolf. Invalid lifting and carrying apparatus. 4,920,590, Cl. 5-86.000.
Weinreb, Daniel L.: *See—*
Holloway, John T.; Moon, David A.; Cannon, Howard I.; Knight, Thomas F.; Edwards, Bruce E.; and Weinreb, Daniel L., 4,922,414, Cl. 364-200.000.
Weinstein, Marshall: *See—*
Finke, Malcolm K.; Weinstein, Marshall; and Muderlak, Kenneth J., 4,921,097, Cl. 206-387.000.
Weir, David J., to Astro ARC Company. Thick tube welder. 4,922,073, Cl. 219-60.00A.
Welkowsky, Murray S.: *See—*
Grinberg, Jan; and Welkowsky, Murray S., 4,922,116, Cl. 250-495.100.
Wella Aktiengesellschaft: *See—*
Clausen, Thomas; and Konrad, Eugen, 4,921,504, Cl. 8-415.000.
Lang, Gunther; Wendel, Harald; and Konrad, Eugen, 4,921,949, Cl. 536-20.000.
Wendel, Harald: *See—*
Lang, Gunther; Wendel, Harald, and Konrad, Eugen, 4,921,949, Cl. 536-20.000.
Wenzel, Philip H., to Ferris Industries, Inc. Drive control for walk-behind mower with hydrostatic transmission. 4,920,734, Cl. 56-11.100.
Wenzel, Richard A.: *See—*
Benoit, Gordon L.; Sable, Lewis E.; and Wenzel, Richard A., 4,921,197, Cl. 248-97.000.
Werner, Silvia: *See—*
Krimmer, Hans-Peter; Drauz, Karlheinz; and Werner, Silvia, 4,921,971, Cl. 548-534.000.
Werner, Willy. Bearing assembly with seal. 4,921,362, Cl. 384-482.000.
Wernicke, Friedrich C.: *See—*
Chin, William B.; Dussault, Rudolph D.; Knepper, Ronald W.; Wernicke, Friedrich C.; and Wong, Robert C., 4,922,455, Cl. 365-154.000.
Weslo, Inc.: *See—*
Watterson, Scott R., 4,921,242, Cl. 272-72.000.
West, Henry L., to Eastman Kodak Company. Fluid pressure switch having venting means for dispersing back pressure. 4,922,067, Cl. 200-83.00P.
West, William L., Jr.; and Shafer, James E., to Metrofone, Inc. System for interfacing a standard telephone set with a radio transceiver. 4,922,517, Cl. 379-58.000.
Western Digital Corporation: *See—*
Lofgren, Karl M. J.; Shearer, Gerald W.; and Ouyang, Kenneth W., 4,922,141, Cl. 307-595.000.
Westinghouse Electric Corp.: *See—*
Boatwright, David A., 4,921,663, Cl. 376-451.000.
Cox, Roger W., 4,922,195, Cl. 324-158.0MG.
Dederer, Jeffrey T.; and Hackworth, Donald T., 4,920,754, Cl. 62-53.100.
Franklin, Richard D.; Auld, Gregg D.; Murray, David E.; Lescisin, John J.; Vaia, Albert R.; and Dunn, Thomas E., 4,921,662, Cl. 376-316.000.
Gaussa, William P.; Theriault, David G.; Wassel, William W.; Skoncey, John A.; and Havelka, Ronald R., 4,922,194, Cl. 324-158.00R.

Livesey, John K.; and Altenhof, James N., Jr., 4,922,220, Cl. 337-82.000.
McKee, Bobby D.; and Nakagawa, Alvin H., 4,922,163, Cl. 310-239.000.
Nathanson, Harvey C.; Driver, Michael C.; and Betsch, Regis J., 4,922,253, Cl. 342-5.000.
Sismour, Albert C., Jr.; Hagaman, Robert T.; and Ying, Sui-Chun, 4,922,147, Cl. 310-61.000.
Twerdochlib, Michael, 4,922,233, Cl. 340-606.000.
Westphal, Gordon W.: *See—*
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W., Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.
Wheatley, Margaret A.; Langer, Robert S.; and Eisen, Herman N., to Massachusetts Institute of Technology. System for delayed and pulsed release of biologically active substances. 4,921,757, Cl. 428-402.200.
Wheeler, Stephen E.: *See—*
Casanova, Wayne J.; Dimmick, Roger F.; Hall, William A.; Homan, Lester C.; Lukes, Frank J.; Martin, Bradley L.; Mosley, Claude J.; Reckinger, Arthur P., Jr.; Schaefer, Paul W.; Squillace, Zanti D.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,922,125, Cl. 307-149.000.
Whiffen, E. L., to Rockwell International Corporation. Moving head high frequency resistance welding system. 4,921,568, Cl. 156-379.800.
While Consolidated Industries, Inc.: *See—*
Mawby, Harold S.; and Weaver, Douglas E., 4,920,696, Cl. 312-214.000.
Whillock, Allan A.: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,921,733, Cl. 428-34.200.
Whirlpool Corporation: *See—*
Janke, Donald E.; and Frohbieter, Edwin H., 4,920,758, Cl. 62-187.000.
Metcalfe, L. D.; Maczuzak, Michael J.; Bailey, Curtis J.; and Deyo, Paul R., 4,921,315, Cl. 312-321.500.
Whitaker, Louis G.: *See—*
Waggamon, Dennis W.; and Whitaker, Louis G., 4,922,168, Cl. 318-286.000.
White, Alfred J.: *See—*
Ty, Henry; Zaveri, Narendra R.; and White, Alfred J., 4,921,165, Cl. 236-93.00P.
White, Danny R.: *See—*
Lesher, Harold D.; Kennedy, Christopher R.; White, Danny R.; and Urquhart, Andrew W., 4,921,818, Cl. 501-89.000.
White, James C.; and Pinson, George T., to Boeing Company, The. Apparatus for winding optical fiber on a bobbin. 4,920,738, Cl. 57-62.000.
White, Larry A.: *See—*
Davidson, Gordon O.; Mitchell, Barry C.; and White, Larry A., 4,922,185, Cl. 324-74.000.
White, Terrance F. Studio stool. 4,921,303, Cl. 297-338.000.
White, William R., Dahlstrom, Mary A.; and Lindholm, Scott O., to Texaco Inc. Diesel lubricating oil consumption control additives. 4,922,045, Cl. 585-10.000.
Whitmore, Bryan: *See—*
Kukanskis, Peter E.; and Whitmore, Bryan, 4,921,571, Cl. 156-656.000.
Wickmann, John T.: *See—*
Horan, Gerald P.; Wickmann, John T.; and McNamee, Stanislaus, 4,920,781, Cl. 72-447.000.
Wiegleb, Gerhard: *See—*
Modlinski, Ulrich; and Wiegleb, Gerhard, 4,922,108, Cl. 250-504.00R.
Wieland, Josef H.: *See—*
Seifert, Gottfried; Staubli, Sebastian; Wieland, Josef H.; Regenass, Willy; Buerli, Martin; Lee, John G.; and Lund, Richard B., 4,922,008, Cl. 562-58.000.
Wiemeri, Ronald W.; and Mitchell, James N., to Blount, Inc. Method and apparatus to fell a tree. 4,921,024. Cl. 144-336.000.
Wienecke, Franz, to Munich, Steinmann, Schiller. Worm mower. 4,920,737, Cl. 56-249.000.
Wies, Georges: *See—*
Klutz, Hans J.; Flora, Bruno; Gilles, Gerard; and Wies, Georges, 4,921,086, Cl. 193-3.000.
Wijay, Bandula; and Angelini, Paolo, to Leocor, Inc. Angioplasty catheter. 4,921,483, Cl. 604-96.000.
Wild, Victor F.; Serrano, Michael; and Burtson, Eric J., to Wild, Victor F. Fiber optic probe. 4,921,326, Cl. 350-96.260.
Wiley, Ronald L.: *See—*
Fischer, Wolfgang; Kennedy, Richard T.; and Wiley, Ronald L., 4,921,139, Cl. 222-129.100.
Wilkening, Steven R.: *See—*
Artwick, Kert E.; and Wilkening, Steven R., 4,920,718, Cl. 52-476.000.
Wilkes, Bernd: *See—*
Naumann, Dieter; Tyrra, Wieland; Kock, Birgit; Rudolph, Werner; and Wilkes, Bernd, 4,922,041, Cl. 570-141.000.
Wilkinson, James H., to Sony Corporation. Apparatus for coding a digital component video signal. 4,922,329, Cl. 358-12.000.
Will, Leslie: *See—*
Clark, Emmit S.; and Will, Leslie, 4,921,195, Cl. 248-97.000.
Willems, William F. M. J.: *See—*
Bossaert, Bernard L. L.; Ohlsson, Stefan B., and Willems, William F. M. J., 4,921,749, Cl. 428-216.000.
Willford, George A., to Dana Corporation. Power take-off control apparatus. 4,920,813, Cl. 74-11.000.
Williams, David F.: *See—*
Vander Meer, Robert K.; Lofgren, Clifford S.; and Williams, David F., 4,921,696, Cl. 424-84.000.
Williams, George A., Jr. Idle/no-idle light system. 4,922,231, Cl. 340-584.000.
Williams, Ralph E.: *See—*
Hill, Lawrence A.; Jacobs, Michael E.; Kroll, Arthur S., and Williams, Ralph E., 4,922,302, Cl. 355-251.000.
Williams, Ronald D.: *See—*
Crow, William D.; and Williams, Ronald D., 4,922,066, Cl. 200-80.00R.
Wilmer, Gerhard: *See—*
Linke, Adolf; Dutz, Karl-Heinz; Niermann, Hans; and Wilmer, Gerhard, 4,920,926, Cl. 122-379.000
Wilson, David N.: *See—*
Matthews, Bernard T.; Joll, David J., Ziauddin, Habeeb M.; and Wilson, David N., 4,921,714, Cl. 426-90.000.
Wilson, Jeffrey D., to Burroughs Wellcome Co. Preparation of 3'azido-3'-deoxythymidine. 4,921,950, Cl. 536-23.000.
Wilson, John R.; Rousek, Marian M.; and Massey, Fred L., to Goodyear Tire & Rubber Company, The. Process for the synthesis of a copolyester adhesive resin. 4,921,929, Cl. 528-272.000.
Wilson, Lloyd W., to Allied-Signal Inc. Dual structure turbine blade. 4,921,405, Cl. 416-241.00R.
Wilson, Ronald A., to Microwave Development Laboratories. Method of assembling electrical connector. 4,920,643, Cl. 29-876.000.
Winblad, Bengt: *See—*
Juhlin, Sven-Eric; Bergkvist, Hakan; Norberg, Astrid; and Winblad, Bengt, 4,921,112, Cl. 215-11.400.
Windorski, David C., to Minnesota Mining and Manufacturing Company. Dispenser for a stack of note paper. 4,921,127, Cl. 221-45.000.
Windward Islands Banana Grower's Association, The: *See—*
Banks, Nigel H.; Borton, Colin A.; Leonce, Francis S.; Lomax, Terence J.; Meier, Antony R. H.; and Skiba, Christopher J., 4,921,702, Cl. 424-404.000.
Winkelmann, Juergen: *See—*
Luther, Hans W.; Winkelmann, Juergen, Sauvestre, Jean-Claude; and Montier, Patrick, 4,920,888, Cl. 102-518.000.
Winsor, Paul, IV: *See—*
MacDougall, Frederick W.; and Winsor, Paul, IV, 4,922,375, Cl. 361-273.000.
Wintershall AG: *See—*
Lindoerfer, Walter; Sewe, Kai-Udo; Jahn-Held, Wilhelm; Ziebolz, Burkhard; and Wagner, Fritz, 4,921,615, Cl. 210-729.000.
Wirtz, Ulrich: *See—*
Surkamp, Paul, and Wirtz, Ulrich, 4,921,179, Cl. 242-18.00R.
Wirz, Peter: *See—*
Hubert, Peter; Kussel, Barbara; and Wirz, Peter, 4,921,724, Cl. 427-41.000.
Withenshaw, John D.: *See—*
Gradwell, Anthony J.; and Withenshaw, John D., 4,921,631, Cl. 252-186.380.
Witherell, Donald R.: *See—*
Voss, Forrest L.; and Witherell, Donald R., 4,921,054, Cl. 174-255.000.
Witkamp, Hendrik A.; Verweij, Jan; DeKoning, Jan J., Grootveld, Herman H.; and Leenderts, Everardus J. A. M., to Gist-Brocades N.V. Process for the preparation of cephem compounds. 4,921,954, Cl. 540-222.000.
Witte, Karl: *See—*
Bockeler, Franz-Josef; Gobmann, Wolfgang; Buchhorn, Axel, Jackenkroll, Horst; Marks, Hubert; Witte, Karl; and Schnelle, Diethard, 4,922,386, Cl. 362-61.000.
Witzel, Ulrich; and Muller, Karl H., to Witzel, Ulrich. External fixture for osteosynthetis. 4,920,959, Cl. 606-53.000.
Wojcik, Thaddeus, to Resinoid Engineering Corporation. Method of manufacturing commutator assemblies. 4,920,633, Cl. 29-597.000.
Wolgast, Stephen, to Spectra Physics, Inc. Mirror translation apparatus for altering focal point position in a laser. 4,922,501, Cl. 372-54.000.
Wolstenholme, Jack: *See—*
Hoos, Keith M.; and Wolstenholme, Jack, 4,922,042, Cl. 570-247.000.
Womack, Kent; and Hise, Tony. Socket pipe wrench. 4,920,834, Cl. 81-165.000.
Womble, Karen M.: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M. L., 4,920,990, Cl. 131-359.000.
Wong, Milly M. L.: *See—*
Lawrence, Brian M.; Moates, Robert F.; Perfetti, Thomas A.; Pogrow, Renee M.; Powell, Robert H.; Redding, Jerry W.; Stewart, Cynthia A.; Womble, Karen M.; and Wong, Milly M. L., 4,920,990, Cl. 131-359.000.
Wong, Robert C.: *See—*
Chin, William B.; Dussault, Rudolph D.; Knepper, Ronald W.; Wernicke, Friedrich C.; and Wong, Robert C., 4,922,455, Cl. 365-154.000.
Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., to Hewlett-Packard Company. Method and apparatus for calibrating a lightwave component measurement system. 4,921,347, Cl. 356-73.100.

VOL
1114
ISS
1
MY
1
1990
UMI

Wood, Anthony M., to River Don Castings Limited. Load lifting apparatus. 4,921,291, Cl. 294-90.000.
Wood, Gary L.: *See—*
LaVelle, Richard E.; Wood, Gary L.; Morrey, Kevin P.; and Bossert, Clayton E., 4,920,589, Cl. 5-61.000.
Wood, J. F. B.: *See—*
Bergeron, Norman J.; Wood, J. F. B.; and Hazelett, R. W., 4,921,037, Cl. 164-432.000.
Wood, John E.: *See—*
Jacobsen, Stephen C.; Wood, John E.; and Price, Richard H., 4,922,164, Cl. 310-309.000.
Woodle, Allan S., IV; and Benoit, Marcell N., to Lodec, Inc. Load cell block and method of manufacturing the same. 4,921,059, Cl. 177-211.000.
Wooten, W Carl, Jr.: *See—*
Walker, Theodore R., Jr.; and Wooten, W. Carl, Jr., 4,922,000, Cl. 560-061.000.
Wright, Michael E., to National Semiconductor Corporation. Feed forward darlington circuit with reduced NPN reverse beta sensitivity. 4,922,129, Cl. 307-315.000.
Wu, Mitchell B.: *See—*
Harwell, William D.; and Wu, Mitchell B., 4,921,292, Cl. 294-65.500.
Wu, Tai-Wing, to Eastman Kodak Company. Method for extracting bilirubin-specific enzyme preparation. 4,921,804, Cl. 435-189.000.
Wu, Tsann-Kuen. Venturi-tube bubble-forming container. 4,921,640, Cl. 261-76.000.
Wuchinich, David G., to Cavitron, Inc. Method for preventing clogging of a surgical aspirator. 4,921,476, Cl. 604-22.000.
Wullbrandt, Dieter: *See—*
Schneider, Manfred; Laumen, Kurt; Breitgoff, Detlef; Wullbrandt, Dieter; Schilingmann, Merten; and Keller, Reinhold, 4,922,001, Cl. 560-112.000.
Wulz, Klaus: *See—*
Birnbach, Stefan; Mueller, Josef; Wulz, Klaus; and Houben, Jochen, 4,922,029, Cl. 568-616.000.
Wuonola, Mark A.: *See—*
Wang, Chia-Lin J.; and Wuonola, Mark A., 4,921,869, Cl 514-376.000.
Wurzburger, Martin: *See—*
Adolfs, Friedhelm; Bittner, Gerd; Busing, Klaus P.; Harris, Stephen; Hahn, Ulrich; and Wurzburger, Martin, 4,921,352, Cl. 356-347.000.
Wyatt, Philip. Method and apparatus for arterial and venous blood sampling. 4,920,970, Cl 128-673.000.
Wykhuis, Lloyd A.: *See—*
Lee, Michael C.; Behrens, Robert N.; Dobberpuhl, Dale R.; Wykhuis, Lloyd A.; and Montgomery, Dix S., 4,920,732, Cl. 56-10.200.
Wyko Equipments Ltd.: *See—*
Greaves, Brian; and Jenkins, Hugh M., 4,920,783, Cl. 72-454.000.
Wykowski, Paul L.: *See—*
Hefner, Robert E., Jr.; and Wykowski, Paul L., 4,921,927, Cl. 528-87.000.
Xerox Corporation: *See—*
Agarwal, Vinod K., 4,922,305, Cl. 355-299.000.
Folkins, Jeffrey J.; Goren, Robert N.; and Rees, James D., 4,922,298, Cl. 355-218.000.
Law, Kock-Yee; and Bailey, F. Courtney, 4,922,018, Cl. 564-307.000.
Melnyk, Andrew R.; Nealey, Richard H.; Brach, Paul J.; and Teuscher, Leon A., 4,921,773, Cl. 430-132.000.
Odell, Peter G.; Baranyi, Giuseppa; and Alexandru, Lupu, 4,921,940, Cl. 528-486.000.
Watson, Peter R., 4,921,240, Cl. 271-245.000.
Yuh, Huoy-Jen; Ong, Beng S.; Spiewak, John W.; and Thornton, Constance J., 4,921,769, Cl. 430-64.000.
Y-TEX Corporation: *See—*
Zatkos, Robert J., 4,920,671, Cl. 40-301.000.
Yada, Katsuyoshi: *See—*
Yamaguchi, Shoji; Yamada, Kimiko; Yada, Katsuyoshi; Sakaguchi, Koichi; and Inoue, Hiromu, 4,921,623, Cl. 252-512.000.
Yagi, Sakai: *See—*
Endo, Takayoshi; Yagi, Sakai; Sakai, Hitoshi; and Saito, Hitoshi, 4,921,448, Cl. 439-595.000.
Yajima, Yasuhito, to NGK Insulators, Ltd. A method of manufacturing a thermo-sensitive resistor. 4,920,635, Cl. 29-612.000.
Yajima, Yasuhito; Watanabe, Yasushi; and Shibata, Kazuyoshi, to NGK Insulators, Ltd. Pressure sensor having baffling means. 4,920,805, Cl. 73-706.000.
Yale Security Inc.: *See—*
Surko, Walter E., Jr., 4,920,773, Cl. 70-224.000.
Yamada, Bunshi; Kimura, Michio; and Noguchi, Yoshio, to Toray Industries. Process for separating dichlorocumene isomer. 4,922,039, Cl. 570-211.000.
Yamada, Chiharu; and Yamada, Hideto. Vacuum-packing machine. 4,920,726, Cl. 53-79.000.
Yamada, Hideto: *See—*
Yamada, Chiharu; and Yamada, Hideto, 4,920,726, Cl. 53-79.000.
Yamada, Kimiko: *See—*
Yamaguchi, Shoji; Yamada, Kimiko; Yada, Katsuyoshi; Sakaguchi, Koichi; and Inoue, Hiromu, 4,921,623, Cl. 252-512.000.
Yamada, Shigeru; and Terada, Setsuo, to Dainichiseika Color & Chemicals Mfg. Co., Ltd.; and Ukima Colour & Chemicals Mfg. Co., Ltd. Polyester imide resins. 4,921,761, Cl. 428-473.500.
Yamaguchi, Akira: *See—*
Yamaguchi, Nobuyuki; and Yamaguchi, Akira, 4,921,187, Cl. 242-232.000.
Yamaguchi, Nobuyuki; and Yamaguchi, Akira, to Daiwa Seiko, Inc. Bail inverter for a spinning fishing reel and reel. 4,921,187, Cl. 242-232.000.
Yamaguchi, Seiji: *See—*
Sagawa, Hirotoshi; and Yamaguchi, Seiji, 4,921,912, Cl. 525-112.000.
Yamaguchi, Shoji; Yamada, Kimiko; Yada, Katsuyoshi; Sakaguchi, Koichi; and Inoue, Hiromu, to Mitsubishi Petrochemical Co., Ltd. Copper conductive coating composition. 4,921,623, Cl. 252-512.000.
Yamaguchi, Terumoto: *See—*
Shinto, Hiroaki; Nakamura, Syuji; Yamaguchi, Terumoto; Oguri, Tomoji; and Terashima, Tuneo, 4,920,821, Cl. 74-552.000.
Yamaguchi, Tomoyoshi, to J. L. S. Corp. Method for fixing permanent magnets to cover of bedclothing. 4,921,560, Cl. 156-213.000.
Yamaguchi, Yuzo; Takeuchi, Yoshinori; Saitoh, Yokuo; Daito, Hiroshi; Nakajima, Hiroyasu; Karakama, Yoshiakira; Umakoshi, Yukimori; Hori, Kazunori; and Tokuyama, Mikio, to Hitachi, Ltd. Transducer supporting apparatus and disk storage unit. 4,922,356, Cl. 360-104.000.
Yamaha Corporation: *See—*
Abe, Yasunao, 4,920,851, Cl. 84-626.000.
Baba, Mitsuru, 4,922,444, Cl. 364-566.000.
Mizuno, Kotaro, 4,920,849, Cl. 84-613.000.
Nagai, Taku, 4,921,812, Cl. 437-35.000.
Noro, Masao, 4,922,469, Cl. 367-140.000.
Suzuki, Hideo, 4,920,848, Cl. 84-600.000.
Yamaichi Electric Mfg. Co., Ltd.: *See—*
Matsuoka, Noriyuki, 4,921,430, Cl. 439-72.000.
Yamakawa, Susumu: *See—*
Ando, Masakatsu; Kawaguchi, Minori; and Yamakawa, Susumu, 4,920,788, Cl. 73-118.100.
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, to Canon Kabushiki Kaisha/Canon Denshi Kabushiki Kaisha. Motor driven exposure adjusting device. 4,922,274, Cl. 354-271.100.
Yamamoto, Masasi: *See—*
Mizuno, Hiroshi; Natasuhara, Toshiya; Enoguchi, Yuji; Ikegawa, Akihito; Yamamoto, Masasi; and Murasaki, Hiroshi, 4,920,916, Cl. 118-653.000.
Yamamoto, Shigemi; and Seto, Toshiaki, to Nippon Seiko Kabushiki Kaisha. Buckle device with switch for detecting tongue lock. 4,920,620, Cl. 24-641.000.
Yamamoto, Yuji; Shiina, Kanichi; and Tokutake, Toshinori, to Showa Aluminum Corporation. Receiver for refrigerant apparatus. 4,920,766, Cl. 62-474.000.
Yamamura, Masaaki: *See—*
Taniguchi, Hisayuki; and Yamamura, Masaaki, 4,922,332, Cl. 358-77.000.
Yamanaka, Kunihiro: *See—*
Takahashi, Shuichi; Yamanaka, Kunihiro; and Horiki, Masanao, 4,922,546, Cl. 455-74.000.
Yamasaki, Masahiko; and Kawakatsu, Satoshi, to Konishiroku Photo Industry Co., Ltd. Method for measuring specific component using peroxidase enzyme reaction. 4,921,791, Cl. 435-28.000.
Yamato Kosan Co., Ltd.: *See—*
Iishiki, Naotsugu; Okano, Shigetou; and Mishima, Shiro, 4,920,750, Cl. 60-671.000.
Yamatsu, Kiyomi: *See—*
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl. 514-319.000.
Yamauchi, Hiroshi. *See—*
Kamiya, Takashi; Naito, Toshihiko; Negi, Shigeto; Komatu, Yuuki; Kai, Yasunobu; Nakamura, Takaharu; Sugiyama, Isao; Machida, Yoshimasa; Nomoto, Seiichiro; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,921,850, Cl. 514-202.000.
Yamauchi, Shouji. Acupressure type rhinitis therapeutic device. 4,920,956, Cl. 128-24.100.
Yamauchi, Yukio: *See—*
Ohtani, Shigeru; and Yamauchi, Yukio, 4,922,230, Cl. 340-577.000.
Yamaura, Yutaka: *See—*
Nakamura, Takashi; and Yamaura, Yutaka, 4,920,905, Cl. 112-275.000.
Yamazaki, Etsuo: *See—*
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, 4,921,357, Cl. 372-38.000
Yamazaki, Yasuhiro: *See—*
Endoh, Toshiaki; and Yamazaki, Yasuhiro, 4,922,545, Cl. 382-56.000.
Yan, Raymond Chan-Man: *See—*
Gray, Richard L.; Yan, Raymond Chan-Man; and Rosenthal, Bruce, 4,922,371, Cl. 361-91.000.
Yanagawa, Nobuyuki: *See—*
Saeki, Sirou; Ikeda, Sunao; Otsuka, Hirohisa; and Yanagawa, Nobuyuki, 4,921,236, Cl. 271-3.100.
Yanagishima, Takayuki: *See—*
Obara, Hideo; and Yanagishima, Takayuki, 4,922,426, Cl. 364-424.050.
Yanai, Masami; and Maeda, Hiroki, to Elco Corporation. Method for connecting wires to an electrical connector. 4,920,642, Cl. 29-860.000.

Yaney, David S.: *See—*
Lee, Kuo-Hua; Lu, Chih-Yuan; and Yaney, David S., 4,922,311, Cl. 357-23.100.
Yano, Mitsuaki: *See—*
Nakatani, Kenji; Okaniwa, Hiroshi; and Yano, Mitsuaki, 4,920,917, Cl. 118-718.000.
Yardley, John P.: *See—*
Abou-Gharbia, Magid A.; Yardley, John P.; Childers, Wayne E., Jr.; and Cliffe, Ian A., 4,921,958, Cl. 544-295.000.
Yasuda, Nobuaki: *See—*
Ikegawa, Sumio; Terashima, Yoshiaki; Yasuda, Nobuaki; Ichihara, Katsutarou; Komatsu, Shuichi; and Arai, Shinji, 4,922,462, Cl. 365-113.000.
Yasui, Takashi: *See—*
Tsukagoshi, Toshihiro; Fukushima, Masanobu; Yoshioka, Keiichi; and Yasui, Takashi, 4,922,441, Cl. 364-491.000.
Yasunaga, Makoto, to Citizen Watch Co., Ltd. Dot matrix print head having easily removable magnets. 4,921,364, Cl. 400-124.000.
Yates Industries, Inc.: *See—*
Khalid, Joseph M.; and Plagge, David G., 4,921,590, Cl. 204-216.000.
Yates, Stephen F.; Good, Mary L.; and Brubaker, Inara M., to Allied-Signal Inc. Polysiloxane bound photosensitizer for producing singlet oxygen. 4,921,589, Cl. 204-157.500.
Yates, Stephen F.; and Zinnen, Hermann A., to Allied-Signal Inc. Purification of chloroform. 4,922,044, Cl. 570-263.000.
Yazaki Corporation: *See—*
Endo, Takayoshi; Yagi, Sakai; Sakai, Hitoshi; and Saito, Hitoshi, 4,921,448, Cl. 439-595.000.
Sato, Kenichi, 4,921,443, Cl. 439-521.000.
Yee, Ian Y. K., to Microelectronics and Computer Technology Corporation. Method of making a multilevel electrical airbridge interconnect. 4,920,639, Cl. 29-846.000.
Yelton, Darrell A.; and Norland, Richard S., to Target Products Inc. Mobile machine suspension system. 4,921,308, Cl. 299-39.000.
Yen, Richard C. K. Anti-clogging apparatus and method for maximal flux and prolonged filtration time. 4,921,603, Cl. 210-106.000.
Yester, Francis R., Jr.: *See—*
Johnson, Mark J.; Yester, Francis R., Jr.; and Jasper, Steven C., 4,922,549, Cl. 455-212.000.
Yeung, Edward S.; and Chen, Guoying, to Iowa State University Research Foundation, Inc. Method and means for a spatial and temporal probe for laser-generated plumbes based on density gradients. 4,921,348, Cl. 356-128.000.
Ying, Sui-Chun: *See—*
Sismour, Albert C., Jr.; Hagaman, Robert T.; and Ying, Sui-Chun, 4,922,147, Cl. 310-61.000.
Yoda, Sumio: *See—*
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,921,984, Cl. 556-40.000.
Yokoo, Chihiro; Onodera, Akira; Fukushima, Hiroshi; Watanabe, Yoshiaki; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. Cephalosporin derivatives. 4,921,953, Cl. 540-227.000.
Yokota Industrial Co., Ltd.: *See—*
Sugimoto, Tadakatsu; Igarashi, Yoshiaki; Saito, Shiro; Wada, Eiichi; and Murai, Keiji, 4,920,836, Cl. 81-463.000.
Yokote, Masatsugu; Ito, Hideo; Kawagoe, Kenji; and Kuroki, Junsuke, to Nissan Motor Company, Limited. Combined power steering and variable suspension control arrangement. 4,922,427, Cl. 364-424.050.
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, to Fuji Photo Film Co., Ltd. Pyrazoloazoleazomethine dyes. 4,921,968, Cl. 548-262.400.
Yonaga, Masahiro: *See—*
Sugimoto, Hachiro; Nakamura, Takaharu; Karibe, Norio; Saito, Isao; Higurashi, Kunizou; Yonaga, Masahiro; Kaneko, Takeru; Nakazawa, Takahiro; Ueno, Masataka; and Yamatsu, Kiyomi, 4,921,863, Cl. 514-319.000.
Yonekawa, Hisashi; and Takeuchi, Hiroshi, to Konica Corporation. Compression method of halftone image data. 4,922,273, Cl. 358-429.000.
Yonekura, Seiji: *See—*
Wakamatsu, Kazuhiro; Yonekura, Seiji; Suzuki, Mitsuo; Tadokoro, Hiroyuki; and Suzuki, Atsuo, 4,922,272, Cl. 346-160.000.
Yonezu, Kiyoshi: *See—*
Negi, Taichi; Tanaka, Nobuo; and Yonezu, Kiyoshi, 4,921,907, Cl. 525-57.000.
Yoshida, Akihiko; Nishino, Atsushi; Tanahashi, Ichiro; and Takeuchi, Yasuhiro, to Matsushita Electric Industrial Co., Ltd. Method of carbonizing and activating fiber materials. 4,921,686, Cl. 423-447.600.
Yoshida, Katumi: *See—*
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, 4,922,274, Cl. 354-271.100.
Yoshida, Kazunori: *See—*
Kawabata, Susumu; Yoshida, Kazunori; and Suzuki, Fujio, 4,921,019, Cl. 139-452.000.
Yoshida Kogyo K. K.: *See—*
Aoki, Tsunetaka; and Ishii, Susumu, 4,920,615, Cl. 24-429.000.
Yoshida Kogyo K K.: *See—*
Takabatake, Hideo, 4,920,616, Cl. 24-418.000.
Yoshida, Shigeru: *See—*
Yamamoto, Hiroshi; Yoshida, Shigeru; Yoshida, Katumi; Suzuki, Ryuji; Arai, Tadashi; Nishimura, Masachika; Seino, Hiroaki; and Ando, Takehiko, 4,922,274, Cl. 354-271.100.
Yoshida, Shinji, to Sanshin Kogyo Kabushiki Kaisha. Marine propulsion device. 4,921,457, Cl. 440-111.000.
Yoshida, Takeshi: *See—*
Nakai, Masayuki; Yoshida, Takeshi; and Tomura, Katsumi, 4,921,831, Cl. 502-418.000.
Yoshida, Yoshinori; Arutaki, Akira; Hashimoto, Masao; and Yoshikawa, Suminori, to NEC Corporation. ISDN remote switching unit for accommodating analog and digital lines. 4,922,484, Cl. 370-68.100.
Yoshii, Rikako: *See—*
Higuchi, Toshio; Hibino, Ken; Yoshii, Rikako; Hiyori, Takayuki; Miyamoto, Yoshinori; Fukusaki, Eiichiro; Matsumura, Takeo; Hashimoto, Yoshiko; Kikuma, Michiko; Sahashi, Yuko; and Okada, Takeshi, 4,921,703, Cl. 424-419.000.
Yoshikawa, Suminori: *See—*
Yoshida, Yoshinori; Arutaki, Akira; Hashimoto, Masao; and Yoshikawa, Suminori, 4,922,484, Cl. 370-68.100.
Yoshimura, Shigeo; Ishino, Renshiro; Takada, Shiro; and Kimura, Hitoshi, to Kubota, Ltd. Magnetically anisotropic torque measuring device with error correction. 4,920,809, Cl. 75-862.360.
Yoshimura, Shoji; Matsuzaki, Yuzi; Sugimoto, Mamoru; Ito, Masayoshi; and Ogawa, Tomoya, to Mect Corporation. Sialosyl glyceride and process for producing the same. 4,921,948, Cl. 536-18.200.
Yoshimura, Yoshinobu: *See—*
Kishimoto, Shoji; Tomimatsu, Kiminori; Miyake, Akio; and Yoshimura, Yoshinobu, 4,921,851, Cl. 514-203.000.
Yoshio, Kunikiyo: *See—*
Nakamura, Toyokazu; Kato, Yuzi; Naemura, Shohei; Tani, Chizuka; Satoh, Masahiro; Yoshio, Kunikiyo; Kishiki, Hiroshi; and Hoshino, Hiroshi, 4,921,632, Cl. 252-299.100.
Yoshioka, Keiichi: *See—*
Tsukagoshi, Toshihiro; Fukushima, Masanobu; Yoshioka, Keiichi; and Yasui, Takashi, 4,922,441, Cl. 364-491.000.
Yoshitake, Yasuhiro; and Oshida, Yoshitada, to Hitachi, Ltd. Semiconductor exposing system having apparatus for correcting change in wavelength of light source. 4,922,290, Cl. 355-53.000.
Yoshizumi, Akira: *See—*
Horiguchi, Kazuo; Hosaka, Kazuyoshi; and Yoshizumi, Akira, 4,921,537, Cl. 106-90.000.
Young, Chi C.: *See—*
Daumit, Gene P.; Ko, Yoon S.; Slater, Christopher R.; Venner, Jozef G.; and Young, Chi C., 4,921,656, Cl. 264-85.000.
Young, James D., to Borg-Warner Automotive Transmission & Engine Components Corporation. Chain tensioner. 4,921,472, Cl. 474-111.000.
Young, Jerry W.: *See—*
Beitz, Donald C.; Young, Jerry W.; and Dehal, Shangara S., 4,921,710, Cl. 426-56.000.
Young, Ping: *See—*
Polak, Anthony J.; and Young, Ping, 4,921,651, Cl. 264-41.000.
Young, Quentin H.: *See—*
Price, Dean C.; and Young, Quentin H., 4,922,064, Cl. 200-61.700.
Young, Ralph H.: *See—*
Kung, Teh-Ming; Vreeland, William B.; and Young, Ralph H., 4,921,637, Cl. 552-295.000.
Yuh, Huoy-Jen; Ong, Beng S.; Spiewak, John W.; and Thornton, Constance J., to Xerox Corporation. Photoresponsive imaging members with polyurethane blocking layers. 4,921,769, Cl. 430-64.000.
Yuito, Isamu: *See—*
Takano, Hisashi; Koyama, Naoki; Yuito, Isamu; Shiiki, Kazuo; and Tanabe, Hideo, 4,922,360, Cl. 360-113.000.
Yukawa, Masayuki: *See—*
Nakagawa, Katsuya; Tanaka, Kunihiro; Yukawa, Masayuki; and Nomura, Masaki, 4,922,420, Cl. 364-410.000.
Zabler, Erich: *See—*
Duckart, Anton; Hauler, Peter; and Zabler, Erich, 4,920,796, Cl. 73-290.00V.
Zaccai, Gianfranco: *See—*
Calzi, Claudio; and Zaccai, Gianfranco, 4,920,976, Cl. 128-764.000.
Zacharias, Friedemann: *See—*
Ueruenduel, Celal; and Zacharias, Friedemann, 4,921,040, Cl. 165-51.000.
Zambon SpA: *See—*
Villa, Marco; Giordano, Claudio; Castaldi, Graziano; and Cavicchioli, Silvia, 4,922,009, Cl. 562-466.000.
Zatkos, Robert J., to Y-TEX Corporation. Male component for two-piece animal ear tag. 4,920,671, Cl. 40-301.000.
Zaveri, Narendra R.: *See—*
Ty, Henry; Zaveri, Narendra R.; and White, Alfred J., 4,921,165, Cl. 236-93.00R.
Zedlani Pty. Limited: *See—*
Biswas, Nicholas, 4,920,986, Cl. 128-885.000.
Zeiss, Hans-Joachim, to Hoechst Aktiengesellschaft. Process for the preparation of L-phosphinothricine (derivatives) and also of their alkyl esters. 4,922,006, Cl. 562-11.000.
Zenith Electronics Corporation: *See—*
Engel, Christopher M.; and Rabii, Khosro M., 4,922,328, Cl. 358-10.000.
Ziauddin, Habeeb M.: *See—*
Matthews, Bernard T.; Joll, David J.; Ziauddin, Habeeb M.; and Wilson, David N., 4,921,714, Cl. 426-90.000.
Ziebolz, Burkhard: *See—*
Lindoerfer, Walter; Sewe, Kai-Udo; Jahn-Held, Wilhelm; Ziebolz, Burkhard; and Wagner, Fritz, 4,921,615, Cl. 210-729.000.
Zieglmeier, Reiner: *See—*
Bunata, Thomas; Hollfelder, Robert; Zieglmeier, Reiner; and Steuer, Thomas, 4,922,193, Cl. 324-158.00R.

Zieltjens, Georges C. P.: *See*—
Bolk, Hendrik J. J.; and Zieltjens, Georges C. P., 4,922,442, Cl. 364-550.000.

Zierl, Richard; Kreuzer, Erwin; and Zuckermayr, Alfred, to Agfa-Gevaert Aktiengesellschaft. Apparatus for determining the thickness of layer supports. 4,922,112, Cl. 250-372.000.

Zimmer, Inc.: *See*—
Webb, John D., Jr.; and Morr, James J., 4,921,493, Cl. 606-85.000.

Zimmer, Johannes. Doctoring installation and doctoring device. 4,920,914, Cl. 118-419.000.

Zimmerman, Roy E.: *See*—
Caserta, Richard T.; and Zimmerman, Roy E., 4,920,704, Cl. 51-302.000.

Zinnen, Hermann A.: *See*—
Yates, Stephen F.; and Zinnen, Hermann A., 4,922,044, Cl. 570-263.000.

Zirps, Wilhelm, to Robert Bosch GmbH. Master brake cylinder suction refill valve. 4,921,007, Cl. 137-543.210.

Zito, Richard R. Method of transmitting an ionizing radiation. 4,921,327, Cl. 350-96.320.

Zohler, Steven R., to Carrier Corporation. High performance heat transfer tube and method of making same. 4,921,042, Cl. 165-179.000.

Zsilla, Gabriella: *See*—
Knoll, Jozsef; Budai, ne Simonyi; Katalin; Berenyi ne Poldermann, Edit; Miklya, Ildiko; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,861, Cl. 514-312.000.
Knoll, Jozsef; Budai nee Simonyi, Katalin; Berenyi nee Poldermann, Edit; Miklya, Ildiko ; Fekete, Marton; Zsilla, Gabriella; Knoll, Berta; Mandi, Attila; Petocz, Lujza; Gyertyan, Istvan; and Gacsalyi, Istvan, 4,921,960, Cl. 546-153.000.

Zuber, James J.: *See*—
Bidner, Harvey; and Zuber, James J., 4,922,266, Cl. 346-1.100.

Zubovics, Zoltan; Toldy, Lajos; Rabloczky, Gyorgy; Varro, Andras; Andrasi, Ferene; Elek, Sandor; and Elekes, Istvan, to BASF Aktiensellschaft. New alkylene diamine derivatives. 4,922,021, Cl. 564-367.000.

Zuckermayr, Alfred: *See*—
Zierl, Richard; Kreuzer, Erwin; and Zuckermayr, Alfred, 4,922,112, Cl. 250-372.000.

Zupancic, Joseph J.; Frechet, Jean M. J.; Zweig, Andrew M.; and Conrad, Jeffrey P., to Allied Signal Inc. Ethers of oligomeric phenoldiketone condensation products and a vinyl-benzyl compound. 4,921,923, Cl. 526-313.000.

Zurawski, John H.; and Harrington, Kathleen P., to Digital Equipment Corporation. Apparatus and method for floating point normalization prediction. 4,922,446, Cl. 364-748.000.

Zuryk, John A.: *See*—
Macken, John A.; and Zuryk, John A., 4,921,338, Cl. 350-619.000.

Zweig, Andrew M.: *See*—
Zupancic, Joseph J.; Frechet, Jean M. J.; Zweig, Andrew M.; and Conrad, Jeffrey P., 4,921,923, Cl. 526-313.000.

2500 Corporation, The: *See*—
Altus, Mark, 4,921,742, Cl. 428-81.000.

501 Hitachi, Ltd.: *See*—
Eguchi, Kinya; Niitsuma, Kikue; Wakena, Shigeru; and Ezawa, Masayoshi, 4,922,104, Cl. 250-339.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF MAY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brodeur, Rene H.; Terlecky, Boris S.; and Misner, Gerald R., to Trailer Train Company. Brake system. Re. 33,207, Cl. 188-1.110.

Conway, James A.; Conway, Peter R.; and Conway, Philip J., to Mentor Corporation. Male condom catheter having adhesive on rolled portion. Re. 33,206, Cl. 604-349.000.

Conway, Peter R.: *See*—
Conway, James A.; Conway, Peter R., and Conway, Philip J., Re. 33,206, Cl. 604-349.000.

Conway, Philip J.: *See*—
Conway, James A., Conway, Peter R.; and Conway, Philip J., Re 33,206, Cl. 604-349.000.

Leland Stanford Jr. Univ., Board of Trustees of the: *See*—
Plummer, James D., Re. 33,209, Cl 357-23.400.

Mentor Corporation: *See*—
Conway, James A.; Conway, Peter R.; and Conway, Philip J., Re. 33,206, Cl. 604-349.000.

Misner, Gerald R.: *See*—
Brodeur, Rene H.; Terlecky, Boris S.; and Misner, Gerald R Re. 33,207, Cl. 188-1.110.

Plummer, James D., to Leland Stanford Jr. Univ., Board of Trustees of the. Monolithic semiconductor switching device Re 33,209, Cl 357-23.400.

Semiconductor Energy Laboratory Co.,Ltd.: *See*—
Yamazaki, Shunpei, Re. 33,208, Cl. 136-244.000.

Terlecky, Boris S.: *See*—
Brodeur, Rene H.; Terlecky, Boris S.; and Misner, Gerald R. Re. 33,207, Cl. 188-1.110.

Trailer Train Company: *See*—
Brodeur, Rene H.; Terlecky, Boris S.; and Misner, Gerald R. Re. 33,207, Cl. 188-1.110.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co.,Ltd. Photoelectric conversion panel and assembly thereof. Re 33,208, Cl 136-244.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bolden, Paul L., Jr.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,666,457, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,684,372, Cl. 44-51.000.

Deal, James F., III: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, B1 4,618,348, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,666,457, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,684,372, Cl. 44-51.000.

Futch, Laurence E., Jr.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L., Futch, Laurence E., Jr.; and Deal, James F., III, B1 4,618,348, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,684,372, Cl. 44-51.000.

Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, to Petroleum Fermentations N.V. Combustion of viscous hydrocarbons. B1 4,618,348, 5-1-90, Cl. 44-51.000.

Hayes, Michael E.; Hrebenar, Kevin R.; Deal, James F., III; and Bolden, Paul L., Jr., to Petroleum Fermentations N.V. Method for reducing emissions utilizing pre-atomize fuels. B1 4,666,457, 5-1-90, Cl. 44-51.000.

Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., to Petroleum Fermentations N.V. Combustion of viscous hydrocarbons. B1 4,684,372, 5-1-90, Cl. 44-51.000.

Hrebenar, Kevin R.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L., Futch, Laurence E., Jr.; and Deal, James F., III, B1 4,618,348, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Deal, James F., III, and Bolden, Paul L., Jr., B1 4,666,457, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L., Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,684,372, Cl. 44-51.000.

LSI Lighting Systems Inc.: *See*—
Ready, Robert J.; Whipple, Donald E.; and Sferra, James P B1 4,512,098, Cl. 40-610.000.

Murphy, Patricia L.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L., Futch, Laurence E., Jr.; and Deal, James F., III, B1 4,618,348, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L., Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,684,372, Cl. 44-51.000.

Petroleum Fermentations N.V.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, B1 4,618,348, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,666,457, Cl. 44-51.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., B1 4,684,372, Cl. 44-51.000.

Ready, Robert J.; Whipple, Donald E.; and Sferra, James P., to LSI Lighting Systems Inc. Sign frame and method for factory installing flexible sign facing material thereon. B1 4,512,098, 5-1-90, Cl 40-610.000.

Sferra, James P.: *See*—
Ready, Robert J.; Whipple, Donald E.; and Sferra, James P, B1 4,512,098, Cl. 40-610.000.

Whipple, Donald E.: *See*—
Ready, Robert J.; Whipple, Donald E.; and Sferra, James P., B1 4,512,098, Cl. 40-610.000.

VOL 1114 ISS 1 MY 1 1990 UMI

VOL
1114
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LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See—*
McCarthy, Alfred F., 307,540, Cl. D8-395.000.

Abe, Yoshinori; Inoue, Muneaki; Hata, Kazuhiro; and Takahashi, Jiro, to Mitsubishi Denki Kabushiki Kaisha. Programmable controller. 307,576, 5-1-90, Cl. D13-164.000.

Abe, Yoshinori; Inoue, Muneaki; and Hata, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Programmable controller. 307,577, 5-1-90, Cl. D13-164.000.

Adair, Edward W.: *See—*
Mallory, John W. R.; Adair, Edward W.; and Mallory, William F., 307,517, Cl. D4-116.000.

Advanced Animal Instrumentation, Inc.: *See—*
Messina, John B. J.; Sondericker, John H.; and Casella, Anthony J., 307,558, Cl. D10-57.000.

AG Communications Systems Corporation: *See—*
Barker, William C.; Desikan, Pathukotta K.; Fraser, Ross E.; Pflueger, Michael W.; and Sethia, Kamal S., 307,588, Cl. D14-241.000.

Airway Industries, Inc.: *See—*
Kim, Hyun S., 307,515, Cl. D3-71.000.

Akatsu, Yukio: *See—*
Yamamura, Yasuo; Akatsu, Yukio; and Sugimoto, Tetsuyuki, 307,647, Cl. D29-2.000.

Alley, Kenneth A.: *See—*
McIntyre, Jonothon M. W.; and Alley, Kenneth A., 307,526, Cl. D6-601.000.

Alm, Sture, to Sandvik AB. Mini hack saw. 307,536, 5-1-90, Cl. D8-95.000.

Alps Electric Co., Ltd.: *See—*
Hashira, Hiroshi; and Dobashi, Koichi, 307,596, Cl. D18-13.000.

Amazing Ventures, Inc. *See—*
Kennedy, Paul A.; Herzog, Richard D.; and Lachenman, Thomas E., 307,637, Cl. D25-119.000.

American Lighting Fixture Corp.: *See—*
Segill, William; Segill, Mark E.; and Dangelo, Michael, 307,643, Cl. D26-91.000.

American National Can Company *See—*
Cochran, Donald D., 307,548, Cl. D9-375.000.

American Telephone and Telegraph Company: *See—*
Andrews, Arlan K.; Dickson, David M.; McGarvey, John N.; and Zambelli, Michael P., 307,560, Cl. D10-106.000.

Anderson, Stephen J., to Merrill Manufacturing Company, Inc. Yard hydrant. 307,627, 5-1-90, Cl. D23-214.000.

Andrews, Arlan K.; Dickson, David M.; McGarvey, John N.; and Zambelli, Michael P., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Housing for an infrared signal detector. 307,560, 5-1-90, Cl. D10-106.000.

Arrington, Richard C. Fire extinguisher. 307,648, 5-1-90, Cl. D29-2.000.

Arrow Art Finishers Co.: *See—*
Smith, Irving, 307,525, Cl. D6-451.000.

AT&T Information Systems Inc.: *See—*
Andrews, Arlan K.; Dickson, David M.; McGarvey, John N.; and Zambelli, Michael P., 307,560, Cl. D10-106.000.

AURORA Konrad G. Schulz GmbH & Co.: *See—*
Schulz, Joachim, 307,632, Cl. D23-392.000.

Autotron Products, Inc.: *See—*
Ziegler, John H.; Oakley, Gerald R.; and Krause, Daniel F., Sr., 307,569, Cl. D12-181.000.

Baetens, Omer R. Combined picnic plate and cup holder. 307,529, 5-1-90, Cl. D7-505.000.

Balatti, Aldo F. *See—*
Layne, Clifford J.; and Balatti, Aldo F., 307,579, Cl. D13-140.000.

Ballu, Patrick J., to Tecnoma. Hand sprayer. 307,628, 5-1-90, Cl. D23-225.000.

Banniza, Harry W.; and Bowlin, Robert D. Sign. 307,604, 5-1-90, Cl. D20-10.000.

Barker, William C.; Desikan, Pathukotta K.; Fraser, Ross E.; Pflueger, Michael W.; and Sethia, Kamal S., to AG Communications Systems Corporation. Key unit housing for a telephone call processor. 307,588, 5-1-90, Cl. D14-241.000.

Beaver, Theodore L., and Campbell, G. Edward, to Clorox Company, The. Bottle and cap. 307,549, 5-1-90, Cl. D9-376.000.

Beaver, Theodore L.; and Campbell, G. Edward, to Clorox Company, The. Bottle. 307,550, 5-1-90, Cl. D9-376.000.

Bellini, Mario. Coat hook. 307,522, 5-1-90, Cl. D6-323.000.

Bennett, Carolyn L., to C. Bennett Scopes, Inc. Kaleidoscope. 307,607, 5-1-90, Cl. D21-60.000.

Bic Corporation: *See—*
De Montgailhard, W. Desazars, 307,542, Cl. D9-300.000.

Bieganski, Zdzislaw. Fiber-optic cable stripper. 307,534, 5-1-90, Cl. D8-51.000.

Bingham, Curt G.; Dalebout, William T.; and Ellis, Richard B., to Proform Fitness Products, Inc. Exercise cycle. 307,614, 5-1-90, Cl. D21-194.000.

Bingham, Curt G.; Dalebout, William T.; and Ellis, Richard B., to Proform Fitness Products, Inc. Exercise cycle. 307,615, 5-1-90, Cl. D21-194.000.

Blazer International Corporation *See—*
Owen, Roderick L.; and Wyers, George J., 307,571, Cl. D12-187.000.

Boone, David D., to Lynx Golf, Inc. Golf club putter head. 307,617, 5-1-90, Cl. D21-219.000.

Bowlin, Robert D.: *See—*
Banniza, Harry W.; and Bowlin, Robert D., 307,604, Cl. D20-10.000.

Boyle-Midway Household Products, Inc.: *See—*
Lyons, Gerard E., 307,546, Cl. D9-373.000.

Bradshaw, Donald L., to Brevda Container Corporation. Toy truck. 307,611, 5-1-90, Cl. D21-134.000.

Brainard, Robert H.: *See—*
Mileos, George; and Brainard, Robert H., 307,543, Cl. D9-302.000.

Branson Ultrasonics Corporation: *See—*
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, 307,653, Cl. D32-1.000.
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, 307,654, Cl. D32-1.000.

Brevda Container Corporation: *See—*
Bradshaw, Donald L., 307,611, Cl. D21-134.000.

Brown, Paul D.: *See—*
Miller, David E.; Brown, Paul D.; Jones, Andrew R.; and Cohen, Eric D., 307,508, Cl. D2-314.000.

Bryant, William C., to Empire Brushes, Inc. Upholstery brush handle. 307,518, 5-1-90, Cl. D4-138.000.

Bycraft, John T.: *See—*
Pomeroy, Charles; and Bycraft, John T., 307,523, Cl. D6-347.000.

C. Bennett Scopes, Inc.: *See—*
Bennett, Carolyn L., 307,607, Cl. D21-60.000.

Cabot Corporation: *See—*
Gardner, Ross, Jr., 307,635, Cl. D24-67.000.
Gardner, Ross, Jr., 307,636, Cl. D24-67.000.

Cal-Comp Electronics, Inc.: *See—*
Chen, Ray, 307,594, Cl. D18-7.000.

Campbell, G. Edward: *See—*
Beaver, Theodore L.; and Campbell, G. Edward, 307,549, Cl. D9-376.000.
Beaver, Theodore L.; and Campbell, G. Edward, 307,550, Cl. D9-376.000.

Carbonell, Leonard. Vehicle oil drip pan or the like. 307,623, 5-1-90, Cl. D23-200.000.

Carson, Steven R.; Griffin, Raymond T.; and Spear, Scott A., to Light Sheller, Inc. Combined escutcheon and power switch. 307,578, 5-1-90, Cl. D13-158.000.

Casella, Anthony J.: *See—*
Messina, John B. J.; Sondericker, John H.; and Casella, Anthony J., 307,558, Cl. D10-57.000.

Cautereels, Victor J. J.; and Daenen, Robert H. C. M., to Dart Industries. Holder for food shcing and grating blade. 307,532, 5-1-90, Cl. D7-641.000.

Central Systems & Controls Corporation *See—*
Reali, Patrick J., 307,580, Cl. D13-133.000.

Chen, Ray, to Cal-Comp Electronics, Inc. Calculator or similar article. 307,594, 5-1-90, Cl. D18-7.000.

Chishty, Aqeel M., and Valdez, Roy K. Vacuum chuck for a lathe for making optically-smooth surfaces. 307,593, 5-1-90, Cl. D15-130.000.

Cholakian, Kevork. Toy figure. 307,612, 5-1-90, Cl. D21-148.000.

Chulick, John. Christmas tree holder. 307,561, 5-1-90, Cl. D11-130.100.

Cline, Marlin F., to Clinetex, Inc. Coiled tubing cover. 307,633, 5-1-90, Cl. D24-16.000.

Clinetex, Inc.: *See—*
Cline, Marlin F., 307,633, Cl. D24-16.000.

Clorox Company, The *See—*
Beaver, Theodore L.; and Campbell, G. Edward, 307,549, Cl. D9-376.000.
Beaver, Theodore L.; and Campbell, G. Edward, 307,550, Cl. D9-376.000.

Cochran, Donald D. to American National Can Company. Bottle. 307,548, 5-1-90, Cl. D9-375.000.

Cohen, Eric D. *See—*
Miller, David E.; Brown, Paul D.; Jones, Andrew R.; and Cohen, Eric D., 307,508, Cl. D2-314.000.

Collister, Kenneth D., to Miles Inc. Reflectance meter. 307,556, 5-1-90, Cl. D10-46.000.

Combi Co., Ltd.: *See—*
Takahashi, Takehiko; Ishii, Yoshiyasu; Matsumoto, Susumu; and Sekine, Jun, 307,629, Cl. D23-296.000.

Conner, Audri J.; and Guzowski, Christopher P., to Kraft, Inc. Packaging container. 307,544, 5-1-90, Cl. D9-352.000.

Cook, June C. Needle cover. 307,634, 5-1-90, Cl. D24-25.000.

Croghan, Theodore. Golf swing practice mat. 307,618, 5-1-90, Cl. D21-234.000.

Curtis Manufacturing Company, Inc.: *See—*
Judd, Thomas W.; and Hames, Edward L., 307,598, Cl. D18-23.000.

Daenen, Robert H. C. M.: *See—*
Cautereels, Victor J. J.; and Daenen, Robert H. C. M., 307,532, Cl. D7-641.000.

Daiwa Seiko, Inc.: *See—*
Kameda, Yasuhisa; Kawai, Michiki; and Masubuchi, Kaoru, 307,620, Cl. D22-140.000.

Dalebout, William T.: *See—*
Bingham, Curt G.; Dalebout, William T.; and Ellis, Richard B., 307,614, Cl. D21-194.000.
Bingham, Curt G.; Dalebout, William T.; and Ellis, Richard B., 307,615, Cl. D21-194.000.

Dangelo, Michael: *See—*
Segill, William; Segill, Mark E.; and Dangelo, Michael, 307,643, Cl. D26-91.000.

Dart Industries: *See—*
Cautereels, Victor J. J.; and Daenen, Robert H. C. M., 307,532, Cl. D7-641.000.

Dart Industries Inc.: *See—*
DeCoster, Pieter K. J., 307,527, Cl. D7-667.000.
DeCoster, Pieter K. J., 307,528, Cl. D7-678.000.

De'Armond, Robert, to Thomas Industries, Inc. Light fixture or the like. 307,641, 5-1-90, Cl. D26-85.000.

DeCoster, Pieter K. J., to Dart Industries Inc. Egg separator. 307,527, 5-1-90, Cl. D7-667.000.

DeCoster, Pieter K. J., to Dart Industries Inc. Food grater. 307,528, 5-1-90, Cl. D7-678.000.

de Lespinay, Philippe. Combined vehicle wheel center and hub cover. 307,572, 5-1-90, Cl. D12-211.000.

Del Vecchio, Frank A., Jr.; and Mansfield, Richard A. Sneaker or similar article. 307,507, 5-1-90, Cl. D2-279.000.

De Montgailhard, W. Desazars, to Bic Corporation. Container for scented liquids or the like. 307,542, 5-1-90, Cl. D9-300.000.

Desikan, Pathukotta K.: *See—*
Barker, William C.; Desikan, Pathukotta K.; Fraser, Ross E.; Pflueger, Michael W.; and Sethia, Kamal S., 307,588, Cl. D14-241.000.

Diamond, Harvey E., to Oasis Industries, Inc. Combined soap holding cavity and cover for bathtubs. 307,530, 5-1-90, Cl. D23-304.000.

Dickson, David M.: *See—*
Andrews, Arlan K.; Dickson, David M.; McGarvey, John N.; and Zambelli, Michael P., 307,560, Cl. D10-106.000.

Dickson, Douglas M., to General Electric Company. Two-way mobile radio. 307,585, 5-1-90, Cl. D14-137.000.

DiCola, Vince, to Thomas Industries Inc. Light fixture or the like. 307,642, 5-1-90, Cl. D26-85.000.

Dobashi, Koichi: *See—*
Hashira, Hiroshi; and Dobashi, Koichi, 307,596, Cl. D18-13.000.

Dooley, Arthur R., Jr.; Garrett, Timothy A.; and Matjasko, Louis S., to Dooley Tacklaberry, Inc. Fire extinguisher charging cylinder guard. 307,651, 5-1-90, Cl. D29-5.000.

Dooley Tacklaberry, Inc.: *See—*
Dooley, Arthur R., Jr.; Garrett, Timothy A.; and Matjasko, Louis S., 307,651, Cl. D29-5.000.

Ducey, Joseph E.: *See—*
Schiff, Bruce R.; and Ducey, Joseph E., 307,505, Cl. D2-6.000.

Du Pont de Nemours, E. I., and Company. *See—*
Tres, Paul A., 307,541, Cl. D8-396.000.

Durand, Jean-Jacques. Wine glass or similar article. 307,533, 5-1-90, Cl. D7-526.000.

Elephant Chain Block Company Limited: *See—*
Kobayashi, Eikichi; and Ueno, Yoshio, 307,659, Cl. D34-33.000.

Elliott, James P.; and Landry, Vincent E., to Shape Inc. Tape cassette. 307,582, 5-1-90, Cl. D14-121.000.

Ellis, Richard B.: *See—*
Bingham, Curt G.; Dalebout, William T.; and Ellis, Richard B., 307,614, Cl. D21-194.000.
Bingham, Curt G.; Dalebout, William T.; and Ellis, Richard B., 307,615, Cl. D21-194.000.

Empire Brushes, Inc.: *See—*
Bryant, William C., 307,518, Cl. D4-138.000.

Englund, Tord, to Sandvik AB. Handle for a compass saw. 307,537, 5-1-90, Cl. D8-97.000.

Fashion World, Inc.: *See—*
Pakzad, Bijan, 307,552, Cl. D9-384.000.

Felkay, T.: *See—*
Fuller, D. Kirk, 307,573, Cl. D12-304.000.

Fingerle, Robert F., to Superstill Technology, Inc. Aerodynamic bumper for a truck. 307,567, 5-1-90, Cl. D12-169.000.

Frahm, Bradley K. Leak sensor housing. 307,557, 5-1-90, Cl. D10-46.000.

Fraser, Ross E.: *See—*
Barker, William C.; Desikan, Pathukotta K.; Fraser, Ross E.; Pflueger, Michael W.; and Sethia, Kamal S., 307,588, Cl. D14-241.000.

FS Manufacturing Co., Ltd.: *See—*
Yamamura, Yasuo; Akatsu, Yukio; and Sugimoto, Tetsuyuki, 307,647, Cl. D29-2.000.

Fujii, Yoshito: *See—*
Saeki, Taisuke; Fujii, Yoshito; and Ohtani, Tohru, 307,584, Cl. D14-126.000.

Fuller, D. Kirk, to Fuller, D. Kirk; and Felkay, T., a part interest to each. Catamaran sailboat. 307,573, 5-1-90, Cl. D12-304.000.

Galant Electronc Products Ltd.: *See—*
Shun, Lau P., 307,586, Cl. D14-150.000.

Ganeaux Industries, Inc.: *See—*
Gano, David A., 307,575, Cl. D12-217.000.

Gano, David A., to Ganeaux Industries, Inc. Wheel chock block. 307,575, 5-1-90, Cl. D12-217.000.

Gardner, Ross, Jr., to Cabot Corporation. Earplug or similar article. 307,635, 5-1-90, Cl. D24-67.000.

Gardner, Ross, Jr., to Cabot Corporation. Earplug or similar article. 307,636, 5-1-90, Cl. D24-67.000.

Garrett, Timothy A.: *See—*
Dooley, Arthur R., Jr.; Garrett, Timothy A.; and Matjasko, Louis S., 307,651, Cl. D29-5.000.

General Electric Company: *See—*
Dickson, Douglas M., 307,585, Cl. D14-137.000.

General Foods Corporation: *See—*
Mileos, George; and Brainard, Robert H., 307,543, Cl. D9-302.000.

Gibbs, Richard B. Luggage handbag. 307,514, 5-1-90, Cl. D3-48.000.

Gillette Company, The: *See—*
Poisson, Norman D.; Searle, Scott G.; Warren, Robert D.; Kapec, Jeffrey; and Tanaka, Kazuna, 307,601, Cl. D19-43.000.

Glass Dimensions, Inc.: *See—*
Perkins, David R., 307,638, Cl. D26-11.000.

Goldstar Co., Ltd.: *See—*
Shin, Sang Y., 307,631, Cl. D23-353.000.

Goodman, Sheldon; and Greenhut, Steven E. Hook. 307,539, 5-1-90, Cl. D8-367.000.

Goodman, Sheldon; and Greenhut, Steven E. Bookend. 307,603, 5-1-90, Cl. D19-34.500.

Grady, Mark P.: *See—*
Parker, Frederick A.; and Grady, Mark P., 307,559, Cl. D10-81.000.

Greenhut, Steven E.: *See—*
Goodman, Sheldon; and Greenhut, Steven E., 307,539, Cl. D8-367.000.
Goodman, Sheldon; and Greenhut, Steven E., 307,603, Cl. D19-34.500.

Griffin, Raymond T.: *See—*
Carson, Steven R.; Griffin, Raymond T.; and Spear, Scott A., 307,578, Cl. D13-158.000.

GTE Products Corporation: *See—*
Titmarsh, Brian V., 307,640, Cl. D26-24.000.

Guzowski, Christopher P.: *See—*
Conner, Audri J.; and Guzowski, Christopher P., 307,544, Cl. D9-352.000.

H. H. Brown Shoe Company, Inc.: *See—*
Issler, James E., 307,510, Cl. D2-320.000.

Haenni, Edwin W.; and Wilkes, Mickey M., to Sonoco Products Co. Dispensing nozzle for plastic bags. 307,555, 5-1-90, Cl. D9-447.000.

Hames, Walter W., Sr. Necktie. 307,511, 5-1-90, Cl. D2-605.000.

Hames, Edward L.: *See—*
Judd, Thomas W.; and Hames, Edward L., 307,598, Cl. D18-23.000.

Harada, Mieko: *See—*
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Harada, Mieko, 307,595, Cl. D18-7.000.

Harrod, Lawrence R., to Kransco. Fire truck toy vehicle. 307,609, 5-1-90, Cl. D21-78.000.

Harrod, Lawrence R., to Kransco. Three wheel ATV toy. 307,610, 5-1-90, Cl. D21-80.000.

Hashira, Hiroshi; and Dobashi, Koichi; to Alps Electric Co., Ltd. Printer for computer. 307,596, 5-1-90, Cl. D18-13.000.

Hata, Kazuhiro. *See—*
Abe, Yoshinori; Inoue, Muneaki; Hata, Kazuhiro; and Takahashi, Jiro, 307,576, Cl. D13-164.000.
Abe, Yoshinori; Inoue, Muneaki; and Hata, Kazuhiro, 307,577, Cl. D13-164.000.

Henry, Ricky L. Fire protection port fog nozzle. 307,649, 5-1-90, Cl. D29-5.000.

Herzog, Richard D. *See—*
Kennedy, Paul A.; Herzog, Richard D.; and Lachenman, Thomas E., 307,637, Cl. D25-119.000.

Hibbert, John L., to Reckitt & Colman Products Limited. Bottle with cap. 307,545, 5-1-90, Cl. D9-352.000.

Hinklin, Darrell W.; and Rogers, Edward A., to Toro Company, The. Convertible blower and vacuum. 307,655, 5-1-90, Cl. D32-15.000.

Hiraishi, Etsuo; and Numata, Teruhisa, to Ryobi Ltd. Fishing reel. 307,622, 5-1-90, Cl. D22-141.000.

Hoover Universal, Inc.: *See—*
Platte, Richard L., Sr., 307,551, Cl. D9-378.000.

Hoshino, Kiyoshi: *See—*
Monobe, Juzaburo; and Hoshino, Kiyoshi, 307,592, Cl. D15-127.000.

Hsu, Ching-Lien. Clamp for repairing a tennis racket or the like. 307,535, 5-1-90, Cl. D8-71.000.

Humphries, Romilly H., to S.A.Y. Industries, Inc. Container. 307,547, 5-1-90, Cl. D9-375.000.

Ikeda, Matafumi; Kuriya, Chikashi; and Nakajima, Mika, to Sharp Corporation. Vacuum cleaner. 307,658, 5-1-90, Cl. D32-22.000.

Ilaria, Peter V.; and Macowski, William, to Tropar Mfg. Co., Inc. Decorative frame. 307,520, 5-1-90, Cl. D6-300.000.

Inoue, Muneaki: *See—*
Abe, Yoshinori; Inoue, Muneaki; Hata, Kazuhiro; and Takahashi, Jiro, 307,576, Cl. D13-164.000.
Abe, Yoshinori; Inoue, Muneaki; and Hata, Kazuhiro, 307,577, Cl. D13-164.000.

Irving Oil Limited: *See—*
Matthews, Walter A.; and MacDormand, Edward B., 307,553, Cl. D9-403.000.

Ishida, Nobumichi. Broth making cooker. 307,531, 5-1-90, Cl. D7-360.000.

Ishii, Yoshiyasu: *See—*
Takahashi, Takehiko; Ishii, Yoshiyasu; Matsumoto, Susumu; and Sekine, Jun, 307,629, Cl. D23-296.000.

Issler, James E., to H. H. Brown Shoe Company, Inc. Shoe sole. 307,510, 5-1-90, Cl. D2-320.000.

Jack-Post Corporation: *See—*
Pomeroy, Charles; and Bycraft, John T., 307,523, Cl. D6-347.000.

Janey Products, Inc.: *See—*
Podall, Robert, 307,605, Cl. D20-18.000.

Jervis, Donald L., Sr. Sign for advertising or similar use. 307,606, 5-1-90, Cl. D20-31.000.

John Manufacturing Limited: *See—*
Yuen, John S., 307,656, Cl. D32-22.000.

Johnson, Tonya C. Ear cap. 307,652, 5-1-90, Cl. D29-19.000.

Jones, Andrew R.: *See—*
Miller, David E.; Brown, Paul D.; Jones, Andrew R.; and Cohen, Eric D., 307,508, Cl. D2-314.000.
Judd, Thomas W.; and Hames, Edward L., to Curtis Manufacturing Company, Inc. Computer support leg with sliding keyboard shelf. 307,598, 5-1-90, Cl. D18-23.000.
Kameda, Yasuhisa; Kawai, Michiki; and Masubuchi, Kaoru, to Daiwa Seiko, Inc. Reel for fishing. 307,620, 5-1-90, Cl. D22-140.000.
Kapec, Jeffrey: *See—*
Poisson, Norman D.; Searle, Scott G.; Warren, Robert D.; Kapec, Jeffrey; and Tanaka, Kazuna, 307,601, Cl. D19-43.000.
Kawai, Michiki: *See—*
Kameda, Yasuhisa; Kawai, Michiki; and Masubuchi, Kaoru, 307,620, Cl. D22-140.000.
Keates, Jeffrey M., to Top Heavy Pty. Ltd. T-shirt. 307,506, 5-1-90, Cl. D2-215.000.
Kelly, Joseph. Ball game goal. 307,616, 5-1-90, Cl. D21-200.000.
Kennedy, Paul A.; Herzog, Richard D.; and Lachenman, Thomas E., to Amazing Ventures, Inc. Extrusion. 307,637, 5-1-90, Cl. D25-119.000
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 307,515, 5-1-90, Cl. D3-71.000.
King, Stephen; Marshall, Bryan H.; and Paver, Graham A., to R & C Products Pty. Limited. Dispenser for toilet tanks. 307,625, 5-1-90, Cl. D23-208.000.
Kingsford, Ted I., to Schering Corporation. Cosmetic powder container. 307,646, 5-1-90, Cl. D9-76.000.
Kitagawa, Ryunosuke: *See—*
Saito, Tomitaro; Kitagawa, Ryunosuke; and Ohtani, Tohru, 307,583, Cl. D14-126.000.
Kittle, Christopher, to Reebok International Ltd. Shoe upper. 307,509, 5-1-90, Cl. D2-314.000.
Kobayashi, Eikichi; and Ueno, Yoshio, to Elephant Chain Block Company Limited. Lever hoist. 307,659, 5-1-90, Cl. D34-33.000.
Koutroukides, Polis P. Green fork. 307,619, 5-1-90, Cl. D21-234.000.
Kraft, Inc.: *See—*
Conner, Audri J.; and Guzowski, Christopher P., 307,544, Cl. D9-352.000.
Kransco: *See—*
Harrod, Lawrence R., 307,609, Cl. D21-78.000.
Harrod, Lawrence R., 307,610, Cl. D21-80.000.
Krause, Daniel F., Sr.: *See—*
Ziegler, John H.; Oakley, Gerald R.; and Krause, Daniel F., Sr., 307,569, Cl. D12-181.000.
Kuriya, Chikashi: *See—*
Ikeda, Matafumi; Kuriya, Chikashi; and Nakajima, Mika, 307,658, Cl. D32-22.000.
Lachenman, Thomas E.: *See—*
Kennedy, Paul A.; Herzog, Richard D.; and Lachenman, Thomas E., 307,637, Cl. D25-119.000.
Landry, Vincent E.: *See—*
Elliott, James P.; and Landry, Vincent E., 307,582, Cl. D14-121.000.
Layne, Clifford J.; and Balatti, Aldo F. In line cord switch. 307,579, 5-1-90, Cl. D13-140.000.
Lee, Genius. Twin-ribbed crayon. 307,602, 5-1-90, Cl. D19-49.000.
Lesch, Jeri D. Fashion pocket insert. 307,516, 5-1-90, Cl. D3-106.000.
Lettenmayer, Horst. Lighting fixture. 307,639, 5-1-90, Cl. D26-24.000.
Levine, Peter A. Hand-held laminating roller. 307,597, 5-1-90, Cl. D18-14.000.
Li, Benny. Vacuum cleaner. 307,657, 5-1-90, Cl. D32-22.000.
Lightolier, Inc.: *See—*
Carson, Steven R.; Griffin, Raymond T.; and Spear, Scott A., 307,578, Cl. D13-158.000.
Lopez, Guadalupe A. Vehicle roof mounted air reversing unit. 307,568, 5-1-90, Cl. D12-181.000.
Lynx Golf, Inc.: *See—*
Boone, David D., 307,617, Cl. D21-219.000.
Lyons, Gerard E., to Boyle-Midway Household Products, Inc. Bottle. 307,546, 5-1-90, Cl. D9-373.000.
Mabry, Steven M. Trailer connecting guide unit. 307,564, 5-1-90, Cl. D12-162.000.
MacDormand, Edward B.: *See—*
Matthews, Walter A.; and MacDormand, Edward B., 307,553, Cl. D9-403.000.
Macowski, William: *See—*
Ilaria, Peter V.; and Macowski, William, 307,520, Cl. D6-300.000.
Mag Instrument, Inc.: *See—*
McAlister, Fred R., Sr., 307,554, Cl. D9-415.000.
Mahlich, Gotthard C.; and Sieffert, Florian, to Robert Krups Stiftung & Co. KG. Cartridge and foil for a dry shaver. 307,645, 5-1-90, Cl. D28-49.000.
Mallory Industries Inc.: *See—*
Mallory, John W. R.; Adair, Edward W.; and Mallory, William F., 307,517, Cl. D4-116.000.
Mallory, John W. R.; Adair, Edward W.; and Mallory, William F., to Mallory Industries Inc. Combined floor brush head and squeegee. 307,517, 5-1-90, Cl. D4-116.000.
Mallory, William F.: *See—*
Mallory, John W. R.; Adair, Edward W.; and Mallory, William F., 307,517, Cl. D4-116.000.
Mansfield, Richard A.: *See—*
Del Vecchio, Frank A., Jr.; and Mansfield, Richard A., 307,507, Cl. D2-279.000.
Marcune, Benjamin F. Base station. 307,587, 5-1-90, Cl. D14-159.000.
Marshall, Bryan H.: *See—*
King, Stephen; Marshall, Bryan H.; and Paver, Graham A., 307,625, Cl. D23-208.000.
Marubeni Construction Material Lease Co., Ltd.: *See—*
Yamamura, Yasuo; Akatsu, Yukio; and Sugimoto, Tetsuyuki, 307,647, Cl. D29-2.000.
Masubuchi, Kaoru: *See—*
Kameda, Yasuhisa; Kawai, Michiki; and Masubuchi, Kaoru, 307,620, Cl. D22-140.000.
Matjasko, Louis S.: *See—*
Dooley, Arthur R., Jr.; Garrett, Timothy A.; and Matjasko, Louis S., 307,651, Cl. D29-5.000.
Matsumoto, Susumu: *See—*
Takahashi, Takehiko; Ishii, Yoshiyasu; Matsumoto, Susumu; and Sekine, Jun, 307,629, Cl. D23-296.000.
Matthews, Walter A.; and MacDormand, Edward B., to Irving Oil Limited. Container for liquids. 307,553, 5-1-90, Cl. D9-403.000.
McAlister, Fred R., Sr., to Mag Instrument, Inc. Blister package. 307,554, 5-1-90, Cl. D9-415.000.
McCarthy, Alfred F., to Aavid Engineering, Inc. Clip for uniting an electronic device with an extruded heat sink. 307,540, 5-1-90, Cl. D8-395.000.
McGarvey, John N.: *See—*
Andrews, Arlan K.; Dickson, David M.; McGarvey, John N., and Zambelli, Michael P., 307,560, Cl. D10-106.000.
McIntyre, Jonothon M. W.; and Alley, Kenneth A. Adjustable neck support for attachment to an automobile headrest. 307,526, 5-1-90, Cl. D6-601.000.
Meelen, Hans T., to U.S. Philips Corporation. Stand for wax-applicator. 307,644, 5-1-90, Cl. D28-9.000.
Merrill Manufacturing Company, Inc.: *See—*
Anderson, Stephen J., 307,627, Cl. D23-214.000.
Messina, John B. J.; Sondericker, John H.; and Casella, Anthony J., to Advanced Animal Instrumentation, Inc. Electronic thermometer for use with animals. 307,558, 5-1-90, Cl. D10-57.000.
Migurski, Tomasz: *See—*
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, 307,653, Cl. D32-1.000.
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, 307,654, Cl. D32-1.000.
Mileos, George; and Brainard, Robert H., to General Foods Corporation. Combined package and dispenser. 307,543, 5-1-90, Cl. D9-302.000.
Miles Inc.: *See—*
Collister, Kenneth D., 307,556, Cl. D10-46.000.
Miller, David E.; Brown, Paul D.; Jones, Andrew R.; and Cohen, Eric D., to Reebok International Ltd. Shoe upper. 307,508, 5-1-90, Cl. D2-314.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Abe, Yoshinori; Inoue, Muneaki; Hata, Kazuhiro; and Takahashi Jiro, 307,576, Cl. D13-164.000.
Abe, Yoshinori; Inoue, Muneaki; and Hata, Kazuhiro, 307,577, Cl. D13-164.000.
Monobe, Juzaburo; and Hoshino, Kiyoshi, to Ryobi Ltd. Electric planer. 307,592, 5-1-90, Cl. D15-127.000.
Murdock, Brian K. Fire extinguisher clamp. 307,650, 5-1-90, Cl. D29-5.000.
Nakajima, Mika: *See—*
Ikeda, Matafumi; Kuriya, Chikashi; and Nakajima, Mika, 307,658, Cl. D32-22.000.
Numata, Teruhisa: *See—*
Hiraishi, Etsuo; and Numata, Teruhisa, 307,622, Cl. D22-141.000.
Oakley, Gerald R.: *See—*
Ziegler, John H.; Oakley, Gerald R., and Krause, Daniel F., Sr., 307,569, Cl. D12-181.000.
Oasis Industries, Inc.: *See—*
Diamond, Harvey E., 307,630, Cl. D23-304.000.
Ohtani, Tohru: *See—*
Saeki, Taisuke; Fujii, Yoshito; and Ohtani, Tohru, 307,584, Cl. D14-126.000.
Saito, Tomitaro; Kitagawa, Ryunosuke; and Ohtani, Tohru, 307,583, Cl. D14-126.000.
Ooshima, Yuriko, to Seiko Epson Corporation. Portable computer. 307,581, 5-1-90, Cl. D14-106.000.
Owen, Roderick L.; and Wyers, George J., to Blazer International Corporation. Towing mirror or similar article. 307,571, 5-1-90, Cl. D12-187.000.
Owen, Sammy L., to Universal Furniture Industries, Inc. Seat. 307,524, 5-1-90, Cl. D6-381.000.
Ozeki, Jiro, to Slidex Corporation. File sheet for magnetic recording carriers. 307,513, 5-1-90, Cl. D3-35.000.
Pakzad, Bijan, to Fashion World, Inc. Combined bottle and stopper. 307,552, 5-1-90, Cl. D9-384.000.
Parker, Frederick A.; and Grady, Mark P., to Seatronics Company, Inc. Oxygen sensor. 307,559, 5-1-90, Cl. D10-81.000.
Paver, Graham A.: *See—*
King, Stephen; Marshall, Bryan H.; and Paver, Graham A., 307,625, Cl. D23-208.000.
Perkins, David R., to Glass Dimensions, Inc. Oil lamp. 307,638, 5-1-90, Cl. D26-11.000.
Peterson, Robert J., to Swede Industries, Inc. Fishing reel. 307,621, 5-1-90, Cl. D22-140.000.
Pflueger, Michael W.: *See—*
Barker, William C.; Desikan, Pathukotta K.; Fraser, Ross E.; Pflueger, Michael W.; and Sethia, Kamal S., 307,588, Cl. D14-241.000.

Pierce, Raymond H., to Tromar Corporation Ltd. Column for a trophy. 307,566, 5-1-90, Cl. D11-164.000.
Pipkorn, Howard W. Boat hull. 307,574, 5-1-90, Cl. D12-314.000.
Platte, Richard L., Sr., to Hoover Universal, Inc. Bottle or similar article. 307,551, 5-1-90, Cl. D9-378.000.
Podall, Robert, to Janey Products, Inc. Parking lot location indicator. 307,605, 5-1-90, Cl. D20-18.000.
Poisson, Norman D.; Searle, Scott G.; Warren, Robert D.; Kapec, Jeffrey; and Tanaka, Kazuna, to Gillette Company, The. Marking instrument. 307,601, 5-1-90, Cl. D19-43.000.
Pomeroy, Charles; and Bycraft, John T., to Jack-Post Corporation. Glider. 307,523, 5-1-90, Cl. D6-347.000.
Proform Fitness Products, Inc.: *See—*
Bingham, Curt G.; Dalebout, William T.; and Ellis, Richard B., 307,614, Cl. D21-194.000.
Bingham, Curt G.; Dalebout, William T.; and Ellis, Richard B., 307,615, Cl. D21-194.000.
R & C Products Pty. Limited: *See—*
King, Stephen; Marshall, Bryan H.; and Paver, Graham A., 307,625, Cl. D23-208.000.
Rahgo, George: *See—*
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, 307,653, Cl. D32-1.000.
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, 307,654, Cl. D32-1.000.
Reali, Patrick J., to Central Systems & Controls Corporation. Pedestal mounted marine power source. 307,580, 5-1-90, Cl. D13-133.000.
Reckitt & Colman Products Limited: *See—*
Hibbert, John L., 307,545, Cl. D9-352.000.
Reebok International Ltd.: *See—*
Kittle, Christopher, 307,509, Cl. D2-314.000.
Miller, David E.; Brown, Paul D.; Jones, Andrew R.; and Cohen, Eric D., 307,508, Cl. D2-314.000.
Remisystem (UK) Ltd.: *See—*
Wright, David, 307,519, Cl. D6-484.000.
Ridgeon, Paul W., to Walkkover Sprayers Limited. Sprayer. 307,589, 5-1-90, Cl. D15-13.000.
Ridgeon, Paul W., to Walkover Sprayers Limited. Sprayer. 307,590, 5-1-90, Cl. D15-13.000.
Ridgeon, Paul W., to Walkover Sprayers Limited. Sprayer. 307,591, 5-1-90, Cl. D15-13.000.
Robert Krups Stiftung & Co. KG: *See—*
Mahlich, Gotthard C.; and Sieffert, Florian, 307,645, Cl. D28-49.000.
Rogers, Edward A.: *See—*
Hinklin, Darrell W.; and Rogers, Edward A., 307,655, Cl. D32-15.000.
Rogers, Hassel T. Ice tray holder. 307,521, 5-1-90, Cl. D3-30.100.
Ryobi Ltd.: *See—*
Hiraishi, Etsuo; and Numata, Teruhisa, 307,622, Cl. D22-141.000.
Monobe, Juzaburo; and Hoshino, Kiyoshi, 307,592, Cl. D15-127.000.
S.A.Y. Industries, Inc.: *See—*
Humphries, Romilly H., 307,547, Cl. D9-375.000.
S. C. Johnson & Son, Inc.: *See—*
Wefler, Mark E., 307,624, Cl. D23-208.000.
Saeki, Taisuke; Fujii, Yoshito; and Ohtani, Tohru, to Sharp Corporation. Television set. 307,584, 5-1-90, Cl. D14-126.000.
Saito, Tomitaro; Kitagawa, Ryunosuke; and Ohtani, Tohru, to Sharp Corporation. Television set. 307,583, 5-1-90, Cl. D14-126.000.
Sakaguchi, Hiroshi: *See—*
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Harada, Micko, 307,595, Cl. D18-7.000.
Sandvik AB: *See—*
Alm, Sture, 307,536, Cl. D8-95.000.
Englund, Tord, 307,537, Cl. D8-97.000.
Sasaoka, Ryoichi, to Toyota Jidosha Kabushiki Kaisha. Front bumper for an automobile. 307,565, 5-1-90, Cl. D12-169.000.
Schering Corporation: *See—*
Kingsford, Ted I., 307,646, Cl. D9-76.000.
Schiff, Bruce R.; and Ducey, Joseph E. Sportsman's undergarment. 307,505, 5-1-90, Cl. D2-6.000.
Schulz, Joachim, to AURORA Konrad G. Schulz GmbH & Co. Air flow directing and controlling fixture for heating and ventilating devices. 307,632, 5-1-90, Cl. D23-392.000.
Searle, Scott G.: *See—*
Poisson, Norman D.; Searle, Scott G.; Warren, Robert D.; Kapec, Jeffrey; and Tanaka, Kazuna, 307,601, Cl. D19-43.000.
Seatronics Company, Inc.: *See—*
Parker, Frederick A.; and Grady, Mark P., 307,559, Cl. D10-81.000.
Segill, Mark E.: *See—*
Segill, William; Segill, Mark E.; and Dangelo, Michael, 307,643, Cl. D26-91.000.
Segill, William; Segill, Mark E.; and Dangelo, Michael, to American Lighting Fixture Corp. Lighting fixture. 307,643, 5-1-90, Cl. D26-91.000.
Seiko Epson Corporation: *See—*
Ooshima, Yuriko, 307,581, Cl. D14-106.000.
Sekine, Jun: *See—*
Takahashi, Takehiko; Ishii, Yoshiyasu; Matsumoto, Susumu; and Sekine, Jun, 307,629, Cl. D23-296.000.
Sethia, Kamal S.: *See—*
Barker, William C.; Desikan, Pathukotta K.; Fraser, Ross E.; Pflueger, Michael W.; and Sethia, Kamal S., 307,588, Cl. D14-241.000.
Shape Inc.: *See—*
Elliott, James P.; and Landry, Vincent E., 307,582, Cl. D14-121.000.
Sharp Corporation: *See—*
Ikeda, Matafumi; Kuriya, Chikashi; and Nakajima, Mika, 307,658, Cl. D32-22.000.
Saeki, Taisuke; Fujii, Yoshito; and Ohtani, Tohru, 307,584, Cl. D14-126.000.
Saito, Tomitaro; Kitagawa, Ryunosuke; and Ohtani, Tohru, 307,583, Cl. D14-126.000.
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Harada, Mieko, 307,595, Cl. D18-7.000.
Shin, Sang Y., to Goldstar Co., Ltd. Air conditioner. 307,631, 5-1-90, Cl. D23-353.000.
Shun, Lau P., to Galant Electronc Products Ltd. Telephone. 307,586, 5-1-90, Cl. D14-150.000.
Shure, Bruce J. Spring shoe. 307,608, 5-1-90, Cl. D21-72.000.
Sieffert, Florian: *See—*
Mahlich, Gotthard C.; and Sieffert, Florian, 307,645, Cl. D28-49.000.
Singer, Franziska. Combined writing instrument and stamp. 307,600, 5-1-90, Cl. D19-36.000.
Slidex Corporation: *See—*
Ozeki, Jiro, 307,513, Cl. D3-35.000.
Smith, Irving, to Arrow Art Finishers Co. Display stand. 307,525, 5-1-90, Cl. D6-451.000.
Sona, Susan. Plush stuffed rabbit. 307,613, 5-1-90, Cl. D21-187.000.
Sondericker, John H.: *See—*
Messina, John B. J.; Sondericker, John H.; and Casella, Anthony J., 307,558, Cl. D10-57.000.
Sonoco Products Co.: *See—*
Haenni, Edwin W.; and Wilkes, Mickey M., 307,555, Cl. D9-447.000.
Spaine, Peter D.: *See—*
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, 307,653, Cl. D32-1.000.
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, 307,654, Cl. D32-1.000.
Spear, Scott A.: *See—*
Carson, Steven R.; Griffin, Raymond T.; and Spear, Scott A., 307,578, Cl. D13-158.000.
Stahl, Ted A., to Stahls' Inc. Numeral font. 307,599, 5-1-90, Cl. D18-24.000.
Stahls' Inc.: *See—*
Stahl, Ted A., 307,599, Cl. D18-24.000.
Sugimoto, Tetsuyuki: *See—*
Yamamura, Yasuo; Akatsu, Yukio; and Sugimoto, Tetsuyuki, 307,647, Cl. D29-2.000.
Superstill Technology, Inc.: *See—*
Fingerle, Robert F., 307,567, Cl. D12-169.000.
Suraci, Gloria. Combined nut holder and nut cracker. 307,530, 5-1-90, Cl. D7-508.000.
Swanson, Arthur P. Front fender mounted automobile rear view mirror. 307,570, 5-1-90, Cl. D12-187.000.
Swede Industries, Inc.: *See—*
Peterson, Robert J., 307,621, Cl. D22-140.000.
Takahashi, Jiro: *See—*
Abe, Yoshinori; Inoue, Muneaki; Hata, Kazuhiro; and Takahashi, Jiro, 307,576, Cl. D13-164.000.
Takahashi, Takehiko; Ishii, Yoshiyasu; Matsumoto, Susumu; and Sekine, Jun, to Combi Co., Ltd. Auxiliary toilet seat for a child. 307,629, 5-1-90, Cl. D23-296.000.
Tanaka, Kazuna: *See—*
Poisson, Norman D.; Searle, Scott G.; Warren, Robert D.; Kapec, Jeffrey; and Tanaka, Kazuna, 307,601, Cl. D19-43.000.
Tecnoma: *See—*
Ballu, Patrick J., 307,628, Cl. D23-225.000.
Thomas Industries, Inc.: *See—*
De'Armond, Robert, 307,641, Cl. D26-85.000.
DiCola, Vince, 307,642, Cl. D26-85.000.
Titmarsh, Brian V., to GTE Products Corporation. Luminaire. 307,640, 5-1-90, Cl. D26-24.000.
Tokyo Bosai Setsubi Co., Ltd.: *See—*
Yamamura, Yasuo; Akatsu, Yukio; and Sugimoto, Tetsuyuki, 307,647, Cl. D29-2.000.
Top Heavy Pty. Ltd.: *See—*
Keates, Jeffrey M., 307,506, Cl. D2-215.000.
Toro Company, The: *See—*
Hinklin, Darrell W.; and Rogers, Edward A., 307,655, Cl. D32-15.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Sasaoka, Ryoichi, 307,565, Cl. D12-169.000.
Tres, Paul A., to Du Pont de Nemours, E. I., and Company. Combined clip and mounting stud. 307,541, 5-1-90, Cl. D8-396.000.
Tromar Corporation Ltd.: *See—*
Pierce, Raymond H., 307,566, Cl. D11-164.000.
Tropar Mfg. Co., Inc.: *See—*
Ilaria, Peter V.; and Macowski, William, 307,520, Cl. D6-300.000.
Tyree, Kenneth W. Combined wall plate and safety cover. 307,538, 5-1-90, Cl. D8-351.000.
Ueno, Yoshio: *See—*
Kobayashi, Eikichi; and Ueno, Yoshio, 307,659, Cl. D34-33.000.
U.S. Philips Corporation: *See—*
Meelen, Hans T., 307,644, Cl. D28-9.000.
Universal Furniture Industries, Inc.: *See—*
Owen, Sammy L., 307,524, Cl. D6-381.000.

VOL
1114
ISS
1
MY
1
1990
UMI

Valdez, Roy K.: *See—*
Chishty, Aqeel M.; and Valdez, Roy K., 307,593, Cl. D15-130.000.
Walkkover Sprayers Limited: *See—*
Ridgeon, Paul W., 307,589, Cl. D15-13.000.
Walkover Sprayers Limited: *See—*
Ridgeon, Paul W., 307,590, Cl. D15-13.000.
Ridgeon, Paul W., 307,591, Cl. D15-13.000.
Warren, Robert D.: *See—*
Poisson, Norman D.; Searle, Scott G.; Warren, Robert D.; Kapec, Jeffrey; and Tanaka, Kazuna, 307,601, Cl. D19-43.000.
Wefler, Mark E., to S. C. Johnson & Son, Inc. Toilet bowl deodorant holder. 307,624, 5-1-90, Cl. D23-208.000.
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, to Branson Ultrasonics Corporation. Ultrasonic cleaner. 307,653, 5-1-90, Cl. D32-1.000.
Weirsman, William; Spaine, Peter D.; Migurski, Tomasz; and Rahgo, George, to Branson Ultrasonics Corporation. Ultrasonic cleaner. 307,654, 5-1-90, Cl. D32-1.000.
Wilkes, Mickey M.: *See—*
Haenni, Edwin W.; and Wilkes, Mickey M., 307,555, Cl. D9-447.000.
Willinger, Allan, to Willinger Brothers, Inc. Aquarium filter cartridge. 307,626, 5-1-90, Cl. D23-210.000.
Willinger Brothers, Inc.: *See—*
Willinger, Allan, 307,626, Cl. D23-210.000.
Woods, Cephia. Belt buckle cover. 307,512, 5-1-90, Cl. D2-639.000.
Wright, David, to Remisystem (UK) Ltd. Desk. 307,519, 5-1-90, Cl. D6-484.000.
Wyers, George J.: *See—*
Owen, Roderick L.; and Wyers, George J., 307,571, Cl. D12-187.000.
Yamamura, Yasuo; Akatsu, Yukio; and Sugimoto, Tetsuyuki, to FS Manufacturing Co., Ltd.; Tokyo Bosai Setsubi Co., Ltd.; and Marubeni Construction Material Lease Co., Ltd. Automatic fire extinguisher. 307,647, 5-1-90, Cl. D29-2.000.
Young, Samuel W. Door frame plaque. 307,562, 5-1-90, Cl. D11-134.000.
Young, Samuel W. Door frame plaque. 307,563, 5-1-90, Cl. D11-134.000.
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Harada, Mieko, to Sharp Corporation. Electronic calculator. 307,595, 5-1-90, Cl. D18-7.000.
Yuen, John S., to John Manufacturing Limited. Rechargeable vacuum cleaner. 307,656, 5-1-90, Cl. D32-22.000.
Zambelli, Michael P.: *See—*
Andrews, Arlan K.; Dickson, David M.; McGarvey, John N.; and Zambelli, Michael P., 307,560, Cl. D10-106.000.
Ziegler, John H.; Oakley, Gerald R.; and Krause, Daniel F., Sr., to Autotron Products, Inc. Deflector shield for motor vehicles. 307,569, 5-1-90, Cl. D12-181.000.

LIST OF PLANT PATENTEES

J & L Plants, Inc.: *See—*
Rosendal, Erik, 7,224, Cl. 68.000.
Rosendal, Erik, to J & L Plants, Inc. Exacum plant named Blue Ropendel. 7,224, 5-1-90, Cl. 68.000.
VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Sundoro. 7,225, 5-1-90, Cl. 76.000.
Yoder Brothers, Inc.: *See—*
VandenBerg, Cornelis P., 7,225, Cl. 76.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 1ST DAY OF MAY, 1990

Babbitt, Richard W.: *See—*
Stern, Richard A.; and Babbitt, Richard W., H781, Cl. 427-34.000.
Bray, Lisa A.: *See—*
Rouse, William G.; Rhea, Ronald E.; Burnham, Michael J.; Kilgore, Connie S.; Fiala, John P.; and Bray, Lisa A., H775, Cl. 86-20.100.
Burnham, Michael J.: *See—*
Rouse, William G.; Rhea, Ronald E.; Burnham, Michael J.; Kilgore, Connie S.; Fiala, John P.; and Bray, Lisa A., H775, Cl. 86-20.100.
Carlton, Lloyd C.; and Finnegan, Julie A., to United States of America, Navy. Microencapsulated catalyst and energetic composition containing same. H778, 5-1-90, Cl. 149-19.200.
Cole, James K., to United States of America, Energy. Aerodynamic flail for a spinning projectile. H776, 5-1-90, Cl. 102-498.000.
Fiala, John P.: *See—*
Rouse, William G.; Rhea, Ronald E.; Burnham, Michael J.; Kilgore, Connie S.; Fiala, John P.; and Bray, Lisa A., H775, Cl. 86-20.100.
Finnegan, Julie A.: *See—*
Carlton, Lloyd C.; and Finnegan, Julie A., H778, Cl. 149-19.200.
Hartman, Richard L., to United States of America, Army. Optical data processing detection of chemical agents. H780, 5-1-90, Cl. 356-71.000.
Kajioka, Mitsuru: *See—*
Miura, Yuzo; Yamamoto, Naoya; Tsushima, Atsushi; and Kajioka, Mitsuru, H774, Cl. 71-92.000.
Keedwell, Cyril A.; and Mills, Steven L., to Pall Corporation. Coalescer filter unit drain device. H773, 5-1-90, Cl. 55-498.000.
Kilgore, Connie S.: *See—*
Rouse, William G.; Rhea, Ronald E.; Burnham, Michael J.; Kilgore, Connie S.; Fiala, John P.; and Bray, Lisa A., H775, Cl. 86-20.100.
Mills, Steven L.: *See—*
Keedwell, Cyril A.; and Mills, Steven L., H773, Cl. 55-498.000.
Miura, Yuzo; Yamamoto, Naoya; Tsushima, Atsushi; and Kajioka, Mitsuru, to Nihon Nohyaku Co., Ltd. R-enantiomers of a Δ^2-1,2,4-triazolin-5-one derivatives. H774, 5-1-90, Cl. 71-92.000.
Nakamura, Yoshisada: *See—*
Ono, Mitsunori; Tamoto, Koji; Nakamura, Yoshisada; and Sato, Shingo, H782, Cl. 430-548.000.
Natarajan, Mani, to United States of America, Air Force. Method for jet gas impingement quenching. H777, 5-1-90, Cl. 148-128.000.
Nihon Nohyaku Co., Ltd.: *See—*
Miura, Yuzo; Yamamoto, Naoya; Tsushima, Atsushi; and Kajioka, Mitsuru, H774, Cl. 71-92.000.
Ono, Mitsunori; Tamoto, Koji; Nakamura, Yoshisada; and Sato, Shingo. Silver halide color photographic material. H782, 5-1-90, Cl. 430-548.000.
Pall Corporation: *See—*
Keedwell, Cyril A.; and Mills, Steven L., H773, Cl. 55-498.000.
Rhea, Ronald E.: *See—*
Rouse, William G.; Rhea, Ronald E.; Burnham, Michael J.; Kilgore, Connie S.; Fiala, John P.; and Bray, Lisa A., H775, Cl. 86-20.100.
Rouse, William G.; Rhea, Ronald E.; Burnham, Michael J., Kilgore, Connie S.; Fiala, John P.; and Bray, Lisa A., to United States of America, Army. Method of assembly of compacted powder and explosive charge for effective dissemination. H775, 5-1-90, Cl. 86-20.100.
Sato, Shingo: *See—*
Ono, Mitsunori; Tamoto, Koji; Nakamura, Yoshisada; and Sato, Shingo, H782, Cl. 430-548.000.
Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Method of making a ferrite circulator. H781, 5-1-90, Cl. 427-34.000.
Tamoto, Koji: *See—*
Ono, Mitsunori; Tamoto, Koji; Nakamura, Yoshisada; and Sato, Shingo, H782, Cl. 430-548.000.
Tsushima, Atsushi: *See—*
Miura, Yuzo; Yamamoto, Naoya; Tsushima, Atsushi; and Kajioka, Mitsuru, H774, Cl. 71-92.000.
United States of America
Air Force: *See—*
Natarajan, Mani, H777, Cl. 148-128.000.
Army: *See—*
Hartman, Richard L., H780, Cl. 356-71.000.
Rouse, William G.; Rhea, Ronald E.; Burnham, Michael J.; Kilgore, Connie S.; Fiala, John P.; and Bray, Lisa A., H775, Cl. 86-20.100.
Stern, Richard A.; and Babbitt, Richard W., H781, Cl. 427-34.000.
Energy: *See—*
Cole, James K., H776, Cl. 102-498.000.
Navy: *See—*
Carlton, Lloyd C.; and Finnegan, Julie A., H778, Cl. 149-19.200.
Verona, Robert W. Daytime flight symbology display system H779, 5-1-90, Cl. 350-174.000.
Yamamoto, Naoya: *See—*
Miura, Yuzo; Yamamoto, Naoya; Tsushima, Atsushi; and Kajioka, Mitsuru, H774, Cl. 71-92.000.

VOL
1114
ISS
1
MY
1
1990
UMI

CLASSIFICATION OF PATENTS

ISSUED MAY 1, 1990

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,920,575
9 4,920,576
24 4,920,577
114 4,920,578
145 4,920,579
206 4,920,580
237 4,920,581
424 4,920,585

CLASS 4

198 4,920,582
237 4,920,583
242 4,920,584
251 4,920,586
480 4,920,587
542 4,920,588

CLASS 5

61 4,920,589
86 4,920,590
455 4,920,591

CLASS 7

100 4,920,592
127 4,920,593

CLASS 8

408 4,921,503
415 4,921,504
526 4,921,505

CLASS 12

7 4,920,594

CLASS 14

2.4 4,920,595
69.5 4,920,596
4,920,597
71.1 4,920,598

CLASS 15

1.7 4,920,599
104.061 4,920,600
244.1 4,920,601
250.04 4,920,602
302 4,920,603
4,920,604
319 4,920,605
338 4,920,606
339 4,920,607
4,920,608

CLASS 16

66 4,920,609

CLASS 17

11 4,920,610
49 4,920,611
56 4,920,612

CLASS 19

80 B 4,920,613

CLASS 24

67.1 4,921,506
67.5 4,920,614
418 4,920,616
429 4,920,615
442 4,920,617
453 4,920,618
602 4,920,619
641 4,920,620

CLASS 26

18.6 4,920,621
75 4,920,622

CLASS 29

129 4,920,623
173 4,920,624
264 4,920,625
282 4,920,626
402.08 4,920,627
4,920,628
428 4,920,629
521 4,920,630
568 4,920,631
4,920,632
597 4,920,633
598 4,920,634
603 4,921,508
612 4,920,635
747 4,920,636
764 4,920,637
786 4,920,638
846 4,920,639
852 4,920,640
856 4,920,641
860 4,920,642
876 4,920,643

CLASS 30

53 4,920,644
162 4,920,645
4,920,646
169 4,920,647
298 4,920,648
382 4,920,649
386 4,920,650
475 4,920,651
504 4,920,652

CLASS 33

18.1 4,920,653
252 4,920,654
304 4,920,655
355 R 4,920,656
393 4,920,657
413 4,921,507
499 4,920,658
555.4 4,920,659
568 4,920,660

CLASS 34

58 4,920,661
60 4,920,662

CLASS 36

11.5 4,920,664
73 4,920,663
117 4,920,665
119 4,920,666

CLASS 37

285 4,920,667

CLASS 38

77.81 4,920,668
140 4,920,669

CLASS 40

300 4,920,670
301 4,920,671
363 4,920,672
405 4,920,673
412 4,920,674
492 4,920,675
610 B1 4,512,098

CLASS 42

16 4,920,677
25 4,920,676
4,920,678
75.02 4,920,679

CLASS 43

4.5 4,920,680
21.2 4,920,681
22 4,920,682
25.2 4,920,683
41.2 4,920,684
42.04 4,920,685
42.24 4,920,686
42.39 4,920,688
42.74 4,920,687
43.13 4,920,689
87 4,920,690

CLASS 44

51 B1 4,618,348
B1 4,666,457
B1 4,684,372
57 4,920,691

CLASS 47

9 4,920,692
41.12 4,920,693
58 4,920,694
83 4,920,695

CLASS 49

348 4,920,697
380 4,920,698
441 4,920,699

CLASS 51

124 L 4,920,700
165.71 4,920,701
170 R 4,920,702
287 4,920,703
302 4,920,704
318 4,920,705

CLASS 52

2 B 4,920,706
6 4,920,707
60 4,920,708
85 4,920,709
108 4,920,710
169.2 4,920,711
169 4 4,920,712
200 4,920,713
222 4,920,714
298 4,920,715
386 4,920,716
400 4,920,717
476 4,920,718
488 4,920,719
506 4,920,720
518 4,920,721
591 4,920,722
606 4,920,723
685 4,920,724
702 4,920,725

CLASS 53

79 4,920,726
252 4,920,727
410 4,920,728
523 4,920,729
532 4,920,730
556 4,920,731

CLASS 55

104 4,921,509
288 4,921,510
294 4,921,511
488 4,921,512

CLASS 56

10.2 4,920,732
10.9 4,920,733
11.1 4,920,734
14.9 4,920,735
249 4,920,737

CLASS 57

62 4,920,738
84 4,920,736
263 4,920,739

CLASS 60

39.07 4,920,741
39.141 4,920,740
39.32 4,920,742
205 4,920,743
226.1 4,920,744
273 4,920,745
299 4,920,746
324 4,920,747
414 4,920,748
648 4,920,749
671 4,920,750
679 4,920,751

CLASS 62

24 4,921,514
46.1 4,920,752
51.3 4,920,753
53.1 4,920,754
171 4,920,755
173 4,920,756
181 4,920,757
187 4,920,758
244 4,920,759
255 4,920,760
259.1 4,920,764
335 4,921,515
342 4,920,761
353 4,920,762
378 4,920,763
408 4,920,765
474 4,920,766

CLASS 65

3.12 4,921,516
4.4 4,921,517
18.1 4,921,518
39 4,921,519
108 4,921,522
111 4,921,520
135 4,921,521
172 4,921,523

CLASS 66

13 4,920,767
176 4,920,769

CLASS 68

18 R 4,920,768
133 4,920,770

CLASS 70

4 4,920,771
53 4,920,772
224 4,920,773
367 4,920,774

CLASS 71

73 4,921,525
86 4,921,526
88 4,921,524
90 4,921,527
92 4,921,528
4,921,529
94 4,921,530

CLASS 72

7 4,920,779
10 4,920,775
79 4,920,776
225 4,920,777
237 4,920,778
389 4,920,780
447 4,920,781
451 4,920,782
454 4,920,783

CLASS 73

1 E 4,920,784
40.7 4,920,785
49.2 4,920,786
54 4,920,787
118.1 4,920,788
118.2 4,920,789
4,920,790
147 4,920,791
153 4,920,792
189 4,920,793
195 4,920,795
269 4,920,794
290 V 4,920,796
309 4,920,797
313 4,920,798
431 4,920,799
517 R 4,920,800
4,920,801
597 4,920,802
606 4,920,803
623 4,920,804
706 4,920,805
779 4,920,806
808 4,920,807
861.42 4,920,808
865.5 4,920,810

CLASS 74

2 4,920,811
6 4,920,812
11 4,920,813
89.15 4,920,814
335 4,920,815
424.8 A 4,920,816
424.8 NA 4,920,817
475 4,920,818
480 B 4,920,819
491 4,920,820
552 4,920,821
4,920,822
553 4,920,823
4,920,824
606 R 4,920,825
868 4,920,829

CLASS 75

315 4,921,533
351 4,921,531
385 4,921,221
460 4,921,532
862.36 4,920,809

CLASS 81

9.51 4,920,830
54 4,920,831
57.29 4,920,832
165 4,920,834
462 4,920,835
463 4,920,836
4,920,837

CLASS 82

1.11 4,920,838

CLASS 83

140 4,920,840
177 4,920,841
308 4,920,842
346 4,920,843
404 3 4,920,844
574 4,920,845
820 4,920,846

CLASS 84

202 4,920,847
600 4,920,848
613 4,920,849
622 4,920,850
626 4,920,851

CLASS 86

1.1 4,920,852
33 4,920,853

CLASS 87

124.1 4,920,833

CLASS 89

14.4 4,920,854
172 4,920,855

CLASS 91

6.5 4,920,856
373 4,920,857
380 4,920,858
446 4,920,861
497 4,920,859
504 4,920,860

CLASS 92

86 4,920,863
158 4,920,862
213 4,920,864

CLASS 98

2.18 4,920,865
45 4,920,866
67 4,920,867

CLASS 99

279 4,920,868
283 4,920,869
289 R 4,920,870
295 4,920,871
339 4,920,872
4,920,873
403 4,920,874
589 4,920,875

CLASS 100

48 4,920,876
171 4,920,877

CLASS 101

115 4,920,878
219 4,920,879
425 4,920,880
488 4,920,881

CLASS 102

202.5 4,920,883
215 4,920,884
281 4,920,885
476 4,920,886
489 4,920,887
518 4,920,888
521 4,920,889

CLASS 104

53 4,920,890
102 4,920,891
173.2 4,920,892
242 4,920,893

CLASS 105

378 4,920,894

CLASS 106

20 4,921,534
21 4,921,535
74 4,921,536
90 4,921,537
100 4,921,538
284.03 4,921,539
287.34 4,921,540
433 4,921,541
456 4,921,542
500 4,921,543

CLASS 108

26 4,920,895
90 4,920,896
150 4,920,897

CLASS 110

265 4,920,898
336 4,920,899

CLASS 111

115 4,920,900
164 4,920,901

CLASS 112

103 4,920,902
229 4,920,903
262.1 4,920,904
275 4,920,905

CLASS 114

140 4,920,906
219 4,920,907
344 4,920,909

CLASS 116

173 4,920,910
308 4,920,912

CLASS 118

301 4,920,911
410 4,920,913
419 4,920,914
503 4,920,915
653 4,920,916
718 4,920,917
724 4,920,918
725 4,920,919
4,920,920

CLASS 119

3 4,920,921
5 4,920,922
51.02 4,920,923

CLASS 122

4 D 4,920,924
149 4,920,925
379 4,920,926

CLASS 123

41.43 4,920,927
41.49 4,920,929
41.86 4,920,930
46 SC 4,920,928
65 PE 4,920,931
4,920,932
73 A 4,920,933
80 BA 4,920,934
90.51 4,920,935
196 S 4,920,936
305 4,920,937
373 4,920,938
399 4,920,939
450 4,920,940
492 4,920,941
497 4,920,942
572 4,920,943
638 4,920,944

CLASS 125

11.01 4,920,946
11.03 4,920,945
21 4,920,947

CLASS 126

21 A 4,920,948
25 R 4,920,949
29 4,920,950
403 4,920,951
414 4,920,952

CLASS 128

4 4,920,953
24 A 4,920,954
4,920,955
24.1 4,920,956
52 4,920,957
206.12 4,920,960

402 4,920,963
403 4,920,964
419 PG 4,920,965
639 4,920,968
659 4,920,969
662.03 4,920,966
662.06 4,920,967
673 4,920,970
675 4,920,972
679 4,920,971
736 4,920,973
759 4,920,974
760 4,920,975
764 4,920,976
770 4,920,977
784 4,920,978
4,920,979
786 4,920,980
800 4,920,981
842 4,920,982
844 4,920,983
861 4,920,984
864 4,920,985
885 4,920,986

CLASS 131

84.3 4,920,987
242 4,920,988
270 4,920,989
359 4,920,990

CLASS 132

73 4,920,991
323 4,920,992
324 4,920,993

CLASS 134

1 4,920,994
4,921,544
15 4,920,995
16 4,921,545
22.11 4,920,996
22.12 4,921,546
57 R 4,920,997

CLASS 136

244 Re.33,208

CLASS 137

3 4,920,998
38 4,920,999
68.1 4,921,000
78.2 4,921,001
115 4,921,547
119 4,921,002
315 4,921,003
318 4,921,004
486 4,921,005
543.21 4,921,007
554 4,921,006
557 4,921,008
4,921,009
580 4,921,010
595 4,921,011
599 4,921,012
614.05 4,921,013
625.11 4,921,015
625.17 4,921,016
625.3 4,921,014
843 4,921,017

CLASS 138

149 4,921,018

CLASS 139

452 4,921,019

CLASS 141

20 4,921,020
103 4,921,021
129 4,921,022

CLASS 144

136 C 4,921,023
336 4,921,024

CLASS 148

12.7 A 4,921,548
13.1 4,921,549
16.5 4,921,025
24 4,921,550
33 4,921,026
101 4,921,551
302 4,921,553

CLASS 150

147 4,921,027
155 4,921,028

CLASS 152

11 4,921,029
210 4,921,030

CLASS 156

89 4,921,554
98 4,921,555
164 4,921,556
169 4,921,557
181 4,921,558
213 4,921,560
219 4,921,561
224 4,921,562
242 4,921,559
280 4,921,513
303.1 4,921,563
344 4,921,564
345 4,921,565
354 4,921,566
361 4,921,567
379.8 4,921,568
380.6 4,921,569
503 4,921,570
653 4,921,572
656 4,921,571

CLASS 160

38 4,921,031
84.1 4,921,032
133 4,921,033

CLASS 162

4 4,921,573
109 4,921,034
198 4,921,574
306 4,921,575

CLASS 164

37 4,921,035
76.1 4,921,036
432 4,921,037
516 4,921,038

CLASS 165

32 4,921,039
4,921,043
51 4,921,040
104.29 4,921,041
179 4,921,042

CLASS 166

116 4,921,044
134 4,921,045
170 4,921,046
252 4,921,576
276 4,921,047
311 4,921,577
372 4,921,048

CLASS 171

51 4,921,050

CLASS 172

21 4,921,051

CLASS 173

78 4,921,052
162.2 4,921,053

CLASS 174

65 R 4,922,056
4,922,057
94 R 4,922,058
254 4,922,059
255 4,921,054

CLASS 175

45 4,921,055
92 4,921,056
203 4,921,057

CLASS 177

25.19 4,921,578
181 4,921,058
211 4,921,059

CLASS 178

18 4,922,060
19 4,922,061

CLASS 180

41 4,921,060
79.1 4,921,061
89.14 4,921,062
178 4,921,063
197 4,921,064
245 4,921,065
322 4,921,066

CLASS 181

115 4,921,068
121 4,921,067

CLASS 182

135 4,921,069
142 4,921,070

CLASS 184

6.4 4,921,071
7.4 4,921,072
11.2 4,921,073

CLASS 187

8.71 4,921,074
9 E 4,921,075

CLASS 188

1.11 Re.33,207
12.6 4,921,076
73.45 4,921,077
171 4,921,078
296 4,921,079
299 4,921,080
344 4,921,081

CLASS 192

13 A 4,921,082
20 4,921,083
45 4,921,084
60 4,921,085

CLASS 193

3 4,921,086

CLASS 198

350 4,921,087
418.7 4,921,088
460 4,921,092
471.1 4,921,093
534 4,921,089
761 4,921,090
782 4,921,091

CLASS 200

11 R 4,922,063
61.45 M 4,922,065
61.7 4,922,064
80 R 4,922,062
4,922,066
83 P 4,922,067
271 4,922,068
334 4,922,069
512 4,922,070

CLASS 201

41 4,921,579

CLASS 202

205 4,921,580

CLASS 203

56 4,921,581

CLASS 204

15 4,921,583
67 4,921,584
72 4,921,585
4,921,586
84 4,921,587
147 4,921,588
153.1 4,921,582
157.5 4,921,589
216 4,921,590
412 4,921,591

CLASS 206

232 4,921,094
328 4,921,095
349 4,921,096
387 4,921,097
408 4,921,098
418 4,921,099
448 4,921,100
451 4,921,101
470 4,921,102
523 4,921,103
621.4 4,921,104
626 4,921,105

CLASS 208

48 AA 4,921,592
58 4,921,594
59 4,921,593
4,921,595
113 4,921,596

CLASS 209

223.2 4,921,597
539 4,921,106
546 4,921,107
552 4,921,109
625 4,921,108

CLASS 210

106 4,921,603
115 4,921,605
136 4,921,598
151 4,921,604
155 4,921,599
169 4,921,600
4,921,601
232 4,921,602
238 4,921,606
266 4,921,607
393 4,921,608
521 4,921,609
636 4,921,610
644 4,921,611
4,921,612
651 4,921,613
695 4,921,614
729 4,921,615
767 4,921,616
776 4,921,617
780 4,921,618

CLASS 211

1.3 4,921,110
13 4,921,111

CLASS 215

11.4 4,921,112
253 4,921,113

CLASS 219

10.55 E 4,922,071
56.1 4,922,072
60 A 4,922,073
69.15 4,922,074
4,922,076
92 4,922,075
121.68 4,922,077
216 4,922,078
415 4,922,079
457 4,922,080
506 4,922,081
541 4,922,082
549 4,922,083
4,922,084

CLASS 220

4 B 4,921,114
18 4,921,115
72 4,921,116
85 H 4,921,117
88 A 4,921,118
212 4,921,119
254 4,921,120
270 4,921,121
323 4,921,123
326 4,921,122
367 4,921,124
426 4,921,125
855 4,921,126

CLASS 221

45 4,921,127
75 4,921,128

CLASS 222

23 4,921,129
46 4,921,130
52 4,921,131
57 4,921,132
63 4,921,133
64 4,921,134
82 4,921,135
85 4,921,138
95 4,921,136
107 4,921,137
129.1 4,921,139
144.5 4,921,140
146.6 4,921,141
162 4,921,142
175 4,921,143
336 4,921,144
473 4,921,146
527 4,921,147
597 4,921,148
639 4,921,149
4,921,150

CLASS 224

32 R 4,921,151
42.42 4,921,152
253 4,921,153

CLASS 225

97 4,921,154

CLASS 226

181 4,921,155

CLASS 228

37 4,921,156
124 4,921,157
4,921,158
182 4,921,159

CLASS 235

101 4,922,085
449 4,922,086
492 4,921,160

CLASS 236

12.12 4,921,162
15 A 4,921,161
46 R 4,921,163
49.3 4,921,164
93 R 4,921,165

CLASS 237

60 4,921,166

CLASS 238

126 4,921,167
287 4,921,168

CLASS 239

3 4,921,169
304 4,921,170
314 4,921,171
698 4,921,172

CLASS 241

5 4,921,173
37.5 4,921,174
4,921,175
260.1 4,921,176

CLASS 242

3 4,921,177
7.05 R 4,921,178
18 R 4,921,179
35.5 A 4,921,180
43 A 4,921,181
54 R 4,921,182
66 4,921,183
107.4 A 4,921,184
129.6 4,921,185
147 R 4,921,186
232 4,921,187
233 4,921,188

CLASS 244

3.16 4,922,096

CLASS 246

448 4,921,189

CLASS 248

70 4,921,191
96 4,921,192
97 4,921,193
4,921,194
4,921,195
4,921,196
4,921,197
123.1 4,921,198
159 4,921,190
314 4,921,199
545 4,921,200
562 4,921,201
581 4,921,202
635 4,921,203

CLASS 249

2 4,921,204
61 4,921,205

CLASS 250

201.4 4,922,087
203.4 4,922,088
205 4,922,089
4,922,090
211 J 4,922,091
213 VT 4,922,092
221 4,922,093
4,922,094
227.17 4,922,095
310 4,922,097
311 4,922,098
324 4,922,099
327.2 4,922,100
4,922,101
4,922,102
4,922,103
339 4,922,104
372 4,922,112
4,922,113
436 4,922,114
484.1 4,922,105
4,922,115
492.2 4,922,106
495.1 4,922,116
504 R 4,922,107
4,922,108
556 4,922,109
4,922,110
566 4,922,111
578.1 4,922,117

CLASS 251

7 4,921,206
14 4,921,207
30.01 4,921,209
30.04 4,921,208
63.4 4,921,215
129.04 4,921,211
129.08 4,921,210
163 4,921,212
328 4,921,213
335.2 4,921,214

CLASS 252

8.513 4,921,620
4,921,621
8.554 4,921,619
8.9 4,921,622
48.6 4,921,624
56 D 4,921,625
79.4 4,921,626
99 4,921,627
111 4,921,628
170 4,921,629
174.12 4,921,630
186.38 4,921,631
299.1 4,921,632
312 4,921,634
314 4,921,633
315.1 4,921,635
408.1 4,921,636
512 4,921,623

CLASS 254

28 4,921,216
29 R 4,921,217
98 4,921,218
284 4,921,219

CLASS 256

1 4,921,220

CLASS 261

67 4,921,639
76 4,921,640
112.2 4,921,641
142 4,921,642

CLASS 264

4.1 4,921,644
6 4,921,645
26 4,921,646
4,921,647
27 4,921,648
33 4,921,649
37 4,921,650
41 4,921,651
4,921,652
4,921,653
45.5 4,921,654
64.23 4,921,224
66 4,921,655
80 4,921,668
85 4,921,656
86 4,921,657
4,921,658
134 4,921,669
141 4,921,670
145 4,921,671
161 4,921,672
254 4,921,673
282 4,921,643
510 4,921,659

CLASS 266

275 4,921,222

CLASS 267

64.13 4,921,225
64.23 4,921,223
4,921,227
64.24 4,921,226
103 4,921,228
140.1 4,921,049
4,921,229
156 4,921,230
196 4,921,231
219 4,921,232

CLASS 269

32 4,921,233
147 4,921,234

CLASS 270

47 4,921,235

CLASS 271

3.1 4,921,236
11 4,921,237
37 4,921,238
186 4,921,239
245 4,921,240
4,921,241

CLASS 272

72 4,921,242
96 4,921,243
109 4,921,245
117 4,921,244
123 4,921,246
136 4,921,247

CLASS 273

1.5 R 4,921,248
58 R 4,921,250
93 R 4,921,251
164 4,921,252
4,921,660
167 B 4,921,253
183 B 4,921,254
232 4,921,255
256 4,921,249
378 4,921,256
401 4,921,257

CLASS 277

29 4,921,258
112 4,921,259
153 4,921,260

CLASS 280

30 4,921,261
43.23 4,921,262
62 4,921,263
79.11 4,921,264
96.1 4,921,265
281.1 4,921,267

402 4,921,268
415.1 4,921,266
475 4,921,269
655.1 4,921,270
661 4,921,271
707 4,921,272
808 4,921,273
812 4,921,274
824 4,921,275
848 4,921,276

CLASS 283

67 4,921,279
81 4,921,277
87 4,921,278
88 4,921,280

CLASS 285

90 4,921,281
104 4,921,282
114 4,921,283
415 4,921,284

CLASS 290

31 4,922,119

CLASS 292

39 4,921,285
106 4,921,287
144 4,921,288
216 4,921,286
336.3 4,921,289
337 4,921,290

CLASS 294

65.5 4,921,292
90 4,921,291
99.1 4,921,294
111 4,921,293

CLASS 296

20 4,921,295
96.21 4,921,297
97.11 4,921,300
97.2 4,921,296
221 4,921,298
978 4,921,299

CLASS 297

1.8 4,921,301
170 4,921,302
338 4,921,303
452 4,921,304

CLASS 298

4,921,305

CLASS 299

4,921,306
34 4,921,307
39 4,921,308
75 4,921,309
92 4,921,310

CLASS 302

296 4,922,398

CLASS 303

9.76 4,921,311
100 4,921,312
110 4,921,314
114 4,922,120
115 4,922,121
116 4,921,313

CLASS 307

87 4,922,124
149 4,922,125
261 4,922,126
262 4,922,127
269 4,922,128
309 4,922,123
315 4,922,129
353 4,922,130
355 4,922,131
359 4,922,132
363 4,922,133
441 4,922,134
450 4,922,135
465.1 4,922,136
480 4,922,122
4,922,137
482 4,922,138
520 4,922,139
591 4,922,140
595 4,922,141

CLASS 310

12 4,922,142
4,922,143
42 4,922,144
49 R 4,922,145
59 4,922,146
61 4,922,147
68 D 4,922,148
89 4,922,149
90 4,922,150
91 4,922,151
156 4,922,152
215 4,922,165
239 4,922,163
268 4,922,162
309 4,922,164

CLASS 312

214 4,920,696
321.5 4,921,315

CLASS 313

414 4,922,166
431 4,922,167

CLASS 315

8 4,922,153
149 4,922,154
205 4,922,155
244 4,922,156
248 4,922,157
383 4,922,158

CLASS 318

128 4,922,159
135 4,922,160
254 4,922,169
4,922,513
269 4,922,161
286 4,922,168
434 4,922,170
471 4,922,171
490 4,922,172
568.2 4,922,173
577 4,922,174
592 4,922,175
602 4,922,176
663 4,922 177

CLASS 320

2 4,922,178

CLASS 322

25 4,922,179

CLASS 324

72.5 4,922,184
74 4,922,185
96 4,922,186
4,922,187
130 4,922,188
142 4,922,189
158 F 4,922,190
4,922,191
158 MG 4,922,195
158 P 4,922,192
158 R 4,922,193
4,922,194
4,922,196
207.13 4,922,198
207.17 4,922,199
207.21 4,922,197
223 4,922,200
236 4,922,201
306 4,922,202
307 4,922,203
322 4,922,204
454 4,922,205
639 4,922,180
664 4,922,181
682 4,922,182
694 4,922,183

CLASS 329

304 4,922,206

CLASS 330

84 4,922,207
255 4,922,208

CLASS 331

12 4,922,209
68 4,922,211
167 4,922,210
176 4,922,212

CLASS 333

21 A 4,922,213
135 4,922,214
137 4,922,215

CLASS 335

128 4,922,216
229 4,922,217

CLASS 337

74 4,922,219
82 4,922,220

CLASS 340

311.1 4,922,221
323 R 4,922,222
428 4,922,224
467 4,922,225
473 4,922,223
521 4,922,226
527 4,922,227
550 4,922,228
572 4,922,229
577 4,922,230
584 4,922,231
605 4,922,232
606 4,922,233
608 4,922,234
686 4,922,235
710 4,922,236
723 4,922,237
726 4,922,238
753 4,922,239
784 4,922,240
4,922,241
786 4,922,242
813 4,922,243
825.08 4,922,245
825.5 4,922,244
825.90 4,922,246

CLASS 341

2 4,922,247
25 4,922,248
57 4,922,249
133 4,922,250
155 4,922,251
172 4,922,252

CLASS 342

5 4,922,253
25 4,922,254
104 4,922,255
132 4,922,256
377 4,922,257
462 4,922,258

CLASS 343

700 MS 4,922,259
718 4,922,260
742 4,922,261
770 4,922,262
797 4,922,263
878 4,922,264

CLASS 346

1.1 4,922,265
4,922,266
136 4,922,267
140 R 4,922,268
4,922,269
4,922,270
4,922,271
160 4,922,272

CLASS 350

1.4 4,921,316
3.6 4,921,319
6.8 4,921,320
96.12 4,921,321
96.20 4,921,322
96.21 4,921,323
4,921,324
4,921,325
96.26 4,921,326
96.27 4,921,316
96.32 4,921,327
96.34 4,921,328
128 4,921,329
4,921,330
164 4,921,331
311 4,921,317
320 4,921,333
333 4,921,334
354 4,921,335
4,921,336
604 4,921,337
619 4,921,338
623 4,921,339
631 4,921,340
86 4,921,341

CLASS 352

171 4,921,342

CLASS 353

66 4,921,343

CLASS 354

62 4,921,344
271.1 4,922,274
293 4,922,275
299 4,922,276
317 4,922,277
320 4,922,278
400 4,922,279
403 4,922,280
404 4,922,281
406 4,922,282
484 4,922,283

CLASS 355

20 4,922,284
4,922,285
27 4,922,286
4,922,287
4,922,288
29 4,922,289
53 4,922,290
72 4,922,291
75 4,922,292
200 4,922,293
208 4,922,296
209 4,922,294
4,922,295
211 4,922,297
218 4,922,298
219 4,922,299
245 4,922,300
251 4,922,301
4,922,302
274 4,922,303
282 4,922,304
299 4,922,305
313 4,922,306

CLASS 356

5 4,922,307
28 4,921,345
72 4,921,346
73.1 4,921,347
128 4,921,348
229 4,921,349
237 4,922,308
300 4,922,309
320 4,921,350
323 4,921,351
347 4,921,352
4,921,353
350 4,921,354

CLASS 357

22 4,922,310
23.1 4,922,311
23.4 Re.33,209
4,922,327
23.6 4,922,312
4,922,313
30 4,922,218
34 4,922,314
35 4,922,315
41 4,922,316
42 4,922,317
43 4,922,318
51 4,922,319
67 4,922,320
68 4,922,321
69 4,922,322
71 4,922,323
74 4,922,324
4,922,325
80 4,922,326

CLASS 358

4,922,328
2 4,922,329
29 4,922,330
31 4,922,331
44 4,922,334
77 4,922,332
78 4,922,333
80 4,922,335
98 4,922,336
101 4,922,337
106 4,922,338
108 4,922,339
135 4,922,340
136 4,922,341
138 4,922,342
140 4,922,118
148 4,922,343
152 4,922,344
183 4,922,345
227 4,922,346
296 4,922,347
407 4,922,348
429 4,922,273
443 4,922,349
488 4,922,350
494 4,922,351

CLASS 360

39 4,922,352
96.5 4,922,353
97.03 4,922,354
4,922,406
104 4,922,356
105 4,922,357
4,922,358
189.01 4,922,359
189.05 4,922,358
206 4,922,459
207 4,922,460
230.08 4,922,461

CLASS 361

3 4,922,363
16 4,922,364
18 4,922,365
56 4,922,366
58 4,922,367
62 4,922,368
88 4,922,369
4,922,370
91 4,922,371
97 4,922,372
105 4,922,373
119 4,922,374
273 4,922,375
386 4,922,376
387 4,922,377
4,922,378
388 4,922,379
399 4,922,380
414 4,921,381
424 4,922,382

CLASS 362

10 4,922,383
31 4,922,384
32 4,922,385
61 4,922,386
4,922,387
4,922,388
4,922,389
72 4,922,390
4 4,922,481
101 4,922,355
144 4,922,391
217 4,922,392
225 4,922,393
269 4,922,394
390 4,922,395

CLASS 363

17 4,922,397
21 4,922,396
4,922,399
37 4,922,400
58 4,922,401
60 4,922,402
4,922,403
89 4,922,404
126 4,922,405

CLASS 364

145 4,922,407
157 4,922,412
200 4,922,408
4,922,409
4,922,410
4,922,413
4,922,414
4,922,415
4,922,416
4,922,417
4,922,418
407 4,922,439
408 4,922,419
410 4,922,420
413.16 4,922,422
413.25 4,922,421
422 4,922,423
424.05 4,922,426
4,922,427
424.1 4,922,424
4,922,425
426.04 4,922,428
431.06 4,922,429
461 4,922,430
474.18 4,922,431
474.22 4,922,440
490 4,922,432
491 4,922,441
510 4,922,433
513 4,922,434
4,922,435
4,922,436
514 4,922,437
550 4,922,442
551.01 4,922,443
561 4,922,447
566 4,922,444
578 4,922,445
748 4,922,446
900 4,922,448
4,922,449
4,922,450
4,922,451

CLASS 365

45 4,922,452
63 4,922,453
113 4,922,462
122 4,922,454
154 4,922,455
155 4,922,411
185 4,922,456
189.01 4,922,457
189.05 4,922,458
206 4,922,459
207 4,922,460
230.08 4,922,461

CLASS 366

21 4,922,463
146 4,921,355
343 4,921,356
349 4,922,464

CLASS 367

38 4,922,465
46 4,922,362
68 4,922,466
87 4,922,467
139 4,922,468
140 4,922,469
163 4,922,470
181 4,922,471
189 4,922,472
4,922,473

CLASS 368

113 4,922,474
252 4,922,475

CLASS 369

47 4,922,476
221 4,922,477
247 4,922,478

CLASS 370

1 4,922,479
3 4,922,480
4 4,922,481
13 4,922,482
50 4,922,483
60 4,922,485
4,922,486
4,922,487
4,922,488
68.1 4,922,484
85.13 4,922,503
85.15 4,922,438
100.1 4,922,489
119.1 4,922,490

CLASS 371

16.1 4,922,491
22.1 4,922,492
31 4,922,493
35 4,922,494

CLASS 372

3 4,922,495
6 4,922,496
8 4,922,497
25 4,922,498
38 4,921,357
46 4,922,499
50 4,922,500
54 4,922,501
66 4,922,502
87 4,922,504

CLASS 373

9 4,922,505

CLASS 375

1 4,922,506
26 4,922,507
34 4,922,508
103 4,922,509
122 4,922,510

CLASS 376

136 4,921,661
316 4,921,662
451 4,921,663

CLASS 378

169 4,922,511
197 4,922,512

CLASS 379

6 4,922,514
4,922,515
21 4,922,516
57 4,922,518
58 4,922,517
67 4,922,519
88 4,922,520
95 4,922,521
4,922,522
96 4,922,523
100 4,922,524
145 4,922,525
157 4,922,526
361 4,922,527
386 4,922,528
387 4,922,529
411 4,922,530
413 4,922,531

CLASS 380

15 4,922,532
46 4,922,533
49 4,922,534

CLASS 381

2 4,922,536
29 4,922,535
31 4,922,537
42 4,922,538
50 4,922,539
69 4,922,540
156 4,922,541
187 4,922,542

CLASS 382

48 4,922,543
56 4,922,544
4,922,545

CLASS 384

15	4,921,358
18	4,921,359
44	4,921,360
45	4,921,361
482	4,921,362

CLASS 4.8

247	4,921,552

CLASS 400

120	4,921,363
124	4,921,364
322	4,921,365
708	4,920,882

CLASS 401

126	4,921,366

CLASS 403

106	4,921,367
134	4,921,368
171	4,921,369
234	4,921,370
408.1	4,921,371

CLASS 404

89	4,921,372

CLASS 405

115	4,921,373
154	4,921,374

CLASS 408

67	4,921,375

CLASS 409

131	4,921,376
140	4,921,377
221	4,921,378

CLASS 410

117	4,921,379

CLASS 411

8	4,921,380
25	4,921,381
45	4,921,382
57	4,921,383
361	4,921,384

CLASS 414

21	4,921,385
22.51	4,921,386
225	4,921,387
412	4,921,388
420	4,921,389
483	4,921,390
505	4,921,391
546	4,921,394
695	4,921,392
729	4,921,393
744.3	4,921,395
751	4,921,396
788.4	4,921,397
798.7	4,921,398

CLASS 415

27	4,921,399
138	4,921,401
148	4,921,402
169.1	4,921,400

CLASS 416

147	4,921,403
223 R	4,921,404
241 R	4,921,405

CLASS 417

87	4,921,406
368	4,921,408
552	4,921,409
553	4,921,407

CLASS 419

1	4,921,664
8	4,921,410
23	4,921,665
25	4,921,666

CLASS 422

28	4,921,674
34	4,921,675
100	4,921,676
103	4,921,677
110	4,921,678
169	4,921,679
197	4,921,680
	4,921,681
247	4,921,752

CLASS 423

225	4,921,682
235	4,921,683
	4,921,886
360	4,921,684
439	4,921,685
447.6	4,921,686
448	4,921,687
463	4,921,688
605	4,921,689

CLASS 424

1.1	4,921,690
45	4,921,691
52	4,921,692
	4,921,693
59	4,921,942
65	4,921,694
81	4,921,695
84	4,921,696
85.5	4,921,697
	4,921,698
85.7	4,921,699
85.8	4,921,667
117	4,921,700
401	4,921,701
404	4,921,702
419	4,921,703
446	4,921,704
450	4,921,705
	4,921,706
690	4,921,707

CLASS 425

12	4,921,411
28.1	4,921,412
71	4,921,413
131.1	4,921,414
135	4,921,415
143	4,921,416
145	4,921,417
371	4,921,418
406	4,921,419
548	4,921,708

CLASS 426

49	4,921,709
56	4,921,710
66	4,921,711
77	4,921,712
85	4,921,713
90	4,921,714
102	4,921,715
521	4,921,719
534	4,921,716
587	4,921,717
618	4,921,718
641	4,921,720

CLASS 427

34	4,921,721
39	4,921,722
41	4,921,723
	4,921,724
45.1	4,921,725
54.1	4,921,726
57	4,921,727
58	4,921,728
131	4,921,729
138	4,921,730
255.2	4,920,908
314	4,921,731
325	4,921,732

CLASS 428

34.2	4,921,733
34.4	4,921,734
34.6	4,921,738
34.9	4,921,735
36.4	4,921,736
36.92	4,921,737
40	4,921,739
	4,921,740
48	4,921,741
81	4,921,742
102	4,921,743
116	4,921,744
118	4,921,745
178	4,921,746
195	4,921,747
209	4,921,748
216	4,921,749
225	4,921,750
229	4,921,751
251	4,921,753
325	4,921,754
328	4,921,755
373	4,921,756
402.2	4,921,757
419	4,921,758
424.4	4,921,759
446	4,921,760
473.5	4,921,761
480	4,921,764
521	4,921,762
692	4,921,763

CLASS 429

16	4,921,765
104	4,921,766

CLASS 430

23	4,921,767
45	4,921,768
64	4,921,769
76	4,921,770
110	4,921,771
126	4,921,772
132	4,921,773
138	4,921,774
281	4,921,775
293	4,921,776
314	4,921,777
326	4,921,778
379	4,921,779
495	4,921,780
496	4,921,781
548	4,921,782
558	4,921,783
567	4,921,784
621	4,921,785

CLASS 431

153	4,921,420
295	4,921,421

CLASS 432

24	4,921,422

CLASS 433

3	4,921,423
62	4,921,425
114	4,921,424

CLASS 434

340	4,921,427

CLASS 435

4	4,921,786
5	4,921,787
6	4,921,788
7	4,921,789
	4,921,790
28	4,921,791
41	4,921,792
84	4,921,793
91	4,921,794
96	4,921,795
97	4,921,796
129	4,921,797
146	4,921,798
167	4,921,799
168	4,921,800
172.3	4,921,801
	4,921,802
179	4,921,803
189	4,921,804
270	4,921,805
302	4,921,806

CLASS 436

18	4,921,807
503	4,921,808
531	4,921,809

CLASS 437

8	4,921,810
31	4,921,811
35	4,921,812
46	4,921,813
47	4,921,814
52	4,921,815
	4,921,816
127	4,921,817

CLASS 439

15	4,921,428
26	4,921,429
34	4,921,426
72	4,921,430
79	4,921,431
164	4,921,432
190	4,921,438
198	4,921,434
248	4,921,435
275	4,921,437
395	4,921,436
417	4,921,439
421	4,921,440
460	4,921,441
499	4,921,442
521	4,921,443
528	4,921,444
532	4,921,445
534	4,921,433
536	4,921,446
585	4,921,447
595	4,921,448
610	4,921,449
621	4,921,450
	4,921,451
622	4,921,452
630	4,921,453
685	4,921,454
709	4,921,455
851	4,921,456

CLASS 440

111	4,921,457

CLASS 446

101	4,921,458
221	4,921,462
296	4,921,461
321	4,921,459
385	4,921,460

CLASS 453

3	4,921,463

CLASS 455

34	4,921,464
74	4,922,546
79	4,922,547
183	4,922,548
193	4,921,465
212	4,922,549
214	4,921,466
264	4,921,467
617	4,921,468

CLASS 460

10	4,921,469

CLASS 464

151	4,921,470

CLASS 474

101	4,921,471
111	4,921,472

CLASS 475

52	4,920,826
166	4,920,827
299	4,920,828

CLASS 494

27	4,921,473

CLASS 501

89	4,921,818
95	4,921,822
127	4,921,819
128	4,921,820
	4,921,821

CLASS 502

4	4,921,823
65	4,921,824
104	4,921,825
167	4,921,827
180	4,921,826
205	4,921,828
302	4,921,829
326	4,921,830
418	4,921,831

CLASS 503

201	4,921,832

CLASS 505

1	4,921,833
	4,921,834

CLASS 514

2	4,921,837
8	4,921,841
18	4,921,835
19	4,921,836
25	4,921,838
29	4,921,839
33	4,921,840
170	4,921,843
171	4,921,844
172	4,921,845
173	4,921,846
182	4,921,848
	4,921,849
188	4,921,847
202	4,921,850
203	4,921,851
210	4,921,852
224.2	4,921,854
227.2	4,921,853
235.8	4,921,855
252	4,921,856
254	4,921,857
258	4,921,858
262	4,921,859
304	4,921,860
312	4,921,861
	4,921,862
319	4,921,863
326	4,921,864
	4,921,887
336	4,921,865
	4,921,866
345	4,921,867
354	4,921,868
376	4,921,869
383	4,921,870
432	4,921,871
523	4,921,872
546	4,921,873
552	4,921,874
567	4,921,875
638	4,921,876
866	4,921,877

CLASS 521

53	4,921,878
129	4,921,879

CLASS 522

12	4,921,880
99	4,921,881
	4,921,882
107	4,921,883

CLASS 523

106	4,921,884
220	4,921,885
310	4,921,888
400	4,921,889
507	4,921,890

CLASS 524

15	4,921,891
61	4,921,892
99	4,921,893
377	4,921,894
379	4,921,895
403	4,921,896
405	4,921,897
459	4,921,898
513	4,921,899
555	4,921,902
	4,921,903
744	4,921,900
839	4,921,842

CLASS 525

53	4,921,905
	4,921,906
57	4,921,907
61	4,921,908
64	4,921,909
74	4,921,910
86	4,921,911
112	4,921,912
119	4,921,913
184	4,921,914
244	4,921,901
279	4,921,915
329.9	4,921,904
423	4,921,916
479	4,921,917

CLASS 526

88	4,921,918
	4,921,919
125	4,921,920
195	4,921,921
255	4,921,922
313	4,921,923
339	4,921,924

CLASS 528

5	4,921,925
17	4,921,926
87	4,921,927
111	4,921,928
272	4,921,929
306	4,921,930
322	4,921,931
339.3	4,921,932
348	4,921,933
355	4,921,934
388	4,921,935
389	4,921,936
392	4,921,937
	4,921,938
486	4,921,940

CLASS 530

331	4,921,941

CLASS 534

10	4,921,944
614	4,921,945

CLASS 536

7.1	4,921,947
18.2	4,921,948
20	4,921,949
23	4,921,950
27	4,921,951
	4,921,952

CLASS 540

222	4,921,954
227	4,921,953

CLASS 544

60	4,921,955
165	4,921,956
217	4,921,957
295	4,921,958

CLASS 546

152	4,921,959
153	4,921,960
169	4,921,961
184	4,921,962

CLASS 548

101	4,921,963
219	4,921,964
251	4,921,965
260	4,921,966
262.4	4,921,968
267.8	4,921,967
335	4,921,969
480	4,921,970
534	4,921,971

CLASS 549

66	4,921,972
212	4,921,973
214	4,921,974
228	4,921,975
256	4,921,977
264	4,921,978
375	4,921,979
426	4,921,980
462	4,921,982
525	4,921,983

CLASS 552

295	4,921,637
610	4,921,638

CLASS 556

40	4,921,984
76	4,921,985
149	4,921,986
401	4,921,987
413	4,921,988
431	4,921,989
482	4,921,976

CLASS 558

104	4,921,990
135	4,921,991
145	4,921,992
392	4,921,993
414	4,921,939
426	4,921,994
441	4,921,995

CLASS 560

25	4,921,996
34	4,921,997
45	4,921,998
52	4,921,999
061	4,922,000
112	4,922,001
193	4,922,002
221	4,922,003
	4,922,004
347	4,922,005

CLASS 562

11	4,922,006
13	4,922,007
15	4,922,013
58	4,922,008
418	4,922,014
451	4,922,015
466	4,922,009
470	4,922,010
554	4,922,011

CLASS 564

15	4,922,012
219	4,922,016
265	4,922,017
307	4,922,018
330	4,922,020
332	4,922,019
367	4,922,021
	4,922,022
479	4,922,023
480	4,922,024

CLASS 568

14	4,922,025
322	4,922,026
445	4,922,027
448	4,922,028
616	4,922,029
713	4,922,030
730	4,922,031
862	4,922,032
909.8	4,922,033
	4,922,034
	4,922,035
	4,922,036

CLASS 570

141	4,922,041
168	4,922,037
175	4,922,038
211	4,922,039
	4,922,040
247	4,922,042
258	4,922,043
263	4,922,044

CLASS 585

10	4,922,045
11	4,922,046
12	4,922,047
25	4,922,052
310	4,922,048

327	4,922,049
379	4,922,050
418	4,922,051
444	4,921,946
449	4,922,053
452	4,922,054
470	4,922,055

CLASS 604

16	4,921,474
20	4,921,475
22	4,921,476
	4,921,477
53	4,921,478
	4,921,479
65	4,921,480
67	4,921,481
95	4,921,482
96	4,921,483
104	4,921,484
	4,921,485
110	4,921,486
153	4,921,488
192	4,921,489
	4,921,490
199	4,921,491
315	4,921,492
349	Re.33,206

CLASS 606

14	4,920,961
53	4,920,959
85	4,921,493
96	4,920,958
152	4,920,962
188	4,921,494

CLASS 609

135	4,921,487

CLASS 623

1	4,921,495
6	4,921,496
	4,921,497
10	4,921,498
16	4,921,499
22	4,921,500
23	4,921,501
33	4,921,502

CLASSIFICATION OF DESIGNS

D2—	6	307,505		641	307,532	D10—	46	307,556		121	307,582		72	307,608		25	307,634
	215	307,506		667	307,527			307,557		126	307,583		78	307,609		67	307,635
	279	307,507		678	307,528		57	307,558			307,584		80	307,610			307,636
	314	307,508	D8—	51	307,534		81	307,559		137	307,585		134	307,611	D25—	119	307,637
		307,509		71	307,535		106	307,560		150	307,586		148	307,612	D26—	11	307,638
	320	307,510		95	307,536	D11—	130.1	307,561		159	307,587		187	307,613		24	307,639
	605	307,511		97	307,537		134	307,562		241	307,588		194	307,614			307,640
	639	307,512		351	307,538			307,563	D15—	13	307,589			307,615		85	307,641
D3—	30.1	307,521		367	307,539		164	307,566			307,590		200	307,616			307,642
	35	307,513		395	307,540	D12—	162	307,564			307,591		219	307,617		91	307,643
	48	307,514		396	307,541		169	307,565		127	307,592		234	307,618	D28—	9	307,644
	71	307,515	D9—	76	307,646			307,567		130	307,593			307,619		49	307,645
	106	307,516		300	307,542		181	307,568	D18—	7	307,594	D22—	140	307,620	D29—	2	307,647
D4—	116	307,517		302	307,543			307,569			307,595			307,621			307,648
	138	307,518		352	307,544		187	307,570		13	307,596		141	307,622		5	307,649
D6—	300	307,520			307,545			307,571		14	307,597	D23—	200	307,623			307,650
	323	307,522		373	307,546		211	307,572		23	307,598		208	307,624			307,651
	347	307,523		375	307,547		217	307,575		24	307,599			307,625		19	307,652
	381	307,524			307,548		304	307,573	D19—	34.5	307,603		210	307,626	D32—	1	307,653
	451	307,525		376	307,549		314	307,574		36	307,600		214	307,627			307,654
	484	307,519			307,550	D13—	133	307,580		43	307,601		225	307,628		15	307,655
	601	307,526		378	307,551		140	307,579		49	307,602		296	307,629		22	307,656
D7—	360	307,531		384	307,552		158	307,578	D20—	10	307,604		304	307,630			307,657
	505	307,529		403	307,553		164	307,576		18	307,605		353	307,631			307,658
	508	307,530		415	307,554			307,577		31	307,606		392	307,632			
	526	307,533		447	307,555	D14—	106	307,581	D21—	60	307,607	D24—	16	307,633	D34—	33	307,659

CLASSIFICATION OF PLANTS

P.—	68	7,224		76	7,225						

STATUTORY INVENTION REGISTRATIONS

55—	498	H773	86—	20.1	H775	148—	128	H777	350—	174	H779						
71—	92	H774	102—	498	H776	149—	19.2	H778	356—	71	H780	427—	34	H781	430—	548	H782

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,920,629	4,920,918	4,921,594	4,920,714	4,922,037	4,922,515
	4,920,682	4,920,966	4,921,600	4,921,152	4,922,038	4,922,532
	4,920,738	4,920,970	4,921,603	4,921,271	12 Re.33,207	15 4,921,220
	4,920,814	4,920,974	4,921,642	4,921,339	4,920,586	4,921,273
	4,921,369	4,920,979	4,921,648	4,921,420	4,920,672	4,921,411
	4,921,733	4,920,989	4,921,660	4,921,458	4,920,680	4,922,385
	4,921,986	4,920,992	4,921,661	4,921,894	4,920,686	16 4,921,713
	4,922,387	4,920,999	4,921,684	4,922,130	4,920,693	17 4,920,575
	4,922,525	4,921,011	4,921,690	4,922,169	4,920,733	4,920,589
04	4,920,580	4,921,033	4,921,698	4,922,352	4,920,847	4,920,593
	4,920,592	4,921,045	4,921,792	09 4,920,606	4,920,897	4,920,633
	4,920,677	4,921,062	4,921,810	4,920,706	4,920,901	4,920,647
	4,920,797	4,921,066	4,921,862	4,920,711	4,920,953	4,920,780
	4,921,120	4,921,073	4,922,012	4,920,773	4,920,964	4,920,798
	4,921,123	4,921,081	4,922,060	4,920,775	4,920,980	4,920,861
	4,921,129	4,921,090	4,922,073	4,920,799	4,920,993	4,920,871
	4,921,205	4,921,116	4,922,116	4,920,802	4,921,078	4,920,881
	4,921,405	4,921,135	4,922,129	4,920,948	4,921,115	4,920,912
	4,921,442	4,921,141	4,922,141	4,920,961	4,921,117	4,921,023
	4,922,059	4,921,153	4,922,163	4,921,029	4,921,188	4,921,025
	4,922,156	4,921,158	4,922,183	4,921,107	4,921,247	4,921,096
	4,922,208	4,921,191	4,922,191	4,921,203	4,921,356	4,921,097
	4,922,379	4,921,195	4,922,192	4,921,214	4,921,427	4,921,102
	4,922,506	4,921,199	4,922,196	4,921,401	4,921,484	4,921,122
05	4,920,824	4,921,219	4,922,224	4,921,503	4,921,498	4,921,133
	4,921,266	4,921,254	4,922,236	4,921,571	4,921,606	4,921,138
	4,921,790	4,921,262	4,922,242	4,921,572	4,921,649	4,921,149
	4,921,820	4,921,264	4,922,250	4,921,585	4,921,696	4,921,370
	4,921,821	4,921,293	4,922,265	4,921,586	4,921,715	4,921,373
06	Re.33,209	4,921,326	4,922,268	4,921,654	4,921,731	4,921,431
	4,920,576	4,921,327	4,922,270	4,921,680	4,921,873	4,921,463
	4,920,577	4,921,338	4,922,307	4,921,936	4,922,070	4,921,465
	4,920,588	4,921,347	4,922,318	4,921,965	4,922,147	4,921,536
	4,920,599	4,921,349	4,922,322	4,921,972	4,922,159	4,921,547
	4,920,646	4,921,350	4,922,337	4,921,994	4,922,233	4,921,567
	4,920,652	4,921,353	4,922,371	4,922,002	4,922,275	4,921,575
	4,920,655	4,921,354	4,922,376	4,922,084	4,922,431	4,921,589
	4,920,674	4,921,384	4,922,381	4,922,085	4,922,463	4,921,595
	4,920,684	4,921,388	4,922,393	4,922,174	4,922,520	4,921,651
	4,920,691	4,921,393	4,922,408	4,922,338	4,618,348	4,921,795
	4,920,698	4,921,449	4,922,451	4,922,355	4,666,457	4,921,806
	4,920,716	4,921,477	4,922,452	4,922,362	4,684,372	4,921,903
	4,920,721	4,921,482	4,922,491	4,922,384	13 : 4,920,596	4,921,904
	4,920,740	4,921,494	4,922,492	4,922,401	4,920,717	4,921,919
	4,920,751	4,921,515	4,922,495	4,922,416	4,920,810	4,921,923
	4,920,764	4,921,522	4,922,501	4,922,468	4,921,028	4,921,942
	4,920,785	4,921,526	4,922,507	4,922,514	4,921,139	4,921,946
	4,920,791	4,921,555	4,922,529	4,922,534	4,921,803	4,922,030
	4,920,832	4,921,557	4,922,535	10 4,921,527	4,921,956	4,922,040
	4,920,896	4,921,564	4,922,541	4,921,818	4,922,081	4,922,044
	4,920,898	4,921,565	08 4,920,604	4,921,819	4,922,161	4,922,062
	4,920,908	4,921,568	4,920,656	4,921,869	4,922,264	4,922,068
	4,920,909	4,921,574	4,920,665	4,921,900	4,922,456	4,922,071

	4,922,072	4,921,837	4,921,908	4,920,833	4,922,363	4,921,514
	4,922,119	4,921,838	4,921,930	4,920,840	38 : 4,921,392	4,921,521
	4,922,131	4,921,973	4,922,113	4,920,842	39 : 4,920,634	4,921,548
	4,922,178	4,922,077	4,922,125	4,920,873	4,920,687	4,921,588
	4,922,209	4,922,079	4,922,184	4,920,895	4,920,709	4,921,593
	4,922,243	4,922,082	4,922,277	4,920,954	4,920,742	4,921,597
	4,922,251	4,922,106	4,922,411	4,920,967	4,920,813	4,921,609
	4,922,328	4,922,132	4,922,435	4,920,971	4,920,864	4,921,621
	4,922,374	4,922,234	28 4,920,729	4,920,982	4,920,904	4,921,635
	4,922,400	4,922,246	4,922,517	4,920,994	4,920,972	4,921,662
	4,922,407	4,922,315	29 4,920,608	4,920,998	4,920,996	4,921,726
	4,922,417	4,922,375	4,921,308	4,921,042	4,921,069	4,921,741
	4,922,486	4,922,397	4,921,450	4,921,094	4,921,075	4,921,748
	4,922,490	4,922,414	4,921,488	4,921,136	4,921,084	4,921,776
	4,922,526	4,922,446	4,921,530	4,921,190	4,921,226	4,921,882
	4,922,537	4,922,449	4,921,538	4,921,197	4,921,248	4,921,898
	4,922,549	4,922,479	4,921,720	4,921,204	4,921,255	4,921,913
18	4,920,747	4,922,481	4,921,723	4,921,253	4,921,294	4,921,958
	4,920,770	4,922,496	4,921,732	4,921,287	4,921,402	4,921,974
	4,921,160	4,922,536	4,921,753	4,921,301	4,921,412	4,922,110
	4,921,423	4,922,542	4,922,066	4,921,319	4,921,451	4,922,142
	4,921,493	26 4,920,625	4,922,144	4,921,320	4,921,452	4,922,152
	4,921,614	4,920,696	4,922,151	4,921,328	4,921,481	4,922,194
	4,921,624	4,920,697	4,922,172	4,921,366	4,921,502	4,922,195
	4,921,739	4,920,708	4,922,259	4,921,415	4,921,517	4,922,220
	4,921,801	4,920,718	31 4,920,689	4,921,444	4,921,533	4,922,229
	4,921,947	4,920,724	4,920,786	4,921,475	4,921,618	4,922,253
	4,921,982	4,920,758	4,920,894	4,921,476	4,921,626	4,922,311
	4,922,222	4,920,768	4,921,002	4,921,480	4,921,644	4,922,325
	4,922,223	4,920,789	4,921,126	4,921,490	4,921,665	4,922,327
	4,922,225	4,920,790	4,921,485	4,921,518	4,921,709	4,922,372
	4,922,395	4,920,815	32 4,921,545	4,921,549	4,921,738	4,922,480
	4,922,530	4,920,878	4,921,674	4,921,556	4,921,828	43 4,920,983
19 :	4,920,611	4,920,911	33 4,921,277	4,921,619	4,921,832	4,921,580
	4,921,054	4,920,931	4,921,365	4,921,637	4,921,871	45 4,920,715
	4,921,083	4,920,939	34 4,920,584	4,921,667	4,921,877	4,920,757
	4,921,348	4,921,013	4,920,669	4,921,675	4,921,888	4,920,890
	4,921,710	4,921,067	4,920,743	4,921,677	4,921,890	4,920,899
	4,922,206	4,921,100	4,920,924	4,921,681	4,921,929	4,921,098
	4,922,339	4,921,101	4,920,969	4,921,700	4,921,985	4,921,105
20	4,920,597	4,921,159	4,921,010	4,921,701	4,921,992	4,921,124
	4,920,859	4,921,216	4,921,014	4,921,736	4,922,076	4,921,225
	4,921,114	4,921,230	4,921,093	4,921,747	4,922,168	4,921,607
	4,921,421	4,921,250	4,921,103	4,921,755	4,922,231	4,921,663
	4,922,043	4,921,258	4,921,177	4,921,769	4,922,232	4,921,750
21	4,920,678	4,921,269	4,921,208	4,921,773	4,512,098	4,921,752
	4,920,765	4,921,296	4,921,249	4,921,779	40 4,920,688	4,921,964
	4,920,891	4,921,297	4,921,321	4,921,788	4,920,835	4,922,069
	4,921,228	4,921,300	4,921,409	4,921,798	4,920,853	4,922,432
	4,921,579	4,921,315	4,921,479	4,921,804	4,920,949	46 4,921,372
	4,922,155	4,921,362	4,921,500	4,921,808	4,921,046	47 4,920,679
22 :	4,920,877	4,921,367	4,921,552	4,921,822	4,921,185	4,921,012
	4,920,928	4,921,377	4,921,590	4,921,841	4,921,386	4,921,171
	4,921,212	4,921,380	4,921,596	4,921,878	4,921,399	4,921,563
	4,921,344	4,921,387	4,921,612	4,921,885	4,921,558	4,921,668
	4,921,486	4,921,395	4,921,620	4,921,962	4,921,581	4,921,899
	4,921,611	4,921,416	4,921,629	4,921,970	4,921,830	4,922,000
	4,921,658	4,921,435	4,921,659	4,921,975	4,922,049	4,922,057
	4,921,925	4,921,459	4,921,691	4,921,997	4,922,086	48 4,920,626
	4,922,054	4,921,472	4,921,692	4,921,999	4,922,095	4,920,639
23	4,920,657	4,921,551	4,921,693	4,922,018	4,922,354	4,920,662
	4,922,180	4,921,582	4,921,699	4,922,045	4,922,472	4,920,681
	4,922,373	4,921,638	4,921,727	4,922,067	4,922,516	4,920,683
24	4,920,640	4,921,657	4,921,767	4,922,089	41 4,920,601	4,920,725
	4,921,222	4,921,742	4,921,772	4,922,091	4,920,820	4,920,735
	4,921,252	4,921,853	4,921,777	4,922,114	4,920,876	4,920,792
	4,921,333	4,921,858	4,921,809	4,922,128	4,920,947	4,920,834
	4,921,335	4,921,859	4,921,824	4,922,137	4,921,192	4,920,841
	4,921,341	4,921,880	4,921,843	4,922,145	4,921,234	4,920,883
	4,921,445	4,921,902	4,921,844	4,922,158	4,921,274	4,920,950
	4,921,531	4,921,917	4,921,847	4,922,182	4,921,340	4,920,960
	4,921,805	4,922,024	4,921,857	4,922,217	4,922,061	4,921,001
	4,922,418	4,922,026	4,921,864	4,922,240	4,922,260	4,921,044
25	4,920,624	4,922,065	4,921,911	4,922,247	4,922,366	4,921,047
	4,920,643	4,922,165	4,921,941	4,922,256	42 4,920,581	4,921,048
	4,920,664	4,922,199	4,921,961	4,922,266	4,920,583	4,921,068
	4,920,793	4,922,200	4,922,003	4,922,298	4,920,603	4,921,131
	4,920,867	4,922,219	4,922,007	4,922,302	4,920,627	4,921,150
	4,920,975	4,922,391	4,922,017	4,922,304	4,920,636	4,921,207
	4,921,004	4,922,425	4,922,028	4,922,305	4,920,658	4,921,257
	4,921,032	4,922,436	4,922,047	4,922,333	4,920,704	4,921,281
	4,921,099	27 Re.33,206	4,922,048	4,922,336	4,920,719	4,921,284
	4,921,132	4,920,582	4,922,050	4,922,347	4,920,720	4,921,292
	4,921,165	4,920,654	4,922,051	4,922,350	4,920,754	4,921,389
	4,921,209	4,920,710	4,922,055	4,922,404	4,920,807	4,921,407
	4,921,211	4,920,756	4,922,058	4,922,421	4,920,925	4,921,438
	4,921,245	4,920,874	4,922,074	4,922,433	4,920,963	4,921,483
	4,921,316	4,920,884	4,922,245	4,922,439	4,920,995	4,921,513
	4,921,334	4,920,958	4,922,284	4,922,455	4,921,034	4,921,546
	4,921,336	4,921,024	4,922,348	4,922,511	4,921,108	4,921,550
	4,921,478	4,921,119	4,922,369	37 4,920,723	4,921,143	4,921,576
	4,921,509	4,921,127	4,922,370	4,920,977	4,921,151	4,921,577
	4,921,512	4,921,237	4,922,500	4,920,978	4,921,161	4,921,592
	4,921,554	4,921,270	4,922,503	4,920,990	4,921,210	4,921,625
	4,921,639	4,921,282	4,922,519	4,921,009	4,921,238	4,921,630
	4,921,643	4,921,408	4,922,522	4,921,186	4,921,256	4,921,646
	4,921,685	4,921,433	35 4,921,604	4,921,261	4,921,299	4,921,647
	4,921,689	4,921,492	4,921,952	4,921,272	4,921,323	4,921,679
	4,921,706	4,921,496	4,922,203	4,921,413	4,921,324	4,921,683
	4,921,712	4,921,507	36 4,920,628	4,921,437	4,921,432	4,921,807
	4,921,757	4,921,627	4,920,637	4,921,656	4,921,441	4,921,813
	4,921,778	4,921,628	4,920,644	4,921,764	4,921,447	4,921,886
	4,921,787	4,921,645	4,920,651	4,921,836	4,921,453	4,921,892
	4,921,789	4,921,743	4,920,653	4,921,950	4,921,454	4,921,897
	4,921,794	4,921,827	4,920,734	4,922,027	4,921,456	4,921,924
	4,921,796	4,921,884	4,920,772	4,922,187	4,921,473	4,921,927

VOL
1114
ISS
1
MY
1
1990
UMI

4,921,931	4,922,378	4,921,037	4,920,921	4,920,598	4,921,071
4,921,969	4,922,423	4,922,096	4,921,026	4,920,612	4,921,092
4,922,033	4,922,465	51 4,920,648	4,921,059	4,920,630	4,921,146
4,922,034	4,922,473	4,920,854	4,921,251	4,920,667	4,921,194
4,922,035	4,922,539	4,921,193	4,921,268	4,920,712	4,921,231
4,922,036	49 4,920,762	4,921,374	4,921,462	4,920,732	4,921,246
4,922,053	4,920,852	4,921,491	4,921,506	4,920,846	4,921,802
4,922,064	4,921,130	4,921,891	4,921,584	4,920,882	4,921,934
4,922,083	4,921,242	4,922,201	4,921,671	4,920,907	4,922,197
4,922,312	4,922,164	4,922,412	54 4,920,579	4,920,936	4,922,450
4,922,320	4,922,227	4,922,413	4,921,765	4,921,027	56 : 4,920,671
4,922,323	50 : 4,920,749	53 4,920,670	55 : 4,920,587	4,921,031	
4,922,326		4,920,774			

DESIGN PATENTS

04 : 307,588	307,617	307,570	307,547	307,626	42 307,511
307,605	307,630	18 : 307,523	307,601	36 : 307,525	307,515
05 307,631	307,649	307,556	307,638	307,543	307,530
06 307,505	08 : 307,569	307,560	307,643	307,552	307,559
307,514	307,633	307,609	26 307,529	307,558	307,587
307,516	09 : 307,507	307,610	307,541	307,612	307,607
307,526	307,510	307,635	307,551	37 : 307,518	44 : 307,640
307,554	307,653	307,636	307,568	307,611	45 : 307,555
307,557	307,654	307,652	307,599	307,650	47 : 307,646
307,561	12 : 307,512	19 : 307,627	27 : 307,574	39 : 307,539	48 : 307,651
307,567	307,604	21 : 307,637	307,655	307,562	49 : 307,614
307,572	13 307,648	307,641	28 307,524	307,563	307,615
307,573	15 307,623	307,642	33 307,540	307,575	51 : 307,521
307,593	17 307,544	22 : 307,564	307,598	307,580	307,538
307,606	307,548	23 : 307,582	34 307,520	307,603	307,585
307,608	307,549	25 : 307,508	307,578	307,616	53 : 307,618
307,613	307,550	307,509	307,597	40 : 307,621	55 : 307,624

PLANT PATENTS

06 : 7,225					

STATUTORY INVENTION REGISTRATIONS

01 : H780					
24 : H775	34 H781	35 : H776	39 : H777	51 : H778	H779

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VOL
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ISS
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MY
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114

ISS
2

MY
8

1990

UMI

VOL
1114

ISS
2

MY
8

1990

UMI

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May 8, 1990 Volume 1114 Number 2

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1114 OG 12
Notice of Maintenance Fees Payable	1114 OG 12
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1114 OG 13
Notification of Acceptance of Delayed Payment of Maintenance Fee	1114 OG 13
Reissue Applications Filed	1114 OG 15
Requests for Reexaminations Filed	1114 OG 15
Service by Publication	1114 OG 16
Patents Available for License or Sale	1114 OG 16
Adverse Decisions in Interference	1114 OG 16
Transfer of Pre-1955/1957 Assignment Records to National Archives and Records Administration	1114 OG 17
Patent Certificates of Correction	1114 OG 18
Special Boxes for Mail	1114 OG 19
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1114 OG 20
Condition of Patent Applications	1114 OG 22
Reexaminations	691
Reissue Patents Granted (33,210)	697
Plant Patents Granted (7,226)	699
Patents Granted	
General and Mechanical (4,922,550)	701
Chemical (4,923,478)	1021
Electrical (4,924,031)	1183
Design Patents Granted (307,660)	1357
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design and Plant Patentees	PI 82
Classification of	
Patents (Including Reissues, and Reexaminations)	PI 87
Designs, and Plants Applications	PI 91
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 92
Designs and Plant Applications	PI 94
Change of Address Form and Subscription Order Form	Back Page

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265-908 O.G.-90-1

VOL
1114
ISS
2
MY
8
1990
UMI

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 5, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,662,005 through 4,663,778
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 3, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,381,567 through 4,382,300
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 25, 1990 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,878	07/004,177	2/28/89
(4,571,775)	(06/712,757)	(2/25/86)
Re. 32,890	07/059,852	3/21/89
(4,571,907)	(06/641,189)	(2/25/86)
Re. 32,933	07/158,879	5/30/89
(4,572,283)	(06/646,699)	(2/25/86)
4,316,361	06/223,348	2/23/82
4,316,402	06/225,845	2/23/82
4,316,463	06/228,628	2/23/82
4,316,464	06/241,495	2/23/82
4,316,530	06/226,310	2/23/82
4,316,683	06/267,429	2/23/82
4,316,746	06/237,477	2/23/82
4,316,776	06/221,745	2/23/82
4,316,987	06/223,875	2/23/82
4,317,040	06/242,097	2/23/82
4,571,741	06/686,234	2/25/86
4,571,746	06/469,295	2/25/86
4,571,751	06/685,407	2/25/86
4,571,758	06/528,223	2/25/86
4,571,761	06/667,809	2/25/86
4,571,769	06/611,712	2/25/86
4,571,773	06/618,700	2/25/86
4,571,778	06/583,612	2/25/86
4,571,781	06/535,080	2/25/86
4,571,782	06/370,671	2/25/86
4,571,800	06/512,274	2/25/86
4,571,804	06/704,110	2/25/86
4,571,809	06/609,061	2/25/86
4,571,811	06/573,503	2/25/86
4,571,813	06/524,979	2/25/86
4,571,830	06/496,296	2/25/86
4,571,836	06/709,296	2/25/86
4,571,839	06/609,529	2/25/86
4,571,840	06/639,342	2/25/86
4,571,858	06/577,937	2/25/86
4,571,866	06/639,132	2/25/86
4,571,870	06/544,541	2/25/86
4,571,871	06/551,999	2/25/86
4,571,872	06/648,451	2/25/86
4,571,873	06/487,042	2/25/86
4,571,874	06/549,550	2/25/86
4,571,875	06/709,673	2/25/86
4,571,876	06/639,503	2/25/86
4,571,878	06/560,875	2/25/86
4,571,879	06/633,031	2/25/86
4,571,880	06/613,784	2/25/86
4,571,883	06/624,798	2/25/86
4,571,885	06/608,697	2/25/86
4,571,890	06/692,438	2/25/86
4,571,895	06/578,028	2/25/86
4,571,896	06/603,716	2/25/86
4,571,897	06/515,808	2/25/86
4,571,901	06/590,565	2/25/86
4,571,915	06/572,248	2/25/86
4,571,918	06/673,416	2/25/86
4,571,919	06/539,097	2/25/86
4,571,921	06/689,876	2/25/86
4,571,929	06/626,407	2/25/86
4,571,944	06/553,425	2/25/86
4,571,948	06/674,730	2/25/86
4,571,953	06/699,728	2/25/86
4,571,954	06/677,949	2/25/86
4,571,956	06/752,293	2/25/86
4,571,963	06/634,708	2/25/86
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VOL
1114
ISS
2
MY
8
1990
UMI

Patent Number	Serial Number	Issue Date
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4,572,093	06/570,499	2/25/86
4,572,096	06/578,565	2/25/86
4,572,097	06/541,894	2/25/86
4,572,107	06/665,705	2/25/86
4,572,109	06/641,312	2/25/86
4,572,113	06/697,156	2/25/86
4,572,121	06/431,734	2/25/86
4,572,133	06/684,647	2/25/86
4,572,134	06/644,693	2/25/86
4,572,140	06/658,667	2/25/86
4,572,147	06/650,081	2/25/86
4,572,152	06/433,098	2/25/86
4,572,153	06/428,200	2/25/86
4,572,158	06/650,237	2/25/86
4,572,163	06/670,860	2/25/86
4,572,173	06/614,567	2/25/86
4,572,175	06/515,621	2/25/86
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4,572,227	06/656,765	2/25/86
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4,572,245	06/612,859	2/25/86
4,572,251	06/563,376	2/25/86
4,572,258	06/694,943	2/25/86
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4,572,302	06/616,914	2/25/86
4,572,304	06/633,407	2/25/86
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4,572,428	06/689,766	2/25/86
4,572,431	06/275,710	2/25/86
4,572,441	06/587,935	2/25/86
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4,572,445	06/577,151	2/25/86
4,572,453	06/647,671	2/25/86
4,572,456	06/657,483	2/25/86
4,572,463	06/415,696	2/25/86
4,572,464	06/542,687	2/25/86
4,572,467	06/593,851	2/25/86
4,572,472	06/384,351	2/25/86
4,572,478	06/555,859	2/25/86
4,572,481	06/311,413	2/25/86
4,572,482	06/673,083	2/25/86
4,572,486	06/602,507	2/25/86
4,572,487	06/608,868	2/25/86
4,572,492	06/626,985	2/25/86
4,572,500	06/633,473	2/25/86
4,572,501	06/510,323	2/25/86
4,572,502	06/491,892	2/25/86
4,572,505	06/565,891	2/25/86
4,572,508	06/671,269	2/25/86
4,572,510	06/670,215	2/25/86
4,572,511	06/657,756	2/25/86
4,572,513	06/520,947	2/25/86
4,572,514	06/478,299	2/25/86
4,572,523	06/513,999	2/25/86
4,572,528	06/493,285	2/25/86
4,572,529	06/694,786	2/25/86
4,572,530	06/712,568	2/25/86
4,572,531	06/621,172	2/25/86
4,572,533	06/614,776	2/25/86
4,572,534	06/539,569	2/25/86
4,572,538	06/617,732	2/25/86
4,572,554	06/694,123	2/25/86
4,572,555	06/710,476	2/25/86
4,572,561	06/669,599	2/25/86
4,572,562	06/722,539	2/25/86
4,572,569	06/602,123	2/25/86
4,572,573	06/425,302	2/25/86
4,572,576	06/642,104	2/25/86
4,572,579	06/563,138	2/25/86
4,572,580	06/569,178	2/25/86
4,572,582	06/599,994	2/25/86
4,572,583	06/528,788	2/25/86
4,572,584	06/274,750	2/25/86
4,572,586	06/606,264	2/25/86
4,572,597	06/584,895	2/25/86
4,572,599	06/498,968	2/25/86
4,572,609	06/679,105	2/25/86
4,572,612	06/537,700	2/25/86
4,572,614	06/588,456	2/25/86
4,572,621	06/651,365	2/25/86
4,572,624	06/511,435	2/25/86
4,572,633	06/661,592	2/25/86
4,572,655	06/516,954	2/25/86
4,572,661	06/412,618	2/25/86
4,572,665	06/550,246	2/25/86
4,572,673	06/697,209	2/25/86
4,572,676	06/515,502	2/25/86
4,572,679	06/242,660	2/25/86
4,572,682	06/556,144	2/25/86
4,572,694	06/632,950	2/25/86
4,572,701	06/535,112	2/25/86
4,572,702	06/583,761	2/25/86
4,572,706	06/359,492	2/25/86
4,572,708	06/571,517	2/25/86
4,572,715	06/626,994	2/25/86
4,572,717	06/520,279	2/25/86
4,572,729	06/567,086	2/25/86
4,572,733	06/711,406	2/25/86
4,572,734	06/603,461	2/25/86
4,572,743	06/603,273	2/25/86
4,572,761	06/628,648	2/25/86
4,572,785	06/594,752	2/25/86
4,572,786	06/634,362	2/25/86
4,572,796	06/671,407	2/25/86
4,572,797	06/471,566	2/25/86
4,572,803	06/393,678	2/25/86
4,572,807	06/357,489	2/25/86
4,572,809	06/560,195	2/25/86
4,572,825	06/381,990	2/25/86
4,572,830	06/564,884	2/25/86
4,572,832	06/540,161	2/25/86
4,572,840	06/696,492	2/25/86
4,572,850	06/699,485	2/25/86
4,572,861	06/620,080	2/25/86
4,572,875	06/569,823	2/25/86
4,572,877	06/749,226	2/25/86
4,572,878	06/683,349	2/25/86

Patent Number	Serial Number	Issue Date
4,572,888	06/563,484	2/25/86
4,572,889	06/684,408	2/25/86
4,572,893	06/437,015	2/25/86
4,572,898	06/449,716	2/25/86
4,572,925	06/589,025	2/25/86
4,572,929	06/461,506	2/25/86
4,572,932	06/479,201	2/25/86
4,572,936	06/581,717	2/25/86
4,572,960	06/438,190	2/25/86
4,572,974	06/512,210	2/25/86
4,572,976	06/558,579	2/25/86
4,572,988	06/525,229	2/25/86
4,572,996	06/602,183	2/25/86
4,573,004	06/459,266	2/25/86
4,573,006	06/503,290	2/25/86
4,573,008	06/501,089	2/25/86
4,573,009	06/558,889	2/25/86
4,573,013	06/363,343	2/25/86
4,573,018	06/602,225	2/25/86
4,573,021	06/592,150	2/25/86
4,573,033	06/514,952	2/25/86
4,573,041	06/587,656	2/25/86
4,573,047	06/461,804	2/25/86
4,573,074	06/559,917	2/25/86
4,573,081	06/526,624	2/25/86
4,573,094	06/522,424	2/25/86
4,573,100	06/607,653	2/25/86
4,573,102	06/557,862	2/25/86
4,573,106	06/636,582	2/25/86
4,573,107	06/656,323	2/25/86
4,573,113	06/574,301	2/25/86
4,573,114	06/544,451	2/25/86
4,573,127	06/452,627	2/25/86
4,573,164	06/702,263	2/25/86
4,573,165	06/507,823	2/25/86
4,573,166	06/507,578	2/25/86
4,573,172	06/623,560	2/25/86
4,573,182	06/595,998	2/25/86
4,573,188	06/685,756	2/25/86
4,573,195	06/528,007	2/25/86
4,573,209	06/496,561	2/25/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41 (c)(1) and 37 CFR 1.378.

Patent No	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,484,740	06/378,773	11/27/84	5/17/82	4/03/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,734,402, Re. S. N. 07/498,817, Filed Mar. 23, 1990, Cl. 514/54, FEEDS FOR DOMESTIC ANIMALS AND METHOD FOR BREEDING THEM, Kiyoshi Hashimoto, et al., Owner of Record: *Meiji Deika Kaisha, Tokyo, Japan*, Attorney or Agent: Gary J. Connell, Ex. Gp.: 183

4,734,869, Re. S. N. 07/501,741, Filed Mar. 29, 1990, Cl. 364/550, DIAGNOSTIC METHOD FOR ANALYZING AND MONITORING THE PROCESS PARAMETERS IN THE OPERATION OF RECIPROCATING EQUIPMENT, John Mickowski, Owner of Record: *Inventor*, Attorney or Agent: Robert W. Faris, Ex. Gp.: 234

4,745,456, Re. S. N. 07/502,852, Filed Apr. 2, 1990, Cl. 357/79, HEAT SINK CLIP ASSEMBLY, Donald L. Clemens, Owner of Record: *Thermalloy Inc., Dallas, Tex.*, Attorney or Agent: Jack A. Kanz, Ex. Gp.: 252

4,746,175, Re. S. N. 07/470,943, Filed Jan. 26, 1990, Cl. 312/001, DETACHABLE RECEPTACLE AND STRIPPING APPARATUS FOR STRIPPING LAGGING, William J. Hamlet, et al., Owner of Record: *Inventor*, Attorney or Agent: Michael T. Gabrik, Ex. Gp.: 357

4,758,120, Re. S. N. 07/501,605, Filed Mar. 23, 1990, Cl. 408/204, FACING CUTTER, Roy Bijl, Owner of Record: *Walker-Hagou B.V., Netherlands*, Attorney or Agent: Anthony M. Lorusso, Ex. Gp.: 322

4,771,357, Re. S. N. 07/499,845, Filed Mar. 27, 1990, Cl. 361/87, POWER DRIVER HAVING SHORT CIRCUIT PROTECTION, Stefan Lorincz, Owner of Record: *Motorola, Inc., Schaumburg, Ill.*, Attorney or Agent: John H. Moore, Ex. Gp.: 214

4,821,440, Re. S. N. 07/500,018, Filed Mar. 20, 1990, Cl. 40/642, WEATHERIZED CONSTRUCTION SITE INSPECTION BOARD ASSEMBLY, Gary Dunn, Owner of Record: *Inventor*, Attorney or Agent: Ronald E. Smith, Ex. Gp.: 357

4,823,475, Re. S. N. 07/501,004, Filed Mar. 29, 1990, Cl. 33/449, DRAFTING DEVICE, Poul E. Hoegh, Owner of Record:

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,578,264, Reexam No. 90/001,966, Requested Mar. 20, 1990, Cl. 244/41, BOUNDARY LAYER CONTROL FLOW SEPARATION AND HEAT EXCHANGE, Arnold M. Kuethe, Owner of Record: *The University of Michigan, Ann Arbor Mich.*, Attorney or Agent: Robert E. Gavin, Ex. Gp.: 310, Requester: Cushman, Darby & Cushman, Washington, D. C.

4,503,035, Reexam No. 90/001,967, Requested Mar. 16, 1990, Cl. 424/85, PROTEIN PURIFICATION PROCESS AND PRODUCT, Sidney Pestka, et al., Owner of Record: *Hoffman-La Roche, Inc., Nutley, N. J.*, Attorney or Agent: George M. Gould, Ex. Gp.: 120, Requester: Owner

4,573,448, Reexam No. 90/001,969, Requested Mar. 22, 1990, Cl. 128/1.R, METHOD FOR DECOMPRESSING HER-

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NIATED INTERVERTEBRAL DISCS, Parviz Kambin, Owner of Record: *Pilling Co., Fort Washington, Pa.*, Attorney or Agent: Jacobs & Jacobs, Ex. Gp.: 330, Requester: Dyonics, Inc., Andover, Mass.

4,836,222, Reexam No. 90/001,968, Requested Mar. 21, 1990, Cl. 131/310, PROCESS FOR TREATING TOBACCO, Larry J. Livingston, Owner of Record: *Inventor, Virginia Beach, Va.*, Attorney or Agent: Francis A. Keegan, Ex. Gp.: 330, Requester: Steven W. Stokes, Norcross, Ga.

Service by Publication

A petition to cancel each of the registrations below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Boulton Music Systems, Inc., Newton, Pa., Reg. Nos. 1,118,141 and 1,400,949 for the marks "BOULTON" and "BOULTON MUSIC SYSTEMS" (stylized), Canc. No. 18,301

Johnson Fishing, Inc., Mankato, Minn., Reg. No. 167,070, for the mark "LEONARD" Canc. No. 18,394

Supplementary Systems, Inc., Rochelle Park, N.J., Reg. No. 1,393,024, for the mark "RMC", Canc. No. 18,430

Florida Fast Chicken, Inc., dba Pollo Campero Fried Chicken, Miami, Fla., Reg. No. 1,432,565, for the mark "THE FLAVOR OF THE DEEPER SOUTH", Canc. No. 18,446

Abraham Zion Corp., Pa., Reg. No. 380,096, for the mark "COUNTRY SQUIRE", Canc. No. 17,749

Watsonville Canning & Frozen Food Co., Watsonville, Calif., Reg. No. 675,758, for the mark "MITY FRESH", Canc. No. 18,461

Walk Thru Entertainment, Inc., Denver, Colo., Reg. No. 1,396,147, for the mark "WALK THRU ROCK", Canc. No. 18,568

JEAN BROWN
Administrator, Trademark
Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner
for Trademarks

Patents Available For License or Sale

398,922 Tree Felling Apparatus and Saw Tooth, Armand J. Morin, 4101 Jarry EST,Suite 305, Montreal, Canada H1Z2H4

4,266,112 Web-Cutting Process, William P. Niedermeyer, 1024 Mount Mary Drive, Green Bay, Wis., 54301

4,482,939 Directionally Variable Lighting Assembly, Andrew Tishman, 170 East 88th St. #8B, New York, N.Y., 10128

4,576,178 Audio Signal Generator, David Johnson, Box 68, 436 East 69th St., New York, N.Y., 10021

4,702,704 Tetrahedral Codon Stereo-Table, Leonard R. Svensson, Birch, Stewart, Kolash & Birch, 301 N. Washington St., P.O. Box 747 Falls Church, Va., 22046

4,875,630 Tilted Leaf Vacuum And Shredder, Douglas E. White, 101 California St., Suite 980, San Francisco, Calif., 94111

ADVERSE DECISIONS IN INTERFERENCE

In the designated interference involving the following patent a final decisions has been rendered that the respective patentee was not the first inventors with respect to the claims listed.

Patent No. 4,347,624, Edgar Tschunt, X-RAY DIAGNOSTIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES, Interference No. 101,228, decided Nov. 30, 1989, claims 2, 5-8.

NANNIE B. HENRY, *Deputy Clerk*
Board of Patent Appeals and
Interferences

ADVERSE DECISIONS IN INTERFERENCE

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,450,110, Ronald L. Simmons, Herbert L. Young, AZIDO NITRAMINE, Interference No. 101,602, decided Oct. 31, 1989, claim 1.

Patent No. 4,552,505, Robert H. Gorman, INDUSTRIAL ROBOT HAVING DIRECT COAXIAL MOTOR DRIVE, Interference No. 101,976, decided Feb. 23, 1990, claim 7.

Patent No. 4,556,998, Steven B. Siepser, ARTIFICIAL INTRAOCULAR LENSES AND METHOD FOR THEIR SURGICAL IMPLANTATION, Interference No. 101,837, decided Jan. 22, 1990, claims 1-14.

Patent No. 4,567,226, Ulrich Grigo, Karl-Heinz Kohler, Rudolf Binsack, Leo Morbitzer, Josef Merten, Ludwig Trabert, Walter Heitz, ELASTOMERIC BLOCK COPOLYAMIDES, Interference No. 101,978, decided Mar. 1, 1990, claims 1-13.

Patent No. 4,571,061, Takenori Osanai, Hideshi Oushiden, IMAGE FORMING APPARATUS, Interference No. 101,926, decided Jan. 29, 1990, claims 1-7 and 11-13.

Patent No. 4,605,377, Thomas D. Wenstadt, MANUAL LIFT MEANS FOR MARINE PROPULSION DEVICE, Interference No. 102,166, decided Jan. 17, 1990, claims 1, 2, 4, 7 and 10.

Patent No. 4,623,234, Masami Shimizu, Shinichi Matsuyama, CAMERA, Interference No. 102,145, decided Apr. 4, 1990, claims 5-10.

Patent No. 4,623,535, Carl D. Pemchonock, LEUKOTRIENE ANTAGONISTS, Interference No. 102,234, decided Mar. 20, 1990, claims 1-14.

Patent No. 4,630,327, Manfred Schmidt, Hans Trube, Hermann Grimm, SINGLE-ARM WINDSHIELD WIPER FOR MOTOR VEHICLES, Interference No. 101,835, decided Mar. 20, 1990, claims 1-3 and 5-7.

Patent No. 4,665,066, John M. Morin, Jr., Nelson J. Leonard, 3-THIAZOLOMETHYL CEPHALOSPORINS AS ANTIBIOTICS, Interference No. 102,232, decided Jan. 26, 1990, claims 1-6.

Patent No. 4,672,068, Teruo Kutsuma, Hiroshi Ikawa, Yoshiaki Sato, ANTIHYPERTENSIVE 1, 4-DIHYDROPYRIDINES HAVING A CONJUGATED ESTER, Interference No. 102,045, decided Apr. 5, 1990, claims 1, 3-7 and 9-19.

Patent No. 4,676,884, Jack A. Dimock, Dirk P. Woestenburg, WAFER PROCESSING MACHINE WITH EVACUATED WAFER TRANSPORTING AND STORAGE SYSTEM, Interference No. 102,255, decided Jan. 11, 1990, claims 1, 2, 4-6, 9 and 17.

Patent No. 4,711,531, Sadao Masubuchi, FERROELECTRIC LIQUID CRYSTAL DISPLAY APPARATUS USING A RESET VOLTAGE STEP, Interference No. 102,323, decided Apr. 4, 1990, claims 1-4.

Patent No. 4,723,989, Wolfgang Buck, Manfred Garrecht, Gerhart Schneider, Christo Drandarevski, HERBICIDAL IMIDAZOLINONES, Interference No. 102,174, decided Mar. 9, 1990, claims 1-8.

Patent No. 4,735,144, Jerome D. Jenkins, DOCTOR BLADE AND HOLDER FOR METERING SYSTEM, Interference No. 102,220, decided Feb. 6, 1990, claims 1-23.

Patent No. 4,773,336, Robert M. Ord, RAILROAD BOGIE FOR REMOVABLY SUPPORTING COUPLED SEMI-TRAILERS, Interference No. 102,155, decided Jan. 24, 1990, claims 1-4 and 9-17.

Patent No. 4,773,336, Robert M. Ord, RAILROAD BOGIE FOR REMOVABLY SUPPORTING COUPLED SEMI-TRAILERS, Interference No. 102,156, decided Jan. 24, 1990, claims 5-8.

Patent No. 4,797,075, Wallace L. Edwards, Joel F. Jones, Howard G. Thompson Jr., OVERSPEED PROTECTIVE GEAR BOX FOR A WELL PUMP, Interference No. 102,240, decided Jan. 17, 1990, claims 1 and 2.

Patent No. 4,806,565, Otto D. Hensens, August J. Kempf, Robert E. Schwartz, Ruth S. Sykes, Carol F. Wichmann, Kenneth E. Wilson, Sheldon B. Zimmerman, Deborah L. Zink, ANTIFUGAL TRI-YNE CARBONATES, Interference No. 102,279, decided Mar. 28, 1990, claims 1-12.

NANNIE B. HENRY, *Deputy Clerk*
Board of Patent Appeals and Interferences

TRANSFER OF PRE-1955/1957 ASSIGNMENT RECORDS TO NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

The Patent and Trademark Office (PTO) is transferring all of the pre-1955/1957 assignment records under its jurisdiction to the National Archives and Records Adminstration. These records will be transferred as soon as possible. Notice of the actual date of the transfer will be placed in all PTO public search facilities.

The records will be transferred to the National Archives to allow for greater accessibility to the public, improvement of file integrity for these records, and to ensure preservation of these materials. The pre-1955/1957 records are currently stored in four locations: The Assignment Search Room, the Federal Records Center, the National Archives in downtown Washington, and the National Archives location in Alexandria. Storage of information in these various locations makes searching of these materials difficult. The materials located at the Federal Records Center can be ordered from the Assignment Search Room. However, many times it takes months to receive the materials to complete a search.

The National Archives will store and maintain all patent and trademark assignment records dating from 1837 to December 31, 1954, for trademarks, and from 1837 to April 30, 1957, for patents. These records will be stored at the Washington National Records Center in Suitland, Maryland, and will be available for public inspection in the National Archives research room located at the Washington National Records Center. The research room is open to the public Monday through Friday 8:00 a.m. to 4:15 p.m. and by appointment on Saturday. The Washington National Records Center has adequate parking in addition to a shuttle bus service which leaves from the National Archives on Pennsylvania Avenue five times a day. Self-service photocopiers are available for use at ten cents a page. National Archives staff will provide photocopies for a fee of thirty-five cents a page. For more information concerning the operation of the National Archives search facilities in Suitland, call the Suitland Reference Branch at (301) 763-7410.

37 CFR 1.12(a) will be waived to the extent fees for copies of records for pre-1955/1957 assignments records will not be established by the PTO. Copies of the pre-1955/1957 assignment records may be obtained upon request and payment of fees required by the National Archives and Records Administration.

HARRY F. MANBECK, JR.
Assistant Secretary
and Commissioner
of Patents and Trademarks

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PATENT NOTICES

Certificates of Correction For Week of May 8, 1990

3,956,480	4,816,258	4,836,166	4,844,821
4,657,927	4,816,868	4,836,280	4,844,969
4,686,263	4,816,935	4,836,352	4,845,101
4,688,223	4,820,471	4,836,562	4,845,185
4,707,743	4,820,589	4,837,146	4,845,351
4,735,840	4,821,507	4,837,240	4,845,447
4,736,433	4,821,571	4,837,387	4,845,509
4,746,907	4,822,403	4,837,426	4,845,718
4,748,036	4,822,412	4,837,448	4,845,725
4,749,833	4,822,929	4,837,478	4,846,169
4,753,698	4,822,941	4,837,482	4,846,279
4,764,289	4,823,606	4,837,678	4,846,301
4,769,534	4,824,093	4,837,693	4,846,587
4,773,009	4,824,832	4,837,813	4,846,680
4,777,107	4,825,052	4,837,970	4,846,733
4,779,578	4,825,300	4,838,103	4,846,786
4,781,931	4,825,344	4,838,332	4,846,822
4,782,178	4,825,590	4,838,463	4,846,909
4,782,983	4,826,417	4,838,534	4,846,981
4,783,717	4,826,671	4,838,864	4,847,081
4,785,720	4,826,841	4,839,076	4,847,083
4,786,820	4,827,448	4,839,111	4,847,128
4,787,759	4,827,831	4,839,216	4,847,174
4,790,302	4,828,028	4,839,325	4,847,347
4,790,574	4,828,891	4,839,373	4,847,484
4,795,559	4,829,208	4,839,519	4,847,772
4,797,012	4,829,377	4,839,674	4,847,783
4,797,049	4,829,717	4,840,001	4,847,814
4,799,362	4,829,880	4,840,782	4,848,079
4,799,818	4,830,214	4,840,859	4,848,225
4,799,845	4,830,483	4,841,041	4,849,293
4,800,132	4,830,994	4,841,182	4,849,934
4,801,437	4,831,013	4,841,448	4,850,054
4,802,013	4,831,465	4,841,487	4,850,152
4,802,239	4,832,184	4,841,551	4,850,198
4,802,777	4,832,609	4,841,604	4,851,501
4,803,084	4,833,108	4,841,854	4,851,578
4,803,156	4,833,555	4,842,053	4,851,635
4,804,691	4,833,843	4,842,490	4,851,754
4,806,048	4,834,032	4,842,679	4,851,986
4,806,205	4,834,108	4,842,912	4,852,889
4,806,381	4,834,162	4,842,961	4,856,854
4,806,509	4,834,189	4,843,013	4,859,975
4,808,759	4,835,249	4,844,031	4,873,467
4,811,509	4,835,266	4,844,092	4,883,561
4,813,027	4,835,365	4,844,101	
4,813,093	4,835,392	4,844,339	
4,814,977	4,835,434	4,844,755	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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PATENT APPLICATION	New patent application and associated papers and fees.
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VOL
1114
ISS
2
MY
8
1990
UMI

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VOL
1114
ISS
2
MY
8
1990
UMI

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF March 24, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-7-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-1-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	2-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M BLIX, Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	3-23-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	3-25-88
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-13-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-11-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during March 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,718,937 to 3,723,991 inclusive
Plant Patents ..... 3,314 to 3,320 inclusive

REEXAMINATIONS

MAY 8, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

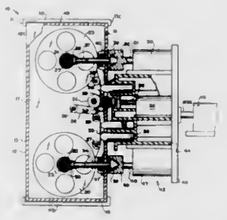
B1 3,693,983 (1264th)
TAPE CARTRIDGE DRIVE AND TRANSDUCING APPARATUS FOR THE TAPE THEREOF
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Reexamination Request No. 90/001,606, Sep. 26, 1988.
Reexamination Certificate for Patent No. 3,693,983, issued Sep. 26, 1972, Ser. No. 93,778, Nov. 30, 1970.
Division of Ser. No. 142,748, Aug. 28, 1961, which is a division of Ser. No. 515,417, Jun. 14, 1955, Pat. No. 3,003,109. This
Int. Cl.[5] G11B *15/24, 15/26, 21/02*
U.S. Cl. 360—93

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 2 are cancelled.

[1. Magnetic tape transducing apparatus comprising in combination with a magazine containing magnetic tape and having walls substantially enclosing said tape therein, a supply reel and a take-up reel supported for rotation within said magazine by the walls thereof, means for guiding the tape of said magazine between said supply and take-up reels, a first tape engaging means rotatably supported behind the tape, an opening in the wall of the magazine in alignment with that portion of the tape aligned with said first tape engaging means, a magnetic transducer head, a moveable support for said transducer head, second tape engaging means rotatably supported on said moveable support for said transducer head, means for prepositioning said moveable support for said transducer head and said magazine in a first relative operative relation prior to effecting a transducing operation with respect to the tape by said transducer head whereby said transducer head and said second tape engaging means are out of engagement with the tape, means for projecting said moveable support when the magazine and support are so prepositioned in said first relative operative relation with respect to each other to a position whereby said transducer head and said second tape engaging means are each simultaneously operatively disposed against the tape and wherein said second tape engaging means compressively engages the tape against said first tape engaging means, first means for rotatably driving one of said first and second tape engaging means to drive the tape from said supply reel past said transducer head, second and third drive means respectively coupleable to said supply and take-up reels of said magazine whensaid magazine is operatively prepositioned with respect to said support for said transducer head and said second tape engaging means, means for operating said third drive means simultaneously with said means for rotatably driving one of said first and second tape engaging means to rotate said take-up reel and wind the tape thereon simultaneously as the tape is driven past said transducer head by the cooperative driving of said first and second tape engaging means.]

B1 3,842,433 (1265th)
MAGNETIC TAPE DRIVE AND TRANSDUCING METHOD
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Reexamination Request No. 90/001,608, Sep. 26, 1988.
Reexamination Certificate for Patent No. 3,842,433, issued Oct. 15, 1974, Ser. No. 449,601, Mar. 11, 1974.
Continuation-in-part of Ser. No. 295,807, Oct. 10, 1972, which is a continuation of Ser. No. 224,131, Feb. 7, 1972, Pat. No. 3,699,266, which is a continuation-in-part of Ser. No. 142,748, Aug. 28, 1961, Pat. No. 3,646,258, which is a division of Ser. No. 515,417, Jun. 14, 1955, Pat. No. 3,003,109.
Int. Cl.[5] G11B *21/02*
U.S. Cl. 360—105



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-8 are cancelled.

[1. A method of transducing information relative to a magnetic tape comprising:

guiding a length of elongated magnetic tape in a fixed path, which path is located closely adjacent to a first rotatable cylindrical member disposed on one side of said tape at a location whereby said cylindrical member is capable of engaging said tape,

movably supporting a common mount for a transducer adjacent said fixed path, which transducer is operable for magnetically transducing signals relative to said tape when in engagement with said tape, and

rotatably supporting a second cylindrical member on said common mount adjacent to said transducer and a fixed distance therefrom,

first disposing said common mount for said transducer and said second cylindrical member at a first location to provide said transducer away from but in direct alignment with a free length of said tape disposed along said fixed path with said second cylindrical member located by said common mount in direct alignment with said first cylindrical member and just off said tape,

moving said common mount for said transducer and said second cylindrical member a predetermined distance towards said tape to cause said transducer to engage and become operatively coupled to said tape and to simultaneously cause said second cylindrical member to engage and pinch said tape against said first cylindrical member, and

power rotating one of said first and second cylindrical members while said tape is pinched therebetween and the other cylindrical member to drive said tape past said transducer

VOL
1114
ISS
2
MY
8
1990
UMI

so as to permit transducing operations to be performed relative to said tape.]

B1 3,943,451 (1266th)
TV CHANNEL SELECTOR ASSEMBLY
James C. Stoddard, Wayland, Mass., assignor to GTE Laboratories Incorporated
Reexamination Request No. 90/001,784, Jun. 13, 1989.
Reexamination Certificate for Patent No. 3,943,451, issued Mar. 9, 1976, Ser. No. 590,752, Jun. 26, 1975.
Int. Cl.[5] H04B *11/16*
U.S. Cl. 455—158



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–13** is confirmed.

Claims **12** and **13** were not reexamined.

1. A TV channel selector assembly of the type providing an output to a TV receiver, the output effective to select any VHF or UHF channel, including:

a. a keyboard having ten keys each of which corresponds to one of the decimal numbers zero through nine inclusive, the keyboard providing a defined output corresponding to the particular one of the keys which is activated,

b. delay means responsive to the activation of any key for defining a first timed interval commencing after the activation of any key, and

c. control means responsive to the keyboard output and the delay means for allocating the keyboard output as a units channel if a second key activation does not occur during the timed interval and for allocating the keyboard output as a tens channel if a second key activation occurs during the timed interval, the second key activation forming a second keyboard output which is allocated as a units channel, the assembly selecting and changing channels by activating the numbered keys corresponding to the desired channel.

B1 4,183,989 (1267th)
SECURITY PAPERS
Alan J. Tooth, Whitchurch, England, assignor to Portals Limited, Hampshire, England
Reexamination Request No. 90/001,769, May 4, 1989.
Reexamination Certificate for Patent No. 4,183,989, issued Jan. 15, 1980, Ser. No. 855,671, Nov. 29, 1977.
Claims priority, application United Kingdom, Dec. 7, 1976, 51047
Int. Cl.[5] B41M *3/14;* **B44F** *1/12*
U.S. Cl. 428—195

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **9–12** and **13** are cancelled

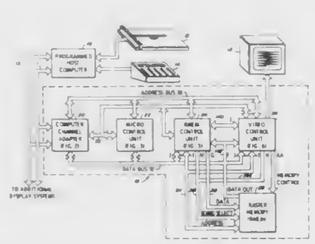
Claims **2–6** and **8** are determined to be patentable as amended.

Claim **7**, dependent on an amended claim, is determined to be patentable.

New claims **14** and **15** are added and determined to be patentable.

14. A security paper which contains a security device which comprises at least two distinct security features, one of said security features being a magnetic material which is carried by a flexible substrate, and the second security feature being a material selected from the group consisting of (a) a luminescent material and (b) a non-magnetic metal, wherein the individual security features are independently machine verifiable, and the security features are superimposed so that there is difficulty in visually determining whether more than one security feature is present in the security device.

B1 4,197,590 (1268th)
METHOD FOR DYNAMICALLY VIEWING IMAGE ELEMENTS STORED IN A RANDOM ACCESS MEMORY ARRAY
Josef S. Sukonick, Cupertino, and Greg J. Tilden, San Jose, both of Calif., assignors to Cadtrak Corporation
Reexamination Request No. 90/001,746, Apr. 5, 1989.
Reexamination Certificate for Patent No. 4,197,590, issued Apr. 8, 1980, Ser. No. 870,822, Jan. 19, 1978.
Division of Ser. No. 650,372, Jan. 19, 1976, Pat. No. 4,070,710.
Int. Cl.[5] G06F *3/153, 3/14*
U.S. Cl. 364—900



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–3** and **6–16** is confirmed.

Claim **4** is determined to be patentable as amended.

Claim **5**, dependent on an amended claim, is determined to be patentable.

10. In a graphic display system of the type in which a display is generated corresponding to the contents of a memory storing an image as a first set of data each representing an element of that stored image, the improvement for selectively supporting another image on the display without destruction of the initially stored image, said other image being represented by a second set of data each representing an element of that other image, comprising:

means for accessing from said memory the data for each element of said stored image for which a corresponding element of the other image is to be superimposed; and

logic means for logically exclusively ORing together the accessed data for each element of the stored image and the data for the corresponding element of the image to be superimposed, and for reentering the resultant logical data into the same memory locations, said display then being generated from the resultant contents of said memory.

B1 4,205,028 (1269th)
FORMING PROTECTIVE SKIN ON INTRICATELY MOLDED PRODUCT
Walter H. Brueggemann, Chagrin Falls, and John A. Brenner, Independence, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio
Reexamination Request No. 90/001,275, Jul. 1, 1987.
Reexamination Certificate for Patent No. 4,205,028, issued May 27, 1990, Ser. No. 2,658, Jan. 11, 1979.
Int. Cl.[5] B29C *41/08;* **B29D** *9/00;* **B29K** *67/00*
U.S. Cl. 264—24

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** to **15** are cancelled.

1. A process for molding in a mold having relatively sharp bends and intricately curving, irregular surface contours a two-part bulk article comprising a sheet molding compound of relatively inferior physical properties, subject to exhibiting sink marks, porosity, waviness, pits, dimples, and the like after molding, defining the bulk of said article, and a resinous film of relatively superior physical properties, having little or no tears or film blemishes after molding, coating said sheet molding compound, said process comprising: coating the intricately curving, irregular surface contours of said mold while hot with particles of a partially cured, cross-linking polyester resin, substantially all of said particles containing within the particulate form said polyester resin, a catalytic amount of a peroxide catalyst, and a flow agent, causing said particles to fuse and bond from the heat of the mold and coalesce into a substantially continuous film coating said mold, said flow agent causing said polyester resin particles to flow along the mold after said fusing, filling the mold with a bulk, curable, organic sheet molding compound compatible with said polyester resin, and then heating the mold to cure said bulk fill resin to the shape of the mold and finally cure said polyester film while adhering the film to said molded bulk fill resin, said molded film having little or no tears or film blemishes in spite of the intricately curving irregular surface contours of the mold.

B1 4,224,769 (1270th)
SPACE DIVIDER SYSTEM
Douglas C. Ball, Senneville, and Marshall Walker, Waterloo, both of Canada, assignors to Hauserman, Inc., Cleveland, Ohio
Reexamination Request No. 90/001,101, Sep. 29, 1986.
Reexamination Certificate for Patent No. 4,224,769, issued Sep. 30, 1980, Ser. No. 914,713, Jun. 12, 1978.
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—36

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–2** is confirmed.

Claim **18** is cancelled.

Claims **3**, **4**, **9**, **11** and **12** are determined to be patentable as amended.

Claims **5–8**, **10**, **13–17** and **19**, dependent on an amended claim, are determined to be patentable.

New claims **20–23** are added and determined to be patentable.

1. In a portable space divider system for dividing office areas into individual task areas, the combination comprising, horizontally disposed beam means, vertical post means disposeed at opposite ends of said beam means, means interconnecting said beam means and said post means, said beam means being recessed lengthwise to receive electrical wiring, and said post means and said connecting means being formed to enable passage of said electrical wiring therethrough, said beam means including an I-beam having upper and lower box portions interconnected by a vertical central web portion to define longitudinal side recesses for reception of said wiring, said plates, and means for mounting said side plates to said beams.

B1 4,230,830 (1271st)
ADHESIVE BLENDS CONTAINING THERMALLY GRAFTED ETHYLENE POLYMER
Stephen R. Tanny; Philip S. Blatz, both of Wilmington, and Kenneth Y. Wright, Jr., Hockessin, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Reexamination Request No. 90/001,672, Dec. 19, 1988.
Reexamination Certificate for Patent No. 4,230,830, issued Oct. 28, 1980, Ser. No. 25,564, Mar. 30, 1979.
Int. Cl.[5] C08L *23/26, 23/08*
U.S. Cl. 525—222

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2** and **4** are cancelled.

Claims **3**, **5** and **6** are determined to be patentable as amended.

New claim **7** is added and determined to be patentable.

7. A polymer blend consisting essentially of

a. about from 80–99% by weight of a first olefinic polymer which is a copolymer of ethylene having up to about 30 weight percent of at least one ethylenically unsaturated ester having from 4 to 12 carbon atoms; and

b. about from 1–19% of a second olefinic polymer which is an ethylene/propylene/hexadiene terpolymer grafted with succinic groups;

the second olefinic polymer being thermally grafted at a temperature of 225°–350° C. with unsaturated acid or anhydride to give a copolymer having about from 1.0 to 4.0 weight percent of grafted succinic groups.

B1 4,359,501 (1272nd)
HYDROLYSIS RESISTANT POLYARYLETHERKETONE FABRIC
Venanzio DiTullio, Perth, Canada, assignor to Albany International Corp., Appleton, Wis.
Reexamination Request No. 90/000,891, Oct. 28, 1985.
Reexamination Certificate for Patent No. 4,359,501, issued Nov. 16, 1982, Ser. No. 315,925, Oct. 28, 1981.
Int. Cl.[5] B32B *5/06*
U.S. Cl. 428—245

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–7** having been finally determined to be unpatentable, are cancelled.

[**1**. A fabric having machine direction and cross machine

direction threads interwoven with one another in a repeated pattern and finished into an endless belt, wherein certain of the threads are a monofilament of a melt extrudable polyaryletherketone selected from the group consisting of polyetherketones having repeating units of —Φ-O-Φ-CO— or —Φ-Φ-O-Φ-CO— and polyetheretherketones having repeating units of —Φ-O-Φ-CO-Φ-O—.]

B1 4,370,368 (1273rd)
PLASTIC BOTTLES AND PROCESS FOR PREPARATION THEREOF

Sadao Hirata, Yokohama; Isao Tanikawa, Ayase, and Yoshitsugu Maruhashi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd.

Reexamination Request No. 90/000,837, Aug. 19, 1985.
Reexamination Certificate for Patent No. 4,370,368, issued Jan. 25, 1983, Ser. No. 258,772, Apr. 29, 1981.
Claims priority, application Japan, May 7, 1980, 55-59505; May 7, 1980, 55-59506
Int. Cl.[5] B65D *23/00*
U.S. Cl. 428—36.6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **23** is confirmed.

Claims **1–22** and **24** having been finally determined to be unpatentable, are cancelled.

Claims **25** and **26** are determined to be patentable as amended.

[1. A molded plastic bottle the walls of which are molded from a wall-forming component consisting essentially of a copolymer consisting essentially of 99 to 70% by weight of vinylidene chloride and 1 to 30% by weight of at least one acrylic or methacrylic monomer and further including up to 100 parts by weight of at least one member selected from other ethylenically unsaturated monomers per 100 parts by weight of the total amount of said two monomers, said copolymer having an oxygen permeability constant of less than 9×10^{-14} cc.cm/cm^2.sec.cmHg as measured at a temperature of 20° C. and a relative humidity of 100% and a water vapor permeability constant of less than 3×10^{-3} g.cm/m^2.day as determined according to the method of JIS Z-0208.**]**

B2 4,551,120 (1274th)
BELT TENSIONER

Henry W. Thomey, Windsor, Canada, assignor to New Dyneer Corporation

Reexamination Request No. 90/001,786, Jun. 12, 1989.
Reexamination Certificate for Patent No. 4,551,120, issued Nov. 5, 1985, Ser. No. 598,837, Apr. 10, 1984.
Reexamination Certificate B1 4,551,120, issued Jul. 25, 1989.
Int. Cl.[5] F16H *7/12*
U.S. Cl. 474—135

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1**, **5–8**, **10**, **11**, **15** and **16** is confirmed.

Claims **2–4** and **9** were previously cancelled.

Claims **12**, **17** and **18** are determined to be patentable as amended.

Claims **13** and **14**, dependent on an amended claim, are determined to be patentable.

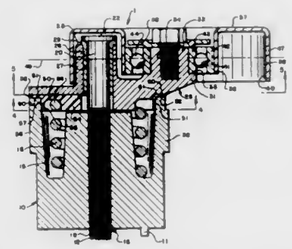
12. A tensioner construction for automatically tensioning an endless power transmission device such as a belt, chain or the like, said tensioner construction including:

(a) bracket means for mounting the tensioner construction adjacent the power transmission device;

(b) a shaft having a longitudinal axis mounted on the bracket means;

(c) lever means pivotally mounted on the shaft and extending generally radially outwardly from the shaft for pivotal movement toward and away from the power transmission device;

(d) spring means biasing the lever means in the tensioning direction; and

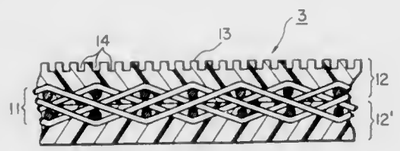


(e) a pulley having a belt engageable wall and *which is* rotatably mounted on the lever means and engageable with the power transmission device for applying a tensioning force on said device when the lever means is biased by the spring means in a tensioning direction toward the device, with an outer end of the shaft projecting within the periphery of the pulley and with the pivotal mounting of the lever means being radially offset, *spaced from*, and generally parallel with the rotational mounting of the pulley, and with an imaginary line which passes through the **[**belt engaging**]** wall intersecting the pivotal mounting of the lever means and rotational mounting of the pulleysubstantially perpendicularly to reduce unbalanced frictional forces on the pivotal mounting of the lever means.

B1 4,559,258 (1275th)
PRESSURE BELT FOR USE WITH EXTENDED NIP PRESS IN PAPER MAKING MACHINE

Masao Kiuchi, Kamagaya, Japan, assignor to Ichikawa Woolen Textile Co., Ltd., Tokyo, Japan

Reexamination Request No. 90/001,630, Oct. 31, 1988.
Reexamination Certificate for Patent No. 4,559,258, issued Dec. 17, 1985, Ser. No. 537,575, Sep. 30, 1983.
Claims priority, application Japan, Oct. 1, 1982, 57-147931
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—156



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

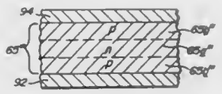
The patentability of claims **1–4** is confirmed.

1. In a pressure belt for use with a paper making machine including an extended nip press having a press roll and a pressure shoe which are in surface contact with each other, said pressure belt travelling between said press roll and a pressure shoe and being forced towards the press roll by the pressure shoe so that a felt and a web of paper to be dewatered and carried on the felt are squeezed in the nip, said pressure belt characterized by comprising an endless base fabric formed of a synthetic fiber filament, and formed with a synthetic resin layer on each outer and inner side thereof, said outer side being provided with a number of drain channels on the surface of said outer side, said channels providing drainage without permitting leakage through the belt.

B1 4,689,645 (1276th)
CURRENT CONTROL DEVICE

Stanford R. Ovshinsky, Bloomfield Hills, and Masatsugu Izu, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc.

Reexamination Request No. 90/001,570, Aug. 2, 1988.
Reexamination Certificate for Patent No. 4,689,645, issued Aug. 25, 1987, Ser. No. 853,269, Apr. 17, 1986.
Continuation of Ser. No. 669,194, Nov. 7, 1984, Pat. No. 4,605,941, which is a continuation of Ser. No. 428,092, Sep. 29, 1982, Pat. No. 4,485,389, which is a continuation of Ser. No. 193,072, Oct. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 104,285, Dec. 17, 1979, abandoned, which is a division of Ser. No. 884,664, Mar. 8, 1978, Pat. No. 4,217,374.
Int. Cl.[5] H01L *45/00*
U.S. Cl. 357—2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–13** and **15** having been finally determined to be unpatentable, are cancelled.

Claim **14** is determined to be patentable as amended.

Claims **16–28**, dependent on an amended claim, are determined to be patentable.

New claims **29–41** are added and determined to be patentable.

29. A current control device including an amorphous silicon:germanium host matrix film which has incorporated thereinto at least one density of states reducing element; said film further including at least three regions operatively disposed such that conducting regions are of different conductivity types; and at least two spaced electrodes disposed in direct electrical communication with regions of the film which are of the same conductivity type.

B1 4,702,783 (1277th)
ADHESIVE TECHNOLOGY

William H. Mason, III, St. Paul, Minn., assignor to Uncommon Conglomerates, Inc., Minneapolis, Minn.

Reexamination Request No. 90/001,631, Oct. 21, 1988.
Reexamination Certificate for Patent No. 4,702,783, issued Oct. 27, 1987, Ser. No. 436,197, Oct. 25, 1982.
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—64

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

1. A process for quickly and removably fastening a screen fabric material to a frame structure for serigraphic printing use, said process utilizing a cyanoacrylate based adhesive to secure the screen fabric to the frame structure with a bond having a high shear strength resistance and a low peel strength, said process comprising the following steps in the sequence set forth:

(a) providing a meshed screen fabric material being essentially in taut and touching communication with the peripheral surface of a frame structure,

(b) applying a cyanoacrylate based adhesive to said screen fabric portions in communication with said frame structure to contact the adhesive with the frame structure through the mesh of the screen fabric, said cyanoacrylate based adhesive being selected from a group consisting essentially of methylcyanoacrylate, ethylcyanoacrylate and isopropylcyanoacrylate, said cyanoacrylate based adhesive further having a colored dye therein to aid a user in the proper application of the adhesive, and,

(c) spraying a chemically basic catalyst to said cyanoacrylate based adhesive applied to said frame structure through the screen fabric mesh, said basic catalyst accelerating the anionic polymerization of said cyanoacrylate adhesive, said chemically basic catalyst further being an aromatic amine.

B1 4,767,746 (1278th)
METHOD FOR ENHANCEMENT OF HEALING OF EPITHELIAL WOUNDS IN MAMMALS

Nicholas Catsimpoolas, Newton Centre, Mass., and Robert S. Sinn, New York, N.Y., assignors to Angio-Medical Corporation, New York, N.Y.

Reexamination Request No. 90/001,660, Dec. 7, 1988.
Reexamination Certificate for Patent No. 4,767,746, issued Aug. 30, 1988, Ser. No. 805,206, Dec. 4, 1985.
Int. Cl.[5] A61K *31/70, 31/715, 31/20*
U.S. Cl. 514—25

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

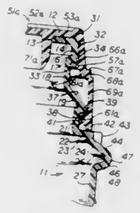
The patentability of claims **1–10** and **12** is confirmed.

Claims **11** and **13** are cancelled.

1. Method for enhanced wound epithelialization in mammals having epithelial wounds which comprises:

treating epithelial wounds systemically or topically with pharmacologically active doses of mammalian omental lipid fractions capable of promoting angiogenic activity and comprising ganglioside.

B1 4,815,620 (1279th)
TAMPER-EVIDENT CAP HAVING PLURAL DIAMETERS
Joseph J. Bullock, III, Atherton, Calif., assignor to Cap Snap Co., San Jose, Calif.
Reexamination Request No. 90/001,800, Jun. 23, 1989.
Reexamination Certificate for Patent No. 4,815,620, issued Mar. 28, 1989, Ser. No. 101,261, Sep. 25, 1987.
Int. Cl.[5] **B65D** *41/48*
U.S. Cl. 215—256



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

1. A cap for closing a container of the type having a neck having upper and lower external locking bead means, said lower external locking bead means being spaced outward relative to said upper external locking bead means, said cap comprising

a top disk,

an upper skirt portion depending from said top disk formed with upper internal locking bead means shaped and positioned to engage the upper external locking bead means of said neck when said cap is seated on said neck,

an outward extending flange on the lower edge of said upper skirt portion,

a lower skirt portion depending from the outer edge of said flange, and having a diameter larger than said upper skirt portion and of said flange and formed with lower internal locking bead means shaped and positioned to engage the lower external locking bead means of said neck,

said flange being formed with a circumferential notch at its upper outer corner, the bottom of said notch having an intersection with the top of said lower skirt portion comprising a first circle,

said lower skirt portion having an inner wall which intersects the underside of said outward extending flange in a second circle,

said first circle being larger than and having an elevation higher than said second circle, the section of said cap between said circles comprising a downward-inward slanted zone of weakness,

a tear tab fixed to said lower skirt portion, said lower skirt portion being formed with a weakened area adjacent said tab and communicating with said zone of weakness of said flange, whereby when a user grips and pulls said tear tab, said lower skirt is torn at said weakened area and said zone of weakness is torn, thereby removing a substantial portion of said lower internal locking bead means from engagement with said lower external locking bead means to permit removal of said cap from said neck.

REISSUES

MAY 8, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification, matter printed in italics indicates additions made by reissue.

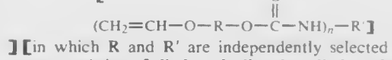
Re. 33,210
CLEANING COMPOSITION OF TERPENE HYDROCARBON AND A COCONUT OIL FATTY ACID ALKANOLAMIDE HAVING WATER DISPERSED THEREIN
Wilmer B. Stoufer, 8133 Naranja Dr., Jacksonville, Fla. 32217
Original No. 4,704,225, dated Nov. 3, 1987, Ser. No. 858,389, May 1, 1986. Application for reissue Dec. 11, 1987, Ser. No. 131,730
Int. Cl.[5] **C11D** *1/18*
U.S. Cl. 252—153 **19 Claims**

1. A composition of matter consisting essentially of an water-in-oil emulsion of (a) an oil phase consisting essentially of from about 95 to 85 parts by volume of an unsaturated terpene hydrocarbon and from about 5 to 15 parts by volume of the condensation product of from 1.5 to 3 moles of a mono-, di-, or trialkylolamine with 1 mole of a fatty acid containing 8 to 18 carbon atoms or a mixture of such fatty acids, and (b) from 5 to 8 parts by volume of water per part by volume of component (a).

19. A composition of matter consisting essentially of a water-in-oil emulsion of (a) an oil phase consisting essentially of from about 95 to 85 parts by volume of and unsaturated terpene hydrocarbon and from 5 to 15 parts by volume of the condensation product of from 1.5 to 3 moles of mono-, di-, or trialkylolamine with 1 mole of fatty acid containing 8 to 18 carbon atoms or a mixture of such fatty acids, and (b) water.

Re. 33,211
VINYL ETHER TERMINATED URETHANE RESINS
Stephen C. Lapin, Wauconda, and David W. House, Arlington Hts., both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Original No. 4,751,273, dated Jun. 14, 1988, Ser. No. 69,924, Jul. 6, 1987. Continuation-in-part of Ser. No. 898,456, Aug. 19, 1986, abandoned. Application for reissue Dec. 19, 1988, Ser. No. 286,685
Int. Cl.[5] **C08L** *29/10*
U.S. Cl. 525—455 **32 Claims**

[1. A vinyl ether terminated urethane resin having the generic formula:] [



] [in which R and R′ are independently selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, cycloalkyl and alkyl oxide radicals and n is an integer of from 1 to 4.]

Re. 33,212
SERVICE STATION FOR REFRIGERATION EQUIPMENT
Ralph C. Lower, Bryan; Kenneth W. Manz, Paulding, and Gary P. Murray, Montpelier, all of Ohio, assignors to Kent-Moore Corporation, Warren, Mich.
Original No. 4,688,388, dated Aug. 25, 1987, Ser. No. 728,589, Apr. 29, 1985. Application for reissue Oct. 7, 1988, Ser. No. 254,852
Int. Cl.[5] **F25B** *49/00*
U.S. Cl. 62—126 **33 Claims**

30. Apparatus for charging refrigeration equipment comprising:

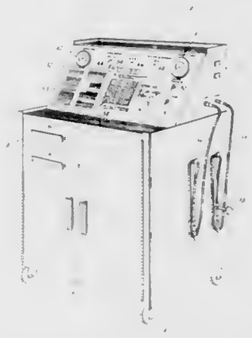
charging means including a pressurized source of refrigerant and means for selectively connecting said pressurized refrigerant source to refrigeration equipment to be charged,

control means including means in an automatic mode of operation for connecting said pressurized refrigerant source to the refrigeration equipment in said automatic mode to transfer a preselected quantity of refrigerant to the refrigeration equipment,

data entry and sequence control means responsive to an operator and coupled to said control means, said control means further including means in a programming mode of operation for receiving and storing data from said data entry and sequence control means indicative said preselected quantity,

means coupled to said control means and to said data entry and sequence control means for selectively initiating said automatic and programming modes of operation,

alphanumeric display means coupled to said control means, said control means including means for displaying said preselected quantity at said alphanumeric display means in both said automatic and said programming modes of operation, and



scale means for providing to said control means signals indicative of weight on said scale means, said refrigerant source being mounted on said scale means, and means responsive to operator activation for initiating a manual scale mode of operation,

said control means including means operable in said manual scale mode of operation and responsive to said weight-indicative signals for indicating weight on said scale means at said alphanumeric display means.

Re. 33,213
LIGHT SCATTERING PARTICLE DETECTOR FOR WAFER PROCESSING EQUIPMENT
Peter Borden, Mountain View, Calif., assignor to High Yield Technology, Mountain View, Calif.
Original No. 4,739,177, dated Apr. 19, 1988, Ser. No. 907,776, Sep. 16, 1986. Continuation-in-part of Ser. No. 807,901, Dec. 11, 1985, abandoned, which is a continuation of Ser. No. 807,395, Dec. 10, 1985, abandoned. Application for reissue Oct. 25, 1988, Ser. No. 262,408
Int. Cl.[5] **G01N** *15/06, 15/07, 21/49*
U.S. Cl. 250—574 **20 Claims**

1. Apparatus for detecting particles in a vacuum, or air or fluid environment comprising:

means for providing a light beam having a defined access;

lens means for shaping said light beam to provide a collimated beam having a predetermined width and height;

first mirror means having a first surface for *reflecting said light beam* [providing multiple reflections of said light beam, the angle of incidence of each of said reflections of said light beam being less than 90°];

VOL
1114
ISS
2
MY
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1990
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second mirror means having a second surface for *reflecting said light beam* [providing multiple reflections of said light beam that is reflected from said first surface, the angle of incidence of each of said reflections of said second surface being less than 90°];

said first and second surfaces of said first and second mirror means respectively being substantially parallel and spaced from each other so that *said light beam is reflected from said first surfoce to said second surface a first multiplicity of times and from said second surface to said first surface o second multiplicity of times, said light beam having an angle of incidence on said first surface and on said second surface of less than ninety degrees (90°) prior to each reflection from said first surface and said second surface, said first and said second surfaces and said means for providing a light beam being arronged so thot* the distance between adjacent points of reflection on each surface is substantially the dimension of the width of said light beam, *said first and second mirror means having highly reflecting surfaces;*

photodiode means *including first and second photodiodes* for detecting light that is scattered by particles that traverse said beam, said *first and second* photodiodes being spaced at a distance from each other greater than the distance



between said first and second [reflecting] surfaces *of said first and second mirror means.*

PLANT PATENTS

GRANTED MAY 8, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,226

EARLY EATING APPLE 'OR'

Abba Stein, Ein Shemer, Israel, assignor to Fruit Board, Tel Aviv, Israel

Filed Jun. 29, 1988, Ser. No. 219,059
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. The new and distinct variety of eating apple substantially as described and illustrated herein, being derived by hybridization from 27×Red Delicious F_2 and distinguished by the fact that it can be grown successfully without the necessity for an extreme degree of cold in the winter season, and that it may be harvested earlier than the nearest comparable variety.

7,227

APPLE 'TOMER'

Abba Stein, Ein Shemer, Israel, assignor to Fruit Board, Tel-Aviv, Israel

Filed Jun. 29, 1988, Ser. No. 219,060
Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. The new and distinct variety of eating apple substantially as described and illustrated herein, being derived by hybridization from Red Delicious×Anna F_2 and distinguished by the fact that it can be grown successfully without the necessity for an extreme degree of cold in the winter season.

VOL
1114

ISS
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MY
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1990

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PATENTS

GRANTED MAY 8, 1990

ERRATA

For CLASS	See PATENT NO.
015-036	4,922,578
029-026	4,922,591
051-394	4,922,675
074-479	4,922,755
074-462	4,922,781
074-479	4,922,782
074-502	4,922,783
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606-037	4,922,903
606-226	4,922,904
606-195	4,922,905
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182-151	4,923,052
184-106	4,923,053
187-001	4,923,054
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187-109	4,923,056
188-071	4,923,056
188-378	4,923,057
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228-117	4,923,100
266-044	4,923,180
264-032	4,923,184
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VOL
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PATENTS

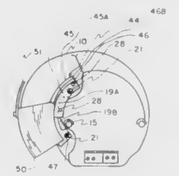
GRANTED MAY 8, 1990

GENERAL AND MECHANICAL

4,922,550
APACHE HELMET ADAPTER FOR NIGHT VISION GOGGLES

Robert W. Verona, Alexandria; J. Brian Gillespie, Fort Belvoir, both of Va., and James H. Brindle, Doylestown, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 1, 1988, Ser. No. 265,447
Int. Cl.[5] A61F *9/00;* **A42B** *3/02*
U.S. Cl. 2—6 **7 Claims**



1. A rail adapter device for attachably interfacing on an aviators helmet previously incompatible visor guard having Aviators Night Vision Imaging System (ANVIS) mount assembly attachable thereto and a visor which is slidably connectable thereto wherein said visor is further slidably interfaced with said rail adapter device, said device comprised of:

at least two single piece rail adapters with one rail adapter attachable to existing mounting points on each of the right and the left front sides of said aviators helmet, each rail adapter is shaped with a concave inner area to conform to the respective outer left and right upper front shapes of said helmet and a convex outer area wherein each rail adapter has an upper thick portion onto which said visor guard is attachable and an open track on said outer area through which the outer edges of said visor are slidably mounted and a lower thin portion which provides clearance for said visor when said visor is extended to its lower position in the line of sight of the aviator with said visor between said ANVIS mount assembly and goggle system and said rail adapter.

4,922,551
OVERALLS FOR CRAWLING AND SLITHERING

George Anthes, 8830 Madison Ave., Fair Oaks, Calif. 95628

Filed Oct. 31, 1988, Ser. No. 264,454
Int. Cl.[5] A41D *1/06*
U.S. Cl. 2—79 **5 Claims**

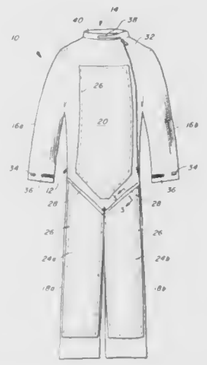
1. A worker's overall garment to cover the entire body from neck to ankles to wrists, comprising, in combination:

a. an overall body covering of durable, slippery fabric including a torso portion having a constrictable neck opening, a pair of generally cylindrical arm tubes extending outwardly from the upper sides of said torso poriton, each having constrictive means at its distal end, and a pair of generally cylindrical leg tubes depending with a crotch therebetween from the lower extreme of said torso portion, each having constrictive means at its distal end;

b. a torso pad of smooth, flexible, abrasion-resistant material affixed to, and covering substantially, the entire anterior face of said torso portion;

c. a pair of arm pads, each having proximal and distal ends and comprising a sheet of smooth, flexible, abrasion-resistant material affixed to, and covering at least the forearm portion of, the posterior face of one of said arm tubes;

d. a pair of leg pads, each having proximal and distal ends and comprising a sheet of smooth, flexible, abrasion-resistant material affixed to, and covering substantially, the entire anterior face of one of said leg tubes, the proximal end of each said pad being cut diagonally upward and away from said crotch, each said proximal end, further, being covered with a fabric layer; and,

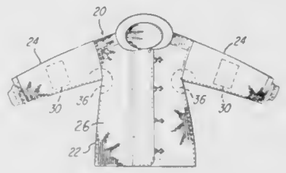


e. a closeable slit forming an entry opening extending from the necks opening substantially to the waistline of the torso portion, and running adjacent but peripheral to the perimeter of said torso pad, including means for closing said slit.

4,922,552
FIREFIGHTER'S GARMENTS HAVING ENHANCED FLEXIBILITY AND MINIMUM WEIGHT

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417

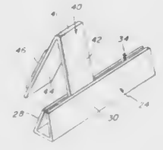
Division of Ser. No. 182,398, Apr. 18, 1988, Pat. No. 4,843,646. This application May 1, 1989, Ser. No. 345,668
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—93 **19 Claims**



1. A firefighter's garment for protection of a firefighter during fire fighting activity and to create minimum stress within the firefighter during firefighting activity, the firefighter's garment comprising an outer shell of flexible abrasion resistant and flame resistant material, a layer of flexible high temperature thermal insulation material enclosed by the outer shell, the layer of flexible high temperature insulation material including a first portion which is relatively bulky and which has limited flexibility, the first portion of the layer of flexible high temperature thermal insulation material having given thermal insulation qualities, the layer of flexible high temperature thermal insulation material also including a second portion of flexible high temperature thermal insulation material, the second portion of flexible high temperature insulation material being less bulky in character and having greater flexibility than the first portion of the layer of flexible high temperature ther-

mal insulation material, the second portion of the layer of flexible high temperature thermal insulation material having lesser thermal insulation qualities than the first portion of the layer of flexible high temperature thermal insulation material.

4,922,553
DECORATIVE SHIRT COLLAR SUPPORT DEVICE
James V. Morrone, 25 Sea Foam Ave., Winthrop, Mass. 02152
Filed Sep. 26, 1988, Ser. No. 249,520
Int. Cl.[5] A44D *3/00*; A41D *27/08, 27/16*
U.S. Cl. 2—132 23 Claims



1. In combination, a plastic shirt collar decorating clip and a shirt collar upon which the clip is to be positioned, said clip comprising a base and opposing legs, said base being integrally formed with said opposing legs, said opposing legs and base forming an interior chamber that is substantially triangular in cross-section, said opposing legs having upper free ends that are adapted to converge forming a relatively thin gap therebetween, said legs being defectable for the purpose of receiving the shirt collar therebetween, said legs providing a spring effect enabling the clip to be secured in place on the shirt collar, the outer surface of at least one of said legs having a decorative indicia thereon, said shirt collar fitting through said gap into said interior chamber with the legs' free ends at said gap engaging the shirt collar at a position inward of the shirt collar edge, said legs both of substantially solid and rigid construction and of fixed unextendable length, one of said legs disposed under said collar and the other one of said legs disposed over said collar, in combination with a sliding member having opposite legs with one of said legs adapted to fit inside of the clip legs, said sliding member being of V-shape with a front leg received in the clip and a rear leg attached behind the collar, wherein both legs of the sliding member are disposed behind the shirt collar with said one leg of the sliding member held in position in said gap, said shirt collar being disposed in said gap on the outside of said one leg of the sliding member.

4,922,554
RETAINER FOR FLEXIBLE DRAIN PIPES
Jin-Chyuan Hwang, No. 118-209, Tai-Tzu Miao, Tai-Tzu Village, Jern-Der District, Tainan Hsien, Taiwan
Filed Sep. 19, 1988, Ser. No. 245,729
Int. Cl.[5] F03C *1/284*
U.S. Cl. 4—191 2 Claims



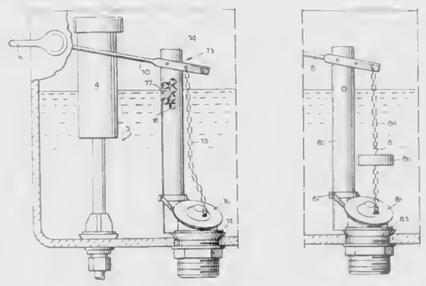
1. A retainer for holding a flexible drain pipe comprising:
(a) an elongate plate having three aligned transverse openings adapted to receive a flexible drain pipe therethrough;
(b) a pair of semicircular sidewalls adjacent the two outside holes of said prealigned openings, a first one extending downwardly, the second extending upwardly both sidewalls extending at an angle perpendicular to the plane of the elongate plate, the sidewalls being adapted to guide the flexible drain pipe in a vertical plane; and
(c) a second upwardly extending sidewall on top of the downwardly extending one, at the opposite side of said first upwardly extending sidewall, said second upwardly extending sidewall having a fourth transverse hole therethrough adapted to receive and guide a flexible drain pipe in a horizontal direction.

4,922,555
COMMODE PLUNGING SHIELD
Marco A. Bonilla, and Linda M. Bonilla, both of 3783 Joplin Ave., San Diego, Calif. 92117
Filed Mar. 10, 1989, Ser. No. 321,713
Int. Cl.[5] E03D *11/00*
U.S. Cl. 4—257 1 Claim



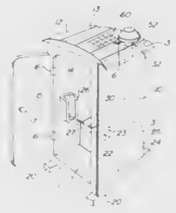
1. A commode plunging shield apparatus for use with a commode wherein said commode includes a drain conduit and is formed with a horizontally disposed commode rim surface of a predetermined configuration in surrounding and overlying relationship to a commode bowl, said apparatus comprising,
a shield including an exterior surface, and an interior surface, and
a horizontally disposed shield rim surface arranged at lowermost terminal ends of said interior and exterior surfaces, and of a configuration equal to said predetermined configuration, and
a through-extending aperture, and a plunger reciprocatably received within said aperture wherein said plunger includes an elongate cylindrical handle and an axially cup-shaped aligned plunger head at a lower terminal end of said handle, and
securement means formed on said shield of secure the shield surface to the commode rim surface, and
wherein said interior surface defines a concave interior surface and said exterior surface defines a convex exterior surface wherein said aperture is formed at an uppermost crown portion of the exterior surface, and said aperture is aligned with said drain conduit when said shield is secured to the commode, and
wherein said securement means includes a continuous downwardly depending skirt orthogonally and integrally formed relative to the shield rim surface and defining a continuous external skirt surface aligned with said external surface to secure and align the commode rim surface relative to the shield rim surface, and wherein said rim surface is wholly positioned interiorly of said skirt, and
wherein the shield is of a generally pear shaped configuration, and the commode rim surface is of a generally pear shaped configuration, and
wherein the crown surface is oriented generally rearwardly of the shield and includes a forwardly tapering upper surface extending forwardly to a nose portion of the shield to overlie a forward nose portion of the commode.

4,922,556
FLUSHING MEANS
Vernon D. Roosa, West Hartford, Conn., assignor to Elwyn V. Harp, West Hartford and Glen H. Baron, Simsbury, both of, Conn.
Division of Ser. No. 118,437, Nov. 9, 1987, Pat. No. 4,842,011.
This application Apr. 17, 1989, Ser. No. 339,396
Int. Cl.[5] E03D *1/34*
U.S. Cl. 4—378 1 Claim



1. In combination with a tank filling inlet valve, an improved flushing valve for sealing a flush tank outlet to a bowl comprising the combination of:
a stationary hollow tube;
means for mounting said hollow tube in a generally vertical position in said tank at a tank outlet;
aperture means on said hollow tube for admitting liquid to said hollow tube from said tank for bowl leveling,
a movably mounted flapper valve spaced from said hollow tube for sealing a tank outlet,
a member attached to a handle for lifting said flappe valve from a tank outlet,
float means adjustably positioned on said member,
said aperture means comprising a plurality of hole sites at this level with plug means in all except a preselected one whereby liquid is admitted in only said one preselected hole site.

4,922,557
OUTDOOR TOILET HOLDING TANK VENTILATION SYSTEM
George W. Harding, Clearwater, Fla., and Rodney M. Mullett, Hammond, Ind., assignors to Poly-John Enterprises Corp., Whiting, Ind.
Filed Mar. 8, 1989, Ser. No. 320,324
Int. Cl.[5] A47K *11/04*; E03D *9/04*
U.S. Cl. 4—477 6 Claims



1. An outdoor toilet holding tank ventilation system for reducing the generation of noxious odors by solar energy heat build-ups in a toilet waste material holding tank located within a portable, outdoor toilet cabana containing toilet equipment, comprising:
a vent pipe having a lower end opening into the toilet waste material holding tank and an opposite upper, open end portion which extends into the cabana;
a small, electrical motor-operated, blower fan mounted upon the vent pipe open end operation for blowing air outside of the cabana, the fan being located within the cabana, just beneath the roof of the cabana and opening outwardly of the cabana roof, said fan including a housing fitted upon the open end of the vent pipe and a cover vent extending from said housing out said cabana roof to exhaust to atmosphere, said cover vent including a vent tube extending from said fan housing through the cabana roof a short distance above the roof, a plurality of axial slots are formed in the vent tube for enabling exhaust, and a cap covering said vent tube to protect against entry of rain or the like, said housing and vent cover are easily and readily removable from said vent pipe to enable changing, replacing, or the like, when needed;
a solar heat-electrical energy generating panel mounted upon the exterior of the cabana for exposure to natural sunlight, to generate electrical energy in response to direct exposure to predetermined levels of sunlight shining thereupon;
said panel being electrically connected to the fan motor for providing electrical energy for activating the fan only during periods of such predetermined levels of sunlight applied to the cabana;
whereby the fan sucks air out of the waste holding tank through the vent pipe and blows the air out of the pipe to atmosphere for causing air to circulate through the cabana and through the tank and, thereby, to remove some of the solar energy-caused heat concentrated in said tank and, as a result, reduce heat-caused chemical or bacteriological activity within the waste material in the tank for reducing the generation of noxious odors resulting from such activity.

4,922,558
HEADREST FOR USE IN BEAUTY SHOP SHAMPOO BOWLS, SINKS AND THE LIKE
Patricia A. Porco, 4922 N. Pearl St., Tacoma, Wash. 98407
Filed Aug. 8, 1988, Ser. No. 229,707
Int. Cl.[5] A45D *44/10*
U.S. Cl. 4—523 1 Claim



1. A headrest, comprising:
a first frame-like member having two elongated side elements and top and bottom cross elements, wherein one side element is shorter than the other;
a second frame-like member similar to said first member;
means rotatably connecting the first and second frame-like members together approximately central of the elongated side elements thereof in such a manner that the respective

shorter side elements of each frame-like member are rotatably connected together and the other side elements are also rotatably connected together, such that when the article is supported on a horizontal surface, the article tilts in the direction of the shorter side elements, wherein each side element of each frame-like member includes an upper portion, a lower portion and an intermediate central portion, the rotatable means being a part of said central portion, wherein the upper portions of the side elements of the first frame-like member are slightly outwardly offset from the lower and central portions thereof, wherein the upper portions of the side elements of said second frame-like member are slightly inwardly offset from the lower and central portions thereof, such that the respective central portions of the respective mating side elements of the first and second frame-like members are in registry substantially immediately adjacent each other, wherein the lower portions of each side element include foot portions which extend substantially vertically to a free end when the headrest is in an operative position supported on a horizontal surface, the article further including suction cups at the free end of each foot portion, wherein each foot portion has such a relationship to the remainder of the side element associated therewith that in the longitudinal plane, the foot portion extends downwardly from the lower portion of its associated side element at an angle approximately of 150° relative to the lower portion and in the lateral plane extends downwardly at an angle of approximately 10° from the lower portion of its associated side element; and

support means for a user's head extending between the respective top cross elements of each of the frame-like members, wherein the support means is made from a web-like, water permeable material, such that any liquid applied to and draining from, the hair of the user will readily drain through such support means.

4,922,559

PUBLIC SANITARY CUBICLE

Hans Wall, St. Barbara Str. 52, 7517 Waldbronn, Fed. Rep. of Germany

PCT No. PCT/EP88/00103, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/06212, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 12, 1988, Ser. No. 272,754

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704375

Int. Cl.[5] A47K *4/00*

U.S. Cl. 4—662 21 Claims



1. Public sanitary cubicle comprising a sanitary room with a water closet accessible through an outer door and a cleaning room divided off by a partition from the sanitary room and which is provided with the means necessary for the supply, disposal and cleaning of the sanitary room and in particular a cleaning implement which can be brought up to the water closet after moving away the partition or a part thereof and a drain connected to the water closet, wherein the water closet has a substantially flat base downwardly inclined from the sanitary room to the partition and having a rear drainage edge and a rear wall formed by the partition or its movable part, and wherein the drain is located in the cleaning room in the vicinity of the partition below the drainage edge of the base of the water closet and is exposed by moving away the partition or its movable part.

4,922,560

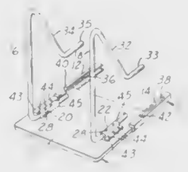
DEVICE TO AID PERSONS RISING FROM A SEATED POSITION

Bernard J. Skibinski, 14117 Mapleridge, Detroit, Mich. 48205

Continuation-in-part of Ser. No. 105,660, Oct. 7, 1987, Pat. No. 4,843,661. This application Mar. 31, 1989, Ser. No. 331,907

Int. Cl.[5] A61H *3/00*

U.S. Cl. 5—81 R 9 Claims



1. An assist to aid a person rising from a seated position, said assist comprising:

a platform having two mutually parallel sides, said two mutually parallel sides defining a plane;

a pair of handles connected with said platform, said pair of handles selectively extending in a predetermined direction away from one side of said two mutually parallel sides of said platform, each handle of said pair of handles being mutually separated to allow a person to walk therebetween, each said handle having a section oriented substantially parallel to said plane for allowing said person to push downwardly thereagainst when rising from said seated position; and

at least one stabilizer means attached to said platform for preventing said platform from tipping; said at least one stabilizer means further comprising a stabilizer which extends from said platform a predetermined distance in said plane so as to prevent tipping of said platform when said person rises from said seated position.

4,922,561

CONVERTIBLE SOFA-BED

Paul Williams, "Mobeetly", Enfield St. East, Penrith, N.S.W. 2750, Australia

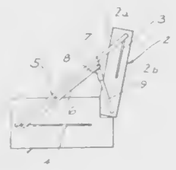
PCT No. PCT/AU87/00171, § 371 Date Feb. 8, 1988, § 102(e) Date Feb. 8, 1988, PCT Pub. No. WO87/07487, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 12, 1987, Ser. No. 179,470

Claims priority, application Australia, Jun. 12, 1986, PH6379; Aug. 25, 1986, PH7641

Int. Cl.[5] A47C *17/04*

U.S. Cl. 5—9 R 16 Claims



2. A sofa selectively convertible into a double bed or a double bunk having an upper bunk and a lower bunk, said sofa

comprising a base having an upper surface and a lower portion, a back having a front face and rear face, and a mechanism connected between said base and said back and movably supporting said back; said back being movable between a stable first position wherein said back is positioned in a generally upright orientation to function as the backrest of said sofa, a stable second position wherein said back is positioned above and spaced apart from said base a sufficient distance to allow a person to enter the space between them and to repose upon said upper surface of said base so that said base functions as said lower bunk, the rear face of said back being oriented generally horizontally and facing upwardly so that said rear face of said back functions as the upper bunk of said double bunk, and a stable third position wherein said rear face of said back is horizontally adjacent to said base with the rear face of said back oriented generally horizontally, facing upwardly and generally in the same plane as said upper surface of said base so that said base and said back together function as said double bed.

4,922,562

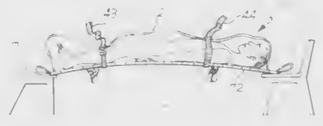
RESCUE POUCH

Floyd R. Allred, Redmond; Gary A. Weible, Richland, and Ronald L. Weible, Bellevue, all of Wash., assignors to Western Group International, Bellevue, Wash.

Filed Jul. 11, 1988, Ser. No. 216,963

Int. Cl.[5] A61G *1/00*

U.S. Cl. 5—82 R 17 Claims



1. A rescue pouch for transporting a human body comprising:

a flexible container capable of enclosing a human body and including an opening through which the body can be inserted and means for closing the opening; and, a foldable beam support extending longitudinally along the container including a plurality of adjoining hinged elements defining a plurality of laterally oriented hinge axes, the elements cooperation to form a beam when the beam support is downwardly loaded and to permit the rescue pouch to be rolled about a substantially lateral axis for storage;

means for securing the beam support to the container and permitting it to move longitudinally with respect thereto; and,

means for grasping the rescue pouch.

4,922,563

WATERBED MATTRESS WITH BAFFLE CHAMBERS

John B. Johenning, Los Angeles, and Charles P. Hall, Santa Rosa, both of Calif., assignors to Advanced Sleep Products, Carson, Calif.

Division of Ser. No. 808,994, Feb. 5, 1986, Pat. No. 4,750,959, which is a division of Ser. No. 364,534, Apr. 1, 1982, Pat. No. 4,577,356. This application Mar. 30, 1987, Ser. No. 31,890

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[5] A47C *27/08*; B32B *31/20*

U.S. Cl. 5—450 19 Claims

1. A baffle structure for a waterbed mattress, the baffle structure comprising a laterally extending pad and a plurality of chambers depending from the pad comprising:

(a) a layer of material forming a laterally extending pad having a length and width less than the length and width of the waterbed mattress into which the pad is to be placed, the pad being sufficiently buoyant to float in water and being constituted of buoyant foam;

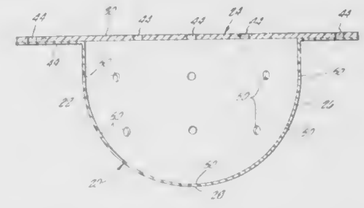
(b) a plurality of chambers of polyethylene material denser than water;

(c) at least one metering hole through a wall of at least a portion of the chambers for passage of water into and out of the chambers;

(d) the chambers being secured together with the pad so as to be capable of depending downwardly from the pad, wherein the buoyant pad has sufficient buoyancy that the baffle structure floats in the waterbed mattress; and

(e) at least one said metering hole being located such that water flow out of the chambers is in a direction having both a horizontal component and downward component.

17. A method for forming a baffle structure for a waterbed mattress, the baffle structure comprising a laterally extending pad and a plurality of chambers depending from the pad, the method comprising the steps of:



(a) cutting a layer of polyethylene material to form a laterally extending pad having a length and width less than the length and width of the waterbed mattress into which the pad is to be placed, the pad being sufficiently buoyant to float in water and being constituted of buoyant foam;

(b) forming a plurality of chambers of polyethylene material denser than water;

(c) forming at least one metering hole through a wall of at least a portion of the chambers for passage of water into and out of the chambers, the at least one metering hole being located such that water flow out of the chambers is in a direction having both a horizontal component and downward component; and

(d) securing the chambers together with the pad so as to be capable of depending downwardly from the pad;

wherein the buoyant pad has sufficient buoyancy that the baffle structure floats in the waterbed mattress.

4,922,564

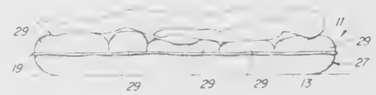
THERAPEUTIC MATTRESS AND METHOD OF MAKING

Charles R. Thomas, 120 E. Golden Gate, Detroit, Mich. 48203

Filed Sep. 12, 1988, Ser. No. 242,525

Int. Cl.[5] A47C *27/00*

U.S. Cl. 5—464 3 Claims



1. A therapeutic mattress of rectangular shape having spaced ends and sides comprising:

a resilient bottom mattress section;

a plurality of transverse interconnected top mattress sections arranged side by side superimposed over and along the length of the mattress bottom section;

peripheral stitching interconnecting the top and bottom mattress sections;

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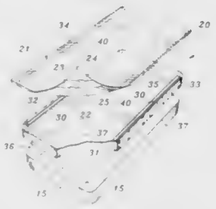
the top mattress sections including a top fabric cover and spaced therefrom an underlying intermediate bottom fabric cover with said covers peripherally interconnected;
a plurality of laterally spaced rows of continuous stitching interconnecting the top and intermediate covers throughout their width;
said rows of stitching defining with said peripheral stitching a plurality of transverse rectangular tubes of generally rectangular cross-section which extend uninterrupted substantially across the entire width of the mattress;
compacted stuffing of resilient fibrous material confined and retained within said transverse tubes defining said top mattress sections;
said bottom mattress section including a second bottom fabric cover spaced from and generally parallel to said intermediate bottom fabric cover and peripherally connected thereto defining an elongated rectangular chamber underlying said top mattress sections; and
a loosely confined stuffing of a resilient fibrous material enclosed and retained within said chamber and yieldably underlying said top mattress sections.

4,922,565

SEPARABLE MOISTURE PROOF SHEET

Bonnae C. Blake, 2781 Collins Rd., Fort Mill, S.C. 29715

Continuation-in-part of Ser. No. 134,995, Dec. 18, 1987. This application Apr. 14, 1989, Ser. No. 338,739
Int. Cl.[5] A47G *9/04*
U.S. Cl. 5—484 3 Claims



1. A separable and moisture proof bottom sheet for covering and protecting a mattress, said sheet comprising an upper panel and a lower panel, said lower panel being configured to cover the top of the mattress and including means to releasably anchor the lower panel of the sheet to the mattress independently of the upper panel, said means comprising parallel edges that extend underneath longitudinal edges of the mattress and an elastic strap attached to and extending between a mid portion of the edges, the upper panel covering the top of the lower panel in use and including a soft fabric upper surface for the comfort of the user and a moisture proof element to protect the lower panel and the mattress, and means for selectively separating the upper panel from the lower panel and connecting the upper panel to the lower panel without disturbing the lower panel, whereby the moisture proof upper panel of the bottom sheet can be separated from the lower panel of the sheet to clean the upper panel when soiled and a clean upper panel can be connected in covering relation to the lower panel to protect the lower panel and the mattress in use.

4,922,566

METHOD FOR OPTIMIZING FLOW AND TEMPERATURE IN WASH WATER WHEN WASHING OUT FABRIC WEBS

Daniel W. Ravensbergen, Bosdreef 34, NL-2352 BC Leiderdorp, Netherlands

Filed Dec. 19, 1988, Ser. No. 286,745
Claims priority, application Netherlands, Dec. 18, 1987, 8703074
Int. Cl.[5] D06B *3/12, 23/00*
U.S. Cl. 8—151 3 Claims



1. A method for adjusting a flow and temperature of wash water when washing out contaminates from fabric webs in a textile process using an open-width washing machine, wherein a fabric web is conducted through a plurality of series connected wash tubs and warm wash water is conducted through the wash tubs in a direction opposite a direction of movement of the fabric web, comprising the steps of:
measuring at a first water temperature a first wash water flow rate and a first washing action of water in the wash tubs as the fabric web is conducted through the was tubs, said first washing action being a ratio of concentration of contamination on the fabric web after washing and before washing;
calculating a first replacement factor from said measured first flow rate and said first washing action by means of the following equation:

$$M = \frac{F}{F-1}\left[1 - \frac{\phi F}{F+\phi-1}\right]^{1/n}$$

where M is the replacement factor, F is the volume of wash water supplied per second divided by the volume of water entrained by the fabric per second, n is the number of washing compartments, and ϕ is the ratio of concentration of contamination on the fabric web after washing and before washing and equals the first washing action;
measuring a second wash water flow rate and a second washing action at a second water temperature, said second washing action being a ratio of concentration of contamination on the fabric web after washing and before washing;
calculating a second replacement factor from said second flow rate and said second washing action;
calculating from said first and second replacement factors and from said first and second water temperatures coefficients of a linear relationship between replacement factor and temperature in accordance with the following equation:

$$M = RC \cdot T + B (T \text{ in } ^\circ C.)$$

by means of the following two equations:

$$RC = \frac{M_2 - M_1}{T_2 - T_1},$$

$$B = M_2 - RC \cdot T_2,$$

wherein M_1 is said first replacement factor, M_2 is said second replacement factor, T_1 is said first water temperature, and T_2 is said second water temperature;
calculating replacement factors M_r for continuously incrementing values of wash water flow rate starting from a desired washing action ϕ_d, namely:

$$\phi_d = \frac{\text{desired concentration of contamination on fabric after washing}}{\text{concentration of contamination on fabric before washing}},$$

by means of the following equation:

$$M_T = \frac{F}{F-1}\left[1 - \frac{\phi_d F}{F+\phi_d-1}\right]^{1/n},$$

including calculating corresponding temperatures T_t via the relationship:

$$T_T = \frac{M_T - B}{RC};$$

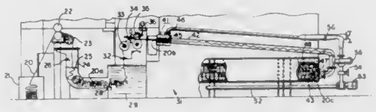
calculating the sum of costs of washing water flow and wash water heating for incremental values of wash water flow rate and corresponding wash water temperatures to form a table of costs;
choosing a wash water flow rate and a corresponding wash water temperature with a minimum cost from the table of costs; and
setting a wash water flow rate through the wash tubs and a wash water temperature of the wash water in the tubs by means of wash water heating to the chosen flow rate and water temperature in order to derive minimum costs thereof.

4,922,567

TREATING FABRICS

Robert A. Miller, New Ringgold, Pa., assignor to J. E. Morgan Knitting Mills, Inc., Tamaqua, Pa.

Filed Jun. 28, 1989, Ser. No. 373,103
Int. Cl.[5] D06B *3/10*
U.S. Cl. 8—151 13 Claims



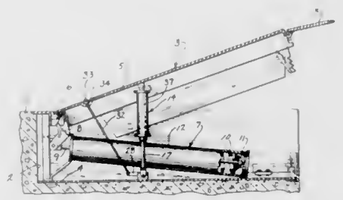
1. A method for pre-shrinking tubular knit fabrics comprising at least 40% cotton comprising the steps of:
forming the fabric into an elongated tube, continuously feeding the tube lengthwise into a first bath of liquid, and retaining each part of the tube in the bath of liquid for a sufficient length of time to completely saturate the fabric of the tube;
continuously withdrawing the tube from said first bath and feeding it longitudinally into a sequence of baths by positively feeding the tube into the bath at its entrance end, maintaining said tube immersed in said bath throughout its length, withdrawing said fabric from the opposite end of each bath section by continuously withdrawing the fabric vertically from the discharge end and transferring it, without substantial stretching to the entrance end of the next bath section for positive feeding of the fabric into the next bath section;
controlling the feed and discharge of the fabric to avoid longitudinal stress on the tube during its travel through the bath section, assuring longitudinal compression or slackening of the fabric in its travel through each section;
thereafter arranging said length of tubular fabric into a flattened tubular shape having only two fabric thicknesses throughout;
maintaining said fabric saturated with liquid throughout said arranging step;
feeding said flattened tube into a dryer so as to reduce the moisture content to a range of 20–40% moisture content;
thereafter subjecting the fabric to heat and moisture to stabilize its moisture content in the range of 35–45%; and
feeding the continuous length of fabric into a tumble dryer section and causing the fabric to be repeatedly impacted while slack and removed from longitudinal tension, and while subjected to heat and dry air and continuing the treatment in the tumble dryer for a period to reduce the residual shrinkage of the fabric to less than 8%.

4,922,568

HOLDDOWN MECHANISM FOR A DOCKBOARD

Martin P. Hageman, Mequon, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

Filed Oct. 14, 1988, Ser. No. 257,874
Int. Cl.[5] E01D *1/00*
U.S. Cl. 14—71.3 20 Claims



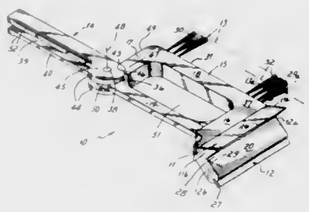
1. In a dockboard, a frame to be mounted on a loading dock, a ramp having a rear end pivotally connected to the frame and movable from a generally horizontal position to an upwardly inclined position, biasing means interconnecting the frame and the ramp to bias the ramp to said upwardly inclined position, and a holddown mechanism interconnecting the frame and the ramp, said holddown mechanism including a cylinder member to contain a substantially incompressible fluid, a piston mounted for sliding movement in the cylinder member, passage means connecting opposite ends of said cylinder member, a piston rod member connected to said piston, one of said members being connected to said ramp and the other of said members being connected to said frame, valve means for opening and closing said passage means, and operating means operably connected to said valve means and extending to the exterior of said cylinder member for opening said valve means, said piston rod member comprising a hollow tube and said operating means comprises an elongated element slidably disposed within said piston rod member, one end of said elongated element engaged with said valve means and the opposite end extending outwardly of said piston rod member, opening of said valve means permitting said piston to move relative to said cylinder member and enabling said ramp to be pivoted upwardly relative to said frame by said biasing means, and closing of said valve means acting to lock the ramp against downward movement.

4,922,569

HAND TOOL

Barry Brinker, and John E. Busse, both of Cincinnati, Ohio, assignors to 'totes', incorporated, Loveland, Ohio

Filed May 18, 1989, Ser. No. 353,810
Int. Cl.[5] A47L *1/08*
U.S. Cl. 15—105 16 Claims



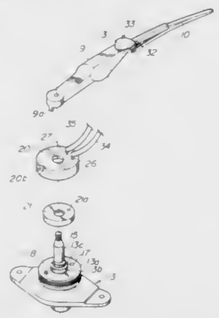
1. A hand tool comprising
a frame of substantially closed loop configuration,
at least one of a squeegee blade and an ice scraper blade fixed to a first section of said closed loop frame, and
a handle movably connected to a second section of said closed loop frame, said handle being movable between a storage position generally co-extensive with said second section and an extended position directed away from said closed loop frame, if desired said handle and said closed loop frame being grippable together by a user's hand upon use of said hand tool when said handle is in said storage position and, alternatively, if desired said handle being grippable alone by a user's hand upon use of said hand tool when said handle is in said extended position.

4,922,570

VEHICULAR WINDSHIELD WASHER SYSTEM

Huji Hirohama, Yokohama; Eiichi Ono, Atsugi, and Yukiho Murata, Sagamihara, all of Japan, assignors to Nissan Motor Co., Ltd. and Jidosha Denki Kogyo Kabushiki Kaisha, both of Yokohama, Japan

Filed Jul. 6, 1988, Ser. No. 215,842
Claims priority, application Japan, Jul. 8, 1987, 62-104964[U]
Int. Cl.[5] B60S *1/52*
U.S. Cl. 15—250.02 9 Claims



1. A vehicular windshield washer system in combination with a windshield wiper having a wiper arm, comprising:
first and second washer nozzles mounted on the wiper arm and so directed as to eject washer fluid to opposite sides of the wiper arm upon being supplied with washer fluid;
first means by which washer fluid from a washer flu source is selectively suppliable to said first and second washer nozzles in accordance with movement of the wiper arm, said first means including means by which washer fluid is suppliable to said first washer nozzle upon a first rotational movement of the wiper arm in a first direction and to said second washer nozzle upon a second rotational movement of the wiper arm in a second direction, said first and second rotational movement turning at a first position of the wiper arm;
second means by which washer fluid is suppliable to said first washer nozzle until the wiper arm reaches a second position spaced from said first position and stoppable to said first washer nozzle for a duration of rotational movement of the wiper arm from said second position to said first position;
a stationary member fixed to a vehicle body;
wherein said second means includes a disc member disposed coaxial with a pivot shaft and rotatable in accordance with the rotational movement of the wiper arm, said disc member being formed with a first fluid passage communicating with said first washer nozzle, an annular valve member disposed coaxial with said pivot shaft and slidably contacting with said disc member, said annular valve being formed with a valve opening communicating with said washer fluid source, said valve opening being agreeable with said first fluid passage of said disc member to establish fluid communication therebetween, means defining an arcuate groove in said annular valve member, said arcuate groove being coaxial with said pivot shaft, an engagement projection projected from said stationary member and inserted into said arcuate groove, said engagement projection stopping the rotation of said annular valve member upon coming into engagement with each of opposite ends of said arcuate groove, means for producing friction between said disc member and said annular valve member to allow said annular valve member to rotate with said disc member under said friction, and means for rotating said disc member in accordance with the rotational movement of the wiper arm.

4,922,571

VACUUM LOADING MACHINE

Joseph R. Driear, Thiensville, Wis., assignor to Aquatech, Inc., Cleveland, Ohio

Filed Nov. 14, 1988, Ser. No. 270,039
Int. Cl.[5] B08B *3/02, 9/04*
U.S. Cl. 15—302 22 Claims



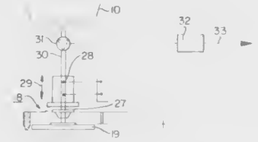
1. A vacuum loading machine which comprises:
a body including
a chassis and
a tank on the chassis for holding material;
means for creating a vacuum in the tank;
a hose through which material is sucked into the tank by the vacuum;
a boom assembly supporting the hose and providing a conduit through which material from the hose is sucked into the tank;
a fluid cylinder on the boom assembly;
fluid supply means on the body;
a swivel assembly for mounting the boom assembly on top of the body and for rotating the boom assembly 360° with respect to the body, the swivel assembly including fluid passage means through the swivel assembly to permit fluid to pass to the fluid cylinder on the boom assembly from the fluid supply means on the body during the entire 360° rotation of the boom assembly.

4,922,572

DRIVABLE AUTOMATIC FLOOR CLEANING MACHINE

Albert Kohl, Solothurn, and Léon Seilaz, Koppigen, both of Switzerland, assignors to Henkel Kommanditgesellschaft auf Aktein, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,053
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708086
Int. Cl.[5] A47L *11/02, 11/29, 11/03*
U.S. Cl. 15—320 8 Claims



1. In a drivable automatic floor cleaning machine have a drive motor, drive wheels associated with said drive motor, integrated fresh liquid and dirty liquid compartments, a cleaning rotor rotatable by said drive motor and designed to be supplied with a regulated supply of liquid from the fresh liquid compartment, and at least one suction nozzle for withdrawing dirty liquid into the dirty liquid compartment, and a control handle containing operating elements, the improvement which comprises an alternating current oscillating piston pump which regulates the supply of the fresh liquid from the fresh liquid compartment to the cleaning rotor, an adjustable electrical control means between said piston pump and said control handle for permitting the operator to adjust the speed of said piston pump at said control handle, independently of the speed of said drive motor, to regulate the volume of fresh liquid supplied to said rotor during operation of said machine, said control means including an electronic pulse generator having a plurality of regulating stages, said pulse generator being connected to said oscillating piston pump for controlling said pump, said control means further including a plus key and a minus key integrated in said control handle, for permitting an operator to regulate said oscillating piston pump, and a dust connected from said pump through the center of said motor and the center of said rotor, for delivering fresh liquid to the center of said brush.

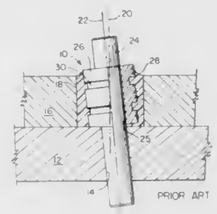
4,922,573

COMPRESSION FITTED BUSHING INSTALLATION

John M. Miller, Huntington Station, and Richard O. Barton, Levittown, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 14, 1989, Ser. No. 338,008
Int. Cl.[5] F16L *5/02*
U.S. Cl. 16—2 4 Claims

1. An embedded bushing structure comprising:
a plate having at least one hole therein, a wall of the hole having concentric and axially spaced grooves formed therein of a predetermined pitch;
a bushing located within the hole, the bushing having matching concentric and axially spaced projections of the same pitch as the grooves but wherein the major diameter of the projections is less than the major diameter of the grooves and more than the minor axis of the grooves to effect axial overlapping between the grooves and projections while creating a gap therebetween; and



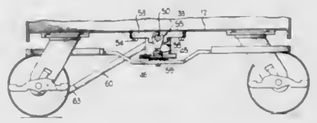
cured castable containment material located in the gap for resisting axial displacement of the bushing in response to axial loads as the material undergoes compression.

4,922,574

CASTER LOCKING MECHANISM AND CARRIAGE

Charles H. Heiligenthal, Oak Creek; George R. Slivon, and Jack A. Parise, both of Kenosha, all of, assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Apr. 24, 1989, Ser. No. 342,523
Int. Cl.[5] B60B *33/00*
U.S. Cl. 16—35 R 21 Claims



1. In a caster locking assembly including mounting means adapted to be coupled to an associated load, a caster wheel rotatably carried by the mounting means for rolling engagement with an underlying support surface, and a locking ring resiliently carried by the mounting means and overlying the wheel, the locking ring being movable between a release position out of engagement with the wheel and a locking position firmly frictionally engaging the wheel for locking thereof, the locking ring being resiliently biased toward its release position, the improvement comprising: a cam follower coupled to the locking ring and having a follower surface including an inclined ramp portion, a locking cam carried by the mounting means for rotation about a pivot axis inclined with respect to the direction of movement of the locking ring and having a cam surface disposed for camming engagement with said follower surface, and actuator means coupled to said cam for effecting rotation thereof between release and locking conditions, said cam surface being out of engagement with said follower surface when said cam is disposed in its release condition for permitting the locking ring to move to its release position, movement of said cam from its release condition to its locking condition moving said cam surface into camming engagement with said ramp portion of said follower surface for driving the locking ring to its locking position.

4,922,575

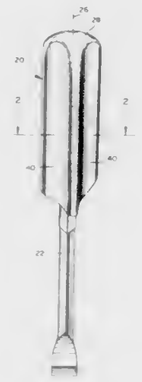
THREE RIBBED TORQUE HANDLE

Herbert F. Riemann, 182 Guinea Rd., Cos Cob, Conn. 06807

Continuation of Ser. No. 646,042, Mar. 30, 1984, abandoned, which is a continuation of Ser. No. 436,281, Oct. 25, 1982, abandoned. This application Oct. 3, 1985, Ser. No. 783,259

Int. Cl.[5] B25G *1/10*

U.S. Cl. 16—111 R 17 Claims



1. A hand tool comprising:

an elongate handle having an axis of rotation extending through its length, said handle having rib means projecting radially outwardly from said axis of rotation and extending along the length of said handle, said rib means consisting essentially of three ribs symmetrically spaced 120° apart, wherein each of said ribs is defined by a pair of walls which are substantially parallel and, wherein each pair of the ribs define between them a concave groove portion having a depth sufficient to receive a large portion of a finger or thumb for application of a force substantially entirely against and perpendicular to the walls of the ribs, thereby rotating said elongate handle about the axis of rotation; and

a torque-driven implement having an elongate shaft with first and second ends, said shaft including a torque-driven tool at its first end with the second end of said shaft connected to and extending from said handle along a path colinear with the axis of rotation, whereby said torque-driven tool can be turned with increased torque compared to such tools with handles having shallower concave groove portions capable of only receiving a smaller portion of a finger or thumb and having more than three ribs, whereby said handle is grasped by inserting the thumb longitudinally in one of the concave groove portions and the tips of the fingers in another of the concave groove portions.

4,922,576

HANDLE FOR APPLIANCES

Timothy B. Weidner, Wyoming, and Jeffery L. Salisbury, Greenville, both of Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Feb. 23, 1989, Ser. No. 314,718

Int. Cl.[5] E05B *1/00*

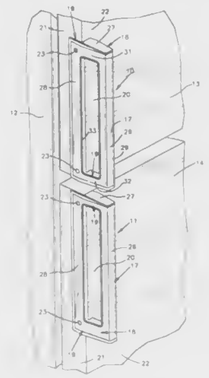
U.S. Cl. 16—114 R 5 Claims

1 An appliance handle consisting only of a one-piece sheet metal stamping and a one-piece molded plastic part, said plastic part and stamping:

(a) each providing a mounting flange portion, said flange portions cooperating to provide a mounting flange assembly adapted to be mounted on an appliance surface with fasteners;

(b) cooperating to provide an elongated gripping section and a pair of legs extending laterally from the ends of said gripping section;

said mounting flange assembly cooperating with said legs and gripping section to define and enclose a hand opening, said plastic part flange portion spacing said metal stamping flange portion from said appliance surface when said handle is mounted on said appliance and preventing said metal stamping from contacting said appliance surface,



said metal stamping providing a generally U-shaped portion defining three sides of said gripping section, said stamping opening surrounding said hand opening, said plastic part providing a recess in which said stamping is positioned and shoulder means mating continuously along all of the edges of said stamping, said shoulder means providing a surface surrounding said stamping substantially flush with said edges of said stamping, said shoulder means extending along said stamping opening cooperating with said U-shaped portion to interlock said plastic part and said stamping together.

4,922,577

EXTENSIBLE HANDLE BAR

Henry M. Unger, 24, Sunset Dr., Weston, Conn. 06880

Filed Feb. 2, 1989, Ser. No. 305,323

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1988, 8814209[U]

Int. Cl.[5] B25G *1/04*

U.S. Cl. 16—115 3 Claims

1. An extensible handle bar for tools comprising:

(a) an inner cylindrical walled tube and an outer cylindrical walled tube, the outside diameter of said inner tube being smaller than the interior diameter of said outer tube and being slidably telescoping within said outer tube;

(b) a cylindrical sleeve-shaped body comprising a resilient material and having one end thereof firmly mounted on one end of said outer tube, the cylindrical surface adjacent said one end of said sleeve-shaped body being provided with an external helical thread; an extension, comprising a substantial portion of said sleeve-shaped body opposite said one end thereof, extending beyond said one end of said outer tube and having a plurality of spaced longitudinally extending slots therein extending from the end of said sleeve-shaped body opposite said one end thereof to a position adjacent said one end of said outer tube, the exterior cylindrical surface of said sleeve-shaped body between said opposite end thereof and said position adjacent said one end of said outer tube having an external taper; and

(c) a cylindrical sleeve-shaped internal helical threaded nut surrounding said sleeve-shaped body and being guided on said external helical thread of said sleeve-shaped body to move said sleeve-shaped nut axially between unlocked and locked positions, substantially the entire portion of said sleeve-shaped nut extending over said extension of said sleeve-shaped body having an internal taper cooperating with said external taper of said extension, the longitudinal length of the surface of said internal taper being at least the longitudinal length of said external taper;

(d) the angle of inclination of said internal taper of said sleeve-shaped nut being less than the angle of inclination of said external taper of said extension of said sleeve-shaped body when said nut is in unlocked position such



that, as said sleeve-shaped nut is screwed on said sleeve-shaped body to move said sleeve-shaped nut from unlocked position to locked position, the internal taper portion of said sleeve-shaped nut surrounding said extension of said sleeve-shaped body first contacts and compresses the portion of said external taper at said opposite end of said sleeve-shaped body and progressively compresses substantially the entire portion of said extension of said sleeve-shaped body between said opposite end of said sleeve-shaped body and said position adjacent said one end of said outer tube against the exterior surface of said inner cylindrical walled tube, and the surface of said internal taper of said sleeve-shaped nut engages the surface of said external taper of said extension of said sleeve-shaped body along substantially said entire surfaces thereof to securely lock said inner and outer tubes relative to each other.

4,922,578

SHOE SOLE CLEANER

Veli V. A. Miettinen, Pielavesi, Finland, assignor to Finkomat Oy, Nivala, Finland

PCT No. PCT/FI86/00035, § 371 Date Sep. 22, 1988, § 102(e) Date Sep. 22, 1988, PCT Pub. No. WO87/05788, PCT Pub. Date Oct. 8, 1987

PCT Filed Apr. 1, 1986, Ser. No. 249,567

Int. Cl.[5] A47L *23/26*

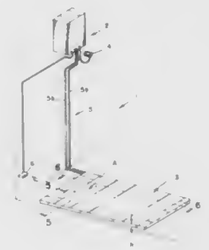
U.S. Cl. 15—36 14 Claims

1. A shoe sole cleaner, comprising:

(a) a power means including fluid power supply means;

(b) a substantially planar brush means comprising a vibrating member and a plurality of brush rods connected to said vibrating member, said brush means located at a distance from said power means; and

(c) fluid transmission means connected to said power means and said vibrating member;



wherein fluid power from said power means is conveyed by said fluid transmission means to said vibrating member, causing said vibrating member to vibrate which causes said brush rods to move in a back and forth motion.

4,922,579

CONTROLLING CARDING MACHINES

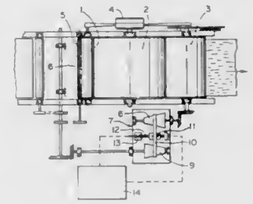
John M. J. Varga, Halifax, England, assignor to Carding Specialists, (Canada) Ltd., Ontario, Canada

Filed Apr. 28, 1988, Ser. No. 187,375

Claims priority, application United Kingdom, Apr. 29, 1987, 8710162

Int. Cl.[5] D01G *15/40*

U.S. Cl. 19—105 10 Claims



1. A carding machine comprising a feed plate, a feed roll forming a nip with the feed plate, first drive means for rotating the feed roll, a takerin for taking fiber from the feed plate, a main carding cylinder, carding means cooperable with the main carding cylinder to effect a carding action, a doffer, delivery means for taking carded fiber from the doffer and delivering it from the machine, sensing means responsive to the power consumption of the takerin for producing an output signal related to deviation in weight of material fed between the feed roll and the feed plate, and means responsive to the output signal to control the speed of the feed roll.

4,922,580

SLIVER GUIDE CONDUIT

Jakob Bothner, Goppngen-Jebenhausen, and Axel Marg, Ebersbach, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 300,036

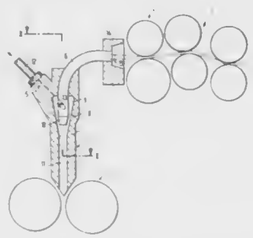
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801688

Int. Cl.[5] D01G *5/74*

U.S. Cl. 19—288 6 Claims

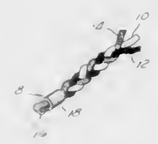
1. In a textile draw frame or a like spinning preparation machine having serially-arranged silver output rollers and calendar rollers, a bipartite silver guide conduit for transport-

ing a traveling silver between said output rollers and said calendar rollers, said silver guide conduit having an upstream conduit section arranged to receive the silver from said output rollers and a downstream conduit section arranged to discharge the silver to said calendar rollers, said upstream conduit section having an end terminating interiorly within said downstream conduit section, said downstream conduit section and said terminal end of said upstream conduit section defining an



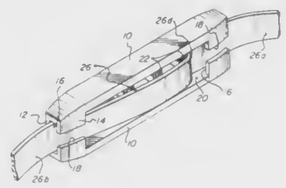
annular airspace therebetween which opens annularly into said downstream conduit section, and air conduit means associated with said silver guide conduit for directing an airstream interiorly into said annular airspace generally tangentially thereto at a location upstream of said terminal end of said upstream conduit section for generating a rotational current of the airstream within said downstream conduit section to impart corresponding rotation to the sliver.

4,922,581
BRAIDED EYEGLASS RETAINER AND WRISTBAND
Joey A. Wilson, 26575 Via Cuervo, Mission Viejo, Calif. 92691
Division of Ser. No. 293,208, Jan. 4, 1989. This application May 19, 1989, Ser. No. 354,621
Int. Cl.[5] G02C *3/00*
U.S. Cl. 24—3 C 3 Claims



1. An eyeglass retainer for preventing a pair of eyeglasses from being accidentally disattached from the body of the wearer comprising:
a strap portion formed from a plurality of interbraided elongate members; and
retaining means for affixing said eyeglass retainer to said eyeglasses;
wherein each of said elongate members is comprised of an elastic material capable of lateral poisson contraction when stretched along its length, said interbraiding coupled with said lateral contractability acting to give said strap portion an elastic stretchability along its length greater than that of said individual elongate members, said elastic material being composed of a fabric coated neoprene, and wherein said retaining means is integrally formed at each end of said strap portion, said integrally formed retaining means comprising a loop portion formed from a turned back distal end of one of said elongate members and a crimp connector sized to secure said loop portion to said strap member, said loop portion being sized to laterally deform to receive the temple member of the eyeglasses therethrough and thereafter contract to frictionally engage the temple member of the eyeglasses and affix the eyeglasses to the strap portion.

4,922,582
STRAP SHORTENING DEVICE
Larry L. Flanigan, 7 Rowland Dr., East Hartford, Conn. 06118
Filed Jul. 5, 1989, Ser. No. 375,915
Int. Cl.[5] A44B *11/00*
U.S. Cl. 24—71.1 15 Claims



9. An assembly of an elongated strap member and a device for reducing the effective length thereof, said device comprising a body having first and second end portions with a cavity defined therebetween, said body having a front face portion and a rear face portion opening to said cavity, and having opposite sidewall portions extending therealong, both of said end portions having a channel extending therethrough between said cavity and the end of said body thereat, and having a slot through said rear face portion along the entire length thereof, said channels being substantially aligned with one another and said slots being narrower than said channels and opening thereinto, said body also having a plurality of crosspiece structures traversing said cavity and disposed at spaced points along said sidewall portions, at least one of said structures being comprised of a pair of transversely aligned stub elements, spaced from one another to define a gap between confronting ends thereof; said strap member having an intermediate portion disposed within said cavity of said body, and having portions adjacent said intermediate portion, lying to opposite sides thereof, extending through said channels of said body end portions, said intermediate portion passing, in double-ply relationship, in front of a crosspiece structure close to said first end portion, being disposed about another of said structures, and being affixed on said one structure by looping it thereabout.

4,922,583
ADJUSTABLE CLAMP
James A. Belanger; Robert J. Wentworth, both of Northville; Barry S. Turner, Livonia, and Graham J. Astley, Novi, all of Mich., assignors to Belanger, Inc., Northville, Mich.
Continuation of Ser. No. 98,118, Sep. 18, 1987, abandoned, which is a continuation of Ser. No. 45,331, May 4, 1987, Pat. No. 4,799,287. This application Oct. 17, 1988, Ser. No. 258,087
Int. Cl.[5] F16L *33/02*
U.S. Cl. 24—279 14 Claims

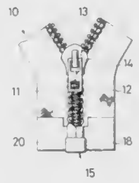
1. An adjustable clamp for use in securing a spiral wound flexible hose on a rigid tubular structure, said adjustable clamp comprising an elongated flexible channel arranged on a spiral, said channel being of a length greater than the circumference of the hose, with the channel having two non-contacting ends and adapted to snugly overlie and follow the spiral on the flexible hose without crossing over the spiral provided on the hose;
said ends of said channel following the spiral and being laterally overlapped and spaced transversely apart;
each end of said channel having an end portion and an adjacent intermediate portion;
spaced opposed anchor strips overlying and connected to intermediate portions of said channel;

each anchor strip having a pair of longitudinal edge portions, with one longitudinal edge portion overlying and connected to one of the intermediate portions of said channel;
the end portion of any one of the ends of said channel underlying and contacting the other longitudinal edge portion of the anchor strip connected to the other end of said channel; and



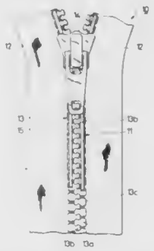
adjustable fastening means interconnecting the opposing ends of said anchor strips for variably drawing upon the intermediate portions of said channel with each of said end portions following the spiral beneath the other longitudinal edge portion of the opposing anchor strip thereby extending the lateral overlap of the ends of said channel.

4,922,584
SLIDE FASTENER
Shigeru Funakawa, Toyama, and Mitsuo Horikawa, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan
Filed Mar. 30, 1989, Ser. No. 330,693
Claims priority, application Japan, Apr. 4, 1988, 63-45499[U]
Int. Cl.[5] A44B *19/40*
U.S. Cl. 24—381 4 Claims



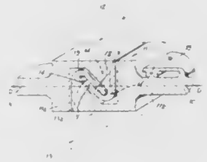
1. A selectively dyeable slide fastener comprising a pair of stringer tapes each carrying along its longitudinal edge a row of coupling elements, a reinforcing strip and an adhesive film adapted to bond said reinforcing strip to an end portion of each of said stringer tapes, characterized in that both said stringer tapes and said reinforcing strip are made of undyed polyester fibers that can be dyed with an associated garment so as to indentically match the color thereof and said adhesive film is a modified polyester melting in the range of 160°-200° C.

4,922,585
LIGHT-REFLECTIVE SLIDE FASTENER
Takashi Suzuki, and Isamu Kumano, both of Kurobe, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan
Filed Jul. 11, 1988, Ser. No. 220,715
Claims priority, application Japan, Jul. 14, 1987, 62-176898
Int. Cl.[5] A44B *19/34*; G09F *13/16*
U.S. Cl. 24—381 10 Claims



1. A light-reflective slide fastener which comprises:
a pair of support tapes each carrying on their respective longitudinal inner edges a row of coupling elements in the form of intermeshing teeth, each of said elements having a coupling head portion, a leg portion and a heel portion, said coupling elements having recesses which form a continuous recess along said row of coupling elements;
a slide adapted to bring said elements on the respective tapes into and out of engagement; and
a continuous flexible light-reflective strip extending longitudinally at least partially over and secured in said continuous recess of said row of coupling elements and disposed independently from any portion of each of said tapes.

4,922,586
SLIDE-TYPE FASTENER
Peter M. . Robson, Les Anguettes, Clos du Port, La Rocque, Grouville, Jersey, Channel Islands
Continuation of Ser. No. 919,713, Oct. 16, 1986, abandoned. This application Aug. 2, 1988, Ser. No. 229,728
Claims priority, application United Kingdom, Oct. 17, 1985, 8525587; Jul. 23, 1986, 8618014
Int. Cl.[5] A44B *19/16*
U.S. Cl. 24—399 8 Claims



1. A slide-type fastener having first and second mating halves of which one has an elongate lengthwise-extending bead and the other has at least one wall portion forming a laterally open elongate, lengthwise extending recess adapted to receive said bead, the fastener being capable of interengagement such that the bead is introduced laterally into and removed laterally from the recess, wherein said first and second halves lie in a first and second plane and wherein said first and second planes constitute a common principal plane, the bead comprising the

free end of a hook-like formation, viewed in cross-section, wherein opposed surfaces of said hook-like formation twice cross said common principal plane so as to form means for applying lateral tension between said first and second halves for urging the bead and the at least one wall portion into closer and tighter engagement and militating against any tendency of the first and second halves to roll out of interengagement by deformation due to such lateral tension wherein said recess and said bead are rigid and said first and second halves are adapted for resilient deformation otherwise than at said bead and said recess which are urged mutually together by resilience and wherein said bead comprises a hook-like formation having a point which can form said other half so that the point of the hook-like formation clears the opening of the recess and can be moved into alignment with the recess at right angles to the direction in which lateral tension forces are applied, and is then urged into the recess by said resilience.

4,922,587

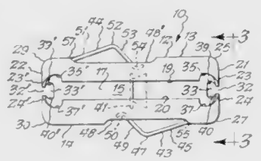
FASTENER CONSTRUCTION

Frederick M. Pettit, 1411 Point Abino Rd. S., Ridgeway, Ontario L0S 1N0, Canada

Continuation-in-part of Ser. No. 216,508, Jul. 8, 1988, abandoned. This application Nov. 4, 1988, Ser. No. 267,302

Int. Cl.[5] A41F *1/00*

U.S. Cl. 24—453 **12 Claims**



1 A fastener for fastening first and second members having first sides which face each other and second sides which are on opposite sides of said members from said first sides, said first member having a first thickness between its first and second sides and said second member having a second thickness between its first and second sides, and first and second holes extending entirely through said first and second members, respectively, comprising a substantially hollow cylindrical body of flexible resilient spring metal having a longitudinal axis and first and second end portions on opposite sides of a central portion, elongated slot means extending continuously along the entire length of said body to permit portions of said body on opposite sides of said elongated slot means to approach each other when compressive forces are applied to said body because of the flexibility of said spring metal and to cause portions of said body on said opposite sides of said elongated slot means to recede when said compressive forces are removed from said body because of the resilience of said sheet metal, said flexibility of said sheet metal permitting said end portions to enter said holes when said holes are of a smaller diameter than said body, first and second cantilever locking tab means on said first and second end portions, respectively, having first and second outer ends, respectively, and first and second inner free ends, respectively, said first and second outer ends being formed integrally with said first and second end portions, respectively, at junctions with said first and second end portions, respectively, which are of substantially the same diameter as said body, said locking tab means except for said first and second outer ends being unattached to said body, said first and second locking tab means extending toward each other and flaring outwardly from said body as they approach said central portion, first and second tab ends on said first and second inner free ends of said first and second locking tab means, respectively, facing toward each other and lying on diameters which are greater than the diameter of said central portion and greater than the diameters of said first and second holes, respectively, and planar stop tab means bent outwardly from said central portion and lying between said first and second tab ends for lying in contiguous relationship to said first sides of said first and second members, said planar tab means having opposite sides for providing abutments for each of said first sides of each of said first and second members, said first and second tab ends being spaced from each other an amount which is at least as great as the total of said first and second thicknesses and the space occupied by said stop tab means to thereby hold said first and second members in assembled relationship when said first and second end portions are located outwardly beyond said second sides of said first and second members with said first and second tab ends facing said second sides, and when said planar stop tab means are located between said first sides of said first and second members.

4,922,588

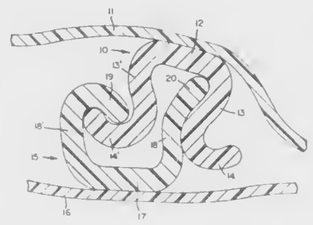
SINGLE HINGE INTERLOCKING CLOSURE PROFILE CONFIGURATION

Ewald A. Kamp, Chicago, Ill., assignor to First Brands Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 567,240, Dec. 30, 1983. This application Sep. 11, 1985, Ser. No. 774,400

Int. Cl.[5] B65D *17/20*

U.S. Cl. 24—576 **87 Claims**



1 A closure fastening device comprising a first closure element and a second closure element; said first closure element having a general omega shape, comprising an apex portion and a profile portion extending from said apex portion, said profile portion comprising two inwardly curved arm portions terminating in two outwardly facing hook portions; said second closure element comprising an apex portion and a profile portion extending from said apex portion, said profile portion comprising first and second arm portions, said first arm portion terminating in an inwardly curved hook portion said first and second arm portions of said second closure element being adapted to receive therebetween one arm portion of said first closure element the hook portion of the latter arm being received in hinging engagement under the inwardly curved hook portion of the first arm of said second closure element, the other arm portion of said first closure element being received in locking engagement by the second arm portion of said second closure element.

4,922,589

PROCESS AND APPARATUS FOR REPEATEDLY CONTROLLING A FABRIL NAPPING OPERATION

Wilhelm Busch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Gebruder Sucker & Franz Mueller GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

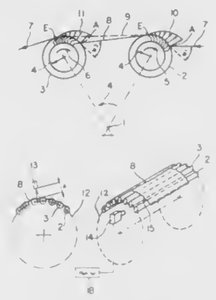
Filed Sep. 23, 1988, Ser. No. 249,342

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731898

Int. Cl.[5] D06C *11/00*

U.S. Cl. 26—29 R **7 Claims**

1 A process for repeatably controlling a napping operation by a napping machine of the type having a rotating cylinder having a plurality of rotating toothed rollers at the periphery of said cylinder for successive peripheral napping engagement with a traveling fabric web, said process comprising measuring the angular degree to which said fabric web is drawn radially inwardly of said cylinder from a path tangential to said rollers under said peripheral napping engagement of said rollers during travel of said fabric web from a point of disengagement with one said roller to a point of initial engagement with the next succeeding roller in relation to the operational time interval required for travel of said fabric web between said points as a characteristic of an adjustment of a variable operating parameter of said napping operation and utilizing the measurement as a reference value for subsequent adjustment of said operating parameter for repeating said napping operation.



4,922,590

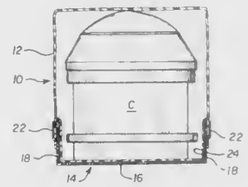
COMPACT CASKET ENCLOSURE SYSTEM AND METHOD

David Yearsley, 2208 Delaware Ave., Pittsburgh, Pa. 15218

Filed Apr. 5, 1989, Ser. No. 333,254

Int. Cl.[5] A61G *17/00*

U.S. Cl. 27—19 **19 Claims**



1. An hermetically sealable enclosure for an entombment casket comprising:

tray means formed of chemically hardened flexible plastic material for receiving said casket; said tray means having a substantially rectangular floor means, and sidewalls and endwalls upwardly extending from side and end portions, respectively, of said rectangular floor means; said tray means being foldable between a closed shipping and storage position and an open casket-receiving position; said tray means having sufficient rigidity to act as a sturdy self-sustaining base for receiving said casket when in said open position and as a sturdy self-sustaining shipping and storage container when in said closed position;

means separate from said tray means for covering said casket when said casket is received in said tray means;

said casket covering means comprising foldable wrapping material of sufficient dimensions to envelop at least upper portions of said sidewalls and said endwalls and all portions of said casket protruding above said sidewalls and said endwalls when said casket is received in said tray means; and

means for hermetically sealing said casket covering means with said tray means to thereby provide an hermetically sealed enclosure for long-term storage of said casket.

4,922,591

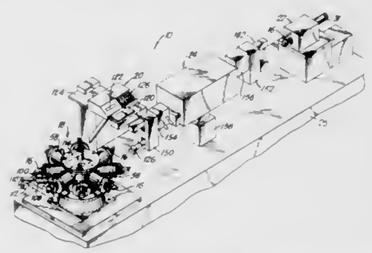
TOOL STORAGE AND CHANGING SYSTEM

Michael E. Campbell, Farmington Hills, Mich., assignor to Carboloy Inc., Warren, Mich.

Filed Mar. 20, 1984, Ser. No. 591,355

Int. Cl.[5] B23Q *3/155*

U.S. Cl. 29—26 A **7 Claims**



1 A system for storing cutting tools and transferring the stored cutting tools to a tool holder, comprising:

means for indexing the cutting tool;

rotatable storage means for sorting a plurality of index cutting tools and for presenting the indexed cutting tools for selection and transfer;

means operatively connected to said storage means for selecting an indexed cutting tool presented for selection; and

tool changing arm assembly adjacent said storage and selecting means for transferring the selected indexed cutting tool from said storage means to the tool holder, including:

a pair of extendable and retractable grippers mounted on a rotary actuator, wherein each of said grippers has engaging means for releasably holding cutting tools, and means connected to said assembly for sequentially operating said grippers and engaging means by extending said grippers, closing said engaging means, the first of said engaging means holding the selected cutting tool in said storage means, the second of said engaging means holding a cutting tool in the tool holder, retracting said pair of grippers with the cutting tools being held by said engaging means, rotating said grippers and engaging means so as to align the selected cutting tool with the tool holder and the cutting tool from the tool holder with said storage means, extending said grippers and inserting the selected cutting tool in the tool holder and the cutting tool from the tool holder in said storage means, and releasing said engaging means from the cutting tools, and retracting said grippers.

4,922,592

METHOD FOR CONTROLLING THE AMOUNT OF SIZE APPLIED TO A TRAVELING TEXTILE SUBSTRATE

Heinrich Bongartz, Monchen-Gladbach; Peter Ruch, Schwalmtal, and Gerhard Voswinckel, Aachen, all of Fed. Rep. of Germany, assignors to Gebrueder Sucker & Franz Mueller GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,604

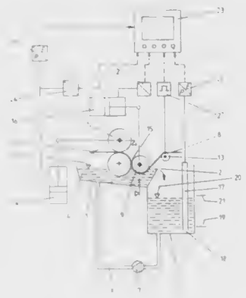
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725890

Int. Cl.[5] D06B *3/04*

U.S. Cl. 28—183 **2 Claims**

1. A method for controlling the amount of size applied to a traveling textile substrate in a size applicator in which the substrate is passed through a size bath and squeeze rollers, the

squeezing pressure of which is regulated as a function of the speed of the substrate, said method further comprising sensing



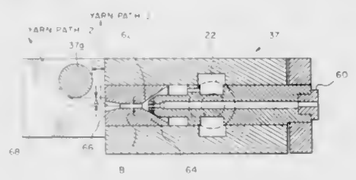
the volume of size being consumed and further regulating said squeezing pressure of said squeeze rollers as a function of said sensed volume of size being consumed.

4,922,593

SYSTEM FOR PREPARING HIGHLY COHERENT AIR JET TEXTURED YARN

Adly A. Gorrafa, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 178,961, Apr. 7, 1988. This application Jan. 30, 1989, Ser. No. 302,898
Int. Cl.[5] D02G *1/16*
U.S. Cl. 28—254 **10 Claims**



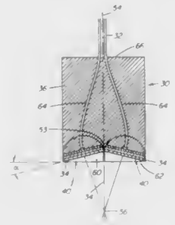
1. In a system for texturing one or more yarns that includes a source of supply for said yarns, a yarn treating jet positioned between a feed roll and a nip roll through which yarn passes for treating with pressurized fluid and means for taking yarn up onto a package under tension, said jet including a body having inlet and outlet ends connected by a central bore along a central axis, means for introducing pressurized gas through a gas inlet into said bore between said ends to contact yarn passing through the jet at a location in said bore, said yarn and said gas following a path from said outlet end of said jet, the improvement comprising: a baffle located adjacent the yarn outlet end of the jet, said baffle having a peripheral surface, the portion of said surface nearest said outlet end being a distance of 0.1 to 2.0 minimum diameters of the bore downstream of said location, the portion of said surface nearest said central axis being a distance of from 0.1 to 3.0 of said minimum diameters above said central axis and providing a guiding surface for said yarn around which said yarn travels in a path after it leaves the outlet end of the jet toward said windup.

4,922,594

METHOD OF MAKING A FOCUSSING ELEMENT FOR USE IN A LENSELESS FOCUSSED TRANSDUCER

Narenora Patel, Hamilton; Jan Van den Andel, Burlington; Patrick S. Nicholson, Ancaster, and Alicja H. Grzymer, Hamilton, all of Canada, assignors to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Apr. 8, 1988, Ser. No. 179,266
Int. Cl.[5] H04R *17/00*
U.S. Cl. 29—25.35 **2 Claims**



1.*A method of making a focusing element for use in a lenseless, focussed transducer for producing an ultrasonic beam, said method comprising the steps of:
(a) cutting a polarized piezoelectric disk into a plurality of substantially identical sectors having first and second opposed surfaces;
(b) simultaneously lapping said sectors to a predetermined thickness on a lapping plate;
(c) while still on said lapping plate,
i. electroding said first surface of each said sector with gold;
ii. securing a fine copper wire to said first surface of each said sectors with silver epoxy resin;
iii. applying a tungsten-epoxy mixture to said first surface of each said sectors; and
iv. cutting said mixture along the side edges of said sectors so as to form a plurality of backed piezoelectric petals;
(d) removing said sectors from said lapping plate and bonding with wax said second surface of each said petals onto a pyramidal surface of a pyramid facetted rod end;
(e) electrically connecting the free ends of said wires;
(f) applying additional tungsten-epoxy mixture to said first surfaces of said petals so as to form an epoxy body while embedding a portion of said wires in said additional mixture with the free end of connected wires emerging from the end of said body remote from said petals;
(g) circumferentially dressing said body; and
(h) removing said body from said rod and sputtering a hydrophobic layer onto said second surface of each said petal, said hydrophobic layer having a thickness of ¼ of the wavelength of said beam.

4,922,595

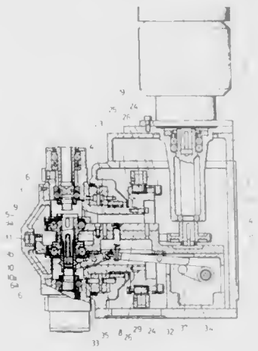
TURRET HEAD UNIT

Takahiro Hattori, Nishio; Yoshinobu Kojima, Aichi, and Masayuki Yamada, Nishio, all of Japan, assignors to Kira Machinery Co., Ltd., Aichi, Japan

Filed Sep. 15, 1988, Ser. No. 244,914
Int. Cl.[5] B23B *29/32*
U.S. Cl. 29—40 **9 Claims**

1. A turret head unit for presenting one of a plurality of tools to a working position, comprising:
a turret head having front and rear ends;
a plurality of angularly disposed tool receiving spindles carried in said turret head;
a spindle drive shaft rotatably mounted in said turret head;

a clutch mounted on said spindle drive shaft and movable into and out of driving engagement with a tool receiving spindle in the working position;
a turret rest rotatably supporting said turret head;
indexing means including a main cam mounted in said turret rest and a disc-like pin wheel coaxially secured to the rear end of said turret head and adapted to engage said main cam so as to impart a rotational force to said turret head;
clamp means including a first auxiliary cam mounted in said turret rest and a clamp member engaged by said first auxiliary cam for exerting a clamping force to said turret



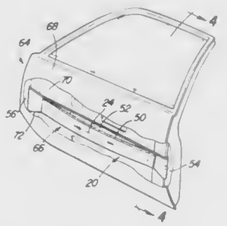
head in its indexed position as said first auxiliary cam rotates;
clutch operating means including a second auxiliary cam mounted in said turret rest and a cooperating member engaged by said second auxiliary cam for engaging and disengaging said clutch as said second auxiliary cam rotates; and
an indexing motor rotatably coupled to a barrel cam, said barrel cam mounted in said turret rest and being formed integrally with said main cam, said first auxiliary cam and said second auxiliary cam.

4,922,596

METHOD OF MANUFACTURING A LIGHTWEIGHT COMPOSITE AUTOMOTIVE DOOR BEAM

Joseph Wycech, Grosse Pointe Woods, Mich., assignor to Essex Composite Systems, Roseville, Mich.

Division of Ser. No. 98,159, Sep. 18, 1987, Pat. No. 4,861,097. This application Dec. 12, 1988, Ser. No. 283,436
Int. Cl.[5] B23P *17/00*
U.S. Cl. 29—897.2 **1 Claim**



1. A method of making a composite door beam to be mounted within a door cavity of a vehicle door to provide increased side impact resistance strength to said vehicle door, said method including the steps of:
forming a metal blank from a quantity of sheet metal, said metal blank having a longitudinal axis;
forming at each end of said metal blank mounting end pieces adapted to attach to said vehicle door in said door cavity;
bending said metal blank along at least a portion of its length to form a channel-shaped portion having a first wall and a second wall which define a groove in the direction of said longitudinal axis, said first and second walls each having end portions and said end portions of said first wall being attached to said end portions of said second wall to close the ends of said channel-shaped portion; and
substantially filling said groove with a reinforcing filler material to form said composite door beam, said reinforcing filler material increasing the bend strength of said channel-shaped portion of said door beam.

4,922,597

BOX FOR DISPOSING OF USED INJECTION NEEDLES

Kohji Ikeda, Osaka; Akira Tsuji, Kishiwada, and Yoshiyuki Sunaga, Kiryu, all of Japan, assignors to Nissho Corporation and Fujisawa Pharmaceutical Company, Ltd., both of Osaka, Japan

Filed Sep. 30, 1988, Ser. No. 251,460
Claims priority, application Japan, Oct. 1, 1987, 62-249345; Mar. 25, 1988, 63-72402
Int. Cl.[5] B65D *25/00*
U.S. Cl. 29—240 **4 Claims**



1. A box for disposing of used injection needles comprising:
(A) a tubular guide hole provided laterally at a box and enabling insertion of a tip portion of a syringe;
(B) a slit formed at an under surface of the guide hole and enabling the drop of an injection needle;
(C) a holding means for holding a hub of the injection needle screwed at a tip of the syringe, the means comprising a fixed member and a movable member and being located at the inner part of the guide hole;
(D) an operation rod for pushing and moving the movable member to release the holding condition, a tip of the rodprotruding outside the case; and
(E) a cap capable of alternatively engaging with the tip of the operation rod and an opening of the tubular guide hole.

4,922,598

ASSEMBLY TABLE FOR MANUFACTURING OF MATS USED IN ROAD CONSTRUCTION

Joseph E. Pouyer, 13928 Aston, Houston, Tex. 77040

Filed Jul. 18, 1988, Ser. No. 220,572
Int. Cl.[5] B25B *27/14*; A47B *5/06*
U.S. Cl. 29—281.4 **6 Claims**

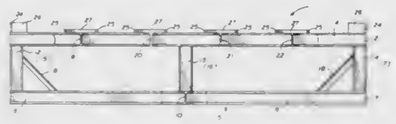
1. A structure for positioning component elements of an artificial road construction system into position within a prede-

termined arrangement, with longitudinal and cross piece components for assembly wherein said structure comprises a base assembly, a support assembly fixed to said base assembly and a top assembly connected to said support, assembly wherein the top assembly of the structure comprises:

(a) four longitudinal elements wherein the first and second longitudinal elements, are of even length and the third and fourth elements, with guide means and stop means, are of relatively longer length than said first and second elements and wherein said four elements are positioned horizontally within a single plane and are fastened end to end to form a rectangular perimeter presenting an upper surface with an outer edge;

(b) a plurality of horizontal interior longitudinal members, each of said longitudinal members each affixed at one perpendicularly to one of said longer perimeter elements and at its other end to the opposite longer perimeter element so that each of said interior horizontal elements is affixed parallel to said shorter perimeter elements and within the same plane as the other interior elements;

(c) guide means are fixed to the upper surfaces of the outer two of the interior horizontal longitudinal members, and



to the two longer perimeter beams, and stop means are provided on the two shorter perimeter beams and on one of the longer perimeter beams;

(d) wherein said guide means and stop means are positioned so that the component elements of an artificial road unit under construction may be positioned as desired to assure uniformity and interchangability of completed artificial road mats; and wherein;

(e) said base assembly is formed from five longitudinal members fashioned into a rectangular frame, wherein all five longitudinal members are positioned horizontally to rest directly on the ground, the base assembly comprising first and second perimeter members of even length and relatively longer third and fourth perimeter members of even length connected end to end to form a rectangle, and wherein the fifth longitudinal member is of even length with the first and second longitudinal members and is connected parallel to the first and second longitudinal members with the first end of the fifth longitudinal member connected to the mid-point of the third member and the second end of the fifth longitudinal member connected perpendicularly to the mid-point of the fourth longitudinal member.

4,922,599

METHOD OF CONVERTING A FOUR SPEED MANUAL TRANSMISSION TO A FIVE SPEED TRANSMISSION

Mark Durfee, 206 N. Stevens St., Orange, Calif. 92668

Filed Jan. 9, 1989, Ser. No. 294,684
Int. Cl.[5] B21K *21/16;* B23P *17/04, 23/00*
U.S. Cl. 29—401.1 3 Claims

3. A method of converting a four speed transmission to a five speed transmission when the four speed transmission has main and pinion shafts having threaded ends and when the four speed transmission has a gear carrier housing and a nose cone, said method comprising the steps of:

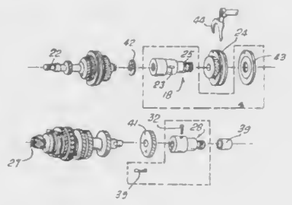
removing and discarding the original gear carrier housing and nose cones;

screwing threaded shaft extensions onto the end of the main shaft and the pinion shaft;

placing a fifth gear on the end of the pinion shaft;

placing a fifth gear and slider on the end of the main shaft;

placing a gear carrier housing having a greater length than the original gear carrier housing over the main and pinion shaft ends and securing the gear carrier housing to the transmission case; and



securing a nose cone to the gear carrier housing, the nose cone having a length shorter than the original nose cone an amount equal to the length that the original gear carrier housing is to the new gear carrier housing.

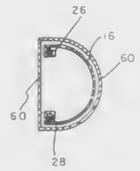
4,922,600

METHOD FOR HANGING CURTAINS

Margaret A. Peters, 1139 Summit Lawn, Wichita, Kans. 67212

Filed Mar. 25, 1988, Ser. No. 173,056
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—433 3 Claims





1. A method for hanging curtains and the like comprising the steps of:

(a) forming a generally semi-circular front plate having an upper edge defining an upper channel and a lower edge defining a lower channel;

(b) forming a generally semi-circular first side plate member having a first upper edge defining a first upper channel and a first lower edge defining a first lower channel;

(c) forming a generally semi-circular second side plate member having a second upper edge defining a second upper channel and a second lower edge defining a second lower channel;

(d) sliding a first section of a first curtain rod means through the first upper channel of the semi-circular first side plate and into the upper channel of the semi-circular front plate;

(e) sliding a second section of the first curtain rod means through the second upper channel of the semi-circular second side plate and into the upper channel of the semi-circular front plate;

(f) continuing to slide the first section and the second section of the first curtain rod means while in the upper channel of the semi-circular front plate until the first section slides into the second section such that the first section is slidably disposed within said second section;

(g) sliding a first section of a second curtain rod means through the first lower channel of the semi-circular first side plate and into the lower channel of the semi-circular front plate;

(h) sliding a second section of the second curtain rod means through the second lower channel of the semi-circular second side plate and into the lower channel of the semi-circular front plate;

(i) continuing to slide the first section and the second section of the second curtain rod means while in the lower channel of the semi-circular front plate until the first section of said curtain rod means slides into the second section of said second curtain rod means such that the first section is slidably disposed within said second section;

(j) forming a fabric means into a cylindrical hollow shape;

(k) sliding the formed cylindrical hollow fabric means of step (j) over the first side plate, the front plate and the second side plate such as to entirely surround the semi-circular plate, the first semi-circular side plate and the second semicircular side plate including the sections of the upper and lower curtain rod means that are slidably disposed in said upper and lower channels respectively of said front plate and in said first upper channel and said first lower channel respectively of said first side plate and in said second upper channel and said second lower channel respectively of said second side plate; and

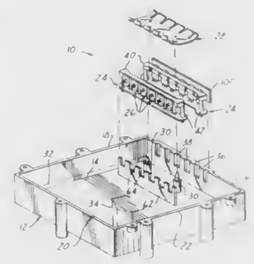
(l) mounting the first and second curtain rod means to a wall member.

4,922,601

METHOD OF MAKING A HEAT SINK FOR ELECTRICAL COMPONENTS

Christopher Mikolajczak, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 115,951, Nov. 2, 1987, Pat. No. 4,845,590.
This application Mar. 10, 1989, Ser. No. 321,929
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—450 3 Claims



1. A method of manufacturing a heat sink assembly comprising the steps of:

providing a housing formed from a suitable heat sinking material, a carrier means, at least one electrical component having a heat sink tab, and a resilient biasing means having at least one finger;

placing said housing onto an automated assembly line;

adding additional desired electrical components such as circuit boards by an automated process to said housing;

positioning said at least one electrical component onto said carrier means;

positioning said carrier means with said at least one electrical component by an automated process into said housing; and

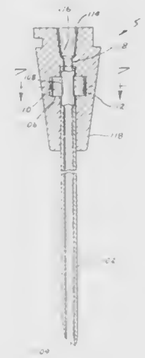
associating said resilient biasing means with said carrier means by an automated process such that said heat sink tab of said at least one electrical component is contacting said housing for dissipating heat from said at least one electrical component to said housing.

4,922,602

METHOD OF MANUFACTURING A BIOPSY NEEDLE

Donald N. Mehl, Minnetonka, Minn., assignor to Creative Research and Manufacturing, Inc., Minnetonka, Minn.

Continuation of Ser. No. 134,155, Dec. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 605,809, May 1, 1984, abandoned, which is a continuation of Ser. No. 354,421, Mar. 3, 1982, abandoned, which is a continuation-in-part of Ser. No. 244,015, Mar. 16, 1981, abandoned. This application Oct. 31, 1988, Ser. No. 264,975
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—460 6 Claims



1. A method of manufacturing a biopsy cannula having a plastic housing comprising:

a. forming a clip means having a plurality of outwardly and axially extending wings for reinforcing a cannula tube against rotation of a cannula housing;

b. fixedly attaching said reinforcing clip means to said cannula tube with said wings extending outwardly and axially of said cannula tube; and

c. molding said cannula plastic housing about said cannula tube and said wings of said slip to interlock the housing with said clip wings to prevent rotation between said housing and clip.

4,922,603

DRILLING TOOL FOR VERY SMALL DIAMETER OPENINGS AND CONTAINER THEREFOR

Wojciech B. Kosmowski, San Juan Capistrano, Calif., assignor to Dynamotion Corporation, Santa Ana, Calif.

Division of Ser. No. 853,662, Apr. 18, 1986, Pat. No. 4,761,876.
This application May 13, 1988, Ser. No. 194,436
Int. Cl.[5] B23Q *3/157;* B23B *51/02;* B65D *85/20*
U.S. Cl. 29—568 14 Claims

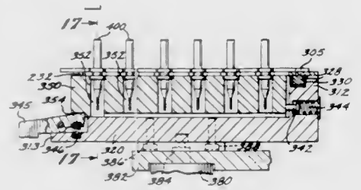
1. In combination with an elongated drilling tool having a shank for insertion into a machine tool and a drilling means

projecting from one end of the shank, a container arrangement for containing a plurality of said drilling tools, comprising;

means for defining a region having a reduced cross-section dimension about the shank of said tool;

means for defining a shoulder region about the periphery of said tool shank between the ends of the tool; and

a clip body defining a first clip surface and a plurality of aligned tool receiving apertures in said surface into which the drilling means of said tools may be inserted, each aperture partially defined by a clip shoulder region for engaging against said tool shoulder region to control the depth of insertion of said tool in said aperture;



said means for defining said reduced region and said means for defining a shoulder region being cooperatively arranged such that said region having a reduced cross-section dimension is exposed from said first surface of the clip body when the tool is inserted in an aperture therein; and

said clip body further comprises means permitting the clip body and said plurality of tools to be removably accepted within a tool changer magazine of a machine tool system having at least one tool head for mounting a tool, thereby providing a supply of the tools in said aligned tool receiving apertures in said clip body available to the tool head during tool changing operations.

4,922,604

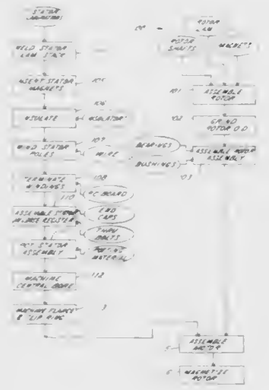
METHOD OF FABRICATING AN ENCAPSULATED MOTOR

James W. Marshall, Towson, Md.; David Gotchy, Roscoe; Bradley L. Uffelman, Rockford, both of Ill.; Wendell B. Leimbach, Baltimore, and Albert A. Wilhelmi, Baldwin, both of Md., assignors to Pacific Scientific Company, Rockford, Ill.

Filed Mar. 13, 1989, Ser. No. 323,507

Int. Cl.[5] H02K *15/02*

U.S. Cl. 29—598 30 Claims



1. A method of producing an electrical motor comprising the steps of:

assembling a rotor assembly on a rotor shaft having a rotor section of predetermined diameter and bearings on the rotor shaft of slightly larger diameter than the rotor section;

assembling a plurality of stator laminations, stator windings, terminations and stator end caps to form an assembled but uncompleted stator assembly;

potting the assembled stator assembly to form a unitized potted stator assembly;

machining a continuous bore through the center of the potted stator assembly to produce a concentric bore for the rotor section and mounting surfaces for the rotor bearings; and

mounting the rotor assembly into the stator assembly, the mounting step including inserting the rotor assembly into the bore of the stator assembly with the bearings engaging the bearing mounting surfaces machined in the end caps during the bore forming step.

4,922,605

DEVICE FOR LINING A PERIPHERAL TUBE OF A STEAM GENERATOR

Jean P. Cartry, and Bruno Fraissenet, both of Lyons, France, assignors to Framatone, Courbevoie, France

Division of Ser. No. 44,255, Apr. 30, 1987, Pat. No. 4,827,594.

This application Nov. 28, 1988, Ser. No. 276,759

Claims priority, application France, Apr. 30, 1986, 86 06344

Int. Cl.[5] B23P *15/26*

U.S. Cl. 29—727 1 Claim



1 Device for lining a peripheral tube of a steam generator comprising a bundle of parallel tubes having a cross-section of substantially circular shape in which said tubes (8) are uniformly distributed, said tubes being crimped at their ends into a circular tube plate (2) over the entire thickness of said late (2), so as to project in relation to a first face (2*b*) of said plate, called an exit face, and to be flush with a second face (2*a*) of said plate, called an entry face, below which said steam generator comprises a water box (3) of hemispherical shape, by means of a lining process comprising insertion of a liner (12) into said tube (8) through one of its ends, from said entry face (2*a*) of said tube plate (2), diametral expansion of said liner (12) inside said tube (8), in at least two regions (15, 16) located adjacent said ends, and crimping by roller-expanding said tube in each of its expansion regions, said device comprising, in addition to means for insertion and diametral expansion of the liner (12) and to a manipulator device comprising an arm (40) enabling placement of an appliance in any position vertically below a tube (8) of said bundle, below said entry face (2*a*) of said tube plate, an assembly for handling and for roller-expanding enabling insertion of a roller-expanding tool (24) into a peripheral tube (8), said device further comprising

(a) a guiding structure (51) fastened to an articulated arm (50), said structure comprising slides (68, 69, 68′, 69′) forming guiding ramps (80, 81) having at least two successive parts forming a certain angle between them, a final portion of said guiding ramp extending in a same direction as the axis of said tube (8);

(b) a screw (57) articulated to an end of said guiding structure (51) and arranged along the entire length of said structure (51);

(c) a trolley (52) fitted with wheels for interacting with said guiding ramps (80, 81), comprising a support (60) in which is rotatably mounted a nut (61) engaged on said screw (57) and driven by a motor (62), and a roller-expanding appliance (53, 54) carried by said support (60) at an end thereof other than that connected to said trolley (52), said nut (61) being in an intermediate position between said trolley (52) and said appliance (63), inclination of successive parts of said guiding ramps (80, 81) in relation to each other being such that said trolley (52) and said appliance (53, 54) which are connected only to said articulated screw (57) can travel and take up an orientation for insertion of the tool (54) into said tube (8) by means of the movement of said trolley (52) by virtue of said motor (62) and said nut (61).

4,922,606

METHOD OF MAKING A CURRENT SENSOR

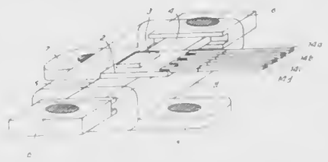
Michael Alexander, Fife, and Fiona G. Riddoch, Edinburgh, both of Scotland, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1988, Ser. No. 259,223

Claims priority, application United Kingdom, Oct. 30, 1987, 8725467

Int. Cl.[5] H05K *3/34;* G11B *5/127;* H01F *7/06*

U.S. Cl. 29—839 9 Claims



1. A method of making a current sensing device comprising a magnetoresistive element configured into a bridge, the method comprising the steps of:

(a) providing a first insulating substrate on which said bridge is disposed together with a first layer of insulation having first vias therein at predetermined positions;

(b) depositing a plurality of first elements of thermally softenable material in said first vias, each element being of a first predetermined volume;

(c) providing a second substrate, having a predetermined thickness and on which there is a second layer of insulation with second vias therein at positions corresponding with those of said first vias, for attachment to a surface of an electrically conductive member having a predetermined shape, wherein said conductive member is provided for conducting the current to be sensed;

(d) depositing second elements of thermally softenable material in said second vias, each element being of a second predetermined volume;

(e) sub-assembling said first and second substrate and said conductive member so that (i) said second substrate is disposed between said first substrate and said conductive member, (ii) the first and second elements of thermally softenable material are in contact with each other, thereby providing a clearance between said first and second layers of insulation; the positions of said first and second vias being such that, when said first and second substrates are sub-assembled, said bridge has a substantially predetermined orientation with respect to said conductive member;

(g) applying heat to said assembled first and second substrates and said conductive member, in a controlled manner, thereby causing said first and second elements to melt sufficiently causing a degree of self-alignment of said bridge with respect to said conductive member and causing said bridge to be disposed substantially parallel to said surface of said conductive member at a predetermined distance therefrom, and thereby attaching said first substrate to said second substrate and said second substrate to said conductive member.

4,922,607

METHOD OF FABRICATION AN IN-LINE, MULTIPOLAR ELECTRICAL CONNECTOR

Phong D. Doan, Shoreview; James E. Upton, New Brighton; Douglas H. Hess, Maple Grove; Wayne R. Bass, Coon Rapids, and Keith A. Ufford, Maple Grove, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 25, 1988, Ser. No. 198,540

Int. Cl.[5] A61N *1/04;* H01R *43/00*

U.S. Cl. 29—879 7 Claims



1. A method of fabricating an in-line, multipolar electrical connector, comprising the steps of:

selecting an elongated conductive connector pin having a proximal end and a distal end and a multipolar conductor wire including at least first and second conductors;

mounting a conductive first connector ring and a first insulative sleeve around said connector pin, such that said first insulative sleeve separates said connector pin from said first connector ring, and the distal end of said first connector ring is proximal to the distal end of said connector pin;

electrically coupling said first conductor to the distal end of said connector pin;

after said coupling step, mounting a conductive first extension to the distal end of said connector ring, said conductive first extension extending distal to the distal end of said connector pin; and

after said step of mounting said conductive first extension to said connector ring, electrically coupling at least said second conductor to the distal end of said conductive first extension.

4,922,608

SHAVING APPARATUS WITH A PIVOTED SHEARING HEAD SYSTEM

Dietrich Pahl, Hofheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,310

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721243

Int. Cl.[5] B26B *19/02*

U.S. Cl. 30—43.91 16 Claims

1. A dry shaving apparatus comprising a housing, a drive assembly and a shearing head including at least one arcuate short hair cutter assembly and at least one long hair cutter assembly associated therewith, said shearing head being pivotally mounted on said housing about a pivot axis (Z) extending in the longitudinal direction of said shearing head, said pivot axis (Z) extending through the point of intersection (SP) of two straight lines (G_1, G_2), where

G_1 is a straight line applied to the outer edge of said long hair cutter assembly as well as to the outer contour of said arcuate short hair cutter assembly,

G_2 is a straight line intersecting said straight line (G_1) at right angles in the center of the distance (A), and



A is the distance between the outermost tangency points (B_1, B_2) of said straight line (G_1) tangent to both said long hair cutter assembly and said short hair cutter assembly.

4,922,609
PIVOT HEAD RAZOR
Kenneth Grange, London, Great Britain, assignor to Wilkinson Sword Gesellschaft mit beschränkter Haftung, Solingen, Fed. Rep. of Germany
Filed Dec. 15, 1988, Ser. No. 284,953
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3742956
Int. Cl.[5] B26B *21/14*
U.S. Cl. 30—57 9 Claims



1. In a pivot head razor having a prong holder that is disposed in a razor head and is adapted to be opened and closed for receiving, holding, and releasing a pivot head razor blade, including a spring cam that can be pressed in and that correspondingly rests against said pivot head razor blade to swivel same about a neutral position and to eject same upon release, with said pivot head razor blade being adapted to be locked in its shaving position in said prong holder, via positive engagement of said pivot head razor blade, by means of a locking device that can be actuated by a user and that is associated with a locking element, the improvement wherein:
said locking element is said spring cam and can be locked by said locking device.

4,922,610
BLADE HOLDER HAVING A MAGAZINE
Stephan L. Szabo, Untere Heslibachstrasse 16, CH-8700 Küsnacht, Switzerland
Filed Nov. 9, 1988, Ser. No. 268,790
Claims priority, application Switzerland, Mar. 10, 1987, 882/87
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—125 14 Claims

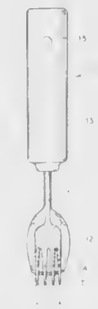


1. A cutter comprising a handle, a blade within the handle and a guiding slot at the front end of the cutter handle for a guiding of the blade which is retractable and extendable relative to the guiding slot and is clampable in an operating position, wherein one section of the center handle is designed as a housing for the receipt of a clamping piece fitted thereinto such that the housing and the clamping piece enclose the guiding slot for the blade between themselves, the clamping piece being designed as lever which is pivotable about a pivot axis relative to the housing around bearing journals extending parallel to the guiding slot and held hinge-like at the housing by an operating screw acting on the longer lever end of the clamping piece, and supported in the housing and movable perpendicularly relative to the lever pivot axis, and clamps with the shorter lever end the blade held in the guiding slot formed by the housing and the clamping piece at the end of the housing.

4,922,611
KNIFE/FORK/SPOON COMBINATION CUTLERY
Isy Levy, 1015 33rd St., Apt. 406, NW., Washington, D.C. 20007
Filed Jul. 26, 1989, Ser. No. 385,068
Int. Cl.[5] A47J *43/28*
U.S. Cl. 30—147 10 Claims

1. A cutlery apparatus comprising:
a cutlery handle,
a removable fork removably engaging said cutlery handle,
a cutting means disposed adjacent said fork and rotably attached to said cutlery handle,
said removable fork having a plurality of tines there attached allowing for the removable attachment of materials thereto,
said removable fork having a substantially fixed position in relation to said cutlery handle,
a motor means disposed within said cutlery handle,
a gravity actuated switching means disposed within said cutlery handle,
said gravity actuated switching means electronically connecting to said motor means,
a switching means disposed through said cutlery handle,
said switching means electronically connecting to said motor means,
said switching means activating said motor means,

said gravity actuated switching means allowing for operation of said motorized means only when said cutlery apparatus is in a substantially vertical position and said switching means is activated,
wire means electronically connecting said switching means, said motor means, and said gravity actuated switching means,



said motor means rotably driving said cutting means around the axis defined by said fork, and
a power means electronically connecting to said motor means providing the electrical input needed to actuate said motor means.

4,922,612
OSCILLATORY SAW
Eugene C. Greenwood, Costa Mesa, Calif., assignor to Henry E. Bruce, Mission Viejo, Calif.
Filed Jun. 16, 1988, Ser. No. 207,728
Int. Cl.[5] B23D *45/16*
U.S. Cl. 30—166.3 10 Claims



1. A high speed, short-stroke oscillatory saw for cutting plaster casts or bone, and the like, comprising:
a casting filled with a lubricating fluid;
a rotary shaft mounted for rotation within said casing;
a cylindrical cam fixedly attached to said rotary shaft for rotation therewith;
an oscillatory shaft mounted for circumferential oscillating motion within said casing;
a crank fixedly attached to said oscillatory shaft for movement therewith; and
a drive rod having a first cylindrical bearing surface therein for receiving said cylindrical cam for rotation therewith and imparting an oscillatory motion to said crank.

4,922,613
PNEUMATIC CONTROL SYSTEM FOR MEAT TRIMMING KNIFE
Timothy J. McCullough, Vermilion, Ohio, assignor to Food Industry Equipment International, Inc., Lorain, Ohio
Continuation-in-part of Ser. No. 102,322, Sep. 29, 1987. This application May 19, 1989, Ser. No. 354,618
Int. Cl.[5] B26B *7/00, 15/00;* F16D *27/00, 31/02*
U.S. Cl. 30—276 20 Claims



1. A fluid control system for an electrically driven meat trimming knife of the type having a handpiece with an annular cutting blade rotatably mounted on a front end of the handpiece and driven by a flexible drive cable communicating with the handpiece, said cable being driven by an electric motor located remote from said handpiece, said control system including:
(a) pump means located remote from the handpiece supplying a flow of low pressure control air to said handpiece;
(b) first means manually actuated by an operator of the handpiece for changing the flow of low pressure control air to the handpiece;
(c) second means for sensing the change in the flow of control air to the handpiece; and
(d) third means for controlling the driving of the flexible drive cable in response to said second means sensing the change in the flow of control air.

4,922,614
CUTTER
Naoyoshi Machida, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Japan
Filed Apr. 29, 1988, Ser. No. 188,497
Claims priority, application Japan, Apr. 30, 1987, 62-66632[U]
Int. Cl.[5] B26B *1/00*
U.S. Cl. 30—339 3 Claims



1. A cutter, comprising:
(A) a blade body having lateral sides, said blade body having:
(i) an engage hole, comprising: a grip hole and a lock hole positioned in front of said grip hole along said blade body, said lock hole being narrower than said grip hole between said lateral sides of said blade body, said lock hole extending to and being connected with said grip hole;
(ii) a peripheral portion around said lock hole; and
(iii) a rear portion in the vicinity of said grip hole; and
(B) a stem positioned generally behind said blade body, said stem having:
(i) a blade body mounting section for supporting said blade

body thereon, said blade body mounting section having an engage projection adapted to be fitted in said engage hole of said blade body, said engage projection having a lock groove defined therein and placed for receiving said peripheral portion of said blade body as said engage projection is moved from said grip hole into said lock hole; and

(ii) pushing means for pushing said rear portion of said blade body to remove said blade body from said stem, said pushing means comprising a resilient push section which is integral and unitary with said blade body mounting section in the form of a deformable cantilever, said push section having a tip portion adapted to face said rear portion of said blade body to push said rear portion, whereby in response to the pushing action of said pushing means, said blade body is curved and separated from said engage projection.

4,922,615

PUNCHING TOOL

Rikio Nishida, 840 Matsuyacho, Fushimi-ku, Kyoto, Japan

Filed Oct. 11, 1988, Ser. No. 255,633

Claims priority, application Japan, Dec. 15, 1987, 62-190945[U]

Int. Cl.[5] B21D *28/24;* B26F *1/00*

U.S. Cl. 30—360 5 Claims



1. A tool for punching holes in a sheet fixed between a punch and a die comprising, in series, a cylindrical handle having an oil reservoir, a manual hydraulic pump, and a hydraulic cylinder unit,

said manual hydraulic pump being actuatable by a pivoted hand lever, and capable of drawing a working fluid from said reservoir to supply fluid under pressure into said hydraulic cylinder unit for containing and moving a punch rod in a reciprocal manner,

said manual hydraulic pump having a hydraulic channel,

the movement of said punch rod compressing a coil spring within the cylinder,

said rod being secured to said punch which moves with respect to said die to form a hole in said sheet,

wherein said manual hydraulic pump and said hydraulic cylinder unit are interconnected by a tubular connector having a through hydraulic channel, said manual hydraulic pump having a longitudinal axis, one end of said tubular connector being rotatingly connected to said manual hydraulic pump for free rotation about the longitudinal axis of said pump without interruption of communication between said hydraulic channel of said tubular connector and said hydraulic channel of said manual hydraulic pump, while the other end of said tubular connector is rotatingly connected to said hydraulic cylinder unit so that it can be freely rotated about an axis perpendicular to the longitudinal axis of said pump, said hydraulic cylinder unit and said tubular connector being connected to each other by an annular groove within said pump.

4,922,616

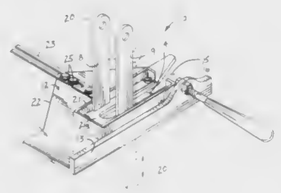
INDUSTRIAL SAW GUIDE ATTACHMENT

Oskar Bensel, 8652 Wellington St., Ventura, Calif. 93004

Filed Nov. 7, 1988, Ser. No. 268,061

Int. Cl.[5] B23D *51/02*

U.S. Cl. 30—374 1 Claim



1. A saw guide apparatus for selective securement of an elongate portable reciprocating saw thereto, said apparatus comprising,

an elongate planar saw guide plate including a top surface and a bottom surface and defining by a forward edge spaced from a rear edge, a right edge spaced from a left side edge, and formed with an elongate cutting groove terminating in an open end defining a "V" shaped opening directed through said forward edge,

said portable reciprocating saw securable between a plurality of upstanding legs integrally and orthogonally formed to a foot member removably secured on the top surface of said planar saw guide plate, and

a first planar vertical guide projecting orthogonally upwardly of said upper surface at the right side thereof including a removably securable handle for guiding said saw guide apparatus about a surface to be cut, and

wherein said first vertical guide defines a first planar surface parallel and spaced from said elongate cutting groove, and

wherein said first vertical guide includes a linear upper edge surface and further includes an integrally formed upstanding boss portion projecting above the upper edge surface for acceptance of the removably securable handle thereto wherein said handle projects orthogonally relative to said boss portion and said first guide, and

including a positioning guide securable to the top surface projecting exteriorly of the left side edge wherein the left side edge includes a triangular projection and wherein the positioning guide overlies an apex defined by the triangular projection and wherein the positioning guide is oriented orthogonally relative to the first planar surface wherein the triangular projection enhances stability of the planar saw guide plate and the positioning guide, and

wherein said positioning guide includes an elongate slot aligned with a plurality of spaced opening pairs for acceptance of fastening means to adjustably fasten said positioning guide to said top surface, and

wherein the foot member includes a surrounding perimeter flange integrally and orthogonally formed to the foot member in surrounding relationship to said elongate cutting groove and said foot member and said perimeter flange terminating in an opening aligned with said groove wherein said perimeter flange defines an accumulation portion for accepting accumulation of sawdust therein during a cutting procedure to enhance visibility during said procedure, and the perimeter flange and foot member positioned on the top surface spaced from the forward edge, rear edge, right side edge and left side edge.

4,922,617

ELECTRICALLY DRIVEN CAN OPENER

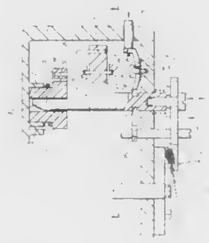
Reinhard Kurz, Nidderau, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 231,154

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729259

Int. Cl.[5] B25F *3/00*

U.S. Cl. 30—419 16 Claims



1. Electrically driven can opener having a housing accommodating a drive motor and a drive mechanism, a drive wheel arranged on the outside of said housing and drivable by said drive motor and said drive mechanism, a switch for energizing said drive motor, a cutter rotatably supported on said housing spaced apart from said drive wheel for severing the lid of a can, an operating member to be actuated by hand and supported on said housing for actuating said switch and a spring-elastic element of spring wire, whose roughly rectangularly deflected ends extend into eccentric bores in said operating member and in said cutter, and which permits tilting of said cutter, said switch being arranged in relation to said operating member such that said switch is switched on by further actuation of said operating member only after said wire has been deformed and said cutter has been put into engagement with the can lid.

4,922,618

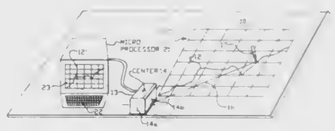
POLAR CO-ORDINATE DIGITIZER

John J. Osborn, and Edgar M. Litzaw, both of 65 Koch Rd., Corte Madera, Calif. 94925

Filed Dec. 19, 1988, Ser. No. 286,462

Int. Cl.[5] G01B *3/00*

U.S. Cl. 33—1 MP 10 Claims



1. A polar co-ordinate digitizer for digitizing angle and length parameters of a planar form being traced by a stylus using a relatively fixed base port at the origin axis of the polar co-ordinate system of the digitizer, the system comprising a cord connected to the stylus extensible from the base support for providing said length parameter and a cord guide through which said cord extends and is pivoted substantially, at said origin movable by lateral pressure of said cord to provide said angle parameter, the improvement comprising:

a continuously rotating disk with its center of rotation at said origin axis, and carrying means for providing an index mark;

a fixed reference photodetector for sensing said index mark;

an angle photodetector mounted for movement with said cord guide and a length photodetector coupled to said cord both pivoted at said origin axis whose rotary positions are indicative of said angle and length parameters, respectively;

means for sensing elapsed time between said reference photodetector sensing said index mark and said length and angle photodetectors sensing said index mark for providing digital data representing said angle and length parameters.

4,922,619

UNIVERSAL SUNDIAL

John S. Singleton, The Old Coach House, Salcombe Road, Newbury, Berks RG14 6EB, United Kingdom

Filed Nov. 9, 1988, Ser. No. 269,133

Claims priority, application United Kingdom, Nov. 19, 1987, 8727154

Int. Cl.[5] G01C *1/00*

U.S. Cl. 33—270 11 Claims



1. A sundial comprising a relieved cylinder in the form of at least a partial turn of a helix, a gnomon, and means for supporting said relieved cylinder and said gnomon such that the gnomon is disposed axially of the relieved cylinder.

4,922,620

DEVICE FOR DETERMINING THE INCLINATION OF A PLANE WITH RESPECT TO THEORETICAL HORIZONTAL PLANE

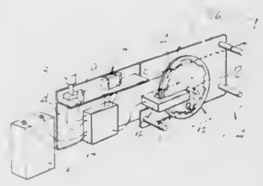
Ezio Terragni, Via Agnesi 13, 20030 Boviso Masciago (Province of Milano), Italy

Filed May 16, 1988, Ser. No. 194,599

Claims priority, application Italy, May 20, 1987, 20605 A/87

Int. Cl.[5] G01C *9/06*

U.S. Cl. 33—366 5 Claims



1. Device for determining the inclination of a plane with respect to a theoretical horizontal plane comprising a box-like body defining a base plane, an inclination detector element rotatably associated with said box-like body, said detector element defining an angular position with respect to said body and to said base plane, electronic readout means for reading said position of said detector element with respect to said base plane, means for displaying said position to determine the

VOL 114 ISS 2 MY 8 1990 UMI

inclination of said base plane, means being furthermore provided for supplying power to said read means and said display means; said inclination detector element comprising a disk rotatably associated with said box-like body according to a rotation axis substantially parallel to said base plane and substantially perpendicular to a longitudinal axis of said base plane, said disk having an eccentrical mass so that by varying the inclination of said longitudinal axis of said base plane relatively to said theoretical horizontal plane said disk rotates relatively to said box-like body about said axis of rotation without rotating relatively to said theoretical horizontal plane;

said readout means comprising circular crowns provided on said disk and having an alternation of regions opaque and transparent to light, at each of said circular crowns there being provided light detector means rigidly associated with said box-like body and electrically connected to an electronic circuit associated with said box-like body, said light detector means cooperating with said circular crowns and said electronic circuit to determine the position of said disk relatively to said base plane; said disk comprising a support provided in plastic material by injection molding, composed of two symmetrically identical parts, each of said parts comprising an outer circular crown connected to a sector supporting a pivot coinciding with said axis of rotation and furthermore supporting said eccentrical mass, in the region comprised between said outer circular crown and said sector there being provided a photographic-type film between said two symmetrically identical parts.

4,922,621
ANGLE GUIDE APPARATUS
Charles J. Maier, 3836 Sheridan Rd., Racine, Wis. 53403
Filed Feb. 6, 1989, Ser. No. 306,694
Int. Cl.[5] B43L *7/06*
U.S. Cl. 33—465 15 Claims



1 In a guide apparatus for replicating angles in construction of the type having a main member with a main straight edge, a bubble-level device attached to the main member in alignment with the main straight edge, and an angle arm with a proximal end pivotably attached to a proximal end of the main member, the angle arm having at least one arm straight edge, the improvement comprising:

the angle arm having a flat planar main portion with said at least one straight edge including parallel distal and proximal straight edges, and an offset end portion of the angle arm proximal end extending substantially perpendicularly from the main portion across said proximal straight edge;

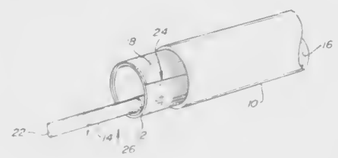
the proximal end of the main member having a slot forming first and second opposed slot-defining portions and receiving the offset end portion of the angle arm;

a bolt extending through both of the slot-defining portions and the angle arm offset portion therebetween, at a position on said offset portion spaced beyond the angle arm proximal edge, the bolt forming a pivot point for the angle arm and having hand-tightening means thereon for drawing the first and second opposed slot-defining portions against the angle arm; and

the main straight edge of the main member being a planar surface normal to the angle arm planar main portion, said angle arm proximal straight edge engaging and dividing said main member planar surface along its length to form ledges of said planar surface on both sides of the angle arm, said angle arm and main portion planar surface dimensioned such that said ledges are of sufficient width to assure proper engagement with surfaces of typical construction lumber normal to said planar main portion of said angle arm,

whereby angle replications can be carried out quickly and easily, without additional tools, and in reverse angle situations.

4,922,622
MEASURING DEVICE FOR THE INTERNAL DIAMETER OF A TUBE
F. Merrill Galloway, Bellefontaine, Ohio, assignor to H.B.D. Industries, Inc., Bellefontaine, Ohio
Filed Apr. 28, 1989, Ser. No. 345,091
Int. Cl.[5] G01B *3/10*
U.S. Cl. 33—542 5 Claims



1 A method for determining the internal diameter of a tube, said method comprising the steps of:

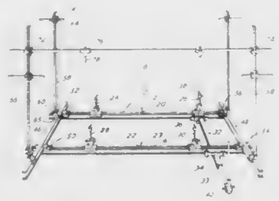
connecting a proximal end of a tape to one end of a shaft, leaving an opposite end of the shaft uncovered so that it may be grasped and turned to scroll the tape around the shaft;

inserting the tape into the tube;

turning the shaft thereby unfurling the tape until the tape is fully contacting the inner wall surface of a section of the tube; and

reading a scale on the tape to provide a measurement related to the internal diameter of the tube.

4,922,623
GAUGING SYSTEM FOR VEHICLE ALIGNMENT EQUIPMENT
Roger B. Aldrich, and John R. Dahlstrom, both of Grand Island, Nebr., assignors to Chief Automotive Systems, Inc., Grand Island, Nebr.
Continuation of Ser. No. 787,963, Oct. 16, 1985, Pat. No. 4,731,936. This application Dec. 21, 1987, Ser. No. 135,664
Int. Cl.[5] G01B *5/00*
U.S. Cl. 33—608 7 Claims



1. Improved apparatus for measuring the location of selected reference points on a vehicle relative to other selected reference points on a vehicle or reference planes associated with

said vehicle, said vehicle of the type having a longitudinal axis extending from the front to the back of the vehicle, said apparatus comprising, in combination:

a first transverse bar member;

means for fixing the first bar member to the vehicle substantially transverse to the longitudinal axis of the vehicle;

a second transverse bar member;

means for fixing the second bar member to the vehicle substantially transverse to the longitudinal axis of the vehicle, parallel to and spaced generally horizontally from the first bar member in a common, generally horizontal plane;

a longitudinally extending measuring bar positioned to extend generally parallel to the longitudinal axis of the vehicle and perpendicular to the first and second transverse bar members;

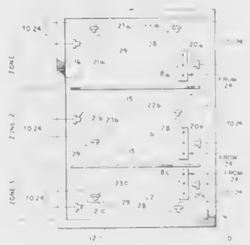
mounting means for slidably mounting the measuring bar simultaneously on both transverse members, said mounting means including means for maintaining the measuring bar continuously movable and slidable as a unit toward and away from the longitudinal axis while remaining at all times substantially parallel to the longitudinal axis and generally perpendicular to the transverse members to define a rigid framework;

first means for measuring the position of the measuring bar in the transverse direction relative to a known point on both of the transverse bar members;

longitudinal direction position indication means affixed to the measuring bar; and

second means on the measuring bar for measuring the position of the longitudinal direction position indication means in the longitudinal axis direction relative to an arbitrary point on the measuring bar, whereby the position indication means may be aligned with any of a number of specific reference points of a vehicle to measure the position of reference points relative to the longitudinal axis of the vehicle, said second means for measuring including a first element slidably mounted on the longitudinal measuring bar, a second element also mounted on the longitudinal measuring bar, and a measuring scale for indicating the magnitude of spacing of the elements.

4,922,624
METHOD AND APPARATUS FOR DRYING LUMBER
John M. Tharpe, 2606 Northgate Rd., Albany, Ga. 31707
Filed Nov. 14, 1988, Ser. No. 270,254
Int. Cl.[5] F26B *21/06*
U.S. Cl. 34—29 11 Claims



1 Method of drying a quantity of green lumber of nonuniform density to a desired level of moisture content, comprising the steps of:

placing a quantity of lumber of nonuniform density into a region;

circulating the air within the region across the quantity of lumber;

adding energy to the region, so as to remove moisture from the lumber;

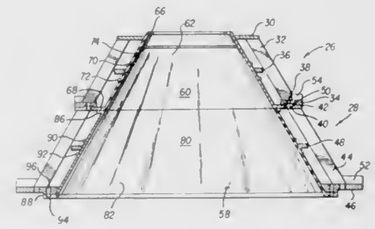
monitoring the dry bulb temperature drop in air flowing across the lumber without attempting to control that temperature drop, so as to determine the occurrence of a certain temperature drop corresponding to a predetermined compliance point indicative of a moisture content greater than the desired moisture content for the lumber;

in response to reaching the compliance point, discontinuing the addition of drying energy to the circulating air; and thereafter

continuing to circulate the air across the lumber while maintaining a temperature set point in the region for a predetermined time to allow equalization of moisture content to the desired dryness for the entire quantity of lumber,

whereby the lumber reaches the desired degree of moisture content without overdrying the relatively less-dense lumber.

4,922,625
SECTIONALIZED CENTRIFUGAL DRYING BASKET/SCREEN ASSEMBLY
Jerry D. Farmer, Galatia, Ill., assignor to Process Equipment Company, Galatia, Ill.
Filed Mar. 3, 1988, Ser. No. 163,804
Int. Cl.[5] F26B *17/24*
U.S. Cl. 34—58 8 Claims



1. A screen and basket assembly for a centrifugal dryer for coal slurry, comprising

a rigid downwardly diverging basket having a vertical axis of rotation,

a screen assembly nested within and removably affixed to said basket,

said screen assembly comprising a plurality of vertically separate screen sections, whereby only that section subject to wear may be replaced when necessary, and further comprising

a plurality of vanes attached to said basket, each of said vanes extending in a plane parallel to said axis of rotation.

4,922,626
PIZZA DELIVERY CONTAINER AND METHOD
R. Charles Fiddler, Lexington, Tenn., assignor to Kolpak Manufacturing Company, Selmer, Tenn.
Filed Jan. 29, 1988, Ser. No. 150,432
Int. Cl.[5] F26B *21/06*
U.S. Cl. 34—80 18 Claims

1. A container for the delivery of pizza comprising:

a plurality of peripheral walls, a top and a bottom, means for defining a duct in said container comprising:

(i) a divider wall in said container spaced from a said peripheral wall,

(ii) at least a portion of said last mentioned peripheral wall, and

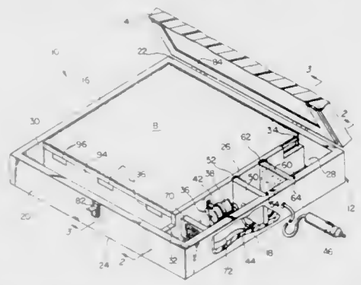
(iii) portions of said top and bottom,

means in said duct for holding desiccant,

a compartment in said container adjacent said duct defined

by portions of said top and bottom, peripheral walls and said divider wall,

means for circulating air through said duct and through desiccant held in said holding means, and



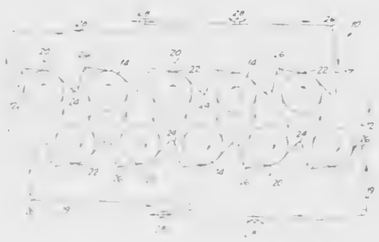
means comprising spaced passages in said divider wall for communicating said compartment and said duct for enabling circulation of air between said duct and said compartment.

4,922,627

PRESS DRYING CONCEPT

Jose Romero Hernandez, Cowansville, Canada, assignor to Albany International Corp., Albany, N.Y.

Filed Sep. 29, 1989, Ser. No. 414,760
Int. Cl.[5] D06F *58/00*; F26B *3/00*
U.S. Cl. 34—116 5 Claims



1. An improved dryer section for a papermaking machine, said dryer section having at least one stage, each said stage having an upper series and a lower series of heated dryer cylinders, each of said upper series and lower series having a plurality of said dryer cylinders, so that a wet paper sheet may be dried by being passed sequentially and alternately around said dryer cylinders of each of said upper series and lower series, said wet paper sheet being held against said dryer cylinders of said upper series and said lower series by an upper dryer felt and a lower dryer felt respectively, wherein the improvement comprises

a press felt used in place of one of said upper and lower dryer felts;

a press roll adjacent to a dryer cylinder in one of said upper and lower series, said series being that on which said press felt is used, said press roll forming a nip through which said wet paper sheet and said press felt pass together in a compressed state;

means for holding said wet paper sheet against said dryer cylinder before passage of said wet paper sheet and said press felt through said nip, so that said wet paper sheet will be warmed by said dryer cylinder;

means for separating said press felt from said wet paper sheet after passage through said nip to prevent the rewetting of said wet paper sheet; and

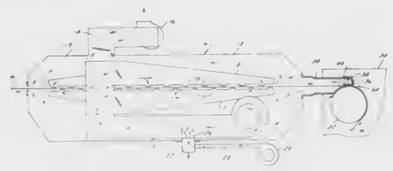
to remove water absorbed by said press felt and to dry said press felt after passage through said nip.

4,922,628

WEB DRYERS OR THE LIKE HAVING AIRFOIL MEANS FOR CONTROLLING A RUNNING WEB AT THE DRYER EXIT

Terry A. Hella, DePere, Wis., assignor to Advance Systems, Inc., Green Bay, Wis.

Filed Apr. 24, 1989, Ser. No. 341,911
Int. Cl.[5] F26B *13/00*
U.S. Cl. 34—156 10 Claims



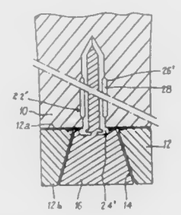
1. A web dryer or the like having air bars spaced along its interior length, for floatingly suspending a running web without contact as it moves through the dryer, said dryer having a horizontal exit slot through which the web exits from the dryer, makeup air being drawn into the dryer through said slot and in a direction opposite to that of web exit movement, the arrangement being such that the running web is forced to move up or down based on the fluctuations in air movement and which cause the web to billow across its width, a rotatable roll means arranged in parallelism to said exit slot and located downstream from the web exit slot and around which roll means the moving web is wrapped, the construction and arrangement causes said web due to said tendency to billow across its width to create a tight side of the web around the roll means and consequently transversely shifts to that tight side, and an airfoil located transversely across the web and adjacent and inside of the horizontal web exit slot, whereby the incoming makeup air is uniformly distributed transversely by the airfoil and across the web width to eliminate uncontrolled web billowing and consequent transverse shifting of the web.

4,922,629

ANTIWEAR AND NONSKID PROTECTIVE ELEMENT FOR A SHOE HEEL

Manoel Bouchet, Le Poil, 21200 Montagny-Les-Beaune, France

Continuation of Ser. No. 809,833, Dec. 9, 1985, abandoned. This application May 22, 1989, Ser. No. 355,807
Claims priority, application France, Dec. 10, 1984, 84 18805
Int. Cl.[5] A43B *21/36, 21/39*
U.S. Cl. 36—36 R 10 Claims



1. An anti-wear and non-skid protective element for the lower end of a solid-core shoe heel comprising:

an outside first part formed of hard plastic having an upper face and a lower face, said faces being parallel to each other, and a through opening extending between said faces;

a tapered inside second part formed of hard plastic and having a height approximately the same as that of said outside first part and an upper face having a first area and a lower face having a second area which is greater than said first area, said tapered inside second part having a shape and dimension such that it can be forced within said through opening so as to be tightly retained therein in such a way as to prevent rotation between said outside first part and said inside second part; and

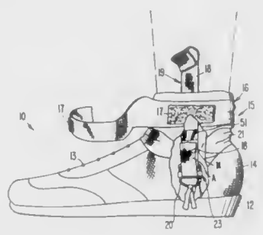
connecting means for connecting the outside first part and the inside second part to the lower end of the shoe heel, said connecting means consisting of a single pin having a shank formed at least partly of metal and axially positioned relative to said tapered inside second part, said pin comprising a shell and a plastic core and having a head which is integral with and mechanically anchored within said inside second part and serving as a support for said inside second part, the shank of said pin having on its surface a plurality of longitudinal grooves, said pin further having a pointed tip capable of penetrating the solid core of the shoe heel, and said plastic core and said tapered inside second part being unitary.

4,922,630

ATHLETIC SHOE WITH INVERSION RESISTING DEVICE

John R. Robinson, Beaverton, Oreg., assignor to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.

Continuation-in-part of Ser. No. 147,365, Jan. 26, 1988, abandoned. This application Nov. 21, 1988, Ser. No. 272,497
Int. Cl.[5] A61F *3/00*; A43B *7/20*
U.S. Cl. 36—89 22 Claims



1. An athletic shoe for resisting ankle inversion comprising:

a sole;

an upper attached to said sole;

securing means for closing said upper around the foot;

an inversion resisting device for resisting ankle inversion including a leg engaging strap, a strapping mechanism, fastening means; and adjusting means for adjusting the degree of inversion resistance;

said leg engaging strap being adjustably positionable around the leg and above the ankle joint;

said strapping mechanism being disposed only on the lateral side of said upper and crossing at least partially the lateral malleolus and the ankle and subtalor joints, said strapping mechanism being movable to permit an unrestricted range of motion in all directions other than inversion; and

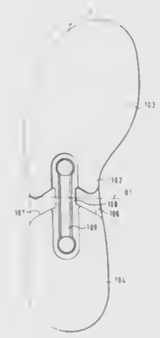
said fastening means fastening a portion of said strapping mechanism to said upper at a location below and adjacent to the axis of motion of the ankle to permit said movability of said strapping mechanism in an area centered about the axis of motion of the ankle.

4,922,631

SHOE BOTTOM FOR SPORTS SHOES

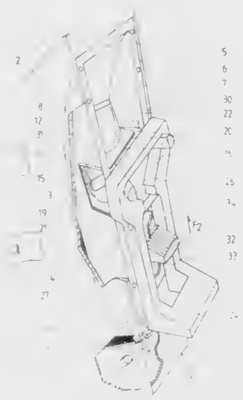
Wolf Anderié, Herzogenaurach, Fed. Rep. of Germany, assignor to Adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 153,082, Feb. 8, 1988. This application Jan. 18, 1989, Ser. No. 298,685
Int. Cl.[5] A43B *5/00, 13/42*
U.S. Cl. 36—102 15 Claims



1. A shoe, in particular a sports shoe, comprising an shoe bottom having a top side and an underside and providing a front sole portion, a rear sole portion and a shank portion joining said front and rear sole portion and having oppositely disposed lateral edges, wherein at least the front sole portion and the rear sole portion have a ground-engaging side, the ground-engaging sides being at least approximately disposed in a common plane, with a longitudinal axis extending substantially in the longitudinal direction of the sole and substantially centrally between said oppositely disposed lateral edges of the shank portion, and first and second transverse axes in the shank portion which extend transversely with respect to said longitudinal axis, one said transverse axis being disposed substantially perpendicularly to said plane and the other said axis being disposed substantially parallel to said plane, torsion stiffness reducing means in the shank portion for reducing the torsional stiffness of the shank portion about said longitudinal axis to permit a relative twisting movement of the front sole portion and the rear sole portion about said longitudinal axis, and comprising in the shank portion a stiffening element in the form of a straight bar of elastically deformable material having first and second ends and extending substantially along said longitudinal axis and provided at each of its ends with plate-like anchoring inserts anchored in the front sole portion and the rear sole portion respectively, the bar comprising a flat strip portion having oppositely disposed lateral edges and extending substantially parallel to said plane and upstanding limb portions extending along said lateral edges of the strip portion and connected to same wherein the stiffening element provides for stiffening of the shank portion against bending in both directions about said first and second transverse axes while at the same time permitting said relative twisting movement of the front and rear sole portions.

4,922,632
SKI BOOT
Simon Arieh, Geneva, and Guy Courvoisier, Celigny, both of Switzerland, assignors to Lange International S.A., Switzerland
Filed Aug. 29, 1989, Ser. No. 399,855
Claims priority, application Switzerland, Oct. 10, 1988, 3774 88
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 5 Claims



1. A ski boot composed of at least one lower part (**1**) intended to surround the foot and the heel, and a shank (**2**) articulated on this lower part and comprising, at the rear, connecting means between the shank and the lower part, these connecting means comprising means (**16**) for fixing or releasing the shank for rotation relative to the lower part, means for adjusting the inclination of the shank relative to the lower part by means of a screw/nut system (**9**, **12**), an elastic element (**15**) and means for adjusting the elasticity of this elastic element (**19**), wherein the connecting means comprise a bar (**9**), in two parts mutually connected by a threaded part, extending parallel to the back of the shank (**5**), and the lower end of which is attached to the lower part of the boot (**1**), a control button (**12**) fixed to the upper part of the shank to adjust the length of the bar, an elastic sleeve of non-compressible material (**15**) surrounding the shank and subject to compression between a stop (*6a*) and a locking member (**16**) mounted to slide on the bar (**9**) between the elastic element (**15**) and said button (**12**), said locking member (**16**) interacting, in order to lock the shank on the lower part of the boot, with at least one notch provided in the shank, a control member for the locking member (**24**) mounted to slide parallel to the shank and capable of occupying two stable positions, one for locking and the other for unlocking the shank, a sliding rigid sleeve (**19**) surrounding the elastic sleeve (**15**) and means (**32**) for displacing said rigid sleeve along the elastic sleeve in order to modify the length of the part of the elastic element situated outside the rigid sleeve and consequently capable of undergoing deformation by expansion.

4,922,633
SKI BOOT, PARTICULARLY OF THE REAR-ENTRY TYPE, WITH SECURING AND ADJUSTMENT DEVICE
Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy
Filed Jun. 20, 1988, Ser. No. 208,613
Claims priority, application Italy, Jun. 23, 1987, 84948 A/87; Jul. 24, 1987, 82572 A/87
Int. Cl.[5] A43B *5/04*; A43C *11/00*
U.S. Cl. 36—117 16 Claims



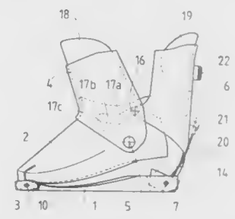
1. Ski boot, particularly of the rear entry type comprising;
a shell,
a front quarter associated with said shell,
a rear quarter associated with said shell,
at least one coupling element interconnected between said shell and said front quarter,
at least one flexible traction element engaging said at least one coupling element,
tensioning means connected to said traction element and being associable with said rear quarter,
wherein said coupling element is slideably engaged in a guiding opening, and
wherein said tensioning means comprise;
a lever having an articulation end,
a plurality of seats provided rearwardly to said rear quarter, and
a transverse pivot located at said articulation end of said lever and being selectively and removably associable with one of said plurality of seats provided on said at least one quarter.

4,922,634
SKI BOOT
Sigurd Seidel, Graz, Austria, assignor to Raichle Sportschuh AG, Kreuzlingen, Switzerland
Filed Dec. 20, 1988, Ser. No. 287,384
Claims priority, application Switzerland, Dec. 22, 1987, 4989/87
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—119 16 Claims



1. In a ski boot having a boot shaft and a sole, a support element arranged in an interior of the boot shaft covering a skier's instep in the form of a saddle, and a pulling element adapted to be tightened and released by means of a driving arrangement, said pulling element being guided across a front end region of the support element and running in a direction towards the sole and acting on the support element in a top end region thereof so as to pull said support element rearwardly, the improvement comprising the pulling element forming a single closed loop divided by the driving arrangement into first and second partial loops actively connected with the driving arrangement, the first partial loop being guided in the front end region of the support element and the second partial loop being guided in the top end region across the support element, the lengths of said first and second partial loops being simultaneously extended and reduced by means of the driving arrangement.

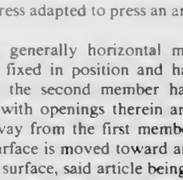
4,922,635
SKI BOOT WITH AUTOMATIC CLOSURE
Alain L. Zanco, Voiron, France, assignor to Skis Rossignol S.A., Switzerland
Filed Jun. 13, 1989, Ser. No. 365,654
Claims priority, application France, Jun. 17, 1988, 88 08169
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—120 6 Claims

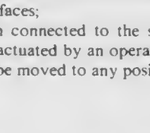


1. A ski boot composed of a rigid sole (**1**), on the front of which a shell in the form of a shoe (**2**) is articulated, and of an upper composed of a front part (**4**) fixed to the shell and of a rear part (**6**) articulated at the rear of the sole, the said shell and the rear part of the upper being connected to one another by connecting means (**15**, **16**, **17**) ensuring the automatic closing and tightening of the upper as a result of the pressure of the foot when the boot is being put on, wherein the rear part of the upper (**6**) is connected to the shell by means of two pivots (**15**, **16**), each interacting with a slot (**17**, **17'**) located in the shell and provided on each side of the latter, these slots having, starting from the rear, a first part in the form of an arc of a circle (*17a*) centered approximately on the axis of articulation (**7**) of the rear part of the upper, followed by a second part (*17b*) rising obliquely forwards, the first part of the slot (*17a*) allowing the rear part of the upper (**6**) to tilt rearwards when the shell is moved away from the sole as a result of a forward rotation, the effect of pressure of the sole of the foot and of the heel, in the open position, being to return the rear part of the upper forwards in a first step and then to close the upper in a second step, a bending of the leg accompanied by a lifting of the heel having the opposite effect of opening the boot wide.

4,922,636
SHOE SPIKE/RECEPTACLE ASSEMBLY
York Chen, San Mateo, Calif., assignor to Contax Sports Inc., Burlingame, Calif.
Filed Sep. 15, 1987, Ser. No. 96,666
Int. Cl.[5] A43C *15/00*; A43B *5/00*
U.S. Cl. 36—127 5 Claims

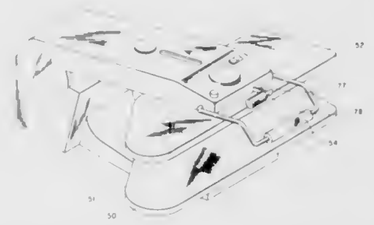
1. A traction spike for removable attachment to a receptacle in the underside of a shoe sole, comprising:
a metal spike member including a ground-engaging head portion extending along an axis and having a tip disposed along said axis, an anchor portion extending along said axis from said head portion opposite from said tip, and a smaller flange portion extending radially outward from a region between said head portion and said anchor portion;
a unitary support member including a larger flange portion disposed adjacent said smaller flange portion opposite from said head portion extending radially outward further than said smaller flange portion, and an engagement portion having external threads for engagement with an internally threaded socket in a receptacle, said engagement portion being molded about said anchor portion; and





means for preventing the removal of said anchor portion from said engagement portion;
wherein said anchor portion has a pair of opposite sides which diverge away from said smaller flange portion in an axially nonsymmetrical fashion.

4,922,637
STEAM IRONING PRESS #1
Donald R. Davidson, Chatham; Pao-Ter Huang, Edison, and H. David Rogers, Fanwood, all of N.J., assignors to SSMC Inc., Fairfield, N.J.
Filed Jul. 31, 1989, Ser. No. 388,126
Int. Cl.[5] D06F *71/34*
U.S. Cl. 38—15 4 Claims



1. A steam iron press adapted to press an article of fabric and comprising:
first and second generally horizontal members, the first member being fixed in position and having an exposed upper surface, the second member having an exposed lower surface with openings therein and being movable toward and away from the first member so that the exposed lower surface is moved toward and away from the exposed upper surface, said article being disposed removably upon the upper surface for pressing, the pressing action ensuing when the second member is moved toward the first member until the article is squeezed between the two exposed surfaces;
a lever mechanism connected to the second member and when manually actuated by an operator causing said second member to be moved to any position between a posi-

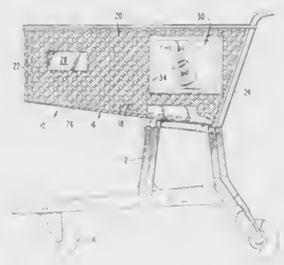
tion of maximum separation and a position of minimum separation (engagement) with respect to the first member;
said second member having means for receiving water supplied thereto and heating said water into steam, the steam being expelled through the openings in the lower surface, said means also heating said exposed lower surface so that when said article is squeezed it is pressed using heat and steam;
a water reservoir containing water;
a pump connected between said second member and said reservoir, said pump when actuated feeding water under pressure from the reservoir to said means and when deactuated preventing flow of water from said reservoir to said means; and
a cam mechanism connected between the lever mechanism and the pump to actuate the pump during a predetermined interval t between the instant of time T1 at which the lever mechanism has initiated movement of the second member toward the first member and the instant of time T2 at which the article is squeezed between the two surfaces, the duration of the interval t being less than that of the interval (T2—T1), said cam mechanism otherwise deactuating the pump.

4,922,638
DECORATIVE MODULAR PICTURE FRAME
Joel Litvak, 150-11 Reeves Ave., Flushing, N.Y. 11367, and Neil Kriegsfeld, 41-42 73rd St., Woodside, N.Y. 11377
Continuation of Ser. No. 167,383, Mar. 11, 1988, abandoned. This application Sep. 20, 1989, Ser. No. 409,939
Int. Cl.[5] A47G *1/10*
U.S. Cl. 40—155 **9 Claims**



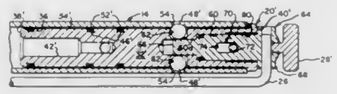
1. A picture frame assembly, comprising:
a plurality of elongate, frame section members; and
a plurality of corner brackets for coupling together pairs of said members; wherein
each corner bracket has a pair of arms which are integrally joined and form an angle therebetween;
each arm has a frame outer edge and a frame inner edge;
each corner bracket further has a prominent, shouldered abutment surface which is a continuum extending from said outer edge of one of said arms to said outer edge of the other of said arms of said pair;
each of said arms further has a longitudinal extension which commences at said abutment surface of said bracket and extends therefrom, lengthwise of said arm;
each frame section member has a beveled end;
said beveled ends of pairs of said members are in abutting relationship with said abutment surface of one of said corner brackets of said plurality thereof;
each frame section member further has a channel formed therein which extends lengthwise of said member from said beveled end thereof; and
said longitudinal extensions of said arms of said corner brackets are nestably set in said channels of said frame section members.

4,922,639
CART WITH ADVERTISING PANELS
Houston Rehrig, Pasadena, Calif., assignor to Rehrig International, Inc., Richmond, Va.
Filed May 4, 1988, Ser. No. 190,065
Int. Cl.[5] G09F *3/00*
U.S. Cl. 40—308 **48 Claims**



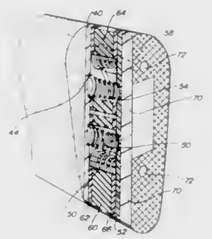
1. A shopping cart comprising:
a plastic first wall;
a plastic second wall connected to said first wall, said second wall having a second wall inner surface, a second wall outer surface, and a second wall opening, said second wall and said first wall defining in part a shopping cart basket;
a plate member disposed in said second wall opening and integrally formed and molded as one piece with said second wall, said plate member having an inner side and an outer side;
a frame member releasably mountable on said plate member and thereby generally recessed in from said second wall outer surface; and
a releasable holding means for releasably holding said frame member on said plate member;
wherein said frame and plate members, when held together by said releasable holding means, define generally therebetween an advertisement card receiving slot and an advertisement card display area, the advertisement card display area being positioned for receiving therein into an advertisement card display position an advertisement card inserted through said advertisement card slot when said frame and plate members are held together by said releasable holding means.

4,922,640
BREECH BOLT
Chauncey E. Toombs, 8010 Lakeshore Rd., Angola, N.Y. 14006
Filed Nov. 4, 1988, Ser. No. 267,288
Int. Cl.[5] F41B *11/06*
U.S. Cl. 42—16 **8 Claims**



1. An improved breech bolt for use in a gas powered gun of the type having a barrel for slidably receiving said breech bolt, said barrel having at least one radially extending latch opening, and an operator for moving said breech bolt within said barrel between breech closed and open positions, said breech bolt comprising:
a generally cylindrical body having an outer surface, a first breech closing end, a second end, a first opening extending axially within said body through said second end and at least one detent opening extending radially of said body between said first opening and said outer surface and having a reduced diameter at said first opening;
an operating plunger slidably supported within said first opening and having an operating end disposed within said body and a mounting end disposed outwardly of said body for attachment to said operator;
motion limiting means for limiting movement of said operating end within said first opening between operative and inoperative positions; and
a ball detent movably supported within said detent opening, said operating end engaging with said ball detent when said plunger is disposed in said operative position to position said ball detent is an operative position thereof in which said ball detent partially projects outwardly of said outer surface for receipt within said latch opening, and said operating end being removed from engagement with said ball detent when said plunger is disposed in said inoperative position for permitting movement of said ball detent inwardly of said detent opening into a retracted position thereof in which said ball detent is removed from within said latch opening.

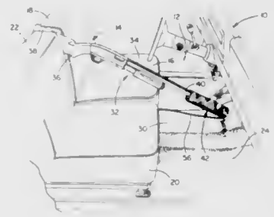
4,922,641
RECOIL PAD
Sam E. Johnson, 1519 Westbury Dr., Davison, Mich. 48423
Filed Feb. 27, 1989, Ser. No. 316,455
Int. Cl.[5] F41C *23/00*
U.S. Cl. 42—74 **12 Claims**



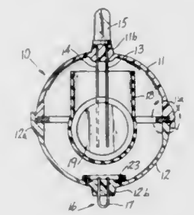
1. A pad for absorbing the recoil of a projectile fired from a weapon having a stock comprising:
a first rigid plate;
a plurality of coiled springs having first and second ends, one surface of said first rigid plate being attached to said first end of said plurality of coiled springs, wherein the axis of compression of said springs is perpendicular to said one surface;
a second rigid plate attached to the second end of said springs opposite said first plate;
a compressible foam material surrounding said plurality of springs, and located between said first and second plates, said compressible foam material including a upper firm foam section and a lower soft foam section; and
means for attachment of said pad to the end of said stock of said weapons.

4,922,642
LONG GUN MUZZLE TETHER AND PROTECTOR
Bradley D. Ohlhauser, 1016-½ N. 11th St., Bismarck, N. Dak. 58502
Filed Jul. 3, 1989, Ser. No. 375,537
Int. Cl.[5] B60R *11/00*
U.S. Cl. 42—96 **11 Claims**

1. A long gun muzzle tether and protector primarily for use in temporarily storing a long gun in the front seat area of a motor vehicle, said protector including a tubular member having a first open end and a second closed end, said tubular member defining an interior cavity having an effective length of a least generally 8 inches and a width of at least generally 2 inches, and a flexible tether line having one end anchored relative to said tubular member at a location at least reasonably adjacent said second end and a second end adapted to be anchored to a vehicle front seat mounting bracket, said tubular member being adapted to have the open end of thereof loosely telescoped over the muzzle end of the barrel of a long gun, said tether line being generally 3 feet in length.



4,922,643
ILLUMINATED FISHING FLOAT
Charles J. Everett, 18 Stonehill Dr., Killingworth, Conn. 06417
Filed Aug. 17, 1989, Ser. No. 395,092
Int. Cl.[5] A01K *93/00*
U.S. Cl. 43—17.5 **14 Claims**



8. A hollow fishing bobber comprising two identical generally upper and lower hemispherical shell members, each of said shell members defining an inner annular shoulder adjacent the open ends thereof, an annular sealing member disposed between said shoulders, cooperative locking means on each of shell members adapted to lock said shell members together with said sealing member therebetween, whereby said bobber is sealed against ingress of water therein, each of said shells having a boss defined thereon at diametrically opposed upper and lower positions when said bobber is assembled, said boss of said upper shell member having a lamp secured thereto with leads extending through said boss into said bobber, a pocket member within said bobber receiving a disc type battery therein having terminals on either side thereof, said leads extending into said pocket member on either side of said battery and frictionally held therein between said pocket and said battery terminals.

4,922,644
FISHING LINE SPOOL HOLDER
Donald C. Sherbondy, P.O. Box 5944, Denver, Colo. 80202
Filed Aug. 22, 1988, Ser. No. 212,176
Int. Cl.[5] A01K *89/00*; B65H *17/52*
U.S. Cl. 43—25 **2 Claims**

1. A fishing line spool holder to support a fishing line storage spool while line is transferred to a fishing reel while both the spool holder and reel are attached to a fishing rod, said spool holder comprising, a base with a centrally located tapered

cylindrical stud for mounting a line storage spool, an arm extending from the base, said arm having a ridge mounted transversely to the arm and parallel to said tapered cylindrical



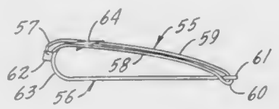
stud, said ridge having a central hole large enough in diameter for a fishing line, a clip mounted to the opposite side of the base from said stud for mounting to a fishing rod.

4,922,645

MAGNETIC FISHING HOOK GUARD AND METHOD

Douglas Hannon, Odessa, Fla., and Bingham A. McClellan, Traverse City, Mich., assignors to McClellan Industries, Inc., Traverse City, Mich.

Division of Ser. No. 105,291, Oct. 5, 1987, Pat. No. 4,878,310. This application Aug. 21, 1989, Ser. No. 396,302
Int. Cl.[5] A01K *83/00*
U.S. Cl. 43—42.4 21 Claims



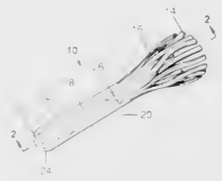
1. A fishing rig comprising a fish hook made from a magnetizable material, said fish hook having a point for impailing fish, weed guard means operatively connected to said fish hook, said weed guard means being movable from a first position in contact with said fish hook that guards said point to a second position that exposes said point, and magnetic means for holding said weed guard means in said first position.

4,922,646

FISHING LURE

Jerry Basgal, 985 E. Hwy. 20, Clearlake Oaks, Calif. 95423

Filed Dec. 23, 1988, Ser. No. 290,185
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.33 6 Claims



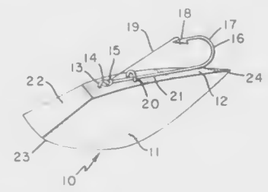
1. A fishing lure comprising:
an elongate, generally cylindrical body portion made of at least partially transparent material, and terminating in a plurality of elongate streamers forming a skirt portion; and
a plurality of internal longitudinal rectangular and non-curved facets forming light-reflecting and optically visible surfaces within said body portion, said internal facets define an internal cavity in said body portion.

4,922,647

FISHING LURE

Keith M. Tompkins, P.O. Box 30, 85 Church St., Moreland, Ga. 30259

Filed Dec. 12, 1988, Ser. No. 282,594
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.44 15 Claims



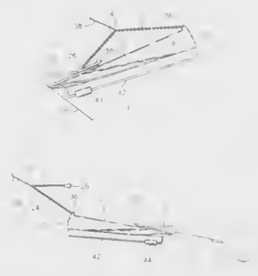
1. A fishing lure comprising:
a fish hook having an eye and shank;
a body having: a substantially flat top nose portion, a substantially flat top back portion, and two relatively teardrop shaped side portions;
a hook attachment means secured atop said flat back portion in a vertical plane passing through the longitudinal axis of said body, and having an aperture to secure said eye;
a yoke positioned atop said back in perpendicular alignment to said attachment means, located a predetermined distance away from said attachment means, forming a second aperture completely bordered on three sides by said yoke and one side by said flat top back portion, having said shank extending through said second aperture;
said fish hook being pivoted about said eye, being swung in a back and forth motion along a lateral arc parallel to and across said flat back, and having said shank strike said second aperture during said back and forth motion.

4,922,648

FISHING DIVER

Clissolde L. Louthan, 9024 NE. Oregon, Portland, Oreg. 97220

Filed Feb. 21, 1989, Ser. No. 312,290
Int. Cl.[5] A01K *95/00*
U.S. Cl. 43—43.13 8 Claims



1. A fishing diver comprising:
a body portion having forward and rearward ends, top and bottom surfaces, and opposite sides,
flexible link means having forward and rearward ends,
pole line connecting means between the ends of said flexible link means,

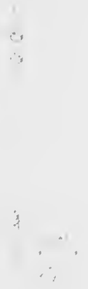
fish line connecting means at the forward end of said body portion,
first connector means on the top surface of said body portion adjacent the forward end thereof,
and second connector means on the top surface of said body portion adjacent the rearward end thereof,
said second connector means including a pair of connecting points adjacent opposite sides of said body portion,
said flexible link means providing a diving function when the diver is subjected to a water current that applies a tension to a fish line connected to said fish line connecting means,
said flexible link means including a single link portion attached at the forward end thereof to said first connector means and diverging portions secured at the rearward end thereof to said second connector means,
said diverging portions stabilizing the rearward portion of the diver when subjected to said water current.

4,922,649

FISH HOOK WITH RETRACTABLE BARB

Jack H. Mitchell, 80 N. Policy St., Salem, N.H. 03079

Filed Apr. 3, 1989, Ser. No. 331,859
Int. Cl.[5] A01K *83/00*
U.S. Cl. 43—43.16 6 Claims



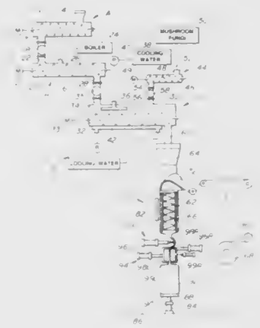
5. A fish hook with a leader for use with a fishing line, said fish hook comprising:
a curved, elongated member having a first end and a second end, said elongated member having a groove along its outer side
a flexible barb at the second end of said elongated member;
a barb retraction wire which is attached to said barb, said barb retraction wire being pulled to apply force to said barb to retract same;
a clip means attached to said elongated member to hold said barb retraction wire in said groove;
a first indicator element attached to said leader and having a first hole in it through which said barb retraction wire passes and moves freely;
a second indicator element attached to said barb retraction wire and having a second hole in it through which said leader passes and moves freely, and as force is applied to said barb retraction wire to retract said barb said second indicator element moves toward said first indicator element, and when they touch it provides a visual indication that said barb is fully retracted, and
a travel limiting means attached to said barb retraction wire external to said curved, elongated member at said first end thereof, said travel limiting means preventing said barb from bending in a direction opposite to that in which it retracts.

4,922,650

SYSTEM FOR MANUFACTURING SOLID MEDIUM

Takeshi Akao; Yoshihiko Nishizawa; Shiro Yamada; Hisahumi Fuse; Katsumichi Ohsaki, and Morihiko Sakai, all of Chiba, Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Sep. 12, 1988, Ser. No. 243,483
Claims priority, application Japan, Dec. 14, 1987, 62-288298; Jan. 29, 1988, 63-16907
Int. Cl.[5] A01G *1/04*; B65B *9/06*
U.S. Cl. 47—1.1 7 Claims



1. A multi-stage system for manufacturing a solid medium, comprising:
a mixer for mixing medium materials;
a heater coupled to said mixer for sterilizing the medium materials supplied from said mixer, with heat;
a mycelia supply device for supplying cycelia; and
a cooler coupled to said heater for cooling the medium materials supplied from said heater and also coupled to said mycelia supply device for spawning the medium materials with the mycelia supplied from said mycelia supply device thereby to produce a solid medium, and
a packaging mechanism for packaging the solid medium, comprising:
a cylindrical member coupled to said cooler and having a feed screw disposed therein, sheet supply means for supplying a packaging sheet around said cylindrical member to shape the packaging sheet into a cylindrical form, sealing means for sealing a seam of the cylindrical packaging sheet form, bundling means for bundling upper and lower ends of the cylindrical packaging sheet form, and cutter means for cutting off the cylindrical packaging sheet form near the bundled ends and
means for vertically moving a bottom of said cylindrical packaging sheet form which is filled with said solid medium, gripper means for gripping the upper end of said cylindrical packaging sheet form, and presser means for laterally pressing the upper end of the cylindrical packaging sheet form.

4,922,651

APPARATUS FOR EFFECTING OR IMPROVING POLLINATION OF PLANTS

Donald T. Atkinson, and Dianne L. Atkinson, both of Whakatane, New Zealand, assignors to DFC New Zealand Limited, Wellington, New Zealand

Filed Nov. 25, 1987, Ser. No. 125,254
Claims priority, application New Zealand, Nov. 28, 1986, 218444; Jun. 5, 1987, 220593
Int. Cl.[5] A01H *1/02*; A01G *7/00*
U.S. Cl. 47—1.41 3 Claims

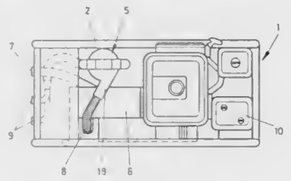
1. Apparatus for use in the pollination of female plant flowers comprising:

a cyclonic separator for the separation of pollen particles from a forced flow of air through said separator;

fan means associated with said separator and providing said forced flow of air through said separator;

a hand-held collection nozzle connected to an air inlet of said cyclonic separator by a flexible conduit, said hand-held collection nozzle being randomly moveable by a person effecting collection of said pollen particles;

a hand-held dispersion nozzle connected to an air outlet of said cyclonic separator by a flexible conduit, said hand-held dispersion nozzle being randomly moveable by a



person effecting the pollination of said female plant flowers, and, controllable means for adjustably proportioning the amount of said pollen particles retained in said cyclonic separator and the amount of said pollen particles discharged from said cyclonic separator and entrained in said air flow outletting said cyclonic separator;

whereby, said apparatus can be selectively employed for the collection of pollen particles, for the dispersion of pollen particles stored in said cyclonic separator, and, for the simultaneous collection of said pollen particles and the dispersion of at least a portion of said collected pollen particles.

4,922,652

SHELTER FOR TREES

James P. Graves, Sutton, England, assignor to Rolinx Limited, Manchester, England

Filed Dec. 6, 1985, Ser. No. 805,875

Claims priority, application United Kingdom, Dec. 20, 1984, 8432198

Int. Cl.[5] A01G *13/10*

U.S. Cl. 47—23 12 Claims



1. A method of protecting a tree including the steps of placing one part of a flexible walled tree shelter adjacent the tree to partially encompass the tree, placing another complementary part of the flexible walled shelter adjacent the tree to encompass the tree in conjunction with the first part and fastening the parts to the ground.

4,922,653

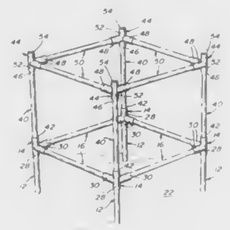
PLANT WATERING AND FEEDING SUPPORT SYSTEM

Alan Stone, 74 Vincennes, Pointe Claire, Quebec, Canada (H9R 4M2)

Filed Dec. 28, 1988, Ser. No. 291,152

Int. Cl.[5] B05B *13/02;* A01G *17/06*

U.S. Cl. 47—45 8 Claims



1. A plant watering and feeding system, comprising at least three substantially upstanding tubular stake means each having a lower end thereof adapted to be planted in a soil means and having a part thereof adapted to be located above a ground surface of said soil means; a connection means mounted on each said stake means receiving ends of tubular cross member means which extend therefrom in a substantially horizontal plane for joining said stake means to define a substantially horizontal distribution network, said connection means receiving lower ends of vertical tube means, said vertically stacked tube means extending upwards from said connection means and being provided at upper ends thereof with further connection means, further cross member means being provided for joining said further connection means, whereby a further horizontal distribution network is provided to said system at a second level thereof, whereby a liquid poured in a top end of at least one of the vertical tube means is distributed to the other vertical tube means and to said stake means through said distribution networks and to the soil means by way of said stake means through said lower ends thereof, said cross member means being also adapted for basically supporting at least one plant.

4,922,654

PLANT OR SEEDLING SUPPORT STAKE

Dan N. Hawke, Box 14, Little Current, Ontario, Canada (P0P 1K0)

Filed Jul. 27, 1989, Ser. No. 385,357

Claims priority, application Canada, Nov. 25, 1988, 584,197

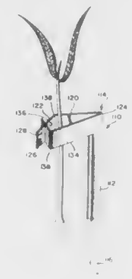
Int. Cl.[5] A01G *9/12*

U.S. Cl. 47—47 20 Claims

1. A plant support comprising:

an elongated, planar, vertically disposed stake which can be folded along its longitudinal axis; and

a pair of planar resilient arms, integral and co-planar with the stake, extending horizontally from the vertical stake in opposite directions, each of the arms being formed with a notch intermediate its free and connected ends to allow the arms to be secured to each other in a crossed-over position when the stake is folded along its longitudinal axis, each of said arms being formed with a rectangularly shaped end portion at its free end, which end portions can be folded inwardly toward each other when said arms are



in the crossed-over position, forming a clasp of generally polygonal configuration to retain a plant stem.

4,922,655

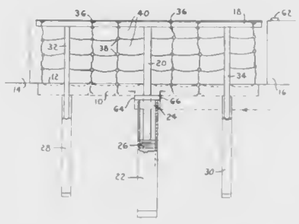
VERTICAL CANTILEVERING GATE

Morton Seal, 5121 Muddy La., Fort Myers, Fla. 33905

Filed Jan. 11, 1988, Ser. No. 142,499

Int. Cl.[5] E06B *11/00*

U.S. Cl. 49—131 2 Claims



1. In a vertically movable barrier structure adapted to intersect a passageway, a cap bar a plurality of interconnected horizontal and vertical members connected to the cap bar and, movable between a down passage unobstructing position and an upper passage obstructing position, an actuator comprising a vertically disposed cylinder and piston combination, connecting means between the piston and the cap bar a source of water pressure and a water pressure control means to move the piston in the cylinder, the cap bar member, and the interconnected horizontal and vertical members between the down unobstructing position and the upper passage obstructing position, a trough extending across the passageway to receive the interconnected horizontal and vertical members and the cap bar member aligned with the trough and connecting means between the cap member and one of the horizontal members, the control means wherein the water pressure is employed to raise or lower the barrier structure by feeding pressurized water into one end of the cylinder and water in the other end of the cylinder is vented to the trough due to the differential of water pressure to wash out the trough member when the gate is actuated.

4,922,656

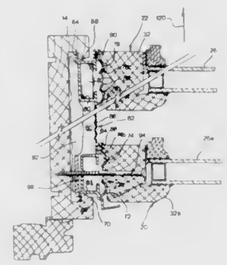
SASH WINDOW

Jean-Paul Giguere, Co. Lotbinière, Canada, assignor to Donat Flamand Inc., Canada

Filed Dec. 15, 1987, Ser. No. 133,084

Int. Cl.[5] E05D *15/22*

U.S. Cl. 49—161 6 Claims



1. A window, comprising:

a window frame;

a glazed sash mounted in said window frame movement by translation therein, said sash including a sash frame comprising four elongated members, namely, two jambs joined at their upper ends by a head member and joined at their lower ends by a sill member; and

a guiding and supporting device between each elongated member of said sash frame which is parallel to the direction of movement by translation of said sash in said window frame, said guiding and supporting device comprising:

(a) a pair of generally parallel grooves formed on said sash, each of said grooves being rounded in cross-section;

(b) a track on said window frame including a pair of generally parallel and elongated guiding projections, each guiding projection being rounded in cross-section, and means to connect said each guiding projection to said track and to allow said each guiding projection to flex with respect to the remaining portion of said track, said guiding projections being resiliently engaged in said grooves during the translatory motion of said sash in said window frame, said sash being completely disengagable from said guiding projections upon exerting a force on said sash in a direction normal to the direction of translatory motion thereof,

wherein said window frame comprises two jambs, a head member joining said jambs at their upper ends and a sill member joining said jambs at their lower ends, and each jamb of said window frame comprises a track, including:

two pairs of guiding projections extending along a longitudinal axis of said each jamb, each pair of guiding projections engaging a sash; and

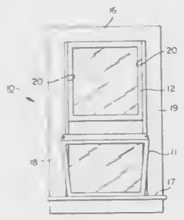
an elongated flexible plate interconnecting said pairs of guiding projections, said elongated plate extending along said longitudinal axis and including a plurality of longitudinal shallow grooves enhancing the flexibility of said elongated plate, thereby allowing one pair of guiding projections to move substantially independently of the other pair of guiding projections.

4,922,657

LOCKING SLIDE FOR TILT-OUT WINDOW BALANCE SYSTEM

Robert E. Foss, Bellville, Ohio, assignor to Eastern Balance Corporation, Mansfield, Ohio

Filed Sep. 8, 1989, Ser. No. 404,861
Int. Cl.[5] E05D *15/22*
U.S. Cl. 49—181 6 Claims



1. In apparatus for supporting a window sash in a frame for vertical movement and for tilting movement about a horizontal axis, the apparatus including counterbalance means connected to the frame and adapted to urge said sash to a raised position, the improvement which comprises:

a pair of fixed vertical jamb liners in said frame, each jamb liner defining a vertical slide channel and a vertical rib in said channel extending perpendicular to the plane of the sash;

a pair of pivot pins secured to opposite sides of the sash to define a horizontal axis for tilting movement of the sash relative to the frame;

a pair of carrier slides, each being received in one of said channels for vertical sliding movement therein and each being connected to said counterbalance means and to one of said pivot pins, each of said slides having

a vertical groove adapted to slidably receive said rib,

a cylindrical roller having a horizontal axis extending parallel to said rib,

means defining a roller slot communicating with said groove adapted to receive said roller and to accommodate linear movement of said roller perpendicular to its axis and in a plane angularly disposed relative to said rib between a retracted position in the upper end of said slot and an extended locking position at the lower end of said slot wherein a cylindrical surface portion thereof engages one face of said rib to grip said rib between said roller and the opposite wall of said groove, and

releasable means for selectively retaining said roller in its retracted position,

whereby the upward force applied to said slide by said counterbalance means cams said roller against said rib to lock said slide in a fixed position in said channel when said releasable means is released.

4,922,658

SLIDING STORM DOOR OR WINDOW ASSEMBLY

Donald L. Coddens, South Bend, Ind., assignor to Therm-O-Loc, Inc., South Bend, Ind.

Continuation-in-part of Ser. No. 851,127, Apr. 11, 1986, Pat. No. 4,667,441. This application Jan. 30, 1987, Ser. No. 9,189
Int. Cl.[5] E05D *15/06*
U.S. Cl. 49—458 6 Claims

1. In a window assembly including a four-sided frame having first and second adjacent lower channel members, a first window having a sash located within said first channel member, and a second window having a sash slidably located within said second channel member, each first and second sash enclosing a glazing panel, the improvement wherein each first and second sash is formed of a lightweight material and includes interconnected horizontal and vertical sash members, at least one of said vertical sash members including a channel part, and a rigid insert fitted within said C-shaped channel part substantially filling the space provided thereby, said insert constituting means for stiffening and strengthening each sash.



4,922,659

ADJUSTABLE METAL DOOR AND FRAME THEREFOR

Luigi Muccioli, Via Marchesina, 41, Trezzano sul Naviglio 20090, Italy

PCT No. PCT/IT86/00057, § 371 Date Jul. 14, 1988, § 102(e) Date Jul. 14, 1988, PCT Pub. No. WO87/04752, PCT Pub. Date Aug. 13, 1987
PCT Filed Jul. 21, 1986, Ser. No. 246,294
Claims priority, application Italy, Jan. 31, 1986, 20784/86[U]
Int. Cl.[5] E06B *3/00*
U.S. Cl. 49—501 10 Claims



1. A metal door assembly comprising:

a pair of vertically extending post members, each post member including a flat vertical plate having at least one vertically extending reinforcing rib;

a plurality of cross-pieces projecting horizontally from one of said post members, the other of said post members having a plurality of horizontal guide grooves telescopically and slidably receiving said cross-pieces whereby said post members are able to move horizontally relative to one another;

upper and lower slides, each of said upper and lower slides including a pair of slide parts horizontally slidable relative to each other, each of said pair of slide parts being adapted to slide vertically relative to a respective post member and each of said pair of slide parts including a vertical post piece telescopically slidable relative to the respective post member, a horizontal post piece telescopically slidable relative to a horizontal post piece of another slide part, and a plate overlapping a plate of another slide part; and

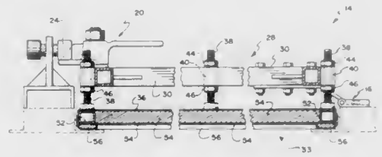
means for fixedly securing said post members and said slides relative to one another.

4,922,660

PLYWOOD VENEER DRYER DOOR

John Omelchuk, Vernon, Canada, assignor to Crown Forest Industries Limited, Vancouver, Canada

Filed Nov. 16, 1988, Ser. No. 272,071
Int. Cl.[5] E05C *9/00*
U.S. Cl. 49—395 3 Claims



1. A door for sealing an aperture in a heated chamber to prevent passage of gases through said aperture, said door comprising:

(a) a flexible door plate sized to cover said aperture;

(b) a door frame having frame members positionable around the circumference of one face of said door plate;

(c) releasable fastening means for releasably fastening said door plate and said door frame over said aperture to sandwich said door plate between said aperture and said door frame; and,

(d) a plurality of adjustable tightening means disposed at intervals around said door frame for adjustably tightening said door frame against said door plate at each of said intervals, said tightening means comprising:

(i) a first plurality of tightening members connected, at said intervals, around said door plate one face circumference, to project outwardly therefrom;

(ii) an equal plurality of apertures disposed, at said intervals, around said door frame, for passage therethrough of respective ones of said first tightening members;

(iii) a second plurality of tightening members, respectively engageable with said first plurality of tightening members, after passage of said first members through respective ones of said door frame apertures; and,

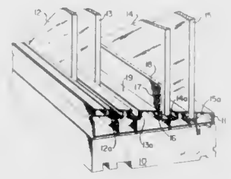
(iv) a third plurality of tightening members, respectively engaged with said first plurality of tightening members, before passage of said first members through respective ones of said door frame apertures.

4,922,661

WATER STOP FOR A WINDOW

Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to Dallaire Industries Ltd., Lauzon, Canada

Continuation of Ser. No. 82,501, Aug. 7, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 319,823
Claims priority, application United Kingdom, Aug. 12, 1986, 8619620
Int. Cl.[5] E06B *1/04*
U.S. Cl. 49—504 9 Claims



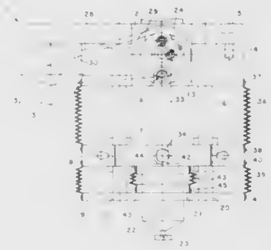
1. In an exterior wall window construction comprising a sill, opposed jambs and at least one outer movable pane, the improvement comprising a water-stop in the form of a removable barrier received within a first track formed in said sill and said jams, said window construction including a second track formed in said sill, a movable pane is disposed in and is freely slidable in said second track, said first track located inwardly of said second track and spaced apart from all movable panes, relative to the orientation of said window construction in a wall opening, and said first track extending in said sill between said jambs and upwardly in said jambs from said sill parallel to said at least one outer movable pane; said removable barrier, when received within said first track, projecting above said sill parallel to and spaced apart from said movable pane; said removable barrier, when received within said first track, inhibiting passage of water thereover and co-operating with said sill and said jambs to inhibit the passage of water through the respective junctions between said removable barrier and said sill and between said removable barrier and said jambs.

4,922,662

RECIPROCATING JIG ADAPTER FOR GRINDING MILLS

Stanley D. Zygiel, 420 Warren Rd., Glenview, Ill. 60025

Filed Jul. 30, 1987, Ser. No. 79,449
Int. Cl.[5] B24B *9/00*
U.S. Cl. 51—34 C 5 Claims



1. A reciprocating jig adapter for grinding mills having a working tool supporting quill with the adapter providing:

(a) a stationary supporting plate adapted to be removably fixed to the quill of the grinding mill and a movable tool carrying carriage,

(b) means for removably attaching said supporting plate to the quill of the grinding mill,

(c) oscillating means carried by said supporting plate for supporting said carriage for reciprocal movement through a plane parallel to the quill of the grinding mill,

(d) means depending from said supporting plate for guiding said carriage and for maintaining it in a plane parallel to said stationary plate during it's reciprocal movement,

(e) means carried by said supporting plate for operating said oscillating means,

(f) means for varying the degree of oscillating movement of said carriage relative to said supporting plate, and

(g) means for incapsulating said oscillating means and said guiding means during reciprocal movement of said carriage.

4,922,663

SANDPAPER CLAMP MECHANISM FOR ORBITAL FINISHING SANDER

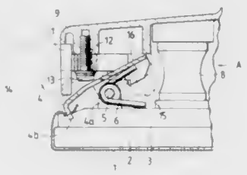
Atsushi Nakagawa, and Kazumi Takeishi, both of Katsuta, Japan, assignors to Hitachi Koki Company, Ltd., Tokyo, Japan

Filed Jun. 30, 1989, Ser. No. 373,553
Claims priority, application Japan, Jul. 1, 1988, 63-88354[U]
Int. Cl.[5] B24B *23/00*
U.S. Cl. 51—170 TL 4 Claims

1. A sandpaper clamp mechanism for use in a finishing tool, comprising:

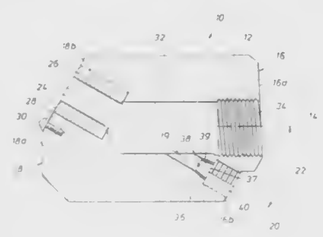
a frame;

a bottom plate connected to said frame in spaced relation thereto;
a platen for supporting a sanding sheet thereon, said platen being attached to a lower surface of said bottom plate;
a sandpaper holder angularly movably mounted on said bottom plate, said sandpaper holder having gripping teeth on one end, a flat surface remote from said gripping teeth, and a slanted surface contiguous to said flat surface, said sandpaper holder being angularly movably between a first position in which said gripping teeth hold the sanding sheet against said bottom plate and a second position in which said gripping teeth are spaced from said bottom plate to release the sanding sheet;



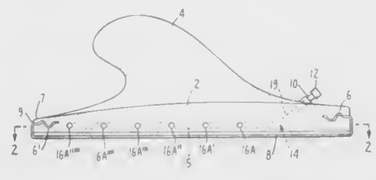
a spring acting between said sandpaper holder and said bottom plate for normally urging said sandpaper holder into said first position; and
a lever angularly movably mounted on said frame and having a presser on one end thereof, said lever being angularly movable between a third position in which said presser is spaced from said slanted-surface to allow said sandpaper holder to remain in said first position under the bias of said spring and a fourth position in which said presser pushes said flat surface to lift said sandpaper holder into said second position, said presser successively camming said slanted and flat surfaces while said lever is moving from said third position to said fourth position.

4,922,664
LIQUID SAND BLAST NOZZLE AND METHOD OF USING SAME
Arthur L. Spinks, and Jerry P. Woodson, both of Houston, Tex., assignors to Whitemetal Inc., Houston, Tex.
Continuation of Ser. No. 49,015, May 6, 1987, abandoned, which is a continuation of Ser. No. 739,500, May 30, 1985, abandoned, which is a continuation of Ser. No. 446,393, Dec. 2, 1982, abandoned. This application Nov. 22, 1988, Ser. No. 274,620
Int. Cl.[5] B24C *5/04*
U.S. Cl. 51—321 **8 Claims**



1 An improved method for propelling abrasive with high pressure water comprising the steps of,
applying a substantially constant flow rate of air and abrasive particles to an abrasive inlet of a body having a propulsion chamber disposed therein, said abrasive inlet communicating with said propulsion chamber via a substantially straight first path from outside said body to inside said body which defines an abrasive axis in said chamber with said propulsion chamber being formed as a a direct extension of the abrasive path along said straight line abrasive axis,
applying high pressure water from a high pressure water supply which is independent of said air and abrasive supply to a water inlet of said body, said water inlet communicating with said propulsion chamber via a substantially straight second path which defines a water axis in said chamber, said abrasive axis and said water axis intersecting each other within said propulsion chamber,
accelerating said water in a propelling jet along said water axis toward an outlet bore of said propulsion chamber, said outlet bore being in substantial alignment with said water axis of said chamber, and
impacting said flow of abrasive particles with said propelling jet of water within said propulsion chamber thereby increasing the energy of said abrasive particles and directing them in a high energy jet through said outlet bore.

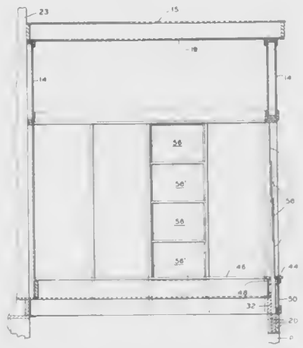
4,922,665
WET SANDER
Andrew Wanatowicz, 730 Broadway, Redwood City, Calif. 94063
Filed Nov. 30, 1988, Ser. No. 277,877
Int. Cl.[4] B24D *11/00;* A47L *13/12*
U.S. Cl. 51—392 **15 Claims**



10. A manually operated wet sander adapted for use with a garden hose, said sander having a top surface, a bottom surface, a front, a back, and two sides, said sander adapted to hold a strip of sandpaper comprising:
a contoured handle molded to fit a user's hand and extending upwardly from the top surface so that only a user's smallest finger is positioned to contact the top surface when the sander is gripped;
a means for securing said strip of sandpaper to the bottom surface of said sander without penetrating said sandpaper and without compressing or distorting said handle;
a means for directing a relatively high pressure stream of fluid from said garden hose through said sander, said means essentially including a fluid inlet, a plurality of outlets along the two sides of the sander which do not penetrate said sandpaper, and a conduit passing through the interior of said sander from said fluid inlet to each said outlet, said inlet, said outlets and said conduit having a diameter of from about $\frac{1}{8}$ inch to about $\frac{1}{4}$ inch for reducing the pressure of the fluid stream to provide a substantially constant, low pressure flow of fluid from the sander onto the surface being sanded, said means not including a valve.

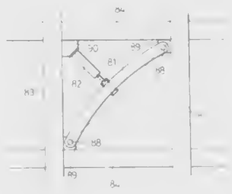
4,922,666
PORCH WITH RECESSIBLE WINDOWS
Bernard J. Rotter, 9001 Chesshire La., Maple Grove, Minn. 55369; Timothy M. Whitten, 8980 Neill Lake Rd., Eden Prairie, Minn. 55344, and Silas A. Brown, P.O. Box 86, Marine on the St. Croix, Minn. 55047
Filed Feb. 2, 1989, Ser. No. 305,517
Int. Cl.[5] E04B *1/346, 1/04*
U.S. Cl. 52—66 **7 Claims**
7. A porch having a ceiling, floor and at least one window

wall, each of said walls being composed of a plurality of window units positioned in side-by-side relationship across the width of said wall such that a substantial part of said wall is composed of the window units, each window unit including laterally spaced apart vertically disposed parallel frames, said frames being provided on both sides of each of the window units, a window track mounted on each side of each unit, each such track includes at least one centrally opening guide channel, a plurality of window sashes slidably mounted with each side edge thereof in one of the channels for vertical sliding movement to provide a plurality of window sashes that can be



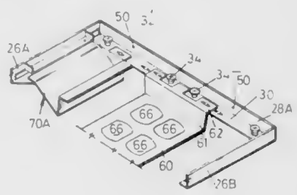
slid vertically in the track, said frames and said track extending downwardly to an elevation below the level of the floor of the porch, each window sash being independently movable and slidably mounted in its channel for movement between a raised operative position for closing the window opening and a lower storage position at least partially below the level of the floor, each window opening having a lower edge constructed in spaced relationship above the floor by a distance that is less than the height of a single one of the sashes whereby the sashes can be lowered to a position at least partially below the level of the floor.

4,922,667
DEVICE AND METHOD FOR PROTECTING A BUILDING AGAINST EARTHQUAKE TREMORS
Takuji Kobori; Shunichi Yamada, and Shuichi Kamagata, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan
Division of Ser. No. 96,012, Sep. 10, 1987. This application Aug. 30, 1989, Ser. No. 400,691
Claims priority, application Japan, Sep. 12, 1986, 61-215402; Sep. 19, 1986, 61-221143; Oct. 30, 1986, 61-258794; Oct. 30, 1986, 61-258795; Nov. 21, 1986, 61-278427; Dec. 17, 1986, 61-301036
Int. Cl.[5] E02D *27/34*
U.S. Cl. 52—167 DF **16 Claims**



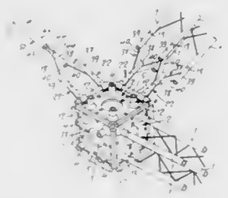
1. In combination with structural members of a building subject to stresses caused by seismic tremors, seismic detector means; mechanical rigidity control devices adapted to relieve said stresses, secured between first and second structural members; actuating means adapted to activate said devices; and control means adapted to activate said actuating means responsive to seismic tremors when said seismic tremors reach a predetermined level of intensity; a preselected number of said first and second building members being equipped with said devices; said actuating means being further adapted to selectively actuate said devices to vary the rigidity of selected portions of said building; said actuating means including computer means, in communication with said seismic detector means, adapted to selectively actuate said rigidity control devices, responsive to communication between said computer and said seismic detector means, each of said rigidity control devices comprising a beam, said actuating means being adapted to deflect said beam to vary the rigidity of said selected portions of said building, whereby the natural vibration period of said building is varied as required by said beam deflection to protect it from destructive earthquake-induced vibration.

4,922,668
SERVICE ACCESS UNIT FOR FLOORS
Harold J. W. Payne, Chester, England, assignor to Bally Engineered Structures, Inc., Bally, Pa.
PCT No. PCT/US86/00571, § 371 Date Jun. 19, 1986, § 102(e) Date Jun. 19, 1986, PCT Pub. No. WO86/05833, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 19, 1986, Ser. No. 879,226
Claims priority, application United Kingdom, Mar. 27, 1985, 8507915
Int. Cl.[5] E04B *5/48;* H02G *3/12, 3/18*
U.S. Cl. 52—221 **9 Claims**



1. A service access unit for such services as electrical power, telephone and computer communication and the like in a floor system disposed above a subfloor having elongate trunking with a top portion for one service feed segregated from other service feed or feeds, the unit comprising a frame to extend across such elongate trunking and beyond such elongate trunking at least to one side thereof, the frame being securable relative to and being not larger than an aperture in the floor of greater size than a lesser aperture into the top of the trunking, said less aperture to be within the first mentioned aperture, the frame having sides; and a subsidiary member having flanged sides and fitting within the frame with the flanged sides connected to two of the sides of the frame, such subsidiary member extending into said lesser aperture with the flanges sides closing off upper section portions of the trunking to define a box inser into the trunking and affording outlet for the service in the trunking, outlet for at least one other service whose feed is outside the trunking being available from at least one side of the subsidiary member but within the frame.

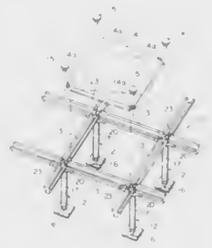
4,922,669
MODULAR LATTICEWORK STRUCTURE
Jonathan De Pas; Donato D'Urbino, and Paolo Lomazzi, all of Milan, Italy, assignors to Quattrocchio S.r.l., Italy
Filed Sep. 19, 1988, Ser. No. 245,774
Claims priority, application Italy, Sep. 18, 1987, 310 A/87
Int. Cl.[4] E04H *12/18*
U.S. Cl. 52—646 24 Claims



1 A modular latticework structure that consists of rods forming any three dimensional framework, and being mutually-connected at structure knots by means of junction plates peripherally provided with inclined flanges at an angle of 45° set in mating relation to be orthogonally joined and connected by means of screws, characterized by the combination of the following features:
(a) each junction plates comprises at least one coupling hub projecting from one face of the plate, perpendicular to a plane thereof, for removably fastening at least one latticework rod to said junction plate;
(b) the flanges in each junction plate are inclined relative to the plane of the plate, toward the plate face from which there projects the said at least one coupling hub;
(c) each of the flanges in each junction plate comprises a free edge formed with a bead projecting from a side of a flange which is turned toward a coupling hub, and extending over at least part of a length of the flange, whereby an enlarged attachment molding is formed between the bead and a corresponding opposite bead in a mating flange of another junction plate;
(d) connecting grippers removably connect the said enlarged attachment molding formed along the outward edge between two orthogonally joined junction plates to at least one latticework rod wherein said connecting gripper has a gripper first end comprising jaws for removably clamping onto said molding, and a gripper second end comprising means for removably fastening onto said at least one latticework rod.

4,922,670
FREE ACCESS FLOOR AND METHOD OF CONSTRUCTING THE SAME
Hiromasa Naka; Norio Nakamura, both of Tokyo; Takehiko Okushima, Saitama; Takao Okumura, Saitama, and Tatsuo Shoji, Saitama, all of Japan, assignors to Naka Technical Laboratory, Tokyo, Japan
Filed Jan. 27, 1989, Ser. No. 302,319
Int. Cl.[5] E04F *15/024*
U.S. Cl. 52—126.6 11 Claims

1. A free access floor comprising:
a plurality of bases secured to a surface where said free access floor is to be built, each of said bases having a base plate, a threaded member standing on said base plate, and a height adjusting nut screwed on said threaded member;
a plurality of column members supported on said bases, respectively, and each being pivotally engaged at the lower end portion thereof with said height adjusting nut and thereby supported so that each of said column members has a pivot point near said free access floor building surface;
a plurality of stringers each connected between a pair of adjacent column members in such a manner that said stringer is not displaced relative to said column members, said stringers extending substantially horizontally;
a plurality of floor panels supported on said stringers; and
fastening means for securing said floor panels to said column members;
said height adjusting nut having a shoulder portion and an annular groove formed in the peripheral surface thereof,



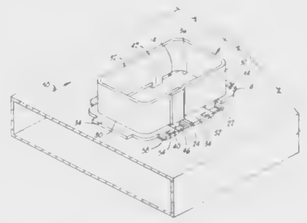
said shoulder portion being reduced in diameter at the upper side thereof, said groove being disposed above said shoulder portion, so that the lower end portion of said column member is engaged with said shoulder portion, and a disengagement preventing bolt attached to said column member, said bolt being radially movable toward and away from said column member, the distal end portion of said bolt being fitted into said annular groove.

4,922,671
METHOD FOR EFFECTIVELY RESTRAINING RESPONSE OF A STRUCTURE TO OUTSIDE DISTURBANCES AND APPARATUS THEREFOR
Takanori Sato, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan
Filed May 6, 1988, Ser. No. 191,278
Claims priority, application Japan, Nov. 17, 1987, 62-290233; Nov. 17, 1987, 62-290235; Nov. 17, 1987, 62-290237; Nov. 17, 1987, 62-290238
Int. Cl.[5] E02D *27/34*
U.S. Cl. 52—167 DF 18 Claims



1. An apparatus for effectively restraining response of a structure to outside disturbances over an extended frequency band, the structure having a natural frequency, the apparatus comprising:
(a) an enclosure defining an inner space thereby and being secured to the structure;
(b) a liquid retained in the enclosure and having a free surface, said liquid retained in said enclosure forming a vibration damping system characterized by at least one sloshing natural frequency of said liquid and a damping coefficient, said sloshing natural frequency of said liquid generally coinciding with said natural frequency of said structure; and
(c) a dynamic obstacle means disposed in said enclosure and submerged in said liquid for disturbing a flow of the liquid sloshing in said enclosure in response to outside disturbances, whereby said dynamic obstacle means increases said damping coefficient of said vibration damping system so as to extend the frequency response of said vibration damping system over an extended frequency band.

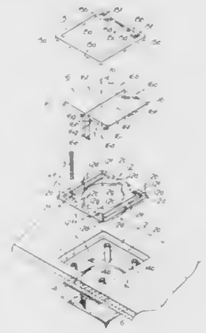
4,922,672
SNAP-ON UNDERFLOOR PRESET
Edward C. Bartee, Fairfield; Edward C. Bartee, Fairfield, Ohio, and Donald L. Chapman, Liberty, Ind., assignors to Square D Company, Palatine, Ill.
Filed Mar. 10, 1989, Ser. No. 321,613
Int. Cl.[5] E04B *5/48*
U.S. Cl. 52—221 20 Claims



1. A preset insert construction for a raceway system for placement in a floor, comprising:
a duct having an access opening defined in a wall thereof, said access opening having a primary perimeter and a plurality of notches extending beyond said primary perimeter;
a preset insert having:
an extension collar defining an insert opening therethrough similar in size and shape to said access opening;
a support flange extending outwardly from a lower end of said collar;
a plurality of locking tabs extending downward from said collar below said support flange, said tabs each including an outwardly extending locking lip portion; and
wherein said tabs are located relative to each other in a pattern corresponding to said notches, and are located on said preset insert so that when said tabs are inserted into said notches said insert opening is partially out of alignment with said access opening, and so that when said insert is then moved relative to said duct to an aligned position wherein said insert opening is aligned with said access opening said wall of said duct is located between said support flange and said lip portions of said tabs.

4,922,673
FIXTURE FOR FLOOR OPENING
Kazuo Ishii; Satoshi Yamashita, and Hiroyuki Ishige, all of Tokyo, Japan, assignors to Senoh Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 31, 1988, Ser. No. 264,390
Claims priority, application Japan, Dec. 11, 1987, 62-188327[U]
Int. Cl.[5] E02D *27/42*; B61D *45/00*; E04B *5/48*
U.S. Cl. 52—221 8 Claims

1. A floor fixture comprising:
a plate having an upper surface and opposed ends and including a pair of elongated holes adjacent to the opposing ends thereof and a center opening for receiving a pole, said plate being fixed on a floor;
a frame mating with and attached to the upper surface of said plate and defining therewith a mating surface, said frame including an opening exposing said elongated holes and center opening;
a lid including a pair of hinge members each of which consists of a lid portion associated with either of said elongated holes to close the opening of said frame, a pole receiving portion associated with said center opening for receiving said pole, said pole receiving portion having a free end and a hinge pin through which said lid portion and said pole receiving portion are hingedly connected with each other, said lid portion having a free end and including a first pivotable portion in the vicinity of the free end thereof, parallel to the axis of said hinge pin, said pole receiving portion including a second pivotable portion provided in the vicinity of the free end thereof, parallel to the axis of said hinge pin;

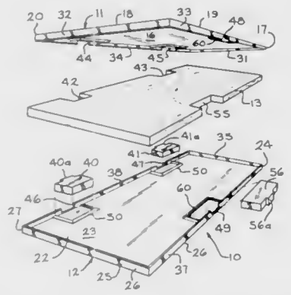


said frame including first and second bearing surfaces being capable of pivotally supporting said first and second pivotable portions respectively, said bearing surfaces being formed on the mating surface of said frame to the upper surface of said plate; and
said lid being movable to a first set position wherein said first pivotable portions are supported by said first bearing surfaces and said lid portions are flush with the floor to cooperatingly close the opening of said frame while said pole receiving portions are disposed beneath the frame and a second set position wherein said second pivotable portions are supported by said second bearing surfaces and said pole receiving portions are flush with the floor to cooperatingly define an opening for receiving the pole.

4,922,674
COMPRESSION MOLDED DOOR ASSEMBLY
John E. Thorn, Sylvania, Ohio, assignor to Therma-Tru Corp., Toledo, Ohio
Filed Jun. 15, 1988, Ser. No. 207,172
Int. Cl.[5] E04C *1/00, 2/34*
U.S. Cl. 52—309.15 2 Claims

1. A door assembly comprising, in combination, a pair of skins, each of said skins having an outer side, an inner side, top and bottom edges and opposed side edges, at least one of said skins being integrally compression molded including resin and fibrous glass, the outer side of said compression molded skin defining a textured pattern simulating the grain and texture of a wood door, said compression molded skin having integral edge members extending from each of said top, bottom and side edges at substantially right angles to the plane formed by its inner side, a core positioned between said skins, means for connecting the integral edge members to the other of said skins, means for mounting said door assembly, said side edges having notch means, said mounting means including a pair of

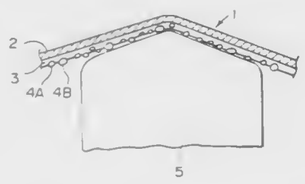
side frame members, one positioned adjacent each of said side edges, and having projection means extending into said notch means and retention means integrally molded with and extending from the inner side of said compression molded skin, said retention means sized to receive each of said side frame members.



4,922,675
ABRASIVE TAPE

Masami Sato; Masaaki Fujiyama; Takashi Iwasaki; Masami Suzuki; Takashi Yoneyama, and Hideaki Kosha, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1989, Ser. No. 337,778
Claims priority, application Japan, Apr. 13, 1988, 63-90951
Int. Cl.[5] B24D *11/00*
U.S. Cl. 51—394 8 Claims



1. An abrasive tape comprising a flexible substrate and an abrasive layer which is overlaid on said flexible substrate and which contains abrasive grains and a binder, wherein said abrasive grains comprise first abrasive grains, which have a mean grain diameter within the range of 0.07 μm to 0.40 μm and a Mohs hardness within the range of 5 to 7, and second abrasive grains, which have a mean grain diameter within the range of 0.20 μm to 0.60 μm and a Mohs hardness not lower than 8.5, wherein the ratio of the weight of said first abrasive grains to the weight of said second abrasive grains falls within the range of 1.0:1 to 16.0:1.

4,922,676
CLOSURE AND SEAL FOR PREFABRICATED BUILDING PANELS

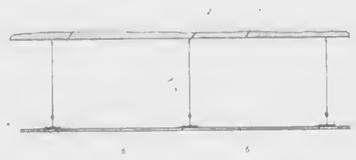
John R. Spronken, 95 Chelsea St., N.W., Calgary Alberta, Canada (T2N 3P9)

Filed Jan. 23, 1989, Ser. No. 299,459
Int. Cl.[5] E04B *1/62, 1/68*
U.S. Cl. 52—396 2 Claims

1. A closure and seal assembly for joining the edges of prefabricated wall panels comprising:

(a) a pair of elongated pocket members each adapted to be embedded in or fastened to a face of a prefabricated wall panel, each pocket member having inner and outer side walls and inner and outer end walls with said outer end wall containing an elongated opening slot and a pair of resilient sealing strips fixed to the edges of said slot and adapted to extend into the pocket and at least one vent hole extending through at least one side wall and

(b) an elongated spline member adapted to connect between the pocket members, said spline comprising a web portion with T-flanges on the side edges thereof and resilient sealing strips projecting outwardly from free edges of the T-flanges, the spline being adapted to be snugly held between said pocket sealing strips and said T-flanges being adapted to be held within the pockets with said T-flange resilient sealing strips being adapted to sealingly engage the side walls of said pocket.



4,922,677
BOARD PARTICULARLY FOR USE BY SUSPENDED CEILINGS

Lars G. Fridh, Malmö , Sweden; Benni Madsen, Kalundborg, and Vagn N. Rasmussen, Bjaeverskov, both of Denmark, assignors to Gyproc AB, Malmo, Sweden

Continuation of Ser. No. 18,502, Feb. 25, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,549
Claims priority, application Denmark, Feb. 27, 1986, 904/86
Int. Cl.[5] E04B *5/57*
U.S. Cl. 52—486 6 Claims

1. A suspended ceiling arrangement for holding a plurality of adjacent panels having first and second side edges in a side by side relationship from a plurality of substantially parallel suspension elements of the type having a substantially T-shaped configuration with a cross member having first and second edges, the suspension elements being spaced apart by approximately the width of a panel between its first and second side edges comprising:

a first and a second hanging strip for mounting on the upper surface of each panel which is to be suspended adjacent a corresponding first and second side edge of adjacent panels,

said first side edge of a panel completely overlying the cross member of a first suspension element and said second side edge of the panel lying adjacent to but spaced away from the second edge of a second suspension element adjacent the panel second side edge,

the first hanging strip on said panel being adjacent the first side edge thereof and lying completely inwardly of said panel first side edge and having a hook shaped end adapted to slidably receive and fit over only the first suspension element cross member first edge to support the panel first side edge and to form a hinge type joint allowing rotation and motion of the panel on said first suspension element cross member,

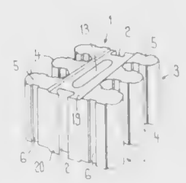
the second hanging strip on said panel extending beyond the second side edge of the panel and having a raised lip portion to overlie only the top of the second edge of the cross member of said adjacent second suspension element and to rest thereon to support the panel second side edge, the second side edge of the panel being spaced away from the second edge of the cross member of said second suspension element,

removal of a panel being accomplished by pushing upwardly of the second side edge thereof to lift the raised lip of the second hanging strip upwardly and off of the second edge of said adjacent second suspension element cross member and to rotate the panel with its second side edge clearing the second edge of the second suspension element about the hook part of the first hanging strip until the first hanging strip becomes disengaged from the first suspension element cross member first edge.

4,922,678
STRUCTURAL ASSEMBLY FOR PRODUCING INTERCONNECTING STRUCTURES

Rolf Scheiwiller, Buolterlistrasse 9, CH-6052 Hergiswil, Switzerland

Continuation of Ser. No. 168,515, Mar. 15, 1988, abandoned. This application Oct. 19, 1989, Ser. No. 425,378
Claims priority, application European Pat. Off., Mar. 20, 1987, 87810163.3
Int. Cl.[5] E04C *1/10*
U.S. Cl. 52—570 10 Claims



1. A structural assembly for producing interconnecting structures, comprising a first element which, on each of two transversely extending sides lying opposite to each other, is provided with a dovetail joint member used to connect said element to other elements, and on each of two longitudinally extending sides lying opposite each other, is provided with at least two fins having a convex portion provided on each side with a corresponding, connecting recess formed to correspond to the fins.

4,922,679
HOLDING AND SUPPORTING ANCHOR TO BE CEMENTED-IN IN A BOREHOLE IN A MOUNTING BASE

Siegfried Fricker, Wurmberger Strasse 30-34, D-7135 Wiernsheim, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 143,108
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1987, 3700743; May 27, 1987, 3717816
Int. Cl.[5] E04B *1/38*
U.S. Cl. 52—698 7 Claims

1. A holding and supporting anchor having a forward end and a rearward end and adapted to be mortared in a borehole of a construction element of concrete or masonry, comprising:

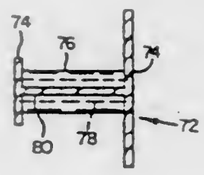
(a) a supporting section at the forward end of said anchor and adapted to protrude from said borehole, said supporting section being constructed and arranged to support at least one facing plate or the like spaced outwardly from said construction element,

(b) a longitudinal section rearwardly of said supporting section and having a forward and rearward end, said longitudinal section being in the form of a single tube adapted to extend at least partly into said borehole, said tube having an axis which lies in vertical and horizontal planes, and

(c) a series of individual axially spaced deformities in said longitudinal section, said deformities being of limited peripheral dimension and being radially offset from wall areas of the longitudinal section immediately surrounding said deformities, with the longitudinal section maintaining its diameter except where said deformities occur, said deformities not extending through the outer surface of said longitudinal section which, together with the spacing of said deformities, does not weaken the resistance of said longitudinal section to torsional stress, and wherein

(d) said supporting section consists of crimped parts of said tube pressed together to form a flat, load supporting surface,

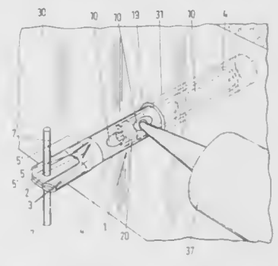
whereby, when the supporting anchor is mortared in the borehole, said deformities absorb torsional, tensile and compressional forces acting on said anchor and transmit the same to said construction element.



4,922,680
SYSTEMS AND METHODS FOR CONNECTING MASONRY VENEER TO STRUCTURAL SUPPORT SUBSTRATES

Donald R. Kramer, Vancouver, Wash., and Eric M. Hayford, Portland, Oreg., assignors to MKH Enterprises, Inc., Vancouver, Wash.

Filed Jan. 9, 1989, Ser. No. 294,415
Int. Cl.[5] E04B *1/38*
U.S. Cl. 52—713 18 Claims



1. A masonry veneer tie system for connecting a masonry veneer wall to a supporting structure, said masonry veneer wall including courses of masonry joined together by mortar material forming a conventional mortar joint, said masonry veneer tie system including a masonry veneer tie device comprising

a masonry veneer tie body including means defining an aperture for inserting means for fastening said masonry veneer tie device to said supporting structure at a fastening point; and

a masonry tie element for connecting said veneer masonry tie device to said masonry wall by attachment within said mortar material and thereby counteracting the substantially horizontal forces imparted to the masonry veneer tie device, the maximum cross-sectional dimension of said masonry tie element being less than the thickness of said mortar material,

said veneer tie device, in the fastened position, being movable in an arcuate path about said fastening point, and thereby said veneer tie element being connectable within said conventional mortar joint at any point along said arcuate path, between a plurality of said courses of masonry in said masonry wall, for counteracting horizontal and vertical forces imparted to said veneer tie device by said masonry wall and said supporting structure,

said veneer tie element, in the fastened position, having a longitudinal axis substantially normal to the vertical plane of the masonry veneer wall.

4,922,681

HOT-ROLLED CONCRETE REINFORCING BAR, IN PARTICULAR REINFORCING RIBBED BAR

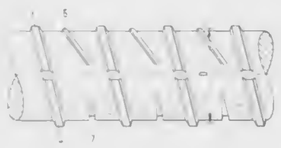
Dieter Russwurm, Puchheim, and Dieter Jungwirth, Munich, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann AG, Fed. Rep. of Germany and Arbed S.A., Luxembourg

Filed Sep. 9, 1988, Ser. No. 242,729

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 37304909

Int. Cl.[5] **E04C** *5/03*

U.S. Cl. 52—737 **20 Claims**



1. Hot-rolled concrete reinforcing bar (**1**), in particular reinforcing ribbed bar consisting of steel having a content of

$0.10 \leqq C \leqq 0.27$

$0.40 \leqq Mn \leqq 1.40$

$Cu \leqq 0.80$,

with circular or almost circular core cross-section (**2**) and two opposed rows of ribs (**3**,**4**) of substantially trapezoidal cross-section which are arranged along a helical line and form portions of a thread for screwing on an anchoring or connecting body provided with a counter thread and which with the definitions

b = foot width of the rib

d_s = nominal diameter of the reinforcing steel

h = rib height

R = curvature radius at the rib foot in mm

α = inclination of the rib with respect to the longitudinal axis of the reinforcing steel in old degrees

β = inclination angle of the rib flank in old degrees, have a rib form and a rib arrangement which fulfills the following conditions

$40° < \beta < 60°$

$1.0 < R < 3.0$

$0.04 \leqq h/d_s \leqq 0.06$

$1.5 \leqq b/h \leqq 3.3$

$60° < \alpha < 80°$

and which by scale formation by means of a quenching and reheat treatment from the rolling heat the coefficient of friction of the concrete reinforcing bar in the rib region is increased compared with the rolling state.

4,922,682

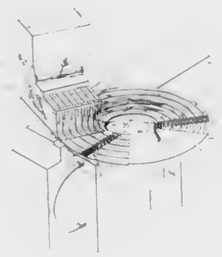
APPARATUS AND METHOD FOR SEALING AND BANDING CAPSULES

Charles N. Tait, Manheim, and Ralph A. Volpe, Landisville, both of Pa., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 15, 1988, Ser. No. 144,122

Int. Cl.[5] **B65B** *51/02, 51/20*

U.S. Cl. 53—139.3 **7 Claims**



1. In a machine for applying a banding or sealing fluid to a capsule, said machine having capsule supply means, means for applying one of a capsule sealing and banding fluid to the capsule, and capsule curing means, and wherein a rotating capsule transfer plate receives the capsule from the capsule supply means and conveys them past the means for applying a sealing or banding fluid and to the capsule curing means, the improvement comprising:

capsule heating and drying means associated with the capsule transfer plate and defining an enclosed chamber through which the plate moves, said chamber being disposed immediately after a sealing means for applying a sealing fluid and before a banding means for applying a banding fluid whereby sealed capsules are conveyed by the plate through the chamber for heating and drying of the sealing fluid to at least partially cure the capsule seal, said capsule heating and drying means including means for circulating a heated fluid medium such as air over the capsules in the chamber, and including heating means for heating the fluid medium.

4,922,683

SHRINK BANDING MACHINE

Thomas Connolly, Nashua, N.H., assignor to Austin-Gordon Design, Inc., Nashua, N.H.

Filed Nov. 10, 1988, Ser. No. 269,871

Int. Cl.[5] **B32B** *31/00*

U.S. Cl. 53—296 **23 Claims**

1. Apparatus for applying flexible plastic bending sleeves on containers comprising:

a generally vertically extending supporting frame;

a roll of continuous flattened tubular web of thin flexible plastic, said roll being rotatably mounted on said frame;

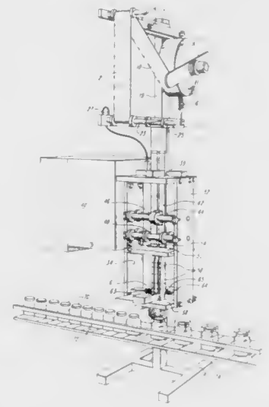
a planar element having a generally rectangular form, the long axis of said rectangle being aligned with the longitudinal dimension of said web, said planar element including rollers mounted within it on a rotational axis parallel to the face of said plane;

a pair of rollers mounted on said frame exterior to said web, said planar element being supported within said web, said pair of exteriorly mounted rollers bearing through said web on the rollers mounted within said planar element;

web feeding means for unrolling said web and feeding it in its flattened form over said planar element to open said web to substantially the cross sectional dimensions of said planar element;

a floating mandrel positioned in the path of said moving web beyond and in general alignment with said planar element, the edge of said mandrel closest to the planar element having transverse cross sectional shape substantially the same as the transverse shape of the edge of said planar element in juxtaposition to it, said mandrel being formed so that its shape changes along the axis of the path of travel of said web to provide a transverse cross sectional shape at its other end substantially the same as the shape of said container in a dimension transverse to the axis of travel of said web;

first mandrel supporting means included within said mandrel, and second mandrel supporting means positioned on



said frame exterior to said web in cooperative relationship with said first support means to support said mandrel within said web;

a shearing blade mounted don said frame on one side of the thickness dimension of said web at a longitudinal position between said planar element and said floating mandrel;

sensor means for determining the length of said web which has passed the position of said shearing blade;

means responsive to the sensing of a particular length of web passing said position for momentarily stopping the travel of said web;

means operative when said web is stopped to cause reciprocal motion of said shearing blade transverse to the path of travel of said web to cut said opened web and return to its original position, providing a severed segment of web to form a banding sleeve; and

transport means for moving said severed segment of web over said mandrel and onto said container.

4,922,684

CAPS FOR MILK BOTTLES AND AN APPLICATOR FOR PLACING CAPS ON BOTTLES

Laurence A. Nelson, Knoxville, Tenn., assignor to PI, Inc., Athens, Tenn.

Filed Jan. 15, 1988, Ser. No. 144,564

Int. Cl.[5] **B67B** *3/20;* **B65B** *7/28*

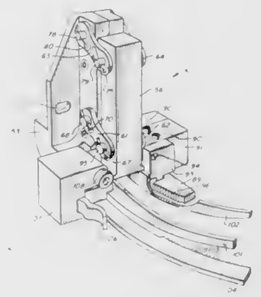
U.S. Cl. 53—314 **25 Claims**

1. An applicator for applying a bottle cap having a first plurality of screw threads to a bottle moving in a predetermined direction on a conveyer having a neck with a second plurality of matching screw threads comprising:

(A) a chute with substantially smooth surfaces for said caps;

(B) retaining means having first and second configurations for, in the first of said configurations, holding a particular one of said caps at a particular location in said chute and, when in said second configuration, allowing the movement of said particular cap in said particular direction; and

(C) tension means including a weight, coupled to said retaining means and acting under the force of gravity, said



weight being sufficient to urge said retaining means into said first configuration, said tension means being overcome and said retaining means being moved to said second configuration by the force of a bottle in contact with said particular cap and moving in said particular direction on said conveyer.

4,922,685

PANTIHOSE PACKAGING AND MANUFACTURE

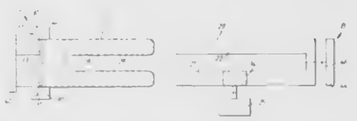
Michael J. Hodges, High Wycombe, England, assignor to Detexomat Machinery Limited, High Wycombe, England

Continuation of Ser. No. 73,017, Jul. 14, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 285,120

Claims priority, application United Kingdom, Sep. 11, 1986, 8621957

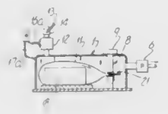
Int. Cl.[5] **B65B** *15/00, 25/20*

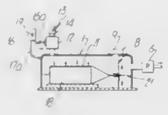
U.S. Cl. 53—429 **29 Claims**



1. A method of packaging a hosiery article comprising a pantihose garment which involves use of a flat support having a pair of elongate limbs which extend side by side, a former is laid on one limb, the garment is drawn onto the support stretching its legs over the respective limbs of said support whereby said former is located inside one of the stretched legs, the garment is thereafter dismounted from the support with said former entrapped within said one leg whereby said former maintains at least a portion of said one leg in a stretched flat state, and the remainder of the garment is disposed to one side of the portion of said leg containing the former.

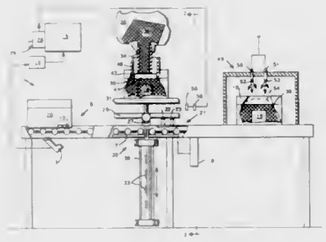
4,922,686
VACUUM PACKAGING METHOD
Pietro Segota, Milan, Italy, assignor to W. R. Grace & Co., Duncan, S.C.
Continuation of Ser. No. 433,319, Oct. 7, 1982, abandoned. This application Jun. 21, 1985, Ser. No. 747,400
Claims priority, application Italy, Oct. 16, 1981, 24538 A/81
Int. Cl.[5] B65B *31/02*
U.S. Cl. 53—434 1 Claim





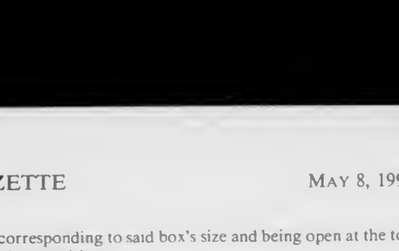
1. In the process of vacuum packaging articles in flexible receptacles by placing the filled, unsealed receptacle in a vacuum chamber, lowering the pressure below atmospheric thereby ballooning the receptacle away from the article, and, subsequently, raising the pressure in the chamber to collapse the receptacle onto the article and sealing the receptacle, the improvement which comprises after the pressure has been lowered and raised in a first cycle and before the receptacle is sealed the additional steps of lowering and raising the pressure through at least one additional cycle of lowered and raised pressure to cause the receptacle to alternately balloon away from and collapse upon the article thereby pumping residual air from within the receptacle and, thereafter, sealing the receptacle.

4,922,687
AUTOMATED PACKAGING LOOSE FILL SYSTEM
Carl S. Chow, Mountain View, Calif.; Timothy J. Zantow, Baraboo, Wis.; Mok-Wing Fung, Stanford, and Hansgregory C. Hartmann, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 24, 1989, Ser. No. 342,917
Int. Cl.[5] B65B *55/20*
U.S. Cl. 53—472 11 Claims



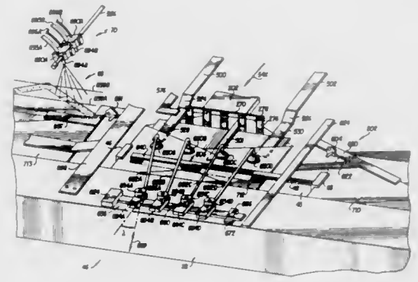
1. A computer-controlled loose fill feeding device for a series of boxes of various sizes, each box having thereon a bar code corresponding to said box's size and being open at the top thereof, comprising:
a computer having setting means for setting control parameters,
reading means for reading the bar code on each box, said computer then adjusting said control parameters accordingly,
a conveyor for moving the box horizontally, said conveyor having a brake,
longitudinal centering means for centering the cylinders at a particular position determined by said bar code, and for simultaneously stopping the conveyor by actuating said brake,
widthwise centering cylinders for centering the box relative to a predetermined position,
a lift cylinder with a platform thereon for lifting the box to a fill height determined by said bar code and then stopping the lifting,
filling means for filling the box by gravity with loose fill through a feed-in pipe until the feed-in pipe is clogged, and then automatically stopping the filling operation,
lowering means for then lowering the lifting cylinder and the box down to the conveyor, and
leveling means for blowing a series of blasts of air toward said loose-filled box, in order to level the loose fill in the box.

4,922,688
LOAD SETTLING MECHANISM FOR CARTON LOADING MACHINES
Marinus J. M. Langen, Rexdale; Peter Guttinger, Milton, and Heiner Hoefkes, Mississauga, all of Canada, assignors to E. J. Langen & Sons Limited, Mississauga, Canada
Filed May 25, 1989, Ser. No. 356,514
Int. Cl.[5] B65B *1/22*
U.S. Cl. 53—525 14 Claims



1. In a load transporting conveyor of the type which has a plurality of load confining compartments located thereon which are transported by the conveyor along a load transporting path, the improvement of load settling means comprising:
(a) a load support platform forming a bottom wall of each compartment, said platform having a marginal edge portion which extends along one edge of the conveyor,
(b) at least one resilient support pad supporting said bottom wall with respect to said conveyor, said support pad being spaced a substantial distance from said marginal edge so as to permit a substantial degree of freedom of movement of the marginal edge portion such that the load platform is free to vibrate with respect to said conveyor,
(c) vibration activator means located along the load transporting path so as to engage the marginal edge portion of successive load support platforms as they are transported along the load transporting path, said vibration activator means being operable to cause the load support platform to vibrate to thereby vibrate any load which is located thereon to cause the load to settle into the load confining compartment.

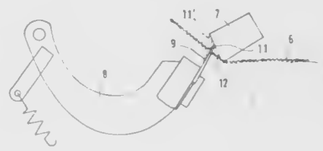
4,922,689
INSERTION MACHINE
David A. Haas, Schaumburg; Gary L. VanderSyde, Naperville; Paul J. Beatty, and Renato O. Roxas, both of Chicago, all of Ill., assignors to Bell & Howell Phillipsburg Company, Allentown, Pa.
Division of Ser. No. 30,015, Mar. 25, 1987, Pat. No. 4,798,040. This application Nov. 15, 1988, Ser. No. 271,260
Int. Cl.[5] B65B *7/00*
U.S. Cl. 53—569 8 Claims



1. An insertion machine comprising:
a frame;
an envelope opening station, said envelope opening station comprising:
means for positioning an envelope in a manner whereby said envelope lies essentially in a first plane;
means for deflecting at least one panel of said envelope when said envelope lies essentially in said first plane so that at least one item can be inserted into said envelope, said deflecting means being mounted on an elongated stem member;
carriage means upon which said elongated stem member is carried, said carriage means including a gate member having a first end and a second end, said gate member being hingedly connected to said frame at said gate member first end, said gate member second end being selectively lockable into a locked position, said gate member being swingable about an axis which is inclined at an acute angle with respect to said first plane when said gate member second end is not in said locked position in order to swing said deflecting means away from the vicinity of said envelope;
an insertion station positioned proximate said envelope opening station for inserting at least one item into an at least partially opened envelope; and
means for transporting at least one item to said insertion station.

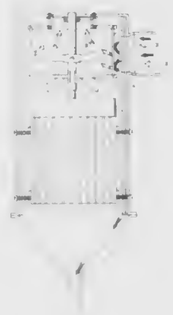
4,922,690
ROUND BALER
Eike Güsewell; Hans-Peter Wölfle, both of Gottmadingen, and Egon Maier, Hilzingen-Riedheim, all of Fed. Rep. of Germany, assignors to Greenland GmbH & Co. KG, Gottmadingen, Fed. Rep. of Germany
Filed May 10, 1989, Ser. No. 349,560
Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816219
Int. Cl.[5] B65B *11/56, 13/00, 27/12, 41/12*
U.S. Cl. 53—587 12 Claims

7. A round baler comprising:
a pressing chamber having an axis for baling a product;
a supply roll arranged parallel to the axis of the pressing chamber for providing a netting web;
means for unwinding a netting web along a path from the supply roll to the pressing chamber and means for wrapping a netting web around a product being baled in the pressing chamber;



a pivotable beating knife bar having a cutting edge extending across the width of said web and positioned on one side of the path at a point between the supply roll and pressing chamber for separating a netting web; and
an anvil positioned on the opposite side of the path from the beating knife bar, and having a surface having a plurality of parallel spaced-apart recesses continuously extending parallel to the beating knife bar edge.

4,922,691
SEPARATOR OF VAPORIZING OIL AND SMOKE
Hsin-Der Shen, 208, Min Shen West Rd., Taipei, Taiwan
Filed Sep. 12, 1988, Ser. No. 243,582
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—400 2 Claims



1. An apparatus for cleaning contaminants from an exhaust gas comprising:
a cylindrical outer casing enclosure;
a convergent-divergent inlet means for introducing said exhaust gas into said casing; a rotatable filter drum supported inside said casing by a drive shaft arranged along the longitudinal axis of said casing; said drum being axially located by means of a bearing block such that filter media arranged circumferentially around said drum directly faces said exhaust gas inlet means; said bearing block providing an operatively sealed clean gas outlet from said drum and said casing, thereby preventing escape of unfiltered exhaust gas;
reversible drive motor means located within said outer casing for driving said shaft selectively in a clockwise or counterclockwise direction; centrifugal fan means secured to said shaft below said rotatable filter drum and gas inlet means; lining means having a plurality of grooves secured within said outer casing, said grooves collecting contaminants separated from said exhaust gas; an axial flow fan

VOL 114 ISS 2 MY 8 1990 UMI

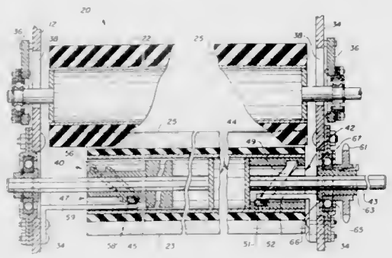
located inside said rotatable filter drum and secured to said drive shaft; and conical contaminant collection means secured to the bottom of said outer casing.

4,922,692

METHOD OF CONDITIONING FORAGE CROPS

Gilbert W. Linde; Shaun A. Seymour, and Emmett G. Webster, all of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 17, 1989, Ser. No. 324,790
Int. Cl.[5] A01D *91/00*
U.S. Cl. 56—1 15 Claims



1. A method of conditioning forage crops by a conditioning mechanism having a pair of counterrotating conditioning rolls each of which has an outer peripheral surface forming a throat therebetween for the passage of said forage crop therethrough, comprising the steps of

counterrotating said conditioning rolls;

simultaneously effecting relative transverse movement between the respective outer peripheral surfaces of said conditioning rolls by inducing a reciprocating transverse motion to the outer peripheral surface of at least one of said conditioning rolls while in engagement with said forage crop in said throat during the rotation of said at least one conditioning roll; and

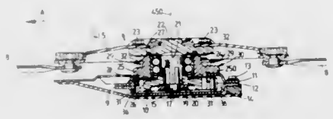
feeding said forage crops into said throat simultaneously with said counterrotating and effecting steps.

4,922,693

MOWER EQUIPPED WITH A CUTTING BAR

Horst Neuerburg, Saverne, France, assignor to Kuhn S.A., Saverne, France

Filed Jan. 23, 1989, Ser. No. 299,450
Claims priority, application France, Jan. 22, 1988, 88 00901
Int. Cl.[5] A01D *34/66, 34/76*
U.S. Cl. 56—13.6 34 Claims



1. A mower equipped with a cutting bar, said cutting bar comprising:

an elongate housing having a longitudinal axis and adapted in a work position to extend close to a field surface so that said longitudinal axis extends transversely to a direction of work, said housing when in said work position having an upper part and a lower part, said upper part including a plurality of bores formed therein, and said housing containing first gears positioned therein;

a plurality of guiding and driving bearings;

a plurality of cutting elements extending, when said housing is in said work position, above said housing and at least a part of said plurality of cutting elements each being guided and driven in rotation about a corresponding axis directed upward by a corresponding one of said guiding and driving bearings, wherein each of said guiding and driving bearings comprises a casing centered in a corresponding one of said bores in said upper part of said housing, a guiding bearing mounted in said casing, a shaft guided in said casing via said guiding bearings, a fastening part for fastening the corresponding one of said at least one part of said plurality of cutting elements, said fastening part being connected to an upper end of said shaft, and a second gear connected to a lower end of said shaft, said second gear extending in said housing and meshing with at least a corresponding one of said first gears positioned in said housing, said second gear having an outside diameter less than a diameter of said corresponding bore formed in the upper part of said housing; and

assembly elements for removably fastening said guiding and driving bearings to said upper part of said housing, said assembly elements including a plurality of fastening members each one of which having a threaded upper portion extending when said housing is in said work position above said upper part of said housing and a lower portion positioned entirely within said housing, a plurality of nuts each one of which being screwed on said threaded upper portion of the corresponding one of said fastening members, and one or several holding elements positioned entirely within said housing and to which are fastened said fastening members by their corresponding lower portion for holding each one of said fastening members in position and for preventing rotation of each one of said fastening members during tightening or loosening of the corresponding nut, said one or said several holding elements and said fastening members fastened thereto being removable from said housing.

4,922,694

WHEELED SUPPORT FOR LINE TRIMMER

Clesson T. Emoto, 812 Kealahou St., Honolulu, Hi. 96825

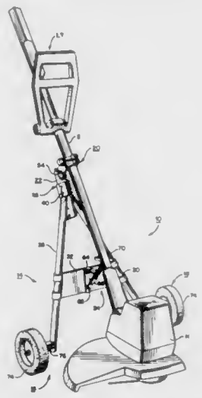
Filed Dec. 2, 1988, Ser. No. 279,410
Int. Cl.[5] A01D *34/67, 34/84, 67/00*
U.S. Cl. 56—16.7 18 Claims

1. A support for a line trimmer having a shaft with an upper portion and a lower portion, comprising:

a substantially planar substantially A-shaped frame having two legs, an apex and a crossbar;

two wheels, each attached to one of the legs of said A-shaped frame;

clamping means for clamping said A-shaped frame to the upper portion of the shaft of said line trimmer, mounted on the apex of said A-shaped frame; and



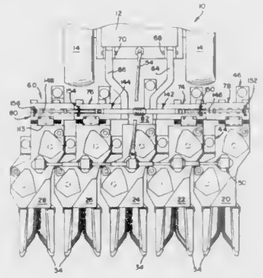
supporting means for supporting the lower portion of the shaft of said line trimmer, attached to the crossbar of said A-shaped frame.

4,922,695

MULTI-ROW COTTON HARVESTER

Michael J. Covington, LaGrange, and Jesse H. Orsborn, Hinsdale, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 6, 1988, Ser. No. 280,372
Int. Cl.[5] A01D *46/14*
U.S. Cl. 56—40 16 Claims



1. A multi-row cotton harvester comprising:

a mobile main frame;

a plurality of cotton harvesting units including a first pair of cotton harvesting units, each harvesting unit defining a fore-and-aft plant passage and includes a first picker rotor with a rotational axis and a second picker rotor with a rotational axis;

an elongated tool bar which is mounted on said frame and extends laterally across a forward end of the frame and rearwardly of said harvesting units, said tool bar being capable of vertical movement relative to said frame;

means for individually connecting said plurality of harvesting units to said tool bar forwardly of the main frame in a side-by-side relationship relative to each other, each individual connecting means comprises support means arranged rearwardly of and connected to a harvesting unit such that each harvesting unit hangs forwardly from the tool bar with a predetermined attitude relative to the frame and for allowing each harvesting to be laterally moved along the tool bar with respect to the frame to facilitate access to the units, and a fore-and-aft extending tension link extending above the harvesting unit and connected to and extending forwardly from said support means for individually setting the predetermined attitude of each harvesting unit relative to the frame; and

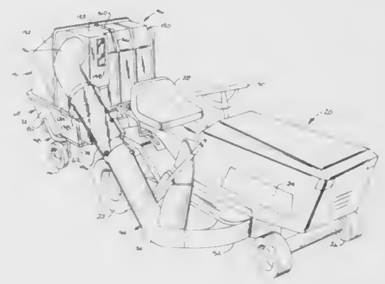
driver means for laterally displacing said harvesting units between said first and second laterally spaced positions.

4,922,696

GRASS COLLECTING/UTILITY CART FOR RIDING LAWN MOWER

Stephen R. Burns, Duluth; Timothy J. Boesch, Roswell; Matthew D. Rao, Alpharetta; Stuart A. Cook, Norcross, all of Ga.; Jack M. Curtis, Santa Fe, and Jack M. Boone, Brentwood, both of Tenn., assignors to The Murray Ohio Manufacturing Company, Brentwood, Tenn.

Filed Jan. 19, 1989, Ser. No. 298,974
Int. Cl.[5] A01D *34/70*
U.S. Cl. 56—202 27 Claims



1. A cart assembly for receiving and collecting grass clippings, leaves and other debris harvested from the ground and discharged by a riding rotary lawn mower or the like to the rear of which said assembly is hitched, comprising:

a chassis having two ground-engaging wheels attached thereto at opposite sides thereof and means at the front end of said chassis for hitching said assembly to a mower or the like;

an open top tub-like bed carried by said chassis;

means mounting said bed to said chassis for rearward tilting about a horizontal transverse axis from a generally horizontal stable loading position to a rearwardly inclined dumping position, said axis being so positioned relative to the center of gravity of said tub when loaded that when said bed is tilted sufficiently rearward said bed will overbalance, move by gravity to said dumping position and dump the contents thereof; and

means for automatically latching said bed to said chassis in said loading position;

operator-controlled means accessible to a mower operator while seated on the mower for unlatching said bed from said chassis in said loading position and for tilting said bed to the overbalance position.

18. Apparatus for cutting grass and collecting grass clippings and other debris comprising:

a riding lawn mower having an operator'seat and a blade housing with a rotary blade therein for cutting grass, said housing having a discharge port for discharging grass clippings and other debris outwardly of said housing;

a cart assembly detachably hitched to the rear of said mower for receiving and collecting grass clippings and other debris discharged from said port, said assembly comprising:

a chassis having two ground-engaging wheels attached thereto at opposite sides thereof;
an open top tub-like bed carried by said chassis;
means mounting said bed to said chassis for rearward tilting about a horizontal transverse axis from a general horizontal loading position to a rearwardly inclined dumping position;
first chute section means having the discharge end thereof secured to said bed for conducing thereto material discharged from said blade housing port and extending from said discharge end forward and downward to an intake end; and
second chute section means having the intake end thereof secured to said blade housing about said port and extending therefrom rearward and upward to a discharge end in telescoping connection with said intake end of said first chute section means, said connection being disconnectable by the rearward tilting of said bed from said loading position to said dumping position and automatically reconnectable by tilting of said bed from said dumping position back to said loading position.

4,922,697
CUTTING ATTACHMENT FOR ROTARY MOWER BLADES AND USE
Anthony J. Paiva, and Pamela J. Paiva, both of Rte. 3, Box 3954-RD 25, Orland, Calif. 95963
Filed Aug. 14, 1989, Ser. No. 393,241
Int. Cl.[5] A01D *43/02*
U.S. Cl. 56—295 **7 Claims**

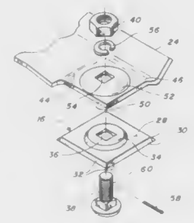


1 A removable cutting attachment for a flat rotary mower blade comprising in combination a short tubular base having a front and back end and at least one flat side and having means for removably joining the back end of the base to the end of a flat mower blade, a C shaped cutting plate element having a straight upper edge at the top of the C and a straight edge at the bottom of the C and two substantially semi-circular side edges, the straight edge at the top of the C being fixedly attached to the flat side of the base, and the straight edge at the bottom of the C forming a sharp cutting edge, a portion of the interior of said cutting plate element being removed to permit passage of any material being cut by the said attachment when joined to the end of a mower blade and the mower is in operation.

4,922,698
CUTTER BAR WITH INDEXABLE BLADES FOR ROTARY LAWN MOWERS
Lyle M. Taylor, 523 Lind St., Quincy, Ill. 62301
Filed Sep. 7, 1989, Ser. No. 404,169
Int. Cl.[5] A01D *34/73, 34/52*
U.S. Cl. 56—295 **10 Claims**

1. A cutter bar with indexable blades for a rotary lawn mower, said cutter bar having a recess on opposite ends thereof for receiving the indexable blades, each said indexable blade comprising a plate with a plurality of sides sharpened into cutting edges and a socket with a hole for receiving the head of a bolt, each said recess in the cutter bar having a socket into which the socket of the indexable blade is fitted and a hole for

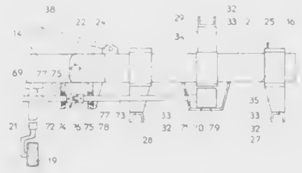




receiving the shank of the bolt, said indexable blade held in the recess in the cutter bar with a nut threaded on the bolt.

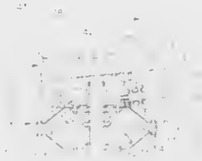
4,922,699
FARM MACHINES WITH A JOINTED TOOLHOLDING FRAME
Jean-Paul Gantzer, Lutzelbourg, France, assignor to Kuhn, s.a., Saverne, France
Filed May 15, 1989, Ser. No. 351,844
Claims priority, application France, May 13, 1988, 88 06619
Int. Cl.[5] A01D *7/00*
U.S. Cl. 56—367 **17 Claims**





1. A farm machine with a toolholding frame movable in a direction of advance, comprising:
a crosswise support and a coupling device which are pivotally connected by means of a substantially vertical hinge pin, said crosswire support having means for connecting at least two rotors, each of said rotors having a support pin and being rotationally driven around said support pin to move hay lying on the ground, said crosswise support having first means for both pivoting the crosswise support around said substantially vertical hinge pin and stopping the crosswise support in several positions in which different angles are formed relative to the direction of advance, wherein the crosswise support comprises a central part which is connected to said coupling device and two lateral parts which are pivotally connected to the ends of the central part by means of substantially horizontal hinge pins, each lateral part being provided with a further coupling device for connection to at least one rotor of said at least two rotors, and each lateral part comprising second means for pivoting said lateral part upward around said substantially horizontal hinge pin, wherein said central part comprises a distribution housing, each of said lateral pats having a transmission housing comprising drive means connected to the corresponding rotor and a transmission shaft connected to said distribution housing.

4,922,700
HAYMAKING MACHINE
Jerome Aron, Bouxwiller, France, assignor to Kuhn, s.a., Saverne, France
Filed May 26, 1989, Ser. No. 357,278
Claims priority, application France, Jun. 3, 1988, 88 07598
Int. Cl.[5] A01D *78/10*
U.S. Cl. 56—370 **16 Claims**



1. A haymaking machine comprising:
(a) a rotor driven in rotation and equipped with tools to windrow plants that are on the ground, said rotor being connected to a beam or a similar support equipped with a three-point coupling device for hooking to a drive tractor;
(b) a central support pin carrying a control cam for said tools, said central support pin being connected to a frame with small support wheels which move over the ground in the work position and which are placed in such a way that their axes of rotation are located at least approximately in two vertical planes which are offset in relation to one another in the direction of movement;
(c) the connection between said rotor and said beam comprising a hinge pin that is at least approximately horizontal and approximately perpendicular to said beam, said hinge pin being located between said two vertical planes;
(d) said rotor comprising a cover which is jointed on said beam by said hinge pin; and
(e) said central support pin being housed in a bore in said cover so as to be able to turn during work in relation to said hinge pin together with said control cam, said frame, and said small support wheels.

4,922,701
SYSTEM FOR PRODUCING YARN
A. Paul S. Sawhney, Metairie; Craig L. Folk, and Kearny Q. Robert, both of New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Jun. 30, 1989, Ser. No. 373,545
Int. Cl.[5] D02G *3/36, 3/38*
U.S. Cl. 57—12 **13 Claims**

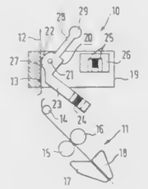


1 In a ring-spinning yarn assembly including a drafting hand having a pair of front rollers defining a nip therebetween and a wind-up spindle downstream from said nip further including means defining a gripper nip immediately downstream from and closely adjacent to said front roller nip; means to feed a core strand and at least one wrap strand on each side of said core strand from said front roller nip to said gripper nip; wherein said wrap strands are spaced from said core strand at said nip and converge with said core strand in said gripper nip to wrap around said core strand in said gripper nip so as to form a wrapped yarn.

4,922,702
STOPPING DEVICE FOR FIBER MATERIAL, SUCH AS A SILVER, ROVING OR SLUBBING IN A TEXTILE MACHINE AND ENERGY STORAGE DEVICE
Urs Meyer, Niederglatt, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland
Filed Dec. 22, 1988, Ser. No. 288,267
Int. Cl.[5] D01H *13/18*
U.S. Cl. 57—87 **12 Claims**

1. A stopping device for elongate fiber material in a textile machine, comprising:
a movable part having a magnet;
a stationary part having a magnet;
one of said magnets being an electromagnet;
the other of said magnets being a permanent magnet having a magnetic field;
said movable part and said stationary part being capable of assuming an operating position with respect to one another;
said movable part and said stationary part when in the operating position being connected with one another by the magnetic field of the permanent magnet;
said magnetic field of the permanent magnet causing mag-

netic attraction of the permanent magnet at the electromagnet;
guide means cooperating with the elongate fiber material;
said movable part including clamping means cooperating with said guide means for clamping the elongate fiber material when said movable part assumes a clamping position;



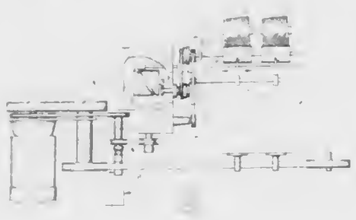
means for supplying electrical energy to said electromagnet for separating said movable part and said stationary part from one another such that said movable part assumes the clamping position for the elongate fiber material; and
said means for supplying electrical energy to said electromagnet causing separation of said electromagnet and said permanent magnet adhering to one another by magnetic attraction, by magnetic repulsion of the permanent magnet and electromagnet with respect to one another.

4,922,703

TWIST NUMBER SETTING DEVICE FOR A TWO-FOR-ONE TWISTER

Isamu Matsui, Kyoto, and Yutaka Ueda, Nara, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed May 5, 1988, Ser. No. 190,573
Claims priority, application Japan, May 9, 1987, 62-113172; Jan. 27, 1988, 63-16147
Int. Cl.[5] D01H *1/26, 1/30, 1/34*
U.S. Cl. 57—93 **13 Claims**



1. A twist number setting device for a two-for-one twister which is operable with a winding package, the device comprising:
a drive motor having an output power shaft;
a drive pulley to which the output power shaft is operatively connected;
a spindle;
an endless belt contacting with the drive pulley and the spindle;
a drum having a rotary shaft to which the output power shaft is also operatively connected, the drum being in contact with the winding package and provides a turning force to the package;
a speed change means interposed between the output power shaft of the drive motor and the rotary shaft of the drum;
wherein the speed change means comprises an input side pulley, an output side pulley and a belt extending between the input side pulley and the output side pulley, the input side pulley having an outer washer and an inner washer for engaging the belt;
wherein each of the washers has a tapered inner side and the outer washer is movable relative to the inner washer to vary the distance between the washers so that the position at which the belt engages the washers is variable and depends upon the distance between the washers and the speed of rotation of the output from the output power shaft of the output side pulley is variable;
wherein said speed change means further includes a control motor having an output port shaft, and a holder secured to the outer washer and connected with the output port shaft, and wherein said outer washer being movable toward the inner washer by an operation of the control motor.

4,922,704

METHOD AND APPARATUS FOR INTRODUCING A ROVING INTO A TEXTILE MACHINE DRAFTING FRAME

Walter Slavik, Horgen, and Arthur Wuermli, Winterthur, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 4, 1988, Ser. No. 253,146
Claims priority, application Switzerland, Oct. 8, 1987, 03946/87
Int. Cl.[5] D01H *13/04, 13/14*
U.S. Cl. 57—261 **15 Claims**



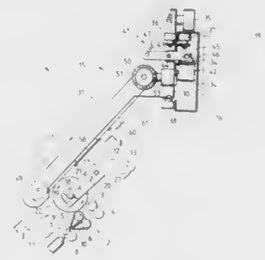
1. A method of introducing a roving into a textile machine drafting frame comprising the steps of
taking up an end part of the roving at a reference point upstream of a drafting frame having a preliminary drafting zone and a downstream main drafting zone;
introducing the taken-up end part of the roving into said main drafting zone while by-passing the roving about said preliminary drafting zone;
thereafter drawing the roving into said main drafting zone while imparting tension in the roving upstream of said main drafting zone to cause a lateral introduction of the roving between said reference point and said main drafting zone into said preliminary drafting zone.

4,922,705

CLEANING DEVICE FOR A DRAFTING DEVICE IN A SPINNING MACHINE

Shoji Sakai, Nagaokakyo, and Yukio Iwai, Ohtsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 20, 1988, Ser. No. 221,737
Claims priority, application Japan, Jul. 22, 1987, 62-182605; Sep. 24, 1987, 62-145712; Nov. 6, 1987, 62-280569
Int. Cl.[5] D01H *5/64, 5/60*
U.S. Cl. 57—306 **25 Claims**



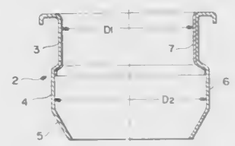
1. A cleaning device for a drafting device in a spinning machine, comprising:
a clearer device provided at a drafting device of each of a large number of spindles provided in a row in said spinning machine for exfoliating and removing fiber waste sticking to the drafting device, the clearer device having a movable clearing element,
a collecting device for fiber waste which reciprocally moves along said large number of spindles provided in a row above the clearer devices while contacting with said clearer devices and exfoliates and removes fiber waste from said clearer devices for the individual spindles, the collecting device having a movable collecting element, and
means for establishing a contact region between the clearing element and the collecting element, including means for moving the clearing element and the collecting element in substantially opposite directions at the contact region between the clearing element and the collecting element.

4,922,706

DEVICE LIMITING BALLOONING IN THE UNWINDING OR WINDING OF A YARN

René Neyraud, Saint Cyr Au Mont D'or, France, assignor to ICBT Lyon, France

Filed Jun. 7, 1989, Ser. No. 363,599
Claims priority, application France, Jun. 21, 1988, 8808563
Int. Cl.[5] D01H *7/18, 13/12*
U.S. Cl. 57—354 **3 Claims**



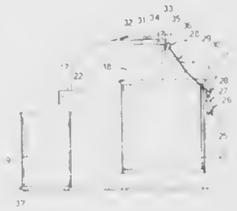
1. An anti-ballooning can which encloses a yarn winding over its entire height, said can comprising: 'a first cylindrical portion which contacts a ballooning yarn exceeding a periphery of said winding over an entire length of an inner surface of said first cylindrical portion;
a second cylindrical portion extending from said first cylindrical portion, said second cylindrical portion having a diameter which is larger than that of said first cylindrical portion; and
a frustoconical portion extending from said second cylindrical portion, said frustoconical portion having a diameter which is smaller than that of said first cylindrical portion.

4,922,707

DEVICE TO DISTRIBUTE SLIVER AUTOMATICALLY TO SPINNING MACHINES

Roberto Meroni; Fred Viol, both of Pordenone; Fabio Lancerotto, Milan, and Umberto Gerin, Pordenone, all of Italy, assignors to Scaglia SpA, Brembilla, Italy

Filed Apr. 13, 1989, Ser. No. 337,377
Claims priority, application Italy, May 2, 1988, 83379 A/88
Int. Cl.[5] D01H *1/12, 7/882*
U.S. Cl. 57—408 **19 Claims**



1. An apparatus to distribute sliver automatically to a plurality of spinning machines, each having a spinning can, the apparatus to distribute sliver comprising at least one movable unit, each of said at least one movable units comprising:
(a) drawing frame can containing sliver to be fed into said spinning can,
(b) means for engaging and towing said drawing frame can,
(c) sliver end engaging means for finding, engaging, and transferring an end of said sliver from said drawing can frame to a transferring means,
(d) rotating means for rotating said drawing frame can at least during a period where the sliver end engaging means is finding the end of said sliver, so that said end of said sliver is brought to a circumferential position and gripped by said sliver end engaging means,
(e) said transferring means receiving sliver from said sliver end engaging means and feeding said sliver into said spinning can, and
(f) spinning can engaging means for extracting said spinning can from said spinning machine, positioning said spinning can so as to be in cooperation with said transferring means so that said spinning can may be refilled, and repositioning said spinning can in said spinning machine after said spinning can has been filled.

4,922,708

STARTING SYSTEM FOR TURBINE ENGINES

Charles A. Nelson, Union Lake, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Feb. 2, 1989, Ser. No. 305,163
Int. Cl.[5] F02C *7/236*
U.S. Cl. 60—39.141 **1 Claim**

1. A starting system for a turbine engine comprising:
a fuel tank,
a D.C. electric motor,
a positive displacement fuel pressure boost pump connected to said fuel tank and driven by said motor for raising the pressure of fuel from said tank to a desired level,

a positive displacement metering pump in series fluid flow relation to said boost pump and driven by said motor for delivering a metered fuel flow to the engine,
a pressure regulator in parallel flow relationship with said metering pump,
a starting fuel reservoir in series relationship with said metering pump and the engine,
first and second burst disks on opposite sides of said reservoir,

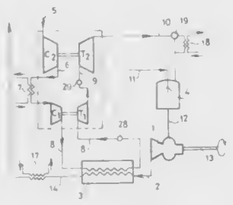


a multiple position recirculation valve between said metering pump and said starting fuel reservoir movable from a first position wherein fuel is shunted to said tank to a second position wherein fuel is directed solely to said starting fuel reservoir, positioning of said recirculation valve in the second position applying full fuel pressure from said metering pump to said first burst disk, thence to starting fuel in said fuel reservoir, thence to said second burst disk so as to bias the starting fuel in said reservoir to the engine.

4,922,709
PLANT FOR THE GENERATION OF MECHANICAL ENERGY, AND A PROCESS FOR GENERATING THE ENERGY

Rudolf Hendriks, Velp, Netherlands, assignor to Turbo Consult B.V., Netherlands

Filed Nov. 28, 1988, Ser. No. 276,900
Claims priority, application Netherlands, Nov. 26, 1987, 8702834
Int. Cl.[5] F02C *6/00*
U.S. Cl. 60—39.183 **5 Claims**

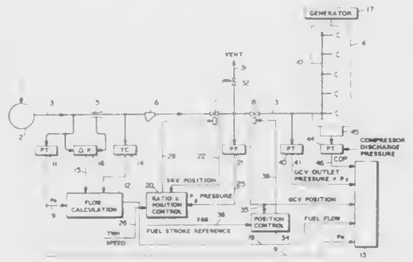


1. A plant for the generation of mechanical energy by using a fluid, the plant comprising:
(a) a gas turbine;
(b) a plurality of compressor units;
(c) a plurality of compressor turbines for driving the compressor units, the compressor turbines being connected in series with the compressor units;
(d) a combustion chamber connected with the gas turbine, the expanded air from the compressor turbines being directed into the combustion chamber;
(e) a main heat exchanger being disposed between the compressor turbines and the compressor units, the exhaust from the gas turbine being directed through the main heat exchanger;
(f) an interim heat exchanger being disposed between the compressor units;
(g) a first external heat exchanger being disposed downstream of the main heat exchanger; and
(h) a second external heat exchanger being disposed between the last compressor turbine and the combustion chamber of the gas turbine;
wherein the first and the second external heat exchangers enable a predetermined h/p ratio to be achieved between the thermal power given off in the interim and the external heat exchangers and the mechanical power delivered to the gas turbine.

4,922,710
INTEGRATED BOOST COMPRESSOR/GAS TURBINE CONTROL

William I. Rowen, Schenectady, N.Y., and David J. Withey, Loveland, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1989, Ser. No. 293,737
Int. Cl.[5] F02C *3/22, 9/26*
U.S. Cl. 60—39.281 **25 Claims**



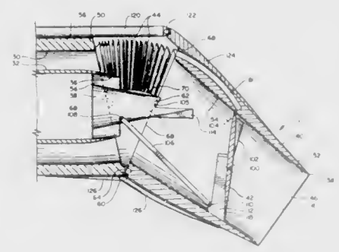
1. In an integrated boost compressor/gas turbine control system having a fuel gas boost compressor to boost the fuel gas pressure before supplying the fuel gas to the turbine comprising:
a first valve to control the pressure of said fuel gas supplied to said turbine;
a second valve to control the volume of said fuel gas supplied to said turbine; and
means to control at least one of said first and second control valves to a substantially fully open position under normal operating conditions;
whereby the pressure of said fuel gas required to be delivered by said gas boost compressor is minimized during said normal operating conditions.

4,922,711
THRUST REVERSING SYSTEM FOR HIGH BYPASS FAN ENGINES

Robert B. Brown, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 10, 1988, Ser. No. 205,184
Int. Cl.[5] F02K *1/72*
U.S. Cl. 60—204 **74 Claims**

1. A jet engine and thrust reversing assembly having a forward end and a rear end, said assembly comprising:
a. a core engine having an intake end and an exhaust end from which the primary exhaust is discharged into an exhaust area;
b. a fan duct structure having an annular rear end portion and defining an annular secondary air passageway which is positioned around the core engine and which exhausts secondary air into said exhaust area;
c. fan means to blow fan air though said secondary air passageway;
d. a thrust reversing subassembly comprising:
i. an annular thrust diverting structure having a cruise position and a thrust reversing position, said thrust reversing structure comprising a circumferential side wall which in the cruise position extends substantially entirely around said exhaust area, with a forward annular end portion of said thrust diverting structure being positioned adjacent to the annular rear end portion of the fan duct structure so as to form a rearward extension of said fan duct structure and to define a rear exhaust passageway portion from which the primary exhaust and the air from the secondary passageway are discharged, said thrust diverting structure being movable rearwardly from the cruise position to the thrust reversing position where at least one portion of the forward annular end portion of the thrust diverting structure is spaced rearwardly from the annular rear end portion of the fan duct structure to form a laterally directed thrust diverting opening; and



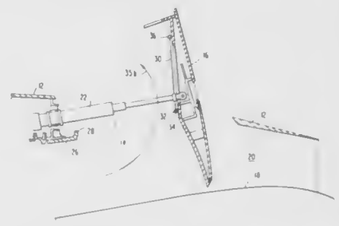
ii. passageway blocking plate means which in the cruise position is located to permit flow through the rear exhaust passageway portion and in the thrust reversing position blocks flow through the rear exhaust passageway portion to create with the thrust diverting structure a flow diverting region to cause the primary exhaust and the fan air to flow through the thrust reversing opening to create a reverse thrust;
e. said assembly being characterized in that lateral and longitudinal thrust reversing loads exerted on said thrust reversing subassembly are transmitted into said fan duct structure which is arranged to in turn transmit said thrust reversing loads into other structure to which the jet engine and thrust reversing assembly is mounted;
f. vane means which, with the thrust diverting structure in said thrust reversing position, is positioned in said thrust reversing opening to properly direct flow through the thrust reversing opening;
g. said thrust diverting structure being pivotally mounted to said fan duct structure at a lower location so that the thrust diverting structure rotates with a downward component of motion to the thrust reversing position, so that the thrust diverting opening is directed upwardly.

4,922,712
THRUST REVERSER FOR HIGH BYPASS TURBOFAN ENGINE

Ram K. Matta, Loveland, and Pupinder K. Bhutiani, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 28, 1988, Ser. No. 173,800
Int. Cl.[5] F02K *1/70*
U.S. Cl. 60—226.2 **12 Claims**

1. A thrust reverser for a gas turbine engine of the type which includes an outer wall spaced from the center body of a core engine to define a bypass duct therebetween, said thrust reverser comprising:
(a) a plurality of circumferentially displaced blocker doors, each of said doors being movable between a normal position generally aligned with said outer wall and a thrust reversing position extending transversely of said bypass duct for blocking the exhaust of air through said bypass duct and directing the air through an opening in said outer wall for thrust reversal;

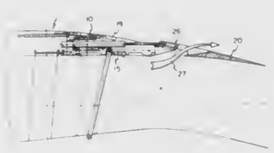


(b) each of said blocker doors being of lightweight construction and including a pit in the inner surface thereof in said normal position;
(c) means for covering said pit during normal flow of air through said bypass duct to reduce the pressure drop in said bypass duct and to reduce noise;
(d) said covering means including a pit cover hingedly mounted at one end thereof on said blocker door; and
(e) means for biasing said pit cover away from said blocker door to a position providing smooth flow of air through said bypass duct during normal operation.

4,922,713
TURBOJET ENGINE THRUST REVERSER WITH VARIABLE EXHAUST CROSS-SECTION

Jacques M. G. Barbarin, Montivilliers, and Pascal B. G. Lecoutre, Le Havre, both of France, assignors to Societe Anonyme Dite Hispano-Suiza, Saint-Cloud, France

Filed Nov. 4, 1988, Ser. No. 267,344
Claims priority, application France, Nov. 5, 1987, 87 15336
Int. Cl.[5] F02K *1/64*
U.S. Cl. 60—226.2 **10 Claims**



1. A thrust reverser for a turbofan-type turbojet engine having a hot gas exhaust duct comprising:

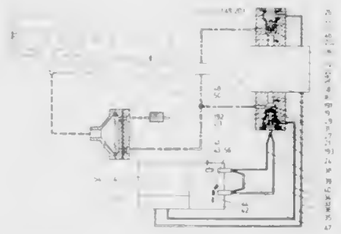
(a) a stationary cowl arranged generally concentrically about the hot gas exhaust duct so as to define a generally annular cold flow air duct therebetween;
(b) deflection vanes attached to the stationary cowl;
(c) a first movable cowl slidably attached to the stationary cowl so as to be movable in a generally axial direction;
(d) a second movable cowl slidably attached to the stationary cowl so as to be movable in a generally axial direction;
(e) flap means movable between a blocking position and a retracted position;
(f) first locking means to releasably lock the first movable cowl to the stationary cowl;
(g) second locking means to releasably lock the second movable cowl to the first movable cowl; and,
(h) actuating means operatively interposed between the stationary cowl and the second movable cowl to move the first and second movable cowls with respect to the stationary cowl between: a first position wherein the first movable cowl is locked to the stationary cowl thereby covering the deflection vanes and the second movable cowl is locked to the first movable cowl; a second position wherein the first and second movable cowls are moved axially as a unit to thereby uncover the deflection vanes; and a third position wherein the second movable cowl is axially displaced from the first movable cowl which is locked to the stationary cowl covering the deflection vanes so as to increase the exit area of the cold flow air duct.

4,922,714

DEVICE FOR MEASURING THE PARTICLE EMISSIONS OF AN INTERNAL COMBUSTION ENGINE

Ferdioand Grob, Besigheim; Ernst Linder, Muehlacker; Dieter Kienzler, Stuttgart; Roger Potschin, Marbach/Neckar, and Heinz Stutzenberger, Vaihingen/Enz, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 254,623
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739622
Int. Cl.[5] F01N *3/00*
U.S. Cl. 60—276 21 Claims



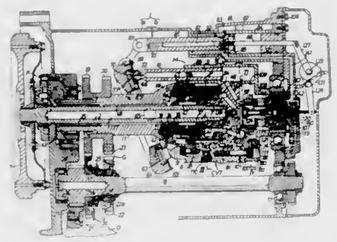
1. A device for measuring the particle emission of an internal combustion engine, in particular for measuring a concentration of soot in an exhaust gas passing through an exhaust gas tube, said exhaust gas tube (**15**) includes oppositely disposed light admitting openings (**16, 17**) therein, means including oppositely disposed transparent bodies (**29, 30, 58, 59**) which close each of said openings (**16, 17**), a light source, a light receiver, means for directing a beam of light from said light source through said openings (**16, 17**), to traverse a flow of gas in said exhaust gas tube, means for directing said light beam that traverses said exhaust gas tube onto a said light receiver, and means for heating said oppositely disposed transparent bodies above a temperature at which any soot contaminants burn.

4,922,715

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Mitsumasa Furumoto; Eiichiro Kawahara, both of Saitama, and Takashi Koyama, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,791
Claims priority, application Japan, Dec. 9, 1986, 61-293072
Int. Cl.[5] F16D *31/00*
U.S. Cl. 60—329 23 Claims



1. An oil control apparatus in a hydraulically operated continuously variable transmission of the type having a hydraulic pump connected to a hydraulic motor by a closed hydraulic circuit, comprising, control valve means coupled to the closed hydraulic circuit on an inlet side of said hydraulic pump and openable for discharging working oil from said closed hydraulic circuit and said hydraulic pump to the outside of said closed hydraulic circuit when the pressure of oil in said closed hydraulic circuit on said inlet side of the hydraulic pump is below a prescribed pressure level, wherein said control valve means is disposed in a motor cylinder of said hydraulic motor, said motor cylinder being rotatable about an axis, and said control valve means operates to discharge a substantial proportion of said working oil when said pressure is below said prescribed level regardless of the rotational position of said motor cylinder.

4,922,716

THROTTLED EXHAUST OUTLET TO RESERVOIR FOR REDUCING NOISE RESULTING FROM RELEASE HYDRAULIC PRESSURE SURGES

Robert L. Suffridge, Goshen, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 13, 1988, Ser. No. 143,649
Int. Cl.[5] B30B *15/18*; F15B *21/04*
U.S. Cl. 60—378 13 Claims



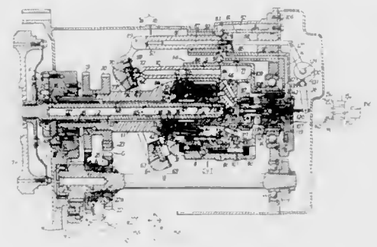
4. An hydraulic circuit for reducing the intensity of sound upon rapid release of hydraulic pressure from a high pressure level to a lower pressure level, said circuit comprising:
(a) reservoir means for containing low pressure hydraulic fluid and having high pressure hydraulic cylinder means communicating with the reservoir means;
(b) first valve means connecting the high pressure hydraulic cylinder means with the reservoir means, the first valve means being movable between an open position and a closed position to control flow between the cylinder means and the reservoir means;
(c) valve housing means defining a valve seat and having a predetermined flow area, the housing means engagable by the first valve means to selectively connect and disconnect the reservoir means with the high pressure hydraulic cylinder means and to permit a large volume of flow of hydraulic fluid between the cylinder means and the reservoir means;
(d) second valve means for providing communication between the cylinder means and the reservoir means, the second valve means having a smaller flow area than the flow area of the first valve means to permit pressure release through the second valve means; and
(e) conduit means within the reservoir means, the conduit means extending from an outlet of the second valve means and terminating in a closed end spaced from the second valve means, the conduit means including a tube having a closed distal end and including a plurality of spaced apertures that extend in a longitudinal direction along the tube to provide communication between the second valve means and the reservoir means; and
(f) operating means for opening the first valve means after the pressure in the high pressure hydraulic cylinder means has been reduced through the second valve means.

4,922,717

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Mistumasa Furumoto, Kawagoe; Eiichiro Kawahara, and Kenichi Ikejiri, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,245
Claims priority, application Japan, Sep. 26, 1986, 61-227418
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—456 12 Claims



1. A hydraulically operated continuously variable transmission comprising:
an output shaft;
a hydraulic motor coupled to said output shaft and having a motor swash plate and a motor cylinder supporting an annular array of slidable motor plungers held in slidable contact with said motor swash plate, said motor cylinder having a distribution member;
an input shaft;
a hydraulic pump coupled to said input shaft and having a pump swash plate and a pump cylinder held slidably against said distribution member and supporting an annular array of slidable pump plungers held in slidable contact with said pump swash plate, said pump cylinder and sid motor cylinder communicating with each other through said distribution member;
a closed hydraulic circuit interconnecting said hydraulic pump and said hydraulic motor;
a distribution ring held slidably against said distribution member and dividing said closed hydraulic circuit into lower- and higher-pressure sides;
an oil chamber defined between said pump cylinder and said motor cylinder;
first oil passage means connecting with said oil chamber;
second oil passage means communicating with said closed hydraulic circuit and having means for selectively conducting oil directly from said closed hydraulic circuit; and
a common oil cooling unit to which said first and second oil passage means are connected for receiving oil from said first and second oil passage means.

4,922,718

THERMAL ENERGY SCAVENGER

Peter A. Hochstein, Troy, and William L. Pringle, Groose Pointe, both of Mich., assignors to Armada Corporation, Detroit, Mich.

Filed Oct. 10, 1989, Ser. No. 419,454
Int. Cl.[5] F03G *7/06*
U.S. Cl. 60—527 19 Claims



1. A thermal energy scavenger assembly (**10**) comprising:
a plurality of integral elements (**12**) made of temperature sensitive material having first and second ends (**14, 16**) and comprising a first portion (**18**) which is subjected to predetermined cyclic temperature changes to cause said first portion (**18**) to undergo thermoelastic, martensitic phase transformations in response to heat to pass from a martensitic phase when at a temperature below a phase transformation temperature range and capable of a first high level of recoverable strain to an austenitic parent phase and a memory shape when at a temperature above the phase transformation temperature range and capable of a second lower level of recoverable strain;
and a second portion (**20**), integral with said first portion (**18**) and incapable of shape memory responses, said assembly is characterized by said second portion (**20**) not being subjected to said predetermined cyclic temperature changes for limiting the stress to which said first portion (**28**) is subjected as said first portion (**18**) of said temperature sensitive elements (**12**) is subjected to temperatures above the phase transformation temperature range and transformed from the martensitic phase to the austenitic parent phase

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4,922,719

FLUIDIC TRANSFORMER WITH SEALED CYLINDER AND CHECK VALVES IN PISTONS

Donald P. Arbuckle, S. Vrain St., Denver, Colo. 80236

Filed Oct. 26, 1987, Ser. No. 112,663
Int. Cl.[5] F04B *5/00*
U.S. Cl. 60—562 13 Claims

5. A fluidic transformer operative with respective to a refer-

ence pressure for transforming an input pressure into at least one output pressure comprising;

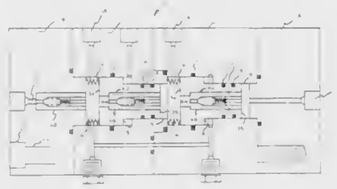
means defining a plurality of pistons;

means operatively retaining each piston for reciprocative movement in a reference movement path associated with each piston, said means for retaining each said piston comprising a plurality of cylinders adapted to receive said pistons therein;

fluidic sealing means for preventing the passage of fluid between the opposing faces of each said cylinder and said respective piston, said fluidic sealing means comprising an annular rod seal received in the surface of each said cylinder, said seals being positioned to cause the pressure forces created by the movement of said pistons to be counteracted by opposite frictional forces associated with movement of each said piston;

means for preventing drift of each said piston within said reference movement path;

each said piston defining a large surface and two small surfaces, the two small surfaces oriented to each derive force from pressure applied thereto to each move each piston in one direction in its reference movement path, the large



surface oriented to derive force from pressure applied thereto to move each piston in the opposite direction in its reference movement path, each surface presenting an effective area which is defined by that amount of the actual area of the surface which is effective during pressure application to move the piston in its reference movement path, the effective area of the large surface of each piston being greater than the effective area of either of its small surfaces,

means communicating the reference pressure to a surface of one piston;

means communicating the input pressure to a surfce of another piston;

internal pressure communication means for directly communicating pressures between different surfaces of different pistons to create at least one internal pressure at least one surface of at least one piston, the internal pressure defined substantially only by the magnitude of the input pressure relative to the reference pressure and a ratio of the effective areas of the surfaces of the pistons; and

means for communicating the internal pressure as the output pressure.

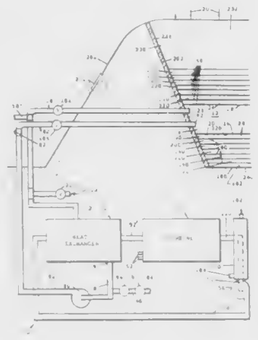
4,922,720

SOLAR LIQUID HEATING SYSTEM

Donald J. Finn, Rte. #1, Box 1200, Jackson, S.C. 29831

Filed Nov. 12, 1987, Ser. No. 120,085
Int. Cl.[5] F03G 7/02
U.S. Cl. 60—641.8 10 Claims

1. A solar heater for heating liquids comprising a heatable bag, a support means supporting said heatable bag , a heatable body of liquid in said heatable bag, said heatable bag being disposed in sunlight so as to become heated thereby, a topside gas bag above said heatable bag, said topside gas bag containing a gas for serving as insulation, a topside fluid bag disposed above said topside gas bag and containing a fluid for further insulation, said bags being substantially gasproof and waterproof and also being flexible whereby the gravity pull on said bags and the flexibility thereof causes the upper sides of said bags to seek horizontal levels, said bags each having a periphery dimension much greater than its maximum vertical height, an inlet to said heatable bag for admitting a liquid thereinto,



said heatable bag having an outlet through which hot liquid can be removed, the upper side of said heatable bag and the upper and lower sides of said insulation bags being capable of permitting sunlight to pass therethrough.

4,922,721

TRANSPORTER UNIT WITH COMMUNICATION MEDIA ENVIRONMENTAL STORAGE MODULES

William M. Robertson, Lewisville; Charles A. Sharp, III, Garland, and Edward J. Burke, Plano, all of Tex., assignors to Marlow Industries, Inc., Dallas, Tex.

Filed May 1, 1989, Ser. No. 345,942
Int. Cl.[4] F25B 21/02
U.S. Cl. 62—3.61 14 Claims



1. A transport apparatus for carrying data storage media requiring environmental protection comprising

a transport module including an insulated housing adapted to receive data storage media, a heating or cooling means connected to the insulated housing for heating or cooling the interior of the insulated housing, a temperature sensing means mounted within the insulated housing for sensing the temperature thereof and outputting signals representative thereof, and a connector means connected to the heating or cooling means and the temperature sensing means; and

a transport cart having a connector means corresponding to the connector means of the transport module for connection thereto, a source of power means mounted on the transport cart and connected to the connector means of the transport cart for supplying operating power to the heating or cooling means of the transport module, a programmable controller including means connected to the

connector means of the transport cart for receiving the temperature indicating signals of the temperature sensor means and controlling operation of the heating and cooling means of the transport module for regulating the temperature of the insulated housing.

6. A transport apparatus according to claim 5 wherein the thermoelectric heat pump of the dehumidifier means is mounted on the heating or cooling means of the transport module.

4,922,722

STIRLING REFRIGERATOR WITH NONLINEAR BRAKING SPRING

Yoshio Kazumoto; Yoshiro Furuishi, and Kazuo Kashiwamura, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 330,856
Claims priority, application Japan, May 24, 1988, 63-126224
Int. Cl.[5] F25B 9/00
U.S. Cl. 62—6 8 Claims



1. A Stirling refrigerator comprising:

a cold-finger which contains a working gas and includes a displacer chamber and a gas spring chamber which is sealed off from said displacer chamber;

a displacer which is disposed slidably inside said displacer chamber so as to be able to reciprocate therein and perform a stroke and which divides said displacer chamber into a compression chamber and an expansion chamber, said displacer having a piston element formed thereon which extends into said gas spring chamber;

a compressor which is connected to said compression chamber and periodically varies the pressure of the working gas inside said compression chamber; and

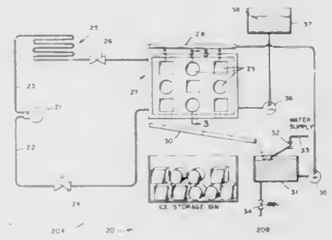
a spring which is connected between said displacer and said cold-finger so as to be deformed as said displacer reciprocates within said cold-finger, said spring having a neutral position which it assumes when said displacer is between the ends of its stroke, a spring constant of said spring being constant within a predetermined displacement from said neutral position, and increasing outside said predetermined displacement, the spring constant of said spring being greater when said displacer is near either end of its stroke than when said spring is in its neutral position.

4,922,723

APPARATUS AND METHOD FOR MAKING ICE CUBES WITHOUT A DEFROST CYCLE

John A. Broadbent, Golden Valley, Minn., assignor to Broad Research, Golden Valley, Minn.

Filed Nov. 14, 1988, Ser. No. 271,228
Int. Cl.[5] F25C 1/12
U.S. Cl. 62—72 9 Claims



1. Apparatus for freezing water or other liquid, comprising:

a thin flexible freezing surface which is held in intimate contact with a rigid refrigerated surface such that said flexible surface is in good heat transfer relation with the refrigerated surface and then removing the resulting frozen liquid from the flexible freezing surface without defrosting by flexing said flexible freezing surface to break the bond between said frozen liquid and said flexible freezing surface,

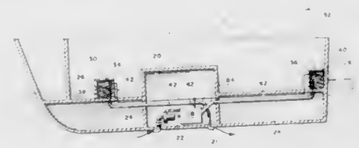
one or more raised freezing sites between said flexible freezing surface and said refrigerated surface such that the only areas where said flexible freezing surface can be in good heat transfer relation with said refrigerated surface is at said raised freeing sites thereby limiting the areas where liquid can be frozen on said flexible freezing surface to the areas defined by said raised freezing sites, and said raised freezing sites allowing the cross-sectional shape of the frozen liquid to be defined and controlled to a controlled shape defined by the shape of said raised freezing sites.

4,922,724

MARINE ICE MAKING AND DELIVERY SYSTEM

William Grayson, 9045 Hawthorne Ave., Surfside, Fla. 33154, and Melvin E. Strahosky, 11919 NE. 8th Ave., North Miami, Fla. 33161

Filed Mar. 13, 1989, Ser. No. 322,187
Int. Cl.[5] B63B 25/26; F25C 5/18
U.S. Cl. 62—135 10 Claims



1. A potable fresh water ice making and delivery system for marine use, the system comprising:

(a) a refrigeration circuit having an inlet supply of potable fresh water, said circuit located on the engine deck of a marine craft, the refrigeration circuit including an ice making assembly having a rotating auger-like extruder having a positive force mechanical ice unit output which is advanced and forced out of an outlet of said ice making assembly, said refrigeration circuit further including a

water cooled condenser in which water for the operation thereof is drawn from ambient water about the marine craft;

(b) a flexible conduit coupled to said output of said assembly, said conduit having length sufficient to reach upper levels of the marine craft and to reach horizontally remote locations from said refrigeration circuit, said flexible conduit, in combination with said extruder of said ice making assembly, defining a transport means for said ice unit in which, within said conduit, there is slideably advanced a column of said ice units in which said column is powered by said ice unit output of said extruder and in which said output of ice units of said extruder are in dynamic positive thrust contact with said column of ice units within said conduit; and

(c) storage chambers located at outputs of said flexible conduit for accumulation and storage of potable ice products advanced out of said outlets by said dynamic positive thrust contact of said output of said extruder and movement of said column of ice units effected by said rotated extruder of the ice making assembly,

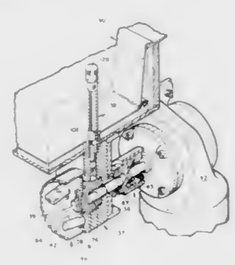
whereby the output of the ice making assembly is effectively transported to desired locations within the marine craft remote from said refrigeration circuit.

4,922,725

REFRIGERATED MIXING AND DISPENSING MACHINE FOR PREPARATION OF FROZEN DAIRY PRODUCTS

Aaron P. Rasmussen, 9609 Candy La., La Mesa, Calif. 92041

Filed Jan. 9, 1989, Ser. No. 295,228
Int. Cl.[5] A23G *9/20*
U.S. Cl. 62—136 9 Claims



2. A refrigerated mixing and dispensing machine for preparation of frozen dairy products and iced mixed beverages comprising:

a motor with a drive shaft that has a longitudinally extending axis;

a mix tank for fluids that are to be processed into a form of frozen food product;

a dasher assembly having a front end and a rear end;

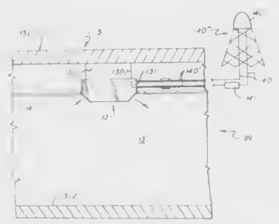
a pump for transferring a fluid from said mix tank to said dasher assembly, said pump having a solid block housing having a top end, a front end and a rear end, said pump having a cavity formed in its front end and a rotor is removably mounted therein on the drive shaft of the pump, said drive shaft passing through a bore hole extending from the rear end of said pump housing to said cavity in said front wall, a fluid inlet passageway having a predetermined width extends from said cavity to the top end of said pump and the top end of said passage way is connected to the interior of said mix tank, a vertically oriented plunger is vertically reciprocally mounted in said fluid inlet passageway, said plunger having a top end, said plunger having a bottom end that normally contacts said rotor and which functions to provide a moving seal and to divide the cavity into a vacuum chamber to the rear of said plunger and a pressure chamber to the front of said plunger, said plunger having a horizontal thickness less than the width of said fluid inlet passageway so that fluid may freely flow therepast, the bottom end of said plunger has a pressure relief surface extending outwardly from said pump rotor into said pressure chamber that permits said plunger to act in the manner of a piston to control pressure at the output side of said plunger, thus when fluid pressure bearing against said pressure relief surface exceeds the gravity of the plunger, said plunger is forced upwardly, in which case, it functions as a bypass valve to regulate dasher assembly pressure.

4,922,726

HEAT PUMP SYSTEM

David M. New, Homer, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 1, 1986, Ser. No. 936,425
Int. Cl.[5] F25B *27/00*
U.S. Cl. 62—235.1 7 Claims



1. A heat pump system comprising an indoor coil and an indoor heat exchange means for engaging in heat transfer operation, refrigerant means for enabling the transport of selected refrigerant between said indoor coil and heat transfer means, compressor means for driving said selected refrigerant through said indoor coil and heat exchange means, and indoor blower means for controllably passing air over said indoor coil means into selected indoor spaces to be temperature controlled, said heat pump system additionally comprising heat transfer means for communicating a selected heat transfer fluid between said heat exchange means and an outdoor location, whereby heat transfer is accomplished between said refrigerant means and regions external to spaces being temperature controlled.

4,922,727

AIR DELIVERY SYSTEM FOR A TRANSPORT REFRIGERATION UNIT

Herman H. Viegas, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Sep. 1, 1989, Ser. No. 401,711
Int. Cl.[5] B60H *1/32*
U.S. Cl. 62—239 4 Claims

1. An air delivery system for a transport refrigeration unit having a prime mover, a condenser, an evaporator, and condenser and evaporator air delivery means, comprising:

a first shaft driven by the prime mover,

a first pulley fixed to said first shaft,

an electric clutch,

a second pulley connectable to said first shaft via said electric clutch,

a second shaft spaced from said first shaft,

said second shaft being connected to drive the evaporator air delivery means,

a one-way clutch having an inner race fixed to said second shaft and an outer race,

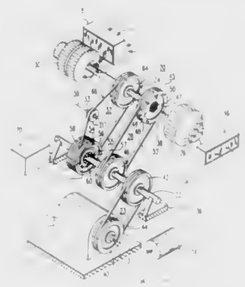
a third pulley fixed to the outer race of said one-way clutch,

said third pulley being connected to drive the condenser air delivery means,

a fourth pulley fixed to said second shaft,

first belt means linking said first and third pulleys to drive the condenser air delivery means at a speed directly proportional to the speed of the prime mover,

and second belt means linking said second and fourth pulleys,



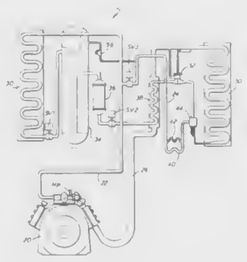
whereby engagement of the electric clutch drives the second shaft and said evaporator air delivery means faster than the condenser air delivery means, and disengagement of the electric clutch results in the faster than the condenser air delivery means, and disengagement of the electric clutch results in the evaporator air delivery means being driven at the same speed as the condenser air delivery means, via said one-way clutch.

4,922,728

HEATER PLATE ASSEMBLY

Robert J. Backus, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 28, 1989, Ser. No. 344,791
Int. Cl.[5] F25B *47/00*
U.S. Cl. 62—278 3 Claims



1. In a refrigeration system operable in a defrost mode having an evaporator, a drain pan and a sloping surface beneath said evaporator and leading to said drain pan, a defrost circuit comprising:

a compressor having a suction line and a discharge line;

a hot gas line connected to said discharge line and said evaporator and having a pair of branches;

said evaporator being connected to said suction line;

a first one of said pair of branches serving to heat said drain pan during a defrost cycle;

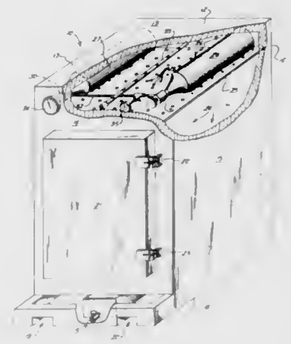
a second one of said pair of branches serving to heat said sloping surface whereby defrost melt is prevented from freezing on said sloping surface during defrost.

4,922,729

PORTABLE SELF-CONTAINED COOLER/FREEZER APPARATUS FOR USE ON COMMON CARRIER TYPE UNREFRIGERATED TRUCK LINES AND THE LIKE

Louis P. Saia, III, P. O. Box A, Station 1, Houma, La. 70360

Filed Apr. 24, 1989, Ser. No. 343,025
Int. Cl.[5] F25D *3/12*
U.S. Cl. 62—384 22 Claims



1. A shipping container for shipping frozen and/or refrigerated cargo comprising:

(a) a container having an interior with an access doorway that can be opened/closed;

(b) one or more refrigerant tanks mounted in the container for containing refrigerant under pressure to be dispensed during use for cooling the container interior;

(c) header means for piping refrigerant in the tanks to the container interior; and

(d) temperature responsive controller means for periodically dispensing refrigerant from the tanks to the header in order to maintain a desired preselected preset refrigerated or frozen temperature range within the container interior; and

(e) a lower pedestal base supporting the container, the base including horizontal slots receptive of fork lift tines.

4,922,730

ABSORPTION REFRIGERATING UNIT

Reto Schüpbach, Ossingen, and Carl U. Wassermann, Künten, both of Switzerland, assignors to Sibir AG, Switzerland

Filed Feb. 3, 1989, Ser. No. 306,545
Claims priority, application Switzerland, Feb. 3, 1988, 376/88
Int. Cl.[5] F25B *15/00*
U.S. Cl. 62—476 11 Claims

1. An absorption refrigerating unit comprising:

a coolant vapor generator for generating a first coolant vapor; a coolant vapor condenser connected with the coolant vapor generator for receiving the coolant vapor and for condensing the first coolant to a liquid;

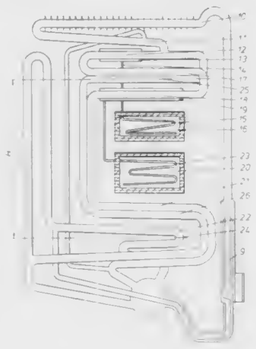
a first partial evaporator connected with the condenser for receiving the first coolant liquid therefrom and for causing only a part of the first coolant liquid to evaporate and to thereby absorb heat while evaporating, forming auxiliary gas;

a second partial evaporator connected with the first partial evaporator for causing the first coolant which is still liquid and that enters the second partial evaporator from the first partial evaporator to at least in part evaporate with the absorption of heat;

a gas heat exchanger between the first and second partial evaporators along the pathway of the first coolant;

a first refrigerating compartment; a first secondary system comprising a first chamber for delivering a second coolant outside the first partial evaporator for the second coolant in the first chamber of the first secondary system to give up its heat to the first partial evaporator for cooling the second coolant in the first secondary system; a first connection between the first refrigerating compartment and the first chamber for transmitting cooled second coolant from the first chamber to the first refrigerating compartment for cooling the first refrigerating compartment;

a second refrigerating compartment; a second secondary



system comprising a second chamber for delivering a third coolant outside the second partial evaporator for the third coolant in the second chamber of the second secondary system to give up its heat to the second partial evaporator for cooling the third coolant in the second secondary system; and a second connection between the second refrigerating compartment and the second chamber for transmitting cooled third coolant from the second chamber to the second refrigerating compartment for cooling the second refrigerating compartment;

the refrigerating compartments, the first and second partial evaporators and the respective secondary systems being designed so that the first and second partial evaporators operate at different temperatures.

4,922,731

QUARTZ CONDUCTIVE BAFFLES FOR HEAT REMOVAL AND METHOD

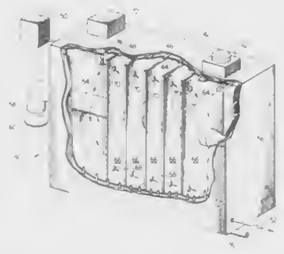
Joseph K. Russell, Allen, and Jeffrey A. McKee, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 30, 1988, Ser. No. 252,227
Int. Cl.[5] F25B *39/02*
U.S. Cl. 62—515 **34 Claims**

1. Apparatus for cooling a waveguide in a downstream remote processor, comprising:

a container surrounding the waveguide; and

at least one heat conductor interconnecting the waveguide and said container such that heat generated within the



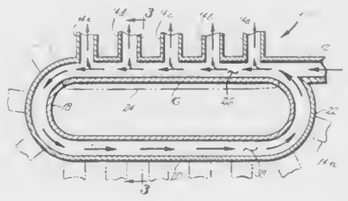
waveguide is removed by said conductor to said container.

4,922,732

EVAPORATOR SYSTEM FOR REFRIGERATION SYSTEMS

Leif B. Eriksson, Nilosia, Cyprus, assignor to Dyna-Manufacturing, Ltd., Cyprus

Filed Nov. 20, 1989, Ser. No. 439,615
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—525 **8 Claims**



5. In an evaporator system for refrigeration systems having an evaporator coil with a plurality of evaporator tubes and a refrigerant supply means which discharges compressed refrigerant into and then through a liquid refrigerant expansion means, the improvement comprising:

an inlet manifold having an inlet operably connected to the refrigerant expansion means and a plurality of outlets operably connected to the plurality of evaporator tubes whereby refrigerant discharging from the refrigerant expansion means is conveyed by said inlet manifold into the plurality of evaporator tubes;

said inlet manifold having an elongated, endless refrigerant passageway having an elongated straight first portion for refrigerant flowing one direction and a straight second portion spaced apart from and generally coextensive with said first portion for reverse flow of refrigerant;

said first portion having an inlet at one end for receiving refrigerant from the refrigerant expansion means;

said first and second portions operably connected to one another at each end to allow refrigerant entering said first portion inlet to circulate around said passageway through said first portion in one direction, into said second portion and therethrough in the opposite direction and returning into said first portion adjacent said first portion inlet;

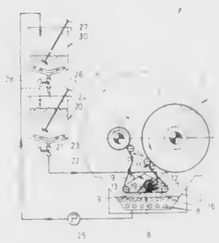
said first portion including said plurality of said inlet manifold outlets extending generally transversely therefrom whereby a portion of the refrigerant flowing through said first portion exits said inlet manifold outlets.

4,922,733

JIG FOR THE TREATMENT OF TEXTILE WEBS

Manfred Driesen, and Dieter Itgenshorst, both of Krefeld, Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 158,335, Feb. 22, 1988, abandoned. This application Mar. 20, 1989, Ser. No. 326,462
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705390
Int. Cl.[5] D06B *1/04*
U.S. Cl. 68—205 R **4 Claims**



1. A jig for the treatment of a textile web comprising;

(a) a housing having first and second portions;

(b) two mutually parallel winding rollers disposed in said first housing portion;

(c) a web of material to be treated mounted on the rollers;

(d) means defining a path along which the web can be reversibly wound back and forth onto said rollers;

(e) a bath disposed within said second housing portion;

(f) an applicator system uniformly applying a proportioned quantity of treatment liquor to the web as the web passes along a portion of said path disposed within said housing between the winding rollers above the level of said bath in said second housing portion;

(g) a reservoir tank supplying the applicator system with treatment liquor, said reservoir tank being of sufficient size to contain the total quantity of treatment liquor necessary for at least one treatment pass of the web; and

(h) means for pumping the bath into the reservoir tank only after said at least one treatment pass of the web is completed whereby the total quantity of treatment liquor is maintained separate from said bath for at least one treatment pass of the web.

4,922,734

LOCKING ASSEMBLY FOR PREVENTING THE UNAUTHORIZED USE OF AN ELECTRICALLY POWERED DEVICE

Paul Iannucci, 31539 Edwood, Warren, Mich. 48093

Filed Jul. 10, 1989, Ser. No. 377,255
Int. Cl.[5] E05B *73/00*
U.S. Cl. 70—58 **20 Claims**

1 A locking assembly for (preventing the unauthorized insertion of an object into an electrically powered device through an opening in the device), said assembly comprising;

a housing having an exterior structure closely corresponding to the opening provided in the device and defining an interior space;

locking means disposed within said interior of said housing and supported by said housing for locking said assembly with respect to the device;

said locking means including stop means movable between extended and retracted positions for providing locking contact with the device and preventing the removal of said assembly when said stop means is in said extended position;

a lock member operable from the exterior of said housing for operatively moving said stop means between said extended and retracted positions;

crank means operatively connected to said stop means and said lock member and being rotatable between first and second positions, said crank means including a crank member;

said lock member having a shaft extending into the interior of said housing and being rotatable about an axis, said crank member being rotatable between first and second



positions about an axis which is parallel to said axis of rotation of said shaft;

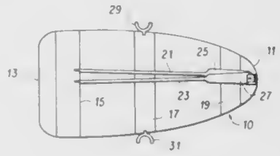
said crank member including a disk having an outer periphery and fixedly connected to said shaft and rotatable about an axis parallel to said axis of rotation of said shaft, said assembly characterized by said crank means including two connecting rods having first and second ends and being operatively connected to substantially opposite positions with respect to one another on said disk at said first ends and being operatively connected at said second end to said stop means for moving said stop means between said retracted position and said extended position.

4,922,735

BOAT ACCESSORY LOCKING DEVICES

Michael J. Leary, 25 Smith La., Kingston, Mass. 02364

Filed May 22, 1989, Ser. No. 354,791
Int. Cl.[5] E05B *73/00*
U.S. Cl. 70—58 **5 Claims**



1. In a vessel having at least one oar separable therefrom, a locking device to lock said oar to said vessel comprising:

(a) a receptacle having two spaced walls and adapted to receive a portion of said oar therein;

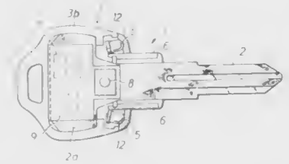
(b) capturing means comprising a pin insertable through holes in said walls and oar for retaining said portion of said oar in said receptacle; and

(c) locking means for locking said capturing means in position retaining said portion of said oar in said receptacle.

4,922,736
KEY DEVICE INCORPORATING AN ELECTRONIC CIRCUIT

Akira Tanaka, Saitama; Takanori Arima, and Ryuji Mori, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Oki Electric Co., Ltd., both of Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,585
Claims priority, application Japan, Oct. 27, 1987, 62-271154
Int. Cl.[5] E05B *47/00*
U.S. Cl. 70—277 5 Claims



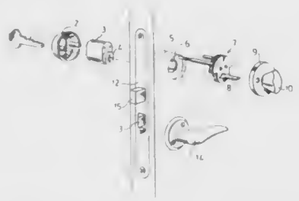
1. A key device including a key main body for actuating a mechanical lock device, a knob fixedly secured to the base end of said key main body and defining a hollow space therein, and an electronic circuit incorporated in said internal space of said knob, wherein:

said base end of said key main body is substantially planar, and said electronic circuit is carried by a printed circuit board which is arranged on a major surface of said base end of said key main body.

4,922,737
LOCK ARRANGEMENT

Lars O. Urby, Eskilstuna, Sweden, assignor to ASSA AB, Eskilstuna, Sweden

PCT No. PCT/SE88/00174, § 371 Date Sep. 20, 1989, § 102(e) Date Sep. 20, 1989, PCT Pub. No. WO88/08067, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 8, 1988, Ser. No. 399,508
Claims priority, application Sweden, Apr. 10, 1987, 8701517
Int. Cl.[5] E05B *35/08*
U.S. Cl. 70—337 7 Claims

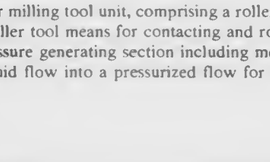


1. A lock arrangement which includes a lock casing (5), a key-operated cylinder lock (1) mounted on one side of the casing, and a knob or finger-turn mechanism (7–10) mounted on the other side of the casing, said knob or finger-turn mechanism being effective in activating a lock-mechanism activator device, such as a follower (6) located in the lock casing (5), through the intermediary of a cylinder-lock dogging element (4) and a knob dogging element (8), characterized in that the cylinder-lock dogging element (4) and the knob dogging element (8) are axially movable and are in end-to-end connection with one another at least in given positions of axial movement; and in that the knob dogging element (8) is intended to be located, depending on whether said knob dogging element is rotated to a position corresponding to the locked mode or the unlocked mode of said lock mechanism, in either a withdrawn position or an outwardly projected position in which the knob dogging element is held against axial movement and in which the cylinder-lock dogging element (4) will prevent a standard key (1) which fits the cylinder lock (3) from being inserted fully into said cylinder lock.

4,922,738
PROCESS FOR MANUFACTURING A SINGLE PIECE ALLOY WHEEL RIM FOR VEHICLE TIRES

Hiroshi Mori, 2751 Aqua Verde Cir., Los Angeles, Calif. 90077

Continuation-in-part of Ser. No. 721,172, Apr. 8, 1985, Pat. No. 4,693,104. This application Sep. 11, 1987, Ser. No. 97,288
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.[5] B21H *1/10*
U.S. Cl. 72—68 5 Claims



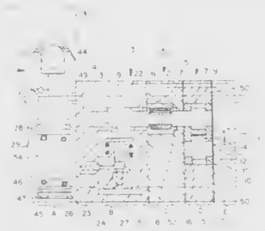
1. A process for forming a single piece rim for vehicle wheels of the type having a radially directed flange for use in securing the rim to a wheel center, said process comprising the steps of pressing a toroid of alloy material in an axial direction between a pair of dies to cause a portion of said material to flow into one of said dies and a portion of said material to flow about the other of said dies so as to define a hollow tubular element of predetermined length having annular inwardly directed radial flange intermediary of the ends thereof and spaced predetermined distances from the ends of said element; machining said flange to define parallel surfaces perpendicularly disposed with respect to the longitudinal axis of said tubular element; and bending the ends of said element radially outwardly and axially to define an inner rim flange and an outer rim flange.

4,922,739
ROLLER MILLING TOOL UNIT FOR A MILLING MACHINE TOOL

Alfred Ostertag, Celle, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Filed Jul. 27, 1989, Ser. No. 401,971
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1988, 8809823; European Pat. Off., Jan. 10, 1989, 89100291.7; Fed. Rep. of Germany, Apr. 11, 1989, 8904687; Jun. 5, 1989, 8906866
Int. Cl.[5] B21H *01/00*
U.S. Cl. 72—80 20 Claims

1. A roller milling tool unit, comprising a roller tool section including roller tool means for contacting and rolling a work piece, a pressure generating section including means for converting a fluid flow into a pressurized flow for pressing said roller tool means against said work piece, means rigidly interconnecting said roller tool section and said pressure generating section, and fluid flow coupling means for connecting said pressure generating section to a fluid circulating system.



4,922,740
ROLLING UNIT SUPPORTED AS A CANTILEVER

Alfredo Poloni, Ronchi Dei Legionari, and Nonini Geremia, Buttrio, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Continuation of Ser. No. 74,370, Jul. 16, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 265,345
Claims priority, application Italy, Aug. 1, 1986, 60440/86[U]
Int. Cl.[5] B21B *31/00*
U.S. Cl. 72—237 12 Claims



1 A rolling mill having easy access to the rolling units, said mill comprising:

a rotatable rolling stand rotatable about a central axis;

two pairs of cantilevered rolls supported on said stand, each of said pairs located on an opposing side of said central axis, each of said rolls having a rolling axis;

a working area located adjacent to said stand on one side of said central axis for processing rolled stock;

a replacement area located adjacent to said stand on the other side of said central axis for replacing or maintaining parts of said system;

a separator screen dividing said working area and said replacement area; and

a protective movable shield surrounding said working area;

said stand being rotatable so as to assume a first or a second position to selectively orient each of said pairs first in said working area and then in said replacement area.

4,922,741
STATOR COIL FORMER

Joseph W. Bridges, North Versailles; Homer W. Luzader, Plum Boro, both of Pa., and Chandrakant P. Amin, Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 4, 1988, Ser. No. 152,289
Int. Cl.[5] B21D *11/10*
U.S. Cl. 72—306 4 Claims



1. An apparatus for shaping an unformed stator coil, comprising:

a cell bend forming section having a parting face and forming surfaces corresponding to a shape in which the unformed stator coil is to be formed, one of the forming surfaces of said cell bend forming section having an arc of curvature with a center;

an involute forming section having forming surfaces corresponding to the shape in which the unformed stator coil is to be formed and having parting faces for aligning said involute forming section with said cell bend forming section by placing corresponding parting faces thereof flush against each other; and

a lead bend forming section having forming surfaces corresponding to the shape in which the unformed stator coil is to be formed and having a parting face for aligning said lead bend forming section with said involute forming section by placing corresponding parting faces thereof flush against each other;

a platen for supporting said cell bend forming section and the unformed stator coil;

a working table for directly supporting said involute forming section in alignment with said cell bend forming section;

an auxiliary table, supported by said working table, for directly supporting said lead bend forming section in alignment with said involute forming section; and

a cell bending pin mountable on said platen at the center of the arc on the one of the forming surfaces of said cell bend forming section.

4,922,742
APPARATUS FOR PRECISION FORMING OF SHEET METAL PARTS

Stephen N. Syrylo, Jr., White Marsh, and Madisnn L. Deal, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1988, Ser. No. 267,082
Int. Cl.[4] B21D *5/04*
U.S. Cl. 72—308 15 Claims

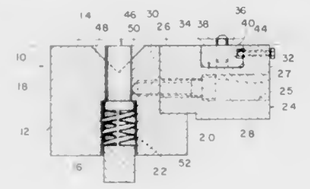
1. A lower die assembly mountable on a die block of a bending machine for bending a piece of sheet metal and having an upper die movable above the lower die, the lower die comprising:

a first die body having an upper surface, a lower surface, and opposite side walls;

a bending slot formed longitudinally in the upper surface of the first die body, and cooperating with the upper die for effecting a bend in the piece of sheet metal.

means, disposed at the lower surface of the first die body, for fixing the longitudinal position of the first die body along the die block;

a second die having an upper surface, a lower surface, and opposite side walls, and having one side wall detachably connected to one side wall of the first die body, the upper surfaces of the first and second die bodies being coplanar and forming a sheet retaining surface for receiving thereon a sheet having attachment holes and positioning holes thereon;



at least one pin stop extending upwardly from the upper surface of the second die body at a predetermined distance from the slot formed in the upper surface of the first die body, for mating with one of the sheet positioning holes of the sheet; and

means, cooperating with the upper die, for holding the punched sheet in place when a bending force is applied to the sheet through the upper die, said holding means being mounted in said first die body.

4,922,745

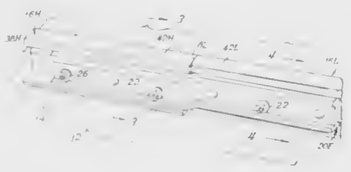
BAR FOR CONNECTING RAILWAY TRACK RAILS AND METHOD OF MAKING SAME

Norman W. Hillegass, Homewood, Ill., and Walter J. Drone, Wheatfield, Ind., assignors to Track-Work Products, Inc., Chicago, Ill.

Continuation of Ser. No. 912,266, Sep. 9, 1986, abandoned. This application May 9, 1989, Ser. No. 349,878

Int. Cl.[5] B21D *31/06*; **E01B** *11/16*

U.S. Cl. 72—377 **16 Claims**



15. A method of forging a bar for overlapping and connecting the ends of aligned railroad rails disposed in end-to-end relation, having a rail side, a remote side and a finite length formed by the steps of:

providing a pair of dies which are shaped to define respectively the entire rail side and remote side of the intended bar, one of said dies having a forming face conforming to the shape of the entire rail side of the bar and the other of said die having a forming face conforming to the shape of the entire remote side of the bar,

providing a billet of metal to be formed into said bar, locating said billet between the die faces and moving at least one of the die faces repeatedly toward the other at a relatively high velocity for a number of successive strikes against the billet to simultaneously form the shape of the bar and its finite length

4,922,744

U-SHAPED PUNCH OR STAMPER WITH ANTI-BENDING MEMBER

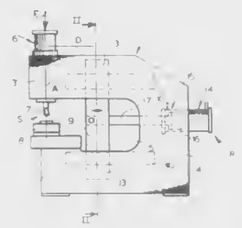
Bernd Stursberg, Ennepetal, Fed. Rep. of Germany, assignor to Carl Ullrich Peddinghaus, Wuppertal-Barmen, Fed. Rep. of Germany

Filed Feb. 28, 1989, Ser. No. 316,754

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 3809327

Int. Cl.[5] B21D *37/00*

U.S. Cl. 72—455 **2 Claims**



1. In a punch machine having a front side and a rear side comprising a U-shaped member with an upper leg, a lower leg and a crosspiece to thereby form a U-shaped work space open on said front side of said punch machine but closed on said rear side by said crosspiece between said upper leg and said lower leg, in which a punch piston-cylinder unit with a punch tool is mounted in said upper leg and a die-bearing member and/or a workpiece receiving member are mounted in said lower leg, in which at least said upper leg experiences a bending moment and a resultant elastic deformation due to a punching force occurring during a punching operation, the improvement wherein both said lower and said upper legs are connected by a tie bar positioned between said crosspiece and said punch piston-cylinder unit, said unit passes through or by said work space, said tie bar is movable horizontally according to said punching force to reduce said elastic deformation, said tie bar is guided on a plurality of guide rails mounted on said upper and lower legs, said tie bar has two flanges and an I-shaped cross section, said upper and lower legs have two steel plate-side walls, said guide rails are mounted inside of said steel plate-side walls and guide said tie bar, and said flanges engage on said guide rails.

4,922,745

FLUID TRANSDUCER

Mark J. Rudkin, 10 Delph Road, Wimborne, Dorset, and David I. H. Atkinson, 6 Dollis Drive, Farnham, Surrey, both of England

Filed Mar. 10, 1988, Ser. No. 166,254

Claims priority, application United Kingdom, Mar. 11, 1987, 8705757

Int. Cl.[5] G01N *9/34*, *11/16*

U.S. Cl. 73—32 A **12 Claims**

1. A fluid transducer comprising:

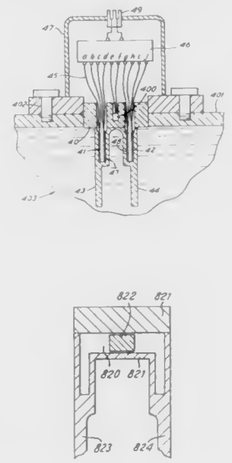
a sensing element adapted for immersion in a fluid, said sensing element comprising a pair of tines which extend from and are coupled together by a common yoke and which are resonantly vibratable at a common frequency but in antiphase;

means for exciting such resonant antiphase vibration of the tines; and

means for sensing the frequency of the vibration;

wherein the exciting means and the sensing means are both piezoelectric and both mounted under compression within at least one cavity in the sensing element, the tines have

respective inner faces facing towards each other, and at least the exciting means is mounted in a cavity in the yoke



in a region thereof closely adjacent the point where the inner face of one of the tines joins the yoke.

4,922,746

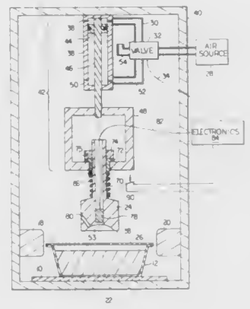
LEAK TESTING

William Hulsman, Falmouth, and Ben G. Allen, Cataumet, both of Mass., assignors to Benthos, Inc., North Falmouth, Mass.

Filed May 25, 1988, Ser. No. 198,753

Int. Cl.[5] G01M *3/36*

U.S. Cl. 73—49.3 **16 Claims**



2. An apparatus for determining leaky or non-leaky condition of a membrane-sealed container, comprising:

a device for contacting one portion of said membrane and for causing motion in one direction of said one portion of said membrane, said motion causing device comprising a contact surface for contacting said one portion of said membrane and a cavity opening into a space bounded by said contact surface, said contact surface is pressed against an exterior surface of said membrane during testing, and said other portion moves into the space defined by said cavity in response to a non-leaking condition; and

a detector for sensing resulting motion in a direction opposite said one direction of another portion of said membrane said another portion being spaced apart from said one portion of said membrane, and for delivering a signal indicative of said leaky or non-leaky condition.

4,922,747

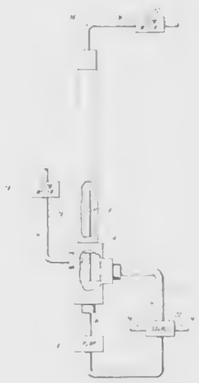
METHOD FOR THE DETERMINATION OF VOLATIVE COMPONENTS IN CONTINUOUS FLOW CONDENSED PHASE SAMPLE STREAM

David L. Wall, Burlington, Mass., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Feb. 17, 1989, Ser. No. 312,644

Int. Cl.[5] G01N *33/28*

U.S. Cl. 73—61.1 R **16 Claims**



1. A method for detecting volatiles in oil comprising the steps of:

creating a cascade of oil the presence of a volatile in which is to be detected;

flowing a dry inert gas in countercurrent to the cascade of oil to absorb volatiles in the oil cascade in the inert gas;

detecting radiation absorption in the inert gas after exposure to the oil cascade as an indication of volatile content of the inert gas and thus of the oil.

4,922,748

METHOD FOR MONITORING THINNING OF PIPE WALLS AND PIPING COMPONENT FOR USE THEREWITH

Joram Hopenfeld, 1724 Yale Pl., Rockville, Md. 20850

Continuation-in-part of Ser. No. 122,126, Nov. 18, 1987, Pat. No. 4,779,453. This application Oct. 20, 1988, Ser. No. 260,292

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[5] G01N *17/00*; **G01M** *3/22*

U.S. Cl. 73—86 **15 Claims**

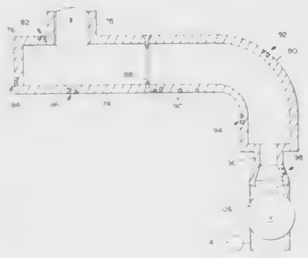
1. A method of monitoring wall thickness of pipes in a piping system comprising the steps of:

boring holes in the outer surfaces of walls of the pipes at predetermined locations along the pipes and to depths larger than the thicknesses at which the pipes will rupture leaving residual wall thicknesses between the ends of the holes and the inner surfaces of the walls;

inserting tracer materials in the holes to be released into fluid in the piping system when pipe wall thinning exceeds the residual wall thickness at any of the holes; and

determining the presence or absence of tracer materials in

the holes whereby pipe wall thinning can be detected prior to rupture and thinning of particular pipes within the



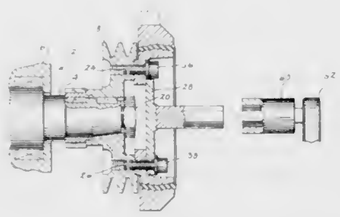
piping system can be determined to facilitate repair with minimal downtime of the piping system.

4,922,749

ENGINE CRANKSHAFT INDEXING METHOD AND TOOL

Thomas J. Steffes, Fond du Lac; Paul A. Feyen, and Wesley R. Martin, both of Oshkosh, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Feb. 2, 1989, Ser. No. 305,740
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—116 19 Claims



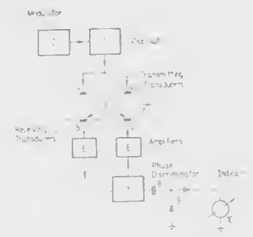
1 In an internal combustion enging having a crankshaft extending axially from a crankcase, a pulley mounted to said crankshaft by a nut, and a disc mounted to said pulley by a plurality of bolts and covering said nut, a method for rotating siad crankshaft to facilitate test and repair adjustments requiring precise indexing of rotational degrees of said crankshaft, comprising removing one or more of said bolts, removing said disc, providing a tool having a disc and an axial shank, engaging said tool disc with the remaining of said bolts, and rotating said shank to rotate said tool disc to impart rotation to said pulley and said crankshaft.

4,922,750

ULTRASOUND PHASE DIFFERENCE METHOD FOR MEASURING HIGH FLOW RATES

Valentin Magori, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 218,474, Jul. 6, 1988, abandoned, which is a continuation of Ser. No. 82,599, Aug. 7, 1987, abandoned.
This application Mar. 28, 1989, Ser. No. 330,940
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633187
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—118.2 10 Claims



1. A method for measuring the flow rate of a fluid flow in a flow path, comprising the steps of:

modulating an oscillator signal to obtain a modulated oscillator output;

transmitting said modulated oscillator output via two paths so that at least one of said paths passes through said flow path and said modulated oscillator output in said one path interacts with said fluid flow thereby phase-shifting said modulated oscillator output in said one path by an amount dependent on said flow rate;

separately receiving said modulated oscillator output from each of said two paths;

comparing the received modulated oscillator output from each of said two paths by phase discrimination to obtain a signal corresponding to the phase difference between said modulated oscillator output from said two paths; and

deriving a signal corresponding to said flow rate from said signal corresponding to the phase difference.

4,922,751

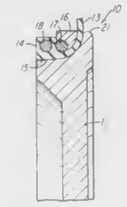
METHOD AND APPARATUS FOR CHECKING THE CONCENTRICITY OR CORRECT CONTOUR OF A PNEUMATIC VEHICLE TIRE

Horst Sergel; Dieter Aschemann, both of Hanover; Klaus Gerloff, Isernhagen, all of Fed. Rep. of Germany; Alexander Kay, Embourg, Belgium, and Lutz Wedemeyer, Wunstorf, Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,821
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731926
Int. Cl.[5] G01M *17/02*
U.S. Cl. 73—146 7 Claims

2. In an apparatus for checking the concentricity or correct contour of a pneumatic vehicle tire that during operation has its bead regions mounted on the radially inner periphery of a wheel rim, said apparatus including a test rim that receives the axially outer bead zones of a tire that is to be checked, the improvement wherein:

said test rim is provided with vulcanizing mold contour means for receiving initially axially outwardly disposed bead-seating surfaces of said bead regions of said tire; and forming ring means that are adapted to be disposed in inner spaces present between said bead regions and the adjacent sidewalls when said tire is mounted on said test rim, and



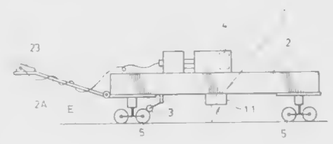
said bead-seating surfaces of said bead regions are displaced to face radially inwardly.

4,922,752

FLATNESS INTEGRATING/RECORDING APPARATUS

Masahiro Kitazume, Yokohama; Makoto Aoki, Tokyo; Hiroshi Nogi; Kazuya Homma, both of Yokohama, and Shigemi Matsuzawa, Kawasaki, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Sep. 2, 1988, Ser. No. 239,652
Claims priority, application Japan, Sep. 4, 1987, 62-135398[U]; Aug. 30, 1988, 63-215810
Int. Cl.[5] G01B *11/24*
U.S. Cl. 73—146 19 Claims



1. An apparatus for integrating/recording the flatness of a road surface, comprising:

a car that can travel on the road surface, said car having a tractor portion at the forward end and wheels on the lower surface thereof;

a travelled distance measuring means connected to one of said wheels;

an optical road surface irregularities measuring means mounted on said car;

first and second signal processing portions for processing data from said travelled distance measuring means and said road surface irregularities measuring means, respectively;

a set value inputting means incorporating a data storage portion for storing the data from said first and second signal processing portions, said set value inputting means additionally setting predetermined measuring conditions employed in said second signal processing portion; and

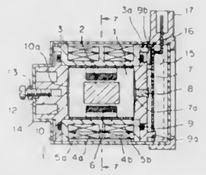
a measurement result display means connected to said data storage portion.

4,922,753

ACCELERATION SENSOR

Takaharu Idogaki, Okazaki; Ikuo Hayashi, Nukata; Toshihisa Ishaibara, Nishio; Tatsuo Sugitani, Mishima, and Hideo Inoue, Ashigarakami, all of Japan, assignors to Nippon Soken & Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 27, 1988, Ser. No. 199,747
Claims priority, application Japan, May 30, 1987, 62-133398; Feb. 13, 1988, 63-30068
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—516 R 23 Claims



1. An acceleration sensor comprising:

a magnetic fluid,

a permanent magnet emplaced movably in said magnetic fluid,

a stable position where the permanent magnet is in a stable state, said stable position being located at a center position in said magnetic fluid, said permanent magnet being displaceable by an inertia force in an acceleration state,

a nonmagnetic casing in which said magnetic fluid and said permanent magnet are sealed and from which air is substantially excluded,

a magnetic-electric detection means for detecting a position of said permanent magnet where said inertia force exerted on said permanent magnet is balanced with a restoration force at said center position, said magneto-electric detection means generating a position detection signal concerning said position of said permanent magnet,

a processing circuit for processing said position detection signal,

wherein the acceleration sensor is magnetically shielded by a case made of a ferromagnetic material which prevents influence from external magnetic fields, and

including a magnetic offset adjustment means made of a ferromagnetic material and movable in an axial direction of the permanent magnet for enabling adjustment of the stable position of the permanent magnet at a zero acceleration state.

4,922,754

ACOUSTIC EMISSION TRANSDUCER AND MOUNTING ADAPTER FOR MONITORING METALCUTTING TOOLS

John G. Horne, Lafayette; David A. Dornfeld, and Keith A. McMillen, both of Berkeley, all of Calif., assignors to Kennametal Inc., Latrobe, Pa.

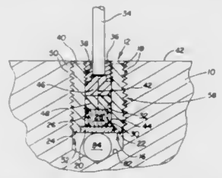
Continuation of Ser. No. 324,959, Mar. 17, 1989, abandoned, which is a continuation of Ser. No. 944,556, Dec. 19, 1986, abandoned. This application Aug. 15, 1989, Ser. No. 395,193
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—587 17 Claims

1. A surface-mountable acoustic emission detection arrangement for use in monitoring the operating condition, of a machine tool said arrangement comprising:

an externally-threaded acoustic emission transducer;

a surface-mountable internally-threaded adapter for receiving said externally-threaded transducer and forming a releasable threaded connection therewith, said adapter being mountable to a surface of a machine tool support structure for receiving acoustic emission energy therefrom and transmitting the same through said threaded connection to said transducer for monitoring machine tool operating condition; and

a contact ball disposable in a recess formed in the machine tool support structure surface for providing acoustic emission energy transmitting contact between said transducer



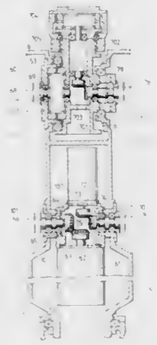
and the machine tool support structure when said adapter is mounted to the machine tool support structure surface so as to position said transducer in overlying relation to the recess.

4,922,755

WRIST MECHANISM OF INDUSTRIAL ROBOT

Masayuki Oshiro, Funabashi; Fusaaki Kozawa, Chiyoda, and Akira Uchida, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,145
Claims priority, application Japan, Dec. 28, 1987, 62-336088
Int. Cl.[5] B25J *17/02*; G05G *11/00*
U.S. Cl. 74—479 **6 Claims**



1 A wrist mechanism of an industrial robot comprising a forearm, a wrist base mounted on said forearm so as to be rotatable about a lengthwise axis of said forearm, a wrist body mounted on said wrist base as to be swingable about an axis of a swing shaft which perpendicularly crosses the lengthwise axis of said wrist body and is provided for swinging said wrist body thereabout, and a wrist tip mounted on said wrist body so as to be rotatably about a rotary shaft perpendicular to the swing shaft axis of said wrist body, wherein an output shaft of a rotation motor provided for rotating said wrist tip and an output shaft of a swing motor provided for swinging said wrist body are arranged oppositely to each other in a lengthwise direction thereof.

4,922,756

MICRO-MACHINED ACCELEROMETER

W. S. Henrion, Austin, Tex., assignor to Triton Technologies, Inc., Austin, Tex.

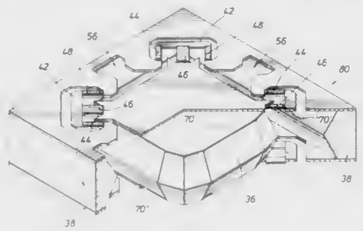
Filed Jun. 20, 1988, Ser. No. 209,415
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—517 R **21 Claims**

1 A transducer comprising,

a movable mass supported by springs from a support structure;

said mass having a surface with a sense conducting area and a force conducting area, said mass being free to move between corresponding first and second sense conducting areas and first and second force conducting areas on plates which face said surface of said mass and which are secured to said support structure, said sensing conducting areas and said force conducting areas being electrically isolated from each other;

means for applying a first voltage between said first and second sense conducting areas of said plates thereby creating a sense electric field between said sense conducting areas and inducing a sense voltage on said mass sense conducting area of said mass surface proportional to the displacement of said mass surface between said plates,



means for applying a second voltage between said first and second force conducting areas of said plates thereby creating a force electric field between said force conducting areas,

forward circuit means responsive to said sense voltage for generating a displacement signal representative of the distance said mass has moved from a reference position between said plates, and

feedback circuit means responsive to said displacement signal for applying an amount of electric charge proportional to the level of said displacement signal on said force conducting area of said mass surface such that a force is created on said mass proportional to the numerical product of said amount of charge and said force electric field in a direction to restore said mass to said reference position.

4,922,757

APPARATUS FOR PRECISE DETECTION OF BLADE PASSING TIMES IN A STEAM TURBINE

Paul F. Rozelle, Fern Park, Fla.; Karl C. Koch, Swissvale; Charles W. Einolf, Jr., and Robert M. Oates, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 13, 1988, Ser. No. 205,770
Int. Cl.[5] G01H *11/02*; G01M *1/22*; G01P *3/488*; H03K *5/153*
U.S. Cl. 73—660 **7 Claims**



1 An apparatus for detecting the passing times of the blades of a steam turbine past a stationary sensor for providing blade vibration data, comprising:

stationary magnetic sensor means for producing an input signal each time a blade of a steam turbine passes said sensor means;

zero crossing detection means responsive to said input signal for producing an output signal each time said input signal crosses a reference axis;

means responsive to said input signal for shifting the phase of said input signal;

comparator means responsive to said phase shifted input signal and a reference signal for producing a gating signal whenever said phase shifted input signal exceeds said reference signal, said gating signal having a pulse width whose duration spans the expected arrival time of the blade at said sensor means; and

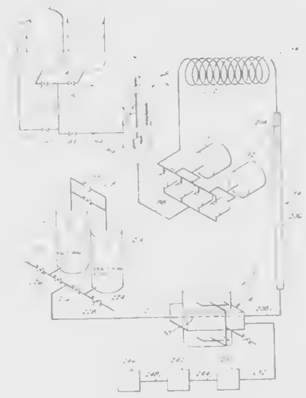
gate means responsive to said gating signal and said output signals for conducting those output signals which occur during the duration of said gating signal, said conducted output signals being indicative of the times at which the steam turbine blades pass said sensor means and from which times blade vibration data may be obtained.

4,922,758

CELL ASSEMBLY FOR DETERMINING CONDUCTIVITY AND PERMEABILITY

Glenn S. Penny, Duncan, Okla., assignor to Stim Lab, Inc., Duncan, Okla.

Division of Ser. No. 52,458, May 20, 1987, Pat. No. 4,791,822.
This application Aug. 17, 1988, Ser. No. 233,158
Int. Cl.[5] G01N *15/08*
U.S. Cl. 73—38 **4 Claims**



1. A cell assembly for determining the effects of gelled fracturing fluids on conductivity and permeability of proppants comprising:

a cell body member having an elongated passageway extending therethrough and a fluid inlet port formed in one end thereof and a fluid outlet port formed in an opposed end thereof, the inlet and outlet ports communicating with the passageway;

a lower piston member having a cross-sectional configuration substantially corresponding to the shape of the passageway of the cell body member, the lower piston member further characterized as having an upper portion, a lower portion, a set of ports extensive through a sidewall portion and an adjacent upper side thereof, and a groove formed about the peripheral edge of its upper portion, the lower piston member connected to the cell body member such that the upper portion thereof extends a selected distance into a lower portion of the passageway, the lower portion of the lower piston member extending outwardly from the cell body member;

first shim means disposed within the passageway of the cell body member adjacent the upper portion of the lower piston member for forming a fluid-tight seal with the cell body member, the first shim means comprising a substantially oval-shaped first shim member formed of quarried rock substantially corresponding to the structure of the subterranean formation, the first shim member having substantially planar, parallel upper and lower surfaces and being fabricated of a predetermined thickness;

second shim means disposed within the passageway of the cell body member for forming a fluid-tight seal with the cell body member, the second shim means disposed in a substantially parallel, spatial relationship with the first shim member so that a proppant pack cavity is formed therebetween and the inlet and outlet ports of the cell body member communicate with the proppant pack cavity, the second shim means comprising a substantially oval-shaped second shim member formed of quarried rock substantially corresponding to the structure of the subterranean formation, the second shim member having substantially planar, parallel upper and lower surfaces and being fabricated of a predetermined thickness;

gasket means disposed about a peripheral edge of each of the oval-shaped first and second shim members for cooperating with adjacently disposed portions of the cell body member defining the passageway such that a fluid-tight seal is formed therebetween and thereby preventing fluid flow between the oval shaped first and second shim members and the cell body member;

an upper piston member having a cross-sectional configuration substantially corresponding to the shape of the passageway of the cell body member, the upper piston member further characterized as having an upper portion, an opposed lower portion, a set of ports extensive through a sidewall portion and an adjacent lower side thereof, and a groove formed about the peripheral edge of its lower portion, the lower portion of the upper piston member positionable in the upper portion of the passageway in an abutting relationship with the oval-shaped second shim member such that the upper portion of the upper piston member extends outwardly from the cell body member, the upper piston member vertically movable within the passageway of the cell body member in response to force imparted thereto;

ring means positionable within the grooves formed in the upper and lower piston members for engaging the oval-shaped first and second shim members and the portion of the cell body member defining the passageway to form a fluid-tight seal therebetween;

manifold means for connecting the ports of the upper piston member and for connecting the ports of the lower piston member so that the rate of leak off of fluid through the oval-shaped first and second shim members can be determined; and

means for injecting an effective amount of proppant into the proppant pack cavity via the fluid inlet port to provide from about 0.5 to about 4 pounds of proppant per square foot of the proppant pack cavity, and thereafter inject a fracturing fluid into the proppant pack cavity containing the proppant pack, the means for injecting the proppant and the fracturing fluid comprising:

an inlet conduit having a hollow injection member supported on one end thereof, the hollow injection member having a distribution channel formed therethrough shaped to substantially disperse fracturing fluids across an input surface of the proppant pack, a portion of the inlet conduit being disposed within the fluid inlet port of the cell body member such that a distal end of the hollow injection member is disposed substantially flush with the portion of the cell body member defining the adjacent end portion of the proppant pack passageway; and

connector means for connecting the inlet conduit to the cell body member to form a fluid-tight seal therebetween.

4,922,759

VORTEX FREQUENCY FLOW METER

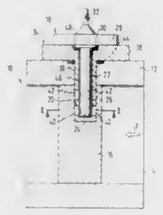
Kurt Steiner, Reinach BL 1, Switzerland, assignor to Flowtec AG, Reinach, Switzerland

Filed Feb. 1, 1989, Ser. No. 305,394

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1988, 3803192

Int. Cl.[5] G01F *1/32*

U.S. Cl. 73—861.22 6 Claims



1. Vortex frequency flow meter having a tube body which comprises a flow passage for the medium of which the flow is to be measured, a bluff body arranged in the flow passage for generating vortices having a recurrence frequency which is proportional to the flow velocity of the medium, and at least one sensor which responds to the pressure fluctuations generated by the vortices and is arranged in a cavity which communicates via closable passages with the flow passage, characterized in that the cavity is formed in the interior of the bluff body, that the closable passages are formed in the bluff body, that a rotatable shutoff member is provided for closing the closable passages, that an actuating member is provided for rotating the shutoff member from the outside of the tube body, and that the shutoff member is a hollow cylindrical blocking bush which is arranged rotatably in the cavity and which has openings formed therein which by rotation of the blocking bush can be brought into or out of coincidence with the closable passages.

4,922,760

DIFFERENTIAL PRESSURE TRANSMITTER, A SQUARE ROOT EXTRACTOR DEVICE THEREFOR AND METHODS OF MAKING THE SAME

Clarence M. Asbill, III, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.

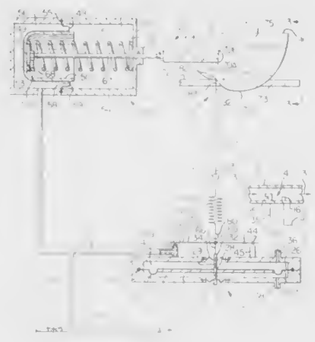
Division of Ser. No. 114,789, Oct. 30, 1987, Pat. No. 4,833,924. This application Mar. 28, 1989, Ser. No. 329,756

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[5] G01F *1/46*

U.S. Cl. 73—861.48 4 Claims

1. In a differential pressure transmitter comprising means for producing an output pneumatic signal from a pneumatic source in relation to the air velocity pressure of air flowing in a passage, means for sensing the difference between the total pressure and the static pressure of said air flowing in said passage, a movable wall carried by said transmitter and defining an output signal chamber therewith whereby the position of said wall is determined by the value of the pressure in said output signal chamber, said means for producing said output pneumatic signal comprising a bleed nozzle carried by said transmitter and a flapper lever pivotally carried by said transmitter for controlling said bleed nozzle, said means for sensing the difference between the total pressure and the static pressure comprising a housing having a pair of chambers separated from each other by a flexible diaphragm whereby one of said chambers is for receiving said total pressure therein and the other of said chambers is for receiving said static pressure therein, said flexible diaphragm having means that is operatively interconnected to said flapper lever to transmit movement of said diaphragm to said flapper lever which will produce said output pneumatic signal with said nozzle, and means for extracting the square root of said air velocity pressure of said air from said pneumatic output signal as said pneumatic output signal is being produced so that said pneumatic output signal is substantially linear with respect to said air velocity of said air flow in said passage whereby said transmitter comprises a linear air velocity transmitter, the improvement wherein said means for extracting the square root comprises a rotatable cam having a cam face that defines at least part of the involute of a circle,



said wall being operatively interconnected to said cam to rotate said cam as the value of said pressure in said output chamber changes, and a cable, said cam face of said cam being operatively interconnected to said flapper lever by said cable, said cable having opposed ends one of which is operatively interconnected to said flapper lever and the other of which is operatively interconnected to said cam in such a manner that said cable is wound onto said cam face as said cam rotates in one direction and is unwound from said cam face as said cam rotates in the opposite direction to said one direction.

4,922,761

STEERING TORQUE DETECTOR

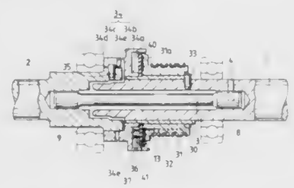
Masayoshi Onishi; Hiromasa Ozawa, and Hisato Umemaru, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 313,844

Claims priority, application Japan, Feb. 25, 1988, 63-45077; Feb. 25, 1988, 63-45079; Feb. 25, 1988, 63-45096; Feb. 25, 1988, 63-45078; Feb. 26, 1988, 63-45148

Int. Cl.[5] G01L *3/10*

U.S. Cl. 73—862.33 5 Claims



1. A steering torque detector, comprising:
input steering shaft means;
output steering shaft means;
fixed section means;
torsion bar means which couples said input and output steering shaft means to each other;
printed circuit board means attached to one of said input and output steering shaft means, and having resistor layers and electrodes on one side thereof as elements of a potentiometer;
means provided between said one steering shaft means and said fixed section means to send out detection signals from said printed circuit board means to said fixed section means;
mounting ring means made of an electric insulator and fitted around both said input and output steering shaft means, said mounting ring means being provided with a flange means turned together by the other steering shaft means; and
slider means attached to said flange means of said mounting ring means and elastically kept in contact with said resistor layers of said potentiometer at the ends of said slider means;
wherein said potentiometer comprises a main circuit and an auxiliary circuit each having one of said resistor layers and one of said electrodes, said resistor layers of both said main and said auxiliary circuits being located at a distance from each other in the radial direction of said detector and extending along mutually concentric circles through the same range of central angle of the cross section of said detector; and said slider means comprises a main slider having one end which is elastically kept in contact with said one of said resistor layers of said main circuit and an auxiliary slider having one end which is elastically kept in contact with said one of said resistor layers of said auxiliary circuit, both said main and said auxiliary sliders being located at a distance from each other in the radial direction of said detector and extending along mutually concentric circles so that said one ends of both said main and said auxiliary sliders are positioned along a same radial direction of said detector.

4,922,762

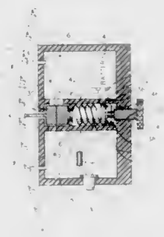
TENSIONING GAUGE FOR SAW BLADES

David A. Loring, North Hollywood, Calif., assignor to Anthony R. Billson, Yorba Linda, Calif., a part interest

Filed Apr. 21, 1989, Ser. No. 341,165

Int. Cl.[5] G01L *5/10*

U.S. Cl. 73—862.48 18 Claims



1. A tensioning gauge for measuring the tension under which an elongated flexible member such as a saw blade is held, said tensioning gauge comprising:
(a) indicator means;
(b) tang means depressible from an extended position toward an activating position for activating said indicator means when said tang means is depressed to said activating position;
(c) adjustable bias means for biasing said tang means towards said extended position; and
(d) depression force calibrating means for adjusting the force required to depress said tang means to said activating position by changing a biasing force of said bias means, whereby said member bows upon being pressed against said tang means so that said tang means is not depressed to its activating position unless said member is held under at least an amount of tension proportional to said biasing force of said bias means.

4,922,763

METHOD AND AN APPARATUS FOR TAKING SOIL SAMPLES

John Ashworth, 9938 - 67 Avenue, Edmonton, Alberta, Canada (T6E 0P5)

Filed Jul. 26, 1988, Ser. No. 224,567

Int. Cl.[5] G01N *1/04, 1/08*

U.S. Cl. 73—864.41 6 Claims



1. A method of taking soil samples, comprising the steps of:
a. cutting at least one slit trench along a path transverse to bands of fertilizer in the soil; and
b. taking a thoroughly intermixed sample from the cuttings.

4,922,764

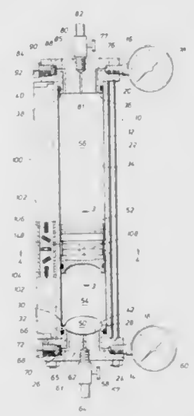
CONSTANT PRESSURE SAMPLE CYLINDER WITH SPHEROID MIXER

Brian H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Sep. 12, 1988, Ser. No. 243,589

Int. Cl.[5] G01N *1/10*

U.S. Cl. 73—864.62 18 Claims



1. A sample storage apparatus comprising:
(a) an elongate hollow cylinder having cylinder heads at both ends to close said cylinder;
(b) a piston slidably mounted within said cylinder to divide said cylinder into first and second chambers, one chamber serving to receive a pressurized fluid and the other chamber adapted to receive sample through a passage in one of said cylinder heads and thereby comprising a sample chamber; and
(c) a mixing element of generally ellipsoid shape having a

size and shape to permit free movement of said element while mixing sample in said sample chamber.

4,922,765

LUBRICATING STRUCTURE FOR TRANSMISSION MECHANISM

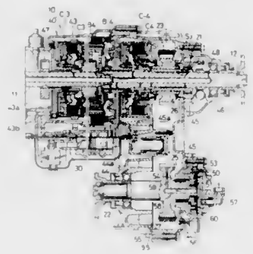
Yoichi Hayakawa; Takahiro Yamashita; Kazuaki Watanabe, and Yoshiharu Harada, all of Aichi, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 889,329, Jul. 23, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 212,155

Claims priority, application Japan, Jul. 25, 1985, 60-162900; Jul. 25, 1985, 60-162901; Jul. 25, 1985, 60-162902; Jul. 25, 1985, 60-162903

Int. Cl.[5] **F16H** *57/04*

U.S. Cl. 74—15.88 **8 Claims**



1 A transmission mechanism comprising.

a first shaft,

a sleeve provided coaxial with the first shaft,

a first sprocket coaxially connected to the sleeve,

a clutch connected between the first shaft and the sleeve,

a second shaft parallel to the first shaft having an axial oil passage,

a second sprocket connected to the second shaft having a radial oil passage connected to the axial passage of the second shaft,

a chain extending between the first sprocket and the second sprocket,

a casing supporting at least the second shaft and forming an enclosed transmission mechanism chamber and a reservoir formed by a reservoir plate dividing the portion of transmission mechanism chamber from which oil in the transmission mechanism chamber is scattered by the chain from the reservoir, said reservoir and reservoir plate being disposed in axially juxtaposed relationship with said second sprocket, and said reservoir being adapted to accommodate the scattered oil and to return a part of said oil to said portion of the transmission mechanism chamber through an orifice provided in the reservoir plate,

an oil pump supported on the casing, connected between the reservoir and the axial oil passage of the second shaft, and connected to be driven by the second shaft, and

means for coupling the oil pump to an external cooler and means for coupling the cooler to the reservoir to permit return of oil from the pump.

4,922,766

ELECTRIC FAN APPARATUS

Soon-Suk Ahn, Seoul, Rep. of Korea, assignor to Seong-Do Moon, Kyonggi, Rep. of Korea

Filed Jan. 12, 1988, Ser. No. 143,089

Int. Cl.[5] **F16H** *35/00*

U.S. Cl. 74—385 **6 Claims**

1. An electric fan apparatus comprising:

a housing including a rotatable hub member provided in the central portion thereof and surrounded with a bearing housing through a pair of bearings;

a vertical main shaft connected to a motor shaft via a coupling;

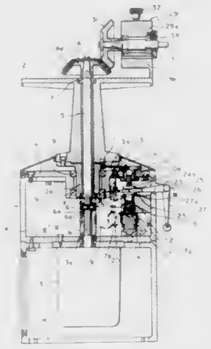
a rotary member connected to said hub member;

a plurality of fan spindles equally disposed on said rotary member, and supported by a plurality of bearing housings, respectively;

a base member supporting said apparatus;

a column vertically fixed on the central portion of said base member;

a stem member movably inserted into said column;



a tilting device connected between the bottom plate of said housing and the top end portion of said stem member;

cooperating means between said coupling fixedly inserted to said motor shaft and a worm wheel shaft arranged in said housing;

a clutch mechanism selectively engaging between said worm wheel shaft and a crank device for angularly moving said rotary member; and

connecting means transmitting between said main shaft and said plurality of fan spindles capable of being mounted with a plurality of fan impellers for sending the wind to all directions.

4,922,767

HELICAL GEAR TRANSMISSION DEVICE

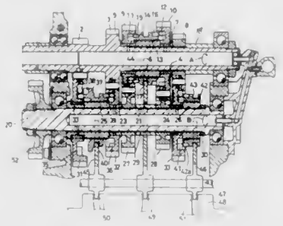
Ito Toshifumi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 104,996

Claims priority, application Japan, Oct. 8, 1986, 61-238103

Int. Cl.[5] **F16H** *3/08*

U.S. Cl. 74—333 **1 Claim**



1. A helical gear transmission including a rotatable driving shaft and rotatable driven shaft, two pairs of drive and driven gears provided side-by-side on each of said shafts including a pair of fixed gears on one of said shafts and a pair of loose,

rotatable gears on the other of said shafts meshing with said fixed gears and a clutch on said other shaft axially selectively movable by a shift fork between said loose, rotatable gears to fix one or the other thereof to said other shaft, characterized in that said pairs of drive and driven gears have helical gear teeth having oppositely directed inclinations of the helix angle and operative to develop a thrust force in a direction opposite to the direction of the axial component of the counterforce transmitted between the respective loose, rotatable gears and the clutch in that said loose, rotatable gears, if disposed on said driving shaft are provided with teeth having a helix angle inclined in a direction to move said loose, rotatable gears axially away from said clutch, or, if disposed on said driven shaft, are provided with teeth having a helix angle inclined in a direction to move said loose, rotatable gear axially toward said clutch.

4,922,768

DRIVING DEVICE

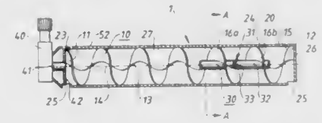
Richard Bruke, Bunkeflostrand, Sweden, assignor to Spirac Engineering AB, Malmo, Sweden

Filed Feb. 27, 1989, Ser. No. 316,281

Claims priority, application Sweden, Feb. 29, 1988, 88007034

Int. Cl.[5] **F16H** *27/02*

U.S. Cl. 74—89 **11 Claims**



1. A driving device comprising a shaftless spiral rotatable around its longitudinal axis and enclosed by limiting means having a first end region and a second end region, said end regions corresponding to each end of the spiral, the shaftless spiral enclosing a sliding body including an element projecting from the sliding body, which passes between two adjoining spiral turns of the spiral and has a part located radially outside the spiral turns in a slot oriented substantially in the axial direction of the limiting means, said spiral being journalled only adjoining the first end region of the limiting means and said spiral along at least a part of its length being in contact with an inner limitation of said limitation means, said sliding body having a length exceeding the distance between two adjoining spiral turns of said spiral.

4,922,769

ELECTRICAL CONTROL SYSTEM FOR CONTROL OF AN AUTOMATIC TRANSMISSION APPARATUS

Edward L. Tury, Brighton, Mich., assignor to Automotive Products (U.S.A.) Inc., Sterling Heights, Mich.

Continuation-in-part of Ser. No. 108,812, Oct. 15, 1987, Pat. No. 4,817,471, which is a continuation-in-part of Ser. No. 62,775, Jun. 16, 1987, Pat. No. 4,790,204. This application Feb. 16, 1989, Ser. No. 311,982

Int. Cl.[5] **B60K** *41/18*

U.S. Cl. 74—866 **10 Claims**

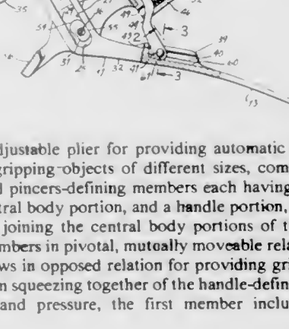
1. An electrical control apparatus for control of a transmission apparatus in a motor vehicle having a plurality of transmission states including at least one electrical actuator adapted to shift the transmission apparatus between transmission states, said electrical control apparatus comprising:

a plurality of momentary contact push buttons, each corresponding to a predetermined transmission state of said plurality of transmission states;

a transmission state sensing means for generating a present transmission state signal indicative of the current state of the transmission; and

a logic control unit connected to the at least one electrical actuator, said plurality of momentary contact push buttons, and said transmission state sensing means

for generating a desired transmission state signal corresponding to one of said plurality of momentary contact push button switches depressed if one or more of said momentary contact push buttons are depressed, said desired transmission state signal corresponding (1) to the single momentary contact push button depressed if only a single momentary contact push button switch is depressed and (2) to one of said plurality of momentary contact push buttons switches depressed in accordance



to a predetermined hierarchy of priority from among the momentary contact push buttons switches depressed if more than one momentary contact push button switch is depressed,

for determining if said desired transmission state signal differs from said present transmission state signal, and

for controlling the at least one electrical actuator to shift the transmission from the present state of the transmission to the state of the transmission corresponding to said desired transmission state signal if said desired transmission state signal differs from said present transmission state signal.

4,922,770

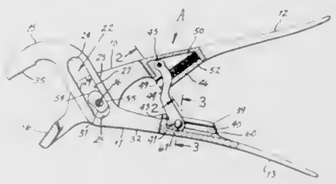
ADJUSTABLE PLIERS

Andrzej J. Dlugolecki, Milwaukee, and Timm R. Herman, Kenosha, both of Wis., assignors to American Pneumatic Technologies, Inc., O'Fallon, Mo.

Filed May 16, 1988, Ser. No. 194,408

Int. Cl.[5] **B25B** *7/12*

U.S. Cl. 81—357 **24 Claims**



1. An adjustable plier for providing automatic jaw adjustment for gripping objects of different sizes, comprising first and second pincers-defining members each having a jaw portion, a central body portion, and a handle portion, securement means for joining the central body portions of the first and second members in pivotal, mutually moveable relationship, to provide jaws in opposed relation for providing gripping of an object upon squeezing together of the handle-defining portions by user hand pressure, the first member including a slot

through which extends the securement means, the slot permitting pivoting as well as sliding movement of the first member relative to the second member, a locking pawl carried shiftably by the securement means within the slot and having on a jaw-proximate side a plurality of locking teeth, and on a jaw-remote side a smooth reaction surface opposite from its teeth, the slot having along a jaw-proximate side a rack of teeth to be engaged by the locking teeth of the pawl, the slot having a jaw-remote side of the slotted opening providing a smooth surface for sliding engagement of the reaction surface of the locking pawl, a control arm pivotally engaged at one end to the central body portion of one of the members, the central body portion of the other member receiving the other end of the control arm in slidable relationship, means for resiliently biasing the control arm for movement about its pivoted end toward the jaws, and interference means for providing controlled pawl engagement of the rack, whereby the control arm initially causes the locking pawl reaction surface to bear against the jaw-remote side of the slot, so that handle squeezing causes jaw-closing movement of the jaws until they contact an object, such jaw contact with an object causing the pivot-remote end of the control arm to shift in a direction away from the jaws for causing shifting of the pawl within the slot for forcing its locking teeth into locking engagement with the rack teeth for maintaining the jaws in locked, object-contacting relationship while user handle pressure is maintained, said interference means for providing controlled pawl engagement comprising detenting means for detenting the control arm in an initial position, said one end of the control arm being pivotally connected to one of said members and the pivot-remote end being guided in a groove formed in the other of said members for controlling shifting therein of the pivot-remote end, and the detenting means comprising a recessed portion of said groove receiving the pivot-remote end of the control arm for establishing a controlled initial position of the control arm.

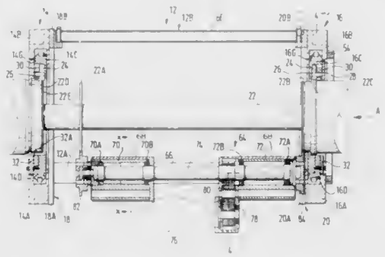
4,922,771
BRAKE ADJUSTING TOOL
Delmer E. Campbell, 1903 South Ave., Springfield, Mo. 65807
Filed Aug. 14, 1989, Ser. No. 392,885
Int. Cl.[5] B25B *13/48*
U.S. Cl. 81—484 4 Claims

1. A hand tool for adjusting the star wheel of a brake adjusting spindle of an adjustable drum/shoe-type brake system, comprising:
- an elongated body having a first end and a second end, and further having a plurality of bends intermediate said first and second ends;
- said first end having a plurality of axially-aligned voids adapted to engage the teeth of the star wheel;
- said second end having a terminal portion defined by a relatively sharp bend is said body, said terminal portion adapted to displace the adjusting lever or pawl of the brake system, and thereby disengage the pawl from the star wheel;
- said second end further comprising a series of axially-aligned voids adjacent said bend intermediate said bend and said first end, said voids adapted to engage the teeth of the star wheel, and an elongated opening adjacent said voids, wherein said opening is parallel to the axis of said elongated body thereby permitting rotation of the star wheel



by said tool in either a clockwise or counter-clockwise direction while the pawl remains disengaged.

4,922,772
MACHINE TOOLS
George R. Silk, Sandiacre, England, assignor to Silk Engineering (Derby) Limited, Derby, England
Filed Feb. 17, 1988, Ser. No. 156,818
Claims priority, application United Kingdom, Feb. 19, 1987, 8703935
Int. Cl.[5] B23B *05/08*
U.S. Cl. 82—128 13 Claims



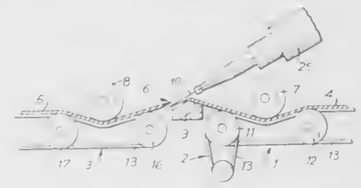
1. A machine tool comprising a frame arranged to be secured to and to be rotatable upon a work piece, the frame including bearing means located adjacent each end of the frame, each bearing means comprising an outer bearing attached to and rotatable with the frame, and an inner bearing having clamping means arranged to attach each inner bearing to a work piece at spaced apart locations, and driving means arranged to drive the frame relative to the work piece, the frame including at least one rotatable shaft eccentrically mounted in two housings, the shaft arranged to be driven by an air motor through a reduction gear box attached to one of said housings, at least one rotatable milling cutting tool being mounted on the rotatable shaft, and drive means for rotatably driving the cutting tool, the cutting tool also having feed means to adjust the position of the cutting tool relative to the work piece in at least a radial sense, the frame drive means and the cutting tool drive means being operable to cause the cutting tool support means to rotate about the work piece and for the rotating cutting tool to machine a surface of revolution of the work piece.

4,922,773
THREE-SIDE CUTTING APPARATUS
Shoji Ito, Nagoya, Japan, assignor to Itoh Iron Works Co., Ltd., Inuyama, Japan
Continuation of Ser. No. 141,028, Jan. 5, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 363,797
Int. Cl.[5] B26D *1/09, 5/06*
U.S. Cl. 83—76.6 4 Claims



1. A three-side cutting apparatus which aligns a carried-in book to be cut and transfers it to a cutting position to cut the book at its top, bottom and side, comprising:
- top and bottom size setting means for receiving data on the top and bottom sizes of the book to be cut and outputting a signal indicative of the sizes;
- transverse size setting means for receiving data on the transverse size of the book and outputting a signal indicative of the transverse size;
- transfer quantity calculating means for calculating a quantity of transfer of the book to the cutting position on the basis of the signal indicative of the transverse size and outputting a signal indicative of the transfer quantity;
- top and bottom cutter means operably connected to said top and bottom size setting means for cutting the top and bottom of the book having means for moving a pair of opposing cutters toward and away from each other under control of the signal outputted from said top and bottom size setting means indicative of the top and bottom sizes;
- position adjusting means operably connected to said top and bottom size setting means controlled in accordance with a signal outputted from said top and bottom size setting means indicative of the top and bottom sizes for positioning said book relative to where said book is being fed in;
- aligning means operably connected to said transverse size setting means controlled by the signal outputted from said transverse size setting means indicative of the transverse size for moving an aligning position and for positioning the back of the book, wherein said aligning means has a moving member for aligning the back of said book at a substantially orthogonal direction in which said book is carried in, and a shaft which extends substantially in the direction in which said book is carried in and having an aligning member for positioning the back of said book; and
- feed-in means for setting a distance based on the signal indicative of a movement quantity and moving the book to a cutting position, wherein said feed-in means has a book back abutting member substantially parallel to the direction in which the book is carried in to thereby have said position adjusting means, aligning means and feed-in means align and adjust the position of said book prior to cutting.

4,922,774
CUTTING DEVICE FOR CUTTING A STRIP OF UNVULCANIZED RUBBER
Robert-Coen Oldeman, Zwolle, Netherlands, assignor to VMI Epe Holland B.V., Epe, Netherlands
Filed Dec. 30, 1988, Ser. No. 292,193
Claims priority, application Netherlands, Jan. 14, 1988, 8800077
Int. Cl.[5] B26D *7/14*
U.S. Cl. 83—175 8 Claims



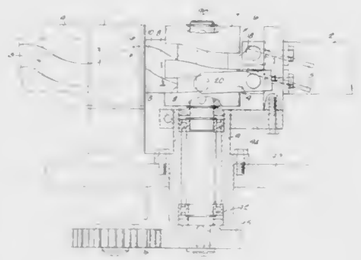
1. A cutting device for cutting strips of unvulcanized rubber to proper lengths for building a pneumatic tire in particular a radial tire, said device comprising a conveyor on each side of a cutting apparatus working crosswise with respect to said conveyors for cutting a strip of unvulcanized rubber, characterized in that said apparatus for cutting said strip comprises means to vibrate a knife longitudinally to and fro with ultrasonic frequency; means to move the knife vibrating longitudinally to and fro along a track crosswise with respect to said strip; clamping means for clamping said strip against said conveyors at both sides of the desired cut and stretching the strip between the clamps during cutting, said strip being put back in condition for conveying by the conveyors by releasing the clamps after the strip has been cut to proper length; and an intermediate conveyor between said conveyors, said intermediate conveyor being pivotable in order to make room for a cutting beam, said cutting beam being movable upwardly for a retired position into a raised position wherein it pushes a strip of unvulcanized rubber upwardly out of its normal position while cutting the strip, and the cutting beam after the cutting operation being movable downwardly to the retired position to make room for said intermediate conveyor.

4,922,775
DEVICE FOR CUTTING CONTOURED LABELS
Horst Winter, Neutraubling, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany
Filed Apr. 29, 1988, Ser. No. 188,318
Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714662
Int. Cl.[5] B26D *1/16, 1/18*
U.S. Cl. 83—333 4 Claims

1. Apparatus for use in proximity with a labeling machine for producing individual labels applicable to containers, the labels being printed in uniform periodicity on a ribbon and having opposite longitudinally extending contoured boundaries which are non-linear in the longitudinal direction of the ribbon and which boundaries are spaced apart in a direction transverse to the length of the ribbon and are bounded by waste strips of ribbon, comprising:
- means for continuously moving said ribbon in a longitudinal direction in one plane,

two levers arranged in proximity to said ribbon and spaced apart in a direction transverse to said longitudinal direction, said levers being mounted for pivoting in parallelism to said one plane about pivot axes, respectively, which are generally perpendicular to said one plane,

a knife mounted on each lever on one side of said pivot axes and projecting into said ribbon for one of said knives to cut the ribbon along one of the longitudinally extending contoured boundaries of said labels to produce one contoured edge of the labels and for the other of said knives to cut the ribbon along the other of the longitudinally extending contoured boundaries of said labels to produce another contoured edge of the labels and at the same time producing waste strips of ribbon which formerly bounded the edges of the labels before the contours were cut while





the labels remain connected in uniform periodicity on the ribbon,

a cam follower mounted to each of said levers on a side of the pivot axis of each of the levers opposite of said one side from which the knives project,

cam means having contoured surfaces corresponding to the contours of the labels, said followers being engaged with said contoured surfaces, respectively, said cam means moving in correlation with the speed of ribbon for pivoting said levers to position said knives on the contours of the labels, and

additional cutting means to which said ribbon of contoured labels is directed after said contours are cut, said additional cutting means operating to cut said ribbon of contoured labels into individual labels.

4,922,776

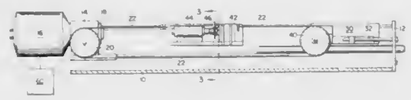
VARIABLE WIDTH SPLITTER

William G. Cook, Glens Falls, N.Y., assignor to Sandy Hill Corporation, Hudson Falls, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,470

Int. Cl.[5] B65H *19/26*

U.S. Cl. 83—398 **1 Claim**



1 Improvements in a mechanism to cut a tail from a paper web running through the dry end of a paper machine for facilitating the subsequent threading of the tail into a successive element of the machine, the mechanism being extendable along the machine width in a cross machine direction, the improvements comprising:

a cylindrical housing having an uppermost chord defining an elongated through-slot forming a path extendable along a major portion of the housing length and complemental to the width of the paper web being served,

a pair of opposed pulleys rotatably mounted at opposite ends of and within the housing,

a pulley drive motor supported by and exteriorly of the housing adjacent one of the pulleys for driving the same,

a band entrained around the pulleys in upper and lower reach-defining segments with opposite free ends of the band having a space therebetween longitudinally aligned with the path of the upper reach,

each part of the upper reach of the band having a sealed and guided relationship with the housing slot,

a knife motor mount reciprocable within the housing with the opposite free ends of the band being secured to respective opposite ends of the mount for supporting the mount within the housing,

a knife motor mounted on the knife motor mount,

a rotary knife driven by the knife motor and having an uppermost cutting segment extendable upwardly through the housing slot for defining a cutting contact with the paper web running therepast,

the band driving the knife motor mount and allowing the knife to selectively traverse the width of the paper web being served with variable portions of the housing slot inboard and outboard of the knife motor mount being closable by respective portions of the band as the band is reciprocated in the cross machine direction along the path defined by the housing slot responsively to the movement of the drive motor and the driven pulley.

4,922,777

BAND SAW FOR CUTTING SHAPED PIECES OF BAR STOCK

James Kawabata, Niles, Ill., assignor to Contour Saws, Inc., Des Plaines, Ill.

Division of Ser. No. 904,157, Sep. 5, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 303,768

Int. Cl.[5] B23D *55/04*; B27B *13/00*

U.S. Cl. 83—452 **1 Claim**

1. A workholding assembly for a band saw machine capable of securing and rotating a work piece comprising:

a collet mounted to the band saw machine and clamped around the work piece,

a collet housing positioned around the collet,

a worm gear housing positioned rearward of the collet housing,

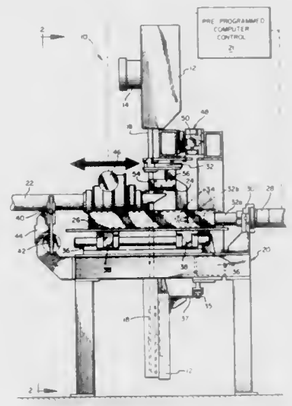
a worm gear positioned within the worm gear housing,

a servo motor mounted to the worm gear housing,

a shaft assembly connected to the servo motor and having a worm formed thereon capable of intermeshing with the worm gear,

an air cylinder mounted to the worm gear housing in position below the shaft assembly and having a piston rod extending therefrom,

a connecting arm connected at one end to the shaft assembly and at the other end to the air cylinder so that when the air



cylinder is engaged, the connecting arm will pull the shat assembly downwardly to counter the upward forces acting on the shaft assembly, to produce proper intermeshing by the worm and worm gear, and

a programmed computer control means for engaging the servo motor so as to rotate the collet assembly to position the work piece in the desired location.

4,922,778

APPARATUS FOR CUTTING METAL SHEET

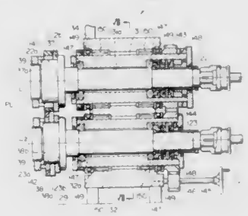
Kiyonori Nagai, Tokyo, Japan, assignor to Sky Aluminum Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,562

Claims priority, application Japan, Oct. 16, 1987, 62-261244; Oct. 19, 1987, 62-263333; Oct. 19, 1987, 62-263334

Int. Cl.[5] B23D *19/04*; B26D *1/24*

U.S. Cl. 83—501 **15 Claims**



1. An apparatus for cutting a metal sheet, the apparatus comprising:

(a) a pair of hollow shafts having respective axes extending in spaced parallel relation to each other, the hollow shafts being supported for angular movement about their respective axes, the hollow shafts having respective hollow bores whose respective axes are eccentric to the axes of the respective hollow shafts;

(b) a pair of holder shafts fitted in the hollow bores of the respective hollow shafts for rotation relative thereto, the holder shafts having respective one ends projecting from the hollow shafts;

(c) drive means associated with the other ends of the respective holder shafts for rotating the holder shafts about their respective axes;

(d) a pair of circular cutting blades mounted on said one ends of the respective holder shafts in concentric relation thereto for rotation therewith, the cutter blades being adaptable for cooperating with each other to cut a metal sheet caused to pass therebetween;

(e) interlocking means for angularly moving the hollow shafts about their respective axes in an interlocking fashion so as to move the respective axes of the holder shafts toward and away from each other to adjust an amount of gap between the cutting blades; and

(f) a pair of fasteners mounted respectively to said one ends of the respective holder shafts, the forward end of each of the holder shafts being formed with a reference surface extending perpendicularly to the axis of the holder shaft, each of the fasteners having a plurality of urging means arranged along a circle concentric to the axis of a corresponding one of the holder shafts, the plurality of urging means urging one end face of the cutter blade mounted on the holder shaft to bring the other end face of the cutter blade into close contact with the holder reference surface of the holder shaft and thereby fixedly mount the cutter blade to the holder shaft, one of the fasteners including a cylindrical base in which a plurality of circular bores are formed in one end face thereof in circumferentially and equidistantly spaced relation to each other, a plurality of plungers being slidably fitted respectively in the circular bores, a plurality of coil springs being interposed under compression respectively between base end faces of the respective plungers and bottom surfaces of the respective circular bores, the plungers being biased outwardly from said circular bores under biasing forces of the respective springs so that as the one fastener threadedly engages with the forward end of the respective holder shaft, the plurality of plungers urge one end face of a fixing ring at a plurality of locations simultaneously to fix the respective cutting blade vertically in such a manner that the other end face of the respective cutting blade is brought into close contact with the reference surface of the respective holder shaft.

4,922,779

SLITTING SHEARS

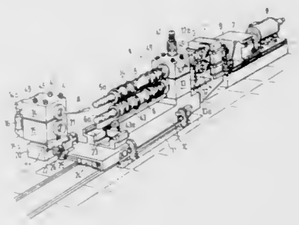
Manfred Fritz, Erkrath, and Hans Scheel, Velbert, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft

Filed Apr. 22, 1988, Ser. No. 185,095

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1987, 3713546

Int. Cl.[5] B23D *19/06*

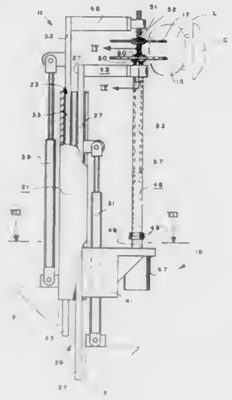
U.S. Cl. 83—503 **15 Claims**



1. Slitting shears for sheets and strips of metal, the shears comprising adjacently arranged knife rollers which support circular knives, wherein the circular knives of adjacent knife

rollers overlap and gaps are defined between the circular knives of each knife roller, the knife rollers being adjustable for adjusting the overlap of the knives, the gaps between knives being adjustable by means of spacer sleeves arranged on the roller between the circular knives, the slitting shears further comprising a bending control means for bending the knife rollers for keeping constant the adjusted knife overlap and knife gaps.

4,922,780
SAWMILL EDGER
Ennis J. Hurdle, Jr., Hwy. 57 East, Moscow, Tenn. 38057
Continuation of Ser. No. 55,995, Jun. 1, 1987, abandoned. This application May 11, 1989, Ser. No. 353,166
Int. Cl.[5] B27B *5/34*
U.S. Cl. 83—508.3 3 Claims



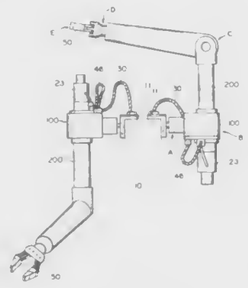
1. A sawmill edger for making parallel cuts in a log, said edger comprising:
(a) a plurality of cutting blades;
(b) drive means coupled to said cutting blades for rotatably driving said cutting blades; and
(c) adjustable support means coupled to said cutting blades for supporting said cutting blades and for allowing the position of said cutting blades to be varied; said drive means including drive shaft means with at least one of said cutting blades fixedly attached thereto in a nonslidable manner with respect to said drive shaft means for preventing wear between said at least one of said cutting blades and said drive shaft means when the position of said cutting blades is varied; said drive means including motor means coupled to said drive shaft means for rotatably driving said drive shaft means; said support means including an elongated body having an elongated raceway therein, and including slide means positioned in said raceway for movement back and forth along said raceway; said support means including piston means attached to said slide means for causing said slide means to move back and forth along said raceway; said support means including mounting means extending between said slide means and said cutting blades for mounting said cutting blades to said slide means; said raceway including an elongated first raceway and an elongated second raceway; said slide means including an elongated first slide member positioned in said first raceway and an elongated second slide positioned in said second raceway; said motor means being attached to said first slice member for movement therewith.

4,922,781
CYCLOIDAL EQUIDISTANT CURVED GEAR TRANSMISSION MECHANISM AND ITS DEVICE
Shen Peiji, Lane 240, No. 13-201 An Shun Road, Shanghai, China
Continuation-in-part of Ser. No. 38,086, Apr. 14, 1987, abandoned. This application Apr. 15, 1987, Ser. No. 38,378
Int. Cl.[5] F16H *55/06, 55/08, 1/28;* F01C *1/10*
U.S. Cl. 74—462 5 Claims



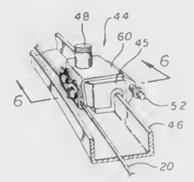
1. A cycloidal equidistant curved gear transmission mechanism including at least a pair of gears, each gear having a tooth profile, said pair of gears comprising a first gear having teeth generated by an equidistant curve of a whole branch cyclic cycloid-type located at a side of a center of curvature of that cycloid, and a second gear having teeth which matingly engage with said teeth of said first gear, with a rolling circle of each said first and second gears being of the same diameter, the epicycloidal gears being inner equidistant curves and the hypocycloidal gears being the external equidistant curves, wherein in external meshing, said first gear is an epicycloidal inner-equidistant curved gear and said second gear is a hypocycloidal outer-equidistant curved gear and said first and second gears are conjugated with each other; and wherein in internal meshing said first gear is an epicycloidal inner-equidistant curved gear and said second gear is a hypocycloidal outer-equidistant curved gear and said first and second gears are respectively conjugated with each other, and in internal and external meshing, the difference of the number of teeth of said first and second gears is greater than or equal to unity.

4,922,782
MANIPULATOR SHOULDER MECHANISM
Seiji Kawai, Gifu, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan and Kabushiki Kaisha Meidensha, both of Tokyo, Japan
Filed Sep. 16, 1986, Ser. No. 907,974
Int. Cl.[5] B25J *9/06*
U.S. C'. 74—479 7 Claims



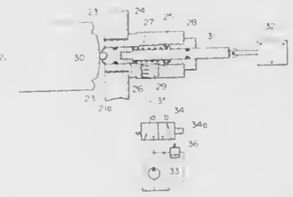
1. A two-arm manipulator comprising:
a frame;
a first manipulator arm having a shoulder movably mounted to the frame and a first hand provided with fingers for grasping and moving an object;
a first power unit detachably mounted on the shoulder of the first manipulator arm for driving the first manipulator arm;
a second manipulator arm having a shoulder mounted movably to the frame and a second hand provided with fingers for grasping and moving an object;
a second power unit detachably mounted on the shoulder of the second manipulator arm for driving the second manipulator arm;
the first manipulator arm having a length for bringing the first hand to a position at which the first hand is accessible to the second power unit for replacing the second power unit with a first new power unit; and
the second manipulator arm having a length for bringing the second hand to a position at which the second hand is accessible to the first power unit for replacing the first power unit with a second new power unit.

4,922,783
CABLE CLAMPING APPARATUS
Dennis W. Wallace, 8853 Tiber Street, Ventura, Calif. 93004
Filed Aug. 23, 1988, Ser. No. 235,911
Int. Cl.[5] F16C *1/10;* E05F *11/48*
U.S. Cl. 74—502.4 1 Claim



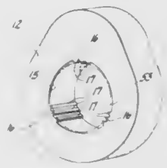
1. An improved cable clamping apparatus for use in a cable actuated power drive mechanism having a cable, said cable having a collar along a portion thereof, and a cable drive mechanism, said improved cable clamping apparatus comprising:
coupling means for moving a mass in response to the movement of said cable and
cable clamp means attached to said coupling means for clamping said cable whereby said coupling means moves in response to the movement of said cable, said cable clamp means being generally L-shaped with an integral first section and dual U-shaped second sections each adapted to receive said cable therein, said dual U-shaped sections of said clamp means being separated to receive and retain said cable collar therebetween and at least one U-shaped section being adapted to cooperate with fastener means for enclosing a portion of said cable in said U-shaped section, said cable clamp means further including an aperture for receiving a protrusion from said coupling means to facilitate the attachment of said cable clamp means to said coupling means.

4,922,784
DETENT DEVICE FOR A CONTROL LEVER
Sachio Hidaka, Kakogawa; Yoshiaki Fujimoto, Himeji, and Takao Tani, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Mar. 2, 1989, Ser. No. 318,003
Claims priority, application Japan, Mar. 3, 1988, 63-28561; Nov. 11, 1988, 63-147954
Int. Cl.[5] G05G *5/06;* G08B *21/00*
U.S. Cl. 74—527 6 Claims



1. A detent device connected to a control lever, comprising:
a cam integrally movable with the control lever,
a piston mounted for sliding contact with a surface of the cam during movement of said cam,
a pressure chamber communicating with a portion of said piston opposite said sliding contact,
a spring provided within said pressure chamber and comprising means to bias said piston toward said cam, wherein said cam is provided with a detent portion in a part of said surface, and wherein the sliding resistance of the end of the piston is greater at the detent position of the control lever than at other portions of said surface,
detection means for detecting that the end of the piston is positioned at said detent portion, and
oil-pressure supply means responsive to the detection by said detection means of the end of said piston being positioned at said detent portion for supplying oil pressure to said chamber and so increasing a force pressing said piston toward said cam only when said detection means detects that the end of said piston is positioned at said detent portion.

4,922,785
TUBULAR CAMSHAFT ASSEMBLIES AND THE LIKE
Philip D. Arnold, Bloomfield Hills, and Roy G. Kaywood, Stockbridge, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 23,320, Mar. 9, 1987. This application Jun. 24, 1988, Ser. No. 211,504
Int. Cl.[5] F16H *53/00;* B23P *15/00;* B21D *39/00;* F01L *1/46*
U.S. Cl. 74—567 26 Claims



1. A camshaft assembly for internal combustion engines and the like, said assembly comprising a plurality of cam elements each including a nonround axial opening having an odd number of regularly spaced lobes of less than 3.0 percent eccentricity and primarily defined by joined outwardly convex arc of varying radii, said elements being secured in predetermined

fixed orientation said spacing, with said openings axially aligned, on a hollow tube expanded into interference engagement with all the element openings.

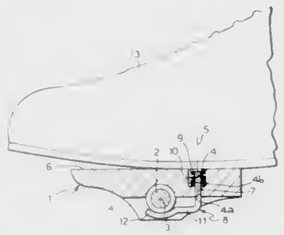
11. A camshaft assembly for internal combustion engines and the like, said assembly comprising a plurality of cam elements each including a nonround axial opening having an odd number of regularly spaced lobes of minimal eccentricity and secured in predetermined fixed orientation and spacing, with said openings axially aligned, on a hollow tube expanded into interference engagement with all the element openings, wherein said lobes include at their ends at least one longitudinal serration of minimal radial extent, said tube being expanded into intimate contact with said at least one serration.

4,922,786

DEVICE FOR PREVENTING THE ROTATION OF A BICYCLE PEDAL RELATIVE TO ITS PIN

Antonio Romano, Padova, Italy, assignor to Campagnolo S.r.l., Vicenza, Italy

Filed Mar. 14, 1989, Ser. No. 323,540
Claims priority, application Italy, Mar. 14, 1988, 67212 A/88
Int. Cl.[5] G05G *1/14*
U.S. Cl. 74—594.4 3 Claims



1. A device for preventing the rotation of a bicycle pedal relative to a pin on which said pedal is rotatably mounted wherein said pedal is provided with an upper portion defining a shoe supporting surface and a lower portion, a guide hole extending through said body in a direction substantially perpendicular to said shoe supporting surface and a slot located in said lower portion of said pedal intersecting said hole and said pin;

a locking element comprised of a bar having a first portion slidably guided in said hole and a second portion located in said slot to prevent rotation of said first portion in said hole and adapted to be moved into and out of locking engagement with said pin; and

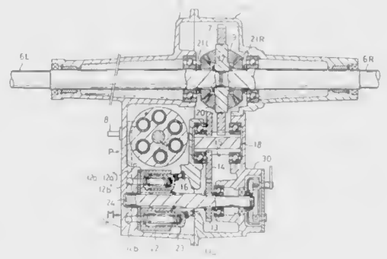
resilient means normally biasing said locking means in a direction in said hole wherein said first portion protrudes from said hole beyond said shoe supporting surface and said second portion is disposed in locking engagement with said pin, said first portion of said locking element being adapted to be engaged by a cyclist shoe to move said locking element against said resilient means to disengage said second portion of said locking element from said pin to permit free rotation of said pedal on said pin.

4,922,787

HST (HYDROSTATIC TRANSMISSION) HOUSING AXLE DRIVING APPARATUS

Koichiro Fujisaki; Ryota Ohashi, both of Kobe, and Shusuke Nemoto, Yao, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan

Filed Jun. 27, 1988, Ser. No. 212,017
Claims priority, application Japan, Jun. 26, 1987, 62-160653; Jun. 27, 1987, 62-160689
Int. Cl.[5] F16H *47/04*
U.S. Cl. 475—83 2 Claims



1. An axle driving apparatus comprising:

an axle housing, said axle housing being divided into a first axle casing and a second axle casing;

a differential gear unit disposed within said axle housing;

a first axle disposed within said first axle casing;

a second axle disposed within said second axle casing;

a hydraulic pump disposed within said axle housing, said hydraulic pump including a pump shaft which is disposed perpendicular to said first and second axles;

a hydraulic motor disposed within said axle housing, said hydraulic motor including a hollow motor shaft which is freely fitted on an outer periphery of one of said first and second axles;

a motor gear fixed to said hollow motor shaft adjacent said differential gear unit;

a speed reduction transmission for drivingly connecting said motor gear and said differential gear unit;

said speed reduction transmission and said differential gear unit being disposed within one of said first and second axle casings; and

said hydraulic pump and said hydraulic motor being disposed within an other of said first and second axle casings.

4,922,788

CONTINUOUSLY VARIABLE TRANSMISSION

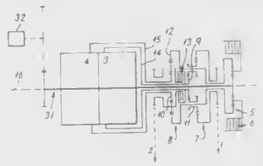
Christopher J. Greenwood, Preston, England, assignor to Torotrak (Development) Ltd, England

Filed Sep. 2, 1988, Ser. No. 239,706
Claims priority, application United Kingdom, Sep. 2, 1987, 8720639
Int. Cl.[5] F16H *37/06*
U.S. Cl. 475—26 11 Claims

1. A continuously-variable-ratio transmission capable of operation in at least first and second regimes, and adapted for use in a vehicle having first and second laterally-displaced rotary driving members and steered by differential rotation of such members, comprising:

first and second ratio-varying units having first and second rotary output members rotatable about first and second output axes, respectively;

associated first and second epicyclic gear sets each having first and second input axes by which said first and second epicyclic gear sets are connected to said first and second rotary output members, respectively, and each epicyclic gear set having three components, namely one each of sun, carrier and annulus components, one of said three components of each of said first and second epicyclic gear sets being connected, respectively, to said first and second



driving members; and in which said first and second input axes of said epicyclic gear sets and said first and second output axes of said first and second ratio-varying units all coincide.

4,922,789

LIMITED SLIP DIFFERENTIAL

Koichi Aono, and Mitsuyuki Ouchi, both of Susono, Japan, assignors to Toyota Jiodosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 79,114, Jul. 29, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,555
Claims priority, application Japan, Jul. 30, 1986, 61-177848; Sep. 29, 1986, 61-228445
Int. Cl.[5] F16H *1/44*
U.S. Cl. 475—86 14 Claims

1. A limited slip differential for limiting the differential motion generated by the cooperation of a differential case, a plurality of pinions and a pair of side gears respectively disposed in the differential case through frictional force resulting from the contact of a plurality of first frictional materials rotatable with one side gear with a plurality of second frictional materials rotatable with the differential case, the first and second frictional materials being disposed exterior to and at one side with respect to the differential case, comprising:

a differential carrier to be mounted stationarily on a vehicle body for supporting rotatably said differential case, surrounding said differential case and first and second frictional materials and having a piston chamber connected to an outside pressure source, the piston chamber being defined by a cylindrical inner portion and a cylindrical outer port of the differential carrier and formed in an annular shape;

an annular first piston disposed shiftably and unrotatably in said piston chamber;

an annular second piston disposed rotatably together with one of said first and second frictional materials and shiftably along a rotary axis of said differential case;

a first thrust bearing between said first and second pistons;

a transmitting member fixed to said differential case at a position between said friction materials and said differential case, and having a portion facing the differential carrier and disposed at an opposite side of said friction materials from said first and second pistons; and

a second thrust bearing disposed between the differential carrier and the portion of the transmitting member,

wherein said second piston receives compressive force through the first thrust bearing directly from said first piston which is operated by fluid pressure directed from said outside pressure source, and wherein said compressive force is transmitted to and received by the differential carrier through said portion of the transmitting member and second thrust bearing,

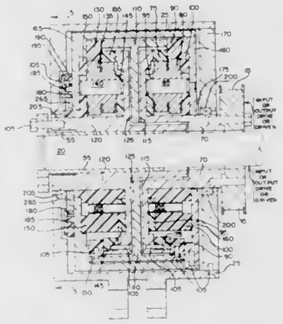
whereby said differential case is isolated from said compressive force.

4,922,790

DYNAMIC PHASE ADJUSTER

Harold F. Abbott, 193 Millen Road, Stoney Creek, Ontario, Canada (L8E-2G4), and Alfred H. Abbott, 3821 Robinson Vail Rd., Franklin, Ohio 45005

Filed Jan. 27, 1988, Ser. No. 149,172
Int. Cl.[5] F16H *57/10, 35/06*
U.S. Cl. 475—271 20 Claims



1. A device for selectively altering the angular relationship of respectively rotating components, comprising:

an outer housing;

an inner housing disposed within said outer housing for coaxial rotation therein and having gearing means therein;

rotational input component means engaging said gearing means in said inner housing through said outer housing;

rotational output component means engaging said gearing means in said inner housing through said outer housing at an angular position relative to said rotational energy input means;

braking means for braking the rotation of said inner housing relative to said outer housing; and

adjustment means for adjusting the angular position of said input component relative to said output component while said inner housing is braked by said braking means.

4,922,791
BRUSH CUTTER BLADE
J. Dana Pinney, P.O. Box 877, Medford, Oreg. 97501
Continuation of Ser. No. 124,673, Nov. 24, 1987, Pat. No. 4,881,438, which is a continuation-in-part of Ser. No. 929,636, Nov. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 754,761, Jul. 15, 1985, abandoned. This application Apr. 10, 1989, Ser. No. 335,423
The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.
Int. Cl.[5] B27B *33/12*
U.S. Cl. 83—840 5 Claims



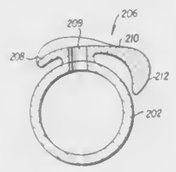
1 A brush cutting blade for a motor driven brush cutting machine, said blade comprising,
a circular disc having opposite planar parallel side surfaces,
and a plurality of cutter teeth individually attached to the peripheral margin of said disc,
said teeth being of alternating left and right configuration and being mounted in peripherally spaced relation alternately on opposite sides of said disc,
each of said teeth comprising a flat plate portion abutting a side surface of said disc,
fastener means extending through each of said tooth plate portions and said disc rigidly to secure said teeth to said disc,
each of said teeth having a single cutter element consisting of a side wall portion integral with said plate portion and an outer flange portion,
said side wall portion being laterally offset from said plate portion, the amount of offset progressively decreasing from the forward end to the rearward end thereof,
said flange portion extending from said side wall portion substantially at right angles to disc side surfaces across the median plane of said disc,
said flange portion being inclined downwardly at an angle of between seven and ten degrees with respect to a perpendicular to a radius of said disc intersecting the forward edge of said flange portion,
the forward edge of said side wall portion and said flange portion of each tooth being formed with a beveled surface defining a cutting edge,
and a depth gauge means on said disc operatively associated with each cutter element positioned forwardly of said cutter element, said depth gauge means defining an upwardly facing substantially flat surface sloping upwardly from its forward to its rearward edge at an angle of between twenty-five and thirty-five degrees with respect to a plane parallel to the axis of said disc and normal to a radius of the disc intersecting the trailing edge of said depth gauge,
said depth gauge means surface having a width of between 0.075 to 0.275 inch,
the top trailing edge of said depth gauge means being spaced between 0.025 and 0.030 inch below the cutting edge of said flange portion.

4,922,792
KEY MECHANISM FOR A WOOD WIND
Shigeru Yamaryo, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Dec. 30, 1987, Ser. No. 139,477
Claims priority, application Japan, Jan. 6, 1987, 62-001398
Int. Cl.[5] G10D *7/06*
U.S. Cl. 84—382 4 Claims



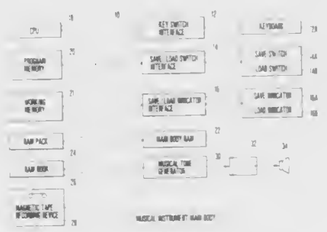
1. An improved key mechanism for a wood wind comprising
an A key unit including an A key used for releasing an A sound hole via a first cap,
a register key unit including a register key used for releasing a B-flat sound hole via a second cap as well as a lower vent tube via third cap,
a G/D key unit including a G/D key used for releasing said lower vent tube via said third cap, and
a first lock unit for inhibiting release of said lower vent tube when said A key and said register key are concurrently operated.

4,922,793
MOUTHPIECE PLATES OF FLUTE-TYPE WIND INSTRUMENTS
J. Charles Culbreath, 2008 Cloverdale Ave., Winston-Salem, N.C. 27103
Division of Ser. No. 238,469, Aug. 31, 1988, Pat. No. 4,875,401.
This application Sep. 11, 1989, Ser. No. 405,443
Int. Cl.[5] G10D *7/02*
U.S. Cl. 84—384 5 Claims



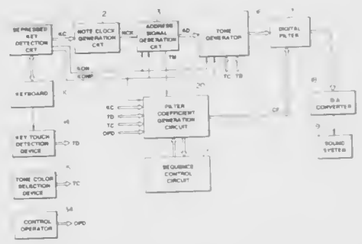
1. In a musical instrument of the flute-type comprising a tubular headjoint having a blow hole with an axis and a mouthpiece plate surrounding said blow hole such that the chin and lips of the user of said instrument engage a portion of said mouthpiece plate to form embouchure therewith, the improvement wherein that portion of said mouthpiece plate engaged by the user comprises a shelf member having a top surface with a planar portion, said planar portion extending in a plane parallel to a plane tangential to said tubular headjoint and a lip member depending downwardly from said shelf member at about a right angle to said planar portion.

4,922,794
ELECTRONIC MUSICAL INSTRUMENT HAVING EXTERNAL MEMORY DEVICES
Takeo Shibukawa, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Feb. 3, 1988, Ser. No. 151,929
Claims priority, application Japan, Feb. 6, 1987, 62-25681
Int. Cl.[5] G10H *7/00, 3/08, 3/09*
U.S. Cl. 84—601 8 Claims



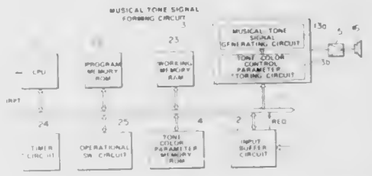
1. An electronic musical instrument comprising:
a musical tone information storing device for storing musical tone information;
a plurality of external memory devices;
control means for controlling information transfer between at least one of said external memory devices and said musical tone information storing device;
switching means for generating a transfer command; and
determining means for determining an external memory device of a highest priority in accordance with a predetermined priority which is in a transfer enable state,
wherein said control means controls information transfer between the external memory device of the highest priority which is determined by said determining means and said musical tone information storing device.

4,922,795
TONE SIGNAL FORMING DEVICE
Hideo Suzuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Nov. 16, 1988, Ser. No. 272,085
Claims priority, application Japan, Nov. 17, 1987, 62-288316
Int. Cl.[5] G10H *1/08, 1/12, 7/00*
U.S. Cl. 84—608 11 Claims



1. A tone signal forming device comprising: parameter generation means for sequentially generating different tone forming parameters by timewise providing them from a memory in a predetermined sequence in order to change a tone color;
sequence control means for performing a control for repeating the sequential generation of the different tone forming parameters in said parameter generation means by repeating at least a part of said sequence; and
tone forming means receiving the tone forming parameters generated by said parameter generation means for forming a tone signal having tone color characteristics based on these tone forming parameters.

4,922,796
MUSICAL-TONE-GENERATING-CONTROL APPARATUS
Kondo Masao, and Takashi Ishida, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Mar. 1, 1989, Ser. No. 317,943
Claims priority, application Japan, Mar. 8, 1988, 63-54570
Int. Cl.[5] G10H *1/06, 1/22, 7/00*
U.S. Cl. 84—618 14 Claims



1. A musical-tone-generating-control apparatus comprising:
musical-tone-signal-generating means having a plurality of musical-tone-signal-generating channels for generating musical-tone signals, controlling the generation of musical-tone signals according to tone-pitch information supplied to each of said musical-tone-signal-generating channels, and controlling tone colors of said musical-tone signals according to tone-color-control parameters;
tone-color-parameter-memory means for storing said tone-color-control parameters;
input means for entering primary information representing tone pitches of said musical-tone signals, and for entering secondary information representing tone colors of said musical-tone signals;
assigning means for selecting one of said musical-tone-signal-generating channels according to a predetermined rule, and for assigning said primary information to said selected musical-tone-signal-generating channel;
output means for supplying said assigned primary information to said musical-tone-signal-generating means to control generation of said musical-tone signal produced from said selected musical-tone-signal-generating channel according to said primary information, and for supplying said tone-color-control parameters corresponding to said secondary information in said tone-color-parameter-memory means to control tone colors of said musical-tone signals; and
output inhibiting means for inhibiting output of said tone-color-control parameters to said musical-tone-signal-generating means when a tone color represented by said secondary information is the same as the tone color of said musical-tone signal previously generated in said selected musical-tone-signal-generating channel.

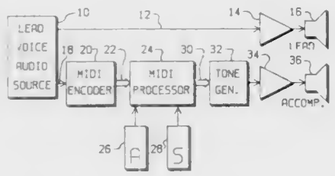
4,922,797
LAYERED VOICE MUSICAL SELF-ACCOMPANIMENT SYSTEM
Emmett H. Chapman, 6011 Woodlake Ave., Woodland Hills, Calif. 1367-3238
Filed Dec. 12, 1988, Ser. No. 283,543
Int. Cl.[5] G10H *1/057, 1/36*
U.S. Cl. 84—650 9 Claims

1. A musical accompaniment control system for providing selective sustain in a musical self-accompaniment synthesizer of the type wherein significant parameters of notes being played by a musician in a lead voice performance are encoded in a real-time note data signal including "note on" event messages and "note off" event messages transmitted to a poly-

phonic tone generator cooperating with an audio sound system so as to produce a musical accompaniment having notes related in pitch and timing to corresponding notes played in the lead voice source, said control system comprising, in combination:

an electronic signal processor adapted to controllably transmit said "note on" messages and said "note off" messages to said tone generator;

an "accompaniment" switch adapted to control said processor in a manner enabling the musician to repeatedly choose between an "off" state in which transmission of said "note on" event messages to said tone generator is inhibited, and an "on" state in which said "note on" event messages are transmitted to said tone generator; and



a "sustain" switch adapted to control said processor in a manner enabling the musician to repeatedly choose between an "off" state wherein said "note off" event messages are transmitted immediately to said tone generator and an "on" state wherein transmission of said "note off" event messages is delayed for as long as said "sustain" switch remains in said "on" state,

whereby the musician is enabled, through interactive operation of said "accompaniment" switch and said "sustain" switch in strategic time relationship with notes of said lead voice performance, to selectively sustain particular notes of said accompaniment and to build up a group of thusly sustained notes which can continue to sustain as background accompaniment over which new lead voice notes may be played independently.

4,922,798

APPARATUS AND METHOD FOR BRAIDING FIBER STRANDS

Thomas J. Ivsan, West Bloomfield; Carlos Bailey, Farmington, and Llewell Jessup, Livonia, all of Mich., assignors to Airfoil Textron Inc., Lima, Ohio

Filed May 9, 1988, Ser. No. 191,434
Int. Cl.[5] D04C *1/06, 3/00*
U.S. Cl. 87—8 31 Claims



1. An apparatus for forming an article by intertwining a plurality of fiber strands, comprising

(a) means for forming a concave quadratic carrier surface having a longitudinal axis, portions of which carrier surface are generally equidistant from a common consolidation point generally lying on said longitudinal axis and axially centrally of said carrier surface,

(b) a plurality of carrier members movably disposed on said portions of the carrier surface with each carrier member including a fiber strand extending therefrom along an axis that intersects the axes of other fiber strands extending from other carrier members generally at said common consolidation point,

(c) means for moving the carrier members on the carrier surface in a pattern to intertwine the fiber strands, and

(d) take-up means for moving the intertwined fiber strands away from the concave carrier surface.

4,922,799

APPARATUS FOR SUSPENDING, STRAPPING, AND LAUNCHING A FLYING BODY FROM A CARRIER

Josef Bartl; Wilhelm Schroettle, and Dietmar Puttinger, all of Munich, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 353,387
Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3815022
Int. Cl.[5] F41F *7/00;* B64D *1/02*
U.S. Cl. 89—1.819 15 Claims



1. An apparatus for suspending, strapping and launching a flying body from a carrier, comprising housing means (3) including rail means (4) for suspending said flying body, strapping bridge means (6) for pressing a suspension block (5) of said flying body against said rail means, toggle lever means (11, 12) for applying a strapping pressure to said strapping bridge means, a spring mechanism (16) for normally holding said toggle lever means in a strapping pressure applying safety position, safety latch pawl means (22) arranged to normally hold said spring mechanism (16) in said safety position, electromagnet means (36) connected to unlatch said latch pawl means for releasing said strapping pressure, flying body retaining means (50, 51) for holding said flying body between said strapping pressure release and actual launching, and safety means responsive to said strapping pressure release, said safety means being operatively connected to said retaining means for preparing said retaining means for launching said flying body in response to a release of said latch pawl means.

4,922,800

MAGNETIC SLINGSHOT ACCELERATOR

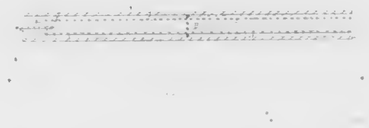
Alan L. Hoffman, Kirkland, Wash., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 7, 1988, Ser. No. 255,708
Int. Cl.[5] F41F *1/02*
U.S. Cl. 89—8 17 Claims

1. Apparatus for accelerating a projectile from a first point at which the projectile is initially positioned to a second point along a path, the projectile being electrically conductive and having an aperture therethrough defining leading and trailing regions of the projectile, the path passing through the aperture, the leading region being disposed in the direction from the first point to the second point and the trailing region being disposed in the direction from the second point to the first point, the apparatus comprising:

first means for producing a magnetic field having first and second sequential antiparallel orientations, both sequential orientations of said magnetic field having magnetic flux lines that are substantially parallel to the path, said magnetic field producing azimuthal currents in the projectile, said azimuthal currents circulating in planes that are substantially transverse to the path; and

a magnetic flux reverser for producing unbalanced magnetic fields around the projectile, said unbalanced magnetic fields interacting with said azimuthal currents in the projectile to produce accelerating forces on the projectile, including:



second means for maintaining and controllably containing at least some of said magnetic flux lines of said first orientation of said first magnetic field along the path, said at least some magnetic flux lines passing through the aperture defined in the projectile, and further for maintaining said second orientation of said magnetic field radially outward of the projectile, said antiparallel magnetic flux lines of said first and second magnetic field orientations being connected by magnetic flux lines curving at a curvature point behind the trailing region of the projectile; and

third means associated with said second means for moving said curvature point along with the projectile as the projectile accelerates.

4,922,801

FIRE CONTROL SYSTEM WITH AIMING ERROR COMPENSATION

Paul Jaquard, Peco; Jean-Pierre Lelay, Argenteuil, and Jean Doreau, Vigny, all of France, assignors to Societe d'Applications Generales d'Electricite et de Mecanique Sagem, Paris, France

Filed Aug. 1, 1989, Ser. No. 387,771
Claims priority, application France, Aug. 12, 1988, 88 10862
Int. Cl.[5] F41G *3/08;* G06F *15/58*
U.S. Cl. 89—41.05 7 Claims



1. A fire control system for a weapon having an operator-aimed barrel, comprising:

a sighting piece carried by the barrel and having a reticle adjustable in position with respect to the bore axis of the barrel, a camera fast with said barrel and having a field coaxial with said bore axis,

means for measuring the apparent movement of an image of a target in the field of the camera,

means for measuring angular movements of said barrel as controlled by said operator,

means for computing a position to be given to said reticle from variations of the aiming direction of the barrel provided by said angular movement measuring means and from said apparent movement,

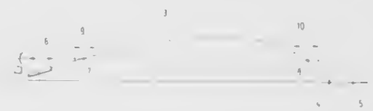
and means for controlling the position of the reticle with respect to the direction of the bore axis responsive to an indication of position provided by said computing means.

4,922,802

METHOD OF DETERMINING ELEVATION ANGLE CORRECTION VALUE FOR A GUN

Heiko Gropp, Hamburg, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 15, 1989, Ser. No. 393,872
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827764
Int. Cl.[5] F41G *3/16;* G01S *13/58*
U.S. Cl. 89—41.07 2 Claims



1. A method for determining an elevation angle correction value for a gun barrel which fires a projectile, comprising:

calculating an elevation angle for the gun barrel for a given point of impact of a projectile to be fired from the barrel;

firing a projectile from the gun barrel;

making a first measurement of the trajectory of the projectile at a point within the ascending portion of the trajectory;

making a second measurement of the trajectory of the projectile at a point within the descending portion of the trajectory;

using the first and second measurements to calculate the actual trajectory of the projectile;

determining the actual point of impact from the actual trajectory; and

determining the elevation angle correction value from the deviation between the given point of impact and the actual point of impact.

4,922,803

FOUR-WAY VALVE

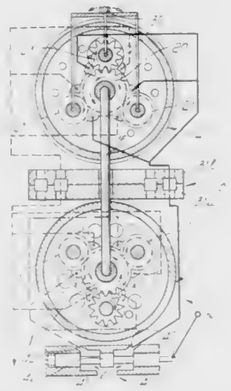
Edward H. Phillips, Middletown, Calif., assignor to Techco Corporation, New York, N.Y.

Filed Mar. 17, 1989, Ser. No. 324,903
Int. Cl.[5] F15B *9/08;* F16K *11/06*
U.S. Cl. 91—375 R 26 Claims



4. A valve in accordance with claim 3 wherein said first and third lateral edge configurations comprise shoulders having surfaces which are cylindrically formed at a first nominal radial dimension but have minimal radial clearance therebetween, and said second and fourth lateral edge configurations comprise shoulders having surfaces which are cylindrically formed at a second nominal radial dimension but have minimal radial clearance therebetween.

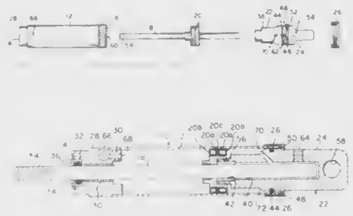
4,922,804
VARIABLE SPEED HYDRAULIC UNIT
Nahum Goldenberg, Kiriat Ono, Israel, assignor to Renato Brevini, Emilia, Italy
Filed Jul. 11, 1988, Ser. No. 217,364
Claims priority, application Italy, Jul. 23, 1987, 21415 A/87
Int. Cl.[5] F15B *11/00*
U.S. Cl. 91—532 11 Claims



1. Variable speed hydraulic power transmission unit, comprising;
a fixed body having first inlet and outlet ducts for a working fluid, a first output shaft journalled to said fixed body, first fixed displacement actuating means located internally of said fixed body for interacting with said first output shaft, said first actuating means being disposed in the path of said working fluid to convert the motive energy thereof into rotational energy of said first output shaft;
a rotatable body having second inlet and outlet ducts for a working fluid, an input shaft journalled to said rotatable body and rigidly coupled to said first output shaft of said fixed body, second fixed displacement actuating means located internally of said rotatable body for interacting with said inlet shaft, said second actuating means being disposed in the path of said working fluid to at least partially convert the motive energy thereof into mechanical energy of said rotatable body;
a terminal output shaft affixed to said rotatable body substantially coaxially thereto;
a flow divider having one inlet port for receiving working fluid at constant flow-rate and a pair of delivery ports, each delivery port connected with one of said first and said second inlet ducts, said flow divider being operable to continuously vary the ratio between the delivery flow rates in said first and said second inlet ducts, said rotatable body and said terminal output shaft being stationary in response to said flow divider setting the ratio between the delivery flow rates at substantially one to one and rotating in either direction at variable speeds in response to said flow divider setting the ratio between the delivery flow rates at other than one to one.

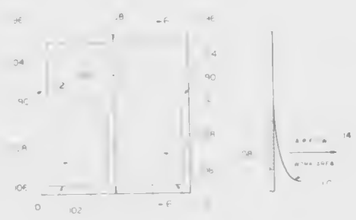
4,922,805
FLUID ACTUATED CYLINDER
Paul R. Beswick, 128 Topsfield Rd., Ipswich, Mass. 01938
Filed Sep. 14, 1988, Ser. No. 244,137
Int. Cl.[5] F16J *15/18*
U.S. Cl. 92—166 11 Claims

1. A fluid actuated cylinder comprising:
a cylinder wall structure in the form of a tubular casing having a nose end and a tail end, each having an opening formed therein;
a piston and piston rod disposed within said cylinder wall structure, said piston being disposed on said rod and spaced from the inner end of said rod;
an end wall disposed in the nose end opening of said casing wall having a bearing assembled therein through which the outer end of said piston rod extends;
a unitary member having a tang extending outwardly from the tail end opening of said casing and a surface disposed in engagement with said cylinder tail end wall structure, said member further comprising a barrel portion having one end extending into said cylinder and in spaced relation with said tubular casing;



a cylinder bore extending through said barrel portion and into said member to a point adjacent said tang;
a bearing mounted in said one end of said barrel portion for supporting said piston rod inner end during piston travel between said tail end and said end wall;
a pair of openings formed in said cylinder, one at each end thereof for flow of fluid into and from said cylinder to move said piston and rod therein, one of said openings being formed in said unitary member and comprising a pair of passages, one passage communicating with said bore at a location spaced from said barrel bearing and the other passage extending from said bore into said casing interior between said unitary barrel member portion and said casing interior wall structure.

4,922,806
DOORS FOR NEGATIVE AIR PRESSURE ENCLOSURE
Eugene E. Newman, Maple Shade, and Anthony Natale, Mt. Holly, both of N.J., assignors to GPAC, Inc., Pennsauken, N.J.
Filed May 2, 1989, Ser. No. 346,621
Int. Cl.[5] E06B *7/02*
U.S. Cl. 98—1.5 9 Claims



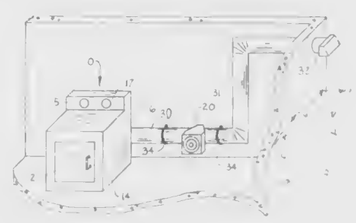
5. A door for entry to and exit from an asbestos containing work area, in which asbestos is to be removed under negative air pressure conditions, said door comprising:
a rigid frame pivotably mounted in a doorway and having an air inlet for passage of air therethrough, and
sealing means mounted on said frame for automatically sealing said inlet upon loss of negative air pressure in said work area.

4,922,807
BALLAST SYSTEM FOR MAINTAINING CONSTANT PRESSURE IN A GLOVE BOX
Paul J. Shlichta, San Pedro, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Sep. 29, 1989, Ser. No. 414,812
Int. Cl.[5] B64D *13/00*
U.S. Cl. 98—1.5 13 Claims



1. An apparatus comprising:
an isolation enclosure means having means for sealably introducing an object therein;
a gas enclosure means for providing a variable volume gas enclosure;
means for communicating gas between said isolation enclosure means and said gas enclosure means; and
weighting means for operating in conjunction with said gas enclosure means to maintain a substantially constant steady state pressure in said isolation enclosure means in response to changes in volume of the isolation enclosure means.

4,922,808
RADON AND OTHER GAS VENTILATOR
Stephen D. Smith, P.O. Box 106, Sedalia, Colo. 80135
Filed Feb. 16, 1989, Ser. No. 311,714
Int. Cl.[5] F24F *11/00, 12/00*
U.S. Cl. 98—42.06 3 Claims



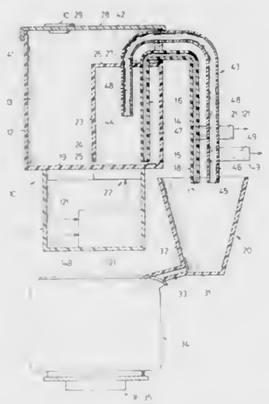
1. Apparatus for venting radon, radon progeny and other objectionable gases from a house basement comprising in combination:
(a) a laundry dryer of the type having a door through which laundry is placed into a chamber, a heat source and a fan for directing air from said heat source through said chamber to a vapor and lint exhaust port;
(b) a house wall ventilation opening provided for use with said laundry dryer vapor and lint exhaust port;
(c) a radon ventilator comprising;
(1) a thin walled ventilator duct body of suitably rigid and heat resistant material having a substantially circular vapor inlet port, a substantially circular outlet port and a radon inlet port arranged with its axis substantially perpendicular to the axis of said vapor inlet port such that the three ports are in fluid communication with one another through the interior of said ventilator body, the ventilator body together with said vapor inlet and said radon inlet ports being configured so that the individual, interior body-to-port juctions are substantially planar;
(2) a freely pivoting, hinge mounted, thin plate flow damper within said ventilator body, said hinges located such that the axis of the hinges is substantially parallel to both the plane defined by the interior periphery of said vapor inlet port and the plane defined by the interior periphery of said radon inlet port, said hinges and said damper further located and sized such that pivotal movement of said damper away from the vapor inlet port causes said damper to fit flush against the interior periphery of the radon inlet port thereby closing it and such that opposite pivotal motion of said damper causes it to meet and fit flush with the interior periphery of the vapor inlet port thereby closing it;
(3) a driven exhaust fan suitably joined with fastening means to the exterior periphery of the radon inlet port external to the high temperature and lint laden interior passages of said ventilator body and separate from the downstream flow paths of the remaining ports of said ventilator body, said exhaust fan sized and oriented to force radon laden room air, radon progeny and objectionable gases from without said ventilator body against said freely pivoting flow damper with sufficient momentum to pivot the damper so as to open the radon inlet port and to close the vapor inlet port thereby forming a passage from the radon inlet port through the ventilator body to the outlet port, and
(d) duct means connecting said laundry dryer vapor and lint exhaust port to the vapor inlet port of the ventilator body wherein the momentum of said vapors acting upon said freely pivoting damper causes said damper to pivot away from the vapor inlet port and to close the radon inlet port thereby forming a passage from the vapor inlet port to the outlet port, and duct means for communicating the outlet port of the ventilator body with said house wall ventilation opening whereby basement radon gas and laundry dryer vapors are separately vented to the outdoors using the same wall vent opening and duct means.

4,922,809
MACHINE FOR BREWING HOT BEVERAGES
Hubert Fühner, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed May 5, 1989, Ser. No. 348,356
Claims priority, application Fed. Rep. of Germany, May 5, 1989, 3815355
Int. Cl.[5] A47J *31/00*
U.S. Cl. 99—283 20 Claims

1. A machine for making hot beverages by contacting a heated liquid with a flavoring agent, comprising a container for a supply of liquid to be heated, said container consisting at least in part of a tasteless material and including a plurality of communicating sections, one of said sections communicating with the atmosphere and another of said sections including a bottom wall having an upper side; adjustable means for heating the liquid in said other section to the boiling point; a holder for a supply of flavoring agent; a plurality of siphons each having an inlet in said other section and an outlet arranged to deliver heated liquid into contact with flavoring agent in said holder,

VOL 114 ISS 2 MY 8 1990 UMI

said outlets being disposed at a level below the upper side of the bottom wall of said other section; and means for adjusting



said heating means, including means for monitoring the temperature of liquid in act least one of said siphons, particularly in the region of the respective outlet.

4,922,810

AUTOMATIC DEVICE FOR OBTAINING FROTHY MILK

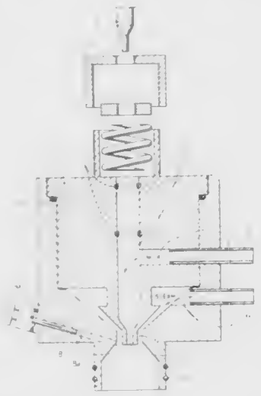
Alberto Siccardi, Via B. Panizza, 8 - 20144 - Milan, Italy

Filed Feb. 6, 1989, Ser. No. 306,705

Claims priority, application Italy, Feb. 4, 1988, 19308 A/88

Int. Cl.[5] **A47J** *31/40, 31/46, 43/12;* **B01F** *3/00*

U.S. Cl. 99—323.1 **8 Claims**



1. Device for obtaining frothy milk, comprising an upstream mixing assembly and a downstream frothing assembly communicating with said upstream mixing assembly, said upstream mixing assembly comprising a milk feeding duct terminating in a first nozzle, and a steam feeding duct terminating in a second nozzle, said first and second nozzles being coaxial and concentrically disposed such that said second nozzle surrounds said first nozzle to define an annular space therebetween, and said first nozzle projects beyond said second nozzle, said downstream frothing assembly comprising an expansion chamber, said device further comprising a passageway interconnecting said upstream mixing assembly and said downstream frothing assembly, and opening tangentially into said expansion chamber.

4,922,811

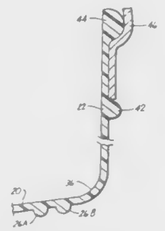
BREAD PAN FABRICATED OF LIQUID-CRYSTAL POLYMER

Sherri O. Stumpf, Andover, Minn., assignor to Premier Pan Products Co., Inc., Andover, Minn.

Filed Apr. 7, 1988, Ser. No. 178,527

Int. Cl.[5] **A47J** *27/00*

U.S. Cl. 99—443 C **15 Claims**



1. A bakeware piece comprising a one-piece injection-molded article for supporting product to be baked and fabricated of a liquid-crystal polymer.

5. A bread pan assembly comprising: a one-piece, injection-molded pan unitarily molded of a liquid-crystal polymer, said bread pan having a bottom and generally rectangular walls extending upwardly therefrom to form an open top enclosure, said pan including flange means formed about the perimeter of said side wall for providing means for supporting a strap for assembling the pan into a module.

7. A bakeware piece comprising a one-piece injection-molded article for supporting product to be baked and fabricated of a liquid-crystal polymer, said molded article including a bottom, and side wall means extending upwardly therefrom, said side wall means including retainer means comprising a pair of vertically spaced peripheral ribs, one of said ribs being adjacent a top edge of the bakeware piece and rounded to the outer side, means positioned between the ribs to form a bakeware piece module comprising a strap fitting around exterior portions of a plurality of adjacent bakeware pieces, and clamp means for tightening the strap means about such plurality of bakeware pieces.

9. A module of a plurality of bakery pieces each comprising an injection molded pan, injected molded from a liquid crystal polymer, and each pan having a bottom wall, and side walls and end walls extending upwardly from the bottom wall to form an open topped pan, the upper edges of the side walls and end walls having a peripheral rib molded in a rounded cross section that overhangs the exterior of the lower portions of the side walls and end walls, the pans being positioned with at least one side wall adjacent the side wall of another pan, spacer means between the adjacent side walls of adjacent pans, and a strap formed to fit around the periphery of the pans forming the module to hold the pans forming the module together.

4,922,812

DEVICE FOR CONTINUOUSLY DECAFFEINATING RAW COFFEE

Hermann Schweinfurth, Bremen, Fed. Rep. of Germany, assignor to Jacobs Suchard AG, Zurich, Switzerland

Filed Oct. 20, 1988. Ser. No. 260,077

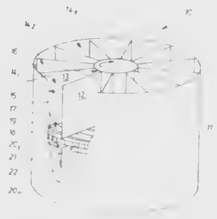
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735636

Int. Cl.[5] **A23F** *5/20;* **B01D** *11/02, 15/08;* **C07D** *473/12*

U.S. Cl. 99—495 **30 Claims**

1. A device for continuously decaffeinating raw coffee that is subjected to various treatment stages, including a first treatment stage where the raw coffee is preswollen by a swelling fluid that is added to the raw coffee and further stages where caffeine is extracted from the coffee by an aqueous extraction fluid and adsorbed in a preloaded adsorbent, the device comprising:

a first extractor including at least one cell for use in the first treatment stage for receiving the raw coffee that is to be preswollen, said cell being defined by a bottom and a plurality of side walls, a substantial part of two of said side walls extending towards one another whereby an angle is formed between the two sides to thereby define a wedge-shaped cell; said first extractor further including a plurality of extraction cells including a last extraction cell, each of the extractor cells and the at least one cell having a receiving chamber located below and associated with the respective cell with a perforated bottom being positioned



between the cells and their associated receiving chambers, the adjoining receiving chambers being separated from one another by a partition, said first extractor comprising a rotary extractor whereby said extraction cells and said at least one cell are adapted to be rotated with respect to their associated receiving chambers, said extraction cells being positioned downstream from the at least one cell in the direction of rotation of said cells and each of said extraction cells having a wetting device associated therewith for wetting the coffee contained therein, each of said receiving chambers being in mutual fluid communication with one another to form a countercurrent of extraction fluid whereby extraction fluid from one receiving chamber is fed to the receiving chamber positioned upstream with respect to the direction of rotation of said cells so that caffeine-rich extract can be fed as the swelling fluid to the at least one cell.

4,922,813

LOW COST QUICK INSERT CITRUS STRAINER TUBE

Joel Compri, Sao Geraldo-Araraquara, Brazil, assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 2, 1989, Ser. No. 305,355

Int. Cl.[5] **A23N** *1/02;* **B30B** *9/02*

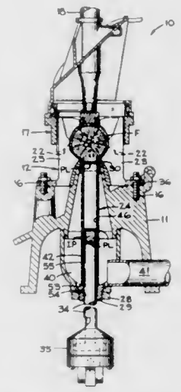
U.S. Cl. 99—510 **8 Claims**

1. A low-cost quick insert strainer tube for use in a citrus fruit juice extractor, said tube comprising:

a generally cylindrical body member having an axial bore extending through said body member, a plurality of holes extending radially outward from said bore to an outer portion of said body member, and a connector end portion thereof for connecting said body member to said juice extractor;

a hollow perforated sleeve for slidable and close-fitting insertion into a portion of said axial bore in said body member to be radially supported thereby, said sleeve having a plurality of groups of radially extending perforations, said perforations each having a size smaller than said body member holes with each of said groups of perforations being positioned adjacent to a corresponding one of said body member holes so juice can move radially outward from inside of said hollow sleeve through said perforations in said hollow sleeve and through said body member holes to said outer portion of said body member; and,

means for releasably securing said hollow sleeve to said body member in an aligned orientation inside said bore of



said body member to insure alignment of said perforations with said holes, and to permit ready removal from and replacement of said sleeve within said body member when desired.

4,922,814

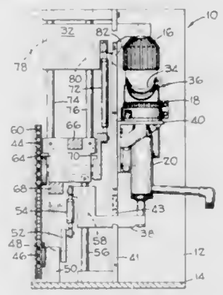
SINGLE HEAD JUICE EXTRACTOR

David N. Anderson, 2818 Elizabeth Pl., and Guillermo T. Segredo, 1720 Rosshire Ct., both of Lakeland, Fla. 33813

Division of Ser. No. 242,845, Sep. 12, 1988. This application Feb. 14, 1989, Ser. No. 310,111

Int. Cl.[5] **A23N** *1/02;* **B30B** *9/02*

U.S. Cl. 99—510 **13 Claims**



1. In a single head juice extractor comprising a frame means, lower cup means mounted to said frame means, juice collecting sump mounted to said frame means proximate to said lower cup means, orifice tube means mounted for reciprocal movement through said juice collecting sump, the improvement comprising:

upper cup reciprocating support structure supported for reciprocal motion on said frame means laterally adjacent said lower cup means,

upper cup means supported in a cantilevered manner by said upper cup reciprocating support structure directly above said lower cup means, said upper cup means capable of being moved vertically with said upper cup reciprocating support structure into and out of said lower cup means,

means to reciprocate said upper cup reciprocating support structure.

4,922,815

CONTAINER FOR COMPRESSED WASTE MATERIAL

Lyndon Teague, Wilmington, N.C., assignor to Container Products Corp., Wilmington, N.C.

Filed Dec. 27, 1988, Ser. No. 290,709
Int. Cl.[5] B30B *15/10*
U.S. Cl. 100—219 5 Claims



2. A holddown rack for compressing waste deposited in a waste container comprising:

(a) a frame composed of a series of end and cross members, with said cross members of a length to provide free end portions,

(b) extension members telescopically journalled in certain of said free end portions of said cross members for varying the size of the holddown rack, with said extension members providing free end portions,

(c) guide means within the waste container for receiving the free end portions of said cross members and their extension members as the rack is moved vertically through the interior of the container against the waste deposited therein, and,

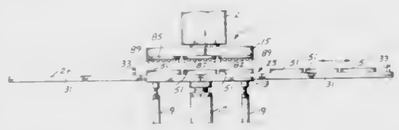
(d) means for securing the free end portions of said cross members and their extension members in said guide means with the rack against the waste compressed within the container so as to maintain the waste in such compressed condition within the container.

4,922,816

DOUBLE SHUTTLE DIFFUSION PRINTER

Brian K. Neil, Hayden Lake, Id., assignor to Advanced Input Devices, Coeur D'Alene, Id.

Continuation of Ser. No. 725,924, Apr. 22, 1985, abandoned. This application Jul. 24, 1986, Ser. No. 888,646
Int. Cl.[5] B41F *17/00*
U.S. Cl. 101—41 16 Claims



1. A diffusion printer for creating indicia in the tops of the assembled keys of a keyboard comprising:

(A) a hot stamp press including a support table and a vertically movable, heated platen mounted above said support table;

(B) shuttle means for shuttling a tray between a loading position located outside of the region between said platen and said support table and a printing position located in the region between said platen and said support plate;

(C) at least one fixture mounted on said tray, said at least one fixture comprising:

(1) a fixture base for receiving a keyboard including assembled blank keys that are to receive indicia, said fixture base including compression means located beneath and aligned with said keys that are to receive indicia for applying irregularity compensation pressure separately to the bottoms of said keys; and,

(2) a locator plate mounted on said fixture base for surrounding and maintaining alignment of the surfaces of said keys that are to receive indicia;

(D) transfer paper means situated atop said keys, said transfer paper means including indicia images formed of dry dye suitable for diffusion printing into said keys under heat and pressure, each of said dry dye indicia images positioned in alignment with the top surface of a respective one of said keys that are to receive indicia; and,

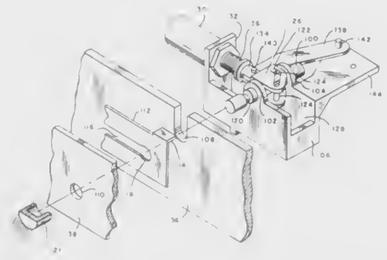
(E) a printing plate attached to the bottom of said heated platen for transferring heat from said heated platen to said transfer paper means and said keys that are to receive indicia when said heated platen is lowered, said printing plate including a plurality of rigid protrusions, each of said rigid protrusions positioned so as to be alignable with the top surface of a respective one of the keys that are to receive indicia of a keyboard mounted in said fixture base when said shuttle moves said tray to said printing position between said platen and said support table and press said transfer paper against said top surface of said keys that are to receive indicia when said heated platen is lowered.

4,922,817

SECURE SHUTTER LOCKING ARRANGEMENT FOR A POSTAGE METER

Richard S. Holodnak, Stratford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 13, 1988, Ser. No. 218,753
Int. Cl.[5] B41L *47/46*
U.S. Cl. 101—91 10 Claims



1. An improved locking apparatus for a postage meter having a shutter comprising:

a housing;

a deadbolt reciprocatingly mounted in said housing, said deadbolt being movable between a first position wherein a shutter for protecting a postage meter print die is moveable and a second position where said shutter is locked;

carriage means disposed in said housing for reciprocating said deadbolt, said carriage means being movable in a direction transverse to the direction of reciprocation of said deadbolt;

a solenoid connected to said carriage means for reciprocation thereof; and

a slide crank pivotally mounted in said housing and pivotally connected to said carriage means, said slide crank and said carriage means being arranged such that said carriage means can not be reciprocated by reciprocating said deadbolt.

4,922,818

WETTING/INKING MECHANISM FOR OFFSET PRINTING PRESSES

Rudi Junghans, Wilhelmsfeld, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 288,790
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 8716847[U]
Int. Cl.[5] B41F *7/26, 7/40, 31/30*
U.S. Cl. 101—148 15 Claims



1. A mechanism for applying at least one of a wetting agent and an ink in a printing press, said printing press comprising a plate cylinder, ink reservoir means for containing a supply of the ink, and ink transfer means for transferring the ink from said ink reservoir means to said plate cylinder, said ink transfer means comprising:

at least a first applicator roller receiving ink from said ink reservoir means, said first applicator roller being in contact with said plate cylinder, and further a distributor roller comprising a portion of said ink transfer means, said distributor roller receiving ink from said ink reservoir means,

said mechanism comprising:

at least a second applicator roller;

wetting agent reservoir means for containing a supply of said wetting agent;

wetting agent transfer means for transferring said wetting agent from said wetting agent reservoir means to said second applicator roller;

selective shifting means for selectively shifting said second applicator roller between at least a first position, wherein said second applicator roller is in contact with said plate cylinder and is also in contact with said distributor roller, and a second position, wherein said second applicator roller is in contact with said plate cylinder and is not in contact with said distributor roller;

a wetting roller separate from said wetting agent transfer means for contacting said second applicator roller; and

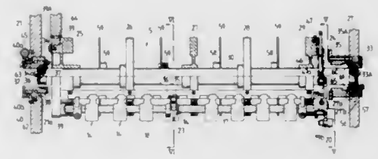
means for maintaining said wetting roller in contact with said second applicator roller in both said first position, wherein said second applicator roller is in contact with said plate cylinder and is also in contact with said distributor roller, and said second position, wherein said second applicator roller is in contact with said plate cylinder and is not in contact with said distributor roller.

4,922,819

IMAGE ADJUSTING APPARATUS FOR MULTI-COLOR PRINTING MACHINE

Koji Ishii, Fucbu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Nov. 9, 1988, Ser. No. 269,694
Claims priority, application Japan, Nov. 9, 1987, 62-284061
Int. Cl.[5] B41F *21/10, 7/10*
U.S. Cl. 101—177 14 Claims



1. An image adjusting apparatus for adjusting a paper position with respect to an original image in a multi-color printing machine, comprising:

a pair of first and second frames;

an impression cylinder having a first shaft rotatably supported on said first and second frames;

plate cylinders mounted between said frames for cooperating with said impression cylinder;

a paper supply table;

a paper-feed cylinder for feeding said paper to said impression cylinder, said paper-feed cylinder being secured to a second shaft for rotation therewith;

means for feeding paper from said paper supply table to said paper-feed cylinder;

means for mounting said second shaft between said first and second frames for rotational and axially slidable movement;

a moving means for moving said second shaft in an axial direction thereof, said moving means being operably connected to said second shaft of said paper-feed cylinder;

means for drivingly connecting said first and second shafts for thus rotating said impression cylinder and said paper-feed cylinder in synchronous relationship;

a phase changing mechanism provided between said first and second shafts, said phase changing mechanism having means for rotating said second shaft relative to said first shaft in response to axial movement of said second shaft by said moving means so as to change a peripheral position of said paper-feed cylinder relative to said impression cylinder, whereby longitudinal image displacement relative to said paper is adjustable.

4,922,820

DEVICE FOR REMOVING SOIL PARTICLES FROM THE PLATE CYLINDER OF AN OFFSET PRINTING MACHINE

Werner Grossmann, Am Jobstenbolz, 9 Seukendorf, Fed. Rep. of Germany (8501); Hans G. Herzing, Hildebrandstr., 22 Lindelburg, Fed. Rep. of Germany (8501), and Manfred Piltz, Hansengarten, 64 Nuernberg, Fed. Rep. of Germany (8500)

Filed Apr. 21, 1988, Ser. No. 184,362
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1987, 3713433
Int. Cl.[5] B41F *35/02*
U.S. Cl. 101—425 20 Claims

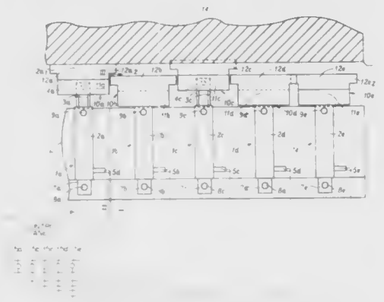
1. Apparatus for removing undesired particles from the outer surface of a rotatable plate cylinder of an offset printing machine comprising:

a plurality of actuating means mounted in relative spaced relationship along at least part of the length of the plate cylinder in spaced relation to the outer surface thereof;

a plunger mounted on each actuating means for movement toward and away from the plate cylinder;

a wiping implement mounted on each plunger for movement thereby into and out of wiping engagement with the outer surface of the plate cylinder for removing undesired particles therefrom;

operating means for operating said actuating means so that said wiping implements are movable into and out of wiping engagement with the plate cylinder outer surface individually for wiping a portion of said outer surface of the plate cylinder and in any combination thereof for



wiping a plurality of portions of said outer surface of the plate cylinder; and

lateral projections extending from said wiping implements in the axial longitudinal direction of the plate cylinder, said lateral projections being shaped so that adjacent lateral projections on adjacent wiping elements overlap each other in said longitudinal direction and overlap each other in a direction substantially transverse to said longitudinal direction, and adjacent wiping implements wipe said outer surface in an overlapping manner.

4,922,821

CLEANING SYSTEM OF PRINTING PRESS

Yoshiki Nozaka; Tetsuro Katsuta, and Hiroshi Miyama, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 77,870, Jul. 27, 1987, abandoned. This application Aug. 15, 1989, Ser. No. 394,269

Claims priority, application Japan, Aug. 2, 1986, 61-182553; Aug. 2, 1986, 61-182554; Aug. 2, 1986, 61-182555; Oct. 8, 1986, 61-237858

Int. Cl.[5] **B41F** *35/00*; **B41L** *41/00*

U.S. Cl. 101—425 **6 Claims**



1. A device for cleaning an impression cylinder of an offset, sheet-fed printing press, comprising:

a support frame;

a magazine roll around which a cleaning cloth is wound, said magazine roll having a rotation shaft supported by said support frame;

a take-up roll around which a used cleaning cloth is taken up, said take-up roll having a rotation shaft supported by said support frame;

pressing means comprising a blade member attached to said support frame at a portion between said magazine roll and said take-up roll and pressing said cleaning cloth against the impression cylinder to be cleaned, said blade member pressing said cleaning cloth against said cylinder in substantially a line contact along the length of said blade;

means attached to said support frame for supplying cleaning liquid to said cleaning cloth; and

means for moving said support frame away from said impression cylinder, said means comprising sheet holding grippers provided on said impression cylinder and projecting over a peripheral surface of said impression cylinder, and means for detecting a predetermined angular position of said impression cylinder and moving said pressing means away from said impression cylinder, thereby preventing said grippers from directly contacting said cleaning cloth.

4,922,822

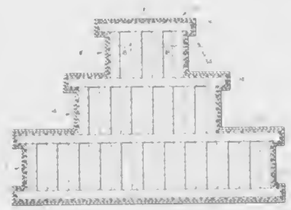
THERMOELECTRIC COOLER

James L. Bierschenk, 4805 Highgate La., Rowlett, Tex. 75088, and Edward J. Burke, 1700 Hearthstone, Plano, Tex. 75023

Filed Dec. 12, 1988, Ser. No. 283,501

Int. Cl.[5] **H01L** *35/28*

U.S. Cl. 136—204 **2 Claims**



1. A thermoelectric cooler device comprising:

a thermoelectric cooler means of materials having a known emissivity, the cooler means having exterior surfaces; and

a coating of material on at least a portion of the exterior surfaces of the thermoelectric cooler means, said coating of material having an insulating layer formed on the thermoelectric cooler means, a diffusion barrier layer formed on the insulation layer, said diffusion barrier layer being titanium tungsten, and a layer of low emissivity material formed on the diffusion barrier layer and having an emissivity sufficiently below that of the materials of the thermoelectric cooler means for reducing substantially thermal radiation loads on the thermoelectric cooler means whereby the cooling efficiency of the thermoelectric cooler device is improved.

4,922,823

IGNITION TRANSFER CHARGE FOR A PROPELLING CHARGE

Eckhard Rahnenführer, Dormagen; Albert Schulze, Mönchengladbach, and Heinz Jaskolka, Velbert, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 239,174

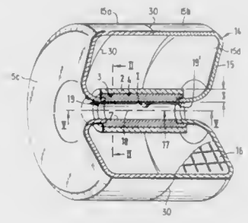
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730530

Int. Cl.[5] **C06D** *5/06*

U.S. Cl. 102—288 **20 Claims**

1. An ignition transfer body for a propellant-charge module, comprising:

(a) an ignition transfer charge having a longitudinal axis composed of a high energy first propellant-charge powder generating thermal energy in a range from 3 kJ/g to 4.5 kJ/g, having at least one clear ignition channel having a longitudinal axis oriented in a direction generally parallel



to said longitudinal axis of said ignition transfer charge; and

(b) a supporting tube composed of a second propellant-charge powder coaxially encasing said ignition transfer charge.

4,922,824

STAND DEVICE FOR A MINE

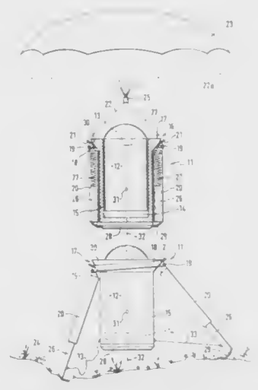
Rudolf Schubart, Ruckersdorf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Apr. 25, 1989, Ser. No. 343,022

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817265

Int. Cl.[5] **F42B** *23/18*

U.S. Cl. 102—387 **7 Claims**



1. A stand device for a mine, especially for an air-deployable mine having a search head and a housing, said device comprising

a cardanic suspension located about an upper region of said housing which includes a spherical washer fastened to the mine housing so as to form an inner frame, said washer being pivotably supported in a spherical cup-shaped outer frame;

support legs articulated to said housing at said outer frame of said cardanic suspension in a hinged arrangement, said support legs each including at least an inner and outer member in telescopic arrangement, said inner member being telescopically extendable from said outer member through a spring means positioned within said outer member, said legs being hingedly movable from a first position adjacent and parallel to said housing to a second position at an angle from said housing; and

an actuating means positioned at a bottom portion of said housing responsive to contact with the ground, said actuating means being in cooperation with said support legs;

wherein upon contact with the ground said actuating means releases each of said support legs from said first position to said second position, said spring means extending said telescopic inner member of each of said support legs to elevate said housing above said ground.

4,922,825

CORE-FORMING EXPLOSIVE CHARGE

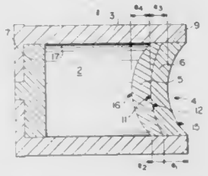
Julien Aubry, Pavillons sous Bois; Richard J. Durand; Alain L. Kerdraon, both of Bourges, and Gérard Solve, Gramat, all of France, assignors to L'Etat Français represente par le Delegue Ministeriel pour l'Armement, Paris Armees, France

Filed Jun. 24, 1987, Ser. No. 75,677

Claims priority, application France, Jul. 24, 1986, 86 10738

Int. Cl.[5] **F42B** *1/02*

U.S. Cl. 102—476 **11 Claims**



1. A core-forming explosive charge including a coating set in motion by an explosive matter initiated by a priming device, wherein the coating comprises two superimposed and contiguous plates, an internal plate intended to form the core, one face of which is in contact with the explosive matter, and an external plate, one face of which is oriented toward the open air, the external plate being made of a material such that its density is between 15% and 55% of the density of the constituent material of the internal plate and its compressibility under 50 Gigapascals is less than or equal to 50%, the total mass of the external plate being less than the total mass of the internal plate, and the external plate thickness on its edges being greater than 125% of the internal plate thickness on its edges.

4,922,826

ACTIVE COMPONENT OF SUBMUNITION, AS WELL AS FLECHETTE WARHEAD AND FLECHETTES THEREFOR

Jurgen-Michael Busch, Wendelstein; Georg Stammel, Lauf/-Peg.; Siegfried Rhau, Neunkirchen; Bernd Gundel, Neubaus, and Karl Rudolf, Schrobenhausen, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,736

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 3806731

Int. Cl.[5] **F42B** *13/50*

U.S. Cl. 102—489 **8 Claims**



1. An active component of articles of submunition which are deployable from a carrier against different types of target

objects, especially such as semi-hard and heavily armored target objects, said active component comprising at least one warhead having a housing; a plurality of flechettes arranged axially-parallel within said housing; a propulsion mechanism for effectuating the acceleration of the warhead in the direction of effectiveness for said flechettes, said propulsion mechanism including means for imparting a rotational acceleration to said warhead about the longitudinal axis thereof; means for imparting an acceleration to an ejecting piston for imparting an additional acceleration to said flechettes for ejection thereof from the precedingly accelerated warhead, a coaxial stack of said warheads of substantially full-caliber size being arranged in said carrier; an inflatable ejector hose meanderingly extending within said carrier along surface portions of said warheads; and means for rupturing said carrier and facilitating said hose to radially expel said warheads in different directions from said ruptured carrier.

5. An active component of articles of submunition which are deployable from a carrier against different types of target objects, especially such as semi-hard and heavily armored target objects, said active component comprising at least one warhead having a housing; a plurality of flechettes arranged axially-parallel within said housing; a propulsion mechanism for effectuating the acceleration of the warhead in the direction of effectiveness for said flechettes, said propulsion mechanism including means for imparting a rotational acceleration to said warhead about the longitudinal axis thereof; means for imparting an acceleration to an ejecting piston for imparting an additional acceleration to said flechettes for ejection thereof from the precedingly accelerated warhead, a plurality of axially-parallel stacks of said warheads being arranged within said carrier, said warheads being preassembled in divided profiled shells extending about a central ejecting hose, and said shells being mounted as a rotationally-symmetrical unit within said carrier.

4,922,827

METHOD AND MEANS FOR INTERCEPTING MISSILES

John L. Remo, St. James, N.Y., assignor to Quantametrics Inc., St. James, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,476
Int. Cl.[5] F42B *13/48*
U.S. Cl. 102—496 6 Claims



1. A shell to be fired at a missile, comprising a mass of material including C_{60} molecules, means for holding said mass of material, and explosive means for dispersing the molecules when the explosive means is detonated.

6. The method of weakening a missile warhead, which comprises:

launching a shell having a mass of C_{60} material;

guiding the shell into the path of a hostile missile;

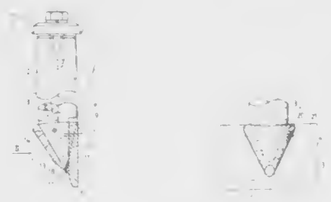
and detonating an explosive within the shell so as to disperse the C_{60} material into a large cloud in the path of the missile.

4,922,828

BALLAST TAMPING TOOL

Josef Theurer, Vienna, and Johann Hansmann, Klosterneuburg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jun. 24, 1988, Ser. No. 210,921
Claims priority, application European Pat. Off., Nov. 26, 1987, 87890274.1
Int. Cl.[5] E01B *27/16*
U.S. Cl. 104—10 10 Claims



1. A ballast tamping tool for attachment to a reciprocating tamping drive of a ballast tamping machine, which comprises

(a) a shaft having an axis and an upper end affixed to the tamping drive,

(b) a tamping blade detachably mounted on a lower end of the shaft, the tamping blade having

(1) a ballast tamping front surface,

(2) an opposite rear surface, and

(3) an upper edge between the surfaces, and

(c) a plug-in, form-fitting connection for detachably connecting the tamping blade to the lower end of the shaft, the detachable connection comprising

(1) a plug projecting from the lower shaft end, the plug having a conical sector shape and an end face, and the plug being offset from the lower shaft end by a step to form a shoulder, the upper tamping blade edge extending at least partially along, and axially adjacent, the shoulder, and

(2) a connecting part at the rear tamping blade surface form-fittingly connecting the tamping blade to the plug, the connecting part being a socket having the shape of a conical sector defining a recess of a shape conforming to that of the plug and having a parabolic end face contacting the rear surface of the tamping blade, and the end faces extending substantially parallel to the rear tamping blade surface.

4,922,829

VARIABLE HEIGHT WORKSTATION AND SYSTEM

Richard Kuchta, Tolland; Larry Billings, Manchester, and Vladimir Evenzon, Vernon, all of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Aug. 29, 1989, Ser. No. 400,290
Int. Cl.[5] B61B *3/00*
U.S. Cl. 104—127 23 Claims

1. A delivery apparatus, positioned in a gap formed between adjoining rails, said apparatus comprising:

a moveable rail section having opposite distal ends supported for movement between one position wherein said moveable rail section bridges a gap between opposed portions of said adjoining rails and another position remote from said one position wherein said moveable rail section is positioned generally adjacent a workstation;

engagement means for automatically arresting travel of a trolley at a position on said moveable rail section between said distal ends as said moveable rail section moves from said one position toward said another position and for automatically accelerating said trolley off said rail section as said moveable rail section is moved into said one position and said another position in unison with one another; and

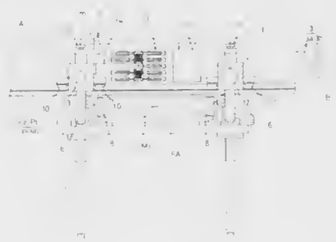
actuator means fixed to a support for carrying said moveable rail section and said engagement means with one another between said one position and said another position.

4,922,830

CONVEYOR SYSTEM UTILIZING LINEAR MOTOR

Shigeyoshi Fujita, Suita; Naobumi Sekiya, Nogaokakyo; Takashi Okamura, Kishiwada, and Yoshitaka Watanabe, Takarazuka, all of Japan, assignors to Daifuku Co., Ltd., Osaka, Japan

Continuation of Ser. No. 50,713, May 14, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 285,792
Int. Cl.[5] B60L *13/00*
U.S. Cl. 104—290 14 Claims



1. A conveyor system utilizing a linear motor comprising:

a conveyor vehicle having running wheels;

a guide rail for supporting said conveyor vehicle to be freely movable relative thereto;

a linear motor disposed downwardly of said running wheels and including a primary coil and a secondary conductor for driving said conveyor vehicle, said secondary conductor including a magnetic member and a conducting member, said primary coil attached to said conveyor vehicle, with said primary coil disposed downwardly of and horizontally opposed to said secondary conductor attached to said guide rail;

magnetic member support means formed by said conducting member and defined integrally with said guide rail, said magnetic member support means limiting downward and transverse movements of said magnetic member with said support means surrounding said magnetic member;

an opening defined at least one end of said magnetic member

support means in a longitudinal direction of said guide rail; and

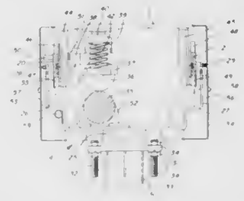
an electromagnetic brake for acting on one of said running wheels, said brake biased to an operative position thereof.

4,922,831

LIGHTWEIGHT CAR-ON-TRACK SYSTEM

Barry L. Ziegenfus, Saylorsburg, Pa., and Russell H. Scheel, Batavia, Ill., assignors to Heico Inc., Addison, Ill.

Filed Jun. 29, 1988, Ser. No. 213,242
Int. Cl.[5] B61B *13/12*
U.S. Cl. 104—166 3 Claims



1. A lightweight car-on-track system having a pair of elongate spaced-apart parallel rails having upper and lower guide surfaces, a rotatable drive tube extending lengthwise of said rails, at least one carrier movable along said rails, at least one drive wheel on said carrier engageable with the rotatable drive tube, means for biasably urging the drive wheel relative to said carrier downwardly against the drive tube so that the drive wheel is driven by the drive tube and the biased drive wheel produces an upward force tending to elevate the carrier on said parallel rails and for mounting the drive wheel for pivoting to change the angle thereof relative to the drive tube, the improvement comprising, means for maintaining a constant bias force from said drive wheel on said drive tube regardless of the weight of said carrier so that said carrier is consistently and positively driven along said rails, said maintaining means including a plurality of vertically spaced-apart guide rollers fixedly mounted to the carrier at opposite sides thereof to have plural guide rollers engage both the upper and lower guide surfaces of both rails for capturing the carrier onto the rails whereby the carrier cannot move in a vertical direction normal to the length of the rails.

4,922,832

INTERMODAL ROAD/RAIL TRANSPORTATION SYSTEM

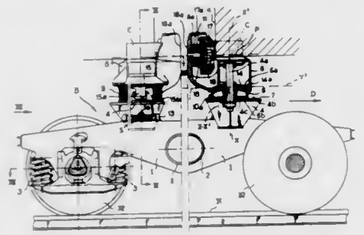
Jean Lienard, Ferriere La Petite; Francis Haesebrouck, Versailles, both of France; Sol Katz, New Hope, Pa.; Andrew Abolins, and George Schmidt, both of Langhorne, Pa., assignors to Strick Corporation, Langhorne, Pa. and Usines et Acieries de Sambre et Meuse, Paris, France

Filed Jan. 22, 1988, Ser. No. 147,361
Int. Cl.[5] B61D *3/12*
U.S. Cl. 105—4.2 58 Claims

55. A railroad bogie intended to be placed between the ends of two freight containers, said bogie including a rigid chassis having two ends mounted on railroad wheels, each of the two ends of the chassis having a support which includes a container support surface to accommodate an end of a freight container, said support including means to attach said container end to said support in a removable manner and each of said two supports being pivotally connected to the chassis such that said supports pivot about a point which is substantially coplanar with the container support surface; wherein the supports each comprise a lower bolster perpendicular to the longitudinal axis of the chassis and attached thereto, and an upper bolster intended to accommodate an end of a freight container, with the

VOL 114 ISS 2 MY 8 1990 UMI

upper bolster having in its center a support surface in the shape of a sphere segment resting on a support surface having a complementary spherical shape to constitute a pivot with a



substantially vertical axis; and wherein the sphere segment of the upper bolster rests on the lower bolster via two surfaces making possible a predetermined sliding between them along the longitudinal axis of the chassis.

4,922,833

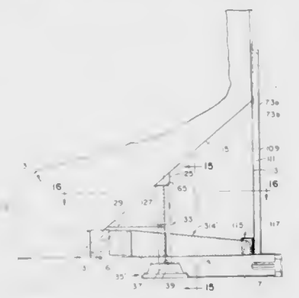
END STRUCTURE FOR RAILWAY CAR

John W. Coulborn, St. Louis County, and John A. Krug, St. Charles County, both of Mo., assignors to ACF Industries, Incorporated, Earth City, Mo.

Continuation-in-part of Ser. No. 792,215, Oct. 28, 1985, Pat. No. 4,696,238. This application Aug. 6, 1987, Ser. No. 82,446

Int. Cl.[5] B61D *7/00, 17/00*

U.S. Cl. 105—248 5 Claims



1. In an end structure for a railway car, said end structure comprising a center stub sill located generally along the longitudinal centerline of the railway car, a side sill at each side of the car extending longitudinally thereof along both sides of the car body in spaced transverse relation to center stub sill for carrying longitudinal loads from one end of the car to the other, and a side sill extension extending diagonally between an end of a respective said side sill and said center stub sill for carrying substantially all of the horizontal, longitudinal loads between said side sill and said center stub sill, wherein the improvement comprises: each of said side sill extensions having a tapered height which substantially continuously decreases from said side sill to said center stub sill.

4,922,834

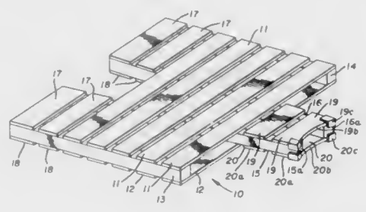
PALLET STORAGE SYSTEM FOR STORING CYLINDRICAL ARTICLES AND PALLET FOR USE THEREIN

Robert T. Kraus, Akron, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed Mar. 10, 1989, Ser. No. 321,817

Int. Cl.[5] B65D *19/00*

U.S. Cl. 108—51.1 2 Claims



1. A pallet for supporting cylindrical or toroidal articles, comprising:

(a) a deck for supporting the objects and having a planar configuration with parallel opposed side walls and first and second ends;

(b) said first end having a centrally disposed projecting portion;

(c) said second end having a centrally disposed recess;

(d) said centrally disposed projecting portion of said first end having opposed side edges which converge as they project from said first end; and

(e) said centrally disposed projection terminating in a transversely extending concave surface.

4,922,835

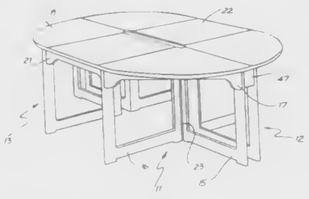
MULTI-PART TABLE

Michael Van Vliet, Drummoyne, and Brian Chester, Darlinghurst, both of Australia, assignors to Trychest Pty., Limited, Australia

Filed Mar. 28, 1989, Ser. No. 329,542

Int. Cl.[5] A47B *3/00*

U.S. Cl. 108—114 11 Claims



1. A table comprising at least one pair of leg members, each leg member being self-supporting, a respective bearer interconnecting the leg members of each pair, a multi-portion table top carried by the leg members and the bearer, the table top having first and second portions which abut to form a continuous surface, the first portion being removably mounted to a respective one of the leg members of the pair and the second portion being removably mounted to the respective bearer for the leg members of the pair, the table top portions and the leg members and the bearer being formed with interfitting projections and recesses which are connected to position and locate the first table top portions onto the respective leg members and the second table top portions onto the bearer and to facilitate

disconnection of the projections and recesses from each other and enable rearrangement of the table top portions in a desired configuration.

4,922,836

LEAD SCREW SUPPORT MECHANISM FOR AN OVERBED TABLE

Frank M. Damico, Neenah, Wis., assignor to Thill, Inc., Oshkosh, Wis.

Filed Dec. 1, 1988, Ser. No. 278,598

Int. Cl.[5] A47B *7/00*

U.S. Cl. 108—144 26 Claims



1. An apparatus, comprising:

a first member;

a second member;

said first and second members being mounted for relative movement therebetween in either a first or a second linear direction; and

a mechanism for selectively fixing the relative position of said first and second members, comprising:

a first threaded member interconnected with one of said first or second members;

a second threaded member threadedly engageable with said first threaded member and interconnected with the other of said first or second members;

said first threaded member and said second threaded member being interconnected with said first and second members so that movement of said first or second member relative to the other said member causes relative movement and rotation between said first threaded member and said second threaded member; and

selectively engageable clutch means associated with one of said first or second threaded members for selectively allowing relative movement between said first and second members in either of said first or second linear directions by selectively allowing relative movement between said first threaded member and said second threaded member, wherein said selectively engageable clutch means includes means for providing relative movement between said first and second members in only one of said linear directions without actuation thereof by allowing relative rotational movement between said first and second threaded members during such relative movement between said first and second members.

4,922,837

SAFE WITH COLOR-CODED DRAWERS EMPTYING INTO COLOR-CODED CONTAINERS

Edward T. McGunn, P.O. Box 388309, Chicago, Ill. 60638

Filed Oct. 4, 1988, Ser. No. 253,040

Int. Cl.[5] E05G *1/00*

U.S. Cl. 109—46 18 Claims

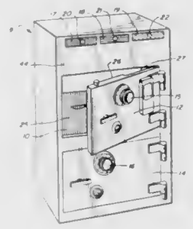
1. A safe for muliple users comprising:

(A) an enclosure with a first set of a plurality of openings;

(B) a second set of a plurality of containers, with said second set being contained within said enclosure;

(C) a further opening in said enclosure of a size to permit the removal of said containers,

(D) locking means for preventing the unauthorized access to said containers or removal of said containers from said enclosure; and



(E) guiding means, coupled to said first set of said plurality of openings and to said second set of containers, for directing material in a particular one of said first set of openings into a particular one of said second set of containers, materials being placed into two different ones of said first set of openings being directed into two different ones of said second set of containers.

4,922,838

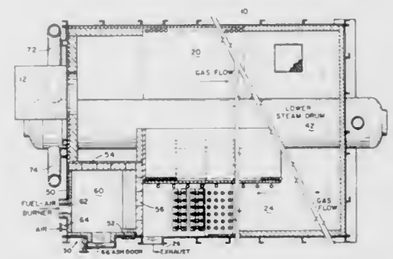
THERMAL PROCESSOR FOR SOLID AND FLUID WASTE MATERIALS

Michael R. Keller, and Richard J. Holman, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Oct. 11, 1988, Ser. No. 255,511

Int. Cl.[5] F23B *7/00*

U.S. Cl. 110—234 7 Claims



1. In an integral apparatus to thermally process hazardous waste fluids and/or solid wastes said apparatus having a secondary combustor comprising a fluid burner section producing products of combustion which are passed first to a radiant heat section with heat exchange tubing therein to receive said products of combustion and heat a fluid in said heat exchange tubing thence cause said products of combustion to pass to a convection heating section with heat exchange tubing therein to heat fluid in said tubing, the improvement comprising a vertically oriented primary combustor for burning solid wastes which is integrally connected with said secondary combustor and its fluid burner section, said primary combustor comprising:

closable means to load said solid waste material into said primary combustor;

a primary air/fuel burner in an outside wall positioned above the bottom of said primary combustor to ignite and maintain burning of said solid waste material;

an under-fire forced air manifold around the inner bottom periphery of at least one side of said incinerator; and

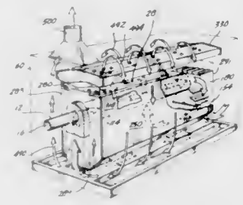
said primary combustor having an opening contiguous its top for direct passage of products of combustion from said primary combustor into said fluid burner section of said secondary combustor.

4,922,839

FUEL REACTOR

Robert J. Boucher, 3904 Nygren Pl., Port Angeles, Wash. 98362

Filed Nov. 28, 1988, Ser. No. 276,884
Int. Cl.[5] F23B *7/00*
U.S. Cl. 110—234 32 Claims



1. A fuel reactor comprising:
a core comprising a fuel tube and a gas tube, said fuel tube having a fuel input port at one end and being provided with a plurality of predeterminedly located and shaped gas vents over its extend distal from said fuel input port, said fuel tube being received within said gas tube, with said gas tube having an input port for receiving combustion air for said core; and
containment means for said core including means for routing combustion gases around at least a portion of the outer surface of said gas tube to produce a temperature thereof within a predetermined temperature range,
whereby the various constituents of the fuel are pyrolyzed along the length of the reactor.

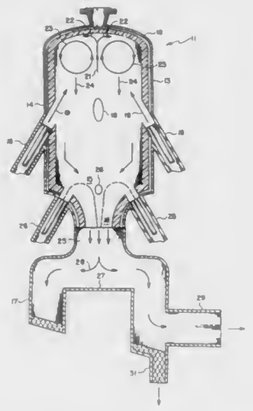
4,922,840

SULFUR EQUILIBRIUM DESULFURIZATION OF SULFUR CONTAINING PRODUCTS OF COMBUSTION

Jaime A. Woodroffe, Andover, and Jeevan S. Abichandani, Maldeo, both of Mass., assignors to Avco Research Laboratory, Inc., Everett, Mass.

Continuation of Ser. No. 173,873, Mar. 28, 1988, abandoned.
This application Dec. 21, 1988, Ser. No. 287,731
Int. Cl.[5] F23J *11/00*
U.S. Cl. 110—345 15 Claims

1. The method for the combustion of a carbon-and sulfur-containing fuel for substantially reducing emission of gaseous sulfur compounds formed during combustion of the fuel in a combustion zone having one or more fuel inlets and one or more oxidizer inlets, and having a combustion products outlet spaced therefrom, and having one or more inorganic sorbent inlets downstream of said fuel inlet(s) and oxidizer inlet(s) and upstream of said combustion products outlet, comprising:
(a) introducing a carbon-and sulfur-containing fuel into said fuel inlet(s) and introducing an oxidizer comprising an oxygen-containing gas into said oxidizer-inlet(s);
(b) combusting said fuel to produce combustion products in said combustion zone at a temperature greater than about 1600 K., said combustion products including gases, particulate combustion matter and gaseous sulfur compounds;
(c) maintaining the temperature of said combustion products, in the area of said sorbent inlet(s), at a temperature greater than that at which decomposition of condensed phase compounds formed by reaction between gaseous sulfur compounds and sorbent begins, and
(d) substantially uniformly introduced through said sorbent inlet(s) and into said combustion products, upstream of said combustion products outlet, inorganic sorbent(s) in particulate form in an amount sufficient to react with at least a substantial portion of the gaseous sulfur compounds



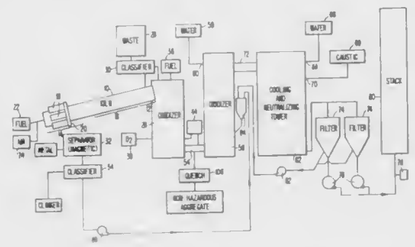
in said combustion products to form particulate reaction products which exit said combustion products outlet with said particulate combustion matter and said gases.

4,922,841

METHOD AND APPARATUS FOR USING HAZARDOUS WASTE TO FORM NON-HAZARDOUS AGGREGATE

John M. Kent, P.O. Box 1649, Slidell, La. 70459

Continuation of Ser. No. 244,017, Sep. 14, 1988, abandoned. This application Jun. 6, 1989, Ser. No. 362,352
Int. Cl.[5] F23G *5/00, 5/12*
U.S. Cl. 110—346 59 Claims



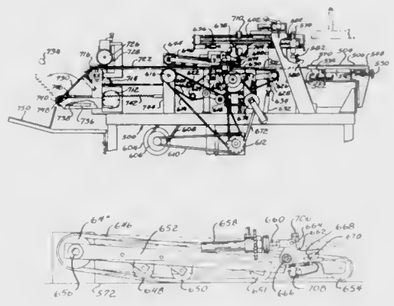
1. A process for using hazardous waste to form non-hazardous aggregate, said process comprising:
providing a source of solid waste material comprised of large solid waste and waste fines;
introducing said large solid waste to a rotary kiln having an input portion, a combustion portion and an exit portion;
separating said large solid waste from said waste fines;
controlling operating conditions in said kiln such that said large solid waste is combusted to form solid particulate primary aggregate, clinker, and gaseous combustion by-products;
a major portion of volatile combustibles in said large solid waste being volatilized in said input portion;
passing said gaseous combustion by-products from said kiln by means of an induced draft;
introducing said waste fines to oxidizing means;
introducing combustible material to said oxidizing means;
inducing combustion in said oxidizing means to convert said waste fines into non-combustible fines, molten slag, and waste gas;
controlling the temperature in said oxidizing means;
passing said non-combustible fines and said waste gas from said oxidizing means by means of said induced draft;
cooling said non-combustible fines, said gaseous combustion by-products and said waste gas;
separating said non-combustible fines from said gaseous combustion by-products and waste gas;
introducing said solid particulate primary aggregate and reintroducing said non-combustible fines into said oxidizing means;
impinging heat from said oxidizing means on said non-combustible fines and said primary aggregate to form a mixture of molten slag and solid particulates; and
cooling said mixture of molten slag and solid particulates to form said non-hazardous aggregate.

4,922,842

HEMMER SEAMER ASSEMBLY

Maximilian Adamski, Palatine; Robert L. Kosrow, Hoffman Estates, and Stephen Ruderman, Oak Park, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 162,919, Mar. 2, 1988, Pat. No. 4,800,830.
This application Oct. 11, 1988, Ser. No. 255,940
Int. Cl.[5] D05B *27/00*
U.S. Cl. 112—304 7 Claims



1. A device for transporting a fabric toward and away from a sewing machine, comprising:
a base plate for supporting the fabric;
a first roller spaced forwardly of the sewing machine;
a second roller located adjacent the sewing machine;
an endless belt passing around the first and second rollers;
means for driving the rollers and belt; and
means for moving the second roller and a portion of the belt adjacent the second roller between a first position located adjacent the plate for moving the fabric, and a second position spaced from the plate and fabric.

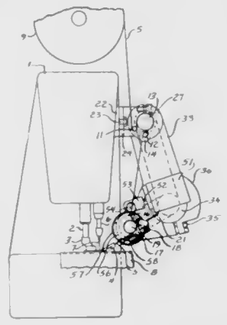
5. A device for transporting a fabric towards a sewing machine, comprising:
a base plate for supporting the fabric;
a plurality of longitudinally extending and laterally spaced endless belts
a first roller to pass the belts extending around the first roller;
a second roller to pass the belts extending around the second roller, with said plate having longitudinally extending and laterally spaced openings to receive the belts, said second roller being located downstream of the sewing machine in a driving position of an adjacent portion of the belts; and
means for moving the first roller and an adjacent portion of the belts between a first position beneath the plate, and a second position of the first roller and the adjacent portion of the belts in a driving position above the plates, with the first roller being located upstream relative to the sewing machine.

4,922,843

USING A VARIABLE SPEED MOTOR IN A TAPE FEED DEVICE FOR A SEWING MACHINE

Bohumil Hyca, Korntal-Munchingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed May 4, 1988, Ser. No. 190,206
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716148
Int. Cl.[5] D05B *27/16, 35/06*
U.S. Cl. 112—318 8 Claims



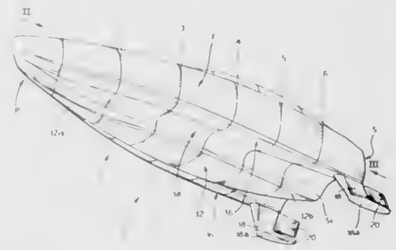
1. A tape feed device for a sewing machine for feeding to a sewing location of the sewing machine at least one tape from a supply comprising, a drive roll for feeding the tape, a feed roll disposed in the path of the tape between the supply and the drive roll, a stepping motor for driving both the drive roll and the feed roll, and guide means for passing tape around at least part of the feed roll, with said feed roll having means for feeding more tape than the drive roll, wherein the feed roll and the drive roll are journalled in respective holding members which are connected together in an articulated manner.

4,922,844

SAILING-BOAT HULL

Franco Solia, Milan, Italy, assignor to AKZO S.r.l., Milan, Italy

Filed Jul. 1, 1988, Ser. No. 214,065
Claims priority, application Italy, Jul. 1, 1987, 53489/87[U]
Int. Cl.[5] B63H *25/38*
U.S. Cl. 114—39.1 2 Claims



1. A sailing-boat hull, characterized in that it has a bottom (C) which is provided with a projecting keel (**12**) having a substantially U-shaped cross-section extending substantially the entire length of the hull with tapered ends (**12***b*, **12***a*) con-

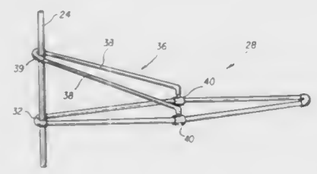
nected to the stern region (S_1) and to the bow region (P) of the hull (**10**) respectively, and which is connected to opposite sides (F) by means of two longitudinal channels (**14**) of rounded section connected to the keel (**12**) and extending from the stern region for approximately two-thirds the length of the hull before becoming rounded steps in the bow region (P) so as to define two longitudinal side portions (**16**) of the bottom (C), which have rounded sections and which are situated at a higher level than the keel (**12**) and extend from the stern (S) for a substantial length of the bottom (C).

4,922,845

BOOM FOR A SAILING DEVICE

Peter Boyd, Paia, Hi., assignor to PDI, Maui, Hi.

Filed Feb. 29, 1988, Ser. No. 162,251
Int. Cl.[5] B63B *35/82*
U.S. Cl. 114—39.2 4 Claims



1. A boom adapted for use on a sailing device comprising a lower portion in a wishbone type shape having a forward end adapted to be secured to a mast and an aft end including means for securing the clew of a sail to the wishbone, the boom further including two elongated members each pivotally and slidably secured at one end to the wishbone near the midpoint of one side of the wisbone by a hinge slidably secured to the wishbone, the hinge being U-shaped and the ends of the elongated members secured to the hinge being in the shape of a flange, the hinge and the flange being pivotly secured together by a fastener, and a clamp at the other ends of the elongated members for releasably securing the elongated members to a mast.

4,922,846

MASTING FOR SAILBOATS

Mario Biagioli, Via Panziera 30 - 50047, Prato (Firenze), Italy

Filed Dec. 14, 1988, Ser. No. 284,319
Claims priority, application Italy, Dec. 17, 1987, 9580 A/87
Int. Cl.[5] B63H *9/04*
U.S. Cl. 114—90 10 Claims



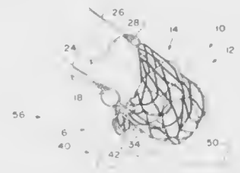
1. A masting arrangement for sailboats comprising: a plurality of poles including at least three poles, each pole having a first end fixed to the sailboat and a second end, each said second end of said poles being joined to form a masting structure;
- a plurality of stays, each stay being connected to the masting structure and extending downwardly to said boat, each stay being connectable to a sail for support of a sail;
- anchoring means connected to the sailboat, said anchoring means for anchoring a plurality of stays to said sailboat, said anchoring means including a plurality of guide rails fixed to said sailboat and anchoring elements for fixing individual stays relative to one of said guide rails, said anchoring elements being movable with respect to said rail and fixable with respect to said rail, to move and fix corresponding sails in a longitudinal direction and a lateral direction with respect to the sailboat.

4,922,847

PLIANT ANCHORING DEVICE FOR USE WITH DISPOSABLE BALLAST

R. James Ryder, Jr., 67645 Dailey Rd., Edwardsburg, Mich. 49112, and D. Michael Barton, 70830 Driftwood Dr., Edwardsburg, Mich. 49112

Filed May 8, 1989, Ser. No. 348,359
Int. Cl.[5] G01V *1/38*
U.S. Cl. 114—299 25 Claims



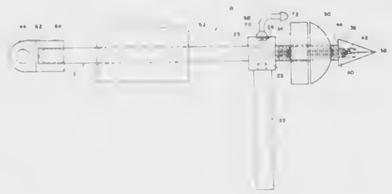
1. An anchoring device (**10**) for boats, which anchoring device comprises:
- ballast anchor means (**12**) for releasably receiving disposable ballast (**40**);
- means, comprising a rope (**24**), for attaching said ballast anchor means to a boat; and
- means (**26**) for partial inversion of said ballast anchor means to dump said ballast from said ballast anchor means without the necessity of retrieving said ballast anchor means.

4,922,848

UNDERWATER RESCUE DEVICE

Michael R. Thiel, 2301 Pasadena Ave., Apt. C, Metairie, La. 70001

Filed Jul. 18, 1988, Ser. No. 221,504
Int. Cl.[6] B63G *8/36*
U.S. Cl. 114—334 17 Claims



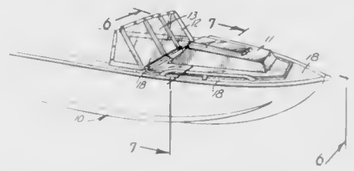
1. A device for delivering air to a submerged vessel, comprising:
- an elongated housing carrying a sealing member of deformable flexible material, the housing having an internal passageway;
- means for puncturing an aperture in a body of said vessel, said means being in fluid communication with the internal passageway of said elongated housing;
- means for moving said sealing member along said elongated housing toward said puncturing means; and
- means for delivering air through said housing and through said puncturing means into the interior of said vessel.

4,922,849

BOW COVER

James H. Wills, 895 90th Ave. N.W., Coon Rapids, Minn. 55433

Filed Nov. 17, 1988, Ser. No. 272,500
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—361 10 Claims



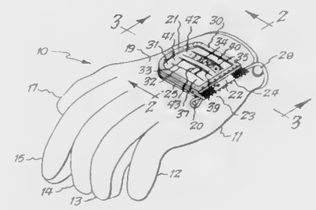
1. A bow cover for covering an open region within a hull of a boat at its bow which boat has a divider means supported by said hull separating its bow portion from remaining portions of said boat with a passageway therethrough such that said bow portion of said boat is accessible from said remaining portions thereof through said passageway, and where said open region in said bow portion has about a substantial part of its periphery, excluding at least that at said passageway, a rim means supported in said boat such that said rim means has a surface thereof exposed, said bow cover comprising:
- a shell means having an inwardly directed opening extending substantially inward therein and having an outer edge substantially all of which is capable of being placed adjacent to said exposed surface of said rim means excluding at said passageway where said inwardly directed opening would be located;
- an access means fastenable to said shell means at a point substantially interior to said outer edge thereof such that it can cover said inwardly directed opening and can extend past said shell means such that if said outer edge of said shell means is placed adjacent to said exposed surface of said rim means with said inwardly directed opening aligned with said passageway, as aforesaid, said access means can extend over said passageway; and
- attachment means connected to said shell means at said interior surface thereof and capable of forming at least a portion of an attachment device.

4,922,850

GOLF GLOVE WITH STROKE COUNTER

Michael J. Conley, 50 Birdsong Cir., East Amherst, N.Y. 14051

Filed Nov. 9, 1988, Ser. No. 268,758
Int. Cl.[5] A63B *57/00*
U.S. Cl. 116—222 15 Claims



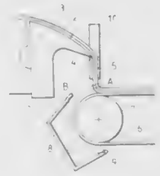
1. A golf glove and golf stroke counter combination comprising a golf glove having a back thereon with a longitudinal opening which separates portions of said back, a tab on said back for closing said opening, said tab having a plurality of layers of sheet material which formed a preexisting original portion of said tab, a plurality of indicia associated with one of said layers, and a cursor effectivcly retained between said layers for selective manual movement relative to said indicia to thereby indicate the number of golf strokes taken by a golfer.

4,922,851

CURTAIN COATER WITH PIVOTED STARTING PLATE

Masshiro Morikawa; Kiyoshi Kobayashi, and Kimiaki Miyamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 2, 1989, Ser. No. 360,635
Claims priority, application Japan, Jun. 2, 1988, 63-135997
Int. Cl.[5] B04C *1/04*
U.S. Cl. 118—324 8 Claims



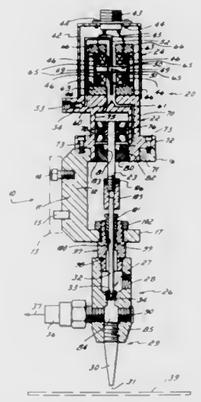
1. In a liquid application device having a turnable application start plate, and wherein a liquid freely falling in the form of a thin curtain from a hopper is caused to collide against a web continuously moving around a backup roller so that said liquid is applied to said web, the improvement wherein said plate is curved or bent, and a fulcrum for turning said plate is located under said roller.

4,922,852

APPARATUS FOR DISPENSING FLUID MATERIALS

Richard P. Price, Parma Heights, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 924,940, Oct. 23, 1986, abandoned.
This applicatioo Sep. 7, 1988, Ser. No. 243,238
Int. Cl.[5] B05B *9/02*
U.S. Cl. 118—683 17 Claims



1. An apparatus for dispensing fluid material onto a workpiece, said apparatus comprising:
- (a) a fluid inlet connectable to a pressurized supply of fluid;
- (b) a valve having a valve inlet and a valve outlet, said valve communication with said fluid inlet and being operable to substantially infinitely variably modulate flow of the fluid

when said valve is at least partially open and to positively cut off flow when said valve is closed;

(c) a dispensing nozzle disposed downstream of said valve, said nozzle having a nozzle inlet and a nozzle outlet, said nozzle inlet being positioned in sufficiently close proximity to said valve outlet that very little fluid pressure drop occurs in a region of flow including said valve outlet and said nozzle inlet in relation to the pressure drop across said nozzle when said valve is at least partially open;

(d) a sensor operably communicating with said region in close proximity to both said valve outlet and said nozzle inlet for sensing a parameter other than the position of a flow restricting element, said parameter being correlated to the rate of flow of the fluid discharged from said nozzle outlet and generating a corresponding flow rate signal, and

(e) an actuator connected to said valve, said actuator being responsive to said flow rate signal to control the rate of flow of fluid discharged from said nozzle outlet when said valve is at least partially open;

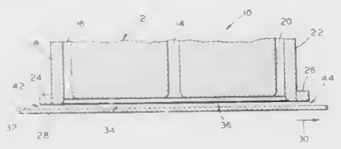
whereby the flow of fluid is modulated by said valve and sensed in close proximity to said nozzle inlet within said region of flow, the instantaneous fluid pressure within which substantially equals the fluid pressure at said nozzle inlet to provide said apparatus with enhanced response characteristics.

4,922,853

STRIPE COATING ON GLASS BY CHEMICAL VAPOR DEPOSITION

Peter H. Hofer, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed May 16, 1989, Ser. No. 352,748
Int. Cl.[5] C23C *16/44*
U.S. Cl. 118—718 **6 Claims**



1. A chemical vapor deposition coater for depositing a stripe of coating material onto glass, comprising:

(A) a coater body adapted for positioning adjacent a surface of an advancing hot glass substrate, defining a reaction zone therebetween wherein a reactant may contact the surface of the hot glass substrate and deposit a coating material thereon;

(B) a reactant supply conduit for admitting a flow of the reactant to the reaction zone;

(C) an upstream exhaust duct for evacuating a portion of the reactant flow from the reaction zone at a point upstream from the reactant supply conduit;

(D) a downstream exhaust duct for evacuating a portion of the reactant flow from the reaction zone at a point downstream from the reactant supply conduit;

(E) left and right evacuation ducts for evacuating a portion of the reactant flow from the reaction zone at points on opposite sides of the reactant supply conduit in directions transverse to the movement of the glass substrate, the distance between the left and right exhaust ducts substantially defining the width of the stripe of coating material;

(F) seal means for preventing the escape of reactant from the reaction zone out between the coater body and the surface of the hot glass substrate; and

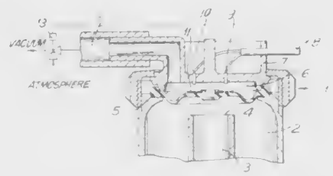
(G) evacuation means for independently controlling the evacuation of the flow of reactant through the upstream exhaust duct, the flow of reactant through the downstream exhaust duct, and the combined flows of reactant through the left and right exhaust ducts, in such a manner so as to cause the deposition of a stripe of coating material having a substantially uniform thickness across the width thereof.

4,922,854

DEVICE FOR CLOSING OFF A LIQUID-SUPPLY CHANNEL

Friedrich Stolte, Halle, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Continuation of Ser. No. 2,839, Jan. 13, 1987, abandoned. This application May 5, 1988, Ser. No. 193,125
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1986, 3602009
Int. Cl.[5] A01J *3/00*
U.S. Cl. 119—14.14 **4 Claims**



1. In a milking system having a liquid supply channel connectable to a vacuum for transporting milk from a cow and a device for closing off the liquid supply channel to prevent the suctioning of air into the liquid supply channel when connected to a vacuum, the device including means forming a product space having a product inlet connected to the liquid supply channel and a control space and including a housing having a cover bounding one side of the control space and having a control inlet and a diaphragm, the improvement comprising: means mounting the diaphragm to separate the product and control spaces in the housing and for movement from a normal midposition wherein the product inlet is open, to a first limiting position away from the product inlet and wherein the product inlet is open and a second limiting position towards the product inlet and wherein the product inlet is closed off thereby; actuatable means for connecting the control space to a vacuum or the atmosphere; switching means responsive to the movement of the diaphragm from the mid-position into the first limiting position as a result of a disconnection of the supply channel from the cow for actuating the actuatable means to connect the control space to the atmosphere to effect the movement of the diaphragm from the first limiting position into the second limiting position wherein the product inlet and therefore the liquid supply channel is closed off and wherein the liquid supply channel is closed off and wherein the diaphragm is disposed in the midposition with the product inlet open and no actuation by the switching means during the transporting of milk from a cow.

4,922,855

MILKING MACHINE

Osamu Tomizawa, and Toshiyuki Okatani, both of Nagano, Japan, assignors to Orion Machinery Co., Ltd., Nagano, Japan

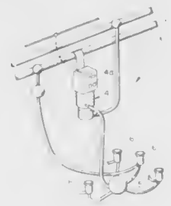
Filed May 24, 1988, Ser. No. 197,918
Int. Cl.[5] H01J *3/00*
U.S. Cl. 119—14.15 **6 Claims**

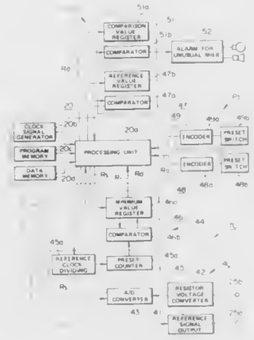
1. A device for measuring and controlling flow rate of a milk in a milking machine, said device comprising:

a pair of electrodes disposed in a milk flow line during a milking process;

flow rate detection means for supplying a reference current between said electrodes, detecting an electrical resistance value between said electrodes, said detected resistance value is represented a measured flow rate of milk, and from said detected resistance value developing a signal representing said measured flow rate of milk;

time integration means for integrating an elapsed time near an end of the milking process when the measured flow rate of milk is at a diminished level;





said time integration means including a timer for calculating said integrated elapsed time, comparing said integrated elapsed time to a predetermined elapsed time and producing a completion alarm, said timer operates in response to said signal from said flow rate detection means when said measured flow rate of milk is less than a predetermined reference flow rate; and

display means for displaying said integrated elapsed time obtained from said time integration means.

4,922,856

VIBRATIONALLY ACTIVATED CONTROL APPARATUS FOR DETECTING SIGNALS FROM FISH TO ENABLE DEMAND FEEDING

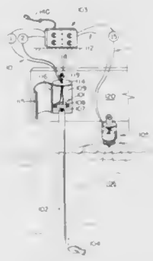
John W. Sweeney, Jr., Boerne, Tex., assignor to Sweeney Enterprises, Inc., Boerne, Tex.

Continuation of Ser. No. 50,728, May 15, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 292,659
Int. Cl.[5] A01K *61/02*
U.S. Cl. 119—51.04 **16 Claims**

1. A sensor for producing an electrical signal in response to mechanical stimuli produced by animals, comprising:

a piezoelectric crystal; and

a rigid conducting structure to which animals may impart a mechanical vibration, said rigid conducting structure being rigidly connected to said piezoelectric crystal for



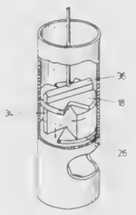
conducing said mechanical vibration from said animal to said piezoelectric crystal.

4,922,857

METHOD AND SYSTEM FOR FEEDING FURRED ANIMALS WITH DRY FODDER

Mogens Arentoft, Lövlundvej 13, DK-7190 Billund, Denmark

Filed Oct. 27, 1988, Ser. No. 263,379
Int. Cl.[5] A01K *5/02*
U.S. Cl. 119—51.12 **13 Claims**



1. A method of effecting feeding in fur farms; primarily mink farms, wherein fur bearing animals are located in respective ones of a plurality of cages having dry fodder containing feeding dispensers with means for supplying portions of fodder contained in said dispensers to the animals, comprising effecting an intermittent supply of fodder portions by means of said dispensers and said means for supplying so as to satisfy the normal feeding requirements of the animals, said intermittent supply providing 5–15 feedings per 24 with more than 50% of the feedings being effected during the evening and night hours between 5 p.m. and 7 a.m.

4,922,858

ANIMAL WATERER

Claude W. Ahrens, Grinnell, Iowa, assignor to Ahrens Agricultural Industries Co., Grinnell, Iowa

Filed Feb. 21, 1989, Ser. No. 312,174
Int. Cl.[5] A01K *7/00*
U.S. Cl. 119—73 **6 Claims**

1. An animal watering tank comprising:

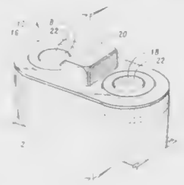
a base unit including a water reservoir having a water level;

a top unit positioned on said base unit over said water reservoir and having an access opening into said reservoir;

a closure valve pivoted to said base unit under said top unit for opening and closing said access opening in said top unit;

an upstanding tube in said base unit having an interior isolated from water in said reservoir; and

a ballast element in said tube connected to said valve to exert an upward pull thereon to normally maintain said valve in



said closed position but operable to pivot downwardly to said open position in response to downward pressure on said closure valve from an animal seeking water.

4,922,859

LIQUID DISPENSING ANIMAL GROOMING DEVICE

Joseph M. Durell, Hillsborough, and Don W. Leathers, Durham, both of N.C., assignors to Specialty Pet Products, Inc., Durham, N.C.

Filed Apr. 5, 1988, Ser. No. 177,972
Int. Cl.[5] A01K *13/00*
U.S. Cl. 119—53 10 Claims



1. A device for applying liquid to animal pets and the like, comprising:

a bottle-like liquid container having an elongate generally vertically extending central axis, said container being adapted to be conveniently grasped and transported by one hand of a user of said device;

pump means connected to said container for conducting liquid from said container upon manual operation of said pump means by the user of said device;

a liquid applying head spaced laterally from said axis of said container, said head including a main body having liquid passageway means therein, and a plurality of hollow tooth-like elements projecting from said head and communicating with said passageway means;

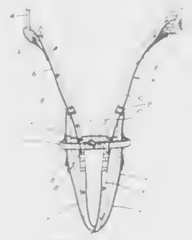
rigid eccentric tubular means supportively connecting said head to said pump means for conducting to said head liquid conducted from said container by said pump means, and for permitting adjustive rotative and translational movement of said head between a plurality of different adjustive positions relative to said generally vertically extending central axis of said container, said positions including a first position wherein said tooth-like elements of said head extend upwardly in generally vertical parallel relationship to said axis of said container, and a second position wherein said tooth-like elements of said head extend in generally horizontal perpendicular relationship to said axis of said container.

4,922,860

CHILD OR DISABLED PERSON TRAINING HARNESS

Deborah A. Hutchings, R.R. #2, Westport, Canada (K0G 1X0)

Filed Mar. 27, 1989, Ser. No. 329,365
Int. Cl.[5] A01K *29/00*; A63B *1/00*; A61G *1/00*
U.S. Cl. 119—96 14 Claims



1. A body harness for supporting the body of a wearer, said body harness comprising an adjustable chest band and adjustable support strap means including two straps, each of which straps has an adjustable fastener at one end and a handle at the other end and includes a torso engaging portion adapted to extend from said fastener positioned generally at one shoulder of the wearer, under the crotch area of the wearer and to connect to the other fastener of the other strap at the wearer's opposite shoulder, and a handle portion extending from the fastener to said handle, whereby the relative lengths of the torso engaging portion and the handle portion are adjustable, and wherein said chest band is adapted to be circumjacent the wearer's chest and to cooperate with said adjustable support strap means to retain the chest band at a selected position.

4,922,861

MULTIPLE-PURPOSE INSTANTANEOUS GAS WATER HEATER

Osamu Tsutsui; Hideki Kawaguchi; Keiji Hayashi; Masahiro Kayano; Shingo Tanaka, all of Fukuoka; Hiroshi Kobayashi, Shiga; Hisashi Nakamura, Shiga, and Atsuo Makita, Shiga, all of Japan, assignors to Toto Ltd., Kitakyusha, Japan

Continuation of Ser. No. 883,773, Jul. 9, 1986, Pat. No. 4,819,587. This application Jan. 25, 1989, Ser. No. 301,361
Claims priority, application Japan, Jul. 15, 1985, 60-156593; Jul. 19, 1985, 60-160770; Jul. 26, 1985, 60-166983; Oct. 24, 1985, 60-238850; Jan. 10, 1986, 61-3153; Jan. 10, 1986, 61-3154
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[5] F22B *37/42*
U.S. Cl. 122—448 R 3 Claims

1. A multiple-purpose instantaneous gas water heater comprising:

(a) a first burner;

(b) an independently operable second burner and a heat exchanger, said first and second burners being positioned adjacent to said heat exchanger, said gas water heater further comprising means for setting the highest and lowest combustion capacities of said burners, wherein the highest combustion capacity of said second burner is slightly larger than the lowest combustion capacity of said first burner;

(c) means for detecting a water flow rate, means for detecting the temperature of feeding water, and means for detecting the temperature of hot water, all three of said detecting means being arranged, respectively, along a feeding water pipeline channel extending through said heat exchanger;

(d) a control panel including means for setting water temperature;

(e) a microprocessor with arithmetic-logic means for receiving data from each of said detecting means and said temperature setting means and for defining a required heat load in response to the data received; and

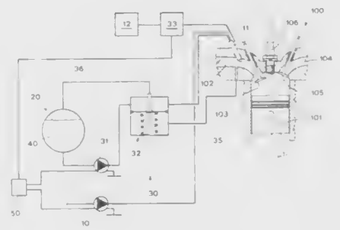
(f) means for selecting at least one of said burners for operation in accordance with the value of the required heat load determined by said microprocessor.

4,922,862

SYSTEM FOR SUPPLYING DIFFERENT FUELS TO OTTO ENGINES WITH ELECTRONIC FUEL-INJECTION

Carlo Casacci, Bologna, Italy, assignor to Sprint Auto S.p.A., Bologna, Italy

Filed Nov. 28, 1988, Ser. No. 276,628
Claims priority, application Italy, Dec. 28, 1987, 3744 A/87
Int. Cl.[5] F02D *19/06*; F02M *37/00*; F02P *5/04*
U.S. Cl. 123—1 A 2 Claims



1. A system, for supplying different fuels to Otto engines with electronic fuel-injection comprising: a primary fuel supply pump designed to send petrol to at least one injection nozzle, situated on an inlet duct, upstream of a valve; an electronic control box, designed to control the enabling of said injection nozzle in accordance with preset supply parameters; a tank containing liquid gas under pressure; a pumping unit designed to deliver said liquid gas to said injection nozzle; a switch for the enabling, in turn, of said primary fuel supply pump or of said pumping unit; a signal multiplier, located between said injection nozzle and said control box, said multiplier being actuated by said switch, when said pumping unit is actuated, and designed to intervene to modify said supply parameters in accordance with a constant correction value.

4,922,863

CAST ENGINE CYLINDER HAVING AN INTERNAL PASSAGEWAY AND METHOD OF MAKING SAME

Gar M. Adams, Elkhart Lake, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Apr. 18, 1989, Ser. No. 339,644
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MC 8 Claims

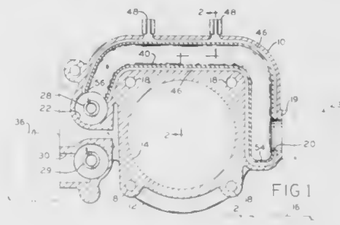


FIG 1

1. A cast cylinder assembly for an internal combustion engine comprising:

a cast cylinder including a piston bore, an intake valve cavity, an intake bore communicating externally of said cast cylinder with ambient air and located on a side of the piston bore opposite said intake valve cavity, and a cast-in-place walled tube embedded in said cast cylinder and defining an internal passageway circumscribing a portion of the piston bore and communicating said intake bore and said intake valve cavity.

4,922,864

SYSTEM FOR CONTROLLING AIR INTAKE FOR AN AUTOMOTIVE ENGINE

Satoshi Maeda, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

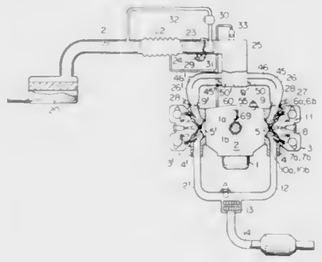
Filed Jul. 12, 1989, Ser. No. 378,906
Claims priority, application Japan, Jul. 19, 1988, 63-180632; Sep. 5, 1988, 63-223307
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 M 7 Claims

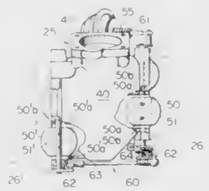
1. In system for controlling air intake for an engine of a vehicle wherein a cylinder head has a left-hand bank and a right-hand bank, and a chamber arranged downstream of a throttle valve at a substantially intermediate position between said two banks so that it is communicated with respective cylinders on both banks via intake manifolds extending from left and right sides of said chamber to intake ports of said cylinders, said intake manifolds being curved at right angles between a vertical plane and a horizontal plane, the improvement comprising;

a high speed intake passage situated on an inner peripheral side of each of intake manifolds and having a larger diameter and a shorter length, and a low speed intake passage situated on an outer peripheral side of each of intake manifolds and having a smaller diameter and a longer distance;

a respective joint chamber in which said high speed intake passage and said low speed intake passage are jointed to each other;

a respective control valve disposed between said chamber and each of said high speed intake passages; and

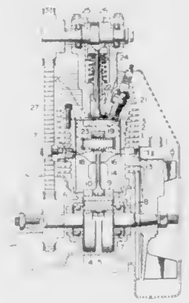


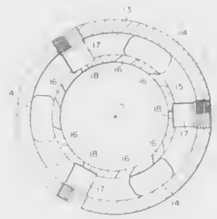


an actuator operatively actuating said control valves via a valve actuating mechanism so as tc open or close said control valves.

4,922,865
TWO-STROKE-CYCLE UNIFLOW SPARK-IGNITION ENGINE
Seiichiro Kumagai, Tokyo; Michikata Kono, Hachioji; Masakazu Okai, Kanagawa, and Hisashi Inaga, Tokyo, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Feb. 16, 1989, Ser. No. 313,057
Claims priority, application Japan, Mar. 9, 1988, 63-53573
Int. Cl.[5] F02B *15/00*
U.S. Cl. 123—65 VC 3 Claims

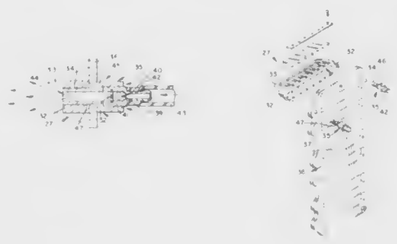
1. A two-stroke-cycle uniflow spark-ignition engine which generates power by pressurizing fluid introduced into a crank chamber within said crank chamber with a piston as it moves toward its bottom dead center position, feeding the pressurized fluid to an annular scavenging chamber extending around the entire periphery of a cylinder where it accumulates, discharging the fluid in said annular scavenging chamber into a combustion chamber within the cylinder above said piston through a plurality of scavenging ports opened near the end of the descending stroke of said piston, each of which ports is shaped to direct the scavenging fluid at an angle to the radial line joining the center of the port and the central axis of the cylinder so that the scavenging fluid enters the combustion chamber as a swirling uniflow, igniting with a spark plug an air-fuel mixture which has been compressed within said combustion chamber by said piston as it moves to its top dead center to provide combustion, and exhausting the resultant burnt exhaust gas through an exhaust valve in a cylinder head, said exhaust valve being opened near the end of the descending





stroke of said piston caused by the expansion of the combustion gas, and in advance of the opening of the scavenging ports.

4,922,866
FUEL INJECTOR ASSEMBLY
Richard E. Staerzl, and Ronald D. Stageman, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed May 25, 1989, Ser. No. 357,003
Int. Cl.[5] F24C *1/16;* F02M *35/10*
U.S. Cl. 123—73 A 18 Claims



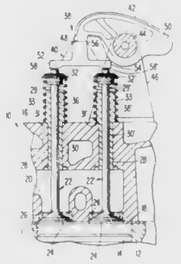
1. A fuel injector assembly for a low pressure fuel injection system of an internal combustion engine, the fuel injector assembly comprising:

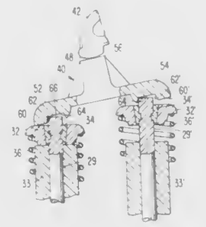
check valve means for receiving a flow of fuel from a fuel supply system and for transmitting the fuel into a crankcase of an internal combustion engine, said check valve means including an inlet end and an outlet end;

fastener housing means for supporting said check valve means and for securing a reed valve block assembly to a location at which the reed valve block assembly opens into the crankcase of the internal combustion engine; and

a hollow passageway in said fastener housing means, said fastener housing means hollow passageway receiving said check valve means, whereby the flow of fuel from said outlet end of the check valve means is directed into the crankcase of the internal combustion engine.

4,922,867
VALVE STOP MECHANISM FOR INTERNAL COMBUSTION ENGINES
Will W. Mathews, Glen Ellyn, Ill., assignor to Cummins Engine Company, Inc., Columbus, Ind.
Filed Aug. 30, 1989, Ser. No. 400,706
Int. Cl.[5] F01L *1/26*
U.S. Cl. 123—90.22 15 Claims





10. A valve stop mechanism for an internal combustion engine including valve stop means for limiting the axial movement toward the piston of one of a pair of valves in said engine to a predetermined maximum length of travel when the other of said pair of valves is rendered unmovable during engine operation.

4,922,868
STARTING SYSTEM
Masao Ohkanda, Sagamihara, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Filed Apr. 27, 1989, Ser. No. 343,703
Claims priority, application Japan, Apr. 27, 1988, 63-55906[U]
Int. Cl.[5] F02N *3/02, 11/00*
U.S. Cl. 123—179 P 2 Claims

1. A starting system comprising:

a recoil type starter disposed so as to be concentric with a crankshaft of an internal combustion engine and to face one end of said crankshaft, said recoil starter having a recoil drum having a hollow boss portion and an engaging portion formed at its one side facing said one end of said crankshaft;

a motor starter;

a rotary shaft inserted into said hollow boss portion of the rotary drum concentrically therewith and capable of being rotated by said motor starter;

a shock absorbing spring disposed around said rotary shaft; and

ratchet members disposed at said one end of said crankshaft, said ratchet members being capable of respectively engaging with said spring and said engaging portion;



wherein when one of said starters is operated, at least one of said ratchet members is brought into engagement with said engaging portion or said spring, and is disengaged from said operating starter by the centrifugal force caused by the rotation of said ratchet member as the rotational speed of said crankshaft increases after the internal combustion engine has been started.

4,922,869
TORQUE CONTROLLING APPARATUS FOR INTERNAL COMBUSTION ENGINE
Yuzo Kadomukai; Makoto Yamakado, and Yozo Nakamura, all of Ibaraki, Japan, assigners to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 17, 1989, Ser. No. 339,106
Claims priority, application Japan, Apr. 18, 1988, 63-94843; Jun. 29, 1988, 63-159145; Aug. 19, 1988, 63-204718
Int. Cl.[5] F02B *75/06*
U.S. Cl. 123—192 R 16 Claims

1. A torque controlling apparatus for an internal combustion engine, comprising:

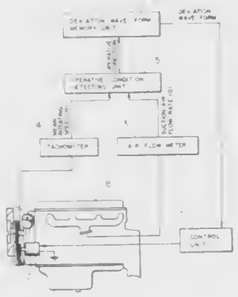
an electric machinery for absorbing torque from said internal combustion engine and/or for imparting torque to said internal combustion engine;

memory means for storing, in advance, waveform characteristics of torque deviation generated by said internal combustion engine in the respective operative conditions of said internal combustion engine;

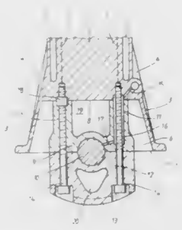
detecting means for detecting an operative condition of said internal combustion engine; and

controlling means for reading out said waveform characteristics of torque deviations from said memory means in correspondence with the detected operative condition of said internal combustion engine detected by said detecting means, and for controlling said electric machinery on the

basis of the read-out waveform characteristics to absorb torque from said internal combustion engine and/or impart torque to said internal combustion engine, thereby reducing said deviation of torque.

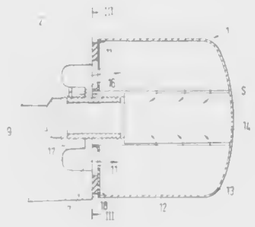


4,922,870
ARRANGEMENT FOR SUPPORTING A CRANKSHAFT
Albert Pietsch, Illingen, and Wolf Boll, Weinstadt, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany
Filed May 8, 1989, Ser. No. 349,425
Claims priority, application Fed. Rep. of Germany, May 6, 1988, 3815508
Int. Cl.[5] F02F 7/00
U.S. Cl. 123—195 R 3 Claims



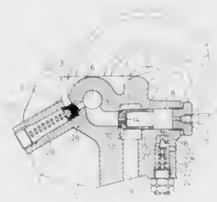
1. Arrangement for supporting a crankshaft of a multi-cylinder internal-combustion engine having side walls forming a crankcase and connected firmly to a cylinder block and having bearing shells which are connected to said cylinder block and provided with fitted bearing caps to receive the crankshaft, wherein support elements connected to the cylinder block are formed geometrically as columnar support elements, which support the bearing shell at their lower end and exhibit no connection to the side walls of the crankcase, for relieving the transmission of transverse vibrations of the crankshaft to the cylinder block and the side walls of the crankcase, and wherein the fitted bearing caps are mutually connected through a continuous bearing bridge which extends in a longitudinal direction of the internal-combustion engine.

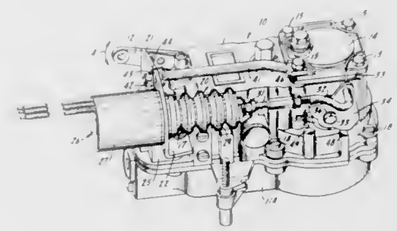
4,922,871
ARRANGEMENT FOR THE PURIFICATION OF LUBRICATING OIL
Manfred Batzill, Neuhausen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Aug. 8, 1989, Ser. No. 390,106
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827570
Int. Cl.[5] F01M 1/00
U.S. Cl. 123—196 A 4 Claims



1. An arrangement for the purification of lubricating oil of an internal-combustion engine having an oil filter which is flanged to the outside of an engine crankcase top part above the oil level of an engine oil sump and having an oil feeding duct which is supplied by an oil pump driven by the internal-combustion engine, this oil feeding duct leading into a ring-shaped duct in the filter flange on the engine-side, and having a central bore located centrically in the filter flange, this central bore being connected to a main oil duct extending above the central bore, this main oil duct supplying the internal-combustion engine with pure oil, wherein in that the oil feeding duct leads into the ring duct extending in the filter flange in such a manner that the leading-in point is located above the central bore leading to the main oil duct.

4,922,872
ENGINE BRAKE SYSTEM
Masaaki Nogami, Machida; Akira Hasegawa, Fujisawa; Hiroshi Nojima, Machida, and Mitsuhiro Murata, Yokohama, all of Japan, assignors to Tokyo-Buhin Kogyo Co., Ltd., Kanagawa and Isuzu Gidoshiya Kogyo Co., Ltd., Tokyo, both of, Japan
Filed Oct. 13, 1988, Ser. No. 257,220
Claims priority, application Japan, Oct. 14, 1987, 62-257079
Int. Cl.[5] F02D 31/00
U.S. Cl. 123—319 10 Claims





1. A braking apparatus for an engine having a moving drive part, comprising: a fluid pump driven by said drive part and having a fluid discharge port, said pump applying to said drive part a braking torque which increases as fluid pressure in said discharge port increases; valve means defining an opening through which fluid flowing out of said discharge port passes and having means for varying the braking torque by changing the effective cross sectional size of said opening progressively between first and second sizes, which each permits fluid flow through said opening at a respective rate greater than zero; and means responsive to a pressure increase in said discharge port for causing said valve means to reduce the effective cross sectional size of said opening from said first size to said second size.

4,922,873
ELECTROMECHANICAL RUN/STOP ACTUATOR FOR DIESEL ENGINE
Anthony J. Gaeti, Chicago, Ill., assignor to Synchro-Start, Skokie, Ill.
Filed Aug. 31, 1988, Ser. No. 238,579
Int. Cl.[5] F02M 39/00
U.S. Cl. 123—357 6 Claims

1. An electromechanical run/stop actuator for a diesel engine fuel pump governor of the kind comprising a plurality of housing members conjointly affording a housing for the governor, a plurality of housing fasteners for securing the governor housing members to each other, and a run/stop member rotatable through a predetermined angle between alternate STOP and RUN positions, the actuator comprising:

a bracket having a base with a configuration complementary to a portion of the governor housing spaced from the run/stop member;

main bracket fastener means, including at least one fastener for replacing at least one housing fastener, for mounting the bracket on the governor housing;

a support rod having one end affixed to the bracket at a location displaced from the main bracket fastener means;

support rod fastener means, including a fastener for replacing at least one housing fastener for affixing the other end of the support rod to the housing at a location displaced from the bracket, thereby bracing the bracket to withstand vibration of the engine;

a solenoid, affixed to the bracket, having a plunger aligned with the run/stop member and movable between alternate extended and retracted positions in response to changes in energization of the solenoid, the solenoid including a spring biasing the plunger toward one of its alternate positions;

a lever mounted on the run/stop member;

a connecting rod of predetermined length having one end affixed to the lever;

and a swivel connection between the other end of the connecting rod and the plunger,

whereby energization of the solenoid drives the lever to rotate the run/stop member to one of its alternate positions and de-energization of the solenoid permits the spring to drive the lever to rotate the run/stop member to its other alternate position.

4,922,874
AUTOMOBILE ELECTRONIC CONTROL MODULES COMMUNICATING BY PULSE WIDTH MODULATED SIGNALS
Charles J. DeBiasi, Allen Park, and Wesley D. Boyer, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jun. 30, 1989, Ser. No. 374,036
Int. Cl.[5] F02P 5/15
U.S. Cl. 123—417 5 Claims

1. A method for communicating spark advance value information between electronic engine control modules comprising the steps of:

calculating said spark advance value in a first module;

determining a width of a pulse width modulated pulse corresponding to said calculated spark advance value such that said width decreases when said spark advance value increases;

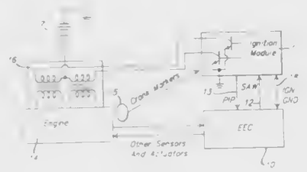
monitoring rotational position of an engine;

detecting the occurrence of a communication period with said engine position being within a first predetermined range of rotational positions;

transmitting said pulse width modulated pulse from said first module to a second module during said communication period;

integrating said pulse in an accumulator in said second module during said communication period;
detecting the occurrence of a read period with said engine position being within a second predetermined range of rotational positions;
reading said integrated pulse from said accumulator during said read period; and
clearing said accumulator prior to a succeeding communication period;
wherein said width is determined by the formula;

$$SAW = ZTDC - (ST * T * 2^x / CMI)$$



where SAW is said pulse width;
ZTDC is the pulse width offset corresponding to 0° spark advance;
ST is the value in degrees of spark advance, and is negative for values after top dead center;
T is the clock period at which said pulse is accumulated;
CMI is the number of degrees of engine rotation between position signals for monitoring said engine position; and
2^x is the number of steps between said position signals for a desired spark advance resolution.

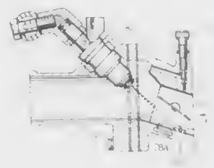
4,922,875
POWER DRIVEN, POSITIVE DISPLACEMENT, COMBUSTION CHAMBER FOR PRODUCTION OF MIXTURES OF STEAM AND EXHAUST GASES
Joseph H. Klaeger, Hondo, Tex., assignor to Gail Whicomb, Houston, Tex.
Filed Sep. 15, 1987, Ser. No. 96,940
Int. Cl.[5] F02B *71/00*
U.S. Cl. 123—46 SC 17 Claims

1. An apparatus for generating hot combustion gases and steam comprising:
a piston block having a bore therethrough;
a piston reciprocally mounted within the bore in said piston block, said piston having a first side and a second side;
controlling means for controlling the flow of hydraulic fluid to cause reciprocation of said piston within said bore;
a fuel inlet control rod reciprocally mounted in said piston block, said fuel inlet control rod being provided with means for introducing fuel into the bore on the second side of said piston;
means for initiating combustion of the fuel;
means for introducing hydraulic fluid used for moving said piston into a chamber means;
an exhaust valve movable between a first position closing the bore and a second position in which combustion gases in the bore on the second side of said piston escape from the bore into the chamber means; and



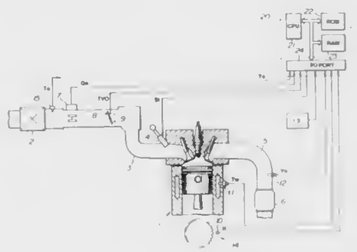
control means actuated by said fuel inlet control rod for controlling the introduction of fuel into the bore and for controlling the controlling means.

4,922,876
FUEL INJECTION DEVICE
Kenji Mizoguchi; Hitoshi Takeuchi; Yosbiyasu Nishigaki; Yoshibiro Kato, and Shinichi Sakakibara, all of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan
Filed Mar. 24, 1989, Ser. No. 328,508
Claims priority, application Japan, Mar. 25, 1988, 63-40024[U]; Jul. 18, 1988, 63-94676[U]
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—470 5 Claims



1. A throttle body adapted to be mounted between an intake pipe and an intake manifold, said throttle body comprising:
an upstream body connected to said intake pipe and formed with a substantially horizontal suction passage;
a downstream body connected to said intake manifold and formed with a downwardly inclined throttle bore, said throttle bore continuously extending from said suction passage on a downstream side thereof;
a throttle valve rotatably mounted to a substantially horizontal throttle shaft in said throttle bore of said downstream body;
a projection formed on an inner wall surface of said throttle bore at a lower portion thereof at a position just downstream of said throttle valve such that rotation of said throttle valve is not hindered; and
a fuel injector mounted to said upstream body in such a manner as to inject fuel toward said projection;
wherein when an opening angle of said throttle valve is small, the fuel injected from said injector collides with a lower portion of said throttle vale to be atomized, and the fuel scattered downwardly from said throttle valve onto the inner wall surface of said throttle bore is allowed to smoothly flow downstream owing to the downward inclination of said throttle bore, thereafter being sucked into an engine by an intake manifold vacuum created downstream of said throttle valve, while when the opening angle of said throttle valve is large, the fuel injected from said injector collides with said projection to be atomized, thereafter being sucked into said engine.

4,922,877
SYSTEM AND METHOD FOR CONTROLLING FUEL INJECTION QUANTITY FOR INTERNAL COMBUSTION ENGINE
Hatsuo Nagaishi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan
Filed Jun. 2, 1989, Ser. No. 360,813
Claims priority, application Japan, Jun. 3, 1988, 63-136699; Jun. 3, 1988, 63-136700; Jun. 29, 1988, 63-162909
Int. Cl.[5] F02B *3/02*; F02D *41/10*; F02M *51/00*
U.S. Cl. 123—478 39 Claims



1. A system for controlling fuel supply quantity for an internal combustion engine, comprising:
(a) first means for detecting parameters determining an engine operating condition;
(b) second means for determining whether the engine falls in a transient operating state on the basis of the detected parameters;
(c) third means for deriving a quantity of fuel to be supplied to each engine cylinder on the basis of the detected parameters;
(d) fourth means for deriving a characteristic having a correlation to part of the quantity of fuel which has been supplied toward a wall surface of an engine intake air passage, has been adhered onto the wall surface, and will be brought into a combustion chamber of each engine cylinder during its suction stroke at the present fuel supply timing on the basis of the detected parameters;
(e) fifth means for deriving a correction quantity for the quantity of fuel derived by the third means on the basis of the characteristic derived by the fourth means when the engine falls in the transient operating condition; and
(f) sixth means for supplying the quantity of fuel for each cylinder which is derived by the third means and corrected by the fifth means.

4,922,878
METHOD AND APPARATUS FOR CONTROLLING A SOLENOID OPERATED FUEL INJECTOR
Ronald D. Shinogle, and Thomas G. Ausman, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Sep. 15, 1988, Ser. No. 245,096
Int. Cl.[5] F02D *41/30*
U.S. Cl. 123—490 10 Claims

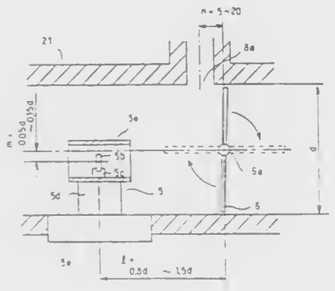


1. A method of controlling operation of each solenoid operated control valve of a plurality of fuel injectors each of which injects fuel into a respective cylinder of a multicylinder internal combustion engine including the steps of:
energizing the solenoid at a first current level to start movement of the control valve;
after the control valve starts to move, reducing the current level to a second level less than the first current level but great enough to continue movement of the control valve;
maintaining the solenoid current at the second level for a period of time;
further reducing the current level to a third level less than either the first and second current levels but sufficient to hold the control valve at the moved position;
deenergizing the solenoid and returning the control valve to its initial position to stop the flow of fuel; and
repeating the foregoing steps for each of the other control valves of said fuel injectors to reduce energy required, reduce heat to be dissipated in the solenoid and its related circuit while maintaining optimum performance of the control valve.

4,922,879
INTAKE ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

Yasumasa Kaji, Toyota, and Toru Takaki, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 12, 1988, Ser. No. 218,586
Claims priority, application Japan, Aug. 3, 1987, 62-193907
Int. Cl.[5] F02D *41/18*
U.S. Cl. 123—494 9 Claims

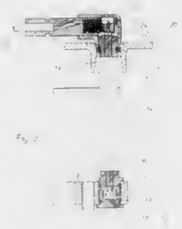


1. An air intake arrangement for an internal combustion engine having at least one intake manifold comprising:
an intake pipe defining a first air passage therein;
a throttle body provided between said intake pipe and said intake manifold of said engine and defining therein a second air passage which has a central longitudinal axis in communication with said first air passage;
a throttle valve rotatably provided in said second air passage of said throttle body for controlling an air flow amount flowing into said intake manifold, said throttle valve including a rotatable shaft and a valve plate having a first half portion and a second half portion, said first half portion rotated in an upstream direction and said second half portion rotated in a downstream direction with respect to a direction of air flow respectively, relative to said rotatable shaft to open said throttle valve and allow air flow into said intake manifold; and
an air flow sensor provided in said second air passage upstream of said throttle valve for sensing a local air flow amount flowing through said second passage, said air flow sensor being located at a local position spaced from said longitudinal axis of said second air passage toward said first half portion of said valve plate so that the local air flow amount is sensed only at said local position upstream said first half portion of said valve plate.

4,922,880
FUEL INJECTOR FOR INTERNAL COMBUSTION ENGINES

Artur Seibt, Vienna; Heinrich Maly, Kottingbrunn; Harald Fleck, Schwechat, and Gottfried Haider, Linz, all of Austria, assignors to Voest-Alpine Automotive Gesellschaft MB. H., Linz, Austria

Filed Oct. 12, 1988, Ser. No. 256,797
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736198
Int. Cl.[5] F02M *39/00*; B05B *1/30*
U.S. Cl. 123—509 13 Claims



1. A fuel injector for an internal combustion engine comprising:
a housing having a flange adapted for mounting said housing to a cylinder head of said engine,
a pump jet internal of said housing, said pump jet having a longitudinal axis extending substantially normal to said flange,
at least one electrical component internal of said housing,
a first pair of electrical connector leads for said electrical component,
at least one aperture extending through said flange, and
a portion of said first pair of electrical connector leads extending from internally of said housing and terminating in said aperture, whereby said first pair of electrical connector leads may be connected with a second pair of electrical connector leads in said aperture.

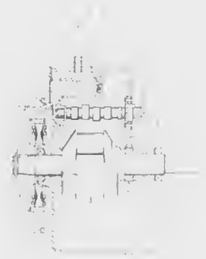
4,922,881
BREATHER DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Shinichi Tamba, Kobe, and Yoshiteru Ueda, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 20, 1988, Ser. No. 286,996
Claims priority, application Japan, Dec. 29, 1987, 62-200616
Int. Cl.[5] F01M *9/10*; F02M *25/06*
U.S. Cl. 123—572 5 Claims

1. In a breather device adapted for an internal combustion engine which includes a lubricant separation chamber having a check valve opening by a positive pressure in the crank chamber and being provided with at least one hole communicating said lubricant separation chamber with a crank chamber, a gas exhausting section connected to an intake air line and with means for returning a separated lubricant to the crank chamber, said lubricant return means comprising.

a gap section communicating to a bottom of said lubricant separation chamber and in contact with an end face of an appropriate revolving shaft, and



at least one forced oil return passage being formed in or on said revolving shaft, which communicates the crank chamber to said gap section, and integrally revolves with said revolving shaft to forcibly send lubricant oil residing in said gap section to the crank chamber.

4,922,882
CRANKCASE VENTILATION SYSTEM

Walter Töpfer, Iptingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.f. Porsche AG, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 379,967
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824791
Int. Cl.[5] F02M *25/06*
U.S. Cl. 123—572 10 Claims

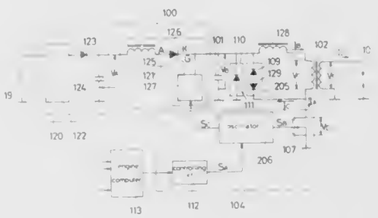
1. A crankcase ventilation system for an internal-combustion engine, having a main ventilating point arranged in a throttle valve housing and leading into the intake air flow in front of a throttle valve, having a secondary ventilating point arranged behind the throttle valve, and having a ventilating pipe leading from the internal-combustion engine into a throttle valve housing, the throttle valve housing being connected to a coolant circulating system and being heated by it, wherein the ventilating pipe, inside the throttle valve housing, branches into a duct leading to the main ventilating point and a duct leading to the secondary ventilating point



4,922,883
MULTI SPARK IGNITION SYSTEM

Shinichiro Iwasaki, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 28, 1988, Ser. No. 263,897
Claims priority, application Japan, Oct. 29, 1987, 62-274515
Int. Cl.[5] F02P *3/08, 15/08*
U.S. Cl. 123—598 4 Claims



1. A multi spark ignition system having an ignition capacitor and an ignition transformer, said transformer having primary and secondary windings, said system comprising:
a charging means for charging energy in said ignition capacitor;
discharge switching means having a field effect transistor for

discharging said energy in said ignition capacitor through a primary winding of said ignition transformer;
oscillator means for making said discharging switching means operate intermittently with a proper cycle;
controlling means for controlling the consumption of magnetic energy stored in said ignition transformer under non-operative state of said discharge switching means; and
first returning means for consuming a magnetic energy stored in said ignition transformer under non-operative state of said discharge switching means;
second returning means for returning said energy stored in said ignition transformer and discharging said energy through said secondary winding under operative state of said discharge switching means; wherein
said first returning means is arranged between said second returning means and said discharge switching means.

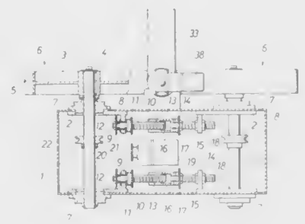
4,922,884
HANDHELD WATER BALLOON CATAPULT
Jack T. Ford, 7033 Hwy. 290 E. #111, Austin, Tex. 78723
Continuation of Ser. No. 57,425, Jun. 2, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 324,978
Int. Cl.[5] F41B *3/00*
U.S. Cl. 124—20.1 **8 Claims**



1. A catapult device for catapulting a projectile, comprising:
a generally spheroidal projectile requiring an applied force per unit area below a predetermined amount to prevent distortion of the projectile which may cause the projectile to break, the projectile having a density substantially greater than air and the projectile having a basic diameter;
a yoke having two upright portions;
a hand grip connected to said yoke;
a forearm support connected to said hand grip;
two elastic means, each elastic means having two ends, with one end of each of said elastic means being connected to one of said yoke upright portions, each of said elastic means having a size substantially less than said projectile's basic diameter; and
pouch means connected to the second end of each of said elastic means,
said pouch means adapted and sized to provide support for said projectile and to prevent an applied force per unit area greater than the predetermined amount being applied to said projectile

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4,922,885
PITCHING MACHINE
Shigeru Iwabuchi, Aikawa; Aritsune Sato, Atsugi, and Haruo Ueno, Zama, all of Japan, assignors to Nagao Company, Inc., Tokyo, Japan
Filed Jul. 27, 1988, Ser. No. 224,848
Claims priority, application Japan, Sep. 22, 1987, 62-144844[U]
Int. Cl.[5] F41B *15/00*
U.S. Cl. 124—78 **20 Claims**



1. A pitching machine, comprising:
a housing;
two parallel rotary shafts projecting from said housing;
two rotary discs respectively mounted on said shafts, said discs having outer circumferences made of urethane;
adjustment mechanism means inside the housing for adjusting the distance between said shafts, the adjustment mechanism means including a screw member, means for coupling the screw member to at least one of the shafts, means for rotating the screw member, and means for electrically sensing the angle of rotation of the screw member;
drive mechanism means for rotating said shafts, said drive mechanism means including means for selecting the rotational direction and angular velocity of said shafts; and
a ball feed mechanism which includes
a hollow feed body having a side wall and having an outlet which is interposed between said discs,
a piston housed in said feed body to reciprocate relative to said outlet, and
a ball supply tube coupled to said side wall of the feed body.

4,922,886
TILE PARTING DEVICE
Paul S. Hepworth, Surrey, England, assignor to Plas Plugs Limited, Burton on Trent, England
Filed Feb. 4, 1988, Ser. No. 152,044
Int. Cl.[5] B28D *1/32*
U.S. Cl. 125—23.01 **17 Claims**

1. A device for parting a member along an intended parting line, comprising:
a main body portion,
a pair of first contact elements provided on the main body portion, the first contact elements being spaced apart laterally of the intended parting line,
a jaw member including a second contact element and having a circular aperture therein,

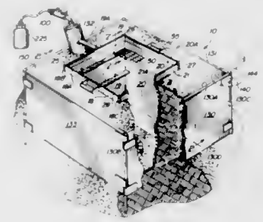
means for mounting the jaw member on the main body portion for movement about a first axis to move the second contact element toward and away from the first contact elements, the first axis bing fixed relative to the main body portion,
a handle device communicating with the main body portion and operative to cause the second contact element to move about the first axis, the handle device including a manually graspable handle member,
means for mounting the second contact element on the main body portion for independent movement about a second



axis, the second axis being spaced from and parallel to the first axis, and
adjustment means for performing adjusting movement of the second contact element angularly about the second axis,
whereby a starting position of the second contact element can be varied,
the adjustment means including a cam member having an external surface, at least part of the external surface being defined in cross-section by an arc centered on the second axis, the cam member being rotatably received within the circular aperture in the jaw member and being fixed relative to the handle.

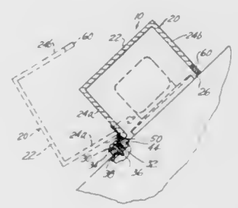
4,922,887
PORTABLE CAMP COOKER
Kenneth E. Foxford, 2477 Kino St., Yuma, Ariz. 85364
Filed Aug. 25, 1989, Ser. No. 398,547
Int. Cl.[5] A47J *37/00*; **F24C** *3/00*
U.S. Cl. 126—41 R **12 Claims**

1. A camp cooker comprising:
(a) a housing having a wall with upper and lower ends and defining a cooking chamber therein having upper and lower ends;
(b) a burner located in the lower end of said cooking chamber;
(c) an air delivery tube extending from the lower end of said cooking chamber to a location at least approximately corresponding to the upper end of said housing;
(d) a fuel supply line extending along said air delivery tube for supplying fuel to said burner in said cooking chamber; and
(e) barrier means including wall means extending substantially around said housing and defining a space between



said barrier and housing which space is adapted to receive an insulating material to insulate said housing.

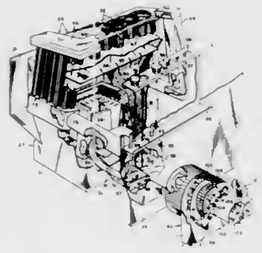
4,922,888
PROTECTIVE COVERING DEVICE
Deborah M. Bryan, and Randall W. Bryan, both of 3614 Lincoln, Dearborn, Mich. 48124
Filed Nov. 21, 1988, Ser. No. 274,450
Int. Cl.[5] F24C *3/12*
U.S. Cl. 126—42 **12 Claims**

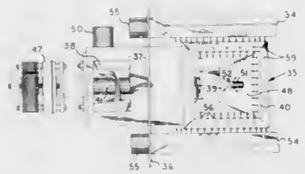


1. A device useful for covering a control knob of an appliance comprising:
a generally rectangular cover including two opposing sides defining an opening therebetween for enveloping the control knob when mated to the appliance, the end of one side being ferromagnetic;
magnetic material fixed to the appliance at a location to magnetically engage the end of the one side when such side is positioned thereto;

means for attaching the other side to the appliance.

4,922,889
PELLETIZED FUEL BURNING HEATER
David Nuesmeyer, Spokane, and Gary Brondt, Cheney, both of Wash., assignors to Thermic, Inc., Spokane, Wash.
Filed Sep. 29, 1987, Ser. No. 102,481
Int. Cl.[5] F24B *13/04, 5/02*
U.S. Cl. 126—73 21 Claims



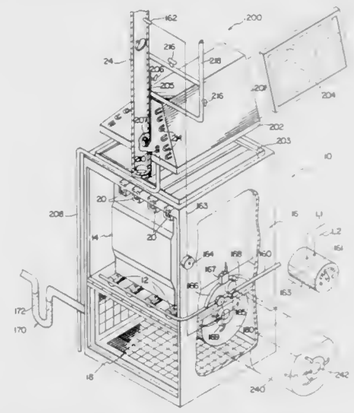


1. A bio-mass fuel burning heater, comprising:
a combustion chamber having top and bottom ends with side walls extending between the top and bottom ends;
pot means for holding the bio-mass fuel, the pot means located adjacent to the lower end of the combustion chamber, the pot means having an open upper combustion end and an open lower fuel feed end passing through a side wall of the combustion chamber;
an enclosure surrounding the combustion chamber and pot means;
air manifold means within the combustion chamber for delivering combustion air above the combustion end of the pot means;
first combustion air supply means positioned around at least part of the periphery of the combustion end of the pot means for supplying combustion air to the pot means;
second combustion air supply means within the combustion chamber for directing a stream of combustion air about at least part of the periphery of the combustion end of the pot means in an upward direction from the combustion end of the pot means;
an exhaust duct opening into the combustion chamber;
air injection means attached to the first and second combustion air supply means and to the air manifold means for drawing air from the ambient atmosphere and injecting it into the first and second combustion air supply means and into the air manifold means, with an area of pressure higher than the ambient atmospheric pressure being created in the area of the combustion end of the pot means;
air extraction means attached to the exhaust duct for producing a lower pressure at the top end of the combustion chamber than the ambient atmospheric pressure to draw exhaust gasses from the combustion chamber; and
pressure control means attached to the enclosure for controlling air flow through the air injection means and air extraction means.

8. A bio-mass fuel burning heater, comprising:
a combustion chamber having top and bottom ends with side walls extending between the top and bottom ends;
pot means for holding the bio-mass fuel, the pot means located adjacent the bottom end of the combustion chamber, the pot means having an open upper combustion end and an open lower fuel feed end passing through a side wall of the combustion chamber;
an enclosure surrounding the combustion chamber and the pot means;
underfire air delivery means for delivering combustion air into the combustion end of the pot means, the underfire air delivery means being positioned about at least part of the periphery of the combustion end of the pot means;
overfire air delivery means located in the combustion chamber above the combustion end of the pot means for delivering combustion air over the combustion end of the pot means;
crossfire air delivery means around the periphery of the combustion end of the pot means for delivering air at approximately a right angle to the air delivered by the overfire air delivery means;
a flame trap positioned over the combustion end of the pot means;
air injection means extending through the enclosure and attached to the underfire air delivery means, the overfire air delivery means and the crossfire air delivery means for injecting ambient air into the combustion chamber at a pressure higher than the ambient atmosphere surrounding the heater;
an exhaust duct extending through the enclosure into the combustion chamber;
air extraction means attached to the exhaust duct for extracting exhaust gasses from the combustion chamber;
injection air control means attached to the enclosure for controlling the amount of air delivered into the combustion chamber by the air injection means; and
extraction air control means attached to the enclosure for controlling the amount of exhaust gasses removed by the air extraction means.

4,922,890
FUEL BURNING FURNACE
Rajendra K. Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056
Continuation of Ser. No. 428,542, Sep. 30, 1982, abandoned. This application Jun. 12, 1989, Ser. No. 366,262
Int. Cl.[5] F24H *3/02*
U.S. Cl. 126—110 R 21 Claims

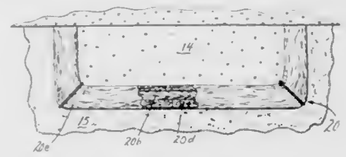
1. A furnace comprising a longitudinally extending burner for use in burning fuel to form hot combustion gases along the length of said burner, a heat exchange enclosure, said heat exchange enclosure including a longitudinally extending exhaust duct portion disposed above said burner for receiving hot combustion gases, and first and second sidewalls at least partially enclosing said burner and extending upwardly from locations adjacent to said burner to said exhaust duct portion and having inner side surfaces which cooperate to define a combustion gas flow path from said burner to said exhaust duct portion, said combustion gas flow path having a width in a direction parallel to the central axis of said burner which is substantially the same as the length of said burner, each of said sidewalls having an undulating cross sectional configuration as viewed in a plane extending perpendicular to the longitudinal axes of said burner and exhaust duct portion, a first series of inwardly projecting undulations formed across the width of said first sidewall and projecting inwardly toward said second sidewall, a second series of inwardly projecting undulations formed across the width of said second sidewall and projecting inwardly toward said first sidewall, said first and second series of inwardly projecting undulations being aligned with each other to form a plurality of spaced apart restricted areas in the combustion gas flow path, a first series of outwardly projecting undulations formed across the width of said first sidewall in an interspersed relationship with said first series of inwardly projecting undulations and projecting outwardly away from said second sidewall, a second series of outwardly projecting undulations formed across the width of said second sidewall in an interspersed relationship with said second series of inwardly projecting undulations and projecting outwardly away from said first sidewall, said first and second series of outwardly projecting undulations being aligned with each other to form a plurality of spaced apart enlarged areas in the combustion gas flow path at locations between the restricted areas in the combustion gas flow path to provide a combustion gas flow path which extends from said burner to said exhaust duct portion and is alternately restricted and expanded to promote a restricted and turbulent flow of combustion gas between said burner and exhaust duct portion, a first plurality of said re-



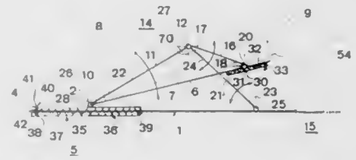
stricted areas in said combustion gas flow path being offset in a first direction relative to a plane containing the longitudinal central axes of said burner and exhaust duct portion, a second plurality of said restricted areas being offset in a second direction relative to the plane containing the longitudinal central axes of said burner and exhaust duct portion, said first plurality of restricted areas being interspersed with said second plurality of restricted areas so that the combustion gas flow path moves sidewardly back and forth relative to the plane containing the central axes of said burner and exhaust duct portions and the combustion gas flows into and out of each of the enlarged areas of the combustion gas flow path at locations which are sidewardly offset, and means for providing a flow of air to be heated across undulations in outer side surfaces of said sidewalls to enable heat to be transmitted from the hot combustion gas disposed between said sidewalls to the air disposed outside of said sidewalls.

4,922,891
HEARTH CONCUSSION BARRIER
Willella King, 725 W. Berkeley Ave., Evansville, Ind. 47710
Filed Mar. 6, 1989, Ser. No. 319,168
Int. Cl.[5] F24C *15/36*
U.S. Cl. 126—544 2 Claims

1. In combination with a fireplace installation having a hearth defined by an exposed front edge, front corners and side edges, a hearth concussion barrier comprising a rigid framework in the form of preassembled padded sections concealing said front edge, said front corners and said side edges in a protective impact resistant relationship, where padding between said framework and a portion of the front and the top of said hearth serves in a further protective impact resistant relationship, and where said hearth concussion barrier is selectively placed and removed from said protective impact resistant relationship on said hearth without the need for independent securement.



4,922,892
APPARATUS FOR RESISTIVE EXTENSION AND FLEXION OF THE LEG
Patrick Akcelrod, Sens, and Bernard Papailhau, Vire, both of France, assignors to Etablissements Tasserit, Gron, France
Filed Nov. 1, 1988, Ser. No. 265,744
Claims priority, application France, Nov. 10, 1987, 87 15527
Int. Cl.[5] A61H *1/02*
U.S. Cl. 128—25 R 9 Claims



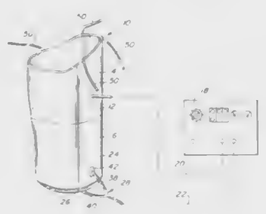
1. Apparatus for resistive extension and flexion of the lweg comprising; a base, a carriage, means for mounting said carriage for displacement along a given direction relative to said base, means for exerting a reaction force against said displacement, a trough for holding the leg substantially between the foot and the knee, means for pivotally mounting one end of said trough to said carriage, a bracket for holding a first rotary shaft about a first axis perpendicular to the displacement direction of said carriage, said first shaft being situated on the side of said trough opposite to said base, said bracket comprising at least one first strut and at least one second strut which are pivotally mounted to each other at first ends thereof about said first axis of rotation, said first strut having a second end pivotally mounted about a second axis parallel to said first axis and connected to said base, said second strut having a second end pivotally mounted about a third axis connected to said carriage, and at least one retaining link having a first end rotatably mounted to said first shaft and having a second end rotatably mounted on said trough by bearing means about a fourth axis of rotation, parallel the first axis.

4,922,893
METHOD FOR PROMOTING FLOW OF A BODY FLUID WITHIN A HUMAN LIMB
Edward S. Wright, Pittsburgh, and Sonja J. Wright, Sewickley, both of Pa., assignors to Wright Linear Pump, Inc., Imperial, Pa.
Division of Ser. No. 64,563, Jun. 22, 1987, Pat. No. 4,773,397. This application May 13, 1988, Ser. No. 193,539
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—64 5 Claims

1. In a treatment for promoting movement of body fluid in a human limb from a relatively distal portion toward a relatively proximal portion thereof by applying thereto pressure compo-

nents of predetermined magnitudes, the improved method of applying such pressure components comprising the steps of:

initiating application of radially inwardly directed pressure to a given part of said distal portion directly adjacent an outermost end of said distal portion and substantially simultaneously initiating application of longitudinally directed pressure to said outermost end of said distal portion;



simultaneously increasing the magnitudes of said longitudinally directed and radially inwardly directed pressures; and

limiting the magnitude of said radially inwardly directed pressure to a magnitude less than the magnitude of said longitudinally directed pressure until said longitudinally directed pressure reaches a first predetermined magnitude which is therapeutically effective for promoting such distal to proximal movement of body fluid.

4,922,894

CERVICAL FASCIA RELEASE BOARD

Carey D. Gipson, 14344 Centreport Landing Cir., Apt. 1906, Fort Worth, Tex. 76155, and James T. Jernigan, Rte. 2, Box 68-A, China Spring, Tex. 76633

Filed Oct. 9, 1987, Ser. No. 106,540
Int. Cl.[5] A61F *5/04*
U.S. Cl. 128—71 **18 Claims**



1. A device for relieving muscle tension in the head and neck area of a user, said device comprising:

a substantially flat base having a top end and a bottom end;

a first support member attached to said base and extending upwardly therefrom, said first support member providing support for the head and neck area of the user thereby causing release of the muscles of the head and neck area; and

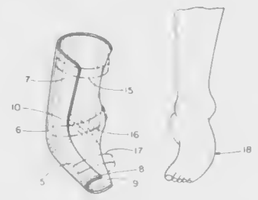
a second support member attached to said base between said top end and said first support member and extending upwardly therefrom, said second support member supporting the head of the user only after the muscles have been released, said second support member including adjustable head support means for adjusting the support position of the second support member.

4,922,895

ORTHOSIS FOR METATARSUS ADDUCTUS

Andrew Chong, 1632 Hemstock Ave., Wheaton, Ill. 60187

Filed Dec. 3, 1984, Ser. No. 677,372
Int. Cl.[5] A61F *3/00*
U.S. Cl. 128—80 J **6 Claims**



1. A unitary rigid foot brace for the correction of metatarsus adductus in children, for use in combination with a child's foot having a convex deformity on the lateral border thereof, said foot including a big toe, leg and heel, comprising

a foot component for enclosing and providing a static force at the medial portion of the foot from the heel to, or slightly beyond, the tip of the big toe,

said foot component having a medial wall C-shaped in cross-sectional configuration, which extends laterally to confine the medial portion of the foot, including the big toe, but not the lateral portion of the foot,

adjustable strap means for applying a dynamic force at the convexity on the lateral border of the deformed foot to urge the foot into contact with said medial wall and anchor the foot to said component,

a heel component extending backwards from said foot component for embracing the bottom and both sides of the heel,

a leg component extending upwardly from said heel component for embracing the lower portion of the leg, and

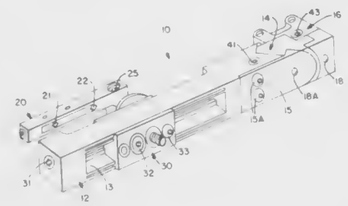
adjustable strap means on said leg component to embrace the leg and prevent the heel from pulling away from said heel component.

4,922,896

COLLES' FRACTURE SPLINT

John M. Agee, 77 Scripps Dr., Suite 101, Sacramento, Calif. 95825, and Francis C. King, Sacramento, Calif., assignors to John M. Agee, Sacramento, Calif.

Filed May 5, 1989, Ser. No. 347,990
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—55 **15 Claims**



1. A fracture splint comprising:

(a) an elongated first element having a free end and a mounting end;

(b) an elongated metacarpal bar carried by said first element and being adjustably movable along said first element; said metacarpal bar including transverse openings therethrough for receiving and securing first and second pins thereto; wherein said pins are adapted to be inserted into a bone of a patient on one side of a bone fracture;

(c) a second element pivotally mounted on said mounting end of said first element for movement about an axis which forms an acute angle relative to the longitudinal axis of said first element; the pivotal movement of said second element relative to said first element being the only degree of freedom of said second element relative to said first element;

(d) a third element pivotally mounted on said second element for movement about an axis which is perpendicular to the longitudinal axis of said second element; said third element including transverse openings extending therethrough;

(e) third and fourth pins adapted to be received and secured in said transverse openings in said third element; wherein said third and fourth pins are adapted to be inserted into the bone of a patient on the opposite side of said bone fracture;

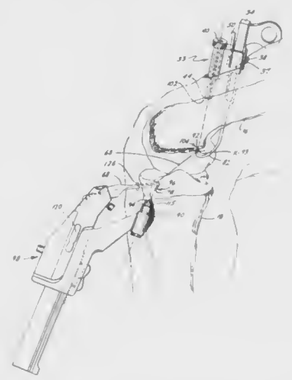
wherein the pivotal movement of said third element relative to said second element is the only degree of freedom of said third element relative to said second element; and wherein said second element is adapted to pivot about said third pin.

4,922,897

APPARATUS AND METHOD FOR RECONSTRUCTIVE SURGERY

Alexander A. Sapega, Philadelphia; Ray A. Moyer, Dresher, both of Pa., and Donald Rose, New York, N.Y., assignors to Temple University, Philadelphia, Pa.

Division of Ser. No. 915,157, Oct. 3, 1986, abandoned. This application May 13, 1988, Ser. No. 180,345
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—80 **12 Claims**



1. In a method for replacing a ligament in a joint connecting pivotable bones to one another, the steps which comprise:

(a) selecting proposed ligament attachment sites for both of said bones;

(b) applying a test ligament to said sites;

(c) pivoting said bones and determining the resulting shortening-lengthening profile relationship;

(d) comparing the resulting shortening-lengthening profile relationship with the optimum shortening-lengthening profile relationship;

(e) repeating if necessary, steps (a) through (d), until optimum attachment sites have been determined against the optimum shortening-lengthening profile relationship; and

(f) attaching a replacement ligament to said optimum sites.

4,922,898

PROCEDURE FOR VERIFYING PROSTHETIC IMPLANT SEATING

Harold K. Dunn, 1231 Chandler Cir., Salt Lake City, Utah 84103

Filed Oct. 4, 1988, Ser. No. 252,985
Int. Cl.[5] A61F *5/04, 2/28*
U.S. Cl. 606—85 **8 Claims**



1. A process for verifying proper friction coupling of a prosthetic hip implant in a prepared femoral intramedullary channel comprising the steps of, to a proximal femur that has had the head and neck thereof removed along a diagonal above the greater and lesser trochanter, preparing the intramedullary channel to receive a prosthetic hip implant; seating a rasp tool means in the prepared intramedullary channel; applying a torsional force to said rasp tool means for a period of seconds where, if said rasp tool means does not experience rotational micromovement, the intramedullary channel preparation is deemed to be correct; installing a prosthetic hip implant in friction fitting engagement in said prepared intramedullary channel; testing the friction fit of said prosthetic hip implant by applying a torsional force for a period of seconds on said prosthetic hip implant, with the fit determined to be correct if said prosthetic hip implant does not experience rotational micromovement

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4,922,899

DOUBLE-COVERAGE ATHLETIC PROTECTIVE CUP WITH HINGED FLANGE

Jeffrey J. Graff, and Deanna M. Graff, both of 7930 NW. 21 St., Sunrise, Fla. 33322

Filed Nov. 21, 1988, Ser. No. 274,365
Int. Cl.[5] A61F *5/40*
U.S. Cl. 128—158 **7 Claims**

1. A double-coverage athletic protective cup apparatus comprising,

an inner relatively rigid cup member, and

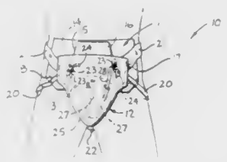
a flange portion extending laterally and upwardly of said inner cup member and fixedly secured thereto, and

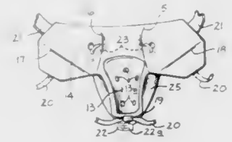
an outer relatively soft cup member pivotally secured to said inner cup member, and

an upper continuous elastic band and a lower continuous elastic band secured to said outer cup member, and

said outer cup member formed of a cup-shaped configura-

tion complementarily accepting therein a cup-shaped configuration defined by the exterior surface of said inner cup member, and





wherein said flange portion includes a plurality of elongate junction hinges to enhance flexibility of said flange portion and accommodate various torso configurations of a wearer.

4,922,900

PUMPING ARRANGEMENT FOR SUPPLYING A VENTILATING APPARATUS WITH BREATHING GAS

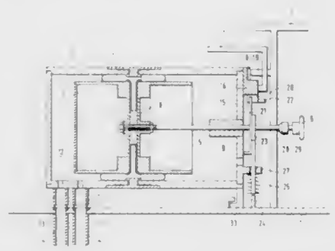
Siegfried Kiske, Grönau; Thorsten Haase, Mölln; Thomas Leyer, and Wolfgang Sauer, both of Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed May 16, 1989, Ser. No. 352,360

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817092

Int. Cl.[5] A62B *9/04*

U.S. Cl. 128—202.27 11 Claims



1 A pumping arrangement for supplying a ventilating apparatus with breathing gas, the pumping arrangement comprising:

a housing;

a piston-cylinder unit removably mounted in said housing, said piston-cylinder unit including a cylinder and a piston mounted in said cylinder so as to perform a reciprocating movement having a predetermined stroke length; said cylinder and said piston conjointly defining a work chamber in which the breathing gas is pumped;

gas line connection means for conducting the breathing gas to and away from said work chamber;

a drive unit mounted in said housing for generating the reciprocating movement for said piston;

motion transmitting means for transmitting the reciprocating movement of said drive unit to said piston;

coupling means for releasably coupling said motion transmitting means to said drive unit;

control means for operating on said drive means so as to cause said motion transmitting means to pass through a preparatory stroke having an end position;

latching means for releasably latching said piston-cylinder unit with respect to said housing; and,

actuating means for actuating said latching means and said coupling means when said motion transmitting means is in said end position to permit removal or installation of said piston-cylinder unit.

4,922,901

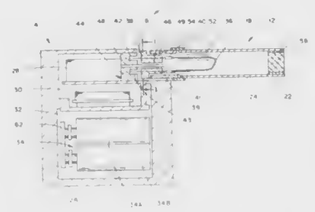
DRUG DELIVERY ARTICLES UTILIZING ELECTRICAL ENERGY

Johnny L. Brooks; Donald L. Roberts, both of Winston-Salem, and Jerry S. Simmons, Rural Hall, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sep. 8, 1988, Ser. No. 241,641

Int. Cl.[5] A61M *16/00, 15/06;* A24K *47/00*

U.S. Cl. 128—203.26 136 Claims



1. A disposable portion of a drug delivery article containing a drug for use with a source of electrical power comprising:

(a) an electrical resistance heating element having a surface area greater than 1 m^2/g; and

(b) aerosol forming substance carried by the heating element prior to use.

4,922,902

METHOD FOR REMOVING CELLULAR MATERIAL WITH ENDOSCOPIC ULTRASONIC ASPIRATOR

David G. Wuchinich, New York; Donald R. Krawitt, Rhinebeck; Robert Brendolan, Mamaroneck, and Louis Katz, Flushing, all of N.Y., assignors to Valleylab, Inc., Boulder, Colo.

Division of Ser. No. 20,266, Feb. 27, 1987, Pat. No. 4,750,488, and a continuation of Ser. No. 865,240, May 19, 1986, Pat. No. 4,750,902, which is a continuation-in-part of Ser. No. 770,342, Aug. 23, 1985, abandoned. This application Dec. 16, 1987, Ser. No. 133,711

Int. Cl.[5] A61B *17/00*

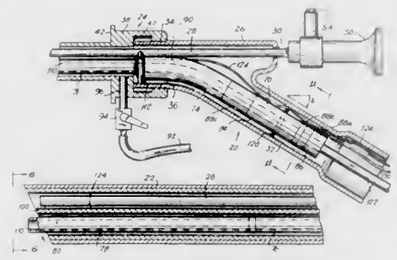
U.S. Cl. 604—22 48 Claims

1 A method of removing cellular material from a compliant tissue relatively deep within a biological body through a narrow orifice comprising:

providing an elongated surgical instrument which comprises an elongated working end having a length of at least about 8 cm, a circumference of no more than about 29 mm, and a working tip at the forward end thereof, said instrument including means for viewing said working tip and said material to be removed;

inserting said forward end of said elongated surgical instrument into the orifice with said working tip located close to the material to be removed; and

vibrating said working tip longitudinally at a frequency of



about 10–20 kHz so as to cavitate the intracellular fluids in such material to destroy the cells thereof while monitoring the removal of said material through the viewing means of said instrument.

4,922,903

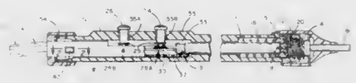
HANDLE FOR ELECTRO-SURGICAL BLADE

Daniel P. Welch, Zimmerman, and Peter Stasz, Moundsview, both of Minn., assignors to Everest Medical Corporation, Brooklyn Center, Minn.

Filed Oct. 6, 1988, Ser. No. 254,248

Int. Cl.[5] A61B *17/39*

U.S. Cl. 606—37 7 Claims



1. An electro-surgical implement having a cutting mode of operation and a coagulating mode of operation comprising:

(a) a blade member comprising a generally flat blank, the blank having first and second opposed major surfaces and a working edge, a distal end portion, an electrically conductive pad area, and a predetermined pattern of electrical conductors extending along the working edge on the opposed major surfaces and terminating in electrical contacts on the distal end portion of the blank;

(b) an elongated insulating handle member having a hollow cavity therein, a proximal end and a distal end and means for retaining the blade member, in either an open or a locked disposition;

(c) electrical switch means contained in the handle member for altering the mode of operation between the cutting mode and coagulating mode when the handle member is in a locked disposition;

(d) means contained within the handle member for vibrating the blade member at a predetermined frequency and amplitude sufficient to create cavitation to prevent buildup of tissue and debris, and means for energizing the blade for cutting and coagulating, the handle means including means for forcing the electrically conductive pad area against the vibration means when the handle member is in locked disposition;

(e) mechanical switch means for altering the handle member's disposition between open and locked disposition such that in open disposition the electrical switch means cannot activate either mode of operation and the blade member is released from the handle member; and

(f) an electrical cable member having a plurality of conductors therein, a first portion of the electrical cable member being disposed in the hollow cavity, a second portion of the electrical cable member extending outwardly from the proximal end of the handle member and terminating in a connector, certain of the plurality of conductors in the electrical cable member being electrically connected to the predetermined pattern of electrical conductors on the blade member, the conductive pad and the blade vibrating element.

4,922,904

APPARATUS FOR CONNECTING THREAD TO SURGICAL NEEDLE

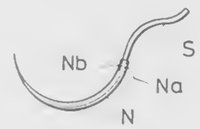
Tsuyoshi Uetake, and Iwao Ueno, both of Tokyo, Japan, assignors to Keisei Medical Industrial Company Limited, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,533

Claims priority, application Japan, Jun. 18, 1988, 63-150798

Int. Cl.[5] A61B *17/06;* B21D *39/00;* B41G *1/06*

U.S. Cl. 606—226 11 Claims



1. An apparatus for automatically connecting a surgical thread to a surgical needle having a hole formed in an end face of a rear end thereof, comprising

a means for feeding the surgical needle into a given position;

a means for supplying the surgical thread;

a means for guiding a front end of the surgical thread into a given position at which the front end of surgical thread is faced to an opening of the hole formed in the end face of the rear end of the surgical needle;

a means for inserting the front end of the surgical thread into the hole of the surgical needle;

a means for pressing the rear end of the surgical needle to clamp the front end of the surgical thread in the hole of the rear end of the surgical needle; and

a means for cutting the surgical thread at a given point to form the surgical needle having the surgical thread of a given length connected to the rear end thereof.

4,922,905

DILATATION CATHETER

Ernst P. Strecker, Vierordtstrasse 7a, 7500 Karlsruhe 41, Fed. Rep. of Germany

PCT No. PCT/DE87/00246, § 371 Date Mar. 2, 1988, § 102(e) Date Mar. 2, 1988

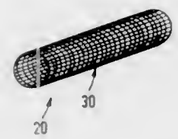
PCT Filed May 28, 1987, Ser. No. 194,995

Int. Cl.[5] A61M *29/02*

U.S. Cl. 606—195 24 Claims

1. A tubular endoprosthesis device having a wall structure comprised of an open fabric of loosely interlocked loops of filament material, the device having a first relatively small diameter form for low profile introduction to a body passageway while encircling a radially expandable section of a cathe-

ter, said loops being capable of progressive permanent deformation with attendant radial expansion of the open fabric in





response to increasing expansion of said expandable section of the catheter.

4,922,906

SMALL-SIZED LOW FREQUENCY CURING APPARATUS

Mitsunori Takeuchi, Sagamibara, and Minoru Sasaki, Yokohama, both of Japan, assignors to Kabushiki Kaisya Advance, Tokyo, Japan

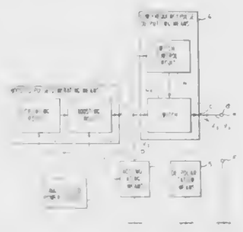
PCT No. PCT/JP86/00615, § 371 Date Jul. 31, 1987, § 102(e) Date Jul. 31, 1987, PCT Pub. No. WO87/03497, PCT Pub. Date Jun. 18, 1987

Continuation of Ser. No. 90,247, Jul. 31, 1987, abandoned. This PCT application Dec. 4, 1986, Ser. No. 258,104

Claims priority, application Japan, Dec. 4, 1985, 60-271589; Nov. 11, 1986, 61-266690

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 R 17 Claims



1. A small-sized low frequency curing apparatus comprising:
a small-sized low voltage and direct-current power source;
a boosted pulse generating means for generating a train of boosted pulses at a high frequency upon receipt of electrical energy from said power source;
an electrical energy accumulating means operatively connected to said boosted pulse generating means, for accumulating electrical energy of said train of pulses generated from said boosted pulse generating means during a predetermined time period defined to accumulate said electrical energy at least to a stimulation level sufficient for curing an object to be electrically stimulated;
a low frequency pulse outputting means operatively connected to said electrical energy accumulating means, for outputting electrical energy accumulated in said accumulating means as low frequency pulses, each defining an output time period, for use in said curing, said low frequency pulse outputting means being operated periodically and alternately together with said accumulating means; and
a pair of electrodes provided on a sheet-like member having a skin-adhesive electrically conductive layer and operatively connected to said low frequency pulse outputting means, for transmitting said low frequency pulses from said low frequency pulse outputting means via said skin-adhesive, electrically conductive layer to said object when said pair of electrodes are applied to said object;
said power source, boosted pulse generating means, electrical accumulating means and low frequency pulse outputting means being formed integrally with at least one of said electrodes.

4,922,907

METHOD FOR FINDING THE PARAMETERS IN A FUNCTIONAL RELATIONSHIP BETWEEN STIMULATION FREQUENCY AND LOAD CONDITION SENSOR SIGNALS IN A RATE RESPONSIVE HEART PACEMAKER

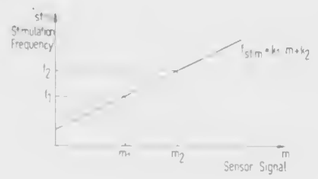
Lennart Moberg, Spanga, and Asa Hedin, Stklm, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,333

Claims priority, application Sweden, Jun. 17, 1987, 87025235

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 P 5 Claims



1. A method for finding the values of a number of parameters in a functional relationship between the stimulation frequency of a physiological stimulating device implanted in a patient and a sensor signal obtained from the patient indicative of a physical load condition of the patient, said method comprising the steps of:
(a) subjecting the patient to a first physical load condition;
(b) selecting a first stimulation frequency for optimally stimulating said patient under said first load condition;
(c) obtaining a first sensor signal from said patient indicative of said first load condition;
(d) repeating steps (a), (b) and (c) for at least one further load condition, the repetition resulting in at least one further stimulating frequency and at least one further sensor signal corresponding to said at least one further load condition, the total of said first load condition and said at least one further load condition being equal to the number of said parameters to be found; and
(e) calculating said parameters in said functional relationship based on said stimulating frequencies and said sensor signals corresponding to all of said load conditions.

4,922,908

MEDICAL STIMULATOR WITH STIMULATION SIGNAL CHARACTERISTICS MODULATED AS A FUNCTION OF STIMULATION SIGNAL FREQUENCY

Peter L. Morawetz, Minneapolis, and Zosim Ioffe, St. Paul, both of Minn., assignors to Empi, Inc., St. Paul, Minn.

Continuation of Ser. No. 757,705, Jul. 22, 1985, abandoned. This application Feb. 8, 1989, Ser. No. 308,999

Int. Cl.[5] A61N *1/36*

U.S. Cl. 128—422 39 Claims



1. A medical electrical stimulation apparatus including:
means for producing a train of electrical pulses at a main frequency;
means for adjustably controlling the main frequency;
means for modulating at least one characteristic of pulses in the train at a modulation frequency;
means for controlling the modulation frequency as a function of the main frequency of the pulse train; and
terminal means for coupling the modulated train of electrical pulses to electrodes.

4,922,909

VIDEO MONITORING AND REAPPOSITION MONITORING APPARATUS AND METHODS

James H. Little, 6601 S. Country Club Dr., Oklahoma City, Okla. 73159, and William A. Lindgren, Rte. 4, Box 248, Rolla, Mo. 65401

Filed Jul. 17, 1987, Ser. No. 74,749

Int. Cl.[5] A61B *5/10*

U.S. Cl. 128—630 20 Claims



15. A method of monitoring for changes in relative spatial relationship of features of a biological tissue, comprising the steps of:
electronically aligning a first video image of the tissue with a second video image of the same tissue after a period of time has elapsed;
automatically superimposing the first and second video images for display purposes to allow the differences between the first and second images of the tissue to be easily distinguished; and
electronically positioning visual reference points under operator control for display on the images of the tissue respectively.

4,922,910

CANNULA HAVING AN ELECTRODE

Naritoshi Kanai, Tokyo, and Akira Suzuki, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi and Kabushiki Kaisha Shisangyokaihatsu, Tokyo, both of, Japan

Filed Sep. 7, 1988, Ser. No. 241,276

Claims priority, application Japan, Sep. 7, 1987, 62-223719

Int. Cl.[5] A61B *5/04*

U.S. Cl. 128—642 20 Claims



1 A cannula having an electrode comprising:
a tubular member comprised of an insulating-substance having one end which is adapted to be inserted in a blood vessel of a patient and another end adapted to be connected to a blood circulating apparatus, said tubular member having a flange adjacent said one end to prevent the separation of the cannula from the blood vessel,
electrode means for detecting an electrocardiographic signal secured in said tubular member on an inner wall of said tubular member and comprised of substances having antithrombus and electrically conductive characteristics; and
electrical conductor means having one end secured to said electrode means for connecting said electrode means externally of said tubular member.

4,922,911

ELECTRODE

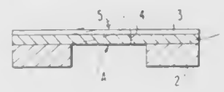
Shintaro Wada; Yoichi Nomura; Hisanori Takahashi, and Masayuki Konno, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation of Ser. No. 95,189, Sep. 11, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 333,833

Claims priority, application Japan, Dec. 24, 1986, 61-201177[U]

Int. Cl.[5] A61B *5/04*

U.S. Cl. 128—640 6 Claims



1. An electrode comprising an electrically conductive substrate and a shrinkable layer laminated on the substrate, wherein a cut is provided through the shrinkable layer and into said substrate and said shrinkable layer is shrunk so as to expose

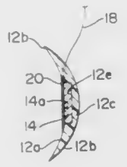
said substrate and form a connection terminal portion projecting outwards.

4,922,912
MAP CATHETER
Hideto Watanabe, No. 6-21, Nishinagaehonmachi, Toyama-shi, Toyama-ken, Japan
Filed Oct. 3, 1988, Ser. No. 252,856
Claims priority, application Japan, Oct. 21, 1987, 62-159998[U]; May 27, 1988, 63-070241[U]
Int. Cl.[5] A61B 5/04; A61N 1/05
U.S. Cl. 128—642 6 Claims



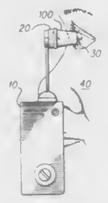
1. A MAP catheter comprising:
a catheter body including a distal section and a rear section, said distal section having an end surface and a peripheral surface;
a pair of Ag-AgCl lines projecting as a pair of needle-like electrodes from said end surface and said peripheral surface in said distal section of said catheter body, respectively, said catheter body including at least in said distal section thereof, an insulating catheter closing section securing in position and in a sealed condition portions of said Ag-AgCl lines and disposed within said catheter body,
a pair of lead wires connected respectively to said Ag-AgCl lines and extending outwardly beyond the rear section of said catheter body.

4,922,913
INTRAOCULAR PRESSURE SENSOR
George E. Waters, Jr., R.R. 1, Westsfield, Ind. 46074, and Robert L. Thommen, 2602 E. 58th St., Indianapolis, Ind. 46220
Filed Nov. 12, 1987, Ser. No. 119,087
Int. Cl.[5] A61B 3/16
U.S. Cl. 128—645 8 Claims



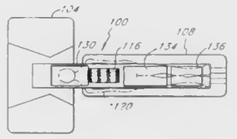
1. An intraocular pressure sensor, comprising:
curved holder means adapted to conform to the curvature of the eyeball for holding said sensor in contacting position with the surface of the eye, the holder means having a circular configuration with a concave inner surface conforming to the surface of the eye and a convex outer surface, the holder means being outwardly tapered in cross-section from a center portion thereof toward an outer peripheral edge thereof, a recess being formed in said center portion and opening to said concave inner surface;
pressure transducer means for detecting intraocular pressure and for providing an output signal corresponding thereto, said pressure transducer means having a planar pressure sensitive surface and being mounted in said central recess in said holder means such that an arc drawn from one peripheral edge of the holder means to the pressure sensitive surface of the pressure transducer means and to the diametrically opposite peripheral edge of the holder means matches the arc of the surface of the eye at which the intraocular pressure is to be sensed, whereby suction results between the concave inner surface of the holder means and the surface of the eye for holding the pressure sensitive surface of said pressure transducer means in pressure-sensing contact with the surface of the eye; and
wire leads operably connected to said pressure transducer means for supplying power thereto and for transmitting output signals therefrom.

4,922,914
DISPOSABLE COVER FOR TONOMETER
Elizabeth O. Segal, and William R. Segal, both of 1503 Marker Rd., Middletown, Md. 21769
Filed Apr. 28, 1988, Ser. No. 187,563
Int. Cl.[5] A61B 3/16
U.S. Cl. 128—646 14 Claims



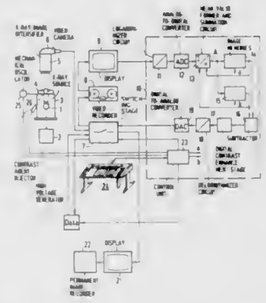
1. A disposable protective cover for application to an applanation tonometer head having a substantially frusto-conical contour defining opposing ends having a smaller diameter end and a larger diameter end including a substantially planar surface bounded by a conical surface, comprising:
a. a sheath member having a predetermined contour for contiguous interface with said tonometer head, said sheath being formed from a substantially optically transparent composition having a predetermined thickness for minimizing tonometer measurement interference, said sheath member being formed of a plastic composition and preformed into a substantially frusto-conical contour having a thickness dimension within the approximate range of 0.00025 to 0.002 inches, said sheath member being inserted on said tonometer head in a predetermined direction;
b. releasable retention means for releasably coupling said sheath member to said conical surface of said tonometer head, said releasable retention means including a retaining ring having an internal conical surface insertable on said tonometer head for clampingly retaining said sheath member between said retaining ring and said conical surface of said tonometer head, said retaining ring having an increasing internal diameter for insertion on and frictional engagement with said tonometer head when said retaining ring is slidingly engaged with said tonometer head in said predetermined direction extending between said tonometer head smaller diameter end and said larger diameter end; whereby said sheath member is sufficiently stretched by said insertion of said retaining ring on said tonometer head to provide a taut covering for said planar surface of said tonometer head.

4,922,915
AUTOMATED IMAGE DETAIL LOCALIZATION METHOD
Ben A. Arnold, 4 Sandstone, Irvine, Calif. 92714, and Alan H. Rowberg, Bellevue, Wash., assignors to Ben A. Arnold, Irvine, Calif.
Continuation of Ser. No. 126,631, Nov. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 48,004, May 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 47,415, May 6, 1987, abandoned. This application Sep. 13, 1989, Ser. No. 406,836
Int. Cl.[5] A61B 6/00
U.S. Cl. 128—653 R 25 Claims



1. A method for analyzing a cross-sectional digitized image of the internal structure of a body having digitized image pixels with intensities that vary in accordance with the physical characteristics of the body, said digitized image being provided by a medical imaging system, so as to measure the physical characteristics of a particular portion of the body structure, comprising the steps of:
(a) positioning a calibration phantom proximate to the body so that a representation of a cross-section of said calibration phantom is included as part of said digitized image, said calibration phantom having at least first and second calibration portions, each having known, calibrated physical characteristics, said digitized image further including first and second calibration portion images, each having a respective intensity corresponding to the physical characteristics of said first and second calibration portions, respectively;
(b) automatically comparing the intensities of the digitized image pixels on a first axis with a predetermined range of intensities corresponding to the intensity of said first calibration portion image to locate image pixels having intensities within said predetermined range of intensities;
(c) automatically geometrically locating a first center pixel on said first axis;
(d) automatically comparing the intensities of the digitized image pixels on a second axis with a predetermined range of intensities corresponding to the intensity of said first calibration portion image to locate image pixels having intensities within said predetermined range of intensities;
(e) automatically geometrically locating a second center pixel of said second axis;
(f) repeating steps (b)–(e) a selected number of times using said first and second axes so as to automatically locate the center of said first calibration portion image;
(g) automatically defining a region of interest centered on said center of said first calibration portion image upon location of said center of said first calibration image;
(h) calculating an intensity representative of the pixels within the region of interest of said first calibration portion image;
(i) repeating steps (b)–(h) for said second calibration portion image to automatically locate the center of said second calibration image, to automatically define a region of interest centered on said center of said second calibration portion image, and to calculate an intensity representative of the pixels within the region of interest of said second calibration portion image;
(j) calculating a calibration factor that relates the intensity of the pixels representative of said first and second calibration portion images with the known, calibrated physical characteristics of said first and second calibration portions of said calibration phantom;
(k) calculating an intensity representative of an image of a portion of said body structure; and
(l) applying said calibration factor to said calculated intensity of said image of said portion of said body structure to calculate the physical characteristics of said body portion.

4,922,916
MEDICAL EXAMINATION INSTALLATION WITH IMPROVED IMAGE CONTRAST
Helmut Ermert, Roettenbach; Manfred Pfeiler, and Karl Barth, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich
Filed Sep. 26, 1988, Ser. No. 249,515
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739230
Int. Cl.[5] A61B 6/00
U.S. Cl. 128—653 R 8 Claims



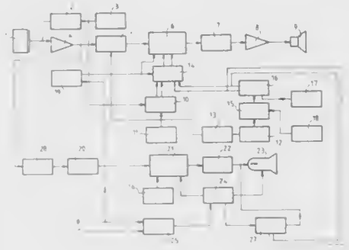
1. A medical examination installation for examining a patient comprising:
means for generating an examination field during an exposure time in which at least a portion of said patient is disposed;
means adapted for mechanically vibrating at least said portion of said patient during said exposure time;
means for detecting said field attenuated by said portion of said patient; and
means connected to said means for detecting for generating a visual image of said portion of said patient including means for generating differential images from chronologically successive signals supplied from said means for detecting; wherein said visual image is enhanced as a result of said mechanical vibration.

4,922,917
ULTRASONIC TISSUE CHARACTERIZATION
Jacques Dory, Coupvray Esbly, France, assignor to EDAP International, France
Filed Aug. 12, 1988, Ser. No. 231,578
Claims priority, application France, Aug. 14, 1987, 87 11828
Int. Cl.[5] A60B 8/00
U.S. Cl. 128—660.01 3 Claims

1. A static tissue scanning characterization method comprising the steps of:
(a) transmitting ultrasonic pulses with high carrier frequency to biological tissue to be characterized,
(b) receiving and storing high frequency pulses as signals reflected from within the tissue;

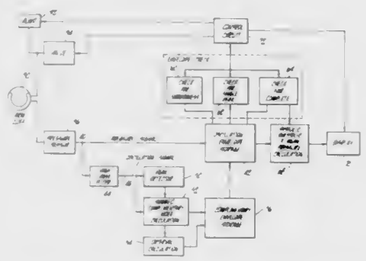
VOL 114 ISS 2 MY 8 1990 UMI

(c) examining deformations undergone by the transmitted and reflected frequency spectrum,



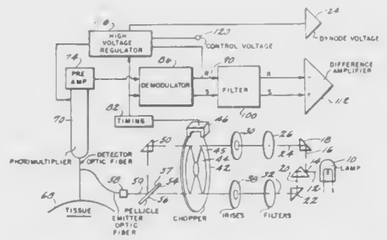
(d) transposing the frequency of the reflected spectrum into the range of audible frequencies, and
(e) listening to the transposed spectrum.

4,922,918
AUTOMATIC NON-INVASIVE BLOOD PRESSURE READING DEVICE
Karl A. Ruiter, La Canada, Calif., assignor to Medical Data Electronics, Inc., Arleta, Calif.
Filed Apr. 17, 1989, Ser. No. 339,307
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—681 **7 Claims**



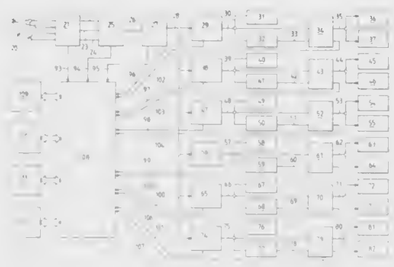
1. The method of determining mean arterial pressure comprising the following steps:
(a) setting the cuff pressure to a first pressure,
(b) storing the cuff pressure oscillations at the first cuff pressure,
(c) determining the complimentary oscillation index for the oscillations at the first cuff pressure,
(d) setting the cuff pressure to a next pressure,
(e) storing the cuff pressure oscillations at the next pressure,
(f) determining the complimentary oscillation index for the oscillations at the next pressure,
(g) repeating steps d through f to establish a complimentary oscillation index envelope, and
(h) taking the cuff pressure corresponding to the maximum value of the complimentary oscillation index envelope as being the mean arterial pressure.

4,922,919
METHOD FOR MEASURING OCULAR OXIDATIVE METABOLISM
Roger L. Novack, Durham, N.C., assignor to Duke University, Durham, N.C.
Filed Mar. 22, 1988, Ser. No. 171,831
Int. Cl.[5] A61B *6/00*
U.S. Cl. 128—633 **14 Claims**



1. A method to detect oxidative metabolism of ocular tissue comprising the steps of:
bleaching photopigments in said ocular tissue with a bright flash;
generating a first beam of optical energy of a predetermined reference wavelength;
generating a second beam of optical energy of a predetermined sample wavelength;
alternately illuminating said ocular tissue with said first beam and said second beam;
detecting optical energy reflected by said ocular tissue;
converting said optical energy to a first electronic signal;
subtracting a second electronic signal from said first electronic signal to obtain a third electronic signal; and
processing said third electronic signal to determine said oxidative metabolism.

4,922,920
PROCESS AND APPARATUS FOR PROCESSING SIGNALS FROM A PHYSIOLOGICALLY PRODUCED ELECTRIC FIELD
Werner Thie, Winterthur, and Johann J. Schmid, Buchs, both of Switzerland, assignors to Willi Studer AB, Switzerland
Filed Jan. 20, 1988, Ser. No. 145,877
Claims priority, application Switzerland, Jan. 22, 1987, 00224/87
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—699 **16 Claims**



1. A process for processing electrical signals which are tapped by electrodes at a plurality of predetermined times in a physiologically produced electrical field, wherein said field is approximated by a dipole used as a model for said physiologically produced electrical field, comprising the steps of:
measuring the signals tapped by said electrodes,
computing a vector from the measured signals which represents the state of said dipole at said predetermined times,
repeatedly computing said vector at a plurality of said predetermined times; and
computing a value of a vector triangle derived from a said vector computed at a first said predetermined time and a said vector computed at a second said predetermined time.

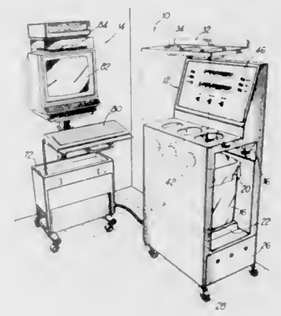
4,922,921
DEVICE FOR TESTING ONE'S BREATH
Laurence B. Donoghue, 27225 Sunnyridge Rd., Palos Verdes, Calif. 90274
Filed Nov. 17, 1986, Ser. No. 931,299
Int. Cl.[5] A61B *5/08*
U.S. Cl. 128—717 **2 Claims**



1. A device for use in testing one's breath comprising a face mask adapted to fit over the nose and mouth of a user, having an edge contoured to sealably engage the user's face under manual pressure, an upper portion of said edge formed to be disposed over the bridge of the user's nose, a lower portion of said edge formed to be disposed below and adjacent the user's lower lip, said mask having a nostril region disposed below said upper edge portion in the vicinity of the user's nostrils, said mask being formed with at least one aperture therethrough between said nostril region and said upper edge portion whereby to provide at least one air escape passageway, and a storage space sump below said lower edge portion with unobstructed direct access from said sump to said nostril region.

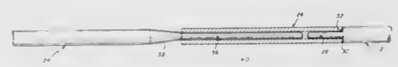
4,922,922
FLUID MONITORING APPARATUS
Richard A. Pollock, 5260 Riverview Rd., Atlanta, Ga. 30327, and R. Edward Murphy, 8697 Canal Dr., Jonesboro, Ga. 30236
Filed Apr. 12, 1988, Ser. No. 180,453
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—760 **18 Claims**

1. Apparatus for monitoring body fluids from a patient, comprising,
(a) at least one container for receiving materials that contain body fluids from the patient;
(b) a sorting grid located above the container and forming a plurality of openings corresponding to predetermined sizes of the materials;
(c) at least one load cell supporting the container for weighing the materials;
(d) at least one sensor for each opening in the grid for sensing placement of materials into the container;
(e) input/output means connected to the load cells and sensors for receiving information produced by the load cells and sensors;
(f) storage means for storing information received from the processor means and the input/output means;
(g) processor means connected to the input/output means and the storage means for processing information received from the input/output means and the storage means; and



(h) display means for displaying information relating to weight of fluids in the materials and counts of materials in the container.

4,922,923
METHOD FOR EFFECTING A CATHETER EXCHANGE
Richard A. Gambale, Tyngsboro, Mass.; James F. Crittenden, Hollis, and James P. Ryan, Amherst, both of N.H., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Division of Ser. No. 766,762, Sep. 18, 1985, abandoned. This application Feb. 27, 1987, Ser. No. 19,626
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 **9 Claims**



1. A method for effecting a catheter exchange comprising:
providing a guide wire having a proximal end and a distal end;
providing a first catheter having a proximal end and a distal end, the first catheter being shorter than the guide wire;
placing the guide wire within a patient's lumen so that the proximal end of the guide wire protrudes exteriorly of the patient;
placing the first catheter in a patient's lumen over the guide wire so that the proximal end of the catheter protrudes exteriorly of the patient and with the proximal end of the guide wire protruding proximally of the proximal end of the catheter;
providing an extension wire having a proximal end and a distal end;
connecting the distal end of the extension wire to the proximal end of the guide wire;
while holding either of the guide wire or extension wire to maintain the position of the guide wire in the patient's vessel, drawing the first catheter proximally over the guide wire and extension wire to remove the first catheter from the patient's lumen;
placing a second catheter over the proximal end of the exchange wire and advancing the second catheter over the extension wire and guide wire and into the patient's lumen,
thereby to effect said catheter change without requiring removal of the guide wire.

4,922,924
CATHETER GUIDEWIRE WITH VARYING RADIOPACITY
Richard A. Gambale, Tyngsboro, Mass., and James F. Crittenden, Hollis, N.H., assignors to C. R. Bard, Inc., Murray Hill, N.J.
Filed Apr. 27, 1989, Ser. No. 344,018
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—772 7 Claims



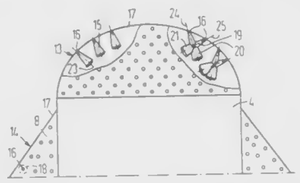
1. A guidewire comprising:
an elongate flexible shaft;
a flexible coil assembly on the distal end of the shaft, the coil assembly being formed from a first coil formed from a highly radiopague material which extends the full length of the coil assembly and a second substantially non-radiopaque coil, shorter than the first coil, and interposed in bifilar configuration between some of the turns of the first coil to define a less radiopague segment of the coil assembly.

4,922,925
COMPUTER BASED UPPER EXTREMITY EVALUATION SYSTEM
Richard E. Crandall; Paul M. Weeks, both of St. Louis, Mo., and Michael W. Vannier, Edwardsville, Ill., assignors to Washington University, St. Louis, Mo.
Continuation of Ser. No. 162,263, Feb. 29, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 314,188
Int. Cl.[5] A61B *5/10*
U.S. Cl. 128—782 15 Claims



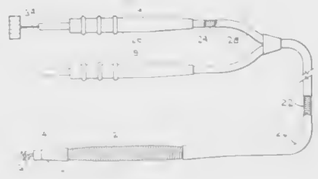
1 A clinical range of motion and disability evaluation device for measuring the range of flexion and extension of a patient's hand comprising a computer means, means directly connected to the computer means for a skilled human operator such as a rehabilitative or physical therapist or physician to selectively measure and input various physical locations of the articulated segments which comprise the fingers of the hand, a common reference point, the measuring and input means including means to locate points proximate the various joints of fingers on the hand with respect to said common reference point in a fully three-dimensional Cartesian coordinate form, said measurements being taken with the fingers of the hand in both a flexed and extended orienation, and the computer means having means to determine the degree of disability from said measured locations according to recognized standard criteria, the disability determining means thereby having means to calculate the angles of maximum flexion and extension for each finger from points that locate the absolute position of maximal and distal segments at each and every joint articulation in the fingers of the hands.

4,922,926
ARRANGEMENT FOR DELIVERING MEDICATIONS IN AN IMPLANTABLE MEDICAL DEVICE
Jakub Hirschberg, Taeby; Lars Botvidsson, Solna, and Ulf Fahlstroem, Stockholm, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Oct. 11, 1988, Ser. No. 255,545
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735137
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—785 11 Claims



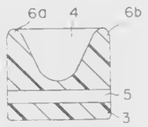
1. An arrangement for delivering medication in an implantable medical device, said device having a plurality of surface regions, said arrangement comprising:
at least two containers, said containers including means for storing medication disposed in said implantable medical device at at least one of said surface regions, each of said containers being in communication with said at least one surface region via an opening in said surface region having the size of a pore adapted to dispense medication from the container to tissue surrounding said surface region.

4,922,927
TRANSVENOUS DEFIBRILLATING AND PACING LEAD
Michael J. Fine, Lake Jackson, and Richard V. Calfee, Houston, both of Tex., assignors to Intermedics, Inc., Angleton, Tex.
Continuation-in-part of Ser. No. 139,839, Dec. 30, 1987, abandoned. This application May 8, 1989, Ser. No. 348,869
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—786 29 Claims



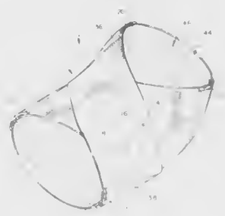
1. A transvenous catheter lead for introduction into the right side of the heart of a cardiac patient for delivering defibrillating shocks to the heart, said lead being an elongated member with electrical connector means at a proximal end, electrode means at a distal end, and first conductor means interconnecting the connector means and the electrode means, the lead having an enlarged flexible portion subjacent to the electrode means for supporting the electrode means, the electrode means comprising a defibrillating electrode coil having an electrically conductive surface exposed along a portion of said lead adjacent said distal end, said coil being a continuation of the conductor means connected to the electrical connector means and being wound on the enlarged flexible portion so that its midsection has a diameter exceeding the diameter of its ends, and means to secure at least said distal end of said lead in the ventricle of the heart whereby said electrode coil extends substantially the entire length of the right ventricle for delivering defibrillating shocks to the ventricular mass.

4,922,928
VAGINAL DEVICE
Michael Burnbill, 269 Lafayette Ave., Chatham, N.J. 07928
Filed Aug. 17, 1988, Ser. No. 232,951
Int. Cl.[5] A61F *13/20*
U.S. Cl. 128—832 25 Claims



23. A vaginal device comprising an outermost layer of a resilient compressible polymeric foam, a nonporous film layer formed of a liquid proof soft material affixed to said outermost layer of polymeric foam and a second innermost layer of resilient compressible polymeric foam affixed to the opposite surface of said nonporous film layer, said outermost layer being formed so as to provide an open ended receptacle therein, said receptacle having a depth which permits termination thereof within said outermost layer and at a distance above said nonporous layer so as to provide three barrier layers.

4,922,929
PADDED ELBOW BRACE
Richard L. DeJournett, 1804 Alaweo St., Honolulu, Hi. 96821
Filed Aug. 31, 1989, Ser. No. 401,190
Int. Cl.[5] A61F *13/00*; A41D *13/08*
U.S. Cl. 128—892 11 Claims



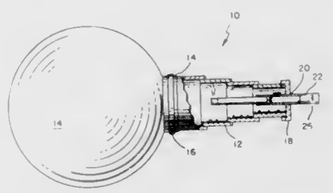
1. A device for protecting limb joints, comprising:
(a) a generally tubular member to be slipped onto a limb joint;
(b) said tubular member including first and second sections connected to each other so as to form an open ended cavity therebetween;
(c) said first section being generally hourglass shaped and made of a stretchable material;
(d) said second section including crossover pieces;
(e) cushion means corresponding in size to said first section and disposed within said cavity;
(f) said cushion means including first and second ends and sides;
(g) said cushion means is connected to said first section at said first and said second ends are unconnected on said sides thereof thereby creating a pocket between said cushion means and said first section;
(h) said pocket being open on said sides and closed at said first and second ends; and
(i) resilient pad means removably positioned within said pocket and generally conforming to said pocket whereby said resilient pad means may be slipped in and out of said pocket.

4,922,930
IMPLANTABLE DEVICE WITH CIRCADIAN RHYTHM ADJUSTMENT
Robert A. Adkins, Angleton, and Ross G. Baker, Jr., Houston, both of Tex., assignors to Intermedics, Inc., Angleton, Tex.
Filed Apr. 11, 1989, Ser. No. 336,093
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 PG 16 Claims



1. A heart pacemaker comprising:
real-time clock means for producing an electrical signal corresponding to elapsed time;
sensor means for detecting events correlated to physiologic needs of a patient;
a microprocessor comprising means for executing stored instructions and means for maintaining a model of predicted cyclic physiologic needs of a patient, the model comprising a plurality of periods, each period having a predicted duration and predicted minimum physiologic need, the model being maintained based on data from the real-time clock means and the sensor means; and
means for pacing the heart of a patient at a rate determined by said microprocessor based on data from the real-time clock means and on the model.

4,922,931
PORTABLE SMOKE RETENTION DEVICE
Donald H. Nare, 16 Willett St., Fort Plain, N.Y. 13339, and Albert L. Schmeiser, 4 Woodview Ct., Ballston Lake, N.Y. 12019
Filed Nov. 9, 1988, Ser. No. 269,984
Int. Cl.[5] A24D *1/02*; A24F *7/00, 7/02*
U.S. Cl. 131—211 5 Claims



1. A portable smoke retention device comprising:
a container having a chamber opened at each end and having a bag secured over one end of the chamber;
an insert secured to the chamber through the chamber opening opposite the bag, said insert having a combustible material holder and a passageway through the combusti-

VOL 114 ISS 2 MY 8 990 UMI

ble material holder and the insert to the exterior of said container;

first valve means in said insert movable between and open position when air is drawn from the bag through the chamber and the insert and a closed position when air is blown through the insert and the chamber into the bag; and

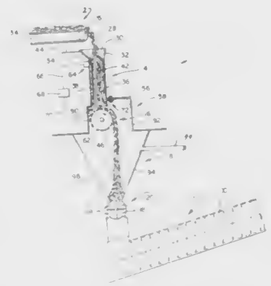
a second valve means in said insert movable between an open position when air is blown through said insert into, and through the chamber into the bag, bypassing the combustible material holder, and a closed position when air is drawn from the bag through the chamber and the insert.

4,922,932

TOBACCO FEEDER

E. Lee Williams, Jr., Lewisville, and J. Sam Thomasson, Statesville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jun. 8, 1988, Ser. No. 204,803
Int. Cl.[5] A24B *3/00, 15/00*
U.S. Cl. 131—290 **16 Claims**



1. A tobacco feeder assembly for feeding tobacco particles to a treatment zone and for preventing egress of treatment medium form the treatment zone, said tobacco feeder assembly comprising:

a feed tube having an upper infeed mouth;

means to feed tobacco particles to said mouth of said feed tube;

conveyor means positioned beneath said feed tube for controllably removing tobacco particles from said feed tube and to maintain a column of tobacco particles in said feed tubes;

hopper means to receive said tobacco particles from said conveyor means; and

means to transfer said tobacco particles from said hopper means to the treatment zone at a controlled rate, said column of tobacco particles providing a barrier to egress of treatment medium from the treatment zone.

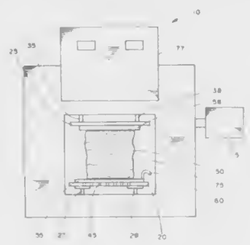
4,922,933

TOBACCO SEPARATION OR DELAMINATION METHOD

Stephen W. Jakob, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 13, 1987, Ser. No. 14,557
Int. Cl.[5] A24B *3/06*
U.S. Cl. 131—299 **5 Claims**

1. A method for reducing the force to separate the constituents of a stored, compacted tobacco mass, the method comprising subjecting the compacted tobacco mass, after storage, to



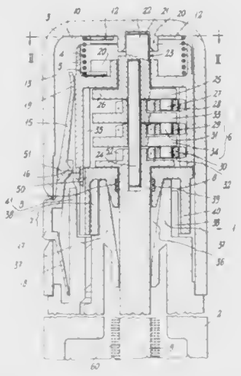
irradiation with electromagnetic waves in the radio frequency range.

4,922,934

ROTARY APPLICATOR DEVICE, PARTICULARLY FOR MASCARA

Angelo Gatti, Biassono, Italy, assignor to Roan S.p.A., Italy

Filed Feb. 29, 1988, Ser. No. 162,008
Claims priority, application Italy, Mar. 6, 1987, 19610 A/87
Int. Cl.[5] A45D *40/26*
U.S. Cl. 132—218 **10 Claims**



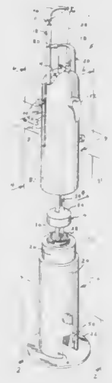
1. An applicator device particularly for mascara and similar products, comprising a stem, carrying at one end a brush or similar protection means, characterized in that onto a container there can be screwed a cap which carries the stem with the application means and comprises elastic means connected at one end to the cap and being tensioned when the latter is unscrewed, and connected at the other end to a mobile member connected to the stem, there being provided linkages to transmit movements to said stem by way of the mobile member, controllable friction means acting on the mobile member and arranged to allow the stem to move only when required and to prevent return of the cap into an untensioned position when the cap is unscrewed, and engagement means arranged to keep the mobile member from transmitting movement to the stem during its unscrewing in order to tension the elastic means.

4,922,935

DENTAL HYGIENE DEVICE

Robert L. Birkeland, Mound, Minn., assignor to T. N. T. Medi Corporation, Mound, Minn.

Filed Oct. 11, 1988, Ser. No. 255,512
Int. Cl.[5] A45D *44/18*
U.S. Cl. 132—309 **17 Claims**



1. A dental hygiene device comprising:

a housing;

first chamber means for storing a toothbrush within the housing;

second chamber means for storing tooth powder within the housing;

means for delivering tooth powder from the second chamber means to the toothbrush including an access opening within the housing and door means engagable by a head of the toothbrush such that when the door means is engaged, tooth powder falls on bristles of the toothbrush;

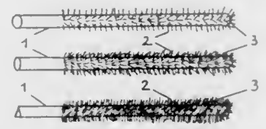
means for storing dental floss within the housing; and flossing tool means detachably attached to the housing.

4,922,936

DENTAL CLEANER

Carlo A. Buzzi, Stauffacherstrasse 98, CH-8004 Zürich; Ulrich A. Saxer, Steinbrüchelstrasse 30, CH-8053 Zürich, and Paul A. Stäger, Lindenstrasse 128, CH-8307 Effretikon, all of Switzerland

PCT No. PCT/CH87/00097, § 371 Date Apr. 11, 1988, § 102(e) Date Apr. 11, 1988, PCT Pub. No. WO88/01154, PCT Pub. Date Feb. 25, 1988
PCT Filed Aug. 12, 1987, Ser. No. 187,522
Claims priority, application Switzerland, Aug. 14, 1986, 3283/86
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—321 **11 Claims**



1. A method of making a dental cleaner in the nature of a toothpick in which an elongated rigid support is at least partially covered with bristles, the method comprising,

providing a rigid stable support, and

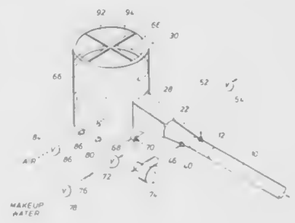
placing plastic bristles which are in the nature of flock on the support by flocking.

4,922,937

METHOD AND APPARATUS FOR CLEANING CONDUITS

Christopher J. Bloch, Kingwood, Tex., assignor to Naylor Industrial Services, Pasadena, Tex.

Division of Ser. No. 78,127, Jul. 27, 1987, Pat. No. 4,853,014. This application Jul. 15, 1988, Ser. No. 219,763
Int. Cl.[5] B08B *9/02*
U.S. Cl. 134—22.12 **12 Claims**



3. A method of exhausting high velocity gas from a conduit having a discharge opening, comprising:

(a) exhausting gas from a conduit from a source of gas having a pressure sufficient for development of a sonic pressure wave at the gas exhaust from said conduit; and

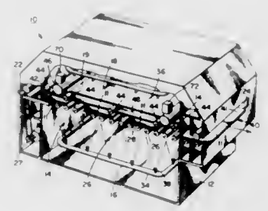
(b) contacting a dispersion of a decelerating fluid with said gas upstream of the exhaust gas discharge of said conduit and in sufficient volume to reduce the pressure and velocity of said gas at discharge, to thereby prevent the development of a sonic pressure wave at discharge while permitting high velocity flow in said conduit.

4,922,938

APPARATUS FOR SINGLE SIDE SPRAY PROCESSING OF PRINTED CIRCUIT BOARDS

Arthur J. Siegmund, Hamden, Conn., and Henry E. Ladouceur, WestHampton, Mass., assignors to Siegmund, Inc., Hamden, Conn.

Filed Sep. 6, 1989, Ser. No. 403,574
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—126 **21 Claims**



1. An apparatus for treating an article with a reactive spray, the article being relatively planar in shape and having a first bottom side and a second top side, the apparatus comprising:

conveyor table means for transporting and supporting an article in a substantially horizontal plane, said table means having at least one aperture for the passage of reactive spray therethrough;

spray means located below said table means for upwardly

VOL 114 ISS 2 MY 8 1990 UMI

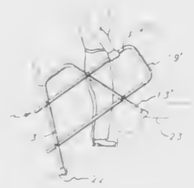
spraying reactive spray through said at least one aperture onto a bottom side of an article on said table means; and cover means for covering a top side of an article on said table means for preventing reactive spray from contacting a top side of an article being sprayed and to prevent an article from being dislodged from said table means during spraying of reactive spray at an article's bottom side.

4,922,939
DENTAL CLEANING APPARATUS
Henry Adamczyk, 2 Windsor Ave., Scullville, N.J. 08330
Filed Feb. 1, 1988, Ser. No. 151,211
Int. Cl.[5] B08B *3/06*
U.S. Cl. 134—140 **10 Claims**



1 A denture cleaning apparatus comprising:
a. a container for holding cleaning fluid, having a first bottom, a first side wall and container cover;
b. a spacer having a plurality of L-shaped baffles affixed to the inside of the container along the side wall and bottom of said container and defining an interior space, a basket for holding the denture disposed within said interior space said basket having a second bottom with a plurality of slots and a second side wall with a plurality of evenly spaced elongated slots having a length about the height of the second side wall, and a plurality of vertical vanes attached along one longitudinal side of each of said slots. extending inwardly into the basket; and means for removably attaching said basket to a basket cover; and,
c. means mounted on the container cover, firmly connected to the basket cover, for supporting and rotating the basket within said interior space of the container including an electric motor having a rotating shaft, said shaft concentrically passing through the container cover and the basket cover, said shaft being firmly connected to the basket cover, whereby the cleaning fluid is agitated and caused to circulate tortuously through the basket via the slots, cleaning the denture placed therein.

4,922,940
INVALID WALKER
Michael M. Lewy, R.D. #1, Box 849, Priddle Point Rd., Gloversville, N.Y. 12078
Filed Jul. 31, 1989, Ser. No. 386,597
Int. Cl.[5] A61H *3/00*
U.S. Cl. 135—67 **8 Claims**



1 A walking assistance device particularly adapted to assisting a user in ascending or descending a stairway having a plurality of steps, said device comprising in combination:
(a) a light weight easily portable open end encircling framework;
(b) said framework having a pair of front leg supports spaced by a first lateral distance and a pair of rear leg supports spaced by a second lateral distance;
(c) a part of said frame defining a first set of parallel spaced apart side handrails for the user of said device to grasp when said device is on a substantially flat surface;
(d) a further part of said frame projecting in the open end direction of said framework such that a second set of parallel spaced apart handrails is provided, said second set of handrails being vertically lower than said first set of handrails, said second set of handrails being sized and located for the user of said device to grasp when ascending or descending the stairway;
(e) said pair of front legs being spaced from said pair of rear legs such that said device spans at least three steps when used to ascend or descend the stairway; and
(f) said open end framework provides continuous support by encircling the user of said device on three sides when in use on a flat surface or a stairway.

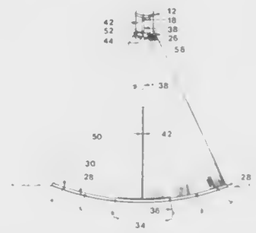
4,922,941
CRUTCH HAVING A CHANGEABLE ARMPIECE
Charles Daniels, Pine Hill Rd., Pleasant Valley, N.Y. 12569
Filed Sep. 26, 1989, Ser. No. 412,343
Int. Cl.[5] A61H *3/02*
U.S. Cl. 135—71 **7 Claims**



1. A crutch comprising:
(A) a monolithic frame having
(1) a footpiece,
(2) a crutch tip on said footpiece in position to engage a support surface,
(3) two bows each attached at one end to said footpiece and having a second end spaced from said footpiece to form a Y-shape for said frame with said bows diverging upwardly from a junction at said footpiece to said second ends, each bow having a length as measured between said junction and the second end, said second ends each being hollow and having an outer diameter, and
(4) a handgrip element attached to each of said bows;
(B) a releasable locking mechanism on said frame which includes
(1) a hole defined in each bow near the second end of such bow,
(2) a hollow tubular support element mounted inside each of said bows near the second ends of such bows and

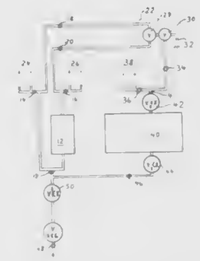
extending across the bow in which it is mounted, said hollow tubular support elements having a longitudinal axis that is aligned with the center of the hole in the bow,
(3) a ball mounted in each tubular support element, said ball having a diameter larger than the diameter of the hole in the bow, and
(4) a spring located in each tubular support element and engaging the ball in each tubular element to bias that ball outwardly of one end of the support element and into engagement with the bow adjacent to the hole in the bow; and
(C) a monolithic arm piece which includes
(1) an arm-engaging element,
(2) two tubular legs each attached at one end to said arm-engaging element and extending away from said arm-engaging element, each of said tubular legs having an inner diameter which is larger than the outer diamter of said hollow tubular bow second ends and being located to releasably receive said bow second ends therein and a length as measured between said one end and a second end,
(3) a hole defined in each hollow leg, each said leg hole being sized and positioned to be concentric with said hole defined in the bow second end on which the leg is mounted, said ball being sized to partially extend through the concentric holes to releasably lock said arm-engaging element to said frame bows.

4,922,942
TENT AND METHOD OF ERECTION
Stephen W. Schaeffer, 693 Old Falmouth Rd., P.O. Box 1030, Marstons Mills, Mass. 02648
Filed Mar. 7, 1989, Ser. No. 319,947
Int. Cl.[5] E04H *15/64*
U.S. Cl. 135—90 **12 Claims**



1. A tent kit for use in the erection of a tent about a free-standing tree or post element, which tent kit comprises in combination:
(a) a tent shelter material to form a tent structure about a free-standing, upright tree or post element and having:
(i) a tent closure means to secure the opposite edges of the tent shelter material together to form the tent structure;
(ii) a top edge web;
(iii) a ring means secured to the top edge web; and
(iv) a bottom edge web having a plurality of means to secure
the bottom edge web in a tent form erected position
(b) top closure means to draw and secure the top edge web of the tent shelter material snugly about the outer periphery of the free-standing tree or post element when the tent is in the erected position;
(c) tent shelter hoist means comprising a belt means adapted to be secured about the periphery of the free-standing tree or post element at a height from the ground above the top edge web and a pulley secured to the belt means and a pulley line for use with the pulley whereby one end of the pulley line may be secured to the ring means, passed through the pulley and employed to hoist the tent shelter material to a desired tent erection height about the free-standing tree or post element and the pulley line then secured to maintain the tent shelter material in the hoisted position and thereafter the top edge web drawn and secured by the top closure means; and
(d) a plurality of ground stakes and means to secure the bottom edge of the tent shelter material to the ground stakes to maintain the bottom edge of the hoisted tent shelter material in a tent form structure.

4,922,943
WATER CONSERVATOR SYSTEM AND METHOD
M. R. Gill, 5024 Glentara Dr., Midlothian, Va. 23112
Filed Aug. 18, 1989, Ser. No. 395,656
Int. Cl.[5] F17D *1/08*
U.S. Cl. 137—1 **18 Claims**



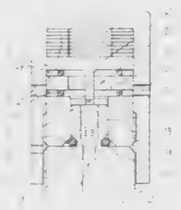
18. A water conservation method in plumbing installations, comprising the steps of:
(a) selectively returning water flow from one or more fixtures in a water supply system to a return conduit for reuse;
(b) receiving said water flow from said return conduit in storage means, said storage means providing operating conditions therein, said operating conditions providing for said receiving;
(c) storing said water flow as stored flow in said storage means, said operating conditions providing for said storing;
(d) delivering said stored flow on demand through a feed conduit to said water supply system for reuse, said operating conditions providing for said delivering;
(e) preventing backflow from said water supply system to a water main, said water main supplying water to said water supply system;
(f) preventing backflow from said storage means to said return conduit;
(g) preventing backflow from said feed conduit to said storage means;
(h) governing said operating conditions by controlled means to engender said operating conditions in said storage means;
(i) sensing of high and low levels of said stored flow; and
(j) controlling by relay means said controlled means in response to said sensing of said high and said low levels.

4,922,944

MELTING SAFETY DEVICE FOR GAS SYSTEM OF HYDROPNEUMATIC PRESSURE ACCUMULATORS

Matthias Mueller, Zweibrucken, and Herbert Baltes, Losheim, both of Fed. Rep. of Germany, assignors to Hydac Technology GmbH, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,317
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1988, 3812552
Int. Cl.[5] F16K *17/40*
U.S. Cl. 137—72 5 Claims



1. A safety device for controlling discharge of gas from a gas system, particularly of a hydropneumatic pressure accumulator, comprising:
a discharge passage;
a normally closed first valve positioned in and controlling fluid flow through said discharge passage;
a control member mounted adjacent said first valve for movement along a path between a rest position in which said control member is operationally disengaged from said first valve allowing said first valve to remain closed and an operative position in which said control member engages said first valve forcing said first valve open;
power means, coupled to said control member, for moving said control member from the rest position to the operative position;
a blocking member projecting into the path of movement of said control member and releasably retaining said control member in the rest position, said blocking member being formed of a material that melts upon exposure to an unexpected temperature increase; and
a normally closed second valve arranged in said discharge passage adjacent said blocking member in series with said first valve, said second valve having a sealing element and being opened upon melting of said blocking member;
whereby, upon melting of said blocking member, said power means moves said control member to the operative position opening said first valve and said discharge passage.

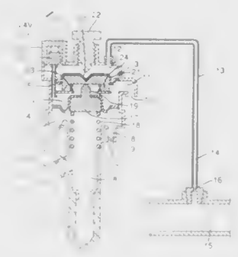
4,922,945

SELF-SERVICING HYDRAULIC TENSIOMETER WITH ELECTRICAL SWITCHING AND RESPONSE CAPABILITIES

Christopher L. Browne, Philomath, Oreg., assignor to Irro-Controls Group, Corvallis, Oreg.

Continuation-in-part of Ser. No. 189,575, May 3, 1988, which is a continuation-in-part of Ser. No. 46,803, May 4, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 303,913
Int. Cl.[5] A01G *25/16*
U.S. Cl. 137—78.3 7 Claims

1. A moisture sensor for measuring soil water matric potential comprising:
a sensor body defining first and second chambers, a first passageway communicating with the first chamber, and a second passageway communicating with the second chamber;
an electrical switching device that is selectively responsive to changes in pressure inside the first chamber and that allows a flow control device to provide a flow of irrigation water when the pressure inside the first chamber is below a predetermined level;
a valve means in the first passageway for selectively preventing fluid communication between the first chamber and the atmosphere via the first passageway when the valve means is closed;
a first moveable diaphragm assembly separating the first and second chambers;
a first diaphragm biasing means for urging the first moveable diaphragm assembly toward the second chamber;
means for limiting the travel of the first moveable diaphragm assembly in the direction of both the first and second chambers; and



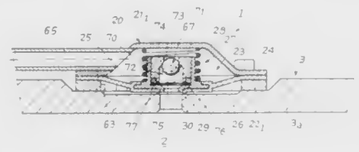
a sealed, water-filled tensiometer probe communicating with the first chamber and bounded at one end by a porous membrane of ceramic or other material through which water may pass in response to a differential water pressure such that a decrease in the moisture level of soil outside the probe causes a lowering of the pressure inside the first chamber;
the first moveable diaphragm assembly being moveable in the direction opposite to the urging of the first diaphragm biasing means when pressure in the second chamber exceeds pressure in the first chamber by an amount sufficient to overcome the force exerted by the biasing means.

4,922,946

REMOTE INFLATION AND DEFLATION SYSTEM AND VALVE THEREFOR

Jean-Michel Boulicault, Germain Lespinasse, France, assignor to Etat Francais, France

Filed Oct. 7, 1988, Ser. No. 254,812
Int. Cl.[4] F16K *7/10*
U.S. Cl. 137—102 6 Claims



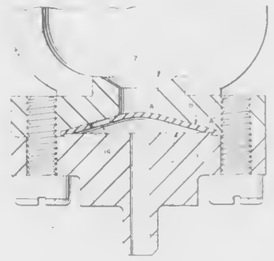
1. A valve for inflation and deflation of a volume of fluid under pressure, comprising:
a cavity;
a flexible membrane disposed in the cavity and dividing the cavity into a pilot chamber and an exhaust chamber;
an orifice in the exhaust chamber in fluid communication with the volume;
exhaust valve means cooperative between the membrane and the orifice for controlling the flow of fluid from the orifice;
means for exhausting fluid from the exhaust chamber;
biasing means for biasing the exhaust valve in a closed position to maintain the pressure of the volume above ambient pressure;
a check valve in fluid communication with the pilot chamber and the volume for permitting fluid under pressure into the volume and preventing fluid flow from the volume, the check valve including a movable element movable between a first position wherein the movable element is in sealing relationship with check valve orifice and a second position wherein the movable element is adjacent a retaining means, and
means for holding the movable element out of sealing relationship with the check valve orifice, the holding means comprises means for producing a magnetic field and wherein the movable element is magnetic.

4,922,947

AUTOMATIC MEMBRANE DRAIN DEVICE FOR PNEUMATIC CIRCUITS

Serge Champseix, Les Mureaux, France, assignor to ABX, Sartrouville, France

Filed Jul. 27, 1988, Ser. No. 224,710
Claims priority, application France, Jul. 28, 1987, 87 10679
Int. Cl.[5] F16T *1/14*; F16K *15/14*
U.S. Cl. 137—204 5 Claims



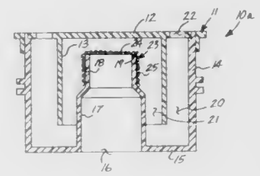
1. An automatic drain device for a pneumatic circuit for draining water from a collecting jar generated by compressed air admitted into the circuit, said device comprising:
a drain pipe connected to an opening of said collecting jar;
a flexible membrane positioned between the drain pipe and the opening of said collecting jar, said membrane being pre-curved to adopt a first position against a precurved bearing face surrounding said opening of said drain pipe, said membrane having an off-centered orifice not in line with said opening and covered by said bearing face when said membrane is in said first position, said membrane adopting a second position against an opening of said drain pipe, and whereby said membrane moves between said first and second positions upon air pressure being intermittently established in said collecting jar so that said off-centered orifice becomes uncovered to allow intermittent draining of water, said drain pipe includes a base member attached directly to the opening of said collecting jar between said drain pipe and said collecting jar and having an opening coaxial with the opening of said collecting jar and a discharge end-piece attached directly to said base member to which said drain pipe is attached to align with the opening of said collecting jar intermittently upon the application of the compressed air in said collecting jar prior to said membrane engaging a flat interior surface of said discharge end-piece in the second position to intermittently close off the off-centered orifice to stop the draining of the water to said drain pipe, said base member and said discharge end-piece forms a drain chamber therebetween, and said membrane being secured between said base member and said discharge end-piece.

4,922,948

FLOOR DRAIN AND TRAP

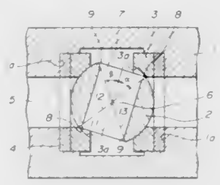
Willem Van Dijk, 6690 Fran Dr., Macon, Ga. 31206

Filed Jun. 1, 1989, Ser. No. 360,137
Int. Cl.[5] F16K *13/10*
U.S. Cl. 137—247.33 3 Claims



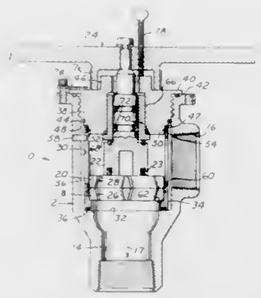
1. A floor drain comprising,
a housing including an encircling exterior wall wherein the wall terminates at an upper end thereof in an orthogonally disposed flange extending outwardly of the exterior wall, the exterior wall including an integrally connected floor spaced below the flange a fixed distance, the floor including a central floor opening defining a floor diameter, and
a circular lid aligned with the flange and including a circular array of lid apertures oriented adjacent a terminal edge of the lid, and
the lid including a downwardly extending lid skirt integrally secured to a bottom surface of the lid defining a cylinder of a predetermined skirt diameter wherein the lid skirt is oriented interiorly of the skirt apertures within the lid, and
wherein the lid skirt defines a skirt length spaced above the floor, and
an upwardly extending first conduit integrally formed to and axially aligned with the floor opening, and
the first conduit defining a first conduit diameter equal to the floor diameter, and
the first conduit extending above a lower terminal end of the lid skirt, and
wherein the first conduit includes a second conduit of a diameter less than the first conduit diameter coaxially aligned with and integrally formed to the first conduit wherein the second conduit is spaced below the bottom surface of the lid, and
wherein the lid skirt spaced interiorly of the encircling exterior wall defines a first channel, and the first channel is in communication with a second channel, the second channel defined by a spacing between an interior surface of the lid skirt and an exterior surface of the first and second conduits, and
wherein the lid, the second conduit, the first conduit, and the floor opening are each coaxially aligned relative to one another, and
further including a first screen, the first screen defining a cylindrical vertical wall and a planar top connecting wall, and the cylindrical wall defining an inner diameter equal to an exterior diameter of the second conduit and of a length equal to a length defined by the second conduit.

4,922,949
ROTARY VALVE MADE OF CERAMICS
Takashi Mizukusa, and Juzo Yagi, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan
Filed Jan. 24, 1989, Ser. No. 300,838
Claims priority, application Japan, Jan. 26, 1988, 63-7695[U]
Int. Cl.[5] G16K *5/20*
U.S. Cl. 137—309 9 Claims



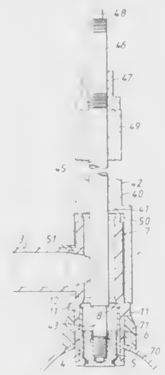
1. A rotary valve made of ceramics and rotatable about an axis, comprising:
an outer periphery of a generally circular cross section concentric with said axis of rotation;
a through hole extending across said axis of rotation; and
a pair of edges at the junctions between said outer periphery and opposite ends of said through hole;
each of said edges having a leading edge portion at opening and a leading edge portion at closing;
each of said leading edge portions being chamferred so as to form part of a surface of a cone whose vertex is contained in said axis of rotation.

4,922,950
UNITIZED DISC FLOW CONTROL ASSEMBLY FOR A RESTRICTOR VALVE
Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73128
Filed Jan. 30, 1989, Ser. No. 303,434
Int. Cl.[5] F16K *27/06*
U.S. Cl. 137—316 3 Claims



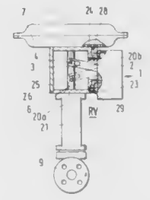
1. In a flow restrictor multiple orifice valve having its body counterbored opposite one valve port defining an annular outwardly facing shoulder for receiving superposed multiple orifice discs adjacent the shoulder in face to face axial alignment with said one port, said body having a lateral port communicating with the counterbore, the improvement comprising:
cage means including a sleeve loosely disposed in the counterbore and normally sealing with said annular shoulder and surrounding said discs,
said sleeve having a wall port in axial alignment with the lateral port and having an elongated wall slot normal to and opposite the wall port;
inwardly projecting guide means on the body slidably received by the sleeve slot for preventing angular rotation of the sleeve relative to the valve body;
yoke means axially connected with the disc opposite said one port and having a yoke stem projecting beyond said valve body at the outer end of the counterbore for angular rotation of one disc relative to the other disc;
valve top means threadedly connected with said valve body at the outward end portion of the counterbore and surrounding the yoke stem,
said valve top means having a diametrically reduced inner end portion entering and slidably surrounded by the adjacent end portion of said sleeve; and,
means joining said sleeve with said valve top means permitting angular rotation of said valve top means relative to said sleeve.

4,922,951
SERVICE TEE FOR CONNECTION TO A GAS OR WATER MAIN
Alan B. Webster, Bury, England, assignor to British GAS plc, England
Filed Jul. 26, 1988, Ser. No. 224,148
Int. Cl.[5] F16K *43/00*
U.S. Cl. 137—321 4 Claims



1. In a service tee which comprises a tubular T-piece having a through-portion with a flexible first end for connection to a gas or water main by way of a hole in the wall of the main, an opposite second end, and a side branch portion between the first end and the second end for connection to a service pipe, the first end of the through-portion being adapted for initial insertion into the hole in the wall of the main and then for subsequent radial outward expansion so that its surface sealingly engages with an edge of the hole, means for expanding said first end including an expander for location within the first end of the through-portion and adapted in a first position to permit the initial insertion of the first end of the through-portion into the hole and on movement to a second position to cause the expansion of the first end into engagement with the edge of the hole, the improvement wherein said service tee includes plug means which is engagable with the expander and which includes engagement means which enables the plug means to be engaged by and moved by a first tool so as to move the expander from its first to its second position and, after expansion of the expander, enables the plug means to be engaged by and moved by a second tool from a first position where it seals the first end of the through-portion from the side branch portion to a second position which allows communication between the side branch portion and the first end of the through-portion.

4,922,952
PNEUMATIC CONTROL VALVE
Lothar Kemmler, Mörfelden, Fed. Rep. of Germany, assignor to Samson AG, Frankfurt, Fed. Rep. of Germany
Filed Aug. 15, 1988, Ser. No. 232,501
Int. Cl.[5] G05B *11/44*
U.S. Cl. 137—382 10 Claims



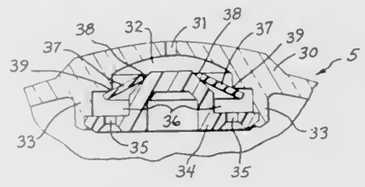
1. A valve arrangement comprising:
a valve housing for containing a movable valve member which is mmovable for opening and closing passage through the valve housing, said valve housing having a stuffing-box;
a valve rod movably engaged with said valve housing and enclosed in said stuffing-box for moving the valve member for opening and closing passage through the valve housing;
a pneumatic servomotor connected to said valve rod for moving said valve rod;
yoke means connected between said servomotor and said valve housing for securing said servomotor to said valve housing;
a position controller having a controllable pneumatic output and a rotatable lever rotatable to control the controllable pneumatic output;
articulating means operative connecting said rotatable lever to said valve rod for transmitting movement of said valve rod into rotation of said rotatable lever; and
a protective housing enclosing at least part of said valve rod, said rotatable lever and said articulating means for protecting said valve rod, said rotatable lever and said articulating means from outside influences, said protective housing being arranged outside a diaphragm space of said servomotor and between said servomotor and said yoke means so as to allow access to said stuffing-box of said valve housing.

4,922,953
VISCOUS LIQUID SUPPLY TANKS
Albert J. Bradley, 22 Home Mead Dr., Brislington BS4 5 AP, United Kingdom
Continuation-in-part of Ser. No. 159,213, Feb. 23, 1988, abandoned. This application Jan. 26, 1989, Ser. No. 301,703
Claims priority, application United Kingdom, Feb. 26, 1987, 8704577
Int. Cl.[5] G05D *9/00*
U.S. Cl. 137—386 8 Claims



1. A liquid supply tank having an inlet for connection to a source of pressurized liquid and incorporating maintenance means for maintaining a desired level of a viscous liquid within said tank, said maintenance means comprising a pump and a two-position control valve, the control valve having connections to two operational sides thereof, said inlet being connected to one of said sides of the control valve, said pump having an input and an output, the pump output being connected to the other of said sides of the control valve, and an outlet passageway leading from the housing of said valve to the interior of the supply tank and arranged to be interconnected with said inlet when said control valve moves to the open position, the pump input communicating with the interior of the supply tank, such that the pump will pump the viscous liquid, when present within the supply tank above said desired level, to bias the control valve into its closed position against the pressure of the liquid from the inlet, said bias being relieved when the liquid falls below said desired level, so that the valve will move to the open position to allow communication of the inlet with the outlet passageway to the supply tank and a relief passageway leading from the control valve housing which will interconnect said pump outlet with said supply tank when said control valve moves to the closed position.

4,922,954
BI-DIRECTIONAL PRESSURE RELIEF VENT FOR A FUEL TANK
James E. Blomquist, Grafton, and Robert M. Larson, Mequon, both of Wis., assignors to Kelch Corp., Cedarburg, Wis.
Continuation-in-part of Ser. No. 164,047, Mar. 4, 1988, abandoned. This application Feb. 14, 1989, Ser. No. 310,980
Int. Cl.[5] F16K *17/19*
U.S. Cl. 137—493 1 Claim



1. A bi-directional vent for a fuel tank comprising:
a vent body having an opening therethrough with a circumferential edge and having a conical seating surface supported centrally in the opening by an inner support member, the conical seating surface being formed on an end of the inner support member that projects upwards towards the top of the vent; and
a resilient washer-like sealing member having a first side with an outer annular seating surface, a second opposite side, and a central hole with an inner circumferential edge, the resilient sealing member being positioned such that the inner circumferential edge of the resilient sealing member contacts the conical seating surface to form a first seal and the circumferential edge of the vent body opening contacts the outer annular seating surface of the resilient sealing member to form a second seal;
whereby a first pressure differential of a first polarity between opposite sides of the resilient sealing member can open the first seal by forcing the inner circumferential edge of the resilient sealing member away from the conical seating surface, so as to permit gaseous flow through the opening of the vent body in a first direction, so as to reduce to magnitude of the first pressure differential;
whereby a second pressure differential of a second polarity which is opposite to the first polarity between said opposite sides of the resilient sealing member can open the second seal by forcing the outer annular seating surface of the resilient sealing member to deflect away from the

circumferential edge of the vent body opening, so as to permit gaseous flow through the opening of the vent body in a second direction, thereby reducing the magnitude of the second pressure differential; and

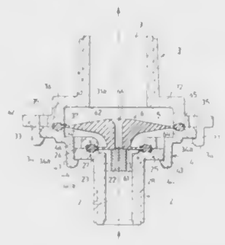
whereby in the absence of a pressure differential between said opposite sides of the resilient sealing member, the first and second seals remain closed.

4,922,955

FLUID FLOW CONTROL DEVICE

Ehud Uri, Menashe, Israel, assignor to Plasson Maagan Michael Industries Ltd.

Filed Jul. 24, 1989, Ser. No. 383,478
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—496 20 Claims



1 A fluid flow control device, comprising:

a housing having an inlet, an outlet, an inlet valve opening communicating with said inlet, an outlet valve opening communicating with said outlet, and a chamber interconnecting said inlet valve opening and said outlet valve opening;

and a displaceable valve member disposed within said chamber and including an inlet diaphragm on one side facing said inlet valve opening and movable to open and closed positions with respect thereto, an outlet diaphragm on the opposite side facing said outlet valve opening and movable to open and closed positions with respect thereto, a substantially rigid connection between said inlet diaphragm and said outlet diaphragm, and a passageway extending through said rigid connection, inlet diaphragm and outlet diaphragm;

the outlet valve opening and the outlet diaphragm being larger than said inlet valve opening and inlet diaphragm, respectively, such that the fluid flow control device permits fluid flow only in the direction of said inlet to said outlet, and produces a reduction in pressure between said inlet and outlet having a constant ratio depending on the ratio of the areas of said inlet and outlet diaphragms.

4,922,956

FLUID FLOW CONTROL REGULATOR

Frank A. Taube, Sr., Birmingham, and Edward J. Rozniecki, St. Clair Shores, both of Mich., assignors to Systems Specialties, Royal Oak, Mich.

Filed Jun. 30, 1988, Ser. No. 214,607
Int. Cl.[5] G05D *7/01*
U.S. Cl. 137—504 26 Claims

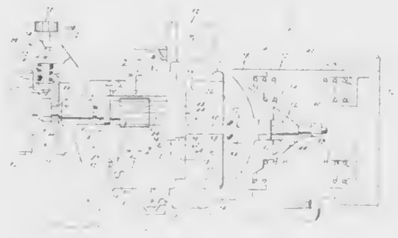
16. An improved constant flow control valve comprising:

a housing including means defining an inlet port and an outlet port;

a piston movably disposed with said housing between said inlet and outlet ports, said piston being operative to vary the effective open area of said outlet port in response to forces acting on opposite sides thereof to thereby define a variable orifice; and

means defining an adjustable orifice in said piston, said means including an axially facing opening in said piston and movable means associated with said piston, said movable means being movable between a first position wherein said movable means fully overlies and closes off said opening and a second position wherein said movable means allows fluid flow through said opening, said adjustable orifice defining a flowpath for placing said inlet and outlet in fluid communication,

drive means for effecting movement of said movable means,



said drive means including a shaft extending outwardly of said housing, rotation of said shaft being operative to effect movement of said movable means.

said movable means including gear teeth and said shaft having a gear meshingly engaging said gear teeth,

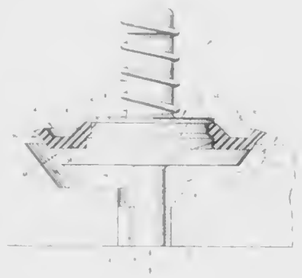
said adjustable orifice and said variable orifice cooperating to provide a predetermined substantially constant flow rate over a substantial range of inlet and outlet fluid pressures.

4,922,957

VALVE WITH REPLACEABLE SEAL ELEMENT

Jerry E. Johnson, Houston, Tex., assignor to National-Oilwell, Houston, Tex.

Filed Mar. 8, 1989, Ser. No. 321,157
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—516.29 19 Claims



1. A resilient seal element adapted to be removably mounted on a rigid valve body, comprising an annular ring member formed of an elastomeric material and defining a front-to-rear extending axis, said ring member including:

a forwardly facing front surface,

a rearwardly facing rear surface,

an inner circumferential surface engageable with an outer circumferential surface of a rigid valve body, and an outer circumferential surface engageable with a rigid valve seat, said outer circumferential surface being of concave configuration and tapering in a forward direction,

said rear surface including an annular, rearwardly open recess therein which includes first and second sidewalls extending in generally front-to-rear directions, said recess having a depth extending forwardly beyond a longitudinal rear end of said concave surface to define therewith a flexible lip,

said inner circumferential surface of said seal element including front and rear cylindrical surface portions interconnected by a frusto-conical interconnecting surface portion, said front cylindrical surface portion being of larger diameter than said rear cylindrical surface portion, each of said front and rear cylindrical surface portions and said interconnecting surface portion having a longitudinal axis which coincides with said front-to-rear extending axis, said front and rear cylindrical surface portions and said interconnecting surface portion arranged to engage corresponding surface portions of a rigid valve body.

4,922,958

MANIFOLD FOR DISTRIBUTING A FLUID AND METHOD FOR MAKING SAME

Mark D. Lemp, Sterling Heights, Mich., assignor to Colt Industries Inc., New York, N.Y.

Division of Ser. No. 80,990, Aug. 3, 1987, Pat. No. 4,836,246.
This application Mar. 6, 1989, Ser. No. 318,916
Int. Cl.[5] F23K *5/00*
U.S. Cl. 137—561 A 5 Claims



1. A fuel manifold for distributing fuel to a plurality of electronic fuel injectors in a fuel injected engine having plurality of cylinders and one injector with associated electrical wiring per cylinder, said fuel manifold comprising an elongated hollow tubular housing for receiving fuel under pressure from a fuel source, one end of said fuel manifold having first means for connection thereof to the fuel source, second means comprising plurality of cups having flow passages therethrough for connecting said manifold to all of the plurality of engine fuel injectors, third means for mounting said fuel manifold on the engine, said housing, said means for connecting said manifold to the injectors and said means for mounting said manifold on the engine being formed from a plastic material as a unitary molded structure, and a first elongate metallic tube disposed within and extending substantially the entire length of said housing, said first tube having openings therein in fluid communication with said flow passages.

4,922,959

FILTER ARRANGEMENT FOR FUEL TANK

Michiaki Sasaki, Hadano, and Joji Masuda, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 4, 1988, Ser. No. 177,368
Claims priority, application Japan, Apr. 7, 1987, 62-51590[U]
Int. Cl.[5] F02M *37/20*
U.S. Cl. 137—587 17 Claims

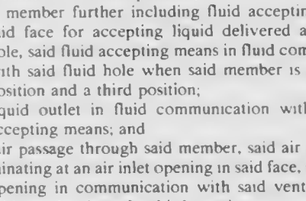
1. A filter arrangement for a fuel tank, comprising:

a connecting pipe section disposed in said fuel tank and fluidly connected to a fuel pump at a suction port;

a fuel sucking section disposed in said fuel tank and fluidly connected with said connecting pipe section, said fuel sucking section including a netting member through which fuel in said fuel tank is sucked into a chamber defined inside said fuel sucking section, upon operation of said fuel pump, said chamber being in fluid communication with inside of said connecting pipe section;

said connecting pipe section maintaining a fluid tight connection between said fuel pump and said fuel sucking section so that fuel vapor from a side of said fuel pump at the suction port is supplied through said connecting pipe section to said chamber of said fuel sucking section;

means defining a through-hole in said fuel sucking section through which through-hole the fuel vapor present in said chamber is releasable;



a valve mechanism adapted to normally close said through-hole and open said through-hole to release the fuel vapor present inside said fuel sucking section; and

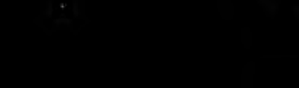
means for trapping the fuel vapor near said through-hole in said fuel sucking section.

4,922,960

SELF VENTING DRAIN VALVE

Victor R. Oelschlaegel, Modesto, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jul. 13, 1989, Ser. No. 379,460
Int. Cl.[5] F16K *24/00*
U.S. Cl. 137—588 22 Claims



1 A self venting drain valve for draining liquid contained in a generally air tight container, said container including a wall on a lower portion thereof, comprising:

a fluid hole in said wall for passing liquid therethrough, said fluid hole communicating with the interior of said container through a first opening;

a vent hole in said wall for passing air therethrough, said vent hole disposed of said fluid hole and communicating with the interior of said container through a second opening, said first and second openings located generally at the same vertical elevation in said container;

a movable member mounted for movement in a first direction on said container, said member including;

a planar face adjacent said wall, said planar face in blocking relation of said fluid hole and vent hole when said member is in a first position;

said member further including fluid accepting means in said face for accepting liquid delivered at said fluid hole, said fluid accepting means in fluid communication with said fluid hole when said member is in a second position and a third position;

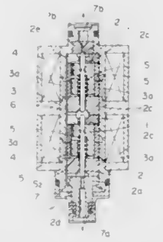
a liquid outlet in fluid communication with said fluid accepting means; and

an air passage through said member, said air passage terminating at an air inlet opening in said face, said air inlet opening in communication with said vent hole when said member is in the third position;

whereby when said member is in the first position said drain valve is closed, upon movement of said member in the first direction to the second position, said container is placed in a negative pressure condition and upon further movement of said member in said first direction to a third position, air is

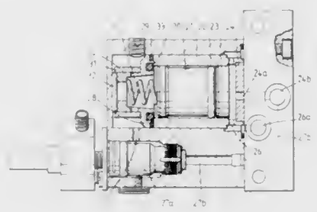
enabled to enter said container through said air passage enabling liquid to drain through said liquid outlet.

4,922,961
ELECTROMAGNETIC VALVE
Toshifumi Maebara, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre, Ltd., Saitama, both of, Japan
Filed Aug. 9, 1989, Ser. No. 391,238
Claims priority, application Japan, Sep. 5, 1988, 63-222029
Int. Cl.[5] F16K *31/02*
U.S. Cl. 137—596.17 9 Claims



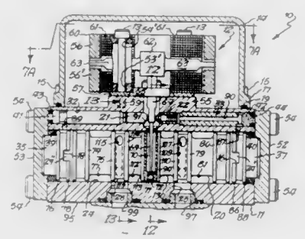
1. An electromagnetic valve comprising: plungers, a casing, valve members operatively connected to said plungers and sealed in said casing, solenoids provided outside said casing and adapted to drive said plungers, a liquid-inlet/outlet port, cylindrical members arranged between said casing and said plungers, and a by-pass passage defined between the respective outer peripheral surfaces of these cylindrical members and the inner peripheral surface of said casing, said by-pass passage being open onto said valve members as well as onto said liquid-inlet/outlet port.

4,922,962
PNEUMATIC OSCILLATORS
Norman S. Jones, Stanbridge, England, assignor to Instruments and Movements Limited, London, England
Filed May 17, 1989, Ser. No. 352,966
Claims priority, application United Kingdom, May 20, 1988, 8812007
Int. Cl.[5] F16K *31/36*
U.S. Cl. 137—624.14 3 Claims



1. A pneumatic oscillator having an operating piston reciprocable in a cylinder to control a poppet valve arrangement so as to control a gas flow path, and biassed to the flow path-closing condition with feedback of output supplementary to the bias in opposition to source pressure, characterised by a piston seal comprising an O-ring having both radial and axial clearance in a retaining groove in the piston, and by a resilient buffer to arrest the piston at its stroke-end in the flow path-opening position and to cause piston rebound to an extent to position the O-ring against the lateral groove wall that is downstream to the prevailing pressure differential.

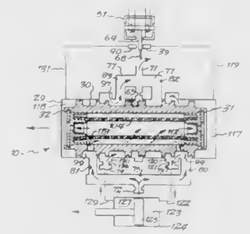
4,922,963
HYDRAULIC SERVOVALVE
William P. Robinson, Lockport, N.Y., assignor to HSC Controls Inc., Buffalo, N.Y.
Filed Feb. 27, 1989, Ser. No. 316,181
Int. Cl.[5] F15B *13/043*
U.S. Cl. 137—625.62 11 Claims



1. A servovalve comprising a valve body, a spool bore in said valve body, a spool in said spool bore, a fluid inlet conduit in said valve body in communication with said spool bore, a fluid outlet conduit in said valve body in communication with said spool bore, first and second control conduits in said valve body in communication with said spool bore, first and second blind bores in said valve body in communication with said spool bore, first and second land means on said spool proximate said first and second control conduits, respectively, first groove means in said spool adjacent said first land means, second groove means in said spool adjacent said second land means, a first bore in said spool extending through said first land means for providing a fluid path between said first control conduit and said first blind bore, a second bore in said spool extending through said second land means for providing a fluid path between said second control conduit and said second blind bore, said first groove means effecting communication between said fluid inlet conduit and said first control conduit while said second groove means effect communication between said fluid outlet conduit and said second control conduit and while said first bore effects communication between said fluid inlet conduit and said first control conduit and while said second bore effects communication between said fluid outlet conduit and said second control conduit in response to a first position of said spool, said second groove means and said second bore effecting communication between said fluid inlet conduit and said second control conduit while said first groove means and said first bore effect communication between said fluid outlet conduit and said first control conduit in response to a second position of said spool, said first and second bores having first ends proximate the first and second control conduits, respectively, and having second end proximate said first and second blind bores, respectively, and third and fourth annular groove means in said first and second land means, respectively, for effecting communication between said first and second ends of each of said first and second bores, respectively.

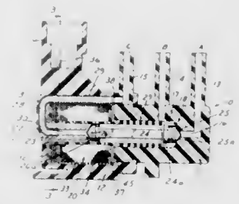
4,922,964
SERVOVALVE CONSTRUCTION
John H. Buscher, East Amherst, N.Y., assignor to HSC Controls Inc., Buffalo, N.Y.
Filed Dec. 8, 1988, Ser. No. 281,339
Int. Cl.[5] F15B *13/043*
U.S. Cl. 137—625.62 6 Claims

1. A servovalve comprising a valve housing, a motor mounted on said valve housing, a flapper coupled to said motor, a flapper bore in said valve housing containing said flapper, a spool bore in said valve housing, a spool in said spool bore, first and second opposite ends on said spool, a fluid supply conduit in said valve housing, an elongated fluid supply bore in said valve housing extending substantially parallel to said spool bore and in communication with said fluid supply conduit, first and second spaced first conduits in said valve housing for effecting communication between said elongated fluid supply bore and said spool bore, a fluid return conduit in said valve housing, an elongated fluid return bore in said valve housing in communication with said fluid return conduit and extending substantially parallel to said spool bore and said supply bore, first and second spaced second conduits in said valve housing for effecting communication between said elongated fluid return bore and said spool bore, first and second spaced annular grooves formed directly in said valve housing and surrounding said spool bore and in communication therewith along substantial circumferential portions of said spool bore, first and second control conduits in said valve housing in communication with said first and second spaced annular grooves, respectively, first and second spaced lands on said spool for obstructing flow from said first and second spaced annular grooves into said spool bore when said spool is in a neutral position, a third land on said spool spaced outwardly from said first land for defining a first spool groove therewith, a fourth land on said spool spaced outwardly from said second land for defining a second spool groove therewith, an elongated filter chamber in said spool, an elongated hollow filter extending substantially coaxially with said spool bore and



dividing said spool chamber into an outer annular filter chamber and an inner filter chamber, first and second spaced bores extending radially inwardly into said spool and in communication with said first and second spool grooves, respectively, for effecting communication between said supply conduit and said outer annular filter chamber through said first and second spaced first conduits and through said first and second spool grooves and said first and second spaced annular grooves, said inner filter chamber being in communication with said outer filter chamber through said filter, first and second annular orifice adapters on said first and second opposite ends of said spool, respectively, means mounting said opposite ends of said elongated hollow substantially cylindrical filter on said first and second orifice adapters to locate said filter within said spool bore and define said inner and outer filter chambers, first and second orifices in said first and second annular adapters, respectively, first and second spool bore chambers in said spool bore on the opposite sides of said first and second orifice adapters, respectively, from said filter chamber and in communication with said inner filter chamber through said first and second orifices, respectively, first and second nozzle bores in said valve housing, first and second nozzles in said first and second nozzle bores, respectively, on opposite sides of said flapper for directing fluid to opposite sides thereof, first and second nozzle fluid supply bores of substantially equal length in said valve housing and located on opposite sides of said flapper for effecting communication between said first and second spool bore chambers and said first and second nozzle bores, respectively, fifth and sixth lands on said spool located centrally between said first and second lands, a third spool groove between said fifth and sixth lands, a feedback spring forming an extension of said flapper, an end on said feedback spring, means locating said end of said feedback spring between said fifth and sixth lands for movement with said spool, a first nozzle fluid return bore in said valve housing for effecting communication between said flapper bore and said third spool groove, a second nozzle fluid return bore in said valve housing for effecting communication between said third spool groove and said elongated fluid return bore, a fourth spool groove between said first land and said fifth land, a fifth spool groove between said second land and said sixth land, said first and second spaced first conduits being located in communication with said first and second spool grooves, respectively, and said first and second spaced second conduits being located in communication with said fourth and fifth spool grooves, respectively.

4,922,965
PNEUMATIC SOLENOID VALVE
Jack B. Meister, Cedar Knolls, N.J., assignor to Beta Mfg. Co., Warren, Mich.
Filed Feb. 22, 1989, Ser. No. 313,948
Int. Cl.[5] F15B *13/044*; F16K *31/06*
U.S. Cl. 137—625.65 2 Claims

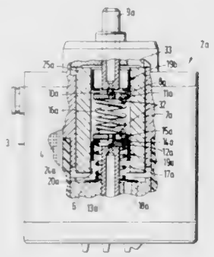


1. The method of forming a pneumatic solenoid valve which comprises
molding a first body part of plastic material having a bore, a first passage intersecting one end of the bore, the bore defining a first seat adjacent one end, the body having a second passage intersecting the bore intermediate its ends and having a third passage,
forming a bobbin of plastic material,
winding wire on said bobbin to form a coil,
providing fixed terminals to said coil,
providing a housing over said bobbin and coil,
inserting a plunger and spring into bore of said first part,
positioning the assembly of the bobbin coil terminals and housing in the first part,
connecting a tube which is U-shaped between the fourth passage and the third passage,
and then molding a second part in section about a portion of the first part and embedding therein the bobbin, coil, core, plunger and tube.

4,922,966
ELECTRICALLY CONTROLLABLE 3-WAY VALVE
Guenter Kaes, Stuttgart, and Alwin Stegmaier, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Feb. 14, 1989, Ser. No. 310,143
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809742
Int. Cl.[5] F15B *13/044*
U.S. Cl. 137—627.5 17 Claims

1. A valve having an electromagnet that controls an armature aligned in a longitudinal direction thereof, at least one valve seat aligned coaxially with the armature and an associated closutre member, a closure member holder firmly joined to said closure member, at least one prestressed valve closing

spring, said closure member holder is movable in the longitudinal direction of the electromagnet by means of said armature and is loaded by said at least one prestressed valve closing spring, a cylindrical bore (**20**,**20***a*) extending in a longitudinal direction of said armature (**7**,**7***a*), at least one adjusting element adjustably displaceable within said armature that maintains the prestressing of said at least one prestressed valve closing spring, said at least one adjusting element including a substantially tubular main body portion and a radially inwardly oriented rim on one end of said substantially tubular main body portion which forms a stop shoulder (**23**) for said closure member holder, said inwardly oriented rim has a wall thickness substantially that of a wall thickness of said substantially tubular main body portion of said at least one adjusting element, and said at least one adjusting element (**19**,**19***a* or **19***b*) is adjustably displaceable in said bore (**20**) by overcoming friction locking.



4,922,967

FIRING DEVICE FOR A PROJECTILE WEAVING MACHINE AND PROJECTILE THEREFOR

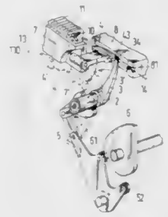
Erwin Pfarrwaller, Winterthur; Danilo Vezzu, Seuzach, both of Switzerland, and Oskar Hubner, Radolfzell, Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 6, 1989, Ser. No. 319,650

Claims priority, application Switzerland, Mar. 14, 1988, 950/88

Int. Cl.[5] **D03D** *49/32*

U.S. Cl. 139—145 **15 Claims**



1. A firing device for a projectile weaving machine comprising

a torsion bar disposed for twisting about a longitudinal axis thereof;

means for twisting said torsion bar about said axis;

a striking lever connected to and extending transversely from said torsion bar for pivoting about said axis during twisting of said torsion bar; and

an end piece at a distal end of said lever for striking and accelerating a projectile from a firing position thereof, said end piece being movable on a circular path and having a striking face for striking a rear face of a projectile and remaining in matching contact with the projectile while moving relative to the rear face of the projectile during pivoting of said lever over a predetermined angle.

4,922,968

PREMOLDING CONSISTING OF MULTIPLY FABRIC

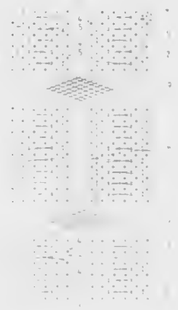
Wolfgang Böttger, Ködnitz, and Kurt Biedermann, Kulmbach, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,112

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732555; Apr. 18, 1988, 3812909

Int. Cl.[5] **D03D** *3/00*

U.S. Cl. 139—384 R **6 Claims**



1. A multiply fabric for use as a reinforcement in plastic composite members, said fabric having a length dimension, a width dimension and a thickness dimension and being formed of weft threads which extend widthwise said fabric, warp threads which extend lengthwise said fabric, and stuffer warp threads which also extend lengthwise said fabric, said weft threads and said stuffer warp threads being also arranged in a plurality of aligned rows extending in the thickness dimension of said fabric, said warp threads being woven with respect to said weft threads so as to provide said fabric, when viewed in a section perpendicular to said width dimension, with a central web and a first end portion, said first end portion having a central gap therein that divides said first end portion into separated left and right flanges.

4,922,969

MULTI-LAYER WOVEN FABRIC HAVING VARYING MATERIAL COMPOSITION THROUGH ITS THICKNESS

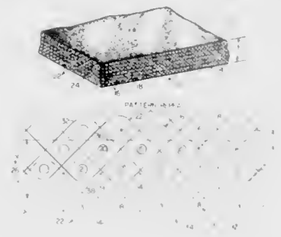
Arthur R. Campman, deceased, late of Los Angeles (by Martha H. Campman, executrix); Dominic P. Calamito, Rancho Palos Verdes, and Richard H. Pusch, Huntington Beach, all of Calif., assignors to Hitco, Gardena, Calif.

Filed Sep. 22, 1988, Ser. No. 247,879

Int. Cl.[5] **D03D** *11/00, 13/00, 15/00*

U.S. Cl. 139—408 **11 Claims**

1. A woven fabric having a thickness between opposite broad surfaces thereof and comprising a first yarn system arranged into a plurality of layers of yard between the opposite surfaces of the fabric, a second yarn system extending through the fabric thickness between the opposite broad surfaces and being interwoven with the layers of yarn of the first yarn system, at least one of the first and second yarn systems being comprised of at least two different groups of yarns of different material composition and extending through different portions of the thickness of the fabric and at least one of the at least two different groups of yarns extending through at least two of the plurality of layers of yarn, and a third yarn system arranged into a plurality of layers of yarn between the opposite broad surfaces of the fabric, the layers of yarn of the third yarn system being comprised of yarn lengths extending generally perpendicular to yarn lengths comprising the layers of yarn of the first yarn system, and the third yarn system being comprised of at least two different groups of yarns of different material composition and extending through different portions of the thickness of the fabric.



4,922,970

WEFT THREAD INSERTING GRIPPER HAVING A GUIDE ELEMENT FOR A SHUTTLELESS LOOM

Fritz Gehring, Bodolz, and Valentin Krumm, Hergensweiler, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau/Bodensee, Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,453

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1988, 3825230; Jan. 20, 1989, 3901549

Int. Cl.[5] **D03D** *47/18*

U.S. Cl. 139—446 **14 Claims**



1. A weft thread inserting gripper for a shuttleless loom, said gripper comprising a gripper body having a first longitudinal axis and a guided side wall for guiding said gripper on its back and forth movements along a reed in a loom shed, a guide element, means for attaching said guide element to said guided side wall so that said guide element can contact said reed, and means arranged for permitting a tilting movement of said guide element around a second longitudinal axis extending substantially in parallel to said first longitudinal axis of said gripper body.

4,922,971

HOSE ASSEMBLY, CLIP THEREFOR AND METHOD OF MAKING THE SAME

Rodger P. Grantham, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

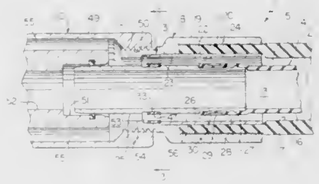
Division of Ser. No. 910,514, Sep. 23, 1986, Pat. No. 4,754,782.

This application Jun. 30, 1988, Ser. No. 213,388

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[5] **B65B** *3/04*

U.S. Cl. 141—1 **10 Claims**



1. In a method of making a hose assembly having fluid passages therein for respectively conveying a volatile liquid in one direction to a container and returning vapors of said volatile liquid from said container, said assembly comprising a flexible inner hose having an outer peripheral surface and defining an inner one of said passages, a flexible outer hose having an inner peripheral surface and being disposed around said inner hose, said inner peripheral surface of said outer hose and said outer peripheral surface of said inner hose defining an outer one of said passages, a coupling fixed to one end portion of said outer hose, a tubular fitting fixed to an end portion of said inner hose, and clip means holding said fitting and said end portion of said inner hose substantially concentrically within said coupling and said outer hose to define a continuation of said outer passage, the improvement comprising the steps of forming said clip means to comprise a generally cylindrical one-piece C-shaped member that extends in a circular arc that is greater than 180° and having substantially concentric inner and outer surfaces respectively engaging said fitting and said coupling, and forming said C-shaped member to have opposite ends spaced from each other to define an opening means between said surfaces in communication with said outer passage on opposite sides of said clip means for fluid flow therethrough.

4,922,972

METHOD OF FILLING A LIQUID CRYSTAL DEVICE WITH LIQUID CRYSTAL

Toshio Watanabe; Akio Osabe; Akira Mase, all of Atsugi; Hiroyuki Sakayori, Machida; Masahiko Sato, Atsugi, and Kaoru Tabata, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Mar. 25, 1988, Ser. No. 174,401

Claims priority, application Japan, Mar. 26, 1987, 62-73413; Mar. 26, 1987, 62-73414

Int. Cl.[5] **B67D** *5/37;* **G02F** *9/00*

U.S. Cl. 141—4 **6 Claims**

1. A method of filling a liquid crystal device including a pair of parallel substrates having external surfaces with a liquid crystal material comprising:

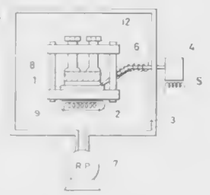
disposing said liquid crystal device in a vacuum chamber between a pair of opposed parallel plates;

evacuating said vacuum chamber;

supplying said liquid crystal material to an inlet of said device;

elevating the pressure in said chamber to allow said liquid crystal material to enter a space formed between said parallel substrates through said inlet by virtue of the dif-

ferential pressure between the inside and the outside of said liquid crystal device; and



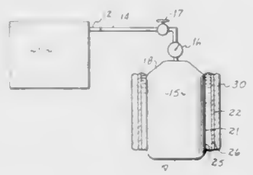
applying opposed pressure with said parallel plates to said external surfaces of said parallel substrates respectively in order to form a uniform liquid crystal device.

4,922,973

COLLECTING VESSELS FOR COLLECTING REFRIGERANTS FROM HEAT EXCHANGE SYSTEMS AND METHODS

Bernie Keneavy, Cincinnati, Ohio, assignor to Coil Matic, Inc., Cincinnati, Ohio

Filed Nov. 17, 1988, Ser. No. 272,728
Int. Cl.[5] B65B *31/00*
U.S. Cl. 141—4 17 Claims



11. A collecting vessel for receiving a refrigerant which has been cycled through a heat exchange unit, such as refrigerative and air-conditioning units, said collecting vessel comprising:

an exterior wall defining a hollow interior;

valve means for opening and closing said collecting vessel to permit the refrigerant to flow into and out from the hollow interior when said valve means is opened or closed, respectively; and

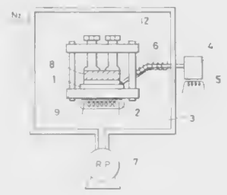
a chemically activatable cold wrap positioned on said exterior wall for absorbing an effective amount of heat from the hollow interior of said collecting vessel when in its activated state to effect transfer of the refrigerant from the heat exchange unit into the hollow interior of said collecting vessel in a condensed state, said chemically activatable cold wrap comprising reactive chemicals separated from one another when said cold wrap is in its non-use state whereby, upon activating said cold wrap, the reactive chemicals are mixed together to cause them to react with each other to produce an endothermic reaction which effectively cools the hollow interior of said collecting vessel.

4,922,974

METHOD OF FILLING A LIQUID CRYSTAL DEVICE WITH LIQUID CRYSTAL

Toshio Watanabe; Akio Osabe; Akira Mase, all of Atsugi; Hiroyuki Sakayori, Machida; Masahiko Sato, Atsugi, and Kaoru Tabata, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

Division of Ser. No. 174,401, Mar. 25, 1988. This application Feb. 14, 1989, Ser. No. 309,890
Claims priority, application Japan, Mar. 26, 1987, 62-73413; Mar. 26, 1987, 62-73414
Int. Cl.[5] G09F *9/00, 1/13;* B67D *5/37*
U.S. Cl. 141—4 1 Claim



1. A method of filling a liquid crystal device with a blended crystal material comprising:

disposing said liquid crystal device having an inlet port, in a vacuum chamber;

evacuating said vacuum chamber;

supplying said inlet port with said blended liquid crystal material; and

elevating the pressure in said chamber to allow said blended liquid crystal material to fill said liquid crystal device through said inlet port by virtue of the differential pressure between the inside and the outside of said liquid crystal device,

wherein said blended liquid crystal material is maintained, until said liquid crystal device is completely filled with said blended liquid crystal material, at a temperature higher than the transition temperature of any one of the constituents of said blended liquid crystal material so that said blended liquid crystal material is transformed in its isotropic phase.

4,922,975

APPARATUS FOR MAKING MIXTURES OF PHARMACEUTICAL LIQUIDS

Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 3,810
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1986, 3602075
Int. Cl.[5] B65B *3/30;* B67C *3/02*
U.S. Cl. 141—104 8 Claims

1. Apparatus for making a mixture of pharmaceutical liquids in a container, the individual liquid components of the mixture being contained in at least first and second supply vessels, said apparatus comprising:

a connection tube for each supply vessel;

a tube connector means connected with said connection tubes;

a further tube for connecting said tube connector means to the container to be filled with the mixture;

a vacuum chamber for containing the container to be filled;

a vacuum pump connected to said vacuum chamber;

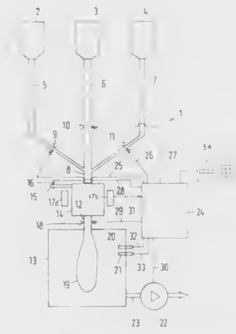
first and second shut off means for said connection tubes of the at least first and second supply vessels, respectively;

means for detecting the presence of air in the apparatus;

pressure sensor means for detecting negative pressure values within said vacuum chamber;

an input device for storing values of volumes of liquid components of the mixture to be transferred from the at least first and second supply vessels to the container; and

control means operatively connected with said pressure sensor means, said vacuum pump, and said first and second shut off means, said control means activating said vacuum pump until a first predetermined negative pressure value is obtained in said vacuum chamber, thereafter opening said first shut off means for allowing liquid to flow from the first supply vessel to the container until a second predetermined pressure exists in said chamber, and thereafter closing said first shut off means and opening said second shut off means for allowing liquid to flow from the second supply vessel to the container until a third predetermined pressure value exists in said chamber.

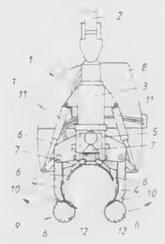


4,922,976

APPARATUS FOR REMOVING BRANCHES FROM AND FOR CROSSCUTTING TREETRUNKS

Gerold Hacker, Vienna, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed May 26, 1989, Ser. No. 358,062
Claims priority, application Austria, Jul. 6, 1988, 1749/88
Int. Cl.[5] B27L *1/00;* A01G *23/08*
U.S. Cl. 144—3 D 12 Claims



1. An apparatus for removing branches from and for crosscutting treetrunks, comprising

a frame, which is adapted to be suspended from a lifting tackle over a treetrunk having a longitudinal axis extending in a predetermined, substantially horizontal direction,

gripping means, which protrude downwardly from said frame and are movable mounted on said frame and operable to move into and out of frictional engagement with the lower half of said treetrunk to support the latter,

branch-removing tools, which are mounted on said frame and distributed around the periphery of said treetrunk when it is thus supported by said gripping means,

a longitudinal feeding device, which is mounted on said frame and operable to impart an axial feed movement to said treetrunk when it is thus supported by said gripping means,

a crosscutting tool, which is on said frame and is operable to move transversely to said predetermined direction and to crosscut said treetrunk when it thus supported by said gripping means, and

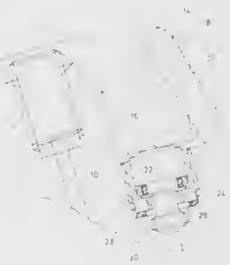
rotary turning means mounted on said frame for bringing an entire planar cross-section of said treetrunk into engagement with said crosscutting tool by imparting to said treetrunk when it is thus supported by said gripping means a rotary movement substantially about said axis.

4,922,977

ROTARY CUTTER HEADS

Peter Colton, Melton Mowbray; Andrew D. Willbond, and Mark A. Stocker, both of Leicester, all of United Kingdom, assignors to Wadkin plc, Leicester, United Kingdom

PCT No. PCT/GB86/00602, § 371 Date Apr. 6, 1989, § 102(e) Date Apr. 6, 1989, PCT Pub. No. WO88/02292, PCT Pub. Date Apr. 7, 1988
PCT Filed Oct. 6, 1986, Ser. No. 346,175
Claims priority, application Denmark, Oct. 6, 1986, 3029/88
Int. Cl.[5] B27G *13/00*
U.S. Cl. 144—230 9 Claims



1. A rotary cutter head for woodworking machinery comprising:

means defining a cutterblock body;

a hydraulic chamber within said cutterblock body;

first hydraulically actuable means for clamping said cutterblock body on a spindle of a woodworking machine in response to hydraulic pressure in said hydraulic chamber;

a plurality of inwardly diverging recesses in said cutterblock body, each said recess being provided with:

a cutter blade received substantially within but extending from the recess; and

a wedge for retaining the cutter blade in the recess, said edge having a tapered lock angle and cooperating with the cutter blade and a wall which defines the recess; and

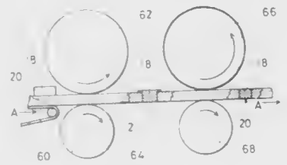
second hydraulically actuable means responsive to hydraulic pressure in said hydraulic chamber for wedging said cutter blades in their respective recesses, said second hydraulically actuable means cooperating with said wedges, pressurization of hydraulic fluid in said hydraulic chamber causing simultaneous clamping of said cutterblock body on a spindle on which said cutterblock body is mounted and the wedging of said cutter blades, subsequent depressurization of the hydraulic fluid in said hydraulic chamber causing release of the clamping of the said cutterblock body on the spindle while said cutter blades remain wedges in their associated recesses by the taper lock action of said wedges.

4,922,978

METHOD OF MENDING DEFECTIVE WOOD PLATE

Yoshinori Koba, c/o Meinen Machinery Works Inc., Kajitacho Obbushi Aichi Pref. 474, Japan

Continuation of Ser. No. 855,589, Apr. 23, 1986, abandoned. This application Mar. 8, 1988, Ser. No. 168,609
Claims priority, application Japan, Apr. 25, 1985, 60-89459
Int. Cl.[5] B27G *1/00;* B32B *35/00*
U.S. Cl. 144—332 8 Claims



1. A method of patching a naturally occurring defect having a periphery in a wood plate having a surface comprising the steps of:

a. preparing a solid patching material which is smaller in thicknesswise shear strength and compressive strength than the wood plate and is sized to extend beyond the periphery of the defect of the wood plate which is to be mended;

b. applying the solid patching material to the wood plate in such a manner as to cover the defect; and

c. compressing the solid patching material in a thicknesswise direction thereof to cause the patching material to undergo shear fracture along the periphery of the defect so that a central portion of the patching material lying over the defect is thrust into the defect while another part of the patching material, lying outside of the periphery of the defect and outside of the central portion of the patching material, remains above the surface of the wood plate and outside of the defect.

4,922,979

LOG CORE STEADY REST

Wayne L. Crabtree, Eugene, and Robert C. Young, Aumsville, both of Oreg., assignors to Premier Gear & Machine Works, Portland, Oreg.

Filed Jun. 2, 1989, Ser. No. 360,853
Int. Cl.[5] B27B *1/00;* B27L *5/02*
U.S. Cl. 144—357 6 Claims



1. A veneer peeling lathe having spindles for pinning a log at its end, drive means for rotatably driving the spindles and a log pinned by the spindles, a veneer peeling blade that is controllably fed into the log in a direction toward the axis of rotation and a nose bar that presses into the log preceding the peeling blade, said blade and nose bar creating a force urging bending of the log between the spindles.

a core steady rest including a pair of arms each having an attached end and a pivotal end, a pair of rollers mounted on and spanning the distance between the pivoted ends of the arms, a fixed support beam, mounting means for mounting the attached ends of the arms to the beam and establishing thereby a determined distance between the fixed support beam and the rollers, said mounting means including pivotal mounting means and motor means for pivoting the pivoted ends of the arms and the rollers carried thereby against the log in the spindles at a side of the log to counter the bending force of the blade and nose bar and to continue pivoting movement of the arms and rollers to maintain supporting contact of the rollers against the log as the log diameter is decreased due to veneer peeling, and the improvement that comprises;

means for fixing the relative positions of the pair of rollers and arms and including arm adjustment means for adjusting the distance between the fixed support beam and the rollers as necessary to maintain a balance of pressure exerted against the log by the pair of rollers, and computer means controlling the arm adjustment means, said computer means programmed with adjustment calibrations matched to the lathe configuration and responsive to the changing diameter of the log to adjust the arms in accordance with the calibrations and thereby achieve said balance of pressure.

4,922,980

COMPUTER KEYBOARD COVER

Laura Parker, 1235 DeHaro St., San Francisco, Calif. 94107

Filed Jul. 27, 1989, Ser. No. 386,524
Int. Cl.[5] B65D *65/02, 65/10;* B41J *29/00*
U.S. Cl. 150—165 6 Claims



1. A cover for a computer keyboard, said keyboard having a breadth between first edge margin and a second edge margin, a height between a third edge margin and a fourth edge margin, and a thickness between a face side and an underside, said cover comprising.

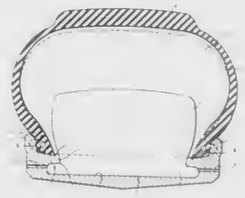
a rectilinear sheet of an elastic elastomeric material, said sheet having a length dimension and a width dimension, said sheet being of a sufficient stiffness to be rollable into a cylindrical shape, said length dimension being greater than a sum of said breadth and twice said thickness, said width dimension being greater than a said height, said sheet having a permanent curl characteristic along said length dimension sufficient to cause said sheet to curl into a cylinder whenever at least one margin at ends of said length dimension is released, said sheet for covering said keyboard with opposing margins gripping said first edge margin and said second edge margin and for rolling into a compact cylinder when not covering said keyboard.

4,922,981

TIRE RIM COMPRISING A BODY TO ALLOW TIRE TO ROLL IN A DEFLATED CONDITION

Jean-Pierre Pompier, Volvic, France, assignor to Campagnie Generale des Establissements Michelin-Michelin & Cie, Clermont-Ferrand, France

Filed Oct. 25, 1988, Ser. No. 262,291
Claims priority, application France, Oct. 26, 1987, 87 14895
Int. Cl.[5] B60B *21/02;* B60C *17/06*
U.S. Cl. 152—158 4 Claims



1. A rim for mounting a pneumatic tire, said tire being used together with a support body which makes possible the rolling of the tire in a deflated condition,

said rim having a groove for receiving and anchoring said support body, the cross section of said groove having approximately a U shape and having a concave shape which is oriented radially outward,

a base portion of said U shape constituting a bottom portion of said groove being approximately parallel to the axis of tire rotation,

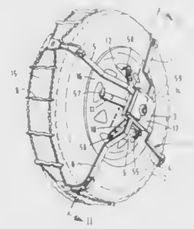
said groove being axially delimited on opposite sides thereof by lateral walls extending laterally outward relative to said bottom portion of said groove, wherein said lateral walls each comprise at least one undercut portion and an orifice and passageway for achieving communication with atmospheric pressure is provided in said groove located radially outward relative to one of said undercut portions.

4,922,982

ANTI-SKID DEVICE FOR WHEELS

Michel Metraux, Pully, Switzerland, assignor to Autotyp S.A., Etagnieres, Switzerland

Filed Oct. 24, 1988, Ser. No. 261,211
Claims priority, application European Pat. Off., Oct. 22, 1987, 87115502.4
Int. Cl.[5] B60C *27/12*
U.S. Cl. 152—216 10 Claims



1. An anti-skid device for a wheel having an inner rim portion and an outer circumferential portion, comprising;

an axial part located at an axis of rotation of the wheel;

said axial part having a securing means facing the wheel for securing said axial part to the inner rim portion and a retaining portion facing away from the wheel;

a rotation means connecting said securing means and said retaining portion;

said securing means thereby being frely rotatable about said rotation means relative to said retaining portion;

a plurality of attaching arms extending from said retaining portion;

an anti-skid means attached to said attaching arms;

said anti-skid means being disposed about said outer circumferential portion of the wheel;

said securing means having a plurality of securing members extending from a central portion;

said securing members having attaching means disposed at distal ends thereof for attaching said securing members to the inner rim portion thereby drawing said anti-skid means toward the axis of rotation of the wheel and drawing said axial part toward the wheel;

said central portion located about the axis of rotation of the wheel, said central portion being one piece with said plurality of securing members; and

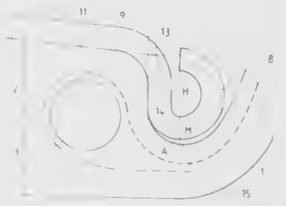
a housing sealably disposed about said central portion to prevent dirt, ice or snow from interfering with rotation of said central portion.

4,922,983

VEHICLE WHEEL AND TIRE ASSEMBLY

Udo Frerichs, Langenhagen, Fed. Rep. of Germany, assignor to Continental Aktiengesellschaft, Hanover

Filed Apr. 14, 1989, Ser. No. 337,963
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1988, 3812492
Int. Cl.[5] B60B *21/10;* B60C *15/02*
U.S. Cl. 152—379.3 4 Claims



1. In a combination of a pneumatic tire and a vehicle wheel, where said wheel has a rigid rim that is provided with essentially radially inwardly extending rim flanges, and with said rim furthermore being provided, on its radially outer side, with support surfaces for operation in an essentially uninflated state of said tire, and, on its radially inner side, with respective recessed mounting portions for the beads of said tire, which is made of rubber or rubber-like synthetic material, and which has a carcass that is anchored in said tire beads by being looped about pull and compression-resistant bead cores thereof, with said tire beads being disposed on rim seating surfaces provided on the radially inner side of said rim next to said rim flanges, the improvement wherein:

each of said rim flanges has a height that is coordinated with the configuration of one of said tire beads in such a way that when said tire is uninflated and not subjected to load, there is provided between said rim flange and an adjacent inner wall of said tire adjacent said bead thereof, at the level of a radially innermost point of said rim flange, a gap of 0.5 to 3 mm.

4,922,984
INFLATION AND DEFLATION OF A TIRE IN ROTATION
Andre Dosjoub, and Claude Lescoffit, both of Chamalieres, France, assignors to Compagnie Generale des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand, France
Filed Jul. 13, 1988, Ser. No. 218,557
Claims priority, application France, Jul. 15, 1987, 87 10100
Int. Cl.[5] B60C *23/12*
U.S. Cl. 152—415 8 Claims



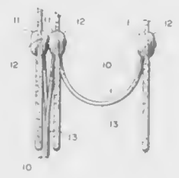
1. A device for inflating a rotating tire, comprising:
a deformable hose mounted for rotation with a tire, said hose being arranged at least in part substantially along an arc of a circle and coaxial with the tire, said hose having one open end in communication with atmospheric pressure and another open end in communication with a gas pressure of a volume inside the tire;
means activatable for selectively locally reducing the sectional area of the hose when the tire is mounted on a vehicle, said reducing means being stationary relative to the rotation of the tire; and
check valve means connected between said another end for said hose and the volume inside the tire for permitting gas flow only from said hose to the volume inside the tire,
whereby a rotation of the tire causes a local reduction in the sectional area of said hose to move along the length of said hose and compress air therein when said reducing means is active, the compressed air pressure being transferrable to the volume inside the tire via said another open end.

4,922,985
TIRE AND RIM ASSEMBLY
Chester J. Gasowski, Uniontown; Michael A. Kolowski, Mogadore; John C. Smithkey, North Canton, and Thomas L. Ford, Mogadore, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 135,497, Dec. 21, 1987, Pat. No. 4,854,361, which is a continuation of Ser. No. 877,940, Jun. 24, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,507
Int. Cl.[5] B60C *15/06*
U.S. Cl. 152—543 4 Claims



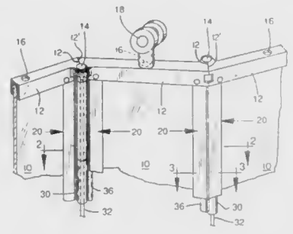
1. An assembly comprising a pneumatic tire mounted upon its designated rim, said rim having rim flanges and said tire comprising:
(a) a pair of annular bead cores, each of which comprises a plurality of metallic filaments;
(b) a carcass ply which is folded about each said bead core, said carcass ply having a main portion that extends between the bead cores and turn-up portions that are anchored around the bead cores, a radially outer edge of each said turn-up portion being in contact with said main portion, any elastomeric substance interposed between a turn-up portion of the carcass ply and the associated bead core being the same as any elastomeric substance contained in said bead core; and
(c) each said bead core having a clamping member folded thereabout, said clamping members each comprising a strip of side-by-side cords of a nonmetallic heat shrinkable material which has a permanent thermal shrinkage of at least 2%, said cords being oriented at 0° to 75° with respect to a plane parallel to the centerplane of the tire, each said clamping member being disposed directly adjacent to said carcass ply on the side of the carcass ply distal from said bead core from a location axially inwardly of the bead core to a location radially outwardly of the bead core such that the respective turn-up portion of the carcass ply is radially interposed between and directly adjacent to both the clamping member and the bead core, and each turn-up portion of the carcass ply being disposed such that said turn-up portion does not extend radially outwardly of said rim flanges, said clamping members securing the turn-up portions of the carcass ply in position and protecting the carcass ply from damage.

4,922,986
VERTICAL BLIND SPACER
Martin N. Leibowitz, 1155 Hillsboro Mile (A1A) Suite 602, Hillsboro Beach, Fla. 33062
Filed Sep. 26, 1988, Ser. No. 249,505
Int. Cl.[5] E06B *9/36*
U.S. Cl. 160—178.1 7 Claims



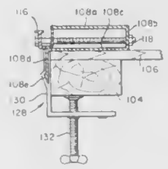
1. In a vertical blind arrangement having a plurality of vertical blind members depending therefrom for accumulation, one or more spacers, each of said spacers being secured to two adjacent vertical blind members at the bottom thereof for spacing and connecting the vertical blind members, wherein, each of said spacers comprise:
an elongated flexible member having a female connector half at one end and a male connector half at the other end thereof:
each of said connector halves having a cuplike shape and means for forming a variable space between facing sides of said connector halves when said connector halves are mated together;
said male connector half comprises a hollow spherical segment member defining said cuplike shape and a shaft member attached to said spherical segment and extending in a direction away from the hollow inside thereof of said spherical segment member;
said female connector half comprises a hollow spherical segment member defining said cuplike shape and having an opening through the center thereof;
said male connector half has a connection side which faces in a first direction and a non-connection side which faces in a second direction;
said female connector has a connection side which faces in said second direction and a non-connection side which faces in said first direction.

4,922,987
SECURE TYPE FOLDING DOOR
John D. Marontate, Forest Grove; Ralph D. Jones, Cornelius, and Mark F. Lewis, Portland, all of Oreg., assignors to Woodfold-Marco Mfg., Inc., Forest Grove, Oreg.
Filed Jan. 9, 1989, Ser. No. 294,681
Int. Cl.[5] E05D *15/26*
U.S. Cl. 160—183 5 Claims



1. An accordion type folding door assembly adapted for mounting on a track positioned across a space to be secured, the folding door assembly comprising:
(a) a plurality of adjacent panels each including a top end having an upper margin and a bottom end and being arranged vertically side-by-side, with juxtaposed side edges,
(b) mounting means on the upper margins of selected ones of the panels for mounting the assembly on the track,
(c) upper and lower primary hinge means mounted at the top and bottom of each panel for hinging said adjacent panels together,
(d) stop means on each panel arranged to engage the stop means on the adjacent panel to limit the relative closing movement of the panels so that they assume a zig zag configuration in the extended, closed condition of the door,
(e) a framing member on each panel juxtaposed side edge, the framing member having inner and outer side margins,
(f) on the inner side margin of each framing member panel fastening means for fastening the framing member to the adjacent panel side edges,
(g) a plurality of hinge knuckles disposed end-to-end in alternating arrangement between each pair of adjacent framing members and between each pair of upper and lower primary hinge means,
(h) connecting means connecting the knuckles to the outer side margins of the adjacnet framing members in alternating arrangement,
(i) floating hinge pin means interconnecting the knuckles, the knuckles and floating hinge pin means forming a supplemental hinge,
(j) the connecting means connecting the knuckles to the adjacnet panel framing members comprising tongue and groove connecting means,
(k) the tongue and groove connecting means comprising a groove component located in the framing member and a tongue component located on the knuckles,
(l) the assembly including an outwardly extending flange on each knuckle radially spaced from the tongue component and positioned for screening the space between adjacent panels during operation of the door.

4,922,988
TENSION MOUNTING SYSTEM AND ASSEMBLY
Russell M. Loomis, Palos Heights, Ill., assignor to Aero Wabash, Inc., Indianapolis, Ind.
PCT No. PCT/US88/03168, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO89/02495, PCT Pub. Date Mar. 23, 1989
Continuation-in-part of Ser. No. 131,217, Dec. 8, 1987, which is a continuation-in-part of Ser. No. 99,056, Sep. 21, 1987, Pat. No. 4,800,947. This PCT application Sep. 20, 1988, Ser. No. 309,206
Int. Cl.[5] B44D *3/18*
U.S. Cl. 160—368.1 10 Claims

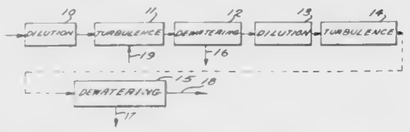


1. A tension mounting assembly for suspending flexible sheet material in a taut condition from a generally planar support surface, comprising
(a) a flexible sheet;
(b) at least one enlarged retaining means mounted on at least one peripheral edge of said flexible sheet;
(c) bracket means adapted for connection with the support surface adjacent at least one edge thereof, a first portion of said bracket means being arranged in spaced parallel relation to the support surface to define a recess open at one end adjacent the edge of the support surface, said bracket means containing a threaded opening in the other end thereof;
(d) jaw means slidably arranged within said bracket recess, said jaw means having a generally U-shaped cross-sectional configuration defining a chamber for receiving said retaining means, the open end of said jaw means being arranged normal to the open end of said bracket recess, said jaw means containing at least one opening aligned with said bracket opening; and
(e) threaded adjustment means arranged within said aligned openings and rotatably operable from the open end of said recess to displace said jaw means within said recess, whereby as said jaw means is displaced inwardly within said bracket recess, said flexible sheet is pulled taut about said bracket first portion which closes said jaw opening, said sheet extending from the edge of the support surface and covering said bracket without covering said bracket recess open end, thereby to provide continuous access to said adjustment means.

4,922,989
TREATMENT OF MECHANICAL PULP TO REMOVE RESIN
Ake Backlund; Olof Ferritslus, and Goran Tistad, all of Karlstad, Sweden, assignors to Kamyr AB, Karlstad, Sweden
Filed Oct. 15, 1985, Ser. No. 787,140
Claims priority, application Sweden, Oct. 15, 1984, 8405128
Int. Cl.[5] D21B *1/04*
U.S. Cl. 162—24 19 Claims

1. A method for removing resin from a mechanical pulp, comprising the steps of:
(a) feeding a mechanical pulp having a consistency of about 7–20 percent to at least one high turbulence stage;
(b) at the high turbulence stage, exposing the mechanical

pulp at about 7–20 percent consistency to a high degree of turbulence for a time period of about 0.2–60 seconds; and



(c) directly after step (b), dewatering the mechanical pulp to produce a pressate containing resin removed from the pulp.

4,922,990

PRESS SECTION FRAME IN A PAPER MACHINE

Yrjö Snellman, Tampere, and Mauri Rantala, Nokia, both of Finland, assignors to Oy Tampella Ab, Tampere, Finland

Filed Sep. 15, 1988, Ser. No. 244,881
Claims priority, application Finland, Sep. 15, 1987, 874002
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] D21F *3/02*
U.S. Cl. 162—273 **3 Claims**



1. A press section in a paper machine, comprising:

a roll combination of at least two rolls which form at least one press nip, members for guiding the paper web through the press section and members for guiding at least one felt into contact with the press section; and

a frame construction including a front frame positioned before said roll combination;

a rear frame positioned behind said roll combination;

an intermediate frame comprising at least one substantially horizontal beam located and level and extending between said front and said rear frame and above said roll combination; and

at least one auxiliary frame located below said intermediate frame and carrying at least one roll of said roll combination;

said auxiliary frame being connected by a shaft to one of said front or rear frames and arranged rotatably around said shaft;

connecting means provided on said front and rear frames and corresponding connecting means provided on said intermediate frame for detachable interconnecting said intermediate frame to said front and rear frames;

locking means provided on said intermediate frame and corresponding locking means provided on said auxiliary frame for detachably interlocking said auxiliary frame to said intermediate frame, during the operating process of the press;

transfer means for moving said intermediate frame horizontally in a longitudinal direction of the paper machine between an operating position in which said intermediate frame is interconnected above said roll combination to a service position in which said intermediate frame is detached from above said front and rear frames and removed from above said roll combination; and

a support means located on the same level as said at least one substantially horizontal beam and connected to said front or rear frames, for receiving and supporting said intermediate frame in said service position.

4,922,991

COMPOSITE CORE ASSEMBLY FOR METAL CASTING

Michael A. Pitcher, Powell; Albert L. Haugse, Dublin; Richard L. Pelfrey, and Gregory P. Sturtz, both of Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 3, 1986, Ser. No. 903,192
Int. Cl.[5] B22C *9/04*
U.S. Cl. 164—36 **6 Claims**

1. In a method for making metal castings wherein a composite core assembly comprising at least one casting core and one temporary core are in intimate contact and wherein said temporary core is removed prior to casting, the improvement which comprises:

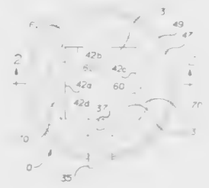
forming said temporary core comprising an aggregate and a binder selected from the group consisting of a silica sand aggregate and a sucrose or starch and water binder, or an aggregate soluble in aqueous solvent and a phenolic resin binder; said temporary core being sufficiently soluble in aqueous solvent for its removal prior to metal casting, said casting core not being removed by said aqueous solvent.

4,922,992

MELT-HOLDING VESSEL AND METHOD OF AND APPARATUS FOR COUNTERGRAVITY CASTING

Richard J. Sabraw, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1988, Ser. No. 290,682
Int. Cl.[5] B22D *18/06*; C21B *3/00*
U.S. Cl. 164—63 **20 Claims**



1. A vessel for holding a melt, comprising bottom wall means of refractory material and upstanding side wall means of refractory material for forming a chamber to hold the melt, said side wall means including insulating air pocket means located peripherally and vertically relative to said chamber for reducing heat loss from the melt in said chamber by conduction through said side wall means.

14. A vacuum countergravity casting apparatus, comprising:

(a) a gas permeable mold having a mold cavity and a bottom ingate passage for admitting molten metal to the mold cavity,

(b) a molten metal holding vessel underlying said mold, said vessel comprising bottom wall means of refractory material and upstanding side wall means of refractory material for forming a chamber to hold the molten metal, said side wall means including insulating air pocket means located peripherally and vertically relative to the chamber for reducing heat loss from the melt by conduction throughout the side wall means,

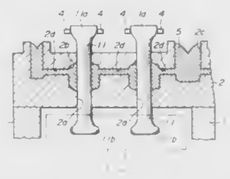
(c) means for relatively moving the mold and the vessel to position the mold in the chamber with the bottom ingate passage immersed in the melt, and (d) means for evacuating the mold cavity when the bottom ingate passage is immersed in the melt to urge the melt upwardly into the mold cavity.

4,922,993

METHOD OF FORMING A ZINC SLEEVE ON AN INSULATOR PIN

Hiroto Matsuo; Iwaji Kawamoto, both of Nagoya; Masamichi Ishihara, Ama, and Takaaki Nakagawa, Komaki, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jan. 25, 1989, Ser. No. 301,126
Claims priority, application Japan, Feb. 9, 1988, 63-29419
Int. Cl.[5] B22D *19/04*
U.S. Cl. 164—104 **2 Claims**



1. A method of forming a zinc sleeve on an insulation pin, comprising the steps of:

dipping an insulator pin into molten zinc, thereby heating the insulator pin to substantially the same temperature as that of the molten zinc;

removing the insulator pin from the molten zinc;

placing the insulator pin wetted with the molten zinc into a die having an open-top cavity such that said open-top cavity defines an annular open-top molding cavity around the insulator pin, said die being at a temperature below that of said insulator pin when said insulator pin is placed therein;

pouring molten zinc into the annular molding cavity through the open top thereof; and

solidifying the zinc in the annular molding cavity to form a zinc sleeve on a substantially centrally located axial portion of the insulator pin as an integral part thereof.

4,922,994

APPARATUS FOR POURING MOLTEN STEEL INTO A MOLD IN CONTINUOUS CASTING OF STEEL

Yasutsugu Ogura, and Ryuichi Maeda, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,587
Claims priority, application Japan, Nov. 6. 1987, 62-169782[U]
Int. Cl.[5] B22D *11/10*
U.S. Cl. 164—437 **10 Claims**

1. An apparatus for pouring molten steel into a mold in continuous casting of steel, comprising:

a tundish for holding molten steel;

a first nozzle arranged at the bottom of said tundish, said first nozzle having a spherical shape opening through which molten steel flows out of said tundish;

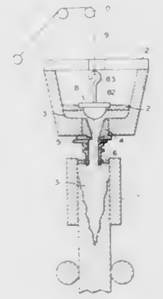
a sliding plate means mounted at a lower portion of said first nozzle for opening and closing said first nozzle;

an immersion nozzle arranged under said sliding plate means and having an opening through which molten steel is poured into the mold; and

a block body having a core body therein, said block body including:

a semi-spherically shaped refractory member around at least a portion of said core body, said semi-spherically shaped refractory member being sufficiently large to cover said opening of said first nozzle, and said semi-spherically shaped refractory member having a radius of curvature of from 0.7 to 3 times the diameter of said opening of said first nozzle; and

a substantially disc-shaped flange made from refractory material and coupled to an upper portion of said semi-spherically shaped refractory member and extending



outwardly of said semi-spherically shaped refractory member; and

said block body having a bulk specific gravity which ranges between the bulk specific gravity of slag and that of molten steel.

4,922,995

METHOD OF PRODUCING MONOLITHIC METAL BLANKS BY FREEZING-ON TECHNIQUES

Boris A. Movchan; Vladimir A. Panna; Evgeny V. Chernenko, and Naum A. Gorba, all of Kiev, U.S.S.R., assignors to Institut Elektrosvarki Imeni E.O. Patona an USSR, Kiev, U.S.S.R.

Filed Nov. 8, 1988, Ser. No. 268,742
Claims priority, application U.S.S.R., Apr. 8, 1987, 4293750
Int. Cl.[5] B22D *23/00, 27/02*
U.S. Cl. 164—469 **9 Claims**



1. A method of producing monolithic blanks by freezing-on techniques, comprising:

(a) producing a bath of a liquid melt of metal;

(b) heating the surface of said liquid melt of metal according to a preset program to produce a variable temperature field, the isotherms of which having a temperature close to the solidification temperature of the alloy and corresponding to the contour of said blank to be produced;

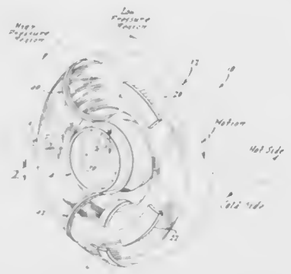
(c) contacting a dummy bar with said liquid melt of metal and forming the blank so that the contour of said isotherm is similar to the contour of the area produced by the intersection of the dummy bar or blank and the surface of the liquid metal melt.

4,922,996
METHOD AND APPARATUS FOR HEAT RECOVERY FROM HYDRAULIC OIL
Cyril A. Rees, 23, The Boltons, Portarlingtoo Close, Portarlington Road, Westbourne, Bournemouth, Dorset BH14 2DR, England
Filed Mar. 3, 1988, Ser. No. 164,931
Int. Cl.[5] F28F *27/00;* B29C *45/73;* G05D *23/00*
U.S. Cl. 165—1 6 Claims



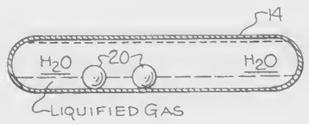
1. A method of reducing heat present in hydraulic oil in hydraulic circuitry of a machine in which oil at a temperature of at least 40° C. is circulated from the machine through a heat exchanger in heat exchange relation with water circulated therethrough, the temperature of the water entering the exchanger being at least 28° C.; and the quantity of water circulated through the exchanger is controlled such that the difference in temperature of the oil entering and leaving the exchanger is not more than 10° C.

4,922,997
FRICTION DRIVE TOROIDAL REGENERATOR
Robert H. Meyer, West Bloomfield; Ronald C. Pampreen, Bloomfield Hills, both of Mich., and Kenneth W. Sawyer, Escondido, Calif., assignors to Williams International Corporation, Walled Lake, Mich.
Filed Mar. 7, 1988, Ser. No. 165,083
Int. Cl.[5] F28D *19/00*
U.S. Cl. 165—8 4 Claims



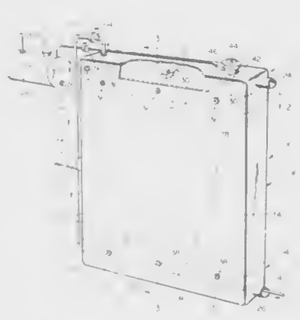
1. In combination with a rotatable toroidal regenerator, a single drive roller having an outside diameter smaller that an inside diameter of said toroid said drive roller being disposed internally of said toroid and frictionally engaged therewith at a single contact, said drive roller being rotatable about an axis extending parallel to and spaced from the axis of rotation of said toroid, said driver roller effecting rotation of said toroid upon rotation of said drive roller.

4,922,998
THERMAL ENERGY STORAGE APPARATUS
Peter Carr, 162 Winners Cir., Cary, N.C. 27511
Filed Nov. 5, 1987, Ser. No. 117,239
Int. Cl.[5] F28D *20/00;* F24H *7/04;* F25D *3/00*
U.S. Cl. 165—10 20 Claims



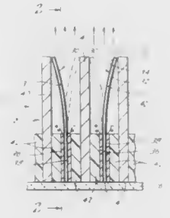
1. A thermal energy storage apparatus comprising a sealed container, an energy storage medium disposed in said container, said medium including water and a gas capable of forming a gas hydrate with the water at a transition temperature which is above 32° F., and movable means positioned within said container for providing mechanical movement within the medium and mechanical contact between structural elements of the apparatus within the medium to facilitate the formation of the gas hydrate at or below said transition temperature.

4,922,999
RADIATOR WITH LEAK DETECTING AND LEAK-ISOLATING SYSTEM
Bennie J. Stokes, 1031 W. Verdine, and Dyrell K. Stokes, Rte. 3, Box 1354, both of Sulphur, La. 70663
Filed May 4, 1989, Ser. No. 347,018
Int. Cl.[5] F28F *11/06*
U.S. Cl. 165—40 12 Claims



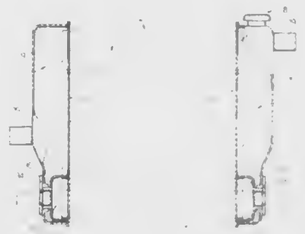
1. A radiator with leak detecting and isolating system, said radiator including a tube core having opposite ends and end tanks sealingly secured to said ends and into which said ends open, said tube core including a plurality of discrete tube sections, communicating means individually communicating each discrete tube section end with the corresponding end tank, said communication means including a liquid flow controlling valve operatively associated with each discrete tube section end and the corresponding end tank for controlling the flow of liquid therebetween, heat transfer liquid condition sensing means operative to sense an undesirable condition of heat transfer liquid in said system, actuating means operative to close each of said liquid flow controlling valve responsive to said heat transfer liquid condition sensing means sensing an undesirable condition, gas pressure means operative to pressurize each of said discrete tube sections, pressure sensing means operatively associated with each discrete tube section to sense a pressure in the corresponding tube section after being pressurized by said gas pressure means, and control means operative to open the liquid flow controlling valves to each of said discrete tube sections in which a pressure is sensed while maintaining the flow controlling valves of each discrete tube section with no pressure sensed closed.

4,923,000
HEAT EXCHANGER HAVING PIEZOELECTRIC FAN MEANS
Richard D. Nelson, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.
Filed Mar. 3, 1989, Ser. No. 318,297
Int. Cl.[5] H01L *23/46;* F04B *35/04*
U.S. Cl. 165—122 7 Claims



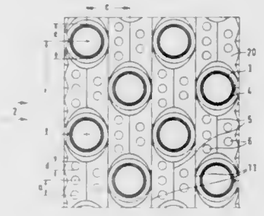
1. A fluid heat exchanger for cooling an electronic component comprising,
a housing having a base for receiving heat from an electronic component,
said housing having a fluid inlet and a fluid outlet,
a plurality of flexible blades positioned in the housing,
piezoelectric means connected to the blades for vibrating the blades to flow fluid from the inlet to the outlet,
means in the housing connected to the base for conducting heat from the base to the flow of fluid, and
said means for conducting heat from its base are the flexible blades which are of a heat conductive material.

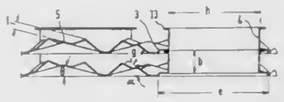
4,923,001
INTEGRAL WATER/OIL RADIATOR, PARTICULARLY FOR VEHICLES
Dario Marcolin, Grugliasco, Italy, assignor to Fiat Auto S.p.A., Italy
Filed Sep. 26, 1989, Ser. No. 412,654
Claims priority, application Italy, Sep. 30, 1988, 67879 A/88
Int. Cl.[5] F28D *11/053*
U.S. Cl. 165—140 6 Claims



1. An integral water/oil radiator, in particular for a vehicle engine, of the type comprising a plurality of finned tubes disposed parallel to each other and connected at their opposing ends to respective header elements provided with respective pairs of pipe stubs for connection to a water and oil circulation circuit respectively, characterised in that said finned tubes define a single monolithic finned tube bundle connected abuttingly to said header elements; these latter comprising a pair of cup members defining the header elements for the oil, formed integrally with and abutting cantilevered against said tube bundle in correspondence with opposing ends of a first series of adjacent tubes of said tube bundle, these being consequently hydraulically connected together in a fluid-tight manner and hydraulically isolated from a second series of tubes defined by the remaining tubes of said tube bundle, and further comprising a pair of chambers defining the header elements for the water, which are abuttingly fixed in a fluid-tight manner to the opposing ends of said tube bundle so as to hydraulically connect together said second series of tubes, and in their interior house said cup members in a fluid-tight manner.

4,923,002
HEAT EXCHANGER RIB
Roland Haussmann, Leimen, Fed. Rep. of Germany, assignor to Thermal-Werke, Warme-Kälte-Klimatechnik GmbH, Hockenheim, Fed. Rep. of Germany
Filed Oct. 22, 1987, Ser. No. 111,481
Int. Cl.[5] F28D *1/04*
U.S. Cl. 165—151 19 Claims





1. In a ribbed-tube heat exchanger for a motor vehicle having a plurality of spaced ribs for joint ribbing of a plurality of heat exchanger tubes wherein ambient air, as a first heat exchange fluid, flows in a given direction along a surface of the ribs and a second heat exchange fluid is conducted in the heat exchanger tubes, with said ribs being made of aluminum or an aluminum alloy and being corrugated in the direction of flow of the first fluid, whereby wave crests and wave troughs of the corrugations extend transverse to the direction of flow of the first fluid, and further including connecting sleeves, connecting a respective said rib to the heat exchanger tubes, fastened and shaped to the respective said rib and disposed such that at least one wave crest of the corrugations extends between two of said connecting sleeves which are disposed adjacent one another transversely to the flow direction of the first fluid, and local air guidance profiles shaped in the corrugated surface of the respective said rib in the spaces between said connecting sleeves; the improvement wherein: said air guidance profiles are constituted of at least predominantly closed bulges, each of a height of at least 15% and at most 80% of the spacing between adjacent said ribs in the ribbed-tube heat exchanger; and, on a respective said rib, each said bulge is disposed on a slope of the corrugation and is spaced from both ends of the slope in the direction of air flow, and the maximum cross-sectional dimension of each said bulge is between 50% and 80% of the length of the slope in the direction of air flow.

4,923,003

HEAT EXCHANGER

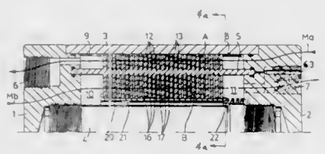
Stig G. Stenlund, Saltsjöbaden, Sweden, assignor to Hypeco AB, Malmo, Sweden

PCT No. PCT/SE84/00245, § 371 Date Feb. 25, 1986, § 102(e) Date Feb. 25, 1986, PCT Pub. No. WO86/00395, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 28, 1984, Ser. No. 847,659

Int. Cl.[5] F28F *13/02, 1/10*

U.S. Cl. 165—165 **19 Claims**



1. A heat exchanger comprising at least two chambers (A, B) separated by means of a medium-impervious, thermally conductive partition wall (5), said chambers being through-passed by a respective one of two media (Ma, Mb) between which heat transfer is to take place, and each of said chambers being provided with at least one inlet and at least one outlet, the interior of at least one chamber being divided into a large number of flow passages (13,17) which are connected in parallel with respect to the flow of medium therethrough, the entrance ends and exit ends of the passages communicating respectively with he inlet and outlet of said chamber through distributing channels (14,18) and collecting channels (15,19) respectively, and the defining and separating walls (12,16) of said flow passages comprising a material of high thermal conductivity and being in good heat-transfer integral contact with said partition wall (5), and in which heat exchanger the flow passages (13,17) have a flow area so adapted to the medium flowing therethrough that said medium flow in said flow passages is substantially totally laminar with no central turbulent zone, characterized in that the height (h) of the flow passages (13,17) and therewith the passage walls (12,16) when seen in a direction perpendicular to the partition wall (5), has a value not exceeding 350 % of the value obtained by solving the following equation system, although not greater than that corresponding to S=H

$$\left.\begin{aligned} H^3 + H^2 (S + 1.5) - 0.5\ S^2 &= 0 \\ S &= \frac{s}{2v}\sqrt{\frac{\lambda}{\lambda_M}} \\ H &= \frac{h}{v} \end{aligned}\right\} \quad (3)$$

where

v=half the wall thickness of the partition wall (m)

s=the flow-passage width parallel with the partition wall (m)

h=the height of the flow passages, and therewith the passage walls, perpendicularly to the partition wall (m)

λ=the thermal conductivity of the material in the passage walls (W/mK)

λ_M=the thermal conductivity of the medium (W/mK) flowing through the flow passages,

and in that the thickness (t) of the passage walls (12,16) parallel with the partition wall (5) has a value which constitutes between 30 % and 500 %, of the value obtained by the equation

$$t_{opt} = 2\,h\sqrt{\frac{\lambda_M}{\lambda}} \quad (2)$$

where

t=the passage wall thickness (m).

4,923,004

COMFORT HEAT EXCHANGER

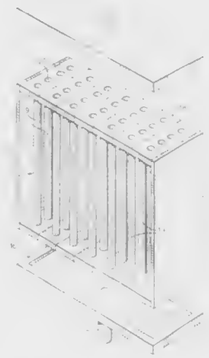
Eldon L. Fletcher, Kingston, and Tiong Hap (Hans) Kho, Chatham, both of Canada, assignors to Du Pont Canada, Inc., Mississauga, Canada

Filed May 12, 1988, Ser. No. 193,546

Claims priority, application United Kingdom, May 14, 1987, 87.11428

Int. Cl.[5] F28F *9/02, 9/16, 9/22*

U.S. Cl. 165—175 **18 Claims**



1. A device manufactured from a thermoplastic polymer, said device essentially comprising a plurality of transverse parallel hollow tubes integrally connected by a radiused and flared integral junction at each end to a substantially rigid end element, each of said end elements having planar sides and opposing faces, the tubes being internally connected to one face of each end element, said end elements having orifices therein extending between said opposite faces and being in fluid flow communication with said hollow tubes, and the hollow tubes having been oriented to increase the length thereof by at least two times and to obtain an internal diameter of at least 0.5 times that of the tubes prior to orientation, the walls of said tubes between the integral junctions being of substantially uniform thickness.

4,923,005

SYSTEM FOR HANDLING REELED TUBING

Tibor Laky, Dallas, and Stewart H. Fowler, Jr., The Colony, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 5, 1989, Ser. No. 293,640

Int. Cl.[5] E21B *19/22, 29/08, 33/064*

U.S. Cl. 166—55 **13 Claims**

1. A shear comprising;

first and second opposed rams,

means for extending and retracting said rams,

said first ram having a first abutment member with a substantially semicylindrical vertically extending convex abut ment surface for bending the wall of a vertically extending tubing into a double C configuration,

said second ram carrying a cutting blade with a horizontally extending cutting edge, and

a cutout in said blade adjacent the cutting edge and on the side of the blade adjacent said abutment surface,

said means for extending said rams extending said abutment surface and cutting edge into overlapping relationship to cut a tubing and crimp the tubing in said cutout.

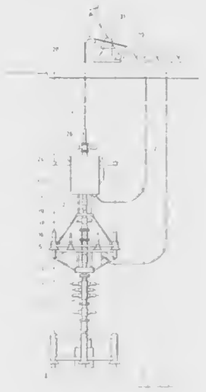
10. A tubing handling system comprising:

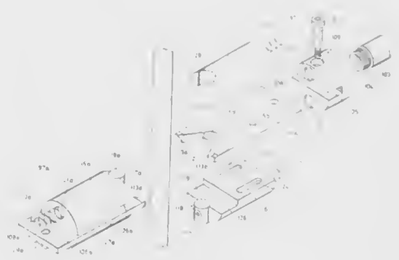
a shear comprising:

first and second opposed rams,

means for extending and retracting said rams, said first ram having a first abutment member with a substantially semicylindrical vertically extending convex abutment surface for bending the wall of a vertically extending tubing into a double C configuration,

said second ram carrying a cutting blade with a horizontally extending cutting edge, and





a cutout in said blade adjacent the cutting edge and on the side of the blade adjacent said semicylindrical surface,

said means for extending said rams extending said semicylindrical surface and cutting edge into overlapping relationship to cut a tubing and crimp the tubing in said cutout;

a tubing guide attached to the top of said shear and centering a tubing in said shear comprising:

a tubular flexible member for receiving a tubing, and

a coiled spring embedded in the flexible member;

a tubing injector in an enclosure for moving tubing though a wellhead: and

a stripper attached between the injector and shear centering a tubing in the shear comprising:

a housing,

upper and lower confronting cup-shaped receptacles in said housing,

resilient seals in said receptacle,

a bore through the receptacles and seals for receiving a tubing, holding means between said resilient seals holding them in engagement with said receptacles and with a tubing to seal therewith, and

fluid relief ports in said housing between said receptacles to exhaust fluid from said housing.

4,923,006

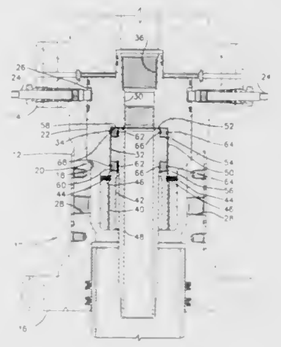
INSULATING SUPPORT FOR TUBING STRING

Michael P. Hartmann, and Jerry D. Smith, both of Houston, Tex., assignors to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Aug. 7, 1989, Ser. No. 373,093

Int. Cl.[5] E21B *33/03, 33/04*

U.S. Cl. 166—65.1 **16 Claims**



2. A wellhead structure comprising

a housing having an internal landing seat,

a hanger having an external landing shoulder adapted to be landed on said housing landing seat to support said hanger within the housing,

said hanger having an upper bore and a lower counterbore with a downwardly facing shoulder between said bore and said counterbore,

a hanger mandrel having a tubular body and a flange extending outwardly therefrom near the upper end thereof,

a first annular bushing of insulating material positioned around the upper end of said mandrel and between said hanger counterbore shoulder and the upper surface of said mandrel flange,

a second annular bushing of insulating material positioned around said mandrel and below said mandrel flange within said counterbore,

means secured to said hanger and providing supporting engagement of said second annular bushing,

said bushings being sized to maintain said mandrel in spaced relationship to said hanger to prevent electrical contact therebetween.

4,923,007

INFLATABLE PACKER WITH IMPROVED REINFORCING MEMBERS

Lawrence Sanford, and Charles O. Stokley, both of Houston, Tex., assignors to Tam International, Houston, Tex.

Filed Nov. 15, 1988, Ser. No. 272,238

Int. Cl.[5] E21B *33/127*

U.S. Cl. 166—187 **15 Claims**

1. An inflatable packer for setting downhole in an oil or gas

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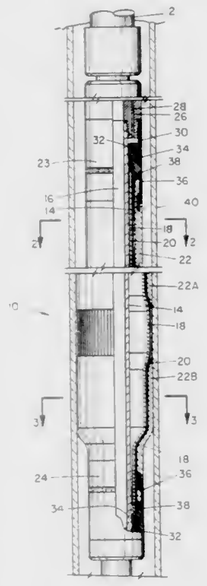
well in response to fluid pressure to prevent fluid flow past the packer, the packer comprising:

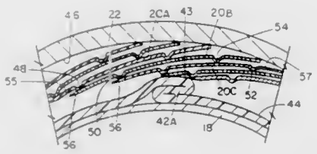
an upper packer head and a lower packer head;

an inflatable elastomeric bladder sleeve having upper and lower ends secured to the upper and lower packer heads, respectively;

an inflatable tubular packer cover radially outward of the bladder sleeve and extending axially between and interconnecting the packer heads; and

a plurality of radially overlapping metal reinforcing members extending axially between the packer heads and each positioned in an annulus between the bladder sleeve and the tubular packer cover, each reinforcing member have a first leading portion for engaging and reinforcing the





inflatable elastomeric bladder sleeve and a second circumferentially spaced trailing portion positioned radially between the first portion of an adjacent reinforcing member and the tubular packer cover, each of the reinforcing members being slidably movable in a substantially tangential direction relative to its adjacent reinforcing member to vary the circumferential spacing between the reinforcing member and the adjacent reinforcing member, each reinforcing member further including a stop member axially positioned between the upper and lower packer heads for limiting to a preselected amount the movement of each reinforcing member in the substantially tangential direction relative to its adjacent reinforcing member during expansion of the packer, such that gaps between reinforcing members and rupture of the bladder are minimized.

4,923,008

HYDRAULIC POWER SYSTEM AND METHOD

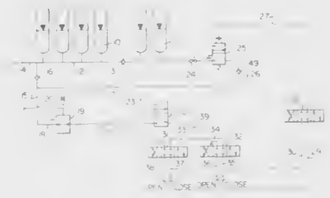
Stanley W. Wachowicz, Edmonton, and R. James Downie, Sherwood Park, both of Canada, assignors to Baroid Technology, Inc., Houston, Tex.

Filed Jun. 1, 1989, Ser. No. 359,968

Claims priority, application Canada, Jan. 16, 1989, 588305

Int. Cl.[5] **E21B** *29/08, 33/06;* **F16K** *31/122;* **F17D** *3/01*

U.S. Cl. 166—250 **15 Claims**



1. A hydraulic system for supplying high pressure hydraulic fluid to a cylinder for operating a shearing and/or shut-off ram for a blowout preventer, comprising means for supplying high pressure hydraulic fluid to the cylinder, said hydraulic fluid supply means comprising first and second storage means for storing hydraulic fluid under pressure, first conduit means for supplying hydraulic fluid under pressure from said first storage means to the cylinder, a pressure sensing device for determining the back pressure in said first conduit means, second conduit means for supplying hydraulic fluid under pressure from said second storage means to the cylinder and valve means for automatically opening said second conduit means when the back pressure in the first conduit means reaches a predetermined amount.

13. A method for supplying high pressure hydraulic fluid to a cylinder for operating a shearing and/or shut-off ram for a blowout preventer, which comprises supplying the fluid from first and second high pressure hydraulic storage means by way of first and second conduit means, and including the steps of initially supplying fluid to the cylinder from the first storage means via the first conduit means until a back pressure develops in said first conduit means, sensing the back pressure by means of a pressure sensing device, generating a signal when the back pressure reaches or exceeds a predetermined value, said signal causing a valve to automatically open in the second conduit thereby providing a high pressure flow of fluid from the second storage means to the cylinder.

4,923,009

STEAM ENHANCED OIL RECOVERY PROCESSES AND COMPOSITIONS FOR USE THEREIN

David R. Watkins, Irvine, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed May 5, 1989, Ser. No. 348,219

Int. Cl.[5] **B21B** *43/22, 43/24, 33/134*

U.S. Cl. 166—272 **72 Claims**

1. A natural resource recovery system comprising:

(a) a natural resource bearing formation;

(b) a well penetrating the natural resource bearing formation; and

(c) a composition for enhancing the recovery of the natural resource from the formation, the composition (i) being present in at least a portion of the natural resource bearing formation, and (ii) comprising steam having a vapor phase and a liquid phase, and a fluorocarbon surfactant, the liquid phase of the steam having a pH of less than about 11.

61. A process for recovering oil from an oil bearing formation, the process comprising the steps of:

(a) injecting a composition into at least a portion of an oil bearing formation, the composition comprising steam having a vapor phase and a liquid phase, and a surface tension reducing concentration of a fluorocarbon surfactant in the vapor phase; and

(b) withdrawing oil from the oil bearing formation.

65. A process for recovering oil from an oil bearing formation, the process comprising the steps of:

(a) injecting a composition into at least a portion of an oil bearing formation, the composition comprising steam having a vapor phase and a liquid phase, and a foam forming concentration of a fluorocarbon surfactant in the vapor phase; and

(b) withdrawing oil from the oil bearing formation.

4,923,010

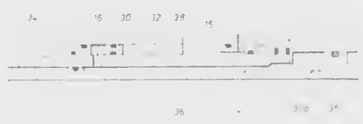
MUD SOLIDS IMMUNE CLEAN FLUID COMPENSATING SYSTEM

James M. Upchurch, and Dinesh R. Patel, both of Sugarland, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 292,701, Jan. 3, 1989, abandoned. This application Sep. 27, 1989, Ser. No. 414,624

Int. Cl.[5] **E21B** *43/116*

U.S. Cl. 166—297 **13 Claims**



1. A well tool, comprising:

a housing defining an internal chamber;

a channel disposed transversely through a portion of said housing;

a sleeve disposed around said housing and enclosing said channel thereby defining an annular space between the sleeve and the housing, one end of said annular space communicating with said channel, the other end of said annular space being completely open;

a piston disposed in said annular space; and

a working fluid disposed in a cavity formed by said chamber, said channel and one portion of said annular space between said piston and said one end of said annular space, said piston being adapted to move within said annular space thereby moving said working fluid in said cavity,

the other portion of said annular space between said piston and said other end of said annular space being bounded solely by three sides and being adapted to contain particulate matter, said three sides being said housing, said piston, and said sleeve, the piston pushing substantially all of said particulate matter out of the completely open end of said annular space when said piston moves toward said completely open end of said annular space.

4,923,011

DRILL STEM MUD WIPING APPARATUS

Uvon Skipper, 7409 S. Rice Ave., Bellaire, Tex. 77401

Filed Aug. 21, 1989, Ser. No. 396,233

Int. Cl.[5] **E21B** *12/06, 33/08, 37/00*

U.S. Cl. 166—311 **19 Claims**

11. A wiping apparatus adapted to be placed in a drill stem when pulling the drill stem from a well borehole, the apparatus comprising:

(a) an elongate weighted mandrel;

(b) an elongated sleeve telescoped around said mandrel for wiping movement thereabout wherein said sleeve comprises:

(i) spaced upper and lower ends having a sufficiently narrow diameter to pass through internal upset pipe without contact against the internal upset pipe;

(ii) a central expanded bulge between said ends thereof and sized to contact the inside wall of the pipe making up the drill stem;

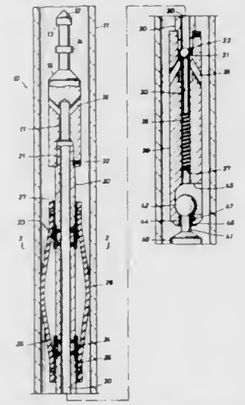
(iii) said sleeve being formed of resilient material permitting reduction in diameter when encountering an internal upset in the pipe making up the drill step; and

(iv) wherein said sleeve has a bias causing said sleeve to expand radially outwardly to contact against and wipe the interior wall of the pipe and wherein flexure occurs on entry into and departure from internal upsets;

(c) means controllably limiting movement of said sleeve along said mandrel.

15. A method of pulling a dry pipe joint on tripping a drill stem from a well borehole, the method comprising the steps of:

(a) from the upper end of the drill stem, dropping a mandrel centered sleeve into the top most drill pipe;



(b) sizing upper and lower ends of the sleeve on the mandrel sufficiently small so that said sleeve ends pass through an internal upset of the pipe without contacting the internal upset;

(c) wiping the pipe inside wall between internal upsets with a central bulge on said sleeve to force drilling fluid downwardly as wiped;

(d) reducing the diameter of the sleeve bulge on passing said bulge through an internal upset;

(e) supporting said sleeve above the column of drilling fluid in the drill stem; and

(f) removing the top most drill pipe after wiping after directing the mandrel centered sleeve into the next drill pipe.

4,923,012

SAFETY VALVE FOR HORIZONTAL COMPLETIONS OF SUBTERRANEAN WELLS

Mark E. Hopmann, Broken Arrow, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 9, 1989, Ser. No. 308,872

Int. Cl.[5] **F21B** *34/06*

U.S. Cl. 166—385 **10 Claims**

1. Apparatus for securement onto one end of a continuous length of remedial tubing introduceable into a subterranen well and concentrically insertable through production tubing previously positioned within said well, said well having a deviated configuration including an entry portion communicating with a curved portion extending downwardly in the well from said entry portion, and a generally linear end portion traversable with a production formation, said apparatus comprising:

(1) a cylindrical housing;

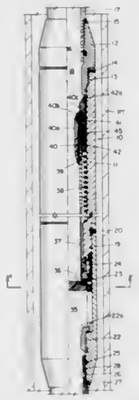
(2) means at one end of said housing for securement to said one end of said remedial tubing;

(3) a fluid throttling sleeve carried within said housing and having a first internal diameter for abatement of velocity

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of primary fluid flow from the top of said well, through said remedial tubing and said housing;

(4) a control mandrel responsive to fluid flow velocity abatement by said fluid throttling sleeve having a second internal diameter larger than the internal diameter of said fluid throttling sleeve and movable in a first direction to position a valve head in open position when in said generally linear end portion of said well to permit primary fluid to flow through said remedial tubing and said apparatus to



the production formation in the generally linear end portion of said well, and movable in a second direction to position said valve head in closed position to prevent passage of fluid from said production formation within said generally linear end portion of said well through said apparatus and said remedial tubing to the top of said well; and

(5) valve means including valve head and seat members carried by said housing.

4,923,013

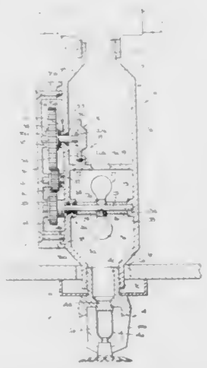
FIRE SPRINKLER SYSTEM AND AUTOMATIC SHUT-OFF VALVE THEREFOR

Sergio K. De Gennaro, 7410 Ridge Blvd., Brooklyn, N.Y. 11207

Filed Aug. 14, 1989, Ser. No. 393,596

Int. Cl.[5] A62C *37/10*

U.S. Cl. 169—90 14 Claims



1. In a fire sprinkler system for a protected building space, said system including a water distribution pipe extending across the top of the building space and fed from the building water main, at least one sprinkler head connected with said water distribution pipe, each said sprinkler head having therein a water exit passageway communicating with said water distribution pipe, a plug sealing said water exit passageway, and rigid fusible metal bar means anchored in said sprinkler head and bearing against said plug to restrain the same under normal circumstances against ejection from said exit passageway by the water pressure in said water distribution pipe;

the improvement comprising:

(a) a respective tubular pipe fitting associated with each sprinkler head and having opposite ends, each said pipe fitting being connected at one end to said water distribution pipe and at its other end to an associated sprinkler head, with the interior of each said pipe fitting being in communication with both said water distribution pipe and said water exit passageway in said associated sprinkler head;

(b) a respective multi-vaned paddle wheel located interiorly of each said pipe fitting intermediate said ends thereof and having an axle mounted for rotation about an axis transverse to said pipe fitting;

(c) a respective valve plate located interiorly of each said pipe fitting intermediate said one end thereof and the associated paddle wheel, each said valve plate having a valve opening therein disposed eccentrically to the associated axle and over the vanes at one side region of the associated paddle wheel;

(d) a respective movable valve member located interiorly of each said pipe fitting and adapted to seal the associated valve opening, each said valve member being normally in a first position relative to the associated valve plate in which it leaves said valve opening thereof unobstructed and being arranged for movement to a second position relative to said associated valve plate in which it seals said valve opening thereof;

(e) respective actuator means for each said valve member and operable for enabling movement of said valve member from said first to said second position thereof; and

(f) respective gear means operatively interconnected between each said paddle wheel axle and the associated actuator means for operating the latter in response to rotation of said paddle wheel;

(g) whereby, upon ejection of said plug from said water exit passageway of said at least one sprinkler head by the water pressure in said water distribution pipe in the event the temperature in the protected building space rises sufficiently to weaken said fusible metal bar means of that sprinkler head and cause the same to yield, the resultant rotation of the associated paddle wheel under the force of water flowing from said water distribution pipe into the respective pipe fitting and through said valve opening thereof past said associated paddle wheel and thence through said water exit passageway into said protected building space operates the associated actuator means via the respective gear means to enable said movement of the associated valve member over a predetermined time interval from said first to said second position thereof for interrupting, after said predetermined time interval, the flow of water into said protected building space.

4,923,014

AGRICULTURAL IMPLEMENT WITH GAS SPRINGS AND CONTROL

Gijsbert J. Mijnders, Nieuw-Vennep, Netherlands, assignor to Multinorm B.V., Netherlands

Filed Dec. 19, 1984, Ser. No. 683,615

Claims priority, application Netherlands, Dec. 22, 1983, 8304410; Jul. 25, 1984, 8402348

Int. Cl.[5] A01B *63/16*

U.S. Cl. 172—2 4 Claims

3. A vehicle comprising a frame having ground engaging wheel means and an agricultural implement, lifting means for supporting said implement in elevated relation to the ground and gas spring means for supporting said implement relative to the ground, said gas spring means comprising a plurality of gas springs in which the prevailing gas pressures may be different and a plurality of gas accumulators with each of said gas accumulators associated with one of said gas springs, said lifting



means comprising a hydraulic piston/cylinder assembly and at least one of said gas accumulators being in communication therewith, control means for controlling the pressures prevailing in said gas springs, said control means including a feed source of pressurized fluid in communication with said hydraulic piston/cylinder assembly, said feed source being a hydraulic cylinder.

4,923,015

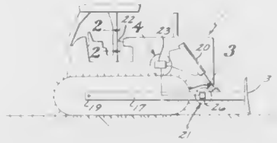
EARTH MOVER BLADE STABILIZING APPARATUS

James B. Barsby, 13116 LaJolla Cir., La Mirada, Calif. 90638, and Tiodoro Mondoy, 13551 Destino St., Cerritos, Calif. 90701

Filed Oct. 3, 1988, Ser. No 252,546

Int. Cl.[5] E02F *3/76;* A01B *63/111*

U.S. Cl. 172—4.5 16 Claims



1. An earth mover blade stabilizing apparatus for controlling the height of a blade carried from an earth mover by means of pivoted arm means rotatable about a transverse mounting axis and driven by a hydraulic cylinder, said apparatus comprising:

an inclinometer including a housing mounted on said arm means in a predetermined transverse plane and including sensor means disposed within said housing, said inclinometer further including a pendulum mounted from said housing for rotation about a pendulum axis disposed in said transverse plane, said pendulum naturally assuming a true vertical position not necessarily coplanar with the predetermined transverse plane, and including on the free end of said pendulum a magnetic element for generating a magnetic field, said sensor means for sensing said magnetic field, and operative in response to the location of said magnetic element on first and second sides of said predetermined transverse plane to produce respective first and second deviation signals of proportionate magnitude indicative of the position of said magnetic element relative to said sensor means;

electrical circuit means including an electrical source coupled with said sensor means and responsive to the magnitude of said first and second deviation signals to produce respective first and second drive signals of proportionate magnitude;

hydraulic control means coupled with said hydraulic cylinder and including electrical drive means operative in response to the magnitude of said first drive signal to direct a proportionate hydraulic fluid flow to one end of said hydraulic cylinder to rotate said control arm means in one direction towards a predetermined angle and operative in response to the magnitude of said second drive signal to direct a proportionate hydraulic fluid flow to the opposite end of said cylinder to rotate said control arm means in the opposite direction toward said predetermined angle whereby when said earth mover encounters an uneven rise or depression causing its blade to be raised or lowered thus raising or lowering said control arm means relative to said predetermined angle, said magnetic element in assuming a position in the true vertical plane will be correspondingly shifted with respect to said predetermined transverse plane causing said sensor means to generate said respective first or second deviation signals thus causing said electrical control circuit to generate said respective first or second drive signal to thus cause said hydraulic control means to direct fluid flow to said respective first or second end of said cylinder to cause said control arm to be driven back toward said predetermined angle.

4,923,016

SCARIFIER AND MOSS RAKE ADAPTED TO BE FITTED TO A SMALL POWER DRIVEN CULTIVATOR

René F. Moïse, Vichy, France, assignor to Forges des Margerides S.A., S-Yorre, France

PCT No. PCT/FR88/00265, § 371 Date Jan. 23, 1989, § 102(e) Date Jan. 23, 1989, PCT Pub. No. WO88/09113, PCT Pub. Date Dec. 1, 1988

PCT Filed May 24, 1988, Ser. No. 327,806

Claims priority, application France, May 25, 1987, 87 07647

Int. Cl.[5] A01B *45/02, 33/02*

U.S. Cl. 172—21 5 Claims



1. A cultivation device having ground cutting tools arranged for rotation in vertical planes about a common axis, the device comprising, in combination:

a drive unit including a pair of drive half-shafts coaxially extending from opposite sides thereof;

a pair of tool carrier shafts extending outwardly from the respective drive half-shafts;

two bearing members mounted adjacent the respective outer ends of the tool carrier shafts, the tool carrier shafts being freely rotatable with respect to their corresponding bearing members;

a plurality of longitudinal members extending in directions traverse to said common axis for respectively supporting said bearing members, said longitudinal members are connected together only by means of said bearing members, said tool carrier shafts and said drive half-shafts;

wheel means rotatably carried adjacent each end of each of said longitudinal members; and

means for adjustably connecting each of said bearing mem-

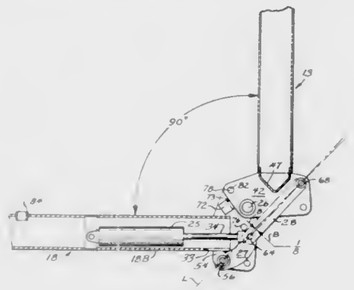
bers to its supporting longitudinal member, to thereby permit adjustment of the depth of cut into the ground of said cutting tools.

4,923,017

HINGE FOR VERTICALLY FOLDING WING SECTION OF AGRICULTURAL IMPLEMENT

Roger L. Meek, Williamsburg, and Alan F. Barry, Fairfax, both of Iowa, assignors to Kinze Manufacturing, Inc., Williamsburg, Iowa

Filed Sep. 6, 1989, Ser. No. 403,663
Int. Cl.[5] A01B *73/04*
U.S. Cl. 172—776 7 Claims



1. In an implement adapted to be drawn by a tractor and having an inner frame section and an outer frame section, an improved hinge assembly for connecting said outer frame section to said inner frame section and for moving said outer frame section from a generally horizontal use position to a generally vertical transport position comprising: main hinge pivot means for mounting said outer frame section to said inner frame section for pivotal motion about a horizontal axis; a hydraulic cylinder mounted at one end to said inner frame section and having a second end; a push link pivotally mounted at one end to said outer frame section and having a second end; a locator link pivotally mounted at one end to said inner frame section and having a second end; and pivot juncture means for pivotally interconnecting said second end of said hydraulic cylinder, said second end of said push link and said second end of said locator link to form a pivot juncture therewith, whereby when said hydraulic cylinder is retracted, said push link and said locator link are folded and said outer frame section is lowered to a generally horizontal use position, and when said hydraulic cylinder is extended, said push link and said locator link are unfolded, said outer frame section is rotated to, a vertical position and said pivot juncture is moved to a position to function as a locking means for locking said outer frame section mechanically in said vertical position such that said outer frame section remains in said vertical position when hydraulic pressure is lost in said hydraulic cylinder until said hydraulic cylinder is retracted.

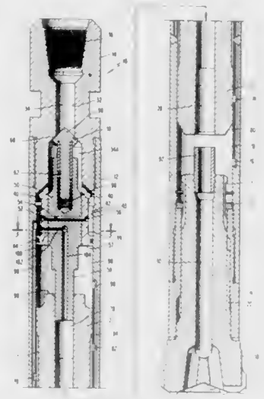
4,923,018

PERCUSSION DRILL

James F. Meek, Houston, Tex., assignor to Sandvik Rock Tools, Inc., Bristol, Va.

Filed Mar. 2, 1989, Ser. No. 317,865
Int. Cl.[5] B25D *17/14*
U.S. Cl. 173—78 20 Claims

1. A percussion drill comprising:
a casing,
a drill bit mounted at a front end of said casing,
a hammer piston slidably mounted in said casing behind said drill bit and arranged for reciprocation to impart percussive blows to said drill bit,
main fluid passage means for conducting pressurized fluid to said hammer piston for reciprocating said hammer piston,
exhaust fluid passage means communicable with said main fluid passage means upstream of said hammer piston for exhausting a portion of said pressurized fluid forwardly through said drill bit for flushing cuttings, and
an adjustable choke valve for regulating the flow of exhaust fluid, said choke valve being indexable between a plurality of adjusted positions for selectively communicating one of a plurality of different size exhaust ports with said main fluid passage means and said exhaust fluid passage means to regulate the amount of said portion of pressurized fluid being exhausted from said main fluid passage to said exhaust fluid passage means, said choke valve being indexable between at least the following distinct positions of adjustment;
a first position wherein a first amount of pressurized fluid is conducted from said main fluid passage means to said exhaust fluid passage means, said first amount being less than the amount of pressurized fluid conducted through said main fluid passage means,
a second position wherein a second amount of pressurized fluid greater than said first amount is conducted from said main fluid passage means to said exhaust fluid passage means, said second amount being less than the amount of pressurized fluid conducted through said main fluid passage means, and
a third position wherein substantially all of said pressurized fluid is conducted to said hammer piston.



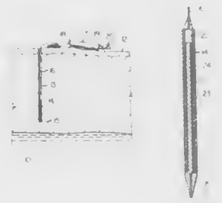
4,923,019

THERMOCHEMICAL PENETRATOR FOR ICE AND FROZEN SOILS

Peter H. F. Gammon, St. John's, Canada, assignor to Arctic Systems Limited, St. John's, Canada

Filed Feb. 28, 1989, Ser. No. 316,844
Int. Cl.[5] F25C *5/08*
U.S. Cl. 175—14 27 Claims

17. A process for penetrating ice which comprises;
providing a thermochemical reaction vessel having a confined thermochemical reaction zone and a penetrator tip, said confined reaction zone including an inlet means and an outlet means, said outlet means including a discharge nozzle, within said penetrator tip, in fluid communication with said confined reaction zone,
providing said confined reaction zone with a substantially immobilized first thermochemical reactant,
flowing an aqueous second thermochemical reactant in through said inlet means and into contact with said first thermochemical reactant to cause a controlled thermochemical reaction within the confined reaction zone with the production of steam and hot aqueous fluid and



discharging the reaction product, including the steam and hot aqueous fluid, through said discharge nozzle into contact with ice to be penetrated.

4,923,020

ROCK BIT WITH RIGID FACE SEALS AND RECESSED ENERGIZERS

Kelly, Jr., Joseph L., and Michael F. Welsh, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 23, 1988, Ser. No. 210,681
Int. Cl.[5] E21B *10/20*
U.S. Cl. 175—372 12 Claims

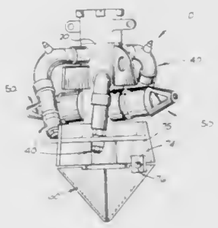
1. An earth boring bit with an improved pressure compensating face seal means, said bit comprising:
a body;
a cantilevered bearing shaft extending obliquely inwardly and downwardly from the body;
a cutter secured for rotation about the bearing shaft, with axial and radial play due to clearances;
a lubrication system in the body, including a hydrostatic pressure compensator;
seal groove means including registering shaft and cutter seal grooves with a pair of oppositely facing radial end walls and a pair of oppositely facing circumferential, beveled walls, one located in the cutter and the other in the shaft, each of which intersects a respective radial end wall;
a pair of rigid rings positioned in the seal groove means to have opposed and engaged sealing faces, each rigid ring having a bevel that is essentially parallel with and opposed to a selected essentially beveled wall in the groove means each of said bevel walls being free of a seal seat;
a cutter and a shaft resilient energizer ring, each of which sealingly engages one of said beveled walls of a respective one of the rigid rings, and continuously engages one of the oppositely facing beveled walls of the seal groove means to be in contact exclusively with said beveled walls and define a seal assembly positioned between the end walls of the seal groove;
the seal assembly being positioned intermediate the end walls of the groove means during assembly of the cutter on the bearing shaft and exposed to and moved axially by dynamic pressure differentials between the lubricant and the ambient drilling fluids;
the axial width of the engaged rigid rings being less than the axial, minimum width of the seal groove when the cutter is thrust outwardly on the bearing shaft to define at least one axial clearance to permit unrestricted axial movement of the rigid rings beteen the end walls of the groove when the cutter moves relative to the bearing shaft.

4,923,021

COMBINATION BIT FOR COKING OVEN

Veatchel A. Courmier, De Quincy, La.; Jerry L. Carnes, Midland, Pa., and Rahn Drost, Sulfur, La., assignors to Conoco Inc., Ponca City, Okla.

Filed Dec. 30, 1988, Ser. No. 292,290
Int. Cl.[5] B08B *9/04;* C10B *43/02;* E21B *7/18*
U.S. Cl. 175—382 17 Claims



1. Apparatus for cutting coke from a generally cylindrical coking oven having a given diameter, said apparatus comprising a cutting bit having a generally cylindrical body portion, a first set of cutting elements extending from said body portion and arranged for drilling a pilot hole which has a first relatively small diameter through said coke in said coking oven, wherein said first set of cutting elements comprises a first plurality of hydraulic jet nozzles extending in a direction 11° from parallel to a longitudinal axis of said body portion of said cutting bit in a first plane;
said cutting bit also having a second set of cutting elements extending from said body portion and arranged for cutting a larger hole which has a second relatively larger diameter through said coke in said coking oven;
manually operable control means mounted on said cutting bit for switching operability of said cutting bit from said first set of cutting elements to said second set of cutting elements, said control means being manually operably by a single workman upon removal of said cutting bit from said coking oven.

4,923,022

AUTOMATIC MAILING APPARATUS

Tzu-Yen Hsieh, Taipei, Taiwan, assignor to Chien-Hua Chang, Taou-Yuan, Taiwan

Filed Apr. 25, 1989, Ser. No. 343,002
Int. Cl.[5] G01G *23/38, 23/22;* B07C *5/00, 9/00*
U.S. Cl. 177—4 7 Claims

1. An automatic mailing apparatus comprising:
a casing with an upper and a lower portion, said upper

portion including a front panel having a letter insertion and retrieval slot formed therein for mailing operations;
a transfer means mounted in said casing behind said letter insertion and retrieval slot of said front panel and provided with a driving mechanism and conveyors for performing letter transferring operations;
a weighing means mounted in a middle portion of said transfer means in said casing with an electronic weighing balance for indicating the weight of a letter to be mailed;
a detecting means installed behind said front panel for detecting the mailing operations performed on said front panel and indicating the detected results;
a stamping means installed in a rear portion of said transfer



means in said casing which includes a stamping plate and a stamper driven by said driving mechanism for stamping a letter being weighed by said weighing means;
a collecting device installed in said lower portion of said casing which has an inclined guiding plate mounted below said transfer means, a plurality of collecting boxes provided below said guiding plate, and a plurality of gates formed in said guiding plate;
wherein, each of said gates is controlled by a solenoid valve so that a letter to be mailed will drop into one of said collecting boxes through one of said gates respectively facing said collecting boxes; whereby a letter received from said letter insertion and retrieval slot can be automatically transferred for weighing, stamping and sorting.

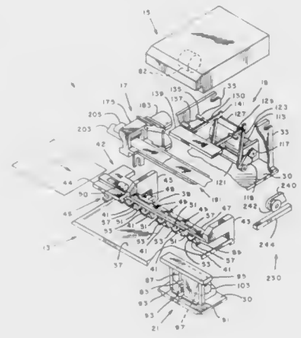
4,923,023

MODULAR MAILING MACHINE

Donald T. Dolan, Ridgefield; Robert T. Durst, Jr., Monroe; David W. Hubbard, Stamford, and Morton Silverberg, Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 134,625, Dec. 17, 1987, abandoned. This application Sep. 15, 1989, Ser. No. 408,435
Int. Cl.[5] G01G *23/22, 23/38, 19/00*
U.S. Cl. 177—25.15 **20 Claims**

1. A mailing machine comprised of a plurality of modules, each of said modules mounted in said mailing machine to perform a single process station, said mailing machine having a base and a plurality of support walls, wherein said modules comprises:
a scale module having means for weighing an envelope including,
a weighing plate having a plurality slots formed in said weighing plate and a recess,
support means for supporting said weighing plate in vertically spaced relationship to the base of said mailing machine;
a transport module having means for positioning said envelope in said process station and ejecting said envelope from said process station including,
a frame,
a plurality of rollers rotatably mounted to said frame,
frame support means for supporting said frame below said weighing plate and selectively placing said frame in a first position such that a portion of said rollers extend through said slots of said weighing plate or a second position such that said rollers repositioned generally below said weighing plate,
said frame and said frame support means be located generally between said mailing machine base and said weighing plate;



a meter module having a registration area and a printing means located in said registration area for imprinting an indicia on said envelope, said registration area being vertically aligned to and spaced above said recess in said weighing plate;
a platen module including,
a platen plate,
elastomeric member fixable mounted to a first surface of said platen plate,
platen support means for supporting said platen plate such that said elastomeric member is opposite said registration area of said meter module and such that said platen plate can be selectively positioned in a first position wherein said elastomeric member is in close proximity to said printing means of said meter module and a second position wherein said elastomeric member positioned generally below said weightplate of said scale module, and
wherein said modules operate in a manner generally functionally independent of any other module, does not interfere with the operation of any other module and said modules can perform there respective function to said envelope while said envelope resides at said process station.

4,923,024

APPARATUS FOR WEIGHTING AND MEASURING THE STATURE OF PERSONS

Jose M. S. Ferrer, C. Padua, 86-88, 08006 Barcelona; Jose N. Pajares, C. Cultura, 15, Santa Coloma De Gramenet Barcelona, and Manuel T. Torres, C. Sant Bru, 210, 08911 Badalona (Barcelona), all of Spain

Filed Jul. 5, 1989, Ser. No. 375,745
Claims priority, application Spain, Jul. 18, 1988, 8802582
Int. Cl.[5] G01G *19/00, 23/38*
U.S. Cl. 177—245 **5 Claims**



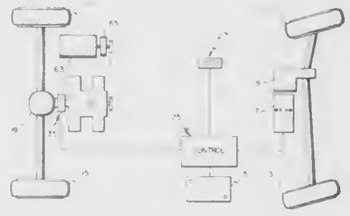
1. Apparatus for weighing and measuring the stature of persons, of the type comprising a device for measuring the stature of a person (**1**) and an electronic scales (**2**), the device for measuring the stature being of the type including an emitter-receiver device (**3**) transforming an electric signal to an ultrasonic pulse which is emitted, and transforming a received ultrasonic pulse to an electric signal, a microprocessor, a device (**4**) for displaying the stature of the examined person, and at least one device (**5**) indicating the end of the stature measuring operation, the microprocessor being communicated with the emitter/receiver device (**3**), with the display device (**4**) and with at least an indicator device (**5,6**), through an input/output port (**14**) and buffers (**15,16,17,18**), the emitter-receiver device (**3**) including a transducer (**11**) transforming an electric signal to an ultrasonic pulse in both emission and receive directions, an oscillator connected to the transducer in the emitting network, and a filter, an amplifier and an alternating/continuous converter series connected in the receive network, and the electronic scales being of the type including a load cell, an analogic/digital converter device, a microprocessor and a display for the weight placed onto the load cell, the microprocessor being in communication with the analogic/digital converter device and the display through an input/output port, characterized in that the device (**1**) for measuring the stature of persons and the scales (**2**) are connected to one and the same microprocessor (**13**), and the apparatus has a weight display and a stature display (**4**), the apparatus also comprises a printer (**20**) providing, for each stature, the corresponding ideal weight according to the data stored in the microprocessor (**13**), and the amplifier of the emitter/receiver device is of a variable gain in function of time with a view of linearizing the signal received in the emitter/receiver device as a function of the distance.

4,923,025

HYBRID ELECTRIC/ICE VEHICLE DRIVE SYSTEM

Clarence W. Ellers, 2892 Mesquite Dr., Santa Clara, Calif. 95051

Continuation-in-part of Ser. No. 789,404, Oct. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 283,611, Jul. 15, 1981, abandoned. This application Oct. 8, 1987, Ser. No. 108,581
Int. Cl.[5] B60L *11/12*
U.S. Cl. 180—65.2 **8 Claims**



1 A hybrid vehicle, comprising:
(a) a first set of wheels;
(b) a multi-speed transmission;
(c) electric motor means for driving said first set of wheels through said transmission;
(d) an internal combusion engine having a 12 volt alternator and an ignition circuit;
(e) a second set of wheels;
(f) a continuously variable magnetic torque converter means operatively interposed between said internal combustion engine and said second set of wheels for directly driving said second set of wheels by said internal combustion engine;
(g) control circuit means connected to said electric motor means and to said torque converter, said control circuit means including speed sensor means for energizing said torque converter means at reduced voltage when a preset speed is reached to activate said internal combustion engine, said torque converter locking up only when said 12 volt alternator builds its output voltage to its normal 14 volts value;
(h) means in said control circuit means responsive to the normal value of said output voltage of said alternator to deactivate said electric motor means;
(i) an accelerator pedal connected to said control circuit means;
(j) override means including a microswitch responsive to said accelerator operable when said vehicle is traveling at said preset speed and being driven by said internal combustion engine to reactivate said electric motor, whereby said electric motor and said internal combustion engine both drive said vehicle;
(k) a brake pedal for braking said vehicle; and
(l) a brake micro-switch connected to said control circuit and operated by pressure to said brake pedal to switch the vehicle back to electric drive, operation of said brake micro-switch automatically shutting down said internal combustion engine by opening said engine ignition and said torque converter circuits.

4,923,026

FLOOR DEVICE FOR VEHICLES

Hiroshi Shimoyama, Saitama, and Katsuyoshi Kawasaki, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

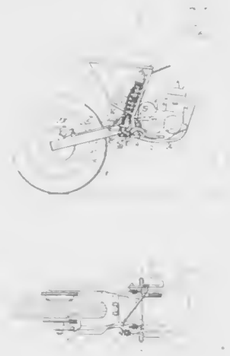
Continuation of Ser. No. 339,384, Jan. 15, 1982, abandoned. This application Apr. 16, 1985, Ser. No. 723,006

Claims priority, application Japan, Jan. 23, 1981, 56-8880[U]

Int. Cl.[5] B62D *61/08*

U.S. Cl. 180—215 **9 Claims**





1. A floor device for a vehicle including a single front wheel, comprising:

a floor portion arranged to be substantially flat in the longitudinal direction of said vehicle;

a footrest portion formed to be continuous with a front portion of said floor portion;

said footrest portion extending obliquely upwardly forwardly from said front portion of said floor portion to above said front wheel on both lateral sides of a steering support member of said front wheel, said steering support member comprising a head tube supporting a steering stem provided therethrough for steering said front wheel;

said footrest portion comprising an integral cover portion which surrounds the entirety of said head tube;

said cover portion comprising a portion defining a fender of said front wheel;

said cover portion covers the entirety of said steering stem; and

said cover portion extends upwardly to a front unit of said vehicle having a headlight and instruments mounted therein.

4,923,027

REAR WHEEL BRAKE OPERATING SYSTEM FOR MOTORCYCLE

Tsutomu Hayashi, Tokyo; Tetsuya Ichikawa; Kiyoshi Katahira, both of Saitama; Yoshinobu Tateshima, Saitama; Takushi Matsuto; Yoshihiro Nakajima, both of Tokyo; Kazuhiko Nakamura, Kanagawa; Nobuyuki Yakigaya, Chiba; Mitsuru Saito, Tokyo, and Kenji Sakakibara, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,478

Claims priority, application Japan, Dec. 25, 1986, 61-310395; Feb. 20, 1987, 62-37546

Int. Cl.[5] B60T *11/20, 13/00*

U.S. Cl. 180—219 **26 Claims**

1. A rear wheel brake operating system for a motorcycle having a pair of left and right steps mounted in a projecting manner on a lower portion of a vehicle body, comprising a pair of left and right brake pedals which are operatively connected to a common rear wheel brake for actuation of said rear wheel brake independently of each other, said left and right brake pedals being pivotally mounted on said vehicle body in close vicinity to said left and right steps, respectively.

4,923,028

REVERSE DRIVING DEVICE FOR AN AUTOBICYCLE

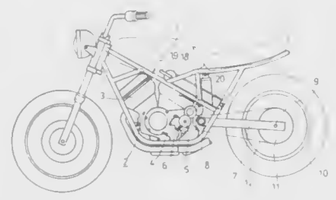
Shoji Yamashita; Atsuo Ohta, and Yoshiaki Hirosawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,697

Claims priority, application Japan, Mar. 20, 1987, 62-64014

Int. Cl.[5] F60K *23/00*

U.S. Cl. 180—219 **12 Claims**



1. A reverse driving device for an autobicycle having an engine, a starter motor for said engine, a driving wheel, a power transmission system operably connecting said engine to said driving wheel characterized in that said reverse driving device comprises a reverse driving motor separate from said engine and said starter motor; a coupling means in said power transmission system for selectively replacing, by disconnectably coupling, said engine with said reverse driving motor in operating relation with said power transmission system, said coupling means being effective to operatively couple said reverse driving motor to said power transmission system only when said autobicycle is to be driven reversely.

4,923,029

DRIVE MEANS FOR ALL-WHEEL-DRIVEN MOTOR VEHICLES

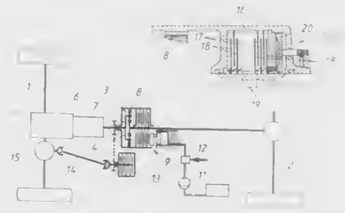
Heribert Lanzer, Gössendorf, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Oct. 19, 1987, Ser. No. 109,943

Claims priority, application Austria, Oct. 21, 1986, 2786/86

Int. Cl.[5] B60K *17/34;* **F16H** *1/44*

U.S. Cl. 180—248 **8 Claims**



1. Drive means for an all-wheel driven motor vehicle having a front axle and a rear axle, which drive means comprises:

an interaxle differential comprising a planeteary gear system having three torque-transmitting members including an input member, a first output member connected to said front axle, and a second output member connected to said rear axle,

a releasable coupling interconnecting said first and second output members, and

a second coupling disposed between said first output member and said front axle, said second coupling being a liquid friction coupling,

said three torque transmitting members being selected so that when said releasable coupling is disengaged, the ratio of the torque applied to said front axle to the torque applied to said rear axle is in recess of the ratio of the axle load on said front axle to the axle load on said rear axle under normal running conditions, and the vehicle operates in an understeering condition, and

said second coupling reducing the torque applied to said front axle when said releasable coupling engages said first and second output members together so that the ratio of the torque applied to said front axle to the torque applied to said rear axle is less than the ratio of the axle load on said front axle to the axle load on said rear axle, and the vehicle operates in an oversteering condition.

4,923,030

DEVICE FOR GENERATING ACOUSTIC WAVES BY CAUSING A FALLING MASS TO STRIKE A TARGET ELEMENT COUPLED WITH THE WALLS OF A WELL

Patrick Meynier, Chatou, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

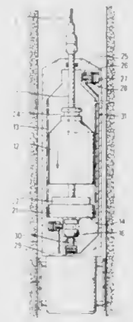
Filed Mar. 27, 1989, Ser. No. 329,328

Claims priority, application France, Mar. 25, 1988, 8804058

Int. Cl.[5] G01V *1/40*

U.S. Cl. 181—106 **14 Claims**

1. An improved acoustic wave generating device adapted to be lowered into a well at an end of a connecting element, for generating acoustic waves by causing a falling mass to strike a target element coupled with a wall of the well, the device comprising an elongated body including a longitudinally extending inner chamber means for permitting the mass to move between a set position and an impact position, retractable anchorage means for intermittently coupling the target element with the wall of the well, resetting means comprising a support element disposed beneath the mass and being movable in a translatory movement between a bottom position and a top position for causing the mass to be raised from the impact position to the set position, retention means movable for retaining the mass in the set position, a flexible cable means for connecting said support element to drive means disposed outside the well, means for locking said support element in the bottom position, a pusher element adapted to be pushed longitudinally when said support element is in a vicinity of a bottom position, and means for coupling a movement of said pusher element under a thrust of the support element and that of the retention means so as to trip a dropping of the mass.



4,923,031

HIGH OUTPUT LOUDSPEAKER SYSTEM

David E. Carlson, Niles, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Feb. 26, 1986, Ser. No. 833,859

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—144 **9 Claims**



1. A loudspeaker comprising:

means for defining a manifold chamber and having an exit opening communicating with the chamber and disposed within a first plane, said exit opening having an axis of elongation and a transverse axis normal thereto, said manifold chamber having a pair of rectangular apertures having particular areas communicating with the chamber, the first aperture of said pair being disposed in a second plane normal to the first plane and a second aperture of said pair being disposed in a third plane parallel to the second plane, the first and second apertures having axes of elongation parallel to the first plane and having transverse axes normal to the axis of elongation thereof of particular lengths, the first and second apertures confronting each other and being spaced from each other by a distance at least equal to the sum of the lengths of the transverse axes of the first and second apertures,

a pair of speaker units exterior of the chamber, each of said speaker units having a sound emitting port,

a first and a second means for acoustical coupling the first and second speaker units respectively, the first coupling means coupling the port of the first speaker unit to the first aperture and the second coupling means coupling the port of the second speaker unit to the second aperture, and

reflecting means for reflecting sound energy disposed within

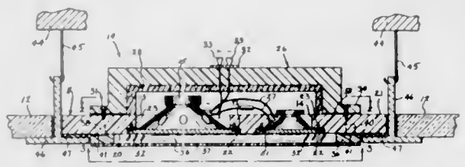
the manifold chamber between said first and second apertures, said reflecting means having first and second sound reflecting faces disposed at an angle of 90 degrees with respect to each other, and an apex axis disposed between the faces, the apex axis being parallel to the axes of elongation of the first and second apertures, the first face of the reflecting means confronting the first aperture at an angle of 45 degrees with respect to the plane of said first aperture to direct sound waves from the first aperture toward the manifold chamber exit opening, and the second face of the reflecting means confronting the second aperture at an angle of 45 degrees with respect to the plane of said second aperture to direct sound waves from the second aperture toward the manifold chamber exit opening, said exit opening having an area at least as great as the sum of the areas of said first and second apertures, whereby the reflected sound waves are merged in side-by-side relation at the exit opening.

4,923,032

CEILING PANEL SOUND SYSTEM

Mark A. Nuernberger, 1553-A S. 25th St., Milwaukee, Wis. 53204

Filed Jul. 21, 1989, Ser. No. 384,300
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—150 **13 Claims**



1. A low profile modular sound system for installation in a suspended ceiling having a supporting grid within which a plurality of ceiling tiles are supported, said system intended to replace one of the ceiling tiles and comprising:

a rectangular component mounting panel having a back face and an outer face and outside dimensions corresponding to the ceiling tile, said panel having a pair of openings therein;

a pair of matched speakers mounted in said panel openings each of said speakers including an outer face and a rear portion;

a shallow rear housing having enclosing rear and side walls and an open front end defining a hollow interior attached to the back face of said mounting panel and enclosing the rear portions of said speaker within said interior said rear and side walls having an exterior surface;

electrical connector means on the exterior surface of one of said housing walls for connection to an external source of power for said speakers;

electrical leads from said speakers extending through said one wall of said housing and electrically connected to said connector means; and,

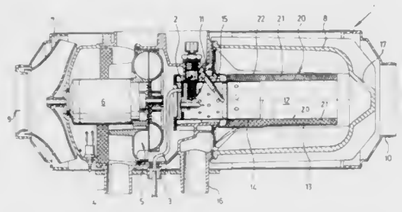
an enclosing grill demountably attached to the outer face of said mounting panel and adapted to cover the outer faces of said speakers, said grill having outside dimensions smaller than said mounting panel.

4,923,033

HEATING DEVICE, PARTICULARLY AUTOMOTIVE HEATING DEVICE, WITH AN INTEGRATED MUFFLER

Karl Panick, Planegg; Friedrich Widemann, Munich; Hermann Schoenberger, Germering; Johann Sperl, Penzberg, and Johann Sondermeier, Krailling, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

Filed Apr. 19, 1988, Ser. No. 183,232
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1987, 3713476; Apr. 22, 1987, 3713448
Int. Cl.[5] F01N *5/00*
U.S. Cl. 181—211 **32 Claims**



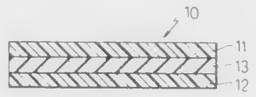
1. In a heating device, particularly an automotive heating device, of a type having a burner and a cylindrical combustion chamber, defined by a combustion pipe, and a heat exchanger disposed concentrically about said combustion pipe, said burner being located at a first end of the combustion pipe and combustion gases exiting the combustion pipe through an opposite end thereof at which the flow of said combustion gases is reversed by a closed end of the heat exchanger so as to flow through the heat exchanger back toward the burner end of said combustion pipe within the heat exchanger, the improvement wherein a heat resistant, noise muffling material is integrated within a substantially flame-free zone of the combustion chamber of the heating device at which prevailing temperatures are sufficiently high to self-clean the muffling material of soot and other combustion generated substances.

4,923,034

VIBRATION-CONTROLLING MEMBER

Masayuki Okuzawa; Okudaira Yuzo, and Futoshi Maeda, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Sep. 15, 1988, Ser. No. 244,510
Claims priority, application Japan, Nov. 26, 1987, 62-298614; May 26, 1988, 63-128757
Int. Cl.[5] F16F *15/00;* **F04B** *1/82*
U.S. Cl. 181—207 **4 Claims**



1. A vibration-controlling member comprising:

a top surface element, and

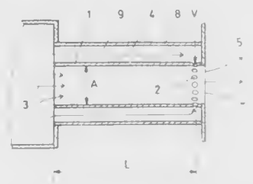
a shock-absorbing and vibration-damping means backing said top surface element, said shock-absorbing and vibration-damping means including a flake-shaped powdery substance having a high flake diameter to thickness ratio providing shock-absorbing and vibration-damping action due to a grain boundary friction of the flake-shaped powdery substance and a retainer of a foamed body sheet of a polymeric material for enclosing therein said powdery substance and adhered to an inner surface of said top surface element, said foamed body sheet being formed of a water dispersion of an emulsion of said polymeric material, and said powdery substance and polymeric material being mixed at a weight ratio of 1:0.1 to 1.

4,923,035

LOW-FREQUENCY MUFFLER

Jakob Keller, Dottikon, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Nov. 10, 1988, Ser. No. 269,313
Int. Cl.[5] F01N *1/06, 7/08*
U.S. Cl. 181—228 **1 Claim**



1. A muffler for muffling low-frequency sound waves comprising

a hollow feed pipe having an inlet, and

a plurality of muffling bore holes distributed over a periphery of said feed pipe at approximately a distance L from said feed pipe inlet, said plurality of bore holes providing access for a medium flow into said feed pipe, said plurality of bore holes having a total cross-sectional area B such that:

$$B = \frac{AV}{C}\left(\frac{1}{\beta^2} + 1\right)^{\frac{1}{2}}$$

where

$$\beta = \tan\left(\frac{2\pi fL}{c}\right),$$

and

A = Cross-sectional area of the feed pipe
c = Sound velocity of the medium
f = Frequency of the sound wave,
L = Effective length of the feed pipe from said pipe inlet to said bore holes,
V = Rate of flow through the muffling bore holes.

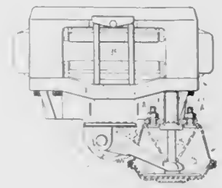
4,923,036

DISC BRAKES

Hugh G. Margetts, Ross-on-Wye, England, assignor to Lucas Industries public limited company, Birmingham, United Kingdom

Continuation of Ser. No. 105,732, Oct. 7, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 342,622
Claims priority, application United Kingdom, Oct. 16, 1986, 8624800
Int. Cl.[5] F16D *55/26*
U.S. Cl. 188—72.6 **8 Claims**

1. A disc brake comprising a housing, a brake actuator which is axially movable within said housing, and brake applying means mounted on a part of said housing, said brake applying means having an axis of actuation laterally spaced from the axis of actuation of said brake actuator, said brake applying means and said actuator being constructed and arranged to move in the same general direction to apply the brake, said brake applying means comprising a casing separate from said housing, means mounting said casing on said housing, said casing including a wall defining a hollow chamber which is divided by a flexible diaphragm, a piston in said chamber having inner and outer sides, said diaphragm being arranged to transmit force to the outer side of said piston, a piston rod extending on the inner side of said piston and being axially movable with said piston against a spring by the introduction of pressure fluid into the chamber on the side of the flexible diaphragm remote from the piston, and a lever having inner and outer ends, said outer end of said lever extended through said wall of said casing into said hollow chamber and engaging said piston rod in said hollow chamber on the inner side of said piston, said inner end of said lever being pivotally connected to said housing outside of said casing for rotation about an axis which is fixed relative to said housing and transverse to the axis of said actuator, said lever being pivotably by axial movement of said piston; said brake actuator including a brake adjuster, and a part movable by said lever and engaging said adjuster to move the same to apply the brake in the same general direction as said piston moves when subjected to pressure fluid, neither said lever nor said part being pivotably connected to said adjuster.



4,923,037

FALL ARREST DEVICE

John Stephenson, P.O. Box 163, Hampton, Ontairo L0B 1J0, and Ian McGuffie, 911 Vistula Drive, Pickering, Ontario L1W 2L6, both of Canada

Filed Jun. 29, 1989, Ser. No. 372,857
Int. Cl.[5] F16D *59/02*
U.S. Cl. 188—188 **7 Claims**



1. A device which is movable along a vertical lifeline and operable to arrest the fall of a load connected thereto, comprising:

an outer housing having a first pair of spaced apart side plates presenting at the respective front edges thereof an opening into said outer housing;

a part-cylindrical cover operable to be removably secured adjacent corresponding front edges of said first pair of side plates, to form therewith a channel having top and bottom openings for passage therethrough of the lifeline;

an inner housing having a second pair of spaced apart side

plates pivotally mounted at the rear thereof about a hinge pin secured at the rear of said outer housing;
a spindle journaled within and extending between said second pair of side plates and a surrounding toothed wheel securely attached to said spindle, presenting a regularly spaced plurality of transversely elongate teeth therealong;
spring means fixed to said outer housing to urge said inner housing pivotally about said hinge pin and upwardly relative to said outer housing, thereby causing said toothed wheel to bear against the lifeline in said channel with a predetermined normal force and increasing the friction between the toothed wheel and the lifeline, so that the toothed wheel rotates on the spindle in response to motion of the device up or down along the lifeline; and
centrifugal clutch means operable to lock said toothed wheel against rotation relative to said inner housing when the rotational velocity of said spindle exceeds a critical value corresponding to a selected downward velocity of the device along the lifeline.

4,923,038

METHOD AND APPARATUS FOR ABSORBING MECHANICAL SHOCK

Magnus B. Lizell, 3355 Alexis Rd., Apt. B12, Toledo, Ohio 43623

Filed Jan. 13, 1988, Ser. No. 154,343
Claims priority, application Canada, Jun. 6, 1986, 510950
Int. Cl.[5] F16F *9/46*; B60G *11/26*
U.S. Cl. 188—299 **48 Claims**



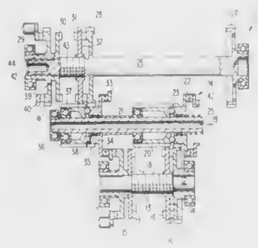
1. A direct acting hydraulic shock absorber for damping the movement of the body of an automobile comprising:
a pressure cylinder forming a working chamber having first and second portions operable to store damping fluid;
a piston disposed within the pressure cylinder between said first and second portions of said working chamber, said piston having first and second surfaces;
first valve means for controlling the flow of damping fluid through said piston between said first and second portions of said working chamber during compression of said shock absorber, said first valve means disposed adjacent to said first surface of said piston;
second valve means for controlling the flow of damping fluid through said piston between said first and second portions of said working chamber during rebound of said shock absorber, said second valve means being disposed adjacent to said second surface of said piston;
a first pressure chamber in fluid communication with said first valve means, said first pressure chamber being disposed within said piston;
a second pressure chamber in fluid communication with said first portion of said working chamber and said first pressure chamber, said second pressure chamber being disposed within said piston; and
electrical controllable flow means for regulating the flow of damping fluid between said first and second pressure chamers and said second portion of said working chamber.

4,923,039

INTERACTIVE DUAL SHAFT INPUT SIGNAL TIMING MECHANISM

David E. Russ, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 10, 1988, Ser. No. 269,700
Int. Cl.[5] B60K *41/26*
U.S. Cl. 192—7 **28 Claims**



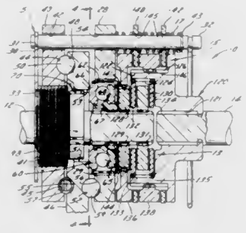
1. An apparatus comprising:
a first system including a first differential mechanism movable between a first state and a second state;
a second system including a second differential mechanism movable between a first state and a second state;
a first brake mechanism for selectively preventing movement of the first system;
a second brake mechanism for selectively preventing movement of the second system;
means for selectively actuating one of the first and second brake mechanisms; and
means receiving inputs from the movement of the first and second differential mechanisms for providing a signal to the selective actuation means such that the second system is braked during actuation of the first system between its first and second state and then said first system is braked during actuation of the second system between its first and second state.

4,923,040

HIGH TORQUE BRAKE/LOCK DIFFERENTIAL WITH EQUAL TORQUE SPLIT CAPABILITY

James A. V. Buckley, Whitefish Bay, Wis., assignor to Hayes Industrial Brake, Inc., Mequon, Wis.

Filed Sep. 23, 1988, Ser. No. 248,803
Int. Cl.[5] F16D *67/02*
U.S. Cl. 192—18 R **10 Claims**



1. A high torque brake/lock differential for selectively connecting two independently rotating shafts to rotate at the same speed or to stop the rotary motion of the shafts, said differential comprising:
a pair of shafts mounted in an axially aligned relation,
a frame mounted in a fixed relation to said shafts,

a drive member mounted on one of said shafts,
a set of clutch plates mounted for axial motion on the other of said shafts,
a set of clutch discs mounted for axial motion in said drive member,
said clutch plates being alternately arranged with respect to said clutch discs,
actuating means for moving said clutch plates and clutch discs from a neutral position into frictional engagement with said drive member and with each other when the actuating means is moved in one direction whereby said shafts rotate as a unit and brake means for selectively connecting said drive member and said other shaft to said frame to prevent the rotation of said shafts when the actuating means is moved from said neutral position in the other direction.

4,923,041

BLADE FOR LIQUID FRICTION COUPLINGS

Jurgen Stockmar, Graz, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Continuation-in-part of Ser. No. 905,887, Sep. 10, 1986, abandoned. This application Jun. 2, 1988, Ser. No. 201,582
Claims priority, application Austria, Sep. 11, 1985, 2656/85
Int. Cl.[5] F16D *35/00*
U.S. Cl. 192—58 B **10 Claims**

1. A torque transmitting liquid friction coupling blade, comprising a flat disc having front and rear faces, a plurality of open straight groove means disposed on said front face for increasing the torque transmitted by a viscous fluid to a blade adjacent said front face, and a plurality of open straight groove means disposed on said rear face for increasing the torque transmitted by a viscous fluid to a blade adjacent said rear face, all of said groove means on said front and rear faces extending along axes which emanate from a single central axis of rotation of said torque transmitting blade, said groove means on said front face being offset from said groove means on said rear face so that said groove means on said front face are positioned in the spaces between said groove means on said rear face, and said groove means on said rear face are positioned in the spaces between said groove means of said front face.

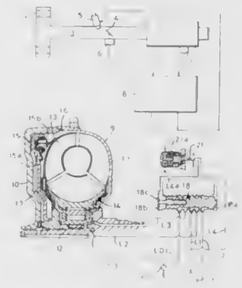
4,923,042

FUEL SUPPLY CONTROL METHOD FOR AN ENGINE WITH A FLUID TORQUE CONVERTER CLUTCH

Hitoshi Yamabe; Noboru Sekine; Shuichi Takagi, and Sachito Fujimoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 39,009, Apr. 15, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 339,855
Claims priority, application Japan, Apr. 15, 1986, 61-85013
Int. Cl.[5] B60K *41/02*; F16H *45/02*
U.S. Cl. 192—0.096 **13 Claims**

1. A fuel supply control method for an engine with a fluid torque converter in which a clutch is used to mechanically connect the input and output sides of the fluid torque converter wherein the clutch is engaged and the fuel supply to said engine is stopped during speed reduction when the speed, consisting of one of the engine speed and the vehicular speed, is over a predetermined value, characterized in that during speed reduction when the speed is below the predetermined value, releasing said clutch first and then restarting the fuel



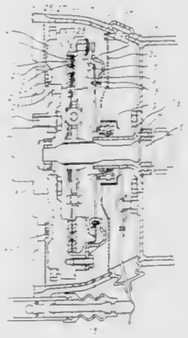
supply to said engine and absorbing at least some of any return shock in the fluid torque converter,
wherein said clutch is released at a first predetermined engine speed, and said fuel supply restaring occurs at a second lower predetermined engine speed.

4,923,043

AIR COOLING SYSTEM FOR CLUTCH

Yoshihiro Okuno, Toyonaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Aug. 29, 1988, Ser. No. 237,461
Claims priority, application Japan, Sep. 11, 1987, 62-229177
Int. Cl.[5] F16D *13/72*
U.S. Cl. 192—70.12 **5 Claims**



1. A cooling system for a clutch mounted in a clutch housing for connecting and disconnecting a drive shaft mounted in an engine block with a driven shaft, said clutch housing being attached at one of its ends to an end of said block with an end of said drive shaft projecting into said housing, the other end of said housing supporting said driven shaft, a flywheel mounted on said end of said drive shaft in said engine end of said housing and spaced from said engine end of said housing for rotation in said housing, a pressure plate mounted on said flywheel on a side of said flywheel facing said other end of said housing for rotation in said housing with said flywheel and for axial movement toward and away from said flywheel, a clutch disc splined to said driven shaft and mounted between said flywheel

and said pressure plate for engagement therewith, an approximately annular disc-like first baffle plate fixed to said end of said engine block and spaced therefrom between said end of said engine block and said flywheel, said first baffle plate having an outer periphery close to and facing on an inner peripheral surface of said clutch housing and an inner periphery spaced from said drive shaft, and an approximately annular disc-like second baffle plate fixed at its outer periphery to said clutch housing between said pressure plate and said other end of said clutch housing supporting said driven shaft, said second baffle plate having an outer periphery close to and facing on said inner peripheral surface of said clutch housing and an inner periphery spaced from said driven shaft; a hole penetrating through said flywheel in an axial direction and at a position in said flywheel at said inner periphery of said first baffle plate; a first air inlet port through said clutch housing between said engine block and said first baffle plate, an air outlet port through said clutch housing between said first baffle plate and said second baffle plate, and a second air inlet port through said clutch housing between said second baffle and said other end of said clutch housing supporting said driven shaft; said first air inlet port forming a first air passage for air flow through said first air inlet port, between said first baffle plate and said engine block, through a central hole between said inner periphery of said first baffle plate and said drive shaft and through said hole penetrating through said flywheel to said air outlet port for cooling said flywheel and said clutch disc, said second inlet port forming a second air passage for air flow through said second air inlet port, between said second baffle plate and said clutch housing and through a central hole between said inner periphery of said second baffle plate and said driven shaft for cooling said pressure plate and said clutch disc and for flowing out of said air outlet port.

4,923,044

CLUTCH CONTROL DEVICE, ESPECIALLY FOR AUTOMOTIVE VEHICLES

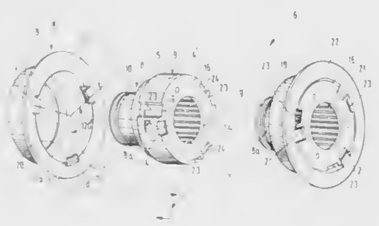
Christian Gay, Amiens, and Philippe Lassiaz, Levallois, both of France, assignors to Valeo, Paris, France

Filed Sep. 15, 1989, Ser. No. 408,187

Claims priority, application France, Sep. 23, 1988, 88 12437

Int. Cl.[5] F16D *23/12*

U.S. Cl. 192—98 **6 Claims**



1. A clutch control device, for example for an automotive vehicle, of the kind comprising a working element, a manoeuvring member, a retaining shroud, and assembly means, the working element having clutch engaging means whereby the clutch control device is adapted to act on a clutch actuating means of a clutch and further having a transverse radial portion, the manoeuvring member having control member engaging means whereby the manoeuvring member is adapted to be displaced by a control member engaged therewith, the retaining shroud being disposed between the working element and the manoeuvring member and joining them together axially, the said shroud comprising an annular lateral wall defining a shoulder, the working element being in engagement with said shoulder, the said assembly means comprising a plurality of tabs projecting from the said lateral wall of the retaining shroud and extending towards the interior of the said lateral wall, the assembly means further comprising an axially acting resilient member disposed between, and in engagement with, the working element and the manoeuvring member and being axially confined thereby so as to be deformable during assembly of the retaining shroud with the manoeuvring member, and the assembly means further comprising a portion of the working element between the said radial portion of the manoeuvring member and the said shoulder of the retaining shroud, wherein the manoeuvring member has axially extending groove means, interrupting its said radial portion, for receiving the said tabs, the said radial portion having a plurality of recesses formed on one of its faces and disposed for cooperation of each said recess with a respective one of the said tabs, each said recess being open in the radial direction at the outer periphery of the said radial portion, and each said recess being circumferentially offset with respect to its associated said groove means, in such a way that the operation of assembling the retaining shroud with the manoeuvring member may be carried out by introducing the said tabs into the axial groove means until the tabs leave the latter at the appropriate face of the radial portion, and so that upon subsequent rotation causes the said tabs to engage with the said recesses, while the said resilient member is compressed during the said assembly operation.

4,923,045

CLUTCH DISC HAVING AN INTEGRAL ANNULUS OF FRICTION MATERIAL

Tadamasa Kobayashi, Okazaki, and Ryoichi Kudo, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 2, 1988, Ser. No. 239,759

Claims priority, application Japan, Sep. 2, 1987, 62-219610

Int. Cl.[5] F16D *13/60*

U.S. Cl. 192—107 R **8 Claims**



1. A clutch disc comprising:

a hub having an integral, radially extending flange;

a circular plate having a plurality of axial openings and mounted on said hub;

vibration damping means for providing an elastic driving connection between said flange and siad circular plate;

a sub plate having a plurality of axial openings and secured to said circular plate so that the plurality of axial openings of the circular plate and the plurality of axial openings of the sub plate are formed in a circumferential direction of the disc; and

a plurality of integral friction materials, each of which has a pair of oppositely faced friction surfaces extending in the axial direction and each of which is securely fitted between said circular plate and said sub plate so that said friction surfaces project outwardly from each of said axial openings, said plurality of axial openings in said circular plate arranged in the circumferential direction and said sub plate being a circular shape with the plurality of circumferentially arranged axial openings being axially coincident with said openings of said circular plate, said sub plate contacting said circular plate at an outer radial extent of said sub plate and said circular plate, said sub plate connected to said circular plate at an inner radial extent of said sub plate, the inner radial extent of said sub plate being disposed radially outwardly of said vibration damping means and said hub.

4,923,046

COOLING MECHANISM OF A CLUTCH COVER ASSEMBLY

Norihisa Ueoohara, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP87/00743, § 371 Date Apr. 1, 1988, § 102(e) Date Apr. 1, 1988, PCT Pub. No. WO88/02825, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 5, 1987, Ser. No. 196,191

Claims priority, application Japan, Oct. 15, 1986, 61-157998[U]

Int. Cl.[5] F16D *13/72*

U.S. Cl. 192—113 A **3 Claims**



1. A cooling mechanism of a clutch cover assembly including a clutch cover body fixed to a flywheel, and a diaphragm spring having a radially outer spring portion which is pinched by means of a wire ring to an inner peripheral portion of the clutch cover body and which is positioned at a flywheel side with respect to the clutch cover body, said diaphragm spring including a plurality of radial tongues which extend radially inwardly from an inner periphery of said radially outer spring portion, slits being formed between the tongues, and enlarged openings being formed radially outside the slits, each said enlarged opening having side edges tabs are formed on said clutch cover body and extend into and are caulked in some of said enlarged openings in said diaphragm spring to support said diaphragm spring on said clutch cover body, and vanes are integrally formed along at least one of the side edges of a plurality of said enlarged openings, said vanes project forwardly and upwardly to partially cover said enlarged openings for feeding air into said clutch cover assembly through said enlarged openings.

4,923,047

MACHINE WITH VARIABLE TORQUE SETTING

Manfred Fink, Eberstadt; Wolfgang Schreiber; Manfred Ludwig, both of Stuttgart; Ewald Hald, Filderstadt, and Guenter Kloss, Stuttgart, all of Fed. Rep. of Germany, assignors to C. & E. Fein GmbH & Co., Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 285,744

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3742952

Int. Cl.[5] F16D *49/00*

U.S. Cl. 192—150 **23 Claims**

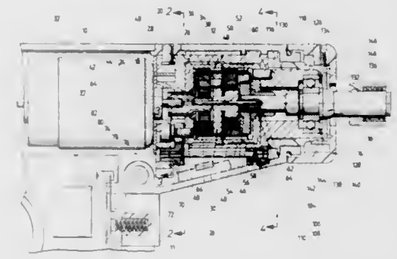
1. A motor-driven machine with a variable torque setting, in particular, a portable electric tool, comprising:

a housing,

a motor within said housing,

a planetary gearing extending in an axial direction and driving a work spindle, said planetary gearing including an internal gear rotatably mounted in said housing and actuating a motor de-energizer against the action of a spring force when a settable limit torque is exceeded,

a torsion spring element extending in said axial direction alongside and sideways of said planetary gearing for generating said spring force,



said torsion spring element carrying at one end thereof a swivel element which engages a cam on said internal gear and being held at an opposite end in a support, said swivel element being able to swivel out of an initial position against the action of the force of said torsion spring element, for actuating said motor de-energizer thereby.

4,923,048

SAFETY RESTRAINT DEVICE

Barry A. Cole, Colchester, Conn., assignor to Sinco, Inc., East Hampton, Conn.

Filed Aug. 4, 1989, Ser. No. 389,752

Int. Cl.[5] A62B *35/00*

U.S. Cl. 182—9 **12 Claims**



1. A safety restraint device comprising:

safety belt means for attachment around the waist of an individual;

safety lanyard means connected to said safety belt means for attachment to a fixed object, said lanyard means comprising:

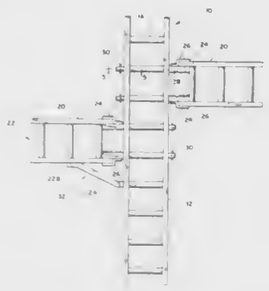
a cable having a free end;

snap hook means connected to said cable at said free end comprising a hook having a releasable safety keeper for securing said lanyard means;

slidable ring means mounted to said cable for slidable positioning therealong, said ring means comprising a connector sleeve defining a longitudinal channel for receiving said cable and a ring integrally extending from said connector sleeve and dimensioned wherein said hook may be securely attached to said slidable ring,

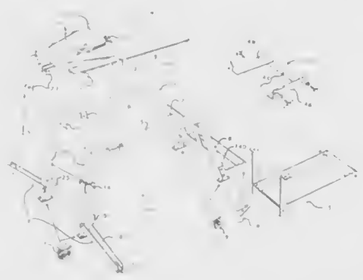
so that said cable is wrappable around a fixed object and said snap hook means is engageable with said slidable ring to secure said lanyard means to said fixed object.

4,923,049
WING EXTENSION FOR ROOF LADDER
Edward C. Kent, P.O. Box 538, Bonita Springs, Fla. 33959, and Charles E. Long, 9691 Alabama St., Bonita Springs, Fla. 33923
Filed Mar. 29, 1989, Ser. No. 330,281
Int. Cl.[5] E06C *1/36*
U.S. Cl. 182—45 9 Claims



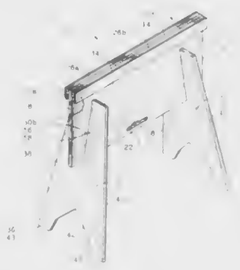
1. A portable wing extension for a roof ladder comprising a horizontal wing section having a pair of horizontally spaced parallel beams connected by vertically spaced parallel rungs,
one end of said beams securely attached to a pair of horizontally spaced parallel slide through supports,
said slide through supports adaptable to be received by a pair of parallel rungs of said ladder,
releasable securing means for releasably securing said slide through supports to one side of of said ladder.

4,923,050
LADDER SUPPORT
John R. Vitols, 300 Oxford Avenue, Brockville, Ontario, Canada K6V 3E2
Filed Aug. 17, 1989, Ser. No. 394,962
Int. Cl.[5] E06C *5/04*
U.S. Cl. 182—127 21 Claims



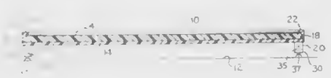
1. A machine for supporting a ladder above a surface, said machine comprising:
a frame having front leg means at the proximal end thereof, rear leg means and ladder fixing means at the distal end thereof and cradle fixing means between said proximal end thereof and said distal end thereof and
a cradle having means for rotatable attachment thereof to opposite sides of said proximal end of said frame, and longitudinal cradling means between said means for rotatable attachment of said cradle and the distal end of said cradle, said longitudinal cradling means having means for rotatable attachment of a ladder therebetween near the distal end of said cradle.

4,923,051
COLLAPSIBLE SAWHORSE
Gerald E. Newville, 4747 Capital Ave., Omaha, Nebr. 68132
Filed Sep. 28, 1988, Ser. No. 250,770
Int. Cl.[5] B27B *21/00*; B25H *1/06*
U.S. Cl. 182—151 11 Claims



1. A collapsible sawhorse, comprising
an elongated upright base plate having top and bottom edges and longitudinally spaced apart opposite ends,
a pair of leg plates, each having top and bottom edges and transversely spaced apart opposite side edges,
each leg plate having an upright slot opening through the top edge thereof, said slot having open and closed ends and being adapted for receiving said base plate,
said base plate having a pair of upright slots opening through the bottom edge thereof, each slot having open and closed ends and being adapted to receive a respective leg plate, upon alignment of the respective slots of said base plate and leg plate, to the extent of engagement of the closed ends of the aligned slots whereby said leg plates are stationarily secured relative to said base plate,
said base plate further comprising a generally horizontal top surface extended transversely outwardly from said base plate, and
means for temporarily supporting said leg plates, upon removal from the slotted connection to said base plate, in generally parallel stacked engagement with said base plate for compact transport and storage of said sawhorse,
said top surface includes a downwardly extended flange partially defining a pocket between said base plate and flange for temporarily receiving and supporting a leg plate in generally stacked engagement with said base plate upon inversion of the base plate.

4,923,052
MECHANICAL-FLUID-RETENTION PLATFORM
Gary L. Englebert, 172 Benders Church Rd., Biglerville, Pa. 17307
Filed Feb. 27, 1989, Ser. No. 316,077
Int. Cl.[5] F16N *31/02*
U.S. Cl. 184—106 1 Claim



1. A platform especially adapted for horizontal disposition underneath a motorized vehicle for trapping mechanical fluids, such as oil, gasoline or grease, dripping from the vehicle, comprising:

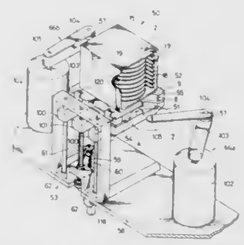
a rigid flat rectangular panel (**14**), upstanding walls **18** extending upwardly from the peripheral edges of said rigid panel, and rim-forming flanges (**22**) extending horizontally and inwardly from the upper edges of said upstanding walls; legs (**20** extending vertically downwardly from corner areas of said rectangular panel, whereby the panel can be positioned above the vehicle support floor out of contact with water, snow or dirt that might accumulate on the floor surface; a nut (**35**) carried on each leg at its lower end, and an elongated foot element (**37**) having a threaded shank area threaded into each nut, whereby each foot element is vertically adjustable on the associated leg so that the rectangular panel can be supported in a stable horizontal position on uneven floor surfaces without wobble;
a flat rectangular flexible liner (**24**) removably disposed on the upper face of the rigid panel, said liner being formed of a porous sponge material capable of absorbing and retaining oily fluids therein, said rectangular liner having length and width dimensions that are slightly greater than the corresponding dimensions circumscribed by the inner edges of the rim-forming flanges, whereby the liner is retained on the rigid panel by the rim flanges,
said liner having sufficient flexibility to permit it to be inserted into, or removed from, the space circumscribed by the upstanding wall (**18**);
said liner (**24**) having a vertical thickness that is only slightly less than the heights of said upstanding walls (**18**), such that the liner is thick enough to absorb and retain appreciable quantities of oily liquids;
a carrying handle (**40**) attached to one of said upstanding walls to facilitate manual carrying of the platform in suitcase fashion;
and a plural number of fastener mechanisms (**16**) carried on the rigid panel inwardly from its four corners, said fastener mechanisms being adapted to releasably grip the undersurface of the flexible liner, whereby the liner is ensured of remaining on the panel while the platform is being carried from place to place.

4,923,053
FLEXIBLE MEMBER MOUNTING ASSEMBLY
Dale R. Daniels, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Continuation-in-part of Ser. No. 851,034, Apr. 11, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 138,908
Int. Cl.[5] B66B *9/00*
U.S. Cl. 187—1 R 29 Claims



1. In apparatus having a frame, a movable component, and means for displacing the movable component within a plane of motion, a mounting assembly comprising:
a flexible member connected between said frame and said movable component;
first and second track units each including an elongated guide member, a movable member parallel with said guide member and spaced therefrom by a distance less than twice a natural radius of curvature of said flexible member, when said flexible member is rolled back upon itself through a turn of 180 degrees, means for securing said flexible member at a first termination point to said guide member and at a second termination point to said movable member, said first and second termination points being spaced along the length of said flexible member, the portion of the flexible member between said first and second termination points extending along said guide member and rolling back upon itself, through a turn of 180 degrees, to extend along said movable member;
said flexible member extending further between said second termination point of said first track unit and said first termination point of said second track unit;
means for mounting said first track unit on said frame with said guide member and movable member thereof extending generally in a first direction;
means for mounting said second track unit for displacement relative to said frame with said first track unit, and with said guide member and said moveable member of said second track unit extending generally in a second direction;
means for displacing said movable member of said first track unit together with said second track unit back and forth in the said first direction; and
means for displacing said movable member of said second track unit in the said second direction.

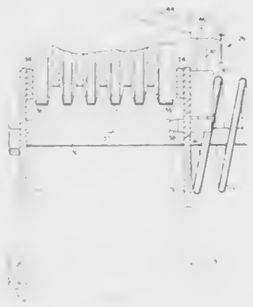
4,923,054
WAFER TRANSFER APPARATUS HAVING AN IMPROVED WAFER TRANSFER PORTION
Masami Ohtani, and Masami Nishida, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan
Filed Nov. 22, 1988, Ser. No. 275,525
Claims priority, application Japan, Nov. 27, 1987, 62-181716[U]
Int. Cl.[5] B65G *1/07*
U.S. Cl. 187—25 15 Claims



1. An apparatus for storing and transferring a wafer, comprising:
a wafer transfer portion having a path through which a wafer can be transferred;
storing means for storing said wafer, said storing means being removably attached to said wafer transfer portion;
first elevating means for elevating and lowering said wafer transfer portion and said storing means to position said wafer transfer portion and said storing means at a predetermined level;
wafer holding means for temporarily holding said wafer in said wafer transfer portion; and
second elevating means for elevating and lowering said

wafer holding means, said second elevating means being separate and independent from said first elevating means.

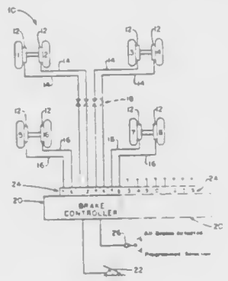
4,923,055
SAFETY MECHANISM FOR PREVENTING UNINTENDED MOTION IN TRACTION ELEVATORS
Gordon A. Holland, DeSoto County, Miss., assignor to Delaware Capital Formation, Inc., Wilmington, Del.
Filed Jan. 24, 1989, Ser. No. 301,190
Int. Cl.[5] B66B *5/02*
U.S. Cl. 187—109 33 Claims



1. A traction elevator having a car, a counterweight, at least one sheave rotated responsive to motion of the car, a main friction brake for holding said car at landings and at least one additional emergency brake, mechanical catch means for holding said emergency brake in a disengaged position; and tripping means for tripping the catch means for actuating the emergency brake, wherein the tripping means comprise:
engagement means on said sheave for selectively engaging a trigger for moving the trigger along a first path responsive to sheave rotation;
a trigger moveable along said first path and also moveable along a second path between an armed position, for engaging said sheave, and a disarmed position out of engagement with said sheave;
coupling means between said trigger and said catch means for releasing said catch means responsive to trigger movement along said first path; and
control means for selectivity moving said trigger between said armed position and said disarmed position responsive to at least one elevator operating condition.

4,923,056
METHOD OF INCREASING THE SERVICE LIFE OF AIRCRAFT CARBON DISK BRAKES
John Nedelk, Massillon, Ohio, assignor to Aircraft Braking Systems Corporation, Akron, Ohio
Filed Feb. 21, 1989, Ser. No. 312,994
Int. Cl.[5] B60T *17/00*
U.S. Cl. 188—71.1 11 Claims

1. A method of increasing the service life of carbon disks which form the functional braking elements of a brake disk stack of an aircraft brake assembly, each brake assembly associated with a respective wheel of a plurality of wheels which comprise a landing gear configuration of the aircraft, the method comprising the steps of:
establishing a preselected first group of brake assemblies of a total number of brake assemblies which are actuated for both low-pressure and high-pressure braking of the aircraft;
establishing a preselected second group of brake assemblies which comprises the remaining number of the total number of brake assemblies which are actuated only during high-pressure braking of the aircraft;
actuating the first group of brake assemblies during the taxi-snub stops of the aircraft when it is on the ground; and



actuating the first and second groups of brake assemblies during landing of the aircraft.

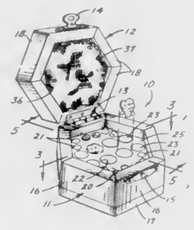
4,923,057
ELECTRORHEOLOGICAL FLUID COMPOSITE STRUCTURES
J. David Carlson, Cary; John P. Coulter, Durham, and Theodore G. Duclos, Raleigh, all of N.C., assignors to Lord Corporation, Erie, Pa.
Filed Sep. 20, 1988, Ser. No. 246,847
Int. Cl.[5] F16F *7/10*
U.S. Cl. 188—378 18 Claims

1. A flexible, laminar beam or panel for carrying lateral loads and bending movements comprising at least two flexible, electrically conductive containment layers configured in a parallel, spaced relationship and defining therebetween an enclosed space, an electrorheological fluid confined within said space, and an electric field generating means connected to each of said layers for applying a voltage potential between said layers thereby producing an electric field across said fluid, wherein the magnitude of said voltage potential is selected for determining the complex moduli of said fluid and the complex stiffness characteristics of said beam or panel.

4,923,058
CONTAINER FOR STORING AND DISPLAYING BABY TEETH
Mary R. Dennison, 945 Dovington Dr., Hoffman Estates, Ill. 60194
Filed May 30, 1989, Ser. No. 358,582
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—83 15 Claims

1. A container for storing baby teeth, said container comprising a base having a substantially flat and planar upper surface, and twenty upwardly opening pockets in said base for receiving and storing baby teeth, twelve of said pockets having a small transverse dimension for receiving incisors and canines, four of said pockets having a large transverse dimension for receiving second molars, and four of said pockets having an intermediate transverse dimension for receiving first molars, said base being a unitary member having a transverse center-

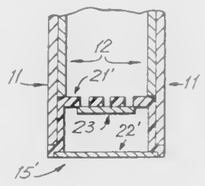
line dividing the base into first and second sections which are mirror images of one another, each of said sections having six



small pockets, two large pockets and two intermediate pockets.

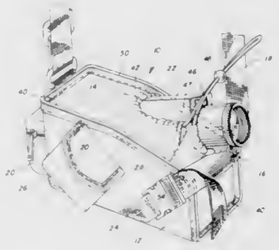
4,923,059
HINGED TOP CIGARETTE BOX
Donald H. Evers, and Xuan M. Pham, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Aug. 1, 1989, Ser. No. 387,835
Int. Cl.[5] A24F *15/00*
U.S. Cl. 206—265 13 Claims





1. A hinged top box comprising:
an inner sleeve formed from a laminate blank having a first panel and a second panel;
an outer sleeve formed from said laminate blank surrounding said inner sleeve;
a cover member formed from said laminate blank and connected to said outer sleeve by a flexural hinge;
said first panel forming said inner sleeve defined by a first edge of said laminate blank and a short cut line parallel to said first edge at an intermediate position along the width of said laminate blank;
said second panel forming said outer sleeve and said cover member defined by a second edge of said laminate blank, parallel to said first edge and said short cut line, said second panel having a first short score line positioned at the end of said short cut line perpendicular thereto and extending in a direction toward said second edge of said laminate blank and having a second short score line in line with said first short score line and extending from said second edge toward said first short score line and a cut line connecting said first short score line and said second short score line;
a top plug inserted into the top of said cover member; and
a bottom plug inserted into the bottom of said outer sleeve.

4,923,060
VIDEO CAMERA CARRYING CASE
Steven M. Breslau, Chicago, Ill., assignor to Sima Products Corporation, Skokie, Ill.
Filed Jun. 30, 1989, Ser. No. 374,279
Int. Cl.[5] B65D *85/38*
U.S. Cl. 206—316.2 8 Claims



1. A carrying case comprising:
a substantially rectangular shaped body portion for accommodating therein a video camera or the like, said body portion having a plurality of upstanding walls and being open to the exterior on at least its top side and one end thereof; and
an adjustable disengageable safety strap connected to opposed walls and extending across at least one of said open top side and open end of said body portion for restraining the camera within said body portion.

4,923,061
CATHETER CURVE RETENTION DEVICE
Frederick W. Trombley, III, Billerica, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Filed Jul. 30, 1986, Ser. No. 892,128
Int. Cl.[5] B65D *75/32, 85/02*
U.S. Cl. 206—364 9 Claims



1. In combination, a catheter having a preformed curved distal end and a device for retaining the preformed curved distal end of the catheter in its preformed curved configuration comprising:
said distal end of said catheter having at least one preformed curve formed therein;
said retention device comprising a pocket receptive to the preformed curved distal end of the catheter, said locations being disposed to restrain said curve in the curved distal

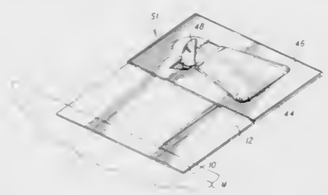
end of the catheter at at least one point proximally and distally of the curve;
said pocket having an opening adapted to enable the preformed curved distal end of the catheter to be inserted into the pocket;
said distal end of the catheter being received in the pocket.

4,923,062
INSERT IN COMBINATION WITH AUDIO CASSETTE SECURITY PACKAGES
Bruce A. Hehn, and James T. Weisburn, both of Massillon, Ohio, assignors to Alpha Enterprises, Inc., East Canton, Ohio
Filed Mar. 9, 1989, Ser. No. 321,569
Int. Cl.[5] B65D *1/36*
U.S. Cl. 206—387 **8 Claims**



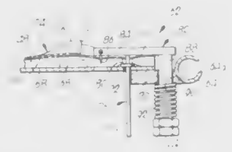
1. In combination, a cassette security package and insert means for holding a cassette whereby said insert means and cassette when placed in a storage compartment of the security package prevents removal of the cassette from said compartment, wherein said compartment is formed by a plurality of spaced members forming a plurality of openings for viewing the cassette within the storage compartment and wherein at least one of said openings is sufficiently large to permit the cassette to be removed therethrough unless held in said insert means; said insert means being a one-piece U-shaped plastic member having a web wall and a pair of spaced parallel sidewalls, said web wall and sidewalls being U-shaped in cross-sectional configuration and forming channel means for trapping a longitudinal edge of the cassette and at least portions of adjacent transverse edges of said cassette therein; and an elongated opening formed entirely in the web wall for viewing portions of the longitudinal edge of the cassette adjacent to and trapped within said web wall.

4,923,063
SAMPLE PACKET FOR CREAMS AND METHOD OF MANUFACTURE
Christopher Tararuj, Trenton, N.J., assignor to Webcraft Technologies, Inc., No. Brunswick, N.J.
Filed Nov. 3, 1988, Ser. No. 266,650
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—484 **24 Claims**



1. A sample packet for creams and the like, comprising:
(a) a paper sheet including means incorporated therewith for preventing absorption of a cream and further including means for defining first and second panels;
(b) a continuous line of adhesive means applied to one of said panels;
(c) said second panel folded into overlying relation with said first panel and being secured thereto by said adhesive means, said panels cooperate with said adhesive means for defining a reservoir; and,
(d) said second panel includes frangible opening means overlying said reservoir, said frangible opening means adapted for being severed from said second panel for thereby causing said reservoir to be opened.

4,923,064
NEWSPAPER BAGGING METHOD AND APPARATUS
Charles N. Hannon, Olathe, Kans., assignor to Stepper, Inc., Olathe, Kans.
Division of Ser. No. 22,436, Mar. 6, 1987, Pat. No. 4,805,381.
This application Jun. 20, 1988, Ser. No. 209,205
Int. Cl.[5] B65B *43/14. 67/04*
U.S. Cl. 206—554 **7 Claims**



1. A bag module for use in connection with the loading station of an article bagging machine comprising:
a flat tray;
a stack of superimposed plastic bags on said tray, each having an article-receiving entry mouth adjacent one end of the bag and a marginal flap projecting outwardly beyond the mouth;
means engageable with the flap of the endmost bag in the stack for retaining the bags on the tray,
said bags being removable from said tray by tearing the flap of the bag being removed from said retaining means; and
means for coupling the tray with the loading station of said machine in a manner to present the bags for successively receiving articles handled by the machine,
said retaining means including a generally inverted U-shaped wicket having a pair of laterally spaced legs projecting through the stack of bags and the tray and a transverse bight spanning the legs in overlying relationship to the flap of the endmost bag in the stack,
said retaining means further including a pair of spring-loaded hold-down clamps, each including an arm removably overlying said bight and yieldably biased against the latter.

4,923,065
MEMBRANE PACKING AND RETAINER
Louis H. Ridgeway, 5835 Leadrope Way, Bonita, Calif. 92002
Continuation-in-part of Ser. No. 162,215, Feb. 29, 1988, Pat. No. 4,852,743. This application Dec. 16, 1988, Ser. No. 285,449
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] B65D *81/02*
U.S. Cl. 206—583 **6 Claims**

1. In combination with a rigid shipping container or the like, a packing device for resiliently suspending an object inside said container which comprises:
a first planar sheet of cardboard having a first opening;
a first film of pliable material covering said first opening and being attached on all sides to said first sheet;
a second planar sheet of cardboard having a second opening;
a second film of pliable material covering said second opening and being attached on all sides to said second sheet;
means for releasably securing said first and second sheets within said container in a generally parallel, spaced-apart and face-to-face alignment wherein each of said films is in pressing contact with opposite sides of said object sandwiched therebetween wherein the pliable films apply tension and friction to said object, and
wherein said means for securing are shaped and positioned to apply equal forces to said sheets to immobilize said object between said films in the absence of any load being applied to said object other than gravity and in whatever position said container may rest and to limit, by tension and friction of the films applied to said object, the movement of said object within said container when said container is subject to impacts from various directions.

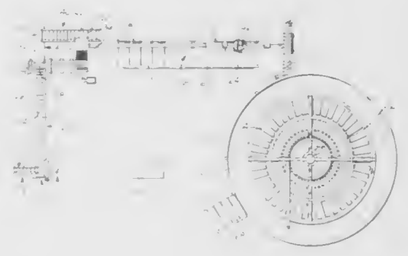


4,923,066
SMALL ARMS AMMUNITION INSPECTION SYSTEM
Zohar Ophir, Tel Aviv; Michael Golstein, Herzlia Pituach, and Miriam Nagler, Tel Aviv, all of Israel, assignors to Elor Optronics Ltd., Tel Aviv, Israel
Filed Oct. 8, 1987, Ser. No. 105,600
Int. Cl.[5] B07C *5/342;* **G05B** *23/02*
U.S. Cl. 209—538 **23 Claims**



1. A small arms ammunition inspection system for cartridges, cases, bullets and the like, said system comprising:
interface means for receiving a supply of ammunition cartridges and providing each cartridge with a predetermined orientation;
conveying means for locating each of the cartridges for inspection in at least one imaging station;
means for imaging surface areas of each cartridge in said imaging station to provide video surface feature data associated therewith; and
means for processing said video surface feature data to detect the presence of a predetermined set of characteristics and provide output signals in accordance therewith,
said conveying means being operated to sort each of said inspected cartridges in accordance with said output signals, said conveying means further comprising means for maintaining cartridges in individual slots of a handling plate in a static orientation when said imaging means is operated, and wherein said imaging means comprises an optical system comprising:
at least one illumination means;
means for direction light from said illumination means to the head area of said cartridge; and
means for directing reflected light from said head area to at least one area CCD camera for producing video signals in accordance with surface features of said head area, and wherein said system also comprises a removable color filter between said illumination means and said head area and wherein said video surface feature data processing means is operated to detect the presence of a complete waterproofing/varnish ring around the primer cap in said set of characteristics, said detection operation comprising subtraction of said video signals produced when said color filter is not present.

4,923,067
AUTOMATED DRILL SORTING SYSTEM AND METHOD
Robert L. Fuller, Jr., Issaquah; Paul E. Faville, and Mark C. Maier, both of Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Nov. 10, 1988, Ser. No. 270,129
Int. Cl.[5] B07C *5/02*
U.S. Cl. 209—539 **17 Claims**

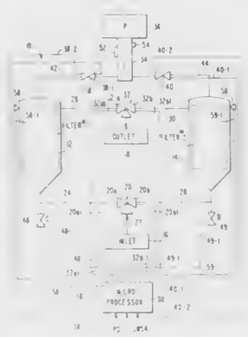


1. A method of sorting large quantities of many different types of drill bits, according to type, comprising:
receiving the drill bits in a mixed bulk form, piled on one another in a random orientation;
delivering said drill bits into an alignment conveyor having a bottom which includes a plurality of elongated, parallel, alignment channels, into which said drill bits migrate as they are conveyed by the alignment conveyor;
delivering aligned drill bits from said alignment conveyor onto an upper portion of a singulator;
moving the aligned drill bits laterally, along the singulator, and as they are moving, separating them, each from the rest;
delivering singulated drill bits, one at a time, from the singulator onto the upper run of a conveyor belt, each spaced apart from the drill bit preceding it;
moving said conveyor belt to carry the drill bits to the upper end of a gravity conveyor, and delivering them in succession into a longitudinal slideway that extends along the gravity conveyor;
moving the drill bits in succession along the slideway, through an identifying means which produces an identification signal for each drill bit as to its type;
moving the identified drill bits one at a time to a loading station;
at the loading station, successively delivering the identified drill bits, each into a separate drill bit carrier that is a part of an endless conveyor;
moving the endless conveyor along a path which borders a succession of dedicated receiving receptacles for the drill bits, each said receiving receptacle being provided to receive and store a particular type of drill bit; and
by use of a computer, and stored information in the computer, and the identification signals generated for the drill

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bits, removing each drill bit from its carrier and depositing it into its dedicated receiving receptacle in response to movement of the carrier from said loading station to a discharge position adjacent the dedicated receiving receptacle.

4,923,068
AUTOMATIC FILTER SYSTEM
Francis R. Crowson, Mount Airy, Md., assignor to CDP Product Development Corporation, Mount Airy, Md.
Filed Feb. 7, 1989, Ser. No. 306,905
Int. Cl.[5] C02F *1/00*
U.S. Cl. 210—741 **10 Claims**



1. A method of cleaning a liquid comprising the steps of:
filtering a flow of liquid between an inlet source and an outlet through a rigid filter element located in a filter vessel having valve means for selectively filtering and backwashing said filter element upon command;
providing a pressurized quantity of superheated liquid in a pressurizer for said liquid located at a location remote from said filter vessel, said pressurizer including means associated with said pressurizer for heating said liquid to a superheated state within said pressurizer so that a quantity of liquid and vapor of said liquid are present within said pressurizer;
forcing a liquid mass at about ambient temperature in a conduit separated from said superheated liquid and said vapor in said pressurizer by a valve to flow to said filter vessel responsive to said pressurized quantity of liquid; and
backwashing said filter element with said quantity of liquid and then with steam from said superheated liquid.

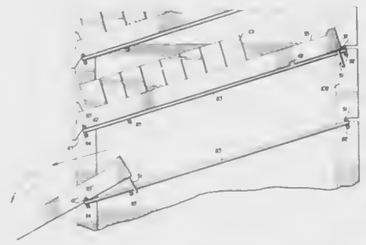
4,923,069
APPARATUS FOR STORING AND DISPLAYING JEWELERY
Sylvia Germain, and Al Germain, both of R.R. 5, Belleville, Ontario, Canada K8N 4Z5
Filed May 3, 1989, Ser. No. 346,799
Int. Cl.[5] B65D *73/00*
U.S. Cl. 211—13 **10 Claims**

1. Apparatus for displaying or storing jewelry having a post comprising in combination support means and successive layers of a spacing means, a backing and a retention medium, wherein:
said support means are adapted to have said successive layers mounted thereupon;
said spacing means is in abutting relationship with said support means and includes means for maintaining a space between said support means and said backing;
said backing comprises a layer of rigid pierceable material having a first and second sides, said first side abutting said spacing means;
said retention medium is in abutting relationship with said second side of said layer or rigid pierceable material, said retention medium being compressible and having a point of maximum compression, said retention medium further



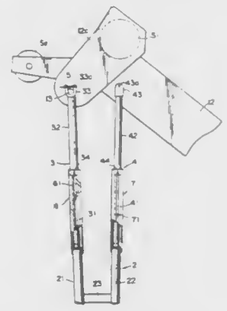
having suitable surface tension characteristics to resist piercing by the said post except when the said post is driven past the said point of maximum compression and having suitable density and adhesion characteristics such that once pierced by the said post, the retention medium will retain said post in said retention medium until the said post is intentionally disengaged.

4,923,070
DISPLAY AND GRAVITY DISPENSING APPARATUS
William C. Jackle, and Tadeusz Czerkies, both of Chicago, Ill., assignors to The Niven Marketing Group, Scottsdale, Ariz.
Filed Nov. 15, 1985, Ser. No. 798,516
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—59.2 **11 Claims**



1 Display and gravity dispensing apparatus comprising
housing means having an opening in front thereof;
at least one elongated support means;
means for mounting said support means in said housing, said support means having a downward inclination angle toward said opening;
at least one tray slidably mounted on said support means, said tray having a solid, substantially planar bottom;
first means for securing said tray on said support means substantially within said housing in a gravity dispensing mode;
second means for securing said tray on said support means so that said tray extends beyond said opening at an inclination angle greater than the inclination angle of said support means so as to place said tray in a restocking mode.

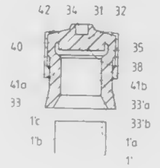
4,923,071
JIB STRETCHING AND FOLDING MECHANISM FOR A JIB CRANE
Yukio Koizumi, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Apr. 14, 1989, Ser. No. 338,158
Claims priority, application Japan, May 6, 1988, 63-110968
Int. Cl.[5] B66C *23/68*
U.S. Cl. 212—266 **2 Claims**



1. A jib stretching and folding mechanism for a jib crane having a jib and a boom provided with jib support pins on opposite sides of a distal end thereof, comprising:
two jib cylinders having rods mounted to the jib such that the cylinder tubes of said jib cylinders are extendible along the longitudinal direction of the jib;
means connected to the cylinder tubes for joining the jib to the jib support pins;
guide tubes each being fixed to one of the jib and one of said cylinder tubes, and extending therefrom so as to surround the rods of said jib cylinders when the rods are fully extended, one of said guide tubes having a guide groove including a helical section having an angular range corresponding to an angle through which the jib must turn in a jib stretching or folding operation; and
a guide member fixed to the other of the jib and the cylinder tube of the jib cylinder having a rod surrounded by said one of said guide tubes, and engaging said guide groove,
whereby an extension or contraction of said rods of said jib cylinders durng a jib stretching or folding operation causes said jib to rotate about the jib cylinder having said one of said guide tubes.

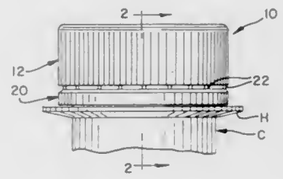
4,923,072
TUBE, STOPPER AND COMPRESSION RING FOR BLOOD SAMPLING SYSTEMS
Francois Rilliet, Chene-Bougeries, Switzerland, assignor to Dematex Development & Investment Establishment, Liechtenstein, Liechtenstein
Filed Mar. 17, 1989, Ser. No. 324,915
Claims priority, application European Pat. Off., Mar. 25, 1988, 88810201.9
Int. Cl.[5] B65D *47/36*
U.S. Cl. 215—247 **15 Claims**

1. In combination, an evacuated vial-type tube and a stopper for the collection of physiological fluids the tube comprising a neck (**1'**) having an open end and the stopper comprising a hollow generally cylindrical body of deformable material, having a head (**31**) including a sealing membrane (**32**) and an integral skirt (**33**) extending from the head (**31**) for fitting over and around the neck of the tube (**1'**) said stopper having an annular recess (**35**) surrounding a central protruding plug (**38**) of the sealing membrane (**32**), and said skirt having a generally cylindrical sealing portion (**33'*a***) which extends from said annular recess (**35**) beyond the plug (**38**) and is smooth and uninterrupted until it reaches the lower portion (**33'*b***) of the skirts such that in the sealing position it sealibly fits against the tube outer wall (**1'*b***) of the tube neck when, simultaneously said plug (**38**) fits against the inner wall (**1'*a***) of the tube neck, said tube being characterized by an outer compression ring (**40**) made of a more rigid material, having two open ends and being set on the upper part of the stopper and extending downwardly



from the head around the upper part of the peripheral wall (**33**) of the stopper that overlaps said cylindrical sealing portion (**33'*a***), said ring presenting on its inner surface at least one annular segment (**41*a***) that fits against said peripheral wall (**33**) of the skirt, at a position intermediate between the upper part of the annular recess (**35**) and the lower part of the sealing portion (**33'*a***).

4,923,073
TAMPER-INDICATING PLASTIC CLOSURE
Sheldon L. Wilde, Crawfordsville, Ind., assignor to H-C Industries, Inc., Crawfordsville, Ind.
Filed Jan. 30, 1989, Ser. No. 303,317
Int. Cl.[5] B65D *41/34*
U.S. Cl. 215—252 **16 Claims**



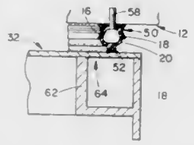
1. A tamper-indicating plastic closure for an associated container having an annular locking ring, comprising:
a closure cap including a circular top wall portion and a depending, generally cylindrical skirt portion;
a pilfer band depending from said cylindrical skirt portion;
fracturable means at least partially detachably connecting said pilfer band to said skirt portion,
said pilfer band including interference means engageable with the locking ring said associated container during application of said closure to said container so that said pilfer band is deformed to minimize stress exerted on said fracturable means, said interference means being further engageable with said container locking ring during removal of said closure from said container so that said fracturable means are progressively stressed in a direction circumferentially of said closure, to thereby at least partially detach said pilfer band from said skirt portion; and
centering means engageable with the locking ring of said associated container during removal of said closure therefrom for maintaining said pilfer band in a circular configuration.

4,923,074

TAILGATE AND TAILGATE SEAL

William T. Johnston, Alliance, Ohio, assignor to Trailstar Manufacturing, Alliance, Ohio

Filed Oct. 28, 1988, Ser. No. 263,827
Int. Cl.[5] E06B 7/22
U.S. Cl. 220—1.5 16 Claims



1. A box-like sealable container for transporting and discharging material, said container comprising:

a plurality of walls defining a chamber wherein said material is stored during transport, said walls having an inner surface and an outer surface and defining an opening in a rear wall of said plurality of walls through which said material is discharged;

a door having a peripheral extent greater than said opening;

mounting means supporting said door for swinging movement from a closed first position located exteriorly of said chamber and overlying said opening to an open second position spaced from said opening;

closure means for selectively maintaining said door in said first position; and,

a sealing gasket assembly for sealing between the peripheral portion of said door and the outer surface of said rear wall, said gasket assembly including a resilient sealing gasket facing outwardly from the rear wall about said opening, and a first rigid flange member extending outwardly of the outer surface of said rear wall about said opening beyond a major portion of said resilient sealing gasket, said resilient sealing gasket situated closely adjacent said first rigid flange on the side laterally opposite said opening, whereby said first rigid flange serves to shield said resilient sealing gasket from contact with material discharging from said container.

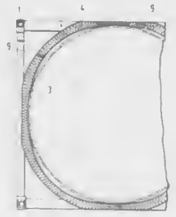
4,923,075

THERMOSTATICALLY CONTROLLABLE TANK CONTAINER

Jurgen Rohl, Horgensweg 6,, D-2000 Hamburg 54, and Heinz Rode, Teilfeld 5,, D-2000 Hamburg 11, both of Fed. Rep. of Germany

PCT No. PCT/DE88/00476, § 371 Date Mar. 27, 1989, § 102(e) Date Mar. 27, 1989, PCT Pub. No. WO89/00962, PCT Pub. Date Feb. 9, 1989
PCT Filed Aug. 2, 1988, Ser. No. 331,527
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 8710599[U]
Int. Cl.[5] B65D 87/00
U.S. Cl. 220—5 A 6 Claims

1. Thermostatically controllable tank container with a support structure (1), which fixes the external dimensions of a parallelepipedic container and serves as a support for a circular cylindrical tank with a non-supporting thermal insulation jacket in the vicinity of the outside of the tank and in which between the tank skin and the thermal insulation jacket ducts are provided for carrying a cooling or heating medium along the tank skin serving as a heat exchange surface, characterized in that the external diameter of the circular cylindrical tank (3) substantially corresponds to the internal dimensions of the square cross-section of the support structure (1), that the thermal insulation jacket (4) adapted to the contour of the circular cylindrical tank is arranged within the parallelepiped defined by the support structure (1) and that the thermal insulation jacket (4) with the circular cylindrical tank skin in cross-section forms crescent-shaped ducts (9) for carrying the cooling or heating medium and which are longitudinally defined by the



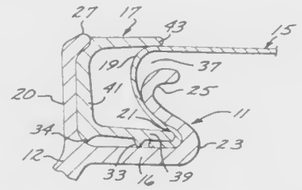
placing of the thermal insulation jacket (4) on the tank skin the corresponding vertical and horizontal plane (tangents in cross-section).

4,923,076

CARGO CONTAINER APPARATUS WITH THERMALLY EXPANDING PANELS

Dale F. Weiss, Hermosa Beach, and Ariel Neustadt, Lomita, both of Calif., assignors to Air Cargo Equipment Corporation, Rancho Dominquez, Calif.

Filed Dec. 9, 1988, Ser. No. 281,668
Int. Cl.[5] B65D 87/00
U.S. Cl. 220—1.5 12 Claims



1. Cargo container apparatus comprising:

a container frame including elongated frame members formed of material of a predetermined coefficient of thermal expansion, at least one frame member including a retaining channel formed in cross section with back, bottom and front walls cooperating to form a cavity, said front wall projecting from the front edge of said bottom wall and turning backwardly thereover to form a retainer terminating in a free extremity spaced from said back wall to cooperate therewith in forming an elongated opening;

a plurality of resilient planar wall panels for spanning between said frame members and constructed of a material having a coefficient of thermal expansion greater than said predetermined coefficient of thermal expansion, at least one of said panels being formed along a marginal extremity thereof to turn out of and back over the plane of the body of the one panel to form a proximal panel curve for inserting through said opening to be received in said cavity and hook over said retainer, said proximal panel curve being configured to, when at a predetermined intermediate temperature, hook loosely over said retainer and leave a contraction space therebetween and to then extend along the interior surface of said front wall, said marginal extremity then being turned back on itself to form a distal panel curve terminating in a clamping flange disposed in overlying relationship over said bottom wall; and

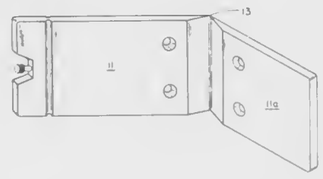
at least one clamping rail sized and configured to be received through said opening to be disposed in close fitting relationship with the interior of said cavity to be trapped between said back wall and said clamping flange to clamp said flange in place, whereby cooling of said container below said intermediate temperature causes at least one of said panels to contract relative to the container frame to thereby take up the contraction space between said proximal panel curve and said retainer.

4,923,077

MODULAR HEAT SINK PACKAGE

Willem H. P. Van Iperen, Westfield; Edmund B. Wilson, III, Randolph, and Robert S. Golabek, Jr., Towaco, all of N.J., assignors to PyMaH Corporation, Fairfield, N.J.

Filed Feb. 14, 1989, Ser. No. 311,073
Int. Cl.[5] B65D 81/18
U.S. Cl. 220—3.1 31 Claims



1. A modular heat sink for protecting thermolabile goods having a thermosensitive temperature from high ambient temperatures in excess of said thermosensitive temperature, said modular heat sink being particularly adapted and configured for use with a plurality of box sizes, said heat sink comprising:

(a) a foldable plastic bottle having an elongated rectangular planar cross section and at least first and second walls;

(b) said bottle being filled with a salt hydrate composition which will absorb heat from said high ambient temperatures and thereby protect said thermolabile goods, said composition being solid at said thermosensitive temperature;

(c) a V shaped notch formed on one side of the bottle in said first wall for enabling said bottle to be folded about said notch when said composition is solid to match the internal dimensions of selected boxes of said plurality of boxes said notch being greater than 90%;

(d) the rectangular dimensions and the placement of the notch being selected so that one of more panels may be formed with one or more bottles, and matched to one or more interior dimensions defined by said plurality of box sizes.

3. A modular heat sink for protecting thermolabile goods having a thermosensitive temperature from high ambient temperatures in excess of said thermosensitive temperature, said modular heat sink being particularly adapted and configured for use with a plurality of box sizes, said heat sink comprising:

(a) a plastic bottle having an external configuration matched to the configuration of selected boxes of said plurality of boxes said bottle having at least first and second planar walls;

(b) a recessed cavity formed within said bottle for receiving a thermosensitive portion of said thermolabile good, the remaining thickness of said bottle around said well being at least ⅛" in thickness;

(c) the external dimensions and configuration being selected so that one or more bottles may be inserted into and matched to one or more interior dimensions defined by said plurality of box sizes;

(d) said bottles being filled with a salt hydrate composition which will absorb heat from said high ambient temperatures and thereby protect said thermolabile goods, said composition including sodium sulfate decahydrate, a suspension agent and from 1 to 10% excess anhydrous sodium sulfate dispersed throughout said sodium sulfate decahydrate.

10. A modular insulated shipping carton for protecting thermolabile goods having a thermosensitive temperature form high ambient temperatures in excess of said thermosensitive temperature, said shipping carton comprising:

(a) an external shipping carton, said carton being selected from one of a plurality of carton sizes;

(b) an internal heat sink, said heat sink including:

(i) at least one plastic bottle having an elongated rectangular planar cross section and at least first and second walls;

(ii) a V shaped notch formed on one side of the bottle in said first wall for enabling said bottle to be folded about said notch to match the internal dimension of selected boxes of said plurality of carton sizes said notch being greater than 90°;

(iii) the rectangular dimensions and the placement of the notch being selected so that one or more panels may be formed with one or more bottles, and matched to one or more interior dimensions defined by said plurality of box sizes;

(iv) said bottle being filled with a salt hydrate composition which will absorb heat from said high ambient temperatures and thereby protect said thermolabile goods;

(c) a layer of insulation between said heat sink and said external shipping carton, said insulation having a rate of heat transfer less than a rate of heat absorption of said heat sink.

21. A modular shipping system for protecting thermolabile goods having a thermosensitive temperature from high ambient temperatures in excess of said thermosensitive temperature, said shipping carton comprising:

(a) a plurality of external shipping cartons having a predetermined configuration each carton of said plurality being of a different size;

(b) an internal heat sink, said heat a sink having:

(i) a plastic bottle having at least one configuration which matches a configuration of each of the external shipping cartons;

(ii) a recessed cavity formed within said plastic bottle for surrounding a thermosensitive portion of said thermolabile goods;

(iii) the external dimension of said bottle and the internal dimensions of said plurality of shipping cartons being selected so that one or more bottles may be inserted into and match the internal dimensions of said plurality of external shipping cartons;

(iv) said bottle, being filled with a salt hydrate composition which will absorb heat form said high ambient temperatures and thereby protect said thermolabile goods;

(c) a layer of insulation, said layer of insulation surrounding at least the portion of the thermosensitive goods not protected by said recessed cavity formed within said heat sink.

4,923,078

BONNET FOR BEVERAGE DISPENSING APPARATUS

Samuel E. Brown, San Antonio, Tex., assignor to Lancer Corporation, San Antonio, Tex.

Filed Mar. 9, 1988, Ser. No. 165,834
Int. Cl.[5] B65D 6/28
U.S. Cl. 220—4 R 5 Claims

1. A bonnet for covering a beverage dispensing apparatus comprising:

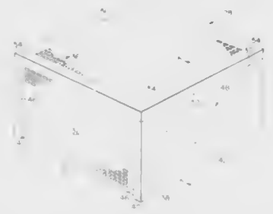
a first member for forming a bottom portion of three walls of a substantially rectangular enclosure, said first member having one end and two integral sides, each of the end and sides of said first member having a top edge and having an external surface for receiving paint thereon;

a second member for forming the top of said enclosure, said second member having integral down-turned edges on

three sides thereof for engaging the top edges of the end and sides of said first member to form a top portion of said three walls of said enclosure, each of said down-turned edges of said second member having an external surface for receiving paint thereon, said second member further having an integral end on a fourth side thereof for forming a fourth wall of said enclosure; and

means for securing said down-turned edges of said second member to the top edges of the end and sides of said first member for forming a substantially flat external surface on each of said three walls of said enclosure.

5. A bonnet for covering a beverage dispensing apparatus comprising:



a first member for forming a bottom portion of a plurality of walls of an enclosure, said first member having a top edge and having an external surface which is painted a first color;

a second member for forming the top of said enclosure, said second member having integral down-turned edges on sides thereof for engaging the top edge of said first member to form top portions of each of said walls, each of said down-turned edges having an external surface which is painted a second color; and

means for securing said down-turned edges of said second member to the top edge of said first member for forming a substantially flat external surface on each of said walls of said enclosure.

4,923,079

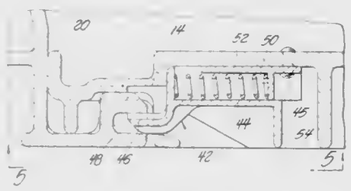
COLLAPSIBLE CONTAINER

Dennis M. Foy, Birmingham, Mich., assignor to Ropak Corporation, Fullerton, Calif.

Continuation of Ser. No. 328,749, Mar. 22, 1989, abandoned, which is a continuation of Ser. No. 22,996, Mar. 6, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 403,064

Int. Cl.[5] B65D *7/24*

U.S. Cl. 220—7 11 Claims



1. A foldable container assembly (**10**) comprising: a base (**12**) having a plurality of sides walls (**14,16,18,20**) extending vertically upward from each side of said base (**12**) at least one of said walls (**14,16,18,20**) including an opening (**60**) therein, said opening (**60**) including an open-ended top side, a horizontal bottom side, a pair of vertical sides extending from said open-ended top side to a point between said open-ended top side and said horizontal bottom side of said opening (**60**) and a pair of inwardly angled sides extending from the point between said top side and said bottom side of said opening (**60**) and which terminates and forms an intersection at said horizontal bottom side and characterized by a pair of ribs forming an apex at the intersection of said inwardly angled side and said downwardly bottom side of said opening (**60**), said pair of ribs diverging from said apex and terminating at the bottom of said side walls (**14,16,18,20**) and for increasing the structural integrity of said opening (**60**) and for providing strength to said container (**10**) at a crucial, load-bearing area.

4,923,080

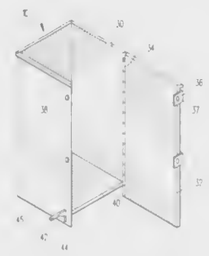
TRASH RECEPTACLE

Donn C. Lounsbury, R.R. 1, Box 24, Wentworth Rd., Walpole, N.H. 03608

Filed Dec. 6, 1988, Ser. No. 280,504

Int. Cl.[5] B65F *1/12*; B65B *67/00*; B65D *43/22, 43/26*

U.S. Cl. 220—66 1 Claim



1. A trash receptacle adapted for use with disposable trash bags, comprising:

an elongated hollow open top body;

a vertically extending side wall portion of said body mounted by a longitudinal hinge for pivotal movement between open and closed positions;

latch means for securing said side wall portion in said closed position;

an interior floor in said hollow body member, disposed above a lower end of said hollow body;

a pivot mounting rod mounting said floor for limited pivotal movement about an axis transverse to said longitudinal hinge;

a torsional coil spring surrounding said pivot mounting rod and urging said floor to a horizontal position;

and a foot pedal connected to said floor and extending exteriorly of said hollow body, for selectively inclining said floor to facilitate removal of filled trash bags from said trash receptacle, with said side wall portion in said open position.

4,923,081

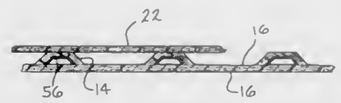
STORAGE TANKS WITH FABRICATED SUPPORT RIBS

A. Michael Weaver; Joseph R. Wiegand, and Dewey C. Stickley, all of Bakersfield, Calif., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 25, 1988, Ser. No. 147,387

Int. Cl.[5] B65D *7/46*

U.S. Cl. 220—72 10 Claims



1. A plastic, fiber reinforced storage tank comprising

a cylindrically shaped side-wall,

a pair of opposed end caps integrally connected to said side-wall and, together therewith, constituting an inner tank, and

annular reinforcing ribs integrally connected to and supported on the exterior of said side-wall, said ribs comprising hollow rib forms and an overlayed structure of chopped fibers and liquid, hardenable resin, said chopped fibers being wetted by and dispersed within said hardenable resin, and including netting and threads in contract with said structure, said threads serving to hold said resin-wetted chopped fiber structure on said rib form against the force of gravity and said netting exerting a compressive action on said threads and overlayed structure so as to promote wetting of the chopped fibers and retain said rib forms on said side-wall.

4,923,082

CARRIER FOR BEVERAGE CARTONS

Stanford W. Bird, 745 Three Fountain Cir., Salt Lake City, Utah 84107

Filed Apr. 20, 1989, Ser. No. 340,843

Int. Cl.[5] B65D *5/46, 25/28*

U.S. Cl. 220—85 H 2 Claims



1. A carrier for a carton-type, tapered container comprising a body made of flat, thin, durable and bendable plastic material and having

a generally rectangular central body portion made of interconnected straps and with a triangular gusset at each strap connection; and

a pair of handles formed from straps at opposite ends of said central portion and each handle having a support strap to be grasped by a user.

4,923,083

STRAW FOR STORAGE WITHIN BEVERAGE CONTAINER

Raymond Forbes, 204 Glenburn Dr., Pittsburgh, Pa. 15236

Division of Ser. No. 92,164, Sep. 2, 1987. This application Dec. 5, 1988, Ser. No. 279,833

Int. Cl.[5] B65D *47/06*

U.S. Cl. 220—90.2 8 Claims



1. A straw for storage entirely within a cylindrical beverage container, said straw having a vertical top section and at least two bends located below said top section with each of said bends having a downwardly inclined section descending therefrom, sequential inclined section inclining downwardly in diametrically opposite directions so that said straw can bear upon the cylindrical wall of said container at diametrically opposite sides of the wall of said container.

4,923,084

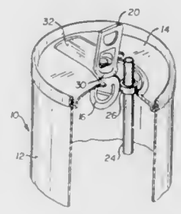
BEVERAGE CONTAINER WITH AUTOMATIC STRAW DELIVERY MECHANISM AND STRAW THEREFOR

Raymond Forbes, 204 Glenburn Dr., Pittsburgh, Pa. 15236

Division of Ser. No. 92,164, Sep. 2, 1987. This application Dec. 5, 1988, Ser. No. 279,861

Int. Cl.[5] A47G *19/22*

U.S. Cl. 220—90.2 2 Claims



1. A method of using a beverage container whose lid has a pull tab and a bend down panel for providing an opening on said lid wherein the underside of the lid has an attached straw delivery mechanism holding a pop-up straw for delivery through said opening, said method comprising pulling said pull tab to bend down said panel to a first position without actuating said straw delivery mechanism, said first position providing an opening in said lid for drinking from said container without said straw, additionally pulling said pull tab to bend down said panel to a second position, said additional pulling step actuating said straw delivery mechanism to pop up said straw through said opening.

4,923,085

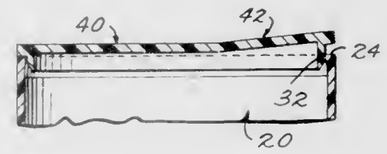
CONTAINER WITH PRESSURE-RELEASE LID

Stig Lillelund, and Eskil H. Olsen, both of Gentofte, Denmark, assignors to Dart Industries Inc., Deerfield, Ill.

Filed Nov. 14, 1988, Ser. No. 269,502

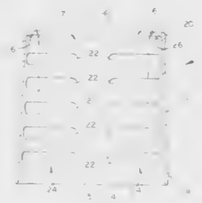
Int. Cl.[5] B65D *43/04*

U.S. Cl. 220—282 10 Claims



1. A rocking lid for a container mouth, said lid including a top member having an underlying base surface with a depending peripheral flange, said base surface comprising first and second planar surface sections, said second surface section extending from said first section at an upwardly inclined angle and defining a fulcrum line between said sections, said flange being of a constant height below said first surface section and of an increasing height below said second surface section and outward of said first surface section.

4,923,086
ICE GUARDS
Terrence K. Mahon, Milwaukee, and Daniel A. Matre, Wauwatosa, both of Wis., assignors to The Vollrath Company, Inc., Sheboygan, Wis.
Filed Jan. 18, 1989, Ser. No. 298,415
Int. Cl.[5] B65D *81/24*
U.S. Cl. 220—401 16 Claims



1. A device for reserving a place for food containers in materials such as flaked, cubed, or broken ice, comprising:
(a) a side wall defining a plurality of apertures generally in rows, the plurality of apertures being sufficient to allow ample heat transfer to cool the food container, the side wall having a first end and a second end and defining an interior space, the first end defining an opening adapted to receive a first size of food container through the first opening and into the interior space; and
(b) a rim mounted on the second end of the side wall and extending inwardly of the side wall, the rim defining a second opening adapted to receive a second, smaller, size of food container through the second opening and into the interior space.

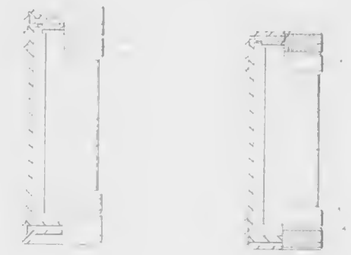
10. A salad bar having a choice of self-serve food items in food containers, comprising:
a table;
a tub contained in the table;
crushed, flaked, cubed, or broken ice contained in the tub; and
at least one ice guard in the crushed, flaked, cubed, or broken ice to reserve a place for a food container, the ice guard having a side wall, the side wall having a first end and a second end and defining an interior space, the first end defining an opening adapted to receive a first size of food container and the second end defining a second opening adapted to receive a second, smaller, sized food container.

4,923,087
TRASH STORAGE AND DISPOSAL COMBINATION UNIT
Roger A. Burrows, Huntington, W. Va., assignor to RRRR Products, Inc., Huntington, W. Va.
Filed May 9, 1989, Ser. No. 349,002
Int. Cl.[5] B65D *25/16*
U.S. Cl. 220—404 1 Claim



1. A trash container provided with a base member connected to side members of equal length forming an opening, means adjacent said opening so that when said trash containers are stacked, one within the other, there will be a space between adjacent base members, and two oppositely disposed sides of said trash container having a plurality of thinner portions capable of being readily removed to form holes to receive fastening means to hold hooks thereon. said hooks being provided with a plurality of upstanding members having enlarged ends which are received through said holes provided in the sides of said trash container thus retaining said hooks firmly against the sides of said trash container, said hooks being adapted to hold a flexible trash bag having two oppositely disposed handle means.

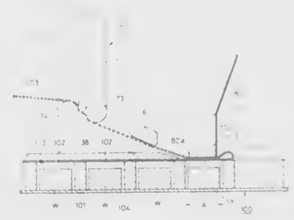
4,923,088
RADIATION-SHIELDING CONTAINER
Shinsuke Tanaka, Chiba; Jun Takahashi, Ichihara; Nobuo Ueda, Chiba, and Hiroaki Matsushima, Nishinomiya, all of Japan, assignors to Nihon Medi-Physics Co., Ltd., Takarazuka, Japan
Filed Mar. 11, 1988, Ser. No. 166,981
Claims priority, application Japan, Mar. 11, 1987, 62-35557
Int. Cl.[5] B65D *90/04*; G21F *5/00*
U.S. Cl. 220—468 6 Claims



1. A radiation-shielding container, comprising:
an outer plastic tube;
an inner radiation-shielding metal tube inserted into said outer tube so that the assembled tubes are substantially longitudinally co-extensive;
a top, plastic cap mounted at one end of said assembled tubes to close said end, said top plastic cap having a skirt portion;
a plug of radiation-shielding metal mounted within said top plastic cap; and
a bottom plastic cap mounted at the other end of said assembled tubes to close said other end, said bottom plastic cap having a skirt portion.
wherein both said top and bottom plastic caps can only be removed from said assembled tubes by irretrievably severing said skirt portions from said caps.

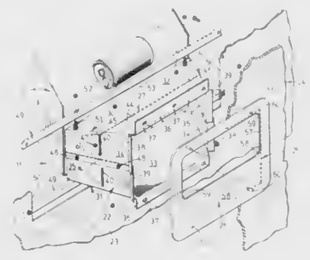
4,923,089
PARTS FEED APPARATUS
Kazuhiro Hineno, and Toshio Koike, both of Oizumi, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Jan. 15, 1988, Ser. No. 144,237
Claims priority, application Japan, Jan. 19, 1987, 62-9726
Int. Cl.[5] B23P *19/04*; H05K *13/02*
U.S. Cl. 221—1 19 Claims

1. A parts feed apparatus, comprising:
tape feed means for intermittently feeding a tape to a predetermined parts pickup position, said tape including a base tape and a cover tape, said cover tape sealing chip-like electronic parts at substantially equal intervals in a base tape;
separating means for separating said cover tape from said base tape at said parts pickup position;
parts pickup means for picking up said electronic parts after said separating means separates said cover tape from said base tape and for preventing said electronic parts from leaving said parts pickup position as said separating means separates said cover tape from said base tape; and
means for disposing said parts pickup means closely over said parts pickup position as said separating means separates said cover tape from said base tape so that even when the electronic parts stick to said cover tape, said parts pickup means blocks said electronic parts from leaving said parts pickup position.



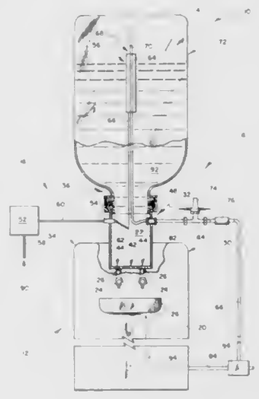
2. A method for feeding parts, comprising:
intermittently feeding a tape that has a base tape and a cover tape, the cover tape sealing chip-like electronic parts at substantially equal intervals in the base tape;
separating the cover tape from the base tape at the parts pickup position;
picking up the electronic parts with a parts pickup element after the step of separating; and
positioning the parts pickup element closely over the parts pickup position during the step of separating so that even when the electronic parts stick to said cover tape, said parts pickup means block the electronic parts from leaving the parts pickup position.

4,923,090
DELIVERY ASSEMBLY FOR COIN-OPERATED CAN VENDING MACHINES
Donald C. Rockola, Chicago, and Shuja Haque, Northbrook, both of Ill., assignors to Rock-Ola Manfacturing Corporation, Addison, Ill.
Filed Oct. 17, 1988, Ser. No. 245,734
Int. Cl.[5] G07F *11/00*
U.S. Cl. 221—312 R 8 Claims



1. In a coin-operated can vending machine having an upright cabinet equipped with a front door including a front panel having a delivery opening therethrough, a door mounted gravitational delivery assembly receptive of cans from the machine's internal storage and delivery system, comprising:
a shroud assembly adapted to be mounted within the interior of the door opposite the delivery opening in the front panel thereof, comprising, a pair of identical shroud members of substantially U-shaped cross section, means for assembling said members in superposed relation with the side walls thereof interconnected in overlapping relationship and the lowermost member upside down with respect to the uppermost member; each of said members having a planar upper wall laterally flanked by divergently related planar side walls; means for supporting the assembled said members within the door so that said side walls thereof converge and the upper walls thereof diverge from back to front of said door and abut the inside of the door's front panel; a rigid frame member formed as a unitary plate of uniform thickness having an enlarged opening therethrough adapted to be mounted over the exterior of the door's front panel to border and partially obstruct the lower regions of said delivery opening therein, means for interconnecting said shroud and frame members so that said front panel is embraced closely therebetween, and deflector means extending between and connected to the side walls of the uppermost of said shroud members to partially block the interior thereof and cooperate with said opening in said frame member to substantially prevent manual entry to the machine's interior via said assembly.

4,923,091
SELF-FILLING BOTTLED-WATER COOLER
Carl M. Sutera, 118 Richmond St., Boston, Mass. 02109
Filed Mar. 10, 1989, Ser. No. 321,769
Int. Cl.[5] B67D *5/08*, *5/62*
U.S. Cl. 222—67 18 Claims



1. A self-filling bottled-water cooler, comprising:
a cabinet body;
a water tank disposed within the top portion of the cabinet body;
at least one tap disposed on the cabinet body and connected to the water tank for dispensing pure water from the water tank;
a water bottle mounted on top of the cabinet body to the water tank such that water freely flows between the water bottle and the water tank;
a water purifier fluidically connected to the water tank and fluidically connectable to an external water source;
an inlet valve fluidically connected to the water purifier and

the water tank and regulating the flow of pure water form the water purifier into the water tank;

a water level controlling means connected to the inlet valve to allow pure water to flow into the water tank to fill the water bottle when pure water within the water bottle is below a desired full level and to close the inlet valve when the pure water is at or above the desired full level; and,

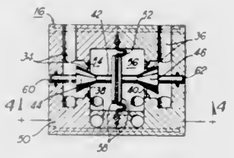
a venting system at least part of which is disposed within the water bottle for preventing a change in air pressure within the water bottle when the level of pure water in the bottle changes.

4,923,092

BINARY SYRUP METERING SYSTEM FOR BEVERAGE DISPENSING

Jonathan Kirschner, Powder Springs, and Robert D. Hughes, IV, Atlanta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jul. 20, 1988, Ser. No. 221,806
Int. Cl.[5] B67D *5/56*
U.S. Cl. 222—129.4 **10 Claims**



1. A binary syrup system for beverage dispensing from two separate containers each holding a different syrup component comprising:

(a) a syrup metering device including a housing having a pair of inlet ports, a single outlet port, and a pair of separate flow channels in liquid communication with a respective one of said inlet ports;

(b) movable pressure equalizing means in said flow channels for compensating for pressure differences in said flow channels and for providing an equal pressure section in each of said flow channels downstream from said pressure equalizing means;

(c) a metering orifice in each of said flow channels downstream from respective ones of said equal pressure sections;

(d) means for combining said flow channels into a single flow conduit for the complete syrup, said flow conduit feeding syrup to said outlet port, whereby flow of two separate syrup components can be controlled and combined into a complete syrup having a constant predetermined volumetric ratio of the two syrup components;

(e) a suction pump with the suction side thereof connected to said outlet port; and

(f) a beverage dispenser with a syrup conduit connected to the other side of the suction pump.

4,923,093

FLAVOR DISPENSING DEVICE

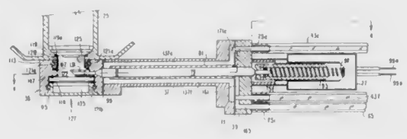
Ernest C. Gerber, 10 Londonderry Ct., Danville, Ind. 46122

Continuation of Ser. No. 57,966, Jun. 3, 1987, Pat. No. 4,793,520. This application Dec. 5, 1988, Ser. No. 280,643
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[5] B67D *5/56*
U.S. Cl. 222—145 **22 Claims**

1. A process for combining a syrup with a confection comprising the steps of:

flowing the confection through a rotor housing having a mixing chamber, a confection inlet to said mixing chamber, and a confection outlet from said mixing chamber, said rotor housing having a syrup duct means for delivering syrup into said mixing chamber;

rotating a rotor having a central aperture and positioned in said mixing chamber circumferentially around said central



aperture and around the confection by means for driving said rotor;

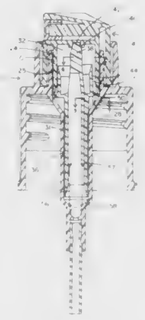
introducing a syrup from a syrup magazine through said syrup duct means and into said mixing chamber.

4,923,094

MANUALLY OPERATED PRESSURE BUILD-UP PUMP SPRAYER

Richard K. O'Neill, P.O. Box 2452, Wrightwood, Calif. 92397

Filed Jan. 6, 1989, Ser. No. 295,067
Int. Cl.[5] G01F *11/00*
U.S. Cl. 222—321 **20 Claims**



20. A pressure build-up pump sprayer to be attached to a container for dispensing liquid therefrom, said sprayer comprising:

cap means to be removably connected to the container said cap means having a hollow bore extending axially and continuously therethrough;

poppet means having a hollow pressure chamber formed therein to communicate fluidically with the container, said poppet means being received within and movable reciprocally through the bore of said cap means;

spray head means having a spray orifice and being arranged in sealing engagement around said poppet means and slidable through the bore of and in sealing engagement with said cap means in response to a manually applied force, the relocation of said spray head means relative to said cap means causing said poppet means to move through the bore of said cap means so that the pressure chamber of said poppet means is filled with liquid from the container to be dispensed from said chamber via said spray orifice;

sealing means extending radially outward from said poppet means for contacting said spray head means and forming a seal thereagainst; and

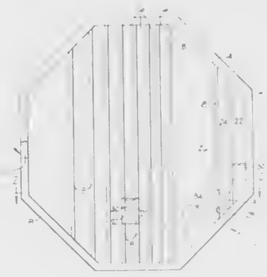
venting means extending radially inward from said cap means, said sealing means being moved into contact with said venting means when said poppet means moves through the bore of said cap means such that said sealing means is displaced from said spray head means and the seal thereagainst is broken to establish a passage through which trapped air can be vented from the pressure chamber of said poppet means to the container.

4,923,095

APPARATUS AND METHOD FOR GENERATING PRESSURES FOR A DISPOSABLE CONTAINER

Jan L. Dorfman, Littleton; Larry M. Dugan, Boulder; David C. Young, Westminster, and Mark A. Willcoxen, Lakewood, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Continuation-in-part of Ser. No. 34,900, Apr. 6, 1987, abandoned. This applicatinn Nov. 3, 1988, Ser. No. 266,515
Int. Cl.[5] B67D *5/42*
U.S. Cl. 222—386.5 **27 Claims**



1. A self-generating pressure applying means which is inserted into a container means having material contained therein so as to apply a pressure on the material so that it may be readily dispensed from the container means comprising:

an expandable pouch means for applying pressure to material in a container comprising at least two relatively flat sheets of a gas and liquid impermeable material in superposed relationship and having a length and a width with said length having a greater linear extent than said width;

said expandable pouch means having a plurality of linearly extending edge portions;

permanent sealing means for joining said superposed flat sheets along said edge portions so as to form an enclosed space therebetween;

compartment forming means between said superposed flat sheets for forming at least three compartments in said expandable pouch means;

said compartment forming means comprising lengthwise extending strips, having end portions joining said sealed edge portions, of a semi-permanent peelable sealing means for securing together superposed portions of said superposed flat sheets so that all of said compartments are completely closed;

said semi-permanent peelable sealing means permitting separation of said superposed portions of said superposed flat sheets in response to pressure applied thereto;

gas pressure generating means in one of said compartments to increase the gas pressure in said one compartment so that, as portions of the material are dispensed from said container, portions of said superposed flat sheets forming said one compartment are forced apart to apply pressure to said semi-permanent peelable sealing means between said one compartment and a first next adjacent compartment so that said one compartment and said first next adjacent compartment are joined together to form a combined compartment;

at least a second next adjacent compartment;

gas pressure generating means in said first next adjacent compartment cooperating with said gas pressure generating means in said one compartment to continue the generation of gas pressure to force apart the portions of said superposed sheets forming said combined compartment as said material is dispensed from said container means to apply pressure to separate said semi-permanent peelable sealing means between said combined compartment and said at least a second next adjacent compartment so that said combined compartment and said at least a second next adjacent compartment are joined together to form a larger combined compartment;

said gas pressure generating means in said one compartment comprising first and second reactive components of a chemical gas generating system;

said gas pressure generating means in all of the other compartments comprises said first of said two reactive components;

said expandable pouch means being located within a container having a gas pressure generating beverage container therein;

said first reactive component of said two component chemical gas generating system in said one compartment comprises a liquid;

wherein said gas pressure generating means in said one compartment comprises:

at least said first reactive component being confined within an enclosure having rupturable means so that said enclosure may be ruptured allowing said first reactive component to react with said second reactive component to commence generating a gas;

said enclosure comprising a rigid container having at least one open end located in said first compartment;

a flexible membrane covering said open end and in sealed engagement therewith so as to contain a quantity of said first reactive component in said container;

membrane rupturing means in said container and located next to said open end so as to pierce said flexible membrane when said flexible membrane is forced into said container by pressure forces generated within said container so as to release said liquid first component into said first compartment.

4,923,096

DRIPLESS AUTOMATIC SYRINGE FOR DISPENSING FLUIDS

James F. Ennis, III, Preston, Conn., assignor to Mark L. Anderson, Elmwood, Wis.

Filed Jan. 9, 1989, Ser. No. 295,149
Int. Cl.[5] B67D *5/42*
U.S. Cl. 222—391 **5 Claims**



1. A fluid dispensing device, comprising:

a cylindrical barrel for containing a fluid to be dispensed, said barrel having forward and rear open ends;

a nozzle at said forward end of said barrel and having an open free end for discharging said fluid from said barrel;

an elongated rod having a forward end insertable axially into said barrel;

a rigid piston head on said forward end of said rod for driving said fluid out of said barrel through said nozzle each

VOL 114 ISS 2 MY 8 1990 UMI

time an axially forward driving force is applied to said rod to move the same axially of said barrel;

a normally unflexed elastic means said elastic means comprising a flexible nipple fractionally gripping said rod rearwardly of said piston head, to hold said rod in place each time said driving force applied to said rod ceases and a flexible disc integral with said nipple for slightly retracting said rod each time said rod ceases driving said piston head forwardly in said barrel and flexible disc arranged to flex when said rod is driven forwardly to discharge said fluid from said barrel, said flexible disc being further arranged to resume unflexed condition when said driving force ceases, to create a suction at said open free end of said nozzle to draw back fluid thereat into said nozzle to prevent dripping of said fluid from said nozzle; and

stationary means defining a recess adjacent to said flexible disc for receiving flexed portions thereof each time said driving force advances said plunger forwardly in said housing and said barrel.

4,923,097

AEROSOL PAINT COMPOSITIONS

Philip L. Bartlett, Wilmington, Del., assignor to E. I. DuPont De Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 304,573, Jan. 31, 1989, abandoned, which is a continuation of Ser. No. 144,581, Dec. 30, 1987, abandoned, which is a continuation of Ser. No. 893,881, Apr. 6, 1986, abandoned. This application Aug. 11, 1989, Ser. No. 403,834

Int. Cl.[5] **B65D** *83/00*; **C08L** *1/08*

U.S. Cl. 222—394 **13 Claims**

1. A solvent-based aerosol paint in an aerosol dispensing container comprising

(a) an effective amount of dimethyl ether as solvent or solvent and propellant and,

(b) a non-aqueous paint resin formulation which contains a paint resin and a coalescing solvent, said paint resin selected from the group consisting of styrene-modified alkyd resins, vinyl toluene-modified alkyd resins, acrylic-modified alkyd resins, phenol-formaldehyde/rosin-modified alkyd resins, silicone-modified alkyd resins, short-oil and oil-free alkyd resins, chain-stopped alkyd resins, nitrocellulose resins, silicone resins and acrylic resins, said acrylic resins containing at least some alkyl groups with less than four carbon atoms, said paint resin capable of being sprayed satisfactorily from an aerosol can and which upon drying provides a flexible, durable, non-tacky film.

4,923,098

FLUID CONTAINER

Michael I. Schoonover, 1218 W. Atherton, and James A. McFadden, 5368 Torrey Rd., both of Flint, Mich. 48507

Continuation-in-part of Ser. No. 32,323, Mar. 30, 1987, Pat. No. 4,781,314. This application Jul. 13, 1988, Ser. No. 220,424

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[5] **A47G** *19/14*

U.S. Cl. 222—456.1 **10 Claims**

1. A container for fluids comprising, in combination:

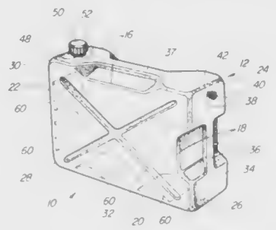
two opposed sides, each of said sides having four edges, the edges of one of said sides corresponding to the edges of the other of said sides;

a first top extending between a first pair of corresponding edges of said two sides including a first neck defining an opening;

a second top extending between a second pair of corresponding edges of said two sides including a second neck defining a second opening; said second pair of corresponding edges extending from ends of said first pair of corresponding edges so that said second top adjoins said first top at a first corner;

a first bottom extending between a third pair of corresponding edges of said two sides, said third pair of corresponding edges being adjacent said second pair of corresponding edges so that said first bottom adjoins said second top at a second corner;

a second bottom extending between a fourth pair of corresponding edges of the two sides, said fourth pair of corresponding edges extending from said third pair of corresponding edges and to said first pair of corresponding edges so that said second bottom adjoins said first bottom and said first top, respectively, at third and fourth corners;



said two sides, two tops and two bottoms together defining a housing, each of said first and second bottoms being adapted to allow stable resting of said housing on either one of said bottoms; and

a pair of caps each securable to said first and second necks; and

a first handle extending between said first pair of corresponding edges of said two sides of said first top; and

a second handle extending between said pair of corresponding edges of said two sides of said second top.

4,923,099

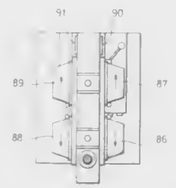
FASTENER ATTACHING APPARATUS

Yoshihiko Hasegawa, and Noriyoshi Suyama, both of Tokyo, Japan, assignors to Scovill Japan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1988, Ser. No. 224,456

Int. Cl.[5] **A41H** *37/10*

U.S. Cl. 227—114 **7 Claims**



1. A fastener attaching apparatus comprising:

at least one hopper;

a guide track comprising an outlet and means for discharging a fastener from said hopper through said outlet;

a mold;

a guide groove extending from said outlet toward said mold;

a push rod mounted for slidable movement in said guide groove and comprising means for pushing a fastener from said outlet to a forward position where said fastener enters said mold;

means for withdrawing said push rod from said forward position and for halting said withdrawal at a position where said push rod obturates said outlet; and

a power source comprising means for withdrawing said push rod from said obturating position to allow said discharge of a fastener into said guide groove, and for subsequently pushing said fastener to said forward position.

4,923,100

PROCESS FOR PRODUCING CLAD SHEETS

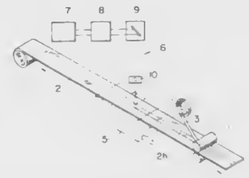
Yasuyuki Nakamura, Takatsuki; Akio Hashimoto, Kobe; Toshiaki Fujita, Hirakata, and Makoto Kawakami, Suita, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Division of Ser. No. 873,350, Jun. 12, 1986, Pat. No. 4,826,736. This application Nov. 15, 1988, Ser. No. 271,503

Claims priority, application Japan, Jun. 14, 1985, 60-130191; Oct. 16, 1985, 60-230666; May 10, 1986, 61-107174; May 10, 1986, 61-107175; May 10, 1986, 61-107176; May 15, 1986, 61-111534

Int. Cl.[5] **B23K** *20/04*

U.S. Cl. 228—117 **36 Claims**



1. A process for producing clad sheets for IC lead frames, which comprises:

forming a hardened layer portion having a thickness of 5 micrometers or less by melting and rapid solidification through irradiating at least one surface of a metal substrate with at least one laser beam, and

cold-cladding a metal cladding layer material by rolling onto the beam-irradiated surface of said substrate, said metal cladding layer material penetrating into microcracks of the hardened layer portion which are produced during the cold-cladding.

4,923,101

BULK MATERIAL CONTAINER WITH A DOOR MOVABLE OVER A RECTILINEAR PATH

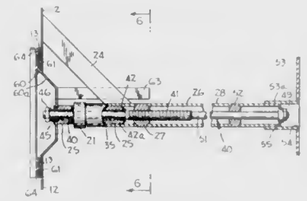
Clarence B. Coleman, Oakland, Calif., assignor to Fabricated Metals, Inc., San Leandro, Calif.

Division of Ser. No. 594,840, Mar. 29, 1984, Pat. No. 4,858,791. This application Mar. 13, 1989, Ser. No. 322,172

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[5] **B65D** *47/00*

U.S. Cl. 222—510 **1 Claim**



1. A bulk material container comprising:

(a) a bulk material container shell having an exterior wall with an opening formed therein;

(b) a door having a plurality of sides and a wall disposed in confronting parallel relation with the wall of said shell, said door being arranged to open and close said opening, said door having fixed thereto a door aligner projecting toward the interior of said container shell;

(c) screw actuating means for imparting movement to said door along a rectilinear path for the opening and closing of said opening and for moving said confronting parallel wall of said door toward and away from said wall of said shell;

(d) a gasket disposed exteriorly of said shell between said confronting parallel walls of said door and said shell, said gasket being arranged to surround said opening exteriorly of said shell and arranged to be compressed between said confronting parallel walls of said door and said shell to form a seal while said door closes said opening; and

(e) aligner guide means fixedly disposed within said container shell for guiding said door aligner to select the orientation of said door about its centerline to orient its closure alignment with said opening upon closure with said opening, said aligner guide means comprising spaced members coupled to said container and said screw actuating means, said spaced members being arranged to receive said door aligner therebetween to limit the rotation of said door for selecting the orientation of said door about its centerline to orient its closure alignment with said opening upon closure with said opening.

4,923,102

GARMENT HANGER

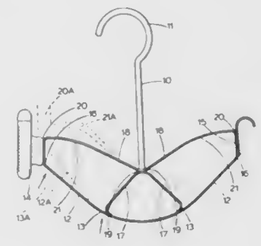
Eva Agathangelou, Limassol, Cyprus, assignor to Cloverleaf Trading Company Ltd., Limassol, Cyprus

Filed May 10, 1988, Ser. No. 192,239

Claims priority, application United Kingdom, May 11, 1987, 8711039

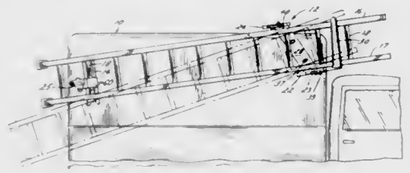
Int. Cl.[5] **A47G** *25/62*

U.S. Cl. 223—95 **9 Claims**



1. A garment hanger comprising a support hook and a shank extending from the hook, a pair of elongated arms extending outwardly in opposite directions from the shank, each arm including upper and lower members which are each hingedly attached with the shank, and garment retaining members hingedly attached to the upper and lower members, wherein each upper member is adapted to operate as a hanger at a predetermined point intermediate its ends so that when applying pressure upon the garment retaining members to compress each arm inwardly towards the shank the upper member of each arm hinges at the said hinge point intermediate the opposed ends thereof to increase the spacing between the said upper and lower members, the resilient forces inherent within the upper member being operative to increase the spacing between the upper and lower members respectively, and wherein the lower arm member is provided with a hinge portion intermediate the center of the hanger and an outermost end of each lower member.

4,923,103
LADDER RACK
Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182
Filed Jun. 29, 1989, Ser. No. 373,249
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—42.45 R 14 Claims



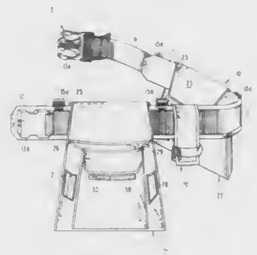
1. A ladder rack device for mounting on a vertical wall such as a vehicle body or the like comprising, in combination:
a first wall mountable support for receiving a first end of a ladder, said first support including a generally U-shaped bracket means for securing said ladder in a mounting position; said first support bracket means including a first horizontal shelf means and a pair of upright arms each having one end connected to said first shelf means and extending normally and upwardly therefrom for supporting the ladder therebetween, one of said pair of arms being mountable on said vertical wall and being angled with respect to said first shelf, said one arm further including an upper flange at an opposite end thereof parallel to said first horizontal shelf and spaced therefrom such that the sides of a ladder would fit parallel to and snugly between said upper flange and said first shelf;
a second support adapted to be wall mounted distally spaced from said first support for receiving a second end of said ladder,
said second support having bracket means and a second horizontal shelf for supporting the ladder, said one arm being angled toward said second support, and
said second support bracket means carrying latching means for engaging a rung of said ladder whereby said ladder is retained in a loaded position on said first and second support shelves and is removed therefrom by unlatching said latching means and pivoting said ladder downwardly about said first horizontal shelf.

4,923,104
CHILD CARRIER AND PROTECTOR
Doris Rice; Kevin A. Rice, both of 7610 Thouron Ave., Philadelphia, Pa. 19150, and Elvin T. Rice, 1921 Bonitz St., Philadelphia, Pa. 19140
Filed Oct. 27, 1987, Ser. No. 113,575
Int. Cl.[5] A47D *13/02*
U.S. Cl. 224—155 7 Claims



1. A device adapted for the transport and protection of an infant or small child having a main body unit, a means for seating said infant or small child which is adjustable so as to accommodate children or infants of various sizes comprising a piece of flexible material, the upper portion of said flexible material being secured to the main body unit and the lower portion of said flexible material adapted, once said infant or small child is placed upon said flexible material, to fold upward and attach to the said upper portion, a means for securing said infant in said seating means, a means for protecting said infant from inclement weather comprising a waterproof panel which may be secured to said main body units and a hood secured to said waterproof panel, said hood comprises a hard, rigid, transparent viewing panel and air vents, and a means for carrying said main body unit; said means for seating and said means for securing being attached to one face of said main body unit, and said means for carrying being attached to the opposite face of said main body unit.

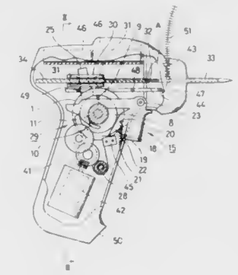
4,923,105
UTILITY BELT
James M. Snyder, P.O. Box 1178, Summerland, Calif. 93067
Filed Aug. 8, 1988, Ser. No. 229,847
Int. Cl.[5] A45F *3/04*
U.S. Cl. 224—255 7 Claims



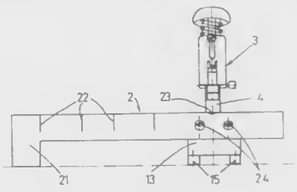
1. A utility belt comprising:
a belt adapted to be worn around the waist of a wearer; and
a number of belt components, each of said belt components having means for removably mounting each of said belt components on said belt,
wherein said number of belt components includes a flexible pouch arrangement, said flexible pouch arrangement including;
a first pocket having an outer wall and a loop arrangement on said wall; and
a detachable pocket having a pressure adherent strip arrangement affixed thereon and adapted to engage about said loop arrangement for removable attachment of said detachable pocket to said first pocket.

4,923,106
PISTON DRIVING APPARATUS IN TAG ATTACHER
Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.
Filed Aug. 2, 1988, Ser. No. 227,215
Claims priority, application Japan, Oct. 15, 1987, 62-156729
Int. Cl.[5] B65C *7/00*
U.S. Cl. 227—67 4 Claims

1. A piston driving apparatus for use in a tag attacher having a piston displaceable between a home position and an actuating position, comprising an oscillating arm coupleable to said piston for displacing said piston between its home and actuating positions, a crank coupled to said oscillating arm for displacing said oscillating arm to operate said piston, motor means coupled to said crank for actuating said crank to displace said oscillating arm, a cam coupled to said crank for selectively deactuating said motor means when said oscillating arm returns said piston to its home position, and a lever coupleable to said cam for displacing said cam to permit actuation of said motor means.



4,923,107
STAPLING MACHINE
Jorge G. Echevarria, Eibar, Spain, assignor to Olave, Solozabal Y CIA, S.A., Spain
Filed Nov. 10, 1988, Ser. No. 269,860
Int. Cl.[5] B25C *1/02*
U.S. Cl. 227—120 6 Claims



1. A stapling machine comprising:
(a) a one-piece support base capable of flexing and having two wings, one wing for carrying a stapling-machine head/staple holder, and another wing for support of an anvil arm, said anvil arm extending upwards towards the stapling machine head/staple holder and backwards towards the back of the stapling machine, said two wings being connected together via a curved core;
(b) a guide rule fitted on said anvil arm, said guide rule having a point-bending cavity along its top edge opposite the stapling head, said point-bending cavity being vertically spaced from said support base when said stapling machine is in its normal operating position.

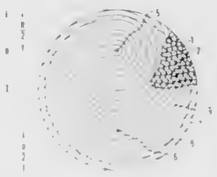
4,923,108
PROCESS FOR INTERNALLY STRENGTHENING TUBES
Steve Cordell, 3317 Cardiff Ave., Los Angeles, Calif. 90034
Filed Nov. 8, 1988, Ser. No. 268,569
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1987, 3738813
Int. Cl.[5] B23K *31/00, 31/06*
U.S. Cl. 228—126 6 Claims

1. A method of internally strengthening and stiffening a tube which has a cross-section which is regular along its length and symmetrical about its longitudinal axis but which is bent or otherwise not straight, or a tube whose cross-section along its length is irregular or has an otherwise non-symmetrical form and which is either straight, bent or has another form lengthwise, accomplishing a solid connection between a strengthening element comprising a plurality of parts and the inner walls of the tube by the process of heating or other welding or gluing processes, characterized by inserting a self-adapting, self-positioning strengthening element into said tube, by the parts of said strengthening element adapting themselves continually to the inner contours of said tube, and finally by establishing said solid connection between said tube and those points and parts



of said strengthening element which are either in direct contact with said tube or in contact with other selected points close to the inner walls of said tube, as well as between the parts of said strengthening element which move relative to each other while said strengthening element self-adapts itself within said tube.

4,923,109
METHOD FOR PRODUCING A HONEYCOMB BODY, ESPECIALLY A CATALYST CARRIER BODY HAVING SHEET METAL LAYERS TWISTED IN OPPOSITE DIRECTIONS
Theodor Cyron, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany
Division of Ser. No. 48,361, May 11, 1987, Pat. No. 4,832,998.
This application Mar. 13, 1989, Ser. No. 322,772
Claims priority, application Fed. Rep. of Germany, May 12, 1986, 3615902
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—181 13 Claims



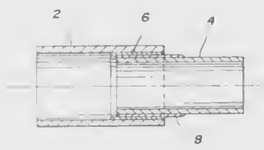
1. Method for producing a honeycomb body, which comprises:
(a) layering a given number of structured metal sheets with ends into a stack with ends;
(b) grasping fixation points at the stack with at least one fork-type tool and twisting the ends of the stack in opposite directions with the at least one fork-type tool while bending over the ends of the stack;
(c) providing the twisted stack with a jacket tube; and
(d) joining the ends of the structured sheets to the jacket tube.

4,923,110

PROCESS USING PROTECTIVE FLUX COATINGS FOR DELAYING, SOLDERING AND LOW TEMPERATURE BRAZING OPERATIONS, AND FLUX SOLUTIONS THEREFOR

Arthur O. Carmichael, 7830 Bransbury, Union Lake, Mich. 48085, and Seymour A. Genden, 15100 Darmouth, Oak Park, Mich. 48237

Continuation-in-part of Ser. No. 8,853, Jan. 30, 1987. This application Dec. 29, 1988, Ser. No. 291,548
Int. Cl.[5] B23K *35/34*
U.S. Cl. 228—214 18 Claims



1. A flux coating solution for treating a clean metallic component having a fluid channel defined through at least a portion thereof to provide a durable, tack-free, protective flux film on a surface of the component so that the component can be fluid-tightly joined to a mating metallic component at a later time without recleaning and refluxing the component at the later time, the solution consisting essentially of:

rosin; and

a highly volatile organic solvent comprising 1, 1, 1, trichloroethane

said solution being adapted to rapidly air dry when coated on the surface of the component to leave a very thin, tack-free protective flux film on the surface of the component; and

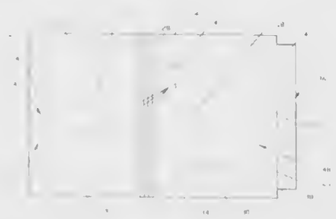
the protective flux film as deposited on the component, being adapted to be stored for long periods of time, handled, assembled, shaped formed and otherwise worked without removal of the film from the surface of the component and without reduction of the protecting and fluxing properties of the film.

4,923,111

COMBINATION MAILING ENVELOPE AND FILE FOLDER

Douglas G. Down, Omaha, Nebr., assignor to Omaha Printing Company, Omaha, Nebr.

Filed May 25, 1989, Ser. No. 357,086
Int. Cl.[4] B65D *27/34*
U.S. Cl. 229—68 R 3 Claims



1. A combination mailing envelope and file folder comprising: a front sheet member having an upper end, opposite side edges, and a lower end,

a back sheet member of substantially the same dimensions as said front sheet member and having an upper edge, opposite side edges, and a lower end,

said back sheet member being superimposed with respect to said front sheet member, the lower ends of said sheet members being joined, adhesive means securing the side edges of said sheet members together,

said back sheet member having a flap portion foldably connected to the upper end of said back sheet which is adapted to be folded over the upper end of said front sheet member and secured thereto to form a mailing envelope,

said front and back sheet members having registering tearable score lines formed therein inwardly of the adhesive means securing the side edges thereof together,

said front and back sheet members having tearable score lines formed therein below the upper ends thereon and below the foldable connection of said folded flap portion to said back sheet, and

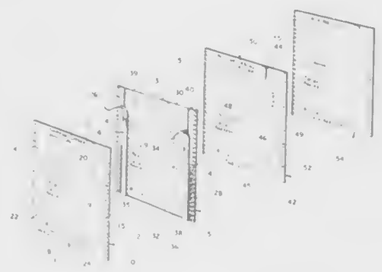
said tearable score lines providing a means for opening the envelope and for providing a file folder with the remaining portions of said sheet members after the sheet members have been torn along the tearable score lines.

4,923,112

MULTIPLE PART SALES FORM

William F. Dale, deceased, late of Marietta, and by Debra L. Dale, executrix, 4106 Manor House Dr., Marietta, both of Ga. 30062

Filed Dec. 14, 1988, Ser. No. 284,081
Int. Cl.[4] B65D *27/06*
U.S. Cl. 229—69 6 Claims



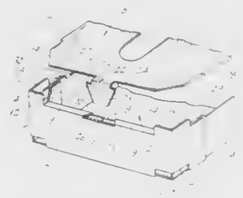
1. A multiple part form, said form including a first part, a second part, a third part and a fourth part juxtaposed and coincident with one another, each of said parts including feed strips for allowing said form to be engaged by a printer tractor, said feed strips being disposed longitudinally along opposite edges of said parts, each of said parts further including an upper portion and a lower portion, said upper and lower portions being selectively separable by perforations extending laterally of said parts, said first part and said second part further defining a first line of perforations for removing said feed strips from said first part and second part, and a second line of perforations parallel to said first line of perforations and inwardly of said first line of perforations, said second part including glue lines extending adjacent and parallel to said first line of perforations from said perforations extending laterally of said part to the bottom edge of said second part and a glue line extending along said bottom edge of said second part, said glue lines being adapted to adhere said second part to the back of said first part, said third part and said fourth part defining a third line of perforations and a fourth line of perforations respectively for removing said feed strips from said third part and fourth part, said third and fourth lines of perforations being coincident with said second line of perforations, the arrangement being such that removal of the feed strips from the right-hand edge of said four parts removes only the feed strips from said first part and said second part along said first line of perforations and shortens the width of said third part and fourth parts for separation of said third part and fourth part from said first part and second part.

4,923,113

CONTAINER WITH A PERFECTED LID

Francisco I. Guijarro, Alicante, Spain, assignor to Iberoamericana Del Ambalaje S.A., Spain

Filed Jun. 7, 1988, Ser. No. 203,427
Claims priority, application Spain, Jan. 25, 1988, 8800162
Int. Cl.[5] B65D *5/22*
U.S. Cl. 229—125.27 5 Claims



1. A container, comprising:

(A) a rectangular tray, including:

(a) a base, said base including first spaced parallel edges and second spaced parallel edges;

(b) first and second sidewalls extending upward from said base along said first spaced parallel edges, said first and second sidewalls including closely spaced inner and outer partitions, each of said inner partitions including ends and a main central portion, said inner and outer partitions including upper edges, said inner and outer sidewalls including narrow connecting panels, said inner and outer partitions being joined along said upper edges by said narrow connecting panels, said first and second sidewalls including a free space between said inner and outer partitions; and

(c) third and fourth sidewalls extending upward from said base along said second spaced parallel edges; and

(B) a removable lid, said removable lid including a downwardly extending tab which is adapted to be received within said free space;

each end of said inner partitions being provided with an extension that comprises a distal portion and a joining portion, said distal portion being connected to and disposed adjacent the inner surface of the closer of said third and fourth sidewalls, said joining portion extending diagonally between the main central portion of the inner partition and the sidewall to which the distal portion is connected.

4,923,114

NEWSPAPER BOX SIGNAL DEVICE AND COVER

John M. Fiske, Jr., 1504 NE. 24th St., Jensen Beach, Fla. 34957

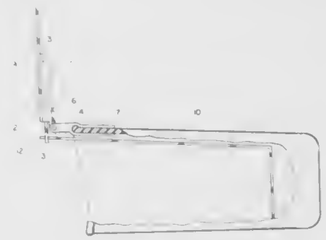
Filed Sep. 12, 1989, Ser. No. 406,251
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—34 14 Claims

1. In a box-like receptacle having enclosing walls forming a substantially cylindrical shaped elongated enclosure, which receptacle is open at one end for insertion of printed matter such as newspapers and other printed matter, an apparatus to visually indicate the absence of such printed matter, which apparatus comprising:

(a) a signal flag element that is pivotally connected to an enclosing wall of said box-like receptacle, adjacent said open end;

(b) a first trigger element slideably connected to said signal flag element;

(c) a second trigger element which is comprised of a vertical member and a horizontal member, said horizontal member slideably engaging said first trigger element such that when said first and second trigger elements are in an untripped position, said signal flag element is substantially perpendicular to said enclosing wall, and when said first and second trigger elements are in a tripped position, said signal flag element is substantially perpendicular to said enclosing wall and substantially covering said open end of said box-like receptacle, said vertical member blocking at least a portion of the cross-section of said box-like receptacle so that placing said printed matter into the receptacle requires pushing said second trigger element to a tripped position and disengaging said second trigger element from said first trigger element; and



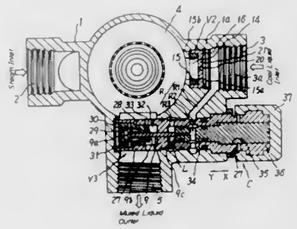
(d) a biasing means whereby said signal flag element is forced from a position perpendicular to said enclosing wall to a position perpendicular to said enclosure wall and substantially covering said open end of said box-like receptacle whenever said first and second trigger elements are disengaged.

4,923,115

MIXING VALVE APPARATUS

Kotohiko Sekoguchi, Ikeda; Keiichi Noguchi; Mutsushi Muramoto, and Takayuki Ohata, all of Osaka, all of Japan, assignors to Miyawaki Incorporated, Osaka, Japan

PCT No. PCT/JP87/00526, § 371 Date Mar. 17, 1988, § 102(e) Date Mar. 17, 1988, PCT Pub. No. WO88/00666, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 17, 1987, Ser. No. 188,794
Claims priority, application Japan, Jul. 17, 1986, 61-168260; Apr. 23, 1987, 62-101398; Apr. 23, 1987, 62-101399; Apr. 23, 1987, 62-101400
Int. Cl.[5] G05D *23/13*
U.S. Cl. 236—12.11 3 Claims



1. A mixing valve apparatus including a casing (1) formed with a first inlet (2) for high temperature fluid, a second inlet (3) for low temperature fluid, a mixing chamber (4) which is in communication with the first and second inlets (2,3), and in which the high temperature fluid and the low temperature

fluid are mixed with each other, and an outlet (5) which is in communication with the mixing chamber (4), wherein an inlet valve (V_1) is arranged to be associated with the first inlet (2) and has a valve element (12) for regulating the flow rate of the high temperature fluid into the mixing chamber (4), control means being provided to control the opening of the inlet value (V_1), said control means comprising:

a differential pressure element (V_2, 4a61) associated with the second inlet (3), for generating a differential pressure (P) between the second inlet (3) and the mixing chamber (4);

a pressure-sensitive control unit (6) including a pressure-sensitive element (7) for displacing the valve element (12) of the inlet valve (V_1) in response to the differential pressure (P), first and second pressure chambers (8*a*, 8*b*) isolated from each other by the pressure-sensitive element (7), the first pressure chamber (8*a*) being in communication with the mixing chamber (4), while the second pressure chamber (8*b*) being in communication with the second inlet (3) via pilot passage (R_0, R_3); and

a temperature-sensitive element (9) displaceable in response to the temperature of the mixed fluid within the mixing chamber (4), the temperature-sensitive element (9) forming a throttle in the pilot passage (R_0R_3) in the form of a small clearance ($L'L_1$) whose size decreases or increases as the temperature of the mixed fluid increases or decreases wherein said temperature-sensitive element (9) is displaceable in a first direction upon an increase in the fluid pressure within the pilot passages (R_0R_3) so that the size of said small clearance ($L'L_1$) decreases, and is displaceable in a second direction upon a decrease in the fluid pressure within the pilot passage so that the size of the small clearance increases.

4,923,116

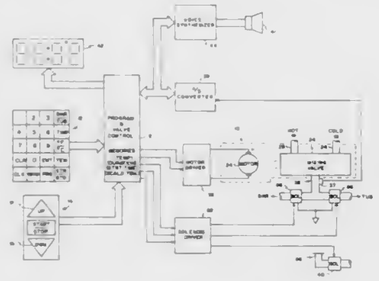
BATH WATER CONTROL SYSTEM

Gerald L. Homan, 103 Dexter Cir., Madison, Ala. 35758

Filed May 24, 1989, Ser. No. 357,063

Int. Cl.[5] G05D *23/185*

U.S. Cl. 236—12.12 **22 Claims**



1. A bath water control system for controlling water flow to a personal bath unit including a bath drain and comprising:

mixing valve means having a hot water input, a cold water input, and a mixed water output and responsive to a control input for supplying a selected mixture of hot and cold water at said mixed water output;

actuator means responsive to both a selected temperature signal and a signal representative of the temperature of water from said mixed water output, for providing said control input to said mixing valve means;

at least one fluid passageway having an input connected to said mixed water output and having a passageway output; and

control means for providing a said selected temperature signal to said actuator means and comprising:

memory means for storing at least one selected temperature signal,

readout means for selectively sensing one of said selected temperature signals and providing it as a selected temperature signal to said actuator means,

temperature adjustments means coupled between said program selection means and said actuator means for selectively varying said selected temperature signal,

second D memory means for storing at least one selected time duration signal representative of a discrete time period, and

said program selection means further includes means in circuit with said actuator means and said second memory means for selectively sensing a said time duration signal together with a said selected temperature signal and providing said selected temperature signal to said actuator means for a said discrete time period.

4,923,117

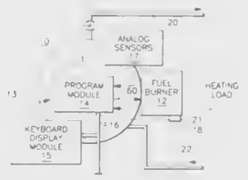
MICROCOMPUTER-CONTROLLED SYSTEM WITH REDUNDANT CHECKING OF SENSOR OUTPUTS

Wilmer L. Adams, Fridley, Minn.; James I. Bartels, Hudson, Wis.; Robert A. Black, Jr., Brooklyn Park, Minn.; Kenneth B. Kidder, Coon Rapids, Minn.; William R. Landis, Bloomington, Minn., and Paul B. Patton, Rockford, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 146,556, Jan. 21, 1988, abandoned. This application Mar. 13, 1989, Ser. No. 337,243

Int. Cl.[4] F23Q *23/00*

U.S. Cl. 236—94 **14 Claims**



1. In a control system for providing a control signal for controlling the activity of a physical device whose operating condition can be derived from the output of a plurality of sensors each sensing a preselected physical quantity associated with the device and each providing an analog voltage signal whose magnitude is indicative of the physical quantity sensed by it, improved apparatus for testing system elements for operation according to design requirements and for issuing an alarm signal responsive to operation outside of design requirements, including

(a) first and second analog to digital converters, each having at least first and second multiplexed analog voltage input channels, the channels for each converter respectively having predetermined unique first and second addresses, and each converter receiving a sensor signal at its second channel, each said converter further receiving channel select signals in which are encoded channel addresses and supplying responsive to the channel select signal a digital output signal encoding the magnitude of the analog signal present at the channel whose address is encoded in the channel select signal;

(b) a first reference voltage source providing a voltage to the first and second converters' first input channels, said provided voltages having predetermined precise values; and

(c) microcomputer means prestoring the digital value of the voltage provided by the first reference voltage source and which microcomputer means receiving the outputs of the first and second converters, for during a first predetermined time providing to each converter a channel select signal encoding the predetermined first input channel address of each, for storing the output from each converter during the first predetermined time, for testing the output of each converter for agreement with the prestored value for the first source's voltage supplied to that converter, and for issuing the alarm signal responsive to failure of the prestored value of the voltage provided by the first reference voltage source to agree with the output of the first or second converter.

4,923,118

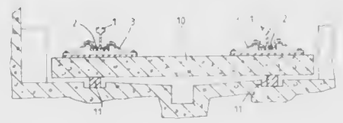
ANTI-VIBRATION SUPPORT SYSTEM FOR RAILROADS

Armand Goossens, Beukenlaan 35, 1990 Hoeilaart, Belgium

Filed Feb. 21, 1989, Ser. No. 313,289

Int. Cl.[5] E01B *9/38*

U.S. Cl. 238—283 **4 Claims**



1. A support system for each rail of rails for a railroad track and the like, said system comprising:

a plurality of sole plates fastened on a concrete slab at spaced apart locations along each rail, each of said sole plates having a shaped housing adapted to receive a shock-absorbing cushion, a plurality of cushions of shock-absorbing material adapted to be received by said shaped housing, each of said cushions within said shaped housing for each distinct sole plate for supporting a rail of said railroad track, fastening means for fastening each rail to each of the sole plates located along said rail, each of said shock-absorbing cushions supporting a rail adapted to display a dynamic stiffness such that said rail is supported alternately on a relatively rigid support and an adjacent resilient support whereby, during a passage of a bogie on the track, a vibration signal generated by a first wheel of the bogie at the level of a resilient support is decayed when a second wheel of the bogie passes the said adjacent resilient support, thereby localizing vibrations of each rail, with a very weak longitudinal transmission of vibrations along said rail.

4,923,119

SUSTAINED-RELEASE PHEROMONE DISPENSER

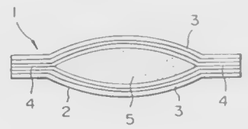
Akira Yamamoto; Ryuichi Saguchi, and Shigehiro Nagura, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 12, 1989, Ser. No. 351,200

Claims priority, application Japan, May 13, 1988, 63-116650; Sep. 29, 1988, 63-245417

Int. Cl.[5] A01N *25/02*

U.S. Cl. 239—55 **5 Claims**



1. A sustained-release dispenser of a sex pheromone compound of insects which comprises:

(a) a sex pheromone compound of insects in the form of liquid; and

(b) a bag containing the sex pheromone compound made at least partly of a laminate film having a thickness in the range from 20 μm to 200 μm and composed of at least two layers, of which (A) one is a film of a poly(vinylidene chloride) or a copolymer mainly composed of vinylidene chloride having a thickness in the range from 4 μm to 20 μm and (B) the other or each of the others, the thickness or total thick-ness thereof being in the range from 10 μm to 196 μm, is a film of a polymer selected from the group consisting of polyolefins, copolymers of ethylene and vinyl acetate, polymers and copolymers of vinyl chloride, polymers and copolymers of an acrylic acid ester, cellulose esters and cellulose ethers.

4,923,120

NOZZLE DEVICE

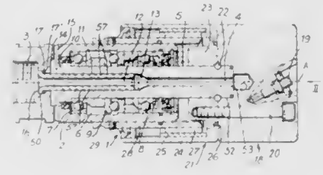
Paul Hammelmann, Zum Sundern 17, 4740 Oelde 1, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,943

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 38121328

Int. Cl.[5] B05B *3/06*

U.S. Cl. 239—252 **16 Claims**



1. A nozzle device comprising:

a stationary housing with a pressurized water connector having an upstream end and a downstream end;

a nozzle support having a front end and a rear end mounted rotatable about a rotation axis in the vicinity of said stationary housing;

a plurality of spray orifices in said nozzle support, said nozzle support being drivable by reaction force from pressurized water issuing from said spray orifices;

a brake device for the rotational motion of said nozzle support;

a stationary sleeve having an upstream end and a downstream end extending centrally from said pressurized water connector;

a hollow shaft having an upstream end and a downstream end with a central duct and a connected central passage attached to said nozzle support rotatable in said housing, said sleeve extending into said central passage of said hollow shaft, said central passage being widened in diameter relative to said central duct, pressurized water being fed from said said sleeve in said central passage into said central duct of said hollow shaft; and

a labyrinth-like sealing gap between said sleeve and a bounding surface of said central passage with a plurality of grooves located in said sleeve, said gap being widened on one side by said grooves.

4,923,121

SPRAY NOZZLE AND METHODS

Harold F. Boyer, Rosharon, Tex., assignor to International Cellulose, Inc., Houston, Tex.

Filed Oct. 18, 1988, Ser. No. 259,968

Int. Cl.[5] B05B *7/04*

U.S. Cl. 239—434.5 **5 Claims**

1. A spray nozzle for spraying a mixture of fibrous insulating material and an adhesive for the fibrous insulating material, the nozzle comprising

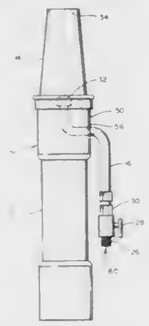
a generally cylindrical hollow body member with a first end and a second end, the fibrous insulating material conveya-

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ble under pressure into the first end and flowable freely through the hollow body member,

a generally cylindrical material conditioning chamber connected to the second end of the hollow body member and having a larger cross-sectional area than the hollow body member so that a space is provided in which compacted fibers of the fibrous insulating material loosen, separate, and re-mix in a less compacted form prior to wetting of the fibrous insulating material,

a generally conical hollow spray hood having an interior, the spray hood immediately adjacent to and connected to the material conditioning chamber, the re-mixed fibrous



insulating material flowable from the material conditioning chamber directly into and through the spray hood, the spray hood having a mixing chamber therein and an exit opening through which the fibrous insulating material flows out of the spray nozzle, and

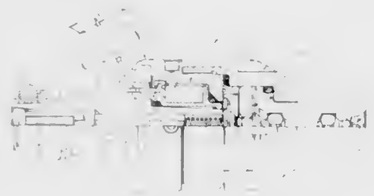
an adhesive feed line connected to the spray nozzle and extending into the spray hood, the adhesive feed line having an end concentrically located in the hollow spray hood through which end liquid adhesive is fed into the fibrous insulating material to homogeneously wet it in the mixing chamber of the spray hood so that a mixture of the adhesive and the fibrous insulating material is sprayable out of the exit opening of the spray hood.

4,923,122

PERFECTED ELECTROMAGNETIC FUEL INJECTOR

Francesco Morini, and Paolo Bortolotti, both of Bologna, Italy, assignors to Weber S.r.l., Turin, Italy

Filed Dec. 27, 1988, Ser. No. 290,156
Claims priority, application Italy, Dec. 24, 1987, 68123 A/87
Int. Cl.[5] F16K *31/02*
U.S. Cl. 239—585 **5 Claims**



1. An electromagnetic fuel injector comprising:

a casing including first and second elements, said first element formed of a ferromagnetic material;

a core including a front face;

an electric winding for said core for providing electromagnetic flux;

a plunger spaced away from said core;

a resilient bearing means;

an anchor comprising a substantially flat disc juxtaposed to and facing said front face, said anchor being integral with said plunger, said anchor and plunger being axially moveable and adapted to be attracted to said core against the action of said resilient biasing means when said winding is supplied with electric current, said anchor providing a radial electromagnetic flux path between said first element and said core;

a nozzle extending from said casing, said nozzle including an opening, said opening being controlled by the axial position of said plunger in relation to said front face of said core;

said first element defining a first cavity for housing said core, said electric winding, said resilient biasing means, and a fuel supply means, said first element including a first end surface which is substantially coplanar with said front face, said first end surface being juxtaposed to and facing at least a portion of said anchor;

said second element comprising a substantially cup-shaped element formed of a non-magnetic material and defining a second cavity for axially slidably receiving said anchor and at least a portion of said plunger, said second cavity having an end wall defining an axial shoulder, said second element further including a second end surface juxtaposed to and facing said first end surface;

a non-magnetic spacer element axially movably disposed between said first end surface and said axial shoulder, said spacer element having an axial length sufficient to prevent contact between said first end surface and said second end surface;

a plunger stop element disposed in said second cavity between said spacer element and said end wall; and

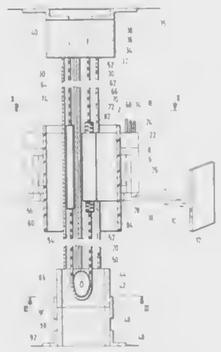
an annular shoulder on said plunger for cooperating with said plunger stop element to define an end position of said plunger, said annular shoulder being spaced a predetermined distance from said anchor.

4,923,123

SPRAY COATING DEVICE FOR ATOMIZATION OF FLUID COATING MATERIAL

Guido Rutz, Gossau, and Daniel Seiler, Jona, both of Switzerland, assignors to Ransburg-Gema AG, St. Gallen, Switzerland

Filed Nov. 8, 1988, Ser. No. 268,808
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738378
Int. Cl.[5] B05B *5/04, 5/08, 3/02, 3/18*
U.S. Cl. 239—691 **10 Claims**



1. Spray coating device for atomization of fluid coating

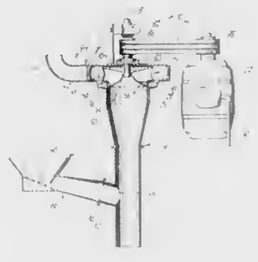
material, with a spray disk (4) which is rotatably arranged on a carrier (2), can be electrically charged, is rotatable relative to the carrier (2) and axially movable together with the carrier by an actuator (34), characterized in that a motor (8) for driving the spray disk (4) is arranged on the carrier (2); a high voltage generator circuit (22) is contained on the carrier (2) for generating a DC high voltage which is connected to the spray disk (4); the spray disk (4) being ring-shaped; the ring-shaped spray disk (4), the motor (8) and the high voltage generator circuit (22) form together an assembly (26) of annular shape with a central opening (28); the assembly (26) is mounted on the carrier (2); the assembly (26) with the ring-shaped spray disk (4) surrounds a guide rod (30) which is arranged stationary and which extends through the central opening (28) in the ring-shaped spray disk (4); the carrier (2) together with the assembly (26) including the spray disk (4) is axially movable together with the spray disk (4) along the guide rod (30), relative to said guide rod (30), by an actuator (34).

4,923,124

METHOD OF PNEUMATIC COMMINUTION

Allen C. Wiley, Coralville, Iowa, assignor to Microfuel Corporation, Coralville, Iowa

Continuation of Ser. No. 697,042, Jan. 31, 1985, abandoned. This application Sep. 13, 1988, Ser. No. 244,643
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[5] B02C *19/00*
U.S. Cl. 241—5 **1 Claim**



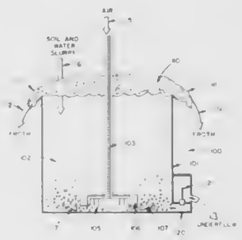
1. A method of pneumatically comminuting materials, said method comprising the steps of: providing a device which has a housing in which a fan which has a rotational axis and is mounted on a vertical axis and which is driven by a motor means, each blade of said fan having a lower portion of one length and an upper portion which has a length greater than said one length, wherein said lengths are measured radially from the rotational axis of said fan and said upper and lower portions of each of said blades are joined to form a continuous fan structure, said housing has a conduit defining a rotational impact zone with an inlet opening aligned with the rotational axis of said fan, said inlet opening bas a diameter which is larger than twice said one length, creating an air lock by providing a sealing ring secured in said inlet opening to said housing, said sealing ring having at least first and second annular parallel spaced apart flanges extending inwardly therefrom which mateably retain said fan in a centered position in said housing supplying the material which is to be comminuted into said rotational impact zone of said housing, rotating said fan, thereby creating section and rotational turbulance in said housing in said rotational impact zone, thereby causing particle to particle collisions in said rotational impact zone, thereby decreasing the size of said particles to a predetermined size, and withdrawing said particles of predetermined size from said rotational impact zone through said inlet opening.

4,923,125

PROCESS FOR TREATING CONTAMINATED SOIL

George F. Bateson, Roseville; Dennis D. Chilcote, Hibbing; Michael M. Martinson, Mound; Steven B. Valine, Carver, and Adolfo R. Zambrano, Hibbing, all of Minn., assignors to BioTrol, Inc., Chaska, Minn.

Continuation of Ser. No. 153,240, Feb. 8, 1988, abandoned. This application Aug. 2, 1989, Ser. No. 388,748
Int. Cl.[5] B02C *23/18*
U.S. Cl. 241—20 **22 Claims**



1. A process for treating soil contaminated with organic material; said process including the steps of:

(a) extracting said soil from the environment and screening same to form a screen undersized material;

(b) subjecting the screen undersized material to an attrition process to break the material into fine particles suspended in fluid;

(c) conducting a classification process on the contaminated soil, for isolation and removal of a fraction containing relatively fine, slow setting, clay and natural organic particles from a fraction containing faster settling, coarser, soil particles on the basis of relative settling velocities; said step of classification being performed prior to complete settling of a suspension from said attrition step; and

(d) conducting a flotation on fast settling material from step (c); said step of flotation including floating soil material in a flotation cell in the presence of microbubbles of air in sufficient concentration to encounter said scrubbed material and selectively partition hydrophobic materials including organics in said soil to an interface with said bubbles; whereby said organics are separated from said scrubbed material and are floated to an upper portion of said flotation cell.

4,923,126

MACHINE FOR CUTTING DISPOSABLE CONTAINERS

Frank J. Lodovico, Delmont, and John W. Wagner, New Alexandria, both of Pa., assignors to John W. John W. Wagner Wagner, New Alexandria, Pa.

Filed Jun. 15, 1988, Ser. No. 207,147
Int. Cl.[5] B02C *19/14*
U.S. Cl. 241—30 **17 Claims**

1. A machine capable of cutting into small pieces the thin wall material of a plurality of disposable containers such as plastic bottles or metal cans comprising:

means for feeding in a first direction at least one of said disposable containers at a time to a cutting section;

said cutting section including a pair of parallel shafts;

said parallel shafts respectively having parallel center axes;

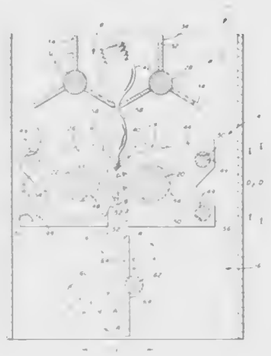
said pair of shafts being mounted for rotation in opposite directions about said center axes thereof;

each of said pair of shafts rigidly supporting a plurality of cutting wheels for rotation therewith;

each said cutting wheel being mounted on one of said shafts to be spaced from axially adjacent said cutting wheels thereon to closely receive one of said cutting wheels on the other of said shafts therebetween;

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each said cutting wheel having a maximum diameter and a plurality of cutting teeth thereon;
each said cutting tooth having an apex at said maximum diameter and a root at a root diameter of said cutting wheel;
said center axes of said shafts being separated by a distance therebetween which is less than said root diameter to produce a general overlapping of said cutting teeth of said cutting wheel on said one shaft and said cutting teeth of said cutting wheel on said other shaft therebetween as said cutting teeth move in said first direction;
said cutting teeth being identical and evenly spaced about an outer periphery of said cutting wheel;
said each cutting tooth having a leading surface and a trailing surface which meet at said apex to form a straight edge at said maximum diameter which is parallel with said center axis of said shaft;
said leading surface and said trailing surface respectively lying in planes which are parallel with said center axis of said shaft and extend toward the same side thereof to cause said straight edge of said apex to circumferentially lead a remainder of said leading surface during said rotation of said cutting wheel;
said cutting wheels on said one shaft being angularly displaced from adjacent said cutting wheels on said other shaft to cause general alignment of said each cutting tooth

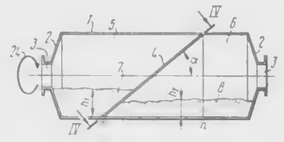


of said one shaft between preceding adjacent said cutting teeth and following adjacent said cutting teeth of said adjacent cutting wheels on said other shaft prior to any overlapping thereof;
said general alignment prior to said overlapping causing said thin wall material of said disposable container to extend about said apex of said each cutting tooth as a first, leading uncut portion of said thin wall material is disposed between said leading surface of said cutting tooth and said trailing surfaces of said preceding adjacent cutting teeth of said other shaft;
said each cutting tooth initially overlapping said preceding adjacent cutting teeth of said other shaft at said apex of said each cutting tooth at said trailing surfaces of said preceding adjacent cutting teeth to cause said straight edge to produce a first transverse cut of said thin wall material transverse to said first direction;
said each cutting tooth further overlapping said preceding adjacent cutting teeth of said other shaft as side edges of said leading surface of said each cutting tooth pass by adjacent side edges of said trailing surfaces of said preceding adjacent cutting teeth to produce a pair of second edge cuts of said thin wall material in said first direction extending from opposite ends of said first transverse cut; and
said each cutting tooth completely overlapping said preceding adjacent cutting teeth as said side edges of said leading surface of said each cutting tooth completely passes by said adjacent side edges of said trailing surfaces of said preceding adjacent cutting teeth to complete said second edge cuts to produce said small pieces of said thin wall material.

4,923,127
BALL TUBE MILL

Vasily S. Bogdanov, ulitsa Kostjukova 36, kv. 103, Belgorod; Viktor S. Platonov, ulitsa Lenina, 52a, kv. 10, Cherkessk; Nikolai S. Bogdanov, bulvar Pervogo Saljuta, 4, kv. 84, Belgorod; Jury G. Bedko, ulitsa Dovatora, 82, kv. 39, Cherkessk; Ivan I. Miroshnichenko, ulitsa Kostjukova, 36, kv. 63, Belgorod, and Nikolai D. Vorobiev, ulitsa Kostjukova, 36, kv. 3, Belgorod, all of U.S.S.R.

Filed Apr. 20, 1988, Ser. No. 183,788
Int. Cl.[5] B02C *17/06*
U.S. Cl. 241—70 3 Claims



1. A ball tube mill comprising:
a housing;
a coarse grinding chamber in said housing containing coarse grinding bodies;
a fine grinding chamber in said housing containing, fine grinding bodies;
an inclined wall dividing said housing into said coarse and fine grinding chambers and defining first and second contacting areas respectively contacting said fine and coarse grinding bodies during rotation of said housing, said inclined wall being formed by a plurality of spaced rods defining slots between said rods to ensure the passage therethrough of a material being ground, part of each slot in said first contacting area having a width which is smaller than a width of part of each said slot in said second contacting area; and wire elements attached to each rod in the areas of contact with the grinding bodies each wire element being parallel, attached and tangent to its respective rod, and being located in a plane which is tangent to each of two immediately adjacent rods along lines along which the wire elements are attached, with associated planes intersecting each other along a line which intersects a line that connects centers of these two immediately adjacent rods

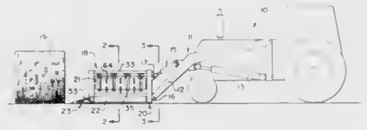
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4,923,128
BALE SHREDDING AND DISPENSING DEVICE FOR USE WITH A TRACTOR

Erroll B. Ostrowski, Box 102, Major Saskatchewan, Canada (S0L 2H0)

Filed Jan. 30, 1989, Ser. No. 303,254
Int. Cl.[5] B02C *18/16*
U.S. Cl. 241—101.7 13 Claims

1. A bale shredding and dispensing device comprising at tractor vehicle having a front end loader linkage, a frame defining a front, a rear and sides, coupling means on the rear of the frame mounting the frame on the front end loader linkage of the tractor, a single horizontal feed conveyor arrangement mounted on the frame and comprising a pair of rollers each mounted adjacent a respective side of the frame and a conveyor element defining an upper surface for the frame and driven by the rollers in a direction across the frame from one side roller to the other side roller, the rollers and element extending from the front to the rear of the frame so as to define a substantially horizontal support surface for the bale and arranged to cause movement of the bale on the support surface transversely of the frame toward one side of the frame, a shredder member mounted on the frame at said one side for rotation about a horizontal axis extending forwardly of the frame, the shredder member extending from the front to the rear of the frame such that the bale as it is carried by the conveyor arrangement toward the shredder is shredded and discharged by the shredder outwardly to said one side, an inclined ramp surface stationary relative to the frame mounted on the frame at the front and having a forward edge for engaging under a

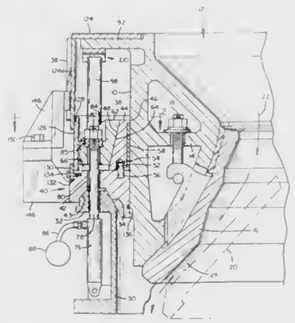


stationary bale engaged by forward movement of the tractor vehicle and a rearward edge at a raised position relative to the forward end adjacent said upper surface of the conveyor element and a duct surface at least partly surrounding the rotatable shredder member and defining a guide duct extending upwardly and outwardly from said one side such that the shredder acts to discharge the shredded material through the guide duct in an upward and outward direction for spreading, the guide duct including a further guide surface for redirecting the material in a downward direction for collection at a localized position adjacent an outer end of the guide duct, the guide surface being movable to an inoperative position for allowing upward discharge of the material.

4,923,129
GYRATORY ROCK CRUSHER

Y. Jin Chae, 520 Main St., Fort Lee, N.J. 07024

Filed Apr. 25, 1989, Ser. No. 343,083
Int. Cl.[5] B02C *2/04*
U.S. Cl. 241—207 10 Claims



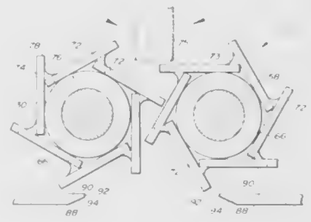
1. A gyratory crusher comprising:
a main frame,
a base member on said main frame having an annular inwardly directed threaded surface extending in an upright direction,
a bowl having an outwardly directed threaded surface engageable with the threaded surface of said base member for supporting said bowl on said base member and for rotatably adjusting said bowl to different vertical planes,

crushing means including a power driven mantle operative in association with said bowl for crushing material,
non-rotatable bowl locking means above said threaded surface of said base member,
said locking means having an inwardly directed threaded surface engageable with the threaded surface of said bowl,
and hydraulic hold-down means secured to said main frame imparting a hold-down force on said locking means which in turn provides a hold-down force acting through the threads of said locking means and said bowl to maintain said bowl in a stationary vertical position relative to said mantle and also to frictionally lock the threads of said locking means and bowl together to maintain said bowl in a non-rotatable position.

4,923,130
DEVICE FOR CRUSHING AND CUTTING PLANT MATERIAL

James S. Campbell, 74 Sleepy Hollow La., Orinda, Calif. 94563

Filed Apr. 17, 1989, Ser. No. 339,395
Int. Cl.[5] B02C *18/06*
U.S. Cl. 241—236 12 Claims



1. A device for crushing plant material, said device comprising, in combination:
a housing defining an interior and an inlet and an outlet communicating with said interior;
a pair of contra rotating rotors rotatably mounted within said interior and defining a passageway therebetween between said inlet and said outlet, each said rotor including a cylindrically-shaped core member and a plurality of generally uniformly spaced blades projecting outwardly from said core member into the space between blades on the other of said core members, each said blade having a positive rake angle, spaced flat sides, and a distal end, said distal end having a flat surface disposed at substantially 90 degree angles to said sides and interconnected to said sides along sharp edges, each blade positioned to project into the space between blades on the other said rotor sufficiently for the distal end of each blade to be in crushing proximity to a flat spaced side of another blade.

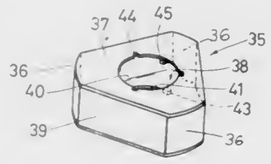
4,923,131
ROTARY IMPACT CRUSHER ROTOR

Pieter J. Rossouw, and Jan H. Rossouw, both of 31 Newton Road, Uraniaville, Klerksdorp, Transvaal Province, South Africa

Filed Jun. 6, 1988, Ser. No. 203,303
Int. Cl.[5] B02C *19/00*
U.S. Cl. 241—275 9 Claims

1. A rotor for a rotary impact crusher comprising:
an upper rotor plate;
a lower rotor plate; and

three rotor side plates, said side plates being joined to both the upper and lower rotor plates to form said rotor, said

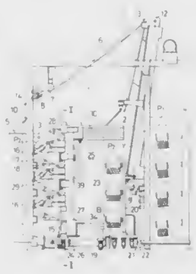


side plates being substantially triangularly oriented and forming rotor outlets at the apices of the triangle.

4,923,132
DOFFING TRUCK FOR A YARN FALSE TWISTING MACHINE

Kazuyasu Hirai, Nagaokakyo; Yasuhiro Inoue, Settsu, and Kazuyoshi Suzuki, Nara, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 18, 1987, Ser. No. 134,865
Claims priority, application Japan, Dec. 26, 1986, 61-308802; Jul. 21, 1987, 62-111627
Int. Cl.[5] B65H *54/26, 67/04*
U.S. Cl. 242—35.5 A **20 Claims**



1. A false twisting machine including a doffing truck which travels between a plurality of juxtaposed yarn winding units and a peg stand located in an opposing relationship to said yarn winding units and exchanges empty bobbins mounted on pegs of said peg stand for fully wound packages from said yarn winding units, characterized in that said doffing truck comprises a plurality of support arms, each support arm being mounted for horizontal turning motion for receiving a fully wound package from one of said yarn winding units and mounting the received fully wound package onto one of said pegs of said peg stand, a plurality of bobbin chucking devices, each bobbin chucking device being mounted for receiving bobbin from the peg stand and directly supplying the bobbin onto one of said yarn winding units, and driving means for supporting and moving said plurality of support arms and said plurality of bobbin chucking devices on the doffing truck.

4,923,133
DANCER ASSEMBLY

Mohammad F. Zaman, and James Gerencser, both of Ft. Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

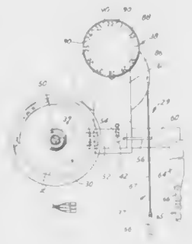
Filed Jun. 28, 1989, Ser. No. 373,041
Int. Cl.[5] B65H *59/38*
U.S. Cl. 242—45 **7 Claims**

1. In a wire winding system including a wind-up unit turntable adapted to receive a spool upon which wire is adapted to be wound, an adjustable wire wind-up tension control system for a plurality of wire gauges, said tension control system comprising:

dancer means;

variable weight means;

wire gauge selection means, operatively connected to the dancer means and the variable weight means, for positioning the variable weight means in the proper position of a selected one of the plurality of wire gauges so that a predetermined tension is placed in the wire;



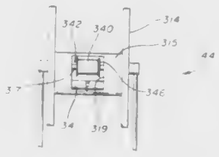
dancer means position sensor means, operatively connected to the dancer means, for sensing the relative position of the dancer means and providing a signal; and

variable torque motor means, operatively connected to a wire wind-up unit turntable and the sensor means, for varying the torque supplied to the wire wind-up turntable responsive to the signal provided by the sensor means.

4,923,134
SELF-PROPELLED SUBSOIL PENETRATING TOOL SYSTEM

Frank R. Kinnan, Camas Valley, Oreg., assignor to Underground Technologies, Inc., Byron, Calif.

Division of Ser. No. 115,487, Nov. 2, 1987. This application Feb. 24, 1989, Ser. No. 300,942
Int. Cl.[5] B65H *75/42*
U.S. Cl. 242—54 R **2 Claims**



1. A device to pre-tension a tension member in a supply cable independently of any tension applied to said supply cable comprising:

a main reel having a hollow central hub and two end plates, one mounted at each end of said hub;

support means supporting said main reel;

drive means coupled to said main reel for selectively rotating said main reel to pay out or take up a supply cable coupled to said hub of said main reel;

an auxiliary hub and two auxiliary circular end plates, one mounted adjacent each of the two ends of said auxiliary hub mounted within said hollow central hub of said main reel;

an axle extending through said auxiliary hub and said auxiliary end plates from a first end attached to one of said two main reel end plates to a second end attached to the second one of said two main reel end plates so that said auxiliary hub and auxiliary end plates can be rotated about said axle;

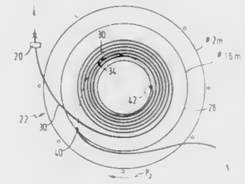
second drive means coupled to one of said two auxiliary end plates to selectively rotate said auxiliary hub and said auxiliary end plates independently of said main reel;

first means coupling said tension member to said auxiliary hub whereby the selective operation of said second drive means rotates said auxiliary hub to pre-tension said tension member independently of the rotation of the main reel.

4,923,135
STOWING APPARATUS FOR THE CONNECTION CABLE OF A CENTRAL SYSTEM FOR POWER SUPPLY TO AIRCRAFT

Heinz Schabmüller, Midgardstr. 20, 8132 Tutzing, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,143
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304276
Int. Cl.[5] B65H *75/34;* **H02G** *11/02*
U.S. Cl. 242—54 R **5 Claims**



1. A power supply connection to an airport central power station; a portion of said airport having a gate **10**, said gate having a bridge head **12**; a connection box **20** at said bridge head and a connecting cable **14** from said power station through said connection box to said bridge head; cable stowing and coiling apparatus **22** at said bridge head to store and control said cable as it is run out to an aircraft; said cable having a plug type connection at its free end adapted to cooperate with a corresponding connector at an aircraft; said cable stowing apparatus comprising cable coiling apparatus **22** having a pair of drums; one of said drums being a coiling drum and the other of said drums being a compensating drum on which the cable is stored without twisting; said cable stowing and coiling apparatus **22** being suspended beneath said bridge head **12** of said gate **10** with its axis **24** extending vertically; and a motor **26** connected to and adapted to drive said drums in both directions of rotation around said axis.

4,923,136
METHOD AND APPARATUS FOR FORMING MULTI-LAYER COILS FROM SUBSTANTIALLY FLAT, FLEXIBLE PRODUCTS, ESPECIALLY PRINTED PRODUCTS

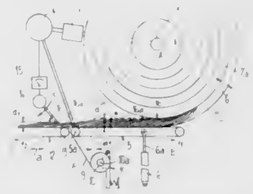
Werner Honegger, Tann-Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Continuation of Ser. No. 922,257, Oct. 23, 1986, Pat. No. 4,793,566, which is a continuation of Ser. No. 649,370, Sep. 11, 1984, abandoned. This application Oct. 31, 1988, Ser. No. 264,789
Claims priority, application Switzerland, Sep. 19, 1983, 5067/83
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[5] B65H *75/00;* **B65B** *63/04*
U.S. Cl. 242—59 **24 Claims**

1. A method for forming a multi-layer coil from products having a given product thickness, comprising the steps of:

supplying a succession of products for winding in an imbricated formation at a winding location where the products are wound to form a multi-layer coil of products;

regulating the supplied succession of products such that there is formed an imbricated product formation having a predetermined imbrication formation thickness and a



predetermined imbrication pitch within the imbricated product formation as a function of the given product thickness of the products; and

winding-up the products at a winding location to form the multi-layer coil.

4,923,137
TAPE REEL HUB

Charles A. Jorgensen, Hudson, Wis., and Robert J. Kline, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 20, 1988, Ser. No. 287,001
Int. Cl.[5] B65H *75/10*
U.S. Cl. 242—68.5 **5 Claims**



1. A tape reel hub comprising:

an inner ring;

an outer ring having an outer surface defining a tape-winding surface;

ribs connecting said inner and said outer rings and angled with respect to a radius of said hub so that compression of said outer ring by said tape results in angular displacement of said ribs relative to said inner and said outer rings and rotation of said inner ring rather than a compression of said inner ring corresponding to said compression of said outer ring; and

a weakened area adjacent said inner and said outer rings to facilitate said angular displacement of said ribs.

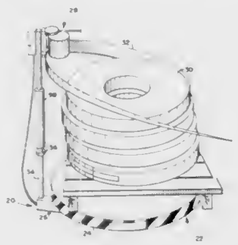
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4,923,138

TURNTABLE FOR MOTORIZED DELIVERY OF COILED STOCK

Bruce Malkin, Newtown, Conn., assignor to Norwalk Innovation Lab, Inc., Milford, Conn.

Filed Dec. 29, 1988, Ser. No. 291,637
Int. Cl.[5] B21C *47/16;* B65H *23/185*
U.S. Cl. 242—78.6 17 Claims



1. A turntable for motorized delivery of coiled stock comprising:

(A) a turntable comprising a right cylindrical flange;

(B) a support frame;

(C) means mounted to said frame for supporting said turntable for free rotation thereof;

(D) a pair of guide wheels mounted to said frame and adapted to engage said cylindrical flange; and,

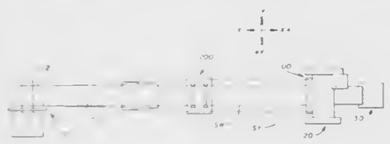
(E) a drive wheel mounted to engage said cylindrical flange at either of two positions for driving said turntable and for causing said guide wheels to engage said cylindrical flange.

4,923,139

COIL FEEDING SYSTEM, MEHOD AND APPARATUS

Joseph D. Bulso, Jr., Canton, and William R. Lewers, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Sep. 26, 1988, Ser. No. 248,594
Int. Cl.[5] B21C *47/16;* B65H *23/02*
U.S. Cl. 242—78.6 14 Claims



1. A system for feeding a continuous length of stock from a coiled source of supply into a press along a principal feed path and shifting the stock transversely thereof, comprising:

(a) compensator means disposed in spaced relationship with respect to the source of supply along a principal feed path and selectively shiftable in a direction normal to the principal feed path;

(b) feeder means disposed between said compensator means and the press along the principal feed path and being selectively shiftabie in a direction normal to the principal feed path; and

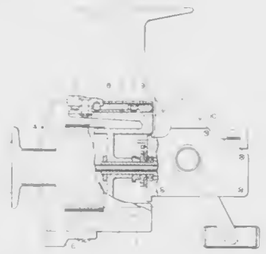
(c) said compensator means and said feeder means being shiftable together in a direction normal to the principal feed path whereby the portion of the continuous length of stock within the press may be shifted in accordance with a preselected pattern.

4,923,140

BAIL REVERSING APPARATUS FOR FISHING SPINNING REELS

Nobuyuki Yamaguchi, and Masayuki Kawashiro, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 247,433
Claims priority, application Japan, Feb. 5, 1988, 63-14393; May 13, 1988, 63-63045
Int. Cl.[5] A01K *89/01*
U.S. Cl. 242—230 5 Claims



1 A bail reversing apparatus mounted on the body of a spinning reel for fishing reels comprising

a rotor connected to the body of the spinning reel;

a bail support arm provided on said rotor;

a bail support member rotatably mounted on a front end of said bail support arm and urged distributedly to a reel-up position and a reel-off position and held by a spring member;

a working rod having one end engaged with said bail support member;

a kick member engaged with an other end of said working rod;

said kick member rotatably mounted on said bail support arm with said kick member partly projectable from a base end surface of said bail support arm wherein a projection on said working rod connected to one of said kick or bail support members is made to engage with a circular-arc-shaped long groove provided on the other of said members;

and an abutting member providing on said reel body for abutting against said projecting kick member to reset said kick member, located at a projected extension of a base end of said ball support arm

whereby when said bail support member is in the reel-up position, said kick member is retracted into said bail support arm, and when said bail support member is in the reel-off position, said kick member projects from the base end surface of said bail support arm.

4,923,141

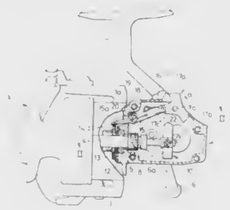
SPINNING REEL HAVING REVERSE ROTATION PREVENTING MECHANISM

Konin Sazaki, and Kenji Maruyama, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Continuation of Ser. No. 689,257, Jan. 7, 1985, abandoned. This application Jul. 28, 1986, Ser. No. 890,892
Claims priority, application Japan, Jan. 11, 1984, 59-2625[U]; Feb. 2, 1984, 59-14761[U]
Int. Cl.[5] A01K *89/01, 89/02*
U.S. Cl. 242—247 2 Claims

1. A spinning reel comprising: a reel body, a winding handle having a shaft and a main gear fixed to said handle shaft; a hollow spindle having a pinion gear at a rear end thereof meshed with said main gear; a sliding shaft extending through a central through-hole in said spindle; an oscillating mechanism coupling said main gear to said sliding shaft, bearing means for mounting said spindle to said reel body so as to be rotatable but

no translatable with respect thereto; a rotor mounted on a front end of said spindle; a spool mounted on a forward end of said sliding shaft; a locking gear fixed to said spindle; locking lever means pivotably mounted to said reel body and having a forward end engagable with said locking gear, for braking said locking gear; a rocker lever mounted to said reel body for pivotal movement about a first pivot point and having first through third arms, said first arm and said second arm being at a rear portion of said rocker lever, said rocker lever being dimensioned such that one and only one of said first and second arms of said rocker lever protrude through a hole in a rear end of said reel body for each of two operative positions of said rocker lever, said third arm extending forwardly of said first



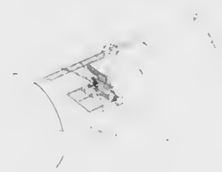
and second arms and being pivotably joined to a rear end of said locking lever means at a second pivot point; wherein said locking lever means comprises a locking lever pivotably joined to said rocker lever at said second pivot point, and being mounted for pivotal movement in a first plane, said locking lever having a forward end extending toward said locking gear, and an L-shaped locking pawl disposed between said forward end of said locking lever and said locking gear, said locking pawl being mounted for pivotal movement in a plane substantially normal to said first plane, one arm of said locking pawl being engagable with said forward end of said locking lever, and an end portion of the other arm of said locking pawl being engagable with said locking gear; and a spring extending between said third arm of said rocker lever and said reel body.

4,923,142

GYROSCOPIC STABILIZING DEVICE FOR A PROJECTILE CONTROL INSTRUMENT

Didier Creusot, Orleans, and Jean-Pierre Roux, Saint Cyr en Val, both of Fed. Rep. of Germany, assignors to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Nov. 3, 1988, Ser. No. 266,752
Claims priority, application France, Nov. 6, 1987, 87 15419
Int. Cl.[5] F42B *15/02*
U.S. Cl. 244—3.1 6 Claims



1. A gyroscopic stabilizing device used to preserve a fixed angular position with respect to a reference fixed on the ground for a control instrument of a rocket-type projectile comprising:

an intermediate projectile section coupled to front and rear sections of said projectile for rotation with respect to the front and rear sections of the projectile, an internal frame coupled along one of its median axes to said intermediate section, for rotation on said one axis, and a top mounted for rotation in said frame having a rotational axis which intersects the rotational axis of said frame perpendicularly wherein a control instrument carried by said intermediate section remains in a fixed angular position.

4,923,143

PROJECTILE HAVING EXTENDABLE WINGS

Raimar Steuer, Leinburg, and Manfred Kraus, Eckental, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Oct. 30, 1989, Ser. No. 428,843
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1988, 3838738
Int. Cl.[5] F42B *13/32, 15/053*
U.S. Cl. 244—3.28 6 Claims



1. A projectile having extendable wings; comprising an extendable front spar; a power element for extending said front spar; a rear spar having an outer end connected to said front spar and being retractable against said front spar; a wing covering extending between said front and rear spars, said power element having one end engaging the front spar and an opposite end engaging a slider which is axially displacably locked on the projectile in a longitudinal direction thereof, said rear spar having an inner end pivotable in front of the slider in the direction of movement of said slider, and upon the slider being unlocked being pivoted further by said slider under the action of said power element for effectuating tensioning of said wing covering.

4,923,144

AIRCRAFT WITH PIVOTABLE WING AND ARRESTABLE PROPELLERS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Filed Sep. 3, 1987, Ser. No. 92,823
Int. Cl.[5] B64C *29/00*
U.S. Cl. 244—7 R 10 Claims

1. An aircraft for vertical and horizontal movement through air,

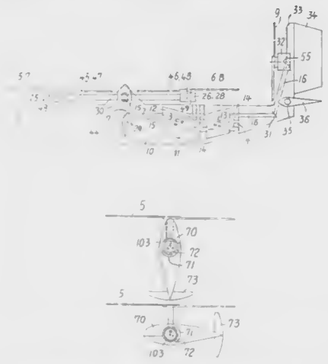
comprising, in combination,

a body substantially symmetrically arranged about a medial longitudinal vertical plane with therefrom laterally extending holding arrangements with one of the arrangements extending to the left and the other to the right of said body, at least one power plant, transmission means between said power plant and propellers which are provided on said aircraft, directional control means for the control of the attitudes of the craft in the air, at least four

propellers with substantially vertical axes at least one propeller with a substantial horizontal axis,

and an improvement which includes at least one wing portion on each of said holding arrangements, forward and rearward from said holding arrangement extending propeller holding arms, propellers with substantial vertical axes provided on the tips of said arms, transmission means between said propellers of said arms and said power plant, a power supply means to said propeller with said substantial horizontal axis, pivot means including stopper means for the provision of a possibility to said wing portions for pivotal movement from a substantial vertical chord to a substantial horizontal chord, and vice versa,

means to revolve and to stop said propellers with substantial vertical axes for setting them to rest with their longitudinal extensions in the direction of movement of said craft at horizontal forward flight, and said transmission including rotary angular velocity equalization means for said propellers with said substantial vertical axes.



4,923,145

AIRCRAFT LANDING EQUIPMENT

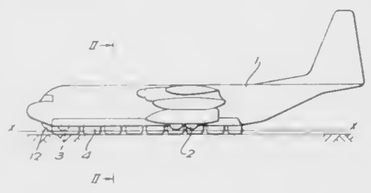
Jeffrey C. Broadhurst, Burton-on-Trent, United Kingdom, assignor to Woodville Polymer Engineering Limited, Ross-on-Wye, England

Filed May 11, 1988, Ser. No. 195,679

Claims priority, application United Kingdom, May 14, 1987, 8711352

Int. Cl.[5] B64C *25/54*

U.S. Cl. 244—100 A 7 Claims



1. In combination with an aircraft with primary landing equipment comprising a plurality of wheels, auxiliary landing equipment comprising an inflatable support structure attachable to the aircraft, a plurality of inflatable cushions attached in a predetermined array to the support structure, inflation means for inflating the support structure and cushions to deploy the auxiliary landing equipment for landing, and deflating means for deflating the support structure and cushions for stowing the same, at least some of the cushions comprising a plurality of individual cushion cells interconnected by air passageways.

4,923,146

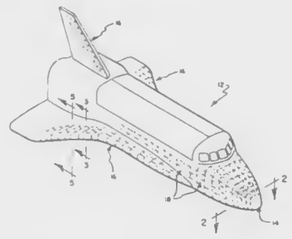
COOLING SYSTEM FOR SURFACES OF HIGH SPEED OPERATING FLIGHT CRAFT

Frank M. Anthony, Kenmore, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Jul. 11, 1988, Ser. No. 217,438

Int. Cl.[5] B64C *1/38*

U.S. Cl. 244—117 A 13 Claims



1. An atmospheric flight operating craft having an external skin structural portion which is subject to air friction-induced overheating during high speed operations of said craft, and a fluid coolant supply and spent coolant return and rejuvenation means carried within said craft, said skin portion comprising:

an outer skin member and a backup skin member facing said outer skin member, and web members integrated therewith and separating said skin members, said web members intersecting to define pluralities of relatively small functionally separated compartments extending between facing surfaces of said skin members;

said backup skin member being apertured to define coolant supply and coolant return apertures in registry with oppositely located portions of each of said compartments and coupled thereat in fluid flow communication with said coolant supply and said coolant return means, respectively.

4,923,147

HEAD SUPPORTSPINE OFFLOADING EJECTION SEAT INSERT

William J. Adams, Torrance; Robert E. Zegler, Redondo Beach, and Conrad B. Monson, Yorba Linda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 27, 1988, Ser. No. 249,794

Int. Cl.[5] B64D *25/04*

U.S. Cl. 244—122 AG 19 Claims

1. A seat insert insertable within the existing seat of a vehicle for maintaining a crew member of the vehicle in a forward posture during high G acceleration, comprising:

(a) an elongated head support member having an upper end and a lower end, said head support member for supporting the crew member's head during a forward leaning posture;

(b) a back plate assembly including at least one back plate connected to the head support member for supporting the thoracic and lumbar spines in their natural curvatures;

(c) means being connected to the back plate assembly for pivoting the back plate assembly forward relative to the seat of the vehicle;

(d) means for transfering any G-induced weight from the spine to the back plate assembly and ultimately to the existing seat of the vehicle; and



(e) means for restraining said head support member in such a manner so as to maintain the crew member's head in an "eyes up" attitude during a forward lean.

4,923,148

APPARATUS FOR STOWING AND DEPLOYING STORES FROM AIR AND MARINE CRAFT

John F. Fillingham, Clacton-on-Sea; Ronald J. Hawkins, Storrington, and Anthony D. Wilson, Dartford, all of England, assignors to Babcock Energy Limited, London, England

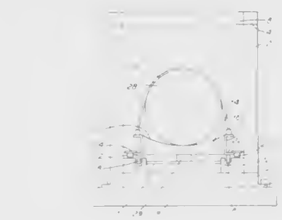
PCT No. PCT/GB88/00047, § 371 Date Oct. 19, 1988, § 102(e) Date Oct. 19, 1988, PCT Pub. No. WO88/05398, PCT Pub. Date Jul. 28, 1988

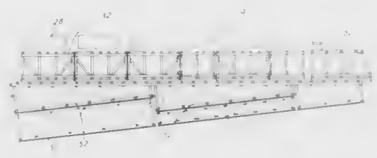
PCT Filed Jan. 26, 1988, Ser. No. 250,693

Claims priority, application United Kingdom, Jan. 26, 1987, 8701600; Aug. 3, 1987, 8718359; Aug. 17, 1987, 8719442; Aug. 17, 1987, 8719443; Aug. 18, 1987, 8719476

Int. Cl.[5] B64D *9/00*

U.S. Cl. 244—137.1 7 Claims





1. Apparatus for stowing and deploying stores relative to air and marine craft including a modular stowage structure for such stores, pallets releasably mounted on the modular stowage structure, releasable locking devices arranged to secure the pallets to the modular stowage structure, the pallets being formed with base portions respectively providing alignable longitudinal tracks, the tracks being formed by spaced pairs of rollers on substantially horizontal axes and spaced pairs of rollers on substantially vertical axes, cradles formed with laterally spaced, longitudinally extending, skids arranged to co-act with the respective pairs of rollers to roll freely in relation to the rollers, further releasable locking devices arranged to secure respective cradles to associated pallets the cradles being formed with support surfaces respectively adapted to accommodate any one of a series of stores, each one of the series of stores having dimensions differing from the dimension of the remainder of the series, the cradles and the pallets being adapted to permit—upon release of the respective further releasable locking devices—movement by the effect of gravity of the cradles relative to the pallets to a deployment position and, also by the effect of gravity, to effect deployment of the cradles.

4,923,149

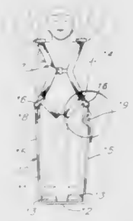
PARACHUTE FOOT SUPPORT STIRRUP

Kalman Feher, 285 DuTour, Laval, Quebec, Canada (H7Y 1H3)

Filed Nov. 7, 1988, Ser. No. 267,824

Int. Cl.[5] B64D *17/30*

U.S. Cl. 244—151 R 20 Claims



1. A parachute foot support stirrup for preloading the leg muscles of a parachutist, said foot support stirrup comprising a footrest member connected to a strapping member of nonstretchable material, said footrest member being dimensioned to receive the feet of said parachutist and an attachment portion for immovable securement of said strapping member to a fixed attachment part located above the feet of said parachutist, said footrest member providing a support means to maintain the leg muscles of said parachutist preloaded with bent legs prior to the parachutist landing on solid ground.

4,923,150

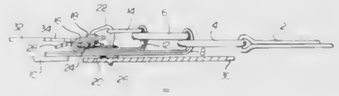
PARACHUTE SPRING RING RELEASE

Robert B. Calkins, Huntington Beach, and Frederick F. Rinke, Lakewood, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 7, 1989, Ser. No. 320,188

Int. Cl.[5] B64D *17/38*

U.S. Cl. 244—151 B 20 Claims



1. A spring ring release mechanism that detachably connects the risers of a parachute to a parachute securing member comprising:

(a) a first ring attached to said riser;

(b) a series of loops each directly attached by means to said parachute securing member, having a first loop passing through the inner circumference of said first ring connecting said first loop to said first ring, each additional loop

passing through the inner circumference of each preceding loop, connecting each additional loop with each preceding loop;
(c) a flap attached to said parachute securing member, said flap having a first aperture near one end;
(d) a flexible thong attached to said parachute securing member, said flexible thong passes through the inner circumference of the last loop in said series of loops and through said first aperture;
(e) a first rip cord detachably connected to said flexible thong, whereby said flexible thong is prevented from passing through said first aperture;
(f) a tension spring attached to said parachute securing member and said flap, whereby said tension spring pulls said flap away from said series of loops after said first rip cord is detached from said flexible thong.

4,923,151
TETHER POWER GENERATOR FOR EARTH ORBITING SATELLITES

Thomas G. Roberts, Huntsville; Edward L. Wilkinson, New Hope, and Lee O. Webster, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 1, 1988, Ser. No. 162,721
Int. Cl.[5] B64G *1/20*
U.S. Cl. 244—158 R **4 Claims**



1. An electrical power generator for earth orbiting satellites, comprising: an earth orbiting object having an electrically conductive external surface region; electrically responsive load means within said object; a hollow, spherical, electrical conducting ball having an opening at one end thereof, electrically conductive means for passing through the planet earth's magnetic field to produce a voltage, said conductive means having respective first and second terminal ends, said first end being coupled to said orbiting object and to said load means, and said second end being coupled to said conducting ball for maintaining said ball and object in spaced apart relationship while simultaneously providing completely self-contained electrical circuit paths between said ball, orbiting object, and load means.

4,923,152
TWO-LIQUID PROPULSIVE SYSTEM FOR AN ARTIFICIAL SATELLITE AND UTILIZATION OF SAID SYSTEM FOR EJECTING THE SATELLITE

Gérard Barkats, Lotissement Persepolis, Domaine de Candéou, 06530 Peymeinade, France

Filed Apr. 3, 1987, Ser. No. 33,829
Int. Cl.[5] B64G *1/26, 1/40*
U.S. Cl. 244—172 **3 Claims**

1. A two fuel component propulsive system for an artificial satellite, in particular for a geostationary satellite, the system being intended to provide advance warning of the end of the normal lifetime of the satellite and to ensure that said satellite is extracted from its operating orbit, the system comprising:
at least two pairs of tanks with each pair including a fuel tank and an oxidizer tank, wherein the oxidizer tank of one pair can hold a quantity of oxidizer greater than the quantity of fuel held by the paired fuel tank by a specific amount and wherein the fuel tank of the other pair can hold a quantity of fuel greater than the quantity of oxidizer held by the paired oxidizer tank by the same specific amount,
a plurality of nozzles for propelling and guiding said satellite,



conduit means for supplying a fuel and an oxidizer from said tanks to each of said nozzles,
valve means in said conduit means, and
control means for selectively operating said valves to initially connect said one pair of tanks to at least one selected nozzle until said fuel tank thereto is exhausted, to subsequently connect said other pair of tanks to at least one selected nozzle until said oxidizer tank thereof is exhausted and to finally connect the oxidizer tank of said one pair and said fuel tank of said other pair to at least one selected nozzle.

4,923,153
STRIP CLAMP

Kazuhiro Matsui, Toyoake, and Fuminori Ito, Nagoya, both of Japan, assignors to Kitagawa Industries Co., Ltd., Japan

Filed Jan. 23, 1989, Ser. No. 299,411
Claims priority, application Japan, Feb. 16, 1988, 63-18871[U]
Int. Cl.[5] F16L *3/08; B77D 77/10*
U.S. Cl. 248—74.1 **14 Claims**



1. A strip clamp for securing a strip comprising,
a base plate,
a top plate that overlaps and locks into the base plate, the top plate including means for defining a frame,
resilient flaps projecting inwardly from the frame toward a central portion of the top plate, and
tips on the flaps projecting toward the base plate.

4,923,154
APPARATUS FOR SUPPORTING POINT-OF-SALE TERMINALS

Richard D. Konkel, Wilton, Calif., assignor to Retail Profits, Inc., Santa Clara, Calif.

Filed Dec. 1, 1988, Ser. No. 279,551
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—131 **7 Claims**



1. A stand for a point-of-sale terminal, comprising:
a base means for mounting to a counter in a retail establishment;
a rotatable member which is rotatably mounted relative to the base means for movement between at least a first and second position;
a stub shaft fixed to the base means for rotatable connection to the rotatable member, the stub shaft and the rotatable member both being circular in cross-section, with one being adapted to be received by the other, and the stub shaft and the rotatable member both being tubular for providing a path through their interiors for wires leading to and from the point-of-sale terminal;
holder means connected to the rotatable member for holding a point-of-sale terminal in a substantially non-horizontal orientation when the rotatable member is in the first and second positions, the holder means being an open box-like structure for receiving the point-of-sale terminal such that its keypad faces upwardly and outwardly, the upper and lower walls of the box-like structure being formed to terminate short of one of the sidewalls of the box-like structure by a distance sufficient to allow free use of a magnetic card-receiving slot in the point-of-sale terminal.

4,923,155
TARGET SUPPORT DEVICE FOR CALIBRATION OF CAMERAS

Andrew Dainis, 2002 Rualan St., Adelphia, Md. 20783, and Geoffrey Bird, 28 S. Floyd St., Alexandria, Va. 22304

Filed Dec. 16, 1988, Ser. No. 285,415
Int. Cl.[5] F16M *3/00*
U.S. Cl. 248—163.1 **11 Claims**



1. An apparatus for supporting a plurality of targets in precise relative spatial relationship comprising the combination of a plurality of substantially inextensible, flexible tension members of predetermined lengths interconnected at a plurality of vertices to form at least one tetrahedron;
means connected to said vertices for concurrently placing all said tension members under tension and for supporting said at least one tetrahedron; and
a plurality of targets attached at selected ones of said vertices.

4,923,156
STAND

Ruben Linnéusson, Skånegatan 7, 441 57 Alingsås, Sweden

Filed Feb. 3, 1989, Ser. No. 306,502
Int. Cl.[5] F16M *11/38*
U.S. Cl. 248—170 **9 Claims**



1. A stand comprising a central supporting upright and supporting legs distributed around same, which supporting legs are mounted on the central supporting upright by bearings in such a way as to be capable of being pivoted between a collapsed stowage position and an unfolded supporting position, with the supporting legs extending essentially along said central upright and at an angle outwards from the central upright for the purpose of erecting the stand on a base, with a lock being provided for locking the legs in the unfolded supporting position, characterized in that a movable leg locking ring is passed onto the central supporting upright in its longitudinal sense and is retained between a stowage position in which it is maintained at a certain distance from the bearings of the supporting legs and a supporting position in which it is maintained at the bearings of the supporting legs, that pivot bearing shafts for the supporting legs are situated on a level above the level for the supporting position of said leg locking ring, and the locking ring is so arranged as to be capable of being accommodated in such a way as to rest against the upper portion of a section of the leg bearing supporting part attached to the central supporting upright, with the supporting legs capable of pivoting freely downwards from its unfolded supporting position when the locking ring is resting against the supporting part for the leg bearing, and with the ends of the supporting legs closest to the central upright resting against the upper side of said locking ring.

4,923,157
SIGNPOST SUPPORT BRACKET

Alexander Belamiza, 8717 Birch Dr. #323, LaVista, Nebr. 68128

Filed Oct. 31, 1988, Ser. No. 264,540
Int. Cl.[5] F16M *11/24*
U.S. Cl. 248—188.2 **13 Claims**

1. A signpost support bracket, comprising
a generally L-shaped ground bracket including an upstanding leg and a generally horizontal leg adapted for ground engagement,
means for securing the lower end of a signpost to said upstanding leg,
an elongated ground spike, and
said horizontal leg including a ground spike hole there-

through, said hole being of a size and shape to receive said elongated ground spike for securement of said ground bracket into the ground, said hole being spaced from said



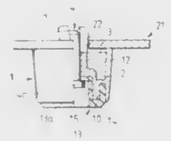
upstanding leg so as to be positioned in spaced relation from a signpost secured to said upstanding leg whereby vertical clearance is available for driving said spike into the ground.

4,923,158

LEGS FOR PROTECTING FURNITURE OR OTHER FITTINGS

Satoru Saisho, Machido, Japan, assignor to Koyo Fastener Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1988, Ser. No. 272,523
Claims priority, application Japan, Apr. 4, 1988, 63-45603[U]
Int. Cl.[5] A47B *91/00*
U.S. Cl. 248—188.8 5 Claims



1. A protective leg to be secured to the bottom of furniture or the like, said protective leg comprising

a body member having a central recess and a surrounding annular groove each open toward the bottom of said body portion,

a supporting base member having a central projection and a peripheral wall portion configured to cooperatively engage said central recess and said annular groove, respectively, of said body member, and

means to fix said base member to said body member and to said furniture upon cooperative engagement of said respective portions.

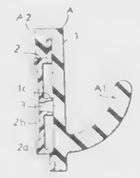
4,923,159

HOOK SEAT WITH A SEPARABLE HOOK

Hsug-Fang Wang, No. 129, Tuan-chu Lane, Tuan-chu Li, Chiayi, and Take Wu, No. 53-47, Shih-ti, Shin-Tsun Li, Chiayi, both of Taiwan

Filed Dec. 22, 1988, Ser. No. 288,095
Int. Cl.[5] A47G *1/16*
U.S. Cl. 248—205.3 2 Claims

1. A hook for hanging an article comprising a hook seat, said hook seat including a seat body having a front side including a peripheral flange and a rear side, said rear side including a peripheral portion which defines a recess, thereby when said seat body is attached to a support, said peripheral portion, said recess and said support define a chamber, means for communicating said recess with said front side, said communicating means having an enlarged mouth at said front side, thereby a flowable adhesive can be introduced from said front side into said recess so as to fill said chamber, said front side having a



depressed portion surrounded by said peripheral flange and said enlarged mouth is flush with said peripheral flange, and a hook cover including a hook finger mounted on said front side for hanging an article, said hook cover having a circumferential groove to engage with said peripheral flange.

4,923,160

CAMMING MEANS FOR CLIMBING ANCHORS

David L. Waggoner, P.O. Box 5353, Durango, Colo. 81302

Filed Dec. 2, 1988, Ser. No. 278,813
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—200 24 Claims



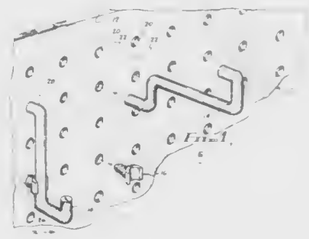
1. A climbing anchor comprising at least one camming element with spring biasing means to urge said element to its open position, a fixed pivot means comprising a pivot axle portion for each camming element, said camming element being pivotably mounted on its respective axle portion, wherein each spring biasing means comprises for each camming element a spring acting in a torsional fashion, each said spring having two ends, there being means at a first said end for engaging said spring with said cam element and there being means at the second said end for engaging said spring with the respective axle portion means whereby the spring biases the camming element relative to the fixed pivot means toward the open position of the camming element.

4,923,161

DEVICE FOR COUPLING HOOKS TO PEGBOARD

Thomas L. Fahringer, 105 Locust Dr., Brandon, Fla. 33511

Continuation of Ser. No. 71,166, Jul. 8, 1987, Pat. No. 4,799,637.
This application Jan. 6, 1989, Ser. No. 294,203
The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.
Int. Cl.[5] E04G *5/06*
U.S. Cl. 248—221.2 1 Claim



1. An attachment device for use in combination with a pegboard and a hook, the pegboard being of a predetermined thickness with holes of a predetermined diameter extending therethrough and the hook having a lower portion outwardly bent away from the pegboard for supporting articles, an upper portion inwardly bent toward the pegboard for being positioned through a hole in the pegboard, and an elongated central portion coupling the upper and lower portions, the attachment device including:

a screw constituting the inboard end of the device and being fastenable within a hole in the pegboard, the size of the screw being correlated to the thickness of the pegboard and the diameter of the hole such that crests of the screw are of a diameter larger than the diameter of the hole an the roots of the screw are of a diameter smaller than the diameter of the hole and with the surfaces of the screw which join the crests and roots being axially spaced a distance so that, upon being twisted into the hole, the screw and the device may be positively held in operative position solely by forces exerted by the screw on the pegboard at the hole; and

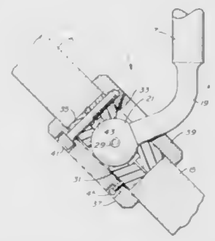
a clip constituting the outboard end of the device and coupled to the screw for being positively fastened to the pegboard by the screw, the clip being formed of a pair of symmetrically shaped, resilient support arms which together for a generally semi-circular cross-sectional configuration in excess of 180 degrees with an opening between the arms on the side of the clip remote from the screw, the clip being of a size so that its opening will allow movement of the central portion of a hook therepast only upon the separating of the arms which thereby facilitates the receipt and releaseable retention of a hook by the resilient force of the arms so that the device may effect a permanent attachment of a hook to a pegboard until the hook is physically withdrawn from the clip by overcoming the resilient retention force of the arms retaining the hook, the device being of a reduced size so that when operatively positioned on the pegboard it will extend outwardly from its supporting hole in a radial direction to a distance less than half the distance to all next adjacent holes in the pegboard.

4,923,162

RADIATION SHIELD SWIVEL MOUNT

Matthew C. Fleming, 751 Smith Ave., Pinole, Calif. 94564, and Melvin T. Magliocco, 156 Greenwood Ave., San Rafael, Calif. 94901

Filed Sep. 19, 1988, Ser. No. 245,700
Int. Cl.[5] F16C *11/06*
U.S. Cl. 248—276 3 Claims



2. A swivel mount for a radiation shield comprising

a support arm having a bearing member mounted at the end thereof, said bearing member being spherical in shape except where said bearing member engages said support arm, said bearing member including a horizontally disposed pin member extending through the center of said bearing member perpendicular to the longitudinal axis of the cantilevered end of said support arm where said support arm engages said bearing member,

a radiation shield having an opening formed proximate the balance center thereof,

a pair of clamping members disposed on opposite sides of said shield and interlocked together clamping the shield and the bearing member of said support arm therebetween in said opening, and

bearing pads mounted between said clamping members on opposite sides of said bearing member and capturing said bearing member therebetween with friction engagement whereby said shield can be partially rotated with respect to said bearing member and positioned at variable stable orientations within the limits of rotation of said shield on said bearing member, said bearing pads including a ring bearing pad mounted concentric with the opening of said clamping member and having an aperture, and at least a partially concave adjustable bearing pad mounted adjacent said other clamping member opposed to said ring bearing pad on the opposite side of said bearing member, said bearing pads being formed to provide a cavity to accommodate said pin member which permits the shield to be rotated 360 degrees around said bearing member and said pin.

4,923,163

FIXING DEVICE

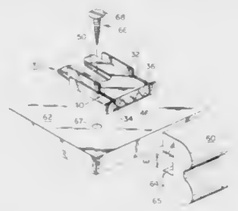
David N. Harley, Dorset, United Kingdom, assignor to Titus Tool Company Limited, Buckinghamshire, England

Filed May 11, 1988, Ser. No. 192,713
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—300 20 Claims

1. A device for use in securing two members to each other in a predetermined angular relationship, one of the members being provided with a groove, the device being adapted to be secured to the other member by a securing means, the device comprising:

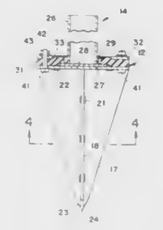
two limbs, having respective free ends which are located at the same end of the device, said limbs being arranged to coact as levers which, when forcibly moved toward each other at a predetermined position, cause their free ends to move apart to engage two walls of the groove of the

grooved member, the device being adapted to cooperate at said predetermined position with said securing means



for forcing the limbs together when said securing means is used to secure the device to said other member.

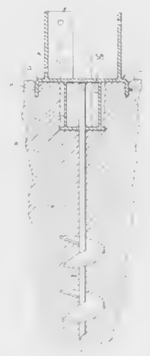
4,923,164
POST SUPPORT AND ANCHOR
Richard A. Stenberg, 14926 Inlet Ct., San Leandro, Calif. 94578
Filed Sep. 19, 1988, Ser. No. 246,334
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—530 **9 Claims**



1. A support anchor and system for a post comprising
a rigid blade assembly having four blades disposed orthagonally and tapered inwardly from top to bottom to form a bottom point for insertion in the ground,
a rigid ground plate secured across the top of said blade assembly for engaging the surface of ground in which said blade assembly is inserted,
a post receiving member having a hollow upright configuration with a flange thereabout disposed upon said ground plate for mounting a post in extension upwardly from said system,
a limitedly resilient retainer sheet having a central aperture and disposed about said post receiving member upon said flange and ground plate, and
means clamping said retainer to said ground plate about the periphery of said retainer,
whereby said post receiving member is mounted upon said ground plate via said resilient member so that said post receiving member and flange thereon is pivotally separable from said ground plate by pivotal forces applied to said post receiving member.

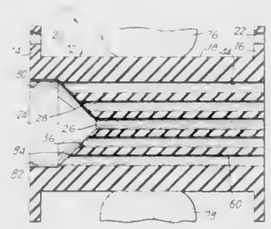
4,923,165
STABILIZED POST ANCHOR
Boyce R. Cockman, 500 Howell Rd., Greenville, S.C. 29615
Continuation-in-part of Ser. No. 189,755, May 2, 1988, Pat. No. 4,863,137. This application Aug. 28, 1989, Ser. No. 399,328
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—545 **18 Claims**

1. A post anchor for anchoring a post in ground soil comprising:
an elongated shank having a boring end and a bracket end;
auger means carried at least near the boring end of said shank for boring a hole in said soil;
bracket means carried near said bracket end of said shank for attaching said post to said shank; and
a compactor plate carried by said shank near said bracket



end for compacting said soil between said compactor plate and said auger means; and
cap means integrally carried about said shank near said bracket end between said compactor plate and said bracket means which includes vertically depending stabilizing means for penetrating said soil and stabilizing said anchor in said soil.

4,923,166
PRESSURE-REDUCING NOISE-ABATING CONTROL VALVE
Spiros G. Raftis, Pittsburgh, Pa., assignor to Red Valve Company, Inc., Carnegie, Pa.
Filed Jul. 28, 1989, Ser. No. 386,241
Int. Cl.[5] F16K *7/04*
U.S. Cl. 251—4 **10 Claims**



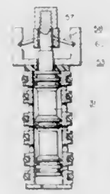
1. In a pipe line for conveying pressurized fluids, a pressure-reducing, noise-attenuating control valve, comprising: an elongated sleeve having an inlet end and an outlet end for respective connection to an upstream section and a downstream section of the pipe line, and a sleeve body of one piece with, and extending between, the inlet end and the outlet end, said sleeve body having a plurality of internal flow channels, at least some of which extend from the inlet end to the outlet end, said inlet end having a predetermined flow-through cross-section, and said flow channels having a combined effective flow-through cross-section less than said predetermined cross-section to drop the pressure and attenuate the noise of the pressurized fluids between the inlet end and the outlet end of the valve.

4,923,167
SLIDE VALVE WITH DOSAGE REGULATION MEANS
Alfred Schmidt, Burgstrasse 11, Pottenstein, Fed. Rep. of Germany (8573)
Filed Dec. 21, 1988, Ser. No. 288,757
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743569
Int. Cl.[5] F16D *63/00;* **F15B** *13/04;* **F02D** *9/06*
U.S. Cl. 251—25 **20 Claims**



16. A variable flow slide valve comprising:
a housing;
a chamber in said housing having a central axis;
a slide element slidably mounted for reciprocating axial movement in said chamber between an open position, closed position, and relief position;
an actuating terminal end on said slide element projecting out of said housing;
an inlet channel in said housing having an inner end communicating with said chamber at a first position;
an outlet channel in said housing having an inner end communicating with said chamber at a second position axially spaced from said first position;
a bore hole slide channel in said slide member extending at an angle relative to said central axis and having an inlet end and an outlet end;
an upstream control recess in the outer surface of said slide member at said inlet end of said slide channel for connecting said inlet end to said first position when said slide member is in said open position and having a planar base extending at an angle relative to said central axis and a width that narrows in the axial direction from said inlet end toward said first position;
a downstream recess in said slide element at said outlet end of said slide channel for connecting said outlet end to said second position when said slide element is in said open position;
a first sealing ring mounted in said housing surrounding said slide element between said first and second positions for sealing between said slide element and said chamber; and
a second sealing ring mounted in said housing surrounding said slide element for sealing between said slide element and said chamber on the opposite side of said first position from said second position;
so that when said slide element is in said open position said upstream control recess overlaps said first sealing ring to a varying degree dependent upon a selective axial position of said slide element relative to said housing for controlling flow of pressurized fluid from said inlet channel to said outlet channel, and when said slide element is in said closed position said first sealing ring prevents said flow of pressurized fluid.

4,923,168
SPOOL TYPE SWITCHING VALVE DEVICE
Minoru Murata, Tokyo, and Kazumasa Yamada, Chiba, both of Japan, assignors to 501 Yamada Yuki Seizo Co., Ltd., Tokyo, Japan
PCT No. PCT/JP88/00573, § 371 Date Jan. 31, 1989, § 102(e) Date Jan. 31, 1989, PCT Pub. No. WO88/10389, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 14, 1988, Ser. No. 309,667
Claims priority, application Japan, Jun. 15, 1987, 62-148257
Int. Cl.[5] F16K *31/56*
U.S. Cl. 251—75 **4 Claims**

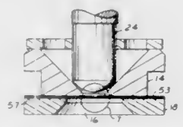


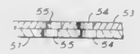
1. A spool type switching valve comprising: a spool inside a sleeve; means for permitting said spool to move in an axial direction in said sleeve; a detent mechanism at an end of said spool; said detent mechanism including a spool operator on a shaft section of said spool; a spring holder in said sleeve; said spring holder surrounding said spool operator; at least first and second C-shaped wire springs with a circular cross section fitted between said spool operator and said spring holder; at least first and second straight grooves in said spring holder; a straight portion on each of said at least first and second C-shaped wire springs; said straight portion fitting into it respective straight groove; first and second end portions on each of said C-shaped wire springs; said first and second end portions being substantially straight and generally parallel to their respective straight portion; and means in said spool operator for permitting rotatable engagement with said first and second end portions of said at least first and second C-shaped springs.

4,923,169
MULTI-STREAM THIN EDGE ORIFICE DISKS FOR VALVES
John H. Grieb; J. Michael Joseph, both of Newport News; Richard D. Weaver, Williamsburg, and George T. Bata, Grafton, all of Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.
Division of Ser. No. 285,143, Dec. 16, 1988, which is a division of Ser. No. 137,497, Dec. 23, 1987, Pat. No. 4,854,024, which is a continuation-in-part of Ser. No. 937,658, Dec. 4, 1986, abandoned. This application Sep. 1, 1989, Ser. No. 402,420
Int. Cl.[5] F16K *47/14, 31/06;* **F02M** *51/06*
U.S. Cl. 251—118 **3 Claims**

1. In a valve for controlling the flow of a fluid having a valve body with a fluid passageway therein terminating in an outlet, a valve seat in the fluid passageway, a valve needle biased to seat on the valve seat to close the passageway, a backup washer between the valve seat and the outlet, the improvement comprising:
a first thin disk member having a dual orifices therein said first member positioned adjacent the valve seat;
a second thin disk member having a dual orifices therein said second member positioned between said first member and the backup washer;

wherein the dual orifices of said first member partially overlap said dual orifices of said second member for directing





the flow of fluid from valve in a dual stream whereby said dual streams are not parallel.

4,923,170

HYDRAULIC PRESSURE CONTROL VALVE

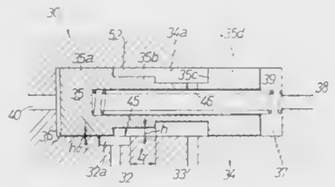
Tokuro Takaoka; Tsuto Sasaki; Yukio Kobayashi, all of Wako; Koichi Saito, Hadano, and Satoshi Hamano, Odawara, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Seiki Giken Kogyo Kabushiki Kaisha, Gotenba, both of, Japan

Filed Oct. 25, 1988, Ser. No. 262,395

Claims priority, application Japan, Oct. 26, 1987, 62-163478[U]

Int. Cl.[5] F16K *47/04*

U.S. Cl. 251—121 **4 Claims**



1. A hydraulic pressure control valve comprising a valve body having a slide bore of a circular cross-section and an inlet port and an outlet port opened into an inner surface of the slide bore at axially spaced apart points, and a valve spool slidably received in said valve body for axially sliding movement and defining, by cooperation with said valve body, a variable orifice for controlling the degree of communication between said inlet and outlet ports, wherein:

said valve spool comprises first and second land portions which are axially spaced from each other and are at all times in slidable contact with an inner surface of the slide bore, said first land portion being disposed adjacent said inlet port and said second land portion being disposed adjacent said outlet port,

the valve spool further comprising a smaller diameter portion coaxial with the slide bore and having a diameter smaller than the diameter of the first land portion and connected to the first land portion by a step to define said variable orifice in cooperation with said inlet port, and

an annular groove portion connected to the smaller diameter portion of the valve spool by a further step and having a diameter smaller than the diameter of the smaller diameter portion, said annular groove portion communicating at all times directly with said outlet port adjacent said second land portion.

4,923,171

GATE VALVE HAVING A SECONDARY SEAL

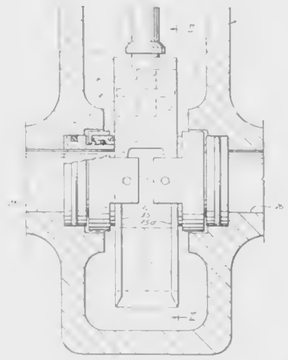
John Beson, Houston, Tex., assignor to Foster Oilfield Equipment Company, Houston, Tex.

Continuation of Ser. No. 814,221, Dec. 27, 1985, abandoned, which is a division of Ser. No. 551,589, Nov. 14, 1983, Pat. No. 4,566,671. This application Dec. 1, 1987, Ser. No. 127,242

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[5] F16K *25/00*

U.S. Cl. 251—159 **20 Claims**



1. A gate valve, comprising:

(a) a valve body having a valve chamber there within and a pair of flow passages through the valve body aligned at opposite sides of the valve chamber, the valve body further having a recess around the inner end of each of the aligned flow passages;

(b) a ring-shaped seat member disposed in each recess around the inner end of the flow passages;

(c) a gate in the chamber reciprocably movable along a line substantially transverse to the valve chamber and having an imperforate section for preventing flow in a closed position of the gate and a section with a flow passage therethrough for permitting fluid flow in an open position of the gate, the gate forming a primary metal-to-metal seal with one of the ring-shaped seat members;

(d) a secondary seal member disposed around at least one of the ring-shaped seat members and adapted to reciprocate on the ring-shaped seat member, the secondary seal member comprising a ring-shaped support element including at least one extended portion extending to and juxtaposed with a side of the gate and having seal means for sealingly engaging the gate; and

(e) cooperating cam means associated with the ring-shaped support element for moving the ring-shaped support element toward the gate when the gate is moved toward the closed position to form a secondary seal between the secondary seal member and the gate, and for deenergizing the secondary seal prior to substantial movement of the gate toward the open position.

4,923,172

FLUID CONTROL VALVE

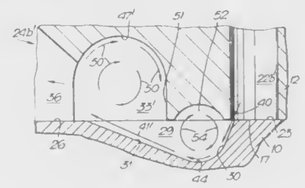
Antony J. Wood, Hardingstone, and George F. Gocher, Bletchley, both of United Kingdom, assignors to Ferranti International plc, Cheshire, England

Filed Mar. 16, 1989, Ser. No. 324,094

Claims priority, application United Kingdom, Mar. 23, 1988, 8806921

Int. Cl.[5] F16K *39/04, 3/22*

U.S. Cl. 251—282 **7 Claims**



1. A fluid control valve having

a body and defined within the body an inlet port, a return port and an aperture,

a spool contained within the aperture displaceable in operation along its longitudinal axis to control flow of fluid from inlet port to return port by way of the aperture, said spool having lands of substantially the same dimensions as the aperture to inhibit fluid flow therebetween and a spool chamber, defined by a portion of the spool of reduced dimensions between spool lands, said spool chamber having a first surface inclined to the longitudinal axis of the spool and arranged to receive fluid from the inlet port, a second surface inclined to the longitudinal axis at a smaller angle and in an opposite sense to the first surface, and an intermediate surface joining the first and second surfaces and

return port chamber means, defined within the body, connected with the return port and disposed to receive fluid as it leaves the spool chamber, said return port chamber means being shaped to direct a portion of the fluid flow to form a first stable vortex at least partially within the return port chamber, the effect of said first stable vortex extending into the spool chamber adjacent to the second surface of the spool to keep the fluid flow between intermediate spool surface and outlet ports against the second surface of the spool, and to form a second stable vortex adjacent to the first surface of the spool, the effect of said second stable vortex keeping the fluid flow between inlet port and intermediate spool surface against the first surface of the spool.

4,923,173

SEATING SEAL MEANS FOR DISC-TYPE VALVE

Paul G. Szymaszek, Waukesha, and Earl Schumacher, New Berlin, both of Wis., assignors to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Oct. 30, 1989, Ser. No. 429,015

Int. Cl.[5] F16K *1/46*

U.S. Cl. 251—333 **15 Claims**

1. A stop valve (**10**) comprising:

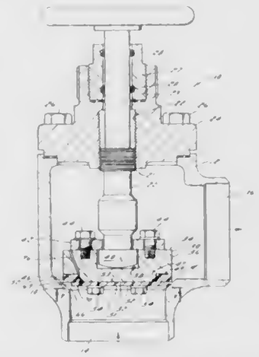
a valve housing (**12**) having a valve seat (**18**) therein;

a valve disc (**30**) selectively movable relative to said valve seat (**18**) between closed and open positions;

resiliently compressible seal means (**50**) for engagement with said valve seat (**18**) when said valve disc (**30**) is in closed position;

means including a member (**52**) for entrapping and compressing said seal means (**50**) against said valve disc (**30**);

said valve disc (**30**), said seal means (**50**) and said member (**52**) cooperating to define passage means (S1, S2, S3) through which fluid can leak when said valve disc (**30**) is in closed position;



and a resiliently compressible O-ring (**70**) disposed and compressed in said passage means (S1, S2, S3) to prevent leakage of fluid.

4,923,174

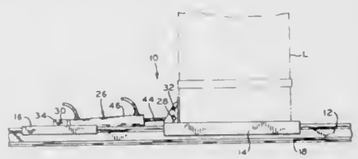
APPARATUS FOR BI-DIRECTIONALLY MOVING AND PLACING LARGE AND HEAVY OBJECTS

Steven R. Loechner, Roanoke, Ind., assignor to G & L Corporation, Fort Wayne, Ind.

Filed Feb. 3, 1989, Ser. No. 306,482

Int. Cl.[5] B66F *1/04, 3/24*

U.S. Cl. 254—105 **11 Claims**



8. A portable apparatus for moving and precisely placing a large and heavy object, said apparatus including a pair of load support rails, a load supporting means disposed on said rails, a plurality of pairs of anchoring structures secured to and spaced longitudinally from one another along said rails, an actuator-supporting shoe movable along said support rails, a pair of lugs attached to said shoe for releasably engaging one pair of said anchoring structures to hold said shoe in a stationary position, and an actuator extending between and connecting said shoe with said load supporting means movably supported on said rails, said actuator being operable in a first mode for moving the load supporting means in one direction relative to said shoe when said lugs are engaged with one pair of said anchoring structures and in a second mode for moving said shoe relative to the stationary load supporting means to disengage said lugs from said one pair of said anchoring structures and reset said lugs in engagement with a next pair of said anchoring structures in preparation for the next movement of the load supporting means, wherein the improvement comprises:

each of said anchoring structures in said plurality of pairs thereof comprising a pair of reinforced spaced-apart anchoring pins secured to each rail and aligned in a generally horizontal plane, and a reinforcing member secured to each rail and disposed between said pins such that said pins are located at respective opposite ends of said reinforcing member and secured thereto; and

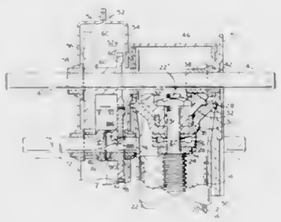
said shoe being configured for placement on said rails in a first orientation wherein said lugs thereon are aligned to releasably engage one of said pins or alternatively in a second orientation wherein said lugs thereon are aligned to releasably engage the opposite other of said pins such that operation of said actuator in one of its modes will produce movement of the load supporting means in one direction when said shoe is placed in said first orientation and in an opposite direction when said shoe is placed in said second orientation.

4,923,175

CONSTANT MESH GEAR BOX LANDING GEAR

Otto T. Bentrup, Rockford, Ill., assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed May 19, 1989, Ser. No. 354,032
Int. Cl.[5] B60S *9/02*
U.S. Cl. 254—419 17 Claims



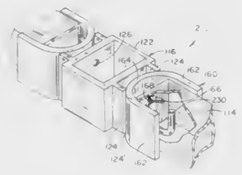
1 A trailer support comprising:
a foot and a telescopic leg assembly thereon,
a vertical elevating screw assembly in said telescopic leg assembly;
a gear box attached to said leg assembly,
a bevel gear on the upper end of said elevating screw assembly;
a cross shaft having a bevel pinion affixed thereto, said bevel pinion engaging said bevel gear;
said cross shaft extending across said gear box;
a slidable input shaft extending into said gear box;
a smaller diameter, low speed, input gear in said gear box, having a sliding axial fit on said input shaft;
a larger diameter, high speed, input gear in said gear box, having a sliding axial fit on said input shaft;
said input gears being axially end-to-end to each other, and having facing adjacent axial ends, said input shaft extending through both said adjacent axial ends;
means for axially retaining said high speed and low speed input gears in one axial position in said gear box;
first and second transverse drive slots in the respective ones of said adjacent axial ends;
transverse drive pin means extending from said input shaft and engageable alternatively with said first and second drive slots for alternate connection with said low speed and high speed input gears by axial shifting of said input shaft relative to said input gears;
an output gear cluster fixed to said cross shaft, located in said gear box, and including a larger diameter gear element and a smaller diameter gear element;
means for retaining said output gear cluster in one axial position in said gear box;
said larger diameter gear element being in constant engagement with said low speed input gear, and said smaller diameter gear element being in constant engagement with said high speed input gear, whereby said telescopic leg assembly and foot can alternatively be elevated or lowered at high speed or low speed by shifting said input shaft and drive pin relative to said axially stationary input gears.

4,923,176

FENCE ANGULAR CONNECTOR ASSEMBLY

Donald E. Heinz, West Olive, Mich., assignor to Harbor Towne Fence, Inc., Grand Haven, Mich.

Continuation-in-part of Ser. No. 149,691, Feb. 28, 1988, and Ser. No. 233,830, Aug. 19, 1988. This application Dec. 30, 1988, Ser. No. 292,455
Int. Cl.[4] E16B *7/08*
U.S. Cl. 256—65 8 Claims



1. A fence connector assembly comprising:
a connector bracket having a vertical sleeve defining a vertical cavity for receiving a fence post;
at least one pair of vertically oriented, laterally extending side members projecting from at least one side of said sleeve, said members being substantially parallel to each other and spaced apart, and having vertical outer bearing edges;
a threaded orifice in said sleeve between said side members;
a swivel bracket having a pair of spaced vertical legs integrally connected by a horizontally convex curvilinear bearing portion, said legs forming a rail receiving pocket therebetween, and said bearing portion having a horizontally elongated slot;
a fastener extending through said slot into threaded engagement with said orifice, and said swivel bracket bearing portion abutting said outer bearing edges, whereby said swivel bracket is swivelable to selected positions on said bearing edges to allow selected horizontal orientation of said swivel bracket and a rail relative to said connector bracket and a post therein.

4,923,177

CONTINUOUS PREHEAT SCRAP CHARGING SYSTEM AND METHOD

Richard B. Kraus, and Albert Musschoot, both of Barrington, Ill., assignors to General Kinematics Corporation, Barrington, Ill.

Filed Nov. 7, 1988, Ser. No. 267,572
Int. Cl.` C22B *1/00*
U.S. Cl. 266—44 23 Claims



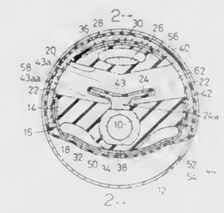
1. A continuous preheat charging system, comprising:
means for transferring scrap from a receiving point to a discharge point;
means for preheating scrap adjacent said discharge point of said transferring means prior to delivery of preheated scrap to one of a pair of melting furnaces; and
means for receiving preheated scrap from said preheating means and directly and substantially continuously feeding preheated scrap to said pair of melting furnaces on an alternating basis.

4,923,178

FLUID-FILLED CYLINDRICAL ELASTIC MOUNT

Nobuo Matsumoto, Nagoya; Keita Shiraki, Kasugai, and Yoshiki Funahashi, Iwakura, all of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Jun. 12, 1989, Ser. No. 364,606
Claims priority, application Japan, Jun. 17, 1988, 63-81020[U]
Int. Cl.[5] F16F *5/00*
U.S. Cl. 267—140.1 16 Claims



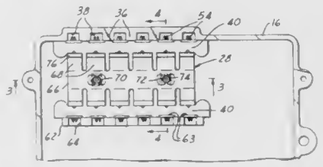
1. A fluid-filled cylindrical elastic mount comprising:
an inner sleeve;
an outer sleeve disposed outwardly of said inner sleeve such that an axis of said inner sleeve and an axis of said outer sleeve are parallel to each other;
an elastic body interposed between said inner and outer sleeves for elastic connection therebetween;
rigid sleeve means disposed over at least an outer circumferential surface of opposite axial end portions of said elastic body, said outer sleeve being fitted on said elastic body via said rigid sleeve means;
means for defining a pressure-receiving chamber between said inner and outer sleeves, said pressure-receiving chamber being filled with a non-compressible fluid, and receiving a vibrational load to be damped by the elastic mount;
means for defining an equilibrium chamber between said inner and outer sleeves, said equilibrium chamber being filled with said non-compressible fluid, and at least partially defined by a flexible wall;
means for defining a restricted passage for restricted fluid communication between said pressure-receiving and equilibrium chambers;
recess-defining means disposed between said inner and outer sleeves, for defining a radially outwardly opening recess, said outer sleeve covering said recess to provide a space of a predetermined volume;
an elastic sleeve for fluid-tight sealing between said outer sleeve and said rigid sleeve means; and
a portion of said elastic sleeve which is aligned with said space, being spaced apart from said outer sleeve so as to provide a flexible diaphragm in said space, said flexible diaphragm serving as said flexible wall, said equilibrium chamber being provided in said space.

4,923,179

SPRING PANEL HEAT SINK FOR ELECTRICAL COMPONENTS

Christopher Mikolajczak, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 115,951, Nov. 2, 1987, Pat. No. 4,845,590. This application Mar. 10, 1989, Ser. No. 321,922
Int. Cl.[5] F16F *1/18, 1/20;* H01G *3/03;* H01L *23/02*
U.S. Cl. 267—160 4 Claims



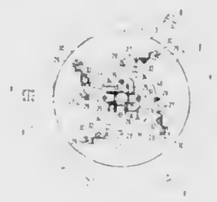
1. A resilient biasing member for forcefully urging electrical components with heat sink tabs against housing walls, the biasing member comprising:
a substantially flat planar elongated body member having at least one longitudinal edge;
means for securing said body member to a housing, said securing means including at least one aperture surrounded by a leaf means for removably securing said body member to a post on said housing; and
at least one finger projecting upwardly from said longitudinal edge at an acute angle for forcefully urging the heat sink tabs of said electrical components against the housing walls.

4,923,180

PROCESS AND APPARATUS FOR RESTORING THE LINING OF THE METALLURGICAL LADLES

Wilhelm Eitel, Ratingen, Fed. Rep. of Germany, assignor to Intocast GmbH Feuerfestprodukte und Giesshilfsmittel, Ratingen, Fed. Rep. of Germany

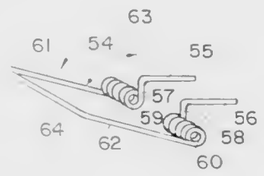
Filed Sep. 16, 1988, Ser. No. 245,219
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741073
Int. Cl.[5] C21C *5/44*
U.S. Cl. 266—44 28 Claims



1. An apparatus for restoring a refractory lining of a metallurgical ladle, comprising:
(a) a rotatable carrier,
(b) at least one displaceable arm mounted on said carrier; said arm having a free end movable against an inner surface of the lining,
(c) means for lowering said carrier into the ladle,
(d) means for rotating said carrier about a ladle axis,
(e) a lining-removing tool mounted on the free end of said arm,
(f) means for vibrating said tool, and
(g) means for pressing said lining-removing tool against the lining with a substantially constant force upon rotation of

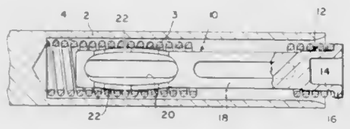
said carrier so that at least a portion of the lining is removed by said tool.

4,923,181
SPRINGS FOR A CORVETTE REAR-SEAT STORAGE COMPARTMENT COVER OPENER
James T. Streett, Pottstown, Pa., assignor to Street Specialty Products Inc., Pottstown, Pa.
Division of Ser. No. 86,618, Aug. 18, 1987, Pat. No. 4,863,208. This application Feb. 23, 1989, Ser. No. 313,944
Int. Cl.[5] F16F *1/06, 1/18*
U.S. Cl. 267—155 **5 Claims**



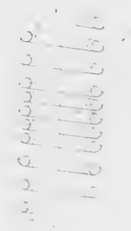
4. A spring made of wire comprising:
first and second spaced apart unconnected straight sections extending coplanar and parallel one another.
third and fourth spaced apart straight sections respectively connected to the first and second sections and bent substantially normal thereof, the first and second sections extending parallel one another and being coplanar:
first and second, spaced apart helical wound sections, one end of each being respectively connected to said third and fourth straight sections;
fifth and sixth spaced apart, straight sections respectively connected to the opposite ends of said first and second helical wound sections and extending coplanar and parallel one another;
a seventh straight section connected between the opposite ends of said and sixth straight and
said fifth and sixth straight sections being respectively oriented so that the angle between the third and fifth sections is an acute angle and the included angle between the fourth and sixth sections in as an acute angle the same as first said acute angle.

4,923,182
SPRING ENERGIZED AIR GUNS
Harold F. Resuggan, Birmingham, Great Britain, assignor to Webley & Scott Limited, United Kingdom
Filed Jun. 9, 1988, Ser. No. 204,244
Claims priority, application United Kingdom, Jun. 13, 1987, 8713857
Int. Cl.[5] F41B *11/00*
U.S. Cl. 267—169 **10 Claims**



1. In a spring energised air gun having a slideable piston and a helical compression spring engageable with said piston and being operable to drive the latter along a path when said spring is released from a compressed condition, the improvement comprising a damping device for damping radial and axial oscillations of said spring in response to decompression of said spring, said damping device comprising an elongate body accommodated within and encircled by said spring, said body having at one end thereof a radially projecting flange on which one end of said spring seats, said body having adjacent its opposite end a plurality of resilient, radially projecting limbs in engagement with said spring, said body having a major portion of its length between its ends of such size as to provide radial clearance between said body and said spring.

4,923,183
NON-CIRCULAR CROSS-SECTION COIL SPRING
Tsutomu Saka, Utsunomiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 17, 1988, Ser. No. 258,746
Claims priority, application Japan, Oct. 20, 1987, 62-262743; Nov. 16, 1987, 62-287522
Int. Cl.[5] F16F *1/06*
U.S. Cl. 267—180 **4 Claims**



1. A coil spring having a center line, wherein a spring wire having a non-circular cross-section with a major diameter and a minor diameter is coiled into a spring configuration with said major diameter of said cross-section in a direction intersecting said center line of said spring; characterized in that said coil spring includes a preliminary torsion, applied to said spring wire when said coil spring is formed, such that a line parallel to said major diameter and a plane perpendicular to said center line form an angle facing said center line, wherein said parallel line forming a side of said angle is inclined toward a direction opposite to the direction of application of a load to be applied in use of said spring and the degree of said applied preliminary torsion is varied in said coil spring relative to a reference plane of extension and contraction of said coil spring.

4,923,184
CLAMPING DEVICE
Peter Schauss, Flörsheim, Fed. Rep. of Germany, assignor to DE-STA-CO Metallerzeugnisse GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 25, 1988, Ser. No. 262,533
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 8714390[U]; Apr. 15, 1988, 8804990[U]
Int. Cl.[5] B23Q *3/03*
U.S. Cl. 269—32 **16 Claims**

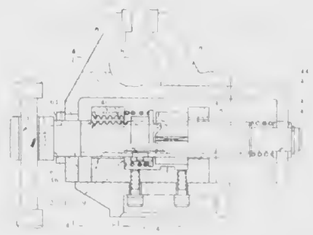
1. A clamping device for clamping a workpiece, comprising
(a) a mounting head,
(b) a clamping arm linked to the mounting head for movement into and out of a clamping position,
(c) an actuator for moving the clamping arm into and out of said positions, the actuator including
(1) a cylinder carrying the mounting head and having a free end face remote from the mounting head, and
(2) a piston rod reciprocable in the actuator cylinder along a longitudinal axis thereof and having a free end extending into the mounting head,
(d) two pressure medium inlet terminals mounted on the free

actuator cylinder end face and extending in the direction of the longitudinal axis for connection to two pressure medium supply lines,
(e) a positioning rod affixed to the free piston rod end and reciprocable therewith, the positioning rod extending towards the actuator cylinder parallel to the piston rod and carrying
(1) positioning elements reciprocable with the positioning



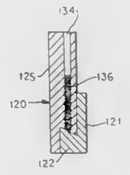
rod in a positioning path extending along the actuator cylinder, the positioning path being defined between two end positions, and
(f) two sensors arranged along the positioning path for detecting the end positions of the positioning path, the sensors having
(1) outlet lines mounted on the free actuator cylinder end face and extending in the direction of the longitudinal axis.

4,923,185
VERTICAL-LIFT SCREW DRIVE MECHANISM
Chaolai Fan, 112 Stalin St., Changchun, Jilin Province, China
Filed Sep. 6, 1988, Ser. No. 240,963
Claims priority, application China, Sep. 4, 1987, 87213118; Nov. 28, 1987, 87108067; Aug. 8, 1988, 88104905
Int. Cl.[5] B25B *1/02*
U.S. Cl. 269—181 **21 Claims**



1. A vertical-lift screw drive mechanism comprising a stationary body, a movable body, a screw, a screw nut seat in the form of a saddle, the nut seat having a hole therethrough and having cam support surfaces thereon, an eccentric cam positioned between two arms of said nut seat, said cam having a hole therethrough, said screw disposed in the holes of said nut seat and said cam, said cam slideably supported on the cam support surfaces of said nut seat, a one-direction ratchet device positioned between said screw nut seat and said eccentric cam, said ratchet device connected to said screw such that said screw drives said eccentric cam to rotate by said one-direction ratchet device, which causes a vertical movement of said screw whereby said screw engages with or disengages from the nut seat.

4,923,186
QUICK LOCK IN PARALLEL AND ANGLE PLATE SYSTEM FOR MACHINING VISE
David L. Durfee, Jr., Erie, Pa., assignor to Susan M. Durfee, Meadville, Pa.
Continuation-in-part of Ser. No. 941,717, Dec. 15, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 223,428
Int. Cl.[5] B25B *1/24*
U.S. Cl. 269—282 **14 Claims**

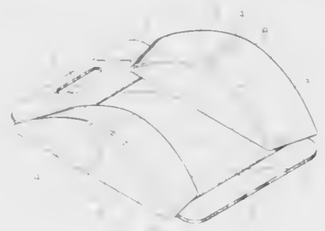


1. A machinist vise comprising,
a base having a reference surface and a fixed jaw attached to said base and extending upwardly therefrom,
a movable jaw supported on said base,
a first removable jaw attached to said fixed jaw and having a downwardly facing surface and a front surface,
a second removable jaw attached to said movable jaw and having a downwardly facing surface and a front surface,
a first positioning plate having a top surface and a bottom surface, and a recess in said bottom surface
said bottom surface of said first positioning plate resting on said reference surface,
a second positioning plate having a top surface and a bottom surface, and a recess in said bottom surface
said bottom surface of said second positioning plate resting on said reference surface,
a first cleat attached to said first positioning plate adjacent said bottom surface of said first positioning plate,
a second cleat attached to said second positioning plate adjacent said bottom surface of said second positioning plate,
a first engagement means on said first removable jaw engaging said first cleat within said first recess forcing said bottom surface of said first positioning plate into engagement with said reference surface,
a second engagement means on said second removable jaw engaging said second cleat within said second recess forcing said bottom surface of said second positioning plate into engagement with said reference surface whereby said positioning plates may be pushed into an operative location such that said first engagement means and said second engagement means holds said cleats and said bottom surfaces of said positioning plates in place against said reference surface without movement of said positioning plates.

4,923,187
RADIOLUCENT ILIAC CREST SUPPORT FRAME
Bruno Mombrinie, Voorhees, N.J., assignor to Avec Scientific Utility Corporation, Philadelphia, Pa.
Filed Mar. 10, 1989, Ser. No. 321,973
Int. Cl.[5] A61G *13/00*
U.S. Cl. 269—328 **14 Claims**

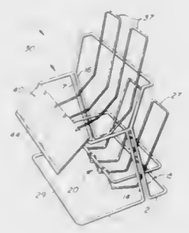
1. A radiolucent iliac crest support frame for supporting the iliac crest of a person and maintaining the person's spine in a substantially straight horizontal position, comprising:
a. a radiolucent sheet;

b. means for causing the sheet to grip a horizontal surface when the sheet is placed on said surface;
c. means for supporting the iliac crest of a person above the



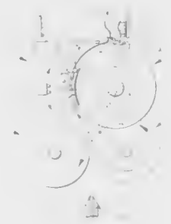
sheet and maintaining said person's spine in a substantially straight horizontal position;
d. means for adjustably attaching said means for supporting and maintaining to the radiolucent sheet.

4,923,188
Z-FOLD PAPER SHEET CARRIER
Kenneth E. Neir, San Jose, Calif., assignor to Spectra-Physics, San Jose, Calif.
Filed Oct. 26, 1988, Ser. No. 262,924
Int. Cl.[5] B65M *45/00*
U.S. Cl. 270—39 **19 Claims**



1. A free-standing paper carrier for unfolding/refolding connected sheets of a continuous stack of Z-fold paper sheets comprising:
a first horizontal base for placement of said carrier on a horizontal work surface rearward of a printer housing resting on said surface;
a first pair of spaced integral upstanding outer frame members extending from opposite sides of said base rearward of a front portion of said base;
a first open lower trough connected across said outer frame members adjacent to and extending above said base including an upstanding paper stack support extending rearwardly from adjacent said base at an acute angle to said base; and
a second open upper trough connected across a top portion of said outer frame members and extending forwardly of and spaced above said first trough, wherein a multiple folded stack of paper sheets is positionable at a rearward acute angle from the vertical in said first trough and forwardly feedable into an adjacent printing mechanism in said printer housing and wherein printed-on paper sheets of said stack exiting said printing mechanism are feedable to and automatically folded into said second trough.

4,923,189
METHOD FOR COMPILING SHEETS IN A BINDERY PROCESS
James W. Nail, Gastonia, N.C., assignor to Craftsman Printing Company, Charlotte, N.C.
Division of Ser. No. 40,613, Apr. 21, 1987, Pat. No. 4,799,661.
This application Dec. 7, 1988, Ser. No. 281,174
Int. Cl.[5] B65H *270/54*
U.S. Cl. 270—54 **7 Claims**



1. A method of compiling a plurality of differently printed groups of sheets into collated sets, and which is characterized by the ability to accurately detect an improperly collated sheet as well as a missing sheet in each collated set, and comprising the steps of
placing an indicium on each of the printed sheets at a predetermined location thereon, and with the predetermined location on the printed sheets of each group being different from the location of the indicia on the other groups of sheets,
sequentially conveying a sheet from each of the groups of sheets along a predetermined path of travel and onto predetermined spaced locations of an advancing conveyor means and so as to form a set of overlying collated sheets at each of said spaced locations, and
scanning each of the sheets during their advance along said path of travel and before being placed on said conveyor to detect whether an indicium is present at the proper predetermined location on each of the sheets, and so as to identify an improperly collated sheet as well as a missing sheet, with said scanning step including directing a light beam toward each sheet, and receiving a portion of the light beams which is reflected from the sheet, and with said directing and receiving steps being conducted while each sheet is at a predetermined location along said path of travel.

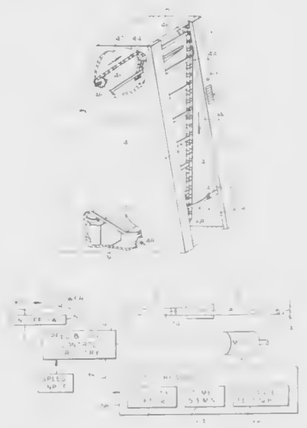
4,923,190
ORIGINAL PAPER TURNING OVER AND CONVEYING OUT APPARATUS
Akira Hirose, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Dec. 23, 1988, Ser. No. 289,267
Claims priority, application Japan, Dec. 28, 1987, 62-333322; Dec. 28, 1987, 62-333323; Oct. 28, 1988, 63-272559
Int. Cl.[5] B65H *29/58*
U.S. Cl. 271—3.1 **14 Claims**

1. An original paper turning over and conveying out apparatus comprising:
an original paper processing portion for processing an original paper;
an original paper stacking portion for stacking original papers;
a first conveyor route which interconnects said original paper processing portion and said original paper stacking portion and which is able to convey said original paper in a forward direction from said original paper processing portion to said original paper stacking portion and in a backward direction;
a discharge roller disposed at an outlet of said first conveyor route;
a second conveyor route diverging from said first conveyor route so that said original paper conveyed backward through said first conveyor route is guided to said second conveyor route and conveyed to said original paper stacking portion and that said original paper is discharged into



said original paper stacking portion in a state of being turned over through said discharge roller disposed at the outlet of said first conveyor route;
a fixed pressing member which always urges said original paper conveyed through said second conveyor route against said discharge roller to apply a discharging force to said original paper from said discharge roller; and
a movable pressing member which selectively urges said original paper conveyed through said first conveyor route against said discharge roller so that said discharging force is applied to said original paper conveyed forward whereas said discharging force is not applied to said original paper conveyed backward.

4,923,191
MOUNTAIN CLIMBER FITNESS MACHINE
Joseph Persico, 1530 Pennsylvania Ave., Apt. 12-F, Brooklyn, N.Y. 11239
Filed Oct. 14, 1988, Ser. No. 258,006
Int. Cl.[5] A63B *23/06*
U.S. Cl. 272—69 **2 Claims**



1. A mountain climber fitness machine, comprising : a housing for enclosing a motor operated sprocket train, rubber coated rungs secured to said sprocket train containing a speed and logic control circuitry unit connected through an on-off switch to a power source, digital readout means secured in said panel and coupled to said unit for displaying velocity, time and distance travelled, and a safety device secured in said housing for stopping said motor operated sprocket train in the event the user missteps or suffers a sudden ailment, wherein said motor is mounted to a bottom wall of said housing and includes a pair of output shafts, one on each end of said motor, a drive sprocket of said sprocket train is secured to said motor output shafts, an endless chain is received on each said drive sprocket, driven sprockets secured on shafts are secured to side walls of said housing, the rungs are secured in spaced apart relation to and between each said endless chain for said user to climb, and said safety device includes a wire looped at one end, the looped wire is received on a hook secured in one side wall of said housing and other end of said wire is secured in a male plug jack normally received in a female jack secured in another side wall of said housing, said female jack being wired in series with an output of said speed and logic control circuitry unit and said motor so that when said male plug jack is pulled and disconnected from said female jack by said user misstep, current to said motor ceases and causing said machine to stop operate, so as to prevent said user from becoming seriously injured.

4,923,192
PORTABLE EXERCISE KIT
Floyd Sawdon, 641 East Aitken Rd., Applegate, Mich. 48401
Continuation-in-part of Ser. No. 150,192, Jan. 29, 1988, abandoned. This application Nov. 29, 1988, Ser. No. 277,316
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—70 **2 Claims**

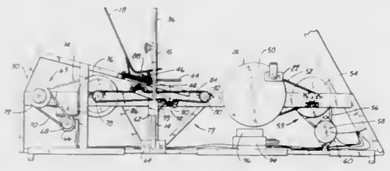


1. An exercise device for use by an individual who is physically impaired or elderly, comprising:
an exercise pad supporting at least one foot of a seated individual;
said pad having a length greater than the width and comprising a base member and an upper layer;
said upper layer is adhesively bonded to the entire upper surface of said base member and provides a smooth surface upon which said at least one foot slides upon;
said base member includes a rough surface on the side opposite said upper layer to prevent movement of said pad;
a divider attached to said upper layer such that said pad is divided into equal portions, each one of said equal portions accommodating one foot;
said divider extending above said upper layer and having an upper surface which prevents said pad from movement if accidentally turned over; said
said pad permitting an exercise to be performed by said individual by sliding at least one foot, while wearing a sock, back and forth along said upper surface without leaving said pad surface, and said individual may exercise their arms by moving them in conjunction with said at least one foot.

4,923,193
UPPER AND LOWER BODY EXERCISER
Gerald Pitzen, Arden Hills; Douglas Garfield, Northfield; Warren G. Beltz; Lawrence O. Arntzen, both of St. Paul, and Joseph C. Bina, Oakdale, all of Minn., assignors to Bioform Engineering, Inc., Ross, Calif.
Filed Sep. 30, 1988, Ser. No. 252,169
Int. Cl.[5] A63B *21/00;* **F16H** *21/16*
U.S. Cl. 272—73 **7 Claims**

1. An exercise apparatus for converting reciprocating motion to rotational motion comprising:
a frame;

first and second wheels supported for rotation at spaced locations on the frame;
a continuous flexible linkage wrapped in a cycle around the first and second wheels to couple movement of the first and second wheels;
a wheel cluster carrier positioned to move in a reciprocating fashion between the first and second wheels;
a first cluster of clutched wheels mounted on the wheel cluster carrier and in engagement with the continuous flexible linkage for driving the flexible linkage in its cycle in a predetermined direction; and



a second cluster of clutched wheels mounted on the wheel cluster carrier and in engagement with the continuous flexible linkage for driving the flexible linkage in its cycle in the predetermined direction;
the first and second clusters of clutched wheels being arranged along the continuous flexible linkage to allow acceleration of the flexible linkage in its predetermined direction of travel notwithstanding the direction of movement of the wheel cluster carrier.

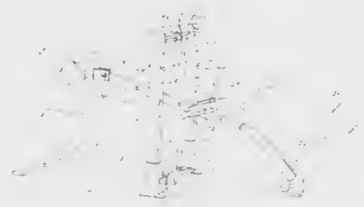
4,923,194
INCLINED EXERCISE BAR SYSTEM
Calvin W. Montgomery, 4 Baynard Cove Rd., Hilton Head, S.C. 29928
Filed Apr. 6, 1989, Ser. No. 333,917
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—93 **19 Claims**



1. An exercise bar assembly comprising
a base adapted to lie on the floor,
two bars extending parallel to each other and each having two ends with one end mounted on said base,
each of said two bars including an inclined portion, said inclined portion of each of said two bars being spaced apart from each other for performing exercises while the feet of the exerciser are located on the floor, and
a symmetrically bent cross bar pivotably mounted on said two bars and including means for limiting rotation of said cross bar to two end positions substantially 180° apart so as to vary the position of gripping of said cross bar by the exerciser as the exerciser performs exercises.

7. An exercise device comprising:
a base plate adapted to sit on the floor,
two exercise bars extending from said base plate, each of said two exercise bars having two ends and having an inclined portion located between said two ends, and
means for pivotably mounting one end of said two bars on said base plate so as to vary the distance between said inclined portions of said two bars and change the difficulty of push-ups and pull-ups being performed on said two bars as said inclined portions are held by an exerciser,
said other end of said two bars extending vertically from the floor towards said inclined portion.

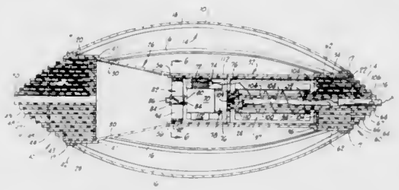
4,923,195
EXERCISE DEVICE
Michael P. Calderone, 9080 Evergreen, Brighton, Mich. 48116
Filed Dec. 5, 1988, Ser. No. 279,835
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—117 **5 Claims**



1. An exercise device for selectively developing the muscles of the user's arms, wrists and shoulders comprising:
a base;
a seat supported above the base;
an adjustable forearm pad adjustably disposed forward of the seat and supported above the base by an adjustable forearm pad support;
a pivoted lever pivoted at a rearward end adjacent the seat, a forward end extending past the forearm pad a distance;
a longitudinal bar including a rear end rearward of the seat, and a front end terminating forward of the forearm pad;
a first cross-bar extending transversely to the longitudinal bar at the rear end;
a pivot stop extending vertically upward from the forward end of the longitudinal bar to support the pivoted lever at rest;
a seat support extending vertically from the longitudinal bar to the seat;
a weight holding pin extending horizontally from the seat support between the base and the seat;
a first "U" shaped bracket affixed to the seat support with an open end extending forward;
a lever aperture formed in the rearward end of the pivoted lever, a pair of aligned apertures formed in the bracket aligned with the lever aperture, a pivot pin engaging the pair of apertures and the lever aperture to form a pivot;
a second cross-bar extending transversely to the longitudinal bar vertically beneath the forearm pad;
a pair of opposed vertical supports extending vertically upward from the ends of the second cross-bar to the forearm pad;
a notch disposed in the center upper surface of the second cross-bar and adapted to receive the longitudinal bar;
a pair of threaded apertures located proximate each side of the notch;
a flat, plate-like member;
a pair of apertures formed in the plate-like member configured to be aligned with the pair of threaded apertures located proximate each side of the notch;
a pair of large-headed threaded fasteners each with a head

formed at one end thereof and adapted to be turned by hand, said head exceeding the threaded aperture diameter, each threaded fastener engaging an aperture and threadingly engaging a threaded aperture to retain the plate-like member and the second cross-bar at a selected position along the longitudinal bar;
a weight supporting pin extending vertically upward from the lever forward end;
an attachment post pivotally and adjustably attached to the pivoted lever forward of the forearm pad;
a lifting means attached to the attachment post and adapted to be grasped by the user's hands; and
a plurality of weights selectively attached to the weight supporting pin.

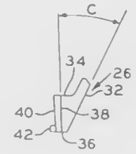
4,923,196
ENGINE-SPIRALED, STABILIZED TOY FOOTBALL
Daniel Z. Rohring, 904 Walnut Pl., Norman, Okla. 73072
Filed Oct. 24, 1988, Ser. No. 261,574
Int. Cl.[5] A63B *43/00*; **A63H** *27/24, 29/20*
U.S. Cl. 273—65 EF **16 Claims**

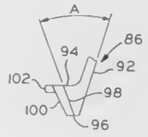


1. A football comprising:
a hollow, open ended oblate spheroidal body having a nose at one end and having a central longitudinal axis extending from said nose to the opposite end of the oblate spheroidal body;
air flow passageway means extending from said nose along said longitudinal axis and opening at the end of said body opposite said nose;
an engine mounted centrally in said oblate spheroidal body and connected for movement therewith about said longitudinal axis;
a propeller drivingly connected to said engine and positioned to impel air through said air flow passageway means from the nose to the opposite end of said oblate spheroidal body, said propeller mounted for rotation about said longitudinal axis and rotatable free of said oblate spheroidal body.

4,923,197
SET OF GOLF CLUBS
James Schacht, Clarksville, Tenn., assignor to Floyd Horgen, Rockledge, Fla., a part interest
Filed Oct. 14, 1988, Ser. No. 258,215
Int. Cl.[5] A63B *53/00*
U.S. Cl. 273—77 A **6 Claims**

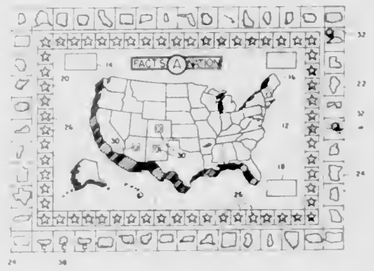
1. A set of golf club irons including a plurality of successive clubs of a common length, lie and head weight comprising:
a first club having a preselected length, lie, head weight and loft;
a second club having a loft greater than the preselected loft of the first club, said second club having a club head with





the weight of said club head distributed more toward the top edge thereof than said first club.

4,923,198
BOARD GAME OF GEOPOLITICAL AND RELATED KNOWLEDGE
Francisco J. Diaz, 9 Leonard Ct., Rockville, Md. 20850
Filed Jun. 12, 1989, Ser. No. 364,103
Int. Cl.[5] A63F *3/04*
U.S. Cl. 273—240 **9 Claims**



1. A game apparatus requiring the demonstration of geographical historical, political, and sociological knowledge, and the like, on the part of the players of the game, including;
a game board,
said game board including a map of the United States or other geographical or political area,
an outer peripheral path along the edges of said game board,
an inner peripheral path adjacent the inner edges of said outer peripheral path,
said outer peripheral path comprised of a plurality of segments, each of said segments containing the representation of a state or other geographical or political area contained within said map,
said inner peripheral path comprised of a plurality of segments, each of said segments containing a category of questions relating to geographical, historical, political, and sociological or other subject matter to be answered by said players,
cards of a plurality of colors,
each of said cards including a front side and a reverse side,
said front sides of said cards each containing a plurality of questions relating to geographical, historical, political,

VOL 114 ISS 2 MY 8 1990 UMI

sociological or other subject matter to be answered by said players,
each of said questions contained upon each of said cards relating to said categories contained in said segments of said inner peripheral path,
said reverse sides of each of said cards containing answers corresponding to said questions on said front sides of said cards,
a plurality of markers equal to the number of individual states or other geographical or political areas contained within said map and said outer periphery, and
a scoresheet, whereby said players may enter correct answers to said questions and thereby provide scoring means for said game.

4,923,199
WORD MAKING CARD GAME
Eugene W. Hahn, 426 Sterling Pl., Apt. 1C, Brooklyn, N.Y. 11238
Filed Mar. 13, 1989, Ser. No. 322,120
Int. Cl.[5] A63F *1/00*
U.S. Cl. 273—299 5 Claims



1 A method of playing a multicycle word game comprising:
dealing out a set of fifteen cards to each of from two to four players, from a shuffled deck containing sixty cards, each card carrying one letter with the frequency of cards containing each letter being roughly the same as the frequency with which each letter occurs in the English language, there being more cards containing letters which are more frequently used and less cards containing letters which are less frequently used;
selecting a period of time for one cycle of the game during which each player forms as many words as possible from the set of fifteen cards dealt to that player, the game having a number of cycles which is equal to the number of players;
issuing to each player, a number of worksheets equal to the number of cycles of the game, each player marking on one of the worksheets issued to that player, the fifteen cards dealt to that player, and each word formed by that player, each word on the worksheet using only letters available from the fifteen cards with subsequent words on the worksheet being allowed to re-use letters appearing in the fifteen cards;
scoring each player for each cycle by assessing the value of each word made by each player on the basis of the length of each word with longer words being scored higher than shorter words,
each player passing the fifteen cards originally dealt to that player, to a neighboring player to commence a second cycle of the game, so that each player has a new set of fifteen cards,
each player marking on a second one of the worksheets issued to that player, the letters of the newly received fifteen cards and as many words as possible formed with the newly received set of fifteen cards during the second cycle; and
repeating the passing of the sets of fifteen cards from each player to a neighboring player until all players have received all the dealt sets of fifteen cards.

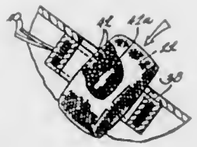
4,923,200
APPARATUS FOR PLAYING CARD GAMES
Laverne Peterson, 98-501 Koauka Loop, Apt. A1104, Aiea, Hi. 96701
Continuation-in-part of Ser. No. 130,997, Dec. 10, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 303,429
Int. Cl.[5] A63F *1/00*
U.S. Cl. 273—309 16 Claims



1 A table and related apparatus for playing a game analogous to a game of cards comprising:
a plurality of spherical elements that have indicia thereon of a character corresponding to playing cards;
said plurality of spherical elements being analogous in use to a deck of playing cards;
said table having holding means deployed thereon for retaining said spherical elements in a plurality of playing positions;
said table having recessed areas containing individual holding trays, said individual holding trays being capable of containing no more than thirteen spherical elements;
said table having stacked thereon an assembly for receiving said spherical elements, and means for randomizing and dispersing said spherical elements;
said receiving assembly includes an aperture through which spherical elements can fall;
said aperture leading to said randomizing and dispersing means which include upper dispersing means and lower dispersing means, both said upper and lower dispersing means being circular and having substantially the same diameter;
said upper dispersing means are rotatable and have disposed thereon vanes whereby the upper surface is divided into four substantially equal quadrants each having an aperture disposed thereon; and
said lower dispersing means are fixed and have disposed thereon four apertures each corresponding to a said aperture on said upper dispersing means, each of said four apertures leading to a cylindrical receiving tube whereby spherical elements can be dispersed to said plurality of playing positions.

4,923,201
ELECTRONIC BAG TOSS GAME
Thomas W. Nichol, 3765 Maplewood Ct., Hubertis, Wis. 53033; Edward T. Gisske, Verona, Wis., and Arlyn Johnson, 7350 N. 76th St., Milwaukee, Wis. 53223, assignors to Thomas W. Nichol and Arlyn Johnson, both of Milwaukee, Wis.
Filed Jan. 23, 1989, Ser. No. 300,134
Int. Cl.[5] A63B *63/00, 71/04*
U.S. Cl. 273—371 8 Claims

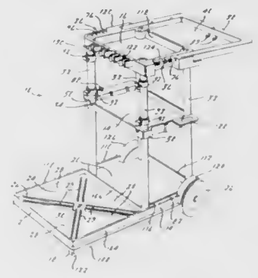




1. An automated bag toss game, comprising:
a game board surface, having a plurality of holes formed therein;
at least one bag, containing a plurality of pellets of material therein, at least some of said pellets being constructed of a material having magnetic properties;
magnetic sensing means, disposed generally beneath said game board surface and aligned with said holes, for sensing the passage of said bag into one of said holes and producing a signal corresponding to the particular hole into which the bag passed.

4,923,202
UTILITY CART
Frank Breveglieri, Spring Lake, Mich., and Kenneth F. Streit, Mt. Prospect, Ill., assignors to Geerpres, Inc., Muskegon, Mich.
Continuation-in-part of Ser. No. 912,567, Sep. 26, 1986, Pat. No. 4,743,040. This application Feb. 18, 1987, Ser. No. 15,950
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.
Int. Cl.[5] B62B *3/00*
U.S. Cl. 280—47.35 21 Claims

1. A manually propelled utility cart comprising:
a base means, an intermediate tray means, and a top tray means including wheeled movement means for multidirectional horizontal movement of said utility cart along a floor surface;
vertical structural support means for supporting said intermediate tray means and said top tray means vertically upward from said base means, and said intermediate tray means having adjustable positioning means and being in slideable engagement with said vertical structural support means, said adjustable positioning means includes an expandable ring means;
said vertical structural support means including at least one hollow rod structural member engaged and secured in compression between said base means and said top tray means by a compression means;
said structural support member further comprises a vertical support member having a continuous peripheral groove therein;
said adjustable positioning means further includes a throughbore means in said intermediate tray means for defining a throughbore corresponding to said vertical support member for close sliding engagement with said vertical support member, and a counterbore means in said intermediate tray means defining a counterbore in a lower portion of



said intermediate tray means, said counterbore means being in alignment with said throughbore means and defining a shoulder portion;
said expandable ring means positioned in said groove, said counterbore means securely engaging an outermost portion of said expandable ring means, wherein said intermediate tray is held in position on said support member by said counterbore means engaging and retaining said expandable ring means in said groove, and said shoulder portion of said tray being held in resting engagement with said expandable ring means to prevent downward movement of said tray beyond a predetermined position.

4,923,203
COMPOSITE BICYCLE FRAME WITH CROSSED TUBULAR PORTIONS
Brent J. Trimble, 8025 Sundi Way, Anchorage, Ak. 99502, and Richard H. Trimble, Box 2, 2 College St., Providence, R.I. 02093
Filed Dec. 23, 1987, Ser. No. 137,124
Int. Cl.[6] B62K *3/14*
U.S. Cl. 280—288.3 24 Claims



1 A bicycle frame connecting a steering support means for rotatably supporting a front fork assembly, a seat support means for supporting a seat assembly, a pedal support means for supporting a pedal assembly, and a rear wheel support means for supporting a rear wheel assembly, said frame comprising:

a generally hollow main tubular portion extending longitudinally between said steering support means and said rear wheel support means and comprising at least one layer of fibrous material impregnated with a synthetic resin;

a generally hollow cross tubular portion extending longitudinally between said pedal support means and said seat support means and comprising at least one layer of fibrous material impregnated with a synthetic resin; and

a generally hollow common junction connecting said main tubular portion and said cross tubular portion to form a generally hollow unitary bicycle frame having a substantially X-shaped geometry as viewed from one side thereof, said common junction providing a substantially continuous wall around an interior cavity of said generally hollow bicycle frame and comprising first and second intermediate segments of said main tubular portion and third and fourth intermediate segments of said cross-tubular portion, said first and third intermediate segments being overlapped and bonded together to provide a unitary wall connecting said main and cross tubular portions along one side of said common junction, and said second and fourth intermediate segments being overlapped and bonded together to provide a unitary wall connecting said main and crossed tubular portions along another side of said common junction.

4,923,204

ADJUSTABLE KING PIN ASSEMBLY

Richard Henderson, 9403-82nd Street, Fort St. John B.C., Canada

Filed Oct. 17, 1988, Ser. No. 258,707
Int. Cl.[5] B62D *53/08*
U.S. Cl. 280—407.1 20 Claims



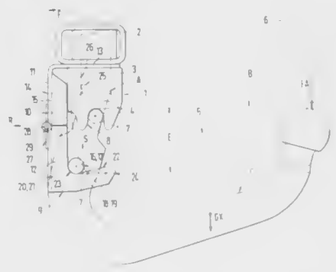
1. In a king pin assembly for a trailer having a longitudinal axis comprising a frame, to releasably mate with a fifth wheel assembly on a tractor, the improvement characterized in that the king pin assembly comprises housing means secured to said frame including spaced, elongated, longitudinally aligned guide bars extending substantially parallel to the longitudinal axis of said trailer, a king pin secured to a plate slidably positioned for longitudinal movement with respect of the frame of the trailer in a space enclosed by said housing means between said spaced, elongated, longitudinally aligned guide bars the guide bars to guide the plate longitudinally in such sliding movement; spaced, longitudinally aligned apertures being provided in the plate; locking means mounted adjacent the plate and releasably movable into locking position within said housing means in any one of each one of the apertures when said aperture is aligned with the locking means, to securely hold the plate in position against longitudinal movement when in locking position in said aperture; and mechanical means for moving the locking means from locking position in said aperture and moving it into locking position in an aligned aperture, as required.

4,923,205

TOWING DEVICE FOR VEHICLES

Jürgen Durm, Ditzingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Mar. 23, 1989, Ser. No. 327,537
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810164
Int. Cl.[5] B60D *1/06, 1/10*
U.S. Cl. 280—491.3 11 Claims



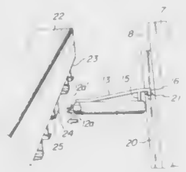
1. A towing device for vehicles, particularly passenger cars, comprising a transverse support mounted at the rearward end of the vehicle, which has a receiving part for the releasable holding of a ball neck with a coupling ball, an end part of the ball neck being inserted into the receiving part from below and being non-rotatably held by a locking mechanism, and a pin being arranged at the ball neck, which extends in transverse direction of the vehicle and projects beyond the ball neck on both sides, wherein a catching device is provided at a predetermined distance below the locking mechanism for catching the ball neck after falling the predetermined distance when the ball neck is released from the receiving part which includes the pin, which penetrates the ball neck, and catch hook, which is held in position at a stationary part of the towing device, the catch hook having a stationary upper part and a swivelling lower part, which is connected with the upper part, the lower part, which cooperate with a spring element, having hook portions for receiving the projecting portions of the pin located above it.

4,923,206

TROLLEY TRANSFER UNIT FOR TUNNEL FURNACE

Keiji Yasuda, Aichi, and Kazuhiro Miyahara, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 31, 1989, Ser. No. 330,902
Claims priority, application Japan, Mar. 31, 1988, 63-42125[U]
Int. Cl.[5] B60D *1/04*
U.S. Cl. 280—504 4 Claims



1. A trolley transfer unit for a tunnel furnace, comprising:

a bar member for joining two trollies at a predetermined interval, said bar member having a first end and a second end;

engaging means for engaging one of said trollies to be joined, said engaging means being provided on at least said second end of said bar member; and

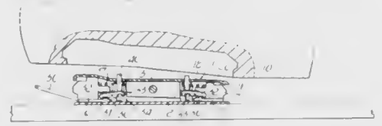
a support bar having a first end connected to the first end of said bar member via a vertical member having one end connected to said bar member and another end connected to said support bar and a second end connected to the second end of said bar member, said first end of said support bar having a bent portion extending therefrom which engages the other one of said trollies to be joined.

4,923,207

MIDDLE BINDING PARTICULARLY FOR SKI SHOES

Alessandro Pozzobon, Paderno di Ponzano Veneto, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Division of Ser. No. 897,563, Aug. 18, 1986, abandoned. This application Jan. 27, 1988, Ser. No. 148,198
Claims priority, application Italy, Sep. 4, 1985, 22065 A/85
Int. Cl.[5] A63C *9/08*
U.S. Cl. 280—613 6 Claims



1. A middle ski binding, particularly for use with ski shoes comprising a sole having a bottom surface with a middle recess formed inwardly thereof, said ski binding comprising:

an elongate box-type case attachable to a ski and including an upper cover element, a lower support plate, a forward end and a rear end;

a forward hook-on ferrule mounted in said box-type case at said forward end thereof;

a rear hook-on ferrule mounted in said box-type case at said rear end thereof;

said forward and said rear ferrules being arranged for reciprocating sliding movement longitudinally of said box-type case between an inoperative retracted position and an operative extended position;

a forward hook-on seat and a rearward hook-on seat defined in said sole recess for removably engaging said respective forward and rear hook-on ferrules in said operative extended position;

first spring means located internally of said box-type case and operative on said forward and said rearward hook-on ferrules to normally urge them in said operative extended position to thereby resiliently engage said respective hook-on seats;

means for adjusting the release tension exerted by said first spring means on said respective forward and rearward hook-on ferrules;

wherein said ski binding further comprises releasable locking means for releasably locking said forward and rear ferrules in said inoperative retracted position, said locking means comprising at least one grooved element defined on each of said forward and rear ferrules, a releasable mechanism engageable with said grooved element to lock said forward and rear ferrules in said retracted position, second spring means operative on said releasable mechanism to hold said mechanism in stable engagement with said grooved element, actuating means located partially internally of said box-type case and interacting with said releasable mechanism for disengagement thereof from said grooved element, said actuating means projecting at least partially outwardly of said box-type case to be automatically operated by insertion of said said box-type case in said recessed sole, whereby said forward and said rear ferrules are initially locked in their retracted position to thereby enable easy insertion of said box-type case in said recessed sole, whereupon said actuating means are currently operated so as to automatically release said forward and rear hook-on ferrules from said retracted position to allow said ferrules to move outwardly towards their operative extended position for engagement with said respective hook-on seats.

4,923,208

BABY CARRIAGE ALSO USABLE AS SHOPPING CARRIER

Takehiko Takahashi, and Hitoshi Katou, both of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,426
Claims priority, application Japan, Mar. 31, 1987, 62-46700[U]
Int. Cl.[5] B62B *7/08, 9/12, 9/26*
U.S. Cl. 280—642 8 Claims



1. A baby carriage usable as a shopping carrier, comprising: a seat in which an infant may be seated; guide rails disposed on opposing sides of an underside of said seat; a foldable article receiving body having an opening at an upper end thereof and being slidably mounted on said guide rails of said seat, said article receiving body being movable from a folded position below the underside of said seat to an unfolded position at the rear of the underside of said seat and being supported at each of said positions.

4,923,209

WHEEL SUSPENSION FOR A POWERED FRONT AXLE OF A MOTOR VEHICLE

Eberhard Armbrust, Renningen, and Hans-Juergen Woehler, Hemmingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Feb. 9, 1989, Ser. No. 307,954
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 3803802
Int. Cl.[5] B60G *11/50*
U.S. Cl. 280—689 11 Claims



1. A suspension for supporting a driven front wheel and wheel carrier on a vehicle body, said suspension comprising:

a stabilizer mounted to the vehicle body;

a suspension linkage having one end connected to the stabilizer by means of a first joint and another end connected to the wheel carrier by means of a second joint, wherein the suspension linkage comprises an arm having a semicircular shape and which extends in the longitudinal direction of the vehicle;

a lower transverse link having one end connected to the wheel carrier by means of a bearing and another end connected to the vehicle body and

a spring strut mounted to the vehicle body at an upper end thereof by means of an upper spring strut bearing and a lower end mounted to the wheel carrier,

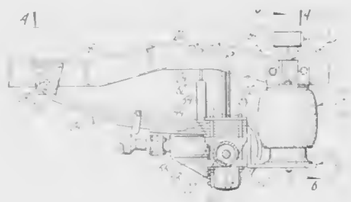
wherein the first joint is located above an axis of rotation of the wheel and an axis of inclination formed by the upper spring strut support bearing and the lower transverse link bearing.

4,923,210

SUSPENSION AND LEVELING SYSTEM FOR A VEHICLE

Merle J. Heider, 203-12th St., SW.; Dale J. Heider, 1108-8th Ave., SW., and Leon J. Heider, R.R., all of Humboldt, Iowa 50548

Filed Mar. 28, 1989, Ser. No. 329,441
Int. Cl.[5] B62D *37/00;* **B60G** *11/26*
U.S. Cl. 280—707 **14 Claims**



1. A suspension system for a vehicle, said vehicle having a vehicle frame with forward and rearward ends and opposite lateral sides, said vehicle also having a vehicle cab and at least one axle extending transversely of said vehicle frame and having opposite axle ends positioned adjacent said opposite sides of said frame; ground engaging wheels being mounted on said axle, said suspension system comprising:

an elongated spring means having a first end attached to said vehicle frame and a second end;

bag means having an upper end, a lower end and flexible walls enclosing a bag compartment whereby said bag compartment is capable of continuously expanding and contracting in vertical size between expanded and retracted positions in response to the introduction of fluid to and removal of fluid from said bag compartment so as to adjust the vertical distance between said upper and lower ends of said bag means;

first securing means attaching said upper end of said bag means to said vehicle frame;

second securing means attaching said second end of said spring means and said lower end of said bag means to said axle whereby the vertical distance of said axle below said frame is controlled by the position of said bag compartment between said expanded and retracted positions;

a pressurized fluid source;

fluid conduit means connecting said fluid source to said bag means;

first and second valve means in said fluid conduit means for controlling the amount of pressure within said bag means, said first and second valve means being movable between a normally closed position and an open position;

photo-electric sensor means located externally of said bag compartment and being connected between said frame and said axle for sensing the relative distance therebetween, said sensor means being electrically connected to said first and second valve means for automatically moving said first and second valve means between said closed and open positions in response to changes in the distance between said frame and said axle.

4,923,211

PASSENGER COVERING FOR MOTOR VEHICLE OR THE LIKE

Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jan. 17, 1989, Ser. No. 297,611
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3804060
Int. Cl.[5] B60R *22/14, 27/00*
U.S. Cl. 280—727 **13 Claims**



1. A covering for a person comprising:

a rotatable winding shaft for being supported upon a support located in front of a seat, and means for rotating the shaft;

a blanket having a first end on the shaft, the blanket being windable onto the shaft upon winding the shaft in one direction and the blanket being rewindable off the shaft; the blanket having lateral edges and a first width between the lateral edges;

a blanket guide located toward the support, the guide being shaped for defining an interior of the guide for receiving the blanket, for passing the blanket through the guide and for guiding movement of the blanket toward and away from the winding shaft as the blanket passes through the guide;

the guide interior having a profile which is generally funnel shaped, narrowing in width at the end thereof toward the shaft; the interior profile of the guide being of a second width narrower than the first width of the blanket and the guide interior profile being shaped for folding over the lateral edges of the blanket thereby narrowing the blanket to be narrower than the first width thereof as the blanket is moved through the guide toward the shaft while the blanket is being wound upon the shaft; and

means for rotating the shaft for winding the blanket on the shaft.

4,923,212

LIGHTWEIGHT NON-WELDED INFLATOR UNIT FOR AUTOMOBILE AIRBAGS

Jess Cuevas, Scottsdale, Ariz., assignor to Talley Automotive Products, Inc., Phoenix, Ariz.

Filed Aug. 17, 1988, Ser. No. 233,191
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—736 **29 Claims**

1. A lightweight, non-welded inflator apparatus which comprises:

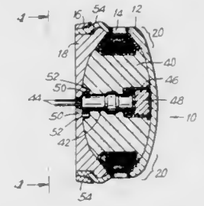
(a) a domed diffuser member, having a first open end and a second closed end;

(b) a closure plate member sealing the open end of said diffuser member, thereby forming an inflator housing;

(c) a sufficient amount of a combustible gas generant material within an interior portion of said housing to produce upon combustion thereof a volume of a gaseous product sufficient to substantially inflate an automobile air bag within about 30–60 milliseconds;

(d) means for initiating combustion of said gas generant material, said initiating means positioned within said housing adjacent said gas generant; and

(e) means within said housing for filtering said gaseous combustion product prior to its discharge from the inflator



housing, said filtering means circumferentially surrounding said gas generant material adjacent an inner wall portion of said housing, and adapted for cooling said gas and removing substantially all particulate matter therefrom,

said closure plate member and said domed diffuser member being sealed together without welding either of said members to form an inflator housing capable of withstanding elevated pressures produced by combustion of said gas generant material.

4,923,213

DRIVE MEMBER FOR PASSIVE SEAT BELT SYSTEM

Kazuo Yamamoto, Kanagawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 266,069
Claims priority, application Japan, Nov. 12, 1987, 62-173022[U]; Jul. 19, 1988, 62-95201[U]
Int. Cl.[5] B60R *22/00*
U.S. Cl. 280—804 **11 Claims**



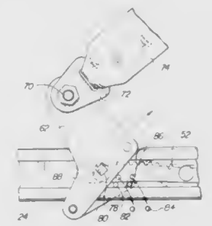
1. A drive member for a passive seat belt system, said drive member being adapted to slidably extend through a guide rail and to transmit a drive force to a webbing-carrying slider so as to selectively displace the slider between an occupant-restraining position and an occupant-non-restraining position, characterized in that an end metal fitting for holding the slider at a free end portion of the drive member has been formed integrally with a main body of the drive member.

4,923,214

SEAT BELT ANCHORAGE

Ronald R. Siegrist, Grass Lake, and Tod A. Shivak, Ypsilanti, both of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Jan. 26, 1989, Ser. No. 301,863
Int. Cl.[5] B60R *21/10*
U.S. Cl. 280—806 **9 Claims**



1. A seat assembly for a motor vehicle of the type providing fore-and-aft seat adjustment and having a seat belt anchorage movable with said seat, comprising:

a toothed track,

first mounting means for affixing said track to said motor vehicle,

a slide rail engaging said toothed track and slideable along said toothed track,

second mounting means for affixing said seat to said slide rail,

an adjustment mechanism engageable with said toothed track for fixing a fore-and-aft position of said rail and said seat or allowing said position to be adjusted,

first and second plate members affixed to one another and forming a gap therebetween and positioned with said track and said slide rail passing through said gap, said plate members being coupled to said seat belt,

a pin member affixed to said plate members and positioned above said slide rail,

an engaging shaft affixed to said plate members, and passing through said gap, and

frangible force sensitive means for attaching said plate member to said rail and positioning said engaging shaft in close proximity to said track projecting teeth, whereby when a force above a predetermined magnitude is applied by said seat belt onto said plate members, said force sensitive means fails, thereby allowing said plate members to rotate causing said pin member to engage said slide rail and said shaft to engage said toothed track thereby coupling forces on said seat belt to said track.

4,923,215

ATTACHMENT STRUCTURE FOR MUD FLAPS

Terry D. Williams, Rte. 2, Box 219, Snyder, Tex. 79549, assignor to F. R. Williams; Ruben C. Martinez and Terry D. Williams, all of Snyder, Tex.

Filed Oct. 11, 1988, Ser. No. 256,774
Int. Cl.[5] B62B *9/16*
U.S. Cl. 280—851 **6 Claims**



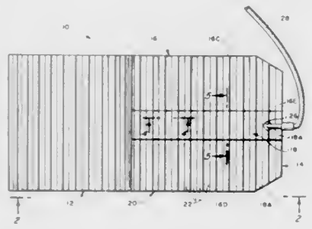
4. The invention as defined in claim 1 further comprising:

j. a cam wrench having

k. a handle with a cam end.

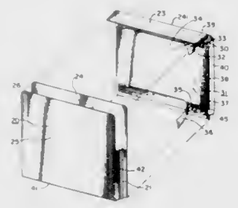
l. two cam plates attached to the handle of the cam end, one of the cam plates on each side of the handle,
m. a pin extending between the cam plates engaged with the notch in the post, and
n. said cams engaging the face plate so as to press it against the mud flap so that a bolt may be placed or removed from the hole in the post.

4,923,216
LONGITUDINALLY REINFORCED CRIMPED STREAMER
Joseph Cedar, 3950 Via Real, #63, Carpinteria, Calif. 93013
Filed Jul. 5, 1988, Ser. No. 215,349
Int. Cl.[5] B42D *21/04; B21D 13/10, 13/00*
U.S. Cl. 281—2 **21 Claims**



1. A longitudinally-reinforced, crimped metal streamer, comprising:
(a) a thin narrow streamer tape strip of flexible metal or metallized plastic streamer tape strip having a first end and a second end having a pair of opposite faces and a multiplicity of longitudinally-spaced, transversely-extending crimps set therein;
(b) at least one elongated strip of said crimped, metal streamer tape strip being flexible and twistable longitudinally to form a spiral, flexible reinforcing tape strip much narrower in width than said strip of streamer tape strip and adhesively applied to one face thereof and extending longitudinally therealong between said ends;
(c) said crimps of said streamer tape strip forming a series of alternating, opposite-facing, permanent bends therein; and
(d) said reinforcing tape strip being applied to said streamer tape strip so as to adhere and conform to the configuration of said bends thereof formed by said crimps.

4,923,217
FILE CONVERTER ASSEMBLY
Philip B. Pressler, Wayne, Pa., assignor to PNS Associates, Inc., Pa.
Filed Sep. 9, 1988, Ser. No. 243,070
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—62 **16 Claims**



1. A conversion tab assembly for application to a file having a panel of predetermined size to enable conversion between a top-index file and a side-index file, the panel being adapted to stand upright to provide a top longitudinal margin and a bottom longitudinal margin, said tab assembly comprising
a base sheet having a tab member at one boundary of said base sheet, the base sheet being dimensioned to overlie at least a substantial portion of the panel with said sheet extending along the length of the panel, said sheet having a selected strength of the panel, said sheet having a selected strength and stiffness to enable the file to be displaced using said tab member,
a flap member along one edge of said base sheet to permit sandwiching of an element of the file between said base sheet and said flap along one longitudinal margin of the panel to reinforce the converted file, and
means to mount said conversion tab assembly to the file with the tab member projecting beyond a side boundary of the file, said mounting means including a first means to affix said flap member to the file panel along the sandwiched margin, and a second means to affix said base sheet to the file, said second means being positioned on said base sheet at a distance from said first means to afford attachment of the assembly to the file at widely-spaced areas.

4,923,218
INSCRIBED, PAPER-BASE ANNOUNCEMENT
William A. Vigilanti, Instant Signs & Graphics, Inc., 200 Main St., Nanuet, N.Y. 10954
Filed Aug. 15, 1988, Ser. No. 232,589
Int. Cl.[5] B42D *15/00, 15/02, 1/08*
U.S. Cl. 283—62 **8 Claims**

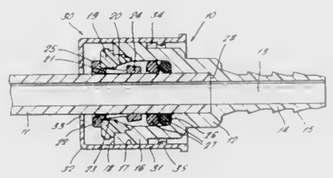
1. An inscribed, paper-base announcement, such as a sign, business card, or place mat, comprising:
one hundred percent cotton fiber paper; wherein
said paper has an inked inscription thereon; and
a lamination fixed over said inscription-bearing paper.

4,923,219
QUICK COUPLING DEVICE FOR DUCTS
Giorgio Bormioli, Via Galileo Galilei, 21, 35100 Padova, Italy
Filed Jan. 15, 1988, Ser. No. 144,038
Claims priority, application Italy, Jan. 21, 1987, 19120 A/87
Int. Cl.[5] F16L *23/00*
U.S. Cl. 285—18 **10 Claims**



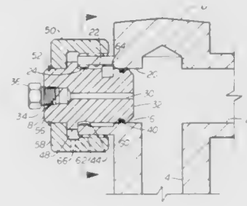
1. Coupling device for releasably coupling together the confronting ends of a pair of ducts, each of said ends having thereon a flange, and said flanges having thereon contact sides disposed in confronting relation to each other, comprising
locking elements mounted on the flange of a first duct of said pair thereof,
means for moving said elements in opposite directions, and respectively toward and away from engagement with the flange on the second duct of said pair thereof, thereby selectively to draw said flanges together to couple said ducts together,
said moving means including a thrust ring mounted to rotate alternately between two positions around the axis of said first duct, and operatively connected to said elements to impart thereto said movement in opposite directions,
sealing means comprising at least one floating ring resiliently mounted in a recess formed coaxially in said contact side of the flange of said first duct and positioned to form a seal between the flanges of said first and second ducts, when said ducts are coupled together by said device,
spring means slidably mounted in said recess rearwardly of said floating ring, and
means for adjustably retaining said floating ring in said recess against the resistance of said spring means.

4,923,220
TUBE COUPLINGS
John D. Guest, Maidenhead, United Kingdom, and Bo Hardc, Gothenberg, Sweden, assignors to John Guest Limited, Middlesex, United Kingdom
Filed Mar. 22, 1989, Ser. No. 327,311
Claims priority, application European Pat. Off., Mar. 25, 1988, 88302709.6
Int. Cl.[5] F16L *21/00*
U.S. Cl. 285—39 **4 Claims**



1. A tube coupling comprising a coupling body having a throughway opening at one end if the body, a collet having an annular portion formed with an encircling annular head disposed adjacent said one end of the body, the annular portion of the collet extending into the throughway through said opening and having resilient arms extending axially from the annular portion along the throughway, a tapered cam surface in the throughway reducing towards said one end of the body and engaged by the resilient arms to compress the arms inwardly with movement of the collet towards said one end to grip and hold a tube extending into the throughway through the collet, a cover encircling and detachably mounted on the coupling body for sliding movement along the body, the cover having an end wall facing said one end of the body and said annular head of the collet with an aperture in the end wall through which a tube may pass into the coupling body, the cover being slidable between a position in which the end wall is spaced clear of the collet head and a position in which the end wall engages the annular head of the collet to depress the collet into the throughway and thereby release a tube from the coupling, the cover having releasable retaining means holding the cover on the body which allows the cover to be detached from the body for direct operation of the collet.

4,923,221
SAFETY CONNECTION INTO PASSAGES IN A TUBULAR BODY
Kennard W. Taylor, Houston, Tex., assignor to Cameron Iron Works U.S.A., Inc., Houston, Tex.
Filed Jan. 25, 1989, Ser. No. 301,665
Int. Cl.[5] F16L *17/02*
U.S. Cl. 285—81 **6 Claims**



1. An apparatus for connecting into one of the passages of a choke body comprising
a body adapted to fit within said one of the passages of the choke body,
a securing ring positioned to engage said body and the choke body for moving said body into its secured position within said choke passage,
means for sealing between the exterior of said body and the interior of said choke body passage when said body is positioned in said one of said passages with said sealing means engaging between the exterior of said body and the interior of said one passage so that the body and said sealing means closes and seals said one of said passages, and
means for allowing limited outward movement of said body when said securing ring relaxes its securing of the body within said passage of said choke body which limited outward movement is sufficient to disengage said sealing means and
orienting means cooperating with said limiting means to prevent discharge of said body from said passage of said choke body prior to said limited outward movement of said body disengaging said sealing means from said passage.

4,923,222
CASING SEALING APPARATUS
William A. Deshazer, 109 Brighton Dr., Lafayette, La. 70503; Robert J. Beck, 601 Mullins Rd., and Wilton L. Helveston, 4100 Pratt Dr., both of Iberia, La. 70560
Filed Apr. 25, 1988, Ser. No. 186,109
Int. Cl.[5] F16L *7/00*
U.S. Cl. 285—137.1 **9 Claims**



1. An apparatus for sealing off the annular space between an internal carrier pipe and both ends of a section of external casing, comprising:
(a) a body portion comprising upper and lower half sections,

each half section having a semicircular bore therethrough and defining a bore for housing the carrier pipe when the sections are connectedly engaged, wherein the face of the body portion provides adequate area for the permanent seal between the external casing and the body portion, even when the internal pipe is misaligned within the external casing;

(b) means for connectedly engaging the upper and lower half sections of the body portion around the fall of the carrier pipe and for forcing the sections into sealing engagement against the wall of the carrier pipe;

(c) sealing means interposed between the wall of the carrier pipe and the upper and lower sections of the half body portions for effecting a fluid-tight seal between the carrier pipe and the wall of the bore of the body portions at each end of the external casing when the sealing means is positioned in sealing engagement therewith; and

(d) means for engaging each end of the external casing against the face of a body portion so that a permanent sealing engagement can be effected between the ends of the casing and each body portion.

4,923,223

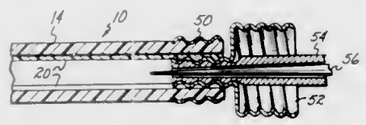
KINK IMPEDING HOSE FOR SPRAYING WATER

Peter H. Seckel, Montclair, N.J., assignor to Plastic Specialties and Technologies Investments, Inc., Ridgefield, N.J.

Continuation-in-part of Ser. No. 228,993, Aug. 5, 1988, Pat. No. 4,867,485. This application Aug. 1, 1989, Ser. No. 386,197

Int. Cl.[5] F16L *11/04*

U.S. Cl. 285—175 **20 Claims**



18. A kink resistant flexible plastic or rubber household water hose for spraying water having opposite open ends for the delivery of pressurized water therethrough comprising:

a hose having an inside wall surface and an outside wall surface, said inside wall surface having integrally molded therewith a plurality of radially spaced ribs, said ribs extending substantially continuously longitudinally between said open ends, said hose having sufficient flexibility to be double backed upon itself to form a kink, said plurality of ribs extend only a short distance from the inside wall surface so that said ribs touch the opposing inside wall surface areas between opposing ribs when said kink is formed, said ribs adapted to provide a plurality of functions including resistance to hose kinking, water delivery through said kink and equalization of water pressure on both sides of said kink causing the hose to unkink and straighten itself,

one said hose end for coupling to a pressurized water supply for delivery of water under pressure through said hose and the other hose end for coupling to a spray nozzle for spraying a pressurized stream of water that provides sufficient back pressure in said hose for said equalization of water pressure on both sides of the kink to cause said hose to unkink and straighten itself for said delivery of water therethrough.

4,923,224

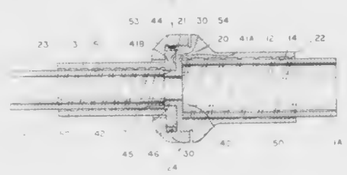
COUPLING DEVICE FOR HIGH PRESSURE HOSES

Anthony E. Makris, 664 Devitt Ave., Campbell, Ohio 44405

Filed Jun. 12, 1989, Ser. No. 364,818

Int. Cl.[5] F16L *25/00*

U.S. Cl. 285—177 **15 Claims**



1. A device for coupling hoses in juxtaposition comprising:

a first body section and a second body section;

a cylindrical bore in each of said first and second body sections, such that a hose end may be fitted into each of said bores;

said first and second body sections having engaging means therebetween;

said engaging means including abutting surfaces on both of said first and second body sections;

said abutting surfaces creating a fluid tight seal when said first and second body sections are engaged in juxtaposition;

said engaging means of said first body section having a seal ring extending into said bore of said first body section to a distance sufficient to permit sealing engagement of a first hose abutting surface with the hose fitted within said bore of said first body section;

said seal ring further extending into said bore of said second body section to a distance sufficient to permit sealing engagement of a second hose abutting surface with the hose fitted within said bore of said second body section, whereby said seal ring effects sealing engagement with said hose ends interiorly of the fluid tight seal between said abutting surfaces of said first and second body sections; and

locking means to securely and selectively attach said first and said second body sections in juxtaposition.

4,923,225

ASSEMBLY FOR CONNECTING A METAL MEMBER TO A CERAMIC REFRACTORY MEMBER

Ernst Lührsen, Bad Schwalbach; Siegfried Pohl, Heidenroth-Springen; Albert Ott, Waldems-Wüstems; Wilhelm Parbel, Neukirchen-Vluyn, and Karl Baum, Wiesbaden, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 250,129

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735546

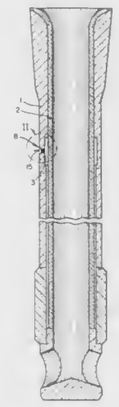
Int. Cl.[5] F16L *41/04*

U.S. Cl. 285—189 **13 Claims**

1. An assembly comprising:

a member of ceramic refractory material having therein an opening; and

means for attaching a metal member to said refractory member, said attaching means comprising a metal coupling member having a longitudinal axis, an externally threaded portion l extending into said opening and a head, said head extending radially outwardly beyond the threads of said



threaded portion relative to said longitudinal axis, and said heated being embedded in said refractory member.

4,923,226

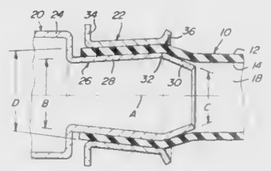
APPARATUS FOR ATTACHING A HOSE TO A FITTING

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Continuation of Ser. No. 189,395, May 2, 1988, abandoned, which is a continuation of Ser. No. 66,749, Jun. 23, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 265,263

Int. Cl.[5] F16L *33/22*

U.S. Cl. 285—242 **6 Claims**



1. A hose coupling for terminating the end of a deformable hose or tubular member, comprising a fitting having an end adapted to be received interiorly of said hose and to expand the interior diameter of said hose when inserted therein, said fitting end having a smooth uninterrupted external surface to contact with the interior surface of said hose, a biconical shape with a first and second portion generally frusto-conical shaped and intersecting at a crest defining a largest diameter portion of said fitting for expanding said hose, and a locking sleeve having a smooth uninterrupted internal surface to contact with said hose, said locking sleeve locatable over said hose whereby to clampingly secure the hose between the fitting and sleeve, said fitting and sleeve are constructed such that a portion of each is formed with a matching frusto-conical surface defined by a double included angle of one to eight degrees the conical surfaces increasing in diameter toward the inserting end of said fitting, said double included angle of said sleeve being less than the double included angle of said fitting, and said sleeve and fitting are sole means retaining, sealing and positioning said hose between said sleeve and fitting.

4,923,227

CORRUGATED PLASTIC PIPE CONNECTOR

John Petty, Bonnet Bay, and Sandy McNeil, Hunters Hill, both of Australia, assignors to Elconnex Lty Limited, Bonnet Bay, Australia

PCT No. PCT/AU87/00031, § 371 Date Nov. 17, 1987, § 102(e) Date Nov. 17, 1987, PCT Pub. No. WO87/04767, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 5, 1987, Ser. No. 137,539

Claims priority, application Australia, Feb. 5, 1986, PH4459

Int. Cl.[5] F16L *37/12*

U.S. Cl. 285—319 **8 Claims**



1. A reusable one-piece liquid-tight plastic connector for affixing in a liquid-tight manner to a conduit having a ridge adjacent a conduit end portion, the connector comprising:

a body including a body wall and a bore, open at a first end communicating with said bore for receiving therein the conduit end portion;

sealing means, disposed in said bore remote from said first end, for sealing in a liquid-tight manner against the conduit end, the conduit end portion having pushed through said first end into said bore; and

an axially extending resilient locking finger having a base attached to the body wall intermediate said first end and said sealing means, and having a free end with an end projection disposed within said body, said end projection extending into said bore;

a body wall region whereat said base of said finger is attached being thinner in cross-section than other portions of said body, said thinning contributing to the resiliency of said finger, wherein the body wall region of thinner cross-section extends from the base of said finger to said first end;

the end projection of said finger resiliently engaging the ridge on the conduit end portion so as to retain the conduit end against said sealing means to form a liquid-tight seal, locking the conduit end portion within the connector; and

a force attempting to withdraw the conduit from the connector causing the end projection of said finger to more firmly and deeply resiliently engage and retain said ridge such that a greater withdrawal force results in a firmer and deeper engagement with said ridge such that the conduit end portion is locked within the connector.

4,923,228

INTEGRAL QUICK-CONNECT TUBE CONNECTOR

Robert A. Laipply, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

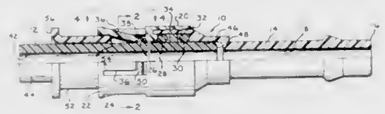
Filed Dec. 12, 1988, Ser. No. 282,699

Int. Cl.[5] F16L *37/04*

U.S. Cl. 285—319 **9 Claims**

6. A quick-connect tube connector characterized by its low cost construction comprising, in combination, a male tubular

part having an outer surface, an elongated cylindrical nose and an external annular shoulder defined on said nose, a female body having an axial passage, an end for connecting to a conduit, a homogeneous cylindrical extension having an open end for receiving said male part nose, a stop defined in said female passage engagable with said male part limiting insertion of said male part nose into said female body passage, a recess defined in said female body passage having sealing means disposed within for providing a fluid tight seal with said male part nose,



a plurality of elongated cantilevered resilient fingers homogeneously extending from said extension and located within the cylindrical configuration of said extension, said resilient fingers each having an inwardly extending deflectable free end engagable with said male part shoulder for maintaining said male part nose in said female body passage upon said male part nose being fully axially inserted into said female body open end and, torsion means defined on said extension adjacent said open said supporting said fingers with regions having a torsion axis transversely disposed to the length of said fingers.

4,923,229

COAXIAL TYPE STARTER DEVICE

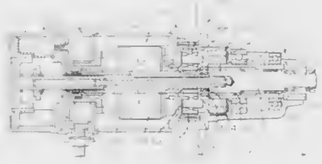
Shuzoo Isozumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 293,857

Claims priority, application Japan, Feb. 5, 1988, 63-026014; Mar. 24, 1988, 63-070233

Int. Cl.[5] F02N *15/06*

U.S. Cl. 290—48 **5 Claims**



1 A coaxial type starter device which comprises:

a d.c. motor having a hollow armature rotary shaft,

an electromagnetic switch attached to an end of said d.c. motor so that a plunger rod of said electromagnetic switch extends in said hollow armature shaft in a coaxial manner,

an output rotary shaft arranged in alignment with said armature rotary shaft so as to be slidable in its axial direction and to be rotated by said armature rotary shaft by means of a planet gear wheel speed-reducing device and an overrunning clutch device, said output rotary shaft being provided with a pinion at its front end, wherein said overrunning clutch device has a clutch inner member which is provided with a cylindrical portion formed integrally therewith and extended forwardly; is rotatably supported by means of first and second bearings spaced apart in the axial direction so that they bear said cylindrical portion; and has a helical spline at the inner circumferential surface so as to be engaged with a helical spline formed at the outer circumferential surface of said output rotary shaft inserted in the clutch inner member so that a rotating force by said armature rotary shaft is transmitted to the same.

4,923,230

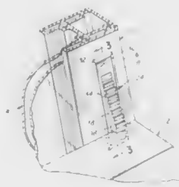
SELF-CONTAINED SECURITY LOCK FOR DOUBLE-HUNG WINDOW

Harold Simpson, Hazel Crest, Ill., assignor to Ashland Products Company, Chicago, Ill.

Filed Aug. 18, 1989, Ser. No. 395,742

Int. Cl.[5] E05C *17/50*

U.S. Cl. 292—67 **7 Claims**



1. A self-contained security lock for use in a double-hung sash window assembly having upper and lower sash window frames formed of assembled header and hollow stile members and installed for vertical reciprocal sliding movement one relative to the other, a stile of said upper sash frame having a recess into the interior thereof from a side of the stile, said security lock comprising:

A. a casing having an internal cavity, a faceplate overlaying said cavity having an opening into said cavity and a pivot lug in said cavity secured to a wall of said casing, said casing adapted to be installed in said recess with said faceplate surrounding the perimetric edges of said recess;

B. a leaf spring having opposite ends and mounted in said cavity;

C. an elongated tumbler having upper and lower ends with said upper end pivotally mounted on said lug in said casing and said lower end being movable between a locking position and a retracted position in said opening of said faceplate relative to said header of said lower sash frame;

D. said leaf spring having one end engageable with said lower end of said tumbler normally to bias said lower end of said tumbler to protrude beyond said opening into said locking position to engage against said lower sash frame and prevent such relative sliding movement between said sash frames;

E. said pivitally mounted tumbler being retractable manually into said cavity to disengage said lower end of said tumbler from said lower sash frame header and permit such relative sliding movement between said sash frames;

F. said second end of said leaf spring being restrained within said cavity; and

G. said tumbler including a countoured recessed surface extending along the length of said tumbler, said recessed surface including a stop member, said one end of said leaf spring being slidable along said recessed surface during pivotal movement of said tumbler between said locking position against said stop member and said retracting positions away from said stop member.

4,923,231

GATE LATCH

Kenneth D. Bergman, 2050 Newcosta Ave., Sand Lake, Mich. 49343, and Mark C. Bergman, 48 Honeoye, Wyoming, Mich. 49508

Filed Mar. 29, 1989, Ser. No. 330,138

Int. Cl.[5] E05C *3/04*

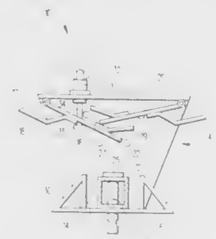
U.S. Cl. 292—238 **10 Claims**

1. A gate latch for use with a gate having a free end mounted for swinging movement relative to a stationary post, comprising:

a latch bar adapted for securement on said gate;

a mounting plate adapted for securement on said post;

a channel member dimensioned to receive said latch bar on said mounting plate;



selectively releasable retaining means for retaining said latch bar in said channel member and allowing said latch bar to be moved out of either side of said channel member; and

a locking pin selectively receivable through aligned apertures in said latch bar and said channel member.

4,923,232

WINDOW APPARATUS FOR VEHICLE

Shigeyuki Kawagoe, Anjo, and Yoshikatu Furuya, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 114,009, Oct. 29, 1987, abandoned. This application Sep. 6, 1989, Ser. No. 403,009

Claims priority, application Japan, Oct. 30, 1986, 61-259353; Oct. 30, 1986, 61-259354

Int. Cl.[5] E05C *17/34*

U.S. Cl. 292—263 **6 Claims**



1. A window apparatus for a vehicle, comprising:

a vehicle body;

a window member having first and second opposite edges;

a first hinge means pivotally connecting the first edge of the window member to the vehicle body for enabling the window member to be pivoted from a closed position wherein said window member is substantially parallel to the vehicle body to a 90° angle with respect to the vehicle body;

retainer means disposed between the second edge of said window member and the vehicle body, said retainer means operable to pivot said window member within a predetermined angle with respect to the vehicle body; and

canceling means disposed between said retainer means and said window member, said canceling means operable from the exterior of the vehicle to disengage said window member from said retainer means, thereby enabling said window member to be pivoted about said first hinge means to a 90° angle with respect to the vehicle body, said cancelling means operable from the exterior of the vehicle body when said window member is in the closed position.

4,923,233

LATCH ASSEMBLY

Raymond P. Daily, 2270 Camino Vida Roble, Ste. 1, Carlsbad, Calif. 92001

Filed Sep. 20, 1988, Ser. No. 246,810

Int. Cl.[5] E05C *5/02*

U.S. Cl. 292—332 **14 Claims**



1. A latch assembly for holding a door in a closed position in a door frame, the assembly comprising

a latch housing for mounting on one side of a door frame surrounding a door opening;

a latch pin for mounting on the corresponding side of a door mounted in the door frame so that it projects away from the door;

the housing having an opening for receiving said latch pin when the door is closed;

a latch member slidably mounted in the housing for sliding movement between a first, latching position in which said latch pin is held in said housing and a second, door release position in which said latch pin is released;

actuating means projecting from said housing and linked to said latch member for moving said latch member between said latching position and said door release position;

biassing means for urging said latch member into said latching position; and

said latch member having a bearing surface facing said opening as said latch member slides between said latching and released position, said bearing surface comprising means for cooperating with said latch pin as said latch member moves towards said release position to urge said latch pin out of said housing in a door opening direction.

4,923,234

CUTLERY IMPLEMENT INCLUDING SPRING BIASED ADJUSTABLE CLAMPING JAWS FOR HOLDING FOOD ITEMS

Kirkpatric Fairley, 4291 Garthwaite, Los Angeles, Calif. 90008

Filed Apr. 26, 1989, Ser. No. 343,491

Int. Cl.[5] A47G *21/10*; A47J *43/28*

U.S. Cl. 294—99.2 **1 Claim**

1. A cutlery implement for holding a food item, comprising:

a frame formed from spring steel wire;

said frame having two frame members forming opposite ends of a torsional coil spring;

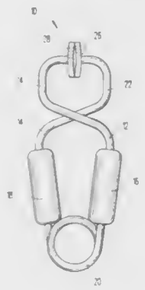
said frame members crossing each other in overlying relation and each having a free end portion provided with juxtaposed clamping jaws;

said torsional coil spring biasing said jaws to a closed position;

said frame member free end portions disposed in coaxial alignment in said closed position;

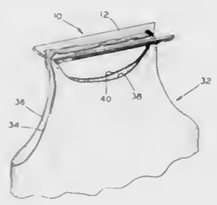
a handle secured on each of said frame members for manually moving said jaws to an open position;

each of said jaws including an internally threaded cylindrical sleeve secured centrally on a back face of a planar disk;
each of said frame member free end portions having an external thread in engagement with said internally threaded sleeve of a respective clamping jaw to enable manual adjustment of clamping jaw separation;



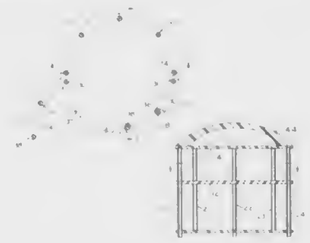
a lock nut on each of said frame member free end portions to maintain said clamping jaws in a selected adjusted position;
and
a plurality of pointed projections on facing grasping surfaces of each of said planar disks to enhance frictional engagement with a food item.

4,923,235
HANDLE
Peter D. Stewart, Windsor, Canada, assignor to Wolverine Aluminum Distributing Ltd., Windsor, Canada, a part interest
Filed Jan. 30, 1989, Ser. No. 302,783
Int. Cl.[5] **A45C** *13/26*; **B65D** *33/06*
U.S. Cl. 294—141 **6 Claims**



4. An elongate, substantially rigid handle for carrying a plastic bag having side walls with openings near the tops, said handle being a substantially rigid plastic strip of shallow arcuate configuration in transverse cross section, said handle having two similar notches at opposite ends, each of said notches having a barb-like configuration, each of said notches being substantially symmetrical about a central, longitudinal axis of said handle, each of said notches having substantially straight diagonal edges extending diagonally inwardly toward one another from corners of the handle end, said substantially straight edges terminating at inner ends, each of said notches having an opening in said handle located toward the opposite end of said handle and communicating with the space between the inner ends of said straight edges, said handle openings and said straight edges forming sharp points at the inner ends of said straight edges.

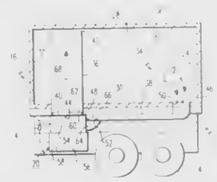
4,923,236
FOOD RECEPTACLE CARRIER
Warren J. Bunck, RR #1, Box 94, Everest, Kans. 66424
Filed Jan. 27, 1989, Ser. No. 302,621
Int. Cl.[5] **A47G** *19/08*
U.S. Cl. 294—161 **1 Claim**



1. A carrier for circular food receptacles comprising: a circular flat bottom disk; a circular flat top disk; a circular flat intermediate disk; said disks being vertically aligned and having an imaginary vertical midplane separating each disk into a front disk half and a rear disk half; each disk having an endless circular circumferential edge that forms a front half edge and a rear half edge;
a number of vertical support rods extending from the bottom disk through the intermediate disk and into the top disk to rigidly retain the three disks in vertically spaced relationship; said rods being circumferentially spaced around the rear half of each disk so that the front half of each disk is open; said rods being located within the circular plan dimensions of the circular disks near the disk circumferential edges;
two equal size arcuate segmental closures extending along the front circumferential edges of the circular disks;
each arcuate closure comprising a vertical shaft located near the edges of the circular disks in close adjacency to the aforementioned disk midplane, each vertical shaft extending from the bottom disk through the intermediate disk and into the top disk to define a closure swing axis, upper and lower arcuate frame members extending from the vertical shaft in near adjacency to the top disk and bottom disk, and two circumferentially spaced vertical posts extending between said arcuate frame members to complete the arcuate closure;
the two equal size arcuate closures spanning substantially the entire front half of each disk circumferential edge so that when the two closures are swung open the intermediate disk and bottom disk are enabled to receive food receptacles thereon;
said intermediate disk having notches in its circumferential edge to accommodate the vertical posts when the closures are swung to their closed positions.

4,923,237
REFRIGERATED TRUCK HAVING A BODY MOVABLE RELATIVE TO A CHASSIS
Kevin W. Kiefer, Prior Lake, and Cynthia J. Satterness, Bloomington, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed Jul. 3, 1989, Ser. No. 375,228
Int. Cl.[5] **B62D** *27/00*
U.S. Cl. 296—24.1 **6 Claims**

1. A refrigerated truck, comprising:
a chassis having support wheels,
a truck body,
means mounting said truck body on said chassis for movement of the truck body between first and second positions relative to said chassis, with said first position being adjacent to said chassis and with said second position being above said first position,
a refrigeration system mounted on said chassis for providing conditioned air for said truck body,



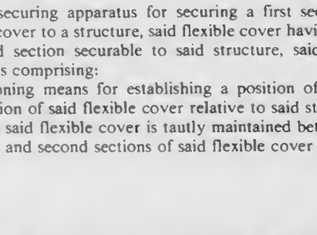
and first and second air duct means associated with said refrigeration system and with said truck body, respectively, with said first and second air duct means being coupled in the first position of said truck body, and separated in the second position of said truck body.

4,923,238
SUNSHIELDING ACCESSORY FOR MOTOR VEHICLES
Alexander Morgulis, Ezra Hasopher 11/10, Herzlia; Menahem Tilman, 34 Shaldag St., Hofit, and David Shemes, 48/10 Hodem, Giloh, Jerusalem, all of Israel
Filed Apr. 3, 1989, Ser. No. 332,140
Int. Cl.[5] **B60J** *3/00*
U.S. Cl. 296—97.6 **19 Claims**

1. A sunshielding accessory for motor vehicles, comprising:
a sun visor panel for pivotal mounting to the vehicle above the windshield to either an upper inoperative position overlying the windshield, or to a lower operative position covering only an upper portion of the windshield;
an assembly of sunshield panels carried by said sun visor panel, said sunshield panels being joined to each other in accordion fashion and being foldable along fold lines against each other into a folded inoperative form against said sun visor panel, or to an extended operative form depending below the sun visor panel, with the fold lines extending perpendicularly to the longitudinal axis of the sun visor panel, to cover a substantial portion of the windshield below the sun visor panel when the latter is in its lower operative position;
and retainer means for releasably retaining said sunshield panels in their folded inoperative form against the sun visor panel.

4,923,239
VEHICLE SUN SCREEN
Henry Wischusen, III, Lilburn, Ga., and William L. Champion, Estill Springs, Tenn., assignors to Rock-Tenn Company, Norcross, Ga.
Continuation-in-part of Ser. No. 193,397, May 12, 1988, Pat. No. 4,838,600. This application May 22, 1989, Ser. No. 355,434
Int. Cl.[5] **B60J** *1/20*
U.S. Cl. 296—97.7 **11 Claims**

1. A sun screen having an expanded configuration adapted for placement in a vehicle window and a folded configuration for storage, comprising:
a generally rectangular sheet of material defining upper right, upper left, lower right, and lower left corners, and top and bottom edges;
a first fold line extending from the center of said top edge to a point adjacent to said lower right corner so as to define a generally triangular right wing panel which includes said upper right corner, said first fold line comprising a pair of non-collinear fold line segments joined at one end of each of said first fold line segments;
a second fold line extending from the center of said top edge to a point adjacent to said lower left corner so as to define a generally triangular left wing panel which includes said upper left corner, said second fold line comprising a pair of non-collinear line segments joined at one end of each of said first fold line segments;
a third fold line segment extending from said upper right corner to the point at which said first fold line segments meet;



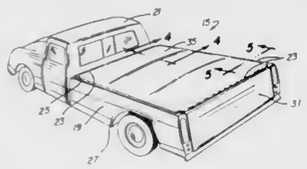
a fourth fold line segment extending from adjacent to the center of said bottom edge to the point at which said first fold line segments meet;
a fifth fold line segment extending from said upper left corner to the point at which said second fold line segments meet; and
a sixth fold line segment extending from adjacent to the center of said bottom edge to the point at which said second fold line segments meet;
said wing panels being foldable about said first and second fold lines such that the folding of said sheet about said non-collinear first fold line and non-collinear second fold line encourages the folding of said third and fourth fold line segments in a manner so as to place said third fold line segment adjacent the original plane of said sheet at a position offset from the orientation of said fourth fold line segment, and said fifth fold line adjacent the original plane of said sheet at a position offset from the orientation of said sixth fold line, whereby said lower corners fold to positions adjacent to the center of said top edge of said sheet, whereby said sun screen is in said folded configuration.

4,923,240
APPARATUS FOR RELEASABLY SECURING A COVER TO A STRUCTURE
Thomas E. Swanson, 4467 Clay St., Boulder, Colo. 80301
Filed Oct. 11, 1988, Ser. No. 255,438
Int. Cl.[5] **B60J** *7/10*
U.S. Cl. 296—100 **18 Claims**

1. A securing apparatus for securing a first section of a flexible cover to a structure, said flexible cover having at least a second section securable to said structure, said securing apparatus comprising:
positioning means for establishing a position of said first section of said flexible cover relative to said structure so that said flexible cover is tautly maintained between said first and second sections of said flexible cover when said

sections are secured, said positioning means being attachable to said structure and including a body portion and first and second mounting portions;

engaging means engagable with said positioning means for securely maintaining said flexible cover on said structure, said engaging means being attachable to said first section of said flexible cover and including first and second parts positionable adjacent to said first and second mounting portions of said positioning means so that said first part is urged substantially constantly in a first direction into contact with said first mounting portion of said position-



ing means by said flexible cover when said second section thereof is secured to said structure, and said second part is urged substantially constantly in a second direction into contact with said second mounting portion of said positioning means by said contact of said first part with said first mounting portion of said positioning means, said contacts maintaining said engaging means in engagement with said positioning means and thus securing said first section of said flexible cover to said structure; and

biasing means positioned adjacent to said second part of said engaging means for biasing said second part toward said body portion of said positioning means.

4,923,241

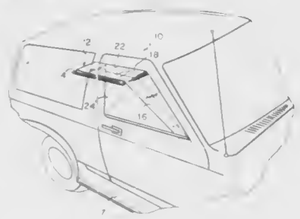
WEATHER WINDOW SHIELD FOR AUTOMOTIVE VEHICLES AND THE LIKE

Evelyn B. Miller, P.O. Box 204, Bluff City, Tenn. 37618

Filed Jan. 23, 1989, Ser. No. 300,310

Int. Cl.[5] B60J *1/20*

U.S. Cl. 296—154 **2 Claims**



1. An optically transparent weather window shield for vehicles which is made of sheet-form clear plastic material and comprises:

a substantially planar main body having front and rear ends and opposite inner and outer edge portions extending between said front and rear ends;

a gutter extending along said outer edge portion between said front and rear ends;

a forward portion also having front and rear ends and opposite inner and outer edge portions extending between said front and rear ends of the forward portion with a rear end thereof integrally attached to a said front end of the main body so that the forward portion will extend forwardly at an angle from said front end of the main body so as to be inclined downwardly towards a front of said vehicle when said weather window shield is installed in said vehicle;

a flange-like mounting member having an outer face with upper and lower free edge portions and being integrally attached at a medial location along said inner edge portions of said main body and said forward portion to extend therealong with said upper and lower free edge portions extending transversely therefrom;

the window shield being resilient whereby the upper edge portion of the mounting member can be force-fitted into a window frame thereby to mount the window shield in the window frame when the window is in open condition so that the main body is horizontal and a top edge of said window will be prevented from entering the window receiving channel when the window is raised to a partially closed condition by abutment with the lower free edge of said mounting member.

4,923,242

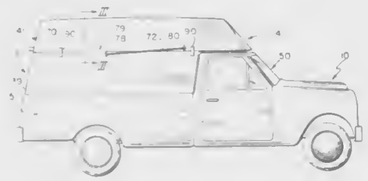
VEHICLE CAP AND BOAT COMBINATION

Michael D. Gentzhorn, 725 McDonald St., Elkhart, Ind. 46516

Filed Apr. 7, 1988, Ser. No. 178,572

Int. Cl.[5] B60P *3/32*

U.S. Cl. 296—157 **26 Claims**



1. A vehicle cap and boat combination comprising:

a vehicle cap for attaching to a bed of a truck having a cab; said vehicle cap having a top, front, back and two side walls;

a boat having a hull including a bottom, front, back and two side walls and a deck extending over a portion of the interior of said hull to define a deck aperture;

male mounting means unitary to and about the periphery of said top wall of said vehicle cap;

female mating means unitary to and about the periphery of said deck aperture for mating with said male mating means and sealing said deck aperture at least along said front and said two side walls when said boat is mounted on said vehicle cap; and

said deck aperture of said boat extends over said cab when mounted.

4,923,243

TRAILER TRANSPORT DEVICE

Michael W. Drabos, 10105 Decbaux Rd. E., Puyallup, Wash. 98371

Filed Aug. 4, 1989, Ser. No. 389,579

Int. Cl.[6] B60R *15/00*

U.S. Cl. 296—157 **13 Claims**



1. A combination trailer-vehicle carrier comprising: a house trailer body having a front end and a rear end, a frame structure extending forwardly from said trailer body, said frame

structure comprising two laterally-spaced lower beams extending longitudinally underneath the trailer body and forwardly therebeyond, two laterally-spaced upper beams extending forwardly from the front end of the trailer body directly above the lower beams, said upper beams projecting forwardly beyond the lower beams to form a platform adapted to overhang the cargo box of a pickup truck; a kingpin extending downwardly from said platform for interengagement with a fifth wheel in the truck cargo box; and two laterally-spaced wheel support rails extending longitudinally along outboard edges of said upper beams, whereby a wheeled vehicle can be supported on said rails in the space between the trailer body and the cab of the pickup truck.

4,923,244

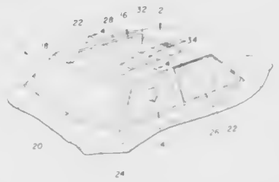
TRANSPARENT VEHICLE ROOF HAVING SUNSHADE

Alain J-M. Clenet, Santa Barbara, Calif., assignor to ASHA Corporation, Santa Barbara, Calif.

Continuation-in-part of Ser. No. 220,785, Jul. 18, 1988. This application Feb. 22, 1989, Ser. No. 313,795

Int. Cl.[5] B60J *7/00*

U.S. Cl. 296—214 **32 Claims**



1. For use with a vehicle including a roof covering an occupant compartment, a sunshade roof construction comprising: a transparent roof panel through which the environment can be viewed from the occupant compartment; a sunshade mounted below the transparent roof panel and including a plurality of laterally elongated blades each of which has opposite ends; said sunshade also including a flexible sheet-like shade that connects the blades; a pair of guides supported below the transparent panel with each guide receiving one end of each blade to support the sunshine for movement between: a closed position where the blades are spaced from each other below the transparent roof panel with the flexible shade extending between the blades to cooperate therewith in shading the occupant compartment from the transparent roof panel, and an open position where the blades are stored in a stacked relationship with all of the blades located in a single vertical stack at a location that exposes the occupant compartment to the transparent roof panel and with portions of the flexible shade folded between the stacked blades; and a mechanism including means for connecting to the blade ends to maintain the blades spaced from each other during movement to and from and while in the closed position, and the means of the mechanism disconnecting from certain blade ends upon movement to the open position to permit the storage of the blades in the stacked relationship with the portions of the flexible shade folded between the blades.

4,923,245

CEILING STRUCTURE OF MOTOR VEHICLE

Akira Kuwabara, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 2, 1988, Ser. No. 201,789

Claims priority, application Japan, Jul. 31, 1987, 62-117865[U]

Int. Cl.[5] B60R *13/02;* **B60J** *7/00*

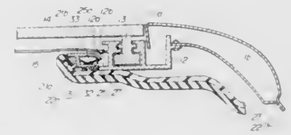
U.S. Cl. 296—214 **7 Claims**

1. In a motor vehicle having a sun roof construction wherein a guide rail for a sun roof lid extends along one side of a sun roof opening of the sun roof construction, said guide rail being secured to a fixed member of the vehicle,

a combination comprising:

a ceiling board located below said sun roof construction and having an opening which faces said sun roof opening, each side of the ceiling board opening being thus bonded by a peripheral edge portion of said ceiling board;

a flange portion integrally connected to said guide rail and extending on a lateral side of said peripheral portion of



said ceiling board, said flange portion being formed with a plurality of cuts;

a plurality of hook members fixed to said peripheral edge portion of the ceiling board each hook member having a pawl which projects upward through one of said cuts of said flange portion; and

an elongate retainer with an engaging foot portion being so arranged that the engaging foot portion is disposed between the pawl and a base portion of each hook member.

4,923,246

LID REGULATING DEVICE OF SUN ROOF STRUCTURE

Jun Takahashi, and Ryoji Shimura, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Jul. 8, 1988, Ser. No. 216,650

Claims priority, application Japan, Jul. 13, 1987, 62-172827; Jul. 13, 1987, 62-172826; Jul. 31, 1987, 62-190470; Feb. 2, 1988, 63-21264

Int. Cl.[5] B60J *7/05*

U.S. Cl. 296—221 **21 Claims**



1. In a sun roof structure including a lid and a sun roof opening defined by a roof,

a lid regulating device comprising:

a guide rail extending along each side of said sun roof opening and secured to said roof;

a first sliding shoe slidably engaged with said guide rail, said first sliding shoe having an extension which is pivotally connected to a front portion of said lid;

a second sliding shoe slidably engaged with said guide rail and supporting a rear portion of said lid; and

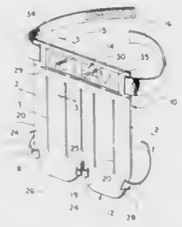
a lid lifting mechanism mounted on said second sliding shoe to tilt said lid upward and downward about said front portion of the lid, said lid lifting mechanism including

mutually spaced first and second walls formed on said second sliding shoe, said first and second walls being respectively formed with first and second guide slots each extending along the corresponding wall, the shapes of said first and second guide slots being asymmetrical with respect to a longitudinal cross-sectional plane centrally extending between said first and second walls; and

a lift arm having one end pivotally connected to a rear portion of said lid, said lift arm having at its opposed side surfaces asymmetrically positioned first and second pins

which are respectively and slidably engaged with said first and second guide slots.

4,923,247
CUSHION WITH MESSAGE SLOT
Carey D. Malmstrom, 2126 LaVista Cir., Tucker, Ga. 30084
Filed Oct. 14, 1988, Ser. No. 257,730
Int. Cl.[5] A47C *27/10*
U.S. Cl. 297—4 2 Claims



1. A seat cushion comprising a body portion for receipt generally over the buttocks of a user, an upper portion for disposition generally at the waist of the user and having a width substantially equal to the width of said body portion, and a lower bifurcated portion, said bifurcated portion defining a crotch opening and including leg portions, said crotch opening being normally disposed at he crotch of the user with said leg portions extending over the upper thighs of the user, and strap means for holding said seat cushion in place on the user, said cushion including a front panel and a back panel, seams for attaching said front panel to said back panel, and a valve for filling said cushion with fluid, and further including a plurality of said seams distributed throughout said body, said plurality of said seams extending generally vertically of said body and of said user, in the direction from said upper portion to said lower portion, and further including a transparent sheet fixed to said cushion at said upper portion and defining a single slot between said transparent sheet and said cushion, said slot having a width substantially equal to the width of said upper portion and being adapted to receive a sheet of printed material so that said sheet of printed material is disposed generally at the waist of the user, said transparent sheet defining at least one vertically extending slit for receiving the sheet of printed material through said slit and into said slot.

4,923,248
COOLING AND HEATING SEAT PAD CONSTRUCTION
Steve Feher, 1909 Aleo Pl., Honolulu, Hi. 96822
Filed Nov. 17, 1988, Ser. No. 272,518
Int. Cl.[5] A47C *7/74*
U.S. Cl. 297—180 12 Claims

1. A seat pad construction for receiving temperature conditioned pressurized air and have its temperature modified accordingly, comprising:
first and second air-tight plate means hingedly interconnected along an edge in a generally L-shaped configuration defining the seat and backrest, respectively;
first spring means overlying the facing major surfaces of the first and second plate means;
second spring means extending along the interconnection of the first and second plate means;
a first air permeable material consisting of plastic mesh overlying the first spring means applied over the first plate means and secured to the first plate means edges;
a second air permeable material consisting of a copper wire mesh overlying the first spring means applied over the second plate means and secured to the second plate means edges;
a first air flow barrier located over the second spring means and edge interconnected with both the first and second air permeable materials;
a second air flow barrier located on the first spring means in the central leading top edge portion of the first plate means secured to both an edge of the first plate means and the first air permeable material; and



means mounted onto the second air flow barrier for interconnecting a source of pressurized modified air to the seat pad plenum defined by the first and second plate means covered by the first and second air permeable materials and the first and second air flow barriers.

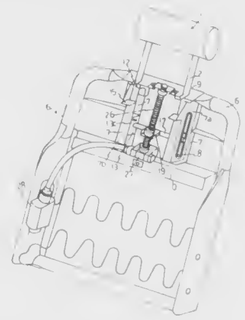
4,923,249
BABY CHAIR SUNSHADE
Elizabeth A. Mattox, 17230 N. 20th St., Phoenix, Ariz. 85022
Filed Oct. 3, 1988, Ser. No. 251,749
Int. Cl.[5] A47C *7/10*
U.S. Cl. 297—184 9 Claims



1. A sunshade and chair combination comprising:
a shade-casting surface for shading a person seated in a chair;
a chair having left and right sides, a seat cushion inserted in between said left and right sides, a first space defined between said left side and said cushion, and a second space defined between said right side and said cushion; and
support means coupled to said surface and removably inserted in at least one of said first and said second spaces for supporting said surface above a person seated in said chair.

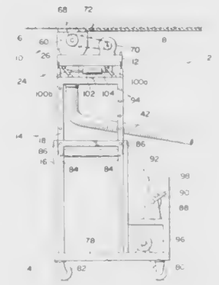
4,923,250
HEADREST APPARATUS
Takemi Hattori, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Feb. 26, 1988, Ser. No. 160,761
Claims priority, application Japan, Feb. 28, 1987, 62-45822
Int. Cl.[5] A47C *1/10*
U.S. Cl. 297—410 11 Claims

1. An apparatus for adjusting the position of a headrest with respect to a vehicle seat, the seat including a back having a top and a frame, comprising:
guide means including at least one guide rail for connection to the frame;
a pair of stays for connection to the headrest;
a pair of shoes, one shoe being attached to each stay for movement with respect to the guide rail;



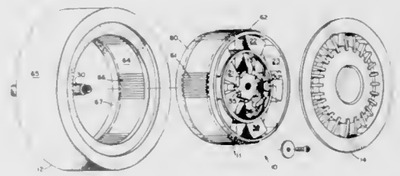
means, interacting with the guide rail, for biasing the shoes against the guide rail; and
means for moving the shoes with respect to the guide rail and for moving the headrest with respect to the top of the seat, said moving means including a rod member connected between the pair of shoes for movement therewith.

4,923,251
APPARATUS FOR REMOVING ASBESTOS AND LIKE MATERIALS FROM A SURFACE
Naoyoshi Funakawa, Koshigaya; Yasuharu Iida, Chiba; Yasumitsu Moriki, and Masahiro Sakurai, both of Tokyo, all of Japan, assignors to Sato Kogyo Co., Ltd. and Maruma Technica Co., Ltd., both of, Japan
Filed Feb. 24, 1989, Ser. No. 314,844
Claims priority, application Japan, Apr. 4, 1988, 63-83640; Oct. 20, 1988, 63-262740; Oct. 20, 1988, 63-306595
Int. Cl.[5] A47L *13/06*
U.S. Cl. 299—64 18 Claims



1. Apparatus for removing a layer of asbestos or like material from a surface, comprising:
a head assembly comprising an outer cover having a first open portion adapted to face the asbestos layer and a second open portion comprising an outlet for the outer cover, an inner wall member mounted within the outer cover to define an air passage between the inner wall member and the outer cover, the air passage communicating with the outlet of the outer cover, and scraping means mounted within the inner wall member and adapted to engage and remove the asbestos layer from the surface,
lift means for raising the head assembly in proximity to the surface, the lift means being adapted to travel on a floor in a direction parallel to the plane of the surface;
adjusting means disposed between the head assembly and the lift means for adjustably moving the head assembly to an operative position wherein the scraping means is in scraping contact with the asbestos layer with a small gap present between the surface and the peripheral edge of the first open portion of the outer cover; and
collection means communicating with the outlet of the outer cover and including suction means for withdrawing the removed asbestos from the outer cover, the suction means being effective to suck the ambient air into the air passage in the outer cover through the small gap between the peripheral edge of the first open portion thereof and the surface being scraped so that the sucked air entrains asbestos laden dust from the inner wall member, thereby preventing the escape of the removed asbestos to the ambient environment.

4,923,252
TIRE ASSEMBLY
Gerhard R. Plamper, and Alan Borling, both of Valley City, Ohio, assignors to MTD Products, Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 203,020, Jun. 1, 1988, abandoned. This application Feb. 1, 1989, Ser. No. 305,377
Int. Cl.[5] B60B *5/02*
U.S. Cl. 301—63 PW 18 Claims



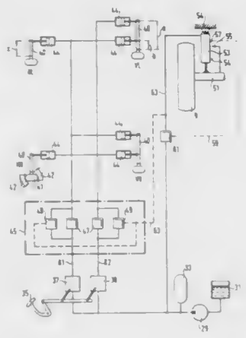
1. In a tire assembly having a tire with an inner surface and a rim with an outer surface having a diameter and an axial width, an improvement comprising tabs, said tabs extending radially outwardly off of the rim about the outer surface thereof, said tabs having a length, said length of said tabs being less than the axial width of the rim, two sidewalls on the inner surface of the tire, said two sidewalls having an inner diameter measured when the tire is not mounted on the rim, projections, said projections extending radially inwardly on the inner surface of the tire about the inner surface thereof between said two sidewalls, said tabs being in contact with said projections drivingly connecting the rim to the tire, said two sidewalls extending off of the inner surface of the tire on either side of said tabs, and said diameter of said two sidewalls being less than the diameter of the rim so as to elastically fit thereon.

4,923,253
BRAKING SYSTEM FOR AIRCRAFT TOWING VEHICLE
Juergen Pollner, Munich; Gregor Trummer, Aschering; Peter Moelzer, and Karl Fichtner, both of Schwabhausen, all of Fed. Rep. of Germany, assignors to Krauss Maffei AG, Munich, Fed. Rep. of Germany
Filed Sep. 28, 1988, Ser. No. 250,273
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732647
Int. Cl.[5] B60T *7/06, 8/18, 8/26*
U.S. Cl. 303—7 17 Claims

1. A braking system for a towing vehicle adapted to tow another vehicle such as an aircraft, the towing vehicle having a front wheel and a rear wheel, each fitted with a brake, at each

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side of the vehicle, the system comprising braking means including first and second independent brake circuits for applying braking forces to each of the wheels so that the braking force applied to the front wheels exceed the braking forces applied to the rear wheels and the braking forces applied to the wheels on each side of the vehicle are equal when the first brake circuit and when the first and second brake circuits are active, the first and second brake circuits each being operatively coupled with the brakes of the front wheels at each side



and a rear wheel at one side of the vehicle for activating the brakes and thereby generating braking forces at the wheels; and control means operatively coupled with the brake circuits and the associated brakes for controlling the braking forces generated at the respective wheels so that for each brake circuit the sum of the braking forces generated by said brake circuit at the front wheel and the rear wheel on one side of the vehicle substantially equals the braking force generated by the same brake circuit at the front wheel on the other side of the vehicle.

4,923,254

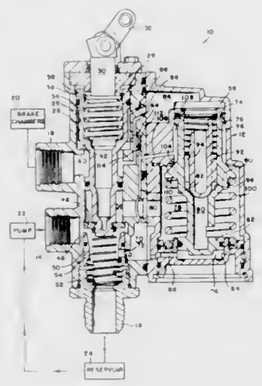
HYDRAULIC PARKING BRAKE CONTROL SYSTEM

Gary L. Vander Molen, North Ridgeville, and Duane R. Johnson, Wellington, both of Ohio, assignors to Allied-Signal Inc., Morristown, N.J.

Filed Feb. 23, 1989, Ser. No. 313,788

Int. Cl.[5] B60T *15/16, 13/18, 13/22*

U.S. Cl. 303—13 **16 Claims**



1. Control valve for controlling the parking brakes of a vehicle braking system having a source of fluid pressure, a reservoir, and mechanically applied parking brakes which are released by fluid pressure, said control valve comprising a housing having an inlet port communicated to a fluid pressure source, a return port communicated to said reservoir, and a delivery port communicated to said parking brakes, a diverter assembly within said housing responsive to fluid communication through said inlet port to establish a fluid pressure level communicated through said delivery port to said parking brakes for releasing the latter, a diverter passage communicating the inlet port with the diverter assembly, a system bypass passage communicating the inlet port with the return port bypassing said diverter assembly, and valve means in said housing movable from a first position closing said diverter passage and opening said bypass passage to a second condition closing said bypass passage and opening said diverter passage.

4,923,255

METHOD OF CONTROLLING THE BRAKE PRESSURE IN AN ANTI-LOCK VEHICLE BRAKE SYSTEM

Volker Braschel, Neuwied; Hubert Schmitt, Ochtendong, and Dieter Roller, Neuwied, all of Fed. Rep. of Germany, assignors to Lucas Industries public limited company, Birmingham, England

Filed Apr. 14, 1989, Ser. No. 338,263

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1988, 3812903

Int. Cl.[4] B60T *8/32;* **G05D** *13/00, 15/01*

U.S. Cl. 303—97 **6 Claims**



1. A method of controlling the brake pressure in an anti-lock vehicle brake system, wherein the rotational behavior of a braked wheel is measured and the brake pressure is changed in response to the same, characterized

in that upon initiating a braking action the rotational retardation of the braked wheel is determined, after predetermined time intervals each, and is compared with the rotational retardation measured during the preceding time interval,

in that the brake pressure is lowered at least during part of the next successive time interval if the comparison shows that the rotational retardation during the last concluded time interval diminished less than a predetermined value as compared to that of the preceding time interval, and

in that the lowering of the brake pressure is terminated if the comparison shows that the rotational retardation during the last concluded time interval diminished more than a predetermined value as compared to that of the preceding time interval.

4,923,256

HYDRAULIC BOOSTER

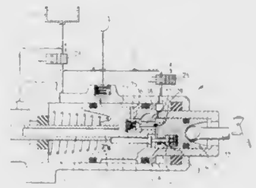
Juan Belart, Moerfelden-Walldorf, and Hans-Christof Klein, Hattersheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 258,234

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735237; Feb. 17, 1988, 3804851

Int. Cl.[5] B60T *8/44;* **F15B** *7/08*

U.S. Cl. 303—114 **12 Claims**



1. A hydraulic booster for an anti-lock vehicular brake system comprising, in combination: a booster piston having one end surface confining a booster chamber and another end surface confining a resetting chamber, a master brake cylinder adjacent to and cooperating with said booster piston, a pedal-force-actuated braking-pressure control valve means for delivering pressurized fluid from a pressure source of said brake system into the booster chamber in an amount proportional to a pedal-force, a pressure-fluid connection between the booster chamber and the resetting chamber including means for closing said pressure-fluid connection, said resetting chamber communicating with a supply reservoir through a connection including means for closing said connection, wherein for pressurization of said master cylinder said pressure-fluid connection between the booster chamber and the resetting chamber is closed and the connection between the resetting chamber and the supply reservoir is open, and wherein for pressure relief of said master cylinder, said pressure-fluid connection is open and the connection between the resetting chamber and the supply reservoir is closed.

4,923,257

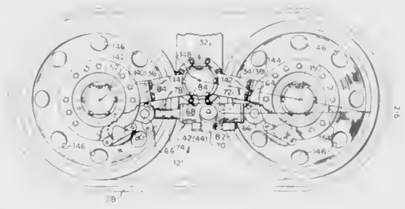
BELTED VEHICLE SUSPENSION SYSTEM

Robert J. Purcell, Washington, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Apr. 13, 1989, Ser. No. 337,238

Int. Cl.[5] B62D *55/104*

U.S. Cl. 305—29 **21 Claims**



1. A suspension system for a vehicle having a longitudinal centerline, comprising:

first and second wheel assemblies positioned on a first side of said centerline;

third and fourth wheel assemblies positioned on a second opposed side of said centerline;

a first flexible endless belt encircling said first and second wheel assemblies;

a second flexible endless belt encircling said third and fourth wheel assemblies;

an axle assembly having first and second end portions and a central portion and extending transverse to said centerline, said first end portion positioned intermediate said first and second wheel assemblies and said second end portion positioned intermediate said third and fourth wheel assemblies;

first and second arms pivotally connecting said first and second wheel assemblies respectively to said first end portion of said axle assembly;

third and fourth arms pivotally connecting said third and fourth wheel assemblies respectively to said second end portion of said axle assembly;

a first adjustable force inducing means connecting said first wheel assembly to said second wheel assembly;

a second adjustable force inducing means connecting said third wheel assembly to said fourth wheel assembly; and

means for directing a downwardly directed force onto said axle assembly.

4,923,258

MOISTURIZED REFRIGERATED PRODUCE RACK COVERED BY MULTIPLE CURTAINS AND STRIP CONNECTIONS

J. Cabot Styles, 162 Paradise Cove, Malibu, Calif. 90265

Continuation-in-part of Ser. No. 533,413, Sep. 19, 1983, abandoned, and a continuation-in-part of Ser. No. 809,564, Dec. 16, 1985, abandoned, and a continuation-in-part of Ser. No. 917,424, Oct. 10, 1986, Pat. No. 4,801,180. This application Jan. 30, 1989, Ser. No. 303,844

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[5] A47F *3/04*

U.S. Cl. 312—115 **3 Claims**



1. A produce rack for storing and displaying produce, comprising:

a display area having a display surface for supporting said produce and defining an opening for viewing said produce;

said display area opening having a rear wall, a front edge, a right side wall, and a left side wall;

means for providing refrigerated air through said display surface into said display area;

means for watering said produce having spray heads in said display area;

control means for automatically controlling said means for watering; and

flexible cover means for selectively closing said opening having:

at least two curtains, each of said curtains having a left edge, a right edge, and a spring-loaded roller coupled to said rear wall;

said curtains selectively extending to said front edge; and

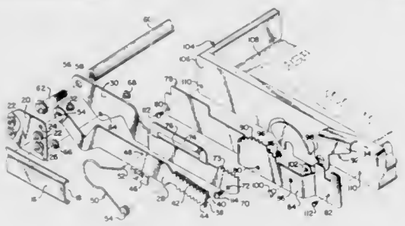
said rollers rolling up said curtains for storage when said curtains are not extended over said opening to said front edge;
said left edge of one of said at least two curtains spaced from and substantially parallel to said right edge of an adjacent of said at least two curtains defining a substantially rectangular gap therebetween;
one strip connector for each of said gaps for covering said gap when said adjacent curtains are extended over said opening; and
fastener means for securing said strip connector to said adjacent curtains.

4,923,259

ADJUSTABLE KEYBOARD DRAWER ASSEMBLY

Stephen Bartok, Rancho Palos Verdes, Calif., assignor to MicroComputer Accessories Incorporated, Los Angeles, Calif.

Filed Aug. 25, 1988, Ser. No. 236,421
Int. Cl.[5] A47B *21/00*
U.S. Cl. 312—208 7 Claims



1. An adjustable keyboard supporting assembly, comprising:
a. housing means;
b. upper first and lower second arm means having first ends pivotally connected to said housing means at respective pivot points and having second free ends extending from said housing means into distal proximity and pivoting about respective horizontal axis extending through said respective pivot points;
c. keyboard support surface means;
d third arm means fixedly connected to said support surface means and pivotally connected to said second arm means, thereby said keyboard support surface means rotates about a horizontal axis into alternative angular dispositions and is pivotally repositionable with respect to said second arm means;
e. engagement means on said free ends of said first and second arm means and said third arm means for bringing said arm means into locking engagement, whereby inhibiting said pivotal and rotational movement of said keyboard support surface means when engaged and for allowing pivotal and rotational movement of said keyboard support means when not engaged.

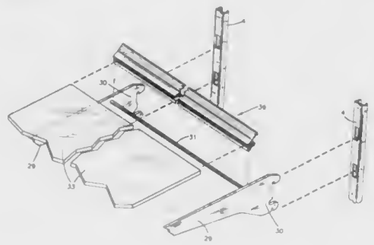
4,923,260

REFRIGERATOR SHELF CONSTRUCTION

Douglas Poulsen, Lakeview, Mich., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Aug. 29, 1989, Ser. No. 400,280
Int. Cl.[5] A47B *81/00*
U.S. Cl. 312—214 4 Claims

1. In a refrigerator having a food compartment, a rear wall, ladder tracks secured to said rear wall, and a shelf assembly mounted on said ladder tracks, said shelf assembly comprising a pair of cantilever shelf supports each having a base secured to said ladder tracks and a front end, a transverse cross member secured at the ends to said cantilever shelf support front ends and having a glass shelf receiving slot, a glass shelf having front and rear edges, said front edge received in said shelf receiving slot, and a rear support wire secured at the ends to said cantilever shelf support bases,
a unitary shelf retainer extending between said cantilever shelf supports adjacent said support wire, said retainer having,



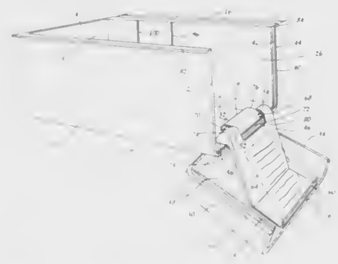
a pair of longitudinally extending angularly disposed slots, the first of said slots opening forwardly and adapted to receive the rear edge of said glass shelf, and the second of said slots opening downwardly and adapted to receive said support wire.

4,923,261

SLIDING DRAWER FOR STORING AND DISPLAYING CARDS

Kristen L. Attardo, 389 Winslow Ave., Long Beach, Calif. 90814

Filed Jun. 19, 1989, Ser. No. 368,285
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—303 7 Claims



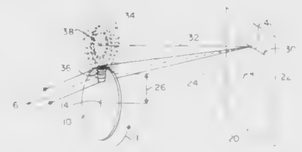
1. A sliding drawer mounted beneath a stationary shelf for storing and displaying cards comprising:
an elongated U-shaped drawer having a length from front to back thereof, the drawer having an open upper end, a closed bottom portion and side portions extending from the closed bottom portion to the upper end along the drawer length, a front door, card holding means located on the inside surface of the door for holding cards to be displayed; and an arm extending obliquely from the inside surface of the door, including spaced apart first and second tips located at the distal end of the arm, each tip having a flat land surface for contacting the inside surface of the bottom portion of the drawer when the door is in the fully opened position, and hinge means for coupling the door to the drawer comprising a U-shaped bracket having first and second closed ends secured to the bottom portion of the drawer defining thereby an open ended shroud, a shaft extending through the open ends of the shroud and coupled to the arm between the first and second tips thereof, such that the door is translatable between the closed ends of the bracket and rotatable about the axis of the shaft which extends through the open ends of the shroud such that while the door is in the fully opened position the flat land surfaces contact the bottom portion to define an inclination of the opened door with respect to the drawer.

4,923,262

SCANNER SYSTEM HAVING ROTATING DEFLECTOR HOLOGRAM

Burton R. Clay, Wayland, assignor to HoloGraphix, Inc., Burlington, Mass.

Continuation of Ser. No. 795,310, Nov. 6, 1985. This application Jun. 23, 1988, Ser. No. 212,158
Int. Cl.[5] G02B *26/10, 5/32*
U.S. Cl. 350—3.71 21 Claims



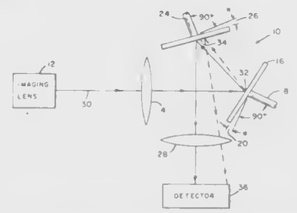
1. A scanning system comprising:
A. an optical spinner having a surface rotatable about an axis that is substantially perpendicular to said surface at its point of interaction with said axis; said spinner divided into a plurality of segments;
B. a plurality of optical elements each capable of processing light by diffraction in a predetermined manner, each of said elements included respectively in a portion of said segments;
C. wherein said portions of said segments are recorded and arranged for receiving a light beam at a non-normal angle in the portion of said segments which include said elements, and efficiently redirecting randomly polarized light received at said non-normal angle;
D. means defining a scanning plane; and
E. correction means, included in said elements, for enabling substantially straight line scan locus on said scanning plane as said spinner rotates.

4,923,263

ROTATING MIRROR OPTICAL SCANNING DEVICE

John L. Johnson, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 22, 1988, Ser. No. 247,555
Int. Cl.[5] G02B *26/10*
U.S. Cl. 350—6.9 20 Claims



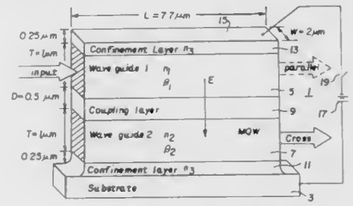
1. An optical scanning device for scanning light beam which has a very large focal plane area coverage and can accept a large f-cone with a high scan rate, under low light conditions, comprising:
(a) a field lens disposed in a field lens plane for receiving said light beam and for focusing said light beam along a first path;
(b) an imaging lens for focusing said light beam onto said field lens in said field lens plane;
(c) first rotary reflecting means for intersecting said focused light beam in said first path at a angle of less than 90° from an axial direction of said first path for reflecting said focused light beam along a second path;
(d) second rotary reflecting means for intersecting the beam reflected from said first reflecting means in said second path at an angle of less than 90° from a central axis of said reflected beam, for reflecting said reflected beam along a third path which is different from said second path; and
(e) detecting means for intersecting the beam reflected from said second rotary reflecting means in said third path for detecting the presence of predetermined images in said reflected beam.

4,923,264

RESONANCE COUPLED OPTICAL COUPLER WITH SEMICONDUCTOR WAVEGUIDE LAYER COMPRISING A MULTI-QUANTUM-WELL STRUCTURE

Dietrich W. Langer, Pittsburgh, Pa., and Marek Chmielowski, Bethesda, Md., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Jan. 18, 1989, Ser. No. 298,572
Int. Cl.[5] G02B *6/10;* H01L *33/00*
U.S. Cl. 350—96.14 20 Claims

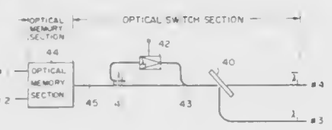


1. An electro-optic coupler comprising a plurality of layers of semiconductor materials including:
a first waveguide layer having an index of refraction n_1;
a second waveguide layer comprising a multiple-quantum-well structure and having an index of refraction n_2;
a coupling layer between said first and second waveguide layers having an index of refraction N;
confinement layers outside said first and second waveguide layers and having an index of refraction n_3; and
means for applying an electric field across said layers of semiconductor materials with n_1, N and n_3 relative to n_2 being unaffected by said electric field, while n_2 varies substantially with the electric field from a first value in the absence of an electric field to a second value in the presence of said electric field, one of said first and second values of n_2 being essentially equal to n_1, and n_3 being substantially less than n_1 and both the first and second values of n_2.

4,923,265
LIGHT TRIGGERING SWITCH

Katsuyuki Utaka, Musashino, and Masanobu Fujioka, Ohmiya, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,167
Claims priority, application Japan, Oct. 22, 1987, 62-265385
Int. Cl.[5] G02B *6/10*
U.S. Cl. 350—96.14 **4 Claims**



1. A light triggering switch which switches the optical path of an input optical signal to a desired output optical path, characterized by the provision of:

a branching filter for branching a portion of an optical control signal of a predetermined wavelength; and

an electrically-controlled optical switch which converts the optical control signal after being branched by the branching filter into an electrical signal and switches the optical signal to the desired output optical path in accordance with the intensity of the converted electrical signal.

4,923,266
OPTICAL FIBER DEVICE FOR GENERATING A TRAIN OF SYNCHRONOUS LIGHT PULSES EACH COMPRISING AT MOST ONE PHOTON AND AN APPARATUS FOR MEASURING SAME

Claude Bovet, Founex, Switzerland, and Edward M. Rossa, Gex, France, assignors to Organisation Europeenne pour la Recherche Nucleaire, Geneva, Switzerland

Filed Apr. 26, 1989, Ser. No. 343,224
Claims priority, application France, Apr. 27, 1988, 88 05613
Int. Cl.[5] G02B *6/26*; G02F *1/00*
U.S. Cl. 350—96.15 **11 Claims**



1. Device for generating, from a single light pulse of brief duration, a train of synchronous light pulses each comprising at most one photon on average, characterized:

in that it comprises several optical paths (1_1, 1_2, . . . 1_n) each formed by at least one single mode optical fiber with zero dispersion in the form of a loop closed on itself by end to end connection of its ends by at least one connector (**20**),

in that the number of loops is n if the number N of the photons in the initial pulse is greater than 10^{2n},

in that these loops are joined together two by two, following each other, by first directional optical coupling means (2_{12}, 2_{23}, . . . $2_{(n-1)n}$) having a relatively small optical coupling coefficient equal to about $(1/N)^{1/(n+1)}$,

in that second directional optical coupling means (3_1, 3_n) also having a relatively low optical coupling coefficient join the first (1_1) and last (1_n) loops with external optical paths (respectively **4** or **7**; **5** or **8**) respectively for the input of only a small part of the initial light pulse and for the output of the train of equidistant pulses formed at most of a single photon on average,

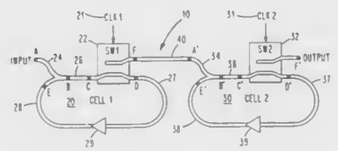
in that the periods of rotation of the photons in the loops are equal to integral numbers, prime with respect to each other, of elementary periods ΔT,

in that the periods of rotation of the photons in the loops are sufficiently small so that the photons remaining in the loops at the end of a sampling procedure do not form a background noise troublesome for the following sampling procedure.

4,923,267
OPTICAL FIBER SHIFT REGISTER

Shing-Fong Su, Southboro, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 5, 1988, Ser. No. 280,045
Int. Cl.[5] G02B *6/28*; G11C *17/00, 5/06*; G06F *7/56*
U.S. Cl. 350—96.16 **8 Claims**



1. An optical shift register, comprising:

at least two optical memory cells, each of said optical memory cells comprising:

an optical switch having an input end adapted to receive an optical pulse, a first output end, a second output end and a control means, said switch being adapted to switchably couple an optical pulse from said first input end to said first output end in its straight-through state and to switchably couple an optical pulse from said input end to said second output end in its cross-over state, responsive to control signals;

an optical combiner having first and second input ends and an output end adapted to receive an optical pulse on either input end and output said optical fiber pulse on said output end;

an optical fiber connecting said output end of said optical combiner to said input end of said optical switch;

an optical fiber connecting said first output end of said optical switch to said second input end of said optical combiner;

such that said optical switch in its straight-through state, said optical combiner and said optical fibers form a memory cell in the form of an optical loop capable of storing a circulating optical pulse;

said first input end of said optical combiner serving as an input port to said memory cell;

said second output end of said optical switch serving as an output port from said memory cell when said optical switch is in its cross-over state; and

clock means providing signals to control the input of an optical pulse to said memory cell and the output of said optical pulse from said memory cell;

said optical memory cells being connected sequentially in cascade by connecting the output port of a first memory cell to the input port of an adjacent memory cell in a sequence of memory cells, such that the input port of the first memory cell in said sequence is the input port of said shift register and the output port of the last memory cell in said sequence is the output port of said shift register;

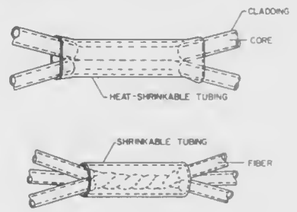
said clock means of each of said memory cells operating at the same clock rate, but out of phase with said clock means in an adjacent memory cell;

whereby the shifting of an optical pulse results from the output of said pulse from a first memory cell and the input of said pulse into the next sequential memory cell.

4,923,268
FIBER OPTIC COUPLER

Jisen Xu, Milford, Mass., assignor to Aster Corporation, Milford, Mass.

Continuation-in-part of Ser. No. 96,547, Sep. 14, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 257,856
Int. Cl.[5] G02B *6/26*
U.S. Cl. 350—96.15 **46 Claims**

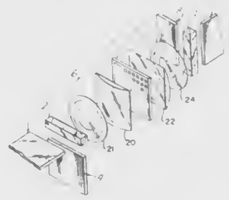


1. A fiber optic coupler formed of a plurality of optical fibers within a surrounding sleeve of heat shrink plastic in a shrunken state, each fiber having an optically transmissive core surrounded, along at least most of its length, by an optical cladding layer, characterized in that the substance of said fibers is preselected to have a heat fusing temperature in a range achievable by exterior heating of said shrink sleeve, said fibers being in a heat fused-together state along a limited length region within said shrunken sleeve as a result of heat and inter-fiber pressure applied to said fibers by exterior heating of said shrink sleeve.

4,923,269
BIDIRECTIONAL OPTICAL SPACE SWITCH

Peter Healey, Ipswich, England, assignor to British Telecommunications public limited company, Great Britain

PCT No. PCT/GB88/00052, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO88/05986, PCT Pub. Date Aug. 11, 1988
PCT Filed Jan. 28, 1988, Ser. No. 249,560
Claims priority, application United Kingdom, Jan. 29, 1987, 8701996
Int. Cl.[5] G02B *6/26*
U.S. Cl. 350—96.15 **19 Claims**



1. A bi-directional optical space switch comprising:

a first array of inputs and a second array of inputs for emitting optical signals to be switched;

a first array of outputs and a second array of outputs for receiving switched optical signals from the first and second array of input, respectively;

an active array of cells having first and second sides each cell being selectively capable of varying the polarisation state of light passing through from one side of the cell to the other in response to an applied control signal;

a first optical coupling means for optically coupling the first sides of each of a plurality of groups of the active array of cells with a corresponding input of the first array of inputs and with a corresponding output of the second array of outputs;

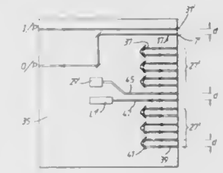
a second optical coupling means for optically coupling the second sides of each of a plurality of groups of the active array of cells with a corresponding input of the second array of inputs and with a corresponding output of the first array of outputs;

the first and second optical coupling means including a respective first and second polarising beam splitter each arranged both to polarise light travelling from an input to the array of cells and to direct only appropriately polarised light passing through a cell away from the inputs and to the outputs.

4,923,270
APPARATUS FOR OPTICAL WAVELENGTH DIVISION MULTIPLEXING

Andrew C. Carter, Northampton, Great Britain, assignor to Plessey Overseas Limited, Ilford, England

PCT No. PCT/GB88/00191, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/07216, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 11, 1988, Ser. No. 269,913
Claims priority, application United Kingdom, Mar. 13, 1987, 8706014
Int. Cl.[5] G02B *6/32*
U.S. Cl. 350—96.18 **23 Claims**



1. Apparatus for optical wavelength division multiplexing comprising:

an optical assembly for collimating, dispersing, and focusing light;

one laser located near a focus of said assembly, wherein said one laser is provided in combination with one or more additional lasers of like type and of nominally the same centre wavelength, these lasers being assembled to provide an array interface and all being effectively located at or near corresponding focii of the optical assembly; and

an optical waveguide, located near a common and conjugate focus of said assembly and arranged to receive light emitted from said one laser, characterized in that:

the optical waveguide is adapted by the provision of reflection enhancement means to reflect light emitted by said one laser and to control the resonant emission thereof.

4,923,271
OPTICAL MULTIPLEXER/DEMULTIPLEXER USING FOCUSING BRAGG REFLECTORS

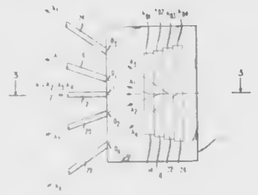
Charles H. Henry, Montgomery Township, Somerset County; Rudolf F. Kazarinov, Martinsville, both of N.J.; Rodney C. Kistler, Easton, Pa.; Kenneth J. Orlowsky, Borough of Middlesex, N.J.; Yosi Shani, Murray Hill, N.J., and Aasmund S. Sudbo, Summit, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Mar. 28, 1989, Ser. No. 329,468
Int. Cl.[5] G02B *6/34*
U.S. Cl. 350—96.19 **26 Claims**

1. An optical device comprising

a first optical waveguide, including entrance and exit ports, capable of supporting a signal at a first optical wavelength $\lambda\alpha$

at least one focusing Bragg reflector comprising a plurality of confocal essentially elliptical grating lines for reflecting optical signals within a bandwidth $\Delta\lambda$ around a first Bragg wavelength λ_{BO}, λ_O being within the bandwidth $\Delta\lambda$ around λ_{BO}, and transmitting all other optical signals therethrough, said focusing Bragg reflector being disposed in relation to said first optical waveguide such that a port of said first waveguide is located at a first focal



point of said plurality of confocal essentially elliptical grating lines; and

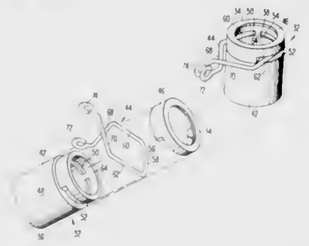
a second optical waveguide, including entrance and exit ports, capable of supporting an optical signal at said first wavelength λ_O, one port of said second optical waveguide being located at a second, remaining focal point of said plurality of confocal essentially elliptical grating lines forming said focusing Bragg reflector.

4,923,272

FIBER OPTIC CONNECTOR

Joseph Cuda, 2937 Christopher Creek Rd., N. Jacksonville, Fla. 32217

Filed Oct. 3, 1988, Ser. No. 252,088
Int. Cl.[5] G02B *6/36*
U.S. Cl. 350—96.20 **34 Claims**



1. A female connector for a fiber optic cable including at one end thereof a male connector having a circumferential groove, said female connector comprising:

a female sleeve having first and second ends, said female sleeve defining a channel therethrough between said first and second ends, parallel first and second side slots communicating along at least a portion of their lengths with said channel, and a third slot communicating along at least a portion of its length with said channel and disposed generally perpendicular to said first and second side slots; and

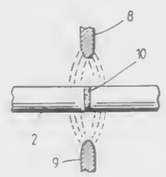
a squared retaining spring including parallel first and second legs having opposite closed and open leg ends, a transverse strand directly connecting said closed leg ends, and ear portions at said open leg ends, said first and second legs being disposed respectively in said first and second side slots, and relative to said channel such that with a male connector of a fiber optic cable passing through said first end and disposed in said channel in an inserted connector position said first and second legs can extend into said channel and engage in a circumferential groove of the male connector and thereby releasably lock the male connector and said female sleeve together, said retaining spring being positionable in a compressed condition by moving said ear portions relative to each other, said first and second legs with said retaining spring in said compressed condition being moved away from the longitudinal center of said channel so that the male connector can be moved to and from the inserted connector position relative to said first end, and said third slot opening towards and into said channel so as to not restrict the inward flexure movement of at least the middle of said transverse strand relative to said channel as said retaining spring is moved to said compressed condition.

4,923,273

METHOD FOR PRODUCING REFLECTIVE TAPS IN OPTICAL FIBERS AND APPLICATIONS THEREOF

Henry F. Taylor, College Station, Tex., assignor to Texas A&M University System, College Station, Tex.

Division of Ser. No. 108,270, Oct. 13, 1987, Pat. No. 4,848,999.
This application Dec. 19, 1988, Ser. No. 286,056
Int. Cl.[5] G02B *6/38;* **H01S** *3/08;* **C22B** *4/00;* **C03B** *23/20*
U.S. Cl. 350—96.21 **13 Claims**



1. A reflectively tapped delay line signal processing device with fixed tap weights where the taps are formed by:

preparing one end of a first optical fiber by cleaving or polishing;

placing said first fiber in a vacuum system;

coating the prepared end of the first fiber with a material having dissimilar refractive properties than said fiber;

fusing the coating, prepared end of the first fiber with the end of a second fiber until the reflectivity of the fused region reaches a desired value.

13. A reflectivity tapped delay line signal processing device with variable tap weights, where the taps are formed by

forming two optical mirrors along a continuous length of optical fiber such that the mirrors are separated by a length of optical fiber, the combination forming a Fabry-Perot cavity.

depositing conductive electrodes on opposite sides of the fiber such that the reflectivity of the cavity will vary upon the application of a voltage between the electrodes.

4,923,274

CONNECTOR FOR OPTICAL FIBERS

David L. Dean, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

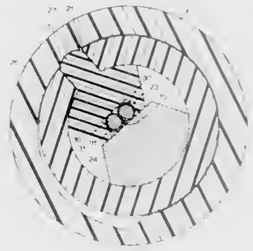
Filed Jun. 26, 1989, Ser. No. 371,193
Int. Cl.[5] G02B *6/36*
U.S. Cl. 350—96.21 **4 Claims**

1. A connector for positioning an optical fiber, comprising:

(a) a housing having an inner surface therein delimiting a first space, said housing having a first slot;

(b) a first body carried by the housing within the first space, the first body having a first rib extending through the first slot; and,

(c) a first locking ring carried by the housing and surrounding the housing, the first locking ring having an inner wall having in circumferential succession a first inner diameter, a second inner diameter, and a third inner diameter, the



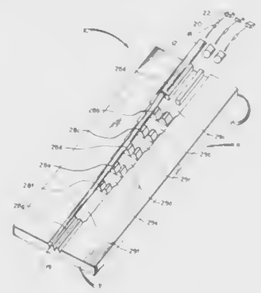
third inner diameter being smaller than the first inner diameter and the second inner diameter being smaller than the third inner diameter.

4,923,275

FIBER OPTIC ARRAY

Joseph Y. Kaukeinen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,757
Int. Cl.[5] G02B *6/04*
U.S. Cl. 350—96.24 **11 Claims**



1. A fiber optic array comprising:

a substrate which is adapted to support optical fibers on a surface thereof, said substrate having sets of grooves on said surface for receiving optical fibers therein, the grooves in each of said sets being generally parallel and the grooves in all of the sets extending in generally the same direction, said sets of grooves being spaced along said substrate from one end to an opposite end thereof and said sets of grooves being separated from each other by generally planar areas of said surface which are generally coplanar with bottoms of said grooves, the pitch of the grooves in each set being less than the preceding set in the direction of said opposite end; and

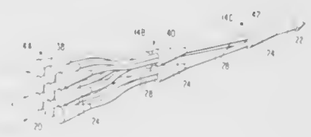
a plurality of fibers in said grooves, said fibers being arranged side-by-side on said substrate, said fibers converging toward said opposite end and having ends at said opposite end which form a generally linear array of closely spaced fiber ends.

4,923,276

TAPERED OPTICAL FIBER TELESCOPE, TRACKING SYSTEM APPARATUS AND METHOD INCORPORATING TAPERED OPTICAL FIBER TELESCOPES

James A. Wells, Huntsville, Ala., assignor to Teledyne Industries, Inc., Huntsville, Ala.

Filed Feb. 13, 1989, Ser. No. 309,675
Int. Cl.[5] G02B *23/26;* **G01J** *1/20;* **F41G** *7/00*
U.S. Cl. 250—206.2 **38 Claims**



1. An optical fiber telescope for concentrating light for tracking without need for forming an image of an object tracked, said telescope comprising an optical train formed of a plurality of tapered optical fibers arranged in cascading stages with each stage having an input and output,

said stages including a collecting stage for collecting light in a field of view at its input and a terminal stage, located downstream of said collecting stage, with its input optically coupled to the output of said collecting stage for receiving collected light from said collecting stage and passing collected light through to the output thereof,

the optical fibers of said collecting stage being arranged in at least one bundle,

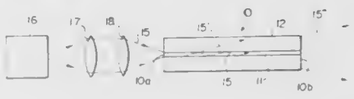
each upstream stage in said optical train having a greater number of tapered optical fibers than its adjacent downstream stage whereby said terminal stage provides concentrated light at its output without eyepiece or objective elements.

4,923,277

OPTICAL WAVELENGTH CONVERTER DEVICE

Yoji Okazaki, and Koji Kamiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 2, 1988, Ser. No. 265,986
Claims priority, application Japan, Nov. 2, 1987, 62-277678; Mar. 8, 1988, 63-54616
Int. Cl.[5] G02F *1/35*
U.S. Cl. 350—96.29 **5 Claims**



2. An optical wavelength converter device according comprising:

a core made of a nonlinear optical material; and

(ii) cladding surrounding said core, for converting a fundamental applied to an end of said core to a second harmonic and radiating said second harmonic into said cladding to eliminate interference between waves traveling in a guided mole in which the fundamental is guided through said core and waves traveling in a radiation mode in which the second harmonic is radiated into said cladding, said cladding having a diameter of at least 500 μm;

wherein said diameter of the cladding is greater than or equal to L.tan θ+d, where d is the diameter of said core, θ the phase

matching angle of the second harmonic, and L the length of the optical wavelength converter device.

4,923,278
TEMPERATURE DESENSITIZATION OF DELAY IN OPTICAL FIBRES

Raman Kashyap; Michael H. Reeve; Stephen A. Cassidy, and Stephen Hornung, all of Ipswich, England, assignors to British Telecommunications public limited company, Great Britain

Continuation of Ser. No. 752,109, Jun. 18, 1985, abandoned. This application Mar. 31, 1987, Ser. No. 32,964
Claims priority, application United Kingdom, Oct. 21, 1983, 8328204
Int. Cl.[5] G02B 1/10
U.S. Cl. 350—96.30 29 Claims



20. An optical fibre having at least part of its length enclosed in a tightly fitting jacket having a selected coefficient of thermal linear expansion α of opposite sign to the coefficient of thermal linear expansion of the optical fibre and being dimensioned to apply a temperature dependent stress σ to the fibre to substantially eliminate variations in optical path length in the fibre due to temperature induced changes in length L and refractive index N of the fibre thereby to reduce temperature dependence of transmission delay dt/dT, where t is transmission delay and T is temperature, in the optical fibre over a predetermined temperature range.

4,923,279
OPTICAL FIBRE WITH FLUORESCENT ADDITIVE

Benjamin J. Ainslie; Susan P. Craig, and Jonathan R. Armitage, all of Ipswich, England, assignors to British Telecommunications plc, London, England

Filed Oct. 13, 1988, Ser. No. 257,101
Claims priority, application United Kingdom, Oct. 22, 1987, 8724736
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.30 21 Claims



1. An optical fibre suitable for forming fluorescent devices, said optical fibre having a cladding, and a core having a longitudinal core axis, said core containing a fluorescent dopant, characterized in that the concentration of the dopant is substantially greater on the core axis than at the interface between the core and the cladding.

4,923,280
REAR-PROJECTION SCREEN

Johannes Clausen, Charlottenlund, and Erik Clausen, Gentofte, both of Denmark, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed May 10, 1989, Ser. No. 349,680
Claims priority, application Denmark, Dec. 9, 1988, 6872/88
Int. Cl.[5] G03B 21/60
U.S. Cl. 350—128 20 Claims

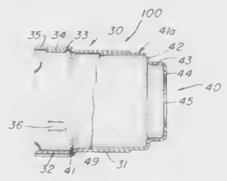


1. A transparent rear-projection screen comprising a rearmost screen element in the form of a lense system for parallelling of light coming from behind, and a middle screen element with vertical, rectilinear lenses on a reverse side of the element, and a foremost screen element with rectilinear, parallel, convex lenses with horizontal axes on a reverse side of the foremost screen element and with rectilinear and mainly horizontal projections comprising projections tops of a predetermined width, on a front side of the foremost screen element, with grooves between the projections which are covered or filled with a light impenetrable material, whereby the focal length of the convex lenses on the reverse side of the foremost element corresponds to the thickness of the foremost element.

4,923,281
LASER DIODE FOCUSING MODULE, METHOD OF FABRICATING, AND METHOD OF USING

Mark Krichever, Hauppauge, and Yuri Gofman, Brooklyn, both of N.Y., assignors to Symbol Technologies Inc., Bohemia, N.Y.

Filed Nov. 1, 1988, Ser. No. 265,549
Int. Cl.[5] G02B 7/02
U.S. Cl. 350—245 37 Claims



1. A focusing module particularly adapted for use with laser diode assembly including a laser diode for emitting a laser beam having a non-radially symmetric cross-section comprising:

(a) a cylindrical assembly holder for said laser diode assembly having a first open end defining a first annular portion for receiving said laser diode assembly and a second open end defining a second annular portion of smaller diameter than that of said first annular portion, said assembly holder being arranged to concentrically receive said laser diode assembly therein and adapted to orient the laser beam cross section with respect thereto and prevent axial movement and rotation of said laser diode assembly also with respect thereto;

(b) a cylindrical lens holder adapted to slide coaxially and concentrically within said cylindrical assembly holder and extend from said second open end of said cylinder assembly holder, said lens holder having an open end defining a first annular portion of a diameter similar to but smaller than the diameter of said second annular portion of said cylindrical assembly holder, and a closed end having an aperture and defining a second annular portion of a diameter smaller than that of said first annular portion of said lens holder, said lens holder having means to interface with said assembly holder at said open end of the lens holder to prevent rotation of said lens holder with respect to said assembly holder;

(c) an optical lens assembly particularly adapted for use with said laser diode assembly being mounted within a seating portion connecting said first and second annular portions of said lens holder; and

(d) means for providing an axial force for urging said lens assembly into engagement with said seating portion;

whereby said lens holder may be axially moved and positioned within said assembly holder to focus the laser beam after said laser beam passes through said lens assembly and said aperture prior to securement of said lens holder to said assembly holder in a focused state.

4,923,282
MAGNIFYING APPARATUS AND METHOD

Larry A. Spitzberg, 5550 N. Braeswood #109, Houston, Tex. 77096

Continuation-in-part of Ser. No. 233,958, Aug. 18, 1988, abandoned, which is a continuation of Ser. No. 877,465, Jun. 23, 1986, abandoned. This application Feb. 23, 1989, Ser. No. 315,217
Int. Cl.[5] G02B 7/02
U.S. Cl. 350—245 14 Claims



1. A magnifying apparatus comprising:

a non-erecting reflecting prism having an emergent face, a substantially flat bottom for resting on a substantially horizontal surface, and a substantially straight leading edge for alignment with a line of print on a page resting on the horizontal surface, the emergent face of said reflecting prism angled at an angle of from about 40° to about 60° when said reflecting prism rests on the horizontal surface;

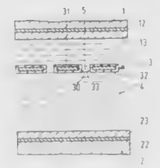
a magnifying lens; and

means for mounting said magnifying lens over a portion of the emergent face of said reflecting prism, whereby the image of the leading edge of said reflecting prism and the image of the line of print are reflected within said reflecting prism and then transmitted at an angle of from about 40° to about 60° with respect to the horizontal surface on which said reflecting prism rests, through said magnifying lens for viewing as magnified images, and the image of the line of print is transmitted without being reflected through another portion of the emergent face for viewing as an image of actual size to facilitate the reading of the line of print.

4,923,283
ELECTROSCOPIC FLUID DISPLAY

Antonius G. H. Verhulst; Jacob Bruinink, and Emanuel J. W. M. Lenders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1988, Ser. No. 191,298
Claims priority, application Netherlands, May 7, 1987, 8701072
Int. Cl.[5] G02B 26/02
U.S. Cl. 350—269 6 Claims



1. An electroscopic fluid display comprising

a first substrate,

a second transparent substrate spaced from said first substrate,

spacer means for positioning said second substrate parallel to said first substrate,

a sealed cell space disposed within said spacer means and said substrates,

a high-impedance contrast liquid disposed in said cell space.

a plurality of display elements, each of said display elements including at least one fixed electrode disposed on at least one of said substrates and at least one resiliently suspended perforated movable electrode disposed for movement between said substrates, said electrodes having facing surfaces provided with an insulating layer,

said movable electrode having a surface with reflective properties facing said transparent substrate, said surface with reflective properties contrasting with said contrast liquid,

means for driving said electrodes with alternating current, said means driving said electrodes with an asymmetric alternating voltage having a degree of asymmetry corresponding to a difference in surface properties of said insulating layer of said facing electrode surfaces relative to charge delivery and charge absorption at said facing electrode surfaces,

wherein said movable electrode has at least one main surface where said insulating layer consists of anodized metal material of said movable electrode, said insulating layer continuing along inner and outer peripheral portions of said perforated movable electrode, and

wherein said insulating layer on the substrate opposite to said anodized metal material on said movable electrode consists of an oxide of the same metal material.

4,923,284
ANTI-DAZZLE SCREEN

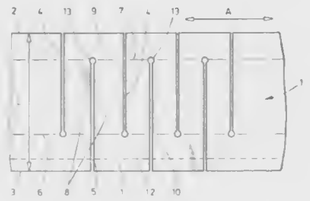
Robert E. Durand, Rambouillet, France, assignor to Materials Et Applications De Securite Pour Les Aeroports L'Industrie Et Les Routes (Masair), Paris, France

Filed Oct. 7, 1988, Ser. No. 254,963
Claims priority, application France, Oct. 7, 1987, 87 13842
Int. Cl.[5] G02B 27/00
U.S. Cl. 350—276 R 7 Claims

1. An anti-dazzle screen comprising:

a strip (1) having opposing upper and lower edges (2, 3), the strip being provided with notches (4) starting from the upper edge and notches (5) starting from the lower edge, the notches (4) issuing from the upper edge (2) and those (5) issuing from the lower edge (3) following one another alternately to form branches (8) in the space between two

succeeding notches (4, 5), the notches (4, 5) terminating short of the opposing edge and having defined at the base thereof upper and lower connection parts (9, 10);
the upper connection parts (9) lying between two succeeding notches (4) emanating from the upper edge (2) and being above the intermediate notch (5) issuing from the lower edge (3) and in each instance joining the corresponding ends of two successive branches (8);
the lower connection parts (10) lying between two succeeding notches (5) emanating from the lower edge (3) and being below the intermediate notch (4) issuing from the

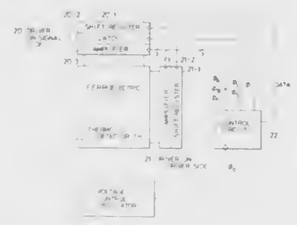


upper edge (2) and in each instance joining the corresponding ends of two succession branches (8);
the lower connection parts (10) being at least partly foldable in order to form a tab (12) for resting and fixing the screen on an elongated support;
the strip (1) being opened-out along the length of the support to open the branches (8) around respective joints formed by the upper part (9) and the lower part (10) connecting two succeeding branches (8, 8) to move these branches apart and incline them one to the other and arrange their surfaces slantwise relative to the support to constitute an opaque screen in the direction along the screen.

4,923,285
DRIVE APPARATUS HAVING A TEMPERATURE DETECTOR

Yoshitaka Ogino; Shinjiro Okada, both of Kawasaki, and Yutaka Inoue, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 853,166, Apr. 17, 1986, abandoned. This application Dec. 21, 1988, Ser. No. 287,657
Claims priority, application Japan, Apr. 22, 1985, 60-86678; Apr. 23, 1985, 60-87085
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—331 T 19 Claims

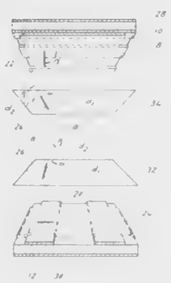


1. A display apparatus comprising:
a display element comprising a ferroelectric liquid crystal having a first and a second threshold value in accordance with the polarity of an applied voltage:
drive means for applying one polarity or another polarity voltage to said display element;
temperature detection means for detecting the temperature of said display element and outputting temperature data representative thereof; and
control means for (1) referring the temperature data to predetermined driving frequency data in accordance with a stored temperature, (2) extracting a designated one of the driving frequency data in accordance with a certain one of the temperature data, and (3) controlling said drive means so as to be able to apply one polarity or the other polarity voltage, exceeding the threshold value of the ferroelectric liquid crystal, to said display element at a selected driving period, and to apply a voltage between the first and the second threshold values of the ferroelectric liquid crystal to said display element at a non-selected driving period at a driving frequency represented by the designated driving frequency data.

4,923,286
DISPLAY CELL

Joachim Grupp, Peseux, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Continuation of Ser. No. 19,391, Feb. 26, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 271,408
Claims priority, application Switzerland, Feb. 27, 1986, 00791/86
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—340 25 Claims



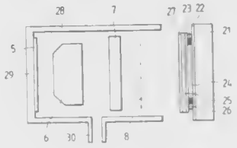
1. A multiplexable, liquid crystals display cell comprising:
a pair of plane and parallel plates, one at the front, the other at the rear;
a frame located between the plates and defining with the latter a chamber;
a mixture of liquid crystals and of a chiralic compound in said chamber, the amount of chiralic compound in said mixture being such as to impart to the liquid crystals a helical motion having a pitch p greater than or equal to the distance d between the plates;
a pair of control electrode networks, one on each plate and each comprising a plurality of conductive tracks, the conductive tracks of one being arranged in crossing relation to the conductive tracks of the other to define a pattern of areas for displaying information;
a pair of alignment layers respectively covering the inner surfaces of said plates;
a polarizer extending parallel to said surfaces, in front of the front plate; and,
reflecting and diffusing means located at the back of the alignment layer covering the rear plate;
wherein one of the alignment layers is adapted to induce planar alignment of the molecules of the mixture and to so orient said molecules that their optical axes will form an angle not exceeding 10° with the plane of the plate adjacent this layer, wherein the other of said alignment layers is adapted to induce homeotropic alignment of the molecules of the mixture and to so orient said molecules that

their optical axes will form an angle not exceeding 10° with an axis perpendicular to the plane of the plate adjacent said other layer, and wherein the optical transmission of the display cell is substantially constant for voltages below a predetermined critical voltage range and varies by a substantial amount within said predetermined critical voltage range.

4,923,287
SPATIAL LIGHT MODULATING DEVICES UTILIZING ELECTRO-OPTIC CRYSTAL

Yoshiharu Ooi, and Tsutomu Hara, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Jan. 24, 1989, Ser. No. 300,986
Claims priority, application Japan, Jan. 25, 1988, 63-15289
Int. Cl.[5] G02F *1/01*
U.S. Cl. 350—355 7 Claims

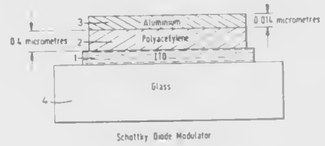


1. A spatial light modulating device, comprising light modulating means which comprises:
a substrate which is transparent with respect to readout light and whose first surface is coated with a first transparent conductive film;
an electro-optic crystal plate whose first surface being opposed to said first surface of said substrate is coated with a second transparent conductive film;
an adhesive layer for bonding said substrate and said electro-optic crystal plate; and
conductive substances disposed in said adhesive layer so as to electrically connect said first and second transparent conductive films.

4,923,288
OPTICAL MODULATORS BASED ON POLYMERS

Philip C. Allen, Feltham; Jeremy H. Burroughes; Richard H. Friend, both of Cambridge, and Alan J. Harrison, Woking, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed May 20, 1988, Ser. No. 196,409
Claims priority, application United Kingdom, May 21, 1987, 8712057
Int. Cl.[5] G02F *1/17*
U.S. Cl. 350—355 22 Claims

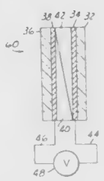


1. A device for electrooptic modulation of an optical beam, said device being a laminate comprising a coherent film of a conjugated polymer having semi-conducting properties as the active component laminated with two or more layers of electrically conducting, insulating or semi-conducting materials or combinations thereof, at least the active component in the laminate being capable of interacting with the optical beam when under the influence of an electric signal and thereby result in a modulated beam, means for establishing electrical contact with one or more layers of the laminate in such a manner that enables an electrical signal to be applied across the active component in the laminate and means for detection of the extent of modulation of the modulated beam energing from the active component layer.

4,923,289
ELECTROCHROMIC DEVICES HAVING A GRADIENT OF COLOR INTENSITIES

Hulya Demiryont, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,457
Int. Cl.[5] G02F *1/17*
U.S. Cl. 350—357 16 Claims

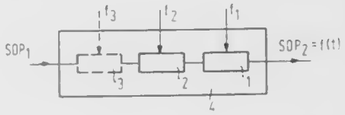


1. A method for forming regions of an electrochromic device adapted to provide a color intensity gradient during operation of said electrochromic device which comprises two substrates and therebetween: one electrode layer; an electrochromic material; an ion conductive material; and another electrode layer in that order, at least one of said one electrode layer and said other electrode layer being transparent and each electrode layer being in contact with a respective one of said substrates, said ion conductive layer being adapted to communicate ions to and from said electrochromic material upon application of a voltage across said electrode layers, which method comprises:
providing said electrochromic material in a continuously decreasing thickness gradient in at least one region when measured normal to the plane of an electrode layer.

4,923,290
POLARIZATION SCRAMBLER

Ernst Brinkmeyer, Buchholz; Wolfgang Brennecke, and Rainer J. R. W. Otto, both of Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Aug. 16, 1988, Ser. No. 232,741
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1987, 3728107
Int. Cl.[5] G02F *1/09*
U.S. Cl. 350—377 19 Claims



14. A scrambler for altering the state of polarization of light comprising:
first and second optical retardation elements, the amount of retardation of said retardation elements being controllable as a function of time by means of a control input;
control means for controlling said first and second retardation elements, said control means controlling said second

retardation element such that the second retardation element, as represented on the Poincaré sphere, alters the states of polarization in accordance with a rotational axis which is different from that associated with said first retardation element and that said control means are controllable at at least one of, differing frequencies, and in an uncoordinated aperiodic manner such that varying states of polarization occur at the output of the second retardation element in such a way that, averaged in time, the light intensities emerging in different states of polarization are at least substantially equal.

4,923,291

OPTICAL AMPLIFICATION

Noboru Edagawa, Tokyo; Kiyofumi Mochizuki, Hachioji, and Yoshinao Iwamoto, Wakayama, all of Japan, assignors to Kokusai Densbin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,600
Claims priority, application Japan, Jul. 23, 1987, 62-182244
Int. Cl.[5] G02B *5/30*; G02F *1/00*
U.S. Cl. 350—389 6 Claims



1. An optical amplification method for an optical communication system which transmits signal light from a transmitting side to a receiving side via an optical transmission medium, comprising:

separating the signal light into two orthogonally polarized beams by a first polarizing beam coupler/splitter;

amplifying each orthogonally polarized beam by an optical amplifier, each of said optical amplifiers being oriented with respect to each polarized beam to achieve maximum optical gain, and

combining together the two orthogonally amplified, polarized beams by a second polarizing beam coupler/splitter.

4,923,292

MACRO LENS SYSTEM

Hirofumi Matsuo, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 314,005
Claims priority, application Japan, Feb. 23, 1988, 63-40303
Int. Cl.[5] G02B *9/64*
U.S. Cl. 350—463 10 Claims



1. A macro lens system comprising a first group which comprises, in order from a side of an object, a first lens element which is a negative meniscus lens, a second lens element which is a positive lens, a third lens element which is a negative meniscus lens, a fourth lens element which is a negative lens, a diaphragm stop, a fifth lens element which is a positive lens, and a sixth lens element which is a positive lens, and a second group which comprises a negative seventh lens element and a positive eighth lens element, both the first and second groups being moved toward the object with their distance increasing when said system is focused from infinity to a close distance, said system further satisfying the following conditions:

$$1.05 < f/f_I < 1.3 \quad (1)$$

$$f/|f_3| < 0.8, (f_3 < 0) \quad (2)$$

$$1.0 < r_5/(d_5 + d_6/2) < 3.0 \quad (3)$$

$$1.0 < r_6/(d_6/2) < 3.0$$

$$0.5 < \frac{d_1 + d_2 + d_3 + d_4 + d_5 + d_{6/2}}{f} < 0.8 \quad (4)$$

wherein

f is the focal length of the overall system;

f_I is the focal length of the first group:

f_3 is the focal length of the third lens element;

r_i is the radius of curvature of an ith surface from the object side; and

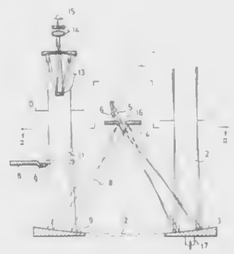
d_i is the distance between an ith surface from the object side and an $(i+1)^{th}$ surface from the object side.

4,923,293

OPTICAL SYSTEM FOR MASKING OUT A COMPONENT REGION OF AN IMAGE

Bruno Nelles, Oberkochen, and Rainer Schwenn, Katlenburg-Lindau, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim

Filed Jan. 26, 1989, Ser. No. 301,601
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804534
Int. Cl.[5] G02B *23/00, 23/10, 17/00*
U.S. Cl. 350—503 12 Claims



1. An optical system for imaging an object while masking out a predetermined portion, the optical system comprising:

first mirror means receiving the object radiation coming from the object and forming an intermediate image defining an intermediate image plane;

second mirror means mounted in said intermediate image plane;

masking means formed in said second mirror means for masking out a component region of said intermediate image and leaving a remainder portion which is reflected at said second mirror means; and,

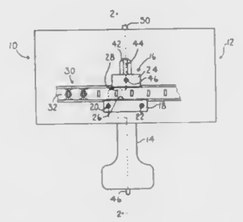
a system component mounted downstream of said second mirror means for forming an image of said remainder portion.

4,923,294

LEAD FRAME HOLDING DEVICE

Robert W. Courtenay, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Oct. 20, 1988, Ser. No. 260,469
Int. Cl.[5] G02B *21/26*
U.S. Cl. 350—529 11 Claims



1. A lead frame holding device for securing at least one lead frame for microscopic examination and transport including base means adapted to interfit with a microscope state, said base means comprising:

(a) a planar member for securement to the microscope stage and having a longitudinal aperture therethrough said planar member having an upper surface and four lateral edge portions;

(b) one of said lateral edge portions formed into handle means wherein said longitudinal aperture continues through said handle means;

(c) the longitudinal aperture extending through a portion of the upper surface of the planar member such that a slot is formed in the planar member;

(d) a stationary bracket means secured to the upper surface of the planar member;

(e) movable bracket means movably affixed to the upper surface of the planar member such that the lead frame may be retained between the stationary bracket and the movable bracket; and

(f) actuating means disposed within the longitudinal aperture through the handle means and through the planar member, with a portion of the actuating means exposed exterior of the handle means.

4,923,295

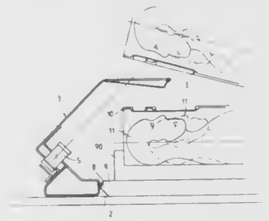
DEVICE TO MONITOR A PATIENT IN AN APPARATUS FOR MEDICAL EXAMINATION

Jacques Sireul, Wissous; Jacob Hervé, Cugnaux, and Gauthier René, Antony, all of France, assignors to General Electric CGR SA, Paris, France

Filed Dec. 7, 1988, Ser. No. 281,011
Claims priority, application France, Dec. 8, 1987, 87 17052
Int. Cl.[5] G02C *5/08*
U.S. Cl. 350—639 12 Claims

1. A device for monitoring a patient in the tunnel of a medical examination apparatus wherein said apparatus includes a frame, said device comprising:

a support having a television camera and a mirror mounted on said support wherein said mirror sends an image of a part of the patient to the television camera;



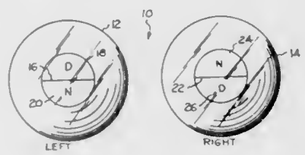
support moving means for moving said support with respect to said frame of said apparatus wherein said support moving means is fixed with respect to said patient.

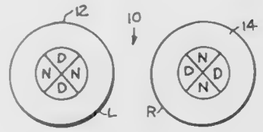
4,923,296

ORIENTED SIMULTANEOUS VISION BIFOCAL CONTACT LENSES OR THE LIKE UTILIZING INTROAOCULAR SUPPRESSION OF BLUR

Paul M. Erickson, 135 Chadwick Dr., Rochester, N.Y. 14618

Filed Jul. 14, 1988, Ser. No. 219,495
Int. Cl.[5] G02C *7/04*; A61F *2/16*
U.S. Cl. 351—161 7 Claims

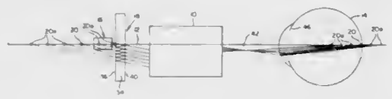




1. A lens system for correcting near and distant vision in humans, comprising:

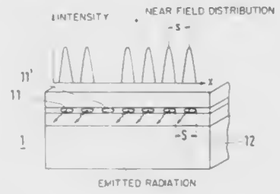
a pair of contact lenses whose optical surfaces are divided into at least two substantially discrete zones, the junction of said zones extending from edge to edge of each lens through substantially the optical center of said lenses, but not along a vertical axis, the position of said discrete zones which, when said lenses are worn one upon the right eye and one upon the left eye, are such that relative to the line of sight of the wearer each zone of one lens defining a distance power correction corresponds to a similar zone defining a near power correction on the other lens.

4,923,297
OPTICAL ALIGNMENT SYSTEM
Joseph H. Arndt, Portland, Oreg., assignor to Eyedentify, Inc., Portland, Oreg.
Filed Jun. 23, 1986, Ser. No. 877,509
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—208 14 Claims



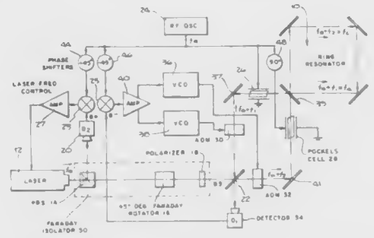
1. In combination: an optical device having an optical axis with which the line of sight of a viewer's eye is to be precisely aligned; and means for producing a plurality of visible fixation targets spaced apart along said optical axis, whereby a viewer positions his/her eye in a plane normal to said viewer's line of sigh to align said line of sight precisely with the optical axis of the optical device, the means for producing a plurality of visible fixation targets comprising a light source positioned substantially on the optical axis of the optical device and, in spaced relation thereto, double coated mirror means in which the coatings are on opposite parallel surfaces, said light source and mirror means forming multiple ghost image generating means, the primary image and its ghost images comprising the visible fixation targets, the double coated mirror means comprising a sheet of light-transmitting material having substantially parallel surfaces, the front surface being coated with an opaque reflective mirror coating material rendering it reflective and being provided with a pinhole located substantially on the optical axis of the optical device, and the rear surface being coated with a semitransparent reflective mirror coating material imparting to it a light reflection/transmission ratio of from about 50/50% to about 95/5%.

4,923,298
DEVICE FOR MEASURING THE SPEED OF MOVING LIGHT-SCATTERING OBJECTS
Dietrich Dopheide; Michael Faber, both of Brunswick; Gerhard Reim, Rothemuehle, and Guenter Taux, Brunswick, all of Fed. Rep. of Germany, assignors to Federal Republic of Germany, represented by the Federal Minister for Economics, who is in turn represented by the President of the Physical-Technical Federal Institute, Brunswick, Fed. Rep. of Germany
Filed May 16, 1988, Ser. No. 194,239
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716249; Oct. 30, 1987, 3736805
Int. Cl.[5] G01P *3/36;* H01L *31/14*
U.S. Cl. 356—28.5 18 Claims



1. A device for measuring the speed of light-scattering objects comprising:
(a) a laser diode array having a plurality of laser diodes arranged on a common substrate spaced apart from one another by predetermined separations, said laser diodes emitting light having an intensity distribution;
(b) an optical system focusing said light from said laser diodes to a measurement region through which said light-scattering objects pass;
(c) said laser diode array and optical system producing a real spatially periodic intensity distribution at said measurement region by imaging said intensity distribution of said emitted light of said laser diodes; and
(d) output means, including at least one detector positioned for receiving light scattered from said light-scattering objects passing through said measurement region, for evaluating the frequencies of said scattered light to produce an output proportional to said speed of said light-scattering objects.

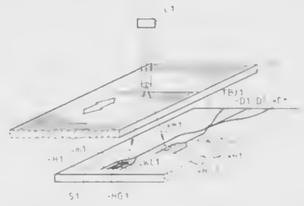
4,923,299
OPTICALLY DIFFERENTIATING AND ADDING PASSIVE RING LASER GYROSCOPE
Dana Z. Anderson, and Nicholas Sampas, both of Boulder, Colo., assignors to University of Colorado Foundation, Inc., Boulder, Colo.
Filed Aug. 9, 1988, Ser. No. 230,020
Int. Cl.[5] G01C *19/64*
U.S. Cl. 356—350 10 Claims



1. An improved passive ring laser gyroscope, having an external source of coherent radiation, comprising:
an optical splitter which receives said coherent radiation to produce counter-propagating radiation components;
means for frequency shifting said radiation components in a manner dependant upon their direction of propagation;
means for phase modulating said frequency shifted radiation components;
a resonator cavity for receiving said frequency shifted and phase modulated, counter-propagating radiation components; and
said optical splitter receiving said frequency shifted and phase modulated, counter-propagating radiation components from said resonator cavity and optically adding and subtracting said radiation components to create a modulated, common mode error optical signal and a modulated, differential mode error optical signal.

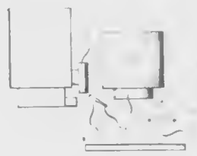
4,923,300
DEFRACTION PHOTOELECTRIC POSITION MEASURING SYSTEM
Dieter Michel, Traunstein, Fed. Rep. of Germany; Olivier Parriaux, Lausanne, and Guy Voirin, Neuchatel, both of Switzerland, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany
Filed Feb. 18, 1988, Ser. No. 161,455
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705653
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—356 13 Claims

1. In a photoelectric position measuring system for measuring the relative position of two objects, of the type comprising: a light emitting radiation source which defines a beam direction; at least one diffraction grating shiftable transversely to the beam direction for generating at least two refracted component beams; two optical waveguides; two coupling-in elements configured to introduce the component beams into the waveguides; a coupler having at least two inputs and at least one output, each of said coupler inputs configured to receive a respective one of the component beams from the associated waveguide to bring the component beams into interference, and at least one detector responsive to an optical signal on the



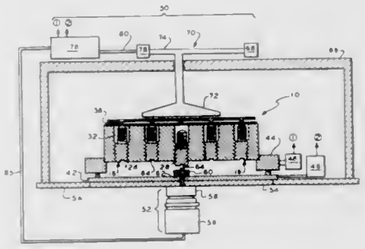
output of the coupler to produce at least one electrical signal; the improvement comprising:
at least two coupling-in gratings, each included in a respective one of the coupling-in elements to introduce the respective component beam into the associated waveguide, wherein said coupling-in gratings are each characterized by a respective grid constant, and wherein said grid constants differ from one another.

4,923,301
ALIGNMENT OF LITHOGRAPHIC SYSTEM
Donald L. White, Springfield, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.
Filed May 26, 1988, Ser. No. 199,106
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—356 20 Claims



1. A method for fabricating a device formed from a device substrate, said substrate including an alignment mark and a radiation sensitive material comprising the steps of (1) positioning said substate for lithographic exposure by employing said alignment mark, (2) exposing said substrate to said radiation through a mask or reticle and through a focussing means to delineate a pattern in said radiation sensitive material, and (3) progressing towards the completion of said device by employing said delineated pattern characterized in that said alignment mark is capable of diffracting light and said alignment is accomplished by (A) intersecting at least two beams of said light at said mark wherein said intersecting beams and said alignment mark are such that an interference pattern is formed that is diffracted from said mark and such that siad beams are directed to avoid passing through said focussing means and (B) positioning said substrate based on an optical characteristic of said diffracted light.

4,923,302
METHOD AND APPARATUS FOR CALIBRATING DEFORMABLE MIRRORS HAVING REPLACEABLE ACTUATORS
Mark A. Ealey, Ayer, and Victor G. Salemme, Concord, both of Mass., assignors to Litton Systems, Inc., Lexington, Mass.
Filed Feb. 2, 1989, Ser. No. 305,671
Int. Cl.[5] G01B *21/20*
U.S. Cl. 356—371 20 Claims

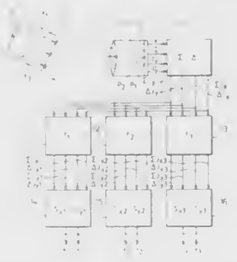


1. An apparatus for adjusting force applied by replaceable actuators against the reflecting surface of a deformable mirror, said deformable mirror having a base with a plurality of threaded apertures for receiving said replaceable actuators, each of said actuators having a threaded portion to permit said actuators to be threaded into the threaded apertures in said base, said deformable mirror having a flat reflecting surface located above said base for reflecting optical signals therefrom, said apparatus including:
(a) an optical displacement sensor supported above the reflecting surface of said deformable mirror, said optical displacement sensor being capable of measuring the displacement between said reflecting surface and said optical displacement sensor for positions on said reflecting surface;
(b) means for supporting said deformable mirror beneath said optical displacement sensor and for moving said deformable mirror in a plane beneath said optical displacement sensor;
(c) means for selectively adjusting the positions of said actuators in said apertures;
(d) coupling means for selectively coupling said adjusting means to selected ones of said actuators; and
(e) control means connected to said optical displacement sensor, to said coupling means and to said adjusting means, said control means selectively engaging said adjusting means through said coupling means to selected ones of said actuators to move said actuators in said apertures to effect a change in the distance between the reflecting surface of said deformable mirror and said optical displacement sensor;
whereby, the force applied by the actuators against the reflecting surface may be adjusted to control the shape of the reflecting surface of the deformable mirror.

4,923,303
MEASURING DEVICE FOR LOCATION AND ATTITUDE DETERMINATION OF AN OBJECT
Reinhold Lutz, Bernhaupten, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm Gmbh, München, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 19,034, Feb. 26, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,265
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606399
Int. Cl.[5] G01S *1/70;* G05D *3/14*
U.S. Cl. 356—375 3 Claims

1. A measuring device for the location and attitude determi-

nation of an object, comprising a plurality of light sources disposed on the object, optical means for reproducing the object with the light sources on a position-sensitive detector, the position-sensitive detector comprising two electrode pairs which define a coordinate system on the detector surface and



generating partial electric currents, each of the plurality of light sources being intensity-modulated with a different code frequency, and evaluating means for computing simultaneously the image coordinates of the light sources from the partial electric currents of the position-sensitive detector using a frequency multiplexing process.

4,923,304

APPARATUS FOR DISPENSING A BLENDED COMPOSITION OF PARTICULATE INGREDIENTS

Miles N. Jackson; Peter J. Rogers, and Brenda L. Watson, all of Cobourg, Canada, assignors to General Foods Inc., Don Mills, Canada

Filed May 9, 1986, Ser. No. 861,478
Int. Cl.[5] B01F *5/24, 15/02*
U.S. Cl. 366—184 **9 Claims**



1. Apparatus for dispensing a blended composition of particulate ingredients, comprising:

a bin section for holding a supply of the blended composition, and having an inlet for receiving the composition and an outlet for discharging the composition from the bin section;

a cone section located below the bin section, and including:

(i) an outer cone connected to and extending downward from the bin section, and having a first conical, annularly closed and downwardly inwardly sloping interior surface, and

(ii) an inner cone supported within the outer cone, and having a second conical, annularly closed and downwardly sloping interior surface to conduct downward a first portion of the composition discharged from the bin section,

the inner and outer cones forming an outer annulus therebetween to conduct downward a second portion of the composition discharged from the bin section; and

an outlet section located below and connected to the cone section to receive the first and second portions of the composition therefrom, and to conduct said first and second portions from the dispensing apparatus, and including

a conical plug extending below the inner cone, and having a conical, annularly closed and downwardly outwardly sloping exterior surface to retard the flow of said first portion of the composition through the inner cone, and to deflect outward said first portion of the composition to mix said first portion with said second portion of the composition.

4,923,305

WATER BATH SHAKER

Alexander Hawrylenko, Bottmingen, Switzerland, assignor to Infors GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,469
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3727010
Int. Cl.[5] B01F *11/00*
U.S. Cl. 366—349 **12 Claims**



1. A water bath shaker apparatus comprising a drive means for generating a shaking motion including a drive shaft means, a tub means for accommodating water of the water bath, a shelf means disposed in the water bath for securing a container means for accommodating a liquid to be shaken, said tub means comprising a filling zone for accommodating the water bath in the form of a closed ring with a central passage for accommodating the drive shaft means of the drive means, and wherein the shelf means is configured essentially as a circular ring mounted at an upper end of the drive shaft means and is driven by the drive shaft means is such a manner that the shelf means is subject to a rotating motion about an axis of symmetry of the shelf means and a shaking motion about an axis parallel to and spaced from the axis of symmetry.

4,923,306

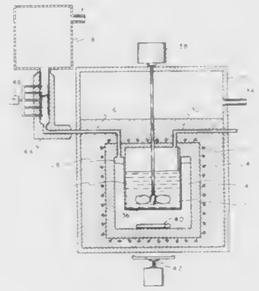
STABLE ISOTHERMAL CALORIMETER

Hans K. Fauske, Hinsdale, Ill., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 1,302, Jan. 8, 1987, abandoned. This application Aug. 3, 1989, Ser. No. 391,622
Int. Cl.[5] G01N *25/48;* G01K *17/02*
U.S. Cl. 374—34 **8 Claims**

1. An apparatus for making measurements used to calculate the energy release rate at various temperatures of an exothermic reaction undergone by reactants under study, said apparatus comprising, in combination, a reactor vessel for containing a quantity of reactants to be studied, a boiling liquid jacket surrounding said reactor vessel and being in intimate heat exchange relation therewith, means permitting introduction of

reactants into, and removal of reactants from, said vessel without removing said reactor vessel from said boiling liquid jacket said jacket containing a quantity of a heat transfer liquid, said liquid having a boiling point which varies in a known manner in relation to variations in pressure, said liquid subdividing said jacket into a subsurface portion and a headspace portion, means for controlling vapor pessure in said headspace portion, a condenser unit having an inlet portion, an outlet portion, and a liquid accumulation area between said inlet portion and said outlet portion, means providing an open path of communication between said condenser inlet portion and said headspace portion above said heat transfer liquid, and means providing an open path of communication between said condenser outlet portion and said means for controlling said vapor pressure in



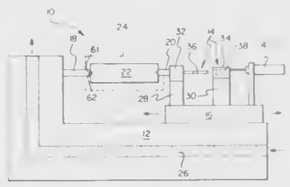
said headspace, means associated with said condenser for permitting observation of the volume of liquid condensed in said condenser accumulation area, means for maintaining said heat transfer liquid at a uniform temperature, and means for minimizing heat losses from said boiling liquid jacket, whereby, when said reactants undergo said exothermic reaction at a given temperature, the heat released by said reaction is used in evaporating a quantity of said heat transfer liquid, and whereby observing the rate of liquid accumulation in said condenser liquid accumulation area the energy release rate of said reactor contents at said given temperature may be ascertained, and whereby observing said liquid volume changes after varying the boiling point of said heat transfer liquid permits a determination of the variation of said energy release rate of said reactants at various temperatures.

4,923,307

DILATOMETER

James F. Gilmore, Rochester, and Carl A. Lloyd, East Bloomfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1989, Ser. No. 301,210
Int. Cl.[5] G01N *25/16*
U.S. Cl. 374—55 **19 Claims**



1. An improved dilatometer suitable for determining the coefficient of thermal expansion (CTE) of a workpiece, said workpiece having a dimension bounded by two points and having a CTE in the range of -0.2×10^{-6} inch/inch °F. to $+0.2\times10^{-6}$ inch/inch °F., said dilatometer comprising:

means, including an insulated enclosure, for imparting a controlled temperature differential ΔT to the workpiece when the workpiece is received in said enclosure;

a reference structure comprising a high thermal conductivity, low CTE material; means for maintaining said reference structure at a constant uniform reference temperature;

a transducer, wholly located outside of said insulated enclosure and including a movable member, and means for converting movement of said movable member into a change in length parameter ΔL; means mounting said transducer to said reference structure; and

means, including oppositely directed first and second members each located substantially outside of said enclosure and each comprising a low thermal conductivity, very low CTE material, for respectively connecting one point of the workpiece to said reference structure and the other point of the workpiece to said movable member, so that changes in the dimension of the workpiece caused by said temperature differential ΔT will be converted into said change in length parameter ΔL.

16. A method for determining the coefficient of thermal expansion (CTE) of a workpiece, said workpiece having a dimension bounded by two points and having a CTE in the range of -0.2×10^{-6} inch/inch °F. to $+0.2\times10^{-6}$ inch/inch °F., said method comprising:

placing the workpiece within an insulated enclosure;

connecting one point of the workpiece by means of a first member to a reference structure of high thermal conductivity, low CTE material and connecting the other point of the workpiece by means of an oppositely directed second member to a movable member of a transducer assembly which converts movement of said movable member into a change in length parameter ΔL; with said first and second members being of low thermal conductivity, very low CTE materials and being located substantially outside of said enclosure, and said transducer assembly being located wholly outside of said enclosure;

maintaining the reference structure at a constant uniform reference temperature;

imparting a controlled temperature differential ΔT to the workpiece received in said enclosure;

monitoring the temperature differential ΔT; and

determining the coefficient of thermal expansion of the workpiece from the parameter ΔL and the monitored temperature differential ΔT.

4,923,308

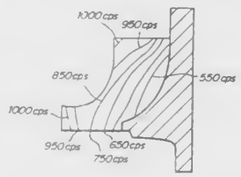
PROCESS FOR DETERMINING THE DISTRIBUTION OF TEMPERATURES AT SURFACES OF HIGH TEMPERATURE MEMBERS

Keiichiro Watanabe, Nagoya; Tadaaki Matsuhisa, Kasugai, and Hiroaki Sakai, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 6, 1989, Ser. No. 334,133
Claims priority, application Japan, Apr. 13, 1988, 63-90915
Int. Cl.[5] G01K *11/00*
U.S. Cl. 374—137 **3 Claims**

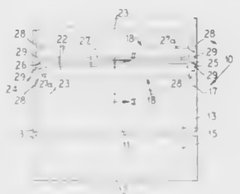
1. A process for determining a relative temperature distribution at a surface of a high temperature member used in a gas containing oxygen at high temperatures, said process comprising the step of determining the relative temperature distribu-

tion at the surface of the member by measuring concentrations of oxygen at the surface of the member, said member being



composed of silicon carbide or being coated with silicon nitride or silicon carbide at least at a surface portion thereof.

4,923,309
TAMPER-EVIDENT PACKAGE
Donald L. VanErden, Wildwood, Ill., assignor to Illinois Tool Works, Glenview, Ill.
Filed Feb. 27, 1989, Ser. No. 315,801
Int. Cl.[5] B65D *33/16, 33/34*
U.S. Cl. 383—5 **5 Claims**

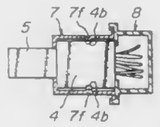


1. A package having opposed wall panels secured together and defining a receptacle space therebetween, and comprising:
- a package mouth defined between upper end portions of said wall panels and which extend between opposite sides of the package;
- a one-time openable non-reclosable peel seal closure means extending in a relatively narrow band from side-to-side of the package and securing said panels together substantially below the upper ends of said upper end portions and initially maintaining said mouth fixedly closed;
- reclosable fastener means comprising a plastic extruded profile zipper assembly extending from side-to-side of the package and located below said upper ends of said upper end portions, but above said peel seal closure means and functioning for maintaining said mouth closed after said non-reclosable peel seal closure means has been opened;
- said zipper assembly having spot seals at said opposite sides of the package;
- said zipper assembly being reclosable by digital pressure applied theretoward on the outer faces of the wall panel areas, and being adapted to be manually pulled open and reclosed for selectively opening and closing said mouth; and
- pilfer/tamper evident means securing said upper end portions against separation and comprising a permanent connection extending from side-to-side of the top ends of said upper end portions, and a line of weakening extending throughout most of its length parallel to and adjacent to said connection requiring permanent destruction of said pilfer/tamper evident means by tearing off of a top end strip comprised of said upper end portions when it is desired to gain access into the package;

said lines of weakening turning downwardly at their ends to the side edges of said package and across said spot seals;

so that after said pilfer/tamper evident means has been destroyed, said fastener means can be opened, if closed, responsive to digital pullapart force applied to said upper end portions of the wall panels for gaining access to said non-reclosable peel seal closure means, and said nonreclosable peel seal closure means being openable by continuing pullapart force applied to said upper end portions of said wall panels, after said fastener means has been pulled open, for gaining complete access into said receptacle space, and said fastener means being thereafter reclosably closable as the sole closure for the package mouth.

4,923,310
DISTRIBUTING CONNECTOR
Yoshichika Sekiguchi, Mooka, and Hideaki Kodama, Sagamihara, both of Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha and Iwatsu Electrical Co., Ltd., both of, Japan
Filed Jul. 20, 1989, Ser. No. 383,195
Claims priority, application Japan, Jul. 27, 1988, 63-98394[U]
Int. Cl.[5] H01R *13/502*
U.S. Cl. 439—701 **8 Claims**

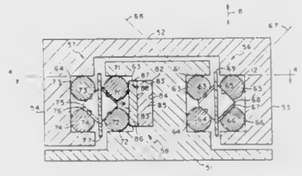


1. A distribution connector including a collective receptacle having a plurality of unit receptacle connectors, and plug connectors to be fitted in the unit receptacle connectors, respectively, comprising a plug connector receiving cover having a U-shaped cross-section forming a plug connector base receiving portion for receiving bases of the plug connectors and having plug connector positioning openings for receiving fitting portions of the plug connectors arranged correspondingly to the unit receptacle connectors of the collective receptacle and back cover mounting ribs along outer edges of an opening of the U-shaped cover, and a back cover including a wire receiving portion having a U-shaped cross-section, back cover mounting rib receiving grooves along outer edges of an opening of the U-shaped back cover for receiving said back cover mounting ribs of the plug connector receiving cover and plug connector retaining ribs along inner edges of said opening of the U-shaped back cover, inserting the plug connectors into the plug connector receiving cover, fitting said back cover mounting ribs of the plug connector receiving cover in the back cover mounting rib receiving grooves of said back cover to embrace the bases of the plug connectors by means of edges of said plug connector positioning openings and the plug connector retaining ribs, thereby aligning and fixing the plug connectors.

4,923,311
PRELOADED SLIDE BEARING SUPPORT APPARATUS
Henry L. Gibbs, 273 Union St., Millis, Mass. 02054, and Allan E. MacNicol, P.O. Box 104, Sherborn, Mass. 01770
Filed Feb. 28, 1989, Ser. No. 316,827
Int. Cl.[5] F16C *29/04, 29/12*
U.S. Cl. 384—49 **16 Claims**

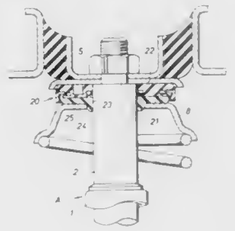
1. A slide bearing support apparatus including one member slidable in a given direction relative to another member, the combination comprising:
- a pair of parallel slide bearing assemblies disposed between said members and each comprising:

raceway means defining a travel path in the given direction;
- an elongated retainer means disposed in said raceway;
- a plurality of rollers disposed in said retainer means and supported by said raceway means, said raceway means adapted to guide movement of said one member on said rollers along said travel path; and
- preload means for producing between said raceways and



said rollers preload forces directed transverse to said travel path; said preload means comprising an elongated block of resilient material retained under compression between one of said members and at least one of said raceways and extending substantially parallel to and coextensive with said at least one said raceway, said resilient material having a hardness in a range measurable by a Type A durometer.

4,923,312
THRUST BEARING MADE OF SYNTHETIC RESIN
Hiroto Kamimura, Fujisawa; Shuichi Kubota, Yokohama, and Masaru Iwakura, Ayase, all of Japan, assignors to Oiles Corporation, Tokyo, Japan
Division of Ser. No. 89,127, Aug. 25, 1987, Pat. No. 4,854,745.
This application Jun. 7, 1989, Ser. No. 362,815
Int. Cl.[5] F16C *17/04, 33/74*
U.S. Cl. 384—420 **3 Claims**



1. A thrust bearing for use with an automobile thrust-strut type suspension having a strut incorporating a shock absorber, a piston rod inserted in the shock absorber, a mounting member for supporting the piston rod to the automobile body, and an upper spring seat loosely engaging the piston rod, the mounting member and the upper spring seat having opposed, substantially planar surfaces offset from each other and defining an annular space between them, said bearing being adapted to be received in the annular space between the upper spring seat and the mounting member and adapted to receive the piston rod therethrough, said bearing comprising:
- a lower casing made of synthetic resin and having a longitudinal axis, said lower casing including:
- a cylindrical portion having a substantially planar upper surface, a lower surface, an outer circumferential surface, a penetration aperture of circular cross-section coaxial with said longitudinal axis of said lower casing, and an annular inner lower lip portion extending upwardly from said upper surface adjacent and offset stepwise from said penetration aperture, said penetration aperture being adapted to receive the piston rod of the suspension therein, said inner lower lip defining a cylindrical aperture having a diameter slightly greater than that of said penetration aperture, and said inner lower lip portion having a distal end offset from said upper surface of said cylindrical portion; and
- a collar portion extending outwardly from and formed integrally with said outer circumferential surface of said cylindrical portion, said collar portion having substantially planar upper and lower surfaces and an outer circumferential surface, said lower surface of said collar portion being substantially offset from said lower surface of said cylindrical portion and adapted to matingly engage the upper surface of the upper spring seat of the suspension, and said collar portion including an annular protruded portion extending upwardly from said upper surface of said collar portion and formed integrally with said outer circumferential surface of said collar portion, said protruded portion having an outer circumferential surface and an outwardly extending engaging portion formed on said outer circumferential surface of said protruded portion, and said collar portion further including an annular outer lower lip portion extending upwardly from said upper surface of said collar portion coaxial with said longitudinal axis of said lower casing and defining an inner annular groove in cooperation with said inner lower lip portion and an outer annular groove with said protruded portion, said outer lower lip portion having a distal end offset from said upper surface of said collar portion, and said inner annular groove having a bottom surface;
- said inner annular lower lip portion having an outer diameter "d1" and said outer annular lower lip portion having an inner diameter "d2", respectively, "d1" being smaller than "d2"; and
- a bearing body made of synthetic resin and having a longitudinal axis, said bearing body comprising a disk-like portion having substantially planar upper and lower surfaces, an outer circumferential edge, a circular aperture formed at the center thereof coaxial with said longitudinal axis of said bearing body and defining an inner circumferential edge, an annular inner upper lip portion extending downwardly from said lower surface of said disk-like portion and formed integrally with said inner circumferential edge of said disk-like portion, an annular outer upper lip portion extending downwardly from said lower surface of said disk-like portion coaxial with said longitudinal axis of said bearing body, an annular suspended portion extending downwardly from said lower surface of said disk-like portion and formed integrally with said outer circumferential edge of said disk-like portion, an annular bearing portion extending downwardly from said lower surface of said disk-like portion and having a lower surface and an inner diameter greater than "d1" and an outer diameter less than "d2", said upper surface of said disk-like portion being adapted to matingly engage the lower surface of the mounting member of the suspension, said circular aperture being adapted to receive the piston rod of the suspension therein, said inner and outer upper annular lip portions each having a distal end offset from said lower surface of said disk-like portion, said suspended portion having a distal end offset from said lower surface of said disk-like portion and an engaging hook portion formed at said distal end for cooperation with said engaging portion of said protruded portion, said lower surface of said bearing portion being adapted to matingly engage said bottom surface of said collar portion within said inner annular groove; and
- said hook portion of said suspended portion of said bearing body being snap-fitted with said engaging portion of said protruded portion of said lower casing to define a snap-fit portion, whereby said bearing body is fitted rotatably to said casing, said distal ends of said inner and outer upper lip portions being overlapped radially with said distal ends of said inner and outer lower lip portions, respectively, to define inner and outer overlapped portions, respectively,

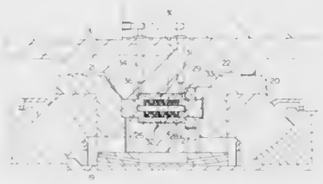
and said lower surface of said bearing portion being slidably abutted against said bottom surface of said inner annular groove, whereby tight seals are formed at said snap-fit portion and said inner and outer overlapped portions.

4,923,313

DEVICE IN ROLLING BEARINGS

Gunnar Bergling, Partille, Sweden, assignor to Aktiebolaget SKF, Sweden

Filed May 1, 1989, Ser. No. 345,766
Claims priority, application Sweden, May 3, 1988, 8801655
Int. Cl.[5] F16C *33/58, 23/06, 19/10*
U.S. Cl. 384—571 **9 Claims**



1 A device for supporting axial and radial loads in rolling bearings comprising two bearing (**10, 11**.) mounted in pairs for rotatable supporting a shaft (**12**) in a housing (**13**), said bearings (**10,11**) being arranged with contact lines (**14,15**) converging or diverging relative to the axis of the shaft, the outer race rings (**17,18**) of the bearings (**10,11**) being mounted in sleeves (**19,20**) which are axially and radially moveable to a predetermine limited degree relative to the housing (**13**), said sleeves (**19,20**) having tapering contact surfaces (**21,22**) which cooperate with corresponding surfaces (**23,24**) of housing (**13**).

4,923,314

THESAURUS FEATURE FOR ELECTRONIC TYPEWRITERS

Raymond A. Blanchard, Jr., Dryden, and Richard E. Roberts, Cortland, both of N.Y., assignors to Smith Corona Corporation, Del.

Filed Jan. 6, 1988, Ser. No. 141,247
Int. Cl.[5] B41J *5/30*
U.S. Cl. 400—63 **10 Claims**



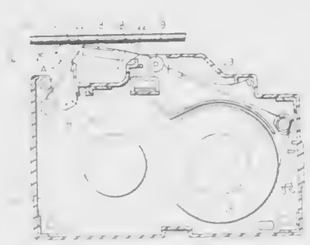
1 A thesaurus feature for an electronic typewriter having an electronic spelling dictionary memory and an electronic thesaurus memory, said typewriter including a keyboard for transmitting character signals to said spelling dictionary memory and said electronic thesaurus memory, said spelling dictionary memory and said electronic thesaurus memory each having a data base stored therein and control signals stored in another electronic memory, a plurality of words are stored in a data base in said spelling dictionary memory and each of said words including a special code character immediately following each word which also appears in the data base of said thesaurus memory, the data base being stored in the said thesaurus memory being words for serial access as lists of words that are synonymous with each other with the lists including a separator code identifying the part of the speech of the synonyms, word separator codes and list separator codes, means including said keyboard for inputting an input word for which synonyms are desired, means governed by said keyboard for initiating a thesaurus operation, scanning means for scanning the data base of said thesaurus memory, means for retrieving said words from said data base by matching the input word, whereby the presence of synonyms for said input word is determined by the position of the list, word and part of speech code, and display means for sequentially displaying any synonyms found for said input words.

4,923,315

PRINTER WITH PRINT HEAD RELEASABLE AFTER PREDETERMINED AMOUNT OF SUCCESSIVE PRINTING OR ERASING

Koshiro Yamaguchi; Toshio Takabashi; Yasunori Kitazawa, and Hiroshi Hattori, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 25, 1988, Ser. No. 198,313
Claims priority, application Japan, May 29, 1987, 62-135380
Int. Cl.[5] B41J *3/20*
U.S Cl. 400—120 **3 Claims**



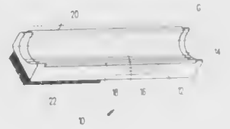
1. In a printer including:
a carriage adapted to be moved along a platen;
a print head mounted in said carriage;
a supply spool idly rotatably mounted in said carriage for feeding an ink ribbon such that said ink ribbon is nipped between said print head and a print paper mounted on said platen during movement of said print head; and 'a take-up spool rotatably mounted in said carriage for taking up said ink ribbon; wherein said print head is adapted to be pressed against or released from said ink ribbon, and a print operation or an erase operation is performed by moving said print head along said platen maintained in press contact with said ink ribbon while energizing said printhead;
the improvement comprising control means for preventing meandering of the ink ribbon relative to the printhead by temporarily interrupting the printing or erasing of characters within a line thereof by temporarily releasing said print head from said ink ribbon at predetermined intervals corresponding to a plurality of characters to be printed or erased, whereby an adjustment of said ink ribbon may be effected;
said control means comprising;
counter means for counting an amount of successive printing or erasing operations with the print head held in said press contact, said counter means being cleared when said print head is released from said ink ribbon;
reference value memory means for storing a reference value;
comparator means for comparing an amount counted by said counter means with said reference value; and
release command output means for outputting a command of releasing the press contact of said print head when it is detected by said comparator means that the amount counted by said counter means reaches said reference value.

4,923,316

GOLF CLUB CLEANING DEVICE

Gregory M. Fattal, 11310 Burlington, #457, Southgate, Mich. 48195

Filed Mar. 8, 1989, Ser. No. 320,612
Int. Cl.[5] A46B *15/00, 11/00*
U.S. Cl. 401—11 **3 Claims**



1. A golf club cleaning device, comprising:
an elongated generally rectangular base;
a concave recess extending along one face of said base, said recess dimensioned to partially surround a golf club grip;
a layer of sponge rubber lining said recess;
a layer of emery cloth secured to said sponge rubber;
a plurality of bristles extending along an opposite face of said base, forming a cleaning brush;
an elongated groove dimensioned to partially surround a golf club shaft extending along a side wall of said base, a soft fabric material lining said groove;
a cleaning fluid receptacle formed in said base; and
a stiff wire brush formed on an end face of said base.

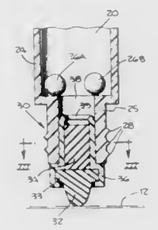
4,923,317

BRUSHLESS WHITE-OUT CORRECTING FLUID APPLICATOR

Willis E. Bishop, Diamond Bar; Ghanshyam H. Popat, Alta Loma; Chen Tien-Tsung, Claremont, and Mannel W. Ruiz, Carmel Valley, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 21,457, Mar. 4, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 314,631
Int. Cl.[5] B43K *8/02*
U.S. Cl. 401—205 **18 Claims**

18. A brushless white-out type fluid applicator comprising:
an elongated applicator housing;
correction fluid or suspension within said applicator housing, said correction fluid including a substantial proportion at least 30 percent by weight of particulate material of a predetermined range of sizes, with the upper end of said range comprising particles of a predetermined maximum diameter;
a porous plastic tip means having a wear-resistant surface and sized generally for applying said correction fluid to a single letter or line of print on paper, said porous plastic tip having a thickness greater than one-thirty-second of an inch; said porous plastic tip means having pores and channels therein;
regulator means between said tip means and said reservoir for controlling the flow of fluid and for preventing dripping;
the pores or channels in said tip means and the maximum flow control opening or openings of said flow regulator means having a cross-section at least slightly greater than said maximum diameter of said particles, whereby clogging of said regulator means and said tip means is prevented; and
said regulator means being formed of foam material in substantial engagement with said porous plastic.

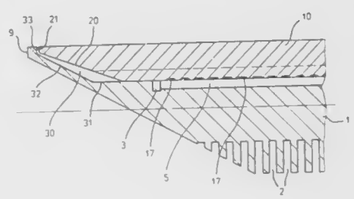


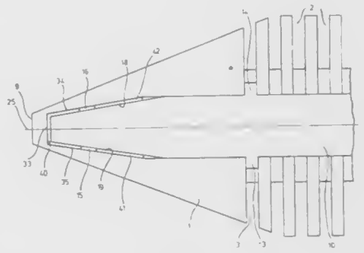
4,923,318

INK FEED FOR A FOUNTAIN PEN

Thomas Rohringer, and Horst Schrage, both of Hamburg, Fed. Rep. of Germany, assignors to Montblanc-Simplo GmbH, Hamburg, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,102
Claims priority, applicatioo Fed. Rep. of Germany, Oct. 31, 1987, 3736954
Int. Cl.[5] B43K *5/18*
U.S. Cl. 401—225 **20 Claims**





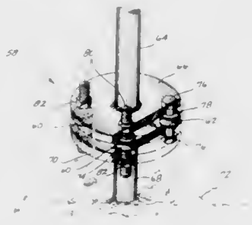
1. An ink feed for a fountain pen comprising:
a main body having a forward end and a rearward end, the forward end having a nib support surface, and the rear-

ward end adapted for connection to an ink reservoir of the fountain pen, the main body portion further provided with a plurality of ink holding chambers located intermediate the forward and rearward ends, and an axially extending groove extending between the forward and rearward ends;

an inset receivable within said groove and configured such that an axially extending air channel and at least one axially extending capillary ink feed channel are formed between the insert and a base of the groove;

wherein the forward end of the main body and a forward end of the insert cooperate to form an ink reserve and an ink exit slit, said ink reserve being substantially covered by said inset and connected to the ink exit slit at a first end thereof, and to said at least one capillary ink feed channel at a second end thereof, such that said ink exit slit and said at least one capillary ink feed channel are connected only through said reserve, and wherein said axially extending air channel is spaced from said reserve.

4,923,319
BREAKAWAY CONNECTOR
Clifford M. Dent, P.O. Box 1119, Kenai, Ak. 99611-1119
Filed Jun. 22, 1989, Ser. No. 370,402
Int. Cl.[5] F16D *9/00*
U.S. Cl. 403—2 **7 Claims**



1. A breakaway connector for attaching a support member to an anchor member, the connector comprising:

a first end adapter to be attached to the support member;

a second end adapter to be attached to the anchor member;

a breakaway shank positioned between and connected to said first and second ends, said breakaway shank having a single performed stress point such that, when said connector is subjected to a predetermined lateral load, said connector will break only at said single performed stress point, said breakaway shank further including a circumscribing flange formed thereon at the intersection of said first end and said breakaway shank, and at the intersection of said second end and said breakaway shank.

4,923,320
DISENGAGEABLE COUPLING
Ditmar Klischat, Velbert, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH
Filed Jun. 20, 1988, Ser. No. 209,413
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720281
Int. Cl.[5] F16D *1/06*
U.S. Cl. 403—5 **10 Claims**

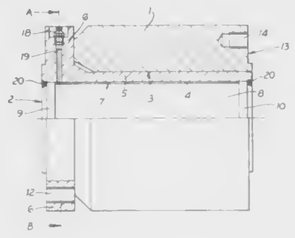
1. A coupling, comprising:

a first coupling part affording a first cylindrical bore;

a second coupling part comprising a sleeve insertable in the first bore, the sleeve having a cylindrical outer surface and affording a second bore, the second coupling part also having a driving flange at one end of the sleeve;

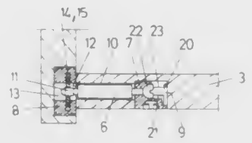
an insert within the second bore having an external surface spaced from the internal surface of the second bore and spaced collar formations extending outwardly from said external surface and sealed to the internal surface to define therewith and with said external surface a space for the reception of hydraulic fluid;

radially extending channel means in the flange communicating with said space; and



means associated with said channel means for filling said space with hydraulic fluid, for pressurizing the fluid to expand the sleeve into frictional driving engagement with the first bore and for releasing the hydraulic pressure in said space.

4,923,321
FURNITURE CONNECTOR
Ulrich Kriz, Hard, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria
Filed Feb. 6, 1989, Ser. No. 306,750
Claims priority, application Austria, Feb. 9, 1988, 271/88
Int. Cl.[5] F16B *12/20*
U.S. Cl. 403—6 **5 Claims**



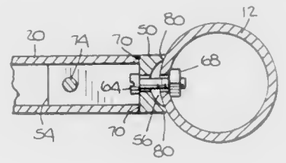
1. In a fitting for releasably connecting two plate-shaped furniture parts meeting at a right angle, said fitting including a bolt anchorable in a first furniture part by a cylindrical dowel casing and having a head acted on by an eccentric bushing to be mounted in a second furniture part, the improvement comprising:

a disc member connected to said bolt and mounted in said dowel casing for displacement relative thereto in a plane extending transversely of the longitudinal axis of said bolt; and

said dowel casing having in a side thereof to be directed toward the second furniture part an opening of a size greater than the diameter of that portion of said bolt extending into said dowel casing.

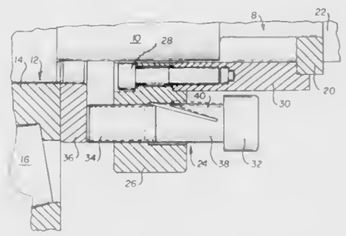
4,923,322
CLAMPED FRAMEWORK ASSEMBLY AND CONNECTORS USED THEREWITH
Robert J. Burg, Hartsdale, N.Y., assignor to Uni Corp., Bronx, N.Y.
Filed Mar. 8, 1989, Ser. No. 320,522
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—190 **14 Claims**

1. A connector assembly comprising a first elongated tubular member having a curved outer surface, a connector connecting together an end of a second elongated tubular member and said curved outer surface of said first elongated tubular member, said connector comprising a block having a first surface formed with a concavity which extends along a line and opens at its opposite ends to upper and lower surfaces of said block, said block being formed with a hole which extends therethrough to accommodate a bolt, said hole opening out near the center of said concavity, a bolt extending through said hole and into the curved outer surface of said first elongated tubular



member and securing said block to said first elongated tubular member with said concavity facing, and in alignment with, the curved outer surface of said first elongated tubular member, and a portion of said block away from said concavity being attached to said end of said second elongated tubular member, the edges of said concavity being located near the side edges of the block to form therewith narrow ridges which press tightly against the curved outer surface of said first elongated tubular member.

4,923,323
THREADED TYPE FASTENER
Rolf H. Steinbock, 128 Grienbrier Dr., Carnegie, Pa. 15106
Filed Nov. 14, 1986, Ser. No. 270,226
Int. Cl.[5] B25G *3/00*
U.S. Cl. 403—261 **10 Claims**



1. A thrust collar assembly for securing a bearing to a journal of a shaft, comprising:

a thrust collar arranged concentric to said journal between an adjacent end of said bearing and an axial portion of said shaft,

a first and second group of holes formed in said collar, said groups being arranged on different concentric bolt circles,

a first spacer ring arranged concentric with said shaft between said collar ad said axial portion of said shaft having one of its sides in a force transmitting relation with said axial portion and said collar,

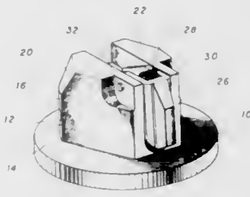
first group of fasteners received in said first group of holes for threadedly engaging one side of said first spacer ring,

means for engaging another side of said first spacer ring with said axial portion,

a second spacer ring arranged between the bearing and an adjacent side of said collar, and

a second group of fasteners being of the torque jack type each received in a different one of said second group of holes of said collar and arranged to have a force transmitting relation with said second spacer ring and hence said bearing.

4,923,324
ZERO CLEARANCE COUPLER FOR CONNECTING A DRIVING MEMBER TO A SPLINED HUB
John M. Favrou, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 3, 1989, Ser. No. 375,308
Int. Cl.[5] B25G *3/28*
U.S. Cl. 403—359 **9 Claims**



1. A mechanical coupler comprising:

a. a planar base having a cylindrical aperture located at the center thereof, the axis of said aperture being perpendicular to said planar base,

b. a member having a yoked section, said member being mounted on said base,

c. a first cylindrical convex surface segment of said member, said surface facing radially outward from said center with the cylindrical axis of said first surface segment perpendicular to said planar base,

d. a second cylindrical convex surface segment of said member, said surface facing radially outward from said center with the cylindrical axis of said second surface segment perpendicular to said planar base, wherein said first and said second surface segments are symmetrically positioned on said member about a line through said center, said line lying in said planar base,

e. a planar lamina, pivotally mounted on said yoked section of said member, wherein the plane of said lamina lies along said line in said base, said plane of said lamina being perpendicular to said base,

f. a spring pivotally urging said lamina along said line in a direction outward from said center, whereby the spring force lies along said line, and

g. means associated with said member adapted for fastening said coupler to an auxiliary drive shaft.

4,923,325
FRICTION FIT KNOB
Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.
Continuation-in-part of Ser. No. 201,969, Jun. 3, 1988, abandoned. This application Apr. 7, 1989, Ser. No. 335,107
Int. Cl.[5] B25G *3/02*
U.S. Cl. 403—361 **7 Claims**

1. A molded knob of the type which frictionally engages and slips over the end of a shafl having an outer surface, at least a portion of which outer surface is curved,

a hub formed as part of said knob,

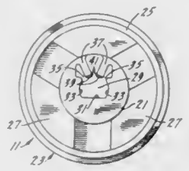
a shaft receiving, axially-extending, walled socket formed in said hub,

said socket having a shaft-receiving portion with a transverse cross-section complimentary to the transverse cross-section of said shaft and having an entrance at one end of said hub to receive said shafl, and

a pair of elongated fingers formed as part of said hub and

located adjacent each other at a curved portion of said socket,

said fingers extending axially into said socket from the entrance thereof and projecting generally radially into the shaft-receiving portion of said socket with each finger terminating in a tip located close to but out of contact with the tip of the other finger,



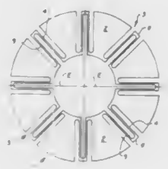
said fingertips extending into said shaft-receiving portion of said socket with each fingertip extending into said socket the greater radial distance on the side of its finger adjacent the other finger than on the side of its finger away from the other finger.

4,923,326

CLAMPING RING FOR CLAMPING A MEMBER ON A SHAFT AND APPARATUS INCORPORATING THE CLAMPING RING

Günter Fietzke, Forest, Va., assignor to Gebr. Hofmann GmbH & Co., Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 308,822
Int. Cl.[5] F16D *1/06*
U.S. Cl. 403—371 20 Claims



1. A clamping ring for clamping a rotating member relative to a drive member comprising:

a ring member having an outer periphery, a hollow interior defining an inner periphery and a plurality of spaced apart segments extending between the inner and outer periphery of the ring member, each of the plurality of segments being separated by generally radially extending gaps with adjacent ones of the segments being interconnected by at least one resilient member disposed in the gaps, each of the segments being movable in a generally radial direction, the inner periphery comprising an inner clamping surface and the outer periphery comprising an outer clamping surface so that the clamping ring is operable by a radially applied force.

4,923,327

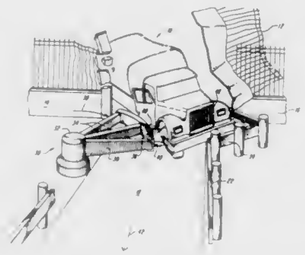
TERRORIST VEHICLE ARRESTING SYSTEM

Alexander M. Gorlov, Brookline, Mass., assignor to Flexible Barricades, Inc., Watertown, Mass.

Division of Ser. No. 128,725, Dec. 4, 1987, Pat. No. 4,818,137.
This application Feb. 13, 1989, Ser. No. 310,735
Int. Cl.[5] E01F *13/00, 15/00*
U.S. Cl. 404—6 2 Claims

1. A method of deflecting a terrorist vehicle so that the terrorist vehicle is prevented from proceeding down a driveway comprising the steps of

removably positioning in the driveway above-ground means for horizontally deflecting an oncoming vehicle away



from its original direction of travel and into an above-ground crash barrier to a side of the driveway opposite the deflecting means and,

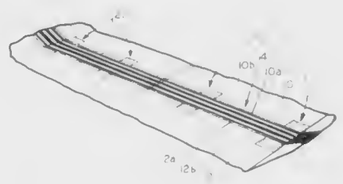
removing the deflecting means from a position in the driveway for normal vehicular traffic.

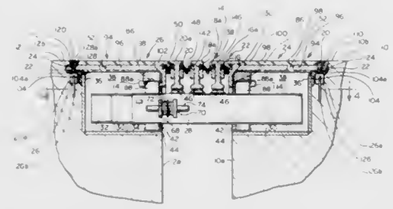
4,923,328

MAINTAINABLE EXPANSION JOINT FOR HIGHWAYS, BRIDGES AND THE LIKE

David H. Arps; Howard R. Brown, both of Bowling Green; Roy J. Lanham, Cygnet, and Donald E. Weiker, Portage, all of Ohio, assignors to The D. S. Brown Company, Inc., North Baltimore, Ohio

Filed Jan. 19, 1989, Ser. No. 300,280
Int. Cl.[5] E01C *11/04*
U.S. Cl. 404—69 55 Claims





1. An expansion joint for use between spaced apart ends of adjacent sections of a structure which a vehicle is adapted to drive over, the structure having a top driving surface, each of the sections being formed at least in part from a pavement material, said expansion joint being adapted to accommodate changes in spacing between the ends resulting from thermal contraction and expansion and comprising:

first box means adapted to be embedded in the pavement material of the end of one of the sections, said first box means having a first top member with a top surface which is adapted to be substantially coplanar with the top driving surface, first wall means extending downwardly from said first top member into the pavement material of the end of the one of the sections, and first fastening means arranged in a generally U-shaped pattern extending in a generally horizontal plane removably fastening said first top member to said first wall means;

second box means adapted to be embedded in the pavement material of the end of the other of the sections in substantial longitudinal alignment with said first box means, said second box means having a second top member with a top surface which is adapted to be substantially coplanar with the top driving surface, second wall means extending downwardly from said second top member into the pavement material of the other of the sections, and second fastening means arranged in a generally U-shaped pattern extending in a generally horizontal plane removably fastening said second top member to said second wall means;

a support rail extending between said first box means and said second box means, said support rail having a first end within said first box means and a second end within said second box means;

first slidable support means within said first box means slidably supporting said first end of said support rail;

second slidable support means within said second box means slidably supporting said second end of said support rail; and

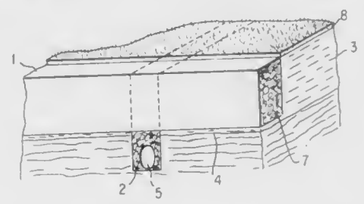
an intermediate rail attached to and supported by said support rail and extending generally transversely thereof, said intermediate rail being adapted to be spaced from the spaced apart ends of the sections and to extend generally parallel thereto, said intermediate rail having a top surface which is adapted to be substantially coplanar with the driving surface.

4,923,329

DRAINING METHOD AND A MACHINE FOR IMPLEMENTING SAME

Jean-Claude Sparfel, Route de Ploulder, 29260 Lesneven, France

Filed Jan. 25, 1989, Ser. No. 301,062
Claims priority, application France, Dec. 28, 1988, 88 17553
Int. Cl.[5] E02B *11/02;* F16L *1/02*
U.S. Cl. 405—36 19 Claims



1. A drainage method for use in the construction or renovation of stabilized grounds, grass-covered grounds and sports grounds comprising the steps of:

levelling and improving a topsoil;

placing said topsoil onto a levelled platform;

forming a network of first surface drainage trenches and second surface drainage trenches of the same width over the whole surface of the ground, wherein said second surface drainage trenches orthogonally cross said first surface drainage trenches;

orienting said second trenches in a direction of slope of said ground;

making said second trenches deeper than said first trenches, wherein the depth of said second trenches substantially correspond to the depth of a base of the layer of said topsoil;

providing said second trenches at their bottom with drains, wherein said drains are positioned below the level of the bottom of said first trenches and communicate with a collector positioned at a side portion of the ground; and

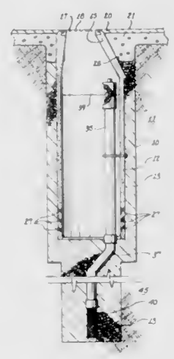
filling the trenches with filtering material.

4,923,330

STORM WATER INJECTION WELL

Stephen C. DeTommaso, 8637 E. Roma, Scottsdale, Ariz. 85251

Filed Dec. 31, 1987, Ser. No. 139,915
Int. Cl.[5] E02B *11/00*
U.S. Cl. 405—36 12 Claims



1. A storm water injection well for receiving water runoff and directing said water through an excavated shaft lined with backfill, comprising:

(a) a settling chamber extending into said shaft and positioned a predetermined distance below grade level, said chamber having an open top;

(b) a manhole entry device positioned on top of said settling chamber and extending to grade level and defining a manhole for admitting storm water;

(c) an overflow pipe extending upwardly into said chamber and terminating an open end thereof a predetermined distance below grade level;

(d) a debris screen mounted to prevent debris from entering the open end of said overflow pipe; and

(e) a debris shield mounted over and covering said open end and extending downwardly along said overflow pipe a predetermined distance to form an annular passageway between the shield and the overflow pipe to permit storm water to flow upwardly through said passageway into said overflow pipe.

4,923,331

COMPOSITE GROUND WATER DRAINABLE SYSTEM

John Kreikemeier, 175 Ranchette Rd., Alpharetta, Ga. 30201

Filed Jun. 3, 1988, Ser. No. 202,147
Int. Cl.[5] E02D *19/18*
U.S. Cl. 405—45 3 Claims

1. A composite drainage and gas venting system for draining below grade ground water and venting radon gas comprising a substantially rectangularly shaped base piece made of a flexible, porous material, said base piece having a top edge and a bottom edge and being longer than it is tall, filter fabric material wrapped around and substantially encasing the base piece, a plurality of chimney assemblies spaced along said base piece and extending substantially perpendicularly thereto, each said chimney assembly being comprised of a narrow elongated

sheet of flexible, corrosive-resistant, porous material and filter fabric wrapped around said narrow elongated sheet for channeling water down to the base piece for drainage; and; a vent



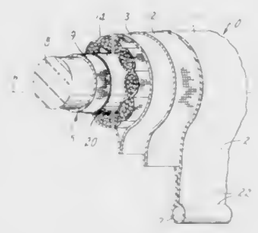
extending from the top of one or more of the chimney assemblies above the surface of the soil placed over the drainage system.

4,923,332

HIGH TEMPERATURE RESISTANT OIL BOOM FLOTATION CORE

Stephen M. Sanocki, Mounds View; Donald D. Johnson, Chisago, and Edward M. Fischer, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 10, 1989, Ser. No. 309,416
Int. Cl.[5] E02B *15/04*
U.S. Cl. 405—63 10 Claims



5. A high temperature resistant oil containment boom comprising an outer layer, a first underlayer of knitted wire mesh, a second underlayer of high temperature resistant refractory fabric covering of heat insulating covering of metal foil surrounding a flotation core including a closed cell foam log covered by a high temperature resistant knitted wire mesh, said outer, first and second layers being secured together at least about their peripheral edges.

4,923,333

LYSIMETER FOR LEAK DETECTION AND METHOD OF ASSEMBLY THEREOF

Robert D. Timmons, S 9061, Meadowdale Rd., Prairie Du Sac, Wis. 53578

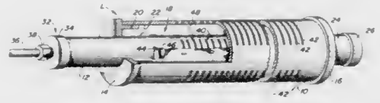
Filed May 12, 1988, Ser. No. 193,062
Int. Cl.[5] E02D *3/00*
U.S. Cl. 405—128 27 Claims

1. A lysimeter, comprising:

(a) a longitudinally extending circumferentially perforated duct means having vacuum application means at one end thereof;

(b) fluid permeable means superposed over the duct means perforations;

(c) a longitudinally extending circumferentially perforated shell extending about at least a portion of said duct means and therewith defining a bounded volume therebetween; and,



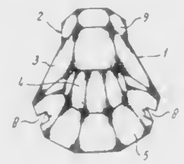
(d) granular filler means substantially filling said bounded volume and said filler means sized so not to be drawn through said fluid permeable means when a vacuum is applied to said duct means.

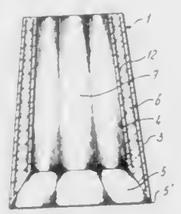
4,923,334

LOST CASING FOR CONSTRUCTING A RIGID STRUCTURE UPON THE BOTTOM OF A BODY OF WATER

Ahmad Masoudi, Pasdaran, Golestan 5, Heravi Sq., Mostafa Vafa Manesh St., After Mozafarian Alley, 16698 Tehran, Iran

Division of Ser. No. 931,665, Nov. 17, 1986. This application Dec. 5, 1988, Ser. No. 279,578
Claims priority, application Iran, Nov. 17, 1985, 26904
Int. Cl.[5] E02B *17/02*; E02D *5/18*; B22C *9/24*
U.S. Cl. 405—203 8 Claims





1. A lost casing for constructing a rigid structure upon the bottom of a body of water, said casing comprising:

inner and outer elongated polygonal walls disposed about a common center, the sides of each wall being formed of flat plates interconnected along their longitudinal edges and having their sides associated so that corresponding angles of the inner and outer walls are located opposite each other, the lower ends of the plates forming the inner and outer walls being interconnected to form a sharp lower edge, said inner and outer walls having a conical shape over at least the lower portion thereof with the casing widest at the lower edge,

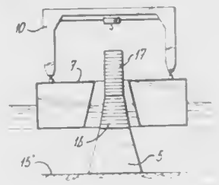
said inner and outer walls defining a hollow space which is open at the top and closed at the bottom whereby, after the sharp lower edge of the casing has been placed upon the bottom of a body of water with the top of the casing extending above the level of the water, reinforcing rods and hardening material such as concrete may be introduced through the open top to fill the hollow space.

4,923,335

PROCESS AND DEVICE FOR THE PRODUCTION OF A MARINE ENGINEERING STRUCTURE, SUCH AS A PIER, JETTY AND THE LIKE

Ahmad Massoudi, Tehran, Iran, assignor to Darya Paye Jetty Co., Ltd., United Kingdom

Filed Mar. 15, 1989, Ser. No. 324,209
Claims priority, application Netherlands, Mar. 17, 1988, 8800664
Int. Cl.[5] E02D *25/00*
U.S. Cl. 405—204 8 Claims



1. Process for producing a marine engineering structure such as a pier, jetty and the like on a water bottom by placing on the water bottom a double-walled hollow column having a base which is broader than the part extending upwardly from it and whose hollow wall is filled with a setting material, such as concrete, during or after the positioning thereof, said column being placed on the water bottom from a floating apparatus having adjustable floating power and providing a platform having a deck substantially entirely designed and equipped as a workshop and a bottom side which allows the platform to be placed on the water bottom, said platform having an opening therethrough which extends from its deck to its bottom side for allowing a column to be lowered via the opening and the platform to be moved away from a completed column, and having means mounted thereon for carrying and lowering a column, said process comprising the steps of:

(1) at the start of production of a column, placing the bottom side of said platform on the water bottom in shallow water of a first depth;

(2) constructing, on the deck of the platform, a first part of a column, such as its base, and displaceably supporting the completed first part beside the opening in the platform;

(3) floating the platform and the completed first part of a column to water having a second depth deeper than said first depth and there removing its support and lowering the completed first part through said opening until it is supported on the bottom of the deeper water, the depth of which is such that the top of the completed first part of the column is accessible from the deck of the platform;

(4) constructing, from the deck of the platform, a further column part on the top of the completed first part of the column;

(5) unless said further part is the last part of the column, connecting the carrying means to the column, regulating the floating power of the platform to lift the column from the water bottom, and floating the platform to yet deeper water and there lowering the already completed part of the column until it is supported on the bottom of the yet deeper water, the depth of which is such that the top of the completed further column part is accessible from the deck of the platform;

(6) repeating steps (4) and (5) until a column of desired height has been constructed, and thereafter connecting the carrying means to the completed bottom-supported column, regulating the floating power of the platform to lift the base of the column from the water bottom, floating the platform to its destination and there lowering and fixing the completed column on the water bottom, and

(7) moving the platform away from the fixed column.

5. Apparatus for manufacturing and setting a column of the bottom of a body of water, said apparatus comprising:

a platform having adjustable floating power, said platform having side edges, an underside adapted to allow the platform to rest on the bottom of a body of water, a top side providing a substantially continuous working deck, and having an opening formed at one side edge thereof which extends from the top side to the bottom side;

equipment means necessary for the manufacture of a column mounted on said working deck;

moveable means disposed at said opening for supporting a first part of a column during manufacture thereof; and

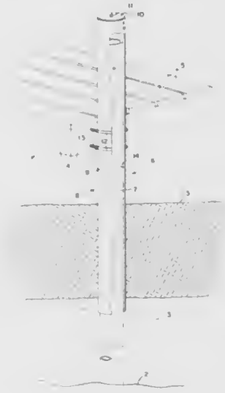
means supported on said platform for carrying and lowering through said opening an already manufactured part of a column.

4,923,336

DOCK SUPPORTING APPARATUS

David A. Schmidt, Bay City, Mich., assignor to Schmidt Industries, Inc., Bay City, Mich.

Filed Jul. 19, 1988, Ser. No. 221,206
Int. Cl.[5] E02B *15/02*
U.S. Cl. 405—216 9 Claims



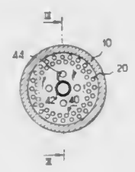
1. Apparatus for supporting a dock or the like above the bottom of a body of water, said apparatus comprising an elongate piling member having one end thereof embedded in said bottom and its other end extending above the surface of said water; an elongate, tubular member in external telescoping relation with said piling member and extending from said other end of said piling member downwardly toward but terminating short of said bottom, said tubular member having a bore of such cross-sectional dimension as to form a gas containing annular passage between said bore and said piling member; and an end cap carried by said tubular member at its upper end for sealing said bore at its upper end, said end cap normally seating upon said other end of said piling member, said tubular member extending below the surface of said water a distance greater than the thickness of ice which may form on said surface.

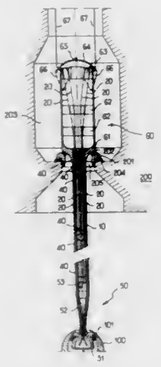
4,923,337

PRESTRESSED STEEL TUBE, IN PARTICULAR FOR MAKING ANCHOR LINES FOR TAUT LINE TYPE PRODUCTION PLATFORMS, A METHOD OF HANDLING AND INSTALLING SUCH A TUBE, AND A PLATFORM INCLUDING SUCH A TUBE

Gilbert Huard, Rueil Malmaison, France, assignor to Bouygues Offshore, Montigny-le-Bretonneux, France

Filed Apr. 7, 1988, Ser. No. 178,470
Claims priority, application France, Apr. 10, 1987, 87 05115
Int. Cl.[5] B63B *35/44, 21/50;* D07B *1/00;* E02D *29/06*
U.S. Cl. 405—224 8 Claims





1. A method of handling and installing a mooring cable assembly between a platform at sea and a base fixed at the bottom of the sea, said method comprising the following steps:

pre-assembling, on land, lengths of tube so as to provide an elongated tubular assembly of constant cross-sectional configuration throughout its length and, providing cable connection means at opposed ends of the tubular assembly,

winding said assembly on a handling drum having a polygonal contour whose sides are substantially equal to the lengths of each tube of said tubular assembly,

providing fibrous tensile elements the full length of said tubular assembly in unstressed condition so as to permit said winding step,

unwinding said tubular assembly into an anchor well of the platform,

applying tension to the fibrous tensile elements and correspondingly by compressing the tubular assembly so as to prestress the structure, securing one cable connection means to the platform and securing the cable connection means at the opposite end to a base at the bottom of the sea,

allowing the platform to exert tension in the cable assembly while assuring that the platform does not exert compressive forces thereof.

3. A mooring cable assembly for securing a platform at sea, said cable assembly comprising;

elongated tubular assembly of constant cross-sectional size throughout its length,

cable connector components at opposite ends said tubular assembly,

fibrous tensile elements extending the full length of said tubular assembly and having end portions secured to said cable connector components,

guide means for said tensile elements and including longitudinally spaced devices laterally spacing said fibrous tensile elements in circumaxial equidistant relationship to one another inside said tubular assembly,

said tubular assembly adapted to absorb compressive stresses as said tension elements are tensioned,

said connector components exerting tension on said compressibly prestressed tubular assembly but said cable connector components being incapable of exerting tension forces on the mooring cable assembly,

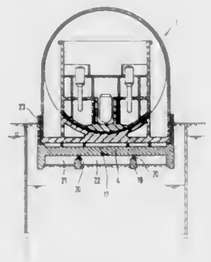
said guide means further including an elongated support provided generally centrally of said tubular assembly, and wherein said longitudinally spaced devices comprise disks secured to said elongated support, said elongated support being segmented so as to remain unstressed during use of the structure.

4,923,338

PROCESS FOR LOWERING BUILDING STRUCTURES

Edmund Hertle, Planegg, and Siegfried Hausner, Munich, both of Fed. Rep. of Germany, assignors to Alfred Kunz GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jan. 31, 1989, Ser. No. 304,152
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1988, 3802910
Int. Cl.[5] E02D *17/02*
U.S. Cl. 405—229 3 Claims



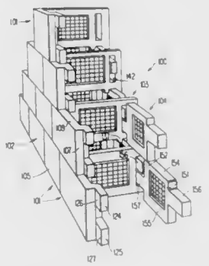
1. A process for lowering into the ground a building structure, such as a shutdown nuclear power plant or a building structure to be erected as it is lowered, comprising constructing a caisson below a bed plate of the building structure for lowering in steps together with the building structure, the caisson having a top plate provided with an outer ring which depends from a rim portion of the top plate and constitutes an outer cutting edge, and an inner ring which constitutes an inner cutting edge and is inwardly spaced from the outer ring, the inner ring being disposed substantially on the same level as the outer ring, locating extendable/retractable hydraulic presses between a top surface of the inner ring and a bottom surface of the top plate to support the top plate on the inner ring, and performing a lowering sequence which includes the steps of excavating soil from between the rings with the presses extended, allowing the presses to retract so that the outer ring, the top plate and the building structure descend toward the inner ring, excavating soil from under the inner ring, and extending the presses so that the inner ring is pushed into the ground and the sequence can be repeated.

4,923,339

FOLDABLE CONCRETE RETAINING WALL STRUCTURE

Peter J. Smith, Gansevoort, N.Y., assignor to Fomico International, Inc., Fort Edward, N.Y.

Filed Sep. 14, 1987, Ser. No. 95,959
Int. Cl.[5] E02D *17/20, 29/02*
U.S. Cl. 405—284 20 Claims



1. A precast concrete retaining wall unit for use in constructing a bin-type retaining wall composed of superposed rows of such units, the unit comprising:

a face member having a front surface, a rear surface, an upper edge, a lower edge, and first and second side edges;

a support member having a front end portion adjacent to the second side edge of the face member, a rear end portion spaced from the front end portion, and an intermediate portion connecting the front and rear end portions;

means for hingedly connecting the front end portion of the support member to the rear surface of the face member adjacent to the second side edge of the face member to permit pivoting the support member with respect to the face member through at least 90 degrees between a position in which the support member is parallel to the face member to a position in which the support member extends transversely to the rear surface of the face member;

first and second interengaging means located in the vicinity of the respective first and second side edges of the face member, said first interengaging means of said unit being adapted to engage the second interengaging means of a like unit, when the second side edge of the face member of the like unit abuts the first side edge of the face member of said unit, to restrain the face member of said unit from forward movement with respect to the face member of the like unit; and

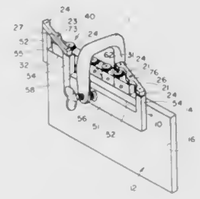
third and fourth interengaging means located in the vicinity of the upper and lower edges of the face member, respectively, said third interengaging means of said unit being adapted to engage the fourth interengaging means of another like unit, when the lower edge of the face member of the other like unit abuts the upper edge of the face member of said unit with the other like unit being shifted laterally by a predetermined amount with respect to said unit, to restrain the face member of said other like unit from movement in at least one direction laterally and one direction transversely with respect to the face member of said unit.

4,923,340

DOWELING JIG

Joseph Hegedusch, Rte. 1, Box 318, Luray, Va. 22835

Filed Aug. 16, 1988, Ser. No. 232,676
Int. Cl.[5] B23B *49/00*
U.S. Cl. 408—72 R 16 Claims



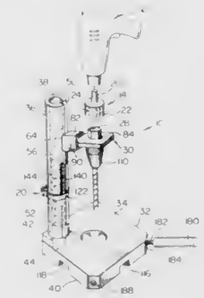
1. A doweling jig comprising: at least two cross bars pivotally engaged at their ends to the ends of at least two clamp rails such that said cross bars and clamp rails generally define a parallelogram when said cross bars are pivoted with respect to said clamp rails; and a bushing holder bar including at least one bushing hole for housing a bushing, said bushing having a sufficient length for guiding a drill and said bushing holding bar being pivotally engaged at tow pivot locations to the centers of said cross bars such that when said clamp rails engage the outer surfaces of a workpiece said bushing holder bar is thereby automatically centered on said workpiece, said clamp rails residing substantially below the plane defined by the bottom surface of said bushing holder bar such that the positioning of said bushing hole with respect to said workpiece may be readily observed by the operator.

4,923,341

PORTABLE DRILL GUIDE

James D. Cameron, P.O. Box 12, Madawaska, Ontario, Canada (K0J 2C0)

Filed Sep. 22, 1989, Ser. No. 410,900
Int. Cl.[5] B23B *49/00*
U.S. Cl. 408—112 8 Claims



1. Portable drill guide apparatus for a hand held drill comprising:

base means having an upper surface, a flat bottom surface and an annular opening therethrough, said opening having an axis;

a support post extending from the base to one side of said opening and perpendicular to the base bottom surface, said post having a longitudinally extending bore, slot means extending longitudinally in the side of said post and parallel to the axis thereof;

a drill chuck assembly comprising bar means complemen-

tary in cross-sectional shape to said bore and chuck support means extending outwardly therefrom and having a portion adapted to move within said slot;

said chuck support means further including a shaft journalled therein, said shaft having an upper end and a lower end with a drill chuck being operatively connected to the lower end over said base opening; and

adapter means for operative association with a drill chuck of a portable drill and having means for detachable driving connection with the upper end of said chuck support shaft.

4,923,342

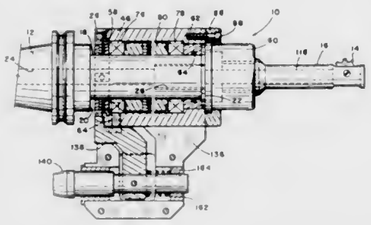
TOOL FOR CUTTING A KEYSLOT IN A WORKPIECE BORE

Harold D. Kopkie, 27331 N.E. 69th Ave., Battle Ground, Wash. 98604, and Delbert D. Homola, Brush Prairie, Wash., assignors to Harold D. Kopkie, Battle Ground, Wash.

Filed Mar. 8, 1989, Ser. No. 321,629

Int. Cl.[5] B23C *3/30*

U.S. Cl. 409—143 **27 Claims**



1. A tool for cutting a keyslot in a workpiece bore for use with an automatic machining device of the type having a plurality of tools for performing a number of machining operations on a workpiece, said apparatus comprising:

a spindle rotatable about the longitudinal axis thereof and being engageable with said machining device for so rotating said spindle;

a housing for said spindle, said spindle having an unlocked condition in which it is rotatable about the longitudinal axis thereof relative to said housing and a locked condition in which it is not rotatable;

a cutter wheel housing;

a cutter wheel mounted on said cutter wheel housing and extending therefrom for cutting a workpiece;

a shaft;

means for connecting one end of said shaft to said spindle for rotating said shaft responsive to spindle rotation;

means for translating shaft rotation to cutter wheel rotation operatively disposed between said shaft and said cutter wheel; and

means for selecting a cutting plane of said cutting wheel relative to said spindle housing.

4,923,343

MACHINE TOOL

George R. Silk, Sandiacre, England, assignor to Silk Engineering (Derby) Limited, England

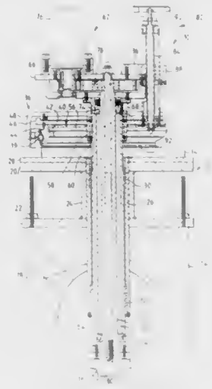
Filed Sep. 16, 1988, Ser. No. 245,321

Claims priority, application United Kingdom, Sep. 18, 1987, 8721935; Jan. 28, 1988, 8801914

Int. Cl.[5] B23C *1/20, 3/05*

U.S. Cl. 409—179 **18 Claims**

1. A machine tool comprising tool support means, a rotatably driven carriage in which the tool support means is mounted, and a base on which the carriage is supported for rotation, the base being securable to a work piece, the tool support means being capable of receiving a drivably rotatable operating tool for performing operations on a surface of the work piece, means being provided to offset the axis of rotation of the operating tool from the axis of the surface upon which



operations are to be performed, wherein the operating tool is arranged to include at least one of a cutting tool and one other operating tool, and includes a tool head having a plurality of cutting tools.

4,923,344

COUPLING SYSTEM FOR BORING TOOLS

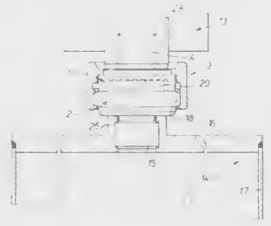
Hans Bieri, Pfäffikon, Switzerland, assignor to Hydrostress AG, Pfaffikon, Switzerland

Filed Dec. 5, 1988, Ser. No. 280,380

Claims priority, application Switzerland, Dec. 5, 1987, 4748/87

Int. Cl.[5] B23C *9/00;* **F16B** *7/20*

U.S. Cl. 409—234 **16 Claims**



1. Coupling system for selectively releasably coupling a drive shaft element (13, 28) to a concrete or boring tool element, particularly a hollow, circular boring tool element (14, 17) having

a first coupling part (1) secured to one (13, 28) of said elements;

a second coupling part (2) secured to the other (14, 17) of said elements; and

means (3) for retaining said first and second coupling parts in axial engagement with each other;

wherein

the first coupling part (1) is formed with a recess (7) having essentially cross-positioned recess portions (9) extending inwardly from an end face (11) thereof facing the second coupling part (2);

and wherein the second coupling part (2) is formed with a

projection (20) which is essentially cross-positioned having cross legs, said cross legs terminating in circular surfaces (21) and fitting into the recess (7), while being axially separable therefrom, said projection extending from an end face (19) of the second part facing the end face (11) of the first part,

said first and second parts including interengaging matching centering means (8, 21) formed by said circular surfaces (21) of the essentially cross-positioned projection (20), and by a circular centering recess (8) within said recess (7) and having a diameter just slightly larger than the diameter of the circle defining said circular surfaces (21) on the projections (20) to provide for centering of said parts with respect to each other regardless of the relative angular position of the cross-positioned projection (20) and the essentially cross-positioned recess portions (9) in said first part and permit relative rotation, while the parts are centered, until an engagement position between the essentially cross-positioned projection (20) and said essentially cross-positioned recess portions (9) is obtained to define a mutually axially at least approximately aligned position of said first and second parts with respect to each other, and being located at facing surfaces of said parts to provide for relative centering of said parts in advance of engagement of said essentially cross-positioned projection (20) in said recess (7) upon relative axial movement of said first and second parts.

4,923,345

DEVICE FOR ADJUSTING THE POSITION OF A TOOL-HODER HEAD ALONG AN AXIS AND PROCESS EMPLOYING IT

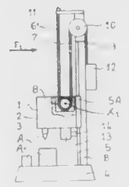
Marcel Therond, Rillieux-la-Pape, France, assignor to Technifor

Filed Jan. 17, 1989, Ser. No. 297,321

Claims priority, application France, Jan. 26, 1988, 88 01091

Int. Cl.[5] B23Q *1/28;* **B23B** *47/26*

U.S. Cl. 409—237 **10 Claims**



3. In an adjusting device for displacing a moveable tool-holder head along an axis to take it rapidly and precisely to any chosen point along the axis the improvement comprising, a guiding means having first and second ends, said guiding means being oriented adjacent the axis, a sliding connection means moveably mounted to said guiding means, the tool-holder head being carried by said sliding connection means so as to allow the displacement thereof along said guiding means, the tool-holder head including a pulley having a lateral wall, said pulley being mounted to freely rotate on a shaft around which a cable makes at least one-half turn, said cable having opposite ends, one of said ends of said cable being connected to one of said ends of said guiding means, a maneuvering handle having an inner wall mounted to freely rotate about said shaft, said shaft carrying said pulley, said handle having inner contact walls and being axially moveable on said shaft so as to either abut said inner contact walls against said lateral wall of said pulley or to move said inner contact walls away from said pulley so that said inner contact walls no longer engage said lateral wall of said pulley so that said maneuvering handle and said pulley are free to rotate with respect to one another.

4,923,346

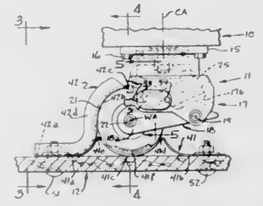
SYSTEM FOR ANCHORING A MOBILE EQUIPMENT CARRIER ON A PLATFORM

Clarence H. Hager, Rockford, Ill., assignor to James C. Hager, Executor of Estate of Clarence H. Hager, Rockford, Ill.

Filed Nov. 7, 1983, Ser. No. 267,802

Int. Cl.[5] B60P *3/06*

U.S. Cl. 410—19 **8 Claims**



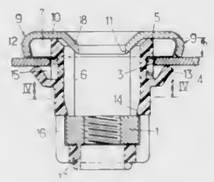
1. A system for anchoring a mobile equipment carrier on a platform for transport by a freight carrier wherein the mobile equipment carrier is supported on a plurality of shock absorbing casters, each shock absorbing caster including a caster bracket mounted on the mobile equipment carrier for swiveling movement relative thereto about a generally upright caster axis, a wheel support bracket mounted on the caster bracket for swinging movement relative thereto about a generally horizontal pivot axis, a caster wheel mounted on the wheel support bracket for rotation about a generally horizontal wheel axis parallel to the pivot axis, the caster wheel having an output periphery and opposite sides, and vibration dampening means acting between the wheel support bracket and the caster bracket for dampening vertical oscillation of the wheel support bracket relative to the caster bracket, and wheel anchor means including a base bracket and a hold-down bracket for attaching each caster wheel to the platform to retain the caster wheel against rolling and swiveling about the caster axis while accommodating relative vertical swinging movement between the wheel support bracket and caster bracket about the horizontal pivot axis, the base bracket having end portions and a wheel receiving portion intermediate the end portions adapted to underlie a caster wheel below the wheel axis, the wheel receiving portion defining at least a first wheel chock means for engaging a lower portion of the periphery of the caster wheel at a location at a first side of a vertical plane through the wheel axis to inhibit rolling of the caster wheel in one direction, the hold-down bracket having a mounting portion at one end adapted for attachment to one end portion of the base bracket and a wheel engaging portion rigid with the mounting portion, the wheel engaging portion extending upwardly from the mounting portion at a second side of the vertical plane through the caster wheel axis opposite said first side and along an upper portion of the caster wheel periphery opposite the portion of the caster wheel periphery engaged by said first wheel chock means to a location above the caster wheel axis to hold the caster wheel down on the wheel receiving portion of the base bracket, and fastener means for detachably securing the mounting portion of the hold-down bracket to one end portion of the base bracket and to the platform, at least one of the items comprising the base bracket and hold-down bracket having abutment means engageable with the opposite sides of the caster wheel adjacent the outer periphery thereof for inhibiting lateral movement of the caster wheel and swiveling of the caster wheel about the caster axis.

4,923,347

ANCHOR NUT-CAGE FIXING SYSTEMS

Richard Moryl, Esubonne, and Roger Bouery, Paris, both of France, assignors to Compagnie De Materiel Et d'Equipements Techniques C.O.M.E.T., France

Filed Oct. 5, 1988, Ser. No. 253,511
Claims priority, application France, Oct. 5, 1987, 87 13722
Int. Cl.[5] F16B *37/04*
U.S. Cl. 411—182 3 Claims



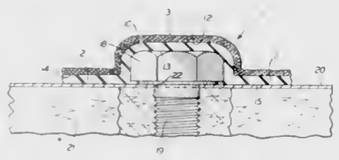
1. An anchor nut-cage fixing system to be applied on a metal sheet from one of the faces of this metal sheet in order to receive bolts presented from the same face, comprising: a nut with wings for fitting into an elongate hole formed in the metal sheet; and a holding and guiding cage for mounting in said hole, said cage being formed by a moulded plastic material socket split longitudinally by windows through which the wings of the nut pass jointedly, said socket being connected to an external collar at one of its ends, and external bosses integrally moulded with this socket being provided for extending into the hole for angularly locking the socket after axial introduction thereof with the nut in said hole, after an angular displacement of 90° of the socket with the nut, wherein the fixing system further comprises a flat metal cap, jointedly covering the external collar, the cap being perforated so as to allow a bolt to pass through and having axially bent flanges whose axial height below the interface of the collar and the cap is equal to or slightly less than the thickness of the collar, wherein at least one of the flanges is bent slightly more than 90° so as to imprison the collar.

4,923,348

PROTECTIVE CAP CONSTRUCTION AND METHOD

Ben J. Carlozzo, Solon; Ronald J. Janoski, Chagrin Falls; James Sterk, Euclid, and Mark C. Rundo, Strongsville, all of Ohio, assignors to Tremco Incorporated, Cleveland, Ohio

Filed Feb. 13, 1989, Ser. No. 309,528
Int. Cl.[5] F16B *19/00, 33/00, 37/14*
U.S. Cl. 411—377 7 Claims



1. A protective cap construction for fastener heads including:

(a) A preformed member formed of an unvulcanized compound of butyl rubber having a natural tackiness and having a dome-shaped central portion and a surrounding generally flat annular flange, said central portion and flange having top and bottom surfaces with said surfaces being tacky;

(b) a reinforcing layer of polyester fabric disposed over the top surfaces of the dome-shaped central portion and annular flange and adhered thereto by the natural tackiness of the butyl rubber to form a homogeneous member; and

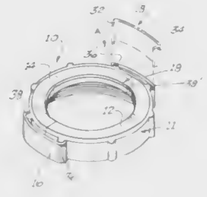
(c) a polyethylene release liner covering the tacky bottom surface of the annular flange, so that said liner can be removed and the preformed member placed over an exposed fastener head, with the natural tackiness of the bottom surface of the flange surrounding said head adhering said member to a surrounding surface and with the natural tackiness of the dome-shaped central portion adhering to and generally encasing said fastener head, with said preformed member remaining in its unvulcanized natural tackiness condition to protect the fastener head and to provide a water proof seal between the fastener head and surrounding surface.

4,923,349

THREADED SPLIT COUPLING NUT

Hartley Logsdon, 965 Churchill Rd., West Palm Beach, Fla. 33405

Filed May 28, 1985, Ser. No. 738,303
Int. Cl.[5] F16L *19/00*
U.S. Cl. 411—433 2 Claims



1. A threaded split-slip coupling nut system comprising:

a threaded split-slip coupling nut having threads and an outside surface and a plurality of spaced apart gripping screw down portions generally parallel to the rotational center line of said split-slip coupling nut and located on said outside side surface of said split-slip coupling nut;

said split-slip coupling nut including two identical nut halves separated along a separation plane containing the rotational center line of said split-slip coupling nut and said separation plane positioned between adjacent said gripping screw down portions on opposite said nut halves on opposite sides of said separation plane;

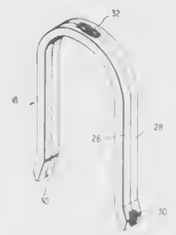
at least two clamping members each having an intermediate body portion having one side and an opposite side with a generally C-shaped distal end connecting means on said one side of said intermediate body portion and a second end having a generally mirror image of said generally C-shaped distal end connecting means on said opposite side, each said intermediate body portion connected to each said C-shaped distal end connecting means for spanning said separation plane and said adjacent gripping screw down portion on each side of said separation plane, said clamping members engageable with the opposite sides of adjacent said gripping screw down portions adjacent each said separation plane each said opposite sides of said gripping screw down portions acting in a dual function as gripping screw down means and as male connecting members for said clamping members.

4,923,350

LAMINATED LOCKING STAPLE

Patrick B. Hinksman, Denewood, 67 White Hill, Kinver, Near Stourbridge, West Midlands, and Gary R. Long, 14 Riberland, Astley Burf, Stourport-on-Severn, West Midlands, both of England

Filed Aug. 2, 1988, Ser. No. 227,339
Claims priority, application United Kingdom, Aug. 4, 1987, 8718392
Int. Cl.[5] F16B *15/00*
U.S. Cl. 411—457 11 Claims



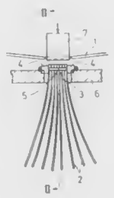
1. A generally U-shaped unitary fluid couplings locking means having two legs with free ends and a curved central portion made of metal and adapted to hold together, in a detachable manner, two parts of a hose coupling, pipe connection or tube connection, the locking means being of rectangular cross-section substantially throughout its length to provide, on both sides of the locking means, flat side surfaces subject, in use, to dynamic loading, wherein said locking means comprises first and second U-shaped elements of rectangular cross-section arranged face-to-face with opposed flat faces of the elements in abutting contact whereby dynamic loading is transmitted through the opposed abutting flat faces from one element to the other, and connections means connecting the two U-shaped elements together in a permanent manner so that they cannot be separated.

4,923,351

BOOKBINDING AND ITS PRODUCTS

Kenjiro Nishikawa, Osaka, Japan, assignor to Maruni Kasei Kabushiki Kaisha, Osaka, Japan

Filed Jun. 7, 1988, Ser. No. 203,876
Claims priority, application Japan, Jun. 10, 1987, 62-143395; Mar. 5, 1988, 63-50625; Apr. 4, 1988, 63-83283
Int. Cl.[5] B42B *5/00*
U.S. Cl. 412—6 15 Claims



1. A method of bookbinding, comprising the steps of:

providing a plurality of sheets, each of said sheets having at least a portion of an edge thereof which includes a first thermoplastic, spine means having an inner face, at least a portion of said inner face including a second thermoplastic, clamp means for clamping said sheets, and press means;

arranging said sheets in a substantially superposed relation with said edges substantially superposed;

clamping said sheets to maintain said edges in essential alignment, said edges thereby defining a surface;

placing said portion of said spine means in contact with said edges and said press means in contact with said spine means at a position opposite said edges; and

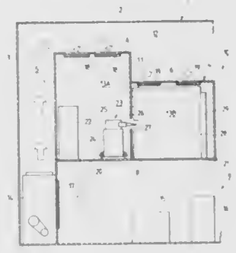
urging said press means against said edges to apply a force to said spine means and therefore said edges while causing relative reciprocation between said spine means and said sheets within a plane substantially parallel to said surface defined by said edges, whereby friction heat generated by said reciprocation bonds said sheets to said spine means.

4,923,352

SYSTEM FOR MANUFACTURING SEMICONDUCTOR UNDER CLEAN CONDITION

Takumi Tamura; Shosuke Shinoda; Tetsuo Yamashita, and Kyohiko Okashita, all of Tateyama, Japan, assignors to Kabushiki Kaisha N.M.B. Semiconductor, Chiba, Japan

Filed Dec. 29, 1988, Ser. No. 291,757
Claims priority, application Japan, Mar. 31, 1988, 63-78485
Int. Cl.[5] B65H *5/08*
U.S. Cl. 414—225 4 Claims



1. A system for manufacturing semiconductors under clean conditions comprising:

a clean room having a floor, a ceiling and walls, said clean room being provided in a space surrounded by outer walls of a building, said clean room separating said space into a plurality of air circulating paths, said air circulating paths being disposed below, above and on the sides of the clean room;

means for vertically partitioning said clean room into a medium cleanliness room and a high cleanliness room, said medium cleanliness room being cleaner than the space and the high cleanliness room being cleaner than the medium cleanliness room;

first and second filters provided on the ceiling of the medium cleanliness room and the high cleanliness room, respectively, said first and second filters purifying the air flowing from the above air circulating path into the medium cleanliness room and the high cleanliness room;

first and second exhausting openings provided at the floor of the medium cleanliness room and the high cleanliness room respectively for exhausting the air from said medium cleanliness room and said high cleanliness room into the below air circulating path;

a first air-blower provided in the air circulating path on the side of said clean room;

a third filter provided on a boundary between the air circulating path on the side of the clean room and the below air circulating path;

a processing unit in the high cleanliness room;

transport means for transporting workpieces comprising a robot having an accomodating carrier for avoiding dust

and holding the workpieces and having a robot arm for moving said workpieces, which is disposed movably in the medium cleanliness room;

a fourth filter provided on the ceiling of the accommodating carrier avoiding the dust, said fourth filter purifying the air flowing from the medium cleanliness room into said accommodating carrier; and

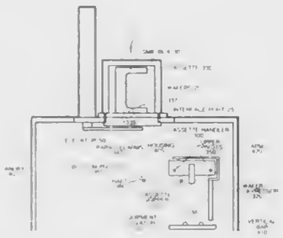
communicating means to communicate between said medium cleanliness room and said high cleanliness room wherein said communicating means comprises an opening in said partitioning means for use of the robot arm through which a workpiece is transported to and from between the accommodating carrier and the processing unit.

4,923,353

APPARATUS FOR AUTOMATED CASSETTE HANDLING

Barclay J. Tullis, Palo Alto; John S. Bailey, Sunnyvale; D. R. Gunawardena, Union City, and Ulrich Kaempf, Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 759,013, Jul. 24, 1985, Pat. No. 4,705,444. This application Jul. 9, 1987, Ser. No. 72,181
Int. Cl.[5] B65G *65/02*
U.S. Cl. 414—226 5 Claims



1. An automated cassette handler for transporting integrated circuit wafers held in a wafer cassette within a canopy, said canopy coupled to a piece of integrated circuit processing equipment, said handler comprising:

a swinger housing within the canopy;

at least two parallel rotation arms coupled between the canopy and the swinger housing so that the swinger housing can be rotationally moved along an arc within the canopy while maintaining the swinger housing in a substantially constant plane with respect to the canopy;

driver means coupled by a shaft to the rotation arms for rotating the swinger housing;

gripper means coupled to the swinger housing for grasping and holding the cassette while the swinger housing is rotated to lift and transport the cassette;

depressor means coupled to the swinger housing for pushing and retaining the wafers within the cassette while the cassette is lifted and transported;

first sensor means coupled to the gripper means for sensing whether the cassette has been gripped by the gripper means;

second sensor means coupled to the depressor means for sensing the position of the depressor means; and

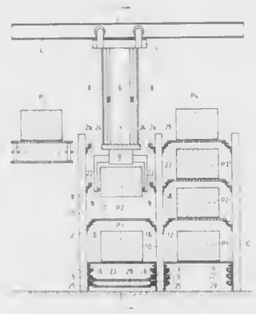
third sensor means coupled to at least one of the rotation arms for sensing the position of the swinger housing.

4,923,354

MAGAZINE WITH MOVABLE SHELVES, FOR THE MATURATION OF CAKES OF SYNTHETIC FOAM MATERIAL

Claudio Giuliano, Gambolò, and Pier E. Gilardi, Robbio, both of Italy, assignors to Gestioni Riunite Toscana Gomma S.p.A., Robbio, Italy

Filed Oct. 24, 1988, Ser. No. 267,164
Claims priority, application Italy, Nov. 5, 1987, 67941 A/87
Int. Cl.[5] F27B *1/08*
U.S. Cl. 414—286 5 Claims



5. In a plant for the maturation of cakes of synthetic foam material, comprising a maturation space, a belt conveyor bringing the cakes for distribution in the maturation space, and an overhead crane having a gripper, for lifting a cake from the belt conveyor, for shifting the cake laterally and for depositing the cake into the maturation space; a magazine comprising at least one stand arranged parallel to and side by side of the belt conveyor, said stand comprising a frame, an operatively fixed lower shelf supported by said frame, the width and length of said fixed shelf being adapted to the width and length of the cakes to be received, and a plurality of means for receiving said cakes, arranged above said fixed shelf at vertical mutual distances somewhat greater than the height of the cakes to be received, each of such means being shiftable between a working position, in which it constitutes a surface whose width and length are adapted to the width and length of the cakes to be received, and a rest position, in which it leaves free the access from above to the shelf lying below, wherein at least a part of the shelves operatively fixed for the reception of the cakes comprise a conveyor to transport the matured cakes.

4,923,355

SYSTEM TO FEED AND DISCHARGE MATERIALS CONTINUOUSLY IN OPERATIONS TO REHABILITATE RAILWAY ROAD BEDS AND THE LIKE

Flavin Mancini, Brescia, Italy, assignor to ITI/CLM Impianti Tecnici Industriali Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

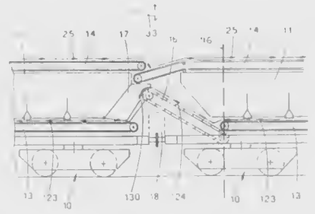
Filed Jul. 12, 1988, Ser. No. 217,968
Claims priority, application Italy, Aug. 4, 1987, 83424 A/87
Int. Cl.[5] B65G *67/00*
U.S. Cl. 414—339 16 Claims

1. System to feed and discharge materials continuously for the rehabilitation of railway road beds and the like in cooperation with at least one operational machine, wherein the system comprises a plurality of waggons for storing materials and wherein each waggon comprises:

at least one hopper adapted to contain materials and comprising lower movable shutter means for opening and closing said at least one hopper;

a lower conveyance means for conveying material, said lower conveyance means cooperating with said at least one hopper and extending substantially along the whole length of the waggon in a horizontal plane;

an upper conveyance means for conveying material, said upper conveyance means being disposed above said at least one hopper and extending substantially along the whole length of the waggon in a horizontal plane; and



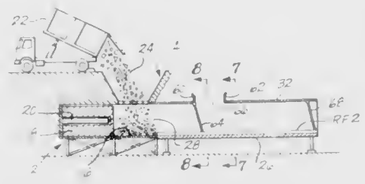
an almost vertical conveyance means for conveying material, said almost vertical conveyance means cooperating with the lower conveyance means in the tranfer of materials.

4,923,356

APPARATUS FOR COLLECTING AND COMPACTING GARBAGE AND THEN LOADING IT INTO A ROAD VEHICLE

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed May 3, 1988, Ser. No. 189,522
Int. Cl.[5] B30B *15/32*
U.S. Cl. 414—373 5 Claims



1. A bulk material handling system, comprising:

a compactor comprising a piston chamber having an inlet and an outlet, a compaction piston, and means for extending the compaction piston through the piston chamber, towards the outlet, and for retracting the compaction piston;

an elongated vault having an inlet at a first end in registry with the outlet of the piston chamber, an outlet at a second end, walls forming an inner space, including an openable/-closeable compacting end wall and a floor in the form of a reciprocating floor conveyor comprising floor slat members movable towards the outlet end to convey its contents towards such end, and retractable towards the first end to bring the slat members back to a start position at said end; and means for so moving said slat member; and

a road vehicle including a cargo compartment having a material receiving end which is registerable with the outlet end of the vault, and a floor in the form of a reciprocating floor conveyor comprising floor slat members movable towards the material receiving end to convey its contents towards said end and retractable in the opposite direction back to a start position, and means for so moving said slat members;

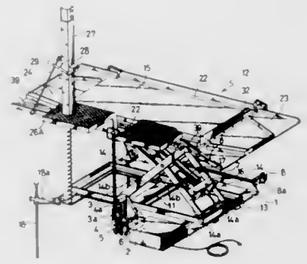
wherein the piston chamber of the compactor is sized and positioned such that an extension of the piston against bulk material, deposited through the inlet of the piston chamber, into the piston chamber, will move the material from the compactor into the inner space of the vault against the closed compacting wall, to be contained within the vault above the reciprocating floor conveyor in the vault, and the vault and the cargo receiving compartment of the road vehicle are so dimensioned that when the cargo receiving compartment of the road vehicle is in registry with the open outlet of the vault, the reciprocating floor conveyor in the vault is substantially at the same level as the reciprocating floor conveyor in the cargo compartment of the road vehicle, allowing the two reciprocating floor conveyors to be operated together to move compacted material from the vault into the cargo receiving compartment of the road vehicle.

4,923,357

CONTAINER TRANSFER LIFT

Shunji Isogai, Hekinan, Japan, assignor to Sugiyasu Industries Co., Ltd., Takahama, Japan

Filed Jun. 30, 1988, Ser. No. 213,700
Claims priority, application Japan, Mar. 20, 1988, 63-36505
Int. Cl.[5] B65G *69/22*
U.S. Cl. 414—495 6 Claims



1. Container transfer lift apparatus for transferring a load from a platform raised above a floor level, said apparatus comprising

horizontal base means having a projecting horizontal portion,

a plurality of wheels mounted on said base means, said wheels being selectively moveable between a raised position in which said base means can be moved on said wheels and a rest position in which said base means can rest on the platform,

a plurality of supporting legs adjustably mounted on the projecting horizontal portion of said base means, said legs being arranged for adjustable vertical extension to the floor level for supporting said lift apparatus when the base means rest on the platform,

a vertically extensible scissors jack mounted on said base means and having extensible means therefor,

a horizontal carrying plate having opposed ends and mounted on said scissors jack, said carrying plate having a portion above said base projecting portion for substantially spanning said base means and said projecting portion thereof, and

first and second load guide flaps mounted on said carrying plate at opposed ends thereof and each rotatable between a vertical position and a horizontal position in which said flap extends horizontally beyond said base means and beyond said projecting portion of said base means.

4,923,358

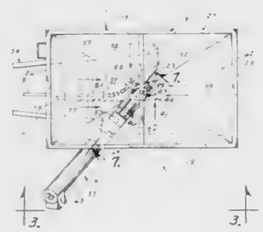
PORTABLE CART WITH ANGULAR DISCHARGE AUGER

Michael D. Van Mill, Shell Rock, Iowa, assignor to Unverferth Manufacturing Co., Inc., Kalida, Ohio

Continuation of Ser. No. 85,886, Aug. 13, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 315,643

Int. Cl.[5] B60P *1/40*

U.S. Cl. 414—519 **6 Claims**



3. A portable cart comprising in construction:

hopper means including a hopper for holding granular material, said hopper having a sump substantially centrally thereof through which the granular material can flow by gravity;

a frame having a front, opposed sides and a rear for supporting said hopper means;

at least a pair of wheels supporting said frame, each wheel mounted adjacent a side thereof;

auger means for receiving the granular material from said sump and for discharging the granular material externally of said hopper means, said auger means including an elongated tube and an auger rotatably mounted therein, said tube having a lower end supported below said sump for receiving material therefrom and an upper end pivotally connected to said lower end and extended forwardly and sidewardly relative to said wheels and away from said hopper so as to have an angular relationship with the longitudinal and transverse axes of said hopper, wherein, said auger tube lower end is connected to and recessed into said hopper and extended below and being open to said sump and wherein said hopper sump includes a gate forming an extension of said auger means lower end; and

hydraulic means connected to said gate to move said gate from a first position closing off said sump to material from said hopper means to a second position opening said sump to the flow of material from said hopper means to said sump.

4,923,359

EXTENDABLE BOOM FOR BELT-CONVEYOR

Woldemar R. Petri, Cambridge, and Stephen L. Foster, RR5 CON 6, London, Ontario both of Canada, assignors to Stephen Leonard Foster, London, Canada

Filed Oct. 18, 1988, Ser. No. 259,265

Claims priority, application Canada, Oct. 21, 1987, 549906

Int. Cl.[5] B60P *1/36*

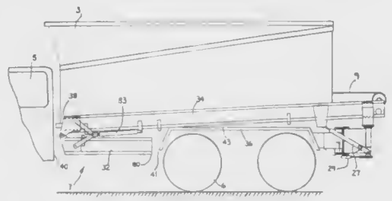
U.S. Cl. 414—523 **10 Claims**

1. A delivery truck comprising:

a hopper, for containing material to be delivered;

a moving conveyor belt mounted on a boom, for dispensing material from the hopper, the boom comprising a main portion and an extension portion, and the extension portion and the main portion are relatively foldable; a chassis, and a rear wheel; a space which lies alongside the chassis, forward of the rear wheel, and below a horizontal level of a top of the said rear wheel; means for stowing the boom, when so folded, on the truck, during road use of the truck, and for placing the said main portion, when the boom is folded and stowed, vertically over the rear wheel;

and the arrangement being such that the extension portion,



when the boom is folded and stowed, lies vertically below the main portion, and in the said space alongside the chassis, forward of the rear wheel, and below the horizontal level of the top of the rear wheel.

4,923,360

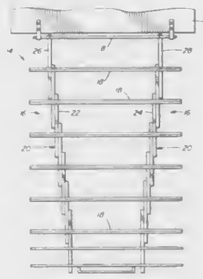
COLLAPSIBLE TAILGATE RAMP

Phillippe J. Beauchemin, 5216 - 55 Street, Box 1807, Bonnyville, Alberta, Canada

Filed Nov. 30, 1987, Ser. No. 126,094

Int. Cl.[5] E01D *1/00;* **B65G** *67/02*

U.S. Cl. 414—537 **5 Claims**



1. A portable, collapsible ramp for a truck tailgate or doorway, said ramp having spaced sides interconnected by crossmembers;

each side of said ramp comprising a plurality of beam members slidably connected one to another to lie in stacked, side-by-side relation when said ramp is collapsed, and in an elongated, staggered relationship one to another when said ramp is extended;

said crossmembers extending-normal to said ramp sides and at least one crossmember being secured to the upper surface of and interconnecting each spaced pair of beam members on either side of said ramp;

a first pair of spaced beam members being securable at one of their ends to said truck tailgate or doorway and the remaining pairs being slidably extendable therefrom;

said beam members of said remaining pairs thereof each comprising on one side thereof a channel defined by spaced, parallel, upper and lower tracks and, on the other side thereof, an elongated support means located in the channel of an adjacent beam member and engagable by said upper and lower tracks thereof and to provide longitudinal, sliding movement of one beam member with respect to said adjacent beam member;

flange means on said support means of one beam member and spaced inwardly of said tracks in the adjacent beam member to limit lateral movement of said support means on said tracks and of said one beam member relative to said adjacent beam member; and

means adjacent one end of said channels to limit longitudinal movement of said beam member with respect to its adjacent beam member.

4,923,361

DEVICE FOR MOVING AT LEAST A PART OF A VEHICLE IN A SIDEWARD DIRECTION

Rune Adolfsson, Skyttegatan 4, Sweden, assignor to SKF Nova AB, Sweden

Filed Apr. 27, 1989, Ser. No. 344,819

Claims priority, application Sweden, May 2, 1988, 8801645

Int. Cl.[5] B66F *9/06*

U.S. Cl. 414—541 **4 Claims**



1. A device for providing sideward displacement of a load handling vehicle having means for movably supporting the vehicle relative to a support surface and having a least one vertically movable load handling member comprising:

means for vertically moving said movable member;

at least one displacement member pivotally attached to the vertically movable member and being pivotally movable form a lower active position to an upper inactive position;

means to lower said displacement member from said inactive position to said active position upon raising said movable member to a raised position;

whereby lowering of said movable member causes contact of said displacement member with the support surface, and whereby the continued lowering of the movable member causes pivoting of said displacement member towards its inactive position to simultaneously displace at least a part of the vehicle in a sideward direction while the vehicle is supported on the movable support means.

4,923,362

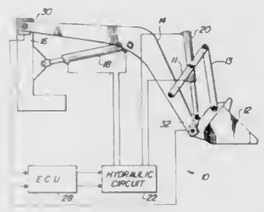
BUCKET LEVELING SYSTEM WITH DUAL FLUID SUPPLY

Bruce K. Fryk, Waverly, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 6, 1988, Ser. No. 202,286

Int. Cl.[5] E02F *3/43*

U.S. Cl. 414—700 **16 Claims**



1. In a control system for a boom pivoted with respect to a frame by a boom motor and a bucket pivoted on the boom by a bucket motor, the control system including a pump, a reservoir, a control valve for controlling fluid communication between the pump, reservoir and boom motor, a circuit means coupled to the boom motor, the bucket motor, the pump and the reservoir for controlling fluid communication between the pump, the reservoir, the boom motor and the bucket motor, and leveling means coupled to the boom, the bucket and the circuit means and cooperating therewith for maintaining a desired orientation of the bucket, the improvement wherein:

the circuit means comprises a leveling valve having outlets coupled to the bucket motor, a sump inlet coupled to the reservoir and a supply inlet, and fluid supply means coupled to the boom motor, to the pump and to the supply inlet for automatically selectively supplying the supply inlet with fluid displaced from the boom motor and/or with fluid directly from the pump.

4,923,363

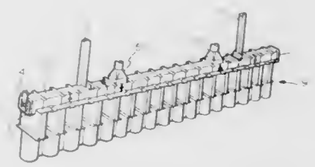
LEHR LOADER PICKUP ARM

Frank J. DiFrank, Toledo, Ohio, assignor to Owens-Illinois Glass Container Inc., Toledo, Ohio

Filed Aug. 31, 1989, Ser. No. 401,385

Int. Cl.[5] B65G *47/26*

U.S. Cl. 414—752 **17 Claims**



1. A vacuum pickup bar for grasping hot glass containers for transferring a row of containers from a cross-conveyor to a moving lehr mat comprising, an elongated manifold, a series of individual, rectangular, box-like structures having vertical end walls mounted beneath said manifold, a pair of spaced apart, vertically depending panels of slightly lesser length and width dimension than the end walls of said box-like structure, said panels being pivotally supported from their upper edges within and spaced from the end walls of said box-like structure, a horizontal plate fixed to the lower edge of each said panel, said plates being of a size that is equal to one-half the length of the

open bottom of said box-like structure and larger than the width of said structure, a pair of heat resistant and air impervious curtains, each said curtain having a length that is sufficient to extend about one-half the circumference of said row of bottles on the cross-conveyor and any gaps therebetween, means attaching the upper edge of each curtain to the horizontal plates along each side of the structure with the curtain having downwardly extending surfaces that generally parallel the semi-circular side wall of the bottles on the cross-conveyor, air baffle means in the interior of each structure for restricting air flow through the bottom of said structure, air evacuating means connected to the interior of said air manifold, and openings from the bottom of said manifold to the interior of each structure whereby the curtains suspended from the pivoted panels will be moved into gripping relationship to the sides of containers when vacuum is applied to said manifold.

4,923,364

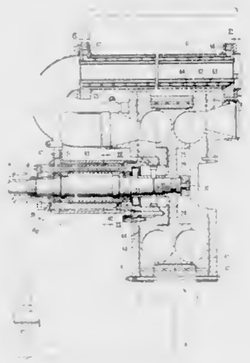
GAS LASER APPARATUS, METHOD AND TURBINE COMPRESSOR THEREFOR

Carl J. Nilsen, Flanders, N.J., and Hardy P. Weiss, Hutten, Switzerland, assignors to PRC Corporation, Landing, N.J.

Division of Ser. No. 28,203, Mar. 20, 1987, Pat. No. 4,817,111. This application Dec. 21, 1988, Ser. No. 287,065

Int. Cl.[5] **F04D** *17/08*

U.S. Cl. 415—55.6 **16 Claims**



1. A two stage, double sided, regenerative turbine type compressor comprising an impeller rotatable about an axis and having a plurality of blades thereon for forming first and second stages of said compressor on respective sides of said impeller for compressing gas, means defining a passage opposite said blades of the impeller with an inlet and an outlet being provided in said passage for communicating gas to be compressed to and from said passage, means for rotating said impeller and the blades thereon to compress the gas, wherein said compressor has a pressure or head coefficient of at least 0.8 and is capable of operating with a pressure ratio for flowing gas at a speed of at least half the speed of sound in said gas in a fast axial flow laser with inlet pressures to said compressor of less than one-third atmospheric pressure, wherein an intercooler is provided between said first and second stages of said compressor for cooling gas compressed in said first stage before it enters the second stage for further compression, and wherein said means defining a passage opposite said blades includes means for cooling essentially the entire surface of both sides of the compressor and also the radially outer or circumferential surface thereof.

4,923,365

IMPELLER WHEEL FOR CONVEYING A MEDIUM

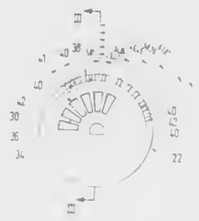
Mathias Rollwage, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 21, 1988, Ser. No. 146,728

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708336

Int. Cl.[5] **F04D** *29/66*

U.S. Cl. 415—119 **7 Claims**



1. An impeller wheel for conveying a medium, including a plurality of vane-shaped conveying elements positioned on a peripheral surface of the wheel and spaced from each other in a peripheral direction of the wheel at non-uniform intervals, said intervals being dimensioned in accordance with the mathematical interrelations of pseudonoise sequence.

4,923,366

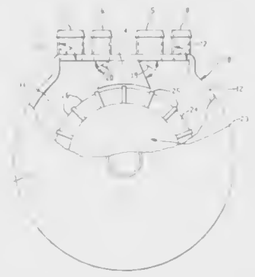
REVERSIBLE TURBINE PUMP

Jeffrey A. Kern, and Roger L. Hoffman, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 1, 1989, Ser. No. 304,478

Int. Cl.[5] **F01D** *1/30*

U.S. Cl. 415—152.1 **8 Claims**



1. A reversible turbine pump comprising:

a casing defining an annular pumping chamber;

a turbine impeller mounted for reversible rotation within said chamber;

a dam positioned within said chamber for substantially interrupting the path around said chamber;

first and second inlets and first and second outlets through which fluid enters and exits said chamber;

said first inlet and second outlet being positioned on one side of said dam and said second inlet and first outlet being positioned on the other side of said dam so that rotation of said impeller in one direction pumps fluid through substantially all said chamber from said first inlet to said first outlet and rotation of said impeller in the other direction pumps fluid through substantially all said chamber from said second inlet to said second outlet;

said first inlet and outlet being sized to limit flow through said pump to a greater extent than said second inlet and outlet; and

valve means associated with each of said inlets and outlets for permitting fluid flow therethrough in the desired direction and preventing fluid flow therethrough in the undesired direction.

4,923,367

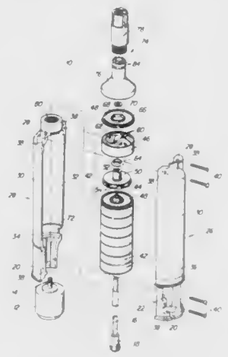
SUBMERSIBLE PUMP WITH PLASTIC HOUSING

John E. Zimmer, Churubusco, Ind., assignor to Flint & Walling, Inc., Kendallville, Ind.

Filed Mar. 14, 1988, Ser. No. 167,924

Int. Cl.[5] **F04D** *29/22*

U.S. Cl. 415—199.1 **19 Claims**



1. A multi-stage submersible centrifugal pump comprising:

an impeller shaft adapted to be drivably rotated by a drive motor;

a cartridge assembly consisting of a plurality of pump stages drivably mounted to said shaft in contiguous stacked relation;

a plastic pump housing having a substantially cylindrical internal chamber adapted to house said cartridge assembly, said housing formed from a pair of mating housing halves having integral inlet and discharge head portions to form inlet and discharge heads of said housing upon joining said housing halves; and

cartridge adjustment means connected to said impeller shaft, said means positionally capturing said cartridge assembly in contiguous stacked relation on said drive shaft to prevent longitudinal movement of said pump stages within said housing and ensure sealing engagement between pump stages.

4,923,368

LIQUID DRIVEN TURBINE

George R. Martin, Dunedin, New Zealand, assignor to Martin Research & Development Ltd., Dunedin, Netherlands

Continuation of Ser. No. 90,759, Aug. 28, 1987, abandoned. This application Jun. 20, 1989, Ser. No. 368,885

Int. Cl.[5] **F01D** *1/02*

U.S. Cl. 415—202 **16 Claims**

1. A substantially cylindrical water driven turbine, comprising:

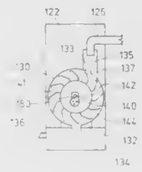
a central shaft;

a drum co-axial and rotatable with said shaft;

a plurality of buckets, each bucket being defined by the outer surface of said drum, an end disc extending radially outwardly at each end of said drum, and connecting radially inner and outer blade portions extending axially between each of said end discs and in a direction substantially radially outwardly from said drum, each bucket being adapted to delay discharge of water from said bucket during rotation of said drum until before but substantially close to bottom dead center;

the diameter of said drum being substantially in the range of one half to three-quarters of the diameter of the circumference defined by the outer lips of said buckets;

inlet means having an intake end which is relatively narrow to receive a flow of water and having an outlet end which is relatively wide to spread said flow horizontally and direct the water into each bucket substantially along the length of said bucket;



the axial distance end to end of said drum being greater than the width of said intake end of said inlet means;

the water outlet end of said inlet means being provided with deflecting means to direct the flow of water in a substantially flat flow, said deflecting means comprising a discharge end having a deflecting lip thereon for deflecting the water in the direction extending substantially along the length of said buckets, and directing means to direct the flow of water from said deflecting lip at said discharge end inwardly toward the opening of each bucket;

the arrangement being such that in use said drum and shaft are rotated by said water falling into said buckets.

4,923,369

SLURRY PUMP HAVING INCREASED EFFICIENCY AND WEAR CHARACTERISTICS

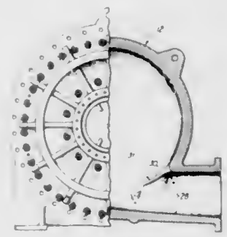
Graeme R. Addie, and Robert J. Visintainer, both of Augusta, Ga., assignors to GIW Industries, Inc., Grovetown, Ga.

Continuation of Ser. No. 22,787, Mar. 6, 1987, Pat. No. 4,872,809. This application Jun. 13, 1989, Ser. No. 367,306

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.[5] **F04D** *29/44*

U.S. Cl. 415—206 **3 Claims**



1. A shell member for a pump housing of a centrifugal pump for cooperating with the rotatable impeller within said centrifugal pump comprising:

(1) and annular shell provided with a throat having an actual throat area;

(2) a tongue positioned along a peripheral portion of said shell; and

(3) an outlet branch having a centerline; wherein the ratio of the radius of the shell at said tongue to the radius of the shell at right angles to a branch centerline is from about 0.8 to 0.9; and

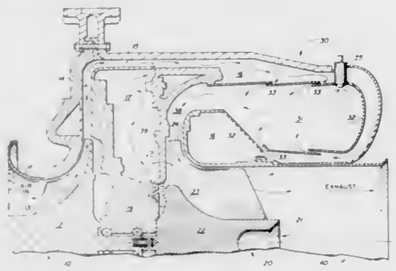
(4) said tongue being formed by a cut-water having a shape defined by the equation $y=Ax^B$, wherein x and y are coordinates defining points along the curve defined by the equation $A=F(2^B/w^{(B-1)})$, where B is a number between and including the numbers 2 and 5 and w is the width of the shell and F is a number between and including the numbers 1.0 and 0.5.

4,923,370

RADIAL TURBINE WHEEL

C. Allan Larson, Tempe, and Montgomerie C. Steele, Phoenix, both of Ariz., assignors to Allied-Signal Inc., Phoenix, Ariz.

Filed Nov. 28, 1988, Ser. No. 277,086
Int. Cl.[5] F01D *5/08*
U.S. Cl. 416—95 **13 Claims**



1. A method of increasing the useful life of a radial flow turbine wheel, of the type having a plurality of thin, scrolled blades arranged in a generally frusto-conical shape extending outwardly from a hub and including a front face with a relatively small diameter, a back face with a relatively large diameter terminating in a peripheral rim having saddle areas formed between adjacent blades, and rotatable within a surrounding housing about its longitudinal axis by the hot gases of a turbine engine, comprising the steps of:

providing said wheel with an integral, annular reinforcing pad extending radially inwardly about 20% of the distance from the saddle areas toward the axis of rotation and extending axially rearwardly from said backface to provide an increased axial thickness of the backface adjacent the saddle areas of the wheel;

impinging generally axially flowing jets of cooling air onto said pad near its radially innermost portion;

flowing said cooling air along the surface of said pad in a generally outwardly radial direction;

subsequently directing the flow of cooling air onto and axially along the saddle areas, while discouraging the flow of hot gases to the backface of the wheel, and flowing the air toward the front face along the hub surfaces for film cooling thereof, in order to reduce thermally induced cracking in the saddle areas of the wheel.

4,923,371

WALL HAVING COOLING PASSAGE

Meir Ben-Amoz, Lynn, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Apr. 1, 1988, Ser. No. 175,878
Int. Cl.[5] F01D *5/18*
U.S. Cl. 416—97 R **13 Claims**

1. A wall comprising:

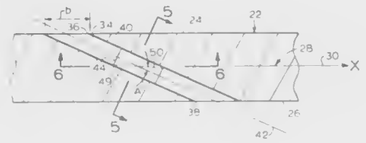
a first surface;

a second surface spaced from said first surface;

a first plane disposed between said first and second surfaces and including first and second coplanar, orthogonal axes; and

a passage extending between said first and second surfaces and including a portion having:

a longitudinal axis disposed at an acute angle to said first plane;



a first section disposed perpendicularly to said longitudinal axis;

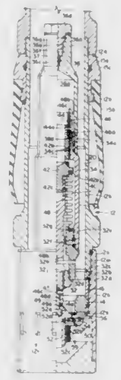
a second section disposed parallel to said first plane; and said first section being generally elliptical and said second section being generally circular.

4,923,372

GAS LIFT TYPE CASING PUMP

Paul L. Ferguson, Tyler, and Robert W. Dinning, Houston, both of Tex., assignors to Fergusoo Beauregard Inc., Tyler, Tex.

Filed Jan. 13, 1989, Ser. No. 297,068
Int. Cl.[5] F04B *47/12*
U.S. Cl. 417—53 **23 Claims**



1. A gas operated, plunger lift type pump for use in a subterranean well conduit extending from a pool of well liquids to the surface comprising, in combination:

a tubular body freely insertable in the bore of the well conduit and defining a vertically extending fluid passage;

annular elastomeric seal means sealingly mounted on the exterior of said tubular body and slidably and sealably engagable with the well conduit;

a valve seat fixedly mounted within said tubular body;

a shiftable valve head engagable with said valve seat to prevent fluid flow through said fluid passage in said tubular body;

trapped fluid pressure means for biasing said shiftable valve head to an open position relative to said valve seat;

means for latching said valve head in said open position relative to said valve seat, said latching means being releasable by a predetermined force on said valve head; and

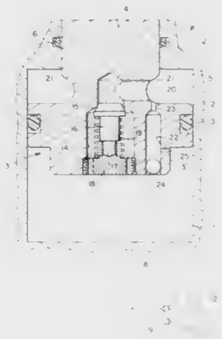
actuator means responsive to a selected level of well hydrostatic pressure for applying said predetermined force to said valve head to shift said valve head from said open position spaced from said seat to a closed position at a selected level in the liquid pool, whereby said tubular body will slide down the well casing to a depth in said liquid pool producing said selected level of hydrostatic pressure where said valve head is released from said latching means to engage said valve seat to close fluid flow through said fluid passage in said tubular body, thus permitting the gas pressure in the well below said tubular body to lift said tubular body and any trapped fluid above said tubular body to the well surface.

4,923,373

HYDRAULIC SINGLE PISTON PUMP FOR MANUAL OPERATION

Stefan Rothaar, St. Wendel, and Otfried Stuck, St. Ingbert, both of Fed. Rep. of Germany, assignors to Flutec Fluidtechnische Gerate GmbH, Fed. Rep. of Germany

PCT No. PCT/DE88/00211, § 371 Date Nov. 21, 1988, § 102(e) Date Nov. 21, 1988, PCT Pub. No. WO88/07495, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 31, 1988, Ser. No. 276,321
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710919
Int. Cl.[5] F04B *21/04, 31/00*
U.S. Cl. 417—439 **10 Claims**



1. A hydraulic single piston pump for manual operation, comprising:

a cylinder with an inlet and an outlet;

a piston dividing said cylinder into a piston chamber and a rod chamber and being movable to decrease said piston chamber in a power stroke and to increase said piston chamber in a return stroke;

a first channel extending through said piston from said piston chamber to said rod chamber;

a check valve in and controlling fluid flow through said first channel, said check valve opening during the return stroke of said piston; and

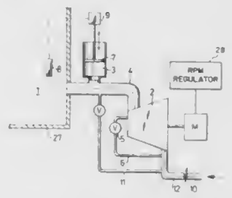
a second channel extending through said piston from said piston chamber to said rod chamber, said second channel having means for automatically controlling hydraulic fluid flow from said piston chamber to said rod chamber dependent on differential pressures in said chambers, said means including a first choke bore along at least as part of a length of said second channel.

4,923,374

METHOD FOR PRODUCING PRESSURE PULSES IN A MASS OF GAS AND A DEVICE FOR PERFORMING THE METHOD

Stig Lundin, and Birger Pettersson, both of Värmdö , Sweden, assignors to Svenska Rotor Maskiner AB, Stockholm, Sweden

PCT No. PCT/SE87/00559, § 371 Date Aug. 19, 1988, § 102(e) Date Aug. 19, 1988, PCT Pub. No. WO88/03995, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 25, 1987, Ser. No. 234,496
Claims priority, application Sweden, Nov. 28, 1986, 8605104
Int. Cl.[5] B08B *5/00;* **F04C** *18/16, 25/00;* **F28G** *7/00*
U.S. Cl. 417—440 **23 Claims**



1. A method for producing selectively controlled pressure pulses in a mass of gas, the pulse energy of which is to be made use of, comprising:

generating pulses by a valveless rotary displacement machine, the machine including a casing having an inlet port and an outlet port, and at least one rotor rotatably mounted in said casing;

communicating said outlet port with said mass of gas;

forming gas chambers in said casing by rotation of said rotor;

filling each gas chamber with gas during a filling phase during which respective gas chambers are in communication with said inlet port;

discharging gas from said gas chambers during a discharge phase when said gas chambers are in communication with said outlet port;

causing said discharge phase and the resultant generation of pulses to occur at a frequency in the range of from 10 to 50 Hz; and

causing the pressure in said each gas chamber, when it starts to communicate with said outlet port, to differ from the pressure in said mass of gas, to thereby produce a controlled pressure pulse.

4,923,375

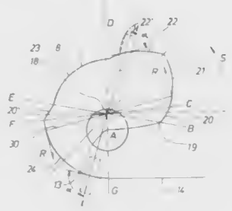
HOSE PUMP, IN PARTICULAR AN INSULIN PUMP

Henning M. Ejlersen, Trorod Kollegiet 15A, DK-2950 Vedb k, Denmark

Continuation of Ser. No. 20,944, Feb. 3, 1987, abandoned. This application Mar. 1, 1989, Ser. No. 318,452
Claims priority, application Denmark, May 15, 1985, 2160/85
Int. Cl.[5] F04B *43/12*
U.S. Cl. 417—477 **14 Claims**

1. In a hose pump of the type comprising an elastic hose for local compression between a hose supporting face and at least one pressure roller for rotation at a constant speed of rotation around an axis, of the pressure roller whereby to pumpingly flow liquid in the hose to an outlet end of the hose, the supporting face being formed with a track for receiving the hose, the track having a varying depth for determining the degree of the local hose compression, the improvement in that the track comprises at least one section with an increasing engagement angle and at least one section with a decreasing engagement angle, the engagement angle being the angle between the axis and the track and, thereby, the hose therein at the point of the local compression between the pressure roller and the hose, the sections of the track being so positioned and their engagement

angles so increased and decreased as to comprise compensation means for increasing the flow of the liquid in the hose by an



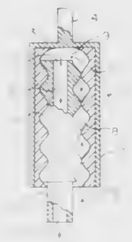
amount compensating for decreased flow caused by opening of the outlet end of the hose.

4,923,376

MOINEAU PUMP WITH ROTATING CLOSED END OUTER MEMBER AND NONROTATING HOLLOW INNER MEMBER

John L. Wright, 1021 Salamanca Rd. NW., Albuquerque, N. Mex. 87107

Filed Mar. 24, 1988, Ser. No. 173,741
Int. Cl.[5] F04C *2/102. 5/00*
U.S. Cl. 418—48 **11 Claims**



I. In a progressing cavity positive displacement rotary pump wherein two helical gears, one inside the other, are engaged with each other along a sealing line to create cavities which progress axially as one of the gears is rotated relative to the other, wherein the improvement comprises:

a. an outer gear having a closed end and an open end; and

b. a hollow inner gear

wherein said outer gear is rotatable about and orbital relative to said hollow inner gear which is nonrotatable, and wherein a pumpable material within said cavities progresses axially from said open end of said outer gear to said closed end of said outer gear and is further pumped into and through said hollow inner gear.

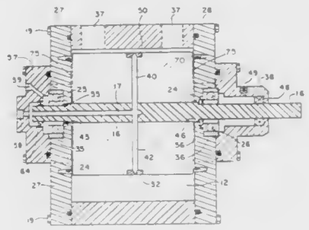
4,923,377

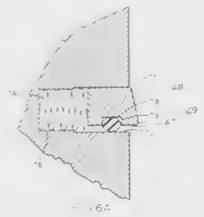
SELF-MACHINING SEAL RING LEAKAGE PREVENTION ASSEMBLY FOR ROTARY VANE DEVICE

Robert J. Cavalleri, 1605 Gran Via, Orlando, Fla. 32825

Continuation-in-part of Ser. No. 95,106, Sep. 11, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,450
Int. Cl.[5] F04C *18/344. 27/00. 29/02;* **F16J** *15/28*
U.S. Cl. 418—98 **15 Claims**

1. A low internal leakage, rotary vane gas compressor utilizing a housing having a generally elliptical cavity therein, whose outer boundary is defined by an inner stator wall, and a shaft mounted rotor disposed in said cavity, with the axis of rotation of said rotor being offset from the central axis of said cavity, an end plate on each end of said housing, each end plate having a centrally mounted hole for receiving the respective side of the rotor shaft, said housing having an inlet passage and a discharge passage, each in contact with said cavity, said rotor having a plurality of radial slots in which slidable vanes of minimal weight are disposed, with each vane being approximately the width of the rotor, and with the outer tip of each vane being in close proximity to said inner stator wall, said vanes serving to define a plurality of chambers that undergo significant volume changes as they move about said cavity during rotation of said rotor, said vanes thus cooperating with





said inner stator wall and said end plates to compress gas entering said inlet passage, such that the gas is discharged at a higher pressure, said compressor utilizing a tapered seal ring mounted in each end plate, that rides on the respective side of said rotor, to effect an essentially zero gap therewith, each seal ring being of particularly hard, tough steel and because of its tapered cross section, the initial footprint area is comparatively small with a high loading, said small footprint area in effect serving as a type of cutting tool, to cause any line contact present between rotor and seal ring due to mutual misalignment to evolve, with rotor wear, into a surface contact.

4,923,378

MOLD ASSEMBLY FOR MOLDING AUTOMOTIVE SEAT

Youichi Omata; Ichiro Matsuura; Kiichiro Ishimaru, and Hisayoshi Mizuno, all of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Dec. 14, 1988, Ser. No. 284,355
Claims priority, application Japan, Feb. 24, 1988, 63-22348[U]
Int. Cl.[5] B28B *7/30*
U.S. Cl. 425—4 R **5 Claims**

1. A mold assembly for molding a plastic article having a recess formed therein, said mold assembly comprising:

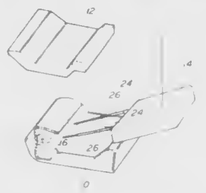
a lower mold having a cavity formed therein;

an upper mold adapted to be put on said lower mold to close said cavity;

a core adapted to be placed in said cavity;

positioning means, including a first member connected to a given portion of the cavity of the lower mold and a second member connected to said core, said first and second members being coupled when mated; and

a telescopically collapsible pin having a base portion held by said second member and a leading end engageable with



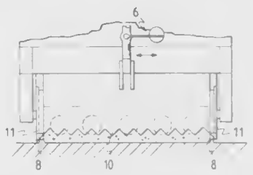
said first member, said pin guiding the insertion of the second member into the first member.

4,923,379

APPARATUS FOR CUTTING HOLLOW-CORED CONCRETE SLABS

Hannu Tomminen, Nurmijärvi, Finland, assignor to Parma Oy, . Forssa, Finland

Filed May 26, 1988, Ser. No. 200,442
Claims priority, application Finland, May 28, 1987, 872372
Int. Cl.[5] B28B *11/16*
U.S. Cl. 425—63 **3 Claims**



I. An apparatus for the instant cutting of hollow-cored slabs, including a frame mounted on wheels and cutting means mounted to the frame, said cutting means comprising

two sheet cutting blades which are connected to the frame to extend over the entire width of the slab, said cutting blades being disposed in a V-shaped posture and provided with cutting tips,

a first set of actuator means capable of pushing the cutting blades towards each other in said V-shaped posture and close to the lower surface of the hollow-cored slab,

a wedge-shaped end cutting knife connected to the frame and extending over the entire width of the slab, said cutting knife having sides which are aligned essentially parallel to the cutting blades, and

a second set of actuator means capable of pushing the wedge-shaped end cutting knife with a shearing motion through the gap between the cutting blades down towards the cutting tips of the blades in order to form a homogeneous sheet of concrete mix over the sides of the cutting knife facing the mix.

4,923,380

APPARATUS FOR THE EXTRUSION OF COLLOGEN TUBES

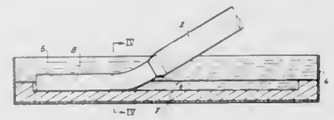
Alain Huc, Sainte-Foy-les-Lyon, and René Gimeno, Pelussin, both of France, assignors to Bioetica, S.A., Lyon, France

Division of Ser. No. 41,652, Apr. 21, 1987, Pat. No. 4,814,120, which is a continuation of Ser. No. 703,890, Feb. 21, 1985, abandoned. This application Dec. 13, 1988, Ser. No. 283,603
Claims priority, application France, Feb. 21, 1984, 84 03181
Int. Cl.[5] B29C *47/20;* **D01F** *9/00;* **B28B** *21/52*
U.S. Cl. 425—68 **4 Claims**

1. An apparatus for the production of a collagen tube to be used as vascular prostheses or as nerve sutures, comprising:

a cylindrical tubular spinneret having a feed end for an aqueous acid collagen gel, and a discharge end;

a coagulant tube concentrically disposed in said spinneret with all around circumferential clearance, having an upstream end for a coagulating solution, and a downstream end upstream of the discharge end of said tubular spinneret, whereby a tube of collagen gel is extruded through said clearance and the inner wall of said collagen gel tube is contacted with the coagulating solution before said



collagen gel tube reaches the discharge end of said tubular spinneret;

a bath of said coagulating solution in which said discharge end of said tubular spinneret terminates;

a bed conformed to the extruded tube of collagen gel, disposed in said bath, for receiving said collagen gel tube from the discharge end of the tubular spinneret; and

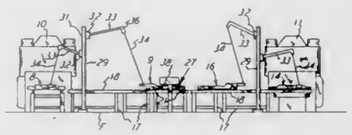
advancement means for displacing the tubular spinneret with respect to the bath.

4,923,381

PRESS TOOLING TRANSFER SYSTEM

Philip T. Delmer, Carlsbad, Calif., and Lewis D. Hunt, Milwaukee, Wis., assignors to Elwood Hydraulics Co., Inc., Oak Creek, Wis.

Filed Feb. 27, 1989, Ser. No. 316,175
Int. Cl.[5] B30B *15/04*
U.S. Cl. 425—77 **12 Claims**



1 A press tooling transport system for a high pressure press, comprising a press, two carriages for respectively carrying a tool set, several spaced-apart stations exterior of said press, a track for mobily supporting said carriages therealong, said track being disposed to interconnect said several stations in relation to one another and with said press and being arranged to accommodate supportive movement of said carriages whereby one of said carriages can move to all but one of said stations while the other of said carriages is immobile at said one station, said one of said stations being an idle station positioned for temporarily storing said other of said carriages while no work is performed at said idle station, and with said idle station being located side-tracked from all other said stations to thereby provide for cleared movement of said one of said carriages between all other said stations.

4,923,382

PRESS FOR PRODUCING PRECISION PARTS FROM POWDERED MATERIAL

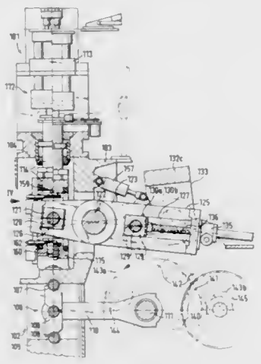
Theodor Klein, Burbach, Fed. Rep. of Germany, assignor to Theodor Grabener Pressensysteme GmbH & Co. KG, Netphen, Fed. Rep. of Germany

Filed Nov. 17, 1988, Ser. No. 272,733

Claims priority, application European Pat. Off., Nov. 19, 1987, 87117037.9

Int. Cl.[5] B30B *11/02*

U.S. Cl. 425—78 14 Claims



1. In a press for the manufacture of die-formed parts from powdered material, comprising a press support having thereon a ram in the form of a press frame movable in ways on the press support in opposition to a press bed fixed on said support, and driven by a mechanical drive to constitute the main ram of the press, and a secondary ram movable through the press bed in cooperative opposition to the main ram by a mechanical drive terminating in a lever pivoted on the press support and pivotally connected to the secondary ram,

wherein the improvement comprises an arrangement in which the lever which drives the secondary ram is a double-arm lever, one arm of which engages the secondary ram and wherein the mechanical drive of which the lever is a part includes a rock arm which is pivoted on the press support and is slidably and pivotally connected to the other arm of said lever, and wherein the rock arm is selectively interchangeably and detachably connectable to a single drive shaft through one or the other of two drive trains.

4,923,383

APPARATUS FOR MOLD ALIGNING IN A COMPRESSION MOLDING MACHINE

Masanobu Kurumaji; Naoki Takeuchi, both of Kobe; Tutomu Sano, Toyonaka; Kazuyuki Kajiyama, Akashi; Hiroaki Kondo, and Etujiro Imanishi, both of Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 23, 1988, Ser. No. 289,037

Claims priority, application Japan, Dec. 26, 1987, 62-198653[U]; Apr. 7, 1988, 63-86791

Int. Cl.[5] B29C *43/58*

U.S. Cl. 425—150 4 Claims

1. A compression molding machine comprising:

(a) a bed;

(b) a plurality of uprights projecting upwardly from said bed;

(c) a crown block mounted on said plurality of uprights;

(d) a slide block guided for vertical sliding movement on said plurality of uprights;

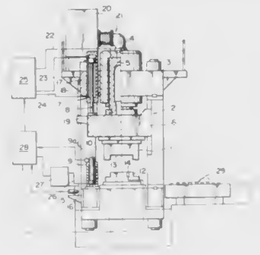
(e) a main cylinder actuator mounted on said crown block and having a piston rod joined to said slide block;

(f) an upper mold detachably attached to the lower surface of said slide block;

(g) a lower mold detachably attached to the upper surface of said bed;

(h) a plurality of mold position adjusting cylinder actuators mounted on said bed, each one of said plurality of mold position adjusting cylinder actuators comprising a cylinder and a piston rod projecting upwardly from said bed;

(i) a plurality of screw jacks, each one of said screw jacks comprising a screw rod operatively connected to said



piston rod of an associated one of said plurality of mold position adjusting cylinder actuators;

(j) a driving motor mounted on said bed, said driving motor having an output shaft;

(k) a plurality of bevel gear units and transmission shafts operatively connecting said output shaft of said driving motor unit to said plurality of screw jacks;

(l) a rotation detector for detecting the number of rotations of said output shaft of said driving motor;

(m) a central processing unit operatively connected to said rotation detector and to said driving motor unit; and

(n) a terminal for controlling said central processing unit.

4,923,384

CONTINUOUS PRESS FOR HOT PRESSING A MAT

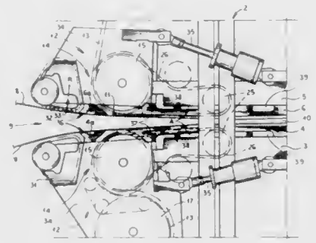
Klaus Gerhardt, Rheurdt, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 339,181

Claims priority, application Fed. Rep. of Germany, May 14, 1988, 3816511

Int. Cl.[5] B30B *5/04*

U.S. Cl. 425—371 12 Claims



1. In a continuous press for hot pressing a mat, comprising a press frame, a lower pressing plate with a heated platen, an upper pressing plate with another heated platen and endless press belts guided about said press plates with the aid of guide drums, which form an entrance mouth in the vicinity of the

entrance side of said guide drums and a press gap in a pressing region, in which said press belts are guided in said pressing region on roll rods, which circulate between said heated platens and said press belts, said roll rods being guided around said pressing plates on a guideway with the help of an upper and lower roll rod circulating mechanism having guide chains and a roll rod feed mechanism with entrance-end roll rod feed wheels, the improvement wherein:

a respective roll shoe is located in a region between said guide drums for said press belts and said roll rod fee mechanisms,

said press belts are guided by said roll shoes each of which has a plurality of auxiliary rolls guided over another guideway, which are guide d on the press belt side over shape-determining guide surfaces, and

said roll shoes and said entrance-end roll rod feed wheels have common side walls, which are connected with hot platen portions protruding beyond said pressing plates, and a closing piston-cylinder unit is connected between said side wall and said press frame, with which a gap width between said roll shoes in the vicinity of said roll rod guide wheels by elastic deformation of said protruding hot platen portions is adjustable.

4,923,385

BLOW MOLDING MACHINE

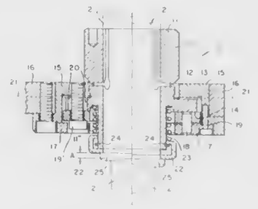
Markus Spoetzl, Munich, Fed. Rep. of Germany, assignor to Krauss-Maffei A.G., Fed. Rep. of Germany

Division of Ser. No. 68,331, Jul. 1, 1987, Pat. No. 4,871,492. This application Apr. 4, 1989, Ser. No. 333,011

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3623099

Int. Cl.[5] B29C *49/42*

U.S. Cl. 425—522 32 Claims



1. A sizing unit useful for a blow molding apparatus comprising:

at least one blow mandrel; and

at least one blow mandrel holder comprising:

a sleeve connected to said mandrel by an adjustable means for fixing an axial alignment of said mandrel;

a flange connected to said mandrel by adjustable means for fixing radial alignment of said mandrel; and

a blow mandrel carrier attached to said sizing unit and detachably connected to said at least one blow mandrel holder.

4,923,386

APPARATUS FOR FORMING LEADS OF A SEMICONDUCTOR DEVICE

Taizo Eshima, and Yasuyoshi Kai, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 5, 1988, Ser. No. 279,800

Claims priority, application Japan, Dec. 17, 1987, 62-322122

Int. Cl.[5] B28B *3/00;* B29C *33/20*

U.S. Cl. 425—450.1 4 Claims

1. An apparatus for forming leads of a semiconductor device comprising:

first mold half supporting means for supporting a first mold half;

second mold half supporting means movable relative to said first mold half supporting means for supporting a second mold half opposite said first mold half;

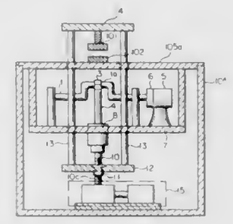
means for reciprocally moving said second mold half supporting means toward and away from said first mold half supporting means including:

a crankshaft having an axis;

means for rotating said crankshaft about its axis;

a first coupling rod having opposed first and second ends and rotatably engaging the crankshaft at the first end;

a coupler pivotally engaging the first coupling rod at its second end;



a second coupling rod having opposed first and second ends and external threads between the first and second ends, the external threads threadedly engaging the second mold half supporting means and the first end of said second coupling rod rotatably engaging said coupler; and

means for rotating said second coupling rod engaging said second coupling rod at its second end for adjusting the engagement of said second coupling rod with said second mold half supporting means along said second coupling rod whereby the minimum spacing between said first mold half supporting means and said second mold half supporting means is adjusted.

4,923,387

INJECTION MOLDING SYSTEM HAVING A VALVE MEMBER WITH A RIBBED INSULATIVE PORTION

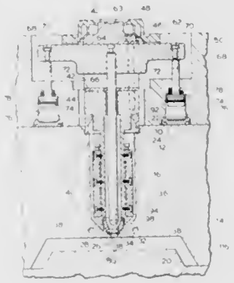
Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1

Filed Feb. 27, 1989, Ser. No. 315,487

Claims priority, application Canada, Feb. 14, 1989, 591009

Int. Cl.[5] B29C *45/23*

U.S. Cl. 425—549 4 Claims



1. In a valve gated hot runner injection molding system having a heated nozzle seated in a well in a cavity plate, the nozzle having a central bore extending therethrough to receive

an elongated valve member and to provide a melt passage which extends in the central bore around at least a forward portion of the valve member to convey melt to a gate extending through the cavity plate to a cavity, the elongated valve member having a forward tip end and a rear end and valve member actuating means to reciprocate the valve member longitudinally between a retracted open position and a forward closed position in which the tip end of the valve member is seated in the gate, the improvement wherein;

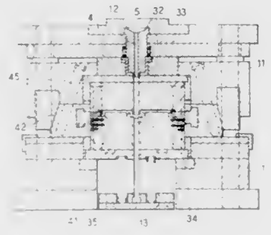
the valve member comprises an integral insulative portion between a long steel main portion extending from the rear end and a short conductive portion adjacent the forward tip end, the conductive portion including a conductive metal, the insulative portion including at least one longitudinal rib positioned to support the conductive metal of the conductive portion.

4,923,388

INJECTION METAL MOLD

Hajime Nakamura, Yamanashi, Japan, assignor to Sankyo Engineering Co., Ltd., Yamanashi, Japan

Filed Dec. 2, 1988, Ser. No. 278,854
Claims priority, application Japan, Jan. 12, 1988, 63-3105
Int. Cl.[5] B29C *45/33*
U.S. Cl. 425—577 **4 Claims**



1. An injection metal mold comprising:

a core metal mold fixing frame (**1**);

a core metal mold element (**3**) detachably fixed to said core metal mold fixing frame;

a cavity metal mold fixing frame (**11**) mounted for movement toward and away from said core metal mold fixing frame;

a cavity metal mold element (**31**) detachably fixed to said cavity metal mold fixing frame and engageable with said core metal mold element to define a cavity (**33**) having an undercut space (**35**) near an edge of said cavity;

injection means connected to either said cavity metal modifying frame or said core metal mold fixing frame for injecting material to be molded into said cavity;

a slide section (**42**) having a front surface facing said core metal mold element, said slide section being slidably mounted to said core metal mold fixing frame for movement toward and away from said core metal mold element, said slide section including a fitting groove (**43**) extending transversely to the direction of sliding movement of said slide section;

an undercut forming section (**4**) detachably connected to said slide section at said front surface thereof, said undercut forming section having a portion for insertion into said undercut space when said slide section slides toward said core metal mold element, said undercut forming section having a fitting portion (**41**) for loosely fitting in said fitting groove, said fitting portion including engagement pins for engaging with bores in said core metal mold element for fixing a relative position between said undercut forming section and said core metal mold element (**3**);

slide moving means connected to said cavity metal mold fixing frame and including an inclined portion (**45**) engageable with said slide section (**42**) when said cavity and core metal mold fixing frames are moved toward each other, for sliding said slide section toward said core metal mold element (**3**);

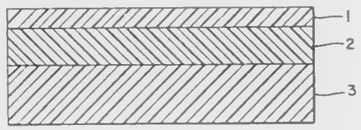
said cavity and core metal mold elements (**3,31**) and said undercut forming section (**4**) comprising an interengageable mold cassette for forming said cavity.

4,923,389

NEGATIVE WORKING LOW SILVER WASH-OFF CONTACT FILM

Robert P. Held, Englishtown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1988, Ser. No. 188,558
Int. Cl.[5] G03C *1/06, 1/68, 1/727*
U.S. Cl. 430—264 **32 Claims**



1. A negative-working, silver wash-off element comprising, in order,

(a) a support,

(b) a photosensitive layer consisting essentially of an aqueous phase containing silver halide, and a hydrophilic, macromolecular organic polymer dispersion medium, and an organic dispersed phase containing:

(i) at least one ethylenically unsaturated monomeric compound having a boiling point above 100° C. at normal atmospheric pressure and being capable of forming a high polymer by free-radical initiated, chain-propagating addition polymerization; and,

(ii) in reactive association with the monomer, at least one free-radical photoinitiator or photoinitiator system activatible by actinic radiation in an amount constituting from 0.01 to 20% by weight of total solids in the dispersion; and

(c) an abrasion overcoat layer comprising an organic binder and a tanning developer.

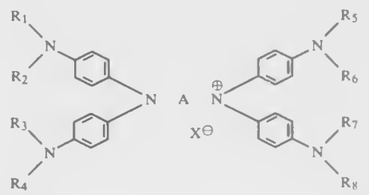
4,923,390

OPTICAL RECORDING MEDIUM IR-RAY ABSORPTIVE COMPOUND AND OPTICAL RECORDING MEDIUM BY USE THEREOF

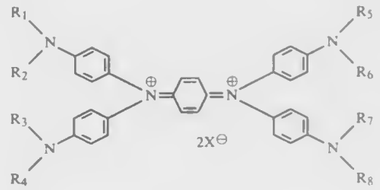
Yoshihiro Oguchi; Hiroyuki Sugata, both of Yokohama; Kyo Miura, Sagamihara; Tetsuro Fukui, Kawasaki, and Yoshio Takasu, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 106,820, Oct. 13, 1987, abandoned. This application Aug. 2, 1988, Ser. No. 227,862
Claims priority, application Japan, Oct. 14, 1986, 61-244609; Oct. 23, 1986, 61-253301; Aug. 4, 1987, 62-194597
Int. Cl.[5] G11B *7/24;* B41M *5/26;* G03C *5/16, 1/72*
U.S. Cl. 430—270 **10 Claims**

1. An optical recording medium capable of optically detecting or imaging a pit therein, comprising a substrate and a recording layer containing (i) at least one aminium or diimonium salt compound represented by formulae (5) and (6) and (ii) dye:



(5)



(6)

(wherein A represents



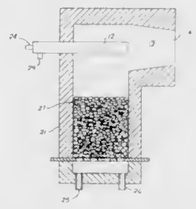
which may be substituted with alkyl, halogen or alkoxy; $X^{\ominus}$ represents an anion; R1 through R8 each represent a substituent having 1 to 8 carbon atoms, and at least one of them is an alkoxyalkyl group, an alkenyl group or alkynyl group).

4,923,391

REGENERATIVE BURNER

Gregory M. Gitman, Duluth, Ga., assignor to American Combustion, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 883,769, Jul. 9, 1986, Pat. No. 4,797,087, which is a continuation-in-part of Ser. No. 755,831, Jul. 15, 1985, Pat. No. 4,642,047, which is a continuation-in-part of Ser. No. 642,141, Aug. 17, 1984, Pat. No. 4,622,007, and a continuation-in-part of Ser. No. 60,420, Aug. 3, 1987, Pat. No. 4,874,311. This application Apr. 12, 1988, Ser. No. 180,445
Int. Cl.[5] F23D *11/44*
U.S. Cl. 431—10 **11 Claims**



1. A method of combusting fuel in a furnace having a pair of regenerative burners, each burner having a combustion chamber, comprising:

(a) supplying fuel and oxygen alternatively to each burner to create alternating firing burners wherein said oxygen is supplied from two sources providing first and second oxidizing gases having different oxygen concentrations and simultaneously alternating the application of negative pressure to the remaining non-firing burner to recover heat from flue gases exhausted by the regenerative bed of the non-firing burner to be used further to preheat at least part of said oxygen being supplied to said firing burner;

(b) mixing said fuel with a fraction of said oxygen under substoichiometric combustion condition to create products of incomplete combustion to form a hot, luminous flame core containing partially pyrolized fuel; and

(c) mixing said partially pyrolyzed fuel with a remaining fraction of said oxygen to complete combustion of said pyrolized fuel; and

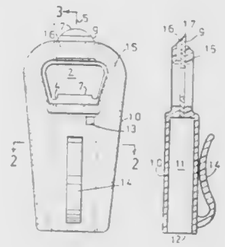
(d) controlling the total flow of fuel and oxygen supplied to each burner to provide each burner with a desired flame stoichiometry.

4,923,392

COMBINATION BEVERAGE OPENER AND LIGHTER HOLDER

John L. Moynihan, III, 2748 NE. 15th St., Fort Lauderdale, Fla. 33304

Filed Oct. 10, 1989, Ser. No. 419,130
Int. Cl.[5] B67B *7/44*
U.S. Cl. 431—253 **7 Claims**



1. A combination case for a lighter and opener for both bottles with crown caps and cans with tab tops, comprising:

(a) an elongate body that serves as a handle;

(b) an internal hollow chamber within said body, said chamber having an open end at a first end of said body, wherein said chamber is arranged to removably receive the body of said lighter to serve as an outer case;

(c) a crown opener element extending from a second end of said body, said crown opener element having an aperture with proximal and distal inner edges arranged transverse to the long axis of said body, said proximal edge arranged for fitting under the edge of said crown cap and said distal edge arranged to serve as a fulcrum for resting upon the top of said crown cap while said proximal edge pries the cap upward;

(d) a thin and narrow projection extending from the terminal end of said crown opener element, wherein said projection is arranged to fit beneath the tab of said tab-top can for prying it upward to open said can, said projection also serving as a tool for removing wrappers and wires from bottles; and

(e) a tab receiving recess located at the base of said projection for receiving said tab, said recess serving to engage said tab for bending it down after it has been raised, said body is made substantially of plastic and said plastic is transparent.

4,923,393

FUEL FIRED BURNER

David M. Sutton, Camberley, England, assignor to British Gas Corporation, London, England

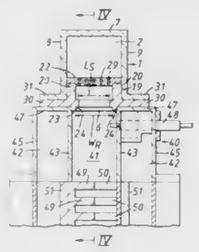
Filed Jul. 8, 1986, Ser. No. 883,502
Int. Cl.[5] F23D *14/12*
U.S. Cl. 431—328 **8 Claims**

1. A fuel fired burner comprising:

a plenum chamber having first and second walls;

means for supplying said plenum chamber with a fully premixed air-fuel mixture via said first plenum wall; and

a plurality of substantially rectangular slots through said second plenum wall for permitting discharge of said air-fuel mixture, said slots being separated by lands having a width Wm, wherein said plurality of slots form an elongate array and each of said slots has a width Ws in the direction of elongation of said array and a length Ls transverse to the direction of elongation of said array, wherein:



Ls≧Ws

and the through-wall depth of each slot is at least equal to twice the width of the slot.

4,923,394

PORTABLE TORCH

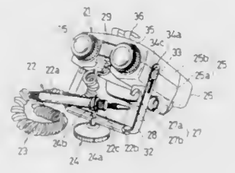
Ichiro Fumino, Tokyo, Japan, assignor to Nippon Tansan Gas Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,249

Claims priority, application Japan, Nov. 19, 1986, 61-275776; Jul. 29, 1987, 62-191366; Jul. 29, 1987, 62-191367; Jul. 29, 1987, 62-191368; Jul. 29, 1987, 62-191369

Int. Cl.[5] F23D *14/20, 14/46*

U.S. Cl. 431—343 23 Claims



1. A portable torch comprising, a first tank containing a combustible gas and a second tank containing a combustion-supporting gas, a first pressure regulating mechanism connected to said first tank and a second pressure regulating mechanism connected to said second tank, each of said first and second pressure regulating mechanisms having a primary pressure side with gas at a primary pressure level, and a secondary pressure side with gas at a secondary pressure level, and an adjustable valve means between the primary and secondary pressure sides for controlling the flow rate of gas from said primary pressure side to said secondary pressure side, the respective primary pressure sides being connected to respective said first and second gas tanks for communication with said adjustable valve means, and a torch portion with flexible tubes for respective connection to the respective secondary pressure sides of said pressure regulating mechanisms, said torch portion having a forward end with a nozzle, and no gas flow regulating devices being provided on said torch portion,

first and second check valves respectively interposed between said first and second pressure regulating mechanisms and said torch portion, for blocking backflow of gas from said nozzle portion to respective said first and second pressure regulating mechanisms, said first and second check valves each having the additional function of reducing the pressure of gas flowing from respective said first and second pressure regulating mechanisms to said torch portion,

said pressure regulating mechanisms each including means for regulating the gas pressure at said secondary pressure side including first and second manually adjustable pressure regulating dials, respectively corresponding to said first and second gas tanks to regulate the flow rate of gas from respective said first and second gas tanks through said nozzle from respective said secondary pressure sides, whereby each said first and second manually adjustable pressure regulating dial is operable without any other manual control to control the flow rate of gas through said nozzle from respective said ;first and second gas tanks,

a housing for said first and second gas tanks and leg means provided on said housing for supporting said housing and said first and second gas tanks in a predetermined inclined position that permits gas to flow outwardly from said gas tanks,

said housing including a nonrotatable stem projecting from said housing, and said leg means include a leg portion pivotable with respect to said nonrotatable stem, said leg portion including a first opening engageable with said nonrotatable stem to fix the leg portion in a predetermined angular position with respect to said housing that permits maintenance of said housing in said inclined position, said leg portion further including a slot communicating with said first opening to permit sliding movement of said leg portion with respect to said housing.

4,923,395

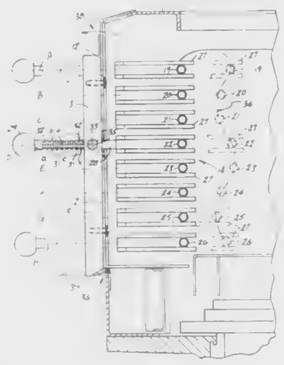
OVEN FOR BLOW MOLDING MACHINE

Bruce Coxhead, Bone Head, Ontario; Gary Hughes, Bolton, Ontario, and John R. Murchie, Everett, Ontario, all of Canada, assignors to Husky Injection Molding Systems Ltd., Bolten, Canada

Filed Nov. 16, 1988, Ser. No. 271,719

Int. Cl.[5] F27D *5/00*

U.S. Cl. 432—5 9 Claims



1. In a blow molding machine having an oven for heating rotating, multi-dimensional preforms or parisons advancing in a continuously or intermittently moving stream in a first direction through the oven, a method of establishing a precisely adjustable temperature profile extending in a second direction for heating the body of each parison to establish in each parison a preferred temperature gradient extending across the body of each said parison comprising the steps of:

placing a battery of individually moveable heating elements within said oven, said elements being arrayed in said second direction,

supporting the arrayed elements so that heat generated by the elements plays directly upon the body of each parison substantially in line with said second direction, and

adjusting individual heating elements in said array of elements along a third direction relative to the body of each parison while the stream of parisons is in motion in said first direction until a desired temperature profile is established whereby said preferred temperature gradient is created across the body of each parison substantially in the plane of said second direction in conformity with the dimensions of each parison.

4,923,396

METHOD AND APPARATUS FOR HEATING A STRIP OF METALLIC MATERIAL IN A CONTINUOUS ANNEALING FURNACE

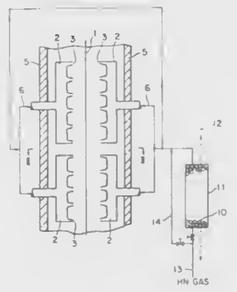
Masahiro Harada; Kenichi Yanagi; Takeo Fukushima, all of Hiroshima; Kusuo Furukawa, Chiba; Naohiko Soeda, Chiba; Norio Ohta, Chiba; Kuniaki Sato, Yotukaido, and Yasuhisa Nakajima, Chiba, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Kawasaki Steel Corporation, Hyogo, both of, Japan

Division of Ser. No. 75,217, Jul. 20, 1987, Pat. No. 4,836,744, which is a continuation of Ser. No. 796,087, Nov. 8, 1985, abandoned. This application Feb. 24, 1989, Ser. No. 315,310

Claims priority, application Japan, Nov. 8, 1984, 59-234089; Nov. 13, 1984, 59-237661; Nov. 13, 1984, 59-237662; Nov. 13, 1984, 59-237663; Mar. 5, 1985, 60-41788

Int. Cl.[5] F27B *9/28*

U.S. Cl. 432—59 3 Claims



1. An apparatus for heat-treating a strip of metallic material in a continuous annealing furnace which comprises

(a) a heating zone having an inlet and an outlet,

(b) a means for introducing a strip of metallic material into said heating zone and withdrawing said strip from said heating zone,

(c) a radiant heating tube system disposed on one or both sides of said metallic strip within said heating zone,

(d) a plurality of gas jet nozzles disposed in a mutually adjacent manner between the radiant tubes of said radiant heating tube system in one or more sections of said heating zone, and

(e) a temperature control means for controlling the temperature of said radiant heating tube system on the basis of the temperature of said metallic strip at the outlet of said heating zone so as to control said temperature of said metallic strip at the required level and also for controlling the flow rate of gas flowing through said gas jet nozzles so that said metallic strip can be always heat-treated at its proper annealing temperature irrespective of changes in operating conditions such as the heat cycle, line speed, strip thickness and strip width.

4,923,397

FLAT SEPARATION FLOOR BETWEEN TWO SUPERPOSED CHAMBERS IN KILNS, IN PARTICULAR ROLLER-HEARTH KILNS FOR CERAMIC TILES

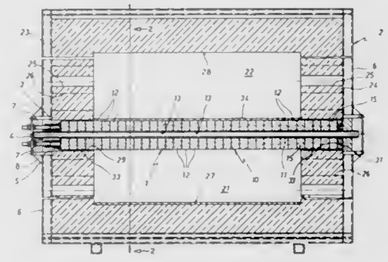
Roberto Nassetti, Milan, Italy, assignor to T.T.C. Termo Tecnica Ceramica S.P.A., Matena, Italy

Filed Apr. 11, 1989, Ser. No. 336,126

Claims priority, application Italy, Apr. 29, 1988, 46843 A/88

Int. Cl.[5] F27D *1/00*

U.S. Cl. 432—251 5 Claims



1. A separation floor disposed between two superimposed chambers of a kiln, in particular, in a roller-hearth kiln for ceramic tiles, which comprises a plurality of structural elements (**10**) of rectilinear elongated shape and disposed parallel and adjacent to each other to form a flat horizontal structure supported by two opposing vertical walls (**23**) and (**24**), each structural element (**10**) comprising:

at least one internal beam (**11**) disposed parallel to the axis of said element;

a plurality of thermal insulation blocks (**12**) each provided with through holes (**13**), one for each internal beam (**11**), and mounted along the internal beam (**11**), said blocks (**12**) being slidable along the internal beam (**11**); and

means acting on the ends of the row of said blocks to compress the row in an axial direction thereby pressing the blocks (**12**) together.

4,923,398

FACE PLATE FOR DENTAL ARTICULATOR

Jay L. Mackman, 2105 W. Applewood La., Glendale, Wis. 53209

Filed Oct. 13, 1987, Ser. No. 108,057

Int. Cl.[5] A61C *11/00*

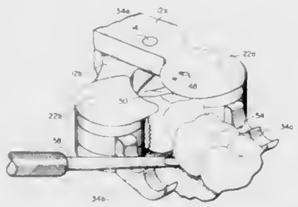
U.S. Cl. 433—60 12 Claims



1. A removable face plate for providing removable plasterless mounting of a dental cast to a frame member of a dental articulator, said frame member including position fixing means, comprising:

a body portion;
plasterless mounting means provided on said body portion for mounting a dental cast thereto;
lateral positioning means movably connected to said body portion, said lateral positioning means being removably engageable with the position fixing means provided on said articulator frame member, and providing lateral positioning of said body portion; and
selectively actuable locking means for selectively securing said body portion and said positioning means together for preventing movement therebetween so that, upon engagement of said positioning means with the position fixing means provided on said articulator and actuation of said locking means, the position of said body portion relative to said articulator frame member is fixed.

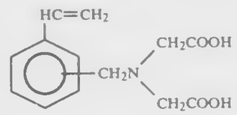
4,923,399
DENTAL INSTRUMENT
Issac M. Funderburg, Jr., 1605 Fairy Dell, Lookout Mountain, Ga. 30750
Filed Aug. 22, 1988, Ser. No. 234,490
Int. Cl.[5] A61C *3/16*
U.S. Cl. 433—159 **8 Claims**



1. A dental instrument for attachment to a first tooth and providing a stable support for the use of other dental instruments comprising:
a pair of arms, each arm having a handle portion and an adjustable instrument mounting head portion comprising opposable tooth gripping means for gripping said first tooth, an upper head member, a lower head member, a tool mounting post located axially and attached between the upper and lower head members, a clamping post attached between the upper and lower head members and located laterally from the tool mounting post wherein said gripping means are attached to said clamping post, and a tool comprising a tongue extending beyond said gripping means to a position adjacent to a second tooth for providing a stable fulcrum for a dental instrument used to pry a dental prosthesis from said second tooth; and
pivot means joining said arms for rotation relative to each other.

4,923,400
DENTAL ADHESIVE COMPOSITION
Kunitomo Suzuki, Odawara; Takao Kiyohara, Fujisawa, and Shinya Kitoh, Ito, all of Japan, assignors to Lion Corporation, Tokyo, Japan
Filed Mar. 18, 1988, Ser. No. 170,371
Claims priority, application Japan, Mar. 18, 1987, 62-64997
Int. Cl.[5] A61C *5/04*
U.S. Cl. 433—226 **15 Claims**

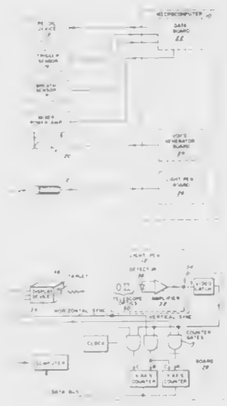
1. A dental adhesive composition comprising a compound having the formula (I):



(I)

(ii) at least one polymerizable monomer selected from the group consisting of (a) styrene, (b) acrylic acid and derivatives thereof, and (c) methacrylic acid and derivatives thereof and optionally (iii) a solvent.

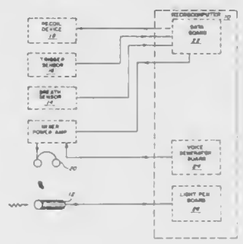
4,923,401
LONG RANGE LIGHT PEN
Albert H. Marshall, Orlando; Ronald S. Wolff, Cocoa; Robert T. McCormack, Orlando, and Edward J. Purvis, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 25, 1988, Ser. No. 276,256
Int. Cl.[5] F41G *3/26*
U.S. Cl. 434—22 **7 Claims**



1. Long range light pen apparatus for weapons training, comprising a two-element optic system having a first bi-convex lens and a second bi-concave lens; a photodiode optically downstream from said lenses for providing a current signal at its output in response to light; a raster scan display device having horizontal and vertical sync signals; and circuitry including means coupled to said output of said photodiode for converting said current signal to a voltage signal, electronic means for filtering and amplifying said voltage signal, a video latch connected to the output of said electronic means, first and second counters and a plurality of gates, wherein said counters are coupled to said horizontal and vertical sync signals of the display device and to said gates, and said gates are connected at their inputs to said video latch, for measuring the location of the raster scan on said display device when the photodiode provides said current signal in response to light.

7. Long range light pen apparatus for weapons training, comprising a two-element optic system having a first bi-convex lens and a second bi-concave lens; a photodiode optically downstream from said lenses for providing a current signal at its output in response to the light; and circuitry including means coupled to said output of said photodiode for converting said current signal to a voltage signal and electronic means for filtering and amplifying said voltage signal; said first lens has a diameter of 25.0 mm and a focal length of 63.5 mm, said second lens has a diameter of 14.0 mm and a focal length of 45.5 mm, and said photodiode is 40 mm downstream of said second lens.

4,923,402
MARKSMANSHIP EXPERT TRAINER
Albert H. Marshall; Robert T. McCormack, both of Orlando; Edward J. Purvis, Winter Park; Ronald S. Wolff, Cocoa, and Herbert C. Towle, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 25, 1988, Ser. No. 276,257
Int. Cl.[5] F41G *3/26*
U.S. Cl. 434—22 **12 Claims**

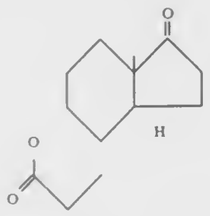


1. A marksmanship trainer having various sensors and a computerized expert instructor that monitors, scores and provides feedback to the trainee, wherein the target image is visually displayed and controlled on a raster scan by the computer, and the trainee's weapon includes a long range light pen receiver that permits the trainee's aim point on the display to be tracked up to, and through, trigger squeeze, comprising:
means for representing in physical appearance a weapon having a barrel and sight;
optical receiving means mounted for movement with said weapon means and aligned with said sight, for magnifying and continuously detecting a spot of light within its field of view, said receiving means comprising a light pen apparatus that includes a two-element optic system having a first bi-convex lens and a second bi-concave lens, a detector which provides a current signal at its output responsive to said spot of light, and circuitry that comprises means coupled to said output of said detector for converting said current signal to a voltage signal and electronic means for filtering and amplifying said voltage signal;
means for providing an image visible to the trainee, wherein a spot of light detectable by said detector is scanned in a raster fashion;
circuit means coupled to said image means and said receiving means for determining the aim point by identifying the location of said spot of light at the pixel level when said spot of light is detected by said receiving means, and for correlating said aim point to said image, said circuit means comprising a video latch connected to said electronic means, first and second counters having outputs coupled to said image means and the inputs of said first and second counters connected to the outputs of a plurality of gates, and the inputs of said plurality of gates are connected to said video latch for measuring the horizontal and vertical locations, respectively, of said spot of light to determine said aim point;
processing means coupled to said circuit means and said image means for comparing the correlation between the aim point and the image to the criteria that corresponds to the quality of trainee performance; and,
means responsive to said processing means for communicating corrective feedback to said trainee that is preselected for corresponding to the results of said comparison from data, said data is representative of an expert marksmanship instructor.

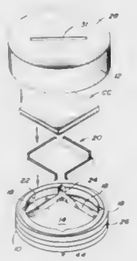
6. A marksmanship trainer having various sensors and a computerized expert instructor that monitors, scores and provides feedback to the trainee, wherein the target image is visually displayed and controlled on a raster scan by the computer, and the trainee's weapon includes a long range light pen receiver that permits the trainee's aim point on the display to be tracked up to, and through, trigger squeeze, comprising:
means for representing in physical appearance of a weapon having a barrel, trigger mechanism and sight;
optical receiving means mounted for movement with said weapon means and aligned with said sight, for magnifying and continuously detecting a spot of light within its field of view;
means for providing an image visible to the trainee, wherein said spot of light detectable by said receiving means is scanned in a raster fashion;
circuit means coupled to said image means and said receiving means for determining the aim point by identifying the location of said spot of light at the pixel level when said spot of light is detected by said receiving means and correlating said aim point to said image;
processing means coupled to said circuit means and said image means for comparing the correlation between the aim point and the image to the criteria that corresponds to the quality of trainee performance, said processing means including a data acquisition analog-to-digital conversion broad;
wherein said trigger mechanism operable by said trainee including a pressure sensor that is electrically connected to said data broad and is responsive to the force applied by said trainee in manipulating said trigger mechanism, such that the quality of trainee performance in applying pressure to the trigger mechanism can be monitored and compared to the criteria that relates to the trigger manipulation; and,
means responsive to said processing means for communicating corrective feedback to said trainee that is preselected for corresponding results of said comparison from data, said data is representative of an expert marksmanship instructor.

4,923,403
MICROBIOLOGICAL PROCESS FOR DEGRADATION OF STEROIDS
Nicolaas P. Ferreira, Pretoria, South Africa, assignor to South African Inventions Development Corp., Pretoria, South Africa
Filed Aug. 15, 1985, Ser. No. 766,126
Claims priority, application South Africa, Aug. 16, 1984, 84/6385
Int. Cl.[5] C12P *17/06*; C12N *25/00, 1/20*; C12R *1/01*
U.S. Cl. 435—125 **8 Claims**

1. A process for preparing a steroidal precursor for the chemical synthesis of a pharmaceutical steroid, which comprises cultivating, in the presence of a degradable steroid, a micro-organism which can selectively degrade the degradable steroid and accumulate the steroidal precursor, the micro-organism being a *Rhodococcus australis* mutant selected form the group consisting of those mutants identified at the NCIB 12146, NCIB 12145, NCIB 12150 and NCIB 12147, the degradable steroid being a steroid selected from the group consisting of cholesterol, β-sitosterol, stigmasterol and a mixture of any two or more thereof, and the steroidal precursor being 3aα-H-4α-[3'-propionic acid]-5α-hydroxy-7aβ-methyl-hexahydro-1-indanone-δ-lactone, having the formula:



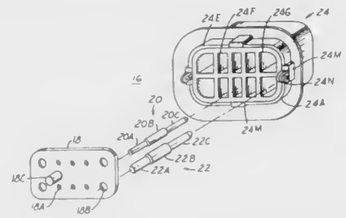
4,923,404
SEALED CHIP CARRIER
John P. Redmond, Mechanicsburg, and Ray N. Shaak, Lebanon, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Oct. 20, 1989, Ser. No. 424,469
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—71 6 Claims



1. An environmentally sealed chip carrier housing for mounting on a printed circuit board, comprising:
a. a chip carrier housing formed of a dielectric material and comprising a base and an upstanding circular side wall, one surface of which is threadably configured for receipt of a cover member, said base being provided with plural slots for receiving a like plurality of elongated elastomeric compressive type connectors and shoulder means for supporting a chip carrier thereon, and
b. a cover member for threadably engaging said housing, said cover member being defined by a top with a peripheral wall thereabout, where said top has a uniformly convex configuration such that the center portion is thicker than the outer portions thereof, whereby when said cover member is positioned over said housing containing a chip carrier, threadably engaging said cover member with said housing will provide a unifore pressure to said chip carrier which in turn will exert a uniform pressure against said elastomeric compressive type connectors.

4,923,405
PRINTED CIRCUIT BOARD, IN LINE STRAIGHT PIN CONNECTOR THEREFOR
Gregg H. Munsterman, Grosse Pointe Park; Paul W. Geyer, Rochester, and Harry Zaverzence, Sterling Heights, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Apr. 21, 1989, Ser. No. 341,335
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—78 4 Claims

1. An in-line printed circuit board connector useful over a wide range of temperature conditions for coupling a harness connector to an input/output port on a printed circuit board, the input/output port containing a plurality of wire-run terminations arranged in a pattern to correspond with an arrangement of terminals in the connector, each of said terminations having a hole for receiving a contact end of each of the arranged terminals of said connector, said contact end of each connector being fixedly attached within the hole of the wire-run termination to form a contact/wire-run joint, said connector comprising:
(a) a thermoplastic rear cover having a plurality of cavities of a chosen diameter extending therethrough disposed in a pattern corresponding with the pattern of the holes at the terminations of the wire-runs at the input/output port of the printed circuit board;
(b) a plurality of male terminals for transferring current signals to or from the printed circuit board to the wire harness, each of said terminals having a tail end slidably mounted in one of said cavities of said rear cover and fixedly coupled to one of the holes of the printed circuit board, a cylindrical collar about a central shaft of a chosen height having a rear and front face and a contact end having a bullet-shape termination;

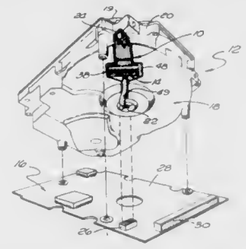


(c) a thermoplastic material header having a rear section, a strain release flange mounted about a mid-region of said header, and a front section extending from said flange, said rear section having a plurality of chambers and a plurality of terminal receiving cavities at a front end of the chambers, each of said receiving cavities slidably receiving the contact end of one of said terminals, said rear section also having a recess about the circumference of a rear face of said rear section for receiving said rear cover and permitting welding of said cover to said rear section to enclose said plurality of chambers,
each of said plurality of chambers including a spaced region between said rear cover and said rear face of each of said collars that permit said header to thermally expand during periods of extreme temperature transitions causing walls of each of said cavities of said rear cover and each of said terminal receiving cavities to slide over said tail and contact ends of each of said terminals in response to the thermal expansion of said header.

4,923,406
SPINDLE MOTOR FLEX CABLE
Neil E. Bucknam, Simi Valley, Calif., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.
Filed Nov. 17, 1988, Ser. No. 272,450
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—77 5 Claims

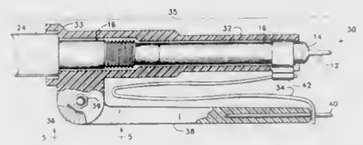
1. In combination:
a disk drive unit including a housing, a spindle motor mounted within said housing, a plurality of spindle motor leads coupled to said spindle motor and protruding from said housing, and drive electronics for controlling operation of said spindle motor;
a spindle motor flex cable defined by a substantially flat ribbon cable base having first and second ends and a plurality of conductors carried by said cable base on one side thereof to extend generally between said first and second ends;

means for supporting said ribbon cable based relative to said housing with said one side of said cable base presented generally toward said housing, said conductors being connected respectively at said first and second ends to said spindle motor leads and to said drive electronics, said first end of said ribbon cable base including a first end segment folded back upon itself to reorient said conductors at said first end segment for presentation away from said housing;



said housing defining a shallow recess for seated reception of a portion of said ribbon cable base adjacent to said first end segment to position said first end segment predeterminably with respect to said housing; and
adhesive means on said portion of said ribbon cable base adjacent to said first end segment, on said one side of said ribbon cable, for securing said portion to said housing within said recess.

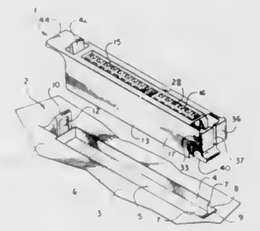
4,923,407
ADJUSTABLE LOW INDUCTANCE PROBE
Delbert L. Rice, and Steven E. Soar, both of Vancouver, Wash., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Oct. 2, 1989, Ser. No. 415,825
Int. Cl.[5] H01R 4/66, 11/88
U.S. Cl. 439—92 9 Claims



1. High frequency electrical signal measurement probe apparatus, comprising:
(a) a signal probe shaft having a signal probe point and an adjacent conductive shield;
(b) a ground probe arm having a ground probe point;
(c) hinge means that rotatably attaches said ground probe arm to said signal probe shaft; and
(d) a low inductance ground lead interconnecting the conductive shield of said signal probe shaft and the ground probe point of said ground probe arm.

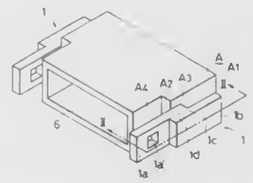
4,923,408
MULTIPOLE ELECTRIC PLUG AND SOCKET
Bernd Zinn, Ennepetal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany
Filed Nov. 8, 1988, Ser. No. 268,813
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738593
Int. Cl.[5] H01R 4/50
U.S. Cl. 439—341 15 Claims

1. Multipole electric plug and socket device including a plug enclosure and a socket box enclosure each having a front and a rear and in which contact elements and mating contact elements attached to electric lines are accommodated in corresponding compartments, where the enclosures can be connected to a pivot hinge device and can be locked with a catch mechanism opposite the pivot hinge device, and box-shaped magazines each having at least one compartment for the contact elements can be inserted into the box-shaped interior of the plug enclosure or the socket box enclosure or both such enclosures, and the magazines have catch lock devices that lock with mating catch devices on the enclosure walls,
characterized in that at least one of the plug enclosure (13) and the socket box enclosure (3) have an insertion orifice (24) at either the front or the rear for insertion of at least one magazine (15, 16), the insertion orifice being adapted



to the form and size of the magazine (15, 16), and that side walls (17, 18) of the plug enclosure extend forwardly from the rear wall (19) in a fork shape, and the side walls 917, 18) have angle bars (20) that are designed identically toward an interior space (4) at the top and bottom of the side walls and define angle recesses 921) facing toward the interior (14), the plug enclosure (13) is open between the upper angle bars (2)) and the lower angle bars (21) of the plug enclosure 913), and the box-shaped magazine (15, 16) has bar pieces 929) that are open toward the top and bottom in an extension of its side walls 927, 28) and fit so as to lock in the angle recesses 921) of angle bars (20) and free end edges (20*a*) of the angle bars (20) rest on upper edges 925*a*) of the walls of the compartments (25).

4,923,409
LOCKING DEVICE FOR CONNECTORS
Takashi Ishii, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Jan. 25, 1989, Ser. No. 301,333
Claims priority, application Japan, Feb. 12, 1988, 63-16350[U]
Int. Cl.[5] H01R 13/639
U.S. Cl. 439—358 2 Claims



1. A locking device for a connector adapted to be locked by fitting projections formed on both sides of a male connector housing in engaging holes 1a' formed in locking arms 1 connected to the side walls of a female connector housing, wherein each of the side walls A_1 of said female connector housing A comprises a riser portion A_2, and a raised supporting portion

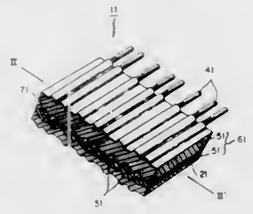
A_3 and a lower non-supporting portion A_4 which are integrally connected, respectively, to both sides of the riser portion, and each of said locking arms 1 comprises a connecting riser portion 1*c*, and an unlocking lever 1*b* and a locking plate portion 1*a* which are integrally connected, respectively, through the connecting riser portion 1*c* to both sides thereof, said unlocking lever 1*b* extending above and away from said supporting portion A_3, said locking plate portion 1*a* extending above and away from said non-supporting portion A_4, said connecting riser portion 1*c* having a surface that is generally coplanar with said unlocking plate portion 1*a* and in abutment with said raised supporting porting A_3, said locking plate portion 1*a* having said engaging hole 1*a'* formed therein and also comprising an unlocking force transmitting portion 1*d* integrally connected thereto as an extension of said unlocking lever 1*b* extending beyond said connecting riser portion 1*c*.

4,923,410

LOW-PERMITTIVITY CONNECTOR AND FLAT-CABLE

Hirosuke Suzuki, Tokorozawa, Japan, assignor to Junkosha Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 314,147
Claims priority, application Japan, Feb. 26, 1988, 63-25295[U]
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—492 **14 Claims**



1. A low permittivity connector for providing a plurality of contacts disposed substantially parallel at predetermined spacings relative to each other comprising

a low-permittivity dielectric sheet;

ribbon-type conductors disposed on the low-permittivity dielectric sheet and exposed on at least one side of the sheet;

wires contacting respective ribbon-type conductors, disposed in a longitudinal direction relative to the conductors, and projecting as pins from an edge at one end of the low-permittivity dielectric sheet;

a housing holding the low-permittivity dielectric sheet, the ribbon-type conductors, and the wires by way of joining sheets and having openings in the area of the ribbon-type conductors at a second end of the low-permittivity sheet for allowing insertion of wires projecting like pins from a second similar low-permittivity connector.

4,923,411

EXTERNAL CONNECTION STRUCTURE OF ELECTRIC CONNECTION BOX

Hideharu Hayashi; Kelichi Ozaki, and Mamoru Sawai, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

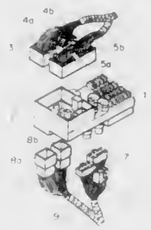
Filed Apr. 11, 1989, Ser. No. 336,150
Claims priority, application Japan, Aug. 7, 1987, 62-120407
Int. Cl.[5] H01R *13/518*
U.S. Cl. 439—540 **3 Claims**

1. An external connection structure of an electric connection box comprising:

an electric connection box having internal wiring therewithin and a first multi-connector housing formed integrally therein, said first multi-connector housing having an internal connector section connected to said internal wiring and a through connector section open therethrough;

a second multi-connector housing having an internal connector section complementary with said internal connector section of said first multi-connector housing and a through connector section complementary with said through connector section of said first multi-connector housing;

through connector housings of a first wire harness, said through connector housings of the first wire harness being received in said through connector section of the second multi-connector housing; and



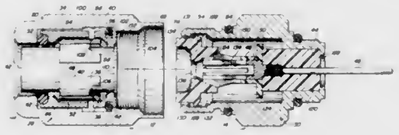
through connector housings of a second wire harness, said through connector housings of the second wire harness being mounted in said through connector section of the first multi-connector housing such that the through connector housings of the first wire harness are mated with the through connector housings of the second wire harness by way of the through connector section of the first multi-connector housing, wherein said internal connector section and said through connector housings of said first and second wire harnesses each have plural electrical contacts therein.

4,923,412

TERMINAL END FOR COAXIAL CABLE

William E. Morris, Mesa, Ariz., assignor to Pyramid Industries, Inc., Phoenix, Ariz.

Continuation of Ser. No. 126,888, Nov. 30, 1987, Pat. No. 4,854,893. This application Jul. 20, 1989, Ser. No. 383,220
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—578 **23 Claims**



1. A coaxial cable connector having two threadedly engageable parts for terminating an end of a coaxial cable having a sheath and a conductor, said connector comprising in combination:

(a) a first part comprising a rear nut body for receiving and gripping the sheath of the coaxial cable, said nut body including

(1) a ferrule disposed within said rear nut body for at least partially circumscribing the sheath, said ferrule including means for at least axially floating said ferrule relative to said rear nut body;

(2) ramp means for radially inwardly compressing at least a segment of said ferrule;

(3) a mandrel for penetrating the cable adjacent the inner surface of the sheath in juxtaposed relationship with said ferrule;

(b) a second part comprising a front nut body for receiving the conductor of the coaxial cable;

(c) means for axially translating said ramp means and said ferrule relative to one another upon threaded engagement of said rear nut body and said front nut body to compress at least a segment of said ferrule; and

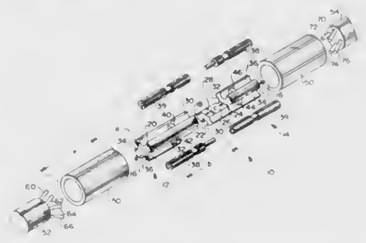
(d) visually perceivable means for limiting the extent of threaded engagement between said rear nut body and said front nut body.

4,923,413

ENVIRONMENTALLY SEALED ELECTRICAL CONNECTOR

Leonard H. Michaels, St. Charles, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Sep. 12, 1988, Ser. No. 242,853
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—589 **8 Claims**



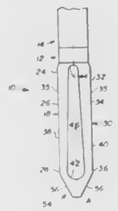
1. An electrical connector assembly comprising opposed mateable connectors, said connectors comprising substantially identical hermaphroditically mateable elongated core insulators, each core insulator having an outer surface and opposed forward and rear ends, generally axially aligned terminal receiving slots extending inwardly into the outer surface of said core insulators, the forward end of each said core insulator being defined by a leading mating face and a trailing mating face disposed in axially spaced generally parallel relationship to one another such that the leading mating face of the core insulator of one connector can be urged into opposed mating relationship with the trailing mating face of the core insulator of the other connector; electrically conductive terminals mounted in the slots of the respective core insulators, such that the terminals of one connector are electrically engageable with the terminals of the other connector when the mating faces of the respective core insulators are urged into mating relationship with one another; each connector further comprising a tubular shroud surrounding the respective core insulator thereof for insulating and retaining the terminals in said respective core insulator, each said shroud comprising a forward longitudinal end, with the forward end of the shroud of one said connector being generally axially aligned with the leading mating face of the core insulator thereof, and with the forward end of the shroud of the other said connector being generally axially aligned with the trailing mating face of the core insulator thereof.

4,923,414

COMPLIANT SECTION FOR CIRCUIT BOARD CONTACT ELEMENTS

Fred C. Sitzler, Dillsburg, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 3, 1989, Ser. No. 374,711
Int. Cl.[5] H01R *13/428*
U.S. Cl. 439—751 **24 Claims**



11. A compliant section of an electrical contact element for mechanical and electrical connection with a plated-through hole in a printed circuit board comprising:

first and second deformable members joined together at respective first and second ends thereof, said second ends forming an insertion end, said members being separated by a recess or slot which extends longitudinally along the compliant section, the recess or slot being wider at said second ends and tapering towards said first ends, thus allowing said members at said second ends to deform together more than at said first ends,

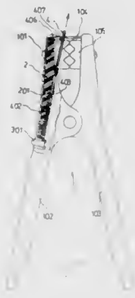
thereby resulting in outer surfaces of said deformable members deforming together in a tapered shape towards said second ends as said compliant section is fully inserted into the plated-through hole, said outer surfaces engaging said hole.

4,923,415

STRUCTURE OF JUMPER CABLE CLAMP

Kuo-Shu Lee, 7F, 16, Alley 3, Lane 227, Nung-An St., Taipei, Taiwan

Filed May 11, 1989, Ser. No. 350,389
Int. Cl.[5] H01R *4/30*
U.S. Cl. 439—755 **6 Claims**



1. A jumper cable clamp, including one pair of clamping elements, a guide block set in one of the said clamping elements, said guide block having a slide way in which a conductive charging clip is set, said conductive charging clip being connected with an expansion spring at the bottom, which expansion spring has its other end connected to said guide block so as to let the conductive charging clip be pulled out for operation or retreated back to be received inside said clamping

element, said conductive charging clip having a curved opening made at the middle part to serve as an electrical connector clamping means for use to clip on the positive or negative side-mounted terminal of a car battery for electrically transmission.

4,923,416

MINIATURIZED, ROUND, ELECTRIC PLUG CONTACTS WITH ROUND PLUG SLEEVES AND ROUND PLUG PRONGS

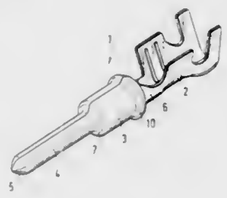
Bernd Zinn, Ennepetal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,678

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810210

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—877 20 Claims



1. Plug prong (1) stamped from a piece of sheet metal, with a part (2), a short cylindrical transition section (6), a hollow, cylindrical base section (3) and a hollow cylindrical contact section (4) with rounded, conically tapered tip (5), which are arranged consecutively in the aforementioned order, whereby the outer diameter of the base section is greater than the outer diameter of the contact section (4) as well as the transition section (6), characterized in that:

the part of the base section (3) bordering on the transition section (6) has a bead (10) bulging outwardly from the base section, so that a relatively deep step is formed for the transition from the bed (10) to the transition section (6); and that

the outer diameter of the transition section (6) is greater than the outer diameter of the contact section (4).

4,923,417

PROPELLER HOUSING RETAINER FOR MARINE PROPULSION DEVICE

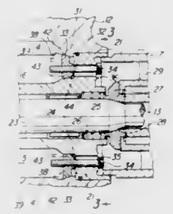
Akihiro Onoue, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 145,965, Jan. 20, 1988, abandoned. This application May 25, 1989, Ser. No. 357,645

Claims priority, application Japan, Jan. 23, 1987, 62-13867

Int. Cl.[5] B63H *1/14, 1/28*

U.S. Cl. 440—78 7 Claims



1. An arrangement for mounting a propeller shaft for rotation about an axis in the lower unit of an outboard drive, said lower unit having an outer housing defining a cavity defined in part by an outer housing shoulder extending circumferentially around said axis, a bearing carrier received, at least in part, in said cavity and rotatably journaling said propeller shaft about said axis, said bearing carrier having a shoulder facing said lower unit outer housing shoulder, and wedging means for urging said bearing carrier shoulder toward said lower unit shoulder, said wedging means having an inclined wedging surface inclined at an angle to said shoulder, a cooperating inclined wedging surface formed by said outer housing engageable with said wedging means wedging surface for effecting a radial thrust on said wedging means, and threaded fastening means for urging said wedging means in an axial direction for bringing said wedging surfaces into engagement to effect thrust upon said wedging means in a radial direction relative to said axis and for urging said shoulders axially toward each other.

4,923,418

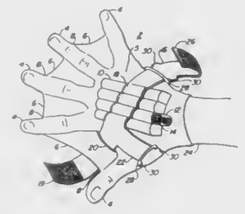
EXERCISE GLOVE

Ned Hoffman, 414 S. 44th St. (A-1), Philadelphia, Pa. 19104

Filed Dec. 23, 1988, Ser. No. 289,191

Int. Cl.[5] A63B *31/04*

U.S. Cl. 441—57 9 Claims



1. An exercising glove comprising:

a mitt having a forehand portion and a palm portion;

a plurality of finger stalls integrally formed on the mitt;

webbing disposed between the finger stalls extending from a point on the mitt where the finger stalls begin to about a point corresponding to the location where a human finger's distal phalange begins when the glove is on a human hand;

a plurality of first insert pockets mounted to the forehand portion of the mitt for receiving a plurality of weights;

at least one second insert pocket mounted to the palm portion of the mitt for receiving a gripping weight;

strap means mounted across the plurality of first insert pockets and securable to the palm portion of the mitt;

a slot formed in the webbing between the forefinger stall and thumb stall through which the strap means is disposed;

a first ring secured to the mitt through which a first end of the strap is disposed;

a second ring secured to the mitt through which a second end of the strap is disposed;

tabs integrally formed on the strap which prevent the first and second ends of the strap from completely passing through the rings; and

a pocket formed on the mitt adapted to receive small items.

4,923,419

POSITIVE DRIVE SWIM FIN

Kevin I. McCarthy, 6841 Via Verano, Carlsbad, Calif. 92008

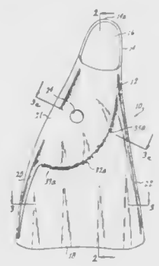
Continuation-in-part of Ser. No. 913,240, Sep. 30, 1986, abandoned. This application Apr. 12, 1988, Ser. No. 180,544

Int. Cl.[5] A63B *31/11*

U.S. Cl. 441—64 29 Claims

1. A swim fin formed with a foot pocket and a blade wherein the improvement comprises:

an offset within the range of 12° to 40° of said foot pocket angularly from the centerline axis of said blade in a direction to cause the offset to compensate for the supination of



the foot during a swimmer's flutter kick and place the axis of the blade in the general direction of a swimmer's leg during a flutter kick motion.

4,923,420

METHOD OF MANUFACTURING CERAMIC TRANSLUCENT MATERIAL

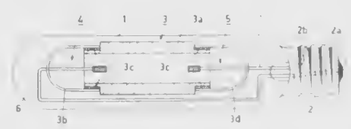
Gijsbertus De With, and Hendricus J. A. Van Dijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Division of Ser. No. 598,959, Apr. 11, 1984, Pat. No. 4,841,195. This application Mar. 1, 1989, Ser. No. 317,371

Claims priority, application Netherlands, Apr. 29, 1983, 8301514

Int. Cl.[5] H01J *9/00*

U.S. Cl. 445—22 12 Claims



1. A method of manufacturing a high-pressure discharge lamp having a discharge envelope which accommodates an ionizable filling and two main electrodes between which a discharge path extends, and the discharge envelope having a wall of ceramic translucent material, said method comprising:

preparing a powder mixture of mainly $Y_2(SO_4)_3$ and $Al_2(SO_4)_3$ by spray-drying an aqueous solution of the said sulphates,

heating the powder mixture at a temperature of 1150°–1400° C. in an oxidizing atmosphere,

adding an Si compound and/or an Mg compound before or after spray-drying or after heating the powder mixture,

molding the garnet powder thus obtained into the shape of the discharge envelope, and

sintering the moulding thus obtained in vacuo at a pressure of at most 0.13 Pa or in hydrogen at a temperature of at least 1700° C.

4,923,421

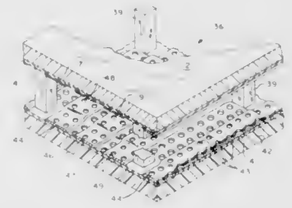
METHOD FOR PROVIDING POLYIMIDE SPACERS IN A FIELD EMISSION PANEL DISPLAY

Ivor Brodie, Palo Alto; Henry R. Gurnick, Pleasanton; Christopher E. Holland, Redwood City, and Helmut A. Moessner, Saratoga, all of Calif., assignors to Innovative Display Development Partners, Menlo Park, Calif.

Filed Jul. 6, 1988, Ser. No. 215,603

Int. Cl.[5] H01J *17/49*

U.S. Cl. 445—24 10 Claims



1. A process for forming and using spacers between the emitting surface of a field emission cathode array and an opposing display face, comprising the steps of

A. Applying a layer of material from which said spacers are to be formed either to said cathode surface or said face;

B. Patterning said layer of material with the desired spacer matrix;

C. Removing said layer from said face or surface except for portions thereof to form said spacer matrix;

D. Baking said spacer matrix to a high temperature in an ultra-high vacuum to remove volatile material from spacers of said matrix;

E. Sandwiching together said display face and said cathode surface with spacers of said matrix therebetween;

F. Forming a vacuum between said surface and said face; and

G. Retaining a vacuum between said surface and said face during emission from said field emission cathode surface toward said display face.

4,923,422

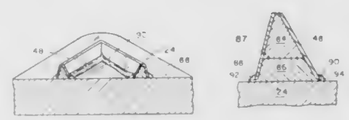
PROCESS FOR AN IMPROVED TENSION MASK SUPPORT STRUCTURE

Raymond G. Capek, Elmhurst, and David B. Danielson, Elk Grove, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 178,175, Apr. 6, 1988, Pat. No. 4,891,545. This application Jun. 6, 1989, Ser. No. 362,175

Int. Cl.[5] H01J *29/06*

U.S. Cl. 445—30 1 Claim



1. For use in the manufacture of a color cathode ray tube having a flat faceplate and a tensed foil shadow mask, a process comprising:

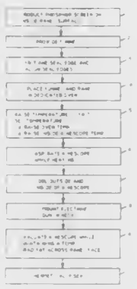
providing a trough-like shadow mask support structure for receiving and securing said mask;

filling said structure with devitrifying solder glass paste of relatively low viscosity;

heating said structure to a temperature effective to dry and harden said paste of relatively low viscosity;

over-filling said structure with devitrifying solder glass paste of relatively high viscosity;
heating said structure to a temperature effective to dry and harden said paste of relatively high viscosity;
fixturing a glass faceplate to rest upon said devitrifying solder glass paste of relatively high viscosity;
heating said faceplate and said structure to a temperature and for a duration of time effective to shrink said solder glass paste into said structure and lower said faceplate into contiguousness with said structure, said over-filling providing fillets of devitrifying solder glass paste extending from said structure; and
heating said faceplate and said structure to a relatively higher temperature effective to devitrify said solder glass paste and permanently secure and seal said structure to said faceplate.

4,923,423
INTEGRATED THERMAL PROCESSING FOR KINESCOPES
George F. Stockdale; Harvey O. Hook, both of Princeton; Robert G. Browne, Fords, and Philip M. Heyman, Robbinsville, all of N.J., assignors to RC/A Licensing Corporation, Princeton, N.J.
Filed Jun. 30, 1989, Ser. No. 373,556
Int. Cl.[5] H01J *9/26*
U.S. Cl. 445—40 **20 Claims**



1. A method of making a kinescope comprising the steps of:
(i) producing a phosphor screen coated with an organic material on the inside surface of a panel having a seal edge;
(ii) providing a funnel having a seal edge and a neck;
(iii) placing a bead of frit material on one of said seal edges, and placing said panel on said funnel with said seal edges in alignment;
(iv) supporting said funnel and said panel in a dedicated oven with said neck extending through one wall of said oven;
(v) heating said funnel and said panel above the set temperature of said frit material to form a kinescope bulb by simultaneously,
(a) raising the temperature inside said oven to said set temperature,
(b) raising the temperature inside said kinescope bulb to minimize the thruwall temperature differential,
maintaining the heating of steps v(a) and v(b) for a time period sufficient to set said frit material;
(vi) aspirating said kinescope bulb during said heating to remove organics and to create a negative pressure inside said kinescope bulb whereby air pressure presses said panel onto said funnel to improve the frit seal;
(vii) cooling said kinescope bulb by ceasing the heating of steps v(a) and v(b) while blowing a cool gas into said kinescope bulb;
(viii) mounting an electron gun in said kinescope bulb when said kinescope bulb is cooled to a predetermined temperature below said set temperature;
(ix) evacuating said kinescope bulb while maintaining a temperature gradient across the face of said panel to reduce stresses caused by the cooling and evacuation; and
(x) hermetically sealing said kinescope bulb.

4,923,424
INCANDESCENT LAMPS INCLUDING A COMBINED GETTER
John W. Shaffer, Montoursville, Pa., assignor to GTE Products Corporation, Danvers, Mass.
Continuation of Ser. No. 287,768, Dec. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 153,862, Feb. 9, 1988, Pat. No. 4,810,221. This application Aug. 8, 1989, Ser. No. 391,724
Int. Cl.[5] H01J *9/38*
U.S. Cl. 445—55 **23 Claims**

9. A method of gettering an incandescent lamp comprising the steps of:
introducing a phosphorus source into an unsealed envelope;
treating the phosphorus source contained in the unsealed envelope to produce elemental phosphorus within the unsealed envelope;
introducing a fill gas and a borane-based compound, selected from the group consisting of a borane compound, a partially halogenated derivative thereof, and mixtures thereof, into the unsealed lamp envelope;
sealing the lamp envelope; and
activating the elemental phosphorus and borane-based compound contained in the sealed envelope.

4,923,425
FLUORESCENT LAMP WITH A PREDETERMINED CRI AND METHOD FOR MAKING
Cheryl A. Ford, Byfield, Mass., assignor to GTE Products Corporation, Danvers, Mass.
Continuation of Ser. No. 62,259, Jun. 12, 1987, Pat. No. 4,857,798. This application Jun. 12, 1989, Ser. No. 365,274
Int. Cl.[5] H01J *1/70*
U.S. Cl. 445—58 **17 Claims**



1. A method for making a fluorescent lamp including a phosphor, said lamp having a CRI approximately the same as the CRI of the phosphor, said method comprising:
applying a coating comprising fine particle-size silica at a coating weight greater than about 0.7 milligrams per square centimeter to the inner surface of the lamp envelope to form a coated envelope;
applying a phosphor coating selected to provide a predetermined CRI over the silica layer; and
processing the phosphor coated envelope into a finished lamp.

4,923,426
BUBBLE BEARD TOY
Kalvin K. Klundt, Louisville, Ky., assignor to K & A Design, Louisville, Ky.
Filed Jul. 20, 1989, Ser. No. 383,187
Int. Cl.[6] A63H *33/28*
U.S. Cl. 446—19 **25 Claims**

1. Apparatus for producing from a bubble solution a beard of long, interconnected bubble chains comprising:
(A) a hollow elongate tube having opposite ends and a sidewall connecting said opposite ends, said tube having at one end an imperforate portion adapted to receive a gas and at the opposite end a perforate portion defining a circumferentially spaced plurality of apertures extending through said sidewall and in gaseous communication with said imperforate portion; and



(B) porous cloth disposed over and about each of said apertures, said cloth defining a multiplicity of substantially minute interstices for holding thin films of bubble solution;
whereby gas introduced at said one tube end passes through said imperforate portion, into said perforate portion, and emerges laterally from said apertures through the bubble solution held in said cloth to form a beard of bubbles.

4,923,427
SURFING FIGURINE
Vincent Roland, 888 Seminole Rd., Atlantic Beach, Fla. 32233
Filed Dec. 23, 1988, Ser. No. 290,283
Int. Cl.[5] A63H *23/02, 23/00;* **A63C** *15/00;* **B63B** *3/38*
U.S. Cl. 446—153 **17 Claims**



1. A wave-propelled surfing figurine construction for simulating a surfer on a surfboard, comprising:
a light-weight doll-like figurine portion in a poise simulating a surfer on a surfboard; and
a toy surfboard portion having a front half with an upwardly curved front end, a rear half, and an upper surface said upper surface being otherwise free at upwardly extending projections supporting said figurine portion, said surfboard portion further comprising a heavy-weight keel projecting downwardly primarily from said rear half, and a stabilizing fin projecting downwardly aft of said keel.

4,923,428
INTERACTIVE TALKING TOY
Kenneth J. Curran, Thousand Oaks, Calif., assignor to Cal R & D, Inc., Culver City, Calif.
Filed May 5, 1988, Ser. No. 190,574
Int. Cl.[5] A63H *30/00, 3/28, 3/20, 13/00*
U.S. Cl. 446—175 **19 Claims**





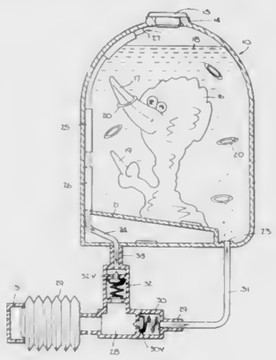
1. An animated talking toy having movable body parts, the improvement therein comprising:
a storage means for storing a plurality of diverse audio programs in different segments of the storage means;
control data in the storage medium associated with each audio program;
an audio input means for a human to input one of a preselected group of audio responses,
a processor means responsive to the audio input means for selecting a particular audio program segment and its associated control data;
audio output means responsive to the chosen program segment selected by said processor for playing the audio program; and
means for controlling the movement of said movable body parts in response to the associated selected data

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4,923,429
BUBBLE-PROPELLED AMUSEMENT DEVICE
Jeffrey B. Lewis, Old Greenwich, Conn., assignor to Lewco Corp., New York, N.Y.
Filed Aug. 7, 1989, Ser. No. 390,274
Int. Cl.[5] A63H *29/10, 23/00, 3/52;* **A63B** *67/00*
U.S. Cl. 446—197 **9 Claims**

1. An air-propelled amusement device comprising:
(a) an enclosed tank of transparent material partially filled with water to produce a water bath and an air space above the bath;
(b) play pieces dispersed in the bath having a specific gravity, such that the pieces tend to gradually sink to the bottom of the tank;
(c) a target disposed within the tank to receive play pieces propelled toward the target; and
(d) a player-actuated air pump assembly associated with the tank and external thereto adapted to withdraw air from the air space and to inject this air into the bottom of the

tank to produce a stream of air bubbles which propel the play pieces toward the target, said tank being provided with a nozzle at its bottom from which the air is injected into the water to produce a stream of air bubbles that



impinge on the pieces that sink to the proximity of the nozzle, and an air intake disposed in the air space from which the air is withdrawn and being operatively coupled to the air pump, whereby the air circulates in the tank in a closed loop.

4,923,430

COIN PAYOUT APPARATUS IN GAMING DEVICE

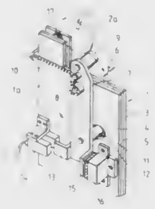
Kouichi Iimura, Atsugi, Japan, assignor to Kabushiki Kaisha Sigma, Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 255,109

Claims priority, application Japan, Oct. 14, 1987, 62-156078[U]; Oct. 28, 1987, 62-163641[U]

Int. Cl.[5] G07D *1/00, 9/04*

U.S. Cl. 453—50 **1 Claim**



1. A coin payout apparatus in a gaming device which includes a coin hopper storing therein a plurality of coins and a coin guide generally in the shape of an elongated flat plate connected to the hopper for successively delivering coins in edge-to-edge relationship from the hopper to a coin dispensing opening, said coin payout apparatus comprising:

a rotary arm pivotally mounted to said coin guide at substantially a central portion of one surface of said coin guide in a widthwise direction thereof, said rotary arm having one end portion movable toward and away from said coin guide;

a coin ejecting roller rotatably supported to said one end portion of the rotary arm, said coin ejecting roller being in rotational contact with an outer peripheral surface of a leading coin in said coin guide;

a biasing means connected to said one end portion of said rotary arm for biasing said one end toward said leading coin;

a supplemental coin ejecting means positioned in confrontation with said coin ejecting roller, said supplemental coin ejecting means being rotatably supported for ejecting the leading coin in cooperation with said coin ejecting roller;

a detecting means for detecting rocking movements of said rotary arm comprising a non-contact type sensor means mounted on said one surface of said coin guide on one side of said rotary arm in the widthwise direction thereof and a protruding piece provided for a lower end of said rotary arm to be movable toward and away from said sensor means in association with the rocking motion of said rotary arm, said sensor means having a structure allowing said protruding piece to enter in a non-contact manner, said sensor means generating a pulse signal in response to entry of said protruding piece; and

a stopper means mounted on said one surface of said coin guide on the side of said rotary arm opposite said one side to restrict a backward movement of said rotary arm.

4,923,431

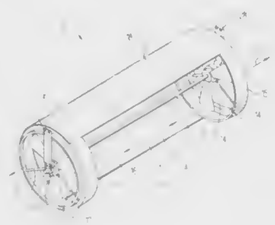
CHAFF SPREADER

DuWayne A. Miller, Box 236, Isabel, S. Dak. 57633, and George F. Miller, Box 72, Manning, N. Dak. 58642

Filed Apr. 17, 1989, Ser. No. 338,947

Int. Cl.[5] A01F *29/12, 12/48*

U.S. Cl. 460—111 **1 Claim**



1. In combination with a combine having a straw chopper and a sieve, the improvement comprising a chaff spreader attachment, said chaff spreader attachment including:

a pair of spaced circular mounting rings;

a stationary hub disposed coaxially within each of said mounting rings;

a plurality of radial support struts secured between each of said mounting rings and said stationary hubs;

a fan rotatably mounted on each of said stationary hubs;

an elongated drive shaft extending between said fans and supported for rotation within said stationary hubs, said drive shaft extending transversely beneath said combine and mounting said fans for rotation in a vertical plane about a horizontal axis;

a belt and pulley drive connected by a belt from said straw chopper on said combine for rotating said drive shaft;

an increased stepped diameter shroud support ring formed integrally with each of said circular mounting rings, said shroud support rings oriented axially inwardly from said circular mounting rings, along said drive shaft;

a semi-cylindrical shroud secured between said shroud support rings, said shroud having interior sidewall portions in abutment with said shroud support rings, and having an open side wall portion directed forwardly toward a sieve of a combine and partially surrounding said fans;

said fans each having a pitch configuration for inducting air and chaff through said open side wall portion of said shroud and exhausting air and chaff only through said circular mounting rings;

a pair of brackets securing said mounting rings to said combine, each of said brackets having a first end connected directly to one of said stationary hubs; and

a generator driven by said belt and pulley drive and a warning light powered by said generator to indicate rotation of said fans.

4,923,432

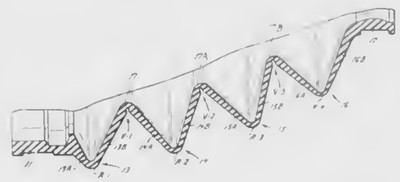
FLEXIBLE BOOT FOR DRIVING AXLE JOINTS

Marshall R. Porter, St. Louis, Mo., assignor to Moog Automotive, Inc., St. Louis, Mo.

Filed Feb. 10, 1989, Ser. No. 308,471

Int. Cl.[5] F16D *3/84*

U.S. Cl. 464—175 **5 Claims**



1. A boot for use with a universal joint for driving a shaft that has freedom of angular movement during shaft rotation about the axis of the shaft, said boot characterized in that:

(a) the boot is an axially elongated hollow body formed with walls of a flexible material and shaped to provide a series of convolutions extending from a large diameter end of the boot to a small diameter end of the boot wherein,

(1) each convolution is formed with an externally presented valley between a pair of externally presented peaks, and

(2) the walls forming valleys beginning at the large diameter of the boot varying progressively from thicker at the large diameter end of the boot to gradually thinner at the small diameter end of the boot.

4,923,433

TRANSMISSION RATIO CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

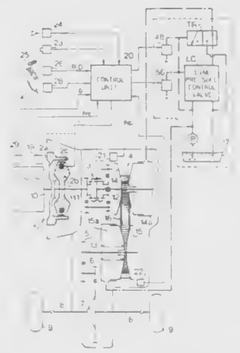
Hiroshi Tanaka, and Keiji Sato, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 310,067

Claims priority, application Japan, Feb. 22, 1988, 63-040255; Feb. 22, 1988, 63-040256

Int. Cl.[5] F16H *11/06*

U.S. Cl. 474—11 **6 Claims**



1. A control system for a continuously variable transmission for transmissing power of an internal combustion engine mounted on a motor vehicle, the transmission comprising a drive pulley having a hydraulically shiftable first disc and a first hydraulic cylinder for operating said disc, a driven pulley having a hydraulically shiftable second disc and a second hydraulic cylinder for operating said second disc, and a belt engaged with said both pulleys, the control system comprising a first hydraulic circuit having a pump for supplying oil to both said first and second hydraulic cylinders, a transmission ratio control valve in said first hydraulic circuit for controlling the oil supplied to said first hydraulic cylinder of said drive pulley to change transmission ratio of the transmission to a desired transmission ratio, a second hydraulic circuit having a solenoid operated valve for operating said transmission ratio control valve, the control system comprising a throttle position sensor for detecting position of a throttle valve of the engine to control power of said engine and for producing a throttle position signal, an actual transmission ratio calculator responsive to speeds of said drive and driven pulleys for producing an actual transmission ratio signal, and an engine speed sensor for detecting engine speed and for producing an engine speed signal, the improvement in the control system which comprises:

detector means responsive to said throttle position signal and said engine speed signal for detecting an increase of an output torque of said engine and for producing an engine torque increase signal;

means responsive to said engine speed signal and said actual transmission ratio signal for providing a maximum line pressure in accordance with driving conditions of said vehicle;

desired line pressure means responsive to said actual transmission ratio signal and said engine torque increase signal for producing a desired line pressure signal;

correcting means responsive to said engine torque increase signal, said actual transmission ratio signal and said desired line pressure signal for producing a correcting quantity signal so as to control pressure of the oil supplied to said first hydraulic cylinder of said drive pulley so as to prevent downshifting of said transmission ratio in spite of existence of said engine torque increase signal;

a reduced line pressure calculator means responsive to said desired line pressure signal and said maximum line pressure signal for producing a reduced line pressure signal for reducing pressure of the oil in the first hydraulic circuit; and

control means responsive to said correcting quantity signal to operate said solenoid operated valve so as to prevent downshifting of said transmission ratio in spite of existence of said engine torque increase signal.

4,923,434

HIGH PRECISION DRIVE MECHANISM

Robert Nemirovsky, 1117 Hyman Ave., Bay Shore, N.Y. 11706, assignor to Robert Nemirovsky, Bay Shore and Joseph Deutsch, Comack, both of, N.Y.

Filed Apr. 3, 1989, Ser. No. 333,134

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—101 **28 Claims**

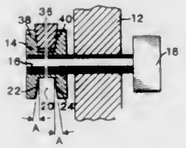
1. A transmission for transmission of power or motion to an object comprising:

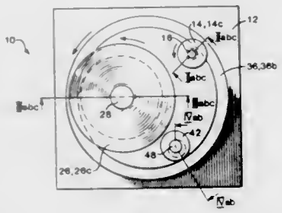
a support;

a rotatable input member with input pulley means mounted on said support;

a rotatable output member with output pulley means mounted on said support connected to said object; and

a rigid coupling member arranged and constructed for frictional engagement of said input and output pulley means;





whereby rotation of said input member is transmitted to the said output member by said rigid coupling member for movement of said object.

4,923,435

CHAIN OR BELT TENSIONER WITH A ONE-WAY CLUTCH

Yasushi Kadota, and Yoshikazu Nishida, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Division of Ser. No. 136,312, Dec. 22, 1987. This application Nov. 16, 1988, Ser. No. 271,811

Claims priority, application Japan, Dec. 27, 1986, 61-311249; Dec. 3, 1987, 62-306471

Int. Cl.[5] F16H *7/12*

U.S. Cl. 474—112 3 Claims



1. A tensioner comprising a first cylindrical member to be fixedly attached to a stationary portion, a movable eccentric member in the form of a cylinder and eccentrically provided around the first member with a one-way clutch interposed therebetween, an idler in the form of a hollow cylinder and rotatably provided around the movable eccentric member for contact with a wrapping connector driving member, and a spring provided between the stationary portion and the movable eccentric member for biasing the eccentric member in a direction to press the idler into contact with the wrapping connector driving member, the one-way clutch permitting the eccentric member to rotate in a direction to press the idler against the wrapping connector driving member but preventing the eccentric member from rotating in a direction to move the idler from the wrapping connector driving member.

4,923,436

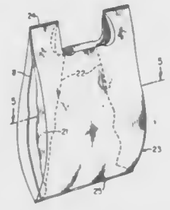
PLASTIC BAG AND METHOD AND APPARATUS OF MANUFACTURE

Edward Gelbard, Monte Carlo, Monaco, assignor to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 26, 1985, Ser. No. 801,752

Int. Cl.[5] B31B *23/86*

U.S. Cl. 493—194 8 Claims



1. In a method for continuously manufacturing gusseted T-shirt bags having handles and made of a thermoplastic material in the form of a tube and containing on its surface at least one elongated heat seal extending the length of the tube, an improvement for reducing the stress on said heat seal when said bag is in use comprising the steps of:

expanding the tube to form a generally cylindrical form;

applying a gusseting force to the expanded tube at a point displaced a predetermined distance from said elongated heat seal so that the heat seal will be displaced a predetermined distance from the interior fold line of the gusset;

collapsing the gusseted tube, and consecutively transversely heat sealing and cutting sections of said gusseted tube to form individual bags, each bag having a transverse heat seal at the bottom and top thereof, said bottom and top transverse heat seals intersecting said elongated heat seal; and

cutting an opening in said bag at said top transverse heat seal to form two handles, each handle including an uncut portion of said top transverse heat seal, and at least one handle including said elongated heat seal extending from said transverse bottom heal seal to the uncut portion of said top transverse heat seal in said handle.

4,923,437

PROCESS FOR APPLYING A LOCALIZED MAGNETIC OR ELECTRIC FIELD

Robert T. Gordon, 4936 W. Estes, Skokie, Ill. 60077

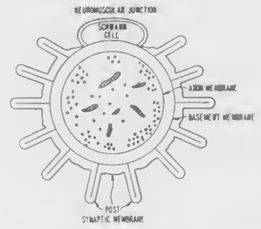
Division of Ser. No. 886,616, Jul. 18, 1986, Pat. No. 4,813,399. This application Sep. 27, 1988, Ser. No. 250,821

Int. Cl.[5] A61N *1/42*

U.S. Cl. 600—12 23 Claims

1. A process comprising:

introducing electric or magnetic dipoles in neurological or muscular tissue or cells; and



thereafter, applying a localized static magnetic or electric field to the tissue to aid in the intracellular uptake and energy absorption of the dipoles in the tissue and the cells.

4,923,438

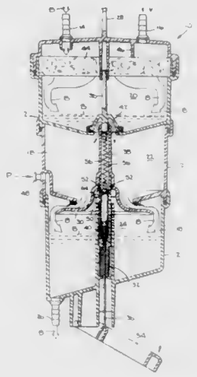
BLOOD RECOVERY SYSTEM AND METHOD

Alfred V. Vasconcellos, Edison, N.J., and Preston J. Keeler, III, Setauket, N.Y., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,193

Int. Cl.[5] A61M *1/03*

U.S. Cl. 604—4 43 Claims



1. A fluid collection reservoir comprising a housing having at least one inlet and at least one outlet, three or more fluid receiving compartments, with a first compartment being in fluid flow communication with said inlet and with a second compartment being in fluid flow communication with said outlet, means for establishing a negative pressure in two or more of said compartments, means for mechanically and selectively isolating said compartments, and means for maintaining said second compartment at a pressure always greater than the pressure established in said first compartment while collecting and transporting fluid through said reservoir.

4,923,439

PROCESS FOR THE SELECTIVE EXTRACORPOREAL PRECIPITATION OF LOW-DENSITY LIPOPROTEINS FROM WHOLE SERUM OR PLASMA

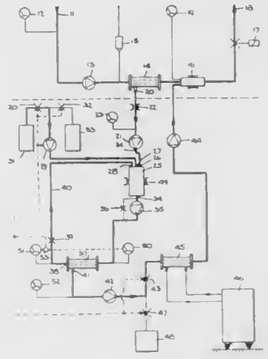
Dietrich Seidel, Göttingen; Heinrich Wieland, Waake; Gerhard Rosskopf, Fuldabrück-Dörnhagen, and Dieter Rath, Melsungen, all of Fed. Rep. of Germany, assignors to B. Braun-SSC AG, Emmenbrucke, Switzerland

Continuation of Ser. No. 769,761, Aug. 26, 1985, abandoned, which is a continuation of Ser. No. 414,809, Sep. 3, 1982, abandoned. This application Mar. 23, 1988, Ser. No. 172,953

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135814; May 13, 1982, 3217925

Int. Cl.[5] G01N *33/48*

U.S. Cl. 604—6 18 Claims



1. A therapeutic process for the selective extracorporeal precipitation of beta-lipoproteins from blood, plasma, serum and solutions thereof, which process comprises withdrawing blood from a mammal, mixing said blood, plasma or serum obtained therefrom, or solutions thereof, with a physiologically non-toxic composition comprising a buffer and an effective amount of a low density lipoprotein precipitating substance selected from the group consisting of heparin and dextran sulfate, whereby a complex of beta lipoprotein-precipitating substance is selectively precipitated, in preference to precipitating pre-beta-lipoproteins or chylomicrons, substantially at the isoelectric point of the complex at a pH in the range of from about 5.05 to about 5.25, separating said complex from at least a portion of the remaining supernatant fluid, and returning to said mammal at least a portion of the supernatant fluid from which said complex has been separated.

4,923,440

DEVICE FOR CONTAINMENT AND INSERTION OF TAMPONS AND OTHER OBJECTS

Donald M. Genaro, Haworth, N.J., assignor to Henry Dreyfuss Associates, New York, N.Y.

Continuation-in-part of Ser. No. 102,611, Sep. 30, 1987. This application Jul. 7, 1988, Ser. No. 216,119

Int. Cl.[5] A61F *13/20*

U.S. Cl. 604—14 17 Claims

1. A containment and insertion device comprising:

an object to be inserted into an opening;

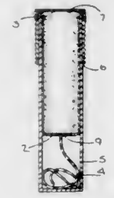
a flexible transporter that is separate from and unattached to the object and which at least partially surrounds the object and which is open at least at one end;

an inner container which contains the object and the transporter;

an outer container having a grasping surface means extending longitudinally along the outer container, an axial force being applicable by fingers grasping the grasping surface

means, the outer container being slidably mounted on the outside of said inner container and being affixed to the open end of the transporter;

the object, transporter, and containers being arranged such that fingers grasping the grasping surface means of the outer container apply an axial force to the outer container,



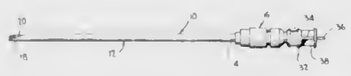
and as the inner container is moved axially relative to the outer container (a) the transporter is drawn over one end of the inner contain (b) the object is propelled by the transporter out of the inner container and (c) the transporter and the containers may be withdrawn without withdrawal of the object.

4,923,441

SURGICAL CUTTING INSTRUMENT WITH TITANIUM NITRIDE COATING ON AN INNER TUBULAR MEMBER

Donald K. Shuler, Largo, Fla., assignor to Concept, Inc., Largo, Fla.

Filed Feb. 23, 1989, Ser. No. 314,196
Int. Cl.[5] A61B *17/32*
U.S. Cl. 604—22 6 Claims



1. A surgical cutting instrument comprising

an elongate outer tubular member having a proximal end, a distal end and an opening disposed at said distal end;

an elongate inner tubular member having a proximal end, a distal end and a cutting edge disposed at said distal end, said inner tubular member being movably received in said outer tubular member to position said proximal end of said inner tubular member adjacent said proximal end of said outer tubular member, said distal end of said inner tubular member adjacent said distal end of said outer tubular member and said cutting edge adjacent said opening to permit said cutting edge to engage bodily tissue through said opening; and

a coating of titanium nitride formed on said inner tubular member by physical vapor deposition and extending from said distal end to said proximal end of said inner tubular member, said inner tubular member having an outer diameter substantially the same as the inner diameter of said outer tubular member such that said titanium nitride coating forms an elongate bearing surface extending along the length of said surgical cutting instrument.

4,923,442

BLOOD SUBSTITUTE

Paul E. Segall; Harold D. Waitz, and Hal Sternberg, all of Berkeley, Calif., assignors to Cryomedical Sciences Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 189,011, May 2, 1988. This application Apr. 26, 1989, Ser. No. 343,850
Int. Cl.[5] A61K *31/70, 53/06, 33/14, 31/715*
U.S. Cl. 604—52 **26 Claims**

1. A blood substitute capable of maintaining a subject and its organs at temperatures below 20° C. comprising a base solution comprising water, electrolytes in physiological concentration, a macromolecular oncotic agent, a biological buffer effective at physiological pH, simple sugar, and potassium ion in a concentration range of 4–5 mEq,

a cardioplegia induction solution comprising said base solution and wherein the concentration of potassium ion is in a range of 25–45 mEq,

a cardioplegia maintenance solution comprising said base solution and wherein the concentration of potassium ion is in a range of 15–45 mEq,

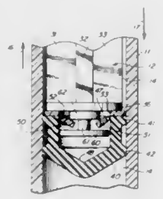
and a recovery solution comprising said base solution and wherein the concentration of potassium ion is in a range of 6–10 mEq.

4,923,443

SINGLE USE SYRINGE

Eugene C. Greenwood, 2956-B Pepper Tree La., Costa Mesa, Calif. 92626, and John A. Holland, 1836 Port Abbey Pl., Newport Beach, Calif. 92660

Filed Oct. 4, 1988, Ser. No. 253,137
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 10 Claims



1. A single use hypodermic syringe comprising:

an elongated syringe body defining an interior syringe bore;

a hollow needle supported by said syringe body in communication with said syringe bore;

a piston defining an internal cavity having an open end facing said piston driver sealingly fitted within said syringe bore and movable therein in a first direction away from said needle and a second direction toward said needle;

a piston driver having a first end extending into said syringe bore; and

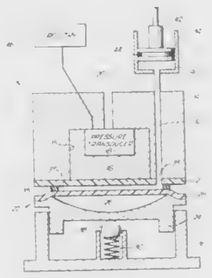
single use coupling means for coupling said piston driver to said piston during initial movement of said piston driver in said first direction followed by movement in said second direction and fracturably releasing said piston during movement of said driver in said first direction thereafter, said single use coupling means including a plurality of inwardly extending fracturable members supported upon said piston driver and interlocking said piston and said first end of said piston driver.

4,923,444

NEGATIVE PRESSURE MEASUREMENT SYSTEM

Adib G. Daoud, San Diego, and C. Russell Horres, Jr., Del Mar, both of Calif., assignors to Ivac Corporation, San Diego, Calif.

Filed Dec. 19, 1988, Ser. No. 286,428
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—131 **30 Claims**



1. A system for measuring pressure in a fluid line, comprising:

a fluid chamber connected to said fluid line;

a first flexible pressure transfer diaphragm forming one wall of said fluid chamber;

a second flexible pressure transfer diaphragm placed in sealing engagement with said first diaphragm and forming an intermediate vacuum chamber for transferring pressure changes in said fluid chamber from said first diaphragm to said second diaphragm;

means for inducing a vacuum in said chamber for maintaining said first and second diaphragms in constant sealing engagement; and

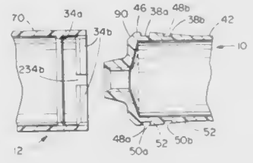
a pressure transducer coupled to said second diaphragm responsive to pressure changes transferred by said second diaphragm.

4,923,445

SAFETY NEEDLED MEDICAL DEVICES

Dana W. Ryan, Brentwood, Tenn., assignor to Ryan Medical, Inc., Brentwood, Tenn.

Continuation-in-part of Ser. No. 162,569, Mar. 1, 1988. This application Jul. 27, 1988, Ser. No. 224,920
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—195 **23 Claims**



1. A medical device for assembly with a hollow needle, comprising:

(a) an inner tube member having a substantially cylindrical inner surface, a front end adapted to have said hollow needle secured thereto, an open rear end, an outer surface having first and second circumferential grooves, said first groove being rearward of said second groove, said outer surface further including a shoulder forward of said second groove with said shoulder having an outer diameter greater than said outer surface rearward of said second groove; and

(b) a hollow outer shield member having a substantially cylindrical inner surface with an inner diameter slightly larger than an outer diameter of said outer surface of said inner tube, a front end and a rear end each having an opening therein, at least one protrusion extending inwardly from said inner surface of said outer shield, said at least one protrusion being adapted to engage said first circumferential groove to maintain said shield member in a first retracted position in which said hollow needle is exposed, and further adapted to fixedly engage said second circumferential groove to maintain said shield member in a second extended position in which said needle is covered by said shield,

wherein said protrusion is disengageable from said first circumferential groove and said shield member is slidable between said first position and said second position, and

wherein said an inner diameter of said at least one protrusion is smaller than said outer diameter of said shoulder and said outer shield member is sufficiently flexible and resilient such that said shield member can be forced over said shoulder in assembling said medical device and substantially reassume its normal diameter when unstressed.

4,923,446

SHIELD FOR DEVICES CAPABLE OF PENETRATING SKIN

Mary J. Page, 4634 French Meadow, San Antonio, Tex. 78250; Benton W. Hamilton, 13403 Townwood, Houston, Tex. 77045; Bruce L. Skiles, 15 Charleston Park, No. 714, Houston, Tex. 77025, and Robert V. Reinhart, Jr., 2303 Moss Ter., San Antonio, Tex. 78232

Filed Apr. 14, 1988, Ser. No. 181,387
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 **4 Claims**



1. An apparatus for inhibiting accidental injury to a user of a device having a part thereof capable of penetrating skin of said user, said apparatus comprising

a sleeve slidably engaging a portion of said device adjacent to said penetrating part,

first means connected to said sleeve for retaining said sleeve at a first position on said portion of said device whereby the penetrating part is exposed, the first sleeve retaining means comprising

a first groove substantially perpendicular to a longitudinal axis of the sleeve and inscribed on an inner surface of said sleeve,

first elastomeric means substantially filling said groove and extending inwardly from said inner surface of the sleeve for slidably engaging an outer wall of said device, and

a ridge carried on said wall which slidably but resistingly engages said elastomeric means to inhibit movement of the sleeve in a first direction along the device, and

second means connected to said sleeve for retaining said sleeve at a second position on said portion of said device whereby a part of the sleeve substantially surrounds the penetrating part. The second sleeve retaining means comprising

a second groove substantially perpendicular to a longitudinal axis of the sleeve, inscribed on an inner surface of said sleeve and spaced away from the first groove,

second elastomeric means substantially filling said second groove and extending inwardly from said inner surface

of the sleeve for slidably engaging an outer wall of said needle carrying device, and

a second ridge carried on said wall which engages said second elastomeric means to prevent additional movement of the sleeve in said first direction along the device, and

a third ridge carried on said wall which slidably but resistingly engages said first elastomeric means to inhibit movement of the sleeve in the first direction along the device, and prevents additional movement of the sleeve in a second direction along the device, said second direction being the reverse of said first direction.

4,923,447

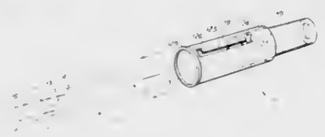
SYRINGE ASSEMBLY

Michael W. Morgan, 191 Nancy La., Greenwood, Ind. 46142

Filed Feb. 17, 1989, Ser. No. 312,661

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—198 **6 Claims**



1. A syringe assembly comprising:

an elongated tubular syringe barrel;

a tubular needle mounted to said syringe barrel with the interior of said tubular needle being in fluid communication with the interior or said syringe barrel;

plunger means movably positioned within said syringe barrel for aspirating or injecting fluid from said syringe;

a hollow casing mounted to said syringe barrel with said casing and said syringe barrel defining an interior space therebetween;

needle shielding means comprising a tubular sleeve movably positioned within said interior space and surrounding said syringe barrel with said sleeve being movable between an extended position surrounding and shielding said needle and a retracted position in which said needle is exposed for use;

said syringe barrel, said casing and said sleeve being substantially cylindrical and coaxial and said sleeve being telescopically disposed within said interior space;

said casing being formed with a longitudinally extending slot and said sleeve including a radially extending projection slidably disposed within said slot, whereby said sleeve can be moved between its extended and retracted positions by sliding said projection within said slot.

4,923,448

SYRINGE WITH SPRAY NOZZLE TIP

James F. Ennis, III, Preston, Conn., assignor to Mark Anderson, Elmwood, Wis.

Filed Dec. 6, 1988, Ser. No. 280,331

Int. Cl.[5] A61M *5/325*

U.S. Cl. 604—239 **10 Claims**

1. A syringe for dispensing a liquid atomized spray, comprising:

a cylindrical barrel having a chamber for containing a liquid and an open end;

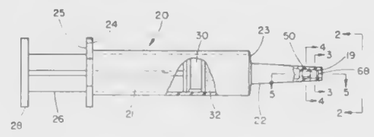
an axially movable plunger in said chamber for discharging said liquid through said open end of said barrel;

a nozzle having a tubular wall secured to said open end of said barrel and having a free open end for discharging said liquid therefrom;

a stem axially disposed in fixed position in said nozzle and radially spaced from said tubular wall to define therewith a tubular first passage, said stem having a free end spaced inwardly from said open end of said nozzle; and

a cup shaped nozzle tip axially disposed in said nozzle, said nozzle tip comprising:

a cylindrical wall engaged on said stem to provide axially extending second passages therebetween communicating with said tubular first passage,



an end wall integral with said cylindrical wall and formed with an aperture for discharging said liquid therefrom as an atomized spray; and

troughs on said end wall defining with said free end of said stem third passages communicating with said second passages and said aperture to pass said liquid turbulently to and through said aperture to and thereby produce said atomized spray.

4,923,449

APPARATUS FOR COLLECTING CONSTANT AMOUNTS OF BLOOD FROM INDIVIDUAL DONORS

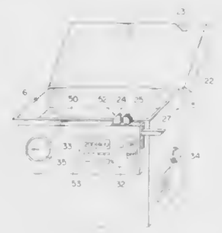
Matsumi Toya, Koushoku, and Yasuyuki Miyairi, Nagano, both of Japan, assignors to Kabushiki Kaisha Tiyoda Seisakusho, Nagano and Kawasumi Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Nov. 18, 1987, Ser. No. 122,025

Claims priority, application Japan, Nov. 19, 1986, 61-176584; Mar. 30, 1987, 62-74240

Int. Cl.[5] A61M *5/005*

U.S. Cl. 604—245 **8 Claims**



1. A blood collection apparatus for use with a collection bag unit having an inflatable bag in which an anticoagulant is prefilled and which is to be filled with a preselected amount of blood, a collapsible inflow pipe extending from an communicating with the bag for introducing the blood therein, and a needle at the tip of the inflow pipe for blood collection from a donor, the apparatus comprising:

(a) a weighing platform to be loaded with the bag of the collection bag unit during collection;

(b) a load cell fixedly coupled to the bottom of the weighing platform for producing an electric weight signal representative of the weight of the blood being collected in the bag on the weighing platform;

(c) a swing cradle having the load cell mounted thereto and being capable of joint oscillation with the load cell and the weighing platform about a fixed horizontal axis to cause the weighing platform to oscillate past a preassigned horizontal position;

(d) shaking means acting on the swing cradle for oscillating the same about the horizontal axis and hence for shaking the bag on the weighing platform in order to intimately mingle the collected blood with the prefilled anticoagulant;

(e) control means responsive to the weight signal from the load cell for producing a collection stop signal when the preselected amount of blood is collected in the bag;

(f) collection stop means responsive to the collection stop signal from the control means for terminating the blood collection by collapsing the inflow pipe of the collection, and

(g) oscillation stop means for causing the shaking means to stop the oscillation of the swing cradle when the weighing platform is in said horizontal position, said oscillation stop means including processor means for ascertaining maximum and minimum values of the weight signal from the load cell during the oscillation of the swing cradle prior to the loading of the bag on the weighing platform and for stopping the oscillation of the swing cradle during the blood collection into the bag on the weighing platform immediately before the maximum value of the weight signal is reached.

4,923,450

MEDICAL TUBES FOR PLACEMENT INTO THE BODY OF A PATIENT

Karo Maeda, Yokohama, and Satoshi Ando, Osaka, both of Japan, assignors to Karo Maeda, Yokohama, Japan

Filed Jun. 30, 1988, Ser. No. 213,898

Claims priority, application Japan, Jul. 9, 1987, 62-171721

Int. Cl.[5] A61M *5/325*

U.S. Cl. 604—265 **7 Claims**



1. A medical tube for placement into a patient comprising metal containing powdered zeolite, wherein at least one of the metals contained in said zeolite is substituted by at least one ion exchangeable metal selected from the group consisting of Ag, Cu and Zn, having anti-bacterial properties, the zeolite being coated onto or kneaded into said medical tube wherein said medical tube, when in contact with said patient, continuously exhibits said antibacterial properties of said ion exchangeable metal for a period of time of at least two days.

4,923,451

SUCTION CONTROL CHAMBER HAVING A FILTER FOR USE IN CHEST DRAINAGE DEVICES

Michael A. McCormick, Rodman, N.Y., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Nov. 7, 1988, Ser. No. 268,310

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—321 **9 Claims**

1. A chest drainage device for removing liquids and gases from the pleural cavity of a patient comprising:

a collection chamber in flow communication with the pleural cavity of a patient;

a water seal chamber having a predetermined amount of liquid therein and wherein said water seal chamber is in flow communication with said collection chamber;

a suction control chamber in flow communication with said water seal chamber and a vacuum source;

said suction control chamber having first and second columns and a level of liquid in said second column;

sai first column having top and bottom ends and wherein said top end is in flow communication with the atmosphere and wherein said bottom end is positioned in the level of liquid in said second column;

a filter means on the bottom end of and externally surrounding the bottom end said first column in flow communication with said first column and the atmosphere wherein



said filter means includes an air chamber therein for dispersing atmospheric air therefrom as the atmospheric air is drawn into said second column of said suction control chamber; and

said second column having a top end in flow communication with said water seal chamber and a vacuum source and a bottom end in flow communication with said filter means and wherein atmospheric air is drawn through said filter means into the liquid in said suction control chamber.

4,923,452

APPARATUS FOR TENDING A STOMA

Gerd Hunger, Munich, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 863,106, May 15, 1986, abandoned, and a continuation of Ser. No. 494,039, May 12, 1983, abandoned. This application Oct. 20, 1987, Ser. No. 112,233

Claims priority, application Fed. Rep. of Germany, May 13, 1986, 3218092

Int. Cl.[5] A61F *5/44*

U.S. Cl. 604—338 **18 Claims**



1. An ostomy device for detachably securing a bag to a stoma comprising:

(a) an apertured base plate, said base plate defining first and second circumferences, said first circumference being

smaller than the second with a diameter enlargeable to a diameter of the stoma to be tended and a second larger circumference the diameter of which is about 4 to about 20 mm smaller than the edge of the base plate for transmitting traction forces to the skin of the user at a maximum distance from said stoma,

(b) A snap ring means substantially parallel to the base plate, the dimension of the aperture of the snap ring means being determined by the diameter of the said second circumference, said snap ring means adapted to be detachably connected with a snap closure on a bag that receives the excreta from said stoma, and

(c) a connector means made of a flexible but non resilient plastic film material having a thickness of about 0.05 to about 0.03 mm connecting said base plate and said snap ring means, said connector means being cylindrical or having the form of a steep truncated cone and extending substantially perpendicular to said base plate, said connector means being attached to said base plate along said second circumference whereby forces transmitted to said base plate upon attachment of a bag to said snap ring means or by the movements of the user or by said bag are absorbed by said base plate at said larger circumference to dissipate said forces at a maximum distance from said stoma.

4,923,453

ABSORBENT DISPOSABLE COVER

Milton Bullard, Jr., 3766 31th St. #7, San Diego, Calif. 92104

Filed Jan. 23, 1989, Ser. No. 300,318
Int. Cl.[5] A61F *13/10*
U.S. Cl. 604—356 **5 Claims**



1. An absorbent disposable cover for hospital x-ray tables and the like comprising

a rectangularly shaped cover having a bottom layer in the form of a sheet of plastic material that is impermeable to moisture, an intermediate fluid absorbent layer that functions as a blotter that will absorb and disperse any fluid that it comes in contact with, and a top layer in the form of a sheet of material of semi-permeable material that will permit the flow of fluids into said intermediate fluid absorbent layer;

said cover having corners formed by a front edge, a rear edge, and laterally spaced side edges, a preformed corner pocket at the respective corners, said corner pockets having a top surface and a bottom surface, adhesive pads are attached to the bottom surface of said pre-formed corner pockets for detachably securing them to the corners of a table upon which the absorbent disposable cover has been placed; and

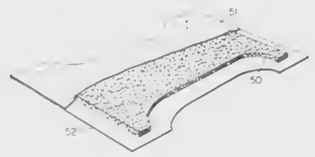
said rectangularly shaped cover being folded into a compact rectangular shape with the respective four pre-formed corner pockets having their bottom surfaces facing upwardly and being on top of said folded cover.

4,923,454

MICROFIBER-CONTAINING ABSORBENT STRUCTURES AND ABSORBENT ARTICLES

Mark D. Seymour; Michael F. LiCause, and Thomas H. Daugherty, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 20, 1988, Ser. No. 146,004
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—368 **17 Claims**



12. An absorbent article of improved comfort, wet integrity and fluid handling characteristics, said article comprising:

(A) a liquid impervious backing sheet;

(B) a liquid pervious topsheet; and

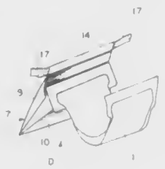
(C) an absorbent core positioned between said backing sheet and said topsheet, said absorbent core containing an absorbent structure which comprises an entangled web of melt-blown microfibers having diameters which range from about 0.5 to 60 microns, said microfibers being formed from a thermoplastic copolymer comprising a nylon component and a hydrophilizing polymeric component which renders said copolymer hydrophilic and which provides a copolymer having a melting point of from about 100° C. to 265° C. and a melt viscosity of from about 1 to 400 Pa-sec.; said web having a dry density of from about 0.006 to 0.3 g/cm^3.

4,923,455

DISPOSABLE DIAPER WITH INTEGRAL DISPOSAL ENVELOPE

Raymond S. Dean, Lynn, and William A. Barabino, North Reading, both of Mass., assignors to Personal Hygiene Research Associates, North Reading, Mass.

Filed May 4, 1988, Ser. No. 190,088
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—385.1 **4 Claims**



1. The combination comprising;

a disposable diaper having a disposable envelope attached thereto,

said diaper having opposite front and back portions provided with outer and inner liners having end terminal edges,

said disposal envelope including an inner panel and outer panel each having an inner surface and provided with terminal edges defining an opening therebetween, said envelope inner panel having an inside face juxtaposed said diaper outer liner adjacent said diaper back portion terminal edge,

means permanently affixing said envelope inner panel inside face to said juxtaposed diaper outer liner throughout substantially the entire width of said inner panel inside face,

a tape-belt member having outer and inner surfaces, the majority of one said member surface permanently attached to one said envelope panel inner surface adjacent its respective said panel terminal edge, an exposed resealable adhesive layer portion on the other one said tape-belt member surface extending the width of said envelope to provide releasable attachment means for one said envelope panel relative the other said envelope panel inner surface to provide temporary closure means for said envelope opening,

a removable protective strip initially overlying a substanial portion of said tape-belt member resealable adhesive layer adjacent said exposed portion thereof to allow only the remaining exposed portion thereof to provide said temporary closure of said envelope opening,

end tab portions on said tape-belt member extending laterally from said envelope adjacent said diaper back portion, said resealable adhesive layer on said tape-belt member extending throughout said end tab portions to provide releasable fastening means thereon,

said releasable attachment means operable to allow opening of said envelope opening as said exposed resealable adhesive layer portion is released from engagement with said other said envelope panel inner surface,

said protective strip thereafter removable to fully expose the entire said resealable adhesive layer on said tape-belt member within said envelope, whereupon

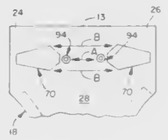
said diaper may be infolded into said permanently affixed envelope following which the full extent of said resealable adhesive layer on said tape-belt within said envelope is engageable with said other said envelope panel to fully encapsulate the infolded diaper within said envelope.

4,923,456

ADJUSTABLE COMBINATION FASTENER FOR A DISPOSABLE DIAPER

Deborah L. Proxmire, Larsen, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 31, 1987, Ser. No. 140,009
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—391 **17 Claims**



1. An article of wear, comprising:

an elongate, outer cover including first and second end portions sized and shaped to overlie the front and rear waist areas of a person, and an intermediate portion separating said end portions from one another and sized and shaped for overlying the crotch of the person, and a pair of side portions extending between and interconnecting said end portions and laterally adjacent to and connected to said intermediate portions; a pair of openings along said side portions and sized and shaped to surround the legs of the person, and pairs of ears at the lateral portions of said end portions, respectively;

one pair of ears being elongate in shape and having proximal portions spaced from a line centered on the longitudinal axis of said cover, free end portions spaced distally from said proximal portions, elastomeric medial portions adjustably spacing and separating said free end portions from said proximal portions, and fixed-position fastening means being provided on said free end portions;

said other pair of ears having zone means for imparting a tensile force distribution pattern which directs stresses away from the edges of said side and end portions while providing a band of support thereacross, and fixed-position fastening means for cooperating with said fixed-position fastening means on said free end portions;

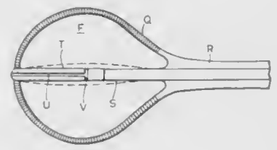
first variable-position fastening means on said other pair of ears mounted on said zone means and second variable-position fastening means on said proximal portions for selective engagement with said first variable-position fastening means, wherein said medial portions stretch to allow adjustment and fastening of said fixed-position fastening means once said variable-position fastening means have been selectively fastened.

4,923,457

ARTIFICIAL GLAND FOR IMPLANTATION IN A HUMAN BODY

Olav Ellingsen, Floro, Norway, assignor to Industrikontakt Ing. O. Ellingsen & Co., Floro, Norway

Filed Nov. 21, 1986, Ser. No. 933,755
Claims priority, application Norway, Nov. 22, 1985, 854668
Int. Cl.[5] A61K *9/22*; **A61M** *11/00*; **A61F** *2/02, 2/04*
U.S. Cl. 604—891.1 **2 Claims**



2. An artificial gland, comprising:

a capillary tube for a passage from a reservoir;

a non-compressible, semipermeable casing forming a chamber about one end of the capillary tube;

a flexible hose about the one end of the capillary tube and inside the casing;

a rod inside the hose, the rod having a first bore to outside the casing and a second bore communicating with the first bore and inside of the hose,

whereby fluid migration from the chamber by osmosis through the semipermeable casing bulges the hose from the one end of the capillary tube and the second bore of the rod for fluid flow through the capillary tube and bores from the reservoir to the outside of the casing.

4,923,458

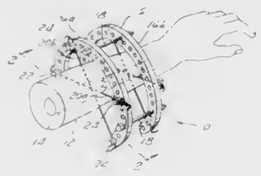
SURGICAL FIXATION PIN TENSION ADJUSTER

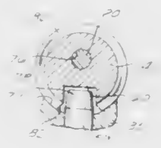
David A. Fischer, Edina, Minn., assignor to Ace Medical Company, Los Angeles, Calif.

Filed Apr. 17, 1986, Ser. No. 853,140
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—59 **2 Claims**

1. In a tension adjuster in an external fixation device having a frame segment and a surgical fixation pin secured at the respective ends thereof to the frame segment, the fixation pin passing through and immobilizing fractured bone during rehabilitation, the fixation pin being secured at one end along the length of said frame segment by a threaded slotted tension screw having a slot circumferentially disposed and extending parallel to its longitudinal axis and a tension mounting nut having an aperture for receiving the threaded slotted tension screw and comprising an alignment pin extending into the aperture of the mounting nut and into the slot of said threaded slotted tension screw to guide the threaded slotted tension

screw, and a tension nut for receiving the tension screw and applying tension thereto; the improvement wherein: the threads of the tension screw adjacent the slot therein are chamfered to provide a substantially linear edge on the slot, and the alignment pin is frusto-conical in configuration, tapering from





a larger proximal portion adjacent the periphery of the tension screw to a smaller distal portion interiorly of the slot in the tension screw, the slot and the alignment pin being so constructed and configured relative to each other that there is a substantially point contact between the surface of the tapered alignment pin and the edge of the slot in the tension screw.

4,923,459

STEREOTACTICS APPARATUS

Kyojiro Nambu, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1988, Ser. No. 243,921

Claims priority, application Japan, Sep. 14, 1987, 62-228605

Int. Cl.[5] A61B *19/00*

U.S. Cl. 606—130 **15 Claims**



1 A stereotactics apparatus which is adapted to utilize tomographic imaging means for photographing a predetermined portion of a patient to display a tomographic image of the predetermined portion so as to designate a surgical target of the predetermined portion on the basis of the tomographic image, comprising:

frame means having a frame coordinate system and fixed in the predetermined portion such that the predetermined portion is located within the frame coordinate system; and

means for calculating the coordinates of the surgical target in the frame coordinate system, said calculating means being provided with a marker member, said marker member being fixed on said frame means so that said marker member is adjacent to the predetermined portion and located within the frame coordinate system, said marker member being adapted to be tomographically imaged together with said predetermined portion by said imaging means and being adapted to be displayed as marker image together with the tomographic image of the predetermined portion, whereby the frame coordinate system is reconstructed on the basis of the displayed marker image, so that the tomographic image of the predetermined portion is located within the reconstructed frame coordinate system and coordinates of the surgical target are calculated on the basis of the reconstructed frame coordinate system,

wherein said frame means includes a curved surface having a concave shape toward the predetermined portion, and said marker member is spirally extending along the curved surface.

4,923,460

SPRING ELEMENT FOR HAIR-REMOVAL DEVICE

Noah Amit, Haifa, Israel, assignor to Aris Enterprises, Ltd., New York, N.Y.

Filed Mar. 3, 1989, Ser. No. 319,433

Claims priority, application Israel, Jan. 23, 1989, 089037

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—133 **4 Claims**



1 A hair removal device comprising a wire shaped in the configuration of a coil spring having a plurality of loops and an arcuate axis and handle means mounting the coil spring for rotation of the spring about said axis, the surfaces of the wire being roughened about the entire circumference and along the entire length of the wire so that mutually opposed surfaces of adjacent loops of the spring are roughened, whereby the performance of the hair removal device in plucking hairs by entrapment thereof between adjacent loops of the spring when a user rolls the device across a body surface from which hairs are to be removed is substantially enhanced.

4,923,461

METHOD OF ARTHROSCOPIC SUTURING OF TISSUE

Richard B. Caspari, Maidens, Va.; Arthur F. Trott, Largo, and F. Barry Bays, Seminole, both of Fla., assignors to Concept, Inc., Largo, Fla.

Division of Ser. No. 117,158, Nov. 5, 1987, Pat. No. 4,890,615. This application Mar. 22, 1989, Ser. No. 326,991

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—146 **8 Claims**



1. A method of arthroscopic suturing of tissue within the body comprising the steps of

penetrating tissue to be sutured with a hollow needle;

feeding suture material through the hollow needle to define a free end segment of the suture material extending from the hollow needle;

withdrawing the hollow needle from the tissue and from the body;

pulling the free end segment of the suture material from the body;

tying a knot in the suture material externally of the body; and

moving the knot into the body to a position adjacent the tissue.

4,923,462

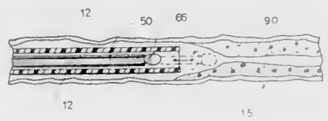
CATHETER SYSTEM HAVING A SMALL DIAMETER ROTATABLE DRIVE MEMBER

Robert C. Stevens, Williston, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 27,186, Mar. 17, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 233,998

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—159 **13 Claims**



1. A process for opening a partially or totally blocked blood vessel within a subject comprising the steps of:

inserting an elongated angiographic catheter into a subject blood vessel;

injecting an opaque dye into a proximal end of the angiographic catheter to cause said opaque dye to flow through a central passageway of said angiographic catheter and enter the blood vessel;

imaging the patient to locate obstructions or regions of reduced blood flow within the blood vessel which can be detected due to the presence of the opaque dye within the blood vessel;

providing a drive catheter by rotatably supporting an elongated flexible drive wire having an enlarged distal head at one end within a tightly coiled wire having adjacent coils that touch and extend along a substantial length of said drive wire to form a sheath that acts as a bearing for the drive wire;

without withdrawing the angiographic catheter from the patient blood vessel inserting the distal head of the drive catheter into a proximal end of the central passageway of said angiographic catheter and pushing the drive catheter into the center passageway of the angiographic catheter until said enlarged distal head is in proximity to an obstruction or region of reduced blood flow within the blood vessel; and

rotating said drive wire at high speed relative said coiled wire sheath bearing by rotating a proximal end of the drive wire not covered by the sheath to effect high speed rotation of the enlarged distal head for opening said blood vessel.

4,923,463

DEPILATORY DEVICE FOR REMOVING HAIR

Avraham Nussbaum, Moshav Mazor, Israel, assignor to Crestmoore Ltd., Jersey, Channel Islands

Filed Oct. 17, 1988, Ser. No. 258,584

Claims priority, application Israel, Feb. 28, 1988, 85568

Int. Cl.[5] A61B *17/00*

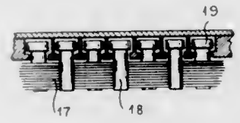
U.S. Cl. 606—133 **2 Claims**

1. A depilatory device for removing body hair of a user and comprising:

a manually grippable housing defining a plate and having an electric motor mounted therein,

an electric switch means on the housing and operatively associated with the motor for engaging it with or disengaging it from a source of energy,

the housing defining from 2 to 30 slide bearing bores in the plate and each having a T-shaped cross section into each of which is journaled a pin for rotation and movement perpendicular to the plate,



the pins projecting out of the plate and connected to a shaft of the motor to be driven therefrom,

a belt wound continuously around the pins whereby when the motor operates the shaft turns to rotate the pins causing the belt to run continuously so that when the pins are in contact with the body hair a strand of the hair is catchable between one of the pins and the belt clamping the strand therebetween to pull it along the plate out of the user's body.

4,923,464

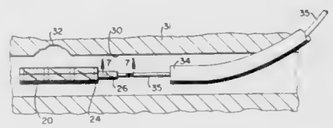
PERCUTANEOUSLY DELIVERABLE INTRAVASCULAR RECONSTRUCTION PROSTHESIS

Joseph A. DiPisa, Jr., Flushing, N.Y., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 3, 1985, Ser. No. 772,216

Int. Cl.[5] A61M *29/02*

U.S. Cl. 606—195 **16 Claims**



1. An intravascular prosthesis comprising:

a lining rolled upon itself in a plurality of overlapping turns around a longitudinal axis so that it is introducible in a rolled configuration into a vascular lumen surrounded by a vascular wall; and

an inflatable channel associated with said lining and being rolled upon itself in a plurality of turns around said longitudinal axis, said channel including a filling port for the introduction of fluid into said channel for the inflation thereof, said lining and said channel having the capability of unrolling inside said vascular lumen when said channel is inflated so that the lining may engage the vascular wall to provide support therefor.

4,923,465

CARDIAC VALVE PROSTHESIS

Martin Knoch; Helmut Reul, and Günter Rau, all of Aachen, Fed. Rep. of Germany, assignors to B. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 387,694

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828781

Int. Cl.[5] A61F *2/24*

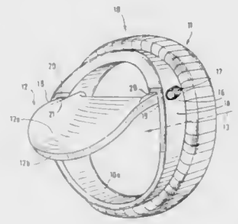
U.S. Cl. 623—2 **17 Claims**

9. A cardiac valve prosthesis comprising:

a valve ring having an interior surface, an exterior surface and a through hole opened to the exterior surface,

a closing body having a journal pin positioned to engage the through hole, the closing body being moveable relative to the valve ring between an open position and a closed position,

the through hole and the journal pin being configured such that the journal pin occupies different regions of the



through hole when the closing body is moved between the open position and the closed position,

whereby different regions of the through hole and journal pin are exposed and subjected to circumfluent blood flow when the closing body is moved between the open position and the closed position, thereby reducing the risk of thrombi formation.

4,923,466

KERATO-PROSTHESIS FOR TRANSCORNEAL IMPLANTATION AND PROCESS OF MANUFACTURE THEREOF

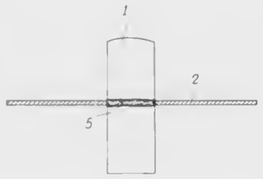
Stefano Pintucci, No. 37, Via Bertolini, 00197 Roma, Italy

Continuation of Ser. No. 132,941, Dec. 9, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 323,225

Claims priority, application Italy, Dec. 15, 1986, 48744 A/86

Int. Cl.[5] A61F *2/14*; C09J *5/00*

U.S. Cl. 623—5 9 Claims



1. A keratoprosthesis for transcorneal implantations, characterized in that it comprises an optical part comprising a biocompatible transparent material in the form of a small cylindrical body, a one piece supporting haptic part comprising a synthetic material having inner spaces that is biocompatible alloplastic and which cannot be reabsorbed, and in addition allows human tissues to grow within said haptic part, having the shape of a small disk which is drilled at its center to form a hole, said optical part and said haptic part being directly fixedly bonded to each other at the points corresponding to a portion of the lateral surface of said small cylinder and of the inner peripheral edge of said hole.

4,923,467

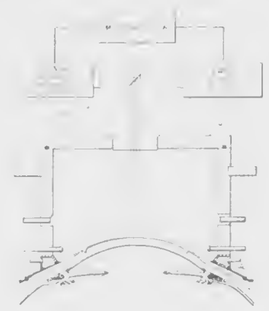
APPARATUS AND PROCESS FOR APPLICATION AND ADJUSTABLE REPROFILING OF SYNTHETIC LENTICULES FOR VISION CORRECTION

Keith P. Thompson, 4584 E. Brookhaven Dr., Atlanta, Ga. 30319

Filed Mar. 2, 1988, Ser. No. 163,519

Int. Cl.[5] A61F *2/14*

U.S. Cl. 623—5 16 Claims



1. A process for application and adjustable reprofiling of synthetic lenticule to the cornea of the human eye for correcting vision, comprising the steps of:

(a) preparing a topographic map of the anterior surface of the cornea;

(b) profiling the posterior surface of a synthetic lenticule to closely match the anterior surface of the cornea, said lenticule being formed of a material that is resistant to invasion by cells and cellular agents in the optical zone and that said lenticule has the capability of being reprofiled through laser ablation and also being constructed so as to correct the patient's particular refractive error;

(c) removing the outer epithelial cell layer from the anterior surface of the cornea;

(d) forming a shallow peripheral groove in the cornea, outside the visual axis of the eye;

(e) applying adhesive means in said groove;

(f) placing the peripheral edge of said lenticule in said groove whereby said lenticule is disposed over the cornea; and

(g) ablating by laser predetermined portions of said lenticule for refining its refractive power.

4,923,468

INTRAOCULAR LENS WITH FLUORESCING SUPPORT LOOPS

Victor F. Wild, 11055 Flintkote St., Bldg. 9H, San Diego, Calif. 92121

Filed Jun. 13, 1989, Ser. No. 365,312

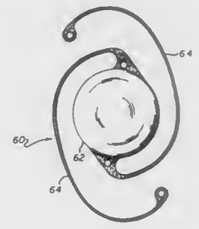
Int. Cl.[5] A61F *2/16*

U.S. Cl. 623—6 10 Claims

1. An intraocular lens, comprising:

a lens body; and

support means for supporting said lens body within the eye of a patient, said support means including luminescent



means integrated permanently therewith for luminescing upon exposure to a selected light source.

4,923,469

PROTHESIS AND ELECTRODE FOR THE ELECTRICAL STIMULATION OF THE INNER EAR, AND METHOD FOR PRODUCING SAID ELECTRODE

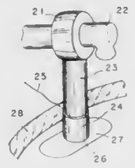
Bruno Frachet, Montmorency, and Michel-Yves David, Paris, both of France, assignors to Assistance Publique and Audit S.A., both of Paris, France

Filed Apr. 6, 1988, Ser. No. 178,345

Claims priority, application France, Apr. 6, 1987, 87 04832

Int. Cl.[5] A61F *2/18*

U.S. Cl. 623—10 3 Claims



1. A prosthesis capable of achieving both an acoustic stimulation and an electrical stimulation of the inner ear, said prosthesis comprising:

an interposition element having first and second ends and means provided at said first end for fixing said interposition element to the descending branch of the anvil of the ear, whereby acoustic stimulation may be transmitted through said interposition element;

means forming a conductive end surface and defining an electrode on said second end for application against the oval window of the ear, said electrode comprising a metal cup within which is inserted said second end of said interposition element, said metal cup defining said end surface and having an outer cylindrical surface;

a conductor welded to said cup of said electrode for connection to a source of electrical stimulation;

a biocompatible insulating covering covering said conductor; and

a biocompatible insulating covering covering said outer cylindrical surface.

4,923,470

PROSTHETIC TUBULAR ARTICLE MADE WITH FOUR CHEMICALLY DISTINCT FIBERS

Barry L. Dumican, Newtown, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 929,577, Dec. 24, 1986, Pat. No. 4,871,365, which is a continuation of Ser. No. 727,326, Apr. 25, 1985, Pat. No. 4,652,264. This application Mar. 22, 1988, Ser. No. 171,606

Int. Cl.[5] A61F *2/02*

U.S. Cl. 623—11 6 Claims

1. A tubular article useful in prosthetic surgery having a plurality of at least three different fibers, a first and a second fiber manufactured from two chemically distinct absorbable polymers, and a third fiber manufactured from a nonabsorbable polymer, the improvement comprising at least one of the first or second absorbable polymers being selected from the group consisting of a copolymer of glycolic acid, poly(lactic acid), polydioxanone, and blends of the same, and a fourth fiber, the third and fourth fibers being chemically distinct and manufactured from two different nonabsorbable polymers.

4,923,471

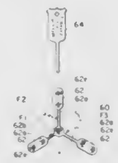
BONE FRACTURE REDUCTION AND FIXATION DEVICES WITH IDENTITY TAGS

Frank H. Morgan, Woodland Hills, Calif., assignor to TiMesh, Inc., Calabasas, Calif.

Filed Oct. 17, 1989, Ser. No. 422,741

Int. Cl.[5] A61F *2/28*

U.S. Cl. 623—16 7 Claims



1. An implantable bone fracture reduction device for the internal fixation and immobilization of bone fragments at a bone fracture site comprising:

(a) a thin malleable bone affixation plate formed of a biocompatible metallic material, said plate having at least two spaced openings extending therethrough each for receiving a bone screw to be driven into bone fragments at a fracture site to affix said plate to said bone fragments; and

(b) a thin bone plate identification tag formed as an integral extension of said bone plate, said identification tag bearing at least the name of the plate manufacturer, the manufacturer's product number, and the manufacturer's production lot number for said plate to provide full traceability of the device with respect to material specifications, manufacturing procedures and quality controls, and said identification tag providing means for handling and manipulating said bone plate during its affixation to bone fragments at a fracture site and being severable from said bone plate for archiving.

4,923,472

ARTIFICIAL KNEE-JOINT

Filippo Ugolini, Rome, Italy, assignor to Salus S.r.l., Rome, Italy

Filed Jan. 18, 1989, Ser. No. 298,616

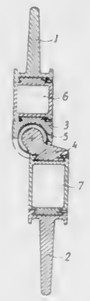
Claims priority, application Italy, Jan. 22, 1988, 47565 A/88

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 12 Claims

1. An artificial articulation, in particular an artificial knee-joint, comprising, a first rod insertable into the bony cavity of

the femoral bone; a first hinge member connected to an end of said first rod that is opposite to its end that is inserted into the bony cavity of the femoral bone; a second rod insertable into the bony cavity of the tibial bone; a second hinge member connected to an end of said second rod that is opposite to its



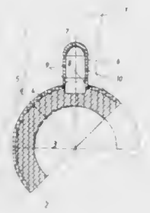
end that is inserted into the bony cavity of the tibial bone; characterized in that a coupling between each said rod and its respective hinge member is of the removable type and includes a mechanical means made up of a dove-tail shaped male-female type joint, and in that an articulated coupling between said two hinge members is provided by at least one bearing.

4,923,473

HEMISPHERICAL ACETABULUM

Peter Griss, Marburg, Fed. Rep. of Germany, and Rudolf Koch, Berlingen, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 9, 1989, Ser. No. 308,428
Claims priority, application Switzerland, Mar. 1, 1988, 00770/88
Int. Cl.[5] A61F *2/34*
U.S. Cl. 623—22 6 Claims



1. A hemispherical acetabulum comprising
a hemispherical cup having a cavity for receiving a femoral head;
a fixing pin secured to said cup and projecting from said cup at an angle of 45° relative to an equatorial plane of said cup; and
a sleeve freely rotatably mounted on said pin and having a closed end enclosing said pin to facilitate twisting of said cup into position in a pelvis.

4,923,474

SLEEVE-SHAPED ARTICLE, PARTICULARLY FOR AMPUTATION STUMPS

Bo Klasson, Skärholmen, Sweden, and Ossur Kristinsson, Reykjavik, Iceland, assignors to Ossur Hf, Iceland

PCT No. PCT/SE87/00299, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO88/00032, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 25, 1987, Ser. No. 294,062
Claims priority, application Sweden, Jun. 26, 1986, 8602855
Int. Cl.[5] A61F *2/78, 2/80, 13/00*
U.S. Cl. 623—33 7 Claims



1. A sleeve member for enclosing and being fixed to a body part, such as an amputation stump, said sleeve member substantially having a frusto-conical shape, including inner and outer portions, the truncated end of a distal portion of said member being completely closed and at least slightly rounded and said sleeve member being made of an airtight material, characterized in that said sleeve member (1) substantially is made of elastic material, at least the distal portion of said member exhibiting such an anisotropy with regard to the elasticity that it has a relatively high elasticity radially and is substantially inelastic axially.

4,923,475

INFLATABLE LIMB PROSTHESIS WITH PREFORMED INNER SURFACE

Barry M. Gosthnian, 5211 E. Trindle Rd., Apt. 3, Mechanicsburg, Pa. 17055, and Hugh Herr, R.D. 1, Box 272, Holtwood, Pa. 17532

Filed Feb. 21, 1989, Ser. No. 312,448
Int. Cl.[5] A61F *2/80, 2/78*
U.S. Cl. 623—37 6 Claims



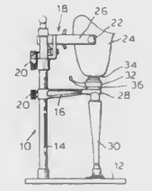
1. A prosthesis comprising:
a socket having a stump-receiving opening and a cup-shaped interior, said socket including an outer shell and a sock disposed therein;
said sock including a plurality of bladders;
means for inflating said bladders; and wherein
said bladders cooperate to define a stump engaging surface, said stump engaging surface of said bladders being molded to have a shape conforming to the outer surface of the user's stump when the stump is under static pressure.

4,923,476

ALIGNMENT DEVICE AND METHOD OF ARTIFICIAL LIMB MANUFACTURE

John E. Cooper, Leatherhead, and Alun Wilcox, Richmond, both of United Kingdom, assignors to J. E. Hanger & Company Limited (British Company), London, United Kingdom

Filed Mar. 23, 1988, Ser. No. 172,228
Claims priority, application United Kingdom, Mar. 24, 1987, 8706912
Int. Cl.[5] A61F *2/80*
U.S. Cl. 623—38 17 Claims



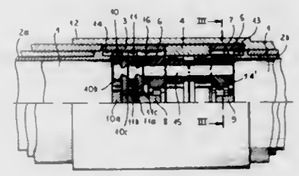
1. In an artificial limb having upper and lower limb parts, and an alignment device positioned between the upper and lower limb parts, the improvement comprising:
said alignment device having first and second end plates fastened to the upper and lower limb parts, respectively, in predetermined angular and axial position;
flexible sleeve means being fastened between the end plates to define therewith an internal cavity for containing a body of hardenable fluid material; and
passage means through which the hardenable fluid material may flow to the internal cavity from the exterior of the alignment device, relative movement between said upper and lower limb parts during alignment thereof being accommodated when the material is in a fluid state, and said hardenable material providing a rigid mechanical link between the first and second end plates when the material is in a hardened state.

4,923,477

PROSTHESIS DRIVE

Eduard Horvath, Vienna, Austria, assignor to Otto Bock Orthopadische Industrie Besitz- Und Verwaltungs-KG, Duderstadt, Fed. Rep. of Germany

Filed Jul. 18, 1989, Ser. No. 381,609
Claims priority, application Austria, Jul. 18, 1988, 1842/88
Int. Cl.[5] A61F *2/66*
U.S. Cl. 623—57 8 Claims



1. A prosthesis drive, comprising:
a first and a second drive motor;
three mutually coaxial first gears disposed in succession along a common axis and including a pair of axially outer gears and an inner gear between said outer gears;
two second gears spaced along said axis, coaxial with said first gears and each defining an annular space with a respective one of said outer gears;
a respective set of planet wheels in each of said annular spaces meshing with one of said second gears and the respective first gear, each of the sets of planet wheels comprising at least one planet wheel, whereby each of said first gears, a respective set of said planet wheels and a respective one of said second gears forms a respective planetary gearing, said first wheels of both of said sets meshing with said inner gear;
means for coupling each of said first and second drive motors with one of said first and second gears of a respective one of said planetary gearings for alternative operation of the drive by said first and second motors, said first and second drive motors being disposed at opposite axial sides of said first gears; and
means for connecting at least one of the others of the first and second gears of the planetary gearings not coupled to said motors to a member of a prosthesis movable relative to another member of the prosthesis.

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4,923,478

COSMETIC STICK COMPOSITION

Samir F. Naggiar, East Windsor, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Aug. 11, 1988, Ser. No. 231,305
Int. Cl.[5] A61K *7/155*
U.S. Cl. 8—161 3 Claims

1. Hydrous stick depilatory compositions consisting essentially of from about 6% to about 12% by weight sodium stearate, from about 15% to about 60% by weight propylene glycol, from about 4% to about 8% by weight of a thioglycolate acid salt selected from the group consisting of sodium, calcium and potassium thioglycolate and mixtures thereof and from about 15% to about 60% by weight water.

4,923,479

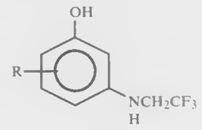
COMPOSITION AND PROCESS FOR THE OXIDATIVE DYEING OF HAIR WITH 3-(2',2', 2'-TRIFLUOROETHYL)AMINO-PHENOL DERIVATIVES

Hans-Jürgen Braun, Albligen, Switzerland, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00692, § 371 Date Aug. 4, 1988, § 102(e) Date Aug. 4, 1988, PCT Pub. No. WO88/04166, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 9, 1987, Ser. No. 221,793
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641630
Int. Cl.[5] A61K *7/13;* C07C *87/60*
U.S. Cl. 8—412 14 Claims

1. A composition of the oxidative dyeing of hair based on a combination of a coupling substance and a developing substance, which comprises:

(a) 0.01 to 4% by weight of a compound of the Formula (I)



wherein

R is C_1 to C_4 alkyl, a mono- or polyhydroxy-alkyl containing 1 to 4 carbon atoms and up to 3 hydroxy groups, C_1 to C_4 alkoxy, a mono- or polyhydroxy-alkoxy containing 1 to 4 carbon atoms and up to 3 hydroxy groups, or a halogen atom, or a physiologically acceptable salt thereof as coupling substance; and

(b) a developer substance conventionally used in the preparation of hair dyes, wherein the amount of the coupler substance and the developer substance makes up 0.1 to 6.0% by weight of the composition; together with a physiologically acceptable carrier or diluent.

4,923,480

OPAQUE TINTING OF CONTACT LENSES WITH RANDOM POSITIONS OF COLOR DEPTH

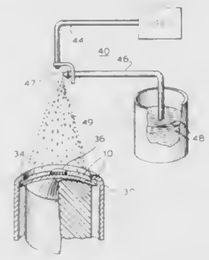
Martin Monestere, Kendall Park, N.J., assignor to Allergan, Inc., Irvine, Calif.

Filed Sep. 21, 1987, Ser. No. 99,038
Int. Cl.[5] D06P *5/00, 1/22, 1/28;* C08J *7/00*
U.S. Cl. 8—507 14 Claims

1. In a method for tinting a hydrogel contact lens which includes

applying a liquid solution of metal salt as an opaquing medium to a selected portion of one face of the lens and reacting the salt with a precipitating agent to form a metallic precipitated which precipitate when exposed to light releases metal therefrom as an opaque covering on the lens face, and

thereafter tinting the opaque covered portion of the lens face with a solution of a water-soluble leuco ester of a vat dye which penetrates said opaque covering with the dye thereafter oxidized to regenerate the vat dye, the improvement which comprises



applying the liquid solution of salt to the selected portions of said one face of the lens as discrete randomly sized, randomly positioned droplets thereof whereby the opaque covering resulting therefrom will possess random size and positioning.

4,923,481

AQUEOUS DISPERSION OF A METALLIZABLE DYE AND SULFONATED AROMATIC CONDENSATE

Roberto Galli, Reinach, and Ernst Tempel, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,845
Claims priority, application Switzerland, Dec. 18, 1987, 495687
Int. Cl.[5] C09B *67/26;* D06P *1/36, 3/20*
U.S. Cl. 8—589 15 Claims

1. An aqueous dispersion of a mordant dye which comprises

(a) at least 10% of a mordant dye, based on the total weight, and

(b) a sulfonated condensation product, which is obtained by reaction of a monocyclic or polycyclic aromatic compound having at least two replaceable ring-positioned hydrogen atoms with a compound of the formula



(1)

in which X is the direct bond or oxygen, Hal is chlorine or bromine and n is 1 to 4, and sulfonation.

4,923,482

PROCESS FOR SEPARATING SULFUR FROM ORE

Arnold B. Menar, San Francisco, Calif., assignor to Sulexport-Intertrade A.G., Burlingame, Calif.

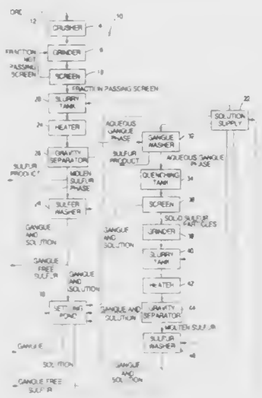
Continuation-in-part of Ser. No. 852,194, Apr. 15, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 183,768
Int. Cl.[5] C01B *17/027*
U.S. Cl. 23—308 S 34 Claims

1. A process for separating sulfur from particles of sulfur ore containing elemental sulfur and gangue, wherein said particles are not substantially larger than 30 U.S. Standard mesh, said process comprising the steps of:

(1) mixing said particles with a dilute aqueous solution having as density and containing water and an agent capable of combining with the gangue constituent of said particles such that the overall density of the combination of said

agent and gangue is substantially less than the density of said aqueous solution to form a slurry;

(2) heating said slurry to a temperature in the range of approximately 250°–350° F. under a pressure sufficient to maintain substantially all of the water in liquid phase and to form a dispersion of molten sulfur droplets in the aqueous solution;



(3) agitating the heated slurry to cause coalescence of the molten sulfur droplets;

(4) settling said heated slurry into an upper aqueous phase containing said aqueous solution and a substantial majority of the gangue originally present in said particles of step (1) and a continuous lower phase containing molten sulfur and a residual amount of gangue; and

(5) separating said lower phase from said upper phase

4,923,483

VISCOUS HYDROCARBON-IN-WATER EMULSIONS

Ignacio A. Layrisse R., Estado Miranda; Domingo R. Polanco, Edo. Miranda; Hercilio Rivas; Euler Jimenez G., both of Caracas; Lirio Quintero; Jose Salazar P., both of Edo. Miranda; Mayela Rivero, Mërida; Antonio Cardenas, Caracas; Maria L. Chirinos, Caracas; Daysi Rojas, Caracas, and Humberto Marquez, El Paraiso, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Division of Ser. No. 96,643, Sep. 11, 1987, Pat. No. 4,795,478, and a continuation-in-part of Ser. No. 14,871, Feb. 17, 1987, Pat. No. 4,834,775, which is a continuation-in-part of Ser. No. 875,450, Jun. 17, 1986, Pat. No. 4,801,304. This application Oct. 28, 1988, Ser. No. 263,896

Int. Cl.[5] **C10L** *1/32*

U.S. Cl. 44—51 **2 Claims**

1. A hydrocarbon-in-water emulsion formed by emulsifying a viscous hydrocarbon having a viscosity of greater than or equal to 100 centipoise at a temperature of 122° F. using a surfactant consisting essentially of ammonia hydroxide in an amount sufficient to adjust the pH of the emulsion to a level of between 10.0 to 12.0, said hydrocarbon-in-water emulsion being characterized by a water content of at least 15 wt. %, a viscosity of no more than 5000 centipoise at 122° F. and an oil droplet size of no more than 300 microns.

4,923,484

METHOD AND APPARATUS FOR TREATING EXHAUST GAS FOR REMOVAL OF FINE PARTICLES

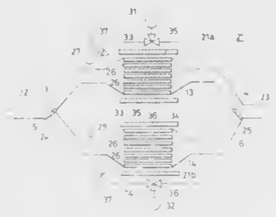
Keizo Saito, Tsuchiura, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 319,723

Claims priority, application Japan, Mar. 11, 1988, 63-58708

Int. Cl.[5] **B01D** *39/20;* **F01N** *3/02*

U.S. Cl. 55—21 **5 Claims**



1. A method for treating exhaust gas for removal of fine particles including volatile components and combustible non-volatile components, which comprises the steps of:

disposing in parallel a pair of first and second paths for the passage of the exhaust gas, each of said first and second paths having an inlet end and an outlet end, and inserting therein between the inlet and the outlet end of each of said first and second paths, a filter capable of trapping the fine particles;

providing a first switchover valve movable between a first position at which the inlet end of the first path is completely opened and the inlet end of the second path is completely closed and a second position at which the inlet end of the first path is completely closed and the inlet end of the second path is completely open, and a second switchover valve movable between another first position at which the outlet end of the first path is completely open and the outlet end of the second path is completely closed and another second position at which the outlet end of the first path is completely closed and the outlet end of the second path is completely open;

introducing the exhaust gas into the first path, with the inlet end and outlet end thereof completely open and the inlet end and outlet end of the second path completely closed with said first and second switchover valves and with a temperature of the filter of the first path set lower than a volatilization temperature of the volatile components, thereby allowing the fine particles to be trapped by the filter of the first path;

completely closing the inlet end and outlet end of the first path when a prescribed amount of fine particles have been trapped by the filter of the first path, and raising the temperature of the filter of the first path to a combustion temperature of the combustible non-volatile components and, at the same time, introducing the exhaust gas into the second path, with the inlet end and outlet end thereof completely open with said first and second switchover valves and with a temperature of the filter of the second path set lower than the volatilization temperature of the volatile components, thereby allowing the fine particles to be trapped by the filter of the second path;

partially opening the inlet end of the first path and completely opening the outlet end of the first path when the temperature of the filter of the first path has reached the combustion temperature of the combustible non-volatile components, thereby combusting the fine particles trapped by the filter of the first path;

completely closing the inlet end of the first path when the fine particles trapped by the filter of the first path have been completely combusted, and cooling the filter of the first path to a temperature lower than the volatilization temperature of the volatile components;

completely closing the inlet end and outlet end of the second path when a prescribed amount of fine particles have been trapped by the filter of the second path, and raising the temperature of the filter of the second path to the combustion temperature of the combustible non-volatile components and, at the same time, introducing the waste gas into the first path, with the inlet end and outlet end of the first path completely open, when the filter of the first path has been cooled to the temperature lower than the volatilization temperature of the volatile components;

partially opening the inlet end of the second path and completely opening the outlet end of the second path when the temperature of the filter of the second path has reached the combustion temperature of the combustible non-volatile components, thereby combusting the fine particles trapped by the filter of the second path; and

completely closing the inlet end of the second path when the fine particles trapped by the filter of the second path have been completely combusted, and cooling the filter of the second path to a temperature lower than the non-volatilization temperature of the volatile components.

4,923,485

PROCESS FOR SEPARATING ORGANIC CONSTITUENTS FROM WASTE GASES OF THE PRODUCTION OF AROMATIC INTERMEDIATES

Ernst Höroldt, Kelkheim; Richard Grimm, Königstein; Siegbert Rittner, Mörfelden-Walldorf; Herbert Kuckertz, Kelkheim, and Wilfried Billmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt Am Main, Fed. Rep. of Germany

Filed Dec. 29, 1988, Ser. No. 291,515

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3837987; Dec. 31, 1987, 3744594

Int. Cl.[5] **B01D** *19/00*

U.S. Cl. 55—55 **22 Claims**

1. A process for the separation of undesired organic ingredients comprising chloroform, carbon tetrachloride, perchloroethylene, and haloaromatics from waste gases which are formed in the preparation of halogenated aromatic intermediates and contain said compounds and mixtures of any of said compounds with unreacted aromatic starting materials, which comprises washing the waste gases with a washing liquid comprising

(a) paraffinic hydrocarbons having from 10 to 20 carbon atoms or

(b) diisopropylnaphthalene or a mixture of isomers thereof having the sum formula $C_{16}H_{20}$, an average molecular weight in the range of from 210 to 215, a boiling range in the range of from 290° to 300° C. and a flash point above 130° C.

at a temperature in the range of from 0° to 50° C., but above the melting point of the washing liquid to remove the said undesired organic ingredients.

4,923,486

GAS CHROMATOGRAPHY METHODS AND APPARATUS

Wayne A. Rubey, Vandalia, Ohio, assignor to University of Dayton, Dayton, Ohio

Filed Dec. 22, 1988, Ser. No. 288,517

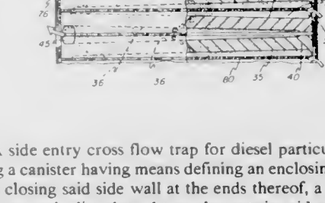
Int. Cl.[5] **B01D** *15/08*

U.S. Cl. 55—67 **31 Claims**

1. In a method of performing gas chromatographic analysis wherein a sample is admitted to a chromatographic column and caused to travel in a direction from upstream to downstream from an inlet port of said column to an elution port, the improvement comprising the steps of

(a) providing temperature control means in thermal transfer relation with said column, said temperature control means being adapted to heat or cool selected locations of said column

(b) providing a curvilinearly shaped negative temperature gradient along said column by said temperature control means, with the temperature at the elution port of said column being maintained lower than the temperature at the inlet port thereof at all times except for the end of said analysis so that the sample will continuously be subjected



to a lower temperature as it travels in a downstream direction along said column, said column and said temperature control means being capable of transferring changes of at least about 0.5° C. per second from said temperature control means to said column and

(c) raising the temperature of the column at said elution port at the end of said analysis so that said sample will elute from the column.

4,923,487

CROSS FLOW DIESEL PARTICULATE TRAP

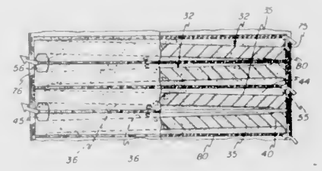
Douglas A. Bogart, Dayton, and Robert C. Schenck, Jr., Kettering, both of Ohio, assignors to The Duriron Company, Inc., Dayton, Ohio

Filed Oct. 17, 1988, Ser. No. 258,968

Int. Cl.[5] **F01N** *3/02*

U.S. Cl. 55—482 **21 Claims**





1. A side entry cross flow trap for diesel particulates, comprising a canister having means defining an enclosing side wall, means closing said side wall at the ends thereof, a plurality of porous ceramic disc-shaped trap elements in said canister, said elements each having an inlet surface on one side thereof and an outlet surface on the opposite side thereof, means mounting

a plurality of said elements in said canister with the inlet surface of one said element in opposed spaced relation to the adjacent inlet surface of an adjacent said element and with the outlet surface of one element opposed to the outlet surface of an adjacent said element defining inlet spaces between opposed pairs of said elements and outlet spaces between opposed alternating pairs of said elements, each of said elements having a peripheral wall partially surrounding each of said inlet and outlet surfaces and forming a gap aligned with corresponding said gaps in the walls of immediately adjacent said elements to form common peripheral inlets and outlets opening into said inlet and outlet spaces respectively, means in said canister side wall forming inlet openings aligned with said common inlets communicating with said inlet spaces and outlet openings aligned with said common outlets communicating with said outlet spaces, and plenum means on said canister for directing exhaust gases to said canister inlets and for receiving gases from said canister outlets.

4,923,488

APPARATUS FOR ALTERING THE DENSITY OF PARTICLES

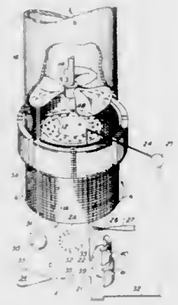
Joseph B. Priestley, Jr., 13200 N. 103rd Ave., Sun City, Ariz. 85351

Continuation-in-part of Ser. No. 180,198, Apr. 11, 1988. This application Apr. 3, 1989, Ser. No. 332,165

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[5] B03C *1/00*

U.S. Cl. 55—100 **4 Claims**



1. Particle treatment apparatus including

(a) means for forming in a volume of fluid a funnel having an upper portion, a lower portion, a core region, and a vortex region of fluid circulating around said core region, said means including

(i) a hollow cylindrical member having first and second inlet and outlet ends and a vertical axis,

(ii) means for rotating said cylindrical member about said vertical axis to cause fluid to circulate around said axis, and

(iii) means for drawing fluid through said rotating cylindrical member in a direction of travel from said second member to said first end;

(b) means for introducing particles into said vortex region, said vortex region causing said particles to rotate around said vertical axis in confined circular paths of travel generally lying in said vortex region and in a horizontal plane;

(c) particle treatment means for altering the density of particles carried in said vortex region.

4,923,489

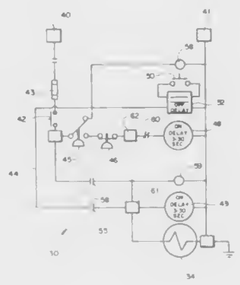
LIQUID LEVEL CONTROLLER

Eric O. Hanson, P.O. Box 991, Taylorsville, N.C. 28681

Filed Jun. 23, 1989, Ser. No. 370,624

Int. Cl.[5] B01F *3/04*

U.S. Cl. 55—227 **8 Claims**



1. In a liquid level controller for a waterpan-type spray booth of the type wherein air propelled by a ventilation fan entrains extraneous spray from the proximity of the waterpan through a restricted opening defined by the water level and a washing enclosure into a washing zone where the extraneous spray is washed from the air into the water pan, and where in a negative static pressure proportional to the volume of the restricted opening is applied through said opening, the improvement comprising:

(a) a normally-open first air pressure sensing and switching means for detecting aminimum level of negative static pressure through said restricted opening indicative of ventilation fan operation and for closing said first air pressure sensing and switching means to thereby permit a voltage output;

(b) a normally-closed second air pressure sensing and switching means for sensing a predetermined negative static pressure level indicative of a minimum adequate air flow through said restricted opening for opening said second air pressure sensing and switching means to interrupt a current flow through said second sensing and switching means, said normally-closed second air pressure sensing and switching means being normally closed by the voltage out put from said normally-open first air pressure sensing and switching means;

(c) said first and said second air pressure sensing and switching means operatively connected to a water supply valve;

(d) whereby a decrease in negative static pressure resulting from a drop in water level in said water pan and a consequent increase in the size of the restricted opening defined by the water level and washing enclosure returns said normally-closed second air pressure sensing and switching means to its normally-closed state, permitting opening of said water supply valve to raise the water level in said waterpan to there by decrease the size of the restricted opening and increase the negative static pressure to reopen said normally-closed second air pressure sensing and switching means and close said water supply valve.

4,923,490

NOVEL GRINDING WHEELS UTILIZING POLYCRYSTALLINE DIAMOND OR CUBIC BORON NITRIDE GRIT

Neil R. Johnson, Columbus, and Harold P. Bovenkerk, Worthington, both of Ohio, assignors to General Electric Company, Worthington, Ohio

Filed Dec. 16, 1988, Ser. No. 286,450

Int. Cl.[5] C09K *3/14*

U.S. Cl. 51—298 **11 Claims**

1. A grinding tool, comprising from about 5 to 30 volume percent thermally stable polycrystalline diamond or polycrystalline cubic boron nitride abrasive particles and from about 5 to 30 volume percent single crystal diamond or single crystal cubic boron nitride abrasive particles attached to a support via a bond matrix, where in the balance being bonding matrix.

4,923,491

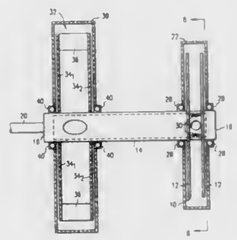
CENTRIFUGAL FILTER FOR SEPARATING AEROSOL PARTICLES FROM A GAS STREAM

Philip A. Lawless, and Andrew S. Viner, both of Durham, N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Filed Jan. 4, 1989, Ser. No. 293,420

Int. Cl.[5] B01D *45/00*

U.S. Cl. 55—409 **3 Claims**



1. A centrifugal filter for separating aerosol particles from a gas stream, comprising:

a rotatable hollow hub;

a stationary housing mounted on said rotatable hollow hub, said housing having an inlet for introducing an aerosol particle laden gas stream into said housing and an outlet for removing an aerosol particle enriched gas stream from said housing;

at least one pair of disks fixedly mounted in spaced apart relationship on said hub in said housing, said hub being perforated in a region between said disks so that an interior space of said hub communicates with the space between the disks;

vacuum pump means communicating with the interior space of said hub to produce a lower pressure in said hub than in the space between the disks;

means for rotating the hub and the disks mounted thereon while an aerosol particle containing gas stream is introduced into the space between said disks; and

said inlet being arranged substantially tangential to the periphery of said disks so as to introduce said aerosol particle laden gas stream into said housing in an annular space between the periphery of said disks and said housing, and said outlet being arranged substantially tangential to said disks in communication with said annular space;

wherein rotation of said disks produces rotation of the particle laden gas stream between the disks, said vacuum pump means produces a drag force which pulls gas from the space between the disks through the perforated hub while the disks are rotated by said rotating means, and the aerosol particles within said gas stream are simultaneously subjected to centrifugal forces and drag forces so that aerosol particles remain entrained in said annular space with substantially no impaction and agglomeration against the housing and are at least partially separated from the gas stream to produce an aerosol particle enriched gas stream expelled from said housing via the housing outlet.

4,923,492

CLOSED SYSTEM REFRIGERATION USING A TURBOEXPANDER

J. Paul Hewitt, P.O. Box 79034, Houston, Tex. 77279

Filed May 22, 1989, Ser. No. 354,860

Int. Cl.[5] F25J *3/00*

U.S. Cl. 62—11 **21 Claims**

1. A system for removing substantially all of the hydrocarbons or chemical vapors from an air-hydrocarbon or chemical vapor mixture, comprising:

(a) a dehydration means for removing any water contained within said mixture;

(b) a vapor chiller in fluid connection with said dehydration means to condense substantially all of said hydrocarbons or chemicals in said mixture by indirect heat exchange with a refrigerant gas at a cryogenic temperature;

(c) a drain to remove substantially all of said condensed hydrocarbons or chemicals from said vapor chiller;

(d) a vent means to remove said air less substantially all of said hydrocarbons coming from said vapor chiller;

(e) a first compressor to compress said refrigerant gas;

(f) a condenser in fluid connection with the outlet of said first compressor to condense substantially all of said refrigerant liquid;

(g) a turboexpander in fluid connection with said condenser to reduce the pressure of and expand said refrigerant liquid back to a refrigerant gas thereby reducing the temperature of said refrigerant gas to a cryogenic temperature;

(h) fluid connection between said turboexpander outlet and said vapor chiller wherein said refrigerant gas is heated by indirect heat exchange with said mixture thereby cooling said mixture; and

(i) a second compressor driven by said turboexpander in fluid connection with the refrigerant gas outlet of said vapor chiller to partially compress said refrigerant gas thereby removing work and providing and essentially isentropic expansion across said turboexpander, the outlet of said second compressor being in fluid connection with the inlet of said first compressor.

4,923,493

METHOD AND APPARATUS FOR CRYOGENIC SEPARATION OF CARBON DIOXIDE AND OTHER ACID GASES FROM METHANE

Jaime A. Valencia, Houston, Tex., and Donald J. Victory, New Orleans, La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 19, 1988, Ser. No. 234,366

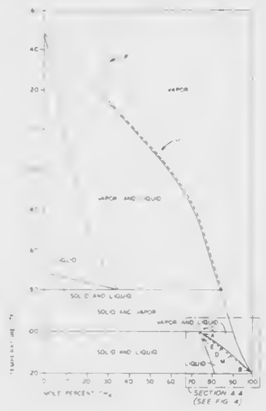
Int. Cl.[5] F25J *5/00*

U.S. Cl. 62—13 **13 Claims**

1. A method for separating a feedstream containing carbon dioxide and other acid gases from methane by use of a distillation column including a controlled freezing zone wherein a freezing zone liquid feedstream is introduced to allow the formation of carbon dioxide solids and simultaneous contact of vapor, liquid, and solids in said controlled freezing zone resulting in separation by distillation, including the step of:

sub-cooling the freezing zone liquid feedstream, so that this freezing zone liquid feedstream remains close to, but not

quite at, carbon dioxide solidification conditions, to prevent the occurrence of solidification conditions in said



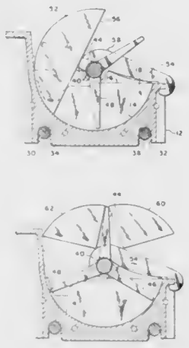
freezing zone liquid feedstream prior to its entering said controlled freezing zone.

4,923,494

MAKING ICE IN A REFRIGERATOR

Frank K. Karlovits, Arlington Hts., Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 17, 1988, Ser. No. 258,308
Int. Cl.[5] F25C *5/08*
U.S. Cl. 62—73 **8 Claims**



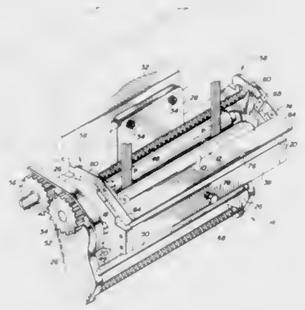
1. An icemaker for use in a refrigerated compartment capable of forming in a mold and harvesting some ice comprising:
(a) tray means defining a plurality of curved-bottom compartments;
(b) electrically operated valve means operable upon connection to a source of water and electrical energization to fill said tray compartments for ice making;
(c) movable harvesting means disposed adjacent said tray means, said harvesting means including a partitioning member extending into each compartment substantially to the said curved bottom, each of said partitioning members being frozen in ice formed in the respective compartment;
(d) heater means operable to heat said tray means for facilitating removal of ice formed in said tray means;
(e) actuator means operable to rotate said harvesting means to cause each of said partitioning members to sweep the respective curved ice frozen thereabout from said tray means; and,
(f) comb means disposed adjacent said tray means in fixed relationship thereto and operable to be contacted by said curved ice form during said rotation of said harvesting means, said comb means operative to strip said curved ice form from said partitioning member and break said curved ice form into a plurality of pieces.

4,923,495

PULL-ROLL ASSEMBLY LATCHING MECHANISM

Kenneth A. Clocksin, and Edward L. Hite, both of Toledo, Ohio, assignors to Manville Corporation, Denver, Colo.

Filed May 26, 1989, Ser. No. 358,994
Int. Cl.[5] C03B *37/065*
U.S. Cl. 65—11.1 **9 Claims**



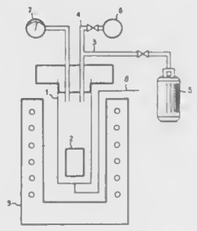
1. In mineral fiber attenuation apparatus having a pair of coacting pull rolls for pulling filament primaries from a bushing, wherein one of the pull rolls is mounted on first support means and the other pull roll is mounted on second support means, and wherein said first and second support means are movable toward and away from each other to enable said pull rolls to be moved into and out of operative engagement with each other, and including a latch mechanism for holding the roll support means in a position whereby the pull rolls are operatively engaged, said latch mechanism comprising:
a latch arm pivotally attached intermediate the length thereof to one of said support means;
the latch arm on one side of the pivotal attachment including a projecting latching surface;
the other of said roll support means defining a mating surface forming a latch seat;
spring means biasing the latching surface of the latch arm into locking engagement with the latch seat;
handle means on the opposite side of the pivotal attachment for manually pressing in opposition to the spring means bias to cause the latching surface of the latch arm to slidably disengage from the latch seat and release the support means for movement of the pull rolls out of engagement with each other; and
wherein said latching surface and said mating surface of said latch seat are generally planar surfaces, and pivotal disengagement of said latch arm causes said surfaces to move relative to each other in a direction having a component separating said surfaces.

4,923,496

METHOD OF FABRICATING FLUORIDE-GLASS INTEGRATED OPTICAL WAVEGUIDES

Marco Braglia, Turin, all of Italy, assignor to Societa' Cavi Pierelli S.p.A.; Sirti S.p.A., both of Milan and SIP-Societa Italiana Per L'Esercizio Telecommunicazione P.A., Turin, all of, Italy

Filed Jun. 2, 1989, Ser. No. 360,399
Claims priority, application Italy, Jul. 4, 1988, 67630 A/88
Int. Cl.[5] C03C *21/00*
U.S. Cl. 65—30.13 **4 Claims**



1. A method of fabricating fluoride-glass integrated optical guides, characterized in that a fluoride-glass plate is exposed in a reactor to a pressurised atmosphere of a gaseous halogen other than fluorine, or of a compound capable of generating such a halogen, at a temperature lower than vitreous transition temperature of the plate material and for a period of time preventing occurrence of crystallisation phenomena, so as to effect a ion exchange between fluoride ions in glass and halide ions and obtain an increase in the refractive index in the glass regions wherein such an exchange takes place.

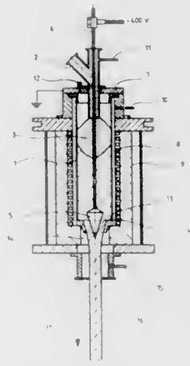
4,923,497

METHOD FOR THE CONTINUOUS PRODUCTION OF A TUBE OR ROD OF VITREOUS FUSED SILICA

Helmut Leber, Hanau, and Nigel R. Whippey, Seligenstadt, both of Fed. Rep. of Germany, assignors to Heraeus Quarschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 312,258
Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3815974
Int. Cl.[5] C03B *15/14, 21/06*
U.S. Cl. 65—86 **4 Claims**

1. A method for the continuous production of a tube or rod from vitreous fused silica comprising:
heating particulate silicon dioxide having an impurity content to softening temperature in a crucible of high-melting material, having a bottom outlet opening;
disposing a shaping tool in said opening;
continuously drawing down the softened silicon dioxide through an annular space formed between the bottom outlet opening and the shaping tool, while maintaining a hydrogen-containing atmosphere having a content of at least 80% hydrogen in the crucible above the silicon dioxide and in a space below the crucible adjoining the annular space; and
reducing the impurity content of the softened silicon dioxide during its passing through the annular space by maintaining between the shaping tool and crucible such an electrical potential deference in such a manner that the electrical field is directed from the shaping tool to the crucible, and the electrical current intensity is at least 0.7 mA per cm^3



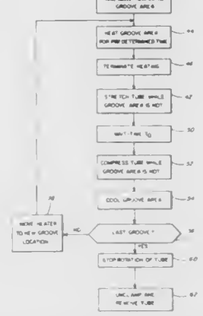
per minute of the time the softened silicon dioxide remains in the electrical field.

4,923,498

METHOD FOR FORMING A GROOVE IN A GLASS TUBE

Jonathan M. Gregory, So Berwick, Me., assignor to GTE Products Corporation, Danvers, Mass.

Filed Sep. 11, 1989, Ser. No. 405,922
Int. Cl.[5] C03B *27/04*
U.S. Cl. 65—109 **22 Claims**



1. A method for forming a groove in a glass tube, comprising the steps of:
rotating the glass tube about its longitudinal axis;
heating a localized area of the glass tube where a groove is to be formed sufficiently to soften the glass tube in the localized area;
stretching the glass tube along its longitudinal axis by a first distance sufficient to cause a reduction in the diameter of the glass tube in the localized area; and
compressing the glass tube along its longitudinal axis by a second distance sufficient to produce a groove in the localized area, said steps of heating, stretching and compressing the glass tube being performed during rotation of the glass tube.

4,923,499

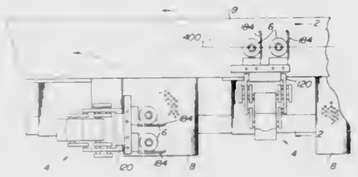
ARTICLE TRANSFER MECHANISM

Mark C. Newkirk, Vineland, N.J., assignor to Maul Technology Corporation, Winchester, Ind.

Continuation of Ser. No. 206,907, Jun. 10, 1988, abandoned, which is a continuation of Ser. No. 216,334, Dec. 16, 1980, abandoned. This application May 2, 1989, Ser. No. 348,154

Int. Cl.[5] C03B *9/40*

U.S. Cl. 65—163 17 Claims



1. Article transfer mechanism for transferring one or more articles from a first location to a second location, comprising:

a retractable-extensible pusher arm for transferring said one or more articles from said first location to said second location when extended and for releasing said one or more articles when retracted;

fluid control means including a fluid motor operatively coupled to the pusher arm for moving said pusher arm between said first and second locations and for retracting said pusher arm from said articles and extending said pusher arm towards said articles in synchronism with movement of the pusher arm between said first and second locations;

said fluid motor including a reciprocable piston provided with a rack, a pinion gear operatively associated with said rack, and a retractable-extensible linkage operatively coupled to said pinion gear for raising and retracting said pusher arm from said articles and for lowering and extending said pusher arm towards said articles.

4,923,500

METHOD FOR DESALINATION AND REHABILITATION OF IRRIGATED SOIL

Truman V. Sylling, and Stephen L. Allen, both of P.O. Box 1123, El Centro, Calif. 92244

Continuation-in-part of Ser. No. 732,501, May 9, 1985, Pat. No. 4,687,505, which is a continuation-in-part of Ser. No. 547,866, Nov. 2, 1983, abandoned. This application Jun. 29, 1987, Ser. No. 68,026

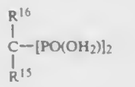
Int. Cl.[5] C05G *3/04;* C09K *17/00*

U.S. Cl. 71—27 17 Claims

1. A process for reducing the harmful effects of alkali or alkaline deposits in soils comprising applying to the soil anionic compounds or neutral salts thereof having threshold properties, applying said anionic compounds or neutral salts thereof to the soil in a quantity of from about 1.0 to 25 pounds per acre over a period of up to about 96 hours, said anionic compounds being selected from the formulas consisting of:



II



-continued

$$R^{17}[R^{18}PO(OH)_{2-5}\text{-} \qquad III$$

wherein

the compounds of formula I have a molecular weight of from 300 to 5000 and

R^1 is hydroxyl, COOH, C_6H_5COOH, $NHC(O)R^9COOH$, phenol, $COOR^9$, SO_3H, $C_6H_5SO_3H$, R^9SO_3H, $COOR^9$-SO_3H, OSO_3H, $C_6H_5OSO_3H$, OR^9SO_3H, OR^9OSO_3H, $OP(OH)_2$, $R^9P(OH)_2O$, or phenyl,

R^2 is hydrogen or COOH

R^3 is hydrogen or C_1–C_4 alkyl

R^4 is hydrogen or C_1–C_4 alkyl

R^5 is hydrogen, COOH, C_6H_5COOH, $NHC(O)R^9COOH$, phenol, $COOR^9$, SO_3H, $C_6H_5SO_3H$, R^9SO_3H, $COOR^9$-SO_3H, OSO_3H C_6H_5OSOH, OR^9SO_3H, OR^9OSO_3H, $OP(OH)_2$, $R^9P(OH)_2O$, phenyl, OR^{10}, hydroxyl or pyrrolidone;

R^6 is hydrogen or COOH

R^7 is hydrogen or C_1–C_41 alkyl

R^8 is hydrogen or C_1–C_4 alkyl

R^9 is C_1 –C_4 alkyl;

R^{10} is C_1–C_4 alkyl;

R^{11} is hydrogen or CH_3

R^{12} and R^{13} are hydrogen;

R^{14} is hydrogen or CH^3 are hydrogen;

R^{15} is hydrogen, hydroxyl or C_1–C_4 alkyl;

R^{16} is hydrogen or C_1–C_4 alkyl;

R^{17} is N, NR^{19} N or NR^9NR^9N

R^{18} is C_1–C_4 alkyl;

R^{19} is C_1–C_6 alkyl;

R^1 and R^2 when taken together are anhydride;

R^5 and R^6 when taken together are anhydride;

n and m are independently 3–100;

p and q are independently 0–3; and excluding anionic polymaleic anhydrides.

4,923,501

PYRIMIDINE DERIVATIVES, PROCESSES FOR THEIR PRODUCTION, AND HERBICIDAL METHOD AND COMPOSITIONS

Yoshihiro Saito; Nobuhide Wada, both of Kakegawa; Shoji Kusano, Hamamatsu; Takeshige Miyazawa; Satoru Takahashi, both of Shizuoka; Yasuhumi Toyokawa, Tokyo, and Ikuo Kajiwaca, Nagaokakyo, all of Japan, assignors to Kumial Chemical Industry Co., Ltd. and Ihara Chemical Industry Company, Ltd., both of Tokyo, Japan

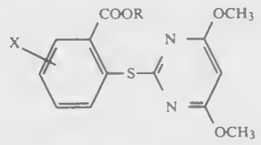
Filed Oct. 28, 1988, Ser. No. 264,015

Claims priority, application Japan, Nov. 4, 1987, 62-278894

Int. Cl.[5] A01N *43/54;* C07D *239/60*

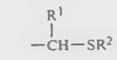
U.S. Cl. 71—92 12 Claims

1. A pyrimidien derivative having the formula:



(I)

wherein X is a halogen atom, a lower alkyl group or a phenoxy group (wherein said phenoxy group may be substituted by halogen, lower alkyl or lower alkoxy), and R is a hydrogen atom, a lower alkyl group, an alkoxyalkyl group, a benzyloxyalkyl group, an alkoxycarbonyl alkyl group, a cyanoalkyl group or a



group (wherein R^1 is a hydrogen atom or a lower alkyl group, and R^2 is a lower alkyl group or a phenyl group which may be substituted by nitro), or a salt thereof.

12. A method for killing weeds which comprises applying a herbicidally effective amount of a pyrimidine derivative of the formula I or its salt as defined in claim 1 to a locus to be protected.

4,923,502

TRIAZOLYL ETHANOL DERIVATIVES AS PLANT GROWTH REGULATORS

Raymond Elliott, Lower Earley, Nr Reading, and Raymond L. Sunley, Twyford, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

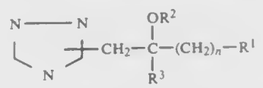
Filed Feb. 3, 1987, Ser. No. 10,446

Claims priority, application United Kingdom, Feb. 18, 1986, 8603951

Int. Cl.[5] C07D *249/08;* A01N *43/653*

U.S. Cl. 71—92 6 Claims

1. A trizole derivative having the formula (I):



(I)

and stereoisomers thereof, wherein R^1 is a cycloalkyl or cycloalkenyl group containing from 3 to 8 carbon atoms in the cycloalkyl or cycloalkenyl ring, the cycloalkyl or cycloalkenyl ring being optionally substituted by from one to two substituents selected from the group consisting of alkyl of 1–4 carbons and halogen; n is 0 or 1; R^2 is hydrogen; and R^3 is tertiary butyl optionally substituted by one or two halogen atoms.

4,923,503

AGENTS FOR INFLUENCING PLANT GROWTH

Guenter Schulz; Ernst Buschmann, both of Ludwigshafen; Hubert Sauter, Mannheim; Bernd Zeeh, Limburgerhof; Bruno Wuerzer, Otterstadt; Johann Jung, Limburgerhof, and Guenter Retzlaff, Roemerberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

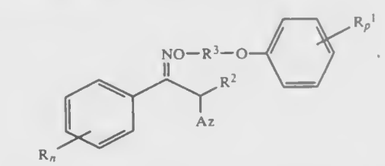
Filed Nov. 30, 1984, Ser. No. 677,034

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343415

Int. Cl.[5] A01N *31/41*

U.S. Cl. 71—92 4 Claims

1. A process for combatting the growth of unwanted plants, wherein the plants or the soil in which they are located are treated with a herbicidally effective amount of an azolylacetophenone ether of the formula I



(I)

where R and R_f independently of one another are each hydrogen, halogen, alkyl of 1–5 carbons, cyclohexyl, alkoxy of 1–2 carbons, alkylthio of 1–2 carbons, alkylsulfonyl of 1–4 carbons, haloalkyl of 1–4 carbons and 1–5 halogen atoms, nitro, cyano, unsubstituted or substituted phenyl or unsubstituted or substituted phenoxy, R^2 is hydrogen or alkyl of 1–4 carbons, R^3 is a divalent radical of the formula $-(CH_2)_m-$, $-(CH_2-CH_2O-)_uCH_2CH_2-$, $-(CH_2)CH=CH-(CH_2)-$ or $-(CH_2)C\equiv C-(CH_2)-$, n, p or u independently of one another are each 1, 2 or 3, m is an integer from 2 to 10 and Az is 1,2,4-triazol-1-yl, pyrazol-1-yl or imidazol-1-yl, or their salts or metal complexes.

4,923,504

2-(2-IMIDAZOLIN-2-YL)PYRIDINES AND QUINOLINES, AND USE OF SAID COMPOUNDS AS HERBICIDAL AGENTS

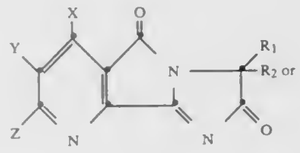
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

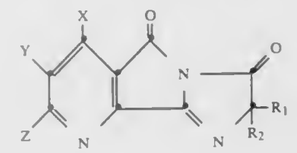
Division of Ser. No. 850,192, Apr. 10, 1986, Pat. No. 4,798,619, which is a division of Ser. No. 382,041, May 25, 1982, Pat. No. 4,638,068, which is a continuation-in-part of Ser. No. 252,704, Apr. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 155,909, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,910, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,867, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,908, Jun. 2, 1980, abandoned, and a continuation-in-part of Ser. No. 155,865, Jun. 2, 1980, abandoned. This application Dec. 9, 1988, Ser. No. 280,906

Int. Cl.[5] C07D *401/14;* A01N *43/90*

U.S. Cl. 71—92 16 Claims

1. A compound having the structure:





wherein

R_1 is C_1–C_4alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl;

R_3 is hydrogen, diloweralkylimino

C_1–C_{12} alkyl optionally substituted with one of the following groups: C_1–C_3 alkoxy, halogen, hydroxyl, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl, nitrophenyl, carboxyl, loweralkoxycarbonyl, cyano or triloweralkylammonium;

C_3–C_{12} alkenyl optionally substituted with one of the following groups: C_1–C_3 alkoxy, phenyl, halogen or loweralkoxycarbonyl or with two C_1–C_3 alkoxy groups or two halogen groups:

C_3–C_6 cycloalkyl optionally substituted with one or two C_1–C_3 alkyl groups;

C_3–C_{10} alkynyl optionally substituted with one or two C_1–C_3 alkyl groups; or,

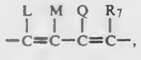
A cation of alkali metals, alkaline earth metals, manganese, copper, iron, zinc, cobalt, lead, silver, nickel, ammonium or organic ammonium;

R_6 is hydrogen, hydroxyl, C_3-alkenyl, C_3-alkynyl or C_1–C_4 alkyl optionally substituted with one hydroxyl or one chlorine group;

B is H, COR_4 or SO_2R_5, provided that when B is COR_4 or SO_2R_5; A is $COOR_3$ in which R_3 is other than H, or a salt-forming cation, CH_3 or CN; W is O; and Y and Z are not alkylamino, hydroxyl, or hydroxyloweralkyl;

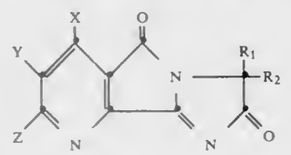
X is hydrogen, halogen, hydroxyl or methyl, with the proviso that when Y and Z are taken together to form a ring and YZ is represented by the structure: $-(CH_2)_n-$, where n is 3 or 4, X is hydrogen;

Y and Z are each hydrogen, halogen, C_1–C_6 alkyl, hydroxyloweralkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, nitro, cyano, C_1–C_4 alkylamino, diloweralkylamino or C_1–C_4 alkylsulfonyl group, or phenyl optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure: $-(CH_2)_n-$, where n is an integer of 3 or 4, provided that X is hydrogen; or

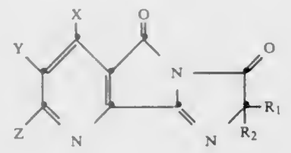


where L, M, Q and R_7 are each hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkyl, NO_2, CN, phenyl, phenoxy, amino, C_1–C_4 alkylamino, diloweralkylamino, chlorophenyl, methylphenyl, or phenoxy substituted with one Cl, CF_3, NO_2 or CH_3 group, with the proviso that only one of L, M, Q or R_7 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy; and the N-oxides thereof, and when R_1 and R_2 are not the same, the optical isomers thereof.

8. A method for the control of monocotyledonous and dicotyledonous annual, perennial and aquatic plant species comprising: applying to the foliage of said plants or to soil or water containing seeds or other propogating organs thereof, a herbicidally effective amount of a compound having a structure:



or



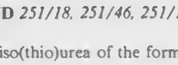
wherein

R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl;

X is hydrogen, halogen, hydroxyl or methyl, with the proviso that when Y and Z are taken together to form a ring and YZ is represented by the structure: $-(CH_2)_n-$, where n is 3 or 4, X is hydrogen;

Y and Z are each hydrogen, halogen, C_1–C_6 alkyl, hydroxyloweralkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, nitro, cyano, C_1–C_4 alkylamino, diloweralkylamino or C_1–C_4 alkylsulfonyl group, or phenyl optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure: $-(CH_2)_n-$, where n is an integer of 3 or 4, provided that X is hydrogen; or



where L, M, Q and R_7 are each hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkyl, NO_2, CN, phenyl, phenoxy, amino, C_1–C_4 alkylamino, diloweralkylamino, chlorophenyl, methylphenyl, or phenoxy substituted with one Cl, CF_3, NO_2 or CH_3 group, with the proviso that only one of L, M, Q or R_7 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy; and the N-oxides thereof, and when R_1 and R_2 are not the same, the optical isomers thereof.

4,923,505

SULPHONYLISO(THIO)UREAS

Hans-Jochem Riebel; Christa Fest, both of Wuppertal; Klaus-Helmut Müller, Duesseldorf; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

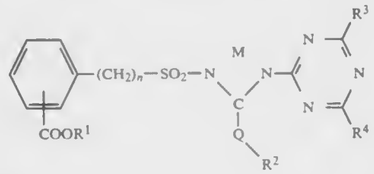
Filed Sep. 9, 1988, Ser. No. 242,398

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731053

Int. Cl.[5] **C07D** *251/18, 251/46, 251/16;* **A01N** *43/66*

U.S. Cl. 71—93 **10 Claims**

1. A sulphonyliso(thio)urea of the formula



in which

M stands for hydrogen or a sodium, potassium, magnesium or calcium equivalent,

n stands for the numbers zero or 1,

Q stands for oxygen or sulphur,

R^1 stands for methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec.-butyl, 2-fluoro-ethyl, 2-chloro-ethyl, 2-methoxy-ethyl or 2-ethoxyethyl,

R^2 stands for a phenyl radical, which is optionally substituted by one or two radicals from the group consisting of fluorine, chlorine, bromine, iodine, cyano, nitro, hydroxyl, carboxyl, C_1–C_3-alkoxy-carbonyl, C_1–C_4-alkyl, trifluoromethyl, hydroxymethyl, methoxy-carbonyl-methyl, phenyl-C_1–C_3-alkyl, cyclohexyl, C_1–C_3-alkoxy, trifluoromethoxy, C_1–C_3-alkylthio, trifluoromethylthio, dimethylamino, amino, acetamido, methylaminocarbonyl, formyl, acetyl, benzoyl, phenyl, hydroxyphenyl, phenoxy (which is optionally substituted by chlorine and/or trifluoromethyl), phenylamino, phenylazo, pyridoxy (which is optionally substituted by chlorine and/or trifluoromethyl), or for naphthyl;

R^3 stands for methyl, ethyl, trifluoromethyl, methoxy, ethoxy, difluoromethoxy or trifluoroethoxy, and

R^4 stands for methyl, methoxy, ethoxy, difluoromethoxy or trifluoroethoxy.

8. A herbicidal composition comprising a herbicidally effective amount of a compound according to claim 1 and a diluent.

4,923,506

POLYHYDROXY POLYMER DELIVERY SYSTEMS

Ludwig K. Huber, Wayne, and Harold G. Monsimer, E. Norriton, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 557,074, Dec. 1, 1983, abandoned. This application Jun. 28, 1988, Ser. No. 213,446

Int. Cl.[5] **A01N** *33/18, 37/22, 57/04, 57/08*

U.S. Cl. 71—121 **6 Claims**

1. A process for making a controlled release biologically active composition which consists essentially of emulsifying/-dispersing a pesticide, optionally on an inert filler, in an aqueous polyhydroxy polymer system wherein said polymer is an unmodified starch, adding a water soluble alkali metal or magnesium and an optional inert filler while thoroughly mixing to precipitate a product, drying the precipitated product, and reducing the product to the desired particle size.

4,923,507

PROCESS FOR OPENING ORES

Egberto Silva, Filho, Sao Paulo, Brazil, assignor to Mamore Mineracao E Metalurgia S/A, Sao Paulo, Brazil

Filed May 19, 1988, Ser. No. 195,844

Claims priority, application Brazil, Jul. 20, 1987, PI 8703766

Int. Cl.[5] **C22B** *1/00*

U.S. Cl. 423—68 **15 Claims**

1. Process for opening of ores, wherein said ore includes at least one of the metals from the group consisting of tantalum, niobium, zirconium and titanium, said process comprising the steps of:

(a) melting said ore with fluorite (CaF_2) to produce a slag;

(b) milling said slag; and

(c) leaching the milled slag using sulfuric acid to give a solid product containing a soluble species of the metal or metals contained in the ore.

4,923,508

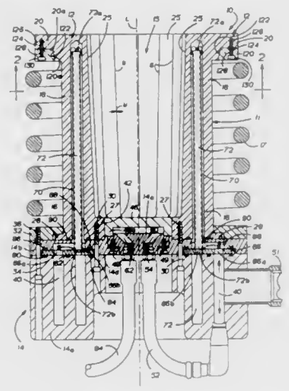
SEGMENTED INDUCTION SKULL MELTING CRUCIBLE AND METHOD

Randall S. Diehm, Whitehall, and Blake K. Zuidema, Muskegon, both of Mich., assignors to Howmet Corporation, Greenwich, Conn.

Filed May 8, 1989, Ser. No. 348,595

Int. Cl.[5] **C22B** *4/00;* **H05B** *6/16*

U.S. Cl. 75—10.14 **27 Claims**



1. A crucible for heating a metal to the molten state, comprising:

(a) an upstanding sidewall formed of a plurality of upstanding metal segments disposed in side-by-side relation about a longitudinal axis of said crucible, each segment having an inner wall facing said axis for forming, together with the inner walls of other segments, a chamber for receiving the metal, each segment being spaced apart from a next adjacent segment by a longitudinal gap that communicates with the chamber and extends outwardly from said chamber to the exterior of said sidewall with each gap between adjacent segments being free of packing material and so fixed in a width dimension where said gap and said chamber communicate as to be small enough to substantially prevent penetration of metal in the molten state therein until a solidified metal skull is formed directly on said inner walls and large enough to sufficiently electrically isolate adjacent segments to allow induction melting of the metal in said chamber,

(b) means for inducing an alternating electrical current in the metal in the chamber to heat the metal to the molten state, and

(c) means for cooling the segments to eventually form the solidified metal skull directly on said inner walls.

4,923,509

SPHERICAL LIGHT METAL BASED POWDER PARTICLES AND PROCESS FOR PRODUCING SAME

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 904,318, Sep. 8, 1986, Pat. No. 4,780,131. This application Nov. 16, 1987, Ser. No. 121,448

Int. Cl.[5] **B22F** *1/00*

U.S. Cl. 420—401 **4 Claims**

1. A powdered material consisting essentially of spherical particles of a light metal based material, wherein said light metal is selected from the group consisting of magnesium and beryllium, said powdered material being essentially free of elongated particles having rounded ends and having a particle size less than about 50 micrometers, said powdered material directly solidified from plasma melted material.

4,923,510

TREATMENT OF REFRACTORY CARBONACEOUS SULFIDE ORES FOR GOLD RECOVERY

Gopalan Ramadorai, 3337 Enfield Ave., Elko, Nev. 89801; Brian Ball, 7355 S., 2200 East, Salt Lake City, Utah 84121; Ronald L. Atwood, 86 S., 350 East, Farmington, Utah 84025; Rong-Yu Wan, 213 University Village, Salt Lake City, Utah 84108, and Serket Acar, 3445 Highland Dr., Salt Lake City, Utah 84106

Continuation of Ser. No. 264,632, Oct. 31, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,839

Int. Cl.[5] **C22B** *11/04*

U.S. Cl. 423—29 **14 Claims**

1. In a method for recovery of precious metals from carbonaceous sulfide ores or concentrates having present organic and inorganic carbon, said recovery employing carbon-in-leach cyanidation of the ores, the improvement comprising first pretreating said ores in an autoclave at a temperature between about 125° and 250° C. with a mineral acid and oxygen sufficient to oxidize said ore so as to minimize chlorine consumption by said ore, thereafter subjecting said ore to a chlorine gas or oxides of chlorine treatment and cyaniding said ore using a carbon-in-leach process.

4,923,511

TUNGSTEN CARBIDE HARDFACING POWDERS AND COMPOSITIONS THEREOF FOR PLASMA-TRANSFERRED-ARC DEPOSITION

James A. Krizan, Baden, Pa., and Richard S. Szereto, Willowick, Ohio, assignors to W S Alloys, Inc., Ambridge, Pa.

Filed Jun. 29, 1989, Ser. No. 372,848

Int. Cl.[5] **C22C** *29/06*

U.S. Cl. 75—252 **12 Claims**

1. A hardfacing powder blend for deposition on a substrate

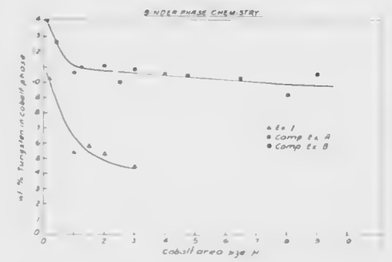
by welding, comprised of: a plurality of different types of tungsten carbide metal particles including at least WC-Co and W_2C particles and a matrix alloy containing nickel, wherein the total content of tungsten carbide in said powder is at least 50% by weight.

4,923,512

COBALT-BOUND TUNGSTEN CARBIDE METAL MATRIX COMPOSITES AND CUTTING TOOLS FORMED THEREFROM

Ed E. Timm, Traverse City, and Douglas B. Schwarz, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 7, 1989, Ser. No. 334,840
Int. Cl.[5] C22C *29/02*
U.S. Cl. 75—239 12 Claims



1. A substantially fully dense article of manufacture suitable for use in cutting tool applications, said article being formed from a powdered composition comprising tungsten carbide in an amount of from about 82 to about 99 percent by weight of composition and cobalt in an amount of from about 1 to about 18 percent by weight of composition and having a unique microstructure, the microstructure comprising tungsten carbide grains having a mean grain size of less than about five microns, and a binder phase, the binder phase being substantially free of graphite and complex, intermetallic carbides and comprising, tungsten, cobalt and carbon, the tungsten in the binder phase being present in an amount of less than about eighty percent of that present in the binder of an article prepared by liquid phase sintering the same powdered composition at a temperature sufficient to provide substantially complete densification in the absence of external pressure.

4,923,513

TITANIUM ALLOY TREATMENT PROCESS AND RESULTING ARTICLE

Paul Ducheyne, Bryn Mawr, and David H. Kohn, Philadelphia, both of Pa., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Apr. 21, 1989, Ser. No. 341,775
Int. Cl.[5] C22C *1/04*
U.S. Cl. 75—245 41 Claims

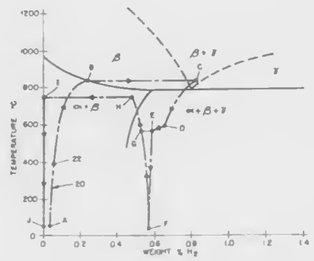
1. A process of treating an article composed of titanium alloy comprising the steps of:

(a) heating the article to a temperature generally in the range of 800° C. to 1000° C.;

(b) diffusing hydrogen into the article until the concentration of hydrogen in the article is an amount in the range of approximately 0.5% to 1.0% by weight, the hydrogen inducing the phase transformation of the article to a fully $beta_H$ or $beta_H$ plus gamma microstructure where $beta_H$ is the beta microstructure substantially completely saturated with hydrogen;

(c) cooling the article in an inert atmosphere to a temperature below the beta transus;

(d) maintaining the article at a temperature below the beta transus and for a duration adequate to achieve a eutectoid decomposition transformation so as to produce a fine and uniform alpha plus beta or alpha plus beta plus gamma microstructure with a distinctly non-lamellar morphology;



(e) reducing the concentration of hydrogen in the article to an amount below approximately 120 to 150 ppm; and

(f) cooling the article to room temperature.

4,923,514

FLOOR POLISHING COMPOSITION

Oliver M. Brown, High Wycombe, England, assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 46,324, May 6, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 243,183
Claims priority, application United Kingdom, May 23, 1986, 8612589
Int. Cl.[5] C09G *1/04, 1/00*
U.S. Cl. 106—11 4 Claims

1. An aqueous polish composition that can be applied as a film onto a substrate, comprising:

a polymeric material produced from a monomer selected from the group consisting of acrylic acid, butyl acrylate, ethyl acrylate, methyl acrylate, 2-ethylhexyl acrylate, acrylonitrile, acrylamide, methacrylic acid, methyl methacrylate, ethyl methacrylate, butyl methacrylate, methacrylamide, styrene, alpha-methyl styrene, and combinations thereof; and

an effective amount of an alkoxylated alkyl amine surfactant having an alkyl chain of about 4 to about 40 carbon atoms and a nitrogen atom that can be substituted by 1, 2 or 3 alkoxy groups, each such alkoxy group having from 1 to about 4 carbon atoms, for producing a polishing composition that, upon being applied in the form of a film onto the substrate, possesses enhanced 60 Degree Specular Gloss, level-surface, and depth-of-gloss values.

4,923,515

RECORDING LIQUID HAVING ORGANIC SOLVENT WITH PLURAL (C_2H_4O) MOIETIES AND RECORDING METHOD USING THE SAME

Shoji Koike; Kazuo Iwata, both of Yokohama; Shinichi Tochihara, Hiratsuka, and Yasuko Tomida, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 891,596, Aug. 1, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 168,593
Claims priority, application Japan, Aug. 6, 1985, 60-172734; Oct. 16, 1985, 60-228922; Nov. 18, 1985, 60-256768; Nov. 25, 1985, 60-256559; Nov. 25, 1985, 60-262560
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 5 Claims

1. An aqueous recording liquid for ink-jet recording, comprising 1 to 10% by weight of a water-soluble dye, at least 61% by weight water, and at least one of the compounds represented by formulae (I), (II), or (III) below, wherein, if selected, said compound (I) is contained in said recording liquid within a range of 2 to 30% by weight, and said compounds (II) or (III) are contained within a range of 6 to 30% by weight based on the total weight of the recording liquid:

$$R_1O-(C_2H_4O)_m-R_2 \quad (I)$$

$$HO-(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_cH \quad (II)$$

$$(R_3)(R_4)Ph-O-(C_2H_4O)_nH \quad (III)$$

wherein R_1 and R_2 are independently $C_{1\text{-}6}$ alkyl or C_8 or less aryl, m is from 3 to 20, a+c are at most 78, b is from 2 to 15, R_3 and R_4 are independently hydrogen or a $C_{1\ or\ 2}$ alkyl and n is from 4 to 20.

4,923,516

WELL CEMENT SLURRIES AND DISPERSANTS THEREFOR

Bharat B. Patel, and Michael Stephens, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1989, Ser. No. 299,661
Int. Cl.[5] C04B *24/00*
U.S. Cl. 106—90 22 Claims

1. A cement slurry dispersant comprised of a water soluble sulfoalkylated naphthol in which the naphthol molecule is alkylated with at least one group having the formula —C(R-)$_2$—SO_3M wherein R is selected from hydrogen and alkyl radicals containing from 1 to 5 carbon atoms and M is an alkali metal.

4,923,517

GLASS FIBER REINFORCED CEMENT COMPOSITIONS

Hans J. Rerup, Hamilton, Canada; Evelyn N. Drake, Lebanon, and Ilan Duvdevani, Leonia, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 97,699, Sep. 17, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 285,563
Int. Cl.[5] C04B *14/44*
U.S. Cl. 106—99 9 Claims

1. A cement composition consisting essentially of:

(a) a plurality of bundles of glass fibers, wherein the concentration of said glass fibers is about 0.1 to about 60 wt. % of the total composition weight;

(b) a polymeric coating encapsulating said bundles of glass fibers, and said polymeric coating not impregnating the bundles of glass fibers and said polymeric coating not coating the individual fibers of the bundles of the glass fibers nor filling the voids between the individual fibers of the bundles, said polymeric coating having a thickness of about 0.1 to about 100 micrometers, wherein said polymeric coating comprises an interpolymeric complex of a neutralized sulfonated polymer and an amine containing polymer, said neutralized sulfonated polymer having a sulfonate content of about 4 to about 200 meq. per 100 grams of said neutralized sulfonated polymer and said amine containing polymer containing basic nitrogen atoms wherein the basic nitrogen content ranges from about 4 to about 500 meq. per 100 grams of polymer; and

(c) a cementitious matrix selected from the group consisting of cement, Portland cement, concrete, mortar, gypsum and hydrous calcium silicate.

4,923,518

CHEMICALLY INERT PIGMENTARY ZINC OXIDES

John R. Brand; Thomas I. Brownbridge, both of Oklahoma City, and James W. Kauffman, Edmond, all of Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Dec. 15, 1988, Ser. No. 284,628
Int. Cl.[5] C08H *17/04*
U.S. Cl. 106—429 37 Claims

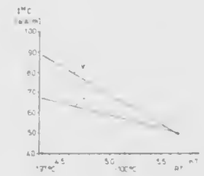
1. Ultraviolet light absorbing chemically inert compositions of matter comprised of particles having cores of chemically reactive pigmentary zinc oxide, said cores having deposited thereon one or more chemically inert coatings, said coatings comprising either (a) a precipitated encapsulating coating of a water insoluble metallic soap of a saturated or unsaturated monocarboxylic acid, wherein said monocarboxylic acid is selected from the group consisting of fatty acids, resin acids and naphthenic acids containing from 7 to 22 carbon atoms and wherein said metallic soap is formed by reaction of a water soluble alkali metal salt of said monocarboxylic acid with a water soluble metallic salt comprised of a metal cation selection from Groups IB, II, III, IV, V, VIB, VIIB and VIII of the Periodic Table of the Elements and an inorganic anion moiety selected from the group consisting of nitrate, sulfate and halogen ions, (b) separate and distinct coatings of at least two different hydrous metal oxides and, optionally, a further precipitated encapsulating coating of said water insoluble metallic soap of said monocarboxylic acid as described hereinabove, or (c) a coating of a single hydrous metal oxide selected from the group consisting of silica, titania, alumina and zirconia and a further precipitated encapsulating coating of said water insoluble metallic soap of said monocarboxylic acid as described hereinabove.

4,923,519

MAGNETIC IRON OXIDE PIGMENTS AND A PROCESS FOR THEIR PREPARATION

Fritz Rodi, Moers; Peter Kiemle, Krefeld-Traar; Aloys Eiling, Bochum, and Hendrik Kathrein, Jüchen-Aldenhoven, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,059
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631193
Int. Cl.[5] C09C *1/22*
U.S. Cl. 106—459 12 Claims



1. Magnetic iron oxide pigments having a monomolecular coating of a cobalt compound wherein the temperature dependence of coercivity in the temperature range from 76 K. to 289 K. is less than 0.13 kA/mK and the coercivity on powder compressed to 0.9 g/cm^3 is from 50 to 51 kA/m.

4,923,520

SPHERICAL FUSED SILICA AND ITS USE IN FILLERS AND RESIN COMPOSITIONS

Kenji Anzai, Kobe, and Tatsuo Hamabe, Osaka, both of Japan, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 178,802, Mar. 29, 1988, abandoned, which is a continuation of Ser. No. 829,853, Feb. 14, 1986, abandooed, which is a continuation of Ser. No. 631,290, Jul. 16, 1984, abandoned. This application Sep. 30, 1988, Ser. No. 251,995

Claims priority, application United Kingdom, Jul. 26, 1983, 8320086

Int. Cl.[5] C04B *14/04*

U.S. Cl. 106—490 11 Claims

1. Particulate fused silica having a silica dioxide content of at least 99.5% and a particle diameter distribution of from 1 to 100 μm with the average particle diameter being from 10 to 50 μm, at least 99% of the particles being substantially perfect spheres.

4,923,521

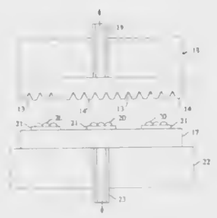
METHOD AND APPARATUS FOR REMOVING SOLDER

Jay J. Liu, Somerville, and Y. H. Wong, Summit, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,896

Int. Cl.[5] B08B *7/00;* B23K *31/02*

U.S. Cl. 134—5 16 Claims



1. A process for repairing electronic device packages each including an electronic chip soldered to bonding pads of a substrate, said process comprising the steps of:

etching a pattern in silicon to make a silicon wick; removing the chip from the substrate, thereby leaving solder remnants on the bonding pads; melting the remnants; and bringing the etched pattern of the silicon wick into contact with the melted solder remnants, thereby to remove the solder remnants from the bonding pads by capillary action.

4,923,522

METHOD AND DEVICE FOR CLEANING A SPRAY GUN ASSEMBLY

David A. Sowers, Coral Springs, Fla., assignor to BSD Enterprises, Inc., Pompano Beach, Fla.

Filed Jan. 19, 1989, Ser. No. 299,010

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—22.1 15 Claims

14. A device for cleaning a spray-gun assembly, said assembly comprising a spray gun, a cup having an open end for storing liquid spray material therein, means for operatively connecting said cup to said gun, and means for operatively connecting said gun to source of compressed air, said device comprising:

a closed chamber comprising a bottom wall integral, main side wall, and a removable cover, said cover including a top wall and auxiliary side walls integral with said top wall, said auxiliary side walls fitting within said main side walls, said chamber having a liquid-resistant seal between said main side walls and said auxiliary side walls, said cover having an air-pressure relief vent therein and containing means for holding fume-absorption material over said vent, said chamber having a shallow pool of cleaning liquid at the bottom thereof during the operation of said device,

a rotatable cup holder for holding said cup with its open end downward, said cup holder including a stationary post attached to and upstanding from said bottom wall, a cylindrical basket rotatably mounted at the upper end of said post, said basket having openings therein for draining cleaning liquid therefrom, and vanes on the cylindrical sides of said basket,

cup-spraying means including a cup-spraying nozzle fixedly mounted on said upper end of said post for spraying cleaning liquid upwardly into said basket,

at least two (2) auxiliary spray nozzles positioned for spraying the outside surfaces of said gun,



a stationary gun support for said spray gun, said gun being positionable in said gun support to direct a spray therefrom into contact with said vanes on said basket to rotate said cup holder,

a compressed-air-supplying means including a compressed air manifold within said chamber, tubular connections connecting said manifold with said cup-spraying nozzle, said gun support, and said auxiliary nozzles, a tubular nipple through a wall of said chamber above said pool of liquid, the inside end of said nipple being connected to said manifold and the outside end of said nipple having means of connection to a source of compressed air, and

a cleaning-liquid-supplying means comprising a filter for said cleaning liquid, said filter having an inlet port located in said liquid pool, an outlet port, and tubular means for conducting cleaning liquid from said filter outlet port to said gun support, said cup-spraying means, and said auxiliary nozzles.

4,923,523

SHORT-CHAIN ALKANE SULFONIC ACIDS IN CLEANING PREPARATIONS AND DISINFECTANTS

Hans-Joachim Schluessler, Haan, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Division of Ser. No. 128,960, Dec. 4, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 313,762

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642604

Int. Cl.[5] B08B *3/08*

U.S. Cl. 134—25.3 8 Claims

1. In a process for cleaning a hard surface contaminated with organic and/or inorganic contaminants comprising contacting the contaminated hard surface with an aqueous acidic cleaning and/or disinfectant composition, the improvement wherein said composition contains a cleaning and disinfecting quantity of at least one C_1–C_4 alkane sulfonic acid.

4,923,524

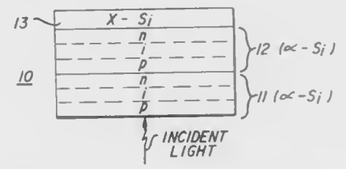
WIDE RANGING PHOTOVOLTAIC LAMINATES COMPRISING PARTICULATE SEMICONDUCTORS

Zoltan J. Kiss, Belle Mead, N.J., assignor to Chronar Corp., Princeton, N.J.

Filed May 6, 1985, Ser. No. 731,065

Int. Cl.[5] H01L *31/04;* B32B *7/02, 9/00;* B05D *5/12*

U.S. Cl. 136—250 10 Claims



2. A photovoltaic laminate which is responsive to a wide range of the electric magnetic spectrum, comprising a plurality of different semiconductor layers, at least one of the layers being of amorphous semiconductor, and at least another of the layers being of particulate crystalline silicon, with the amorphous layer having a thickness above about 1 micron and the crystalline layer having a thickness above about 60 microns.

4,923,525

NICKEL BASED MONOCRYSTALLINE SUPERALLOY, METHOD OF HEAT TREATING SAID ALLOY, AND PARTS MADE THEREFROM

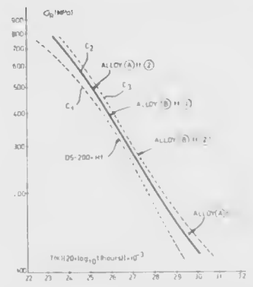
Tasadduq Khan, Jouy en Josas, and Pierre Caron, Les Ulis, both of France, assignors to Office National D'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed Mar. 29, 1982, Ser. No. 363,285

Claims priority, application France, Apr. 3, 1981, 81 06782

Int. Cl.[5] C22F *1/10*

U.S. Cl. 148—3 17 Claims



5. A method of producing a single crystal superalloy part suited for use as a blade in an aeroengine turbine which comprises the steps of:

(a) forming an alloy part which consists essentially of:

Al	5.4	to	6.2%
Co	4	to	7%
Cr	6	to	9%
Mo	0	to	2.5%
Ta	5.5*	to	8%
Ti	0	to	1%
W	7	to	9%

less than 80 ppm carbon, 50 ppm boron and 100 ppm zirconium,

Ni balance to 100%;

(b) heating the alloy part formed during step (a) to a temperature of 1305°–1325° for about 30 minutes to put the Ni_3Al gamma-prime phase of the alloy completely into solution;

(c) cooling the alloy part in the air to ambient temperature; and

(d) heating the alloy part to a temperature of 1050°–1120° C. for a time period sufficient to precipitate the gamma-prime phase into a gamma phase solid solution of the alloy wherein the gamma-prime phase has a grain size of 5000 Å, and is aligned along a well-defined crystallographic direction.

4,923,526

HOMOGENEOUS FINE GRAINED METAL FILM ON SUBSTRATE AND MANUFACTURING METHOD THEREOF

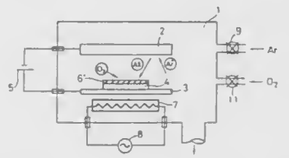
Hiroshi Harada; Yoshihiro Hirata, and Masanobu Tosa, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 90,366, Aug. 28, 1987, abandoned, which is a division of Ser. No. 811,885, Dec. 20, 1985, Pat. No. 4,726,983. This application Jan. 23, 1989, Ser. No. 300,877

Claims priority, application Japan, Feb. 20, 1985, 60-33725

Int. Cl.[5] C23C *8/06*

U.S. Cl. 148—6.3 14 Claims



1. A method of manufacturing of a metal film arrangement having substantially homogeneous fine grains on a substrate, comprising the steps of:

(a) positioning said substrate in a deposition apparatus,

(b) depositing a metal layer of said metal on said substrate to establish a metal layer thickness corresponding to the grain size of said metal,

(c) feeding a gas reactive with said metal into said deposition apparatus to form a layer of a metal compound, resulting from a reaction between said metal and said gas, on an upper surface of said metal layer, and

(d) performing step (b) after repeating said steps (b) and (c) by a predetermined number of times.

4,923,527

APPARATUS AND METHOD FOR SLAG-FREE CUTTING OF BILLETS AND THE LIKE

Robert G. Ludwigson, Brookfield, Wis., assignor to Messer Griesheim Industries, Inc., Valley Forge, Pa.

Filed Mar. 14, 1989, Ser. No. 323,620

Int. Cl.[5] B23K *7/02*

U.S. Cl. 148—9 R 10 Claims

7. A method for preventing the formation of slag along the lower edges of the kerf defined by the cut faces of a torch cut steel section, said method comprising:

(1) positioning a cutting torch above the steel section;

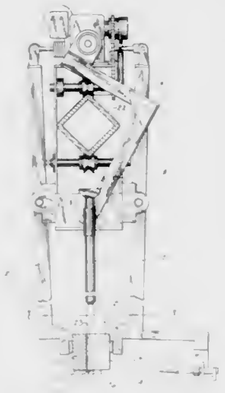
(2) directing a cutting jet from the torch across the section through a lateral cutting path generally perpendicular to the longitudinal axis of the section;

(3) moving the cutting torch transversely over the section to cause the cutting jet to traverse said cutting path;

(4) mounting an oxygen nozzle laterally spaced from the

section, in a fixed position with respect thereto and sufficiently outside the normal maximum range of the cutting jet path so as not to be destroyed or significantly damaged thereby;

(5) constructing the oxygen nozzle with an outlet opening having a narrow vertical dimension and a wide horizontal dimension shaped to create a thin flat oxygen jet which diverges from the outlet opening in a horizontal plane;



(6) positioning the axis of the nozzle in alignment with the kerf such that the oxygen jet is disposed immediately adjacent the lower edges of the kerf; and,

(7) supplying oxygen gas to the nozzle during operation of the cutting torch at a volume and pressure sufficient to create an oxygen jet having a velocity effective to oxidize and blow away the slag tending to form along said lower edges over the full length of the cut section.

4,923,528

METHOD FOR MANUFACTURING ROLLED STEEL PRODUCTS

Dieter Russwurm, Puchheim, and Erich Richartz, Peine, both of Fed. Rep. of Germany, assignors to Max Aicher, Freilassing, Fed. Rep. of Germany

PCT No. PCT/EP87/00537, § 371 Date Mar. 14, 1988, § 102(e) Date Mar. 14, 1988, PCT Pub. No. WO88/02031, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 18, 1987, Ser. No. 335,967

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631928

Int. Cl.[5] C21D *8/00*

U.S. Cl. 148—12.4 **16 Claims**

1. A method for manufacturing rolled steel products with steel having a C-content of 0.50 to 0.80 Wt%, a Si-content of 0.20 to 0.60 Wt%, and Mn-content of 0.30 to 0.80 Wt%, said method comprising the steps of:

hot rolling said steel;

surface quenching said steel from the rolling heat at the output side of the rolling equipment by means of cooling so that a peripheral zone of said steel is converted to martensite,

subsequently further cooling said steel, during which subsequent cooling the heat remaining in the core zone of said steel effects a partial annealing of the martensitic peripheral zone;

then cold working said steel; and

thereafter annealing said steel.

4,923,529

EQUIPMENT FOR CONTINUOUS HEAT TREATMENT OF TUNGSTEN FILAMENTS WOUND ON MOLYBDENUM CORES

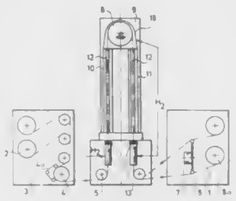
Tibor Ferenczi, Debrecen; László Kovács, Hajdúböszörmény, and Attila Szathmari, Debrecen, all of Hungary, assignors to Tungsram Részvénytársaság, Budapest, Hungary

Filed Oct. 17, 1988, Ser. No. 258,712

Claims priority, application Hungary, Oct. 22, 1987, 4733/87

Int. Cl.[5] C21D *9/52*

U.S. Cl. 148—20.3 **10 Claims**



1. An equipment for continuous heat treatment of coiled tungsten filaments wound on molybdenum cores, wherein a coiled tungsten filament wound over a molybdenum core is passed in axial direction through heating tubes of low thermal inertial made of appropriate high-melting metal and heated by direct conduction of electric current for carrying out a purifying heating step at lower and a fixing heating step at high temperature range, said heating tubes being continuously heated by a power unit in stationary condition of said coiled tungsten filament, up to full temperature during the period of purifying heating, but only up to basic temperature during the period of fixing heating, whereas at starting the power input of heating is increased to raise the temperature of the heating tube up to heating temperature exceeding the mentioned full temperature by a certain overtemperature, and on stopping of tungsten spiral filament the power unit cools down to basic temperature in a similar short time, the rapid and direct measurement of the temperature of the heating tubes being performed by evaluating their electric resistance and being utilized, after processing in an electronic unit, for controlling, on the one hand, the power unit, and the other hand, for displaying the temperature, the purifying and fixing heating process taking place under a common hood by feeding humid hydrogen gas directly into the heating tube accommodated in the first heating space, and feeding dry hydrogen gas directly into the heating tube accommodated in the second heating space and permitting the two gases of different humidity to mix in said hood only, said hood being closed from above, since the tungsten spiral filament is led out through the open bottom of the hood, after introducing a change in the forwarding direction of said filament.

4,923,530

BRAZING FLUX OF STABLE SUSPENSION FOR ALUMINUM MATERIAL

Nobuhiro Miki, 23-14-521, Tezukayama 1-Chome, Abeno-ku, Osaka; Toshiro Fukudome, 68-335, Oaza kobuki, Chihaya akasaka-mura, Minami kawachi-gun, Osaka-fu, and Takesi Kaibori, 98-2, Mozunishino-cho 1-Chome, Sakai-shi, Osaka-fu, all of Japan

Filed May 9, 1989, Ser. No. 349,299

Int. Cl.[5] B23K *35/34*

U.S. Cl. 148—26 **9 Claims**

1. A brasing flux for aluminum material having superior suspension stability consisting essentially of $M_xAlF_yO_z$ wherein $x=0.5$ to 2.0, $y=1.5$ to 4.8 and $z=0.1$ to 1.0 and M is an alkali metal or mixture of alkali metals.

4,923,531

DEOXIDATION OF TITANIUM AND SIMILAR METALS USING A DEOXIDANT IN A MOLTEN METAL CARRIER

Richard L. Fisher, Warren, Ohio, assignor to RMI Company, Niles, Ohio

Filed Sep. 23, 1988, Ser. No. 248,227

Int. Cl.[5] C21D *1/00*

U.S. Cl. 148—126.1 **18 Claims**

1. A process for the deoxidation of an oxidized refractory metal selected from the group consisting of titanium, zirconium, hafnium, thorium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, and alloys comprising these metals, the process comprising:

(a) combining in an inert, dry atmosphere the oxidized refractory metal, wherein the oxidized metal contains less than about one weight percent oxygen, with a mixture of metallic deoxidant contained in a molten metal carrier having a lower melting point than the deoxidant, to form a combination;

(b) heating the combination at a temperature which is sufficient to liquify the deoxidant and for a time sufficient to at least partially deoxidize the refractory metal;

(c) removing the carrier from the refractory metal

(d) contacting the refractory metal, after cooling, with an acid.

4,923,532

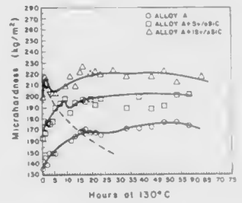
HEAT TREATMENT FOR ALUMINUM-LITHIUM BASED METAL MATRIX COMPOSITES

Michael S. Zedalis, Randolph, N.J., and Paul S. Gilman, Suffern, N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 12, 1988, Ser. No. 242,921

Int. Cl.[5] C22F *1/04*; C22C *1/09, 21/00*

U.S. Cl. 148—159 **19 Claims**



1. A process for producing a composite having a metal matrix and a reinforcing phase, comprising the steps of:

(a) forming a charge containing, as ingredients, a rapidly solidified aluminum-lithium based alloy and particles of a reinforcing material present in an amount ranging from about 0.1 to 50 percent by volume of said charge;

(b) ball milling the charge energetically to enfold metal matrix material around each of said particles while maintaining the charge in a pulverulant state;

(c) consolidating said charge to provide a mechanically formable, substantially void-free mass;

(d) subjecting said mass to a heat treatment comprising the steps of:

(i) solutionizing said mass at a temperature above the solvus temperature of said alloy;

(ii) rapid cooling said mass;

(iii) age hardening said mass at a temperature below the solvus temperature of said alloy to promote precipitation of a primary strengthening $Al_3(Li, Zr)$ phase into said metal matrix.

4,923,533

MAGNETIC SHIELD-FORMING MAGNETICALLY SOFT POWDER, COMPOSITION THEREOF, AND PROCESS OF MAKING

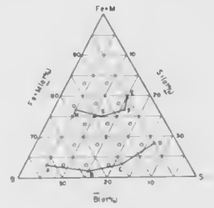
Masao Shigeta, Narashino; Tsutomu Choh, Yachiyo; Hiroyoshi Shimizu, Narita; Ippo Hirai, Yachiyo; Shobei Mimura, Tokyo; Atsushi Makimura, Sagamihara, and Hiroshi Hosaka, Hoya, all of Japan, assignors to TDK Corporation and Tokyo Magnetic Printing Company, Ltd., both of Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,836

Claims priority, application Japan, Jul. 31, 1987, 62-190261; Aug. 29, 1987, 62-215857; Oct. 16, 1987, 62-262211; Dec. 25, 1987, 62-326894; Dec. 26, 1987, 62-331224; Dec. 28, 1987, 62-333666; Dec. 29, 1987, 62-332526; Jul. 21, 1988, 63-182490

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—304 **35 Claims**



16. A magnetically shielding composition, comprising.

a powder of flakes of magnetically soft amorphous alloy with the flakes having an average thickness ranging from about 0.01 to about 1 μm and an aspect ratio, defined as average outer diameter divided by average thickness, of from about 10 to about 10,000, said soft amorphous alloy being of a ternary composition of the formula:

$$Fe_uM_v(Si,B)_w$$

wherein M is at least one metal selected from the group consisting of Cr, Nb, Ti, V, Ta, Mo, W, Mn, Co, and Ni; u, v and w are the atom percentages of Fe, M and Si+B, respectively, and are v=0 to 10, w=15 to 38 and u=100−v−w; and

a binder.

4,923,534

TUNGSTEN-MODIFIED TITANIUM ALUMINUM ALLOYS AND METHOD OF PREPARATION

Sbyh-Chin Huang, Latham, and Michael P. X. Gigliotti, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,622

Int. Cl.[5] C22C *14/00*

U.S. Cl. 148—407 **7 Claims**

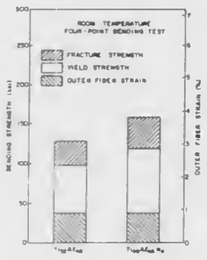
1. The process of forming a titanium aluminide having good strength and ductility and high oxidation resistance which comprises,

doping a TiAl with tungsten to provide a composition as follows:

$$Ti_{52\text{-}46}Al_{47\text{-}49}W_{1\text{-}5},$$

rapidly solidifying the composition from a melt thereof,

hot isostatically pressing the rapidly solidified composition, and



annealing the pressed composition at a temperature of 1250° to 1350° C.

4,923,535

POLYMER BINDING OF PARTICULATE MATERIALS

Paul F. Waters, Washington, D.C.; Albert F. Hadermann, Ijansville, Md., and Jerry C. Trippe, Fairfax Station, Va., assignors to General Technology Applications, Inc., Manassas, Va.

Filed Mar. 17, 1982, Ser. No. 359,046
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.1 **17 Claims**

1. A method for fabricating a polymer bonded propellant or explosive composite comprising:

cryogenically comminuting an elastomeric polymer to obtain a relatively finely divided powder, said powder particles having reactive sites thereon;

mechanically working particles of an active agent comprising an oxidizing material or explosive compound by grinding or abrading said agent at cryogenic temperature with at least sufficient intensity to create fresh surfaces thereon;

maintaining both said polymer particles and other particles of said oxidizing or explosive compound at cryogenic temperatures and admixing said polymer particles and other particles while at cryogenic temperatures,

forming said admixed particles into a shape under pressure, and

allowing said formed shape to warm thereby causing reactions to occur among the components of the composite.

16. A polymer bonded propellant or explosive composite produced by:

cryogenically comminuting an elastomeric polymer to obtain a relatively finely divided powder, said powder particles having reactive sites thereon;

mechanically working particles of an active agent comprising an oxdizing material or explosive compound by grinding or abraiding said agent at cryogenic temperatures with at least sufficient intensity to create fresh surfaces thereon;

mixing said polymer particles with said other particles of said oxidizing or explosive compound and maintaining all said particles at cryogenic temperatures during said mixing;

forming said admixed particles into a shape under pressure at cryogenic temperatures; and

allowing said formed shape to warm whereby there is produced a chemical bonding among and between said polymer particles and said other particles of said oxidizing or explosive compound.

4,923,536

EXPLOSIVES AND PROPELLANT COMPOSITIONS CONTAINING A POLYURETHANE POLYACETAL ELASTOMER BINDER AND METHOD FOR THE PREPARATION THEREOF

J. B. Canterberry, Crawfordville, Fla., and Lawrence E. Katz, Orange, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Feb. 17, 1988, Ser. No. 156,695
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.4 **22 Claims**

1. An explosive or propellant composition characterized by low vulnerability to unplanned stimuli, said composition comprising between 51 and 99 weight percent of a high energy material and between 1 and 50 weight percent of a binder, said binder being a polyurethane polyacetal elastomer made by a process of:

(a) reacting a dihydroxy-terminated polyacetal homopolymer with an alkylene diisocyanate in the presence of a urethane-forming catalyst in a reaction to produce an isocyanate-terminated prepolymer, said homopolymer having a weight average molecular weight of between about 5,000 and about 60,000 as measured against a polystyrene standard by gel permeation chromatography and being produced by polymerizing a 4-lower alkyl substituted-1,3-dioxolane, said reaction employing between about 50 mole percent and about 70 mole percent of said alkylene diisocyanate based upon the total amount of said alkylene diisocyanate and said homopolymer employed, and

(b) reacting said isocyanate-terminated prepolymer with a dihydroxy-terminated polyacetal copolymer in the presence of a solvent and a urethane-forming catalysr to provide a polyurethane polyacetal elastomer, said copolymer having a weight average, molecular weight of between about 10,000 and about 200,000 as measured against a polystyrene standard by gel permeation chromatography and being the reaction product of a formaldehyde-providing compound and 1,3-dioxolane, said copolymer being employed in an amount of between about 30 and about 50 mole percent based upon the total amount of said copolymer and said isocyanate-terminated prepolymer employed.

4,923,537

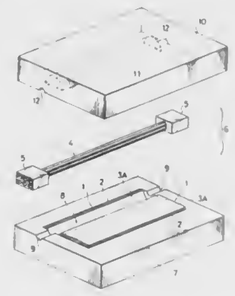
METHOD FOR SHAPING A RESIN COATING OF A WIRE HARNESS

Yuzo Matsushima, Utsunomiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 308,218
Claims priority, application Japan, Feb. 12, 1988, 63-28821
Int. Cl.[5] H01B *13/06*
U.S. Cl. 156—48 **6 Claims**

1. A method for shaping a resin coating of a wire harness comprising steps of placing a laminated sheet formed by integrally laminating an outer skin sheet made of semi-hard resin and an unfoamed foamable sheet made of foamable resin material along a cavity wall surface of a shaping mold with said foamable sheet directed to the inside, disposing a bundle of wires having terminals, connectors or the like attached to their opposite ends within a space defined by said laminated sheet,

heating and foaming said foamable sheet by heating said shaping mold, and thereby coating said bundle of wires with a



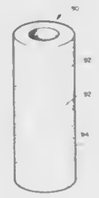
foamed resin layer and the outer skin sheet made of semi-hard resin.

4,923,538

METHOD OF MAKING POROUS INORGANIC PARTICLE FILLED POLYIMIDE FOAM INSULATION PRODUCTS

Frank U. Hill, San Diego, Calif., assignor to Sorrento Engineer, Inc., National City, Calif.

Division of Ser. No. 312,490, Feb. 21, 1989, Pat. No. 4,865,784.
This application Jun. 19, 1989, Ser. No. 367,623
Int. Cl.[5] B32B *5/18, 31/14*
U.S. Cl. 156—78 **4 Claims**



1. The method of making shaped thermal insulation products which comprises the steps of:

providing a quantity of foamable polyimide precursor powder;

mixing therewith from about 50 to 150 wt% porous, lightweight, high temperature resistant inorganic particles, based on power weight, until said particles are substantially uniformly coated with said powder;

said inorganic particles being flake-like, having a least dimension of from about 1/32 to 1/16 inch and greatest dimension of about ¼ to ⅜ inch;

pouring said mixture into an open mold;

compressing the filled mold contents by about 2 to 5%,

closing the mold;

heating said filled mold to the foaming temperature of the polyimide precursor power for a period sufficient to allow substantially complete spontaneous foaming to occur;

increasing the temperature of the filled mold to a temperature sufficient to cure said precursor to a polyimide;

removing the resulting bonded insulation product from the mold; and

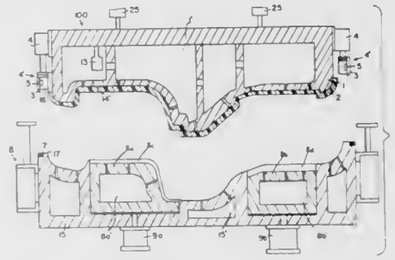
coating at least one surface of the insulation product with a solution of a polyimide precursor, applying a sheet material to the coated surface and heating the resulting assembly to cure the polyimide precursor.

4,923,539

METHOD AND APPARATUS FOR MANUFACTURING TRIM PANELS INCLUDING SEVERAL TRIM COMPONENTS

Gerhard Spengler, Frankfurt, and Ernst Spengler, Heusenstamm by Ffm., both of Fed. Rep. of Germany, assignors to Stanztechnik GmbH R+S, Bergen-Enkheim, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,777
Int. Cl.[5] B32B *5/18, 1/10*
U.S. Cl. 156—79 **6 Claims**



1. A method for manufacturing a trim panel in a mold having a first mold section (**15**) and a second mold section (**1**), said trim panel including at least one trim insert as part of the finished trim panel, comprising the following steps;

(a) positioning a cover skin layer (**12**) between said first mold section (**15**) and said second mold section (**1**), said cover skin layer (**12**) being made of a material suitable for forming said trim panel into a three-dimensional shape in said mold, said cover skin layer having a front surface and a rear surface, said first mold section (**15**) facing said front surface and said second mold section (**1**) facing said rear surface of said cover skin layer (**12**),

(b) forming at least one nesting cavity (**8c**, **8d**) in one of said mold sections by moving a nesting die (**8a**, **8b**) in said nesting cavity relative to said one mold section so that a surface of said nesting die is withdrawn relative to a mold surface of said one mold section to form said nesting cavity.

(c) locating said at least one trim insert (**10**, **11**) into said nesting cavity which positively holds said trim insert (**10**, **11**) against lateral displacement in said nesting cavity,

(d) contacting said at least one trim insert with said cover skin layer by closing said first and second mold sections into a closed mold position, and

(e) moving said nesting die independently of said one mold section (**15**) toward the other mold section (**1**) for pressing said trim insert against said cover skin layer.

4,923,540

METHOD AND JOINING PROFILES

Eberhard Born; Helmut Korber, and Josef Mersch, all of Bayer Aktiengesellschaft, D 5090 Leverkusen, Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 834,407, Feb. 28, 1986, abandoned.
This application Feb. 13, 1989, Ser. No. 310,473
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1985, 3508644
Int. Cl.[5] B32B *31/00*; B29C *65/00*
U.S. Cl. 156—86 **2 Claims**

1. An improved method for joining round profiles composed of long-fiber-reinforced plastics materials by adhering the ends together using resins while maintaining the cross section of the profile,

comprising providing the profiles to be adhered with faces at an angle of from 0.1° to 0.5° to the longitudinal axis by removing material from the faces whereby at least a few fibers are freed from the surrounding embedding resin

over a length of from 1 to 30 mm, orienting the profiles, positioning a removeable tube over the combined profile



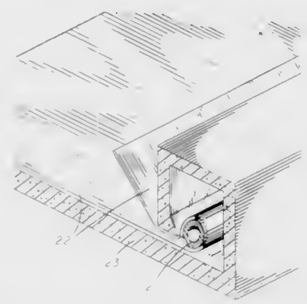
ends, and adhering the faces in true alignment under pressure.

4,923,541

METHOD FOR MAKING COMPOSITE REINFORCED TUBES

George Burger, 4 Carmel Dr., Novato, Calif. 94947

Filed Oct. 22, 1988, Ser. No. 260,866
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—87 **20 Claims**



1. A method of fabricating a composite tube which comprises the steps of:

(a) wrapping a plurality of layers around an outer surface of an expandable mandrel such that said layers are wrapped in substantially concentric relationship to said mandrel with at least one of said layers comprising reinforcing fibers impregnated with resin, at least a second of said layers comprising an absorbent material with said absorbent material being placed between said mandrel and said layer of reinforcing fibers, and at least a third of said layers comprising a perforated sheet of impermeable material, said perforated sheet being placed between and isolating said layer of absorbent material from said layer of reinforcing fibers;

(b) placing said mandrel and said plurality of layers in an elongated tubular female mold ; and

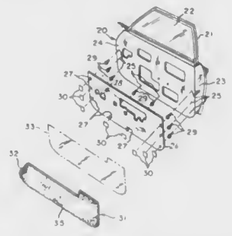
(c) pressurizing said expandable mandrel to cause said mandrel to expand and move said plurality of layers outwardly , thereby compacting said layers against an inner surface of said mold and forcing entrapped gas and excess resin to travel through said perforated sheet and enter said absorbent layer.

4,923,542

METHOD OF MAKING A COMPOSITE CAR DOOR PANEL

Mark A. Janicki, Kettering, and Paul S. Schultz, Miamisburgh, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 27, 1988, Ser. No. 290,067
Int. Cl.[5] B32B *31/10, 7/08*
U.S. Cl. 156—92 **12 Claims**



1. Method of making a composite car door panel which is adapted to be attached to the inner side of a car door frame, the method comprising the steps of: providing a generally planar first panel section having a series of holes, providing fasteners each having a head and a shank projecting from the head, securing the fasteners to the first panel section with the heads against an inner surface of the first panel section and with the shanks projecting beyond an outer surface of the first panel section and adapted to be received in holes in the car door frame, the shanks of the fasteners being small enough relative to the holes so that the fasteners can be oriented relative to the first panel section, providing pressure sensitive labels each having an adhesive-free area, applying the labels to the inner surface of the first panel with the adhesive free areas masking off the heads, the adhesive-free area of each label being large enough to enable the fastener to be oriented relative to the first panel section, providing a generally planar second panel section having a coating of pressure sensitive adhesive on one surface, and adhering the second panel section to the inner surface of the first panel section with the labels masking the pressure sensitive adhesive from the heads.

4,923,543

PREFORMED PLUG - TIRE REPAIR

Russell W. Koch, Hartville, Ohio, and Douglas D. Snyder, Tempe, Ariz., assignors to Bridgestone/Firestone, Inc., Akron, Ohio

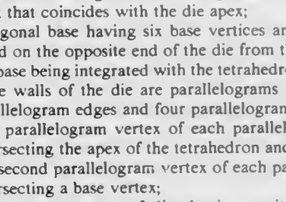
Continuation of Ser. No. 142,754, Jan. 11, 1988, abandoned, which is a division of Ser. No. 872,313, Jun. 9, 1986, Pat. No. 4,718,467, which is a continuation-in-part of Ser. No. 718,666, Apr. 1, 1985, Pat. No. 4,618,519, which is a continuation-in-part of Ser. No. 584,426, Feb. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 767,998, Aug. 21, 1985, abandoned, which is a continuation of Ser. No. 584,426, Feb. 28, 1984, abandoned. This application Mar. 2, 1989, Ser. No. 326,131
Int. Cl.[5] B60C *21/06*
U.S. Cl. 156—97 **15 Claims**

1. A process for repairing an elastomer article having a hollow therein, comprising the steps of:

forming a cured, soft, and pliable elastomer plug having a lower modulus than the article, said elastomer plug having a volume of at least 50 percent of the volume of the hollow;

applying a treating agent to the walls of said hollow, said treating agent selected from the group consisting of a N-halohydantoin, a N-haloamide, a N-haloimide, and combinations thereof;

applying an amine curable polymer or prepolymer to said treated hollow walls;



inserting said cured, soft and pliable low modulus elastomer plug substantially into said treated hollow containing said amine curable polymer or prepolymer and forming a channel filled with said amine curable polymer or prepolymer, said channel existing between said plug and said elastomer article; and

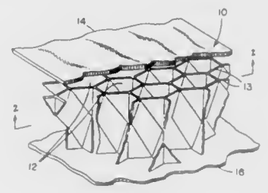
curing said amine curable prepolymer or polymer at ambient temperature.

4,923,544

METHOD OF MANUFACTURING A TETRAHEXACONAL TRUSS STRUCTURE

Dick O. Weisse, Camarillo, Calif., assignor to Tetrahex, Inc., Camarillo, Calif.

Division of Ser. No. 266,386, Nov. 2, 1988. This application Sep. 18, 1989, Ser. No. 408,698
Int. Cl.[5] B32B *31/22*
U.S. Cl. 156—153 **10 Claims**



1. A method of manufacturing a structure, comprising:

forming a first and second plurality of dies, each die including:

a plurality of walls;

a die apex;

a tetrahedron having tetrahedron edges and a tetrahedron apex that coincides with the die apex;

a hexagonal base having six base vertices and being located on the opposite end of the die from the die apex, the base being integrated with the tetrahedron such that three walls of the die are parallelograms having four parallelogram edges and four parallelogram vertices, a first parallelogram vertex of each parallelogram wall intersecting the apex of the tetrahedron and the opposing second parallelogram vertex of each parallelogram intersecting a base vertex;

creating an upper array of dies having cavities between adjacent dies from the first plurality of dies with the hexagonal die bases being affixed to an upper plate;

creating a lower array of dies having cavities between adjacent dies from the second plurality of dies with the hexagonal die bases being affixed to a lower plate;

aligning the upper and lower arrays so that the die apices from each array are positioned above the cavities on the other array;

placing a core material between the upper and lower arrays; and

moving at least one of the arrays near to the other array until the dies from the two arrays are in close proximity with each other to form a core of the structure from the core material having upper and lower surfaces.

3. The method of claim 1, wherein said core material is molten plastic.

4,923,545

METHOD OF INSETTING PREDESIGNED DISBOND AREAS INTO COMPOSITE LAMINATES

George E. Dickerson, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 23, 1988, Ser. No. 248,018
Int. Cl.[5] B32B *31/06, 31/18*
U.S. Cl. 156—153 **1 Claim**

1. A process for producing composite laminates containing interlaminar disbond areas of controlled sizes, shapes and positions within a composite structure without increasing the thickness of the laminate, which process comprises the steps of:

cutting a single ply of composite tape prepreg to a desired size;

placing the single ply of composite tape prepreg between two plies of polymeric film which have been coated with a releasing interface;

curing said single ply of composite tape prepreg;

separating the cured single ply of composite tape prepreg from said two plies of polymeric film;

washing said cured single ply of composite tape prepeg with a solvent;

sandblasting the desired bond areas of the cured single ply of composite tape prepreg and coating the desired disbond areas with a releasing interface;

heating the coated ply of cured composite tape prepreg to a composite cure temperature to bake on the releasing interface;

cooling the resulting ply of composite tape; and

positioning the ply of composite tape between plies of an uncured prepreg layup where it is desired to duplicate faulty adhesion in a subsequently cured composite laminate structure;

whereby disbond areas are located anywhere in a composite laminate without altering laminate thickness, either in bond or disbond areas thereof.

4,923,546

METHOD AND APPARATUS FOR FORMING A BUTT SPLICE

Roger R. Wheeler, Roscoe, and John R. Martin, Rockford, both of Ill., assignors to Martin Automatic Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 153,578, Jan. 29, 1988, Pat. No. 4,801,342, which is a continuation of Ser. No. 907,117, Sep. 12, 1986, abandoned. This application Jan. 26, 1989, Ser. No. 302,569
The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.
Int. Cl.[5] B31F *5/06;* **B65H** *69/06*
U.S. Cl. 156—159 **5 Claims**

1. An improved method for forming a butt splice to join together a web from a new roll of material to a web which is from an expiring roll of material, which has two, substantially parallel side edges, and which should be run, through a web processing operation downstream from the expiring roll, at a high speed and under a constant, low preselected tension,

along a predetermined path of travel that includes running web festoon means having floating dancer rollers and the web processing operation, the improved method comprising the steps of:

driving the expiring roll at a speed so as to maintain the web, downstream of the running web festoon means, at a high speed and under a constant, low tension and so as to maintain the dancer rollers of the running web festoon means in their normal running position;

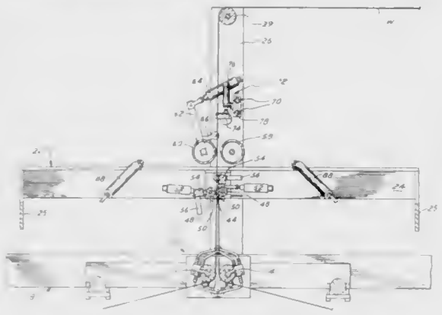
holding a portion of the web from the new roll against anvil means that includes a cutting edge;

trimming the portion of the web from the new roll along the cutting edge of the anvil means so that the trimmed edge of the downstream, leaving end of the web from the new roll is aligned with and conforms to the cutting edge of the anvil means;

applying a first piece of adhesive tape to the leading end of the web from the new roll so that the adhesive of the tape faces the path of travel and so that a portion of the adhesive tape extends downstream beyond the cutting edge of the anvil means and the trimmed edge of the web from the new roll;

sensing the amount of web remaining on the expiring roll;

momentarily stopping the running of the portion of the web from the expiring roll adjacent to the anvil means in response to the sensed expiration of web from the expiring roll, while permitting further downstream portions of the web from the expiring roll, remote from the anvil means,



to continue to run at the high speed and under the constant, low tension;

holding the stopped, anvil means adjacent portion of the web from the expiring roll against the anvil means;

trimming the stopped, anvil means adjacent portion of the web from the expiring roll along the cutting edge of the anvil means by cutting the stopped, anvil means adjacent portion of the web from the expiring roll a part at a time, across the web and beginning at one side edge thereof, so that the point of cutting moves across the stopped, anvil means adjacent portion of the web from the expiring roll from the one side edge to the other side edge, so that the uncut part of the stopped, anvil means adjacent portion of the web from the expiring roll remains under tension ahead of the point of cutting, and so that the trimmed edge of the trailing end of the stopped, anvil means adjacent portion of the web from the expiring roll is aligned with and conforms to the cutting edge of the anvil means;

adhering the cut part of the trailing end of the stopped, anvil means adjacent portion of the web from the expiring roll, behind the point of cutting, to the downstream extending portion of the adhesive tape substantially simultaneously as the point of cutting moves across the stopped, anvil means adjacent portion of the web from the expiring roll, so that the trimmed edge of the trailing end of the stopped, anvil means adjacent portion of the web from the expired roll abuts and is disposed closely adjacent to the trimmed edge of the leading end of the web from the new roll, and so that the adhesive tape secures together the leading end of the web from the new roll and the trailing end of the web from the expiring roll and;

driving the new roll at a speed so as to bring the joined web from the expiring roll and from the new roll so that the dancer rollers of the running web festoon means are again restored to their normal running position, and so that the web continues at the high speed and under the constant, low tension.

3. An improved apparatus for forming a butt splice to join together a web from a new roll of material to a web which is from an expiring roll of material, which has two substantially parallel side edges, and which should be run, through a web processing operation downstream from the expiring roll, at a relatively high preselected speed and under a constant, low tension, along a pre-determined path of travel that includes running web festoon means having floating dancer rollers and the web processing operation, the improved apparatus comprising:

means for driving the expiring roll at a speed so as to maintain the web, downstream of the running web festoon means at the high speed and under the constant, low tension and so as to maintain the dancer rollers of the running web festoon means in their normal running position;

an anvil disposed adjacent to the path of travel and having first and second sides and a cutting edge at the downstream ends of the sides;

means for supporting and driving the expiring roll and the new roll so that each web on each roll may run off of the roll and past the anvil and so that each roll may be selectively driven at various speeds;

means for selectively holding a portion of the web from the new roll against the first side of the anvil;

means for selectively trimming off the web from the new roll along the cutting edge of the anvil so that the trimmed edge of the leading end of the web from the new roll is aligned with and conforms to the cutting edge of the anvil and so that a first piece of adhesive tape can be applied to one side of the leading end, with the adhesive on the adhesive tape facing the path of travel and with an exposed portion of the adhesive tape projecting downstream beyond the cutting edge of the anvil and the trimmed edge of the web from the new roll;

means for sensing the amount of web remaining on the expiring roll;

means responsive to the means for sensing the amount of web remaining on the expired roll, for momentarily stopping the running of the portion of the web from the expiring roll adjacent to the anvil while permitting the further downstream portions of the web from the expiring roll, remote from the anvil, to continue to run at the high speed and under the constant, low tension;

means for selectively holding the stopped, anvil adjacent portion of the web from the expiring roll against the second side of the anvil;

means for trimming the stopped, anvil adjacent portion of the web from the expiring roll along the cutting edge of the anvil by cutting the stopped, anvil adjacent portion of the web from the expiring roll a part at a time, across the web and beginning at one side edge thereof, so that the point of cutting moves across the stopped, anvil adjacent portion of the web from the expiring roll from the one side edge to the other side edge, so that the uncut part of the web from the expiring roll remains under tension ahead of the point of cutting, and so that the trimmed edge of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll is aligned with and conforms to the cutting edge of the anvil;

means for applying the cut part of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll, behind the point of cutting, to the downstream extending, exposed portion of the adhesive tape substantially simultaneously as the point of cutting moves across the stopped, anvil adjacent portion of the web from the expiring roll so that the trimmed edge of the trailing end of the stopped, anvil adjacent portion of the web from the expiring roll abuts and is disposed closely adjacent to the trimmed edge of the leading end of the web from the new roll, and so that the adhesive tape secures together the leading end of the web from the new roll and the trailing end of the web from the exiting roll, so that as the joined web runs along the path of travel, the dancer rollers of the running web festoon means are again restored to their normal running position, and so that the web continues at the high speed and under the constant, low tension.

4,923,547

PROCESS FOR PRODUCING COMPOSITE MOLDED ARTICLES FROM NONWOVEN MAT

Katsuhiko Yamaji, Kyoto; Masahiko Ishida, Yokohama, and Masahiro Tsukamoto, Takatsuki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 17, 1988, Ser. No. 233,282

Claims priority, application Japan, Aug. 20, 1987, 62-207674; Aug. 20, 1987, 62-207675; Sep. 16, 1987, 62-231742; Sep. 16, 1987, 62-231743; Dec. 15, 1987, 62-316728; Dec. 22, 1987, 62-326461; May 12, 1988, 63-115398

Int. Cl.[5] **B32B** *5/00, 5/16, 5/24*

U.S. Cl. 156—181 **31 Claims**

1. A process for producing a composite molded article which comprises forming a nonwoven fibrous mat composed of inorganic monofilaments having a length of 10 to 200 mm and a diameter of 2 to 30 micrometers and a thermoplastic resin binder, heating the mat at a temperature above the melting point of the thermoplastic resin binder, compressing the mat at said temperature, then releasing the compression to form a compression-released mat, recovering the thickness of the mat to obtain a heat-moldable composite sheet, and heat-molding the resulting composite sheet, wherein the step of recovering the thickness of the mat is carried out by pulling both sides of the compression-released mat outwardly at a temperature above the melting point of the binder.

22. The process for producing a composite sheet which comprises forming a nonwoven fibrous mat from inorganic monofilaments having a length of 10 to 200 mm and a diameter of 2 to 30 micrometers, laminating at least one thermoplastic resin film on at least one side of the nonwoven fibrous mat to form a laminated sheet, heating the laminated sheet at a temperature above the melting point of at least one of the thermoplastic resin films, compressing the laminated sheet at said temperature, then releasing the compression, recovering the thickness of the laminated sheet to obtain a heat-moldable composite sheet, and heat-molding the resulting composite sheet, wherein thermoplastic resin films whose melting points are approximately the same but whose melt indices are different from each other are laminated on both sides of the nonwoven fibrous mat, the melt index of one of the thermoplastic resin films is 2 to 40 g/10 min, and the melt index of the other is 1 to 7 g/10 min.

4,923,548

PROCESS FOR THE PRODUCTION OF LEAD-BASED CAPPING CAPS AND THE CAPS OBTAINED

Jacques Granger, Libourne, France, assignor to CEBAL, Clichy, France

Filed Jul. 20, 1989, Ser. No. 382,583

Claims priority, application France, Jul. 28, 1988, 88 10451

Int. Cl.[5] **D02G** *3/00*

U.S. Cl. 156—182 **14 Claims**

1. Process for the production of a lead-based capping cap, in which a metal strip is prepared by rolling which has an alloyed lead core with a lead content exceeding 95% and covered on each of its two faces with an alloyed tin film with a tin content exceeding 80%, characterized in that:

(a) a multilayer plastics material strip is prepared having an adhesive plastics material surface layer and at least two successive layers of a plastics material selected from the group consisting of polyolefins, grafted polyolefins and terpolymers;

(b) the two strips are joined by applying the adhesive face of the plastics material strip to one of the two faces of the metal strip, thus giving a complex strip;

(c) from said complex strip is cut a blank and the latter is converted into a cap internally coated with plastics material.

4,923,549

METHOD OF MAKING A MULTILAYER POLYMERIC FILM HAVING DEAD BEND CHARACTERISTICS

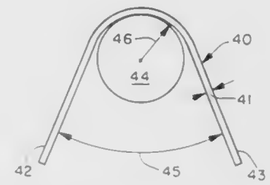
Steven B. Warner, Acworth, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 115,132, Oct. 30, 1987, Pat. No. 4,882,230.

This application Jun. 30, 1989, Ser. No. 374,686

Int. Cl.[5] **B32B** *31/08*

U.S. Cl. 156—229 **15 Claims**



1. A method of making a multilayer polymeric film having dead bend characteristics which are substantially planar isotropic which comprises the steps of:

A. forming a first polymeric film from a first thermoplastic polymer;

B. uniaxially orienting said first polymeric film by stretching the film to a draw ratio of at least about 20;

C. forming a second polymeric film from a second thermoplastic polymer;

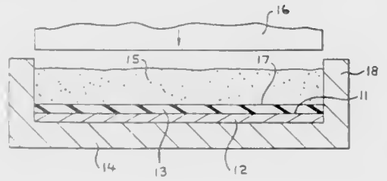
D. uniaxially orienting said second polymeric film by stretching the film to a draw ratio of at least about 20;

E. laminating said uniaxially oriented first polymeric film to said uniaxially oriented second polymeric film with the direction of orientation of said uniaxially oriented first polymeric film forming an angle of at least 30 degrees with the direction of orientation of said uniaxially oriented second polymeric film to give a multilayer polymeric film having dead bend characteristics which are substantially planar isotropic, wherein each polymeric film is composed substantially of polymer fibrils having an average length of at least about 5 micrometers and an average diameter of less than about 0.5 micrometers.

4,923,550
METHOD OF MAKING A WEAR RESISTANT COMPOSITES

James H. Kramer, 2793 Erie Dr., Akron, Ohio 44313

Continuation of Ser. No. 822,439, Jan. 27, 1986, abandoned, which is a division of Ser. No. 564,615, Dec. 22, 1983, Pat. No. 4,596,734, which is a continuation-in-part of Ser. No. 246,567, Mar. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 126,760, Mar. 3, 1980, abandoned. This application May 14, 1987, Ser. No. 49,370
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—242 **6 Claims**



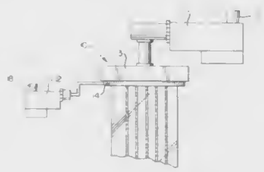
1. A method of making a wear resistant composite comprising the steps of:

providing a mold, placing a metallic backing plate in said mold, coating one surface of said metallic backing plate with a thin film of cementitious compound, depositing a thick resilient layer of uncured elastomer on said metallic plate in engagement with said thin film of cementitious compound to bond said elastomer thereto and provide resiliency to said elastomeric layer to absorb stresses as said plate is bent or shaped, depositing a layer of ultra-high molecular weight polyethylene powder on said thick elastomer layer, and thence apply pressure and heat to said layers to cure said elastomer and melt said polyethylene powder to form a single bonded composite sheet.

4,923,551
METHOD FOR THE PRODUCTION OF COMPOSITE PLASTIC FILM

Kevin J. Wagers, and Douglas P. Gundlach, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1988, Ser. No. 164,705
Int. Cl.[5] B29C *47/04*
U.S. Cl. 156—244.11 **10 Claims**



1. A method for production of a composite plastic film having embedded in both surfaces of the film strips of an adhering material having adhesion characteristics substantially different from the film, comprising:

(a) providing a first stream of heat plastified extrudable thermoplastic film material to cast film die having two opposing die lips, each die lip having at least 24 strip channels located therein, the strip channels in one die lip being offset laterally from the strip channels in the opposing die lip;

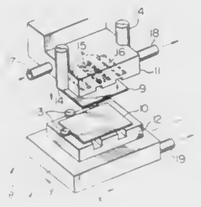
(b) introducing a heat plastified extrudable adhering material into the film material from the plurality of strip channels in each opposing die lip to form a composite body of material and

(c) extruding the composite body of materials through the die lips of the cast film die to form the plastic film such that strips of the adhering material are substantially embedded in both surfaces of the thermoplastic film in an alternating pattern.

4,923,552
METHOD OF PRODUCING LIQUID CRYSTAL DISPLAY ELEMENT

Tetsuo Fukushima; Takao Inoue, both of Hirakata, and Keinosuke Kanashima, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 8, 1988, Ser. No. 203,814
Claims priority, application Japan, Jun. 12, 1987, 62-147588
Int. Cl.[5] B32B *31/20, 31/28*
U.S. Cl. 156—273.7 **3 Claims**



1. A method of producing a liquid crystal display element having a first electrode substrate and a second electrode substrate bonded to the first electrode substrate with a gap therebetween, said method comprising the steps of:

holding said first electrode substrate on one of an upper and lower jig of an alignment apparatus, said lower jig having a holding pattern;

holding said second electrode substrate on the other of said upper and lower jig of said alignment apparatus;

relatively moving said upper and lower jigs of said alignment apparatus so as to align said first and second electrodes with each other;

superposing said two substrates together with substantially no slippage therebetween through the intermediary of a photo-settable sealing agent with a gap therebetween pressing said two substrates together through said sealing agent to obtain a temporarily assembled liquid crystal display element;

fixing said temporarily assembled liquid crystal display element to a fixing base which is placed in a case and which has the same holding pattern as that of said lower jig in said alignment apparatus;

placing a transparent plastic sheet on said temporarily assembled liquid crystal display element;

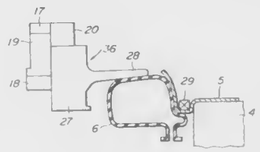
evacuating the space between said fixing base and said plastic sheet to produce a vacuum so as to press said temporarily assembled liquid crystal display element under vacuum; and

photo-setting said sealing agent press-bonded to said substrates to obtain a liquid crystal display element.

4,923,553
TIRE BUILDING APPARATUS

Seiichiro Nishide, and Shigeoki Usami, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,203
Claims priority, application Japan, Oct. 6, 1987, 62-251964
Int. Cl.[5] B29D *30/32*
U.S. Cl. 156—401 **10 Claims**

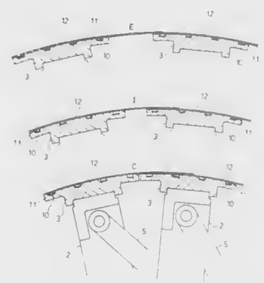


1. A tire building apparatus comprising; a forming drum to which tire constituting members are attached, annular bead setting rings movable in axial directions of the forming drum for grasping tire beads on their inner circumferential sides and driving the tire beads into predetermined positions on a tire constituting member, and annular turning-up holders movable in the axial directions of the forming drum for turning up parts of the tire constituting member on axially outer sides of bead driven positions about said tire beads with the aid of bladders, wherein said annular bead setting rings and said turning-up holders are divided into a plurality of arcuate segments circumferentially spaced, guiding means for supporting said arcuate segments radially movably, moving means for moving said arcuate segments in radial directions in synchronism with each other into radial positions corresponding to a size of a tire to be formed and for causing movements of said arcuate segments required for forming tires of various sizes, and regulating means for regulating radially outward movements of the arcuate segments against reactions to which the arcuate segments are subjected from the bladders.

4,923,554
FORMING DRUM FOR BUILDING A TIRE

Chiaki Ozawa, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 232,748
Claims priority, application Japan, Aug. 20, 1987, 62-205053
Int. Cl.[5] B29D *30/24*
U.S. Cl. 156—417 **7 Claims**

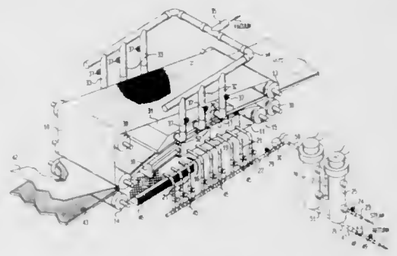


1. A forming drum for building a tire to form a strip-like belt member comprising a rubber-coated steel cord into an annular belt, said drum comprising; a plurality of segments divided in the circumferential direction and adapted to form substantially cylindrical shapes having different outer diameters as moved in the radial direction; said plurality of segments formed of non-magnetic material, permanent magnets buried in arc-shaped outer surfaces of said segments; cover plates made of non-magnetic material respectively mounted between adjacent ones of the segments to form a cylindrical outer circumferential surface, and each of said cover plates fixedly secured to the arc-shaped outer surface of the corresponding one of the segments to form a continuous covering over said permanent magnets buried in said segments irrespective of any radial movement of said segments.

4,923,555
APPARATUS FOR STEAM LAMINATION

George M. Elliott, Alpharetta; Ervin L. Watford, Jr., Rome, and George W. Howell, Nelson, all of Ga., assignors to Astechnologies, Inc., Roswell, Ga.

Continuation of Ser. No. 905,405, Sep. 10, 1986, abandoned. This application Aug. 22, 1988, Ser. No. 234,927
Int. Cl.[5] B32B *31/00;* **B30B** *5/02, 15/20*
U.S. Cl. 156—497 **22 Claims**



1. Apparatus for continuously laminating two sheets of material together, using a heat-activatable or moisture-curing adhesive, wherein at least one of the sheets is steam-permeable, which comprises:

(a) first and second opposed, open mesh, endless conveyor belts, disposed so as to permit a composite of two sheets of material and an intermediate layer of adhesive to be clamped therebetween in a clamping zone, each belt having an inside surface and an outside surface, the outside surface being the surface which touches the composite when it is clamped between the belts;

(b) means for revolving the belts in opposite directions so as to convey the composite between them;

(c) a platen mounted adjacent the inside surface of the first belt, said platen having an enclosed chamber with a perforated surface facing the first belt in the clamping zone;

(d) means for supplying superheated steam to said platen chamber under sufficient pressure to eject the steam through the perforations in the platen with enough force to pass through the first belt;

(e) means for cooling the second belt during its return to the clamping zone; and

(f) a pair of pressure rollers mounted adjacent to the end of the first belt, said rollers being adapted to receive and compress the composite after the composite has run off the end of said belt.

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4,923,556

LAMINATING DEVICE FOR MANUFACTURING IDENTIFICATION CARDS

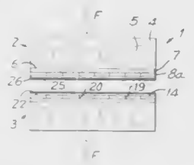
Johannes Kettelhoit, Verl; Hans W. Künne, Rheda-Wiedenbrück, and Erhard Schröder, Gütersloh, all of Fed. Rep. of Germany, assignors to D.I.S. Versand Service GmbH, Versmold, Fed. Rep. of Germany

Division of Ser. No. 151,708, Feb. 3, 1988, Pat. No. 4,790,901, which is a continuation of Ser. No. 713,271, Mar. 18, 1985, abandoned. This application Jul. 14, 1988, Ser. No. 219,438

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409808

Int. Cl.[5] B30B *15/34*

U.S. Cl. 156—498 8 Claims



1. A laminating device for producing identification cards carrying data and/or information out of blanks and including at least one core foil of plastics, at least one transparent protective foil of plastics for a front side of a card and at least one transparent protective foil of plastics for a back side of a card, the device comprising press means including at least one metallic press member for welding said foils together and having cooling means and a pressing side facing a card to be laminated; a heating element on said pressing side, said heating element including a plurality of current conductive strips connected to each other in series and positioned one next to the other in one plane and having a relatively great width as compared to a thickness thereof, said strips being spaced from each other by thin straight line separating gaps and being positioned to form parallel straight line elements connected to each other by curved portions so as to form a large surface, serpentine-shaped current-conductive path with closely adjacent straight line elements, said heating element further including electric connection webs positioned at ends of said path; a thin electrical insulation layer positioned between said metallic press member and said heating element and partially transmitting heat generated by said heating element to said press member and providing homogeneous pressure distribution during welding of said foils together, said thin electrical insulation layer being made of a foamed material impregnated at two sides with glue, said heating element having small heating capacity and a small thickness and being formed as a metallic resistance heating element through which electric current applied thereto flows directly, said press member being cooled in cooperation with said insulation layer so that a temperature of said press member remains constant during the welding and the cooling; a pressure plate of small heat capacity but good heat conductivity, said pressure plate being mounted to a side of said heating element facing a card to be laminated; and an electric insulating layer position-d between said pressure plate and said heating element.

4,923,557

APPARATUS AND METHOD FOR APPLYING A HEAT SHRINK FILM TO A CONTAINER

Daniel M. Dickey, Denair, Calif., assignor to Trine Manufacturing Co., Inc., Turlock, Calif.

Filed Aug. 1, 1988, Ser. No. 226,660

Int. Cl.[5] B29C *27/00*

U.S. Cl. 156—86 17 Claims

1. A method for applying a solvent reactive heat shrink film to a container having a first outer wall section, defined by a major container diameter, and having a second outer wall section, defined by a minor container diameter, comprising the steps of:

(a) disposing the film upon the outer periphery of a rotary vacuum drum, with the inner face of the film being exposed;

(b) applying adhesive to the inner face of the leading end of the film;

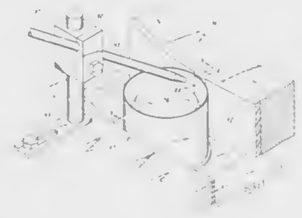
(c) applying solvent to said inner face of the trailing end of the film;

(d) bringing said leading end of the film into adhesive contact with said first outer wall section of the container;

(e) wrapping the film around the container, and overlapping the outer face of said leading end of the film with said solvent treated inner face of said trailing end;

(f) compressively rolling the container against said vacuum drum, forming an overlapping solvent seal along a portion of the film seam supported by the first outer wall section of the container, and simultaneously applying compressive pressure to the inner wall of said film seam along a portion of said film seam unsupported by said first outer wall section, while the outer wall of said film seam is backed by said vacuum drum; and,

(g) applying heat to said unsupported portion of the film, shrinking said unsupported portion around said second outer wall section of the container.



2. An apparatus for applying a solvent reactive heat shrink film to a container having a first outer wall section, defined by a major diameter, and having a second outer wall section, defined by a minor container diameter, comprising:

a. a rotary vacuum drum for transporting a film strip upon its outer periphery, said strip having an exposed inner face;

b. means for applying adhesive to said inner face of the leading end of the film;

c. means for applying solvent to said inner face of the trailing end of the film;

d. means for bringing a container into tangential contact with said adhesive on said film;

e. a curved roll-on pad, spaced from and concentric with said vacuum drum, said pad cooperating with said vacuum drum to rotate the container and wrap the adhesively attached film around the container, compressively forming an overlapping solvent seal along a portion of the film seam supported by the first outer wall section of the container;

f. means for applying compressive pressure to the inner wall of said film seam along a portion of the label unsupported by said first outer wall section, while the outer wall of said film seam is backed by said vacuum drum;

g. means for applying heat to said unsupported portion of the film, shrinking said unsupported portion around said second outer wall section of the container.

4,923,558

DEVICE FOR THE WELDING OF PLASTIC FOIL

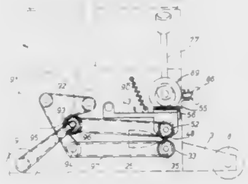
Bernd Ellenberger, Gonbach; Friedrich Jennet, Kaiserslautern; Karlheinz Schäfer, Neustadt/Weinstrasse; Rainer Spickermann, Thaleischweiler, and Gerhard Lass, Enkenbach-Alsenhorn, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen, GmbH, Kaiserslautern, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,207

Claims priority, application Fed. Rep. of Germany, May 2, 1988, 8805783[U]

Int. Cl.[5] B32B *31/08*

U.S. Cl. 156—499 6 Claims



1. A device for the welding of plastic foils after they are moved into edge overlapping relationship adjacent a heating device for the heating of the foil parts to be welded together, comprising: a carrier; a draw spring acting on said carrier; a pair of a first fixed and a second movable pressure roll for the creation of a welding pressure and between which the foil parts to be joined are moved, said second pressure roll being mounted to said carrier, said carrier being movable between said second pressure roll and relative to said first pressure roll for adjustment in the width of a gap; a spring mechanism; a pressure device supported on said spring mechanism, said pressure device including a first regulating mechanism for setting of the width of the overlapping gap while said spring mechanism is relaxed, and a second regulating mechanism for regulating the welding pressure said second regulating mechanism being arranged on said first regulating mechanism and being movable with said first regulating mechanism each of said regulating mechanisms having an eccentric element provided for said regulation, one of said eccentric elements comprising a hollow eccentric shaft, a regulating shaft connected with the other of said eccentric elements being located in said hollow eccentric shaft.

4,923,559

APPARATUS FOR APPLYING TAPE TO PAVEMENT

Ronald R. Kennedy, Montoursville; Michael T. Manzitti, Williamsport; Frank E. Bennett; John F. Stout, both of Montgomery, and Anthony M. Vellam, Cogan Station, all of Pa., assignors to Linear Dynamics, Inc., Montgomery, Pa.

Filed Aug. 23, 1988, Ser. No. 235,439

Int. Cl.[5] E01C *23/16*

U.S. Cl. 156—523 7 Claims

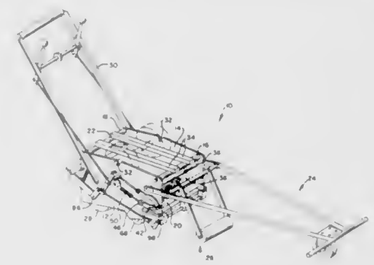
1. An apparatus for applying tape to a paved surface comprising:

a main frame having at least first and second wheel means for advancing said main frame along a paved surface to be marked;

means for rotatably carrying at least one roll of tape to be applied;

a tape applying roller mounted for pressing tape dispensed from said at least one roll of tape against the paved surface;

means for selectively advancing tape from at least one of said at least one roll of tape towards the paved surface, said tape advancing means including first and second rollers, at least one of said rollers being mounted for selective movement into engagement with the other of said rollers and means for rotating at least one of said rollers at least when said rollers are in engagement whereby a strip of tape depending between said rollers will be advanced by rotation of said at least one roller, said means for rotating at least one of said rollers comprising a ratchet and pawl assembly operatively coupled to a shaft of said roller



so as to selectively rotate said roller about the longitudinal axis thereof in one direction while prohibiting rotation in the opposite direction; and

means for cutting a strip of tape extending at least between said tape advancing means and said tape applying roller.

4,923,560

APPARATUS FOR CONNECTING SHEET-LIKE TEXTILE ARTICLES OR WEBS OF MATERIAL

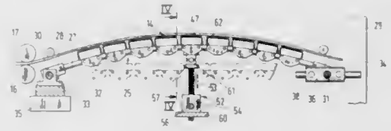
Jürgen Inselmann, Löhne, Fed. Rep. of Germany, assignor to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 254,643

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734279

Int. Cl.[5] B30B *5/06, 15/34*

U.S. Cl. 156—555 19 Claims



1. Apparatus for connecting sheet-like textile articles or webs and comprising a heating station having at least one curved heating plate, and conveyor belts between which are conveyable the sheet-like textile articles or webs to be connected, which belts are guided over the heating plate under tension, said apparatus characterized in that:

the curvature of the heating plate (**14**, **15**) is adjustable for varying a pressure force of the conveyor belts (**11**, **12**) against one another;

the heating plate (**14**, **15**) consists of individual heating elements in the form of hollow-section heating bodies (**23**) which are arranged next to one another, and the relative position of which in relation to one another is variable for varying the curvature;

the heating plate (**14**, **15**) is arranged on a supporting trestle (**25**) having a curvature which is variable: and

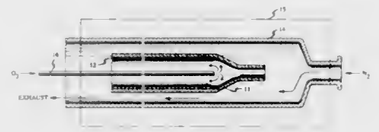
the supporting trestle (**25**) comprises two parallel longitudinal members (**26**, **27**) which are arranged at a distance from one another, on which the heating plate (**14**, **15**) rests, and which are deformable so that their curvature is thereby varied.

4,923,561

CRYSTAL GROWTH METHOD

Jim E. Chemans, Trenton, and Eric M. Monberg, Princeton, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,530
Int. Cl.[5] C30B *11/02, 35/00*
U.S. Cl. 156—616.4 18 Claims



1. A process for making large single crystals of a material comprising the steps of introducing into a boron nitride crucible a relatively small monocrystalline seed crystal of the material and a quantity of the material in polycrystalline form, heating the crucible to melt the quantity of material, and freezing the material such that at least a major part of the frozen material extends as a single crystal from the seed crystal, characterized in that;

prior to the introduction of the quantity of polycrystalline material into the crucible, essentially all of that part of the inner surface of the crucible with which the quantity of material makes contact is reacted to form a layer of boric oxide.

4,923,562

PROCESSING OF ETCHING REFRACTORY METALS

Rhett B. Jucha, Celeste, and Cecil J. Davis, Greenville, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 73,942, Jul. 16, 1987, abandoned. This application Dec. 1, 1988, Ser. No. 279,320
Int. Cl.[5] B44C *1/22*
U.S. Cl. 156—643 7 Claims



1. A method for etching refractory metals on a wafer comprising:

(a) transferring a wafer in to a vacuum processing chamber;

(b) applying a pressure to said processing chamber less than ambient to maintain said processing chamber at lessthan ambient;

(c) providing fluorine containing gas to a plasma generating chamber remote from said processing chamber and producing free radicals using microwave energy excitation of the fluorine containing gas;

(d) adding a bromine containing gas and a resist selectivity enhancement gas to said free radicals to form a gas mixture;

(e) flowing the gas mixture over said wafer disposed within said processing chamber; and

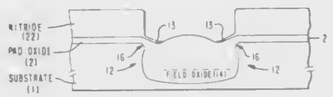
(f) etching said refractory metal layer.

4,923,563

SEMICONDUCTOR FIELD OXIDE FORMATION PROCESS USING A SEALING SIDEWALL OF CONSUMABLE NITRIDE

Steven S. Lee, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 61,923, Jun. 15, 1987, abandoned. This application May 22, 1989, Ser. No. 356,591
Int. Cl.[5] B05D *5/12;* H01L *21/306*
U.S. Cl. 156—649 8 Claims



1. A process for forming field oxide regions between active regions in a semiconductor substrate, comprising the steps of:

forming over the substrate active regions a pad oxide layer;

forming over the pad oxide layer a first silicon nitride layer to a thickness in the range of 100 nm or greater;

anisotropically etching in the presence of a photoresist mask through the first nitride layer, the pad oxide layer, and into the substrate to define field oxide regions with substantially vertical sidewalls;

forming a conformal second silicon nitride layer, over the patterned structure of the substrate and layers including the substantially vertical sidewalls, to a nominal thickness of 10–13 nm;

anisotropically etching the horizontally disposed surfaces of the second silicon nitride layer to expose selected horizontally disposed surfaces of the substrate, while retaining second silicon nitride on the substantially vertical sidewalls of a thickness so that it will be consumed and converted to silicon dioxide when the substrate is oxidized to lift said retained sidewall silicon nitride;

oxidizing the exposed substrate and second silicon nitride in a proportion to effectuate concurrent oxidation and lifting and bending, beginning at the low edge of the retained sidewall silicon nitride;

continuing the oxidation of the substrate and the lifting of the sidewall silicon nitride until the upper surface of the oxidized substrate approximates the level of the pad oxide layer by the sidewall silicon nitride being consumed and converted in to silicon dioxide; and

removing the remaining silicon nitride.

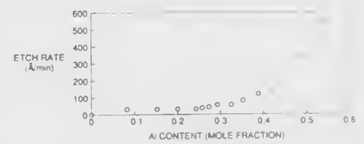
4,923,564

SELECTIVE ETCHING PROCESS

Jaya Bilakanti, Teaneck, and Edward J. Laskowski, Scotch Plains, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Aug. 24, 1989, Ser. No. 398,116
Int. Cl.[5] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—655 9 Claims

1. A process for fabricating a device, said device comprising an aluminum containing III-V semiconducting compound comprising the step of etching said aluminum-containing III-V semiconductor compound in an etching solution characterized in that the etching solution comprises dichromate ion in an acidic aqueous solution in which the acid is selected from the group consisting of sulfuric acid and phosphoric acid.



4,923,565

METHOD FOR TREATING A PAPER PULP WITH AN ENZYME SOLUTION

Jean-Luc Fuentes, Villenave d'Ornon, and Michel Robert, Lacanau, both of France, assignors to La Cellulose Du Pin, Bordeaux, France

Filed Sep. 22, 1987, Ser. No. 99,786
Claims priority, application France, Sep. 22, 1986, 86 13208
Int. Cl.[5] D21C *3/00*
U.S. Cl. 162—72 2 Claims

1. A method for treating a papermaking pulp with an enzyme preparation, comprising treating a homogeneous aqueous suspension of said papermaking pulp having a Schopper-Riegler degree (SR) determined in accordance with standard NFQ 50 003 of at least equal to 25 prior to treatment with an enzyme preparation introduced at a concentration of 0.01% to 2% by weight in relation to the total weight of dry papermaking pulp, with the indicated percentages corresponding to an enzyme preparation in powder form having a C_1 activity (highly pure microcrystalline cellulose) of 0.168 USI/mg of powder, a C_x activity (carboxymethylcellulose) of 3.91 USI/mg of powder and a xylanase activity of 31 USI/mg of powder, to obtain a lowering of the SR degree and improve the suspension's drainability.

4,923,566

METHOD OF PACIFYING STICKIES IN PAPER

Shamel M. Shawki, Mississauga, and Richard N. Van Oss, Bramalea, both of Canada, assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 26, 1989, Ser. No. 343,614
Claims priority, application Canada, Jul. 19, 1988, 572380
Int. Cl.[5] D21H *19/10*
U.S. Cl. 162—135 7 Claims

1. In a paper making process in which paper furnish including recycled fibre is passed over drying rolls, the improvement for the purpose of pacifying stickies in the paper product, which comprises applying to the paper between the drying rolls and the finished produce reel an aqueous solution of urea, the amount of urea applied being such that the paper product bears a coating surface of urea in an amount between 0.1 g/m^2 and 2.0 g/m^2 of paper surface.

4,923,567

GUIDING AN END CONDUCTION STRIP OF A WEB FORWARDLY FROM A ROLL

Allan Liedes, Palokka; Heikki Ilvespää, and Olavi Viitanen, both of Jyväskylä, all of Finland, assignors to Valmet Paper Machinery Inc, Finland

Filed Jan. 10, 1989, Ser. No. 295,292
Claims priority, application Finland, Jan. 26, 1988, 880350
Int. Cl.[5] D21F *7/00*
U.S. Cl. 162—193 29 Claims

1. Method for guiding an end conduction strip from a roll and aiming the end conduction strip towards a desired location, comprising the combination of steps of

directing a first gas jet having sufficient impulse and sharpness against the end conduction strip on a surface of the roll, whereby the end conduction strip is detached from the roll surface,

cutting off the end conduction strip from a remainder of a web with the first gas jet and detaching a leading edge of said strip off the roll surface, and

directing a second transfer blowing action along a guide plate to generate an under-pressure field in conjunction with the guide plate, whereby the thus-detached end conduction strip is guided in a direction determined by the guide plate, wherein the first gas jet is directed against the surface at substantially right angles to a tangent thereof, and at a location after the detaching point of the end conduction strip off the roll surface,

orienting said second transfer blowing action, at least to some extent, against a direction in which the end conduction strip arrives from the roll,

directing the first gas jet and the second transfer blowing action both from the same side of a web being led by the end conduction strip, and

directing the first gas jet and the second transfer blowing action to be initially substantially perpendicular to one another in a radial plane of the roll.



14. Apparatus for guiding an end conduction strip from a roll and towards a desired location, comprising the combination of

a roll from which the end conduction strip is being detached,

first blow nozzle means for directing a first gas jet at a surface of the roll from which the end conduction strip is being detached, substantially against the roll surface,

said first blow nozzle means being situated to direct the first gas jet substantially perpendicularly to a tangent of the roll surface,

second blow nozzle means for directing a second transfer blowing action to guide the end conduction strip to the desired location after detachment off the roll, and

a guide plate oriented to commence substantially adjacent to said second blow nozzle means and extend substantially in a direction the end conduction strip is to be guided from the roll surface, said second blow nozzle means are oriented to direct said second transfer blowing action, at least to some extent, against a direction in which the end conduction strip arrives from the roll,

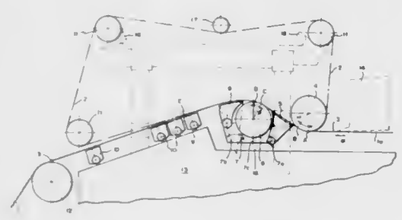
said first and second blow nozzle means are situated adjacent one another on the same side of a web being led by the end conduction strip, and arranged such that said first gas jet and said second transfer blowing action issuing respectively from said first and second blow nozzle means are substantially perpendicular to one another in a radial plane of the roll.

4,923,568

DEWATERING ZONE IN A PAPERMACHINE

Erkki Hietikko, and Ilpo Kylmäkorpi, both of Tampere, Finland, assignors to Oy Tampella Ab, Tampere, Finland

Filed Jul. 6, 1988, Ser. No. 215,849
Claims priority, application Finland, Jul. 9, 1987, 873034
Int. Cl.[5] D21F *1/00*
U.S. Cl. 162—301 11 Claims



1. A two-wire papermaking machine having a joint dewatering zone formed by a joint wire run of a first wire loop and a second wire loop, the first wire loop forming a single-wire initial portion preceding said dewatering zone, said dewatering zone comprising:

a first forming roll situated outside the second wire loop where the join wire run begins; and

dewatering members situated, in the direction of travel of the wires, after said first forming roll and inside the first wire loop and in contact with the first wire, said dewatering members in said first loop including at least:

a first suction box having means for providing a predetermined pressure; a second suction box located after said first suction box in the direction of travel of the wires and having means for providing a predetermined pressure;

a second forming roll interposed between said suction boxes;

means for defining a substantially closed chamber inside the first wire loop around the second forming roll and at least one of the suction boxes, said chamber opening onto the face of the first wire loop being in contact with the second forming roll; and

means for adjusting the pressure in said chamber independently of the pressures within said suction boxes.

4,923,569

HYDRAULIC HEADBOX WITH AIR ATTENUATION CHAMBER LOCATED UNDER THE STOCK FLOW ROUTE

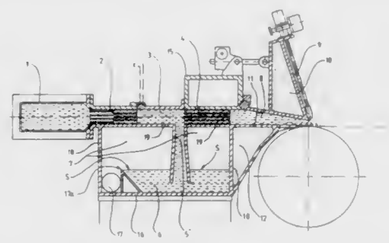
Tapani Nyman; Vesa Rommi, both of Karhula, and Kai Wikman, Virkkala, all of Finland, assignors to Valmet-Ahlstrom, Inc., Karhula, Finland

Filed May 8, 1989, Ser. No. 348,531
Claims priority, application Finland, May 27, 1988, 882513
Int. Cl.[5] D21F *1/02*
U.S. Cl. 162—339 9 Claims

1. A hydraulic headbox comprising:

means defining a stock suspension flow route, said means including, in sequence, an inlet header, a manifold tube section, an equalizing chamber, a turbulence generator and a tapered slice section for dispensing the stock suspension onto a wire;

said headbox further comprising an attenuation chamber for attenuating pressure variations in said stock suspension, said attenuation chamber located subjacent and intermediate the inlet header and tapered slice section of the flow route and including a connecting channel extending from said flow route to an inlet in a lower portion of said chamber, below a level of stock suspension in said chamber to thereby form an air space in said chamber above said level,



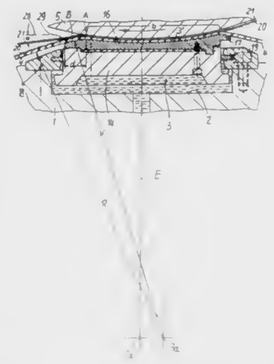
said attenuation chamber further including an outlet in said lower portion.

4,923,570

LONG NIP PRESS ROLL ARRANGEMENT

Karl Steiner, Herbrechtingen; Andreas Schütte, Steinheim, and Hans Flämig, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 328,171
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 3808293
Int. Cl.[5] D21F *3/02*
U.S. Cl. 162—358 20 Claims



1. A long nip press roll arrangement in a machine for manufacturing fibrous material including paper and cardboard, for removing water from a traveling fiber web, the long nip press roll arrangement comprising:

a stationary support beam extending through the roll and across the travel direction of the web;

a flexible tubular press shell around the support beam and being movable therearound on an at least approximately circular path, the press shell extending across the travel direction of the web;

a backing roll having a substantially convex curvature;

means on the exterior of the support beam inside the press shell for supporting a press shoe; a radially displaceable press shoe supported at the press shoe support means on the beam, and means in the beam for acting upon the press shoe for urging the press shoe radially outwardly to press against the press shell toward the backing roll;

the press shoe having a concavely curved support surface concavely curved generally according to the convex curvature of the backing roll so that the concave surface of the press shoe being urged against the press shell and the press shell in turn being urged toward the backing roll, an elongate press nip is formed between the press shell and the backing roll;

a single felt dewatering belt which travels through the press nip together with the web;

the press shoe having a substantially convexly curved guide surface formed thereon and facing toward the press shell and located past the elongate press nip in the travel direction of the web; means for guiding the felt belt after it travels through the press nip together with the web and the press shell, so that the felt belt travels over at least a substantial part of the convexly curved guide surface of the press shoe; and

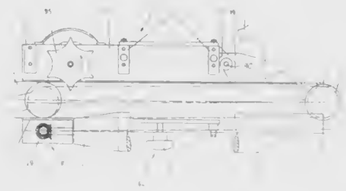
means for guiding the web to pass through the press nip between the felt belt and the press shell and directly in contact with the press shell.

4,923,571

APPARATUS FOR SPACING APART CONTAINERS THAT ARE CONVEYED CLOSE TO EACH OTHER IN A SINGLE LANE

Hermann Kronseder, Regensburgerstrasse 42, D-8404 Worth-/Donau, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,537
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1987, 8714646[U]
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—459 16 Claims



1. Apparatus for changing the spacing between containers being conveyed in a single lane, comprising:

a first conveyor driven longitudinally in a generally horizontal plane for conveying said containers in said single lane,

a screw conveyor arranged adjacent said first conveyor to be driven rotationally about a horizontal axis for engaging the containers from one side to advance them longitudinally,

means mounting said screw conveyor for pivotal movement about an axis perpendicular to said horizontal axis to set the angle of said horizontal axis relative to said first conveyor and means for securing said screw conveyor at the angle in which it is set,

guide rail means extending along said screw conveyor on a side opposite of said one side of the first conveyor to retain said containers in the groove of the screw conveyor and to maintain the center points of containers of different sizes on the same line when they are discharged from said screw conveyor,

carriage means for supporting said guide rail means and means for supporting said carriage means for generally transverse adjustment to selectively alter the distance and angle of the guide rail means relative to the first conveyor,

at least one stop element on said carriage means, and

a movable member adjustable crosswise of the direction of adjustment of said carriage means and a plurality of stop units mounted on said member and extending from said member by various amounts,

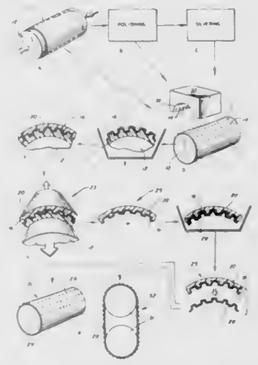
adjustment of said member positioning a selected one of said stop units in the path of said stop element to control the position of said guide rail means.

4,923,572

IMAGE TRANSFER TOOL

John Watkins, Independence; Ramon Magee, Blue Springs, and Arthur Doerflinger, Kansas City, all of Mo., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed Sep. 29, 1988, Ser. No. 251,174
Int. Cl.[5] C25D *1/10*
U.S. Cl. 204—6 15 Claims



1. A method of producing a generally cylindrical embossing tool which can be used for embossing a web or sheet of material in a continuous manner which comprises imparting an image or pattern onto a seamless embossable material maintained generally in the form of a cylinder, forming from the imaged embossable material an electroform in generally cylindrical form corresponding to the image or pattern, and supporting the electroform on a carrier.

4,923,573

METHOD FOR THE ELECTRO-DEPOSITION OF A ZINC-NICKEL ALLOY COATING ON A STEEL BAND

Theodor Florian, Melsbach, Fed. Rep. of Germany, assignor to Rasselstein AG, Neuwied, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 343,528
Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816419
Int. Cl.[5] C25D *3/56, 7/06*
U.S. Cl. 204—28 12 Claims

1. A method for the electro-deposition of a zinc-nickel alloy coating on a steel band in an electrolyte containing Zn^{2+} and Ni^{2+} ions at a current density of at least 10 A/dm^2 comprising the steps of:

(1) adjusting the chloride content of the electrolyte to less than 300 mg/l;

(2) passing the steel band through a plating tank containing said electrolyte and at least one metal anode consisting of electrolytic nickel having a nickel content of at least 99.5%;

(3) depositing a zinc-nickel alloy coating on said steel band from said electrolyte in said plating tank thereby depleting the content of Zn^{2+} and Ni^{2+} ions in said electrolyte;

(4) providing a regeneration tank in fluid communication with said plating tank, said regeneration tank containing at least one zinc anode and one nickel anode;

(5) removing said depleted electrolyte from said plating tank and introducing it into said regeneration tank;

(6) replenishing said depleted electrolyte in said regeneration

tank by galvanic dissolution of said at least one zinc anode and one nickel anode; and

(7) reintroducing said replenished electrolyte into said plating tank.

4,923,574

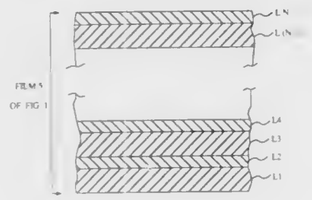
METHOD FOR MAKING A RECORD MEMBER WITH A METALLIC ANTIFRICTION OVERCOAT

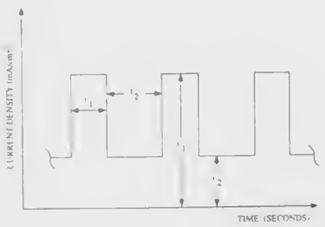
Uri Cohen, 765 San Antonio Rd., Unit 53, Palo Alto, Calif. 94303

Continuation of Ser. No. 61,512, May 15, 1987, abandoned, which is a division of Ser. No. 747,612, Jun. 21, 1985, Pat. No. 4,678,722, which is a continuation-in-part of Ser. No. 670,135, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 405,062, Aug. 4, 1982, abandoned. This application Jun. 16, 1989, Ser. No. 368,119

Int. Cl.[5] C25D *5/10, 3/56, 3/64;* G11B *5/84*

U.S. Cl. 204—40 40 Claims





1. A method of forming a magnetic recording member comprising the step of:

forming an antifriction overcoat over a magnetic film for presenting a soft, low friction metallic surface for contacting a head member, said overcoat having a thickness less than 10,000 Å and comprising an alloy of silver and one or more of the following metals: cadmium, indium, tin, lead; said overcoat being formed so that it has a hardness less than 250 kg/mm^2.

4,923,575

AQUEOUS ALKALINE BATH AND PROCESS FOR ELECTRODEPOSITION OF A ZINC-IRON ALLOY

Günter Voss; Martin Kunjoweit, and Wolfgang Richter, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 364,610

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1988, 3819892

Int. Cl.[5] C25D *3/56*

U.S. Cl. 204—44.2 15 Claims

1. In an aqueous alkaline bath for electrochemical deposition of a Zinc-Iron alloy containing a zincate. and an iron compound as essential constituents, the improvement wherein said iron compound comprises a compound of iron with a sugar.

4,923,576

ADDITIVES FOR ELECTROPLATING COMPOSITIONS AND METHODS FOR THEIR USE

Harry Kroll, East Greenwich; Florence Butler, Smithfield, and Therese R. Souza, Cranston, all of R.I., assignors to Technic, Inc., Cranston, R.I.

Filed Jul. 6, 1988, Ser. No. 215,749

Int. Cl.[5] C25D *3/56, 3/60*

U.S. Cl. 204—44.4 20 Claims

1. An electroplating bath comprising water-soluble tin and lead salts and an amount of a deposit regulating agent effective to improve electrodeposit consistency, said deposit regulating agent being selected from the group consisting of phenanthrolines, guinolines, pyridyl compounds, and combinations of the foregoing.

4,923,577

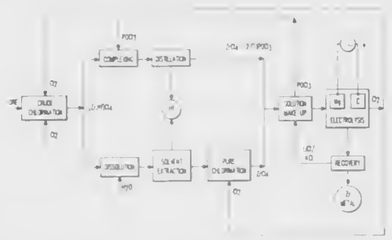
ELECTROCHEMICAL-METALLOTHERMIC REDUCTION OF ZIRCONIUM IN MOLTEN SALT SOLUTIONS

David F. McLaughlin, Oakmont, and Francis Talko, North Huntingdon Twp., Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1988, Ser. No. 242,564

Int. Cl.[5] C25C *3/26*

U.S. Cl. 204—64 T 4 Claims



1. In a method for separating hafnium from zirconium of the type wherein a feed containing zirconium and hafnium chlorides is prepared from zirconium-hafnium chloride and the feed is introduced into a distillation column, which distillation column has a reboiler connected at the bottom and a reflux condenser connected at the top and wherein a hafnium chloride enriched stream is taken from the top of the column and a zirconium enriched chloride stream is taken from the bottom of the column, wherein the improvement comprises:

reducing said zirconium enriched chloride stream taken from said distillation column to metal by electrochemically reducing an alkaline earth metal in a molten salt bath with the molten salt in said molten salt bath consisting essentially of a mixture of at least one alkali metal chloride and at least one alkaline earth metal chloride and zirconium chloride, with the reduced alkaline earth metal reacting with said zirconium chloride to produce zirconium metal and alkaline earth metal chloride.

4,923,578

GRAPHITE COMPOSITES AND PROCESS FOR THE MANUFACTURE THEREOF

Kenneth C. Benton, Macedonia; David A. Pierman, Cleveland, and Joseph R. Fox, Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 106,642, Oct. 8, 1989, Pat. No. 4,857,395. This application Jul. 3, 1989, Ser. No. 375,197

Int. Cl.[5] C25D *5/00*

U.S. Cl. 204—130 23 Claims

1. A process for the manufacture of graphite composites comprising the steps of:

infiltrating a porous graphite structure with a material selected from the group consisting of glass precursors and ceramic precursors; and

subsequently converting said precursor to a glass or a ceramic respectively.

4,923,579

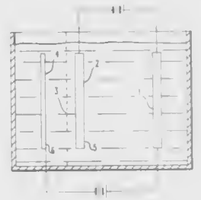
ELECTROCHEMICAL PROCESS FOR ZIRCONIUM ALLOY RECYCLING

Thomas S. Snyder, Oakmont; Richard A. Stoltz, Murrysville, and David Zuckerbrod, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1988, Ser. No. 242,573

Int. Cl.[5] C25F *5/00*

U.S. Cl. 204—140 8 Claims



1. A method of separating nickel from zirconium for recycling nickel-containing zirconium alloy, said method comprising:

a. placing said nickel-containing zirconium in a molten salt bath at 500° to about 722° C. with the molten salt in said molten salt bath consisting essentially of a mixture of 0 to about 46.5 mole % lithium fluoride, about 11.5 to about 40 mole % sodium fluoride and potassium fluoride to produce a molten salt bath containing dissolved zirconium and dissolved nickel;

b. electrochemically plating said nickel from said molten salt bath at a voltage sufficient to plate nickel but less than the voltage to plate zirconium to provide an essentially nickel-free molten salt bath; and

c. electrochemically plating said zirconium from said essentially nickel-free molten salt bath to provide an essentially nickel-free zirconium.

4,923,580

BROMINATION

Philip J. Turner, Cheshire, England; Martin Jeff, Houston, Tex., and Kevan M. Reeve, Cheshire, England, assignors to Interox Chemicals Limited, London, England

Filed Mar. 20, 1989, Ser. No. 326,065

Claims priority, application United Kingdom, Mar. 19, 1988, 8806582

Int. Cl.[5] B01J *19/08*

U.S. Cl. 204—157.97 13 Claims

1. A process for the production of a dibrominated alkylbenzene product from an alkylbenzene substrate in which process in step (a) a dilute solution of the substrate in a non-reactive organic solvent is agitated with an aqueous phase containing over 2.5 moles of hydrogen bromide per mole of substrate and in step (b) (i) hydrogen peroxide which generates bromine from the hydrogen bromide, is introduced progressively and in a controlled manner into the mixture obtained in step (a) in a mole ratio to the substrate of about 2.8:1 or higher, and (ii) the mixture is maintained at a temperature in the range of about 20° to 80° C. and irradiated with light that is able to dissociate the bromine into free radicals, until no substrate is detectable and no more than a minor proportion of monobrominated substrate remains.

4,923,581

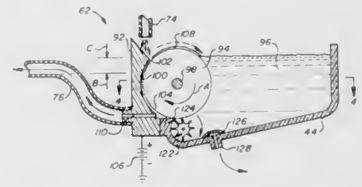
TONER RECYCLING BY COUNTERFLOW

Gene F. Day, Hillsborough, Calif., assignor to Precision Image Corporation, Redwood City, Calif.

Filed Nov. 28, 1988, Ser. No. 277,121

Int. Cl.[5] B03C *5/02*

U.S. Cl. 204—180.1 17 Claims



13. A method of separating charge-bearing solid pigment particles from a liquid toner comprising,

introducing and maintaining a flow of liquid toner from an upstream end and toward a downstream end of a channel formed between an electrode and a particle-accumulating surface, said liquid toner having charge-bearing solid pigment particles dispersed in a fluid dispersant,

moving said particle-accumulating surface past said electrode at a selected velocity in an upstream direction opposed to said flow of liquid toner,

electrically biasing said electrode to repel said pigment particles so as to leave a stream of substantially particle-free fluid dispersant flowing through said channel adjacent to said electrode, said pigment particles thereby forming a pigment particle rich slime proximate to said particle-accumulating surface, said velocity selected to cause said slime to collect on said particle-accumulating surface moving upstream relative to said dispersant flow, thereby leaving substantially particle-free fluid dispersant at the downstream end of said channel,

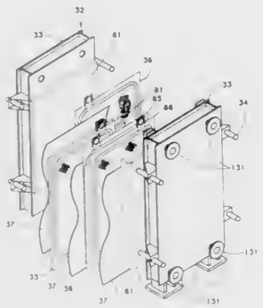
removing said substantially particle-free fluid dispersant from said downstream end, and

removing said pigment particle-containing slime from said particle-accumulating surface after said movement past said electrode, said removing of said pigment particles being performed within a storage tank for said pigment particles.

4,923,582
MONOPOLAR, BIPOLAR AND/OR HYBRID MEMBERANE CELL

Donald W. Abrahamson, Painesville; Marilyn J. Harney, Concord; Elvin W. Vauss, Jr., Cleveland; Andrew J. Niksa, Concord, and James J. Stewart, Chardon, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 841,486, Mar. 19, 1986, Pat. No. 4,738,763, which is a continuation of Ser. No. 558,850, Dec. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 529,691, Sep. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 453,573, Dec. 27, 1982, abandoned. This application Feb. 29, 1988, Ser. No. 161,921
Int. Cl.[5] C25B *9/00, 11/00*
U.S. Cl. 204—255 16 Claims

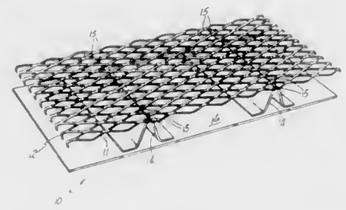


1. A filter press electrolyzer comprising bulkheads, at least one electrolytic cell having an anode electrode assembly and a cathode electrode assembly and an ion-exchange membrane resiliently engaged therebetween, said electrode assemblies having electrode active areas and back plates of electrically conductive material forming at least a portion of an electrolyte compartment, said cell including sealing means and means for introducing and removing fluids and electrical energy, wherein
(a) said back plates of the electrode assemblies are formed of electrically conductive material,
(b) said electrical energy is passed between two adjacent back plates of adjacent cells and between the back plate of an end cell and a bulkhead via current distributor members through mechanical contact joints involving only low pressure connection, said contact joints being at least substantially as large as the dimensions of the electrode active areas, and being separated from cell electrolyte by the back plates and being located outside the adjacent cells, and
(c) at least some of said electrode assemblies include spring compression members extending between said back plates and the active electrode areas, and wherein
(d) said current distributor members protrude past the side of adjacent cells on at least one side and provide structural support for said cells.

4,923,583
ELECTRODE ELEMENTS FOR FILTER PRESS MEMBRANE ELECTROLYTIC CELLS

Kenneth E. Woodard, Jr., Cleveland, Tenn.; Julius C. Fister, Jr., Hamden, Conn.; David L. Fair, Cheshire, Conn., and Robert A. Dean, Guilford, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Nov. 4, 1985, Ser. No. 795,013
Int. Cl.[5] C25B *11/02*
U.S. Cl. 204—286 33 Claims

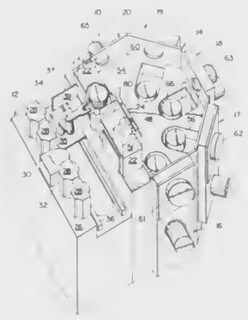


20. An electrode for an electrolytic cell, comprising:
(a) an electrode surface;
(b) a backplate;
(c) a plurality of conducting elements joined to the electrode surface and the backplate for conducting electrical energy from the backplate to the electrode surface; and
(d) a conducting plate bonded to the backplate by applying an adhesive to the backplate or the conducting plate and mating the conducting plate to the backplate.

4,923,584
SEALING APPARATUS FOR A VACUUM PROCESSING SYSTEM

Robert B. Bramhall, Jr., Gloucester; Richard M. Cloutier, Salisbury; Albert P. Laber, Revere, and Richard S. Muka, Topsfield, all of Mass., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 31, 1988, Ser. No. 264,592
Int. Cl.[5] C23C *16/00*
U.S. Cl. 204—298.25 15 Claims

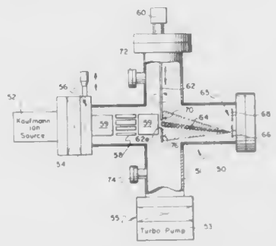


1. An apparatus for the vacuum processing of semiconductor wafers comprising a first chamber; a second chamber adjacent the first chamber; a wall separating said first chamber from said second chamber, said wall having an aperture formed therein providing communication between said first and second chambers; and a valve element engageable with said wall over said aperture and being operable to selectively open and close communication between said first and second chambers: means applying a closing force to said valve element against said wall, said force applying means comprising a ramp element fixed to said valve element; and clamp means acting against said ramp element, said clamp means including a contact element movable along said ramp in a direction wherein said contact element is operable to apply an increasing closing force component to said valve element as said contact element moves along said ramp element, and means for moving said contact element along said ramp element.

4,923,585
SPUTTER DEPOSITION FOR MULTI-COMPONENT THIN FILMS

Alan R. Krauss, Plainfield, Ill., and Orlando Auciello, Cary, N.C., assignors to Arch Development Corporation, Argonne, Ill.

Filed Nov. 2, 1988, Ser. No. 266,196
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—298.04 20 Claims



1. Apparatus for the deposition of a thin film on a substrate by sequential beam-induced desorption from multiple targets, on a substrate wherein atoms of each of said targets are deposited in a layer having a predetermined thickness in a cyclic manner until a desired thickness of said film is deposited, said apparatus comprising:
beam generating means for providing a single, fixed energetic beam;
a plurality of targets each comprised of a selected composition;
displacement means coupled to said beam generating means or to each of said targets for sequentially aligning said beam with each of said targets, whereupon atoms of a target which is aligned with said beam are desorbed from said target and are deposited on the substrate;
detection means responsive to the atoms deposited on the substrate for comparing the thickness of a layer of the thus deposited atoms with said predetermined thickness;
control means coupled to said detection means and to said displacement means for removing said one of said targets from alignment with said beam and for aligning another one of said targets with said beam when the thickness of the layer of the thus deposited atoms equals said predetermined thickness for permitting atoms of said another one of said targets to be deposited on the substrate; and
support means for supporting said substrate and said detection means in a spaced manner such that said beam is directed intermediate said substrate and said detection means and is incident generally normal upon the targets such that the atoms of a target aligned with said beam are desorbed from the target and directed back toward said support means and onto said substrate and said detection means, and wherein said substrate and said detection means are disposed symmetrically on opposed sides of said beam.

4,923,586
ENZYME ELECTRODE UNIT

Hideo Katayama, Kusatsu; Yoshiaki Yoshida, Ikoma, and Tatsuhiko Osaka, Kurita, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 176,281, Mar. 31, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 407,672
Claims priority, application Japan, Mar. 31, 1987, 62-80431; Mar. 31, 1987, 62-80433
Int. Cl.[5] C12M *1/34*
U.S. Cl. 204—403 13 Claims

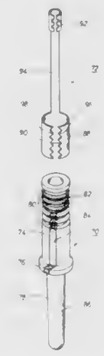


1. An enzyme electrode unit, comprising:
an enzyme-immobilized membrane;
a first diffusion-limiting membrane having a first target substance diffusion limiting effect, said first membrane being secured to the surface of said enzyme-immobilized membrane;
a second diffusion-limiting membrane having a target substance diffusion limiting effect which is lower than said first target substance diffusion limiting effect;
first holding means for holding in place said first diffusion-limiting membrane and said enzyme-immobilized membrane; and
second holding means for holding said second diffusion-limiting membrane in a releasably disposed manner on a surface of said first diffusion-limiting membrane

4,923,587
TERMINAL FIXING STRUCTURE FOR A CERAMIC BASE

Hisaharu Nishio, Tokai, and Hiromichi Hayashi, Nagoya, both of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jun. 15, 1989, Ser. No. 366,390
Int. Cl.[5] G01N *27/26;* H01R *13/428*
U.S. Cl. 204—424 6 Claims



1. An oxygen sensor comprising:

a cylindrical ceramic base with a conductive contact on the side,
a metal terminal with a pair of resilient arms for fastening the side of the ceramic base and for conductively engaging the conductive contact, and
an oxygen detection element with electrodes comprising an electrode connected to the conductive contact;
in which the ceramic base has at least one engaging receptor on the side and each of side arms has at least one engaging portion for engaging with the engaging receptor.

4,923,588

WAX ISOMERIZATION USING SMALL PARTICLE LOW FLUORIDE CONTENT CATALYSTS

Ian A. Cody, Clearwater, and David L. Brown, Ontario, both of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 16, 1988, Ser. No. 285,462
Int. Cl.[5] C10G *69/02*
U.S. Cl. 208—27 11 Claims

1. A method for the isomerization of waxes into liquid hydrocarbons comprising passing the wax to be isomerized in the presence of hydrogen and under isomerization conditions over an isomerization catalyst comprising a noble Group VIII metal on small particle size, fluorided, refractory metal oxide wherein the catalyst possesses a fluoride content in the range of 0.1 to up to but less than 2.0 wt % and the small particle size refractory metal oxide has a particle diameter of less than 1/16 inch.

4,923,589

PROCESS FOR REFORMING NEPHTHENE AND PARAFFIN-CONTAINING HYDROCARBONS IN THE NAPHTHA BOILING RANGE AND ISOMERIZING C5-C6 NORMAL PARAFFIN FEEDSTOCK TO PRODUCE A HIGH OCTANE GASOLINE

Milton H. Dalson, La Palma, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 24, 1987, Ser. No. 42,071
Int. Cl.[5] C10G *35/04;* C07C *5/13*
U.S. Cl. 208—66 8 Claims



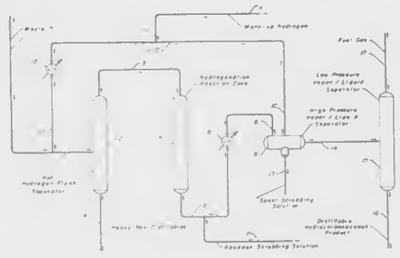
1. In a process for reforming a naphthenic and paraffin-containing hydrocarbon feedstock to produce a reformate product having an increased octane rating by contacting said feedstock with a reforming catalyst in the presence of hydrogen at reforming conditions in a reforming zone, said reforming zone including a naphtha dehydrogenation zone and a paraffin dehydrocyclization zone wherein heated, pressurized hydrogen is added to the effluent stream from said naphtha dehydrogenation zone prior to charging said effluent stream to said paraffin dehydrocyclization zone to produce a first product stream comprising a gasoline range reformate product having an RON octane rating of at least about 90 and hydrogen wherein said reformate product is separated from said hydrogen in a reformate separation zone, an improvement comprising: charging at least a portion of said heated, pressurized hydrogen with a C_5–C_6 n-paraffin feedstock to an isomerization zone containing an isomerization catalyst at isomerization conditions to produce a second product stream containing an isomerized C_5–C_6 product and passing said second product stream to said reformate separation zone and recovering at least a major portion of said isomerized C_5–C_6 product with said reformate product.

4,923,590

PROCESS FOR TREATING A TEMPERATURE-SENSITIVE HYDROCARBONACEOUS STREAM CONTAINING A NON-DISTILLABLE COMPONENT TO PRODUCE A HYDROGENATED DISTILLABLE HYDROCARBONACEOUS PRODUCT

Tom N. Kalnes, La Grange, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 84,954, Aug. 13, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 302,518
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] C10G *65/04*
U.S. Cl. 208—85 32 Claims



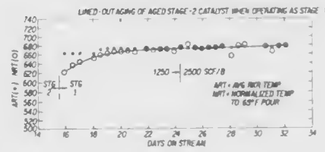
21. A process for treating a temperature-sensitive hydrocarbonaceous stream containing a non-distillable component to produce a hydrogenated distillable hydrocarbonaceous product and a heavy product comprising said non-distillable component while minimizing thermal degradation of said hydrocarbonaceous stream which process comprises the steps of:
(a) contacting said hydrocarbonaceous stream with a first hydrogen-rich gaseous stream having a temperature greater than said hydrocarbonaceous stream in a flash zone at flash conditions thereby increasing the temperature of said hydrocarbonaceous stream with minimal degradation and vaporizing at least a portion thereof to provide a hydrocarbonaceous vapor stream comprising hydrogen and a heavy product comprising said non-distillable component;
(b) contacting said hydrocarbonaceous vapor stream comprising hydrogen recovered from step (a) without intermediate separation with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation conditions to simultaneously increase the hydrogen content of the hydrocarbonaceous compounds contained in said hydrocarbonaceous vapor stream and to generate at least one water-soluble inorganic compound produced from the reaction of said hydrocarbonaceous compounds and said hydrogen;
(c) contacting the resulting effluent from said hydrogenation zone containing hydrogenated hydrocarbonaceous compounds and at least one water-soluble inorganic compound with a fresh aqueous scrubbing solution;
(d) introducing a resulting admixture of said effluent from said hydrogenation zone and said aqueous scrubbing solution into a separation zone to provide a second hydrogen-rich gaseous stream, a first liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds and a spent aqueous scrubbing solution containing at least a portion of said water-soluble inorganic compound; and
(e) separating said first liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds to provide a second hydrocarbonaceous vapor stream comprising normally gaseous hydrocarbons and a normally liquid hydrogenated distillable hydrocarbonaceous product.

4,923,591

CONTINUOUS LUBRICATING OIL DEWAXING PROCESS

Kenneth R. Graziani, Woodbury; James R. Katzer, Moorestown, and Chwan P. Kyan, Manuta, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1988, Ser. No. 140,452
Int. Cl.[5] C10G *45/18*
U.S. Cl. 208—111 10 Claims



1. A continuous process for catalytically dewaxing a hydrocarbon feedstock wherein a countercurrent flow of catalyst and oil is obtained comprising:
(a) assembling a plurality of dewaxing reactors in series, operating under dewaxing conditions;
(b) charging a first reactor, being last in the series, with hydrogen gas, hydrocarbon feedstock and first charge of a dewaxing catalyst;
(c) withdrawing a partially dewaxed hydrocarbon feedstock and unreacted hydrogen gas from the first reactor;
(d) charging a second reactor, being second in series, with the partially dewaxed hydrocarbon feedstock and unreacted hydrogen gas and a second charge of dewaxing catalyst to produce a product having a reduced pour point relative to the hydrocarbon feedstock; and
(e) withdrawing the product having a reduced pour point, wherein said first charge of catalyst is supplied from the second reactor so that catalyst which dewaxes the harder to dewax components and which has undergone concave upward aging is moved to a position to conduct easier dewaxing and to undergo line-out aging, and the second charge of dewaxing catalyst is fresh catalyst.

4,923,592

NICKEL-CONTAINING HYDROCRACKING CATALYST AND PROCESS

Suheil F. Abdo, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 81,472, Aug. 4, 1987, Pat. No. 4,816,538, which is a continuation-in-part of Ser. No. 74,294, Jul. 16, 1987, Pat. No. 4,827,076. This application Dec. 5, 1988, Ser. No. 279,780
Int. Cl.[5] C10G *13/02*
U.S. Cl. 208—111 19 Claims

1. A hydrocarbon conversion process which comprises contacting a hydrocarbon feedstock containing a hydrocarbon compound under hydrocarbon conversion conditions including a temperature from about 50° F. to about 1,000° F., a pressure from atmospheric to about 4,000 p.s.i.g., and a liquid hourly space velocity of about 0.05 to about 25 with a hydrocarbon conversion catalyst comprising a hydrogenation metal component consisting essentially of greater than 13 weight percent of nickel components, calculated as NiO, in combination with a cracking component, said cracking components being a silica-alumina or a crystalline molecular sieve selected from the group consisting of zeolitic molecular sieves, silicoaluminophosphates, alumino-phosphates, ferrosilicates and titanium aluminosilicates and wherein said conditions produce a hydrocarbon product containing at least one chemically-changed derivative form of said hydrocarbon compound in said feedstock.

4,923,593

CRACKING CATALYST AND CATALYTIC CRACKING PROCESS

Christian Marcilly, Houilles; Jean-Marie Deves, Rueil Malmaison, and Michel Bourgogne, Sainte Adresse, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 19, 1989, Ser. No. 299,167
Claims priority, application France, Jan. 21, 1988, 88 00763; Mar. 4, 1988, 88 02903
Int. Cl.[5] C10G *11/18*
U.S. Cl. 208—113 7 Claims

1. A fluid catalytic cracking process for a hydrocarbon charge, in an extended tubular essentially vertical zone, catalyst particles being introduced at one end of the extended zone, a charge being introduced into the extended zone at a level B downstream from the level at which catalytic particles are admitted, whereby cracking of the charge takes place, said catalytic particles being separated from the reaction effluent at the other end of the extended zone, the reaction effluent then being fractionated to obtain fractions comprising liquefied petroleum gas, a gasoline, a light cycle oil, and a heavy cycle oil, wherein in said process a gasoline is injected into the extended zone at an intermediate level C between the level at which catalytic particles are admitted and the level B at which the charge is admitted, said gasoline representing 5 to 50% by volume of the charge, whereby cracking of the gasoline takes place; and said catalyst particles are comprised of by weight:
(a) 20 to 95% of a matrix,
(b) 1 to 70% of a zeolite with an open structure other than a zeolite of the erionite family, and
(c) 0.05 to 40% of a zeolite of the erionite family selected from the group consisting of erionite, offretite, ZSM-34, erionite T and their mixtures, having a potassium content less than 4% by weight.

4,923,594

FLUID CATALYTIC CRACKING PROCESS

Regis J. Pellet, Croton; Peter K. Coughlin, Yorktown Heights, and Jule A. Rabo, Armonk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 58,275, Jun. 4, 1987, Pat. No. 4,814,316. This application Dec. 19, 1988, Ser. No. 286,289
Int. Cl.[5] C10G *11/04, 11/05*
U.S. Cl. 208—114 1 Claim

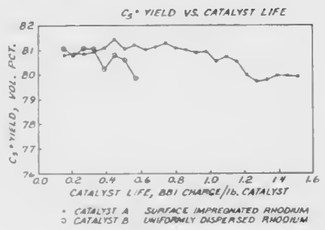
1. A fluid catalytic cracking process comprising contacting, at effective catalytic cracking conditions, a crude oil feedstock with a cracking catalyst comprising an effective amount of a microporous crystalline multi-compositional, multiphase composite comprising different inorganic microporous crystalline molecular sieve compositions as phases thereof, having at least two phases wherein at least one phase is grown by crystal growth in the presence of another phase, wherein said other phase is a deposition substrate, in which:
(a) the different phases are contiguous and have a common crystal framework structure;
(b) at least one phase is an acidic non-zeolitic molecular sieve, NZMS-37 composition which contains aluminum and phosphorus and another element possessing a valence below 4 in its framework structure, and
(c) the composite exhibits a distinct heterogeneity in composition from one phase to another therein.

4,923,595

TRIMETALLIC REFORMING CATALYST

Mark D. Moser, Elk Grove Village, and R. Joe Lawson, Palatine, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 65,541, Jun. 23, 1987, Pat. No. 4,791,087, which is a continuation-in-part of Ser. No. 910,099, Sep. 22, 1986, Pat. No. 4,677,094. This application Dec. 12, 1988, Ser. No. 283,403
Int. Cl.[5] C10G *35/06*
U.S. Cl. 208—139 9 Claims



1. A process for the catalytic reforming of naphtha charge stock comprising contacting the naphtha and hydrogen at reforming conditions with a catalytic composite comprising a uniformly dispersed platinum component, a uniformly dispersed Group IVA metal component, a surface-impregnated metal or metal-containing component selected from the group consisting of rhodium, ruthenium, cobalt, nickel, or iridium and a halogen component on a refractory support having a nominal diameter of at least 650 microns.

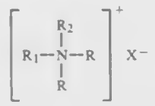
4,923,596

USE OF QUATERNARY AMMONIUM COMPOUNDS IN A LIQUID/LIQUID PROCESS FOR SWEETENING A SOUR HYDROCARBON FRACTION

Jeffery C. Bricker, Buffalo Grove; Robert R. Frame, Glenview, both of Ill.; Bryan L. Benedict, Redondo Beach, Calif., and Sheila L. Pollastrini, Bloomingdale, Ill., assignors to UOP, Des Plaines, Ill.

Filed May 22, 1989, Ser. No. 354,966
Int. Cl.[5] C10G *27/10*
U.S. Cl. 208—207 6 Claims

1. A process for sweetening a sour hydrocarbon fraction containing mercaptans comprising contacting the hydrocarbon fraction in the presence of an oxidizing agent with an alkaline solution containing a metal chelate and a surfactant quaternary ammonium compound having the structural formula



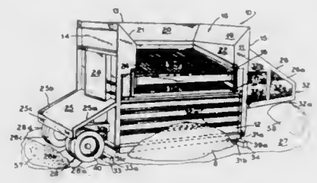
where R is a hydrocarbon group containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl, R_1 is a straight chain alkyl group containing from about 5 to about 20 carbon atoms, R_2 is a hydrocarbon group selected from the group consisting of aryl, alkaryl and aralkyl and X is an anion selected from the group consisting of halide, hydroxide, nitrate, sulfate, phosphate, acetate, citrate and tartrate, the surfactant quaternary ammonium compound present in a concentration from about 2 to about 100 ppm.

4,923,597

PORTABLE SCREEN WITH RAISING AND LEVELLING SYSTEM

Don W. Anderson, 1000 Karen Dr.; Robert Eddy, 704 E. 21st St.; Alan Egge, Rte. 2, Box 240, all of Yankton, S. Dak. 57078, and Richard Lewison, 103 S. Side Dr., Pocahontas, Iowa 50574

Filed Jan. 13, 1989, Ser. No. 297,417
Int. Cl.[5] B07B *1/28*
U.S. Cl. 209—420 10 Claims



1. A portable screen with raising and levelling system to permit levelling during screening operation on non-level and uneven ground, comprising:

a rectangular frame with a screen assembly mounted therein below a top of the frame, said top of the frame forming a feed hopper means for loading material to be screened onto the screen assembly, the frame having a first end wall, a second end wall opposite said first end wall, and a front end wall having a bottom edge which is spaced from the ground during screening operation;

means for shaking the screen assembly;

a set of wheels on an axle and means for attaching and rigidly fixing the axle with its set of wheels in fixed non-movable fashion relative to the frame at said first end wall thereof such that said wheels remain in a same relative position to the frame in both the screening operation and transport and such that a bottommost portion of said wheels always extends below bottom edges of the frame;

means for connecting the frame to a two vehicle being provided adjacent said second end wall;

a first hydraulic raising and levelling assembly attached in substantially laterally centered fashion to an exterior surface of the first end wall of the frame, and a second hydraulic raising and levelling assembly attached in substantially laterally centered fashion to an exterior surface of the second end wall of the frame;

the first and second hydraulic raising and levelling assemblies each having a rectangular base bar having a longitudinal extent parallel to the first and second end walls and a length at least two-thirds a length of a width of the frame, said base bars being laterally centered relative to a width of the frame at the end walls, guide means for guiding the base bars during extending and retracting movement along a vertical path, and hydraulic means for driving the base bars along the vertical path;

the first and second raising and levelling assemblies each having first and second telescoping tubes each with a first end and an opposite second end and whose longitudinal extent is perpendicular to the base bar and which are attached at their respective first ends to the base bar and at their respective second ends are telescopically received within respective first and second tubular members attached to the exterior of the frame at the respective first and second end walls, and wherein said hydraulic means for each of the levelling assemblies is substantially centrally positioned between the first and second telescoping tubes with one end of the hydraulic means connecting to the base bar and an opposite end attached to the respective frame end walls; and

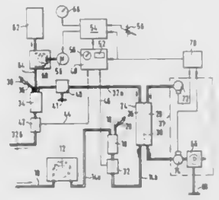
hydraulic control means for independently adjusting the hydraulic means of the first and second assemblies so as to selectively raise and space the bottom edge of the frame away from the ground such that the screen assembly is horizontally levelled in desired fashion in a direction from the first end wall to the second end wall, so that non-level ground conditions beneath the frame are selectively compensated for.

4,923,598

APPARATUS FOR THE TREATMENT OF BLOOD IN PARTICULAR FOR HEMODIALYSIS AND HEMOFILTRATION

Wilfried Schäl, Bad Homburg, Fed. Rep. of Germany, assignor to Fresenius AG, Fed. Rep. of Germany

Filed Jun. 21, 1988, Ser. No. 209,678
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1987, 3720665
Int. Cl.[5] B01D *13/00, 35/00*
U.S. Cl. 210—87 22 Claims



1. An apparatus for the extracorporeal treatment of blood, comprising:

an extracorporeal blood circuit which is formed by a blood tubing system;

means for dialyzing, filtering or both located in said extracorporeal blood circuit;

a first ultrasonic flow sensor located in said extracorporeal blood circuit upstream of the dialyzing and filtering means, comprising:

a first dimensionally stable measuring insert inserted into the blood tubing system having a defined flow cross-section and lateral extensions for coupling-in said coupling-out and conducting of ultrasonic waves, each said extension having at one end a coupling face;

ultrasonic transducers with piezoelectric transducer elements having coupling pieces connected thereto and disposed such that each said coupling piece is in mechanical engagement with a corresponding coupling face;

a second ultrasonic flow sensor located in said extracorporeal blood circuit downstream of the dialyzing and filter means, comprising:

a second dimensionally stable measuring insert inserted into the blood tubing system having a defined flow cross-section and lateral extensions for coupling-in and coupling-out and conducting of ultrasonic waves, each said extension having at one end a coupling face;

second ultrasonic transducers with piezoelectric transducer elements having coupling pieces connected thereto and disposed such that each said coupling piece is in mechanical engagement with a corresponding coupling face.

evaluating means for performing predetermined evaluating operations based on signals generated by the first and second flow sensors connected to the first and second flow sensors; and

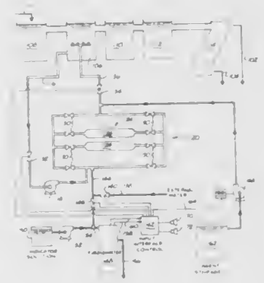
withdrawal control means for controlling the withdrawal of fluid from the extracorporeal blood circuit via the dialyzer or filter means, based on said evaluating operations.

4,923,599

WASTE WATER TREATMENT APPARATUS

Gregory S. Bowers, Green, S.C., assignor to Southern Water Treatment Co., Inc.

Filed Jun. 10, 1988, Ser. No. 205,313
Int. Cl.[5] C02F *1/62*
U.S. Cl. 210—96.1 24 Claims



1. Apparatus for waste water treatment, comprising:

pH treatment means for conducting pH treatment of a controlled body of waste water for substantially precipitating non-chelated and non-complexed metals therefrom;

sampling means for sampling said pH treated waste water;

separation means for substantially removing solid precipitated metals from said sampled pH treated waste water to provide a clear sample;

testing means for testing said clear sample for the presence of any remaining metals in solution therein; and

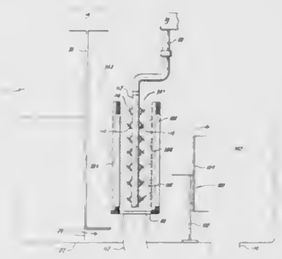
feeding means for feeding a given precipitating agent to the controlled body of waste water in response to the presence of said remaining metals so as to substantially precipitate same, whereby both pH-precipitated and non-pH-precipitated metals are substantially precipitated from such body of waste water for removal therefrom, with minimized feeding of said precipitating agent.

4,923,600

WATER CLARIFICATION SYSTEM ADAPTED FOR REMOVING PARTICULATE MATTER OF GREATER THAN A PREDETERMINED SIZE

Milos Krofta, Lenox, Mass., assignor to Lenox Institute for Research, Inc., Lenox, Mass.

Filed Aug. 28, 1987, Ser. No. 90,775
Int. Cl.[5] B01D *23/24*
U.S. Cl. 210—107 8 Claims



1. A water clarification system comprising:

a cylindrical flotation tank;

a carriage rotating above said tank;

first means rotating with said carriage for inputting water to be clarified into said tank, said water having dissolved air and a flocculating chemical therein which combine to cause particles in the water to float to the surface of the tank;

second means for rotating at least in part with said carriage for collecting particles on the surface of the tank and for outputting the collected particles;

third means for removing clarified water from a point near the bottom of said tank;

a clarified water outlet;

a circular screen having openings of less than a predetermined size positioned between said third means and said clarified water outlet to remove particles of greater than said predetermined size from the clarified water; and

means rotating with said carriage for cleaning the screen including a row of shower nozzles positioned to direct clarified water from substantially the top to substantially the bottom of the outlet side of the screen, and means for mounting the row of nozzles for rotation with the carriage over the outlet side of the screen.

4,923,601

FILTER SYSTEM HAVING MULTIPLE FILTER ELEMENTS AND BACKFLUSHING ASSEMBLIES

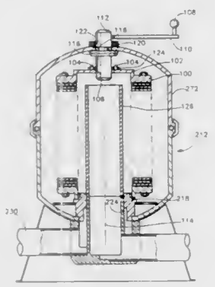
Mordeki Drori, 89 Zahal Street, Kiron, Israel

Filed Sep. 16, 1988, Ser. No. 245,783

Claims priority, application Israel, Sep. 18, 1987, 83950; Feb. 24, 1988, 85543; Aug. 2, 1988, 87308

Int. Cl.[5] B01D *29/38*

U.S. Cl. 210—107 **18 Claims**



1. A fluid filter comprising:

a housing;

a central aperture formed in the bottom of said housing;

a filter element disposed in said housing;

a fluid inlet arranged to receive a flow of fluid to be filtered from an upstream side of said filter element;

a fluid outlet arranged to release said flow of fluid from a downstream side of said filter element;

a fluid inlet and outlet manifold disposed at said bottom of said housing in communication with said central aperture, comprising means for providing fluid communication through said aperture between said filter element and said fluid inlet and means for providing fluid communication through said aperture between said filter element and said fluid outlet;

and fluid distributor apparatus in threaded engagement with said fluid inlet and outlet manifold, for distributing fluid entering at said fluid inlet in the interior of said housing in communication with the upstream side of said filter element, said fluid distributor apparatus comprising a plurality of distributed upstanding members which define a plurality of azimuthally distributed pathways for fluid entering said housing.

4,923,602

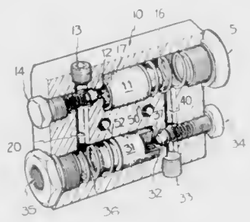
BI-DIRECTIONAL FLOW FILTER

Neil J. Blood, 8 Mitchel Street, Wongan Hills, Australia (6603)

Filed Dec. 12, 1988, Ser. No. 282,491

Int. Cl.[5] B01D *35/30*

U.S. Cl. 210—117 **17 Claims**



1. A filter for filtering fluid flowing in either direction through a conduit, said filter comprising:

a block having first and second peripheral ports adapted to be connected to respective sections of bi-directional fluid flow conduit;

first and second filter element cavities in said block, each supporting therein a filter element to respectively filter fluid passing therethrough in a respective single direction, said first filter element cavity being in direct communication with said first peripheral port so fluid entering said first port is filtered by said filter element in said first cavity, said second filter element cavity being in direct communication with said second peripheral port so fluid entering said second port is filtered by said filter element in said second cavity, said filter element cavities being positioned in said block in a generally side by side relation with said first peripheral port in one face of said block and said second peripheral port in the opposite face of said block;

a first passage in said block communicating the downstream side of said filter element in said first filter element cavity with said second peripheral port;

a second passage in said block communicating the downstream side of said filter element in said second filter element cavity with said first peripheral port; and

check valve means for controlling the flow of fluid in each said first and second passages so fluid can only flow through each passage in the direction to said respective peripheral ports.

4,923,603

COMBINED OIL FILTER AND COOLER

Joseph S. Maykulsky, 1400 Edgewood Way, #10, Oxnard, Calif. 93030

Filed Jan. 30, 1989, Ser. No. 303,291

Int. Cl.[5] B01D *35/18*

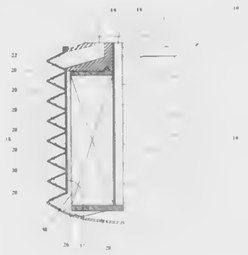
U.S. Cl. 210—168 **7 Claims**

1. A combination oil filter and cooling unit comprising:

a base member having coupling means for attaching said unit to an automotive oil system and formed with a central outlet port and a plurality of inlet ports,

a jacket formed with a plurality of helical tubes circling about the exterior of a said unit and serving to gradually transport oil from the inlet ports of said base member to the bottom of the jacket to provide cooling of said oil, and

a filter element mounted within said jacket connected to receive oil from the bottom of said jacket and to allowing



said oil to pass upwardly through said filter element to the outlet port of said base member.

4,923,604

CHEMICAL REFORMER

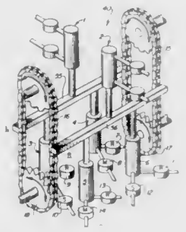
David L. Baker, 100 S. Home Ave., Oak Park, Ill. 60302

Filed Feb. 9, 1989, Ser. No. 307,991

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[5] B01D *17/00;* **B22C** *13/08*

U.S. Cl. 210—180 **12 Claims**



1. A heat exchange apparatus for causing heat to flow from heated fluid in one flow conduit portion to less heated fluid in another flow conduit portion, said heat exchange apparatus comprising a convoluted heat exchange wall proportioned to define the respective flow conduit portions on opposed sides of said convoluted heat exchange wall, said convoluted heat exchange wall being enclosed within a tubular housing capable of withstanding high fluid pressures in both of said flow conduit portions.

4,923,605

FILTER BAG FOR A FILTER SECTION

Bjarne Nilsson, Lanterngatan 9, S-462 00 Vänersborg, Sweden

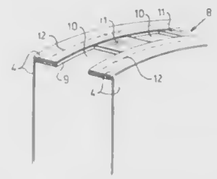
Filed Jun. 23, 1988, Ser. No. 210,441

Claims priority, application Sweden, Jun. 24, 1987, 8702618

Int. Cl.[5] B01D *33/26*

U.S. Cl. 210—232 **9 Claims**

1. A filter bag for a filter section, said filter section having discharge means for filtrate and being one of a plurality of such sections assembled to an annularly shaped filter disk for a rotating filter, said filter bag comprising a flexible filtering medium material and having an outlet and further having a shape in conformity with a shape of said filter section so as to be adapted to be pulled over and fitted onto said filter section, wherein said outlet comprises a strip of a relatively rigid material fastened to said filter bag prior to its being fitted onto said filter section, said strip including a generally flat portion provided with at least one opening located over and communicating with said discharge means when said filter bag is fitted onto said filter section.



4,923,606

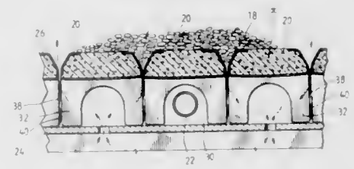
PLASTIC-JACKETED FILTER UNDERDRAIN BLOCK

Richard D. Gresh, Coraopolis, and Robert B. Netherland, Beaver, both of Pa., assignors to Tetra Technologies, The Woodlands, Tex.

Filed Feb. 26, 1988, Ser. No. 160,637

Int. Cl.[5] B01D *23/24*

U.S. Cl. 210—275 **16 Claims**



1. A combination mold and jacket for a filter underdrain block, including support legs and opposite ends and sides, comprising a hollow plastic member preferred to form the jacket of a filter underdrain block, shaped to provide for the passage of fluid between said support legs, and defining an opening for receiving a castable fill material.

4,923,607

MEMBRANE CONTAINING A LIQUID ACTIVE SUBSTANCE AND PROCESS FOR THE PRODUCTION OF SAME

Yasuo Ninomiya; Yoshikazu Musa; Yoichi Kainoh, and Chiaki Komamura, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Continuation of Ser. No. 515,227, Jul. 19, 1983, abandoned. This application Nov. 30, 1987, Ser. No. 127,513

Claims priority, application Japan, Aug. 16, 1982, 57-141952

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—490 **7 Claims**



7. A liquid active substance-containing membrane having an anisotropic structure comprising (a) a polysulfone cellular

layer containing a myriad of minute closed cells and septa thereof, (b) a dense thin layer covering one surface of the cellular layer and (c) a support provided on the surface of the cellular layer opposite the dense thin layer, wherein said minute cells contain a liquid active substance having a limited solubility in said polysulfone of less than 5 parts by weight per 100 parts by weight of the polysulfone at normal temperature and in the form of liquid droplets, wherein the minute cells of the cellular layer have a diameter of 0.5 to 20 μm, the septa of the cells have a thickness of 0.1 to 10 μm and the dense thin layer has a thickness of 0.1 to 100 μm and wherein said liquid active substance in the minute cells diffuses into the polysulfone at a limited rate and the release of the liquid active substance into the atmosphere is controlled at a substantially constant rate by said surface dense thin layer.

4,923,608

MICRO/ULTRAFILTRATION MEMBRANES WITH A FIXED PORE SIZE FORMED THROUGH IRRADIATION WITH PULSED LASERS AND PROCESS FOR MANUFACTURING THE SAME

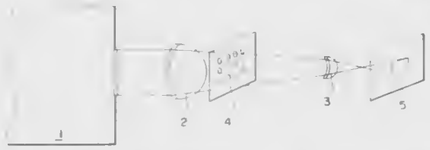
Thomas Flottmann, Aschaffenburg, and Joachim Tretzel, both of Aschaffenburg, Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Dec. 16, 1988, Ser. No. 285,113

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742770

Int. Cl.[5] B01D *13/00, 13/04*

U.S. Cl. 210—500.25 **12 Claims**



1. A flat membrane comprising a foil of organic polymers, glass or ceramic materials, with pores formed by at least one pulsed laser tapering in funnel-shaped fashion, and having a fixed pore size and a pore size distribution of less than 10% and an arrangement of the pores in a pattern of adjacent rows sufficient to provide a clear separation limit, wherein average diameters of said pores range from 0.05 to 10 μm and the pore patterns are evenly arranged in a regularly bounded area and have, between the individual pores, remaining ribs with varying heights in a direction of a thickness of the foil material sufficient to permit underwashing of retained parts of a filtered medium.

8. A process for manufacturing a flat membrane from a foil of organic polymers, glass or ceramic materials, comprising eroding pores in said membrane with at least one pulsed laser and continuously transporting the foil past said at least one laser, wherein a uniformly spatially intensity-modulated laser beam bounded by a regular area is pulsed onto the foil with a pulse duration ranging from 1 to 100 nanoseconds said membrane being sufficient to provided a clear separation limit, said pores being separated by ribs which are capable of providing underwashing of retained parts of a filtered medium.

4,923,609

METHOD AND APPARATUS FOR PURIFYING LIQUIDS EMPLOYING A PARTICULATE FILTER AND A MEMBRANE

Douglas M. Jardine, Colorado Springs, Colo., assignor to Bio, Inc., Colorado Springs, Colo.

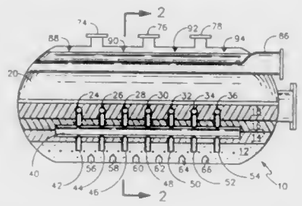
Filed May 20, 1988, Ser. No. 196,932

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—636 **49 Claims**

36. A method for cleaning an apparatus for purifying liquids comprising a particulate filter and a membrane, said method comprising:

(a) introducing a cleaning liquid within a particulate filter having an exposed surface under a pressure sufficient to pass said cleaning liquid through said particulate filter but not through said membrane, wherein said particulate filter and said membrane are positioned within a single container;



(b) causing said cleaning liquid to circulate through said particulate filter and around an inlet side of said membrane, said inlet side of said membrane facing said exposed surface of said particulate filter; and

(c) removing said cleaning liquid from an area of said container located between said inlet side of said membrane and said exposed surface of said particulate filter.

4,923,610

MACROPOROUS POLYMERIC MEMBRANES FOR THE SEPARATION OF POLYMERS AND A METHOD OF THEIR APPLICATION

Frantisek Svec, Hrebec, Czechoslovakia, and Boris G. Belenkii, Leningrad, U.S.S.R., assignors to Ceskoslovenska akademive ved and Akademia Nauk SSSR, Praha, Czechoslovakia

Division of Ser. No. 281,266, Dec. 7, 1988, Pat. No. 4,889,632. This application Sep. 25, 1989, Ser. No. 411,665

Claims priority, application Czechoslovakia, Dec. 10, 1987, 9034-87; Oct. 21, 1988, 6987-88

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—637 **1 Claim**



1. A method comprising: providing a macroporous membrane which comprises a copolymer of a monovinyl monomer, selected from the group consisting of acrylates, methacrylates, vinylpyridine, N-vinylpyrrolidone, vinyl acetate, and hydroxystyrene, and a dinvinyl monomer selected from the group consisting of alkylene and hydroxyalkylene diacrylates and dimethacrylates, divinylbenzene, and divinylpyridine, wherein the weight ratio of the respective types of monomers ranges from 5:95 to 95:5, formed of polymeric globules having a size from about 0.05 micron to about 0.5 micron, said globules being interconnected by covalent bonds to form communicating voids or pores between the globules, placing a section of said membrane having an arbitrary size and shape on a base to secure the membrane in a fixed position and to enable liquid to pass through the membrane, the base in combination with the membrane forming a chamber, filling the chamber with a solution of a polymer or mixture to pass through the membrane under a pressure of up to 1 MPa, allowing the polymer to be sorbed in the membrane, then introducing a solvent having predetermined properties into a region in front of the membrane, and eluting, detecting or collecting individual components of the separated mixture by varying pH, ionic strength, temperature, or concentration of the organic solvent, which is miscible with water, according to a predetermined protocol.

4,923,611

NOVEL ANION-EXCHANGE MEMBRANE

Fumio Hanada; Nobuhiko Ohmura, and Koki Hirayama, all of Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Jan. 30, 1989, Ser. No. 302,942

Claims priority, application Japan, Nov. 24, 1988, 63-294653

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—638 **8 Claims**

6. A method of diffusion dialysis, which comprises using as a dialysis membrane an anion-exchange membrane prepared by subjecting a membrane composed of a resin containing a high-molecular-weight compound having haloalkyl groups chemically bound thereto to ultraviolet radiation or ionizing radiation to thereby decrease the amount of the haloalkyl groups present in its surface portion less than 0.1 micrometer deep from its surface by 10 to 95% from that of the haloalkyl groups present in the interior of the membrane, and then, converting the haloalkyl groups present in the membrane into anion-exchange groups.

4,923,612

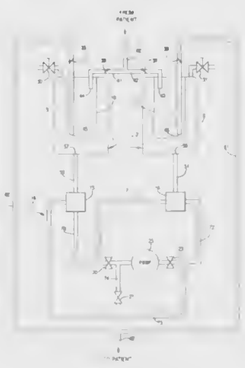
FLUID RECOVERY AND TRANSFER SYSTEM

Gordon S. Trivett, P.O. Box 213114, Tantallon, Nova Scotia B0J 3J0, and John L. Leahey, 17 Wedgewood Ave., Halifax N.S., B3M 2B2, both of Canada

Filed Jnl. 26, 1988, Ser. No. 224,297

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—646 **23 Claims**



17. In a medical fluid recovery and transfer system including first and second rigid containers, first and second semi-permeable collapsible containers respectively disposed within said first and second right containers, said first and said second semi-permeable collapsible containers respectively coupled to a common intake and a common output for a body fluid, a method of dialysis for said body fluid comprising the alternate steps of:

(a) pumping a dialysate fluid from said first rigid container to said second rigid container so as to hydraulically effect the output of said body fluid from said second semi-permeable collapsible container while simultaneously effecting the intake of said body fluid to said first semi-permeable collapsible container; and

(b) pumping said dialysate fluid from said second rigid container to said first rigid container so as to hydraulically effect the output of said body fluid from said first semi-permeable collapsible container while simultaneously effecting the intake of said body fluid to said second semi-permeable collapsible container;

(c) said dialysate fluid having a suitable composition to establish a concentration gradient for a material to be dialyzed between said body fluid and said dialysate fluid to cause the transfer of said material through said semi-permeable container between said body fluid and said dialysate fluid.

4,923,613

METHOD FOR DETERMINING A PATIENT'S BLOOD SODIUM LEVEL AND ARTIFICIAL KIDNEY FOR THE APPLICATION THEREOF

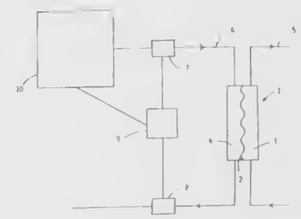
Jacques Chevallet, Serezin dn Rhone, France, assignor to Hospal Industrie, Cedex, France

Filed May 11, 1988, Ser. No. 192,657

Claims priority, application France, May 15, 1987, 87 07017

Int. Cl.[5] B01D *13/00;* **A61M** *1/16*

U.S. Cl. 210—647 **15 Claims**



1. A method for determining the blood sodium level of a patient whose blood circulates through a first compartment of an exchanger of an artificial kidney, said first compartment being separated from a second compartment of the exchanger by a semipermeable membrane for permitting dialysis and ultrafiltration of the blood, said second compartment being disposed in a dialysis fluid circuit through which dialysis fluid passes, comprising the steps of:

changing, in a selected manner, the conductivity of the dialysis fluid flowing into the second compartment of the exchanger;

measuring, in response to the step of changing the conductivity of the dialysis fluid, the change in conductivity of the dialysis fluid flowing out of the second compartment of the exchanger;

determining a lag time t_L between the change in conductivity of the dialysis fluid flowing into the second compartment of the exchanger and the corrresponding measured change in conductivity of dialysis fluid flowing out of the second compartment of the exchanger;

determining an equilibrium conductivity value of the dialysis fluid in the second compartment of the exchanger for which the conductivity of the dialysis fluid at outflow from the second compartment at a time t is substantially equal to the conductivity of the dialysis fluid at inflow into the second compartment at a time $t' = t - t_L$; and

determining the sodium concentration in the patient's blood

in accordance with the determined equilibrium conductivity value.

4,923,614

PROCESS AND DEVICE FOR LARGE SURFACE-AREA FINE-BUBBLE GASIFICATION OF LIQUIDS

Wilke Engelbart, Welsburg, D-2879 Brettorf, Fed. Rep. of Germany

PCT No. PCT/DE87/00273, § 371 Date Feb. 6, 1989, § 102(e) Date Feb. 6, 1989, PCT Pub. No. WO87/07590, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 12, 1987, Ser. No. 314,577

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1986, 3619757; Aug. 14, 1986, 3627665

Int. Cl.[5] B01D *41/00*

U.S. Cl. 210—648 25 Claims



1. A method for the widespread, fine-bubble aeration of liquids employing a porous or perforated, support-free resilient membrane to which a gas is supplied, which passes out from the membrane and into the liquid, comprising the steps of:

providing holding devices and deflector devices

holding said membrane at at least two opposite sides in holding devices:

strectching said membrane (2) with the help of said holding devices by said deflector devices (**10**) and guide devices which are provided in said a liquid receptacle and which maintain said membrane (2) horizontal; and

varying the position and/or the stretched state of said membrane (2) by varying the pulling force at at least one of said holding devices.

10. A device for the widespread fine-bubble aeration of liquids, comprising:

a porous or perforated, support-free resilient membrane to which gas is supplied which passes out from the resilient membrane and into the liquid;

guide devices (61 60) horizontally directed in a liquid receptacle;

means for holding said resilient membrane (2) at least two opposite sides in holding devices (12, 14, 16, 18, 20), of which the spacing from one another is variable by variation of the stretched state of said resilient membrane (2); and

means for enabling said resilient membrane (2) to be drawn with the help of said holding devices (12, 14, 16, 18, 20) through said guide devices (6, 60).

4,923,615

FLUID/SOLID CONTACTING COLUMNS

Ahmet Mehmet, Johannesburg, South Africa, assignor to Council of Mineral Technology, South Africa

Continuation-in-part of Ser. No. 171,932, Mar. 22, 1988, abandoned. This application Mar. 1, 1989, Ser. No. 317,469

Claims priority, application South Africa, Mar. 26, 1987, 87/2228

Int. Cl.[5] B01D *15/02*

U.S. Cl. 210—661 13 Claims

1. A method of contacting a loaded solution with solids in a multi-stage contacting column comprising:

providing a series of vertically spaced perforated plates in a column to form stages, said stages including an uppermost stage immediately above the uppermost plate and a lowermost stage between the bottom plate and an intermediate plate immediately thereabove;

providing outlet duct means separate from said bottom plate in said lowermost stage, said outlet duct means having opening means located at a predetermined height above said bottom plate in said lowermost stage;

feeding solids into the uppermost stage;

performing a cycling operation during which said solids move from said uppermost stage to said lowermost stage and then out of the column, said cycling operation comprising the steps of:

a first flow step of directing a loaded solution from below said bottom plate through said perforations in all said plates so that said loaded solution contacts and fluidizes any of said solids in each said stage while substantially preventing axial mixing of said solids between stages along said column; and



following said first flow step, a reverse flow step comprising directing solution flow downward through said column to cause a mixture of solution and solids to pass downwardly through the perforations in all of said plates other than said bottom plate so that substantially all of said solids on one plate are moved by said downward flow to the next lower stage, and wherein said reverse flow step includes removing a volume of said solution and solids through said duct means, through amount of said solids in said volume being less than the amount of said solids which passes from one stage to another.

4,923,616

METHOD OF SEPARATING CHEMICAL COMPONENTS IN SIMULATED MOVING BED

Kentaro Hirata; Yoshio Fukui, and Sadao Hayashi, all of Mie, Japan, assignors to Mitsubishi Petrochemical Company, Ltd., Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,083

Claims priority, application Japan, Sep. 24, 1987, 62-239847; Nov. 19, 1987, 62-290541

Int. Cl.[5] B01D *15/00*

U.S. Cl. 210—676 8 Claims

1. A method of separating chemical components in a simulated-moving-bed continuous separator having a series of plural packed beds filled with adsorbent for selectively adsorbing a specific component contained in a crude solution including plural chemical components, said packed beds being divided toward the downstream side into three zones, the last of said packed beds being connected to the first, and a piping system including switching means for interrupting and switching connections among each bed, said method comprising:

(a) introducing a crude solution to an inlet of a front-row bed of a first zone of said packed beds and, at the same time, interrupting the piping at a position between a rear-row bed of the first zone and a front-row bed of a second zone, to thereby discharge a raffinate solution containing a less

than substantial percentage of said specific component from an outlet of the rear-row bed of the first zone;

(b) introducing a first eluent to an inlet of the front-row bed of the second zone and, at the same time, interrupting the piping at a position between a rear-row bed of the second zone and a front-row bed of the third zone to thereby extract a product solution containing a substantial percentage of said specific component from an outlet of the rear-row bed of the second zone;

(c) introducing a second eluent to an inlet of the front-row bed of the third zone; and



(d) shifting down the position of inflow of said crude solution, the position of outflow of said raffinate solution, the position of inflow of said first eluent, the position of outflow of said product solution and the position of inflow of said second eluent to the downstream side by one bed and, at the same time, shifting down the interruption positions of said piping systems in correspondence with the shifting of the positions of inflow and outflow of the respective solutions.

4,923,617

PROCESS FOR INHIBITING SCALE FORMATION

Israel J. Heilweil, Princeton, N.J., and Gerald L. Shoemaker, Aurora, Ohio, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 128,305, Dec. 3, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,823

Int. Cl.[5] C02F *5/10*

U.S. Cl. 210—698 7 Claims

1. A process for inhibiting scale formation in process equipment and conduits through which scale-prone process fluids flow consisting essentially of adding a scale inhibiting effective amount of a cellulose sulfate inhibiting agent to a scale-prone process fluid flowing through process equipment and conduits.

4,923,618

METHOD OF CHLORINATING A SWIMMING POOL

John M. Casberg, Cheshire, and David E. Michaels, Southington, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 191,640, May 9, 1988, Pat. No. 4,876,003. This application Apr. 3, 1989, Ser. No. 332,312

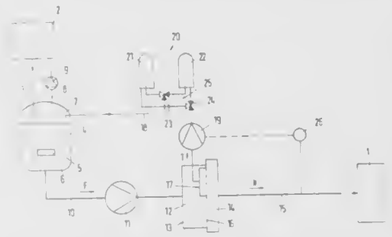
Int. Cl.[5] C02F *1/76*

U.S. Cl. 210—755 1 Claim

1. A method of chlorinating a swimming pool in a forced water circulation system using a skimmer comprising the steps of:

(a) placing in the skimmer a chlorine containing chemical tablet having a length longer than its thickness with an elongate central section connecting two opposing obliquely tapered ends along a longitudinal axis, the tablet lying on its central section in contact with the skimmer and being encased in a shell having an elongate central section connecting two opposing obliquely tapered ends corresponding to the central section and obliquely tapered ends of the tablet, the shell further having openings in the tapered ends said tapered ends of said shell forming an inwardly sloping and obliquely angled junction with the elongate central section of said shell;

(b) circulating water through the skimmer in a generally vertically downward direction toward the encased tablet; and



(c) dissolving away the tablet within the shell through the openings so that there is less tablet in the shell adjacent the side resting in contact with the skimmer than on the opposing side by the action of the downwardly directed water contacting the tablet adjacent and through the shell openings nearer the bottom of the shell and swirling about in a bottom to top dissolving flow pattern.

4,923,619

DISINFECTANT COMPOSITIONS AND DISINFECTION PROCESS APPLICABLE TO INFECTED LIQUIDS OR SURFACES

Alain C. A. G. Legros, Nalinnes, Belgium, assignor to Fabricom Air Conditioning S.A., Nalinnes, Belgium

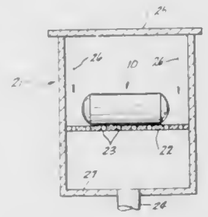
PCT No. PCT/BE86/00032, § 371 Date Aug. 3, 1987, § 102(e) Date Aug. 3, 1987, PCT Pub. No. WO87/02221, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 14, 1986, Ser. No. 73,796

Claims priority, application Luxembourg, Oct. 17, 1985, 86.123

Int. Cl.[5] C02F *1/68*

U.S. Cl. 210—764 10 Claims



1. A process for disinfection of aqueous liquids or infected surfaces, comprising treating said aqueous liquids or infected surfaces with an effective disinfecting amount of (a) at least one ion selected from the group consisting of copper, silver and manganese and (b) at least one quaternary ammonium polymer or copolymer, said polymer or copolymer being a condensation product obtained by condensation of at least one difunctional tertiary amine of the formula I



(I)

and at least one organic dihalide of the formula (IV)

X—B—X (IV)

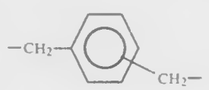
in which formulae:

R, A, B and X have the following means:

R designates a lower alkyl radical or the radical —CH_2—CH_2—OH;

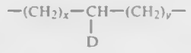
X designates a halogen atom, and

A and B, which may be identical or different, with the proviso that the sum of the carbon atoms contained in A and B is greater than 8, and A and B have one of the five following formulae:



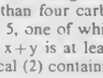
(1)

in which one of the substituents —CH_2— may be in an ortho, metha or para position,



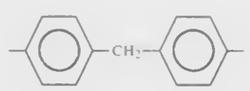
(2)

where D designates hydrogen or an alkyl radical containing less than four carbon atoms, and x and y are integers lower than 5, one of which may have a value equal to 0, while the sum x+y is at least equal to 1 and at most equal to 10, the radical (2) containing at most two double bonds,



(3)

(4) —$(CH_2)_n$—O—$(CH_2)_n$— in which n is equal to 2 or 3, and



(5)

4,923,620

DEVICE FOR DEPLETION OF THE LEUKOCYTE CONTENT OF BLOOD AND BLOOD COMPONENTS

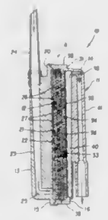
David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 110,413, Oct. 20, 1987, abandoned, and a continuation-in-part of Ser. No. 218,169, Jul. 13, 1988, abandoned. This application Oct. 20, 1988, Ser. No. 260,391

Int. Cl.[5] B01D *35/02*

U.S. Cl. 210—767 14 Claims

1. A device for separating one or more substances from a fluid to be administered to a patient, the device comprising a housing including an inlet and an outlet and defining a fluid flow path between the inlet and the outlet and a separating element disposed within the housing across the fluid flow path and including a downstream surface, wherein the inlet communicates with the housing near the bottom of the housing and upstream from the separating element and wherein the housing includes a wall facing the downstream surface of the separating element and defining a plenum and a slot disposed in the wall and communicating between the plenum and the outlet for allowing air in the fluid to separate from the fluid, said outlet being located near the top of the housing.



9. A method for the depletion of the leukocyte content of blood product comprising passing the blood product through the device of claim 1.

4,923,621

EXTINGUISHING COMBUSTIBLE METAL FIRES

Jay S. Greene, Manheim, Pa., assignor to Environmental Security Incorporated, Gloucester, Mass.

Continuation-in-part of Ser. No. 695,349, Jan. 25, 1985, Pat. No. 4,897,207, and a continuation-in-part of Ser. No. 744,771, Jun. 14, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,279

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] A62D *1/00*; B01F *17/00*; C11D *1/12*

U.S. Cl. 252—2 14 Claims

1. A liquid formulation for use as a Class D firefighting agent and consisting essentially of a mixture of:

a linear alkylbenzene sulfonate, non-ionic detergent and lauric superamide detergent mixture comprising about 39–67 percent of the total mass of the formulation;

vitamin B-6 in the amount of 1–3 percent by weight of the detergent mixture;

sodium chloride in the amount of about 25–41 percent by weight of the detergent mixture;

bicarbonate of soda in the amount of about 3–18 percent by weight of the detergent mixture;

0–4 percent by weight of the detergent mixture coloring and perfuming agents; and

a volume of water large enough only to provide effective mixing of the other components of the formulation and insufficiently large to interfere with the use of the formulation as an effective Class D firefighting agent.

4,923,622

FABRIC SOFTENER COMPOSITION: CONCENTRATE OF QUATERNARY AMMONIUM COMPOUND AND AN OIL

Rudolf W. Sberman, Knutsford, and Philip J. Stainer, Dennis, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 808,374, Dec. 16, 1985, Pat. No. 4,792,409, which is a continuation of Ser. No. 258,994, Apr. 30, 1981, abandoned, which is a continuation of Ser. No. 952,649, Oct. 19, 1978, abandoned. This application Sep. 19, 1988, Ser. No. 245,806

Claims priority, application United Kingdom, Oct. 22, 1977, 44062/77

Int. Cl.[5] C11D *1/62*; D06M *13/46, 15/18*

U.S. Cl. 252—8.6 2 Claims

1. A substantially water-free softener liquid concentrate consisting essentially of a non-heterocyclic fatty quaternary ammonium salt which contains at least one long chain alkyl group of 8 to 30 carbon atoms and an oil or water-insoluble compound having oily/fatty properties and selected from the group consisting of a mineral oil, a half-refined white oil, rape seed oil, sunflower oil, tung oil and long chain C_8 to C_{24} fatty alcohols, said concentrate having a viscosity in the range of about 15 to 40 seconds, measured at 20° C. in No. 4 Ford Cup, and said concentrate capable of being dispersed/emulsified in cold water at a temperature of 5° to 30° C.

4,923,623

STARCH WITH CURABLE AMINE FUNCTIONAL SILICONE FOR FABRIC WRINKLE REDUCTION AND SHAPE RETENTION

Timothy W. Coffindaffer, Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1988, Ser. No. 287,782

Int. Cl.[5] D06M *00/90*; C08G *37/26*

U.S. Cl. 252—8.8 13 Claims

1. A liquid starch composition for treating laundered fabrics, said composition comprising: (1) from about 0.1% to about 33% by weight of a curable amine functional silicone emulsion for wrinkle reduction, and (2) from about 0.5% to about 35% of a laundry starch and (3) water to deposit said curable amine functional silicone and said starch on said fabric, wherein said curable amine functional silicone on said fabric cures to form silicone-oxyen-silicone linkages;

wherein said curable amine functional silicone is selected from the group of linear and branch curable amine functional branch silicones and mixtures thereof having the following structure:

$((RO)R'_2SiO_{1/2})_X(R'_2SiO_{2/2})_Y(R''SiO_{3/2})_Z$,

wherein

X is equal to Z+2; and

Y is at least 3; and

wherein

Z is zero for a linear curable amine functional silicone;

Z is at least one for a branched curable amine functional silicone;

wherein

R is a hydrogen or a $C_{1\text{-}20}$ alkyl; and

R′, R″ is a $C_{1\text{-}20}$ alkyl or an amine group selected from cyclic amines, polyamines and alkylamines having from about 2 to about 7 carbon atoms in their alkyl chain, and wherein at least R′ or R″ is an amine group.

4,923,624

LUBRICATING COMPOSITION ON POCKET-SIZED SUPPORT, SUITABLE TO BE SMEARED ON SLIDING SURFACES

Giancarlo Albanesi, Milan, Italy, assignor to Brico s.r.l., Meina, Italy

PCT No. PCT/EP87/00066, § 371 Date Sep. 22, 1987, § 102(e) Date Sep. 22, 1987, PCT Pub. No. WO87/05319, PCT Pub. Date Sep. 11, 1987

PCT Filed Feb. 12, 1987, Ser. No. 112,719

Claims priority, application Italy, Mar. 5, 1986, 19644 A/86

Int. Cl.[5] C10M *129/68, 159/06, 111/02*

U.S. Cl. 252—10 5 Claims

1. A ski-wax composition, comprising:

(a) paraffin waxes;

(b) microcrystalline hydrocarbon waxes; and

(c) decahydronaphthalene (decalin), or a decalin-based solvent blend,

the paraffin and microcrystalline hydrocarbon waxes being present according to a weight ratio to each other within the range of from 1:3 to 3:1, and the decalin or decalin-based solvent blend being present in said composition in an amount within the range of from 30% to 95%, as referred to the total weight.

4,923,625

LUBRICANT COMPOSITIONS

James P. King, Lansdale, Pa., assignor to Desilube Technology, Inc., Lansdale, Pa.

Filed Sep. 28, 1989, Ser. No. 413,968

Int. Cl.[5] C10M *135/10*

U.S. Cl. 252—32.5 12 Claims

1. A lubricant composition having extreme pressure and antiwear properties comprising a base lubricant and a synergistic additive mixture consisting of from about 0.01 to about 30 weight percent of said lubricant of a mixture of a metal thiosulfate and a metal phosphate, the weight ratio of thiosulfate to phosphate being from about 1:99 to about 99:1.

4,923,626

REFRIGERANTS

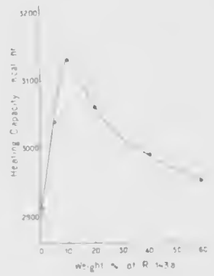
Kohji Tamura, Kawanishi; Hirosbi Kashiwagi, Settsu, and Masahiro Noguchi, Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Oct. 28, 1988, Ser. No. 263,890

Claims priority, application Japan, Nov. 2, 1987, 62-277873

Int. Cl.[5] C09K *5/04*

U.S. Cl. 252—67 2 Claims



1. A refrigerant comprising about 40 to about 95% by weight of chlorodifluoromethane and about 60 to about 5% by weight 1,1,1-trifluoroethane.

4,923,627

HARD TRANSLUCENT HIGH MOISTURE SOAP BAR

David P. Joshi, South Plainfield, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed Oct. 19, 1988, Ser. No. 259,766

Int. Cl.[5] C11D *13/18*

U.S. Cl. 252—108 2 Claims

1. A process for preparing hard translucent, high moisture soap bars without special additives comprising the steps of:

(a) reparing a molten wet kettle soap containing 29 to 32% water,

(b) heating the molten wet kettle soap to a temperature of about 190° F.,

(c) spray drying the molten wet kettle soap in a spray dryer operated at a temperature of 190–230° F. under vacuum;

(d) extruding the spray dried soap containing 18–25 percent water to prepare pellets,

(e) plodding the pellets in a vacuum plodder,

(f) pressing the plodded soap at a temperature of 90 to 100° F. into bars,

(g) recovering the hard translucent, high moisture soap bar product.

4,923,628

HIGH BULK DENSITY DETERGENT COMPOSITION AND PROCESS FOR ITS PRODUCTION

Peter W. Appel, Rotterdam; Huug Euser, Vlaardingen, and Seeng D. Liem, Rhoon, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 915,194, Oct. 3, 1986, abandoned. This application Mar. 20, 1989, Ser. No. 327,419

Claims priority, application United Kingdom, Oct. 14, 1985, 8525269

Int. Cl.[5] C11D *3/065, 3/14, 11/02, 17/06*

U.S. Cl. 252—135 22 Claims

1. A process for the preparation of a low-phosphate granular detergent composition comprising one or more anionic and/or nonionic detergent-active compounds, from 10 to 25% by weight of sodium tripolyphosphate, and sodium sulphate, which process comprises the steps of:

(i) spray-drying an aqueous slurry comprising from 10 to 25% by weight of sodium tripolyphosphate, from 0 to 6% by weight of sodium silicate, from 0 to 20% by weight (in total) of sodium sulphate and/or sodium carbonate, and one or more anionic and/or nonionic detergent-active compounds, to form a spray-dried base powder;

(ii) postdosing to from 40 to 75% by weight of said spray-dried base powder from 20 to 35% by weight of sodium sulphate; and

(iii) postdosing from 0 to 40% by weight of other solid and/or liquid material;

the sodium sulphate postdosed in step (ii) and any solid material postdosed in step (iii) having an overall bulk density of at least 1000 g/liter and an overall Rosin-Rammler average particle size not exceeding 75% of the Rosin-Rammler average particle size of the base powder; the final composition having a bulk density at least 150 g/liter greater than that of the base powder; all percentages being based on the final composition.

4,923,629

METHOD AND FLOCCULANT FOR WATER TREATMENT

Takao Hasegawa, Toda; Takuya Onitsuka, Sagamigara; Minoru Suzuki; Yasuhiro Ehara, both of Tokyo; Katsuhiro Hashimoto, Yamato, and Tadamasa Ozaki, Machida, all of Japan, assignors to Suido Kiko Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1988, Ser. No. 190,984

Int. Cl.[5] C02F *1/52*

U.S. Cl. 252—181 6 Claims

1 A flocculant for water treatment which is an aqueous solution containing a polysilicic acid having a limiting viscosity of not less than about twice that of monosilicic acid and a water-soluble salt of metal capable of forming a hydroxide in water, said solution having a pH of not higher than about 2 or not lower than about 11.

4,923,630

EXTRACTANT COMPOSITION

Barbara F. Smith; Gordon D. Jarvinen, and Robert R. Ryan, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 176,131, Mar. 31, 1988, Pat. No. 4,867,951. This application Apr. 3, 1989, Ser. No. 331,775

Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—184 12 Claims

1. An organic extracting solution for separating actinides from lanthanides which is comprised of:

a. a primary ligand which is a substituted monothio-1,3-dicarbonyl having substituents chosen from a class consisting of alkyl groups, alkoxy groups, aryl groups, aroxy groups, and alkylamine groups, where said substituted monothio-1,3-dicarbonyl is an acyclic compound or a cyclic compound with an acyl group attached to the ring at a ring position adjacent to a ring thiocarbonyl or a cyclic compound with a thioacyl group attached to the ring at a ring position adjacent to

a ring carbonyl; and

b. a secondary ligand which is a substituted phosphine oxide having substituents chosen from a class consisting of alkyl groups, alkoxy groups, aryl groups, aroxy groups, 2-pyridyl-N-oxide groups, carbamoylmethylene groups having either one or two alkyl or aryl groups substituted at the nitrogen atom, and phosphorylmethylene groups having two alkyl or aryl groups substituted at the phosphorous atom.

4,923,631

PERFUME AND BLEACH COMPOSITIONS

Peter S. Sims, Chester, and Peter Carter, Burton, both of Great Britain, assignors to Lever Brothers Company, New York, N.Y.

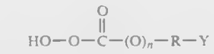
Filed Jun. 27, 1988, Ser. No. 211,659

Claims priority, application United Kingdom, Jul. 9, 1987, 8716219

Int. Cl.[5] D06L *3/02;* C11D *3/39, 3/395, 3/50*

U.S. Cl. 252—186.42 6 Claims

1. A bleach composition comprising 0.5 to 65% by weight of a peracid bleach selected from the group consisting of monopersulphate salts and organic peroxyacids having the general formula



wherein R is a radical selected from the group consisting of an alkylene or substituted alkylene group containing 1 to 20 carbon atoms, and an arylene group containing from 6 to 8 carbon atoms, n is 0 to 1, and Y is selected from the group consisting of hydrogen, halogen, alkyl, aryl and any group which provides an anionic moiety in aqueous solution.

and from 0.01 to 2.5% by weight of at least five classes of perfume components which do not contain alkenyl or alkynyl groups and have a Peracid Stability Value of at least 65% selected from the following classes:

(i) saturated alcohols
(ii) saturated esters
(iii) saturated aromatic ketones
(iv) saturated lactones
(v) saturated nitriles
(vi) saturated ethers
(vii) saturated acetals
(viii) saturated phenols
(ix) saturated hydrocarbons, and
(x) aromatic nitromusks.

4,923,632

LIQUID CRYSTAL COMPOSITION FOR TWIST NEMATIC MODE

Shinichi Sawada; Toyoshiro Isoyama, both of Ichiharashi; Tetsuya Matsushita, Sodegauramachi, and Hideo Saito, Ichiharashi, all of Japan, assignors to Chisso Corporation, Japan

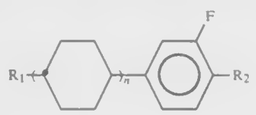
Filed Nov. 18, 1988, Ser. No. 272,942

Claims priority, application Japan, Nov. 24, 1987, 62-293906

Int. Cl.[5] G02F *1/13;* G09K *19/34, 19/30*

U.S. Cl. 252—299.61 24 Claims

1. A liquid crystal composition for twist nematic mode comprising a component expressed by the formula



(I)

wherein R_1 represents an alkyl group of 1 to 8 carbon atoms, R_2 represents F or CN and n represents 1 or 2 including about 13 to about 40%, by weight, of at least one compound in which n=1 and about 14.2%, to about 60% by weight, of at least one compound in which n=2, the total proportion of said compounds of said component of formula (I) being about 42.7 to about 100%, by weight.

4,923,633

LIQUID CRYSTAL COMPOUNDS CONTAINING TWO OR MORE CHIRAL CENTERS

George W. Gray; David Lacey; Kenneth J. Toyne, all of North Humberside; David Coates, Hertfordshire; Adam Jackson, and Richard M. Scrowston, both of North Humberside, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

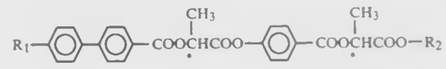
Filed Nov. 30, 1987, Ser. No. 116,282

Claims priority, application United Kingdom, Jan. 29, 1986, 8602168

Int. Cl.[5] C07C *69/76, 69/84;* C09K *19/12, 19/20*

U.S. Cl. 252—299.65 6 Claims

1. A compound suitable for use in a ferroelectric smectic liquid crystal composition having a structure which contains two chiral centers derived from alpha-hydroxy carboxylic acid groups and having the formula:



wherein R_1 is n-alkoxy containing from 1 to 12 carbons atoms and R_2 is n-alkyl containing from 1 to 12 carbons atoms.

4,923,634

COOLING WATER CORROSION INHIBITION METHOD

John E. Hoots; Donald A. Johnson; Dodd W. Fong, all of Naperville, and James F. Kneller, LaGrange, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

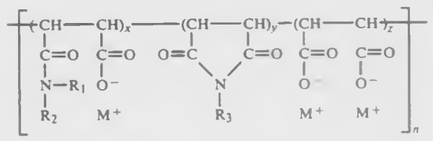
Division of Ser. No. 861,763, May 9, 1986, Pat. No. 4,752,443. This application Feb. 12, 1988, Ser. No. 155,393

Int. Cl.[5] C09K *15/12*

U.S. Cl. 252—389.2 9 Claims

1. A method for improving the performance of corrosion inhibitors in aqueous systems having hardness and a pH of at least 6.9 by dosing said systems with from 10 to 100 ppm of a composition comprising:

I. A hydrocarbon polymer selected from the group consisting of: derivatized maleic anhydride homo-, co- and terpolymers having N-substituted maleamic acid units, N-substituted maleimide units and maleic acid (and salts) units having a structure as follows:



wherein R_1, R_2 and R_3 are each independently chosen from the group consisting of hydrogen, sulfophenyl, linear or branched sulfoalkyl of from one to ten carbon atoms, with the proviso that no more than two of R_1, R_2 and R_3 is hydrogen, and M^+ may be H^+, alkali metal ions, alkaline earth metal ions, or ammonium ions and wherein:

n=total mole of of derivatized and underivatized maleic units in the polymer and is in the range of from 10 to about 1200;

x=mole fraction of maleamic acid (salts) units in the polymer and can vary from 0 to about 1.0;

y=mole fraction of maleimide units in the polymer and can vary from 0 to about 0.95;

z=mole fraction of maleic acid (salts) units in the polymer and can vary from 0 to 0.95,

wherein x+y+z=1; and

II. A water soluble inorganic phosphate capable of inhibiting corrosion in an aqueous alkaline environment;

with the weight ratio of polymer:phosphate being within the range of 0.1:1 to 5:1.

4,923,635

LIQUID DETERGENT COMPOSITION CONTAINING ALKYLBENZENE SULFONATE, ALKYL ETHANOL ETHER SULFATE, ALKANOLAMIDE FOAM BOOSTER AND MAGNESIUM AND TRIETHANOLAMMONIUM IONS

F. Anthony Simion, Hazlet; Dirk Warscjewski, Spotswood, and Leonard A. Zyzyck, Somerset, all of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 69,679, Jul. 6, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 283,034

Int. Cl.[5] C11D *1/83, 3/02, 3/30, 11/00*

U.S. Cl. 252—545 3 Claims

1. A method of making a liquid detergent composition consisting essentially of about 10% to 50% by weight of a mixture of a water-soluble C_{10}–C_{16} alkyl benzene sulfonate salt and a water-soluble C_{10}–C_{16} primary alkyl ethenoxy ether sulfate salt containing an average of about 1 to 5 ethylene oxide groups per alkyl group, the weight ratio of said alkyl benzene sulfonate salt to said alkyl ether sulfate salt being in the range about 1:1 to 1.5:1; about 1% to 8% by weight of a C_8–C_{18} alkanoic acid mono- or di-ethanolamide foam booster, at least about 0.5% to 1.8% by weight of magnesium ions, an amount of triethanolammonium ions sufficient to provide a synergistic weight ratio of magnesium ions to triethanolammonium ions in the range of about 1:1 to about 1:2.4 and the balance an aqueous medium comprising water and about 0% to 15% by weight of a solubilizer selected from the group consisting of C_2–C_3 monohydric and polyhydric alcohols, water-soluble C_1–C_3 alkyl substituted benzene sulfonates, urea and mixtures thereof, said composition having a pH of from 5 to 8 and exhibiting improved oily soil removal and oily soil emulsification properties at a temperature of 18° C. to 26° C. as compared to the same composition without the magnesium ions and triethanolammonium ions, comprising the steps of neutralizing a C_{10}–C_{16} linear alkyl benzene sulfonic acid with magnesium hydroxide to a pH of about 1.5 and thereafter adding sodium hydroxide to increase the pH to the range of 5 to 7, neutralizing a C_{10}–C_{16} alkyl ethenoxy ether sulfuric acid with a mixture of triethanolamine and ammonium hydroxide, admixing said sulfonate salt with said sulfate salt and thereafter adding said alkanoic acid ethanolamide in liquid form with agitation to form a homogeneous liquid detergent composition.

3. A method of making the liquid detergent composition consisting essentially of about 10% to 50% by weight of a mixture of a water-soluble C_{10}–C_{16} alkyl benzene sulfonate salt and a water-soluble C_{10}–C_{16} primary alkyl ethenozy ether sulfate salt containing an average of about 1 to 5 ethylkene oxide groups per alkyl group, the weight ratio of said alkyl benzene sulfonate salt to said alkyl ether sulfate salt being in the range about 1:1 to 1.5:1; about 1% to 8% by weight of a C_8–C_{18} alkanoic acid mono- or di-ethanolamide foam, booster, at least about 0.5% to 1.8% by weight of magnesium ions, an amount of triethanolammonium ions sufficient to provide a synergistic weight ratio of magnesium ions to triethanolammonium ions in the range of about 1:1 to about 1:2.4 and the balance an aqueous medium comprising water and about 0% to 15% by weight of a solubilizer selected from the group consisting of C_2–C_3 monohydric and polyhydric alcohols, water-soluble C_1–C_3 alkyl substituted benzene sulfonates, urea and mixtures thereof, said composition having a pH of from 5 to 8 and

exhibiting improved oily soil removal and oily soil emulsification properties at a temperature of 18° C. to 26° C. as compared to the same composition without the magnesium ions and triethanolammonium ions, comprising the steps of admixing triethanolamine with an aqueous composition containing a sodium or ammonium salt of said sulfonate, a sodium or ammonium salt of said sulfate and said alkanoic acid alkanolamide, thereafter admixing a water-soluble magnesium salt selected from the group consisting of magnesium sulfate, magnesium sulfate heptahydrate, magnesium acetate, magnesium acetate tetrahydrate, magnesium benzoate trihydrate, magnesium chloride, magnesium chloride hexahydrate, magnesium nitrate, magnesium nitrate hexahydrate, and mixtures thereof with the mixture of the preceding step and adjusting the pH of the resultant composition to a pH of from 6.5 to 7.5.

4,923,636

DETERGENT COMPOSITIONS

Stephen N. Blackburn, Chester, England; Francois Delwel, NE Dordrecht, Netherlands, and Elfed H. Evans, Clwyd, Scotland, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 109,340, Oct. 16, 1987. This application Mar. 30, 1989, Ser. No. 317,178

Claims priority, application United Kingdom, Oct. 20, 1986, 8625104

Int. Cl.[5] **C11D** *1/12, 1/755, 1/83, 1/831*

U.S. Cl. 252—550 **2 Claims**

1. An aqueous liquid surfactant composition mobile at a temperature within the range of from 20° to 80° C. characterised in that the composition consists essentially of

(a) a sodium or potassium salt of an alkylbenzene sulphonate or alkyl sulphate in an amount of about 20% to 60% by weight.

(B) an ethoxylated nonionic surfactant in an amount of about 20% to 60% by weight.

(C) the balance being water in an amount not exceeding 10% by weight.

4,923,637

HIGH CONDUCTIVITY CARBON FIBER

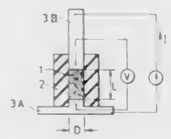
Kiyoshi Yagi; Toshiaki Kanno, and Toshio Inada, allof Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Jun. 23, 1988, Ser. No. 210,379

Claims priority, application Japan, Jun. 24, 1987, 62-155396; Jul. 17, 1987, 62-177272

Int. Cl.[5] **H01B** *1/06*

U.S. Cl. 252—511 **2 Claims**



1. A high conductivity resin, comprising;

(a) 5 to 200 wt. parts of a pulverized graphite fiber of 0.05 to 2 μm in diameter and 10 μm or less in length with crystal structure such that carbon hexagonal net planes are arranged substantially in parallel to a fiber axis and in annular ring growth fashion around the fiber axis;

(b) 100 wt. parts of synthetic resin kneaded with said graphite fiber so that said graphite fiber is dispersed into said synthetic resin; and

(c) reactive substances infiltrated to between the carbon hexagonal net planes, to form higher conductivity carbon intercalation compound by reacting the graphite fiber with reactive substance.

4,923,638

NEAR INFRARED ABSORBING COMPOSITION

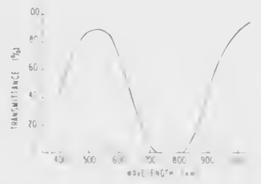
Shigeru Ohno; Yuji Mihara; Keiichi Adachi; Toshinao Ukai, and Gouichi Hayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 913,278, Sep. 30, 1986, abandoned. This application Mar. 28, 1989, Ser. No. 331,075

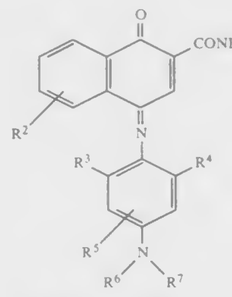
Claims priority, application Japan, Sep. 30, 1985, 60-217315; Feb. 12, 1986, 61-28711

Int. Cl.[5] **F15V** *9/04*

U.S. Cl. 252—587 **10 Claims**

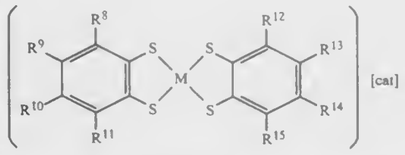


1. A near infrared absorbing composition containing at least one compound represented by general formula (I) and having its absorption maxima at wave-lengths of 720 nm or more and at least one compound represented by the general formula (II):



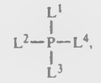
(I)

wherein R^1 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; R^2 and R^5, which may be the same or different, each represents a hydrogen atom or a group capable of substituting a hydrogen atom; R^3 and R^4, which may be the same or different, each represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkoxy group or a substituted or unsubstituted alkyl group with the proviso that they do not simultaneously represent hydrogen atoms; and R^6 and R^7, which may be the same or different, each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, an acyl group or a sulfonyl group, or R^6 and R^7 may be taken together to form a 5- or 6-membered ring;



(II)

wherein R^8, R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14} and R^{15} each represents a hydrogen atom, a halogen atom or a substituted or unsubstituted alkyl group which is bonded to the benzene ring either directly or via a divalent linking group; M represents nickel, cobalt, copper, palladium or platinum; and "cat" represents a quaternary phosphonium represented by the formula



wherein L^1, L^2, L^3 and L^4 each represents a substituted or unsubstituted alkyl group having from 1 to 20 carbon atoms or a substituted or unsubstituted aryl group having from 6 to 14 carbon atoms.

4,923,639

METHOD OF PROCESSING PLUTONIUM AND/OR URANYL NITRATE

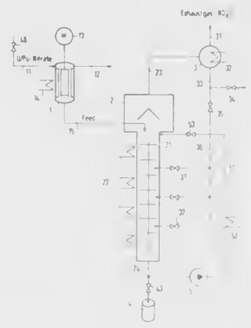
Wolfgang Stoll, Hanau; Christian Ost, Mainaschaff, and Volker Schneider, Heusenstamm, all of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,753

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101505

Int. Cl.[5] **G21F** *9/08, 9/14;* **C01G** *43/01, 56/00*

U.S. Cl. 252—632 **10 Claims**



1. Method for treating a nitrate selected from the group consisting of plutonium nitrate and uranyl nitrate and mixtures thereof in aqueous nitric acid solution to produce a nitrate in compact solid form which can with greater safety be stored or transported as a solid body until further processing, which comprises

(a) oxidizing plutonium nitrate which may be contained in the aqueous solution to cause the plutonium to reach a stage of oxidation with a valence of VI,

(b) heating the aqueous solution to vaporize water and nitrogen oxides and form a Pu(VI)-containing nitrate melt or a U(VI)-containing melt or melt of said latter two nitrates,

(c) pouring the melt into a mold wherein the melt is solidified by cooling down, and

(d) storing or transporting the solidified body until further processing.

4,923,640

PROCESS FOR THE PRODUCTION OF 17α-ETHINYL-17β-HYDROXY-18-METHYL-4,15-ESTRADIEN-3-ONE AND NEW INTERMEDIATE PRODUCTS FOR THIS PROCESS

Rolf Bohlmann; Henry Laurent; Helmut Hofmeister, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

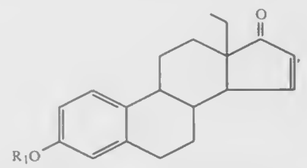
Filed Mar. 31, 1988, Ser. No. 176,111

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710728

Int. Cl.[5] **C07J** *1/00;* **A61K** *31/56*

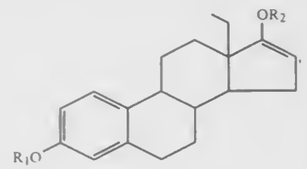
U.S. Cl. 552—625 **14 Claims**

1. A process for the production of a compound of the formula III



III

wherein R_1 is alkyl of 1–3 carbon atoms, comprising reacting a 17-enolester of formula II



II

wherein

R_1 is alkyl of 1–3 carbon atoms and

R_2 represents an acyl or a trialkylsilyl group with up to 10 carbon atoms,

with a palladium catalyst to form a compound having the formula III.

4,923,641

HIGHLY CONCENTRATED STABLE SOLUTIONS OF COLOR-FORMING AGENT: FOR PRESSURE-SENSITIVE RECORDING MATERIALS

Udo Eckstein, Cologne, and Hubertus Psaar, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

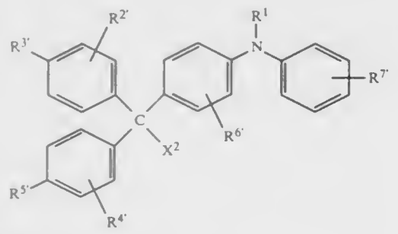
Continuation of Ser. No. 10,932, Feb. 5, 1987, Pat. No. 4,783,196. This application Sep. 20, 1988, Ser. No. 247,125

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605552

Int. Cl.[5] **B41M** *5/16;* **C09B** *11/04, 67/44*

U.S. Cl. 544—86 **1 Claim**

1. A color-forming agent of the formula



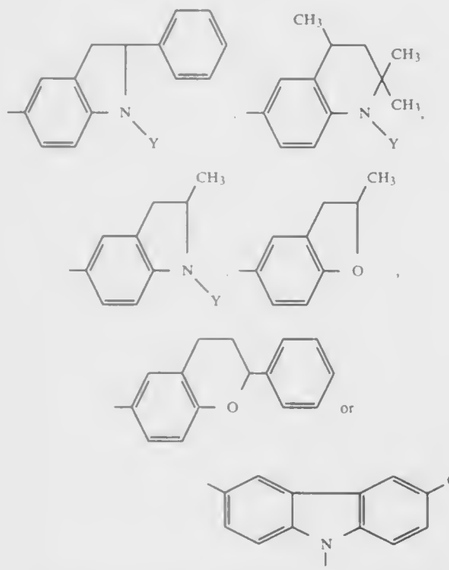
wherein
R^1 denotes C_1-C_{12}-alkyl or benzyl,
X^2 denotes hydroxyl or C_1-C_{12}-alkoxy,
$R^{3'}$ denotes hydrogen, chlorine, C_1-C_{12}-alkyl, C_1-C_{12}-alkoxy, benzyloxy, phenoxy or a radical of the formula



$R^{5'}$ denotes a radical of the formula



$R^{2'}$, $R^{4'}$, $R^{6'}$ and $R^{7'}$ independently of one another denote hydrogen, chlorine, C_1-C_{12}-alkyl, C_1-C_{12}-alkoxy, C_1-C_4-alkylamino or di-C_1-C_{12}-alkylamino or
$R^{2'}$ and $R^{3'}$ denote members which, together with the benzene ring to which they are bonded, complete a ring system of one of the formulae



Y denotes C_1-C_{12}-alkyl, which unsubstituted or substituted by chlorine, cyano, C_1-C_4-alkoxycarbonyl or C_1-C_4-alkoxy, or Y denotes cyclohexyl, phenyl or benzyl, which are unsubstituted or substituted by chlorine, C_1-C_{12}-alkyl or C_1-C_{12}-alkoxy,
Y^1 and Y^2 independently of one another denote C_1-C_{12}-alkyl which is unsubstituted or substituted by chlorine, cyano, C_1-C_4-alkoxycarbonyl or C_1-C_4-alkoxy, or cyclohexyl, phenyl or benzyl, which can be substituted by chlorine, C_1-C_{12}-alkyl or C_1-C_{12}-alkoxy, or
denotes a pyrrolo, pyrrolidino, piperidino, pipecoline, morpholine, pyrazolo or pyrazolino radical which is unsubstituted or substituted by chlorine, C_1- to C_4-alkyl or phenyl.

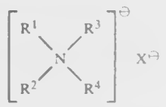
4,923,642

QUATERNARY AMMONIUM COMPOUNDS, THEIR PRODUCTION AND USE IN FABRIC AFTERTREATMENT PREPARATIONS

Horst Rutzen, Langenfeld; Horst Baumann, Leichlingen, and Bert Gruber, Bedburg, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

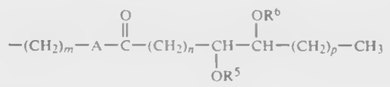
Filed Nov. 16, 1987, Ser. No. 121,267
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3638918
Int. Cl.[5] **C09F** *5/00*
U.S. Cl. 260—404 **11 Claims**

1. Quaternary ammonium compound corresponding to the following formula



(I)

wherein
R^1 is a C_1-C_4 alkyl radical or a C_1-C_4 hydroxyalkyl radical,
R^2 is a C_1-C_4 alkyl radical, a C_1-C_4 hydroxyalkyl radical or a phenalkyl radical containing from 1 to 3 carbon atoms in the alkyl group, and
R^3 and R^4 may be the same or different and represent a radical corresponding to the following formula



(II)

in which
m is an integer of from 1 to 3,
n and p independently of one another is an integer of from 1 to 12 with a sum (p+n) of from 2 to 20,
A is a group —O— or —NH—, and
R^5 and R^6 are hydrogen or a C_1-C_{22} alkyl radical, with the proviso that R^5 is H when R^6 is an alkyl radical and vice versa, and
$X^{\ominus}$ is the anion of an inorganic or organic acid.

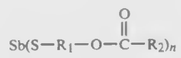
4,923,643

ANTIMONY MERCAPTIDE ESTERS AND METHODS OF PREPARING THE SAME

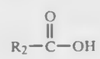
Howard F. Efner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 16, 1988, Ser. No. 245,784
Int. Cl.[5] **C07F** *9/90, 9/92;* **C11C** *3/02;* **C08H** *3/00*
U.S. Cl. 260—410.9 R **25 Claims**

1. A method of preparing an antimony mercaptide ester having the formula



wherein R_1 is selected from hydrocarbylene groups having from 2 to 18 carbon atoms, R_2 is selected from hydrocarbyl groups having from 1 to 35 carbon atoms and n is 3 or 5 comprising:
reacting an antimony oxide compound of the formula $Sb_2(O)_n$ with a mercapto alcohol of the formula HS—R_1—OH in a first reaction to form an antimony mercaptide intermediate of the formula $Sb(S—R_1\text{-}OH)_n$; and then
reacting said intermediate with an organic acid of the formula



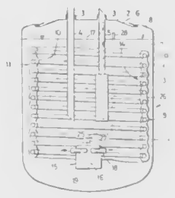
or the anhydride of such acid in a second reaction to form said antimony mercaptide ester.

4,923,644

APPARATUS FOR IMPREGNATING WATER WITH CARBON DIOXIDE

Alexander Kuckens, Harvestehuder Weg 28, 2000 Hamburg 13, Fed. Rep. of Germany

Continuation of Ser. No. 343,876, Jan. 29, 1982, abandoned, which is a continuation of Ser. No. 91,404, Nov. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 59,264, Jul. 20, 1979, abandoned. This application Oct. 16, 1984, Ser. No. 660,570
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832377; Nov. 7, 1978, 2848146
Int. Cl.[5] **B01F** *3/04*
U.S. Cl. 261—29 **1 Claim**



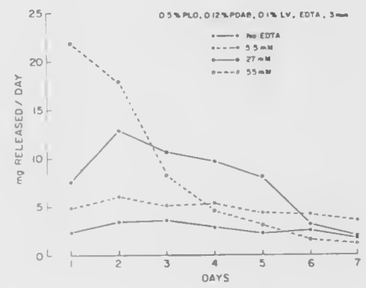
1. Apparatus for impregnating water with carbon dioxide comprising a pressure tight vessel having a vertical central axis, means for supplying fresh water into the vessel at the top thereof to a predetermined water line to define a head space in the vessel above the water line, means for supplying carbon dioxide gas into the vessel at the top thereof above the water line, a motor submerged in water in the vessel below the predetermined water line located on the vertical central axis of the vessel, a liquid pump within the container on the vertical central axis thereof connected to the motor for rotation thereby, said pump having a suction inlet proceeding circumferentially of the vessel in one direction and said pump having a delivery port proceeding circumferentially of the container in the opposite direction, means for drawing carbon dioxide gas from the head space of the vessel above the water line therein into the pump on actuation of the pump by the motor whereby the carbon dioxide gas and water are mixed in the pump and are delivered from the delivery port of the pump in a mixed condition and traverse the vessel in a generally horizontal circular path centered on the axis of the container and a cylinder positioned within the container having an axis of generation substantially congruent with the axis of the vessel and having an outer periphery which is in spaced relation to the inner periphery of the vessel providing an inner and outer cooling surface between the pump and the inner wall of the vessel, whereby the pump produces a circulation of carbon dioxide impregnated water along both the inside and outside cooling surfaces with the circulation velocity of the water along the inside cooling surface being greater than along the outside cooling surface.

4,923,645

SUSTAINED RELEASE OF ENCAPSULATED MOLECULES

Wen-Ghih Tsang, Lexington, and Andrew S. Magee, Weston, both of Mass., assignors to Damon Biotech, Inc., Needham Heights, Mass.

Filed Nov. 16, 1987, Ser. No. 121,214
Int. Cl.[5] **A61K** *9/62, 9/64;* **B01J** *13/02*
U.S. Cl. 264—4.3 **13 Claims**



1. A method of providing controlled release of molecules encapsulated in a gelled mass with a surrounding semi-permeable membrane into a solution in which said molecules are soluble, the method comprising the steps of:
A. suspending said molecules in a solution of a polyanionic polymer which can be reversibly gelled by contact with a chelatable, multivalent cationic cross-linking agent;
B. gelling said polyanionic polymer by contacting said polymer with said multivalent cationic cross-linking agent to form a gelled mass with said molecules encapsulated therein;
C. forming a semi-permeable membrane about said gelled mass by contacting said gelled mass with a solution of a polycationic polymer, said gelled mass within said semi-permeable membrane being in a first semi-solid gel state;
D. controlling the release rate of said encapsulated molecules into said solution in which they are soluble by modifying the gel state of the gelled mass within said semi-permeable membrane from said first semi-solid gel state to a second semi-solid gel state by treating said gelled mass for a predetermined duration with a solution containing a predetermined concentration of a chelating agent, said treatment resulting in reversibly controlled modification of the gel state of said gelled mass without liquification of said gelled mass or disruption of said semi-permeable membrane, said release rate of said molecules being different from said gelled mass when in said first gel state than it is in said second gel state.

8. A method of providing controlled release of molecules encapsulated in a gelled mass with a surrounding semi-permeable membrane into a solution in which said molecules are soluble, the method comprising the steps of:
A. suspending said molecules in a solution of a polyanionic polymer which can be reversibly gelled by contact with a first multivalent cationic cross-linking agent;
B. gelling said polyanionic polymer by contacting said poly-

mer with said first multivalent cationic cross-linking agent to form a gelled mass with said molecules encapsulated therein;

C. forming a semi-permeable membrane about said gelled mass by contacting said gelled mass with a solution of a polycationic polymer, said gelled mass within said semi-permeable membrane being a first semi-solid gel state;

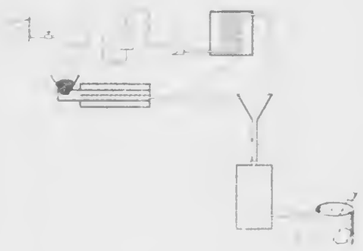
D. controlling the release rate of said encapsulated molecules into said solution in which they are soluble by modifying the gel state of the gelled mass within said semi-permeable membrane from said first semi-solid gel state to a second semi-solid gel state by treating said gelled mass for a predetermined duration with a solution containing a predetermined concentration of a second multivalent cationic cross-linking agent of a different electropotential than said first multivalent cationic cross-linking agent, said treatment resulting in reversibly controlled modification of the gel state of said gelled mass without liquification of said gelled mass or disruption of said semi-permeable membrane, said release rate of said molecules being different from said gelled mass when in said first gel state than it is in said second gel state.

4,923,646

METHOD AND APPARATUS FOR THE MANUFACTURE OF FIBRIDS

Homan B. Kinsley, Jr., Powhatan, Va., assignor to James River Corporation, Richmond, Va.

Filed Nov. 8, 1988, Ser. No. 268,470
Int. Cl.[5] B29B *9/10*
U.S. Cl. 264—13 35 Claims



1. A method for the manufacture of fibrids comprising the steps of:

(a) mixing a melted polymer and superheated water;

(b) forming a suspension of molten polymer droplets suspended in said superheated water;

(c) passing said suspension through at least one bank of capillary tubes wherein said molten polymer droplets are elongated to form pre-fibrids suspended in said superheated water due to shear forces acting upon the droplets during their passage through the bank of capillary tubes;

(d) allowing said pre-fibrid/superheated water suspension to exit from the capillary tubes and pass into an environment of lower pressure and temperature thereby expanding said superheated water such that polymer fibrids are formed.

27. An apparatus for the manufacture of fibrids comprising:

a mixing chamber;

means for superheating and continuously supplying superheated water to said mixing chamber;

means for melting, heating and transporting polymer material to said mixing chamber;

a bank of capillary tubes connected at a first end to said mixing chamber;

a nozzle attached to a second end of said bank of capillary tubes; and

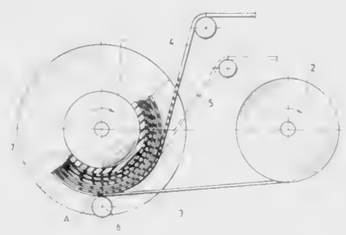
an expansion chamber into which an aperture of said nozzle opens.

4,923,647

PROCESS FOR THE VULCANIZATION OF LAMINAR RUBBER PRODUCTS

Ilona Tatai; Tibor Penziás; László Palotás; Elemér Lantos; Péter Smaroglay, and László B. Deák, all of Budapest, Hungary, assignors to Taurus Gumiipari Vallalat, Budapest, Hungary

Filed Dec. 3, 1987, Ser. No. 128,281
Int. Cl.[5] B32B *31/20, 31/26*
U.S. Cl. 264—27 2 Claims



1. A process for the vulcanization of laminar rubber products, comprising winding onto a drum an unvulcanized laminar rubber product together with a flexible, windable, electrically conducting band,

and together with a heat resistant, electrically nonconducting layer between said laminar rubber product and said electrically conducting band, said layer having a pattern thereon

applying a force to said band the direction of said force being counter to the direction of winding for prestressing said wound up rubber product together with said band, applying substantially uniform pressure on the surface of said conducting band substantially at the point at which it and said laminar rubber product are being wound onto said drum, and applying electrical current to the wound up electrically conducting band until the wound up laminar rubber product becomes vulcanized, and recovering the vulcanized laminar rubber product.

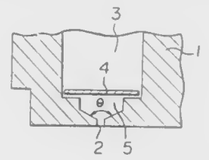
4,923,648

PROCESS FOR THE PRODUCTION OF PITCH-TYPE CARBON FIBERS

Fyuichi Hara, Machida; Masami Kagizaki; Tsuyoshi Takakura, both of Kitakyushu, and Shigeki Tomono, Kawasaki, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Division of Ser. No. 39,679, Apr. 20, 1987, which is a continuation-in-part of Ser. No. 748,441, Jun. 21, 1985, abandoned. This application Sep. 19, 1988, Ser. No. 245,564
Claims priority, application Japan, Jun. 26, 1984, 59-131641; Feb. 7, 1985, 60-22570; May 7, 1985, 60-96194; May 8, 1985, 60-96973; May 8, 1985, 60-96974; May 8, 1985, 60-96975
Int. Cl.[5] D01F *9/12*
U.S. Cl. 264—29.2 8 Claims

1. A process for producing carbon fibers having a cross-sectional crystal structure of substantially uniform mesh form orientation as observed by a polarizing microscope, which comprises melt spinning pitch material through spinning nozzles, followed by infusible treatment and carbonization, wherein a mesh filter layer is provided at an upstream portion of each nozzle, and the pitch material is passed first through the mesh filter layer and then through the nozzle for spinning.

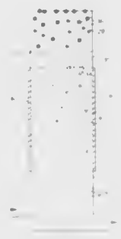


4,923,649

PELLETIZING POLYMERS

Eric T. Hsieh; Gene H. C. Yeh, and John R. Donaldson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 6, 1986, Ser. No. 836,884
Int. Cl.[5] B29B *9/08, 9/10*
U.S. Cl. 264—37 18 Claims



1. A method for pelletizing polymer particolates comprising (1) dispensing polymer in the form of fluff or powder in a vessel containing a liquid that (a) is not miscible with said polymer, (b) has a boiling point that is at a temperature greater than the melting point of said polymer and (c) has a density greater than the density of said polymer so that said polymer rises through said liquid, (2) heating a zone of said liquid to a temperature greater than the melting point of said polymer thereby producing molten polymer particulates and allowing said molten polymer particulates to agglomerate into drops, (3) allowing said drops to pass through a zone of unheated liquid thereby cooling said drops into solid pellets and (4) recovering said pellets.

11. A method for pelletizing polymer particulates comprising (1) dispersing polymer in the form of fluff or powder in a vessel containing at least two liquids (a) both of which are not miscible with (i) said polymer and (ii) with each other, and wherein said second liquid has a density grater than said first liquid and (b) at least one of which has a boiling point that is at a temperature greater than the melting point of said polymer, (2) heating a zone of said liquid having a boiling point that is at a temperature greater than the melting point of said polymer to a temperature greater than the melting point of said polymer thereby producing molten polymer particulates and allowing said molten polymer particulates to agglomerate into drops, (3) allowing said drops to pass through a zone of unheated liquid thereby cooling said drops into solid pellets and (4) recovering said pellets.

4,923,650

BREATHABLE MICROPOROUS FILM AND METHODS FOR MAKING IT

Mitchell K. Antoon, Jr., and David J. Hill, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jul. 27, 1988, Ser. No. 224,632
Int. Cl.[5] C08J *9/32, 9/36;* B29C *55/12*
U.S. Cl. 264—41 5 Claims

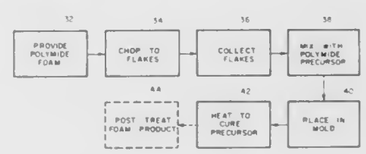
1. A method of preparing a breathable microporous polymeric film having the composition of 20–37% by weight of a polymer or copolymer of an α-olefin having 1–8 carbons or mixtures thereof, 60–75% by weight of calcium carbonate or glass beads, 0.1–3.0% by weight of calcium stearate and, optionally, 0–2% by weight of a UV light, oxygen, and heat stabilizer by preparing a melt blend of the ingredients, maintaining the moisture level in the melt blend below 700 ppm prior to extruding a casting, and based on the polymer or copolymer used, stretching the casting in two directions of from 1.5 to 7 times in each direction in a temperature range of from about 20° to about 160° C. thereby producing the breathable microporous film having a Gurley Porosity of from 0.1 to 85 seconds so that the film has good air and water vapor transmission rates but is substantially imPenetrable by liquid water.

4,923,651

METHOD OF MANUFACTURING POLYIMIDE FOAM SHAPES HAVING IMPROVED DENSITY AND CELL SIZE UNIFORMITY

Francis U. Hill, San Diego, Calif., assignor to Sorrento Engineering, Inc., National City, Calif.

Filed Jun. 30, 1989, Ser. No. 373,901
Int. Cl.[5] C08J *9/22*
U.S. Cl. 264—45.1 10 Claims



1. The method of manufacturing polyimide foam shapes of uniform density which comprises the steps of:

providing a quantity of polyimide foam having less than uniform density;

chopping said foam into flakes having lengths less than about ¼ inch and a length to thickness ratio of at least about 2 to 1;

mixing said flakes with a polyimide precursor powder;

placing said mixture in a mold; and

heating said mixture to the curing temperature of said precursor powder;

whereby a foam product having highly uniform density and cell size results.

4,923,652

METHOD OF REMOVING BINDER FROM POWDER MOLDED PRODUCTS

Norihiro Murakawa; Hisashi Isomura; Kazukiyo Miura, all of Shimonoseki, and Shinichi Aoki, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Japan

PCT No. PCT/JP87/00459, § 371 Date Feb. 24, 1988, § 102(e) Date Feb. 24, 1988, PCT Pub. No. WO88/00174, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 1, 1987, Ser. No. 186,487

Claims priority, application Japan, Jul. 1, 1986, 61-152807; Feb. 26, 1987, 62-41487

Int. Cl.[5] C04B *33/34*

U.S. Cl. 264—62 9 Claims



1. A method of vaporizing and removing a binder from a powder-molded product containing a binder, which method comprises:

coating all but 0.5% to 20% of the total surface area of said powder-molded product with an airtight thin resin film thereby leaving an exposed surface portion

hydrostatically pressurizing the thus-coated surface portion of the pressure molded product;

vaporizing the binder in the powder-molded product under said hydrostatic pressurization; and

removing the vaporizing binder from the powder-molded product through said exposed surface portion not coated with the thin film.

4,923,653

METHOD OF MOLDING SKIN-COVERED FOAMED PLASTIC ARTICLE

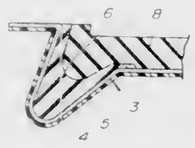
Ichiro Matsunra; Kiichiro Ishimaru; Hisayoshi Mizuno; Youichi Omata, and Fumio Soutome, all of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Dec. 13, 1988, Ser. No. 283,853

Claims priority, application Japan, Mar. 30, 1988, 63-74641

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—46.6 7 Claims



1. A method of molding a skin-covered foamed plastic article, comprising by steps:

(a) putting a bag-shaped outer skin member into a cavity of a lower mold, said skin member including an outer layer and a porous inner layer lining said outer layer;

(b) putting a first upper mold on said lower mold to close said cavity with a portion of said porous inner layer exposed in said cavity;

(c) fastening said lower and first upper molds together with a first fastening force;

(d) pouring a foamable plastic material into said cavity and foaming and curing said material;

(e) releasing an excessive pressure produced in said cavity during said foaming by discharging gas through said porous inner layer so that part of said material penetrates into said portion of said porous inner layer;

(f) removing said first upper mold from said lower mold after the material is hardened to a certain degree;

(g) putting a second upper mold on said lower mold to define a space therebetween with another portion of said porous inner layer exposed in said space;

(h) fastening said lower and second upper molds together with a second fastening force of a magnitude different from said first fastening force;

(i) pouring a foamable plastic material into said space and foaming and curing said material; and

(j) releasing an excessive pressure produced in said space during said foaming by discharging gas through said porous inner layer so that part of said material penetrates into said another portion of said porous inner layer;

said different fastening forces resulting in discharge of different amounts of gas and penetration of different amounts of material into said portions of said porous inner layer, thereby resulting in said article having certain portions which are different in resiliency.

4,923,654

BLOWING AGENT FOR EXPANDABLE POLYMERIC FOAMS

James F. Freeland, Newport Beach, Calif., assignor to Dolco Packaging Corporation, Pico Rivera, Calif.

Filed Jun. 9, 1988, Ser. No. 205,402

Int. Cl.[5] C08J *9/14;* B29C *67/22*

U.S. Cl. 264—53 18 Claims

1. In a process for the preparation of a thermoplastic foam comprising blending a thermoplastic resin and a volatile foaming agent, the improvement comprising employing as the volatile foaming agent a mixture comprising from about 50 to about 75 weight percent chlorodifluoromethane and from about 25 to about 50 weight percent of a hydrocarbon selected from the group consisting of butane and pentane.

4,923,655

SEALING OF END FACES OF CERAMIC TUBES

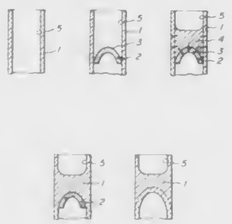
Shinji Oshima, Ama, and Hidenobu Misawa, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 10, 1988, Ser. No. 205,356

Claims priority, application Japan, Jun. 17, 1987, 62-149229

Int. Cl.[5] C04B *35/64*

U.S. Cl. 264—60 3 Claims



1. A process for sealing an end face of a ceramic tube, comprising the steps of:

inserting a porous member made of an organic material into the ceramic tube shaped by extrusion after the ceramic tube is dried, said porous member being shaped to meet an inner shape of an end portion of the ceramic tube to be sealed;

pouring and depositing a slurry into one end of the ceramic tube on an axially outer side of the porous member, said slurry exhibiting the same coefficient of thermal expansion as that of the ceramic tube during firing; and

drying and firing the ceramic tube and deposited slurry.

4,923,656

METHOD OF PRODUCING PROCESSED WOOD MATERIAL PANELS

Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

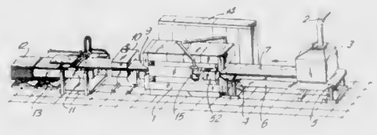
Division of Ser. No. 120,355, Nov. 13, 1987, Pat. No. 4,802,837.

This application Apr. 21, 1988, Ser. No. 183,836

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639061

Int. Cl.[5] B29C *43/22*

U.S. Cl. 264—70 23 Claims



1. Method of continuously producing processed wood material board or panels, including chipboard, fiberboard, OSB panels, and MDF panels, including using a binder resin for coating the wood material particles, with the binder including urea resins, melamine resins and phenol-formaldehyde resins, and accelerating curing the resin coated wood particles by applying a hardener, and including the steps of spreading the wood particle material coated with the binder on a support surface and forming a mat of the material, conveying the mat into a continuously operating double-band press and gradually compacting the mat of material at an inlet to the press for reducing mat thickness and maintaining pressure on the mat while it hardens, wherein the improvement comprises coating the wood particle material with a hardener-free resin, and introducing the hardener as an acid hardener or a basic hardener in a gaseous phase or a binary phase with a gaseous carrier agent, across and onto the surface of the mat or directly into the interior of the material forming the mat as the mat is gradually compacted at the inlet into the double-band press.

4,923,657

METHOD FOR MAKING PLASTIC PARTS

John C. Gembinski, Dover; Robert A. Grimmer, Rollinsford, and Patricia A. Betzig, Dover, all of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Division of Ser. No. 885,884, Jul. 15, 1986, Pat. No. 4,784,911, which is a continuation of Ser. No. 653,279, Sep. 24, 1984, abandoned. This application Aug. 4, 1988, Ser. No. 228,372

Int. Cl.[5] B29C *39/12, 41/22*

U.S. Cl. 264—73 5 Claims



1. In a process for molding a unique, three-dimensional, multi-colored, solid plastic part for vehicular interior or exterior use, the steps comprising:

providing a mold having a casting surface; providing an open-ended charge box; providing two or more colors of pigmented powder particles of thermoplastic material, each having a diameter in the range of 60 to 400 microns; and the multi-colored particles having varying degrees of light transmission to produce a three-dimensional surface effect after heat fusing; randomly mixing the multi-colored powder particles and depositing the random mixture into the charge box; casting the random mixture from the charge box onto a preheated mold surface to build up stacked nonpatterned layers of multi-colored particles having voids therebetween; heating the mold by a single heating step which is selected to cause marginal heat flow of the cast multi-colored particles to form non-patterned, color-blended fused fringe zones between each of the particles which fused fringe zones fill the voids between the multi-colored particles while retaining discrete particle cores to maintain each particle's central or original color concentration thereby forming the solid, three-dimensional, multi-colored plastic part with light transmissive properties; cooling the formed plastic part and removing the cooled plastic part from the mold.

4,923,658

PROCESS FOR THE PRODUCTION OF DYED, FLAT ARTICLES FROM THERMOPLASTIC SYNTHETIC RESINS

Alexander Hover, Troisdorf-Spich; Manfred Simon, Neiderkassel, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Troisdorf, Fed. Rep. of Germany

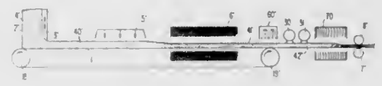
Continuation-in-part of Ser. No. 946,008, Dec. 24, 1986, abandoned, and Ser. No. 946,009, Dec. 24, 1986, abandoned.

This application Sep. 28, 1988, Ser. No. 250,151

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1985, 3546151; Dec. 27, 1985, 3546215

Int. Cl.[5] B29C *43/24, 43/30*

U.S. Cl. 264—76 30 Claims



1. A process for the production of multicolored, homogeneous flooring sheets made of thermoplastic synthetic resin wherein pourable particles are continuously formed into a uniform layer and are sintered under the action of heat up to the plasticization of the thermoplastic synthetic resin to form a coherent, porous layer; and the porous layer is press-molded under the action of pressure and heat to form a flooring sheet that is void-free and smooth, and wherein several colored batches of thermoplastic resin are formed, with each batch having a color different from the other; each batch is then heat-treated above the softening point of the thermoplastic resin and is formed into colored agglomerates or colored granules; a blend of differently colored agglomerates or granules is prepared in a predetermined mixing ratio; the blend is mechanically comminuted to form the pourable particles which comprise a multi-colored mixture of particles having a random grain size distribution and, thereafter, the pourable particles are continuously applied directly to a conveyor surface to form the uniform layer which is subsequently sintered to form the porous layer.

4,923,659

METHOD OF WELDING TUBULAR COMPONENTS OF THERMOPLASTIC MATERIAL

Peter Kunz, Schaffhausen, Switzerland, assignor to George Fischer AG, Schaffhausen, Switzerland

Filed Aug. 29, 1988, Ser. No. 237,902

Claims priority, application Switzerland, Sep. 23, 1987, 03681/87

Int. Cl.[5] B29C *65/02;* B29D *23/22*

U.S. Cl. 264—85 15 Claims

1. A method of welding tubular components of thermoplastic material, wherein the ends of the tubular components are

placed in contact with each other and then melted by applying heat, comprising building up pressure in the interior of the tubular components by supplying a gaseous medium in at least the regions of the ends of the tubular components, wherein the medium supplied to the interior of the tubular components cools the inner walls of the tubular components in the welding region, so that the temperature of the inner wall remains under the melting temperature of the thermoplastic material when the tubular components are heated.

4,923,660

PROCESS FOR THE PRODUCTION OF MOULDINGS AND FILMS FROM THERMOTROPIC POLYMERS

Bernd Willenberg; Aziz El Sayed; Harry Röhr, all of Bayer Aktiengesellschaft, D 5090 Leverkusen, Bayerwerk, and Hans-Rudolf Dicke, P.O. Box 166, Bayer Aktiengesellschaft, Krefeld-Uerdingen, all of Fed. Rep. of Germany

Continuation of Ser. No. 855,677, Apr. 25, 1986, abandoned. This application Mar. 25, 1988, Ser. No. 173,131

Claims priority, application Fed. Rep. of Germany, May 8, 1986, 3516425

Int. Cl.[5] B29B *11/12;* B29C *43/02*

U.S. Cl. 264—103 **10 Claims**

1. A process for the production of films and mouldings from a sheet-like structure of thermotropic polymer fiber or filaments, comprising precompacting the sheet-like structure at a temperature below the melting point of the thermotropic polymer to substantially eliminate cavities between the fibers or filaments within the sheet-like structure, heating said sheet-like structure to obtain an anisotropic melt, followed by compacting and cooling of the sheet-like structure.

4,923,661

METHOD AND APPARATUS FOR MAKING BRAKE PADS

Sergio Russo, Faiano, Italy, assignor to Abex Corporation, Boston, Mass.

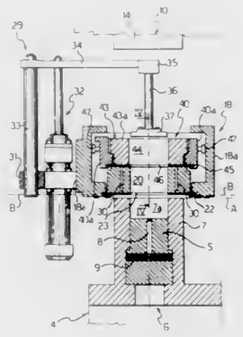
PCT No. PCT/EP87/00577, § 371 Date Aug. 5, 1988, § 102(e) Date Aug. 5, 1988, PCT Pub. No. WO88/02685, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 7, 1987, Ser. No. 221,787

Claims priority, application Italy, Oct. 14, 1986, 21997 A/86

Int. Cl.[5] B29C *31/08;* B28B *5/04*

U.S. Cl. 264—119 **20 Claims**



1. An apparatus for making brake pads from a brake friction material which comprises:

a hot molding multiple press having a plurality of molding seats and pressure members acting on the bottom of said molding seat plurality;

a hot carriage with a first moving bottom having a plurality of hot mold cavities formed therein corresponding in number to said molding seat plurality, said carriage being movable between a first position inside said press where said hot mold cavities are aligned with said molding seats and a second position outside said press;

a cold carriage with a second moving bottom having a plurality of cold mold cavities corresponding in number to said hot mold cavities movable between a first position in which said cold carriage overlies said hot carriage and said cold mold cavities are aligned with said hot mold cavities and a second position in which said cold carriage is remote from said hot carriage; and

pressure means and heater means mounted on the hot carriage and acting on said hot mold cavities.

4,923,662

PROCESS FOR PRODUCING POLYESTER FIBERS

Kazuo Kurita, and Yoshihiko Teramoto, both of Ootsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1988, Ser. No. 287,082

Claims priority, application Japan, Dec. 21, 1987, 62-324745

Int. Cl.[5] D01D *5/088, 5/16*

U.S. Cl. 264—178 F **5 Claims**

1. A process for the production of polyester fibers which comprises melt-spinning an ethylene terephthalate polyester to form highly oriented low crystalline polyester filaments which, at the stage of being taken-up and prior to being drawn, have a birefringence (Δn) and specific gravity (SG) within the below indicated ranges (a) and (b), and then, without winding-up, subjecting the said filaments immediately to drawing and heat treatment between first godet rolls and second godet rolls under a draw ratio (DR) defined by the following formulas:

$$\Delta n \geqq 5SG - 6.64 \quad \text{(a)}$$

$$\Delta n \geqq 0.100 \quad \text{(b)}$$

$$2.0 \geqq DR > 1.0 \quad \text{(c)},$$

and then winding up the drawn filaments.

4,923,663

METHOD OF LINING TUBULAR MEMBERS INCLUDING ROLLING AND CRUSHING A LINER

Jim S. McMillan, Fort Worth, Tex., assignor to Simon Sama'an Tarsha, Fort Worth, Tex.

Filed Oct. 17, 1988, Ser. No. 258,796

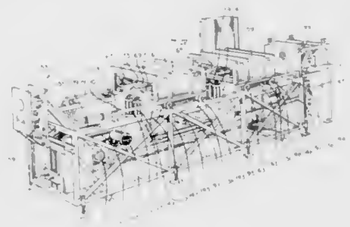
Int. Cl.[5] B29C *43/46, 63/34, 63/38*

U.S. Cl. 264—229 **7 Claims**

1. A method of lining a tubular member with an elastomeric liner having an outside diameter which is initially greater than the inside diameter of the tubular member, the method comprising the steps of:

reducing a length of the liner to a downsized outside diameter by passing the liner through a series of downsizing rollers to initially reduce the outside diameter at a first station and through a hydraulic press at a second station to additionally reduce the liner outside diameter, the liner being rolled and simultaneously crushed a preselected amount as it is gripped and pulled through the first and second stations to thereby effect a linear elongation of the liner, whereby the liner retains a standard dimensional ratio in the downsized condition;

inserting the downsized liner into the tubular member to be lined;



allowing the downsized liner to expand to substantially its original outside diameter whereby the liner makes 360 degree contact with the inner surface of the tubular member and exerts radial pressure on the tubular member to hold the liner firmly in position.

4,923,664

PROCESS FOR MANUFACTURING A BUILDING PANEL

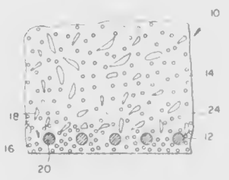
Gert Kossatz, Braunschweig; Wolfgang Heine, Osterode/Harz; Karsten Lempfer, and Heinz Sattler, both of Braunschweig, all of Fed. Rep. of Germany, assignors to Fraunhofer Gesellschaft zur Forderung der Angewandten Forschung E.V., Munich, Fed. Rep. of Germany

Division of Ser. No. 88,430, Aug. 24, 1987, abandoned. This application May 18, 1988, Ser. No. 195,642

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629223

Int. Cl.[5] B28B *1/16;* E04B *5/04;* E04C *2/04*

U.S. Cl. 264—256 **15 Claims**



1. Process for manufacturing a building panel constructed in layers, including a main layer comprising a mixture of hydrated binder and reinforcing additive, and at least one further layer comprising a reinforcement and a hydrated binder, comprising:

(a) soaking a porous reinforcing additive (**18**) with water, the porous reinforcing additive being capable of taking up, storing and releasing water needed for the hydration of a binder;

(b) mixing the soaked reinforcing additive containing an amount of water needed for hydration of the binder (**18**) with binder (**16**) and depositing the mixture on a forming surface, the weight ratio W of water to binder being about 0.16 to 0.6;

(c) placing reinforcement onto the deposited mixture;

(d) dusting further binder (**16**) in dry powder form onto the deposited mixture and placed reinforcement thereby forming a layer of binder having a deficiency of water needed for hydration of the binder, and increasing the density of the deposited reinforcing additive and binder by mechanical action, whereby the water in the reinforcing additive flows by capillary action to the binder at contact points between the reinforcing additive and the binder resulting in the formation of a coherent matrix by hydration of the binder thereby forming a main layer (**14**) of hydrated binder and the reinforcing additive, a further layer of hydrated binder and the reinforcement, and a transition layer therebetween the transition layer forming a gradual and continuous transition in composition between the main layer and the further layer.

4,923,665

METHOD OF IMPROVING CHARACTERISTICS OF A MOULDED BODY

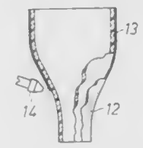
Arne Andersen, and Hans Bache, both of Klokkerholm, Hjallerup, Denmark, assignors to Aktieselskabet Aalborg Portland-Cement-Fabrik, Aalborg, Denmark

Continuation of Ser. No. 518,302, Jun. 29, 1983, abandoned, which is a continuation of Ser. No. 910,354, Sep. 22, 1986, abandoned. This application Dec. 19, 1988, Ser. No. 287,706

Claims priority, application Denmark, Oct. 30, 1981, 4816/81

Int. Cl.[5] B29C *43/22*

U.S. Cl. 264—259 **5 Claims**



1. A method of providing a metal coated article of a mold, tool or machine part which comprises forming a metal layer of a desired shape and molding a basic composition against said metal, thereby bonding said molded article to said metal layer, said basic composition comprising

(A) inorganic particles of a size of from about 50 Å to about 0.5 u,

(B) solid particles having a size of the order of 0.5–100 u, and being at least one order of magnitude larger than the respective particles stated under (A), and

(C) compact-shaped solid particles of a material having a strength exceeding that of ordinary sand and stone used for ordinary concrete, typically a strength corresponding to at least one of the following criteria:

(1) a die pressure of about 30 MPa at a degree of packing of 0.70, above 50 MPa at a degree of packing of 0.75, and above 90 MPa at a degree of packing of 0.80, (on particles of the material having a size ratio between the largest and smallest particle substantially not exceeding 4 mm),

(2) a compressive strength of a composite material with the particles embedded in a specified matrix exceeding 170 MPa (in case of a substantial amount of the particles being larger than 4 mm) and 200 MPa (in case of substantially all particles being smaller than 4 mm),

(3) a Moh's hardness (referring to the mineral constituting the particles) exceeding 7 and

(4) a Knoop indentor hardness (referring to the mineral constituting the particles) exceeding 800, said particles having a size of 100 u–0.1 m, a liquid, and a surface-active dispersing agent, the particles (A) being homogeneously distributed in the voids between particles (B) and optionally

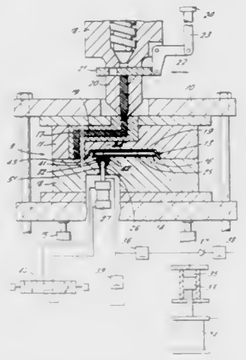
(D) additional bodies which have at least one dimension which is at least one order of magnitude larger than the particles (A), with the proviso that when additional bodies D are not present or are present and consist of sand and/or stone, at least 20% by weight of the particles B are Portland cement particles.

4,923,666

METHOD OF INJECTION MOULDING

Kunio Yamazaki, Takatsuki, and Tetsuzi Watanabe, Toyonaka, both of Japan, assignors to Cinpres Limited, Staffordshire, England

Filed Apr. 28, 1988, Ser. No. 187,309
Claims priority, application Japan, Apr. 28, 1987, 62-103227
Int. Cl.[5] B29C *45/34;* B29D *22/00*
U.S. Cl. 264—572 5 Claims



1. A method of producing a resin molding comprising introducing molten synthetic thermoplastic resin at an elevated temperature in a mold cavity defining the shape of a resultant molding, introducing pressurized gas into the resin, and allowing the resin molding to cool and harden in the mold cavity whilst maintaining the gas under pressure, the mold cavity being designed to manufacture moldings with unevenly distributed thick-walled sections connected to at least one gate for the introduction of the pressurized gas, wherein the process comprises filling the mold cavity to its full capacity with the resin and, subsequent to the filling and whilst the resin of the molding cools from said elevated temperature and tends to shrink within the mold cavity, introducing the pressurized gas into the resin within the mold cavity, the gas flowing only within the resin forming the thick-walled sections and immediately adjacent areas of the molding, the gas entering said thick-walled sections and thereby taking up the shrinkage in the resin and forming gas-filled sections within the resin, and the pressure of the gas within the gas-filled sections being maintained during the cooling stage of the molding cycle until the molding can itself sustain the form dictated by the mold surface.

4,923,667

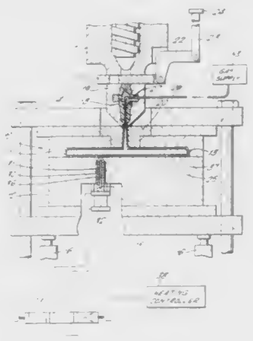
METHOD AND APPARATUS FOR INJECTION MOULDING

Matthew E. Sayer, Tamworth, England, assignor to Cinpres Limited, Staffordshire, England

Filed Sep. 23, 1988, Ser. No. 248,539
Claims priority, application United Kingdom, Sep. 25, 1987, 8722620
Int. Cl.[5] B29C *45/00, 45/34;* B29D *22/00*
U.S. Cl. 264—572 20 Claims

1. A method of producing an injection molded plastic article comprising introducing a stream of molten plastic material from an injection molding machine cylinder into an article forming mold space, supplying pressurized gas into the interior of the molten plastic material to form a gas containing cavity therein, allowing the plastic material to solidify and cool sufficiently so that the article can itself sustain the form dictated by the mold surface, and venting the cavity to reduce the pressure within the cavity to ambient pressure prior to opening of the mold, the step of venting the cavity being achieved by providing at at least one position which is separate from the plastic inlet and the gas inlet a vent passage in the mold open at its inner end to a part of the interior of the mold at which the gas containing cavity is formed, and a retractable closure for opening and closing the vent passage at its inner end, maintaining the closure in its closed position during the forming of the article whereby the cavity wall is formed over the inner end of the vent passage and the closure therefor, and subsequently retracting the closure to allow the creation of a vent opening in the cavity wall in the area of the inner end of the vent passage through which vent opening gas from the cavity passes into the vent passage.

8. Apparatus for producing an injection molded plastic



article comprising means for introducing a stream of molten plastic material from an injection molding machine cylinder into an article forming mold space, means for supplying pressurized gas into the interior of the molten plastic material to form a gas containing cavity therein, and at at least one position which is separate from the plastic inlet and the gas inlet a vent passage in the mold open at its inner end to a part of the interior of the mold at which the gas containing cavity is to be formed, a retractable closure positioned in the inner end of the vent passage for movement between an extended position in which the vent passage is closed and a retracted position in which the vent passage is open, and means for moving the closure between its extended and retracted positions.

4,923,668

METHOD FOR HANDLING A FUEL ELEMENT SKELETON

Helfrid Lahr, Wedemark, and Bernd Pontani, Alzenau, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hannover, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 249,964
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733387; Feb. 2, 1988, 3802966
Int. Cl.[5] G21F *9/36*
U.S. Cl. 376—261 4 Claims

1. A method of handling a fuel element skeleton of an irradiated nuclear reactor fuel element from which the fuel rods have been removed, the method comprising the steps of:

placing the fuel element skeleton in a compacting shaft of a ram-type press, the compacting shaft defining a longitudinal axis and the ram-type press having a removable press base part disposed at one end of the compacting shaft, said base part having a predetermined length measured in the direction of said longitudinal axis;

compacting the fuel element skeleton in the direction of said axis against said press base part so as to form a compacted fuel element skeleton;

removing said press base part from said ram-type press and replacing said press base part with a transportable transfer shaft open at both ends, said transfer shaft having a length corresponding substantially to said length of said base part;



pushing said compacted fuel element skeleton from out of said compacting shaft and into said transportable transfer shaft seated in said ram-type press; and,

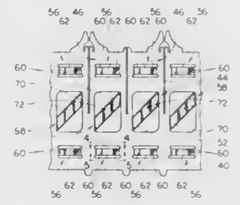
removing the loaded transfer shaft from said ram-type press and transporting the loaded transfer shaft away therefrom.

4,923,669

NUCLEAR FUEL ROD GRID SPRING AND DIMPLE STRUCTURES HAVING CHAMFERED EDGES FOR REDUCED PRESSURE DROP

Edmund E. DeMario, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 21, 1989, Ser. No. 312,288
Int. Cl.[5] G21C *3/34*
U.S. Cl. 376—442 22 Claims



1. In a nuclear fuel rod grid including a plurality of inner and outer straps being interleaved with one another to form a matrix of hollow cells, each cell for receiving one fuel rod and being defined by pairs of opposing wall sections of said straps which wall sections are shared with adjacent cells, each cell having a central longitudinal axis defining a coolant flow direction through said cell, at least fuel rod engaging dimple structure of resiliently yieldable material being integrally formed on each wall section of said inner straps, said dimple structure comprising:

(a) a pair of spaced apart opposite outer portions being integrally attached at their outer ends to said respective wall section and extending in opposite inclined relation to said wall section toward and in alignment with one another and in generally transverse relation to the coolant flow direction through said one cell; and

(b) a middle portion disposed between and integrally connected at its outer ends with respective inner ends of said outer portions, said middle portion extending in generally transverse relation to the coolant flow direction through said one cell;

(c) each of said outer portions having a pair of opposite edges running lengthwise thereof, each outer portion edge having a chamber defined thereon;

(d) said middle portion having a pair of opposite edges running lengthwise thereof, each middle portion edge having a chamfer defined thereon;

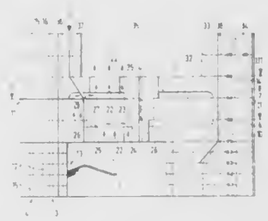
(e) each of said chambers on said respective lengthwise edges of said portions of said dimple structure being composed of at least one side extending in an inclined relation to and solely between and within extensions of spaced apart planes of opposite surfaces on said portions of said dimple structure having said chamfered edges thereon.

4,923,670

ROOF REFLECTOR FOR A NUCLEAR REACTOR

Claus Elter, Bad Durkheim; Edgar Hornischer, Mannheim; Hermann Schmitt, Winnweiler, and Josef Schoening, Hambrueken, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Dortmund, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,442
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641284
Int. Cl.[5] G21C *11/06*
U.S. Cl. 376—459 23 Claims



1. A roof reflector in combination with a nuclear reactor having a thermal shield encircling a lateral reflector of radially oriented blocks aligned in vertically displaceable lateral reflector columns surrounding core, said roof reflector comprising:

a plurality of annular layers of sector shaped radially oriented elements wherein said layers define a stepped, open central area and are supported on said lateral reflector, said sector shaped elements of said layers are aligned and connected in continuously vertically displaceable columns with said lateral reflector columns, and

a canter plug exhibiting a stepped configuration corresponding to said stepped central area and disposed in said central area above said reactor core in said nuclear reactor.

4,923,671

METHOD OF PRODUCING POWDER-METALLURGICAL OBJECTS, SPECIFICALLY ELONGATE OBJECTS SUCH AS RODS, SECTIONS, TUBES OR THE LIKE

Christer Aslund, Bruksgrand 14, S-64 400 Torshalla, Sweden

Filed Feb. 6, 1989, Ser. No. 308,048
Claims priority, application Sweden, Feb. 5, 1988, 8800366; Feb. 5, 1988, 8800365
Int. Cl.[5] B22F *7/06*
U.S. Cl. 419—8 17 Claims

1. Method of producing powder-metallurgical objects, specifically elongate objects such as rods, sections, tubes or the like, wherein a powder of metal and/or metal alloys of great hardness, such as a tool or high-speed steel powder, is charged into a thin-walled capsule, said capsule is then sealed so as to be airtight to produce a blank which is to be extruded or otherwise hot-worked to form the finished product, comprising the steps following the airtight sealing of the capsule:

(a) heating the airtight sealed blank to an elevated tempera-

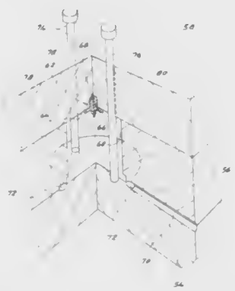
ture higher than 1,000° C. until the capsule and powder is at the elevated temperature in the range from 1,100° C. to 1,200° C.;
(b) maintaining the capsule at said elevated temperature for a defined length of time which is longer than said heating interval to heat the capsule and powder;
(c) slowly cooling the capsule, and
(d) after said cooling and prior to subjecting the capsule to hot-working, cold isostatic compressing said capsule to achieve a powder density higher than 75% of the theoretical density.

4,923,672

METHOD OF OBTAINING A MOULD INTENDED FOR THE MANUFACTURE OF VERY SMALL PARTS

Thomas Gladden, Cormondrèche, and Fritz Füllemann, Granges, both of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Switzerland

Filed Dec. 16, 1988, Ser. No. 284,030
Claims priority, application France, Dec. 16, 1987, 8717695
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—18 **10 Claims**



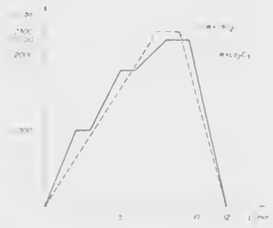
1. In a process of obtaining a mould intended for the manufacture of very small dimensioned parts, said mould comprising one or several mould shells adapted to be assembled so as to define a part moulding cavity having the form and dimensions of the parts to be manufactured, a method for the obtaining of each shell comprising the steps of:
machining a matrix from a hard material of which at least a portion has the form of a negative of the desired shell, such portion having dimensions slightly greater than those of the shell to be obtained;
positioning said matrix in a blank forming cavity and obtaining a blank of the shell by injecting into said cavity a mixture containing a binding agent and a powder comprising at least one metallic element;
removing said matrix from said cavity; and,
eliminating the binding agent from said blank by heating and subjecting said blank to a sintering operation, said sintering operating causing said blank to shrink and form said mould shell such that the portion of said part moulding cavity to be provided by said mould shell has the form and dimensions of the corresponding portion of the small parts to be moulded therein.

4,923,673

METHOD FOR PRODUCING ALLOYED TUNGSTEN RODS

Richard Litty, Sondermoning, Fed. Rep. of Germany, assignor to Gesellschaft fur Wolfram-Industrie mbH, Traunstein, Fed. Rep. of Germany

Filed Aug. 28, 1989, Ser. No. 399,620
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1988, 3835328
Int. Cl.[5] B22F *3/24*
U.S. Cl. 419—20 **8 Claims**



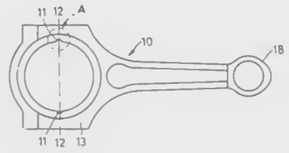
1. Method for producing alloyed tungsten rods, in particular tungsten electrodes for tungsten inert gas welding, tungsten plasma welding, tungsten plasma fusion cutting and the like, in which pulverulent tungsten with an admixed lanthanum oxide additive is compacted, sintered, mechanically worked and subjected to a recrystallization treatment, wherein
(a) lanthanum oxide is prepared to an average grain size of 0.5 to 2.0 μm by storing at 25 to 30° C. for at least 20 hours,
(b) the pulverulent tungsten is alloyed with the prepared lanthanum oxide additive of 1.8 to 2.2 % by weight with respect to the total weight, and wherein
(c) compacting with a multiphase pressure buildup and sintering with a multiphase temperature buildup is performed.

4,923,674

METHOD OF PRODUCING POWDER FORGED COMPONENTS

Manfred Weber, Witten, Fed. Rep. of Germany, assignor to Sintermetallwerk Krebsöge GmbH, Radevormwald, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 315,578
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806236; Jan. 14, 1989, 3901019
Int. Cl.[5] B22F *3/26*
U.S. Cl. 419—27 **28 Claims**



1. A method of producing powder forged components having parts which precisely fit together, comprising the steps of:
forming a one-piece preform by pressing from powder;
forming at least one tear notch in said preform at a corresponding selected location;
sintering said preform;
providing a protective layer on said at least one tear notch;

forging said preform into a component, including closing each said tear notch during said forging to form a corresponding slit;
cooling said component; and
separating said component at said corresponding selected location into a plurality of individual parts by breaking.

4,923,675

WEAR-RESISTANT STEEL AND METHOD OF ITS PRODUCTION

Nikolai A. Svidunovich, Minsk; Leonid I. Parfenov, Moscow; Alexandr I. Garost, Minsk; Gennady A. Sorokin; Viktor N. Volkov, both of Ust-Kamenogorsk, and Alexandr N. Verbitsky, Minsk, all of U.S.S.R., assignors to Belorussky Tekhnologichesky Institut Imeni S.M. Kirova, U.S.S.R.

Division of Ser. No. 92,676, Sep. 3, 1987, abandoned. This application Apr. 11, 1989, Ser. No. 336,217
Int. Cl.[5] C22C *39/54*
U.S. Cl. 420—129 **7 Claims**

1. A method of producing a wear-resistant steel, comprising:
melting plain steel to obtain a metal of carbon content of from about 0.1% to about 1.4% by mass;
providing an alloying additive melt of from about 3% to about 13% by mass and consisting essentially of manganese and elements that combine with nitrogen;
treating the alloying additive melt with a low-temperature plasma of a nitrogen-containing gas at a nitrogen partial pressure of from about 0.08 to about 0.3 MPa to saturate the alloying additive melt with nitrogen; and
combining the metal and alloying additive melts in the following way:
adding the treated alloying additive melt to a portion of up to 0.7 of the mass of the metal melt; and
thereafter introducing a balance of the mass of the metal melt.

4,923,676

ALUMINIUM ALLOY PARTS, SUCH AS IN PARTICULAR RODS, HAVING AN IMPROVED FATIGUE STRENGTH AND PRODUCTION PROCESS

Jean-Francois Faure, Voiron, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Nov. 23, 1988, Ser. No. 275,506
Claims priority, application France, Dec. 7, 1987, 87 17674
Int. Cl.[5] C22C *21/00*
U.S. Cl. 420—535 **3 Claims**

1. Aluminium alloy parts, such as in particular rods, having an improved fatigue strength and which, apart from aluminium, consists essentially of by weight, 11 to 22% silicon, 2 to 5% iron, 0.5 to 4% copper, 0.2 to 1.5% magnesium, and wherein they also contain 0.4 to 1.5% zirconium.

4,923,677

CHEMICAL STERILIZATION

Gilbert I. Simon, 1111 Midland Ave., Bronxville, N.Y. 10708, and Roy T. Witkin, 23 Broadview Rd., Westport, Conn. 06880, assignors to Roy T. Witkin, Westport, Conn. and Gilbert I. Simon, Bronxville, N.Y.

Filed Aug. 7, 1985, Ser. No. 763,469
Int. Cl.[5] A61L *2/18*
U.S. Cl. 422—37 **9 Claims**

1. A method of chemically sterilizing dental and surgical instruments before, during and after use which comprises subjecting the dental and surgical instruments for a short but sufficient period of time to effect sterilization thereof to the action of a freshly prepared antimicrobial solution comprising an admixture of a separate solution of an iodophor component which is a source of derived solubilized iodine and a peroxide component in solution which is a source of active or nascent oxygen, the components when admixed being in aqueous solution in proportions to provide 1% to 2% by weight of derived iodine such that the oxygen released from the peroxide potentiates the antimicrobial activity of the iodine derived from the iodine source, admixing the two components to form the solution and sterilizing the dental and surgical instruments therewith.

4,923,678

LOW DIELECTRIC CONSTANT PREPREG BASED ON BLENDS OF POLYNORBORNENE AND POLYOLEFINS DERIVED FORM C_2–C_4 MONOMERS

George M. Benedikt, Macedonia, Ohio, and Linwood P. Tenney, Birmingham, Ala., assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 14, 1989, Ser. No. 309,857
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 **31 Claims**

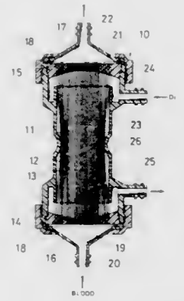
1. A printed circuit wiring board comprising at least one layer formed of a woven or non-woven, noncellulosic cloth impregnated with a polymer blend comprising at least one polynorbornene and at least one polyolefin derived from C_2–C_4 monomers.

4,923,679

HOLLOW FIBER MEMBRANE TYPE OXYGENATOR AND METHOD FOR MANUFACTURING SAME

Hiromichi Fukasawa; Yoshiro Katsura, both of Fuji, and Kazuhiko Hagiwara, Fujinimiya, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1989, Ser. No. 386,032
Claims priority, application Japan, May 24, 1984, 59-105384; May 25, 1984, 59-106278; May 25, 1984, 59-106279; May 26, 1984, 59-107179
Int. Cl.[5] A61M *1/14*
U.S. Cl. 422—48 **17 Claims**



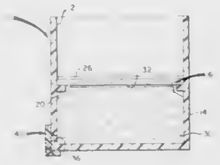
1. A hollow fiber membrane type oxygenator comprising
a housing,
a bundle of a plurality of gas-exchange hollow fiber membranes axially extending through the housing,
a first fluid chamber defined by the outer surface of said hollow fibers and the inner surface of said housing,
a first fluid inlet and a first fluid outlet both in fluid communication with said first fluid chamber,
a partition supporting either end of said hollow fibers and isolating the fiber end from said first fluid chamber, and
a second fluid inlet and a second fluid outlet both in fluid communication with the interior space of said hollow fibers, characterized in that
each said hollow fiber membrane has a plurality of micropores extending throughout the membrane, the micropores are substantially filled with a silicone blend comprising a silicone rubber and a silicone oil, but the hollow fiber membrane is free of a layer of said silicone blend on each of its internal and external walls of more than 500 Å.

4,923,680

TEST DEVICE CONTAINING AN IMMUNOASSAY FILTER WITH A FLOW-DELAYING POLYMER

Roger W. Nelson, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 18, 1987, Ser. No. 98,249
Int. Cl.[5] G01N *33/53*; B01L *11/00*
U.S. Cl. 422—58 6 Claims



1. In a reaction test device, comprising an upper reaction compartment, a lower fluid collection compartment, and a filter separating the two compartments and comprising a membrane having pores sized to retain selected material and to pass through a solvent, said lower compartment including means for drawing liquid from the upper to the lower compartment through the filter,

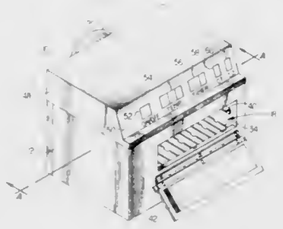
the improvement wherein said filter further comprises a first water-soluble polymer on and within portions of said membrane, and an additional water-soluble polymer applied on said at least one polymer after the latter is dry, said polymers being of a type, a molecular weight and a dry solids coverage effective to create for said membrane an induction time at room temperature of at least about 30 seconds and no greater than about 300 seconds, for a liquid head of pressure of about 6 mm of water.

4,923,681

HIGH VELOCITY HOT AIR STERILIZATION DEVICE WITH CONTROLLER

M. Keith Cox, Dallas, Tex., and William E. Davidson, Scarborough, Canada, assignors to ArcherAire Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 915,116, Oct. 3, 1986, abandoned. This application Oct. 22, 1987, Ser. No. 112,227
Int. Cl.[5] G05B *17/02*
U.S. Cl. 422—116 11 Claims



1. An automatically controlled sterilization device for non-destructively sterilizing medical instruments comprising:

a sterilization chamber, a temperature sensing means mounted in the sterilization chamber for outputting temperature indicating signals;

a plenum chamber, a blower means and a heater means mounted in operative association in the plenum chamber, for forcing hot air into the sterilization chamber;

a control chamber, a programmable controller means mounted in the control chamber for controlling operation of the sterilization device at a sterilization temperature between about 350° F. and 400° F.;

an on/off switch means connected to the programmable controller for initializing the sterilization device; and

an ac circuit means for connection to a source of ac power, said ac circuit means including a thyristor connected to the heater means, a switch means connected to the blower means and thyristor, said thyristor having a triggering gate for selectively pulsing on the thyristor, an ac zero crossing detector means connected to the ac power source for determining zero crossings for each ac cycle, and logic means connected to the zero crossing detector means for producing interrupt signals for the programmable controller indicative of zero current crossings and corresponding turn off of the ac working current; and

wherein the programmable controller includes: a first instruction means including means for monitoring the on/-off switch means for selectively supplying ac working current to the blower means and thyristor, a nonmaskable interrupt means responsive to the interrupt signals of the logic means for interrupting the first instruction means for said second instruction means, a second instruction means including an ac working current duty cycle determining means connected to the temperature sensing means for producing working current duty cycle information first for a 100% duty cycle for minimizing the time required to raise the temperature in the sterilization chamber up to a selected sterilization temperature and thereafter to maintain the temperature, timing means responsive to the zero crossing interrupts and duty cycle information for determining ac cycle quadrants and time to issue a control pulse to the thyristor's triggering gate for enabling the thyristor to begin each ac working current duty cycle at a time for enabling completion of the duty cycle on the last zero crossing of each ac cycle, and means for determining any zero crossings occurring during a duty cycle and responsive to corresponding interrupts therefor for pulsing the triggering gate to turn the thyristor back on, whereby the thyristor is triggered on by the timing means timing pulse and remains in until the working current is interrupted at the end of the duty cycle and the thyristor is automatically reset to the off state.

4,923,682

PREPARATION OF PURE TITANIUM DIOXIDE WITH ANATASE CRYSTAL STRUCTURE FROM TITANIUM OXYCHLORIDE SOLUTION

George L. Roberts, and Earl R. Lawhorne, both of Savannah, Ga., assignors to Kemira, Inc., Savannah, Ga.

Filed Mar. 30, 1989, Ser. No. 331,628
Int. Cl.[5] C01G *23/047*
U.S. Cl. 423—611 20 Claims

1. A method for producing titanium dioxide with anatase crystal structure, comprising the steps of:

(a) providing a titanium oxychloride solution;

(b) providing a quantity of an organic reagent selected from the group consisting of sugar, polyhydric alcohols, starch and organic acids which readily form complexes with metal ions;

(c) adding said organic reagent in an amount equivalent to about 0.1 to about 10.0% by weight based on titanium dioxide concentration to said titanium oxychloride solution;

(d) providing a seed suspension of titanium dioxide;

(e) adding said seed suspension to the resultant solution from step (c);

(f) heating said resultant solution including said seed suspension to boiling and continuing boiling for a period sufficient to effect precipitation of titanium hydrolysate;

(g) recovering the precipitated titanium hydrolysate; and

(h) calcining said precipitated titanium hyrolystate to form an anatase titanium dioxide as the final product.

4,923,683

COMPOSITIONS FOR PREVENTING TOOTH DECAY

Shuji Sakuma, and Kiminori Atsumi, both of Chuo, Japan, assignors to Kabushiki Kaisha Sangi, Tokyo, Japan

Continuation of Ser. No. 210,985, Jun. 24, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 412,548
Claims priority, application Japan, Jun. 27, 1987, 62-158831
Int. Cl.[5] A61K *7/16*, *7/18*
U.S. Cl. 424—52 4 Claims

1. In the art of coating teeth with an effective tooth decay preventing amount of fluoride in a dentifrice containing hydroxy-apatite which serves to absorb dental plaque responsible for tooth decay which simultaneously adheres to the surface of teeth, the improvement wherein the premature reaction of hydroxy-apatite with fluoride which yields apatite fluoride acid calcium fluoride is avoided which consists essentially of the step of breaking or rupturing of coated hydroxy-apatite or microencapsulated hydroxy-apatite at time of use in a hydroxy-apatite containing fluoride dentifrice thereby promoting recalcification and strengthening of teeth.

4,923,684

TRIPOLYPHOSPHATE-CONTAINING ANTI-CALCULUS TOOTHPASTE

Nader Ibrahim, Hackettstown, and Jeanette L. Sodano, Clifton, both of N.J., assignors to Beecham, Inc., Clifton, N.J.

Filed May 8, 1989, Ser. No. 348,805
Int. Cl.[5] A61K *7/16*, *7/18*
U.S. Cl. 424—52 20 Claims

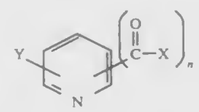
1. A storage stable fluoride toothpaste, which contains a dental calculus inhibitor consisting of at least about 4%, by weight, based on the total weight of the toothpaste, of a water-soluble alkali metal tripolyphosphate and a phosphatase enzyme inhibitor consisting of a fluoride ion source in an amount sufficient to supply from about 25 ppm to about 3500 ppm of fluoride ion; a silica dental abrasive; and an orally acceptable vehicle; the toothpaste having a pH of from about 8 to about 10.

4,923,685

ANTIMICROBIAL FLAVORED COMPOSITIONS HAVING PARTICULAR UTILITY AS MOUTH WASHES

Peter Wnelknitz, Duesseldorf-Benrath; Rudolf Lehmann, Leichlingen; Walter Ploeger, Hilden; Karlheinz Hill, Erkratb, and Franz Förg, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 28, 1988, Ser. No. 225,405
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725248
Int. Cl.[5] A61K *7/22*
U.S. Cl. 424—54 10 Claims



1. An aqueous homogeneous composition containing an antimicrobial biguanide compound and an alkyl glycoside, comprising

(A) from about 0.0025 to about 0.1% by weight of an antimicrobial biguanide compound,

(B) from about 0.005 to about 0.2% by weight of an alkyl glycoside containing 8 to 16 carbon atoms in the alkyl group and having an average degree of oligomerization of the glycoside commonent of from 1 to 8.

(C) from about 0.01 to about 0.3% by weight of a water-insoluble aromatic oil,

(D) from about 0.01 to about 0.3% by weight of a solubilizer selected from the group consisting of ethoxylated fatty acid sorbitan partial esters, fatty acid partial esters of glycerol, or sorbitan ethoxylates.

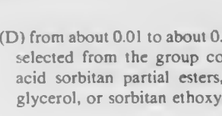
4,923,686

PROCESS FOR THE EXTRACTION OF METAL VALUES

Raymond F. Dalton, Cheshire; Raymond Price, Huddersfield; Peter M. Quan, Lancashire, and David Stewart, Oldham, all of England, assignors to Imperial Chemical Industries, London, United Kingdom

Division of Ser. No. 702,579, Feb. 19, 1985, Pat. No. 4,683,310, which is a division of Ser. No. 418,833, Sep. 16, 1982, Pat. No. 4,525,330, which is a continuation-in-part of Ser. No. 341,176, Jan. 20, 1982, abandoned. This application May 13, 1987, Ser. No. 49,163
Claims priority, application United Kingdom, Feb. 3, 1981, 8103223; Aug. 26, 1981, 8126079
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[5] C01G *3/00*; C22B *15/00*
U.S. Cl. 423—38 8 Claims

1. In a solvent extraction process for extracting copper values from aqueous solutions of copper salts containing halide or pseudo halide anion which comprises the steps of (1) contacting the aqueous solution containing copper salts with a solution of an extractant in a water-immiscible organic solvent to extract the copper into the solvent in the form of a complex of copper and the extractant; (2) separating the aqueous solution from the solution of the complex in the water-immiscible solvent; and (3) contacting the resultant organic phase with an aqueous strip solution whereby the complex of copper with the extractant is unstable and copper transfers into the aqueous strip solution, the improvement in which the extractant is substituted pyridine of the formula:



where X is the group $-NR_2R_3$, R_2 and R_3 being hydrogen or a hydrocarbyl group, R_2 and R_3 together containing from 5 to 36 carbon atoms, and n is 1, 2 or 3; and wherein Y is hydrogen or is one or more substituents selected from the group consisting of halogen, alkyl, aryl, alkoxy, aryloxy, aralkyl, cyano, nitro and carboxylic acid.

4,923,687

METHOD FOR REMOVING SILANE COMPOUNDS FROM SILANE-CONTAINING EXHAUST GASES

Reinhold Schork; Reinhard Matthes, both of Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Mar I, Fed. Rep. of Germany

Filed Aug. 17, 1989, Ser. No. 395,352

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 3828549

Int. Cl.[5] C01B *7/00;* **B01D** *8/00, 47/00*

U.S. Cl. 423—210 **5 Claims**

1. The method of removing silane compounds from silane-containing exhaust gases, which comprises reacting said exhaust gases with a metal alcoholate in an alcoholic solution to form tetraalkoxysilane.

4,923,688

WET SCRUBBER PROCESS FOR REMOVING TOTAL REDUCED SULFUR COMPOUNDS FROM INDUSTRIAL GASES

Joseph Iannicelli, 796 S. Beachview Dr., Jekyll Island, Ga. 31520

Filed Nov. 19, 1985, Ser. No. 799,494

Int. Cl.[5] B01D *53/54*

U.S. Cl. 423—224 **11 Claims**



1. A process for the removal of Total Reduced Sulfur compounds and recovery of non-magnetic entrained particulates from an industrial gas comprising the steps of:

(a) scrubbing said industrial gas with an aqueous absorbent slurry containing activated manganese dioxide absorbent particles in a reaction zone to effect oxidation of said Total Reduced Sulfur compounds and recovery of Total Reduced Sulfur compound oxidation products and said non-magnetic entrained particulates in said aqueous absorbent slurry;

(b) recovering from said reaction zone said aqueous absorbent slurry containing manganese dioxide absorbent particles, reduced manganous compounds, Total Reduced Sulfur compound oxidation products and non-magnetic entrained particulates;

(c) subjecting at least a portion of said aqueous absorbent slurry recovered in step (b) to oxidation to produce an aqueous absorbent slurry containing activated manganese dioxide absorbent particles;

(d) recycling the aqueous absorbent slurry containing activated manganese dioxide absorbent particles to the reaction zone as at least a portion of said aqueous absorbent slurry for step (a);

(e) magnetically separating manganese dioxide absorbent particles from at least a portion of the recirculating aqueous absorbent slurry to produce a substantially manganeses dioxide-free, aqueous slurry containing said recovered non-magnetic entrained particulates;

(f) removing a stream of said substantially manganese dioxide-free aqueous slurry containing said recovered non-magnetic entrained particulates from the recirculating aqueous absorbent slurry; and

(g) recycling said magnetically separated manganese dioxide absorbent particles to said recirculating aqueous absorbent slurry.

4,923,689

ALUMINUM NITRIDE POWER HAVING IMPROVED WATER-RESISTANCE

Masatoshi Uenishi, Fujiidera; Yoshiki Hashizume, Kawachi-Nagano, and Takamasa Yokote, Nara, all of Japan, assignors to Toyo Aluminium Kabushiki Kaisha, Osaka, Japan

Filed Jul. 18, 1989, Ser. No. 381,066

Claims priority, application Japan, Aug. 1, 1988, 63-192265; Aug. 1, 1988, 63-192266; Jul. 17, 1989, 1-183885; Jul. 17, 1989, 1-183886

Int. Cl.[5] C01B *21/072*

U.S. Cl. 423—267 **13 Claims**

1. An aluminium nitride powder having improved water-resistance, which is treated with an or organic phosphoric acid compound followed by heating at about 150° to 800° C.

13. An aluminum nitride powder having improved water-resistance, which is treated with an inorganic phosphoric acid compound comprising orthophosphoric acid, pyrophosphoric acid, polyphosphoric acid, phosphorous acid, hypophosphorous acid, metaphosphoric acid or a mixture thereof.

4,923,690

METHOD FOR PRODUCING HIGHLY SILICEOUS ZEOLITES

Ernest W. Valyocsik, Yardley, Pa.; Stephen S. Wong, Medord, and Robert B. Calvert, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 779,724, Sep. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,529, Jun. 11, 1984, abandoned. This application Apr. 20, 1987, Ser. No. 40,437

Int. Cl.[5] C01B *33/28*

U.S. Cl. 423—328 **11 Claims**

2. A method for synthesizing highly siliceous zeolite Beta which comprises (i) preparing a mixture capable of forming said zeolite Beta, said mixture comprising sources of alkali metal cations (M), an oxide of aluminum, tetraethylammonium cations (R), an oxide of silicon and water and having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3	20–1000
H_2O/SiO_2	5–200
OH^-/SiO_2	0.10–2.0
M/SiO_2	0.01–1.0

-continued

R/SiO_2	0.10–2.0

(ii) maintaining the mixture at a temperature of from about 90° C. to about 200° C. for crystallization of said zeolite Beta, (iii) terminating crystallization when said zeolite Beta is from about 30% to about 90% crystalline by X-ray analysis, and (iv) recovering zeolite Beta containing alkali metal cations and being from about 30% to about 90% crystalline by X-ray analysis and having a composition in terms of more ratios of oxides in the anhydrous state of:

$$(0.1 \text{ to } 4)R_2O:(0.05 \text{ to } 2)M_{2/n}O:(0.1 \text{ to } 5)Al_2O_3:(100)SiO_2.$$

4,923,691

ALUMINUM NITRIDE POWDER AND A PROCESS FOR THE PREPARATION THEREOF

Dieter Peters, Hürth; Gero Heymer, and Christian May, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 364,013

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821185; Jan. 3, 1989, 3900065

Int. Cl.[5] C01B *21/072*

U.S. Cl. 423—412 **21 Claims**

1. A process for the preparation of aluminum nitride powder, which comprises melting metallic aluminum and monoammineraluminum chloride $[AlCL_3(NH_3)]$ together in an inert gas atmosphere at temperatures above 125° C. and allowing these to react with one another with evolution of hydrogen; 8 to 20 g of ammonia are introduced per hour per mol of monoammineraluminum chloride into the aluminum-containing monoammineraluminum chloride melt at temperatures between 250° and 400° C., aluminum nitride being precipitated as a solid until the conversion of the aluminum is complete, the temperature of the melt being finally raised to more then 400° C.

4,923,692

PROCESS FOR PRODUCING PITCH-TYPE CARBON FIBERS

Akira Nakagoshi; Hiroshi Tahara; Tetuo Yamada, all of Kitakyushu; Hiroyuki Sekiguchi, and Hidemi Murata, both of Sakaide, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 60,517, Jun. 11, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 253,402

Claims priority, application Japan, Jun. 12, 1986, 61-137180; Jun. 19, 1986, 61-143441; Jul. 1, 1986, 61-154586; Jul. 8, 1986, 61-160338; Jul. 14. 1986, 61-165237

Int. Cl.[5] D01F *9/12*

U.S. Cl. 423—447.4 **31 Claims**

1. A process for producing pitch-based carbon fibers, which comprises:

(a) melt-spinning pitch material in a gaseous atmosphere to form pitch fibers;

(b) gathering the pitch fibers into a tow either before or after applying to the fibers an oiling agent consisting essentially of:

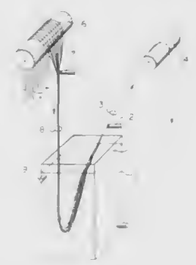
(i) a silicone oil selected from the group consisting of dimethylpolysiloxane, phenylmethylpolysiloxane, epoxypolysiloxane and aminopolysiloxane;

(ii) a higher alcohol selected from the group consisting of stearyl alcohol, oleyl alcohol and isopentacosanyl alcohol; and

(iii) a higher fatty acid selected from the group consisting of stearic acid glyceride, polyethyleneglycol and stearate and polyethylene glycol oleate, and mixtures and emulsions of all of the above;

(c) washing said gathered fibers with a solvent incapable of substantially dissolving said fibers, but capable of removing the oiling agent deposited on said fibers, thereby removing said oiling agent;

(d) subjecting said washed fibers to an infusible treatment by



heating the fibers for a time and a temperature sufficient to effect the same; and

(e) carbonizing the fibers by heating the fibers in inert atmosphere for a time and at a temperature sufficient to carbonize the same.

4,923,693

ULTRAVIOLET RADIATION SCREENING METHOD FOR EYES

Peter Michalos, Brooklyn, N.Y., assignor to Sundrops Enterprises, Inc., Boca Raton, Fla.

Filed Jan. 21, 1988, Ser. No. 146,346

Int. Cl.[5] A61K *7/40, 7/42, 33/00*

U.S. Cl. 424—59 **5 Claims**

1. A method for minimizing the effect of ultraviolet radiation on mammalian eyes comprising applying an effective amount of a composition containing hydroxpropylmethylcellulose in a carrier to the outer tissues of the mammalian eyes.

4,923,694

HYDROLYSIS RESISTANT VINYL LACTAM AMINO ACRYLAMIDE POLYMERS

Jenn S. Shih, Paramus, and Terry E. Smith, Morristown, both of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Aug. 25, 1988, Ser. No. 236,395

Int. Cl.[5] A61K *7/11*

U.S. Cl. 424—70 **3 Claims**

1. A stable, non-irritating hair care composition having conditioner action comprising an aqueous solution of pH about 10 characterized by containing about 0.05 to about 8% by weight of a copolymer of about 50 to 99 mole % vinyl pyrroldone and 1 to about 50 mole % of a quaternized amino acrylamide which is (3-methacrylamidopropyl) trimethylammonium chloride "having less than 7 wt. % residual monomer content".

4,923,695

HYDROCARBON TOLERANT HAIR FIXING COMPOSITIONS

Frank A. Nowak, Jr., Somerville; Albert L. Micchelli, Middletown, and William M. Rouse, III, Morristown, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 166,332, Mar. 10, 1988, Pat. No. 4,842,852. This application Mar. 6, 1989, Ser. No. 292,804

Int. Cl.[5] A61K *7/11*

U.S. Cl. 424—71 **6 Claims**

1. An improved hair fixing composition having increased hydrocarbon tolerance, for use in aerosol formulations, comprising a copolymer of 20–35% (by wt.) of vinyl acetate or

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vinyl propionate, 35–50% (by wt.) of a vinyl ester of a C_5-C_{12} α-branched carboxylic acid, and 25–40% (by wt.) of a C_3-C_8 monoalkyl maleate, wherein percentages total 100% and all the improvement comprises neutralizing at least 70% of the carboxylic acid functionalities with an alkaline neutralizing agent comprising at least one base selected from the group consisting of NaOH or KOH, such that the tolerance of the copolymer to hydrocarbons is enhanced.

4,923,696

METHOD TO PREPARE A NEUROTROPHIC COMPOSITION

Stanley H. Appel, Houston; McManaman, James L., Kingwood, and Kenneth W. Vaca, Houston, all of Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation-in-part of Ser. No. 46,134, May 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 769,860, Aug. 23, 1985, abandoned, which is a division of Ser. No. 444,293, Nov. 24, 1982, abandoned. This application Apr. 22, 1988, Ser. No. 179,229

Int. Cl.[5] A61K *37/02*

U.S. Cl. 424—548 **29 Claims**

1. A method to prepare a neurotrophic protein composition which comprises:

(a) extracting proteins from the skeletal muscle of a normal mammal;

(b) assaying the protein extract for trophic effects on motor neurons; and

(c) isolating protiens which are shown to exert a chloinergic effect on motor neurons.

4,923,697

ANTIOXIDANT COMPOSITIONS AND METHODS

Michael Albeck, and Shlomo Grossman, both of Ramat Gan, Israel, assignors to Bar-Ilan University, Ramat-Gan, Israel

Continuation-in-part of Ser. No. 846,599, Mar. 31, 1986, Pat. No. 4,851,325, which is a continuation-in-part of Ser. No. 726,540, Apr. 25, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 932,702

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] A61K *35/78*

U.S. Cl. 424—195.1 **24 Claims**

1. A water soluble antioxidant material prepared from plant tissue, and fractions separable from said water soluble antioxidant material by chromatography, wherein said tissue is obtained from a plant of the Order Chenopodiales said antioxidant having the following characteristics; namely:

(a) it is stable for an extended period of time, at least in the dry state, at ambient temperature and pressure;

(b) it is absorbed through the skin;

(c) it lowers the peroxide level of the skin.

4,923,698

BIOACTIVE FILM-FORMING COMPOSITION FOR CONTROL OF CRAWLING INSECTS AND THE LIKE

Alejandro Rodero, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 943,405, Dec. 19, 1986, Pat. No. 4,822,614. This application Jan. 6, 1989, Ser. No. 294,328

Int. Cl.[5] A01N *25/00, 25/34, 25/02;* **A61L** *9/04*

U.S. Cl. 424—405 **3 Claims**

1. A method of applying a substantially evaporable bioactive composition onto a surface, wherein the bioactive composition is characterized as being able to provide a substantial and effective positive barrier for control of crawling insects and the like, the method comprising the steps of:

combining a lubricating agent, a bioactive ingredient, an evaporable solvent, and an effective amount of an emulsifier system, with agitation, for producing a substantially evaporable emulsified continuous phase, wherein the bioactive ingredient is selected from the group consisting of an insecticidally-active ingredient, an insect-repellent ingredient, and combinations thereof, wherein the insecticidally-active ingredient is selected from the group consisting of synthetic pyrethroids, natural pyrethrum, and organo phosphates, and wherein the insect-repellent ingredient is selected from the group consisting of synthetic pyrethroids having intrinsic repellancy, N,N-diethyl-meta-toluamide, BHA, BHT, Neem extract and Sembury extract;

adding water to the continuous phase, utilizing agitation, thereby producing the bioactive composition, wherein the lubricating agent is present in an amount of about 1 to about 20 weight percent based upon the weight of the bioactive composition, wherein the lubricating agent is selected from the group consisting of silicones, mineral oils, petrolatum and polybutenes, and blends of each of these;

applying particles of the bioactive composition onto the surface; and

evaporating a substantial portion of the surface-applied bioactive composition, thereby producing a bioactive film on the surface, wherein the bioactive film provides the substantial and effective positive barrier for control of crawling insects.

4,923,699

EYE TREATMENT SUSPENSION

Herbert E. Kaufman, 300 Lake Marina Dr., Unit 18E, New Orleans, La. 70124

Filed Jun. 3, 1988, Ser. No. 201,933

Int. Cl.[5] A61M *31/00*

U.S. Cl. 424—427 **33 Claims**



1. An opthalmic treatment system comprising:

three dimensional particles of bioerodible material being at least 0 5 mm and in the range of 1 to 2 mm in greatest dimension, being no greater than 0.4 mm to 0.7 mm in smallest dimension when disposed in an ocular environment, and at least 0.5 mm in the remaining dimension and one of a liquid carrier and an ointment carrier having a pH acceptable to the eye in which said particles are suspended.

4,923,700

ARTIFICIAL TEAR SUSPENSION

Herbert E. Kaufman, 300 Lake Marina Dr., Unit 18E, New Orleans, La. 70124

Filed Jun. 3, 1988, Ser. No. 201,929

Int. Cl.[5] A61M *31/00*

U.S. Cl. 424—427 **20 Claims**

1. Artificial tear system comprising:

bioerodible mucin-type particles for releasing mucin-type material when placed in an ocular environment to provide a hydrophilic surface to hold aqueous material in the ocular environment;

lipid-type material for releasing lipid-type material when placed in the ocular environment to provide a layer to retard evaporation of aqueous material in the ocular environment;

aqueous-type material for releasing aqueous-type material when placed in the ocular environment;



wherein said mucin-type particles are suspended in at least one of said lipid-type material carrier and said aqueous-type material carrier.

4,923,701

ZIPPERED COOK-IN-BAG POUCH AND METHOD

Donald L. VanErden, Wildwood, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Jan. 12, 1989, Ser. No. 296,078

Int. Cl.[5] B65D *27/06, 27/18*

U.S. Cl. 426—113 **6 Claims**

FIG. 1



5. A method of handling and cooking a contents in a zippered cook-in-bag pouch, comprising:

providing a pouch body having a mouth and a zipper comprising a profiled extruded plastic structure having a pair of complementary zipper strips having reclosably interlockable profiles and the strips being attached permanently to said pouch in closing relation to said pouch mouth;

forming said pouch body and zipper from material which will withstand without deterioration at least a boiling heat temperature during a cooking procedure to which the pouch and the zipper may be subjected when cooking the contents;

placing said contents into said pouch;

providing a hot melt adhesive which sets at room temperature between said profiles and thereby bonding the profiles tenaciously against separation at room temperature;

providing said adhesive in a formulation which is sufficiently softenable within a temperature range of 150° F. to 197° F. for permitting manually releasing said profiles when heated within said range for opening said pouch mouth;

subjecting said pouch and contents to cooking temperature and thereby releasably softening said adhesive;

after said cooking temperature softening of the adhesive opening said pouch by separating said profiles; for access to the cooked contents;

and while the adhesive is still tacky reclosing the zipper and permitting the adhesive to set for resealing the zipper at substantially room temperature.

4,923,702

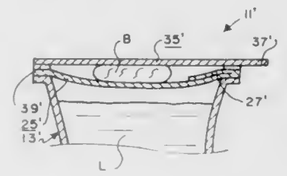
COMMUNION CONTAINER

Levisky Powell, deceased, late of Memphis, Tenn.; by Bettye J. Powell, aministratrix, 4534 Whitepine St., Memphis, Tenn. 38109, and Johnese W. Powell, 4911 Whitworth Rd., Memphis, Tenn. 38116

Continuation-in-part of Ser. No. 75,650, Jul. 20, 1987, abandoned. This application Sep. 7, 1988, Ser. No. 241,408

Int. Cl.[5] B65D *81/32, 25/08*

U.S. Cl. 426—115 **3 Claims**



1. The combination of a portion of either wine or grape juice, a portion of bread, and an improved communion container containing said portion of either wine or grape juice and said portion of bread; wherein said improved communion container comprises:

(a) a cup containing said portion of either wine or grape juice, said cup having an upper rim for defining an open mouth;

(b) lid means releasably closing said open mouth of said cup, said lid means having a main portion with an outer periphery that matches said upper rim of said cup and having a tab attached to said outer periphery of said main portion for being pulled by the communicant to open said lid means and gain access to said portion of either wine or grape juice, said main portion of said lid means having an upper surface supporting said portion of bread;

(c) cover means releasably covering said upper surface of said main portion of said lid means and said portion of bread supported on said upper surface of said main portion of said lid means, said cover means having a main portion with an outer periphery that matches said upper rim of said cup and having a tab attached to and extending outwardly of said outer periphery of said main portion of said cover means, said lid means and said cup for being pulled by the communicant to easily open said cover means and gain access to said portion of bread, said lid means remaining intact on said mouth of said cup when said cover means is opened;

said tab of said lid means having a first position folded back over said lid means and beneath said main portion of said cover means for preventing the communicant from inadvertently pulling said tab of said lid means and opening said lid means prior to opening said cover means and receiving said portion of bread and a second position extending outward of said outer periphery of said main portion of said lid means after said cover means has been opened sufficiently to gain access to said portion of bread and expose said tab of said lid means for allowing the communicant to easily open said lid means to gain access to said portion of either wine or grape juice; and (d) attachment means releasably attaching the outer periphery of said cover means to said outer periphery of said lid means and at least a portion of said tab of said lid means such that said tab of said lid means is held folded back beneath said main portion of said cover means in said first position such that the communicant is prevented from inadvertently pulling said tab of said lid means and open-

ing said lid means prior to opening said cover means and receiving said portion of bread such that the communicant is required to first pull said tab of said cover means to gain access to said portion of bread before being able to pull said tab of said lid means to gain access to said portion of either wine or grape juice.

4,923,703

CONTAINER COMPRISING UNIAXIAL POLYOLEFIN/FILLER FILMS FOR CONTROLLED ATMOSPHERE PACKAGING

Mitchell K. Antoon, Jr., Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 167,815, Mar. 14, 1988, Pat. No. 4,879,078. This application May 22, 1989, Ser. No. 339,048
Int. Cl.[5] A23B *7/148;* B65D *85/50, 81/20*
U.S. Cl. 426—118 3 Claims

1. A container for retarding the maturation of respiring fresh produce selected from the group consisting of fruits, vegetables, or flowers contained therein by creating within the container a preselected carbon dioxide and oxygen concentration in the presence of said respiring fresh fruit, vegetables, or flowers, said container being constructed of a substantially gas-impermeable material completely enclosing said fresh fruit, vegetables, or flowers, said gas impermeable material having a gas-permeable panel in one or more of its walls to provide a controlled flow or flux of CO_2 and O_2 through its walls, wherein the panel is a microporous plastic membrane that is an uniaxially oriented film having a composition of 64–84% by volume of a polymer selected from the group consisting of homopolymer, copolymer, or blends thereof of alpha-monoolefins having 2 to 10 carbons, poly(ethylene terephthalate), poly(butylene terephalate), nylon, polystyrene, ethylene-vinyl acetate copolymers, ethylene-methacrylic acid copolymers, ethylene-vinyl alcohol copolymers, or polycarbonate, 15–34% by volume of an inert filler having particle sizes about 0.3–14 microns, 0.2–5% by volume of a processing aid selected from calcium stearate, zinc stearate, oleic acid, and stearic acid, and 0.3% by volume of a stabilizer, said uniaxially oriented film having an oxygen and carbon dioxide permeance between about 5,000 and 10,000,000 cc/100 in^2-atm-day, said uniaxially oriented film being prepared by

(a) melt blending in a vessel in a temperature range of 150°–300° C. said polymer, inert filler, processing aid, and stabilizer,
(b) maintaining the moisture level in the melt blend below 700 ppm,
(c) casting a film from said blend,
(d) cooling the film to a temperature below the melting point of the film,
(e) uniaxially stretching the film at least two times its original casting dimensions in one direction with the temperature of the film during stretching being within the temperature range which is above the line-drawing temperature and below the melting temperature of the polymer, until the film has a sufficient number of elongated, narrow shaped microporous voids in order to create a CO_2 and O_2 permeance in the film in the range of 5,000 to 10,000,000 cc/100 in^2-atm-day with a standard deviation of the permeance in the range of less than 35%, and
(f) cooling the film to room temperature,

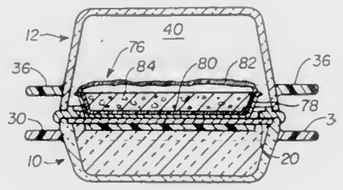
the permeance and area of the membrane being such as to provide a flux of O_2 and CO_2 approximately equal to the predicted O_2 and CO_2 respiration rates for not more than 3.0 kg of the enclosed fruit, vegetable, or flower, and having an O_2 to CO_2 permeance ratio of about 1.

4,923,704

METHODS FOR MICROWAVE COOKING IN A STEAM-CHAMBER KIT

Melvin L. Levinson, 612 Ziegler Ave., Linden, N.J. 07036

Division of Ser. No. 737,502, May 24, 1985, abandoned. This application Oct. 7, 1987, Ser. No. 106,240
Int. Cl.[5] A23L *1/07*
U.S. Cl. 426—243 18 Claims



1. The method of baking a frozen two-crust pie having a wide top crust and a narrow bottom crust in a microwave oven which comprises:

placing the frozen two-crust pie in a metal pie pan on a metal surface with the said wide crust resting on said metal surface; enclosing said pie in a chamber having a superatmospheric pressure and exposing said pie, said metal surface and a microwave absorptive substance engaged with said metal surface to microwave energy, whereby the said metal surface is heated by conduction from said microwave absorptive substance; thereafter, when the top crust is suitably pre-baked, removing the pie from the said chamber and inverting the pie in the said metal pie pan to its normal orientation with its pie pan on the bottom and its pre-baked wide crust on top; thereafter placing the said pie pan on the said heated metal surface in heat transfer engagement, and restoring the pie to said chamber having superatmospheric pressure and thereafter exposing the said pie, the said heated metal plate and the said microwave absorptive substance to microwave energy until the pie baking is completed.

4,923,705

CONTINUOUS METHOD FOR MAKING KETTLE STYLE POTATO CHIPS

George P. Mottur, Danville; Hilbert J. Cope, Jr.; Dennis L. Kisbbaugh, both of Berwick; Michael J. Luebbers, Danville, and Norman E. Peters, Berwick, all of Pa., assignors to Borden, Inc., Columbus, Ohio

Filed Sep. 30, 1988, Ser. No. 251,354
Int. Cl.[5] A23L *1/217*
U.S. Cl. 426—438 19 Claims

1. A continuous method for making potato chips by conveying unwashed potato slices through a heated liquid frying medium, said method comprising the following steps:

conveying uncooked, unwashed potato slices through a first zone comprising an oil flume containing agitating means for pre-frying at a maximum zone temperature in the range of from above about 300° F (about 149° C) to about 320° F (about 160° C) with agitation sufficient to prevent substantial agglomeration to form a dehydrated skin on the surface of said slices;
conveying said surface dehydrated potato slices through a second zone at a zone temperature in the range of about 240° F (about 116° C) to about 265° F (about 129° C) for a time period sufficient to impart a pliable, shape-holding consistency to the potato slices;
conveying the potato slices through a third zone at a maximum zone temperature in the range of about 285° F (about 141° C) to about 310° F (about 154° C) for a time period sufficient to produce rigid, completely fried potato chips; and

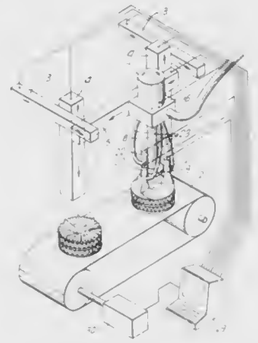
removing the completely fried potato chips.

4,923,706

PROCESS OF AND APPARATUS FOR SHAPING EXTRUDABLE MATERIAL

Gary N. Binley, Kettering; Alan F. Giles, St. Neots; Christopher A. Pearson, Harpenden, and Terence P. Baker, Rushden, all of Great Britain, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Jan. 12, 1989, Ser. No. 296,717
Claims priority, application United Kingdom, Jan. 14, 1988, 8800764; Mar. 28, 1988, 8807450
Int. Cl.[5] A23G *9/04, 9/22;* B29C *47/12, 47/92*
U.S. Cl. 426—516 13 Claims



9. Apparatus for shaping extrudable ice confection material to form a shaped ice confection product, said apparatus comprising:

a plurality of extrusion nozzles supported on a common carrier rotatable about an axis of rotation which is non-coincident with any axis of complete rotational symmetry of all nozzles, each nozzle having means for feeding ice confection material thereto and having valve means positioned therein at a sufficiently small distance from the nozzle opening to prevent leakage of ice confection material from the nozzle opening following closure of the valve means,
elongate movable conveyor means disposed below and spaced from the openings of said nozzles for providing a support surface for directly receiving ice confection material extruded from said nozzles,
first motor means for driving said conveyor means and effecting translational movement of said support surface,
means including second motor means for driving said carrier in rotation about said axis of rotation and translationally in at least one direction relative to said support surface, and
means including a programmable computer for programmably controlling the opening and closing of the valve means of said nozzles and actuation of the first motor means and the means including second motor means so as to lay down on the movable support surface an ice confection product having a shape dependent upon the distance between the nozzle opening and the support surface and the rotational speed of said carrier.

13. A process for preparing a shaped ice confection product from extrudable ice confection material comprising the steps of:

extruding the extrudable ice confection material from three extrusion nozzles each having valve means therein positioned sufficiently close to the nozzle opening as to prevent leakage of material therefrom following closure of the valve means, and all supported in angularly spaced relationship on a common carrier which is rotatable about a vertically-oriented axis of rotation, downwardly onto a horizontally-oriented support surface provided by an elongate conveyor arranged some distance below the nozzle openings and travelling in a direction orthogonal to the axis of rotation of the carrier, and
using programmable computer means programming the travel of said conveyor, the opening and closing of the valve means in said nozzles, and direction and speed of rotation of said carrier to form on the support surface an ice confection product of desired shape.

4,923,707

LOW OIL MAYONNAISE AND METHOD OF MAKING

Edgar A. Schoenberg, Germantown, Wis., assignor to Kraft, Inc., Glenview, Ill.

Filed Jan. 6, 1989, Ser. No. 294,417
Int. Cl.[5] A23D *5/00;* A23L *1/09*
U.S. Cl. 426—602 8 Claims

1. A method for manufacture of mayonnaise comprising providing low D.E. corn syrup having a D.E. of from about 27 to about 43, adding water and egg yolk to said corn syrup to provide a premix, combining said premix with oil and an edible acid to provide a mayonnaise mix, said oil being present at a level of from at least 65% to about 72% in said mayonnaise mix and processing said mayonnaise mix under conditions of high shear to provide a stable, high viscosity, low oil mayonnaise.

4,923,708

METHOD AND COMPOSITION FOR INHIBITING FAT BLOOM IN FAT BASED COMPOSITIONS AND HARD BUTTER

Peter S. Given, Jr., Verona, N.J., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Filed Dec. 30, 1988, Ser. No. 292,532
Int. Cl.[5] A23G *1/00*
U.S. Cl. 426—610 59 Claims

1. A stabilized hard butter composition having a resistance to fat bloom comprising a mixture of at least one hard butter made up of a mixture of triglycerides and fatty acids and an effective amount of a fat bloom inhibitor comprising at least one dicarboxylic acid having the formula:

$$HO_2C—R—CO_2H$$

wherein R is an alkyl or alkenyl moiety having 4 to 22 carbon atoms; or, $(CH_2)_x—R_1—(CH_2)_y$ wherein R_1 is an aryl moiety, —O—, —NH—, CO—NH—, —CO_2— or —CO— and x and y are 0 or an integer from 1 to 22 provided that the sum of $(x+y)$ is an integer from 4 to 22.

4,923,709

PROCESSES FOR PRODUCTS FROM CASSAVA

Karen M. Slimak, 9207 Shotgun Ct., Springfield, Va. 22153

Filed Jan. 31, 1986, Ser. No. 825,655
Int. Cl.[5] A23L *1/214*
U.S. Cl. 426—640 14 Claims

1. A non-grain edible cassava flour possessing the ability to maintain a risen structure in the absence of grain flour, legume flour, or added fiber, said non-grain edible flour consisting of comminuted particles of the entire cassava including substantially all of the starch and fiber content of the cassava, comminuted to a size so that all of said particles pass through a screen of 0.02 inch mesh, wherein said flour has a moisture content of less than 20% by weight.

4,923,710

METHOD FOR THE PREPARATION OF A ROASTED NUT-LIKE PRODUCT

Frans van der Marel, Oud Beijerland, Netherlands, assignor to Solnuts B. V., Tilburg, Netherlands

Filed Mar. 10, 1988, Ser. No. 166,374

Claims priority, application Netherlands, Apr. 29, 1987, 8701014

Int. Cl.[5] A23L *1/36*

U.S. Cl. 426—634 8 Claims

1. A method of treating soybeans, comprising:
soaking the soybeans in liquid, whereby the soybeans become swollen;
draining the soybeans;
fixing the outer surface layers of the swollen soybeans by exposing the soybeans to heat; and
thereafter substantially removing the interior moisture from the fixed soybeans.

4,923,711

MAGNETIC RECORDING MEDIUM MANUFACTURING PROCESS

John G. Chernega, Stillwater; John A. Martens, North Oaks; Roger A. Olsen, Woodbury, and Auburn B. Cottingham, deceased, late of Lake Elmo, all of Minn. (by Sue E. Cottingham, administrator), assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 229,278, Aug. 8, 1988, Pat. No. 4,889,895, Division of Ser. No. 868,134, May 28, 1986, Pat. No. 4,783,370.

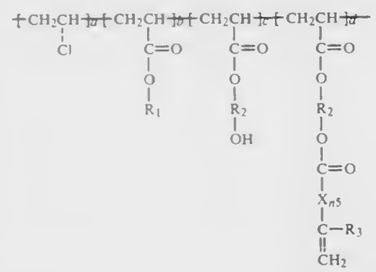
This application Oct. 12, 1989, Ser. No. 420,356

Int. Cl.[5] G11B *5/70;* B05D *3/06*

U.S. Cl. 427—44 2 Claims

1. A process for manufacturing magnetic recording medium comprising the steps of:

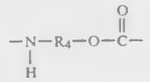
A. making a dispersion comprising magnetizable material particles dispersed in solvent and at least one binder resin, one of said binder resins being a vinylchloride-alkylacrylate copolymer having the formula:



wherein
the portion of the copolymer having the a subscript comprises 50 to 97 weight percent of the copolymer, the portion of the copolymer having the b subscript comprises 0 to 30 weight percent of the copolymer, the portions of the copolymer having the c and d subscripts combined comprise 0.1 to 20 weight percent of the copolymer, while d can be 0,
R_1 is an alkyl group selected from $—CH_3$ and $—(CH_2)_{n1}CH_3$ wherein n1 = 1–10,
R_2 is an alkylene group selected from the group consisting of $CH_2)_{n1}$ and



wherein n2 = 1–4 and n3 = 0–4,
R_3 is selected from the group consisting of —H, $—CH_3$ and $CH_2)_{n4}CH_3$ wherein n4 = 0–4, n5 = 0 or 1, and X is a linking group which is stable under electron beam irradiation and is selected from the group consisting of



wherein R_4 is selected from the group consisting of alkylene moieties having 1–6 carbon atoms and cycloalkylene moieties having 5–8 carbon atoms;



with the proviso that when d = 0, there is at least one additional polymer in the binder;

B. coating the dispersion from A onto a flexible substrate; and

C. drying the coating substrate.

4,923,712

ASPHALTIC FLASHING STICK

Jason Gladfelter, Montclair; William J. Woodring; Louis L. Grube, both of Bound Brook, and Charles J. Horner, Jr., Piscataway, all of N.J., assignors to GAF Building Materials Corporation, Wayne, N.J.

Filed Apr. 7, 1988, Ser. No. 178,697

Int. Cl.[5] B32B *35/00*

U.S. Cl. 427—140 5 Claims



1. A method for applying an asphaltic composition of modified bitumen roof flashing to spot locations comprising the steps of:
(a) selecting a spot location for application of molten or softened bitumen; and
positioning the end of an elongated rod of solidified modified bitumen and simultaneously heating the end of the rod to melt or soften the bitumen so that the molten or softened bitumen drips or can be applied onto the selected location.

4,923,713

MOISTURE-RESISTANT, COATED THERMOPLASTIC FILM HAVING ENHANCED ADHESION TO INKS AND METALLIC LAYERS

David Rudd, Naples, N.C., and R. Scott Caines, Greenville, S.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 116,106, Nov. 3, 1987, Pat. No. 4,880,695.

This application Nov. 1, 1989, Ser. No. 430,024

Int. Cl.[5] B05C *3/107;* B05D *3/12*

U.S. Cl. 427—171 8 Claims

1. A process for applying a water-soluble alkaline earth salt of a fatty acid onto a polyester film comprising
(i) coating said film with a first aqueous solution containing at least one fatty acid having from 10 to 18 carbon atoms;
(ii) subsequently overcoating said aqueous coating with a second aqueous solution containing a water-soluble alkaline earth compound, thereby forming a water-insoluble alkaline earth salt of a fatty acid having from 10 to 18 carbon atoms;
(iii) removing the water from the film by evaporation to form a water-insoluble alkaline earth salt primer coating upon the web, said primer coating being present at a weight effective to improve the adhesion of printing inks to said film and wherein said film is prepared by melt extruding a substantially amorphous polyester film and thereafter orienting said film by stretching in one or two directions and heat setting said film, said coatings being applied to said film prior to stretching in one direction, or subsequent to stretching in one direction but prior to stretching in a mutually perpendicular direction, or subsequent to stretching but prior to winding the oriented film.

4,923,714

NOVOLAC COATED CERAMIC PARTICULATE

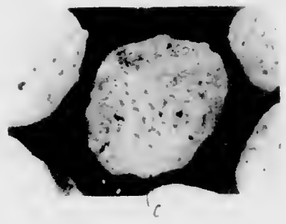
James L. Gibb, Woodbury, Minn.; James A. Laird, St. Joseph, Wis., and Leslie G. Berntson, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 97,871, Sep. 17, 1987, Pat. No. 4,869,960.

This application May 1, 1989, Ser. No. 345,692

Int. Cl.[5] B05D *7/00*

U.S. Cl. 427—221 5 Claims



1. A process for making coated ceramic particulates which comprises:
(A) furnishing raw materials comprising:
(1) ceramic particles which have been fired and are made from raw materials which comprise:
(a) mineral particulates comprising a ceramic which melts below about 1300° C., vitrifies upon cooling and has a fired density of less than about 2.9 grams per cubic centimeter; and
(b) sufficient binder to adhere the mineral particulates together after they have been formed but before they have been fired;
(2) an epoxidized cresol novolac resin compound containing less than one weight percent of fillers which are soluble in aqueous 12:3 molar ratio HCl:HF solutions:
(B) mixing said raw materials at a temperature sufficient to melt the epoxidized cresol novolac resin compound and allow it to flow around and coat the fired ceramic particles; and
(C) curing the resulting coating on the particles.

4,923,715

METHOD OF FORMING THIN FILM BY CHEMICAL VAPOR DEPOSITION

Tetsuo Matsuda, Tokyo, and Iwao Kunishima, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

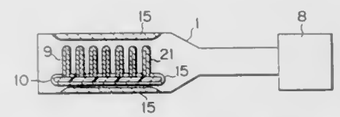
Continuation of Ser. No. 13,434, Feb. 11, 1987, abandoned. This application May 30, 1989, Ser. No. 358,493

Claims priority, application Japan, Mar. 31, 1986, 61-70781; Sep. 16, 1986, 61-217505

Int. Cl.[5] B05D *7/22;* C23C *16/08*

U.S. Cl. 427—237 17 Claims

1. A method of forming, by means of CVD (Chemical Vapor Deposition), a thin film of high melting-point metal selected from the group consisting of Ti, W, Mo and Ta, comprising the steps of:
(a) forming a metal film of the high melting-point metal on the surface of the inner wall of a quartz CVD reaction tube and on at least a part of the fittings disposed therein;
(b) forming a nitride film of the high melting-point metal on



the metal film formed in step (a), by nitriding the surface of the metal film, said nitriding being carried out by heat-treatment in an atmosphere containing ammonia;
(c) forming, by carrying out the CVD, the thin film of the high melting-point metal on a surface of a substrate situated in the CVD reaction tube from a fluoride of the high melting-point metal.

4,923,716

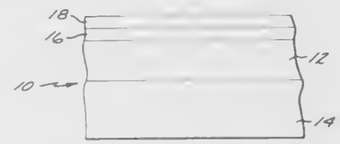
CHEMICAL VAPOR DESPOSITION OF SILICON CARBIDE

Duncan W. Brown, Wilton, Conn., and James D. Parsons, Newbury Park, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 26, 1988, Ser. No. 248,651

Int. Cl.[5] C23C *16/00;* C01B *31/36*

U.S. Cl. 427—249 15 Claims



1. A process for depositing beta silicon carbide on a substrate at a deposition temperature, comprising the steps of:
furnishing a deposition source vapor which contains both silicon and carbon in a single molecule, the source vapor having the molecular formula $C_nSi_nH_m$, where m ranges from 2n+1 to 4n+2 inclusive and n ranges from 2 to 6 inclusive, and where the source vapor molecule delivers silicon and carbon atoms to the substrate in equal numbers and with each in a reactive form at the deposition temperature; and
contacting the deposition source vapor to the substrate at the deposition temperature.

4,923,717

PROCESS FOR THE CHEMICAL VAPOR DEPOSITION OF ALUMINUM

Wayne L. Gladfelter, St. Paul, and David C. Boyd, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

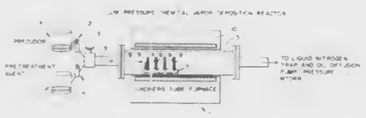
Filed Mar. 17, 1989, Ser. No. 325,381

Int. Cl.[5] C23C *16/06, 16/08, 16/18*

U.S. Cl. 427—252 11 Claims

1. A method for applying an aluminum film to the surface of a substrate comprising employing the techniques of flow-through chemical vapor deposition to:
(a) expose the surface to a first vapor comprising a Group IVB or VB metal complex; and
(b) expose the surface to a second vapor to deposit a mirror-

like coating of aluminum thereon; said second vapor comprising a compound of the formula
$[(R_1R^2R^3)Y]_xAlH_3$ wherein:
(i) Y is a Group VA element;



(ii) R^1, R^2, and R^3 are independently alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, or aralkyl; and
(iii) x is an integer with a value of 1 or 2.

4,923,718

FUNCTIONAL FILM AND PROCESS FOR ITS PRODUCTION

Kosuke Iida; Hiroshi Yamato, and Yoji Kadono, all of Osaka, Japan, assignors to Takiron Co., Ltd., Osaka, Japan

PCT No. PCT/JP87/00761, § 371 Date Feb. 10, 1988, § 102(e) Date Feb. 10, 1988, PCT Pub. No. WO88/02761, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 8, 1987, Ser. No. 172,723

Claims priority, application Japan, Mar. 14, 1987, 62-59675; May 29, 1987, 137438; May 29, 1987, 62-137436; May 29, 1987, 137437; Sep. 11, 1987, 62-228729; Sep. 11, 1987, 62-228728; Oct. 14, 1987, 61-244858

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—386 10 Claims



1. A process for producing a functional film, which comprises a step of forming a thin film of a solution of one, two or more resins selected from among phenol resin, epoxy resin, melamine resin, silicone resin, fluorine resin, polyimide resin, polyamidoimide resin, polyparabanic acid resin, and polyhydantoin resin on one or both sides of a base substrate composed of a flexible thermoplastic resin, and a step of baking said thin film at 130° to 300° C. for 0.5 to 5 minutes with keeping it in a flatly form-retained state without looseness using a clipping mechanism to form a coating layer.

4,923,719

METHOD OF COATING SILICON CARBIDE FIBERS

Keith R. Karasek, Elk Grove Village, Ill.; William L. Olson, Solvang, Calif., and Jeffry T. Donner, Lake Zurich, Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 22, 1988, Ser. No. 234,766

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—387 12 Claims

1. A method of applying a thin surface coating to silickon carbide fibers comprising contacting the silicon carbide fibers with an organochlorosilane and heating the silicon carbide fibers at a temperature of about 300° to about 500° C. for a time sufficient to form a coating on the fibers, which coating has the formula SiC_xO_y where x ranges from about 0.4 to about 3.2.

4,923,720

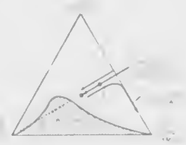
SUPERCRITICAL FLUIDS AS DILUENTS IN LIQUID SPRAY APPLICATION OF COATINGS

Chinsoo Lee, Charleston; Kenneth L. Hoy, St. Albans, both of W. Va., and Marc D. Donohue, Ellicot City, Md., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 133,068, Dec. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 833,156, Aug. 7, 1986, abandoned. This application Oct. 4, 1989, Ser. No. 418,820

Int. Cl.[5] B05D *1/02*

U.S. Cl. 427—422 55 Claims



1. A process for the liquid spray application of coatings to a substrate, which comprises:
(1) forming a liquid mixture in a closed system, said liquid mixture comprising:
(a) a coating formulation comprising at least one liquid polymeric compound capable of forming a coating on a substrate; and
(b) at least one supercritical fluid, in at least an amount which when added to (a) is sufficient to render the vicosity of said mixture to a point suitable for spray application; and
(2) spraying said liquid mixture, forming droplets having an average diameter of 1 micron or greater, onto a substrate to form a liquid coating thereon having substantially the composition of the said coating formulation.

4,923,721

MUSICAL ORNAMENT

William M. Gilmore, Wanchai, Hong Kong, assignor to Enesco Imports Corp., Elk Grove Village, Ill.

Filed Aug. 23, 1988, Ser. No. 235,317

Int. Cl.[5] A47G *33/08*

U.S. Cl. 428—11 9 Claims



1. An improved Christmas tree ornament comprising: a separate, rectangularly shaped battery box unit; a separate, holiday - type, generally spherically shaped ornament unit; an elongated flexible cable that has a predetermined length and that is formed of at least two electrical conductors, the flexible cable interconnecting the battery box unit and the ornament unit; the battery box unit having its outer surfaces visually ornamented for disguising the battery box unit as a Christmas wrapped gift box;
first hook means adapted for hanging the battery box unit at a first point within a Christmas tree;
the battery box unit also having: means in one of its outer surfaces for permitting removal and replacement of a battery supply within the battery box unit;
electrical contact means for interconnecting the battery supply stored within the battery box unit to the electrical conductors for developing a D.C. voltage across the electrical conductors; and electrical switch means for selectively activating the electrical contact means so as to interconnect and disconnect the battery supply stored within the battery box unit to the electrical conductors, the electrical switch means being mounted, at least in part, on an outer surface of the battery box unit so that the electrical switch means may be activated from without the battery box unit, with the part of the electrical switch means mounted on the outer surface of the battery box unit having a shape and visual appearance such that it forms an integral part of and blends with the visual ornamentation of the battery box unit;
the ornament unit comprising:
an outer generally spherical shell that is, in part transparent and, in part nontransparent; that has a first interior portion which is disposed within the transparent part of the shell and which is visually decorated with a holiday - type theme; at least one part that is movable along a preselected path within the interior of the shell so as to cooperate with and enhance the first visually decorated portion of the interior of the shell and so as to provide a decorative visual effect;
a D.C. motor being disposed within the nontransparent part of the shell and being connected to the one moveable part for the moving the same, the motor also being electrically connected to the electrical conductors for powering of the motor by said D.C. voltage; and
second hook means adapted for hanging the ornament unit at a second point, within the Christmas tree spaced from said first point, with the first and second points being spaced apart a distance less than the predetermined length of the flexible cable.

4,923,722

HEAT SHRINKABLE COMPOSITE FILM AND PACKAGING METHOD USING SAME

Kazuo Kondo, and Nobuya Ishiguro, both of Marugame, Japan, assignors to Okura Industrial Co., Ltd., Marugame, Japan

Filed Mar. 1, 1988, Ser. No. 162,451

Claims priority, application Japan, Mar. 2, 1987, 62-48444; Jun. 23, 1987, 62-157123; Aug. 27, 1987, 62-214671; Aug. 27, 1987, 62-214672

Int. Cl.[5] B65B *53/00*

U.S. Cl. 428—34.9 5 Claims



1. A heat shrinkable composite film comprising as a core at least one of (a) a low density polyethylene having a density of 0.890–0.905 g/cm^3 and a Vicat softening point of 60°–80° C. and/or (b) a copolymer of propylene and one or more α-olefins with 2–8 carbon atoms having a Vicat softening point of 70°–110° C., and two outer layers laminated over the opposite surfaces of said core layer (c) a crystalline polypropylene resin having a melting point of 135°–150° C., said core layer having a thickness of 30–80% of the total thickness of said outer layers and said core layer.

4,923,723

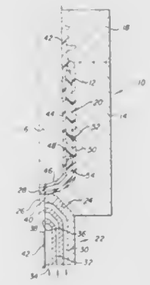
MULTI-LAYER PREFORM, METHOD OF FORMING PREFORM, AND CONTAINER FORMED FROM THE PREFORM

Wayne N. Collette, Merrimack; Suppayan M. Krishnakumar, Nashua, and Thomas E. Nahill, Amherest, all of N.H., assignors to Continental PET Technologies, Inc., Norwalk, Conn.

Filed Nov. 1, 1988, Ser. No. 265,775

Int. Cl.[5] B65D *23/00*

U.S. Cl. 428—35.7 16 Claims



1. An injection molded plastic preform for blow molding to form a plastic container, said preform including an open ended mouth forming portion, an intermediate body forming portion, and a closed base forming portion, said preform being of a laminated construction with said body forming portion including inner and outer layers and at least one intermediate layer of a plastic different from the plastic of said inner and outer layers, said intermediate layer terminating generally at said base, said base forming portion also including said inner and outer layers with there being a core layer between said inner and outer layers in at least a bottom part of said base portion, said core layer generally forming a continuation of said intermediate layer and being formed of a plastic different from said intermediate layer.

4,923,724

COMPOSITE ARTICLES

Gerald F. Day; Frank Robinson, and Dennis J. Williams, all of Derbyshire, United Kingdom, assignors to Courtaulds PLC, London, United Kingdom

Continuation of Ser. No. 38,943, Apr. 16, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 304,933

Claims priority, application United Kingdom, Apr. 23, 1986, 09865

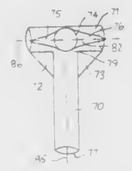
Int. Cl.[5] D03D *3/02;* B29C *67/14*

U.S. Cl. 428—36.1 11 Claims

1. A composite article comprising a synthetic plastics material reinforced with a fabric reinforcing element, said reinforcing element comprising
(a) at least three tubular portions each of which has a longitudinal axis, said tubular portions intersecting at a common junction such that said longitudinal axes extend in planes lying at an angle to one another, and
(b) flanges interconnecting the tubular portions each of said flanges lying in a plane containing the longitudinal axes of

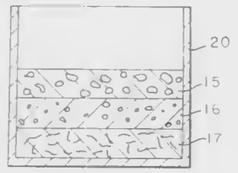
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the tubular portions interconnected thereby and extending in the direction of said longitudinal axes,



said tubular portions and flanges comprising an integrally knitted fabric element.

4,923,725
ARTICLE FOR ABSORBING COOKING GREASE
Dimitri Zafiroglu, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 29, 1988, Ser. No. 226,000
Int. Cl.[5] B01D *39/02, 39/04*
U.S. Cl. 428—36.4 **10 Claims**



1. A cooking-grease trapping-and-immobilizing disposable article comprising
a multi-layered bed of absorbent material in a container,
said absorbent material consisting essentially of particles and polyolefin microfibers, the microfibers amounting to at least 30% of the bed volume,
said container having an inlet through which the grease can enter and come into contact with the surface of the first layer of the absorbent material,
said first layer being located closest to the container inlet, consisting essentially of particles, and having a depth equal to at least one-quarter of the total depth of the bed, a free volume of at least 50%, and a multiplicity of passages therethrough, and at least 25% of the first layer total cross-sectional area consisting of passages having a width of at least 2 millimeters,
said microfibers being included in a second or subsequent layer of the bed having a free volume of at least 80%.

4,923,726
LIGHTSAFE MASKING FILM
Hiroshi Maruyama, Misato, and Yoshiharu Horii, Kasukabe, both of Japan, assignors to Somar Corporation, Japan
Filed Dec. 2, 1988, Ser. No. 279,028
Int. Cl.[5] B32B *7/06*
U.S. Cl. 428—40 **10 Claims**

1. A lightsafe masking film comprising a substrate formed of a plastic material, and a lightsafe layer peelably provided over the surface of said substrate and containing a fluorescent substance so that a cutting line formed on said lightsafe layer fluoresces under illuminated conditions to form a legible pattern.

4,923,727
LIGHTSAFE MASKING FILM
Hiroshi Maruyama, Misato; Naohiko Kiryu, Urawa, and Etsuko Minezaki, Misato, all of Japan, assignors to Somar Corporation, Japan
Filed Feb. 16, 1989, Ser. No. 310,967
Claims priority, application Japan, Feb. 16, 1988, 63-33612
Int. Cl.[5] B32B *7/06*
U.S. Cl. 428—40 **13 Claims**

1. A lightsafe masking film, comprising a substrate, and a peelable lightsafe layer provided over the surface of said substrate and including a lightsafe substance, a copolymer containing vinyl chloride, and a mixture of a first nitrile rubber containing 25–30% by weight of acrylonitrile and a second nitrile rubber containing 31–35% by weight of acrylonitrile.

4,923,728
PROTECTIVE ARMOR AND METHOD OF ASSEMBLY
Richard S. Soedeker, Cranbury, N.J., assignor to Titan Corporation, San Diego, Calif.
Continuation of Ser. No. 267,826, Nov. 7, 1988, abandoned. This application Sep. 20, 1989, Ser. No. 410,019
Int. Cl.[5] B32B *3/10, 3/22*
U.S. Cl. 428—52 **14 Claims**



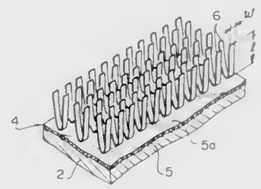
1. A protective armor comprising:
an assemblage of approximately equal size, flat, relatively small tiles arranged in edge-to-edge relationship in a checkerboard pattern such that the tiles are situated in longitudinal and transverse rows,
a series of first fabric tapes interwoven in a zig-zag path through each longitudinal row of tiles so as to pass over alternate tiles in the row and under the other tiles in the row, and
a series of second fabric tapes interwoven in like fashion through each transverse row of tiles so as to cover each tile on the side opposite that covered by the first fabric tapes.

4,923,729
COATED FIRE BARRIERS FOR UPHOLSTERED FURNISHINGS
Rick A. Porter, North Augusta, S.C., and Hans R. Hoernle, Augusta, both of Ga., assignors to Springs Industries, Inc., Fort Mill, S.C.
Division of Ser. No. 74,074, Jul. 16, 1987, Pat. No. 4,806,185. This application Nov. 14, 1988, Ser. No. 270,828
Int. Cl.[5] A47C *27/00;* **B32B** *1/06, 27/18, 33/00*
U.S. Cl. 428—71 **9 Claims**

1. A fire resistant upholstered article comprising an outer upholstery fabric that houses and contains filler materials, and a fire barrier material interposed between the outer upholstery fabric and the filler materials, comprising a fibrous substance selected from the group consisting of glass, carbon, polyaramid, polybenzimidazole, polymeta-phenylene diamine isophthalate, and combinations thereof, coated with a latex of enhanced thermal conductivity containing a finely divided heat conductive metal selected from the group consisting of aluminum, copper, nickel, and mixtures thereof, and wherein said interposed fire barrier-upholstered fabric has a porosity

rating of less than 10 cubic feet of air per minute per square foot measured at a pressure of ½ inch of water.

4,923,730
ANTI-FOULING SURFACE STRUCTURE, ANTI-FOULING COVERING MATERIAL AND METHOD OF PLANTING RIBBONS FOR PRODUCING ANTI-FOULING SURFACE STRUCTURE AND COVERING MATERIAL
Yasuyuki Taniguchi, Yokohama; Yutaka Ohwada, Kanagawa, and Mitsunori Araki, Nagasaki, all of Japan, assignors to Dai-Ichi High Frequency Co. Ltd., Tokyo, Japan
Filed Aug. 2, 1988, Ser. No. 227,015
Int. Cl.[5] B32B *33/00*
U.S. Cl. 428—92 **7 Claims**



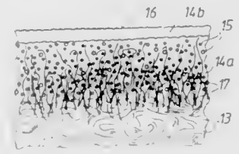
1. An anti-fouling structure for inhibiting marine growth on a surface comprising a multiplicity of ribbons on said surface, said ribbons having a thickness of between about five and twenty-five microns, a width ranging between 1 and 10 mm, and a length ranging between 10 and 100 mm so that said ribbons may flutter in water to inhibit marine growth.

4,923,731
NOVEL PREFORM SCREENS AND PREFORM PRODUCT
Earl P. Carley, New Kensington, and Philip L. Schell, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 27, 1988, Ser. No. 290,065
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—131 **8 Claims**



1. A preform screen adapted for use in producing preforms for subsequent use in a mold comprising a body and solid frame transition zone surrounding said body and wall member encompassing the screen area and providing a raised edge around the screen that is at least ½' in height and oriented at an angle of between 30° to 90° from the surface of the screen.

4,923,732
LEATHER, IN PARTICULAR SPLIT LEATHER PROVIDED WITH A DRESSING AS A PROCESS AND APPARATUS FOR PRODUCING DRESSED LEATHER
Philipp Schaefer, Oberstrasse 16, D-3000 Hannover, Fed. Rep. of Germany, assignor to Philipp Schaefer, Hanover, Fed. Rep. of Germany and Microplastic Corp., Bella Vista, Panama
Continuation of Ser. No. 90,956, Aug. 28, 1987, abandoned, which is a division of Ser. No. 784,866, Oct. 4, 1985, abandoned. This application Aug. 14, 1989, Ser. No. 394,239
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1984, 3436751
Int. Cl.[5] B32B *27/12*
U.S. Cl. 428—151 **12 Claims**

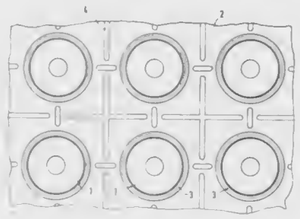


1. A dressed leather provided at least on one side with depressions and having on said one side absorbent protruding fibers and being bonded at this side with a layer formed from an aqueous dispersion of synthetic plastics material,
said layer filling the depressions and completely receiving the protruding fibers and forming at least part of a dressing,
said dressing being provided with a structured surface at the side turned away from the leather, the dressing consisting of
an inner layer which is adjacent the leather and completely receives the protruding fibers, and which is formed from the aqueous dispersion of synthetic plastics material, and
an outer layer which has the structured surface and is formed from an aqueous dispersion of synthetic plastics material, the inner layer having a greater thickness and lesser density than the outer layer, the thickness of the inner layer being greater than 0.11 mm, the thickness of the outer layer being smaller than 0.10 mm, and at least the inner layer having a pore structure or foam structure, respectively, and
a reinforcement in at least one of the layers.

4,923,733
FLEXIBLE FORM SHEET
Donald Herbst, Marienplast 11, 1000 Berlin 45, Fed. Rep. of Germany
Filed Jan. 26, 1989, Ser. No. 302,421
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3803062
Int. Cl.[5] B32B *3/00, 3/28*
U.S. Cl. 428—156 **7 Claims**

1. A flexible form sheet for use in producing a plaster cavity floor, comprising a sheet with regularly distributed bulges and

defined increased flexibility areas between the bulges as a result of a modification to bending behavior of the sheet,

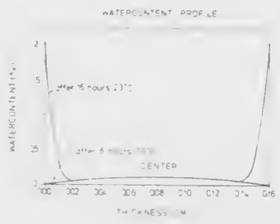


wherein the increased flexibility areas are deformed areas concentrically surrounding the bulges.

4,923,734
LAMINATES OF POLYNORBORNENE AND POLYOLEFINS DERIVED FROM C_2-C_4 MONOMERS
George M. Benedikt, Macedonia, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Dec. 23, 1988, Ser. No. 288,999
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 46 Claims

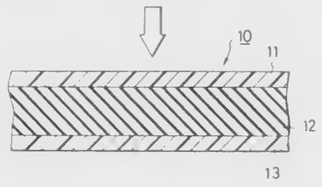
19. A laminate of claim 13 wherein the silane is selected from the group consisting of
3-methylacryloyloxypropyltrimethoxysilane,
3-(N-styrylmethyl-2-aminoethylamino)propyltrimethoxysilane hydrochloride,
3-(N-allyl-2-aminoethylamino)-propyltrimethoxysilane hydrochloride,
N-(styrylmethyl)-3-aminopropyltrimethoxysilane hydrochloride,
N-2-aminoethyl-3-aminopropyltrimethoxysilane, and
3-(N-benzyl-2-aminoethylamino)-propyltrimethoxy silane hydrochloride.

4,923,735
MOULDED PRINTED CIRCUIT BOARD
Erik R. Peerlkamp, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands
Filed Dec. 30, 1988, Ser. No. 292,237
Claims priority, application Netherlands, Dec. 31, 1987, 8703166
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 6 Claims



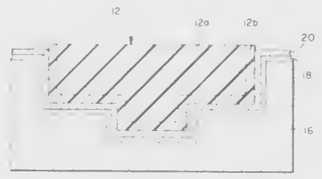
1. Moulded circuit board of a thermoplastic polymer composition, wherein the polymer is composed substantially of tetramethylene adipamide units.

4,923,736
MULTI-LAYERED MICROWAVE ABSORBER AND METHOD OF MANUFACTURING THE SAME
Misao Hiza, Hiratsuka; Hajime Yamazaki, Hadano; Kazuhiro Sugihara, and Tetsu So, both of Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Apr. 20, 1987, Ser. No. 39,720
Claims priority, application Japan, May 14, 1986, 61-108634
Int. Cl.[5] B32B *77/10, 9/04, 7/00*
U.S. Cl. 428—212 7 Claims



1. A multi-layered microwave absorber comprising a plurality of layers differing in impedance from one another which are bonded together into an integral sheet structure by a silicone adhesive compound between said layers with a coat thickness of less than 0.1 mm, said layers including at least a low impedance layer having a resinous material free of ferroelectric and ferromagnetic materials, and a reflecting layer, said layers being laminated in the order mentioned.

4,923,737
SURFACE MODIFIED PLASTIC AND COMPOSITE ARTICLES AND METHOD
William De La Torre, Whittier, Calif., assignor to Northrop Corporation, Hawthorne, Calif.
Filed Oct. 20, 1988, Ser. No. 260,440
Int. Cl.[5] B29C *45/14;* B29D *9/00;* B32B *3/26, 5/14, 5/16*
U.S. Cl. 428—217 32 Claims



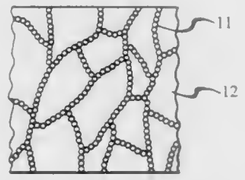
1. A method of modifying the surface properties of a shaped plastic article which comprises:
(i) providing a release mold of the shaped article;
(ii) applying atop the release mold a metal cloth which comprises fibrillate polytetrafluorethylene having particulate matter entrapped in the fibrils;
(iii) placing a thermosetting polymeric resin atop the metal cloth; and
(iv) heating the structure produced by (i)–(iii) for a sufficient period of time and at a sufficient temperature and pressure as to cause the resin to flow into and encapsulate in the metal cloth and cure to form the shaped article.

24. A molded, shaped plastic article having an integral metal-filled-resin composite surface, comprising a molded body of a thermoset polymeric resin having an integral surface portion comprising a fibrillated polytetrafluorethylene metal cloth having particulate matter entrapped in the fibrils thereof, said metal cloth being integrated with said polymeric resin during the molding of said plastic article under sufficient heat and pressure to cure said polymeric resin.

4,923,738
INTERSTITIALLY CAPACITIVE ABSORPTIVE ARTICLES
Robert D. Newell, 429 N. Main St., Roxboro, N.C. 27573
Continuation of Ser. No. 181,158, Apr. 13, 1988, abandoned. This application May 2, 1988, Ser. No. 189,484
Int. Cl.[5] D03D *3/00*
U.S. Cl. 428—221 12 Claims

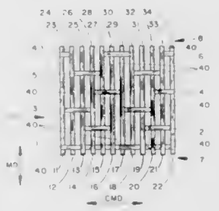
1. A mop head comprising a three-dimensional open lattice filamentous polyhedral structure defining interstitial spaces therein of sufficient size and shape to take up liquid by capillarity and surface tension effects producing flow of said liquid into said interstitial spaces.

4,923,739
COMPOSITE ELECTRICAL INTERCONNECTION MEDIUM COMPRISING A CONDUCTIVE NETWORK, AND ARTICLE, ASSEMBLY, AND METHOD
Sungho Jin, Millington; William R. Lambert, Mendham; Robert C. Moore, Lawrenceville; John J. Mottine, Jr., West Keansburg; Richard C. Sherwood, New Providence, and Thomas H. Tiefel, Piscataway, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.
Filed Jul. 30, 1987, Ser. No. 79,374
Int. Cl.[5] H01R *9/09*
U.S. Cl. 428—221 15 Claims



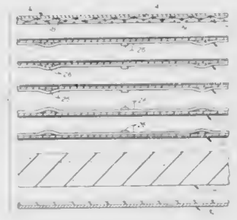
1. An electrical interconnection medium comprising a body of composite material in the form of a layer or sheet extending in x- and y-directions,
said composite material comprising first particles in an essentially nonconductive matrix material,
said first particles at least in part being magnetic and having at least a surface portion which is electrically conducting, and
said first particles being magnetically aligned into a conductive network, whereby said medium has significant conductivity in said x- and y-directions.

4,923,740
MULTILAYER FORMING FABRIC WITH HIGH OPEN AREA
Jeffrey L. Todd, Summerville, S.C., assignor to Asten Group, Inc., Charleston, S.C.
Continuation of Ser. No. 198,475, May 25, 1988. This application Oct. 11, 1989, Ser. No. 419,959
Int. Cl.[5] B32B *05/02*
U.S. Cl. 428—233 4 Claims



1. A papermaker's substrate fabric of the type which is combined with a patterned paper contacting surface to produce an embossing fabric, said substrate fabric comprised of:
at least two machine direction yarn systems, each machine direction yarn system being formed of a plurality of yarns which defines a respective machine direction horizontal plane, said horizontal planes being parallel planes and the respective yarns of said horizontal planes vertically aligned with each other; and
a cross machine direction yarn system interwoven with said machine direction yarn systems and maintaining the respective machine direction yarns substantially within their respective horizontal planes and in vertical alignment,
whereby said interwoven machine and cross machine yarns defining a substrate fabric with an open area of at least 40%.

4,923,741
HAZARDS PROTECTION FOR SPACE SUITS AND SPACECRAFT
Joseph J. Kosmo, Seabrook, and Frederic S. Dawn, Houston, both of Tex., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.
Filed Jun. 30, 1988, Ser. No. 213,880
Int. Cl.[5] B32B *7/00, 27/00*
U.S. Cl. 428—252 20 Claims



1. A flexible covering article for providing protection against the hazards of exposure to the environment of outer space and extraterrestrial surfaces, said covering article comprising:
an outer layered section including an outermost lamina of woven expanded tetrafluoroethylene yarns for protecting against abrasion and tearing, an underlying lamina of

interwoven meta-aramid fiber yarns and para-aramid fiber yarns which are also woven to the inner side of said outermost lamina section,

means including a plurality of electrically conductive elements woven in said underlying lamina with said meta-aramid and para-aramid fiber yarns for distribution and dispersion of electrostatic charges which may accumulate on said outer layered section and for providing a potential discharge path for said charges, and

chemical protection means in the form of a coating applied to the inward side of said interwoven meta-aramid and para-aramid fiber yarns for protecting against chemical attack from chemical contaminants comprised of spacecraft propellants;

a middle section comprised of a plurality of successively adjacent thermal insulation layers in the form of thin films or fabrics of polymeric thermoplastic or thermoforming resin material, each of which is coated on one surface by a deposit of metallic material which exhibits a high degree of infra-red emissivity and low absorption of solar radiation,

and a low thermal conductive spacer means for spacing each of said thermal insulation layers, to preclude thermal "shorting" between said thermal insulation layers;

a flexible radiation attenuating section for protecting against secondary radiation produced by the bremsstrahlung effect and comprised of a layer of flexible binder material loaded with micron sized powder particles of a high density, high atomic number material uniformly dispersed therein;

an innermost layer of woven polymeric thermoforming resin yarns for protecting against abrasion; and

means for securing all of said layers of said covering together in a flexible laminated composite relationship.

4,923,742

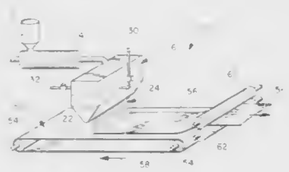
ELASTOMERIC POLYETHER BLOCK AMIDE NONWOVEN WEB

Thomas M. Killian, Green Bay, and Tony J. Wisneski, Kimberly, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

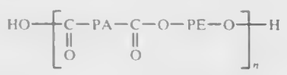
Division of Ser. No. 108,506, Oct. 13, 1987, Pat. No. 4,820,572, which is a division of Ser. No. 919,299, Oct. 15, 1986, Pat. No. 4,724,184. This application Oct. 14, 1988, Ser. No. 258,280

Int. Cl.[5] **D03D** *3/00;* **D04H** *1/58;* **B32B** *5/16*

U.S. Cl. 428—283 **5 Claims**



1. A composite elastic nonwoven web comprised of: from about 50–99 percent, by weight, of a coherent matrix of melt-blown fibers of a polyether block amide copolymer having the formula:



where n is a positive integer, PA represents a polyamide segment and PE represents a polyether segment; and

from about 1–50 percent, by weight, of at least one type of particulate material selected from the group consisting of activated charcoal and powdered superabsorbent.

4,923,743

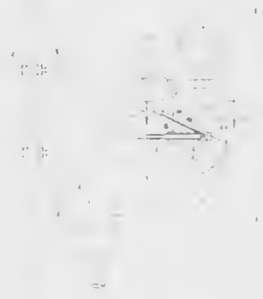
APPARATUS AND METHOD FOR SPRAYING MOVING SUBSTRATES

William H. Stewart, Jr., Campobello, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 62,141, Jun. 15, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 274,625

Int. Cl.[5] **B05D** *1/02*

U.S. Cl. 427—288 **12 Claims**



1. A method for dyeing a web of sheet material wherein said web is positioned in the path of a marking spray, said spray being formed by the interaction of a pressurized stream of liquid marking material and a stream of a pressurized gaseous dispersing agent, said method comprising the steps of projecting a plurality of discrete, substantially continuous liquid streams of a marking material along a path which precludes contact with said web, forming at least one pressurized dispersing stream of a gaseous dispersing agent, said dispersing stream being projected in an expanding trajectory directed at said web and being oriented to provide for the intersection of said dispersing stream with at least one respective liquid marking stream, said dispersing stream having sufficient lateral width at the location of said intersection with said at least one liquid marking stream to envelope laterally said liquid marking stream at said location, and having sufficient maximum pressure to form from said laterally enveloped respective stream of marking material a shower of diverging droplets of said marking material and to project at least a portion of said diverging droplets onto said web, said pressure associated with said dispersing stream being rapidly modulated so as t form from said continuous stream a series of spaced discrete bursts of droplets directed at said web, each burst containing a controlled quantity of marking material, and thereby meter a controllable quantity of marking material onto said web at a rate determined by the frequency and duration of said bursts, and moving said web on a path which brings at least a portion of said web into contact with said droplets.

4,923,744

PRESENTATION BASKET

Emma L. Peeters, 3832 Larkspur Dr., Concord, Calif. 94519

Filed Jan. 9, 1989, Ser. No. 295,136

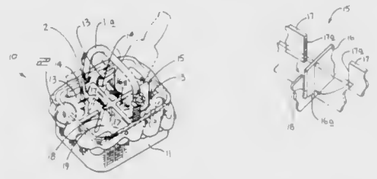
Int. Cl.[5] **B65D** *5/46, 5/48*

U.S. Cl. 428—34.1 **7 Claims**

1. A presentation basket comprising,

a basket container body including an exterior surface and an interior surface and further including an integral upwardly depending handle overlying a cavity defined by said interior surface, and

a partition assembly removably securable within said cavity including fastening means on portions of said partition assembly for securement of said assembly to said interior surface of said cavity, and



wherein said interior surface of said cavity is covered by a fabric loop portion, and

wherein said fastening means includes hook fabric fasteners securable and interengageable with said fabric loop portion.

4,923,745

INSECT REPELLENT CLOTHING BAG

Barbara Wolfert, 11 Cross Ridge Rd., Chappaqua, N.Y. 10514, and Ira S. Dorman, Manchester, Conn., assignors to Barbara Wolfert, Chappaqua, N.Y.

Filed Apr. 7, 1989, Ser. No. 334,327

Int. Cl.[5] **A01N** *25/08;* **B65D** *85/18*

U.S. Cl. 428—35.4 **19 Claims**



1. An article for the containment and treatment of a garment or the like, comprising adjacent first and second coextensive panels of a gas barrier material sealed about a major portion of their common peripheral margin to provide an open-ended bag, one of said panels comprising, on the inner face thereof, a fumigant source elcment having an inner surface and capable of evolving a gaseous agent when said inner surface is exposed, the other of said panels comprising covering means overlying and disengageably held against said inner surface of said source element to prevent exposure thereof, displacement of said covering means by separation of said panels, and consequential exposure of said inner surface, enabling evolution and diffusion of said gaseous agent within said bag.

4,923,746

PROCESS FOR PRODUCING PADDINGS MOLDED FROM POLYURETHANE FOAM COMPRISING SEVERAL REGIONS OF DIFFERENT PLIABILITY, AND PADDINGS THUS PRODUCED

Michel Balmisse, and Georges Molinari, both of Erstein, France, assignors to Roth Freres, Societe Anonyme, Strasbourg, France

Continuation-in-part of Ser. No. 53,671, May 26, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 252,911

Claims priority, application France, May 23, 1986, 86 07521

Int. Cl.[5] **A47C** *7/00;* **B29C** *67/22*

U.S. Cl. 428—309.9 **11 Claims**

1. Process for producing a padding molded from polyurethane foam having several juxtaposed and/or superposed regions of different pliability, characterized in that it consists of dividing a mold (1) into compartments and placing therein one or several collecting vessels (2) and/or one or several partitions (3) of expanded polystyrene, simultaneously pouring different foamable polyurethane mixtures of different pliability each into one of the volumes delimited by the walls of the partitions (3) and of the mold (1) and/or by the walls of the collecting vessels (2), covering the mold (1), subjecting the mold (1) filled with polyurethane foams to a temperature (T) provided by an exterior heat source and/or by the exothermic



reaction of the foams, said temperature (T) being such as to obtain not only polymerization of the polyurethane foams, but also contraction of the expanded polystyrene, this contraction at the temperature (T) causing the transformation of the said expanded polystyrene into a layer (6) of fine, compact and pliable material serving to interconnect the polyurethane foams of different pliability which were simultaneously poured.

8. Molded padding produced by the process of claim 1.

4,923,747

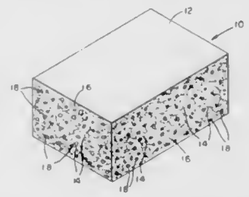
CERAMIC THERMAL BARRIERS

Francis P. McCullough, Jr.; Steven L. Brewster, both of Lake Jackson, and R. Vernon Snelgrove, Damon, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 18, 1988, Ser. No. 233,685

Int. Cl.[5] **B32B** *5/18, 18/00, 33/00;* **C04B** *35/78*

U.S. Cl. 428—312.6 **17 Claims**



1. A lightweight ceramic structure comprising a set pourous ceramic composition and a batting, felt or web of carbonaceous fibers within said ceramic composition in a reinforcing amount.

4,923,748

MAGNETIC RECORDING MEDIUM

Tadashi Yasunaga; Akio Yanai, and Koji Sasazawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 11, 1988, Ser. No. 179,924

Claims priority, application Japan, Apr. 10, 1987, 62-87193

Int. Cl.[5] **H01F** *10/08*

U.S. Cl. 428—336 **7 Claims**

1. A magnetic recording medium comprising a non-magnetic

support having thereon a magnetic layer of iron oxide nitride thin film comprising iron, nitrogen, oxygen and at least one element selected from the group consisting of silicon and aluminum.

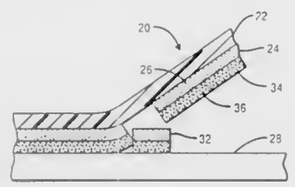


4,923,749

THERMAL TRANSFER RIBBON

Shashi G. Talvalkar, Kettering, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 25, 1988, Ser. No. 224,042
Int. Cl.[5] B41M *5/20*
U.S. Cl. 428—341 13 Claims



1. A thermal transfer ribbon comprising a substrate, a thermal sensitive coating which is a mixture containing as essential ingredients about 30 to 60% paraffin wax, about 10 to 40% oxidized, isocyanated hydrocarbon wax, about 5 to 35% carnauba wax, about 5 to 25% acetate copolymer, about 0 to 10% hydracinnamate, and about 35 to 60% iron oxide, and a protective layer between the substrate and the thermal sensitive coating and containing as essential ingredients about 1 to 15% polyvinyl alcohol, about 4 to 30% acrylic primer, about 30 to 60% sucrose benzoate, about 18 to 30% saturated fatty alcohol, and about 8 to 16% carbon black pigment, the thermal sensitive coating being coated on the protective layer and then dried at a temperature wherein the thermal sensitive coating remains nonintegral with the protective layer.

4,923,750

THERMOPLASTIC STRETCH-WRAP MATERIAL

Jerry F. Jones, Christiana, Tenn., assignor to Co-Ex Plastics, Inc., Lewisburg, Tenn.

Filed Dec. 30, 1987, Ser. No. 139,776
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—349 12 Claims

1. An improved co-extruded composite stretch-wrap film comprising a core and at least one skin layer thereon, said core comprising an ethylene polymer having in polymerized form a major portion of ethylene and a minor portion of an olefinic monomer and said at least one skin layer comprising an ethylene polymer having in polymerized form a major portion of ethylene and a minor portion of an olefinic monomer, said olefinic monomer used in said at least one skin layer containing no more than three carbon atoms different than said olefinic monomer used in said core.

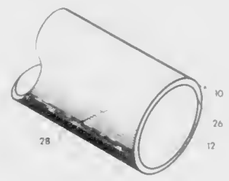


4,923,751

SEAMLESS METAL-CLAD FIBER-REINFORCED ORGANIC MATRIX COMPOSITE STRUCTURES, AND PROCESS FOR THEIR MANUFACTURE

Raymond M. Bluck, San Jose, Calif.; Harold G. Bush, Yorktown, Va., and Robert R. Johnson, Saratoga, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 21, 1986, Ser. No. 921,572
Int. Cl.[5] F16L *9/14*
U.S. Cl. 428—35.9 3 Claims



1. A seamless metal-clad composite structure having a controlled coefficient of thermal expansion for construction of space truss elements comprising:

a hollow metallic inner member,

a metallic outer sleeve surrounding the inner member so that an inner space is defined therebetween,

said inner member and outer sleeve having a positive coefficient of thermal expansion,

a plurality of continuous reinforcing fibers in a cured matrix material completely filling said inner space,

said continuous reinforcing fibers having a negative coefficient of thermal expansion,

whereby the coefficient of thermal expansion of the composite structure may be tuned to a desired value by adjusting the thickness of the inner member and the outer sleeve.

4,923,752

SIZING FOR CARBON FIBER

Richard H. Cornelia, Hockessin, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 19, 1988, Ser. No. 145,111
Int. Cl.[5] C08K *5/20, 5/36, 5/34;* C08L *77/10*
U.S. Cl. 428—367 4 Claims

1. A size composition comprising from 0.5 to 10% by weight of a fluorinated poly(amide-acid) in a mixture of an aprotic solvent of the group comprising dimethyl sulfoxide, dimethylformamide, diglyme and N-methylpyrrolidone and an alcohol of the group consisting of methanol, isopropanol and ethanol, the mixed solvent having a ratio of aprotic solvent to alcohol of from 1:4 to 1:20 on a weight basis.

2. A size composition according to claim 1 wherein the polymer is formed by a substantially stoichiometric reaction between 2,2-bis(3',4'-dicarboxyphenyl) hexafluoropropane dianhydride and a mixture of para- and meta-phenylene diamine in about a 95:5 ratio in anhydrous N-methylpyrrolidone.

4. Carbon fiber having a uniform continuous coating of up to about 3% by weight of a fluorinated poly(amide-acid) formed by application to the carbon fiber of the size composition of claims 2 or 3.

4,923,753

CONTROLLED-RELEASE COMPOSITIONS FOR ACIDS

Wilhelm E. Walles, Freeland, and Donald L. Tomkinson, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 26, 1987, Ser. No. 30,957
Int. Cl.[5] B01J *13/02*
U.S. Cl. 428—402.24 40 Claims



1. A composition comprising:

(1) a porous matrix, the matrix comprising and substantially inert to an absorbed acid:

(2) a midlayer surrounding the matrix and consisting essentially of one or more salts of the acid: and

(3) a membrane surrounding the matrix, the membrane being exterior of the midlayer, the membrane further being substantially inert to the midlayer and permeable to the environment, the thickness and permeability of the membrane comprising means for controlling diffusion of a selected environment therethrough.

20. A method of preparing a controlled release composition comprising the steps of

(1) absorbing an acid into a porous matrix that is substantially inert to the acid;

(2) surrounding the matrix with a midlayer consisting essentially of a salt of the acid; and

(3) surrounding the matrix with a membrane, the membrane being exterior of the midlayer, the membrane further being substantially inert to the midlayer and permeable to a selected environment, the thickness and permeability of the membrane comprising means for controlling diffusion of the environment therethrough.

4,923,754

FAST ULTRAVIOLET RADIATION CURING SILICONE COMPOSITION

Chi-long Lee, and Michael A. Lutz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 863,672, May 15, 1986, Pat. No. 4,780,486, which is a continuation-in-part of Ser. No. 545,729, Oct. 26, 1983, abandoned. This application Apr. 29, 1988, Ser. No. 187,693
Int. Cl.[5] B32B *15/08, 17/10, 17/12*
U.S. Cl. 428—429 20 Claims

1. A cured product comprising a substrate with at least a surface which results from exposing to a curable amount of ultraviolet radiation a composition comprising a material which is storable in one package, is viscosity stable indicated by the failure of the 25° C. viscosity to double when heated at 100° C. for 24 hours, cures when exposed to ultraviolet radiation of 70 millijoules or less per square centimeter in one second or less where the ultraviolet radiation includes a wavelength of 365 nanometers, and is obtained by mixing

(A) alkenyl functional, linear triorganosiloxy endblocked polydiorganosiloxane having a degree of polymerization of 30 to 1,000 where each silicon-bonded organic radical is selected from vinyl, methyl, phenyl, 3,3,3-trifluoropropyl, beta-(cyclohexenyl)ethyl, ethyl, cyclohexenyl, allyl, higher alkenyl radicals represented by the formula $-R^{\bullet}(CH_2)_rCH{=}CH_2$ wherein $R^{\bullet}$ is $-(CH_2)_s-$ or $-(CH_2)_rCH{=}CH-$, r has a value of 1, 2, or 3; s has a value of 3 or 6; and t has a value of 3, 4, or 5, and silacyclopentenyl, and having per molecule at least two silicon-bonded organic radicals selected from vinyl, beta-(cyclohexenyl)ethyl, cyclohexenyl, allyl, higher alkenyl radical and silacyclopentenyl,

(B) mercapto functional crosslinker which is at least one material selected from mercapto functional polyorganosiloxanes and mercapto organic compounds, said mercapto functional polyorganosiloxanes are represented by the general formula

$$R''R'_2SiO(R'''R'SiO)_x(R'RSiO)_ySiR'_2R''$$

wherein each R is selected from mercaptoalkyl radicals having from 2 to 6 carbon atoms per radical; each R' is selected from methyl, phenyl, 3,3,3-trifluoropropyl, and ethyl; and each R'' is selected from the radicals of —OH, R, and R'; and each R''' is selected from methyl and phenyl, on the average there being per molecule at least two mercaptoalkyl radicals, x is 0 or greater, y is 0 or greater, and the amount and kind of organic radicals represented by R, R', R'', and R''' being of such a nature as to make (A) and (B) compatible, and said mercapto organic compounds have at least two mercapto groups per molecule, consisting of atoms of sulfur, carbon, and hydrogen, and optionally oxygen, having a molecular weight less than 1,000, and being of such a nature as to make (A) and (B) compatible,

(C) photosensitizer,

(D) storage stabilizer, and

(E) optionally reinforcing agent, there being in said material from 0.5 to 1.5 total alkenyl radicals per mercapto group.

4,923,755

ORGANOSILICONE RESIN COATING COMPOSITIONS

Gerald L. Witucki, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 28, 1989, Ser. No. 329,466
Int. Cl.[5] B32B *9/04*
U.S. Cl. 428—447 14 Claims

1. A comPosition comprising:

(A) 100 parts by weight of a hydroxyl functional organosiloxane resin copolymer comprised of at least two units selected from the group consisting of $MeSiO_{3/2}$ units, $Me_2SiO_{2/2}$ units. $PhMeSiO_{2/2}$ units. $PhSiO_{3/2}$ units,

$Ph_2SiO_{2/2}$ units and $PrSiO_{3/2}$ units, in which Me denotes a methyl radical, Ph denotes a phenyl radical and Pr denotes a propyl radical, said resin copolymer having 0.5 to 6 weight percent residual hydroxyl radicals attached to the silicon atoms thereof, a total molar organic group to silicon ratio of 1 to 1 7 and a total molar phenyl group to silicon ratio of 0.35 to 0.85; and

(B) from about 1 to 100 parts by weight of a liquid silicone resin composition prepared by a process comprising

(I) reacting a mixture consisting essentially of

(i) a phenylsilane having the general formula

$PhSi(OR)_3$

wherein R is selected from the group consisting of methyl, ethyl, propyl and acetyl radicals and Ph denotes a phenyl radical,

(ii) a polydimethylsiloxane and

(iii) an equilibrating amount of an acid catalyst having the formula

ZSO_3H

wherein Z is a perfluoroalkyl group having 1 to 10 carbon atoms, molar ratio of said polydimethylsiloxane (ii) to said phenylsilane (i) being between about 1:9 and about 9:1,

(II) hydrolyzing the reaction product formed in step (I) with sufficient water to provide from about 0.5 to about 1 mole of residual—OR functionality per 100 parts by weight of said liquid silicone resin and

(III) neutralizing said acid catalyst (iii).

4,923,756

PRIMERLESS ADHESIVE FOR FIBERGLASS REINFORCED POLYESTER SUBSTRATES

Daniel A. Chung, Dublin, and Laurence G. Dammann, Westerville, both of Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Filed Aug. 20, 1987, Ser. No. 87,194

Int. Cl.[5] B32B *27/08, 27/36, 27/40*

U.S. Cl. 428—423.7 **8 Claims**

1. A laminated composite comprising a first unprimed fiber reinforced polyester substrate having a second substrate adhesively bound thereto by the cured residue of an adhesive comprising a blend of a prepolymer component comprising the reaction product of a polyol and an aromatic isocyanate and having 3 to 15 percent free isocyanate groups; an aliphatic polyisocyanate and a curative component comprising a polyfunctional polyether polyol.

4,923,757

BILAYER WINDSHIELD WITH AN ABRASION AND SOLVENT RESISTANT POLYURETHANE PROTECTIVE COATING

James B. O'Dwyer, Valencia; Wen-Hsuan Chang; Roger L. Scriven, both of Gibsonia, and Joseph Cherenko, Valencia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 133,830, Dec. 16, 1987, Pat. No. 4,824,926. This application Nov. 14, 1988, Ser. No. 270,858

Int. Cl.[5] B32B *27/00*

U.S. Cl. 428—425.6 **10 Claims**

1. An abrasion-resistant coated transparent article comprising:

a. a rigid transparent substrate;

b. a transparent energy-absorbing elastomer sheet, one surface of which is bonded to said rigid substrate; and

c. coated on the other surface of said elastomer sheet, an abrasion-resistant branched polyurethane which is the reaction product of:

(1) an aliphatic polyisocyanate and

(2) a hydroxy-terminated polyol selected from the group consisting of polyethers and polyesters having a molecular weight between 300 and 5000;

wherein at least one of said polyisocyanate and polyol has a functionality greater than 2.

4,923,758

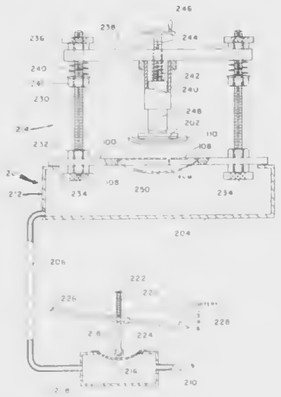
POLARIZING PRESCRIPTION LENSES AND METHOD OF MAKING

Mortimer Marks, 166-17 Cryders La., Whitestone, N.Y. 11357, and Ned Steinfeld, 1600 Parker Ave., Fort Lee, N.J. 07024

Filed Feb. 5, 1988, Ser. No. 152,907

Int. Cl.[5] B32B *17/10*

U.S. Cl. 428—437 **26 Claims**



1. A method of making a polarized lens, comprising the steps of:

(a) making a flexible and stretchable polarizing film;

(b) putting said film and said lens in facing spaced relationship to each other, with the surface of the lens to be adhered to the film in facing relationship to the surface of the film to be adhered to the lens;

(c) maintaining a small quantity of liquid at a point in between said two surfaces of said lens and said film; and

(d) bringing said lens and said film closer together in a relative direction with respect to each other which results in said film and said lens contacting said small quantity of liquid before they contact each other and advancing them relatively to each other until said film and said lens are in intimate contact over an area and said liquid has been substantially excluded from between said lens and said film.

4,923,759

COHESIVE BONDING PROCESS FOR FORMING A LAMINATE OF A WEAR RESISTANT THERMOPLASTIC AND A WEATHER RESISTANT RUBBER

Mark L. Brooks, and Keith E. Wilson, both of Wabash, Ind., assignors to GenCorp Inc., Fairlawn, Ohio

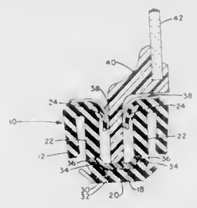
Filed Feb. 3, 1989, Ser. No. 305,583

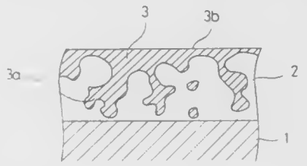
Int. Cl.[5] B32B *27/32*

U.S. Cl. 428—521 **8 Claims**

1. A glass run strip having a base comprising

a cured weather resistant rubber housing, said housing having a base, said base having a longitudinal central web adjoined by two opposing sides to form a channel, each said side having a longitudinal flexible lip, each said lip extending towards each other and forming a channel enclosure, and a thermoplastic wear strip, said thermoplastic wear strip being laminated to said longitudinal central web by melt bonding.





4,923,760

WATERBORNE PENETRATING COATING COMPOSITION METHOD

Adrian S. Adkins, Moraga, and Diane J. Englund, Livermore, both of Calif., assignors to The Olympic Homecare Products Company, Bellevue, Wash.

Division of Ser. No. 115,175, Oct. 30, 1987, Pat. No. 4,814,016. This application Feb. 24, 1989, Ser. No. 314,987

Int. Cl.[5] C08L *91/00;* **B32B** *23/00*

U.S. Cl. 428—541 **5 Claims**

1. A method of coating and protecting wood articles by contacting them with a penetrating coating consisting essentially of

a resin component forming about 5 to 25 wgt. % of the coating composition, the resin component comprising a first maleinized linseed oil having a low molecular weight in the range of about 1,000 to 3,000, a second maleinized linseed oil having a medium molecular weight in the range of about 4,000 to 8,000 and a medium-long oil length water-reducible alkyd resin,

a solvent component forming about 45 to 95 wgt. % of the coating composition, the solvent component comprising water and propylene glycol tertiary butyl ether (PTB) as a coupling solvent for solubilizing the resin component in the water and for enhancing handling characteristics of the coating composition as it is applied to the wood surface, and

a pigment component forming about 0 to 25 wgt. % of the coating composition.

4,923,761

BEARING MATERIAL HAVING MULTIPLE LAYER THEREIN AND A METHOD OF MANUFACTURING THE SAME

Takeshi Shindo, Chiba, Japan, assignor to NDC Company, Ltd., Chiba, Japan

Continuation of Ser. No. 53,655, May 26, 1987, abandoned. This application Sep. 6, 1989, Ser. No. 402,992

Claims priority, application Japan, Oct. 29, 1986, 61-257694

Int. Cl.[5] B22F *3/10*

U.S. Cl. 428—550 **6 Claims**

1. A bearing material including a back metal, a porous sintered metal layer having a large number of pores therein and covering said back metal and a bearing layer formed on said porous sintered metal layer such as to partly penetrate into said pores of said porous sintered metal layer, in which said bearing layer consists essentially of an integrated resin powder and Pb-Sn alloy powder adhering to each particle surface of said integrated resin powder, said integrated resin powder being formed by simultaneous precipitation of tetrafluoroethylene resin and tetrafluoroethylene-hexafluoropropylene copolymer and/or tetrafluoroethylene-perfluoroalkylvinylether copolymer.

4,923,762

PRECOATED STEEL SHEET FOR TWO-PIECE CAN

Hiroshi Ishikawa; Naoki Gunji, both of Tokyo; Yoshinori Hoshino, Kawagoe, and Taro Obyama, Hoya, all of Japan, assignors to NKK Corporation and Toyn Ink Mfg. Co., Ltd., both of Tokyo, Japan

Filed Jul. 19, 1989, Ser. No. 382,108

Claims priority, application Japan, Jul. 27, 1988, 63-187685

Int. Cl.[5] B22F *3/24*

U.S. Cl. 428—551 **10 Claims**

1. A precoated steel sheet for a two-piece can, characterized by comprising:

a steel sheet;

a precoating film formed on one surface of said steel sheet by applying a precoating composition onto said one surface of said steel sheet and then curing same, said one surface of said steel sheet being to be the outer surface of a two-piece can, and said precoating composition comprising:

(a) a thermosetting coating material comprising a resin as a solid content and a solvent, and

(b) an internal lubricant, the content ratio of said internal lubricant being within the range of from 0.1 to 30 weight parts relative to 100 weight parts of said resin as said solid content in said thermosetting coating material; and

another precoating film formed on the other surface of said steel sheet by applying another precoating composition onto said other surface of said steel sheet and then curing same, said other surface of said steel sheet being to be the inner surface of said two-piece can, and said another precoating composition comprising:

(a) said thermosetting coating material, and

(b) an aluminum powder, the content ratio of said aluminum powder being within the range of from 10 to 400 weight parts relative to 100 weight parts of said resin as said solid content in said thermosetting coating material.

4,923,763

PERPENDICULAR MAGNETIC RECORDING MEDIUM

Hiroki Nakamura, Kawasaki; Takashi Yamada, and Yoshiaki Ouchi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 158,038, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 795,547, Nov. 6, 1985, abandoned. This application Sep. 19, 1988, Ser. No. 245,945

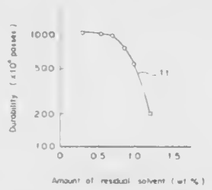
Claims priority, application Japan, Nov. 14, 1984, 59-238517; Jul. 23, 1985, 60-161174

Int. Cl.[5] G11B *5/64*

U.S. Cl. 428—458 **13 Claims**

1. A perpendicular magnetic recording medium which comprises a substrate of a polymer film selected from the group consisting of a polyimide film, an aromatic polyamide film, a polyamidimide film, a polyparabanic acid film and a polyoxazole film containing 0.1 to 0.7% by weight of a residual sol-

vent selected from the group consisting of N,N'-dimethylacetamide, N,N'-dimethylformamide, dimethyl sulfoxide, hexamethylphosphorylamide, N-methyl-2-pyrrolidone, tetramethylurea, tetramethylenesulfone, phenol, phenol monohalide cresol, cresol monohalide and xylene and a ferromagnetic alloy layer formed on said substrate.



4,923,764

ARTICLE OF BLACK SILVER COLOR

Kouji Hirose; Hitoshi Ito, and Kazuhito Yoshida, all of Tokyo, Japan, assignors to Seikosha Co., Ltd, Japan

Filed Sep. 1, 1987, Ser. No. 91,650
Claims priority, application Japan, Sep. 2, 1986, 61-206529
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—632 **12 Claims**

4. An article having a colored surface, said article having a working surface and a cermet composed of alumina and one of chromium and nichrome applied as a coating on said working surface and exhibiting a silver color, said alumina being present in an amount 5 to 50% by weight of the coating, and said coating being such that the alumina therein is not substantially reduced by the metal during application thereof to said working surface.

4,923,765

MAGNETO-OPTICAL RECORDING MEDIUM

Shinji Takayama, Mitaka; Toshio Niihara, Hachioji; Katsuhiro Kaneko, Sayama, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 85,716, Aug. 17, 1987, abandoned, which is a continuation of Ser. No. 786,498, Oct. 11, 1985, abandoned. This application Jan. 6, 1989, Ser. No. 294,941
Claims priority, application Japan, Oct. 11, 1984, 59-211320; Oct. 11, 1984, 59-211321; Oct. 19, 1984, 59-218303; Mar. 20, 1985, 60-54421
Int. Cl.[5] G11B *7/24*
U.S. Cl. 428—694 **6 Claims**



1. A magneto-optical recording medium comprising an amorphous perpendicular magnetized film having an easy axis of magnetization in a direction perpendicular to the film surface, comprising 24–30 atomic % Tb, 7–20 atomic % Co, and the remainder being substantially Fe and having a Curie temperature of 250° C. or less and a magnetic compensation temperature of 50° C. or more.

4,923,766

PROCESS FOR PREPARING MAGNETIC RECORDING

Nohuyuki Hosoi, Kawasaki; Shigeru Hashimoto, Yokohama; Hiroshi Yoshida, Kawasaki; Yukio Watanabe, Machida; Yasuo Mukai, Yokohama, and Michiko Yamamoto, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1989, Ser. No. 329,314
Claims priority, application Japan, Mar. 29, 1988, 63-73365; Mar. 30, 1988, 63-74483
Int. Cl.[5] G11B *5/66*
U.S. Cl. 428—694 **8 Claims**



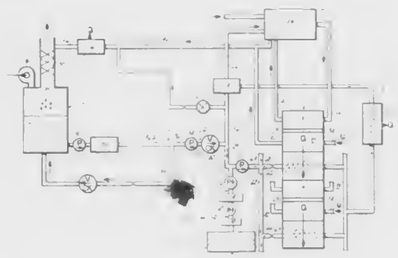
1. A process for preparing a magnetic recording medium by coating a magnetic coating material on a non-magnetic support and then drying the above magnetic coating material, which comprises imparting a magnetic field to said magnetic coating material with a magnet which rotates with the rotational surface at an angle of 5° to 30° relative to the surface of said support prior to drying of said magnetic coating material on said support.

4,923,767

FUEL CELL POWER PLANTS EMPLOYING AN AQUEOUS SOLUTION

Albert P. Grasso, Vernon, and Wolfgang M. Vogel, Glastonbury, both of Conn., assignors to International Fuel Cells, South Windsor, Conn.

Continuation of Ser. No. 746,168, Jun. 18, 1985, abandoned. This application Jun. 24, 1988, Ser. No. 239,020
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Int. Cl.[5] H01M *8/00*
U.S. Cl. 429—12 **15 Claims**



1. A fuel cell powerplant having a flow path for an aqueous solution, a conduit for the aqueous solution through which the flow path extends and a component in heat transfer communication with a portion of the flow path for the aqueous solution for transferring heat to the aqueous solution, the aqueous solution including water and iron based compounds which deposit on the interior of the conduit, the water being capable of reacting with its environment to form iron based compounds, wherein the improvement comprises a fuel cell powerplant which has an aqueous solution consisting essentially of:

water having a pH which is at least 5.5, having an electrical conductivity which is less than or equal to one micromho per centimeter, having a solids content which is less than one part per million (1 ppm), the solid content including an amount of iron based compounds other than ferric hydrous oxide, and the water further including ferric hydrous oxide of a character and of an amount that retards the deposition of said iron based compounds on the interior of the conduit.

4,923,768

FUEL CELL POWER GENERATION SYSTEM

Hideo Kaneko, Yokohama, and Hideo Nishigaki, Ichihara, both of Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Aug. 17, 1989, Ser. No. 395,260
Claims priority, application Japan, Aug. 22, 1988, 63-207897
Int. Cl.[5] H01M *8/06*
U.S. Cl. 429—19 **9 Claims**



1. A fuel cell power generation system comprising:

a fuel cell;

fuel reformer means coupled to said fuel cell for supplying fuel gas;

motor driven compressor means coupled to said fuel cell for supplying pressurized reaction gas to said fuel cell;

and power generator means including turbine means arranged for utilization of energy recovered from by-product fluids resulting from operation of the fuel cell system for secondary power generation;

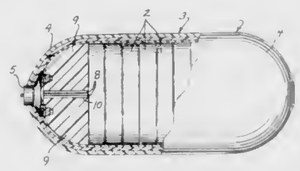
whereby, improved efficiency is achieved by providing a stable supply of pressurized reaction gas from a compressor driven by power from an external power system and by returning power to the external power system from a secondary power generator driven by a turbine using energy recovered by by-products of operation of the fuel cell system.

4,923,769

PRESSURE VESSEL CONSTRUCTION FOR A METAL OXIDE-HYDROGEN BATTERY

Kenneth R. Jones, Oconomowoc, and John F. Sindorf, Pewaukee, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Apr. 7, 1989, Ser. No. 334,362
Int. Cl.[5] H01M *2/06*
U.S. Cl. 429—101 **32 Claims**



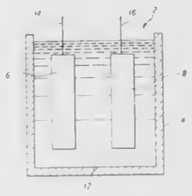
1. A metal oxide-hydrogen battery, comprising an outer vessel, a battery cell disposed within the vessel, said vessel including a flexible inner liner of a material impervious to the passage of hydrogen gas, and an outer layer of fiber reinforced resin disposed in contact with said inner liner, a fitting disposed within an opening in a wall of said vessel and having an opening therethrough, and sealing means for sealing said inner liner to said fitting.

4,923,770

AMORPHOUS METAL ALLOY COMPOSITIONS FOR REVERSIBLE HYDROGEN STORAGE AND ELECTRODES MADE THEREFROM

Robert K. Grasselli, Aurora; Jonathan H. Harris, Shaker Heights; Richard S. Henderson, and Michael A. Tenhover, both of Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 53,772, May 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 717,429, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 717,430, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 915,962, Oct. 6, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 243,109
Int. Cl.[5] H01M *4/36, 6/24*
U.S. Cl. 429—101 **32 Claims**



19. An energy storage device comprising: a working electrode, a counter electrode, electrically isolated from said working electrode; an electrolyte in contact with the working electrode and the counter electrode, and means for collecting electrical current therefrom; the working electrode consisting essentially of an amorphous metal alloy of the formula:

$$A_aM_bM'_c$$

wherein

A is at least one metal selected from the group consisting of Ag, Hg and Pt;

M is at least one metal selected from the group consisting of Pb, Cu, Cr, Mo, W, Ni, Al, Co, Fe, Zn, Ru, Cd and Mn;

M' is at least one of the elements selected from the group consisting of Ca, Mg, Ti, Zr, Hf, V, Nb and Ta; and

wherein

a ranges from about 0.005 to about 0.80;

b ranges from 0.05 to about 0.70; and

c ranges from about 0.08 to about 0.95.

4,923,771

DIAMOND-SHAPED MASK FOR MAKING MULTIPLE EXPOSURE HOLOGRAMS

Lane W. Cosner, Hermosa Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 14, 1988, Ser. No. 168,115
Int. Cl.[5] G03H *1/04; B60Q 1/00*
U.S. Cl. 430—1 **7 Claims**

1. A method of making a multiple exposure hologram so as to minimize crosstalk and provide a wide viewing angle during playback, said method comprising:

(a) illuminating first and second generally rectangular areas of a photosensitive plate from one side thereof at a given angle with an object beam, wherein the object beam is directed towards one surface of the plate through a first opaque mask with a plurality of cut-outs therein, each cut out being generally rectangular in shape and arranged as a

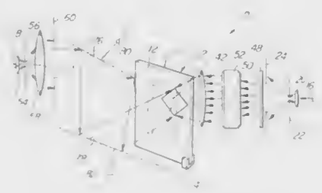
seven-segment display which includes a middle horizontal segment;

(b) illuminating said plate at a first angle with a diamond-shaped reference beam so that the rectangular area illuminated by the object beam lies laterally between opposite apices of the diamond-shaped area illuminated by the reference beam thereby creating a first holographic image in one segment of the plate;

(c) illuminating said plate at a second angle with a second diamond-shaped reference beam so that the second rectangular area illuminated by the object beam lies laterally between opposite apices of the second diamond-shaped area illuminated by the reference beam thereby creating a second holographic image in another segment of the plate;

(d) developing the photosensitive plate to form a hologram with multiple holographic images therein on different segments thereof;

wherein steps (b) and (c) include directing said reference beam towards the opposite surface of the plate through a second opaque mask with a plurality of diamond-shaped cut outs therein, the cut outs being arranged in a compact, non-overlapping pattern with a central cut out for the middle horizontal segment and six substantially similar cut



outs surrounding and contiguous to the central cutout; and

whereby said first and second holographic images can be played back by selectively illuminating the plate with playback beams striking the plate at angles associated with the first and second angles of the reference beam during steps (b) and (c) thereby substantially eliminating crosstalk during playback while providing a relatively wide viewing angle.

5. A method of making a hologram in the form of a seven-segment alphanumeric display, said method comprising:

exposing a photosensitive plate in a multiple number of steps, each step using cut outs in masks for an object and reference beam to selectively illuminate only certain segments of the plate while preventing light from striking other areas of the plate, the object beam striking the plate from one side thereof at the same angle during each exposure step while the reference beam strikes the plate from the other side thereof at different angles during each exposure step, the cut outs in the object beam mask corresponding in shape and arrangement to the display segments, with the cut outs in the reference beam mask being diamond shaped.

4,923,772

HIGH ENERGY LASER MASK AND METHOD OF MAKING SAME

Steven J. Kirch, 344 Beaver Rd., Lagrangeville, N.Y. 12540; John R. Lankard, Archer Rd., R.D. 4, Box 7, Mahopac, N.Y. 10541; John J. Ritsko, 70 High Ridge Rd., Mt. Kisco, N.Y. 10549; Kurt A. Smith, 6 Silver La., Poughkeepsie, N.Y. 12602; James L. Speidell, 1527 Weber Hill Rd., Carmel, N.Y. 10512, and James T. Yeh, Veronica Pl., R.D. 2, Katonah, N.Y. 10536

Continuation of Ser. No. 924,480, Oct. 29, 1986, abandoned. This application Apr. 17, 1989, Ser. No. 341,273

Int. Cl.[5] G03F *1/00*

U.S. Cl. 430—5 8 Claims

1. A method for making a mask, for use with high energy radiation sources, on a substrate comprising the steps of:

applying a lift-off patterned mask to the substrate

applying a plurality of layers of dielectric, each layer comprising a coating of a first material and a coating of a second material overlying said first material, the index of refraction of said second material being higher than the index of refraction of said first material and

removing the lift-off mask and dielectric material deposited thereon.

4,923,773

MULTILAYERED ELECTROPHOTOGRAPHIC PHOTORECEPTOR OF AMORPHOUS SILICON HAVING A SURFACE LAYER OF NITROGENATED AMORPHOUS SILICON

Shigeru Yagi; Masato Ono; Noriyoshi Takahashi; Masayuki Nishikawa; Yuzuru Fukuda, and Kenichi Karakida, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,238

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—57 18 Claims

1. An electrophotographic photoreceptor comprising:

a support;

a charge blocking layer;

a first photoconductive layer composed of at least amorphous silicon;

a second photoconductive layer composed of at least boron-containing amorphous silicon;

surface layer composed of at least nitrogenated amorphous silicon, said surface layer having an interface for contacting said second photoconductive layer, said surface layer including a lower region corresponding to an area not greater than approximately 100 Å away from said interface, said lower region having a ratio of not less than 0.5 parts of nitrogen atoms for one part of silicon atoms, said nitrogen ratio of said lower region and the boron content of said second photoconductive layer corresponding to the relation $B \geqq 10(9N-5.5)$ where B is the boron content in PPM and N is the ratio of nitrogen atoms to silicon atoms.

4,923,774

LAYERED ELECTROPHOTOGRAPHIC RECORDING ELEMENT COMPRISING P-TYPE CHARGE TRANSPORT COMPOUNDS

Mark G. Van der Auweraer; Frans C. De Schrijver; Guy P. Verbeek; Carina Geelen, all of Leuven; David R. Terrell, Lint, and Stefaan K. De Meutter, Zandhoven, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Jun. 16, 1989, Ser. No. 367,125

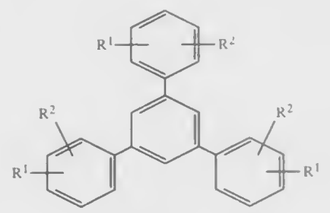
Claims priority, application European Pat. Off., Jun. 28, 1988, 88201332.9

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—59 11 Claims

1. An electrophotographic recording material comprising a conductive support and a photosensitive layer containing a photoconductive compound that has p-type charge transport

capacity and corresponds to the following general formula (I):



(I)

wherein:

R^1 represents a $-NR^3R^4$ group, wherein each of R^3 and R^4 (same or different) represents a C_1–C_{10} alkyl group, a cycloalkyl group, or an aryl group, and

R^2 represents hydrogen, an alkyl group or halogen.

4,923,775

PHOTORECEPTOR OVERCOATED WITH A POLYSILOXANE

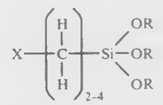
Richard L. Schank, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1988, Ser. No. 288,841

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—59 14 Claims

1. An electrophotographic imaging member comprising a supporting substrate, at least one photoconductive layer and an overcoating layer comprising a polymerized silane, said polymerized silane comprising a reaction product of a hydrolyzed alkoxy silane, said alkoxy silane having the following structual formula:



wherein R is an alkyl group having from 1 to 4 carbon atoms and X is an electron accepting atom or an electron attracting moiety.

4,923,776

TONER PARTICLES FOR ELECTROPHOTOGRAPHIC COPYING AND PROCESSES FOR THEIR PREPARATION

Bertil Hedvall, Sundsvall; Gunnar Mattson, Njurunda; Sten Porrvik, and Göran Sundström, both of Sundsvall, all of Sweden, assignors to Casco Nobel AB, Stockholm, Sweden

PCT No. PCT/SE87/00139, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/07225, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 18, 1987, Ser. No. 265,140

Int. Cl.[5] G03G *9/00, 13/06*

U.S. Cl. 430—111 17 Claims

1. Toner for electrophotographic copying or electrostatic printing, characterized in that it comprises an internally pigmented thermoplastic base or main particle prepared by suspension polymerization and having a mean diameter within the range of from 2 to 25 μm, the surface of the base particle being covered by a fine-grained polymerizate prepared by emulsion- or microsuspension polymerization and having a mean diameter of from 0.05 to 33 percent of the mean diameter of the base particle and whereby from 1 up to 10 percent of the surface of the base particle is covered by the fine-grained polymerizate.

4,923,777

SINGLE-COMPONENT DEVELOPING METHOD

Takashi Imai; Susumu Saito, and Koichi Takashima, all of Kanagawa, Japan, assignors to Fuji Xerox Co, Ltd., Tokyo, Japan

Filed Aug. 25, 1988, Ser. No. 236,424

Int. Cl.[5] G03G *15/08*

U.S. Cl. 430—120 8 Claims

1. A single-component developing method comprising the steps of:

forming a uniform developer layer and applying a charge to said developer by abutting a layer regulating member made of a plate spring and a plate of soft, elastic material mounted on said plate spring against a developer carrier and regulating the developer layer by urging at least one end edge of said plate of soft plastic material against the developer carrier; and developing an electrostatic latent image formed on a photo-sensitive material by moving a portion of said developer carrier with said uniform developer layer formed thereon to a position opposite said photo-sensitive material.

4,923,778

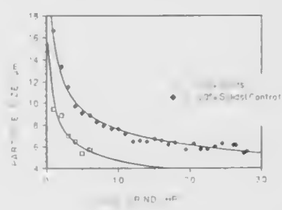
USE OF HIGH PERCENT SOLIDS FOR IMPROVED LIQUID TONER PREPARATION

David E. Blair, Chester Springs; Bradley J. Gollhardt, Kennett Square, and James R. Larson, West Chester, all of Pa., assignors to D X Imaging, Lionville, Pa.

Filed Dec. 23, 1988, Ser. No. 289,179

Int. Cl.[5] G03G *9/12*

U.S. Cl. 430—137 28 Claims



1. A process for the preparation of toner particles for electrostatic liquid developers comprising

A. dispersing at an elevated temperature in a vessel a thermoplastic resin, and a hydrocarbon liquid having a Kauributanol value of less than 120, such that the dispersion contains a total % solids of at least 22% by weight by means of moving particulate media whereby the moving particulate media creates shear and/or impact, while maintaining the temperature in the vessel at a temperature sufficient to plasticize and liquify the resin and below that at which the hydrocarbon liquid boils and the resin decomposes,

B. cooling the dispersion containing a total % solids of at least 22% by weight in said vessel to permit precipitation of the resin out of the dispersant, the particulate media being maintained in continuous movement during and subsequent to cooling whereby toner particles having an average by area particle size of 10 μm or less are formed, and

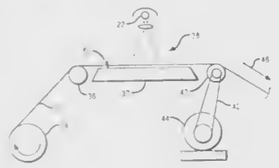
C. separating the dispersion of toner particles from the particulate media.

4,923,779

COLOR-CORRECTING EXPOSURE SYSTEM FOR A PHOTOSENSITIVE MEDIA

Erik K. Nelson, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 9, 1989, Ser. No. 294,449
Int. Cl.[5] G03C *1/72*; G03B *27/70*
U.S. Cl. 430—138 4 Claims



1. A method of exposing a photosensitive material wherein said material comprises a supportive substrate, said substrate being at least partially transmissive and having a layer of microcapsules on one surface thereof, said microcapsules containing a color precursor and a photohardenable or photosoftenable composition, the method comprising the steps of:

supporting said substrate to define a forward surface of said substrate carrying said microcapsules, and to define an opposite, rearward surface of said substrate;

positioning on the side of said substrate corresponding to said rearward surface a reflective surface, said reflective surface having a greater reflectivity of light within a selected wavelength band than outside of said band; and

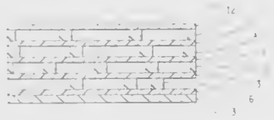
directing an exposure beam onto said forward side of said substrate, whereby at least a portion of said beam passes through said substrate to said reflective surface and is reflected back through said substrate, said greater reflectivity within said band increasing the relative color content of said beam at wavelengths within said band with respect to wavelengths outside of said band, wherein said reflective surface is a dichroic mirror.

4,923,780

PROCESS FOR MAKING A REVERSE IMAGE USING A PIGMENTED PEEL-APART PHOTOSENSITIVE ELEMENT CONTAINING A PHOTOINHIBITOR

Harvey W. Taylor, Jr., Sayre, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 12, 1988, Ser. No. 282,642
Int. Cl.[5] G03C *11/12*, *5/16*
U.S. Cl. 430—257 12 Claims



1. A process for producing a negative or reverse image on a multilayer peel-apart photosensitive element, comprising, in the stated order, the steps of:

(1) providing a multilayer peel-apart photosensitive element, comprising, in order from top to bottom,

(a) a strippable cover sheet comprised of a polymeric film which is transparent to actinic radiation,

(b) a photoadherent layer comprising a photohardenable material with ethylenically unsaturated groups, an o-nitroaromatic photoinhibitor compound, a free-radical generating photoinitiator or photoinitiator system activatable by actinic radiation of wavelength(s) greater than 380 nm, and a colorant, and

(c) an essentially nonphotosensitive organic contiguous layer;

wherein, after exposure to actinic radiation substantially limited to wavelengths greater than about 380 nm, the peel force required to remove the cover sheet (a) with the exposed photoadherent layer (b) thereon from the contiguous layer (c) is at least four times the peel force required to remove the cover sheet (a) from the unexposed photoadherent layer (b),

(2) exposing the multilayer peel-apart element through an image-bearing transparency to actinic radiation substantially limited to wavelengths of about 200 to about 380 nm, whereby a polymerization inhibitor is formed in the areas of the photoadherent layer struck by the radiation;

(3) exposing the element overall to actinic radiation substantially limited to wavelengths greater than 380 nm, whereby the areas of the photoadherent layer unexposed in step (2) are polymerized;

(4) peeling the cover sheet (a) from the photoadherent layer (b), whereby the areas of the photoadherent layer exposed in step (2) remain on the contiguous layer (c) as a negative or reverse image of the transparency used.

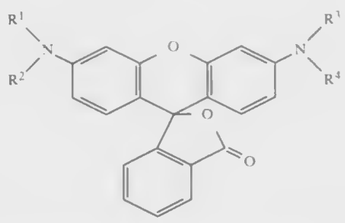
4,923,781

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING 3,6-DIAMINOFLUORAN COMPOUNDS

Sadao Fujikura; Masayuki Iwasaki; Minoru Maeda, and Ken Iwakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 126,377, Nov. 30, 1987, abandoned. This application Oct. 23, 1989, Ser. No. 425,460
Claims priority, application Japan, Nov. 29, 1986, 61-284820
Int. Cl.[5] G03C *1/68*
U.S. Cl. 430—281 5 Claims

1. A photopolymerizable composition consisting essentially of 50–99% by weight of a polyfunctional monomer having a methacrylate or acrylate group, 1–10% by weight of a photopolymerization initiator, 0.5–5% by weight of an organic halogen compound capable of causing a 3,6-diaminofluoran derivative to form a color by the irradiation of light, and 0.5–5% by weight of a 3,6-diaminofluoran derivative having the formula (II):



(II)

wherein R^1, R^2, R^3 and R^4 are the same or different groups and each is phenyl or p-methylphenyl.

4,923,782

PHOTOGRAPHIC STABILIZING BATH CONTAINING HYDROLYZED POLYMALEIC ANHYDRIDE

Paul A. Schwartz, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,729
Int. Cl.[5] G03C *5/39*, *11/00*
U.S. Cl. 430—372 20 Claims

1. An aqueous photographic stabilizing bath for use in the color processing of photographic elements, said bath containing a dye stabilizing agent, an alkanolamine in an amount sufficient to inhibit sulfurization of said stabilizing bath resulting from carry-in of a thiosulfate fixing agent, and a hydrolyzed polymaleic anhydride or water soluble salt thereof in an amount sufficient to prevent the precipitation of calcium salts.

4,923,783

SILVER HALIDE PHOTOGRAPHIC MATERIALS AND METHOD OF PROCESSING THE SAME

Hidetoshi Kobayashi, and Hideaki Naruse, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1988, Ser. No. 257,893
Claims priority, application Japan, Oct. 14, 1987, 62-259112
Int. Cl.[5] G03C *7/16*, *7/32*
U.S. Cl. 430—377 14 Claims

1. A method for processing a silver halide photographic material containing a color coupler and comprising a support having thereon at least one hydrophilic colloid layer containing at least one high boiling point organic solvent and at least one substantially water-insoluble photographically useful reagent both dispersed therein, wherein at least one of said high boiling point organic solvents is a compound represented by formula (I):

$$(ArCOO)_n—L \quad (I)$$

wherein Ar represents an aryl group having from 6 to 24 carbon atoms; L represents a 2- to 6-valent alkylene group having from 2 to 24 carbon atoms which may contain one or more ether bonds; and n represents an integer of from 2 to 6, wherein said method comprises imagewise exposing said material and then developing said material with a color developer which is an aqueous alkaline solution consisting essentially of an aromatic primary amine color developing agent and which is substantially free of benzyl alcohol.

4,923,784

PHOTOGRAPHIC ELEMENTS CONTAINING A BLEACH ACCELERATOR PRECURSOR

John W. Harder, Rochester, and Stephen P. Singer, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 124,723, Nov. 24, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 270,926
Int. Cl.[5] G03C *5/44*, *5/24*, *5/38*, *7/00*
U.S. Cl. 430—430 14 Claims

1. A color photographic element comprising a support, a silver halide emulsion layer and, as a bleach accelerator precursor, a silver metal salt of an acid-containing non-zwitterionic organic thiol, the precursor having a solubility of greater than or equal to 1 g/l silver ion in both (a) a color developing solution comprising a pH of 10, a sulfite concentration of 4.25 g/l and a bromide concentration of 1.3 g/l, and (b) a bleach solution comprising a pH of 6 and a bromide concentration of 150 g/l, when held at 23° C. for five minutes.

4,923,785

BLEACHING BATH CONCENTRATE

Karl Frank, Leverkusen, Fed. Rep. of Germany, assignor to AGFA Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,304
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723307
Int. Cl.[5] G03C *5/44*
U.S. Cl. 430—430 5 Claims

1. Aqueous, one-part bleaching bath concentrate for producing a bleaching bath for the processing of color photographic materials comprising an ammonium iron (III)-complex salt concentration of at least 0.4 mol/l, an ammonium bromide concentration of from 1.5 to 3 mol/l, an ammonium nitrate concentration of from 0.25 to 1 mol/l and optionally an acetic acid concentration of up to 1 mol/l and a pH of <3.

4,923,786

GRANULATED COLOR PHOTOGRAPHIC DEVELOPER AND ITS PREPARATION

Peter Kühnert, Leverkusen, and Peter Feyen, Mettmann, both of Fed. Rep. of Germany, assignors to Afga-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 18, 1989, Ser. No. 395,598
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3830023
Int. Cl.[5] G03C *7/30*
U.S. Cl. 430—450 1 Claim

1. Process for the production of a granulated preparation of the solid constituents of a colour photographic developer, characterised in that the anti-oxidizing agent, the developer substance and the alkali donor of a colour photographic developer are ground down separately to a particle size of < 10 μm and then subjected to a process of powder agglomeration, optionally with the addition of a granulating liquid and a binder, and dried in a vacuum, and the individual granulates are mixed together and packaged in a damp-proof package.

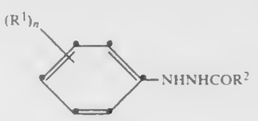
4,923,787

PHOTOGRAPHIC ELEMENT CONTAINING SCAVENGER FOR OXIDIZED DEVELOPING AGENT

John W. Harder, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 184,526, Apr. 21, 1988, abandoned. This application May 12, 1989, Ser. No. 351,515
Int. Cl.[5] G03C *1/34*
U.S. Cl. 430—489 17 Claims

1. A color photographic element comprising a support, at least one silver halide emulsion layer and a scavenger compound for oxidized developing agent wherein the scavenger compound is a hydrazine having the structural formula:



wherein:

R^1 represents an electron donating group;

R^2 represents hydrogen, alkyl, alkoxy, aryl, aryloxy, aralkyl or amino of the formula $—NHR^3$, where R^3 is phenyl or benzyl; with the proviso that at least one of the substituents R^1 and R^2 (a) represents a ballast group of sufficient size as to render the hydrazide compound non-diffusible in the photographic element prior to development in alkaline processing solution and (b) comprises a polar group having a π constant which is more negative than -1.0, and n is 0, 1 or 2.

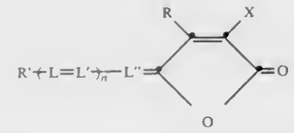
4,923,788

FILTER DYES FOR PHOTOGRAPHIC ELEMENTS

Leslie Shuttleworth, Webster; Paul B. Merkel, and Glenn M. Brown, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 9, 1989, Ser. No. 308,236
Int. Cl.[5] G03C *1/84*, *7/20*
U.S. Cl. 430—507 18 Claims

1. A photographic element comprising a support having thereon a radiation sensitive silver halide emulsion layer and a layer, which is the same as or different from said silver halide layer, comprising a hydrophilic vehicle and a filter dye of the formula:



wherein
R is substituted or unsubstituted alkyl or aryl,
X is an electron withdrawing group,
R' is substituted or unsubstituted aryl or a substituted or unsubstituted aromatic heterocyclic nucleus,
L, L', and L'' are each independently a substituted or unsubstituted methine group, and
n is 0 or a positive integer of from 1 to 6.

4,923,789

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Morio Yagihara; Tetsuori Matushita; Toshinao Ukai, and Kazunobu Katoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 12, 1988, Ser. No. 193,443
Claims priority, application Japan, May 13, 1987, 62-116180
Int. Cl.[5] G03C *1/06, 1/84*
U.S. Cl. 430—517 **8 Claims**

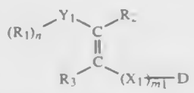
1. A silver halide photographic material comprising a support having thereon at least one silver halide light-sensitive emulsion layer, wherein at least one compound represented by the formula (I) is present in said silver halide emulsion layer or at least one other hydrophilic colloid layer of said material:

A—B (I)

wherein A represents a blocking group which can release B during processing in a processing bath having a pH of 5.0 to 12.5, wherein B is a photographic dye bonded to A by means of a hetero atom and B is able to diffuse within a hydrophilic colloid layer, and wherein the compound of formula (I) is a compound represented by formula (II):

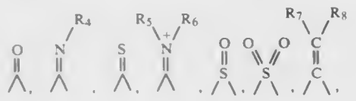
$A(X_1)_{m_1}D$ (II)

wherein D, which is released during processing in a processing bath having a pH of 5.0 to 12.5, represents a photographic dye which is bonded to X_1 by means of a hetero atom of the dye D and D is able to diffuse within a hydrophilic colloid layer, wherein X_1 represents a divalent linking group which is bonded to A by means of a hetero atom of the divalent linking group X_1, and m_1 represents 0 or 1, and wherein the compound of formula (II) is a compound represented by formula (III) or (IV):

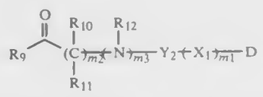


(III)

wherein R_1, R_2 and R_3 each represents a hydrogen atom or a substituent and R_1 and R_2 and R_3, may be bonded together to form a carbocyclic or heterocyclic ring, Y_1 represents



a cyano group or a nitro group (wherein R_4, R_5, R_6, R_7 and R_8 each represents a hydrogen atom or a substituent), n represents 0 or 1, and X_1, D and m_1 have the same meaning as in formula (II);



(IV)

wherein R_9 is a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, a cycloalkyl group or a heterocyclic group, R_{10}, R_{11} and R_{12} each represents a hydrogen atom or a substituent, Y_2 represents a carbonyl group or a sulfonyl group, m_2 represents an integer of 1 to 4, m_3 is 0 or 1, and X_1, D and m_1 have the same meaning as in the formula (II), provided that when m_2 is 2, 3 or 4, the carbon atom onto which R_{10} and R_{11} is substituted can form a cycloalkyl group, an aromatic ring or a heterocyclic ring.

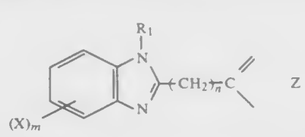
4,923,790

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hirohiko Kato; Keiji Mihayashi, and Kazubiro Aikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 22, 1988, Ser. No. 247,565
Claims priority, application Japan, Sep. 22, 1987, 62-23809
Int. Cl.[5] G03C *7/26, 1/37*
U.S. Cl. 430—523 **8 Claims**

1. A silver halide photographic material comprising a support having thereof at least one light-sensitive silver halide emulsion layer, wherein said material contains the combination of (i) at least one compound represented by formula (I) added to a protective layer and (ii) at least one compound represented by formulae (II) and/or (III) added to a protective layer, an interlayer, a filter layer or an antihalation layer



(I)

wherein R_1 represents hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted aralkyl group; X represents a halogen atom, a nitro group, a hydroxyl group, a cyano group, a lower alkyl group, a lower alkoxy group, $—COR_2$,

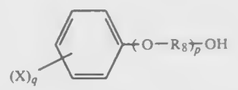


or $—SO_3M$; R_2 represents hydrogen, —OM, a lower alkyl group, an aryl group, an aralkyl group, a lower alkoxy group, an aryloxy group, an aralkyloxy group or



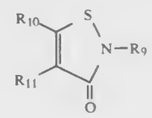
R_3 and R_4, which may be the same or different, each represents hydrogen, a lower alkyl group, an aryl group, an aralkyl group, $—COR_7$ or $—SO_2R_7$; R_5 and R_6, which may be the same or different, each represents hydrogen, a lower alkyl group, an aryl group or an aralkyl group; R_7 represents a lower alkyl group, an aryl group or an aralkyl group; M represents hydrogen, an alkali metal atom or a monovalent cation; m represents 0 or an integer of 1 to 4, n represents 0 or an integer

of 1 to 4, and Z represents an atomic group necessary for forming a thiazolyl ring



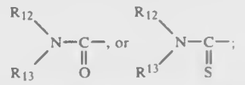
(II)

wherein R_8 represents a lower alkylene group, X is the same as defined for X in formula (I); p represents 0 or 1, and q represents 0 or an integer of 1 to 5; and



(III)

wherein R_9 represents hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a heterocyclic group,



R_{10} and R_{11} each represents hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a cyano group, a heterocyclic group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a substituted or unsubstituted alkylsulfonyloxy group or a substituted or unsubstituted alkylsulfonyl group; R_{10} and R_{11} may be linked to form an aromatic ring; and R_{12} and R_{13}, which may be the same or different, each represents hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted aralkyl group.

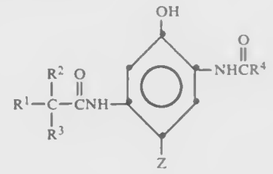
4,923,791

PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A CYAN DYE-FORMING COUPLER

Paul B. Merkel, and David Hoke, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1989, Ser. No. 335,167
Int. Cl.[5] G03C *1/08*
U.S. Cl. 430—553 **11 Claims**

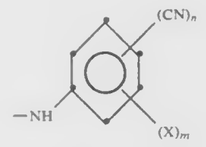
1. A photographic recording material comprising a support and a photosensitive silver halide emulsion which has associated therewith a cyan dye-forming coupler compound having the structural formula:



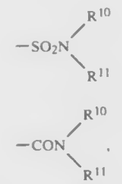
wherein:
R^1 is an unsubstituted or a substituted, straight or branched chain alkyl group having from 1 to about 20 carbon atoms, an unsubstituted or a substituted cycloalkyl group having from 3 to about 8 carbon atoms in the ring or an unsubstituted or a substituted aryl group;
R^2 is hydrogen or as defined for R^1;
R^3 is a ballast group comprising one of the following:
(a) a sulfoxide containing group having the formula $R^5SO—$;
(b) an amide containing group having the formula $R^6R^7NCO—$;
(c) an ester containing group having the formula $R^5OCO—$;
(d) a ketone containing group having the formula $R^5CO—$; or
(e) a phosphine oxide containing group having the formula



R^4 represents an unsubstituted linear or branched aliphatic group or a linear or branched aliphatic group substituted with one or more substituents selected from halogen, alkoxy. alkylthio, arylthio, alkylsulfonyl, arylsulfonyl, sulfonamido, acylamino, alkyloxycarbonyl, aryloxycarbonyl, carbamoyl, alkylcarbonylocy, arylcarbonyloxy, carboxyl and hydroxyl; or R^4 represents



where X is $—COOR^{10}$, $—COR^{10}$, $—SO_2OR^{10}$, $—SO_2R^{10}$,



$—NO_2$, $—CF_3$, hydrogen, halogen, hydroxy or a monovalent orgainc group;
R^5 is alkyl or aryl which may be substituted;
R^6 and R^7, which may be the same or different, represent hydrogen or are as defined for R^5;
R^8 and R^9, which may be the same or different, represent alkyl, alkoxy, aryl or aryloxy which may be substituted;
R^{10} is an alkyl group having up to 16 carbon atoms or an aryl group having from 6 to 12 carbon atoms;
R^{11} is hydrogen, or as defined for R^{10};
n is 0, 1 or 2;
m is 3 to 5; and
Z is hydrogen or a coupling off group;
with the proviso that at least one of R^1, R^2, R^3 or Z is of such size and configuration as to render the coupler compound substantially nondiffusible in the layer of a photographic recording material in which it is coated.

4,923,792

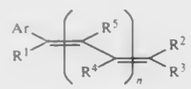
COLOR PHOTOTHERMOGRAPHIC ELEMENTS

Duncan M. A. Grieve, Walden; Stephen S. C. Poon; Tran V. Thien, both of Harlow, all of United Kingdom; Kumars Sakizadeh, Woodbury, and David C. Weigel, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 200,665, May 31, 1988, Pat. No. 4,883,747. This application Jun. 20, 1989, Ser. No. 368,566
Int. Cl.[5] G03C *1/08*
U.S. Cl. 430—559 12 Claims

1. A photothermographic element comprising a support bearing a photothermographic medium, the medium comprising:

(A) a coating comprising a light sensitive silver halide in reactive association with a silver salt of an organic acid and a colour generating reducing agent which is leuco compound which is oxidizable by silver ions into a coloured dye of the general formula:



in which:

N =0, 1 or 2,

R^1 represents H, CN, lower alkyl of 1 to 5 carbon atoms, aryl or $COOR^6$ in which R^6 is lower alkyl of 1 to 5 carbon atoms or aryl,

R^2 and R^3 independently represent CN, NO_2, $COOR^6$, SO_2R^6, and $CONHR^6$ in which R^6 is as defined above, or R^2 and R^3 together represent the necessary atoms to form a 5- or 6-membered carbocyclic or heterocyclic ring having ring atoms selected from C, N, O and S atoms, which carbocyclic or heterocyclic rings possess at least one conjugated electron withdrawing substituent,

R^4 and R^5 independently represent H, CN or lower alkyl of 1 to 5 carbon atoms or together represent the necessary atoms to complete a 5- or 6-membered carbocyclic ring, and

Ar represents:

(a) a thienyl group which may be substituted with one or more lower alkyl groups of 1 to 5 carbon atoms,

(b) a furyl group which may be substituted with one more lower alkyl groups of 1 to 5 carbon atoms or

(c) a phenyl group which may be substituted with one or more groups selected from halogen, hydroxy, lower alkyl of 1 to 5 carbon atoms, lower alkoxy of 1 to 5 carbon atoms, NR^7R^8 in which R^7 and R^8 are independently selected from H, lower alkyl group of 1 to 5 carbon atoms which may possess substituents selected from CN, OH, halogen and phenyl group which may be substituted with substituents selected from OH, halogen, lower alkyl of 1 to 5 carbon atoms or lower alkoxy of 1 to 5 carbon atoms or R^7 and R^8 together represent the necessary atoms to complete a morpholino group, or when Ar is a phenyl group, that phenyl group may be part of a larger ring structure comprising two or more ring may be aromatic or heterocyclic containing up to 20 ring atoms selected from C, N, O and S; and

(B) a topcoat comprising a polyvinyl alcohol resin in contact with said coating.

4,923,793

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Yoshihiko Shibahara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 22, 1988, Ser. No. 274,546
Claims priority, application Japan, Nov. 26, 1987, 62-298569
Int. Cl.[5] G03C *1/06*
U.S. Cl. 430—567 6 Claims

1. A silver halide photographic material, comprising:

at least one negative type silver handle emulsion layer coated onto a support;

at least one compound represented by general formula (1); said compound being included in at least said one emulsion layer; and

sensitivity specks present in at least one kind of silver halide grains which are included in the said emulsion layer wherein the maximum value of said sensitivity speck distribution in the depth direction is present within the grains at a depth of at least 2 nm, but less than 50 nm, from the surface of the grains, with the number of said sensitivity specks on the surface of the grains being at least 1/10th, but not more than 5/10ths of the maximum value of sensitivity speck distribution in the depth direction,

(1)

wherein, Z_2 represents a heterocyclic ring having at least one substituent group selected from the group consisting of $—SO_3M$, $—COOR_2$, —OH and $—NHR_3$, M is selected from the group consisting of a hydrogen atom, an alkali metal and an $—NH_4$ group, R_2 is selected from the group consisting of a hydrogen atom, an alkali metal and an alkyl group having from 1 to 6 carbon atoms, R_3 is selected from the group consisting of a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms, $—COR_4$, $—COOR_4$ and $—SO_2R_4$, and R_4 is selected from the group consisting of a hydrogen atom, an aliphatic group which may be substituted and an aromatic group which may be substituted.

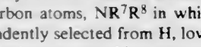
4,923,794

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Hirotomo Sasaki; Tadao Shishido, and Hiroyuki Mifune, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1989, Ser. No. 378,100
Claims priority, application Japan, Jul. 12, 1988, 63-173474
Int. Cl.[5] G03C *1/08*
U.S. Cl. 430—603 17 Claims

1. A silver halide photographic material comprising at least one silver halide emulsion which contains at least one telluroether compound represented by the formula (I) indicated below:



(I)

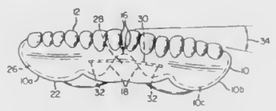
where L_1 and L_2 each independently represents a substituted or unsubstituted aliphatic group, and at least one of L_1 or L_2 represents an aliphatic group which is substituted with at least one hydroxyl, group, mercapto group, amino group, ether group, selenoether group, thioether group, ammonium group, sulfonyl group, carbamoyl group, carbonamido group, sulfamoyl group, sulfonamido group, acyloxy group, sulfonyloxy group, ureido group, thioureido group, thioamido group, oxysulfonyl group, oxycarbonylamino group, sulfonic acid group or salt thereof, phosphoric acid or salt thereof, phosphoric ester group, sulfinic acid group or a salt thereof, phosphino group or heterocyclic group.

4,923,795

FLEXIBLE LOWER ARTIFICIAL DENTURE

Scott B. Franklin, 919 SW. Taylor, #512, Portland, Oreg. 97205

Filed Apr. 25, 1988, Ser. No. 185,484
Int. Cl.[5] A61C *13/02*
U.S. Cl. 433—168.1 8 Claims



1. A lower artificial denture comprising:

a pair of cooperating rigid denture base sections having upper and lower surfaces,

said sections each having a curved front portion and a side extension with defining side surfaces,

said sections cooperating to form a U-shape to correspond to the shape of the ridge of a person's lower jaw and having (front) facing edges disposed closely adjacent each other throughout their length in disconnected relation,

the lower surface of said sections being contoured to fit over the lower gums of a person,

and a lower layer of resilient material bonded integrally to said sections including the area across said disconnected front edges of said sections,

said layer of resilient material connecting said sections together into an integral unit at the front and also providing a bottom seamless surface across said disconnected front edges,

said resilient layer across said seamless surface comprising the sole connection between said sections and allowing said sections to adjust relative to each other to compensate for distortion of the gums during chewing.

4,923,796

METHOD FOR THE QUANTITATIVE ENZYMATIC DETERMINATION OF ADP

Ulfert Deneke, Peissenberg; Gerhard Michal, and Hans-Otto Beutler, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 614,372, May 24, 1984, abandoned, which is a continuation of Ser. No. 59,366, Jul. 20, 1979, abandoned. This application Jan. 17, 1989, Ser. No. 298,768
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1978, 2834704
Int. Cl.[5] C12Q *1/48*
U.S. Cl. 435—15 5 Claims

1. Method for quantitative enzymatic determination of adenosine diphosphate (ADP) formed from ATP in the presence of adenosine triphosphate (ATP) comprising contacting a sample containing ADP with a kinase and a phosphorylated substrate to form ATP from ADP and a dephosphorylated substrate, reacting said dephosphorylated substrate with NAD(P) in the presence of a dehydrogenase to form NAD(P)H, and measuring NAD(P)H as a measure of ADP originally present.

4,923,797

STABILIZATION OF LEUKOCYTES

Bernard M. Babior, San Diego, Calif., assignor to President & Fellows of Harvard College, Cambridge, Mass.

Filed Nov. 29, 1988, Ser. No. 277,256
Int. Cl.[5] A01N *1/02*; A61K *35/14*
U.S. Cl. 435—2 7 Claims

1. The method of stabilizing for storage leukocytes obtained from human blood which comprises mixing a suspension of said leukocytes in plasma with modified fluid gelatin and with a non-toxic buffer.

4,923,798

SALIVA TEST FOR FELINE LEUKEMIA VIRUS

Eric D. LeMoine, Poway; Eric S. Bean, and Morton A. Vodian, both of Escondido, all of Calif., assignors to Synbiotics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 844,098, Mar. 26, 1986, Pat. No. 4,853,325. This application Mar. 17, 1988, Ser. No. 169,291
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] G01N *33/569, 33/577*
U.S. Cl. 435—5 17 Claims



1. A method of determining whether a cat has persistent, FeLV-induced viremia comprising:

combining a saliva sample from said cat with anti-p27 antibodies; and

detecting the presence of antibody-p27 complex formation as indicative of persistent, FeLV-induced viremia.

12. A probe comprising:

an elongated handle having a length sufficient to enable insertion of said probe into a cat's posterior oral cavity, and

a spherically-shaped immunochemically-sensitive member connected to said handle comprising immobilized anti-p27 antibodies; and

a control submember integrally connected to said immunochemically-sensitive member having a nipple shape extending from the immunochemically-sensitive member axially with said handle, said control submember comprising an anti-Fc antibody specific for the species of said anti-p27 antibodies.

4,923,799

T CELL SPECIFIC CDNA CLONE

Tak W. Mak, Toronto, Canada, assignor to The Ontario Cancer Institute, Toronto, Canada

Division of Ser. No. 577,526, Feb. 6, 1984, Pat. No. 4,713,332. This application Nov. 9, 1987, Ser. No. 100,286
Int. Cl.[5] C12Q *1/68, 1/00*; C07K *13/00*; C12N *15/00*
U.S. Cl. 435—6 20 Claims



1. A method of determining whether an unknown cell is a T cell which comprises recovering nucleic acid from the unknown cell, contacting the unknown nucleic acid with nucleic acid having a sequence comprising at least about 936 nucleotides and encoding a polypeptide which is at least part of the beta chain of a human T cell antigen receptor, which sequence is labelled with a detectable marker, said contacting being under suitable conditions permitting hybridization, and detect-

ing whether hybridization of the unknown nucleic acid with said sequence has occurred.

4,923,800

INSTRUMENTLESS QUANTITATIVE ANALYSIS SYSTEM

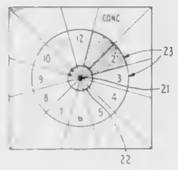
Uy-Vu Ly, P.O. Box 32564, San Jose, Calif. 95152

Continuation of Ser. No. 693,739, Jan. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 569,891, Jan. 10, 1984, Pat. No. 4,654,310. This application Jul. 15, 1987, Ser. No. 75,244

The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.

Int. Cl.[5] G01N *21/77, 21/78, 33/48, 33/52*

U.S. Cl. 435—10 28 Claims



1. A method for determining the concentration of an analyte in a sample comprising:

dividing a sample into a plurality of individual testing portions:

combining each one of said plurality of testing portions with first reaction and second reaction components,

said first reaction components including at least a first catalyst capable of reacting with said analyte in a first reaction,

said second reaction components including at least a second catalyst capable of reacting with said analyte in a second reaction in competition with said first catalyst;

wherein the ratio of the concentrations of said first catalyst and second catalyst are different in each one of said individual testing portions, and wherein the ratio varies systematically over the plurality of testing portions;

wherein either said first reaction or second reaction is an indicator reaction which produces a detectable result, and the other of said first and second reaction is a nonindicator reaction which does not produce a detectable result,

whereby an array of testing portions having different results is obtained, such that in testing portions where the ratio of indicator reaction catalyst to nonindicator reaction catalyst is high, the result of the indicator reaction is detectable, and in test portions wherein said ratio is low, the result of said indicator reaction is not detectable,

whereby the concentration of analyte in said sample is determinable by observing the point at which changeover from detectable to nondetectable indicator reaction occurs.

4,923,801

COMPOSITIONS AND METHODS FOR THE ENRICHMENT AND ISOLATION OF *CAMPYLOBACTER PYLORI* AND RELATED ORGANISMS FROM BIOLOGICAL SPECIMENS AND THE ENVIRONMENT

Barry J. Marshall, and Richard L. Guerrant, both of Charlottesville, Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Apr. 13, 1987, Ser. No. 37,938

Int. Cl.[5] C12Q *1/58, 1/04, 1/34, 1/24*

U.S. Cl. 435—12 12 Claims

1. A method of enrichment and isolation of *C. pylori* from a specimen contaminated with a plurality of non-urease and urease producing organisms comprising the steps of:

(a) homogenizing a specimen contaminated with a plurality of organisms in water;

(b) introducing the contaminated specimen into a solution of urea which has been acidified to a pH of less than 2.5, wherein some of the urease producing and most of the non-urease producing organisms are killed by the acidic medium and remaining urease producing organisms are protected from acid attack by creating a protective ammonia layer by breaking down the urea; and

(c) plating the remaining urease producing organisms onto a medium which contains antibiotics inhibitory to most of the remaining urease producing organisms, but not inhibitory to the *C. pylori;* and

(d) detecting the presence of colonies of *C. pylori.*

4,923,802

PEPTIDE SUBSTRATES FOR THE DETECTION, CHARACTERIZATION AND PURIFICATION OF PROTEIN KINASE C

Byron M. Gallis, Seattle, Wash., assignor to Immunex Corporation, Seattle, Wash.

Filed Jun. 13, 1985, Ser. No. 744,498

Int. Cl.[5] C12Q *1/48*

U.S. Cl. 435—15 19 Claims

1. A method for assaying for the presence of protein kinase C, comprising:

(a) reacting activated protein kinase C in the presence of ATP with a peptide substrate of the following formula:

$$H_2N—A_n—X—A_n—COOH$$

wherein:

each A, which may be the same or different, represents a basic amino acid residue;

each n is independently selected from the integers 1 to 5; and,

X_1 represents a serine (Ser) or threonine (Thr) residue; and,

(b) measuring the extent to which the peptide substrate is phosphorylated, and

(c) determining the presence of protein kinase C based on the degree of phosphorylation of the peptide substrate.

2. A method according to claim 1, wherein A is selected from the group consisting of Arg and Lys.

4,923,803

METHOD FOR DETERMINING GALACTITOL

Ken Izumori, Kagawa, and Shuzo Sakai, Okayama, both of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Continuation of Ser. No. 873,366, Jun. 12, 1986, abandoned. This application Aug. 8, 1988, Ser. No. 230,010

Claims priority, application Japan, Jul. 3, 1985, 60-144585

Int. Cl.[5] C12Q *1/32*

U.S. Cl. 435—26 8 Claims

1. A clinical assay method for indicating the probability of human developing a cataract or for indicating the possible presence of human cataract, comprising:

providing body fluid from said human containing galactitol in an amount up to about 220 micrograms/ml;

incubating the body fluid together with a bacterium capable of converting the galactitol in the body fluid into D-tagatose; and

determining the amount of the resultant D-tagatose;

whereby the determination of a galactitol level over a predetermined amount is indicative of the probability of developing a human cataract or is indicative of the possible presence of a human cataract.

4,923,804

ESCHERICHIA COLI (*E.COLI*) TEST METHOD

Arthur N. Ley; Neil E. Rickey, and Michael J. Taylor, all of Kingston, Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Apr. 17, 1987, Ser. No. 39,435

Claims priority, application Canada, Mar. 17, 1987, 532191

Int. Cl.[5] C12Q *1/10*

U.S. Cl. 435—38 5 Claims

1. A method of determining the presence of *E. coli,* having glucuronidase activity, contained in a liquid sample, said method comprising:

(a) passing a predetermined amount of said sample through a membrane filter arranged to retain said *E. coli* thereon while passing said liquid sample therethrough;

(b) contacting said filter with a chromogenic reagent comprising indoxyl-β-D-Glucuronide or a salt thereof contained in an *E. coli* nutrient medium; and

(c) incubating said filter whereby the chromogenic reagent is subjected to said glucuronidase activity so as to produce clearly defined indigo blue coloring representative of individual colonies of any *E. coli* cells present on said membrane filter.

4,923,805

FSH

Vemuri B. Reddy, Framingham; Nancy Hsiung, Wellesley; Anton K. Beck, Chestnut Hill, and Edward G. Berstine, Boston, all of Mass., assignors to Integrated Genetics, Inc., Framingham, Mass.

Continuation-in-part of Ser. No. 548,228, Nov. 2, 1983. This application Jan. 30, 1985, Ser. No. 696,647

Int. Cl.[5] C12P *21/00, 21/02;* C12N *15/00, 5/00*

U.S. Cl. 435—69.4 2 Claims

1. A method for producing biologically active, heterodimeric human FSH comprising culturing mammalian cells capable of glycosylating proteins, said cells comprising an expression vector encoding the alpha and beta subunits of said FSH.

4,923,806

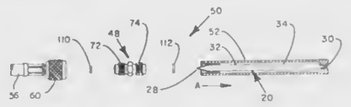
METHOD AND APPARATUS FOR REFRIGERANT TESTING IN A CLOSED SYSTEM

Harry F. Klodowski, E. Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 746,491, Jun. 14, 1985, abandoned. This application Mar. 27, 1987, Ser. No. 32,106

Int. Cl.[5] G01N *31/22, 33/18*

U.S. Cl. 436—39 11 Claims



1. A method of determining the presence of and the amount of contaminants present in refrigerants subject to contain oil, moisture and acids comprising the steps of:

withdrawing a limited amount of refrigerant from a closed refrigeration or air conditioning system;

reducing the pressure of the withdrawn refrigerant;

serially taking the steps of:

(a) removing any oil present in the withdrawn refrigerant;

(b) removing any water present in the withdrawn refrigerant;

(c) determining the amount of water present in the withdrawn refrigerant; and

(d) determining the amount of acid present in the withdrawn refrigerant.

4,923,807

ARG-SERPIN HUMAN PLASMINOGEN ACTIVATOR INHIBITOR DESIGNATED PAI-2

Andrew C. Webb, Wellesley, and Philip E. Auron, Framingham, both of Mass., assignors to New England Medical Center Hospitals Inc., Boston; Tufts College, Boston; Wellesley College, Wellesley and MIT, Cambridge, all of, Mass.

Continuation-in-part of Ser. No. 4,319, Jan. 8, 1987, Pat. No. 4,766,069, which is a continuation of Ser. No. 611,669, May 18, 1984, abandoned. This application Feb. 6, 1987, Ser. No. 11,580

Int. Cl.[5] C12P *21/00, 21/02;* C12N *5/00, 1/20*

U.S. Cl. 435—69.2 13 Claims



1. Recombinant DNA coding for human precursor PAI-2 comprising the following amino acid sequence:

1	M E D L C V A N T L F A L N L F	16
17	K H L A K A S P T Q N L F L S P W S I S	36
37	S T M A M V Y M G S R G S T E D Q M A K	56
57	V L Q F N E V G A N A V T P M T P E N F	76
77	T S C G F M Q Q I Q K G S Y P D A I L Q	96
97	A Q A A D K I H S S F R S L S S A I N A	116
117	S T G N Y L L E S V N K L F G E K S A S	136
137	F R E E Y I R L C Q K Y Y S S E P Q A V	156
157	D F L E C A E E A R K K I N S W V K T Q	176
177	T K G K I P N L L P E G S V D G D T R M	196
197	V L V N A V Y F K G K W K T P F E K K L	216
217	N G L Y P F R V N S A Q R T P V Q M M Y	236
237	L R E K L N I G Y I E D L K A Q I L E L	256
257	P Y A G D V S M F L L L P D E I A D V S	276
277	T G L E L L E S E I T Y D K L N K W T S	296
297	K D K M A E D E V E V Y I P Q F K L E E	316
317	H Y E L R S I L R S M G M E D A F N K G	336
337	R A N F S G M S E R N D L F L S E V F H	356
357	Q A M V D V N E E G T E A A A G T G G V	376
377	M T G R T G H G G P Q F V A D H P F L F	396
397	L I M H K I T N C I L F F G R F S S P	415

4,923,808

METHOD FOR IDENTIFYING MUTANTS SECRETING HIGH LEVELS OF HETEROLOGOUS PROTEINS

Mark D. Matteucci, San Francisco, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 711,127, Mar. 12, 1985, abandoned. This application Jul. 18, 1988, Ser. No. 220,901

Int. Cl.[5] C12N *9/00*

U.S. Cl. 435—69.8 11 Claims

1. A method for producing a secreted protein comprising (a) providing a replicable expression vector comprising nucleic acid that encodes a marker protein and nucleic acid that encodes a preprotein gene capable of expression and secretion of the preprotein, said marker protein undergoing a detectable change in activity upon secretion of said marker protein from a host cell, and said marker protein being fused to the C-terminus of the preprotein and being capable of expression and secretion under common control; (b) preparing a plurality of said vectors each containing a mutation in the preprotein gene; (c) transforming a host cell with each vector of step (b) wherein the mutated preprotein genes of step (b) are heterologous to said host cell; (d) assaying the transformed host cells

for a change in activity which occurs in the marker protein upon secretion of said marker protein; (e) selecting the transformed host cell capable of secreting the most fused protein product; (f) introducing the mutation identified in step (e) into a vector comprising the selected, heterologous preprotein gene unfused to the marker protein nucleic acid; (g) transforming a host cell therewith; and (h) recovering said secreted protein from the host cell of step (g) in culture.

4,923,809

POLYSACCHARIDE AND PROCESS FOR PREPARING THE SAME

Kazuya Otsuji, Utsunomiya; Yasuki Honda, Ichikai; Kikuhiko Okamoto, Koshigaya; Hakaru Inaoka, Utsunomiya; Satoshi Takano, Utsunomiya; Yukio Sugimura, Utsunomiya; Noriko Okamura, Tokyo; Kazumi Saito, Tokyo; Yoshinori Takema, Tokyo, and Toshiyuki Suzuki, Ichikawa, all of Japan, assignors to KAO Corporation, Tokyo, Japan

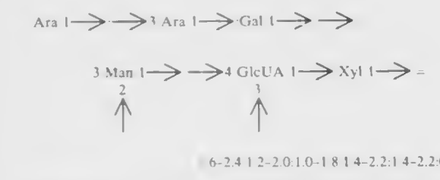
Filed Mar. 9, 1988, Ser. No. 165,912

Claims priority, application Japan, Mar. 9, 1987, 62-53768; Feb. 2, 1988, 63-22621

Int. Cl.[5] C12P *19/04;* C07H *1/00;* C07G *17/001, 17/00*

U.S. Cl. 435—101 9 Claims

1. An acidic heteropolysaccharide which comprises as its structural units arabinose, mannose, galactose, glucuronic acid, and xylose, with the following combination sequence and in the following ratio:



6-2.4 1.2-2.0:1.0-1.8 1.4-2.2:1.4-2.2:0.1-0.3;

and which has a molecular weight of 1.0×10^4–2.0×10^7.

4,923,810

RESOLUTION OF GLYCIDYL ESTERS TO HIGH ENANTIOMERIC EXCESS

Alan E. Walts, Brookline, Mass., and Ellen M. Fox, Cranston, R.I., assignors to Genzyme Corporation, Boston, Mass.

Filed Aug. 24, 1988, Ser. No. 236,616

Int. Cl.[5] C12P *17/00, 17/02;* C07P *41/00;* C12N *9/20*

U.S. Cl. 435—117 12 Claims

1. In a method of making chiral epoxy alcohols or esters thereof which comprises providing a racemic carboxylic acid ester of an epoxy alcohol, bringing said ester into contact with water and a hydrolytic enzyme to hydrolyze said ester to the extent of about 5% to about 95%, and separating the resultant free alcohol from unhydrolyzed ester, the improvement wherein an aqueous solution of a crude hydrolytic enzyme is fractionated into an aqueous non-adsorbed enzyme fraction and an adsorbed enzyme fraction on an inert adsorbent before the non-adsorbed fraction is brought into contact with said ester.

4,923,811

CARRYING OUT ENZYMATIC OXIDATIONS

Helmut Simon, Freising, and Helmut Guenther, Haag, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 28, 1987, Ser. No. 90,444

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631228

Int. Cl.[5] C12P *7/40, 7/44, 7/62;* C07P *41/00*

U.S. Cl. 435—136 1 Claim

1. A process for carrying out enzymatic oxidations of alpha-hydroxycarboxylic acids to the corresponding ketocarboxylic acids, which process comprises transferring electrons from the alpha-hydroxycarboxylic acid to an electron acceptor in the presence of a redox enzyme wherein the electrons are transferred from the redox enzyme to the electron acceptor in the presence of a catalytic amount of CAV of CYV, thereby forming the ketocarboxylic acid corresponding to the alpha-hydroxycarboxylic acid.

4,923,812

PROCESS FOR PRODUCING ERYTHRITOL

Hiroyuki Horikita, Chita; Nobuo Hattori; Yahei Takagi, both of Nagoya; Gaku Kawaguchi, Gyoda, and Toshihiro Maeda, Zama, all of Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 300,973, Jan. 24, 1989, abandoned. This application Jun. 29, 1989, Ser. No. 373,694

Claims priority, application Japan, Feb. 3, 1988, 63-24813

Int. Cl.[5] C12P *7/18;* C12R *1/645*

U.S. Cl. 435—158 2 Claims

1. A process for continuously producing erythritol by cultivating erythritol-producing microorganisms under aerobic conditions, said process comprising the steps of:

maintaining a concentration of dissolved oxygen in a culture broth inside a fermentation tank at not less than 0.2 ppm;

separating a part of the culture broth into a concentrated liquid in which a concentration of cells is increased and a clarified liquid by a cell separator;

returning said concentrated liquid to the fermentation tank;

controlling an amount of said clarified liquid to be extracted outside an erythritol-producing system and an amount of the culture broth and/or the concentrated liquid to be extracted outside the producing system such that the concentration of the cells in the culture broth in the fermentation tank may be kept in a range from 40 to 200 g/l when calculated as a weight of dried cells;

and recovering erythritol from said clarified liquid.

4,923,813

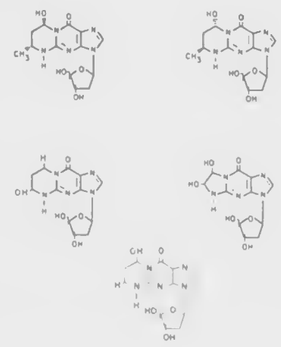
MONOCLONAL ANTIBODY-BASED IMMUNOASSAY FOR CYCLIC DNA ADDUCTS RESULTING FROM EXPOSURE TO CROTONALDEHYDE OR ACROLEIN

Stephen S. Hecht, Larchmont; Peter G. Foiles, Croton-on-Hudson, and Fung-Lung Chung, Yorktown Heights, all of N.Y., assignors to American Health Foundation, Valhalla, N.Y.

Filed Jan. 15, 1988, Ser. No. 144,490

Int. Cl.[4] G01N *33/577*

U.S. Cl. 435—172.2 3 Claims



1. Monoclonal antibodies recognizing at least one of the 8R, 6R- and 8S, 6S stereoisomers of 3-(2-deoxy-β-D-erythropentofuranosyl)-5, 6, 7, 8-tetrahydro-8-hydroxy-6-methylpyrimino (1, 2-a) purine-10(3H)one produced by a hybridoma cell line

selected from the group consisting of HB9621; HB9622; HB9623; and HB9624.

4,923,814

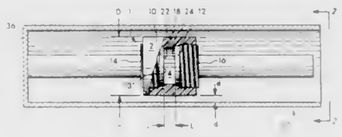
HIGH SPEED, HIGH POWER APPARATUS FOR VESICLE PREALIGNMENT, PORATION, LOADING AND FUSION IN UNIFORM ELECTRIC FIELDS AND METHOD THEREFOR

John Marshall, III, Boulder, Colo., assignor to Electropore, Inc., Boulder, Colo.

Continuation of Ser. No. 47,208, May 8, 1987, Pat. No. 4,906,576, which is a continuation-in-part of Ser. No. 861,534, May 9, 1986, abandoned. This application Apr. 26, 1989, Ser. No. 325,676

Int. Cl.[5] C12N *13/00, 15/00*

U.S. Cl. 435—173 26 Claims





18. A method for producing stable pores in and through the membrane walls of ellipsoidal, electrically or dielectrically aspherical vesicles placed in a liquid suspension, said method comprising the steps in the order of:

inserting more than one milliliter of the liquid suspension in a chamber, said liquid suspension being capable of being selected from the group consisting of electrolytic and non-electrolytic fluids,

applying a first uniform, homogeneous electric field at least one preselected frequency across said chamber for a first predetermined time interval, said at least one preselected frequency being capable of electrically rotationally aligning said vesicles along either their major or minor axis with the direction of said electric field, and

applying a second uniform, homogeneous electric field rectangular wave poration pulse at a preselected high voltage and high current having a power greater than one megawatt across said chamber for a second predetermined time interval in response to the step of applying said preselected frequency, said second field having an adjustable rise time of less than 50 nanoseconds, said uniform, homogeneous electric field pulse being capable of providing substantially the same transmembrane poration electric field simultaneously across each aligned vesicle to produce said stable pores in said vesicles.

4,923,815

PROCESS FOR HEAT TREATING THROMBIN

Kenji Tanaka, Nara; Kenmi Miyano, Osaka; Hideo Nishimaki, Nara, and Yoshiro Iga, Osaka, all of Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed Mar. 25, 1988, Ser. No. 173,702

Claims priority, application Japan, Mar. 27, 1987, 62-75562

Int. Cl.[5] C12N *9/00*

U.S. Cl. 435—183 8 Claims

1. A process for heat treating thrombin which comprises heating an aqueous solution containing thrombin in a concentration from about 500 to 5,000 U/ml at a temperature of from 50 to 70° C. for 10 minutes to 20 hours for inactivation of viruses contained therein, in the presence of a combination stabilizer of at least one sugar selected from the group consisting of monosaccharides, disaccharides and sugar alcohols and at least one amino acid selected from the group consisting of glycine, serine, threonine, aspartic acid, glutamic acid, arginine and lysine until viruses contaminating said thrombin are inactivated.

4,923,816

GASSING INCUBATOR

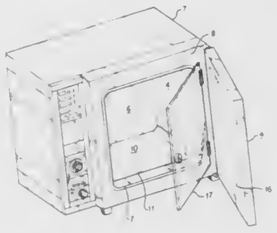
Hubert Heeg, Frankfurt; Hans-Peter Werner, Grosskrotzenburg; Manfred Fenner, Kleinkahl, and Olaf Schmidt, Isenburg, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Apr. 19, 1989, Ser. No. 340,891

Claims priority, application Fed. Rep. of Germany, May 6, 1988, 3815528

Int. Cl.[5] F27D *11/00*

U.S. Cl. 435—284 7 Claims



1. A gassing incubator for cultivating human or animal cells or tissues, said incubator comprising:

an inner case having a door;

a thermally insulating outer case surrounding said inner case and disposed at a distance from side walls, a back wall and a roof of said inner case;

electrical heating elements including at least one tubular heating body, said elements being disposed underneath a floor of the inner case in flat contact direct with the outer side of the floor of the inner case and angled upwardly in the area of the side walls and the back wall of the inner case such that they extend above the floor level of the inner case by the depth of a water bath on said floor and thus heat the area of transition between the bottom and side walls and the back wall in the area of the side walls; and

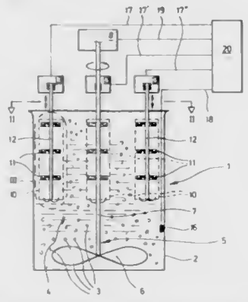
means forming a pan accommodating said water bath for humidifying the inner chamber atmosphere.

4,923,817

FERMENTER FOR CULTURING CELL CULTURES

Wolfgang Mundt, Vienna, Austria, assignor to "Immuno" Aktiengesellschaft fur Chemisch-Medizinische, Produkte, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 273,931
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739650
Int. Cl.[5] C12M *1/06*
U.S. Cl. 435—315 14 Claims



1. A fermenter for culturing cell cultures on microcarriers in a liquid, said fermenter comprising:

a vessel having a central portion and a peripheral portion;

an agitator disposed within said vessel for maintaining the cell culture in a suspension within said vessel, said agitator having an axis for rotation;

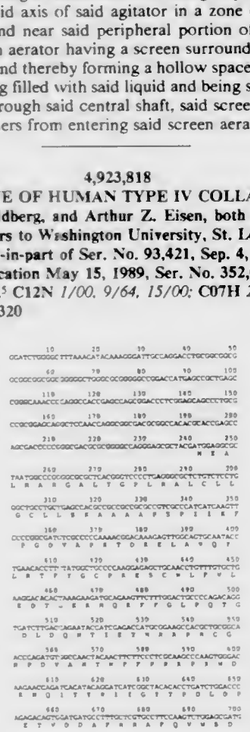
a screen aerator for supplying oxygen in finely distributed form to the suspension within said vessel, said screen aerator having a central shaft and being disposed eccentrically of said axis of said agitator in a zone of high flow velocity and near said peripheral portion of said vessel, said screen aerator having a screen surrounding said central shaft and thereby forming a hollow space, said hollow space being filled with said liquid and being supplied with oxygen through said central shaft, said screen preventing microcarriers from entering said screen aerator.

4,923,818

DNA CLONE OF HUMAN TYPE IV COLLAGENASE

Gregory I. Goldberg, and Arthur Z. Eisen, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 93,421, Sep. 4, 1987. This application May 15, 1989, Ser. No. 352,069
Int. Cl.[5] C12N *1/00, 9/64, 15/00;* C07H *21/00*
U.S. Cl. 435—320 5 Claims





5. A human type IV collagenase cDNA clone containing a 3020 basepair insert having the nucleotide sequence shown in FIG. 9 of the drawings.

4,923,819

TIME-RESOLVED FLUORESCENCE IMMUNOASSAY

Salvador M. Fernandez, Hartford; Hann-Ping Wang, Glastonbury; Yong-Sheng Chao, Glaston, and Ernest F. Gulgnon, Canton, all of Conn., assignors to Chimerix Corporation, Glastonbury, Conn.

Filed Mar. 27, 1987, Ser. No. 31,408
Int. Cl.[5] G01N *33/533, 33/543, 33/546, 33/536*
U.S. Cl. 436—518 12 Claims

1. A time-resolved fluorescence immunoassay for multiple analytes, comprising the steps of:

a. forming an incubation mixture of:

(i) antibodies against each analyte;

(ii) a predetermined amount of fluorescently labeled analytes wherein each fluorescently labeled analyte has a different fluorescene lifetime; and

(iii) a sample to be tested;

b. incubating the mixture under conditions and for a period of time sufficient for antibody and analytes to complex;

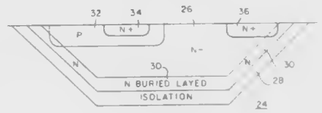
c. determining contemporaneously the amount of each fluorescently labeled analyte bound with antibody as an indication of the amount of each corresponding analyte in the sample, by (i) exciting the fluorescently labeled analyte with a light pulse; and (ii) determining the amplitude of each fluorescence decay curve for the antibody-bound fluorescently labeled analyte by a single amplitude measurement measuring all of the fluorescence reaching the detector from the instant of excitation.

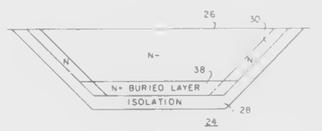
4,923,820

IC WHICH ELIMINATES SUPPORT BIAS INFLUENCE ON DIELECTRICALLY ISOLATED COMPONENTS

James D. Beasom, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 777,269, Sep. 18, 1985, Pat. No. 4,807,012.
This application Feb. 17, 1989, Ser. No. 311,812
Int. Cl.[5] H01L *21/223, 21/265, 21/76, 21/95*
U.S. Cl. 437—21 12 Claims





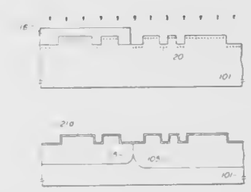
12. In a method of forming dielectrically isolated semiconductor islands including forming grooves in a bottom surface of a substrate of a first conductivity type and concentration, forming a dielectric layer on said bottom surface and said grooves, forming a semiconductor support on said dielectric layer and removing the top surface of said substrate sufficient to form dielectrically isolated islands in said support the improvement comprising introducing impurities of said first conductivity type into only said grooves before forming said dielectric layer to form a shield layer only along said grooves having an impurity concentration greater than said substrate and less than a region of a second conductivity type to be formed in said substrate as a PN junction.

4,923,821

FORMING TRENCH IN SEMICONDUCTOR SUBSTRATE WITH ROUNDED CORNERS

Isamu Namose, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Mar. 22, 1989, Ser. No. 327,234
Claims priority, application Japan, Mar. 24, 1988, 63-70222; Mar. 24, 1988, 63-70221; Nov. 18, 1988, 63-291520
Int. Cl.[5] H01L *21/265, 21/76*
U.S. Cl. 437—38 5 Claims



1. A method of manufacturing a semiconductor device having an element isolating region formed by embedding an insulator in a groove provided in a semiconductor substrate, said method comprising the steps of:

(a) selectively etching a semiconductor substrate to form a groove therein;

(b) selectively introducing an impurity to said semiconductor substrate around said groove and into the bottom of said groove provided therein;

(c) rounding the corner portions at at least the upper and lower portions of said groove by thermal oxidation of said semiconductor substrate after said step of introducing, thereby forming a thermal oxide film on the surface of said semiconductor substrate with said corner portions;

(d) activating the impurity introduced to said substrate and into the bottom of said groove so as to form a well region simultaneously with said step of rounding; and

(e) embedding an insulator in said groove with said corner portions rounded, thereby forming an element isolating region.

4,923,822

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE BY CAPPING A CONDUCTIVE LAYER WITH A NITRIDE LAYER

Martin S. Wang, Fremont, and Kuang-Yi Chiu, Los Altos Hills, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 22, 1989, Ser. No. 356,021
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—41 9 Claims

1. A method of fabricating a semiconductor device, the method comprising:

forming spaced-apart first and second field oxide regions in a planar surface of a substrate;

creating a gate region between the field oxide regions;

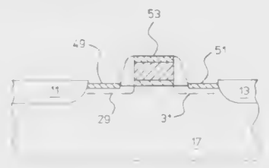
forming a source diffusion region between the gate region and the first field oxide region and a drain diffusion region between the gate region and the second field oxide region;

covering the substrate with a conductive layer;

covering the conductive layer with a nitride layer;

annealing at a relatively low temperature whereby those portions of the conductive layer which overlie silicon react therewith to form a silicon compound and any re-

maining portions of the conductive layer react with the nitride layer to form a generally homogeneous nitride layer covering the device;



etching to remove the nitride layer; and

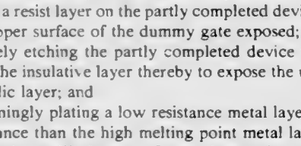
annealing at a relatively high temperature to convert the silicon compound into a silicide.

4,923,823

METHOD OF FABRICATING A SELF ALIGNED SEMICONDUCTOR DEVICE

Yasutaka Kohno, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,429
Claims priority, application Japan, Sep. 30, 1987, 62-246547
Int. Cl.[5] H01L *21/28*
U.S. Cl. 437—41 **16 Claims**



1 A method of producing a self-aligned gate MESFET comprising the steps of:

successively depositing a high melting point metallic film, a thin high melting point metal film, and an insulative film on a semiconductor substrate;

anisotropically etching the superimposed films to form a gate structure including a metallic gate formed by the metallic layer, a dummy gate formed by the insulative layer, and a metal separator formed by the intermediate metal layer, protecting the metallic and insulative layers during the anisotropic etching step by the interposed metal layer selected to have an etching rate slower than the metallic or insulative layers;

forming source and drain regions using the gate structure as a mask, said forming step including a high temperature annealing operation, the metal layer being sufficiently thin and the annealing temperature being sufficient to transform the metal layer to a metallic layer;

forming a resist layer on the partly completed device leaving the upper surface of the dummy gate exposed;

selectively etching the partly completed device to remove only the insulative layer thereby to expose the underlying metallic layer; and

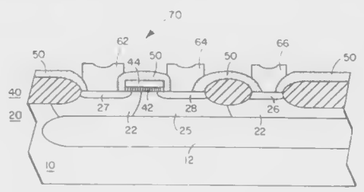
self-alignngly plating a low resistance metal layer of lower resistance than the high melting point metal layer on the exposed metallic layer to form a low resistance contact self-aligned on the high melting point gate.

4,923,824

SIMPLIFIED METHOD OF FABRICATING LIGHTLY DOPED DRAIN INSULATED GATE FIELD EFFECT TRANSISTORS

Daniel J. Fertig, Edina, and Matthew F. Schmidt, Bloomington, both of Minn., assignors to VTC Incorporated, Bloomington, Minn.

Filed Apr. 27, 1988, Ser. No. 186,555
Int. Cl.[5] H01L *21/265, 21/203*
U.S. Cl. 437—44 **5 Claims**



1. A method of fabricating an insulated gate field effect transistor comprising the steps of:

(a) providing a semiconductor substrate including a first conductivity type region;

(b) growing a lightly doped epitaxial layer of a second conductivity type on the surface of the substrate;

(c) forming in the epitaxial layer at least a first well of the first conductivity type in electrical contact with the first conductivity type region of the substrate such that at least first and second portions of the second conductivity type of the epitaxial layer are electrically isolated from one another,

(d) forming an insulated gate electrode on the surface of the epitaxial layer across at least a first diode junction between the first well and the first portion of the epitaxia layer;

(e) forming at least first and second heavily doped second conductivity type regions in the epitaxial layer adjacent the gate electrode and separated from one another by the diode junction between the first well and the first portion of the epitaxial layer; and

(f) attaching electrical contacts to the first and second heavily doped second conductivity type regions.

4,923,825

METHOD OF TREATING A SEMICONDUCTOR BODY

Morley M. Blouke; Thaian N. Tran, and Marjorie L. Lust, all of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 1, 1989, Ser. No. 345,747
Int. Cl.[5] H01L *21/70, 21/60, 21/00*
U.S. Cl. 437—53 **8 Claims**



1. A method of treating a semiconductor body having a front face and a back face, comprising the steps of:

(a) providing a layer of dielectric material having at least one aperture over a peripheral region of the front face of the body and depositing conductive material in the aperture so that the layer of metal on the exposed dielectric material contacts the conductive material,

(b) mounting the body on a support member, with the front face of the body in confronting relationship with the support member,

(c) removing material of the body in the peripheral region, so as to expose at least a portion of the layer of dielectric material,

(d) forming a layer of metal on the back face of the body and a layer of metal on the exposed dielectric material, the layer of metal on the back face of the body being electrically separate from the layer of metal on the exposed dielectric material and removing metal from a selected are of the exposed dielectric material, without removing the metal that overlies the conductive material, and

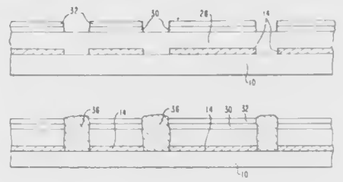
(e) connecting the layer of metal on the back face of the body to an electrical terminal.

4,923,826

METHOD FOR FORMING DIELECTRICALLY ISOLATED TRANSISTOR

Lubomir L. Jastrzebski, Plainsboro; Ronald J. Johansson, Lawrenceville, and Donald J. Sauer, Allentown, all of N.J., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 2, 1989, Ser. No. 388,416
Int. Cl.[5] H01L *21/82*
U.S. Cl. 437—57 **11 Claims**



1. A method for forming dielectrically isolated transistors on a silicon wafer, comprising:

(a) providing a silicon wafer having a substantially flat major surface and having a monocrystalline portion at said major surface;

(b) forming a first insulating layer on said major surface;

(c) defining a plurality of device regions on said major surface in accordance with a mask pattern;

(d) removing portions of said first insulating layer in regions of said major surface not included in said device regions so as to form a plurality of apertures therethrough exposing said monocrystalline portion, said apertures being spaced no wider apart than a predetermined distance;

(e) epitaxially depositing silicon within said apertures and over said first insulating layer so as to form a continuous monocrystalline layer of silicon having a thickness substantially equal to said predetermined distance;

(f) oxidizing substantially all of the surface of said monocrystalline layer of silicon so as to transform a uniformly thick layer of said monocrystalline layer of silicon into oxide;

(g) removing all of said oxide so as to expose a surface of said monocrystalline layer of silicon;

(h) forming a second insulating layer over said monocrystalline layer of silicon;

(i) depositing a layer of silicon nitride (Si_3N_4) over said second insulating layer;

(j) defining said plurality of device regions on said layer of silicon nitride in accordance with said mask pattern;

(k) removing portions of said silicon nitride and said second insulating layer not included within said device regions so as to form apertures therethrough exposing said surface of said monocrystalline layer of silicon;

(l) treating said monocrystalline layer of silicon such as to replace portions of said monocrystalline layer of silicon exposed by said apertures by a dielectric down to said major surface of said silicon wafer so as to result in dielectric isolation between separate ones of said plurality of device regions; and

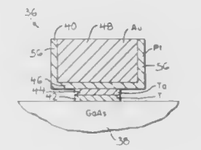
(m) forming devices in respective ones of said plurality of device regions.

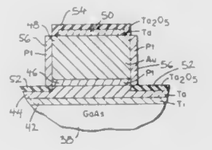
4,923,827

T-TYPE UNDERCUT ELECTRICAL CONTACT PROCESS ON A SEMICONDUCTOR SUBSTRATE

Joseph A. Calviello, Kings Park; Paul R. Bie, Commack, and David Ward, Roslyn Heights, all of N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 16, 1988, Ser. No. 194,533
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—190 **8 Claims**





1. A process for fabricating T-type undercut electrical contact structure on a semiconductor substrate, with said contact structure encapsulated on the bottom and sides by a diffusion barrier, comprising:

depositing a first metal layer on said substrate, said first metal layer being oxidizable;

depositing a second metal layer on said first metal layer;

depositing a third metal layer on said second metal layer, said third metal layer being non-oxidizable, said second metal layer being a material providing a diffusion barrier against migration therethrough from said third metal layer;

depositing a fourth metal layer on said third metal layer, said fourth metal layer being oxidizable;

removing portions of said fourth metal layer outside of a given contact area;

removing portions of said third metal layer outside said contact area;

removing portions of said second metal layer outside said contact area;

oxidizing portions of said first metal layer outside said contact area and oxidizing the remainder of said fourth metal layer within said contact area;

electroplating a fifth metal layer on the sides of said third metal layer between said second and fourth metal layers, said fifth metal layer being a material providing a diffusion barrier against migration therethrough from said third metal layer;

removing said portions of said first metal layer outside said contact area and removing said remainder of said fourth metal layer within said contact area, and also removing

portions of said first metal layer within said contact area undercut beneath said second and third layers.

4,923,828

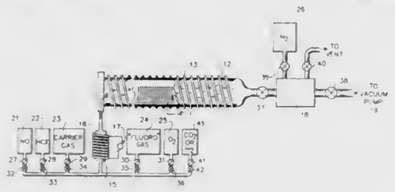
GASEOUS CLEANING METHOD FOR SILICON DEVICES

Ronald Gluck, and Paul L. Roselle, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 376,483, Jul. 7, 1989. This application Aug. 7, 1989, Ser. No. 390,314

Int. Cl.[5] H01L *21/00, 21/02, 21/30, 21/306*

U.S. Cl. 437—225 **6 Claims**



1. A method for cleaning a silicon semiconductor device in which metallic impurities are removed from a silicon surface of the device, said method comprising, in sequence, the steps of:

(a) exposing a silicon surface of a device for a first time to a plasma afterglow anhydrous cleaning gas mixture containing nitric oxide and hydrogen chloride together with an inert carrier gas to remove metallic impurities;

(b) exposing said surface for a second time to a plasma afterglow gas mixture of a fluorocarbon gas and hydrogen or carbon dioxide to remove the silicon oxynitrochloride film which is formed by step (a), leaving a fluorocarbon polymer film; and

(c) exposing said surface for a third time to a plasma afterglow gas of oxygen to remove the fluorocarbon polymer film deposited in step (b).

4,923,829

COMPOSITE CERAMICS AND METHOD OF MAKING THE SAME

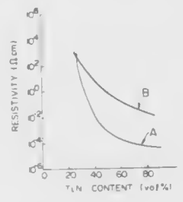
Yoshiyuki Yasutomi, Katsuta; Yasuo Matsushita, and Kousuke Nakamura, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 92,614, Sep. 3, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,300

Claims priority, application Japan, Sep. 5, 1986, 61-207927

Int. Cl.[5] C04B *35/58, 35/76*

U.S. Cl. 501—95 **27 Claims**



1. A sintered ceramic material consisting essentially of: first particles of at least one member selected from the group consisting of TiN, TiB_2, TiC, ZrN, ZrC, ZrB_2, Cr_2N, Cr_3C_2, CrB, HfN, HfC, TaN, TaC, TaB_2, NbN, NbC, NbB_2, WC, W_2C, Mo_2N, Mo_2C, MoB, VN, VC, WSi_2, $TiSi_2$, $ZrSi_2$, $NbSi_2$, $TaSi_2$, $CrSi_2$, $MoSi_2$, Cr_7, C_2, CeC_2, each having an electric resistivity not greater than 10^{-3} Ωcm; second particles consisting essentially of silicon nitride; and whiskers consisting essentially of silicon nitride; wherein said first particles are interlocked with each other by means of said second particles and said whiskers, said sintered material having porosity of 5 to 30%, and the amount of said whiskers being 1 to 70% by weight based on the sum of said second particles and said whiskers; said sintered material having a resistivity ranging from 4.2×10^{-5} to 2.8×10^{0} Ωcm, being substantially free from glass phase and having a bending strength ranging from 140 to 510 MN/m^2 at 1200° C., said bending strength being substantially the same as that at room temperature.

4,923,830

CERAMIC BODIES FORMED FROM PARTIALLY STABILIZED ZIRCONIA

Richard Everhart; Paul Bosomworth; Kenneth Butcher, and Matthias Hoffmann, all of Hendersonville, N.C., assignors to Swiss Aluminum Ltd., Chippis, Switzerland

Filed Sep. 18, 1989, Ser. No. 408,739

Int. Cl.[5] C04B *38/00, 35/48*

U.S. Cl. 501—103 **6 Claims**

1. A process for preparing a high temperature resistant ceramic body which comprises:

forming an aqueous thixotropic slurry having a solids content consisting of essentially of from about 30% to about 98% by weight monoclinic zirconia, from about 0.5% to about 5% by weight of a stabilizing material and up to about 8.5% by weight of a binder material and the balance water;

impregnating a porous body with said slurry by immersing said body in said slurry;

drying said impregnated body;

heating said impregnated porous body at an elevated temperature of less than or equal to about 2000° C. for about 15 minutes to about 10 hours and thereby producing a ceramic body from about 12% to about 80% by weight of said zirconia in a monoclinic phase and from about 20% to about 88% by weight of said zirconia in a cubic phase at room temperature so as to at least partially stabilize said zirconia and to form said ceramic body.

4,923,831

MAGNESIA-CALCIUM OXIDE REFRACTORIES

Nobuyuki Uzaki, Ako; Hiroaki Ishii, Okayama; Ichiro Tsuchiya, Ako; Yukio Oguchi, Himeji, and Tatsuo Kawakami, Aioi, all of Japan, assignors to Kawasaki Refractories Company Ltd., Japan

Filed Apr. 10, 1989, Ser. No. 335,753

Claims priority, application Japan, Apr. 28, 1988, 63-107291

Int. Cl.[5] C04B *35/04*

U.S. Cl. 501—108 **5 Claims**

1. A magnesia-calcium oxide refractory brick made from a mixture consisting essentially of (i) about 100 parts by weight of a refractory aggregate consisting essentially of about 20 to about 95% by weight of MgO and about 80 to about 5% by weight of CaO, and (ii) about 0.5 to about 5 parts by weight of aragonite-type calcium carbonate.

4,923,832

METHOD OF MAKING SHAPED CERAMIC COMPOSITES WITH THE USE OF A BARRIER

Marc S. Newkirk, Newark, Del., and Robert C. Kantner, Springfield, Pa., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed May 8, 1986, Ser. No. 861,024

Int. Cl.[5] C04B *35/00*

U.S. Cl. 501—128 **49 Claims**

1. A method for producing a self-supporting ceramic body by oxidation of a parent metal to form a polycrystalline material comprising the oxidation reaction product of said parent metal with at least one oxidant including a vapor-phase oxidant

said method comprising the steps of: (a) providing at least a portion of said parent metal with a barrier means at least partially spaced from said parent metal for establishing at least one surface of the ceramic body; (b) heating said parent metal to a temperature above its melting point but below the melting point of the oxidation reaction product to form a body of molten parent metal; (c) reacting said molten parent metal at said temperature with said oxidant to form said oxidation reaction product; (d) maintaining at least a portion of said



oxidation reaction product in contact with and between said molten parent metal and said oxidant, to transport molten parent metal through the oxidation reaction product towards said barrier means and into contact with said oxidant so that fresh oxidation reaction product continues to form at an interface between the oxidant and previously formed oxidation reaction product; and (e) continuing said reaction until said oxidation reaction product contacts said barrier means to produce said ceramic body having said surface established by said barrier means.

4,923,833

CATALYST FOR OLEFIN POLYMERIZATION AND PROCESSES FOR ITS PRODUCTION

Mamoru Kioka, and Norio Kashiwa, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP87/01034, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO88/05057, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 25, 1987, Ser. No. 245,400

Claims priority, application Japan, Dec. 27, 1986, 61-309280; Feb. 4, 1987, 62-22594

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[5] C08F *4/64*

U.S. Cl. 502—9 **17 Claims**

1. A process for producing an unsupported catalyst for olefin polymerization, which comprises:

(1) contacting a solution of an aluminoxane in a first solvent with a second solvent in which the aluminoxane is insoluble or sparingly soluble, to precipitate solid aluminoxane to form a suspension, and

(2) contacting the resulting suspension of solid aluminoxane with a solution of a compound of a transition metal of Group IVB of the Periodic Table in a third solvent, to form solid fine particles.

4,923,834

SIDE MOUNTED COOLERS WITH IMPROVED BACKMIX COOLING IN FCC REGENERATION

David A. Lomas, Arlington Heights, Ill., assignor to UOP, Des Plaines, Ill.

Filed Mar. 17, 1989, Ser. No. 325,268

Int. Cl.[5] B01J *38/30, 38/32, 29/38;* **C10G** *11/18*

U.S. Cl. 502—41 **3 Claims**

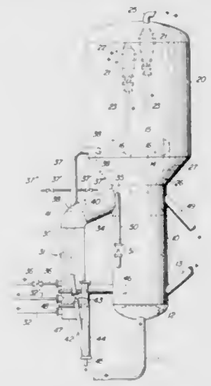
1. A process for regenerating fluidized cracking catalyst for use in a catalytic cracking reaction zone said process comprising:

(a) introducing an oxygen-containing regeneration gas and coke-contaminated fluidized catalyst into a first bed of catalyst in a combustion zone maintained at a temperature sufficient for coke oxidation and therein oxidizing coke to produce hot regenerated catalyst and hot flue gas;

(b) transporting said hot flue gas and said hot regenerated catalyst from said combustion zone into a regenerated catalyst disengaging zone, wherein said hot regenerated catalyst is separated from said flue gas and forms a second bed of catalyst in a lower portion of said disengaging zone;

(c) withdrawing regenerated catalyst from said second bed and transporting said regenerated catalyst to said fluidized catalytic cracking reaction zone;

(d) communicating catalyst from said second bed through a first passage across a horizontal distance into a third bed of catalyst located at the top of a remote and vertically-oriented cooling zone;



(e) passing a fluidizing gas upwardly through said cooling zone, and said third bed and maintaining a dense catalyst phase, having a density greater than 20 lb/ft^3 in said cooling zone and said third bed;

(f) operating said vertically-oriented cooling zone in an at least partial backmix mode to exchange catalyst between said third bed and said cooling zone and remove heat from said catalyst by indirect heat exchange with a cooling fluid in said cooling zone and produce relatively cool regenerated catalyst in said cooling zone and said third bed; and

(g) withdrawing a mixture of fluidizing gas and catalyst, having a density of at least 2 lb/ft^3 from said third bed at a location below the top of said second bed through a second passage and returning particles from said second passage to said second bed.

4,923,835

CATALYST OF ALUMINOSILICATE TYPE CONTAINING AT LEAST ONE NOBLE METAL AND ITS USE FOR ISOMERIZING A C8 AROMATIC CUT

Christine Travers; Francis Raatz, both of Rueil Malmaison; Jean-Louis Guth, Mulhouse, and Henri Kessler, Wittenheim, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 12, 1988, Ser. No. 235,342

Claims priority, application France, Aug. 14, 1987, 87 11634

Int. Cl.[5] B01J *29/06, 29/32*

U.S. Cl. 502—66 **8 Claims**

1. An aluminosilicate catalyst comprising by weight:

(a) 0.01 to 1.5% of at least one metal selected from platinum and palladium,

(b) 0 to 99.49% of a matrix selected from the group formed of alumina, silica, magnesia, a clay or any combination of at least two of the above-mentioned compounds, and

(c) 0.5 to 99.9% of a zeolite of MFI structure having a SiO_2/Al_2O_3 molar ratio from 12 to 1000,

said zeolite, previously synthesized in fluoride medium at a pH lower than 10, having a fluorine content from 0.02 to 1.5% by weight, being characterized by an X-ray diffraction diagram as shown in table 1 of the description.

4,923,836

NI/CU ABSORBENT/CATALYST FOR DESULFURIZATION AND ISOMERIZATION OF N-PARAFFINS

Peter Kokayeff, Fullerton, and Subeil F. Abdo, Diamond Bar, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 238,779, Aug. 31, 1988, Pat. No. 4,886,935, which is a continuation-in-part of Ser. No. 74,294, Jul. 16, 1987, Pat. No. 4,827,076. This application Sep. 27, 1989, Ser. No. 413,396

Int. Cl.[5] B01J *29/14*

U.S. Cl. 502—74 21 Claims

1. A catalytic composition consisting essentially of greater than about 1.0 weight percent of at least one nickel component, calculated as NiO, greater than about 1.0 weight percent of at least one copper component, calculated as CuO, and an acidic component containing a crystalline molecular sieve having cracking activity.

4,923,837

HYDROGENATION CATALYST

Hiroshi Fukuhara; Fujihisa Matsunaga, and Yasushi Nakashima, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 19, 1988, Ser. No. 286,024

Claims priority, application Japan, Dec. 29, 1987, 62-332527

Int. Cl.[5] B01J *21/00, 21/16*

U.S. Cl. 502—84 7 Claims

1. A hydrogenation catalyst for producing cycloolefins from monocyclic aromatic hydrocarbons, wherein said catalyst is prepared by adsorbing ruthenium ions on a hydrotalcite support or a compound capable of conversion to a hyrotalcite structure by hydration, and then reducing the adsorbed ruthenium ions.

4,923,838

PROCESS FOR PREPARING AN IRON-COAL SLURRY CATALYST FOR HYDROCRACKING HEAVY OILS

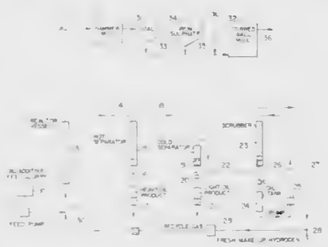
Chandra P. Khulbe, Oakville; Keith Belinko, Nepean; Richard J. Waugh, Oakville, and Michel Perreault, Montreal, all of Canada, assignors to Petro-Canada Inc., Mississauga, Canada

Filed Feb. 1, 1989, Ser. No. 304,557

Claims priority, application Canada, Feb. 2, 1988, 557988

Int. Cl.[5] B01J *31/02, 37/04;* C10G *47/02, 1/08*

U.S. Cl. 502—151 9 Claims



1. A process for producing a hydroconversion catalyst which comprises grinding carbonaceous particles and particles of an iron compound in the presence of an oil to form a paste or slurry in which the carbonaceous material and iron compound have been ground to particle sizes of less than 75 microns.

4,923,839

LOW TEMPERATURE SYNTHESIS OF CONDENSATION POLYMERS

Naoya Ogata, Tokyo, Japan, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 180,924, Apr. 11, 1988, Pat. No. 4,843,053, which is a division of Ser. No. 11,464, Feb. 5, 1987, Pat. No. 4,804,730. This application Apr. 27, 1989, Ser. No. 344,160

Int. Cl.[5] B01J *31/06*

U.S. Cl. 502—159 11 Claims

1. A catalyst system which is particularly useful in synthesizing condensation polymers which is comprised of (1) at least one polymeric agent having bound acid acceptor groups, (2) at least one halogenated organic compound, and (3) at least one phosphorus containing compound selected from the group consisting of (a) triphenylphoshine, (b) triphenylphosphine oxide, (c) triphenylphosphine sulfide, (d) compounds with the structural formula $(C_6H_5)_3P{=}N{-}R$, wherein R is a hydrogen atom or an alkyl group containing from 1 to 10 carbon atoms, and (e) compounds with the structural formula $(C_6H_5)PR^1R^2$ wherein R^1 and R^2 can be the same or different, wherein R^1 is selected from the group consisting of alkyl groups containing from 1 to 10 carbon atoms and phenyl groups, wherein R^2 is an alkyl group containing from 1 to 10 carbon atoms.

4,923,840

ELECTROCHEMICAL CATALYTIC SYSTEM, THE PROCESS FOR PREPARATION THEREOF AND ITS APPLICATION TO THE PRODUCTION OF ALDEHYDES

André Mortreux, Hem; Francis Petit, Villeneuve D'Ascq; Sylvain Mutez, Tourcoing, and Eric Paumard, Ronchin, all of France, assignors to Exxon Chemical COmpany, Abingdon, United Kingdom

Continuation of Ser. No. 98,697, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 934,602, Jan. 5, 1987, abandoned. This application Apr. 18, 1989, Ser. No. 341,233

Claims priority, application France, Mar. 13, 1985, 85 03670

Int. Cl.[5] B01J *31/22*

U.S. Cl. 502—167 19 Claims

1. A catalytic system for the production of aldehydes by the hydroformylation of olefinically unsaturated compounds comprising:

(a) at least one platinum complex of formula $LPtX_2$ in which L is an organic compound containing at least two phosphorus atoms capable of coordinating platinum and X is a halogen atom, and

(b) at least one organic tin compound comprising at least one Sn—O bond and at least one C—O bond wherein said tin compound is selected from the group consisting of a tin compound mixed with an alkene carbonate, tin alcoholate, and tin cyclic alcoholates.

4,923,841

CATALYST FOR THE HYDROISOMERIZATION AND HYDROCRACKING OF WAXES TO PRODUCE LIQUID HYDROCARBON FUELS AND PROCESS FOR PREPARING THE CATALYST

Glen P. Hamner, deceased, late of Baton Rouge (by Annabelle Hamner, executrix), and Willard H. Sawyer, Baton Rouge, both of La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 134,796, Dec. 18, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 283,690

Int. Cl.[5] B01J *27/12, 27/13*

U.S. Cl. 502—230 14 Claims

1. A particulate fluorided Group VIII metal-on-alumina catalyst having: (a) a Group VIII metal concentration ranging from about 0.1 to about 2 weight percent; (b) a bulk fluoride concentration ranging from about 2 to about 10 weight percent, wherein the fluoride concentration is less than about 3.0 weight percent at the outer surface layer to a depth less than one one hundredth of an inch, provided the surface fluoride concentration is less than the bulk fluoride concentration; (c) an aluminum fluoride hydroxide hydrate level greater than 60 where an aluminum fluoride hydroxide hydrate level of 100 corresponds to the X-ray diffraction peak height at 5.66Å for a Reference Standard; and (d) a N/Al ratio less than about 0.005.

4,923,842

LANTHANUM CONTAINING CATALYST FOR TREATING AUTOMOTIVE EXHAUST

Jack C. Summers, Tulsa, Okla., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 11, 1988, Ser. No. 255,245

Int. Cl.[5] B01J *23/10*

U.S. Cl. 502—261 16 Claims

1. A catalytic composite for treating an exhaust gas, said catalytic composite a first support having dispersed thereon an oxygen storage component and at least one noble metal component selected from the group consisting of platinum, palladium, rhodium, ruthenium and iridium and having dispersed immediately thereon an overlayer comprising lanthanum oxide and optionally a second support, said first and second support both being a refractory inorganic oxide selected from the group consisting of alumina, silica, titania, zirconia, aluminosilicates and mixtures thereof.

12. The catalytic composite of claim 1 where said oxygen storage component is an oxide of a metal selected from the group consisting of iron, nickel, cobalt, the rare earths and mixtures thereof.

15. The catalytic composite of claim 1 where said second support is selected from the group consisting of alumina, silica, titania, zirconia, and aluminosilicates.

4,923,843

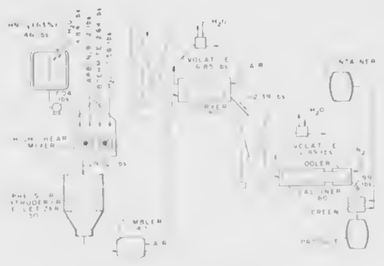
PEPTIZED ACTIVATED CARBON/ALUMINA COMPOSITE

Emmanuel K. Saforo, Allison Park; Paul K. T. Liu, Pittsburgh; Robin K. Bergstrom, Natrona Heights, and David G. Gatty, Tarentum, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 911,317, Sep. 25, 1986, Pat. No. 4,795,735. This application Oct. 14, 1988, Ser. No. 257,873

Int. Cl.[5] B01J *20/08, 20/20*

U.S. Cl. 502—415 41 Claims



1. A process of preparing an activated carbon/alumina cementitious composite comprising the steps of:

(a) providing a blend containing alumina hydrate powder and activated carbon powder having an average particle size in the range of 0.5 to 500 μm;

(b) adding to said blend a peptizing agent and water to form a mixture, the carbon powder being dispersed in the mixture;

(c) forming a green body from said mixture; and

(d) heating the green body to form the activated carbon/alumina cementitious composite having said carbon powder particles uniformly dispersed therethrough and having a crush strength of at least 10 lbs. for a $\frac{1}{8}$ inch diameter extrudate.

4,923,844

HEAT-SENSITIVE RECORDING MATERIAL

Yulchi Itabashi; Takayuki Hayashi, and Akira Igarashi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 23, 1989, Ser. No. 327,840

Claims priority, application Japan, Mar. 23, 1988, 62-069053; Jun. 20, 1988, 151800

Int. Cl.[5] G01M *5/18*

U.S. Cl. 503—207 10 Claims

1. A heat-sensitive recording material comprising a support having provided thereon a heat-sensitive recording layer, wherein a layer (b) comprising a binder mixed with porous grains comprising secondary particles bound to the surface of primary particles as a core is provided between said heat-sensitive recording layer and said support of said recording material.

4,923,845

HEAT-SENSITIVE RECORDING MATERIAL

Naomasa Koike, Tokyo, and Fumio Okumura, Kunitachi, both of Japan, assignors to 501 Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,615

Claims priority, application Japan, Oct. 31, 1987, 62-276463; Dec. 14, 1987, 62-317178

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—226 12 Claims

1. A heat-sensitive recording material which comprises a support and, provided thereon in succession, an undercoat layer and a heat-sensitive layer comprising a dye precursor and a color developer which, upon being heated, reacts with said dye precursor to develop color, said undercoat layer comprising a first layer comprising urea-formaldehyde resin and a second layer comprising a pigment and a binder provided on the first layer.

4,923,846

HEAT TRANSFER SHEET FOR COLOR IMAGE FORMATION

Masaki Kutsukake, Chofu, and Jumpei Kanto, Komae, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

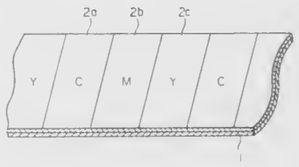
PCT No. PCT/JP87/00269, § 371 Date Dec. 17, 1987, § 102(e) Date Dec. 17, 1987, PCT Pub. No. WO87/06533, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 30, 1987, Ser. No. 143,947

Claims priority, application Japan, Apr. 30, 1986, 61-97972; Apr. 30, 1986, 61-97973; Apr. 30, 1986, 61-97974

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 15 Claims



1. A heat transfer sheet for color image formation comprising respective dye carrying layers containing dyes with respective hues of cyan, magenta and yellow formed on a substrate sheet, characterized in that said respective dye carrying layers

each contain one kind or plural kinds of dyes, and the color characteristics of said respective dye carrying layers satisfy the following conditions as the color characteristics (based on GATF) in a state of having been transferred on an image receiving sheet:

cyan:

hue error is in the range of from 10% on the green side to 60% on the blue side, and turbidity is 35% or less in the range of hue error from 10% on the green side to 45% on the blue side and is 20% or less in the range of hue error from 45% to 60% on the blue side;

magenta:

hue error is in the range of from 10% on the blue side to 60% on the red side, and turbidity is 25% or less in the range of hue error from 10% on the blue side to 35% on the red side and is 10% or less in the range of hue error from 35% to 60% on the red side;

yellow:

hue error is in the range of from 10% on the red side to 10% on the green side, and turbidity in this range is 10% or less.

4,923,847

SHEET FOR HEAT TRANSFERENCE AND METHOD FOR USING THE SAME

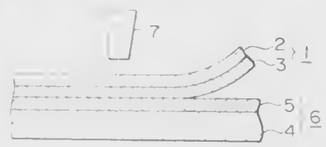
Yoshikazu Ito; Masanori Akada; Masaki Kutsukake, all of Tokyo; Mineo Yamauchi, Ichikawa; Masanori Saito, Tokyo; Atsushi Takano, Tokyo; Hideichiro Takeda, Tokyo, and Hitoshi Arita, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 82,225, Aug. 6, 1987, Pat. No. 4,820,686, which is a division of Ser. No. 833,039, Feb. 26, 1986, Pat. No. 4,720,480. This application Jan. 26, 1989, Ser. No. 301,989

Claims priority, application Japan, Feb. 28, 1985, 60-39934; Feb. 28, 1985, 60-39935; Apr. 15, 1985, 60-79857

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 3 Claims



1. A heat transfer recording process which performs printing by a dot-shaped heating means on a laminate of (a) a heat transfer sheet having a heat transfer layer of a substance which is softened, melted or gasified by heating formed on a base sheet and (b) a dye-receiving sheet to be used in combination with the heat transfer sheet, having a receptive layer for receiving a dye migrated from the heat transfer sheet upon heating to form an image on the dye-receiving sheet, said process comprising:

reading a physically detectable detection mark formed on the dye-receiving sheet;

laminating the heat transfer sheet with the dye-receiving sheet in accordance with the information thus read; and

carrying out printing.

4,923,848

IMAGE FORMATION ON OBJECTIVE BODIES

Masanori Akada; Yoshikazu Ito; Jumpei Kanto, all of Tokyo; Mitsuru Takeda, Yokohama; Masaki Kutsukake, Tokyo; Noritaka Egashira, Ichikawa; Shunsuke Mukasa, Tokyo; Takao Suzuki, Kawagoe; Hideo Hosoi, Tokyo, and Yasuo Otatsume, Chiba, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

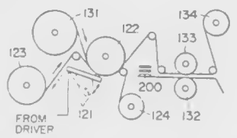
PCT No. PCT/JP87/00228, § 371 Date Dec. 8, 1987, § 102(e) Date Dec. 8, 1987, PCT Pub. No. WO87/06195, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 10, 1987, Ser. No. 138,384

Claims priority, application Japan, Apr. 11, 1986, 61-81988; Apr. 11, 1986, 61-81989; Sep. 24, 1986, 61-223896; Sep. 24, 1986, 61-225473; Oct. 1, 1986, 61-231224; Jan. 14, 1987, 62-5066

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 11 Claims



1 A process for forming sublimation transfer images on an objective body, said process comprising:

a first transferring step for sublimation transferring images on an image-transferable sheet comprising a sheet-like substrate and an image-reception layer provided on one surface of said sheet-like substrate, said sublimation transferring being carried out by means of a thermal printer on the basis of image data formulated by an image data processor; and

a second transferring step for transferring the images formed on the image-transferable sheet from the image-transferable sheet to the objective body.

4,923,849

PROCESS FOR FORMING METAL OXIDE SUPERCONDUCTORS FROM A PRECURSAR MATERIAL OF THE GENERAL FORMULA $YBA_2CU_3(OH)_3(OX)_2O_3H_2O$ (WHERE OX IS AN OXALATE)

Fawzy G. Sherif, Stony Point, N.Y., assignor to Akzo America Inc., New York, N.Y.

Continuation of Ser. No. 109,338, Oct. 16, 1987, Pat. No. 4,804,649. This application Feb. 10, 1989, Ser. No. 309,512

Int. Cl.[5] C01F *11/04, 17/00;* C01G *3/02;* H01L *39/12*

U.S. Cl. 505—1 4 Claims

1. A precursor material of the general formula $YBa_2Cu_3.(OH)_3(Ox)_2O_3.H_2O$, where Ox is oxalate for a yttrium-barium-copper-oxide superconductor.

4,923,850

SUPERCONDUCTING DC SQUID MAGNETOMETER WORKING IN LIQUID NITROGEN

Ronan Stephan, Locmaria Plouzane; Martine Doisy, Plougonvelin; Yves Montfort, Herouville St Clair; Didier Robbes, Verson; Marc L. C. Sing, Herouville St Clair; Daniel Bloyet; Jackie Provost, both of Thaon, and Bernard Raveau, Beuville, all of France, assignors to Thomson-CSF, Puteaux, France

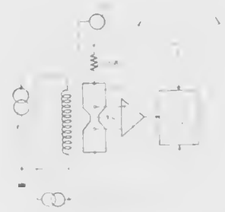
Filed Oct. 17, 1988, Ser. No. 258,765

Claims priority, application France, Oct. 20, 1987, 87 14454

Int. Cl.[5] G01R *33/02;* H03H *3/38*

U.S. Cl. 505—1 3 Claims

1. A superconducting magnetometer of the DC SQUID type, comprising a piece of material which is superconductive at a temperature at least equal to that of liquid nitrogen and having a constriction by which it is possible to limit the number of useful intrinsic loops in the material and to obtain a behaviour equivalent to that of a single loop, first polarizing means to make a DC current flow in this piece, second polarizing means to subject this piece to a magnetic field of polarization and means to measure the voltage appearing in the piece wherein the piece of superconducting material is shaped substantially like a flat bar with a central constriction formed by two hollow



V-shaped notches, facing each other, on the large sides of the bar to determine a first central channel, wherein the flanks of the channel are treated so that the superconductive effect is modified on the surface in order to demarcate a second central channel which is narrower than the first channel.

4,923,851

COMPOSITION OF MATTER FOR INCREASING INTRACELLULAR ATP LEVELS AND PHYSICAL PERFORMANCE LEVELS AND FOR INCREASING THE RATE OF WOUND REPAIR

Francis J. Carniglia, Windsor Locks, Conn., assignor to Raymond A. Roncari, Windsor Locks, Conn.

Continuation of Ser. No. 139,288, Dec. 29, 1987, Pat. No. 4,871,718. This application Oct. 2, 1989, Ser. No. 415,885

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—23 23 Claims

1. A method for increasing the intracellular level of ATP comprising delivering to the cells of a mammal a composition of matter including:

amino acids selected from the group of amino acids which are the metabolic precursors of ATP;

at least one metabolite selected from the group consisting of choline chloride and inositol;

electrolyte; and ribose.

4,923,852

AMINOALKYL NAPHTHALENEDIOLS AS HOST RESISTANCE ENHANCERS AGAINST VIRAL INFECTIONS

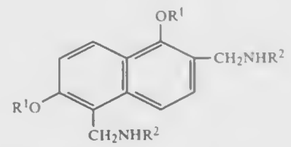
Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 11, 1987, Ser. No. 60,209

Int. Cl.[5] A61K *31/70. 31/505, 31/33*

U.S. Cl. 514—49 3 Claims

1. A composition for enhancing host resistance against bacterial, fungal or viral infection in a human host immunocompromised by AIDs-related virus comprising a compound of the formula:



where R^1 is independently selected from H, C_1-C_6 alkyl; R^2 is independently selected from substituted monocycloalkyl, unsubstituted or substituted di- or tri- cycloalkyl, or substituted or unsubstituted tetrahydropyranyl, or pharmaceutically acceptable acid addition salts thereof, in combination with an anti-viral, anti-AIDS drug selected from the group consisting of ansamycin, ribavirin, deoxycytidine, HPA-23, AL-721, foscarnet and AZT, in a physiologically acceptable medium in an amount effective to impart enhanced resistance against opportunistic infection.

4,923,853

PROCESS FOR ENHANCING THE ACTIVITY OF PLANT PROTECTING AGENTS BY USING CYCLODEXTRIN

József Szejtli; Péter Tétényi; Márta Kiniczky; Jenö Bernáth; Magda Tétényi née Erdösi; Éva Dobos, and Erzsébet Bánky née Elöd, all of Budapest, Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Continuation of Ser. No. 916,484, Sep. 8, 1986, abandoned. This application Jul. 11, 1988, Ser. No. 218,466

Claims priority, application Hungary, Jan. 7, 1985, 41/85

Int. Cl.[5] A01N *43/04, 9/00;* A61K *31/715*

U.S. Cl. 514—58 9 Claims

1. A fungicidal plant-protecting composition which consists essentially of:

(a) a fungicidally active ingredient selected from the group consisting of benomyl, BCM and metomeclan; and

(b) a cyclodextrin selected from the group consisting of alpha-cyclodextrin, beta-cyclodextrin, and gamma-cyclodextrin, wherein the weight ratio between the fungicide and the cyclodextrin is 49:1 to 7:3, together with a fungicidally acceptable inert carrier.

4,923,854

SOLUBILIZATION OF HYDROPHOBIC MATERIALS USING LYSOPHOSPHOLIPID

Colin P. S. Tilcock; Pieter R. Cullis; Michael J. Hope, all of Vancouver, Canada, and Andrew S. Janoff, Yardley, Pa., assignors to The Liposome Company, Inc., Princeton, N.J.

Filed Jan. 22, 1986, Ser. No. 821,366

Int. Cl.[5] A61K *31/685;* A01N *57/26, 43/16*

U.S. Cl. 514—78 99 Claims

1. A method of solubilizing a hydrophobic material comprising the steps of:

(a) removing an organic solvent in which a composition comprising a hydrophobic-material-solubilizing effective amount of a lysophosphatidylethanolamine of the formula:

$$H_2C(O_2CR)CH(OH)CH_2OP(O)_2OCH_2CH_2NH_3 \quad I$$

or

$$H_2C(OH)CH(O_2CR)CH_2OP(O)_2OCH_2CH_2NH_3 \quad II$$

and a hydrophobic material are dissolved to obtain a film;

(b) hydrating the film with an aqueous medium at pH of between about 8.5 and about 14.0; and

(c) admixing the aqueous medium and the hydrated film comprising the hydrophobic material and the lysophosphatidylethanolamine.

wherein R is a hydrocarbon chain having between about 11 and 21 carbon atoms and 1 double bond.

4,923,855

SYNTHETIC GTF CHROMIUM MATERIAL AND PROCESS THEREFOR

Ned L. Jensen, Martinez, Calif., assignor to The William Seroy Group, Walnut Creek, Calif.

Continuation-in-part of Ser. No. 512,111, Jul. 8, 1983. This application Apr. 26, 1988, Ser. No. 186,149

Int. Cl.[5] C07D *213/89;* A61K *31/555, 33/24, 35/02*

U.S. Cl. 514—188 4 Claims

1. A method of providing chromium supplementation to mammals, comprising administering in oral dosage form an effective amount of a chromium-nicotinate GTF material

obtained by contracting an alkali metal salt of nicotinic acid with a pharmaceutically acceptable trivalent chromium salt.

4,923,856

PENEM COMPOUNDS

Nigel J. P. Broom; Gerald Brooks, and Steven Coulton, all of Betchworth, England, assignors to Beecham Group p.l.c., Brentford, United Kingdom

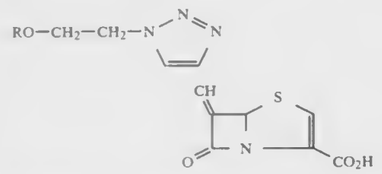
Filed Dec. 16, 1988, Ser. No. 286,375

Claims priority, application United Kingdom, Dec. 18, 1987, 8729613

Int. Cl.[5] **C07D** *499/00;* **A61K** *31/425*

U.S. Cl. 514—192 **11 Claims**

1. A compound of formula II:



(II)

or a pharmaceutically acceptable salt or in vivo hydrolysable ester thereof in which

R denotes a hydrogen atom or an in vivo hydrolysable acyl group;

and the wavy line denotes either the E- or Z-isomeric position.

4,923,857

3-ALKENYL-1-AZABICYCLO(3.2.0)HEPT-2-ENE-2-CARBOXYLIC ACID COMPOUNDS

Masayoshi Murata; Toshiyuki Chiba, both of Osaka, and Akira Yamada, Fujiidera, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

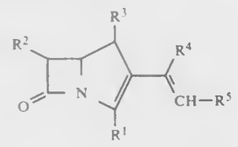
Filed Feb. 17, 1989, Ser. No. 312,061

Claims priority, application United Kingdom, Feb. 22, 1988, 8804058

Int. Cl.[5] **C07D** *487/01;* **A61R** *31/40*

U.S. Cl. 514—210 **8 Claims**

1. A compound of the formula:



in which

R^1 is carboxy or protected carboxy,

R^2 is hydoxy(lower)alkyl or protected hydroxy(lower)alkyl,

R^3 and R^4 are each hydrogen or lower alkyl, and

R^5 is saturated 4 to 6-membered heteromonocyclic group containing 1 to 4 nitrogen atom(s), saturated 5 or 6-membered heteromonocyclic group containing 1 to 2 oxygen atom(s) and 1 to 3 nitrogen atom(s) or saturated 5 or 6-membered heteromonocyclic group containing 1 to 2 sulfur atom(s) and 1 to 3 nitrogen atom(s), wherein said aliphatic heterocyclic group may be substituted by one or more suitable substituent(s) selected from a group consisting of hydroxy, protected hydroxy, hydroxy(lower)alkyl, protected hydroxy(lower)alkyl, halogen, lower alkoxy, lower alkyl, lower alkoxy(lower)alkyl, imino, protected imino, lower alkylamino, protected lower alkylamino, mono(or di)(lower)alkylcarbamoyloxy, lower alkylidene, lower alkanimidoyl and imino-protective group, or pharmaceutically acceptable salts thereof.

4,923,858

SUBSTITUTED 3-(N-HETEROCYCLIC)-2,6-DIAMINOPYRIDINES AND -N-OXIDES

Jürgen Engel, Alzenau; Peter Emig, Niederdorfelden; Bernd Nickel, Mühltal, and Istvan Szelenyi, Schwalg, all of Fed. Rep. of Germany, assignors to Asta Pharma Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

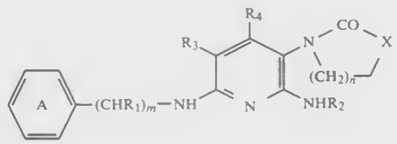
Filed May 16, 1989, Ser. No. 352,287

Claims priority, application Fed. Rep. of Germany, May 16, 1988, 3816629

Int. Cl.[5] **A61K** *31/44;* **C07D** *401/04, 413/04, 417/04*

U.S. Cl. 514—211 **3 Claims**

1. Compounds of the general formula I:



wherein the radicals R_1 and R_2 are the same or different and represent hydrogen or C_1–C_6-alkyl, the radicals R_3 and R_4 are the same or different and represent hydrogen, C_1–C_6-alkyl, hydroxy, C_1–C_6-alkoxy, C_2–C_6-alkanoyloxy, halogen or C_2–C_6-alkanoyl, X is oxygen, sulphur or the group $—NR_5$ and R_5 is hydrogen, C_1–C_6-alkyl, C_2–C_6-alkanoyl or benzoyl, m and n in each case may represent the integers 1, 2 or 3 and the phenyl radical A is unsubstituted or is substituted by halogen, nitro, C_1–C_6-alkyl, trifluoromethyl, C_3–C_7-cycloalkyl, hydroxy, C_1–C_6-alkoxy, C_2–C_6-alkanoyloxy, amino, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, C_2–C_6-alkanoylamino, CN, carboxy, C_1–C_6-alkoxycarbonyl, phenyl, C_1–C_6-alkylphenyl or trifluoromethylphenyl, their pyridine-N-oxides or a physiologically acceptable salt thereof.

3. A method of producing an anti-epileptic effect which comprises administering an anti-epileptically effective amount of a compound as set forth in claim 1.

4,923,859

PYRIDO-BENZOTHIAZINE DERIVATIVES HAVING HIGH ANTIBACTERIAL ACTIVITY AND HIGH BIOAVAILABILITY TO TISSUES

Patrizia Terni; Stefano Maiorana; Antonio Papagni, and Piergiuseppe Pagella, all of Milan, Italy, assignors to Mediolanum farmaceutici, S.r.l., Italy

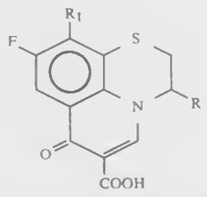
Filed Sep. 30, 1988, Ser. No. 251,457

Claims priority, application Italy, Oct. 6, 1987, 22156 A/87

Int. Cl.[5] **A61K** *31/54;* **C07D** *513/06*

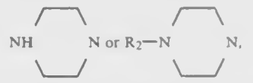
U.S. Cl. 514—224.5 **2 Claims**

1. Pyrido-benzothiazine derivatives possessing high antibacterial activity and tissue bio-availability, having the following general formula:



(I)

in which R is H or $—CH_3$ or $—CH_2F$ and R_1 is N-alkyl-3-pyrrolidynalkylamine with C_1 to C_6 alkyls or if R is $—CH_2F$ R_1 is



where R_2 is a C_1–C_6 alkyl or a C_2–C_6 alkenyl or an arylalkyl, possibly substituted by halogen, hydroxy or keto groups, both in the racemic form and in the optically active form.

2. Antibacterially active pharmaceutical compositions comprising as an active principle at least one of the pyrido-benzothiazine derivatives of general formula (I) of claim 1 and a pharmaceutically acceptable carrier.

4,923,860

METHOD OF MAKING A COLOR FILTER ARRAY USING LIGHT FLASH

Michael J. Simons, Ruislip, Great Britain, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 18, 1989, Ser. No. 408,581

Claims priority, application United Kingdom, Oct. 18, 1988, 8824366

Int. Cl.[5] **B41M** *5/035, 5/26*

U.S. Cl. 503—227 **5 Claims**

1. A method of making an array of a repeating mosaic pattern of colorants carried on a support using

(a) a plurality of donor materials each comprising a radiation-absorbing material and, respectively, a sublimable dye of a different color, and

(b) a receiver element comprising a support having thereon a dye-receiving layer,

wherein each donor material is in turn brought into face-to-face contact with the receiver and exposed patternwise to a high-intensity light source to transfer the desired pattern of dye to the receiver layer.

4,923,861

6-(2-(2-(SUBSTITUTED AMINO)-3-QUINOLINYL) ETHENYL AND ETHYL) TETRAHYDRO-4-HYDROXYPYRAN-2-ONE INHIBITORS OF CHOLESTEROL BIOSYNTHESIS

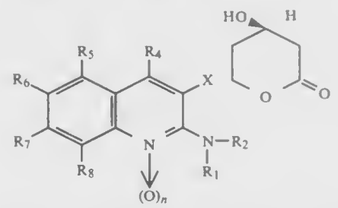
Joseph A. Picard, Ann Arbor, and Drago R. Sliskovic, Ypsilanti, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 7, 1989, Ser. No. 307,442

Int. Cl.[5] **C07D** *417/00, 413/00, 215/60, 215/38*

U.S. Cl. 514—227.8 **6 Claims**

1. A compound of Formula I



I

wherein X is $—CH_2CH_2—$ or $—CH=CH—$; R_1 and R_2 are independently hydrogen, alkyl of from one to four carbon atoms or R_1 and R_2 taken together form a ring of from three to six carbon atoms, which ring may be interrupted by a heteroatom comprising O, S or $N—R_3$, wherein R_3 is hydrogen or alkyl of from one to four carbon atoms; R_4 is

hydrogen,

alkyl of from one to six carbon atoms,

trifluoromethyl,

cyclopropyl,

cyclohexyl,

cyclohexylmethyl,

phenyl,

phenyl substituted with

fluorine,

chlorine,

bromine,

hydroxy,

trifluoromethyl,

alkyl of from one to four carbon atoms, or

alkoxy of from one to four carbon atoms,

phenylmethyl,

phenylmethyl substituted with

fluorine,

chlorine,

bromine,

hydroxy,

trifluoromethyl,

alkyl of from one to four carbon atoms, or

alkoxy of from one to four carbon atoms,

2-pyrazinyl,

2-, 3-, or 4-pyridinyl, or

2-, 4-, or 5-pyrimidinyl;

R_5, R_6, R_7, R_8 are independently selected from hydrogen,

alkyl of from one to six carbon atoms,

trifluoromethyl,

cyclopropyl,

fluorine,

chlorine,

bromine,

hydroxy,

alkoxy of from one to four carbon atoms,

cyano,

nitro,

amino,

acetylamino,

aminomethyl,

phenyl,

phenyl substituted with

fluorine,

chlorine,

bromine,

hydroxy,

trifluoromethyl,

alkyl of from one to four carbon atoms, or

alkoxy of from one to four carbon atoms,

phenylmethyl, or

phenylmethyl substituted with

fluorine,

chlorine,

bromine,

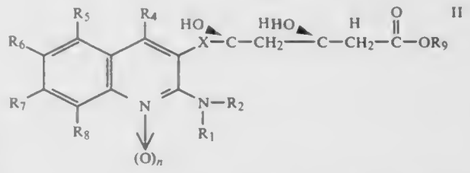
hydroxy,

trifluoromethyl, or

alkyl of from one to four carbon atoms;

n is 0 or 1;

or a corresponding 3,5-dihydroxy compound of Formula II



II

wherein R_9 is hydrogen or alkyl of from one to six carbon atoms and X, n, R_1, R_2, R_4, R_5, R_6, R_7, R_8 and n are as defined above, or a pharmaceutically acceptable salt thereof.

6. A method of inhibiting cholesterol biosynthesis in a patient in need of said treatment comprising administering a cholesterol synthesis inhibiting amount of a compound as defined by claim 1 in combination with a pharmaceutically acceptable carrier.

4,923,862

TOPICAL PREPARATION CONTAINING OFLOXACIN

Sadao Hirota, Tokyo, Japan, assignor to Dailchi Seiyaku Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1987, Ser. No. 133,975
Claims priority, application Japan, Dec. 18, 1986, 61-302412
Int. Cl.[5] A61K *31/535*
U.S. Cl. 514—230.2 4 Claims

1. A topical hydrogel or oil-in-water type cream preparation containing, as an active ingredient, an antibacterially effective amount of 9-fluoro-3-methyl-10-(4-methyl-1-piperazinyl-7-oxo-2,3-dihydro-7H-pyrido[1,2,3-de][1,4]-benzoxazine-6-carboxylic acid or a pharmaceutically acceptable salt thereof.

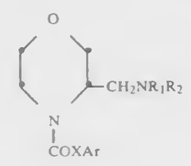
4,923,863

MORPHOLINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND USE

David I. C. Scopes, Furneux Pelham, and David E. Bays, Ware, both of United Kingdom, assignors to Glaxo Group Limited, London, England

Filed Jun. 6, 1989, Ser. No. 362,170
Claims priority, application United Kingdom, Jun. 9, 1988, 8813714
Int. Cl.[5] A61K *31/535;* C07D *265/30, 413/06*
U.S. Cl. 514—235.5 7 Claims

1. A compound of formula (I)



(I)

wherein

R_1 and R_2 are the same or different and are C_{1-6} alkyl or C_{3-6} alkenyl; or $—NR_1R_2$ forms a 5-membered (optionally containing an oxygen atom adjacent to the nitrogen) or a 6-membered ring, which ring optionally contains one unit of unsaturation and which is unsubstituted or substituted by hydroxy, oxo, optionally substituted methylidene, $—COR_3$ (where R_6 represents C_{1-6} alkyl, OR_4 or $—NHR_4$, and R_4 represents hydrogen, C_{1-6} alkyl, aryl, ar(C_{1-6})alkyl) or $=NOR_5$ (where R_5 represents C_{1-6} alkyl);

X represents a direct bond, $—CH_2—$ or $—CH_2O—$;

Ar represents a substituted phenyl moiety;

and physiologically acceptable salts thereof.

7. A method of treating a human suffering from pain or cerebral ischaemia which comprises administering an effective amount of a compound of formula (I) as defined in claim 1 or a physiologically acceptable salt thereof.

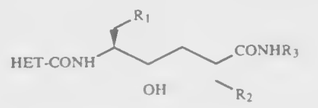
4,923,864

CERTAIN HETEROCYCLIC-HEXANAMIDES USEFUL FOR TREATING HYPERTENSION

Robert L. Rosati, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

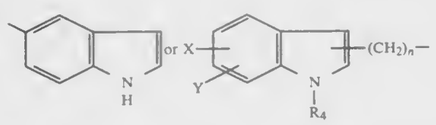
Continuation-in-part of Ser. No. 132,373, Dec. 15, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 261,878
Int. Cl.[5] A61K *31/495;* C07D *403/12, 413/12, 487/00*
U.S. Cl. 514—234.8 12 Claims

1. A compound selected from those of the formula



(I)

or a pharmaceutically acceptable salt thereof, wherein HET is



where X is hydrogen, (C_1–C_3)alkyl, (C_1–C_3)alkoxy, fluoro, chloro, bromo or cyano; Y is hydrogen, (C_1–C_3)alkyl, (C_1–C_3)alkoxy, fluoro or chloro; R_4 is hydrogen or (C_1–C_3)alkyl; n is an integer of 0 to 2; R_1 is (C_6–C_8)cycloalkyl or i-propyl; R_2 is (C_3–C_5)alkyl, phenyl, methylvinyl, dimethylvinyl, halovinyl, hydroxy(C_1–C_3)alkyl or amino(C_1–C_4)alkyl; and R_3 is (C_1–C_6)alkyl or morpholinoethyl.

11. A method of treating hypertension in a mammal which comprises administering to said mammal an antihypertensive effective amount of a compound according to claim 1.

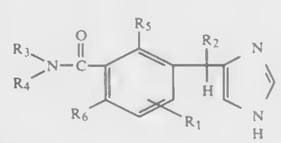
4,923,865

SUBSTITUTED 1-(1H-IMIDAZOL-4-YL)ALKYL-BENZAMIDES AS ANTI-ISCHEMICS AND AS ALPHA-2-ADRENERGIC RECEPTOR AGONISTS

Eric Cossement, Brussels; Jean-Pierre Geerts, Leglise; Jean Gobert, Brussels; Philippe Michel, Brussels, and Ernst Wülfert, Brussels, all of Belgium, assignors to U C B Societe Anonyme, Brussels, Belgium

Filed Apr. 6, 1989, Ser. No. 334,854
Claims priority, application United Kingdom, Apr. 28, 1988, 8810067
Int. Cl.[5] A61K *31/535;* C07D *233/64, 413/10*
U.S. Cl. 514—235.8 12 Claims

1. A compound selected from the group consisting of substituted 1-(1H-imidazol-4-yl)alkyl-benzamide, the optically active isomers thereof and racemic mixtures thereof, of the formula



(I)

wherein

R_1 and R_2 each, independently, represent a hydrogen atom or an alkyl radical,

R_3 represents a hydrogen atom, an alkyl or hydroxyalkyl radical, an amino or hydroxyl group,

R_4 represents a hydrogen atom or an alkyl radical, or

R_3 and R_4, taken together with the nitrogen atom to which they are attached, represent a heterocyclic radical selected from the group consisting of the pyrrolidino, piperidino and morpholino radicals, and

R_5 and R_6 each, independently, represent a hydrogen atom, a hydroxyl group, an alkyl or alkoxy radical,

at least one of the symbols R_5 and R_6 being other than a hydrogen atom,

all the alkyl and alkoxy radicals having 1 to 4 carbon atoms,

or a non-toxic pharmaceutically acceptable acid addition salt thereof.

11. A method for achieving an anti-ischemic effect in a patient in need thereof, which comprises administering to said patient an effective amount of a substituted 1-(1H-imidazol-4-yl)alkyl-benzamide as claimed in claim 1.

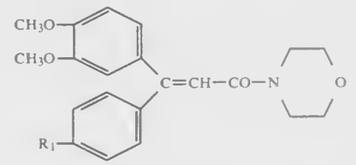
4,923,866

FUNGICIDAL COMPOSITIONS

Guido Albert, Hackenheim, and Jürgen Curtze, Geisenheim-Johannisberg, both of Fed. Rep. of Germany, assignors to Shell Agrar GMBH & Co., KG, Ingelheim am Rhein, France

Filed Jan. 28, 1988, Ser. No. 149,516
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702769
Int. Cl.[5] A01N *43/84, 43/86, 43/88, 47/10*
U.S. Cl. 514—237.5 9 Claims

1. A fungicidal composition comprising a contact fungicide comprising a manganese ethylenebis(dithiocarbamate) complex with zinc salt and at least one acrylic acid morpholide derivative of the formula



in which R_1 represents a chlorine atom or a phenyl group, the weight ratio of acrylic acid morpholide derivative to said contact fungicide within said composition being in the range of from 1:32 to 1:4, based on parts by weight of active ingredient.

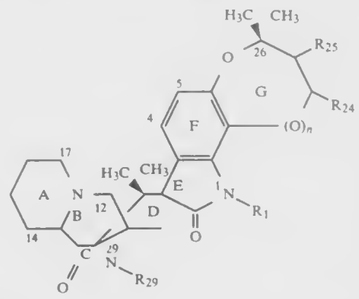
4,923,867

SYNTHETIC MARCFORTINE DERIVATIVES USEFUL AS ANTIPARASITIC AGENTS

Timothy A. Blizzard, Rahway, and Helmut Mrozik, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 24, 1988, Ser. No. 235,418
Int. Cl.[5] C07D *491/22;* A61K *31/495;* A01N *43/60*
U.S. Cl. 514—250 19 Claims

1. A compound having the formula:



wherein:

n is 0 or 1

R_1 is hydrogen, lower alkyl, benzyl, lower alkanoyl, benzenesulfonyl in which the benzene ring is substituted with from 0 to 3 substituents selected from lower alkyl groups, lower alkoxy groups and halogen atoms, lower alkylamiano-carbonyl, lower alkoxy-carbonyl;

R_{24} is hydrogen, halogen or lower alkoxy (provided that R_{24} is other than hydrogen only if the broken line represents a single bond at the 24, 25-position),

R_{25} is hydrogen or halogen (provided that R_{25} is other than hydrogen only if the broken line represents a single bond at the 24, 25-position);

R_{29} is hydrogen, lower alkyl, alkoxyalkyl, haloalkyl, lower alkenyl, lower alkynyl, benzyl, lower alkanoyl, substituted benzenesulfonyl, lower alkylamino-carbonyl, not hydrogen or methyl if R_1 is hydrogen; and the broken line represents a single or double bond between carbons 24 and 25.

16. A method for the treatment and/or prevention of helminth or anthropod infections in domesticated animals which comprises treating such animals with an effective amount of a compound of claim 1.

17. A method for the treatment of insect or nematode pests of plants which comprises treating said plants or the soil in which they grow with an effective amount of a compound of claim 1.

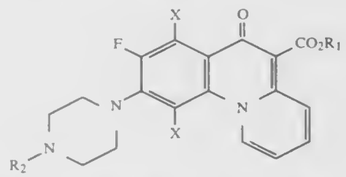
4,923,868

8-FLUORO AND 7,8,10-TRIFLUORO-9-(SUBSTITUTED)-6-OXO-6H-BENZO(C)QUINOLIZINE-5-CARBOXYLIC ACIDS

Daniel B. Moran, Suffern; Yang-I Lin, Tappan, and Carl B. Ziegler, Pearl River, all of N.Y., assignors to American Cyanamid Company, Wayne, N.J.

Filed Feb. 21, 1989, Ser. No. 312,153
Int. Cl.[5] A61K *31/495;* C07D *401/04*
U.S. Cl. 514—253 4 Claims

1. A compound of the formula:



wherein R_1 is hydrogen, alkyl(C_1–C_3), alkali metal, or alkaline earth metal; R_2 is hydrogen, benzyl or alkyl(C_1–C_3); X is hydrogen or fluoro; and when R_1 is hydrogen, a pharmaceutically acceptable salt thereof.

3. A method of treating bacterial infections in warm-blooded animals which comprises administering to said animals an antibacterially effective amount of a compound selected from those of claim 1.

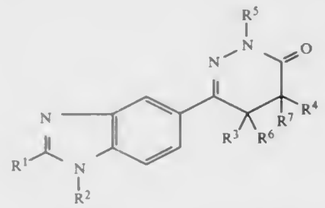
4,923,869

BENZIMIDAZOLYLPYRIDAZINONES

Helmut Prücher, Heppenheim; Rochus Jonas, Darmstadt, both of Fed. Rep. of Germany; Jaime Piulats, Barcelona, Spain, and Michael Klockow, Rossdorf, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Feb. 19, 1986, Ser. No. 830,781
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505609
Int. Cl.[5] C07D *401/14;* A61K *31/50*
U.S. Cl. 514—253 20 Claims

1. A benzimidazolylpyridazinone of the formula



wherein

R^1 is styryl, a mononuclear or binuclear heteroaryl group which contains 1-4 heterotoms, or styryl or one of said heteroaryl groups each of which is single or multiply substituted by alkyl, alkoxy, alkylthio, halogen, OH, SH, amino, alkylamino, dialkylamino, acylamino of 1-8 carbon atoms, nitro, COOH, COOalkyl or CN,

each of R^2, R^3, R^4 and R^5 independently is H or alkyl, and R^6 and R^7 are each H, or together are a C—C bond,

and in which each alkyl and alkoxy group is of 1-4 C atoms and acyl is alkanoyl, benzoyl, picolinoyl, nicotinoyl, isonicotinoyl, or benzoyl, picolinoyl, nicotinoyl or isonicotinoyl each substituted by the substituents listed for styryl except acylamino,

or a pharmacologically acceptable salt thereof.

4,923,870

2-CARBONYL SUBSTITUTED N,N'-DI-(TRIMETHOXYGENZOYL)PIPERAZINES, PROCESS FOR PREPARING THE SAME AND THERAPEUTICAL COMPOUNDS CONTAINING THEM

Pierre Braquet, Garches, France; Georges Dive, Tilff, Belgium; Jean-Jacques Godfroid; Francoise Heymans, and Eduardo Pirotzky, all of Paris, France, assignors to Societe de Conseils de Reserches et d'Applications Scientifiques, France

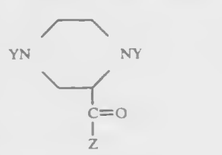
Filed Oct. 6, 1989, Ser. No. 418,114

Claims priority, applicatioo United Kingdom, Oct. 11, 1988, 8823775

Int. Cl.[5] **A61K** *31/495;* **C07D** *241/04*

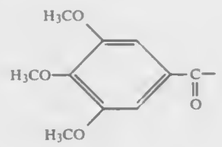
U.S. Cl. 514—255 **3 Claims**

1. Piperazine derivatives having the general formula I:



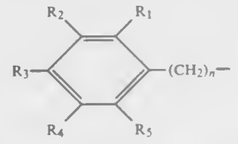
I

wherein Y stands for



and Z represents

either a substituent OA wherein A represents a straight or branched alkyl chain having from 1 to 12 carbon atoms; a cycloalkyl group having from 5 to 10 carbon atoms or a group of the general formula:



wherein n is zero or an integer of from 1 to 5 and either each of R_1, R_2, R_3, R_4 and R_5 independently represents a hydrogen, chlorine or bromine atom, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, methyl or methoxy, group,

or a substituent



wherein A_1 and A_2 independently represent a hydrogen atom or, the same groups A as above defined or A_1 and A_2, together form a cycloalkyl group having from 5 to 10 carbon atoms.

3. A therapeutic composition of matter comprising an effective amount of, at least, one compound according to claim 1, associated with the usual excipients for the selected administration route.

4,923,871

CERTAIN 2,6-DIMETHYL-4-(PYRAZOLO[1,5A]-PYRIDIN-3-YL)1,4-DIHYDRO-PYRIDINE-3,5-DICARBOXYLATE DERIVATIVES AND COMPOSITIONS CONTAINING SAME

Makoto Inaba, Tokyo; Hirotaka Shinoda, and Fujio Iinuma, both of Saitama, all of Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha and Japanese Foundation for Cancer Research, both of Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,373

Claims priority, application Japan, Nov. 26, 1986, 61-281093

Int. Cl.[5] **C07D** *401/04, 241/04;* **A61K** *31/44, 31/495*

U.S. Cl. 514—255 **3 Claims**

1. A compound selected from the group consisting of dimethyl 2,6-dimethyl-4-(2-isopropylpyrazolo[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate;

methyl ethyl 2,6-dimethyl-4-(2-isopropylpyrazolo-[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate;

butyl methyl 2,6-dimethyl-4-(2-isopropylpyrazolo-[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate;

tert-butyl methyl 2,6-dimethyl-4-(2-isopropylpyrazolo-[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate;

methyl octyl 2,6-dimethyl-4-(2-isopropylpyrazolo-[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate;

N-benzyl-N-methyl-2-aminoethyl methyl 2,6-dimethyl-4-(2-isopropylpyrazolo-[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate;

methyl 2-dimethylaminoethyl 2,6-dimethyl-4-(2-isopropylpyrazolo-[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate;

methyl 2-(4-methyl-1-piperazinyl)ethyl 2,6-dimethyl-4-(2-isopropylpyrazolo-[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate; and

methyl 2-(N-benzyl-N-methylamino)ethyl 2,6-dimethyl-4-(2-isopropylpyrazolo-[1,5-a]pyridin-3-yl)-1,4-dihydropyridine-3,5-dicarboxylate.

4,923,872

ANALOGUES OF PYRROLO[3,2D]PYRIMIDIN-4-ONES

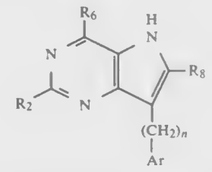
Catherine R. Kostlan, and Jagadish C. Sircar, both of Ann Arbor, Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.

Continuation of Ser. No. 117,352, Nov. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 59,419, Jun. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 900,486, Aug. 26, 1986, abandoned. This application Apr. 10, 1989, Ser. No. 336,585

Int. Cl.[5] **A61K** *31/505;* **C07D** *487/04*

U.S. Cl. 514—258 **16 Claims**

1. A compound of the formula (I)



wherein R_6 is OH or SH; R_2 is hydrogen or NH_2, R_8 is hydrogen or NH_2, n is an integer of one through four, and Ar is (i) phenyl unsubstituted or substituted by halogen, alkyl of from one to four carbon atoms, hydroxy, alkoxy of one to four carbon atoms, or trifluoromethyl, (ii) 2- or 3- thienyl, (iii) 2- or 3- furanyl; or a pharmaceutically acceptable acid or base addition salt thereof.

4,923,873

QUINAZOLINE SUBSTITUTED AMINOMETHYL BENZENE DERIVATIVES

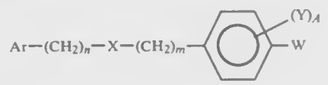
David M. Stout, Vernon Hills, and William L. Matier, Libertyville, both of Ill., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 617,286, Jun. 4, 1984, which is a division of Ser. No. 401,752, Jul. 26, 1982, Pat. No. 4,562,201. This application May 18, 1987, Ser. No. 50,354

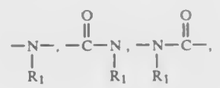
Int. Cl.[5] **C07D** *239/72, 239/84;* **A61K** *31/505*

U.S. Cl. 514—259 **16 Claims**

1. A compound of the formula

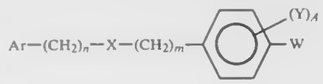


where X is

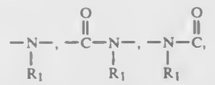


wherein R_1 is hydrogen, or lower alkyl; W is hydrogen, or hydroxy, $(Y)_A$ is positioned ortho to W and is an aminoalkyl having the formula $—CH_2NR_2R_3$, wherein R_2 and R_3 are the same or different and may be hydrogen, lower alkyl of 1 to 6 carbon atoms or, cycloalkyl of from 3 to 7 carbon atoms, or is 1 or 2 piperidinomethyl or 1 or 2 pyrrolidinomethyl moieties, and A is 1 or 2; n and m are independently from 0 to 2 with the proviso that n and m are not simultaneously 2; and Ar is quinazoline, optionally substituted with methyl, chloro or methoxy, or a pharmaceutically acceptable salt thereof.

8. A cardiac arrhythmic composition having an antiarrhythmic-effective amount of the compound having the formula



where X is



wherein R_1 is hydrogen, or lower alkyl; W is hydrogen, or hydroxy, $(Y)_A$ is positioned ortho to W and is an aminoalkyl having the formula $—CH_2NR_2R_3$, wherein R_2 and R_3 are the same or different and hydrogen, lower alkyl of 1 to 6 carbon atoms, cycloalkyl of from 3 to 7 carbon atoms, or represents 1 or 2 piperidinomethyl or 1 or 2 pyrrolidinomethyl moieties and A is 1 or 2; n and m are independently from 0 to 2 with the proviso that n and m are not simultaneously 2 and Ar is quinazoline, optionally substituted with chloro, lower alkyl, lower alkoxy, or trifluoromethyl; or a pharmaceutically acceptable salt thereof in admixture with a pharmaceutically acceptable carrier or diluent.

4,923,874

USE OF 8-AZAPURIN-6-ONE DERIVATIVES FOR CONTROL OF HYPERTENSION

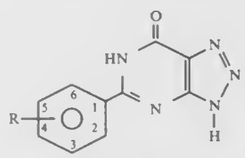
Ellen G. McMahon, and Robert E. Manning, both of St. Louis, Mo., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 21, 1988, Ser. No. 222,680

Int. Cl.[5] **A61K** *31/505*

U.S. Cl. 514—258 **18 Claims**

1. A method for treatment of hypertension in a host in need of said treatment by administering a therapeutically-effective amount of an antihypertensive compound selected from the group consisting of a family of compounds of formula



wherein R represents one or more groups selected from the group consisting of alkyl, alkenyl, alkoxy, alkenyloxy, aralkyl and aralkoxy, the alkyl portion of any of said groups being in linear or branched configuration and containing one to about twenty carbon atoms; and or a pharmaceutically-acceptable salt thereof; with the proviso that at least one of R is an alkoxy group.

4,923,875

METHOD FOR TREATMENT OF MAST CELL-MEDIATED DERMATOLOGIC DISORDERS

Phillip Frost, Miami Beach, Fla., assignor to Baker Cummins Pharmaceuticals, Inc., Miami, Fla.

Filed Jul. 10, 1989, Ser. No. 377,572

Int. Cl.[5] **A61K** *31/44*

U.S. Cl. 514—282 **10 Claims**

1. A method of treating an affected skin area of a human or animal patient suffering from a mast cell-mediated dermatologic disorder comprising the topical application to the skin area of said patient of an effective amount of a pharmaceutical composition comprising (a) from about 0.01 to about 10% by weight of a compound selected from the group consisting of

nalmefene and its pharmaceutically acceptable salts and esters, and (b) an inert pharmaceutical carrier.

4,923,876

VINCA ALKALOID PHARMACEUTICAL COMPOSITIONS

Daniel L. Francis, Albuquerque, N. Mex., and Robert Kasubick, Auora, Ohio, assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 185,231, Apr. 18, 1988, abandoned, which is a continuation of Ser. No. 83,507, Aug. 7, 1987, abandoned, which is a continuation of Ser. No. 918,387, Oct. 19, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,391

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—283 **8 Claims**

1. A pharmaceutical formulation comprising, per ml of a final solution, water, about 1 mg of vincristine sulfate, between 1 and 2 mg of a preservative selected from methyl paraben and propyl paraben either alone or in combination, and a citrate buffer at a concentration between 0.002 to about 0.01M, wherein the solution pH is between about 4.4 and 4.8.

4,923,877

COMPOSITION AND METHOD FOR TREATING GLAUCOMA

Marko T. Markov; Chavdar B. Ivanov, both of Sofia; Deltcho G. Jelyazkov, Varna; Diana M. Mondeschka, Sofia; Nikolina D. Berova, Sofia; Rositza S. Rakovska, Sofia; Maria G. Todorova, Sofia; Diana D. Popova, Sofia; Emiliya D. Slavova, Sofia; Tatyana S. Zikolova, Sofia; Viola M. Marinova, Sofia; Radi G. Ovcharov, Sofia; Petko D. Uzunov, Sofia; Jossif N. Nissimov, Sofia, and Dobrinka G. Gentcheva, Sofia, all of Bulgaria, assignors to Pharmachim, Sofia, Bulgaria

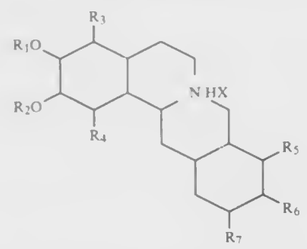
Filed Mar. 3, 1988, Ser. No. 163,595

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—284 **6 Claims**

1. An antiglaucoma composition in unit dosage form comprising a carrier and as active component from 0.25%–0.5% of a hexahydrodibenzo (a, f) quinolizine in a collyre in racemic or optically active form of general formula I:

I



where r_1 and R_2 are H, Ch_3, or CH_3CO; R_3 and R_4 are H or OH; R_5, R_6 and R_7 are H, OH or CH_3O; X is a halogen, and pharmaceutically acceptable salts thereof-in an amount effective to treat glaucoma in a host having this condition, said composition being characterized by not irritating the eye or causing myosis, hyperemia or allergic reactions when locally and systematically given in the eye, said composition not causing bronchospasm or brandicardia and only momentary hypotensive effect.

4,923,878

QUINOLIZINE SULFONAMIDES USED AGAINST CERTAIN NEOPLASTIC DISEASE STATES

Joel R. Huff, Lederach, and Allen I. Oliff, Gwynedd Valley, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

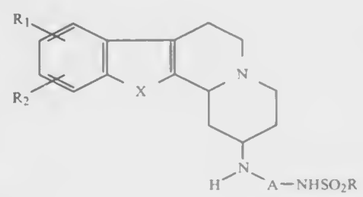
Filed Nov. 14, 1988, Ser. No. 270,323

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—285 **3 Claims**

1. A method of treating or preventing neoplastic disease in animals including humans which comprises administering a therapeutically effective amount of a compound of the formula:

I



wherein:

A is ethylene;

X is oxygen;

R is methyl;

R_1 and R_2 are hydrogen; and the pharmaceutically acceptable salts thereof to an animal affected by neoplastic disease which is sensitive to treatment with the compounds of formula I.

4,923,879

1,8-NAPHTHYRIDINES AND THEIR USE AS ANTIBACTERIAL AGENTS

Marland P. Hutt, Jr., Saline, and John S. Kiely, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

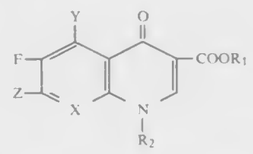
Filed Jul. 31, 1987, Ser. No. 80,113

Int. Cl.[5] A61K *31/435, 31/47;* **C07D** *471/04, 279/10*

U.S. Cl. 514—300 **6 Claims**

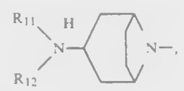
1. A compound of the formula

I

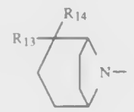


wherein Z is selected from the group consisting of (c) to (e):

(c)



(d)



or

-continued

(e)



R_{11} and R_{12} are each independently hydrogen, isopropyl or cyclopropyl with the proviso that both R_{11} and R_{12} cannot both be hydrogen;

the dotted line shows a double or single bond, R_{14} is hydrogen or alkyl of from one to three carbons, or

R_{17} and R_{18} are each independently hydrogen, $NR_{19}R_{20}$, OR_{19}, SR_{19}, alkyl of from one to three carbon atoms, or halogen, wherein R_{19} and R_{20} are each independently hydrogen, alkyl of from one to three carbon atoms, or alkanoyl of from one to three carbon atoms;

X is N;

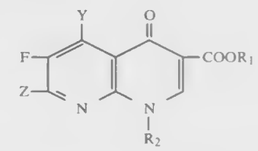
Y is hydrogen, fluoro, or amino;

R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation;

R_2 is an alkyl of from one to four carbon atoms, vinyl, haloalkyl, hydroxyalkyl of from two to four carbon atoms, or a cycloalkyl of from three to six carbon atoms, phenyl, or substituted phenyl wherein the substituents on the phenyl are halogen, amino, hydroxy, or alkyl;

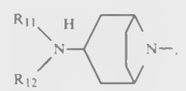
or a pharmaceutically acceptable acid addition or base salt thereof.

5. A pharmaceutical composition for treating bacterial infections comprising an antibacterially effective amount of a compound of the formula

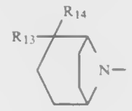


wherein Z is selected from the group consisting of (c) to (e):

(c)



(d)



or

(e)



R_{11} and R_{12} are each independently hydrogen, or cyclopropyl with the proviso that both R_{11} and R_{12} cannot both be hydrogen;

the dotted line shows a double or single bond, R_{13} is CH_2OR_{15}, $CH_2NR_{15}R_{16}$, or $NR_{15}R_{16}$ wherein R_{15} and R_{16} are hydrogen, alkyl of from 1–3 carbon atoms, alkanoyl of from 1–3 carbon atoms; R_{14} is hydrogen or alkyl of from one to three carbons, or

R_{17} and R_{18} are each independently hydrogen, $NR_{19}R_{20}$, OR_{19}, SR_{19}, alkyl of from one to three carbon atoms, or halogen, wherein R_{19} and R_{20} are each independently hydrogen, alkyl of from one to three carbon atoms, or alkanoyl of from one to three carbon atoms;

Y is hydrogen, fluoro, or amino;

R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation;

R_2 is an alkyl of from one to four carbon atoms, vinyl, haloalkyl, hydroxyalkyl of from two to four carbon atoms, or a cycloalkyl of from three to six carbon atoms, phenyl, or substituted phenyl wherein the substituents on the phenyl are halogen, amino, hydroxy, or alkyl;

or a pharmaceutically acceptable acid addition or base salt thereof together with a pharmaceutically acceptable carrier.

4,923,880

4,5,6,7-TETRAHYDROISOTHIAZOLO (4,5-C) PYRIDINE DERIVATIVES

Povl Krogsgaard-Larsen, Alleroed; Erik Falch, Vedbaek, and Henrik Pedersen, Broenshoej, all of Denmark, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

Filed Mar. 13, 1989, Ser. No. 322,632

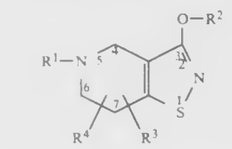
Claims priority, application United Kingdom, Mar. 14, 1988, 8806013; Sep. 26, 1988, 8822564

Int. Cl.[5] A61K *31/44;* **C07D** *513/04*

U.S. Cl. 514—301 **9 Claims**

1. A compound of the following formula:

I



individual isomers and pharmaceutically acceptable acid addition salts thereof, wherein

R^1 is hydrogen, alkyl or phenyl-lower alkyl, in which the phenyl group may be substituted with halogen, lower alkyl or lower alkoxy;

R^2 is alkyl, alkenyl, alkynyl, branched or unbranched, with 1–6 carbon atoms inclusive, which group may be optionally substituted with fluoro, hydroxy or phenyl optionally substituted with halogen, trifluoromethyl, lower alkyl, hydroxy or lower alkoxy;

R^3 and R^4 are the same or different, and each represents hydrogen, alkyl (1–6 C-atoms), cycloalkyl (3–6 C-atoms), phenyl optionally substituted with halogen trifluoromethyl, lower alkyl, hydroxy or lower alkoxy, or phenyl-lower alkyl, in which the phenyl group may be substituted with halogen, trifluoromethyl, lower alkyl, hydroxy or lower alkoxy.

4,923,881

QUINOLYL METHOXY COMPOUNDS, PROCESSES FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Teruo Oku; Yoshio Kawai; Hiroshi Kayakiri; Kazuyoshi Kuratani, and Masashi Hashimoto, all of Tsukuba, Japan, assignors to Fujisawa Phatmaceutical Co., Ltd., Osaka, Japan

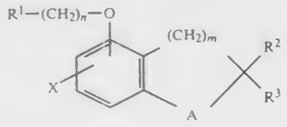
Filed Apr. 13, 1988, Ser. No. 181,174

Claims priority, application United Kingdom, Apr. 28, 1987, 8710008; Aug. 21, 1987, 8719778; Jan. 15, 1988, 8800872

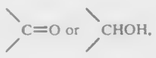
Int. Cl.[5] A61K *31/47;* **C07D** *215/4*

U.S. Cl. 514—311 **7 Claims**

1. A bicyclic compound of the following formula:



wherein



R^1 is quinoly
R^2 is hydrogen or lower alkyl,
R^3 is lower alkyl,
X is hydrogen, halogen, hydroxy or lower alkyl,
m is an integer 1 or 2, and
n is an integer 1 to 4, or pharmaceutically acceptable salts thereof.

4,923,882

NOVEL AMINE DERIVATIVES, SALTS THEREOF AND AN ANTI-ULCER AGENT CONTAINING THE SAME

Shiro Hirai, Toyama; Hiroshi Hirano, Oyabe; Hirotoshi Arai, Toyama; Yasuo Kiba, Toyama; Hisanari Shibata, Toyama; Yoshikazu Kusayanag, Toyama; Minako Yotsuji, Toyama; Kazuhiko Hashiba, Toyama, and Kikuko Tanada, Takaoka, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

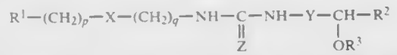
Division of Ser. No. 550,933, Nov. 14, 1983, Pat. No. 4,643,849. This application Oct. 16, 1986, Ser. No. 919,716

Claims priority, application Japan, Nov. 12, 1982, 57-198434

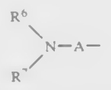
Int. Cl.[5] A61K *31/445;* **C07D** *409/12*

U.S. Cl. 514—326 **22 Claims**

1. An amine compound represented by the formula:



or pharmaceutically acceptable salt thereof, wherein R^1 is phenyl, thienyl or furyl which may optionally be substituted by at least one substituent selected from the group consisting of C_{1-8} alkyl or,



wherein R^6 and R^7, which may be the same or different, are C_{1-8} alkyl or R^6 and R^7 may be bonded together forming a piperidino radical and A is C_{1-4} alkylene; p is 0 or 1; X is oxygen or sulfur; q is 2 or 3; Z is $CHNO_2$; Y is C_{1-4}-alkylene; R^2 is phenyl or thienyl which may optionally be substituted by at least one substituent selected from the group consisting of halogen, hydroxyl, amino, C_{1-8} alkyl, C_{1-4} alkoxy, halogeno-C_{1-4} alkyl or methylenedioxy in which the oxygen atoms are linked to adjacent carbon atoms; and R^3 is hydrogen.

4,923,883

1-AMINOMETHYL-3-ARYL-4-CYANO-PYRROLES AND THEIR USE AS FUNGICIDES

Detlef Wollweber, Wuppertal; Wolfgang Krämer, Burscheid; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

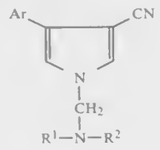
Division of Ser. No. 147,466, Jan. 25, 1988. This application Jun. 8, 1989, Ser. No. 363,015

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702852

Int. Cl.[5] C07D *401/12;* **A01N** *43/40*

U.S. Cl. 514—343 **11 Claims**

1. A 1-aminomethyl-3-aryl-4-cyano-pyrrole of the formula



in which
Ar represents optionally substituted phenyl,
R^1 represents optionally substituted alkyl, represents alkenyl, alkynyl or cycloalkyl, or represents in each case optionally substituted aralkyl or aryl, and
R^2 represents in each case optionally substituted pyridylalkyl, pyridylalkenyl, pyridylalkynyl or pyridyl.

9. A fungicidal composition comprising a fungicidally effective amount of a 1-aminomethyl-3-aryl-4-cyano-pyrrole according to claim 1 and a diluent.

4,923,884

ETHYNYLHETEROAROMATIC-ACIDS HAVING RETINOIC ACID-LIKE ACTIVITY

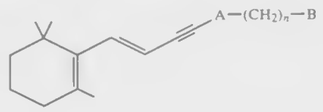
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Continuation of Ser. No. 946,749, Dec. 24, 1986, abandoned. This application Apr. 1, 1988, Ser. No. 180,649

Int. Cl.[5] A61K *31/455, 31/44;* **C07D** *213/56, 213/46*

U.S. Cl. 514—354 **5 Claims**

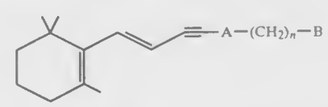
1. A compound of the formula



where
A is pyridyl;
n is 0–5; and
B is H, —COOH or its esters of saturated aliphatic alcohols of ten or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic alcohols of 5 to 10 carbon atoms, phenol, amides or mono- or di-substituted amides of saturated aliphatic alcohols of ten or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic radicals of 5 to 10 carbon atoms, and pharmaceutically acceptable salts, —CHO and its lower alkyl acetal derivatives, $—CH_2OH$ and its lower alkyl ethers and acyl esters of saturated aliphatic acids of ten or fewer carbon atoms or the cyclic or saturated aliphatic cyclic acids of 5 to 10 carbon atoms, and benzoic acid, or $—COR_1$ and its lower alkyl ketal derivatives where R_1 is $—(CH_2)_nCH_3$ where n is define above; or a pharmaceutically acceptable salt.

4. A method for treating psoriasis in a mammal which method comprises administering to a mammal in need thereof,

a therapeutically effective amount of a compound of the formula I alone or in admixture with a pharmaceutically acceppt-ble excipient where formula I is



I

wherein A is pyridyl, n is 0–5; and B is H, —COOH and its esters, amides and pharmaceutically acceptable salts, —CHO and its acetal derivatives, or $—COR_1$ and its ketal derivatives where R_1 is $—(CH_2)_nCH_3$ where n is defined above; or a pharmaceutically acceptable salt.

4,923,885

5-AMINO-1-(4-NAPHTHOYLBENZYL)-1,2,3-TRIAZOLE-4-CARBOXAMIDES AND ANALOGS AS ANTIPROLIFERATIVE AGENTS

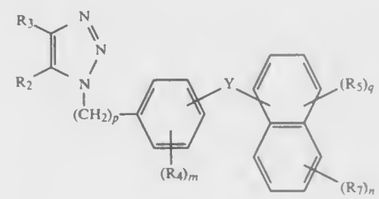
Donald Hupe, Westfield, and Matthew J. Wyvratt, Mountainside, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 19, 1988, Ser. No. 233,779

Int. Cl.[5] C07D *213/04*

U.S. Cl. 514—359 **8 Claims**

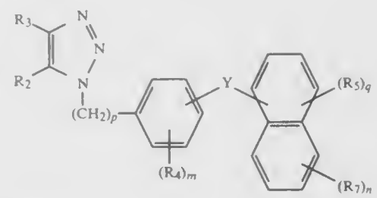
1. A pharmaceutical composition for controlling, hyperliferation in mammalian cells comprising a pharmaceutical carrier and a therapeutically effective amount of a compound of formula



(I)

wherein
p is 0 to 2;
m and n independently are 0 to 4;
q is 0 to 3;
Y is O, S, SO, SO_2, CO, CHCN, CHF, CH_2, or $C{=}NR_6$
where R_6 represents
(a) hydrogen;
(b) loweralkyl;
(c) hydroxy;
(d) loweralkoxy;
(e) amino;
(f) loweralkylamino;
(g) diloweralkylamino; or
(h) cyano;
R_4, R_5 and R_7 independently are
(a) halogen;
(b) cyano;
(c) trifluoromethyl;
(d) loweralkanoyl;
(e) nitro;
(f) loweralkyl;
(g) loweralkoxy;
(h) carboxy;
(i) carbaloxy;
(j) trifluoromethoxy;
(k) acetamido;
(l) loweralkylthio;
(m) loweralkylsulfonyl;
(n) loweralkylsulfonyl;
(o) trichlorovinyl;
(p) trifluoromethylthio;
(q) trifluoromethylsulfinyl; or
(r) trifluoromethylsulfonyl;
R_2 is
(a) amino;
(b) mono or diloweralkylamino;
(c) acetamido;
(d) acetimido;
(e) ureido;
(f) formamido;
(g) formimido; or
(h) guanidino; and
R_3 is
(a) carbamoyl;
(b) cyano;
(c) carbazoyl;
(d) carbazoyl;
(e) amidino; or
(f) N-hydroxycarbamoyl.

5. A compound of formula



(I)

wherein
p is 0 to 2;
m and n independently are 0 to 4;
q is 0 to 3;
Y is O, S, SO, SO_2, CO, CHCN, CHF, CH_2, or $C{=}NR_6$
where R_6 represents
(a) hydrogen;
(b) loweralkyl;
(c) hydroxy;
(d) loweralkoxy;
(e) amino;
(f) loweralkylamino;
(g) diloweralkylamino; or
(h) cyano;
R_4, R_5 and R_7 independently are
(a) halogen;
(b) cyano;
(c) trifluoromethyl;
(d) loweralkanoyl;
(e) nitro;
(f) loweralkyl;
(g) loweralkoxy;
(h) carboxy;
(i) carbaloxy;
(j) trifluoromethoxy;
(k) acetamido;
(l) loweralkylthio;
(m) loweralkylsulfonyl;
(n) loweralkylsulfonyl;
(o) trichlorovinyl;
(p) trifluoromethylthio;
(q) trifluoromethylsulfinyl; or
(r) trifluoromethylsulfonyl;
R_2 is
(a) amino;
(b) mono or diloweralkylamino;
(c) acetamido;
(d) acetimido;
(e) ureido;
(f) formamido;

(g) formimido; or
(h) guanidino; and
R_3 is
(a) carbamoyl;
(b) cyano;
(c) carbazoyl;
(d) carbazoyl;
(e) amidino; or
(f) N-hydroxycarbamoyl.

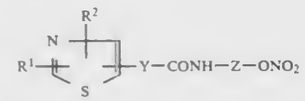
4,923,886
NITRIC ESTER DERIVATIVE
Youichi Shiokawa, Ibaraki; Koichi Takimoto, Takarazuka, and Kohei Takenaka, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan
Filed Jun. 30, 1988, Ser. No. 213,623
Claims priority, application United Kingdom, Jul. 20, 1987, 8717068
Int. Cl.[5] C07D *277/30, 277/56;* A61K *31/425*
U.S. Cl. 514—365 9 Claims

1. A compound of the formula:



wherein
R^1 is hydrogen, lower alkyl, halo(lower)alkyl, halogen, phenyl, nitrophenyl, pyridyl, morpholino, piperidino, amino, lower alkanoylamino, higher alkanoylamino, benzamido, lower alkoxycarbonylamino, N-lower alkylamino, N,N-di(lower)alkylamino, N-lower alkyl-N-lower alkanoylamino, 3-lower-alkylureido or N,N-di(lower) alkylamino(lower)alkyl,
R^2 is hydrogen, lower alkyl or N-(nitrooxy-(lower)alkyl) carbamoyl,
Y is a single bond, lower alkylene or lower alkenylene, and
Z is ethylene, trimethylene, tetramethylene, 1-methyl-1-nitrooxymethylethylene, 1,1-bis(nitrooxymethyl)ethylene, 2-nitrooxytrimethylene or ethyleneoxyethylene, and pharmaceutically acceptable salts thereof.

2. A compound of the formula:



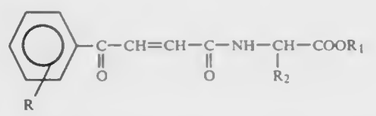
wherein
R^1 is hydrogen, lower alkyl, halo(lower)alkyl, halogen, aryl selected from the group consisting of phenyl, tolyl, xylyl, cumenyl, naphthyl and biphenylyl, which may have one or more substituent(s) selected from the group consisting of nitro, halogen, hydroxy and amino, pyridyl, morpholino, piperidino, amino, lower alkanoylamino, higher alkanoylamino, aroyl selected from the group consisting of benzoyl, toluoyl, xyloyl, isopropylbenzoyl, naphthoyl and biphenylcarbonyl, lower alkoxycarbonylamino, N-lower alkylamino, N,N-di(lower)-alkylamino, N-lower alkyl-N-lower alkanoylamino, 3-lower alkylureido or N,N-di(lower)alkylamino(lower)-alkyl,
R^2 is hydrogen, lower alkyl or N-(nitrooxy(lower)-alkyl)-carbamoyl,
Y is a single bond, lower alkylene or lower alkenylene, and
Z is lower alkylene selected from the group consisting of ethylene, trimethylene, propylene, tetramethylene, methyltrimethylene, dimethylethylene and hexamethylene, which may have one or more nitrooxy, or lower alkyleneoxy(lower)alkylene, in which lower alkylene is selected from the group consisting of ethylene, trimethylene, propylene, tetramethylene, methyltrimethylene, dimethylethylene and hexamethylene, and pharmaceutically acceptable salts thereof.

4,923,887
LIQUID FORMULATIONS OF 1,2-BENZISOTHIAZOLIN-3-ONE, THEIR PREPARATION AND THEIR USE
Wolfgang Bauer, Maintal; Hans-Walter Bücking, Kelkheim, and Karl-Heinz Wallhäusser, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 19,520, Feb. 26, 1987, abandoned. This application Aug. 25, 1988, Ser. No. 236,903
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1986, 3609939
Int. Cl.[5] A61K *31/425, 31/33*
U.S. Cl. 514—373 4 Claims

1. Antimicrobially active liquid composition formulation which is a biocide for preserving and protecting aqueous solutions from infestation with Escherichia coli and which contains
(a) 14 to 45% by weight of a mixture of substantially equimolar amounts of 1,2-benzisothiazolin-3-one and an ethoxylated (coconut alkyl)-amine with a degree of ethoxylation of 2;
(b) 10 to 35% by weight of one or more water-miscible organic solvents, selected from the group consisting of lower mono-, di-and trihydric alcohols, glycols, di- and polyglycols, ethers of glycols and di- and polyglycols;
(c) 20 to 55% by weight of water;
(d) 0 to 15% by weight of one or more emulsifying agents, selected from the group consisting of sulfuric acid esters; salts of sulfonic acids; ethyleneoxide and propyleneoxide adducts with fatty acids, fatty alcohols, fatty amines, alkylphenoles, partial fatty acid esters of polyhydric alcohols and of sorbitol; and polyalkylene glycol; and
(e) 0 to 5% by weight of one or more complexing agents based on ethylene diamino tetraacetic acid.

4,923,888
BUTENOIC ACID AMIDES, THEIR SALTS, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM
Tamás Fodor; Lászlo Dobay; Jáanos Fischer; Béla Stefkóo; Eleméer Ezer; Judit Matuz; Katalin Sághy, and Lászlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary
Filed Sep. 26, 1988, Ser. No. 248,969
Claims priority, application Hungary, Sep. 25, 1987, 4302/87
Int. Cl.[5] A61K *31/40*
U.S. Cl. 514—414 4 Claims

1. A 4-Oxo-4-(substituted phenyl)butenoic acid amide of the formula (I),

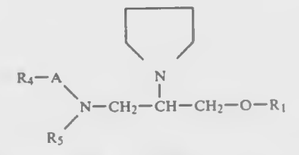


(I)

wherein
R =stands for hydrogen, halogen, C_{1-4}alkyl, C_{1-4}alkoxy or C_{1-4}acylamino group;
R_1 =means hydrogen or a carboxyl-protective group selected from the group consisting of C_{1-4}alkyl, diphenylmethyl, trimethylbenzyl and phthalimidomethyl; and
R_2 =represents a $-(CH_2)_n-CO_2R_5$ group, wherein
n =is 1, 2, 3 or 4; and
R_5 =stands for hydrogen or a carboxyl-protective group selected from the group consisting of C_{1-4}alkyl, diphenylmethyl, trimethylbenzyl and phthalimidomethyl; or
R_2 =means a $-(CH_2)_n-NH_2$ group, wherein
n is 1, 2, 3 or 4
of E and/or Z configuration or a salt thereof.

4,923,889
1,2-DIAMINO COMPOUNDS, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM
Herbert Leinert, Heppenheim; Christos Tsaklakidis, Weinheim, and Gisbert Sponer, Laudenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany
Filed Aug. 11, 1988, Ser. No. 230,947
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726632
Int. Cl.[5] A61K *31/40;* C07D *295/08*
U.S. Cl. 514—422 9 Claims

1. Compound selected from the group consisting of 2-diethylamino-3-isobutoxy-N-phenyl-N-2-furanyl-methyl-propylamine and a compound of the formula:



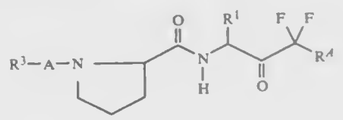
(I)

wherein R_1 is an iso-C_4-C_6-alkyl radical; A is a valency bond or a straight-chained or branched alkyl radical containing up to 6 carbon atoms; R_4 is a phenyl radical which is unsubstituted or substituted one or more times by C_1-C_6-alkyl, C_2-C_6-alkenyl, C_1-C_3-alkoxy, C_2-C_6-alkenyloxy, hydroxy-C_1-C_6-alkyl, C_2-C_6-alkylenedioxy, hydroxy-C_1-C_3-alkoxy, C_1-C_3-alkoxy-C_1-C_3-alkoxy, C_1-C_6-alkylamino, di(C_1-C_6-alkyl)amino, C_1-C_3-alkoxycarbonyl-C_1-C_3-alkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylsulphinyl, C_1-C_6-alkylsulphonyl, C_1-C_6-alkylsulphonyloxy, carboxyl, C_1-C_3-alkoxycarbonyl, aminocarbonyl, mono- or di(C_1-C_6-alkyl)aminocarbonyl, halo-C_1-C_6-alkyl, cyano, or halogen; and R_5 is a benzyl radical substituted at least once by C_1-C_3-alkoxy; or a pharmacologically acceptable salt thereof or optical isomer thereof.

7. A method of producing a blood vessel relaxing effect in a patient in need of such effect, comprising administering to said patient a blood vessel relaxing amount of a compound of claim 1.

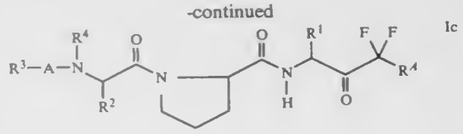
4,923,890
DIFLUORO KETO COMPOUNDS AND THEIR USE AS HLE INHIBITORS
Diane A. Trainor, Glen Mills, Pa., and Mark M. Stein, Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.
Continuation-in-part of Ser. No. 3,993, Jan. 16, 1987, abandoned. This application May 19, 1987, Ser. No. 51,951
Claims priority, application United Kingdom, Jun. 5, 1986, 8613704
Int. Cl.[5] A61K *9/12, 31/40, 9/14;* C07D *207/09*
U.S. Cl. 424—46 12 Claims

1. A compound of formula Ib or Ic



Ib

-continued



Ic

wherein
R^1 is an alkyl group having 1 to 5 carbons;
R^2 is an alkyl group containing from 1 to 10 carbons;
R^3 is selected from a group consisting of:
(A) an alkyl group containing from 1 to 12 carbons;
(B) an alkyl group containing from 1 to 12 carbons and substituted by 1 to 3 members selected independently from a group consisting of:
(1) hydroxy, provided that it may not be on a carbon directly bonded to A;
(2) amino, provided that it may not be on a carbon directly bonded to A;
(3) alkylamino containing from 1 to 6 carbons, provided that it may not be on a carbon directly bounded to A;
(4) dialkylamino wherein each alkyl group contains from 1 to 6 carbons, provided that it may not be on a carbon directly bonded to A;
(5) alkanoyl containing from 2 to 6 carbons;
(6) arylcarbonyl wherein the aryl contains 6, 10 or 12 carbons;
(7) aralkanoyl containing 8 to 13 carbons;
(8) amido which may be attached to the alkyl group via either a nitrogen or carbon of said amido;
(9) alkylcarabonylamino wherein the alkyl group contains from 1 to 6 carbons;
(10) alkylaminocarbonyl wherein the alkyl group contains from 1 to 6 carbons;
(11) arylcarbonylamino wherein the aryl group contains 6, 10 or 12 carbons;
(12) arylcarbonylamino wherein the aryl group contains 6, 10 or 12 carbons and is substituted by a member selected from carboxy, alkoxycarbonyl, where alkoxy is 1 to 3 carbons, 5 -tetrazolo, and acylsulfonamido containing 2 to 15 carbons and provided that when the acylsulfonamido contains an aryl the aryl contains 6, 10 or 12 carbons and may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;
(13) aralkylcarbonylamino wherein the aralkyl group contains from 7 to 13 carbons;
(14) aralkylcarbonylamino wherein the aralkyl group contains 7 to 13 carbons and is substituted on the aryl portion by a member selected from carboxy, alkoxycarbonyl, where the alkoxy has 1 to 3 carbons, 5-tetrazolo, and acylsulfonamido containing 2 to 15 carbons and provided that when the acylsulfonamido contains an aryl the aryl contains 6, 10 or 12 carbons and may be further substituted by a member selected from fluro, chloro, bromo, iodo and nitro;
(15) arylaminocarbonyl wherein the aryl group contains 6, 10 or 12 carbons;
(16) aralkylaminocarabonyl wherein the aralkyl group contains from 7 to 13 carbons;
(17) carboxy;
(18) aryloxycarbonyl wherein the aryl group contains 6, 10 or 12 carbons;
(19) aralkoxycarbonyl wherein the aralkoxy group contains from 7 to 13 carbons;
(20) alkanoyloxy containing from 2 to 6 carbons;
(21) aroyloxy wherein the aryl portion contains 6, 10 or 12 carbons;
(22) aralkanoyloxy, containing from 8 to 13 carbons;
(23) alkylsulfonamido wherein the alkyl group contains from 1 to 6 carbons;

(24) cycloalkylsulfonamido wherein the cycloalkyl portion contains 3 to 15 carbons;
(25) aralkylsulfonamido wherein the aralkyl group contains from 7 to 13 carbons;
(26) arylsulfonamido wherein the aryl group contains 6, 10 or 12 carbons;
(27) acylsulfonamido (2 to 15 carbons) including acylsulfonamido wherein the acyl group contains 1 to 7 carbons when it is the terminal portion of the acylsulfonamide, and provided that when the acylsulfonamido contains an aryl the aryl contains 6, 10 or 12 carbons and may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;
(28) alkoxycarbonyl wherein the alkoxy group contains from 1 to 6 carbons;
(29) aralkoxycarabonylamino containing from 8 to 13 carbons;
(30) aralkylaminocarbonyloxy containing 8 to 13 carbons;
(31) aryloxy wherein the aryl contains 6, 10 or 12 carbons;
(32) aryloxy wherein the aryl contains 6, 10 or 12 carbons and is substituted by a member selected from aminocarbonyl, aminocarabonylalkyl where the alkyl has 1 to 3 carbons, alkoxycarbonyl having 1 to 3 carbons, and carboxy;
(33) aryloxycarbonylamino wherein the aryloxy group contains 6, 10 or 12 carbons;
(34) arylaminocarbonyloxy wherein the aryl group contains 6, 10 or 12 carbons;
(35) alkoxycarbonylamino wherein the alkyloxy group contains from 1 to 6 carbons;
(36) aryloxyalkylcarbonylamino wherein the aryl contains 6 or 10 carbons and the alkyl has 1 to 6 carbons;
(37) alkylaminocarbonyloxy wherein the alkyl group contains 1 to 6 carbons;
(38) aryl containing 6, 10 or 12 carbons;
(39) aryloxy containing 6, 10 or 12 carbons;
(40) aryl containing 6, 10 or 12 carbons and substituted by 1 to 3 members independently selected from a group consisting of chloro, bromo, iodo, fluoro, hydroxy, trifluoromethyl, alkyl (1 to 6 carbons), alkoxy (1 to 6 carbons), alkanoyloxy (2 to 6 carbons), alkoxycarbonyl (2 to 6 carbons), carboxy, aminocarbonylalkyl (2 to 6 carbons), aminocarbonyl, 5-tetrazolo, and acylsulfonamido (2 to 15 carbons), and provided that when the acylsulfonamido contains an aryl the aryl contains 6, 10 or 12 carbons and may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;
(41) aryloxy containing 6, 10 or 12 carbons and substituted on carbon by 1 to 3 members independently selected from a group consisting of chloro, bromo, iodo, fluoro, hydroxy, trifluoromethyl alkyl (1 to 6 carbons), alkoxy (1 to 6 carbons), alkanoyloxy (2 to 6 carbons), alkoxycarbonyl (2 to 6 carbons), carboxy, aminocarbonylalkyl (2 to 6 carbons), aminocarbonyl, 5-tetrazolo, acylsulfonamido (2 to 15 carbons) and provided that when the acylsulfonamido contains an aryl the aryl contains 6, 10 or 12 carbons and may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;
(42) cycloalkyl containing from 3 to 15 carbons;
(43) cycloalkyloxy containing from 3 to 15 carbons;
(44) alkylureido wherein the alkyl group contains from 1 to 6 carbon atoms;
(45) cycloalkylureido wherein the cycloalkyl group contains 3 to 15 carbons;
(46) aralkylureido wherein the aralkyl group contains from 7 to 13 carbons;
(47) arylureido wherein the aryl group contains 6, 10 or 12 carbons;
(48) arylureido wherein the aryl group contains 6, 10 or 12 carbons and is substituted by 1 to 3 members selected independently from a group consisting of chloro, bromo, iodo, fluoro, hydroxy, trifluoromethyl, alkyl (1 to 6 carbons), alkoxy (1 to 6 carbons), alkanoyloxy (2 to 6 carbons), alkoxycarbonyl (2 to 6 carbons), carboxy, aminocarbonylalkyl (2 to 6 carbons), aminocarbonyl, 5-tetrazolo, and acylsulfonamido (2 to 15 carbons) including acylsulfonamido wherein the acyl group contains 1 to 7 carbons when it is the terminal portion of the acylsulfonamide and provided that when the acylsulfonamido contains an aryl the aryl contains 6, 10 or 12 carbons and may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;

(C) an aryl group containing 6, 10 or 12 carbons;

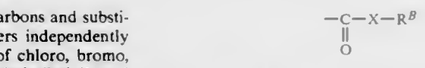
(D) an aryl group containing 6, 10 or 12 carbons suitably substituted by 1 to 3 members selected independently from a group consisting of fluoro, chloro, bromo, iodo, trifluromethyl, hydroxy, alkyl containing from 1 to 6 carbons, alkanyoyloxy (2 to 6 carbons), alkoxy containing from 1 to 6 carbons, alkoxycarbonyl containing from 2 to 6 carbons, carboxy, alkylcarbonylamino wherein the alkyl group contains 1 to 6 carbons, 5-tetrazolo, and acylsulfonamido containing from 2 to 15 carbons, and provided that when the acylsulfonamido contains an aryl the aryl contains 6, 10 or 12 carbons and may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro;

(E) a cycloalkyl group containing from 3 to 15 carbons;

(F) an alkenyl group of 2 to 10 carbons, having at least one double bond; and

(G) an alkenyl group of 2 to 10 carbons, having at least one double bond and substituted by a member selected from a group consisting of
(a) aryl of 6 or 10 carbons;
(b) aryl of 6 or 10 carbons substituted by 1 to 3 members selected independently from a group consisting of chloro, bromo, iodo, fluoro, hydroxy, trifluoromethyl, alkyl (1 to 6 carbons), alkoxy (1 to 6 carbons), alkanoyloxy (2 to 6 carbons), alkoxycarbonyl (2 to 6 carbons), carboxy, 5-tetrazolo, and acylsulfonamido (2 to 15 carbons) and provided that when the acylsulfonamido contains an aryl the aryl contains 6, 10 or 12 carbons and may be further substituted by a member selected from fluoro, chloro, bromo, iodo and nitro; and
(c) ureidocarbonyl;

R^4 is selected from a group consisting of hydrogen and methyl; R^A is represented by the following formula

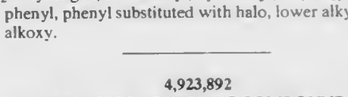


or is CH_2R^B; wherein

R^B is alkyl group containing from 2–12 carbons and substituted on a terminal carbon by a member selected from a group consisting of:
(a) amido which may be attached to the alkyl group via either a nitrogen or carbon of said amido;
(b) alkylaminocarbonyl wherein the alkyl group contains from 1 to 6 carbons;
(c) arylaminocarbonyl wherein the aryl group contains 6, 10 or 12 carbons;
(d) aralkylaminocarbonyl wherein the aralkyl group contains from 7 to 13 carbons;
(e) carboxy;
(f) aryloxycarbonyl wherein the aryl group contains 6, 10 or 12 carbons;
(g) aralkoxycarbonyl wherein the aralkoxy group contains from 7 to 13 carbons;
(h) alkoxycarbonyl wherein the alkoxy group contains from 1 to 6 carbons;
(i) (7 or 11 C)arylsulfonylaminocarbonyl;
(j) (7 or 11 C) arylsulfonylaminocarbonyl substituted on the aryl portion by 1 to 3 member(s) selected from a group consisting of fluoro, chloro, bromo and iodo; and
(k) (2–15 C)alkylsulfonylaminocarbonyl; and

X is CH_2 or NR^C with R^C being hydrogen or CH_3; or, when taken together, XR^B is CH_3 or phenyl; and

A is selected from a group consisting of



and pharmaceutically acceptable salts thereof.

10. A pharmaceutical composition comprising a compound as claimed in claim 1 in an amount sufficient to inhibit human leukocyte elastase in a living mammal in association with a non-toxic pharmaceutically acceptable diluent or carrier.

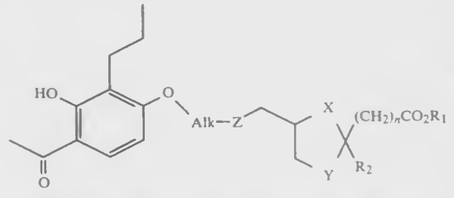
4,923,891

LEUKOTRIENE LTD_4 AND LTB_4 ANTAGONISTS

James R. Deason, Wilmette; Michael A. Stealey, Libertyville, and Richard M. Weier, Lake Bluff, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 100,685, Sep. 24, 1987, Pat. No. 4,808,729. This application Sep. 9, 1988, Ser. No. 241,265
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] A61K *31/335*
U.S. Cl. 514—433 **40 Claims**

31. A method of treating allergy comprising administering to an animal in need of such treatment a therapeutically effective amount of a compound of the formula



or a pharmaceutically acceptable salt or geometrical or optical isomer thereof wherein:
X, Y, and Z are each independently O or S with S optionally oxidized to S=O;
Alk is straight or branched chain alkylene or hydroxyalkylene containing 1–6 carbon atoms;
R_1 is hydrogen or lower alkyl;
n is 0 to 5; and
R_2 is hydrogen, lower alkyl, cycloalkyl, $—(CH_2)_n—CO_2R_1$, phenyl, phenyl substituted with halo, lower alkyl or lower alkoxy.

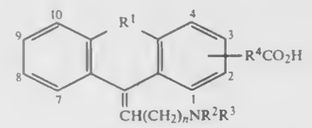
4,923,892

TRICYCLIC AROMATIC COMPOUNDS

O. William Lever, Jr., Skillman, N.J., and Harry J. Leighton, Chapel Hill, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 6,894,306, Aug. 7, 1986, Pat. No. 4,871,865. This application May 23, 1989, Ser. No. 356,884
Claims priority, application United Kingdom, Aug. 17, 1985, 8520662
Int. Cl.[5] A61K *31/335*
U.S. Cl. 514—450 **12 Claims**

1. A method of treating allergy in a mammal which comprises administering to a mammal in need thereof an effective allergy treatment amount of a compound of formula (I)



(I)

or a pharmacologically and pharmaceutically acceptable salt thereof; wherein R^1 is $—CH_2—O—$, R^2 and R^3 are the same or different and are each hydrogen or C_{1-4} alkyl, R^4 is a C_{1-2} bivalent hydrocarbon group and is joined to the aromatic ring system at the 2 position and n is 2.

4,923,893

EXTERNAL PREPARATION OF VITAMIN-E

Izumi Saitoh, Hyogo; Shigeru Kido; Yoshio Doi, both of Osaka, and Shohei Egawa, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Nov. 4, 1988, Ser. No. 267,284
Claims priority, application Japan, Dec. 8, 1987, 62-310481
Int. Cl.[5] A61K *31/355, 31/185*
U.S. Cl. 514—458 **6 Claims**

1. An external preparation consisting essentially of about 0.1% to about 5% of tocopherol acetate, with or without about 0.05% to about 0.3% of glycyrrhetinic acid; about 1% to about 15% of a methacrylic acid-ethyl acrylate copolymer, in which the monomer ratio of ethyl acrylate to methacrylic acid is within a range from 75/25 to 95/5 with residual monomer being 50 ppm or less and with substantially no surfactants; and 0.2% to about 3% of a thickening agent in a lower alkanol whose concentration in water is 60% or greater.

4,923,894

POLYMERIC MICROPARTICLES HAVING PESTICIDAL ACTIVITY

Kazunori Kanda, Yao, and Ryuzo Mizuguchi, Yawata, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 9, 1986, Ser. No. 849,929
Claims priority, application Japan, Apr. 10, 1985, 60-077179
Int. Cl.[5] C07F *7/22*
U.S. Cl. 514—493 **2 Claims**

1. Fungicide-loaded internally cross-linked polymeric microparticles having a diameter of about 0.01 to 2 microns, said microparticles being prepared by polymerizing a mixture of ethylenically unsaturated monomers wherein at least a portion of the monomer mixture is a monomer having at least two polymerizable sites per molecule or a combination of two monomers having mutually reactive groups, said monomer mixture further containing a fungicide dissolved therein, wherein said fungicide is soluble in said monomer mixture but insoluble in the polymerization medium thereof, and whereby said fungicide is physically entrapped within a polymer matrix constituting said polymer microparticles.

4,923,895

METHOD OF TREATMENT OF HUMAN IMMUNODEFICIENCY VIRUS

Monto Ho, and Phalguni Gupta, both of Pittsburgh, Pa., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Oct. 24, 1988, Ser. No. 261,680
Int. Cl.[5] A61K *31/285*
U.S. Cl. 514—504 **8 Claims**

1. A method of treating a human patient having human immunodeficiency virus comprising
administering to said patient intravenously a dosage of oxyphenarsine therapeutically effective to inhibit immunodeficiency virus.

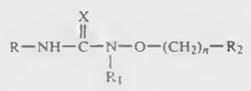
4,923,896

N-(SUBSTITUTED ARYL)-N'-(SUBSTITUTED ALKOXY)-UREAS AND THIOUREAS AS ANTIHYPERCHOLESTEROLEMIC AND ANTIATHEROSCLEROTIC AGENTS

Bharat K. Trivedi, Canton, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

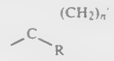
Filed Feb. 9, 1989, Ser. No. 308,911
Int. Cl.[5] A61K *31/21; C07C 83/10*
U.S. Cl. 514—507 **8 Claims**

1. A compound of Formula I



I

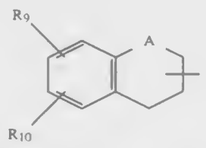
wherein
R is phenyl,
phenyl mono or disubstituted with
alkyl of from one to four carbon atoms,
alkoxy of from one to four carbon atoms,
fluorine,
chlorine,
bromine,
iodine,
CO_2R_3 wherein R_3 is alkyl of from one to four carbon atoms, or
NR_4R_5 wherein R_4 and R_5 are independently hydrogen or alkyl of from one to four carbon atoms,
naphthyl, or
naphthyl substituted with alkyl of from one to four carbon atoms
alkoxy of from one to four carbon atoms,
fluorine,
chlorine,
bromine,
iodine,
CO_2R_3 wherein R_3 is as defined above, or
NR_4R_5 wherein R_4 and R_5 are as defined above;
X is O or S;
R_1 is hydrogen,
alkyl of from four to eight carbon atoms, or phenylalkyl wherein alkyl is from one to four carbon atoms;
n is 0 or an integer of 1 or 2;
R_2 is bicyclo[2.2.1]heptane, bicyclo[2.2.2]octane,



wherein n' is an integer of 2 to 6 and
R is as defined above,



wherein R_6 is hydrogen, alkyl of from one to eight carbon atoms or phenyl, R_7 is alkyl of from one to eight carbon atoms when R_6 is alkyl of from one to eight carbon atoms or R_7 is phenyl, and R_8 is phenyl or phenyl substituted with alkyl of from one to four carbon atoms, alkoxy of from one to four carbon atoms, fluorine, chlorine, bromine, iodine, CO_2R_3 wherein R_3 is as defined above, or NR_4R_5 wherein R_4 and R_5 are as defined above,



wherein R_9 and R_{10} are independently hydrogen, alkyl of from one to four carbon atoms, alkoxy of from one to four carbon atoms, fluorine, chlorine, bromine, iodine, CO_2R_3 wherein R_3 is as defined above or NR_4R_5 wherein R_4 and R_5 are as defined above, and A is $—CH_2—$,
naphthyl or
naphthyl substituted with alkyl of from one to four carbon atoms,
alkoxy of from one to four carbon atoms,
fluorine,
chlorine,
bromine,
iodine,
CO_2R_3 wherein R_3 is as defined above or
NR_4R_5 wherein R_4 and R_5 are as defined above; or a pharmaceutically acceptable acid addition salt thereof.

7. A method of treating hypercholesterolemia or atherosclerosis comprising administering to a mammal in need of such treatment an acylcoenzyme A: cholesterol acyltransferase-inhibitory effective amount of a compound as defined in claim 1 in unit dosage form.

4,923,897

STABLE AQUEOUS PYRETHROID INSECTICIDAL FORMULATIONS FOR CONTAINMENT IN POLYVINYL CHLORIDE CONTAINERS

Stanley J. Flashinski, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 921,286, Oct. 20, 1986, Pat. No. 4,851,438, which is a continuation of Ser. No. 767,225, Aug. 19, 1985, abandoned. This application May 4, 1989, Ser. No. 347,467
Int. Cl.[5] A01N *53/00*
U.S. Cl. 514—531 **9 Claims**

1. In combination with a polyvinyl chloride container, an aqueous insecticidal composition for containment in the polyvinyl chloride container, the aqueous insecticidal composition comprising water, wherein the improvement comprises:
the aqueous insecticidal composition further comprising:
at least one pyrethroid insecticide in the water; and
an effective amount of a nonionic surfactant selected from the group consisting of an alkylphenol ethoxylate, an ethoxylated primary alcohol, a polyoxyethylene thioether, and mixtures thereof, and having an HLB value of about 10 to about 14, for producing an aqueous pyrethroid insecticidal formulation that is able to maintain its insecticidal activity and integrity when contained in the polyvinyl chloride container;
the thus-produced aqueous pyrethroid insecticidal formulation being contained within the polyvinyl chloride container.

4,923,898

ANALGESIC, ANTI-INFLAMMATORY AND SKELETAL MUSCLE RELAXANT COMPOSITIONS COMPRISING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS AND MUSCULOSKELETAL RELAXANTS AND METHODS OF USING SAME

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Division of Ser. No. 114,751, Oct. 30, 1987, Pat. No. 4,780,463, which is a division of Ser. No. 815,502, Jan. 2, 1986, Pat. No. 4,722,938, which is a continuation of Ser. No. 686,380, Dec. 26, 1984, abandoned. This application Aug. 3, 1988, Ser. No. 227,989
Int. Cl.[5] A61K *31/19*
U.S. Cl. 514—557 **20 Claims**

1. A pharmaceutical composition of matter for use in the treatment of musculoskeletal disorders in a mammalian organism, said composition comprising an analgesically and anti-inflammatory effective amount of (i) at least one of the propionic acid NSAIDs, ibuprofen, naproxen, benoxaprofen, flurbiprofen, fenoprofen, fenbufen, ketoprofen, indoprofen, pirprofen, carprofen, oxaprozin, pranoprofen, miroprofen, ibuprofen aluminum, tioxaprofen, suprofen, alminoprofen, tiaprofenic acid, fluprofen, bucloxic acid or pharmaceutically acceptable salt thereof, in combinatory immixture with a skeletal muscle relaxing amount of (ii) at least one of the SMRs, zoxazolamine, chlorzoxazone or pharmaceutically acceptable salt thereof.

4,923,899

STERILANT COMPOSITION

Stanley L. Wachman, Cherry Hill, and Sidney Karlan, Nutley, both of N.J., assignors to Cetylite Industries, Inc., Pennsauken, N.J.

Continuation-in-part of Ser. No. 139,166, Dec. 22, 1987, abandoned, which is a continuation of Ser. No. 906,557, Sep. 8, 1986, abandoned, which is a continuation of Ser. No. 776,479, Sep. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 692,776, Jan. 18, 1985, abandoned. This application Jun. 23, 1988, Ser. No. 210,626
Int. Cl.[5] A01N *33/12, 35/00*
U.S. Cl. 514—642 **2 Claims**

1. A sterilant composition for killing on a nonabsorbent surface bacteria, spores, fungi, and viruses selected from the group consisting of *Salmonella Chloreraesuis* (ATCC 10708), *Staphylococcus aureus* (ATCC 19659), *Pseudomonas aeruginosa* (ATCC 15442), *Bacillus subtilis* (ATCC 19659) *Clostridium sporogeneses* (ATCC 3584), *Trichophyton mentagrophytes* (ATCC 27289), Herpes Simplex I, Herpes Simplex II, Coxsackie virus BI, Coxsackie virus A9, Vaccinia virus, Influenza virus A, Adeno virus II, Poliovirus I, Rhino virus, Cytomegalo virus, and Corona virus, consisting of
(a) from about 0.05 wgt % to about 3 wgt % of alkylbenzyldimethyl ammonium chloride wherein the alkyl group has from 10 to 18 carbon atoms,
(b) from about 0.5 wgt % to about 7 wgt % of glutaraldehyde,
(c) from about 0.05 wgt % to about 3 wgt % of cetyldimethylethylammonium bromide,
(d) from about 0.1 wgt % to about 3 wgt % of an alcohol having from one to six carbon atoms,
(e) from about 0.05 wgt % to about 2 wgt % of a less than totally oxidized salt whose anion is selected from the group consisting of nitrite, bisulfite, and chlorite and who cation is selected from the group consisting of sodium, potassium, lithium and ammonium,
(f) from about 0.1 wgt % to about 3 wgt % of a polyol selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol, and glycerine,
(g) from 0 to 0.015 wgt % of a salt or ester of ethylene diamine tetraacetic acid, and
(h) balance of water.

4,923,900

THERAPEUTIC COMPOSITIONS CONTAINING BENZOYL PEROXIDE

Richard L. De Villez, San Antonio, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 694,226, Jan. 24, 1985, abandoned. This application May 13, 1986, Ser. No. 862,808
Int. Cl.[5] A61K *3/075*
U.S. Cl. 514—714 **18 Claims**

1. A method for alleviation of an individual's acne, seborrhea, dermatophyte infection, reaction to irritative plant contactants or body order, the method including
applying to affected skin areas of the individual a therapeutically effective amount of a composition comprising:
benzoyl peroxide particles in a quantity between about 1% by weight and about 20% by weight of the composition;
water in a quantity between about 30% by weight and about 94% by weight of the composition; and
demethylisosorbide in a quantity between about 5% by weight and about 50% by weight of the composition.

4,923,901

MEMBRANES WITH BOUND OLIGONUCLEOTIDES AND PEPTIDES

Hubert Koester, Concord, and James M. Coull, Acton, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Sep. 4, 1987, Ser. No. 93,011
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—53 **42 Claims**

1. A modified membrane comprising a polymeric membrane having a protected nucleoside or amino acid linked thereto.

4,923,902

PROCESS AND COMPOSITIONS FOR REINFORCING STRUCTURAL MEMBERS

Joseph Wycech, Grosse Pointe Woods, Mich., assignor to Essex Composite Systems, Roseville, Mich.

Filed Mar. 10, 1988, Ser. No. 166,282
Int. Cl.[5] C08J *9/32;* **B01J** *13/02*
U.S. Cl. 521—54 **19 Claims**



1. A two-part kit for reinforcing a hollow structural member comprising:
a pre-measured quantity of a first composition;
a pre-measured quantity of a second composition;
said first composition including from about 5 to about 99 percent by weight thermosetting resin and from aboout 0.1 to about 20 percent by weight unexpanded, thermally-expandable microspheres;
said second composition including from about 10 to about 90 percent by weight curing agent adapted to promote cross-linking polymerization of said thermosetting resin in an exothermic reaction, said unexpanded, thermally expandable microspheres being adapted to expand due to the heat

generated by said exothermic reaction without the application of heat from an external heat source;
said first composition further having from about 0.5 to about 90 percent by weight filler to provide a doughy consistency to said first composition;
said second composition further having from about 0.5 to about 90 percent by weight filler to provide a doughy consistency to said second composition;
said first and second compositions being provided in said kit at a predetermined ratio to one another;
whereby the blending of said second composition with said first composition causes said curing agent to combine with said thermosetting resin to bring about said exothermic reaction of said thermosetting resin, and wherein heat evolved during said exothermic reaction causes said thermally-expandable microspheres to expand as said thermosetting resin cures.

4,923,903

DYED AQUEOUS AIR FOAMS

Roger R. Alm, and Richard M. Stern, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 24, 1989, Ser. No. 301,512
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—65 **40 Claims**

1. A dyed or colored, non-extractable or non-leachable, air-entrained, closed cell, low density, fluid, aqueous air foam comprising: (A) air as a discontinuous gas phase and the major component of said foam by volume; and (B) a continuous, dyed or colored, polymeric, aqueous, liquid phase comprising water as the major component of said foam by weight, surfactant, and dyed or colored, gelling or viscosity-increasing agent consisting essentially of a mixture of poly(oxyalkylene) polyisocyanate prepolymer and reaction product derived from said poly(oxalkylene)polyisocyanate poly(oxyalkylene) prepolymer and one or more isocyanate-reactive dyes.

4,923,904

PROCESS FOR PRODUCING POLYURETHANE FOAM

Hajime Hasegawa, Chigasaki; Taiji Koga, Yokohama; Atsuo Takei, Fujisawa, and Toru Okuyama, Sagamihara, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,244
Claims priority, application Japan, Dec. 26, 1987, 62-330685
Int. Cl.[5] C08G *18/18, 18/65*
U.S. Cl. 521—115 **5 Claims**

1. A process for producing a polyurethane foam having good buckling performance by a one-shot process or prepolymer process which comprises:
mixing a raw material comprising polyols, an organic isocyanate, a catalyst and a blowing agent, said polyols consisting of a mixture of a high-molecular weight polyol having a hydroxyl number of from 25 to 100 and a molecular weight of from 2000 to 4000 and a low-molecular weight polyol having a hydroxyl number of from 200 to 600 and a molecular weight of from 200 to 800 at a weight ratio of 4:6 to 6:4, and said catalyst consisting of a tertiary amine, wherein said organic isocyanate is used in an amount of from 20 to 70 parts by weight for 100 parts by weight of the total amount of said polyols, and said catalyst is used in an amount of from 0.1 to 3 parts by weight for 100 parts by weight of the total amount of said polyols, and
foaming said raw material to obtain a polyurethane foam.

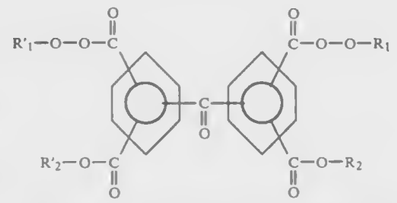
4,923,905

LIGHT CURABLE DENTAL COMPOSITION

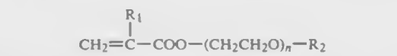
Eiichi Masuhara; Yoshinori Kadoma, both of Tokyo; Takeo Matsumoto, Sakuramura; Takeshi Komai, Aichi; Eiichi Yamada, Sakuramura; Osamu Nakachi, Yokohama, and Godo Irukayama, Yatabemachi, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 768,546, Aug. 23, 1985, Pat. No. 4,746,685. This application Feb. 26, 1988, Ser. No. 160,621
Claims priority, application Japan, Aug. 31, 1984, 59-180268; Dec. 29, 1984, 59-275895; Feb. 26, 1985, 60-35342
Int. Cl.[5] C08F *2/50, 20/28, 20/30, 265/06*
U.S. Cl. 522—24 **15 Claims**

1. A light curable dental paste comprising an ethylenic unsaturated compound and a light polymerization initiator, said light polymerization initiator comprising a combination of an α-diketone and a tetraperoxy ester containing a benzophenone group and represented by the following general formula (I) of:



wherein R_1 and R'_1 each represents the same or different group and stands for a tertiary alkyl group having 4 to 8 carbon atoms or a tertiary aralkyl group having 9 to 12 carbon atoms and R_2 and R'_2 each represents the same or different atom or group and stands for a tertiary alkoxy group having 4 to 8 carbon atoms or a tertiary aralkyloxy group having 9 to 12 carbon atoms, said dental paste further comprising fine particles of an inorganic filler and a high polymer surface active agent, said high polymer surface active agent being a copolymer which is prepared by copolymerizing an unsaturated monomer represented by the following general formual (II) of:



wherein R_1 is a hydrogen atom or a methyl group, R_2 is an alkyl group having 1 to 4 carbon atoms or a phenyl group, and n is an integer of 1 to 15; with an unsaturated ester copolymerizable with said monomer represented by the general formula (II).

4,923,906

RIGID, GAS-PERMEABLE POLYSILOXANE CONTACT LENSES

Karl F. Mueller, New York, and Paul Harislades, Woodhaven, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

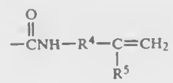
Continuation-in-part of Ser. No. 167,806, Mar. 14, 1988, Pat. No. 4,837,289, which is a continuation-in-part of Ser. No. 45,020, Apr. 30, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 344,158
Int. Cl.[5] C08F *30/08, 120/08, 230/08*
U.S. Cl. 523—107 **8 Claims**

1. A contact lens prepared from an oxygen permeable copolymer which comprises the copolymerization product of
(A) 15 to 85% by weight of a polyunsaturated polysiloxane of formula I



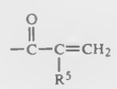
(I)

wherein
n is 5 to about 500;
at least three of A either consists of a reactive vinyl containing group of the formula



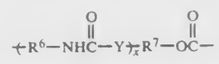
(Ia)

or



(Ib)

where R^4 is arylene of 6 to 12 carbon atoms, alkarylene of 7 to 14 carbon atoms, alkylene of up to 8 carbon atoms, or a group of the formula



(Iaa)

where R^7 is alkylene of 2 to 8 carbon atoms, x is zero or 1, Y is —O— or —NR^8— where R^8 is hydrogen or alkyl of up to 4 carbon atoms, and R^6 is the diradical residue of an aliphatic, cycloaliphatic, aromatic or araliphatic diisocyanate; and R^5 is hydrogen or methyl; and the remaining A are hydrogen or said reactive vinyl containing group;
R^1 is alkyl of up to 4 carbon atoms or phenyl;
R^2 is alkylene of 2 to 6 carbon atoms;
R^3 is an alkanetriyl radical of 3 to 6 carbon atoms, and
(B) 85 to 15% by weight of a comonomer or mixture thereof, which, when polymerized by itself, gives a polymer with a glass-transition temperature greater than 70° C., and which, based on the total weight of comonomer, is
(B_1) 100 to 65% by weight of a water insoluble, monoolefinic monomer or mixture thereof,
(B_2) 0 to 35% by weight, but not over 15% by weight of the total composition, of a water soluble monoolefinic monomer or mixture thereof, and
(B_3) 0 to 50% by weight, but not over 20% of the total composition, is a di- or tri-olefinic crosslinking monomer or mixture thereof.

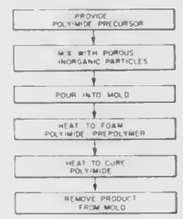
4,923,907

METHOD OF MAKING POROUS INORGANIC PARTICLE FILLED POLYIMIDE FOAM INSULATION PRODUCTS

Francis U. Hill, San Diego, Calif., assignor to Sorrento Engineering, Inc., National City, Calif.

Division of Ser. No. 312,490, Feb. 21, 1989, Pat. No. 4,865,784. This application Jul. 24, 1989, Ser. No. 368,033
Int. Cl.[5] C08J *9/32*
U.S. Cl. 523—218 **2 Claims**

1. A thermal insulation product comprising:
a cured substantially closed cell polyimide foam matrix;
substantially uniform dispersed in said matrix from about 38 to 65 wt%, based on foam weight, of porous, lightweight, high temperature resistant inorganic particles;
said inorganic particles having flake-like configurations with average greatest dimension in the range of from about ¼ to ¾ inch and least dimension in the range of from about 1/32 to 1/16 inch; and
a sheet material bonded to at least one surface thereof.



4,923,908

EPOXY COMPOSITIONS, AND METHOD OF MAKING SAME

Arthur J. Lostumo, Franklin Park, and Bernard M. Wiltgen, Villa Park, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 14, 1988, Ser. No. 257,653
Int. Cl.[5] C08K *3/36, 3/26*; B05D *3/02*
U.S. Cl. 523—220 **43 Claims**

1. A method of making an epoxy resin composition, which comprises: (A) preparing a first mixture comprising (i) an epoxy resin consisting essentially of a polyglycidal ether of a polyhydroxyl phenol and liquid at room temperature and (ii) finely divided solid filler of silica, and calcium carbonate, said filler being at least 50 percent by weight of said first mixture, and admixing said epoxy resin and said filler by applying a high shearing force; (B) preparing a second mixture comprising (i) a cycloaliphatic acid anhydride curing agent, (ii) finely divided solid filler of silica, hydrated alumina, and calcium carbonate, and (iii) a catalytic amount of a catalyst for accelerating the curing of step (C) below, said filler being at least 50 percent by weight of said second mixture, and admixing said curing agent, said filler and said catalyst by applying a high shearing force; and (C) thereafter admixing said first and second mixtures and curing said epoxy resin at a elevated temperature.

4,923,909

METHOD FOR THE SUSPENSION OF PLASTIC ADDITIVES WITH RHEOLOGY AGENTS

Charles C. Kuo, Avon Lake, and Robert M. Gengarelly, Wadsworth, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 3, 1985, Ser. No. 772,113
Int. Cl.[5] C08K *3/04*
U.S. Cl. 523—333 **19 Claims**

1. A method of applying a plastic additive to a polymer; comprising the steps of:
rheologally suspending the plastic additive in a liquid carrier with an effective amount of a thixotropic agent to form a thixotropic slurry capable of retaining at least 60% of an original slurry level during an initial 24 hour period;
applying said thixotropic slurry to the polymer, said polymer being a thermoplastic or a thermoset; and
removing said liquid carrier whereby said polymer contains said plastic additive thereon.

4,923,910

EPOXY RESIN POWDER COATING COMPOSITION WITH EXCELLENT ADHESIBILITY

Katugi Kitagawa, Saitama, and Akira Shinozuka, Matsudo, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 234,056, Aug. 19, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 396,732

Int. Cl.[5] **C08L** *63/02;* **C08K** *7/14, 3/36, 3/34*

U.S. Cl. 523—428 **6 Claims**

1. An epoxy resin powder coating composition with excellent adhesibility which comprises a bisphenol A mixed epoxy resin having a number average molecular weight of from 800 to 2,000 comprising a mixture of a bisphenol A epoxy resin having a number average molecular weight of from 350 to 1,000 and a bisphenol A epoxy resin having a number average molecular weight of from 2,500 to 8,000, an imidazole compound, dicyandiamide, a pre-reacted product of an imidazole compound with epoxy resin, and a filler, wherein the amount of said imidazole compound is 0.1 to 3 parts by weight per 100 parts by weight of the mixed epoxy resin, the amount of said dicyandiamide is 1 to 10 parts by weight per 100 parts by weight of the mixed epoxy resin and the amount of said pre-reacted product is 0.2 to 3 parts by weight per 100 parts by weight of the mixed epoxy resin.

4,923,911

CURABLE MIXTURES

Kurt Munk, Grenzach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,678

Claims priority, application Switzerland, Dec. 29, 1987, 5090/87

Int. Cl.[5] **C08G** *59/68*

U.S. Cl. 523—457 **20 Claims**

1. A curable mixture comprising

(a) at least one epoxy resin containing on average more than one 1,2-epoxy group per molecule,

(b) at least one cyclic carboxylic anhydride,

(c) an adduct of a zinc salt of a C_6–C_{18}carboxylic acid with a tertiary amine, and

(d) optionally a filler and/or further conventional additives.

4,923,912

EPOXY RESIN COMPOSITION

Yukio Sasaki, Roslyn, N.Y.; Takayuki Watanabe, Matsudo, Japan; Hiroshi Takamiya, Kamisu, Japan; Kazuo Watanabe, Osaka, Japan, and Yoko Yamazaki, Nagareyama, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,915

Claims priority, application Japan, Jul. 22, 1987, 62-181235

Int. Cl.[5] **C08G** *59/40, 77/38*

U.S. Cl. 523—466 **11 Claims**

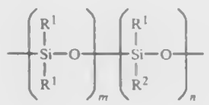
1. An epoxy resin composition consisting essentially of:

(A) an epoxy resin,

(B) a curing agent,

(C) a curing promoter,

(D) an organic silicon compound represented by the formula

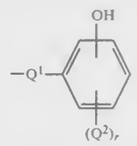


[i]

in which

R^1's are identical or different and each represents a hydrocarbon group selected from the class consisting of C_1–C_3 alkyl groups, C_2–C_4 alkenyl groups, C_6–C_{12} aryl groups, C_3–C_{10} cycloalkyl groups and C_7–C_{12} aralkyl groups, the hydrocarbon group being optionally substituted by 1 to 6 halogen atoms;

R^2 represents a group of the general formula



where Q^1 is a group of the general formula:

$$-O-_p-C_qH_{2q}-$$

p is 0 or 1 and q is an integer of 1 to 3, with the proviso that Q^1 may be bonded to the benzene ring at either end, Q^2 represents a hydrogen atom, a halogen atom, a C_1–C_3 alkyl group, a C_1–C_3 alkoxy group, a C_1–C_3 haloalkyl group or a C_1–C_3 haloalkoxy group, and r is 1 or 2;

m and n represent the numbers of the two types of siloxane moieties contained in the organic silicon compound, and m is 0 or an integer of 1 or more, n is an integer of 1 or more, and the total of m and n is 3 to 250; and,

each of the two ends is R^1 or R^2, and the type of each end group and the number represented by n are selected from the above definitions os that formula [I] contains at least one R^2 group, and

(E) a filler.

4,923,913

LOW TEMPERATURE SEALING ADHESIVE COMPOSITION

Adem Chich, Kearny; Steven S. Lalwani, Upper Montclair; Steven C. Bettoli; Louis L. Grube, both of Bound Brook, and Alfredo A. Bondoc, South Bound Brook, all of N.J., assignors to GAF Building Materials Corporation, Wayne, N.J.

Filed Dec. 30, 1988, Ser. No. 292,408

Int. Cl.[5] **C08L** *95/00, 51/02;* **C08K** *5/12, 5/01*

U.S. Cl. 524—62 **19 Claims**

1. An adhesive composition comprising:

(a) a hard asphaltic bitumen fraction having a penetration number at 77° F. of from 0 to 30 dmm and a softening point of from about 150° to 220° F., and

(b) an elastomeric composition comprising a thermoplastic elastomer and a plasticizer, said plasticizer having a flash point equal to or greater than 250° F. and a boiling point equal to or greater than 250° F. and being present in an amount from about 1 to 80 percent by weight of the elastomeric composition; wherein the amount of plasticizer in the adhesive composition is such that the mixture has a penetration number of from 30 to 100 dmm at 130° F. and a softening point of 140° to 230° F. and wherein the amount of bitumen fraction is about 99 to 80 percent by weight and the amount of elastomeric composition is from about 1 to 20 percent by weight, based on the total amount of the bitumen and elastomeric composition.

4,923,914

SURFACE-SEGREGATABLE, MELT-EXTRUDABLE THERMOPLASTIC COMPOSITION

Ronald S. Nohr, Roswell, and J. Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 14, 1988, Ser. No. 181,359

Int. Cl.[5] **C08K** *5/34*

U.S. Cl. 524—99 **31 Claims**

1. A surface-segregatable, melt-extrudable thermoplastic composition which comprises at least one thermoplastic polyolefin and at least one siloxane-containing additive having at least two moieties, A and B, in which:

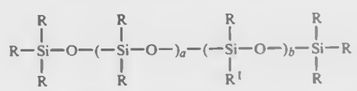
(A) said additive is compatible with said polyolefin at melt extrusion temperatures but is incompatible at temperatures below melt extrusion temperatures, but each of moiety A and moiety B, if present as separate compounds, would be incompatible with said polyolefin at melt extrusion temperatures and at temperatures below melt extrusion temperatures;

(B) moiety B has at least one functional group which is a poly(oxyalkylene) moiety which is end-capped by a C_1–C_4 alkyl group;

(C) the molecular weight of said additive is in the range of from about 400 to about 15,000; and

(D) the weight ratio of said polyolefin to said additive is in the range of from about 1 to about 1,000;

with the proviso that said additive cannot be a compound having the general formula,



in which each R independently is a monovalent organic group selected from the group consisting of alkyl groups; R^1 is a monovalent organic group containing at least one ethyleneoxy group, vicinal epoxy group, or amino group; and a and b, which can be the same or different, each have a value of at least 1.

4,923,915

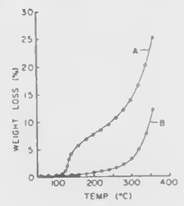
THERMALLY STABILIZED RESIN COATINGS FOR OPTICAL FIBERS

Eric H. Urruti, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed May 18, 1988, Ser. No. 195,651

Int. Cl.[5] **C08K** *5/34*

U.S. Cl. 524—102 **17 Claims**



1. A method for thermally stabilizing a UV-cured acrylate-terminated resin selected from the group consisting of polyurethane acrylate, polyurea acrylate, and polyurethane/polyurea acrylate resins which comprises the step of:

adding to the composition for the resin, in a concentration at least effective to reduce the thermal decomposition rate of the cured resin, a combination of stabilizers which consists essentially of a hindered piperidine derivative and a hindered phenol derivative.

4,923,916

TETRAHALOPHTHALATE ESTERS AS FLAME RETARDANTS FOR POLYSTYRENE RESINS

Joseph M. Bohen, King of Prussia, and Ronald F. Lovenguth, Doylestown, both of Pa., assignors to Pennwalt Corporation, Philadephia, Pa.

Division of Ser. No. 115,211, Oct. 30, 1987, Pat. No. 4,762,861. This application Jul. 19, 1988, Ser. No. 221,053

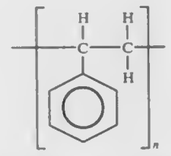
Int. Cl.[5] **C08K** *5/12, 5/20*

U.S. Cl. 524—217 **14 Claims**

1. A flame retardant composition comprising

(i) a styrenic resin which is selected from one of the following:

(a) a homopolymer of styrene having the following repeatable unit



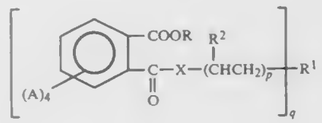
wherein n is within the range of greater than 1 to about 3000;

(b) a homopolymer of styrene as in (a) modified with rubber in which the rubber is dispersed as discrete particles into a matrix of said homopolymer and the weight ratio of rubber to homopolymer is within the range of from about 2:98 to about 25:75; or

(c) a copolymer of butadiene and styrene in which the weight ratio of butadiene to styrene is within the range of about 2:98 to about 25:75; or

(d) blends of (a) and (b);

(ii) a flame retarding effective amount of a flame retardant processing aid of the formula:



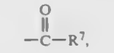
wherein:

(a) R is selected from the group consisting of hydrogen, an alkyl or substituted alkyl of 1 to 30 carbons, hydroxyalkyl of 2 to 20 carbons, polyhydroxyalkyl of 3 to 10 carbons; and

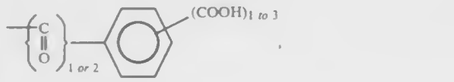


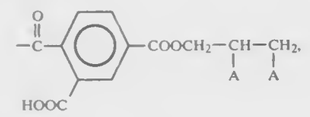
where R^8 is an alkyl or substituted alkyl of 1 to 18 carbons, and b is 1 to 50;

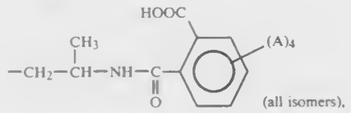
(b) R^1 is selected from the group consisting of hydrogen, an alkyl or substituted alkyl of 1 to 30 carbons, alkenyl or substituted alkenyl of 2 to 22 carbons,

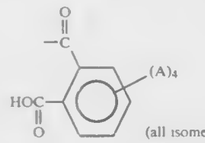


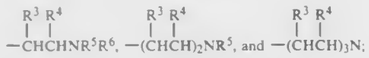
where R^7 is an alkyl of 1 to 18 carbons; a polyhydroxyalkyl of 3 to 12 carbons;











(c) R^2 is independently selected from the class consisting of H and CH_3;
(d) R^3, R^4, R^5, and R^6 are independently selected from the class consisting of H and an alkyl of 1 to 18 carbons;
(e) p is an integer of 0 to 50;
(f) q is an integer of 1 to 6;
(g) X is selected from O or NH; and
(h) A is selected from Cl or Br.

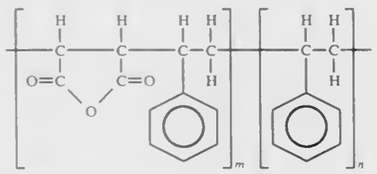
4,923,917

TETRAHALOPHTHALATE ESTERS AS FLAME RETARDANTS FOR STYRENE-MALEIC ANHYDRIDE COPOLYMER (SMA) RESINS

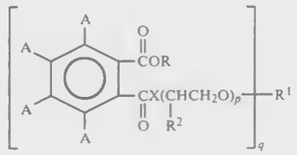
Joseph M. Bohen, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadephia, Pa.

Filed Mar. 25, 1988, Ser. No. 173,691
Int. Cl.[5] C08K *5/12*
U.S. Cl. 524—288 **18 Claims**

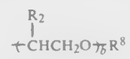
1. A uniform flame retardant composition comprising
(i) a resin consisting essentially of styrene-maleic anhydride having the following general formula:



wherein m is a number from 1 to about 100 and n is a number from zero to about 100; and
(ii) a flame retarding effective amount of a tetrahalophthalate ester flame retardant processing aid of the formula:



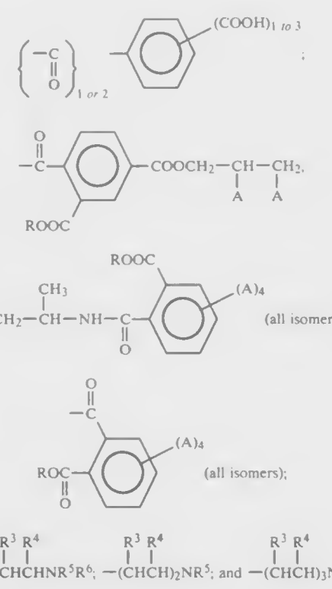
wherein
(a) R is selected from the group consisting of hydrogen, an alkyl or substituted alkyl of 1 to 9 carbons, hydroxyalkyl of 2 to 20 carbons, polyhydroxyalkyl of 3 to 10 carbons, and



where R^8 is an alkyl or substituted alkyl of 1 to 18 carbons, and b is 1 to 50;
(b) R^1 is selected from the group consisting of hydrogen, an alkyl or substituted alkyl of 1 to 9 carbons, alkenyl or substituted alkenyl of 2 to 22 carbons,



where R^7 is an alkyl of 1 to 18 carbons; a polyhydroxyalkyl of 3 to 12 carbons;



with the proviso that the valence of R^1 is equal to q;
(c) R^2 is independently selected from the group consisting of H and CH_3;
(d) R^3, R^4, R^5, and R^6 are independently selected from the group consisting of H and an alkyl of 1 to 18 carbons;
(e) p is an integer of 0 to 50;
(f) q is an integer of 1 to 6;
(g) X is selected from the group consisting of O or NH;
(h) A is selected from the group consisting of Cl or Br; and
(i) provided further that when p is zero and X is oxygen that R and R^1 are other than a neopentyl group.

4,923,918

PROCESS FOR PRODUCING MODIFIED PROPYLENE POLYMER COMPOSITION

Nobutoshi Komori, and Hirokazu Nakazima, both of Chiba, Japan, assignors to Chisso Corporation, Japan

Filed Jun. 8, 1988, Ser. No. 203,822
Claims priority, application Japan, Jun. 10, 1987, 62-144609
Int. Cl.[5] C08K *5/09*
U.S. Cl. 524—339 **16 Claims**

1. A process for producing a modified propylene polymer composition, with propylene polymers having 5 ppm or more of a titanium content or 0.5 ppm or more of a vanadium content as a catalyst residue, which comprises compounding at least 0.01 parts by weight of a zinc salt of carboxylic acid, at least 0.01 parts by weight of a phenolic antioxidant, and from 0.001 to 0.5 part by weight of a radical generator with 100 parts by weight of a propylene polymer and melt-kneading the resulting mixture at a temperature of from 150° C. to 300° C.

4,923,919

PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Glenn R. Frazee, Kenosha County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 119,282, Nov. 4, 1987, Pat. No. 4,845,149, which is a continuation of Ser. No. 899,282, Aug. 22, 1986, abandoned. This application Mar. 8, 1989, Ser. No. 320,349
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] C08F *2/16*
U.S. Cl. 524—460 **8 Claims**

1. A method for preparing a polymer emulsion that can be uitilized as a pressure-sensitive adhesive, the method comprising the steps of:
combining, in an agitated reaction vessel, an alkali-soluble or an alkali-dispersible polymeric resin with water and an effective amount of an alkaline material for forming either a resin-containing alkaline solution or a resin-containing alkaline dispersion, wherein at least about 6 weight percent up to about 30 weight percent of the polymeric resin is prepared from monomers selected from the group consisting of a polymerizable carboxylic acid, a polymerizable acid anhydride, and a polymerizable ester or a polymerizable partial ester of an inorganic acid, and wherein the polymeric resin further includes a polymerizable vinyl monomer selected from the group consisting of acrylic acid esters and derivatives thereof, methacrylic acid esters and derivatives thereof, styrene, alpha-methyl styrene, vinyl toluene, and combinations thereof;
subjecting the agitated reaction vessel contents to an inert atmosphere and maintaining the agitated reaction vessel contents at a predetermined reaction temperature;
adding to the agitated reaction vessel an emulsion-polymerization initiator and, a predetermined time thereafter, further adding to the agitated reaction vessel one of a first emulsion-polymerizable monomer mixture and a second emulsion-polymerizable monomer mixture, wherein the relative amounts of initiator and said one of the first and second emulsion-polymerizable monomer mixtures are effective for initiating emulsion-polymerization of said one monomer mixture in the presence of the polymeric resin, and wherein at least about 40 weight percent of each of the first and second monomer mixtures is selected from the group consisting of at least one alkyl acrylate monomer having an alkyl group with from 2 to 20 carbon atoms, styrene, alpha-methyl styrene, tetraethylene glycol diacrylate, hydroxyethyl methacrylate, methyl methacrylate, propyl methacrylate, hexyl methacrylate, vinyl acetate, and combinations thereof;
and, a predetermined time thereafter, further adding to the agitated reaction vessel, over a predetermined time period, the other of the first and second emulsion-polymerizable monomer mixtures; and
thereafter, maintaining the agitated reaction vessel contents at the predetermined reaction temperature for a predetermined time period, for producing a polymer emulsion that can be utilized as a pressure-sensitive adhesive.

4,923,920

MIXTURES OF ELASTOMER LATICES AND DISPERSIONS OF AROMATIC POLYCARBONATES, POLYESTERS OR POLYESTER CARBONATES AND PRODUCTS PRODUCED THEREFROM

Thomas Scholl, Meerbusch; Hermann Perrey, Krefeld, and Martin Matner, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen

Filed Jun. 20, 1988, Ser. No. 208,655
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721766
Int. Cl.[5] C08L *73/00*
U.S. Cl. 524—501 **8 Claims**

1. Mixtures of latices of 2-chlorobutadiene/methacrylic acid copolymers, 2-chlorobutadiene/dichlorobutadiene copolymers or 2-chlorobutadiene homopolymers and (ii) aqueous dispersions of aromatic polycarbonates.

4,923,921

AQUEOUS DISPERSION OF STYRENE-ACRYLIC POLYMERS AND ITS APPLICATION TO WATER RESISTANT ADHESIVE COMPOSITIONS ESPECIALLY SUITED FOR TILING

Pierre Chevalier, Paris, and Christian Sidot, Ezanville, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Jan. 31, 1989, Ser. No. 304,251
Claims priority, application France, Feb. 24, 1988, 88 02215
Int. Cl.[5] C08J *39/00*
U.S. Cl. 524—555 **4 Claims**

1. Aqueous styrene-acrylic type polymer dispersion characterized in that it contains at least one copolymer consisting of 0.5 to 5% by weight of N-allylacetoacetamide monomer (A) and 99.5 to 95% by weight of a mixture of monomers (B) consisting of 90 to 99.9% by weight of styrene and of at least one monomer selected from C_1 to C_8 alkyl(meth)acrylates and 10 to 0.1% by weight of at least one monomer selected from acrylic acid, methacrylic acid, acrylamide and methacrylamide.

4,923,922

ETHYL ALCOHOL PROCESS FOR POLYVINYL ACETATE PRODUCTION

Paolo Carlin, Rosolina, Italy, assignor to Tecnoassistance S.R.L., Rosolina, Italy

PCT No. PCT/IT87/00002, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/04441, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 26, 1987, Ser. No. 113,930
Claims priority, application Italy, Jan. 28, 1986, 83309 A/86
Int. Cl.[5] C08F *16/06*
U.S. Cl. 525—56 **6 Claims**

1. A method for the preparation of a partially hydrolyzed polyvinyl acetate, suitable for polymerization of vinyl chloride in aqueous suspension, which comprises:
(a) polymerizing vinyl acetate in ethanolic solution under reflux at a weight ratio of vinyl acetate/ethanol of lower than 0.7,
(b) cooling the ethanolic solution of polyvinyl acetate prepared according to step (a) until said solution distinctly separates into an upper phase and a lower phase.

(c) separating said lower phase containing polyvinyl acetate having a K value of higher than 21 from said upper phase, and

(d) hydrolyzing said polyvinyl acetate under acidic or basic conditions to obtain the partially hydrolyzed polyvinyl acetate.

4,923,923

POWDER COMPOSITIONS BASED ON POLYARYLENE SULPHIDES

Klaus Struss, Bayer Aktiengesellschaft, P.O. Box 100140, D4047 Dormagen; Christian Lindner; Karl-Erwin Piejko, both of Bayer Aktiengesellschaft, D 5090 Leverkusen, Bayerwerk, all of Fed. Rep. of Germany; Hans-Jürgen Kress, Mobay Corporation, Plastics and Rubber Division, Building 8, Mobay Rd., Pittsburgh, Pa. 15205, and Dieter Wittmann, Bayer Aktiengesellschaft, P.O. Box 100140, D 4047 Dormagen, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,757

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711623; May 9, 1987, 3715543

Int. Cl.[5] C08L *51/04, 81/04*

U.S. Cl. 525—64 **7 Claims**

1. Process for the preparation of a powder composition of at least one thermoplastic polymer of vinyl monomers and a polyarylene sulphide wherein (a) a dispersion of a polyarylene sulphide is mixed with a dispersion of a thermoplastic polymer of vinyl monomers, (b) the resulting mixture is subjected to coagulation, and (c) the coagulate obtained is separated from the liquid phase and worked up into a powder.

4,923,924

THERMOPLASTIC IMPACT MODIFIED POLYAMIDE-POLYPHENYLENE ETHER COMPOSITION

Thomas S. Grant, Vienna; Ronald L. Jalbert, Parkersburg; David Whalen, Parkersburg; Brenda A. Bartges, Parkersburg, and Tracey L. Thompson, Vienna, all of W. Va., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation-in-part of Ser. No. 60,600, Jun. 11, 1987, Pat. No. 4,798,865, which is a division of Ser. No. 805,644, Dec. 6, 1985, Pat. No. 4,732,938. This application Mar. 22, 1988, Ser. No. 171,801

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[5] C08L *77/00, 59/00, 53/02*

U.S. Cl. 525—66 **20 Claims**

1. A thermoplastic blend composition, comprising (a) from about 30 to about 90 weight percent polyamide, (b) from about 10 to about 70 weight percent carboxylated polyphenylene ether resin which is the product of melt mixing a mixture consisting essentially of 100 parts by weight polyphenylene ether resin and 0.05 to 1 part by weight of an ethylenically unsaturated carboxylic acid compound, and (c) from about 0.1 to about 40 weight percent of an impact modifier selected from the group consisting of grafts of a vinyl aromatic polymer on a diene rubber substrate; vinyl aromatic-conjugated diene-vinyl aromatic triblock polymers; carboxylated vinyl aromatic-conjugated diene-vinyl aromatic triblock polymers; carboxylated hydrogenated vinyl aromatic-conjugated diene-vinyl aromatic triblock polymers; copolymers of an alpha-olefin compound and an unsaturated carboxylic compound; grafts of an acrylic polymer on an acrylate rubber substrate; linear low density polyethylene, and mixtures thereof.

4,923,925

RESIN COMPOSITIONS AND THEIR MANUFACTURING METHOD

Kazumasa Chiba; Kazuhiko Kobayashi, and Osamu Ueno, all of Nagoya, Japan, assignors to Toray Industries, Inc.

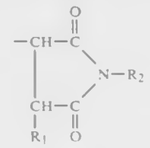
Filed Sep. 1, 1987, Ser. No. 91,708

Claims priority, application Japan, Sep. 2, 1986, 61-206453; Sep. 11, 1986, 61-214614

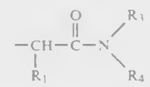
Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—66 **8 Claims**

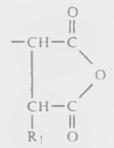
1. A resin composition having improved flowability when discharged from an extruder comprising: (A) 50–95 percent by weight of a polyamide and (B) 5–50 percent by weight of a modified polyolefin containing in the side chain 0.02–4 molar percent based upon the weight of the modified polyolefin of functional groups (C) expressed by formulas selected from the group consisting of one or both of (I) and (II) and 0.04–1 molar percent based upon the weight of the modified polyolefin of functional groups (d) expressed by formulas selected from the group consisting of one or both of (III) and (IV)



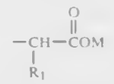
(I)



(II)



(III)



(IV)

wherein R_1 represents a hydrogen atom or methyl group; R_2, R_3 and R_4 represent respectively a hydrogen atom or an aliphatic, alicyclic or aromatic residual group having 1–30 carbon atoms; and M represents a hydrogen atom or a metal ion of a valence of 1–3.

4,923,926

THERMOPLASTIC MOLDING COMPOSITIONS, AND A PROCESS FOR THE PRODUCTION THEREOF

Ralf Schueler, Recklinghausen; Joachim Muegge, Haltern; Michael Droescher, Dorsten; Wilfried Bartz, and Roland Feinauer, both of Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 5, 1989, Ser. No. 333,281

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818871

Int. Cl.[5] C08L *69/00*

U.S. Cl. 525—67 **7 Claims**

1. A thermoplastic molding composition comprising:

70 to 98 parts of an aromatic polycarbonate having a viscosity number of from 40 to 100 cm^3/g and

2 to 30 parts of a polyoctenylene or a modified polyoctenylene containing functional groups.

4,923,927

CURABLE COMPOSITION

Toshifumi Hirose, and Katsuhiko Isayama, both of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 1, 1988, Ser. No. 278,504

Claims priority, application Japan, Dec. 5, 1987, 62-308318

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—100 **10 Claims**

1. A composition curable to a substantially tack-free condition comprising; 100 parts by weight of an oxyalkylene polymer having at least one silicon-containing group which has a hydroxyl or hydrolyzable group attached to a silicon atom and which is crosslinkable by forming a siloxane linkage, and a tack reducing amount, from 0.1 to less than 10 parts by weight, of a liquid diene polymer.

4,923,928

THERMOSETTING BISMALEIMIDE RESIN COMPOSITION CONTAINING AN ADDUCT OF A PROPENYLPHENOL AND AN EPOXY COMPOUND

Jack D. Boyd, Westminster, and Hong-Son Ryang, Camarillo, both of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 156,983

Int. Cl.[5] C08F *297/02;* **C08L** *79/08*

U.S. Cl. 525—117 **14 Claims**

1. A heat curable resin composition comprising: (a) a maleimide-group-containing, heat curable resin, and (b) a toughening amount of one or more prereact modifiers prepared by reacting a propenylphenol with an epoxy resin, and having the formula:



wherein R^1 is selected from the group consisting of C_1–C_4 lower alkyl, C_1–C_4 halogenated alkyl, and aryl radicals; wherein m is 1 or 2; wherein R is a mononuclear or polynuclear aromatic hydrocarbon; wherein n is an integer from 2 to about 4; and wherein X is the residuum of an epoxy resin having an epoxy functionality of 2 to 4.

4,923,929

PROCESS FOR PRODUCING GRAFT COPOLYMER

Takeo Ohwada, Ibaraki, and Kengo Kobayashi, Hitachi, both of Japan, assignors to Hitachi Chemical Co., Tokyo, Japan

Filed Jun. 12, 1987, Ser. No. 61,081

Claims priority, application Japan, Jun. 13, 1986, 61-138724

Int. Cl.[5] C08F *255/02;* **C08L** *75/04*

U.S. Cl. 525—126 **10 Claims**

1. A process for producing a graft polymer useful as raw material of coating compositions having excellent transparency and pigment dispersibility which comprises polymerizing 99.5 to 0.5% by weight of an ethylenically unsaturated monomer (B) in the presence of 0.5 to 99.5% by weight of a fluorine-containing resin (A) having reactive double bonds via a urethane linkage, the amount of said double bonds being 0.001 to 0.025 mole per 100 g of the resin (A) and said fluorine-containing resin (A) being obtained by reacting a fluorine-containing copolymer having hydroxyl groups derived from a hydroxyalkyl vinyl ether, an isocyanate compound having two or more isocyanate groups and a hydroxyl group-containing ethylenically unsaturated monomer.

4,923,930

CURABLE RESIN AND RESIN COMPOSITION CURABLE AT LOW TEMPERATURE

Naozumi Iwasawa, Hiratsuka, and Osamu Isozaki, Yokohama, both of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

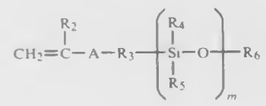
Filed Nov. 18, 1988, Ser. No. 272,959

Claims priority, application Japan, Nov. 20, 1987, 62-294499; Nov. 26, 1987, 62-298761

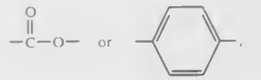
Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—168 **14 Claims**

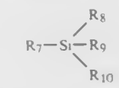
1. A curable resin obtained by subjecting to radical polymerization at least one of an alkoxysilicon-containing vinyl monomer and (b) a polysiloxane macromonomer with (c) an oxirane-containing vinyl monomer in the presence of a polymerization initiator and in the presence of a resin (A) having in the molecule at least one member selected from the group consisting of a carboxyl group and an alicyclic hydrocarbon ring having one or two hydrogen atoms bonded to at least one carbon atom forming the alicyclic hydrocarbon ring, wherein said monomer (a) is a compound represented by the formula



wherein A is

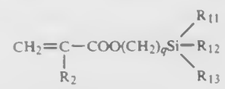


R_2 is a hydrogen atom or methyl, R_3 is a bivalent aliphatic saturated hydrocarbon group having 1 to 6 carbon atoms, R_4 and R_5 are the same or different and are each phenyl, alkyl having 1 to 6 carbon atoms or alkoxyl having 1 to 10 carbon atoms, R_6 is alkyl having 1 to 10 carbon atoms, and m is an integer of from 1 to 10; and said macromonomer (b) is prepared by subjecting to condensation reaction 70 to 99.999 mole % of a compound (b^1) represented by the formula



(XIV)

wherein R_7 is an aliphatic hydrocarbon group having 1 to 8 carbon atoms or phenyl, and R_8, R_9 and R_{10} are each alkoxyl having 1 to 4 carbon atoms or hydroxyl with 30 to 0.001 mole % of a compound (b^2) represented by the formula



(XV)

wherein R_2 is a hydrogen atom or methyl, R_{11}, R_{12} and R_{13} are each hydroxyl, alkoxyl having 1 to 4 carbon atoms or an aliphatic hydrocarbon group having 1 to 8 carbon atoms, at least one of R_{11}, R_{12} and R_{13} being hydroxyl or alkoxyl, and q is an integer of 1 to 6, the macromonomer having one polymerizable unsaturated bond and at least two members selected from the group consisting of hydroxyl groups and alkoxyl groups at a portion thereof corresponding to the terminal end per molecule on the average, the macromonomer being 400 to 100000 in number average molecular weight.

4,923,931

OXIDATION OF HALOGENATED POLYMERS

Donald W. Pennington, and Joseph L. Allison, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1987, Ser. No. 101,615
Int. Cl.[5] C08C *19/20*; C08F *8/34*
U.S. Cl. 525—344 **17 Claims**

1. A process of preparing an oxidized halogenated polymer comprising steps of:

(a) forming an admixture of (1) an acidic oxidizing agent selected from the group consisting of peroxydisulfuric acid, and its alkali and alkaline earth metal salts and (2) a suspension of a particulate halogenated polymer selected from the group consisting of halogenated olefin polymers and halogenated rubbers in a polar liquid;

(b) heating the admixture to a temperature sufficient to initiate reaction between the polymer and the oxidizing agent; and

(c) continuing the reaction until an oxidized polymer having a preselected extent of oxidation is obtained.

4,923,932

POLYPHENYLENE ETHER RESIN COMPRISING CHLOROFORM EXTRACTABLE/NONEXTRACTABLE POLYPHENYLENE ETHER RESIN

Teruo Katayose, Sakura, and Hiroji Oda, Kawasaki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1988, Ser. No. 242,234
Claims priority, application Japan, Sep. 9, 1987, 62-224146; Sep. 9, 1987, 62-224147; Oct. 27, 1987, 62-269459; Oct. 27, 1987, 62-269460
Int. Cl.[5] C08G *65/44*
U.S. Cl. 525—391 **17 Claims**

1. A cured polyphenylene ether resin comprising a chloroform nonextractable polyphenylene ether and a chloroform extractable polyphenylene ether,

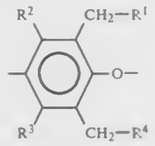
said resin being decomposable by pyrolysis gas chromatography to form (a) 2-methylphenol, (b) 2,6-dimethylphenol, (c) 2,4-dimethylphenol, (d) 3,5-dimethylphenol and (e) 2,4,6-trimethylphenol in proportions such that said components (a), (b), (c), (d) and (e) satisfy the following inequality:

$$40 \geqq \frac{D}{A + B + C + D + E} \times 100 \geqq 7.0(\%),$$

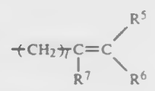
wherein A, B, C, D and E represent the areas of peaks on a pyrolysis gas chromatogram attributed to said components (a), (b), (c), (d) and (e), respectively,

said chloroform extractable polyphenylene ether being present in an amount of from 0.01 to 20 % by weight, based on the weight of said resin, as determined from the amount of a chloroform extract obtained by treating the resin with chloroform at 23° C. for 12 hours,

said chloroform extractable polyphenylene ether containing units of the formula:


(I)

wherein R^1, R^2, R^3 and R^4 each independently represent a hydrogen atom, an alkenyl group represented by the formula:


(II)

wherein l is an integer of from 1 to 4, and R^5, R^6 and R^7 each independently represent a hydrogen atom or a methyl group,

or an alkynyl group represented by the formula:

$$(CH_2)_kC{\equiv}C{-}R^8 \quad \text{(III)}$$

wherein k is an integer of from 1 to 4 and R^8 represents a hydrogen atom, a methyl group or an ethyl group,

at least one of R^1, R^2, R^3 and R^4 being other than hydrogen, with the proviso that each unit is the same or different.

4,923,933

POLYCARBONATE/POLYPHTHALATE CARBONATE BLENDS EXHIBITING GOOD FLAME RESISTANCE

Herbert L. Curry, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 6, 1989, Ser. No. 294,718
Int. Cl.[5] C08F *20/00*; C08L *69/00*
U.S. Cl. 525—439 **15 Claims**

1. A polymeric blend comprising:

(a) an aromatic brominated polycarbonate resin present at a level of from 20 percent to about 77 percent by weight of said blend;

(b) a polyphthalatecarbonate resin present at a level of from about 77 percent to about 20 percent by weight of said blend; and

(c) a silicone-polyimide resin present at a level of about 10 percent to about 3 percent by weight of said blend.

4,923,934

INTERPENETRATING POLYMER NETWORK OF BLOCKED URETHANE PREPOLYMER, POLYOL, EPOXY RESIN AND ANHYDRIDE

Todd A. Werner, 11515 - 41st Ave. North, Plymouth, Minn. 55441

Continuation of Ser. No. 55,299, May 29, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 294,934
Int. Cl.[5] C08L *63/02, 67/02, 71/02, 75/06*
U.S. Cl. 525—528 **6 Claims**

1. An interpenetrating polymer network for use as a coating formed by the reaction product of a composition comprising:

a blocked urethane prepolymer;

a polyol;

an epoxy resin; and an anhydride as an epoxy catalyzing agent.

4,923,935

PROCESS FOR PRODUCING POLYETHYLENE OF ULTRAHIGH MOLECULAR WEIGHT

Akira Sano, Kawasaki; Shigeki Yokoyama, Yokohama; Yasunosuke Miyazaki, Machida; Tetsujiro Kuroishi, Chiba, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo

Continuation of Ser. No. 148,487, Jan. 26, 1988, abandoned, which is a continuation of Ser. No. 28,486, Mar. 20, 1987, abandoned, which is a continuation of Ser. No. 807,977, Dec. 12, 1985, abandoned. This application Jan. 26, 1989, Ser. No. 302,564
Claims priority, application Japan, Dec. 21, 1984, 59-270181
The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.
Int. Cl.[5] B01J *8/00*
U.S. Cl. 526—73 **5 Claims**

1. A process for producing polyethylene of ultra-high molecular weight having an intrinsic viscosity of 10–30 dl/g at 135° C. in decalin, which process consists essentially of the following two stages of polymerization reaction:

(a) a first reaction stage wherein ethylene monomer is polymerized in a reaction vessel with use of a composite catalyst comprising a solid component containing at least magnesium, titanium and/or vanadium and an organoluminum compound in the presence of 0–10 mol percent of hydrogen at 0°–90° C. and at a pressure of 0–70 kg/cm^2·g. to produce 75–99 parts by weight of polyethylene having an intrinsic viscosity of 12–32 dl/g at 135° C. in decalin; and

(b) a second reaction stage wherein a fresh feed of ethylene monomer is introduced into the same reaction vessel and polymerized in the presence of 35–95 mol percent of hydrogen at 40°–100° C. and at a pressure of 0–70 kg/cm^2·g. while retaining the reaction product from the first reaction stage in said reaction vessel to produce 25-1 parts by weight of polyethylene having an intrinsic viscosity of 0.1–5 dl/g at 135° C. in decalin.

4,923,936

HETEROPOLYMETALLATE METATHESIS CATALYSTS FOR CYCLOOLEFIN POLYMERIZATION

Brian L. Goodall, Akron, and Larry F. Rhodes, Cuyahoga Falls, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Filed Feb. 21, 1989, Ser. No. 312,150
Int. Cl.[5] C08F *4/78, 32/04*
U.S. Cl. 526—115 **17 Claims**

1. Process for preparing a polymer by ring opening polymerization in the presence of a metathesis catalyst system, said process comprising the steps of polymerizing a monomer charge comprising a norbornene-type monomer or a mixture thereof in the presence of an effective amount of a heteropolymetallate metathesis catalyst component and an effective amount of a metathesis cocatalyst component, said catalyst and cocatalyst components are soluble in said monomer charge that is polymerized and said norbornene-type monomer is characterized by the presence of at least one norbornene group defined as follows:



wherein said catalyst component is selected from organoammonium, organophosphonium, and organoarsonium heteropolymolybdates and heteropolytungstates, and mixtures thereof; and said cocatalyst component is selected form alkylaluminum, alkylaluminum halides, alkoxyalkylaluminum halides, aryloxyalkylalyminum halides, and mixtures thereof.

4,923,937

METHOD OF POLMERIZING OLEFINES

Hanneli Seppänen, and Outi Krause, both of Helsinki, Finland, assignors to Neste OY, Finland

Division of Ser. No. 102,137, Sep. 29, 1987, Pat. No. 4,814,309. This application Jan. 17, 1989, Ser. No. 298,103
Claims priority, application Finland, Sep. 29, 1986, 863929
Int. Cl.[5] C08F *4/64*
U.S. Cl. 526—124 **4 Claims**

1. Method for the polymerization of α-olefines, which comprises subjecting an α-olefine to polymerization under polymerization conditions in contact with a catalyst component, an external electron donor and an organoaluminum compound, said catalyst component being prepared by the steps of

(a) reacting a magnesium alkyl compound with chlorine gas,

(b) dissolving the thus formed chlorinated magnesium alkyl compound in alcohol,

(c) adding magnesium silicate which has been calcinated by heating it about 200° -900° C., to the thus formed solution,

(d) adding the resulting mixture obtained in step (c) into a hydrocarbon medium at a temperature under about 0° C., thereby precipitating the chlorinated magnesium alkyl compound into and onto the magnesium silicate.

(e) separating the obtained solid catalyst component, and

(f) reacting the thus obtained solid catalyst component with a titanium halogen compound in the presence of an internal electron donor, whereby the resulting catalyst component acts as a catalyst for the polymerization of said α-olefine.

4,923,938

CATALYST FOR REGULATING THE MOLECULAR WEIGHT DISTRIBUTION OF ETHYLENE POLYMERS

Sun-Chueh Kao, Piscataway; Kevin J. Cann, Belle Mead; Frederick J. Karol, both of Belle Mead, all of N.J.; Arthur E. Marcinkowsky, Charleston, W. Va.; Mark G. Goode, St. Albans, W. Va., and Eugene H. Theobald, Poca, W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Division of Ser. No. 214,587, Jul. 1, 1988, Pat. No. 4,845,067. This application Apr. 14, 1989, Ser. No. 339,590
Int. Cl.[5] C08F *4/68*
U.S. Cl. 526—133 **36 Claims**

1. In a process for homopolymerizing ethylene, or copolymerizing ethylene with one or more alpha olefins containing from 3 to 8 carbon atoms, with a catalyst system comprising

(A) a solid catalyst precursor consisting essentially of

(1) a solid, particulate, porous, inorganic carrier, as support for

(2) the reaction product of (a) a vanadium trihalide and (b) an electron donor, and

(3) a boron halide or alkylaluminum modifier,

(B) an alkylaluminum cocatalyst, and

(C) a halohydrocarbon polymerization promoter,

the improvement which comprises treating solid catalyst precursor (A) with an oxygen-containing molecular weight distribution regulator selected from the group consisting of compounds having the formulas

A—R—B and R^1—B

wherein:

R is a divalent hydrocarbon radical free of aliphatic unsaturation containing from 1 to 14 carbon atoms,

R^1 is a heterocyclic ring free of aliphatic unsaturation containing from 2 to 14 carbon atoms and at least one oxygen or nitrogen atom, and

A and B are each selected from the group consisting of:

—OH, —R^1, —OR^2, $COOR^2$, —NR^3R^4

and

wherein:

R^1 is as defined above,

R^2 is a monovalent hydrocarbon radical free of aliphatic unsaturation containing from 1 to 14 carbon atoms, and

R^3 and R^4 are individually hydrogen or monovalent hydrocarbon radicals free of aliphatic unsaturation containing from 1 to 14 carbon atoms,

with the proviso that at least one of A and B must be —OH or —$COOR^2$, but both A and B cannot be —OH.

4,923,939

RING OPENING POLYMERIZATION WITH ORGANOPHOSPHONIUM AND ORGANOARSONIUM METATHESIS CATALYSTS

Brian L. Goodall, Akron, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Feb. 21, 1989, Ser. No. 312,151
Int. Cl.[5] C08F *4/78*
U.S. Cl. 526—161 **18 Claims**

1. Process for preparing a polymer by ring opening polymerization in the presence of a metathesis catalyst system, said process comprising the steps of polymerizing a cycloolefin monomer containing a norbornene group, or a mixture thereof, in the presence of an effective amount of a metathesis catalyst component and an effective amount of a metathesis cocatalyst component; said catalyst component is selected from organophosphonium molybdates and tungstates, organoarsonium molybdates and tungstates, and mixtures thereof and is wholly or partially soluble or forms an emulsion in said monomer or mixture thereof.

4,923,940

POLYCARBOXYLIC ACIDS WITH HIGHER THICKENING CAPACITY AND BETTER CLARITY

Chin C. Hsu, Avon Lake, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 157,685, Feb. 19, 1988. This application Mar. 16, 1989, Ser. No. 324,530
Int. Cl.[5] C08F *2/00*
U.S. Cl. 526—208 **8 Claims**

1. Process for preparing a polymer from a monomer change containing at least 85% by weight of said monomer charge of at least one olefinically unsaturated carboxylic acid of 3 to 5 carbon atoms, salts of such acid, and mixtures thereof, with up to 15% by weight of said monomer charge of at least one copolymerizable comonomer in the presence of a mixed reaction medium, an effective amount of a crosslinker and an effective amount of an initiator, said process comprising the steps of polymerizing said monomer charge in said reaction medium and said crosslinker and said initiator and recovering said polymer, said mixed reaction medium comprises at least one organic solvent and at least one hydrocarbon solvent. and at least one hydrocarbon solvent.

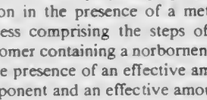
4,923,941

CARBOXY-FUNCTIONAL POLYMERS AND THEIR USE AS DETERGENT ADDITIVE

William J. Bailey, University Park, Md., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 28, 1987, Ser. No. 114,638
Int. Cl.[5] C08F *24/00*
U.S. Cl. 526—268 **11 Claims**

1. Biodegradable, carboxy-functional copolymers prepared by free radical-initiated copolymerization and consisting essentially of an acrylate compound of the formula $H_2C{=}C(R)COOH$, or a salt thereof, and a methylene-substituted heterocyclic compound having the formula



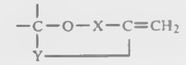
wherein

R is hydrogen, lower alkyl or phenyl; and wherein

X is a direct bond or $-CH_2-$;

Y is —O—, —S—, C_1-C_6 oxyalkylene, C_1-C_6 thioalkylene, or $-COO-(CH_2)_n-$, where n is 0, 1. 2 or 3; and

R^4 and R^5 are, independently, hydrogen, C_1-C_6 alkyl, or phenyl, or R^4 and R^5, together with the carbon atom they are bonded to, form a C_5-C_{12} cycloalkyl, cycloalkenyl or aryl radical, a heterocyclic radical, or a ring of the formula



wherein X and Y are as defined above.

4,923,942

OPTICAL DISC AND METHOD OF MANUFACTURING THE SAME

Tadao Takeyama, and Mitsutoshi Aritomi, both of Ami, Japan, assignors to Mitsuhishi Petrochemical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 31,674, Mar. 30, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 251,999
Claims priority, application Japan, Mar. 28, 1986, 61-70347
Int. Cl.[5] C08F *32/08*
U.S. Cl. 526—282 **21 Claims**

1. An optical disc made of a resin having a light transmission of not less than 85%, a birefringence of not more than 1×10^{-5}, a heat resistance of not lower than 180° C., a thermal stability of not lower than 250° C., and a modulus of elasticity of no less than 300 kg mm^{-2}, wherein said resin consists essentially of radical polymerization polymer of an ethylenically unsaturated monomer, characterized in that at least a major part of the ethylenically unsaturated monomer is an ester of 1 mole of tricyclo[5.2.1.$0^{2,6}$]decanedimethanol with 2 moles of a mixture of acrylic acid and methacrylic acid.

4,923,943

METATHESIS POLYMERIZED COPOLYMER

Shigeyoshi Hara, and Zen-ichiro Endo, both of Iwakuni, Japan, assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 14, 1988, Ser. No. 168,045
Claims priority, application Japan, Mar. 13, 1987, 62-56913
Int. Cl.[5] C08F *32/00*
U.S. Cl. 526—283 **17 Claims**

1. A metathesis polymerized cross-linked copolymer comprising:

(a) 50–99 mole % of repeating units derived from at least one of metathesis polymerizable cyclic compounds containing at least 30 mole %, based on total moles of the metathesis polymerizable cyclic compounds, of dicyclopentadiene, and

(b) 50–1 mole % of repeating units derived from at least one of carboxylic acid esters of which the acid residue and alcohol residue have individually at least one norbornene-moiety.

4,923,944

RELEASE AGENT COMPOSITION

Takateru Yamada, and Shosaku Sasaki, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 275,455
Claims priority, application Japan, Nov. 27, 1987, 62-298766; Feb. 23, 1988, 63-40138
Int. Cl.[5] C08G *77/06*
U.S. Cl. 528—15 **6 Claims**

1. Release agent composition comprising

(A) 100 weight parts methylalkenylpolysiloxane having at least 2 alkenyl groups in each molecule and having a viscosity of at least 40 centipoise at 25 degrees Centigrade,

(B) 0.5 to 20 weight parts alkylhydrogenpolysiloxane having at least 3 silicon-bonded hydrogen atoms in each molecule and having a viscosity of 1 to 1,000 centipoise at 25 degrees Centigrade,

(C) 0.1 to 6.0 weight parts organopolysiloxane having the formula $R^1(R_2SiO)_nSiR_2R^1$ and a viscosity of 100 to 500,000 centipoise at 25 degrees Centigrade wherein R is the methyl group or a monovalent hydrocarbon group which lacks aliphatically unsaturated bonds and which contains 6 to 18 carbon atoms, with the proviso that said monovalent hydrocarbon group which lacks aliphatically unsaturated bonds and which contains 6 to 18 carbon atoms comprises 2 to 20 mole % of the total groups R in the molecule; R^1 is selected from the group consisting of a monovalent hydrocarbon group which lacks aliphatically unsaturated bonds and which contains 1 to 18 carbon atoms, the hydroxyl group and an alkoxy group; and n is a positive integer with a value which provides a viscosity of 100 to 500,000 centipoise at 25 degrees Centigrade, and

(D) a catalytic quantity of a platinum, palladium or rhodium catalyst.

4,923,945

RESIN COMPOSITION CURABLE AT LOW TEMPERATURE

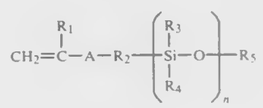
Osamu Isozaki, Yokohama; Noboru Nakai, Hiratsuka; Satoru Ito, Kanagawa, and Seiji Takami, Hiratsuka, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Nov. 8, 1988, Ser. No. 268,406
Claims priority, application Japan, Nov. 9, 1987, 62-282335; Nov. 9, 1987, 62-282336
Int. Cl.[5] C08G *77/06*
U.S. Cl. 528—16 **13 Claims**

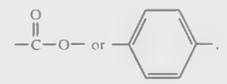
1. A resin composition curable at a low temperature and characterized in that the composition comprises:

(a) at least one copolymer selected from the group consisting of a copolymer X which is prepared from a monomer mixture comprising an oxirane-containing vinyl monomer and an alkoxysilane-containing vinyl monomer represented by the formula

(I)



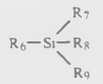
wherein A is



R_1 is a hydrogen atom or methyl, R_2 is a bivalent aliphatic saturated hydrocarbon group having 1 to 6 carbon atoms, R_3 and R_4 are the same or different and are each phenyl, alkyl having 1 to 6 carbon atoms or alkoxyl having 1 to 10 carbon atoms, R_5 is alkyl having 1 to 10 carbon atoms, and n is an integer of from 1 to 10, and a vinyl copolymer Y which is prepared from a monomer mixture comprising:

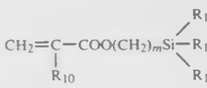
(i) a polysiloxane macromonomer prepared by reacting about 70 to about 99.999 mole % of a compound (A) represented by the formula

(II)



wherein R_6 is an aliphatic hydrocarbon group having 1 to 8 carbon atoms or phenyl, and R_7, R_8 and R_9 are each alkoxyl having 1 to 4 carbon atoms or hydroxyl with about 30 to about 0.001 mole % of a compound (B) represented by the formula

(III)



wherein R_{10} is a hydrogen atom or methyl, R_{11}, R_{12} and R_{13} are each hydroxyl, alkoxyl having 1 to 4 carbon atoms or an aliphatic hydrocarbon group having 1 to 8 carbon atoms, at least one of R_{11}, R_{12} and R_{13} being hydroxyl or alkoxyl, and m is an integer of 1 to 6, the polysiloxane macromonomer having per molecule at least two functional groups selected from hydroxyl and the alkoxyl and being about 400 to about 100,000 in number average molecular weight, and

(ii) an oxirane-containing vinyl monomer,

(b) a metal chelate compound capable of acting as a curing agent, and

(c) a reactive diluent which is a compound having a number average molecular weight of up to about 1,000 and containing at least two alicyclic oxirane groups in the molecule.

4,923,946

COMPOSITION AND METHOD FOR PRIMING AND COATING SILICONE SUBSTRATES

Michael D. Meddaugh, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 12, 1988, Ser. No. 283,423
Int. Cl.[5] C08G *77/06*
U.S. Cl. 528—18 **4 Claims**

1. A primer composition consisting essentially of a partial hydrolyzate obtained by mixing 0.5 mols of water per mol of alkoxy radicals of an aminoalkyl-substituted trialkoxysilane, from 0.1 to 10 percent by weight, based on the weight of said partial hydrolyzate, of a carboxylic acid salt of tin and the balance a solvent component.

4,923,947

THERMOTROPIC LIQUID CRYSTALLINE AROMATIC POLYESTERS OF DISUBSTITUTED 4,4'-DIHYDROXYDIPHENYLENE

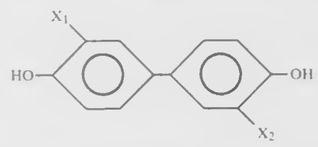
Alfredo Coassolo, Novara; Giampiero Sabarino, Vercelli; Marco Foá, Novara, and Larry L. Chapoy, Lesa, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 12, 1989, Ser. No. 296,072
Claims priority, application Italy, Jan. 12, 1988, 19038 A/88
Int. Cl.[5] C08G *63/02*
U.S. Cl. 528—193 **13 Claims**

1. A thermotropic liquid crystalline aromatic polyester comprising:

(a) at least one unit derived from an essentially bisubstituted diphenol of the formula:

(I)



wherein X_1 and X_2, which are the same or different, represent halogen or an alkyl radical containing from 1 to 6 carbon atoms, an aralkyl radical containing at least 7 carbon atoms, or a cycloalkyl radical containing from 6 to 12 carbon atoms;

(b) at least one unit derived from a bicarboxylic acid of the formula:

$$HOOC-R_1-COOH \quad (2)$$

where R_1 represents a cycloalkylene radical, a simple, double or condensed arylene radical containing from 6 to 18 carbon atoms unsubstituted or substituted by groups inert under the reaction conditions selected from the group consisting of halogen and alkyl radicals containing a low number of carbon atoms;

(c) optionally in the presence of at least one unit derived from a a hydroxyacid of the formula:

$$HO—Ar_1—(CH=CH)_n—COOH \quad (3)$$

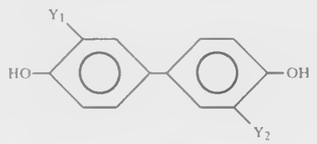
wherein Ar_1 represents a simple, double or condensed arylene radical containing from 6 to 18 carbon atoms unsubstituted or substituted by groups inert under the reaction conditions selected from the group consisting of halogen and alkyl radicals containing a low number of carbon atoms and n is zero or 1;

(d) optionally in the presence of at least one unit derived from a diphenol of the formula:

$$HO—AR_2—OH \quad (4)$$

wherein Ar_2 represents a simple or condensed arylene radical containing from 6 to 18 carbon atoms, unsubstituted or substituted by at least one radical X_1 or X_2; as previously defined and

(e) optionally in the presence of at least one unit derived from a diphenol of the formula:



(5)

wherein Y_1 and Y_2, which are the same or different, are hydrogen or an aryl radical containing from 6 to 12 carbon atoms.

4,923,948

CURABLE COMPOSITION

Yasuo Matsuki, Yokohama; Yosinobu Kariya, Yokkaichi; Masayuki Endo, Yokohama; Hiroharu Ikeda, Machida, and Yoshihiro Hosaka, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,449

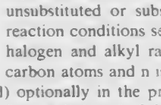
Claims priority, application Japan, Sep. 24, 1987, 62-237289; Oct. 16, 1987, 62-259516; Feb. 24, 1988, 63-39610

Int. Cl.[5] C08G *77/04*

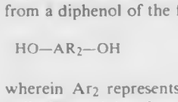
U.S. Cl. 528—26 **7 Claims**

1. A curable composition comprising the following components (a) and (b):

(a) (A) a reaction product of a tetracarboxylic acid anhydride with a silicon compound selected from the group consisting of the following compounds of formulas (1) to (6):

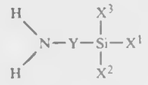


(1)

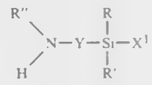


(2)

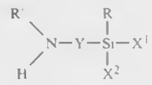
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(3)

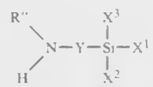


(4)



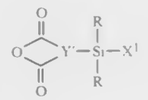
(5)

and

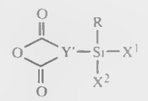


(6)

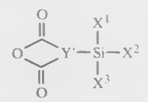
wherein R, R′ and R″, which may be the same of different, are aliphatic hydrocarbon groups of 1–5 carbon atoms or aromatic hydrocarbon groups of 6–18 carbon atoms; X^1, X^2 and X^3, which may be the same or different, are alkoxy groups of 1–5 carbon atoms or halogen atoms; Y is a divalent aliphatic hydrocarbon group of 1–5 carbon atoms or a divalent aromatic hydrocarbon group of 6–10 carbon atoms or a group in which the divalent aliphatic hydrocarbon group is bonded to the divalent aromatic hydrocarbon group, or (B) a reaction product of a diamino compound with a silicon atom-containing dicarboxylic acid anhydride selected from the group consisting of the following compounds represented by formulas (7) to (9):



(7)



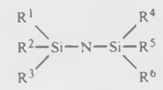
(8)



(9)

wherein R and R′, which may be the same or different, are aliphatic hydrocarbon groups of 1–5 carbon atoms or aromatic hydrocarbon groups of 6–18 carbon atoms, and wherein X^1, X^2 and X^3, which may be the same or different, are alkoxy groups of 1–5 carbon atoms or halogen atoms, and Y, is a trivalent aliphatic hydrocarbon group of 2–20 carbon atoms, a trivalent alicyclic hydrocarbon group of 3–20 carbon atoms, a trivalent aromatic hydrocarbon group of 6–20 carbon atoms, or a trivalent group wherein these groups are bonded to one another;

(b) an organosilane compound represented by the formula (I):



(I)

wherein R^1–R^6, which may be the same or different, are alkyl groups of 1–10 carbon atoms or aryl groups of 6–10 carbon atoms.

4,923,949

ETHYNYLENE-DISILANYLENE COPOLYMERS AND METHOD OF PREPARING SAME

Takahisa Iwabara, and Robert C. West, both of Madison, Wis., assignors to Kanegafuchi Chemical Industry Co., Ltd., Japan

Filed Aug. 3, 1988, Ser. No. 227,695

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—33 **11 Claims**

1. A method of preparing an ethynylene disilanylene polymer comprising the steps of:

(a) forming a diGrignard reagent by reacting a 1,2-diethynyldisilane of the formula $HC{\equiv}C—SiR'_2SiR'_2—C{\equiv}CH$ with a Grignard reagent comprising an alkyl metallic halide;

(b) adding $ClSiR_2SiR_2Cl$ and permitting the mixture to stand and react at room temperature; and

(c) isolating the resulting ethynylene disilanylene copolymer having a repeating unit of the formula:

$$—C{\equiv}CSiR_2SiR_2C{\equiv}CSiR'_2SiR'_2—$$

where R and R′ is an alkyl of 1–10 carbon atoms or an aryl group of 6–10 carbon atoms.

4,923,950

COMPOSITIONS BASED ON DERIVATIVES OF SILICA MODIFIED BY ORGANIC GROUPS, PREPARATION AND APPLICATION THEREOF, PARTICULARLY AS CATIONIC CONDUCTORS

Lucienne Ravaine, Gieres; Michel B. Armand, Echirolles; Yves Charbouillot, Coligny, and Abdelkader Hammou, Grenoble, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

PCT No. PCT/FR87/00261, § 371 Date Apr. 28, 1986, § 102(e) Date Apr. 28, 1988, PCT Pub. No. WO88/00215, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 2, 1987, Ser. No. 167,474

Claims priority, application France, Jul. 2, 1986, 86 09602

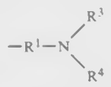
Int. Cl.[5] C08G *77/26*

U.S. Cl. 528—38 **15 Claims**

1. A composition comprising a silica derivative modified by organic groups, said derivative being an amorphous solid and having the formula

$$SiO_{2-0.5(x+y)}(Z^1)_x(Z^2)_y(XA)_z \quad (I)$$

wherein Z^1 represents



wherein

R^1 is alkylene having 3–8 carbon atoms optionally interrupted by —NH— and

R^3 and R^4 each represent hydrogen or taken together represent —CH=CH—N=CH—;

Z^2 represents $—R^2—SO_3H$ wherein

R^2 is alkylene having 3–8 carbon atoms optionally interrupted by —NH—;

XA represents an acid HA whose anion is A^- when X is H or a salt of said acid when X is a metal, said salt being soluble in water;

x is a non-negative number less than or equal to 1;

y is a number ranging from 0 to 0.5 but not greater than x;

x and y are such that the sum, x+y, is greter than or equal to ½, it being understood that the sum, x+y, is at most equal to 1; and

z is a number, optionally zero, such that the ratio z+y/x is greater than zero and less than or equal to 1.

4,923,951

PRODUCTION PROCESS OF AROMATIC POLYAMIDE

Tadashi Kobayashi; Shouji Obuchi, both of Omuta; Hiroaki Matsuno, Kumamoto; Mitsuo Wada, Omuta, and Hiroshi Takayanagi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 306,943

Claims priority, application Japan, Feb. 8, 1988, 63-25678; Nov. 30, 1988, 63-301078; Dec. 28, 1988, 63-334662

Int. Cl.[5] G08G *18/22*

U.S. Cl. 528—48 **12 Claims**

1. A process for producing an aromatic polyamide by subjecting an aromatic diisocyanate and an aromatic dicarboxylic acid to polycondensation in the presence of an alkali metal compound and/or an alkaline earth metal compound as a catalyst in an aprotonic polar solvent, which comprises charging in advance the solvent, aromatic dicarboxylic acid and catalyst in a mixing system, reducing the water content in the mixing system to at least 50 ppm and then introducing the aromatic diisocyanate to conduct the polycondensation.

4,923,952

MONOFORMYLATED 3,3′-DIAMINODIPROPYLAMINES, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Hans-Joachim Scholl, Cologne, and Helmut Reiff, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

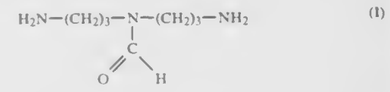
Filed Mar. 28, 1989, Ser. No. 329,472

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3811342

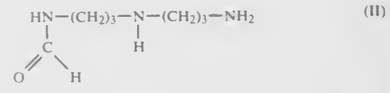
Int. Cl.[5] C08G *18/38*

U.S. Cl. 528—60 **7 Claims**

1. A monoformylated 3,3′-diaminodipropylamine mixture corresponding to formulae I and II in a ratio of 1:99 to 99:1 mole-%.



(I)



(II)

4,923,953

MOLDING COMPOUNDS COMPRISING A THERMOPLASTICALLY PROCESSIBLE, AROMATIC POLYESTER IMIDE

Wolfgang Neugebauer, Duelmen-Merfeld, and Heinz-Guenter Poll, Marl, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 318,827

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816402

Int. Cl.[5] **C08G** *8/20, 63/02*

U.S. Cl. 528—170 **14 Claims**

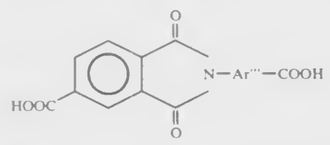
1. A molding compound comprising a thermoplastically processible, aromatic polyester imide prepared by polymerizing the following starting materials consisting essentially of:

(A) from 0 to 70 mole % of HO—Ar—COOH and derivatives thereof;

(B) from 0 to 44 mole % of HOOC—Ar'—COOH and derivatives thereof;

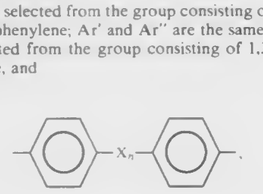
(C) from 15 to 45 mole % of HO—Ar''—OH and derivatives thereof; and

(D) from 1 to 45 mole % of a compound having the general structure



and derivatives thereof;

wherein Ar is selected from the group consisting of 1,3-phenylene and 1,4-phenylene; Ar' and Ar'' are the same or different and are selected from the group consisting of 1,3-phenylene, 1,4-phenylene, and



Ar''' is selected from the group consisting of 1,3-phenylene and 1,4-phenylene;

wherein

X is —O—, —S—, —SO_2—, or —CO—;

R is —H, C_1- to C_4-alkyl; and

n is 0 or 1;

and wherein all amounts are based on the sum of the amounts of (A) to (D), and the sum of the amounts of (A) to (D) must equal 100 mole %; and wherein the molar ratio of [(B)+(D)]:(C) is from 0.9:1 to 1.1:1.

4,923,954

PRODUCTION OF PARTICULATE POLYIMIDE POLYMERS

W. Dirk Klobucar; Adam Nugent, Jr., and Ronald C. Zumstein, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 23, 1988, Ser. No. 289,028

Int. Cl.[5] **C08G** *69/26*

U.S. Cl. 528—183 **18 Claims**

1. A process for the production, in particulate form, of aromatic polyimides derived from a 2,2-bis[4-(aminophenoxy)-phenyl]hexafluoropropane as the sole or predominant aromatic primary diamine component thereof, which process comprises forming a solution of a substantially equimolar mixture of (1) an aromatic tetracarboxylic dianhydride and (2) a 2,2-bis[4-(aminophenoxy)phenyl]hexafluoropropane as the sole or predominant aromatic diamine in (3) a solvent composed of (i) tetrahyurofuran, or (ii) one or more alkyltetrahydrofurans having a normal boiling point below 100° C., or (iii) a mixture of (i) and (ii), and heating and agitating such solution in a closed reaction system under superatmospheric pressure such that a separate phase of particulate aromatic polyimide is formed therein.

4,923,955

THERMOTROPIC LIQUID-CRYSTALLINE AROMATIC POLYESTERS OF SUBSTITUTED 4,4'-DIHYDROXY-DIPHENYLENE

Alfredo Coassolo, Novara; Giampiero Sabarino, Vercelli; Marco Foa', and L. Lawrence Chapoy, both of Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Nov. 21, 1988, Ser. No. 273,843

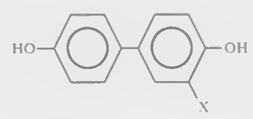
Claims priority, application Italy, Nov. 24, 1987, 22746 A/87

Int. Cl.[5] **C08G** *63/02, 8/02*

U.S. Cl. 528—193 **10 Claims**

1. A thermotropic liquid-crystalline aromatic polyester which comprises:

(a) at least one unit derived from an essentially monosubstituted phenol having the formula:



(1)

wherein:

X represents a halogen or an alkyl radical containing from 1 to 6 carbon atoms, an aralkyl radical containing at least 7 carbon atoms, a cycloalkyl, a single, double or condensed aryl radical containing from 6 to 18 carbon atoms, a keto group —COR or an ether group —OR, wherein R is an alkyl or aryl radical containing from 1 to 12 carbon atoms, optionally substituted with halogens or alkyl radicals with a small number of carbon atoms;

(b) at least one unit derived from a dicarboxy acid of the formula:

$$HOOC—R_1—COOH \quad (2)$$

wherein:

R_1 represents a cycloalkylene, a single, double or condensed arylene radical containing from 6 to 18 carbon atoms, optionally substituted with halogens or alkyl radicals containing a small number of carbons atoms;

(c) optionally at least one unit derived from a hydroxyacid of the formula:

$$HO\text{-}Ar_1\text{—}(CH{=}CH)_n\text{—}COOH \quad (3)$$

wherein:

Ar_1 represents a single, double or condensed arylene radical containing from 6 to 18 carbon atoms, optionally substituted with halogens or alkyl radicals containing a small number of carbon atoms, and

n is either 0 or 1; and

(d) optionally at least one unit derived from a diphenol having the formula:

$$HO—Ar_2—OH \quad (4)$$

wherein:

Ar_2 represents a single or condensed arylene radical containing from 6 to 18 carbon atoms, optionally substituted with at least one X radical, or a double, unsubstituted aryl radical.

4,923,956

GRAFT POLYMERIZATION PRECURSOR AND METHOD OF MANUFACTURING THE SAME

Yasuo Moriya; Nobuyoshi Suzuki, and Hiroshi Goto, all of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,260

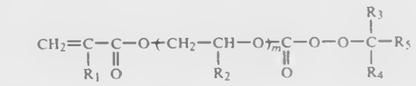
Claims priority, application Japan, Apr. 30, 1987, 62-107037

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

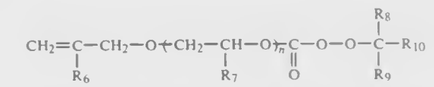
Int. Cl.[5] **C08F** *255/02*

U.S. Cl. 525—263 **6 Claims**

1. A graft polymerization precursor obtained by mixing (a) 100 parts by weight of a propylene polymer with (b) from 5 to 400 parts by weight of a solution of at least one radical polymerizable organic peroxide dissolved in a vinyl monomer component, said vinyl monomer component being one or more vinyl monomers selected from the group consisting of vinyl aromatic monomers, acrylic ester monomers, methacrylic ester monomers, acrylonitrile, methacrylonitrile and vinyl ester monomers, said organic peroxide being selected from the group consisting of compounds having the formula



wherein R_1 is hydrogen or alkyl having 1 or 2 carbon atoms, R_2 is hydrogen or methyl, R_3 and R_4, which can be the same or different, are alkyl having 1 to 4 carbon atoms, R_5 is alkyl having 1 to 12 carbon atoms, phenyl, alkylphenyl having 1 to 12 carbon atoms or cycloalkyl having 3 to 12 carbon atoms, and m is 1 or 2, and compounds having the formula



wherein R_6 is hydrogen or alkyl having 1 to 4 carbon atoms, R_7 is hydrogen or methyl, R_8 and R_9, which can be the same or different, are alkyl having 1 to 4 carbon atoms, R_{10} is alkyl having 1 to 12 carbon atoms, phenyl, alkylphenyl having 1 to 12 carbon atoms or cycloalkyl having 3 to 12 carbon atoms, and n is 0, 1 or 2,

said solution containing from 0.1 to 10 parts by weight of said organic peroxide per 100 parts by weight of said vinyl monomer component,

and copolymerizing said vinyl monomer component and said peroxide to form a graft polymerization precursor, said graft polymerization precursor containing from 20 to 95% by weight of said propylene polymer and, correspondingly, from 80 to 5% by weight of a vinyl copolymer of said vinyl monomer component and said polymerizable organic peroxide, said vinyl copolymer containing from 0.01 to 0.73% by weight of active oxygen.

4,923,957

PROCESS FOR THE PRODUCTION OF AROMATIC POLYESTERS

Peter Tacke; Ulrich Grigo, and Karsten-Josef Idel, all of Bayer Aktiengesellschaft, D 4150 Krefeld-Uerdingen, P.O. Box 166, Fed. Rep. of Germany

Filed Jan. 3, 1989, Ser. No. 292,917

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1988, 3800671

Int. Cl.[5] **C08G** *63/00, 67/00, 69/00*

U.S. Cl. 528—271 **5 Claims**

1. A process for the production of aromatic polyesters based on diphenols and an aromatic dicarboxylic acid selected from isophthalic acid, terephthalic acid or mixtures thereof by transesterification of acetic acid, propionic acid or benzoic acid esters of diphenols with the aromatic dicarboxylic acids in the melt, characterised in that the aromatic dicarboxylic acids are first reacted with a stoichiometric excess of the diphenol ester to form oligomers which are then condensed to the aromatic polyesters with elimination and removal by distillation of diphenol ester.

4,923,958

NOVEL UNSATURATED POLYESTERS

William W. Blount, Surgoinsville, and Joseph R. Zoeller, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1989, Ser. No. 387,314

Int. Cl.[5] **C08G** *63/02*

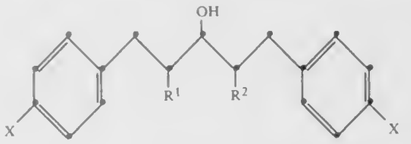
U.S. Cl. 528—272 **18 Claims**

1. An unsaturated polyester comprised of

A. 2-butenedioic acid residues;

B. diol residues; and

C. residues of 1,5-diaryl-3-pentanols having the structure



wherein:

R^1 and R^2 each is hydrogen, alkyl containing up to about 6 carbon atoms or phenyl or collectively R^1 and R^2 are 1,2- or 1,3-alkylene or 1,2-phenylene; and

each X is carboxyl, alkoxycarbonyl of up to about 7 carbon atoms, hydroxyalkoxycarbonyl of up to about 9 carbon atoms, formamido, alkanoylamido having up to about 6 carbon atoms or hydroxyalkoxy having up to about 10 carbon atoms.

4,923,959

POLYAMINOBISIMIDE RESIN FROM BIS(ANILINO PROPYLENE) BENZENE

Kojiro Kan, and Isao Kaneko, both of Chiba, Japan, assignors to Mitsui Petrochemical Industries, Inc., Tokyo, Japan

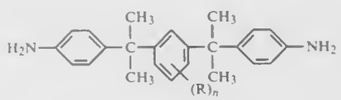
Filed Nov. 8, 1988, Ser. No. 268,439

Claims priority, application Japan, Nov. 13, 1987, 62-286757

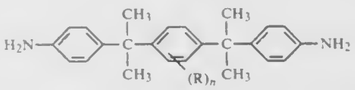
Int. Cl.[5] **C08G** *73/10*

U.S. Cl. 528—322 **3 Claims**

1. A polyaminobisimide resin consisting essentially of the polymeric reaction product of N,N'-4,4'-diphenylmethanebismaleimide and at least one diamine component selected from the group consisting of 1,3-bis(2-p-anilinopropylidene) benzene represented by the following formula (I) and 1,4-bis(2-p-anilinopropylidene) benzene represented by the following formula (II):



(I)



(II)

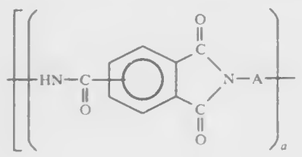
where each R represents a halogen atom or an alkyl group, which is the same or different, and n is a number from 0 to 4.

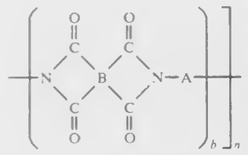
4,923,960
POLYAMIDE-IMIDE POLYMERS HAVING FLUORINE-CONTAINING LINKING GROUPS

Paul N. Chen, Sr., Gillette, and Rohitkumar H. Vora, Westfield, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

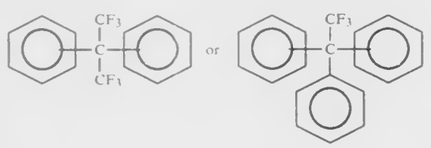
Filed Feb. 27, 1989, Ser. No. 316,220
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—353 **10 Claims**

1. A polyamide-imide polymer containing at least one recurring structural unit of the formula:





wherein the terms (a) and (b) are equal to the mole fraction of each recurring unit in the polymer chain and (a) ranges from about 0.05 to about 0.95, (b) ranges from about 0.95 to about 0.05, with the proviso that the sum of (a) and (b) is equal to 1, n is a number sufficient to give rise to a polyamide-imide inherent viscosity of at least about 0.1 as measured from a solution of the polymer in dimethylacetamide at 25° C. at a polymer concentration of 0.5 weight percent, A is a divalent aromatic moiety, and B is a tetravalent aromatic moiety containing the ring substituted or ring unsubstituted residuum selected from:



4,923,961
PROCESS FOR DEODORIZING ISOBUTYLENE POLYMER

Egils Vitands, Lisle, and Kelley R. Lane, Winfield, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 13, 1988, Ser. No. 257,513
Int. Cl.[5] C08F *8/04;* **C07C** *7/12*
U.S. Cl. 528—482 **5 Claims**

1. A process for deodorizing an odorous isobutylene polymer of molecular weight of from about 100 to 4000 for cosmetic applications, which process comprises:

(a) hydrogenating said polymer at a temperature of about 300° F. to about 465° F. in the presence of a catalyst, to prepare a substantially saturated hydrogenated isobutylene polymer containing odorous compounds,

(b) nitrogen-stripping said hydrogenated isobutylene polymer at a temperature within the range of from about 290° F. to about 350° F. for a period sufficient to strip off from about 2 wt% to about 4 wt% of said hydrogenated isobutylene polymer to remove a portion of said odorous compounds, and to prepare a nitrogen-stripped hydrogenated isobutylene polymer,

(c) percolating said nitrogen-stripped hydrogenated isobutylene polymer through attapulgite clay of from about 4 to about 200 mesh wherein the ratio of said isobutylene polymer to said clay is in the range of from 10:1 to 1:1 at a temperature within the range of from about 70° F. to about 200° F. to remove additional odorous compounds, and

(d) recovering the nitrogen-stripped, clay-percolated hydrogenated isobutylene polymer substantially free of impurities and odorous compounds, being colorless and odorless, having a viscosity of 3 to 37 centistokes at 100° F., color, haze—5 maximum, haze-free—10 APHA maximum, and of a molecular weight range of from about 100 to about 4000.

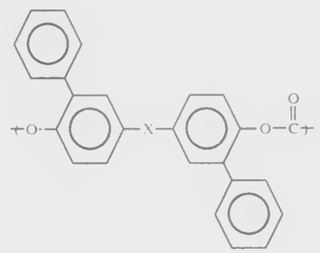
4,923,962
OPTICAL DISK SUBSTRATE COMPRISING AROMATIC POLYCARBONATE

Kazuyoshi Shigematsu; Shigenori Shirouzu; Shuji Sakamoto, and Toshiyasu Suzuki, all of Chiba, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

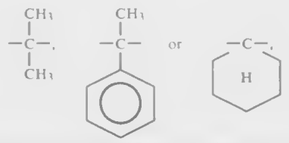
Filed Oct. 12, 1988, Ser. No. 256,643
Claims priority, application Japan, Oct. 20, 1987, 62-262850; Feb. 5, 1988, 63-23657; Feb. 5, 1988, 63-23658
Int. Cl.[5] C08G *63/62*
U.S. Cl. 528—196 **2 Claims**

1. An optical disk substrate comprising a polycarbonate having the repeating units represented by the following general formula:

(I)



wherein X represents



and having the viscosity average molecular weight of 12,000 to 25,000.

4,923,963
BRADYKININ ANTAGONIST PEPTIDES

John M. Stewart, and Raymond J. Vavrek, both of Denver, Colo., assignors to Nova Technology Limited Partnership, Baltimore, Md.

Filed Sep. 2, 1987, Ser. No. 91,995
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.[5] C07K *7/18*
U.S. Cl. 530—314 **6 Claims**

1 The peptide having the formula

CDF-Pro-Pro-Gly-Phe-Ser-DPhe-Phe-Arg.

4,923,964
HUMAN SPLENIN

Gideon Goldstein, Short Hills, and Tapan Audhya, Bridgewater, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed May 22, 1987, Ser. No. 53,186
Int. Cl.[5] A61K *37/02;* **C07C** *103/52*
U.S. Cl. 530—324 **6 Claims**

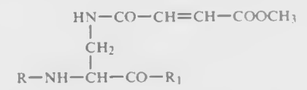
1. A protein, splenin, substantially free of other human proteinaceous material, comprising the amino acid sequence as follows:
-GLY-LEU-PRO-LYS-GLU-VAL-PRO-ALA-VAL-LEU-THR-LYS-GLN-LYS-LEU-LYS-SER-GLU-LEU-VAL-ALA-ASN-ASN-VAL-THR-LEU-PRO-ALA-GLY-GLV-MET-ARG-LYS-ALA-VAL-TYR-VAL-GLU-LEU-TYR-LEU-GLN-SER-LEU-THR-ALA-GLU-HIS-, said protein having the ability to induce elevation of intracellular cGMP as measured by an assay with MOLT-4 T-cells.

4,923,965
TRIPEPTIDES OF N^3-4-METHOXYFUMARYL-L-2,3-DIAMINO-PROPANOIC ACID

Ryszard Andruszkiewicz, Sopot; Henryk Chmara, Gda sk; Slawomir Milewski, Gda sk; Edward Borowski, Gda sk; Maria Zaremba, Bialystok, and Jerzy Borowski, Bialystok, all of Poland, assignors to Politechnika Gdanska, Gda sk, Poland

Filed Jul. 21, 1988, Ser. No. 222,190
Int. Cl.[5] A61K *37/02;* **C07K** *5/08*
U.S. Cl. 530—331 **1 Claim**

1. A tripeptide of N^3-4-methoxyfumaryl-L-2,3-diaminopropanoic acid of the general formula



where R is a hydrogen atom when R_1 is the dipeptide residue containing the residue of alanine, methionine, valine, leucine, norvaline, or R and R_1 have the same meaning and are the residue of monoaminomonocarboxylic aminoacid, selected from the group consisting of alanine, methionine, valine, leucine, norvaline, or R is the dipeptide residue containing the residue of alanine, methionine, valine, leucine, norvaline, lysine, ornithine, sarcosine, 2,4-diaminobutanoic acid and 2,3-diaminopropanoic acid, and R_1 is a hydroxide group.

4,923,966
USE OF GUANIDINE-RELATED COMPOUNDS COMPRISING A TETRAPHENYL-BORATE ION IN SOLUTION PHASE PEPTIDE SYNTHESIS

Roland Callens, Gent-Drongen, and André Collin, Ligny, both of Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Jun. 17, 1988, Ser. No. 207,876
Claims priority, application France, Jun. 19, 1987, 87 08695
Int. Cl.[5] C07K *1/02, 1/06*
U.S. Cl. 530—338 **4 Claims**

1. Use of a guanidine-related compound in solution phase peptide synthesis, the guanidine-related compound comprising a tetraphenylborate ion and having the general formula:



wherein R denotes an organic radical comprising at least one amine group.

4,923,967
PURIFICATION AND REFOLDING OF RECOMBINANT PROTEINS

Jesse L. Bobbitt, and Joseph Manetta, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 26, 1988, Ser. No. 248,757
Int. Cl.[5] C07K *3/24, 15/06, 7/40, 13/00*
U.S. Cl. 530—351 **39 Claims**

1. A method for purifying recombinant human Interleukin-2 comprising:

(a) disrupting the cell wall of a host cell that contains insoluble recombinant Interluekin-2 granules, said granules also containing cellular impurities, and isolating said granules from the cellular debris;

(b) solubilizing said granules in a denaturing reagent containing a sulfitolyzing reagent to form a solution containing sulfitolyzed recombinant human Interleukin-2 and said impurities;

(c) solvent exchanging said solution containing sulfitolyzed recombinant human Interleukin-2 into a solution comprising approximately 7M urea at a temperature in the range of about 1° C. to about 6° C. and forming a precipitate of said sulfitolyzed recombinant Interleukin-2 by raising the temperatures of said solvent exchanged solution from a range of about 1° C. to 6° C. to a range of about 18° C. to about 28° C. and

(d) isolating said recombinant human Interleukin-2 sulfitolyzed precipitate from said impurities in the resultant supernatant.

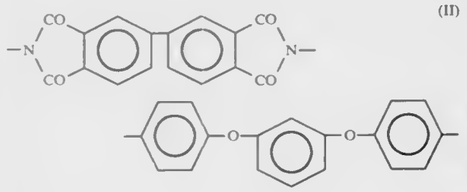
4,923,968
MELT-MOLDABLE CRYSTALLINE POLYIMIDE POLYMER

Kouichi Kunimune, Chibaken; Kazutsune Kikuta, Yokohamashi; Takao Kawamoto, Kawasakishi, and Shiro Konotsune, Yokosukashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

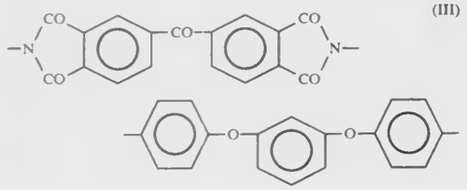
Filed Jul. 11, 1988, Ser. No. 217,302
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—353 **5 Claims**



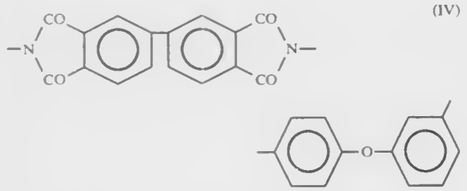
1. A melt-moldable, crystalline polyimide polymer comprising the following imide reptition unit (II) in 30% by mol or more based on the polymer, and also comprising at least one member selected from the group consisting of the following imide repetition units (III), (IV), (V), (XIV), (XV) and (XVI) and also having an inherent viscosity of 0.1 to 5 dl/g as measured in a concentration thereof of 0.5 g/dl in concentrated sulfuric acid at a temperature of 30±0.01° C., and further having a melting point of 300° to 390° C. as measured by means of a differential scanning calorimeter:



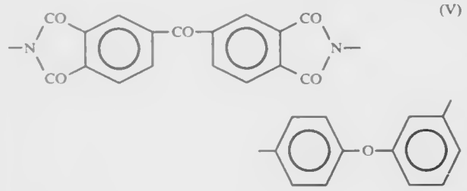
(II)



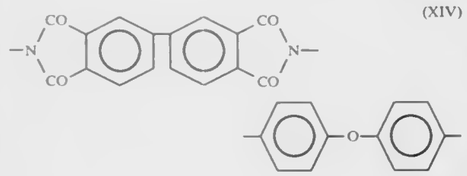
(III)



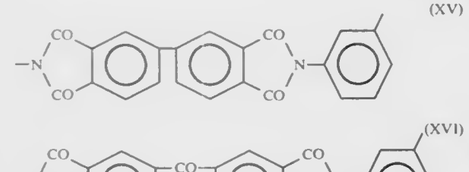
(IV)



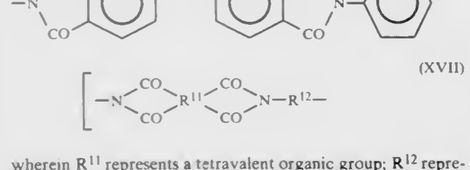
(V)



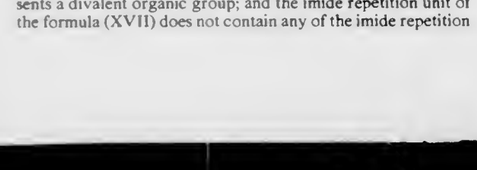
(XIV)



(XV)



(XVI)



(XVII)

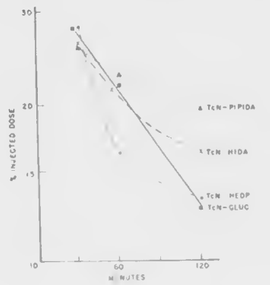
wherein R^{11} represents a tetravalent organic group; R^{12} represents a divalent organic group; and the imide repetition unit of the formula (XVII) does not contain any of the imide repetition units of the formulas (II), (III), (IV), (V), (XIV), (XV) and (XVI).

4,923,969

PREPARATION OF 99M TC RADIOPHARMACEUTICALS

John Bonnyman, Nunawading, and John Baldas, Rosanna East, both of Australia, assignors to The Commonwealth of Australia, Phillip, Australia

Division of Ser. No. 774,592, Aug. 23, 1985, Pat. No. 4,851,515.
This application Sep. 7, 1988, Ser. No. 241,471
Claims priority, application Australia, Dec. 29, 1983, PG 3034/83
Int. Cl.[5] C07F *13/00*; A61K *49/02, 43/00*
U.S. Cl. 534—14 7 Claims



1. A method of producing a ^{99m}TcN-labelled product, which comprises reacting a compound of the formula

$$R^+[^{99m}TcNX_4]$$

wherein R^+ represents a cation and X represents a halo group, with a ligand.

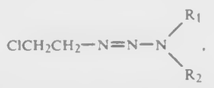
4,923,970

SUBSTITUTED 1-(2-CHLOROETHYL)-3-ACYL-3-ALKYLTRIAZENES

Christopher J. Michejda, Gaithersburg, and Richard H. Smith, Jr., Taneytown, both of Md., assignors to Bionetics Research, Inc., Kensington, Md.

Filed Mar. 28, 1988, Ser. No. 179,622
Int. Cl.[5] C07C *115/00, 107/00, 107/02*; A61K *31/655*
U.S. Cl. 534—550 23 Claims

1. A substituted 1-(2-chlorethyl)-3-acyl-3-alkyltriazene of the formula:



wherein R_1 is selected from the group consisting of

1-oxoalkyl containing from two to eight carbon atoms, fluorinated 1-oxoalkyls containing from two to eight carbon atoms and substituted with up to three fluorine atoms, benzoyl, phenylacetyl, carboalkoxy containing from two to eight carbon atoms, fluorinated carboalkoxy containing from two to eight carbon atoms and up to three fluorine atoms, carbophenoxy, N-phenyl aminocarbonyl, N-alkyl aminocarbonyl containing from two to eight carbon atoms, thiocarbamoyl, N-alkylthiocarbamoyls with from two to eight carbon atoms, N-phenylthiocarbamoyl, dialkylphosphonates in which the alkyl groups can be the same or different and each contains from one to seven carbon atoms, phenylsulfonyl, and meta or para-substituted phenylsulfonyl in which the meta or para substituent is selected from the group consisting of methyl, ethyl, methoxy, ethoxy, fluoro and chloro;

and wherein R_2 is independently selected from the group consisting of

alkyl containing from one to seven carbon atoms, fluoroalkyl containing from two to seven carbon atoms and from one to three fluorine atoms in which the α carbon of the fluoroalkyl group is not substituted with fluorine, benzyl, meta or para-substituted benzyl in which the meta or para substituent is selected from the group consisting of chloro, fluoro, and alkoxy with from one to three carbon atoms, alkenyl containing from two to seven carbon atoms, and alkynyl containing from two to seven carbon atoms.

23. A process for synthesizing a 1-(2-chloroethyl)-3-acyl-3-alkyltriazene as defined in claim 1, comprising the steps of:

protecting the hydroxy group of 2-azidoethanol with tert-butylchloro-dimethylsilane to produce 1-azido-2-(tertbutyl-dimethylsiloxy)ethane;

reacting 1-azido-2-(tert-butyldimethylsiloxy)ethane with an alkyllithium, alkenyllithium or alkynyllithium to produce a corresponding 3-substituted triazene;

acylating the 3-substituted triazene with an isocyanate or by treatment with potassium hydride in presence of a phase transfer catalyst to form an anion followed by reaction with an acylating agents; and

deprotecting the hydroxy group by treatment with tetra-n-butylammonium fluoride; and forming a chloride by reacting the hydroxy group with Ph_3P/CCl_4.

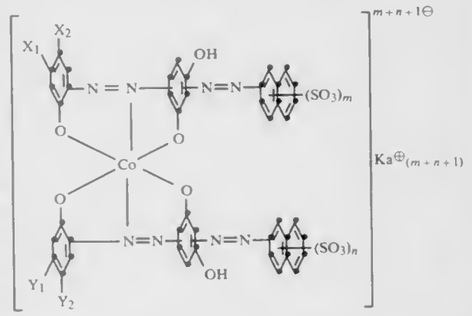
4,923,973

1:2 COBALT COMPLEXES OF DISAZO DYES

Alois Püntener, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 567,014, Dec. 30, 1983, abandoned.
This application Jul. 17, 1989, Ser. No. 382,001
Claims priority, application Switzerland, Jan. 5, 1983, 46/83
Int. Cl.[5] C09B *45/24, 33/04*; D06P *1/10, 3/02*
U.S. Cl. 534—684 6 Claims

1. A 1:2 cobalt complex dye of the formula



in which X_1 is nitro or hydrogen, X_2 is nitro, hydrogen, chlorine or methyl, Y_1 is nitro or hydrogen, Y_2 is nitro, hydrogen, chlorine or methyl, m and n, independently of each other, are each 1, 2 or 3, and $Ka^{\oplus}$ is a cation, and one of each pair of substituents X_1 or X_2 and Y_1 or Y_2 is nitro and the other is as defined but not nitro.

4,923,971

TREATMENT OF ARYLENE SULFIDE POLYMER FIBER

Bruce L. Ramsey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 17, 1988, Ser. No. 272,562
Int. Cl.[5] C08G *75/14*
U.S. Cl. 528—481 24 Claims

1. A method of treating crystallizable poly(arylene sulfide) fiber comprising subjecting said poly(arylene sulfide) fiber to treatment with an organic halide.

4,923,972

PREPARATION OF LIQUID FORMULATIONS OF BASIC AZO DYES IN CARBOXYLIC ACID SOLUTION AND SUBSEQUENT HEATING

Karl Schmeidl, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 14, 1988, Ser. No. 181,579
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1987, 3713617
Int. Cl.[5] C09B *29/085, 37/00, 67/10, 67/34*
U.S. Cl. 534—677 2 Claims

1. A process for preparing a liquid formulation of a basic azo dye from unsubstituted or C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted m-phenylenediamine by diazotizing and coupling in carboxylic acid solution, which comprises performing the reaction with from 0.76 to 0.95 mole of nitrite, calculated as nitrous acid and based on 1 mole of m-phenylenediamine, and then heating the resulting reaction mixture at from 60° C. to the boiling point of the reaction mixture.

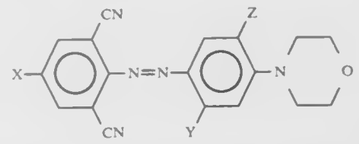
4,923,974

2,6-DICYANO-4'-MORPHOLINOAZOBENZENE COMPOUNDS USEFUL FOR DYEING HYDROPHOBIC MATERIALS

Yasuyoshi Ueda; Hideo Hattori; Jun Yamamoto, all of Osaka, and Kiyoyasu Hashimoto, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 19, 1988, Ser. No. 221,223
Claims priority, application Japan, Aug. 4, 1987, 62-195532
Int. Cl.[5] C09B *29/34, 29/01*; D06P *1/18, 3/54*
U.S. Cl. 534—799 4 Claims

1. A monoazo compound of the following formula,



wherein X is halogen or C_{1-4} alkyl; Y is hydrogen, chlorine, methyl or —NHCOR in which R is C_{1-4} alkyl, C_{1-4} alkoxy, amino, chloromethyl or chloroethyl; and Z is hydrogen, chlorine, methyl, methoxy or ethoxy.

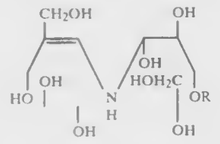
4,923,975

VALIOLAMINE DERIVATIVES AND PRODUCTION THEREOF

Yukihiko Kameda, Kanazawa, and Satoshi Horii, Sakai, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 24, 1986, Ser. No. 855,407
Claims priority, application Japan, Apr. 24, 1985, 60-89513
Int. Cl.[5] C07H *5/06;* C07C *87/36*
U.S. Cl. 536—17.9 3 Claims

1. A valiolamine derivative of the formula:



where R stands for hydrogen or β-D-glucopyranosyl group.

4,923,976

PROCESS FOR PREPARING SURFACE-ACTIVE GLYCOSIDES AND THE USE OF THE GLYCOSIDES IN COSMETIC, PHARMACEUTICAL AND HOUSHOLD PRODUCTS

Germaine Arnaudis, Castres, France, assignor to Rohm and Haas S.A., Paris Cedex, France

Filed Oct. 28, 1982, Ser. No. 437,508
Int. Cl.[5] C07H *1/00;* C07G *3/00*
U.S. Cl. 536—18.6 6 Claims

1. A process for the preparation of surface active glycosides having improved color which comprises reacting a C_8–C_{18} fatty alcohol with an aldose or ketose in a mole ratio of from 1.25:1 to 4:1 in the presence of from 0.03 to 10% by weight, based on the weight of the aldose or ketose, of an acid catalyst composition comprising an acid catalyst useful in etherification reactions and an acid reducing agent or salt thereof.

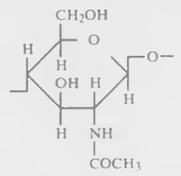
4,923,977

COSMETIC COMPOSITION BASED UPON N-HYDROXYPROPYLISOPROPYLETHER CHITOSANS AS WELL AS NEW N-HYDROXYPROPYLISOPROPYLETHER DERIVATIVES OF CHITOSAN

Günther Lang, Reinheim; Gerhard Maresch, and Hans-Rudi Lenz, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

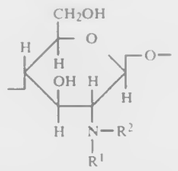
PCT No. PCT/EP87/00774, § 371 Date Jul. 29, 1988, § 102(e) Date Jul. 29, 1988, PCT Pub. No. WO88/05790, PCT Pub. Date Aug. 11, 1988
PCT Filed Dec. 12, 1987, Ser. No. 228,928
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703760
Int. Cl.[5] C08B *37/08;* A61K *31/73, 7/00;* A61L *9/04*
U.S. Cl. 536—20 10 Claims

1. A cosmetic composition for the treatment of hair and skin which contains in a suitable cosmetic base an N-hydroxy-propyl-isopropyl ether chitosan consisting of (a) 4 to 40 mole percent of monomer units having the formula (I)



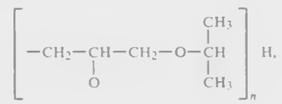
(I)

and (b) 60 to 96 mole percent of monomer units having the formula (II)



(II)

wherein R^1 and R^2 are identical or different and are hydrogen or the group



wherein n equals 1 or 2, with the condition that in at least half the units having the formula (II) R^1 and R^2 do not simultaneously represent hydrogen.

4,923,978

PROCESS FOR PURIFYING NUCLEIC ACIDS

Randy M. McCormick, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 28, 1987, Ser. No. 138,038
Int. Cl.[5] C07H *21/00;* C07K *3/18, 3/20*
U.S. Cl. 536—27 4 Claims

1. A process for separating enzymes from nucleic acids which comprises

a. contacting a solution containing enzymes and nucleic acids with a rehydrated silica gel said rehydrated silica gel having a specific surface area of 50 to 150 m^2/g and pores throughout having an effective diameter of 60 Å to 150 and having surface hydroxyl groups at a concentration of 0.1 $\mu mol/m^2$ to 8 mol/m^2 and at a pK_a between 6 and 10 capable of binding enzymes to leave an unbound fraction containing the nucleic acids; and

b. isolating the unbound fraction.

4,923,979

CELLULOSE CARBAMATE PRODUCTS OF LOWERED CARBAMATE CONTENT

Vidar Eklund; Jan Fors; Leo Mandell; Kerstin Meinander, all of Porvoo; Johan-Fredrik Selin, Helsinki, and Olli T. Turunen, Porvoo, all of Finland, assignors to Neste Oy, Finland

Division of Ser. No. 178,546, Apr. 7, 1988, Pat. No. 4,861,874.
This application Apr. 5, 1989, Ser. No. 333,683
Claims priority, application Finland, Jul. 7, 1987, 872992
Int. Cl.[5] D01F *2/00;* D06M *1/02;* C08B *15/06*
U.S. Cl. 536—32 4 Claims

1. Cellulose carbamate having a reduced carbamate content, said cellulose carbamate being produced by contacting cellulose carbamate with a solution of an alkali or organic base and also containing in solution at least one soluble alkali metal salt, the carbamate content of said cellulose carbamate being lowered without adversely affecting strength and elongation characteristics thereof.

4,923,980

PROCESS FOR THE MANUFACTURE OF A GEL PRODUCT

Arne L. Blomberg, Lund, Sweden, assignor to BioCarb AB, Sweden

Filed Nov. 7, 1988, Ser. No. 268,213
Claims priority, application Sweden, Nov. 10, 1987, 8704387
Int. Cl.[5] C07H *5/06, 5/04;* B01J *20/22*
U.S. Cl. 536—55.3 11 Claims

1. A process for the manufacture of a gel matrix which is covalently coupled with a reducing sugar comprising the steps of coupling the sugar, through its reducing end, to a matrix provided with amino groups to form a glycosyl amine and then stabilizing said glycosyl amine by acylation to form a glycosyl amide.

4,923,981

USE OF PARENCHYMAL CELL CELLULOSE TO IMPROVE COMESTIBLES

Michael K. Weibel, Redding, Conn., and Chester D. Myers, Toronto, Canada, assignors to SBP, Inc., Philadelphia, Pa. and SLR Inc., Mississauga, Canada, a part interest

Continuation-in-part of Ser. No. 62,445, Jun. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 512,940, Jul. 12, 1983, Pat. No. 4,831,127, which is a continuation-in-part of Ser. No. 414,931, Sep. 3, 1982, abandoned. This application Apr. 6, 1989, Ser. No. 334,596
Int. Cl.[5] A61K *47/00, 31/715;* A23K *1/00;* A23L *1/24*
U.S. Cl. 536—56 30 Claims

1. A stabilized food or drug comestible having at least one of the following properties:

(a) reduced caloric content;
(b) reduced fat content;
(c) improved texture;
(d) improved flavor release; or
(e) improved mouthfeel;

said comestible comprised of at least one first material in at least one second material and parenchymal cell cellulose in an amount sufficient to stabilize said dispersion.

4,923,982

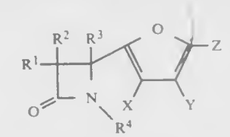
OXIDATION AND REDUCTION METHOD TO PRODUCE 4-ACYLOXYAZETIDIN-2-ONE

Joseph E. Lynch, Plainfield, N.J.; William L. Laswell, Perkasie, Pa.; Ralph P. Volante, East Windsor, and Ichiro Shinkai, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 21, 1989, Ser. No. 369,396
Int. Cl.[5] C07D *285/10, 501/34, 307/56*
U.S. Cl. 540—200 12 Claims

1. A method for the production of 4-acyloxyazetidin-2-ones comprising the steps of:

(a) contacting, at temperatures from about 0°–20° C., an oxidizing combination comprising about 2 to 150 mole % bromine based on 4-furanyl compound, and sufficient sodium chlorite to produce 4-hydroxylactone azetidin-2-one with 4-furanyl compound of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, C_{1-10} alkyl, C_{1-10} fluoroalkyl, alpha-carbon substituted C_{1-10} alkyl, alpha-carbon substituted C_{1-10} fluoroalkyl, where the alpha-carbon substituent is selected from the group consisting of hydroxyl and protected hydroxyl; R^3 is selected from the group consisting of hydrogen and C_{1-10} alkyl; R^4 is selected from the group consisting of hydrogen and a protecting group for nitrogen; and X, Y and Z are independently selected from the group consisting of hydrogen, halogen, C_{1-10} alkyl, C_6 or $_{10}$ aryl, C_{1-10} alkoxy, C_6 or $_{10}$ aryloxy.

4,923,983

METHOD OF RESOLVING CIS 3-AMINO-4-[2-(2-FURYL)ETH-1-YL]-1-METHOXYCARBONYLMETHYL-AZETIDIN-2-ONE

Ian G. Wright, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 31, 1989, Ser. No. 386,664
Int. Cl.[5] C07D *250/08;* C07C *59/255*
U.S. Cl. 540—363 1 Claim

1. A method for resolving cis αα/ββ-3-amino-4-[2-(2-furyl)eth-1-yl]-methoxycarbonylmethyl-azetidin-2-one into its component enantiomers, which comprises the steps:

(a) contacting a solution of acetonitrile containing between 1 and 4% water and the cis αα/ββ racemate with at least about 0.5 mole-equivalents of an optically active tartaric acid;

(b) seeding said solution with an optically-active L-(+)-tartaric acid salt of cis ββ-3-amino-4-[2-(2-furyl)eth-1-yl]-1-methoxycarbonylmethyl-1-azetidin-2-one or the D-(−) tartaric acid salt of cis αα-3-amino-4-[2-(2-furyl)eth-1-yl]-1-methoxycarbonylmethyl-1-azetidin-2-one; and

(c) separating the insoluble salt formed thereby.

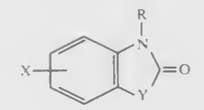
4,923,984

PYRROLO(1,4)BENZODIAZEPINE DERIVATIVES

Hiromu Matsumura, Hyogo; Hiroshi Hashizume, Osaka; Akira Matsushita, Hyogo, and Masami Eigyo, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

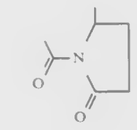
Filed Jul. 31, 1989, Ser. No. 386,946
Claims priority, application Japan, Aug. 5, 1988, 63-196354
Int. Cl.[5] C07D *413/06*
U.S. Cl. 540—496 23 Claims

1. A compound of the formula:



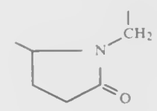
(I)

wherein Y is



(a)

or



(b)

R is hydrogen, C_1–C_5 alkyl, C_1–C_5 alkanoyl, or C_7–C_9 phenylalkyl, and X is hydrogen, C_1–C_5 alkoxy, or halogen.

4,923,985

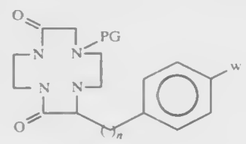
PROCESS FOR SYNTHESIZING MACROCYCLIC CHELATES

Otto A. Gansow, Washington, D.C., and Krishan Kumar, Rockville, Md., assignors to The United States of America as represented by the Department of Health & Human Services, Washington, D.C.

Filed May 25, 1988, Ser. No. 198,537
Int. Cl.[5] C07D *257/00, 259/00*
U.S. Cl. 540—474 **6 Claims**

1. A method of producing a compound of the formula:

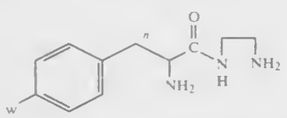
(Formula VII)



comprising the steps of:

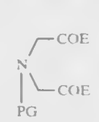
(1) reacting, in dilute anhydrous solution, a compound of the formula:

(Formula III)



wherein n is an integer from 1 to 5, w is a member selected from the group consisting of $—NO_2$, —COOH, $—OCH_2OOCH_3$, with a compound of the formula:

(Formula VI)



wherein PG is a carbamate amino protecting group and E is a leaving group; and

(2) extracting the compound of formula I from the reaction mixture.

4,923,986

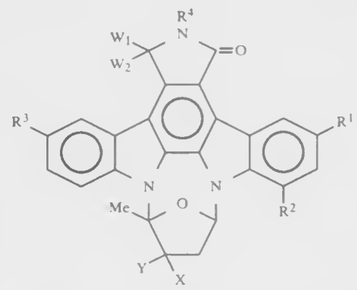
DERIVATIVES OF PHYSIOLOGICALLY ACTIVE SUBSTANCE K-252

Chikara Murakata, Saitama; Akira Sato, Tokyo; Mitsuru Takahashi, Kanagawa; Eiji Kobayashi, Shizuoka; Makoto Morimoto, Shizuoka; Shiro Akinaga, Shizuoka; Tadashi Hirata; Kenichi Mochida, both of Kanagawa; Hiroshi Kase; Koji Yamada, both of Tokyo, and Kazuyuki Iwashashi, Kanagawa, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00144, § 371 Date Nov. 8, 1988, § 102(e) Date Nov. 8, 1988, PCT Pub. No. WO88/07045, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 9, 1987, Ser. No. 273,519
Int. Cl.[5] C07D *498, 22;* A61K *31/55*
U.S. Cl. 540—545 **4 Claims**

1. A K-252 derivative represented by formula (I) and a pharmacologically acceptable salt thereof

(I)



wherein:

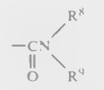
R^1 represents hydrogen, methyl, hydroxy, hydroxymethyl, lower alkoxy, bromine, chlorine or $—NR^5R^6$ (wherein either R^5 or R^6 is hydrogen and the other is hydrogen, carbamoyl, or lower alkylaminocarbonyl, or both are lower alkyl) and R^3 is hydrogen, or R^1 and R^3 are the same and represent hydroxy, lower alkoxy or amino;

R^2 is hydrogen or amino;

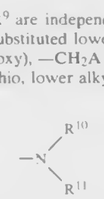
R^4 is hydrogen, chlorine, carbamoyl, lower alkyl, amino or $—CH_2CH_2R^7$ (wherein R^7 is bromine, amino, di-lower alkylamino, hydroxy or hydroxy-substituted lower alkylamino);

W_1 and W_2 are hydrogen or both are combined together to represent oxygen;

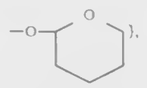
X is hydrogen, formyl, lower alkoxycarbonyl,



(wherein R^8 and R^9 are independently hydrogen, lower alkyl or hydroxy-substituted lower alkyl, or R^8 is hydrogen and R^9 is hydroxy), $—CH_2A$ {wherein A is hydroxy, azido, lower alkylthio, lower alkylsulfenyl,



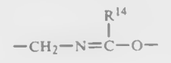
[wherein either R^{10} or R^{11} is hydrogen and the other is hydrogen, lower alkyl, allyl, carboxylic acid-substituted lower alkyl, dihydroxy-substituted lower alkyl, a residue of an α-amino acid in which the hydroxy of the carboxylic acid is removed or lower alkoxycarbonyl-substituted lower alkyl; or both are lower alkyl or chlorine-substituted lower alkyl; or R^{10} and R^{11} are combined together to form $—CH_2CH_2—B—CH_2CH_2—$ (wherein B is $—CH_2—$, —NH—, —S— or —O—)], —N=CH—NMe_2 (wherein Me is methyl), $—OCOCH_2CH_2CO_2H$ or



or —C=N—R^{12} (wherein R^{12} is hydroxy, amino, guanidino or 2-imidazolylamino);

Y is hydroxy or carbamoyloxy; or X and Y are combined together to form, as —X—Y—, O=, $—CH_2O—$, $—CH_2OCOO—$, $—CH_2—O—CS—O—$, $—CH_2—NR^{13}—CO—O—$

$—CH_2—NH—CS—O—$, $—CH_2—O—SO—O—$ or



(wherein R^{14} is lower alkyl or lower alkylthio);

with the proviso that:

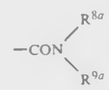
when W_1 and W_2 are combined together to represent oxygen, R^1, R^2 and R^3 are all hydrogen;

when R^4 is lower alkyl, amino or $—CH_2CH_2R^1$, W_1 and W_2 are combined together to represent oxygen;

when Y is carbamoyloxy, R^1, R^2, R^3, W_1 and W_2 are all hydrogen, R^4 is carbamoyl and X is lower alkoxycarbonyl;

when R^4 is chlorine, R^1, R^2, R^3, W, and W_2 are all hydrogen and X is lower alkoxycarbonyl;

when X is hydrogen, formyl,



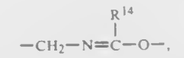
(wherein R^{8a} and R^{9a} are independently hydrogen, lower alkyl, hydroxy-substituted lower alkyl) or CH_2Aa (wherein the Aa representation is the same as the above A representation excluding hydroxy and amino) of —CH=N—R^{12}, R^1, R^2, R^3, R^4, W_1 and W_2 are all hydrogen;

when X is CONHOH, R^1, R^2, R^3 and R^4 are all hydrogen;

when X is lower alkoxycarbonyl, R^4 is hydrogen, chlorine, carbamoyl, lower alkyl or $—CH_2CH_2R^{7a}$ (wherein R^{7a} is bromine or di-lower alkylamino);

when A is aminomethyl, R^1, R^2 and R^3 are hydrogen, and when W_1 and W_2 are combined together to represent oxygen, R^4 is hydrogen or amino and when W_1 and W_2 are hydrogen, R^4 is hydrogen;

when X and Y are combined together to represent, as $—X—Y—$, $—O—$, $—CH_2—O—$, $—CH_2—O—CO—O—$, $—CH_2—O—CS—O—$, $—CH_2—NR^{13a}—CO—O—$ (wherein the R^{13a} representation is the same as the above R^{13} representation excluding hydrogen and lower alkyl), $—CH_2—NH—CS—O—$, $—CH_2—O—SO—O—$ or



R^1, R^2, R^3, R^4, W_1 and W_2 are all hydrogen;

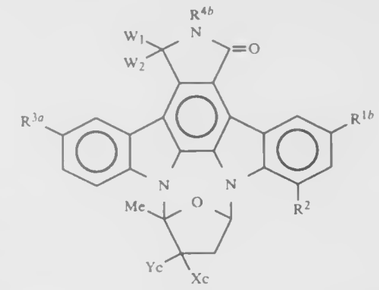
when X and Y are combined together to represent, as —X—Y, $—CH_2—NR^{13b}—CO—O—$ [wherein R^{13b} is hydrogen or lower alkyl), R^1, R^2, R^3 and R^4 are all hydrogen;

when R^1 is methyl, hydroxy, hydroxymethyl, lower alkoxy, bromine, chlorine or $—NR^5R^6$, R^2 and R^4 are hydrogen;

when R^2 is amino, R^1 and R^4 are hydrogen; and the combinations wherein R^1, R^2, R^3, R^4, W_1 and W_2 are hydrogen, X is methoxycarbonyl and Y is hydroxy are excluded.

4. A K-252 derivative represented by formula (Ic) and a pharmacologically acceptable salt thereof:

(Ic)



wherein

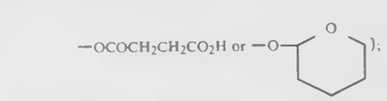
R^{1b} represents hydrogen, methyl, hydroxy, chlorine, hydroxymethyl, lower alkoxy, bromine or $—NR^5R^6$ (wherein either R^5 or R^6 is hydrogen and the other is hydrogen, carbamoyl or lower alkylaminocarbonyl, or both are lower alkyl) and R^{3a} is hydrogen, or R^{1b} and R^{3a} are the same and represent hydroxy, lower alkoxy or amino;

R^2 is hydrogen or amino;

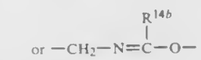
R^{4b} is hydrogen, amino or $—CH_2CH_2R^7$ (wherein R^7 is bromine, amino, di-lower alkylamino, hydroxy or hydroxy-substituted lower alkylamino);

W_1 and W_2 are hydrogen or both are combined together to represent oxygen;

Xc is hydrogen, lower alkoxycarbonyl, hydroxyaminocarbonyl or CH_2Ad {wherein Ad is hydroxy, ,**1041**, [wherein either R^{10b} or R^{11b} is hydrogen and the other is hydrogen, allyl, carboxylic acid-substituted lower alkyl, dihydroxy-substituted lower alkyl, a residue of an α-amino acid in which the hydroxy of the carboxylic acid is removed or lower alkoxycarbonyl-substituted lower alkyl; or both are chlorine-substituted lower alkyl; or R^{10b} and R^{11b} are combined together to form $—CH_2CH_2—Va—CH_2CH_2—$ (wherein Ba is $—CH_2—$, —NH— or —S—)], —N=CH—NMe_2,



Yc is hydroxy; or Xc and Yc are combined together to form, as —Xc—Yc—, $—CH_2—NR^{13c}—CO$;**13** O— [wherein R^{13c} is lower alkyl, allyl, formylmethyl, $—CH_2CH(OH—CH_2OH$,



(wherein R^{14b} is lower alkyl);

with the proviso that:

when W_1 and W_2 are oxygen, R^{1b}, R^2 and R^{3a} are all hydrogen;

when R^{4b} is amino or $—CH_2CH_2R^7$, W_1 and W_2 are oxygen;

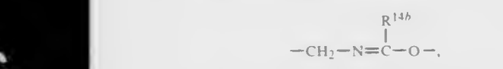
when R^{1b} is methyl, hydroxy, hydroxymethyl, lower alkoxy, bromine or $—NR^5R^6$, R^2 and R^{4b} are hydrogen and Xc is hydroxymethyl;

when R^{1b} is chlorine, R^2 and R^{4b} are hydrogen and Xc is lower alkoxycarbonyl or hydroxymethyl;

when R^2 is amino, R^{1b} and R^{4b} are hydrogen and Xc is lower alkoxycarbonyl or hydroxymethyl;

when Xc is hydrogen or CH_2Ae (wherein the Ae representation is the same as the above Ad representation

excluding hydroxy and amino), R^{1b}, R^2, R^{3a}, R^{3a}, W_1 and W_2 are all hydrogen;
when Xc is hydroxyaminocarbonyl, R^{1b}, R^2, R^{3a} and R^{4b} are all hydrogen and W_1 and W_2 are oxygen;
when Xc is lower alkoxycarbonyl and W_1 and W_2 are oxygen, R^{4b} is $-CH_2CH_2R^{7a}$ (wherein R^{7a} is bromine or di-lower alkylamino);
when Xc is aminomethyl, R^{1b}, R^2 and R^{3a} are hydrogen, W_1 and W_2 are oxygen and R^{4b} is hydrogen or amino;
when Xc is hydroxymethyl and W_1 and W_2 are oxygen, R^{4b} is amino or $-CH_2CH_2R^7$;
when Xc and Yx are combined together to represent, as $-Xc-Yc-$, $-CH_2-NR^{13d}-CO-O-$ (wherein the R^{13d} representation is the same as the above R^{13c} representation excluding lower alkyl) or



R^{1b}, R^2, R^{3a}, R^{4b}, W_1 and W_2 are all hydrogen;
when Xc and Yc are combined together to represent, as $-Xc-Yc-$, $-CH_2-NR^{13e}-CO-O-$ (wherein R^{13e} is lower alkyl), R^{1b}, R^2, R^{3a} and R^{4b} are hydrogen and W_1 and W_2 are oxygen; and the combinations wherein R^{1b}, R^2, R^{3a}, R^{4b}, W_1 and W_2 are hydrogen, Xc is methoxycarbonyl and Yc is hydroxy and the combinations wherein R^{1b}, R^2, R^{3a}, R^{4b}, W_1 and W_2 are hydrogen, Xc is hydroxymethyl and Yc is hydroxy are removed.

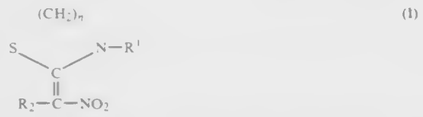
4,923,987

PROCESS FOR THE PREPARATION OF NITROMETHYLENE HETEROCYCLIC COMPOUNDS

Martin Harris, Sittingbourne; Graham Heyes, Durham, and Arthur Jackson, Washington, all of England, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1988, Ser. No. 223,874
Int. Cl.[5] **C07D** *277/10, 279/06*
U.S. Cl. 544—53 **7 Claims**

1. A process for the preparation of a nitromethylene heterocyclic compound of formula



(I)

wherein R^1 represents a hydrogen atom, each moiety R^2 is independently selected from hydrogen atoms and C_{1-4} alkyl and benzyl groups, and n is 2 or 3, which process comprises reacting an alkali metal methylnitrodithioacetate with a compound of formula

$$H_2N-(CR^2_2)n-OSO_3H \quad (II)$$

wherein R^2 and n are as defined above, to produce a compound of Formula I wherein R_1 is hydrogen.

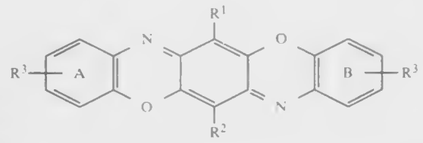
4,923,988

PREPARATION OF TRIPHENDIOXAZINES

Uwe Nahr, Dannstadt-Schauernheim, and Manfred Pastsch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 257,807
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735057
Int. Cl.[5] **C07D** *498/04*
U.S. Cl. 544—74 **8 Claims**

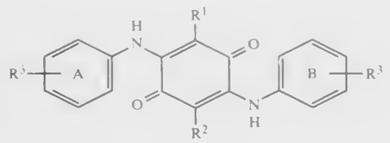
1. A process for preparing triphendioxazine of the formula (I):



(I)

wherein R^1 and R^2 are identical or different and each is independently hydrogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, halogen, phenyl, phenyl substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, amino, hydroxysulfonyl or halogen; phenoxy or phenoxy substituted by methyl, methoxy or chloro; and wherein rings A and B are identical or different and each is independently of the other unsubstituted or substituted by R^3, wherein R^3 is hydrogen, C_1-C_4 alkyl, C_1-C_4 alkyl substituted by amino, C_1-C_4-mono- or dialkylamino, hydroxyl, C_1-C_4-alkoxy, hydroxylsulfonyl, carboxyl, C_1-C_4-alkanoylamino, sulfato or 2-sulfatoethylsulfonyl, phenyl, phenyl substituted by hydroxyl, C_1-C_4-mono- or dialkylamino, carboxyl, C_1-C_4-alkanoylamino, sulfato or 2-sulfatoethylsulfonyl; phenoxy, phenoxy substituted by amino, benzyl, C_1-C_4-alkoxy, C_5-C_7-cycloalkoxy, phenylthio, amino, C_1-C_4-alkylamino, C_1-C_4-alkylamino substituted by lower alkyl, amino, hydroxy, hydroxysulfonyl or 2-sulfatoethyl; C_5-C_7-cycloalkylamino, phenylamino, phenylamino substituted by amino, benzylamino, C_1-C_4-alkanoylamino, halogen carboxyl, hydroxysulfonyl, sulfamoyl or 2-sulfatoethylsulfonyl; or wherein said rings A and B are fused to a benzo ring, an indan ring or indole ring, which benzo, indan or indole rings are unsubstituted or substituted by amino, C_1-C_4-mono- or a dialkylamino, C_1-C_4-alkoxy, hydroxylsulfonyl, or carboxyl, C_1-C_4-alkanoylamino or 2-sulfatoethylsulfonyl, which process comprises:

cyclizing a benzoquinone of the formula (II):



(II)

wherein R^1, R^2, R^3 and rings A and B are as defined above, in oleum as the reaction medium and in the presence of an effective amount of an organic iodine compound.

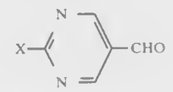
4,923,989

COMPOUNDS AND COMPOSITIONS

Keith G. Watson, Box Hill North, and Graeme J. Farquharson, Reservoir, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Continuation of Ser. No. 687,933, Dec. 31, 1984, abandoned, which is a division of Ser. No. 525,483, Aug. 22, 1983, abandoned. This application Mar. 20, 1989, Ser. No. 326,456
Int. Cl.[5] **C07D** *234/28, 239/36*
U.S. Cl. 544—318 **3 Claims**

1. A compound of formula Va



Va

wherein X is methyl or methoxy.

4,923,990

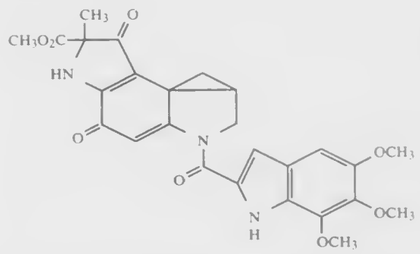
PYRINDAMYCINS A AND B AND DUOCARMYCIN A ANTIBIOTICS DERIVED FROM CERTAIN STREPTOMYCES CULTURE

Hirofumi Nakano; Isami Takahashi, both of Tokyo, Japan; Michio Ichimura, Nashville, Tenn.; Isao Kawamoto, Kanagawa, Japan; Kozo Asasno, Ibaraki, Japan; Fusao Tomita, Tokyo, Japan; Hiroshi Sano, Tokyo, Japan; Toru Yasuzawa, Tokyo, Japan; Makoto Morimoto, Shizouka, Japan, and Kazuhisa Fujimoto, Kanagawa, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

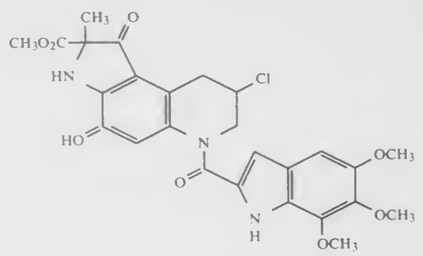
Continuation-in-part of Ser. No. 143,138, Dec. 16, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 242,788
Claims priority, application Japan, Apr. 17, 1986, 61-89031; Apr. 24, 1986, 61-95649
Int. Cl.[5] **C07D** *487/04, 519/00;* **C07** *519/00;* **C12P** *17/18*
U.S. Cl. 546—84 **2 Claims**



1. DC-88A, a compound of the formula



2. DC-89A1, a compound of the formula



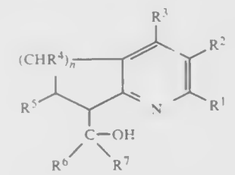
4,923,991

QUINOLINE DERIVATIVES

Roger Crossley, Reading, and Kenneth Heatherington, Burnham, both of United Kingdom, assignors to John Weyth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 571,972, Jan. 18, 1984, Pat. No. 4,837,329. This application Dec. 16, 1988, Ser. No. 285,909
Claims priority, application United Kingdom, Jan. 19, 1983, 8301377
Int. Cl.[5] **C07D** *215/04*
U.S. Cl. 546—152 **5 Claims**

1. A compound of formula III



III

or a pharmaceutically acceptable salt thereof,
wherein
R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms cycloalkyl of 4 to 6 carbon atoms, aralkyl of 7 to 12 carbon atoms or phenyl, any of which cyclic structures may be monosubstituted by alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, or $-CF_3$,
or R^2 and R^3, taken together, form a 5, 6 or 7 membered saturated carbocyclic ring;
R^4 and R^5 may also be alkoxy of 1 to 6 carbon atoms or cycloalkoxy of 4 to 6 carbon atoms;
n is one of the integers 1, 2 or 3;
and, if more than one R^4 group is present, the R^4 groups may be the same or different;
and carboxylic acid esters of the depicted hydroxy substituent;
with the provisos that (1) when R^1, R^2, R^3, R^4, and R^5 are all hydrogen, R^6 and R^7 are other than hydrogen, and (2) when R^4 is methyl, R^6 and R^7 are not both methyl.

4,923,992

PROCESS FOR THE PREPARATION OF BIS(2,2,6,6-TETRAMETHYL-4-PIPERIDYL)AMINE

Graziano Vignali, Sasso Marconi; Giovanni De Roit, Bologna, both of Italy; Paul Dubs, Marly, and Peter Baumeister, Flüh, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 27, 1989, Ser. No. 329,168
Claims priority, application Italy, Apr. 7, 1988, 20117 A/88
Int. Cl.[5] C07D *401/12*
U.S. Cl. 546—186 16 Claims

1. A one step process for the preparation of bis(2,2,6,6-tetramethyl-4-piperidyl)amine by reacting 2,2,6,6-tetramethyl-4-piperidone or 2,2,6,6-tetramethyl-4-piperidone×H_2O with ammonia and hydrogen in the presence of a nobel metal hydrogenation catalyst, characterized in that the molar ratio of 2,2,6,6-tetramethyl-4-piperidone versus ammonia is between 1:0.4 and 1:0.8.

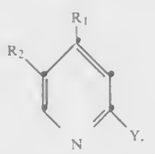
4,923,993

PROCESS FOR THE PREPARATION OF 2-PYRIDINECARBOXYLIC ACID DERIVATIVES AND 1-AMINO-1,4-DIHYDROPYRIDINE-2-CARBOXYLIC ACID DERIVATIVES

Adrian Waldner, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 919,532, Oct. 16, 1986, abandoned.
This application Sep. 2, 1988, Ser. No. 240,165
Claims priority, application Switzerland, Oct. 25, 1985, 4609/85
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[5] C07D *213/803, 471/04, 491/048*
U.S. Cl. 546—250 12 Claims

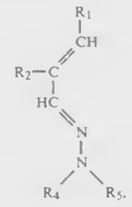
1. A process for the preparation of a substituted pyridine of formula I



(I)

wherein R_1 is hydrogen or unsubstituted linear or branched C_1–C_6alkyl; R_2 independently has the same meaning as R_1 and is additionally fluorine, chlorine or bromine; or R_1 and R_2 together are an unsubstituted C_3–C_4alkylene bridge and Y is CN or $COOR_3$, wherein R_3 is C_1–C_3alkyl cyclopentyl, cyclohexyl, phenyl or benzyl or C_1–C_3alkyl, cyclopentyl, cyclohexyl, phenyl or benzyl which is substituted by C_1–C_4alkyl, C_1–C_4 alkoxy or halogen, which process comprises

(a) reacting a hydrazone of formula II



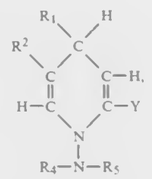
(II)

wherein R_1 and R_2 are as defined for formula I and R_4 and R_5 are each individually linear or branched C_1–C_6alkyl, cyclopentyl, cyclohexyl, phenyl, or C_1–C_4alkylphenyl or, when taken together, are tetramethylene, pentamethylene or 3-oxapentalene, in the presence of an inert solvent and a base, with a compound of formula III



(III)

wherein X is chlorine or bromine and Y is as defined for formula I, to give a 1-amino-1,4-dihydropyridine of formula IV



(IV)

wherein R_1, R_2, R_4, R_5 and Y have the given meanings, and

(b) converting the compound of formula IV into a compound of formula I by treatment with an acid, with removal of HNR_4R_5.

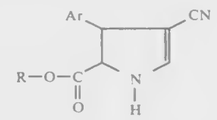
4,923,994

2-CARBOXY-3-CYANO-4-ARYL-PYRROLES

Detlef Wollweber, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktienegesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 197,065, May 19, 1988. This application May 9, 1989, Ser. No. 349,191
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718375
Int. Cl.[5] C07D *401/00, 405/00, 207/00*
U.S. Cl. 546—281 1 Claim

1. A pyrrole-2-carboxylic acid derivative of the formula



(IV)

in which

R is hydrogen, alkyl or an equivalent of an inorganic or organic cation, and

Ar is optionally substituted heteroaryl or aryl.

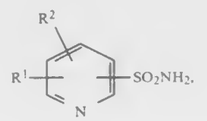
4,923,995

PYRIDYLSULFONAMIDES

Willy Mayer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 908,768, Sep. 18, 1986, Pat. No. 4,778,513, which is a division of Ser. No. 676,905, Nov. 30, 1984, Pat. No. 4,643,760. This application Jul. 20, 1988, Ser. No. 221,847
Claims priority, application Switzerland, Dec. 8, 1983, 6574/83
Int. Cl.[5] C07D *213/60, 213/61, 213/71*
U.S. Cl. 546—294 2 Claims

1. A substituted pyridinylsulfonamide of the formula IIa



(IIa)

wherein

R^1 is a



radical,

R^2 is hydrogen, halogen, nitro, C_1–C_3alkyl, C_1–C_3alkoxy or —$COOR^9$,

R^6 is hydrogen or C_1–C_3alkyl,

R^7 is hydrogen or methyl,

R^8 is C_4–C_6cycloalkanonyl which is unsubstituted or substituted by C_1–C_3alkyl or halogen; C_3–C_6cycloalkyl which is unsubstituted or substituted by one or more identical or different members selected from the group consisting of C_1–C_3alkyl, C_1–C_3alkoxy, halogen or cyano; or is C_5–C_6-cycloalkenyl which is unsubstituted or substituted by C_1–C_3alkyl, halogen or cyano,

R^9 is C_1–C_3alkyl or allyl and

n is 0 or 1.

4,923,996

OPTICALLY ACTIVE RHODIUM COMPLEXES OF 3,4-BIS(DIARYLPHOSPHINO)PYRROLIDINES AND THEIR USE FOR THE PREPARATION OF PHOSPHINOTHRICIN BY ASYMMETRIC HYDROGENATION

Wolf-Dieter Müller, Hofheim am Taunus, and Hans-Jerg Kleiner, Kronberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 312,030
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805151; May 31, 1988, 3818435
Int. Cl.[5] C07F *9/65, 9/30*
U.S. Cl. 548—402 7 Claims

1. A rhodium complex of the formula

$$[A—O—(CH_2CH_2O)_n—A]^{2+}\,2\,X^- \qquad Ia$$

and

$$[A—O—(CH_2CH_2O)_m—CH_3]^+\,X^- \qquad Ib$$

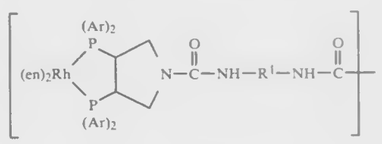
in which

n = 5–1,000,

m = 5–250,

X^- a tetrafluoroborate, hexafluorophosphate or per-chlorate anion,

A is a radical of the formula



II

where R′ is an alkylene or alkenylene group; the R″ groups are independently selected from hydrocarbon and halohydrocarbon groups; and n is an integer of at least one.

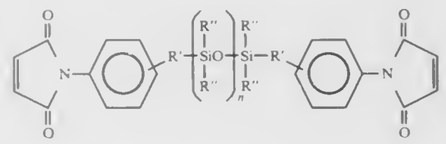
4,923,997

NOVEL SILOXANE MALEIMIDES

Philip Klemarczyk, Collinsville, Conn., assignor to Loctite Corporation, Newing, Conn.

Division of Ser. No. 26,535, Mar. 16, 1987, Pat. No. 4,806,608. This application Feb. 21, 1989, Ser. No. 313,550
Int. Cl.[5] C07F *9/65;* C07D *207/448*
U.S. Cl. 548—406 6 Claims

1. A bismaleimide compound of the formula:



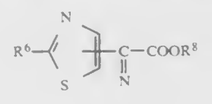
4,923,998

CEPHEM AND CEPHAM COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi; Kiyoshi Tsuji, both of Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Division of Ser. No. 886,340, Mar. 14, 1978, Pat. No. 4,425,341. This application Oct. 19, 1983, Ser. No. 543,298
The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.
Int. Cl.[5] C07D *277/40, 277/46*
U.S. Cl. 548—195 22 Claims

1. The compound of the formula



wherein R^2 is carboxy(lower)-alkyl or lower alkoxyxycarbonyl(lower)alkyl,

R^6 is amino, substituted or unsubstituted (lower)alkanamido or tritylamino, and

R^8 is hydrogen or lower alkyl.

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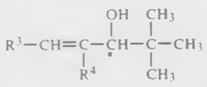
4,923,999

OPTICALLY ACTIVE BORANE COMPLEX AND A METHOD FOR PRODUCING AN OPTICALLY ACTIVE ALCOHOL DERIVATIVE BY THE USE THEREOF

Yukio Yoneyoshi, Ootsu; Gohfu Suzukamo, Ibaraki; Kazuhiko Hamada, Nishigyo, and Toshio Nishioka, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

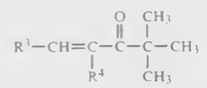
Division of Ser. No. 750,255, Jul. 1, 1985, Pat. No. 4,749,809. This application Mar. 16, 1988, Ser. No. 169,056
Claims priority, application Japan, Jul. 5, 1984, 59-140157
The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.
Int. Cl.[5] C07D *249/08, 233/60*
U.S. Cl. 548—268.4 4 Claims

1. A process for producing optically active alcohol derivatives represented by the formula (IV),



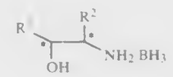
(IV)

wherein R^3 represents a C_3-C_8 cycloalkyl unsubstituted or substituted by halogen, C_5-C_8 cycloalkenyl unsubstituted or substituted by halogen, or phenyl unsubstituted or substituted by at least one member selected from the group consisting of halogen, C_1-C_4 alkyl, C_1-C_4 haloalkyl, cyano, C_1-C_4 alkoxy, phenoxy and phenyl, R^4 represents an imidazol-1-yl or 1,2,4-triazol-1-yl group, and the mark * represents an asymmetric carbon, which comprises reducing a prochiral ketone represented by the formula (III),



(III)

wherein R^3 represents a C_3-C_8 cycloalkyl unsubstituted or substituted by halogen, C_5-C_8 cycloalkenyl unsubstituted or substituted by halogen, or phenyl unsubstituted or substituted by at least one member selected from the group consisting of halogen, C_1-C_4 alkyl, C_1-C_4 haloalkyl, cyano, C_1-C_4 alkoxy, phenoxy and phenyl, R^4 represents an imidazol-1-yl or 1,2,4-triazol-1-yl with an active borane complex represented by the formula (I),



(I)

wherein R^1 represents phenyl unsubstituted or substituted by at least one of halogen, C_1-C_{10} alkyl, cyano, C_5-C_{10} cycloalkoxy, C_1-C_5 alkoxy, C_7-C_{11} aralkyloxy, C_6-C_{10} aryloxy and C_1-C_3 alkoxycarbonyl, or naphthyl unsubstituted or substituted by at least one of halogen, C_1-C_5 alkyl, cyano, C_1-C_5 alkoxy and C_1-C_3 alkoxycarbonyl, R^2 represents C_1-C_5 alkyl and the mark * means an asymmetric carbon.

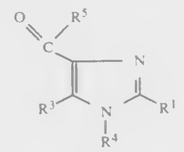
4,924,000

PREPARATION OF ACYLATED IMIDAZOLES

Michael Hesse, Ludwigshafen; Wolfgang Hoelderich, Frankenthal; Toni Dockner, Meckenheim, and Hermann Koehler, Beindersheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

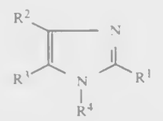
Filed Mar. 9, 1989, Ser. No. 321,110
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808071
Int. Cl.[5] C07D *233/54*
U.S. Cl. 548—343 4 Claims

1. A process for preparing an acylated imidazole of the formula I



(I)

where R^1, and R^3 are each H, alkyl of from 1 to 12 carbon atoms, alkenyl of from 1 to 12 carbon atoms, aryl, aralkyl or alkylaryl, R^4 is H, alkyl of from 1, to 12 carbon atoms, alkenyl of from 1 to 12 carbon atoms, aryl, aralkyl or alkylaryl, and R^5 is alkyl of from 1 to 12 carbon atoms, alkenyl of from 1 to 12 carbon atoms, aryl, aralkyl, alkylaryl or carboxyl, which comprises reacting an imidazole of the formula II



(II)

where R^1 R^2 and R^3 are each alkyl of from 1 to 12 carbon atoms, alkenyl of from 1 to 12 carbon atoms, aryl, aralkyl or alkylaryl, at least one of the radicals R^1, R^2 and R^3 being hydrogen, and R^4 is H, alkyl of from 1 to 12 carbon atoms, alkenyl of from, 1 to 12 carbon atoms, aryl, aralkyl or alkylaryl, with an acylating agent of the formula (III)



(III)

where R^5 is as defined above and Y is halide, alkoxy, acyloxy or hydroxyl, in the presence of an acidic metal oxide or a phosphate in the gas phase.

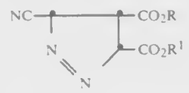
4,924,001

PROCESS FOR PREPARING 5-CYANO-4, 5-DIHYDRO-3,4-DICARBOXYPYRAZOLE DERIVATIVES

John R. Rizzo, and Eddie V. P. Tao, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 267,905, Nov. 7, 1988. This application Oct. 17, 1989, Ser. No. 422,922
Int. Cl.[5] C07D *231/06*
U.S. Cl. 548—356 4 Claims

1. A process for preparing 5-cyano-4,5-dihydro 3H-pyrazole-3,4-dicarboxylic acid dialkyl esters of the formula



wherein R and R^1 are independently C_1-C_{10} alkyl, comprising reacting a dialkyl fumarate of the formula



with diazoacetonitrile.

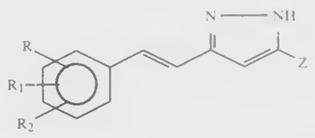
4,924,002

NOVEL PROCESS FOR THE PREPARATION OF PYRAZOLES FROM ISOXAZOLES

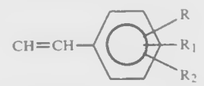
Thomas R. Belliotti, Ypsilanti; David T. Connor, Ann Arbor; Daniel L. Flynn, Ann Arbor; Catherine R. Kostlan, Ann Arbor, and Donald E. Nies, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 32,730, Apr. 6, 1987, which is a continuation-in-part of Ser. No. 910,692, Sep. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 861,179, May 9, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 310,260
Int. Cl.[5] C07D *231/20, 231/12*
U.S. Cl. 548—206 6 Claims

1. A process for the preparation of a compound of the formula

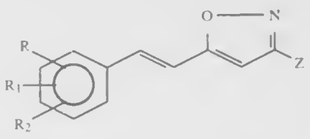


wherein R, R_1, and R_2 may be the same or different and are selected from the group consisting of (1) hydrogen, (2) lower alkyl, (3) hydroxy, (4) OR_3 where R_3 is lower alkyl, (5) $C(O)OR_4$ wherein R_4 is hydrogen or lower alkyl, (6) $OC(O)R_3$ wherein R_3 is independently as defined above, (7) $C(O)R_3$ wherein R_3 is independently as defined above, (8) NR_6R_7, wherein R_6 and R_7 may be the same or different and are hydrogen or lower alkyl, (9) $NHC(O)R_3$ wherein R_3 is independently as defined above, (10) NHCHO, (11) $NHSO_2R_3$ wherein R_3 is independently as defined above, (12) $NHCONHR_4$ wherein R_4 is as defined above, (13) hydroxymethyl, (14) halogen, (15) trifluoromethyl, (16) SR_4 wherein R_4 is independently as defined above, or (17) nitro; Z is (1) H, (2) lower alkyl, (3) aryl, (4) aralkyl, (5) $OC(O)R_3$ wherein R_3 is independently as defined above, (6) $C(O)OR_4$ wherein R_4 is independently as defined above, (7) $C(O)R_3$ wherein R_3 is independently as defined above, (8) $CH(R_1')CO_2R_2'$ wherein R_1' and R_2' may be the same or different and are hydrogen or lower alkyl, (9) halogen, (10) trifluoromethyl,

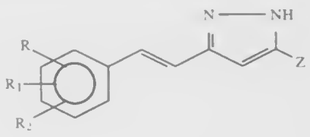


(II)

wherein R, R_1 and R_2 are independently as defined above, (12) heteroaryl, or (13) heteroaralkyl; which comprises treating a compound of the formula



wherein R, R_1, R_2 and Z are as defined above with
(1) $Mo(CO)_6$ and then
(2) hydrazine;
to obtain the compound of the formula



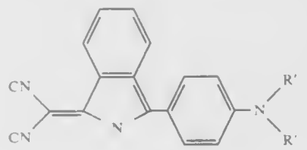
4,924,003

PYRAZOLINE COMPOUNDS

Reinhold J. Leyrer, Ludwigshafen, and Peter Neumann, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 274,969, Nov. 22, 1988, Pat. No. 4,880,719. This application May 24, 1989, Ser. No. 356,064
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1987, 3740420
Int. Cl.[5] C07D *231/06*
U.S. Cl. 548—379 2 Claims

1. An isoindolenine dye of the formula Ia



Ia

where the group



is a substituted or unsubstituted Δ^2-pyrazolin-1-yl or unsubstituted or substituted Δ^3-pyrazolin-1-yl radical.

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4,924,004

1-PHENYL-2-AMINOCARBONYLINDOLE COMPOUNDS, PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Heinrich-Wilhelm Ohlendorf; Wilhelm Kaupmann, both of Hanover; Ulrich Kuehl, Gehrden; Gerd Buschmann, and Stephen Magda, both of Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 885,684, Jul. 15, 1986, Pat. No. 4,803,198, which is a continuation of Ser. No. 648,932, Sep. 10, 1984, abandoned, which is a continuation of Ser. No. 402,766, Jul. 28, 1982, abandoned. This application Oct. 28, 1988, Ser. No. 264,049

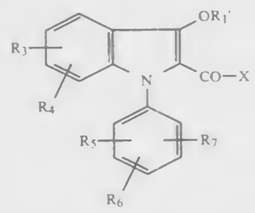
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131527

Int. Cl.[5] C07D *491/056, 209/42*

U.S. Cl. 548—431 2 Claims

1. A compound of the general formula IId

IId



wherein R_1' is an alkyl, alkenyl, cycloalkyl or cycloalkylalkyl radical with up to 7 carbon atoms, R_3 is a hydrogen or halogen atom, or a lower alkyl, hydroxyl or lower alkoxy radical, R_4 is a hydrogen or halogen atom, or a lower alkyl, hydroxyl or lower alkoxy radical, or, if R_3 is a hydrogen atom, R_4 may be a nitro or trifluoromethyl radical, or R_3 and R_4 are bonded to adjacent carbon atoms and together denote a methylenedioxy or an ethylenedioxy radical, R_5 is a hydrogen or halogen atom, or a lower alkyl, hydroxyl or lower alkoxy radical and R_6 is a hydrogen or halogen atom, or a lower alkyl, lower alkoxy or hydroxyl radical or, if R_5 is a hydrogen atom, R_6 may be a nitro or trifluoromethyl radical, or R_5 and R_6 are bonded to adjacent carbon atoms and together denote a methylenedioxy or ethylenedioxy radical, R_7 is a hydrogen atom, or, if R_5 and R_6 are lower alkoxy radicals, R_7 may also be a lower alkoxy radical and X is a hydroxyl group.

4,924,005

BISMALEIMIDE RESINS

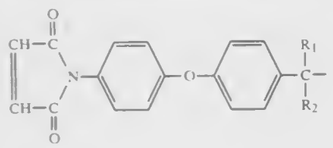
Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1986, Ser. No. 944,157

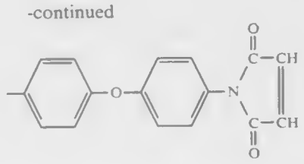
Int. Cl.[5] C07D *209/56*

U.S. Cl. 548—521 4 Claims

1. A substantially insoluble composition consisting essentially of bismaleimides of the formula



-continued



where R_1 and R_2 is independently a hydrogen, methyl ethyl, or halogenated methyl group wherein said composition exhibits a solubility in acetone at 20° C. of less than about 5 percent by weight.

4,924,006

N-PYRROLIDONYL ALKYL AMINO 1,3,4-BUTANETRIOL COMPOUNDS

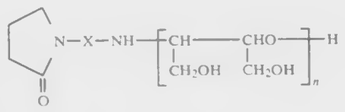
Lowell R. Anderson, Morristown; Mohamed M. Hashem, Wayne, and Robert B. Login, Oakland, all of N.J., assignors to GAF Chemical Corporation, Wayne, N.J.

Filed Oct. 2, 1989, Ser. No. 415,830

Int. Cl.[5] C07D *207/27*

U.S. Cl. 548—550 4 Claims

1. A compound having the formula:



where

X is alkylene C_1-C_5 and

n is 1–4.

4,924,007

PROCESS FOR THE PREPARATION OF CYCLIC SULPHATES

Viviane Massonneau, and Michel Mulhauser, both of Ecully, France, assignors to Rhone-Poulenc Sante, Antony, France

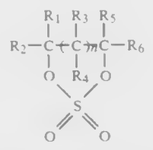
Filed May 15, 1989, Ser. No. 351,831

Claims priority, application France, May 16, 1988, 88 06523

Int. Cl.[5] C07D *327/10;* C07B *41/04*

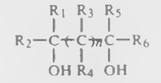
U.S. Cl. 549—18 6 Claims

1. A process for the preparation of a cyclic sulphate of formula:



in which R_1, R_2, R_3, R_4, R_5 and R_6, which are identical or different, each denote a hydrogen or halogen atom or an alkyl, aryl, alkoxy, aryloxy or alkoxycarbonyl radical and n is 0 or 1, the aforesaid alkyl radicals and the alkyl moieties of the alkoxy and alkoxycarbonyl radicals containing 1 to 4 carbon atoms each and being unsubstituted or substituted by one or more identical or different atoms or radicals chosen from halogen atoms and alkoxy, aryloxy or alkoxycarbonyl radicals, and the said aryl radicals and aryloxy radicals containing 6 to 10 carbon atoms each and being unsubstituted or substituted by one or more identical or different atoms or radicals chosen from halogen atoms and alkyl, alkoxy, aryloxy or alkoxycarbonyl radicals, and n is 0 or 1, which comprises reacting concentrated

sulphuric acid rapidly at a temperature of 150° to 250° C., with a glycol of formula:



in which R_1, R_2, R_3, R_4, R_5, R_6 and n are as defined above, and recovering the cyclic sulphate obtained.

4,924,008

BENZOBICYCLOALKANE DERIVATIVES AS ANTICONVULSANT NEUROPROTECTIVE AGENTS

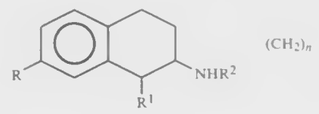
Magid A. M. Abou-Gharbia, Glen Mills, Pa., and Ronald R. Notvest, Jamesburg, N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed May 4, 1989, Ser. No. 347,538

Int. Cl.[5] C07D *333/12, 333/22, 307/02*

U.S. Cl. 849—75 3 Claims

1. A compound of the formula:



in which

R is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxy, alkanoyloxy of 2 to 6 carbon atoms, phenylalkoxy having 1 to 6 carbon atoms in the alkoxy moiety, halo or trifluoromethyl;

R^1 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms or phenylalkyl having 1 to 6 carbon atoms in the alkyl moiety;

R^2 is thienylalkyl having 1 to 6 carbon atoms in the alkyl moiety or furylalkyl having 1 to 6 carbon atoms in the alkyl moiety; and

n is one of the integers 2, 3, 4, 5 or 6;

or a pharmaceutically acceptable salt thereof.

4,924,009

XANTHENE DYE COMPLEXES

Douglas C. Necker, Perrysburg, and Shwn M. Y. Linden, Bowling Green, both of Ohio, assignors to Bowling Green State University, Bowling Green, Ohio

Filed Jun. 3, 1987, Ser. No. 57,544

Int. Cl.[5] C07D *311/82*

U.S. Cl. 549—223 19 Claims

1. An ionically bonded compound of the formula (I)

$$X^{-n}[Y^+]_n \quad (I)$$

wherein X represents an anionic xanthene dye and Y^+ represents a gegen ion selected from the group consisting of sulfonium, phosphonium, iodonium, pyrylium, hydrazinium and hydrazide ions and n is 1 or 2.

4,924,010

BENZOXEPINS AS INTERMEDIATES TO $5HT_3$ ANTAGONISTS

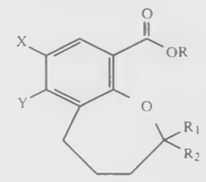
Raymond Youssefyeh, Princeton Junction, N.J.; Scott I. Klein, Audubon, Pa.; Henry F. Campbell, North Wales, Pa., and Donald E. Kuhla, Doylestown, Pa., assignors to Rorer Pharmaceutical Corporation, Ft. Washington, Pa.

Division of Ser. No. 152,112, Feb. 4, 1988, Pat. No. 4,857,517. This application Jul. 31, 1989, Ser. No. 351,685

Int. Cl.[5] C07D *313/08*

U.S. Cl. 549—355 7 Claims

1. A compound of the formula:



where:

X is hydrogen or halo;

Y is hydrogen, amino, loweralkylamino or alkanoylamino;

OR is hydroxy, halo, alkoxy, benzyloxy or phenethyloxy;

R_1 and R_2 are independently hydrogen or loweralkyl; provided that X, Y, R, R_1 and R_2 are not all hydrogen at the same time; or a pharmaceutically acceptable salt thereof.

4,924,011

PROCESS FOR PREPARING TAXOL

Jean-Noel Denis; Andrew E. Greene, both of Uriage; Daniel Guenard, Montrouge, and Francoise Gueritte-Voegelein, Les Ulis, all of France, assignors to Centre National De La Recherche Scientifique, Paris, France

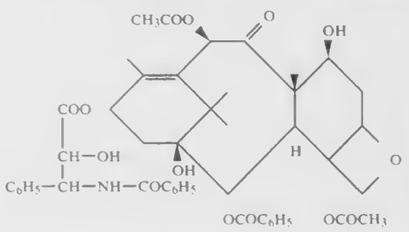
Filed Apr. 3, 1989, Ser. No. 331,807

Claims priority, application France, Apr. 6, 1988, 88 04512

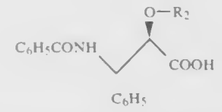
Int. Cl.[5] C07D *305/14*

U.S. Cl. 549—510 11 Claims

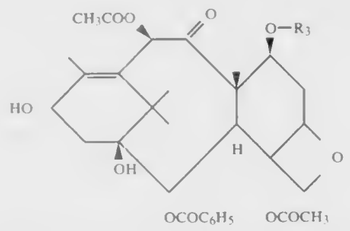
1. A process for preparing taxol of formula:



in which a (2R, 3S) 3-phenylisoserine derivative of general formula:



in which R_2 is a hydroxy-protecting group, is esterified with a taxan derivative of general formula



in which R_3 is a hydroxy-protecting group, and the protecting groups R_2 and R_3 are then both replaced by hydrogen.

4,924,012

PROCESS FOR PREPARING DERIVATIVES OF BACCATINE III AND OF 10-DEACETYL BACCATINE III

Michel Colin, Thoiry; Daniel Guenard, Montrouge; Francoise Gueritte-Voegelein, Les Ulis, and Pierre Potier, Paris, all of France, assignors to Rhone-Poulenc Sante, Antony, France

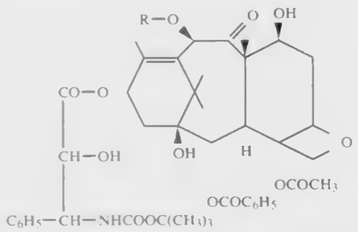
Filed Apr. 3, 1989, Ser. No. 331,758

Claims priority, application France, Apr. 6, 1988, 88 04513

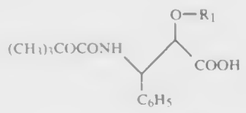
Int. Cl.[5] **C07D** *305/14*

U.S. Cl. 549—510 **11 Claims**

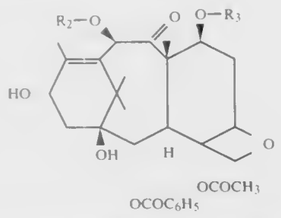
1. A process for preparing a derivative of baccatine III or of 10-deacetylbaccatine III, of general formula:



in which R denotes hydrogen or acetyl, wherein an acid of general formula:



in which R_1 is a hydroxy-protecting group, is condensed with a taxan derivative of general formula



in which R_2 is an acetyl group or a hydroxy-protecting group and R_3 is a hydroxy-protecting group, and the protecting groups R_1, R_3 and, where appropriate, R_2 are then replaced by hydrogen.

4,924,013

PROCESS FOR THE REDUCTION OF FREE EPICHLOROHYDRIN IN EPOXY COMPOUNDS

Joe M. Hunter, Fern Creek, Ky., assignor to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Filed Jul. 22, 1988, Ser. No. 222,794

Int. Cl.[5] **C07D** *301/27, 301/32*

U.S. Cl. 549—514 **17 Claims**

1. A process for the reduction of free epichlorohydrin in an epoxy compound prepared by reacting epichlorohydrin with an alcohol, phenol or carboxylic acid which comprises the steps of:

(a) adding an alkali metal sulfite to the epoxy compound;

(b) mixing water, the alkali metal sulfite and the epoxy compound; and

(c) separating the epoxy compound from the water, unreacted alkali metal sulfite, and sulfite by-products.

4,924,014

PROCESS FOR THE PREPARATION OF HALOGEN-CONTAINING AROMATIC COMPOUNDS

Andreas Fuss, Karlstein, and Günter Siegemund, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

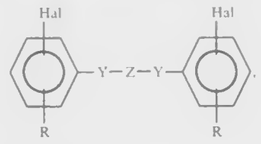
Filed Feb. 28, 1989, Ser. No. 316,794

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 3806656

Int. Cl.[5] **C07C** *45/46*

U.S. Cl. 568—323 **26 Claims**

1. A process for the preparation of halogen-containing aromatic compounds of the formula I



(I)

wherein

Hal represents halogen,

R represents H, C_1–C_3-alkyl, phenyl halogen or trifluoromethyl,

Y represents CO or SO_2 and

Z represents an aromatic or heteroaromatic group, and

Y-Z-Y together can also be CO or SO_2, which comprises reacting at a temperature in the range of from −80° to +200° C. a haloaromatic compound of the formula RC_6H_4Hal (II) with a fluoride of a bisacid having the formula F-Y-Z-Y-F (III) in a molar ratio of at least 2:1 in the presence of hydrogen fluoride and of boron trifluoride, in formula II and III Hal, R, Y and Z having the aforementioned meaning, the hydrogen fluoride being applied in an amount of from 0.1 to 5 moles per mole of compound III and 2 to 10 moles of the compound II being reacted per mole of compound III.

4,924,015

SUBSTITUTED ANTHRAQUINONES AND USE THEREOF IN EPOXY RESINS

Frederick H. Howell, Atherton, England; Rudolf Duthaler, Bettingen, Switzerland; Jürgen Finter, Freiburg, Fed. Rep. of Germany; Konrad Oertle, Therwil, and Visvanathan Ramanathan, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

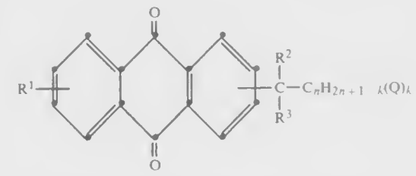
Filed Jun. 20, 1988, Ser. No. 208,526

Claims priority, application United Kingdom, Jul. 1, 1987, 87 15436

Int. Cl.[5] **C07C** *49/76, 101/80, 49/74*

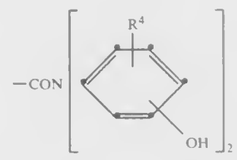
U.S. Cl. 552—266 **8 Claims**

1. A compound of the formula I



(I)

in which n is a number from 1 to 17, k is 1 or 2 and Q is —COOH or —$CONR^4$—NH_2 or k is 1 and Q is —OH, —NHR^4, —$OCOR^5$, —$N(R^4)COR^5$ or



in which R^4 is H or C_1–C_4-alkyl and R^5 is a monodecarboxylated radical of a tricarboxylic acid or tetracarboxylic acid, R^2 and R^3 are independently of each other linear or branched C_1–C_5-alkyl which is unsubstituted, or, substituted by —COOH or —$CONR^4$—NH_2 only if Q is —COOH or —$CONR^4$—NH_2, or R^2 together with the C_nH_{2n+1-k} group forms C_5–C_{12}cycloalkylene and R^3 is C_1–C_5-alkyl, and R^1 is H, linear or branched C_1–C_8-alkyl, unsubstituted or monohalogenated or dihalogenated C_7—C_9-aralkyl, unsubstituted or C_1–C_4-alkyl-substituted C_5–C_{12}-cycloalkyl, or a radical of the formula —CR^2R^3—$C_nH_{2n+1-k}(Q)_k$.

4,924,016

CONDENSED ACETOACETIC ACID ESTER TITANIUM CHELATES AND PROCESS FOR THEIR PREPARATION

Dieter Barfurth, Troisdorf-Spich, and Heinz Nestler, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Troisdorf, Fed. Rep. of Germany

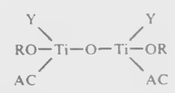
Filed Nov. 8, 1988, Ser. No. 268,897

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739174

Int. Cl.[5] **C07F** *7/28*

U.S. Cl. 556—40 **3 Claims**

1. A cold-resistant, alcohol-free chelate of titanium(IV) of the formula



wherein Y is RO or AC,

R is alkyl of 1 to 4 carbon atoms, and

AC is an alkylacetoacetato radical.

4,924,017

STANNIC ACID ANHYDRIDE

Toshiyuki Kobashi, and Hideo Naka, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

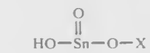
Filed Jul. 22, 1988, Ser. No. 222,829

Claims priority, application Japan, Aug. 5, 1987, 62-197030; Aug. 5, 1987, 62-197031; Aug. 7, 1987, 62-198948; Aug. 7, 1987, 62-198949; Aug. 7, 1987, 62-198950

Int. Cl.[5] **C07F** *7/22*

U.S. Cl. 556—85 **1 Claim**

1. Stannic acid anhydride shown in the following structural formula:



wherein X represents T,181

4,924,018

ALKYLALUMINOXANE PROCESS

Scott A. Bottelberghe, Port Allen, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 26, 1989, Ser. No. 371,192

Int. Cl.[5] **C07F** *5/06*

U.S. Cl. 556—179 **18 Claims**

1. A continuous process for making an alkylaluminoxane, said process comprising:

(A) feeding a solution of an alkyl aluminum compound in an inert hydrocarbon solvent to a first reaction zone,

(B) forming an emulsion of 0.5–10 weight percent water in an inert solvent and feeding said emulsion to said first reaction zone, the ratio of moles of water to aluminum atoms being about 0.4–1:1,

(C) removing reaction mixture from said first reaction zone at a rate that maintains a constant liquid volume in said first reaction zone,

further characterized in that the combined feed rate of said solution of an alkyl aluminum compound and said emulsion results in an average residence time in said first reaction zone of about 1 to 60 minutes.

4,924,019

SYNTHESIS OF HIGH PURITY DIMETHYLALUMINUM HYDRIDE

Benjamin C. Hui, Peabody, and Luis I. Victoriano, Danvers, both of Mass., assignors to CVD Incorporated, Woburn, Mass.

Continuation of Ser. No. 136,032, Dec. 21, 1987, abandoned. This application Jan. 18, 1989, Ser. No. 298,845

Int. Cl.[5] **C07F** *5/06*

U.S. Cl. 556—187 **9 Claims**

1. A method of producing dimethylaluminum hydride that is sufficiently free of silicon-containing impurities such that the level of silicon is about 4 ppm or less and sufficiently free of other impurities such that the dimethylaluminum hydride produced is useful for depositing films by chemical vapor deposition processes, the method comprising

reacting gallium trichloride with trimethylaluminum to produce trimethylgallium and dimethylaluminum chloride,

separating a product trimethylgallium from a waste produce which comprises dimethylaluminum chloride, trimethylaluminum, and trimethylgallium,

without further purifying said waste product, reacting said waste product with a material selected from the group consisting of: an alkali metal hydride, a group IIIA hydride, and a group IA–IIIA complex hydride to produce dimethylaluminum hydride, and

separating by distillation the dimethylaluminum hydride from other components of the reaction mixture.

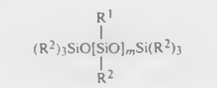
4,924,020

PHTHALIC ACID ESTER-MODIFIED ORGANOPOLYSILOXANE AND METHOD FOR ITS PREPARATION

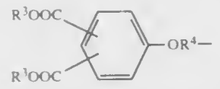
Tadashi Okawa, Ichihara, and Toshio Suzuki, Kimitsu, both of Japan, assignors to Toray Silicon Company, Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,804
Claims priority, application Japan, Nov. 18, 1987, 62-290900
Int. Cl.[5] C07F *7/08*
U.S. Cl. 556—441 **6 Claims**

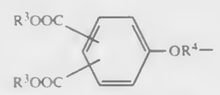
1. Phthalic acid ester-modified organopolysiloxane characterized by the formula



wherein R^1 is a monovalent hydrocarbon group, R^2 is a group R^1 or a group with the formula



with the proviso that at least one of the groups R^2 in each molecule is the group with the formula



in which R^3 is an alkyl group, R^4 is an alkylene group, and m is a positive integer.

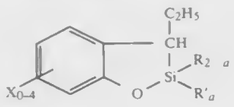
4,924,021

CYCLIC PHENOL ORGANOSILANES AND METHOD FOR THEIR PREPARATION

Hans-Joachim Kötzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 634,571, Jul. 26, 1984, abandoned. This application Jul. 6, 1987, Ser. No. 70,258
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1983, 3327795
Int. Cl.[5] C07F *7/08*
U.S. Cl. 556—464 **18 Claims**

1. A 2-silacoumarane of Formula I



(I)

in which X represents halogen moieties and/or alkyl or fluorinated alkyl moieties with 1 to 4 carbon atoms, R' represents chlorine moieties or alkoxy moieties with 1 to 4 carbon atoms, R represents identical or different alkyl moieties with 1 to 4 carbon atoms and a=0 or 1 or 2.

4,924,022

METHOD FOR PREPARATION OF ORGANOALKOXYSILANES

Howard M. Bank, Saginaw County, Mich., and Robert A. Petrisko, Maricopa County, Ariz., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 4, 1989, Ser. No. 417,128
Int. Cl.[5] C07F *7/18*
U.S. Cl. 556—471 **24 Claims**

1. A process for making organoalkoxysilanes using fractionation means consisting essentially of (i) a column comprised of contacting devices (ii) means for providing heat to and partially containing the contents at a sump portion and (iii) means for providing cooling to the contents at a head of the column; wherein the process comprises

(A) feeding simultaneously into the column a) an organochlorosilane, (b) liquid alcohol and (c) vaporized alcohol, such that the alcohol contacts the organochlorosilane;

(B) maintaining a temperature within said column such that at least the lower ⅓ of the column is above the boiling point of the alcohol and no reflux of alcohol is present in the head of the column;

(B) recovering any organoalkoxysilane formed from the sump portion of the column; and

(C) recovering HCl at the head of the column.

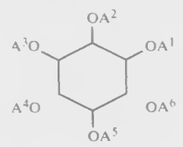
4,924,023

PHOSPHORYLATED INOSITOLS

Frank W. Hobbs, and James L. Meek, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 56,181, May 29, 1987, Pat. No. 4,873,355. This application Jun. 27, 1989, Ser. No. 372,242
Int. Cl.[5] C07F *9/09, 9/24*
U.S. Cl. 558—162 **3 Claims**

1. A myo-inositol phosphite of the formula



wherein

A^1 through A^6 are independently selected from the group consisting of

H,

a hydroxyl protecting group, and

P(YR)(ZR[1]),

where

R and R^1 are, independently, a phosphate protecting group,

Y and Z are, independently, selected from the group consisting of O, S, and NR^2, where R^2 is aryl or a C_1–C_{15} straight chain, branched or cyclic alkyl where the alkyl may be internally interrupted by ether oxygen,

provided that

at least one of A^1 through A^6 are P(YR)(ZR[1]).

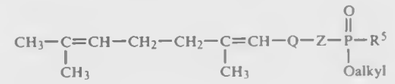
4,924,024

PHOSPHORUS-CONTAINING SQUALENE SYNTHETASE INHIBITORS, NEW INTERMEDIATES AND METHOD

Scott A. Biller, Ewing, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 141,744, Jan. 11, 1988, Pat. No. 4,871,721. This application Jun. 1, 1989, Ser. No. 359,606
Int. Cl.[5] C07F *9/38, 9/42*
U.S. Cl. 558—202 **3 Claims**

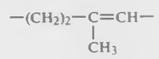
1. A compound having the structure



wherein

R^5 is OH or Cl and

Q is



or a bond; and

Z is —(CH_2)n- or -(CH_2)p-CH=CH-(CH_2)m-, wherein n is 1 to 5; p is 0, 1 or 2; m is 0, 1 or 2.

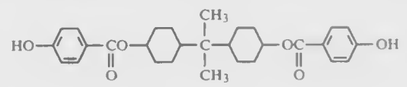
4,924,025

NOVEL DIHYDROXY COMPOUND

Mitsuhiko Masumoto; Toshiaki Asoh; Youichirou Ezaki, and Hiroshi Aibe, all of Osaka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo and Arakawa Chemical Industries, Ltd., Osaka, both of, Japan

Filed May 17, 1989, Ser. No. 353,308
Claims priority, application Japan, May 30, 1988, 63-132190
Int. Cl.[5] C07C *69/88*
U.S. Cl. 560—072 **6 Claims**

1. 2,2-Bis[4-(4'-hydroxybenzoyloxy)cyclohexyl]propane represented by the formula:



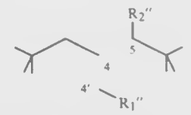
4,924,026

TRIISOBUTYLENE ALCOHOLS AND ESTERS, USES THEREOF IN PERFUMERY AND HALOGENATED INTERMEDIATES USEFUL FOR PREPARING SAME

Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge, and Marie R. Hanna, Keyport, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 11, 1989, Ser. No. 392,423
Int. Cl.[5] C07C *69/007*
U.S. Cl. 560—261 **7 Claims**

1. At least one triisobutylene alcohol or ester having the structure:



wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond; wherein R_1'' and R_2'' are the same or different and each represents hydrogen, hydroxyl or a C_1–C_3 acyloxy with the provisos that:

(i) when the carbon-carbon bond at the 4—4' position is a double bond, then R_1'' is hydrogen; and

(ii) R_1'' and R_2'' are not both hydrogen.

4,924,027

SEPARATION OF SALTS OF CITRIC ACID FROM FERMENTATION BROTH WITH A WEAKLY BASIC ANIONIC EXCHANGE RESIN ADSORBENT

Santi Kulprathipanja, Inverness, and Scott A. Strong, Des Plaines, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 121,830, Nov. 16, 1987, Pat. No. 4,851,573, which is a continuation-in-part of Ser. No. 943,219, Dec. 18, 1986, Pat. No. 4,720,579. This application Nov. 25, 1988, Ser. No. 275,827
Int. Cl.[5] C07C *51/42*
U.S. Cl. 562—580 **9 Claims**

1. A process for separating citric acid from a fermentation broth feed mixture, containing citric acid and impurities, comprising contacting said mixture with a water-insoluble, macroreticular or gel, weakly basic anionic exchange resin possessng tertiary amine or pyridine functional groups, said weakly basic anionic exchange resin having a crosslinked acrylic or styrene resin matrix at adsorption conditions selected to selectively adsorb said citric acid, contacting said adsorbent with a weak desorbent liquid for a period of time to elute the non-adsorbed components of said feed, reacting the adsorbed citric acid with an aqueous alkaline solution whereby said citric acid is converted to a salt and eluted with said aqueous alkaline solution.

4,924,028

PROCESS FOR THE PRODUCTION OF POLYNUCLEAR AROMATIC POLYAMINES

Hartmut Knöfel, Odenthal; Michael Brockelt, Leverkusen; Marcel Petinaux, and Rndolf Uchdorf, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 6, 1989, Ser. No. 335,062
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 3812083
Int. Cl.[5] C07C *87/50*
U.S. Cl. 564—331 **5 Claims**

1. A process for the preparation of polynuclear aromatic polyamines by reacting aniline with formaldehyde in the presence of water and an acid catalyst in a single-stage or two-stage reaction within a temperature range of from 0° to 180° C., optionally preceded by an aminal preliminary step in which an N,N'-disubstituted aminal is formed in the absence of acid catalyst and then converted into the desired polynuclear aromatic polyamine end product in one or more stages in the presence of an acid catalyst at a temperature in the range from 0° to 180° C., thereby forming a reaction mixture; working up the reaction mixture by extraction with a hydrophobic solvent containing aniline, said extraction producing an organic phase and an aqueous phase; separating the organic phase from the aqueous phase; distilling the organic phase into (i) a distillate consisting of aniline-containing solvent, said distillate being reused in the extraction stage, optionally after addition of fresh aniline, and (ii) a distillation residue consisting essentially of the polynuclear aromatic polyamine end product; recycling the aqueous phase containing the acid catalyst, wherein water is removed in a water separator downstream from the aminal preliminary stage and upstream of the first stage of the reaction and/or in an evaporator downstream from the extraction stage and upstream of the first stage of the reaction, and wherein the acid catalyst is reused in the reaction; said process further characterized in that

(a) formaldehyde in the form of an aqueous solution is reacted by mixing said formaldehyde in an aminal preliminary stage with an aniline-containing hydrophobic solvent

and/or in the first stage of the reaction with an aniline-containing hydrophobic solvent and the recycled aqueous phase containing the catalyst in the form of amine salts;
(b) upon completion of the reaction, the resultant two-phase reaction mixture is separated into an aqueous phase and an organic phase in a phase separator upstream of the product extraction stage;
(c) the organic phase that accumulates in the phase separator is extracted in a re-extraction stage downstream from the product extraction stage using substantially product-free aqueous phase obtained from the product extraction stage;
(d) an aqueous phase that accumulates in the re-extraction stage and which is product-enriched due to the introduction of the organic phase from the phase separator is returned to the reaction;
(e) a product-depleted organic phase that accumulates in the re-extraction stage is used as part of the extractant in the main product extraction stage;
(f) the aqueous phase that accumulates in the phase separator is extracted in the product extraction stage with hydrophobic solvent containing aniline and, optionally, end product,
(g) the organic phase accumulating in the product extraction stage is separated in a distillation stage into a distillate consisting of aniline-containing solvent and a distillation residue consisting essentially of end product; and
(h) the distillate that accumulates in the distillation stage is separated, optionally after addition of fresh aniline, into two component streams, one component stream being used at the beginning of the process according to (a) above and the other component stream being used together with the organic phase leaving the re-extraction stage as extractant for the aqueous phase in the product extraction stage.

4,924,029

REDUCTION OF NITROALIPHATICS VIA HOMOGENEOUS CATALYSIS

Stephen G. Harsy, Mt. Airy, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jun. 24, 1988, Ser. No. 210,944
Int. Cl.[5] C07C *85/11*
U.S. Cl. 564—418 **6 Claims**

1. A process for providing homogeneous catalytic hydrogenation of nitroalcohols to form amino alcohols comprising hydrogenating an aliphatic nitroalcohol represented by the formula $RR'C(OH)—CR''HNO_2$, wherein each R, R' and R'' independently is selected from hydrogen, alkyl, or substituted alkyl group and said substitution is of hydroxyl, halogen, amino or aryl group, by contacting a solution of the nitroalcohol in an inert solvent with hydrogen at a pressure of from about 500 to about 1500 psi and a temperature of from about 30° to 150° C. in the presence of soluble catalyst complex formed from a soluble organometallic compound of a metal selected from Rh, Ir, Pt or Pd and a soluble organophosphine represented by Z_3P or $Z_2P—Y—PZ_2$ wherein each Z represents a C_1–C_{12} alkyl or an aryl group and Y represents a divalent C_1–C_{12} alkyl or aryl group or an organometallic radical of a transition metal, and separating the amino alcohol formed.

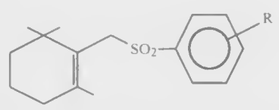
4,924,030

PROCESS FOR PREPARING CYCLIC TERPENOIDS

Takashi Onishi; Shigeaki Suzuki; Toshiki Mori, and Yoshiji Fujita, all of Kurashiki, Japan, assignors to Kuraray Company Ltd., Kurashiki, Japan

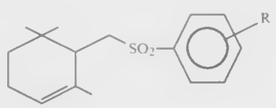
Filed Mar. 7, 1988, Ser. No. 164,909
Claims priority, application Japan, Mar. 17, 1987, 62-63417
Int. Cl.[5] C07C *147/06*
U.S. Cl. 568—34 **9 Claims**

1. A process for preparing a mixture of cyclic terpenoids of formula (I),



(I)

wherein R is a hydrogen atom or a lower alkyl group, and formula (II),



(II)

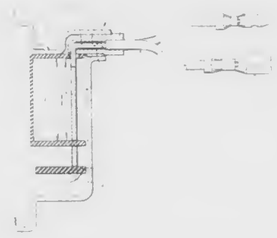
wherein R is defined as above, containing the cyclic terpenoid of formula (I) predominant over (III), which comprises reacting an acid selected from the group consisting of sulfuric acid, a mixture of sulfuric acid and a lower aliphatic carboxylic acid, and a mixture of sulfuric acid and water, with a cyclic terpenoid of formula (II), or a mixture of cyclic terpenoids of formulas (I) and (II), containing the cyclic terpenoid of formula (II) predominant over (I), in a hydrocarbon solvent.

4,924,031

WATER-TIGHT STRUCTURE FOR MULTICORE CABLE

Takatoshi Arai, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 285,067
Claims priority, application Japan, Dec. 24, 1987, 62-194956[U]
Int. Cl.[5] H01B *17/30*; F04B *17/04*
U.S. Cl. 174—52.3 **1 Claim**



1. A multicore cable and a water-tight structure comprising;
a sealed vessel in which electrical components are arranged;
a grommet having an insertion hole disposed at a multicore cable lead portion of said sealed vessel;
wherein the multicore cable is held in the insertion hole of said grommet, includes a covering and an internal conductor, and has a solder-dipped portion which has been bent disposed within said grommet;
wherein a portion of the solder-dipped portion is covered with a metal sleeve having first and second open end portions; and
wherein the portion of the multicore cable which is covered with said metal sleeve is a portion from which said covering has been removed, and said open first and second end portions of said metal sleeve are bonded to said internal conductor by a solder layer.

4,924,032

PREWIRED ELECTRICAL JUNCTION BOX

Charles S. Akins, 1117 Trellis, Garland, Tex. 75040

Filed Jul. 30, 1986, Ser. No. 890,631
Int. Cl.[5] H02G *3/18*
U.S. Cl. 174—53 **7 Claims**



1. A prewired junction box for making electrical wiring connections, said box comprising:
a housing having a partition therein which divides the interior of said housing into a buss compartment and a utility compartment;
first buss means in said buss compartment for establishing a prewired 3-way switch circuit through said housing from a first point adjacent the exterior surface of said housing to a second point adjacent said partition;
means adapted to connect said first buss means to electrical conductor means which, in turn, is adapted to be connected to a first remote 3-way switch means; and
means to connect said first buss means to electrical conductor means which, in turn, is adapted to be connected to a second remote 3-way switch means;
opening means through said housing through which electrical conductor means of a 3-way circuit is adapted to be connected to said first buss means at said first point;
opening means through said partition through which electrical conductor means of a 3-way utility device is adapted to be connected to said first buss means at said second point;
second buss means in said buss compartment for establishing a prewired single pole switch circuit through said housing from a third point adjacent the exterior surface of said housing to a fourth point adjacent said partition;
opening means through said housing through which electrical conductor means of a single pole circuit is adapted to be connected to said second buss means at said third point;
opening means through said partition through which electrical conductor means of a single pole utility device is adapted to be connected to said second buss means at said fourth point;
third buss means in said buss compartment for establishing a prewired hot electrical circuit through said housing from a fifth point adjacent the exterior surface of said housing to a sixth point adjacent said partition;
opening means through said housing through which electrical conductor means of a hot electrical circuit is adapted to be connected to third buss means at said fifth point;
opening means through said partition though which electrical conductor means of a utility device is adapted to be connected to said third buss means at said sixth point;
opening means through said housing through which an electrical conductor means is adapted to be connected to said third buss means at a seventh point to provide an outlet for said hot electrical circuit from said box;
a first set of mounting holes vertically aligned at the top and bottom of said utility compartment of said housing adapted to mount a standard switch or receptacle to said housing; and
a second set of mounting holes offset at the top and the bottom of said utility compartment of said housing to increase the distance therebetween adapted to amount a standard light fixture to said housing.

4,924,033

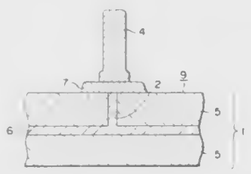
BRAZING PASTE FOR BONDING METAL AND CERAMIC

Kiyoshi Iyogi, Kawasaki; Masako Nakahashi, Tokyo; Hiromitsu Takeda, Tokyo, and Makoto Shirokane, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1989, Ser. No. 318,331
Claims priority, application Japan, Mar. 4, 1988, 63-49642
Int. Cl.[5] B23K *35/26*; H05K *1/00*; H01R *9/00*
U.S. Cl. 174—259 **9 Claims**

1. An electronic component part, comprising:
(i) a high thermal conductivity ceramic circuit board;
(ii) terminal pins located over said circuit board; and
(iii) a metal brazing material layer bonding said board and said pins and comprised of a brazing metallic material and

at least one element selected from the group consisting of Group IVa elements, said brazing material layer having



metal particles having a melting point higher than that of said brazing metallic material mixed therein.

4,924,034

RE-ENTERABLE ENCLOSURE AROUND SPLICE

Grant Truesdale, Cary, N.C., and Tommy Petersen, Ishoej, Denmark, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 106,751, Oct. 6, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,463

Int. Cl.[5] H02G *15/06*

U.S. Cl. 174—87 **11 Claims**



1. An environmentally-sealed cable splice which comprises:
(a) a butt cable splice between at least two substantially side-by-side cables; and
(b) a re-enterable enclosure heat-shrunk around the cable splice, the enclosure comprising
(i) a first substantially tubular part through which said cables extend and an outlet, said outlet being heat-shrunk around the cables, and
(ii) a second part which is hollow and which together with the first part forms a closed space within which lies the cable splice, the second part being attached to the first part but separable therefrom by cutting the closure;
the first part or second part having a portion that has an inside diameter that is substantially equal to the outside diameter of a portion of respectively the second part or first part such that after said cutting the portion of one of the first and second parts can be slid within the portion of the other of the first and second parts to reconstitute the closure.

4,924,035

TWIST ON ELECTRICAL CONNECTOR

H. Laurie Miller, and Donald W. Marr, both of Oakville, Canada, assignors to Marr Electric Limited, Mississauga, Canada

Filed Mar. 9, 1988, Ser. No. 165,913

Int. Cl.[5] H01R *5/12*

U.S. Cl. 174—87 **13 Claims**

1. A molded plastic cap for use in a twist on wire connector that is adapted to connect a plurality of wires in electrically conductive relation, comprising:
a substantially frustum shaped body, said body being generally hollow, and having an interior surface and an exterior surface; and including a proximal end, a distal end, and a circumferential wall portion disposed therebetween forming a solid connection between two said ends, with said proximal end being the larger end of the frustum and said distal end being the smaller end of the frustum; said body having a gripping portion forming a substantial portion of said exterior surface of said body;
wherein said proximal end is open for insertion of wires and said distal end is closed to preclude passage of wires when inserted in said cap;
wherein said circumferential wall portion includes a wire receiving portion, a channelling portion, and a wire retaining portion, all forming part of said interior surface, with all of said included portions being substantially coaxially aligned seriatim within said frustum shaped body;



wherein said wire retaining portion comprises a generally tapered bore hole which is adapted to receive a conductive wire retainer in the form of a coiled spring;
wherein said gripping portion includes a plurality of circumferentially evenly spaced radially outwardly extending ribs around said exterior surface, which ribs extend radially outwardly from said wire retaining portion and substantially along the lengths thereof;
wherein said ribs are generally straight and parallel, and substantially of constant thickness, and said ribs act to provide structural reinforcement to said circumferential wall portion;
wherein the distance between two adjacent ones of said ribs is below the 2-point threshold of discrimination for a human finger; and
wherein said circumferential wall portion is generally thin.

4,924,036

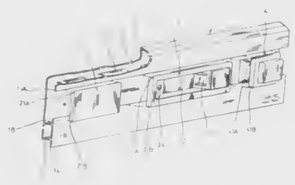
MULTI-PURPOSE APPARATUS FOR DISTRIBUTING WIRES

June Y. Shyu, 4F, No. 8, Alley 14, Lane 121 Gen Hua St., Taipei, Taiwan

Filed Mar. 9, 1989, Ser. No. 321,121

Int. Cl.[5] H02G *3/04*

U.S. Cl. 174—97 **1 Claim**



1. A Multi-purpose apparatus for distributing wires comprising:

a strip member having an upper flange and a lower flange, said strip member being formed at its upper and lower edges with chambers, for receiving wires, each chamber having in its interior a plurality of upwardly bent partitions each being spaced from its adjacent partition by a wire distribution opening, each chamber being formed at one end with a horizontal pattern portion and at the other end with a vertical pattern portion, a backward bent member of flexible material being disposed at the uppermost edge of said strip member; a plurality of single units including decorative plate assemblies, electrical socket assemblies, switch assemblies and other desired terminals, each single unit having an upper groove and a lower groove respectively corresponding to said upper flange and lower flange of said strip member such that said single unit is able to be detachably secured to said strip member by respectively forcing said upper and lower flanges into said upper and lower grooves, wires received in said chambers of said strip member and being connected to associated single units to supply electrical power thereto; a joint consisting of a horizontal pattern portion and a vertical pattern portion which respectively correspond to said vertical pattern portion and said horizontal pattern portion of each of said chambers of said strip members in order to connect two aligned strip members; and an L-shaped joint consisting of a horizontal pattern arm and a vertical pattern arm which respectively correspond to said vertical pattern portion and said horizontal pattern portion of each of said chambers of said strip member in order to connect two angularly intersecting strip members.

4,924,037

ELECTRICAL CABLE

James Ainsworth, Phoenix, Ariz.; William G. Hardie, Newark, Del.; Edward L. Kozlowski, Jr., Elkton, Md., and Dinesh T. Shaf, Chandler, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Dec. 20, 1988, Ser. No. 286,919

Int. Cl.[5] H01B *7/08*

U.S. Cl. 174—117 F **5 Claims**



1. An electrical cable comprising:
(a) at least one conductive wire
(b) an insulating layer surrounding the conductive wire, said insulating layer comprising a microporous polymeric material,
(c) a coating of an organic solvent soluble polyurethane surrounding the insulating layer,
(d) a film covering and surrounding the coating comprising a film of extruded polyurethane.

4,924,038

FLAT CABLE SEALING ELEMENT

John J. Klosin, and J. William Venezia, both of Ormond Beach, Fla., assignors to Homac Mfg. Company, Ormond Beach, Fla.

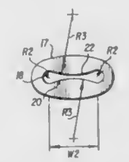
Division of Ser. No. 7,681, Jan. 28, 1987, Pat. No. 4,859,812. This application Apr. 4, 1989, Ser. No. 333,074

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[5] H02G *15/013*

U.S. Cl. 174—135 **9 Claims**

1. A sealing element adapted to be used with an insulated flat cable having opposed substantially flat parallel major surfaces and opposed rounded minor surfaces comprising an elongated body of resilient material;
an orifice having opposed side walls and opposed end walls extending within said body, said opposed side walls having a width greater than the height of said end walls; and
said opposed side walls of said orifice having involute surfaces extending substantially across their width and within said orifice, said involute surfaces extending the length of



said orifice and adapted to stretch and conform to substantially the entire major surfaces of a flat cable having opposed substantially flat parallel major surfaces and opposed rounded minor surfaces, said end walls of said orifice adapted to stretch and conform to the opposed rounded minor surfaces thereof so as to provide a watertight interference fit entirely about said cable.

4,924,039

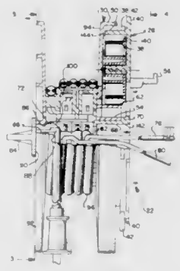
COOLED CORD REEL

Gregg A. McAllise, North Canton, and Thomas L. Ingersoll, Boliver, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Feb. 8, 1989, Ser. No. 307,822

Int. Cl.[5] A47L *9/26*

U.S. Cl. 191—12.2 R **3 Claims**



1. A cooled cord reel cooled by allowing cooling air passing therethrough including;
(a) a hub for the reception of a coiled cord,
(b) a terminal block for connection of said coiled cord, attached to said hub,
(c) a bore in said hub for allowing at least a portion of said cooling air passing therethrough, and
(d) slots in said terminal block communicating with said bore for allowing at least a fraction of said portion of cooling air exhausting therethrough.

4,924,040

ELECTRICAL SWITCHING APPARATUS

Mario M. Orrico, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

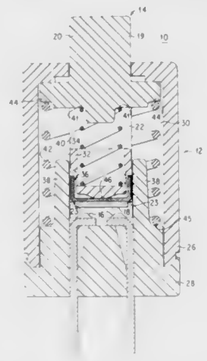
Filed Sep. 25, 1986, Ser. No. 911,448

Int. Cl.[5] H01H *15/00, 1/20, 13/50*

U.S. Cl. 200—16 A **4 Claims**

1. An electrical switching apparatus comprising a housing,

an actuator means for actuating the apparatus along an axis, first contact means for establishing an incomplete electrical path within said housing, and second contact means for bridgingly electrically completing said electrical path in response to movement of said actuator means within said housing; said first contact means comprising at least two substantially rigid elongate contacts generally coplanar in a plane substantially perpendicular to said axis, said second contact means comprising at least two substantially rigid elongate bridging contacts ori-



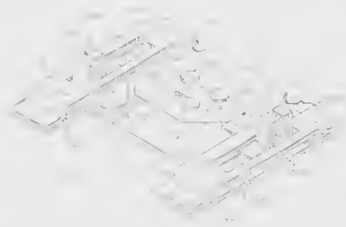
entated generally perpendicular to said axis; said first contact means being orientated about a first elongate contact axis and said second contact means being orientated about a second elongate contact axis, said first elongate contact axis being substantially perpendicular to said second elongate contact axis; said second contact means being floatingly captive to said actuator means in a manner allowing movement of said second contact means with respect to said first contact means about at least one of said first and said second elongate contact axes.

4,924,041

UNIVERSAL CIRCUIT BREAKER INTERLOCK ARRANGEMENT

Edgar Yee, Vernon, Conn., assignor to General Electric Company, New York, N.Y.

Filed Apr. 26, 1989, Ser. No. 343,308
Int. Cl.[5] H01H *9/26*
U.S. Cl. 200—50 C **11 Claims**



1. An interlock for electric circuit breakers and switches comprising:

a metallic base plate;

a pair of U-shaped top pieces attached to said base plate and spaced apart from each other to define an operating region on a surface of said base plate between said U-shaped top pieces;

a corresponding pair of planar latches, each latch being slidably arranged under one of said top pieces;

a corresponding first pair of upright posts attached to said latches each of said posts extending in a plane perpendicular to said base plate, and being captured within an elongated slot formed within each of said top pieces; and

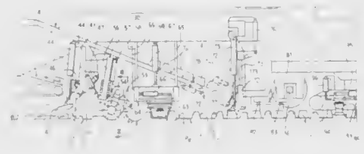
a trapezoidal lever slidably arranged on said base plate within said operating region for transferring in and out of abutment with said latches, one of said latches and an associated one of said posts being refrained from movement within an associated one of said slots when the other of said latches is in abutment with said trapezoidal lever.

4,924,042

RAILCAR FOR RENOVATING RAILWAYS

Enrico Valditerra, Viale Rimembranze 67, 15067 Novi Ligure, Province of Alessandria, Italy, assignor to Enrico Valditerra, Novi Ligure, Italy

Filed May 31, 1988, Ser. No. 200,494
Claims priority, application Italy, Jun. 8, 1987, 67486 A/87
Int. Cl.[5] E01B *29/06*
U.S. Cl. 104—9 **27 Claims**



1. Railcar for renovating railways, comprising an operating unit provided with equipment for removing old tracks lying on old sleepers and with supporting means for advancing on said old sleepers deprived of said old tracks, each of said old sleepers lying in an old seat, said railcar having a frame for said operating unit and being adapted to have a forward motion, said railcar further comprising, in sequence:

(a) first grip means adapted to move with controlled cyclic oscillatory and vertical movements for gripping each of said old sleepers, for removing each of said old sleepers from a respective said old seat and for laying each of said old sleepers on a removal conveyor;

(b) a rotary operating element adapted to move with controlled cyclic oscillatory, vertical and horizontal movements for preparing each of said old seats, deprived of a respective said old sleeper, to define a prepared seat for each of said old seat;

(c) at least one strike element adapted to move cyclically with a longitudinal motion, relatively to said frame of said operating unit, and controlled by displacing and unloading fluid-actuated means for compacting each of said prepared seats to define a laying plane and for shaping each of said prepared seats to define a new seat, said new seat having compacted walls;

(d) second grip means adapted to move with controlled cyclic oscillatory and vertical movements for gripping new sleepers from a feeder conveyor and for laying each of said new sleepers on a respective said laying plane in a respective said new seat, interspaces being defined between said new sleepers and said compacted walls of said new seat;

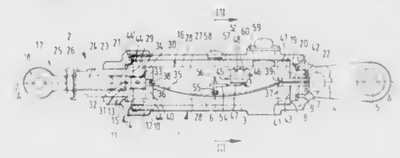
(e) strike means adapted to move with controlled longitudinal and vertical movements for packing rubble into said interspaces for filling said interspaces to secure each of said new sleepers into a respective said new seat.

4,924,043

CONTACT LINK FOR FLIGHT CONTROLS OF AERODYNES

Jacques A. Aubry, Cabries, and André Guillem, Marignane, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Oct. 24, 1988, Ser. No. 261,438
Claims priority, application France, Oct. 23, 1987, 87 14725
Int. Cl.[5] H01H *3/00, 35/00;* **G01L** *5/00*
U.S. Cl. 200—52 R **14 Claims**



1. A contact link for flight controls of aerodynes, for ensuring mechanical control of the actuation of at least one electrical contactor (**45**) beyond a dynamometric operating threshold, said contact link comprising

(a) a link body (l) comprising a substantially tubular part (**3**) and having an end (**4**) which has means for connection to and articulation on a support;

(b) at least one electrical contactor (**45**) accommodated in the link body (l) and equipped with at least one movable contact member (**55**) having a predetermined actuating stroke;

(c) a link rod (**2**) shiftable axially relative to the body (l) by means of a rod part (**16**) which is engaged and slideably mounted in said tubular part (**3**), over an axial stroke less than said predetermined actuating stroke of the movable contact member (**55**) and defined between two mechanical stops (**9, 15**) of the body (**1**), an end of the rod (**2**) outside the body (**1**) having means (**18**) for connection to and articulation on a support;

(d) a detector for detecting the exceeding of the dynamometric operating threshold, said detector, in the link body (**1**), comprising at least one prestressed spring (**35**) stressing the rod (**2**) elastically and allowing shifting of the rod (**2**) relative to the body (**1**) only when the rod (**2**) is subjected, counter to the spring (**35**), to a stress of which the axial component under tension or compression exceeds said threshold; and

(e) a mechanical amplifier of the stroke of the rod (**2**) relative to the body (**1**), said amplifier being actuated by the rod (**2**) and itself actuating said movable contact member (**55**) of the contactor (**45**) over said predetermined actuating stroke when the rod (**2**) is shifted relative to the body (**1**) over its entire stroke under tension or compression, in order to actuate the electrical contactor (**45**);

(f) wherein said prestressed spring (**35**) is a leaf spring deformed in compressive bucking and constituting both said detector for detecting the exceeding of the dynamometric operating threshold and said stroke amplifier for activating said contactor (**45**), opposite ends of said leaf spring abutting against two spring supports (**36, 37**) mounted axially slideable relative to the link body (**1**) and to the link rod (**2**), said spring supports being biased by said leaf spring subjected to compressive prestress against at least one of a stop (**8, 14–44'**) of said body (**1**) and a stop (**29, 43**) of said rod (**2**);

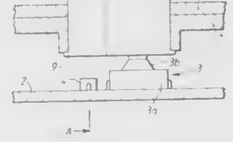
(g) whereby any axial shift of said rod (**2**) relative to said body (**1**), under tension or compression, causes a supplementary compression of said leaf spring (**35**) between one of said spring supports (**36** or **37**) bearing against a stop of said body (**1**) and the other of said spring supports bearing against a stop of said rod (**2**), said leaf spring 935) being further directly in contact by its central part with said movable contact member (**55**) of said contactor (**45**), whereby, as soon as the axial tension or compression stress to which said link is subjected exceeds the value of the axial prestress in compressive buckling of said leaf spring (**35**), lateral deflection of said leaf spring increases and resulting transversal displacement of said central part of said leaf spring is substantially amplified with respect to its axial deformation and actuates said movable contact member (**55**) of said contactor (**45**) with a stroke greater than the displacement of said link rod (**2**) relative to said link body (**1**).

4,924,044

LIGHT EMITTING PUSH BUTTON SWITCH FOR AN ELECTRONIC APPARATUS

Yoshiya Takahashi, Hino; Koichiro Suda, Fuchu, and Katumi Itoyama, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 41,842, Apr. 23, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 296,860
Claims priority, application Japan, Apr. 30, 1986, 61-69513[U]; Jul. 9, 1986, 61-105198[U]
Int. Cl.[5] H01H *9/00*
U.S. Cl. 200—314 **10 Claims**



1. A light emitting push button switch for an electronic apparatus comprising:

a button block movable in an upward and downward direction responsive to a pushing force applied by an operator to thus alternately change the state of the switch from a first state to a second state, said button including:

a transparency block having a top surface and a bottom surface disposed directly opposite and parallel to said top surface, the rearwardly facing side of said transparency block having a first portion of the side perpendicular to the top and bottom surfaces and a second of he side sloped forward from said first portion;

a non-transparency block adhered to said transparency block; and

detecting means for detecting movement of said button block; and

a light source disposed directly opposite and parallel to the bottom surface of said bottom block and responsive to said detecting means for emitting light to illuminate the bottom surface of said transparency block when said switch is in the first state, so that light reflected by the rearwardly facing side of he transparency block is guided to the top surface of the transparency block and is radiated therefrom.

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4,924,045

PUSH BUTTON FOR A VALUE INPUT KEYBOARD

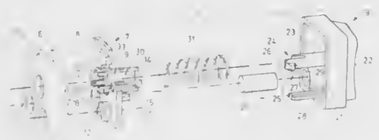
Oskar Zumkeller, Villingen-Schwenningen, and Hugo Fesenmeieir, Bräunlingen, both of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen, Fed. Rep. of Germany

Continuation of Ser. No. 178,468, Apr. 7, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 396,750

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 8705193[U]

Int. Cl.[5] H01G *5/16*

U.S. Cl. 200—341 1 Claim



1. A push button for a value input inductive keyboard, comprising: a one-piece keyboard base to which a longitudinal guidance sleeve is molded on one side thereof and snap-in means are provided on another side thereof for fastening the keyboard base to a printed circuit board, the snap-in means including snap-in hooks arranged so as to engage the circuit board through a hole therein so that the keyboard base lies essentially flat on one side of the circuit board and the hooks project beyond the other side of the circuit board a very small distance in comparison to the guidance sleeve length; a one-piece push-button head having a lower side and a shaft integrally molded on the lower side so as to be engagable with the guidance sleeve; a pressure spring effective between the keyboard base and the push-button head; a ferrite core attached to the lower side of the push-button head so as to engage in respective holes in the keyboard base and the printed circuit board; and stop means for limiting the stroke of the push button in a non-actuated state thereof, the guidance sleeve having a pass-through aperture formed therethrough for receiving said shaft, the snap-in means being centrally located about said aperture, and a lug integrally molded on the same side of said keyboard base as said snap-in means, said lug being formed with a guidance aperture therethrough, said shaft on said push-button head having an axial slot forming resilient shaft segments, and a dog radially molded on at least one of the resilient shaft segments so as to cooperate with a stop face formed in said keyboard base, said push-button head further having a finger molded integrally therewith on the lower side so as to be substantially parallel to said shaft and engagable with said guidance aperture formed in said lug with a close tolerance so as to prevent relative turning of said head and said base.

4,924,046

TRIM SWITCH

William A. Howard, Burton, Ohio, assignor to Delta Systems, Inc., Streetsboro, Ohio

Filed Sep. 27, 1988, Ser. No. 249,859

Int. Cl.[5] H01H *13/70*

U.S. Cl. 200—516 11 Claims

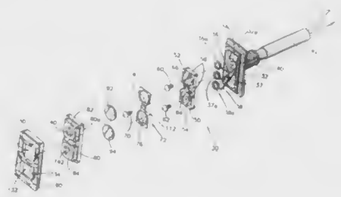
1. Switch apparatus comprising:

(a) a switch base comprising a mounting portion including a through passage for routing signal carrying conductors;

(b) a switch body defining first and second circular depressions located on either side of a center portion that separates said circular depressions; said switch body having three openings extending through said body; where first and second openings extend through said switch body centered within the first and second depressions and a third opening extends through said center portion of the switch body;

(c) first and second metallic switch contacts extending through the openings in the first and second circular depressions for connection to conductors coupled to the contacts, each contact having a curved contact region centered within an associated circular depression and facing away from said switch body;

(d) metallic bridging means coupled to the switch body by a third switch contact extending through the third opening in the center portion of the switch body; said bridging



means comprising two domed side lobes spaced from the curved region of the first and second switch contacts; and

(e) a switch actuator including first and second spaced dome engaging buttons carried by an elastic material, each button defining a projection having a curved projection surface for contacting a middle portion of an associated one of said first and second domed side lobes to deform said associated one of said dome side lobes into curved engagement with an associated one of said first and second metallic switch contacts and complete a circuit path between said associated one of said first and second metallic switch contacts and the third switch contact.

4,924,047

SEESAW SWITCH

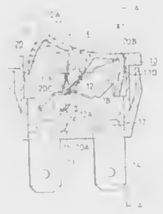
Kazuya Tsuge, Shimane, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 97,005, Sep. 14, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 315,228

Claims priority, application Japan, Sep. 16, 1986, 61-140611; Sep. 16, 1986, 61-140612; Sep. 16, 1986, 61-140613

Int. Cl.[5] H01H *23/08*

U.S. Cl. 200—553 8 Claims



1. A switch comprising:

a case having a bottom wall and upwardly extending side walls;

a button having an operation portion and housed within the case;

a first and a second fixed terminal fixed to the case, said first fixed terminal having an upwardly extending holding portion, said second fixed terminal having a fixed contact;

a generally U-shaped movable piece having one end rotatably held by the holding portion of the first fixed terminal while another end is provided with a movable contact for making and breaking contact with the fixed contact of the second fixed terminal, wherein the generally U-shaped movable piece has a middle portion which is in contact with the operation portion of the button between the movable contact and a bent portion of the movable piece; and

isolating means for isolating said first fixed contact and said second fixed contact, wherein said isolation means comprises a projection extending upwardly from the bottom wall of the case between the first and second fixed terminals, and wherein said projection is entirely disposed between the first and second fixed contacts.

4,924,048

TRAY FOR USE IN MICROWAVE OVENS WITH HEAT SEALED COVER AND INNER LID

Martin C. Bunce; David W. Helps, both of London; Leonard A. Jenkins, Southmoor, and Adrian C. Noke, Wantage, all of England, assignors to CMB Packaging (UK) Limited, Worcester, United Kingdom

Filed Apr. 11, 1989, Ser. No. 336,061

Claims priority, application United Kingdom, Apr. 11, 1988, 8808458

Int. Cl.[5] H05B *6/80;* B65D *81/34*

U.S. Cl. 219—10.55 E 8 Claims



1. A food container formed of a material suitable for use in microwave ovens comprising:

an upstanding peripheral wall;

a horizontal flange extending outwardly from said wall around its periphery;

an outer lid heat-sealed to the horizontal flange around its periphery;

a step formed in said peripheral wall; and

an inner lid formed of a substantially rigid material supported by said step and comprising an upwardly extending peripheral wall and a substantially flat top portion perforated so as to permit venting when the outer lid has been removed and food is heated in the tray;

said upwardly extending peripheral wall extending to a sufficient height above said step so that said top portion of the inner lid serves to support the outer lid; and

said upwardly extending peripheral wall being shaped to provide indented portions which act as fingerholds whereby the inner lid may be grasped and removed after the outer lid has been removed.

4,924,049

BACON BOX

Fred E. Dexter, Jr., P.O. Box 423, Red Hook, N.Y. 12571

Filed Jan. 21, 1989, Ser. No. 369,209

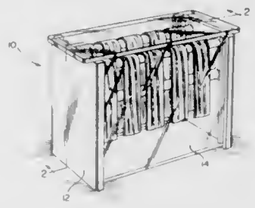
Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E 14 Claims

1. A box for microwave cooking, said box comprising:

a base rack unit having support means for supporting a central portion of a bacon strip to be heated so that lateral portions of the bacon strip hang downwardly from said support means when the central portion of the bacon strip is supported by said support means, and

a cover unit removably mounted on said base rack unit and defining with said base rack unit an enclosed cooking space for microwave cooking, said cover unit fitting on



said base rack unit so as to define a relief space for excess vapors to escape from the enclosed cooking space when said cover unit is mounted on said base rack unit, said base rack unit including side plates having longitudinally extending supports extending between said side plates to form said support means.

4,924,050

WIRE ELECTRODE FOR USE IN SPARK-EROSIVE CUTTING

Hans Hermanni, Sinn-Fleisbach, Fed. Rep. of Germany, assignor to Berkenhoff GmbH, Heuchelheim, Fed. Rep. of Germany

Filed Mar. 27, 1989, Ser. No. 328,866

Claims priority, application European Pat. Off., Mar. 26, 1988, 88/104897.9

Int. Cl.[5] B23H *7/08*

U.S. Cl. 219—69.12 10 Claims

RECRYSTALLIZATION ANNEALING
ENLARGEMENT 250 :1



1. A method for the manufacture of a wire electrode for use in spark-erosive cutting, with the wire electrode including a core surrounded by an outer layer, comprising reducing the wire electrode in cross section in a first step, subsequently diffusion annealing the wire electrode in an oxidizing atmosphere in a second step, subjecting the wire electrode to a further reduction in cross section to an intermediate diameter in a third step, recrystallizing annealing in a reducing atmosphere in a fourth step, and deforming the wire electrode to a final diameter in a fifth step.

4,924,051

SPLIT GRIP TIP FOR MOUNTING OF ELECTRODE BLANKS

Jack Sebzda, Sr., 7 Schuyler Ave., Pequannock, N.J. 07440

Filed Nov. 18, 1988, Ser. No. 272,938

Int. Cl.[5] B23H *1/04*

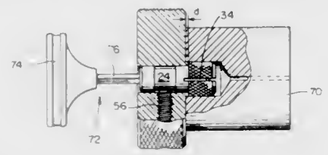
U.S. Cl. 219—69.15 17 Claims

1. A grip tip for mounting an electrode blank onto an electrode holding shank, said grip tip comprising:

an elongated cylindrical body having a knurled head for

engaging and gripping a smooth-walled bore of an electrode blank, said body being split by axially and radially extending grooves into a plurality of sections, and said body being hollow and internally threaded, and

an internal set screw being threadingly mounted in said



internal threads of said body for rotation and movement along a longitudinal axis of said body to engage and force radially outwardly said plurality of sections of said knurled head,

said set screw being hollow for passage of dielectric fluid therethrough.

4,924,052

PROCESSING GRAIN-ORIENTED "ELECTRICAL" STEEL

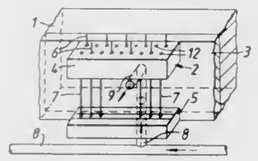
Philip Beckley, Bettws Hill, and David Snell, Six Bells, both of United Kingdom, assignors to British Steel Plc, London, United Kingdom

Filed Mar. 6, 1989, Ser. No. 319,041

Claims priority, application United Kingdom, Mar. 5, 1988, 8805296

Int. Cl.[5] B23K *9/04*; H01F *1/04*

U.S. Cl. 219—75 **7 Claims**



2. Apparatus for forming continuous or spot-sequenced lines across the surface of grain oriented steel strip, comprising banks of electrodes closely spaced for said strip said banks of electrodes being movable transversely to said strip and energised to produce said lines by spark discharge, means for injecting an inert gas to envelope the electrodes throughout the spark discharge.

4,924,053

ELECTRODE CARRYING WIRE FOR GTAW WELDING

Gene E. Morgan, Camarillo, and Gerald E. Dyer, Canoga Park, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

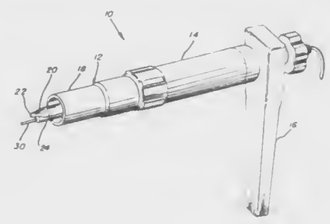
Filed Dec. 5, 1988, Ser. No. 279,677

Int. Cl.[5] B23K *9/24*

U.S. Cl. 219—75 **3 Claims**

1. In a welding torch for gas tungsten arc welding apparatus comprising a housing for supporting an axially extending annular nozzle and an axially extending tungsten electrode, said electrode being disposed substantially coaxially within the nozzle and having a tip disposed outside said nozzle, means for supplying electricity to said electrode and means for supplying an inert gas to said nozzle for shielding said electrode from oxidizing conditions,

the improvement comprising an axially extending bore formed through said electrode, and elongated non-electrified filler metal wire guide disposed within said bore terminating outside said nozzle and inwardly of said tip,



said guide comprising a conduit of electrically insulated material through which a filler metal wire may be fed relatively to said electrode so that said filler material is not electrified by said guide or by said electrode.

4,924,054

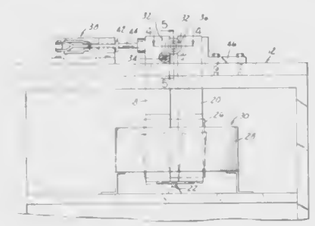
ELECTRICAL RESISTANCE BRAZING DEVICE

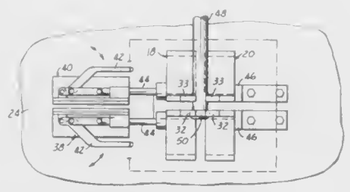
Mark J. Marcie, Walled Lake, and John P. Williams, Jr., Redford, both of Mich., assignors to Daykin Electric Corporation, Livonia, Mich.

Filed Dec. 16, 1988, Ser. No. 285,504

Int. Cl.[5] B23K *1/04*; B21V *5/08*

U.S. Cl. 219—85.14 **12 Claims**





1. Apparatus for heating a tube/sleeve end fitting for brazing comprising: a pair of electrodes, means for selectively bringing said electrodes into physical engagement with a tube sleeve end fitting with one of said electrodes in engagement with the fitting sleeve and the other of said electrodes in engagement with the tube closely adjacent to but spaced from the sleeve, means for selectively applying electrical current between said electrodes through the tube and sleeve to heat said tube/sleeve end fitting to elevated temperature sufficient for brazing, each of said electrodes comprising an opposed pair of electrode elements, and said elements of each said pair having arcuate portions contoured for external peripheral surface engagement with the tube and sleeve.

4,924,055

SPOT GUN FOR A WELDER MACHINE

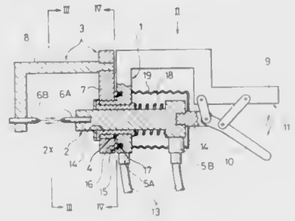
Isamu Nakahigasi, and Yoshio Suzuki, both of Mie, Japan, assignors to Shinano Pneumatic Industries Inc., Mure, Japan

Filed Sep. 20, 1988, Ser. No. 246,843

Claims priority, application Japan, Sep. 28, 1987, 62-243261

Int. Cl.[5] B23K *11/30*

U.S. Cl. 219—86.21 **16 Claims**



1. A spot gun for a welder machine, comprising:

first electrode means mounted upon said gun and extending along a welding axis;

second electrode means extending along said welding axis in a coaxially, oppositely disposed, manner with respect to said first electrode means, so as to define with said first electrode means a welding gap therebetween within which a component to be welded is to be disposed, and rotatably mounted upon said gun with respect to said first electrode means and about said welding axis so as to be selectively disposed at any one of a plurality of predetermined circumferentially spaced positions with respect to said welding axis so as to improve the accessibility of said spot gun to said component to be welded during a welding operation; and

means for positively locking said second electrode means at said any one of said plurality of predetermined circumferentially spaced positions.

4,924,056

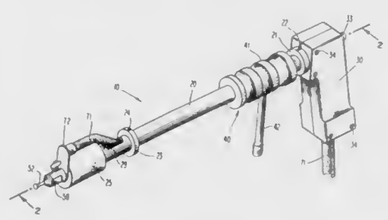
DENT PULLER AND METHOD OF USE

Richard M. Bevilacqua, 56 Belmont Ave., Ambler, Pa. 19002

Continuation of Ser. No. 896,397, Aug. 13, 1986, abandoned. This application Feb. 14, 1989, Ser. No. 311,430

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—98 **18 Claims**



1. A method for straightening a dent in a metal workpiece comprising the consecutive steps of:

(a) applying a fusible stud to said workpiece at the location of said dent;

(b) applying electrical energy to said stud to cause said stud to fuse to said workpiece and terminating the application of said energy to said stud when the stud is welded to said workpiece sufficiently securely to withstand the application of a pulling force thereon to pull said dent out of said workpiece;

(c) pulling on said stud in a direction away from said workpiece to thereby straighten said dent; and

(d) applying electrical energy to said stud to cause said stud to melt at its junction with said workpiece while pulling on said stud in a direction away from said workpiece to cause said stud to separate from said workpiece, leaving said workpiece without the stud attached thereto.

4,924,057

METHOD OF FORMING A JOINT BETWEEN ALUMINUM WORKPIECES WITH CURABLE ADHESIVE AND RESISTANCE WELDING

Mark W. Puddle; Nigel C. Davies, both of Banbury; William F. Marwick, Daventry, and Peter G. Sheasby, Banbury, all of England, assignors to Alcan International Limited, Montreal, Canada

Filed May 12, 1988, Ser. No. 193,106

Claims priority, application United Kingdom, May 13, 1987, 8711295

Int. Cl.[5] B23K *11/18*

U.S. Cl. 219—118 **9 Claims**

1. A method of forming a joint between aluminium workpieces which have an artificially applied strongly adherent coating on their surfaces at least at the location of the intended joint, which method comprises providing between faying surfaces of the workpiece a curable adhesive containing up to 40% by weight of particulate filler having a maximum particle size of 300 microns, providing a welding electrode whose tip has a surface with an average roughness depth R_z of at least 10 microns, resistance welding the faying surfaces of the workpieces together, and curing the adhesive.

4,924,058

POWDER RECHARGING APPARATUS, ESPECIALLY FOR A COATING APPARATUS OPERATING IN A VACUUM CHAMBER

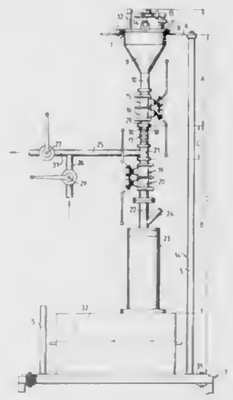
Gerhard Johner, Gelnhausen, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,135

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834740

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.47 **14 Claims**



1. Powder recharging apparatus comprising a supply funnel having a neck,

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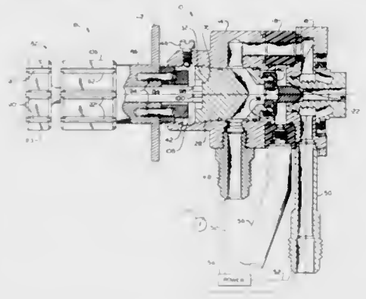
a powder feeder below said supply funnel, said feeder receiving powder along a powder path from said supply funnel,
a tee between said neck and said powder feeder, said tee being aligned to pass powder downward therethrough, said tee being connected laterally to a valved vacuum pipe out of the path of said powder,
first valve means connected serially between said neck and said tee,
second valve means connected serially between said tee and said powder magazine,
a fill tube connected to said second valve means between said second valve means and said powder feeder, and
a powder magazine connected between said fill tube and said powder feeder.

4,924,059

PLASMA GUN APPARATUS AND METHOD WITH PRECISION ADJUSTMENT OF ARC VOLTAGE

Anthony J. Rotolico, Hauppauge, and William H. Maidhof, Kings Park, both of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 18, 1989, Ser. No. 423,314
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.48 **14 Claims**



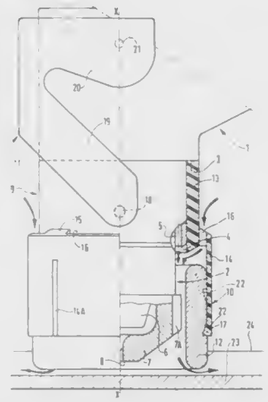
1. A plasma gun apparatus with precision adjustment of arc voltage, comprising a gun body with a bore therethrough receptive of a plasma-forming gas, a nozzle anode retained coaxially in one end of the bore, a cathode holder engaged in the bore with threads so as to be positionable axially by rotation, an axial cathode mounted on the cathode holder and cooperatively positioned with respect to the anode so that with a plasma-forming gas and an arc voltage applied between the anode and the cathode a plasma stream issues from the nozzle anode, a locking ring with an axial hole therethrough engaged in the bore with threads in the end opposite the anode and locatable in a locking location for locking the cathode holder in a selected axial position, an inner wrench formed of a handle attached to a shaft inserted through the locking ring hole and engaged with the cathode holder to rotate the same for axial positioning, and a sleeve wrench disposed coaxially over the shaft and engaged with the locking ring to rotate the same between the locking location and a selected location spaced axially from the cathode holder, the handle and the sleeve wrench each having at least one angular position marking thereon mutually alignable while the sleeve wrench is in the selected location so as to provide rotational reference for precision positioning by the inner wrench of the cathode holder and the cathode axially with respect to the anode, whereby said positioning of the cathode provides for precision adjustment of arc voltage.

4,924,060

CAP FOR AN ARC TORCH AND TORCH PROVIDED WITH SAID CAP

Michel Delzenne, Franconville, France, assignor to L'air Liquide, Societe Anonyme Pour L'etude et L'exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 142,664, Jan. 11, 1988, abandoned. This application Jun. 2, 1989, Ser. No. 363,405
Claims priority, application France, Jan. 13, 1987, 87 00256
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.48 **12 Claims**



1. A cap for fitting on an arc torch of the type comprising a torch body having an end portion, said end portion having an axis and comprising cooling gas conduit means and a nozzle having an arc outlet orifice substantially on said axis, said cap comprising in combination:
a plastic skirt comprising means for securing the skirt to said body, said skirt having a free end portion;
a tubular shield member made of refractory material and fitted in and supported by and extending beyond said free end portion of said skirt, whereby said plastic skirt protects the refractory shield member against shocks or blows;
said shield member coaxially surrounding and being spaced from said nozzle when said skirt is secured to said torch body, whereby said shield member thermally protects said plastic skirt; and
cooling gas passage means between said shield member and said nozzle, said cooling gas conduit means opening into said cooling gas passage means.

4,924,061

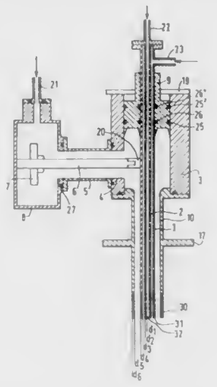
MICROWAVE PLASMA TORCH, DEVICE COMPRISING SUCH A TORCH AND PROCESS FOR MANUFACTURING POWDER BY THE USE THEREOF

Jean-Luc Labat, Ibaraki, Japan; Lahcen Ougarane, Elancourt, France, and Michel Gastiger, Orsay, France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'exploitation des procedes Georges Claude, Paris, France

Filed Jun. 10, 1988, Ser. No. 204,866
Claims priority, application France, Jun. 10, 1987, 87 08096
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.52 **7 Claims**

1. A microwave plasma torch, comprising: a hollow wave guide member for connection to a microwave energy generator, said wave guide member having a rectangular cross-section defining first and second opposite walls, and a first opening in said first wall; at least one gas supply conduit having an outlet; a resonant cavity-forming sleeve around said conduit,

said sleeve being open adjacent to said conduit outlet and including a lateral opening; a transition coaxial structure perpendicular to said sleeve and comprising an outer tube connected to said sleeve lateral opening and to said first opening and an inner element extending through both said openings, said inner element having one end in contact with said conduit and an opposite end which is contact with said second wall and which carries a transition member disposed in said wave guide member; said wave guide member being substantially perpendicular to said coaxial structure; and shielding gas supply means for supplying shielding gas into at least one of said wave guide member, said coaxial structure and said sleeve; wherein said outer tube is connected in a sealed manner to at least one



of the lateral opening and said first opening; wherein the wave guide member is connected to a source of shielding gas and is provided on each side of said first opening with windows being connected in a sealed manner; wherein said sealed windows are conductive and comprise a rectangular window composed of a material which is transparent to the microwaves, two rectangular flanges surrounding said rectangular window, first gas-tight means between the window and the flanges, and second gas-tight means between that one of the two flanges which is in facing relation to a portion on the wave guide member having said first opening and said portion; wherein the sleeve is connected to a source of shielding gas and a coaxial structure is provided with gas-tight means; and wherein said wave guide is supplied with shielding gas.

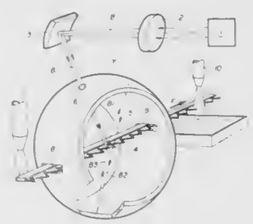
4,924,062

METHOD FOR HARDENING DISCRETE IDENTICAL ELEMENTS INTEGRAL WITH A COMMON STRUCTURE AND REGULARLY SEPARATED FROM EACH OTHER AND DEVICE FOR EMBODYING THIS METHOD

Erwin Zurcher, Le Lignon, Switzerland, assignor to Graf & Cie AG, Rapperswil, Switzerland

Filed Jan. 30, 1989, Ser. No. 303,113
Claims priority, application Switzerland, Feb. 2, 1988, 349/88
Int. Cl.[5] B23K *26/12, 26/00*
U.S. Cl. 219—121.6 **6 Claims**

1. A method of hardening discrete, identically shaped elements integral with a common supporting structure and regularly spaced from each other, inter alia the teeth of a dentate member, according to which there is formed a laser beam, there is defined a path of travel for these elements, the laser beam is aimed at a point of this path and the light reflected by these elements is returned against the same path, characterized in forming a mirror on the internal surface of a hollow sphere, providing through this sphere at least one opening located on a diameter of this sphere that coincides with said path and another opening located in a diametral plane containing this path, but on a radius that forms an oblique angle therewith, directing the laser beam through this other opening against a point of this path situated at a distance from the center of the sphere that corresponds to a fraction of the space between said elements in order that all successive reflections of said beam be trapped within the sphere and that the whole of these reflections converges, at one time, toward this point of said path



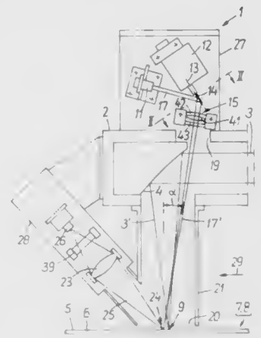
when they come, alternately, from two opposite directions after crossing the space between two said elements, and at another time toward another point of this path located on this path in symmetry to the first point with regard to the center of the mirror, this occurence being dependent on whether one of said elements intercepts or not said beam which penetrates into the sphere before said beam strikes the surface of said mirror.

4,924,063

METHOD AND APPARATUS FOR DETERMINING THE POSITION OF A WELD GROOVE FOR LASER WELDING

Manfred Büchel, Mülheim, and Norbert Hangmann, Oberhausen, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Sep. 8, 1989, Ser. No. 404,908
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1988, 3830892
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.64 **5 Claims**



1. In a laser welding process including the steps of
guiding a laser welding beam along a weld groove defined by two abutting workpieces,
determining the actual position of the weld groove relative to a predeterminable desired position of the weld groove; said determining step including the steps of
deflecting a collimated and focused laser measuring beam across the path of the weld groove during co-travel with the laser welding beam along the weld groove;

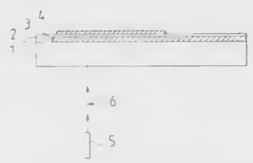
directing the laser measuring beam to the workpieces;
sensing, by an electro-optical sensor, rays of the laser measuring beam reflected by the workpieces;
generating, by the sensor, measuring signals in response to the sensed reflected rays;
applying follow-up signals in response to the measuring signals, and
correcting the position of the laser welding beam by a follow-up device in response to the follow-up signals applied thereto;
the improvement comprising the steps of
(a) oscillating, in the performance of the deflecting step, the laser measuring beam with a deflecting frequency of at least 100 Hz;
(b) modulating the intensity of the laser measuring beam with a frequency of at least 200 kHz;
(c) causing the laser measuring beam to impinge on the workpieces at a distance of maximum 10 mm from the central longitudinal axis of the laser welding beam; and
(d) using, in the performance of said sensing, step, a single light-sensitive element as the electro-optical sensor.

4,924,064

METHOD FOR TRIMMING A PLANAR CAPACITOR

Lars Stormbom; Jouko Jalava, both of Vantaa; Heikki Mesiä; Ari Lehto, both of Helsinki, and Pekka Belt, Vantaa, all of Finland, assignors to Vaisala Oy, Helsinki, Finland

Filed Dec. 23, 1988, Ser. No. 291,225
Claims priority, application Finland, Dec. 30, 1987, 875769
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 **3 Claims**



1. A method for trimming a planar capacitor, comprising the steps of:
(a) providing a substrate transparent to laser emission;
(b) providing a capacitor on an upper planar surface of said substrate, said capacitor including an upper electrode, an insulation layer, and a lower electrode;
(c) locally focussing a laser emission on said lower electrode of said capacitor through said substrate, thereby achieving a local heating effect on said lower electrode, wherein said step of locally focussing a laser emission is with a power density for rapidly oxidizing said lower electrode by dissolving gaseous oxygen in the insulation layer, thereby preventing vaporization of said lower electrode layer; and
(d) locally converting said lower electrode into an electrically non-conductive state according to step (c), wherein the integrity of each of said substrate and said insulation layer are maintained.

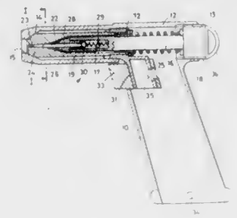
4,924,065

WELDING ELECTRODE HOLDING DEVICE WITH QUICK EJECTION OF THE WORN OUT ELECTRODE

Bruno Vito, Fraz. Mombresto, Pessinetto- TO, Italy

Filed Mar. 9, 1989, Ser. No. 321,097
Claims priority, application Italy, Mar. 15, 1988, 52972/88[U]
Int. Cl.[5] B23K *9/28*
U.S. Cl. 219—138 **10 Claims**

1. Welding electrode device with quick ejection of the worn out electrode which comprises: a cover; an extended hollow body in the cover having an end opening; a tubular pin in said hollow body; a jaw sleeve assembled on said tubular pin and which is extended in correspondence with the end opening of said hollow body able to contain the welding electrode; elastic means in said hollow body; a rivet sliding into said pin and pushed towards the opening of the hollow body by said elastic means; a pushbutton connected to said sleeve; wherein said sleeve has longitudinal grooves adjacent said end opening and has oblique inner and outer walls which cooperate with corresponding inner and outer walls respectively of the body and of the pin, in order to expand in the grooved portion during its movement of the pin due to the action of said pushbutton connected to it and held by the cover in such a way to be manually pressed from the exterior; and power feeding means to the electrode designed to go through the interior of the device.

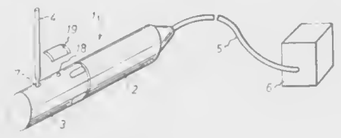


4,924,066

COOLING DEVICE

Rolf Wikström, Vintergatan 5 C, and Erik Sjölund, Johannesvägen 4, both of S-891 00 Örnsköldsvik, S-89100, Sweden

PCT No. PCT/SE88/00709, § 371 Date Aug. 1, 1988, § 102(e) Date Aug. 1, 1988, PCT Pub. No. WO89/06582, PCT Pub. Date Jul. 27, 1989
PCT Filed Dec. 28, 1988, Ser. No. 382,693
Claims priority, application Sweden, Jan. 13, 1988, 8800083
Int. Cl.[5] B23K *9/32*
U.S. Cl. 219—142 **2 Claims**



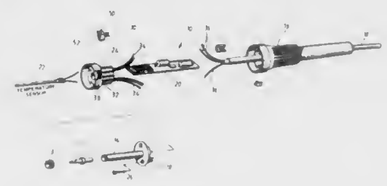
1. A device for cooling an electrode holder (1) for manual arc welding with coated electrodes, as well as the electrode (4) and the electric supply cable (5), said cable (5) being surrounded by a tube (10), and said electrode holder (1) comprising a handle (2) provided with a projecting electrode pin (11) having threads (12) and a conical tip (13), and a top part (3) having a bore (16) provided with threads (17) and arranged to receive the electrode pin (11), and a fixing hole (7) extending away from and at right angles to the bore (16) to the periphery of the top part (3), the conical tip (13) of the electrode pin (11) being adapted to urge an electrode (4) inserted in the fixing hole (7), into line or point contact with the wall of the fixing hole, characterised in that the electrode pin (11) has a channel (15) connecting the inlet end of the tube (10) in the electrode holder (1) to the fixing hole (7) for the electrode (4), cooling gas, preferably air, which is supplied to the end of the tube (10) remote from the electrode holder (1), flowing through the tube (10) and the channel (15) in the electrode pin (11) and being caused to flow out around substantially the entire circumferential portion of the electrode (4) in the fixing hole (7) therefor, and out from said fixing hole (7).

4,924,067

TEMPERATURE CONTROLLED SOLDERING RESISTOR TO CHANGE THE SET TEMPERATURE

Jack L. Wilhelmson, Mt. Pleasant, S.C., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 17,508, Feb. 24, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 262,034
Int. Cl.[5] H05B *1/02;* **B23K** *3/04;* **H01C** *1/04, 3/00*
U.S. Cl. 219—241 **13 Claims**



1. A soldering iron comprising:
a soldering tip;
a tubular member mounting said soldering tip;
a hollow handle portion mounting said tubular member, said hollow handle portion being removably attached to said tubular member;
an electrical heating element contained in said tubular member for heating said soldering tip;
means within said hollow handle portion and connected to said heating element for controlling the energization of said electrical heating element to maintain the temperature of said soldering tip at a predetermined level;
wherein said means for controlling the energization of said electrical heating element comprising an electronic temperature control circuit including a non-adjustable resistor whose resistance determines said predetermined temperature level of said soldering tip;
said resistor being mounted on a readily removable replaceable key positioned within said hollow handle portion and electricaHy connected in said temperature control circuit by detachable plug-in electrical connectors, said key being constructed and arranged with respect to tubular member and said hollow handle portion that said key may be changed only by disassembling said tubular member from said hollow handle portion.

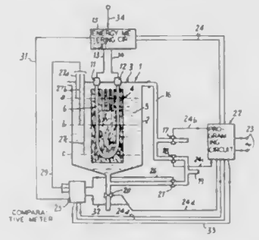
4,924,068

STEAM GENERATOR

Benon Henri, Sceaux, France, assignor to A.R.M.I.N.E.S., Paris, France

Filed Nov. 18, 1988, Ser. No. 274,325
Claims priority, application France, Nov. 19, 1987, 87 160022
Int. Cl.[5] F22B *1/28*
U.S. Cl. 219—274 **18 Claims**

1. A steam generator comprising:
an enclosure containing a liquid to be evaporated;
a rapid evaporation module inside said enclosure;
a porous body immersed in said liquid,
means to vary the liquid level in the enclosure in a direct proportion with the vapor output to be furnished for decreasing the level when the steam output must be reduced and vice versa;
said means for varying the liquid level within said enclosure comprising a device for detecting the level of the liquid to be evaporated, said device comprising a level detector for each plurality of liquid levels, and different vapor output amounts for each said liquid level;
each said level detector being connected to a comparative metering circuit for controlling the operation of a metering electric gate for admitting liquid into said enclosure;
an electric gate for evacuating excess water; and
means correspondingly to adjust the electrical energy fed to the heating resistance, said last-mentioned means being



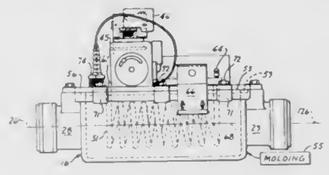
formed by an electric metering circuit connected to the comparative metering circuit.

4,924,069

HOT WATER SUPPLY FOR TUBS

Attilio G. Giordani, Simi Valley, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Nov. 19, 1987, Ser. No. 122,766
Int. Cl.[5] F24H *1/16*
U.S. Cl. 219—306 **12 Claims**



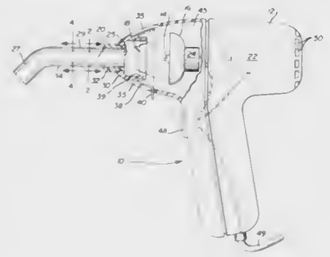
1. In a method of providing a water heating system including an elongate electric flow-through heater, the improvement comprising in combination the steps of:
providing an electric heating element for heating water in said elongate flow-through heater;
providing an elongate housing structure extending along a predetermined plane for encompassing said electric heating element, said elongate housing structure being provided at one end thereof with a water inlet lying in said horizontal plane and connected to a first part of said piping, and at the other end thereof with a water outlet lying in said horizontal plane and connected to a second part of said piping, and having a lateral opening extending from said water inlet to said water outlet in parallel to said predetermined plane for receiving said electric heating element therethrough;
reducing thermal losses and corrodibility by molding said elongate housing structure of an electrically insulating corrosion-resistant synthetic resin;
providing a metal plate extending from said water inlet to said water outlet in parallel to said predetermined plane as both a base for said electric heating element and as an electrically conductive complement of said electrically insulating elongate housing structure; and
closing said laterally opening by sealing said metal plate to said elongate housing structure over said lateral opening in parallel to said predetermined plane while mounting said electric heating element with said metal plate in said housing structure extending along said predetermined plane.

4,924,070

APPARATUS FOR CONTROLLED IRRADIATION

Joshua Friedman, 13 Fairfield Ct., Ridgefield, Conn. 06877

Filed Aug. 10, 1989, Ser. No. 392,157
Int. Cl.[5] H05B *1/00*
U.S. Cl. 219—346 9 Claims



1. Apparatus for irradiating photocurable dental material comprising:

a lamp for generating radiant energy;

reflecting means for reflecting energy emitted from said lamp to a desired focal point;

optic guide means for transmitting light reflected by said reflecting means along a predetermined direction to a photocurable material at a site external of said Apparatus;

means for channeling heated ambient air generated by said lamp to cause it to flow along a predetermined path; and

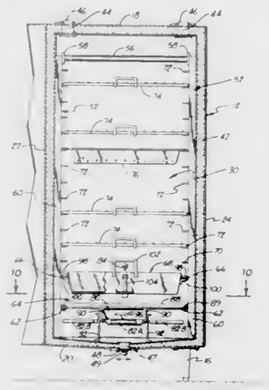
means for diverting a controlled amount of said heated ambient air from said predetermined path into said predetermined direction for applying heat to said photocurable material.

4,924,071

OVEN

Sheldon F. Jacobs, Wayzata, Minn., assignor to Woodroast Systems, Inc., Wayzata, Minn.

Filed Jul. 6, 1987, Ser. No. 70,332
Int. Cl.[5] A21B *1/26*
U.S. Cl. 219—400 25 Claims



1. An oven comprising:

a housing having a top, a bottom, first and second parallel sides, and a back defining a chamber with a front door opening, the housing further having an inlet vent through the bottom and exhaust vent through the top;

first and second shelf support members removably positionable parallel to and substantially adjacent to the first and second sides respectively, each shelf support member substantially restricting air flow laterally in the chamber and including means for spacing the shelf support member from its respective side for defining a circulation plenum between the shelf support member and its respective side, each support member further having a plurality of vertically spaced, horizontally oriented, inwardly projecting flanges and each support member having at least a first and second openings for permitting gaseous communication through the shelf support member;

first heating means positioned proximate to the bottom;

a plurality of cooking racks, each supported between opposing flanges of the first and second shelf support members;

means for dividing the chamber between the shelf support members into upper and lower portions with the first heating means in the lower portion and the cooking racks in the upper portion and with the first opening in each shelf support connecting a circulation plenum to the lower portion and the second opening in each shelf support connecting a circulation plenum to the upper portion;

the inlet vent, the lower portion, the circulation plenums, the upper portion and the exhaust vent defining a natural convective path upon operation of the first heating means causing flow of heated gas from areas adjacent the heating means to areas adjacent the cooking racks along the convective path substantially without use of forced air; and

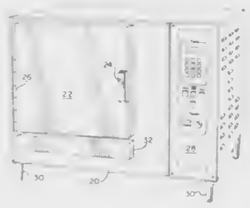
a front door disposed on the housing for closing the front door opening.

4,924,072

HUMIDITY CONTROL FOR OVEN CHAMBER

G. Robert Oslin, Chicago, Ill., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Division of Ser. No. 50,708, May 14, 1987, Pat. No. 4,851,644.
This application Jun. 30, 1989, Ser. No. 329,203
Int. Cl.[5] F22B *1/28;* H05B *1/02*
U.S. Cl. 219—401 21 Claims



1. Apparatus for controlling humidity in a chamber, such as a proofing oven, which comprises:

(a) an enclosure;

(b) a chamber within the enclosure;

(c) a vaporizing compartment disposed within the enclosure in vapor communication with said chamber;

(d) means for supplying water to said vaporizing compartment;

(d) means for heating water within said vaporizing compartment to produce water vapor;

(f) means for draining water from said vaporizing compartment;

(g) means disposed within the chamber for sensing dry-bulb temperature within said chamber;

(h) means for sensing web-bulb temperature within said vaporizing compartment by sensing the temperature of water within said compartment;

(i) heating means disposed in said chamber to heat gas and water vapor within the chamber;

(j) a blower fan disposed to circulate gas and water vapor in the chamber through the chamber heating means to heat the chamber;

(k) means disposed in the enclosure and outside of the chamber for controlling said chamber heating means in response to sensed dry-bulb temperature;

(l) means for sensing a level of water within said vaporizing compartment;

(m) means operatively connected to said level sensing means for controlling the means for supplying water and the means for draining water to control a desired level of water in the vaporizing compartment; and,

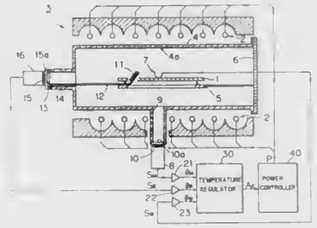
(n) means operatively connected to said dry-bulb temperature sensing means, to said web-bulb temperature sensing means, to said water heating means, and to said water level controlling means to control a desired humidity within said chamber by heating water within the vaporizing compartment when the humidity is too low, and by introducing cold water into said compartment and draining hot water therefrom when the humidity is too high.

4,924,073

METHOD OF CONTROLLING HEAT TREATMENT APPARATUS FOR SUBSTRATE

Takatoshi Chiba, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Feb. 8, 1989, Ser. No. 308,094
Claims priority, application Japan, Feb. 9, 1988, 63-28262
Int. Cl.[5] F27B *5/14;* H05B *1/02*
U.S. Cl. 219—413 17 Claims



1. A method of operating a furnace, the method comprising the steps of:

(a) stabilizing the temperature within a furnace by heating the interior of the furnace according to a heating cycle while introducing and discharging a dummy object into and from the furnace in synchronism with the heating cycle;

(b) after stabilizing the temperature within the furnace, and while continuing to heat the interior of the furnace according to the heating cycle while introducing and discharging the dummy object into and from the furnace in synchronism with the heating cycle, and immediately prior to introducing the dummy object into the furnace, measuring and storing an idling temperature corresponding to the temperature within the furnace;

(c) subsequently, heat treating objects to be treated by heating the interior of the furnace according to the heating cycle while sequentially introducing and discharging the objects to be treated into and from the furnace in synchronism with the heating cycle; and

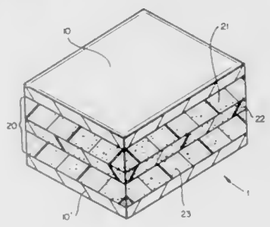
(d) after heat treating the objects to be treated, maintaining the temperature within the furnace in accordance with the idling temperature.

4,924,074

ELECTRICAL DEVICE COMPRISING CONDUCTIVE POLYMERS

Shou-Mean Fang, Union City, and Charles H. Camphouse, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 103,077, Sep. 30, 1987, abandoned. This application Jan. 3, 1989, Ser. No. 293,542
Int. Cl.[5] H05B *3/10*
U.S. Cl. 219—548 20 Claims



1. A process for the preparation of an electrical device which comprises

(1) a PTC element composed of a cross-linked conductive polymer composition which exhibits PTC behavior and which comprises a polymeric component and, dispersed in the polymeric component, a particulate conductive filler; and

(2) two electrodes which are electrically connected to the PTC element and which are connectable to a source of electrical power to cause current to pass through the PTC element,

which process comprises subjecting the PTC element to radiation cross-linking in which

(i) said cross-linking is achieved by use of an electron beam;

(ii) said cross-linking is conducted such that the radiation dose absorbed by each current-carrying part of the PTC element is at least 50 Mrad; and

(iii) during the cross-linking process, no part of the PTC element which is in contact with the electrodes reaches a temperature greater than (Tm−60)°C., where Tm is the temperature measured at the peak of the endothermic curve generated by a differential scanning calorimeter for the lowest melting polymer in the polymeric component.

4,924,075

SMART IC CARD

Tsutomu Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 29, 1988, Ser. No. 250,724
Claims priority, application Japan, Sep. 30, 1987, 62-246042
Int. Cl.[5] G06K *5/00*
U.S. Cl. 235—380 12 Claims

1. A hand-held electronic circuit card, comprising:

memory means for storing data;

control means operable in accordance with at least first and second modes, for writing data to and reading data from said memory means;

clock generating means for generating clock pulses;

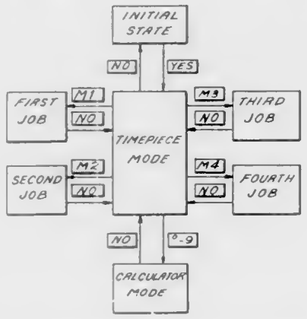
timepiece means for counting the clock pulses generated by said clock generating means to produce timepiece data;

display means for selectively displaying data from said control means and said timepiece means;

a keyboard having at least first and second keys;

start means for causing said control means to operate in accordance with said first mode wherein said display means displays timepiece data from said timepiece means in response to the operation of said first key; and

mode setting means for causing said control means to operate in accordance with said second mode in response to

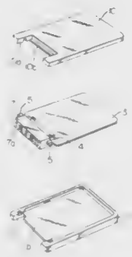


operation of said second key during display of the timepiece data.

4,924,076
MEMORY CARD HOUSING A SEMICONDUCTOR DEVICE

Mamoru Kitamura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 11, 1988, Ser. No. 217,294
Claims priority, application Japan, Jul. 14, 1987, 62-176294
Int. Cl.[5] G06K *19/00, 19/04*
U.S. Cl. 235—492 **5 Claims**

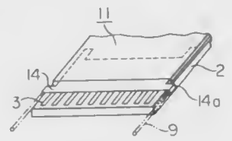


1. A memory card comprising:
a base for a semiconductor device;
a semiconductor device which is mounted on said base;
an electrical connector which has a front end and a rear end and which is electrically connected to said semiconductor device, said front end being electrically connectable to external equipment, said rear end including connector mounting surfaces; and
an outer package which encloses said base and said semiconductor device, said outer package having a front end including an opening, an adjacent front edge forming part of the opening, and a rear end, said outer package comprising first and second package sections having front and rear ends, the first and second package section front ends each including a package mounting surface complementary to and joined to one of said connector mounting surfaces, said first and second package sections being stacked on and joined to each other, said electrical connector being disposed within the opening at the front edge of said outer package.

4,924,077
MEMORY CARD

Toshinobu Banjo; Yasuhiro Murasawa, and Shigeo Onoda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 10, 1988, Ser. No. 154,319
Claims priority, application Japan, Mar. 31, 1987, 62-79919
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—492 **5 Claims**

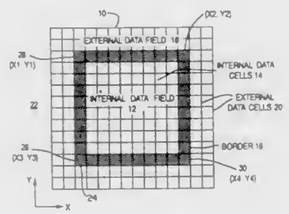


1. A memory card comprising:
a card-shaped package;
a semiconductor module disposed within said package;
a plurality of electrode terminals mounted on said package for external electrical connection of said semiconductor module in said package to an external circuit;
a metallic shutter disposed on said package and movable between an open position in which said electrode terminals are exposed for said electrical connection and a closed position in which said electrode terminals are covered; and
an insulating layer formed on a surface of said shutter facing said electrode terminals.

4,924,078
IDENTIFICATION SYMBOL, SYSTEM AND METHOD

Carl Sant'Anselmo, 5249 Valley View Rd., Rancho Palos Verdes, Calif. 90274; Robert Sant'Anselmo, 7912 Bobbyboyer Ave., Canoga Park, Calif. 91304, and David C. Hooper, 693 Lantana St., Apt. 74, Camarillo, Calif. 93010

Filed Nov. 25, 1987, Ser. No. 125,616
Int. Cl.[5] G06K *7/14, 19/06*
U.S. Cl. 235—494 **20 Claims**

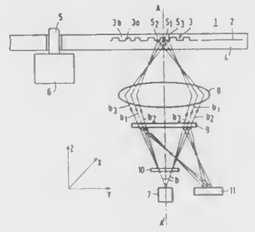


1. An identification symbol, comprising:
a computer readable data matrix data field providing symbol information for uniquely identifying the symbol; and
a computer readable orientation border positioned adjacent said field on at least two sides.

4,924,079
APPARATUS FOR OPTICALLY SCANNING AN INFORMATION PLANE

Willem G. Ophelj; Peter Coops; Adrianus J. Duijvestijn, all of Eindhoven; Dirk C. Van Eck, Nijmegen, and Peter De Zoeten, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1989, Ser. No. 345,493
Claims priority, application Netherlands, Dec. 5, 1988, 8802988
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.5 **36 Claims**



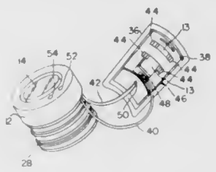
1. An apparatus for optically scanning a radiation-reflecting information plane, which apparatus comprises a radiation source supplying a scanning beam, an objective system for focusing the scanning beam to a scanning spot in the information plane and for re-imaging the scanning spot on a composite radiation-sensitive detection system, and a first diffraction element arranged in the radiation path between the radiation source and the objective system for deflecting a part of the radiation reflected by the information plane to the radiation-sensitive detection system and for deforming the deflected scanning beam in such a way that a focus-error signal can be derived therefrom by means of the composite detection system, characterized in that a second, single diffraction element is arranged between the radiation source and the first diffraction element for splitting the beam supplied by the radiation source into a scanning beam and two auxiliary beams which form the scanning spot and the two auxiliary spots, respectively, in the information plane, in that the composite detection system comprises extra detectors for the re-imaged auxiliary spots and in that the second diffraction element is so small and is arranged at such position that the beams diffracted by the first diffraction element do not reach the second diffraction element.

4,924,080
ELECTROMAGNETIC INTERFERENCE PROTECTION FOR IMAGE INTENSIFIER TUBE

Joseph N. Caserta; William D. Mims, both of Roanoke; Joseph Reed, Arlington, and James H. Bowen, Salem, all of Va., assignors to ITT Corporation, New York, N.Y.

Filed Jul. 5, 1988, Ser. No. 215,088
Int. Cl.[5] H01J *31/50;* **H05K** *9/00*
U.S. Cl. 250—213 VT **15 Claims**

1. A method of protecting a power supply for an image intensifier tube from electromagnetic interference comprising the steps of:
shielding the power supply by applying a conductive coating to a surface of a housing surrounding the tube and power supply to reflect the interference away from the power supply; and
forming a low impedance path between the power supply and the conductive coating in order that electromagnetic interference entering the power supply along a connection from a voltage source located outside of the housing is

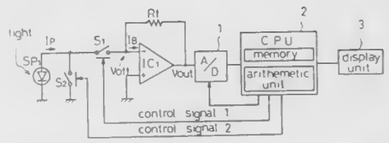


directed to a lower potential area spaced from the power supply.

4,924,081
PHOTO-ELECTRIC CONVERTER HAVING OFFSET VOLTAGE CORRECTING FUNCTION

Jiro Arima, and Yoshihiro Okui, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 21, 1988, Ser. No. 247,364
Claims priority, application Japan, Sep. 22, 1987, 62-238193
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 R **16 Claims**



1. A photo-electric converter having an offset voltage correcting function, comprising:
(a) a photosensitive means;
(b) means for outputting a signal corresponding to an output of said photosensitive means;
(c) a first switching means provided between said photosensitive means and said outputting means;
(d) a second switching means connected in parallel with said photosensitive means;
(e) means for analog-to-digital (A-D) conversion of a signal from said outputting means;
(f) means for controlling ON and OFF states of said first and second switching means;
(g) means for storing an output data from said A-D converting means when said first switching means is in OFF state and said second switching means is in ON state; and
(h) means for calculating a difference between the output data from said A-D converting means when said first switching means is in ON state and said second switching means is in OFF state and the data stored in said storing means.

4,924,082

OPTICAL SCANNING DEVICE, MIRROR OBJECTIVE SUITABLE FOR USE IN SAID DEVICE AND OPTICAL WRITE AND/OR READ APPARATUS PROVIDED WITH SAID DEVICE

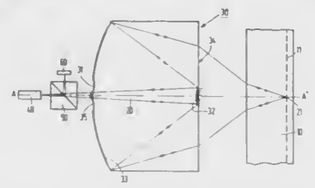
Willem G. Opheij, and Josephus J. M. Braat, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1989, Ser. No. 319,773

Claims priority, application Netherlands, Dec. 13, 1988, 8803048

Int. Cl.[5] H01J *3/14*

U.S. Cl. 250—216 **18 Claims**



1. A scanning device for optically scanning an information plane, which device comprises a radiation source supplying a scanning beam and a mirror objective for focusing the scanning beam to a scanning spot in the information plane, characterized in that the mirror objective comprises a transparent body having a first surface facing the radiation source and a second surface remote from the radiation source, said first surface having a first radiation window which is located symmetrically around the optical axis of the mirror objective and having a first reflector surrounding said window, said second surface having a second reflector which is located symmetrically around the optical axis and a second radiation window surrounding the second reflector, the radiation path through the mirror objective extending via passage through the first window, reflection on the second reflector, reflection on the first reflector and passage through the second window, at least one of the two windows having an aspherical surface.

4,924,083

METHOD AND DEVICE FOR INSPECTING SIDEWALL OF BOTTLE

Kazushi Ishikawa; Shinsaku Yamamoto, both of Yokohama, and Hisao Katogi, Hino, all of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 336,792

Claims priority, application Japan, Apr. 13, 1988, 63-90888

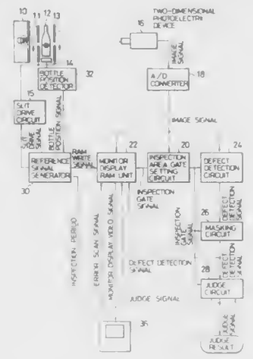
Int. Cl.[5] G01N *9/04*

U.S. Cl. 250—223 B **12 Claims**

1. A method for inspecting the sidewall of a bottle comprising the steps of

moving an elongate illumination portion to irradiate illumination light to the entire sidewall of the bottle to be inspected;

observing the illumination light transmitted through the sidewall of the bottle by an elongate observation portion moved synchronously with the illumination portion to observe an image of the entire sidewall formed by &he transmitted light; and



judging whether there is a defect on the sidewall of the bottle, based on the transmitted light image.

4,924,084

DEVICE FOR DETERMINING SURFACE MOISTURE

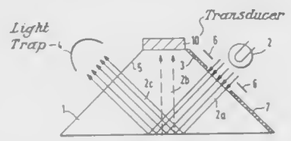
Helmut Lask, Eltville; Arno Holst, Wiesbaden, and Kurt Dryczynski, deceased, late of Hofheim am Taunus, Fed. Rep. of Germany (by Christa Magdalene Dryczynski, Thomas Dryczynski, Beate Dryczynski, Regina Struth née Dryczynski, legal heirs), assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,327

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735269

Int. Cl.[5] G01N *21/49*

U.S. Cl. 250—227.25 **2 Claims**



1. A device for determining surface moisture, which comprises a Dove reflection prism (**1**), a radiation source (**2**) of such a design that its beams (*2a*), which are aligned parallel, perpendicularly strike one of the two small surfaces (**3**) of the prism, a light trap (**4**) which traps the light beams (*2c*) emanating from the other small surface (**5**), and a photoelectric transducer (**10**) which is located in the angle formed by the two small surfaces and is arranged such that its measurement surface is located parallel and opposite to the hypotenuse surface of the prism, and which converts the light (*2b*) scattered by the surface which is to be measured.

4,924,085

UNEVEN-SURFACE DATA DETECTION APPARATUS

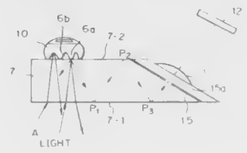
Masayuji Kato, Atsugi; Seigo Igaki, Inagi; Fumio Yamagishi, Ebina; Hiroyuki Ikeda, Yokohama; Takashi Shinzaki, and Shin Eguchi, both of Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 23, 1989, Ser. No. 370,768

Claims priority, application Japan, Jun. 23, 1988, 63-155670; Aug. 12, 1988, 63-201674; Dec. 16, 1988, 63-317747; Dec. 28, 1988, 63-331560

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.28 **27 Claims**



1. An uneven surface data detection apparatus for detecting an uneven surface having projected portions and recessed portions, comprising:

a transparent base having first and second surfaces, at least a part of said first surface defining an uneven surface contact portion;

a light source for illuminating said uneven surface on said uneven surface contact portion, said light source simultaneously illuminating said projected portions and recessed portions of said uneven surface, so that the light derived from the recessed portions enters to said transparent base and comes out thereof and, at least a part of the light derived from the projected portions is totally reflected at least one time by the second surface opposite to said first surface;

a focussing lens integrally formed on or integrally adhered to said transparent base, said focussing lens being located at a position for drawing said totally reflected light out of said transparent base; and

an image sensor arranged outside said transparent base for detecting an image of said uneven surface including said projected and recessed portions.

4,924,086

OPTICAL SCANNING APPARATUS FOR DETECTING FAULTS ON A SURFACE

Klaus Weber, Königsbronn, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,230

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737631

Int. Cl.[5] G01N *21/89*

U.S. Cl. 250—235 **12 Claims**

1. Optical scanning apparatus for flat surfaces comprising:

a laser light source;

a periodic light deflecting means illuminated by a laser beam;

a telecentric optical scanning system for directing the laser beam, periodically swept over a specific angular range by the light deflecting means in the form of a scanning beam displaced parallel to itself at an angle of incidence other than zero towards the flat surface where a light bead arises which periodically scans the flat surface along a scanning line;

a light receiving means for receiving the light reflected from the region of the scanning line on the surface; and

an image forming retroreflector disposed at an angle of regular reflection and forming an image of the light bead



running along the scanning line, the image being formed adjacent the light bead.

4,924,087

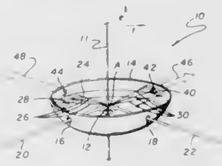
OPTIC FIBER BUFFER DEFECT DETECTION SYSTEM

Wilbur M. Bailey; George H. Hulderman, both of Tucson, Ariz.; Vincent L. Jones, Simi Valley, Calif.; Joseph L. Pikulski, Westlake, Calif.; Arlie G. Standlee, Thousand Oaks, Calif.; Gregory L. Tangonan, Oxnard, Calif.; Michael R. Vince, Thousand Oaks, Calif., and Joseph A. Wysocki, Oxnard, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1988, Ser. No. 286,444

Int. Cl.[5] H01J *5/16*

U.S. Cl. 356—73.1 **16 Claims**



1. An optic fiber buffer defect detection system comprising:

means for illuminating a first optical fiber with a collimated beam for electromagnetic energy along a transverse axis thereof, said transverse axis being substantially orthogonal to the longitudinal axis of said fiber;

means for detecting any scattering of said beam, from a defect in said fiber, out of a radial plane defined by the angular rotation of said beam about said fiber at the point of intersection of said beam with said fiber; and

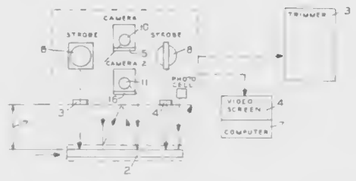
retaining means for retaining and illuminating means and said detecting means relative to said fiber, said retaining means including a dish, mounted in a plane substantially parallel with said transverse axis, having a first aperture at the radial center thereof for receiving said fiber and an iris diaphragm mounted in said first aperture for substantially closing around said first optical fiber.

4,924,088

APPARATUS FOR READING INFORMATION MARKS

George Carman, 2961 NW. Jackson Ave.; Joseph G. LaChapelle, 6050 NW. Happy Valley, and Mark Hiatt, 2335 NW. Arthur, all of, Corvallis, Oreg. 97330

Filed Feb. 28, 1989, Ser. No. 317,529
Int. Cl.[5] G06K 7/10
U.S. Cl. 250—271 25 Claims



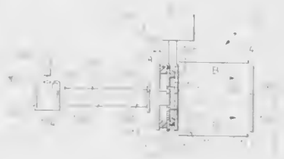
1. An apparatus for reading information marks comprising:
at least one strobe light to activate or reflect marks on a product where said strobe light is on for a short time at high intensity such that the movement of the product does not affect the reading of the marks;
at least one camera for reading marks;
a means to time the strobe light such that an object is positioned under said strobe light and said camera;
means to process, solve and interpret character and color recognition; and
means to report the solution to other control system devices.

4,924,089

METHOD AND APPARATUS FOR THE ACCUMULATION OF IONS IN A TRAP OF AN ION CYCLOTROM RESONANCE SPECTROMETER, BY TRANSFERRING THE KINETIC ENERGY OF THE MOTION PARALLEL TO THE MAGNETIC FIELD INTO DIRECTIONS PERPENDICULAR TO THE MAGNETIC FIELD

Pablo Caravatti, Winterthur, Switzerland, assignor to Spectrospin AG, Switzerland

Filed Sep. 29, 1988, Ser. No. 251,192
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733853
Int. Cl.[5] H01J 49/36
U.S. Cl. 250—290 11 Claims



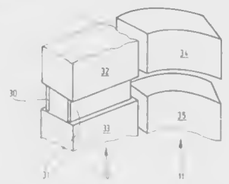
1. Method for introducing ions into an ion trap of an ion cyclotron resonance spectrometer, the ion trap being arranged in a constant homogeneous magnetic field and comprising walls which are designed as electrodes and extend in parallel and/or perpendicularly to a symmetry axis having the direction of the magnetic field and which are supplied with electric trapping potentials retaining the ions in the ion trap, one of the walls which extend perpendicularly to the magnetic field being provided with a hole, the method including the steps of generating the ions outside the ion trap, forming the ions into an ion beam, directing the ion beam upon the hole in the one wall of the ion trap, in the direction of the magnetic field, and reducing thereafter the velocity component, in the direction of the magnetic field, of ions which have passed the hole and entered the trap, below the value determined by the trapping potentials which is needed by the ions for leaving the ion trap, characterized in that
the ions that have entered the ion trap are imparted a second motion component in a direction perpendicular to the magnetic field, such that the magnitude of the ion velocity component in the direction of the magnetic field is reduced.

4,924,090

DOUBLE FOCUSING MASS SPECTROMETER AND MS/MS ARRANGEMENT

Hermann Wollnik, auf der Platte 30, 6301 Fernwald 2, Fed. Rep. of Germany, and Hisashi Matsuda, 2-27-19 Kiyosbikojin, Takarazuka 665, Japan

Filed Jan. 24, 1989, Ser. No. 301,514
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802171; Apr. 22, 1988, 3813641
Int. Cl.[5] H01J 49/32
U.S. Cl. 250—296 14 Claims



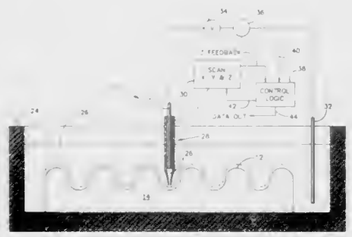
1. A double focusing mass spectrometer having a combination of an electrical and a magnetic field for directional and velocity forming comprising a combination of a Wien filter and of a sector magnet, characterized in that the Wien filter (10) and the sector magnet (11) possess a common magnet (32 to 37; 45, 46), the pole pieces of which are constructed to be continuous.

4,924,091

SCANNING ION CONDUCTANCE MICROSCOPE

Paul K. Hansma, and Barney Drake, both of Santa Barbara, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 1, 1989, Ser. No. 305,465
Int. Cl.[5] G21K 5/08
U.S. Cl. 250—306 11 Claims



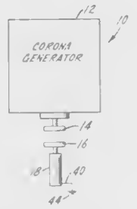
1. A scanning ion conductance microscope comprising:
(a) a reservoir holding a sample to be scanned therein;
(b) a micropipette having an open tip communicating with a hollow shaft;
(c) an electrolyte solution disposed within said reservoir covering said sample and disposed within said tip and shaft of said micropipette;
(d) a first microelectrode diposed in said shaft in electrical contact with said electrolyte therein, said first microelectrode being spaced from inner sidewalls of said shaft to allow said electrolyte solution to pass between said first microelectrode and said inner sidewalls of said shaft;
(e) a second microelectrode disposed in said reservoir in electrical contact with said electrolyte therein;
(f) scanning means for scanning said tip of said micropipette over a top surface of said sample in a scanning pattern;
(g) voltage means for applying a voltage across said first and second microelectrodes;
(h) current means for measuring the current flowing between said first and second microelectrodes through said open tip of said micropipette and for supplying an indication of said current at an output thereof; and,
(i) control logic means having an output connected to said scanning means and an input connected to said output of said current means for causing said scanning means to set the height of said tip at a desired distance above said top surface and for outputting data of interest related to said top surface as it is scanned.

4,924,092

CORONA GENERATING SYSTEM

Buckley Crist, Jr., Wilmette, Ill., assignor to Electro-Technic Products Company, Chicago, Ill.

Filed Mar. 3, 1989, Ser. No. 318,535
Int. Cl.[5] H01T 19/00
U.S. Cl. 250—324 7 Claims



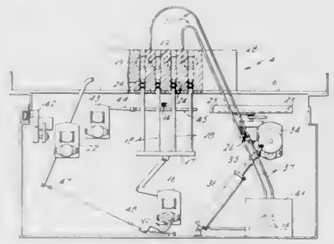
1. a system for creating a uniform corona over a predetermined volume of free space, comprising
a. a high frequency electrical corona generator including means for generating resonant frequencies on the order of 2 MHz and above,
b. a first electrode attached to said corona generator, said first electrode having a first corona driving element and a first corona emitting element, with the corona driving element being greater in size than the corona emitting element such that corona is emitted from the corona emitting element is a direction away from the corona driving element,
c. a second electrode having a second corona driving element and a second corona emitting element, the second corona driving element being greater in size than the second corona emitting element such that corona is emitted from the second corona emitting element in a direction away therefrom, said second electrode being spaced from said first electrode and having said second corona emitting element oriented such that corona emitted from said second electrode is emitted in a direction toward said first electrode, and
d. a resonator coil having one end attached to said second electrode, said resonator coil having a resonant frequency the same as a resonant frequency of said corona generator, said coil being located within an electric field generated by said first electrode.

4,924,093

BETA COUNTING MEANS AND APPARATUS

Edgar G. Johnson, Huntsville, and James J. Cornelison, Gurley, both of Ala., assignors to ICN Micromedic Systems, Inc., Costa Mesa, Calif.

Filed Apr. 22, 1985, Ser. No. 725,582
Int. Cl.[5] G01T 1/00
U.S. Cl. 250—328 6 Claims



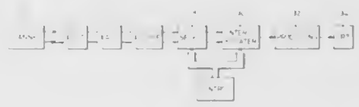
1. In a scintillation counting method utilizing an external radioactive source which is introduceable into and removable from a counting chamber in order to accomplish auxillary counting procedures such as quench counting, the improvement comprising the steps of:
providing at least a pair of parallel, side-by-side counting chambers: and
conducting plural simultaneous auxillary counts while utilizing a single external source per pair of counting chambers.

4,924,094

IMAGING APPARATUS

William T. Moore, Buckhurst Hill, United Kingdom, assignor to Rank Pullin Control Limited, Longhton, England

Filed Mar. 19, 1987, Ser. No. 27,978
Claims priority, application United Kingdom, Mar. 20, 1986, 8606876
Int. Cl.[5] G02B 26/10
U.S. Cl. 250—334 5 Claims



1. Imaging apparatus comprising an optical scanner for scanning a field of view with a plurality of curved line scans, a detector for producing first image signals each corresponding to a respective one of said curved line scans, and signal processing means for processing the first image signals to produce therefrom second image signals, each of at least a plurality of said second image signals being derived from a plurality of said first image signals such that the extent to which a particular first image signal contributes to a particular second image signal of said plurality of second image signals varies between different portions of said particular second image signal such that said particular second image signal represents a substantially straight line across said field of view intersecting a plurality of said curved line scans.

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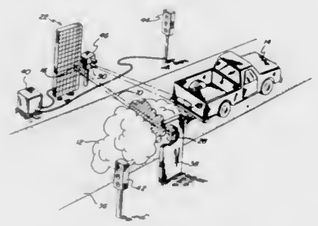
REMOTE GAS ANALYZER FOR MOTOR VEHICLE EXHAUST EMISSIONS SURVEILLANCE

Caleb V. Swanson, Jr., Orange, Calif., assignor to West Lodge Research, Orange, Calif.

Continuation-in-part of Ser. No. 57,293, Jun. 2, 1987. This application Nov. 23, 1988, Ser. No. 275,391

Int. Cl.[5] G01J *1/00*

U.S. Cl. 250—338.5 **21 Claims**



1. An apparatus for determining the amount of pollutants in the exhaust emitted from a moving motor vehicle traveling along a path, comprising:

a first array of emitters and detectors suitable for use in absorption spectroscopy positioned so the beams emitted by said emitters traverse said path down which said motor vehicle passes, said emitters and detectors positioned so that beams emitted by said emitters intersect substantially an entire cross-sectional area of said exhaust plume along a predetermined length of said exhaust plume, before said beams are received by said detectors, said first array detecting a first pollutant;

a second gas analyzer emitter and detector suitable for use in absorption spectroscopy orientated so that a second beam emitted by said second emitter passes adjacent said motor vehicle, the second beam intersecting the exhaust plume as it mixes with the atmosphere along a path length sufficient to allow determination of the increase in concentration of a plurality of pollutants emitted by said exhaust plume relative to the concentration before the exhaust from said motor vehicle intersected said second beam, said plurality of pollutants including said first pollutant;

a computer in communication with said first array of emitters and detectors to determine the relative increase in the amount per unit volume of said first predetermined pollutant contained in that portion of said exhaust plume intersected by said array, said relative increase being determined with respect to the amount of said first pollutant before said exhaust from said motor vehicle intersected the beams emitted by said first array, said computer further determining the relative increase in the amount per unit volume of said plurality of gases other than said first pollutant by using the ratio of said relative increased amount of said first pollutant to said relative increased concentration of said first pollutant from said second gas analyzer, multiplied by the relative increase in the concentration of each of said plurality of gases as determined from said second gas analyzer.

4,924,096

NON-CONTACT TESTING OF PHOTOVOLTAIC DETECTOR ARRAYS

Jacek A. Mroczkowski, 4 Frances Rd., Lexington, Mass. 02173; Marion B. Reine, 11 Cottage St., Wellesley, Mass. 02181, and Neal R. Butler, 144 School St., Acton, Mass. 01720

Filed Jul. 13, 1988, Ser. No. 218,677

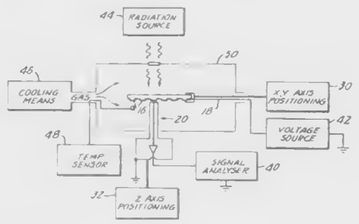
Int. Cl.[5] G01R *31/28*

U.S. Cl. 250—341 **6 Claims**

1. A method for non-contact testing of an infrared photovoltaic detector prior to dicing the infrared photovoltaic detector from a wafer comprising the steps of:

(a) forming a capacitance with a probe and an individual contact of said infrared photovoltaic detector;

(b) subjecting said infrared photovoltaic detector to known variable AC voltage;



(c) subjecting said photovoltaic detector to known modulated infrared radiation;

(d) amplifying a signal from said probe by the use of a suitable preamplifier; and

(e) determining electrical and electro-optical properties of the said photovoltaic detector by analyzing the output of the said preamplifier.

4,924,097

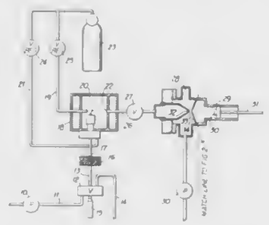
MONODISPERSE AEROSOL GENERATOR FOR USE WITH INFRARED SPECTROMETRY

Richard F. Browner, Atlanta, and James A. de Haseth, Athens, both of Ga., assignors to Georgia Tech RSS. Corp, Atlanta and Univ of Ga Rss. Foundation, Athens, both of, Ga.

Continuation-in-part of Ser. No. 841,324, Mar. 19, 1986, Pat. No. 4,762,955, which is a continuatioo-in-part of Ser. No. 623,711, Jun. 22, 1989, Pat. No. 4,629,487. This application Aug. 8, 1988, Ser. No. 229,641

Int. Cl.[5] G01J *1/00, 3/44;* **G01N** *1/00*

U.S. Cl. 250—343 **14 Claims**



1. A method of introducing solute into an infrared or Roman spectrometer, which comprises the steps of:

(a) providing a solution including a relatively volatile solvent and a relatively involatile solute;

(b) generating an aerosol from the solution by delivering the solution through a conduit at a velocity such that formation of droplets with a narrow size distribution occurs;

(c) providing a dispersing gas;

(d) dispersing the formed droplets with the gas;

(e) entraining the aerosol in gas and desolvating the aerosol at substantially atmospheric pressure;

(f) expanding the components of step (e) into low pressure environment while removing gas therefrom to form a high momentum aerosol beam of solute particles with a narrow particle size distribution; and

(g) directing said beam into an infrared or Roman spectrometer.

4,924,098

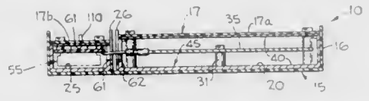
NUCLEAR RADIATION LEVEL DETECTOR

Philip D. Wasserman, Cupertino, Callf., assignor to Radiation Detectors, Inc., San Mateo, Calif.

Filed Nov. 30, 1987, Ser. No. 126,714

Int. Cl.[5] G01T *1/185*

U.S. Cl. 250—380 **17 Claims**



1. A nuclear radiation level detector for detecting the nuclear radiation level in an atmosphere comprising:

(a) an ionization chamber communicating with the atmosphere, said ionization chamber being formed with a plurality of walls having internal surfaces facing the interior of said ionization chamber;

(b) a plurality of electrodes disposed in said ionization chamber and exposed to the nuclear radiation of the atmosphere communicating with said ionization chamber;

(c) a source of voltage interconnecting said electrodes, said electrodes conducting current in response to the magnitude of the nuclear radiation level of the atmosphere communicating with said ionization chamber, the magnitude of the current flow from said electrodes is commensurate with the magnitude of the nuclear radiation level of the atmosphere communicating with said ionization chamber;

(d) one of said electrodes being formed from a conductor lining an internal surface of at least one of said walls of said ionization chamber, said conductor providing an electrostatic shield for said ionization chamber; and

(e) a circuit connected to said electrodes for producing an alarm in response to the nuclear radiation level of the atmosphere exceeding a reference level.

4,924,099

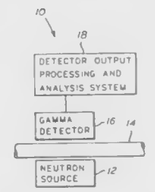
METHOD AND APPARATUS FOR MONITORING A FLOWSTREAM

Git B. Lim; Ronald E. Nieman, both of Calgary, Canada, and Sanjoy Banerjee, Santa Barbara, Calif., assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 941,972, Dec. 15, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 296,398

Int. Cl.[5] G01V *5/00*

U.S. Cl. 250—390.04 **8 Claims**



1. A method for monitoring a mixture of oil, water and gas flowing through a conduit, comprising the steps of:

introducing into the flowstream a population of fast neutrons generated by a chemical fast neutron source, said source being substantially free of Beryllium and adapted to gene rate gamma radiation having at least one gamma peak at X MeV, X being greater than the 4.43 Mev C^{12} inelastic scattering gamma peak;

monitoring the gamma emanating from said mixture to establish a first gamma count rate for a range of gamma energies above about X MeV, whereby the first gamma count rate represents the simultaneous detection of the 2.2 Mev C^{12} inelastic scattering gamma plus the source gamma at X MeV plus background; and

comparing the first gamma count rate of an empirical relationship between the count rate and gas fraction to establish the relative amount of gas within the conduit.

4,924,100

STRAIN AND TEMPERATURE MEASUREMENT

Peter A. E. Stewart, and Peter H. Fowler, both of Bristol, England, assignors to ROLLS-ROYCE plc, United Kingdom

Filed May 11, 1988, Ser. No. 192,620

Claims priority, application United Kingdom, May 14, 1987, 8711327

Int. Cl.[5] G01N *23/206*

U.S. Cl. 250—390.09 **7 Claims**

1. A method of simultaneously measuring strain and temperature in an object comprising exposing the object to a neutron beam containing neutrons having energies in the thermal and epithermal ranges, determining a neutron diffraction pattern for thermal neutrons scattered from the object, monitoring the angular distribution of thermal neutrons in the said diffraction pattern and tracking changes therein to determine strain in the object, and substantially simultaneously determining transmission resonance characteristics for epithermal neutrons for elements contained in the object and monitoring doppler broadening of said resonances to determine the temperature in the object.

4,924,101

CHARGED PARTICLE SOURCE

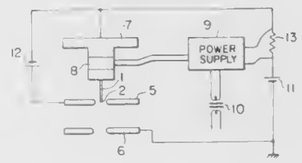
Noriyuki Sakudo, Ome, and Hifumi Tamura, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1988, Ser. No. 141,145

Claims priority, application Japan, Feb. 27, 1987, 62-42557

Int. Cl.[5] H01J *37/08*

U.S. Cl. 250—423 R **8 Claims**



1. A charged particle source comprising:

a tip electrode covered with a liquid substance and having an end portion, said liquid substance having a threshold electric field intensity value for emission of charged particles.;

means for applying a voltage to said tip electrode to generate an electric field; and

means for varying the shape of said liquid substance on said tip electrode periodically to vary the intensity of said electric field at that part of said liquid substance which is on said end portion of said tip electrode wherein the periodic variation of said electric field intensity at said part is a variation between electrode field intensity values larger than and smaller than said threshold electric field intensity value for emission of a pulsed charged particle beam.

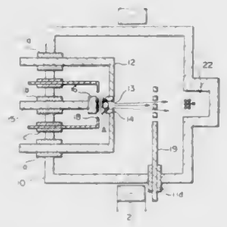
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4,924,102

APPARATUS FOR GENERATING NEGATIVELY CHARGED SPECIES

Hideaki Toya; Hiroyuki Sasao, and Tatsuya Hayshi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 5, 1988, Ser. No. 279,801
Claims priority, application Japan, Dec. 25, 1987, 62-326850; May 10, 1988, 63-111467; Jul. 26, 1988, 63-184643
Int. Cl.[5] H01J *3/04*
U.S. Cl. 250—426 **22 Claims**



1. An apparatus for generating charged species comprising:
a vacuum vessel;
an anode having a central axis and disposed in said vacuum vessel;
a cylindrical cathode having a central axis and a bottom wall including a generally axially aligned opening, said cylindrical cathode being disposed in said vacuum vessel coaxially with and surrounding said anode, said opening being generally aligned with said anode;
a cylindrical trigger electrode having a central axis and a bottom wall including a generally axially aligned opening disposed in said vacuum vessel coaxially with and between said anode and said cathode, the opening in said bottom wall of said trigger electrode being disposed opposite said anode, for initiating an arc between said anode and cathode;
a grid disposed in said vacuum vessel opposite said cathode for accelerating charged species formed in the arc between said anode and cathode; and
an electromagnetic coil disposed outside said vacuum vessel for producing a magnetic field in said vacuum vessel having an axis aligned with the central axes of said anode and cathode for converging charged species produced in the arc.

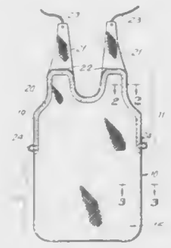
4,924,103

RADIATION PROTECTION APRON

Jeffrey Stein, Brooklyn, and Ray C. Lapof, New York, both of N.Y., assignors to Bar Ray Products, Inc., Brooklyn, N.Y.

Filed Dec. 12, 1988, Ser. No. 283,126
Int. Cl.[5] G21F *3/02*; A41D *13/00*; A42B *3/02*
U.S. Cl. 250—516.1 **3 Claims**

1. A radiation protection apron comprising first and second congruent flaccid lead filled polymeric sheets configured to define a torso embracing bib portion extending substantially to the waist portion of a wearer and a front panel portion disposed below said bib portion, a fabric sleeve encompassing said sheets, said sleeve being configured to conform to the shape of said sheets, said sleeve being comprised of first and second congruent fabric layers stitched together along a stitch line generally coextensive with the margins of the front panel portion and terminating substantially at said bib portion, said layers being everted whereby said stitch line is disposed interiorly of said sleeve, the perimeters of said sheets forming said front panel portion being free of attachment to each other and said sleeve, a reinforcing binding web overlying the perimeter of the bib portion of said sleeve and the front and rear faces of said sleeve adjacent said perimeter, a second stitch line extending between the front and rear surfaces of said binding, said second stitch line extending through and linking said binding to said sheets and the front and rear surfaces of said sleeve, and



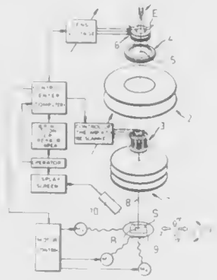
attachment means secured to said binding, sheets and sleeve at the upper end of said bib portion for securing said apron over the shoulders of a wearer.

4,924,104

ION BEAM APPARATUS AND METHOD OF MODIFYING SUBSTRATE

Gerhard Stengl, Wernberg, and Hans Loschner, Vienna, both of Austria, assignors to Ims Ionen Mikrofabrikations Systeme Gesellschaft m.b.H and Oesterreichische Investitions-Kredit Aktiengesellschaft, both of Vienna, Austria

Continuation of Ser. No. 62,464, May 8, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 244,786
Claims priority, application Austria, Sep. 11, 1985, A266/85; World Int. Prop. O., Sep. 10, 1986, PCT/AT86/00053
Int. Cl.[5] H01J *37/08*
U.S. Cl. 250—492.3 **11 Claims**



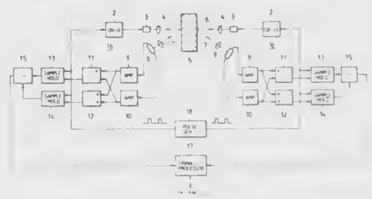
1. Ion beam apparatus having substrate-inspection and substrate-modifying modes of operation, the apparatus comprising a duoplasmatron ion source, a lens arrangement in the path of the beam of ions from the source for accelerating and focusing the ions, deflecting means for deflecting the focused beam across the substrate, a mask positioned in the region between the ion source and the lens, the mask having an aperture which is imageable in reduced size upon the substrate by the lens arrangement, and between the ion source and the mask there being a controllable lens constructed and arranged to vary the divergence angle at which the beam of ions reaches the mask, in said substrate-inspection mode said controllable lens produces a relatively wide divergence angle to illuminate the aperture with a relatively low flux density of ions which form the image of the aperture upon the substrate, and in said substrate-modifying mode said controllable lens produces a narrower beam divergence angle to illuminate the aperture with a relatively high flux density of ions which form the image of the aperture upon the substrate.

4,924,105

OPTICAL MEASURING DEVICE WITH ALTERNATELY-ACTIVATED DETECTION

Toshishige Nagao, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1988, Ser. No. 273,916
Claims priority, application Japan, Mar. 15, 1988, 63-62139
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—560 **6 Claims**



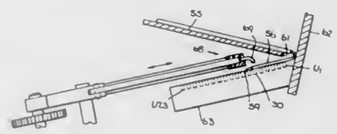
1. An optical measuring device for measuring a workpiece, comprising:
a first deviation measuring means; and
a second deviation measuring means;
said second deviation measuring means, comprising:
first light emission means for directing a first light beam upon said workpiece at a time t1;
first drive circuit means for activating the first light emission means;
first light receiving means for generating a plurality of first measurement data which are a function of the first light beam reflected from said workpiece;
first addition and subtraction means for adding and subtracting said plurality of first measurement data;
first sample hold means for sampling and holding the subtracted and added plurality of first measurement data from said first addition and subtraction means at the time t1; and
said second deviation measuring means, comprising:
second light emission means for directing a second light beam upon said workpiece at a time t2;
second drive circuit means for activating the second light emission means;
second light receiving means for generating a plurality of second measurement data which are a fuction of the second light beam reflected from said workpiece;
second addition and subtraction means for adding and subtracting said plurality of second measurement data;
second sample hold means for sampling and holding the subtracted and added plurality of second measurement data at the time t2;
said measuring device further comprising:
pulse generating means for providing said first drive means and for providing said first sample hold means with a first pulse which occurs at the time t1, and for providing said second drive means and said second sample hold means with a second pulse which occurs at the time t2 and wherein the time t1 and the time t2 represent different and non-overlapping time intervals.

4,924,106

ENVELOPE FLAP PROFILING APPARATUS

Robert J. Tolmie, Jr., Brookfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1988, Ser. No. 291,092
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 **10 Claims**



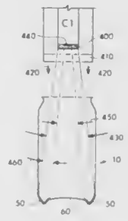
1. A method of mapping the profile of a selected edge of an object, comprising the steps:
(a) providing an array of sensors in fixed relative location to each other,
(b) causing the selected object edge to displace across the sensor array at a defined rate such that the sensors respectively are caused to change state in response to encountering respective lead portions of the selected object edge,
(c) while step (b) is being carried out, recording the state change of the respective sensors and a function of elapsed time, and
(d) determine the selected object edge profile map as a function of the recorded sensor state change as function of elapsed time and the defined object displacement rate.

4,924,107

SYSTEM FOR INSPECTING THE INSIDE SURFACES OF A CONTAINER FOR DEFECTS AND METHOD THEREFOR

John W. Tucker, Louisville, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Oct. 7, 1988, Ser. No. 254,952
Int. Cl.[5] G01N *21/88*
U.S. Cl. 250—572 **19 Claims**



1. A system for inspecting a selected area on the inside surface of an object through an opening in the object, the object having a reflective surface which when illuminated interferes with the inspection of the selected area, said system comprising:
means for illuminating the inside of the object through said opening with light,
a camera, said camera having a lens,
means for locating the opening of said object under the lens of said camera, said lens being focussed in the field of view for the selected area,
means in said field of view of said focussed camera for masking out light reflected from said interfering reflective surface,

said camera capturing an image of the illuminated selected area, and

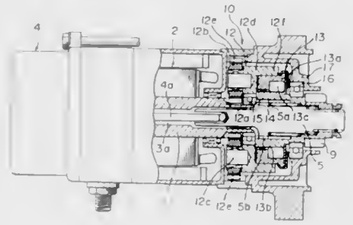
means for analyzing said captured image of said selected area for defects.

4,924,108

COAXIAL TYPE STARTER DEVICE

Shuzoo Isozumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 298,437
Claims priority, application Japan, Feb. 2, 1988, 63-23266
Int. Cl.[5] F02N *15/06*
U.S. Cl. 290—48 **4 Claims**



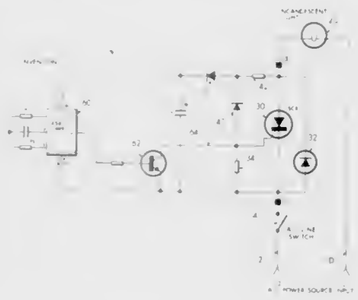
1. A coaxial type starter device comprising a d.c. motor, a pinion provided at the front end of an armature rotary shaft of said d.c. motor and an output rotary shaft arranged in alignment with said armature rotary shaft so as to be movable in its axial direction so that a rotating force of said armature rotary shaft is transmitted to said output rotary shaft through a planet gear speed-reducing device and an overrunning clutch device, said coaxial type starter device being characterized in that a carrier for supporting each planet gear wheel has a cylindrical portion at its front end and said cylindrical portion is fitted to the outer circumference of a clutch outer member of said overrunning clutch device so as to cause a relative sliding movement in their circumferential directions when a predetermined torque is produced.

4,924,109

DIM-DOWN ELECTRIC LIGHT TIME SWITCH METHOD AND APPARATUS

Harold J. Weber, P.O. Box 191, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Nov. 2, 1987, Ser. No. 115,855
Int. Cl.[5] H01H *7/00*; H05B *37/02*
U.S. Cl. 307—126 **20 Claims**



1. Timed lighting method comprising the steps of:

a. providing a series electrical circuit including a source of alternating current electric power, a load device usually in the form of an incandescent light bulb, and a switch means effective for connecting and disconnecting electrical coupling of the light bulb with the power source;

b. coupling an electrical timing device substantially in series with the load device, the switch means, and the power source, whereby subsequent to initiation of current flow through the circuit the timing device operation serves to:

ba. couple full-cycles of alternating current electrical power to produce about symmetrical power flow between the power source and the load device for a first period of time; and,

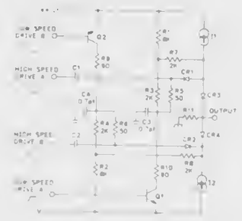
bb. couple a portion of every-other half-cycle of alternating current electrical power to produce asymmetrical power flow between the power source and the load device for a successive second period of time.

4,924,110

HIGH SPEED STEP GENERATOR OUTPUT CIRCUIT

John B. Rettig; Jonathan Lueker; John E. Carlson, all of Portland; Stanley P. Kaveckis, Aurora, and Roy W. Lewallen, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 8, 1988, Ser. No. 241,686
Int. Cl.[5] H03K *4/02, 5/12, 5/01, 17/56*
U.S. Cl. 307—227 **7 Claims**



1. An apparatus for producing an output voltage step comprising:

(a) means for producing a first current;

(b) means for producing a second current, the first and second currents being of opposite polarities and unequal magnitudes;

(c) a load resistor;

(d) first low speed switch means responsive to a first low speed control signal switchable between first and second voltage states for directing the first current through the load resistor when the first low speed control signal is in the first voltage state, and for preventing the first current from passing through the load resistor when the first low speed control signal is in the second voltage state, the first low speed switch means including a high speed switch terminal and means for providing a relatively constant switching threshold that is substantially insensitive to the value of the load resistor;

(e) second low speed switch means responsive to a second low speed control signal switchable between first and second voltage states for directing the second current through the load resistor when the second low speed control signal is in the first voltage state, and for preventing the second current from passing through the load resistor when the second low speed control signal is in the second voltage state, the second low speed switch means including a high speed switch terminal and means for providing a relatively constant switching threshold that is substantially insensitive to the value of the load resistor;

(f) first high speed switch means coupled to the high speed switch terminal of the first low speed switch means responsive to a first high speed control signal switchable between first and second voltage states for temporarily preventing the first current from passing through the load resistor when the first high speed control signal is switched between the second voltage state and the first voltage state; and

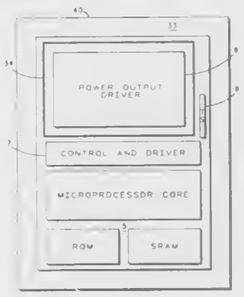
(g) second high speed switch means coupled to the high speed switch terminal of the second low speed switch means responsive to a second high speed control signal switchable between first and second voltage states for temporarily preventing the second current from passing through the load resistor when the second high speed control signal is switched between the second voltage state and the first voltage state.

4,924,111

MICROPROCESSOR LAYOUT MINIMIZING TEMPERATURE AND CURRENT EFFECTS

Floyd E. Anderson, Phoenix, and Stephen P. Robb, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1988, Ser. No. 263,746
Int. Cl.[5] H03K *17/12*
U.S. Cl. 307—270 **11 Claims**



1. A monolithically integrated circuit comprising:

at least one power output device having a current drive capability of greater than 0.25 amps;

a microprocessor core coupled to said at least one power output device for driving said at least one power output device, wherein said microprocessor core has a heat sensitive circuit which is more heat sensitive than other portions of said microprocessor core, and wherein said heat sensitive circuit is located at a distance remote from said at least one power output device in order to minimize the effects of heat dissipation from said at least one power output device.

4,924,112

MICROPROCESSOR HAVING HIGH CURRENT DRIVE AND FEEDBACK FOR TEMPERATURE CONTROL

Floyd E. Anderson, Phoenix; Stephen P. Robb, Tempe, both of Ariz., and Pern Shaw, Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

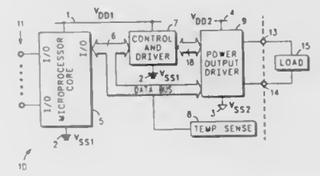
Filed Oct. 31, 1988, Ser. No. 264,732
Int. Cl.[5] H03K *17/08*
U.S. Cl. 307—270 **9 Claims**

1. A monolithically integrated circuit comprising:

at least one power output device having a current drive capability of greater than 0.25 amps;

a microprocessor core coupled to said at least one power output device for driving said at least one power output device;

a temperature sensing means coupled to said microprocessor core for providing said microprocessor core with a temperature indication of the junction temperatures of said microprocessor core and of said at least one power output



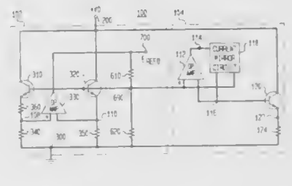
device, therein providing feedback and protection to said microprocessor core.

4,924,113

TRANSISTOR BASE CURRENT COMPENSATION CIRCUITRY

Otto H. Schade, Jr., North Caldwell, N.J., assignor to Harris Semiconductor Patents, Inc., Melbourne, Fla.

Filed Jul. 18, 1988, Ser. No. 220,712
Int. Cl.[5] H03K *3/01, 3/26*
U.S. Cl. 307—296.6 **17 Claims**



10. In combination:

a reference voltage generator comprising first and second n-p-n transistors and first, second, third, fourth and fifth resistors and a first operational amplifier having first and second inputs and an output;

each of the first and second n-p-n transistors having a base and an emitter;

the bases of the first and second transistors being coupled to first terminals of the first and second resistors;

the emitter of the first transistor being coupled to a first terminal of the third resistor and to the first input of the operational amplifier;

the emitter of the second transistor being coupled to a first terminal of the fourth resistor;

a second terminal of the fourth resistor being coupled to a first terminal of the fifth resistor and to the second input of the operational amplifier;

the output of the operational amplifier being coupled to a second terminal of the first resistor;

current compensation circuitry coupled to the bases of the first and second transistors comprising a second operational amplifier having first and second inputs and an output, a current mirror having an input and first and second outputs, a third n-p-n transistor and a sixth resistor;

the third n-p-n transistor having a base and an emitter;

the output of the second operational amplifier being coupled to the input of the current mirror;

the first output of the current mirror being coupled to the second input of the second operational amplifier and to the base of the third n-p-n transistor;

the second output of the current mirror being coupled to the bases of the first and second transistors and to the first input of the operational amplifier;

the emitter of the third transistor being coupled to a first terminal of the sixth resistor; and

the combination of the third n-p-n transistor and the sixth

resistor being designed to be essentially the electrical equivalent of the combination of the first transistor and third resistor and the second transistor and the fourth and fifth resistors.

4,924,114

TEMPERATURE SENSOR

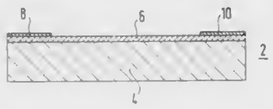
Wolfgang Rühle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,488

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3212026

Int. Cl.[5] H01L *47/02;* **G01K** *7/22*

U.S. Cl. 307—310 **4 Claims**



1. The use of a mixed crystal of the mixed crystal series gallium-arsenic-phosphorus having the composition $GaAs_{1-y}P_y$ as a temperature sensitive material of a temperature sensitive resistor, said mixed crystal being arranged as an epitaxial layer on a substrate and the temperature dependent change of the resistivity of the resistor comprising said mixed crystal being caused by a change of the distribution of electrons between the minima of different conduction bands whose respective minima have minute energy differences and different effective masses and wherein the phosphorous concentration y in the mixed crystal ranges between 0.25 and 0.45 and the substrate comprises a compound semiconductor.

4,924,115

INTEGRATED CIRCUIT RC FILTERS WITH VERY LARGE TIME CONSTANTS

Mostafa R. Yazdy, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1989, Ser. No. 312,161

Int. Cl.[5] H03K *17/16, 5/00*

U.S. Cl. 307—443 **1 Claim**



1. A digital noise filter circuit having a digital input and a filtered digital output and further comprising:

a capacitor,

a comparator for comparing the charge across said capacitor against a predetermined reference, and for generating a high output voltage when the charge is above said predetermined reference, and a low output voltage when the charge is below said predetermined reference,

transistor means responsive to the input voltage and coupled to said capacitor for charging said capacitor when there is a high voltage at said input and for discharging said capacitor when there is a low voltage at said input, and

logic means responsive to the input voltage and to the comparator output voltage for allowing said transistor means to have low resistance when there is a high voltage at the input and at the output, to have a high resistance when the input is a high voltage and the output is a low voltage, and to have a high resistance when the input is a low voltage and the output is a high voltage.

4,924,116

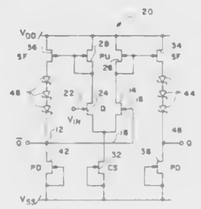
FEEDBACK SOURCE COUPLED FET LOGIC

Tho T. Vu, New Brighton, Minn., and Danh N. Tran, Irvine, Tex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 19, 1988, Ser. No. 145,339

Int. Cl.[5] H03K *17/14*

U.S. Cl. 307—448 **7 Claims**



1. A feedback source coupled FET logic circuit comprising:

a first FET having a drain, a gate and a source;

a second FET having a source connected to the source of said first FET, having a drain and having a gate;

a third FET having a gate connected to the drain of said second FET, having a drain and having a source;

a first voltage level shifter having an anode connected to the source of said third FET and having a cathode connected to the gate of said first FET;

a first current source connected to the drain of said first FET;

a second current source connected to the drain of said second FET;

a first current sink connected to the source of said first FET;

a second current sink connected to the cathode of said first voltage level shifter;

an input terminal connected to the gate of said second FET;

a first output terminal connected to the cathode of said first voltage level shifter;

a fourth FET having a gate connected to the drain of said first FET, having a drain, and having a source;

a second voltage level shifter having an anode connected to the source of said fourth FET, and having a cathode;

a third current sink connected to the cathode of said second voltage level shifter;

a second output terminal connected to the cathodes of said second voltage level shifter; and wherein

said first voltage level shifter comprises at least one diode;

said second voltage level shifter comprises at least one diode;

said first current source comprises a fifth FET having a gate and a source connected to the drain of said first FET, and having a drain;

said second current source comprises a sixth FET having a gate and a source connected to the drain of said second FET, and having a drain;

said first current sink comprises a seventh FET having a drain connected to the source of said first FET, having a gate, and having a source connected to the gate of said seventh FET;

said second current sink comprises an eighth FET having a drain connected to the cathode of said first voltage level shifter, having a gate, and having a source connected to the gate of said eighth FET;

said third current sink comprises a ninth FET having a drain connected to the cathode of said second voltage level shifter, having a gate, and having a source connected to the gate of said ninth FET;

said first voltage level shifter, having the cathode connected to the gate of said first FET, provides a reference voltage to the gate of said first FET; and

said circuit comprises Schottky diodes and metal semiconductor FET's implemented in integrated circuit technology comprising a material of a group consisting of gallium arsenide, silicon, and indium phosphide.

4,924,117

LOGIC CIRCUIT HAVING AN ERROR DETECTION FUNCTION

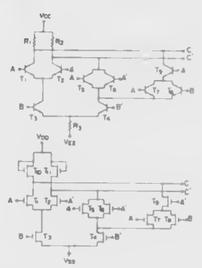
Kiichiro Tamaru, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 12, 1983, Ser. No. 493,999

Claims priority, application Japan, May 13, 1982, 80581

Int. Cl.[5] H03K *3/013, 17/16, 19/003, 19/086*

U.S. Cl. 307—455 **2 Claims**



1. A circuit for producing a pair of output signals indicative of either a result of a predetermined logical operation or the presence of an error condition, comprising:

first circuit means for receiving a first signal, a second signal which, absent error, is a logical inverse of said first signal, a third signal, and a fourth signal which absent error is a logical inverse of said third signal, for performing said logical operation on said first and third signals, and for producing a first output signal which, absent error, is indicative of the result of said logical operation, and a second output signal which is a logical inverse of said first output signal; and

second circuit means for receiving said first, second, third, and fourth signals, and responsive to said first and second output signals, for, in the absence of error, outputting said first and second output signals unaltered as said pair of output signals, and otherwise, in the presence of error, for inverting one of said first and second output signals and then outputting said first and second output signals as said pair of output signals so that said first and second output signals are not mutually inverted, thus indicating said presence of error.

4,924,118

PROGRAMMABLE LOGIC ARRAY WITH INTERFACIAL PLANE

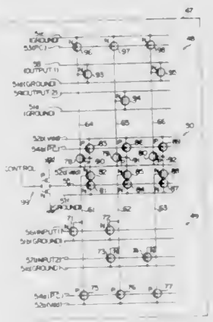
Masahiko Kashimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 315,652

Claims priority, application Japan, Feb. 29, 1988, 63-48312

Int. Cl.[5] H03K *19/177*

U.S. Cl. 307—468 **5 Claims**



1. A programmable logic array fabricated on a semiconductor chip, comprising:

(a) a first logical plane supplied with a plurality of input signals and achieving a first logical operation to produce a plurality of first logical signals;

(b) a second logical plane supplied with a plurality of intermediate signals and achieving a second logical operation to produce a plurality of output signals; and

(c) an interfacial plane responsive to said first logical signals and producing said intermediate signals, wherein said interfacial plane is provided between first and second constant voltage lines different in voltage level from one another and comprises plural series combinations of first, second and third field effect transistors coupled in parallel between the first and second constant voltage lines, each first field effect transistor coupled at one end thereof to said first constant voltage line and being gated by a precharge control line, each third field effect transistor coupled at one end thereof to said second constant voltage line and being gated by a control signal line, each of said second field effect transistors having a gate electrode supplied with each of said first logical signals, each of said intermediate signals being produced between each first field effect transistor and each second field effect transistor.

4,924,119

ELECTRICALLY PROGRAMMABLE ERASABLE INVERTER DEVICE WITH DEPROGRAMMING LIMITATION

Ruojia Lee, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Sep. 13, 1988, Ser. No. 243,611

Int. Cl.[5] H03K *19/094*

U.S. Cl. 307—469 **19 Claims**

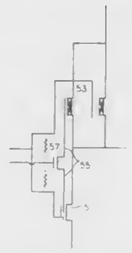
1. Inverter circuit, in which the inverter is programmable, characterized by:

(a) a first n-channel transistor having a floating gate extending over a substrate and a control gate extending over the floating gate, the floating gate being electrically isolated from the substrate and from the control gate, and having a gate oxide window adjacent to the drain, the control gate receiving an input signal;

(b) a p-channel transistor;

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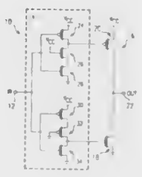
(c) the p-channel transistor having a floating gate and a control gate, the floating gate extending between the control gate and source and drain regions of the p-channel transistor, said control gate of the p-channel transistor being connected to the control gate of the first n-channel transistor so as to receive the input signal;
(d) the floating gates of the n- and p-channel transistors being in electrical communication with each other;



(e) a second n-channel transistor connected in series with the floating gate n-channel transistor, the second n-channel transistor having a transition voltage not controlled by the floating gates, the second n-channel transistor having a control gate connected to the control gate of the first n-channel transistor and the p-channel transistor;
(f) the second n-channel transistor being fabricated as a section of the floating gate n-channel transistor, with the floating gate not extending across an area defined by a gate portion of the second n-channel transistor; and

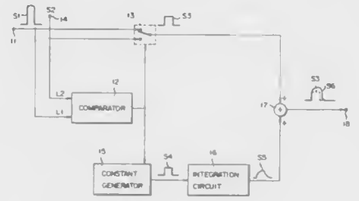
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4,924,120
LOW NOISE OUTPUT CIRCUIT
Stephen R. Schenck, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jun. 29, 1988, Ser. No. 213,002
Int. Cl.[5] H03K *17/16, 17/26, 17/687, 19/003*
U.S. Cl. 307—542 **16 Claims**



1. Output circuitry to reduce inductive voltage spikes in an integrated circuit comprising:
an input node for receiving an input voltage signal; an output transistor; and
voltage control circuitry coupled between said input node and output transistor, said voltage control circuitry responsive to the voltage at said input node for controlling the voltage driving said output transistor with respect to time, such that the change in current with respect to time of the output transistor is relatively constant.

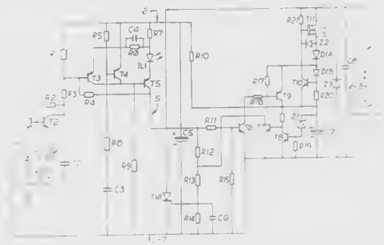
4,924,121
DIGITAL CLIPPING CIRCUIT WITH SOFT CLIP CHARACTERISTICS
Tatsuyuki Ohno, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 27, 1989, Ser. No. 329,207
Claims priority, application Japan, Mar. 30, 1988, 63-76903
Int. Cl.[5] H03K *5/08*
U.S. Cl. 307—542 **15 Claims**



1. A digital clipping circuit for clipping a digital input signal, comprising:
means for receiving a digital input signal;
comparing means for comparing the digital input signal received by said receiving means with a reference signal, and outputting a first comparison signal when the level of the digital input signal is higher than that of the reference signal, and outputting a second comparison signal when the level of the digital input signal is lower than that of the reference signal;
selection means for selecting the reference signal when said selection means receives the first comparison signal from said comparing means, and for selecting the digital input signal when said selection means receives the second comparison signal therefrom;
compensation signal generating means for receiving the first comparison signal from the comparing means, and generating a compensation signal for compensating the reference signal selected by said selection means; and
synthesizing means for synthesizing the reference signal selected by said selection means, and the compensation signal output from said compensation signal generating means, thereby to produce a compensated output signal.

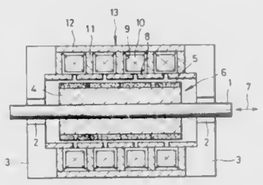
4,924,122
LOW LEAKAGE, A.C. PROXIMITY-SWITCH CIRCUIT
Geoffrey J. Harris, Swindon, United Kingdom, assignor to Square D Company, Palatine, Ill.
PCT No. PCT/GB86/00562, § 371 Date May 15, 1987, § 102(e) Date May 15, 1987, PCT Pub. No. WO87/01883, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 19, 1986, Ser. No. 71,228
Claims priority, application United Kingdom, Sep. 24, 1985, 8523516
Int. Cl.[5] H03K *17/30, 17/26, 17/28, 3/013*
U.S. Cl. 307—570 **4 Claims**

1. A proximity switch for use with an AC supply to control a load connected in series with the switch comprising:
a low voltage power supply circuit including a storage capacitor (C7) and a Zener Diode (Z1);
a sensor means for generating an output signal in the presence of a sensed target connected to said low voltage power supply circuit;
a controllable switching element (TH1) connected, in use, across said AC supply and having a control input connected to the sensor output signal;
said low voltage power supply including means for limiting a current charging said storage capacitor (C7) to a predetermined maximum value when the switch (TH1) is "off";



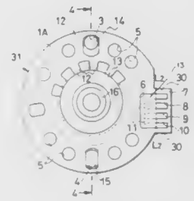
characterized in that said current limiting means includes a variable resistance device (T11) connected in series with said storage capacitor (C7) and means (R21, T10, R20) responsive to the level of the charging current for controlling the resistance of said device.

4,924,123
LINEAR GENERATOR
Takanori Hamajima, Aichi, and Yukio Inaguma, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, both of, Japan
Filed Dec. 16, 1988, Ser. No. 285,666
Claims priority, application Japan, Dec. 18, 1987, 62-318506
Int. Cl.[5] H02K *35/02*
U.S. Cl. 310—15 **11 Claims**



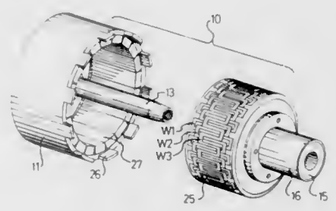
1. A linear generator comprising a first part which has a yoke fixed to a shaft and a plurality of permanent magnets substantially positioned along the longitudinal direction of said shaft and fixed to the surface of said yoke and in which said permanent magnets are magnetized in the direction perpendicular to the longitudinal direction of said shaft and each of adjacent permanent magnets has a polarity opposite to each other; and a second part which has a plurality of magnetic poles facing oppositely to said permanent magnets with clearance between said poles and said permanent magnets and said poles are spaced from each other by a specified distance therebetween, coils wound around bobbins made of non-magnetic material and a housing enclosing said coils, wherein said plurality of magnetic poles are provided between said permanent magnet and said coils.

4,924,124
ELECTRIC MOTOR
Iwao Kato, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Aug. 4, 1987, Ser. No. 81,444
Claims priority, application Japan, Aug. 5, 1986, 61-183769
Int. Cl.[5] H02K *1/04*
U.S. Cl. 310—43 **6 Claims**



1. A motor comprising stator assemblies, each having magnetic means and a non-magnetic molding member to be incorporated in said magnetic means, a coil wound on the outer periphery of each stator assembly, and a rotor for rotation within said stator assemblies,
said magnetic means being provided with magnetic pole plates, a recess formed in each magnetic pole plate and a plurality of terminal elements disposed in said recess and electrically connected to the ends of said coils, one end of each of said terminal elements having an enlarged shape, whereas said non-magnetic molding member fills said recess and simultaneously covers said one end of each of said terminal elements so as to hold said terminal elements in the recess.

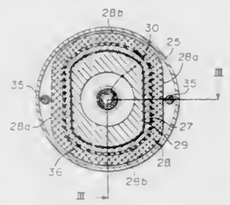
4,924,125
ELECTRIC MOTOR OR ALTERNATOR
Peter B. Clark, Warkworth, New Zealand, assignor to Clark Automotive Developments Limited, Warkworth, New Zealand
Continuation of Ser. No. 144,386, Jan. 26, 1988, abandoned. This application May 3, 1989, Ser. No. 349,939
Claims priority, application New Zealand, Sep. 15, 1987, 221822
Int. Cl.[5] H02K *7/00*
U.S. Cl. 310—67 R **6 Claims**



1. A permanent magnet rotary dynamo electric machine, comprising
(a) at least one cylindrical stator;
(b) at least one external cylindrical rotor rotatable about an axis and having an interior cylindrical surface surrounding said stator and spaced apart therefrom by a cylindrical gap;
(c) a plurality of permanent magnetic poles on said interior cylindrical surface of the rotor and closely spaced interiorly of the rotor and positioned adjacent said cylindrical gap;

(d) said stator having a plurality of wound poles on a substrate with said wound poles being positioned adjacent said cylindrical gap and being of shallow depth relative to the distance between circumferentially adjacent permanent magnetic poles;
(e) the configuration of said plurality of permanent magnetic poles about the rotor being such that there are relatively short magnetic flux paths between circumferentially adjacent permanent magnetic poles; and
(f) the substrate of the stator and said cylindrical gap having both a relative magnetic permeability of less than 20 relative to air and being substantially non-conducting.

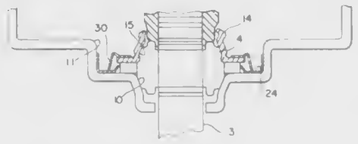
4,924,126
SOLENOID FOR COAXIAL TYPE STARTER DEVICE
Shuzoo Isozumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 24, 1989, Ser. No. 356,164
Claims priority, application Japan, Jun. 3, 1988, 63-138010; Aug. 29, 1988, 63-214327
Int. Cl.[5] H02K *5/15, 3/04*
U.S. Cl. 310—83 **5 Claims**



1. A coaxial type starter device which comprises:
an armature rotary shaft disposed in a dc motor,
a rotary output shaft having a pinion at its one end and supported so as to be slidable in the axial direction,
an electromagnetic switch means disposed in alignment with the axial line of said rotary output shaft, said electromagnetic switch means comprising a cylindrical casing surrounding through bolts extending in the axial direction along the inner circumferential surface of the casing, an exciting coil disposed in said casing and a plunger disposed at the inner part of said casing so as to be slidable in the axial direction, wherein said exciting coil is in the shape of a race track in cross section and has a portion extending near the inner circumferential surface of said casing except for areas where said through bolts extend.

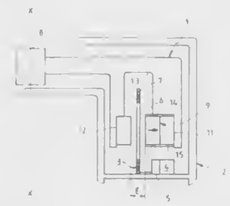
4,924,127
RETAINING MEANS FOR AN ELECTRIC MOTOR SHAFT
Christian Boireau, Guyancourt, and Patrick Larseneur, Courbevoie, both of France, assignors to Valeo, Paris, France
Filed Apr. 14, 1989, Ser. No. 338,203
Claims priority, application France, Apr. 15, 1988, 88 04996
Int. Cl.[5] H02K *5/16*
U.S. Cl. 310—90 **8 Claims**

1. In an electric motor having an end plate comprising a retainer housing means and further having a rotor shaft and a bearing associated with said rotor shaft, retaining means for retaining said shaft bearing by trapping the latter between the end plate and the retaining means, with the retaining means fitted in the retainer housing means, said retaining means comprising a resilient element and a bell ring, wherein the resilient element comprises a securing ring having a peripheral anchor rim portion defining, in transverse cross-section, an outer branch and an inner branch thereof, and further comprises anchor means carried by the outer branch and a junction zone joining the said branches together, the inner branch being



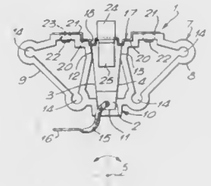
interrupted by slots and comprising securing fingers carried by the inner branch at an axial distance from said junction zone.

4,924,128
HIGH-EFFICIENCY ELECTRIC MOTOR WITH LOW TORQUE VARIATION
Hubert Vaillant de Guelis, Aubergenville; Patrice Jamain, Maule, and Jean-Pierre Roland, Vetheuil, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Dec. 16, 1988, Ser. No. 285,490
Claims priority, application France, Dec. 16, 1987, 87 17556
Int. Cl.[5] H02K *21/12*
U.S. Cl. 310—156 **7 Claims**



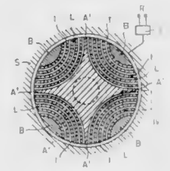
1. A multiphase electric motor comprising:
a fixed body;
a body mobile with one degree of freedom along a path relative to the fixed body;
an exciter strip carried by one of the bodies formed by a set of pluralities of alternately wound coils aligned with each other and incorporating runs perpendicular to the path, there being one plurality of coils per electrical phase, the exciter strip being connected to an energiser device including a switch adapted to excite the pluralities of coils alternately;
at least one row incorporated by the other body and formed by a twofold plurality of magnets magnetised transversely to the path and in alternate magnetisation directions and two magnetic bars provided on either side of this row and defining along the row an airgap of constant width in which the exciter strip is disposed; a permanently magnetised row being disposed, parallel to the magnetisation directions of the magnets and disposed, between two plates of a soft magnetic material.

4,924,129
ELECTRICAL BRUSHGEAR
Arthur G. Copus, Restharrow, 1B Bernhard Avenue, Blackberry Lane, Four Marks, Alton, Hampshire GU34 5DQ, England
Filed Jul. 26, 1988, Ser. No. 224,324
Claims priority, application United Kingdom, May 6, 1988, 8810771
Int. Cl.[5] H02K *5/14*
U.S. Cl. 310—239 **10 Claims**



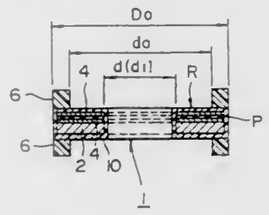
1. Electrical brushgear comprising a brush, a frame supporting the brush against movement in directions corresponding to directions towards a motor axis and peripherally of the motor, and adapted to allow movement of the brush in a first direction corresponding to movement away from the motor axis and in a second direction orthogonal to the first direction, said second direction corresponding to movement axially of the motor, and a clip releasably securably securable to said frame and adapted to bear on the brush to prevent the said movement away from the axis, the clip including a spring biassing means for engagement with a rear portion of the brush, said biassing means urging the brush in said second direction.

4,924,130
RELUCTANCE SYNCHRONOUS ELECTRIC MACHINE HAVING INTRINSIC PHASE CORRECTION MEANS
Antonino Fratta, Via Cristalliera 17, I-10139 Torino, Italy
Filed Mar. 30, 1989, Ser. No. 330,471
Claims priority, application Italy, Apr. 21, 1988, 67370 A/88
Int. Cl.[5] H02K *1/22, 21/12, 21/00*
U.S. Cl. 310—261 **12 Claims**



1. A reluctance synchronous electric machine, comprising a stator having slots arranged according to a predetermined pitch and electric windings inserted in said slots, a feed circuit delivering feed current to said windings for producing a magnetic flux, a rotor inserted into said stator and separated from said stator by a magnetic gap, said rotor including axial magnetic segmentations comprising magnetically axial layers of ferromagnetic material alternated with magnetically axial intercalary layers of non-ferromagnetic material, said ferromagnetic layers and intercalary layers defining in the rotor at least one direct axis and at least one quadrature axis, and permanent magnets inserted within said intercalary non-ferromagnetic layers said permanent magnets being oriented for producing a magnetic flux along the direction of said quadrature axis and in the sense opposite the magnetic flux produced along the same quadrature axis by the feed current which flows through the stator windings, the length of the ferromagnetic layer of each magnetic segmentation of the rotor, measured along the magnetic gap, being substantially equal to the pitch of the stator slots, also measured along the magnetic gap.

4,924,131
PIEZO-ELECTRIC ACCELERATION SENSOR
Shiro Nakayama; Satoshi Kunimura; Shigemi Takahashi; Katsuhiko Takahashi; Toshimitu Hirayama, and Masao Akutsu, all of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan
Filed Oct. 13, 1988, Ser. No. 257,346
Claims priority, application Japan, Oct. 14, 1987, 62-258780; Dec. 28, 1987, 62-332418; Jan. 29, 1988, 63-18588; Apr. 22, 1988, 63-54144[U]; Jun. 20, 1988, 63-151390; Jun. 20, 1988, 63-151389; Jun. 20, 1988, 63-151388; Jun. 27, 1988, 63-158335; Jun. 27, 1988, 63-158334; Jun. 27, 1988, 63-158333; Aug. 15, 1988, 63-202906; Aug. 15, 1988, 63-202903; Aug. 15, 1988, 63-202904; Aug. 15, 1988, 63-202905; Aug. 15, 1988, 63-202910; Aug. 15, 1988, 63-202903; Aug. 15, 1988, 63-202902; Aug. 15, 1988, 63-202901; Aug. 15, 1988, 63-202909; Aug. 15, 1988, 63-202911; Aug. 15, 1988, 63-202907
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—329 **5 Claims**



1. A piezo-electric acceleration sensor, comprising: a piezoelectric polymer membrane element having an element through hole; a diaphragm having a diaphragm through hole and attached to the piezo-electric membrane element so that the diaphragm hole is concentric to the element through hole to form a laminate with a laminate through hole; and fixing means, having a sensing hole, for fixing the laminate in a stretched manner, and wherein: the laminate through hole has about 2.25 to approximately 80% of the area of the sensing hole; and the diaphragm and the piezo-electric element meet the equation:

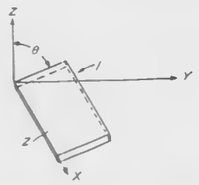
$$(Eb \times Tb^3)/(Ep \times Tp^3) \cong \text{about } 5$$

where Eb, Tb, Ep and Tp are Young's modulus and thickness of the diaphragm and Young's modulus and thickness of the piezoelectric element, respectively, whereby acceleration, applied to the diaphragm, is detected based on a quantity of electricity generated due to strains in a piezo-electric element.

4,924,132
TEMPERATURE SENSITIVE QUARTZ OSCILLATOR CRYSTAL WITH TEMPERATURE COEFFICIENT CONTROLLED IN MANUFACTURE
Horst Ziegler, Paderborn, Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany
Continuation of Ser. No. 102,121, Sep. 29, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 312,332
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1987, 3703241
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—361 **14 Claims**

1. Temperature-sensitive quartz crystal oscillator for precise measurement of temperature comprising a quartz crystal having a pair of parallel surfaces of substantially equal size each carrying one of a single pair of electrodes situated thereon substantially opposite each other, each electrode having a

principal portion covering a central area of one of said parallel surface and a lateral portion extending from said principal portion towards an edge of said one of said parallel surfaces so as to have a border portion near said edge, and each of which parallel surfaces are intersected by the electrical (x) axis of the crystal at an angle ϕ within the tolerance range between $+1°$ and $-1°$, and wherein, for reducing the range of variation of the temperature coefficient of oscillation frequency within said



tolerance range, the angle θ at which said optic (z) axis intersects said pair of planes lies within the range from 3° to 6°, whereby the manufacturing tolerances are reduced for a high precision quartz temperature sensor, said crystal being held in a contacting holder by means holding said crystal by attachment to said respective electrodes at border portions of said lateral electrode portions and being connected in an oscillation producing circuit, whereby the crystal is caused to vibrate in a thickness-shear mode.

4,924,133

HIGH-PRESSURE DISCHARGE LAMP WITH SUPPORT STRUCTURE FOR DISCHARGE VESSEL

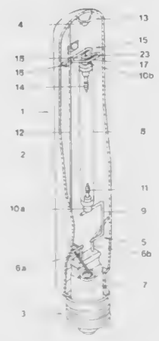
Joachim Dassler, and Klaus Kramer, both of Berlin, Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Nov. 1, 1988, Ser. No. 265,588

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3739008

Int. Cl.[5] H01J *61/34*

U.S. Cl. 313—25 **14 Claims**



1. A high-pressure discharge lamp (**1**) having
an elongated outer bulb (**2**) of glass, defining a longitudinal bulb axis, a base end, and a remote end,
a base (**3**) retaining said outer bulb;
a tubular discharge vessel (**8**) of transparent material subject, in operation of the lamp, to temperature-dependent elongation from a nominal dimension, located within the bulb;
a pair of spaced electrodes (**11**, **14**) and a gas fill within the discharge vessel (**8**);
electrode connection means (**10***a*, **10***b*, **25***a*, **25***b*) coupled to respective electrodes, and extending outwardly of the discharge vessel (**8**);
a holder frame (**5**) for retaining the tubular discharge vessel in predetermined position in the bulb (**2**) including
two connection leads (**6***a*, **6***b*) vacuum-tightly melted through the glass bulb (**2**) and connected to the base (**3**),
one of the connection leads (**6***b*) being electrically connected to one (**10***a*) of the electrode connection means;
a support rod (**12**) secured and electrically connected to one (**6***a*) of the connection leads, said support rod extending axially towards the remote end of the bulb, and forming part of said one of the connection leads; and
means (**4**, **13**; **13'**) at the remote end of the bulb for locating the support rod in predetermined position in the bulb,
and comprising
means for providing a joining structure to the other connection lead (**6***a*) of the other electrode connection means (**10***b*), said joining structure being electrically conductive and temperature-dependent movement-compensated,
and including
an essentially flat leaf spring element (**15**, **15'**) having a major plane and being electrically and mechanically rigidly secured to the other electrode connection means (**10***b*) and further electrically connected to the said connection lead (**6***a*), said essentially flat leaf spring element being located in the bulb with the major plane of the flat leaf spring element being oriented essentially perpendicularly to the longitudinal axis of the bulb.

4,924,134

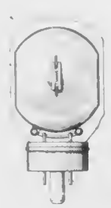
INTERNAL LAMP REFLECTOR

Arnold E. Westlund, Jr., Winchester; John M. Boyd, Nicholasville, and Raymond T. Fleming, Lexington, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.

Filed Aug. 15, 1988, Ser. No. 232,355

Int. Cl.[5] H01K *1/26, 1/30*

U.S. Cl. 313—113 **11 Claims**



1. A lamp having an improved light weight reflector comprising:
(a) lamp envelope enclosing,
(b) a filament connected by electrical leads extending through the envelope,
(c) an inert atmosphere, and
(d) a light weight aluminum reflector positioned to reflect light generated by the filament.

4,924,135

ELECTRODE FOR VAPOR DEPOSITION AND VAPOR-DEPOSITION METHOD USING SAME

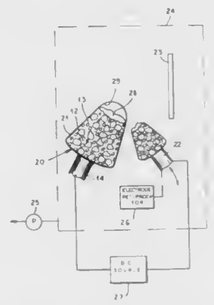
Eduard Pinkhasov, Eastchester, N.Y., assignor to Vapor Technologies Inc., Mt. Vernon, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,549

Int. Cl.[5] H01J *1/13, 17/26, 61/28*

U.S. Cl. 313—326 **4 Claims**

1. An electrode for use in arc-vapor deposition which comprises:
an electrode body consisting essentially of slightly sintered coarse pieces of an electrode material, said electrode body being sintered together to a density of at most 70% of the density of the electrode material in a continuous solid form; and



a shank of a material of high conductivity different from said electrode material and extending into said body.

4,924,137

CATHODE FOR ELECTRON TUBE

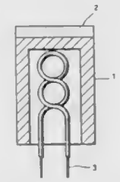
Keiji Watanabe; Keiji Fukuyama; Masako Ishida; Ryo Suzuki, and Masato Saito, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1989, Ser. No. 307,709

Claims priority, application Japan, Feb. 23, 1988, 63-40318; Mar. 1, 1988, 63-49083; Mar. 15, 1988, 63-62121; Apr. 19, 1988, 63-97873

Int. Cl.[5] H01J *1/14, 1/20, 19/06, 19/14*

U.S. Cl. 313—337 **9 Claims**



1. An oxide-coated cathode for an electron tube, comprising:
a base (**1**) containing Ni as a major element, said base having an external surface;
a reducing agent contained in said base (**1**)
a layer (**2**) of an electron-emissive substance formed on a part of said external surface and containing
(a) an alkaline earth metal oxide as a principal component containing at least Ba,
(b) a compound of Sc, and
(c) at least one heat-resisting oxide selected from the group consisting of oxides of Al, Si, Ti, V, Cr, Fe, Zr, Nb, Hf, Ta, Mo and W; and
a heater (**3**) for heating said layer (**2**) of the electron-emissive substance.

4,924,136

BEAM GENERATING SYSTEM FOR ELECTRON BEAM MEASURING INSTRUMENTS HAVING CATHODE SUPPORT STRUCTURE

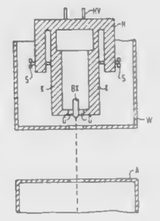
Burkhard Lischke, and Dieter Winkler, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,580

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732620

Int. Cl.[5] H01J *1/18*

U.S. Cl. 313—336 **9 Claims**



1. A beam generating system for electron beam measuring instruments having an electron-accelerating electrode, a control electrode, a directly heated boride cathode having a tip for emitting electrons and a cathode mount that has a clamping mechanism, the clamping mechanism contacting the boride cathode via a means for holding comprising the means for holding located immediately under the tip for emitting electrons of the boride cathode.

4,924,138

DEVICE COMPRISING A VACUUM ION ARC SOURCE

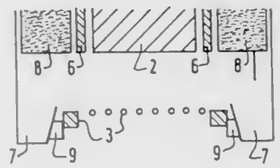
Henri Bernardet, Saint Michel Sur Orge, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 11, 1988, Ser. No. 179,610

Claims priority, application France, Apr. 10, 1987, 87 05120

Int. Cl.[5] H05H *1/02, 1/24*

U.S. Cl. 313—361.1 **9 Claims**



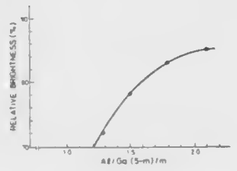
1. A device comprising
(a) a vacuum arc ion source including
(i) a cathode,
(ii) an anode separated from said cathode, and
(iii) a plasma being emitted from said cathode, said cathode and said anode each being energized by respective potentials to form said plasma; and
(b) means disposed relative to said anode for eliminating micro drops of molten material from said plasma.

4,924,139

PROJECTION CATHODE-RAY TUBE WITH GREEN EMITTING PHOSPHOR SCREEN

Yasukazu Morita, Mobara, and Yasuhiko Uehara, Chiba, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,936
Claims priority, application Japan, Jun. 22, 1987, 62-153261
Int. Cl.[5] H01J *29/20*
U.S. Cl. 313—468 **9 Claims**



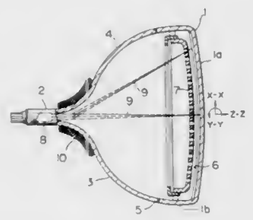
1. A projection cathode-ray tube wherein its phosphor screen is made of phosphor consisting of 20 to 40 wt% of green emitting phosphor $InBO_3$:Tb, the balance being substantially green emitting phosphor $Y_3Al_{5-m}Ga_mO_{12}$:Tb and the value of m being in the range of $0<m\leqq2.27$.

4,924,140

COLOR PICTURE TUBE OF SHADOW MASK TYPE WITH PARTICULAR FACEPLATE PANEL STRUCTURE

Ryoji Hirai, Mobara; Eiichi Yamazaki, Ichihara, and Fumiaki Yonai, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,705
Claims priority, application Japan, Mar. 20, 1987, 62-63796
Int. Cl.[5] H01J *31/00*
U.S. Cl. 313—477 R **5 Claims**



1. A color picture tube of shadow mask type, including a faceplate panel mounted on said tube, said faceplate panel having curvatures along its major and minor axes;

wherein when outer surface contour of said faceplate panel is represented by a three-dimensional expression of a space defined by X-axis corresponding to said major axis, Y-axis corresponding to said minor axis and Z-axis corresponding to the axis of said tube, respectively, contour Zx of said panel along said major axis is so implemented as to be approximated by $Zx=A_1X^2+A_2X^4$ and contour Zy of said panel along said minor axis is so implemented as to be approximated by $Zy=A_3Y^2+A_4Y^4$, where X and Y represent distances from the center of said faceplate panel along said X-axis and said Y-axis, respectively, and Zx and Zy represent distances of said outer surface contour of said faceplate panel along said X-axis and Y-axis from the center of said panel to Z-axis direction, respectively, and where constant A_1 and A_2 are so selected such that a condition $0.3\leqq Px(X=X_1)\leqq0.6$ where $Px=A_1X^2/(A_1X^2+A_2X^4)$ is satisfied at a point $X=X_1$ and $Y=0$ which is on boundary defining an effective picture area on said faceplate and constants A_3 and A_4 are so selected such that a condition $0.95\leqq Py\ (Y=Y_2)\leqq1.0$ where $Py=A_3Y^2/(A_3Y^2+A_4Y^4)$ is satisfied at a point $X=0$ and $Y=Y_2$ which is on boundary defining an effective picture area on said faceplate; and

wherein the contours of said effective picture are defining boundaries extending in parallel with short and long sides of the outer surface of said faceplate panel are so curved as to have an approximately same curvature, the radius R(mm) of said curvature at said boundary being so selected as to satisfy the condition that $1.5\ (42.5\ V+45.0)\leqq R\leqq2.0\ (42.5\ V+45.0)$ where V represents the diagonal length (inch) of said effective picture area.

4,924,141

ALUMINUM OXIDE REFLECTOR LAYER FOR FLUORESCENT LAMPS

Fred R. Taubner, Danvers; Richard L. Doucette, Beverly, and Gerald B. Fredrickson, Danvers, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Nov. 12, 1986, Ser. No. 929,691
Int. Cl.[5] H01J *61/35*
U.S. Cl. 313—488 **16 Claims**



1. A fluorescent lamp comprising:

an envelope containing an ionizable medium including mercury and having electrodes located therein;

an aluminum oxide reflector layer on the inner surface of said envelope, said aluminum oxide reflector layer comprising particles of aluminum oxide having an average particle size greater than 0.5 micrometers and less than or equal to about 1 micrometer and having a surface area of about 4 to about 6 meter^2/gram; and

a phosphor layer disposed upon said reflector layer within said envelope.

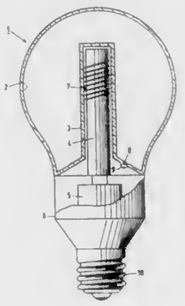
4,924,142

LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP

Lambert C. I. Kaldenhoven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,823
Claims priority, application Netherlands, Sep. 8, 1987, 8702123
Int. Cl.[5] H01J *61/20*
U.S. Cl. 313—490 **5 Claims**

1. A low-pressure mercury vapor discharge lamp having a discharge vessel sealed in a gas-tight manner in which a discharge is present during operation of the lamp, said discharge vessel containing a small quantity of an alloy consisting essentially of indium, tin and zinc, which alloy forms an amalgam with mercury, and wherein the ratio between the atoms of indium and the atoms of tin in the amalgam-forming alloy is between 3:1 and 8 1, the ratio between the sum of the atoms of indium and tin and the atoms of zinc being between 95:5 and 99:1, and the ratio between the sum of the atoms of indium, tin



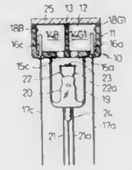
and zinc and the atoms of mercury being between 95:5 and 99:1.

4,924,143

COLORED FLUOROESCENT DISPLAY LAMP ASSEMBLY

Hiroshi Imamura; Makoto Toho; Eiji Shiohama; Shoiti Morii, and Koji Hiramatsu, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 24, 1988, Ser. No. 210,809
Claims priority, application Japan, Jul. 9, 1987, 62-171642; Jul. 9, 1987, 62-171643
Int. Cl.[5] H01J *61/33, 61/48*
U.S. Cl. 313—493 **12 Claims**



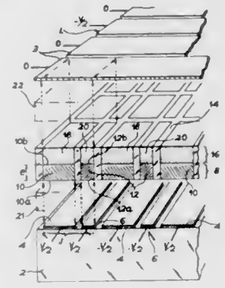
1. A colored fluorescent display lamp assembly comprising a lamp housing having a bottom wall, at least one side wall, and an open top side covered by a light permeable plate bonded to said housing, said housing including a separator therein defining a plurality of discharge chambers covered by said plate, a plurality of differently colored fluorescent substances applied to inner surfaces of said chambers, a plurality of main electrodes projecting into respective ones of said chambers whereby said chambers define portions of discharge paths for said main electrodes, a plurality of discharge holes formed in said bottom wall of said housing and arranged generally concentrically in a central region of said bottom wall, said discharge holes forming portions of said discharge paths, an electrode-supporting base open at a top end and sealingly bonded at said top end to an underside of said bottom wall to enclose said discharge holes whereby an inner space formed by said base communicates with said discharge chambers through said discharge holes, a common electrode carried by said base and disposed within said space, said base including a wall formed of a relatively thin, light-weight material whereby said wall of said base is of smaller cross-sectional thickness than said bottom and side wall of said housing.

4,924,144

MATRIX SCREEN, ITS PRODUCTION PROCESS AND MATRIX DISPLAY MEANS WITH SEVERAL TONES, CONTROLLED ON AN ALL OR NOTHING BASIS AND INCORPORATING SAID SCREEN

Roger Mena, 17 Rue Latour Prolongee, 60140 Liancourt; Christian Brunel, 5 Rue Monere, 92120 Montrouge, and Dario Pecile, 59 rue de la Bourgogne, 95430 Auders // Oise, all of France

Filed Apr. 17, 1986, Ser. No. 853,170
Claims priority, application France, Apr. 17, 1985, 85 05798
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] H01J *1/68, 17/70*
U.S. Cl. 313—505 **9 Claims**



1. A matrix screen incorporating a layer of material having electroluminescent properties and placed between p parallel row electrodes and q parallel column electrodes, said row electrodes and column electrodes crossing one another, an image point x_{ij} of said screen being defined by the region of the electroluminescent material covered by row electrode i and column electrode j, in which i and j are integers such that $1\leqq i\leqq p$ and $1\leqq j\leqq q$, wherein each row electrode is formed from m first parallel conductive strips of different widths and each column electrode is formed from n second parallel conductive strips of different widths, m and n being positive integers, whereof at least one, either m, n or both is $\geqq2$ and wherein the material layer is formed from at least two solid materials, a first and a second material, each having different electroluminescent properties and cut over its entire thickness into several zones distributed in matrix-like manner, said zones being defined by the intersection of said first and second parallel conductive strips, wherein each zone is formed from one of at least two luminescent materials, each image point corresponding to at least two adjacent zones respectively formed from said first and said second electroluminescent materials.

4,924,145

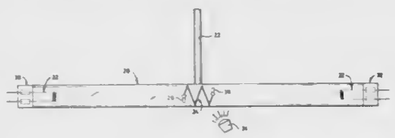
MERCURY CAPSULE SUPPORT

Jeffrey P. Buschmann, Lexington, Ky., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 27, 1988, Ser. No. 290,727
Int. Cl.[5] H01J *61/28*
U.S. Cl. 313—546 **2 Claims**

1. A lamp having a mercury fill component comprising, an envelope having electrodes and associated press-seal areas at opposite ends of the envelope, the envelope adapted to contain a rare gas fill after sealing, a compressible coil spring disposed substantially midway intermediate the press-seal areas and positioned independent of and spaced from the press-seal areas and at least one sealed mercury capsule openable at a distance by radiant means and disposed at an end of the coil spring, the

coil spring having an uncompressed state prior to insertion in the envelope and a compressed state upon insertion in the



envelope for retention of the coil spring and in turn the mercury capsule in a fixed position in the envelope.

4,924,146

UNSATURATED HIGH-PRESSURE SODIUM LAMP

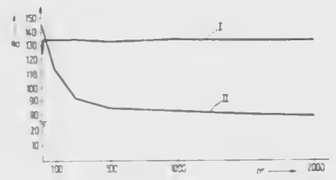
Marina M. J. Meeuwssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,466

Claims priority, application Netherlands, Feb. 10, 1988, 8800323

Int. Cl.[5] H01J *61/22, 61/26*

U.S. Cl. 313—638 **3 Claims**



1. An unsaturated high-pressure sodium lamp provided with a discharge vessel enclosing a discharge space and having a ceramic wall and closed at both ends by a leadthrough element, a respective electrode secured to each leadthrough element, at least one electrode provided with emitter material, the discharge vessel having a filling containing sodium and at least mercury and a rare gas, characterized in that at least one of the elements of the group consisting of Mg, Ca, Sr and Ba is provided in open communication with the discharge space in metallic form up to at most 10% by weight of the Hg present in the discharge space.

4,924,147

HIGH-FREQUENCY FLUORESCENT MARINE LIGHT

Jürgen Renach, Vogelsang 19, 5650 Solingen, Fed. Rep. of Germany

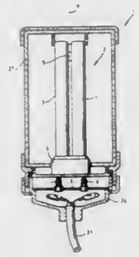
Division of Ser. No. 851,870, Apr. 11, 1986, which is a continuation of Ser. No. 535,358, Sep. 23, 1983. This application Mar. 10, 1989, Ser. No. 322,611

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235381; Jan. 18, 1983, 3301395

Int. Cl.[5] H01J *7/44*

U.S. Cl. 315—58 **12 Claims**

1. An indicator lamp comprising:
- a U-shaped fluorescent bulb having a pair of generally parallel legs;
- a driving circuit connected to said bulb for energizing same with an alternating-current voltage of a frequency greater than 40 kHz; and
- respective opaque shields provided between the bulb legs and each snugly fitting over said legs to cover a half of a respective one of said legs turned toward the other leg



thereby preventing light transmission through said legs in areas covered by said shields.

4,924,148

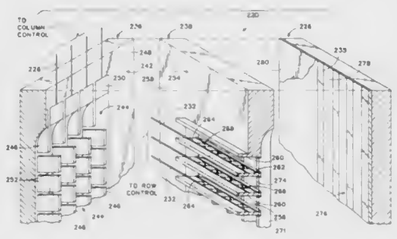
HIGH BRIGHTNESS PANEL DISPLAY DEVICE

James W. Schwartz, Deerfield, Ill., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 24, 1988, Ser. No. 210,955

Int. Cl.[5] G09G *3/10, 3/22;* **H01J** *1/62;* **H04N** *9/12*

U.S. Cl. 315—169.4 **10 Claims**



1. A high brightness panel display device comprising:

(a) a back panel section having a plurality of cathode grooves formed therein;

(b) a central panel section having a front surface and a back surface, the back surface having a plurality of anode grooves formed therein, the cathode grooves and the anode grooves being configured and arranged so that when the back panel section and central panel section are sealed together there resides therebetween a plurality of discrete cells, the central panel section having a plurality of apertures formed through the front surface thereof so that one aperture is connected with each cell;

(c) a front panel section sealed against the front surface of the central panel section, the front panel section carrying pixels distributed over the front panel section for emitting light in response to electron bombardment; and

(d) control means operable for addressing all of the cells and generating gas discharges in selected cells for delivering electrons through the connected apertures to bombard selected pixels and create an image.

4,924,149

APPARATUS FOR CONTROLLING THE CHARGING OF A MAIN CAPACITOR OF A FLASH UNIT

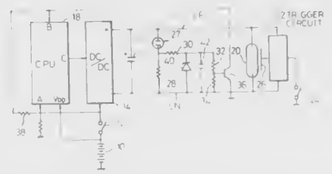
Takao Nishida, Saitama, and Takeo Kobayashi, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,329

Claims priority, application Japan, Dec. 23, 1987, 61-307478

Int. Cl.[5] H05B *37/00*

U.S. Cl. 315—241 P **2 Claims**



1. An apparatus for controlling the charging of a main capacitor of a flash unit, comprising:
- a DC/DC converter having an output voltage that is supplied to said main capacitor;
- comparison means for outputting a timer start-up command when a voltage developed across said main capacitor has reached a reference voltage level at which flash photography is enabled;
- a timer for outputting a charging stop command when a predetermined time period has elapsed after said main capacitor has reached said reference voltage;
- control means responsive to an initial issuance of said charging stop command for disabling an oscillatory operation of said DC/DC converter to thereby stop the charging of said main capacitor, said control means being responsive to an ensuring issuance of said timer start-up command for re-starting said oscillatory operation of said DC/DC converter to restart the charging of said main capacitor; and
- means for displaying the level of charging of said flash unit, said display means being regulated by said control means, said charging level display corresponding to said output value of said A/D converter, wherein said timer and said control means comprise a microprocessor and said comparison means comprises a first resistor having one end connected to one end of said main capacitor, a second resistor having one end connected to the second end of said first resistor, a second end of said second resistor being connected to a second end of said main capacitor, an A/D converter for performing an analog to digital conversion of a voltage across one of said resistors, and means for outputting said timer start-up command when an output voltage of said A/D converter momentarily coincides with said reference voltage level.

4,924,150

POWER-LINE CONTROL SYSTEM

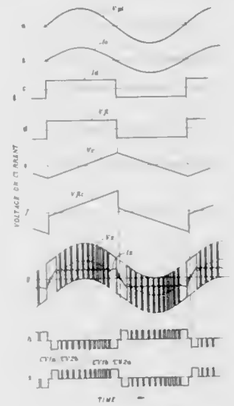
Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Continuation of Ser. No. 7,481, Jan. 28, 1987, abandoned. This application Jul. 22, 1988, Ser. No. 224,178

Int. Cl.[5] H05B *41/16*

U.S. Cl. 315—244 **24 Claims**

1. An arrangement comprising:
- a source of ordinary electric utility power line voltage, the source having a pair of source terminals, the power line voltage being an alternating voltage having a period;
- a load means having a pair of load terminals; and
- control and connect means interposed between the source and the load means and operable to controllably permit current to flow therebetween, the control and connect means: (i) having a pair of main control terminals connected in series with the source terminals and the load terminals, and (ii) being operable to control the flow of current between the source and the load means by means of controllably and intermittently providing an auxiliary voltage across the main control terminals, thereby controllably and intermittently supplying or absorbing energy



at its main control terminals, the absolute magnitude of the auxiliary voltage remaining substantially constant throughout the duration of several periods of the power line voltage.

4,924,151

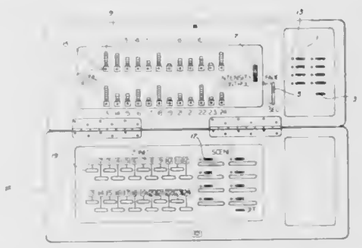
MULTI-ZONE, MULTI-SCENE LIGHTING CONTROL SYSTEM

Michael D'Aleo, Erwinna; Denis Darragh, Allentown; Jonathan Ference, Riegelsville; David Luchaco, Macungie; Michael J. Rowen, Center Valley, and Joel S. Spira, Coopersburg, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Sep. 30, 1988, Ser. No. 251,498

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—295 **56 Claims**



1. A lighting control system comprising, in combination:

(a) means for independently setting power levels to each of a plurality of zones of lighting,

(b) means, requiring no operator action, for electronically storing a plurality of combinations of said power levels, and

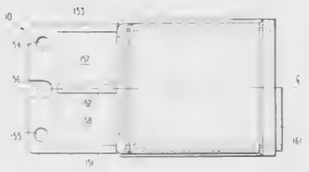
(c) means for selecting any one of said combinations of power levels.

4,924,152

THERMOPLASTIC BALLAST HOUSING IN A NOVEL THREE-DIMENSIONAL PRINTED CIRCUIT BOARD

Jon Flickinger, 314 Irene St., Salina, Kans. 67401

Filed Jun. 13, 1988, Ser. No. 205,982
Int. Cl.[5] H05B *41/00*; H05K *1/03, 5/02, 7/14*
U.S. Cl. 315—363 23 Claims



1. A metalless unpotted housing for an electronic power conditioning apparatus subject to heat generated by said apparatus, required to meet weather and shock standards, said housing comprising:

a plurality of thermoplastic housing components fitted together to form a closed, integral housing, at least one of said thermoplastic housing components having an aperture for receiving a conductor receptacle,

a three dimensional molded printed circuit board supported within said housing, said three dimensional molded printed circuit board having:

a lower, generally plane surface, spaced from an interior, adjacent surface of said housing,

a generally plane upper surface,

at least one integrally molded feature extending above said upper generally plane surface of said printed circuit board,

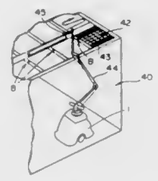
at least one integrally molded conductor receptacle extending from an interior of said housing to an exterior thereof, said integrally molded conductor receptacle including a conductor receiving aperture, and a fixed conductor extending from said conductor receiving aperture to a conductive trace on said printed circuit board.

4,924,153

APPARATUS FOR GUIDING MOVEMENT OF AN UNMANNED MOVING BODY

Suzuki Toru, Hiratsuka; Atsuhiko Kato, Isehara; Mitsuo Hosoi, Hiratsuka, and Ichiro Nakano, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Division of Ser. No. 157,510, Jan. 20, 1988, Pat. No. 4,862,047.
This application Apr. 7, 1989, Ser. No. 335,057
Claims priority, application Japan, May 21, 1986, 61-116856; Jun. 27, 1986, 61-150902
Int. Cl.[5] G05D *1/02*; B25J *5/00*
U.S. Cl. 318—587 4 Claims



1. An apparatus for guiding the movement of an unmanned moving body for inspecting a dust proofing property of each of a plurality of filters laid on the ceiling or on the floor of a clean room, wherein a number of marks are disposed in a spaced relation along a predetermined reference passage on each of a plurality of fitting frames into which said filters are fitted, said unmanned moving body including:

visual recognizing means for visually recognizing the presence of each of said marks;

detecting means for detecting a declination angle and a displacement of the unmanned moving body relative to at least two marks which are visually recognized by said visual recognizing means;

steering control means for controlling the steering of said unmanned moving body so that said declination angle and said displacement detected by said detecting means assume a predetermined value;

a manipulator, having an arm and a probe installed on the top of the arm, for scanning and for sucking air through a specified filter;

a granular material measuring instrument for measuring the number of granular materials filtered by said specified filter from the sucked air; and

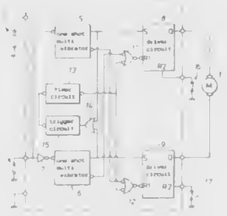
a storing device for storing the value of the number of measured granular materials per filter.

4,924,154

REVERSIBLE MOTOR DRIVE CONTROL CIRCUIT

Seiichi Ogino, Gumma, Japan, assignor to Mitsuba Electric Manufacturing Co., Ltd., Japan

Filed Oct. 18, 1988, Ser. No. 259,069
Claims priority, application Japan, Oct. 19, 1987, 62-159820[U]
Int. Cl.[5] H02P *1/22*
U.S. Cl. 318—286 8 Claims



1. A control circuit for reversible control of the rotation of a motor, comprising:

switch means for producing a selection signal for selecting the rotational direction of the motor;

timer means which is initialized every time said switch means is actuated and produces a pulse signal when a predetermined time period has passed from the time it is initialized;

driver means which can take a first state for driving said motor in a first direction, a second state for driving said motor in a second direction, and a third state for not driving said motor in either direction;

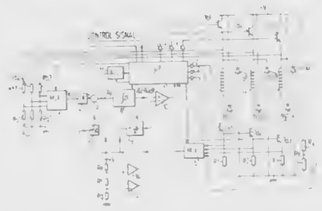
said driver means comprising a first input for receiving said selection signal from said switch means to produce said first or second state of said driver means selected by said switch means, self retaining means which keeps said driver means in said first or second selected state once and whenever either said first or second state of said driver means is produced, and a reset input for receiving said pulse signal from said timer means for breaking said self retained state of said driver means to produce said third state of said driver means.

4,924,155

ENERGIZING SYSTEM FOR A VARIABLE RELUCTANCE MOTOR

Gunnar Hedlund, and Henrik Lundberg, both of Stockholm, Sweden, assignors to EMS Electronic Motor Systems AB, Stockholm, Sweden

PCT No. PCT/SE87/00442, § 371 Date May 26, 1988, § 102(e) Date May 26, 1988, PCT Pub. No. WO88/02951, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 1, 1987, Ser. No. 198,816
Claims priority, application Sweden, Oct. 10, 1986, 8604307
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 14 Claims



1. An energizing system for a variable reluctance motor including a stator having at least one winding for at least one phase and a permanent magnet rotor the position of which influences the permeance in each stator winding, comprising

(a) means for sensing the inductance of each winding at least during a portion of the revolution of the rotor when a respective phase is energized;

(b) means for indicating when the inductance of each winding reaches a predetermined inductance L_k;

(c) rotor position sensing means for sensing the rotor position when said predetermined inductance is reached to define a rotor starting point;

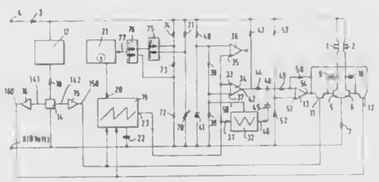
(d) control means for controlling the energized state of said sensed winding in accordance with a rotor position relative to said starting point.

4,924,156

DRIVER CIRCUIT FOR A D.C. MOTOR WITHOUT COMMUTATOR

Rolf Müller, Möochen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,232
Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3717863
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 8 Claims



1. A device for electronically regulating the speed of a rotor of a brushless d.c. motor having at least one stator winding, the motor having an on state in which a current in the form of a pulse having ramped on and off edges is fed to the at least one stator winding and an off state in which a current is not fed to the stator winding, the device comprising:

a frequency to voltage converter having means, responsive to a frequency-modulated signal whose frequency is proportional to the speed of the motor, for generating a periodic signal having a signal value which changes monotonically during each period of the periodic signal and has a limit value at the end of the period of the periodic signal which is proportional to the speed of the motor;

means for applying current pulses to the stator winding at a rate which is proportional to the speed of the motor;

a comparator stage having means, responsive to the periodic signal, for generating a comparator output signal having a value which is proportional to the limit value at the end of each period; and

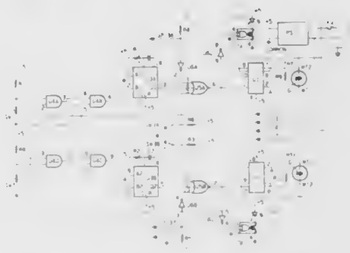
a triangular-wave generator having means, responsive to the periodic signal during each respective period, for generating a triangularly shaped signal having a peak formed at approximately the midpoint of the duration of the period, said applying means having means, responsive to the comparator output signal and said triangularly shaped signal, for controlling the duration of each of the current pulses, the duration controlling means including means, responsive to the triangularly shaped signal, for controlling the on and off edges of each current pulse.

4,924,157

MOTORIZED VIDEO PROJECTION SCREEN CONTROL WITH DIGITAL INTERFACE

Arthur P. Walter, 216 Tremont Ave., S. Plainfield, N.J. 07080

Filed Feb. 2, 1989, Ser. No. 305,100
Int. Cl.[5] H02P *1/22*; H02J *1/00*
U.S. Cl. 318—265 2 Claims



1. A device for controlling the electric motor in a video projection screen to drive the screen both up and down to its full mechanical limits, which comprises an electronic circuit with:

first up/down drive initiation means including:

first switch means comprising a first pair of switches, one for up initiation kand one for down initiation, to provide a manual pulse when momentarily actuated;

first gate means comprising a first pair of gates, one for up control and one for down control, each gate having a first input and a second input and an output, said first input of said first up gate, being connected to said first up switch, said first input of said first down gate, being connected to said first down switch;

second gate means comprising a second pair of gates, one for up control and one for down control, each gate having a first input and a second input and an output, said first input of said second up gate, being connected to said output of said first up gate, said first input of said second down gate, being connected to said output of said first down gate, functioning along with first gate means to lock out initiation from first up switch means during down initiation and to lock out initiation from first down switch means during up initiation;

timer means comprising a pair of adjustable timers, one for up control and one for down control, each timer having an input and an output, said input of said up timer being connected to said output of said second up gate, said input of said down timer being connected to said output of said

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second down gate, functioning to provide an adjustable length pulse on its output when a pulse appears on its input;

third gate means comprising a third pair of gates, one for up control and one for down control, each gate having a first input and a second input and a third input and an output, said first input of said third up gate being connected to said up timer output, said first input of said third down gate being connected to said down timer output, functioning to allow drive initiation and input from several sources, also along with first and second gate means to lock out first up/down drive initiation means during all other drive initiation means;

second up/down drive initiation means including:

switch means comprising a switch, having a first pole and a second pole, one pole for up initiation and one pole for down initiation, each of said poles having a first throw and a second throw, said first pole being connected to said second input of said third up gate, said first throw of said first pole being connected to circuit common, said second pole being connected to said second input of said third down gate, said first throw of said second pole being connected to circuit common, functioning to provide a mutually exclusive manual signal to either the up or the down circuit for the duration of actuation;

digital interface for up/down drive initiation including:

first inverter means comprising a first pair of inverters, one for up control and one for down control, each inverter having an input and an output, said input of said first up inverter being connectable to an external signal capable of sinking the required current to change said first up inverter input to the low state, said output of said first up inverter being connected to said third input of said third up gate, said input of said first down inverter being connectable to an external signal capable of sinking the required current to change said first down inverter input to the low state, said output of said first down inverter being connected to said third input of said third down gate;

alternating current motor control means including:

alternating current trigger means comprising a pair of current triggers, one for up triggering and one for down triggering, having an input and an output, said input of said up alternating current trigger being connected to said output of said third up gate and said second input of said first up gate and said second input of said second down gate, said input of said down alternating current trigger being connected to said output of said third down gate and said second input of said first down gate and said second input of said second up gate;

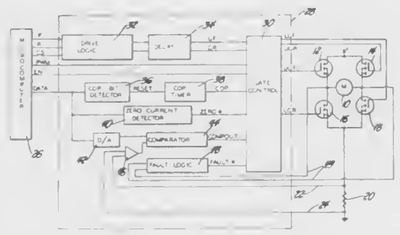
alternating current switch means comprising a pair of current switches, one for up switching and one for down switching, having a gate input and an alternating current input and an alternating current output, said gate input of said up alternating current switch being connected to said up alternating current trigger output, said up alternating current switch input being connectable to an alternating current power line, said up alternating current output being connectable to an up winding on the motor of a video projection screen, said gate input of said down alternating current switch being connected to said down alternating current trigger output, said down alternating current switch input being connectable to an alternating current power line, said down alternating current switch output being connectable to a down winding on the motor of a video projection screen, functioning to apply an alternating current to either of the motor windings during the period that its associated gate input is triggered.

4,924,158

MOTOR DRIVER PROTECTION CIRCUIT

Gerard F. Kelley, and Larry R. Hach, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1989, Ser. No. 332,133
Int. Cl.[5] H02P *1/22*
U.S. Cl. 318—434 **7 Claims**



1. In a motor control having a motor driver circuit responsive to commands from a controller and an interface coupling the controller to the motor driver circuit, the interface having means for protecting the driver circuit, the interface comprising:

means for detecting the commands from the controller,

forward and reverse gating means for gating the commands to the motor driver circuit,

means for disabling the gating means to turn off the motor driver circuit when the period between commands exceeds a preset period, and

logic means for receiving forward and reverse direction signals from the controller and for passing each of the forward and reverse signals to the respective forward and reverse gating means only when one of the signals is at a logic high and the other of the signals is at a logic low, so that invalid direction signals are ineffective to cause the motor driver circuit operation.

6. A controller for a motor comprising, in combination:

a motor driver for driving the motor;

a computer for executing a control loop and issuing a data word once during each of successive equal loop time intervals, each data word having a COP (continuous operation) bit and a number of bits establishing a motor command value;

means for generating a command signal in accord with the motor command value established by the number of bits in the data word;

timing means for (A) timing the period between COP bits in successive data words and (B) producing a disable signal representing an irregularity in operation of the computer when the timed period exceeds a predetermined constant period that is greater than the loop time interval; and

gating means coupled to the timing means for (A) gating the command signal to the motor driver in the absence of the disable signal and (B) blocking the command signal while the disable signal is produced, whereby the motor driver is inhibited during the irregularity in operation of the computer when the timed period between COP bits is greater than the predetermined constant period.

4,924,159

METHOD AND APPARATUS FOR REMOTELY REVERSING ELECTROMECHANICAL DOOR OPENERS

Ronald Olson, 3560 118th Ave., Coon Rapids, Minn. 55433

Filed Jun. 21, 1989, Ser. No. 369,636
Int. Cl.[5] G05D *3/00*
U.S. Cl. 318—466 **8 Claims**

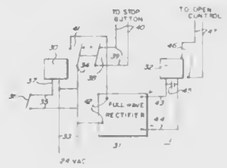
1. A reversing apparatus for a door operator for reversing a moving door upon sensing an obstruction, comprising:

(a) an obstruction sensor;

(b) means for communicating a stop signal to the door operator responsive to the obstruction sensor;

(c) a relay activated responsively to the means for communicating the stop signal; and

(d) means for providing direct current and means for releasably storing said direct current for a predetermined time to said relay to hold said relay in an activated state for producing an open signal and communicating said open signal to the door operator for the predetermined time responsive to the means for communicating the stop signal; whereby the door operator is allowed to completely stop during the predetermined time and is restarted in an opening direction.



5. A process for reversing a moving door operator upon sensing an obstruction comprising the steps:

(a) sensing the obstruction includes closing a current carrying loop with at least one normally open obstruction switch;

(b) communicating a stop signal to the door operator responsive to sensing the obstruction; and

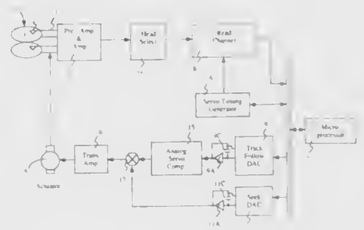
(c) activating a relay responsive to communication of the stop signal and holding said relay in the activated state for a predetermined time by providing direct current electricity to said relay and releasably storing said direct current electricity for said predetermined time.

4,924,160

STAGGERED SEEKING METHOD FOR DISK DRIVE SECTOR SERVO

Joseph S-T Tung, Saratoga, Calif., assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1989, Ser. No. 295,093
Int. Cl.[5] G05B *13/00*
U.S. Cl. 318—561 **18 Claims**



1. A sampled position system for moving a member between a first position and a second position comprising:

controlled acceleration means for moving the member at a controlled acceleration rate; and

position sampling means for providing a sampled position signal representing a position of the member;

means for providing timing signals;

means for generating actuator control signals; and

an actuator for moving the member in proximity to a surface in response to the actuator control signals, the surface having a plurality of tracks, each track having a width;

wherein the position sampling means is responsive to the timing signals to provide the sampled position signal representing the position of the member during a sampling time defined by the timing signals; and

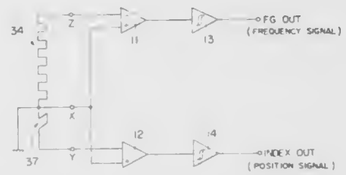
wherein the controlled acceleration is at a critical acceleration value such that the member, from a standing start, moves the width of one track in a time equal to the duration of two sampled positions signals.

4,924,161

POSITION AND SPEED DETECTING DEVICE

Yasuhiro Ueki, Sagamihara, and Toru Fujimoto, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 6, 1989, Ser. No. 333,679
Claims priority, application Japan, Apr. 6, 1988, 63-84930
Int. Cl.[5] G05B *19/10*
U.S. Cl. 318—567 **6 Claims**



1. A position and speed detecting device comprising:

a detection-signal generating means comprising a rotor magnet assembly having a plurality of magnetic poles and a coil pattern for signal detection which moves relatively facing magnetized bodies of said rotor magnet assembly, an interface of at least one pair of S and N magnetic poles among said magnetic poles being slanted at an angle different from that of interfaces of other magnetic poles to make the pair of magnetic poles magnetic poles for position-signal detection and to make other magnetic poles magnetic poles magnetic poles for frequency-signal detection, and a part of coil pattern in said coil pattern for signal detection being slanted at an angle subtantially the same as that of said magnetic poles for position-signal detection to make it a coil pattern for position-signal detection, and other part of coil pattern being formed at an angle substantially the same as that of said magnetic poles for frequency-signal detection to make it a coil pattern for frequency-signal detection;

speed-signal detection means for taking out a signal for frequency detection from said coil pattern for frequency-signal detection to produce a signal for speed detection; and

position-signal detector for producing a signal for position detection from said coil pattern for position-signal detection.

4,924,162

METHOD OF CONTROLLING A SIDE SUPPORT FOR USE WITH A VEHICLE SEAT AND DEVICE FOR USE IN SUCH METHOD

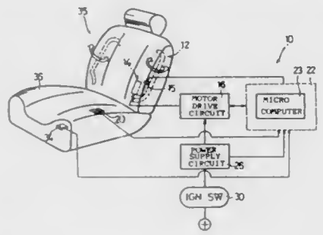
Takao Sakamoto, and Kiyotaka Takizawa, both of Akishima, Japan, assignors to Tachi-S Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,713
Int. Cl.[5] A47C *7/46*; G05B *19/18*
U.S. Cl. 318—569 **4 Claims**

3. A side support device for use with a seat in a vehicle, comprising:

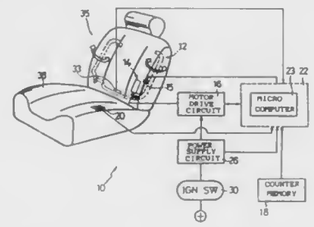
a side support movable between a closed position where the

side support presses against an occupant from both sides thereof to support the occupant so as to prevent the occupant from losing his or her sitting position and an open position where it is kept apart from the occupant;
a motor with a rotation sensor for moving said side support;
a circuit for driving said motor;
a counter memory for storing the number of rotations of said motor;
switch means including a manual switch for controlling driving of said motor to thereby set an arbitrary support position and an automatic switch for controlling the driving of said motor to said closed position and open position, both adjoining said arbitrary support position;
a central processing unit for controlling operation of said device;
said manual switch of said switch means being arranged such that if it is depressed, then said circuit drives said motor continuously to thereby set said arbitrary support position, and, if said arbitrary support position is set, then said counter memory is reset to thereby set the number of counts to zero;
said automatic switch of said switch means including a self-maintaining type hard switch which, when depressed, drives said motor from said arbitrary support position in the direction of said closed position until the number of counts reaches a pre-set value to thereby set said closed position and, thereafter, when depressed again, drives said motor in the direction of said open position until said counter memory is set to zero to thereby set said arbitrary support position, and a self-maintaining type soft switch which, when depressed, drives said motor from said arbitrary support position in the direction of said open position until said number of counts reaches another pre-set value to thereby set said open position and, thereafter, when depressed again, drives said motor in the direction of said closed position until said counter memory is set to zero to thereby set said arbitrary support position.

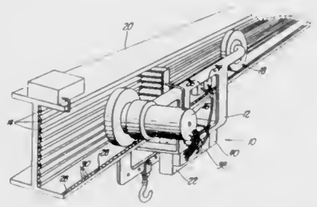


4,924,163
SIDE SUPPORT CONTROL DEVICE FOR USE IN A VEHICLE SEAT
Takao Sakamoto, and Tosio Takano, both of Akishima, Japan, assignors to Tachi-S Company, Ltd., Tokyo, Japan
Filed Sep. 22, 1989, Ser. No. 411,271
Int. Cl.[5] A47C *7/46*; G05B *19/18*
U.S. Cl. 318—569 5 Claims

1. A side support control device for use with a vehicle seat, comprising:
a side support movable between a support position to press against and support an occupant of the seat from both sides thereof to thereby prevent said occupant from losing the sitting position thereof and an open position spaced apart from said occupant;
a motor with a rotation sensor for moving said side support;
a motor drive circuit for driving said motor;
a counter memory for storing the number of rotations of said motor as a number of counts;
switch means including a manual switch adapted to be depressed for continuously driving said motor to thereby move said side support to an arbitrary support position corresponding to an initial position and to arbitrary hard and soft support positions respectively adjacent to said initial position, an automatic switch operable for storing and setting said hard and soft support positions, and a set switch operable prior to the operation of said automatic switch when said hard and soft support positions are stored, said switch means being arranged such that, after the operation of said manual switch, if said set switch is not operated then the support position thereof is stored as said initial position; and,
a central processing unit connected to said motor drive circuit for processing information input therein in accordance with a given program.

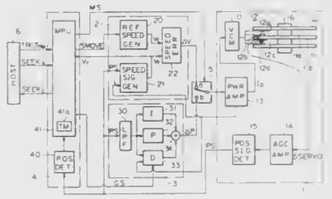


4,924,164
SOFTWARE ZONING OF CONVEYOR CONTROL
Ron J. Riley, Grand Blanc, Mich., assignor to J. N. Fauver Company, Inc., Madison Heights, Mich.
Filed Apr. 8, 1988, Ser. No. 179,551
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—587 10 Claims



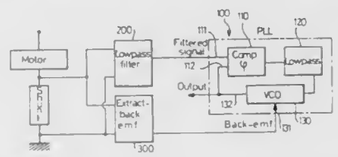
1. A conveyor vehicle assembly (10) including wheels for mobility to move along a track and a motor for rotating the wheels wherein power rails are provided for supplying power to the motor, said assembly comprising; a vehicle (12) including wheels (18) for moving said vehicle (12) about a track, motor means (16) on said vehicle for receiving power from power rails along the track and external said vehicle for rotating said wheels (18) to move said vehicle (12), speed sensor means (24) on said vehicle (12) for sensing the speed of said vehicle (12) and for producing an actual speed signal, location sensor means (26) on said vehicle (12) for sensing the absolute location of said vehicle (12) along the track (20) and for producing a position signal, control means (22) connected to and moving with said vehicle (12) for receiving said actual speed signal and said position signal and for driving said motor means (16) to move said vehicle (12) at a predetermined speed determined by the absolute location of said vehicle (12) along the track (20); said control means (22) including memory means (32) containing speed values representing a selected speed relative to absolute locations on the track (20), location comparison means (34) responsive to said location sensor means (28) for receiving and comparing the position signal to to obtain the predetermined speed stored in the memory means (32) said memory means (32) for the absolute location of said vehicle (12) along the track (20) to produce an ideal speed signal indicative of the predetermined speed, speed adjustment means (36) for receiving said actual speed signal and said ideal speed signal to adjust the speed of said motor means (16) to move said vehicle at said predetermined speed.

4,924,165
SERVO CONTROL SYSTEM CARRYING OUT COARSE CONTROL AND FINE CONTROL
Keiichi Kohno, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 94,850, Sep. 10, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,185
Claims priority, application Japan, Sep. 10, 1986, 61-213005
Int. Cl.[5] G05B *11/18, 5/01*
U.S. Cl. 318—592 18 Claims



1. A servo control system comprising:
a controlled system including:
a controlled object to be position controlled;
a drive unit driving said controlled object;
speed control means, connected to said drive unit, for controlling the speed of said controlled object through said drive unit to move and position said controlled object to one of a reference position and a position adjacent to the reference position; and
position control means, having differential control means, for controlling a position of said controlled object through said drive unit to position said controlled object at said reference position after the speed control means moves said controlled object to one of the reference position and the position adjacent to said reference position,
a differential gain of said differential control means in said position control means being selected from at least two values, a first value being used at an initial state during a coarse control mode of position control by said position control means and a second value being used at an initial state during a fine control mode of said position control, said fine control node being controlled for a predetermined time for minimizing undershoot and overshoot of said controlled object during a transient state from the speed control by said speed control means to the position control by said position control means, and reducing a settle time for said controlled object.

4,924,166
CIRCUIT FOR SHAPING AND MAKING USE OF ARMATURE CURRENT RIPPLE AS GENERATED BY A D.C. MOTOR, IN PARTICULAR FOR POSITION CONTROL
Pierre Roussel, Neuilly Sur Seine, France, assignor to Jaeger, Levallois-Perret, France
Filed Mar. 14, 1989, Ser. No. 323,959
Claims priority, application France, Mar. 15, 1988, 88 03325
Int. Cl.[5] H12P *5/16*
U.S. Cl. 318—608 20 Claims

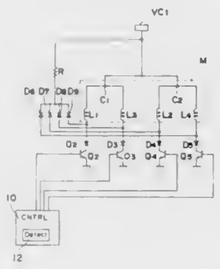


1. A circuit for shaping ripple in D.C. motor armature current, wherein the circuit includes;
a phase-locked loop comprising;
a phase comparator having two inputs and an output;
a first voltage controlled oscillator having a main input, a control input and an output, said output of the first voltage controlled oscillator being connected to a first input of the phase comparator; and
a first lowpass filter connected between the output of said phase comparator and the main input of said voltage controlled oscillator;
means for sensing armature current of a D.C. motor having a mean back-electro-motive force;
a second lowpass filter having an input connected to the sensing means and generating an output signal to be applied to the second input of the phase comparator; and
means connected to the sensing means for generating a signal proportional to the mean back-electro-motive force of the motor, said signal proportional to the mean back-electro-motive force being applied to the control input of the voltage controlled oscillator for controlling the frequency of the phase-locked loop,
wherein the output of the shaping circuit is the output of the first voltage controlled oscillator.

4,924,167
ROTOR MOVEMENT WARNING DEVICE FOR USE IN STEPPER MOTORS
Yuzo Miyazawa, and Koichi Nakamura, both of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 22, 1988, Ser. No. 288,132
Claims priority, application Japan, Dec. 25, 1987, 62-197777[U]
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 11 Claims

1. A rotor movement warning device for use in a stepper motor having a stator provided with a plurality of windings and a rotor rotatably provided in association with said stator, said rotor movement warning device comprising:
a power source;
a plurality of switching means provided in association with said plurality of windings, respectively, for controlling the power supplied from said power source to said windings;
driving pulse producing means for producing driving pulses to said plurality of switching means for effecting the rotation of said rotor;
detecting means for detecting, when said rotor stops, at least one switching means that is provided with the last driving pulse; and

low frequency signal producing means for producing low frequency signals which are applied to only said switching means detected by said detecting means;



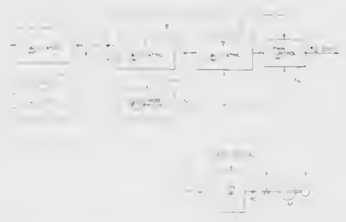
said low frequency signals warning an operator that movement of said rotor should not be undertaken.

4,924,168

CONTROL APPARATUS FOR PWM-CONTROLLED, VARIABLE VOLTAGE/VARIABLE FREQUENCY INVERTERS

Akira Horie, and Yoshiji Jimbo, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 199,188, May 26, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 378,961
Claims priority, application Japan, Jun. 1, 1987, 62-134984
Int. Cl.[5] H02M *1/12*
U.S. Cl. 318—811 **3 Claims**



1. A control apparatus for an inverter, which is fed with a DC voltage and supplies an induction motor with a variable voltage/variable frequency output AC voltage produced in accordance with a PWM control, comprising:

detection means for detecting a frequency (an output frequency) of the output AC voltage of the inverter;

output AC voltage factor calculating means for calculating an output AC voltage factor, which is a ratio of an output AC voltage to be produced by the inverter at that time to a maximum value of the output AC voltage, which can be produced by the inverter under a then present DC voltage, on the basis of the output frequency from said detection means and the DC voltage;

pulse mode determining means for determining a pulse mode in the operation of the inverter, in which a particular number of voltage pulses is maintained within one cycle of the output AC voltage, on the basis of the output frequency from said detection means and the output AC voltage factor from said output AC voltage factor calculating means

modulation factor calculating means for producing the modulation factor on the basis of the output AC voltage factor from said output AC voltage factor calculating means and the pulse mode signal from said pulse mode determining means; and

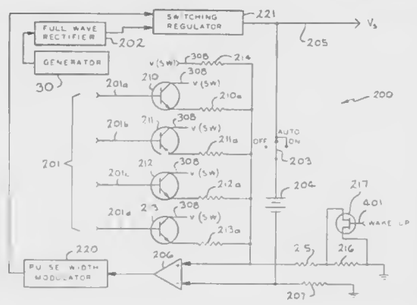
PWM control means for producing gate signals for the inverter on the basis of the modulation factor and the output frequency in accordance with the pulse mode determined in said pulse mode determining means.

4,924,169

CURRENT REGULATOR FOR A BATTERY RE-CHARGING CIRCUIT

Glenn Shifflet, Minnetonka; Herbert C. Johnson, Minneapolis, both of Minn., and Paul W. Revenaugh, Oak Harbor, Ohio, assignors to Dana Corporation, Toledo, Ohio

Division of Ser. No. 134,407, Dec. 17, 1987, Pat. No. 4,838,077.
This application Feb. 24, 1989, Ser. No. 315,429
Int. Cl.[5] H02J *7/00*
U.S. Cl. 320—21 **14 Claims**



1. In an instrument including a control circuit, a battery pack for supplying power to the control circuit, and a generator for generating electrical current to re-charge the battery pack, a means for regulating the amount of electrical current supplied to the battery pack for re-charging comprising:

means for generating a signal representing the desired amount of the re-charging current, said desired signal generating means including a plurality of individual current signal sources and means for summing all of said individual current signals to provide said desired current signal;

means for generating a signal representing the actual amount of the re-charging current; and

means responsive to said desired and actual current signals for controlling said actual amount of said re-charging current to correspond to said desired amount of said re-charging current.

4,924,170

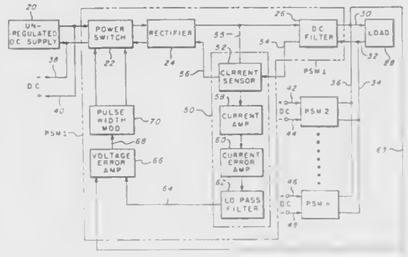
CURRENT SHARING MODULAR POWER SUPPLY

Christopher P. Henze, Eagan, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jan. 3, 1989, Ser. No. 292,707
Int. Cl.[5] H02M *3/158*
U.S. Cl. 323—272 **17 Claims**

1. A regulator circuit for equalizing the load currents of a plurality of power supply modules connected in common to supply a common load voltage, each of said modules comprising modulator means for adjusting the load current of said module substantially independently of load current changes in any other module, current sensing means responsive to a load current of said module for producing a current signal indicative of said load current of said module, voltage sensing means responsive to its load voltage for providing a first voltage signal corresponding thereto, and means for applying said current and voltage signals to said modulator means, said modulator means being constructed so that said load current is adjusted in a substantially inversely proportional manner to changes in its load voltage,

wherein said modulator means comprises pulse width generator means responsive to said current level and said first voltage signal for producing a pulse width signal such that said duty cycle is adjusted to incrementally decrease said load current of said module with an increase in load voltage, and to incrementally increase said load current with a decrease in load voltage,



said current sensing means further comprising means responsive to said load current for providing a second voltage signal proportional thereto, means for providing a predetermined reference voltage, and first circuit means responsive to the difference of said predetermined reference voltage and said second voltage signal for providing an error signal representative thereof,

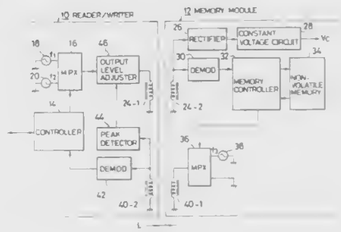
said regulator circuit further comprising second circuit means which is responsive to the difference of said error signal and said first voltage signal for producing pulse signals which have pulse widths that are linearly proportional to the difference between said error signal and said first voltage signal.

4,924,171

SYSTEM FOR SUPPLYING POWER SOURCE BY ELECTROMAGNETIC INDUCTION COUPLING

Fujio Baba, Tokyo; Kunihiko Takeuchi, Kawasaki, and Shinichi Horinouchi, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,687
Claims priority, application Japan, Oct. 8, 1987, 62-254331; Jan. 26, 1988, 63-015155
Int. Cl.[5] H02J *1/00*
U.S. Cl. 323—347 **5 Claims**



1. A transmitter/receiver apparatus, said apparatus transmitting a power supply signal via electromagnetic induction coupling to a device, and said apparatus receiving a signal via electromagnetic induction coupling from said device, said apparatus and said device having a coupling distance therebetween, said apparatus comprising:

coupling distance detecting means for detecting said coupling distance in accordance with a magnitude of said received signal, said magnitude changing in accordance with a change in said coupling distance; and

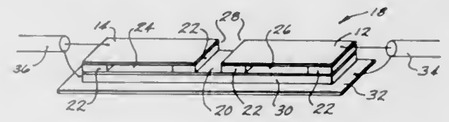
power supply signal level control means, operatively coupled to said coupling distance detecting means, for setting a signal level of said power supply signal in accordance with said coupling distance detected by said coupling distance detecting means.

4,924,172

CAPACITIVE SENSOR AND ELECTRONIC CIRCUIT FOR NON-CONTACT DISTANCE MEASUREMENT

William A. Holmgren, Colorado Springs, Colo., assignor to Kaman Instrumentation Corporation, Colorado Springs, Colo.

Filed Aug. 25, 1988, Ser. No. 236,598
Int. Cl.[5] G01R *1/06, 1/067*
U.S. Cl. 324—664 **34 Claims**



1. A capacitive sensor comprising:

at least one pair of first electrode means, said first electrode means being spaced apart and being coplanar in a first plane;

coupling plate means spaced from said pair of first electrode means in a second plane, said second plane being parallel to said first plane;

ground plate means spaced from said coupling plate means in a third plane, said third plane being parallel to said first and second planes, and said second plane being sandwiched between said first and third planes;

first dielectric material being positioned between said first electrode means and said coupling plate means;

second dielectric material being positioned between said coupling plate means and said ground plate means;

a first gap between one of said first electrode means and said coupling plate means;

a second gap between the other of said first electrode means and said coupling plate means; and

said coupling plate means being electrically isolated from said pair of first electrode means and from said ground plate means.

4,924,173

SHIELDED CAPACITANCE STANDARD

Michael R. Dishman, Raleigh, N.C., assignor to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Feb. 6, 1989, Ser. No. 307,410
Int. Cl.[5] G01N *27/02;* **G01R** *27/26*
U.S. Cl. 324—690 **10 Claims**

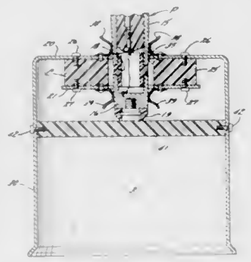
1. A shielded capacitance standard for use with a capacitance sensitive probe having electrodes mounted for sensing a capacitance adjacent thereto, said standard comprising:

capacitor means having respective plates and a dielectric cooperating to define a capacitance of fixed value;

means cooperating with said capacitor means for connecting the electrodes of the probe to the respective plates of the capacitor so that the probe will measure said fixed value capacitance; and

shield means for shielding both the capacitor means and the probe from external electrical fields and comprising a generally cylindrical metallic enclosing wall adjoining

and extending from one of said plates of said capacitor means to define a shielded space wherein said capacitor means is generally disposed within said shielded space



thereby providing an accurate and reproducible standard for facilitating the calibration of capacitance sensitive probes.

4,924,174

METHOD OF SECURING MULTIPLE LAYERED ROOF STRUCTURES

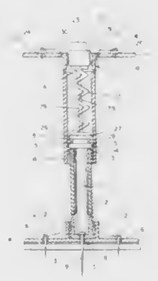
James P. Sheahan, Midland, Mich., assignor to J. P. Sheahan Assoicates, Inc., Midland, Mich.

Division of Ser. No. 838,201, Mar. 7, 1986, Pat. No. 4,723,109, which is a division of Ser. No. 727,589, Apr. 26, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 121,786

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[5] **E04D** *1/00, 13/00;* **G01R** *31/00;* **G01N** *27/07*

U.S. Cl. 324—696 **6 Claims**



1. A method of securing a multiple layered roof, the method comprising the steps of

(I) providing a roof support means;

(II) surmounting the roof support means with a roof deck;

(III) surmounting the roof deck with a water impermeable membrane, said membrane having a generally flat surface coextensive with the roof deck;

(IV) securing to the roof deck and on top of the water impermeable membrane, at least one hold down and detector device by spacing a plurality of said devices over the area of the roof;

(V) surmounting the water impermeable membrane with planks of thermal insulation;

(VI) adjusting the devices downwardly to compress and secure the thermal insulating planks to hold them securely and,

(VII) surmounting the thermal insulating planks with a ballast layer, the improvement comprising, using a hold down and leak detector device comprising

an enlarged flanged base;

a first adjustable nesting stem inserted in and extending vertically from said flanged base;

a second nesting stem operably associated with the first nesting stem;

an enlarged flanged top secured to the upper end of the second nesting stem and surmounted by an adjusting protrusion;

said nesting stems being adjustable up or down relative to one another;

said enlarged flanged base being adapted to be fixedly secured to a roof surface via mechanical attachment.

4,924,175

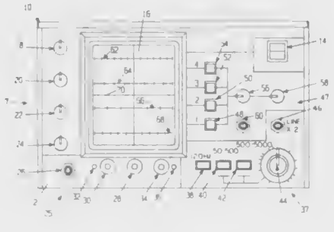
APPARATUS FOR DISPLAYING ANALOG SIGNATURES OF AN ELECTRONIC COMPONENT

James R. Clinton, 3622 SW. Donovan, Seattle, Wash. 98126

Filed Feb. 29, 1988, Ser. No. 162,192

Int. Cl.[5] **G01R** *31/22, 13/20*

U.S. Cl. 324—73.1 **25 Claims**



24. An apparatus for testing an electronic device, comprising:

a sequential switch having a plurality of selectable states, said sequential switch being adapted to sequentially select first and then second pluralities of conditions under which the electronic device is to be tested;

a signal generator connected to said sequential switch and for sequentially generating first and then second analog input signals, said first and second analog input signals respectively corresponding to said first and second pluralities of selected test conditions;

a first electronic circuit for sequentially applying said first and then said second analog input signals to the electronic device to produce corresponding first and second analog responses of the electronic device and to respectively generate first and second pairs of related horizontal and vertical analog output signals, said related horizontal and vertical analog output signals being respectively indicative of said first and second responses;

a second electronic circuit for receiving said pairs of related horizontal and vertical analog output signals from said first electronic circuit and to sequentially produce a first plurality of first pairs of related horizontal and vertical analog signature signals from said first pair of related horizontal and vertical analog output signals concurrently with the generation of said first pairs of output signals and then a second plurality of second pairs of related horizontal and vertical analog signature signals from said second pair of related horizontal and vertical analog output signals concurrently with the generation of said second pairs of output signals, said first plurality of first pairs of related horizontal and vertical analog signature signals corresponding to said first plurality of selected test conditions and said second plurality of second pairs of related horizontal and vertical analog signature signals corresponding to said second plurality of selected test conditions;

an analog-to-digital connector connected to said second electronic circuit for sequentially periodically sampling said first plurality of first pairs of analog signature signals and to produce digital signals;

an electronic digital memory for storing said digital signals;

a third electronic circuit for retrieving said stored digital signals from said electronic digital memory;

a digital-to-analog converter connected to said third electronic circuit for producing a reconstructed first plurality of first pairs of analog signature signals; and

an analog visual display for simultaneously displaying said reconstructed first plurality of first pairs of analog signature signals and said second plurality of second pairs of analog signature signals.

4,924,176

POLARITY INDICATOR FOR VEHICLE BATTERY

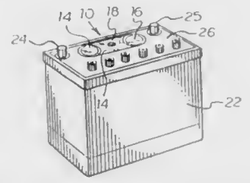
Alfred U. Tremblay, 2742, Marquette, Longueuil, Quebec, Canada (J4K 4K4)

Filed Feb. 21, 1989, Ser. No. 313,041

Claims priority, application United Kingdom, Feb. 22, 1988, 8804011

Int. Cl.[5] **G01R** *19/14*

U.S. Cl. 324—133 **11 Claims**



1. A polarity indicator for checking the matching of polarities of a vehicle battery with a d.c. power supply, said indicator adapted to be mounted on a vehicle battery provided with a positive and a negative terminal, said indicator comprising a non-conductive elongated strip adapted to be aligned end to end between said positive and negative terminals, a positive and a negative electrically conductive pole spacedly mounted on said strip, said positive and negative poles adapted to be respectfully located adjacent the positive and negative terminals, a directional light emitting means connected between said poles, said light emitting means adapted to emit light upon the passage of an electric direct current between said poles coming from said d.c. power supply, a resistor element electrically mounted between one of said poles and said light emitting means, said strip, said poles, said light emitting means and said resistor element being mounted on a support member adapted to be fixed on the top surface of the vehicle battery between said positive and negative terminals, whereby the light emitted by the light emitting means identifies the matching of the polarity of the d.c. power supply with the polarity of the terminals of battery adjacent the poles of the indicator.

4,924,177

TESTER FOR SOLID STATE ELECTRONIC COMPONENTS

Robert H. Mulz, 3927 Palm Ave., San Diego, Calif. 92154

Filed Apr. 29, 1983, Ser. No. 489,758

Int. Cl.[5] **G01R** *31/02*

U.S. Cl. 324—133 **11 Claims**

1. A quality tester for electronic components, said tester selectively providing indications of simple circuit continuity and, in two- and three-terminal solid state components, of short and open conditions, transistor type, and latchability of SCR's and triacs, said tester comprising:

a DC voltage source having a positive side and a negative side;

bistable switching means connected to the positive and negative sides of said voltage source, said switching means having first and second stable positions;

a first lead selectively connected to the positive and negative sides of said voltage source;

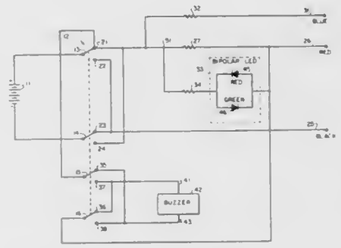
a second lead selectively coupled to the negative and positive sides of said voltage source;

a first resistor connected between said second lead and said switching means;

a third lead connected between said first resistor and said switching means;

a second resistor connected in said third lead; and

a three-state visual indicator and diode means connected in parallel with said first resistor, said visual indicator and diode means having first and second terminals and providing selective quality indications for the component being tested;



said first and second leads being adapted to be connected to the leads of a two-lead device such as an LED, fuse, diode and two circuit leads for circuit continuity testing, the emitter and collector of a transistor, the two main terminals of a triac and the anode and cathode of a silicon controlled rectifier (SCR), to determine shorts and open circuits, said third lead being adapted to be connected to the base of the transistor, and the gate of the triac and the SCR, whereby said second resistor biases the transistor ON and latches the triac and the SCR;

said switching means and said visual indicator and diode means being adapted to distinguish NPN and PNP transistors from each other and to determine state of latching ability of SCR's and triacs in either their positive or negative state by reversing the polarity of the applied voltage of said first and second leads and to said visual indicator and diode means, said switching means further changing the voltage polarity on said first and second leads to determine shorts, opens and conductive direction through various of the electronic components to be tested.

4,924,178

DRIVE APPARATUS FOR A CROSS COIL TYPE METER

Motoyasu Miyajima, Shimada, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 299,109

Claims priority, application Japan, Jan. 22, 1988, 63-10916

Int. Cl.[5] **G01R** *1/00*

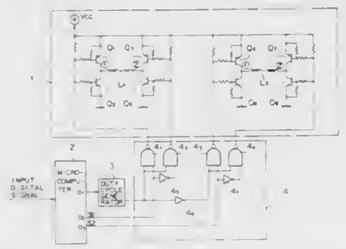
U.S. Cl. 324—154 R **4 Claims**

1. A drive apparatus for a cross-coil type meter having a cross-coil formed of a first coil and a second coil disposed in intersecting relation with respect to each other, a magnet rotor being disposed in a magnetic field set up by said cross-coil, and a measurement of an input to said meter being indicated in terms of an angle by which the magnet rotor rotates; wherein said drive apparatus comprises:

a first supply means for supplying said first coil with a first

square wave current having a duty cycle of a% in accordance with said input to said meter;

a second supply means for supplying said second coil with a second square wave current having a duty cycle of (100-a)% complementary to said first square wave current; and



a polarity setting means for setting polarities of said first square wave current provided by said first supply means and of said second square wave current provided by said second supply means in accordance with said input to said meter.

4,924,179

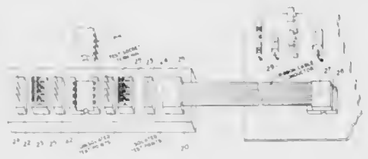
METHOD AND APPARATUS FOR TESTING ELECTRONIC DEVICES

Leslie H. Sherman, 214 Dumont Ave., Dumont, N.J. 07628

Continuation of Ser. No. 859,679, Dec. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,903, Apr. 30, 1976, abandoned. This application Aug. 6, 1982, Ser. No. 405,899

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—158 F **1 Claim**



1. The method of employing an apparatus for detecting a fault in a first plug-in component of an electronic circuit, said first plug-in component having a plurality of inputs, a plurality of outputs, and a plurality of subcircuit components associated with each of said inputs and said outputs, and normally being received in a second socket in said electronic circuit, wherein said apparatus device comprises:

a first socket means for electrically receiving and contacting each of said inputs and outputs of said first plug-in component;

a second plug-in component having a plug configuration corresponding to the plug configuration of said first plug-in component and being electrically received in said second socket;

connector means electrically connecting said first socket means and said second plug-in component, and

a first test point extending from said device, and switch and a second test point extending from said device in series between each of said inputs and outputs of first plug-in component and said second plug-in component, comprising the steps of:

a. placing all switches in the "off" position,

b. starting with a first test point - switch - test point unit, placing said first unit in the "on" position,

c. testing a first subcircuit associated with said first test point - switch - test point unit by taking readings at the test points electrically connected to the input and output sides of said first subcircuit,

d. placing the next test point - switch - test point unit in said sequence in the "on" position and repeating the test steps of (c) for the subcircuit combination electrically associated by said second test point - switch - test point unit,

e. repeating step (d) until the entire combination of subcircuits have been tested,

f. starting with the second test point - switch - test point unit, repeating step (d),

g. starting sequentially with each next test point - switch - test point repeating steps (d) and (e) until every combination of subcircuits, for each start point, has been tested.

4,924,180

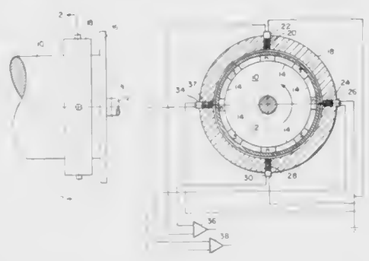
APPARATUS FOR DETECTING BEARING SHAFT WEAR UTILIZING ROTATABLE MAGNET MEANS

Ali M. Nasr, Summit, and Gregory W. Miller, Bridgewater, both of N.J., assignors to Liquiflo Equipment Company, Warren, N.J.

Filed Dec. 18, 1987, Ser. No. 135,072

Int. Cl.[5] G01B *7/14;* **G01M** *13/04;* **G01P** *3/44;* **F04B** *21/00*

U.S. Cl. 324—207.15 **7 Claims**



1. In an apparatus comprising a rotating shaft mounted in a bearing and a stationary housing surrounding said rotating shaft, the improvement comprising a means for detecting wear in said bearing or said shaft including a plurality of magnets mounted about the circumference of said shaft and at least two pairs of coils mounted on said stationary housing surrounding said shaft, the coils being positioned substantially equidistant from each other, each coil being positioned to detect magnetic flux density of said magnets when said shaft rotates, and means for detecting a change in axial position of said rotating shaft independently of speed of shaft rotation by detecting a change in voltage induced in each pair of coils, said means for detecting a change of shaft position independent of shaft rotation speed comprising means for generating a D.C. voltage from each of said coils, means for generating a reference D.C. signal voltage as a function of speed of shaft rotation and means for subtracting said reference D.C. signal voltage from the D.C. voltage generated from each of said pairs of coils.

4,924,181

DEVICE HAVING ELECTROMAGNET FOR PROVIDING A MAGNETIC FIELD INCLINED WITH RESPECT TO THE TRANSPORTATION DIRECTION OF A FERROMAGNETIC BODY FOR NON-DESTRUCTIVE, MAGNETIC TESTING OF THE BODY

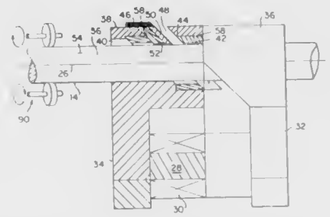
Gerhard Hüschelrath, Laufach-Frohnbofen, Fed. Rep. of Germany, assignor to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Jun. 28, 1988, Ser. No. 212,696

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723360

Int. Cl.[5] G01N *27/82;* **G01R** *33/06, 33/12*

U.S. Cl. 324—235 **10 Claims**



1. A device for non-destructively testing a long ferromagnetic body for structural faults by transporting the ferromagnetic body longitudinally through a magnetic field generated by an electromagnet, which field magnetizes the body and extends transverse to the transportation direction of the body so that structural faults in the body cause changes of the course of the magnetic field, which changes are measured by magnetic field sensors arranged on or near to the surface of the body, wherein:

pole shoes of the electromagnet are located on or near to the surface of the body in a zone which covers the body at least partially;

the pole shoes are separated from each other by an air gap;

the pole shoes each have a face which is inclined with respect to an axis defined by the transportation direction of the body;

the faces face each other, are separated from each other by the air gap, and have an inclination angle being greater than 0° and less than 90°;

the pole shoes, in the zone, have at least one portion which extends over a point on a surface of the body to be tested to the location of such point after a rotation of the body around its longitudinal axis by 90°;

a row of magnetic field sensors, corresponding to the extension of the zone, are arranged in the air gap transverse to the transportation direction; and

means are provided for rotating the body as the body is transported in the transportation direction.

4,924,182

EDDY CURRENT METHOD TO MEASURE DISTANCE BETWEEN SCANNED SURFACE AND A SUBSURFACE DEFECT

Susan N. Vernon, Annandale, Va., and Paul M. Gammell, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 9, 1989, Ser. No. 294,621

Int. Cl.[5] G01N *27/87, 27/90*

U.S. Cl. 324—237 **45 Claims**

1. A method for estimating the distance (flaw depth) between the scanned surface and a subsurface flaw of unknown geometry from the effect of the flaw on the impedance of an eddy current probe consisting of the following steps:

(a) providing an electrically conducting material to be tested; then

(b) selecting a ferrite probe whose diameter is at least 4.2 times the thickness of said material over which inspection is desired; then

(c) connecting the probe at said step (b) to an impedance measuring device; then

(d) selecting on the impedance measuring device of said step (c) a range of frequencies such that at the lowest frequency selected the skin depth is equal to or greater than the thickness of the material provided at said step (a); then

(e) measuring over frequency range at said step (d) the real (R_o) and imaginary (X_o) components of the probe impedance when the probe is "in air", far removed from any conductor; then

(f) storing the data obtained in step (e); then

(g) measuring, over the frequency range of said step (d), the real (R_b) and imaginary (X_b) components of the impedance of the probe of said step (b) when it is in contact with the test material at a point known to be free of defects; then

(h) storing the data measured in step (g); then

(i) calculating at each frequency, the lift-off angle, θ_L, given by

$$\theta_L = \tan^{-1}(X_o - X_b)/(R_b - R_o);$$

then



(j) storing these data; then

(k) scanning the probe selected in step (b) over the test material provided at said step (a) while monitoring one aspect of probe impedance and identifying the region where there is a distinct change in the monitored quantity; then

(l) locating in the region identified in said step (k) the point where the magnitude of the monitored change is greatest; then

(m) measuring, over the range of frequencies of said step (d), the real (R_d) and imaginary (X_d) components of the probe impedance at the point located in said step (l); then

(n) calculating the normalized defect phase angle θ_n, at each frequency measured in said step (m); then

(o) substituting, at each frequency measured in said step (m), the normalized defect phase angle, θ_n, calculated at said step (m), the skin depth, s, into the relationship

$$\theta_n = C_1 + C_2(ar)^{\frac{1}{2}}/s + C_3 ar/s^2$$

where a is the depth of the subsurface defect and r is the mean radius of the probe selected in said step (b), and the coefficients, C_1, C_2, and C_3, have been empirically determined for the probe selected at said step (b), using flat bottom synthetic defects of known depth, and solving for a at each frequency; then

(p) averaging those values from said step (o) which are randomly distributed about a mean.

4,924,183

METHOD OF DETERMINING THE SPECTRAL DISTRIBUTION OF THE NUCLEAR MAGNETIZATION IN A LIMITED VOLUME, AND DEVICE FOR PERFORMING THE METHOD

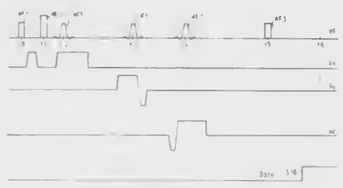
Dietmar Kunz, Quickborn; Karl Georg H. Bomsdorf, Hamburg, and Jürgen S. Wieland, Pinneberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,465

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1988, 3804924

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **20 Claims**



1. A method of determining the nuclear magnetisation distribution in a limited volume by means of a plurality of sequences, three r.f. pulses being applied to an examination zone in each sequence in the presence of a steady, uniform magnetic field, the first and the second r.f. pulse cooperating with a respective one of two magnetic fields whose gradients extend perpendicularly with respect to one another, stimulated echo signals generated in each sequence being added and subjected to a Fourier transformation, characterized in that each sequence comprises a sub-sequence (HF1′ . . . HF3′) which precedes the three r.f. pulses (HF1 . . . HF3) and which dephases the nuclear magnetisation everywhere outside a layer (S) in said examination zone which extends parallel to the plane defined by the two gradient directions (Gy, Gz), the sequences taking place in cycles, the sequences being repeated n times in each cycle, where n is larger than or equal to 3, all sequences of a cycle being distinct from one another as regards the phase difference between the first and the second r.f. pulse by 360°/n or an integer multiple thereof which is not zero, the spin resonance signals generated by the sequences being added so that FID signals produced by the third r.f. pulse (HF3) compensate for one another.

4,924,184

MAGNETIC RESONANCE APPARATUS

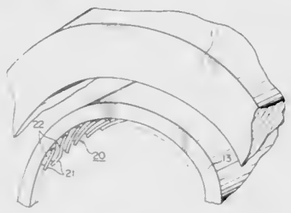
Kiyoshi Yoda, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 312,149

Claims priority, application Japan, Apr. 11, 1988, 63-87292

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **2 Claims**



1. A magnetic resonance apparatus comprising:

a magnet for generating a stationary magnetic field;

a magnetic field gradient coil for generating gradient magnetic field pulses;

a radio frequency coil disposed within said magnet and said magnetic field gradient coil for transmitting radio frequency pulses and receiving a magnetic resonance signal;

a radio frequency shield member disposed between said magnetic field gradient coil and said radio frequency coil, said radio frequency shield member including a plurality of electrically conductive strips each extending in the direction of axis of said magnet and being at least partly overlapping with respect to a neighbouring conductor strip and a plurality of non-conductors sandwiched between any two adjacent two conductive strips; and

a ring-shaped conductor disposed at each of the axial ends of said radio frequency coil along arcuated end portions of said radio frequency coil, said ring-shaped conductor having a capacitor inserted therein.

4,924,185

MAGNET APPARATUS FOR USE IN MAGNETIC RESONANCE IMAGING SYSTEM

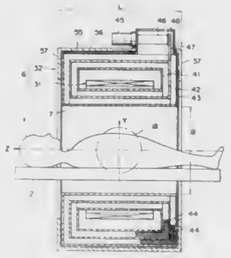
Kinya Matsutani, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1989, Ser. No. 328,460

Claims priority, application Japan, Mar. 25, 1988, 63-69620

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—319 **9 Claims**



1. A magnet apparatus for use in magnetic resonance imaging systems, said magnet apparatus having an axis and a bore extending coaxially with the axis and adapted to accommodate an examined body, said bore having the length (L) parallel with the axis and the diameter (B), said magnet apparatus comprising:

a superconducting coil disposed coaxially with the axis and radially outside the bore and capable of producing a main magnetic field inside the bore; and

a cryostat having a cylindrical wall which defines the bore such that the dimensions of the bore comply with $1.0 \leqq L/B' < 1.9$, accommodating said superconducting coil and keeping said coil in the superconducting state, said cryostat including:

a helium chamber containing liquid helium, said helium chamber accommodating said superconducting coil immersed in the liquid helium, thereby keeping said superconducting coil in the superconducting state;

a vacuum container having a vacuum internal space in which said helium chamber is accommodated;

a thermal radiation shield disposed in the internal space of said vacuum container and surrounding said helium chamber; and

means for cooling said thermal radiation shield to a specified temperature, whereby said thermal radiation shield cooperates with the internal space of said vacuum container to prevent the greater part of the radiant heat from entering said helium chamber from outside said vacuum container, thus said helium chamber being insulated from the radiant heat.

4,924,186

MAGNETIC RESONANCE IMAGING SYSTEM WITH AUXILIARY COMPENSATION COIL

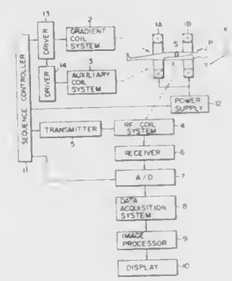
Hiromi Kawamoto, Tochigi, and Osamu Fujitsuka, Ootawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1987, Ser. No. 101,965

Claims priority, application Japan, Sep. 29, 1986, 61-228232; Sep. 30, 1986, 61-233466

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—320 **8 Claims**



1. A magnetic resonance imaging system, comprising: static field generation means for generating a static field applied to an object, gradient field application means including at least one pair of gradient field coils for applying a gradient field in the form of a pulse to the object disposed in said static field, high frequency wave transmitting/receiving means having high frequency coil means for applying a high frequency excitation pulse to the object in said static field and for detecting a magnetic resonance signal excited in said object, controlling/processing means for driving said gradient field application means and high frequency wave transmitting/receiving means at predetermined timing and for processing a magnetic resonance signal obtained by said high frequency wave transmitting-/receiving means to obtain magnetic resonance image data, and a conductive member disposed in the vicinity of the gradient field, said magnetic resonance imaging system further comprising:

auxiliary coil means, disposed independently of said gradient field coils, for producing a compensation field so as to cancel an eddy current which the gradient field causes in said conductive member, said auxiliary coil means being operated such that the center of said gradient field coincides substantially with the center of a field produced by said eddy current; and

current supply means for supplying a compensation current to said auxiliary coil means, in a manner to produce said compensation field.

4,924,187

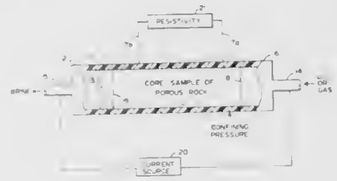
METHOD FOR MEASURING ELECTRICAL ANISOTROPHY OF A CORE SAMPLE FROM A SUBTERRANEAN FORMATION

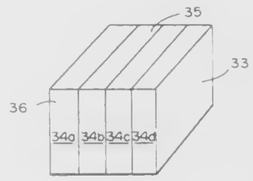
Eve S. Sprunt, Farmers Branch; R. Michael Davis, Bedford; W. David Kennedy, Dallas, and Samuel H. Collins, De Soto, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 12, 1989, Ser. No. 364,281

Int. Cl.[5] G01V *3/02*

U.S. Cl. 324—376 **16 Claims**





1. A method for measuring electrical anisotropy of a core sample from a subterranean formation, comprising the steps of:

(a) shaping said core sample to provide a plurality of pairs of parallel, planar outer surfaces on said core sample,

(b) measuring electrical resistivity in each of the azimuthal directions through said core sample which are perpendicular to each of said pairs of parallel, planar outer surfaces for each of a plurality of differing fluid saturations within said core sample, and

(c) comparing each of said measured electrical resistivities to identify the azimuthal direction of any electrical anisotropy through said core sample.

4,924,188

SPREAD SPECTRUM RECEIVER HAVING PHASE SHIFTER FOR EFFECTING PHASE SYNCHRONIZATION OF TWO CONVOLVERS

Shigeo Akazawa; Masaharu Mori, and Masahiro Hamatsu, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 250,236

Claims priority, application Japan, Oct. 6, 1987, 62-251910

Int. Cl.[5] H03K *5/13;* **H04B** *15/00*

U.S. Cl. 328—155 **4 Claims**

1. A spread-spectrum receiver, comprising:

a correlator which includes first and second convolvers each having first and second inputs, said first inputs each being supplied with a common spread-spectrum received signal;

first multiplier means for applying a first reference signal produced by multiplication of a first CW signal and a first PN code to said second input of said first convolver;

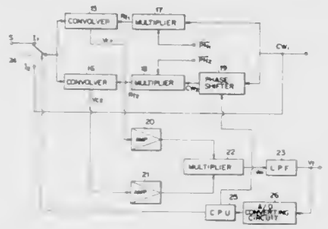
signal distributing means supplied with said first CW signal for distributing said first CW signal into first and second signals which are different in phase by 90 degrees;

function signal generating means responsive to a predetermined digital signal for generating a sine function signal and a cosine function signal;

weighting means for weighting said first and second signals

by said sine function signal and said cosine function signal, respectively;

adder means for adding said weighted first and second signals from said weighting means to generate a second CW signal which has the same frequency as and a predetermined phase difference from said first CW signal;



second multiplier means for applying a second reference signal produced by multiplication of said second CW signal and a second PN code to said second input of said second convolver; and

demodulating means for demodulating data by multiplying outputs of both of said convolvers.

4,924,189

TWO-PORT SWITCHED CAPACITOR FILTER NETOWRK WITH LINEARIZED PHASE/FREQUENCY RESPONSE

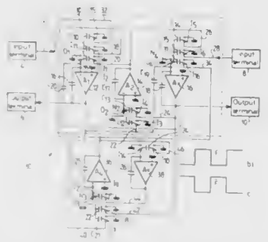
Patrice Senn, and Mohamed S. Tawfik, both of Grenoble, France, assignors to L'Etat Francais, represente par la Ministre Delegue des Postes et Telecommunications, (Centre National d'Etudes des Telecommunications), Issy Les Moulineaux, France

Filed Aug. 24, 1988, Ser. No. 235,494

Claims priority, application France, Aug. 26, 1987, 87 11962

Int. Cl.[5] H03H *11/12, 19/00*

U.S. Cl. 328—167 **8 Claims**



1. A two-port switched capacitor filter network comprising:

two input terminals;

two output terminals;

a first integrator circuit having three inputs provided with capacitors which are switched under control of first and second clock states which are distinct from each other, a first input of the first integrator circuit being connected to a first of the input terminals, and an output of the first integrator circuit being connected to a first of the output terminals;

a second integrator circuit having two inputs provided with capacitors which are switched under control of the first and second clock states, with a first input of the second integrator circuit being connected to the output of the first integrator circuit and with an output of the second integrator circuit constituting a second input of the first integrator circuit;

a third integrator circuit having three inputs provided with capacitors which are switched under control of the first and second clock states, the first input of the third integrator circuit being connected to the output of the second integrator circuit, the second input of the third integrator circuit being connected to a second of the input terminals and an output of the third integrator circuit being connected to a second of the output terminals and also to a second input of the second integrator circuit;

a fourth integrator circuit having three inputs provided with capacitors which are switched under control of the first and second clock states, the first input of the fourth integrator circuit being connected to the output of the first integrator circuit and the second input of the fourth integrator circuit being connected to the output of the third integrator circuit, and an output of the fourth integrator circuit being connected to a third input of each of the first and third integrator circuits; and

a fifth integrator circuit having a single input provided with a capacitor which is switched under control of first and second clock states, also connected to the output of the fourth integrator circuit and having an output connected to a third input of the fourth integrator circuit; said five integrator circuits being interconnected to constitute a sampling filter having a linear phase/frequency response.

4,924,190

AMPLIFIERS

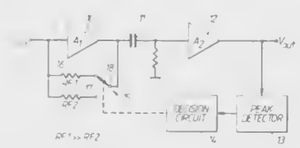
Michael P. Cooke, Wiltshire, Great Britain, assignor to Plessey Overseas Limited, Essex, England

Filed Jul. 21, 1988, Ser. No. 222,421

Claims priority, application United Kingdom, Jul. 21, 1987, 8717152

Int. Cl.[5] H03F *1/36;* **H03G** *3/20*

U.S. Cl. 330—86 **3 Claims**



1. An amplifier having a feed-back path, a variable resistance in the feed-back path, and means for varying the value of the variable resistance in accordance with an output of the amplifier to increase the dynamic range of the amplifier, wherein the variable resistance comprises a plurality of resistors, and the means for varying the resistance is arranged to detect the magnitude of the output of the amplifier and to select the appropriate resistor or resistors for inclusion into the feed-back path, said means for varying the resistance comprising a peak detector and a decision circuit, with the peak detector being arranged to monitor the output of the amplifier, and said decision circuit comprising a logic circuit, the plurality of resistors comprising a first resistor switched into the feed-back path on a logic '1' output of the decision circuit and a second resistor switched into the feed-back path in response to a logic '0' output of the decision circuit.

4,924,191

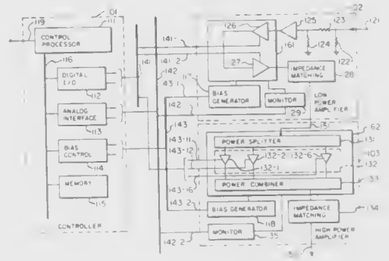
AMPLIFIER HAVING DIGITAL BIAS CONTROL APPARATUS

Lee A. Erb; Alan R. Carr, both of Boulder; Paul G. Beaty, Broomfield; Brian D. Bandhauer, Louisville, and Mitchell A. Randall, Boulder, all of Colo., assignors to Erbtec Engineering, Inc., Boulder, Colo.

Filed Apr. 18, 1989, Ser. No. 340,385

Int. Cl.[5] H03F *3/68*

U.S. Cl. 330—130 **11 Claims**



9. In an amplifier circuit that includes a plurality of amplifying elements, a digital control apparatus for regulating the operating point of said amplifying elements comprising:

means for storing bias signal values individual to each of said amplifying elements;

means for selecting an individual one of said amplifying elements for operating point testing;

means for applying a bias signal representative of the associated one of said stored bias signal values to said selected amplifying element;

means for monitoring the output signal generated by said selected amplifying element;

means responsive to said monitored output signal for modifying said associated stored bias signal value if said monitored output signal deviated from a predetermined value by greater than a predetermined amount.

4,924,192

ADJUSTING APPARATUS FOR ADJUSTING SOUND VOLUME OR SOUND QUALITY

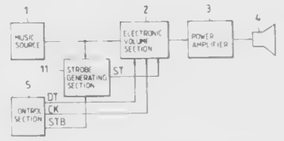
Yoshio Sasaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,073

Claims priority, application Japan, Jun. 14, 1988, 63-144825

Int. Cl.[5] H03G *3/30*

U.S. Cl. 330—279 **6 Claims**



1. An adjusting apparatus for adjusting at least one of sound volume and sound quality, having an electronic volume section comprising a group of analog switches responsive to a control signal for adjusting said at least one of sound volume and sound quality with respect to a reproducing signal of a music source, said apparatus avoiding distortion in said reproducing signal due to switching of an adjustment of said electronic volume section and further comprising:

signal generating means for generating said control signal, said signal generating means including:

zero-cross generating means for providing a detection signal upon detection of an approximately zero-cross point of the reproducing signal of said music source;

control means for generating a standby signal which allows said signal generating means to operate said electronic volume section; and

logical means for generating a logical product between said zero-cross detection signal and said standby signal to generate said control signal.

4,924,193

VOLUME CONTROL CIRCUIT FOR USE IN PORTABLE TELEPHONE OR THE LIKE

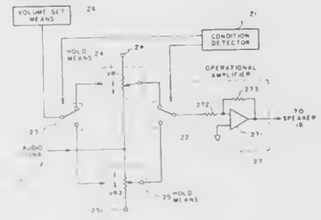
Akio Saito, Tokyo, and Masahiro Ishigami, Saitama, both of Japan, assignors to NEC Corporation, Japan

Filed Jan. 28, 1988, Ser. No. 149,626

Claims priority, application Japan, Jan. 30, 1987, 62-18189

Int. Cl.[5] H03G *3/18;* **H04B** *1/00*

U.S. Cl. 330—284 **13 Claims**



1. A volume control circuit comprising:

amplifier means for amplifying an audio signal;

first and second holding means for holding the gain of said amplifier means at a first and second predetermined value, respectively;

condition detector means for producing a condition detect signal in response to a detection of a condition of use of equipment which incorporates said circuit; and

switch means for selectively enabling one of said first and second holding means in response to said condition detect signal, said condition detector means comprising a plunger which is movable when operated from outside said equipment.

4,924,194

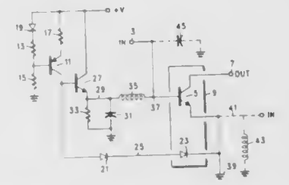
RF POWER AMPLIFIER

George F. Opas, Park Ridge, and Edward C. Porrett, Elgin, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 19, 1989, Ser. No. 355,205

Int. Cl.[5] H03F *1/30*

U.S. Cl. 330—289 **21 Claims**



21. A linear RF power amplifier including an output transis-

tor and a thermally-variable device thermally adjacent to said output transistor, said thermally-variable device thermally responsive to said output transistor and having means for providing temperature compensation for said output transistor, the improvement comprising:

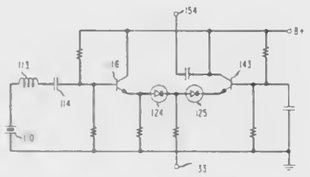
said thermally-variable device including a PIN-type diode.

4,924,195

CRYSTAL OSCILLATOR WITH BROAD TUNING CAPABILITY

Joseph Gonda, Moultonboro, N.H., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 19, 1989, Ser. No. 368,691
Int. Cl.[5] H03B *5/36*
U.S. Cl. 331—116 R **10 Claims**



1. A crystal controlled oscillator comprising:

a first transistor connected in grounded collector-emitter-follower configuration to provide a relatively high impedance input as its base electrode and a relatively low impedance output at its emitter electrode;

a crystal resonator connected to said high impedance input, and

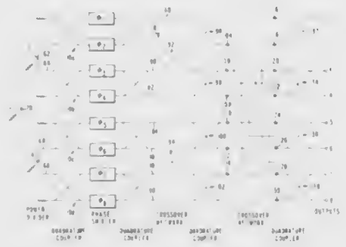
a second transistor connected as a buffer amplifier in a grounded base configuration having a relatively low impedance input connected to said first transistor low impedance output and a relatively high impedance output for connection to a load.

4,924,196

WAVEGUIDE MATRIX SWITCH

Harold A. Uyeda, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 14, 1988, Ser. No. 284,034
Int. Cl.[5] H01P *1/10*
U.S. Cl. 333—101 **17 Claims**



1. A microwave switch comprising:

at least one switch input port and first, second, third, fourth, fifth, sixth, seventh, and eighth output ports;

a plurality of signal divider means each having divider input ports connected to said switch input port and each having a pair of outputs for equally dividing an input microwave signal into four in-phase first signal components;

a first coupling means connected to receive each said first signal component for equally dividing each said first signal component into quadrature phased second signal components;

a phase shifter means connected to receive said second signal components and selectively operable between first and second states to output individual ones of said second signal components with one of a zero and a 180 degree phase shift, respectively;

second coupling means connected to receive the second signal components from predetermined pairs of said phase shifter means for equally dividing each said second signal component into quadrature phased third signal components;

third coupling means connected to receive predetermined pairs of said third signal components for equally dividing said third signal components into quadrature phased fourth signal components for equally dividing said fourth signal components into quadrature phased fourth signal components;

fourth coupling means connected to receive predetermined pairs of said fourth signal components for equally dividing said fourth signal components into quadrature phased fifth signal components; and

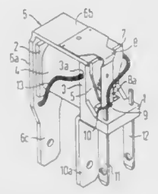
said output ports being connected to receive said fifth signal components, said fifth signal components comprising a plurality of phased signal components of phase determined by the combination of predetermined pairings of inputs to said first through said fourth coupling means and the selected operative states of said phase shifting means, seven of the outputs of said output ports having a vector sum of zero and one of the outputs of said output ports having a vector sum of one.

4,924,197

ELECTROMAGNETIC RELAY

Richard Siepmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 12, 1989, Ser. No. 350,726
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1988, 8808401
Int. Cl.[5] H01H *67/02*
U.S. Cl. 335—128 **6 Claims**



1. An electromagnetic relay, comprising:

a coil having a coil member with end flanges and a winding on said coil member between said end flanges;

a core arranged axially inside said winding, said core having a first end and a second free end;

a yoke arranged outside of said winding and being connected to said first end of said core;

an armature seated at said yoke and forming a working air gap with said second free end of said core;

a switch contact mounted for actuation by said armature; a terminal element;

a power lead element connected to said terminal element at one side of said coil;

one of said end flanges of said coil member having a transverse opening; and

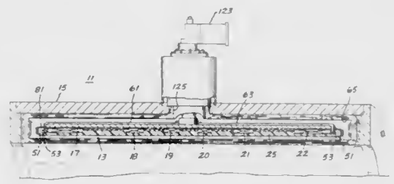
said power lead element passing through said transverse opening in said one end flange and being connected to said switch contact after said power lead element passes through said transverse opening relative to said terminal element.

4,924,198

SUPERCONDUCTIVE MAGNETIC RESONANCE MAGNET WITHOUT CRYOGENS

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1988, Ser. No. 215,165
Int. Cl.[5] H01F *7/22*
U.S. Cl. 335—216 **12 Claims**



1. A magnet for magnetic resonance imaging not requiring consumable cryogens, cryogen liquid or vapor cooling of superconducting coils comprising;

a resin impregnated coil of superconductor wire;

heat conductive means, having a thermal conductivity greater than the resin, contacting the impregnated coil along the length of at least one of the impregnated coil surfaces;

a thermal radiation shield spaced away from and surrounding said resin impregnated coil and said heat conductive means;

an evacuable housing spaced away from and surrounding said shield, the housing supporting shield, heat conductive means and impregnated coil; and

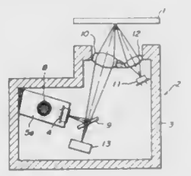
a multiple stage cryocooler mounted in said housing, one stage thermally coupled to said radiation shield, another stage capable of achieving lower temperatures than the other stage thermally coupled to said heat conductive means, whereby said superconductor wire can operate superconductively without quenching in a vacuum without being immersed in cryogen liquid or vapor.

4,924,199

OPTICAL CARD FOR DATA STORAGE FOR USE IN A DATA RECORDING AND RETRIEVING APPARATUS

Akihiko Hashimoto, Hachioji; Toshihiro Kitahara, Akishima; Hiroshi Hashi, Higashimurayama, and Takao Rokutan, Koganei, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed May 18, 1987, Ser. No. 50,430
Claims priority, application Japan, May 23, 1986, 61-118663; May 28, 1986, 61-122892; Mar. 17, 1987, 62-60228
Int. Cl.[5] G06K *19/06, 7/10*
U.S. Cl. 235—494 **12 Claims**



1. An optical card for storing data as optically readable pits comprising:

(a) a substrate having a data storage area; and

(b) a plurality of track units formed in the data storage area, each of said track units comprising:

(i) a data section comprised of two sets of data tracks, wherein, each set of data tracks includes an equal number of a plurality of adjacent data tracks, each data track comprises a plurality of optically readable data pits in linear alignment, all data tracks within both sets of data tracks are aligned in a first direction in parallel with each other and are aligned in a second direction perpendicular to said first direction so that said data pits are aligned in a column in said second direction thereby forming one or more bytes of simultaneously readable data, and wherein there is no vacant space between adjacent pits within a set of data tracks when viewed in either the first or second direction;

(ii) a control track situated between the two sets of data tracks and aligned in the first direction in parallel with said data tracks, said control track being comprised of a plurality of control blocks each having the same configuration and being equidistantly spaced from each other as viewed in the first direction; and

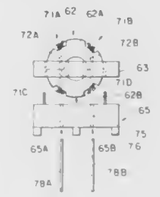
(iii) a track address section disposed at one or both ends of each track unit as viewed in the first direction, said track address section being comprised of data tracks wherein information identifying a track unit is recorded, said information including a track unit identifier that generically identifies a track unit, and a track number that uniquely identifies a track unit.

4,924,200

SPLIT BOBBIN AND COIL DEVICE

Satoru Kitahara; Koichi Yasuda, and Toshio Izu, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,812
Claims priority, application Japan, Mar. 23, 1988, 63-38946
Int. Cl.[5] H01F *15/02, 15/10, 27/30*
U.S. Cl. 336—65 **3 Claims**

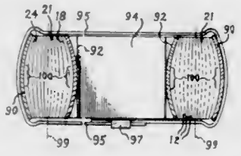


1. A coil device including a split bobbin having coil winding areas, winding end fastening members provided on an outer periphery, and collars, provided with through holes, connected to said winding end fastening members; a core produced of a magnetic material with said bobbin mounted in a split state; a coil wound on said bobbin in said winding areas, with its end wound on said winding end fastening members; and a bobbin holding base which supports said bobbin and said coil in a fitted state, and has lead terminals routed in said through holes of said collars to said winding end fastening members, the end of said coil is connected with said lead terminals at said winding end fastening members.

4,924,201
CORE AND COIL ASSEMBLY FOR A TRANSFORMER HAVING AN AMORPHOUS STEEL CORE

Donald E. Ballard, Conover, N.C., assignor to General Electric Company, King of Prussia, Pa.

Division of Ser. No. 237,378, Aug. 29, 1988, Pat. No. 4,847,987.
This application Jan. 13, 1989, Ser. No. 296,620
Int. Cl.[5] H01F 27/24
U.S. Cl. 336—210 10 Claims



1. A core and coil assembly for an amorphous metal core transformer, comprising:

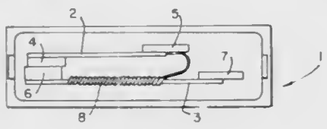
(a) a coil subassembly having a coil window of generally rectangular cross-section, the coil window being bounded by two spaced-apart generally-parallel end faces and two spaced-apart side faces, at least one side face being slightly concave, the side faces each having two end regions adjacent said end faces and a central region, the central regions of the side faces being spaced apart by a slightly greater amount than the end regions,

(b) a core having a leg that fits within said coil window and comprises superposed substantially-aligned strips of amorphous steel stacked in the direction of the leg thickness, each strip having two edges spaced apart by the width of the strip and a central region disposed centrally of said two edges, the width of the strips approximating the distance between said coil-window end faces, the strips being characterized by a slightly greater thickness in their central region than in the regions of their edges, said leg having a thickness that is substantially less in both edge regions of said strips than in the central region of said strips, thereby rendering said leg capable of fitting more tightly within said coil window.

4,924,202
NON-CYCLING ELECTRICAL CIRCUIT BREAKER

John L. Schneider, Raymond, and Stephen T. Manchester, Limerick, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 27, 1989, Ser. No. 315,648
Int. Cl.[5] H01H 71/22
U.S. Cl. 337—100 4 Claims

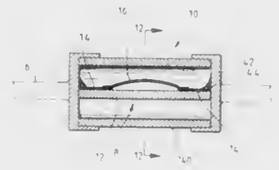


1. An electrical circuit breaker comprising: an elongated compensator bimetal having a contact A at one end thereof and connected to a terminal A at its other end; an elongated armature bimetal having a contact B at one end thereof and connected to a terminal B at its other end; the arrangement of the high and low expansion layers of the bimetals being such that the bimetals deflect in the same direction when they are heated; a heater wire wrapped around the armature bimetal and electrically connected between terminals A and B, the arrangement of the heater wire being such that, in operation, with contacts A and B closed, no current flows through the heater wire but upon overload, when contacts A and B open, current flows through the heater wire and generates sufficient heat to keep the armature bimetal deflected, thereby keeping contacts A and B apart.

4,924,203
WIRE BONDED MICROFUSE AND METHOD OF MAKING

Leon Gurevich, St. Louis, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 29,831, Mar. 24, 1987. This application Jun. 29, 1988, Ser. No. 212,986
Int. Cl.[5] H01H 85/16
U.S. Cl. 337—231 8 Claims



1. A fuse subassembly comprising:

a flat insulating substrate;

a first end of said substrate;

a second end of said substrate;

a metallized area on said first end and a metallized area on said second end of said substrate;

a fusible element attached to said metallized areas in a manner not employing solder or flux;

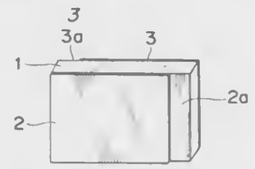
an enclosure, having a first end and a second end, said enclosure surrounding said substrate, metallized area, and fusible element; and,

a ferrule attached to each of said metallized area and said ends of said enclosure.

4,924,204
ORGANIC PTC THERMISTOR DEVICE

Katsuyuki Uchida, Ohmihachiman, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 22, 1988, Ser. No. 275,101
Claims priority, application Japan, Nov. 27, 1987, 62-301218
Int. Cl.[5] H01C 7/10
U.S. Cl. 338—22 R 3 Claims



1. An organic-PCT thermistor device which comprises:

an organic-PCT thermistor element having first and second surfaces opposite to each other;

first and second electrode layers deposited on the first and second surfaces, respectively; said first and second electrode layers having respective non-electrode regions defined therein; said non-electrode regions in the first and second electrode layers being displaced in position with respect to each other; and

first and second terminal members elastically engaged respectively to a portion of the first electrode layer that is aligned with the non-electrode region in the second electrode layer, and to a portion of the second electrode layer that is aligned with the non-electrode region in the first electrode layer.

4,924,205
CHIP RESISTOR AND METHOD OF MANUFACTURING A CHIP RESISTOR

Didier Y. F. Caporali, and Frans L. A. Geernickx, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1989, Ser. No. 295,717
Claims priority, application Netherlands, Jan. 25, 1988, 8800156
Int. Cl.[5] H01C 1/02
U.S. Cl. 338—227 4 Claims

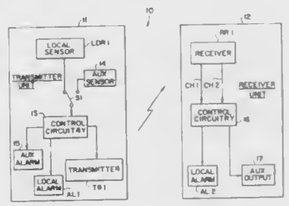


1. A chip resistor comprising of cuboid ceramic resistor body, electrically insulating layers completely covering a first pair of opposing side faces of said resistor body, and metal current-supply strips provided on a second pair of opposing side faces of said resistor body and extending over the edges of said first pair of opposing side faces covered with layers of said electrically insulating layers so as to partially cover said electrically insulating layers.

4,924,206
CAR SECURITY SYSTEM AND METHOD

Robert F. Ayers, 206 Missouri Ave., Lynn Haven, Fla. 32444

Filed Dec. 5, 1988, Ser. No. 279,868
Int. Cl.[5] B60R 25/00
U.S. Cl. 340—426 18 Claims

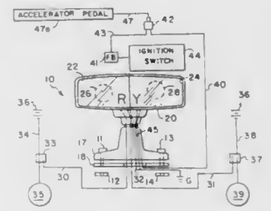


1. A security system for indicating access to a protected area comprising a transmitter means providing a radio frequency signal, power supply means for supplying electric power to said transmitter means, receiver means adapted to continuously receive said radio frequency signal as an input signal and to provide a receiver output signal in response to said received input signal, indicating means operatively coupled to said receiver means and responsive to a disabling condition of an insufficient said input signal to provide said receiver output signal, said radio frequency signal having a first and second frequency component, said receiver output signal in response to said first frequency component and a second receiver output signal in response to said second frequency component, said indicating means adapted to be responsive to said first and second receiver output signals for providing an indicator output signal in the absence of one of said first and second receiver output signals.

4,924,207
VEHICLE SAFETY LIGHT ASSEMBLY

Emory L. Lariscy, Stuart, Va., assignor to Lariscy Enterprises Inc., Patrick Springs, Va.

Filed Apr. 10, 1989, Ser. No. 335,838
Int. Cl.[5] B60Q 1/26
U.S. Cl. 340—467 7 Claims



1. A combination braking and deceleration warning light system for timely warning the driver of a trailing vehicle of the deceleration and braking actions of a lead vehicle driver, comprising:

a unitary lamp housing adapted to be installed at the rear area of a vehicle;

said lamp housing having a first and a second separate compartment,

a first electric light bulb mounted in said first separate compartment and a second electric light bulb mounted in said second separate compartment,

a red lens closing the front of said first compartment and an amber lens closing the front of said second compartment,

said first electric light bulb in said first compartment having a pair of lead wires for electrically connecting said bulb to a brake power line leading to each of the vehicle brake lights, and a ground wire for grounding said first electric light bulb to the vehicle chassis,

said second electric light bulb having a ground wire and a lead wire extending therefrom, said ground wire serving to ground said second bulb to the vehicle chassis,

a switch member mounted on the carburetor of the vehicle,

said lead wire extending from said second electric light bulb being in electrical connection with said switch member,

said switch member having a first electrical contact connected to said lead wire extending from said second bulb and a second electrical contact connected to the vehicle fuse box such that current is received from the fuse box when the vehicle ignition switch is in the "on" position,

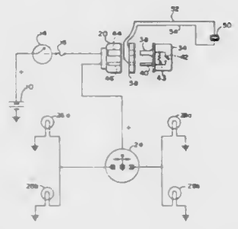
said switch member being mounted adjacent to the throttle valve arm leading to the vehicle carburetor such that when the throttle valve arm is in position to maintain the throttle valve closed, said switch will be in contact with the throttle valve arm and maintained in the closed position causing said second light bulb to burn and when the throttle valve is opened, movement of the throttle valve arm out of contact with said switch member permits said switch member to open and interrupt the current flow to said second bulb causing said second bulb to cease burning, and

an elongated bracket member having a first end attached to the carburetor of the vehicle and a second end having adjustable means thereon for linear, adjustable, attachment of said switch member thereto, said elongated bracket member serving to mount said switch member adjacent to the throttle valve arm,

said adjustable means including a slotted opening disposed adjacent said second end of said elongated bracket, a threaded terminus on said switch member positioned within said slotted opening, and a nut threadingly positioned on said threaded terminus to engage said bracket

and maintain said switch member in relative fixed position along the length of the slotted opening of said bracket.

4,924,208
AUDIO INDICATOR FOR A MOTOR VEHICLE DIRECTION SIGNAL CIRCUIT
Joseph E. Coughlin, 1125 Jackson St., Easton, Pa. 18042
Filed Jan. 18, 1989, Ser. No. 298,485
Int. Cl.[5] B60Q *1/34*
U.S. Cl. 340—474 15 Claims



1. An audio indicator for a motor vehicle direction signal circuit including a battery and a turn signal switch connecting the battery to at least one indicator lamp through a set of periodically switchable contacts and mean for intermittently opening and closing said contacts to flash the indicator lamps, the audio indicator comprising:

an electrically operated sound generating device connected in parallel with said switchable contacts, whereby when said contacts are closed, said indicator lamps are "on", and current is shorted through said contacts such that said sound generating device is "off"; and when said contacts are open, said indicator lamps are "off", battery voltage appearing across said switchable contacts and said sound generating device, whereby said sound generating device is "on", said sound generating device thereby producing an intermittent audible signal alternating with operation of the indicator lamp, alerting a driver of activation of said signal circuit.

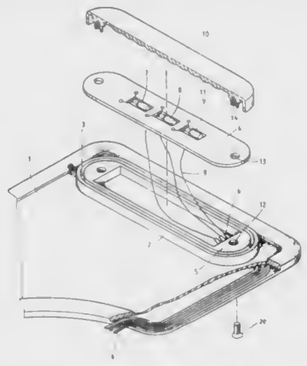
4,924,209
CAR FENDER WITH BRAKE LIGHT DEVICE
Chung-Chen Kao, No. 2-3 Tsou Tsuoh Luen, Shoei Yuan Li, Tansui, Taipei, Taiwan
Filed May 25, 1989, Ser. No. 356,851
Int. Cl.[5] B60Q *1/44*
U.S. Cl. 340—479 2 Claims

1. A car fender with brake light device, comprising:

a fender sheet having a light seat provided with a peripheral groove;

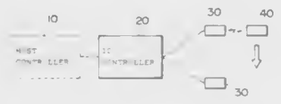
a circuit board having conducting plates, position light means and brake light means, said circuit board being mounted on said light seat; and

a light cover fitted in said peripheral groove of said light seat to encapsulate said circuit board for waterproof ability, a set of wires being disposed on said circuit board to electrically connected said light means with said conducting plates, said conducting plates being extended through said fender sheet to electrically connect with external brake



circuit and activating circuit, whereby said brake light means is lighted when the brake of a car is applied.

4,924,210
METHOD OF CONTROLLING COMMUNICATION IN AN ID SYSTEM
Kenji Matsui, Nagaokakyo, and Yasuo Uchida, Takatsuki, both of Japan, assignors to Omron Tatelsi Electronics Company, Hanazono, Japan
Filed Mar. 16, 1988, Ser. No. 168,775
Claims priority, application Japan, Mar. 17, 1987, 62-63469; Mar. 17, 1987, 62-63470
Int. Cl.[5] G08B *13/14*
U.S. Cl. 340—572 10 Claims



1. A method of controlling communication in an ID system in which an exchange of data is carried out between a controller and plural types of data carriers having respective internal memories and different communication protocols, said method comprising the steps of:

previously registering the different types of communication protocols of the plurality of data carriers in a memory of said controller in correspondence with classification information of the communication protocols;

previously registering in the memory of each data carrier the classification information of its own communication protocol;

causing said controller to receive classification information sent by a data carrier at the beginning of communication;

causing said controller to select a corresponding communication protocol from its memory using the received classification information; and

causing said controller to communicate with the corresponding data carrier in accordance with the selected communication protocol.

4,924,211
PERSONNEL MONITORING SYSTEM
Ronald C. Davies, Ft. Lauderdale, Fla., assignor to Digital Products Corporation, Ft. Lauderdale, Fla.
Filed Oct. 28, 1988, Ser. No. 264,201
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—573 22 Claims

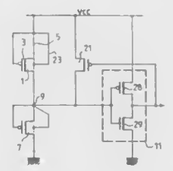


1. Apparatus for monitoring a plurality of persons at a plurality of preselected monitoring locations comprising:

(a) a plurality of local units each disposed at a monitoring location and associated with a person to be monitored at such monitoring location, each said local unit including detector means for determining the presence or absence of the associated person to be monitored and providing presence or absence information accordingly, each said local unit further including report signal sending means for transmitting a report radio signal bearing said presence or absence information through free space from the monitoring location; and

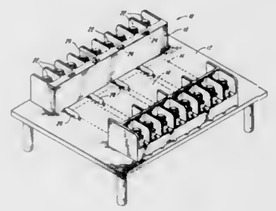
(b) a mobile unit including report signal receiving means for detecting the report signal from the local unit at each said monitoring location while the mobile unit is within range thereof and recovering the presence information from the detected report signal, whereby presence information regarding all of the persons to be monitored can be recovered by bringing said mobile unit within range of all said monitoring locations seriatim.

4,924,212
TEMPERATURE THRESHOLD DETECTION CIRCUIT
Serge Fruhauf, Peynier, and Eric Mattera, Gardanne, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France
Filed Aug. 23, 1988, Ser. No. 235,280
Claims priority, application France, Aug. 31, 1987, 87 12070
Int. Cl.[5] G08B *17/00*
U.S. Cl. 340—598 6 Claims



1. A temperature threshold detection circuit comprising at least one transistor, reverse biased by an electrical supply circuit, and means for measuring the reverse saturation current which flows through this transistor, wherein the measuring means comprise a second transistor in series with the first transistor and reverse biased by the supply, having a size different from that of the first transistor, and a threshold comparator connected to the mid-point of these two transistors.

4,924,213
MULTIPLE TERMINAL BLOCK INDICATOR LIGHT COMBINATION
David R. Decho, Carol Stream, and William H. Jones, Villa Park, both of Ill., assignors to Reed Devices, Inc., Carol Stream, Ill.
Filed Mar. 23, 1989, Ser. No. 327,744
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—653 39 Claims



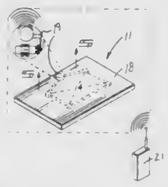
1. An electrical terminal block assembly for use in combination with a circuit board, comprising:

a terminal block housing adapted for mounting onto the circuit board;

a plurality of terminals disposed in said terminal block housing, each of said plurality of terminals having at least one conductive member extending below said housing for coupling to the circuit board;

signalling means for indicating operational status disposed on said terminal block housing in proximate alignment and association with said plurality of terminals, said signalling means having at least one conductive lead extending below said housing for coupling to the circuit board.

4,924,214
DOOR MAT ALARM
Lennard C. Hill, 394 Orange St. #11, Oakland, Calif. 94610
Filed Apr. 17, 1989, Ser. No. 339,228
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—666 1 Claim



1. A door mat alarm apparatus for indication of a mat deforming pressure directed onto an upper surface of said mat, said apparatus comprising,

a mat including a forward edge, a rear edge, side edges joining said forward edge and said rear edge, a bottom surface, and said upper surface;

a matrix of pressure responsive switches positioned within said mat for detecting and directing a signal in response to said mat deforming pressure, and a remote receiver for reception of said signal, and

wherein said mat comprises an elongate compressible flexible resilient mat, and wherein said mat deforming pressure is operative to actuate said switches remote from said switches, and

wherein said apparatus further includes a transmitter encapsulated within said mat, and

wherein said transmitter is positioned adjacent a forward edge of said mat, and

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wherein said remote receiver is portably transportable by an individual, and

wherein the bottom surface of said mat includes a matrix of orthogonally and downwardly extending friction projections for maintaining said mat in orientation relative to a support surface, and

further including a battery access cover positioned within said bottom surface to provide access to said transmitter and to provide insertion of a battery through said battery access cover to provide power to said transmitter.

4,924,215

FLAT PANEL COLOR DISPLAY COMPRISING BACKLIGHT ASSEMBLY AND FERROELECTRIC LIQUID CRYSTAL SHUTTER ASSEMBLY

Terence J. Nelson, New Providence, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 12, 1988, Ser. No. 180,442
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—701 3 Claims



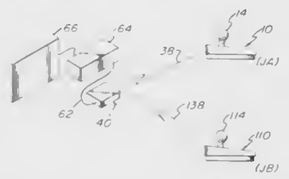
1. A flat panel color display comprising a light emitting row backlight assembly, row backlight driver means for sequentially addressing one or more of said light emitting rows, a ferroelectric liquid crystal column shutter assembly disposed in front of said row backlight assembly including means for driving the column shutters of said assembly, spaced column electrodes coupled to said column shutter driving means, said row backlight and column shutter driver means synchronized to cause a desired image to be formed from said display, and wherein color is formed by means for providing varying phase retardation of light passing through the ferroelectric shutter assembly, wherein said means for providing a variation in said phase retardation comprises different thicknesses of said ferroelectric liquid crystal so as to correspond to the primary colors required to form a color display arranged sequentially along said columns.

4,924,216

JOYSTICK CONTROLLER APPARATUS

Albert M. Leung, Burnaby, Canada, assignor to Acemore International Ltd., Lemoyne, Pa.

Filed Feb. 12, 1988, Ser. No. 155,669
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—709 18 Claims



1. Joystick controller apparatus for video games and the like, comprising:

a first manually operable control apparatus including a directionally operable joystick switch means and at least one additional switch, for providing signal information means for transmitting a first signal of infrared light energy on a modulated carrier of a predetermined frequency to include an address signal for said first manually operable control apparatus and signal information from said directionally operable joystick switch means and said at least one additional switch, said first signal having a duration of T0 and a repetition period of T1;

a second manually operable control apparatus including a second directionally operable joystick switch means and at least one additional second switch for providing signal information means for transmitting a second signal of infrared light energy on a modulated carrier of said same predetermined frequency to include an address signal for said second manually operable control apparatus and signal information from said second directionally operable joystick switch means and said at least one additional second switch, said second signal having a duration substantially equal to T0 and a repetition period of T2, said T2 being selected to be at least two T0 greater than T1, at least 4 times greater than T0 and less than 16.6 milliseconds; and

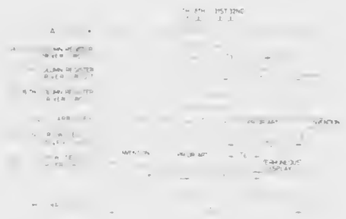
receiver means for receiving infrared light energy signals having said modulated carrier of said predetermined frequency and detecting the modulation thereon, said receiver means including means for decoding said first and second signals and separating them by address and means for providing separate control signals by means of wire connections to a video game.

4,924,217

DRIVER CIRCUITS FOR DOT MATRIX DISPLAY APPARATUS

Hirosbi Uwai, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 15, 1987, Ser. No. 96,494
Claims priority, application Japan, Nov. 10, 1986, 61-265637
Int. Cl.[5] G09G *3/20, 3/32*
U.S. Cl. 340—782 3 Claims



1. A dot matrix display apparatus comprising:

at least one display panel unit having a plurality of light emitting elements arranged in matrix fashion;

at least one shift register for storing image data for each row in sequence in response to clock signals;

at least one column driver composed of plural column driver circuits for activating the light emitting elements arranged in a row on the basis of image data stored in said shift register;

a counter for counting clock signals and outputting a carry signal to store data in the shift register without activating the row driver whenever the counted clock signal exceeds the number of light emitting elements arranged in a row;

a carry counter for counting the carry signals and outputting a coded row selecting signal;

a decoder for decoding the coded row selecting signal, said decoder being disabled when a carry signal is being applied thereto; and

a row select driver composed of plural row driver circuits for selecting light emitting elements arranged in a predetermined row on the basis of the decoded row selecting signal, said row select driver also being disabled when the carry signal is applied to said decoder;

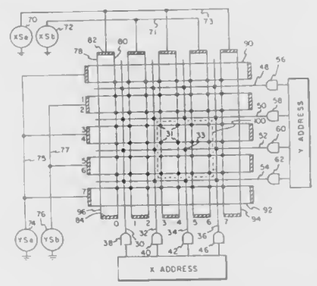
said display apparatus further comprises means for disabling said decoder for a predetermined time period before and after the carry signal to increase the decoder disabling time period in such a way that a current row driver circuit of the row select driver is turned off to deactivate the display panel unit being advanced by a time period from a carry signal rise time to store a first column data for a succeeding row in the shift register after the current row driver circuit has been turned off, and a succeeding row driver circuit of the row select driver is turned on to activate the display panel unit being delayed by said time period from a carry signal fall time to select a succeeding driver circuit of the row select driver after the last column driver circuit of the row driver has been turned off.

4,924,218

INDEPENDENT SUSTAIN AND ADDRESS PLASMA DISPLAY PANEL

Larry F. Weber, Champaign, Ill., and Richard C. Younce, South Bend, Ind., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

Division of Ser. No. 787,541, Oct. 5, 1985, Pat. No. 4,772,884.
This application Jul. 11, 1988, Ser. No. 217,404
Int. Cl.[5] G09F *9/00*
U.S. Cl. 340—776 3 Claims



2. In an ac plasma panel, a method for controlling the discharge state of at least a pair of coupling discharge sites adjacent to and on either side of an address site, which address site is bounded by a pair of orthogonally oriented X and Y drive lines, said address site being bounded by four pixel sites at the intersections between a pair of X sustain lines and a pair of orthogonally oriented Y sustain lines, the intersections of said X and Y drive lines respectively with said Y and X sustain lines, defining said coupling discharge sites, the method comprising:

applying a positive voltage signal between said X and Y drive lines, said signal poled so as to cause said X drive line to be more positive than said Y drive line and being of sufficient voltage to create an intense plasma discharge at said address site, which discharge spreads along said X drive line and deposits residual wall charges at a pair of adjacent coupling discharge sites; and

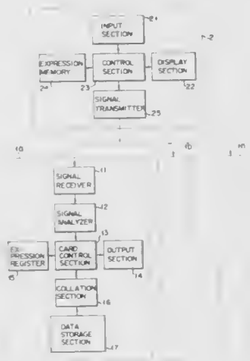
subsequently applying time-phased sustain signals via said Y sustain lines to said pair of coupling discharge sites to cause said sites to discharge and cause a transfer of wall charge from a coupling discharge site to at least one said pixel site.

4,924,219

RETRIEVAL APPARATUS USING LOGICAL OPERATORS

Matsamitsu Satō, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 31, 1987, Ser. No. 80,308
Claims priority, application Japan, Aug. 13, 1986, 61-190101
Int. Cl.[5] G08B *5/22*
U.S. Cl. 340—825.49 16 Claims



1. A hand-held book retrieval apparatus for use in a library, comprising:

retrieval request generating means including:

retrieval condition generating means for inputting a condition including at least logical product, logical sum, and logical negation for retrieving an object requested to be retrieved;

retrieval condition transmission means for transmitting the retrieval condition input from said retrieval condition generating means; and

retrieval request response means individually attached to a plurality of objects to be retrieved, and including:

retrieval condition reception means for receiving the retrieval condition including at least logical product, logical sum, and logical negation transmitted from the retrieval condition transmission means;

retrieval condition analyzing means, including means for performing at least any of the logical product, logical sum, and logical negation, for analyzing the retrieval condition received by said retrieval condition reception means;

identification information storage means for storing identification information inherent to the objects to be retrieved;

collating means for collating the analysis result from said analyzing means with the inherent identification information stored in said identification information stored means and outputting a coincidence signal when a coincidence is detected; and

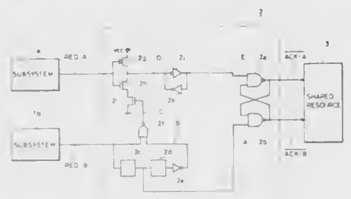
signaling means for signaling, in response to the coincidence signal from said collation means, that the object requested to be retrieved is present.

4,924,220

ARBITER CIRCUIT FOR PROCESSING CONCURRENT REQUESTS FOR ACCESS TO SHARED RESOURCES

Masaaki Mihara, and Toshifumi Kobayashi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 286,922
Claims priority, application Japan, Nov. 19, 1987, 62-292832
Int. Cl.[5] H04Q 1/20
U.S. Cl. 340—825.510 6 Claims



1. An arbiter circuit comprising:
first control means operative in response to an externally supplied first request signal to control the point of time when said first request signal is to be activated;
second control means operative in response to an externally applied second request signal to control the point of time when said second request signal is to be activated; and
SR flip-flop means operative in response to said first and second activated request signals supplied from said first and second control means to provide first and second acknowledgement signals;
said second control means comprising means for delaying the activation of said second request signal for a predetermined first delay time, and
means for providing to said first control means a signal for defining a second predetermined delay time longer than said first predetermined delay time,
said first control means comprising means operable in response to said signal for defining said second predetermined delay time to delay the activation of said first request signal until said second predetermined delay time has lapsed.

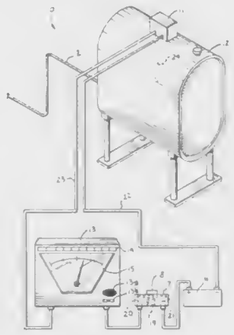
4,924,221

REMOTE OIL TANK DISPLAY APPARATUS

Andrew Filippone, 20 LakeView Ave., Wakefield, Mass. 01880

Filed Dec. 5, 1988, Ser. No. 279,512
Int. Cl.[5] G08C 19/04; G01F 23/00
U.S. Cl. 340—870.38 1 Claim

1. A remote oil tank display apparatus for use in combination with an oil storage tank comprising, in combination,
an oil tank including a fluid indicating unit secured thereto, and
a housing unit overlying said fluid indicating unit, and
a display means for indicating fluid level within said oil tank in response to a fluid level signal generated from said fluid indicating unit;
a normally open switch means electrically associated in series with said fluid indicating unit, said display means, and a storage battery for providing electrical association between said fluid indicating unit and said display means, and
wherein said switch means includes a spring normally biasing said switch means to an open position and further including a manually depressible button means for accepting manual displacement overcoming a force imposed by said spring to close said switch means to electrically associate said fluid indicating unit and said display means, and
wherein the said display means includes an analog display and a digital display, and
wherein said digital display comprises a series of light emitting diodes for indicating fluid level in said oil tank, and
wherein said housing unit includes a resilient sealing member integrally secured about a lower peripheral surface of said housing unit and further including a removable adhesive flexible strip to enable adhesive securement of said housing unit to said oil tank and wherein said housing unit further includes a plurality of openings to accept electrical transmission lines to electrically associate the fluid indicating unit with said display means, and



wherein said fluid indicating unit includes a float arm reciprocatably disposed within a brass grommet, said brass grommet includes a through-extending bore to slidingly accept said float arm therethrough and wherein said brass grommet is sealingly secured to said oil tank, and
wherein said float arm is mechanically connected to a rheostat by an interconnecting angulated link to pivot a sender arm in response to fluid level within said oil tank, and
wherein said rheostat is secured within a rheostat housing, and said rheostat housing is slidingly securable to an "L" shaped bracket, and said "L" shaped bracket includes an elongate slot for adjustably positioning said rheostat housing vertically with respect to said bracket.

4,924,222

CAPACITIVE KEYBOARD OPERABLE THROUGH A THICK DIELECTRIC WALL

Jean-Pierre Antikidis, 30 Avenue des Sources, 31320 Castanet-Tolosan, and Frederic C. Louis, 21 Place Victor Hugo, 31000 Toulouse, both of France

PCT No. PCT/FR85/00024, § 371 Date Oct. 16, 1985, § 102(e) Date Oct. 16, 1985, PCT Pub. No. WO85/03820, PCT Pub. Date Aug. 29, 1985
PCT Filed Feb. 11, 1985, Ser. No. 788,206
Claims priority, application France, Feb. 16, 1984, 8402981
Int. Cl.[5] H03M 11/00; H03K 17/955
U.S. Cl. 341—33 12 Claims



1. A keyboard responsive to the proximity of an electrical surface such as the tip of a finger and adapted to be operated through a dielectric protective wall of up to about 30 mm in thickness, comprising:

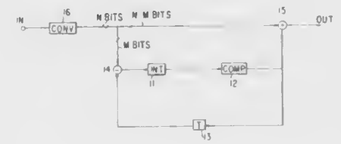
a supporting panel adapted to be secured to one side of the protective wall in confronting relationship therewith;
a plurality of sensing electrodes forming keys of the keyboard, said sensing electrodes being mounted on the supporting panel and facing the one side of the protective wall, each electrode having a relatively low capacitance and being responsive to the proximity of the electrical surface at an opposite, second side of said protective wall;
a plurality of free running oscillators, at least one of said free running oscillators being connected to the sensing electrodes and having a relatively high variable natural frequency, said natural frequency being dependent upon a capacitance value exhibited by the associated key and varying in response to the proximity of the electrical surface to the key;
control circuitry means for selectively blocking and unblocking sequentially the free running oscillators such that only one oscillator is activated at a given time; and
microprocessor means coupled to the control circuitry means for controlling the sequence of oscillator selection and for analyzing the number of counts produced by any oscillator during its activation and deriving therefrom an output indicative of a selected key.

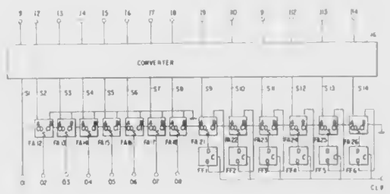
4,924,223

DIGITAL CODE CONVERTER FORMED OF A DECREASED NUMBER OF CIRCUIT ELEMENTS

Toshiyuki Okamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 31, 1988, Ser. No. 264,556
Claims priority, application Japan, Oct. 30, 1987, 62-276609
Int. Cl.[5] H03M 7/30
U.S. Cl. 341—95 4 Claims





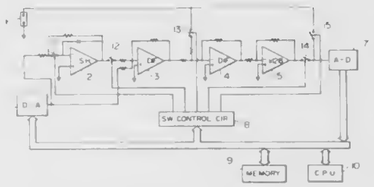
1. In a code converter wherein an input digital code having any desired bit length is converted into an output digital code having another bit length shorter than said desired bit length; the code converter comprising a signal converter converting said input digital code into an intermediate digital code in a form of two's complement, said intermediate digital code consisting of any desired number of upper bits and remaining lower bits, a subtracter having a minuend side input node receiving said lower bits and having a subtrahend side input node, an integrator receiving an output of said subtracter, a digital comparator receiving an output of said integrator, a one-sampling period delay unit receiving an output of said digital comparator to execute a time delay of one sample period, an output of said one-sample period delay unit being applied to said subtrahend side of said subtracter, and an adder receiving said upper bits and an output from said digital comparator, an output of said adder being delivered as said output digital code.

4,924,224

HIGH-ACCURACY A/D CONVERTER

Kenichiro Takahasi, Iberaki, and Yukichi Ueno, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,608
Claims priority, application Japan, Oct. 9, 1987, 62-253778
Int. Cl.[5] H03M 1/00
U.S. Cl. 341—155 10 Claims



1. A high-accuracy A/D converter comprising:
digital signal generation means which generates a digital signal;
a D/A conversion circuit which performs D/A conversion for the signal provided by said digital signal generation means;
a sample-holding circuit which samples and holds the output signal of said D/A conversion circuit;
an input terminal for an input signal to be rendered A/D conversion;
a subtracting-amplifying circuit which performs subtraction selectively between the output signal of said D/A conversion circuit and the output signal of said sample-holding circuit or between the output signal of said D/A conversion circuit and the input signal from said input terminal, and amplifies the subtracted signal;
a switching circuit which selects one of the signal from said subtracting-amplifying circuit and the input signal from said input terminal; and
an A/D conversion circuit which performs A/D conversion for the signal from said switching circuit.

4,924,225

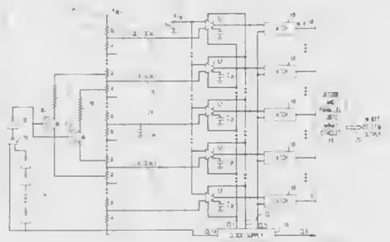
ANALOG TO DIGITAL CONVERTER WITH INTEGRAL LINEARITY ERROR COMPENSATION AND METHOD OF OPERATION

Andrew G. F. Dingwall, Princeton Township, Mercer County, and Victor Zazzu, Montgomery Township, Somerset County, both of N.J., assignors to Harris Semiconductor Patents, Inc., Melbourne, Fla.

Filed Jan. 28, 1988, Ser. No. 149,514
Int. Cl.[5] H03M 1/06
U.S. Cl. 341—118 17 Claims

1. An analog to digital signal converter comprising:
means for developing a plurality of different reference voltages said means including a plurality of points at which the different reference voltages are produced;
means for comparing an input analog signal with said plurality of different reference voltages to develop a digital output signal corresponding to said analog input signal, said digital output signal including a predetermined degree of integral linearity error; and

means coupled between two or more of said plurality of points for generating a voltage having an amplitude and



polarity to offset at least in part said integral linearity error.

4,924,226

SIGNAL ERROR COMPENSATION

Robert W. Adams, Acton, Mass., assignor to Carillon Technology, Inc., Sunnyvale, Calif.

Filed Jul. 29, 1988, Ser. No. 226,401
Int. Cl.[5] H03M *1/60*
U.S. Cl. 341—157 24 Claims



1. A system for use in correcting errors in a waveform comprising a plurality of binary pulses, each having a different rise time and fall time with respect to the positive going and negative going transitions of each said pulse, said system comprising:

means for generating a plurality of correction pulses, each synchronously with a corresponding positive going or negative going transition of said binary pulses; and

means for adding each of said correction pulses to said waveform so that the signal area lost by the rise characteristic of the resulting binary pulses will equal the signal area gained by the fall characteristics of the resulting binary pulses.

4,924,227

PARALLEL ANALOG-TO-DIGITAL CONVERTER

Christopher W. Mangelsdorf, Reading, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

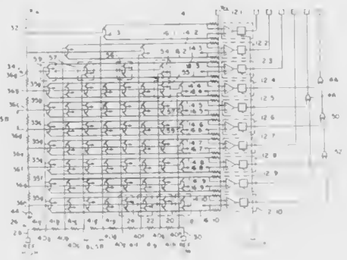
Filed Dec. 13, 1988, Ser. No. 283,791
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—159 14 Claims

1. An apparatus for converting an analog input signal to a digital output signal comprising:

means for producing a plurality of successive pairs of row output signals, each pair comprising a first and a second row output signal, each of said pairs of row output signals responsive to said analog input signal such that, over at least one specified voltage range of the analog input signal, said first row output signals gradually transition from a first stable level to a second stable level and said second row output signals gradually transition from said second stable level to said first stable level similarly but inversely to said first row output signal, and wherein said specified voltage range associated with each successive pair of row output signals is greater than the specified voltage range associated with a preceding one of said successive pairs of row output signals by twice the value of a least significant bit of said apparatus,

means for comparing the first row output signal to the second row output signal for each of the pairs of row output signals,

means for comparing one of the first and second row output



signals of each pair of row output signals with one of the second and first tow output signals, respectively, of a succeeding one of said successive pairs of row output signals, and

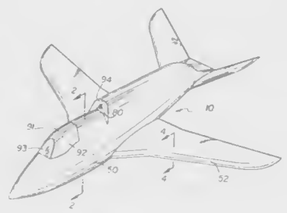
means for producing an output signal in response to each comparison that is in a first state if the first mentioned signal of the comparison exceeds the second mentioned signal and in a second state otherwise.

4,924,228

AIRCRAFT CONSTRUCTION

Philip F. Novak; Robert D. Shannon, both of Wichita, Kans.; Robert L. Pinckney, Cheyney, Pa., and James R. Humphreys, Jr., Wichita, Kans., assignors to Boeing Company

Filed Jul. 17, 1963, Ser. No. 295,644
Int. Cl.[5] B64C *1/38;* G01S *7/38*
U.S. Cl. 342—2 11 Claims



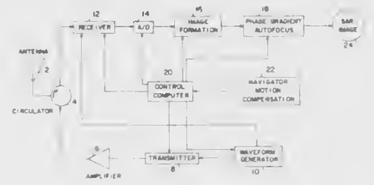
1. An aircraft fuselage structure having a central vertical plane comprising in transverse cross-section, curved top wall means, curved bottom wall means, and two substantially flat side wall means inclined inwardly and away from said bottom wall means toward each other, said side wall means having lower edges thereof respectively connected to opposite edges of said curved bottom wall means and having upper edge portions connected to opposite portions of said curved top wall means, and said side wall means extending away from said bottom wall means at an angle of at least ten degrees to the central vertical plane in such a manner that electromagnetic reflection of microwaves from a source located laterally of and below the aircraft fuselage structure are directed at an angle upwardly from the horizontal when the aircraft fuselage is in a substantially normal horizontal flight mode.

4,924,229

PHASE CORRECTION SYSTEM FOR AUTOMATIC FOCUSING OF SYNTHETIC APERTURE RADAR

Paul H. Eichel, Albuquerque; Dennis C. Ghiglia, Placitas, and Charles V. Jakowatz, Jr., Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 14, 1989, Ser. No. 407,088
Int. Cl.[5] G01S *13/90*
U.S. Cl. 342—25 33 Claims



1. A synthetic aperture radar comprising:

a directional radar antenna directed at a target area to be imaged and displaying relative movement with respect thereto;

means for supplying radar interrogation pulses to said antenna;

image formation processing means for receiving position indicating reflections from said target area and comparing said position indicating reflections with said interrogation pulses produced by said means for supplying, said image formation processing means using multiple samples of said position indicating reflections to develop target range and azimuth data representative of a target image;

at least one of said target range and azimuth data exhibiting arbitrary phase error between said samples, resulting in smearing of the target image; and

phase correction autofocus means for estimating and subtracting said phase error from said target image, said phase correction autofocus means including,

autofocus processor means for,

(a) dividing said target image into a plurality of target image portions,

(b) locating the strongest highlight in each of said target image portions,

(c) estimating the width of the smearing of each highlight in each dimension of said phase error for each of said target image portions,

(d) estimating of the phase error in each said dimension thereof from said estimated smear width of said highlights, and

(e) compensating for said phase error in said target image to produce compensated data for said target image.

4,924,230

SEARCH DETECTION APPARATUS

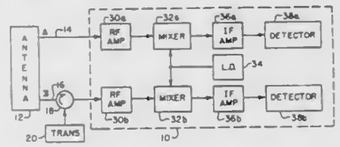
Raymond G. Martin, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 14, 1989, Ser. No. 323,577
Int. Cl.[5] G01S *13/00*
U.S. Cl. 342—90 3 Claims

1. A radar search detection apparatus for detecting a target, comprising in combination:

a directional antenna to receive a return signal from said target, said target return signal includes a sum signal and a difference signal, and,

a radar receiver operatively connected to said antenna to receive said sum signal and said difference signal, said radar receiver having a first and a second target detection channel, said first target detection channel receiving said sum signal, said second target detection channel receiving said difference signal, said first and second target detection channels independently processing their respective signals to independently detect said target.

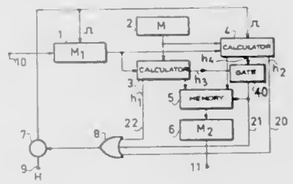


4,924,231

DEVICE FOR REMOVING THE AMBIGUITY OVER RANGE AND SPEED, USED MORE ESPECIALLY IN COMBINATION WITH A DOPPLER TYPE RADAR RECEIVER AND A RADAR CONTAINING IT

Michel Prenat, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 787,707, Oct. 16, 1985, abandoned, which is a continuation of Ser. No. 589,036, Mar. 13, 1984, abandoned, which is a continuation of Ser. No. 296,976, Aug. 26, 1981, abandoned, which is a continuation of Ser. No. 132,663, Apr. 1, 1980, abandoned. This application Oct. 31, 1988, Ser. No. 267,639
Claims priority, application France, Jun. 15, 1979, 79 15450
Int. Cl.[5] G01S *13/42, 13/54*
U.S. Cl. 342—137 11 Claims



1. A device for removing the range and speed ambiguities at the output of a Doppler-type radar transmitting pulses at first and second repetition frequencies fr_1 and fr_2, receiving echo signals from targets and applying the echo signals to a plurality of frequency filters comprising:

first memory means for storing in succession sets of two pairs of signals (p_1, q_1) and (p_2, q_2) corresponding to echoes at said different repetition frequencies fr_1 and fr_2 respectively, where p_1 and p_2 represent with respect to the latest transmitted pulse the number of the range quantum τ from which an echo signal is received and q_1 and q_2 represent the number of the filter at the output of which an echo signal is maximum and supplying at an output successively pairs of signals (p_1, q_1) and (p_2, q_2) in response to a succession of clock signals;

second memory means for storing radar data including said repetition frequencies fr_1 and fr_2, the Doppler frequency limits F1 and F2 and the maximum radar range Do;

first calculating means for receiving said signals p_1 and p_2 from said first memory means and said radar data from said second memory means, and for testing to determine if said signals p_1 and p_2 come from the same target to produce a first signal when said signals do not and a second signal when they do, and in the latter event calculating a distance d to the target;

second calculating means for receiving said signals q_1 and q_2 from said first memory means and said radar data from said second memory means, and for testing to determine if

said signals q_1 and q_2 come from the same target to produce a third signal when they do not and a fourth signal when they do and in the latter event calculating an interval encompassing the true Doppler frequency F_D;

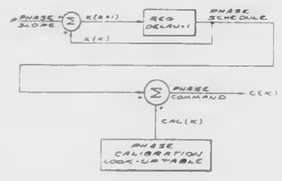
means for transferring said calculated distance d and said calculated interval encompassing the true Doppler frequency F_D to an output device if said second and fourth signals are produced, and alternatively not transferring said calculated information to said output device if either of said second and fourth signals are not produced.

4,924,232

METHOD AND SYSTEM FOR REDUCING PHASE ERROR IN A PHASED ARRAY RADAR BEAM STEERING CONTROLLER

Ralph E. Hudson, Los Angeles; Stanley O. Aks, Cerritos; Peter P. Bogdanovic, Los Angeles, and David D. Lynch, Northridge, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 31, 1988, Ser. No. 265,079
Int. Cl.[5] G01S *7/40*
U.S. Cl. 342—174 12 Claims



1. A method of reducing phase error of digitally controlled phase shifters in a beam steering controller system for phased array radar, in which phase commands for achieving a failure free-phase slope are directed to individual phase changer elements in each phase shifter, comprising the steps of:

(a) detecting failure of each of said individual digitally controlled phase changer elements;

(b) determining an additive phase correction which will reduce the number of failed phase changer elements;

(c) determining whether said additive phase correction is achievable by comparing the stuck bit state at each said failed changer element with said additive phase correction; and

(d) adjusting said phase commands to the nearest values which can be achieved when said additive phase correction is unachievable.

4,924,233

SENSOR INPUT/OUTPUT SYSTEM WITH CONTINUOUS COMPASS INTERFACE

Rebecca A. Bird, Earlysville, Va., assignor to Sperry Marine Inc., Charlottesville, Va.

Filed Sep. 2, 1988, Ser. No. 241,166
Int. Cl.[5] G01S *13/86*; G01C *21/00*
U.S. Cl. 342—175 6 Claims

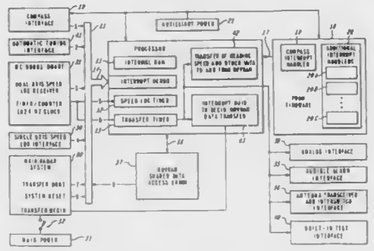
1. Sensor interface apparatus for interfacing a compass system sensor and a plurality of additional sensors to a main system comprising:

a compass interface for interfacing said compass system sensor to said main system, said compass interface providing a compass interrupt when compass data are available,

a plurality of additional interfaces for interfacing said additional sensors, respectively, to said main system, said plurality of additional interfaces providing a plurality of additional interrupts, respectively, when respective interface data are available,

digital processor means having input port means for receiving said interrupts,

a plurality of interrupt handlers responsive, respectively, to said interrupts for servicing said interrupts, respectively, without control by executive software, each said interrupt hanler continuously servicing an interrupt to completion once said servicing has begun and being constructed and arranged to provide all the servicing required by said interrupt,



a main power source for controllably providing power to said main system, and

an auxiliary power source for providing power only to said compass system sensor, said compass interface, at least said interrupt handler servicing said compass interrupt and said digital processor means when said main power source is not providing power to said main system,

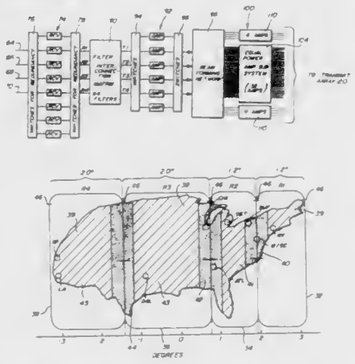
thereby providing a continuous compass interface for maintaining heading synchronization while said main power source is not providing power to said main system.

4,924,234

PLURAL LEVEL BEAM-FORMING NETWORK

James D. Thompson, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 26, 1987, Ser. No. 34,460
Int. Cl.[5] G01S *5/02*
U.S. Cl. 342—369 11 Claims



1. A beam-forming network for producing, from at least one transmit signal, a plurality of output signals having a predetermined relationship with respect to one another for providing a predetermined excitation pattern to an array of radiating elements in an antenna forming a portion of a transmit system having amplifying means for amplifying a plurality of output signals before the output signals are applied to the array, comprising:

a first line for carrying the transmit signal;

a second set of lines spaced from one another and operatively disposed at an angle to and crossing the first line so as to define cross-over points therewith, each of the second lines being coupled to the first line at the cross-over points such that a portion of the electromagnetic energy of the transmit signal carried by the first line is transferable to each of the second lines, each of the second lines having an output adapted to be placed in electromagnetic communication with the array,

the first line having first and second portions spaced apart from one another and respectively defining first and second levels displaced from one another,

the second set of lines having first and second subsets of second lines respectively arranged adjacent to said first and second levels and respectively associated with the first and second portions of the first line, such that the first subset of second lines is coupled to the first portion of the first line, and the second subset of second lines is coupled to the second portion of the first line,

said predetermined excitation pattern defining an amplitude distribution function desired for driving said array of radiating elements to produce a microwave beam having selected characteristics; and

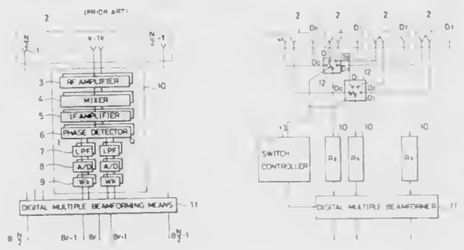
means, associated with the cross-over points, for passing different percentages of the transmit signal of the first line to the second lines, thereby providing the desired distribution function.

4,924,235

HOLOGRAPHIC RADAR

Takahiko Fujisaka, Yokohama; Yoshimasa Ohashi, Fujisawa, and Mithimasa Kondo, Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00131, § 371 Date Oct. 12, 1988, § 102(e) Date Oct. 12, 1988, PCT Pub. No. WO88/06295, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 10, 1988, Ser. No. 290,048
Claims priority, application Japan, Feb. 13, 1987, 62-32101; Apr. 14, 1987, 62-91187
Int. Cl.[5] H04B *7/00*
U.S. Cl. 342—374 2 Claims



1. A holographic radar comprising:

a plurality of antenna arrays each comprising a plurality of antenna elements,

a like plurality of receivers connected one at a time to each of the antenna elements of a respective array of said antenna arrays,

switches for switching the connections between each of the receivers and the antenna elements of the respective arrays connected thereto,

switch controlling means for synchronously controlling the timing of switching of said switches according to pulse hit numbers and range bin numbers, and

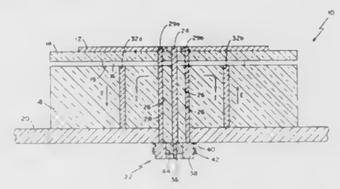
a digital multiple beamforming means coupled to the outputs of each of said receivers to generate multiple beams.

4,924,236

PATCH RADIATOR ELEMENT WITH MICROSTRIP BALIAN CIRCUIT PROVIDING DOUBLE-TUNED IMPEDANCE MATCHING

Jack J. Schuss, Sharon, and Jerome D. Hanfling, Framingham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 3, 1987, Ser. No. 116,192
Int. Cl.[5] H01Q *1/38*
U.S. Cl. 343—700 MS 21 Claims



1. In a radiator for use in a phased array antenna, said radiator including an electrically-conductive patch element separated from a ground plane element to form a cavity therebetween, and further including coupling means for receiving an input signal thereto, an apparatus for exciting an electric field in said cavity, said apparatus comprising:

a microstrip circuit including trace wiring positioned intermediate said patch element and said ground plane element, said trace wiring coupled to said coupling means, said patch element functioning as a ground plane for said microstrip circuit; and

first and second conductive probes disposed between said trace wiring and said ground plane element for conducting currents in said cavity, said currents providing electromagnetic coupling between said first and second conductive probes and said patch element,

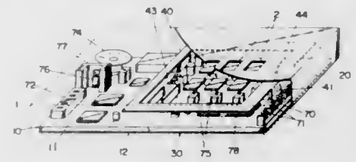
said microstrip circuit providing double-tuned impedance matching between said coupling means and said patch element, said microstrip circuit further including a balun coupled to said first and second probes and responsive to an input signal applied at said coupling means for providing balun output signals in phased-apart relationship respectively at said first and second probes.

4,924,237

ANTENNA AND ITS ELECTRONIC CIRCUIT COMBINATION

Kazuhiro Honda; Kouji Yamashita; Masanori Kawai; Kazuo Nakahi, and Kuniharu Tatetsuki, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 13, 1988, Ser. No. 243,744
Claims priority, application Japan, Mar. 28, 1988, 63-73684
Int. Cl.[5] H01Q *1/24*
U.S. Cl. 343—702 20 Claims



1. An antenna and its electronic circuit combination comprising:

a ground conductor plane;

a radiating conductor plane disposed in parallel and spaced relation to said ground conductor plane to define therebe-

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tween an open air space and shorted at one end to said ground conductor plane, said radiating conductor plane is defined by a conductor plate with an access window;

a number of electronic components disposed on said ground conductor plane to form a receiving or transmitting electronic circuit which is electrically coupled by means of a feed element to a feedpoint on said radiating conductor plane, said electronic components being received within said open air space between said ground conductor plane and said radiating conductor plane wherein one or more of said electronic components can be accessed through said access window.

4,924,238

ELECTRONICALLY TUNABLE ANTENNA

George Ploussios, 4 Hackney Cir., Andover, Mass. 01810

Continuation-in-part of Ser. No. 11,736, Feb. 6, 1987, abandoned. This application Feb. 8, 1988, Ser. No. 153,605

Int. Cl.[5] H01Q *1/36*

U.S. Cl. 343—802 **8 Claims**



1. An electrically-turnable helical antenna comprising

a source of r-f signals,

a radiating helix coupled to said source formed of tubular material having an outer electrically-conductive structure for radiating r-f signals, said helix comprising the primary radiating element of said antenna and being resonant at the frequency of operation,

a plurality of bias leads positioned within said structure,

means for selectively applying bias voltages to said bias leads, and

a plurality of antenna tuning elements such comprising

electronically-actuated switch means including first and second serially-connected diodes connected respectively to first and second spaced points on said structure and being responsive to voltages carried by said bias leads,

a first one of said bias leads extending from said structure at an electrically balanced position between said first and second spaced points and connected to similar elements of said diodes at the junction thereof.

4,924,239

ANTENNA MOUNTING APPARATUS

Joseph P. Ceklovsky, Rome, N.Y., assignor to The united States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 28, 1989, Ser. No. 316,760

Int. Cl.[5] H01Q *1/12, 3/16*

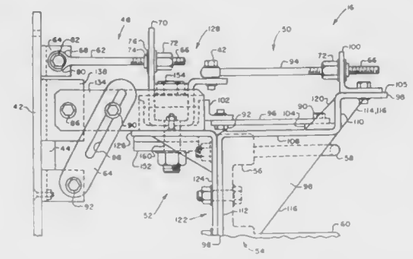
U.S. Cl. 343—882 **8 Claims**

8. An antenna mounting apparatus as defined in claim 7. wherein said supporting frame further comprises:

a lower supporting frame, said lower supporting frame fixedly attached to said azimuth support bracket and to said attachment means, said lower supporting frame having a vertical frame member and a horizontal frame member; and

an upper supporting frame, said upper supporting frame being connected by pivot means to said lower supporting frame during adjustment, said upper and said lower supporting frames being fixedly attached during non-adjustment, said upper supporting frame comprising:

a rectangularly shaped box, said box having a partially open top, said box having a left support arm and a right support



arm, each of said arms having said pivot means for said elevation locking bars and pivot means for attaching ends of said arms to said brackets of said dish attachment plate; and

a control means bracket, said control means bracket fixedly attached to the bottom of said box, said elevation adjustable nut rotatably connected to said control means bracket, said ball end of said azimuth adjustable rod pivotally connected to said control means bracket; and

a means for rotatably locking said box to said lower supporting frame.

4,924,240

FEED FOR THERMAL PRINTING RIBBON

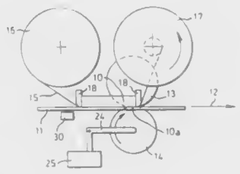
Raymond J. Herbert, Leigh-on-Sea, and Thomas D. Williams, Billericay, both of United Kingdom, assignors to Alcatel Business Systems, Limited, Romford, United Kingdom

Filed Oct. 31, 1988, Ser. No. 264,832

Claims priority, application United Kingdom, Nov. 2, 1987, 8725619

Int. Cl.[5] G01D *9/00, 15/10*

U.S. Cl. 346—1.1 **14 Claims**



1. Thermal printing apparatus operable to form print impressions upon successive items in successive printing operations respectively including:

a thermal print head;

means to guide a thermal transfer inked ribbon past the print head from a supply of unused ribbon;

means to feed items upon which printing is to be effected successively to the print head;

pressure means to actuable to press an item being fed into ink transfer engagement with the ribbon, said engagement of the ribbon by the item being effective to feed the ribbon with the item past the print head in a first direction;

control means operable in each of successive printing operations to actuate the pressure means, to generate print signals to operate the print head to transfer ink from the ribbon to an item to form a print impression on said item and after formation of the print impression to terminate actuation of the pressure means to release the ribbon and said item;

operation of the print head during one said printing operation causing transfer of ink from a first region of first length of the ribbon;

rewind means operative during intervals between successive ones of said printing operations to feed the ribbon in a second direction opposite to said first direction by an extent of second length related to said first length; and operation of the print head during a second printing operation succeeding said one printing operation causing further transfer of ink from said first region.

7. A method of printing using a thermal print head selectively operable to transfer ink from a thermal transfer inked ribbon to the surface of an item in which the ribbon is made available a plurality of times for ink transfer including the steps of feeding a first item together with the inked ribbon past the print head with the first item in ink transfer relationship with the ribbon during which feeding a first length of ribbon is fed in a first direction past the print head;

selectively operating the print head to transfer ink from the first length of ribbon to the surface of the item to form a print impression on said first item;

releasing the first item from engagement with the ribbon;

feeding the ribbon in a second direction opposite to said first direction by an amount related to said first length; feeding a second item together with the inked ribbon past the print head with the second item in ink transfer relationship with the ribbon and selectively operating the print head to effect further transfer of ink from at least a part of said first length of ribbon to the second item.

4,924,241

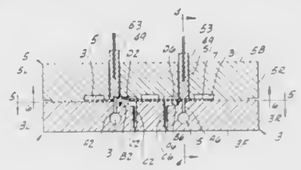
PRINTHEAD FOR INK JET PRINTING APPARATUS

Ronald Parks, Marion, and Anthony B. Castro, Herrin, both of Ill., assignors to Diagraph Corporation, Herrin, Ill.

Filed Aug. 1, 1989, Ser. No. 388,641

Int. Cl.[5] G01D *15/18;* **F16K** *1/00;* **B05B** *7/06*

U.S. Cl. 346—75 **32 Claims**



1. A printhead for ink jet printing apparatus comprising:

a body having a front face and a back face,

a chamber in the body for ink under pressure,

a port extending from the chamber to the back face of the body,

a recess in the back face of the body adjacent but spaced from the end of the port at the back face constituting the back end of the port,

a passage extending forward from the recess through the body to the front face of the body, the end of said passage at said front face constituting an orifice for delivery of ink onto a target surface moving relative to the body past its front face,

a flexible membrane on said back face engageable therewith all around the back end of said port and said recess, and

means for releasably holding the membrane pressed against the back face of the body around the back end of said port to block flow of ink from said chamber out of the back end of said port,

said holding means being operable to release the membrane for flexing away from the back end of the port for delivery of ink from said chamber through the back end of the port and thence via said recess to and through said passage.

4,924,242

THERMAL RECORDING APPARATUS USING A DETACHABLE INK SHEET CASSETTE

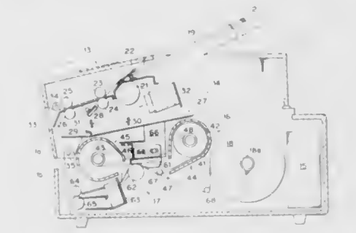
Kazumi Fukawa, Asaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

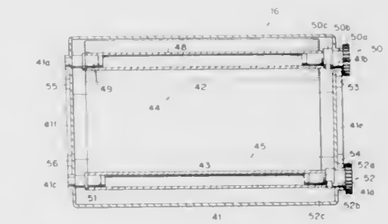
Filed Nov. 25, 1988, Ser. No. 276,395

Claims priority, application Japan, Nov. 25, 1987, 62-180024[U]

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH **4 Claims**





1. A thermal recording apparatus comprising:

a housing;

a thermal print head mounted in said housing;

transporting means mounted in said housing for transporting a sheet or recording paper along a predetermined path including a recording section where said thermal print head is located, said recording paper being pressed against said thermal print head at said recording section;

an ink sheet cassette which may be detachably mounted in position in said housing, said ink sheet cassette including a cassette case of a predetermined shape, a supply spool around which a roll of ink sheet is wound before use and a take-up spool to which a leading end of said ink sheet is fixedly attached, whereby said ink sheet is unwound from said supply spool and wound around said take-up spool after use, a portion of said ink sheet extending between said supply and take-up spools being sandwiched between said recording paper and said thermal print head at said recording section, said cassette case being provided with at least four first engaging means at its outer side surface spaced apart from one another;

supporting means for supporting said ink sheet cassette in position in said housing, said supporting means including at least four second engaging means provided in said housing for engagement with the respective four first

engaging means of said ink sheet cassette when said ink sheet cassette is mounted to keep said ink sheet cassette in position in said housing; and

transmitting means for transmitting power at least to said ink sheet cassette when required during operation of said apparatus to thereby have said ink sheet wound or re-wound,

wherein said cassette case is generally rectangular in shape and has a pair of opposite side walls each of which is formed with a pair of said first engaging means spaced apart from each other along a longitudinal direction of the side wall, each of said first engaging means includes a pin receiving portion, and four of said second engaging means are provided in said lower housing fixed in position and each of said four second engaging means includes a pin engageable with the corresponding pin receiving portion.

4,924,243

METHOD FOR MANUFACTURING LIQUID CRYSTAL DEVICE WITH SPACERS FORMED BY PRINTING

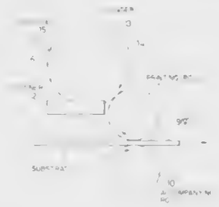
Masahiko Sato; Akira Mase, both of Atsugi; Hiroyuki Sakayori, Machida, and Shunpei Yamazaki, Tokyo, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 88,389, Aug. 24, 1987. This application May 23, 1988, Ser. No. 197,434

Claims priority, application Japan, Sep. 4, 1986, 61-208617

Int. Cl.[5] G02F *1/13*; B32B *31/00*

U.S. Cl. 350—320 **9 Claims**



1. A method of manufacturing a liquid crystal device comprising the steps of:

forming an electrode arrangement on the inside surfaces of a pair of substrates;

printing a prescribed pattern of pillars and a sealing member on the inside surface of one of said substrates;

joining and uniting said pair of substrates; and

disposing a liquid crystal material between said pair of substrates;

wherein said printing step is implemented by a printing press including a container holding said material, a cylinder capable of rotating and receiving said material on a surface thereof which cylinder is formed with indentations corresponding to said patterns, a squeegee for pushing off said material other than that trapped in the pattern and a printing roll engaged with said cylinder which receives said material in the form of said prescirbed pattern;

with said printing roll being adapted to engage said one substrate in order to transfer said pattern from said surface to a surface of the substrate such that the thickness of the pillars and the sealing members can be controlled in accordance with the depth of the indentations in the cylinder.

4,924,244

LENS SYSTEM FOR PROJECTION TYPE TELEVISION

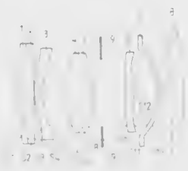
Hiroshi Kataoka, Yokohama, and Kyohei Fukuda, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1988, Ser. No. 284,381

Claims priority, application Japan, Dec. 21, 1987, 62-321282

Int. Cl.[5] G02B *27/18*

U.S. Cl. 350—432 **7 Claims**



1. A lens system for a projection type television, comprising, successively from a screen side, a concave first lens, a convex second lens cemented to the first lens, a third lens at least one side of which is aspherical, a bi-convex fourth lens, a concave fifth lens cemented to the fourth lens, a sixth lens at least one side of which is aspherical, and a concave seventh lens having an aspherical surface.

4,924,245

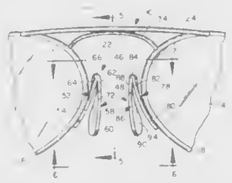
RESILIENT NOSE PAD FOR SPECTACLES

Franz Dianitsch, Leondiog, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.

Filed May 26, 1988, Ser. No. 199,316

Int. Cl.[5] G02C *5/12*

U.S. Cl. 351—136 **23 Claims**



1. An eyeglass assembly comprising: a pair of lenses, each having a peripheral edge,

a frame means including first and second lens frames each having a first portion at least partially surrounding said lenses, in contact with the peripheral edge thereof to provide support therefor,

a bridge means on the frame means connecting the first and second lens frames together,

a pair of nose support means connected to the frame means for engaging the nose of the wearer,

each of said nose support means comprising inner and outer elongated legs, both having longitudinal axes, with the longitudinal axis of the outer leg lying in a plane formed by the adjacent lens or a plane generally thereto, and both legs having a strip-like configuration with elongated cross-sections, said inner and said outer legs having first and second ends, with the second end of the inner leg positioned proximate the wearer's nose and the second end of the outer leg located proximate a lens,

said legs being flexible and being joined together at first ends so that the inner leg is flexible relative to the outer leg,

said legs being flexible relative to each other and the outer leg being flexible relative to said frame portion to which it is joined so as to provide a compound motion when fitted on the nose of the wearer.

4,924,246

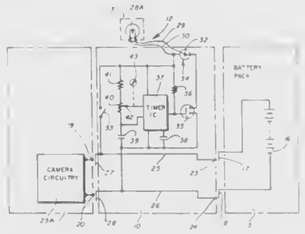
ENERGIZING SYSTEM FOR VIDEO CAMERAS AND LIGHTS USING ADAPTER MODULES

Masahiro Yamada, North White Plains, N.Y., assignor to Asahi Research Corporation, North White Plains, N.Y.

Filed Sep. 29, 1988, Ser. No. 250,927

Int. Cl.[5] G03B *15/03*

U.S. Cl. 354—126 **6 Claims**



1. A plurality of adapter modules for use with light units of similar construction and with a plurality of different types of video cameras and battery packs respectively associated with said cameras, each camera and pack having mating interconnection means, each of said modules being associated with one of said cameras and each comprising one interconnection means arranged to mate with interconnection means of the associated camera and a second interconnection means arranged to mate with interconnection means of the battery pack associated with the associated camera, and each of said modules having electrical circuitry for applying the proper operating voltages from said associated battery pack to said associated camera and to a light unit.

4,924,247

APPARATUS AND METHOD FOR CORRECTING AND ADJUSTING PARALLAX IN ELECTRONIC CAMERA

Nobuharu Suzuki; Harumi Aoki, and Tahei Morisawa, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,381

Claims priority, application Japan, Mar. 11, 1988, 63-57917; May 21, 1988, 63-124780

Int. Cl.[5] G03B *13/20*

U.S. Cl. 354—164 **18 Claims**



1. In an electronic camera having a photographing optical system, an object distance measuring device, a finder optical system separate from the photographing optical system, and an imaging device on which an image of an object is formed by the photographing optical system, a parallax correcting apparatus which comprises an imaging device driving mechanism for supporting the imaging device so as to move away from and towards the optical axis of the finder optical system, said imaging device driving mechanism being adapted to move the imaging device in accordance with the object distance detected by the object distance measuring device.

4,924,248

PHOTOGRAPHIC CAMERA

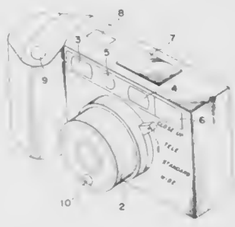
Nobuyuki Taniguchi, Nishinomiya; Takeo Hoda, Kawachinagano; Yoshiaki Hata, Nishinomiya; Manabu Inoue, Kobe; Yoshinobu Kudo, Sakai, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 939,706, Dec. 9, 1986, abandoned. This applicatioo May 5, 1989, Ser. No. 348,075

Claims priority, application Japan, Dec. 9, 1985, 60-277584; Dec. 10, 1985, 60-278586; Dec. 10, 1985, 60-288366

Int. Cl.[5] G03B *3/00*

U.S. Cl. 354—195.1 **5 Claims**



1. A photographic camera comprising:

first means for selecting either of a normal photographing mode in which an object located within a normal distance range is photographed and a close-up photographing mode in which an object closer than the closest point of the normal distance range is photographed;

means for varying in response to a manual operation a focal length of a photographing lens between a minimum focal length and a maximum focal length when the normal photographing mode is selected;

first means for fixing the focal length of the photographing lens in the maximum focal length when the close-up mode is selected;

means for automatically adjusting, when the normal photographing mode is selected, a position of the photographing lens between a first position and a second position so as to focus the photographing lens on an object within the normal distance range, wherein the photographing lens is focused on an object at the closest point of the normal distance range when the photographing lens is at the first position and the photographing lens is focused on an object at the infinity point when the photographing lens is at the second position; and

second means for fixing the photographing lens in a predetermined position when the close-up mode is selected, wherein the photographing lens is focused on an object located at a point closer than the closest point of the normal distance range when the photographing lens is at the predetermined position.

4,924,249

POWER SUPPLY DEVICE FOR CAMERA

Yoshihiko Aihara, and Mutsuhide Matsuda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 136,976, Dec. 23, 1987, abandoned.
This application Sep. 13, 1989, Ser. No. 406,876
Claims priority, application Japan, Dec. 27, 1986, 61-312676; Dec. 27, 1986, 61-312680
Int. Cl.[5] G03B *17/14*
U.S. Cl. 354—286 41 Claims



1. A camera system having an accessory which is detachably mountable on a camera body having a power source, comprising:

the camera body including an electronic circuit arranged to communicate with said accessory; a first connection terminal arranged to permit a first power supply to said accessory; a second connection terminal arranged to permit a second power supply to said accessory; a third connection terminal arranged to permit communication with said accessory; and means for detecting that said accessory is mounted, and

the accessory including a motor arranged to perform a camera action; an electronic circuit arranged to communicate with said camera body and to control rotation of said motor; a first connection terminal arranged to be connected to said first connection terminal on the camera body to permit said first power supply to be effected to said electronic circuit at the accessory when said accessory is mounted; a second connection terminal arranged to be connected to said second connection terminal on the camera body to permit said second power supply to be effected for said motor when said accessory is mounted; and a third connection terminal arranged to be connected to said third connection terminal on the camera body when said accessory is mounted,

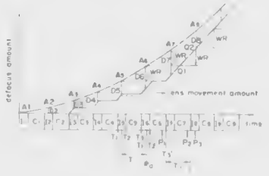
so that when said accessory is detected to have been mounted on said camera body, said first power supply is effected to said first connection terminal on the camera body for communication between said electronic circuit at the camera body and said electronic circuit at the accessory, and when preset specific digital information is supplied from said electronic circuit of the accessory to said electronic circuit at the camera body, said second power supply is effected to said second connection terminal on the camera body.

4,924,250

AUTOMATIC FOCUS CONTROL DEVICE

Masataka Hamada, Osaka; Tokuji Ishida, Daito; Kenji Ishibashi, Sakai; Nobuyuki Taniguchi, Nishinomiya, and Hiroshi Ootsuka, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 247,079, Sep. 20, 1988, abandoned, which is a division of Ser. No. 32,738, Mar. 30, 1987, Pat. No. 4,816,856. This application Jun. 28, 1989, Ser. No. 374,590
Claims priority, application Japan, Mar. 31, 1986, 61-74580
Int. Cl.[5] G03B *3/00*
U.S. Cl. 354—402 17 Claims



1. An automatic focus control device of a camera, comprising:

(a) optical means for transmitting an image of an object;

(b) light receiving means for receiving light passing through the optical means and for converting the light into an electrical signal;

(c) defocus amount calculating means for repeatedly calculating the defocus amount for a predetermined focal plane of a photographic lens in the camera on the basis of the electrical signal generated by the light receiving means;

(d) judging means for judging whether or not an object to be focused is moving in accordance with the repeatedly calculated defocus amounts, and

(e) in-focus condition determining means for determining that the photographic lens is in an in-focus condition when the defocus amount calculated by the defocus amount calculating means is smaller than a predetermined first amount in the condition where the judging means judges that the object is not moving, and for determining that the photographic lens is in an in-focus condition when the defocus amount calculated by the defocus amount calculating means is smaller than a predetermined second amount in the condition where the judging means judges that the object is moving, said first amount being smaller than said second amount.

4,924,251

CAMERA SYSTEM HAVING PHOTOGRAPHIC CAMERA AND ELECTRONIC FLASH DEVICE

Toshihiko Ishimura, Habikino; Kenji Tsuji, Kashiwara; Nobuyuki Taniguchi, Nishinomiya, and Hiroshi Ootsuka, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 152,867, Feb. 5, 1988, abandoned, which is a continuation of Ser. No. 912,233, Sep. 29, 1986, abandoned. This application Nov. 23, 1988, Ser. No. 275,691
Claims priority, application Japan, Apr. 10, 1985, 60-222536; Sep. 30, 1985, 60-218761; Oct. 1, 1985, 60-218945
The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—418 5 Claims

1. A photographic camera system having a camera and an electronic flash device, comprising:

(a) said camera, including;

(1) lens information output means for outputting lens information,

(2) a circuitry for carrying out preparatory operation for a photography,

(3) power supply hold means connected to said circuitry and lens information output means and adapted for supplying power to said circuitry, having;

(i) timer means for measuring a predetermined time period,

(ii) information input means for periodically inputting the lens information,

(iii) comparison means for comparing the lens information previously input by said information input means with newly input lens information and for outputting a disagreement signal when said two pieces of information disagree from each other,

(iv) reset means responsive to the disagreement signal for resetting the measuring time of said timer means and for restarting said timer means, and

(v) start signal output means for outputting a start signal to said electronic flash device in response to the disagreement signal,

wherein said power supply hold means holds the power supply to said circuitry until said timer means has measured said predetermined time period, and

(4) first terminal means electrically connected to said electronic flash device and adapted for providing therethrough the start signal and the lens information to said electronic flash device, and



(b) said electronic flash device, including;

(1) second terminal means electrically connected to said first terminal means,

(2) a second circuitry for carrying out preparatory operation for a flash photography,

(3) control means for controlling said second circuitry in response to the lens information input through said second terminal means, and

(4) second power supply hold means connected to said second circuitry and second terminal means and adapted for supplying power to said second circuitry, having;

(i) power supply start means for starting the power supply to said second circuitry in response to the input of the start signal through said second terminal means,

(ii) power supply stop means for stopping the power supply to said second circuitry when a predetermined time period has passed since said power supply start means starts the power supply, and

(iii) means for resetting the predetermined power supply time period when the start signal is input through said second terminal means in the course of the power supply operation.

4,924,252

ELECTRONIC FLASH DEVICE FOR CAMERA

Yoshikazu Iida, Chigasaki; Nobuyoshi Hagiuda, Kawasaki; Norikazu Yokonuma, Tokyo; Hiroshi Sakamoto, Kawasaki, and Hideki Matsui, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,238
Claims priority, application Japan, Apr. 5, 1988, 63-83666
Int. Cl.[5] G03B *15/03*
U.S. Cl. 354—420 6 Claims



1. An electronic flash device adapted to be mounted on a first camera body capable of releasing data on photographing information, or a second camera body incapable of releasing data on photographing information, comprising:

(a) display means;

(b) setting means for manually setting data on photographing information;

(c) control means for causing said display means to display data set by said setting means in a first display state;

(d) transmission means for transmitting data from said first camera body to said control means when said electronic flash device is mounted on said first camera body; and

(e) means for releasing a detection signal upon detection that said electronic flash device is mounted on said first camera body, wherein said control means is adapted, in response to said detection signal, to cause said display means to display the data from said transmission means in a second display state different from said first display state.

4,924,253

DRIVE APPARATUS FOR A FOCUSING LENS

Yuji Imai, Higashiyamato, and Kazuyuki Iwasa, Mitaka, both of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,308
Claims priority, application Japan, Apr. 13, 1987, 62-91533
Int. Cl.[5] G03B *3/00, 29/00*
U.S. Cl. 354—400 18 Claims

1. A focusing lens drive apparatus for focusing a taking lens of a camera which lens is capable of switching to one of a plurality of focal lengths, comprising:

focal length information input means for inputting information on a focal length of the taking lens;

range detection means for detecting a range to an object being photographed;

a digital memory for storing a plurality of adjusting values for focusing operations in response to information of focal lengths;

adjusting value selecting means for selecting a specific adjusting value from a plurality of adjusting values stored in said digital memory in response to said inputted information on a focal length;

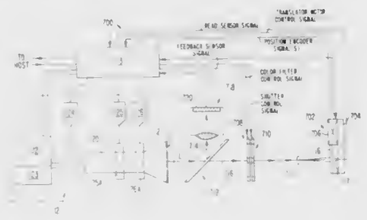
lens drive amount determining means for determining an amount of driving the focusing lens on the basis of data detected by said range detection means and the specific adjusting value selected by said adjusting value selecting means;

a lens drive mechanism for driving the focusing lens; and
a lens drive mechanism controller means for controlling said



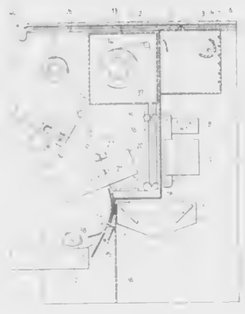
lens drive mechanism in accordance with an amount of driving the lens determined by said lens drive amount determining means.

4,924,254
FILM PRINTING/READING SYSTEM
Eugene J. Dwyer, III, New York, N.Y., assignor to Silhouette Technology, Inc., Morristown, N.J.
Continuation-in-part of Ser. No. 54,294, May 26, 1987, Pat. No. 4,829,339. This application May 4, 1989, Ser. No. 347,247
Int. Cl.[5] G03B *27/72, 27/80*
U.S. Cl. 355—20 **44 Claims**



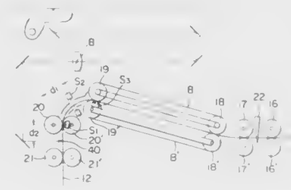
1. An apparatus for recording an image onto a light recording medium by sequentially recording a plurality of sections onto the light recording medium which constitute the image comprising:
a light source which emits light at a position which is movable over a light emitting area of the light source controlled by a controller, the position of the light being subject to deviation from a desired position on the light emitting area of the light source which corresponds to a position to be recorded on the recording medium which has recording position coordinates;
a translator having controllable positions for moving the recording medium relative to a light source during the recording of the plurality of sections of the image;
a light transmitting medium disposed between the light source and the recording medium for transmitting the light from the light source to the recording medium;
a light position sensor having a target area optically coupled to light emitted from a plurality of positions within the light emitting area of the light source used for recording for detecting the position of the light intersecting the target area of the sensor from the light emitting area of the light source and generating at least one signal dependent upon the light intersecting the target area; and wherein
the controller, responsive to the at least one signal, produces at least one correction parameter, sequentially controls the recording of the sections to record the image by controlling the position of the light on the light emitting area of the light source as a function of the at least one correction parameter during the recording of each section to cause the light to move to coordinates on the light emitting area of the light source to cause the light to intersect the recording medium at the recording position coordinates and controls the position of the translator for the recording of each section.

4,924,255
EXPOSURE UNIT IN AN IMAGE RECORDING APPARATUS
Yoichi Horaguchi, Nagoya; Kenji Sakakibara, Ichinomiya; Makoto Yamada, Gifu; Osamu Nagata, Aichi; Tsuyoshi Suzuki, and Toshio Sugiura, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan
Filed Dec. 15, 1988, Ser. No. 284,895
Claims priority, application Japan, Dec. 18, 1987, 62-193086[U]; Jan. 29, 1988, 63-20986; Apr. 1, 1988, 63-45167[U]
Int. Cl.[5] G03B *27/32, 27/52*
U.S. Cl. 355—27 **16 Claims**



1. An exposure unit for use in an image recording apparatus for exposing a substrate to a light, said exposure unit comprising:
a filter unit for receiving a first light passing along an optical path and adjusting light components contained in said first light, said filter unit including:
(a) a light source for emitting said first light;
(b) a filter housing to which an opening is formed;
(c) a first filter member for adjusting a red-color light component;
(d) a second filter member for adjusting a blue-color light component; and
(e) a third filter member for adjusting a green-color light component, wherein said first, second and third filter members are retained in said filter housing and adapted to be drawn from said opening,
a drive unit for selectively drawing said first, second and third filter members from said opening into the optical path, said drive unit comprising:
an operation panel for outputting a color adjusting signal, said signal instructing adjustment of the color components of said first light;
a controller connected to said operation panel for supplying first, second and third drive signals in response to the color adjusting signal;
a first motor responsive to said first drive signal for moving said first filter member, said first filter member being moved by a first distance depending upon said first drive signal;
a second motor responsive to said second drive signal for moving said second filter member, said second filter member being moved by a second distance depending upon said second drive signal; and
a third motor responsive to said third drive signal for moving said third filter member, said third filter member being moved by a third distance depending upon said third drive signal.

4,924,256
SLIT EXPOSURE TYPE COLOR IMAGE FORMING APPARATUS
Hiromi Yanatori, Hachioji, Japan, assignor to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan
Continuation of Ser. No. 886,570, Jul. 16, 1986, abandoned. This application May 4, 1988, Ser. No. 188,710
Claims priority, application Japan, Jul. 19, 1985, 60-160831; Jul. 19, 1985, 60-160832
Int. Cl.[5] G03B *29/00*
U.S. Cl. 355—28 **8 Claims**



1. A slit exposure type color image forming apparatus comprising an exposure portion, an exposure conveying means adapted to transport a photosensitive silver halide material through said exposure portion where said material is exposed to an optical image from an original being copied, means for processing said material downstream of said exposure portion, means for controlling said apparatus so that there are no other conveying forces applied to said material by other conveying means while said material is transported through said exposure portion,
said other conveying means having a clamped position in which said material is held and said other conveying forces are applied to said material, and a free position, in which none of said other conveying forces is applied to said material, said means for controlling moving said other conveying means to said free position while said material is transported through said exposure portion.

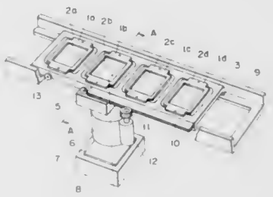
4,924,257
SCAN AND REPEAT HIGH RESOLUTION PROJECTION LITHOGRAPHY SYSTEM
Kantilal Jain, 18 Algonquian Trail, Briarcliff Manor, N.Y. 10510
Filed Oct. 5, 1988, Ser. No. 253,717
Int. Cl.[5] G03B *27/42*
U.S. Cl. 355—53 **22 Claims**

1. A high resolution, high exposure speed, large effective field size scan and repeat lithography system for producing precise images of a pattern that is present on a mask onto a substrate, comprising:
(a) a substrate stage capable of scanning a substrate in one dimension and, when not scanning in that dimension, capable of moving laterally in a direction perpendicular to the scan direction so as to position the substrate for another scan; said substrate stage thus being capable of exposing the full substrate by breaking up the substrate are into a certain number of parallel strips, and exposing each of said strips by scanning the length of the strip across a fixed illumination region;
(b) a mask stage capable of scanning in the same dimension as, and synchronized with, the substrate stage, at a speed equal to the substrate stage scanning speed multiplied by a certain ratio M;
(c) an illumination subsystem having the desired characteristics of wavelength and intensity distribution, having an effective source plane in the shape of a polygon, and capable of uniformly illuminating a polygon-shaped region on the mask;
(d) a projection subsystem for imaging the said polygon-shaped illuminated region on the mask onto the substrate, having an object-to-image reduction ratio M, having the



desired image resolution, and having an image field in the shape of a polygon and of an area smaller than the desired effective image field size of the said lithography system; and
(e) control means to operatively interrelate said substrate stage, said mask stage and said illumination subsystem, and to provide complementary exposures in an overlap region between the areas exposed by adjacent scans in such a way that the exposure dose distribution received in the overlap region is seamless, and such that the exposure dose delivered across the entire substrate is uniform.

4,924,258
MASK HOLDER AND A MASK CONVEYING AND HOLDING MECHANISM USING THE SAME
Shinji Tsutsui, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 13, 1988, Ser. No. 218,137
Claims priority, application Japan, Jul. 30, 1987, 188816
Int. Cl.[5] G03B *27/42, 27/62;* **B25B** *11/00*
U.S. Cl. 355—53 **8 Claims**



1. A mask holder usable in an exposure apparatus for printing a pattern of a mask upon a workpiece and also being usable for conveying and holding the mask, said mask holder comprising:
a reference member operable as a reference for the positioning of the mask;
an aperture formed in said mask holder and being adapted to be used when the mask is attracted by vacuum;

a spring-biased first pressing member operable to press a side of the mask, when it is held by said mask holder, in a direction contacting another side of the mask to said reference member; and

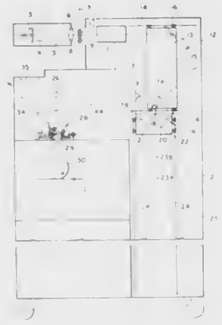
a spring-biased second pressing member operable to press an upper face of the mask, when it is held by said mask holder, in a direction contacting a lower face of the mask to said aperture.

4,924,259

MICROFORM PRINTER

David S. Wise, Solon, Ohio, assignor to Tameran, Inc., Chagrin Falls, Ohio

Filed Oct. 14, 1988, Ser. No. 258,210
Int. Cl.[5] G03B *27/40*
U.S. Cl. 355—57 **21 Claims**



1. A microform printing system comprising:

a microform image;

optics means to pass light from a light source along an optical path including the microform image, an objective lens, image magnification means and image slit to a printing roll for printing the microform image onto plain bond paper;

the image magnification means including a reciprocally adjustable short zoom mirror assembly selectively to provide magnification within a lower magnification ratio range and a reciprocally adjustable long zoom mirror assembly selectively to provide magnification within a higher magnification ratio range; and

optical switching means selectively to vary the optical path to exclude or include the long zoom mirror assembly in accordance with the magnification ratio selected.

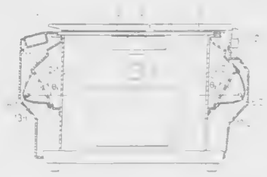
4,924,260

EXPOSURE SYSTEM OF IMAGE FORMING APPARATUS

Kenichi Shimizu, Kawasaki, Japan, assignor to Polaroid Corporation, Cambridge, Mass.

PCT No. PCT/JP88/00522, § 371 Date Feb. 16, 1989, § 102(e) Date Feb. 16, 1989
PCT Filed Jun. 23, 1988, Ser. No. 315,898
Claims priority, application Japan, Jun. 23, 1987, 62-154546
Int. Cl.[5] G03B *27/72*
U.S. Cl. 355—69 **3 Claims**

1. In an image forming apparatus in which a plurality of flash lamps disposed in opposition to and at opposite ends of an original are lit for exposure of the original to obtain a copied image on a light sensitive film, an exposure system characterized in that for attaining a required amount of total exposure on the light sensitive film, the individual flash lamps are alternately lit a plurality of times to produce a series of identical individual exposures whose sum is approximately equal to said total exposure, respectively, even when the requisite total exposure can be obtained by lighting alternately only once



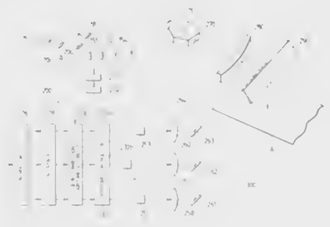
each of the flash lamps, to thereby prevent nonuniformity of exposure of the film due to the reciprocity law failure.

4,924,261

IMAGE FORMING METHOD

Yoshiharu Okino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 25, 1989, Ser. No. 398,584
Claims priority, application Japan, Sep. 14, 1988, 63-228335
Int. Cl.[5] G03B *27/72*
U.S. Cl. 355—35 **3 Claims**



1. In an image forming method for forming a color image by exposing a photosensitive material to light of three colors, the improvement comprising: providing at least three light-emitting elements which emit light of three colors, and selecting simultaneous three-color exposure or sequential monochromatic exposure of the photosensitive material by controlling the simultaneous or separate driving of the light-emitting elements in response to a three-color light signal.

4,924,262

SHUTTER CALIBRATION AND DOCUMENT SIZE DETECTION

Roger W. Budnik, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1989, Ser. No. 369,876
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—75 **28 Claims**

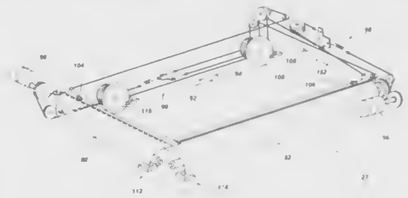
1. An apparatus for determining the size of a document, including:

a platen for supporting the document so that one set of perpendicular edges thereof are located at a registration position thereon;

a shutter located in a open position with the distance between the open position and the registration position being stored as a constant, said shutter being adapted to move from the open position to another set of perpendicular edges of the document;

means for measuring the distance that the shutter moves between the open position and the other set of perpendicular edges of the document; and

means for calculating the size of the document as a function of the distance that the shutter moves and the constant



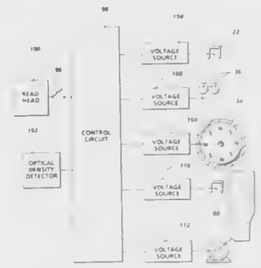
corresponding to distance between the open position and the registration position.

4,924,263

QUALITY CONTROL FOR MAGNETIC IMAGES

Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 10, 1989, Ser. No. 336,285
Int. Cl.[5] G03G *15/00, 15/09*
U.S. Cl. 355—203 **22 Claims**



1. A printing machine of the type in which magnetically permeable marking particles develop a latent image recorded on a member, wherein the improvement includes a read head positioned adjacent the member to detect magnetic field intensity effects produced by the marking particles developed on the member and, in response thereto, generates a signal.

4,924,264

IMAGE DUPLICATING APPARATUS HAVING EDITED COPYING MODE

Masazumi Ito, and Kimihiko Higashio, both of Aichi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1987, Ser. No. 135,251
Claims priority, application Japan, Jun. 30, 1987, 62-164584; Jun. 30, 1987, 62-164585; Jun. 30, 1987, 62-164586
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—204 **17 Claims**

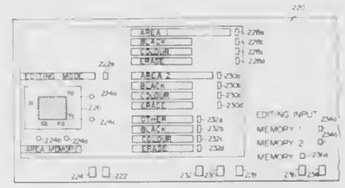
1. An image duplicating apparatus having an edited mode of copying operation, comprising

(a) image forming means for producing an edited copy of a given image;

(b) mode selecting means for selecting said edited mode of copying operation;

(c) area designating means for designating an edited copy area in which images are to be copied in the edited mode of copying operation;

(d) data input means for entering data indicative of particulars in accordance with which said edited mode of copying operation is to be executed for the designated edited copy area; and



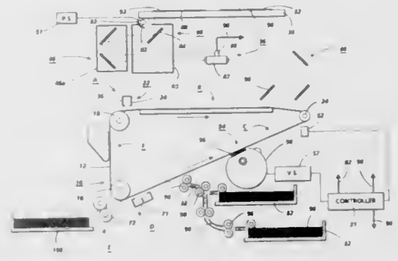
control means for allowing entry of data from said data input means in any desired manner after said edited copy area has been designated by said area designating means, provided said edited mode of copying operation is selected.

4,924,265

AUTOMATIC INSERT FEED CONTROL

Stephen R. Partilla, Webster, and Mark F. Mungenast, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1988, Ser. No. 168,042
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—204 **2 Claims**



1. In a copying machine with a control, transfer station and output tray for copying a set of originals: having a background area onto copy sheets, including means for projecting light on the originals and detecting means for receiving light reflected from the background portion of the originals and producing signals in accordance with the density of the light reflected from the background portion of the originals, and including a first supply station providing the copy sheets and a second supply station providing insert sheets, the detector including a photo diode and amplifier located in the light path of the rays reflected form the originals, the improvement comprising:

means responsive to a first signal from the detecting means for providing insert sheets from the second supply station in the reproduced set of originals, the control including the option to provide the insert sheets to the transfer station or directly to the output tray.

4,924,266

PRINTER FOR CONTINUOUS FORM

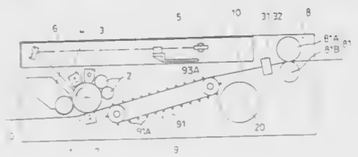
Ikuo Negoro, Sakado, and Masahiro Kita, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed May 18, 1988, Ser. No. 195,298

Claims priority, application Japan, May 19, 1987, 62-74830[U]; Jun. 12, 1987, 62-90385[U]; Jul. 7, 1987, 62-169341; Aug. 20, 1987, 62-206666

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—205 **20 Claims**



1. A printer for printing information onto a continuous form having opposed side edges, said printer comprising side-edge detecting means arranged adjacent at least one of said side edges for detecting each said one side edge of said continuous form, and traveling-trouble detecting means for determining that an abnormality has occurred in movement of said continuous form, said detecting means being operative, when a detecting signal representative of a side edge of said continuous form detected by said side-edge detecting means continues for at least a pre-determined period of time, to output an error signal, wherein said traveling-trouble detecting means comprises clock-signal generating means and counter means for counting clock signals outputted from said clock-signal generating means, wherein the detecting signal outputted from said side-edge detecting means is employed as a clear signal for said counter means, and wherein said counter means outputs said error signal when numbers of said clock signals counted by said counter means reach a preset count value.

4,924,267

PROCESS CARTRIDGE AND MULTI-COLOR IMAGE FORMING APPARATUS USING SAME

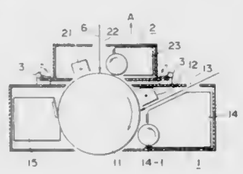
Masao Yoshikawa, Tokyo; Takashi Saito, Yokohama; Tatuya Kobayashi, Yokohama; Otoya Kosugiyama, Yokohama; Atsushi Kubota, Machida; Tuyoshi Waragai, Tokyo; Tomoyuki Araki, Tokyo; Hiroo Kobayashi, Tokyo; Masahiko Yashiro, Tokyo, and Hiroyuki Ishii, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 141,771, Jan. 11, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 379,685

Claims priority, application Japan, Jan. 9, 1987, 62-003076; Mar. 20, 1987, 62-066954; Aug. 3, 1987, 62-194126; Dec. 23, 1987, 62-326427

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—210 **39 Claims**



1. A main process cartridge detachably mountable to a main assembly of an image forming apparatus, comprising as a unit:

an image bearing member;

first developing means for developing a latent image formed on said image bearing member;

a supporting member for supporting said image bearing member and said first developing means as a unit; and

a mounting portion, on said supporting member, for detachably mounting to said main process cartridge a subordinate cartridge separate from said main process cartridge and containing second developing means, separate from said first developing means, for developing a latent image formed on said image bearing member.

4,924,268

ELECTRONIC COPIER WITH SIMULTANEOUS CHARGER AND ERASING ARRAY CLEANING

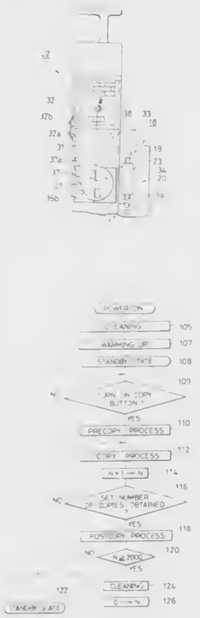
Masahiko Ogura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1988, Ser. No. 278,111

Claims priority, application Japan, Nov. 30, 1987, 62-302028

Int. Cl.[5] G03G 21/00, 15/02

U.S. Cl. 355—219 **11 Claims**



1. An image forming apparatus which scans the surface of a charged photoconductor with light to form a latent image on the photoconductor and develops the latent image, said image forming apparatus comprising;

(a) charging means for uniformly charging the surface of the photoconductor;

(b) charge eliminating means for eliminating charges from an area other than the latent image of the surface of the photoconductor charged by said charging means;

(c) cleaning means for cleaning said charging means and charge eliminating means simultaneously; and

(d) control means for counting the number of image formations to control said cleaning means such that said cleaning means cleans said charging means and charge eliminating means when the counted number of image formations is equal to or larger than a predetermined value.

4,924,269

ORIGINAL ILLUMINATING APPARATUS

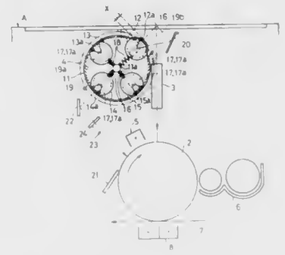
Hirofumi Hasegawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1988, Ser. No. 263,818

Claims priority, application Japan, Oct. 28, 1987, 62-165938[U]; Oct. 28, 1987, 62-165939[U]

Int. Cl.[5] G03G *15/00, 15/04*

U.S. Cl. 355—229 **16 Claims**



1. An original illuminating apparatus for copying or image reading, comprising:

a plurality of light sources having respectively different spectral distributions:

a holding means for supporting a plurality of light sources in a manner that is rotatively movable;

a first moving means for rotatively moving each one of the light sources to position a desired light source at an original illuminating position; and

a second moving means for moving the desired light source to an original illuminating point when the desired light source is positioned at an illuminating position.

4,924,270

TONER SUPPLY DEVICE FOR USE IN IMAGE FORMING APPARATUS

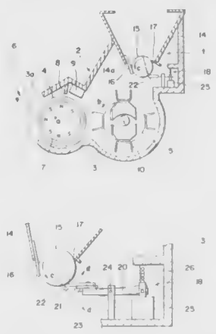
Mineyuki Sako; Tateki Oka; Yasuyuki Hiromoto; Tomoaki Yokoyama, and Kunio Toda, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1988, Ser. No. 263,415

Claims priority, application Japan, Oct. 29, 1987, 62-274161; Oct. 29, 1987, 62-274162; Oct. 29, 1987, 62-274163; Oct. 29, 1987, 62-274164

Int. Cl.[5] G03G *21/00, 15/06;* B05C *11/00*

U.S. Cl. 355—246 **12 Claims**



1. A toner supply device adapted to a developing device for developing a latent image on an electrostatic latent image support member by supplying toner to the latent image, which comprises:

a hopper for containing said toner;

a toner supply roller rotatably disposed below said hopper so as to fill an opening formed in a lower section of said hopper, said toner supply roller being simultaneously driven at the time when said developing device is driven;

a charging blade which is disposed so as to be in close contact under pressure with a peripheral surface of said toner supply roller to electrically charge said toner which is transported on said toner supply roller, so that a predetermined thickness of a toner layer is formed on the peripheral surface of said toner supply roller;

toner scraping means arranged at a position located downstream of said charging blade with respect to a rotational direction of said toner supply roller, by which said toner layer on said toner supply roller may be scraped off to be supplied to said developing device;

detecting means for detecting toner density; and

control means for controlling said toner scraping means depending on signals from said detecting means so as to make said toner scraping means remove to one of a first position at which said toner scraping means comes in close contact under pressure with said toner supply roller and a second position at which said toner scraping means stands apart from said toner supply roller.

4,924,271

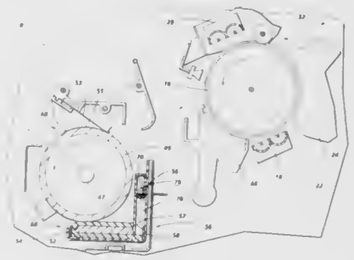
OIL DISTRIBUTION SYSTEM FOR A HEAT AND PRESSURE FUSER

Catherine A. Brinton, Rochester, and Adalbert A. Lux, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Coan.

Filed Aug. 11, 1988, Ser. No. 231,120

Int. Cl.[5] G03G *15/20, 21/00*

U.S. Cl. 355—284 **5 Claims**



1. Apparatus for forming toner images on a copy substrate,

said apparatus including a fuser roll, and a release oil distribution assembly, such oil assembly comprising:

a metering chamber including a metering channel having an oil flow surface aligned in a plane at an angle θ to the horizontal,

a plurality of enclosed reservoirs located beneath, and in communication with said metering channel, each of said reservoirs having an orifice at the bottom thereof, said reservoirs located in a plane parallel to said oil flow surface plane whereby said reservoirs are progressively filled, under the influence of gravity, from the end of said channel below the horizontal and progressing towards the reservoris located at the channel end above the horizontal, and

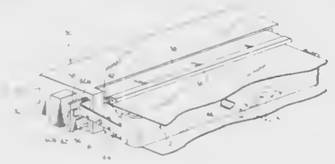
an oil application wick assembly wick extending along the length of said metering chamber and plurality of reservoirs, said wick assembly adapted to dispense oil by capillary action to the fuser roll surface.

4,924,272

CLEANING ASSEMBLY FOR ELECTROSTATOGRAPHIC APPARATUS

Edwin A. Hediger, Fairport, and Brandon H. Brown, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 1, 1988, Ser. No. 278,382
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—298 7 Claims



1. In a electrostatographic reproduction apparatus including a dielectric web upon which marking particle developed images are formed for transfer to a receiver sheet, said web being supported for movement along a desired path relative to electrostatographic process stations by guide rollers, means for removing residual marking particles from said web, said removing means comprising:

a housing including a chamber adapted to store removed residual marking particles, and means for sweeping residual marking particles from said web into said chamber, and

a bracket having a pair of arms, said arms supporting one of said guide rollers, and means associated with said arms for retaining said housing with said sweeping means in operative association with said web.

4,924,273

ROLLER TRANSFER APPARATUS

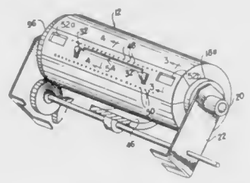
Brian J. Joseph, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1989, Ser. No. 339,743
Int. Cl.[5] G03G *21/00, 15/00;* B65H *29/54, 5/12*
U.S. Cl. 355—312 9 Claims

1. A transfer apparatus located such that its peripheral surface is in operative relation with the dielectric member of an electrostatographic copier, said transfer apparatus comprising:

means for selectively tacking at least the lead marginal edge of a receiver member on the peripheral surface of said apparatus along an element thereof; and

means defined in the peripheral surface of said apparatus substantially aligned with said tacking means for minimizing contact of the tacked lead edge of the receiver sheet to the peripheral surface of said apparatus, thereby facilitating release of the sheet from said apparatus at a desired time.

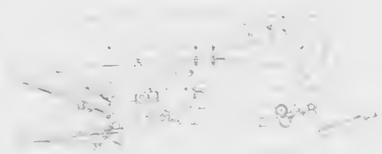


4,924,274

COPYING MACHINE

Masazumi Ito, and Tomoji Murata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 20, 1988, Ser. No. 246,865
Claims priority, application Japan, Sep. 25, 1987, 62-241491
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—313 16 Claims



1. A copying machine including a setting means for respectively setting a plurality of parameters necessary for specific copying operations comprising;

a plurality of memory means for respectively storing a set of the parameters as a copying mode;

a read-out key for reading out copying modes stored respectively in said plurality of memory means in a predetermined order by a manipulation thereof;

a control means for executing the copying operation in accordance with the set of parameters read out by said read-out key;

a changing means for changing the reading sequence of said plurality of memory means carried out by said read-out key, and

a reading sequence control means for applying the changed reading sequence instead of the reading sequence of said predetermined order, when an operation for changing the reading sequence is executed by said changing means.

4,924,275

PRINTER SWITCHABLE BETWEEN DUPLEX AND SIMPLEX MODE ON A PAGE BY PAGE BASIS

Thomas C. Nelson, Melbourne, Fla., assignor to Storage Technology Corporation, Louisville, Colo.

Filed May 12, 1989, Ser. No. 351,429
Int. Cl.[5] B41J *13/00*
U.S. Cl. 355—319 22 Claims

1. In a printer system, connected to an associated processor that transmits print command signals to said printer system, and having a single simplex print engine with an input for receiving a page of paper to be printed on one side and an output for ejecting a page of paper that said print engine has printed on one side, apparatus for selectively printing in the duplex mode on a page by page basis comprising:

means for returning, in a flipped mode, said printed page of paper ejected by said print engine to said input of said print engine for printing on the other side of said printed page of paper;

means for receiving a printed page of paper ejected by said print engine;

means for selectively routing said printed page of paper ejected by said print engine to said returning means or said receiving means, as a function of whether or not, respectively, said other side of said page of paper is to receive print, including:

means responsive to said print command signals received from said associated processor for detecting the presence of said print command signals indicative of a blank other side of said page of paper;

means responsive to said detected blank page for activating said receiving means.

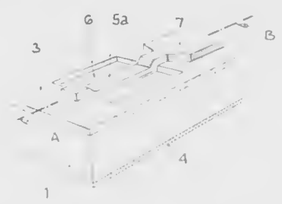


4,924,276

OPTOELECTRONIC COMPONENT

Axel Heime, Heilbronn-Sontheim; Gerhard Rosin-Schröder, Heilbronn, and Werner Schairer, Weinsberg, all of Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Aug. 17, 1988, Ser. No. 235,311
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1987, 3727488
Int. Cl.[5] H01L *33/00, 23/48, 27/14*
U.S. Cl. 357—17 8 Claims



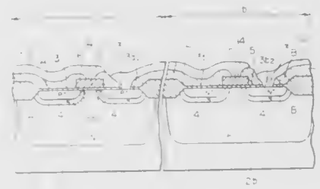
1. An optoelectronic component that is made from a semiconductor element (1) containing at least one p-n junction (2), and that has one rear contact (4) on the semiconductor element (1) and one front contact (5) in a contact window (6) located in a passivation layer (3), wherein the front contact (5) comprises a narrow contact bridge (5*a*) passing transversely over the contact window (6) in such a way that it projects beyond said window (6) on both sides and divides said window (6) into two areas.

4,924,277

MIS TRANSISTOR DEVICE

Hiroyuki Yamane, Nagoya; Yasushi Higuchi, Kariya, and Tetsuo Fujii, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 26,998, Mar. 17, 1987, abandoned. This application Apr. 20, 1989, Ser. No. 342,608
Claims priority, application Japan, Mar. 18, 1986, 61-60378
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.3 4 Claims



1. A CMOS transistor device comprising:

a semiconductor substrate;

an N^- type and a P^- type well region formed in said semiconductor substrate;

an insulating film formed on said N^- type and said P^- type well regions;

a first and a second gate electrode formed on said insulating film respectively over said N^- type and said P^- type well regions;

a first pair of N type diffusion layers formed in said N^- type well region and separated by a portion underlying said first gate electrode, said first pair of N type diffusion layers having an impurity concentration of 3 to 30 times higher than an impurity concentration of said N^- *type well region*,

a second pair of N type diffusion layers formed in said P^- type well region and separated by a portion underlying said second gate electrode, said second pair of N type diffusion layers having an impurity concentration of 3 to 30 times higher than an impurity concentration of said P^- type well region;

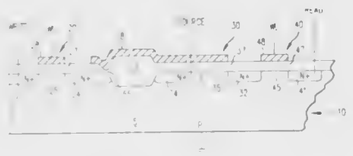
a first and a second P^+ type diffusion layer formed respectively in said first pair of N type diffusion layers formed in said N^- type well region, and having widths respectively narrower than widths of said first pair of N type diffusion layers, said first and said second P^+ type diffusion layers having an impurity concentration higher than the impurity concentration of said first pair of N type diffusion layers;

a first and a second N^+ type diffusion layer formed respectively in said second pair of N type diffusion layers formed in said P^- type well region, and having widths respectively narrower than widths of said second pair of N type diffusion layers, said first and said second N^+ type diffusion layers having an impurity concentration higher than the impurity concentration of said second pair of N type diffusion layers;

a first and a second drain electrode respectively electrically connected to said first P^+ type diffusion layer and said first N^+ type diffusion layer; and

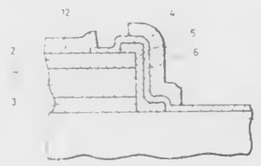
a first and a second source electrode respectively electrically connected to said second P^+-type diffusion layer and said second N^+-type diffusion layer.

4,924,278
EEPROM USING A MERGED SOURCE AND CONTROL GATE
Stewart Logie, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 65,040, Jun. 19, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 274,633
Int. Cl.[5] H01L *29/78, 27/02, 29/34*
U.S. Cl. 357—23.5 8 Claims



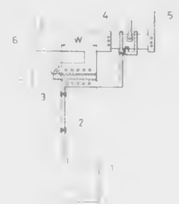
1. An EEPROM comprising:
a semiconductor substrate of a first conductivity type having a ton surface;
a source/control region of a conductivity type opposite that of said substrate formed on and below said surface of said substrate, said source/control region acting as both a source for a sense transistor and as a control gate for said EEPROM;
a drain region of a conductivity type opposite that of said substrate formed on and below said surface of said substrate;
a third region of a conductivity type opposite that of said substrate formed on and below said surface of said substrate;
a channel region between said source/control and drain regions;
a gate oxide layer formed over said channel region;
a tunnel oxide layer formed over said third region;
a floating gate formed over said channel region, said floating gate being capacitively coupled to said source/control region via said gate oxide layer and capacitively coupled to said third region via said tunnel oxide layer, said gate oxide layer being of a thickness that does not allow electron tunneling to the source/control region, said tunnel oxide layer being of a thickness to allow electron tunneling upon incurrence of a sufficient voltage potential between said floating gate and said third region.

4,924,279
THIN FILM TRANSISTOR
Masafemi Shimbo, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan
Filed May 10, 1984, Ser. No. 608,981
Claims priority, application Japan, May 12, 1983, 58-83383
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.7 36 Claims



1. A thin film field effect transistor of the type formed on a substantially planar substrate, said transistor comprising:
a plurality of layers, said plurality of layers being contiguous and formed over said substrate to form a drain region layer, a source region layer and an electrically insulating layer between said source and drain regions layers;
said plurality of layers having edge portions forming a plurality of surfaces which are non-parallel to said substrate;
a deposited semiconductor material layer overlying said non-parallel surfaces and electrically coupled to said drain region layer and said source region layer along said non-parallel surfaces for forming a plurality of current conduction channels therebetween;
a gate insulator disposed over said deposited semiconductor material layer; and
a gate electrode separated from said deposited semiconductor material layer by said gate insulator.

4,924,280
SEMICONDUCTOR FET WITH LONG CHANNEL LENGTH
Yasuhiro Fukuda, and Shooji Kitazawa, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 96,529, Sep. 15, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 403,026
Claims priority, application Japan, Jan. 23, 1987, 62-12290
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.8 4 Claims

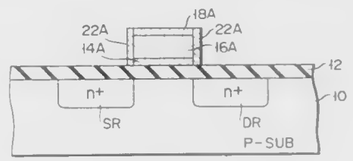


1. A semiconductor device having:
an external input terminal;
a first insulated-gate field-effect transistor having a gate oxide which has a predetermined thickness and having a channel formed in a semiconductor substrate;
a protection resistor connecting the gate of said first insulated-gate field-effect transistor to said external input terminal; and
a second insulated gate field-effect transistor having a gate oxide which has a thickness which is substantially the same as said predetermined thickness of said gate oxide of said first insulated field-effect transistor; said second insulated-gate field-effect transistor including a channel formed in the semiconductor substrate, a drain connected directly to the gate of said first insulated-gate field-effect transistor, a gate, and a source, said gate and said source each being connected to ground potential;
wherein said channel of said second insulated-gate field-effect transistor has a channel width and a channel length, and the ratio of said channel width to said channel length is not less than 12.

4,924,281
GATE STRUCTURE FOR A MOS FET
Kazuo Endo, Yokohama; Noboru Noda, Kawasaki, and Tatsuro Mitani, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 804,452, Dec. 4, 1985, abandoned. This application Mar. 16, 1987, Ser. No. 27,131
Claims priority, application Japan, Dec. 5, 1984, 59-256939
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.9 5 Claims

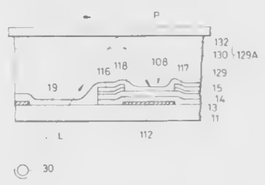
1. A gate structure for an insulated gate type FET, comprising:

a substrate;
a silicon oxide layer formed on said substrate; and
a gate electrode formed on said silicon oxide layer, said gate electrode including a high-melting metal layer and first and second silicidized, high-melting metal layers each thinner than said high-melting metal layer, said first silicidized, high-melting metal layer being formed on said



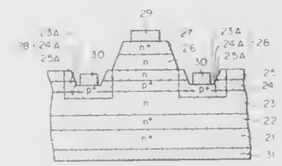
silicon oxide layer, with said high-melting metal layer being formed between respective upper and bottom surfaces of said first and second silicidized, high-melting metal layers, and side surfaces of said high-melting metal layer being in alignment with corresponding side surfaces of said first and second silicidized, high-melting metal layers.

4,924,282
IMAGE READING DEVICE WITH MOISTURE RESISTANT LAYER
Katsumi Komiyama; Masaki Fukaya, both of Isehara; Kojiro Yokono, Yokohama, and Hitoshi Toma, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 310,467, Feb. 15, 1989, abandoned, which is a continuation of Ser. No. 104,072, Oct. 5, 1987. This application Jul. 25, 1989, Ser. No. 384,904
Claims priority, application Japan, Oct. 7, 1986, 61-237061; Oct. 7, 1986, 61-237062; Oct. 7, 1986, 61-237063; Jun. 12, 1987, 62-145355
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 13 Claims



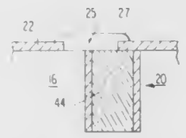
1. An image reading apparatus for reading information from an information bearing member, said image reading apparatus comprising:
a substrate;
an illuminating window for introducing light to illuminate the information bearing member;
a plurality of photosensors disposed on said substrate for receiving light reflected by the information bearing member; and
a protective layer for maintaining a constant distance between said photosensors and the information bearing member, said protective layer comprising a first intermediate layer disposed on said photosensors for insulating said photosensors and a second intermediate layer arranged to cover said first intermediate layer entirely, and said second intermediate layer having moisture resistance properties higher than said first intermediate layer.

4,924,283
HETEROJUNCTION BIPOLAR TRANSISTOR AND PROCESS FOR FABRICATING SAME
Toshio Ohshima, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 832,896, Feb. 26, 1986, abandoned. This application Oct. 20, 1988, Ser. No. 262,241
Claims priority, application Japan, Feb. 28, 1985, 60-39120
Int. Cl.[5] H01L *29/72, 29/161, 27/12*
U.S. Cl. 357—34 16 Claims



10. A bipolar transistor comprising:
a collector layer of a first conductivity type;
a base layer of a second conductivity type opposite to the first conductivity type, said base layer on said collector layer except for a first portion of said collector layer;
an emitter layer of the first conductivity type on the base layer, said emitter layer forming a heterojunction with said base layer and being a semiconductor having a band gap wider than that of said base layer;
a base contact region of the second conductivity type along the first portion of said collector layer and along a periphery of a junction between said emitter layer and said base layer adjacent the first portion of said collector layer, so that the periphery of the heterojunction formed by said emitter layer and said base layer is covered by said base contact region;
a first electrode electrically connected to said collector layer;
a second electrode electrically connected to said base contact region; and
a third electrode electrically connected to said emitter layer.

4,924,284
METHOD OF TRENCH FILLING
Klaus D. Beyer, Poughkeepsie, and Victor J. Silvestri, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 793,518, Oct. 31, 1985, Pat. No. 4,745,081. This application Jan. 20, 1988, Ser. No. 145,863
Int. Cl.[5] H01L *27/12*
U.S. Cl. 357—49 19 Claims



1. An integrated circuit semiconductor structure comprising: a silicon substrate, a trench having substantially vertical sidewalls extending downward from a surface of said substrate, said trench filled with silicon; an insulator covering said substrate surface and only said trench sidewalls and having an opening that overlies a portion of said trench and an adjacent portion of said surface of said substrate; and a silicon material in said opening forming a contact.

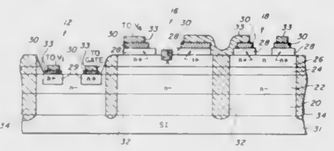
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4,924,285

MONOLITHIC MULTICHANNEL DETECTOR AMPLIFIER ARRAYS AND CIRCUIT CHANNELS

Gordon W. Anderson, Washington, D.C.; John B. Boos, Springfield, Va.; Harry B. Dietrich, Fairfax, Va.; David I. Ma, Arlington, Va.; Ingham A. G. Mack, Laurel, and Nicolas A. Papanicolaou, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1988, Ser. No. 262,765
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 **20 Claims**



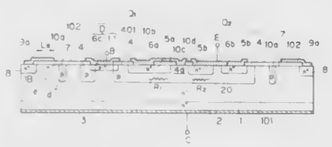
1. An integrated planar single-channel photodetector-amplifier device, comprising:
a photodetector layer;
an amplifier layer above said photodetector layer;
said photodetector layer is low-doped to provide a low-dark current, and is sufficiently thick to provide a high quantum efficiency;
said amplifier layer is of a smaller thickness and is more highly doped, than the photodetector layer, to provide an amplifier having high gain;
an insulating layer between said photodetector and amplifier layers for electrically insulating said low-doped photodetector layer from the more highly doped amplifier layer;
a substrate below said photodetector layer;
isolation regions, extending from the surface of the amplifier layer down toward the substrate, for electrically, laterally isolating a photodetector, amplifier, and other circuit components comprising the single-channel photodetector-amplifier device from each other; and
means for making electrical connection from one circuit component to another.

4,924,286

SEMICONDUCTOR DEVICE

Kiyoshi Ishibashi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1988, Ser. No. 224,404
Claims priority, application Japan, Feb. 3, 1988, 63-24281
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—46 **5 Claims**



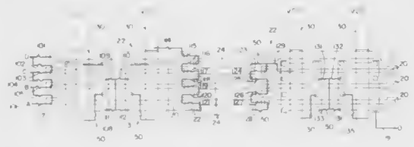
1. A semiconductor device comprising:
(a) a semiconductor chip having:
(a-1) a collector layer of a first conductivity type,
(a-2) a base layer of a second conductivity type formed in a part of a first surface of said collector layer,
(a-3) an emitter layer of said first conductivity type formed in a part of a surface of said base layer, and
(a-4) a semiconductor layer of said second conductivity type formed in another part of said first surface, said semiconductor layer contacting said base layer and having higher conductivity than said base layer, a junction of said semiconductor layer and said collector layer being a pn diode junction;
(b) a collector electrode layer formed on a second surface of said collector layer,
(c) an emitter electrode layer formed on a surface of said emitter layer,
(d) a base electrode layer formed on a surface of said semiconductor layer,
(e) an insulating film formed on a part of said first surface surrounding said base layer, and
(f) a field plate electrode layer formed on a part of a surface of said insulation film, wherein said field plate electrode layer is included in a vertical projection of said first surface of said collector layer so that a part of said insulation film is sandwiched between said field plate electrode layer and said collector layer.

4,924,287

PERSONALIZABLE CMOS GATE ARRAY DEVICE AND TECHNIQUE

Zvi Orbach, Haifa, Israel, assignor to Avner Pdahtzur, Haifa, Israel

Continuation of Ser. No. 311,397, Feb. 16, 1989, abandoned, and a continuation of Ser. No. 273,706, Nov. 15, 1988, abandoned, which is a continuation of Ser. No. 819,707, Jan. 17, 1986, abandoned. This application Dec. 18, 1989, Ser. No. 449,063
Claims priority, application Israel, Jan. 20, 1985, 74108
Int. Cl.[5] H01L *27/02, 21/10*
U.S. Cl. 357—51 **17 Claims**



1. A CMOS gate array device comprising:
a substrate;
a collection of individual semiconductor elements formed on the substrate;
fusible links interconnecting the collection of individual semiconductor elements into an inoperably connected CMOS gate array device; and
said collection of semiconductor elements being interconnected for converting the inoperable CMOS gate array device into a selected operable electronic function upon the fusing of predetermined ones of the fusible links.

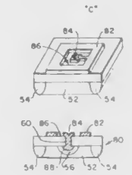
4,924,288

HIGH CURRENT-GAIN PNP TRANSISTOR

Robert A. Neidorff, Bedford, assignor to Unitrode Corporation, Lexington, Mass.

Continuation of Ser. No. 61,786, Jun. 11, 1987, abandoned. This application Feb. 15, 1989, Ser. No. 312,372
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—68 **4 Claims**

1. A high current gain PNP transistor
a substrate of n— material providing a base region;
a p+ diffusion area in said substrate providing a collector region;
a p+ diffusion area in said substrate providing an emitter region in selected proximity to said collector region;
an insulative material overlaying said substrate having an aperture providing access to said emitter region, wherein said aperture comprises a lesser cross sectional area than said emitter region providing conductive access to a contact portion of said emitter; and
a metal surface layer having a first portion substantially completely overlaying said base region between said emitter and said collector, and a second portion providing electrical connection to said contact portion of said emitter through said aperture and having an area confronting said emitter substantially less than the corresponding confronting area of said emitter region, wherein alloying of the metal surface layer through said aperture into said emitter region is minimized.

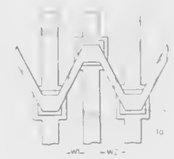


4,924,289

AIR BRIDGE WIRING FOR SEMICONDUCTOR DEVICES

Hiroshi Matsuoka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 17, 1988, Ser. No. 208,083
Claims priority, application Japan, Jun. 19, 1987, 62-154104
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—68 **9 Claims**



1. In a semiconductor device, an air bridge wiring structure comprising a first layer of conductors disposed on a semiconductor substrate, at least some of said conductors having relatively narrow and relatively wide portions, a plurality of bridge posts disposed on said wide portions, and a substantially planar bridge plate disposed straddling said bridge posts, said wide portions of said first layer of conductors not being arranged in a straight line disposed transversely to said conductors.

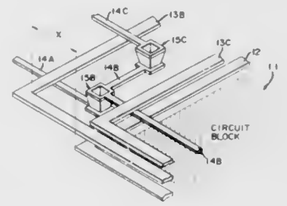
4,924,290

SEMICONDUCTOR DEVICE HAVING IMPROVED MULTILAYERED WIRINGS

Motohiro Eukaku, Sagamihara, and Toshiya Kato, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1988, Ser. No. 238,122
Claims priority, application Japan, Aug. 31, 1987, 62-216710
Int. Cl.[5] H01L *23/48, 29/46, 27/10*
U.S. Cl. 357—68 **21 Claims**

1. A semiconductor device comprising:
at least one circuit block formed on a semiconductor chip with multilayered wiring layers having two or more layers, and having a specific function assigned thereto;
a first current path pattern formed in a first layer of said multilayered wiring layers and running around said circuit block;
a second current path pattern formed in a second layer of said multilayered wiring layers and running around said circuit block, part of said second current path pattern lying over said first current path pattern and the other portion of said second current path pattern lying off said first current path pattern so as to define a connection space with a predetermined width between said first current path pattern and said second current path pattern;



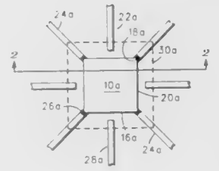
a first signal path pattern formed in said first layer of said multilayered wiring layers and serving as a signal path to said circuit block;
a second signal path pattern formed in said second layer of said multilayered wiring layers and serving as said signal path to said circuit block; and
connecting means, formed in said connection space, for electrically coupling said first signal path pattern and said second signal path pattern;
wherein said first signal path pattern extends under said second current path pattern to outward of said circuit block and said second path pattern extends over said first current path pattern to inward of said circuit block.

4,924,291

FLAGLESS SEMICONDUCTOR PACKAGE

Israel A. Lesk, Phoenix; George W. Hawkins, Mesa; Ronald E. Thomas, Tempe; William L. Hunter, Scottsdale, all of Ariz.; Michael B. McShane, and James J. Casto, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 24, 1988, Ser. No. 261,439
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—70 **19 Claims**



1. A molded semiconductor package having a flagless leadframe comprising:
a semiconductor die having a first surface, a second surface, sides and corners;
a flagless leadframe including leads and a die opening, said leadframe being physically bonded to said semiconductor die and further,, said leads of said leadframe being wire bonded to said semiconductor die in a selective manner; and

an encapsulation disposed about said semiconductor die and said leadframe except for said leads which protrude therefrom.

4,924,292

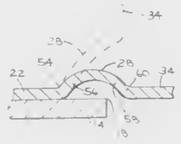
DIRECT BOND CIRCUIT ASSEMBLY WITH CRIMPED LEAD FRAME

Lance R. Kaufman, 131 N. White Oak Way, Mequon, Wis. 53092

Division of Ser. No. 180,541, Apr. 12, 1988. This application Mar. 24, 1989, Ser. No. 328,543

Int. Cl.[5] H01L *21/48, 21/60*

U.S. Cl. 357—70 **4 Claims**



1. An electric circuit assembly comprising:

an electrically insulating thermally conductive non-metallic refractory substrate;

an electrically conductive metallic lead frame having a pad portion on said substrate, a crimped portion having a humped configuration with an upward section extending upwardly away from said pad portion and a downward section extending back downwardly, and an extension portion extending from said downward section;

said lead frame pad portion being directly bonded to said substrate by placing said lead frame pad portion in contact with said substrate, heating said lead frame and said substrate to a temperature below the melting point of said lead frame to form a eutectic with said lead frame which wets said lead frame and said substrate, and cooling said lead frame and said substrate, with said lead frame pad portion bonded to said substrate.

4,924,293

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yoshikazu Saito, Takasaki, and Yoshiaki Yazawa, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 866,923, May 27, 1986, abandoned. This application May 4, 1989, Ser. No. 348,117

Claims priority, application Japan, May 24, 1985, 60-110319; May 24, 1985, 60-110364

Int. Cl.[5] H01L *23/48, 29/46, 29/54, 29/62*

U.S. Cl. 357—71 **32 Claims**



1. A semiconductor integrated circuit device comprising:

an electronic circuit which includes an output section having at least a pair of output stage circuits, each one being separately supplied with a predetermined operation voltage from a voltage supply connection pad, said predetermined operation voltage being substantially of the same amplitude for each one of said at least a pair of output stage circuits; and

wiring layer means formed on the main surface of a semiconductor substrate of said semiconductor integrated circuit device to separately supply said predetermined operation voltage to each one of said at least a pair of output stage circuits of said electronic circuit;

wherein said wiring layer means is comprised of at least a first path and a second path respectively connected along opposite sides near the periphery of said substrate from said voltage supply connection pad which is located near one end on said substrate to individual ones of said at least a pair of output stage circuits of said electronic circuit output section which is located near an opposite end on said semiconductor substrate.

4,924,294

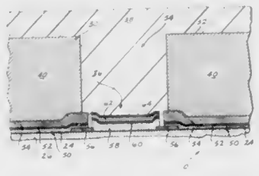
STRUCTURE AND METHOD FOR SELECTIVELY PRODUCING A CONDUCTIVE REGION ON A SUBSTRATE

Minas H. Tanielian, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 1, 1989, Ser. No. 317,739

Int. Cl.[5] H01L *23/48, 29/46, 29/54, 29/62*

U.S. Cl. 357—71 **10 Claims**



1. A structure for selectively providing electrical continuity between two spaced apart conductors formed on a substrate, comprising:

(a) a layer of silicon deposited on the substrate between the two conductors;

(b) a barrier layer of a metallic material that is chemically nonreactive with silicon and does not diffusively mix with silicon below an elevated reaction temperature, said barrier layer being deposited on the layer of silicon and separated thereby from electrically connecting with the two conductors; and

(c) a layer of an electrically conductive material that is chemically reactive with silicon at a second temperature substantially below the reaction temperature, said layer of conductive material being deposited on the barrier layer and separated thereby from the layer of silicon, said barrier layer preventing the silicon from reacting with the layer of conductive material if the structure is heated above the second temperature but below the reaction temperature, said structure being selectively changed from an electrically nonconductive state to an electrically conductive state by heating the layers of the conductive material and the metallic material above the reaction temperature, causing the conductive material and metallic material to react with the silicon, forming conductive silicides, electrical continuity being thus provided between the two conductors through the conductive silicides.

4,924,295

INTEGRATED SEMI-CONDUCTOR CIRCUIT COMPRISING AT LEAST TWO METALLIZATION LEVELS COMPOSED OF ALUMINUM OR ALUMINUM COMPOUNDS AND A METHOD FOR THE MANUFACTURE OF SAME

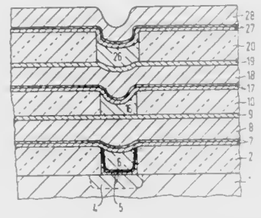
Peter Küecher, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 13, 1987, Ser. No. 107,344

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640656

Int. Cl.[5] H01L *23/48*

U.S. Cl. 357—71 **13 Claims**



1. An integrated semi-conductor circuit including a substrate composed of silicon and at least two metallization levels composed of aluminum or of an aluminum compound and separated by an insulating layer, said metallization levels being connected to one another and to regions in the silicon substrate which are to be contacted, by intermediate layers and contact hole fillers composed of tungsten, the circuit further comprising:

a first intermediate layer chosen from the group consisting of tungsten silicide (WSi_x), titanium/tungsten, titanium/-tungsten nitride, and titanium nitride on the regions in the silicon substrate which are to be contacted;

further intermediate layers composed of metal silicide arranged on the respective metallization levels as cover layers; and

nucleation layers for improving the metallization and the electromigration resistance of aluminum, arranged under the respective metallization levels.

4,924,296

MULTIPLE-CHIP SEMICONDUCTOR ELEMENT IN A CASE OF METAL AND RESIN

Carlo Cini, Cornaredo, and Luigi Sisti, Genoa, both of Italy, assignors to SGS-Thomson Microelectronics SpA, Agrate Brianza, Italy

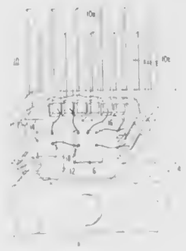
Filed Jul. 28, 1988, Ser. No. 227,539

Claims priority, application Italy, Jul. 28, 1987, 21472 A/87

Int. Cl.[5] H01L *23/28, 23/48*

U.S. Cl. 357—72 **6 Claims**

1. A semiconductor device in a case of the type comprising a metallic plate, a body made of synthetic resin which incorporates a portion of said plate, leaving free a larger surface thereof, and a plurality of metallic terminals issuing from one side of said body of synthetic resin, said device comprising inside said body of synthetic resin; a semiconductor element chip affixed to said metallic plate so as to be in electrical contact therewith and connected electrically to at least one of the said plurality of metallic terminals; at least one metallic lamina disposed on said metallic plate so as to be separated therefrom by an electrically insulating layer and made integral with at least one of said plurality of terminals, and another



semiconductor element chip affixed to said at least one metallic lamina so as to be in electrical contact therewith.

4,924,297

SEMICONDUCTOR DEVICE PACKAGE STRUCTURE

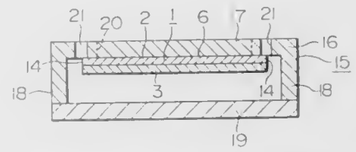
Masahiko Denda, Itami, Japan, assignor to Director General, Agency of Industrial Science and Technology, Japan

Filed Mar. 30, 1988, Ser. No. 175,276

Claims priority, application Japan, Jul. 22, 1987, 62-181157

Int. Cl.[5] H01L *23/04, 23/12*

U.S. Cl. 357—74 **4 Claims**



1. A semiconductor device package for containing a semiconductor device, said package including an outside package wall on which a semiconductor device having edges may be mounted, said package wall having at least two apertures therein for exposing edges of the semiconductor device for accurately determining the position of the semiconductor device within the package.

4,924,298

METHOD AND APPARATUS FOR PREDICTIVE CODING

Hiroyuki Kitamura, Hiratsuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 15, 1988, Ser. No. 245,113

Claims priority, application Japan, Sep. 18, 1987, 62-234073

Int. Cl.[5] H04N *7/12*

U.S. Cl. 358—12 **5 Claims**

1. A method comprising the steps of:

(a) sampling an analog color video signal at a frequency which equals a multiple of a frequency of a chrominance subcarrier of the color video signal;

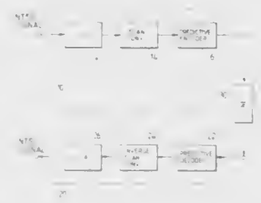
(b) converting the sampled signal into a corresponding first digital signal;

(c) changing an arrangement of data of the first digital signal and thereby converting the first digital signal into a second digital signal;

(d) processing the second digital signal into a coded signal through a predictive coding process;

(e) during the predictive coding process, predicting first data of the second digital signal on the basis of only second data of the second digital signal, the first data corresponding to a first data picture element in a first scanning line,

the second data corresponding to only a single second data picture element in a second scanning line adjacent to the first scanning line, the second data picture element being selected from picture elements in the second scanning line at which phases of the chrominance subcarrier



are equal to a phase of the chrominance subcarrier at the first data picture element, the selected second data picture element being spatially closest to the first data picture element; and

(f) using the predicted first data in the predictive coding process.

4,924,299

IMAGE DISPLAY DEVICE DISPLAYING A COMPOSITE CHARACTER AND GRAPHIC COLOR IMAGE

Yutaka Mizuno, and Hideyuki Takamuku, both of Hachioji, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP87/00693, § 371 Date Jul. 13, 1988, § 102(e) Date Jul. 13, 1988, PCT Pub. No. WO88/02163, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 21, 1987, Ser. No. 210,582

Claims priority, application Japan, Sep. 22, 1986, 61-222187

Int. Cl.[5] H04N *9/76*; G09G *1/28*

U.S. Cl. 358—22 **2 Claims**

1. An image display apparatus having a plurality of color factors constituting each pixel on a character image and a graphic image, wherein each respective corresponding pixel is expressed by logical values, wherein the logical values of the color factors of the corresponding pixel on the character image and the graphic image are logically operated, and a composite image of the character image and the graphic image is expressed, the image display apparatus, comprising:

a logical operation circuit means, including a means for preventing the display of a color factor on the graphic image of a pixel when at least one color factor on the character image exists for the pixel; and a means for preventing the display of a color factor on the character image when the color factor constituting the pixel of the character image is identical to the color factor constituting the corresponding pixel of the graphic image.

4,924,300

METHOD OF AND DEVICE FOR TUNING A RESONANT CIRCUIT COUPLED TO A FREQUENCY DISCRIMINATOR

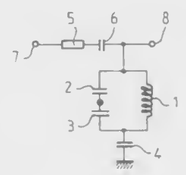
Philippe Vilard, Ruell, France, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1988, Ser. No. 241,515

Claims priority, application France, Sep. 22, 1987, 87 13061

Int. Cl.[5] H04N *5/44*

U.S. Cl. 358—23 **21 Claims**



7. A device having an adjustable resonant circuit and at least one frequency discriminator coupled to an output of the adjustable resonant circuit, characterized in that said device comprises:

synchronizing means for determining a first instant and a second instant following rapidly after the first instant;

a generator coupled to said adjustable resonant circuit for supplying thereto a signal at a nominal frequency of said adjustable resonant circuit, said generator modifying said signal in response to a control signal applied thereto;

means for generating said control signal for said generator for a period of time commencing at said first instant and ending at said second instant;

means for sampling at said second instant a signal supplied by said frequency discriminator, and for shaping said signal;

means for forming an error signal which is a function of the amplitude of said sampled signal; and

means for adjusting said adjustable resonant circuit as a function of said error signal.

4,924,301

APPARATUS AND METHODS FOR DIGITAL HALFTONING

Craig L. Surbrook, Bellevue, Wash., assignor to SeeColor Corporation, Bellevue, Wash.

Filed Nov. 8, 1988, Ser. No. 268,951

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—75 **22 Claims**



4. A digital signal processing method for sequentially processing digitally encoded continuous tone intensity values each of which represent the color content within an associated spatial region of an image being reproduced, said method for producing one or more halftone screens in which a digitally encoded continuous tone intensity value is associated with an incremental region of said halftone screen, said method comprising the steps of:

establishing a first m×m dither array, each element of said first dither array being a dither threshold value with said first m×m dither array defining a first pattern of halftone dither cells that are positioned within said first m×m dither array to provide a predetermined screen ruling and a predetermined screen angle when said first m×m dither array is repeated as a larger array that is formed by consecutive repetition of said first m×m dither array, each said halftone cell of said first m×m dither array including a plurality of dither threshold values with the maximum threshold value being no greater than a predetermined continuous tone intensity value that is within the range of continuous tone intensity values that is associated with each halftone screen that is to be produced with said first m×m dither array, each dither threshold value not associated with one of said halftone dither cells of said first m×m dither array being of a value that exceeds every threshold value associated with one of said halftone dither cells;

establishing a second m×m dither array, each element of said second dither array being a dither threshold value with said second dither array defining a second pattern of halftone dither cells that are positioned within said second m×m dither array to provide both a screen ruling and a screen angle that are substantially identical to said predetermined screen ruling and said predetermined screen angle of said first m×m dither array, each said dither cell of said second m×m dither array including a plurality of threshold values with each said threshold value being no greater than the maximum continuous tone intensity value contained in the set of continuous tone intensity values that is associated with each halftone screen that is to be produced with said second m×m dither array, each dither threshold value not associated with one of said halftone dither cells being of a value that is not equal to any threshold value included in one of said halftone dither cells of said second m×m dither array;

comparing each said continuous tone intensity value with said predetermined continuous tone intensity value to determine whether a continuous tone intensity value being processed is less than said predetermined continuous tone intensity value;

for each said continuous tone intensity value that is less than said predetermined continuous tone intensity value, performing the additional steps of

(a) associating said continuous tone intensity value with a dither threshold value of said first m×m dither array;

(b) comparing said continuous tone intensity value with said associated dither threshold value of said first m×m dither array; and

(c) based on said comparison, generating a binary value representative of whether said incremental region of said halftone screen that is associated with said continuous tone intensity value is to be produced as a substantially blackened region of said halftone screen; and

for each said continuous tone intensity value that is not less than said predetermined continuous tone intensity value, performing the additional steps of

(a) associating said continuous tone intensity value with a dither threshold value of said second m×m dither array;

(b) comparing said continuous tone intensity value with said associated dither threshold value of said second m×m dither array; and

(c) based on said comparison, generating a binary value representative of whether said incremental region of said halftone screen that is associated with said continuous tone intensity value is to be produced as a substantially blackened region of said halftone screen.

4,924,302

CRT COLOR VIDEO PRINTER WHICH ELIMINATES MAGNIFICATION CHANGES DUE TO CHROMATIC ABERRATIONS

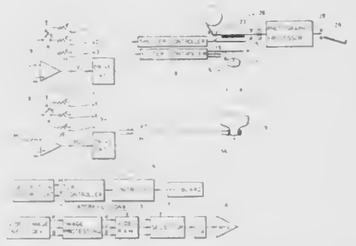
Kazuo Shiota, and Kiichiro Sakamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 19, 1988, Ser. No. 246,114

Claims priority, application Japan, Sep. 18, 1987, 62-233797; Sep. 18, 1987, 62-233798

Int. Cl.[5] H04N *1/46, 5/84, 9/79*

U.S. Cl. 358—75 **5 Claims**



1. A printer for making a color print, which comprises:

a black-and-white CRT for sequentially displaying black-and-white images of three monochromatic images of an image in the form of a brightness pattern thereon;

color filters for sequentially changing said black-and-white images to corresponding monochromatic images;

a printing lens for projecting each monochromatic image onto a photographic material;

an amplifier for amplifying vertical and horizontal deflection signals for driving said CRT; and

means for changing a gain of said amplifier for every exposure of each monochromatic image, so as to make said three monochromatic images projected onto said photographic material the same size.

4. An apparatus for making a color print, which comprises:

a black-and-white CRT for sequentially displaying black-and-white images of three monochromatic images of an image in the form of a brightness pattern thereon;

color filters for sequentially changing said black-and-white images to corresponding monochromatic images;

a zoom printing lens for projecting each monochromatic image onto a photographic material;

memory means for memorizing focal lengths by color for several specific magnifications of said zoom printing lens;

and means for adjusting the focal length of said zoom printing lens according to said focal lengths memorized in said memory means on the basis of a selected specific magnification, so as to make said three monochromatic images projected onto said photographic material the same size.

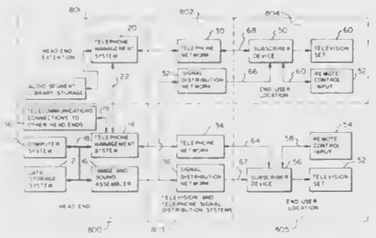
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4,924,303

METHOD AND APPARATUS FOR PROVIDING INTERACTIVE RETRIEVAL OF TV STILL FRAME IMAGES AND AUDIO SEGMENTS

Daniel Brandon, Littleton; Kenneth N. B. Dunlop, Englewood; Lester B. Jensen, Denver; Richard M. Lucas, Lakewood, and Robert E. Pietruszewski, Denver, all of Colo., assignors to Kenneth Dunlop; Richard Lucas and Robert Pietruszewski, all of Denver, Colo.

Filed Sep. 6, 1988, Ser. No. 240,663
Int. Cl.[5] H04N *7/10*
U.S. Cl. 358—86 7 Claims



1. A method for providing interactive video image selection, from a library containing a plurality of video images, by a plurality of library end users, comprising,

providing a library of video images at a head end, said library comprising the number X of video images, each of said video images having a unique identifier,

selecting the number Y of said library video images to be continuously transmitted to said plurality of end users in carousel fashion, where said number Y is less than said number X, and where each of said Y video images is transmitted with a unique identifier,

providing first means whereby an end user may request a carousel video images from said Y number of images in said carousel, by using the unique identifier for said requested carousel image, whereupon said requested carousel image is captured from said transmission by said requesting end user,

providing second means whereby an end user may request a non-carousel video image that is not contained in said Y number of images in said carousel, by using the unique identifier for said requested non-carousel image, whereupon said requested non-carousel image is retrieved from said library, is addressed to said requested end user, and is transmitted to all end user, but is captured from said transmission only by said requesting end user, and

providing a third means whereby an end user may request a non-carousel video image that is not contained in said Y number of images in said carousel, and may additionally request that said requested non-carousel image be addressed to a plurality of end users, whereupon said requested non-carousel image is retrieved from said library, is addressed to said plurality of end users, and is transmitted to all end users, but is captured from said transmission only by said plurality of end users.

6. A device adapted to receive TV still-frame images and audio signals for presentation of the images and signals to a TV receiver, comprising

input video signal port means,

by-pass switch means having first input means connected to said input video signal port means, second input means, first output means adapted to be connected to a TV receiver, and second output means,

said by-pass switch means having a first mode of operation wherein said first input means is connected to said first output means, having a second mode of operation wherein said first input means is connected to said second output means, and having a third mode of operation whereby said second input means is connected to said first output means,

RF demodulator means having first and second output means, and having input means connected to the second output means of said by-pass switch means,

RF modulator means having first and second input means, and having output means connected to the second input means of said by-pass switch means,

video memory means,

video A/D convertor means connecting to the first output means of said RF demodulator means to said video memory means,

video D/A converter means connecting said video memory means to the first input means of said RF modulator means,

controllable telephone interface means having input means adapted to be connected to a telephone line, and having output means,

audio switch means having first, second and third input means, and having first and second output means,

means connecting the first input means of said audio switch means to the output means of said telephone interface means to thereby present audio signals received on said telephone line to the first input means of said audio switch means,

means connecting the first output means of said audio switch means to the second input means of said RF modulator means,

digital memory means for storing audio signals,

audio A/D converter means connecting the second output means of said audio switch to said digital memory means,

audio D/A convertor means connecting said digital memory means to the second input means of said audio switch means,

means connecting the third input means of said audio switch means to the second output means of said RF demodulator means,

first control means connected to control said by-pass switch means to selectively provide said three modes of operation of said by-pass switch means, whereby in said first mode of operation of said by-pass switch means a video signal present at the first input means of said by-pass switch means is connected to a TV receiver by way of the first output means of said by-pass switch means, in said second mode of operation of said by-pass switch means a video signal present at the first input means of said by-pass switch means is connected to the input means of said RF demodulator means and said video signal is stored in said video memory means, and in said third mode of operation of said by-pass switch means the second input means of said by-pass switch means is connected to the first output means of said by-pass switch means and a video signal stored in said video memory means is connected to a TV receiver by way of said RF modulator means, and

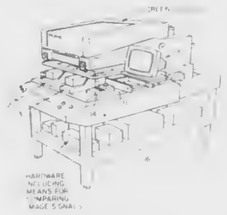
second control means connected to control said audio switch means to selectively provide three modes of operation of said audio switch means, whereby in said first mode of operation of said audio switch means the output means of said telephone interface means is connected to the second input means of said RF modulator means, and in said second mode of operation of said audio switch means the second output means of said RF demodulator means is connected to said digital memory means by way of said audio A/D convertor means, and in said third mode of operation of said audio switch means said digital memory means is connected to the second input means of said RF modulator means by way of said audio D/A convertor means.

4,924,304

VIDEO PROBE ALIGNING OF OBJECT TO BE ACTED UPON

Gary T. Freeman, Beverly, Mass., assignor to MPM Corporation, Medfield, Mass.

Filed Nov. 2, 1987, Ser. No. 116,490
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—101 14 Claims



1. Aligning apparatus comprising,

an object to be acted upon at predetermined locations defining a pattern,

a device characterized by said pattern for acting upon said object,

a video probe arranged to look at both said device and said object for providing image signals representative of both,

means for comparing both image signals to obtain an error signal representative of misalignment between the device and object,

means responsive to said error signal for relatively positioning said device and said object to reduce said error,

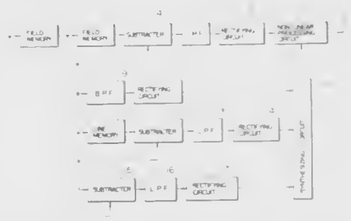
and means for operating upon said object with said device upon said predetermined locations.

4,924,305

MOTION DETECTING CIRCUIT FOR VIDEO SIGNAL PROCESSING USING CORRELATION TECHNIQUES

Isao Nakagawa; Sadao Kubota; Toru Suzaki; Toshimitsu Ozawa, all of Yokohama; Masaharu Yao, Kyoto; Hiroshi Ito, Nagaokakyo; Yoshiteru Suzuki, Takatsuki, and Tatsuo Shibata, Nagaokakyo, all of Japan, assignors to Hitachi, Ltd. and Mitsubishi Electric Corporation, both of Tokyo, Japan

Filed Jun. 13, 1989, Ser. No. 365,315
Claims priority, application Japan, Jun. 15, 1988, 63-145769
Int. Cl.[5] H04N *5/14*
U.S. Cl. 358—105 18 Claims



1. An image motion detecting circuit in a television signal processing circuit in which an interlace scanning for constructing an image for one frame through scanning of images for two fields is performed, comprising:

inter-frame correlation detecting means for detecting and outputting the value of correlation of video signals between adjacent frames;

inter-field correlation detecting means for detecting and outputting the value of correlation of signals of corresponding pixels between adjacent fields; and

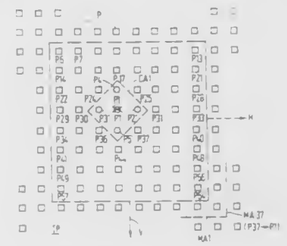
adjusting means for adjusting the output of said inter-frame correlation detecting means in accordance with the inter-field correlation value outputted from said inter-field correlation detecting means.

4,924,306

METHOD OF AND DEVICE FOR ESTIMATING THE EXTENT OF MOTION IN A PICTURE ELEMENT OF A TELEVISION PICTURE

Jan van der Meer; Kiran Varshneya-Rohra, and Franciscus W. P. Vreeswijk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1989, Ser. No. 313,660
Claims priority, application Netherlands, Feb. 23, 1988, 8800452
Int. Cl.[5] H04N *7/137*
U.S. Cl. 358—105 7 Claims



1. A method of estimating the extent of motion in a picture element (pixel) of a television picture, said method being based on picture signal value comparisons between pixels in successive television pictures in which, starting with a present pixel in a present television picture, the picture signal value of said present pixel is compared with that of a corresponding pixel in a previous and/or subsequent television picture, and with that of a plurality of surrounding pixels in the present television picture, and in which the extent of motion in said present pixel is established dependent on a number of comparison results exceeding or not exceeding a threshold value, said number being obtained by means of the picture signal value comparisons, characterized in that said method comprises the steps:

comparing the difference between the picture signal values of said present pixel and said corresponding pixel with a first threshold value, motion being indicated by said difference exceeding said first threshold value;

comparing the difference between the picture signal values of said present pixel and each of said surrounding pixels with a second threshold value, motion only being indicated by all of said differences exceeding said second threshold value;

storing the results of the above comparing steps as a first and a second comparison result signifying no motion and motion, respectively, for the pixels of the television picture;

repeating the above comparing and storing steps for a sub-region of a number of pixels surrounding said present pixel thereby forming a matrix of first and second comparison results;

separately determining the number of first and second comparison results indicating no motion and motion and dividing each of the four determined numbers by the number of pixels in said sub-region;

comparing the two determined numbers for the first comparison results with a first threshold number and comparing the two determined numbers for the second comparison results with a second threshold number; and

deciding the extent of motion at said present pixel dependent

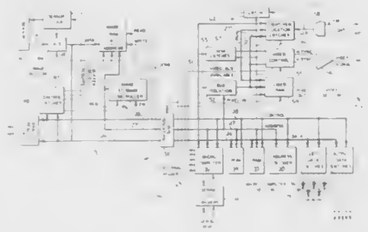
on the combinations of the first and the second threshold numbers be exceeded or not exceeded by said determined numbers.

4,924,307

IMAGE PROCESSOR

Roger W. Landowski, Waukesha; Richard M. Roszkowski, Brookfield; Donald J. Christian, New Berlin, and Assad A. Ansari, Bayside, all of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 3, 1988, Ser. No. 202,198
Int. Cl.[5] H04N *7/18, 17/00*
U.S. Cl. 358—107 20 Claims



1. An image processor comprising: a data bus divided into first and second sections;

an address bus divided into first, second and third sections;

an analog to digital converter, coupled to the second section of said data bus, for receiving an analog signal representing an image to be processed and for producing digitized representations of image elements of the image;

a first memory means coupled to the second section of said data bus for storing the digitized representations of the image elements;

a first means, coupled to the second section of said address bus, for addressing said first memory means;

means for generating a first coupling signal whenever the first means for addressing is not addressing said first memory means;

a first means, responsive to the first coupling signal, for coupling the first and second sections of said data bus together and for coupling the first and second sections of said address bus together;

means, coupled to the first sections of said address and data buses, for processing the digitized representations of the image elements;

a second memory means coupled to the third section of said address bus and to the second section of said data bus for storing video image data;

a second means, coupled to the third section of said address bus, for addressing said second memory means;

means for generating a second coupling signal whenever the second means for addressing is not addressing said second memory means; and

a second means for coupling the first and third sections of said address bus together in response to a second coupling signal.

4,924,308

BANDWIDTH REDUCTION SYSTEM FOR TELEVISION SIGNALS

David Feuchtwanger, London, England, assignor to Thorn EMI plc, London, England

Filed Mar. 7, 1989, Ser. No. 319,714
Claims priority, application United Kingdom, Mar. 10, 1988, 8805742
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—133 4 Claims



1. A bandwidth reduction system for television signals comprising static, intermediate and motion mode processor circuits for encoding the television signals and spatially filtering the horizontal and vertical resolution of the television signals, respectively, in dependence upon whether features in spatial areas of a television picture represented by the signals are static, moving at less than a predetermined rate, or moving at more than a predetermined rate, the processor circuits including decoding means for providing reconstituted television signals from the signals encoded and filtered thereby; a filter circuit for imposing spatial filtering on the horizontal and vertical resolution of the television signals substantially corresponding to that imposed by the static mode processor circuit; and a selection circuit for receiving the reconstituted television signals from the static, intermediate and motion mode processor circuits and the filtered signal from the filter circuit and for determining therefrom the static, intermediate or motion mode processor for imposition on the television signals to effect bandwidth reduction to the television signals in dependence upon the degrees of motion in the spatial areas of the television picture represented by the television signals.

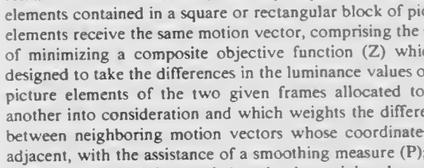
4,924,309

METHOD AND CIRCUIT ARRANGEMENT FOR IMPROVING THE RESOLUTION OF THE COEFFICIENTS OF DIGITAL SIGNALS, PARTICULARLY DIGITAL TV SIGNALS

Wolfgang Hartnack, Hemmingen; Heinz-Werner Keesen, and Herbert Schütze, both of Hanover, all of Fed. Rep. of Germany, assignors to Deutche Thomson-Brandt GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,057
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728444
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—133 7 Claims

1. A method for improving the resolution of digital signals, in particular luminance and/or chrominance TV signals, composed of sampled values having an original value range, in a system in which the sampled values are transformed in blocks in such a way that one positive coefficient representing a DC-coefficient and several negative and/or positive coefficients representing AC-coefficients are created, each coefficients having a given value range, and each coefficient is in the course of calculation limited to a smaller range of values, rounded off and inversely transformed after transmission and-/or storage, said method comprising: shifting the value range of each coefficient containing a DC-coefficient, after transformation and prior to transmission or storage, into the same



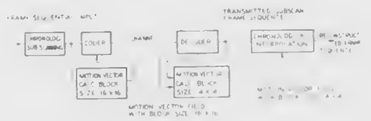
value range as is occupied by the coefficients containing the AC-coefficients and providing each coefficient containing a DC-coefficient with a sign; and after transmission or storage, returning each coefficient containing a DC-coefficient to its original value range.

4,924,310

METHOD FOR THE DETERMINATION OF MOTION VECTOR FIELDS FROM DIGITAL IMAGE SEQUENCES

Achim von Brandt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 202,150, Jun. 2, 1988, abandoned. This application Aug. 22, 1989, Ser. No. 397,049
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718491
Int. Cl.[5] H04N *7/13*
U.S. Cl. 358—136 15 Claims



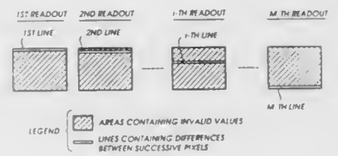
1. A method for the determination of motion vector fields from digital image sequences that determines a motion vector field from respectively two successive image frames, said motion vector field relating a picture element of the other image frame to every picture element of the one image frame, whereby the relation is respectively defined by a motion vector that reproduces the displacement of the picture elements relative to one another and, whereby respectively all picture elements contained in a square or rectangular block of picture elements receive the same motion vector, comprising the steps of minimizing a composite objective function (Z) which is designed to take the differences in the luminance values of the picture elements of the two given frames allocated to one another into consideration and which weights the differences between neighboring motion vectors whose coordinates are adjacent, with the assistance of a smoothing measure (P); said minimization step being carried out by determining the motion vectors that minimize the objective function using constant motion vectors in blocks that are larger than the blocks ultimately desired; subsequently subdividing each of these blocks (16×16) into smaller, preferably equal-sized blocks until the desired block size (4×4) is achieved, whereby the objective function is again minimized by variation of the motion vectors after each diminution of the blocks.

4,924,311

DUAL-MODE TELECONFERENCING SYSTEM

Jun'ichi Obki, and Toshio Koga, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 17, 1989, Ser. No. 339,441
Claims priority, application Japan, Apr. 15, 1988, 63-93036; Mar. 31, 1989, 1-78564; Mar. 31, 1989, 1-78566
Int. Cl.[5] H04N *7/12, 7/14*
U.S. Cl. 358—138 23 Claims



1. A still-picture video encoder for a teleconferencing system, comprising:

a frame memory;

control means for writing video samples of a frame of a motion-picture signal into said frame memory and reading stored video samples at frame intervals from said frame memory; and

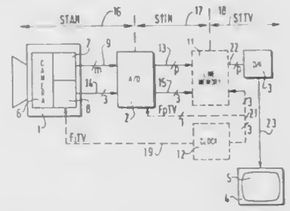
encoder means for encoding video samples read out of a location of said frame memory corresponding to at least one scanning line period of said frame into a signal representative of an intraframe correlation between adjacent ones of said video samples and generating a signal of a constant value during remaining line periods of said frame, said location being successively shifted by at least one scanning line at said frame intervals.

4,924,312

DEVICE FOR ENSURING THE TELEVISION COMPATABILITY OF PICTURE SENSORS WITH OPTOMECHANICAL ANALYSIS

Jacques Rotival, Vanves, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 14, 1988, Ser. No. 181,298
Claims priority, application France, Apr. 17, 1987, 87 05527
Int. Cl.[5] H04N *11/20, 7/01, 5/14*
U.S. Cl. 358—140 5 Claims



1. A device for ensuring the video compatability of picture sensors operating optomechanical analysis, said analysis being effected by the analyser of a camera using a serial or parallel-serial scanning of a field of view, comprising a digital device which serially supplies in digital form samples which are representative of elements of the field of view analysed in a chronological sequence, each sampled element being coded in p bits in parallel and a digital-to-analog converter, and also wherein the improvement comprises: a combination of, arranged between said digital device and said digital-to-analog converter, a line RAM memory containing at least N lines, N being an integer,

said line memory being constituted by P blocks of X lines, P and X being integers such that:

$$(P-3)X < N \leqq (P-2)X$$

wherein

$$X \leqq N \text{ and } P \geq 3$$

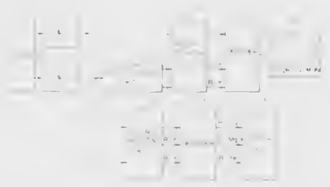
and designed to receive the picture elements of the field of view at a first line rate and opto mechanical analysis elements and to supply these elements to said video monitor at a second video line rate irrespective of the fluctuations, which vary versus time, between these respective rates, these fluctuations being such that the instantaneous shift between the analysis and the recovery on the video monitor varies with a maximum of N lines, and a picture clock generator which applies picture synchronizing signals of the same frequency to said analyser and to said line memory and also line and element synchronizing signals at a video standard to said line memory.

4,924,313

STILL PICTURE SIGNAL PROCESSING APPARATUS HAVING HIGH RESOLUTION IMAGE PICKUP DEVICE WITH 4-TO-1 INTERLACE

Masahiro Juen, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 314,228, Feb. 22, 1989, abandoned, which is a continuation of Ser. No. 153,709, Feb. 8, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,802
Claims priority, application Japan, Feb. 13, 1987, 62-30876
Int. Cl.[5] H04N *7/12, 7/01, 9/79*
U.S. Cl. 358—140 **11 Claims**



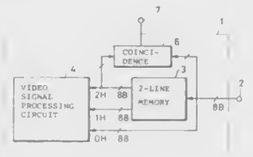
1. A still picture signal processing apparatus comprising:
(a) image pickup means having a number of vertical effective pixels that is double the number of effective scan lines in a broadcast television;
(b) processing means for reading a still picture signal, including first, second, third and fourth fields, from said image pickup means at a horizontal scan frequency of the broadcast television with a 4-to-1 interlace, two of said fields constituting a first frame of a broadcast television signal and the remaining fields constituting a second frame of said broadcast television signal, said processing means sampling said still picture signal with a number of samples that is half the number of effective horizontal pixels of said image pickup means, horizontal scan lines of said first, third, second and fourth fields being positioned in a vertical direction in that order, said processing means sampling said still picture signal so that sampling points of successive horizontal scan lines in each of said fields are phase-reversed;
(c) recording means for recording said still picture signal on a magnetic disk; and
(d) reproducing means for reproducing at least one frame of said still picture signal recorded on said magnetic disk.

4,924,314

SEMICONDUCTOR DEVICE CONTAINING VIDEO SIGNAL PROCESSING CIRCUIT

Masahiko Yoshimoto; Hiroshi Segawa, and Tetsuya Matsumura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,648
Claims priority, application Japan, Sep. 9, 1986, 61-213112
Int. Cl.[5] H04N *5/14*
U.S. Cl. 358—160 **4 Claims**



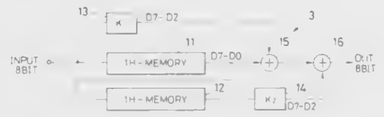
2. A semiconductor device for processing video signals comprising:
means (2) for providing a digital video signal of n bits (n is a positive integer) including analog-digital converting means (13) for converting an externally applied analog video signal into said digital video signal of n bits;
digital delay means (3) responsive to said digital video signal of n bits provided from said digital video signal providing means for outputting a 1-line through m-line (m is a positive integer) delay signal of said digital video signal of n bits;
video signal processing means (4) responsive to said digital delay means output for performing video signal processing; and
means for testing an operation of said digital delay means (3), including coincidence determining means (6) for (a) comparing said digital video signal of n bits inputted from said digital video signal providing means to said digital delay means and an l-line (l is an integer, $1 \leqq l \leqq m$) delay signal to be tested, out of said 1-line through m-line delay signal outputted from said digital delay means, and (b) determining coincidence of said digital video signal of n bits and said l-line delay signal,
wherein said analog-digital converting means comprises switching means (31) for replacing specific less significant bits out of said converted digital video signal of n bits with specific more significant bits out of said converted video signal of n bits at a test of said digital delay means.

4,924,315

VIDEO SIGNAL PROCESSING SYSTEM

Yasushi Yamashita, Atsugi, Japan, assignor to Kabushiki Kaisha Yamashita Denshi Sekkei, Atsugi, Japan

Filed Feb. 28, 1989, Ser. No. 316,762
Claims priority, application Japan, May 23, 1988, 63-125466
Int. Cl.[5] H04N *5/213*
U.S. Cl. 358—160 **5 Claims**



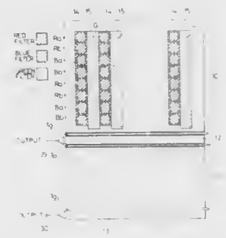
1. A video signal processing system comprising:
a processing circuit for processing input video signals including isolated luminance signals, in a format of sequential scanning so that each horizontal scanning line of the video signals does not include the isolated luminance signals,
a memory for storing the video signals processed by the processing circuit, and
a reading means for reading out the video signals stored in the memory and generating video signals in a format of interlaced scanning,
wherein the processing circuit comprises:
a first delaying circuit for delaying the input video signals by one horizontal scanning period,
a second delaying circuit for delaying by one horizontal scanning period the video signal delayed by the first delaying circuit,
a first coefficient multiplier for multiplying the input video signals by a first coefficient,
a second coefficient multiplier for multiplying the video signals delayed by the second delaying circuit by a second coefficient, and
an adding circuit for adding the outputs from the first and second coefficient multipliers and the first delaying circuit.

4,924,316

SOLID COLOR PICKUP APPARATUS

Kiyotaka Kobayashi; Makoto Shizukuishi, and Masatoshi Tabei, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 35,402, Apr. 7, 1987, Pat. No. 4,829,368.
This application Jun. 17, 1988, Ser. No. 207,989
Claims priority, application Japan, Apr. 7, 1986, 61-78308; Apr. 18, 1986, 61-89505; May 27, 1986, 61-120181; Jun. 6, 1986, 61-130341; Jun. 17, 1986, 61-139144; Jul. 9, 1986, 61-159544; Jul. 15, 1986, 61-164716; Jul. 17, 1986, 61-166792; Aug. 21, 1986, 61-194074; Aug. 26, 1986, 61-198257; Sep. 16, 1986, 61-215975; Sep. 16, 1986, 61-215976; Sep. 18, 1986, 61-218214; Sep. 22, 1986, 61-222209
Int. Cl.[5] H04N *9/30*
U.S. Cl. 358—213.26 **10 Claims**



1. A process for reading out signal charges from a solid pickup element, in the form of a frame interline transfer type solid pickup element containable in a camera, comprising a photosensitive portion comprising photosensitive means for generating first and second color signal charges and photosensitive transfer means for generating third color signal charges and mutually transferring said first and second color signal charges, first horizontal charge transfer means, storage means and second horizontal charge transfer means attached to said storage means, wherein two out of the three primary color signals are formed in said photosensitive means, wherein the remaining one color signal is formed in said photosensitive transfer means and wherein a shutter is usable to cut off incident light,
said process comprising the steps of:
transferring, at high speed, said third color signal charges formed in said photosensitive transfer means to said charge storage means during exposure resulting from the opening of said shutter;
forming the further third color signal charges in said photosensitive transfer means by continuously effecting the exposure;
closing said shutter;
alternately reading out and recording said further third color signal charges from said photosensitive transfer means through said first horizontal charge transfer means and said first color signal charges from said storage means through said second horizontal charge transfer means;
transferring said first color signal charges from said photosensitive means to said photosensitive transfer means;
transferring said first color signal charges from said photosensitive transfer means to said storage means at high speed;
transferring said second color signal charges from the photosensitive means to said photosensitive transfer means;
alternately reading out said second color signal charges from said photosensitive transfer means through said first horizontal charge transfer means and said first color signal charges from said storage means through said second horizontal charge transfer means; and
recording said first, second, third color charges.

4,924,317

VIDEO CAMERA WITH AN AUTOMATIC FOCUSING SYSTEM

Yoshiaki Hirao, Habikino; Ryuichiro Kuga, Katano; Masayuki Yoneyama, and Shusuke Ono, both of Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

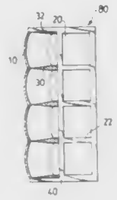
Filed Oct. 7, 1988, Ser. No. 254,683
Claims priority, application Japan, Oct. 8, 1987, 62-254199
Int. Cl.[5] H04N *5/232*
U.S. Cl. 358—227 **17 Claims**



1. A video camera comprising:
photographing means for picking up an image of an object, said photographing means comprising a photographic lens including a focusing lens for focusing a light from said object, and image pickup means for converting an image formed thereon by the light passed through said photographic lens to an electric signal;
signal processing means for processing said electric signal to obtain therefrom a video signal;
focus detecting means for detecting a focus condition of the image on said image pickup means from said video signal and outputting a focus signal indicative of the the detected focus condition;
driving means for moving said focusing lens along an optical axis of said photographic lens thereby to adjust focus and for driving said photographing means to cause an auxiliary oscillation which is a cyclic change of the focus condition of the image on said image pickup means thereby to change said focus signal;
control means for controlling said driving means such that said control means selectively sends either a command to said driving means to cause said auxiliary oscillation for a predetermined period to detect an in-focus direction in which said focusing lens is to be moved from a change of

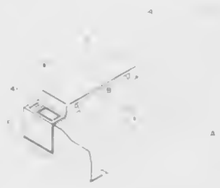
said focus signal caused by said auxiliary oscillation, or another command to said driving means to execute an in-focus control operation in which said focusing lens is moved by said driving means in said in-focus direction so that said focus condition becomes an optimum condition.

4,924,318
LATTICE ELIMINATION ASSEMBLY FOR A TELEVISION WALL
Ji S. Ho, 6 Fl., No. 162, An Ho Rd., Taipei, Taiwan
Filed Jun. 15, 1989, Ser. No. 366,474
Int. Cl.[5] H04N *5/65*
U.S. Cl. 358—250 7 Claims



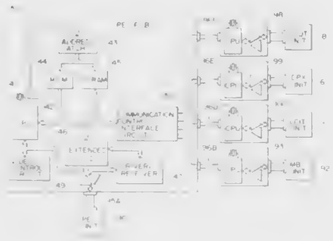
1. A lattice elimination assembly for a television wall, said television wall having a pile of televisions substantially arranged in a matrix shape; said lattice elimination assembly comprising a number of partition plates disposed in front of said television wall, and a convex lens being supported by said partition plates in front of every television; said partition plates separating every two adjacent televisions from interfering with each other, and said lenses being integrally connected together so as to form a full and perfect screen thereof.

4,924,319
BOARD-WRITING APPARATUS
Yoshitaka Ogino, Kawasaki; Ryozo Yanagisawa, Matsudo; Noboru Koumura, Narashino, and Masanori Nanamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 19, 1987, Ser. No. 16,652
Claims priority, application Japan, Feb. 19, 1986, 61-34774; Apr. 9, 1986, 61-52168[U]; Apr. 9, 1986, 61-52169[U]; Apr. 16, 1986, 61-86004
Int. Cl.[5] H04N *1/10*
U.S. Cl. 358—296 7 Claims



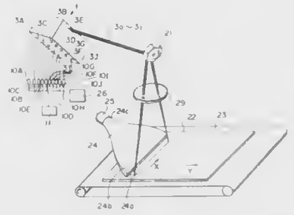
1. A board-writing apparatus for outputting image information onto a recording material, said board-writing apparatus comprising:
a sheet member having one end as a free end;
sheet member supporting means for supporting said sheet member such that said sheet member can be moved between a first position in which the other end of said sheet member is wound into and supported on a receiving portion of the body of said apparatus and a second position in which said sheet member is located outside the body of said apparatus and in which said sheet member is accessible for having image information written onto said sheet member;
read-out means disposed facing a path of movement of said sheet member, for reading out the image information on the sheet member as said sheet member is moved and for converting the image information into an electrical signal; and
means for recording the image information on the recording material on the basis of said electrical signal,
wherein said means for recording is a printer for outputting the image information reach out by said read-out means, and
wherein said printer is integral with the body of said board-writing apparatus.

4,924,320
IMAGE SYSTEM WITH CONNECTION TO OPERATIONAL UNITS
Hidetake Tanaka, Tokyo; Shigeru Yamazaki, Tanashi; Koji Yamanobe, Tokyo; Hiroaki Kotabe, Funabashi; Yasushi Nakazato, Tokyo, and Masahiko Banno, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Feb. 26, 1988, Ser. No. 161,471
Claims priority, application Japan, Feb. 28, 1987, 62-45931
Int. Cl.[5] H04N *1/21*
U.S. Cl. 358—296 12 Claims



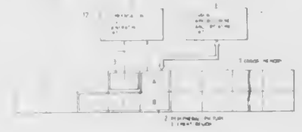
1. An image forming system comprising:
a main unit including image forming means for forming an image on a recording medium and means for generating and receiving control communications, said main unit having a number of physical ports and a number of logical ports and further having means for selectively interconnecting said physical and logical ports to establish a selected interconnection pattern between physical and logical ports;
at least one of a plurality of predermined optional units operatively connectable to said main unit, each optional unit having a predtermined function associated with and controlled by said main unit and having means for generating and receiving control communications; and
connecting means for connecting said main unit to said at least one of a plurality of predetermined optional units to establish communicative and operative coupling between said main unit and said at least one of a plurality of predetermined optional units, said connecting means being commonly usable between said main unit and any of said plurality of predetermined optional units, each optional unit being responsive to control communications generated by said main unit and sent to the optional unit via said connecting means to generate and send back to said main unit other control communications via said connecting means, said control communications generated by each optional unit and sent back to said main unit comprising a respective identification of each optional unit;
wherein said means for selectively interconnecting said physical and logical ports in said main unit includes means for identifying each optional unit connected to said main unit on the basis of the respective identification sent by the optional unit to the main unit via said connecting means and means for establishing said selected interconnection pattern between said physical and logical ports in accordance with each respective identification received by the main unit from each optional unit.

4,924,321
METHOD AND APPARATUS FOR IMAGE READ-OUT AND REPRODUCTION, AND MULTI-SEMICONDUCTOR-LASER LIGHT SOURCE DEVICE FOR THE SAME
Ichirou Miyagawa, and Toshitaka Agano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 17, 1989, Ser. No. 310,997
Claims priority, application Japan, Feb. 18, 1988, 63-35836; Feb. 18, 1988, 63-35837
Int. Cl.[5] H04N *1/23, 1/04, 1/10;* **G01D** *9/42*
U.S. Cl. 358—296 9 Claims



1. An image read-out and reproducing method for conveying an image storage sheet, on which an image has been recorded, or a recording sheet, on which an image is to be reproduced, in a sub-scanning direction by a single sub-scanning means, reading out the image from the image storage sheet by scanning the image storage sheet with read-out light in a main scanning direction and detecting the light emitted from the image storage sheet which is being scanned, and reproducing an image on the recording sheet by scanning the recording sheet in a main scanning direction with reproducing light modulated in accordance with the image,
wherein the improvement comprises the steps of:
(i) combining laser beams produced by a plurality of semiconductor lasers and utilizing the combined laser beams as said read-out light, and
(ii) operating one or some of a plurality of said semiconductor lasers, modulating the laser beams emitted thereby and utilizing the laser beams thus produced as said reproducing light at the time of image reproduction.

4,924,322
BI-LEVEL IMAGE DISPLAY SIGNAL PROCESSING APPARATUS
Toshiharu Kurosawa, Yokobama; Hiroyoshi Tsuchiya, Kawasaki; Yuji Maruyama, and Katsuo Nakazato, both of Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 17, 1989, Ser. No. 324,780
Claims priority, application Japan, Mar. 18, 1988, 63-66585; Oct. 7, 1988, 63-260803
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 16 Claims



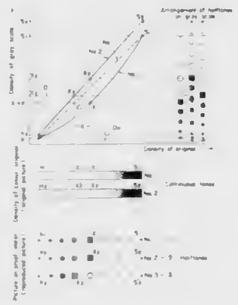
1. An image signal processing apparatus for receiving an input image signal comprising successive input signal values representing quantized density values of respective picture elements of an image, for sequentially processing the input signal values to produce an output signal comprising successive bi-level output values, the apparatus comprising:
error memory means (**1**) for storing accumulated errors at storage locations respectively corresponding to positions in the image of an object picture element and of a plurality of picture elements which have not yet been processed by the apparatus and which are positioned adjacent to the object picture element in the image;
compensation level computation means (**12**) for multiplying by a first factor (K_a) the accumulated error (S_{xy}) which has been stored in the memory means for the object picture element, for obtaining the sum of the accumulated errors which have been stored in the memory means for the adjacent picture elements, for multiplying the sum by a second factor (K_b), and for adding together respective results obtained from these multiplications to thereby obtain an error compensation level (e_{xy});
first input compensation means (**5**) for adding an input signa value (I_{xy}) corresponding to the object picture element to the error compensation level to obtain a first compensated input level (I_{1xy});
bi-level conversion means (**8**) for comparing the first compensated input level with a fixed threshold value to thereby determine a bi-level output value (P_{xy}) for the object picture element, and for producing the bi-level output value as the bi-level image signal;
second input compensation means (**101**) for adding the input signal value (I_{xy}) corresponding to the object picture element to the accumulated error that has been stored in the error memory means for the object picture element, to obtain a second compensated input level (I_{2xy});
difference computation means (**9**) for deriving a bi-level conversion error (E_{xy}) which is the difference between the second compensated input level and the bi-level output value determined for the object picture element; and
error apportionment and updating means (**11**) for computing respective error apportionment values corresponding to the adjacent picture elements, based on the bi-level conversion error (E_{xy}) for the object picture element and a plurality of apportionment factors (K_A to K_D), adding the the error apportionment values to corresponding accumulated errors which have been previously stored in the error memory means at storage locations respectively corresponding to the adjacent picture elements, to thereby obtain updated accumulated errors, and storing the updated accumulated errors in the error memory means.

4,924,323

TONAL CONVERSION METHOD FOR PICTURES

Takashi Numakura, and Iwao Numakura, both of Tama, Japan, assignors to Yamatoya & Co., Ltd., Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,620
Claims priority, application Japan, May 13, 1988, 63-114599
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—456 10 Claims



1. A method for conducting tonal conversion of an original picture based on pictorial information from the original picture upon production of a reproduced picture from the original picture, which comprises converting the base density information datum (x) of a desired control point on the original picture into a halftone intensity (y) at a corresponding control point on the reproduced picture in accordance with the following formula (1):

$$y = y_H + \frac{\alpha(1 - 10^{-kx})}{\alpha - \beta}(y_S - y_H) \quad (1)$$

where

x: the base density information datum of the desired control point on the original picture, which is a value obtained by subtracting the density at the brightest area of the original picture from the density at the desired control point of the original picture;

y: the halftone intensity at the corresponding control point on the reproduced picture;

y_H: a desired halftone intensity set for the brightest area of the reproduced picture;

y_S: a desired halftone intensity set for the darkest area of the reproduced;

α: the surface reflectivity of a base material on which the reproduced picture is to be formed;

k: γ/the density range of the original picture, γ being a predetermined factor; and

β: a value determined from the value γ, which determines k above, in accordance with $\beta = 10^{-\gamma}$.

4,924,324

FACSIMILE MACHINE WHICH PREVENTS THE LOSS OF RECORDED DATA IN MULTIPLE CUT SHEET REPORTS

Tatsuo Takaoka, Isehara, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,847
Claims priority, application Japan, May 28, 1987, 61-129815
Int. Cl.[5] H04N *1/32, 1/40*
U.S. Cl. 358—468 4 Claims

1. A report outputting system of a facsimile machine which includes a recording device using cut sheets of recording paper set in the recording device for recording information thereon, said system comprising:

means for determining a maximum number of character lines which may be recorded on each of said cut sheets of recording paper set in said recording device, said maximum number of character lines being determined with the provision of a predetermined leading end margin and a predetermined trailing end margin at the top and bottom of each of said cut sheets of recording paper;

monitoring means for monitoring a number of character lines recorded on a cut sheet of recording paper by said recording device; and

controlling means for controlling said recording device when said recording device records a report of predetermined information regarding an operation of said facsimile machine on one or more of said cut sheets of recording paper such that when said number of character, lines monitored by said monitoring means has reached said maximum number of character lines while said report is being recorded on one of said cut sheets of recording paper, the remaining portion of said report is recorded on one or more subsequent cut sheets of recording paper until all of said remaining portion of said report has been recorded.

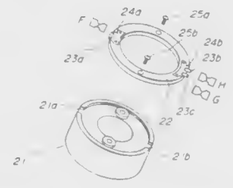


4,924,325

HEAD POSITION CONTROLLING METHOD

Tatsumaro Yamashita, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 872,673, Jun. 10, 1986, abandoned. This application Jul. 8, 1988, Ser. No. 218,430
Claims priority, application Japan, Jun. 11, 1985, 60-125235
Int. Cl.[5] H04N *5/783*
U.S. Cl. 360—10.2 2 Claims



1. A head position controlling method for a magnet recording and reproducing apparatus, comprising the steps of:

providing a rotary drum supporting exactly three magnetic heads on its periphery which are rotatable on an axis of the drum in contact with a travelling magnetic tape;

providing an electro-mechanical transducing element for deflecting said magnetic heads to different axial positions along said axis in conjunction with rotation of said drum in response to control voltage signals supplied to said transducer element, for optimal axial positioning of said heads for tracking the travelling magnetic tape in each of a plurality of different modes for the apparatus, including a recording mode and a reproducing mode;

determining during assembly the optimal control voltage signals to be supplied to said transducing element for deflecting said heads in each of the plurality of modes of the apparatus by using a standard defining tape having a specified track format recorded thereon to locate optimal axial positions for the magnetic heads at different rotational phase positions thereof in each of said modes, and storing the optimal control voltage signals corresponding thereto in a memory for subsequent actual use;

selecting an optional mode for actual use of the apparatus and reading the stored optimal control voltage signals corresponding thereto from said memory;

supplying said optimal control voltage signals to said transducing element to control the axial positions of said magnetic heads in the selected operation mode;

using only two of said magnetic heads for recording at both a normal speed and a speed one-half of the normal speed; and

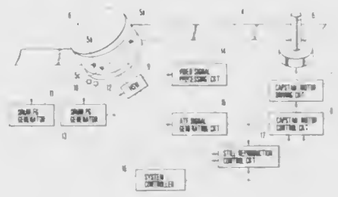
using the third of said magnetic heads only for reproducing at speeds other than a speed used for recording.

4,924,326

SIGNAL REPRODUCING APPARATUS

Hiroyuki Takimoto; Kenichi Nagasawa; Mikihiro Fujimoto; Hiroyuki Kobayashi, and Masahiro Takei, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 772,767, Sep. 5, 1985, abandoned. This application May 17, 1988, Ser. No. 198,706
Claims priority, application Japan, Sep. 7, 1984, 59-187317; Sep. 7, 1984, 59-187318; Sep. 7, 1984, 59-187319; Sep. 7, 1984, 59-187320
Int. Cl.[5] H04N *5/783;* G11B *21/10*
U.S. Cl. 360—10.2 20 Claims



1. A signal reproducing apparatus, arranged to reproduce from a record bearing medium signals recorded in many recording tracks formed on said medium, comprising:

(a) a reproducing head arranged to periodically trace said record bearing medium;

(b) means for forming a first rectangular signal relative to a tracking error between said reproducing head and one of said many recording tracks by using an output of said reproducing head;

(c) means for forming a second rectangular signal which has a period relative to a tracing period of said reproducing head;

(d) means for forming a control pulse signal having a pulse width which corresponds to a phase difference between said first and said second rectangular signals, by using at least part of edges of said first rectangular signal and corresponds to a timing of at least part of edges of said second rectangular signal; and

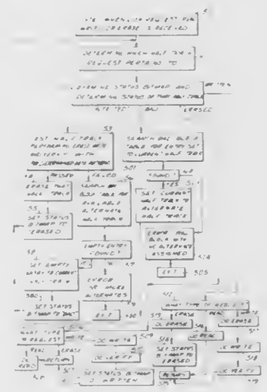
(e) control means for controlling the positions of said reproducing head and said record bearing medium relative to each other on the basis of said control pulse signal.

4,924,327

SYSTEM AND METHOD FOR IMPROVING THE PERFORMANCE OF HIGH-DENSITY DATA STORAGE MEDIA

John K. Seamons, San Anselmo, and Kevin P. Grundy, San Jose, both of Calif., assignors to NeXT, Inc., Redwood City, Calif.

Division of Ser. No. 255,337, Oct. 11, 1989. This application Aug. 14, 1989, Ser. No. 393,134
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—48 29 Claims



1. In a computer system having at least one high density data storage medium, said data storage medium having a large number of data storage subdivisions and requiring lengthy format times, a system for formatting said medium on a time-distributed basis, said formatting system comprising:

means for maintaining a record of status information for each of said subdivisions, said status information including an indication of whether or not said subdivision has been formatted;

means for determining when said computer system is disk-idle;

means responsive to said disk-idle determining means and to said status information record maintaining means for selecting an unformatted one of said subdivisions when said computer system is disk-idle; and

means for formatting an unformatted one of said subdivisions responsive to one of (a) selection by said selecting means of said unformatted one of said subdivisions upon a determination by said determining means that said computer system is disk-idle, and (b) a need by said computer system for access to a formatted one of said subdivisions when said status information record maintaining means indicates that no formatted subdivisions exist.

4,924,328

SYSTEM FOR RECORDING/REPRODUCING AN INFORMATION SOURCE HAVING AN APPARATUS-SPECIFIC IDENTIFICATION SIGNAL

Kenjiro Endoh, Tokyo, and Osamu Yasuda, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 27, 1988, Ser. No. 187,041
Claims priority, application Japan, Jun. 30, 1987, 62-160908; Jun. 30, 1987, 62-160909
Int. Cl.[5] G11B *15/04*
U.S. Cl. 360—60 9 Claims

1. A recording/reproducing system comprising:

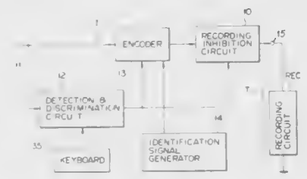
generating means for generating a specific identification signal particular to the recording/reproducing system;

recording means for adding the specific identification signal

generated by said generating means to a recording signal and recording the recording signal including the specific identification signal on a recording medium;

selection means for selecting, based on a predetermined input signal, whether a selected recording medium includes a selected recording signal having a selected identification signal;

detection means for detecting the selected identification signal added to the selected recording signal from a signal read from said selected recording medium if the selection



means indicates that the selected recording signal includes a selected identification signal;

discrimination means for determining whether the selected identification signal detected by said detection means substantially coincides with the specific identification signal; and

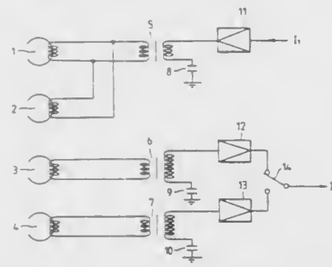
disturbing means for disturbing the signal read from said recording medium when said discrimination means determines the selected identification signal does not coincide with the specific identification signal.

4,924,329

ROTARY DRUM APPARATUS FOR A MAGNETIC RECORDING AND REPRODUCING DEVICE

Kenmei Masuda; Kenji Ogiro; Yoshinori Okada, all of Yokohama; Akihiro Nakajima; Mashanori Kochi, both of Katsuta, and Kazutoshi Konno, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,310
Claims priority, application Japan, Oct. 30, 1987, 62-273421
Int. Cl.[5] G11B *15/14*
U.S. Cl. 360—64 **3 Claims**



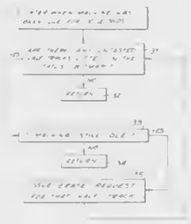
1. A magnetic recording and reproducing device wherein n recording magnetic heads and n reproducing magnetic heads are carried on a rotary drum, n being an integer equal or greater than 2, and a recording signal is supplied to said recording magnetic heads and reproduction of a signal by said reproducing magnetic heads is performed by way of a flattened rotary transformer, characterized in that said rotary transformer is provided with a single recording channel for transmitting a recording signal simultaneously to said recording magnetic heads and n reproducing channels for transmitting a reproduction signal individually from said reproducing magnetic heads, said recording channel being disposed on at least one of an outermost circumference side and an innermost circumference side of said rotary transformer, said recording channel and said n reproducing channels include windings received in respective concentric grooves which are formed on mutually opposing surfaces of a rotor and a stator of said rotary transformer such that a sum total of surface areas of portions of said rotor and said stator which are located on adjacent sides of the grooves formed for said recording channel is smaller than a sum total of surface areas of portions of said rotor and said stator which are located on adjacent sides of the grooves formed for any one of said n reproducing channels.

4,924,330

SYSTEM AND METHOD FOR IMPROVING THE PERFORMANCE OF HIGH-DENSITY DATA STORAGE MEDIA

John K. Seamons, San Anselmo, and Kevin P. Grundy, San Jose, both of Calif., assignors to NeXT, Inc., Redwood City, Calif.

Filed Oct. 11, 1988, Ser. No. 255,337
Int. Cl.[5] G11B *5/03*
U.S. Cl. 360—66 **30 Claims**



1. In computer system having a main memory and having a magneto-optical data storage medium of a type having data subdivisions which must be erased before they can be written on, a system for erasing previously used data subdivisions before they are needed again, said erasing system comprising:

means for maintaining a table of previously-used, formatted, erased data subdivisions;

means for maintaining a list of previously-used formatted data subdivisions to be erased;

means for automatically determining when said computer system is disk-idle;

means responsive to said disk-idle determining means and to said list maintaining means for automatically selecting from said list one of said previously-used subdivisions to be erased when said computer system is disk-idle; and

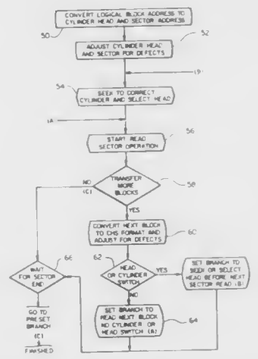
means for automatically erasing one of said subdivisions responsive to one of (a) selection by said selecting means of said one of said subdivisions upon a determination by said determining means that said computer system is disk-idle, and (b) a need by said computer system for access to one of said subdivisions when said table maintaining means indicates that no erased subdivisions exist.

4,924,331

METHOD FOR MAPPING AROUND DEFECTIVE SECTORS IN A DISC DRIVE

Don M. Robinson, Santa Clara County, and Henry E. Davenport, Santa Cruz County, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 800,062, Nov. 20, 1985, Pat. No. 4,746,998. This application May 23, 1988, Ser. No. 197,247
Int. Cl.[5] G11B *15/18, 5/09*
U.S. Cl. 360—72.1 **22 Claims**



1. In a microprocessor controlled disc drive including at least one constantly rotating disc having a plurality of concentric tracks where data is written and read, and means for positioning a transducer relative to a specified track on said disc for reading and writing data thereon, said positioning means being responsive to user-initiated commands to position said transducer head on user-accessible tracks on said disc and read or write data, the improvement comprising means for storing multiple copies of controlling operating data relative to said user-initiated commands on non-user accessible tracks of said disc, means for accessing said controlling operating data and for modifying said user-initiated commands in accordance with said controlling operating data for controlling said seek to position said transducer over a selected track.

4,924,332

DISPLAY FOR MODULAR DICTATION/TRANSCRIPTION SYSTEM

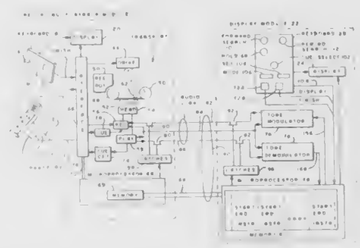
John J. Dwyer, Stratford; David B. Chamberlin, Milford, and Emil F. Jachmann, Greenwich, all of Conn., assignors to Dictaphone Corporation, Stratford, Conn.

Continuation of Ser. No. 894,993, Aug. 8, 1986, abandoned. This application Mar. 6, 1989, Ser. No. 319,906
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[5] G11B *15/18*
U.S. Cl. 360—72.2 **27 Claims**

1. A dictation/transcription system for the playing back of audio messages recorded on a record medium on which also is recorded a summary block of data relating to each of said messages, said summary block of data including data such as message type data representing the type of each respective message, message location data representing the location of each respective message on the record medium, and message length data representing the lengths of respective messages of at least predetermined types, said system comprising:

playback means for playing back said summary block of data; and

display means responsive to the message type, message location and message length data played back from said



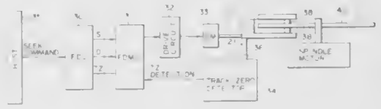
summary block to display visual indications of the type, location and length of said recorded messages.

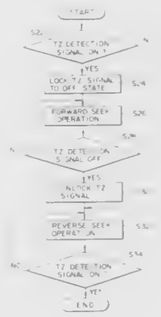
4,924,333

SEEK CONTROL APPARATUS AND METHOD FOR PREVENTING HEAD IN A FLOPPY DISK APPARATUS FROM BEING OUTWARDLY MOVED BEYOND AN OUTERMOST TRACK

Hiromi Hamaoka, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1988, Ser. No. 238,248
Claims priority, application Japan, Aug. 31, 1987, 62-216615
Int. Cl.[5] G11B *21/02*
U.S. Cl. 360—75 **11 Claims**





1. A seek control device, comprising:

a carriage mechanism including a head and a tab, said head assessing a recording medium, said recording medium having a reference track at an outermost track of the recording medium;

driving means for moving said head in an outer direction along said recording medium in response to an input first drive control signal to cause said head to seek the reference track and for moving said head in an inner direction along said recording medium in response to an input sec-

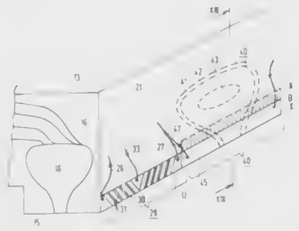
ond drive control signal to cause said head to seek a destination track;
detecting means for detecting said tab to determine whether said head is positioned on the reference track, and for generating a reference track detection signal when the detecting means detects that said head is positioned on the reference track;
first control means for sequentially generating outer and inner driving instructions in response to an input seek command for moving said head to the destination track; and
second control means for (1) generating and outputting the first and second drive control signals to said driving means, in response to the outer and inner direction driving instructions, respectively, and for (2) interrupting the outer driving instruction generated by said first control means and generating and outputting the second drive control signal to said driving means, in response to the reference track detection signal from said detecting means.

4,924,334

MAGNETIC STORAGE DEVICE WITH TRACK GUIDANCE SYSTEM

Heinrich Diepers, Hoechstadt, and Dietrich Stephani, Bubenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 17, 1988, Ser. No. 233,235
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727432
Int. Cl.[5] G11B *5/39, 5/596*
U.S. Cl. 360—77.07 **18 Claims**



1. A magnetic storage device, comprising:
a magnetizable storage disk;
a flying body adapted to glide aerodynamically over said storage disk, said flying body having a long side face;
at least one read/write magnetic head arranged on said flying body to write data on and read data from such disk; and
a track guidance system for guiding the magnetic head including:
at least one separate guidance track on said disk; and
a servo head in the form of a magneto-resistive sensor disposed on a long side face of said flying body whereby subsequent electronics coupled to said servo head can be used to keep said servo head positioned on said guidance track.

4,924,335

TAPE CARTRIDGE LOADING MECHANISM WITH ENGAGEMENT MEANS TO RETAIN CARTRIDGE

Yoshihisa Inoue, Hannou, Japan, assignor to Nakamichi Corporation, Kodaira, Japan

Filed May 25, 1988, Ser. No. 198,761
Claims priority, application Japan, May 27, 1987, 62-80124[U]
Int. Cl.[5] G11B *15/675, 15/67*
U.S. Cl. 360—93 **3 Claims**

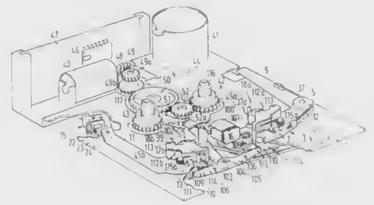
1. An apparatus for loading a tape cartridge for a magnetic instrument in which a holder containing said tape cartridge is moved between a cartridge operative position and a cartridge loading/unloading position, said apparatus comprising:
first urging means to urge said holder from said cartridge operative position to said cartridge loading/unloading position;
second urging means to urge said tape cartridge so as to remove said tape cartridge from said holder;
locking means to lock said holder to said cartridge operative position against said first urging means;
engagement means comprising a reel support of reel drive means and protrusively provided in said holder at least in said cartridge loading/unloading position and having an engagement member to engage a reel contained in said cartridge when said tape cartridge is inserted into said holder to hold said tape cartridge in said holder against said second urging means;
and whereby when said holder is brought by said first urging means from said cartridge operative position to said cartridge loading/unloading position by unlocking said locking means, said tape cartridge is displaced by its inertia from the position of engagement of said reel support with said reel substantially in the direction in which said holder is displaced by said first urging means so that said reel is disengaged from said reel support, which allows said tape cartridge to be removed from said holder by said second urging means.

4,924,336

MAGNETIC-TAPE-CASSETTE APPARATUS COMPRISING A MOTOR-DRIVEN AXIALLY MOVABLE SERVO ROD

Karl Klös-Hein, Wettenberg, and Horst H. Rumpf, Herborn-Schönbach, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1988, Ser. No. 189,274
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719890
Int. Cl.[5] G11B *21/02*
U.S. Cl. 360—105 **20 Claims**



1. A magnetic-tape-cassette apparatus, comprising:
a motor;
control means comprising a logic circuit for controlling said motor;
a loading mechanism for carrying a tape cassette between an unload and a load position in said apparatus;
a pair of rotatable turntables for winding the reels of a tape cassette loaded in said loading mechanism;
a head mounting plate and a magnetic head carried on said plate;
means for mounting said head mounting plate for movement between a rest and a play position;
a servo rod translatable for controlling functional elements of the apparatus;
coupling means for coupling said servo rod to said motor;
turntable drive means for alternately coupling said winding turntables to said motor, said turntable drive means comprising a pivotable arm;
a rotatable switching member for limiting movement of said pivotable arm during change over in apparatus functions such that said winding turntables are not connected to said motor and for coupling and uncoupling said servo rod to said motor for translating said servo rod in predetermined positions of said switching member;
a control member for coupling said rotatable switching member and said head mounting plate, the position of said control member being determined by said servo rod and said head mounting plate such that in a first position of said control member said servo rod controls movement of said head mounting plate and in a second position of said control member said head mounting plate controls said rotary switching member; and
switching means activatable by said switching member for activating said logic circuit for controlling said motor.

4,924,337

DISK DRIVE SERVO SHIELD

William Reppahun, and David Harper, both of Boulder, Colo., assignors to MiniScribe Corporation, Longmont, Colo.

Filed Apr. 26, 1988, Ser. No. 186,184
Int. Cl.[5] G11B *5/02, 5/115*
U.S. Cl. 360—128 **9 Claims**

1. Disk drive apparatus, comprising:
a housing including interior and exterior surfaces;
a plurality of hard disks fixedly mounted in the housing with each hard disk having a first and second surface with one of the surfaces of one of the disks being provided with servo information, the area between two adjacent hard disks forming a gap;
means for rotating said hard disks;
a plurality of read/write heads which write information on and read information from corresponding surfaces of the hard disks;
transducer means including a servo head which reads the servo information on the servo surface and is mounted



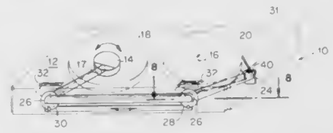
adjacent to a read/write head in back-to-back relationship in the gap between two disks; and
shielding means mounted directly to the interior surface of the housing and extending inwardly thereof independent of the servo head and the adjacent read/write head and positioned between the servo head and the adjacent read/write head in the gap to minimize undesired cross-talk between the servo head and the adjacent read/write head.

4,924,338

PROLONG VCR TAPE CASSETTE

Tyrone B. Stacey, 122-34 Nellis St., Springfield Gardens, N.Y. 11431

Filed Dec. 2, 1988, Ser. No. 278,766
Int. Cl.[5] G11B *23/087*
U.S. Cl. 360—132 **8 Claims**



1. A cassette for a video cassette recorder which comprises:
(a) a housing for storing and transporting a magnetic tape;
(b) a first hub rotatively mounted in said housing, said hub having an inlet with a slot contained within a pivot rotatable within said hub;
(c) a first reel supported on said hub;
(d) a second hub rotatively mounted in said housing;
(e) a take-up reel on said second hub;
(f) a magnetic tape having front and back recording surfaces and including an end portion fixed in said slot and a twisted portion;
(g) a guide having a semi-circular slit through which said twisted portion passes;
(h) a first actuating means receiving said twisted portion as it issues from said semi-circular slit for imparting a half twist to said magnetic tape in a first rotational direction; and
(i) a second actuating means receiving said twisted tape for completing the twisting thereof by rotating said twisted tape against said pivot, said actuating means projecting partly out of said housing for actuation of same.

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4,924,339
INPUT PROTECTING CIRCUIT IN USE WITH A MOS SEMICONDUCTOR DEVICE
Shigeru Atsumi, Tokyo; Toru Yoshida; Yasuo Kawahara, both of Kawasaki, and Fuminari Tanaka, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 28, 1988, Ser. No. 291,476
Claims priority, application Japan, Jan. 11, 1988, 63-3612
Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—56 **18 Claims**



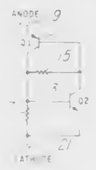
1. An input protecting circuit in use with a MOS semiconductor device having an input stage, comprising:
an input pad;
a MOS transistor in the input stage of the MOS semiconductor device, the gate of which receives a signal from said input pad;
a wire interconnecting said input pad and the gate of said MOS transistor in said input stage;
a first protecting element provided near said input pad and connected at one end to said interconnecting wire; and
a second protecting element provided near the gate of said MOS transistor and connected at one end to said interconnecting wire, said second protecting element being formed in a circuit block which is enclosed by a guard ring region and contains said MOS transistor of the input stage formed therein.

4,924,340
CIRCUIT PROTECTION DEVICE
Martin Sweet, Swindon, England, assignor to Raychem Limited, England
Continuation of Ser. No. 99,931, Sep. 23, 1987, abandoned. This application Aug. 31, 1988, Ser. No. 239,070
Claims priority, application United Kingdom, Sep. 26, 1986, 8623176
Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—56 **7 Claims**



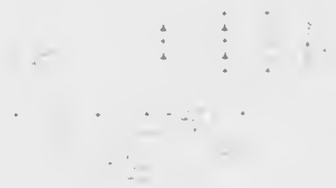
1. A circuit protection device for protecting an electrical circuit from a voltage transient which comprises:
a threshold switching element that will change from a high resistance state to a low resistance state on application of a voltage, but will remain in its low resistance state only for as long as a small holding current is maintained through the element, the switching element being formed from an amorphous composition comprising:
(a) from 10 to 65 atomic percent arsenic;
(b) from 15 to 90 atomic percent sulfur; and
(c) up to 40 atomic percent germanium;
in which the proportions of (a), (b) and (c) (based on the total molar quantity of (a), (b) and (c) add up to 100%
the composition having not more than 10 atomic percent tellurium (based on the total molar quantity of the composition);
and a pair of electrodes in contact with the composition.

4,924,341
TRANSIENT PROTECTOR
Norman L. Culp, and Stephen C. Kwan, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 20, 1988, Ser. No. 183,859
Int. Cl.[5] H02H *3/20*
U.S. Cl. 361—56 **22 Claims**



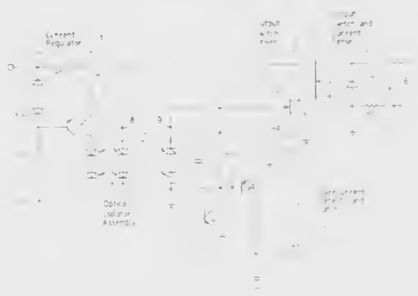
2. A unidirectional circuit device comprising:
a pnp transistor having an emitter electrode and an npn transistor having an emitter electrode, a control electrode of said pnp transistor coupled to a collector electrode of said npn transistor, a collector electrode of said pnp transistor coupled to a control electrode of said npn transistor, resistive means coupling said control electrode and said collector electrode of said pnp transistor and resistive means coupling said control electrode and said emitter electrode of said npn transistor.

4,924,342
LOW VOLTAGE TRANSIENT CURRENT LIMITING CIRCUIT
Robert H. Lee, Fullerton, Calif., assignor to Teledyne Inet, Torrance, Calif.
Continuation-in-part of Ser. No. 6,798, Jan. 27, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 228,829
Int. Cl.[5] H02H *9/02*
U.S. Cl. 361—58 **7 Claims**



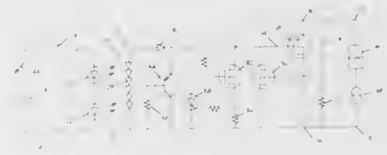
1. A method of controlling a polyphase AC current limiting circuit to produce in response to a load fault, a gradual rise in fault current at a rate typically less than 0.3 amperes per microsecond, so as to avoid the imposition of significant voltage transients on the AC electrical power bus; the method comprising:
(a) connecting in each phase, a high impedance circuit which comprises two inverse-paralleled SCR's in series with an inductor L1, across a low impedance circuit which comprises two inverse-paralleled GTO thyristors;
(b) detecting an overcurrent condition when load current rises sharply above a set pickup level;
(c) switching to "OFF" said GTO thyristors in said low impedance circuit, immediately upon detection of said overcurrent condition;
(d) switching to "ON", at the same time as Step (c), said SCR's in said high impedance circuit; said SCR's being initially set at a retarded firing angle in the range of 85 to 130 degrees;
(e) changing the retarded firing angle of said SCR's in said high impedance circuit, to reach zero degrees over a preset period of time or number of cycles and to phase said SCR's full "ON"; and
(f) limiting the fault current in said high impedance circuit to a value which is determined by selection of said inductor L1.

4,924,343
SOLID STATE OPTICAL RELAY
Bill H. Niemi, San Diego, Calif., assignor to Sermed Incorporated, San Diego, Calif.
Filed Apr. 17, 1989, Ser. No. 339,319
Int. Cl.[5] H02H *3/08*
U.S. Cl. 361—98 **26 Claims**



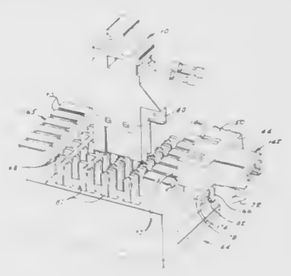
1. A relay for use connected between an input drive voltage and a load, said relay comprising:
a solid-state output switch connected across said load having a conducting state and a nonconducting state;
means for generating an optical signal corresponding to said input drive voltage;
two photodiode banks disposed to receive said optical signal and respectively polarized for generating a positive voltage corresponding to said input drive voltage at a positive voltage output and a negative voltage corresponding to said input drive voltage at a negative voltage output;
solid-state means connected to said positive voltage output for driving said output switch to cause said output switch to change state in dependence upon said input drive voltage exceeding or falling below at least one selected level; and
solid-state overload protection means connected to said negative voltage output, to said means for driving and to said load for causing said means for driving to drive said output switch to said non-conducting state upon the occurrence of a shorted load.

4,924,344
CIRCUITRY FOR PROTECTION AGAINST ELECTROMOTIVELY-INDUCED VOLTAGE TRANSIENTS IN SOLID STATE RELAY CIRCUITS
Guajardo, Harbor City, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Feb. 27, 1989, Ser. No. 316,241
Int. Cl.[5] H02H *3/08*
U.S. Cl. 361—101 **6 Claims**



1. In a solid state relay circuit including a power semiconductor for switching power to a load circuit and having means for disabling the power semiconductor to protect against current overload or short circuits, such disabling means including a silicon controlled rectifier for short circuiting the input to the power semiconductor, means for sensing the presence of transient voltages in the load circuit, and means for disabling any short circuit caused by the silicon controlled rectifier due to such voltage transients.

4,924,345
COMBINED TRANSIENT VOLTAGE AND SNEAK CURRENT PROTECTOR
John A. Siemon, and Howard Reynolds, Waterbury, both of Conn., assignors to The Siemon Company, Watertown, Conn.
Filed May 4, 1988, Ser. No. 190,180
Int. Cl.[5] H02H *3/22. 9/06;* **H01H** *39/00*
U.S. Cl. 361—111 **34 Claims**



33. A protector module for a terminal block comprising:
an insulative housing having opposed upper and lower surfaces, opposed first and second end surfaces and opposed first and second side surfaces;
at least four mutually parallel slots defining a first slot, a second slot, a third slot and a fourth slot, said four mutually parallel slots extending through at least a portion of said housing, each of said slots terminating at said lower surface at first, second, third and fourth openings corresponding to said respective four aligned slots;
a first conductive contact in said first slot, a second conductive contact in said second slot, a third conductive contact in said third slot and a fourth conductive contact in said fourth slot;
first plug-in and replaceable fuse means slidably received through one of said end surfaces of said housing, said first fuse means being electrically connected between said first contact and said third contact;

second plug-in and replaceable fuse means slidably received through one of said end surfaces of said housing, said second fuse means being electrically connected between said second contact and said fourth contact;

three element voltage surge suppressor means in said housing, a first element of said suppressor means being electrically connected to said third contact and a second element of said suppressor means being electrically connected to said fourth contact; and

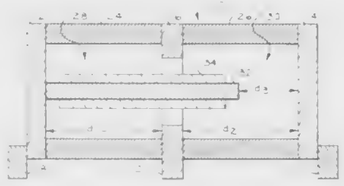
ground contact means, said ground contact means being electrically connected to a third element of said suppressor means, said ground contact means extending outwardly of said housing through a slot in said housing.

4,924,346

GAS DISCHARGE SURGE SUPPRESSOR FOR A TELEPHONE LINE

John W. Capps, Atlanta, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed May 2, 1989, Ser. No. 346,577
Int. Cl.[5] H02H *9/06*
U.S. Cl. 361—117 12 Claims



1 A surge suppressor having a first end and a second end, comprising:

a first electrically conductive element positioned at said first end;

a second electrically conductive element positioned at said second end;

a third electrically conductive element positioned between said first and second electrically conductive elements and being a first predetermined distance from said first electrically conductive element and a second predetermined distance from said second electrically conductive element;

a first insulator positioned between said first and third electrically conductive elements and defining a first chamber; and

a second insulator positioned between said second and third electrically conductive elements and defining a second chamber;

a fourth electrically conductive element connected to said first electrically conductive element and extending through said first chamber and an opening in said third electrically conductive element into said second chamber to a third predetermined distance from said second electrically conductive element;

whereby a first breakdown voltage, between said first and third electrically conductive elements, is at least partially determined by said first predetermined distance, a second breakdown voltage, between said second and third electrically conductive elements, is at least partially determined by said second predetermined distance, and a third breakdown voltage, between said first and second electrically conductive elements, is at least partially determined by said third predetermined distance; and

wherein said fourth electrically conductive element has a middle portion covered with an insulating material.

4,924,347

GAS LIGHTNING ARRESTER CONTAINING A MINERAL ADDITION AGENT

Michel Cantagrel, Houilles, France, assignor to Compagnie Industrielle de Tubes et Lampes Electriques Citel, Issy-Les-Moulineaux, France

Filed Aug. 21, 1989, Ser. No. 396,151
Claims priority, application France, Sep. 8, 1988, 88 11728
Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—120 9 Claims

1. Gas lightning arrester comprising at least two electrodes (*2a,2b;* **12***a,***12***b*) separated from each other by an inert gas contained in a tight enclosure, each electrode being electrically insulated from the other one (or the other ones), the enclosure containing an at least partially powdery mineral addition agent, characterized in that the mineral addition agent comprises a metal oxide or a mixture of elementary or mixed metal oxides, globally corresponding to the general formula:

$$Al\ X_a\ Y_b\ O_c \qquad (1)$$

in which formula:

X represents at least one alkaline metal;

Y represents at least one alkaline-earth metal;

a is any number between 0,02 and 1,5;

b is any number between 0 and 0.25;

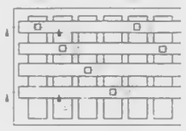
c is the value required to comply with the valency rules.

4,924,348

CAPACITOR FOR CAPACITIVE MEASURING DEVICES

Hans R. Weber, 10, chemin du Grillon, CH-1007 Lausanne, Switzerland

Filed Jun. 14, 1989, Ser. No. 365,821
Claims priority, application Switzerland, Jun. 20, 1988, 2365/88
Int. Cl.[5] G01N *25/64;* H01G *7/00*
U.S. Cl. 361—280 11 Claims



1. A capacitor for capacitive measuring devices with mutually displaceable capacitor elements for the purpose of varying the capacitance of the measuring device as a function of the relative position of the capacitor elements to one another, in which a first capacitor element (**2**) has patterned electrode areas consisting of individual electrode areas (**1**) which are applied to a substrate (**6**) and are electrically connected to one another in a predetermined manner by means of conducting strips (**3**), where the conducting strips (3) and the electrode areas (**1**) are located on the same side of the substrate (**6**) and where between the conducting strips (3) and the electrode areas (**1**) there is an insulating layer (**4**) which is interrupted at predetermined contact points (**5**) such that at these points an electrode area (**1***a*) is electrically connected to a conducting strip (**3***a*) and that a second capacitor element consists of a carrier (**12**) on which the counter-electrode or counterelectrodes (**10**) are mounted, wherein the substrate (**6**) and/or the carrier (**12**) form at least part of the dielectric (**13**) of the capacitor.

4,924,349

FACE PLATE ASSEMBLY FOR ELECTRICAL DEVICES

David L. Buehler, Bethlehem; Elliot G. Jacoby, Glenside, and Rita Swartzagher, Philadelphia, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed May 9, 1988, Ser. No. 191,921
Int. Cl.[5] H02B *1/04*
U.S. Cl. 361—357 18 Claims



1. A wallbox-mountable face plate assembly comprising, in combination,

(a) a wiring device;

(b) a generally flat support plate supporting said device, removably attachable to said wallbox;

(c) a generally flat intermediate plate, removably attached to said support plate, having a first surface that is adjacent to a surface of said support plate and, opposite said first surface, a second surface that faces outward when said plates are mounted in a wallbox, said second surface being interrupted by a peripheral, outward-facing first cantilever snap; and

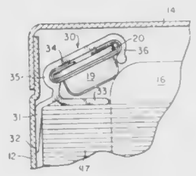
(d) a face member having a peripheral, inward-facing first connector demountably engaged with said first cantilever snap on said intermediate plate.

4,924,350

RETENTION CLIP FOR A THERMAL PROTECTION SENSOR

Gaddam P. Reddy, Jackson, Miss.; Robert A. Kulka, Livington; Gregory P. Goring, Cedar Grove, both of N.J., and Raymond H. Van Wagener, Darien, Conn., assignors to Magnetek Universal MFG, Corporation, Paterson, N.J.

Filed May 17, 1988, Ser. No. 194,744
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 20 Claims



1. A clip for retaining a thermal protection sensor, with the clip adapted to be disposed in a housing having an electrical device with a heat generating portion, with the clip placing and maintaining the thermal protection sensor firmly in contact with the heat generating portion of the electrical device, the clip comprising:

first wall means for engaging a wall of the housing;

second wall means, integral with the first wall means, for engaging the electrical device; and,

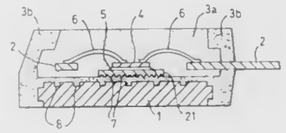
a thermal protection sensor retaining arm, integral with one of the first or second wall means, the arm including holding means for engaging the thermal protection sensor, the arm being disposed at an angle relative to the electrical device such that the thermal protection sensor is held in intimate contact with the electrical device.

4,924,351

RECESSED THERMALLY CONDUCTIVE PACKAGED SEMICONDUCTOR DEVICES

Toshihiro Kato; Shinjiro Kojima, both of Chigasaki; Takao Emoto, Yokosuka, and Hiroshi Matsumoto, Hyogo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 134,610, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 873,705, Jun. 12, 1986, abandoned. This application Apr. 10, 1989, Ser. No. 334,771
Claims priority, application Japan, Jun. 20, 1985, 60-134658; Sep. 30, 1985, 60-214852; Mar. 31, 1986, 61-071134
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 2 Claims



1. A packaged semiconductor device comprising:

a bed part having front surface and back surface;

a semiconductor chip mounted on said front surface of said bed part;

a first molded layer which seals said front surface of said bed part and said semiconductor chip to expose said back surface of said bed part;

a heat sink having first and second main surfaces, and facing said back surface of said bed part on said first main surface thereof with a gap of a prescribed distance from said back surface of said bed part;

a second molded layer formed to cover an outside of said heat sink and said first molded layer and fill said gap from one direction; and

leads which pass through said second molded layer, of which ends are disposed inside said first molded layer, and which are connected to internal terminals of said semiconductor chip;

wherein at least one of the back surface of said bed part and the first main surface of said heat sink is provided with a plurality of roughened recessed parts.

4,924,352

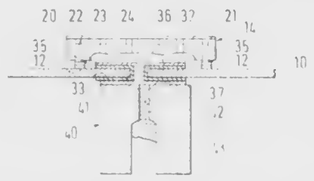
METHOD AND DEVICE FOR COOLING AN INTEGRATED CIRCUIT PACKAGE

René Septfons, Paris, France, assignor to Societe Anonyme dite: Alcatel CIT, Paris, France

Filed Dec. 21, 1988, Ser. No. 287,251
Claims priority, application France, Dec. 22, 1987, 87 17920
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—388 10 Claims

3. A device for cooling an integrated circuit package mounted on a substrate, said device comprising a heat-dissipating peg soldered together with the bottom of the integrated circuit package respectively, at a common location on opposite faces of said substrate, said substrate including tinnable areas disposed on each of said opposite faces, and said tinnable areas on the substrate being in communication with each other via reflow solder extending through at least one plated-through

hole and said heat-dissipating peg being pierced by at least one metal-walled channel terminating at one end in a capillary opening out adjacent to the substrate and terminating at another end in at least one solder receptacle bearing excess reflow solder such that in soldering the heat-dissipating peg and the integrated circuit package to said substrate by reflow sol-



der, excess reflow solder is sucked up by the capillary into said at least one solder receptacle resulting in the integrated circuit package being intimately pressed against the surface of the substrate to thereby facilitate proper soldering of connecting pads of the integrated circuit package to corresponding connecting pads of the substrate.

4,924,353

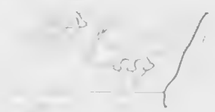
CONNECTOR SYSTEM FOR COUPLING TO AN INTEGRATED CIRCUIT CHIP

Nils E. Patraw, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 881,319, Jul. 1, 1986, abandoned, which is a division of Ser. No. 811,560, Dec. 20, 1985, abandoned. This application Aug. 1, 1988, Ser. No. 227,441

Int. Cl.[5] H05K *7/02*

U.S. Cl. 361—400 **7 Claims**



1. A combination for providing a chip interface mesa and a plurality of compressive pedestals for microminiature connections comprising:

a mesa member made from a dielectric material having:

a first planar axis extending parallel to a first planar dimension of said mesa member,

a second planar axis extending parallel to a second planar dimension of said mesa member,

a transverse axis extending perpendicular to both said first and second planar axes,

a top planar mesa surface extending substantially perpendicular to said transverse axis and bounded by said first and said second planar dimensions of said mesa member,

a bottom planar mesa surface disposed opposite to said top planar mesa surface,

a plurality of planar perimeter walls disposed generally parallel to said transverse axis,

a plurality of vertical electrical coupler means located substantially near said planar perimeter walls,

said plurality of vertical electrical coupler means each having a vertical dimension which is substantially parallel to said transverse axis of said mesa member,

a plurality of mesa interface conductive terminals disposed upon said top planar mesa surface,

said plurality of mesa interface conductive terminals disposed upon said top planar mesa surface being electrically coupled to a plurality of conductive pathways which are mechanically coupled to said top planar mesa surface,

said plurality of mesa interface conductive terminals disposed upon said top planar mesa surface being electrically coupled to a plurality of conductive pathways which are mechanically coupled to said top planar mesa surface,

said plurality of conductive pathways being further selectively and electrically coupled to said vertical electrical coupler means,

a semiconductor chip having a top chip surface and further having a plurality of chip interface means deployed upon said top chip surface and disposed about a perimeter of said top chip surface;

said semiconductor chip being mechanically coupled to said bottom planar mesa surface so that said top chip surface is substantially adjacent to said mesa member;

said plurality of chip interface means being selectively and electrically coupled to a respective one or ones of said vertical electrical coupler means by a plurality of mesa-chip electrical contact means; the combination further comprising

an insulating substrate means having at least one recess made therein, said recess having a substantially planar bottom surface, said bottom surface of said recess having electrical signal conducting pathways formed thereon;

a plurality of electrically conductive compressible pedestals for microminiature connection deployed on said recess bottom surface, individual ones of said pedestals being conductively coupled to selected ones of said pathways;

said recess having a first and a second planar dimension approximately equal to said first and said second planar dimensions of said mesa member for receiving said mesa member therein such that said mesa interface conductive terminals are conductively coupled to said pedestals whereby said chip interface means are conductively coupled to said pathways.

4,924,354

GUIDE RAIL COMPRISING ATTACHMENT MEANS FOR A PLUG BOARD

Helmut Hermanutz, Straubenhardt; Fred Koch, Gaggenau, and Hans M. Schwenk, Straubenhardt, all of Fed. Rep. of Germany, assignors to Schroff Gesellschaft mit beschrankter Haftung, Industriegebiet, Fed. Rep. of Germany

Continuation of Ser. No. 653,521, Sep. 24, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 892,289

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 8327191[U]

Int. Cl.[5] H05K *7/18*

U.S. Cl. 361—415 **1 Claim**



1. A guide rail for printed circuitboards in industrial electronic equipment comprising an attachment member for a spring contact strip made up of a retaining limb attached at right angles at one end of the guide rail, a holding lug formed on said retaining limb, and an angled resilient tongue formed on the guide rail and extending toward the holding lug so as to enable a mounting of the spring contact in the guide rail, and wherein an end of the resilient tongue defines a rectangular space with a portion of the retaining limb for ensuring a firm mounting of the spring contact strip on the holding lug.

4,924,355

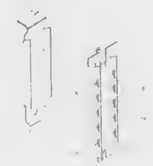
PERSONAL COMPUTER HAVING EXPANSION CARD ADAPTER BRACKET

Charles W. Mitchell, Spring, and Robert G. Rodriquez, San Antonio, both of Tex., assignors to Dell Corporate Services Corporation, Austin, Tex.

Filed Apr. 25, 1989, Ser. No. 343,765

Int. Cl.[5] H05K *7/14*

U.S. Cl. 361—415 **4 Claims**



1. A personal computer comprising;

(a) a mounting chassis having a plurality of expansion card positions, each position having a mounting fixture;

(b) at least one first expansion card, mounted in one of the expansion card positions, having a first bracket adapted for connection to a respective mounting fixture;

(c) at least one second expansion card, mounted in one of the expansion card positions, having a second bracket not adapted for connection to a respective mounting fixture; and

(d) an adapter bracket, configured to connect to a respective mounting fixture, and also configured to connect to the second bracket, to effect mounting the second expansion card in the one of the expansion card positions.

4,924,356

ILLUMINATION SYSTEM FOR A DISPLAY DEVICE

Park French, Aurora, Ohio, and Wilbur C. Stewart, Hightstown, N.J., assignors to General Electric Company, Princeton, N.J.

Filed Dec. 7, 1988, Ser. No. 280,842

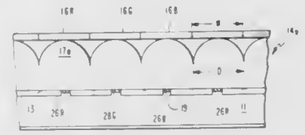
Int. Cl.[5] F21V *8/00*

U.S. Cl. 362—31 **18 Claims**

1. An illumination system for a display device having a plurality of pixels arranged in rows and columns substantially parallel to the axes of said display device comprising:

a plurality of juxtaposed elongated lenslets having a generally elliptical cross section arranged substantially parallel to one of said axes for providing light, partially collimated along one of said axes to said pixels;

a light box for providing uncollimated light to said lenslets, said light box being internally highly and diffusively reflective, said light box housing at least one light source arranged in the proximity of one edge of said light box, said light box having a light opaque reflector coincident with said lenslets, said reflector including a plurality of elongated light transmissive slots having a width substantially less than the width of said lenslets, and arranged substantially parallel to said lenslets, and centered with respect to said lenslets for individually transmitting uncollimated light from said light box to said lenslets; and



first, second and third interference filters sequentially arranged in said slots in a repetitive pattern, said first filters transmitting the first primary light color and reflecting the second and third primary light colors back into said box, said second filters transmitting the second primary light color and reflecting the other two primary light colors back into said box, and said third filters transmitting the third primary light color and reflecting the outer two primary light colors back into said box.

4,924,357

LIGHT SOURCE UNIT FOR A BUSINESS MACHINE

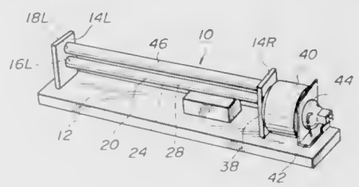
Hiroshi Yamashita, Osaka; Kanenaga Fujii, Hyogo; Takumi Fukunishi, Kanagawa; Masafumi Shigeoka, Kanagawa, and Hiroshi Sudo, Kanagawa, all of Japan, assignors to Japan as represented by Director General of Agency of Industrial Science and Technology; Nippon Silica Glass Co., Ltd. and Kondo Sylvania Ltd., all of Tokyo, Japan

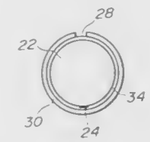
Continuation of Ser. No. 87,568, Jul. 21, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 344,390

Claims priority, application Japan, Dec. 17, 1985, 60-284115

Int. Cl.[5] F21V *8/00*

U.S. Cl. 362—32 **6 Claims**





1. A light source unit for a business machine, said light source unit comprising:

means for generating irradiation light with a small light distribution beam angle of substantially parallel rays for providing an even linear light profile of uniform luminous energy, said means including:

VOL
114
ISS
2
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1990
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a base having means for being attached to a business machine;

a light transmitting rod attached to and rotatably supported by said base, said light transmitting rod having first and second axial ends, and said first axial end having a reflecting mirror attached thereto;

a diffusion stripe of fine powder having a high refractive index, said diffusion stripe being disposed on a portion of an outer circumferential surface of said light transmitting rod, and said diffusion stripe extending rectilinearly along the length of said rod in the axial direction of said light transmitting rod;

a light-emitting lamp disposed adjacent to said second axial end of said light transmitting rod for causing light emitted from said lamp to pass into said second axial end of said light transmitting rod; and

a cylindrical mirror having a reflecting surface thereon and facing radially inwardly, said cylindrical mirror substantially surrounding said light transmitting rod, said cylindrical mirror having an axially extending slit therein, said slit being disposed adjacent to a portion of said circumferential surface of said light transmitting rod diametrically spaced opposed to said diffusion stripe for causing light emitted from said lamp into said light transmitting rod and reflected within said light transmitting rod by said reflecting mirror, reflected by peripheral surfaces of said light transmitting rod, and reflected by said diffusion stripe to be transmitted radially out of said light emitting rod through said slit as irradiation light with a small light distribution beam angle of substantially parallel rays.

4. A light source unit for a business machine, said light source unit comprising:

means for generating irradiation light with a small light distribution beam angle of substantially parallel rays for providing an even linear light profile of uniform luminous energy, said means including:

a base having means for being attached to a business machine;

a light transmitting rod attached to and rotatably supported by said base, said light transmitting rod having first and second axial ends, and said first axial end having a reflecting mirror attached thereto;

a diffusion stripe of fine powder having a high refractive index, said diffusion stripe being disposed on a portion of an outer circumferential surface of said light transmitting rod, and said diffusion stripe extending rectilinearly along the length of said rod in the axial direction of said light transmitting rod;

a light-emitting lamp disposed adjacent to said second axial end of said light transmitting rod for causing light emitted from said lamp to pass into said second axial end of said light transmitting rod;

a cylindrical mirror having a reflecting surface thereon and facing radially inwardly, said cylindrical mirror substantially surrounding said light transmitting rod, said cylindrical mirror having an axially extending slit therein, said slit being disposed adjacent to a portion of said circumferential surface of said light transmitting rod diametrically spaced opposed to said diffusion stripe for causing light emitted from said lamp into said light transmitting rod and reflected within said light transmitting rod by said reflecting mirror, reflected by peripheral surfaces of said light transmitting rod, and reflected by said diffusion stripe to be transmitted radially out of said light emitting rod through said slit as irradiation light with a small light distribution beam angle of substantially parallel rays; and

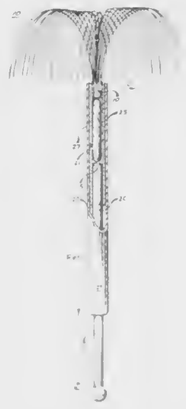
a condenser disposed adjacent to said light transmitting rod for condensing the light emitted radially from said light transmitting rod.

4,924,358

SAFETY-SPARKLER WAND W/CHEMILUMINESCENT OR ELECTRIC-LIGHT ILLUMINATION

Robt. Von Heck, San Diego, Calif., assignor to Inventech Licensing Co., San Diego, Calif.

Filed Sep. 12, 1988, Ser. No. 242,740
Int. Cl.[5] F21K *2/00*; F21V *8/00*
U.S. Cl. 362—32 15 Claims



1. A child's hand-portable novelty magic-wand toy article effectively serving as a nighttime safety-sparkler; comprising:

a chemiluminescently illuminated apparatus, having a detachable lower body rod like carrying handle member of semi-rigid material, including an upper body portion having easy rod securing means for secure insertion of an end of the rod into a bore into a lower lumen portion of an upwardly extending substantially tubular aggregate light-body portion, said light-body made of light-permeable plastic so as to receive light radiating outward from a conventional expendable light-stick cartridge unit manually inserted into the lumen bore, the light thus being piped up via refraction means into base fustrums of myriad fiberoptic-strands fixedly arranged to an uppermost end of the light body; said strands blossoming out distally thereabove so as to freely billow about, thus conveying dynamic points of light appearing much as sparks to an onlooker.

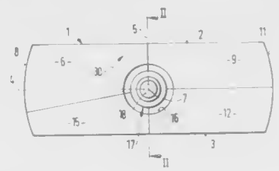
4,924,359

MOTOR VEHICLE HEADLIGHT

Gerhard Lindae, Leonberg; Rainer Neumann, and Peter Perthus, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,195
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731232
Int. Cl.[5] B60Q *1/04*
U.S. Cl. 362—61 13 Claims

1. A headlight for motor vehicles, having a reflector (1) with a reflecting surface (20) made up of a plurality of related segments, each of said segments are formed by different conical sectional curves which merge smoothly with one another and a lamp of axial extension is disposed on a vertical and horizontal axis in the reflector, said reflector comprises first and second reflector halves divided by said vertical axis through the headlight axis, said first reflector half is composed of a first lower segment (15) in the form of a second paraboloid and a first upper segment (6) formed by a second paraboloid which given asymmetrical light distribution of the headlight serves as a high beam, and said second reflector half has a second upper



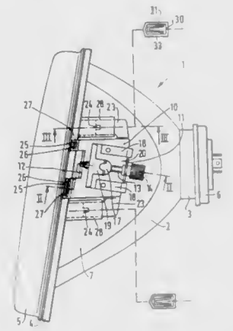
segment (9, 50) and a second lower segment (12) formed by conical sectional curves.

4,924,360

MOUNTING AND ADJUSTING APPARATUS FOR AN ILLUMINATING DEVICE, MORE PARTICULARLY A HEADLAMP, ESPECIALLY FOR AN AUTOMOBILE

Eric Philippe, Saint Germain en Laye, France, assignor to Valeo Vision, Bobigny Cedex, France

Filed Feb. 17, 1989, Ser. No. 312,052
Claims priority, application France, Feb. 19, 1988, 88 01983
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 12 Claims



1. An apparatus for mounting and adjusting a headlamp of a vehicle, said apparatus comprising:

an adjustment support plate connected to the headlamp;

a carrier for connection to the body of the vehicle, said carrier having a foot portion adjacent to and in sliding contact with said support plate and a threaded female portion;

a spring member fixed on said carrier and adapted to be connected to the body of the vehicle so as to bias said carrier against said support plate; and

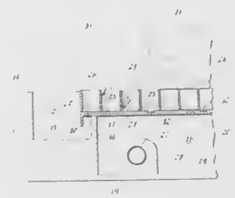
an adjusting screw extending through said threaded female portion of said carrier, said adjusting screw mounted freely rotatable but translatably fixed with respect to said support plate, whereby rotation of said adjusting screw in said threaded female portion of said carrier causes said support plate to translate relative to said carrier to adjust said headlamp.

4,924,361

SYSTEM FOR GLARE-FREE ILLUMINATION IN WET LOCATIONS

Henry Von Kohorn, 945 Treasure Lane, Vero Beach, Fla. 32963

Filed Apr. 25, 1989, Ser. No. 343,060
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—96 7 Claims



1. System for glare-free illumination in wet locations comprising

a peripheral receptacle open at the top, formed by an outer, light-impervious wall having an upper rim, a connecting bottom and an inner wall having an upper rim, said first receptacle being adapted to contain water,

a second inner receptacle being formed, at least partially, by said first receptacle inner wall and having an open top and a waterproof seal at said inner wall between said second receptacle and said first receptacle, said second receptacle being adapted to contain a light source, said first and second receptacles being located in substantially the same horizontal plane and having a substantially common bottom structure

a waterproof lid covering said second receptacle, said lid comprising at least one transparent portion and having at least one portion peripherally extending into the space above the bottom of said first receptacle,

a structure having a perforate surface disposed above said lid, said structure being formed by a frame having a plurality of grouped, hollow, vertically extending conduits with means for reducing glare from light generated in said second receptacle,

an electric light source disposed in said second receptacle below said lid, and means to supply electricity to said light source,

so that light generated in said second receptacle and shining upwardly through said lid and the members of said structure is not directly visible to observers grouped around said system, and

so that water falling on said object and said system flows downwardly through said members and across the upper surface of said lid into said first receptacle without contacting the light source.

4,924,362

ILLUMINATED ARTICLE AND WATERPROOF ILLUMINATED HARNESS

Michael Janko, Richmond, and Matthew McAllister, Lexington, both of Mich., assignors to Alliko Unlimited Corporation, Anchorville, Mich.

Continuation-in-part of Ser. No. 897,192, Aug. 15, 1986, Pat. No. 4,774,642. This application Sep. 1, 1988, Ser. No. 239,448
Int. Cl.[5] F21L *15/08*
U.S. Cl. 362—108 21 Claims

1. An illuminated object having an outer surface comprising:

a plurality of harnesses, each harness including:

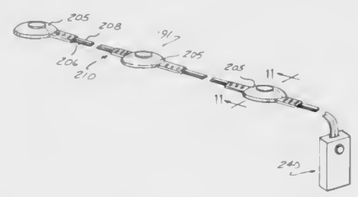
an electric power source housed in a waterproof housing;

electrical conductors connectable to the electric power source;

an illumination means attached in electrical contact with the electrical conductors; and

VOL
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a housing surrounding and forming a waterproof enclosure about the illumination means and the attached portion of the electrical conductors adjacent to the illumination means;



means for interconnecting the electrical conductors of a plurality of harnesses to form an electrical circuit between the illumination means in the harnesses and the electrical power source;

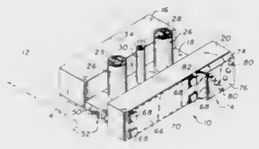
the harnesses mounted on the object with the illumination means being viewable from the outer surface.

4,924,363

ATTENTION-ATTRACTING DEVICE FOR USE BENEATH A DISPLAY SHELF

Bradley F. Kornelson, Saanichton, Canada, assignor to Dapopp Products Ltd., Saanichton, Canada

Filed Feb. 15, 1989, Ser. No. 311,186
Int. Cl.[5] A47F *11/10*
U.S. Cl. 362—125 **9 Claims**



1. An attention-attracting device for use in association with a display shelf, comprising:

light-emitting means at the front of said device for presenting a visually noticeable signal to persons in the vicinity of said device;

means for intermittently energizing said light-emitting means to cause said signal to be a flashing signal; and

means for securing said light-emitting means in a location beneath the display shelf.

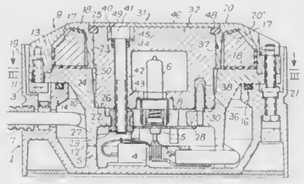
4,924,364

FLUSH-TYPE AIRPORT RUNWAY LIGHT, WITH REMOVABLE OPTICAL UNIT

Daniel Pannier, Les Andelys, France, assignor to Societe Anonyme, Paris, France

Filed Mar. 21, 1988, Ser. No. 171,130
Claims priority, application France, Apr. 1, 1987, 87 04571
Int. Cl.[5] F21S *1/02*
U.S. Cl. 362—153.1 **9 Claims**

1. Flush-type runway light for airport runways, of the type comprising an embedded seating, a lid fixed on the seating, and an optical unit removable through an opening in the center of the lid, and housed, while in working position, so as to be on the same upper level as the lid, said optical unit comprising a cylindrical body and an electric lamp, and wherein means are provided in said light for guiding the optical unit in vertical translation, as well as means for interlocking the optical unit and the lid arranged in such a way that the locking or unlocking control of said means causes selected vertical translational motion of said unit including a grasping position in which the



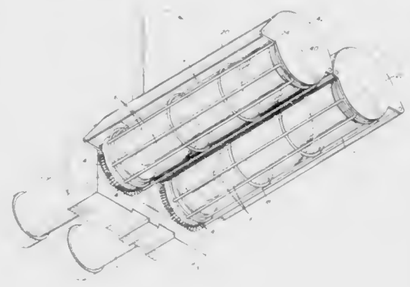
unit protrudes sufficiently from the upper level of the lid to be grasped and removed from its working position.

4,924,365

ADJUSTABLE REFLECTOR ATTACHMENT

Andris Bogdanovs, Liverpool, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 17, 1989, Ser. No. 324,946
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—224 **16 Claims**



1. A lighting fixture comprising:

a housing;

a lamp holder projecting from said housing;

a reflector mounted on said lamp holder by means of a spring;

a dimple in said reflector;

a glass tube projecting from said lamp holder;

an end cap mounted on said glass tube opposite said lamp holder;

cavities in said end cap which selectively engage said dimple;

a fastener in said reflector and end cap which may be loosened to allow rotation of the reflector relative to said end cap to engage said dimple of said reflector into a cavity of said end cap for desired positioning and subsequent retightening without any disassembly of parts.

4,924,366

UNIVERSAL MODULAR LIGHTING SYSTEM

Sylvan R. Shemitz, Woodbridge, and James A. Melling, New Haven, both of Conn., assignors to Sylvan R. Shemitz Associates, Inc., West Haven, Conn.

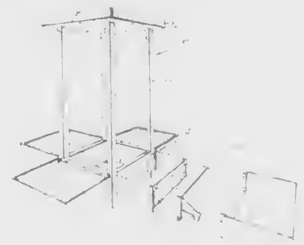
Filed Mar. 7, 1989, Ser. No. 319,997
Int. Cl.[5] F21V *21/00*
U.S. Cl. 362—249 **3 Claims**

1. A universal modular lighting system comprising:

(a) a universal mounting system further comprising:

(1) at least one substantially rectangular mounting frame, having longitudinal sides and a face;

(2) a substantially planar base;



(3) at least two elongated stems, each with one end attached to the base and another end attached to at least one of the longitudinal sides of the mounting frame; and

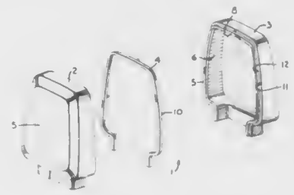
(b) at least one lighting module, attached to the mounting frame face.

4,924,367

SEAM CONSTRUCTION FOR MOLDED SIGNAL LAMPS

Joseph T. Hodges, Leawood, Kans., and Russell L. White, Raymore, Mich., assignors to Peterson Manufacturing Company, Grandview, Mich.

Filed Mar. 2, 1989, Ser. No. 318,701
Int. Cl.[5] B60Q *1/26*
U.S. Cl. 362—311 **6 Claims**



1. In a signal lamp:

(a) a lamp housing of synthetic resin having an unsightly welded seam where housing portions are joined in secured relationship,

(b) a peripheral open groove extending about said housing over said seam,

(c) a strip of material filling said groove and visually blocking said seam, said seam being exposed when viewed from the outside of said lamp except for said strip, and

(d) means projecting from one of said strip and a groove side wall into the other of said strip and side wall, thereby locking said strip in said groove.

4,924,368

FLUORESCENT LAMP WITH PROTECTIVE SHIELD

Donald P. Northrop, Glen Rock, and David P. Strauss, Ridgefield, both of N.J., assignors to Duro-Test Corporation, North Bergen, N.J.

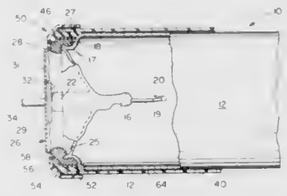
Filed Jan. 6, 1989, Ser. No. 295,043
Int. Cl.[5] F21V *15/00*
U.S. Cl. 362—376 **16 Claims**

1. A shatterproof fluorescent lamp comprising:

an elongated glass envelope having an ionizable medium therein to interact with a phosphor coating on the envelope inner wall and an electrode at each end of the envelope;

a base on each end of the lamp having a collar which fits over the end of the envelope;

a protective sleeve having an inner diameter larger than the outer diameter of the envelope for fitting over the envelope; and



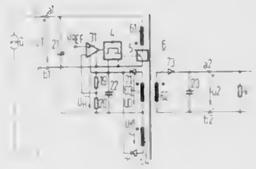
adhesive means at each end of the envelope for connecting the base, envelope and sleeve for mounting the sleeve relative to the envelope to provide an air space between the outer surface of the envelope and the inner surface of the sleeve, said adhesive mounting means holding the lamp base attached to the sleeve upon breakage of the envelope.

4,924,369

REGULATED BLOCKING CONVERTER WHEREIN SWITCH CONDUCTION TIME INCREASES WITH HIGHER OUTPUT VOLTAGES

Werner J. Varadi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich

Filed Nov. 14, 1988, Ser. No. 271,018
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802224
Int. Cl.[5] H02M *3/28*
U.S. Cl. 363—21 **8 Claims**



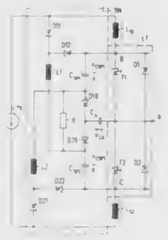
1. A feed circuit for feeding at least one user with a dc voltage acquired from an impressed direct current, having a controllable switch in a current branch which is connected in parallel to an input of the feed circuit and that is controllable with and that is connected to an output of a pulse width modulator dependent on a voltage that is the determining factor for an output voltage of the feed circuit comprising: the feed circuit being a blocking converter, whereby the switch is connected in series with a primary winding of a storage transformer in the current branch; and the pulse width modulator being controllable by a means for a controlling coupled to the primary winding and which provides the voltage that is the determining factor such that, in a range of control of the feed circuit, a relative on-duration of the switch becomes increasingly longer for higher output voltages.

4,924,370

LOW-LOSS AND LOW-REACTIVE POWER SWITCHING RELIEF DEVICE FOR THE SEMICONDUCTOR SWITCHES OF AN INVERTER

Hans-Juergen Toelle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,608
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1988, 3810535
Int. Cl.[5] H02H 7/122; H02M 7/515
U.S. Cl. 363—57 9 Claims



1. A circuit providing low-loss relief for an inverter during a switching-off and on process of a plurality of semiconductor switches, said inverter having a phase output and being coupled to a DC voltage source, the circuit comprising:

a first saturable inductance coupled between a positive potential of said voltage source and an upper end of said inverter;

a second saturable inductance coupled between a lower end of said inverter and a negative potential of said voltage source;

a wiring network coupled to said inverter and wherein said wiring network further comprises:

(a) a first capacitor, having a first and a second terminal, coupled at said first terminal to said phase output;

(b) a first series circuit including a first storage capacitor and a first diode, said series circuit coupled at the first storage capacitor end to said upper end of said inverter and at the first diode end to said second terminal of said first capacitor;

(c) a second series circuit including a second storage capacitor and a second diode, said second series circuit coupled at the second storage capacitor end to said lower end of said inverter and at the second diode end to said second terminal of said first capacitor;

(d) a first relief coil coupled at one end to a first junction point in said second series circuit between said second storage capacitor and said second diode;

(e) a first feedback diode coupled between said first relief coil and said positive potential;

(f) a second feedback diode coupled between said first relief coil and said upper end of said inverter;

(g) a second relief coil coupled at one end to a second junction point in said first series circuit between said first storage capacitor and said first diode;

(h) a third feedback diode coupled between said second relief coil and said negative potential; and

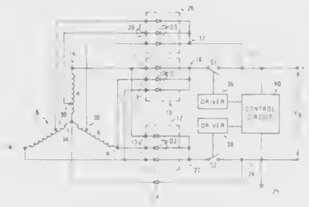
(i) a fourth feedback diode coupled between said second relief coil and said lower end of said inverter.

4,924,371

RECTIFIER CIRCUIT PROVODING COMPRESSION OF THE DYNAMIC RANGE OF THE OUTPUT VOLTAGE

William A. Peterson, Vestal, N.Y., assignor to General Electric Company, Binghamton, N.Y.

Filed Jul. 10, 1989, Ser. No. 377,670
Int. Cl.[5] H02M 7/217
U.S. Cl. 363—89 19 Claims



1. A rectifier circuit comprising, in combination:

A. an AC source subject to variation in voltage over a large dynamic range, said source including

(1) a winding in which a voltage is induced having at least first and second winding sections with corresponding one ends thereof commonly connected to a neutral point and corresponding other ends thereof respectively connected to separate AC output terminals; and

(2) each said first and second winding sections having a tap at a location uniformly spaced from said neutral point;

B. first and second DC voltage buses;

C. first rectifier means poled in a first direction and having input terminals respectively connected between said AC output terminals and a first DC terminal;

D. second rectifier means poled in a second direction opposite said first direction and having input terminals respectively connected between said AC output terminals and a second DC terminal;

E. a first switch connecting said first DC terminal to said first DC bus;

F. a second switch connecting said second DC terminal to said second DC bus;

G. third rectifier means poled in said first direction and having input terminals respectively connected between said taps and said first DC bus;

H. fourth rectifier means poled in said second direction and connecting said neutral point to said second DC bus; and

I. a control circuit operating in response to the DC output voltage across said first and second DC buses for selectively opening and closing said first and second switches such as to limit the DC output voltage to a dynamic range smaller than the dynamic voltage range of said AC source.

4,924,372

SINGLE PHASE RECTIFIER CIRCUIT

David A. Fox, Shawnee Township, Allen County, and David L. Stechschulte, Pleasant Township, Putnam County, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1989, Ser. No. 385,845
Int. Cl.[5] H02M 7/06
U.S. Cl. 363—89 8 Claims

1. A single phase rectifier circuit comprising:

means for producing a full wave rectified voltage by rectifying an AC input voltage;

means for coupling the rectified voltage to a filter capacitor through an inductor; and

means for repeatedly switching the sum of said rectified voltage and the voltage on said capacitor across said inductor, thereby alternately driving current through said inductor, to store energy in a magnetic field of said induc-



tor, and transferring said energy to said capacitor, to reduce distortion of the AC input current.

4,924,373

APPARATUS AND METHOD FOR CONTROLLING SWITCHING ELEMENTS IN A PWN-CONTROLLED VOLTAGE SOURCE INVERTER

Hiromi Inaba; Kiyoshi Nakamura; Akira Kimura· Sadao Hokari, all of Katsuta, and Naoyuki Oouchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Hitachi, both of, Japan

Filed Jan. 19, 1989, Ser. No. 298,962
Claims priority, application Japan, Feb. 1, 1988, 63-19690
Int. Cl.[5] H02M 7/44
U.S. Cl. 363—95 16 Claims



1. A control apparatus generating a control signal for controlling the conduction state of a plurality of switching elements in a PWM-controlled voltage source inverter converting a d.c. power input into a polyphase a.c. power output, comprising:

(a) means responsive to given target command values which are parameters relating to the a.c. output of said inverter for determining a composite phase command value θ_T;

(b) control mode selecting means responsive to said composite phase command value θ_T for selecting a control mode specifying the order of controlling said plural switching elements from among a plurality of control modes;

(c) means for determining control timing for said switching elements to be controlled in order specified by said control mode selected in response to said composite phase command value, said control timing determining means including means for generating a modulation wave signal corresponding to each phase of said polyphase a.c. power, means for setting a first reference value having a level higher by a predetermined value than the level of the positive peak value of said modulation wave signal of each phase and a second reference value having a level lower by a predetermined value than the level of the negative peak value of said modulation wave signal of each phase, means for setting the difference between said first reference value and the instantaneous value of said modulation wave signal of each phase at said composite phase command value as a first control timing for said switching elements, and means for setting the difference between said second reference value and the instantaneous value of said modulation wave signal of each phase at a value, which is the sum of said composite phase command value and a predetermined phase value $\Delta\theta$, as a second control timing succeeding said first control timing for said switching elements; and

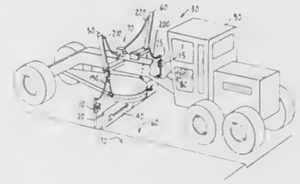
(d) means for generating a control signal to control said switching elements on the basis of said selected control mode and said first and second control timing settings, said control signal generating means further including timer means generating an output representing the real time, comparing means generating a coincidence signal when coincidence is detected between the real time output of said timer means and said first or second control timing setting, sand output means responsive to said coincidence signal for applying said control signal at said control timings to said switching elements to be controlled in the order specified by said selected control mode at a constant time interval Δt_1.

4,924,374

METHOD FOR AUTOMATIC POSITION CONTROL OF A TOOL

Christohper O. Middleton, Capitola, and Colin L. Robson, San Jose, both of Calif., assignors to Spectra Physics, San Jose, Calif.

Filed Jun. 9, 1988, Ser. No. 204,541
Int. Cl.[6] G06F 15/20; G05D 1/04
U.S. Cl. 364—167.01 4 Claims



1. An apparatus for establishing a distance between a tool portion of a machine and a reference surface as a reference distance when said tool portion is placed in a selected position relative to said reference surface, comprising:

means for detecting an event indicating that said tool portion is located at said selected position relative to said reference surface;

a table storing control words which indicate the amount and direction of a change in tool position for establishing said tool portion in the position it was in when said reference distance was established, including a control word indicating that no change in the position of the tool portion is necessary;

acoustic means coupled to said detecting means for generating an acoustic signal and transmitting said acoustic signal toward said reference surface and for detecting a measure of the round trip travel time between the time of generation of said acoustic signal and the time when an echo of said acoustic signal returns to said acoustic means after bouncing off said reference surface and for mapping said measure into the control word in said table indicating that no change in the tool position is necessary and for estab-

VOL
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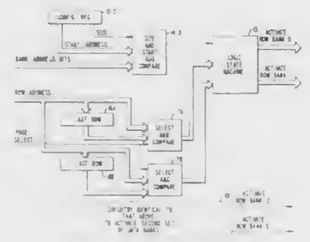
lishing said mapping as a reference mapping for use in generating control words from measures of round trip travel time for acoustic signals during future acoustic distance measuring of the distance between the tool portion and the reference surface.

4,924,375

PAGE INTERLEAVED MEMORY ACCESS

Michael G. Fung, San Jose, and Justin Wang, Saratoga, both of Calif., assignors to Chips and Technologies, Inc., San Jose, Calif.

Filed Oct. 23, 1987, Ser. No. 112,863
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—200 **1 Claim**



1 A high-performance memory controller for a memory that is divided into banks, said memory being arranged in a plurality of rows and a plurality of columns, each row and column being individually addressed, each row requiring a pre-charge cycle prior to being accessed, comprising in combination:

a memory addressing bus that has at least one page indicating bit which indicates if a particular address is on an odd or an even page of said memory, said odd and even pages being in different ones of said banks, each page being one of said rows of memory;

means, coupled to said memory addressing bus, for switching between rows of said memory, in response to the value of said page addressing bit, by enabling an appropriate one of said banks;

means, coupled to said memory addressing bus, for registering the last row that was accessed in each bank of said memory from the row address bits of a last memory address, said row address bits being more significant than said page addressing bit;

means for comparing the row address of a current address to said row address in said means for registering and providing a row pre-charge cycle to a bank of said memory enabled by said switching means only when said current and last row address are different; and

whereby sequential memory accesses to the same row in said memory are started without waiting for a row pre-charge cycle to be completed.

4,924,376

SYSTEM FOR DYNAMICALLY ADJUSTING THE ACCUMULATION OF INSTRUCTIONS IN AN INSTRUCTION CODE PREFETCHED PIPELINED COMPUTER

Yasushi Ooi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,209
Claims priority, application Japan, Dec. 26, 1985, 60-294162
Int. Cl.[5] G06F *9/38, 13/18, 9/24*
U.S. Cl. 364—200 **9 Claims**

1. An instruction code access control system used in an instruction code prefetched computer system which includes at least means for accumulating prefetched instruction codes, the instruction code accumulating means being cleared when one of a branch instruction, a call instruction and a return instruction is executed, and means for selectively coupling the instruction code accumulating means to a data path through which an instruction code and an operand data are selectively transferred, wherein the control system comprises:

counting means which is cleared when one of a branch instruction, a call instruction and a return instruction is executed, and operating for counting a total number of the instruction codes which have been inputted in the instruction code accumulating means from a time said one of a



branch instruction, a call instruction and a return instruction is executed,

means coupled to receive a value of the counting means indicative of said total number and comparing the value of the counting means with a predetermined value, and

means coupled to the comparing means for determining, on the basis of an output of the comparing means, a priority between an instruction memory access for instruction code prefetching and an operand access caused as a result of an instruction execution, the priority determining means operating to control the selectively coupling means in accordance with the result of the determination.

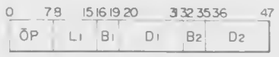
4,924,377

PIPELINED INSTRUCTION PROCESSOR CAPABLE OF READING DEPENDENT OPERANDS IN PARALLEL

Kazunori Kuriyama, Hadano; Kenichi Wada, Sagamihara, and Akira Yamaoka, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,161
Claims priority, application Japan, Dec. 28, 1983, 58-246281
Int. Cl.[4] G06F *9/28, 9/22, 9/38*
U.S. Cl. 364—200 **10 Claims**

PRIOR ART



1. A pipelined instruction processor, comprising:

first and second buffer storage means each for holding operand data items;

first address generating means connected to said first buffer storage means and responsive to an applied instruction of a first or second kind for sequentially applying addresses of first operand data items requested by the applied instruction of the first or second kind to said first buffer storage means so as to sequentially read the first operand data items from said first buffer storage means;

second address generating means operating concurrently with said first address generating means and connected to said first and second buffer storage means and (i) responsive to the instruction of the first kind being applied to said first address generating means for sequentially applying

addresses of second operand data items requested by the instruction of the first kind to said second buffer storage means, each address of a second operand data item being applied to said second buffer storage means in synchronism with the generation of an address of a corresponding first operand data item by said first address generating means, so that each of the second operand data items are sequentially read out from said second buffer storage means in synchronism with read out of a corresponding first operand data item from said first buffer storage means, and (ii) responsive to the instruction of the second king being applied to the first address generating means and to each first operand data item read out from said first buffer storage means for sequentially applying addresses of second operand data items requested by the instruction of the second kind to said second buffer storage means, each address of a second operand data item depending upon a corresponding first operand data item read out of said first buffer storage means, so that each of the second operand data items are sequentially read out from said second buffer storage means in response to read out of a corresponding first operand data item from said first buffer storage means;

operation means connected to said first and second buffer storage means and (i) responsive to the instruction of the first kind being applied to said first address generating means for sequentially performing an operation requested by the instruction of the first kind on each pair of a first operand data item read out from said first buffer storage means and a corresponding second operand data item read out synchronously from said second buffer storage means so that third operand data items corresponding to the result of the operations are sequentially provided to said first buffer storage means and (ii) responsive to the instruction of the second kind being applied to said first address generating means for sequentially transferring the second operand data items read out from said second buffer storage means to said first buffer storage means; and

transfer means connected to said first address generating means and said first buffer storage means and (i) responsive to the instruction of the first kind being applied to said first address generating means for sequentially transferring the generated address of the first operand data items requested by the instruction of the first kind to said first buffer storage means as write addresses thereto, each in synchronism with transfer of each of the third operand data items to said first buffer storage means, and (ii) responsive to the instruction of the second kind being applied to said first address generating means for sequentially transferring the generated addresses of the first operand data items requested by the instruction of the second kind to said first buffer storage means as write addresses thereto, each in synchronism with transfer of one of the second operand data items to said first buffer storage means.

4,924,378

LICENSE MANGAGEMENT SYSTEM AND LICENSE STORAGE KEY

Antoinette F. Hershey, Acton; Andrew H. French, Lexington, and Christopher P. Boire, Westborough, all of Mass., assignors to Prime Computer, Inc., Natick, Mass.

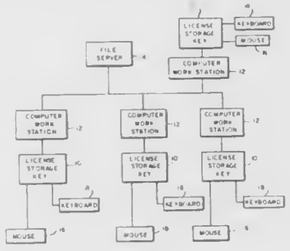
Filed Jun. 13, 1988, Ser. No. 205,986
Int. Cl.[5] G06F *3/00, 15/16;* H04L *9/00*
U.S. Cl. 364—200 **29 Claims**

1. A license storage key comprising:

communication means for sending messages to and receiving messages from a computer;

memory means for storing a count of licenses for each of a plurality of application programs; and

a processor, coupled to said communication means and to said memory means, for decoding encrypted messages received through said communication means and for encoding messages for sending through said communication means, said processor including means for assigning a



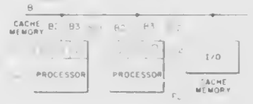
license in said memory means for an execution environment on said computer.

4,924,379

MULTIPROCESSOR SYSTEM WITH SEVERAL PROCESSORS EQUIPPED WITH CACHE MEMORIES AND WITH A COMMON MEMORY

Hubert Kirrmann, Baden, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Oct. 1, 1987, Ser. No. 103,491
Claims priority, application Switzerland, Oct. 3, 1986, 3968/86
Int. Cl.[5] G06F *12/08, 15/16, 13/00*
U.S. Cl. 364—200 **6 Claims**



1. A multiprocessor system comprising:

a plurality of processors, each of said plurality of processors being equipped with an associated cache memory,

a common memory, said common memory and each of said cache memories adapted to store at least one variable in accordance with address information associated with said variable;

a bus which connects said processors and said common memory, said common memory or one of said cache memories being owner of a variable determined by the address of said variable, only said owner delivering a variable to said bus following a read request,

each of said processors including means for modifying the variable present in the associated cache memory, a cache memory in which a variable having a valid value is stored becoming owner of the variable when said variable is modified by the associated processor,

means for writing a modified value of a variable into said common memory for each modification of said variable in said cache memory when said cache memory was not owner of the variable before modification or when said cache memory was owner but which variable was delivered by said cache memory to said bus before modification, said common memory or one of said cache memories losing ownership over the written variable during said writing,

means for marking said variable as invalid in all said cache memories except in a cache memory from which said

VOL
1114
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variable is being written, during each writing of a variable through the bus into said common memory,

said writing means operative during displacement of a variable from a cache memory which has ownership of said variable to write said variable into said common memory through said bus, said common memory assuming ownership of said variable during displacement of the variable from said cache memory which has ownership over the variable,

said common memory including a first memory bit for each variable, said first memory bit specifying whether said common memory is owner of the respective variable,

each of said cache memories including a second memory bit and a third memory bit for each variable which, in combination with one another, specify the operating state of the variable, possible operating states including:

(a) the associated variable has an invalid value and a write process into said common memory is required on modification of said associated variable,

(b) the associated variable has a valid value but the respective cache memory is not owner of the variable and a write process into said common memory is required on modification of the variable but not on displacement of the variable,

(c) the associated variable has a respective value, the respective cache memory is owner of this variable and a write process into said common memory is required on modification of the variable and on displacement of the variable, and

(d) the associated variable has a valid value, the respective cache memory is owner of this variable and a write process into said common memory is required only on displacement of said variable.

4,924,380

DUAL ROTATING PRIORITY ARBITRATION METHOD FOR A MULTIPROCESSOR MEMORY BUS

Steven J. McKinney, Coral Springs, and William E. Earnshaw, N. Lauderdale, both of Fla., assignors to Modular Computer Systems, Inc. (Florida Corporation), Ft. Lauderdale, Fla.

Filed Jun. 20, 1988, Ser. No. 208,506
Int. Cl.[5] G06F *13/18*
U.S. Cl. 364—200 **7 Claims**



1. A multiprocessor system, comprising:

a common bus;

a plurality of first system agents connected to the bus and a plurality of second system agents connected to the bus, each system agent having means for selectively generating a request signal to request access to the bus; and

central arbitration controller means for sampling the request signals generated by the system agents and for granting bus access based on an arbitration scheme having a plurality of rotating queues with a fixed priority between the queues, the central arbitration controller means including first latch means for storing request signals generated by the first system agents,

first combinatorial logic means, responsive to the signals stored by the first latch means, for selecting the next first system agent to have priority, among the plurality of first system agents, in accessing the bus, and

first FIFO memory means for storing a signal identifying a first system agent that was previously selected to have priority among the plurality of first system agents in accessing the bus,

wherein the first combinatorial logic means is additionally responsive to the signal stored in the first FIFO memory means.

4,924,381

MICROPROCESSOR HAVING A DYNAMIC MEMORY REFRESH CIRCUIT

Takahiro Tokuume, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 743,549, Jun. 11, 1985. This application Aug. 5, 1988, Ser. No. 228,880
Claims priority, application Japan, Jun. 11, 1984, 59-119593; Nov. 15, 1984, 59-241002
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—200 **1 Claim**



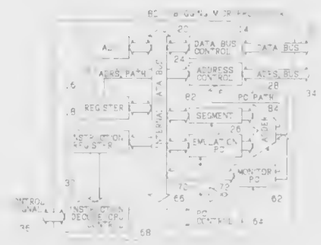
1. A microprocessor coupled to an external bus and to a dynamic memory; comprising an execution unit for executing data processing according to an instruction, said execution unit including means for generating a first status signal indicating that said execution unit does not access said external bus during a period of time equal to or greater than the period of time required for a refresh operation, a refresh control circuit including a refresh timer, and producing a first refresh request signal, the first refresh request signal being produced in response to a request for refreshing from said refresh timer, a refresh control unit for receiving said first status signal and said first refresh request signal, said refresh control unit accepting said first refresh request signal only when said first status signal is present to generate a refresh grant signal, said refresh control circuit further producing a second refresh request signal when said refresh control unit does not accept said first refresh signal a plurality of times, said refresh control unit further receiving said second and generating a refresh grant signal whenever said second refresh request signal is applied thereto irrespective of the presence or absence of said first status signal, said refresh control circuit further including means for receiving said refresh grant signal and controlling said dynamic memory such that the refresh operation can be executed once when said refresh grant signal is generated in response to said first refresh request signal and the refresh operation can be executed a plurality of times when said refresh grant signal is generated in response to said second refresh request signal.

4,924,382

DEBUGGING MICROPROCESSOR CAPABLE OF SWITCHING BETWEEN EMULATION AND MONITOR WITHOUT ACCESSING STACK AREA

Masahiro Shouda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,479
Claims priority, application Japan, Oct. 5, 1987, 62-251273
Int. Cl.[5] G06F *13/00*
U.S. Cl. 364—200 **4 Claims**



4. A debugging microprocessor for moving into a debugging interrupt processing execution mode in response to an external supervisor interrupt instruction, comprising an execution controller for generating a supervisor interrupt acknowledge signal after an execution of an instruction being executed when reception of a supervisor interrupt request has been completed, and also for generating a return instruction execution signal when a return instruction has been executed, a first program counter put in an operating condition when said microprocessor is in a user's program execution mode, a second program counter put in an operating condition when said microprocessor is in a said debugging interrupt processing execution mode, a segment for generating a portion of an address of a debug memory, and an adder coupled to receive and add the content of said segment and the content of said second program counter for generating a completed address for said debug memory, a program counter controller coupled to receive said supervisor interrupt acknowledge signal and said return instruction execution signal and also coupled to said first and second program counters, said segment and said adder for controlling said first and second program counters, said segment and said adder, said program counter controller responding to said supervisor interrupt acknowledge signal to disable said first program counter and to enable said second program counter, said segment and said adder so as to cause an output of said adder to be outputted as the address for said debug memory, and also responding to said return instruction execution signal to disable said second program counter, said segment and said adder and to enable said first program counter so as to cause the content of said first program counter to be outputted as an address for a user memory, and an address controller coupled to said first and second program counters so as to execute an instruction fetch cycle on the basis of an address outputted from an enabled one of said first and second program counters so that an instruction read in said instruction fetch cycle is fetched through an external bus and through an internal bus to a register and decoded so as to be executed.

4,924,383

METHOD AND APPARATUS FOR MEASURING PERFORMANCE OF A MULTIPROCESSOR

Kaoru Suzuki, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1988, Ser. No. 215,788
Claims priority, application Japan, Jul. 6, 1987, 62-168438
Int. Cl.[5] G06F *15/16, 11/30*
U.S. Cl. 364—200 **7 Claims**



1. A method for measuring performance of a multiprocessor having a plurality of processors and common resources shared by the processors, comprising the steps of:

assigning any one of said plurality of processors as a master processor and other processors as slave processors and extracting by said master processor, from an external unit, measurement data for creating a competition state in which said master processor and at least one slave processor of said slave processors access said common resources;

activating said at least one slave processor by said master processor to cause said at least one slave processor to issue an instruction to access said common resources and issuing by said master processor an instruction to access said common resources to create said competition state; and

measuring instruction execution time by said master processor.

4,924,384

METHOD FOR CONTROLLING THE PEER-TO-PEER PROCESSING OF A DISTRIBUTED APPLICATION ACROSS A SYNCHRONOUS REQUEST/RESPONSE INTERFACE USING PUSH-DOWN STACK AUTOMATA

Ming C. Hao, Los Altos Hills; Ronald L. Obermarck, Redwood City; Gene E. Trivett, and Lynn Trivett, both of Portola Valley, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1988, Ser. No. 247,794
Int. Cl.[5] G06F *15/16*
U.S. Cl. 364—300 **9 Claims**



1. A method for managing peer-to-peer processing of a distributed application over a synchronous request/response (CALL/RETURN) interface, peer-to-peer processing connoting execution of at least one application or part thereof on at least a first and a second communicating processor (CP), said

first and second CP including counterpart first and second stacks of indicia of CP and interface activity, comprising the steps of:

(a) generating and communicating either a request or a response from the first CP to the second CP over the synchronous interface, said generating and communicating step being responsive to either a request or response from the second CP, input received from the application, or indicia provided by the first stack or operated according to a LIFO discipline;

(b) concurrently pushing or popping onto or from the first stack indicia of each generated or received request or response from or to the first CP; and

(c) repeating steps (a)–(b) until the first stack becomes exhausted.

4,924,385

METHOD OF DETECTING TYPES OF PARTS CONSTITUTING A LARGER GROUP OF PARTS

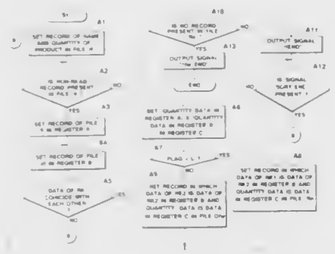
Kazumi Dote, Fussi, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,586

Claims priority, application Japan, Oct. 26, 1987, 62-268334; Oct. 26, 1987, 62-268335

Int. Cl.[5] **G06F** *9/00*

U.S. Cl. 364—300 **4 Claims**



1. A method of detecting lower-level parts constituting an arbitrary upper-level part, the method comprising the steps performed with a computer of:

prestoring structure records of all combinations of upper-level parent parts and lower-level child parts constituting parent-to-child relationships in a file, each of the structure records comprising a parent part code as a first word and a child part code as a second word;

inputting an input record including a code of an arbitrary parent part;

extracting all structure records including a code coinciding with a code of the input record as a first word from said file;

determining whether a structure record including as a first word a code which coincides with a code of a second word of each of the extracted structure records is stored in said file in units of the extracted records;

generating an input record including the code of the second word of each of the extracted structure records in units of the extracted structure records when it is determined that the structure record is stored;

repeating the extraction and determination steps in units of the generated input records; and

outputting the code of the second word of each of the extracted structure records when it is determined that the record is not stored.

4,924,386

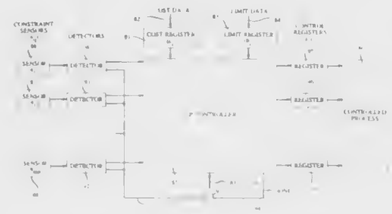
METHODS AND APPARATUS FOR EFFICIENT RESOURCE ALLOCATION

Barry A. Freedman, Lincroft; Mark S. Meketon, Middletown, and Robert J. Vanderbei, Morganville, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Jul. 13, 1987, Ser. No. 72,943

Int. Cl.[5] **G06F** *15/20*

U.S. Cl. 364—402 **6 Claims**



1. A method for allocating available industrial facilities among the users of said facilities so as to minimize the total cost of providing said facilities, said method comprising the steps of:

tentatively and iteratively reassigning said available facilities to said users in accordance with a deterministic process so as to reduce said total costs at each said reassignment with each of the reassignments in said tentatively and iteratively reassigning being characterized by a total cost that is lower than the cost of preceding reassignment,

terminating said iterative reassigning steps when said costs are minimized, and

physically allocating said facilities in accordance with the minimum cost assignment

wherein said deterministic process is the Karmarkar algorithm where each reassignment is developed by normalizing the previous reassignment with respect to constraints on said allocations, and

the direction of changes in said previous reassignment to develop said each reassignment is made under the constraint that at least one of said assignments has a finite limit.

4,924,387

COMPUTERIZED COURT REPORTING SYSTEM

John C. Jeppesen, 82209 Edison, Ventura, Calif. 93001

Filed Jun. 20, 1988, Ser. No. 211,826

Int. Cl.[5] **G11B** *15/10*

U.S. Cl. 364—409 **25 Claims**



1. A court reporting system for providing a simultaneous written and video record under the sole control of a single court reporter comprising:

(a) a court reporter's stenographic recording input device having a keyboard for accepting phonetic keystroke combination manual inputs from the court reporter and for providing a corresponding signal reflecting keystroke combinations input by the court reporter at an output thereof;

(b) system clock means for providing a current time and date signal at an output thereof;

(c) stroke record memory means for receiving and storing a sequence of said signal reflecting keystroke combinations input by the court reporter;

(d) a stroke definition table defining a plurality of keystroke combinations not employed for phonetic representations as control strokes;

(e) video camera means for viewing a scene and providing a video signal reflecting said scene at an output thereof;

(f) microphone means for providing an audio signal reflecting verbal testimony at an output thereof;

(g) recorder means connected to said outputs of said video camera means and said microphone means for producing a recording of said video and audio signals reflecting testimony in progress; and,

(h) control means operably connected to said court reporter's stenographic recording input device, said system clock means, said video camera means, said microphone means, said stroke definition table, said recorder means, and said stroke recorder memory means for separating keystroke combinations input by the court reporter into phonetic keystrokes and control keystrokes, for controlling the operation of said video camera means and said recorder means as a function of recognized ones of said control keystrokes, for recording said phonetic keystrokes in said stroke record memory means, and for periodically obtaining said current time and date signal from said system clock means and appending it to said recording of said video and audio signals and said sequence of said signal reflecting keystroke combinations stored in said stroke record memory means.

4,924,388

IMAGE MOVEMENT PROCESSING FOR PAGE PLANNING

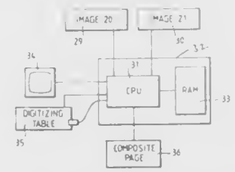
Peter W. Stansfield, Hertfordshire, and Alastair Reed, Bedfordshire, both of England, assignors to Crosfield Electronics Limited, London, England

Filed Jan. 5, 1988, Ser. No. 140,847

Claims priority, application United Kingdom, Jan. 5, 1987, 8700092

Int. Cl.[5] **G01R** *33/20*

U.S. Cl. 364—413.2 **7 Claims**



7. A computer programmed to modify part of a first image, represented digitally in a frequency domain by at least one first block of data locations containing frequency coefficient data in which, for each said first block, a second block of data locations containing frequency coefficient data is generated, said first and second blocks representing, after conversion to a spatial domain, spatially shifted versions of said image part relative to a fixed spatial coordinate system, said computer producing a second image accordingly, and including:

means for applying a predetermined shift function defined in the frequency domain to said first blocks of data to generate modified blocks in which the content of each data location is modified;

means for determining the data locations in said modified first blocks which contribute to the content of each said second block of data locations;

means, responsive to an identification of each said second block which does not define an edge of the shifted image, for summing the coefficients of each frequency as defined by the content of those data locations of the modified first blocks which are determined to contribute to said second block to generate resultant coefficients for each frequency, and for storing the resultant coefficients in respective data locations of the second block; and

means, responsive to said means for applying, said means for determining, and said means for summing, for producing said second image.

4,924,389

DEVICE FOR IMPLEMENTING A METHOD FOR FEEDING PERSONS

Claude Gerbaulet, 15, rue de la Touviere, 75400 Evian-les-Bains, and Sonia Ferry, 204, rue de la Croix Nivert, 75015 Paris, both of France

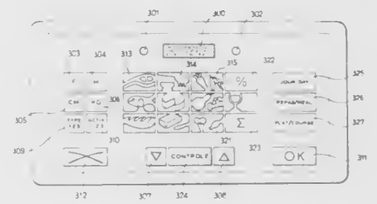
PCT No. PCT/FR87/00335, § 371 Date May 2, 1988, § 102(e) Date May 2, 1988, PCT Pub. No. WO88/01770, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 28, 1987, Ser. No. 194,989

Claims priority, application France, Sep. 1, 1986, 86 12274

Int. Cl.[5] **G06F** *15/42*

U.S. Cl. 364—413.29 **11 Claims**



1. A device for implementing a method for feeding persons in which, food being subdivided in a given number of categories according to energy values, the recommended energy ration for a given day to a given person depends upon the energy rations consumed by said person during the preceding days, which device comprises in combination:

a first memory means (**11–19, 81–89**) to memorize each quantity (LVC, FRC, . . . ALCC), as anticipated by said person, of food belonging to each of said categories for his/her diet during that day,

a second memory means (**21**) connected to the outlet of said first memory means (**11–19**) to memorize each quantity (LVC**1**, LVC2, . . . , LVC**4**, FRC**1**, FRC**2**, . . . ALCC**2**), as consumed by said person, of food belonging to each of said categories during at least one of said preceding days,

a first computer means (**22, 23**), connected to the outlet of said second memory means (**21**), to determine each quantity (LVA, FRA, . . . ALCA) of food in each of said categories which is recommended for said person based on the quantities consumed on preceding days, as well as said energy ration (CASA), recommended to said person, for his/her diet during said day,

a third memory means (**30–39**), connected to the outlet of said first computer means (**22, 23**), to memorize said recommended quantities (LVA, FRA, . . . ALCA) and said recommended energy ration (CASA),

a second computer means (**24**), connected to the outlet of said first memory means (**11–19**) to determine the energy ration (CASC), as anticipated by said person, for his/her diet during said day,

a first comparison means (**40–49**) connected to the outlet of said first memory means (**11–19**), to the outlet of said second computer means (**24**) and to the outlet of said third memory means (**30–39**), to compare each of said anticipated quantities (LVC, FRC, . . . ALCC) to each said

recommended quantity (LVA, FRA, . . . ALCA) in the same category, and to compare said anticipated energy ration (CASC) to said recommended energy ration (CAS),

a first indicator means (**50–59**), controlled by the outlet of said first comparison means (**40–49**), and

controlling means (**6**, **60**) for writing, in said second memory means (**21**), said anticipated and consumed quantities (LVC, FRC, . . . , ALCC) and then writing, in said third memory means (**30–39**), new recommended quantities of food in each of said categories, and the new recommended energy ration for the next day.

4,924,390

METHOD FOR DETERMINATION OF EARTH STRATUM ELASTIC PARAMETERS USING SEISMIC ENERGY

Roger Parsons, and Robert H. Stolt, both of Poncha City, assignors to Conoco, Inc., Ponca City, Okla.

Continuation of Ser. No. 707,838, Mar. 4, 1985, abandoned. This application Feb. 22, 1988, Ser. No. 161,257

Int. Cl.[5] **G06F** *15/20*; **G01V** *1/36, 1/30, 1/34*

U.S. Cl. 364—421 **5 Claims**



1. A method of seismic data processing to extract relative elastic parameter data output, comprising:

obtaining and pre-processing seismic data along a selected survey line overlying locally layered substrata that necessarily exhibit locally negligible lateral change in elastic parameters;

sorting the seismic data into data groups having the same common basement point;

4,924,391

TROUBLE-DIAGNOSABLE MULTIFUNCTION TESTING APPARATUS

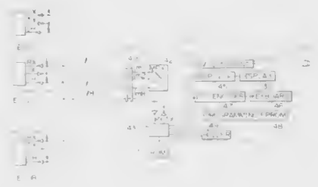
Shigeaki Hirano; Hirotoshi Maekawa, both of Himeji; Tsutomu Kubozono, and Minoru Tatemoto, both of Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,837

Claims priority, application Japan, Feb. 27, 1987, 62-28231[U]; Feb. 27, 1987, 62-28232[U]; Feb. 27, 1987, 62-28233[U]; Feb. 27, 1987, 62-28234[U]; Feb. 27, 1987, 62-28235[U]; Feb. 27, 1987, 62-28237[U]; Feb. 27, 1987, 62-28238[U]; Feb. 27, 1987, 62-28239[U]; Mar. 31, 1987, 62-78715[U]; Mar. 31, 1987, 62-47758[U]; Mar. 31, 1987, 62-47759[U]

Int. Cl.[5] **G06F** *15/74*

U.S. Cl. 364—424.03 **15 Claims**



1 Vehicle diagnostic testing apparatus for operating with a conventional test unit that receives data in a first format and with a diagnostic test unit that receives data in a second format which is different from said first format, said diagnostic testing apparatus comprising:

a plurality of electronic control units, each of said electronic control units being responsive to one or more vehicle operating conditions for generating diagnostic data signals, said electronic control units generating said diagnostic data signals in said first format and being responsive to a control signal for generating said diagnostic data signals in said second format;

means for connecting said conventional test unit to each of said plurality of electronic control units;

means responsive to said diagnostic data signals for transmitting said diagnostic data signals from each of said plurality of electronic control units to said conventional test unit in said first format to allow said conventional test unit to operate with said diagnostic testing apparatus;

a diagnostic test unit attachable to each of said plurality of electronic control units;

means in said diagnostic test unit for generating said first control signal; and

means for transmitting said control signal from said diagnostic test unit to each of said electronic control units to enable said electronic control units to transfer said diagnostic data signals to said diagnostic test unit in said second format.

4,924,392

ACTIVE SUSPENSION FOR A VEHICLE COORDINATELY RESPONSIVE TO CENTRIFUGAL FORCE DUE TO TURNING AND SIDE WIND

Ryuichi Kurosawa, Numazu, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 16, 1988, Ser. No. 207,514

Claims priority, application Japan, Jun. 23, 1987, 62-156261

Int. Cl.[5] **B60G** *17/00*

U.S. Cl. 364—424.05 **5 Claims**

1. A suspension system for a vehicle comprising a vehicle body and a plurality of wheels, comprising:

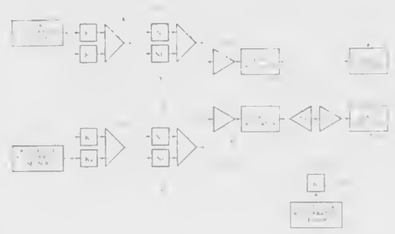
a plurality of actuators, each of which supports said vehicle body from a corresponding one of said wheels and is

controllable to provide a variable force between said vehicle body and said corresponding wheel;

a sensor means for detecting acceleration a of said vehicle body in lateral directions thereof and for producing a signal representative thereof;

a sensor means for detecting roll angle acceleration r of said vehicle body and for producing a signal representative thereof; and

a control means for inputting said signals representative of said lateral acceleration and said roll angle acceleration of said vehicle body from said sensor means, for calculating based thereupon fluctuation Fs of the load acting between



said vehicle body and said wheels due to turning of the vehicle and fluctuation Fw of the load acting between said vehicle body and said wheels due to a side wind blown against the vehicle according to:

$$Fs = K_1 a + K_2 r$$

$$Fw = -K_3 a + K_4 r$$

(K_1, K_2, K_3 and K_4 being positive constants)

and for controlling said actuators to increase or decrease forces provided thereby between said vehicle body and said actuators according to the sum of said fluctuations Fs and Fw.

4,924,393

ACTIVE SUSPENSION FOR A VEHICLE CONTROLLING BODY FOR COMBINATION OF BOUNCE AND PITCH BASED ON HEIGHT SENSOR SIGNALS

Ryuichi Kurosawa, Numazu, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 18, 1988, Ser. No. 220,687

Claims priority, application Japan, Jul. 24, 1987, 62-185862

Int. Cl.[5] **B60G** *17/00*

U.S. Cl. 364—424.05 **5 Claims**



1. An active suspension for a vehicle having a vehicle body, a front right wheel, a front left wheel, a rear right wheel, and a rear left wheel, comprising: a plurality of cylinder-piston type actuators, each producing a supporting force for supporting the vehicle body with respect to each corresponding one of said wheels; a plurality of vehicle height detection means detecting vehicle heights Hfr, Hfl, Hrr and Hrl of portions of the vehicle body corresponding to the front right wheel, the front left wheel, the rear right wheel, and the rear left wheel; and a calculation control device which inputs signals from said vehicle height detection means, calculates based on these signals a bounce amount B and a pitch amount P with respect to a road surface from a standard state of the vehicle body according to:

$$B = Kb\,(Hfr + Hfl + Hrr + Hrl = 4\,H)$$

$$P = Kp\,(Hrr + Hrl) - (Hfr + Hfl)$$

where Kb and Kp are positive coefficients, and H is the mean value of standard vehicle heights of said portions of the vehicle body corresponding to said respective wheels at the standard state of the vehicle body,

calculates based on said amount B and P a necessary supporting force for said actuators necessary to reduce the bounce and the pitch amount, and controls said actuators based on the necessary supporting force to increase or decrease the force acting between the wheels and the vehicle body through the actuators.

4,924,394

ANTI-SKID BRAKING SYSTEM FOR AUTOMOTIVE VEHICLE

Kiyoyuki Uchida, Susono; Hideo Inoue, Kanagawa, and Tatsuo Sugitani, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 99,239, Sep. 21, 1987, abandoned. This application Jun. 26, 1989, Ser. No. 372,138

Claims priority, application Japan, Sep. 20, 1986, 61-222749

Int. Cl.[5] **B60T** *8/68, 8/58, 8/74*

U.S. Cl. 364—426.02 **9 Claims**

1. An anti-skid braking system for an automotive vehicle comprising:

a plurality of hydraulically operated brakes provided for a plurality of wheels of the vehicle;

a plurality of actuators provided for a corresponding plurality of groups of brakes, each group including at least one of said plurality of brakes, each of said actuators being operable for controlling a braking pressure or pressures of said at least one brake of the corresponding group;

a plurality of speed sensors, at least one of which is provided corresponding to each of said plurality of actuators, for detecting rotating speeds of said wheels;

a controller comprising means for normally presuming that an actual running speed of the vehicle is represented by a highest one of the speeds of the wheels detected by said speed sensors; after a deceleration value of said highest speed has exceeded a preset upper limit, fixing the deceleration value of the vehicle at said preset upper limit, and presuming said actual running speed of the vehicle, based on said upper limit; and calculating an amount of slip of each of said wheels based on a difference between the presumed running speed of the vehicle and the detected speed of said each wheel, to control each of said actuators so as to prevent at least one of said wheels which corre-

sponds to said each actuator, from skidding on a road surface;

a detecting device attached to a body of the vehicle, and comprising means for detecting an actual deceleration value of said body, said detecting device generating an electric signal whose level is changed in at least two steps representative of at least two different values of said deceleration value of the body; and

upper-limit setting means for determining said upper limit of the deceleration value of the vehicle such that said upper limit is changed with said actual deceleration value of said body detected by said detecting device, said upper limit setting means including memory means for storing said electric signal which is generated when an amount of slip of each of the wheels except the wheel which has said highest speed exceeds a predetermined value, said upper-limit setting means determining said upper limit based on the electric signal stored in said memory means.

4,924,395

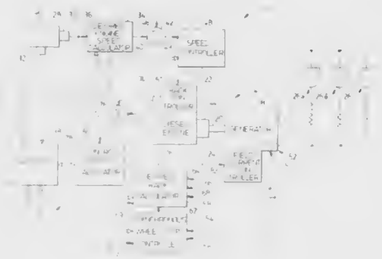
SYNCHRONOUS WHEEL SLIP STRATEGY FOR A LOCOMOTIVE GOVERNOR

Raymond G. Evans, Washington; Walter E. Earleson, Peoria, and Joseph W. Richardson, Jr., East Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 13, 1989, Ser. No. 337,514

Int. Cl.[5] **B61C** *15/08*

U.S. Cl. 364—426.02 **20 Claims**



1. An apparatus for controlling synchronous wheel slip of a locomotive having at least one electric traction motor powered by an engine-generator unit of the type having a field current controller, comprising:

a current sensing means for detecting a current produced by said engine-generator unit and producing a current signal responsive to said detected current;

a voltage sensing means for detecting a voltage produced by said engine-generator unit and producing a voltage signal responsive to said detected voltage; and,

a processor means for receiving said produced current and voltage signals, processing said produced current and voltage signals to produce a calculated wheel speed signal indicative of the actual locomotive wheel speed, processing said calculated wheel speed signal to produce a lagged wheel speed signal, deriving a difference signal in response to a difference between said calculated and lagged wheel speed signals, and delivering a control signal to said field current controller in response to said difference signal being greater than a first preselected reference signal in order to reduce wheel slip.

4,924,396

WHEEL BEHAVIOR DETECTING SYSTEM

Hideaki Fujioka, and Tatsuji Matsumoto, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 7, 1988, Ser. No. 215,957

Claims priority, application Japan, Jul. 9, 1987, 62-171813; Jun. 8, 1988, 63-140988

Int. Cl.[5] **B60T** *8/32*

U.S. Cl. 364—426.03 **16 Claims**



1. In a traction control system including (a) wheel speed detecting means for detecting speeds of rotation of front left-hand and right-hand wheels and rear left-hand and right-hand wheels, (b) vehicle speed detecting means for detecting a speed of movement of a vehicle, (c) control variable calculating means for calculating variable F based on output values from said wheel speed a control detecting means and said vehicle speed detecting means, the control variable F being used to detect an occurrence of excessive wheel slippage represented by differences in the speeds of rotation of the wheels relative to the speed of movement of the vehicle, (d) control command determining means for determining a command for instructing braking forces to be applied to the wheels, and (e) actuator means for controlling the braking forces in response to an output value from said control command determining means, a wheel behavior detecting system comprising:

bad road coefficient calculating means for calculating a bad road coefficient A representative of a road surface irregularity upon which the vehicle is moving, the bad road coefficient A being calculated on the basis of output values from said wheel speed detecting means; and

control variable filtering means for producing a filtered value Lm exhibiting a first waveform similar to a waveform of the control variable F when the bad road coefficient A is small and a second waveform in which abruptly changing components of the control variable F waveform are removed when the bad road coefficient A is large;

wherein said control command determining means responds to the filtered value Lm from said control variable filtering means.

4,924,397

VEHICLE CRUISE CONTROL SYSTEM

Norimitsu Kurihara; Masahiko Asakura, both of Wako; Mitsuru Matsui, Kiryu; Yasuhiko Otsuka, Kiryu, and Kazuhiko Tachikawa, Kiryu, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo and Mitsuba Electric Mfg. Co., Ltd., Gunma, both of, Japan

Filed Dec. 7, 1987, Ser. No. 129,257

Claims priority, application Japan, Dec. 8, 1986, 61-292940; Dec. 8, 1986, 61-291941; Apr. 16, 1987, 62-094157; Apr. 16, 1987, 62-094158; Apr. 30, 1987, 62-106875

Int. Cl.[5] **B60K** *31/00*

U.S. Cl. 364—426.04 **17 Claims**

11. A vehicle cruise control system comprising:

a control circuit for producing a control signal for maintaining a speed of a vehicle at a fixed level according to a difference between an actual vehicle speed and a target vehicle speed; and

a drive circuit for producing a drive signal for selectively driving an actuator in a direction either to accelerate the vehicle or to decelerate the vehicle according to the control signal from the control circuit; wherein:

the drive circuit comprises an acceleration drive circuit and a direction drive circuit; and



the acceleration drive circuit is connected to a first power line by way of a brake switch which opens upon pressing of a brake pedal while the deceleration drive circuit is directly connected to a second power line;

wherein the drive control further comprises a transistor for controlling an electromagnetic clutch interposed in an output shaft of the actuator.

4,924,398

FAULT DIAGNOSIS SYSTEM FOR AUTOMOTIVE ELECTRONIC DEVICES

Toru Fujiwara, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 21, 1987, Ser. No. 99,011

Claims priority, application Japan, Sep. 25, 1986, 61-228730

Int. Cl.[5] **G06F** *15/74*

U.S. Cl. 364—431.11 **15 Claims**



1. In an automobile having a plurality of electronic devices, each of which is provided with a sensor for sensing the state of operation of at least one automotive part and an actuator for controlling the operation of the respective automotive part in accordance with the state sensed by the sensor, each of said electronic devices having a self-diagnosis function for detecting any fault in the respective sensor and actuator and for storing data concerning a detected fault,

a fault diagnosis system for diagnosing the state of said electronic devices comprising a diagnostic tester including:

an input circuit for receiving fault detection signals produced by the self-diagnosis function of each of a plurality of electronic devices, each operatively connected to a respective sensor and an actuator;

a display control circuit receiving the fault detection signals from said input circuit for converting the fault detection signals into display control signals;

display means for automatically displaying, in response to said display control signals, data identifying which of the sensors and actuators have faults; and

sound generating means receiving said display control signals for producing an aural alarm in response to the display control signals.

4,924,399

VEHICLE CONTPOL SYSTEM WITH HSO-TRIGGERED OUTPUT

Gunther Kaiser, Stuttgart; Winfried Klötzner, Maulbronn; Immanuel Krauter, Erbstetten, and Edmund Jeenicke, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 21, 1988, Ser. No. 184,379

Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3714998

Int. Cl.[5] **F02P** *9/00;* **F02D** *41/30*

U.S. Cl. 364—431.03 **4 Claims**



1. An output circuit for a vehicular control system performing regularly recurring ignition and fuel injection tasks and having

a microprocessor central processing unit (CPU) with a plurality of control outputs and a High-Speed Output (HSO) port;

an output interface (I, AI); and

an Internal Data bus (ID) interconnecting said microprocessor and said output interface,

comprising,

an output register (**10**) having a plurality of data inputs, a latch-enable input connected to said HSO port of said CPU, and outputs connected to said output interface (**5**, AI); and

a preparatory register (**9**) having a plurality of inputs, and an output connected directly to said output register (**10**), connected in said Internal Data bus (ID) between said CPU and said output register (**10**);

said preparatory register (**9**) accepting and storing data from said CPU, said stored data being transferred directly from said register (**9**) to said output register (**10**) in response to a transfer signal from said CPU, said transfer signal being generated periodically in connection with said regularly recurring ignition and fuel injection tasks, thereby making all said stored data available simultaneously to said output interface (**5**, AI).

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4,924,400
ARRANGEMENT FOR CONTROLLING THE PERFORMANCE OF BOB-UP/BOB-DOWN MANEUVERS BY A HELICOPTER

Joseph A. Post, Huntington, and Lorren Stiles, Boxbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 1, 1988, Ser. No. 239,475
Int. Cl.[5] G06F *15/50;* **B64C** *19/00*
U.S. Cl. 364—433 **6 Claims**



1. A control apparatus, for use in conjunction with a flight control computer which controls the flight regime of a helicopter in response to various input signals including collective stick force signals received from and indicative of manipulation forces applied to a collective stick, for causing the helicopter to perform bob-up and bob-down maneuvers, comprising

means for generating a first control signal when the helicopter is to perform a bob-up maneuver from its instantaneous altitude to a higher altitude;

means for storing data descriptive of said instantaneous altitude at the time of commencement of said first control signal;

ascent command means for issuing, in response to said first control signal, an ascent command signal representative of a helicopter ascent at a maximum permissible ascent rate;

means for generating a second control signal when the helicopter is to perform a bob-down maneuver from said higher altitude to that stored in said storing means;

descent command means for issuing, in response to said second control signal, a descent command signal representative of a helicopter descent at a maximum permissible descent rate; and

means for supplying the respective one of said ascent and descent command signals as an additional input signal to the flight control computer for use in controlling the flight regime of the helicopter in accordance therewith.

4,924,401
AIRCRAFT GROUND COLLISION AVOIDANCE AND AUTORECOVERY SYSTEMS DEVICE

Gregory W. Bice; Mark A. Skoog, both of Lancaster, Calif., and John D. Howard, Ft. Lauderdale, Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 30, 1987, Ser. No. 120,567
Int. Cl.[5] G05D *1/10*
U.S. Cl. 364—433 **26 Claims**

17. A method of automatically avoiding aircraft ground collision comprising the steps of:

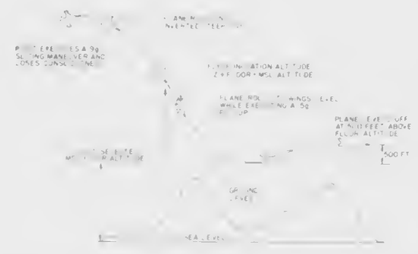
entering a preselected aircraft flight floor altitude in an aircraft flight computer;

monitoring aircraft flight states with said flight computer, said flight states including air speed, altitude and flight path angles;

calculating by said flight computer the amount of altitude to be lost during recovery maneuver if the monitored flight states, when extrapolated would indicate a loss of altitude;

adding by said flight computer the amount of altitude to be lost as indicated by the monitored flight states during the recovery maneuver to the preselected floor altitude to determine a flyup altitude;

comparing by said flight computer the flyup altitude to aircraft altitude; and



sending a command via said flight computer to an autopilot to commence initiation of an automatic flyup maneuver if aircraft altitude is less than the preselected aircraft flight floor altitude.

4,924,402
METHOD FOR IDENTIFYING CURRENT POSITION OF VEHICLE

Hitoshi Ando; Takashi Kashiwazaki; Masayuki Hosoi, and Atsuhiko Fukushima, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,085
Claims priority, applicatinn Japan, Jul. 2, 1986, 61-156883; Jul. 2, 1986, 61-156884; Jul. 2, 1986, 61-156885; Jul. 2, 1986, 61-156886; Jul. 2, 1986, 61-156887; Jul. 2, 1986, 61-156888
Int. Cl.[5] G06F *15/50;* **G09B** *29/10*
U.S. Cl. 364—449 **5 Claims**



1. A method for identifying the current position of a vehicle on a road map, comprising the steps of:

storing data on the positions of roads and intersections on a road map as map data in the form of numerical values;

detecting a traveling of a predetermined distance by the vehicle and a current azimuth of the vehicle to thereby obtain a measured portion on said road map;

calculating the distance between said measured position and the point on a road proximate to said measured position on said road map;

comparing said distance with a predetermined threshold value to judge whether or not said distance is less than said predetermined threshold value;

identifying said point as a current position on said road map when said distance is less than said predetermined threshold value;

judging whether or not the vehicle has curved when said distance is not less than said predetermined threshold value; and

carrying out an intersection loading to coincide said measured position of the vehicle with the intersection proximate to said measured position when it is judged that the vehicle has curved.

4,924,403
NUMERICAL CONTROL METHOD AND SYSTEM THEREFOR HAVING OVERRIDE PLAYBACK FUNCTION

Hideaki Kawamura; Takao Sasaki, both of Hachioji, and Shuji Matsuura, Kodaira, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP87/00614, § 371 Date Mar. 16, 1988, § 102(e) Date Mar. 16, 1988, PCT Pub. No. WO88/01406, PCT Pub. Date Feb. 25, 1988
PCT Filed Aug. 17, 1987, Ser. No. 186,475
Claims priority, application Japan, Aug. 16, 1986, 61-191192
Int. Cl.[5] G05B *19/00*
U.S. Cl. 364—474.22 **15 Claims**



1. A numerical control method, having an override playback function, for controlling movement of an apparatus, said method comprising the steps of:

(a) judging whether a teaching mode has been entered during execution of a numerical control program,

(b) judging whether a predetermined command is input in said teaching mode,

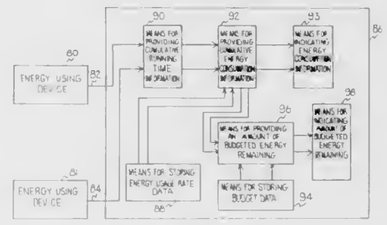
(c) editing, when it is judged in steps (a) and (b) that the predetermined command is given in said teaching mode, the numerical control program to include override conditions, set manually, in a corresponding block of the numerical control program, thereby enabling numerical control in accordance with the override conditions during subsequent execution of the numerical control program without repeating manual setting of the override conditions, and

(d) storing, into the corresponding block, a validation distance between a command generation position, at generation of the predetermined command, on an axis of movement of the apparatus controlled by the numerical control program and a target position on the axis at completion of execution of the corresponding block.

4,924,404
ENERGY MONITOR

Karl L. Reinke, Jr., Dundee, Ill., assignor to K. Reinke, Jr. & Company, Dundee, Ill.

Filed Apr. 11, 1988, Ser. No. 179,882
Int. Cl.[5] G01D *4/00;* **G01R** *11/56;* **G06F** *15/22*
U.S. Cl. 364—464.04 **12 Claims**



1. An energy monitor for individually monitoring first and second energy consuming devices which produce signals when operating, said devices having respective first and second rates of energy usage, said energy monitor comprising:

a processor;

means associated with said processor for storing energy usage rate data, said data representing individual rates of energy consumption for each of said devices;

means associated with said processor and responsive to said signals for separately providing cumulative running time information for each of said devices;

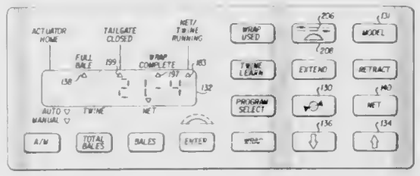
means associated with said providing means and said storing means for separately producing cumulative energy consumption information for each of said devices; and

means associated with said producing means for separately indicating said energy consumption information for each of said devices.

4,924,405
ROUND BALER WITH CONTINUOUS BALE SIZE MONITORING

Richard P. Strosser, Akron; Edward J. Wynn; Mark K. Chow, both of Leola, and Stephen C. Schlotterbeck, New Holland, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Division of Ser. No. 49,874, May 14, 1987, Pat. No. 4,855,924. This application Apr. 4, 1989, Ser. No. 333,152
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—468 **12 Claims**



10. A round baler having an apron at least partially defining an expandable bale forming chamber and a serpentine arm assembly for maintaining tension in said apron as a bale being formed in said chamber expands the chamber by acting against said apron, said serpentine arm assembly moving as the size of the bale increases, the improvement comprising circuit means

for continuously producing an analog output signal, said circuit means including a bale sensing potentiometer for controlling said circuit means to vary the magnitude of said analog output signal, and means comprising a flexible link for connecting said potentiometer to said serpentine arm assembly to move said potentiometer and vary the magnitude of said analog output signal as the size of a bale being formed in said chamber increases.

4,924,406
OPTICAL SLUB CATCHER, PARTICULARLY SUITABLE FOR OPENEND PROCESS
Giorgio Bergamini, and Tommaso Cipriani, both of Bari, Italy, assignors to Nuovopignone Industrie Meccanichee Fonderia S.p.A., Florence, Italy
Filed Dec. 19, 1988, Ser. No. 287,516
Claims priority, application Italy, Oct. 16, 1985, 22509 A/85
Int. Cl.[5] G01B *11/00*
U.S. Cl. 364—470 **8 Claims**



1. An optical slub catcher for weaving unit of the open-end type comprising:
(a) optical head means for measurement of yarn diameter that supplies an analog signal proportional to said yarn diameter, said analog signal being used to control production of yarn and to determine yarn characteristics;
(b) compensation means coupled to said optical head means for amplifying, demodulating, and normalizing said analog signal;
(c) an analog-digital converter coupled to said compensation means for converting said analog signal into a digital value;
(d) modulation means coupled to said optical head means for supplying said optical head means with a pulsating current;
(e) timer and sequences generator means coupled to said modulation means for driving said modulation means;
(f) central processing means for analyzing data and controlling the operations of said slub catcher connected to said modulation means and said timer and sequences generator means;
(g) presetting means for presetting a reference average yarn diameter connected to said central processing means;
(h) subtractor node means for calculating the error of a measured yarn diameter with said reference average yarn diameter connected to said central processing means;
(i) count control means for synchronizing the parts of said slub catcher connected to said central processing means; and
(j) calculation means for calculating a unitary diameter of the yarn connected to said central processing means.

4,924,407
HUMIDITY RESISTANT METER READING DEVICE
John A. King, Allen, and Harley J. Staber, Lewisville, both of Tex., assignors to Siecor Corporation, Hickory, N.C.
Filed Aug. 15, 1988, Ser. No. 232,214
Int. Cl.[5] G08C *19/10*
U.S. Cl. 364—480 **40 Claims**

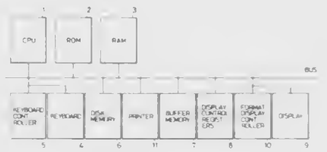


1. In combination with an electrode array of a type in which a plurality of spaced apart excitable electrodes are deposited on one surface of a carrier plate about a center electrode, which in turn is deposited on the same surface of said carrier plate, and in which it is desired to provide a guard around said center electrode so that humidity will not substantially cause leakage from anyone of said plurality of excitable electrodes to said center electrode, the improvement comprising:
(a) a ring shaped conducive strip deposited on said one surface of said carrier plate spaced apart from said plurality of spaced apart excitable electrodes and at least partially circumscribing said center electrode; and
(b) another conductive strip deposited on said one surface of said carrier plate in electrical communication with, extending radially from said ring shaped conducive strip and disposed between two adjacent members of said plurality spaced apart excitable electrodes.

4,924,408
TECHNIQUE FOR COMPILATION OF KNOWLEDGE BASES
Frederic D. Highland, New Midway, Md., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 19, 1988, Ser. No. 234,268
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 **13 Claims**

1. A method of converting both a knowledge base and an inferencing technique into compilable program code forming a knowledge based system, said knowledge base including rules and data items, said rules being arranged in a network of nodes and links between such nodes, said nodes representing tests, logical operators, actions and data items, said network being in a form convenient for interpretive inferencing, said method comprising the steps of:
(a) partitioning said network into a plurality of sub-networks;
(b) labelling each node within each respective sub-network with a unique identifier;
(c) generating a segment of compilable, procedural, program code for inferencing which is equivalent to each respective sub-network when combined with said inferencing technique, said identifiers locating the respective code for each node within each respective sub-network, said inferencing code comprising a node sub-segment that implements the function of each node in said respective sub-network based on the rules specified in said knowledge base and that conditionally invokes other sub-segments using said identifiers, and a control sub-segment which provides access to each node sub-segment using said identifiers and provides for repeated execution of each node sub-segment as necessary; and
(d) generating for each data item a segment of compilable procedural, program code for the distribution of such data item which invokes the appropriate program inferencing code by means of said identifiers when such data item is modified during execution of the knowledge based system.

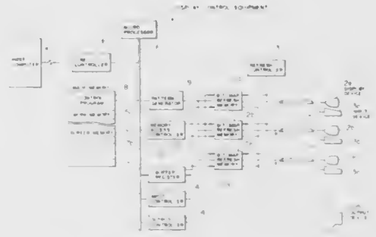
4,924,409
IMAGE PROCESSING APPARATUS WHEREIN CHARACTER STRING PROCESSING CAN BE PERFORMED ON A DISPLAY SCREEN
Kouji Fukunaga, Tokyo, Japan, assignor to Canon Kabushiki Kasiah, Tokyo, Japan
Continuation of Ser. No. 88,544, Aug. 20, 1987, abandoned, which is a continuation of Ser. No. 673,157, Nov. 19, 1984, abandoned. This application Aug. 11, 1989, Ser. No. 394,317
Claims priority, application Japan, Nov. 22, 1983, 58-218729; Nov. 22, 1983, 58-218730; Nov. 22, 1983, 58-218731; Nov. 22, 1983, 58-218732
Int. Cl.[5] G06F *3/02, 15/20;* G09G *1/06*
U.S. Cl. 364—518 **7 Claims**



1. An image processing apparatus comprising:
input means for inputting a special code, relating to the position of characters t be displayed, and a character code string;
storage means for continuously storing, as addresses, the special code and the character code string subsequent to the special code input by said input means;
display means for displaying a character string on the basis of the special code stored in said storage means; and
control means for controlling said input means such that the special code is displayed as at least one space and such that a character string corresponding to the character code string subsequent to the special code is displayed subsequently to the space and for controlling said storage means such that when a character code is input at the space by said input means, a space code is inserted subsequent to the special code in said storage means and the space code is stored with the input character code.

4,924,410
DISPLAY CONTROL METHOD AND SYSTEM
Tatsuzo Hamada, Hatano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 10, 1987, Ser. No. 13,241
Claims priority, application Japan, Feb. 13, 1986, 61-29524
Int. Cl.[5] G06K *3/00;* G06F *15/40*
U.S. Cl. 364—518 **8 Claims**

RULES
IF Q OR Z>122 THEN ACTION 1
IF X=1 AND Y<10 THEN Q



1. A display control system for controlling displays on a plurality of display units, said control system comprising:
input means for receiving coded information representative of a plurality of displays to be generated;
a plurality of screen memories equal in number to the number of displays to be generated;
a work memory;
first control means responsive to the format of received coded information for applying received coded information having a first format to a selected one of said plurality of screen memories for storage therein, the selected one of said plurality of screen memories being associated with the display unit on which the display represented by that coded information is to be generated, and applying received coded information having a second format to said work memory for storage therein;
editing means for editing coded information stored in said work memory and applying the edited coded information to said selected one of said plurality of screen memories for storage therein;
a pattern generator connected to said screen memories for converting the coded information stored therein into bit pattern information;
a plurality of bit map memories equal in number to the number of displays to be generated, each bit map memory storing as a bit map the bit pattern information of the display to be generated on a corresponding one of the plurality of display units;
second control means for controlling application of the bit pattern information from said pattern generating means to said bit map memories; and
third control means for controlling application of the stored bit pattern information from each of said bit map memories to the corresponding one of the plurality of display units to generate a display thereon.

VOL
1114
ISS
2
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8
1990
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4,924,411
DOCUMENT PROCESSING APPARATUS HAVING SHADING PROCESS FUNCTION

Teiichi Kashiwagi, Hiratsuka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 140,789
Claims priority, application Japan, Jan. 12, 1987, 62-4438
Int. Cl.[5] G06F *3/14*
U.S. Cl. 364—518 2 Claims



1. A document processing apparatus having a shading process function comprising:

an input editor for editing a text entered through an input unit, said input editor operating to insert a first specifier indicative of a shading process start and a second edit specifier indicative of a shading process end in said entered text in response to a shading process start command and shading process end command, respectively, from said input unit, and thereafter storing said text in a document file storage; and

an output document editor connected to said document file storage and an output unit, said output document editor receiving said text from said storage, implementing a shading process for a text portion enclosed by said first and second edit specifiers in said text, and delivering said text to said output unit, and said output document editor implementing the shading process for a character when the character is inserted within said text portion after the shading process of said text portion;

wherein said output document editor generates positional addresses for specifying a shading area in an output page produced by said output unit, in accordance with said first and second edit specifiers, and stores said addresses in a shading address table.

4,924,412
INTEGRATED POLY-PHASE POWER METER

Robert A. Leydier, Mountain View, Calif., assignor to Schlumberger Industries, Inc., Norcross, Ga.

Filed Jun. 25, 1987, Ser. No. 66,794
Int. Cl.[5] G01R *21/06, 21/133*
U.S. Cl. 364—483 36 Claims

4. A system for measuring electrical energy in a conductor of alternating current comprising:

(a) voltage sensing means coupled to a circuit, said voltage sensing means supplying a first signal related to potential in the circuit;

(b) current sensing means coupled to the circuit, said current sensing means supplying a second signal related to current in the circuit;

(c) means connected to receive the first signal and the second signal and provide a third signal having a current representative of the product of the first and the second signals and further comprising:

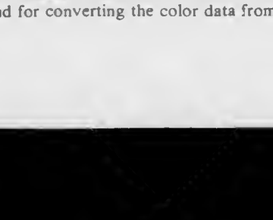
(i) signal generator means for generating a periodically varying signal;

(ii) comparison means connected to receive both the periodically varying signal and a selected one of the first and the second signals, and in response thereto provide a comparison means output signal when the periodically varying signal is in a predetermined relationship to the selected one of the first and the second signals, said comparison means further comprising:

a first switch for connecting the selected one of the first and the second signals to a first terminal of a first charge storage means;

a second switch for connecting the periodically varying signal to the first terminal;

voltage comparison means having a first electrode connected to a second terminal of the first charge storage means, as second electrode connected to a reference



potential and an output electrode connected to supply the comparison means output signal; and

a third switch connected between the first and the second electrodes;

(iii) switchably controlled current source means connected to operate under control of the comparison means output signal and connected to receive the other of the first and the second signals and supply the third signal;

(d) converter means connected to receive the third signal and provide a fourth signal having a frequency related to the product of the first and the second signals, wherein the converter means includes sign bit means for supplying a sign bit digital signal to the means for providing a product which digital signal is of a first state when power in the circuit is flowing in a first direction and in a second state when the power in the circuit is flowing in an opposite direction, said sign bit causing said means for providing a product to provide said third signal with a polarity opposite that of the polarity of a reference current.

4,924,413
COLOR CONVERSION APPARATUS AND METHOD

Sakarin Suwannukul, Oakland, Calif., assignor to Hercules Computer Technology, Berkeley, Calif.

Filed May 29, 1987, Ser. No. 55,789
Int. Cl.[5] G06F *5/06*
U.S. Cl. 364—521 7 Claims

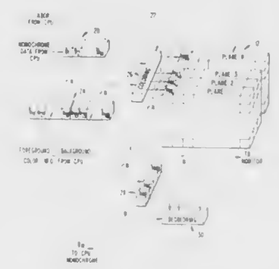
1. An apparatus for converting monochrome data from a CPU into color data for display on a color monitor as a function of color control information which is specified by a user and supplied through the CPU comprising

memory means addressed by the CPU for storing the color data, wherein the memory means includes N planes of memory each of which is addressed by the CPU; and

means, responsive to the color control information and the monochrome data, and coupled to the CPU; and to the memory means, for converting the monochrome data into the color data as a function of the color control information and for converting the color data from the memory means into monochrome data for supply to the CPU, so that the CPU can perform logical operations upon monochrome data, independently of the color by which the data is to be displayed on the color monitor and further wherein the converting means include

register means for storing the color control information;

N coloring means each of which is associated with one of the N planes of memory and each of which is responsive to the monochrome data and to the color control infor-



mation for providing color data corresponding to the monochrome data to each of the associated planes of memory; and

N-decoloring means responsive to the color information and to color data from memory means each of which is associated with one of the N planes of memory for collectively determining a corresponding monochrome value for the color data received from the memory means, and for providing the monochrome values to the CPU.

4,924,414
APPARATUS AND METHOD FOR OBTAINING PRIORITY NUMBERS FOR DRAWING FIGURES FORMING A DISPLAY FIGURE

Tomoaki Ueda, Kyoto, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

Filed Sep. 24, 1987, Ser. No. 100,517
Claims priority, application Japan, Sep. 24, 1986, 61-225142; Oct. 22, 1986, 61-251342
Int. Cl.[5] G06F *3/153*
U.S. Cl. 364—522 5 Claims



1. Apparatus for obtaining a drawing priority number for a polygonal drawing figure forming a portion of a display figure, said apparatus comprising:

a segment memory for storing drawing figure data representative of all drawing figures constituting each display figure;

filling means for generating picture element data representative of picture elements from drawing figure data received from said segment memory;

filling control means for causing said filling means to generate picture element data representative of a drawing figure not given a priority number;

hidden surface removing means for receiving generated picture element data representative of said drawing figure from said filling means and executing hidden surface removing processing on said picture element data;

a memory for memorizing picture element data supplied thereto from said hidden surface removing means;

said filling control means further causing said filling means to generate picture element data representative of another drawing figure not given a drawing priority number whereafter said hidden surface removing means executes hidden surface removal processing on said picture element data representative of said another drawing figure until picture element data generation and hidden surface removal processing have been performed in succession for each drawing figure not given a drawing priority number,

said filling control means thereafter causing said filling means to re-generate picture element data corresponding to one of said drawing figures not given a drawing priority number;

coincidence judging means for judging whether or not all said re-generated picture element data representative of said one drawing figure not given a drawing priority number are identical with picture element data memorized in said memory and providing a coincidence judgement signal indicative thereof;

priority number generating means for generating a drawing priority number for said one drawing figure not given a priority number based on the coincidence judgement signal associated with said one drawing figure and on the number of times said hidden surface removal means has supplied picture element data to said memory before generation of the coincidence judgment signal associated with said one drawing figure;

said filling control means further causing said filling means to re-generate picture element data for another drawing figure not given a drawing priority number whereafter said coincidence judging means judges said re-generated picture element data and said priority number generating means generates a drawing priority number for said another drawing figure until picture element re-generation, coincidence judging, and priority number generating have been performed in succession for each drawing figure not given a drawing priority number whereby all drawing figures are given a drawing priority number; and

priority number holding means for holding the drawing priority number generated for each drawing figure.

4,924,415
APPARATUS FOR MODIFYING DATA STORED IN A RANDOM ACCESS MEMORY

Paul A. Winser, Redhill, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,336
Claims priority, application United Kingdom, Aug. 7, 1987, 8718807
Int. Cl.[5] G06F *15/68*
U.S. Cl. 364—522 11 Claims

1. An apparatus for modifying data stored in a random access memory, the data corresponding to one or more rows of pixels of a stored image, the memory comprising a first memory (colour RAM) for storing a colour value for each pixel and a second memory (z-RAM) for storing a depth (z) value for each pixel, the apparatus comprising:

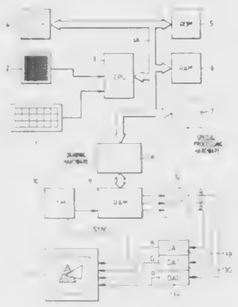
means for receiving input data defining: addresses, colour values, and depth (z) values, which input data corresponds to a series of pixels;

means for successively selecting each pixel in the series and synchronously supplying the corresponding addresses, input colour values, and input z-values;

means for applying the corresponding address of each se-

VOL
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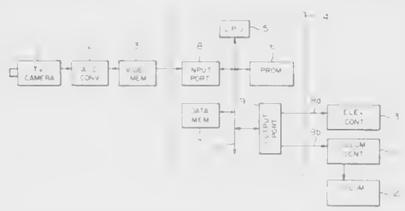
lected pixel to address inputs of the z-RAM and colour-RAM;
means for reading from the z-RAM a currently stored z-value for each selected pixel;
means for comparing the currently stored z-value with the corresponding input z-value for each selected pixel;
means for writing the corresponding input z-values for each selected pixel into the addressed location of the z-RAM and for writing the corresponding input colour values into the addressed location of the colour-RAM, said writing means, responsive to an output of the comparing means, writing the corresponding input colour value into the colour-RAM and the corresponding input z-value into the z-RAM, to define a new stored colour value and a new



stored z-value for a given selected pixel if the corresponding input z-value represents a lesser depth than the currently stored z-value for that pixel;
wherein:
(a) the z-RAM comprises: (i) a main random access array, and (ii) a serial access memory;
(b) the apparatus further comprises means responsive to the input data for transferring the currently stored z-values for all pixels in the series from the main array of the z-RAM into the serial access memory of the z-RAM; and
(c) the reading means reads the currently stored z-value of a succeeding pixel in the series from an output of the serial access memory, while the corresponding input values for the given pixel are being written into the colour-RAM and the main array of the z-RAM.

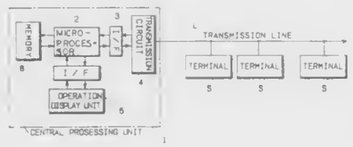
4,924,416
APPARATUS FOR DETECTING RELATIVE CROWDING IN A HALL
Isao Sasao, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Sep. 9, 1988, Ser. No. 244,028
Claims priority, application Japan, Oct. 2, 1987, 62-249228
Int. Cl.[5] H05B *37/02;* **H04N** *7/18*
U.S. Cl. 364—550 **6 Claims**

1. An apparatus for determining relative crowding by people of a hall comprising:
a variable intensity illuminator for varying illumination intensity in a hall;
a television camera for generating images of the hall, the images having a brightness depending upon the illumination intensity in and crowding of the hall and being composed of pixels;
means for storing the images generated by said camera as:
(a) current video data;
(b) reference video data obtained with a predetermined illumination intensity and a predetermined degree of crowding in the hall; and
(c) old video data, periodically replaced with current video data; and
a computer receiving the current, reference, and old video data from said means for storing for: (i) comparing the brightness of the current video data to the brightness of the reference video data; (ii) comparing the brightness of the current video data to the brightness of the old video data; and (iii) replacing the old video data in said means for storing with current video data in response to the comparison of the brightness of the current video data to



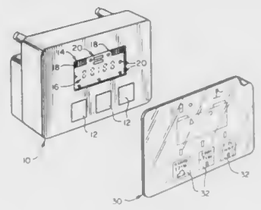
the brightness of brightness produced with a reference illumination intensity; and
a computer operatively connected to said illuminator controller for calculating relative crowding in the hall from the illumination intensity producing the image of the hall of predetermined brightness relative to the reference illumination intensity.

4,924,417
ENVIRONMENTAL ABNORMALITY ALARM APPARATUS
Hayami Yuasa, Tokyo, Japan, assignor to Nittan Co., Ltd., Tokyo, Japan
Filed Mar. 21, 1988, Ser. No. 171,467
Claims priority, application Japan, Apr. 8, 1987, 62-84650
Int. Cl.[5] G08B *26/00, 23/00*
U.S. Cl. 364—550 **4 Claims**



1. An environmental abnormality alarm apparatus comprising:
a plurality of terminals connected to a transmission line, each terminal having sensor means for monitoring an environmental characteristic and for generating an electrical signal corresponding to said characteristic, each terminal having a unique address:
a central processing means connected to said transmission line for sequentially circularly accessing the addresses of said terminals via said transmission line and for receiving said electrical signal from the means for sensing from each terminal;
each terminal further including means for generating an alarm determination reference level and comparator means connected to said means for generating and to said sensor means for comparing said electrical signal with said reference level and generating an output based on the comparison; and
means for setting said reference level in said means for generating based on at a received from said central processing means via said transmission line.

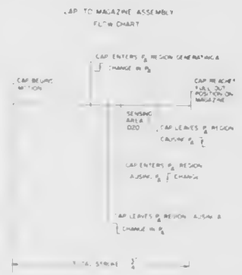
4,924,418
UNIVERSAL MONITOR
Wesley J. Bachman, Auburn, and Steven G. Stone, Virden, both of Ill., assignors to Dickey-John Corporation, Auburn, Ill.
Continuation-in-part of Ser. No. 154,786, Feb. 10, 1988, abandoned. This application Aug. 23, 1988, Ser. No. 238,975
Int. Cl.[5] G06F *15/20;* **A01D** *41/00*
U.S. Cl. 364—550 **15 Claims**



1. A monitoring module for monitoring a plurality of functions and conditions of a machine, said machine having a plurality of sensors associated therewith for producing sensor signals corresponding to said plurality of functions and conditions, said monitoring module comprising: a plurality of input means for receiving respective, selected ones of said sensor signals; processing means responsive to the sensor signals received at said input means for producing display signals corresponding to the associated functions and conditions in accordance with said sensor signals; memory means for storing data and instructions for enabling said processing means to respond to the sensor signals from any of said sensor means for monitoring any of said corresponding functions and conditions; and programming means for programming said memory means with data and instructions for enabling response of said processing means to any given plurality of sensors coupled to said input means for monitoring a corresponding plurality of functions and conditions; wherein said memory means comprises a first memory portion for containing non-chargeable operating data, a second memory portion accessible only to authorized factory or service programming personnel for containing changeable data corresponding to data and instructions for monitoring particular types of sensors which may be selected for association with a given machine, and a third, user-accessible memory portion accessible independently of said first and second memory portions for receiving and storing data and instructions relating to the particular characteristics of particular sensors selected for use with a given machine.

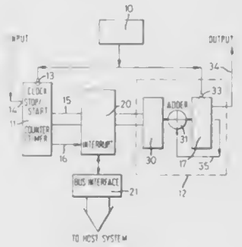
4,924,419
SYSTEM AND A METHOD FOR DETECTING A MALFUNCTION IN THE OPERATION OF A PARTS ASSEMBLY MACHINE
Dennis A. McIntyre, Rochester, and Edward J. Sullivan, Canandaigua, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 24, 1988, Ser. No. 197,861
Int. Cl.[5] G06F *15/46;* **G05B** *9/02*
U.S. Cl. 364—551.02 **7 Claims**

1. A method for detecting assembly errors in an automatic parts assembler of a type which positions a first part into initial engagement with a second part and then forces the parts together a fixed distance comprising the steps of:
(a) determine a time T_0 that said first part initially engages said second part;
(b) determine a time T_1 that it takes the automatic assembler to reach the fixed distance after time T_0;
(c) determine the time difference or ratio between time T_0 and time T_1;
(d) compare the time difference or ratio to a time which corresponds to the time that it takes for the correct assembly of said first and said second, part,
(e) set limits around all time measurements; and



(f) reject all assemblies which do not have an assembly time corresponding to the correct assembly time.

4,924,420
TACHO SIGNAL PROCESSING
Maxwell R. Hadley, Lindhurst, and Richard P. Dudley, Southampton, both of United Kingdom, assignors to Stewart Hughes Limited, Southampton, United Kingdom
Filed Feb. 27, 1987, Ser. No. 19,674
Claims priority, application United Kingdom, Mar. 3, 1986, 8605152
Int. Cl.[5] G01P *3/42*
U.S. Cl. 364—569 **20 Claims**



1. An apparatus for producing a periodic output signal having predetermined frequency and phase relationship to a variable frequency periodic input signal, said apparatus comprising:
input means for evaluating successive periods of said periodic input signal as multiples of a clock signal period and outputting a succession of first data signals, each representative of the duration of a corresponding period of the periodic input signal;
control means coupled to said input means for receiving said first data signals from the input means, said control means operating upon each said first data signal in accordance with a predetermined algorithm so as to derive a succession of second data signals each representative of a quantity having a relationship to a respective one of said first data signals which is determined by said algorithm, wherein said algorithm executed by said control means includes a first component which is a function of said predetermined frequency relationship and a second component which is a function of the changing periodicity of said periodic input signal and effects a correction of the phase of the signal to account for a finite delay inherent in

the operation of said control means to derive said second data signals; and

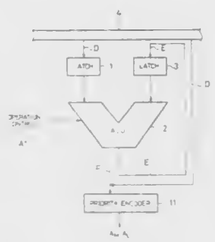
output signal generation means coupled to said control means for receiving said second data signals from the control means and including accumulator means incremented at a rate equal to the clock frequency and by quantities corresponding to the received second data signals, said output signal generation means producing an output signal whenever the accumulated amount attains a predetermined level.

4,924,421

PRIORITY ENCODING SYSTEM

Yoshihiro Seguchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1988, Ser. No. 195,061
Claims priority, application Japan, Jul. 21, 1987, 62-182676
Int. Cl.[5] G06F *7/00*
U.S. Cl. 364—715.1 **6 Claims**



1. A logic operation system comprising:

a first holding circuit for holding an input data;

an arithmetic and logical unit for performing an arithmetic operation to provide a first operation result;

a second holding circuit for holding said first operation result;

a priority encoder for encoding a first bit position having a predetermined value as viewed from a most significant bit of said input data; and

said arithmetic and logical unit performing a logical operation on contents of said first and second holding circuits to provide a second operation result to said priority encoder thereby encoding a first bit position having said predetermined value as viewed from a least significant bit.

4,924,422

METHOD AND APPARATUS FOR MODIFIED CARRY-SAVE DETERMINATION OF ARITHMETIC/LOGIC ZERO RESULTS

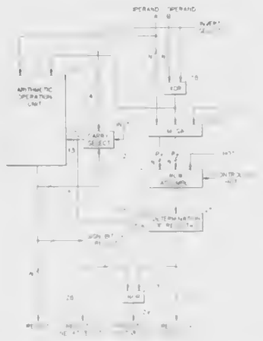
Stamatis Vassiliadis, Vestal; Michael Putrino, Endicott; Ann E. Huffman, Johnson City; Brice J. Feal, Endicott, and Gerald G. Pechanek, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 17, 1988, Ser. No. 157,500
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—715.09 **9 Claims**

1. In a computing system including an arithmetic operation unit responsive to a carry-in signal for performing an arithmetic operation on a pair of operands, A and B, each of said operands comprising an ordered sequence of N bits, A(i) and B(i), respectively, where i=0 . . . N−1, and, for each operand, the significance of operand bit i being greater than the significance of any operand bit i+M, where M=1 . . . N−1−i, and for producing a digital output signal representing a result of said arithmetic operation, an improvement to said computing system for predicting when said result has a zero magnitude, said improvement comprising:

a carry-save adder circuit responsive to said operands for producing an ordered sequence of intermediate result signals by carry-free combination of operand A with operand B; and

condition code prediction means connected to said carry-save adder circuit for generating a condition code signal



based upon an algebraic combination of said carry-in signal with said ordered sequence of intermediate result signals and for providing an indication whether the magnitude of said result equals zero, said indication being provided substantially simultaneously with said result.

4,924,423

HIGH SPEED PARITY PREDICTION FOR BINARY ADDERS USING IRREGULAR GROUPING SCHEME

Stamatis Vassiliadis, Vestal, and Eric M. Schwarz, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,581
Int. Cl.[5] G06F *11/10*
U.S. Cl. 364—738 **4 Claims**



1. In a data processing system including an adder for adding binary data operands A and B and a carry-in signal to produce a multibit result output signal representing the sum S of said operands in the form of a plurality of sequential eight-bit sum bytes, the improvement comprising;

a parity prediction circuit connected to receive said operands and said carry-in signal for determining the parity of each of three sequential bit groups, s0s1, s2s3s4, and s5s6s7, in a sum byte, Sj, and for producing three group parity signals, Ps0–1, Ps2–4, and Ps5–7, respectively indicating the parities of said bit groups, where si denotes a bit at significance location i in said sum byte sj; and

an exclusive-OR circuit for combining said group parity signals to produce a signal P indicative of parity for said sum byte according to:

$$P = Ps0\text{–}1 \vee Ps2\text{–}4 \vee Ps5\text{–}7$$

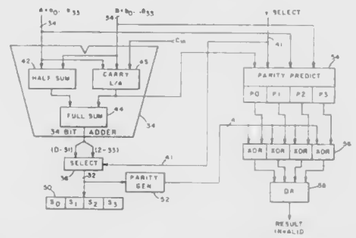
where V is the logical exclusive-OR operation.

4,924,424

PARITY PREDICTION FOR BINARY ADDERS WITH SELECTION

Stamatis Vassiliadis, Vestal; Eric M. Schwarz, Endicott; Michael Putrino, Endicott, and Brice J. Feal, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,759
Int. Cl.[5] G06F *11/10*
U.S. Cl. 364—738 **21 Claims**



1. A parity prediction system for a binary adder unit which receives and combines a pair of multi-bit data operands to produce a multi-bit result, said parity prediction system comprising:

selection signal means for producing a selection signal indicating selected bits of said result, said selected bits including fewer than all of the bits of said result;

selection means connected to said adder unit and to said selection signal means for providing said selected bits in response to said selection signal, said selected bits representing a sum of said operands; and

parity prediction means connected to said adder unit and to said selection signal means for predicting the parity of said selected bits in response to said operands and said selection signal and for providing a predicted parity signal representing said parity.

4,924,425

METHOD FOR IMMEDIATELY WRITING AN OPERAND TO A SELECTED WORD LOCATION WITHIN A BLOCK OF A BUFFER MEMORY

Satoru Koga, Kawasaki, and Tsutomu Tanaka, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

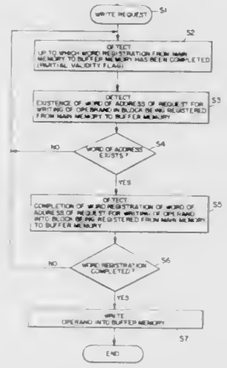
Division of Ser. No. 674,321, Nov. 23, 1984, abandoned. This application Jul. 8, 1987, Ser. No. 73,281
Claims priority, application Japan, Nov. 30, 1983, 58-226335; Dec. 7, 1983, 58-231105
Int. Cl.[5] G06I *12/08, 7/00*
U.S. Cl. 364—900 **3 Claims**

3. A method for controlling a buffer memory in a data processing apparatus having a central processing unit which includes the buffer memory, the buffer memory storing a copy of a portion of a main memory, said method comprising the steps of:

(a) holding an address of a block to be loaded, upon block-loading from the main memory to the buffer memory;

(b) successively transferring a plurality of words constituting a block, word by word, to the buffer memory and designating a selected flag among partial validity flags arranged in correspondence with the words in the block at each transfer of one word, upon block-loading from the main memory to the buffer memory;

(c) checking the coincidence between an address of block containing a write request word and the address of the block under load operation held in said holding step (a);



(d) checking whether or not the transfer of the write request word is completed with reference to the flag designated in said transferring and designating step (b), when the result of said coincidence checking step (c) indicates a coincidence; and

(e) when the result of said transfer completion checking step (d) indicates a completion, executing a writing into the buffer memory even if the transfer of the entire block which is being transferred is not completed.

4,924,426

APPARATUS WITH SELECTION CIRCUITRY FOR DISTRIBUTING DATA BLOCKS FROM EXTERNAL MEMORY TO PROCESSING UNITS ACCORDING TO ATTRIBUTE DATA CONTAINED IN EACH DATA BLOCK

Keiichi Kameda; Kenichi Takahashi, both of Kyoto; Kouichi Horigami, Suita, and Hiroyuki Iitsuka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 2, 1986, Ser. No. 902,958
Claims priority, application Japan, Sep. 3, 1985, 60-195225
Int. Cl.[5] G06F *3/00, 9/06, 12/06, 13/14*
U.S. Cl. 364—900 **2 Claims**

1. An information memory control apparatus comprising:

a memory means for storing therein a plurality of information in the form of a plurality of data blocks each containing an information data and an attribute data, wherein said attribute data represents at least a destination to which said information data is to be sent, and wherein each of said plurality of data blocks further contains a synchronizing signal located at the beginning thereof for indicating the beginning position of each data block and an address data indicating an address of the data block in said memory means;

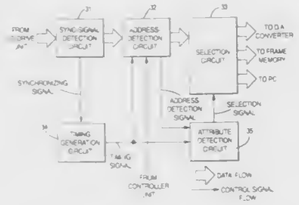
an access means for causing said memory means to read out each of said data blocks from said memory means;

a selection means directly coupled to said memory means for receiving each data block read out from said memory means and for detecting the attribute data contained in each received data block and for sending each received data block to one of a plurality of output ports of said selection means according to the detected attribute data, said selection means including: a synchronizing signal

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detecting means for detecting said synchronizing signal; and an address detecting means for detecting said address data and for determining whether or not the detected address data is a desired address data when said synchronizing signal detecting means has detected said synchronizing signal;





at least one processing means coupled to a corresponding output port of said selection means for processing said information data of a data block sent to said corresponding output port coupled thereto according to said attribute data; and

an output means coupled to said processing means for outputting the processed information data.

4,924,427

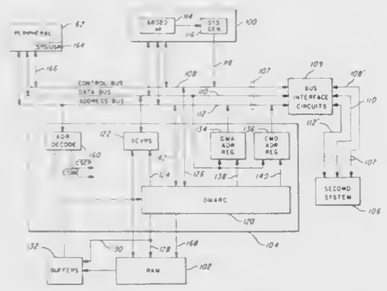
DIRECT MEMORY ACCESS CONTROLLER WITH DIRECT MEMORY TO MEMORY TRANSFERS

Shaun V. Savage, Bountiful, and Johnny M. Harris, Woods Cross, both of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 798,532, Nov. 15, 1985, Pat. No. 4,797,853. This application Oct. 7, 1988, Ser. No. 255,076

Int. Cl.[5] G06F *12/02, 15/16, 13/14*

U.S. Cl. 364—900 **11 Claims**



1. A data processing system including:

first and second memory means, each having a plurality of addressable data storage locations;

a bus interconnecting said first and second memory means;

a first controller connected to said bus and said first memory means;

a second controller connected to said bus and said second memory means;

first means in said first controller for simultaneously generating the address of a first location in said first memory means and placing on said bus an address for addressing a second location in said second memory means;

first memory addressing means in said first controller responsive to said generated address for addressing said first memory means; and,

second means in said second controller responsive to said address placed on said bus for addressing said location in said second memory means at the same time said first addressing means addresses said first location in said first memory means,

whereby a transfer of data takes place directly between an addressed location in said first memory means and an addressed location in said second memory means over said bus.

4,924,428

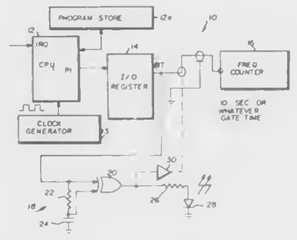
REAL TIME DIGITAL SIGNAL PROCESSOR IDLE INDICATOR

Matthew J. J. Vea, Rowlett, Tex., assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 8, 1987, Ser. No. 130,153

Int. Cl.[5] G04F *10/00*

U.S. Cl. 364—900 **22 Claims**



17. A digital signal processing method comprising:

(1) operating a digital signal processor alternately in a busy state and in an idle state;

(2) processing input signals with said processor whenever said processor operates in said busy state;

(3) producing a continually alternating binary valued output signal directly at an output terminal of said processor under control of a processor idle loop routine only when said processor operates in said idle state; and

(4) indicating the percentage of time said processor operates in said idle state in response to the average rate over time said output signal is alternated by said step (3).

4,924,429

HARDWARE LOGIC SIMULATOR

Masahiro Kurashita, and Nobuyoshi Nomizu, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,741

Claims priority, application Japan, Feb. 25, 1987, 62-40343; Apr. 23, 1987, 62-100287

Int. Cl.[5] G06F *9/44, 12/00;* **G01R** *31/28*

U.S. Cl. 364—578 **6 Claims**

4. A hardware logic simulator comprising:

a model memory for storing a simulation model of a logic circuit including a plurality of signals;

means for selecting a set of signals in said simulation model;

an additional memory for receiving said set of signals as an address signal;

means for executing a simulation according to said simulation model including said additional memory;

means for writing predetermined data in a memory location at an address in said additional memory which is determined by a change in state of said set of signals during simulation; and



evaluating means for reading out said data from said additional memory and evaluating said simulation using said data readout after said simulation is completed.

4,924,430

STATIC TIMING ANALYSIS OF SEMICONDUCTOR DIGITAL CIRCUITS

John J. Zasio, Sunnyvale; Kenneth C. Choy, Fremont, and Darrell R. Parham, Sunnyvale, all of Calif., assignors to Teradyne, Inc., Boston, Mass.

Filed Jan. 28, 1988, Ser. No. 149,555

Int. Cl.[5] G06F *15/60, 11/00*

U.S. Cl. 364—578 **11 Claims**



1. A method of verifying time-oriented operating requirements of a logic circuit including logic elements that are to be fabricated as semiconductor circuits to operate with propagation delays therethrough on applied data and clock signals that are correlated within predetermined ranges of timing parameters, the method comprising the steps of:

designating for each of the logic elements the absolute fast and relative slow extremes of one range of propagation delays therethrough;

designating for each of said logic elements the relative fast and absolute slow extremes of another range of propagation delays therethrough;

tracing selected data signal paths including logic elements through the logic circuit;

tracing selected clock signal paths through the logic circuit to selected logic elements;

accumulating the propagation delays at said absolute fast, relative slow, relative fast and absolute slow extremes of said ranges for logic elements along both the selected clock path and data signal path;

comparing the accumulated absolute fast path values to the relative slow path values of one range of propagation delays of the respective clock and data paths through the selected logic elements to determine the correlation of said absolute fast path values and said relative slow path values within a predetermined range of timing parameters; and

comparing the accumulated relative fast path values to the absolute slow path values of another range of propagation delays of the respective clock and data paths through the selected logic elements to determine the correlation of said relative fast path values and said absolute slow path values within a predetermined range of timing parameters.

4,924,431

KEYBOARD LOCATED INDICIA FOR INSTRUCTING A MULTI-MODE PROGRAMMABLE COMPUTER HAVING ALPHANUMERIC CAPABILITIES FROM A FEW KEYBOARD KEYS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 844,872, Mar. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 729,559, May 2, 1985, which is a continuation-in-part of Ser. No. 459,998, Jan. 21, 1983, Pat. No. 4,547,860. This application Mar. 29, 1989, Ser. No. 331,043

Int. Cl.[5] G06F *3/023*

U.S. Cl. 364—709.16 **8 Claims**



1. The method of identifying and processing keyboard entered commands in a portable miniaturized multi-purpose programmable electronic computer with an operating system having alphanumeric data processing capabilities operable to process alphabetic characters and numeric digits in various operation modes from a set of data processing commands to which the computer responds in response to keystrokes from an accompanying keyboard located on a panel of said portable computer and coupled permanently thereto for entry of said processing commands with at least six keys for making the alphabetic character and numeric digit entries, comprising the steps of:

providing in a location visible along with the keyboard entry instructions displayed in a set of abbreviated instruction indicia designating a comprehensive set of computer entries of at least said alphabetic characters and set of data processing commands together with the sequence of keystrokes for those entries from the keyboard keys requiring more than one stroke per entry, thereby to reduce the

need for reference to external manuals for operation and entry instructions for that comprehensive set of computer entries,

establishing a two keystroke per entry mode of computer operation for making keyboard entries directly into the computer operating system by means of two successive keystrokes in mutually exclusive time sequence from a subset of said keys for processing those entries from the keyboard keys displayed in said set of indicia designated to have a two stroke entry sequence, thereby to decrease the number of keys necessary on the keyboard for processing a subset of said comprehensive set of entries by providing the capability for selecting for a subset of X keys a plurality of X times X individual entries,

providing at least one other keystroke entry mode of computer operation for processing a further subset of the comprehensive set of entries including numeric digit entries with a single keystroke from a selected further subset of said keys, and

providing in said visible instructions indicia coding for defining the two sequential keystrokes of said two stroke entry sequence for a plurality of different entries with the first sequential key to be stroked identified by placement of a chart in a location in the proximity of that key and with the second key of the two stroke entry sequence identified by a designation of one of said different entries with additional indicia of the particular key to be selected.

4,924,432

DISPLAY INFORMATION PROCESSING APPARATUS

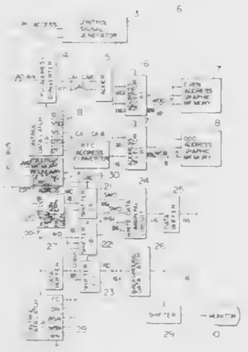
Nobuteru Asai; Yasuo Sakai, and Kazuo Miyazaki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1987, Ser. No. 31,676

Claims priority, application Japan, Mar. 29, 1986, 61-72239; Apr. 9, 1986, 61-80167; Jul. 3, 1986, 61-154967

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—900 **9 Claims**



1. A display information processing circuit comprising:

memory means including a plurality of memory elements to each of which a respective word address is assigned, each of said elements being accessible in response to a word address to write and read out dot data in a word unit formed with a predetermined number of bits;

data transfer means for producing dot data in a word unit to be written into a memory element, the word address of said memory element in which said dot data is to be stored and a bit number indication signal which indicates a start bit in said memory element for writing said dot data, said bit number indication signal identifying said start bit by a bit number counted (from a boundary between adjacent memory elements;) and

a peripheral control circuit connected to receive said dot data, said word address and said bit number indication signal from said data transfer means for selecting the memory element to which said word address is assigned and for beginning the writing of said dot data at said start bit in said selected memory element; wherein

said memory means includes an odd address memory part and an even address memory part which are simultaneously accessible, said odd address memory part storing dot data to which odd number word addresses are assigned, said even address memory part storing dot data to which even number word addresses are assigned; and

said peripheral control circuit includes write data generation means for simultaneously generating a first part of said dot data to be written in said selected memory element and a remaining part of said dot data which extends beyond a boundary of said selected memory element so as to apply said dot data to said odd address memory part and said even address memory part, and access address generation means for generating an access address of one of said two memory parts corresponding to said selected memory element having said word address produced by said data transfer means and an access address which is adjacent to said word address in the other one of said two memory parts.

4,924,433

WORD PROCESSOR WITH ATTRIBUTE FUNCTIONS

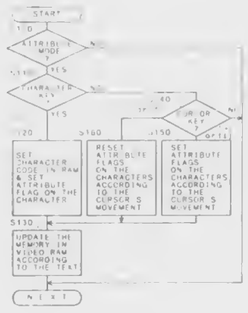
Keiichi Hirata, Kuwana; Yoshinari Morimoto, Nagoya; Tomohiro Ban, Iwakura; Tokihito Furushima, Nagoya; Tomoko Miura, Nagoya; Yoshie Ikeda, Nagoya, and Yasushi Kawakami, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 13, 1987, Ser. No. 72,730

Claims priority, application Japan, Jul. 15, 1986, 61-166219; Nov. 15, 1986, 61-272665

Int. Cl.[5] G06F *3/14*

U.S. Cl. 364—900 **15 Claims**



1. A word processor comprising:

input means having at least a character key for inputting character data and two or more cursor keys for inputting cursor position data, said cursor keys including a first cursor key group for providing an attribute and a second cursor key group for deleting an attribute;

display means responsive to the input means for displaying a character corresponding to the character data and a cursor corresponding to the cursor position data;

attribute selection means having an attribute selection key for selecting attribute data;

control means, responsive to the attribute selection means and to a cursor key of the first cursor key group, for adding an attribute to a character within a display range and for adding the attribute data to the character data in the memory means in response to cursor movement controlled by cursor position data input by the key of the first cursor key group, the display range being delimited by an initial position of the cursor prior to its movement and a final position of the cursor after its movement in a predetermined direction, the initial position being the cursor position when the attribute selection means selects the attribute data; and

deletion means, responsive to the attribute selection means and a key of the second cursor key group, for deleting an attribute from a character that has the attribute within the display range in response to the cursor movement controlled by cursor position data input by the key of the second cursor key group, the display range being delimited by an initial position of the cursor prior to its movement and a final position of the cursor after its movement in a direction opposite to the predetermined direction, the initial position being the cursor position when the attribute selection means selects the attribute data.

4,924,434

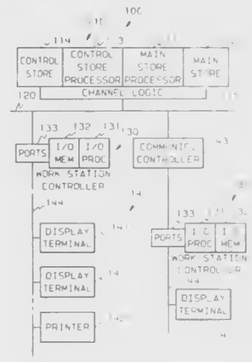
SHARING WORD-PROCESSING FUNCTIONS AMONG MULTIPLE PROCESSORS

Patrick J. Christenson; Robert J. Hart; David C. Nastz, all of Rochester; Edward J. Rowlance, Stewartville, and David G. Wenz, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 787,235, Oct. 15, 1985, abandoned. This application May 9, 1988, Ser. No. 196,833

Int. Cl.[5] G06F *15/16, 3/153*

U.S. Cl. 364—900 **13 Claims**



9. The system of claim 6 further comprising:

a channel coupled between said central data and said auxiliary data processors, said channel being controlled by said central data processor to transfer said nonexecutable data-/entity portion both to and from said auxiliary data processor.

4,924,435

CIRCULATING CONTEXT ADDRESSABLE MEMORY

Eric L. Brunvand, Pittsburgh, Pa., and Alan L. Davis, Half Moon Bay, Calif., assignors to Fairchild Semiconductor Corporation, Palo Alto, Calif.

Continuation of Ser. No. 765.391, Aug. 13, 1985, abandoned. This application May 2, 1988, Ser. No. 188,640

Int. Cl.[5] G06F *15/40, 7/04*

U.S. Cl. 364—900 **27 Claims**

1. A memory system for the storage and retrieval of data sequences of symbols comprising:

a circulating memory comprising a first array of memory cells for storing a plurality of said data sequences, each said data sequence comprising a plurality of symbols, and means for causing said symbols to circulate sequentially past a plurality of tap points, said tap points being coupled to said first array of memory cells at mutually exclusive locations in said first array of memory cells;

means for receiving a query sequence of symbols coupled to said memory system including means for initializing said circulating memory each time a said query sequence is received, said initializing means including means for specifying one of two states, compared and not compared, for each said data sequence of symbols, said initializing means specifying the not compared state for each said data sequence of symbols in response to the receipt of said query sequence of symbols,

means coupled to said receiving means for storing said query sequence of symbols comprising a second array of memory cells; and

means operatively coupled to each said tap point for retrieving a said data sequence of symbols which corresponds to said query sequence of symbols from said first array of



memory cells provided said data sequence has not previously been retrieved from said circulating memory since said initializing means initialized said circulating memory, said retrieving means being operative on each said data sequence of symbols in the not compared state, said retrieving means including means for comparing said data sequence of symbols with said query sequence of symbols to determine if said data sequence of symbols corresponds to said query sequence of symbols; means for causing said initialization means to specify the compared state for said data sequence of symbols; and means for outputting said data sequence of symbols if said comparing means determines that said data sequence of symbols corresponds to said query sequence of symbols, said outputting means including means for causing a different said tap point to output said data sequence of symbols if said data sequence of symbols corresponds to said query sequence of symbols.

4,924,436

DATA STORAGE DEVICE HAVING A PHASE CHANGE MEMORY MEDIUM REVERSIBLE BY DIRECT OVERWRITE AND METHOD OF DIRECT OVERWRITE

David Strand, West Bloomfield, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 64,645, Jun. 22, 1987. This application Jul. 20, 1987, Ser. No. 75,502

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[5] G11C *13/00;* **G11B** *3/70;* **G01D** *15/10*

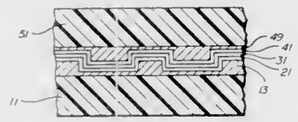
U.S. Cl. 365—113 **2 Claims**

1. A method of storing data in individual memory cells of a data storage disc having a layer of non-ablative, reversible, phase change data storage medium between adjacent heat sink layers, said data storage medium comprising a miscible telluride-selenide solid solution having a crystallization time of less then 1 microsecond and chosen from the group consisting of:

(a) arsenic telluride-arsenic selenide;

(b). antimony telluride-antimony selenide;

(c). bismuth telluride-bismuth selenide; and
(d). mixtures thereof; which method comprises:
(1). single laser beam direct overwrite storing data of one sense by heating within a track an individual memory cell comprised of phase change material and adjacent heat sink layers with a first, high energy pulse to melt and superheat the phase change material and adjacent heat sink layers, and thereafter allowing the phase change material of the individual memory cell to slowly cool and crystallize; and



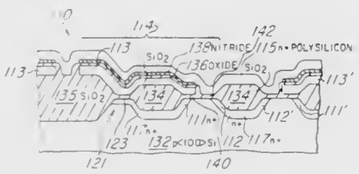
(2). single laser beam direct overwrite storing data of another sense by heating within the same track another individual memory cell comprised of phase change material and adjacent heat sink layers with a second, low energy pulse to melt and heat the phase change material and adjacent heat sin layers, and thereafter allowing the phase change material of the individual memory cell to rapidly cool and vitrify.

4,924,437

ERASABLE PROGRAMMABLE MEMORY INCLUDING BURIED DIFFUSION SOURCE/DRAIN LINES AND ERASE LINES

James L. Paterson, Richardson; David D. Wilmoth, Sugarland, and Bert R. Riemenschneider, Murphy, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1987, Ser. No. 130,774
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 **5 Claims**



1. A memory device, comprising:
(a) a semiconductor layer of first conductivity type having a surface;
(b) a plurality of parallel first buried lines of a second conductivity type in said layer, each of said buried lines beneath a corresponding insulating line beneath said surface of said layer;
(c) a plurality of parallel conducting lines over both said surface and said insulating lines, said parallel conducting lines crossing over said buried lines;
(d) a plurality of parallel erase lines of said second conductivity type in said layer beneath said surface, said erase lines parallel to said buried lines; and
(e) a plurality of isolated gates, each of said gates: (i) made of a conductive material, (ii) located beneath one of said parallel conducting lines, (iii) overlying one of said insulating lines and extending on both sides of said one insulating line, (iv) with a first end terminating over a portion of said surface between a pair of adjacent ones of said insulating lines with the corresponding pair of adjacent ones of said buried lines extending up to said portion of said surface, wherein said pair of adjacent ones of said buried lines form the source and drain of a merged floating gate tansistor with said gate forming the floating gate of the transistor and with said one of said conducting lines forming the control gate of the transistor, and (v) a second end remote from said first end and separated from one of said erase lines by a tunnelable insulator.

4,924,438

NON-VOLATILE SEMICONDUCTOR MEMORY INCLUDING A HIGH VOLTAGE SWITCHING CIRCUIT

Hiroyuki Kobatake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 814,473, Dec. 30, 1985, abandoned. This application Nov. 7, 1988, Ser. No. 268,607
Claims priority, application Japan, Dec. 28, 1984, 59-277436
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 **6 Claims**



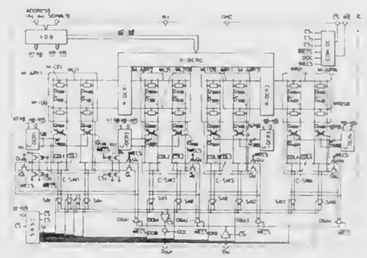
1. A semiconductor memory device, comprising, a plurality of memory cells, a plurality of row lines, each of which is coupled to at least one of said memory cells, at least one column line coupled to at least one of said memory cells, an address decoder responding to a set of address signals for selecting one row line and one column line to designate one of said memory cells, a terminal at which a writing voltage is supplied, a writing circuit coupled between said row lines and said terminal, said writing circuit having a plurality of switching circuits, first ends of each of said switching circuits being coupled in common to said terminal, a second end of each of said switching circuits being coupled to a respective row line, each of said switching circuits including a plurality of enhancement type transistors and a plurality of depletion type transistors which are serially connected in a predetermined order between respective row line and said terminal, said plurality of enhancement type transistors and said plurality of depletion type transistors of said switching circuits being arranged in rows and columns, rows of said transistors being contained in the same switching circuit, each of said transistors including a channel layer, at least vertically adjacent transistors of the same type and residing in the same column sharing the same channel layer, and a control circuit coupled to said writing circuit and controlling said switching circuits such that all the transistors in that switching circuit coupled to the row line selected by said address decoder are turned on and at least one of the transistors in each of the remaining switching circuits except for that switching circuit coupled to the selected row line is turned off.

4,924,439

SEMICONDUCTOR INTEGRATED CIRCUIT

Katsumi Ogiue; Yukio Suzuki, both of Hinod; Ikuro Masuda, Hitachi; Masanori Odaka, Kodaira, and Hideaki Uchida, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 121,914, Nov. 17, 1987, Pat. No. 4,858,189, which is a continuation of Ser. No. 701,226, Feb. 13, 1985, Pat. No. 4,713,796. This application May 30, 1989, Ser. No. 358,262
Claims priority, application Japan, Feb. 13, 1984, 59-22811
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—189.05 **10 Claims**



1. A semiconductor integrated circuit comprising:
a plurality of storage means for storing information therein;
selecting means coupled to receive a selecting signal and for selecting one of said plurality of storage means according to said selecting signal, said selecting means including a plurality of circuits coupled to one another, at least one circuit in said selecting means having an input stage comprised of a CMOS circuit, and an output stage comprised of a first bipolar transistor which executes at least one of charge and discharge of an output line of said at least one circuit;
read-out means for reading out the information stored in said storage means selected by said selecting means, said read-out means including a second bipolar transistor responsive to the information to be read out; and
control means coupled to said read-out means and responsive to a control signal and for controlling a read-out operation of said read-out means.

4,924,440

MOS GATE ARRAY DEVICES

Satoru Tanoi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 2, 1988, Ser. No. 189,161
Claims priority, application Japan, Apr. 30, 1987, 62-104465
Int. Cl.[5] G11C *7/00*; H03K *19/177*
U.S. Cl. 365—189.08 **5 Claims**

1. A programmable logic array formed in a first area of a gate array, the gate array having a plurality of memory cells in a second area thereof which is adjacent to the first area, said memory cells respectively having a first transistor group including a plurality of transistors, said transistors in said first transistor group being arranged in a memory formation which is suitable for forming said memory cell therein, the programmable logic array comprising:
a first array having a plurality of first input terminals extending in a first direction and having a plurality of first output terminals extending in a second direction substantially perpendicular to said first direction;
a first pull-up circuit connected to said first output terminals;
said first array having a plurality of first cells, said first cells each having a second transistor group including a plurality of transistors, said transistors in said second transistor group being arranged in the memory formation and being coupled to one another so that said first array connected to said first pull-up circuit forms a first NOR circuit;
a second array haaving a plurality of second input terminals extended in said second direction and having a plurality of second output terminals extending in said first direction; and
a second pull-up circuit connected to said second output terminals;

FIG 2



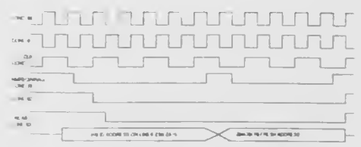
said second array having a plurality of second cells, said second cells each having a third transistor group including a plurality of transistors, said transistors in said third transistor group being arranged in the memory formation and being coupled to one another so that said second array connected to said second pull-up circuit forms a second NOR circuit differing from said first NOR circuit.

4,924,441

METHOD AND APPARATUS FOR REFRESHING A DYNAMIC MEMORY

Jeffrey Inskeep, Marietta, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Mar. 18, 1987, Ser. No. 27,635
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—222 **8 Claims**



1. An improved memory refresh method in a processor controlled system having a first clock, a processor, and a dynamic random access memory (DRAM), said first clock generating a first clock signal having a first predetermined frequency, said processor providing a memory request (MREQ) signal, said MREQ signal being in a first state when said processor is not accessing said DRAM and, when said processor is accessing said DRAM, said MREQ signal being, in sequence, in a second state for a first predetermined period of time, in said first state for a second predetermined period, and again in said second state for a third predetermined period, said DRAM requiring a row address strobe (RAS) signal to be in said second state to input a row address, a column address strobe (CAS) signal to be in said second state to input a column address, and having an internal refresh address counter, said internal refresh address counter being incremented and a row of memory in said DRAm being refreshed when, in sequence, said RAS signal and said CAS signal are placed in said second state, said RAS signal is placed in said first state, and then said

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RAS signal is returned to said second state, comprising the steps of:

providing said MREQ signal to said DRAM as said RAS signal;

generating a second clock signal having a second predetermined frequency, said second predetermined frequency being greater than said first predetermined frequency;

sampling, on predetermined transitions of said first clock signal, said MREQ signal to provide a first output signal, said sampling occurring in a manner such that said second predetermined period when said MREQ signal is in said first state occurs between samples of said MREQ signal;

sampling, on predetermined transitions of said second clock signal, said first output signal to provide a second output signal;

causing said second output signal to be in said first state when said first output signal is in said first state; and

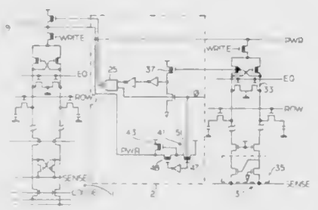
providing said second output signal to said DRAM as said CAS signal.

4,924,442

PULL UP CIRCUIT FOR DIGIT LINES IN A SEMICONDUCTOR MEMORY

Zhitong Chen; Gary M. Johnson; Ward D. Parkinson; Wen-Foo Chern; Tyler A. Lowrey, and Thomas M. Trent, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 30, 1988, Ser. No. 252,494
Int. Cl.[5] G11C *7/00*; H03K *5/08*
U.S. Cl. 365—189.11 **18 Claims**



1. A semicondcutor memory device having a memory which includes memory elements, the memory device comprising:

(a) a pullup circuit for conducting current from a high potential source to a high potential node of a memory array;

(b) a reference control circuit for periodically setting a sense node to a high potential state;

(c) a gate control circuit for controlling, in response to a signal from the reference control circuit, the current supplied to the high potential node of the memory array from the high potential source, the gate control circuit gating the pullup circuit to conduct current from the high potential source to said high potential node of the memory array, the gate control circuit including a voltage sensor which senses a potential at said sense node and gates OFF the pullup circuit when that potential reaches a predetermined potential and gates ON the pullup circuit when that potential has not reached said predetermined potential; and

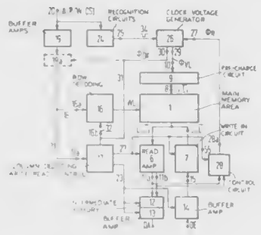
(d) a potential maintenance circuit for providing sufficient current from the high potential source to maintain said high potential node of the memory array at a potential approximately that of the predetermined potential, the potential maintenance circuit being gated ON after receipt of a clock signal and being gated OFF when said high potential node reaches the predetermined potential.

4,924,443

SEMICONDUCTOR MEMORY COMPRISING A RECOGNITION CIRCUIT FOR SIGNAL CHANGES

Hans J. Mattausch, Kirchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,271
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1987, 3727548
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—203 **15 Claims**



14. A semiconductor memory, comprising:

a memory area having a plurality of memory cells connectable via data lines to a write circuit connected with a data input and a read circuit connected with a data output;

a pre-charge circuit means connected for charging the data lines to a prescribed potential when the pre-charge circuit means is activated;

a recognition circuit means for recognizing a signal change at a control input to the semiconductor memory;

a clock voltage generator means connected to said recognition circuit means for generating a first clock voltage for controlling the pre-charge circuit means, and said clock voltage generator means deactivating the pre-charge circuit means by switching the first clock voltage to a first voltage level in response to said signal change; and

an output of the read circuit connecting to a control circuit means for controlling the clock voltage generator means by providing a control signal thereto when an output signal at the read circuit exceeds a given level to cause said clock voltage generator means to switch said first clock voltage to a second voltage level for activating the pre-charge circuit means.

4,924,444

STIRRING IMPLEMENT

Ruben Castellanos, 310 S. Mott St., Los Angeles, Calif. 90033

Filed Apr. 24, 1989, Ser. No. 341,851
Int. Cl.[5] B01F *3/00*
U.S. Cl. 366—343 **1 Claim**

1. A stirring implement, comprising:

an elongated cylindrical shaft;

a thin flat blade secured to a distal end portion of said shaft;

said thin flat blade having a pair of generally parallel side walls extending generally parallel to said shaft and connected by radiused corners with a straight bottom transverse edge;

a laterally outwardly extending arcuate downwardly opening hook member disposed intermediate end portions of said shaft and dimensioned for engagement with a top side wall edge of a beverage container;

a scraping blade extending from one of said parallel side walls, said scraping blade perpendicular to said thin flat blade;

said scraping blade connected to said side wall of said thin flat blade by a radiused bend portion;



a serrated cutting edge formed on one of said parallel side walls of said flat blade, opposite said scraping blade; and

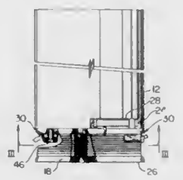
a plurality of apertures formed through said thin flat blade.

4,924,445

SONOBUOY CABLE PACK

Murray O. Hill, Ingersoll, Canada, assignor to Her Majesty the Queen in Right of Canada as represented by the Minister of National Defence, Canada

Filed Mar. 9, 1989, Ser. No. 321,077
Claims priority, application Canada, May 26, 1988, 567751
Int. Cl.[5] H04B *1/59*
U.S. Cl. 367—4 **10 Claims**



1. A sonobuoy, comprising:

a sonobuoy body;

a main cable having a proximal end secured to the body and a distal end;

a spool on which the cable is wound from the distal end toward the proximal end; and

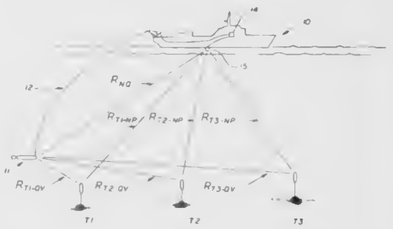
release means, securing the spool to the body and operative in response to immersion in water, for releasing the spool from the body, the release means including at least one pin secured to the body and extending into an opening in the spool, and retainer means for releasably securing the pin in the opening, the retainer means including retaining clips engageable with the pin and a water soluble band holding the clips in engagement with the pin.

4,924,446

NAVIGATION SYSTEM AND METHOD FOR DETERMINING THE POSITION OF A RELATIVELY NOISY PLATFORM USING UNDERWATER TRANSPONDERS

Reginald J. Cyr, Santa Barbara, Calif., assignor to Sonatech, Inc., Santa Barbara, Calif.

Filed Feb. 9, 1989, Ser. No. 308,653
Int. Cl.[5] H04B *1/59*; G01S *3/80*
U.S. Cl. 367—6 **9 Claims**



1. A method of acoustically positioning a noisy platform comprising the steps of:

(a) deploying said platform in a region in which an array of transponders have previously been deployed;

(b) deploying a vehicle tethered to said platform;

(c) calculating a number of first acoustic ranges between said vehicle and the transponders in said array by transmitting at least one interrogation signal from said vehicle, each said transponders responding to said at least one interrogation signal by transmitting a reply signal, said vehicle having means to receive said reply signal, measuring the elapsed times between the generation of said at least one interrogation signal and the reception of said at least one reply signal at each transponders in said array to thereby determine said first acoustic range from each transponder in said array;

(d) calculating a number of second acoustic ranges, each one of said second acoustic ranges being equal to the total distance from said platform to a selected one of said transponders in said array and thence from said selected one of said transponders to the vehicle by transmitting at least one acoustic interrogation signal from said platform, each said transponder responding to said at least one acoustic interrogation signal by transmitting a reply signal, said signal receiving means on board said vehicle receiving said reply signal, measuring the elapsed time for the sound to travel from the platform separately to each of said transponders and thence from each of said transponders to the vehicle to thereby determine the acoustic distances from the platform to the vehicle via each of said transponders; and

(e) calculating the distance the platform is from each transponder using the first acoustic ranges and the second acoustic ranges for each transducer.

4,924,447

OPTICAL MEMORY DEVICE FOR RECORDING, REPRODUCING OR ERASING INFORMATION ONTO A RECORDING MEDIUM, INCLUDING A RECORDED REGION DETECTING CIRCUIT.

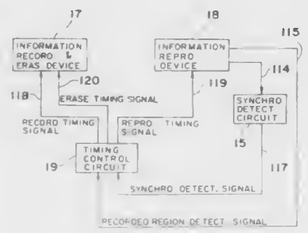
Hiroshi Fuji, Tenri; Shigemi Maeda, Yamatokoriyama; Noriaki Sakamoto, Kyoto; Shigeo Terashima; Takeshi Yamaguchi, both of Tenri; Kentaro Tsuji, and Kunio Kojima, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

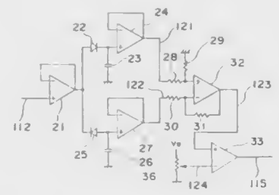
Filed Feb. 6, 1987, Ser. No. 12,087

Claims priority, application Japan, Feb. 7, 1986, 61-26636; Feb. 28, 1986, 61-45761; Mar. 28, 1986, 61-73298

Int. Cl.[5] G11B *11/12*

U.S. Cl. 369—13 4 Claims





1. An optical memory device for recording, reproducing or erasing information by applying an optical beam such as a laser beam onto a recording medium, said optical memory device comprising:

peak hold circuit means for detecting a peak level of a playback signal;

reference voltage generating means for supplying a reference voltage, wherein said reference voltage is preset independent of said playback signal;

a comparator means for comparing therein an output through said peak hold circuit means with said reference voltage supplied from said reference voltage generating means; and

a recorded region detecting circuit means including said peak hold circuit means and said comparator means for detecting said information recorded region.

4,924,448

BISTATIC SYSTEM AND METHOD FOR OCEAN BOTTOM MAPPING AND SURVEYING

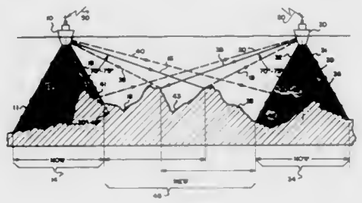
Marvin C. Gaer, 1756 Morris Dr., Cherry Hill, N.J. 08003

Filed Mar. 9, 1989, Ser. No. 321,084

Int. Cl.[5] G01S *15/00*

U.S. Cl. 367—88 17 Claims

1. A system for mapping the ocean bottom through the transmission and reception of underwater sonic pulses which comprises two ships, traveling some distance apart, wherein each of said ships is equipped with means for transmitting sonic pulses to be scattered off the ocean floor in such a direction so that portions of said scattered pulses will be intercepted by its companion ship, means on each ship for receiving said sonic pulses and determining the angles of arrival of said intercepted pulses, means on each ship for determining the time of transmission and the time of reception of said sonic pulses, positioning means on each ship for determining its global location, the system having a relative positioning means for determining the relative position of said ships with respect to each other, com-



munication means on each ship for transmitting and receiving data from its companion ship, the system having means for recording, processing and analyzing said intercepted pulses to determine the depth of the ocean bottom at the locations of the pulse reflections, and the system having a means for recording said analyzed data;

4,924,449

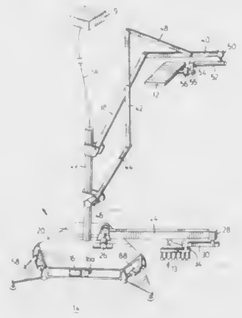
ACOUSTIC SUB-SURFACE INTERROGATOR

Jacques Y. Guigné, St. John's, Canada, assignor to Nordco Limited, St. John's, Canada

Filed Apr. 13, 1989, Ser. No. 337,648

Int. Cl.[5] G01S *15/00*

U.S. Cl. 367—104 11 Claims



1. A method for investigating sub-surface acoustical properties of a layered site, comprising the steps of:

(a) selecting a plurality of primary scanning locations at a site;

(b) generating at least one sonic pulse for calculating the speed of sound in water at said scanning locations;

(c) for each scanning location, undertaking at least once the sub-steps of:

(i) selecting a power, resultant center frequency, beamwidth, bandwidth, shape and incident angle for an input signal, said incident angle chosen so that a significant portion of the energy in the input signal will enter the site;

(ii) insonifying said scanning location with said input signal;

(iii) receiving reflected signals; and

(iv) predicting sub-surface acoustical properties of layers of said site at said scanning location from said reflected signals and said at least one sonic pulse.

4,924,450

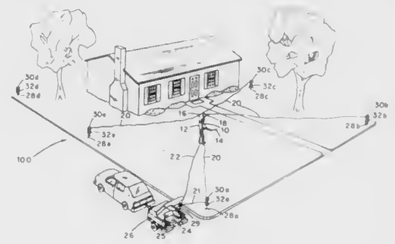
ULTRASONIC RANGING AND DATA TELEMETRY SYSTEM

Hugh R. Brashear, Farragut; Michael S. Blair; James E. Phelps, both of Knoxville; Martin L. Bauer, and Charles H. Nowlin, both of Oak Ridge, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Continuation of Ser. No. 28,986, Mar. 23, 1987, abandoned. This application Apr. 13, 1989, Ser. No. 338,529

Int. Cl.[5] G01S *3/80*

U.S. Cl. 367—118 15 Claims



1. A method for surveying a property site comprising the steps of:

(a) positioning a plurality of portable transceivers on or in the vicinity of the property site wherein acoustic line of sight is maintained to at least two of the transceivers from all points of the site;

(b) positioning a survey means on the property site within acoustic line of sight of at least two transceivers;

(c) transmitting an ultrasonic pulse from the survey means;

(d) receiving the ultrasonic pulse at each of the at least two transceivers;

(e) determining time differences which are elapsed times between transmitting the ultrasonic pulse from the survey means and receiving the ultrasonic pulse at each of the at least two transceivers;

(f) determining a relative location of the survey means based on the time difference between transmitting the ultrasonic pulse from the survey means and receiving the ultrasonic pulse at each of the at least two transceivers and the speed of sound;

(g) recording the relative location of the survey means;

(h) moving the survey means to a different location on the site; and

(i) repeating steps (b) through (h) until the survey of the site is complete.

4,924,451

COMPUTER TIME CLOCK

Bear Hsiung, 1FL., No. 18, Lane 55, Sec. 3, Chung Shan N. Rd., Taipei, Taiwan

Filed Jun. 13, 1988, Ser. No. 206,084

Int. Cl.[5] G04B *47/00;* G06K *7/10*

U.S. Cl. 368—10 2 Claims

1. A computer time clock comprising a photo-electric card-reader system including a card slot, a CPU system, a memory system, a time display system, a display system, a printer system, and a disk driver system; means coupled to said time display system for displaying the card number read by the card-reader and the existing time when a card is checked by said card-reader, said means being controlled by the CPU to store into the disk driver system and to print out through the printer while being displayed by the display system; means for making the data stored at the disk driver system accessible by the main computer, and means when the disk driver system is fully occupied for storing data obtained by said card reader at the memory system to prevent data loss and means for providing a burglar alarms function wherein a specifically coded card inserted into the card slot activates an interface scanning to



check burglar alarm detectors and if the burgular detectors have been triggered to activate a burglar alarm and a pre-set telephone to respectively provide alarm signals.

4,924,452

WATCH PROVIDED WITH A DIAL

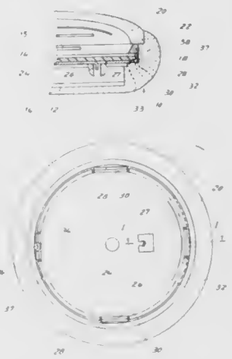
Clément Meyrat, Le Landeron, and Antoine Dubois, Le Locle, both of Switzerland, assignors to ETA SA Fabriques d'Ebaubches, Grenchen, Switzerland

Filed Aug. 25, 1988, Ser. No. 236,488

Claims priority, application Switzerland, Sep. 3, 1987, 3390/87

Int. Cl.[5] G04B *37/04, 19/14*

U.S. Cl. 368—236 7 Claims



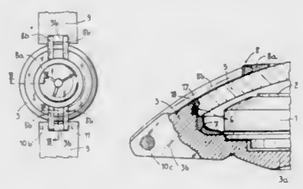
1. A watch comprising a case with a glass, a case band, a back, a movement, hands, a dial and positioning means for positioning the dial in the case; said positioning means comprising a first and a second part, said first part being rigid with the case and defining an annular groove as well as an angular stop, said annular groove opening towards the axis of the hands, said second part being integral with the dial and engaged in said annular groove to ensure axial positioning of the dial, said second part being provided with an angular counter stop so arranged as to cooperate with said angular stop to ensure an angular positioning of the dial, said second part and said angular counter stop being arranged to cooperate, with play, respectively with said groove and said angular stop, whereby said first and said second part of said positioning means are loosely fitted together and allow radial deformation of the dial while still positioning the dial both angularly and axially.

4,924,453

WATCH HAVING A GLASS RETAINING STRAP

Claude Ray, Canton of Neuchatel, and Michiel Groothuis, Canton of Berne, both of Switzerland, assignors to Le Phare-Jean D'Eve S.A., Switzerland

Filed Feb. 6, 1989, Ser. No. 307,067
Claims priority, application Switzerland, Feb. 9, 1988, 457/88
Int. Cl.[5] G04B *37/00*
U.S. Cl. 368—294 5 Claims



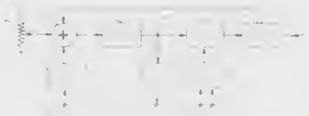
1. A watch casing comprising a back and a middle part made in one piece, in which a glass is frictionally engaged into the middle part and is retained by a diametral strap which bears thereon, said diametral strap being secured, by its ends, to said back/middle part of the casing and including an annular central part bearing on the glass and two radial arms, situated on a common diameter, the free ends of said radial arms being secured to said back/middle part.

4,924,454

SERVO APPARATUS WITH OFFSET COMPENSATION

Dieter Baas, Kehl, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 250,248
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732924
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.11 3 Claims



1. Apparatus for the reproduction of data from the data tracks of a record medium, comprising:

a servo loop including:

(1) transducer means disposed for picking up data from said data tracks and converting said data into an electrical signal;

(2) a source of reference signal;

(3) control means coupled to said source of reference signal and to said transducer means and responsive to said reference signal and to said electrical signal for producing a control signal representative of a difference between said electrical signal and said reference signal, said control signal being subject to an undesirable effect voltage generated within said control means;

(4) coupling means for coupling said control signal to said transducer means for disposing said transducer means relative to said data tracks in a manner to reduce the difference between said electrical signal and said reference signal;

means coupled to said control signal for generating successive trains of pulses of opposite polarity pulses, trains of one polarity of pulses being interleaved between trains of the other polarity pulses, for combining said pulse trains with said control signal for effecting a change in value of said control signal;

measuring means responsive to said changed control signal for determining when said changed control signal reaches predetermined thresholds in opposite directions in response to said pulses of opposite polarity and for measuring the duration of said successive opposite polarity pulse trains required to cause said changed control signal to reach said predetermined thresholds; and

means coupled to said measuring means and to an input terminal of said control means for producing a compensation signal representative of a difference between said successive opposite polarity pulse train durations for altering the operation of said control means to compensate for said undesirable offset voltage.

4,924,455

APPARATUS FOR GENERATING TRACKING ERROR SIGNALS IN A DIFFERENTIAL PHASE DETECTION SYSTEM

Kazuhiko Fujiie, Tokyo; Chiaki Nonaka, and Tadao Yoshida, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 12, 1984, Ser. No. 599,731
Claims priority, application Japan, Apr. 14, 1983, 58-65853
Int. Cl.[5] G11B *7/12, 7/09*
U.S. Cl. 369—44.21 18 Claims



1. Apparatus for producing a tracking servo signal of the differential phase detection kind for use in an optical pickup system of the kind having a light source emitting a light beam focused onto a record medium surface on which is formed an information track having an array of pits, a tracking servo device for causing the light beam to trace the track in a tracking direction in response to the tracking servo signal, and a photo-detector for receiving light reflected by the record medium surface and having a plurality of light-receiving areas, said apparatus for producing the tracking servo signal comprising:

first tracking error detecting means receiving output signals from said plurality of light-receiving areas of said photo-detector for producing therefrom a first tracking error signal formed as a difference between first and second sums of output signals from selected ones of said plurality of light-receiving areas of said photo-detector;

second tracking error detecting means receiving output signals from said plurality of light-receiving areas of said photo-detector for producing therefrom a second tracking error signal formed as a difference between third and fourth sums of output signals from selected ones of said plurality of light-receiving areas of said photo-detector, said third and fourth sums being different than said first and second sums, respectively; and

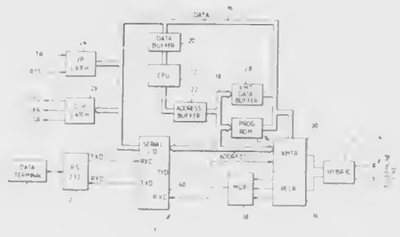
signal combining means connected to combine said first and second tracking error signals to form a tracking servo signal.

4,924,456

HIGH SPEED MODEM

Ronald K. Maxwell, Palo Alto; Karl J. Zorzi, Pleasanton; Harunori Yoshikawa, Cupertino; Venkat S. Prasad, San Jose, all of Calif.; Fred G. Smith, Longwood, Fla., and Ming-Chih Hsieh, San Jose, Calif., assignors to Racal Data Communications, Inc., Sunrise, Fla.

Division of Ser. No. 909,012, Sep. 18, 1986, Pat. No. 4,771,417.
This application Aug. 29, 1988, Ser. No. 197,128
Int. Cl.[5] H04J *15/00*
U.S. Cl. 370—32 6 Claims



1. Apparatus for providing communication of data over a telephone line, comprising:

a transmitter receiving frames of data, for placing a transmit signal on a telephone line;

said transmitter being selectively operable to transmit data at discrete data rates in response to a speed control command;

a processor for monitoring the transmission of data frames to determine data transmission errors, for selectively effecting the retransmission of data frames having errors in their transmission, and for producing the speed control command to select the data rate of the transmitter; and

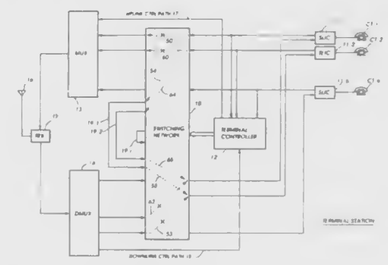
said processor causing the data transmission rate to fallback to a lower data rate or to fallforward to a higher data rate based upon the number of retransmitted data frames.

4,924,457

CONCENTRATOR SYSTEM WITH POLLING-RESPONSE MEANS FOR DETECTING FAILURES TO STOP TARIFF CHARGES ON LOCALLY ESTABLISHED INTRAOFFICE CALLS

Toshimitsu Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 321,924
Claims priority, application Japan, Mar. 11, 1988, 63-57410
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—56 7 Claims



1. A method for operating a concentrator system having a master station connected to a public switched network and a terminal station serving a plurality of communications terminals, comprising:

establishing a first communication path between a first communication terminal and said network via said terminal and master stations and a second communication path between a second communication terminal and said network via said terminal and master stations and a third communication path in said network for connecting said first and second communication paths to establish an intraoffice call;

establishing a local communication path in said terminal station between said first and second communications terminals and clearing said first and second communication paths;

transmitting a polling signal from said master station to said terminal station at periodic intervals;

transmitting an acknowledgment signal from said terminal station to said master station in response to receipt of said polling signal when said intraoffice call is in progress;

detecting said acknowledgment signal by said master station; and

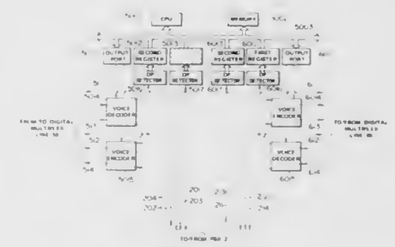
transmitting a signal from said master station to said public switched network when said response is not detected for a prescribed time interval indicating that said intraoffice call is terminated.

4,924,458

MULTIPLEX COMMUNICATION SYSTEM

Keiichi Obara, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 16, 1988, Ser. No. 207,660
Claims priority, application Japan, Jun. 18, 1987, 62-151720
Int. Cl.[5] H04J *3/08*
U.S. Cl. 370—58.1 23 Claims



1. A multiplex communication system including a plurality of multiplex communication apparatuses and a plurality of exchanges each having a relay function, wherein each of said multiplex communication apparatuses is connected to a plurality of lines and to an associated one of said exchanges and includes a plurality of sets each corresponding to one of said lines, each of said sets comprising:

decoding means for decoding a voice signal sent from one of said lines and sending a decoded voice signal to the associated exchange;

encoding means for encoding a voice signal sent from the associated exchange and sending an encoded voice signal to the one of said lines;

means for sending to the exchange first selection number information received from the one of said lines;

means for sending to the one of said lines second selection number information received from the exchange;

first storage means for storing said first selection number information received from the one of said lines;

second storage means for storing said second selection number information received from the exchange; and

control means for reading the first selection number infor-

mation stored in said first storage means and the second selection number information stored in said second storage means, for detecting coincidence between the first and second selection number information, and for inhibiting operation of said encoding means and said decoding means when the first and second selection number information coincide.

4,924,459

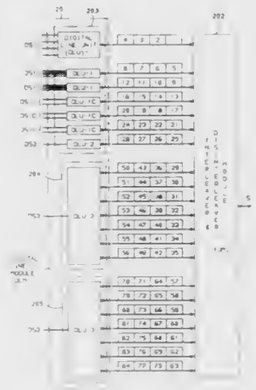
DIGITAL TRANSMISSION INTERCONNECT SIGNAL

Eric H. Angell, North Andover; Thomas J. Aprille, Andover; Rong-Chin Fang, North Andover; Byeong G. Lee, Methuen, all of Mass., and Jan-Dieter Spalink, Woodbridge, Va., assignors to AT & T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 60,951, Jun. 15, 1987, abandoned, which is a continuation of Ser. No. 769,508, Aug. 26, 1985, abandoned. This application Sep. 27, 1988, Ser. No. 250,026

Int. Cl.[5] H04J *3/22*

U.S. Cl. 370—84 **19 Claims**



1. Apparatus for combining a plurality of digital signals of one or more digital transmission bit rates into a transmission signal, comprising:

means for formatting each of said plurality of digital signals being combined into channel frames having a predetermined number of digital words, said formatting means including means for generating a number of said channel frames for each of said plurality of digital signals being combined during a first predetermined interval, said number of channel frames being dependent on a predetermined relationship of the digital transmission bit rate of the particular one of said plurality of digital signals being formatted and a transmission bit rate of one of a predetermined set of digital signals;

means for supplying a predetermined number of digital words from said channel frames for each of said plurality of digital signals being combined during a predetermined frame interval of said transmission signal; and

means for inserting said number of supplied digital words for each particular digital signal being combined into a corresponding number of data word positions of a repetitive frame of said transmission signal during said predetermined transmission signal frame interval, the number of said digital words supplied and the number of data word positions in said transmission signal frame for each particular digital signal being dependent on said predetermined relationship of the digital transmission bit rate of the particular signal and the transmission bit rate of said one of the predetermined set of digital signals.

4,924,460

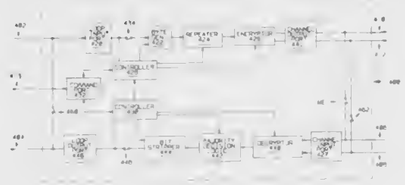
OFFICE CONTROL UNIT APPARATUS FOR USE IN A DIGITAL NETWORK

Daniel P. Lubarsky, San Jose; George A. Weight, Livermore, and Mark E. Haisch, Freemont, all of Calif., assignors to Pacific Bell, San Francisco, Calif.

Filed Oct. 5, 1988, Ser. No. 254,236

Int. Cl.[5] H04J *3/22, 3/12*

U.S. Cl. 370—84 **14 Claims**



1. An office control unit for transferring digital data between first and second subscriber loops and the time-domain multiplexed communication channels of a multipoint communication network which includes a plurality of network units with at least two of said network units comprising said office control unit, said network units coupled to telephone system communication channels, each said network unit comprising means for transmitting and receiving digital data in a frame mode in which said data is organized into frames on said communication channels, each said frame including synchronization data, command data, error correcting data, and user data, each said network unit further comprising:

means for storing an address identifying said network unit;

means for receiving commands from other said network units in said computer network, said commands being specified by command data in a said frame received by said network unit;

means for generating command data in response to a received command included in said command data;

means for transmitting commands to other network units in said computer network, said transmitting means comprising means for inserting command data generated by said command data generating means into a said frame transmitted by said network unit; and

means for executing a said received command specifying said stored address as the target thereof;

said office control unit further comprising:

loop input port means for receiving a said frame on said first subscriber loop;

loop output port means for transmitting a said frame on said second subscriber loop;

time-domain multiplexed input port means for receiving data from a first incoming channel of said time-domain multiplexed communication channels, said time-domain multiplexed input port means including first decrypting means for receiving primary channel words on said first incoming channel and for generating a data word from each said primary channel word, each said data word comprising a portion of a said frame, said frame being constructed from successive said data words, said time-domain multiplexed input port means being coupled to said loop output port means, said generated data words being transmitted by said loop output port means; and

time-domain multiplexed output port means for transmitting data on a first outgoing channel on said time-domain multiplexed communication channels, said time-domain multiplexed output port means including first encrypting means, coupled to said first loop input port means, for receiving a data word comprising a portion of a said frame and for generating a primary channel word therefrom, said primary channel word being transmitted on said first outgoing channel.

4,924,461

POLLING NETWORK COMMUNICATION SYSTEM HAVING TRANSMISSION REQUEST REGISTRATION MEANS

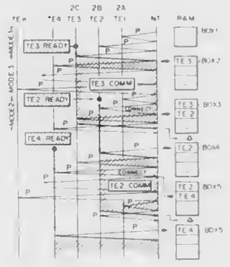
Shigeo Amemiya, Yokohama; Hiroaki Komine, Kawasaki; Tomohiro Shinomiya; Kazuo Iguchi, both of Yokohama, and Tetsuo Soejima, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 20, 1988, Ser. No. 286,872

Claims priority, application Japan, Dec. 22, 1987, 62-326118

Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—95.2 **9 Claims**



1. A polling type communication network system for transmitting data between a master station and slave stations via a first channel and a second channel, said system comprising:

a master station comprising:

sequential polling means for sequentially carrying out a normal polling of said slave stations in a predetermined sequence through the first channel even during transmission of data between said master station and any of said slave stations,

request registration means for registering a data transmission request from a first slave station through the second channel while a data transmission between said master station and a second slave station is carried out, and

interrupt polling means for carrying out interrupt polling prior to the normal polling of the first slave station having the data transmission request registered in said request registration means, after completion of the data transmission by the second slave station; and

slave stations, operatively connected to said master station via the first and second channels, each of said slave station comprising:

first response means for responding to the normal polling of said sequential polling means and transmitting a disconnection signal to said master station through the second channel when data to be transmitted does not exist,

second response means for responding to the normal polling of said sequential polling means, transmitting a connection signal to said master station through the second channel when data to be transmitted exists, and transmitting, in response to the normal polling, the data to said master station until the data transmission is completed,

third response means for responding to the normal polling of said sequential polling means during the data transmission between said master station and the second slave station and for transmitting the data transmission request to said request registration means when data to be transmitted exists, and

fourth response means for responding to the interrupt polling of said interrupt polling means and transmitting, in response to the interrupt polling, the data to said master station until the data transmission is completed.

4,924,462

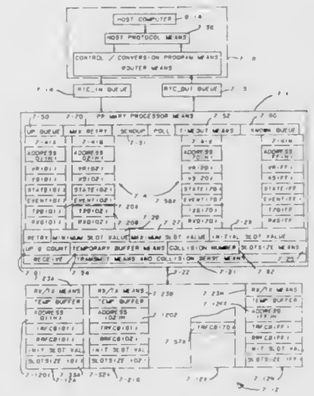
MULTITERMINAL COMMUNICATION SYSTEM AND METHOD

Marvin L. Sojka, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 265,842, Nov. 1, 1988. This application Jan. 3, 1989, Ser. No. 292,810

Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—95.2 **10 Claims**



1. A method of effecting communication between a primary processor means and a group of secondary processor means having respective distinctive identification means, with communication link means for affording communication therebetween, said method comprising:

(a) operating said primary processor means to transmit a polling message via said communication link means,

(b) operating the secondary processor means which receive said polling message and which have reason to respond thereto,

(b1) to select from a series of response time slots less than the number of secondary processor means, and

(b2) in the respective selected time slots, to send respective response messages which contain the respective identification means such that the primary processor means may identify respective secondary processor means of the group which have responded to the polling message, and

(c) operating the primary processor means to time the expiration of the series of response time slots defining a response time interval and after expiration of such response time interval, to initiate communication via said communication link means with a particular one of said secondary processor means which has responded to said polling messages.

4,924,463

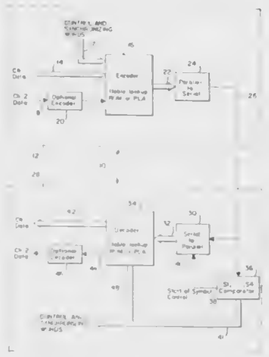
DATA CODING METHOD FOR USE IN DIGITAL COMMUNICATION SYSTEMS

Robert E. Thomas, Hudson; Jeffrey L. Cooper, Worcester, and Robert J. Simcoe, Westborough, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 318,463, Mar. 2, 1989, abandoned, which is a continuation of Ser. No. 176,314, Mar. 3, 1988, abandoned. This application Jul. 24, 1989, Ser. No. 383,439

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—105.4 20 Claims



1. A method of coding a stream of binary data in a digital communication system comprising the steps of:

selecting a first group of sixteen five bit binary symbols;

mapping each of the five bit binary symbols in said first group to one of each of sixteen possible four bit binary words;

encoding a first binary data stream by converting every four bits of data in the data stream to a corresponding five bit symbol from said first group;

interleaving single bits of data from a second data stream between each five bit symbol from said first group that corresponds to each four bits of data in said first data stream to form an encoded data stream;

selecting a second group of five bit binary symbols that are not in said first group;

forming a plurality of synchronizing words from pairs of the five bit symbols in said second group and two additional bits of binary data, by placing one of the additional bits immediately before one of the two five bit symbols in each synchronizing word, and the second additional bit immediately after the same one of the two five bit symbols in each synchronizing word, said synchronizing words having the characteristic that if they are placed in said encoded data stream exactly n times, their bit patterns will occur in said encoded data stream exactly n times regardless of symbol boundaries; and,

placing at least one of said synchronizing words in said encoded data stream.

4,924,464

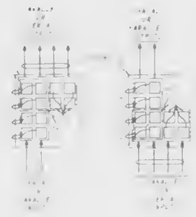
TECHNIQUE FOR CONVERTING EITHER WAY BETWEEN A PLURALITY OF N SYNCHRONIZED SERIAL BIT STREAMS AND A PARALLEL TDM FORMAT

Gerald A. Baylock, Aberdeen, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 13, 1989, Ser. No. 325,614

Int. Cl.[5] H04J *3/07*

U.S. Cl. 370—112 13 Claims



1. A method of performing a conversion in either direction between (1) a first format comprising a plurality of N concurrent serial bit streams including M-bit words at a first predetermined bit rate, and (2) a second format comprising a parallel Time Division Multiplexed (TDM) bit stream including N sequential M-bit words at a second predetermined bit rate, the method comprising the steps of:

(a) sequentially shifting at least all but one of received sets of concurrent bits of the plurality of N words of either one of the first or second input formats in a predetermined direction into an array of storage elements at the predetermined bit rate of the input format, so that the bits of the N words shifted into the array are aligned parallel to each other along a first axis of the array;

(b) during a period when the last set of concurrent bits of the plurality of N words are entered into the array, shifting the bits of the N words to transposed positions within the array so that the N words are arranged parallel to each other in the storage elements along a second axis of the array; and

(c) sequentially transmitting the M-bits of the N transposed words from step (b) in the predetermined direction out of the array at the predetermined bit rate of the converted output format to complete the conversion in either direction between the first and second format.

4,924,465

MEMORY WITH FUNCTION TEST OF ERROR DETECTION/CORRECTION DEVICE

Toshiyuki Matsubara; Shuzo Fujioka; Atsuo Yamaguchi; Kenichi Takahira; Shigeru Furuta, and Takesi Inoue, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 20, 1988, Ser. No. 260,021

Claims priority, application Japan, Jun. 30, 1988, 63-160744

Int. Cl.[5] G06F *11/10, 11/00*

U.S. Cl. 371—3 5 Claims

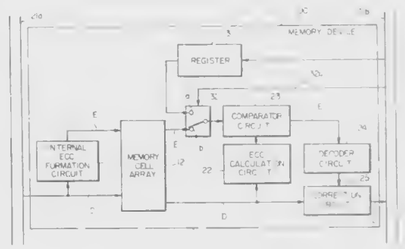
1. A memory device for detecting and correcting errors in stored data comprising:

means for generating a first error-detection/correction code with respect to data to be stored;

memory means for storing said data and said first error-detection/correction code;

error-detection/correction means for detecting and correcting errors in said data by using said first error-detection/correction code when said data is read out of said memory means; and

function test means selectively and directly connectable to said error-detection/correction means for testing said error-detection/correction mean by outputting from said error-detection/correction means an error-detection/correction code set derived from an error-detection/correction code set of known content input from outside said memory device and comparing the output code set with the input code set.



4,924,467

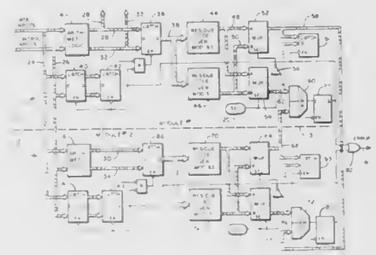
SYSTEM FOR CHECKING DUPLICATE LOGIC USING COMPLEMENTARY RESIDUE CODES TO ACHIEVE HIGH ERROR COVERAGE WITH A MINIMUM OF INTERFACE SIGNALS

Peter B. Criswell, Bethel, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 24, 1988, Ser. No. 235,425

Int. Cl.[5] G06F *7/72, 11/00*

U.S. Cl. 371—68.1 3 Claims



4,924,466

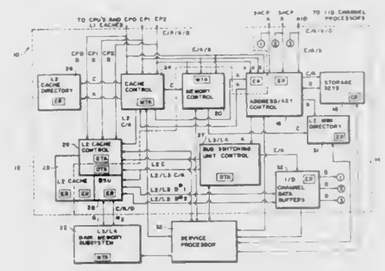
DIRECT HARDWARE ERROR IDENTIFICATION METHOD AND APPARATUS FOR ERROR RECOVERY IN PIPELINED PROCESSING AREAS OF A COMPUTER SYSTEM

Steven L. Gregor, and Victor S. Lee, both of Endicott, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 30, 1988, Ser. No. 213,523

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—12 14 Claims



1. A computer system having retry domains comprising:

first and second hardware devices coupled to each other such when one of said devices yields an error, said error can propagate to the other device, each of said devices including a trace array having at least one entry, each entry in the trace array including at least an event trace ID and an error flag, said event trace ID identifying an operation occurring in said device, wherein the insertion of said event trace ID in the trace array is initiated by the execution of said operation in said retry domain.

1. Apparatus for detecting and isolating fault conditions within a digital electronic system, comprising:

(a) a first digital logic array for generating digital output signals in response to digital signal inputs thereto;

(b) a second digital logic array, identical to said first array, said second array normally receiving as its inputs, the digital signal inputs to said first array and producing digital output signals in response to said digital signal inputs;

(c) means for operating said first and second arrays in synchrony to normally produce identical digital outputs in the absence of a fault condition occurring in said first array;

(d) first residue code generating means coupled to receive said digital outputs of said first array;

(e) second residue code generating means coupled receive said digital outputs of said first array, the modulo of said second residue code generating means being different from the modulo of said first residue code generating means;

(f) third residue code generating means, identical to said first residue code generating means coupled to receive said digital outputs from said second array;

(g) fourth residue code generating means, identical to said second residue code generating means coupled to receive said digital outputs from said second array;

(h) first comparator means coupled to the output of said first and third residue code generating means for detecting inequality between the residue codes issued by said first and third residue code generating means;

(i) second comparator means coupled to the output of said second and fourth residue code generating means for detecting inequality between the residue codes issued by said second and fourth residue code generating means; and

(j) combinatorial logic means for providing an output signal indicative of a fault condition when either said first or said second comparator means produces an output indicative of inequality between respective residue codes.

4,924,468

LOGIC ANALYZER

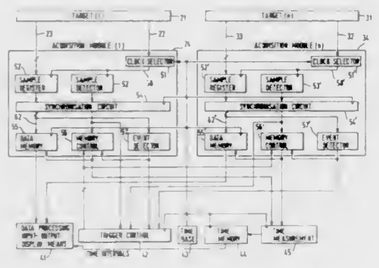
Dieter K. Horak, Moosburg, and Rodolf Wieczorek, Munich, both of Fed. Rep. of Germany, assignors to Kontron Holding AG, Zurich, Switzerland

Filed Nov. 16, 1988, Ser. No. 272,158

Claims priority, application Switzerland, Nov. 30, 1987, 4655/87

Int. Cl.[5] G01R *31/28*

U.S. Cl. 371—22.1 8 Claims



1. A logic analyzer, characterized in that it has at least one acquisition module (24, 34) which can be connected to an associated target (21, 31) and which acquisition module comprises the following circuit arrangements:

(a) clock selector means enabling the selection either of a constant-frequency internal clock signal or of an external clock signal derived from an associated target, selected clock signal appearing at the output of the sample clock signal;

(b) sample register means to store data signals delivered by the target and sampled by the sample clock signal;

(c) sample detector means which responds to the sample clock signal by delivering for each sampling as an output signal a sample signal from which the instant of time of sampling can be derived;

(d) synchronizing circuit means comprising a synchronization register means for storing data signals read out of the sample register means in response to the sample clock signal and sampled by the internal clock signal, and logic circuit means responsive to the internal clock signal and to the sample signal for delivering sample marking pulses for marking sampling time;

(e) event detector means for comparing data signals read out of the synchronization register means of the synchronization circuit means with a predetermined pattern and in the event of coincidence, for delivering an output signal corresponding to an event;

(f) memory control means providing a logic link between control signals delivered by a trigger control means, one or more output signals of the event detector means and one or more sample marking pulses, for producing as output signal a recording marking pulse causing the storage of data signals which are read out of the synchronization register means in response to the internal timing signal and whose time position is marked by a corresponding sample marking pulse; and

(g) data memory means controlled by the memory control means and operative to store data signals read out of the synchronization register means.

4,924,469

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

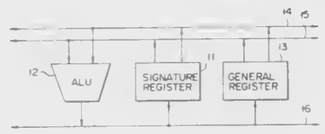
Kiichiro Tamaru, Tokyo; Koichi Tanaka, Kawasaki; Akira Kanuma, and Yasuo Yamada, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 5, 1988, Ser. No. 152,824

Claims priority, application Japan, Feb. 6, 1987, 62-25724

Int. Cl.[5] G06F *3/04*

U.S. Cl. 371—22.4 10 Claims



1. A semiconductor integrated circuit device having a signature register operable in a test mode, comprising:

test mode means for providing a test mode;

a signature register coupled to the test mode means;

means coupled to the signature register for operating the signature register in the test mode;

means coupled to the signature register for setting a signature in the signature register;

means coupled to the signature register for generating a machine instruction; and

means coupled to the signature register for recognizing the machine instruction to access the signature register.

4,924,470

LASER DIODE CONTROL APPARATUS

Gordon Ries, 1712 Huron Trail, Plano, Tex. 75075

Filed Jul. 25, 1989, Ser. No. 384,626

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—26 11 Claims



1. Laser diode wavelength shift control apparatus comprising, in combination:

laser diode first means, including signal input means and signal output means, said first means changing in operational wavelength as a function of current passing therethrough, where the function includes a non-linear "knee";

signal source second means, connected to said input means of said first means, for passing a given frequency binary data first signal through said first means wherein the two logic levels alter current levels in said first means between opposite sides of said "knee";

intermodulation signal source third means, connected to said first means, for superimposing upon said data first signal intermodulation second and third signals, whose frequencies are different and are both low compared to the data rate of said first signal, the second and third signals creating maximum intermodulation signal levels when the current in said first means corresponds to said "knee";

second signal frequency amplitude detection and feedback fourth means, connected between said output means of said first means and said third means, for adjusting the amplitude of said second signal toward a value whereby the amplitude of said second signal frequency components appearing at said output means of said first means is maintained constant; and

intermodulation signal frequency amplitude detection and feedback fifth means, connected between said output means of said first means and said second means, for adjusting the amplitude of said first signal toward a value whereby the amplitude of said intermodulation frequency components appearing at said output means of said first means is maintained constant.

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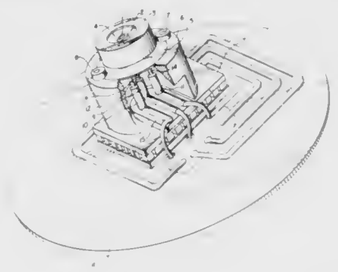
METHOD FOR INCREASING THE OUTPUT POWER OF A LASER DIODE

John H. Clark, Wheaton; James H. Fisher, Aurora, and Thomas Wolfram, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 13, 1989, Ser. No. 322,196

Int. Cl.[5] H01S *3/04*

U.S. Cl. 372—34 16 Claims



1. A method for increasing the optical output power of a GaInP based laser diode which comprises:

(a) placing said diode in an environment having an ambient temperature in the range from about 10° to about 40° C.;

(b) cooling said diode with thermoelectric cooling means to an operating temperature which is lower than said ambient temperature; and

(c) operating said diode in said environment at said operating temperature, wherein said operating temperature is effective to increase the optical output power of said diode by at least 100% relative to the output power of said diode when measured at said ambient temperature and a constant driving current.

4,924,472

LASER OUTPUT POWER STABILIZING APPARATUS OF A CONTINUOUS-WAVE GAS LASER DEVICE

In W. Lee, and Dong J. Shin, both of Taejon, Rep. of Korea, assignors to Korea Standards Research Institute, Chungnam, Rep. of Korea

Filed Sep. 8, 1988, Ser. No. 241,661

Claims priority, application Rep. of Korea, Jul. 13, 1988, 1988-8693

Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—29 4 Claims

1. A continuous-wave laser output power stabilizing apparatus, comprising:

a power supply means for supplying power to said apparatus;

a laser head means for generating a laser beam having a discharge tube, an auxiliary electrode and at least two reflectors, and further having an anode portion and cathode portion connected to said power supply means;

a detector means for detecting laser output power fluctuations and for providing an output signal therefrom;

a feedback control means for receiving said feedback signal from said detector means and for controlling voltage



applied to said auxiliary electrode of said laser head means to thereby stabilize said laser output power fluctuations.

4,924,473

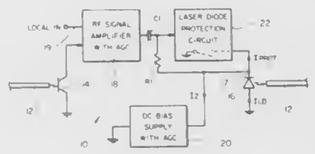
LASER DIODE PROTECTION CIRCUIT

Lajos Burgyan, Palo Alto, and Wilfred L. Hand, Mountain View, both of Calif., assignors to Raynet Corporation, Menlo Park, Calif.

Filed Mar. 28, 1989, Ser. No. 329,797

Int. Cl.[5] H01S *3/04*

U.S. Cl. 372—38 20 Claims



1. A method for protecting a laser diode included within an electro-optical circuit including: the laser diode, a DC bias supply for supplying forward conduction current to the laser diode to cause it to emit light energy at a predetermined quiescent operating point, and an RF amplifier means for supplying an RF amplitude of an analog modulating signal to the laser diode for modulating the intensity of the emitted light energy about the quiescent operating point thereof, the method including providing a very high impedance to said laser diode during its nominal operating conditions about said quiescent point and, the steps of:

sensing an instantaneous amplitude of the RF amplitude modulating signal to detect amplitude surges therein,

responding to the sensing means by removing forward conduction current from the laser diode during the sensed amplitude surges in the RF amplitude of the analog modulating signal, thereby causing the laser diode to reduce emission of light energy to a safe level.

4,924,474

LASER DEVICE WITH HIGH OSCILLATION EFFICIENCY

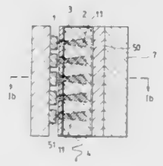
Shigenori Yagi; Yasuhito Myoi; Masaki Kuzumoto; Kazuki Kuba; Yoshito Seiwa; Toshitaka Aoyagi, and Yutaka Mihashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 308,586

Claims priority, application Japan, Feb. 10, 1988, 63-29205; Mar. 24, 1988, 63-70241; Aug. 18, 1988, 63-205577; Aug. 31, 1988, 63-217621

Int. Cl.[5] H01S *3/091*

U.S. Cl. 372—75 **17 Claims**



1. A laser device, comprising:

a laser medium;

a semiconductor light-emitting element, disposed adjacent said laser medium, for exciting said laser medium directly;

a reflecting surface surrounding the outer periphery of said laser medium along its optical axis;

an opening provided in a part of said reflecting surface for causing light from said semiconductor light-emitting element to be incident upon said laser medium.

4,924,475

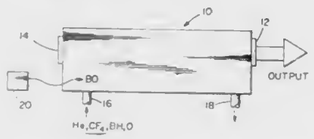
BORON OXIDE LASER WITH CF_4 ADDITIVE

John J. Hinchen, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 23, 1989, Ser. No. 300,774

Int. Cl.[5] H01S *3/095*

U.S. Cl. 372—89 **17 Claims**



1. An optical gain medium comprising BO and CF_4.

4,924,476

TRAVELING WAVE SEMI-CONDUCTOR LASER

Abbas Behfar-Rad, and S. Simon Wong, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Dec. 4, 1987, Ser. No. 129,024

Int. Cl.[5] H01S *3/083*

U.S. Cl. 372—94 **9 Claims**

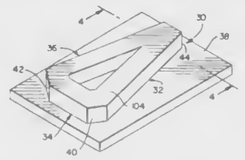
1. A ring-type laser comprising:

a substrate;

a monolithic laser body on said substrate and etched to form a laser structure, said laser structure including at least three longitudinal, integrally formed cavity sections with each section having first and second ends and an axis and each section defining a longitudinal light path along its axis, corresponding ends of said sections being integral to define at least three apexes at the intersections of the axes of adjoining sections, said axes intersecting at preselected angles to form a closed ring-type light path in the laser structure;

current supply means connected across said laser structure for stimulating light emission within each said cavity section, whereby light propagates therein along light paths parallel to the axes of said cavity sections; and

a facet integral with said laser structure at each of said apexes, each facet being positioned at its corresponding apex at preselected angles with the axes of adjoining sections to produce internal reflection of at least a part of said



stimulated light propagating in said cavity sections to direct said light along said closed light path, said facets having a critical angle and each being positioned at a preselected angle with respect to the axes of adjacent cavity sections so as to cause at least a portion of said light propagating along said closed light path to impinge on each of said facets in turn, the angle between a line perpendicular to at least one of said facets and its adjacent cavity section axes being selected to be equal to or less than the critical angle thereof to thereby select the amount of light emitted by said laser.

4,924,477

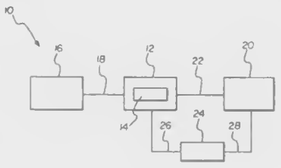
ASSEMBLY AND METHOD FOR DETERMINING THE COEFFICIENT OF THERMAL EXPANSION OF A WORKPIECE

James F. Gilmore, Rochester; Carl A. Lloyd, East Bloomfield, and Charles S. Kirk, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1989, Ser. No. 301,211

Int. Cl.[5] G01N *25/16*; G01B *11/02*

U.S. Cl. 374—55 **20 Claims**



1. An assembly suitable for determining a coefficient of thermal expansion of a workpiece having opposite ends, the assembly comprising:

(a) a chamber which surrounds and is spaced apart from the workpiece;

(b) means for locating the workpiece in the chamber including a first imaging device attachable to one end of the workpiece to move with said one end and a second imaging device attachable to the other end of the workpiece to move with said other end;

(c) means for selectively changing and monitoring the temperature of the workpiece;

(d) a dual channel laser interferometer system including a source of first and second measurement laser beams of different frequencies placed in operative association with the workpiece so that, under testing conditions, the first beam is reflected off said first imaging device and the second beam is reflected off said second imaging device, said imaging devices moving with said ends to induce frequency shifts in said beams from which information concerning the length of the workpiece is obtained; and

(e) a data acquisition system for computing the coefficient of thermal expansion of the workpiece based on the temperature and length of the workpiece under test.

16. A method for determining a coefficient of thermal expansion of a workpiece having opposite ends, which method comprises:

(a) locating the workpiece in a chamber which surrounds and is spaced apart from the workpiece, including attaching a first imaging device to one end of the workpiece to move with said one end and a second imaging device to the other end of the workpiece to move with said other end;

(b) changing the temperature of the chamber, which in turn, causes the temperature of the workpiece to change from an arbitrary and known state to a measurable isothermal state; and

(c) placing in operative association with the workpiece a dual channel laser interferometer system having first and second measurement laser beams of different frequencies, with the first beam being reflected off said first imaging device and the second beam being reflected off said second imaging device, said imaging devices moving with said ends to induce frequency shifts in said beams for obtaining information concerning the change in length of the workpiece, as the chamber temperature changes from the arbitrary and know state to the isothermal state.

4,924,478

METHOD OF AND DEVICE FOR CONTACTLESS TEMPERATURE MEASUREMENT OF AN OBJECT INDEPENDENTLY OF RADIATION EMISSIVITY

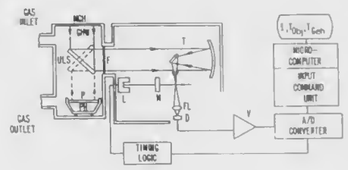
Volker Tank, Eching a.A., Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt E.V., Cologne, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,553

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321874; Jun. 16, 1983, 3321875

Int. Cl.[5] G01J *5/00*

U.S. Cl. 374—121 **7 Claims**



1. A device for contactless actual temperature measurement of an object, comprising:

a spectrometer for measuring radiation in discrete wavelength ranges, the spectrometer including a radiation modulator having a plurality of filters for selectively passing a succession of visible and/or infrared radiation beams of radiation emitted by the object corresponding to the transmission ranges of the filters;

a detector arranged opposite the modulator for producing electrical output signals proportional to the radiation passing through the modulator;

an analog/digital converter connected to the detector via an amplifier;

a timing circuit connected to the modulator for supplying to the analog/digital converter clock pulses at a clock frequency which are synchronized with the modulator whereby the analog/digital converter generates digital signals at the clock frequency;

a microprocessor programmed for an iterative computation and having an input unit connected to the analog/digital converter and a display unit for indicating the actual temperature, emissivity of the object and the environment temperature; and

a controlled deviating mirror tiltable between a first and a second position relative to the object and the environment, the tilting mirror being adjusted so as to direct in the first position thereof the radiation emerging from the object, and in the second position thereof similarly directing the radiation emitted by the environment, into the spectrometer.

4,924,479

COMMUNICATION CONTROL SYSTEM

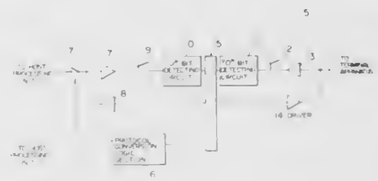
Hideki Iwao, Nagoya; Michio Kato, Seto, and Shuichi Yamano, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1987, Ser. No. 83,165

Claims priority, application Japan, Aug. 12, 1986, 61-189202

Int. Cl.[5] H04B *1/38*

U.S. Cl. 375—7 **7 Claims**



1. A communication control system arranged between a plurality of terminal apparatuses and a host processing unit in order to send and receive signals based on a non-return-to-zero inverted (NRZI) coding system between them by way of a half duplex communication system, comprising:

branch means in which one end is connected to the host processing unit by a first signal line and the other end is connected to said plurality of terminal apparatuses through a second signal line;

said branch means having first and second transmission paths connected in parallel between said one end and the other end;

said first transmission path having a first switching circuit to disconnect or connect said first transmission path, a first "0" bit detecting circuit to detect a "0" bit of a one-bit length in the signal which passes through the first transmission path in a direction from said one end to the other end, and a first control circuit to control a second switching circuit of said second transmission path in response to an output of said first "0" bit detecting circuit; and

said second transmission path having said second switching circuit to disconnect or connect the second transmission path, a second "0" bit detecting circuit to detect a "0" bit of a one-bit length in the signal which passes through the second transmission path in a direction from the other end to the one end, and a second control circuit to control said first switching circuit in response to an output of said second "0" bit detecting circuit.

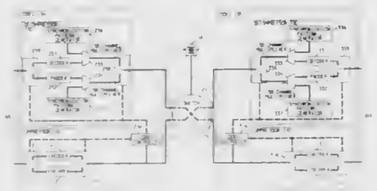
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4,924,480

CODECS WITH SUPPRESSION OF MULTIPLE ENCODING/DECODINGS ACROSS A CONNECTION

Steven L. Gay, Lincroft; Richard D. Gitlin, Little Silver, and John Hartung, Marlboro, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Mar. 11, 1988, Ser. No. 166,867
Int. Cl.[5] H04L *3/00*
U.S. Cl. 375—8 **28 Claims**



1. A codec having a capability of decoding a coded digital input signal into a decoded digital output signal, for use in a system in which said codec is connected to receive said coded digital input signal and is further connected to a communication endpoint via a transmission path, said communication endpoint for receiving intelligence in decoded form and said codec being adapted to generate an output digital signal destined for said communication endpoint in response to said coded digital input signal, said output signal representing said intelligence to be received by said endpoint and said coded digital input signal representing said intelligence in coded form, said codec comprising,

first means for forming a determination as to whether said transmission path includes means for decoding a signal representing said intelligence in said coded form into a signal representing said intelligence in said decoded form,

second means operative when said determination is that said path does not include said means for decoding, for decoding said coded digital input signal into said decoded digital output signal, said decoded digital output signal representing said intelligence in decoded form, and

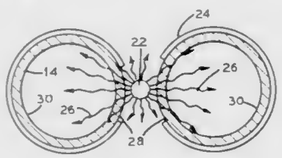
third means operative when said determination is that said path does include said means for decoding, for generating as said digital output signal a signal in which said coded digital input signal is embedded.

4,924,481

RADIOGRAPHIC INSPECTION OF TUBE WELDS IN PANEL WALLS

Henry P. Vaughn, Canal Fulton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 3, 1989, Ser. No. 374,728
Int. Cl.[5] G01B *15/06*
U.S. Cl. 378—59 **10 Claims**



1. A radiographic method of inspecting tube welds in tubular membrane panel walls comprising the steps of:

(a) installing a radiation source intermediate an adjacent pair of tube welds in a tubular membrane panel wall;

(b) securing a radiation receiver around a perimeter portion of each said tube weld, said radiation receivers closely conforming to their respective perimeter portion and covering at least one critical area of its respective tube weld, a critical area of a tube weld being that region where a tube and a membrane bar join; and,

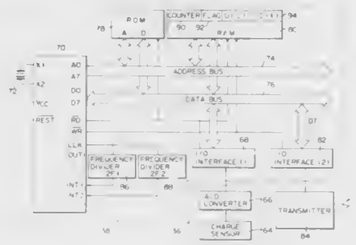
(c) simultaneously exposing each said radiation receiver to said radiation source thereby creating an image of said perimeter portion of each said tube weld.

4,924,482

DATA-TRANSMITTING APPARATUS

Giichiro Shimizu; Misao Shimizu; Hajime Takeuchi; Toshiharu Okuyama, and Yoshio Wakatsuki, all of Tokyo, Japan, assignors to Man Design Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 111,673, Oct. 23, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 346,360
Claims priority, application Japan, Jan. 22, 1987, 62-12701
Int. Cl.[5] H03C *3/00*
U.S. Cl. 375—65 **16 Claims**



16. A remote measuring device comprising:

measuring means for measuring a physical parameter and for providing a digital value indicating said measured physical parameter;

data transmitter means for transmitting signals to a remote location in response to signals applied to an input terminal thereof;

oscillator means for generating a clocking signal;

first frequency divider means connected to receive said clocking signal for dividing said clocking signal by a first dividing factor to provide a first frequency signal;

second frequency dividing means connected to receive said clocking signal for dividing said clocking signal by a second dividing factor to provide a second frequency signal; and

microprocessor means, connected to receive said digital signal, said clocking signal, and said first and second frequency signals and operatively connected to said transmitter means input terminal, for applying a serial digital output signal to said data transmitter means input terminal, said microprocessor means including:

means for generating a digital signal message containing said digital value, said message having a first bit and a next bit,

first interrupt routine means responsive to said first frequency signal for:

(a1) examining the value of said first bit,

(b1) applying said first frequency signal to said data transmitter means input terminal during a first time period if said first bit has a first value,

(c1) examining the value of said next bit, and

(d1) applying said first frequency signal to said data transmitter means input terminal during a further time period after said first time period if said next bit has said first value; and

second interrupt routine means responsive to said second frequency signal for:

(a2) examining the value of said first bit,

(b2) applying said second frequency signal to said data transmitter means input terminal during said first time period if said first bit has a second value different from said first value,

(c2) examining the value of said next bit, and

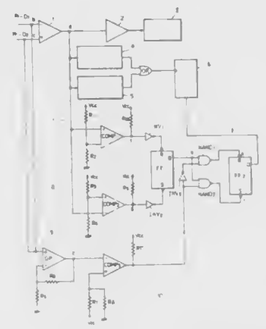
(d2) applying said second frequency signal to said data transmitter means input terminal during said further time period if said next bit has said second value different from said first value.

4,924,483

TRACK COUNTING CIRCUIT FOR USE IN AN OPTICAL DISK DRIVER

Hun C. Cho, Seoul, Rep. of Korea, assignor to Samsung Electronics Co. Ltd., Suwon, Rep. of Korea

Filed Sep. 16, 1988, Ser. No. 245,582
Claims priority, application Rep. of Korea, Sep. 17, 1987, 1987-10329
Int. Cl.[5] H03K *5/24, 21/02*
U.S. Cl. 377—3 **22 Claims**



1. A track counting circuit for use in an optical disk driver, comprising:

a differential amplifier connectable to a plurality of photo diodes subjectable to exhibiting a direction of movement, said differential amplifier receiving signals from photo diodes as the photodiodes traverse tracks and lands of a disk and providing output signals in correspondence thereto;

a positive zero crossing detector and a negative zero crossing detector operating upon said output signals to generate said indication signals indicative of movement of the photo diodes relative to the track an lands;

counting means for making a count of the tracks in response to indication signals;

first logic means including a first logic device, for operating on said output signal to detect and provide tracking signals indicating direction of movement the photodiodes,

second logic means for operating on said output signal to distinguish and generate a comparison signals indicating whether the photodiodes are placed on a track or land of a disk,

a second logic device controlling whether said counting means makes an up count or down count of the tracks,

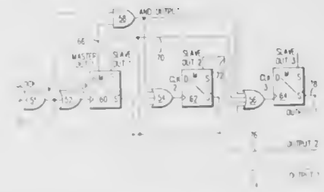
third logic means coupled between said second logic device and said first and second logic means, for responding to said tracking signal and comparison signal, whereby said third logic means and second logic device are controlled, thereby controlling the up count or down count of the tracks by said counting means.

4,924,484

HIGH SPEED DIGITAL COUNTER

Lawrence J. Grasso, Austin, Tex.; Dale E. Hoffman, Stormville, N.Y.; Carroll E. Morgan, Wappingers Falls, N.Y.; Charles A. Puntar, Hopewell Junction, N.Y., and Diane K. Young, Wappingers Falls, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,092
Int. Cl.[5] H03K *21/02, 23/40*
U.S. Cl. 377—116 **17 Claims**



1. A high speed counter circuit for counting electrical pulses comprising, in combination:

a master/slave flip-flop with a clock input and a master, a slave and an inverse slave output;

means coupling said clock input to the electrical pulses to be counted;

AND gate means for producing a first gating signal from the logical AND of the electrical pulses being counted with said master output of said master/slave flip-flop;

a plurality of other flip-flops coupled in cascade each having a clock input, a slave output and an inverse slave output, said clock input of each cascade coupled flip-flop being coupled to the output of an OR gate, the input of which comprises the electrical pulses being counted, said first gating signal, said slave output of said master/slave flip-flop and said slave output of each preceding cascade coupled flip-flop;

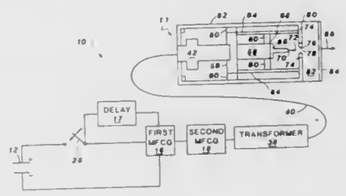
said inverse slave output of each said cascade coupled flip-flop and said master/slave flip-flop comprise the output for each flip-flop stage of the counter.

4,924,485

PORTABLE RADIOGRAPHY SYSTEM USING A RELATIVISTIC ELECTRON BEAM

Robert F. Hoeberling, 502 Hamlin Ct., Los Alamos, N. Mex. 87544

Filed Sep. 22, 1987, Ser. No. 99,850
Int. Cl.[5] H05G *1/24*
U.S. Cl. 378—102 **15 Claims**



1. A portable radiographic generator comprising:

magnet means for producing a field comprising magnetic flux;

compression generator means for compressing said magnetic flux to produce a high voltage pulse effective for generating a relativistic electron beam;

diode means having a cathode and an anode responsive to said voltage pulse for generating a relativistic electron beam pulse, said cathode and anode having a

shape and spacing effective to require a high voltage therebetween from said compression generator for an initial plasma generation and to thereafter provide an increased electrode area accessible to said plasma to obtain a low resistance for high current production from said high voltage producing said plasma.

4,924,486

FILM-RECEIVING CASSETTE HAVING SPIRAL GUIDE PLATE

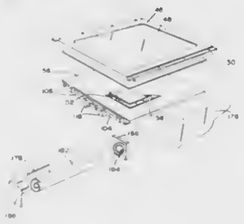
Otto K. Weber, Chatsworth, and Lief A. Johansson, Agoura, both of Calif., assignors to Medrad, Inc., Pittsburgh, Pa.

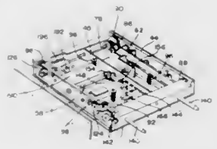
Division of Ser. No. 801,595, Nov. 23, 1985, Pat. No. 4,782,504. This application Oct. 28, 1988, Ser. No. 263,894

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[5] G03B *42/02*

U.S. Cl. 378—173 8 Claims





1. A passive-type cassette which includes no film driving mechanism, for receiving exposed resilient film from a film exposure device, which comprises:

an essentially box-shaped member having a film-receiving feed-in aperture; and

a spirally-shaped guide plate formed into an inwardly spiraling configuration such that a first resilient film fed into the inwardly spiraling configuration, is fed along an inwardly spiraling path defined by said spirally-shaped guide plate, and becomes disposed into engagement with an inner surface of the guide plate and assumes a configuration corresponding to that of the guide plate to facilitate storage of the film, the guide plate being positioned such that each subsequently fed film becomes nested within each previously received film and maintained in nested relationship regardless of the orientation of the cassette.

4,924,487

X-RAY DIAGNOSTIC APPARATUS

Masayuki Nishiki, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 1, 1988, Ser. No. 213,965

Claims priority, application Japan, Jul. 3, 1987, 62-165300

Int. Cl.[5] H05G *1/64*

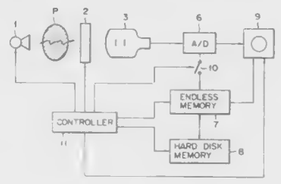
U.S. Cl. 378—190 9 Claims

1. An X-ray diagnostic apparatus comprising:

X-ray image detecting means, having a fluoroscopy mode and a radiography mode for, in the fluoroscopy mode, radiating fluoroscopic X-rays onto an object being examined so as to detect X-ray fluoroscopic image data of the object being examined, and for, in the radiography mode, radiating radiographic X-rays onto the object being examined so as to detect X-ray radiographic image data of the object being examined, the radiography mode being selected in response to a radiography instruction applied in the fluoroscopy mode;

display means for displaying the X-ray fluoroscopic image data obtained by said X-ray image detecting means in the fluoroscopy mode;

radiographic image recording means for recording the X-ray radiographic image data obtained by said X-ray image detecting means in the radiography mode;



A/D (analog-to-digital) conversion means for converting the X-ray fluoroscopic image data obtained by said X-ray image detecting means in the fluoroscopy mode into a digital signal; and

fluoroscopic image storage means for continuously storing a plurality of frames of digital image signals of X-ray fluoroscopic images obtained by said A/D conversion means in correspondence with a period which includes an input timing of the radiography instruction.

4,924,488

MULTILINE COMPUTERIZED TELEPHONE MONITORING SYSTEM

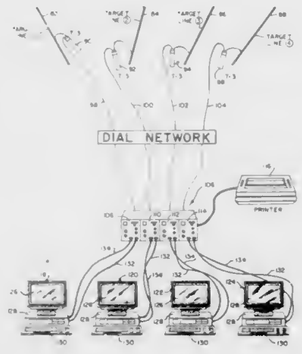
Milo Kosich, Cuyahoga Falls, Ohio, assignor to Enforcement Support Incorporated, Cuyahoga Falls, Ohio

Continuation-in-part of Ser. No. 78,593, Jul. 28, 1987, Pat. No. 4,815,120. This application Feb. 23, 1989, Ser. No. 314,449

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[5] H04M *15/04, 15/18, 15/22, 3/22*

U.S. Cl. 379—34 17 Claims



1. A telephone monitoring system comprising,

monitor means for attachment to at least one of a number of target telephone lines to simultaneously sense voltage changes on the lines and convert the voltage changes into data input capable of being stored,

a number of computers corresponding in number to the number of target telephone lines being sensed for voltage changes by said monitor means,

each computer having a memory unit with a program and a keyboard to allow an operator to input data into said memory,

means for electrically connecting said computer memory unit of each computer through said monitor to the respective target telephone line for the transmission of input data from the telephone line to said monitor and therefrom to said computer memory unit,

a processing unit associated with each computer for receiving and processing data from said monitor means and said keyboard to develop responsive data by operation of said program contained in said memory unit, and

a display screen associated with each computer and connected to said processing unit, said keyboard, and said memory unit for independently displaying data entered through said monitor in response to the input data from the respective telephone lines and data entered from the keyboard and developed by said processing unit.

4,924,489

CUSTOMER LINE TESTER

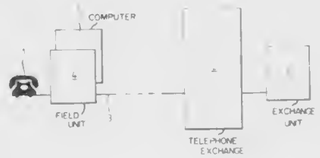
Peter J. Lawrence, Felixstowe, and David W. Pring, Stowupland, both of England, assignors to British Telecommunications public limited company, United Kingdom

Filed Apr. 6, 1989, Ser. No. 333,921

Claims priority, application United Kingdom, Apr. 12, 1988, 8808623

Int. Cl.[5] H04B *3/46*

U.S. Cl. 379—6 21 Claims



1. Apparatus for testing a telephone line between a customer's telephone and a local exchange associated therewith, the apparatus comprising:

a field unit positionable between the customer's telephone and the line,

an exchange unit positionable at the exchange, and control means including means for calculating associated with the field unit for controlling operation of the field unit and the exchange unit,

wherein the field unit and the exchange unit each have means for transmitting a plurality of frequency tones down the line and means for measuring the voltage across the line, and

wherein the control means is effective to instruct the field unit to send a plurality of frequency tones to the exchange unit for measurement of the line voltage at each frequency, to instruct the exchange unit to send a plurality of frequency tones to the field unit for measurement of the line voltage at each frequency, to instruct the exchange unit to send the voltage values measured thereby to the field unit, and to calculate the loudness rating of the line from the measured voltage values.

4,924,490

X-RAY MIRROR AND PRODUCTION THEREOF

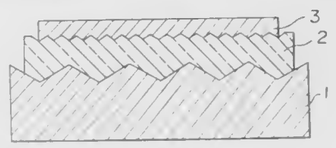
Yoichi Hashimoto, and Masami Inoue, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 300,949

Claims priority, application Japan, Feb. 9, 1988, 63-28360

Int. Cl.[5] G21K *1/00*

U.S. Cl. 378—145 6 Claims



1. An X-ray mirror which comprises, in combination: a substrate having the surface roughness of 1,000 Å or below; an intermediate layer of high molecular weight organic polymer material formed on said substrate and having a surface roughness of 100 Å or below; and a thin film formed on said intermediate layer.

4,924,491

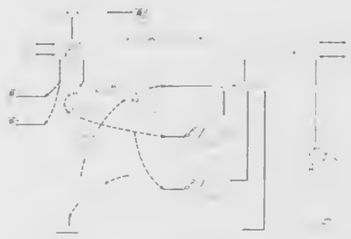
ARRANGEMENT FOR OBTAINING INFORMATION ABOUT ABANDONED CALLS

Merle F. Compton, Thornton; Vincent D. Vanacore, Boulder, and Brian W. Walsh, Westminster, all of Colo., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Nov. 18, 1988, Ser. No. 273,285

Int. Cl.[5] H04M *11/04, 3/50;* G08B *25/00*

U.S. Cl. 379—37 15 Claims



1. Apparatus for providing information about an abandoned call, comprising

means responsive to a call for determining an origin of the call;

means for detecting that the call has been abandoned prior to being one of (a) assigned or (b) answered; and

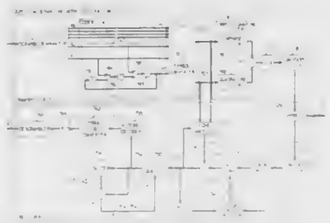
means connected to the determining means and to the detecting means, for obtaining geographical location address of the determined call origin, in response to the detection of abandonment of the call, to make the information available to a user.

4,924,492

METHOD AND APPARATUS FOR WIDEBAND TRANSMISSION OF DIGITAL SIGNALS BETWEEN, FOR EXAMPLE, A TELEPHONE CENTRAL OFFICE AND CUSTOMER PREMISES

Richard D. Gitlin, Monmouth County; Sailesh K. Rao, Ocean County; Jean-Jacques Werner, and Nicholas Zervos, both of Monmouth County, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems, Inc., Morristown, N.J.

Filed Mar. 22, 1988, Ser. No. 171,636
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—93 28 Claims



1. A data communication method comprising the steps of
generating an outbound passband signal representing a stream of outbound data bits,
applying said outbound passband signal to a two-wire telephone local loop,
receiving over said telephone local loop an inbound passband signal representing a stream of inbound data bits, said inbound passband signal including echoes of said outbound passband signal,
generating a replica of said echoes,
substracting said replica from said inbound passband signal to generate an echo compensated signal, and
recovering said inbound data bits from said echo-compensated signal,
at least one of said inbound or outbound bit streams being at a rate of at least 160 kb/s.

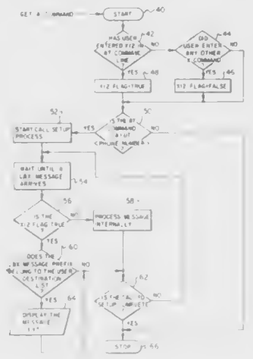
4,924,493

METHOD FOR MONITORING CALL SETUP COMMUNICATIONS

Mieu-Hong Dang, and Jorge R. Taborga, both of Austin, Tex., assignors to IBM Corporation, Armonk, N.Y.

Filed Sep. 19, 1988, Ser. No. 246,473
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—94 7 Claims

1. A method of monitoring call setup communications for data communication between a communication station and a telecommunications network, said method comprising the steps of:
transmitting a plurality of digital result codes corresponding to multiple command and information messages from said telecommunication network to said communication station in response to an attempted call setup for data communications;
selecting from said plurality of digital result codes received at said communication station only those particular digital result codes indicative of selected call setup information; and



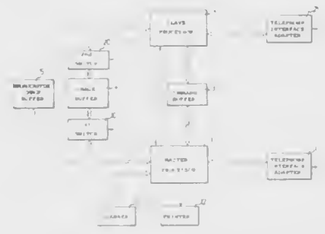
displaying at said communication station a user discernible indication of said selected call setup information.

4,924,494

FAX MACHINE EQUIPPED FOR SIMULTANEOUS TRANSMISSION AND RECEPTION VIA TWO TELEPHONE LINES

Kevin Shung, Taipei, Taiwan, assignor to Copam Electronics Corp., Taipei, Taiwan

Filed May 5, 1989, Ser. No. 347,667
Int. Cl.[5] H04M *1/21, 11/00*
U.S. Cl. 379—100 2 Claims



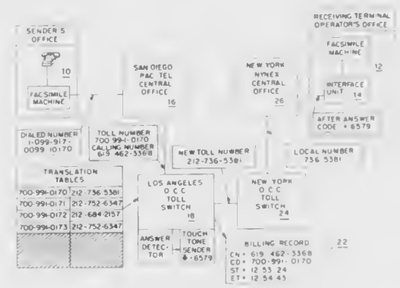
1 A fax machine equipped for simultaneous transmission and reception via two telephone lines, comprising a master processor connected to a first telephone interface adapter and a first telephone line for communicating with a first remote fax machine, a printer connected to said master processor for printing image data received from said first remote fax machine, and a scanner for scanning image data to be transmitted to said first remote fax machine, characterized in that said fax machine further comprises:
a slave processor connected to a second telephone interface adapter and a second telephone line for communicating with a second remote fax machine;
a command buffer electrically interposed between said master and said slave processor, and providing a transmission channel for command signals therebetween;
an image buffer connected to said master processor via a first control switch and to said slave processor via a second control switch to store said image data at the request of said master processor when transmitting said image data to said second remote fax machine and to store said image data at the request of said slave processor when receiving said image data from said second remote fax machine;
said slave process switching off said second control switch and said master processor switching on said first control switch so that said master processor stores said image data into said image buffer when said slave processor is requested to transmit image data from said scanner to said second remote fax machine; said master processor switching off said first control switch after having stored said image data into said image buffer and said slave processor switching on said second control switch to transmit said image data to said second remote fax machine; and
said master processor switching off said first control switch and said slave processor switching on said second control switch to store said image data into said image buffer when said slave processor receives said image data; said slave processor switching off said second control switch after finishing receipt of said image data and said master processor switching on said first control switch and outputting said image data via said printer.

4,924,495

ENHANCED COMMUNICATION SERVICES AND APPARATUS

Philip C. Richards, 59 Old Highway, Wilton, Conn. 06897, and Robert T. Evans, 28 Sunset Dr., Weston, Conn. 06883

Filed Sep. 1, 1988, Ser. No. 239,402
Int. Cl.[5] H04M *3/02, 15/00*
U.S. Cl. 379—127 6 Claims



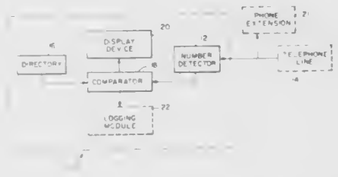
1. A method for communicating between a first communication terminal and any selected one of a group of second remotely disposed compatible communication terminals using a designated communication service of a designated common carrier having toll switches connectable via local telephone company central offices between the first terminal and any selected second terminal, each terminal having at least one different postal zip code assigned thereto that designates the geographical location thereof, each second terminal being provided with means to receive a designated security code from a toll switch which identifies the designated service means to record the time, date and type of call identified by the designated security code, means to initiate receipt of any message transmitted thereto, means responsive to the end of any message transmitted thereto to terminate reception and to send an end of reception signal to said toll switch, said method comprising the steps of:
selection at the first terminal of any one of said second terminals;
dialing at the first terminal the number 1-0xx-x17-00yy plus the zip code of the selected second terminal where xxx is the occasional user carrier access code for said carrier and yy designates any two digits, each digit having a value from one to nine, other than the combination of five and five [55] as assigned by the designated common carrier to identify the selected communication service, the call progressing automatically through a local central office connected to the first terminal, at least one toll switch and a local central office connected to the selected second terminal;
automatically sending an acknowledgement of receipt of the call from the selected second terminal to a toll switch;
upon receipt of the acknowledgement by said toll switch, automatically sending said security code from said toll switch to the selected second terminal;
verification at the selected second terminal upon receipt of the security code by the selected second terminal that the received security code authenticates the designated service;
recording at the selected second terminal the time, date and type of call defined byy the received security code;
initiating receipt of the call at the selected second terminal;
terminating such receipt at the selected second terminal when said call reception ends; and
automatically sending an end of message signal from the selected second terminal whereby said toll switch records all billing information concerning the call.

4,924,496

AUTOMATIC INCOMING TELEPHONE CALL ORIGINATING NUMBER AND PARTY DISPLAY SYSTEM

Romek Figa, Quincy, Mass.; Jonathan H. Cohen, Bethel, Conn., and Samuel G. Cohen, Pleasantville, N.Y., assignors to Romek Figa d/b/a Abraham & Sons, Hanover, Mass.

Filed May 12, 1988, Ser. No. 193,377
Int. Cl.[5] H04M *1/27*
U.S. Cl. 379—142 32 Claims



1. An automatic incoming telephone call number display device comprising:
a directory of telephone numbers and parties associated with those numbers;
means for detecting the origin telephone number of an incoming telephone call;
means for comparing the detected incoming telephone number with said directory of telephone numbers to identify the party associated with the incoming call number;
display means for displaying the incoming call number or the incoming call number and the identified associated party before the incoming call is answered;
means for logging the detected incoming telephone number;
means for retrieving telephone numbers of incoming calls logged by said means for logging; and
means for automatically entering telephone numbers retrieved by said means for retrieving into said directory.

4,924,497

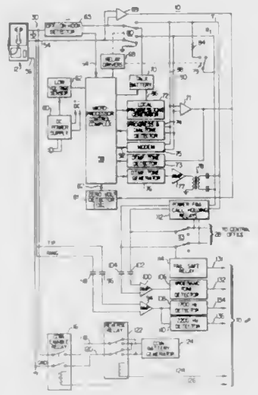
PAY STATION TELEPHONE INTERFACE CIRCUITS

Benjamin A. Smith, Celeste, and Conaway K. Hoback, Dallas, both of Tex., assignors to Digital Telecommunications Systems, Inc., Richardson, Tex.

Division of Ser. No. 912,984, Sep. 29, 1986. This application Jun. 22, 1988, Ser. No. 210,073
Int. Cl.[5] H04M *17/02*
U.S. Cl. 379—150 27 Claims

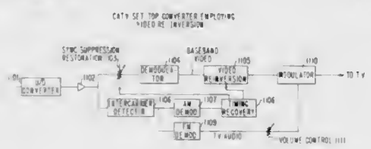
1. An interface for connection between a pay station tele-

phone and a telephone line associated with a telecommunication switching system, comprising:
means for isolating the telephone from the line during the initial placing of a call by the user of the telephone;
means for collecting digit information dialed from the telephone by the user;



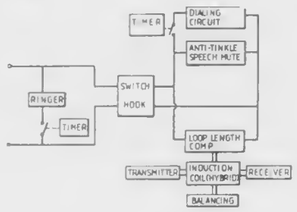
means for detecting a coin deposited in the telephone;
means for transmitting the collected digit information over the line to the switching system;
means for detecting on the line a signal indicative of an answer to the telephone call; and
means for connecting the telephone to the telephone line.

4,924,498
METHOD AND APPARATUS FOR IMPROVING VIDEO SCRAMBLING AND EMPLOYING SPLIT SNYC PULSES
James O. Farmer, Lilburn; Blair J. Schodowski, Alpharetta; Joseph G. Mobley, Danwoody; Gregory C. Cole, Marietta; John E. Tomblin, Decatur; Robert O. Banker, Cumming, and Lamar West, Maysville, all of Ga., assignors to Scientific Atlanta, Inc., Atlanta, Ga.
Filed Apr. 29, 1988, Ser. No. 188,480
Int. Cl.[5] H04N *7/167*
U.S. Cl. 380—15 **4 Claims**



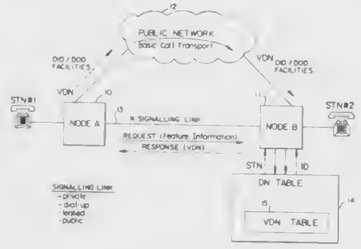
1. In a video signal transmission system, wherein said video signal comprises at least a video component and a sync pulse component, a method of transmitting said sync pulse comprising the steps of:
transmitting a first sync pulse portion at a first predetermined voltage level; and
transmitting a second sync pulse portion at a second predetermined voltage level;
wherein said video signal is scrambled by inversion of at least a portion of said video signal about a predetermined axis of inversion in a scrambler and said scrambled video signal is descrambled by reinversion about a calculated axis of inversion in a descrambler, wherein said calculated axis of inversion is derived from said first and second predetermined voltage levels.

4,924,499
TIMER CONTROL FOR TELEPHONE
Victor M. Serby, 255 Hewlett Neck Rd., Woodmere, N.Y. 11598
Filed Feb. 25, 1988, Ser. No. 162,500
Int. Cl.[5] H04M *1/21, 1/66*
U.S. Cl. 379—200 **4 Claims**



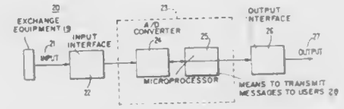
1. A device for selectively and independently switching the dialing and ringing functions of a telephone between operating and non-operating states comprising:
(a) a switch having a first state and a second state which can allow the flow of phone line current to said telephone when said switch is in said first state and can restrict the flow of phone line current to said telephone when said switch is in said second state;
(b) a means for detecting a ring signal on a telephone line;
(c) a timer acting in conjunction with said means for detecting a ring signal to control said states of said switch, said switch being in said second state in absence of a detected ring signal;
(d) rectification means for allowing the flow of DC current to said telephone and rectifying AC current to said telephone, said rectification means bypassing said switch; and
(e) means to selectively allow or block current flow through said rectification means.

4,924,500
CARRIER INDEPENDENT NETWORK SERVICES
Harry E. Lewis; Gibson D. Ritenour, both of Plano, Tex.; Cho L. Wong, Cary, N.C.; George Gara, Ottawa, and Allen F. Eddisford, Stittsville, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed May 17, 1989, Ser. No. 353,089
Int. Cl.[5] H04M *7/00*
U.S. Cl. 379—201 **8 Claims**



1. A method of establishing carrier independent network services (CINS), comprising the steps of:
generating an intra-network call between a first station of a originating node and a second station of a terminating node;
sending a CINS request message from said originating node to said terminating node, via a signalling link connected between said originating node and said terminating node;
selecting a virtual directory number (VDN) at said terminating node to be assigned to said intra-network call;
sending a first reply message containing said selected VDN from said terminating node to said originating node;
transmitting said intra-network call with the VDN through a public network;
receiving said transmitted intra-network call with the VDN at said terminating node;
translating the VDN to a real directory number, line equipment number and network feature information; and
establishing a "call reference" between the originating and terminating nodes to link the first and second stations for the delivery of assigned network features between them.

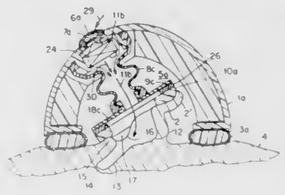
4,924,501
DIAL PULSE SELECTION
David S. Cheeseman, and Arthur J. Wright, both of Ipswich, England, assignors to British Telecommunications plc, London, United Kingdom
Continuation of Ser. No. 934,079, Nov. 24, 1986, abandoned.
This application Mar. 30, 1989, Ser. No. 331,030
Claims priority, application United Kingdom, Nov. 25, 1985, 8528951
Int. Cl.[5] H04M *3/22, 3/42*
U.S. Cl. 379—201 **22 Claims**



10. A method of detecting dial pulse signalling data in a received signal comprising the steps of:
performing a training process to train a dial pulse detector by processing a signal known to be a dialled signal; said step of performing a training process including the steps of extracting timing information relating to the dialled pulses in a dialled digit in said dialled signal and processing said timing information; and
performing a recognition process by using said processed timing information to assist said detector in detecting dial pulse signalling data in the received signal.

4,924,502
MEANS FOR STABILIZING SOUND PRESSURE PRODUCED AT THE EARDRUM UNDER AN EARPAD
Clayton H. Allen, 80 South Rd., Chebeague Island, Me. 04017-9710, and Elliott H. Berger, 7911 Zionsville Rd., Indianapolis, Ind. 46268-0898
Filed May 8, 1987, Ser. No. 47,790
Int. Cl.[5] H04R *1/10, 1/28*
U.S. Cl. 381—72 **11 Claims**

1. In a sound attenuating ear enclosure comprising a circumaural cushion, resting against the head around the ear supporting a rigid, massive shell, within which there is at least one localized source of sound that radiates a sound into an acoustic path of small volume that conducts at least a portion of said sound directly to the eardrum of the user, wherein said acoustic path of small volume comprises a confining structure comprising an earpad assembly and the user's ear, wherein said earpad assembly comprises a duct, a flange and an earpad cushion, wherein said earpad cushion is lightly pressed against the user's ear by a force exerted through said earpad assembly:
the improvement comprising apparatus for reducing the variation in sound level at the eardrum of the user, said apparatus comprising at least one specifiable acoustic side branch circuit comprising an acoustic leakage path through said earpad assembly, to carry at least some sound from said acoustic path of small volume to a larger volume comprising the space confined between the inside surface of said ear enclosure and the outside surface of the said confining structure of said acoustic path of small volume, thereby maintaining said at least one specifiable leakage



path as a minimum path for the purpose of reducing the variation in sound level at the eardrum that results from the uncontrollable, acoustic leakage openings between the adjacent surfaces of said earpad cushion and the external ear of the user, caused by the irregular size and shape of the external ear from one user to another and by the variation in the force of contact and the positioning of said earpad assembly upon the external ear of the user.

4,924,503
ELECTROACOUSTIC TRANSDUCER
Siegfried Klein, 42, rue de la tour d'Auvergne, 75009 Paris, France
Filed Mar. 17, 1989, Ser. No. 324,722
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 8803776[U]
Int. Cl.[5] H04R *15/00*
U.S. Cl. 381—190 **10 Claims**



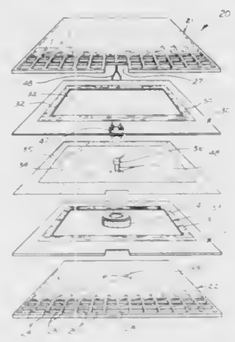
1. An electroacoustic transducer comprising a vibrating hollow body (2) with a curved surface carrying coil turns, said vibrating hollow body comprising a magnetostrictive ball, characterized in that the coil is applied to said hollow body as a corrugated strip with corrugations at right angles to the running direction.

4,924,504
AUDIO SPEAKER
Paul Burton, Alberta, Canada, assignor to Highwood Audio Inc., Ottawa, Canada
Filed Nov. 19, 1987, Ser. No. 123,191
Claims priority, application Canada, Jun. 18, 1987, 539976
Int. Cl.[5] H04R *9/00, 7/02, 7/18, 9/04*
U.S. Cl. 381—199 **2 Claims**

1. An audio transducer comprising:
a frame having a central open area,
a substantially planar, thin, flexible film forming a central portion thereof supported by said frame within said open area of said frame,
means for imparting a motion to a drive area of said diaphragm in a direction normal to the plane of the diaphragm, said drive area being small relative to the supported portion of the diaphragm whereby waves are cre-

ated in said diaphragm and radiate away from said drive area in the form of a number of waves travelling at the same time toward said frame,

said motion imparting means being a line source drive in the form of a centrally disposed linear coil provided by a plurality of juxtaposed, parallel conductors affixed to and extending for a distance along said diaphragm,



a stationary elongated magnetic means supported adjacent said coil and defining a gap receiving said coil, and

a pair of members varying a mass along their lengths provided on immediate opposite sides and extending the length of said linear coil.

4,924,505

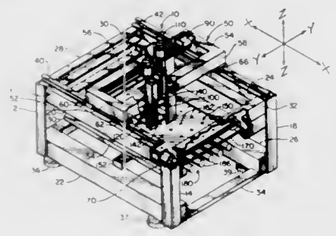
METHOD OF MENSURATION OF AN IMAGE ON AN OBJECT

Franz W. Leberl, Boulder; Milan Karspeck, Loveland; Bryan Johns, Boulder; Sean Curry, Boulder; Scott Lee, Boulder, and Dana Meyer, Boulder, all of Colo., assignors to Vexcel Corporation, Boulder, Colo.

Filed Aug. 3, 1987, Ser. No. 81,128

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—8 7 Claims



1. The method of mensuration of an image on an object, comprising the steps of:

positioning said object under a solid state camera that has a two-dimensional array of light sensing elements and focus lens means for focusing light rays emanating from the image on said object onto said array of light sensing elements, the individual light sensing elements in said array being positioned in fixed relation to a frame coordinate system that indicates the position of any of the light sensing elements in the array in relation to each other and to the camera;

positioning a reseau array of grid marks on the image of said object, said grid marks being positioned in fixed relation to an image coordinate system that indicates the position of individual grid marks in relation to the other grid marks and to the image on the object;

moving said camera over said object in relation to a table coordinate system that indicates the position of said camera as it moves over said object to a home position that is in a fixed relationship to said table coordinate system;

correlating said frame coordinate system with said table coordinate system to indicate the positions of the light sensing elements in the array to said home position;

illuminating said grid marks, and focusing light emanating from the ones of said grid marks directly under the camera onto said array of light sensing elements, measuring light intensity sensed by said light sensing elements, determining on which light sensing elements in the array that the light emanating from the grid marks is focused; and

initializing the image coordinate positions of said grid marks that are focused on said light sensing elements to said home position in relation to said table coordinate system.

4,924,506

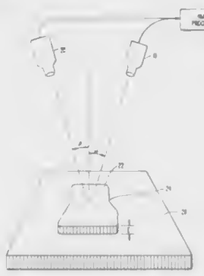
METHOD FOR DIRECTLY MEASURING AREA AND VOLUME USING BINOCULAR STEREO VISION

P. Anthony Crossley, Palo Alto; H. Keith Nishihara, Los Altos, and Neil D. Hunt, Mountain View, all of Calif., assignors to Schlumberger Systems & Services, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 888,535, Jul. 22, 1986. This application Nov. 5, 1987, Ser. No. 117,704

Int. Cl.[5] G06K *9/52*

U.S. Cl. 382—28 20 Claims



1. A method of determining the area of a selected region having an arbitrary boundary, the selected region disposed at a different elevation than a background region of known area encompassing all of the selected region comprising:

acquiring an image of all of the selected region which image includes some of the the background from each of two separated viewpoints;

in an arbitrary order, correlating a first portion of one image with a first portion of the other image, where the first portion of each image is disposed entirely within the selected region, to obtain a first correlation value;

correlating a second portion of one image with a second portion of the other image, where the second portion is disposed entirely within the background, to obtain a second correlation value;

correlating a third portion of one image with a third portion of the other image, where the third portion includes all of the selected region, to obtain a third correlation value; and then

relating the third correlation value to the difference between the first and second correlation values to provide a measure of the area of the selected region with respect to the known area of the background region.

4,924,507

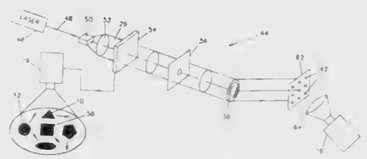
REAL-TIME OPTICAL MULTIPLE OBJECT RECOGNITION AND TRACKING SYSTEM AND METHOD

Tien-Hsin Chao, Valencia, and Hua-Kuang Liu, South Pasadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 11, 1988, Ser. No. 154,718

Int. Cl.[5] G06K *9/76*

U.S. Cl. 382—31 18 Claims



1. Apparatus for optically simultaneously recognizing a plurality of objects within a field of vision comprising:

(a) a source of a coherent collimated light beam;

(b) beam splitter means for splitting said light beam into an object beam and a reference beam;

(c) two-dimensional spatial light modulation means disposed in said object beam for modulating said object beam with optical information as a function of signals connected to X and Y inputs thereof;

(d) television camera means for developing X and Y signals reflecting the contents of its field of vision, said X and Y signals being connected to said X and Y inputs of said two-dimensional spatial light modulation means;

(e) hololens means disposed in said object beam subsequent to said two-dimensional spatial light modulation means for focusing said object beam at a plurality of focal points;

(f) planar film means disposed with said focal points on an exposable surface thereof for forming a multiple position interference filter upon exposure of said exposable surface and subsequent development processing of said film means;

(g) means for directing said reference beam onto said exposable surface of said planar film means to expose said exposable surface in combination with images focused by said hololens means forming interference patterns on said exposable surface; and,

(h) means for simultaneously sensing and indicating light passage through respective ones of the positions of said multiple position interference filter following development processing of said exposable surface whereby simultaneous recognition of objects corresponding to respective ones of said positions of said multiple position interference filter is affected.

4,924,508

PITCH DETECTION FOR USE IN A PREDICTIVE SPEECH CODER

Hubert Crepy, Paris; Philippe Elie, La Gaude; Claude Galand, Cagnes sur Mer; Emmanuel Lancon, Nice; Thierry Liethoudt, Nice, and Michele Rosso, Nice, all of France, assignors to International Business Machines, Armonk, N.Y.

Filed Feb. 12, 1988, Ser. No. 155,459

Claims priority, application France, May 3, 1987, 87 430006

Int. Cl.[5] G10L *9/08, 7/02*

U.S. Cl. 381—38 12 Claims

1. Method for detecting related data (M) in a representative signal split into blocks of samples including a rough M determination followed by a fine M determination, said method comprising the steps of:

a. for said rough M determination:

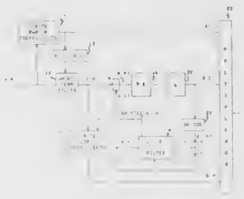
1. setting a positive threshold (Th^+) and a negative threshold (Th^-) based on characteristics of the representative signal;

2. locating and storing a plurality of samples representative of said blocks of samples, having magnitudes above and below said Th^+ and Th^-;

3. Identifying significant signal magnitude transitions within said blocks of samples;

4. storing a set of values M' indicative of said samples between each of said significant signal magnitude transitions; and

5. averaging said set of values M' to calculate said rough M determination; and



b. for said fine M determination:

1. setting a plurality of autocorrelation zones about said plurality of samples;

2. splitting said blocks of samples into consecutive sub-blocks of samples;

3. autocorrelating, using the autocorrelation zones of a current sub-block of samples; and

4. setting the fine M value equal to a maximum value for said current sub-block of samples in accordance with step 3 of said fine M determination.

4,924,509

IMAGE PROCESSING APPARATUS

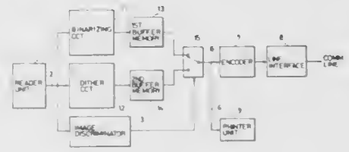
Yoshikazu Yokomizo, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 22,513, Mar. 9, 1987, abandoned, which is a continuation of Ser. No. 611,124, May 17, 1984, abandoned. This application Mar. 6, 1989, Ser. No. 319,817

Claims priority, application Japan, May 25, 1983, 58-92074

Int. Cl.[5] G06K *9/36*

U.S. Cl. 382—50 32 Claims



1. An image processing apparatus comprising:

input means for inputting pixel data sequentially;

first process means for halftone processing the pixel data from said input means;

second process means for non-halftone processing the pixel data from said input means;

first buffer means for delaying the pixel data processed by said first process means;

second buffer means for delaying the pixel data processed by said second process means, said second buffer means being different from said first buffer means;

discrimination means for discriminating whether the inputted pixel data represents a halftone image or a non-halftone image, said discrimination means performing discrim-

ination operation thereof for each block, each block comprising a plurality of pixel data; and

selecting means for selecting one of outputs from said first and second buffer means in accordance with the result of the discrimination operation of said discrimination means,

wherein each of said first and second buffer means is capable of storing the processed pixel data of plural lines associated with said block so as to delay the processed pixel data in correspondence to the discrimination operation of said discriminating means

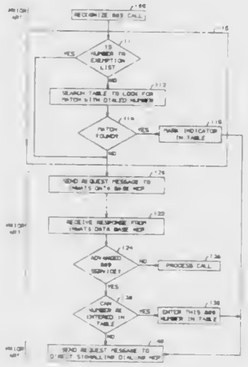
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4,924,510

TELECOMMUNICATIONS DATABASE ACCESSING METHOD

Van-Ban Le, Naperville, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Dec. 28, 1988, Ser. No. 290,795
Int. Cl.[5] H04M *3/42*
U.S. Cl. 379—221 **28 Claims**



1. A method of accessing first and second database means for a switching system for routing a first or second type of call, comprising:

in response to receipt of a first or second type of call, selectively accessing said second database means directly in response to data of said first or second type of call and data stored in said switching system, for deriving routing data for a second type of call;

alternately, accessing said first database means for deriving routing data for a first type of call; and

subsequently accessing said second database means, in response to receiving one of a class of responses from said first database means, for deriving routing data for a second type of call.

4,924,511

RING SIGNAL GENERATOR FOR GENERATING RING SIGNALS OF DIFFERENT FREQUENCIES AND POWER LEVELS IN RESPONSE TO USER SELECTION

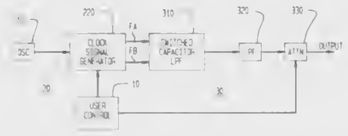
Robert V. Burns, and Sanjay Gupta, both of Phoenix, Ariz., assignors to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed Dec. 16. 1988, Ser. No. 285,460
Int. Cl.[5] H04M *3/02*
U.S. Cl. 379—418 **5 Claims**

1. A ring signal generator for generating any one of a plurality of types of ring signals of different frequencies and power levels in response to an input selection by a user, comprising:

a source of a user control signal for selecting any one of the plurality of ring signals;

a controlled clock signal generator responsive to said user control signal and including a master oscillator, first means for producing a first clock signal having a frequency corresponding to that of the ring signal type selected via said user control signal, and second means for producing a second clock signal having a frequency which is a fixed submultiple of the frequency of said first clock signal;



sine-wave converter means including a switched capacitor low pass filter (LPF) for receiving said first and second clock signals as inputs and operating to pass a sine-wave component of said second clock signal at said selected ring signal frequency while blocking higher order harmonics thereof and to output an analog sine wave at said selected ring signal frequency; and

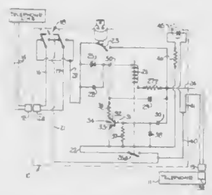
a power amplifier coupled to the output of said sine-wave converter means for amplifying said analog sine wave to a voltage output level corresponding to that of the ring signal type selected via said user control signal.

4,924,512

METHOD AND APPARATUS FOR PREVENTING RECOGNITION OF A TELEPHONE DIALING SIGNAL

Norman Sizemore, Channahon, and Rudolf Gerritsen, Kingston, both of Ill., assignors to GSA Systems, Cresthill, Ill.

Filed Jan. 6, 1989, Ser. No. 294,731
Int. Cl.[5] H04K *1/02*
U.S. Cl. 380—6 **57 Claims**



38. Apparatus for preventing recognition by a telephone system of a telephone dialing signal while allowing recognition by said telephone system of voice and data signals and allowing recognition by said telephone of ring, off-hook, voice, and data signals, comprising:

first means adapted for connection to a telephone;

second means adapted for connection to a telephone system;

third means connected between said first and second means for allowing said voice and data signals to pass between said first and second means and allowing said ring signal to pass from said second to said first means; said third means including relay means responsive to said off-hook signal for closing the contact thereof; and

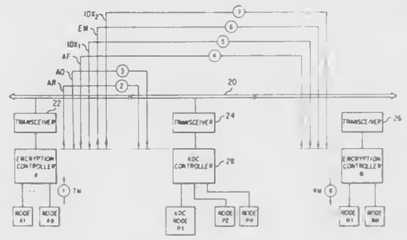
a transistor connected between said first and second means and said relay contact; said transistor being enabled by said relay contact and being responsive to said dialing signal for inverting that portion of said dialing signal which exceeds a predetermined amplitude to produce an inverted signal, and applying the inverted signal to said second means, whereby the inverted signal at said second means prevents said dialing signal from being recognized by said telephone system.

4,924,513

APPARATUS AND METHOD FOR SECURE TRANSMISSION OF DATA OVER AN UNSECURE TRANSMISSION CHANNEL

B. J. Herbison, Clinton, Mass.; Carter Lyman, Merrimack, N.H.; Paul Karger, Acton, Mass.; Bruce Mann, Mason, N.H.; Steve Lipner, Wellesley, Mass., and Arnold Miller, Austin, Tex., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 101,125, Sep. 25, 1987, Pat. No. 4,881,263.
This application Apr. 14, 1989, Ser. No. 338,234
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—21 **19 Claims**



1. An encryption controller connected between a source node and an unsecured data transmission channel for transmitting data packets from the source node in a secure manner over the unsecured channel, the encryption controller comprising:

transceiver means, coupled to the unsecured channel, for exchanging data packets between the unsecured channel and the encryption controller;

receiver means for receiving an encrypted data packet from the source node for transmission over the unsecured channel to a destination mode;

data packet memory means for storing the unencrypted data packet received from the source node;

means, responsive to the receipt of the unencrypted data packet, for forming a key request data packet for transmission via the transceiver means over the unsecured channel to a key distribution node, to request assignment of an association key for use in encrypting data packets to be transmitted from the source node to the destination node, the key request data packet including an address identifying the destination node;

decryption means for decrypting a message portion of an association open data packet received via the transceiver means over the unsecured channel from the key distribution node with a first master encryption key unique to the encryption controller, the message portion of the association open data packet being encrypted according to the first master encryption key and including an association key and a message field containing the association key encrypted according to a second master encryption key unique to the destination node;

means for assembling an association setup data packet for transmission via the transceiver means over the unsecured channel to the destination node, the association setup data packet having a message portion that includes the encrypted message field from the association open data packet containing the association key encrypted according to the second master encryption key; and

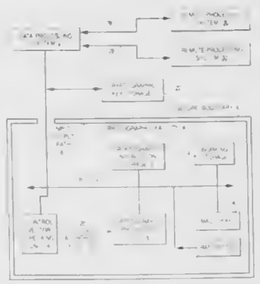
encryption means for encrypting the unencrypted data packet stored in the data packet memory means according to the association key for transmission via the transceiver means over the unsecured channel to the destination node.

4,924,514

PERSONAL IDENTIFICATION NUMBER PROCESSING USING CONTROL VECTORS

Stephen M. Matyas, Manassas, Va.; Dennis G. Abraham, Concord, N.C.; Donald B. Johnson, Manassas, Va.; Ramesh K. Karne, Herndon, Va.; An V. Le, Arlington, Va.; Rostislaw Prymak, Dumfries, Va.; Julian Thomas, Lagrange, N.Y.; John D. Wilkins, Somnerville, Va.; Phil C. Yeh, Poughkeepsie, and Ronald M. Smith, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 237,938, Aug. 26, 1988, abandoned.
This application Aug. 24, 1989, Ser. No. 398,300
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—24 **51 Claims**



1. In a data processing system which outputs cryptographic service requests for management of cryptographic keys which are associated with control vectors defining the functions which each key is allowed by its originator to perform, an apparatus for validating that PIN processing functions requested for a cryptographic key have been authorized by the originator of the key, comprising:

a cryptographic instruction storage coupled to an input path;

a cryptographic facility characterized by a secure boundary through which passes said input path for receiving said cryptographic service requests, cryptographic keys and their associated control vectors, and an output path for providing responses thereto, there being included within said boundary a control vector checking means and a cryptographic processing means coupled to said instruction storage, and a master key storage coupled to said processing means, for providing a secure location for executing PIN processing functions in response to said received service requests;

said cryptographic instruction storage receiving over said input path a cryptographic service request for performing a PIN processing function with a cryptographic key;

said control vector checking means having an input coupled to said input path for receiving a control vector associated with said cryptographic key and an input connected to said cryptographic instruction storage, for receiving control signals to initiate checking that said control vector authorizes the PIN processing function which is requested by said cryptographic service request;

said control vector checking means having an authorization output coupled to an input of said cryptographic processing means, for signalling that said PIN processing function is authorized, the receipt of which by said cryptographic processing means initiates the performance of the requested PIN processing function with said cryptographic key.

4,924,515

SECURE MANAGEMENT OF KEYS USING EXTENDED CONTROL VECTORS

Stephen M. Matyas, Manassas, Va.; Dennis G. Abraham, Concord, N.C.; William C. Arnold, Mahopac, N.Y.; Donald B. Johnson, Manassas; Ramesh K. Karne, Herndon; An V. Le, Arlington; Rostislaw Prymak, Dumfries, all of Va.; Steve R. White, New York, N.Y., and John D. Wilkins, Somerville, Va., assignors to International Business Machines Coprporation, Armonk, N.Y.

Continuation of Ser. No. 238,010, Aug. 29, 1988, abandoned. This application Aug. 24, 1989, Ser. No. 398,299
Int. Cl.[5] H04L *9/02*
U.S. Cl. 380—25 41 Claims



1. In a data processing system which outputs cryptographic service requests for operations with cryptographic keys which are associated with control vectors defining the functions which each key is allowed by its originator to perform, an improved apparatus to enable the use of control vectors having a given length, comprising:

a control vector input for receiving a control vector of a given length associated with an N-bit cryptographic key;

a control vector checking means having an input coupled to said control vector input and input for receiving a cryptographic service request, for checking that said control vector authorizes the cryptographic function which is requested by said cryptographic service request, and outputting an enable signal;

a hash function generator having an input coupled to said control vector input and an N-bit output, for mapping said control vector into an N-bit hash value;

a key input for receiving said N-bit cryptographic key;

a logic block having a first input coupled to said N-bit output of said hash function generator, and a second input coupled to said key input, for forming at the output thereof a computed key value which is a product of said N-bit key and said N-bit hash value;

a cryptographic transformation device having a first input for receiving input information and a key value input coupled to the output of said logic block, for forming output information which has been cryptographically transformed from said input information using said computed key value;

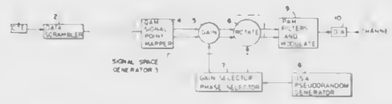
said cryptographic transformation device coupled to said enable signal output from said control vector checking means for inhibiting said formation of said cryptographically transformed output information if said control vector checking means determines that said requested cryptographic function is not authorized by said control vector.

4,924,516

METHOD AND SYSTEM FOR A SYNCHRONIZED PSEUDO-RANDOM PRIVACY MODEM

Gordon Bremer, Clearwater, and William L. Betts, St. Petersburg, both of Fla., assignors to AT&T Paradyne, Largo, Fla.

Filed May 23, 1989, Ser. No. 356,080
Int. Cl.[5] H04L *9/22*
U.S. Cl. 380—46 9 Claims



1. A method for a synchronized pseudorandom privacy modem comprising the steps of:

storing a table with parameters corresponding to N signal spaces;

generating a string of pseudorandom numbers;

indexing into said table with said string of pseudorandom numbers thereby generating a string of parameters corresponding to said N signal spaces;

quadrature amplitude modulating a digital signal;

altering the quadrature amplitude modulated digital signal responsive to said string of parameters corresponding to said N signal spaces;

converting the altered quadrature amplitude modulated digital signal to an analog signal; and

transmitting the analog signal over a communication channel.

4,924,517

ENCODER OF A MULTI-PULSE TYPE CAPABLE OF CONTROLLING THE NUMBER OF EXCITATION PULSES

Yasuhiro Wake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 305,924
Claims priority, application Japan, Feb. 4, 1988, 63-22902; Sep. 14, 1988, 63-231250
Int. Cl.[5] G10L *5/00*
U.S. Cl. 381—40 5 Claims



1. An encoder for use in encoding a speech signal into an encoded signal, said speech signal being divided into a succession of frames, said encoder including first means responsive to said speech signal for calculating a sequence of factors in each of said frames to produce a factor signal representative of said factors, second means responsive to said speech signal for calculating cross-correlation in each of said frames to produce a cross-correlation signal representative of said cross-correlation, and pulse sequence calculating means responsive to said speech signal, said factor signal, and said cross-correlation signal for calculating a plurality of excitation pulses in each of said frames, said pulse sequence calculating means updating said cross-correlation signal to an updated cross-correlation signal when said pulse sequence calculating means calculates each of said excitation pulses, said updated cross-correlation signal being for use in calculating a next one of said excitation pulses, wherein the improvement comprises:

control means responsive to said updated cross-correlation signal for producing a control signal;

said pulse sequence calculating means stopping calculation of said excitation pulses at a controlled number of excitation pulses in response to said control signal;

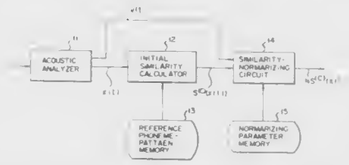
said control means being responsive to said controlled number of excitation pulses for producing a pulse number signal representative of said controlled number.

4,924,518

PHONEME SIMILARITY CALCULATING APPARATUS

Teruhiko Ukita, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1987, Ser. No. 133,808
Claims priority, application Japan, Dec. 23, 1986, 61-306769
Int. Cl.[5] G10L *7/02, 9/06*
U.S. Cl. 381—41 15 Claims



1. A phoneme similarity calculating apparatus comprising:

means for calculating a feature parameter of input speech for every frame of a predetermined time;

means for calculating a steadiness parameter indicating steadiness of the input speech for each frame in accordance with a change in the feature parameter;

means for calculating a phoneme similarity of the feature parameter for each phoneme based on matching between the feature parameter and a reference phoneme pattern for each phoneme; and

normalizing means for correcting said phoneme similarity calculated by said phoneme similarity calculating means in accordance with the steadiness parameter such that said phoneme similarity is increased if the steadiness parameter increases when the reference phoneme is a steady one, and is decreased if the steadiness parameter increases when the reference phoneme is an unsteady one.

4,924,519

FAST ACCESS DIGITAL AUDIO MESSAGE SYSTEM AND METHOD

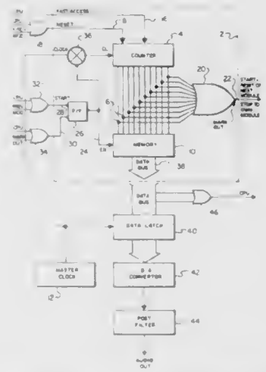
Terry D. Beard, 1407 N. View Dr., Westlake Village, Calif. 91362

Filed Apr. 22, 1987, Ser. No. 41,346
Int. Cl.[5] G10L *5/02*
U.S. Cl. 381—51 22 Claims

1. A fast access digital audio message system, comprising:

a digital memory having a plurality of memory bytes for storing digital audio message signals, the digital memory being organized into a plurality of sequential message units, each message unit including a plurality of sequentially ordered bytes for storing digital audio messages, said messages being stored in mutually exclusive message units in respective continuous sequences of memory bytes, the first memory byte for each stored message being located at substantially the same location within its respective memory unit as the location of the first memory bytes for the other stored messages within their respective message units,

means for accessing the memory by stepping through the message units in multi-byte steps to a desired message unit, skipping the memory bytes between said multi-byte steps, said accessing means comprising a counter addressing the memory, means for producing and applying to the counter a lower order control input causing the counter to count up at a rate corresponding to one memory byte per count, and means for producing and applying to the counter a higher order control input causing the counter to count up at an accelerated rate of one message unit per count, the



counter addressing a memory message unit in the memory in accordance with its higher order control input, the counter further addressing the memory bytes within the message unit in accordance with its lower order control input for reading out the message stored therein, and

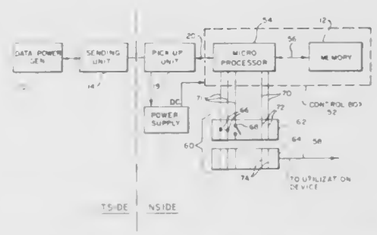
means for reading out the message at the desired message unit.

4,924,520

DEFINING AIRCRAFT PROTOCOL BY SHORTED PINS

Melvin Kolbert, Boca Raton, Fla., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 17, 1988, Ser. No. 258,732
Int. Cl.[5] H04L *11/00*
U.S. Cl. 380—59 4 Claims



1. A method for initializing security data communication between a portable data source and bidirectional data utilization devices on board an aircraft, the method comprising the steps:

mechanically modifying normally connected pins of an electrical connector between a microprocessor on board the aircraft and a utilization device which establishes a coded bit pattern corresponding to data format and protocol requirements of the device;

communicating the coded bit pattern from the microprocessor to the source;

subsequently transmitting data from the source to a buffer memory in the required format and protocol; and reading

out the data from the memory to the utilization device through normally retained connected pins of the electrical connector.

4,924,521

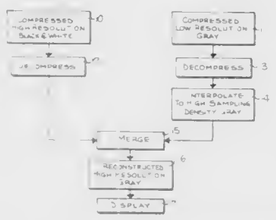
IMAGE PROCESSING SYSTEM AND METHOD EMPLOYING COMBINED BLACK AND WHITE AND GRAY SCALE IMAGE DATA

Raymond F. Dinan, Mint Hill, N.C.; James F. Dubil, Wylie, S.C.; John R. Hillery, Charlotte, N.C.; Robert R. Rodite, Matthews, N.C., and James M. White, Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1987, Ser. No. 134,733

Int. Cl.[5] **G06K** *9/54*

U.S. Cl. 382—54 **8 Claims**



1. An image processing system for producing high resolution gray scale image data representing an image, comprising:

means defining low resolution gray scale image data which independently represents the image;

means defining high resolution black and white image data which independently represents the image;

means for merging the low resolution gray scale image data and the high resolution black and white image data to produce reconstructed high resolution gray scale image data representing the image, and comprising

means for interpolating the low resolution gray scale data by a two-dimensional linear interpolation to high sampling density gray scale image data of the same sampling density as said black and white image data; and

means for combining the interpolated high sampling density gray scale data with the black and white data to produce reconstructed high resolution gray scale image data representing the image, and including means for generating enhancement values from the high resolution black and white image data to compensate for the loss of defining resulting from representing the image with low resolution gray scale image data, and means for adding the thus generated enhancement values to the interpolated high sampling density gray scale image data to thereby produce the reconstructed high resolution gray scale image data.

4,924,522

METHOD AND APPARATUS FOR DISPLAYING A HIGH RESOLUTION IMAGE ON A LOW RESOLUTION CRT

John E. Bray, Guelph, and David Poos, Grimsby, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 89,715, Aug. 26, 1987, abandoned. This application May 11, 1989, Ser. No. 351,264

Int. Cl.[5] **G06K** *9/46*

U.S. Cl. 382—56 **6 Claims**

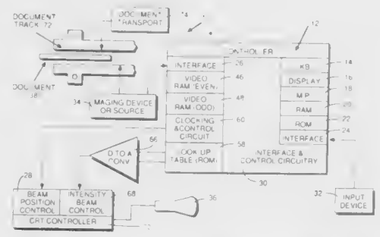
1. In a system in which image data for an image is provided in the form of a matrix of binary pixels of a first predetermined resolution, the method of displaying said image data onto a CRT having a resolution lower than said first predetermined resolution, comprising the steps:

(a) selecting a block of four of said pixels which represents a predetermined area of said image data;

(b) examining only the status of each pixel in said predetermined area to determine whether it is a binary one or a binary zero;

(c) assigning a predetermined value ranging from zero through three for the various combinations of binary ones and binary zeros which exist in said block of four pixels in said predetermined area, with said predetermined value representing said block of four pixels;

(d) using a said predetermined value to control a gray scale value ranging from completely white to completely black for displaying on said CRT said gray scale value as representing solely said predetermined area of said image, said displaying being effected on said CRT at a resolution which is lower than said first predetermined resolution;



(e) selecting in a predetermined order or examining pattern an adjacent and completely new block of four pixels which represents said predetermined area for said image; and

(f) repeating steps b, c, and d for said adjacent predetermined area and the remaining predetermined areas for the entire said image until the entire image is completely displayed.

4,924,523

BEARINGS

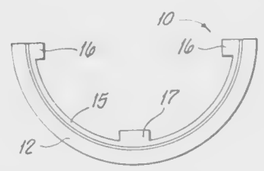
Roger L. Gojon, Annecy, France, assignor to The Glacier Metal Company Limited, Northwood Hills, United Kingdom

Filed Sep. 6, 1988, Ser. No. 241,114

Claims priority, application United Kingdom, Sep. 17, 1987, 8721841

Int. Cl.[5] **F16C** *17/10*

U.S. Cl. 384—273 **5 Claims**



1. A bearing, the bearing comprising a substantially semi-cylindrical half journal bearing member having at least one thrust flange member, the thrust flange being substantially of a semi-circular annular form having at least three inwardly directed lugs formed on the inner periphery, two lugs being positioned at approximately the circumferential extremities of the flange member, the third lug being positioned on the inner periphery intermediate the first two lugs and said lugs being engageable and axially interlockable with co-operating recesses on the half-bearing by opening the half-bearing in the elastic range such that the lugs engage with the recesses and then releasing the half-bearing to interlock the lugs and recesses against axial separation and thus to retain the flange.

4,924,524

BEARING ASSEMBLY FOR THE WORKING SPINDLE OF A MACHINE TOOL

Siegfried Kuhn, Dürnau; Bernhard Philipp, Eislingen, and Hermann Schulten, Birenbach, all of Fed. Rep. of Germany, assignors to Boehringer Werkzeugmaschinen GmbH, Bundesrepublik, Fed. Rep. of Germany

PCT No. PCT/EP88/00613, § 371 Date May 8, 1989, § 102(e) Date May 8, 1989, PCT Pub. No. WO89/00090, PCT Pub. Date Jan. 12, 1989

PCT Filed Jul. 8, 1988, Ser. No. 336,353

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722572

Int. Cl.[5] **F16C** *19/08*

U.S. Cl. 384—537 **4 Claims**

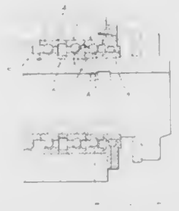
1. In combination, for use with a machine tool:

a working spindle;

an assembly of angular ball bearings arranged in tandem relationship on said spindle and including an inner bearing, a middle bearing and an outer bearing,

said spindle having a section of larger diameter in the area of the outer bearing than in the area of the inner and middle bearings; and

spacing means between said inside bearing and said middle



bearing, said spacing means including an inner ring and an outer ring, said inner ring being concentric with said outer ring and having a width less than the width of said outer ring.

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DESIGN PATENTS

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ERRATA

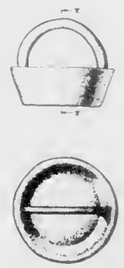
For CLASS	See PATENT NO.
D07-620	307,669
D18-040	307,700
D08-033	307,766

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1990
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307,660
ICE CREAM CONE
Harold Y. W. Kim, P.O. Box 10741, Hilo, Hi. 96721
Filed Aug. 31, 1987, Ser. No. 91,072
Term of patent 14 years
U.S. Cl. D1—101



307,661
COOKIE
Kathy E. Tetzlaff, 7392 Doncaster La., Memphis, Tenn. 38125
Filed May 21, 1987, Ser. No. 52,753
Term of patent 14 years
U.S. Cl. D1—128



307,662
INSECT NETTING JACKET OR SIMILAR ARTICLE
Ada deMare, Rte. 9, Box 9441, Hayward, Wis. 54843
Filed Nov. 30, 1987, Ser. No. 126,676
Term of patent 14 years
U.S. Cl. D2—185



307,663
SHOE UPPER
Pamela B. Boucher, Brighton, and Christopher Kittle, Cohasset, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 23, 1989, Ser. No. 370,301
Term of patent 14 years
U.S. Cl. D2—314



307,664
SHOE SOLE
Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Dec. 8, 1987, Ser. No. 130,189
Claims priority, application Japan, Jun. 10, 1987, 62-23674
Term of patent 14 years
U.S. Cl. D2—320





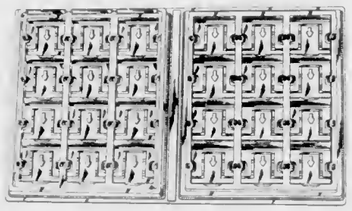
307,665
WALKING CANE
Robert C. Pressley, 11557 S. Kildare Ave., Alsip, Ill. 60658
Filed Feb. 17, 1987, Ser. No. 15,866
Term of patent 14 years
U.S. Cl. D3—6



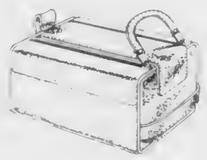
307,666
COMBINED CANE AND TOILER PAPER HOLDER
Patrick M. Fisher, 2909 Clear Way, Orlando, Fla. 32805
Filed Jul. 8, 1987, Ser. No. 1,549
Term of patent 14 years
U.S. Cl. D3—9



307,667
CASE FOR RECEIVING MAGNETIC RECORDING MEDIUMS
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed Jul. 3, 1986, Ser. No. 881,718
Claims priority, application Japan, Feb. 14, 1986, 61-4742
Term of patent 14 years
U.S. Cl. D3—35



307,668
TRAVEL KIT
Raymond W. Young, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.
Filed Feb. 6, 1987, Ser. No. 12,037
Term of patent 14 years
U.S. Cl. D3—39



307,669
MULTIPLE SIZE AUTOMOBILE CUP HOLDER
Chieko K. Inouye, 4785 Anaili St., Honolulu, Hi. 96821
Filed Jan. 27, 1987, Ser. No. 7,389
Term of patent 14 years
U.S. Cl. D7—620



307,670
CARD DISPENSER
Rinaldo Nava, Milan, Italy, assignor to Nava Milano S.P.A., Milan, Italy
Filed Jul. 8, 1986, Ser. No. 883,411
Claims priority, application Italy, Jan. 17, 1986, 20540/86[U]
Term of patent 14 years
U.S. Cl. D3—56



307,671
COMBINED KEY RING AND HOLDER THEREFOR
Karen J. Satterly, 6318 Oak Valley Dr., Lonisville, Ky. 40214
Filed Jun. 25, 1987, Ser. No. 66,411
Term of patent 14 years
U.S. Cl. D3—61





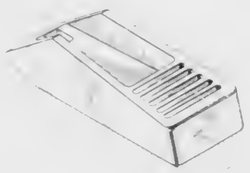
307,672
CARRYING BAG
Yu-Ho D. Lam, Aberdeen, Hong Kong, assignor to Mascotte Industrial Associates, Hong Kong
Filed Mar. 14, 1986, Ser. No. 844,741
Term of patent 14 years
U.S. Cl. D3—71



307,673
PAGER CARRIER CASE
Frederick D. Brown, P.O. Box 16881, Orlando, Fla. 32861
Filed Jan. 4, 1988, Ser. No. 140,594
Term of patent 14 years
U.S. Cl. D3—106



307,674
BRUSH HANDLE
Jolyon Saunders, Auckland, New Zealand, assignor to Libman Broom Company, Arcola, Ill.
Filed Jun. 22, 1987, Ser. No. 64,448
Term of patent 14 years
U.S. Cl. D4—138



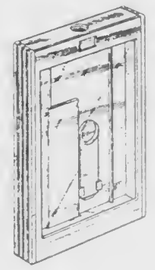
307,675
PICTURE FRAME
Willis Y. Jordan, 965 Shades Crest Rd., Birmingham, Ala. 35226
Filed Nov. 23, 1987, Ser. No. 123,996
Term of patent 14 years
U.S. Cl. D6—300



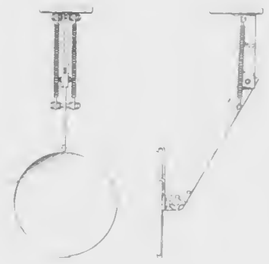
307,676
PICTURE FRAME
Lance S. Davis, 8-10 Eastern Place, Hawthorn East, Victoria, 3123, Australia
Filed Jul. 15, 1987, Ser. No. 73,430
Term of patent 14 years
U.S. Cl. D6—310



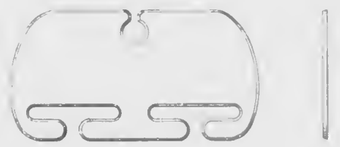
307,677
PICTURE DISPLAY RECEPTACLE
Sergio Tontarelli, Ancona, Italy, assignor to Simaco Import Ltd., Ville St. Laurent, Canada
Filed Jul. 15, 1987, Ser. No. 74,011
Claims priority, application Italy, Mar. 13, 1987, 521-B/87
Term of patent 14 years
U.S. Cl. D6—311



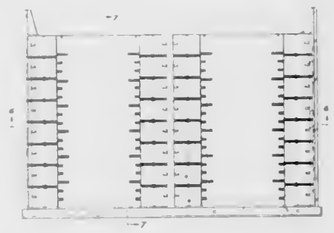
307,678
POSITIONALLY ADJUSTABLE MIRROR
Jerry P. Lookerse, 830 Clifton Ave., Redlands, Calif. 92373
Filed Nov. 20, 1987, Ser. No. 123,656
Term of patent 14 years
U.S. Cl. D6—312



307,679
HANGER FOR SUSPENDERS
Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B & G Plastics, Inc., New York, N.Y.
Filed Apr. 25, 1988, Ser. No. 185,818
Term of patent 14 years
U.S. Cl. D6—315

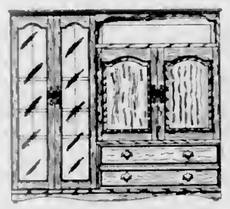


307,680
AUDIO AND VIDEO STORAGE TRAY
Saul E. Ashkenazi, Deal, N.J., assignor to Soundesign Corp., Jersey City, N.J.
Filed Mar. 2, 1987, Ser. No. 20,658
Term of patent 14 years
U.S. Cl. D6—407



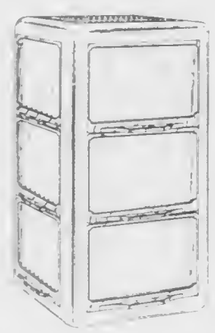
307,681
ENTERTAINMENT CENTER
Paul Bush, Lakewood, N.Y., and Bruce O. Anderson, Talbott, Tenn., assignors to Bush Industries, Inc., Jamestown, N.Y.
Filed Dec. 21, 1987, Ser. No. 135,624
Term of patent 14 years
U.S. Cl. D6—436

307,682
ENTERTAINMENT CENTER
Paul Bush, Lakewood, N.Y., and Bruce O. Anderson, Talbott, Tenn., assignors to Bush Industries, Inc., Jamestown, N.Y.
Filed Dec. 21, 1987, Ser. No. 135,613
Term of patent 14 years
U.S. Cl. D6—436

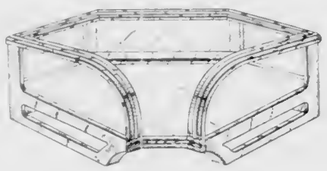


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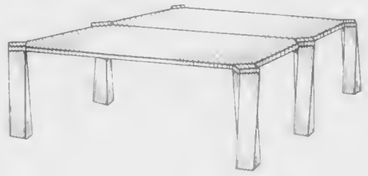
307,683
DISPLAY CASE FOR WATCH BANDS
John Jaquish, Brewster, N.Y., assignor to Textron, Inc., Providence, R.I.
Filed Aug. 17, 1987, Ser. No. 86,833
Term of patent 14 years
U.S. Cl. D6—457



307,684
CORNER TABLE
David P. G. Williams, Darien, Conn., assignor to Mohasco Upholstered Furniture Corp., Fairfax, Va.
Filed Nov. 7, 1988, Ser. No. 267,766
Term of patent 14 years
U.S. Cl. D6—484



307,685
TABLE
James O. Kelley, Spring Lake, Mich., and Clino T. Castelli, Milan, Italy, assignors to Herman Miller, Inc., Zeeland, Mich.
Filed Dec. 23, 1985, Ser. No. 812,239
The portion of the term of this patent subsequent to Oct. 11, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—484



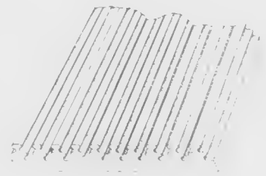




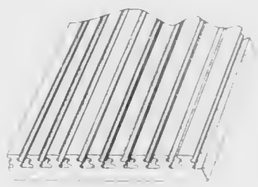
307,686
ORNAMENT OR PLATE DISPLAY HOLDER
Christian B. Cadman, 309 East 24th Avenue, Vancouver, British Columbia, Canada (V5V 1Z8)
Filed Jul. 14, 1986, Ser. No. 885,028
Claims priority, application Canada, May 23, 1986, 23-05-86-8
Term of patent 14 years
U.S. Cl. D6—572



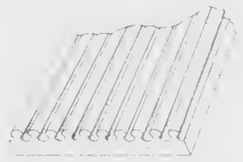
307,687
MATTRESS PAD MATERIAL
Richard W. Raburn, Mauldin, S.C., assignor to Span-America Medical Systems, Inc., Greenville, S.C.
Filed Oct. 28, 1987, Ser. No. 114,529
Term of patent 14 years
U.S. Cl. D6—606



307,688
MATTRESS PAD MATERIAL
Daniel J. Schaefer, Greenville, S.C., assignor to Span-America Medical Systems, Inc., Greenville, S.C.
Filed Dec. 4, 1987, Ser. No. 129,089
Term of patent 14 years
U.S. Cl. D6—606



307,689
MATTRESS PAD MATERIAL
Daniel J. Schaefer, Greenville, S.C., assignor to Span-America Medical Systems, Inc., Greenville, S.C.
Filed Nov. 19, 1987, Ser. No. 122,661
Term of patent 14 years
U.S. Cl. D6—606



307,690
MATTRESS PAD MATERIAL
Richard W. Raburn, Mauldin, S.C., assignor to Span-America Medical Systems, Inc., Greenville, S.C.
Filed Oct. 28, 1987, Ser. No. 114,527
Term of patent 14 years
U.S. Cl. D6—606



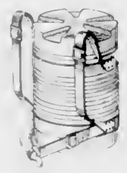
307,691
PORTABLE CONDIMENT DISPENSER
Gerald Cook, 2465 E. Chevy Chase, Glendale, Calif. 91206, assignor to Gerald Cook, Glendale, Calif.
Filed Jul. 14, 1986, Ser. No. 885,154
Term of patent 14 years
U.S. Cl. D7—591



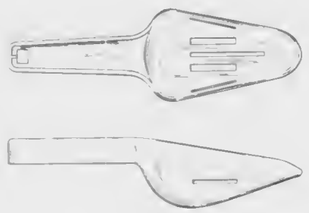
307,692
INSULATED BEVERAGE CONTAINER
Randolph K. Shoup, 1635 E. 111th St., Indianapolis, Ind. 46280
Filed Mar. 21, 1988, Ser. No. 171,306
Term of patent 14 years
U.S. Cl. D7—608



307,693
PORTABLE BEVERAGE DISPENSER
Mitchell Rezman, 1112 Devonshire, Buffalo Grove, Ill. 60089
Filed Feb. 16, 1988, Ser. No. 156,089
Term of patent 14 years
U.S. Cl. D7—608



307,694
SCOOP
William C. Billie, 5894-2 Longbow La., West Palm Beach, Fla. 33415
Filed Aug. 6, 1987, Ser. No. 47,709
Term of patent 14 years
U.S. Cl. D7—691



307,695
COFFEE MAKER
William C. Cesaroni, Glenview, Ill.; Gary L. Heilman, and Daniel E. Gremooprez, both of West Bend, Wis., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Aug. 12, 1987, Ser. No. 84,710
Term of patent 14 years
U.S. Cl. D7—321



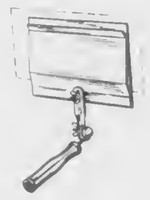
307,696
PRUNING SHEARS
Kimikazu Ishida, and Tsuneo Ishida, both of Miki, Japan, assignors to Saboten Co., Ltd., Hyogo, Japan
Filed Apr. 5, 1988. Ser. No. 178,077
Claims priority, application Japan, Feb. 4, 1988, 63-4349
Term of patent 14 years
U.S. Cl. D8—5



307,697
SCREW HOLDING ATTACHMENT FOR A SCREWDRIVER
Billy R. Geckle, 11 Center St., West Leipsic, Ohio 45856
Filed Apr. 28, 1986, Ser. No. 857,815
Term of patent 14 years
U.S. Cl. D8—14



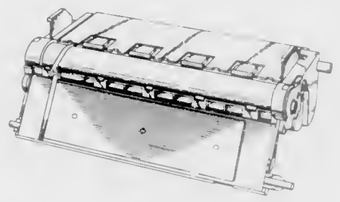
307,698
SPRAY PAINT SCREEN HOLDER
John Bonie, 3001 W. Union St., Englewood, Colo. 80110
Filed Jun. 15, 1987, Ser. No. 62,559
Term of patent 14 years
U.S. Cl. D8—14



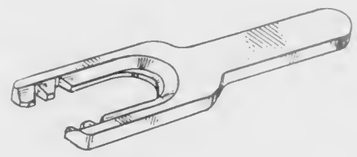
307,699
CUTTING PLIERS
Yasufumi Suganami, Kakogawa, Japan, assignor to Kabushikigaisha Taimu Kemikaru, Tokyo, Japan
Filed Sep. 16, 1987, Ser. No. 97,096
Claims priority, application Japan, Mar. 27, 1987, 62-44240
Term of patent 14 years
U.S. Cl. D8—52



307,700
PROCESS CARTRIDGE
Shigeki Sakakura, Tama, and Masayoshi Otsuka, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 18, 1987, Ser. No. 131,549
Claims priority, application Japan, Sep. 14, 1987, 62-37636
Term of patent 14 years
U.S. Cl. D18—40



307,701
BOTTLE PLUG REMOVER
Paul O. Planchon, 2580 Melody La., Reno, Nev. 89512
Filed Feb. 2, 1987, Ser. No. 10,285
Term of patent 14 years
U.S. Cl. D8—40



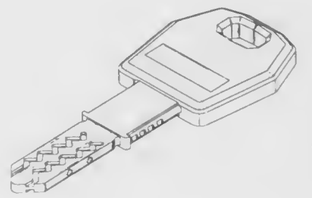
307,702
HANDLE FOR A SAW OR SIMILAR ARTICLE
An Sun Hsu, No. 99, Yu Ai Street, Tainan, Taiwan
Filed May 13, 1986, Ser. No. 862,897
Term of patent 14 years
U.S. Cl. D8—97



307,703
HANDLE FOR A TORQUE-APPLYING TOOL
Ronald L. Tomasula, 358 Iroquois Pl., Beaver, Pa. 15009
Filed Jan. 27, 1987, Ser. No. 7,420
Term of patent 14 years
U.S. Cl. D8—107



307,704
KEY
Benno Vonlanthen, Zollikofen, Switzerland, assignor to R. Berchtold AG, Switzerland
Filed Sep. 1, 1988, Ser. No. 239,417
Claims priority, application Int'l Pat. Institute, May 3, 1988, DM/010871
Term of patent 14 years
U.S. Cl. D8—347

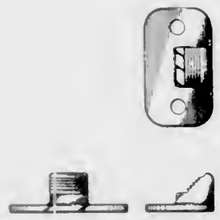


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307,705
HOOK
Bernard Mair, 40 Viceroy Road, Concord, Ontario, Canada (L4K 2L8)
Filed Sep. 2, 1987, Ser. No. 95,069
Term of patent 14 years
U.S. Cl. D8—367



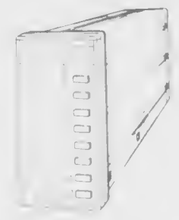
307,706
VENT SECURING DEVICE FOR CASEMENT WINDOWS
Phillip J. Cunningham, Claymont; Leon F. Slocomb, Jr., and George Wilkie, both of Wilmington, all of Del., assignors to Slocomb Industries, Inc., Wilmington, Del.
Filed Sep. 29, 1986, Ser. No. 912,616
Term of patent 14 years
U.S. Cl. D8—400



307,707
CONVEYOR CHAIN LINK
Goran Abbestam, Goteborg, and Leif Lachonius, Surte, both of Sweden, assignors to AB SKF, Sweden
Division of Ser. No. 659,372, Oct. 10, 1984, Pat. No. Des. 290,932. This application Jan. 29, 1987, Ser. No. 8,428
Term of patent 14 years
U.S. Cl. D8—499



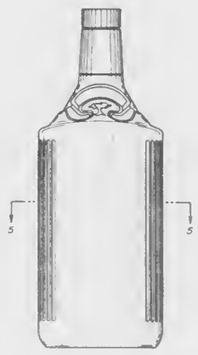
307,708
CONTROLLER FOR INDUSTRIAL INSTRUMENTATION
Tatsurou Moriyama, and Masaharu Wakamatsu, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 29, 1988, Ser. No. 250,506
Claims priority, application Japan, Apr. 1, 1988, 63-13421
Term of patent 14 years
U.S. Cl. D13—164

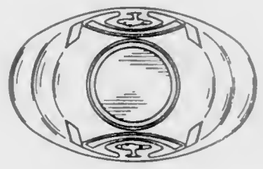


307,709
BOTTLE AND DISPENSING CAP
Douglas M. Liss, New York, N.Y., assignor to Alko, Ltd.
Filed Nov. 12, 1987, Ser. No. 119,424
Term of patent 14 years
U.S. Cl. D9—300

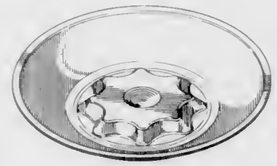


307,710
BOTTLE
Frederick H. Mittleman, New York, N.Y., assignor to Whitbread North America, Inc., Lake Success, N.Y.
Filed Dec. 5, 1986, Ser. No. 938,755
Term of patent 14 years
U.S. Cl. D9—307





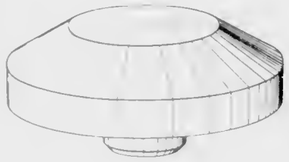
307,711
DISPLAY TRAY FOR FRUIT OR THE LIKE
Dean B. Blaser, Bryan, Ohio, assignor to Potter, Inc., Bryan, Ohio
Filed Mar. 6, 1986, Ser. No. 842,003
Term of patent 14 years
U.S. Cl. D9—341



307,712
BOTTLE CARRIER
Craig Ralls, 1527 Canterbury, and Robert Ralls, 25865 Chaucer Dr., both of Westlake, Ohio 44145
Filed Jun. 8, 1987, Ser. No. 59,311
Term of patent 14 years
U.S. Cl. D9—344



307,713
CAPSULE FOR PAINT TINT
Michael H. Groves, Warwick, England, assignor to Imperial Chemical Industries PLC, London, England
Filed Aug. 18, 1987, Ser. No. 86,673
Claims priority, application United Kingdom, Feb. 20, 1987, 1040137
Term of patent 14 years
U.S. Cl. D9—349





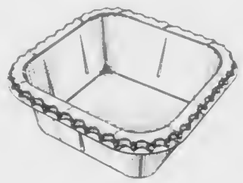
307,714
COMBINED CONTAINER AND DISPENSER
Werner Rosenberg, Vienna, Austria, assignor to Henkel Austria Gesellschaft m.b.H, Vienna, Austria
Filed Aug. 7, 1987, Ser. No. 83,832
Claims priority, application Austria, Feb. 11, 1987, 541.993
Term of patent 14 years
U.S. Cl. D9—373



307,715
PACKAGE FOR GLOVES
Bruce R. Kindler, West Linn, Oreg., assignor to Kinco International, Inc., Portland, Oreg.
Filed Jun. 8, 1988, Ser. No. 204,184
Term of patent 14 years
U.S. Cl. D9—415



307,716
CONTAINER
Charles W. Fitzloff, Mankato, and Duane M. Regenscheid, Austin, both of Minn., assignors to Geo. A. Hormel & Co., Austin, Minn.
Filed Feb. 29, 1988, Ser. No. 162,176
Term of patent 14 years
U.S. Cl. D9—424



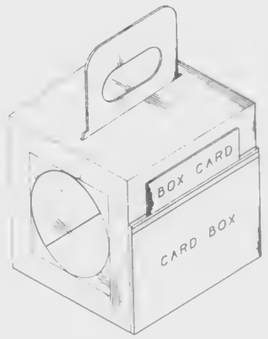
307,717
COMBINED BOX AND TAG
Roger Bannister, London, England, assignor to Helix Fragrances Inc., Toronto, Canada
Filed Aug. 1, 1986, Ser. No. 891,668
Claims priority, application Canada, May 27, 1986, 27-05-86-6
Term of patent 14 years
U.S. Cl. D9—430



307,718
INTERFITTING CONTAINER
Charles P. Tabler, Hamilton, Ohio, assignor to Buckhorn, Inc., Milford, Ohio
Filed Apr. 17, 1986, Ser. No. 856,102
Term of patent 14 years
U.S. Cl. D9—432



307,719
GIFT BOX WITH A POCKET
Suzanne G. Band, 15201 Park Ave., Oak Park, Mich. 48237
Filed Oct. 9, 1986, Ser. No. 917,229
Term of patent 14 years
U.S. Cl. D9—432



307,720
CONTAINER END CLOSURE
William T. Saunders, Weirton, W. Va., and James A. Bray, Salineville, Ohio, assignors to Weirton Steel Corporation, Weirton, W. Va.
Filed Jan. 23, 1987, Ser. No. 6,450
Term of patent 14 years
U.S. Cl. D9—438



307,721
BASE CUP FOR A PLASTIC CONTAINER
John M. Barth, Saline, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Oct. 29, 1987, Ser. No. 114,531
Term of patent 14 years
U.S. Cl. D9—455



307,722
DISPOSABLE MAGAZINE FOR A STICKING PLASTER DISPENSER
Sigrid Qvennerstedt, Stocksund, Sweden, assignor to Akla AB, Danderyd, Sweden
Filed Nov. 21, 1986, Ser. No. 933,776
Claims priority, application Sweden, May 26, 1986, 86-1286
Term of patent 14 years
U.S. Cl. D9—455

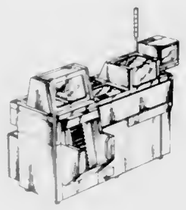




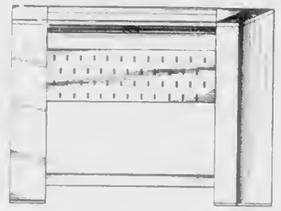
307,723
TRAVEL CLOCK
Raymond Chan, Hong Kong, Hong Kong, assignor to Integrated Display Technology Limited, Hong Kong, Hong Kong
Filed Jan. 5, 1987, Ser. No. 965
Claims priority, application United Kingdom, Aug. 8, 1986, 1035990
Term of patent 14 years
U.S. Cl. D10—15



307,724
DEFECT INSPECTION DEVICE FOR SEMICONDUCTORS
Yoshiaki Nishida, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 18, 1987, Ser. No. 134,892
Claims priority, application Japan, Jun. 25, 1987, 62-25627
Term of patent 14 years
U.S. Cl. D10—46



307,725
GRAPHIC PLOTTER
Yong Paik, San Jose, Calif., assignor to AM International Corporation, Chicago, Ill.
Filed Jun. 29, 1987, Ser. No. 67,355
Term of patent 14 years
U.S. Cl. D10—46



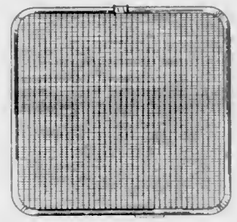


307,726
SWIVEL MOUNTED TAPE MEASURE
Frank Amico, 145 Suellen Dr., Rochester, N.Y. 14609
Filed May 14, 1987, Ser. No. 50,345
Term of patent 14 years
U.S. Cl. D10—72





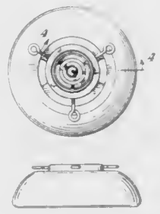
307,727
SCALE BASE
Richard S. Hart, Elgin; David H. Bloom, Vernon Hills, and Jeffery D. Bransky, La Grange, all of Ill., assignors to Sunbeam Corporation, Downers Grove, Ill.
Filed Dec. 8, 1986, Ser. No. 939,492
Term of patent 14 years
U.S. Cl. D10—94



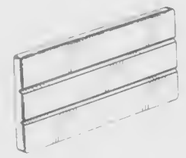
307,728
NECKLACE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari, S.p.A., Rome, Italy
Filed Apr. 30, 1987, Ser. No. 44,125
Claims priority, application Italy, Oct. 31, 1986, 36218/84[U]
Term of patent 14 years
U.S. Cl. D11—13



307,729
SUPPORT STAND
Nick Zonni, 6311 Southwind Dr., Whittier, Calif. 90601
Filed Apr. 27, 1987, Ser. No. 42,645
Term of patent 14 years
U.S. Cl. D11—130.1



307,730
INTERCHANGEABLE BELT ATTACHMENT
Keith Foster, Box 132, Green Ridge, Mo. 65532
Filed Feb. 24, 1987, Ser. No. 18,074
Term of patent 14 years
U.S. Cl. D11—200

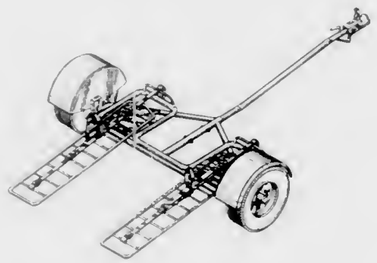




307,731
TRUCK CAB
Jeffery E. Kerney, Hayward; Charles E. Koske, Fremont, and Daniel E. Oen, San Francisco, all of Calif., assignors to Paccar Inc., Bellevue, Wash.
Filed Aug. 31, 1987, Ser. No. 91,257
Term of patent 14 years
U.S. Cl. D12—96



307,732
VEHICLE TOWING TRAILER
Jack R. Level, Plano, Tex., assignor to Tow Pro, Inc., McKinney, Tex.
Filed Jan. 30, 1987, Ser. No. 10,119
Term of patent 14 years
U.S. Cl. D12—101



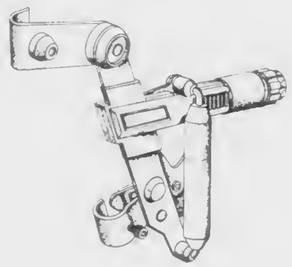
307,733
BAG FOR MOTORCYCLE
Hisashi Kushitani, No. 9-14,4-chome, Yoga, Setagaya-ku, Tokyo, Japan
Filed Nov. 14, 1986, Ser. No. 931,434
Term of patent 14 years
U.S. Cl. D12—158



307,734
FIFTH WHEEL LATCH RELEASE HOOK
Walter E. Ethridge, P.O. Box 462, Iva, S.C. 29655
Filed Oct. 5, 1987, Ser. No. 104,486
Term of patent 14 years
U.S. Cl. D12—161



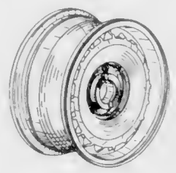
307,735
DERAILLEUR SHIFTER
Gilmore H. Chappell, Philadelphia. Pa., assignor to Bike-O-Matic Ltd., Audubon, Pa.
Filed May 4, 1987, Ser. No. 45,140
Term of patent 14 years
U.S. Cl. D12—124



307,736
STEERING COLUMN MOUNTED CONTROL STALK
Jack O. Otteson, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio
Filed Nov. 12, 1987, Ser. No. 121,756
Term of patent 14 years
U.S. Cl. D12—174



307,737
WHEEL FOR AN AUTOMOBILE
Boyke Boyer, Seefeld, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke, AG, Munich, Fed. Rep. of Germany
Filed Jan. 20, 1987, Ser. No. 5,131
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, MR16761
Term of patent 14 years
U.S. Cl. D12—209



307,738
FOLDING HUB ASSEMBLY FOR PROPELLER BLADES
Thomas C. Kerr, 7824 Lexington Ave., Philadelphia, Pa. 19152
Filed Jun. 1, 1988, Ser. No. 201,093
Term of patent 14 years
U.S. Cl. D12—214

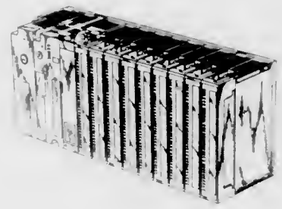


307,739
REMOTE CONTROL
Alexander D. Grant, London, England, assignor to Tunstall Telecom Limited, Yorkshire, England
Filed Jul. 21, 1987, Ser. No. 76,206
Claims priority, application United Kingdom, Jan. 23, 1987, 1039475
Term of patent 14 years
U.S. Cl. D13—168





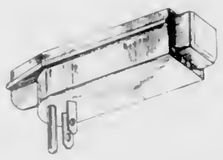
307,740
PROGRAMMABLE CONTROLLER
Masato Shibayama, Sayama; Kazuyuki Tsuburaya, Akikawa; Michiaki Kotsuka, Chiba; Takayuki Oshiga, Narashino, and Katsuhiro Fujiwara, Sakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 22, 1986, Ser. No. 899,428
Claims priority, application Japan, Jul. 21, 1986, 61-28230
Term of patent 14 years
U.S. Cl. D13—164



307,741
ELECTRONIC CONTROL MODULE CASE
Jeffrey S. Gilbert, Clay, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 23, 1987, Ser. No. 125,040
Term of patent 14 years
U.S. Cl. D13—162

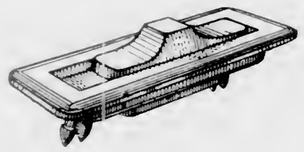


307,742
ELECTRIC PLUG WITH CIRCUIT BREAKER
Michael J. Serr; Carlyle Serr, and Lawrence E. Pierce, all of Holland, Mich., assignors to High Q Manufacturing Co., Holland, Mich.
Filed May 4, 1987, Ser. No. 346,285
Term of patent 14 years
U.S. Cl. D13—141

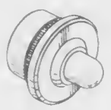


VOL
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ISS
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307,743
SLIDE SWITCH
Lawrence E. Pierce; Michael J. Serr, both of Holland; Paul C. DeKleine, Zeeland, and Robert L. Shaw, Holland, all of Mich., assignors to High Q Manufacturing Co., Holland, Mich.
Filed Sep. 15, 1986, Ser. No. 907,641
Term of patent 14 years
U.S. Cl. D13—170



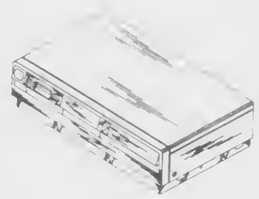
307,744
ELECTRICAL CONTACT ASSEMBLY
Richard B. Ernest, Northampton Township, Bucks County, Pa., assignor to Penn Engineering & Manufacturing Corp., Danboro, Pa.
Filed Mar. 9, 1987, Ser. No. 23,305
Term of patent 14 years
U.S. Cl. D13—171



307,745
COMBINED MAGNET AND HOLDER
William E. Adams, Portersville, Pa., assignor to Adams Mfg., Portersville, Pa.
Filed May 21, 1987, Ser. No. 52,750
Term of patent 14 years
U.S. Cl. D13—183



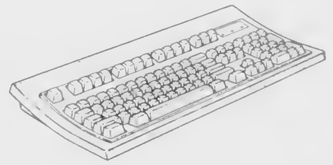
307,746
CONTROL UNIT FOR A PERSONAL COMPUTER
Daniel E. Armstrong, Lexington; John H. Barker; Troy A. Lee, both of Nicholasville; Peter J. Mendel, Lexington, all of Ky., and Ronald A. Smith, Apex, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 3, 1987, Ser. No. 34,319
Term of patent 14 years
U.S. Cl. D14—100



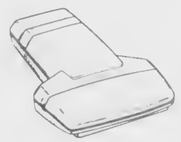
307,747
FLOOR STANDING COMPUTER
Vincent S. Garmon, West Palm Beach, and Joseph F. Talerico, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 12, 1986, Ser. No. 862,557
Term of patent 14 years
U.S. Cl. D14—102



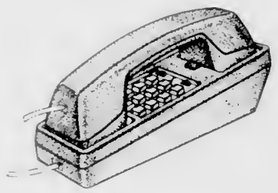
307,748
KEYBOARD
Ramon M. Cardona, Des Plaines; David G. Geis, Niles; Francis E. Huntoon, Des Plaines, all of Ill.; Chris G. Johnson, New York, N.Y.; Kenneth F. Lewinski, Hoffman Estates, Ill.; Raymond R. Seidlitz, Lincolnshire, Ill., and Eugene K. Sokolowski, Chicago, Ill., assignors to American Telephone & Telegraph Company, Holmdel, N.J. and AT&T Information Systems
Filed Oct. 7, 1987, Ser. No. 107,728
Term of patent 14 years
U.S. Cl. D14—115

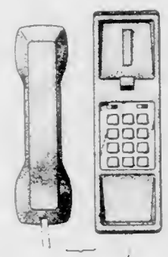


307,749
IMAGE SCANNER
Mineo Kubota, Yamanashi, and Kenji Masuyama, Kofu, both of Japan, assignors to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan
Filed Jun. 1, 1988, Ser. No. 200,790
Claims priority, application Japan, May 23, 1988, 63-20212
The portion of the term of this patent subsequent to Mar. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—116

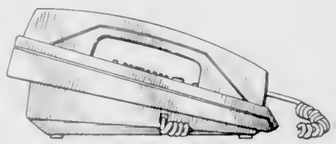


307,750
TWO-PIECE TELEPHONE
Patricia Schoenberg, Chicago, Ill., assignor to Ima-Hong Kong Limited, Kowloon, Hong Kong
Filed Aug. 15, 1988, Ser. No. 232,507
Claims priority, application United Kingdom, Mar. 12, 1988, 1049169
Term of patent 14 years
U.S. Cl. D14—149





307,751
TELEPHONE SET
Takashi Oshima, and Kenji Nozawa, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Jun. 10, 1988, Ser. No. 204,770
Claims priority, application Japan, Jan. 14, 1988, 63-1187
Term of patent 14 years
U.S. Cl. D14—151



307,752
ELECTRONIC PRIVATE BRANCH EXCHANGE HOUSING OR SIMILAR ARTICLE
Shin-ichiro Yoshida; Ryouichi Himeno, both of Yokosuka, and Takaharu Andou, Yokohama, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan
Filed May 12, 1987, Ser. No. 55,753
Claims priority, application Japan, Dec. 1, 1986, 61-47233
Term of patent 14 years
U.S. Cl. D14—240



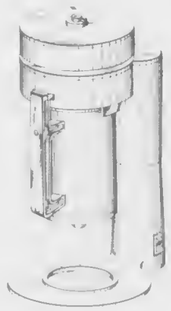


307,753
HANDSET TELEPHONE MOUTHPIECE COVER
Anthony J. Oliver, 124 Mt. Auburn St., Cambridge, Mass. 02138
Filed Dec. 21, 1987, Ser. No. 135,195
Term of patent 14 years
U.S. Cl. D14—249





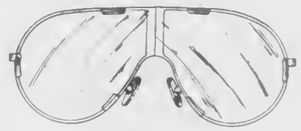
307,754
ICE CREAM MAKING MACHINE
Harold Osrow, Dix Hills, and Gordon Perry, New York, both of N.Y., assignors to Creative Technologies, Corporation, Deer Park, N.Y.
Filed May 11, 1988, Ser. No. 192,875
Term of patent 14 years
U.S. Cl. D15—82

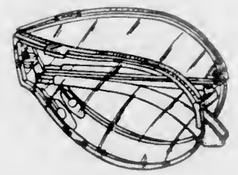


307,755
SUPPORT FOR FILLING BAGS OR THE LIKE
Stephen C. Rhodes, 104 Laurel St., Conway, S.C. 29526, and Jerry F. Richmond, 3704 Fernwood Dr., Raleigh, N.C. 27612
Filed Apr. 21, 1986, Ser. No. 857,420
Term of patent 14 years
U.S. Cl. D15—199

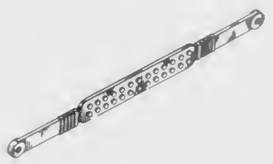


307,756
FOLDING EYEGLASSES
Ferdinand A. Porsche, Gries, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Jan. 22, 1987, Ser. No. 6,824
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 16770
Term of patent 14 years
U.S. Cl. D16—108





307,757
RETAINER FOR EYE GLASSES
Wilson Seet, 116 Lobo Vista, Novato, Calif. 94947
Filed May 11, 1987, Ser. No. 49,201
Term of patent 14 years
U.S. Cl. D16—123



307,758
MAGNIFYING GLASS
Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Tokyo, Japan
Filed Aug. 5, 1988, Ser. No. 229,383
Term of patent 14 years
U.S. Cl. D16—135

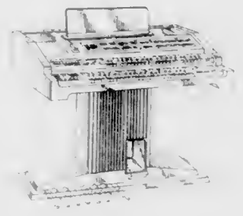


307,759
HOUSING FOR SURVEILLANCE CAMERA
Raymond V. Pagano, 2675C Lithonia Industrial Blvd., Lithonia, Ga. 30058
Filed Aug. 21, 1987, Ser. No. 87,910
Term of patent 14 years
U.S. Cl. D16—203



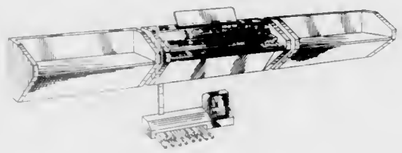


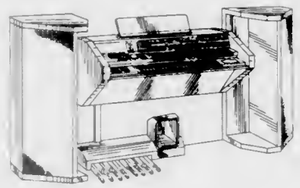
307,760
HOUSING FOR MUSICAL INSTRUMENT
Le Roi J. Ryan, P.O. Box 11404, Chicago, Ill. 60611
Filed Sep. 8, 1987, Ser. No. 93,868
Term of patent 14 years
U.S. Cl. D17—6



VOL
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ISS
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MY
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1990
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307,761
HOUSING FOR A WALL MOUNTED KEYBOARD INSTRUMENT WITH HORIZONTALLY SPACED SPEAKER UNITS
Le Roi J. Ryan, P.O. Box 11404, Chicago, Ill. 60611
Filed Sep. 8, 1987, Ser. No. 93,869
Term of patent 14 years
U.S. Cl. D17—6

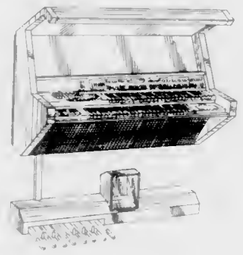




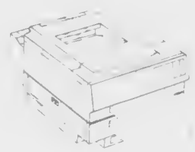
307,762
MODULAR WALL MOUNTED CABINET AND BENCH UNIT FOR A KEYBOARD INSTRUMENT
Le Roi J. Ryan, P.O. Box 11404, Chicago, Ill. 60611
Filed Sep. 8, 1987, Ser. No. 93,867
Term of patent 14 years
U.S. Cl. D17—6



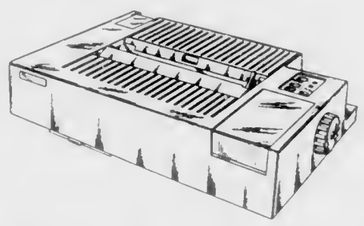
307,763
HOUSING FOR A WALL MOUNTED KEYBOARD INSTRUMENT
Le Roi J. Ryan, P.O. Box 11404, Chicago, Ill. 60611
Filed Sep. 8, 1987, Ser. No. 93,866
Term of patent 14 years
U.S. Cl. D17—6



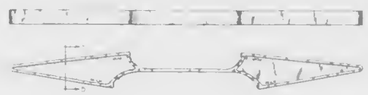
307,764
PRINTER
Tatsuo Kojima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 25, 1987, Ser. No. 29,875
Claims priority, application Japan, Oct. 2, 1986, 61-39204
Term of patent 14 years
U.S. Cl. D18—13



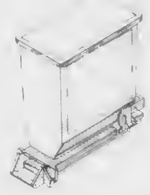
307,765
PRINTER
Paul T. Dubson, Escondido, and Lynn D. Palmer, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed May 29, 1987, Ser. No. 56,214
Term of patent 14 years
U.S. Cl. D18—13



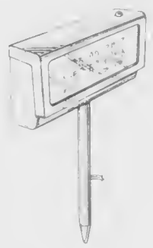
307,766
BOTTLE CAP REMOVING TOOL
Robert Hanks, 1026 W. Vandeveer, Taylorville, Ill. 62568
Filed Mar. 6, 1989, Ser. No. 318,944
Term of patent 14 years
U.S. Cl. D8—33



307,767
TONER CARTRIDGE FOR COMPUTER OUTPUT PRINTERS
Yoshitaka Tsumuro, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Apr. 9, 1987, Ser. No. 36,820
Claims priority, application Japan, Oct. 9, 1986, 40284/1986
Term of patent 14 years
U.S. Cl. D18—43



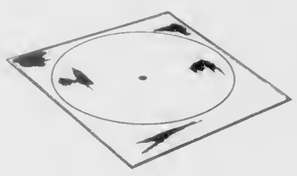
307,768
ELECTRICALLY ILLUMINATED HOUSE SIGN
Monte L. Levin, New york, N.Y., assignor to Trine Products Corporation, Bronx, N.Y.
Filed Feb. 3, 1988, Ser. No. 152,082
Term of patent 14 years
U.S. Cl. D20—17



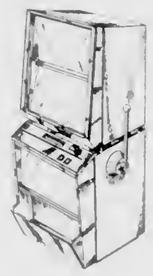
307,769
LOCKBOX DOOR PROTECTIVE SHIELD WITH BUSINESS CARD HOLDER
Debra L. Murphy, Conyers, Ga., assignor to T. J. Style, Stone Mountain, Ga.
Filed Sep. 18, 1986, Ser. No. 909,091
Term of patent 14 years
U.S. Cl. D20—43



307,770
GAME BOARD
Douglas D. Seaton, 482 Wellington St. W., Toronto, Ontario, Canada (M5V 1E3)
Filed Mar. 19, 1987, Ser. No. 28,143
Claims priority, application Canada, Oct. 17, 1986, 17-10-86-12
Term of patent 14 years
U.S. Cl. D21—34



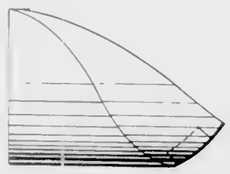
307,771
CABINET FOR GAMING MACHINE
William C. Cesaroni, Glenview; Anthony M. Kulusic, Chicago, and Michael P. Eckert, Prospect Heights, all of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.
Filed Jul. 29, 1986, Ser. No. 891,605
Term of patent 14 years
U.S. Cl. D21—38



307,772
TOY VEHICLE
Takehiko Takahashi; Yoshiyasu Ishii, and Taira Hanashima, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jul. 15, 1988, Ser. No. 219,244
Claims priority, application Japan, Feb. 17, 1988, 63-6258
Term of patent 14 years
U.S. Cl. D21—74

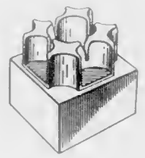


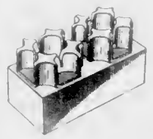
307,773
AERIAL TOY
Donald R. Colton, 326 Hayes St., Hollywood, Fla. 33019
Filed Jul. 6, 1987, Ser. No. 70,504
Term of patent 14 years
U.S. Cl. D21—82



307,774
CONSTRUCTION TOY BLOCK
Vic Bertrand, Ile Bizard, Canada, assignor to The Ritvik Group Inc., Dorval, Canada
Filed Dec. 19, 1988, Ser. No. 286,492
Term of patent 14 years
U.S. Cl. D21—108



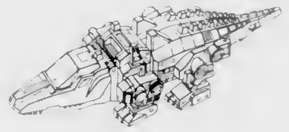




307,775
TOY CONSTRUCTION ELEMENT
Niels M. Pedersen, Århus, Denmark, assignor to Interlego A.G., Switzerland
Filed Nov. 29, 1988, Ser. No. 278,146
Term of patent 14 years
U.S. Cl. D21—108



307,776
RECONFIGURABLE TOY ALLIGATOR
Muneyoshi Shinohara, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 2, 1987, Ser. No. 10,150
Claims priority, application Japan, Nov. 5, 1986, 61-43670
Term of patent 14 years
U.S. Cl. D21—150





307,777
RECONFIGURABLE TOY BAT
Muneyoshi Shinohara, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 2, 1987, Ser. No. 10,002
Claims priority, application Japan, Nov. 5, 1986, 61-43671
Term of patent 14 years
U.S. Cl. D21—150





307,778
RECONFIGURABLE TOY WOLF
Muneyoshi Shinohara, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1987, Ser. No. 10,116
Claims priority, application Japan, Nov. 5, 1986, 61-43672
Term of patent 14 years
U.S. Cl. D21—161



307,779
DOLL
Anna L. Bryant, R.R. #1, Box 22, Pawnee, Okla. 74058
Filed Jul. 30, 1987, Ser. No. 79,487
Term of patent 14 years
U.S. Cl. D21—166



307,780
MARBLE RACEWAY
Gaylen D. Healzer, 200 Estes St., Nixa, Mo. 65714
Filed Apr. 18, 1988, Ser. No. 182,765
Term of patent 14 years
U.S. Cl. D21—143



VOL
1114
ISS
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MY
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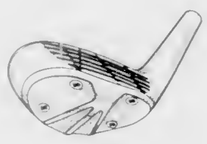
307,781
STUFFED TOY FIGURE
Gwendolyn A. Fiust, 526 Hellwig La., West Islip, N.Y. 11795
Filed Dec. 19, 1986, Ser. No. 943,590
Term of patent 14 years
U.S. Cl. D21—171



307,782
EXERCISE CYCLE
James S. Birrell, Seattle; Timothy O. Armstrong, Bellevue, and Cole J. Dalton, Seattle, all of Wash., assignors to Precor Incorporated, Bothell, Wash.
Filed Oct. 12, 1988, Ser. No. 254,794
Term of patent 14 years
U.S. Cl. D21—194



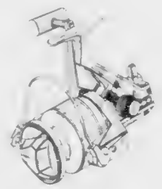
307,783
GOLF CLUB HEAD
Kanji Iinuma, Musashino, Japan, assignor to Daiwa Gold Co., Ltd., Higashikurume, Japan
Filed Feb. 2, 1987, Ser. No. 10,145
Claims priority, application Japan, Aug. 1, 1986, 61-30219
Term of patent 14 years
U.S. Cl. D21—214



307,784
TROT LINE GUIDE
Thomas E. Rodgers, Rte. 4, Box 3075, Stigler, Okla. 74462
Filed Jun. 15, 1987, Ser. No. 62,055
Term of patent 14 years
U.S. Cl. D22—134



307,785
REEL FOR FISHING
Toshiaki Yoshikawa, Musashino, Japan, assignor to Daiwa Seico, Inc., Tokyo, Japan
Filed Mar. 15, 1988, Ser. No. 168,329
Claims priority, application Japan, Sep. 24, 1987, 62-38918
Term of patent 14 years
U.S. Cl. D22—141



307,786
FISHING ROD HOLDER
Steven D. Cedergreen, Seattle, Wash., assignor to Tempress Incorporated, Seattle, Wash.
Filed Aug. 3, 1987, Ser. No. 81,124
Term of patent 14 years
U.S. Cl. D22—147



307,787
COMBINED ROD AND REEL HOLDER, OR SIMILAR ARTICLE
John Y. Jacobson, 19 Dart St., Loma Linda, Calif. 92354
Filed Aug. 14, 1987, Ser. No. 85,609
Term of patent 14 years
U.S. Cl. D22—147



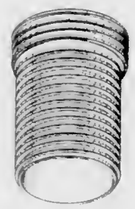
307,788
FISH HANDLING TOOL OR SIMILAR ARTICLE
Dean A. Mattson, 15 Nevada, Rapid City, S. Dak. 57701
Filed Jul. 17, 1987, Ser. No. 75,053
Term of patent 14 years
U.S. Cl. D22—150



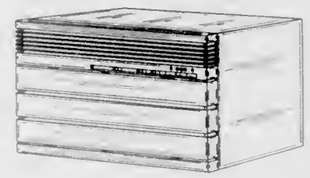
307,789
SHOWER FILTER
William T. Kerr, P.O. Box 18, Lamont, Fla. 32336
Filed May 31, 1988, Ser. No. 200,312
Term of patent 14 years
U.S. Cl. D23—209



307,790
TUBE OR THE LIKE
Gunnar Björkman, Fristad, Sweden, and Jyri Jarvenkyla, Hollola, Finland, assignors to Oyuponor AB, Nastola, Finland
Filed Mar. 13, 1986, Ser. No. 844,734
Claims priority, application Sweden, Sep. 13, 1985, 85-2153
Term of patent 14 years
U.S. Cl. D23—266

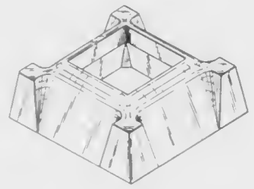


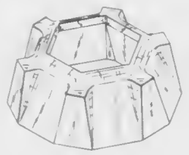
307,791
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,448
Claims priority, application Japan, Jun. 5, 1987, 62-23226
Term of patent 14 years
U.S. Cl. D23—353



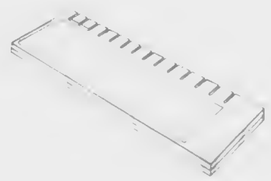
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307,792
CHIMNEY CAP COMPONENT
Leif A. Poulsen, 7803 Bremridge Drive, North Delta, British Columbia V4C 5E3, Canada
Filed May 4, 1988, Ser. No. 190,230
Term of patent 14 years
U.S. Cl. D23—374





307,794
FLUID DISPENSING CASSETTE FOR DISPENSING DOSES OF STERILIZING LIQUID
Harold R. Williams, Capistrano Beach, and Jay Wilson, Portola Valley, both of Calif., assignors to Surgikos, Inc., Arlington, Tex.
Filed May 26, 1987, Ser. No. 54,662
Term of patent 14 years
U.S. Cl. D24—9

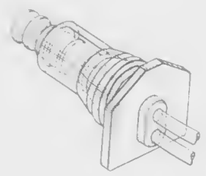


307,795
COMBINED DISPOSABLE MEDICAL PUMP CASSETTE AND CONNECTORS FOR ENTERAL FLUID DELIVERY PUMP SYSTEMS
Mark G. Frantz, New York, N.Y., assignor to Frantz Medical Development Ltd., New York, N.Y.
Filed Jun. 16, 1987, Ser. No. 63,273
Term of patent 14 years
U.S. Cl. D24—17

307,793
GLASS FIRESCREEN DOOR UNIT
Charles P. Becker, Jr., St. Louis County, Mo., assignor to Charles Becker Associates, Inc., Fenton, Mo.
Filed Dec. 8, 1986, Ser. No. 939,472
Term of patent 14 years
U.S. Cl. D23—406





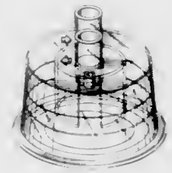


307,796
BLOOD NEEDLE HOLDER
Paul H. Hanifl, Barrington; John J. Newton, Jr., Palatine, and Lawrence G. Ponsi, Wheeling, all of Ill., assignors to Sage Products, Inc., Cary, Ill.
Filed Aug. 5, 1987, Ser. No. 82,064
Term of patent 14 years
U.S. Cl. D24—25





307,798
HUMIDIFYING CHAMBER
Adrian J. Elsworth, Mt. Wellington Highway, Mt. Wellington, Auckland, New Zealand
Filed May 26, 1987, Ser. No. 53,944
Claims priority, application New Zealand, Nov. 25, 1986, 20872
Term of patent 14 years
U.S. Cl. D24—34



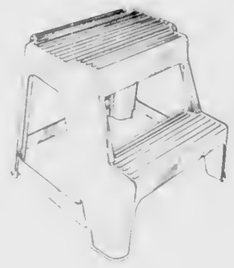
307,799
PATIENT RESTRAINT JACKET
James W. Worley, Cohutta, Ga., assignor to DeRoyal Industries, Inc., Knoxville, Tenn.
Filed Jul. 14, 1987, Ser. No. 72,851
Term of patent 14 years
U.S. Cl. D24—34



307,797
SKIN STAPLER
Larry E. Spreckelmeier, and John V. Hunt, both of Milford, Ohio, assignors to Ethicon, Inc., Somerville, N.J.
Filed Sep. 24, 1987, Ser. No. 100,812
Term of patent 14 years
U.S. Cl. D24—27

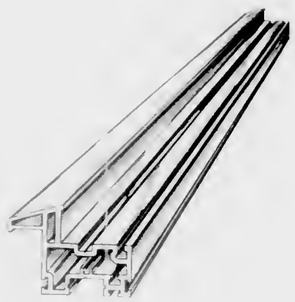


307,800
STEP STOOL
John L. Hradisky, Parma, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 22, 1988, Ser. No. 288,155
Term of patent 14 years
U.S. Cl. D25—65

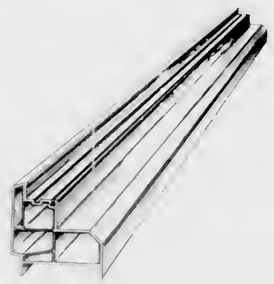


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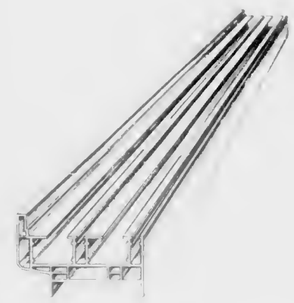
307,801
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 19, 1988, Ser. No. 246,523
Term of patent 14 years
U.S. Cl. D25—124



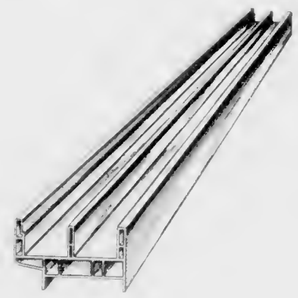
307,802
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 19, 1988, Ser. No. 246,525
Term of patent 14 years
U.S. Cl. D25—124



307,803
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 19, 1988, Ser. No. 246,522
Term of patent 14 years
U.S. Cl. D25—124



307,804
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 19, 1988, Ser. No. 246,188
Term of patent 14 years
U.S. Cl. D25—124



307,805
LAMP
Raymond J. Noe, Highland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Nov. 14, 1986, Ser. No. 930,825
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—2





307,806
FLASHLIGHT FOR ATTACHMENT TO A PORTABLE AIR COMPRESSOR
Peter Byar, Willingboro, N.J., and Edward Spector, Philadelphia, Pa., assignors to Interdynamics, Inc., Brooklyn, N.Y.
Filed Aug. 12, 1987, Ser. No. 85,001
Term of patent 14 years
U.S. Cl. D26—37



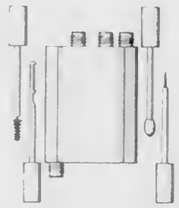
307,807
DECORATIVE OIL LAMP
David R. Perkins, Manchester, Mass., assignor to Glass Dimensions, Inc., Essex, Mass.
Filed Sep. 28, 1987, Ser. No. 101,546
Term of patent 14 years
U.S. Cl. D26—111



307,808
HAIR COMB
John Cabiddu, 5701 Hansen Rd., Minneapolis, Minn. 55436
Filed Jan. 19, 1988, Ser. No. 145,494
Term of patent 14 years
U.S. Cl. D28—29



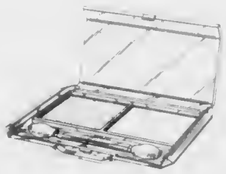
307,809
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 790,517, Oct. 23, 1985, Pat. No. Des. 300,269. This application Mar. 10, 1989, Ser. No. 321,555
Term of patent 14 years
U.S. Cl. D28—77



VOL
1114
ISS
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MY
8
1990
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307,810
DUO EYE SHADOW COMPACT
Ellen Gavin, Atlantic Highlands, N.J., assignor to L'Oreal, S.A., Paris, France
Filed Apr. 1, 1987, Ser. No. 33,488
Term of patent 14 years
U.S. Cl. D28—83



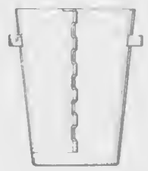


307,811
CLOTHING HAMPER
Marlene Branco, 435 Riverside Ave., Westport, Conn. 06880
Filed Mar. 14, 1988, Ser. No. 167,627
Term of patent 14 years
U.S. Cl. D32—37



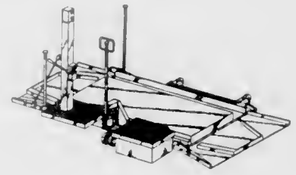


307,812
GARBAGE PAIL
Akihiro Yamaki, 63 Stratford Crescent, Farmingdale, N.Y. 11735
Filed Dec. 21, 1988, Ser. No. 288,000
Term of patent 14 years
U.S. Cl. D34—6

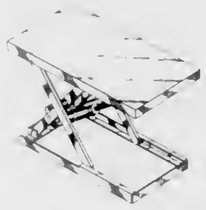




307,813
CONTAINER TRANSFER LIFT
Shunji Isogai, 5-25 Kanda-cho, Hekinan-shi, Aichi-ken, Japan, assignor to Shunji Isogai, Hekinan, Japan
Filed May 6, 1988, Ser. No. 190,939
Claims priority, application Japan, Mar. 19, 1988, 63-11160
Term of patent 14 years
U.S. Cl. D34—28



307,814
COMPACT LIFT FOR RAISING PALLETS OR OTHER LOADS
Yusuke Kawana, Otowa, Japan, assignor to Sugiyasu Industries, Co., Ltd., Takahama, Japan
Filed Feb. 2, 1988, Ser. No. 151,267
Claims priority, application Japan, Dec. 3, 1987, 62-49641
Term of patent 14 years
U.S. Cl. D34—31



VOL.
1114
ISS
2
MY
8
1990
UMI

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MAY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.R.M.I.N.E.S.: *See—*
Henri, Benon, 4,924,068, Cl. 219-274.000.

Abbott, Alfred H.: *See—*
Abbott, Harold F.; and Abbott, Alfred H., 4,922,790, Cl. 475-271.000.

Abbott, Harold F.; and Abbott, Alfred H. Dynamic phase adjuster. 4,922,790, Cl. 475-271.000.

Abdo, Suheil F., to Union Oil Company of California. Nickel-containing hydrocracking catalyst and process. 4,923,592, Cl. 208-111.000.

Abdo, Suheil F.: *See—*
Kokayeff, Peter; and Abdo, Suheil F., 4,923,836, Cl. 502-74.000.

Abex Corporation: *See—*
Russo, Sergio, 4,923,661, Cl. 264-119.000.

Abichandani, Jeevan S.: *See—*
Woodroffe, Jaime A.; and Abichandani, Jeevan S., 4,922,840, Cl. 110-345.000.

Abolins, Andrew: *See—*
Lienard, Jean; Haesebrouck, Francis; Katz, Sol; Abolins, Andrew; and Schmidt, George, 4,922,832, Cl. 105-4.200.

Abou-Gharbia, Magid A. M.; and Notvest, Ronald R., to American Home Products Corporation. Benzobicycloalkane derivatives as anticonvulsant neuroprotective agents. 4,924,008, Cl. 849-75.000.

Abraham, Dennis G.: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.

Abrahamson, Donald W.; Harney, Marilyn J.; Vauss, Elvin W., Jr.; Niksa, Andrew J.; and Stewart, James J., to ELTECH Systems Corporation. Monopolar, bipolar and/or hybrid memberane cell. 4,923,582, Cl. 204-255.000.

ABX: *See—*
Champseix, Serge, 4,922,947, Cl. 137-204.000.

Acar, Sevket: *See—*
Ramadorai, Gopalan; Ball, Brian; Atwood, Ronald L.; Wan, Rong-Yu; and Acar, Sevket, 4,923,510, Cl. 423-29.000.

Ace Medical Company: *See—*
Fischer, David A., 4,923,458, Cl. 606-59.000.

Acemore International Ltd.: *See—*
Leung, Albert M., 4,924,216, Cl. 340-709.000.

ACF Industries, Incorporated: *See—*
Coulborn, John W.; and Krug, John A., 4,922,833, Cl. 105-248.000.

Adachi, Keiichi: *See—*
Ohno, Shigeru; Mihara, Yuji; Adachi, Keiichi; Ukai, Toshinao; and Hayashi, Gouichi, 4,923,638, Cl. 252-587.000.

Adamczyk, Henry. Dental cleaning apparatus. 4,922,939, Cl. 134-140.000.

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Adams, Robert W., to Carillon Technology, Inc. Signal error compensation. 4,924,226, Cl. 341-157.000.

Adams, William J.; Zegler, Robert E.; and Monson, Conrad B., to Rockwell International Corporation. Head supportspine offloading ejection seat insert. 4,923,147, Cl. 244-122.0AG

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Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, to Union Special Corporation. Hemmer seamer assembly. 4,922,842, Cl. 112-304.000.

Addie, Graeme R.; and Visintainer, Robert J., to GIW Industries, Inc. Slurry pump having increased efficiency and wear characteristics 4,923,369, Cl. 415-206.000.

Adidas Sportschuhfabriken Adi Dassier Stiftung & Co. KG: *See—*
Anderie, Wolf, 4,922,631, Cl. 36-102.000.

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Adolfsson, Rune, to SKF Nova AB. Device for moving at least a part of a vehicle in a sideward direction. 4,923,361, Cl. 414-541.000.

Adolph Coors Company: *See—*
Dorfman, Jan L.; Dugan, Larry M.; Young, David C.; and Willcoxen, Mark A., 4,923,095, Cl. 222-386.500.

Advance Systems, Inc.: *See—*
Hella, Terry A., 4,922,628, Cl. 34-156.000.

Advanced Input Devices: *See—*
Neil, Brian K., 4,922,816, Cl. 101-41.000.

Advanced Micro Devices, Inc.: *See—*
Logie, Stewart, 4,924,278, Cl. 357-23.500.

Advanced Sleep Products: *See—*
Johenning, John B.; and Hall, Charles P., 4,922,563, Cl. 5-450.000.

Aero Wabash, Inc.: *See—*
Loomis, Russell M., 4,922,988, Cl. 160-368.100.

Aeroquip Corporation: *See—*
Laipply, Robert A., 4,923,228, Cl. 285-319.000.

Aerospatiale Societe Nationale Industrielle: *See—*
Vaillant de Guelis, Hubert; Jamain, Patrice; and Roland, Jean-Pierre, 4,924,128, Cl. 310-156.000.

Afga-Gevaert Aktiengesellschaft: *See—*
Kuhnert, Peter; and Feyen, Peter, 4,923,786, Cl. 430-450.000.

Agano, Toshitaka: *See—*
Miyagawa, Ichirou; and Agano, Toshitaka, 4,924,321, Cl. 358-296.000.

Agathangelou, Eva, to Cloberleaf Trading Company Ltd. Garment hanger. 4,923,102, Cl. 223-95.000.

Agee, John M.; and King, Francis C., to Agee, John M. Colles' fracture splint. 4,922,896, Cl. 606-55.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See—*
Saito, Keizo, 4,923,484, Cl. 55-21.000.

AGFA Gevaert AG: *See—*
Frank, Karl, 4,923,785, Cl. 430-430.000.

Agfa-Gevaert, N.V.: *See—*
Van der Auweraer, Mark G.; De Schrijver, Frans C.; Verbeek, Guy P.; Geelen, Carina; Terrell, David R.; and De Meutter, Stefaan K., 4,923,774, Cl. 430-59.000.

Ahn, Soon-Suk, to Seong-Do Moon. Electric fan apparatus. 4,922,766, Cl. 74-385.000.

Ahrens Agricultural Industries Co.: *See—*
Ahrens, Claude W., 4,922,858, Cl. 119-73.000.

Ahrens, Claude W., to Ahrens Agricultural Industries Co. Animal waterer. 4,922,858, Cl. 119-73.000.

Aibe, Hiroshi: *See—*
Masumoto, Mitsuhiko; Asoh, Toshiaki; Ezaki, Youichirou; and Aibe, Hiroshi, 4,924,025, Cl. 560-072.000.

Aicher, Max: *See—*
Russwurm, Dieter; and Richartz, Erich, 4,923,528, Cl. 148-12.400.

Aihara, Yoshihiko; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Power supply device for camera. 4,924,249, Cl. 354-286.000.

Aikawa, Kazuhiro: *See—*
Kato, Hirohiko; Mihayashi, Keiji; and Aikawa, Kazuhiro, 4,923,790, Cl. 430-523.000.

Ainslie, Benjamin J.; Craig, Susan P.; and Armitage, Jonathan R., to British Telecommunications plc. Optical fibre with fluorescent additive. 4,923,279, Cl. 350-96.300.

Ainsworth, James; Hardie, William G.; Kozlowski, Edward L., Jr.; and Shaf, Dinesh T., to W. L. Gore & Associates, Inc. Electrical cable. 4,924,037, Cl. 174-117.00F.

Air Cargo Equipment Corporation: *See—*
Weiss, Dale F.; and Neustadt, Ariel, 4,923,076, Cl. 220-1.500.

Aircraft Braking Systems Corporation: *See—*
Nedelk, John, 4,923,056, Cl. 188-71.100.

Airfoil Textron Inc.: *See—*
Ivsan, Thomas J.; Bailey, Carlos; and Jessup, Llewell, 4,922,798, Cl. 87-8.000.

Aisan Kogyo Kabushiki Kaisha: *See—*
Mizoguchi, Kenji; Takeuchi, Hitoshi; Nishigaki, Yoshiyasu; Kato, Yoshihiro; and Sakakibara, Shinichi, 4,922,876, Cl. 123-470.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Hamajima, Takanori; and Inaguma, Yukio, 4,924,123, Cl. 310-15.000.
Hattori, Takemi, 4,923,250, Cl. 297-410.000.
Iwasaki, Shinichiro, 4,922,883, Cl. 123-598.000.
Kanai, Naritoshi; and Suzuki, Akira, 4,922,910, Cl. 128-642.000.
Kawagoe, Shigeyuki; and Furuya, Yoshikatu, 4,923,232, Cl. 292-263.000.
Kobayashi, Tadamasa; and Kudo, Ryoichi, 4,923,045, Cl. 192-107.00R.

Aisin-Warner Kabushiki Kaisha: *See—*
Hayakawa, Yoichi; Yamashita, Takahiro; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,922,765, Cl. 74-15.880.

Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, to Dai Nippon Insatsu

VOL
1114
ISS
2
MY
8
1990
UMI

Kabushiki Kaisha. Image formation on objective bodies. 4,923,848, Cl. 503-227.000.

Akada, Masanori: *See—*
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,923,847, Cl. 503-227.000.

Akao, Takeshi; Nishizawa, Yoshihiko; Yamada, Shiro; Fuse, Hisahumi; Ohsaki, Katsuichi; and Sakai, Morihiko, to Kikkoman Corporation. System for manufacturing solid medium. 4,922,650, Cl. 47-1.100.

Akazawa, Shigeo; Mori, Masaharu; and Hamatsu, Masahiro, to Clarion Co., Ltd. Spread spectrum receiver having phase shifter for effecting phase synchronization of two convolvers. 4,924,188, Cl. 328-155.000.

Akcelrod, Patrick; and Papaithau, Bernard, to Etablissements Tasserit. Apparatus for resistive extension and flexion of the leg. 4,922,892, Cl. 128-25.00R.

Akebono Brake Industry Co , Ltd.: *See—*
Maehara, Toshifumi, 4,922,961, Cl. 137-596.170.

Akebono Research and Development Centre, Ltd.: *See—*
Maehara, Toshifumi, 4,922,961, Cl. 137-596.170.

Akinaga, Shiro: *See—*
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.

Akins, Charles S. Prewired electrical junction box. 4,924,032, Cl. 174-53.000.

Aks, Stanley O.: *See—*
Hudson, Ralph E.; Aks Stanley O.; Bogdanovic, Peter P.; and Lynch, David D., 4,924,232, Cl. 342-174.000.

Aktiebolaget SKF: *See—*
Bergling, Gunnar, 4,923,313, Cl. 384-571.000.

Aktieselskabet Aalborg Portland-Cement-Fabrik: *See—*
Andersen, Arne; and Bache, Hans, 4,923,665, Cl. 264-259.000.

Akutsu, Masao: *See—*
Nakayama, Shiro; Kunimura, Satoshi; Takahashi, Shigemi; Takahashi, Katsuhiko; Hirayama, Toshimitu; and Akutsu, Masao, 4,924,131, Cl. 310-329.000.

Akzo America Inc.: *See—*
Sherif, Fawzy G., 4,923,849, Cl. 505-1.000.

Akzo N V.: *See—*
Flottmann, Thomas; and Tretzel, Joachim, 4,923,608, Cl. 210-500.250.

AKZO S.r.l.: *See—*
Solia, Franco, 4,922,844. Cl 114-39.100.

Albanesi, Giancarlo, to Brico s.r.l. Lubricating composition on pocket-sized support, suitable to be smeared on sliding surfaces. 4,923,624, Cl. 252-10.000.

Albany International Corp.: *See—*
Romero Hernandez, Jose, 4,922,627, Cl. 34-116.000.

Albeck, Michael; and Grossman, Shlomo, to Bar-Ilan University. Antioxidant compositions and methods. 4,923,697, Cl. 424-195.100.

Albert, Guido; and Curtze, Jurgen, to Shell Agrar GMBH & Co., KG Fungicidal compositions. 4,923,866, Cl. 514-237.500.

Alcan International Limited: *See—*
Puddle, Mark W.; Davies, Nigel C.; Marwick, William F.; and Sheasby, Peter G., 4,924,057 Cl. 219-118.000.

Alcatel Business Systems, Limited: *See—*
Herbert, Raymond J.; and Williams, Thomas D., 4,924,240, Cl. 346-1.100.

Aldrich, Roger B., and Dahlstrom, John R., to Chief Automotive Systems, Inc. Gauging system for vehicle alignment equipment 4,922,623, Cl. 33-608.000.

Alexander, Michael; and Riddoch, Fiona G., to Honeywell Inc. Method of making a current sensor. 4,922,606, Cl. 29-839.000.

Alfred Kunz GmbH & Co.: *See—*
Hertle, Edmund; and Hausner, Siegfried, 4,923,338, Cl. 405-229.000.

Alfred Teves GmbH: *See—*
Belart, Juan; and Klein, Hans-Christof, 4,923,256, Cl. 303-114.000.

Alkem GmbH: *See—*
Stoll, Wolfgang; Ost, Christian; and Schneider, Volker, 4,923,639, Cl. 252-632.000

Allen, Ben G.: *See—*
Hulsman, William; and Allen, Ben G., 4,922,746, Cl. 73-49.300.

Allen-Bradley Company, Inc.: *See—*
Landowski, Roger W.; Roszkowski, Richard M., Christian, Donald J.; and Ansari, Assad A., 4,924,307, Cl. 358-107.000.

Allen, Clayton H.; and Berger, Elliott H. Means for stabilizing sound pressure produced at the eardrum under an earpad 4,924,502, Cl. 381-72.000.

Allen, Philip C; Burroughes, Jeremy H.; Friend, Richard H.; and Harrison, Alan J., to British Petroleum Company p.l.c., The. Optical modulators based on polymers. 4,923,288, Cl. 350-355.000.

Allen, Stephen L.: *See—*
Sylling, Truman V., and Allen, Stephen L., 4,923,500, Cl. 71-27.000.

Allergan, Inc.: *See—*
Chandraratna, Roshantha A. S., 4,923,884, Cl. 514-354.000.
Monestere, Martin, 4,923,480, Cl. 8-507.000.

Allied-Signal Inc.: *See—*
Karasek, Keith R.; Olson, William L.; and Donner, Jeffry T., 4,923,719, Cl. 427-387.000.
Larson, C. Allan; and Steele, Montgomerie C., 4,923,370, Cl. 416-95.000.
Sumniers, Jack C., 4,923,842, Cl. 502-261.000.
Vander Molen, Gary L.; and Johnson, Duane R., 4,923,254, Cl. 303-13.000.
Zedalis, Michael S.; and Gilman, Paul S., 4,923,532, Cl. 148-159.000.

Alliko Unlimited Corporation: *See—*
Janko, Michael; and McAllister, Matthew, 4,924,362, Cl. 362-108.000.

Allison, Joseph L.: *See—*
Pennington, Donald W.; and Allison, Joseph L., 4,923,931, Cl. 525-344.000.

Allred, Floyd R.; Weible, Gary A.; and Weible, Ronald L., to Western Group International. Rescue pouch. 4,922,562, Cl. 5-82.00R.

Alm, Roger R.; and Stern, Richard M., to Minnesota Mining and Manufacturing Company. Dyed aqueous air foams. 4,923,903, Cl. 521-65.000.

Alpha Enterprises, Inc.: *See—*
Hehn, Bruce A.; and Weisburn, James T., 4,923,062, Cl. 206-387.000.

Alps Electric Co., Ltd.: *See—*
Tung, Joseph S-T, 4,924,160, Cl. 318-561.000.
Yamashita, Tatsumaro, 4,924,325, Cl. 360-10.200.

Aluminum Company of America: *See—*
Saforo, Emmanuel K.; Liu, Paul K. T.; Bergstrom, Robin K.; and Gatty, David G., 4,923,843, Cl. 502-415.000.

Amemiya, Shigeo; Komine, Hiroaki; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, to Fujitsu Limited. Polling network communication system having transmission request registration means. 4,924,461, Cl. 370-95.200.

American Combustion, Inc.: *See—*
Gitman, Gregory M., 4,923,391, Cl. 431-10.000.

American Cyanamid Company: *See—*
Bailey, William J., 4,923,941, Cl. 526-268.000.
Dumican, Barry L., 4,923,470, Cl. 623-11.000.
Los, Marinus, 4,923,504, Cl. 71-92.000.
Moran, Daniel B.; Lin, Yang-I; and Ziegler, Carl B., 4,923,868, Cl. 514-253.000.

American Health Foundation: *See—*
Hecht, Stephen S.; Foiles, Peter G.; and Chung, Fung-Lung, 4,923,813, Cl. 435-172.200.

American Home Products Corporation: *See—*
Abou-Gharbia, Magid A. M.; and Notvest, Ronald R., 4,924,008, Cl. 849-75.000.

American Pneumatic Technologies, Inc.: *See—*
Dlugolecki, Andrzej J.; and Herman, Timm R., 4,922,770, Cl 81-357.000.

American Telephone and Telegraph Company: *See—*
Baylock, Gerald A., 4,924,464, Cl. 370-112.000.
Bilakanti, Jaya; and Laskowski, Edward J., 4,923,564, Cl. 156-655.000.
Chemans, Jim E.; and Monberg, Eric M., 4,923,561, Cl. 156-616.400.
Compton, Merle F.; Vanacore, Vincent D.; and Walsh, Brian W., 4,924,491, Cl. 379-37.000.
Freedman, Barry A.; Meketon, Mark S.; and Vanderbei, Robert J., 4,924,386, Cl. 364-402.000.
Gay, Steven L.; Gitlin, Richard D.; and Hartung, John, 4,924,480, Cl. 375-8.000.
Gitlin, Richard D.; Rao, Sailesh K.; Werner, Jean-Jacques; and Zervos, Nicholas, 4,924,492, Cl. 379-93.000.
Henry, Charles H.; Kazarinov, Rudolf F.; Kistler, Rodney C.; Orlowsky, Kenneth J.; Shani, Yosi; and Sudbo, Aasmund S., 4,923,271, Cl. 350 96.190.
Jin, Sungho; Lambert, William R.; Moore, Robert C.; Mottine, John J., Jr.; Sherwood, Richard C.; and Tiefel, Thomas H., 4,923,739, Cl. 428-221.000.
Le, Van-Ban, 4,924,510, Cl. 379-221.000.
Liu, Jay J.; and Wong, Y. H., 4,923,521, Cl. 134-5.000.
White, Donald L., 4,923,301, Cl. 356-356.000.

Amin, Chandrakant P.: *See—*
Bridges, Joseph W.; Luzader, Homer W.; and Amin, Chandrakant P., 4,922,741, Cl. 72-306.000.

Amit, Noah, to Aris Enterprises, Ltd. Spring element for hair-removal device. 4,923,460, Cl. 606-133.000.

Amoco Corporation: *See—*
Clark, John H.; Fisher, James H., and Wolfram, Thomas, 4,924,471, Cl. 372-34.000.
Hoffman, Alan L., 4,922,800, Cl. 89-8.000.
Vitands, Egils; and Lane, Kelley R., 4,923,961, Cl. 528-482.000.

AMP Incorporated: *See—*
Redmond, John P.; and Shaak, Ray N , 4,923,404, Cl. 439-71.000.

Ampex Corporation: *See—*
Daniels, Dale R., 4,923,053, Cl. 187-1.00R.

Analgesic Associates: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,923,898, Cl. 514-557.000.

Analog Devices, Inc.: *See—*
Mangelsdorf, Christopher W., 4,924,227, Cl. 341-159.000.

Anderle, Wolf, to Adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG. Shoe bottom for sports shoes. 4,922,631, Cl. 36-102.000.

Andersen, Arne; and Bache, Hans, to Aktieselskabet Aalborg Portland-Cement-Fabrik. Method of improving characteristics of a moulded body. 4,923,665, Cl. 264-259.000.

Anderson, Dana Z.; and Sampas, Nicholas, to University of Colorado Foundation, Inc. Optically differentiating and adding passive ring laser gyroscope. 4,923,299, Cl. 356-350.000.

Anderson, David N.; and Segredo, Guillermo T. Single head juice extractor. 4,922,814, Cl. 99-510.000.

Anderson, Don W.; Eddy, Robert; Egge, Alan; and Lewison, Richard. Portable screen with raising and levelling system. 4,923,597, Cl. 209-420.000.

Anderson, Floyd E.; and Robb, Stephen P., to Motorola, Inc. Microprocessor layout minimizing temperature and current effects. 4,924,111, Cl. 307-270.000.

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Anderson, Lowell R.; Hashem, Mohamed M.; and Login, Robert B., to GAF Chemical Corporation. N-pyrrolidonyl alkyl amino 1,3,4-butanetriol compounds. 4,924,006, Cl. 548-550.000.

Anderson, Mark L.: *See—*
Ennis, James F., III, 4,923,096, Cl. 222-391.000.

Ando, Hitoshi; Kashiwazaki, Takashi; Hosoi, Masayuki; and Fukushima, Atsuhiko, to Pioneer Electronic Corporation. Method for identifying current position of vehicle. 4,924,402, Cl. 364-449.000.

Ando, Satoshi: *See—*
Maeda, Karo; and Ando, Satoshi, 4,923,450, Cl. 604-265.000.

Andruszkiewicz, Ryszard; Chmara, Henryk; Milewski, Slawomir; Borowski, Edward; Zaremba, Maria; and Borowski, Jerzy, to Politechnika Gdanska. Tripeptides of N^3-4-methoxyfumaryl-L-2,3-diaminopropanoic acid. 4,923,965, Cl. 530-331.000.

Angell, Eric H.; Aprille, Thomas J.; Fang, Rong-Chin; Lee, Byeong G.; and Spalink, Jan-Dieter, to AT & T Bell Laboratories. Digital transmission interconnect signal. 4,924,459, Cl. 370-84.000.

Ansari, Assad A.: *See—*
Landowski, Roger W.; Roszkowski, Richard M.; Christian, Donald J.; and Ansari, Assad A., 4,924,307, Cl. 358-107.000.

Anthes, George. Overalls for crawling and slithering. 4,922,551, Cl. 2-79.000.

Anthony, Frank M., to Textron Inc. Cooling system for surfaces of high speed operating flight craft. 4,923,146, Cl. 244-117.00A.

Antikidis, Jean-Pierre; and Louis, Frederic C. Capacitive keyboard operable through a thick dielectric wall. 4,924,222, Cl. 341-33.000.

Antoon, Mitchell K., Jr.; and Hill, David J., to Hercules Incorporated. Breathable microporous film and methods for making it. 4,923,650, Cl. 264-41.000.

Antoon, Mitchell K., Jr., to Hercules Incorporated. Container comprising uniaxial polyolefin/filler films for controlled atmosphere packaging. 4,923,703, Cl. 426-118.000.

Anzai, Kenji; and Hamabe, Tatsuo, to Ciba-Geigy Corporation. Spherical fused silica and its use in fillers and resin compositions. 4,923,520, Cl. 106-490.000.

Aoki, Harumi: *See—*
Suzuki, Nobuharu; Aoki, Harumi; and Morisawa, Tahei, 4,924,247, Cl. 354-164.000.

Aoki, Makoto: *See—*
Kitazume, Masahiro; Aoki, Makoto; Nogi, Hiroshi; Homma, Kazuya; and Matsuzawa, Shigemi, 4,922,752, Cl. 73-146.000.

Aoki, Shinichi: *See—*
Murakawa, Norihiro; Isomura, Hisashi; Miura, Kazukiyo; and Aoki, Shinichi, 4,923,652, Cl. 264-62.000.

Aono, Koichi; and Ouchi, Mitsuyuki, to Toyota Jiodosha Kabushiki Kaisha. Limited slip differential. 4,922,789, Cl. 475-86.000.

Aoyagi, Toshitaka: *See—*
Yagi, Shigenori; Myoi, Yasuhito; Kuzumoto, Masaki; Kuba, Kazuki; Seiwa, Yoshito; Aoyagi, Toshitaka; and Mihashi, Yutaka, 4,924,474, Cl. 372-75.000.

Appel, Peter W.; Euser, Huug; and Liem, Seeng D., to Lever Brothers Company. High bulk density detergent composition and process for its production. 4,923,628, Cl. 252-135.000.

Appel, Stanley H.; McManaman, James L.; and Vaca, Kenneth W., to Baylor College of Medicine. Method to prepare a neurotrophic composition. 4,923,696, Cl. 424-548.000.

Aprille, Thomas J.: *See—*
Angell, Eric H.; Aprille, Thomas J.; Fang, Rong-Chin; Lee, Byeong G.; and Spalink, Jan-Dieter, 4,924,459, Cl. 370-84.000.

Aquatech, Inc.: *See—*
Driear, Joseph R., 4,922,571, Cl. 15-302.000.

Arai, Hirotoshi: *See—*
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000.

Arai, Takatoshi, to Jidosha Kiki Co., Ltd. Water-tight structure for multicore cable. 4,924,031, Cl. 174-52.300.

Arakawa Chemical Industries, Ltd.: *See—*
Masumoto, Mitsuhiko; Asoh, Toshiaki; Ezaki, Youichirou; and Aibe, Hiroshi, 4,924,025, Cl. 560-072.000.

Araki, Mitsunori: *See—*
Taniguchi, Yasuyuki; Ohwada, Yutaka; and Araki, Mitsunori, 4,923,730, Cl. 428-92.000.

Araki, Tomoyuki: *See—*
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.

Arbed S.A.: *See—*
Russwurm, Dieter; and Jungwirth, Dieter, 4,922,681, Cl. 52-737.000.

Arbuckle, Donald P. Fluidic transformer with sealed cylinder and check valves in pistons. 4,922,719, Cl. 60-562.000.

Arch Development Corporation: *See—*
Krauss, Alan R.; and Auciello, Orlando, 4,923,585, Cl. 204-298.040.

ArcherAire Industries, Inc.: *See—*
Cox, M. Keith; and Davidson, William E., 4,923,681, Cl. 422-116.000.

Arctic Systems Limited: *See—*
Gammon, Peter H. F., 4,923,019, Cl. 175-14.000.

Arentoft, Mogens. Method and system for feeding furred animals with dry fodder. 4,922,857, Cl. 119-51.120.

Arieh, Simon; and Courvoisier, Guy, to Lange International S.A. Ski boot. 4,922,632, Cl. 36-117.000.

Arima, Jiro; and Okui, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Photo-electric converter having offset voltage correcting function. 4,924,081, Cl. 250-214.00R.

Arima, Takanori: *See—*
Tanaka, Akira; Arima, Takanori; and Mori, Ryuji, 4,922,736, Cl. 70-277.000.

Aris Enterprises, Ltd.: *See—*
Amit, Noah, 4,923,460, Cl. 606-133.000.

Arita, Hitoshi: *See—*
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,923,847, Cl. 503-227.000.

Aritomi, Mitsutoshi: *See—*
Takeyama, Tadao; and Aritomi, Mitsutoshi, 4,923,942, Cl. 526-282.000.

Armada Corporation: *See—*
Hochstein, Peter A.; and Pringle, William L., 4,922,718, Cl. 60-527.000.

Armand, Michel B.: *See—*
Ravaine, Lucienne; Armand, Michel B.; Charbouillot, Yves; and Hammou, Abdelkader, 4,923,950, Cl. 528-38.000.

Armbrust, Eberhard; and Woehler, Hans-Juergen, to Dr. Ing. h.c.F. Porsche AG. Wheel suspension for a powered front axle of a motor vehicle. 4,923,209, Cl. 280-689.000.

Armitage, Jonathan R.: *See—*
Ainslie, Benjamin J.; Craig, Susan P.; and Armitage, Jonathan R., 4,923,279, Cl. 350-96.300.

Arnaudis, Germaine, to Rohm and Haas S.A. Process for preparing surface-active glycosides and the use of the glycosides in cosmetic, pharmaceutical and houshold products. 4,923,976, Cl. 536-18.600.

Arndt, Joseph H., to Eyedentify, Inc. Optical alignment system. 4,923,297, Cl. 351-208.000.

Arnold, Ben A.; and Rowberg, Alan H., to Arnold, Ben A. Automated image detail localization method. 4,922,915, Cl. 128-653.00R.

Arnold, Philip D.; and Kaywood, Roy G., to General Motors Corporation. Tubular camshaft assemblies and the like. 4,922,785, Cl. 74-567.000.

Arnold, William C.: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.

Arntzen, Lawrence O.: *See—*
Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 4,923,193, Cl. 272-73.000.

Aron, Jerome, to Kuhn, s.a. Haymaking machine. 4,922,700, Cl. 56-370.000.

Arps, David H.; Brown, Howard R.; Lanham, Roy J.; and Weiker, Donald E., to D. S. Brown Company, Inc., The. Maintainable expansion joint for highways, bridges and the like. 4,923,328, Cl. 404-69.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Katayose, Teruo; and Oda, Hiroji, 4,923,932, Cl. 525-391.000.

Asahi Kogaku Kogyo K.K.: *See—*
Negoro, Ikuo; and Kita, Masahiro, 4,924,266, Cl. 355-205.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Matsuo, Hirofumi, 4,923,292, Cl. 350-463.000.
Nishida, Takao; and Kobayashi, Takeo, 4,924,149, Cl. 315-241.00P.
Suzuki, Nobuharu; Aoki, Harumi; and Morisawa, Tahei, 4,924,247, Cl. 354-164.000.

Asahi Research Corporation: *See—*
Yamada, Masahiro, 4,924,246, Cl. 354-126.000.

Asai, Nobuteru; Sakai, Yasuo; and Miyazaki, Kazuo, to Hitachi, Ltd. Display information processing apparatus. 4,924,432, Cl. 364-900.000.

Asakura, Masahiko: *See—*
Kurihara, Norimitsu; Asakura, Masahiko; Matsui, Mitsuru; Otsuka, Yasuhiko; and Tachikawa, Kazuhiko, 4,924,397, Cl. 364-426.040.

Asasno, Kozo: *See—*
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asasno, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.

Asbill, Clarence M., III, to Robertshaw Controls Company. Differential pressure transmitter, a square root extractor device therefor and methods of making the same. 4,922,760, Cl. 73-861.480.

Aschemann, Dieter: *See—*
Sergel, Horst; Aschemann, Dieter; Gerloff, Klaus; Kay, Alexander; and Wedemeyer, Lutz, 4,922,751, Cl. 73-146.000.

ASHA Corporation: *See—*
Clenet, Alain J-M., 4,923,244, Cl. 296-214.000.

Ashland Oil, Inc.: *See—*
Chung, Daniel A.; and Dammann, Laurence G., 4,923,756, Cl. 428-423.700.

VOL
1114
ISS
2
MY
8
1990
UMI

Pitcher, Michael A.; Haugse, Albert L.; Pelfrey, Richard L.; and Sturtz, Gregory P., 4,922,991, Cl. 164-36.000.
Ashland Products Company: *See—*
Simpson, Harold, 4,923,230, Cl. 292-67.000.
Ashworth, John. Method and an apparatus for taking soil samples. 4,922,763, Cl. 73-864.410.
Aslund, Christer. Method of producing powder-metallurgical objects, specifically elongate objects such as rods, sections, tubes or the like. 4,923,671, Cl. 419-8.000.
Asoh, Toshiaki: *See—*
Masumoto, Mitsuhiko; Asoh, Toshiaki; Ezaki, Youichirou; and Aibe, Hiroshi, 4,924,025, Cl. 560-072.000.
ASSA AB: *See—*
Urby, Lars O., 4,922,737, Cl. 70-337.000.
Assistance Publique: *See—*
Frachet, Bruno; and David, Michel-Yves, 4,923,469, Cl. 623-10.000.
Asta Pharma Aktiengesellschaft: *See—*
Engel, Jurgen; Emig, Peter; Nickel, Bernd; and Szelenyi, Istvan, 4,923,858, Cl. 514-211.000.
Astechnologies, Inc.: *See—*
Elliott, George M.; Watford, Ervin L., Jr.; and Howell, George W., 4,923,555, Cl. 156-497.000.
Asten Group, Inc.: *See—*
Todd, Jeffrey L., 4,923,740, Cl. 428-233.000.
Aster Corporation: *See—*
Xu, Jisen, 4,923,268, Cl. 350-96.150.
Astley, Graham J.: *See—*
Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., 4,922,583, Cl. 24-279.000.
Asulab S.A.: *See—*
Grupp, Joachim, 4,923,286, Cl. 350-340.000.
AT & T Bell Laboratories: *See—*
Angell, Eric H.; Aprille, Thomas J.; Fang, Rong-Chin; Lee, Byeong G.; and Spalink, Jan-Dieter, 4,924,459, Cl. 370-84.000.
Baylock, Gerald A., 4,924,464, Cl. 370-112.000.
Gonda, Joseph, 4,924,195, Cl. 331-116.00R.
AT&T Information Systems, Inc.: *See—*
Gitlin, Richard D.; Rao, Sailesh K.; Werner, Jean-Jacques; and Zervos, Nicholas, 4,924,492, Cl. 379-93.000.
AT&T Paradyne: *See—*
Bremer, Gordon; and Betts, William L., 4,924,516, Cl. 380-46.000.
Atkinson, David I. H.: *See—*
Rudkin, Mark J.; and Atkinson, David I. H., 4,922,745, Cl. 73-32.00A.
Atkinson, Dianne L.: *See—*
Atkinson, Donald T. and Atkinson, Dianne L., 4,922,651, Cl. 47-1.410.
Atkinson, Donald T.; and Atkinson, Dianne L., to DFC New Zealand Limited. Apparatus for effecting or improving pollination of plants. 4,922,651, Cl. 47-1.410.
Atlantic Richfield Company: *See—*
Dalson, Milton H., 4,923,589, Cl. 208-66.000.
Atsumi, Kiminori: *See—*
Sakuma, Shuji; and Atsumi, Kiminori, 4,923,683, Cl. 424-52.000.
Atsumi, Shigeru; Yoshida, Toru; Kawahara, Yasuo; and Tanaka, Fuminari, to Kabushiki Kaisha Toshiba. Input protecting circuit in use with a MOS semiconductor device. 4,924,339, Cl. 361-56.000.
Attardo, Kristen L. Sliding drawer for storing and displaying cards. 4,923,261, Cl. 312-303.000.
Atwood, Ronald L.: *See—*
Ramadorai, Gopalan; Ball, Brian; Atwood, Ronald L.; Wan, Rong-Yu; and Acar, Sevket, 4,923,510, Cl. 423-29.000.
Aubry, Jacques A.; and Guillem, Andre , to Societe Nationale Industrielle et Aerospatiale. Contact link for flight controls of aerodynes. 4,924,043, Cl. 200-52.00R.
Aubry, Julien; Durand, Richard J.; Kerdraon, Alain L.; and Solve, Gerard, to L'Etat Francais represente par le Delegue Ministeriel pour l'Armement. Core-forming explosive charge. 4,922,825, Cl. 102-476.000.
Auciello, Orlando: *See—*
Krauss, Alan R.; and Auciello, Orlando, 4,923,585, Cl. 204-298.040.
Audhya, Tapan: *See—*
Goldstein, Gideon; and Audhya, Tapan, 4,923,964, Cl. 530-324.000.
Audit S.A.: *See—*
Frachet, Bruno; and David, Michel-Yves, 4,923,469, Cl. 623-10.000.
Auron, Philip E.: *See—*
Webb, Andrew C.; and Auron, Philip E., 4,923,807, Cl. 435-69.200.
Ausman, Thomas G.: *See—*
Shinogle, Ronald D.; and Ausman, Thomas G., 4,922,878, Cl. 123-490.000.
Austin-Gordon Design, Inc.: *See—*
Connolly, Thomas, 4,922,683, Cl. 53-296.000.
Automotive Products (U.S.A.) Inc.: *See—*
Tury, Edward L., 4,922,769, Cl. 74-866.000.
Autotyp S.A.: *See—*
Metraux, Michel, 4,922,982, Cl. 152-216.000.
Avco Research Laboratory, Inc.: *See—*
Woodroffe, Jaime A.; and Abichandani, Jeevan S., 4,922,840, Cl. 110-345.000.
Avec Scientific Utility Corporation: *See—*
Mombrinie, Bruno, 4,923,187, Cl. 269-328.000.
Avery International Corporation: *See—*
Bishop, Willis E.; Popat, Ghanshyam H.; Tien-Tsung, Chen; and Ruiz, Manuel W., 4,923,317, Cl. 401-205.000.
Ayers, Robert F. Car security system and method. 4,924,206, Cl. 340-426.000
B. Braun Melsungen AG: *See—*
Knoch, Martin; Reul, Helmut; and Rau, Gunter, 4,923,465, Cl. 623-2.000.
B. Braun-SSC AG: *See—*
Seidel, Dietrich; Wieland, Heinrich; Rosskopf, Gerhard; and Rath, Dieter, 4,923,439, Cl. 604-6.000.
B. F. Goodrich Company, The: *See—*
Benedikt, George M.; and Tenney, Linwood P., 4,923,678, Cl. 428-209.000.
Benedikt, George M., 4,923,734, Cl. 428-209.000.
Goodall, Brian L., 4,923,939, Cl. 526-161.000.
Hsu, Chin C., 4,923,940, Cl. 526-208.000.
Kuo, Charles C.; and Gengarelly, Robert M., 4,923,909, Cl. 523-333.000.
Baas, Dieter, to Deutsche Thomson-Brandt GmbH. Servo apparatus with offset compensation. 4,924,454, Cl. 369-44.110.
Baba, Fujio; Takeuchi, Kunihiko; and Horinouchi, Shinichi, to Tokyo Keiki Co., Ltd. System for supplying power source by electromagnetic induction coupling. 4,924,171, Cl. 323-347.000.
Babcock Energy Limited: *See—*
Fillinghani, John F.; Hawkins, Ronald J., and Wilson, Anthony D., 4,923,148, Cl. 244-137.100.
Babcock & Wilcox Company, The: *See—*
Vaughn, Henry P., 4,924,481, Cl. 378-59.000.
Babior, Bernard M., to President & Fellows of Harvard College. Stabilization of leukocytes. 4,923,797, Cl. 435-2.000.
Bache, Hans: *See—*
Andersen, Arne; and Bache, Hans, 4,923,665, Cl. 264-259.000.
Bachman, Wesley J.; and Stone, Steven G., to Dickey-John Corporation. Universal monitor. 4,924,418, Cl. 364-550.000.
Backlund, Ake; Ferritsius, Olof; and Tistad, Goran, to Kamyr AB. Treatment of mechanical pulp to remove resin. 4,922,989, Cl. 162-24.000.
Backus, Robert J., to Carrier Corporation. Heater plate assembly. 4,922,728, Cl. 62-278.000.
Bailey, Carlos: *See—*
Ivsan, Thomas J.; Bailey, Carlos; and Jessup, Llewell, 4,922,798, Cl. 87-8.000.
Bailey, John S.: *See—*
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,923,353, Cl. 414-226.000.
Bailey, Wilbur M.; Hulderman, George H.; Jones, Vincent L.; Pikulski, Joseph L.; Standlee, Arlie G.; Tangonan, Gregory L.; Vince, Michael R.; and Wysocki, Joseph A., to Hughes Aircraft Company. Optic fiber buffer defect detection system. 4,924,087, Cl. 356-73.100.
Bailey, William J., to American Cyanamid Company. Carboxy-functional polymers and their use as detergent additive. 4,923,941, Cl. 526-268.000.
Baker Cummins Pharmaceuticals, Inc.: *See—*
Frost, Phillip, 4,923,875, Cl. 514-282.000.
Baker, David L. Chemical reformer. 4,923,604, Cl. 210-180.000.
Baker Hughes Incorporated: *See—*
Hopmann, Mark E., 4,923,012, Cl. 166-385.000.
Baker, Ross G., Jr.: *See—*
Adkins, Robert A.; and Baker, Ross G., Jr., 4,922,930, Cl. 128-419.0PG.
Baker, Terence P.: *See—*
Binley, Gary N.; Giles, Alan F.; Pearson, Christopher A.; and Baker, Terence P., 4,923,706, Cl. 426-516.000.
Baldas, John: *See—*
Bonnyman, John; and Baldas, John, 4,923,969, Cl. 534-14.000.
Ball, Brian: *See—*
Ramadorai, Gopalan; Ball, Brian; Atwood, Ronald L.; Wan, Rong-Yu; and Acar, Sevket, 4,923,510, Cl. 423-29.000.
Ball Corporation: *See—*
Tucker, John W., 4,924,107, Cl. 250-572.000.
Ballard, Donald E., to General Electric Company. Core and coil assembly for a transformer having an amorphous steel core. 4,924,201, Cl. 336-210.000.
Bally Engineered Structures, Inc.: *See—*
Payne, Harold J. W., 4,922,668, Cl. 52-221.000.
Balmisse, Michel; and Molinari, Georges, to Roth Freres, Societe Anonyme. Process for producing paddings molded from polyurethane foam comprising several regions of different pliability, and paddings thus produced. 4,923,746, Cl. 428-309.900.
Baltes, Herbert: *See—*
Mueller, Matthias; and Baltes, Herbert, 4,922,944, Cl. 137-72.000.
Ban, Tomohiro: *See—*
Hirata, Keiichi; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; Ikeda, Yoshie; and Kawakami, Yasushi, 4,924,433, Cl. 364-900.000.
Bandhauer, Brian D.: *See—*
Erb, Lee A.; Carr, Alan R.; Beaty, Paul G.; Bandhauer, Brian D.; and Randall, Mitchell A., 4,924,191, Cl. 330-130.000.
Banerjee, Sanjoy: *See—*
Lim, Git B.; Nieman, Ronald E.; and Banerjee, Sanjoy, 4,924,099, Cl. 250-390.040.
Banjo, Toshinobu; Murasawa, Yasuhiro; and Onoda, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Memory card. 4,924,077, Cl. 235-492.000.
Bank, Howard M.; and Petrisko, Robert A., to Dow Corning Corporation. Method for preparation of organoalkoxysilanes. 4,924,022, Cl. 556-471.000.

Banker, Robert O.: *See—*
Farmer, James O.; Schodowski, Blair J.; Mobley, Joseph G.; Cole, Gregory C.; Tumblin, John E.; Banker, Robert O.; and West, Lamar, 4,924,498, Cl. 380-15.000.
Banky nee Elod, Erzsebet: *See—*
Szejtli, Jozsef; Tetenyi, Peter; Kiniczky, Marta; Bernath, Jeno ; Tetenyi nee Erdosi, Magda; Dobos, Eva; and Banky nee Elod, Erzsebet, 4,923,853, Cl. 514-58.000.
Banno, Masahiko: *See—*
Tanaka, Hidetake; Yamazaki, Shigeru; Yamanobe, Koji; Kotabe, Hiroaki; Nakazato, Yasushi; and Banno, Masahiko, 4,924,320, Cl. 358-296.000.
Bar-Ilan University: *See—*
Albeck, Michael; and Grossman, Shlomo, 4,923,697, Cl 424-195.100.
Bar Ray Products, Inc.: *See—*
Stein, Jeffrey; and Lapof, Ray C., 4,924,103, Cl. 250-516.100.
Barabino, William A.: *See—*
Dean, Raymond S.; and Barabino, William A., 4,923,455, Cl. 604-385.100.
Barbarin, Jacques M. G.; and Lecoutre, Pascal B. G., to Societe Anonyme Dite Hispano-Suiza. Turbojet engine thrust reverser with variable exhaust cross-section. 4,922,713, Cl. 60-226.200.
Bares, Jan, to Xerox Corporation. Quality control for magnetic images. 4,924,263, Cl. 355-203.000.
Barfurth, Dieter; and Nestler, Heinz, to Huels Troisdorf AG. Condensed acetoacetic acid ester titanium chelates and process for their preparation. 4,924,016, Cl. 556-40.000.
Barkats, Gerard. Two-liquid propulsive system for an artificial satellite and utilization of said system for ejecting the satellite. 4,923,152, Cl. 244-172.000.
Baroid Technology, Inc.: *See—*
Wachowicz, Stanley W.; and Downie, R. James, 4,923,008, Cl. 166-250.000.
Baron, Glen H.: *See—*
Roosa, Vernon D., 4,922,556, Cl. 4-378.000.
Barry, Alan F.: *See—*
Meek, Roger L.; and Barry, Alan F., 4,923,017, Cl. 172-776.000.
Barsby, James B.; and Mondoy, Tiodoro. Earth mover blade stabilizing apparatus. 4,923,015, Cl. 172-4.500.
Bartee, Edward C.; Bartee, Edward C.; and Chapman, Donald L., to Square D Company. Snap-on underfloor preset. 4,922,672, Cl. 52-221.000.
Bartee, Edward C.: *See—*
Bartee, Edward C.; Bartee, Edward C.; and Chapman, Donald L., 4,922,672, Cl. 52-221.000.
Bartels, James I.: *See—*
Adams, Wilmer L.; Bartels, James I.; Black, Robert A., Jr.; Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,923,117, Cl. 236-94.000.
Bartges, Brenda A.: *See—*
Grant, Thomas S.; Jalbert, Ronald L.; Whalen, David; Bartges, Brenda A.; and Thompson, Tracey L., 4,923,924, Cl. 525-66.000.
Barth, Karl: *See—*
Ermert, Helmut; Pfeiler, Manfred; and Barth, Karl, 4,922,916, Cl. 128-653.00R.
Bartholomew, Donald D., to Proprietary Technology, Inc. Apparatus for attaching a hose to a fitting. 4,923,226, Cl. 285-242.000.
Bartl, Josef; Schroettle, Wilhelm; and Puttinger, Dietmar, to Messerschmitt-Boelkow-Blohm GmbH. Apparatus for suspending, strapping, and launching a flying body from a carrier. 4,922,799, Cl. 89-1.819.
Bartlett, Philip L., to Du Pont de Nemours, E. I., and Company. Aerosol paint compositions. 4,923,097, Cl. 222-394.000.
Bartok, Stephen, to MicroComputer Accessories Incorporated. Adjustable keyboard drawer assembly. 4,923,259, Cl. 312-208.000.
Barton, D. Michael: *See—*
Ryder, K. James, Jr.; and Barton, D. Michael, 4,922,847, Cl. 114-299.000.
Barton, Richard O.: *See—*
Miller, John M.; and Barton, Richard O., 4,922,573, Cl. 16-2.000.
Bartz, Wilfried: *See—*
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,923,926, Cl. 525-67.000.
BASF Aktiengesellschaft: *See—*
Boyd, Jack D.; and Ryang, Hong-Son, 4,923,928, Cl. 525-117.000.
Hesse, Michael; Hoelderich, Wolfgang; Dockner, Toni; and Kohler, Hermann, 4,924,000, Cl. 548-343.000.
Leyrer, Reinhold J.; and Neumann, Peter, 4,924,003, Cl. 548-379.000.
Nahr, Uwe; and Pastsch, Manfred, 4,923,988, Cl. 544-74.000.
Schmeidl, Karl, 4,923,972, Cl. 534-677.000.
Schulz, Guenter; Buschmann, Ernst; Sauter, Hubert; Zeeh, Bernd; Wuerzer, Bruno; Jung, Johann; and Retzlaff, Guenter, 4,923,503, Cl. 71-92.000.
Simon, Helmut; and Guenther, Helmut, 4,923,811, Cl. 435-136.000.
Basgal, Jerry. Fishing lure. 4,922,646, Cl. 43-42.330.
Bass, Wayne R.: *See—*
Doan, Phong D.; Upton, James E.; Hess, Douglas H.; Bass, Wayne R.; and Ufford, Keith A., 4,922,607, Cl. 29-879.000.
Bata, George T.: *See—*
Grieb, John H.; Joseph, J. Michael; Weaver, Richard D.; and Bata, George T., 4,923,169, Cl. 251-118.000.
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., to BioTrol, Inc. Process for treating contaminated soil. 4,923,125, Cl. 241-20.000.
Batzill, Manfred, to Dr. Ing. h.c.F. Porsche AG. Arrangement for the purification of lubricating oil. 4,922,871, Cl. 123-196.00A
Bauer, Martin L.: *See—*
Brashear, Hugh R.; Blair, Michael S.; Phelps, James E.; Bauer, Martin L.; and Nowlin, Charles H., 4,924,450, Cl. 367-118.000.
Bauer, Wolfgang; Bucking, Hans-Walter; and Wallhausser, Karl-Heinz, to Cassella Aktiengesellschaft. Liquid formulations of 1,2-benziso-thiazolin-3-one, their preparation and their use. 4,923,887, Cl. 514-373.000.
Baum, Karl: *See—*
Luhrsen, Ernst; Pohl, Siegfried; Ott, Albert; Parbel, Wilhelm; and Baum, Karl, 4,923,225, Cl. 285-189.000.
Baumann, Horst: *See—*
Rutzen, Horst; Baumann, Horst; and Gruber, Bert, 4,923,642, Cl. 260-404.000.
Baumeister, Peter: *See—*
Vignali, Graziano; De Roit, Giovanni; Dubs, Paul; and Baumeister, Peter, 4,923,992, Cl. 546-186.000.
Bayer Aktienegesellschaft: *See—*
Wollweber, Detlef, 4,923,994, Cl. 546-281.000.
Bayer Aktiengesellschaft: *See—*
Eckstein, Udo; and Psaar, Hubertus, 4,923,641, Cl. 544-86.000.
Knofel, Hartmut; Brockelt, Michael; Petinaux, Marcel; and Uchdorf, Rudolf, 4,924,028, Cl. 564-331.000.
Riebel, Hans-Jochem; Fest, Christa; Muller, Klaus-Helmut; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,923,505, Cl. 71-93.000.
Rodi, Fritz; Kiemle, Peter; Eiling, Aloys; and Kathrein, Hendrik, 4,923,519, Cl. 106-459.000.
Scholl, Hans-Joachim; and Reiff, Helmut, 4,923,952, Cl. 528-60.000.
Scholl, Thomas; Perrey, Hermann; and Matner, Martin, 4,923,920, Cl. 524-501.000.
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,923,883, Cl. 514-343.000.
Baylock, Gerald A., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Technique for converting either way between a plurality of N synchronized serial bit streams and a parallel TDM format. 4,924,464, Cl. 370-112.000.
Baylor College of Medicine: *See—*
Appel, Stanley H.; McManaman, James L.; and Vaca, Kenneth W., 4,923,696, Cl. 424-548.000.
Bays, David E.: *See—*
Scopes, David I. C.; and Bays, David E., 4,923,863, Cl. 514-235.500.
Bays, F. Barry: *See—*
Caspari, Richard B.; Trott, Arthur F.; and Bays, F. Barry, 4,923,461, Cl. 606-146.000.
BBC Brown Boveri AG: *See—*
Keller, Jakob, 4,923,035, Cl. 181-228.000.
Kirrmann, Hubert, 4,924,379, Cl. 364-200.000.
Bean, Eric S.: *See—*
LeMoine, Eric D.; Bean, Eric S.; and Vodian, Morton A., 4,923,798, Cl. 435-5.000.
Beard, Terry D. Fast access digital audio message system and method 4,924,519, Cl. 381-51.000.
Beasom, James D., to Harris Corporation. IC which eliminates support bias influence on dielectrically isolated components. 4,923,820, Cl. 437-21.000.
Beatty, Paul J.: *See—*
Haas, David A.; VanderSyde, Gary L.; Beatty, Paul J.; and Roxas, Renato O., 4,922,689, Cl. 53-569.000.
Beaty, Paul G.: *See—*
Erb, Lee A.; Carr, Alan R.; Beaty, Paul G.; Bandhauer, Brian D., and Randall, Mitchell A., 4,924,191, Cl. 330-130.000.
Beauchemin, Phillippe J. Collapsible tailgate ramp. 4,923,360, Cl. 414-537.000.
Beck, Anton K.: *See—*
Reddy, Vemuri B.; Hsiung, Nancy; Beck, Anton K.; and Berstine, Edward G., 4,923,805, Cl. 435-69.400.
Beck, Robert J.: *See—*
Deshazer, William A.; Beck, Robert J.; and Helveston, Wilton L., 4,923,222, Cl. 285-137.100.
Beckley, Philip; and Snell, David, to British Steel Plc. Processing grain-oriented "electrical" steel. 4,924,052, Cl. 219-75.000.
Becton, Dickinson and Company: *See—*
DiPisa, Joseph A., Jr., 4,923,464, Cl. 606-195.000.
Bedko, Jury G.: *See—*
Bogdanov, Vasily S.; Platonov, Viktor S.; Bogdanov, Nikolai S.; Bedko, Jury G.; Miroshnichenko, Ivan I.; and Vorobiev, Nikolai D., 4,923,127, Cl. 241-70.000.
Beecham Group p.l.c.: *See—*
Broom, Nigel J. P.; Brooks, Gerald; and Coulton, Steven, 4,923,856, Cl. 514-192.000.
Beecham, Inc.: *See—*
Ibrahim, Nader; and Sodano, Jeanette L., 4,923,684, Cl. 424-52.000.
Behfar-Rad, Abbas; and Wong, S. Simon, to Cornell Research Foundation, Inc. Traveling wave semi-conductor laser. 4,924,476, Cl. 372-94.000.
Belamiza, Alexander. Signpost support bracket. 4,923,157, Cl. 248-188.200.
Belanger, Inc.: *See—*
Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., 4,922,583, Cl. 24-279.000.
Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., to Belanger, Inc. Adjustable clamp. 4,922,583, Cl. 24-279.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Belart, Juan; and Klein, Hans-Christof, to Alfred Teves GmbH. Hydraulic booster. 4,923,256, Cl. 303-114.000.

Belenkii, Boris G.: *See—*
Svec, Frantisek; and Belenkii, Boris G., 4,923,610, Cl. 210-637.000.

Belinko, Keith: *See—*
Khulbe, Chandra P.; Belinko, Keith; Waugh, Richard J.; and Perreault, Michel, 4,923,838, Cl. 502-151.000.

Belko, Robert P.: *See—*
Sprecker, Mark A.; Belko, Robert P.; and Hanna, Marie R., 4,924,026, Cl. 560-261.000.

Bell Communcations Research, Inc.: *See—*
Nelson, Terence J., 4,924,215, Cl. 340-701.000.

Bell & Howell Phillipsburg Company: *See—*
Haas, David A.; VanderSyde, Gary L.; Beatty, Paul J.; and Roxas, Renato O., 4,922,689, Cl. 53-569.000.

Belliotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., to Warner-Lambert Company. Novel process for the preparation of pyrazoles from isoxazoles. 4,924,002, Cl. 548-206.000.

Belorussky Tekhnologichesky Institut Imeni S.M. Kirova: *See—*
Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; and Verbitsky, Alexandr N., 4,923,675, Cl. 420-129.000.

Belt, Pekka: *See—*
Stormbom, Lars; Jalava, Jouko; Mesia , Heikki; Lehto, Ari; and Belt, Pekka, 4,924,064, Cl. 219-121.690.

Beltz, Warren G.: *See—*
Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 4,923,193, Cl. 272-73.000.

Ben-Amoz, Meir, to General Electric Company. Wall having cooling passage. 4,923,371, Cl. 416-97.00R.

Ben Clements & Sons, Inc.: *See—*
Furutsu, Akira, 4,923,106, Cl. 227-67.000.

Benedict, Bryan L.: *See—*
Bricker, Jeffery C.; Frame, Robert R.; Benedict, Bryan L.; and Pollastrini, Sheila L., 4,923,596, Cl. 208-207.000.

Benedikt, George M.; and Tenney, Linwood P., to B. F. Goodrich Company, The. Low dielectric constant prepreg based on blends of polynorbornene and polyolefins derived form C_2-C_4 monomers. 4,923,678, Cl. 428-209.000.

Benedikt, George M., to B. F. Goodrich Company, The. Laminates of polynorbornene and polyolefins derived from C_2-C_4 monomers. 4,923,734, Cl. 428-209.000.

Bennett, Frank E.: *See—*
Kennedy, Ronald R.; Manzitti, Michael T.; Bennett, Frank E.; Stout, John F.; and Vellam, Anthony M., 4,923,559, Cl. 156-523.000.

Bensel, Oskar. Industrial saw guide attachment. 4,922,616, Cl. 30-374.000.

Benthos, Inc.: *See—*
Hulsman, William; and Allen, Ben G., 4,922,746, Cl. 73-49.300.

Benton, Kenneth C.; Pierman, David A.; and Fox, Joseph R., to Standard Oil Company, The. Graphite composites and process for the manufacture thereof. 4,923,578, Cl. 204-130.000.

Bentrup, Otto T., to Kysor Industrial Corporation. Constant mesh gear box landing gear. 4,923,175, Cl. 254-419.000.

Bergamini, Giorgio; and Cipriani, Tommaso, to Nuovopignone Industrie Meccanichee Fonderia S.p.A. Optical slub catcher, particularly suitable for openend process. 4,924,406, Cl. 364-470.000.

Berger, Elliott H.: *See—*
Allen, Clayton H.; and Berger, Elliott H., 4,924,502, Cl. 381-72.000.

Bergling, Gunnar, to Aktiebolaget SKF. Device in rolling bearings. 4,923,313, Cl. 384-571.000.

Bergman, Kenneth D.; and Bergman, Mark C. Gate latch. 4,923,231, Cl. 292-238.000.

Bergman, Mark C.: *See—*
Bergman, Kenneth D. and Bergman, Mark C., 4,923,231, Cl. 292-238.000.

Bergstrom, Robin K.: *See—*
Saforo, Emmanuel K.; Liu, Paul K. T.; Bergstrom, Robin K.; and Gatty, David G., 4,923,843, Cl. 502-415.000.

Berkenhoff GmbH: *See—*
Hermanni, Hans, 4,924,050, Cl. 219-69.120.

Bernardet, Henri, to U.S. Philips Corporation. Device comprising a vacuum ion arc source. 4,924,138, Cl. 313-361.100.

Bernath, Jeno : *See—*
Szejtli, Jozsef; Tetenyi, Peter; Kiniczky, Marta; Bernath, Jeno ; Tetenyi nee Erdosi, Magda; Dobos, Eva; and Banky nee Elod, Erzsebet, 4,923,853, Cl. 514-58.000.

Berntson, Leslie G.: *See—*
Gibb, James L.; Laird, James A.; and Berntson, Leslie G., 4,923,714, Cl. 427-221.000.

Berova, Nikolina D.: *See—*
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S., Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

Berstine, Edward G.: *See—*
Reddy, Vemuri B.; Hsiung, Nancy; Beck, Anton K.; and Berstine, Edward G., 4,923,805, Cl. 435-69.400.

Beson, John, to Foster Oilfield Equipment Company. Gate valve having a secondary seal. 4,923,171, Cl. 251-159.000.

Beswick, Paul R. Fluid actuated cylinder. 4,922,805, Cl. 92-166.000.

Beta Mfg. Co.: *See—*
Meister, Jack B., 4,922,965, Cl. 137-625.650.

Bettoli, Steven C.: *See—*
Chich, Adem; Lalwani, Steven S.; Bettoli, Steven C.; Grube, Louis L.; and Bondoc, Alfredo A., 4,923,913, Cl. 524-62.000.

Betts, William L.: *See—*
Bremer, Gordon; and Betts, William L., 4,924,516, Cl. 380-46.000.

Betzig, Patricia A.: *See—*
Gembinski, John C.; Grimmer, Robert A.; and Betzig, Patricia A., 4,923,657, Cl. 264-73.000.

Beutler, Hans-Otto: *See—*
Deneke, Ulfert; Michal, Gerhard; and Beutler, Hans-Otto, 4,923,796, Cl. 435-15.000.

Bevilacqua, Richard M. Dent puller and method of use. 4,924,056, Cl. 219-98.000.

Beyer, Klaus D.; and Silvestri, Victor J., to International Business Machines Corporation. Method of trench filling. 4,924,284, Cl. 357-49.000.

BFGoodrich Company, The: *See—*
Goodall, Brian L.; and Rhodes, Larry F., 4,923,936, Cl. 526-115.000.

Bhutiani, Pupinder K.: *See—*
Matta, Ram K.; and Bhutiani, Pupinder K. 4,922,712, Cl. 60-226.200.

Biagioli, Mario. Masting for sailboats. 4,922,846, Cl. 114-90.000.

Bice, Gregory W.; Skoog, Mark A.; and Howard, John D., to United States of America, Air Force. Aircraft ground collision avoidance and autorecovery systems device. 4,924,401, Cl. 364-433.000.

Bie, Paul R.: *See—*
Calviello, Joseph A.; Bie, Paul R.; and Ward, David, 4,923,827, Cl. 437-190.000.

Biedermann, Kurt: *See—*
Bottger, Wolfgang; and Biedermann, Kurt, 4,922,968, Cl. 139-384.00R.

Bieri, Hans, to Hydrostress AG. Coupling system for boring tools. 4,923,344, Cl. 409-234.000.

Bierschenk, James L.; and Burke, Edward J. Thermoelectric cooler. 4,922,822, Cl. 136-204.000.

Bilakanti, Jaya; and Laskowski, Edward J., to American Telephone and Telegraph Company. Selective etching process. 4,923,564, Cl. 156-655.000.

Biller, Scott A., to E. R. Squibb & Sons, Inc. Phosphorus-containing squalene synthetase inhibitors, new intermediates and method. 4,924,024, Cl. 558-202.000.

Billings, Larry: *See—*
Kuchta, Richard; Billings, Larry; and Evenzon, Vladimir, 4,922,829, Cl. 104-127.000.

Billmann, Wilfried: *See—*
Horoldt, Ernst; Grimm, Richard; Rittner, Siegbert; Kuckertz, Herbert; and Billmann, Wilfried, 4,923,485, Cl. 55-55.000.

Billson, Anthony R.: *See—*
Loring, David A., 4,922,762, Cl. 73-862.480.

Bina, Joseph C.: *See—*
Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 4,923,193, Cl. 272-73.000.

Binley, Gary N.; Giles, Alan F.; Pearson, Christopher A.; and Baker, Terence P., to Thomas J. Lipton, Inc. Process of and apparatus for shaping extrudable material. 4,923,706, Cl. 426-516.000.

Bio, Inc.: *See—*
Jardine, Douglas M., 4,923,609, Cl. 210-636.000.

BioCarb AB: *See—*
Blomberg, Arne L., 4,923,980, Cl. 536-55.300.

Bioetica, S.A.: *See—*
Huc, Alain; and Gimeno, Rene , 4,923,380, Cl. 425-68.000.

Bioform Engineering, Inc.: *See—*
Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 4,923,193, Cl. 272-73.000.

Bionetics Research, Inc.: *See—*
Michejda, Christopher J.; and Smith, Richard H., Jr., 4,923,970, Cl. 534-550.000.

BioTrol, Inc.: *See—*
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 4,923,125, Cl. 241-20.000.

Bird, Geoffrey: *See—*
Dainis, Andrew; and Bird, Geoffrey, 4,923,155, Cl. 248-163.100.

Bird, Rebecca A., to Sperry Marine Inc. Sensor input/output system with continuous compass interface. 4,924,233, Cl. 342-175.000.

Bird, Stanford W. Carrier for beverage cartons. 4,923,082, Cl. 220-85.00H.

Birkeland, Robert L., to T. N. T. Medi Corporation. Dental hygiene device. 4,922,935, Cl. 132-309.000.

Bishop, Willis E.; Popat, Ghanshyam H.; Tien-Tsung, Chen; and Ruiz, Manuel W., to Avery International Corporation. Brushless white-out correcting fluid applicator. 4,923,317, Cl. 401-205.000.

Black, Robert A., Jr.: *See—*
Adams, Wilmer L.; Bartels, James I.; Black, Robert A., Jr.; Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,923,117, Cl. 236-94.000.

Blackburn, Stephen N.; Delwel, Francois; and Evans, Elfed H., to Lever Brothers Company. Detergent compositions. 4,923,636, Cl. 252-550.000.

Blair, David E.; Gollhardt, Bradley J.; and Larson, James R., to D X Imaging. Use of high percent solids for improved liquid toner preparation. 4,923,778, Cl. 430-137.000.

Blair, Michael S.: *See—*
Brashear, Hugh R.; Blair, Michael S.; Phelps, James E.; Bauer, Martin L.; and Nowlin, Charles H., 4,924,450, Cl. 367-118.000.

Blake, Bonnae C. Separable moisture proof sheet. 4,922,565, Cl. 5-484.000.

Blanchard, Raymond A., Jr.; and Roberts, Richard E., to Smith Corona Corporation. Thesaurus feature for electronic typewriters. 4,923,314, Cl. 400-63.000.

Blizzard, Timothy A.; and Mrozik, Helmut, to Merck & Co., Inc. Synthetic marcfortine derivatives useful as antiparasitic agents. 4,923,867, Cl. 514-250.000.

Bloch, Christopher J., to Naylor Industrial Services. Method and apparatus for cleaning conduits. 4,922,937, Cl. 134-22.120.

Blomberg, Arne L., to BioCarb AB. Process for the manufacture of a gel product. 4,923,980, Cl. 536-55.300.

Blomquist, James E.; and Larson, Robert M., to Kelch Corp. Bi-directional pressure relief vent for a fuel tank. 4,922,954, Cl. 137-493.000.

Blood, Neil J. Bi-directional flow filter. 4,923,602, Cl. 210-117.000.

Blouke, Morley M.; Tran, Thaian N.; and Lust, Marjorie L., to Tektronix, Inc. Method of treating a semiconductor body. 4,923,825, Cl. 437-53.000.

Blount, William W.; and Zoeller, Joseph R., to Eastman Kodak Company. Novel unsaturated polyesters. 4,923,958, Cl. 528-272.000.

Bloyet, Daniel: *See—*
Stephan, Ronan; Doisy, Martine; Montfort, Yves; Robbes, Didier; Sing, Marc L. C.; Bloyet, Daniel; Provost, Jackie; and Raveau, Bernard, 4,923,850, Cl. 505-1.000.

Bluck, Raymond M.; Bush, Harold G.; and Johnson, Robert R., to United States of America, National Aeronautics and Space Administration. Seamless metal-clad fiber-reinforced organic matrix composite structures, and process for their manufacture. 4,923,751, Cl 428-35.900.

Board of Regents, The University of Texas System: *See—*
De Villez, Richard L., 4,923,900, Cl. 514-714.000.

Bobbitt, Jesse L.; and Manetta, Joseph, to Eli Lilly and Company. Purification and refolding of recombinant proteins. 4,923,967, Cl. 530-351.000.

Boehringer Mannheim Corporation: *See—*
Ducheyne, Paul; and Kohn, David H., 4,923,513, Cl 75-245.000.

Boehringer Mannheim GmbH: *See—*
Deneke, Ulfert; Michal, Gerhard; and Beutler, Hans-Otto, 4,923,796, Cl. 435-15.000.
Leinert, Herbert; Tsaklakidis, Christos; and Sponer, Gisbert, 4,923,889, Cl. 514-422.000.

Boehringer Werkzeugmaschinen GmbH: *See—*
Kuhn, Siegfried; Philipp, Bernhard; and Schulten, Hermann, 4,924,524, Cl. 384-537.000.

Boeing Company, The: *See—*
Brown, Robert B., 4,922,711, Cl. 60-204.000.
Fuller, Robert L., Jr.; Faville, Paul E.; and Maier, Mark C., 4,923,067, Cl. 209-539.000.
Novak, Philip F.; Shannon, Robert D.; Pinckney, Robert L.; and Humphreys, James R., Jr., 4,924,228, Cl. 342-2.000.
Tanielian, Minas H., 4,924,294, Cl. 357-71.000.

Boesch, Timothy J.: *See—*
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 4,922,696, Cl. 56-202.000.

Bogart, Douglas A.; and Schenck, Robert C., Jr., to Duriron Company, Inc., The. Cross flow diesel particulate trap. 4,923,487, Cl. 55-482.000.

Bogdanov, Nikolai S.: *See—*
Bogdanov, Vasily S.; Platonov, Viktor S.; Bogdanov, Nikolai S.; Bedko, Jury G.; Miroshnichenko, Ivan I.; and Vorobiev, Nikolai D., 4,923,127, Cl. 241-70.000.

Bogdanov, Vasily S.; Platonov, Viktor S.; Bogdanov, Nikolai S.; Bedko, Jury G.; Miroshnichenko, Ivan I.; and Vorobiev, Nikolai D. Ball tube mill. 4,923,127, Cl. 241-70.000.

Bogdanovic, Peter P.: *See—*
Hudson, Ralph E.; Aks, Stanley O.; Bogdanovic, Peter P.; and Lynch, David D., 4,924,232, Cl. 342-174.000.

Bogdanovs, Andris, to Cooper Industries, Inc. Adjustable reflector attachment. 4,924,365, Cl. 362-224.000.

Bohen, Joseph M.; and Lovenguth, Ronald F., to Pennwalt Corporation. Tetrahalophthalate esters as flame retardants for polystyrene resins. 4,923,916, Cl. 524-217.000.

Bohen, Joseph M., to Pennwalt Corporation. Tetrahalophthalate esters as flame retardants for styrene-maleic anhydride copolymer (SMA) resins. 4,923,917, Cl. 524-288.000.

Bohlmann, Rolf; Laurent, Henry; Hofmeister, Helmut; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the production of 17α-ethinyl-17β-hydroxy-18-methyl-4,15-estradien-3-one and new intermediate products for this process. 4,923,640, Cl. 552-625.000.

Boire, Christopher P.: *See—*
Hershey, Antoinette F.; French, Andrew H.; and Boire, Christopher P., 4,924,378, Cl. 364-200.000.

Boireau, Christian; and Larseneur, Patrick, to Valeo. Retaining means for an electric motor shaft. 4,924,127, Cl. 310-90.000.

Boll, Wolf: *See—*
Pietsch, Albert; and Boll, Wolf, 4,922,870, Cl. 123-195.00R.

Bomsdorf, Karl Georg H.: *See—*
Kunz, Dietmar; Bomsdorf, Karl Georg H.; and Wieland, Jurgen S., 4,924,183, Cl. 324-309.000.

Bondoc, Alfredo A.: *See—*
Chich, Adem; Lalwani, Steven S.; Bettoli, Steven C.; Grube, Louis L.; and Bondoc, Alfredo A., 4,923,913, Cl. 524-62.000.

Bongartz, Heinrich; Ruch, Peter; and Voswinckel, Gerhard, to Gebrueder Sucker & Franz Mueller GmbH & Co. Method for controlling the amount of size applied to a traveling textile substrate. 4,922,592, Cl. 28-183.000.

Bonilla, Linda M.: *See—*
Bonilla, Marco A.; and Bonilla, Linda M., 4,922,555, Cl. 4-257.000.

Bonilla, Marco A.; and Bonilla, Linda M. Commode plunging shield. 4,922,555, Cl. 4-257.000.

Bonnyman, John; and Baldas, John, to Commonwealth of Australia, The. Preparation of 99m Tc radiopharmaceuticals. 4,923,969, Cl. 534-14.000.

Boone, Jack M.: *See—*
Burns, Stephen R.; Boesch, Timothy J., Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 4,922,696, Cl. 56-202.000.

Boos, John B.: *See—*
Anderson, Gordon W.; Boos, John B.; Dietrich, Harry B.; Ma, David I.; Mack, Ingham A. G.; and Papanicolaou, Nicolas A., 4,924,285, Cl. 357-30.000.

Borden, Inc.: *See—*
Mottur, George P.; Cope, Hilbert J., Jr.; Kishbaugh, Dennis L.; Luebbers, Michael J.; and Peters, Norman E., 4,923,705, Cl. 426-438.000.

Borg-Warner Chemicals, Inc.: *See—*
Grant, Thomas S.; Jalbert, Ronald L.; Whalen, David; Bartges, Brenda A.; and Thompson, Tracey L., 4,923,924, Cl. 525-66.000.

Borling, Alan: *See—*
Plamper, Gerhard R.; and Borling, Alan, 4,923,252, Cl. 301-63.0PW.

Bormioli, Giorgio. Quick coupling device for ducts. 4,923,219, Cl. 285-18.000.

Born, Eberhard; Korber, Helmut; and Mersch, Josef. Method and joining profiles. 4,923,540, Cl. 156-86.000.

Borowski, Edward: *See—*
Andruszkiewicz, Ryszard; Chmara, Henryk; Milewski, Slawomir; Borowski, Edward; Zaremba, Maria; and Borowski, Jerzy, 4,923,965, Cl. 530-331.000.

Borowski, Jerzy: *See—*
Andruszkiewicz, Ryszard; Chmara, Henryk; Milewski, Slawomir; Borowski, Edward; Zaremba, Maria; and Borowski, Jerzy, 4,923,965, Cl. 530-331.000.

Bortolotti, Paolo: *See—*
Morini, Francesco; and Bortolotti, Paolo, 4,923,122, Cl. 239-585.000.

Bosomworth, Paul: *See—*
Everhart Richard; Bosomworth, Paul; Butcher, Kenneth; and Hoffmann, Matthias, 4,923,830, Cl. 501-103.000.

Bothner, Jakob; and Marg, Axel, to Zinser Textilmaschinen GmbH. Sliver guide conduit. 4,922,580, Cl. 19-288.000.

Bottelberghe, Scott A., to Ethyl Corporation. Alkylaluminoxane process. 4,924,018, Cl. 556-179.000.

Bottger, Wolfgang; and Biedermann, Kurt, to Vorwerk & Co. Interholding GmbH. Premolding consisting of multiply fabric. 4,922,968, Cl. 139-384.00R.

Botvidsson, Lars: *See—*
Hirschberg, Jakub; Botvidsson, Lars; and Fahlstroem, Ulf, 4,922,926, Cl. 128-785.000.

Boucher, Robert J. Fuel reactor. 4,922,839, Cl. 110-234.000.

Bouchet, Manoel. Antiwear and nonskid protective element for a shoe heel. 4,922,629, Cl. 36-36.00R.

Bouery, Roger: *See—*
Moryl, Richard; and Bouery, Roger, 4,923,347, Cl. 411-182.000.

Boulicault, Jean-Michel, to Etat Francais. Remote inflation and deflation system and valve therefor. 4,922,946, Cl. 137-102.000.

Bourgogne, Michel: *See—*
Marcilly, Christian; Deves, Jean-Marie; and Bourgogne, Michel, 4,923,593, Cl. 208-113.000.

Bouyguess Offshore: *See—*
Huard, Gilbert, 4,923,337, Cl. 405-224.000.

Bovenkerk, Harold P.: *See—*
Johnson, Neil R.; and Bovenkerk, Harold P., 4,923,490, Cl 51-298.000.

Bovet, Claude; and Rossa, Edward M., to Organisation Europeenne pour la Recherche Nucleaire. Optical fiber device for generating a train of synchronous light pulses each comprising at most one photon and an apparatus for measuring same. 4,923,266, Cl. 350-96.150.

Bowen, James H.: *See—*
Caserta, Joseph N.; Mims, William D.; Reed, Joseph; and Bowen, James H., 4,924,080, Cl. 250-213.0VT.

Bowers, Gregory S., to Southern Water Treatment Co., Inc. Waste water treatment apparatus. 4,923,599, Cl. 210-96.100.

Bowling Green State University: *See—*
Necker, Douglas C.; and Linden, Shwn M Y., 4,924,009, Cl. 549-223.000.

Boyd, David C.: *See—*
Gladfelter, Wayne L.; and Boyd, David C., 4,923,717, Cl. 427-252.000

Boyd, Jack D.; and Ryang, Hong-Son, to BASF Aktiengesellschaft. Thermosetting bismaleimide resin composition containing an adduct of a propenylphenol and an epoxy compound. 4,923,928, Cl. 525-117.000.

Boyd, John M.: *See—*
Westlund, Arnold E., Jr.; Boyd, John M., and Fleming, Raymond T., 4,924,134, Cl. 313-113.000.

Boyd, Peter, to PDI. Boom for a sailing device. 4,922,845, Cl 114-39.200.

VOL
1114
ISS
2
MY
8
1990
UMI

Boyer, Harold F., to International Cellulose, Inc. Spray nozzle and methods. 4,923,121, Cl. 239-434.500.
Boyer, Wesley D.: *See—*
DeBiasi, Charles J.; and Boyer, Wesley D., 4,922,874, Cl. 123-417.000.
Braat, Josephus J. M.: *See—*
Opheij, Willem G.; and Braat, Josephus J. M., 4,924,082, Cl. 250-216.000.
Bradley, Albert J. Viscous liquid supply tanks. 4,922,953, Cl. 137-386.000.
Braglia, Marco, to Societa' Cavi Pierelli S.p.A.; Sirti S.p.A.; and SIP-Societa Italiana Per L'Esercizio Telecommunicazione P.A. Method of fabricating fluoride-glass integrated optical waveguides. 4,923,496, Cl. 65-30.130.
Bramhall, Robert B., Jr.; Cloutier, Richard M.; Laber, Albert P.; and Muka, Richard S., to Eaton Corporation. Sealing apparatus for a vacuum processing system. 4,923,584, Cl. 204-298.250.
Brand, John R.; Brownbridge, Thomas I.; and Kauffman, James W., to Kerr-McGee Chemical Corporation. Chemically inert pigmentary zinc oxides. 4,923,518, Cl 106-429.000.
Brandes, Wilhelm: *See—*
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,923,883, Cl. 514-343.000.
Brandon, Daniel; Dunlop, Kenneth N. B.; Jensen, Lester B.; Lucas, Richard M.; and Pietruszewski, Robert E., to Dunlop, Kenneth; Lucas, Richard; and Pietruszewski, Robert. Method and apparatus for providing interactive retrieval of TV still frame images and audio segments. 4,924,303, Cl. 358-86.000.
Braquet, Pierre; Dive, Georges; Godfroid, Jean-Jacques; Heymans, Francoise; and Pirotzky, Eduardo, to Societe de Conseils de Reserches et d'Applications Scientifiques. 2-Carbonyl substituted N,N'-di-(trimethoxygenzoyl)piperazines, process for preparing the same and therapeutical compounds containing them. 4,923,870, Cl. 514-255.000.
Braschel, Volker; Schmitt, Hubert; and Roller, Dieter, to Lucas Industries public limited company. Method of controlling the brake pressure in an anti-lock vehicle brake system. 4,923,255, Cl. 303-97.000.
Brashear, Hugh R.; Blair, Michael S.; Phelps, James E.; Bauer, Martin L.; and Nowlin, Charles H., to Martin Marietta Energy Systems, Inc. Ultrasonic ranging and data telemetry system. 4,924,450, Cl. 367-118.000.
Braun Aktiengesellschaft: *See—*
Kurz, Reinhard, 4,922,617, Cl. 30-419.000.
Pahl, Dietrich, 4,922,603, Cl. 30-43.910.
Braun, Hans-Jurgen, to Wella Aktiengesellschaft. Composition and process for the oxidative dyeing of hair with 3-(2',2', 2'-trifluoroethyl-jamino-phenol derivatives. 4,923,479, Cl. 8-412.000
Bray, John E.; and Poos, David, to NCR Corporation. Method and apparatus for displaying a high resolution image on a low resolution CRT. 4,924,522, Cl. 382-56.000.
Bremer, Gordon; and Betts, William L., to AT&T Paradyne. Method and system for a synchronized pseudo-random privacy modem. 4,924,516, Cl. 380-46.000.
Brendolan, Robert. *See—*
Wuchinich, David G.; Krawitt, Donald R.; Brendolan, Robert, and Katz, Louis, 4,922,902, Cl. 604-22.000
Brennecke, Wolfgang: *See—*
Brinkmeyer, Ernst; Brennecke, Wolfgang; and Otto, Rainer J. R. W., 4,923,290, Cl. 350-377.000.
Breslau, Steven M., to Sima Products Corporation. Video camera carrying case. 4,923,060, Cl. 206-316.200.
Breveglieri, Frank; and Streit, Kenneth F., to Geerpres, Inc. Utility cart. 4,923,202, Cl. 280-47.350
Brewster, Steven L.: *See—*
McCullough, Francis P., Jr.; Brewster, Steven L.; and Snelgrove, R. Vernon, 4,923,747, Cl. 428-312.600.
Bricker, Jeffery C.; Frame, Robert R.; Benedict, Bryan L.; and Pollastrini, Sheila L., to UOP. Use of quaternary ammonium compounds in a liquid/liquid process for sweetening a sour hydrocarbon fraction. 4,923,596, Cl. 208-207.000.
Brico s.r.l.: *See—*
Albanesi, Giancarlo, 4,923,624, Cl. 252-10.000.
Bridges, Joseph W.; Luzader, Homer W.; and Amin, Chandrakant P., to Westinghouse Electric Corp. Stator coil former. 4,922,741, Cl. 72-306.000.
Bridgestone Corporation: *See—*
Hasegawa, Hajime; Koga, Taiji; Takei, Atsuo; and Okuyama, Toru, 4,923,904, Cl. 521-115.000.
Nishide, Seiichiro; and Usami, Shigeoki, 4,923,553, Cl. 156-401.000.
Ozawa, Chiaki, 4,923,554, Cl. 156-417.000.
Bridgestone/Firestone, Inc. *See—*
Koch, Russell W.; and Snyder, Douglas D., 4,923,543, Cl. 156-97.000.
Brindle, James H. *See—*
Verona, Robert W.; Gillespie, J. Brian; and Brindle, James H., 4,922,550, Cl. 2-6.000.
Brinker, Barry; and Busse, John E., to 'totes', incorporated. Hand tool. 4,922,569, Cl. 15-105.000.
Brinkmeyer, Ernst; Brennecke, Wolfgang; and Otto, Rainer J. R. W., to U.S. Philips Corp. Polarization scrambler. 4,923,290, Cl. 350-377.000.
Brinton, Catherine A.; and Lux, Adalbert A., to Xerox Corporation. Oil distribution system for a heat and pressure fuser. 4,924,271, Cl. 355-284.000.
British Gas Corporation: *See—*
Sutton, David M., 4,923,393, Cl. 431-328.000.
British GAS plc: *See—*
Webster, Alan B., 4,922,951, Cl. 137-321.000.
British Petroleum Company p.l.c., The: *See—*
Allen, Philip C.; Burroughes, Jeremy H.; Friend, Richard H.; and Harrison, Alan J., 4,923,288, Cl. 350-355.000.
British Steel Plc: *See—*
Beckley, Philip; and Snell, David, 4,924,052, Cl. 219-75.000.
British Telecommunications plc: *See—*
Ainslie, Benjamin J.; Craig, Susan P.; and Armitage, Jonathan R., 4,923,279, Cl. 350-96.300.
Cheeseman, David S.; and Wright, Arthur J., 4,924,501, Cl. 379-201.000.
British Telecommunications public limited company: *See—*
Healey, Peter, 4,923,269, Cl. 350-96.150.
Kashyap, Raman; Reeve, Michael H.; Cassidy, Stephen A.; and Hornung, Stephen, 4,923,278, Cl. 350-96.300.
Lawrence, Peter J.; and Pring, David W., 4,924,489, Cl. 379-6.000.
Broad Research: *See—*
Broadbent, John A., 4,922,723, Cl. 62-72.000.
Broadbent, John A., to Broad Research. Apparatus and method for making ice cubes without a defrost cycle. 4,922,723, Cl. 62-72.000.
Broadhurst, Jeffrey C., to Woodville Polymer Engineering Limited. Aircraft landing equipment. 4,923,145, Cl. 244-100.00A
Brockelt, Michael: *See—*
Knofel, Hartmut; Brockelt, Michael; Petinaux, Marcel; and Uchdorf, Rudolf, 4,924,028, Cl. 564-331.000.
Brodie, Ivor; Gurnick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., to Innovative Display Development Partners. Method for providing polyimide spacers in a field emission panel display. 4,923,421, Cl. 445-24.000.
Brondt, Gary: *See—*
Nuesmeyer, David; and Brondt, Gary, 4,922,889, Cl. 126-73.000.
Brooks, Gerald: *See—*
Broom, Nigel J. P.; Brooks, Gerald; and Coulton, Steven, 4,923,856, Cl. 514-192.000.
Brooks, Johnny L.; Roberts, Donald L.; and Simmons, Jerry S., to R. J. Reynolds Tobacco Company. Drug delivery articles utilizing electrical energy. 4,922,901, Cl. 128-203.260.
Brooks, Mark L.; and Wilson, Keith E., to GenCorp Inc. Cohesive bonding process for forming a laminate of a wear resistant thermoplastic and a weather resistant rubber. 4,923,759, Cl. 428-521.000.
Broom, Nigel J. P.; Brooks, Gerald; and Coulton, Steven, to Beecham Group p.l.c. Penem compounds. 4,923,856, Cl. 514-192.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Hirata, Keiichi; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; Ikeda, Yoshie; and Kawakami, Yasushi, 4,924,433, Cl. 364-900.000.
Horaguchi, Yoichi; Sakakibara, Kenji; Yamada, Makoto; Nagata, Osamu; Suzuki, Tsuyoshi; and Sugiura, Toshio, 4,924,255, Cl. 355-27.000.
Kato, Iwao, 4,924,124, Cl. 310-43.000.
Yamaguchi, Koshiro; Takahashi, Toshio; Kitazawa, Yasunori; and Hattori, Hiroshi, 4,923,315, Cl. 400-120.000.
Brown, Brandon H. *See—*
Hediger, Edwin A.; and Brown, Brandon H., 4,924,272, Cl. 355-298.000.
Brown, David L.: *See—*
Cody, Ian A.; and Brown, David L., 4,923,588, Cl. 208-27.000.
Brown, Duncan W.; and Parsons, James D., to Hughes Aircraft Company. Chemical vapor desposition of silicon carbide. 4,923,716, Cl. 427-249.000.
Brown, Glenn M. *See—*
Shuttleworth, Leslie; Merkel, Paul B.; and Brown, Glenn M., 4,923,788, Cl. 430-507.000.
Brown, Howard R.: *See—*
Arps, David H.; Brown, Howard R.; Lanham, Roy J.; and Weiker, Donald E., 4,923,328, Cl. 404-69.000.
Brown, Oliver M., to S. C. Johnson & Son, Inc. Floor polishing composition. 4,923,514, Cl. 106-11.000.
Brown, Robert B., to Boeing Company, The. Thrust reversing system for high bypass fan engines. 4,922,711, Cl. 60-204.000.
Brown, Samuel E., to Lancer Corporation. Bonnet for beverage dispensing apparatus. 4,923,078, Cl. 220-4.00R.
Brown, Silas A. *See—*
Rotter, Bernard J.; Whitten, Timothy M.; and Brown, Silas A., 4,922,666, Cl. 52-66.000.
Brownbridge, Thomas I.: *See—*
Brand, John R.; Brownbridge, Thomas I.; and Kauffman, James W., 4,923,518, Cl. 106-429.000.
Browne, Christopher L., to Irro-Controls Group. Self-servicing hydraulic tensiometer with electrical switching and response capabilities. 4,922,945, Cl. 137-78.300.
Browne, Robert G.: *See—*
Stockdale, George F.; Hook, Harvey O.; Browne, Robert G.; and Heyman, Philip M., 4,923,423, Cl. 445-40.000.
Browner, Richard F.; and de Haseth, James A., to Georgia Tech RSS. Corp; and Univ of Ga Rss. Foundation. Monodisperse aerosol generator for use with infrared spectrometry. 4,924,097, Cl. 250-343.000.
Bruce, Henry E.: *See—*
Greenwood, Eugene C., 4,922,612, Cl. 30-166.300.
Bruinink, Jacob: *See—*
Verhulst, Antonius G. H.; Bruinink, Jacob; and Lenders, Emanuel J. W. M., 4,923,283, Cl. 350-269.000.
Bruke, Richard, to Spirac Engineering AB. Driving device. 4,922,768, Cl. 74-89.000.

Brunel, Christian: *See—*
Menn, Roger; Brunel, Christian; and Pecile, Dario, 4,924,144, Cl. 313-505.000.
Brunswick Corporation: *See—*
Staerzl, Richard E.; and Stageman, Ronald D., 4,922,866, Cl. 123-73.00A.
Steffes, Thomas J.; Feyen, Paul A.; and Martin, Wesley R., 4,922,749, Cl. 73-116.000.
Brunvand, Eric L.; and Davis, Alan L., to Fairchild Semiconductor Corporation. Circulating context addressable memory. 4,924,435, Cl. 364-900.000.
Bryan, Deborah M.; and Bryan, Randall W. Protective covering device. 4,922,888, Cl. 126-42.000.
Bryan, Randall W.: *See—*
Bryan, Deborah M.; and Bryan, Randall W., 4,922,888, Cl. 126-42.000.
BSD Enterprises, Inc.: *See—*
Sowers, David A., 4,923,522, Cl. 134-22.100.
Buchel, Manfred; and Hangmann, Norbert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method and apparatus for determining the position of a weld groove for laser welding. 4,924,063, Cl. 219-121.640.
Bucking, Hans-Walter: *See—*
Bauer, Wolfgang; Bucking, Hans-Walter; and Wallhausser, Karl-Heinz, 4,923,887, Cl. 514-373.000.
Buckley, James A. V., to Hayes Industrial Brake, Inc. High torque brake/lock differential with equal torque split capability. 4,923,040, Cl. 192-18.00R.
Bucknam, Neil E., to Magnetic Peripherals Inc. Spindle motor flex cable. 4,923,406, Cl. 439-77.000.
Budnik, Roger W., to Xerox Corporation. Shutter calibration and document size detection. 4,924,262, Cl. 355-75.000.
Buehler, David L.; Jacoby, Elliot G.; and Swartvagher, Rita, to Lutron Electronics Co., Inc. Face plate assembly for electrical devices. 4,924,349, Cl. 361-357.000.
Bullard, Milton, Jr. Absorbent disposable cover. 4,923,453, Cl. 604-356.000.
Bulso, Joseph D., Jr.; and Lewers, William R., to Redicon Corporation. Coil feeding system, mehod and apparatus. 4,923,139, Cl. 242-78.600.
Bunce, Martin C.; Helps, David W.; Jenkins, Leonard A.; and Noke, Adrian C., to CMB Packaging (UK) Limited. Tray for use in microwave ovens with heat sealed cover and inner lid. 4,924,048, Cl. 219-10.55E.
Bunck, Warren J. Food receptacle carrier. 4,923,236, Cl. 294-161.000.
Burg, Robert J., to Uni Corp. Clamped framework assembly and connectors used therewith. 4,923,322, Cl. 403-190.000.
Burger, George. Method for making composite reinforced tubes. 4,923,541, Cl. 156-87.000.
Burgyan, Lajos; and Hand, Wilfred L., to Raynet Corporation. Laser diode protection circuit. 4,924,473, Cl. 372-38.000.
Burke, Edward J.: *See—*
Bierschenk, James L.; and Burke, Edward J., 4,922,822, Cl. 136-204.000.
Robertson, William M.; Sharp, Charles A., III; and Burke, Edward J., 4,922,721, Cl. 62-3.610.
Burnhill, Michael. Vaginal device. 4,922,928, Cl. 128-832.000.
Burns, Robert V.; and Gupta, Sanjay, to Siemens Transmission Systems, Inc. Ring signal generator for generating ring signals of different frequencies and power levels in response to user selection. 4,924,511, Cl. 379-418.000.
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., to Murray Ohio Manufacturing Company, The. Grass collecting/utility cart for riding lawn mower. 4,922,696, Cl. 56-202.000.
Burroughes, Jeremy H.: *See—*
Allen, Philip C.; Burroughes, Jeremy H.; Friend, Richard H.; and Harrison, Alan J., 4,923,288, Cl. 350-355.000.
Burroughs Wellcome Co.: *See—*
Lever, O. William, Jr.; and Leighton, Harry J., 4,923,892, Cl. 514-450.000.
Burrows, Roger A., to RRRR Products, Inc. Trash storage and disposal combination unit. 4,923,087, Cl. 220-404.000.
Burton, Paul, to Highwood Audio Inc. Audio speaker. 4,924,504, Cl. 381-199.000.
Busch, Jurgen-Michael; Stammel, Georg; Rhau, Siegfried; Gundel, Bernd; and Rudolf, Karl, to Diehl GmbH & Co. Active component of submunition, as well as flechette warhead and flechettes therefor. 4,922,826, Cl. 102-489.000.
Busch, Wilhelm, to Gebruder Sucker & Franz Mueller GmbH & Co. Process and apparatus for repeatedly controlling a fabril napping operation. 4,922,589, Cl. 26-29.00R.
Buscher, John H., to HSC Controls Inc. Servovalve construction. 4,922,964, Cl. 137-625.620.
Buschmann, Ernst: *See—*
Schulz, Guenter; Buschmann, Ernst; Sauter, Hubert; Zeeh, Bernd; Wuerzer, Bruno; Jung, Johann; and Retzlaff, Guenter, 4,923,503, Cl. 71-92.000.
Buschmann, Gerd: *See—*
Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen, 4,924,004, Cl. 548-431.000.
Buschmann, Jeffrey P., to GTE Products Corporation. Mercury capsule support. 4,924,145, Cl. 313-546.000.
Bush, Harold G.: *See—*
Bluck, Raymond M.; Bush, Harold G.; and Johnson, Robert R., 4,923,751, Cl. 428-35.900.
Busse, John E.: *See—*
Brinker, Barry; and Busse, John E., 4,922,569, Cl. 15-105.000.
Butcher, Kenneth: *See—*
Everhart, Richard; Bosomworth, Paul; Butcher, Kenneth; and Hoffmann, Matthias, 4,923,830, Cl. 501-103.000.
Butler, Florence: *See—*
Kroll, Harry; Butler, Florence; and Souza, Therese R., 4,923,576, Cl. 204-44.400.
Butler, Neal R.: *See—*
Mroczkowski, Jacek A.; Reine, Marion B.; and Butler, Neal R., 4,924,096, Cl. 250-341.000.
Buzzi, Carlo A.; Saxer, Ulrich A.; and Stager, Paul A. Dental cleaner. 4,922,936, Cl. 132-321.000.
C. & E. Fein GmbH & Co.: *See—*
Fink, Manfred; Schreiber, Wolfgang; Ludwig, Manfred; Hald, Ewald; and Kloss, Guenter, 4,923,047, Cl. 192-150.000.
C. R. Bard, Inc.: *See—*
Gambale, Richard A.; Crittenden, James F.; and Ryan, James P., 4,922,923, Cl. 128-772.000.
Gambale, Richard A.; and Crittenden, James F., 4,922,924, Cl. 128-772.000.
Trombley, Frederick W., III, 4,923,061, Cl. 206-364.000.
Caines, R. Scott: *See—*
Rudd, David; and Caines, R. Scott, 4,923,713, Cl. 427-171.000.
Cal R & D, Inc.: *See—*
Curran, Kenneth J., 4,923,428, Cl. 446-175.000.
Calamito, Dominic P.: *See—*
Campman, Arthur R., deceased; Calamito, Dominic P.; and Pusch, Richard H., 4,922,969, Cl. 139-408.000.
Calderone, Michael P. Exercise device. 4,923,195, Cl. 272-117.000.
Calfee, Richard V.: *See—*
Fine, Michael J.; and Calfee, Richard V., 4,922,927, Cl. 128-786.000.
Calkins, Robert B.; and Rinke, Frederick F., to McDonnell Douglas Corporation. Parachute spring ring release. 4,923,150, Cl. 244-151.00B.
Callens, Roland; and Collin, Andre, to Solvay & Cie (Societe Anonyme). Use of guanidine-related compounds comprising a tetraphenyl-borate ion in solution phase peptide synthesis. 4,923,966, Cl. 530-338.000.
Calvert, Robert B.: *See—*
Valyocsik, Ernest W.; Wong, Stephen S.; and Calvert, Robert B., 4,923,690, Cl. 423-328.000.
Calviello, Joseph A.; Bie, Paul R.; and Ward, David, to Eaton Corporation. T-type undercut electrical contact process on a semiconductor substrate. 4,923,827, Cl. 437-190.000.
Cameron Iron Works U.S.A., Inc.: *See—*
Taylor, Kennard W., 4,923,221, Cl. 285-81.000.
Cameron Iron Works USA, Inc.: *See—*
Hartmann, Michael P.; and Smith, Jerry D., 4,923,006, Cl. 166-65.100.
Cameron, James D. Portable drill guide. 4,923,341, Cl. 408-112.000.
Campagnie Generale des Etablissements Michelin-Michelin & Cie: *See—*
Pompier, Jean-Pierre, 4,922,981, Cl. 152-158.000.
Campagnolo S.r.l.: *See—*
Romano, Antonio, 4,922,786, Cl. 74-594.400.
Campbell, Delmer E. Brake adjusting tool. 4,922,771, Cl. 81-484.000.
Campbell, Henry F.: *See—*
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,924,010, Cl. 549-355.000.
Campbell, James S. Device for crushing and cutting plant material 4,923,130, Cl. 241-236.000
Campbell, Michael E., to Carboloy Inc. Tool storage and changing system. 4,922,591, Cl. 29-26.00A.
Camphouse, Charles H.: *See—*
Fang, Shou-Mean; and Camphouse, Charles H., 4,924,074, Cl. 219-548.000.
Campman, Arthur R., deceased (by Campman, Martha H., executrix); Calamito, Dominic P.; and Pusch, Richard H., to Hitco. Multi-layer woven fabric having varying material composition through its thickness. 4,922,969, Cl. 139-408.000.
Campman, Martha H., executrix: *See—*
Campman, Arthur R., deceased; Calamito, Dominic P.; and Pusch, Richard H., 4,922,969, Cl. 139-408.000.
Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence: *See—*
Hill, Murray O., 4,924,445, Cl. 367-4.000.
Cann, Kevin J.: *See—*
Kao, Sun-Chueh; Cann, Kevin J.; Karol, Frederick J.; Marcinkowsky, Arthur E.; Goode, Mark G.; and Theobald, Eugene H., 4,923,938, Cl. 526-133.000.
Canon Kabushiki Kaisha: *See—*
Aihara, Yoshihiko; and Matsuda, Mutsuhide, 4,924,249, Cl. 354-286.000.
Hosoi, Nobuyuki; Hashimoto, Shigeru; Yoshida, Hiroshi; Watanabe, Yukio; Mukai, Yasuo; and Yamamoto, Michiko, 4,923,766, Cl. 428-694.000.
Koike, Shoji; Iwata, Kazuo; Tochihara, Shinichi; and Tomida, Yasuko, 4,923,515, Cl. 106-22.000.
Komiyama, Katsumi; Fukaya, Masaki; Yokono, Kojiro; and Toma, Hitoshi, 4,924,282, Cl. 357-30.000.
Ogino, Yoshitaka; Okada, Shinjiro; and Inoue, Yutaka, 4,923,285, Cl. 350-331.00T.
Ogino, Yoshitaka; Yanagisawa, Ryozo; Koumura, Noboru; and Nanamura, Masanori, 4,924,319, Cl. 358-296.000.

Oguchi, Yoshihiro; Sugata, Hiroyuki; Miura, Kyo; Fukui, Tetsuro; and Takasu, Yoshio, 4,923,390, Cl. 430-270.000.
Takimoto, Hiroyuki; Nagasawa, Kenichi; Fujimoto, Mikihiro; Kobayashi, Hiroyuki; and Takei, Masahiro, 4,924,326, Cl. 360-10.200.
Tsutsui, Shinji, 4,924,258, Cl. 355-53.000.
Yokomizo, Yoshikazu, 4,924,509, Cl. 382-50.000.
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.

Canon Kabushiki Kasiah: *See—*
Fukunaga, Kouji, 4,924,409, Cl. 364-518.000.

Cantagrel, Michel, to Compagnie Industrielle de Tubes et Lampes Electriques Citel. Gas lightning arrester containing a mineral addition agent. 4,924,347, Cl. 361-120.000.

Canterberry, J. B.; and Katz, Lawrence E., to Olin Corporation. Explosives and propellant compositions containing a polyurethane polyacetal elastomer binder and method for the preparation thereof. 4,923,536, Cl. 149-19.400.

Capek, Raymond G.; and Danielson, David B., to Zenith Electronics Corporation. Process for an improved tension mask support structure. 4,923,422, Cl. 445-30.000.

Caporali, Didier Y. F.; and Geernickx, Frans L. A., to U.S. Philips Corporation. Chip resister and method of manufacturing a chip resistor. 4,924,205, Cl. 338-227.000.

Capps, John W., to Hayes Microcomputer Products, Inc. Gas discharge surge suppressor for a telephone line. 4,924,346, Cl. 361-117.000.

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Carboloy Inc.: *See—*
Campbell, Michael E., 4,922,591, Cl. 29-26.00A.

Cardenas, Antonio: *See—*
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

Carding Specialists, (Canada) Ltd.: *See—*
Varga, John M. J., 4,922,579, Cl. 19-105.000.

Carillon Technology, Inc.: *See—*
Adams, Robert W., 4,924,226, Cl. 341-157.000.

Carl-Zeiss-Stiftung: *See—*
Nelles, Bruno; and Schwenn, Rainer, 4,923,293, Cl. 350-503.000.

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Carlin, Paolo, to Tecnoassistance S.R.L. Ethyl alcohol process for polyvinyl acetate production. 4,923,922, Cl. 525-56.000.

Carlozzo, Ben J.; Janoski, Ronald J.; Sterk, James; and Rundo, Mark C., to Tremco Incorporated. Protective cap construction and method. 4,923,348, Cl. 411-377.000.

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Carlson, J. David; Coulter, John P.; and Duclos, Theodore G., to Lord Corporation. Electrorheological fluid composite structures. 4,923,057, Cl. 188-378.000.

Carlson, John E.: *See—*
Rettig, John B.; Lueker, Jonathan; Carlson, John E.; Kaveckis, Stanley P.; and Lewallen, Roy W., 4,924,110, Cl. 307-227.000.

Carman, George; LaChapelle, Joseph G.; and Hiatt, Mark. Apparatus for reading information marks. 4,924,088, Cl. 250-271.000.

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Carnes, Jerry L.: *See—*
Cournier, Veatchel A., Carnes, Jerry L.; and Drost, Rahn, 4,923,021, Cl. 175-382.000.

Carniglia, Francis J., to Roncari, Raymond A. Composition of matter for increasing intracellular ATP levels and physical performance levels and for increasing the rate of wound repair. 4,923,851, Cl. 514-23.000.

Caron, Pierre: *See—*
Khan, Tasadduq; and Caron, Pierre, 4,923,525, Cl. 148-3.000.

Carr, Alan R.: *See—*
Erb, Lee A.; Carr, Alan R.; Beaty, Paul G.; Bandhauer, Brian D.; and Randall, Mitchell A., 4,924,191, Cl. 330-130.000.

Carr, Peter. Thermal energy storage apparatus. 4,922,998, Cl. 165-10.000.

Carrier Corporation: *See—*
Backus, Robert J., 4,922,728, Cl. 62-278.000.
Klodowski, Harry F., 4,923,806, Cl. 436-39.000.
New, David M., 4,922,726, Cl. 62-235.100.

Carter, Andrew C., to Plessey Overseas Limited. Apparatus for optical wavelength division multiplexing. 4,923,270, Cl. 350-96.180.

Carter, Peter: *See—*
Sims, Peter S.; and Carter, Peter, 4,923,631, Cl. 252-186.420.

Carter-Wallace, Inc.: *See—*
Naggiar, Samir F., 4,923,478, Cl. 8-161.000.

Cartry, Jean P.; and Fraissenet, Bruno, to Framatone. Device for lining a peripheral tube of a steam generator. 4,922,605, Cl. 29-727.000.

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Casberg, John M.; and Michaels, David E., to Olin Corporation. Method of chlorinating a swimming pool. 4,923,618, Cl. 210-755.000.

Casco Nobel AB: *See—*
Hedvall, Bertil; Mattson, Gunnar; Porrvik, Sten; and Sundstrom, Goran, 4,923,776, Cl. 430-111.000.

Caserta, Joseph N.; Mims, William D.; Reed, Joseph; and Bowen, James H., to ITT Corporation. Electromagnetic interference protection for image intensifier tube. 4,924,080, Cl. 250-213.0VT.

Casio Computer Co., Ltd.: *See—*
Dote, Kazumi, 4,924,385, Cl. 364-300.000.

Caspari, Richard B.; Trott, Arthur F.; and Bays, F. Barry, to Concept, Inc. Method of arthroscopic suturing of tissue. 4,923,461, Cl. 606-146.000.

Cassella Aktiengesellschaft: *See—*
Bauer, Wolfgang; Bucking, Hans-Walter; and Wallhausser, Karl-Heinz, 4,923,887, Cl. 514-373.000.

Cassidy, Stephen A.: *See—*
Kashyap, Raman; Reeve, Michael H.; Cassidy, Stephen A.; and Hornung, Stephen, 4,923,278, Cl. 350-96.300.

Castellanos, Ruben. Stirring implement. 4,924,444, Cl. 366-343.000.

Castro, Anthony B.: *See—*
Parks, Ronald; and Castro, Anthony B., 4,924,241, Cl. 346-75.000.

Caterpillar Inc.: *See—*
Evans, Raymond G.; Earleson, Walter E.; and Richardson, Joseph W., Jr., 4,924,395, Cl. 364-426.020.
Purcell, Robert J., 4,923,257, Cl. 305-29.000.
Shinogle, Ronald D.; and Ausman, Thomas G., 4,922,878, Cl. 123-490.000.

Cavalleri, Robert J. Self-machining seal ring leakage prevention assembly for rotary vane device. 4,923,377, Cl. 418-98.000.

CDP Product Development Corporation: *See—*
Crowson, Francis R., 4,923,068, Cl. 210-741.000.

CEBAL: *See—*
Granger, Jacques, 4,923,548, Cl. 156-182.000.

Cedar, Joseph. Longitudinally reinforced crimped streamer. 4,923,216, Cl. 281-2.000.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Faure, Jean-Francois, 4,923,676, Cl. 420-535.000.

Ceklovsky, Joseph P., to United States of America, Air Force. Antenna mounting apparatus. 4,924,239, Cl. 343-882.000.

Centre National De La Recherche Scientifique: *See—*
Denis, Jean-Noel; Greene, Andrew E.; Guenard, Daniel; and Gueritte-Voegelein, Francoise, 4,924,011, Cl. 549-510.000.

Centre National de la Recherche Scientifique (CNRS): *See—*
Ravaine, Lucienne; Armand, Michel B.; Charbouillot, Yves; and Hammou, Abdelkader, 4,923,950, Cl. 528-38.000.

Ceskoslovenska akademive ved and Akademia Nauk SSSR: *See—*
Svec, Frantisek; and Belenkii, Boris G., 4,923,610, Cl. 210-637.000.

Cetus Corporation: *See—*
Francis, Daniel L.; and Kasubick, Robert, 4,923,876, Cl. 514-283.000.

Cetylite Industries, Inc.: *See—*
Wachman, Stanley L.; and Karlan, Sidney, 4,923,899, Cl. 514-642.000.

Chae, Y. Jin. Gyratory rock crusher. 4,923,129, Cl. 241-207.000.

Chamberlin, David B.: *See—*
Dwyer, John J.; Chamberlin, David B.; and Jachmann, Emil F., 4,924,332, Cl. 360-72.200.

Champion, William L.: *See—*
Wischusen, Henry, III; and Champion, William L., 4,923,239, Cl. 296-97.700.

Champseix, Serge, to ABX. Automatic membrane drain device for pneumatic circuits. 4,922,947, Cl. 137-204.000.

Chandraratna, Roshantha A. S., to Allergan, Inc. Ethynyl-heteroaromatic-acids having retinoic acid-like activity. 4,923,884, Cl. 514-354.000.

Chang, Chien-Hua: *See—*
Hsieh, Tzu-Yen, 4,923,022, Cl. 177-4.000.

Chang, Wen-Hsuan: *See—*
O'Dwyer, James B.; Chang, Wen-Hsuan; Scriven, Roger L.; and Cherenko, Joseph, 4,923,757, Cl. 428-425.600.

Chao, Tien-Hsin; and Liu, Hua-Kuang, to United States of America, National Aeronautics and Space Administration. Real-time optical multiple object recognition and tracking system and method. 4,924,507, Cl. 382-31.000.

Chao, Yong-Sheng: *See—*
Fernandez, Salvador M.; Wang, Hann-Ping; Chao, Yong-Sheng; and Guignon, Ernest F., 4,923,819, Cl. 436-518.000.

Chapman, Donald L.: *See—*
Bartee, Edward C.; Bartee, Edward C.; and Chapman, Donald L., 4,922,672, Cl. 52-221.000.

Chapman, Emmett H. Layered voice musical self-accompaniment system. 4,922,797, Cl. 84-650.000.

Chapoy, L. Lawrence: *See—*
Coassolo, Alfredo; Sabarino, Giampiero; Foa', Marco; and Chapoy, L. Lawrence, 4,923,955, Cl. 528-193.000.

Chapoy, Larry L.: *See—*
Coassolo, Alfredo; Sabarino, Giampiero; Foa, Marco; and Chapoy, Larry L., 4,923,947, Cl. 528-193.000.

Charbouillot, Yves: *See—*
Ravaine, Lucienne; Armand, Michel B.; Charbouillot, Yves; and Hammou, Abdelkader, 4,923,950, Cl. 528-38.000.

Cheeseman, David S.; and Wright, Arthur J., to British Telecommunications plc. Dial pulse selection. 4,924,501, Cl. 379-201.000.

Chemans, Jim E.; and Monberg, Eric M., to American Telephone and Telegraph Company. Crystal growth method. 4,923,561, Cl. 156-616.400.

Chen, Paul N., Sr.; and Vora, Rohitkumar H., to Hoechst Celanese Corp. Polyamide-imide polymers having fluorine-containing linking groups. 4,923,960, Cl. 528-353.000.

Chen, York, to Contax Sports Inc. Shoe spike/receptacle assembly. 4,922,636, Cl. 36-127.000.

Chen, Zhitong; Johnson, Gary M.; Parkinson, Ward D.; Chern, Wen-Foo; Lowrey, Tyler A.; and Trent, Thomas M., to Micron Technology, Inc. Pull up circuit for digit lines in a semiconductor memory. 4,924,442, Cl. 365-189.110.

Cherenko, Joseph: *See—*
O'Dwyer, James B.; Chang, Wen-Hsuan; Scriven, Roger L.; and Cherenko, Joseph, 4,923,757, Cl. 428-425.600.

Chern, Wen-Foo: *See—*
Chen, Zhitong; Johnson, Gary M.; Parkinson, Ward D.; Chern, Wen-Foo; Lowrey, Tyler A.; and Trent, Thomas M., 4,924,442, Cl. 365-189.110.

Chernega, John G.; Martens, John A.; Olsen, Roger A.; and Cottingham, Auburn B., deceased (by Cottingham, Sue E., administrator), to Minnesota Mining and Manufacturing Company. Magnetic recording medium manufacturing process. 4,923,711, Cl. 427-44.000.

Chernenko, Evgeny V.: *See—*
Movchan, Boris A.; Panna, Vladimir A.; Chernenko, Evgeny V.; and Gorba, Naum A., 4,922,995, Cl. 164-469.000.

Chester, Brian: *See—*
Van Vliet, Michael; and Chester, Brian, 4,922,835, Cl. 108-114.000.

Chevalier, Pierre; and Sidot, Christian, to Societe Francaise Hoechst. Aqueous dispersion of styrene-acrylic polymers and its application to water resistant adhesive compositions especially suited for tiling. 4,923,921, Cl. 524-555.000.

Chevallet, Jacques, to Hospal Industrie. Method for determining a patient's blood sodium level and artificial kidney for the application thereof. 4,923,613, Cl. 210-647.000.

Chiba, Kazumasa; Kobayashi, Kazuhiko; and Ueno, Osamu, to Toray Industries, Inc. Resin compositions and their manufacturing method. 4,923,925, Cl. 525-66.000.

Chiba, Takatoshi, to Dainippon Screen Mfg. Co., Ltd. Method of controlling heat treatment apparatus for substrate. 4,924,073, Cl. 219-413.000.

Chiba, Toshiyuki: *See—*
Murata, Masayoshi; Chiba, Toshiyuki; and Yamada, Akira, 4,923,857, Cl. 514-210.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,923,998, Cl. 548-195.000.

Chich, Adem; Lalwani, Steven S.; Bettoli, Steven C.; Grube, Louis L.; and Bondoc, Alfredo A., to GAF Building Materials Corporation. Low temperature sealing adhesive composition. 4,923,913, Cl. 524-62.000.

Chief Automotive Systems, Inc.: *See—*
Aldrich, Roger B.; and Dahlstrom, John R., 4,922,623, Cl. 33-608.000.

Chilcote, Dennis D.: *See—*
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 4,923,125, Cl. 241-20.000.

Chimerix Corporation: *See—*
Fernandez, Salvador M.; Wang, Hann-Ping; Chao, Yong-Sheng; and Guignon, Ernest F., 4,923,819, Cl. 436-518.000.

Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T.: *See—*
Szejtli, Jozsef; Tetenyi, Peter; Kiniczky, Marta; Bernath, Jeno ; Tetenyi nee Erdosi, Magda; Dobos, Eva; and Banky nee Elod, Erzsebet, 4,923,853, Cl. 514-58.000.

Chips and Technologies, Inc.: *See—*
Fung, Michael G.; and Wang, Justin, 4,924,375, Cl. 364-200.000.

Chirinos, Maria L.: *See—*
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

Chisso Corporation: *See—*
Komori, Nobutoshi; and Nakazima, Hirokazu, 4,923,918, Cl. 524-339.000.
Kunimune, Kouichi; Kikuta, Kazutsune; Kawamoto, Takao; and Konotsune, Shiro, 4,923,968, Cl. 528-353.000.
Sawada, Shinichi; Isoyama, Toyoshiro; Matsushita, Tetsuya; and Saito, Hideo, 4,923,632, Cl. 252-299.610.

Chiu, Kuang-Yi: *See—*
Wang, Martin S.; and Chiu, Kuang-Yi, 4,923,822, Cl. 437-41.000.

Chmara, Henryk: *See—*
Andruszkiewicz, Ryszard; Chmara, Henryk; Milewski, Slawomir; Borowski, Edward; Zaremba, Maria; and Borowski, Jerzy, 4,923,965, Cl. 530-331.000.

Chmielowski, Marek: *See—*
Langer, Dietrich W.; and Chmielowski, Marek, 4,923,264, Cl. 350-96.140.

Cho, Hun C., to Samsung Electronics Co. Ltd. Track counting circuit for use in an optical disk driver. 4,924,483, Cl. 377-3.000.

Choh, Tsutomu: *See—*
Shigeta, Masao; Choh, Tsutomu; Shimizu, Hiroyoshi; Hirai, Ippo; Mimura, Shohei; Makimura, Atsushi; and Hosaka, Hiroshi, 4,923,533, Cl. 148-304.000.

Chong, Andrew. Orthosis for metatarsus adductus. 4,922,895, Cl. 128-80.00J.

Chow, Carl S.; Zantow, Timothy J.; Fung, Mok-Wing; and Hartmann, Hansgregory C., to Hewlett-Packard Company. Automated packaging loose fill system. 4,922,687, Cl. 53-472.000.

Chow, Mark K.: *See—*
Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., 4,924,405, Cl. 364-468.000.

Choy, Kenneth C.: *See—*
Zasio, John J.; Choy, Kenneth C.; and Parham, Darrell R., 4,924,430, Cl. 364-578.000.

Christenson, Patrick J.; Hart, Robert J.; Naatz, David C.; Rowlance, Edward J.; and Wenz, David G., to International Business Machines Corporation. Sharing word-processing functions among multiple processors. 4,924,434, Cl. 364-900.000.

Christian, Donald J.: *See—*
Landowski, Roger W.; Roszkowski, Richard M.; Christian, Donald J.; and Ansari, Assad A., 4,924,307, Cl. 358-107.000.

Chronar Corp.: *See—*
Kiss, Zoltan J., 4,923,524, Cl. 136-250.000.

Chrysler Corporation: *See—*
Mikolajczak, Christopher, 4,922,601, Cl. 29-450.000.
Mikolajczak, Christopher, 4,923,179, Cl. 267-160.000.
Munsterman, Gregg H.; Geyer, Paul W.; and Zaverzence, Harry, 4,923,405, Cl. 439-78.000.

Chung, Daniel A.; and Dammann, Laurence G., to Ashland Oil, Inc. Primerless adhesive for fiberglass reinforced polyester substrates. 4,923,756, Cl. 428-423.700.

Chung, Fung-Lung: *See—*
Hecht, Stephen S.; Foiles, Peter G.; and Chung, Fung-Lung, 4,923,813, Cl. 435-172.200.

Ciba-Geigy Corporation: *See—*
Anzai, Kenji; and Hamabe, Tatsuo, 4,923,520, Cl. 106-490.000.
Galli, Roberto; and Tempel, Ernst, 4,923,481, Cl. 8-589.000.
Howell, Frederick H.; Duthaler, Rudolf; Finter, Jurgen; Oertle, Konrad; and Ramanathan, Visvanathan, 4,924,015, Cl. 552-266.000.
Mayer, Willy; and Fory, Werner, 4,923,995, Cl. 546-294.000.
Mueller, Karl F.; and Harisiades, Paul, 4,923,906, Cl. 523-107.000.
Munk, Kurt, 4,923,911, Cl. 523-457.000.
Puntener, Alois, 4,923,973, Cl. 534-684.000.
Vignali, Graziano; De Roit, Giovanni; Dubs, Paul; and Baumeister, Peter, 4,923,992, Cl. 546-186.000.
Waldner, Adrian, 4,923,993, Cl. 546-250.000.

Cincinnati Milacron Inc.: *See—*
Suffridge, Robert L., 4,922,716, Cl. 60-378.000.

Cini, Carlo; and Sisti, Luigi, to SGS-Thomson Microelectronics SpA. Multiple-chip semiconductor element in a case of metal and resin. 4,924,296, Cl. 357-72.000.

Cinpres Limited: *See—*
Sayer, Matthew E., 4,923,667, Cl. 264-572.000.
Yamazaki, Kunio; and Watanabe, Tetsuzi, 4,923,666, Cl 264-572.000.

Cipriani, Tommaso: *See—*
Bergamini, Giorgio; and Cipriani, Tommaso, 4,924,406, Cl. 364-470.000.

Clarion Co., Ltd.: *See—*
Akazawa, Shigeo; Mori, Masaharu; and Hamatsu, Masahiro, 4,924,188, Cl. 328-155.000.

Clark Automotive Developments Limited: *See—*
Clark, Peter B., 4,924,125, Cl. 310-67.00R.

Clark, John H.; Fisher, James H.; and Wolfram, Thomas, to Amoco Corporation. Method for increasing the output power of a laser diode. 4,924,471, Cl. 372-34.000.

Clark, Peter B., to Clark Automotive Developments Limited. Electric motor or alternator. 4,924,125, Cl. 310-67.00R.

Clausen, Erik: *See—*
Clausen, Johannes; and Clausen, Erik, 4,923,280, Cl. 350-128.000.

Clausen, Johannes; and Clausen, Erik, to Dai Nippon Printing Co., Ltd. Rear-projection screen. 4,923,280, Cl. 350-128.000.

Clay, Burton R., to HoloGraphix, Inc. Scanner system having rotating deflector hologram. 4,923,262, Cl. 350-3.710.

Clenet, Alain J-M., to ASHA Corporation. Transparent vehicle roof having sunshade. 4,923,244, Cl. 296-214.000.

Clinton, James R. Apparatus for displaying analog signatures of an electronic component. 4,924,175, Cl. 324-73.100.

Cloberleaf Trading Company Ltd.: *See—*
Agathangelou, Eva, 4,923,102, Cl. 223-95.000.

Clocksin, Kenneth A.; and Hite, Edward L., to Manville Corporation. Pull-roll assembly latching mechanism. 4,923,495, Cl. 65-11.100.

Cloutier, Richard M.: *See—*
Bramhall, Robert B., Jr.; Cloutier, Richard M.; Laber, Albert P.; and Muka, Richard S., 4,923,584, Cl. 204-298.250.

CMB Packaging (UK) Limited: *See—*
Bunce, Martin C.; Helps, David W.; Jenkins, Leonard A.; and Noke, Adrian C., 4,924,048, Cl. 219-10.55E.

Co-Ex Plastics, Inc.: *See—*
Jones, Jerry F., 4,923,750, Cl. 428-349.000.

Coassolo, Alfredo; Sabarino, Giampiero; Foa, Marco; and Chapoy, Larry L., to Montedison S.p.A. Thermotropic liquid crystalline aromatic polyesters of disubstituted 4,4'-dihydroxydiphenylene. 4,923,947, Cl. 528-193.000.

Coassolo, Alfredo; Sabarino, Giampiero; Foa', Marco; and Chapoy, L. Lawrence, to Montedison S.p.A. Thermotropic liquid-crystalline aromatic polyesters of substituted 4,4'-dihydroxy-diphenylene. 4,923,955, Cl. 528-193.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Coates, David: *See—*
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Coates, David; Jackson, Adam; and Scrowston, Richard M., 4,923,633, Cl. 252-299.650.
Coca-Cola Company, The: *See—*
Kirschner, Jonathan; and Hughes, Robert D., IV, 4,923,092, Cl. 222-129.400.
Cockman, Boyce R. Stabilized post anchor. 4,923,165, Cl. 248-545.000.
Coddens, Donald L., to Therm-O-Loc, Inc. Sliding storm door or window assembly. 4,922,658, Cl. 49-458.000.
Cody, Ian A.; and Brown, David L., to Exxon Research and Engineering Company. Wax isomerization using small particle low fluoride content catalysts. 4,923,588, Cl. 208-27.000.
Coffindaffer, Timothy W., to Procter & Gamble Company, The. Starch with curable amine functional silicone for fabric wrinkle reduction and shape retention. 4,923,623, Cl. 252-8.800.
Cohen, Jonathan H.: *See—*
Figa, Romek; Cohen, Jonathan H.; and Cohen, Samuel G., 4,924,496, Cl. 379-142.000.
Cohen, Samuel G.: *See—*
Figa, Romek; Cohen, Jonathan H.; and Cohen, Samuel G., 4,924,496, Cl. 379-142.000.
Cohen, Uri. Method for making a record member with a metallic antifriction overcoat. 4,923,574. Cl. 204-40.000.
Coil Matic, Inc.: *See—*
Keneavy, Bernie, 4,922,973, Cl. 141-4.000.
Cole, Barry A., to Sinco, Inc. Safety restraint device. 4,923,048, Cl. 182-9.000.
Cole, Gregory C.: *See—*
Farmer, James O.; Schodowski, Blair J.; Mobley, Joseph G.; Cole, Gregory C.; Tumblin, John E.; Banker, Robert O.; and West, Lamar, 4,924,498, Cl. 380-15.000.
Coleman, Clarence B., to Fabricated Metals, Inc. Bulk material container with a door movable over a rectilinear path. 4,923,101, Cl. 222-510.000.
Colgate-Palmolive Company: *See—*
Joshi, David P., 4,923,627, Cl. 252-108.000.
Simion, F. Anthony; Warscjewski, Dirk; and Zyzyck, Leonard A., 4,923,635, Cl. 252-545.000.
Colin, Michel; Guenard, Daniel; Gueritte-Voegelein, Francoise; and Potier, Pierre, to Rhone-Poulenc Sante. Process for preparing derivatives of baccatine III and of 10-deacetyl baccatine III. 4,924,012, Cl. 549-510.000.
Collette, Wayne N.; Krishnakumar, Suppayan M.; and Nahill, Thomas E., to Continental PET Technologies, Inc. Multi-layer preform, method of forming preform, and container formed from the preform. 4,923,723, Cl. 428-35.700.
Collin, Andre : *See—*
Callens, Roland; and Collin, Andre , 4,923,966, Cl. 530-338.000.
Collins, Samuel H.: *See—*
Sprunt, Eve S.; Davis, R Michael; Kennedy, W David; and Collins, Samuel H., 4,924,187, Cl. 324-376.000.
Colt Industries Inc.: *See—*
Lemp, Mark D., 4,922,958, Cl. 137-561.00A.
Colton, Peter; Willbond, Andrew D.; and Stocker, Mark A., to Wadkin plc. Rotary cutter heads. 4,922,977, Cl. 144-230.000.
Combi Co., Ltd.: *See—*
Takahashi, Takehiko; and Katou, Hitoshi, 4,923,208, Cl. 280-642.000.
Commonwealth of Australia, The: *See—*
Bonnyman, John; and Baldas, John, 4,923,969, Cl. 534-14.000.
Compagnie De Materiel Et d'Equipements Techniques C.O.M.E.T.: *See—*
Moryl, Richard; and Bouery, Roger, 4,923,347, Cl. 411-182.000.
Compagnie Generale des Etablissements Michelin-Michelin & Cie: *See—*
Dosjoub, Andre; and Lescoffit, Claude, 4,922,984, Cl. 152-415.000.
Compagnie Industrielle de Tubes et Lampes Electriques Citel: *See—*
Cantagrel, Michel, 4,924,347, Cl. 361-120.000.
Compri, Joel, to FMC Corporation. Low cost quick insert citrus strainer tube. 4,922,813, Cl. 99-510.000.
Compton, Merle F.; Vanacore, Vincent D.; and Walsh, Brian W., to American Telephone and Telegraph Company. Arrangement for obtaining information about abandoned calls. 4,924,491, Cl. 379-37.000.
Concept, Inc.: *See—*
Caspari, Richard B.; Trott, Arthur F.; and Bays, F. Barry, 4,923,461, Cl. 606-146.000.
Shuler, Donald K., 4,923,441, Cl. 604-22.000.
Conley, Michael J. Golf glove with stroke counter. 4,922,850, Cl. 116-222.000.
Connolly, Thomas, to Austin-Gordon Design, Inc. Shrink banding machine. 4,922,683, Cl. 53-296.000.
Connor, David T.: *See—*
Belliotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,924,002, Cl. 548-206.000.
Conoco Inc.: *See—*
Courmier, Veatchel A.; Carnes, Jerry L.; and Drost, Rahn, 4,923,021, Cl. 175-382.000.
Parsons, Roger; and Stolt, Robert H., 4,924,390, Cl. 364-421.000.
Container Products Corp.: *See—*
Teague, Lyndon, 4,922,815, Cl. 100-219.000.
Contax Sports Inc.: *See—*
Chen, York, 4,922,636, Cl. 36-127.000.
Continental Aktiengesellschaft: *See—*
Frerichs, Udo, 4,922,983, Cl. 152-379.300.
Sergel, Horst; Aschemann, Dieter; Gerloff, Klaus; Kay, Alexander; and Wedemeyer, Lutz, 4,922,751, Cl. 73-146.000.
Continental PET Technologies, Inc.: *See—*
Collette, Wayne N.; Krishnakumar, Suppayan M.; and Nahill, Thomas E., 4,923,723, Cl. 428-35.700.
Contour Saws, Inc.: *See—*
Kawabata, James, 4,922,777, Cl. 83-452.000.
Cook, Stuart A.: *See—*
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 4,922,696, Cl. 56-202.000.
Cook, William G., to Sandy Hill Corporation. Variable width splitter. 4,922,776, Cl. 83-398.000.
Cooke, Michael P., to Plessey Overseas Limited. Amplifiers. 4,924,190, Cl. 330-86.000.
Cooper Industries, Inc.: *See—*
Bogdanovs, Andris, 4,924,365, Cl. 362-224.000.
Gurevich, Leon, 4,924,203, Cl. 337-231.000.
Wilhelmson, Jack L., 4,924,067, Cl. 219-241.000.
Cooper, Jeffrey L.: *See—*
Thomas, Robert E.; Cooper, Jeffrey L.; and Simcoe, Robert J., 4,924,463, Cl. 370-105.400.
Cooper, John E.; and Wilcox, Alun, to J. E. Hanger & Company Limited (British Company). Alignment device and method of artificial limb manufacture. 4,923,476, Cl. 623-38.000.
Coops, Peter: *See—*
Opheij, Willem G.; Coops, Peter; Duijvestijn, Adrianus J.; Van Eck, Dirk C.; and De Zoeten, Peter, 4,924,079, Cl. 250-201.500.
Copam Electronics Corp.: *See—*
Shung, Kevin, 4,924,494, Cl. 379-100.000.
Cope, Hilbert J., Jr.: *See—*
Mottur, George P.; Cope, Hilbert J., Jr.; Kishbaugh, Dennis L.; Luebbers, Michael J.; and Peters, Norman E., 4,923,705, Cl. 426-438.000.
Copus, Arthur G. Electrical brushgear. 4,924,129, Cl. 310-239.000.
Cordell, Steve. Process for internally strengthening tubes. 4,923,108, Cl. 228-126.000.
Cordis Corporation: *See—*
Stevens, Robert C., 4,923,462, Cl. 606-159.000.
Cornelia, Richard H., to Du Pont de Nemours, E. I., and Company. Sizing for carbon fiber. 4,923,752, Cl 428-367.000.
Cornelison, James J.: *See—*
Johnson, Edgar G.; and Cornelison, James J., 4,924,093, Cl. 250-328.000.
Cornell Research Foundation, Inc.: *See—*
Behfar-Rad, Abbas; and Wong, S. Simon, 4,924,476, Cl. 372-94.000.
Corning Incorporated: *See—*
Urruti, Eric H., 4,923,915, Cl. 524-102.000.
Cosner, Lane W., to Hughes Aircraft Company. Diamond-shaped mask for making multiple exposure holograms. 4,923,771, Cl. 430-1.000.
Cossement, Eric; Geerts, Jean-Pierre; Gobert, Jean; Michel, Philippe; and Wulfert, Ernst, to U C B Societe Anonyme. Substituted 1-(1H-imidazol-4-yl)alkyl-benzamides as anti-ischemics and as alpha-2-adrenergic receptor agonists. 4,923,865, Cl. 514-235.800.
Cottingham, Auburn B., deceased: *See—*
Chernega, John G.; Martens, John A.; Olsen, Roger A.; and Cottingham, Auburn B., deceased, 4,923,711, Cl. 427-44.000.
Cottingham, Sue E., administrator: *See—*
Chernega, John G.; Martens, John A.; Olsen, Roger A.; and Cottingham, Auburn B., deceased, 4,923,711, Cl. 427-44.000.
Coughlin, Joseph E. Audio indicator for a motor vehicle direction signal circuit. 4,924,208, Cl. 340-474.000.
Coughlin, Peter K.: *See—*
Pellet, Regis J.; Coughlin, Peter K.; and Rabo, Jule A., 4,923,594, Cl. 208-114.000.
Coulborn, John W.; and Krug, John A., to ACF Industries, Incorporated. End structure for railway car. 4,922,833, Cl. 105-248.000.
Coull, James M.: *See—*
Koester, Hubert; and Coull, James M., 4,923,901, Cl. 521-53.000.
Coulter, John P.: *See—*
Carlson, J. David; Coulter, John P.; and Duclos, Theodore G., 4,923,057, Cl. 188-378.000.
Coulton, Steven: *See—*
Broom, Nigel J. P.; Brooks, Gerald; and Coulton, Steven, 4,923,856, Cl. 514-192.000.
Council of Mineral Technology: *See—*
Mehmet, Ahmet, 4,923,615, Cl. 210-661.000.
Courmier, Veatchel A.; Carnes, Jerry L.; and Drost, Rahn, to Conoco Inc. Combination bit for coking oven. 4,923,021, Cl. 175-382.000.
Courtaulds PLC: *See—*
Day, Gerald F.; Robinson, Frank; and Williams, Dennis J., 4,923,724, Cl. 428-36.100.
Courtenay, Robert W., to Micron Technology, Inc. Lead frame holding device. 4,923,294, Cl. 350-529.000.
Courvoisier, Guy: *See—*
Arieh, Simon; and Courvoisier, Guy, 4,922,632, Cl. 36-117.000.
Covington, Michael J.; and Orsborn, Jesse H., to J. I. Case Company. Multi-row cotton harvester. 4,922,695, Cl. 56-40.000.
Cox, M. Keith; and Davidson, William E., to ArcherAire Industries, Inc. High velocity hot air sterilization device with controller. 4,923,681, Cl. 422-116.000.
Coxhead, Bruce; Hughes, Gary; and Murchie, John R., to Husky Injection Molding Systems Ltd. Oven for blow molding machine. 4,923,395, Cl. 432-5.000.
Crabtree, Wayne L.; and Young, Robert C., to Premier Gear & Machine Works. Log core steady rest. 4,922,979, Cl. 144-357.000.

Craftsman Printing Company: *See—*
Nail, James W., 4,923,189, Cl. 270-54.000.
Craig, Susan P.: *See—*
Ainslie, Benjamin J.; Craig, Susan P.; and Armitage, Jonathan R., 4,923,279, Cl. 350-96.300.
Crandall, Richard E.; Weeks, Paul M.; and Vannier, Michael W., to Washington University. Computer based upper extremity evaluation system. 4,922,925, Cl. 128-782.000.
Creative Research and Manufacturing, Inc.: *See—*
Mehl, Donald N., 4,922,602, Cl. 29-460.000.
Crepy, Hubert; Elie, Philippe; Galand, Claude; Lancon, Emmanuel; Liethoudt, Thierry; and Rosso, Michele, to International Business Machines. Pitch detection for use in a predictive speech coder. 4,924,508, Cl. 381-38.000.
Crestmoore Ltd.: *See—*
Nussbaum, Avraham, 4,923,463, Cl. 606-133.000.
Creusot, Didier; and Roux, Jean-Pierre, to Thomson-Brandt Armements. Gyroscopic stabilizing device for a projectile control instrument. 4,923,142, Cl. 244-3.100.
Crist, Buckley, Jr., to Electro-Technic Products Company. Corona generating system. 4,924,092, Cl. 250-324.000.
Criswell, Peter B., to Unisys Corporation. System for checking duplicate logic using complementary residue codes to achieve high error coverage with a minimum of interface signals. 4,924,467, Cl. 371-68.100.
Crittenden, James F.: *See—*
Gambale, Richard A.; Crittenden, James F.; and Ryan, James P., 4,922,923, Cl. 128-772.000.
Gambale, Richard A.; and Crittenden, James F., 4,922,924, Cl. 128-772.000.
Crosfield Electronics Limited: *See—*
Stansfield, Peter W.; and Reed, Alastair, 4,924,388, Cl. 364-413.200.
Crossley, P. Anthony; Nishihara, H. Keith; and Hunt, Neil D., to Schlumberger Systems & Services, Inc. Method for directly measuring area and volume using binocular stereo vision. 4,924,506, Cl. 382-28.000.
Crossley, Roger; and Heatherington, Kenneth, to John Weyth & Brother Limited. Quinoline derivatives. 4,923,991, Cl. 546-152.000.
Crown Forest Industries Limited: *See—*
Omelchuk, John, 4,922,660, Cl. 49-395.000.
Crowson, Francis R., to CDP Product Development Corporation. Automatic filter system. 4,923,068, Cl. 210-741.000.
Cryomedical Sciences Inc.: *See—*
Segall, Paul E.; Waitz, Harold D.; and Sternberg, Hal, 4,923,442, Cl. 604-52.000.
Cuda, Joseph. Fiber optic connector. 4,923,272, Cl. 350-96.200.
Cuevas, Jess, to Talley Automotive Products, Inc. Lightweight non-welded inflator unit for automobile airbags. 4,923,212, Cl. 280-736.000.
Culbreath, J. Charles. Mouthpiece plates of flute-type wind instruments. 4,922,793, Cl. 84-384.000.
Cullis, Pieter R.: *See—*
Tilcock, Colin P. S.; Cullis, Pieter R.; Hope, Michael J.; and Janoff, Andrew S., 4,923,854, Cl. 514-78.000.
Culp, Norman L.; and Kwan, Stephen C., to Texas Instruments Incorporated. Transient protector. 4,924,341, Cl. 361-56.000.
Cummins Engine Company, Inc.: *See—*
Mathews, Will W., 4,922,867, Cl. 123-90.220.
Curran, Kenneth J., to Cal R & D, Inc. Interactive talking toy. 4,923,428, Cl. 446-175.000.
Curry, Herbert L., to General Electric Company. Polycarbonate/-polyphthalate carbonate blends exhibiting good flame resistance. 4,923,933, Cl. 525-439.000.
Curry, Sean: *See—*
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; Curry, Sean; Lee, Scott; and Meyer, Dana, 4,924,505, Cl. 382-8.000.
Curtis, Jack M.: *See—*
Burns, Stephen R.; Boesch, Timothy J., Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 4,922,696, Cl. 56-202.000.
Curtze, Jurgen: *See—*
Albert, Guido; and Curtze, Jurgen, 4,923,866, Cl. 514-237.500.
CVD Incorporated: *See—*
Hui, Benjamin C.; and Victoriano, Luis I., 4,924,019, Cl. 556-187.000.
Cyr, Reginald J., to Sonatech, Inc. Navigation system and method for determining the position of a relatively noisy platform using underwater transponders. 4,924,446, Cl. 367-6.000.
Cyron, Theodor, to Interatom GmbH. Method for producing a honeycomb body, especially a catalyst carrier body having sheet metal layers twisted in opposite directions. 4,923,109, Cl. 228-181.000.
Czerkies, Tadeusz: *See—*
Jackle, William C.; and Czerkies, Tadeusz, 4,923,070, Cl. 211-59.200.
D.I.S. Versand Service GmbH: *See—*
Kettelhoit, Johannes; Kunne, Hans W.; and Schroder, Erhard, 4,923,556, Cl. 156-498.000.
D. S. Brown Company, Inc., The: *See—*
Arps, David H.; Brown, Howard R.; Lanham, Roy J.; and Weiker, Donald E., 4,923,328, Cl. 404-69.000.
D X Imaging: *See—*
Blair, David E.; Gollhardt, Bradley J.; and Larson, James R., 4,923,778, Cl. 430-137.000.
Dahlstrom, John R.: *See—*
Aldrich, Roger B.; and Dahlstrom, John R., 4,922,623, Cl. 33-608.000.
Dahms, Ronald H., to Monsanto Company. Bismaleimide resins. 4,924,005, Cl. 548-521.000.
Dai-Ichi High Frequency Co. Ltd.: *See—*
Taniguchi, Yasuyuki; Ohwada, Yutaka; and Araki, Mitsunori, 4,923,730, Cl. 428-92.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.000.
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,923,847, Cl. 503-227.000.
Kutsukake, Masaki; and Kanto, Jumpei, 4,923,846, Cl. 503-227.000.
Nozaka, Yoshiki; Katsuta, Tetsuro; and Miyama, Hiroshi, 4,922,821, Cl. 101-425.000.
Dai Nippon Printing Co., Ltd.: *See—*
Clausen, Johannes; and Clausen, Erik, 4,923,280, Cl. 350-128.000.
Daifuku Co., Ltd.: *See—*
Fujita, Shigeyoshi; Sekiya, Naobumi; Okamura, Takashi; and Watanabe, Yoshitaka, 4,922,830, Cl. 104-290.000.
Daiichi Denshi Kogyo Kabushiki Kaisha: *See—*
Sekiguchi, Yoshichika; and Kodama, Hideaki, 4,923,310, Cl. 439-701.000.
Daiichi Seiyaku Co., Ltd.: *See—*
Hirota, Sadao, 4,923,862, Cl. 514-230.200.
Daikin Industries, Ltd.: *See—*
Katayama, Hideo; Yoshida, Yoshiaki; and Osaka, Tatsuhiko, 4,923,586, Cl. 204-403.000.
Tamura, Kohji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, 4,923,626, Cl. 252-67.000.
Ueda, Tomoaki, 4,924,414, Cl. 364-522.000.
Daily, Raymond P. Latch assembly. 4,923,233, Cl. 292-332.000.
Daimler-Benz AG: *See—*
Pietsch, Albert; and Boll, Wolf, 4,922,870, Cl. 123-195.00R.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Chiba, Takatoshi, 4,924,073, Cl. 219-413.000.
Ohtani, Masami; and Nishida, Masami, 4,923,054, Cl. 187-25.000.
Dainis, Andrew; and Bird, Geoffrey. Target support device for calibration of cameras. 4,923,155, Cl. 248-163.100.
Daiwa Seiko, Inc.: *See—*
Yamaguchi, Nobuyuki; and Kawashiro, Masayuki, 4,923,140, Cl. 242-230.000.
Dale, Debra L., executrix: *See—*
Dale, William F., deceased; and Dale, Debra L., executrix, 4,923,112, Cl. 229-69.000.
Dale, William F., deceased; and by Dale, Debra L., executrix. Multiple part sales form. 4,923,112, Cl. 229-69.000.
D'Aleo, Michael; Darragh, Denis; Ference, Jonathan; Luchaco, David, Rowen, Michael J.; and Spira, Joel S., to Lutron Electronics Co., Inc. Multi-zone, multi-scene lighting control system. 4,924,151, Cl. 315-295.000.
Dallaire, Dominique: *See—*
Dallaire, Raymond; and Dallaire, Dominique, 4,922,661, Cl. 49-504.000.
Dallaire Industries Ltd.: *See—*
Dallaire, Raymond; and Dallaire, Dominique, 4,922,661, Cl. 49-504.000.
Dallaire, Raymond; and Dallaire, Dominique, to Dallaire Industries Ltd. Water stop for a window. 4,922,661, Cl. 49-504.000.
Dalson, Milton H., to Atlantic Richfield Company. Process for reforming nephthene and paraffin-containing hydrocarbons in the naphtha boiling range and isomerizing C5-C6 normal paraffin feedstock to produce a high octane gasoline. 4,923,589, Cl. 208-66.000.
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, to Imperial Chemical Industries. Process for the extraction of metal values. 4,923,686, Cl. 423-38.000.
Damico, Frank M., to Thill, Inc. Lead screw support mechanism for an overbed table. 4,922,836, Cl. 108-144.000.
Dammann, Laurence G.: *See—*
Chung, Daniel A.; and Dammann, Laurence G., 4,923,756, Cl. 428-423.700.
Damon Biotech, Inc.: *See—*
Tsang, Wen-Ghih; and Magee, Andrew S., 4,923,645, Cl. 264-4.300.
Dana Corporation: *See—*
Shifflet, Glenn; Johnson, Herbert C.; and Revenaugh, Paul W., 4,924,169, Cl. 320-21.000.
Dang, Mieu-Hong; and Taborga, Jorge R., to International Business Machines Corporation. Method for monitoring call setup communications. 4,924,493, Cl. 379-94.000.
Danieli & C. Officine Meccaniche SpA. *See—*
Poloni, Alfredo; and Nonini Geremia, 4,922,740, Cl. 72-237.000.
Daniels, Charles. Crutch having a changeable armpiece. 4,922,941, Cl. 135-71.000.
Daniels, Dale R., to Ampex Corporation. Flexible member mounting assembly. 4,923,053, Cl. 187-1.00R.
Danielson, David B.: *See—*
Capek, Raymond G.; and Danielson, David B., 4,923,422, Cl. 445-30.000.
Daoud, Adib G.; and Horres, C. Russell, Jr., to Ivac Corporation. Negative pressure measurement system. 4,923,444, Cl. 604-131.000.
Dapopp Products Ltd.: *See—*
Kornelson, Bradley F., 4,924,363, Cl. 362-125.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Darragh, Denis: *See—*
D'Aleo, Michael; Darragh, Denis; Ference, Jonathan; Luchaco, David; Rowen, Michael J.; and Spira, Joel S., 4,924,151, Cl. 315-295.000.

Dart Industries Inc.: *See—*
Lillelund, Stig; and Olsen, Eskil H., 4,923,085, Cl. 220-282.000.

Darya Paye Jetty Co., Ltd.: *See—*
Massoudi, Ahmad, 4,923,335, Cl. 405-204.000.

Dassler, Joachim; and Kramer, Klaus, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. High-pressure discharge lamp with support structure for discharge vessel. 4,924,133, Cl. 313-25.000.

Daugherty, Thomas H.: *See—*
Seymour, Mark D.; LiCause, Michael F.; and Daugherty, Thomas H., 4,923,454, Cl. 604-368.000.

Davenport, Henry E.: *See—*
Robinson, Don M.; and Davenport, Henry E., 4,924,331, Cl. 360-72.100.

David, Michel-Yves: *See—*
Frachet, Bruno; and David, Michel-Yves, 4,923,469, Cl. 623-10.000.

Davidson, Donald R.; Huang, Pao-Ter; and Rogers, H. David, to SSMC Inc. Steam ironing press #1. 4,922,637, Cl. 38-15.000.

Davidson Textron Inc.: *See—*
Gembinski, John C.; Grimmer, Robert A.; and Betzig, Patricia A., 4,923,657, Cl. 264-73.000.

Davidson, William E.: *See—*
Cox, M. Keith; and Davidson, William E., 4,923,681, Cl. 422-116.000.

Davies, Nigel C.: *See—*
Puddle, Mark W.; Davies, Nigel C.; Marwick, William F.; and Sheasby, Peter G., 4,924,057, Cl. 219-118.000.

Davies, Ronald C., to Digital Products Corporation. Personnel monitoring system. 4,924,211, Cl. 340-573.000.

Davis, Alan L.: *See—*
Brunvand, Eric L.; and Davis, Alan L., 4,924,435, Cl. 364-900.000.

Davis, Cecil J.: *See—*
Jucha, Rhett B.; and Davis, Cecil J., 4,923,562, Cl. 156-643.000.

Davis, R. Michael: *See—*
Sprunt, Eve S.; Davis, R. Michael; Kennedy, W. David; and Collins, Samuel H., 4,924,187, Cl. 324-376.000.

Dawn, Frederic S.: *See—*
Kosmo, Joseph J.; and Dawn, Frederic S., 4,923,741, Cl. 428-252.000.

Day, Gene F., to Precision Image Corporation. Toner recycling by counterflow. 4,923,581, Cl. 204-180.100.

Day, Gerald F.; Robinson, Frank; and Williams, Dennis J., to Courtaulds PLC. Composite articles. 4,923,724, Cl. 428-36.100.

Dayco Products, Inc.: *See—*
Grantham, Rodger P., 4,922,971, Cl. 141-1.000.

Daykin Electric Corporation: *See—*
Marcie, Mark J.; and Williams, John P., Jr., 4,924,054, Cl. 219-85.140.

De La Torre, William, to Northrop Corporation. Surface modified plastic and composite articles and method. 4,923,737, Cl. 428-217.000.

DE-STA-CO Metallerzeugnisse GmbH: *See—*
Schauss, Peter, 4,923,184, Cl. 269-32.000.

Deak, Laszlo B.: *See—*
Tatai, Ilona; Penzias, Tibor; Palotas, Laszlo ; Lantos, Elemer; Smaroglay, Peter; and Deak, Laszlo B., 4,923,647, Cl. 264-27.000.

Deal, Madison L.: *See—*
Syrylo, Stephen N., Jr.; and Deal, Madison L., 4,922,742, Cl. 72-308.000.

Dean, David L., to Siecor Corporation. Connector for optical fibers. 4,923,274, Cl. 350-96.210.

Dean, Raymond S.; and Barabino, William A., to Personal Hygiene Research Associates. Disposable diaper with integral disposal envelope. 4,923,455, Cl. 604-385.100.

Dean, Robert A.: *See—*
Woodard, Kenneth E., Jr.; Fister, Julius C., Jr.; Fair, David L.; and Dean, Robert A., 4,923,583, Cl. 204-286.000.

Deason, James R.; Stealey, Michael A.; and Weier, Richard M., to G. D Searle & Co. Leukotriene LTD_4 and LTB_4 antagonists. 4,923,891, Cl. 514-433.000.

DeBiasi, Charles J.; and Boyer, Wesley D., to Ford Motor Company. Automobile electronic control modules communicating by pulse width modulated signals. 4,922,874, Cl. 123-417.000.

Decho, David R.; and Jones, William H., to Reed Devices, Inc. Multiple terminal block indicator light combination. 4,924,213, Cl. 340-653.000.

Deere & Company: *See—*
Fryk, Bruce K., 4,923,362, Cl. 414-700.000.

De Gennaro, Sergio K. Fire sprinkler system and automatic shut-off valve therefor. 4,923,013, Cl. 169-90.000.

de Haseth, James A.: *See—*
Browner, Richard F.; and de Haseth, James A., 4,924,097, Cl. 250-343.000.

DeJournett, Richard L. Padded elbow brace. 4,922,929, Cl. 128-892.000.

Delaware Capital Formation, Inc.: *See—*
Holland, Gordon A., 4,923,055, Cl. 187-109.000.
Oslin, G. Robert, 4,924,072, Cl. 219-401.000.

Dell Corporate Services Corporation: *See—*
Mitchell, Charles W.; and Rodriquez, Robert G., 4,924,355, Cl. 361-415.000.

Delmer, Philip T.; and Hunt, Lewis D., to Elwood Hydraulics Co., Inc. Press tooling transfer system. 4,923,381, Cl. 425-77.000.

Delta Systems, Inc.: *See—*
Howard, William A., 4,924,046, Cl. 200-516.000.

Delwel, Francois: *See—*
Blackburn, Stephen N.; Delwel, Francois; and Evans, Elfed H., 4,923,636, Cl. 252-550.000.

Delzenne, Michel, to L'air Liquide, Societe Anonyme Pour L'etude et L'exploitation des Procedes Georges Claude. Cap for an arc torch and torch provided with said cap. 4,924,060, Cl. 219-121.480.

DeMario, Edmund E., to Westinghouse Electric Corp. Nuclear fuel rod grid spring and dimple structures having chamfered edges for reduced pressure drop. 4,923,669, Cl. 376-442.000.

Dematex Development & Investment Establishment: *See—*
Rilliet, Francois, 4,923,072, Cl. 215-247.000.

De Meutter, Stefaan K.: *See—*
Van der Auweraer, Mark G.; De Schrijver, Frans C.; Verbeek, Guy P.; Geelen, Carina; Terrell, David R.; and De Meutter, Stefaan K., 4,923,774, Cl. 430-59.000.

Demiryont, Hulya, to Ford Motor Company. Electrochromic devices having a gradient of color intensities. 4,923,289, Cl. 350-357.000.

Denda, Masahiko, to Director General, Agency of Industrial Science and Technology. Semiconductor device package structure. 4,924,297, Cl. 357-74.000.

Deneke, Ulfert; Michal, Gerhard; and Beutler, Hans-Otto, to Boehringer Mannheim GmbH. Method for the quantitative enzymatic determination of ADP. 4,923,796, Cl. 435-15.000.

Denis, Jean-Noel; Greene, Andrew E.; Guenard, Daniel; and Gueritte-Voegelein, Francoise, to Centre National De La Recherche Scientifique. Process for preparing taxol. 4,924,011, Cl. 549-510.000.

Dennison, Mary R. Container for storing and displaying baby teeth. 4,923,058, Cl. 206-83.000.

Dent, Clifford M. Breakaway connector. 4,923,319, Cl. 403-2.000.

De Pas, Jonathan; D'Urbino, Donato; and Lomazzi, Paolo, to Quattrocchio S.r.l. Modular latticework structure. 4,922,669, Cl. 52-646.000.

De Roit, Giovanni: *See—*
Vignali, Graziano; De Roit, Giovanni; Dubs, Paul; and Baumeister, Peter, 4,923,992, Cl. 546-186.000.

De Schrijver, Frans C.: *See—*
Van der Auweraer, Mark G.; De Schrijver, Frans C.; Verbeek, Guy P.; Geelen, Carina; Terrell, David R.; and De Meutter, Stefaan K., 4,923,774, Cl. 430-59.000.

Deshazer, William A.; Beck, Robert J.; and Helveston, Wilton L. Casing sealing apparatus. 4,923,222, Cl. 285-137.100.

Desilube Technology, Inc.: *See—*
King, James P., 4,923,625, Cl. 252-32.500.

Detexomat Machinery Limited: *See—*
Hodges, Michael J., 4,922,685, Cl. 53-429.000.

DeTommaso, Stephen C. Storm water injection well. 4,923,330, Cl. 405-36.000.

Deutche Thomson-Brandt GmbH: *See—*
Hartnack, Wolfgang; Keesen, Heinz-Werner; and Schutze, Herbert, 4,924,309, Cl. 358-133.000.

Deutsch, Joseph: *See—*
Nemirovsky, Robert, 4,923,434, Cl. 474-101.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt E.V.: *See—*
Tank, Volker, 4,924,478, Cl. 374-121.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Lahr, Helfrid; and Pontani, Bernd, 4,923,668, Cl. 376-261.000.

Deutsche Thomson-Brandt GmbH: *See—*
Baas, Dieter, 4,924,454, Cl. 369-44.110.

Deves, Jean-Marie: *See—*
Marcilly, Christian; Deves, Jean-Marie; and Bourgogne, Michel, 4,923,593, Cl. 208-113.000.

De Villez, Richard L., to Board of Regents, The University of Texas System. Therapeutic compositions containing benzoyl peroxide. 4,923,900, Cl. 514-714.000.

De With, Gijsbertus; and Van Dijk, Hendricus J. A., to U.S. Philips Corp. Method of manufacturing ceramic translucent material. 4,923,420, Cl. 445-22.000.

Dexter, Fred E., Jr. Bacon Box. 4,924,049, Cl. 219-10.55E.

De Zoeten, Peter: *See—*
Opheij, Willem G.; Coops, Peter; Duijvestijn, Adrianus J.; Van Eck, Dirk C.; and De Zoeten, Peter, 4,924,079, Cl. 250-201.500.

DFC New Zealand Limited: *See—*
Atkinson, Donald T.; and Atkinson, Dianne L., 4,922,651, Cl. 47-1.410.

Diagraph Corporation: *See—*
Parks, Ronald; and Castro, Anthony B., 4,924,241, Cl. 346-75.000.

Dianitsch, Franz, to Optyl Eyewear Fashion International Corporation. Resilient nose pad for spectacles. 4,924,245, Cl. 351-136.000.

Diaz, Francisco J. Board game of geopolitical and related knowledge. 4,923,198, Cl. 273-240.000.

Dicke, Hans-Rudolf: *See—*
Willenberg, Bernd; El Sayed, Aziz; Rohr, Harry; and Dicke, Hans-Rudolf, 4,923,660, Cl. 264-103.000.

Dickerson, George E., to United States of America, National Aeronautics and Space Administration. Method of insetting predesigned disbond areas into composite laminates. 4,923,545, Cl. 156-153.000.

Dickey, Daniel M., to Trine Manufacturing Co., Inc. Apparatus and method for applying a heat shrink film to a container. 4,923,557, Cl. 156-86.000.

Dickey-John Corporation: *See—*
Bachman, Wesley J.; and Stone, Steven G., 4,924,418, Cl. 364-550.000.

Dictaphone Corporation: *See—*
Dwyer, John J.; Chamberlin, David B.; and Jachmann, Emil F., 4,924,332, Cl. 360-72.200.

Didier-Werke AG: *See—*
Luhrsen, Ernst; Pohl, Siegfried; Ott, Albert; Parbel, Wilhelm; and Baum, Karl, 4,923,225, Cl. 285-189.000.

Diehl GmbH & Co.: *See—*
Busch, Jurgen-Michael; Stammel, Georg; Rhau, Siegfried; Gundel, Bernd; and Rudolf, Karl, 4,922,826, Cl. 102-489.000.
Schubart, Rudolf, 4,922,824, Cl. 102-387.000.
Steuer, Raimar; and Kraus, Manfred, 4,923,143, Cl. 244-3.280.

Diehm, Randall S.; and Zuidema, Blake K., to Howmet Corporation. Segmented induction skull melting crucible and method. 4,923,508, Cl. 75-10.140.

Diepers, Heinrich; and Stephani, Dietrich, to Siemens Aktiengesellschaft. Magnetic storage device with track guidance system. 4,924,334, Cl. 360-77.070.

Dietrich, Harry B.: *See—*
Anderson, Gordon W.; Boos, John B.; Dietrich, Harry B.; Ma, David I.; Mack, Ingham A. G.; and Papanicolaou, Nicolas A., 4,924,285, Cl. 357-30.000.

DiFrank, Frank J., to Owens-Illinois Glass Container Inc. Lehr loader pickup arm. 4,923,363, Cl. 414-752.000.

Digital Equipment Corporation: *See—*
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, 4,924,513, Cl. 380-21.000.
Thomas, Robert E.; Cooper, Jeffrey L.; and Simcoe, Robert J., 4,924,463, Cl. 370-105.400.

Digital Products Corporation: *See—*
Davies, Ronald C., 4,924,211, Cl. 340-573.000.

Digital Telecommunications Systems, Inc.: *See—*
Smith, Benjamin A.; and Hoback, Conaway K., 4,924,497, Cl. 379-150.000.

Dinan, Raymond F.; Dubil, James F.; Hillery, John R.; Rodite, Robert R.; and White, James M., to International Business Machines Corporation. Image processing system and method employing combined black and white and gray scale image data 4,924,521, Cl. 382-54.000.

Dingwall, Andrew G. F.; and Zazzu, Victor, to Harris Semiconductor Patents, Inc. Analog to digital converter with integral linearity error compensation and method of operation. 4,924,225, Cl. 341-118.000.

Dinning, Robert W.: *See—*
Ferguson, Paul L.; and Dinning, Robert W., 4,923,372, Cl. 417-53.000.

DiPisa, Joseph A., Jr., to Becton, Dickinson and Company. Percutaneously deliverable intravascular reconstruction prosthesis. 4,923,464, Cl. 606-195.000.

Director General, Agency of Industrial Science and Technology: *See—*
Denda, Masahiko, 4,924,297, Cl. 357-74.000.

Dishman, Michael R., to Troxler Electronic Laboratories, Inc. Shielded capacitance standard. 4,924,173, Cl. 324-690.000.

Dive, Georges: *See—*
Braquet, Pierre; Dive, Georges; Godfroid, Jean-Jacques; Heymans, Francoise; and Pirotzky, Eduardo, 4,923,870, Cl. 514-255.000.

Dlugolecki, Andrzej J.; and Herman, Timm R., to American Pneumatic Technologies, Inc. Adjustable pliers. 4,922,770, Cl. 81-357.000.

Doan, Phong D.; Upton, James E.; Hess, Douglas H.; Bass, Wayne R.; and Ufford, Keith A., to Medtronic, Inc. Method of fabrication an in-line, multipolar electrical connector. 4,922,607, Cl. 29-879.000.

Dobay, Laaszlo : *See—*
Fodor, Tamas; Dobay, Laaszlo ; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Sagny, Katalin, and Szporny, Laaszlo , 4,923,888, Cl. 514-414.000.

Dobos, Eva: *See—*
Szejtli, Jozsef; Tetenyi, Peter; Kiniczky, Marta; Bernath, Jeno ; Tetenyi nee Erdosi, Magda; Dobos, Eva; and Banky nee Elod, Erzsebet, 4,923,853, Cl. 514-58.000.

Dockner, Toni: *See—*
Hesse, Michael; Hoelderich, Wolfgang; Dockner, Toni; and Koehler, Hermann, 4,924,000, Cl. 548-343.000.

Dr. Ing. h.c.F. Porsche AG: *See—*
Armbrust, Eberhard; and Woehler, Hans-Juergen, 4,923,209, Cl. 280-689.000.
Batzill, Manfred, 4,922,871, Cl. 123-196.00A.
Durm, Jurgen, 4,923,205, Cl. 280-491.300.
Topfer, Walter, 4,922,882, Cl. 123-572.000.

Dr. Johannes Heidenhain GmbH: *See—*
Michel, Dieter; Parriaux, Olivier; and Voirin, Guy, 4,923,300, Cl. 356-356.000.

Doerflinger, Arthur: *See—*
Watkins, John; Magee, Ramon; and Doerflinger, Arthur, 4,923,572, Cl. 204-6.000.

Doi, Yoshio: *See—*
Satoh, Izumi; Kido, Shigeru; Doi, Yoshio; and Egawa, Shohei, 4,923,893, Cl. 514-458.000.

Doisy, Martine: *See—*
Stephan, Ronan; Doisy, Martine; Montfort, Yves; Robbes, Didier; Sing, Marc L. C.; Bloyet, Daniel; Provost, Jackie; and Raveau, Bernard, 4,923,850, Cl. 505-1.000.

Dolan, Donald T.; Durst, Robert T., Jr.; Hubbard, David W.; and Silverberg, Morton, to Pitney Bowes Inc. Modular mailing machine. 4,923,023, Cl. 177-25.150.

Dolco Packaging Corporation: *See—*
Freeland, James F., 4,923,654, Cl. 264-53.000.

Donaldson, John R.: *See—*
Hsieh, Eric T.; Yeh, Gene H. C., and Donaldson, John R., 4,923,649, Cl. 264-37.000.

Donat Flamand Inc.: *See—*
Giguere, Jean-Paul, 4,922,656, Cl. 49-161.000.

Donner, Jeffry T.: *See—*
Karasek, Keith R.; Olson, William L.; and Donner, Jeffry T., 4,923,719, Cl. 427-387.000.

Donoghue, Laurence B. Device for testing one's breath. 4,922,921, Cl. 128-717.000.

Donohue, Marc D.: *See—*
Lee, Chinsoo; Hoy, Kenneth L.; and Donohue, Marc D., 4,923,720, Cl. 427-422.000.

Dopheide, Dietrich; Faber, Michael; Reim, Gerhard; and Taux, Guenter, to Federal Republic of Germany, represented by the Federal Minister for Economics, who is in turn represented by the President of the Physical-Technical Federal Institute. Device for measuring the speed of moving light-scattering objects. 4,923,298, Cl. 356-28.500.

Doreau, Jean: *See—*
Jaquard, Paul; Lelay, Jean-Pierre; and Doreau, Jean, 4,922,801, Cl. 89-41.050.

Dorfman, Jan L.; Dugan, Larry M.; Young, David C.; and Willcoxen, Mark A., to Adolph Coors Company. Apparatus and method for generating pressures for a disposable container. 4,923,095, Cl. 222-386.500.

Dorman, Ira S.: *See—*
Wolfert, Barbara; and Dorman, Ira S., 4,923,745, Cl. 428-35.400.

Dornfeld, David A.: *See—*
Horne, John G.; Dornfeld, David A.; and McMillen, Keith A., 4,922,754, Cl. 73-587.000.

Dory, Jacques, to EDAP International. Ultrasonic tissue characterization. 4,922,917, Cl. 128-660.010.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Kawai, Seiji, 4,922,782, Cl. 74-479.000.

Dosjoub, Andre; and Lescoffit, Claude, to Compagnie Generale des Etablissements Michelin-Michelin & Cie. Inflation and deflation of a tire in rotation. 4,922,984, Cl. 152-415.000.

Dote, Kazumi, to Casio Computer Co., Ltd. Method of detecting types of parts constituting a larger group of parts. 4,924,385, Cl 364-300.000.

Doucette, Richard L.: *See—*
Taubner, Fred R.; Doucette, Richard L.; and Fredrickson, Gerald B., 4,924,141, Cl. 313-488.000.

Dow Chemical Company, The: *See—*
McCullough, Francis P., Jr., Brewster, Steven L.; and Snelgrove, R. Vernon, 4,923,747, Cl. 428-312.600.
Pennington, Donald W.; and Allison, Joseph L., 4,923,931, Cl. 525-344.000.
Timm, Ed E.; and Schwarz, Douglas B., 4,923,512, Cl. 75-239.000.
Wagers, Kevin J., and Gundlach, Douglas P., 4,923,551, Cl 156-244.110.
Walles, Wilhelm E.; and Tomkinson, Donald L., 4,923,753, Cl. 428-402.240.

Dow Corning Corporation: *See—*
Bank, Howard M.; and Petrisko, Robert A., 4,924,022, Cl. 556-471.000.
Lee, Chi-long; and Lutz, Michael A., 4,923,754, Cl. 428-429.000.
Meddaugh, Michael D., 4,923,946, Cl. 528-18.000.
Witucki, Gerald L., 4,923,755, Cl. 428-447.000.

Down, Douglas G., to Omaha Printing Company. Combination mailing envelope and file folder. 4,923,111, Cl. 229-68.00R.

Downie, R. James: *See—*
Wachowicz, Stanley W.; and Downie, R James, 4,923,008, Cl. 166-250.000.

Dragerwerk Aktiengesellschaft: *See—*
Kiske, Siegfried; Haase, Thorsten; Leyer, Thomas, and Sauer, Wolfgang, 4,922,900, Cl. 128-202.270.

Drahos, Michael W. Trailer transport device. 4,923,243, Cl 296-157.000.

Drake, Barney: *See—*
Hansma, Paul K.; and Drake, Barney, 4,924,091, Cl. 250-306.000.

Drake, Evelyn N.: *See—*
Rerup, Hans J.; Drake, Evelyn N.; and Duvdevani, Ilan, 4,923,517, Cl. 106-99.000.

Driear, Joseph R., to Aquatech, Inc. Vacuum loading machine. 4,922,571, Cl. 15-302.000.

Driesen, Manfred; and Itgenshorst, Dieter, to Eduard Kusters Maschinenfabrik GmbH & Co. KG. Jig for the treatment of textile webs. 4,922,733, Cl. 68-205.00R.

Droescher, Michael: *See—*
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,923,926, Cl. 525-67.000

Drone, Walter J.: *See—*
Hillegass, Norman W.; and Drone, Walter J., 4,922,743, Cl. 72-377.000.

Drori, Mordeki. Filter system having multiple filter elements and backflushing assemblies. 4,923,601, Cl. 210-107.000.

Drost, Rahn: *See—*
Courmier, Veatchel A.; Carnes, Jerry L.; and Drost, Rahn, 4,923,021, Cl. 175-382.000.

Dryczynski, Christa Magdalene, Thomas Dryczynski, Beate Dryczynski, Regina Struth nee Dryczynski, legal heirs: *See—*
Lask, Helmut; Holst, Arno; and Dryczynski, Kurt, deceased, 4,924,084, Cl. 250-227.250.

Dryczynski, Kurt, deceased: *See—*
Lask, Helmut; Holst, Arno; and Dryczynski, Kurt, deceased, 4,924,084, Cl. 250-227.250.

VOL
1114
ISS
2
MY
8
1990
UMI

Du Pont Canada, Inc.: *See*—
Fletcher, Eldon L.; and Kho, Tiong Hap (Hans), 4,923,004, Cl. 165-175.000.
Dubil, James F.: *See*—
Dinan, Raymond F., Dubil, James F.; Hillery, John R.; Rodite, Robert R.; and White, James M., 4,924,521, Cl. 382-54.000.
Dubois, Antoine: *See*—
Meyrat, Clement; and Dubois, Antoine, 4,924,452, Cl. 368-236.000.
Dubs, Paul: *See*—
Vignali, Graziano; De Rott, Giovanni; Dubs, Paul; and Baumeister, Peter, 4,923,992, Cl. 546-186.000.
Ducheyne, Paul; and Kohn, David H., to Boehringer Mannheim Corporation. Titanium alloy treatment process and resulting article. 4,923,513, Cl. 75-245.000.
Duclos, Theodore G.: *See*—
Carlson, J. David; Coulter, John P.; and Duclos, Theodore G., 4,923,057, Cl. 188-378.000.
Dudley, Richard P.: *See*—
Hadley, Maxwell R.; and Dudley, Richard P., 4,924,420, Cl. 364-569.000.
Dugan, Larry M.: *See*—
Dorfman, Jan L.; Dugan, Larry M.; Young, David C.; and Willcoxen, Mark A., 4,923,095, Cl. 222-386.500.
Duijvestijn, Adrianus J.: *See*—
Opheij, Willem G.; Coops, Peter; Duijvestijn, Adrianus J.; Van Eck, Dirk C.; and De Zoeten, Peter, 4,924,079, Cl. 250-201.500.
Duke University: *See*—
Novack, Roger L., 4,922,919, Cl. 128-633.000.
Dumican, Barry L., to American Cyanamid Company. Prosthetic tubular article made with four chemically distinct fibers. 4,923,470, Cl. 623-11.000.
Dunlop, Kenneth: *See*—
Brandon, Daniel; Dunlop, Kenneth N. B.; Jensen, Lester B., Lucas, Richard M.; and Pietruszewski, Robert E., 4,924,303, Cl. 358-86.000.
Dunlop, Kenneth N. B.: *See*—
Brandon, Daniel; Dunlop, Kenneth N. B.; Jensen, Lester B., Lucas, Richard M.; and Pietruszewski, Robert E., 4,924,303, Cl. 358-86.000.
Dunn, Harold K. Procedure for verifying prosthetic implant seating. 4,922,898, Cl. 606-85.000.
Du Pont de Nemours, E. I. and Company: *See*—
Bartlett, Philip L., 4,923,097, Cl. 222-394.000.
Cornelia, Richard H., 4,923,752, Cl. 428-367.000.
Gorrafa, Adly A., 4,922,593, Cl. 28-254.000.
Harris, Martin; Heyes, Graham; and Jackson, Arthur, 4,923,987, Cl. 544-53.000.
Held, Robert P., 4,923,389, Cl. 430-264.000.
Hobbs, Frank W.; and Meek, James L., 4,924,023, Cl. 558-162.000.
McCormick, Randy M., 4,923,978, Cl. 536-27.000.
Sitzler, Fred C., 4,923,414, Cl. 439-751.000.
Stout, David M., and Matier, William L., 4,923,873, Cl. 514-259.000.
Taylor, Harvey W., Jr., 4,923,780, Cl. 430-257.000.
Zafiroglu, Dimitri, 4,923,725, Cl. 428-36.400.
Durand, Richard J.: *See*—
Aubry, Julien; Durand, Richard J.; Kerdraon, Alain L.; and Solve, Gerard, 4,922,825, Cl. 102-476.000.
Durand, Robert E., to Materials Et Applications De Securite Pour Les Aeroports L'Industrie Et Les Routes (Masair). Anti-dazzle screen. 4,923,284, Cl. 350-276.00R.
D'Urbino, Donato: *See*—
De Pas, Jonathan; D'Urbino, Donato; and Lomazzi, Paolo, 4,922,669, Cl. 52-646.000.
Durell, Joseph M., and Leathers, Don W., to Specialty Pet Products, Inc. Liquid dispensing animal grooming device. 4,922,859, Cl. 119-83.000.
Durette, Philippe L., to Merck & Co., Inc. Aminoalkyl naphthalenediols as host resistance enhancers against viral infections. 4,923,852 Cl. 514-49.000.
Durfee, David L., Jr., to Durfee, Susan M. Quick lock in parallel and angle plate system for machining vise. 4,923,186, Cl. 269-282.000.
Durfee, Mark. Method of converting a four speed manual transmission to a five speed transmission. 4,922,599, Cl. 29-401.100.
Durfee, Susan M.: *See*—
Durfee, David L., Jr., 4,923,186, Cl. 269-282.000.
Durkon Company, Inc., The: *See*—
Bogart, Douglas A., and Schenck, Robert C., Jr., 4,923,487, Cl. 55-482.000.
Durm, Jurgen, to Dr. Ing. h.c.F. Porsche AG. Towing device for vehicles. 4,923,205, Cl. 280-491.300.
Duro-Test Corporation: *See*—
Northrop, Donald P. and Strauss, David P., 4,924,368, Cl. 362-376.000.
Durst, Robert T., Jr.: *See*—
Dolan, Donald T.; Durst, Robert T., Jr.; Hubbard, David W.; and Silverberg, Morton, 4,923,023, Cl. 177-25.150.
Duthaler, Rudolf: *See*—
Howell, Frederick H.; Duthaler, Rudolf; Finter, Jurgen; Oertle, Konrad; and Ramanathan, Visvanathan, 4,924,015, Cl. 552-266.000.
Dutzmann, Stefan: *See*—
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,923,883, Cl. 514-343.000.
Duvdevani, Ilan: *See*—
Rerup, Hans J.; Drake, Evelyn N.; and Duvdevani, Ilan, 4,923,517, Cl. 106-99.000.
Dwyer, Eugene J., III, to Silhouette Technology, Inc. Film printing/-reading system. 4,924,254, Cl. 355-20.000.
Dwyer, John J.; Chamberlin, David B.; and Jachmann, Emil F., to Dictaphone Corporation. Display for modular dictation/transcription system. 4,924,332, Cl. 360-72.200.
Dyckerhoff & Widmann AG: *See*—
Russwurm, Dieter; and Jungwirth, Dieter, 4,922,681, Cl. 52-737.000.
Dyer, Gerald E.: *See*—
Morgan, Gene E.; and Dyer, Gerald E., 4,924,053, Cl. 219-75.000.
Dyna-Manufacturing, Ltd.: *See*—
Eriksson, Leif B., 4,922,732, Cl. 62-525.000.
Dynamotion Corporation: *See*—
Kosmowski, Wojciech B., 4,922,603, Cl. 29-568.000.
E. J. Langen & Sons Limited: *See*—
Langen, Marinus J. M.; Guttinger, Peter; and Hoefkes, Heiner, 4,922,688, Cl. 53-525.000.
E. R. Squibb & Sons, Inc.: *See*—
Biller, Scott A., 4,924,024, Cl. 558-202.000.
Hunger, Gerd, 4,923,452, Cl. 604-338.000.
Ealey, Mark A.; and Salemme, Victor G., to Litton Systems, Inc. Method and apparatus for calibrating deformable mirrors having replaceable actuators. 4,923,302, Cl. 356-371.000.
Earleson, Walter E.: *See*—
Evans, Raymond G.; Earleson, Walter E.; and Richardson, Joseph W., Jr., 4,924,395, Cl. 364-426.020.
Earnshaw, William E.: *See*—
McKinney, Steven J.; and Earnshaw, William E., 4,924,380, Cl. 364-200.000.
Eastern Balance Corporation: *See*—
Foss, Robert E., 4,922,657, Cl. 49-181.000.
Eastman Kodak Company: *See*—
Blount, William W.; and Zoeller, Joseph R., 4,923,958, Cl. 528-272.000.
Favrou, John M., 4,923,324, Cl. 403-359.000.
Gilmore, James F.; and Lloyd, Carl A., 4,923,307, Cl. 374-55.000.
Gilmore, James F.; Lloyd, Carl A.; and Kirk, Charles S., 4,924,477, Cl. 374-55.000.
Gluck, Ronald; and Roselle, Paul L., 4,923,828, Cl. 437-225.000.
Harder, John W., and Singer, Stephen P., 4,923,784, Cl. 430-430.000.
Harder, John W., 4,923,787, Cl. 430-489.000.
Hediger, Edwin A.; and Brown, Brandon H., 4,924,272, Cl. 355-298.000.
Joseph, Brian J., 4,924,273, Cl. 355-312.000.
Kaukeinen, Joseph Y., 4,923,275, Cl. 350-96.240.
McIntyre, Dennis A.; and Sullivan, Edward J., 4,924,419, Cl. 364-551.020.
Merkel, Paul B., and Hoke, David, 4,923,791, Cl. 430-553.000.
Nelson, Roger W., 4,923,680, Cl. 422-58.000.
Schwartz, Paul A., 4,923,782, Cl. 430-372.000.
Shuttleworth, Leslie; Merkel, Paul B.; and Brown, Glenn M., 4,923,788, Cl. 430-507.000.
Simons, Michael J., 4,923,860, Cl. 503-227.000.
Eaton Corporation: *See*—
Bramhall, Robert B., Jr.; Cloutier, Richard M.; Laber, Albert P.; and Muka, Richard S., 4,923,584, Cl. 204-298.250.
Calviello, Joseph A.; Bie, Paul R.; and Ward, David, 4,923,827, Cl. 437-190.000.
Karlovits, Frank K., 4,923,494, Cl. 62-73.000.
Echevarria, Jorge G., to Olave, Solozabal Y CIA, S.A. Stapling machine. 4,923,107, Cl. 227-120.000.
Eckstein, Udo; and Psaar, Hubertus, to Bayer Aktiengesellschaft. Highly concentrated stable solutions of color-forming agent: for pressure-sensitive recording materials. 4,923,641, Cl. 544-86.000.
Edagawa, Noboru; Mochizuki, Kiyofumi; and Iwamoto, Yoshinao, to Kokusai Denshin Denwa Kabushiki Kaisha. Optical amplification. 4,923,291, Cl. 350-389.000.
EDAP International: *See*—
Dory, Jacques, 4,922,917, Cl. 128-660.010.
Eddisford, Allen F.: *See*—
Lewis, Harry E.; Ritenour, Gibson D.; Wong, Cho L.; Gara, George; and Eddisford, Allen F., 4,924,500, Cl. 379-201.000.
Eddy, Robert: *See*—
Anderson, Don W.; Eddy, Robert; Egge, Alan; and Lewison, Richard, 4,923,597, Cl. 209-420.000.
Eduard Kusters Maschinenfabrik GmbH & Co. KG: *See*—
Driesen, Manfred; and Itgenshorst, Dieter, 4,922,733, Cl. 68-205.00R.
Efner, Howard F., to Phillips Petroleum Company. Antimony mercaptide esters and methods of preparing the same. 4,923,643, Cl. 260-410.90R.
Egashira, Noritaka: *See*—
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.000.
Egawa, Shohei: *See*—
Saitoh, Izumi; Kido, Shigeru; Doi, Yoshio, and Egawa, Shohei, 4,923,893, Cl. 514-458.000.
Egge, Alan: *See*—
Anderson, Don W.; Eddy, Robert; Egge, Alan; and Lewison, Richard, 4,923,597, Cl. 209-420.000

Eguchi, Shin: *See*—
Kato, Masayuji; Igaki, Seigo; Yamagishi, Fumio; Ikeda, Hiroyuki; Shinzaki, Takashi; and Eguchi, Shin, 4,924,085, Cl. 250-227.280.
Ehara, Yasuhiro: *See*—
Hasegawa, Takao; Onitsuka, Takuya; Suzuki, Minoru; Ehara, Yasuhiro; Hashimoto, Katsuhiro; and Ozaki, Tadamasa, 4,923,629, Cl. 252-181.000.
Eichel, Paul H.; Ghiglia, Dennis C.; and Jakowatz, Charles V., Jr., to United States of America, Energy. Phase correction system for automatic focusing of synthetic aperture radar. 4,924,229, Cl. 342-25.000.
Eickmann, Karl. Aircraft with pivotable wing and arrestable propellers. 4,923,144, Cl. 244-7.00R.
Eigyo, Masami: *See*—
Matsumura, Hiromu; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masami, 4,923,984, Cl. 540-496.000.
Eiling, Aloys: *See*—
Rodi, Fritz; Kiemle, Peter; Eiling, Aloys; and Kathrein, Hendrik, 4,923,519, Cl. 106-459.000.
Einolf, Charles W., Jr.: *See*—
Rozelle, Paul F.; Koch, Karl C.; Einolf, Charles W., Jr.; and Oates, Robert M., 4,922,757, Cl. 73-660.000.
Eisen, Arthur Z.: *See*—
Goldberg, Gregory I.; and Eisen, Arthur Z., 4,923,818, Cl. 435-320.000.
Eitel, Wilhelm, to Intocast GmbH Feuerfestprodukte und Giesshilfsmittel. Process and apparatus for restoring the lining of the metallurgical ladles. 4,923,180, Cl. 266-44.000.
Ejlersen, Henning M. Hose pump, in particular an insulin pump. 4,923,375, Cl. 417-477.000.
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., to Neste Oy. Cellulose carbamate products of lowered carbamate content. 4,923,979, Cl. 536-32.000.
Elconnex Lty Limited: *See*—
Petty, John; and McNeil, Sandy, 4,923,227, Cl. 285-319.000.
Electro-Technic Products Company: *See*—
Crist, Buckley, Jr., 4,924,092, Cl. 250-324.000.
Electro-Voice, Incorporated: *See*—
Carlson, David E., 4,923,031, Cl. 181-144.000.
Electropore, Inc.: *See*—
Marshall, John, III, 4,923,814, Cl. 435-173.000.
Eli Lilly and Company: *See*—
Bobbitt, Jesse L.; and Manetta, Joseph, 4,923,967, Cl. 530-351.000.
Rizzo, John R.; and Tao, Eddie V. P., 4,924,001, Cl. 548-356.000.
Wright, Ian G., 4,923,983, Cl. 540-363.000.
Elie, Philippe: *See*—
Crepy, Hubert; Elie, Philippe; Galand, Claude; Lancon, Emmanuel; Liethoudt, Thierry; and Rosso, Michele, 4,924,508, Cl. 381-38.000.
Ellenberger, Bernd; Jennet, Friedrich; Schafer, Karlheinz; Spickermann, Rainer; and Lass, Gerhard, to Pfaff Industriemaschinen, GmbH. Device for the welding of plastic foil. 4,923,558, Cl. 156-499.000.
Ellers, Clarence W. Hybrid electric/ice vehicle drive system. 4,923,025, Cl. 180-65.200.
Ellingsen, Olav, to Industrikontakt Ing. O. Ellingsen & Co. Artificial gland for implantation in a human body. 4,923,457, Cl. 604-891.100.
Elliott, George M.; Watford, Ervin L., Jr.; and Howell, George W., to Astechnologies, Inc. Apparatus for steam lamination. 4,923,555, Cl. 156-497.000.
Elliott, Raymond; and Sunley, Raymond L., to Imperial Chemical Industries PLC. Triazolyl ethanol derivatives as plant growth regulators. 4,923,502, Cl. 71-92.000.
Elor Optronics Ltd.: *See*—
Ophir, Zohar; Golstein, Michael; and Nagler, Miriam, 4,923,066, Cl. 209-538.000.
El Sayed, Aziz: *See*—
Willenberg, Bernd; El Sayed, Aziz; Rohr, Harry; and Dicke, Hans-Rudolf, 4,923,660, Cl. 264-103.000.
ELTECH Systems Corporation: *See*—
Abrahamson, Donald W.; Harney, Marilyn J.; Vauss, Elvin W., Jr.; Niksa, Andrew J.; and Stewart, James J., 4,923,582, Cl. 204-255.000.
Elter, Claus; Hornischer, Edgar; Schmitt, Hermann; and Schoening, Josef, to Hochtemperatur-Reaktorbau GmbH. Roof reflector for a nuclear reactor. 4,923,670, Cl. 376-459.000.
Elwood Hydraulics Co., Inc.: *See*—
Delmer, Philip T.; and Hunt, Lewis D., 4,923,381, Cl. 425-77.000.
Emig, Peter: *See*—
Engel, Jurgen; Emig, Peter; Nickel, Bernd; and Szelenyi, Istvan, 4,923,858, Cl. 514-211.000.
Emoto, Clesson T. Wheeled support for line trimmer. 4,922,694, Cl. 56-16.700.
Emoto, Takao: *See*—
Kato, Toshihiro; Kojima, Shinjiro; Emoto, Takao; and Matsumoto, Hiroshi, 4,924,351, Cl. 361-386.000.
Empi, Inc.: *See*—
Morawetz, Peter L.; and Ioffe, Zosim, 4,922,908, Cl. 128-422.000.
EMS Electronic Motor Systems AB: *See*—
Hedlund, Gunnar; and Lundberg, Henrik, 4,924,155, Cl. 318-254.000.
Endo, Kazuo; Noda, Noboru; and Mitani, Tatsuro, to Kabushiki Kaisha Toshiba. Gate structure for a MOS FET. 4,924,281, Cl. 357-23.900.
Endo, Masayuki: *See*—
Matsuki, Yasuo; Kariya, Yosinobu; Endo, Masayuki; Ikeda, Hiroharu; and Hosaka, Yoshihiro, 4,923,948, Cl. 528-26.000.
Endo, Zen-ichiro: *See*—
Hara, Shigeyoshi; and Endo, Zen-ichiro, 4,923,943, Cl. 526-283.000.
Endoh, Kenjiro; and Yasuda, Osamu, to Kabushiki Kaisha Toshiba. System for recording/reproducing an information source having an apparatus-specific identification signal. 4,924,328, Cl. 360-60.000.
Energy Conversion Devices, Inc.: *See*—
Strand, David, 4,924,436, Cl. 365-113.000.
Enesco Imports Corp.: *See*—
Gilmore, William M., 4,923,721, Cl. 428-11.000.
Enforcement Support Incorporated: *See*—
Kosich, Milo, 4,924,488, Cl. 379-34.000.
Engel, Jurgen; Emig, Peter; Nickel, Bernd; and Szelenyi, Istvan, to Asta Pharma Aktiengesellschaft. Substituted 3-(n-heterocyclic)-2,6-diaminopyridines and -n-oxides. 4,923,858, Cl. 514-211.000.
Engelbart, Wilke. Process and device for large surface-area fine-bubble gasification of liquids. 4,923,614, Cl. 210-648.000.
Englebert, Gary L. Mechanical-fluid-retention platform. 4,923,052, Cl. 184-106.000.
Englund, Diane J.: *See*—
Adkins, Adrian S.; and Englund, Diane J., 4,923,760, Cl. 428-541.000.
Enkaku, Motohiro; and Kato, Toshiya, to Kabushiki Kaisha Toshiba. Semiconductor device having improved multilayered wirings. 4,924,290, Cl. 357-68.000.
Ennis, James F., III, to Anderson, Mark L. Dripless automatic syringe for dispensing fluids. 4,923,096, Cl. 222-391.000.
Ennis, James F., III, to Mark Anderson. Syringe with spray nozzle tip. 4,923,448, Cl. 604-239.000.
Environmental Security Incorporated: *See*—
Greene, Jay S., 4,923,621, Cl. 252-2.000.
Erb, Lee A.; Carr, Alan R.; Beaty, Paul G.; Bandhauer, Brian D.; and Randall, Mitchell A., to Erbtec Engineering, Inc. Amplifier having digital bias control apparatus. 4,924,191, Cl. 330-130.000.
Erbtec Engineering, Inc.: *See*—
Erb, Lee A.; Carr, Alan R.; Beaty, Paul G.; Bandhauer, Brian D.; and Randall, Mitchell A., 4,924,191, Cl. 330-130.000.
Erickson, Paul M. Oriented simultaneous vision bifocal contact lenses or the like utilizing intraocular suppression of blur. 4,923,296, Cl. 351-161.000.
Eriksson, Leif B., to Dyna-Manufacturing, Ltd. Evaporator system for refrigeration systems. 4,922,732, Cl. 62-525.000.
Ermert, Helmut; Pfeiler, Manfred; and Barth, Karl, to Siemens Aktiengesellschaft. Medical examination installation with improved image contrast. 4,922,916, Cl. 128-653.00R.
Erwin Sick GmbH Optik-Elektronik: *See*—
Weber, Klaus, 4,924,086, Cl. 250-235.000.
Eshima, Taizo; and Kai, Yasuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for forming leads of a semiconductor device 4,923,386, Cl. 425-450.100.
Essex Composite Systems: *See*—
Wycech, Joseph, 4,922,596, Cl. 29-897.200.
Wycech, Joseph, 4,923,902, Cl. 521-54.000.
Essex Group, Inc.: *See*—
Zaman, Mohammad F.; and Gerencser, James, 4,923,133, Cl. 242-45.000.
ETA SA Fabriques d'Ebauches: *See*—
Gladden, Thomas; and Fullemann, Fritz, 4,923,672, Cl. 419-18.000.
Meyrat, Clement; and Dubois, Antoine, 4,924,452, Cl. 368-236.000.
Etablissements Tasserit: *See*—
Akcelrod, Patrick; and Papailhau, Bernard, 4,922,892, Cl. 128-25.00R.
Etat Francais: *See*—
Boulicault, Jean-Michel, 4,922,946, Cl. 137-102.000.
Ethyl Corporation: *See*—
Bottelberghe, Scott A., 4,924,018, Cl. 556-179.000.
Klobucar, W. Dirk; Nugent, Adam, Jr.; and Zumstein, Ronald C., 4,923,954, Cl. 528-183.000.
Euser, Huug: *See*—
Appel, Peter W.; Euser, Huug; and Liem, Seeng D., 4,923,628, Cl. 252-135.000.
Evans, Elfed H.: *See*—
Blackburn, Stephen N.; Delwel, Francois; and Evans, Elfed H., 4,923,636, Cl. 252-550.000.
Evans, Raymond G.; Earleson, Walter E.; and Richardson, Joseph W., Jr., to Caterpillar Inc. Synchronous wheel slip strategy for a locomotive governor. 4,924,395, Cl. 364-426.020.
Evans, Robert T.: *See*—
Richards, Philip C.; and Evans, Robert T., 4,924,495, Cl. 379-127.000.
Evenzon, Vladimir: *See*—
Kuchta, Richard; Billings, Larry; and Evenzon, Vladimir, 4,922,829, Cl. 104-127.000.
Everest Medical Corporation: *See*—
Welch, Daniel P.; and Stasz, Peter, 4,922,903, Cl. 606-37.000.
Everett, Charles J. Illuminated fishing float. 4,922,643, Cl. 43-17.500.
Everhart, Richard; Bosomworth, Paul; Butcher, Kenneth; and Hoffmann, Matthias, to Swiss Aluminum Ltd. Ceramic bodies formed from partially stabilized zirconia. 4,923,830, Cl. 501-103.000.
Evers, Donald H.; and Pham, Xuan M., to Philip Morris Incorporated. Hinged top cigarette box. 4,923,059, Cl. 206-265.000.
Exxon Chemical COmpany: *See*—
Mortreux, Andre; Petit, Francis; Mutez, Sylvain; and Paumard, Eric, 4,923,840, Cl. 502-167.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Exxon Production Research Company: *See—*
Lim, Git B.; Nieman, Ronald E.; and Banerjee, Sanjoy, 4,924,099, Cl. 250-390.040.
Valencia, Jaime A., and Victory, Donald J., 4,923,493, Cl. 62-13.000.

Exxon Research and Engineering Company: *See—*
Cody, Ian A.; and Brown, David L., 4,923,588, Cl. 208-27.000.
Hamner, Glen P., deceased; and Sawyer, Willard H., 4,923,841, Cl. 502-230.000.
Rerup, Hans J.; Drake, Evelyn N.; and Duvdevani, Ilan, 4,923,517, Cl. 106-99.000.

Eyedentify, Inc.: *See—*
Arndt, Joseph H., 4,923,297, Cl. 351-208.000.

Ezaki, Youichirou: *See—*
Masumoto, Mitsuhiko; Asoh, Toshiaki; Ezaki, Youichirou; and Aibe, Hiroshi, 4,924,025, Cl. 560-072.000.

Ezer, Elemeer: *See—*
Fodor, Tamas; Dobay, Laaszlo ; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Saghy, Katalin; and Szporny, Laaszlo , 4,923,888, Cl. 514-414.000.

Faber, Michael: *See—*
Dopheide, Dietrich; Faber, Michael; Reim, Gerhard; and Taux, Guenter, 4,923,298, Cl. 356-28.500.

Fabricated Metals, Inc.: *See—*
Coleman, Clarence B., 4,923,101, Cl. 222-510.000.

Fabricom Air Conditioning S.A.: *See—*
Legros, Alain C. A. G., 4,923,619, Cl. 210-764.000.

Fahlstroem, Ulf: *See—*
Hirschberg, Jakub; Botvidsson, Lars; and Fahlstroem, Ulf, 4,922,926, Cl. 128-785.000.

Fahringer, Thomas L. Device for coupling hooks to pegboard. 4,923,161, Cl. 248-221.200.

Fair, David L.: *See—*
Woodard, Kenneth E., Jr.; Fister, Julius C., Jr.; Fair, David L.; and Dean, Robert A., 4,923,583, Cl. 204-286.000.

Fairchild Semiconductor Corporation: *See—*
Brunvand, Eric L.; and Davis, Alan L., 4,924,435, Cl. 364-900.000.

Fairley, Kirkpatric. Cutlery implement including spring biased adjustable clamping jaws for holding food items. 4,923,234, Cl. 294-99.200.

Falch, Erik: *See—*
Krogsgaard-Larsen, Povl; Falch, Erik; and Pedersen, Henrik, 4,923,880, Cl. 514-301.000.

Fan, Chaolai. Vertical-lift screw drive mechanism. 4,923,185, Cl. 269-181.000.

Fang, Rong-Chin: *See—*
Angell, Eric H.; Aprille, Thomas J.; Fang, Rong-Chin; Lee, Byeong G.; and Spalink, Jan-Dieter, 4,924,459, Cl. 370-84.000.

Fang, Shou-Mean; and Camphouse, Charles H., to Raychem Corporation. Electrical device comprising conductive polymers. 4,924,074, Cl. 219-548.000.

Fanuc Ltd.: *See—*
Mizuno, Yutaka; and Takamuku, Hideyuki, 4,924,299, Cl. 358-22.000.

Fanuc Ltd: *See—*
Kawamura, Hideaki; Sasaki, Takao; and Matsuura, Shuji, 4,924,403, Cl. 364-474.220.

Farmer, James O.; Schodowski, Blair J.; Mobley, Joseph G.; Cole, Gregory C.; Tumblin, John E.; Banker, Robert O.; and West, Lamar, to Scientific Atlanta, Inc. Method and apparatus for improving video scrambling and employing split snyc pulses. 4,924,498, Cl. 380-15.000.

Farmer, Jerry D., to Process Equipment Company. Sectionalized centrifugal drying basket/screen assembly. 4,922,625, Cl. 34-58.000.

Farquharson, Graeme J.: *See—*
Watson, Keith G.; and Farquharson, Graeme J., 4,923,989, Cl. 544-318.000.

Fattal, Gregory M. Golf club cleaning device. 4,923,316, Cl. 401-11.000.

Faure, Jean-Francois, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Aluminium alloy parts, such as in particular rods, having an improved fatigue strength and production process. 4,923,676, Cl. 420-535.000.

Fauske, Hans K., to Westinghouse Electric Corp. Stable isothermal calorimeter. 4,923,306, Cl. 374-34.000.

Faville, Paul E.: *See—*
Fuller, Robert L., Jr.; Faville, Paul E.; and Maier, Mark C., 4,923,067, Cl. 209-539.000.

Favrou, John M., to Eastman Kodak Company. Zero clearance coupler for connecting a driving member to a splined hub. 4,923,324, Cl. 403-359.000.

Feal, Brice J.: *See—*
Vassiliadis, Stamatis; Putrino, Michael; Huffman, Ann E.; Feal, Brice J.; and Pechanek, Gerald G., 4,924,422, Cl. 364-715.090.
Vassiliadis, Stamatis; Schwarz, Eric M.; Putrino, Michael; and Feal, Brice J., 4,924,424, Cl. 364-738.000.

Federal Republic of Germany, represented by the Federal Minister for Economics, who is in turn represented by the President of the Physical-Technical Federal Institute: *See—*
Dopheide, Dietrich; Faber, Michael; Reim, Gerhard; and Taux, Guenter, 4,923,298, Cl. 356-28.500.

Feher, Kalman. Parachute foot support stirrup. 4,923,149, Cl. 244-151.00R.

Feher, Steve. Cooling and heating seat pad construction. 4,923,248, Cl. 297-180.000.

Feinauer, Roland: *See—*
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,923,926, Cl. 525-67.000.

Fenner, Manfred: *See—*
Heeg, Hubert; Werner, Hans-Peter; Fenner, Manfred; and Schmidt, Olaf, 4,923,816, Cl. 435-284.000.

Ferag AG: *See—*
Honegger, Werner, 4,923,136, Cl. 242-59.000.

Ference, Jonathan: *See—*
D'Aleo, Michael; Darragh, Denis; Ference, Jonathan; Luchaco, David; Rowen, Michael J.; and Spira, Joel S., 4,924,151, Cl. 315-295.000.

Ferenczi, Tibor; Kovacs, Laszlo ; and Szathmari, Attila, to Tungsram Reszvenytarsasag. Equipment for continuous heat treatment of tungsten filaments wound on molybdenum cores. 4,923,529, Cl. 148-20.300.

Ferguson Beauregard Inc.: *See—*
Ferguson, Paul L.; and Dinning, Robert W., 4,923,372, Cl. 417-53.000.

Ferguson, Paul L.; and Dinning, Robert W., to Ferguson Beauregard Inc. Gas lift type casing pump. 4,923,372, Cl. 417-53.000.

Fernandez, Salvador M.; Wang, Hann-Ping; Chao, Yong-Sheng; and Guignon, Ernest F., to Chimerix Corporation. Time-resolved fluorescence immunoassay. 4,923,819, Cl. 436-518.000.

Ferranti International plc: *See—*
Wood, Antony J.; and Gocher, George F., 4,923,172, Cl. 251-282.000.

Ferreira, Nicolaas P., to South African Inventions Development Corp. Microbiological process for degradation of steroids. 4,923,403, Cl. 435-125.000.

Ferrer, Jose M. S.; Pajares, Jose N.; and Torres, Manuel T. Apparatus for weighting and measuring the stature of persons. 4,923,024, Cl. 177-245.000.

Ferritsius, Olof: *See—*
Backlund, Ake; Ferritsius, Olof; and Tistad, Goran, 4,922,989, Cl. 162-24.000.

Ferry, Sonia: *See—*
Gerbaulet, Claude; and Ferry, Sonia, 4,924,389, Cl. 364-413.290.

Fertig, Daniel J.; and Schmidt, Matthew F., to VTC Incorporated. Simplified method of fabricating lightly doped drain insulated gate field effect transistors. 4,923,824, Cl. 437-44.000.

Fesenmeicir, Hugo: *See—*
Zumkeller, Oskar; and Fesenmeicir, Hugo, 4,924,045, Cl. 200-341.000.

Fest, Christa: *See—*
Riebel, Hans-Jochem; Fest, Christa; Muller, Klaus-Helmut; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,923,505, Cl. 71-93.000.

Feuchtwanger, David, to Thorn EMI plc. Bandwidth reduction system for television signals. 4,924,308, Cl. 358-133.000.

Feyen, Paul A.: *See—*
Steffes, Thomas J.; Feyen, Paul A.; and Martin, Wesley R., 4,922,749, Cl. 73-116.000.

Feyen, Peter: *See—*
Kuhnert, Peter; and Feyen, Peter, 4,923,786, Cl. 430-450.000.

Fiat Auto S.p.A.: *See—*
Marcolin, Dario, 4,923,001, Cl. 165-140.000.

Fichtner, Karl: *See—*
Pollner, Juergen; Trummer, Gregor; Moelzer, Peter; and Fichtner, Karl, 4,923,253, Cl. 303-7.000.

Fiddler, R. Charles, to Kolpak Manufacturing Company. Pizza delivery container and method. 4,922,626, Cl. 34-80.000.

Fietzke, Gunter, to Gebr. Hofmann GmbH & Co. Clamping ring for clamping a member on a shaft and apparatus incorporating the clamping ring. 4,923,326, Cl. 403-371.000.

Figa, Romek; Cohen, Jonathan H.; and Cohen, Samuel G., to Romek Figa d/b/a Abraham & Sons. Automatic incoming telephone call originating number and party display system. 4,924,496, Cl. 379-142.000.

Filippone, Andrew. Remote oil tank display apparatus. 4,924,221, Cl. 340-870.380.

Fillingham, John F.; Hawkins, Ronald J.; and Wilson, Anthony D., to Babcock Energy Limited. Apparatus for stowing and deploying stores from air and marine craft. 4,923,148, Cl. 244-137.100.

Fine, Michael J.; and Calfee, Richard V., to Intermedics, Inc. Transvenous defibrillating and pacing lead. 4,922,927, Cl. 128-786.000.

Fink, Manfred; Schreiber, Wolfgang; Ludwig, Manfred; Hald, Ewald; and Kloss, Guenter, to C. & E. Fein GmbH & Co. Machine with variable torque setting. 4,923,047, Cl. 192-150.000.

Finkomat Oy: *See—*
Miettinen, Veli V. A., 4,922,578, Cl. 15-36.000.

Finn, Donald J. Solar liquid heating system. 4,922,720, Cl. 60-641.800.

Finter, Jurgen: *See—*
Howell, Frederick H.; Duthaler, Rudolf; Finter, Jurgen; Oertle, Konrad; and Ramanathan, - Visvanathan, 4,924,015, Cl. 552-266.000.

First Brands Corporation: *See—*
Kamp, Ewald A., 4,922,588, Cl. 24-576.000.

Fischer, David A., to Ace Medical Company. Surgical fixation pin tension adjuster. 4,923,458, Cl. 606-59.000.

Fischer, Edward M.: *See—*
Sanocki, Stephen M.; Johnson, Donald D.; and Fischer, Edward M., 4,923,332, Cl. 405-63.000.

Fischer, Jaanos: *See—*
Fodor, Tamas; Dobay, Laaszlo ; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Saghy, Katalin; and Szporny, Laaszlo , 4,923,888, Cl. 514-414.000.

Fisher, James H.: *See—*
Clark, John H.; Fisher, James H.; and Wolfram, Thomas, 4,924,471, Cl. 372-34.000.

Fisher, Richard L., to RMI Company. Deoxidation of titanium and similar metals using a deoxidant in a molten metal carrier. 4,923,531, Cl. 148-126.100.

Fiske, John M., Jr. Newspaper box signal device and cover. 4,923,114, Cl. 232-34.000.

Fister, Julius C., Jr.: *See—*
Woodard, Kenneth E., Jr.; Fister, Julius C., Jr.; Fair, David L.; and Dean, Robert A., 4,923,583, Cl. 204-286.000.

Flamig, Hans: *See—*
Steiner, Karl; Schutte, Andreas; and Flamig, Hans, 4,923,570, Cl. 162-358.000.

Flanigan, Larry L. Strap shortening device. 4,922,582, Cl. 24-71.100.

Flashinski, Stanley J., to S. C. Johnson & Son, Inc. Stable aqueous pyrethroid insecticidal formulations for containment in polyvinyl chloride containers. 4,923,897, Cl. 514-531.000.

Fleck, Harald: *See—*
Seibt, Artur; Maly, Heinrich; Fleck, Harald; and Haider, Gottfried, 4,922,880, Cl. 123-509.000.

Fleming, Matthew C.; and Magliocco, Melvin T. Radiation shield swivel mount. 4,923,162, Cl. 248-276.000.

Fleming, Raymond T.: *See—*
Westlund, Arnold E., Jr.; Boyd, John M.; and Fleming, Raymond T., 4,924,134, Cl. 313-113.000.

Fletcher, Eldon L.; and Kho, Tiong Hap (Hans), to Du Pont Canada, Inc. Comfort heat exchanger. 4,923,004, Cl. 165-175.000.

Flexible Barricades, Inc.: *See—*
Gorlov, Alexander M., 4,923,327, Cl. 404-6.000.

Fliekinger, Jon. Thermoplastic ballast housing in a novel three-dimensional printed circuit board. 4,924,152, Cl. 315-363.000.

Flint & Walling, Inc.: *See—*
Zimmer, John E., 4,923,367, Cl. 415-199.100.

Florian, Theodor, to Rasselstein AG. Method for the electro-deposition of a zinc-nickel alloy coating on a steel band. 4,923,573, Cl. 204-28.000.

Flottmann, Thomas; and Tretzel, Joachim, to Akzo N.V. Micro/ultrafiltration membranes with a fixed pore size formed through irradiation with pulsed lasers and process for manufacturing the same. 4,923,608, Cl. 210-500.250.

Flowtec AG: *See—*
Steiner, Kurt, 4,922,759, Cl. 73-861.220.

Flutec Fluidtechnische Gerate GmbH: *See—*
Rothaar, Stefan; and Stuck, Otfried, 4,923,373, Cl. 417-439.000.

Flynn, Daniel L.: *See—*
Belliotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,924,002, Cl. 548-206.000.

FMC Corporation: *See—*
Compri, Joel, 4,922,813, Cl. 99-510.000.

Foa, Marco: *See—*
Coassolo, Alfredo; Sabarino, Giampiero; Foa, Marco; and Chapoy, Larry L., 4,923,947, Cl. 528-193.000.
Coassolo, Alfredo; Sabarino, Giampiero; Foa', Marco; and Chapoy, L. Lawrence, 4,923,955, Cl. 528-193.000.

Fodor, Tamas; Dobay, Laaszlo ; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Saghy, Katalin; and Szporny, Laaszlo , to Richter Gedeon Vegyeszeti Gyar RT. Butenoic acid amides, their salts, and pharmaceutical compositions containing them. 4,923,888, Cl. 514-414.000.

Foiles, Peter G.: *See—*
Hecht, Stephen S.; Foiles, Peter G.; and Chung, Fung-Lung, 4,923,813, Cl. 435-172.200.

Folk, Craig L.: *See—*
Sawhney, A. Paul S.; Folk, Craig L.; and Robert, Kearny Q., 4,922,701, Cl. 57-12.000.

Fomico International, Inc.: *See—*
Smith, Peter J., 4,923,339, Cl. 405-284.000.

Fong, Dodd W.: *See—*
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., 4,923,634, Cl. 252-389.200.

Food Industry Equipment International, Inc.: *See—*
McCullough, Timothy J., 4,922,613, Cl. 30-276.000.

Forbes, Raymond. Straw for storage within beverage container. 4,923,083, Cl. 220-90.200.

Forbes, Raymond. Beverage container with automatic straw delivery mechanism and straw therefor. 4,923,084, Cl. 220-90.200.

Ford, Cheryl A., to GTE Products Corporation. Fluorescent lamp with a predetermined CRI and method for making. 4,923,425, Cl. 445-58.000.

Ford, Jack T. Handheld water balloon catapult 4,922,884, Cl. 124-20.100.

Ford Motor Company: *See—*
DeBiasi, Charles J.; and Boyer, Wesley D., 4,922,874, Cl. 123-417.000.
Demiryont, Hulya. 4,923,289, Cl. 350-357.000.

Ford New Holland, Inc.: *See—*
Linde, Gilbert W.; Seymour, Shaun A.; and Webster, Emmett G., 4,922,692, Cl. 56-1.000.
Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., 4,924,405, Cl. 364-468.000.

Ford, Thomas L.: *See—*
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., 4,922,985, Cl. 152-543.000.

Forg, Franz: *See—*
Wuelknitz, Peter; Lehmann, Rudolf; Ploeger, Walter; Hill, Karlheinz; and Forg, Franz, 4,923,685, Cl. 424-54.000.

Forges des Margerides S.A.: *See—*
Moise, Rene F., 4,923,016, Cl. 172-21.000.

Fors, Jan: *See—*
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,923,979, Cl. 536-32.000.

Fory, Werner: *See—*
Mayer, Willy; and Fory, Werner, -,923,995, Cl. 546-294.000.

Foss, Robert E., to Eastern Balance Corporation. Locking slide for tilt-out window balance system. 4,922,657, Cl. 49-181.000.

Foster Oilfield Equipment Company: *See—*
Beson, John, 4,923,171, Cl. 251-159.000.

Foster, Raymond K. Apparatus for collecting and compacting garbage and then loading it into a road vehicle. 4,923,356, Cl. 414-373.000.

Foster, Stephen L.: *See—*
Petri, Woldemar R.; and Foster, Stephen L., 4,923,359, Cl. 414-523.000.

Foster, Stephen Leonard: *See—*
Petri, Woldemar R.; and Foster, Stephen L., 4,923,359, Cl. 414-523.000.

Fowler, Peter H.: *See—*
Stewart, Peter A. E.; and Fowler, Peter H., 4,924,100, Cl. 250-390.090.

Fowler, Stewart H., Jr.: *See—*
Laky, Tibor; and Fowler, Stewart H., Jr., 4,923,005, Cl. 166-55.000.

Fox, David A.; and Stechschulte, David L., to Westinghouse Electric Corp. Single phase rectifier circuit. 4,924,372, Cl. 363-89.000.

Fox, Ellen M.: *See—*
Walts, Alan E.; and Fox, Ellen M., 4,923,810, Cl. 435-117.000.

Fox, Joseph R.: *See—*
Benton, Kenneth C.; Pierman, David A.; and Fox, Joseph R., 4,923,578, Cl. 204-130.000.

Foxford, Kenneth E. Portable camp cooker. 4,922,887, Cl. 126-41.00R.

Foy, Dennis M., to Ropak Corporation. Collapsible container. 4,923,079, Cl. 220-7.000.

Frachet, Bruno; and David, Michel-Yves, to Assistance Publique; and Audit S.A. Prothesis and electrode for the electrical stimulation of the inner ear, and method for producing said electrode. 4,923,469, Cl. 623-10.000.

Fraissenet, Bruno: *See—*
Cartry, Jean P.; and Fraissenet, Bruno, 4,922,605, Cl. 29-727.000.

Framatone: *See—*
Cartry, Jean P.; and Fraissenet, Bruno, 4,922,605, Cl. 29-727.000.

Frame, Robert R.: *See—*
Bricker, Jeffery C.; Frame, Robert R.; Benedict, Bryan L.; and Pollastrini, Sheila L., 4,923,596, Cl. 208-207.000.

Francis, Daniel L.; and Kasubick, Robert, to Cetus Corporation. Vinca alkaloid pharmaceutical compositions. 4,923,876, Cl. 514-283.000.

Frank, Karl, to AGFA Gevaert AG. Bleaching bath concentrate. 4,923,785, Cl. 430-430.000.

Franklin, Scott B. Flexible lower artificial denture. 4,923,795, Cl. 433-168.100.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Hansmann, Johann, 4,922,828, Cl. 104-10.000.

Fratta, Antonino. Reluctance synchronous electric machine having intrinsic phase correction means. 4,924,130, Cl. 310-261.000.

Fraunhofer Gesellschaft zur Forderung der Angewandten Forschung E.V.: *See—*
Kossatz, Gert; Heine, Wolfgang; Lempfer, Karsten; and Sattler, Heinz, 4,923,664, Cl. 264-256.000.

Frazee, Glenn R., to S. C. Johnson & Son, Inc. Pressure sensitive adhesive compositions. 4,923,919, Cl. 524-460.000.

Fredrickson, Gerald B.: *See—*
Taubner, Fred R.; Doucette, Richard L.; and Fredrickson, Gerald B., 4,924,141, Cl. 313-488.000.

Freedman, Barry A.; Meketon, Mark S.; and Vanderbei, Robert J., to American Telephone and Telegraph Company. Methods and apparatus for efficient resource allocation. 4,924,386, Cl. 364-402.000.

Freeland, James F., to Dolco Packaging Corporation. Blowing agent for expandable polymeric foams. 4,923,654, Cl. 264-53.000.

Freeman, Gary T., to MPM Corporation. Video probe aligning of object to be acted upon. 4,924,304, Cl. 358-101.000.

French, Andrew H.: *See—*
Hershey, Antoinette F.; French, Andrew H.; and Boire, Christopher P., 4,924,378, Cl. 364-200.000.

French, Park; and Stewart, Wilbur C., to General Electric Company. Illumination system for a display device. 4,924,356, Cl. 362-31.000.

Frerichs, Udo, to Continental Aktiengesellschaft. Vehicle wheel and tire assembly. 4,922,983, Cl. 152-379.300.

Fresenius AG: *See—*
Polaschegg, Hans-Dietrich, 4,922,975, Cl. 141-104.000.
Schal, Wilfried, 4,923,598, Cl. 210-87.000.

Fricker, Siegfried. Holding and supporting anchor to be cemented-in in a borehole in a mounting base. 4,922,679, Cl. 52-698.000.

Fridh, Lars G.; Madsen, Benni; and Rasmussen, Vagn N., to Gyproc AB. Board particularly for use by suspended ceilings. 4,922,677, Cl. 52-486.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Buchel, Manfred; and Hangmann, Norbert, 4,924,063, Cl. 219-121.640.

Friedman, Joshua. Apparatus for controlled irradiation. 4,924,070, Cl. 219-346.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Friend, Richard H.: *See*—
Allen, Philip C.; Burroughes, Jeremy H.; Friend, Richard H.; and Harrison, Alan J., 4,923,288, Cl. 350-355.000.
Fritz, Manfred; and Scheel, Hans, to SMS Schloemann-Siemag Aktiengesellschaft. Slitting shears. 4,922,779, Cl. 83-503.000.
Frost, Phillip, to Baker Cummins Pharmaceuticals, Inc. Method for treatment of mast cell-mediated dermatologic disorders. 4,923,875, Cl. 514-282.000.
Fruhauf, Serge; and Mattera, Eric, to SGS-Thomson Microelectronics S.A. Temperature threshold detection circuit. 4,924,212, Cl. 340-598.000.
Fryk, Bruce K., to Deere & Company. Bucket leveling system with dual fluid supply. 4,923,362, Cl. 414-700.000.
Fuentes, Jean-Luc; and Robert, Michel, to La Cellulose Du Pin. Method for treating a paper pulp with an enzyme solution. 4,923,565, Cl. 162-72.000.
Fuhner, Hubert, to Robert Krups Stiftung & Co. KG. Machine for brewing hot beverages. 4,922,809, Cl. 99-283.000.
Fuji Electric Co., Ltd.: *See*—
Kaneko, Hideo; and Nishigaki, Hideo, 4,923,768, Cl. 429-19.000.
Fuji, Hiroshi; Maeda, Shigemi; Sakamoto, Noriaki; Terashima, Shigeo; Yamaguchi, Takeshi; Tsuji, Kentaro; and Kojima, Kunio, to Sharp Kabushiki Kaisha. Optical memory device for recording, reproducing or erasing information onto a recording medium, including a recorded region detecting circuit. 4,924,447, Cl. 369-13.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Maeda, Satoshi, 4,922,864, Cl. 123-52.00M.
Tanaka, Hiroshi; and Sato, Keiji, 4,923,433, Cl. 474-11.000.
Fuji Photo Film Co., Ltd.: *See*—
Fujikura, Sadao; Iwasaki, Masayuki; Maeda, Minoru; and Iwakura, Ken, 4,923,781, Cl. 430-281.000.
Itabashi, Yuichi; Hayashi, Takayuki; and Igarashi, Akira, 4,923,844, Cl. 503-207.000.
Kato, Hirohiko; Mihayashi, Keiji; and Aikawa, Kazuhiro, 4,923,790, Cl. 430-523.000.
Kobayashi, Hidetoshi; and Naruse, Hideaki, 4,923,783, Cl. 430-377.000.
Kobayashi, Kiyotaka; Shizukuishi, Makoto; and Tabei, Masatoshi, 4,924,316, Cl. 358-213.260.
Miyagawa, Ichirou; and Agano, Toshitaka, 4,924,321, Cl. 358-296.000.
Morikawa, Masahiro; Kobayashi, Kiyoshi; and Miyamoto, Kimiaki, 4,922,851, Cl. 118-324.000.
Ohno, Shigeru; Mihara, Yuji; Adachi, Kenichi; Ukai, Toshinao; and Hayashi, Gouichi, 4,923,638, Cl. 252-587.000.
Okazaki, Yoji; and Kamiyama, Koji, 4,923,277, Cl. 350-96.290.
Okino, Yoshiharu, 4,924,261, Cl. 355-35.000.
Sasaki, Hirotomo; Shishido, Tadao; and Mifune, Hiroyuki, 4,923,794, Cl. 430-603.000.
Sato, Masami; Fujiyama, Masaaki; Iwasaki, Takashi; Suzuki, Masami; Yoneyama, Takashi; and Kosha, Hideaki, 4,922,675, Cl. 51-394.000.
Shibahara, Yoshihiko, 4,923,793, Cl. 430-567.000.
Shiota, Kazuo; and Sakamoto, Kiichiro, 4,924,302, Cl. 358-75.000.
Yagihara, Morio; Matushita, Tetunori; Ukai, Toshinao; and Katoh, Kazunobu, 4,923,789, Cl. 430-517.000.
Yasunaga, Tadashi; Yanai, Akio; and Sasazawa, Koji, 4,923,748, Cl. 428-336.000.
Fuji Xerox Co, Ltd.: *See*—
Imai, Takashi; Saito, Susumu; and Takashima, Koichi, 4,923,777, Cl. 430-120.000.
Yagi, Shigeru; Ono, Masato; Takahashi, Noriyoshi; Nishikawa, Masayuki; Fukuda, Yuzuru; and Karakida, Kenichi, 4,923,773, Cl. 430-57.000.
Fujii, Kanenaga: *See*—
Yamashita, Hiroshi; Fujii, Kanenaga; Fukunishi, Takumi; Shigeoka, Masafumi; and Sudo, Hiroshi, 4,924,357, Cl. 362-32.000.
Fujii, Tetsuo: *See*—
Yamane, Hiroyuki; Higuchi, Yasushi; and Fujii, Tetsuo, 4,924,277, Cl. 357-23.300.
Fujiie, Kazuhiko; Nonaka, Chiaki; and Yoshida, Tadao, to Sony Corporation. Apparatus for generating tracking error signals in a differential phase detection system. 4,924,455, Cl. 369-44.210.
Fujikura Ltd.: *See*—
Nakayama, Shiro; Kunimura, Satoshi; Takahashi, Shigemi; Takahashi, Katsuhiko; Hirayama, Toshimitu; and Akutsu, Masao, 4,924,131, Cl. 310-329.000.
Fujikura, Sadao; Iwasaki, Masayuki; Maeda, Minoru; and Iwakura, Ken, to Fuji Photo Film Co., Ltd. Photopolymerizable composition containing 3,6-diaminofluoran compounds. 4,923,781, Cl. 430-281.000.
Fujimoto, Kazuhisa: *See*—
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asano, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.
Fujimoto, Mikihiro: *See*—
Takimoto, Hiroyuki; Nagasawa, Kenichi; Fujimoto, Mikihiro; Kobayashi, Hiroyuki; and Takei, Masahiro, 4,924,326, Cl. 360-10.200.
Fujimoto, Sachito: *See*—
Yamabe, Hitoshi; Sekine, Noboru; Takagi, Shuichi; and Fujimoto, Sachito, 4,923,042, Cl. 192-0.096.
Fujimoto, Toru: *See*—
Ueki, Yasuhiro; and Fujimoto, Toru, 4,924,161, Cl. 318-567.000.
Fujimoto, Yoshiaki: *See*—
Hidaka, Sachio; Fujimoto, Yoshiaki; and Tani, Takao, 4,922,784, Cl. 74-527.000.
Fujioka, Hideaki; and Matsumoto, Tatsuji, to Sumitomo Electric Industries, Ltd. Wheel behavior detecting system. 4,924,396, Cl. 364-426.030.
Fujioka, Masanobu: *See*—
Utaka, Katsuyuki; and Fujioka, Masanobu, 4,923,265, Cl. 350-96.140.
Fujioka, Shuzo: *See*—
Matsubara, Toshiyuki; Fujioka, Shuzo; Yamaguchi, Atsuo; Takahira, Kenichi; Furuta, Shigeru; and Inoue, Takesi, 4,924,465, Cl. 371-3.000.
Fujisaka, Takahiko; Ohashi, Yoshimasa; and Kondo, Mithimasa, to Mitsubishi Denki Kabushiki Kaisha. Holographic radar. 4,924,235, Cl. 342-374.000.
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg. Co. Ltd HST (hydrostatic transmission) housing axle driving apparatus. 4,922,787, Cl. 475-83.000.
Fujisawa Pharmaceutical Company, Ltd.: *See*—
Ikeda, Kohji; Tsuji, Akira; and Sunaga, Yoshiyuki, 4,922,597, Cl. 29-240.000.
Murata, Masayoshi; Chiba, Toshiyuki; and Yamada, Akira, 4,923,857, Cl. 514-210.000.
Shiokawa, Youichi; Takimoto, Koichi; and Takenaka, Kohei, 4,923,886, Cl. 514-365.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,923,998, Cl. 548-195.000.
Fujisawa Phatmaceutical Co., Ltd.: *See*—
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,923,881, Cl. 514-311.000.
Fujita, Shigeyoshi; Sekiya, Naobumi; Okamura, Takashi; and Watanabe, Yoshitaka, to Daifuku Co., Ltd. Conveyor system utilizing linear motor. 4,922,830, Cl. 104-290.000.
Fujita, Toshiaki: *See*—
Nakamura, Yasuyuki; Hashimoto, Akio; Fujita, Toshiaki; and Kawakami, Makoto, 4,923,100, Cl. 228-117.000.
Fujita, Yoshiji: *See*—
Onishi, Takashi; Suzuki, Shigeaki; Mori, Toshiki; and Fujita, Yoshiji, 4,924,030, Cl. 568-34.000.
Fujitsu Limited: *See*—
Amemiya, Shigeo; Komine, Hiroaki; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, 4,924,461, Cl. 370-95.200.
Kato, Masayuji; Igaki, Seigo; Yamagishi, Fumio; Ikeda, Hiroyuki; Shinzaki, Takashi; and Eguchi, Shin, 4,924,085, Cl. 250-227.280.
Koga, Satoru; and Tanaka, Tsutomu, 4,924,425, Cl. 364-900.000.
Kohno, Keiichi, 4,924,165, Cl. 318-592.000.
Ohshima, Toshio, 4,924,283, Cl. 357-34.000.
Fujitsuka, Osamu: *See*—
Kawamoto, Hiromi; and Fujitsuka, Osamu, 4,924,186, Cl. 324-320.000.
Fujiwara, Toru, to Mitsubishi Denki Kabushiki Kaisha. Fault diagnosis system for automotive electronic devices. 4,924,398, Cl. 364-431.110.
Fujiyama, Masaaki: *See*—
Sato, Masami; Fujiyama, Masaaki; Iwasaki, Takashi; Suzuki, Masami; Yoneyama, Takashi; and Kosha, Hideaki, 4,922,675, Cl. 51-394.000.
Fukasawa, Hiromichi; Katsura, Yoshiro; and Hagiwara, Kazuhiko, to Terumo Kabushiki Kaisha. Hollow fiber membrane type oxygenator and method for manufacturing same. 4,923,679, Cl. 422-48.000.
Fukawa, Kazumi, to Ricoh Company, Ltd. Thermal recording apparatus using a detachable ink sheet cassette. 4,924,242, Cl. 346-76.0PH
Fukaya, Masaki: *See*—
Komiyama, Katsumi; Fukaya, Masaki; Yokono, Kojiro; and Toma, Hitoshi, 4,924,282, Cl. 357-30.000.
Fukuda, Kyohei: *See*—
Kataoka, Hiroshi; and Fukuda, Kyohei, 4,924,244, Cl. 350-432.000.
Fukuda, Yasuhiro; and Kitazawa, Shooji, to Oki Electric Industry Co., Ltd. Semiconductor fet with long channel length. 4,924,280, Cl. 357-23.800.
Fukuda, Yuzuru: *See*—
Yagi, Shigeru; Ono, Masato; Takahashi, Noriyoshi; Nishikawa, Masayuki; Fukuda, Yuzuru; and Karakida, Kenichi, 4,923,773, Cl. 430-57.000.
Fukudome, Toshiro: *See*—
Miki, Nobuhiro; Fukudome, Toshiro; and Kaibori, Takesi, 4,923,530, Cl. 148-26.000.
Fukuhara, Hiroshi; Matsunaga, Fujihisa; and Nakashima, Yasushi, to Mitsui Petrochemical Industries, Ltd. Hydrogenation catalyst. 4,923,837, Cl. 502-84.000.
Fukui, Tetsuro: *See*—
Oguchi, Yoshihiro; Sugata, Hiroyuki; Miura, Kyo; Fukui, Tetsuro; and Takasu, Yoshio, 4,923,390, Cl. 430-270.000.
Fukui, Yoshio: *See*—
Hirata, Kentaro; Fukui, Yoshio; and Hayashi, Sadao, 4,923,616, Cl. 210-676.000.
Fukunaga, Kouji, to Canon Kabushiki Kasiah. Image processing apparatus wherein character string processing can be performed on a display screen. 4,924,409, Cl. 364-518.000.
Fukunishi, Takumi: *See*—
Yamashita, Hiroshi; Fujii, Kanenaga; Fukunishi, Takumi; Shigeoka, Masafumi; and Sudo, Hiroshi, 4,924,357, Cl. 362-32.000.
Fukushima, Atsuhiko: *See*—
Ando, Hitoshi; Kashiwazaki, Takashi; Hosoi, Masayuki; and Fukushima, Atsuhiko, 4,924,402, Cl. 364-449.000.

Fukushima, Takeo: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.
Fukushima, Tetsuo; Inoue, Takao; and Kanashima, Keinosuke, to Matsushita Electric Industrial Co., Ltd. Method of producing liquid crystal display element. 4,923,552, Cl. 156-273.700.
Fukuyama, Keiji: *See*—
Watanabe, Keiji; Fukuyama, Keiji; Ishida, Masako; Suzuki, Ryo; and Saito, Masato, 4,924,137, Cl. 313-337.000.
Fullemann, Fritz: *See*—
Gladden, Thomas; and Fullemann, Fritz, 4,923,672, Cl. 419-18.000.
Fuller, Robert L., Jr.; Faville, Paul E.; and Maier, Mark C., to Boeing Company, The. Automated drill sorting system and method. 4,923,067, Cl. 209-539.000.
Fumino, Ichiro, to Nippon Tansan Gas Co., Ltd. Portable torch. 4,923,394, Cl. 431-343.000.
Funahashi, Yoshiki: *See*—
Matsumoto, Nobuo; Shiraki, Keita; and Funahashi, Yoshiki, 4,923,178, Cl. 267-140.100.
Funakawa, Naoyoshi; Iida, Yasuharu; Moriki, Yasumitsu; and Sakurai, Masahiro, to Sato Kogyo Co., Ltd.; and Maruma Technica Co., Ltd. Apparatus for removing asbestos and like materials from a surface. 4,923,251, Cl. 299-64.000.
Funakawa, Shigeru; and Horikawa, Mitsuo, to Yoshida Kogyo K. K. Slide fastener. 4,922,584, Cl. 24-381.000.
Funderburg, Issac M., Jr. Dental instrument. 4,923,399, Cl. 433-159.000.
Fung, Michael G.; and Wang, Justin, to Chips and Technologies, Inc. Page interleaved memory access. 4,924,375, Cl. 364-200.000.
Fung, Mok-Wing: *See*—
Chow, Carl S.; Zantow, Timothy J.; Fung, Mok-Wing; and Hartmann, Hansgregory C., 4,922,687, Cl. 53-472.000.
Furuishi, Yoshiro: *See*—
Kazumoto, Yoshio; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,922,722, Cl. 62-6.000.
Furukawa, Kusuo: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.
Furumoto, Mistumasa; Kawahara, Eiichiro; and Ikejiri, Kenichi, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulically operated continuously variable transmission. 4,922,717, Cl. 60-456.000.
Furumoto, Mitsumasa; Kawahara, Eiichiro; and Koyama, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulically operated continuously variable transmission. 4,922,715, Cl. 60-329.000.
Furushima, Tokihito: *See*—
Hirata, Keiichi; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; Ikeda, Yoshie; and Kawakami, Yasushi, 4,924,433, Cl. 364-900.000.
Furuta, Shigeru: *See*—
Matsubara, Toshiyuki; Fujioka, Shuzo; Yamaguchi, Atsuo; Takahira, Kenichi; Furuta, Shigeru; and Inoue, Takesi, 4,924,465, Cl. 371-3.000.
Furutsu, Akira, to Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Piston driving apparatus in tag attacher. 4,923,106, Cl. 227-67.000.
Furuya, Yoshikatu: *See*—
Kawagoe, Shigeyuki; and Furuya, Yoshikatu, 4,923,232, Cl. 292-263.000.
Fuse, Hisahumi: *See*—
Akao, Takeshi; Nishizawa, Yoshihiko; Yamada, Shiro; Fuse, Hisahumi; Ohsaki, Katsumichi; and Sakai, Morihiko, 4,922,650, Cl. 47-1.100.
Fuss, Andreas; and Siegemund, Gunter, to Hoechst Aktiengesellschaft. Process for the preparation of halogen-containing aromatic compounds. 4,924,014, Cl. 568-323.000.
G. D. Searle & Co.: *See*—
Deason, James R.; Stealey, Michael A.; and Weier, Richard M., 4,923,891, Cl. 514-433.000.
McMahon, Ellen G.; and Manning, Robert E., 4,923,874, Cl. 514-258.000.
G & L Corporation: *See*—
Loechner, Steven R., 4,923,174, Cl. 254-105.000.
G. Siempelkamp GmbH & Co.: *See*—
Gerhardt, Klaus, 4,923,384, Cl. 425-371.000.
Gaer, Marvin C. Bistatic system and method for ocean bottom mapping and surveying. 4,924,448, Cl. 367-88.000.
Gaeti, Anthony J., to Synchro-Start. Electromechanical run/stop actuator for diesel engine. 4,922,873, Cl. 123-357.000.
GAF Building Materials Corporation: *See*—
Chich, Adem; Lalwani, Steven S.; Bettoli, Steven C.; Grube, Louis L.; and Bondoc, Alfredo A., 4,923,913, Cl. 524-62.000.
Gladfelter, Jason; Woodring, William J.; Grube, Louis L.; and Horner, Charles J., Jr., 4,923,712, Cl. 427-140.000.
GAF Chemical Corporation: *See*—
Anderson, Lowell R.; Hashem, Mohamed M.; and Login, Robert B., 4,924,006, Cl. 548-550.000.
GAF Chemicals Corporation: *See*—
Shih, Jenn S.; and Smith, Terry E., 4,923,694, Cl. 424-70.000.
Galand, Claude: *See*—
Crepy, Hubert; Elie, Philippe; Galand, Claude; Lancon, Emmanuel; Liethoudt, Thierry; and Rosso, Michele, 4,924,508, Cl. 381-38.000.
Galli, Roberto; and Tempel, Ernst, to Ciba-Geigy Corporation. Aqueous dispersion of a metallizable dye and sulfonated aromatic condensate. 4,923,481, Cl. 8-589.000.
Gallis, Byron M., to Immunex Corporation. Peptide substrates for the detection, characterization and purification of protein kinase C. 4,923,802, Cl. 435-15.000.
Galloway, F. Merrill, to H.B.D. Industries, Inc. Measuring device for the internal diameter of a tube. 4,922,622, Cl. 33-542.000.
Gambale, Richard A.; Crittenden, James F.; and Ryan, James P., to C. R. Bard, Inc. Method for effecting a catheter exchange. 4,922,923, Cl. 128-772.000.
Gambale, Richard A.; and Crittenden, James F., to C. R. Bard, Inc. Catheter guidewire with varying radiopacity. 4,922,924, Cl. 128-772.000.
Gammell, Paul M.: *See*—
Vernon, Susan N.; and Gammell, Paul M., 4,924,182, Cl. 324-237.000.
Gammon, Peter H. F., to Arctic Systems Limited. Thermochemical penetrator for ice and frozen soils. 4,923,019, Cl. 175-14.000.
Gansow, Otto A.; and Kumar, Krishan, to United States of America, Health & Human Services. Process for synthesizing macrocyclic chelates. 4,923,985, Cl. 540-474.000.
Gantzer, Jean-Paul, to Kuhn, s.a. Farm machines with a jointed tool-holding frame. 4,922,699, Cl. 56-367.000.
Gara, George: *See*—
Lewis, Harry E.; Ritenour, Gibson D.; Wong, Cho L.; Gara, George; and Eddisford, Allen F., 4,924,500, Cl. 379-201.000.
Garfield, Douglas: *See*—
Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., 4,923,193, Cl. 272-73.000.
Garost, Alexandr I.: *See*—
Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; and Verbitsky, Alexandr N., 4,923,675, Cl. 420-129.000.
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., to Goodyear Tire & Rubber Company, The. Tire and rim assembly. 4,922,985, Cl. 152-543.000.
Gastiger, Michel: *See*—
Labat, Jean-Luc; Ougarane, Lahcen; and Gastiger, Michel, 4,924,061, Cl. 219-121.520.
Gatti, Angelo, to Roan S.p.A. Rotary applicator device, particularly for mascara. 4,922,934, Cl. 132-218.000.
Gatty, David G.: *See*—
Saforo, Emmanuel K.; Liu, Paul K. T.; Bergstrom, Robin K.; and Gatty, David G., 4,923,843, Cl. 502-415.000.
Gay, Christian; and Lassiaz, Philippe, to Valeo. Clutch control device, especially for automotive vehicles. 4,923,044, Cl. 192-98.000.
Gay, Steven L.; Gitlin, Richard D.; and Hartung, John, to American Telephone and Telegraph Company. Codecs with suppression of multiple encoding/decodings across a connection. 4,924,480, Cl. 375-8.000.
Gebr. Happich GmbH: *See*—
Klose, Odo, 4,923,211, Cl. 280-727.000.
Gebr. Hofmann GmbH & Co.: *See*—
Fietzke, Gunter, 4,923,326, Cl. 403-371.000.
Gebruder Sucker & Franz Mueller GmbH & Co.: *See*—
Busch, Wilhelm, 4,922,589, Cl. 26-29.00R.
Gebrueder Sucker & Franz Mueller GmbH & Co.: *See*—
Bongartz, Heinrich; Ruch, Peter; and Voswinckel, Gerhard, 4,922,592, Cl. 28-183.000.
Geelen, Carina: *See*—
Van der Auweraer, Mark G.; De Schrijver, Frans C.; Verbeek, Guy P.; Geelen, Carina; Terrell, David R.; and De Meutter, Stefaan K., 4,923,774, Cl. 430-59.000.
Geernickx, Frans L. A.: *See*—
Caporali, Didier Y. F.; and Geernickx, Frans L. A., 4,924,205, Cl. 338-227.000.
Geerpres, Inc.: *See*—
Breveglieri, Frank; and Streit, Kenneth F., 4,923,202, Cl. 280-47.350.
Geerts, Jean-Pierre: *See*—
Cossement, Eric; Geerts, Jean-Pierre; Gobert, Jean; Michel, Philippe; and Wulfert, Ernst, 4,923,865, Cl. 514-235.800.
Gehring, Fritz; and Krumm, Valentin, to Lindauer Dornier Gesellschaft mbH. Weft thread inserting gripper having a guide element for a shuttleless loom. 4,922,970, Cl. 139-446.000.
Gelbard, Edward, to Sonoco Products Company. Plastic bag and method and apparatus of manufacture. 4,923,436, Cl. 493-194.000.
Gelenkwellenbau GmbH: *See*—
Klischat, Ditmar, 4,923,320, Cl. 403-5.000.
Gellert, Jobst U. Injection molding system having a valve member with a ribbed insulative portion. 4,923,387, Cl. 425-549.000.
Gembinski, John C.; Grimmer, Robert A.; and Betzig, Patricia A., to Davidson Textron Inc. Method for making plastic parts. 4,923,657, Cl. 264-73.000.
Genaro, Donald M., to Henry Dreyfuss Associates. Device for containment and insertion of tampons and other objects. 4,923,440, Cl. 604-14.000.
GenCorp Inc.: *See*—
Brooks, Mark L.; and Wilson, Keith E., 4,923,759, Cl. 428-521.000.
Genden, Seymour A.: *See*—
Carmichael, Arthur O.; and Genden, Seymour A., 4,923,110, Cl. 228-214.000.
Genentech, Inc.: *See*—
Matteucci, Mark D., 4,923,808, Cl. 435-69.800.
General Electric CGR SA: *See*—
Sireul, Jacques; Herve, Jacob; and Rene, Gauthier, 4,923,295, Cl. 350-639.000.

VOL
1114
ISS
2
MY
8
1990
UMI

General Electric Company: *See*—
Ballard, Donald E., 4,924,201, Cl. 336-210.000.
Ben-Amoz, Meir, 4,923,371, Cl. 416-97.00R.
Curry, Herbert L., 4,923,933, Cl. 525-439.000.
French, Park; and Stewart, Wilbur C., 4,924,356, Cl. 362-31.000.
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., 4,923,534, Cl. 148-407.000.
Johnson, Neil R.; and Bovenkerk, Harold P., 4,923,490, Cl. 51-298.000.
Kern, Jeffrey A.; and Hoffman, Roger L., 4,923,366, Cl. 415-152.100.
Laskaris, Evangelos T., 4,924,198, Cl. 335-216.000.
Matta, Ram K.; and Bhutiani, Pupinder K., 4,922,712, Cl. 60-226.200.
Peterson, William A., 4,924,371, Cl. 363-89.000.
Rowen, William I.; and Withey, David J., 4,922,710, Cl. 60-39.281.
Yee, Edgar, 4,924,041, Cl. 200-50.00C.
General Foods Inc.: *See*—
Jackson, Miles N.; Rogers, Peter J.; and Watson, Brenda L., 4,923,304, Cl. 366-184.000.
General Kinematics Corporation: *See*—
Kraus, Richard B.; and Musschoot, Albert, 4,923,177, Cl. 266-44.000.
General Motors Corporation: *See*—
Arnold, Philip D.; and Kaywood, Roy G., 4,922,785, Cl. 74-567.000.
Kelley, Gerard F.; and Huch, Larry R., 4,924,158, Cl. 318-434.000.
Sabraw, Richard J., 4,922,992, Cl. 164-63.000.
General Technology Applications, Inc.: *See*—
Waters, Paul F.; Hadermann, Albert F.; and Trippe, Jerry C., 4,923,535, Cl. 149-19.100.
Gengarelly, Robert M.: *See*—
Kuo, Charles C.; and Gengarelly, Robert M., 4,923,909, Cl. 523-333.000.
Gentcheva, Dobrinka G.: *See*—
Markov, Marko T.; Ivanov, Chavdar B., Jelyazkov, Deltcho G.; Mendeschka, Diana M., Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G., Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.
Gentzhorn, Michael D. Vehicle cap and boat combination. 4,923,242, Cl. 296-157.000.
Genzyme Corporation: *See*—
Walts, Alan E.; and Fox, Ellen M., 4,923,810, Cl. 435-117.000.
George Fischer AG: *See*—
Kunz, Peter, 4,923,659, Cl. 264-85.000.
Georgia Tech RSS. Corp: *See*—
Browner, Richard F.; and de Haseth, James A., 4,924,097, Cl. 250-343.000.
Gerbaulet, Claude; and Ferry, Sonia. Device for implementing a method for feeding persons 4,924,389, Cl. 364-413.290.
Gerber, Ernest C. Flavor dispensing device. 4,923,093, Cl. 222-145.000.
Gerber Garment Technology, Inc.: *See*—
Kuchta, Richard; Billings, Larry; and Evenzon, Vladimir, 4,922,829, Cl. 104-127.000.
Gerencser, James: *See*—
Zaman, Mohammad F.; and Gerencser, James, 4,923,133, Cl. 242-45.000.
Gerhardt, Klaus, to G. Siempelkamp GmbH & Co. Continuous press for hot pressing a mat. 4,923,384, Cl. 425-371.000.
Gerin, Umberto: *See*—
Meroni, Roberto; Vicl, Fred; Lancerotto, Fabio; and Gerin, Umberto, 4,922,707, Cl. 57-408.000.
Gerloff, Klaus: *See*—
Sergel, Horst; Aschemann, Dieter; Gerloff, Klaus; Kay, Alexander; and Wedemeyer, Lutz, 4,922,751, Cl. 73-146.000.
Germain, Al: *See*—
Germain, Sylvia; and Germain, Al, 4,923,069, Cl. 211-13.000.
Germain, Sylvia; and Germain, Al. Apparatus for storing and displaying jewelery. 4,923,069, Cl. 211-13.000.
Gerritsen, Rudolf: *See*—
Sizemore, Norman; and Gerritsen, Rudolf, 4,924,512, Cl. 380-6.000.
Gesellschaft fur Wolfram-Industrie mbH: *See*—
Litty, Richard, 4,923,673, Cl. 419-20.000.
Gestioni Riunite Toscana Gomma S.p.A.: *See*—
Giuliano, Claudio; and Gilardi, Pier E., 4,923,354, Cl. 414-286.000.
Geyer, Paul W.: *See*—
Munsterman, Gregg H.; Geyer, Paul W.; and Zaverzence, Harry, 4,923,405, Cl. 439-78.000.
Ghiglia, Dennis C.: *See*—
Eichel, Paul H.; Ghiglia, Dennis C.; and Jakowatz, Charles V., Jr., 4,924,229, Cl. 342-25.000.
Gibb, James L.; Laird, James A.; and Berntson, Leslie G., to Minnesota Mining and Manufacturing Company. Novolac coated ceramic particulate. 4,923,714, Cl. 427-221.000.
Gibbs, Henry L.; and MacNicol, Allan E. Preloaded slide bearing support apparatus. 4,923,311, Cl. 384-49.000.
Gigliotti, Michael F. X., Jr.: *See*—
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., 4,923,534, Cl. 148-407.000.
Giguere, Jean-Paul, to Donat Flamand Inc. Sash window. 4,922,656, Cl. 49-161.000.
Gilardi, Pier E.: *See*—
Giuliano, Claudio; and Gilardi, Pier E., 4,923,354, Cl. 414-286.000.
Giles, Alan F.: *See*—
Binley, Gary N.; Giles, Alan F.; Pearson, Christopher A.; and Baker, Terence P., 4,923,706, Cl. 426-516.000.
Gill, M. R. Water conservator system and method. 4,922,943, Cl. 137-1.000.
Gillespie, J. Brian: *See*—
Verona, Robert W.; Gillespie, J. Brian; and Brindle, James H., 4,922,550, Cl. 2-6.000.
Gilman, Paul S.: *See*—
Zedalis, Michael S.; and Gilman, Paul S., 4,923,532, Cl. 148-159.000.
Gilmore, James F.; and Lloyd, Carl A., to Eastman Kodak Company. Dilatometer. 4,923,307, Cl. 374-55.000.
Gilmore, James F.; Lloyd, Carl A.; and Kirk, Charles S., to Eastman Kodak Company. Assembly and method for determining the coefficient of thermal expansion of a workpiece. 4,924,477, Cl. 374-55.000.
Gilmore, William M., to Enesco Imports Corp. Musical ornament. 4,923,721, Cl. 428-11.000.
Gimeno, Rene : *See*—
Huc, Alain; and Gimeno, Rene , 4,923,380, Cl. 425-68.000.
Giordani, Attilio G., to Teledyne Industries, Inc. Hot water supply for tubs. 4,924,069, Cl. 219-306.000.
Gipson, Carey D.; and Jernigan, James T. Cervical fascia release board. 4,922,894, Cl. 128-71.000.
Gisske, Edward T.: *See*—
Nichol, Thomas W.; Gisske, Edward T.; and Johnson, Arlyn, 4,923,201, Cl. 273-371.000.
Gitlin, Richard D.; Rao, Sailesh K.; Werner, Jean-Jacques; and Zervos, Nicholas, to American Telephone and Telegraph Company; and AT&T Information Systems, Inc. Method and apparatus for wideband transmission of digital signals between, for example, a telephone central office and customer premises. 4,924,492, Cl. 379-93.000.
Gitlin, Richard D.: *See*—
Gay, Steven L.; Gitlin, Richard D.; and Hartung, John, 4,924,480, Cl. 375-8.000.
Gitman, Gregory M., to American Combustion, Inc. Regenerative burner. 4,923,391, Cl. 431-10.000.
Giuliano, Claudio; and Gilardi, Pier E., to Gestioni Riunite Toscana Gomma S.p.A. Magazine with movable shelves, for the maturation of cakes of synthetic foam material. 4,923,354, Cl. 414-286.000.
Given, Peter S., Jr., to Nabisco Brands, Inc. Method and composition for inhibiting fat bloom in fat based compositions and hard butter. 4,923,708, Cl. 426-610.000.
GIW Industries, Inc.: *See*—
Addie, Graeme R.; and Visintainer, Robert J., 4,923,369, Cl. 415-206.000.
Glacier Metal Company Limited, The: *See*—
Gojon, Roger L., 4,924,523, Cl. 384-272.000.
Gladden, Thomas; and Fullemann, Fritz, to ETA SA Fabriques d'Ebauches. Method of obtaining a mould intended for the manufacture of very small parts. 4,923,672, Cl. 419-18.000.
Gladfelter, Jason; Woodring, William J.; Grube, Louis L.; and Horner, Charles J., Jr., to GAF Building Materials Corporation. Asphaltic flashing stick. 4,923,712, Cl. 427-140.000.
Gladfelter, Wayne L.; and Boyd, David C., to University of Minnesota, Regents of the. Process for the chemical vapor deposition of aluminum. 4,923,717, Cl. 427-252.000.
Glaxo Group Limited: *See*—
Scopes, David I. C.; and Bays, David E., 4,923,863, Cl. 514-235.500.
Globe-Union Inc.: *See*—
Jones, Kenneth R.; and Sindorf, John F., 4,923,769, Cl. 429-101.000.
Gluck, Ronald; and Roselle, Paul L., to Eastman Kodak Company. Gaseous cleaning method for silicon devices. 4,923,828, Cl. 437-225.000.
Gobert, Jean: *See*—
Cossement, Eric; Geerts, Jean-Pierre; Gobert, Jean; Michel, Philippe; and Wulfert, Ernst, 4,923,865, Cl. 514-235.800.
Gocher, George F.: *See*—
Wood, Antony J.; and Gocher, George F., 4,923,172, Cl. 251-282.000.
Godfroid, Jean-Jacques: *See*—
Braquet, Pierre; Dive, Georges; Godfroid, Jean-Jacques; Heymans, Francoise; and Pirotzky, Eduardo, 4,923,870, Cl. 514-255.000.
Gofman, Yuri: *See*—
Krichever, Mark; and Gofman, Yuri, 4,923,281, Cl. 350-245.000.
Gojon, Roger L., to Glacier Metal Company Limited, The. Bearings. 4,924,523, Cl. 384-273.000.
Golabek, Robert S., Jr.: *See*—
Van Iperen, Willem H. P.; Wilson, Edmund B., III; and Golabek, Robert S., Jr., 4,923,077, Cl. 220-3.100.
Goldberg, Gregory I.; and Eisen, Arthur Z., to Washington University. DNA clone of human type IV collagenase. 4,923,818, Cl. 435-320.000.
Goldenberg, Nahum, to Renato Brevini. Variable speed hydraulic unit. 4,922,804, Cl. 91-532.000.
Goldstein, Gideon; and Audhya, Tapan, to Ortho Pharmaceutical Corporation. Human splenin. 4,923,964, Cl. 530-324.000.
Gollhardt, Bradley J.: *See*—
Blair, David E.; Gollhardt, Bradley J.; and Larson, James R., 4,923,778, Cl. 430-137.000.
Golstein, Michael: *See*—
Ophir, Zohar; Golstein, Michael; and Nagler, Miriam, 4,923,066, Cl. 209-538.000.
Gonda, Joseph, to AT&T Bell Laboratories. Crystal oscillator with broad tuning capability. 4,924,195, Cl. 331-116.00R.

Goodall, Brian L.; and Rhodes, Larry F., to BFGoodrich Company, The. Heteropolymetallate metathesis catalysts for cycloolefin polymerization. 4,923,936, Cl. 526-115.000.
Goodall, Brian L., to B.F. Goodrich Company, The. Ring opening polymerization with organophosphonium and organoarsonium metathesis catalysts. 4,923,939, Cl. 526-161.000.
Goode, Mark G.: *See*—
Kao, Sun-Chueh; Cann, Kevin J.; Karol, Frederick J.; Marcinkowsky, Arthur E.; Goode, Mark G.; and Theobald, Eugene H., 4,923,938, Cl. 526-133.000.
Goodyear Tire & Rubber Company, The: *See*—
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., 4,922,985, Cl. 152-543.000.
Ogata, Naoya, 4,923,839, Cl. 502-159.000.
Goossens, Armand. Anti-vibration support system for railroads. 4,923,118, Cl. 238-283.000.
Gorba, Naum A.: *See*—
Movchan, Boris A.; Panna, Vladimir A.; Chernenko, Evgeny V.; and Gorba, Naum A., 4,922,995, Cl. 164-469.000.
Gordon, Robert T. Process for applying a localized magnetic or electric field. 4,923,437, Cl. 600-12.000.
Goring, Gregory P.: *See*—
Reddy, Gaddam P.; Kulka, Robert A.; Goring, Gregory P.; and Van Wagener, Raymond H., 4,924,350, Cl. 361-386.000.
Gorlov, Alexander M., to Flexible Barricades, Inc. Terrorist vehicle arresting system. 4,923,327, Cl. 404-6.000.
Gorrafa, Adly A., to Du Pont de Nemours, E. I., and Company. System for preparing highly coherent air jet textured yarn. 4,922,593, Cl. 28-254.000.
Gosthnian, Barry M.; and Herr, Hugh. Inflatable limb prosthesis with preformed inner surface. 4,923,475, Cl. 623-37.000.
Gotchy, David: *See*—
Marshall, James W.; Gotchy, David; Uffelman, Bradley L.; Leimbach, Wendell B.; and Wilhelmi, Albert A., 4,922,604, Cl. 29-598.000.
Goto, Hiroshi: *See*—
Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, 4,923,956, Cl. 525-263.000.
GPAC, Inc.: *See*—
Newman, Eugene E.; and Natale, Anthony, 4,922,806, Cl. 98-1 500.
Graf & Cie AG: *See*—
Zurcher, Erwin, 4,924,062, Cl. 219-121.600.
Graff, Deanna M.: *See*—
Graff, Jeffrey J.; and Graff, Deanna M., 4,922,899, Cl. 128-158.000.
Graff, Jeffrey J.; and Graff, Deanna M. Double-coverage athletic protective cup with hinged flange. 4,922,899, Cl. 128-158.000.
Grange, Kenneth, to Wilkinson Sword Gesellschaft mit beschrankter Haftung. Pivot head razor. 4,922,609, Cl. 30-57.000.
Granger, Jacques, to CEBAL. Process for the production of lead-based capping caps and the caps obtained. 4,923,548, Cl. 156-182.000.
Grant, Thomas S.; Jalbert, Ronald L.; Whalen, David; Bartges, Brenda A.; and Thompson, Tracey L., to Borg-Warner Chemicals, Inc. Thermoplastic impact modified polyamide-polyphenylene ether composition. 4,923,924, Cl. 525-66.000.
Grantham, Rodger P., to Dayco Products, Inc. Hose assembly, clip therefor and method of making the same. 4,922,971, Cl. 141-1.000.
Grasselli, Robert K.; Harris, Jonathan H.; Henderson, Richard S.; and Tenhover, Michael A., to Standard Oil Company, The. Amorphous metal alloy compositions for reversible hydrogen storage and electrodes made therefrom. 4,923,770, Cl. 429-101.000.
Grasso, Albert P.; and Vogel, Wolfgang M., to International Fuel Cells. Fuel cell power plants employing an aqueous solution. 4,923,767, Cl. 429-12.000.
Grasso, Lawrence J.; Hoffman, Dale E.; Morgan, Carroll E.; Puntar, Charles A.; and Young, Diane K., to International Business Machines Corp. High speed digital counter. 4,924,484, Cl. 377-116.000.
Graves, James P., to Rolinx Limited. Shelter for trees. 4,922,652, Cl. 47-23.000.
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Coates, David; Jackson, Adam; and Scrowston, Richard M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal compounds containing two or more chiral centers. 4,923,633, Cl. 252-299.650.
Grayson, William; and Strahosky, Melvin E. Marine ice making and delivery system. 4,922,724, Cl. 62-135.000.
Graziani, Kenneth R.; Katzer, James R.; and Kyan, Chwan P., to Mobil Oil Corporation. Continuous lubricating oil dewaxing process. 4,923,591, Cl. 208-111.000.
Green Cross Corporation: *See*—
Tanaka, Kenji; Miyano, Kenmi; Nishimaki, Hideo; and Iga, Yoshiro, 4,923,815, Cl. 435-183.000.
Greene, Andrew E.: *See*—
Denis, Jean-Noel; Greene, Andrew E.; Guenard, Daniel; and Gueritte-Voegelein, Francoise, 4,924,011, Cl. 549-510.000.
Greene, Jay S., to Environmental Security Incorporated. Extinguishing combustible metal fires. 4,923,621, Cl. 252-2.000.
Greenland GmbH & Co. KG: *See*—
Gusewell, Eike; Wolfle, Hans-Peter; and Maier, Egon, 4,922,690, Cl. 53-587.000.
Greenwood, Christopher J., to Torotrak (Development) Ltd. Continuously variable transmission. 4,922,788, Cl. 475-26.000.
Greenwood, Eugene C., to Bruce, Henry E. Oscillatory saw. 4,922,612, Cl. 30-166.300.
Greenwood, Eugene C.; and Holland, John A. Single use syringe. 4,923,443, Cl. 604-110.000.
Gregor, Steven L.; and Lee, Victor S., to International Business Machines Corp. Direct hardware error identification method and apparatus for error recovery in pipelined processing areas of a computer system. 4,924,466, Cl. 371-12.000.
Gregory, Jonathan M., to GTE Products Corporation. Method for forming a groove in a glass tube. 4,923,498, Cl. 65-109.000.
Gresh, Richard D.; and Netherland, Robert B., to Tetra Technologies. Plastic-jacketed filter underdrain block. 4,923,606, Cl. 210-275.000.
Grieb, John H.; Joseph, J. Michael; Weaver, Richard D.; and Bata, George T., to Siemens-Bendix Automotive Electronics L.P. Multistream thin edge orifice disks for valves. 4,923,169, Cl. 251-118.000.
Grieve, Duncan M. A.; Poon, Stephen S. C.; Thien, Tran V.; Sakizadeh, Kumars; and Weigel, David C., to Minnesota Mining and Manufacturing Company. Color photothermographic elements. 4,923,792, Cl. 430-559.000.
Grigo, Ulrich: *See*—
Tacke, Peter; Grigo, Ulrich; and Idel, Karsten-Josef, 4,923,957, Cl. 528-271.000.
Grigoleit Company, The: *See*—
Howie, Robert K., Jr., 4,923,325, Cl. 403-361.000.
Grilliot, Mary I.: *See*—
Grilliot, William L.; and Grilliot, Mary I., 4,922,552, Cl. 2-93.000.
Grilliot, William L.; and Grilliot, Mary I. Firefighter's garments having enhanced flexibility and minimum weight. 4,922,552, Cl. 2-93.000.
Grimm, Richard: *See*—
Horoldt, Ernst; Grimm, Richard; Rittner, Siegbert; Kuckertz, Herbert; and Billmann, Wilfried, 4,923,485, Cl. 55-55.000.
Grimmer, Robert A.: *See*—
Gembinski, John C.; Grimmer, Robert A.; and Betzig, Patricia A., 4,923,657, Cl. 264-73.000.
Griss, Peter; and Koch, Rudolf, to Sulzer Brothers Limited. Hemispherical acetabulum. 4,923,473, Cl. 623-22.000.
Grob, Ferdinand; Linder, Ernst; Kienzler, Dieter; Potschin, Roger; and Stutzenberger, Heinz, to Robert Bosch GmbH. Device for measuring the particle emissions of an internal combustion engine. 4,922,714, Cl. 60-276.000.
Groothuis, Michiel: *See*—
Ray, Claude; and Groothuis, Michiel, 4,924,453, Cl. 368-294.000.
Gropp, Heiko, to Rheinmetall GmbH. Method of determining elevation angle correction value for a gun. 4,922,802, Cl. 89-41.070.
Grossman, Shlomo: *See*—
Albeck, Michael; and Grossman, Shlomo, 4,923,697, Cl. 424-195.100.
Grossmann, Werner; Herzing, Hans G., and Piltz, Manfred. Device for removing soil particles from the plate cylinder of an offset printing machine. 4,922,820, Cl. 101-425.000.
Grote & Hartmann GmbH & Co. KG: *See*—
Zinn, Bernd, 4,923,408, Cl. 439-341.000.
Zinn, Bernd, 4,923,416, Cl 439-877.000.
Grube, Louis L.: *See*—
Chich, Adem; Lalwani, Steven S.; Bettoli, Steven C.; Grube, Louis L.; and Bondoc, Alfredo A., 4,923,913, Cl. 524-62.000.
Gladfelter, Jason; Woodring, William J.; Grube, Louis L.; and Horner, Charles J., Jr., 4,923,712, Cl. 427-140.000.
Gruber, Bert: *See*—
Rutzen, Horst; Baumann, Horst; and Gruber, Bert, 4,923,642, Cl. 260-404.000.
Grumman Aerospace Corporation: *See*—
Kolbert, Melvin, 4,924,520, Cl. 380-59.000.
Miller, John M.; and Barton, Richard O., 4,922,573, Cl. 16-2.000.
Grundy, Kevin P.: *See*—
Seamons, John K.; and Grundy, Kevin P., 4,924,327, Cl. 360-48.000.
Seamons, John K.; and Grundy, Kevin P., 4,924,330, Cl. 360-66.000.
Grupp, Joachim, to Asulab S.A. Display cell. 4,923,286, Cl. 350-340.000.
Grzymer, Alicja H.: *See*—
Patel, Narenora; Van den Andel, Jan; Nicholson, Patrick S.; and Grzymer, Alicja H., 4,922,594, Cl. 29-25.350.
GSA Systems: *See*—
Sizemore, Norman; and Gerritsen, Rudolf, 4,924,512, Cl. 380-6.000
GTE Laboratories Incorporated: *See*—
Su, Shing-Fong, 4,923,267, Cl. 350-96.160.
GTE Products Corporation: *See*—
Buschmann, Jeffrey P., 4,924,145, Cl. 313-546.000.
Ford, Cheryl A., 4,923,425, Cl. 445-58.000.
Gregory, Jonathan M., 4,923,498, Cl. 65-109.000.
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,923,509, Cl. 420-401.000.
Schneider, John L.; and Manchester, Stephen T., 4,924,202, Cl. 337-100.000.
Shaffer, John W., 4,923,424, Cl. 445-55.000.
Taubner, Fred R.; Doucette, Richard L.; and Fredrickson, Gerald B., 4,924,141, Cl. 313-488.000.
Westlund, Arnold E., Jr.; Boyd, John M.; and Fleming, Raymond T., 4,924,134, Cl. 313-113.000.
Guajardo, , to Teledyne Industries, Inc. Circuitry for protection against electromotively-induced voltage transients in solid state relay circuits. 4,924,344, Cl. 361-101.000.
Guenard, Daniel: *See*—
Colin, Michel; Guenard, Daniel; Gueritte-Voegelein, Francoise; and Potier, Pierre, 4,924,012, Cl. 549-510.000.
Denis, Jean-Noel; Greene, Andrew E.; Guenard, Daniel; and Gueritte-Voegelein, Francoise, 4,924,011, Cl. 549-510.000.

Guenther, Helmut: *See—*
Simon, Helmut; and Guenther, Helmut, 4,923,811, Cl. 435-136.000.

Gueritte-Voegelein, Francoise: *See—*
Colin, Michel; Guenard, Daniel; Gueritte-Voegelein, Francoise; and Potier, Pierre, 4,924,012, Cl. 549-510.000.
Denis, Jean-Noel; Greene, Andrew E.; Guenard, Daniel; and Gueritte-Voegelein, Francoise, 4,924,011, Cl. 549-510.000.

Guerrant, Richard L.: *See—*
Marshall, Barry J.; and Guerrant, Richard L., 4,923,801, Cl. 435-12.000.

Guest, John D.; and Harde, Bo, to John Guest Limited. Tube couplings. 4,923,220, Cl. 285-39.000.

Guigne, Jacques Y., to Nordco Limited. Acoustic sub-surface interrogator. 4,924,449, Cl. 367-104.000.

Guignon, Ernest F.: *See—*
Fernandez, Salvador M.; Wang, Hann-Ping; Chao, Yong-Sheng; and Guignon, Ernest F., 4,923,819, Cl. 436-518.000.

Guijarro, Francisco I., to Iberoamer icana Del Ambalaje S.A. Container with a perfected lid. 4,923,113, Cl. 229-125.270.

Guillem, Andre : *See—*
Aubry, Jacques A.; and Guillem, Andre , 4,924,043, Cl. 200-52.00R.

Gunawardena, D. R.: *See—*
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,923,353, Cl. 414-226.000.

Gundel, Bernd: *See—*
Busch, Jurgen-Michael; Stammel, Georg; Rhau, Siegfried; Gundel, Bernd; and Rudolf, Karl, 4,922,826, Cl. 102-489.000.

Gundlach, Douglas P.: *See—*
Wagers, Kevin J.; and Gundlach, Douglas P., 4,923,551, Cl. 156-244.110.

Gunji, Naoki: *See—*
Ishikawa, Hiroshi; Gunji, Naoki; Hoshino, Yoshinori; and Ohyama, Taro, 4,923,762, Cl. 428-551.000.

Gupta, Phalguni: *See—*
Ho, Monto; and Gupta, Phalguni, 4,923,895, Cl. 514-504.000.

Gupta, Sanjay: *See—*
Burns, Robert V.; and Gupta, Sanjay, 4,924,511, Cl. 379-418.000.

Gurevich, Leon, to Cooper Industries, Inc. Wire bonded microfuse and method of making. 4,924,203, Cl. 337-231.000.

Gurnick, Henry R.: *See—*
Brodie, Ivor; Gurnick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., 4,923,421, Cl. 445-24.000.

Gusewell, Eike; Wolfle, Hans-Peter; and Maier, Egon, to Greenland GmbH & Co. KG. Round baler. 4,922,690, Cl. 53-587.000.

Guth, Jean-Louis: *See—*
Travers, Christine; Raatz, Francis; Guth, Jean-Louis; and Kessler, Henri, 4,923,835, Cl. 502-66.000.

Guttinger, Peter: *See—*
Langen, Marinus J. M.; Guttinger, Peter; and Hoefkes, Heiner, 4,922,688, Cl. 53-525.000.

Gyproc AB: *See—*
Fridh, Lars G.; Madsen, Benni; and Rasmussen, Vagn N., 4,922,677, Cl. 52-486.000.

H.B.D. Industries, Inc.: *See—*
Galloway, F. Merrill, 4,922,622, Cl. 33-542.000.

H-C Industries, Inc.: *See—*
Wilde, Sheldon L., 4,923,073, Cl. 215-252.000.

H. Lundbeck A/S: *See—*
Krogsgaard-Larsen, Povl; Falch, Erik; and Pedersen, Henrik, 4,923,880, Cl. 514-301.000.

Haas, David A.; VanderSyde, Gary L.; Beatty, Paul J.; and Roxas, Renato O., to Bell & Howell Phillipsburg Company. Insertion machine. 4,922,689, Cl. 53-569.000.

Haase, Thorsten: *See—*
Kiske, Siegfried; Haase, Thorsten; Leyer, Thomas; and Sauer, Wolfgang, 4,922,900, Cl. 128-202.270.

Hach, Larry R.: *See—*
Kelley, Gerard F.; and Hach, Larry R., 4,924,158, Cl. 318-434.000.

Hacker, Gerold, to Steyr-Daimler-Puch AG. Apparatus for removing branches from and for crosscutting treetrunks. 4,922,976, Cl. 144-3.00D.

Hadermann, Albert F.: *See—*
Waters, Paul F.; Hadermann, Albert F.; and Trippe, Jerry C., 4,923,535, Cl. 149-19.100.

Hadley, Maxwell R.; and Dudley, Richard P., to Stewart Hughes Limited. Tacho signal processing. 4,924,420, Cl. 364-569.000.

Haesebrouck, Francis: *See—*
Lienard, Jean; Haesebrouck, Francis; Katz, Sol; Abolins, Andrew; and Schmidt, George, 4,922,832, Cl. 105-4.200.

Hageman, Martin P., to Kelley Company Inc. Holddown mechanism for a dockboard. 4,922,568, Cl. 14-71.300.

Hager, Clarence H., to Hager, James C., Executor of Estate of Clarence H. Hager. System for anchoring a mobile equipment carrier on a platform. 4,923,346, Cl. 410-19.000.

Hager, James C., Executor of Estate of Clarence H. Hager: *See—*
Hager, Clarence H., 4,923,346, Cl. 410-19.000.

Hagiuda, Nobuyoshi: *See—*
Iida, Yoshikazu; Hagiuda, Nobuyoshi; Yokonuma, Norikazu; Sakamoto, Hiroshi; and Matsui, Hideki, 4,924,252, Cl. 354-420.000.

Hagiwara, Kazuhiko: *See—*
Fukasawa, Hiromichi; Katsura, Yoshiro; and Hagiwara, Kazuhiko, 4,923,679, Cl. 422-48.000.

Hahn, Eugene W. Word making card game. 4,923,199, Cl. 273-299.000.

Haider, Gottfried: *See—*
Seibt, Artur; Maly, Heinrich; Fleck, Harald; and Haider, Gottfried, 4,922,880, Cl. 123-509.000.

Haisch, Mark E.: *See—*
Lubarsky, Daniel P.; Weight, George A.; and Haisch, Mark E., 4,924,460, Cl. 370-84.000.

Hald, Ewald: *See—*
Fink, Manfred; Schreiber, Wolfgang; Ludwig, Manfred; Hald, Ewald; and Kloss, Guenter, 4,923,047, Cl. 192-150.000.

Hall, Charles P.: *See—*
Johenning, John B.; and Hall, Charles P., 4,922,563, Cl. 5-450.000.

Hallmark Cards, Incorporated: *See—*
Watkins, John; Magee, Ramon; and Doerflinger, Arthur, 4,923,572, Cl. 204-6.000.

Hamabe, Tatsuo: *See—*
Anzai, Kenji; and Hamabe, Tatsuo, 4,923,520, Cl. 106-490.000.

Hamada, Kazuhiko: *See—*
Yoneyoshi, Yukio; Suzukamo, Gohfu; Hamada, Kazuhiko; and Nishioka, Toshio, 4,923,999, Cl. 548-268.400.

Hamada, Masataka; Ishida, Tokuji; Ishibashi, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, to Minolta Camera Kabushiki Kaisha. Automatic focus control device. 4,924,250, Cl. 354-402.000.

Hamada, Tatsuzo, to Hitachi, Ltd. Display control method and system. 4,924,410, Cl. 364-518.000.

Hamajima, Takanori; and Inaguma, Yukio, to Aisin Seiki Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Linear generator. 4,924,123, Cl. 310-15.000.

Hamamatsu Photonics Kabushiki Kaisha: *See—*
Ooi, Yoshiharu; and Hara, Tsutomu, 4,923,287, Cl. 350-355.000.

Hamano, Satoshi: *See—*
Takaoka, Tokuro; Sasaki, Tsuto; Kobayashi, Yukio; Saito, Koichi; and Hamano, Satoshi, 4,923,170, Cl. 251-121.000.

Hamaoka, Hiromi, to Kabushiki Kaisha Toshiba. Seek control apparatus and method for preventing head in a floppy disk apparatus from being outwardly moved beyond an outermost track. 4,924,333, Cl. 360-75.000.

Hamatsu, Masahiro: *See—*
Akazawa, Shigeo; Mori, Masaharu; and Hamatsu, Masahiro, 4,924,188, Cl. 328-155.000.

Hamilton, Benton W.: *See—*
Page, Mary J.; Hamilton, Benton W.; Skiles, Bruce L.; and Reinhart, Robert V., Jr., 4,923,446, Cl. 604-198.000.

Hammelmann, Paul. Nozzle device. 4,923,120, Cl. 239-252.000.

Hammou, Abdelkader: *See—*
Ravaine, Lucienne; Armand, Michel B.; Charbouillot, Yves; and Hammou, Abdelkader, 4,923,950, Cl. 528-38.000.

Hamner, Annabelle, executrix: *See—*
Hamner, Glen P., deceased; and Sawyer, Willard H., 4,923,841, Cl. 502-230.000.

Hamner, Glen P., deceased (by Hamner, Annabelle, executrix); and Sawyer, Willard H., to Exxon Research and Engineering Company. Catalyst for the hydroisomerization and hydrocracking of waxes to produce liquid hydrocarbon fuels and process for preparing the catalyst. 4,923,841, Cl. 502-230.000.

Hanada, Fumio; Ohmura, Nobuhiko; and Hirayama, Koki, to Tokuyama Soda Kabushiki Kaisha. Novel anion-exchange membrane. 4,923,611, Cl. 210-638.000.

Hand, Wilfred L.: *See—*
Burgyan, Lajos; and Hand, Wilfred L., 4,924,473, Cl. 372-38.000.

Hanfling, Jerome D.: *See—*
Schuss, Jack J.; and Hanfling, Jerome D., 4,924,236, Cl. 343-700.0MS.

Hangmann, Norbert: *See—*
Buchel, Manfred; and Hangmann, Norbert, 4,924,063, Cl. 219-121.640.

Hanna, Marie R.: *See—*
Sprecker, Mark A.; Belko, Robert P.; and Hanna, Marie R., 4,924,026, Cl. 560-261.000.

Hannon, Charles N., to Stepper, Inc. Newspaper bagging method and apparatus. 4,923,064, Cl. 206-554.000.

Hannon, Douglas; and McClellan, Bingham A., to McClellan Industries, Inc. Magnetic fishing hook guard and method. 4,922,645, Cl. 43-42.400.

Hansma, Paul K.; and Drake, Barney, to University of California, The Regents of the. Scanning ion conductance microscope. 4,924,091, Cl. 250-306.000.

Hansmann, Johann: *See—*
Theurer, Josef; and Hansmann, Johann, 4,922,828, Cl. 104-10.000.

Hanson, Eric O. Liquid level controller. 4,923,489, Cl. 55-227.000.

Hanssler, Gerd: *See—*
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,923,883, Cl. 514-343.000.

Hao, Ming C.; Obermarck, Ronald L.; Trivett, Gene E.; and Trivett, Lynn, to International Business Machines Corporation. Method for controlling the peer-to-peer processing of a distributed application across a synchronous request/response interface using push-down stack automata. 4,924,384, Cl. 364-300.000.

Haque, Shuja: *See—*
Rockola, Donald C.; and Haque, Shuja, 4,923,090, Cl. 221-312.00R.

Hara, Ryuichi; Kagizaki, Masami; Takakura, Tsuyoshi; and Tomono, Shigeki, to Mitsubishi Kasei Corporation. Process for the production of pitch-type carbon fibers. 4,923,648, Cl. 264-29.200.

Hara, Shigeyoshi; and Endo, Zen-ichiro, to Hercules Incorporated. Metathesis polymerized copolymer. 4,923,943, Cl. 526-283.000.

Hara, Tsutomu: *See—*
Ooi, Yoshiharu; and Hara, Tsutomu, 4,923,287, Cl. 350-355.000.

Harada, Hiroshi; Hirata, Yoshihiro; and Tosa, Masanobu, to Mitsubishi Denki Kabushiki Kaisha. Homogeneous fine grained metal film on substrate and manufacturing method thereof. 4,923,526, Cl. 148-6.300.

Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kawasaki Steel Corporation. Method and apparatus for heating a strip of metallic material in a continuous annealing furnace. 4,923,396, Cl. 432-59.000.

Harada, Yoshiharu: *See—*
Hayakawa, Yoichi; Yamashita, Takahiro; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,922,765, Cl. 74-15.880.

Harbor Towne Fence, Inc.: *See—*
Heinz, Donald E., 4,923,176, Cl. 256-65.000.

Harde, Bo: *See—*
Guest, John D.; and Harde, Bo, 4,923,220, Cl. 285-39.000.

Harder, John W.; and Singer, Stephen P., to Eastman Kodak Company. Photographic elements containing a bleach accelerator precursor. 4,923,784, Cl. 430-430.000.

Harder, John W., to Eastman Kodak Company. Photographic element containing scavenger for oxidized developing agent. 4,923,787, Cl. 430-489.000.

Hardie, William G.: *See—*
Ainsworth, James; Hardie, William G.; Kozlowski, Edward L., Jr.; and Shaf, Dinesh T., 4,924,037, Cl. 174-117.00F.

Harding, George W.; and Mullett, Rodney M., to Poly-John Enterprises Corp. Outdoor toilet holding tank ventilation system. 4,922,557, Cl. 4-477.000.

Harisiades, Paul: *See—*
Mueller, Karl F.; and Harisiades, Paul, 4,923,906, Cl. 523-107.000.

Harley, David N., to Titus Tool Company Limited. Fixing device. 4,923,163, Cl. 248-300.000.

Harney, Marilyn J.: *See—*
Abrahamson, Donald W.; Harney, Marilyn J.; Vauss, Elvin W., Jr.; Niksa, Andrew J.; and Stewart, James J., 4,923,582, Cl. 204-255.000.

Harp, Elwyn V.: *See—*
Roosa, Vernon D., 4,922,556, Cl. 4-378.000.

Harper, David: *See—*
Repphun, William; and Harper, David, 4,924,337, Cl. 360-128.000.

Harris Corporation: *See—*
Beasom, James D., 4,923,820, Cl. 437-21.000.
Jastrzebski, Lubomir L.; Johansson, Ronald J.; and Sauer, Donald J., 4,923,826, Cl. 437-57.000.

Harris, Geoffrey J., to Square D Company. Low leakage, A.C. proximity-switch circuit. 4,924,122, Cl. 307-570.000.

Harris, Johnny M.: *See—*
Savage, Shaun V.; and Harris, Johnny M., 4,924,427, Cl. 364-900.000.

Harris, Jonathan H.: *See—*
Grasselli, Robert K.; Harris, Jonathan H.; Henderson, Richard S.; and Tenhover, Michael A., 4,923,770, Cl. 429-101.000.

Harris, Martin; Heyes, Graham; and Jackson, Arthur, to Du Pont de Nemours, E. I., and Company. Process for the preparation of nitromethylene heterocyclic compounds. 4,923,987, Cl. 544-53.000.

Harris Semiconductor Patents, Inc.: *See—*
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,924,225, Cl. 341-118.000.
Schade, Otto H., Jr., 4,924,113, Cl. 307-296.600.

Harrison, Alan J.: *See—*
Allen, Philip C.; Burroughes, Jeremy H.; Friend, Richard H.; and Harrison, Alan J., 4,923,288, Cl. 350-355.000.

Harsy, Stephen G., to W. R. Grace & Co.-Conn. Reduction of nitroaliphatics via homogeneous catalysis. 4,924,029, Cl. 564-418.000.

Hart, Robert J.: *See—*
Christenson, Patrick J.; Hart, Robert J.; Naatz, David C.; Rowlance, Edward J.; and Wenz, David G., 4,924,434, Cl. 364-900.000.

Hartmann, Hansgregory C.: *See—*
Chow, Carl S.; Zantow, Timothy J.; Fung, Mok-Wing; and Hartmann, Hansgregory C., 4,922,687, Cl. 53-472.000.

Hartmann, Michael P.; and Smith, Jerry D., to Cameron Iron Works USA, Inc. Insulating support for tubing string. 4,923,006, Cl. 166-65.100.

Hartnack, Wolfgang; Keesen, Heinz-Werner; and Schutze, Herbert, to Deutche Thomson-Brandt GmbH. Method and circuit arrangement for improving the resolution of the coefficients of digital signals, particularly digital TV signals. 4,924,309, Cl. 358-133.000.

Hartung, John: *See—*
Gay, Steven L.; Gitlin, Richard D.; and Hartung, John, 4,924,480, Cl. 375-8.000.

Hasegawa, Akira: *See—*
Nogami, Masaaki; Hasegawa, Akira; Nojima, Hiroshi; and Murata, Mitsuhiro, 4,922,872, Cl. 123-319.000.

Hasegawa, Hajime; Koga, Taiji; Takei, Atsuo; and Okuyama, Toru, to Bridgestone Corporation. Process for producing polyurethane foam. 4,923,904, Cl. 521-115.000.

Hasegawa, Hirofumi, to Minolta Camera Kabushiki Kaisha. Original illuminating apparatus. 4,924,269, Cl. 355-229.000.

Hasegawa, Takao; Onitsuka, Takuya; Suzuki, Minoru; Ehara, Yasuhiro; Hashimoto, Katsuhiro; and Ozaki, Tadamasa, to Suido Kiko Kabushiki Kaisha. Method and flocculant for water treatment. 4,923,629, Cl. 252-181.000.

Hasegawa, Yoshihiko; and Suyama, Noriyoshi, to Scovill Japan Kabushiki Kaisha. Fastener attaching apparatus. 4,923,099, Cl. 227-114.000.

Hashem, Mohamed M.: *See—*
Anderson, Lowell R.; Hashem, Mohamed M.; and Login, Robert B., 4,924,006, Cl. 548-550.000.

Hashi, Hiroshi: *See—*
Hashimoto, Akihiko; Kitahara, Toshihiro; Hashi, Hiroshi; and Rokutan, Takao, 4,924,199, Cl. 235-494.000.

Hashiba, Kazuhiko: *See—*
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000.

Hashimoto, Akihiko; Kitahara, Toshihiro; Hashi, Hiroshi; and Rokutan, Takao, to Olympus Optical Co., Ltd. Optical card for data storage for use in a data recording and retrieving apparatus. 4,924,199, Cl. 235-494.000.

Hashimoto, Akio: *See—*
Nakamura, Yasuyuki; Hashimoto, Akio; Fujita, Toshiaki; and Kawakami, Makoto, 4,923,100, Cl. 228-117.000.

Hashimoto, Katsuhiro: *See—*
Hasegawa, Takao; Onitsuka, Takuya; Suzuki, Minoru; Ehara, Yasuhiro; Hashimoto, Katsuhiro; and Ozaki, Tadamasa, 4,923,629, Cl. 252-181.000.

Hashimoto, Kiyoyasu: *See—*
Ueda, Yasuyoshi; Hattori, Hideo; Yamamoto, Jun; and Hashimoto, Kiyoyasu, 4,923,974, Cl. 534-799.000.

Hashimoto, Masashi: *See—*
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,923,881, Cl. 514-311.000.

Hashimoto, Shigeru: *See—*
Hosoi, Nobuyuki; Hashimoto, Shigeru; Yoshida, Hiroshi; Watanabe, Yukio; Mukai, Yasuo; and Yamamoto, Michiko, 4,923,766, Cl. 428-694.000.

Hashimoto, Yoichi; and Inoue, Masami, to Mitsubishi Denki Kabushiki Kaisha. X-ray mirror and production thereof. 4,924,490, Cl. 378-145.000.

Hashizume, Hiroshi: *See—*
Matsumura, Hiromu; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masami, 4,923,984, Cl. 540-496.000.

Hashizume, Yoshiki: *See—*
Uenishi, Masatoshi; Hashizume, Yoshiki; and Yokote, Takamasa, 4,923,689, Cl. 423-267.000.

Hata, Yoshiaki: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,924,248, Cl. 354-195.100.

Hattori, Hideo: *See—*
Ueda, Yasuyoshi; Hattori, Hideo; Yamamoto, Jun; and Hashimoto, Kiyoyasu, 4,923,974, Cl. 534-799.000.

Hattori, Hiroshi: *See—*
Yamaguchi, Koshiro; Takahashi, Toshio; Kitazawa, Yasunori; and Hattori, Hiroshi, 4,923,315, Cl. 400-120.000.

Hattori, Nobuo: *See—*
Horikita, Hiroyuki; Hattori, Nobuo; Takagi, Yahei; Kawaguchi, Gaku; and Maeda, Toshihiro, 4,923,812, Cl. 435-158.000.

Hattori, Takahiro; Kojima, Yoshinobu; and Yamada, Masayuki, to Kira Machinery Co., Ltd. Turret head unit. 4,922,595, Cl. 29-40.000.

Hattori, Takemi, to Aisin Seiki Kabushiki Kaisha. Headrest apparatus. 4,923,250, Cl. 297-410.000.

Haugse, Albert L.: *See—*
Pitcher, Michael A.; Haugse, Albert L.; Pelfrey, Richard L.; and Sturtz, Gregory P., 4,922,991, Cl. 164-36.000.

Hausner, Siegfried: *See—*
Hertle, Edmund; and Hausner, Siegfried, 4,923,338, Cl. 405-229.000.

Haussmann, Roland, to Thermal-Werke, Warme-Kalte-Klimatechnik GmbH. Heat exchanger rib. 4,923,002, Cl. 165-151.000.

Hawke, Dan N. Plant or seedling support stake. 4,922,654, Cl. 47-47.000.

Hawkins, George W.: *See—*
Lesk, Israel A.; Hawkins, George W.; Thomas, Ronald E.; Hunter, William L.; and McShane, Michael B., 4,924,291, Cl. 357-70.000.

Hawkins, Ronald J.: *See—*
Fillingham, John F.; Hawkins, Ronald J.; and Wilson, Anthony D., 4,923,148, Cl. 244-137.100.

Hawrylenko, Alexander, to Infors GmbH. Water bath shaker. 4,923,305, Cl. 366-349.000.

Hayakawa, Yoichi; Yamashita, Takahiro; Watanabe, Kazuaki; and Harada, Yoshiharu, to Aisin-Warner Kabushiki Kaisha. Lubricating structure for transmission mechanism. 4,922,765, Cl. 74-15.880.

Hayashi, Gouichi: *See—*
Ohno, Shigeru; Mihara, Yuji; Adachi, Keiichi; Ukai, Toshinao; and Hayashi, Gouichi, 4,923,638, Cl. 252-587.000.

Hayashi, Hideharu; Ozaki, Keiichi; and Sawai, Mamoru, to Yazaki Corporation. External connection structure of electric connection box. 4,923,411, Cl. 439-540.000.

Hayashi, Hiromichi: *See—*
Nishio, Hisaharu; and Hayashi, Hiromichi, 4,923,587, Cl. 204-424.000.

Hayashi, Ikuo: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Ishaihara, Toshihisa; Sugitani, Tatsuo; and Inoue, Hideo, 4,922,753, Cl. 73-516.00R.

Hayashi, Keiji: *See—*
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,922,861, Cl. 122-448.00R.

VOL
1114
ISS
2
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1990
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Hayashi, Sadao: *See*—
Hirata, Kentaro; Fukui, Yoshio; and Hayashi, Sadao, 4,923,616, Cl. 210-676.000.
Hayashi, Takayuki: *See*—
Itabashi, Yuichi; Hayashi, Takayuki; and Igarashi, Akira, 4,923,844, Cl. 503-207.000.
Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, to Honda Giken Kogyo Kabushiki Kaisha. Rear wheel brake operating system for motorcycle. 4,923,027, Cl. 180-219.000.
Hayes Industrial Brake, Inc.: *See*—
Buckley, James A. V., 4,923,040, Cl. 192-18.00R.
Hayes Microcomputer Products, Inc.: *See*—
Capps, John W., 4,924,346, Cl. 361-117.000.
Inskeep, Jeffrey, 4,924,441, Cl. 365-222.000.
Hayford, Eric M.: *See*—
Kramer, Donald R.; and Hayford, Eric M., 4,922,680, Cl. 52-713.000.
Hayshi, Tatsuya: *See*—
Toya, Hideaki; Sasao, Hiroyuki; and Hayshi, Tatsuya, 4,924,102, Cl. 250-426.000.
Healey, Peter, to British Telecommunications public limited company. Bidirectional optical space switch. 4,923,269, Cl. 350-96.150.
Heatherington, Kenneth: *See*—
Crossley, Roger; and Heatherington, Kenneth, 4,923,991, Cl. 546-152.000.
Hecht, Stephen S.; Foiles, Peter G.; and Chung, Fung-Lung, to American Health Foundation. Monoclonal antibody-based immunoassay for cyclic DNA adducts resulting from exposure to crotonaldehyde or acrolein. 4,923,813, Cl. 435-172.200.
Hediger, Edwin A.; and Brown, Brandon H., to Eastman Kodak Company. Cleaning assembly for electrostatographic apparatus. 4,924,272, Cl. 355-298.000.
Hedin, Asa: *See*—
Moberg, Lennart; and Hedin, Asa, 4,922,907, Cl. 128-419.00P.
Hedlund, Gunnar; and Lundberg, Henrik, to EMS Electronic Motor Systems AB. Energizing system for a variable reluctance motor. 4,924,155, Cl. 318-254.000.
Hedvall, Bertil; Mattson, Gunnar; Porrvik, Sten; and Sundstrom, Goran, to Casco Nobel AB. Toner particles for electrophotographic copying and processes for their preparation. 4,923,776, Cl. 430-111.000.
Heeg, Hubert; Werner, Hans-Peter; Fenner, Manfred; and Schmidt, Olaf, to W. C. Heraeus GmbH. Gassing incubator. 4,923,816, Cl. 435-284.000.
Hegedusch, Joseph. Doweling jig. 4,923,340, Cl. 408-72.00R.
Hehn, Bruce A.; and Weisburn, James T., to Alpha Enterprises, Inc. Insert in combination with audio cassette security packages. 4,923,062, Cl. 206-387.000.
Heico Inc.: *See*—
Ziegenfus, Barry L.; and Scheel, Russell H., 4,922,831, Cl. 104-166.000.
Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Junghans, Rudi, 4,922,818, Cl. 101-148.000.
Heider, Dale J.: *See*—
Heider, Merle J.; Heider, Dale J.; and Heider, Leon J., 4,923,210, Cl. 280-707.000.
Heider, Leon J.: *See*—
Heider, Merle J.; Heider, Dale J.; and Heider, Leon J., 4,923,210, Cl. 280-707.000.
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Heilweil, Israel J.; and Shoemaker, Gerald L., to Mobil Oil Corporation. Process for inhibiting scale formation. 4,923,617, Cl. 210-698.000.
Heime, Axel; Rosin-Schroder, Gerhard; and Schairer, Werner, to Telefunken electronic GmbH. Optoelectronic component. 4,924,276, Cl. 357-17.000.
Heine, Wolfgang: *See*—
Kossatz, Gert; Heine, Wolfgang; Lempfer, Karsten; and Sattler, Heinz, 4,923,664, Cl. 264-256.000.
Heinz, Donald E., to Harbor Towne Fence, Inc. Fence angular connector assembly. 4,923,176, Cl. 256-65.000.
Held, Kurt. Method of producing processed wood material panels. 4,923,656, Cl. 264-70.000.
Held, Robert P., to Du Pont de Nemours, E. I., and Company. Negative working low silver wash-off contact film. 4,923,389, Cl. 430-264.000.
Hella, Terry A., to Advance Systems, Inc. Web dryers or the like having airfoil means for controlling a running web at the dryer exit. 4,922,628, Cl. 34-156.000.
Helps, David W.: *See*—
Bunce, Martin C.; Helps, David W.; Jenkins, Leonard A.; and Noke, Adrian C., 4,924,048, Cl. 219-10.55E.
Helveston, Wilton L.: *See*—
Deshazer, William A.; Beck, Robert J.; and Helveston, Wilton L., 4,923,222, Cl. 285-137.100.
Henderson, Richard. Adjustable king pin assembly. 4,923,204, Cl. 280-407.100.
Henderson, Richard S.: *See*—
Grasselli, Robert K.; Harris, Jonathan H.; Henderson, Richard S.; and Tenhover, Michael A., 4,923,770, Cl. 429-101.000.
Hendriks, Rudolf, to Turbo Consult B.V. Plant for the generation of mechanical energy, and a process for generating the energy. 4,922,709, Cl. 60-39.183.
Henkel Kommanditgesellschaft auf Aktein: *See*—
Kohl, Albert; and Seilaz, Leon, 4,922,572, Cl. 15-320.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Rutzen, Horst; Baumann, Horst; and Gruber, Bert, 4,923,642, Cl 260-404.000.
Schluessler, Hans-Joachim, 4,923,523, Cl. 134-25.300.
Wuelknitz, Peter; Lehmann, Rudolf; Ploeger, Walter; Hill, Karlheinz; and Forg, Franz, 4,923,685, Cl. 424-54.000.
Henri, Benon, to A.R.M.I.N.E.S. Steam generator. 4,924,068, Cl. 219-274.000.
Henrion, W. S., to Triton Technologies, Inc. Micro-machined accelerometer. 4,922,756, Cl. 73-517.00R.
Henry, Charles H.; Kazarinov, Rudolf F.; Kistler, Rodney C.; Orlowsky, Kenneth J.; Shani, Yosi; and Sudbo, Aasmund S., to American Telephone and Telegraph Company. Optical multiplexer/demultiplexer using focusing Bragg reflectors. 4,923,271, Cl. 350-96.190.
Henry Dreyfuss Associates: *See*—
Genaro, Donald M., 4,923,440, Cl. 604-14.000.
Henze, Christopher P., to Unisys Corporation. Current sharing modular power supply. 4,924,170, Cl. 323-272.000.
Hepworth, Paul S., to Plas Plugs Limited. Tile parting device. 4,922,886, Cl. 125-23.010.
Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Patel, Narenora; Van den Andel, Jan; Nicholson, Patrick S.; and Grzymer, Alicja H., 4,922,594, Cl. 29-25.350.
Heraeus Quarschmelze GmbH: *See*—
Leber, Helmut; and Whippey, Nigel R., 4,923,497, Cl. 65-86.000.
Herbert Kannegiesser GmbH & Co.: *See*—
Inselmann, Jurgen, 4,923,560, Cl. 156-555.000.
Herbert, Raymond J.; and Williams, Thomas D., to Alcatel Business Systems, Limited. Feed for thermal printing ribbon. 4,924,240, Cl. 346-1.100.
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, to Digital Equipment Corporation. Apparatus and method for secure transmission of data over an unsecure transmission channel. 4,924,513, Cl. 380-21.000.
Herbst, Donald. Flexible form sheet. 4,923,733, Cl. 428-156.000.
Hercules Computer Technology: *See*—
Suwannukul, Sakarin, 4,924,413, Cl. 364-521.000.
Hercules Incorporated: *See*—
Antoon, Mitchell K., Jr.; and Hill, David J., 4,923,650, Cl. 264-41.000.
Antoon, Mitchell K., Jr., 4,923,703, Cl. 426-118.000.
Hara, Shigeyoshi; and Endo, Zen-ichiro, 4,923,943, Cl. 526-283.000.
Herman, Timm R.: *See*—
Dlugolecki, Andrzej J., and Herman, Timm R., 4,922,770, Cl. 81-357.000.
Hermanni, Hans, to Berkenhoff GmbH. Wire electrode for use in spark-erosive cutting. 4,924,050, Cl. 219-69 120.
Hermanutz, Helmut; Koch, Fred; and Schwenk, Hans M., to Schroff Gesellschaft mit beschrankter Haftung. Guide rail comprising attachment means for a plug board. 4,924,354, Cl. 361-415.000.
Herr, Hugh: *See*—
Gosthnian, Barry M.; and Herr, Hugh, 4,923,475, Cl. 623-37.000.
Hershey, Antoinette F.; French, Andrew H.; and Boire, Christopher P., to Prime Computer, Inc. License mangagement system and license storage key. 4,924,378, Cl. 364-200.000.
Hertle, Edmund; and Hausner, Siegfried, to Alfred Kunz GmbH & Co. Process for lowering building structures. 4,923,338, Cl. 405-229.000.
Herve, Jacob: *See*—
Sireul, Jacques; Herve, Jacob; and Rene, Gauthier, 4,923,295, Cl. 350-639.000.
Herzing, Hans G.: *See*—
Grossmann, Werner; Herzing, Hans G.; and Piltz, Manfred, 4,922,820, Cl. 101-425.000.
Hess, Douglas H.: *See*—
Doan, Phong D.; Upton, James E.; Hess, Douglas H.; Bass, Wayne R.; and Ufford, Keith A., 4,922,607, Cl. 29-879.000.
Hesse, Michael; Hoelderich, Wolfgang; Dockner, Toni; and Koehler, Hermann, to BASF Aktiengesellschaft. Preparation of acylated imidazoles. 4,924,000, Cl. 548-343.000.
Hewitt, J. Paul. Closed system refrigeration using a turboexpander. 4,923,492, Cl. 62-11.000.
Hewlett-Packard Company: *See*—
Chow, Carl S.; Zantow, Timothy J.; Fung, Mok-Wing; and Hartmann, Hansgregory C., 4,922,687, Cl. 53-472.000.
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,923,353, Cl. 414-226.000.
Wang, Martin S.; and Chiu, Kuang-Yi, 4,923,822, Cl. 437-41.000.
Heyes, Graham: *See*—
Harris, Martin, Heyes, Graham; and Jackson, Arthur, 4,923,987, Cl. 544-53.000.
Heyman, Philip M.: *See*—
Stockdale, George F.; Hook, Harvey O.; Browne, Robert G.; and Heyman, Philip M., 4,923,423, Cl. 445-40.000.
Heymans, Francoise: *See*—
Braquet, Pierre; Dive, Georges; Godfroid, Jean-Jacques; Heymans, Francoise; and Pirotzky, Eduardo, 4,923,870, Cl. 514-255.000.
Heymer, Gero: *See*—
Peters, Dieter; Heymer, Gero; and May, Christian, 4,923,691, Cl. 423-412.000.

Hi-Tek Polymers, Inc.: *See*—
Hunter, Joe M., 4,924,013, Cl. 549-514.000.
Hiatt, Mark: *See*—
Carman, George; LaChapelle, Joseph G.; and Hiatt, Mark, 4,924,088, Cl. 250-271.000.
Hidaka, Sachio; Fujimoto, Yoshiaki; and Tani, Takao, to Kabushiki Kaisha Kobe Seiko Sho. Detent device for a control lever. 4,922,784, Cl. 74-527.000.
Hietikko, Erkki; and Kylmakorpi, Ilpo, to Oy Tampella Ab. Dewatering zone in a papermachine. 4,923,568, Cl. 162-301.000.
Higashio, Kimihiko: *See*—
Ito, Masazumi; and Higashio, Kimihiko, 4,924,264, Cl. 355-204.000.
Highland, Frederic D., to International Business Machines Corporation. Technique for compilation of knowledge bases. 4,924,408, Cl. 364-513.000.
Highwood Audio Inc.: *See*—
Burton, Paul, 4,924,504, Cl. 381-199.000.
Higuchi, Yasushi: *See*—
Yamane, Hiroyuki; Higuchi, Yasushi; and Fujii, Tetsuo, 4,924,277, Cl. 357-23.300.
Hill, David J.: *See*—
Antoon, Mitchell K., Jr.; and Hill, David J., 4,923,650, Cl. 264-41.000.
Hill, Francis U., to Sorrento Engineering, Inc. Method of manufacturing polyimide foam shapes having improved density and cell size uniformity. 4,923,651, Cl. 264-45.100.
Hill, Francis U., to Sorrento Engineering, Inc. Method of making porous inorganic particle filled polyimide foam insulation products. 4,923,907, Cl. 523-218.000.
Hill, Frank U., to Sorrento Engineer, Inc. Method of making porous inorganic particle filled polyimide foam insulation products. 4,923,538, Cl. 156-78.000.
Hill, Karlheinz: *See*—
Wuelknitz, Peter; Lehmann, Rudolf; Ploeger, Walter; Hill, Karlheinz; and Forg, Franz, 4,923,685, Cl. 424-54.000.
Hill, Lennard C. Door mat alarm. 4,924,214, Cl. 340-666.000.
Hill, Murray O., to Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence. Sonobuoy cable pack. 4,924,445, Cl. 367-4.000.
Hillegass, Norman W.; and Drone, Walter J., to Track-Work Products, Inc. Bar for connecting railway track rails and method of making same. 4,922,743, Cl. 72-377.000.
Hillery, John R.: *See*—
Dinan, Raymond F.; Dubil, James F.; Hillery, John R.; Rodite, Robert R.; and White, James M., 4,924,521, Cl. 382-54.000.
Hinchen, John J., to United Technologies Corporation. Boron oxide laser with CF_4 additive. 4,924,475, Cl. 372-89.000.
Hineno, Kazuhiro; and Koike, Toshio, to Sanyo Electric Co., Ltd. Parts feed apparatus. 4,923,089, Cl. 221-1.000.
Hinksman, Patrick B.; and Long, Gary R. Laminated locking staple. 4,923,350, Cl. 411-457.000.
Hirai, Ippo: *See*—
Shigeta, Masao; Choh, Tsutomu; Shimizu, Hiroyoshi; Hirai, Ippo; Mimura, Shohei; Makimura, Atsushi; and Hosaka, Hiroshi, 4,923,533, Cl. 148-304.000.
Hirai, Kazuyasu; Inoue, Yasuhiro; and Suzuki, Kazuyoshi, to Murata Kikai Kabushiki Kaisha. Doffing truck for a yarn false twisting machine. 4,923,132, Cl. 242-35.50A.
Hirai, Ryoji; Yamazaki, Eiichi; and Yonai, Fumiaki, to Hitachi, Ltd. Color picture tube of shadow mask type with particular faceplate panel structure. 4,924,140, Cl. 313-477.00R.
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, to Toyama Chemical Co., Ltd. Novel amine derivatives, salts thereof and an anti-ulcer agent containing the same. 4,923,882, Cl. 514-326.000.
Hiramatsu, Koji: *See*—
Imamura, Hiroshi; Toho, Makoto; Shiohama, Eiji; Morii, Shoiti; and Hiramatsu, Koji, 4,924,143, Cl. 313-493.000.
Hirano, Hiroshi: *See*—
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000.
Hirano, Shigeaki; Maekawa, Hirotoshi; Kubozono, Tsutomu; and Tatemoto, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Trouble-diagnosable multifunction testing apparatus. 4,924,391, Cl. 364-424.030.
Hirao, Yoshiaki; Kuga, Ryuichiro; Yoneyama, Masayuki; and Ono, Shusuke, to Matsushita Electric Industrial Co., Ltd. Video camera with an automatic focusing system. 4,924,317, Cl. 358-227.000.
Hirata, Keiichi; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; Ikeda, Yoshie; and Kawakami, Yasushi, to Brother Kogyo Kabushiki Kaisha. Word processor with attribute functions. 4,924,433, Cl. 364-900.000.
Hirata, Kentaro; Fukui, Yoshio; and Hayashi, Sadao, to Mitsubishi Petrochemical Company, Ltd. Method of separating chemical components in simulated moving bed. 4,923,616, Cl. 210-676.000.
Hirata, Tadashi: *See*—
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.
Hirata, Yoshihiro: *See*—
Harada, Hiroshi; Hirata, Yoshihiro; and Tosa, Masanobu, 4,923,526, Cl. 148-6.300.
Hirayama, Koki: *See*—
Hanada, Fumio; Ohmura, Nobuhiko; and Hirayama, Koki, 4,923,611, Cl. 210-638.000.
Hirayama, Toshimitu: *See*—
Nakayama, Shiro; Kunimura, Satoshi; Takahashi, Shigemi; Takahashi, Katsuhiko; Hirayama, Toshimitu; and Akutsu, Masao, 4,924,131, Cl. 310-329.000.
Hirohama, Huji; Ono, Eiichi; and Murata, Yukiho, to Nissan Motor Co., Ltd.; and Jidosha Denki Kogyo Kabushiki Kaisha. Vehicular windshield washer system. 4,922,570, Cl. 15-250.020.
Hiromoto, Yasuyuki: *See*—
Sako, Mineyuki; Oka, Tateki; Hiromoto, Yasuyuki; Yokoyama, Tomoaki; and Toda, Kunio, 4,924,270, Cl. 355-246.000.
Hirosawa, Yoshiaki: *See*—
Yamashita, Shoji; Ohta, Atsuo; and Hirosawa, Yoshiaki, 4,923,028, Cl. 180-219.000.
Hirose, Akira, to Ricoh Company, Ltd. Original paper turning over and conveying out apparatus. 4,923,190, Cl. 271-3.100.
Hirose, Kouji; Ito, Hitoshi; and Yoshida, Kazuhito, to Seikosha Co., Ltd. Article of black silver color. 4,923,764, Cl. 428-632.000.
Hirose, Toshifumi; and Isayama, Katsuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable composition. 4,923,927, Cl. 525-100.000.
Hirota, Sadao, to Daiichi Seiyaku Co., Ltd. Topical preparation containing ofloxacin. 4,923,862, Cl. 514-230.200.
Hirschberg, Jakub; Botvidsson, Lars; and Fahlstroem, Ulf, to Siemens Aktiengesellschaft. Arrangement for delivering medications in an implantable medical device. 4,922,926, Cl. 128-785.000.
Hitachi Chemical Co.: *See*—
Ohwada, Takeo; and Kobayashi, Kengo, 4,923,929, Cl. 525-126.000.
Hitachi Engineering Co., Ltd.: *See*—
Inaba, Hiromi; Nakamura, Kiyoshi; Kimura, Akira; Hokari, Sadao; and Oouchi, Naoyuki, 4,924,373, Cl. 363-95.000.
Hitachi Koki Company, Ltd.: *See*—
Nakagawa, Atsushi; and Takeishi, Kazumi, 4,922,663, Cl. 51-170.0TL.
Hitachi, Ltd.: *See*—
Asai, Nobuteru; Sakai, Yasuo; and Miyazaki, Kazuo, 4,924,432, Cl. 364-900.000.
Hamada, Tatsuzo, 4,924,410, Cl. 364-518.000.
Hirai, Ryoji; Yamazaki, Eiichi; and Yonai, Fumiaki, 4,924,140, Cl. 313-477.00R.
Horie, Akira; and Jimbo, Yoshiji, 4,924,168, Cl. 318-811.000.
Inaba, Hiromi; Nakamura, Kiyoshi; Kimura, Akira; Hokari, Sadao; and Oouchi, Naoyuki, 4,924,373, Cl. 363-95.000.
Iwao, Hideki; Kato, Michio; and Yamano, Shuichi, 4,924,479, Cl. 375-7.000.
Kadomukai, Yuzo; Yamakado, Makoto; and Nakamura, Yozo, 4,922,869, Cl. 123-192.00R.
Kashiwagi, Teiichi, 4,924,411, Cl. 364-518.000.
Kataoka, Hiroshi; and Fukuda, Kyohei, 4,924,244, Cl. 350-432.000.
Kuriyama, Kazunori; Wada, Kenichi; and Yamaoka, Akira, 4,924,377, Cl. 364-200.000.
Masuda, Kenmei; Ogiro, Kenji; Okada, Yoshinori; Nakajima, Akihiro; Kochi, Mashanori; and Konno, Kazutoshi, 4,924,329, Cl. 360-64.000.
Morita, Yasukazu; and Uehara, Yasuhiko, 4,924,139, Cl. 313-468.000.
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 358-105.000.
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,924,439, Cl. 365-189.050.
Oshiro, Masayuki; Kozawa, Fusaaki; and Uchida, Akira, 4,922,755, Cl. 74-479.000.
Saito, Yoshikazu; and Yazawa, Yoshiaki, 4,924,293, Cl. 357-71.000.
Sakudo, Noriyuki; and Tamura, Hifumi, 4,924,101, Cl. 250-423.00R.
Suzuki, Kaoru, 4,924,383, Cl. 364-200.000.
Takahasi, Kenichiro; and Ueno, Yukichi, 4,924,224, Cl. 341-155.000.
Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, 4,923,765, Cl. 428-694.000.
Yasutomi, Yoshiyuki; Matsushita, Yasuo; and Nakamura, Kousuke, 4,923,829, Cl. 501-95.000.
Hitco: *See*—
Campman, Arthur R., deceased; Calamito, Dominic P.; and Pusch, Richard H., 4,922,969, Cl. 139-408.000.
Hite, Edward L.: *See*—
Clocksin, Kenneth A.; and Hite, Edward L., 4,923,495, Cl. 65-11.100.
Hiza, Misao; Yamazaki, Hajime; Sugihara, Kazuhiro; and So, Tetsu, to Yokohama Rubber Co., Ltd., The. Multi-layered microwave absorber and method of manufacturing the same. 4,923,736, Cl. 428-212.000.
Ho, Ji S. Lattice elimination assembly for a television wall. 4,924,318, Cl. 358-250.000.
Ho, Monto; and Gupta, Phalguni, to University of Pittsburgh of the Commonwealth System of Higher Education. Method of treatment of human immunodeficiency virus. 4,923,895, Cl. 514-504.000.
Hoback, Conaway K.: *See*—
Smith, Benjamin A.; and Hoback, Conaway K., 4,924,497, Cl. 379-150.000.
Hobbs, Frank W.; and Meek, James L., to Du Pont de Nemours, E. I., and Company. Phosphorylated inositols. 4,924,023, Cl. 558-162.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Hochstein, Peter A., and Pringle, William L., to Armada Corporation. Thermal energy scavenger. 4,922,718, Cl. 60-527.000.
Hochtemperatur-Reaktorbau GmbH: *See*—
Elter, Claus; Hornischer, Edgar; Schmitt, Hermann; and Schoening, Josef, 4,923,670, Cl. 376-459.000.
Hoda, Takeo: *See*—
Taniguchi, Nobuyuki Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,924,248, Cl. 354-195.100.
Hodges, Joseph T.; and White, Russell L., to Peterson Manufacturing Company. Seam construction for molded signal lamps. 4,924,367, Cl. 362-311.000.
Hodges, Michael J., to Detexomat Machinery Limited. Pantihose packaging and manufacture. 4,922,685, Cl. 53-429.000.
Hoeberling, Robert F. Portable radiography system using a relativistic electron beam. 4,924,485, Cl. 378-102.000.
Hoechst Aktiengesellschaft: *See*—
Fuss, Andreas; and Siegemund, Gunter, 4,924,014, Cl. 568-323.000.
Horoldt, Ernst; Grimm, Richard; Rittner, Siegbert; Kuckertz, Herbert; and Billmann, Wilfried, 4,923,485, Cl. 55-55.000.
Lask, Helmut; Holst, Arno; and Dryczynski, Kurt, deceased, 4,924,084, Cl. 250-227.250.
Muller, Wolf-Dieter; and Kleiner, Hans-Jerg, 4,923,996, Cl. 548-402.000.
Peters, Dieter; Heymer, Gero; and May, Christian, 4,923,691, Cl. 423-412.000.
Hoechst Celanese Corp.: *See*—
Chen, Paul N., Sr.; and Vora, Rohitkumar H., 4,923,960, Cl. 528-353.000.
Rudd, David; and Caines, R. Scott, 4,923,713, Cl. 427-171.000.
Hoefkes, Heiner: *See*—
Langen, Marinus J. M.; Guttinger, Peter; and Hoefkes, Heiner, 4,922,688, Cl. 53-525.000.
Hoelderich, Wolfgang: *See*—
Hesse, Michael; Hoelderich, Wolfgang; Dockner, Toni; and Kohler, Hermann, 4,924,000, Cl. 548-343.000.
Hoernle, Hans R.: *See*—
Porter, Rick A.; and Hoernle, Hans R., 4,923,729, Cl. 428-71.000.
Hofer, Peter H., to Libbey-Owens-Ford Co. Stripe coating on glass by chemical vapor deposition. 4,922,853, Cl. 118-718.000.
Hoffman, Alan L., to Amoco Corporation. Magnetic slingshot accelerator. 4,922,800, Cl. 89-8.000.
Hoffman, Dale E.: *See*—
Grasso, Lawrence J., Hoffman, Dale E.; Morgan, Carroll E.; Puntar, Charles A.; and Young, Diane K., 4,924,484, Cl. 377-116.000.
Hoffman, Ned. Exercise glove. 4,923,418, Cl. 441-57.000.
Hoffman, Roger L.: *See*—
Kern, Jeffrey A.; and Hoffman, Roger L., 4,923,366, Cl. 415-152.100.
Hoffmann, Matthias: *See*—
Everhart, Richard; Bosomworth, Paul; Butcher, Kenneth; and Hoffmann, Matthias, 4,923,830, Cl. 501-103.000.
Hofmeister, Helmut: *See*—
Bohlmann, Rolf; Laurent, Henry; Hofmeister, Helmut, and Wiechert, Rudolf, 4,923,640, Cl. 552-625.000.
Hokari, Sadao: *See*—
Inaba, Hiromi; Nakamura, Kiyoshi; Kimura, Akira; Hokari, Sadao; and Oouchi, Naoyuki, 4,924,373, Cl. 363-95.000.
Hoke, David: *See*—
Merkel, Paul B.; and Hoke, David, 4,923,791, Cl. 430-553.000.
Holland, Christopher E.: *See*—
Brodie, Ivor; Gurnick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., 4,923,421, Cl. 445-24.000.
Holland, Gordon A., to Delaware Capital Formation, Inc. Safety mechanism for preventing unintended motion in traction elevators. 4,923,055, Cl. 187-109.000.
Holland, John A.: *See*—
Greenwood, Eugene C.; and Holland, John A., 4,923,443, Cl. 604-110.000.
Holman, Richard J.: *See*—
Keller, Michael R., and Holman, Richard J., 4,922,838, Cl. 110-234.000.
Holmgren, William A., to Kaman Instrumentation Corporation. Capacitive sensor and electronic circuit for non-contact distance measurement. 4,924,172, Cl. 324-664.000.
Holodnak, Richard S., to Pitney Bowes Inc. Secure shutter locking arrangement for a postage meter. 4,922,817, Cl. 101-91.000.
HoloGraphix, Inc.: *See*—
Clay, Burton R., 4,923,262, Cl. 350-3.710.
Holst, Arno: *See*—
Lask, Helmut; Holst, Arno; and Dryczynski, Kurt, deceased, 4,924,084, Cl. 250-227.250.
Homac Mfg. Company: *See*—
Klosin, John J.; and Venezia, J. William, 4,924,038, Cl. 174-135.000.
Homan, Gerald L. Bath water control system. 4,923,116, Cl. 236-12.120.
Homma, Kazuya: *See*—
Kitazume, Masahiro; Aoki, Makoto; Nogi, Hiroshi; Homma, Kazuya; and Matsuzawa, Shigemi, 4,922,752, Cl. 73-146.000.
Homola, Delbert D.: *See*—
Kopkie, Harold D.; and Homola, Delbert D., 4,923,342, Cl. 409-143.000.
Honda Giken Kogyo K.K.: *See*—
Kurihara, Norimitsu; Asakura, Masahiko; Matsui, Mitsuru; Otsuka, Yasuhiko; and Tachikawa, Kazuhiko, 4,924,397, Cl. 364-426.040.
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Furumoto, Mitsumasa; Kawahara, Eiichiro; and Ikejiri, Kenichi, 4,922,717, Cl. 60-456.000.
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Matsushima, Yuzo, 4,923,537, Cl. 156-48.000.
Saka, Tsutomu, 4,923,183, Cl. 267-180.000.
Shimoyama, Hiroshi; and Kawasaki, Katsuyoshi, 4,923,026, Cl. 180-215.000.
Takaoka, Tokuro; Sasaki, Tsuto; Kobayashi, Yukio; Saito, Koichi; and Hamano, Satoshi, 4,923,170, Cl. 251-121.000.
Tanaka, Akira; Arima, Takanori; and Mori, Ryuji, 4,922,736, Cl. 70-277.000.
Toshifumi, Ito, 4,922,767, Cl. 74-333.000.
Yamabe, Hitoshi; Sekine, Noboru; Takagi, Shuichi; and Fujimoto, Sachito, 4,923,042, Cl. 192-0.096.
Yamashita, Shoji; Ohta, Atsuo; and Hirosawa, Yoshiaki, 4,923,028, Cl. 180-219.000.
Honda, Kazuhiro; Yamashita, Kouji; Kawai, Masanori; Nakahi, Kazuo; and Tatetsuki, Kuniharu, to Matsushita Electric Works, Ltd. Antenna and its electronic circuit combination. 4,924,237, Cl. 343-702.000.
Honda, Yasuki: *See*—
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.
Honegger, Werner, to Ferag AG. Method and apparatus for forming multi-layer coils from substantially flat, flexible products, especially printed products. 4,923,136, Cl. 242-59.000.
Honeywell Inc.: *See*—
Adams, Wilmer L.; Bartels, James I.; Black, Robert A., Jr.; Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,923,117, Cl. 236-94.000.
Alexander, Michael; and Riddoch, Fiona G., 4,922,606, Cl. 29-839.000.
Vu, Tho T.; and Tran, Danh N., 4,924,116, Cl. 307-448.000.
Hook, Harvey O.: *See*—
Stockdale, George F.; Hook, Harvey O.; Browne, Robert G.; and Heyman, Philip M., 4,923,423, Cl. 445-40.000.
Hooper, David C.: *See*—
Sant'Anselmo, Carl; Sant'Anselmo, Robert; and Hooper, David C., 4,924,078, Cl. 235-494.000.
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., to Nalco Chemical Company. Cooling water corrosion inhibition method. 4,923,634, Cl. 252-389.200.
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McAllise, Gregg A.; and Ingersoll, Thomas L., 4,924,039, Cl. 191-12.20R.
Hoover Universal, Inc.: *See*—
Siegrist, Ronald R.; and Shivak, Tod A., 4,923,214, Cl. 280-806.000.
Hope, Michael J.: *See*—
Tilcock, Colin P. S.; Cullis, Pieter R.; Hope, Michael J.; and Janoff, Andrew S., 4,923,854, Cl. 514-78.000.
Hopenfeld, Joram. Method for monitoring thinning of pipe walls and piping component for use therewith. 4,922,748, Cl. 73-86.000.
Hopmann, Mark E., to Baker Hughes Incorporated. Safety valve for horizontal completions of subterranean wells. 4,923,012, Cl. 166-385.000.
Horaguchi, Yoichi; Sakakibara, Kenji; Yamada, Makoto; Nagata, Osamu; Suzuki, Tsuyoshi; and Sugiura, Toshio, to Brother Kogyo Kabushiki Kaisha. Exposure unit in an image recording apparatus. 4,924,255, Cl. 355-27.000.
Horák, Dieter K.; and Wieczorek, Rudolf, to Kontron Holding AG. Logic analyzer. 4,924,468, Cl. 371-22.100.
Horgen, Floyd: *See*—
Schacht, James, 4,923,197, Cl. 273-77.00A.
Horie, Akira; and Jimbo, Yoshiji, to Hitachi, Ltd. Control apparatus for PWM-controlled, variable voltage/variable frequency inverters. 4,924,168, Cl. 318-811.000.
Horigami, Kouichi: *See*—
Kameda, Keiichi; Takahashi, Kenichi; Horigami, Kouichi; and Iitsuka, Hiroyuki, 4,924,426, Cl. 364-900.000.
Horii, Satoshi: *See*—
Kameda, Yukihiko; and Horii, Satoshi, 4,923,975, Cl. 536-17.900.
Horii, Yoshiharu: *See*—
Maruyama, Hiroshi; and Horii, Yoshiharu, 4,923,726, Cl. 428-40.000.
Horikawa, Mitsuo: *See*—
Funakawa, Shigeru; and Horikawa, Mitsuo, 4,922,584, Cl. 24-381.000.
Horikita, Hiroyuki; Hattori, Nobuo; Takagi, Yahei; Kawaguchi, Gaku; and Maeda, Toshihiro, to NGK Insulators, Ltd. Process for producing erythritol. 4,923,812, Cl. 435-158.000.
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Baba, Fujio; Takeuchi, Kunihiko; and Horinouchi, Shinichi, 4,924,171, Cl. 323-347.000.
Horne, John G.; Dornfeld, David A.; and McMillen, Keith A., to Kennametal Inc. Acoustic emission transducer and mounting adapter for monitoring metalcutting tools. 4,922,754, Cl. 73-587.000.
Horner, Charles J., Jr.: *See*—
Gladfelter, Jason; Woodring, William J.; Grube, Louis L.; and Horner, Charles J., Jr., 4,923,712, Cl. 427-140.000.

Hornischer, Edgar: *See*—
Elter, Claus; Hornischer, Edgar; Schmitt, Hermann; and Schoening, Josef, 4,923,670, Cl. 376-459.000.
Hornung, Stephen: *See*—
Kashyap, Raman; Reeve, Michael H.; Cassidy, Stephen A.; and Hornung, Stephen, 4,923,278, Cl. 350-96.300.
Horoldt, Ernst; Grimm, Richard; Rittner, Siegbert; Kuckertz, Herbert; and Billmann, Wilfried, to Hoechst Aktiengesellschaft. Process for separating organic constituents from waste gases of the production of aromatic intermediates. 4,923,485, Cl. 55-55.000.
Horres, C. Russell, Jr.: *See*—
Daoud, Adib G.; and Horres, C. Russell, Jr., 4,923,444, Cl. 604-131.000.
Horvath, Eduard;, to Otto Bock Orthopadische Industrie Besitz- Und Verwaltungs-KG. Prosthesis drive. 4,923,477, Cl. 623-57.000.
Hosaka, Hiroshi: *See*—
Shigeta, Masao; Choh, Tsutomu; Shimizu, Hiroyoshi; Hirai, Ippo; Mimura, Shohei; Makimura, Atsushi; and Hosaka, Hiroshi, 4,923,533, Cl. 148-304.000.
Hosaka, Yoshihiro: *See*—
Matsuki, Yasuo; Kariya, Yosinobu; Endo, Masayuki; Ikeda, Hiroharu; and Hosaka, Yoshihiro, 4,923,948, Cl. 528-26.000.
Hoshino, Yoshinori: *See*—
Ishikawa, Hiroshi; Gunji, Naoki; Hoshino, Yoshinori; and Ohyama, Taro, 4,923,762, Cl. 428-551.000.
Hosoi, Hideo: *See*—
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.000.
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Ando, Hitoshi; Kashiwazaki, Takashi; Hosoi, Masayuki; and Fukushima, Atsuhiko, 4,924,402, Cl. 364-449.000.
Hosoi, Mitsuo: *See*—
Toru, Suzuki; Kato, Atsuhiko; Hosoi, Mitsuo; and Nakano, Ichiro, 4,924,153, Cl. 318-587.000.
Hosoi, Nobuyuki; Hashimoto, Shigeru; Yoshida, Hiroshi; Watanabe, Yukio; Mukai, Yasuo; and Yamamoto, Michiko, to Canon Kabushiki Kaisha. Process for preparing magnetic recording. 4,923,766, Cl. 428-694.000.
Hospal Industrie: *See*—
Chevallet, Jacques, 4,923,613, Cl. 210-647.000.
Hover, Alexander; Simon, Manfred; and Weiss, Richard, to Huels Troisdorf AG. Process for the production of dyed, flat articles from thermoplastic synthetic resins. 4,923,658, Cl. 264-76.000.
Howard, John D.: *See*—
Bice, Gregory W.; Skoog, Mark A.; and Howard, John D., 4,924,401, Cl. 364-433.000.
Howard, William A., to Delta Systems, Inc. Trim switch. 4,924,046, Cl. 200-516.000.
Howell, Frederick H.; Duthaler, Rudolf; Finter, Jurgen; Oertle, Konrad; and Ramanathan, Visvanathan, to Ciba-Geigy Corporation. Substituted anthraquinones and use thereof in epoxy resins. 4,924,015, Cl. 552-266.000.
Howell, George W.: *See*—
Elliott, George M.; Watford, Ervin L., Jr.; and Howell, George W., 4,923,555, Cl. 156-497.000.
Howie, Robert K., Jr., to Grigoleit Company, The. Friction fit knob. 4,923,325, Cl. 403-361.000.
Howmet Corporation: *See*—
Diehm, Randall S.; and Zuidema, Blake K., 4,923,508, Cl. 75-10.140.
Hoy, Kenneth L.: *See*—
Lee, Chinsoo; Hoy, Kenneth L.; and Donohue, Marc D., 4,923,720, Cl. 427-422.000.
HSC Controls Inc.: *See*—
Buscher, John H., 4,922,964, Cl. 137-625.620.
Robinson, William P., 4,922,963, Cl. 137-625.620.
Hsieh, Eric T.; Yeh, Gene H. C.; and Donaldson, John R., to Phillips Petroleum Company. Pelletizing polymers. 4,923,649, Cl. 264-37.000.
Hsieh, Ming-Chih: *See*—
Maxwell, Ronald K.; Zorzi, Karl J.; Yoshikawa, Harunori; Prasad, Venkat S.; Smith, Fred G.; and Hsieh, Ming-Chih, 4,924,456, Cl. 370-32.000.
Hsieh, Tzu-Yen, to Chang, Chien-Hua. Automatic mailing apparatus. 4,923,022, Cl. 177-4.000.
Hsiung, Bear. Computer time clock. 4,924,451, Cl. 368-10.000.
Hsiung, Nancy: *See*—
Reddy, Vemuri B.; Hsiung, Nancy; Beck, Anton K.; and Berstine, Edward G., 4,923,805, Cl. 435-69.400.
Hsu, Chin C., to B.F. Goodrich Company, The. Polycarboxylic acids with higher thickening capacity and better clarity. 4,923,940, Cl. 526-208.000.
Huang, Pao-Ter: *See*—
Davidson, Donald R.; Huang, Pao-Ter; and Rogers, H. David, 4,922,637, Cl. 38-15.000.
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., to General Electric Company. Tungsten-modified titanium aluminum alloys and method of preparation. 4,923,534, Cl. 148-407.000.
Huard, Gilbert, to Bouygues Offshore. Prestressed steel tube, in particular for making anchor lines for taut line type production platforms, a method of handling and installing such a tube, and a platform including such a tube. 4,923,337, Cl. 405-224.000.
Hubbard, David W.: *See*—
Dolan, Donald T.; Durst, Robert T., Jr.; Hubbard, David W.; and Silverberg, Morton, 4,923,023, Cl. 177-25.150.
Huber, Ludwig K.; and Monsimer, Harold G., to Pennwalt Corporation. Polyhydroxy polymer delivery systems. 4,923,506, Cl. 71-121.000.
Hubner, Oskar: *See*—
Pfarrwaller, Erwin; Vezzu, Danilo; and Hubner, Oskar, 4,922,967, Cl. 139-145.000.
Huc, Alain; and Gimeno, Rene , to Bioetica, S.A. Apparatus for the extrusion of collogen tubes. 4,923,380, Cl. 425-68.000.
Hudson, Ralph E.; Aks, Stanley O.; Bogdanovic, Peter P.; and Lynch, David D., to Hughes Aircraft Company. Method and system for reducing phase error in a phased array radar beam steering controller. 4,924,232, Cl. 342-174.000.
Huels Aktiengesellschaft: *See*—
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,924,021, Cl. 556-464.000.
Neugebauer, Wolfgang; and Poll, Heinz-Guenter, 4,923,953, Cl. 528-170.000.
Schork, Reinhold; Matthes, Reinhard; and Vahlensieck, Hans-Joachim, 4,923,687, Cl. 423-210.000.
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, 4,923,926, Cl. 525-67.000.
Huels Troisdorf AG: *See*—
Barfurth, Dieter; and Nestler, Heinz, 4,924,016, Cl. 556-40.000.
Hover, Alexander; Simon, Manfred; and Weiss, Richard, 4,923,658, Cl. 264-76.000.
Huff, Joel R.; and Oliff, Allen I., to Merck & Co., Inc. Quinolizine sulfonamides used against certain neoplastic disease states. 4,923,878, Cl. 514-285.000.
Huffman, Ann E.: *See*—
Vassiliadis, Stamatis; Putrino, Michael; Huffman, Ann E.; Feal, Brice J.; and Pechanek, Gerald G., 4,924,422, Cl. 364-715.090.
Hughes Aircraft Company: *See*—
Bailey, Wilbur M.; Hulderman, George H.; Jones, Vincent L.; Pikulski, Joseph L.; Standlee, Arlie G.; Tangonan, Gregory L.; Vince, Michael R.; and Wysocki, Joseph A., 4,924,087, Cl. 356-73.100.
Brown, Duncan W.; and Parsons, James D., 4,923,716, Cl. 427-249.000.
Cosner, Lane W., 4,923,771, Cl. 430-1.000.
Hudson, Ralph E.; Aks, Stanley O.; Bogdanovic, Peter P.; and Lynch, David D., 4,924,232, Cl. 342-174.000.
Patraw, Nils E., 4,924,353, Cl. 361-400.000.
Thompson, James D., 4,924,234, Cl. 342-369.000.
Uyeda, Harold A., 4,924,196, Cl. 333-101.000.
Hughes, Gary: *See*—
Coxhead, Bruce; Hughes, Gary; and Murchie, John R., 4,923,395, Cl. 432-5.000.
Hughes, Robert D., IV: *See*—
Kirschner, Jonathan; and Hughes, Robert D., IV, 4,923,092, Cl. 222-129.400.
Hughes Tool Company: *See*—
Kelly, Jr., Joseph L.; and Welsh, Michael F., 4,923,020, Cl. 175-372.000.
Hui, Benjamin C.; and Victoriano, Luis I., to CVD Incorporated. Synthesis of high purity dimethylaluminum hydride. 4,924,019, Cl. 556-187.000.
Hulderman, George H.: *See*—
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Hulsman, William; and Allen, Ben G., to Benthos, Inc. Leak testing. 4,922,746, Cl. 73-49.300.
Humphreys, James R., Jr.: *See*—
Novak, Philip F.; Shannon, Robert D.; Pinckney, Robert L.; and Humphreys, James R., Jr., 4,924,228, Cl. 342-2.000.
Hunger, Gerd, to E. R. Squibb & Sons, Inc. Apparatus for tending a stoma. 4,923,452, Cl. 604-338.000.
Hunt, Lewis D.: *See*—
Delmer, Philip T.; and Hunt, Lewis D., 4,923,381, Cl. 425-77.000.
Hunt, Neil D.: *See*—
Crossley, P. Anthony; Nishihara, H. Keith; and Hunt, Neil D., 4,924,506, Cl. 382-28.000.
Hunter, Joe M., to Hi-Tek Polymers, Inc. Process for the reduction of free epichlorohydrin in epoxy compounds. 4,924,013, Cl. 549-514.000.
Hunter, William L.: *See*—
Lesk, Israel A.; Hawkins, George W.; Thomas, Ronald E.; Hunter, William L.; and McShane, Michael B., 4,924,291, Cl. 357-70.000.
Hupe, Donald; and Wyvratt, Matthew J., to Merck & Co., Inc. 5-amino-1-(4-naphthoylbenzyl)-1,2,3-triazole-4-carboxamides and analogs as antiproliferative agents. 4,923,885, Cl. 514-359.000.
Hurdle, Ennis J., Jr. Sawmill edger. 4,922,780, Cl. 83-508.300.
Huschelrath, Gerhard, to Nukem GmbH. Device having electromagnet for providing a magnetic field inclined with respect to the transportation direction of a ferromagnetic body for non-destructive, magnetic testing of the body. 4,924,181, Cl. 324-235.000.
Husky Injection Molding Systems Ltd.: *See*—
Coxhead, Bruce; Hughes, Gary; and Murchie, John R., 4,923,395, Cl. 432-5.000.
Hutchings, Deborah A. Child or disabled person training harness. 4,922,860, Cl. 119-96.000.
Hutt, Marland P., Jr.; and Kiely, John S., to Warner-Lambert Company. 1,8-Naphthyridines and their use as antibacterial agents. 4,923,879, Cl. 514-300.000.
Hwang, Jin-Chyuan. Retainer for flexible drain pipes. 4,922,554, Cl. 4-191.000.

Hyca, Bohumil, to Union Special G.m.b.H. Using a variable speed motor in a tape feed device for a sewing machine. 4,922,843, Cl. 112-318.000.
Hydac Technology GmbH: *See—*
Mueller, Matthias; and Baltes, Herbert, 4,922,944, Cl. 137-72.000.
Hydrostress AG: *See—*
Bieri, Hans, 4,923,344, Cl 409-234.000.
Hypeco AB: *See—*
Stenlund, Stig G., 4,923,003, Cl. 165-165.000.
Iannicelli, Joseph. Wet scrubber process for removing total reduced sulfur compounds from industrial gases. 4,923,688, Cl. 423-224.000.
Iannucci, Paul. Locking assembly for preventing the unauthorized use of an electrically powered device. 4,922,734, Cl. 70-58.000.
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Guijarro, Francisco I., 4,923,113, Cl. 229-125.270.
Ibrahim, Nader; and Sodano, Jeanette L., to Beecham, Inc. Tripolyphosphate-containing anti-calculus toothpaste. 4,923,684, Cl. 424-52.000.
ICBT Lyon: *See—*
Neyraud, Rene , 4,922,706, Cl 57-354.000.
Ichikawa, Tetsuya: *See—*
Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, 4,923,027, Cl. 180-219.000.
Ichimura, Michio: *See—*
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asasno, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.
ICI Americas Inc.: *See—*
Trainor, Diane A.; and Stein, Mark M., 4,923,890, Cl. 424-46.000.
ICI Australia Limited: *See—*
Watson, Keith G.; and Farquharson, Graeme J., 4,923,989, Cl. 544-318.000.
ICN Micromedic Systems, Inc.: *See—*
Johnson, Edgar G.; and Cornelison, James J., 4,924,093, Cl. 250-328.000.
Idel, Karsten-Josef: *See—*
Tacke, Peter; Grigo, Ulrich; and Idel, Karsten-Josef, 4,923,957, Cl. 528-271.000.
Idemitsu Kosan Co., Ltd.: *See—*
Shigematsu, Kazuyoshi; Shirouzu, Shigenori; Sakamoto, Shuji; and Suzuki, Toshiyasu, 4,923,962, Cl. 528-196.000.
Idogaki, Takaharu; Hayashi, Ikuo; Ishaihara, Toshihisa; Sugitani, Tatsuo; and Inoue, Hideo, to Nippon Soken & Toyota Jidosha Kabushiki Kaisha. Acceleration sensor 4,922,753, Cl. 73-516.00R.
Iga, Yoshiro: *See—*
Tanaka, Kenji; Miyano, Kenmi; Nishimaki, Hideo; and Iga, Yoshiro, 4,923,815, Cl. 435-183.000.
Igaki, Seigo: *See—*
Kato, Masayuji; Igaki, Seigo; Yamagishi, Fumio; Ikeda, Hiroyuki; Shinzaki, Takashi; and Eguchi, Shin, 4,924,085, Cl. 250-227.280.
Igarashi, Akira: *See—*
Itabashi, Yuichi; Hayashi, Takayuki; and Igarashi, Akira, 4,923,844, Cl. 503-207.000.
Iguchi, Kazuo: *See—*
Amemiya, Shigeo; Komine, Hiroaki; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, 4,924,461, Cl. 370-95.200.
Ihara Chemical Industry Company, Ltd.: *See—*
Saito, Yoshihiro; Wada, Nobuhide; Kusano, Shoji; Miyazawa, Takeshige; Takahashi, Satoru; Toyokawa, Yasuhumi; and Kajiwaca, Ikuo, 4,923,501, Cl. 71-92.000.
Iida, Kosuke; Yamato, Hiroshi, and Kadono, Yoji, to Takiron Co., Ltd. Functional film and process for its production. 4,923,718, Cl. 427-386.000.
Iida, Yasuharu: *See—*
Funakawa, Naoyoshi; Iida, Yasuharu; Moriki, Yasumitsu; and Sakurai, Masahiro, 4,923,251, Cl. 299-64.000.
Iida, Yoshikazu; Hagiuda, Nobuyoshi; Yokonuma, Norikazu; Sakamoto, Hiroshi; and Matsui, Hideki, to Nikon Corporation. Electronic flash device for camera. 4,924,252, Cl. 354-420.000.
Iimura, Kouichi, to Kabushiki Kaisha Sigma. Coin payout apparatus in gaming device. 4,923,430, Cl. 453-50.000.
Iinuma, Fujio: *See—*
Iraba, Makoto; Shinoda, Hirotaka; and Iinuma, Fujio, 4,923,871, Cl. 514-255.000.
Iitsuka, Hiroyuki: *See—*
Kameda, Keiichi; Takahashi, Kenichi; Horigami, Kouichi; and Iitsuka, Hiroyuki, 4,924,426, Cl. 364-900.000.
Ikeda Bussan Co., Ltd.: *See—*
Kuwabara, Akira, 4,923,245, Cl. 296-214.000.
Matsuura, Ichiro; Ishimaru, Kiichiro; Mizuno, Hisayoshi; Omata, Youichi; and Soutome, Fumio, 4,923,653, Cl. 264-46.600.
Omata, Youichi; Matsuura. Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, 4,923,378, Cl 425-4.00R.
Ikeda, Hiroharu: *See—*
Matsuki, Yasuo; Kariya, Yosinobu; Endo, Masayuki; Ikeda, Hiroharu; and Hosaka, Yoshihiro, 4,923,948, Cl. 528-26.000.
Ikeda, Hiroyuki: *See—*
Kato, Masayuji; Igaki, Seigo; Yamagishi, Fumio; Ikeda, Hiroyuki; Shinzaki, Takashi; and Eguchi, Shin, 4,924,085, Cl. 250-227.280.
Ikeda, Kohji; Tsuji, Akira; and Sunaga, Yoshiyuki, to Nissho Corporation; and Fujisawa Pharmaceutical Company, Ltd. Box for disposing of used injection needles. 4,922,597, Cl. 29-240.000.
Ikeda, Yoshie: *See—*
Hirata, Keiichi; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; Ikeda, Yoshie; and Kawakami, Yasushi, 4,924,433, Cl. 364-900.000.
Ikejiri, Kenichi: *See—*
Furumoto, Mistumasa; Kawahara, Eiichiro; and Ikejiri, Kenichi, 4,922,717, Cl. 60-456.000.
Illinois Tool Works: *See—*
VanErden, Donald L., 4,923,309, Cl. 383-5.000.
Illinois Tool Works Inc.: *See—*
Orrico, Mario M., 4,924,040, Cl. 200-16.00A.
Ilvespaa, Heikki: *See—*
Liedes, Allan; Ilvespaa, Heikki; and Viitanen, Olavi, 4,923,567, Cl. 162-193.000.
Imai, Takashi; Saito, Susumu; and Takashima, Koichi, to Fuji Xerox Co, Ltd. Single-component developing method. 4,923,777, Cl. 430-120.000.
Imai, Yuji; and Iwasa, Kazuyuki, to Olympus Optical Company Limited. Drive apparatus for a focusing lens. 4,924,253, Cl. 354-400.000.
Imamura, Hiroshi; Toho, Makoto; Shiohama, Eiji; Morii, Shoiti; and Hiramatsu, Koji, to Matsushita Electric Works, Ltd. Colored fluoroescent display lamp assembly. 4,924,143, Cl. 313-493.000.
Imanishi, Etujiro: *See—*
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 4,923,383, Cl. 425-150.000.
Immunex Corporation: *See—*
Gallis, Byron M., 4,923,802, Cl. 435-15.000.
"Immuno" Aktiengesellschaft fur Chemisch-Medizinische: *See—*
Mundt, Wolfgang, 4,923,817, Cl. 435-315.000.
Imperial Chemical Industries: *See—*
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,923,686, Cl. 423-38.000.
Imperial Chemical Industries PLC: *See—*
Elliott, Raymond, and Sunley, Raymond L., 4,923,502, Cl. 71-92.000.
Sherman, Rudolf W.; and Stainer, Philip J., 4,923,622, Cl. 252-8.600.
Ims Ionen Mikrofabrikations Systeme Gesellschaft m.b.H: *See—*
Stengl, Gerhard; and Loschner, Hans, 4,924,104, Cl. 250-492.300.
Inaba, Hiromi; Nakamura, Kiyoshi; Kimura, Akira; Hokari, Sadao; and Oouchi, Naoyuki, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Apparatus and method for controlling switching elements in a PWN-controlled voltage source inverter. 4,924,373, Cl. 363-95.000.
Inaba, Makoto; Shinoda, Hirotaka; and Iinuma, Fujio, to Kyorin Seiyaku Kabushiki Kaisha; and Japanese Foundation for Cancer Research. Certain 2,6-dimethyl-4-(pyrazolo[1,5a]-pyridin-3-yl)1,4-dihydro-pyridine-3,5-dicarboxylate derivatives and compositions containing same. 4,923,871, Cl. 514-255.000.
Inada, Toshio: *See—*
Yagi, Kiyoshi; Kanno, Toshiaki; and Inada, Toshio, 4,923,637, Cl. 252-511.000.
Inaga, Hisashi: *See—*
Kumagai, Seiichiro; Kono, Michikata; Okai, Masakazu; and Inaga, Hisashi, 4,922,865, Cl. 123-65.0VC.
Inaguma, Yukio: *See—*
Hamajima, Takanori; and Inaguma, Yukio, 4,924,123, Cl. 310-15.000.
Inaoka, Hakaru: *See—*
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.
Industrikontakt Ing. O. Ellingsen & Co.: *See—*
Ellingsen, Olav, 4,923,457, Cl. 604-891.100.
Infors GmbH: *See—*
Hawrylenko, Alexander, 4,923,305, Cl. 366-349.000.
Ingersoll, Thomas L.: *See—*
McAllise, Gregg A.; and Ingersoll, Thomas L., 4,924,039, Cl. 191-12.20R.
Innovative Display Development Partners: *See—*
Brodie, Ivor; Gurnick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., 4,923,421, Cl. 445-24.000.
Inoue, Hideo: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Ishaihara, Toshihisa; Sugitani, Tatsuo; and Inoue, Hideo, 4,922,753, Cl. 73-516.00R.
Uchida, Kiyoyuki; Inoue, Hideo; and Sugitani, Tatsuo, 4,924,394, Cl. 364-426.020.
Inoue, Manabu: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,924,248, Cl. 354-195.100.
Inoue, Masami: *See—*
Hashimoto, Yoichi; and Inoue, Masami, 4,924,490, Cl. 378-145.000.
Inoue, Takao: *See—*
Fukushima, Tetsuo; Inoue, Takao; and Kanashima, Keinosuke, 4,923,552, Cl. 156-273.700.
Inoue, Takesi: *See—*
Matsubara, Toshiyuki; Fujioka, Shuzo; Yamaguchi, Atsuo; Takahira, Kenichi; Furuta, Shigeru; and Inoue, Takesi, 4,924,465, Cl. 371-3.000.
Inoue, Yasuhiro: *See—*
Hirai, Kazuyasu; Inoue, Yasuhiro; and Suzuki, Kazuyoshi, 4,923,132, Cl. 242-35.50A.

Inoue, Yoshihisa, to Nakamichi Corporation. Tape cartridge loading mechanism with engagement means to retain cartridge. 4,924,335, Cl. 360-93.000.
Inoue, Yutaka: *See—*
Ogino, Yoshitaka; Okada, Shinjiro; and Inoue, Yutaka, 4,923,285, Cl. 350-331.00T.
Inselmann, Jurgen, to Herbert Kannegiesser GmbH & Co. Apparatus for connecting sheet-like textile articles or webs of material. 4,923,560, Cl. 156-555.000.
Inskeep, Jeffrey, to Hayes Microcomputer Products, Inc. Method and apparatus for refreshing a dynamic memory. 4,924,441, Cl. 365-222.000.
Institut Elektrosvarki Imeni E.O. Patona an USSR: *See—*
Movchan, Boris A.; Panna, Vladimir A.; Chernenko, Evgeny V.; and Gorba, Naum A., 4,922,995, Cl. 164-469.000.
Institut Francais du Petrole: *See—*
Marcilly, Christian; Deves, Jean-Marie; and Bourgogne, Michel, 4,923,593, Cl. 208-113.000.
Meynier, Patrick, 4,923,030, Cl. 181-106.000.
Travers, Christine; Raatz, Francis; Guth, Jean-Louis; and Kessler, Henri, 4,923,835, Cl. 502-66.000.
Instruments and Movements Limited: *See—*
Jones, Norman S., 4,922,962, Cl. 137-624.140.
Integrated Genetics, Inc.: *See—*
Reddy, Vemuri B.; Hsiung, Nancy; Beck, Anton K.; and Berstine, Edward G., 4,923,805, Cl. 435-69.400.
Interatom GmbH: *See—*
Cyron, Theodor, 4,923,109, Cl. 228-181.000.
Intermedics, Inc.: *See—*
Adkins, Robert A.; and Baker, Ross G., Jr., 4,922,930, Cl. 128-419.0PG.
Fine, Michael J.; and Calfee, Richard V., 4,922,927, Cl. 128-786.000.
International Business Machines: *See—*
Crepy, Hubert; Elie, Philippe; Galand, Claude; Lancon, Emmanuel; Liethoudt, Thierry; and Rosso, Michele, 4,924,508, Cl. 381-38.000.
International Business Machines Coprporation: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.
International Business Machines Corporation: *See—*
Beyer, Klaus D.; and Silvestri, Victor J., 4,924,284, Cl. 357-49.000.
Christenson, Patrick J.; Hart, Robert J.; Naatz, David C.; Rowlance, Edward J.; and Wenz, David G., 4,924,434, Cl. 364-900.000.
Dang, Mieu-Hong; and Taborga, Jorge R., 4,924,493, Cl. 379-94.000.
Dinan, Raymond F.; Dubil, James F.; Hillery, John R.; Rodite, Robert R.; and White, James M., 4,924,521, Cl. 382-54.000.
Grasso, Lawrence J.; Hoffman, Dale E.; Morgan, Carroll E.; Puntar, Charles A.; and Young, Diane K., 4,924,484, Cl. 377-116.000.
Gregor, Steven L.; and Lee, Victor S., 4,924,466, Cl. 371-12.000.
Hao, Ming C.; Obermarck, Ronald L.; Trivett, Gene E.; and Trivett, Lynn, 4,924,384, Cl. 364-300.000.
Highland, Frederic D., 4,924,408, Cl. 364-513.000.
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Vassiliadis, Stamatis; Putrino, Michael; Huffman, Ann E.; Feal, Brice J.; and Pechanek, Gerald G., 4,924,422, Cl. 364-715.090.
Vassiliadis, Stamatis; and Schwarz, Eric M., 4,924,423, Cl. 364-738.000.
Vassiliadis, Stamatis; Schwarz, Eric M.; Putrino, Michael; and Feal, Brice J., 4,924,424, Cl. 364-738.000.
International Cellulose, Inc.: *See—*
Boyer, Harold F., 4,923,121, Cl. 239-434.500.
International Flavors & Fragrances Inc.: *See—*
Sprecker, Mark A.; Belko, Robert P.; and Hanna, Marie R., 4,924,026, Cl. 560-261.000.
International Fuel Cells: *See—*
Grasso, Albert P.; and Vogel, Wolfgang M., 4,923,767, Cl. 429-12.000.
Interox Chemicals Limited: *See—*
Turner, Philip J.; Jeff, Martin; and Reeve, Kevan M., 4,923,580, Cl. 204-157.970.
Intevep, S.A.: *See—*
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.
Intocast GmbH Feuerfestprodukte und Giesshilfsmittel: *See—*
Eitel, Wilhelm, 4,923,180, Cl. 266-44.000.
Inventech Licensing Co.: *See—*
Von Heck, Robt., 4,924,358, Cl. 362-32.000.
Ioffe, Zosim: *See—*
Morawetz, Peter L.; and Ioffe, Zosim, 4,922,908, Cl. 128-422.000.
Irro-Controls Group: *See—*
Browne, Christopher L., 4,922,945, Cl. 137-78.300.
Irukayama, Godo: *See—*
Masuhara, Eiichi; Kadoma, Yoshinori; Matsumoto, Takeo; Komai, Takeshi; Yamada, Eiichi; Nakachi, Osamu; and Irukayama, Godo, 4,923,905, Cl. 522-24.000.
Isayama, Katsuhiko: *See—*
Hirose, Toshifumi; and Isayama, Katsuhiko, 4,923,927, Cl. 525-100.000.
Ishaihara, Toshihisa: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Ishaihara, Toshihisa; Sugitani, Tatsuo; and Inoue, Hideo, 4,922,753, Cl. 73-516.00R.
Ishibashi, Kenji: *See—*
Hamada, Masataka; Ishida, Tokuji; Ishibashi, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 4,924,250, Cl. 354-402.000.
Ishibashi, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,924,286, Cl. 357-46.000.
Ishida, Masahiko: *See—*
Yamaji, Katsuhiko; Ishida, Masahiko; and Tsukamoto, Masahiro, 4,923,547, Cl. 156-181.000.
Ishida, Masako: *See—*
Watanabe, Keiji; Fukuyama, Keiji; Ishida, Masako; Suzuki, Ryo; and Saito, Masato, 4,924,137, Cl. 313-337.000.
Ishida, Takashi: *See—*
Masao, Kondo; and Ishida, Takashi, 4,922,796, Cl. 84-618.000.
Ishida, Tokuji: *See—*
Hamada, Masataka; Ishida, Tokuji; Ishibashi, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 4,924,250, Cl. 354-402.000.
Ishigami, Masahiro: *See—*
Saito, Akio; and Ishigami, Masahiro, 4,924,193, Cl. 330-284.000.
Ishige, Hiroyuki: *See—*
Ishii, Kazuo; Yamashita, Satoshi; and Ishige, Hiroyuki, 4,922,673, Cl. 52-221.000.
Ishiguro, Nobuya: *See—*
Kondo, Kazuo; and Ishiguro, Nobuya, 4,923,722, Cl. 428-34.900.
Ishihara, Masamichi: *See—*
Matsuo, Hiroto; Kawamoto, Iwaji; Ishihara, Masamichi; and Nakagawa, Takaaki, 4,922,993, Cl. 164-104.000.
Ishii, Hiroaki: *See—*
Uzaki, Nobuyuki; Ishii, Hiroaki; Tsuchiya, Ichiro; Oguchi, Yukio; and Kawakami, Tatsuo, 4,923,831, Cl. 501-108.000.
Ishii, Hiroyuki: *See—*
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.
Ishii, Kazuo; Yamashita, Satoshi; and Ishige, Hiroyuki, to Senoh Kabushiki Kaisha. Fixture for floor opening. 4,922,673, Cl. 52-221.000.
Ishii, Koji, to Ryobi Ltd. Image adjusting apparatus for multi-color printing machine. 4,922,819, Cl. 101-177.000.
Ishii, Takashi, to Yazaki Corporation. Locking device for connectors. 4,923,409, Cl. 439-358.000.
Ishikawa, Hiroshi; Gunji, Naoki; Hoshino, Yoshinori; and Ohyama, Taro, to NKK Corporation; and Toyo Ink Mfg. Co., Ltd. Precoated steel sheet for two-piece can. 4,923,762, Cl. 428-551.000.
Ishikawa, Kazushi; Yamamoto, Shinsaku; and Katogi, Hisao, to Kirin Beer Kabushiki Kaisha. Method and device for inspecting sidewall of bottle. 4,924,083, Cl. 250-223.00B
Ishimaru, Kiichiro: *See—*
Matsuura, Ichiro; Ishimaru, Kiichiro; Mizuno, Hisayoshi; Omata, Youichi; and Soutome, Fumio, 4,923,653, Cl. 264-46.600.
Omata, Youichi; Matsuura, Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, 4,923,378, Cl. 425-4.00R.
Ishimura, Toshihiko; Tsuji, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, to Minolta Camera Kabushiki Kaisha. Camera system having photographic camera and electronic flash device. 4,924,251, Cl. 354-418.000.
Isogai, Shunji, to Sugiyasu Industries Co., Ltd. Container transfer lift. 4,923,357, Cl. 414-495.000.
Isomura, Hisashi: *See—*
Murakawa, Norihiro; Isomura, Hisashi; Miura, Kazukiyo; and Aoki, Shinichi, 4,923,652, Cl. 264-62.000.
Isoyama, Toyoshiro: *See—*
Sawada, Shinichi; Isoyama, Toyoshiro; Matsushita, Tetsuya; and Saito, Hideo, 4,923,632, Cl. 252-299.610.
Isozaki, Osamu; Nakai, Noboru; Ito, Satoru; and Takami, Seiji, to Kansai Paint Company, Limited. Resin composition curable at low temperature. 4,923,945, Cl. 528-16.000.
Isozaki, Osamu: *See—*
Iwasawa, Naozumi; and Isozaki, Osamu, 4,923,930, Cl. 525-168.000.
Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Coaxial type starter device. 4,923,229, Cl. 290-48.000.
Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Coaxial type starter device. 4,924,108, Cl. 290-48.000.
Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Solenoid for coaxial type starter device. 4,924,126, Cl. 310-83.000.
Isuzu Gidoshiya Kogyo Co., Ltd.: *See—*
Nogami, Masaaki; Hasegawa, Akira; Nojima, Hiroshi; and Murata, Mitsuhiro, 4,922,872, Cl. 123-319.000.
Itabashi, Yuichi; Hayashi, Takayuki; and Igarashi, Akira, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,923,844, Cl. 503-207.000.
Itgenshorst, Dieter: *See—*
Driesen, Manfred; and Itgenshorst, Dieter, 4,922,733, Cl. 68-205.00R.
ITI/CLM Impianti Tecnici Industriali Danieli & C. Officine Meccaniche SpA: *See—*
Mancini, Flavio, 4,923,355, Cl. 414-339.000.
Ito, Fuminori: *See—*
Matsui, Kazuhiro; and Ito, Fuminori, 4,923,153, Cl. 248-74.100.

Ito, Hiroshi: *See*—
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 358-105.000.

Ito, Hitoshi: *See*—
Hirose, Kouji; Ito, Hitoshi; and Yoshida, Kazuhito, 4,923,764, Cl. 428-632.000.

Ito, Masazumi; and Higashio, Kimihiko, to Minolta Camera Kabushiki Kaisha. Image duplicating apparatus having edited copying mode. 4,924,264, Cl. 355-204.000.

Ito, Masazumi; and Murata, Tomoji, to Minolta Camera Kabushiki Kaisha. Copying machine. 4,924,274, Cl. 355-313.000.

Ito, Satoru: *See*—
Isozaki, Osamu; Nakai, Noboru; Ito, Satoru; and Takami, Seiji, 4,923,945, Cl. 528-16.000.

Ito, Shoji, to Itoh Iron Works Co., Ltd. Three-side cutting apparatus. 4,922,773, Cl. 83-76.600.

Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, to Dai Nippon Insatsu Kabushiki Kaisha. Sheet for heat transference and method for using the same. 4,923,847, Cl. 503-227.000.

Ito, Yoshikazu: *See*—
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.000.

Itoh Iron Works Co., Ltd.: *See*—
Ito, Shoji, 4,922,773, Cl. 83-76.600.

Itoyama, Katumi: *See*—
Takahashi, Yoshiya; Suda, Koichiro; and Itoyama, Katumi, 4,924,044, Cl. 200-314.000.

ITT Corporation: *See*—
Caserta, Joseph N.; Mims, William D.; Reed, Joseph; and Bowen, James H., 4,924,080, Cl. 250-213.0VT.

Ivac Corporation: *See*—
Daoud, Adib G.; and Horres, C. Russell, Jr., 4,923,444, Cl. 604-131.000.

Ivanov, Chavdar B.: *See*—
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D., Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

Ivsan, Thomas J.; Bailey, Carlos; and Jessup, Llewell, to Airfoil Textron Inc. Apparatus and method for braiding fiber strands. 4,922,798, Cl. 87-8.000.

Iwabuchi, Shigeru; Sato, Aritsune; and Ueno, Haruo, to Nagao Company, Inc. Pitching machine. 4,922,885, Cl. 124-78.000.

Iwahara, Takahisa; and West, Robert C., to Kanegafuchi Chemical Industry Co., Ltd. Ethynylene-disilanylene copolymers and method of preparing same. 4,923,949, Cl. 528-33.000.

Iwai, Yukio: *See*—
Sakai, Shoji; and Iwai, Yukio, 4,922,705, Cl. 57-306.000.

Iwakura, Ken: *See*—
Fujikura, Sadao; Iwasaki, Masayuki; Maeda, Minoru; and Iwakura, Ken, 4,923,781, Cl. 430-281.000.

Iwakura, Masaru: *See*—
Kamimura, Hiroto; Kubota, Shuichi; and Iwakura, Masaru, 4,923,312, Cl. 384-420.000.

Iwamoto, Yoshinao: *See*—
Edagawa, Noboru; Mochizuki, Kiyofumi; and Iwamoto, Yoshinao, 4,923,291, Cl. 350-389.000.

Iwao, Hideki; Kato, Michio; and Yamano, Shuichi, to Hitachi, Ltd. Communication control system. 4,924,479, Cl. 375-7.000.

Iwasa, Kazuyuki: *See*—
Imai, Yuji; and Iwasa, Kazuyuki, 4,924,253, Cl. 354-400.000.

Iwasaki, Masayuki: *See*—
Fujikura, Sadao; Iwasaki, Masayuki; Maeda, Minoru; and Iwakura, Ken, 4,923,781, Cl. 430-281.000.

Iwasaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Multi spark ignition system. 4,922,883, Cl. 123-598.000.

Iwasaki, Takashi: *See*—
Sato, Masami; Fujiyama, Masaaki; Iwasaki, Takashi; Suzuki, Masami; Yoneyama, Takashi; and Kosha, Hideaki, 4,922,675, Cl. 51-394.000.

Iwasawa, Naozumi; and Isoza'ki, Osamu, to Kansai Paint Company, Limited. Curable resin and resin composition curable at low temperature. 4,923,930, Cl. 525-168.000.

Iwashashi, Kazuyuki: *See*—
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto. Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.

Iwata, Kazuo: *See*—
Koike, Shoji; Iwata, Kazuo; Tochihara, Shinichi; and Tomida, Yasuko, 4,923,515, Cl. 106-22.000.

Iwatsu Electrical Co., Ltd.: *See*—
Sekiguchi, Yoshichika; and Kodama, Hideaki, 4,923,310, Cl. 439-701.000.

Iyogi, Kiyoshi; Nakahashi, Masako; Takeda, Hiromitsu; and Shirokane, Makoto, to Kabushiki Kaisha Toshiba. Brazing paste for bonding metal and ceramic. 4,924,033, Cl. 174-259.000.

Izu, Toshio: *See*—
Kitahara, Satoru; Yasuda, Koichi; and Izu, Toshio, 4,924,200, Cl. 336-65.000.

Izumori, Ken; and Sakai, Shuzo, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Method for determining galactitol. 4,923,803, Cl. 435-26.000.

J. E. Hanger & Company Limited (British Company): *See*—
Cooper, John E.; and Wilcox, Alun, 4,923,476, Cl. 623-38.000.

J. E. Morgan Knitting Mills, Inc.: *See*—
Miller, Robert A., 4,922,567, Cl. 8-151.000.

J. I. Case Company: *See*—
Covington, Michael J.; and Orsborn, Jesse H., 4,922,695, Cl. 56-40.000.

J. M. Voith GmbH: *See*—
Steiner, Karl; Schutte, Andreas; and Flamig, Hans, 4,923,570, Cl. 162-358.000.

J. N. Fauver Company, Inc.: *See*—
Riley, Ron J., 4,924,164, Cl. 318-587.000.

J. P. Sheahan Assoicates, Inc.: *See*—
Sheahan, James P., 4,924,174, Cl. 324-696.000.

Jachmann, Emil F.: *See*—
Dwyer, John J.; Chamberlin, David B.; and Jachmann, Emil F., 4,924,332, Cl. 360-72.200.

Jackle, William C.; and Czerkies, Tadeusz, to Niven Marketing Group, The. Display and gravity dispensing apparatus. 4,923,070, Cl. 211-59.200.

Jackson, Adam: *See*—
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Coates, David; Jackson, Adam; and Scrowston, Richard M., 4,923,633, Cl. 252-299.650.

Jackson, Arthur: *See*—
Harris, Martin; Heyes, Graham; and Jackson, Arthur, 4,923,987, Cl. 544-53.000.

Jackson, Miles N.; Rogers, Peter J.; and Watson, Brenda L., to General Foods Inc. Apparatus for dispensing a blended composition of particulate ingredients. 4,923,304, Cl. 366-184.000.

Jacobs, Sheldon F., to Woodroast Systems, Inc. Oven. 4,924,071, Cl. 219-400.000.

Jacobs Suchard AG: *See*—
Schweinfurth, Hermann, 4,922,812, Cl. 99-495.000.

Jacoby, Elliot G.: *See*—
Buehler, David L.; Jacoby, Elliot G.; and Swartvagher, Rita, 4,924,349, Cl. 361-357.000.

Jaeger: *See*—
Roussel, Pierre, 4,924,166, Cl. 318-608.000.

Jain, Kantilal. Scan and repeat high resolution projection lithography system. 4,924,257, Cl. 355-53.000.

Jakob, Stephen W., to R. J. Reynolds Tobacco Company. Tobacco separation or delamination method. 4,922,933, Cl. 131-299.000.

Jakowatz, Charles V., Jr.: *See*—
Eichel, Paul H.; Ghiglia, Dennis C.; and Jakowatz, Charles V., Jr., 4,924,229, Cl. 342-25.000.

Jalava, Jouko: *See*—
Stormbom, Lars; Jalava, Jouko; Mesia , Heikki; Lehto, Arı; and Belt, Pekka, 4,924,064, Cl. 219-121.690.

Jalbert, Ronald L.: *See*—
Grant, Thomas S.; Jalbert, Ronald L.; Whalen, David; Bartges, Brenda A.; and Thompson, Tracey L., 4,923,924, Cl 525-66.000.

Jamain, Patrice: *See*—
Vaillant de Guelis, Hubert; Jamain, Patrice; and Roland, Jean-Pierre, 4,924,128, Cl. 310-156.000.

James River Corporation: *See*—
Kinsley, Homan B., Jr., 4,923,646, Cl. 264-13.000.

James, Robert B., Jr.: *See*—
Kalnes, Tom N.; and James, Robert B, Jr., 4,923,590, Cl. 208-85.000.

Janicki, Mark A.; and Schultz, Paul S., to Monarch Marking Systems, Inc. Method of making a composite car door panel. 4,923,542, Cl. 156-92.000.

Janko, Michael; and McAllister, Matthew, to Alliko Unlimited Corporation. Illuminated article and waterproof illuminated harness. 4,924,362, Cl. 362-108.000.

Janoff, Andrew S.: *See*—
Tilcock, Colin P. S.; Cullis, Pieter R.; Hope, Michael J.; and Janoff, Andrew S., 4,923,854, Cl. 514-78.000.

Janoski, Ronald J.: *See*—
Carlozzo, Ben J.; Janoski, Ronald J.; Sterk, James; and Rundo, Mark C., 4,923,348, Cl. 411-377.000.

Japan as represented by Director General of Agency of Industrial Science and Technology: *See*—
Yamashita, Hiroshi; Fujii, Kanenaga; Fukunishi, Takumi; Shigeoka, Masafumi; and Sudo, Hiroshi, 4,924,357, Cl. 362-32.000.

Japan Bano'k Co., Ltd.: *See*—
Furutsu, Akira, 4,923,106, Cl. 227-67.000.

Japan Exlan Company Limited: *See*—
Kobashi, Toshiyuki; and Naka, Hideo, 4,924,017, Cl. 556-85.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Matsuki, Yasuo; Kariya, Yosinobu; Endo, Masayuki; Ikeda, Hiroharu; and Hosaka, Yoshihiro, 4,923,948, Cl. 528-26.000.

Japanese Foundation for Cancer Research: *See*—
Inaba, Makoto; Shinoda, Hirotaka; and Iinuma, Fujio, 4,923,871, Cl. 514-255.000.

Jaquard, Paul; Lelay, Jean-Pierre; and Doreau, Jean, to Societe d'Applications Generales d'Electricite et de Mecanique Sagem. Fire control system with aiming error compensation. 4,922,801, Cl. 89-41.050.

Jardine, Douglas M., to Bio, Inc. Method and apparatus for purifying liquids employing a particulate filter and a membrane. 4,923,609, Cl. 210-636.000.

Jarvinen, Gordon D.: *See*—
Smith, Barbara F.; Jarvinen, Gordon D.; and Ryan, Robert R., 4,923,630, Cl. 252-184.000.

Jaskolka, Heinz: *See*—
Rahnenfuhrer, Eckhard; Schulze, Albert; and Jaskolka, Heinz, 4,922,823, Cl. 102-288.000.

Jastrzebski, Lubomir L.; Johansson, Ronald J.; and Sauer, Donald J., to Harris Corporation. Method for forming dielectrically isolated transistor. 4,923,826, Cl. 437-57.000.

Jeenicke, Edmund: *See*—
Kaiser, Gunther; Klotzner, Winfried; Krauter, Immanuel; and Jeenicke, Edmund, 4,924,399, Cl. 364-431.030.

Jeff, Martin: *See*—
Turner, Philip J.; Jeff, Martin; and Reeve, Kevan M., 4,923,580, Cl. 204-157.970.

Jelyazkov, Deltcho G.: *See*—
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

Jenkins, Leonard A.: *See*—
Bunce, Martin C.; Helps, David W.; Jenkins, Leonard A.; and Noke, Adrian C., 4,924,048, Cl. 219-10.55E.

Jennet, Friedrich: *See*—
Ellenberger, Bernd; Jennet, Friedrich; Schafer, Karlheinz; Spickermann, Rainer; and Lass, Gerhard, 4,923,558, Cl. 156-499.000.

Jensen, Lester B.: *See*—
Brandon, Daniel; Dunlop, Kenneth N. B.; Jensen, Lester B.; Lucas, Richard M.; and Pietruszewski, Robert E., 4,924,303, Cl. 358-86.000.

Jensen, Ned L., to William Seroy Group, The. Synthetic GTF chromium material and process therefor. 4,923,855, Cl. 514-188.000.

Jeppesen, John C. Computerized court reporting system. 4,924,387, Cl. 364-409.000.

Jernigan, James T.: *See*—
Gipson, Carey D.; and Jernigan, James T., 4,922,894, Cl. 128-71.000.

Jessup, Llewell: *See*—
Ivsan, Thomas J.; Bailey, Carlos; and Jessup, Llewell, 4,922,798, Cl. 87-8.000.

Jidosha Denki Kogyo Kabushiki Kaisha: *See*—
Hirohama, Huji; Ono, Eiichi; and Murata, Yukiho, 4,922,570, Cl. 15-250.020.

Jidosha Kiki Co., Ltd.: *See*—
Arai, Takatoshi, 4,924,031, Cl. 174-52.300.

Jimbo, Yoshiji: *See*—
Horie, Akira; and Jimbo, Yoshiji, 4,924,168, Cl. 318-811.000.

Jimenez G., Euler: *See*—
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

Jin, Sungho; Lambert, William R.; Moore, Robert C.; Mottine, John J., Jr.; Sherwood, Richard C.; and Tiefel, Thomas H., to American Telephone and Telegraph Company. Composite electrical interconnection medium comprising a conductive network, and article, assembly, and method. 4,923,739, Cl. 428-221.000.

Johansson, Lief A.: *See*—
Weber, Otto K.; and Johansson, Lief A., 4,924,486, Cl. 378-173.000.

Johansson, Ronald J.: *See*—
Jastrzebski, Lubomir L.; Johansson, Ronald J.; and Sauer, Donald J., 4,923,826, Cl. 437-57.000.

Johenning, John B.; and Hall, Charles P., to Advanced Sleep Products. Waterbed mattress with baffle chambers. 4,922,563, Cl. 5-450.000.

John Guest Limited: *See*—
Guest, John D.; and Harde, Bo, 4,923,220, Cl. 285-39.000.

John Weyth & Brother Limited: *See*—
Crossley, Roger; and Heatherington, Kenneth, 4,923,991, Cl. 546-152.000.

John Zink Company: *See*—
Keller, Michael R.; and Holman, Richard J., 4,922,838, Cl. 110-234.000.

Johner, Gerhard, to Leybold Aktiengesellschaft. Powder recharging apparatus, especially for a coating apparatus operating in a vacuum chamber. 4,924,058, Cl. 219-121.470.

Johns, Bryan: *See*—
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; Curry, Sean; Lee, Scott; and Meyer, Dana, 4,924,505, Cl. 382-8.000.

Johnson, Arlyn: *See*—
Nichol, Thomas W.; Gisske, Edward T.; and Johnson, Arlyn, 4,923,201, Cl. 273-371.000.

Johnson, Donald A.: *See*—
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., 4,923,634, Cl. 252-389.200.

Johnson, Donald B.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.

Johnson, Donald D.: *See*—
Sanocki, Stephen M.; Johnson, Donald D.; and Fischer, Edward M., 4,923,332, Cl. 405-63.000.

Johnson, Duane R.: *See*—
Vander Molen, Gary L.; and Johnson, Duane R., 4,923,254, Cl. 303-13.000.

Johnson, Edgar G.; and Cornelison, James J., to ICN Micromedic Systems, Inc. Beta counting means and apparatus. 4,924,093, Cl. 250-328.000.

Johnson, Gary M.: *See*—
Chen, Zhitong; Johnson, Gary M.; Parkinson, Ward D.; Chern, Wen-Foo; Lowrey, Tyler A.; and Trent, Thomas M., 4,924,442, Cl. 365-189.110.

Johnson, Herbert C.: *See*—
Shifflet, Glenn; Johnson, Herbert C.; and Revenaugh, Paul W., 4,924,169, Cl. 320-21.000.

Johnson, Jerry E., to National-Oilwell. Valve with replaceable seal element. 4,922,957, Cl. 137-516.290.

Johnson, John L., to United States of America, Army. Rotating mirror optical scanning device. 4,923,263, Cl. 350-6.900.

Johnson, Neil R.; and Bovenkerk, Harold P., to General Electric Company. Novel grinding wheels utilizing polycrystalline diamond or cubic boron nitride grit. 4,923,490, Cl. 51-298.000.

Johnson, Robert R.: *See*—
Bluck, Raymond M.; Bush, Harold G.; and Johnson, Robert R., 4,923,751, Cl. 428-35.900.

Johnson, Sam E. Recoil pad. 4,922,641, Cl. 42-74.000.

Johnson, Walter A.: *See*—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,923,509, Cl. 420-401.000.

Johnston, William T., to Trailstar Manufacturing. Tailgate and tailgate seal. 4,923,074, Cl. 220-1.500.

Jonas, Rochus: *See*—
Prucher, Helmut; Jonas, Rochus; Piulats, Jaime; and Klockow, Michael, 4,923,869, Cl. 514-253.000.

Jones, Jerry F., to Co-Ex Plastics, Inc. Thermoplastic stretch-wrap material. 4,923,750, Cl. 428-349.000.

Jones, Kenneth R.; and Sindorf, John F., to Globe-Union Inc. Pressure vessel construction for a metal oxide-hydrogen battery. 4,923,769, Cl. 429-101.000.

Jones, Norman S., to Instruments and Movements Limited. Pneumatic oscillators. 4,922,962, Cl. 137-624.140.

Jones, Ralph D.: *See*—
Marontate, John D.; Jones, Ralph D.; and Lewis, Mark F., 4,922,987, Cl. 160-183.000.

Jones, Vincent L.: *See*—
Bailey, Wilbur M.; Hulderman, George H.; Jones, Vincent L.; Pikulski, Joseph L.; Standlee, Arlie G.; Tangonan, Gregory L.; Vince, Michael R.; and Wysocki, Joseph A., 4,924,087, Cl. 356-73.100.

Jones, William H.: *See*—
Decho, David R.; and Jones, William H., 4,924,213, Cl. 340-653.000.

Jorgensen, Charles A.; and Kline, Robert J., to Minnesota Mining and Manufacturing Company. Tape reel hub. 4,923,137, Cl. 242-68.500.

Joseph, Brian J., to Eastman Kodak Company. Roller transfer apparatus. 4,924,273, Cl. 355-312.000.

Joseph, J. Michael: *See*—
Grieb, John H.; Joseph, J. Michael; Weaver, Richard D.; and Bata, George T., 4,923,169, Cl. 251-118.000.

Joshi, David P., to Colgate-Palmolive Company. Hard translucent high moisture soap bar. 4,923,627, Cl. 252-108.000.

Jucha, Rhett B.; and Davis, Cecil J., to Texas Instruments Incorporated. Processing of etching refractory metals. 4,923,562, Cl. 156-643.000.

Juen, Masahiro, to Nikon Corporation. Still picture signal processing apparatus having high resolution image pickup device with 4-to-1 interlace. 4,924,313, Cl. 358-140.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Kriz, Ulrich, 4,923,321, Cl. 403-6.000.

Jung, Johann: *See*—
Schulz, Guenter; Buschmann, Ernst; Sauter, Hubert; Zeeh, Bernd; Wuerzer, Bruno; Jung, Johann; and Retzlaff, Guenter, 4,923,503, Cl. 71-92.000.

Junghans, Rudi, to Heidelberger Druckmaschinen Aktiengesellschaft. Wetting/inking mechanism for offset printing presses. 4,922,818, Cl. 101-148.000.

Jungwirth, Dieter: *See*—
Russwurm, Dieter; and Jungwirth, Dieter, 4,922,681, Cl. 52-737.000.

Junkosha Co., Ltd.: *See*—
Suzuki, Hirosuke, 4,923,410, Cl. 439-492.000.

K & A Design: *See*—
Klundt, Kalvin K., 4,923,426, Cl. 446-19.000.

K. Reinke, Jr. & Company: *See*—
Reinke, Karl L., Jr., 4,924,404, Cl. 364-464.040.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Okuno, Yoshihiro, 4,923,043, Cl. 192-70.120.
Uenohara, Norihisa, 4,923,046, Cl. 192-113.00A.

Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Izumori, Ken; and Sakai, Shuzo, 4,923,803, Cl. 435-26.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Hidaka, Sachio; Fujimoto, Yoshiaki; and Tani, Takao, 4,922,784, Cl. 74-527.000.
Koizumi, Yukio, 4,923,071, Cl. 212-266.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 4,923,383, Cl. 425-150.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Toru, Suzuki; Kato, Atsuhiko; Hosoi, Mitsuo; and Nakano, Ichiro, 4,924,153, Cl. 318-587.000.
Kabushiki Kaisha Meidensha: *See*—
Kawai, Seiji, 4,922,782, Cl. 74-479.000.
Kabushiki Kaisha N.M.B. Semiconductor: *See*—
Tamura, Takumi; Shinoda, Shosuke; Yamashita, Tetsuo; and Okashita, Kyohiko, 4,923,352, Cl. 414-225.000.
Kabushiki Kaisha Sangi: *See*—
Sakuma, Shuji; and Atsumi, Kiminori, 4,923,683, Cl. 424-52.000.
Kabushiki Kaisha Shisangyokaihatsu: *See*—
Kanai, Naritoshi; and Suzuki, Akira, 4,922,910, Cl. 128-642.000.
Kabushiki Kaisha Sigma: *See*—
Iimura, Kouichi, 4,923,430, Cl. 453-50.000.
Kabushiki Kaisha Tiyoda Seisakusho: *See*—
Toya, Matsumi; and Miyairi, Yasuyuki, 4,923,449, Cl. 604-245.000.
Kabushiki Kaisha Toshiba: *See*—
Atsumi, Shigeru; Yoshida, Toru; Kawahara, Yasuo; and Tanaka, Fuminari, 4,924,339, Cl. 361-56.000.
Endo, Kazuo; Noda, Noboru; and Mitani, Tatsuro, 4,924,281, Cl. 357-23.900.
Endoh, Kenjiro; and Yasuda, Osamu, 4,924,328, Cl. 360-60.000.
Enkaku, Motohiro; and Kato, Toshiya, 4,924,290, Cl. 357-68.000.
Hamaoka, Hiromi, 4,924,333, Cl. 360-75.000.
Iyogi, Kiyoshi; Nakahashi, Masako; Takeda, Hiromitsu; and Shirokane, Makoto, 4,924,033, Cl. 174-259.000.
Kato, Toshihiro; Kojima, Shinjiro; Emoto, Takao; and Matsumoto, Hiroshi, 4,924,351, Cl. 361-386.000.
Kawamoto, Hiromi; and Fujitsuka, Osamu, 4,924,186, Cl. 324-320.000.
Matsuda, Tetsuo; and Kunishima, Iwao, 4,923,715, Cl. 427-237.000.
Matsutani, Kinya, 4,924,185, Cl. 324-319.000.
Nakamura, Hiroki; Yamada, Takashi; and Ouchi, Yoshiaki, 4,923,763, Cl. 428-458.000.
Nambu, Kyojiro, 4,923,459, Cl. 606-130.000.
Nishiki, Masayuki, 4,924,487, Cl. 378-190.000.
Obara, Keiichi, 4,924,458, Cl. 370-58.100.
Ogura, Masahiko, 4,924,268, Cl. 355-219.000.
Ohno, Tatsuyuki, 4,924,121, Cl. 307-542.000.
Sato, Matsamitsu, 4,924,219, Cl. 340-825.490.
Takahashi, Yoshiya; Suda, Koichiro; and Itoyama, Katumi, 4,924,044, Cl. 200-314.000.
Tamaru, Kiichiro; Tanaka, Koichi; Kanuma, Akira; and Yamada, Yasuo, 4,924,469, Cl. 371-22.400.
Tanaka, Tsutomu, 4,924,075, Cl. 235-380.000.
Ukita, Teruhiko, 4,924,518, Cl. 381-41.000.
Uwai, Hiroshi, 4,924,217, Cl. 340-782.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Hamajima, Takanori; and Inaguma, Yukio, 4,924,123, Cl. 310-15.000.
Kabushiki Kaisha Yamashita Denshi Sekkei: *See*—
Yamashita, Yasushi, 4,924,315, Cl. 358-160.000.
Kabushiki Kaisya Advance: *See*—
Takeuchi, Mitsunori; and Sasaki, Minoru, 4,922,906, Cl. 128-419.00R.
Kadoma, Yoshinori: *See*—
Masuhara, Eiichi; Kadoma, Yoshinori; Matsumoto, Takeo; Komai, Takeshi; Yamada, Eiichi; Nakachi, Osamu; and Irukayama, Godo, 4,923,905, Cl. 522-24.000.
Kadomukai, Yuzo; Yamakado, Makoto; and Nakamura, Yozo, to Hitachi, Ltd. Torque controlling apparatus for internal combustion engine. 4,922,869, Cl. 123-192.00R.
Kadono, Yoji: *See*—
Iida, Kosuke; Yamato, Hiroshi; and Kadono, Yoji, 4,923,718, Cl. 427-386.000.
Kadota, Yasushi; and Nishida, Yoshikazu, to Koyo Seiko Co., Ltd. Chain or belt tensioner with a one-way clutch. 4,923,435, Cl. 474-112.000.
Kaempf, Ulrich: *See*—
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,923,353, Cl. 414-226.000.
Kaes, Guenter; and Stegmaier, Alwin, to Robert Bosch GmbH. Electrically controllable 3-way valve. 4,922,966, Cl. 137-627.500.
Kagizaki, Masami: *See*—
Hara, Ryuichi; Kagizaki, Masami; Takakura, Tsuyoshi; and Tomono, Shigeki, 4,923,648, Cl. 264-29.200.
Kai Cutlery Center Co., Ltd.: *See*—
Machida, Naoyoshi, 4,922,614, Cl. 30-339.000.
Kai, Yasuyoshi: *See*—
Eshima, Taizo; and Kai, Yasuyoshi, 4,923,386, Cl. 425-450.100.
Kaibori, Takesi: *See*—
Miki, Nobuhiro; Fukudome, Toshiro; and Kaibori, Takesi, 4,923,530, Cl. 148-26.000.
Kainoh, Yoichi: *See*—
Ninomiya, Yasuo; Musa, Yoshikazu; Kainoh, Yoichi; and Komamura, Chiaki, 4,923,607, Cl. 210-490.000.
Kaiser, Gunther; Klotzner, Winfried; Krauter, Immanuel; and Jeenicke, Edmund, to Robert Bosch GmbH. Vehicle control system with HSO-triggered output. 4,924,399, Cl. 364-431.030.
Kaji, Yasumasa; and Takaki, Toru, to Nippondenso Co., Ltd. Intake arrangement for internal combustion engine. 4,922,879, Cl. 123-494.000.
Kajima Corporation: *See*—
Kobori, Takuji; Yamada, Shunichi; and Kamagata, Shuichi, 4,922,667, Cl. 52-167.0DF.
Kajiwaca, Ikuo: *See*—
Saito, Yoshihiro; Wada, Nobuhide; Kusano, Shoji; Miyazawa, Takeshige; Takahashi, Satoru; Toyokawa, Yasuhumi; and Kajiwaca, Ikuo, 4,923,501, Cl. 71-92.000.
Kajiyama, Kazuyuki: *See*—
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 4,923,383, Cl. 425-150.000.
Kaldenhoven, Lambert C. I., to U.S. Philips Corporation. Low pressure mercury vapor discharge lamp. 4,924,142, Cl. 313-490.000.
Kali-Chemie Pharma GmbH: *See*—
Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen, 4,924,004, Cl. 548-431.000.
Kalnes, Tom N.; and James, Robert B., Jr., to UOP. Process for treating a temperature-sensitive hydrocarbonaceous stream containing a non-distillable component to produce a hydrogenated distillable hydrocarbonaceous product. 4,923,590, Cl. 208-85.000.
Kamagata, Shuichi: *See*—
Kobori, Takuji; Yamada, Shunichi; and Kamagata, Shuichi, 4,922,667, Cl. 52-167.0DF.
Kaman Instrumentation Corporation: *See*—
Holmgren, William A., 4,924,172, Cl. 324-664.000.
Kameda, Keiichi; Takahashi, Kenichi; Horigami, Kouichi; and Iitsuka, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Apparatus with selection circuitry for distributing data blocks from external memory to processing units according to attribute data contained in each data block. 4,924,426, Cl. 364-900.000.
Kameda, Yukihiko; and Horii, Satoshi, to Takeda Chemical Industries, Ltd. Valiolamine derivatives and production thereof. 4,923,975, Cl. 536-17.900.
Kamimura, Hiroto; Kubota, Shuichi; and Iwakura, Masaru, to Oiles Corporation. Thrust bearing made of synthetic resin. 4,923,312, Cl. 384-420.000.
Kamiyama, Koji: *See*—
Okazaki, Yoji; and Kamiyama, Koji, 4,923,277, Cl. 350-96.290.
Kamp, Ewald A., to First Brands Corporation. Single hinge interlocking closure profile configuration. 4,922,588, Cl. 24-576.000.
Kamyr AB: *See*—
Backlund, Ake; Ferritsius, Olof; and Tistad, Goran, 4,922,989, Cl. 162-24.000.
Kan, Kojiro; and Kaneko, Isao, to Mitsui Petrochemical Industries, Inc. Polyaminobisimide resin from bis(anilino propylene) benzene. 4,923,959, Cl. 528-322.000.
Kanai, Naritoshi; and Suzuki, Akira, to Aisin Seiki Kabushiki Kaisha; and Kabushiki Kaisha Shisangyokaihatsu. Cannula having an electrode. 4,922,910, Cl. 128-642.000.
Kanashima, Keinosuke: *See*—
Fukushima, Tetsuo; Inoue, Takao; and Kanashima, Keinosuke, 4,923,552, Cl. 156-273.700.
Kanda, Kazunori; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Polymeric microparticles having pesticidal activity. 4,923,894, Cl 514-493.000.
Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Iwahara, Takahisa; and West, Robert C., 4,923,949, Cl. 528-33.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Hirose, Toshifumi; and Isayama, Katsuhiko, 4,923,927, Cl. 525-100.000.
Kaneko, Hideo; and Nishigaki, Hideo, to Fuji Electric Co., Ltd. Fuel cell power generation system. 4,923,768, Cl. 429-19.000.
Kaneko, Isao: *See*—
Kan, Kojiro; and Kaneko, Isao, 4,923,959, Cl. 528-322.000.
Kaneko, Katsuhiro: *See*—
Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, 4,923,765, Cl. 428-694.000.
Kanno, Toshiaki: *See*—
Yagi, Kiyoshi; Kanno, Toshiaki; and Inada, Toshio, 4,923,637, Cl. 252-511.000.
Kansai Paint Company, Limited: *See*—
Isozaki, Osamu; Nakai, Noboru; Ito, Satoru; and Takami, Seiji, 4,923,945, Cl. 528-16.000.
Iwasawa, Naozumi; and Isozaki, Osamu, 4,923,930, Cl. 525-168.000.
Kantner, Robert C.: *See*—
Newkirk, Marc S.; and Kantner, Robert C., 4,923,832, Cl. 501-128.000.
Kanto, Jumpei: *See*—
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.000.
Kutsukake, Masaki; and Kanto, Jumpei, 4,923,846, Cl. 503-227.000.
Kanuma, Akira: *See*—
Tamaru, Kiichiro; Tanaka, Koichi; Kanuma, Akira; and Yamada, Yasuo, 4,924,469, Cl. 371-22.400.
Kanzaki Kokyukoki Mfg. Co. Ltd.: *See*—
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,922,787, Cl. 475-83.000.
Kao, Chung-Chen. Car fender with brake light device. 4,924,209, Cl. 340-479.000.
KAO Corporation: *See*—
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko;

Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.
Kao, Sun-Chueh; Cann, Kevin J.; Karol, Frederick J.; Marcinkowsky, Arthur E.; Goode, Mark G.; and Theobald, Eugene H., to Union Carbide Chemicals and Plastics Company Inc. Catalyst for regulating the molecular weight distribution of ethylene polymers. 4,923,938, Cl. 526-133.000.
Karakida, Kenichi: *See*—
Yagi, Shigeru; Ono, Masato; Takahashi, Noriyoshi; Nishikawa, Masayuki; Fukuda, Yuzuru; and Karakida, Kenichi, 4,923,773, Cl. 430-57.000.
Karasek, Keith R.; Olson, William L.; and Donner, Jeffry T., to Allied-Signal Inc. Method of coating silicon carbide fibers. 4,923,719, Cl. 427-387.000.
Karger, Paul: *See*—
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, 4,924,513, Cl. 380-21.000.
Kariya, Yosinobu: *See*—
Matsuki, Yasuo; Kariya, Yosinobu; Endo, Masayuki; Ikeda, Hiroharu; and Hosaka, Yoshihiro, 4,923,948, Cl. 528-26.000.
Karlan, Sidney: *See*—
Wachman, Stanley L.; and Karlan, Sidney, 4,923,899, Cl. 514-642.000.
Karlovits, Frank K., to Eaton Corporation. Making ice in a refrigerator. 4,923,494, Cl. 62-73.000.
Karne, Ramesh K.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V., Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.
Karo Maeda: *See*—
Maeda, Karo; and Ando, Satoshi, 4,923,450, Cl. 604-265.000.
Karol, Frederick J.: *See*—
Kao, Sun-Chueh; Cann, Kevin J.; Karol, Frederick J.; Marcinkowsky, Arthur E.; Goode, Mark G.; and Theobald, Eugene H., 4,923,938, Cl. 526-133.000.
Karspeck, Milan: *See*—
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; Curry, Sean; Lee, Scott; and Meyer, Dana, 4,924,505, Cl. 382-8.000.
Kase, Hiroshi: *See*—
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.
Kashimura, Masahiko, to NEC Corporation. Programmable logic array with interfacial plane. 4,924,118, Cl. 307-468.000.
Kashiwa, Norio: *See*—
Kioka, Mamoru; and Kashiwa, Norio, 4,923,833, Cl. 502-9.000.
Kashiwagi, Hiroshi: *See*—
Tamura, Kohji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, 4,923,626, Cl. 252-67.000.
Kashiwagi, Teiichi, to Hitachi, Ltd. Document processing apparatus having shading process function. 4,924,411, Cl. 364-518.000.
Kashiwamura, Kazuo: *See*—
Kazumoto, Yoshio; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,923,722, Cl. 62-6.000.
Kashiwazaki, Takashi: *See*—
Ando, Hitoshi; Kashiwazaki, Takashi; Hosoi, Masayuki; and Fukushima, Atsuhiko, 4,924,402, Cl. 364-449.000.
Kashyap, Raman; Reeve, Michael H.; Cassidy, Stephen A.; and Hornung, Stephen, to British Telecommunications public limited company. Temperature desensitization of delay in optical fibres. 4,923,278, Cl. 350-96.300.
Kasubick, Robert: *See*—
Francis, Daniel L.; and Kasubick, Robert, 4,923,876, Cl. 514-283.000.
Katahira, Kiyoshi: *See*—
Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, 4,923,027, Cl. 180-219.000.
Kataoka, Hiroshi; and Fukuda, Kyohei, to Hitachi, Ltd. Lens system for projection type television. 4,924,244, Cl. 350-432.000.
Katayama, Hideo; Yoshida, Yoshiaki; and Osaka, Tatsuhiko, to Daikin Industries, Ltd. Enzyme electrode unit. 4,923,586, Cl. 204-403.000.
Katayose, Teruo; and Oda, Hiroji, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyphenylene ether resin comprising chloroform extractable/nonextractable polyphenylene ether resin. 4,923,932, Cl. 525-391.000.
Kathrein, Hendrik: *See*—
Rodi, Fritz; Kiemle, Peter; Eiling, Aloys; and Kathrein, Hendrik, 4,923,519, Cl. 106-459.000.
Kato, Atsuhiko: *See*—
Toru, Suzuki; Kato, Atsuhiko; Hosoi, Mitsuo; and Nakano, Ichiro, 4,924,153, Cl. 318-587.000.
Kato, Hirohiko; Mihayashi, Keiji; and Aikawa, Kazuhiro, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,923,790, Cl. 430-523.000.
Kato, Iwao, to Brother Kogyo Kabushiki Kaisha. Electric motor. 4,924,124, Cl. 310-43.000.
Kato, Masayuji; Igaki, Seigo; Yamagishi, Fumio; Ikeda, Hiroyuki; Shinzaki, Takashi; and Eguchi, Shin, to Fujitsu Limited. Uneven-surface data detection apparatus. 4,924,085, Cl. 250-227.280.
Kato, Michio: *See*—
Iwao, Hideki; Kato, Michio; and Yamano, Shuichi, 4,924,479, Cl. 375-7.000.
Kato, Toshihiro; Kojima, Shiajiro; Emoto, Takao; and Matsumoto, Hiroshi, to Kabushiki Kaisha Toshiba. Recessed thermally conductive packaged semiconductor devices. 4,924,351, Cl. 361-386.000.
Kato, Toshiya: *See*—
Enkaku, Motohiro; and Kato, Toshiya, 4,924,290, Cl. 357-68.000.
Kato, Yoshihiro: *See*—
Mizoguchi, Kenji; Takeuchi, Hitoshi; Nishigaki, Yoshiyasu; Kato, Yoshihiro; and Sakakibara, Shinichi, 4,922,876, Cl. 123-470.000.
Katogi, Hisao: *See*—
Ishikawa, Kazushi; Yamamoto, Shinsaku; and Katogi, Hisao, 4,924,083, Cl. 250-223.00B.
Katoh, Kazunobu: *See*—
Yagihara, Morio; Matushita, Tetunori; Ukai, Toshinao; and Katoh, Kazunobu, 4,923,789, Cl. 430-517.000.
Katou, Hitoshi: *See*—
Takahashi, Takehiko; and Katou, Hitoshi, 4,923,208, Cl. 280-642.000.
Katsura, Yoshiro: *See*—
Fukasawa, Hiromichi; Katsura, Yoshiro; and Hagiwara, Kazuhiko, 4,923,679, Cl. 422-48.000.
Katsuta, Tetsuro: *See*—
Nozaka, Yoshiki; Katsuta, Tetsuro; and Miyama, Hiroshi, 4,922,821, Cl. 101-425.000.
Katz, Lawrence E.: *See*—
Canterberry, J. B.; and Katz, Lawrence E., 4,923,536, Cl 149-19.400.
Katz, Louis: *See*—
Wuchinich, David G.; Krawitt, Donald R.; Brendolan, Robert; and Katz, Louis, 4,922,902, Cl. 604-22.000.
Katz, Sol: *See*—
Lienard, Jean; Haesebrouck, Francis; Katz, Sol; Abolins, Andrew; and Schmidt, George, 4,922,832, Cl. 105-4.200.
Katzer, James R.: *See*—
Graziani, Kenneth R.; Katzer, James R.; and Kyan, Chwan P., 4,923,591, Cl. 208-111.000.
Kauffman, James W.: *See*—
Brand, John R.; Brownbridge, Thomas I.; and Kauffman, James W., 4,923,518, Cl. 106-429.000.
Kaufman, Herbert E. Eye treatment suspension. 4,923,699, Cl 424-427.000.
Kaufman, Herbert E. Artificial tear suspension 4,923,700, Cl. 424-427.000.
Kaufman, Lance R. Direct bond circuit assembly with crimped lead frame. 4,924,292, Cl. 357-70.000.
Kaukeinen, Joseph Y., to Eastman Kodak Company. Fiber optic array. 4,923,275, Cl. 350-96.240.
Kaupmann, Wilhelm: *See*—
Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen, 4,924,004, Cl. 548-431.000.
Kaveckis, Stanley P.: *See*—
Rettig, John B.; Lueker, Jonathan; Carlson, John E.; Kaveckis, Stanley P.; and Lewallen, Roy W., 4,924,110, Cl. 307-227.000.
Kawabata, James, to Contour Saws, Inc. Band saw for cutting shaped pieces of bar stock. 4,922,777, Cl. 83-452.000.
Kawagoe, Shigeyuki; and Furuya, Yoshikatu, to Aisin Seiki Kabushiki Kaisha. Window apparatus for vehicle. 4,923,232, Cl. 292-263.000.
Kawaguchi, Gaku: *See*—
Horikita, Hiroyuki; Hattori, Nobuo; Takagi, Yahei; Kawaguchi, Gaku; and Maeda, Toshihiro, 4,923,812, Cl. 435-158.000.
Kawaguchi, Hideki: *See*—
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,922,861, Cl. 122-448.00R.
Kawahara, Eiichiro: *See*—
Furumoto, Mistumasa; Kawahara, Eiichiro; and Ikejiri, Kenichi, 4,922,717, Cl. 60-456.000.
Furumoto, Mitsumasa; Kawahara, Eiichiro; and Koyama, Takashi, 4,922,715, Cl. 60-329.000.
Kawahara, Yasuo: *See*—
Atsumi, Shigeru; Yoshida, Toru; Kawahara, Yasuo; and Tanaka, Fuminari, 4,924,339, Cl. 361-56.000.
Kawai, Masanori: *See*—
Honda, Kazuhiro; Yamashita, Kouji; Kawai, Masanori; Nakahi, Kazuo; and Tatetsuki, Kuniharu, 4,924,237, Cl. 343-702.000.
Kawai, Seiji, to Doryokuro Kakunenryo Kaihatsu Jigyodan; and Kabushiki Kaisha Meidensha. Manipulator shoulder mechanism. 4,922,782, Cl. 74-479.000.
Kawai, Yoshio: *See*—
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,923,881, Cl. 514-311.000.
Kawakami, Makoto: *See*—
Nakamura, Yasuyuki; Hashimoto, Akio; Fujita, Toshiaki; and Kawakami, Makoto, 4,923,100, Cl. 228-117.000.
Kawakami, Tatsuo: *See*—
Uzaki, Nobuyuki; Ishii, Hiroaki; Tsuchiya, Ichiro; Oguchi, Yukio; and Kawakami, Tatsuo, 4,923,831, Cl. 501-108.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Kawakami, Yasushi: *See—*
Hirata, Keiichi; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; Ikeda, Yoshie; and Kawakami, Yasushi, 4,924,433, Cl. 364-900.000.

Kawamoto, Hiromi; and Fujitsuka, Osamu, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging system with auxiliary compensation coil. 4,924,186, Cl. 324-320.000.

Kawamoto, Isao: *See—*
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asasno, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.

Kawamoto, Iwaji: *See—*
Matsuo, Hiroto; Kawamoto, Iwaji; Ishihara, Masamichi; and Nakagawa, Takaaki, 4,922,993, Cl. 164-104.000.

Kawamoto, Takao: *See—*
Kunimune, Kouichi; Kikuta, Kazutsune; Kawamoto, Takao; and Konotsune, Shiro, 4,923,968, Cl. 528-353.000.

Kawamura, Hideaki; Sasaki, Takao; and Matsuura, Shuji, to Fanuc Ltd. Numerical control method and system therefor having override playback function. 4,924,403, Cl. 364-474.220.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Tamba, Shinichi; and Ueda, Yoshiteru, 4,922,881, Cl. 123-572.000.

Kawasaki, Katsuyoshi: *See—*
Shimoyama, Hiroshi; and Kawasaki, Katsuyoshi, 4,923,026, Cl. 180-215.000.

Kawasaki Refractories Company Ltd.: *See—*
Uzaki, Nobuyuki; Ishii, Hiroaki; Tsuchiya, Ichiro; Oguchi, Yukio; and Kawakami, Tatsuo, 4,923,831, Cl. 501-108.000.

Kawasaki Steel Corporation: *See—*
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.

Kawashiro, Masayuki: *See—*
Yamaguchi, Nobuyuki; and Kawashiro, Masayuki, 4,923,140, Cl. 242-230.000.

Kawasumi Kagaku Kogyo Kabushiki Kaisha: *See—*
Toya, Matsumi; and Miyairi, Yasuyuki, 4,923,449, Cl. 604-245.000.

Kay, Alexander: *See—*
Sergel, Horst; Aschemann, Dieter; Gerloff, Klaus; Kay, Alexander; and Wedemeyer, Lutz, 4,922,751, Cl. 73-146.000.

Kayakiri, Hiroshi: *See—*
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,923,881, Cl. 514-311.000.

Kayano, Masahiro: *See—*
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,922,861, Cl. 122-448.00R.

Kaywood, Roy G.: *See—*
Arnold, Philip D.; and Kaywood, Roy G., 4,922,785, Cl. 74-567.000.

Kazarinov, Rudolf F.: *See—*
Henry, Charles H.; Kazarinov, Rudolf F.; Kistler, Rodney C.; Orlowsky, Kenneth J.; Shani, Yosi; and Sudbo, Aasmund S., 4,923,271, Cl. 350-96.190.

Kazumoto, Yoshio; Furuishi, Yoshiro; and Kashiwamura, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Stirling refrigerator with nonlinear braking spring. 4,922,722, Cl. 62-6.000.

Keeler, Preston J., III: *See—*
Vasconcellos, Alfred V.; and Keeler, Preston J., III, 4,923,438, Cl. 604-4.000.

Keesen, Heinz-Werner: *See—*
Hartnack, Wolfgang; Keesen, Heinz-Werner; and Schutze, Herbert, 4,924,309, Cl. 358-133.000.

Keisei Medical Industrial Company Limited: *See—*
Uetake, Tsuyoshi; and Ueno, Iwao, 4,922,904, Cl. 606-226.000.

Kelch Corp.: *See—*
Blomquist, James E.; and Larson, Robert M., 4,922,954, Cl. 137-493.000.

Keller, Jakob, to BBC Brown Boveri AG. Low-frequency muffler. 4,923,035, Cl. 181-228.000.

Keller, Michael R.; and Holman, Richard J., to John Zink Company. Thermal processor for solid and fluid waste materials. 4,922,838, Cl. 110-234.000.

Kelley Company Inc.: *See—*
Hageman, Martin P., 4,922,568, Cl. 14-71.300.

Kelley, Gerard F.; and Hach, Larry R., to General Motors Corporation. Motor driver protection circuit. 4,924,158, Cl. 318-434.000.

Kelly, Jr., Joseph L.; and Welsh, Michael F., to Hughes Tool Company. Rock bit with rigid face seals and recessed energizers. 4,923,020, Cl. 175-372.000.

Kemira, Inc.: *See—*
Roberts, George L.; and Lawhorne, Earl R., 4,923,682, Cl. 423-611.000.

Kemmler, Lothar, to Samson AG. Pneumatic control valve. 4,922,952, Cl. 137-382.000.

Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation. Spherical light metal based powder particles and process for producing same. 4,923,509, Cl. 420-401.000.

Keneavy, Bernie, to Coil Matic, Inc. Collecting vessels for collecting refrigerants from heat exchange systems and methods. 4,922,973, Cl. 141-4.000.

Kennametal Inc.: *See—*
Horne, John G.; Dornfeld, David A.; and McMillen, Keith A., 4,922,754, Cl. 73-587.000.

Kennedy, Ronald R., Manzitti, Michael T.; Bennett, Frank E.; Stout, John F.; and Vellam, Anthony M., to Linear Dynamics, Inc. Apparatus for applying tape to pavement. 4,923,559, Cl. 156-523.000.

Kennedy, W. David: *See—*
Sprunt, Eve S.; Davis, R. Michael; Kennedy, W. David; and Collins, Samuel H., 4,924,187, Cl. 324-376.000.

Kent, Edward C.; and Long, Charles E. Wing extension for roof ladder. 4,923,049, Cl. 182-45.000.

Kent, John M. Method and apparatus for using hazardous waste to form non-hazardous aggregate. 4,922,841, Cl. 110-346.000.

Kerdraon, Alain L.: *See—*
Aubry, Julien; Durand, Richard J.; Kerdraon, Alain L.; and Solve, Gerard, 4,922,825, Cl. 102-476.000.

Kern, Jeffrey A.; and Hoffman, Roger L., to General Electric Company. Reversible turbine pump. 4,923,366, Cl. 415-152.100.

Kerr-McGee Chemical Corporation: *See—*
Brand, John R.; Brownbridge, Thomas I.; and Kauffman, James W., 4,923,518, Cl. 106-429.000.

Kessler, Henri: *See—*
Travers, Christine; Raatz, Francis; Guth, Jean-Louis; and Kessler, Henri, 4,923,835, Cl. 502-66.000.

Kettelhoit, Johannes; Kunne, Hans W.; and Schroder, Erhard, to D.I.S. Versand Service GmbH. Laminating device for manufacturing identification cards. 4,923,556, Cl. 156-498.000.

Khan, Tasadduq; and Caron, Pierre, to Office National D'Etudes et de Recherches Aerospatiales. Nickel based monocrystalline superalloy, method of heat treating said alloy, and parts made therefrom. 4,923,525, Cl. 148-3.000.

Kho, Tiong Hap (Hans): *See—*
Fletcher, Eldon L.; and Kho, Tiong Hap (Hans), 4,923,004, Cl. 165-175.000.

Khulbe, Chandra P.; Belinko, Keith; Waugh, Richard J.; and Perreault, Michel, to Petro-Canada Inc. Process for preparing an iron-coal slurry catalyst for hydrocracking heavy oils. 4,923,838, Cl. 502-151.000.

Kiba, Yasuo: *See—*
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000.

Kidder, Kenneth B.: *See—*
Adams, Wilmer L.; Bartels, James I.; Black, Robert A., Jr.; Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,923,117, Cl. 236-94.000.

Kido, Shigeru: *See—*
Saitoh, Izumi; Kido, Shigeru; Doi, Yoshio; and Egawa, Shohei, 4,923,893, Cl. 514-458.000.

Kiefer, Kevin W.; and Satterness, Cynthia J., to Thermo King Corporation. Refrigerated truck having a body movable relative to a chassis. 4,923,237, Cl. 296-24.100.

Kiely, John S.: *See—*
Hutt, Marland P., Jr.; and Kiely, John S., 4,923,879, Cl. 514-300.000.

Kiemle, Peter: *See—*
Rodi, Fritz; Kiemle, Peter; Eiling, Aloys; and Kathrein, Hendrik, 4,923,519, Cl. 106-459.000.

Kienzler, Dieter: *See—*
Grob, Ferdinand; Linder, Ernst; Kienzler, Dieter; Potschin, Roger; and Stutzenberger, Heinz, 4,922,714, Cl. 60-276.000.

Kikkoman Corporation: *See—*
Akao, Takeshi; Nishizawa, Yoshihiko; Yamada, Shiro; Fuse, Hisahumi; Ohsaki, Katsumichi; and Sakai, Morihiko, 4,922,650, Cl. 47-1.100.

Kikuta, Kazutsune: *See—*
Kunimune, Kouichi; Kikuta, Kazutsune; Kawamoto, Takao; and Konotsune, Shiro, 4,923,968, Cl. 528-353.000.

Killian, Thomas M.; and Wisneski, Tony J., to Kimberly-Clark Corporation. Elastomeric polyether block amide nonwoven web. 4,923,742, Cl. 428-283.000.

Kimberly-Clark Corporation: *See—*
Killian, Thomas M.; and Wisneski, Tony J., 4,923,742, Cl. 428-283.000.
Nohr, Ronald S.; and MacDonald, J. Gavin, 4,923,914, Cl. 524-99.000.
Proxmire, Deborah L., 4,923,456, Cl. 604-391.000.
Warner, Steven B., 4,923,549, Cl. 156-229.000.

Kimura, Akira: *See—*
Inaba, Hiromi; Nakamura, Kiyoshi; Kimura, Akira; Hokari, Sadao; and Oouchi, Naoyuki, 4,924,373, Cl. 363-95.000.

King, Francis C.: *See—*
Agee, John M.; and King, Francis C., 4,922,896, Cl. 606-55.000.

King, James P., to Desilube Technology, Inc. Lubricant compositions. 4,923,625, Cl. 252-32.500.

King, John A.; and Staber, Harley J., to Siecor Corporation. Humidity resistant meter reading device. 4,924,407, Cl. 364-480.000.

King, Willella. Hearth concussion barrier. 4,922,891, Cl. 126-544.000.

Kiniczky, Marta: *See—*
Szejtli, Jozsef; Tetenyi, Peter; Kiniczky, Marta; Bernath, Jeno; Tetenyi nee Erdosi, Magda; Dobos, Eva; and Banky nee Elod, Erzsebet, 4,923,853, Cl. 514-58.000.

Kinnan, Frank R., to Underground Technologies, Inc. Self-propelled subsoil penetrating tool system. 4,923,134, Cl. 242-54.00R.

Kinsley, Homan B., Jr., to James River Corporation. Method and apparatus for the manufacture of fibrids. 4,923,646, Cl. 264-13.000.

Kinze Manufacturing, Inc.: *See—*
Meek, Roger L.; and Barry, Alan F., 4,923,017, Cl. 172-776.000.

Kioka, Mamoru; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Catalyst for olefin polymerization and processes for its production. 4,923,833, Cl. 502-9.000.

Kioritz Corporation: *See—*
Kumagai, Seiichiro; Kono, Michikata; Okai, Masakazu; and Inaga, Hisashi, 4,922,865, Cl. 123-65.0VC.
Ohkanda, Masao, 4,922,868, Cl. 123-179.00P.

Kira Machinery Co., Ltd.: *See—*
Hattori, Takahiro; Kojima, Yoshinobu; and Yamada, Masayuki, 4,922,595, Cl. 29-40.000.

Kirch, Steven J.; Lankard, John R.; Ritsko, John J.; Smith, Kurt A.; Speidell, James L.; and Yeh, James T. High energy laser mask and method of making same. 4,923,772, Cl. 430-5.000.

Kirin Beer Kabushiki Kaisha: *See—*
Ishikawa, Kazushi; Yamamoto, Shinsaku; and Kategi, Hisao, 4,924,083, Cl. 250-223.00B.

Kirk, Charles S.: *See—*
Gilmore, James F.; Lloyd, Carl A.; and Kirk, Charles S., 4,924,477, Cl. 374-55.000.

Kirrmann, Hubert, to BBC Brown Boveri AG. Multiprocessor system with several processors equipped with cache memories and with a common memory. 4,924,379, Cl. 364-200.000.

Kirschner, Jonathan; and Hughes, Robert D., IV, to Coca-Cola Company, The. Binary syrup metering system for beverage dispensing. 4,923,092, Cl. 222-129.400.

Kiryu, Naohiko: *See—*
Maruyama, Hiroshi; Kiryu, Naohiko; and Minezaki, Etsuko, 4,923,727, Cl. 428-40.000.

Kishbaugh, Dennis L.: *See—*
Mottur, George P.; Cope, Hilbert J., Jr.; Kishbaugh, Dennis L.; Luebbers, Michael J.; and Peters, Norman E., 4,923,705, Cl. 426-438.000.

Kiske, Siegfried; Haase, Thorsten; Leyer, Thomas; and Sauer, Wolfgang, to Dragerwerk Aktiengesellschaft. Pumping arrangement for supplying a ventilating apparatus with breathing gas. 4,922,900, Cl. 128-202.270.

Kiss, Zoltan J., to Chronar Corp. Wide ranging photovoltaic laminates comprising particulate semiconductors. 4,923,524, Cl. 136-250.000.

Kistler, Rodney C.: *See—*
Henry, Charles H.; Kazarinov, Rudolf F.; Kistler, Rodney C.; Orlowsky, Kenneth J.; Shani, Yosi; and Sudbo, Aasmund S., 4,923,271, Cl. 350-96.190.

Kita, Masahiro: *See—*
Negoro, Ikuo; and Kita, Masahiro, 4,924,266, Cl. 355-205.000.

Kitagawa Industries Co., Ltd.: *See—*
Matsui, Kazuhiro; and Ito, Fuminori, 4,923,153, Cl. 248-74.100.

Kitagawa, Katugi; and Shinozuka, Akira, to Somar Corporation. Epoxy resin powder coating composition with excellent adhesibility. 4,923,910, Cl. 523-428.000.

Kitahara, Satoru; Yasuda, Koichi; and Izu, Toshio, to TDK Corporation. Split bobbin and coil device. 4,924,200, Cl. 336-65.000.

Kitahara, Toshihiro: *See—*
Hashimoto, Akihiko; Kitahara, Toshihiro; Hashi, Hiroshi; and Rokutan, Takao, 4,924,199, Cl. 235-494.000.

Kitamura, Hiroyuki, to Victor Company of Japan, Ltd. Method and apparatus for predictive coding. 4,924,298, Cl. 358-12.000.

Kitamura, Mamoru, to Mitsubishi Denki Kabushiki Kaisha. Memory card housing a semiconductor device. 4,924,076, Cl. 235-492.000.

Kitazawa, Shooji: *See—*
Fukuda, Yasuhiro; and Kitazawa, Shooji, 4,924,280, Cl. 357-23.800.

Kitazawa, Yasunori: *See—*
Yamaguchi, Koshiro; Takahashi, Toshio; Kitazawa, Yasunori; and Hattori, Hiroshi, 4,923,315, Cl. 400-120.000.

Kitazume, Masahiro; Aoki, Makoto; Nogi, Hiroshi; Homma, Kazuya; and Matsuzawa, Shigemi, to Tokyo Keiki Co., Ltd. Flatness integrating/recording apparatus. 4,922,752, Cl. 73-146.000.

Kitoh, Shinya: *See—*
Suzuki, Kunitomo; Kiyohara, Takao; and Kitoh, Shinya, 4,923,400, Cl. 433-226.000.

Kiyohara, Takao: *See—*
Suzuki, Kunitomo; Kiyohara, Takao; and Kitoh, Shinya, 4,923,400, Cl. 433-226.000.

Klaeger, Joseph H., to Whicomb, Gail. Power driven, positive displacement, combustion chamber for production of mixtures of steam and exhaust gases. 4,922,875, Cl. 123-46.0SC.

Klasson, Bo; and Kristinsson, Ossur, to Ossur Hf. Sleeve-shaped article, particularly for amputation stumps. 4,923,474, Cl. 623-33.000.

Klein, Hans-Christof: *See—*
Belart, Juan; and Klein, Hans-Christof, 4,923,256, Cl. 303-114.000.

Klein, Scott I.: *See—*
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,924,010, Cl. 549-355.000.

Klein, Siegfried. Electroacoustic transducer. 4,924,503, Cl. 381-190.000.

Klein, Theodor, to Theodor Grabener Pressensysteme GmbH & Co. KG. Press for producing precision parts from powdered material. 4,923,382, Cl. 425-78.000.

Kleiner, Hans-Jerg: *See—*
Muller, Wolf-Dieter; and Kleiner, Hans-Jerg, 4,923,996, Cl. 548-402.000.

Klemarczyk, Philip, to Loctite Corporation. Novel siloxane maleimides. 4,923,997, Cl. 548-406.000.

Kline, Robert J.: *See—*
Jorgensen, Charles A.; and Kline, Robert J., 4,923,137, Cl. 242-68.500.

Klischat, Ditmar, to Gelenkwellenbau GmbH. Disengageable coupling. 4,923,320, Cl. 403-5.000.

Klobucar, W. Dirk; Nugent, Adam, Jr.; and Zumstein, Ronald C., to Ethyl Corporation. Production of particulate polyimide polymers. 4,923,954, Cl. 528-183.000.

Klockow, Michael: *See—*
Prucher, Helmut; Jonas, Rochus; Piulats, Jaime; and Klockow, Michael, 4,923,869, Cl. 514-253.000.

Klodowski, Harry F., to Carrier Corporation. Method and apparatus for refrigerant testing in a closed system. 4,923,806, Cl. 436-39.000.

Klos-Hein, Karl; and Rumpf, Horst H., to U.S. Philips Corporation. Magnetic-tape-cassette apparatus comprising a motor-driven axially movable servo rod. 4,924,336, Cl. 360-105.000.

Klose, Odo, to Gebr. Happich GmbH. Passenger covering for motor vehicle or the like. 4,923,211, Cl. 280-727.000.

Klosin, John J.; and Venezia, J. William, to Homac Mfg. Company. Flat cable sealing element. 4,924,038, Cl. 174-135.000.

Kloss, Guenter: *See—*
Fink, Manfred; Schreiber, Wolfgang; Ludwig, Manfred; Hald, Ewald; and Kloss, Guenter, 4,923,047, Cl. 192-150.000.

Klotzner, Winfried: *See—*
Kaiser, Gunther; Klotzner, Winfried; Krauter, Immanuel; and Jeenicke, Edmund, 4,924,399, Cl. 364-431.030.

Klundt, Kalvin K., to K & A Design. Bubble beard toy. 4,923,426, Cl. 446-19.000.

Kneller, James F.: *See—*
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., 4,923,634, Cl. 252-389.200.

Knoch, Martin; Reul, Helmut; and Rau, Gunter, to B. Braun Melsungen AG. Cardiac valve prosthesis. 4,923,465, Cl. 623-2.000.

Knofel, Hartmut; Brockelt, Michael; Petinaux, Marcel; and Uchdorf, Rudolf, to Bayer Aktiengesellschaft. Process for the production of polynuclear aromatic polyamines. 4,924,028, Cl. 564-331.000.

Koba, Yoshinori. Method of mending defective wood plate. 4,922,978, Cl. 144-332.000.

Kobashi, Toshiyuki; and Naka, Hideo, to Japan Exlan Company Limited. Stannic acid anhydride. 4,924,017, Cl. 556-85.000.

Kobatake, Hiroyuki, to NEC Corporation. Non-volatile semiconductor memory including a high voltage switching circuit. 4,924,438, Cl. 365-185.000.

Kobayashi, Eiji: *See—*
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.

Kobayashi, Hidetoshi; and Naruse, Hideaki, to Fuji Photo Film Co., Ltd. Silver halide photographic materials and method of processing the same. 4,923,783, Cl. 430-377.000.

Kobayashi, Hiroo: *See—*
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.

Kobayashi, Hiroshi: *See—*
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,922,861, Cl. 122-448.00R.

Kobayashi, Hiroyuki: *See—*
Takimoto, Hiroyuki; Nagasawa, Kenichi; Fujimoto, Mikihiro; Kobayashi, Hiroyuki; and Takei, Masahiro, 4,924,326, Cl. 360-10.200.

Kobayashi, Kazuhiko: *See—*
Chiba, Kazumasa; Kobayashi, Kazuhiko; and Ueno, Osamu, 4,923,925, Cl. 525-66.000.

Kobayashi, Kengo: *See—*
Ohwada, Takeo; and Kobayashi, Kengo, 4,923,929, Cl. 525-126.000.

Kobayashi, Kiyoshi: *See—*
Morikawa, Masahiro; Kobayashi, Kiyoshi; and Miyamoto, Kimiaki, 4,922,851, Cl. 118-324.000.

Kobayashi, Kiyotaka; Shizukuishi, Makoto; and Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Solid color pickup apparatus. 4,924,316, Cl. 358-213.260.

Kobayashi, Tadamasa; and Kudo, Ryoichi, to Aisin Seiki Kabushiki Kaisha. Clutch disc having an integral annulus of friction material. 4,923,045, Cl. 192-107.00R.

Kobayashi, Tadashi; Obuchi, Shouji; Matsuno, Hiroaki; Wada, Mitsuo; and Takayanagi, Hiroshi, to Mitsui Toatsu Chemicals, Incorporated. Production process of aromatic polyamide. 4,923,951, Cl. 528-48.000.

Kobayashi, Takeo: *See—*
Nishida, Takao; and Kobayashi, Takeo, 4,924,149, Cl. 315-241.00P.

Kobayashi, Tatuya: *See—*
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.

Kobayashi, Toshifumi: *See—*
Mihara, Masaaki; and Kobayashi, Toshifumi, 4,924,220, Cl. 340-825.510.

Kobayashi, Yukio: *See—*
Takaoka, Tokuro; Sasaki, Tsuto; Kobayashi, Yukio; Saito, Koichi; and Hamano, Satoshi, 4,923,170, Cl. 251-121.000.

Kobori, Takuji; Yamada, Shunichi; and Kamagata, Shuichi, to Kajima Corporation. Device and method for protecting a building against earthquake tremors. 4,922,667, Cl. 52-167.0DF.

Koch, Fred: *See—*
Hermanutz, Helmut; Koch, Fred; and Schwenk, Hans M., 4,924,354, Cl. 361-415.000

VOL
1114
ISS
2
MY
8
1990
UMI

Koch, Karl C.: *See*—
Rozelle, Paul F.; Koch, Karl C.; Einolf, Charles W., Jr.; and Oates, Robert M., 4,922,757, Cl. 73-660.000.
Koch, Rudolf: *See*—
Griss, Peter; and Koch, Rudolf, 4,923,473, Cl. 623-22.000.
Koch, Russell W.; and Snyder, Douglas D., to Bridgestone/Firestone, Inc. Preformed plug - tire repair. 4,923,543, Cl. 156-97.000.
Kochi, Mashanori: *See*—
Masuda, Kenmei; Ogiro, Kenji; Okada, Yoshinori; Nakajima, Akihiro; Kochi, Mashanori; and Konno, Kazutoshi, 4,924,329, Cl. 360-64.000.
Kodama, Hideaki: *See*—
Sekiguchi, Yoshichika; and Kodama, Hideaki, 4,923,310, Cl. 439-701.000.
Koehler, Hermann: *See*—
Hesse, Michael; Hoelderich, Wolfgang; Dockner, Toni; and Koehler, Hermann, 4,924,000, Cl. 548-343.000.
Koester, Hubert; and Coull, James M., to Millipore Corporation. Membranes with bound oligonucleotides and peptides. 4,923,901, Cl. 521-53.000.
Koga, Satoru; and Tanaka, Tsutomu, to Fujitsu Limited. Method for immediately writing an operand to a selected word location within a block of a buffer memory. 4,924,425, Cl. 364-900.000.
Koga, Taiji: *See*—
Hasegawa, Hajime; Koga, Taiji; Takei, Atsuo; and Okuyama, Toru, 4,923,904, Cl. 521-115.000.
Koga, Toshio: *See*—
Ohki, Jun'ichi; and Koga, Toshio, 4,924,311, Cl. 358-138.000.
Kohl, Albert; and Seilaz, Leon, to Henkel Kommanditgesellschaft auf Aktein. Drivable automatic floor cleaning machine. 4,922,572, Cl. 15-320.000.
Kohn, David H.: *See*—
Ducheyne, Paul; and Kohn, David H., 4,923,513, Cl. 75-245.000.
Kohno, Keiichi, to Fujitsu Limited. Servo control system carrying out coarse control and fine control. 4,924,165, Cl. 318-592.000.
Kohno, Yasutaka, to Mitsubishi Denki Kabushiki Kaisha. Method of fabricating a self aligned semiconductor device. 4,923,823, Cl. 437-41.000.
Koike, Naomasa; and Okumura, Fumio, to 501 Mitsubishi Paper Mills, Ltd. Heat-sensitive recording material. 4,923,845, Cl. 503-226.000.
Koike, Shoji; Iwata, Kazuo; Tochihara, Shinichi; and Tomida, Yasuko, to Canon Kabushiki Kaisha. Recording liquid having organic solvent with plural (C_2H_4O) moieties and recording method using the same. 4,923,515, Cl. 106-22.000.
Koike, Toshio: *See*—
Hineno, Kazuhiro; and Koike, Toshio, 4,923,089, Cl. 221-1.000.
Koizumi, Yukio, to Kabushiki Kaisha Kobe Seiko Sho. Jib stretching and folding mechanism for a jib crane. 4,923,071, Cl. 212-266.000.
Kojima, Kunio: *See*—
Fuji, Hiroshi; Maeda, Shigemi; Sakamoto, Noriaki; Terashima, Shigeo; Yamaguchi, Takeshi; Tsuji, Kentaro; and Kojima, Kunio, 4,924,447, Cl. 369-13.000
Kojima, Shinjiro: *See*—
Kato, Toshihiro; Kojima, Shinjiro; Emoto, Takao; and Matsumoto, Hiroshi, 4,924,351, Cl. 361-386.000.
Kojima, Yoshinobu: *See*—
Hattori, Takahiro; Kojima, Yoshinobu; and Yamada, Masayuki, 4,922,595, Cl. 29-40.000.
Kokayeff, Peter; and Abdo, Suheil F., to Union Oil Company of California. Ni/Cu absorbent/catalyst for desulfurization and isomerization of N-paraffins. 4,923,836, Cl. 502-74.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Edagawa, Noboru; Mochizuki, Kiyofumi; and Iwamoto, Yoshinao, 4,923,291, Cl. 350-38[illegible].000.
Utaka, Katsuyuki; and Fujioka, Masanobu, 4,923,265, Cl. 350-96.140.
Kolbert, Melvin, to Grumman Aerospace Corporation. Defining aircraft protocol by shorted pins. 4,924,520, Cl. 380-59.000.
Kolowski, Michael A.: *See*—
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., 4,922,985, Cl. 152-543.000.
Kolpak Manufacturing Company: *See*—
Fiddler, R. Charles, 4,922,626, Cl. 34-80.000.
Komai, Takeshi: *See*—
Masuhara, Eiichi; Kadoma, Yoshinori; Matsumoto, Takeo; Komai, Takeshi; Yamada, Eiichi; Nakachi, Osamu; and Irukayama, Godo, 4,923,905, Cl. 522-24.000.
Komamura, Chiaki: *See*—
Ninomiya, Yasuo; Musa, Yoshikazu; Kainoh, Yoichi; and Komamura, Chiaki, 4,923,607, Cl. 210-490.000.
Komine, Hiroaki: *See*—
Amemiya, Shigeo; Komine, Hiroaki; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, 4,924,461, Cl. 370-95.200.
Komiyama, Katsumi; Fukaya, Masaki; Yokono, Kojiro; and Toma, Hitoshi, to Canon Kabushiki Kaisha. Image reading device with moisture resistant layer. 4,924,282, Cl. 357-30.000.
Komori, Nobutoshi; and Nakazima, Hirokazu, to Chisso Corporation. Process for producing modified propylene polymer composition. 4,923,918, Cl. 524-339.000.
Kondo, Hiroaki: *See*—
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 4,923,383, Cl. 425-150.000.
Kondo, Kazuo; and Ishiguro, Nobuya, to Okura Industrial Co., Ltd. Heat shrinkable composite film and packaging method using same. 4,923,722, Cl. 428-34.900
Kondo, Mithimasa: *See*—
Fujisaka, Takahiko; Ohashi, Yoshimasa, and Kondo, Mithimasa, 4,924,235, Cl. 342-374.000.
Kondo Sylvania Ltd.: *See*—
Yamashita, Hiroshi; Fujii, Kanenaga; Fukunishi, Takumi; Shigeoka, Masafumi; and Sudo, Hiroshi, 4,924,357, Cl. 362-32.000.
Konishiroku Photo Industry Co. Ltd.: *See*—
Yanatori, Hiromi, 4,924,256, Cl. 355-28.000.
Konkel, Richard D., to Retail Profits, Inc. Apparatus for supporting point-of-sale terminals. 4,923,154, Cl. 248-131.000.
Konno, Kazutoshi: *See*—
Masuda, Kenmei; Ogiro, Kenji; Okada, Yoshinori; Nakajima, Akihiro; Kochi, Mashanori; and Konno, Kazutoshi, 4,924,329, Cl. 360-64.000.
Konno, Masayuki: *See*—
Wada, Shintaro; Nomura, Yoichi; Takahashi, Hisanori; and Konno, Masayuki, 4,922,911, Cl. 128-640.000.
Kono, Michikata: *See*—
Kumagai, Seiichiro; Kono, Michikata; Okai, Masakazu; and Inaga, Hisashi, 4,922,865, Cl. 123-65.0VC.
Konotsune, Shiro: *See*—
Kunimune, Kouichi; Kikuta, Kazutsune; Kawamoto, Takao; and Konotsune, Shiro, 4,923,968, Cl. 528-353.000.
Kontron Holding AG: *See*—
Horak, Dieter K.; and Wieczorek, Rudolf, 4,924,468, Cl. 371-22.100.
Kopkie, Harold D.; and Homola, Delbert D., to Kopkie, Harold D. Tool for cutting a keyslot in a workpiece bore. 4,923,342, Cl. 409-143.000.
Korber, Helmut: *See*—
Born, Eberhard; Korber, Helmut; and Mersch, Josef, 4,923,540, Cl. 156-86.000.
Korea Standards Research Institute: *See*—
Lee, In W.; and Shin, Dong J., 4,924,472, Cl. 372-29.000.
Kornelson, Bradley F., to Dapopp Products Ltd. Attention-attracting device for use beneath a display shelf. 4,924,363, Cl. 362-125.000.
Kosha, Hideaki: *See*—
Sato, Masami; Fujiyama, Masaaki; Iwasaki, Takashi; Suzuki, Masami; Yoneyama, Takashi; and Kosha, Hideaki, 4,922,675, Cl. 51-394.000.
Kosich, Milo, to Enforcement Support Incorporated. Multiline computerized telephone monitoring system. 4,924,488, Cl. 379-34.000.
Kosmo, Joseph J.; and Dawn, Frederic S., to United States of America, Administrator, National Aeronautics and Space Administration. Hazards protection for space suits and spacecraft. 4,923,741, Cl. 428-252.000.
Kosmowski, Wojciech B., to Dynamotion Corporation. Drilling tool for very small diameter openings and container therefor. 4,922,603, Cl. 29-568.000.
Kosrow, Robert L.: *See*—
Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, 4,922,842, Cl. 112-304.000.
Kossatz, Gert; Heine, Wolfgang; Lempfer, Karsten; and Sattler, Heinz, to Fraunhofer Gesellschaft zur Forderung der Angewandten Forschung E.V. Process for manufacturing a building panel. 4,923,664, Cl. 264-256.000.
Kostlan, Catherine R., and Sircar, Jagadish C., to Warner-Lambert Co. Analogues of pyrrolo[3,2d]pyrimidin-4-ones. 4,923,872, Cl. 514-258.000.
Kostlan, Catherine R.: *See*—
Belliotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,924,002, Cl. 548-206.000.
Kosugiyama, Otoya: *See*—
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.
Kotabe, Hiroaki: *See*—
Tanaka, Hidetake; Yamazaki, Shigeru; Yamanobe, Koji; Kotabe, Hiroaki; Nakazato, Yasushi; and Banno, Masahiko, 4,924,320, Cl. 358-296.000.
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Huels Aktiengesellschaft. Cyclic phenol organosilanes and method for their preparation. 4,924,021, Cl. 556-464.000.
Koumura, Noboru: *See*—
Ogino, Yoshitaka; Yanagisawa, Ryozo; Koumura, Noboru; and Nanamura, Masanori, 4,924,319, Cl. 358-296.000.
Kovacs, Laszlo : *See*—
Ferenczi, Tibor; Kovacs, Laszlo ; and Szathmari, Attila, 4,923,529, Cl. 148-20.300.
Koyama, Takashi: *See*—
Furumoto, Mitsumasa; Kawahara, Eiichiro; and Koyama, Takashi, 4,922,715, Cl. 60-329.000.
Koyo Fastener Co., Ltd.: *See*—
Saisho, Satoru, 4,923,158, Cl. 248-188.800.
Koyo Seiko Co., Ltd.: *See*—
Kadota, Yasushi; and Nishida, Yoshikazu, 4,923,435, Cl 474-112.000.
Kozawa, Fusaaki: *See*—
Oshiro, Masayuki; Kozawa, Fusaaki; and Uchida, Akira, 4,922,755, Cl. 74-479.000.
Kozlowski, Edward L., Jr.: *See*—
Ainsworth, James; Hardie, William G.; Kozlowski, Edward L., Jr.; and Shaf, Dinesh T., 4,924,037, Cl. 174-117.00F.
Kraft, Inc.: *See*—
Schoenberg, Edgar A., 4,923,707, Cl. 426-602.000.

Kramer, Donald R.; and Hayford, Eric M., to MKH$_3$ Enterprises, Inc. Systems and methods for connecting masonry veneer to structural support substrates. 4,922,680, Cl. 52-713.000.
Kramer, James H. Method of making a wear resistant composites. 4,923,550, Cl. 156-242.000.
Kramer, Klaus: *See*—
Dassler, Joachim; and Kramer, Klaus, 4,924,133, Cl. 313-25.000.
Kramer, Wolfgang: *See*—
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,923,883, Cl. 514-343.000.
Kraus, Manfred: *See*—
Steuer, Raimar; and Kraus, Manfred, 4,923,143, Cl. 244-3.280.
Kraus, Richard B.; and Musschoot, Albert, to General Kinematics Corporation. Continuous preheat scrap charging system and method. 4,923,177, Cl. 266-44.000.
Kraus, Robert T., to Uniroyal Goodrich Tire Company, The. Pallet storage system for storing cylindrical articles and pallet for use therein. 4,922,834, Cl. 108-51.100.
Krause, Outi: *See*—
Seppanen, Hanneli; and Krause, Outi, 4,923,937, Cl. 526-124.000.
Krauss, Alan R.; and Auciello, Orlando, to Arch Development Corporation. Sputter deposition for multi-component thin films. 4,923,585, Cl. 204-298.040.
Krauss Maffei AG: *See*—
Pollner, Juergen; Trummer, Gregor; Moelzer, Peter; and Fichtner, Karl, 4,923,253, Cl. 303-7.000.
Krauss-Maffei A.G.: *See*—
Spoetzl, Markus, 4,923,385, Cl. 425-522.000.
Krauter, Immanuel: *See*—
Kaiser, Gunther; Klotzner, Winfried; Krauter, Immanuel; and Jeenicke, Edmund, 4,924,399, Cl. 364-431.030.
Krawitt, Donald R.: *See*—
Wuchinich, David G.; Krawitt, Donald R.; Brendolan, Robert; and Katz, Louis, 4,922,902, Cl. 604-22.000.
Kreikemeier, John. Composite ground water drainable system. 4,923,331, Cl. 405-45.000.
Kress, Hans-Jurgen: *See*—
Struss, Klaus; Lindner, Christian; Piejko, Karl-Erwin; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,923,923, Cl. 525-64.000.
Krichever, Mark; and Gofman, Yuri, to Symbol Technologies Inc. Laser diode focusing module, method of fabricating, and method of using. 4,923,281, Cl. 350-245.000.
Kriegsfeld, Neil: *See*—
Litvak, Joel; and Kriegsfeld, Neil, 4,922,638, Cl. 40-155.000.
Krishnakumar, Suppayan M.: *See*—
Collette, Wayne N.; Krishnakumar, Suppayan M.; and Nahill, Thomas E., 4,923,723, Cl. 428-35.700.
Kristinsson, Ossur: *See*—
Klasson, Bo; and Kristinsson, Ossur, 4,923,474, Cl. 623-33.000.
Kriz, Ulrich, to Julius Blum Gesellschaft m.b.H. Furniture connector. 4,923,321, Cl. 403-6.000.
Krizan, James A.; and Szereto, Richard S., to W S Alloys, Inc. Tungsten carbide hardfacing powders and compositions thereof for plasma-transferred-arc deposition. 4,923,511, Cl. 75-252.000.
Krofta, Milos, to Lenox Institute for Research, Inc. Water clarification system adapted for removing particulate matter of greater than a predetermined size. 4,923,600, Cl. 210-107.000.
Krogsgaard-Larsen, Povl; Falch, Erik; and Pedersen, Henrik, to H. Lundbeck A/S. 4,5,6,7-Tetrahydroisothiazolo (4,5-c) pyridine derivatives. 4,923,880, Cl. 514-301.000.
Kroll, Harry; Butler, Florence; and Souza, Therese R., to Technic, Inc. Additives for electroplating compositions and methods for their use. 4,923,576, Cl. 204-44.400.
Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Winter, Horst, 4,922,775, Cl. 83-333.000.
Kronseder, Hermann. Apparatus for spacing apart containers that are conveyed close to each other in a single lane. 4,923,571, Cl. 198-459.000.
Krug, John A.: *See*—
Coulborn, John W.; and Krug, John A., 4,922,833, Cl. 105-248.000
Krumm, Valentin: *See*—
Gehring, Fritz; and Krumm, Valentin, 4,922,970, Cl. 139-446.000.
Kuba, Kazuki: *See*—
Yagi, Shigenori; Myoi, Yasuhito; Kuzumoto, Masaki; Kuba, Kazuki; Seiwa, Yoshito; Aoyagi, Toshitaka; and Mihashi, Yutaka, 4,924,474, Cl. 372-75.000.
Kubota, Atsushi: *See*—
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.
Kubota, Sadao: *See*—
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 358-105.000.
Kubota, Shuichi: *See*—
Kamimura, Hiroto; Kubota, Shuichi; and Iwakura, Masaru, 4,923,312, Cl. 384-420.000.
Kubozono, Tsutomu: *See*—
Hirano, Shigeaki; Maekawa, Hirotoshi; Kubozono, Tsutomu; and Tatemoto, Minoru, 4,924,391, Cl. 364-424.030.
Kuchta, Richard; Billings, Larry; and Evenzon, Vladimir, to Gerber Garment Technology, Inc. Variable height workstation and system. 4,922,829, Cl. 104-127.000.
Kuckens, Alexander. Apparatus for impregnating water with carbon dioxide. 4,923,644, Cl. 261-29.000.
Kuckertz, Herbert: *See*—
Horoldt, Ernst; Grimm, Richard; Rittner, Siegbert; Kuckertz, Herbert; and Billmann, Wilfried, 4,923,485, Cl. 55-55.000.
Kudo, Ryoichi: *See*—
Kobayashi, Tadamasa; and Kudo, Ryoichi, 4,923,045, Cl. 192-107.00R.
Kudo, Yoshinobu: *See*—
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,924,248, Cl. 354-195.100.
Kuecher, Peter, to Siemens Aktiengesellschaft. Integrated semi-conductor circuit comprising at least two metallization levels composed of aluminum or aluminum compounds and a method for the manufacture of same. 4,924,295, Cl. 357-71.000.
Kuehl, Ulrich: *See*—
Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen, 4,924,004, Cl. 548-431.000.
Kuga, Ryuichiro: *See*—
Hirao, Yoshiaki; Kuga, Ryuichiro; Yoneyama, Masayuki; and Ono, Shusuke, 4,924,317, Cl. 358-227.000.
Kuhla, Donald E.: *See*—
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,924,010, Cl. 549-355.000.
Kuhn, Siegfried; Philipp, Bernhard; and Schulten, Hermann, to Boehringer Werkzeugmaschinen GmbH. Bearing assembly for the working spindle of a machine tool. 4,924,524, Cl. 384-537.000.
Kuhn, s.a.: *See*—
Aron, Jerome, 4,922,700, Cl. 56-370.000.
Gantzer, Jean-Paul, 4,922,699, Cl. 56-367.000.
Neuerburg, Horst, 4,922,693, Cl. 56-13.600.
Kuhnert, Peter; and Feyen, Peter, to Afga-Gevaert Aktiengesellschaft. Granulated color photographic developer and its preparation. 4,923,786, Cl. 430-450.000.
Kulka, Robert A.: *See*—
Reddy, Gaddam P.; Kulka, Robert A.; Goring, Gregory P.; and Van Wagener, Raymond H., 4,924,350, Cl. 361-386.000.
Kulprathipanja, Santi; and Strong, Scott A., to UOP. Separation of salts of citric acid from fermentation broth with a weakly basic anionic exchange resin adsorbent. 4,924,027, Cl. 562-580.000.
Kumagai, Seiichiro; Kono, Michikata; Okai, Masakazu; and Inaga, Hisashi, to Kioritz Corporation. Two-stroke-cycle uniflow spark-ignition engine. 4,922,865, Cl. 123-65.0VC.
Kumano, Isamu: *See*—
Suzuki, Takashi; and Kumano, Isamu, 4,922,585, Cl. 24-381.000.
Kumar, Krishan: *See*—
Gansow, Otto A.; and Kumar, Krishan, 4,923,985, Cl. 540-474.000.
Kumai Chemical Industry Co., Ltd.: *See*—
Saito, Yoshihiro; Wada, Nobuhide; Kusano, Shoji; Miyazawa, Takeshige; Takahashi, Satoru; Toyokawa, Yasuhumi; and Kajiwaca, Ikuo, 4,923,501, Cl. 71-92.000.
Kunimune, Kouichi; Kikuta, Kazutsune; Kawamoto, Takao; and Konotsune, Shiro, to Chisso Corporation. Melt-moldable crystalline polyimide polymer. 4,923,968, Cl. 528-353.000.
Kunimura, Satoshi: *See*—
Nakayama, Shiro; Kunimura, Satoshi; Takahashi, Shigemi; Takahashi, Katsuhiko; Hirayama, Toshimitu; and Akutsu, Masao, 4,924,131, Cl. 310-329.000.
Kunishima, Iwao: *See*—
Matsuda, Tetsuo; and Kunishima, Iwao, 4,923,715, Cl. 427-237.000.
Kunne, Hans W.: *See*—
Kettelhoit, Johannes; Kunne, Hans W.; and Schroder, Erhard, 4,923,556, Cl. 156-498.000.
Kunz, Dietmar; Bomsdorf, Karl Georg H.; and Wieland, Jurgen S., to U.S. Philips Corporation. Method of determining the spectral distribution of the nuclear magnetization in a limited volume, and device for performing the method. 4,924,183, Cl. 324-309.000.
Kunz, Peter, to George Fischer AG. Method of welding tubular components of thermoplastic material. 4,923,659, Cl. 264-85.000.
Kuo, Charles C.; and Gengarelly, Robert M., to B. F. Goodrich Company, The. Method for the suspension of plastic additives with rheology agents. 4,923,909, Cl. 523-333.000.
Kuraray Company Ltd.: *See*—
Onishi, Takashi; Suzuki, Shigeaki; Mori, Toshiki; and Fujita, Yoshiji, 4,924,030, Cl. 568-34.000.
Kurashita, Masahiro; and Nomizu, Nobuyoshi, to NEC Corporation. Hardware logic simulator. 4,924,429, Cl. 364-578.000.
Kuratani, Kazuyoshi: *See*—
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, 4,923,881, Cl. 514-311.000.
Kurihara, Norimitsu; Asakura, Masahiko; Matsui, Mitsuru; Otsuka, Yasuhiko; and Tachikawa, Kazuhiko, to Honda Giken Kogyo K.K.; and Mitsuba Electric Mfg. Co., Ltd. Vehicle cruise control system. 4,924,397, Cl. 364-426.040.
Kurita, Kazuo; and Teramoto, Yoshihiko, to Toyo Boseki Kabushiki Kaisha. Process for producing polyester fibers. 4,923,662, Cl. 264-178.00F.
Kuriyama, Kazunori; Wada, Kenichi; and Yamaoka, Akira, to Hitachi, Ltd. Pipelined instruction processor capable of reading dependent operands in parallel. 4,924,377, Cl. 364-200.000.
Kuroishi, Tetsujiro: *See*—
Sano, Akira; Yokoyama, Shigeki; Miyazaki, Yasunosuke; Kuroishi, Tetsujiro; and Matsuura, Kazuo, 4,923,935, Cl. 526-73.000.
Kurosawa, Ryuichi, to Toyota Jidosha Kabushiki Kaisha. Active suspension for a vehicle coordinately responsive to centrifugal force due to turning and side wind. 4,924,392, Cl. 364-424.050.

VOL
1114
ISS
2
MY
8
1990
UMI

Kurosawa, Ryuichi, to Toyota Jidosha Kabushiki Kaisha. Active suspension for a vehicle controlling body for combination of bounce and pitch based on height sensor signals. 4,924,393, Cl. 364-424.050.
Kurosawa, Toshiharu; Tsuchiya, Hiroyoshi; Maruyama, Yuji; and Nakazato, Katsuo, to Matsushita Electric Industrial Co., Ltd. Bi-level image display signal processing apparatus. 4,924,322, Cl. 358-448.000.
Kurpjoweit, Martin: *See—*
Voss, Gunter; Kurpjoweit, Martin; and Richter, Wolfgang, 4,923,575, Cl. 204-44.200.
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for mold aligning in a compression molding machine. 4,923,383, Cl. 425-150.000.
Kurz, Reinhard, to Braun Aktiengesellschaft. Electrically driven can opener. 4,922,617, Cl. 30-419.000.
Kusano, Shoji: *See—*
Saito, Yoshihiro; Wada, Nobuhide; Kusano, Shoji; Miyazawa, Takeshige; Takahashi, Satoru; Toyokawa, Yasuhumi; and Kajiwaca, Ikuo, 4,923,501, Cl. 71-92.000.
Kusayanag, Yoshikazu: *See—*
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000.
Kutsukake, Masaki; and Kanto, Jumpei, to Dai Nippon Insatsu Kabushiki Kaisha. Heat transfer sheet for color image formation. 4,923,846, Cl. 503-227.000.
Kutsukake, Masaki: *See—*
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.000.
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,923,847, Cl. 503-227.000.
Kuwabara, Akira, to Ikeda Hussan Co., Ltd. Ceiling structure of motor vehicle. 4,923,245, Cl. 296-214.000.
Kuzumoto, Masaki: *See—*
Yagi, Shigenori; Myoi, Yasuhito; Kuzumoto, Masaki; Kuba, Kazuki; Seiwa, Yoshito; Aoyagi, Toshitaka; and Mihashi, Yutaka, 4,924,474, Cl 372-75.000.
Kwan, Stephen C.: *See—*
Culp, Norman L.; and Kwan, Stephen C., 4,924,341, Cl. 361-56.000.
Kyan, Chwan P.: *See—*
Graziani, Kenneth R.; Katzer, James R.; and Kyan, Chwan P., 4,923,591, Cl. 208-111.000.
Kylmakorpi, Ilpo: *See—*
Hietikko, Erkki; and Kylmakorpi, Ilpo, 4,923,568, Cl. 162-301.000.
Kyorin Seiyaku Kabushiki Kaisha: *See—*
Inaba, Makoto; Shinoda, Hirotaka; and Iinuma, Fujio, 4,923,871, Cl. 514-255.000.
Kyowa Hakko Kogyo Co., Ltd.: *See—*
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asasno, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.
Kysor Industrial Corporation: *See—*
Bentrup, Otto T., 4,923,175, Cl. 254-419.000.
La Cellulose Du Pin: *See—*
Fuentes, Jean-Luc; and Robert, Michel, 4,923,565, Cl. 162-72.000.
Labat, Jean-Luc; Ougarane, Lahcen; and Gastiger, Michel, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'exploitation des procedes Georges Claude. Microwave plasma torch, device comprising such a torch and process for manufacturing powder by the use thereof. 4,924,061, Cl. 219-121.520.
Laber, Albert P.: *See—*
Bramhall, Robert B., Jr.; Cloutier, Richard M.; Laber, Albert P.; and Muka, Richard S., 4,923,584, Cl. 204-298.250.
Lacey, David: *See—*
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Coates, David; Jackson, Adam; and Scrowston, Richard M., 4,923,633, Cl. 252-299.650.
LaChapelle, Joseph G.: *See—*
Carman, George; LaChapelle, Joseph G.; and Hiatt, Mark, 4,924,088, Cl. 250-271.000.
Ladouceur, Henry E.: *See—*
Siegmund, Arthur J.; and Ladouceur, Henry E., 4,922,938, Cl. 134-126.000.
Lahr, Helfrid; and Pontani, Bernd, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Method for handling a fuel element skeleton. 4,923,668, Cl. 376-261.000.
Laipply, Robert A., to Aeroquip Corporation. Integral quick-connect tube connector. 4,923,228, Cl. 285-319.000.
L'air Liquide, Societe Anonyme Pour L'etude et L'exploitation des Procedes Georges Claude: *See—*
Delzenne, Michel, 4,924,060, Cl. 219-121.480.
Labat, Jean-Luc; Ougarane, Lahcen; and Gastiger, Michel, 4,924,061, Cl. 219-121.520.
Laird, James A.: *See—*
Gibb, James L.; Laird, James A.; and Berntson, Leslie G., 4,923,714, Cl. 427-221.000.
Laitram Corporation, The: *See—*
Lapeyre, James M., 4,924,431, Cl. 364-709.160.
Laky, Tibor; and Fowler, Stewart H., Jr., to Otis Engineering Corporation. System for handling reeled tubing. 4,923,005, Cl. 166-55.000.
Lalwani, Steven S.: *See—*
Chich, Adem; Lalwani, Steven S.; Bettoli, Steven C.; Grube, Louis L.; and Bondoc, Alfredo A., 4,923,913, Cl. 524-62.000.
Lambert, William R.: *See—*
Jin, Sungho; Lambert, William R.; Moore, Robert C.; Mottine, John J., Jr.; Sherwood, Richard C.; and Tiefel, Thomas H., 4,923,739, Cl. 428-221.000.
Lancer Corporation: *See—*
Brown, Samuel E., 4,923,078, Cl. 220-4.00R.
Lancerotto, Fabio: *See—*
Meroni, Roberto; Viol, Fred; Lancerotto, Fabio; and Gerin, Umberto, 4,922,707, Cl. 57-408.000.
Lancon, Emmanuel: *See—*
Crepy, Hubert; Elie, Philippe; Galand, Claude; Lancon, Emmanuel; Liethoudt, Thierry; and Rosso, Michele, 4,924,508, Cl. 381-38.000.
Landis, William R.: *See—*
Adams, Wilmer L.; Bartels, James I.; Black, Robert A., Jr.; Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,923,117, Cl. 236-94.000.
Landowski, Roger W.; Roszkowski, Richard M.; Christian, Donald J.; and Ansari, Assad A., to Allen-Bradley Company, Inc. Image processor. 4,924,307, Cl. 358-107.000.
Lane, Kelley R.: *See—*
Vitands, Egils; and Lane, Kelley R., 4,923,961, Cl. 528-482.000.
Lang, Gunther; Maresch, Gerhard; and Lenz, Hans-Rudi, to Wella Aktiengesellschaft. Cosmetic composition based upon N-hydroxypropylisopropylether chitosans as well as new N-hydroxypropylisopropylether derivatives of chitosan. 4,923,977, Cl. 536-20.000.
Lange International S.A.: *See—*
Arieh, Simon; and Courvoisier, Guy, 4,922,632, Cl. 36-117.000.
Langen, Marinus J. M.; Guttinger, Peter; and Hoefkes, Heiner, to E. J. Langen & Sons Limited. Load settling mechanism for carton loading machines. 4,922,688, Cl. 53-525.000.
Langer, Dietrich W.; and Chmielowski, Marek, to University of Pittsburgh of the Commonwealth System of Higher Education. Resonance coupled optical coupler with semiconductor waveguide layer comprising a multi-quantum-well structure. 4,923,264, Cl. 350-96.140.
Lanham, Roy J.: *See—*
Arps, David H.; Brown, Howard R.; Lanham, Roy J.; and Weiker, Donald E., 4,923,328, Cl. 404-69.000.
Lankard, John R.: *See—*
Kirch, Steven J.; Lankard, John R.; Ritsko, John J.; Smith, Kurt A.; Speidell, James L.; and Yeh, James T., 4,923,772, Cl. 430-5.000.
Lantos, Elemer: *See—*
Tatai, Ilona; Penzias, Tibor; Palotas, Laszlo ; Lantos, Elemer; Smaroglay, Peter; and Deak, Laszlo B., 4,923,647, Cl. 264-27.000.
Lanxide Technology Company, LP: *See—*
Newkirk, Marc S.; and Kantner, Robert C., 4,923,832, Cl. 501-128.000.
Lanzer, Heribert, to Steyr-Daimler-Puch AG. Drive means for all-wheel-driven motor vehicles. 4,923,029, Cl. 180-248.000.
Lapeyre, James M., to Laitram Corporation, The. Keyboard located indicia for instructing a multi-mode programmable computer having alphanumeric capabilities from a few keyboard keys. 4,924,431, Cl. 364-709.160.
Lapof, Ray C.: *See—*
Stein, Jeffrey; and Lapof, Ray C., 4,924,103, Cl. 250-516.100.
Lariscy, Emory L., to Lariscy Enterprises Inc. Vehicle safety light assembly. 4,924,207, Cl. 340-467.000.
Lariscy Enterprises Inc.: *See—*
Lariscy, Emory L., 4,924,207, Cl. 340-467.000.
Larseneur, Patrick: *See—*
Boireau, Christian; and Larseneur, Patrick, 4,924,127, Cl. 310-90.000.
Larson, C. Allan; and Steele, Montgomerie C., to Allied-Signal Inc. Radial turbine wheel. 4,923,370, Cl. 416-95.000.
Larson, James R.: *See—*
Blair, David E.; Gollhardt, Bradley J.; and Larson, James R., 4,923,778, Cl. 430-137.000.
Larson, Robert M.: *See—*
Blomquist, James E.; and Larson, Robert M., 4,922,954, Cl. 137-493.000.
Lask, Helmut; Holst, Arno; and Dryczynski, Kurt, deceased (by Dryczynski, Christa Magdalene, Thomas Dryczynski, Beate Dryczynski, Regina Struth nee Dryczynski, legal heirs), to Hoechst Aktiengesellschaft. Device for determining surface moisture. 4,924,084, Cl. 250-227.250.
Laska, Eugene M.: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,923,898, Cl. 514-557.000.
Laskaris, Evangelos T., to General Electric Company. Superconductive magnetic resonance magnet without cryogens. 4,924,198, Cl. 335-216.000.
Laskowski, Edward J.: *See—*
Bilakanti, Jaya; and Laskowski, Edward J., 4,923,564, Cl. 156-655.000.
Lass, Gerhard: *See—*
Ellenberger, Bernd; Jennet, Friedrich; Schafer, Karlheinz; Spickermann, Rainer; and Lass, Gerhard, 4,923,558, Cl. 156-499.000.
Lassiaz, Philippe: *See—*
Gay, Christian; and Lassiaz, Philippe, 4,923,044, Cl. 192-98.000.

Laswell, William L.: *See—*
Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, 4,923,982, Cl. 540-200.000.
Laurent, Henry: *See—*
Bohlmann, Rolf; Laurent, Henry; Hofmeister, Helmut; and Wiechert, Rudolf, 4,923,640, Cl. 552-625.000.
Lawhorne, Earl R.: *See—*
Roberts, George L.; and Lawhorne, Earl R., 4,923,682, Cl. 423-611.000.
Lawless, Philip A.; and Viner, Andrew S., to Research Triangle Institute. Centrifugal filter for separating aerosol particles from a gas stream. 4,923,491, Cl. 55-409.000.
Lawrence, Peter J.; and Pring, David W., to British Telecommunications public limited company. Customer line tester. 4,924,489, Cl. 379-6.000.
Lawson, R. Joe: *See—*
Moser, Mark D.; and Lawson, R. Joe, 4,923,595, Cl. 208-139.000.
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, to Intevep, S.A. Viscous hydrocarbon-in-water emulsions. 4,923,483, Cl. 44-51.000.
Le, An V.: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.
Le Phare-Jean D'Eve S.A.: *See—*
Ray, Claude; and Groothuis, Michiel, 4,924,453, Cl. 368-294.000.
Le, Van-Ban, to American Telephone and Telegraph Company. Telecommunications database accessing method. 4,924,510, Cl. 379-221.000.
Leahey, John L.: *See—*
Trivett, Gordon S.; and Leahey, John L., 4,923,612, Cl. 210-646.000.
Leary, Michael J. Boat accessory locking devices. 4,922,735, Cl. 70-58.000.
Leathers, Don W.: *See—*
Durell, Joseph M.; and Leathers, Don W., 4,922,859, Cl. 119-83.000.
Leber, Helmut; and Whippey, Nigel R., to Heraeus Quarschmelze GmbH. Method for the continuous production of a tube or rod of vitreous fused silica. 4,923,497, Cl. 65-86.000.
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; Curry, Sean; Lee, Scott; and Meyer, Dana, to Vexcel Corporation. Method of mensuration of an image on an object. 4,924,505, Cl. 382-8.000.
Lecoutre, Pascal B. G.: *See—*
Barbarin, Jacques M. G.; and Lecoutre, Pascal B. G., 4,922,713, Cl 60-226.200.
Lee, Byeong G.: *See—*
Angell, Eric H.; Aprille, Thomas J.; Fang, Rong-Chin; Lee, Byeong G.; and Spalink, Jan-Dieter, 4,924,459, Cl. 370-84.000.
Lee, Chi-long; and Lutz, Michael A., to Dow Corning Corporation. Fast ultraviolet radiation curing silicone composition. 4,923,754, Cl. 428-429.000.
Lee, Chinsoo; Hoy, Kenneth L.; and Donohue, Marc D., to Union Carbide Chemicals and Plastics Company Inc. Supercritical fluids as diluents in liquid spray application of coatings. 4,923,720, Cl. 427-422.000.
Lee, In W.; and Shin, Dong J., to Korea Standards Research Institute. Laser output power stabilizing apparatus of a continuous-wave gas laser device. 4,924,472, Cl. 372-29.000.
Lee, Kuo-Shu. Structure of jumper cable clamp. 4,923,415, Cl. 439-755.000.
Lee, Robert H., to Teledyne Inet. Low voltage transient current limiting circuit. 4,924,342, Cl. 361-58.000.
Lee, Ruojia, to Micron Technology, Inc. Electrically programmable erasable inverter device with deprogramming limitation. 4,924,119, Cl. 307-469.000.
Lee, Scott: *See—*
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; Curry, Sean; Lee, Scott; and Meyer, Dana, 4,924,505, Cl. 382-8.000.
Lee, Steven S., to NCR Corporation. Semiconductor field oxide formation process using a sealing sidewall of consumable nitride. 4,923,563, Cl. 156-649.000.
Lee, Victor S.: *See—*
Gregor, Steven L.; and Lee, Victor S., 4,924,466, Cl. 371-12.000.
Legros, Alain C. A. G., to Fabricom Air Conditioning S.A. Disinfectant compositions and disinfection process applicable to infected liquids or surfaces. 4,923,619, Cl. 210-764.000.
Lehmann, Rudolf: *See—*
Wuelknitz, Peter; Lehmann, Rudolf; Ploeger, Walter; Hill, Karlheinz; and Forg, Franz, 4,923,685, Cl. 424-54.000.
Lehto, Ari: *See—*
Stormbom, Lars; Jalava, Jouko; Mesia , Heikki; Lehto, Ari; and Belt, Pekka, 4,924,064, Cl. 219-121.690.
Leibowitz, Martin N. Vertical blind spacer. 4,922,986, Cl. 160-178.100.
Leighton, Harry J.: *See—*
Lever, O. William, Jr.; and Leighton, Harry J., 4,923,892, Cl. 514-450.000.
Leimbach, Wendell B.: *See—*
Marshall, James W.; Gotchy, David; Uffelman, Bradley L.; Leimbach, Wendell B.; and Wilhelmi, Albert A., 4,922,604, Cl. 29-598.000.
Leinert, Herbert; Tsaklakidis, Christos; and Sponer, Gisbert, to Boehringer Mannheim GmbH. 1,2-diamino compounds, process for their preparation and pharmaceutical compositions containing them. 4,923,889, Cl. 514-422.000.
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Jaquard, Paul; Lelay, Jean-Pierre; and Doreau, Jean, 4,922,801, Cl. 89-41.050.
LeMoine, Eric D.; Bean, Eric S.; and Vodian, Morton A., to Synbiotics Corporation. Saliva test for feline leukemia virus. 4,923,798, Cl. 435-5.000.
Lemp, Mark D., to Colt Industries Inc. Manifold for distributing a fluid and method for making same. 4,922,958, Cl. 137-561.00A.
Lempfer, Karsten: *See—*
Kossatz, Gert; Heine, Wolfgang; Lempfer, Karsten; and Sattler, Heinz, 4,923,664, Cl. 264-256.000.
Lenders, Emanuel J. W. M.: *See—*
Verhulst, Antonius G. H.; Bruinink, Jacob; and Lenders, Emanuel J. W. M., 4,923,283, Cl. 350-269.000.
Lenox Institute for Research, Inc.: *See—*
Krofta, Milos, 4,923,600, Cl. 210-107.000.
Lenz, Hans-Rudi: *See—*
Lang, Gunther; Maresch, Gerhard; and Lenz, Hans-Rudi, 4,923,977, Cl. 536-20.000.
Lescoffit, Claude: *See—*
Dosjoub, Andre; and Lescoffit, Claude, 4,922,984, Cl. 152-415.000.
Lesk, Israel A.; Hawkins, George W.; Thomas, Ronald E.; Hunter, William L.; and McShane, Michael B., to Motorola Inc. Flagless semiconductor package. 4,924,291, Cl. 357-70.000.
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Senn, Patrice; and Tawfik, Mohamed S., 4,924,189, Cl. 328-167.000.
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Aubry, Julien; Durand, Richard J.; Kerdraon, Alain L.; and Solve, Gerard, 4,922,825, Cl. 102-476.000.
Leung, Albert M., to Acemore International Ltd. Joystick controller apparatus. 4,924,216, Cl. 340-709.000.
Lever Brothers Company: *See—*
Appel, Peter W.; Euser, Huug; and Liem, Seeng D., 4,923,628, Cl. 252-135.000.
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Levinson, Melvin L. Methods for microwave cooking in a steam-chamber kit. 4,923,704, Cl. 426-243.000.
Levy, Isy. Knife/fork/spoon combination cutlery. 4,922,611, Cl. 30-147.000.
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Rettig, John B.; Lueker, Jonathan; Carlson, John E.; Kaveckis, Stanley P.; and Lewallen, Roy W., 4,924,110, Cl. 307-227.000.
Lewco Corp.: *See—*
Lewis, Jeffrey B., 4,923,429, Cl. 446-197.000.
Lewers, William R.: *See—*
Bulso, Joseph D., Jr.; and Lewers, William R., 4,923,139, Cl. 242-78.600.
Lewis, Harry E.; Ritenour, Gibson D.; Wong, Cho L.; Gara, George; and Eddisford, Allen F., to Northern Telecom Limited. Carrier independent network services. 4,924,500, Cl. 379-201.000.
Lewis, Jeffrey B., to Lewco Corp. Bubble-propelled amusement device. 4,923,429, Cl. 446-197.000.
Lewis, Mark F.: *See—*
Marontate, John D.; Jones, Ralph D.; and Lewis, Mark F., 4,922,987, Cl. 160-183.000.
Lewison, Richard: *See—*
Anderson, Don W.; Eddy, Robert; Egge, Alan; and Lewison, Richard, 4,923,597, Cl. 209-420.000.
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Johner, Gerhard, 4,924,058, Cl. 219-121.470.
Leydier, Robert A., to Schlumberger Industries, Inc. Integrated polyphase power meter. 4,924,412, Cl. 364-483.000.
Leyer, Thomas: *See—*
Kiske, Siegfried; Haase, Thorsten; Leyer, Thomas; and Sauer, Wolfgang, 4,922,900, Cl. 128-202.270.
Leyrer, Reinhold J.; and Neumann, Peter, to BASF Aktiengesellschaft. Pyrazoline compounds. 4,924,003, Cl. 548-379.000.
Libbey-Owens-Ford Co.: *See—*
Hofer, Peter H., 4,922,853, Cl. 118-718.000.
LiCause, Michael F.: *See—*
Seymour, Mark D.; LiCause, Michael F.; and Daugherty, Thomas H., 4,923,454, Cl. 604-368.000.
Liedes, Allan; Ilvespaa, Heikki; and Viitanen, Olavi, to Valmet Paper Machinery Inc. Guiding an end conduction strip of a web forwardly from a roll. 4,923,567, Cl. 162-193.000.

Liem, Seeng D.: *See*—
Appel, Peter W.; Euser, Huug; and Liem, Seeng D., 4,923,628, Cl. 252-135.000.

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Crepy, Hubert; Elie, Philippe; Galand, Claude; Lancon, Emmanuel; Liethoudt, Thierry; and Rosso, Michele, 4,924,508, Cl. 381-38.000.

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Lim, Git B.; Nieman, Ronald E.; and Banerjee, Sanjoy, to Exxon Production Research Company. Method and apparatus for monitoring a flowstream. 4,924,099, Cl. 250-390.040.

Lin, Yang-I: *See*—
Moran, Daniel B.; Lin, Yang-I; and Ziegler, Carl B., 4,923,868, Cl. 514-253.000.

Lindae, Gerhard; Neumann, Rainer; and Perthus, Peter, to Robert Bosch GmbH. Motor vehicle headlight. 4,924,359, Cl. 362-61.000.

Lindauer Dornier Gesellschaft mbH: *See*—
Gehring, Fritz; and Krumm, Valentin, 4,922,970, Cl. 139-446.000.

Linde, Gilbert W.; Seymour, Shaun A.; and Webster, Emmett G., to Ford New Holland, Inc. Method of conditioning forage crops. 4,922,692, Cl. 56-1.000.

Linden, Shwn M. Y.: *See*—
Necker, Douglas C.; and Linden, Shwn M. Y., 4,924,009, Cl. 549-223.000.

Linder, Ernst: *See*—
Grob, Ferdinand; Linder, Ernst; Kienzler, Dieter; Potschin, Roger; and Stutzenberger, Heinz, 4,922,714, Cl. 60-276.000.

Lindgren, William A.: *See*—
Little, James H.; and Lindgren, William A., 4,922,909, Cl. 128-630.000.

Lindner, Christian: *See*—
Struss, Klaus; Lindner, Christian; Piejko, Karl-Erwin; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,923,923, Cl. 525-64.000.

Linear Dynamics, Inc.: *See*—
Kennedy, Ronald R.; Manzitti, Michael T.; Bennett, Frank E.; Stout, John F.; and Vellam, Anthony M., 4,923,559, Cl. 156-523.000.

Linneusson, Ruben. Stand. 4,923,156, Cl. 248-170.000.

Lion Corporation: *See*—
Suzuki, Kunitomo; Kiyohara, Takao; and Kitoh, Shinya, 4,923,400, Cl. 433-226.000.

Lipner, Steve: *See*—
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, 4,924,513, Cl. 380-21.000.

Liposome Company, Inc., The: *See*—
Tilcock, Colin P. S.; Cullis, Pieter R.; Hope, Michael J.; and Janoff, Andrew S., 4,923,854, Cl. 514-78.000.

Liquiflo Equipment Company: *See*—
Nasr, Ali M.; and Miller, Gregory W., 4,924,180, Cl. 324-207.150.

Lischke, Burkhard; and Winkler, Dieter, to Siemens Aktiengesellschaft. Beam generating system for electron beam measuring instruments having cathode support structure. 4,924,136, Cl. 313-336.000.

Little, James H.; and Lindgren, William A. Video monitoring and reapposition monitoring apparatus and methods. 4,922,909, Cl. 128-630.000.

Litton Systems, Inc.: *See*—
Ealey, Mark A.; and Salemme, Victor G., 4,923,302, Cl. 356-371.000.

Litty, Richard, to Gesellschaft fur Wolfram-Industrie mbH. Method for producing alloyed tungsten rods. 4,923,673, Cl. 419-20.000.

Litvak, Joel; and Kriegsfeld, Neil. Decorative modular picture frame. 4,922,638, Cl. 40-155.000.

Litzaw, Edgar M.: *See*—
Osborn, John J.; and Litzaw, Edgar M., 4,922,618, Cl. 33-1.0MP

Liu, Hua-Kuang: *See*—
Chao, Tien-Hsin; and Liu, Hua-Kuang, 4,924,507, Cl. 382-31.000.

Liu, Jay J.; and Wong, Y. H., to American Telephone and Telegraph Company. Method and apparatus for removing solder. 4,923,521, Cl. 134-5.000.

Liu, Paul K. T.: *See*—
Saforo, Emmanuel K.; Liu, Paul K. T.; Bergstrom, Robin K.; and Gatty, David G., 4,923,843, Cl. 502-415.000.

Lizell, Magnus B. Method and apparatus for absorbing mechanical shock. 4,923,038, Cl. 188-299.000.

Lloyd, Carl A.: *See*—
Gilmore, James F.; and Lloyd, Carl A., 4,923,307, Cl. 374-55.000.
Gilmore, James F.; Lloyd, Carl A.; and Kirk, Charles S., 4,924,477, Cl. 374-55.000.

Loctite Corporation: *See*—
Klemarczyk, Philip, 4,923,997, Cl. 548-406.000.

Lodovico, Frank J.; and Wagner, John W., to Wagner, John W. John W. Wagner. Machine for cutting disposable containers. 4,923,126, Cl. 241-30.000.

Loechner, Steven R., to G & L Corporation. Apparatus for bi-directionally moving and placing large and heavy objects. 4,923,174, Cl. 254-105.000.

Logie, Stewart, to Advanced Micro Devices, Inc. EEPROM using a merged source and control gate. 4,924,278, Cl. 357-23.500.

Login, Robert B.: *See*—
Anderson, Lowell R.; Hashem, Mohamed M.; and Login, Robert B., 4,924,006, Cl. 548-550.000.

Logsdon, Hartley. Threaded split coupling nut. 4,923,349, Cl. 411-433.000.

Lomas, David A., to UOP. Side mounted coolers with improved backmix cooling in FCC regeneration. 4,923,834, Cl. 502-41.000.

Lomazzi, Paolo: *See*—
De Pas, Jonathan; D'Urbino, Donato; and Lomazzi, Paolo, 4,922,669, Cl. 52-646.000.

Long, Charles E.: *See*—
Kent, Edward C.; and Long, Charles E., 4,923,049, Cl. 182-45.000.

Long, Gary R.: *See*—
Hinksman, Patrick B.; and Long, Gary R., 4,923,350, Cl. 411-457.000.

Loomis, Russell M., to Aero Wabash, Inc. Tension mounting system and assembly. 4,922,988, Cl. 160-368.100.

Lord Corporation: *See*—
Carlson, J. David; Coulter, John P.; and Duclos, Theodore G., 4,923,057, Cl. 188-378.000.

Loring, David A., to Billson, Anthony R., a part interest. Tensioning gauge for saw blades. 4,922,762, Cl. 73-862.480.

Los, Marinus, to American Cyanamid Company. 2-(2-Imidazolin-2-yl)pyridines and quinolines, and use of said compounds as herbicidal agents. 4,923,504, Cl. 71-92.000.

Loschner, Hans: *See*—
Stengl, Gerhard; and Loschner, Hans, 4,924,104, Cl. 250-492.300.

Lostumo, Arthur J.; and Wiltgen, Bernard M., to Zenith Electronics Corporation. Epoxy compositions, and method of making same. 4,923,908, Cl. 523-220.000.

Louis, Frederic C.: *See*—
Antikidis, Jean-Pierre; and Louis, Frederic C., 4,924,222, Cl. 341-33.000.

Lounsbury, Donn C. Trash receptacle. 4,923,080, Cl. 220-66.000.

Louthan, Clissolde L. Fishing diver. 4,922,648, Cl. 43-43.130.

Lovenguth, Ronald F.: *See*—
Bohen, Joseph M.; and Lovenguth, Ronald F., 4,923,916, Cl. 524-217.000.

Lowrey, Tyler A.: *See*—
Chen, Zhitong; Johnson, Gary M.; Parkinson, Ward D.; Chern, Wen-Foo; Lowrey, Tyler A.; and Trent, Thomas M., 4,924,442, Cl. 365-189.110.

Lubarsky, Daniel P.; Weight, George A.; and Haisch, Mark E., to Pacific Bell. Office control unit apparatus for use in a digital network. 4,924,460, Cl. 370-84.000.

Lucas Industries public limited company: *See*—
Braschel, Volker; Schmitt, Hubert; and Roller, Dieter, 4,923,255, Cl. 303-97.000.
Margetts, Hugh G., 4,923,036, Cl. 188-72.600.

Lucas, Richard: *See*—
Brandon, Daniel; Dunlop, Kenneth N. B.; Jensen, Lester B.; Lucas, Richard M.; and Pietruszewski, Robert E., 4,924,303, Cl. 358-86.000.

Lucas, Richard M.: *See*—
Brandon, Daniel; Dunlop, Kenneth N. B.; Jensen, Lester B.; Lucas, Richard M.; and Pietruszewski, Robert E., 4,924,303, Cl. 358-86.000.

Luchaco, David: *See*—
D'Aleo, Michael; Darragh, Denis; Ference, Jonathan; Luchaco, David; Rowen, Michael J.; and Spira, Joel S., 4,924,151, Cl. 315-295.000.

Ludwig, Manfred: *See*—
Fink, Manfred; Schreiber, Wolfgang; Ludwig, Manfred; Hald, Ewald; and Kloss, Guenter, 4,923,047, Cl. 192-150.000.

Ludwigson, Robert G., to Messer Griesheim Industries, Inc. Apparatus and method for slag-free cutting of billets and the like. 4,923,527, Cl. 148-9.00R.

Luebbers, Michael J.: *See*—
Mottur, George P.; Cope, Hilbert J., Jr.; Kishbaugh, Dennis L.; Luebbers, Michael J.; and Peters, Norman E., 4,923,705, Cl. 426-438.000.

Lueker, Jonathan: *See*—
Rettig, John B.; Lueker, Jonathan; Carlson, John E.; Kaveckis, Stanley P.; and Lewallen, Roy W., 4,924,110, Cl. 307-227.000.

Luhrsen, Ernst; Pohl, Siegfried; Ott, Albert; Parbel, Wilhelm; and Baum, Karl, to Didier-Werke AG. Assembly for connecting a metal member to a ceramic refractory member. 4,923,225, Cl. 285-189.000.

Lundberg, Henrik: *See*—
Hedlund, Gunnar; and Lundberg, Henrik, 4,924,155, Cl. 318-254.000.

Lundin, Stig; and Pettersson, Birger, to Svenska Rotor Maskiner AB. Method for producing pressure pulses in a mass of gas and a device for performing the method. 4,923,374, Cl. 417-440.000.

Lust, Marjorie L.: *See*—
Blouke, Morley M.; Tran, Thaian N.; and Lust, Marjorie L., 4,923,825, Cl. 437-53.000.

Lutron Electronics Co., Inc.: *See*—
Buehler, David L.; Jacoby, Elliot G.; and Swartvagher, Rita, 4,924,349, Cl. 361-357.000.
D'Aleo, Michael; Darragh, Denis; Ference, Jonathan; Luchaco, David; Rowen, Michael J.; and Spira, Joel S., 4,924,151, Cl. 315-295.000.

Lutz, Michael A.: *See*—
Lee, Chi-long; and Lutz, Michael A., 4,923,754, Cl. 428-429.000.

Lutz, Reinhold, to Messerschmitt-Bolkow-Blohm Gmbh. Measuring device for location and attitude determination of an object. 4,923,303, Cl. 356-375.000.

Lux, Adalbert A.: *See*—
Brinton, Catherine A.; and Lux, Adalbert A., 4,924,271, Cl. 355-284.000.

Luzader, Homer W.: *See*—
Bridges, Joseph W.; Luzader, Homer W.; and Amin, Chandrakant P., 4,922,741, Cl. 72-306.000.

Ly, Uy-Vu. Instrumentless quantitative analysis system. 4,923,800, Cl. 435-10.000.

Lyman, Carter: *See*—
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, 4,924,513, Cl. 380-21.000.

Lynch, David D.: *See*—
Hudson, Ralph E.; Aks, Stanley O.; Bogdanovic, Peter P.; and Lynch, David D., 4,924,232, Cl. 342-174.000.

Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, to Merck & Co., Inc. Oxidation and reduction method to produce 4-acyloxyazetidin-2-one. 4,923,982, Cl. 540-200.000.

Ma, David I.: *See*—
Anderson, Gordon W.; Boos, John B.; Dietrich, Harry B.; Ma, David I.; Mack, Ingham A. G.; and Papanicolaou, Nicolas A., 4,924,285, Cl. 357-30.000.

MacDonald, J. Gavin: *See*—
Nohr, Ronald S.; and MacDonald, J. Gavin, 4,923,914, Cl. 524-99.000.

Machida, Naoyoshi, to Kai Cutlery Center Co., Ltd. Cutter. 4,922,614, Cl. 30-339.000.

Mack, Ingham A. G.: *See*—
Anderson, Gordon W.; Boos, John B.; Dietrich, Harry B.; Ma, David I.; Mack, Ingham A. G.; and Papanicolaou, Nicolas A., 4,924,285, Cl. 357-30.000.

Mackman, Jay L. Face plate for dental articulator. 4,923,398, Cl. 433-60.000.

MacNicol, Allan E.: *See*—
Gibbs, Henry L.; and MacNicol, Allan E., 4,923,311, Cl. 384-49.000.

Madsen, Benni: *See*—
Fridh, Lars G.; Madsen, Benni; and Rasmussen, Vagn N., 4,922,677, Cl. 52-486.000.

Maeda, Futoshi: *See*—
Okuzawa, Masayuki; Okudaira Yuzo; and Maeda, Futoshi, 4,923,034, Cl. 181-207.000.

Maeda, Karo; and Ando, Satoshi, to Karo Maeda. Medical tubes for placement into the body of a patient. 4,923,450, Cl. 604-265.000.

Maeda, Minoru: *See*—
Fujikura, Sadao; Iwasaki, Masayuki; Maeda, Minoru; and Iwakura, Ken, 4,923,781, Cl. 430-281.000.

Maeda, Ryuichi: *See*—
Ogura, Yasutsugu; and Maeda, Ryuichi, 4,922,994, Cl. 164-437.000.

Maeda, Satoshi, to Fuji Jukogyo Kabushiki Kaisha. System for controlling air intake for an automotive engine. 4,922,864, Cl. 123-52.00M.

Maeda, Shigemi: *See*—
Fuji, Hiroshi; Maeda, Shigemi; Sakamoto, Noriaki; Terashima, Shigeo; Yamaguchi, Takeshi; Tsuji, Kentaro; and Kojima, Kunio, 4,924,447, Cl. 369-13.000.

Maeda, Toshihiro: *See*—
Horikita, Hiroyuki; Hattori, Nobuo; Takagi, Yahei; Kawaguchi, Gaku; and Maeda, Toshihiro, 4,923,812, Cl. 435-158.000.

Maehara, Toshifumi, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre, Ltd. Electromagnetic valve. 4,922,961, Cl. 137-596.170.

Maekawa, Hirotoshi: *See*—
Hirano, Shigeaki; Maekawa, Hirotoshi; Kubozono, Tsutomu; and Tatemoto, Minoru, 4,924,391, Cl. 364-424.030.

Magda, Stephen: *See*—
Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen, 4,924,004, Cl. 548-431.000.

Magee, Andrew S.: *See*—
Tsang, Wen-Ghih; and Magee, Andrew S., 4,923,645, Cl. 264-4.300.

Magee, Ramon: *See*—
Watkins, John; Magee, Ramon; and Doerflinger, Arthur, 4,923,572, Cl. 204-6.000.

Magliocco, Melvin T.: *See*—
Fleming, Matthew C.; and Magliocco, Melvin T., 4,923,162, Cl. 248-276.000.

Magnetek Universal MFG, Corporation: *See*—
Reddy, Gaddam P.; Kulka, Robert A.; Goring, Gregory P.; and Van Wagener, Raymond H., 4,924,350, Cl. 361-386.000.

Magnetic Peripherals Inc.: *See*—
Bucknam, Neil E., 4,923,406, Cl. 439-77.000.

Magori, Valentin, to Siemens Aktiengesellschaft. Ultrasound phase difference method for measuring high flow rates. 4,922,750, Cl. 73-118.200.

Mahon, Terrence K.; and Matre, Daniel A., to Vollrath Company, Inc., The. Ice guards. 4,923,086, Cl. 220-401.000.

Maidhof, William H.: *See*—
Rotolico, Anthony J.; and Maidhof, William H., 4,924,059, Cl. 219-121.480.

Maier, Charles J. Angle guide apparatus. 4,922,621, Cl. 33-465.000.

Maier, Egon: *See*—
Gusewell, Eike; Wolfle, Hans-Peter; and Maier, Egon, 4,922,690, Cl. 53-587.000.

Maier, Mark C.: *See*—
Fuller, Robert L., Jr.; Faville, Paul E.; and Maier, Mark C., 4,923,067, Cl. 209-539.000.

Maiorana, Stefano: *See*—
Terni, Patrizia; Maiorana, Stefano; Papagni, Antonio; and Pagella, Piergiuseppe, 4,923,859, Cl. 514-224.500.

Mak, Tak W., to Ontario Cancer Institute, The. T cell specific cDNA clone. 4,923,799, Cl. 435-6.000.

Makimura, Atsushi: *See*—
Shigeta, Masao; Choh, Tsutomu; Shimizu, Hiroyoshi; Hirai, Ippo; Mimura, Shohei; Makimura, Atsushi; and Hosaka, Hiroshi, 4,923,533, Cl. 148-304.000.

Makita, Atsuo: *See*—
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,922,861, Cl. 122-448.00R.

Makris, Anthony E. Coupling device for high pressure hoses. 4,923,224, Cl. 285-177.000.

Malkin, Bruce, to Norwalk Innovation Lab, Inc. Turntable for motorized delivery of coiled stock. 4,923,138, Cl. 242-78.600.

Malmstrom, Carey D. Cushion with message slot. 4,923,247, Cl. 297-4.000.

Maly, Heinrich: *See*—
Seibt, Artur; Maly, Heinrich; Fleck, Harald; and Haider, Gottfried, 4,922,880, Cl. 123-509.000.

Mamore Mineracao E Metalurgia S/A: *See*—
Silva, Egberto, Filho, 4,923,507, Cl. 423-68.000.

Man Design Co., Ltd.: *See*—
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,924,482, Cl. 375-65.000.

Manchester, Stephen T.: *See*—
Schneider, John L.; and Manchester, Stephen T., 4,924,202, Cl. 337-100.000.

Mancini, Flavio, to ITI/CLM Impianti Tecnici Industriali Danieli & C. Officine Meccaniche SpA. System to feed and discharge materials continuously in operations to rehabilitate railway road beds and the like. 4,923,355, Cl. 414-339.000.

Mandell, Leo: *See*—
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,923,979 Cl. 536-32.000.

Manetta, Joseph: *See*—
Bobbitt, Jesse L.; and Manetta, Joseph, 4,923,967, Cl. 530-351.000.

Mangelsdorf, Christopher W., to Analog Devices, Inc. Parallel analog-to-digital converter. 4,924,227, Cl. 341-159.000.

Mann, Bruce: *See*—
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, 4,924,513, Cl. 380-21.000.

Mannesmann Kienzle GmbH: *See*—
Zumkeller, Oskar; and Fesenmeieir, Hugo, 4,924,045, Cl. 200-341.000.

Manning, Robert E.: *See*—
McMahon, Ellen G.; and Manning, Robert E., 4,923,874, Cl. 514-258.000.

Manville Corporation: *See*—
Clocksin, Kenneth A.; and Hite, Edward L., 4,923,495, Cl. 65-11.100.

Manzitti, Michael T.: *See*—
Kennedy, Ronald R.; Manzitti, Michael T.; Bennett, Frank E.; Stout, John F., and Vellam, Anthony M., 4,923,559, Cl. 156-523.000.

Marcie, Mark J.; and Williams, John P., Jr., to Daykin Electric Corporation. Electrical resistance brazing device. 4,924,054, Cl. 219-85.140.

Marcilly, Christian; Deves, Jean-Marie; and Bourgogne, Michel, to Institut Francais du Petrole. Cracking catalyst and catalytic cracking process. 4,923,593, Cl. 208-113.000.

Marcinkowsky, Arthur E.: *See*—
Kao, Sun-Chueh; Cann, Kevin J.; Karol, Frederick J.; Marcinkowsky, Arthur E.; Goode, Mark G.; and Theobald, Eugene H., 4,923,938, Cl. 526-133.000.

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Maresch, Gerhard: *See*—
Lang, Gunther; Maresch, Gerhard; and Lenz, Hans-Rudi, 4,923,977, Cl. 536-20.000.

Marg, Axel: *See*—
Bothner, Jakob; and Marg, Axel, 4,922,580, Cl. 19-288.000.

Margetts, Hugh G., to Lucas Industries public limited company. Disc brakes. 4,923,036, Cl. 188-72.600.

Marinova, Viola M.: *See*—
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

Mark Anderson: *See*—
Ennis, James F., III, 4,923,448, Cl. 604-239.000.

Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., to Pharmachim. Composition and method for treating glaucoma. 4,923,877, Cl. 514-284.000.

Marks, Mortimer; and Steinfeld, Ned. Polarizing prescription lenses and method of making. 4,923,758, Cl. 428-437.000.

Marlow Industries, Inc.: *See*—
Robertson, William M.; Sharp, Charles A., III; and Burke, Edward J., 4,922,721, Cl. 62-3.610.

Marontate, John D.; Jones, Ralph D.; and Lewis, Mark F., to Woodfold-Marco Mfg., Inc. Secure tyre folding door. 4,922,987, Cl. 160-183.000.
Marquez, Humberto: *See*—
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.
Marr, Donald W.: *See*—
Miller, H. Laurie; and Marr, Donald W., 4,924,035, Cl. 174-87.000.
Marr Electric Limited: *See*—
Miller, H. Laurie; and Marr, Donald W., 4,924,035, Cl. 174-87.000.
Marshall, Albert H.; Wolff, Ronald S.; McCormack, Robert T.; and Purvis, Edward J., to United States of America, Navy. Long range light pen. 4,923,401, Cl. 434-22.000.
Marshall, Albert H.; McCormack, Robert T.; Purvis, Edward J.; Wolff, Ronald S.; and Towle, Herbert C., to United States of America, Navy. Marksmanship expert trainer. 4,923,402, Cl. 434-22.000.
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Marshall, James W.; Gotchy, David; Uffelman, Bradley L.; Leimbach, Wendell B.; and Wilhelmi, Albert A., to Pacific Scientific Company. Method of fabricating an encapsulated motor. 4,922,604, Cl. 29-598.000.
Marshall, John, III, to Electropore, Inc. High speed, high power apparatus for vesicle prealignment, poration, loading and fusion in uniform electric fields and method therefor. 4,923,814, Cl. 435-173.000.
Martens, John A.: *See*—
Chernega, John G.; Martens, John A.; Olsen, Roger A.; and Cottingham, Auburn B., deceased, 4,923,711, Cl. 427-44.000.
Martin Automatic Inc.: *See*—
Wheeler, Roger R.; and Martin, John R., 4,923,546, Cl. 156-159.000.
Martin, George R., to Martin Research & Development Ltd. Liquid driven turbine. 4,923,368, Cl. 415-202.000.
Martin, John R.: *See*—
Wheeler, Roger R.; and Martin, John R., 4,923,546, Cl. 156-159.000.
Martin Marietta Energy Systems, Inc.: *See*—
Brashear, Hugh R.; Blair, Michael S.; Phelps, James E.; Bauer, Martin L.; and Nowlin, Charles H., 4,924,450, Cl. 367-118.000.
Martin, Raymond G., to United States of America, Air Force. Search detection apparatus. 4,924,230, Cl. 342 90.000.
Martin Research & Development Ltd.: *See*—
Martin, George R., 4,923,368, Cl. 415-202.000.
Martin, Wesley R.: *See*—
Steffes, Thomas J.; Feyen, Paul A.; and Martin, Wesley R., 4,922,749, Cl. 73-116.000.
Martinez, Ruben C.: *See*—
Williams, Terry D., 4,923,215, Cl. 280-851.000.
Martinson, Michael M.: *See*—
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 4,923,125, Cl. 241-20.000.
Maruma Technica Co., Ltd.: *See*—
Funakawa, Naoyoshi; Iida, Yasuharu; Moriki, Yasumitsu; and Sakurai, Masahiro, 4,923,251, Cl. 299-64.000.
Maruni Kasei Kabushiki Kaisha: *See*—
Nishikawa, Kenjiro, 4,923,351, Cl. 412-6.000.
Maruyama, Hiroshi; and Horii, Yoshiharu, to Somar Corporation. Lightsafe masking film. 4,923,726, Cl. 428-40.000.
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Maruyama, Kenji: *See*—
Sazaki, Konin; and Maruyama, Kenji, 4,923,141, Cl. 242-247.000.
Maruyama, Yuji: *See*—
Kurosawa, Toshiharu; Tsuchiya, Hiroyoshi; Maruyama, Yuji; and Nakazato, Katsuo, 4,924,322, Cl. 358-448.000.
Marwick, William F.: *See*—
Puddle, Mark W.; Davies, Nigel C.; Marwick, William F.; and Sheasby, Peter G., 4,924,057, Cl. 219-118.000.
Masao, Kondo; and Ishida, Takashi, to Yamaha Corporation. Musical-tone-generating-control apparatus. 4,922,796, Cl. 84-618.000.
Maschinenfabrik Rieter AG: *See*—
Meyer, Urs, 4,922,702, Cl. 57-87.000.
Mase, Akira: *See*—
Sato, Masahiko; Mase, Akira; Sakayori, Hiroyuki; and Yamazaki, Shunpei, 4,924,243, Cl. 350-320.000.
Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,972, Cl. 141-4.000.
Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,974, Cl. 141-4.000.
Masoudi, Ahmad. Lost casing for constructing a rigid structure upon the bottom of a body of water. 4,923,334, Cl. 405-203.000.
Massonneau, Viviane; and Mulhauser, Michel, to Rhone-Poulenc Sante. Process for the preparation of cyclic sulphates. 4,924,007, Cl. 549-18.000.
Massoudi, Ahmad, to Darya Paye Jetty Co., Ltd. Process and device for the production of a marine engineering structure, such as a pier, jetty and the like. 4,923,335, Cl. 405-204.000.
Masuda, Ikuro: *See*—
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,924,439, Cl. 365-189.050.
Masuda, Joji: *See*—
Sasaki, Michiaki; and Masuda, Joji, 4,922,959, Cl. 137-587.000.
Masuda, Kenmei; Ogiro, Kenji; Okada, Yoshinori; Nakajima, Akihiro; Kochi, Mashanori; and Konno, Kazutoshi, to Hitachi, Ltd. Rotary drum apparatus for a magnetic recording and reproducing device. 4,924,329, Cl. 360-64.000.
Masuhara, Eiichi; Kadoma, Yoshinori; Matsumoto, Takeo; Komai, Takeshi; Yamada, Eiichi; Nakachi, Osamu; and Irukayama, Godo, to Nippon Oil and Fats Co., Ltd. Light curable dental composition. 4,923,905, Cl. 522-24.000.
Masumoto, Mitsuhiko; Asoh, Toshiaki; Ezaki, Youichirou; and Aibe, Hiroshi, to Mitsubishi Gas Chemical Company, Inc.; and Arakawa Chemical Industries, Ltd. Novel dihydroxy compound. 4,924,025, Cl. 560-072.000.
Materials Et Applications De Securite Pour Les Aeroports L'Industrie Et Les Routes (Masair): *See*—
Durand, Robert E., 4,923,284, Cl. 350-276.00R.
Mathews, Will W., to Cummins Engine Company, Inc. Valve stop mechanism for internal combustion engines. 4,922,867, Cl. 123-90.220.
Matier, William L.: *See*—
Stout, David M.; and Matier, William L., 4,923,873, Cl. 514-259.000.
Matner, Martin: *See*—
Scholl, Thomas; Perrey, Hermann; and Matner, Martin, 4,923,920, Cl. 524-501.000.
Matre, Daniel A.: *See*—
Mahon, Terrence K.; and Matre, Daniel A., 4,923,086, Cl. 220-401.000.
Matsubara, Toshiyuki; Fujioka, Shuzo; Yamaguchi, Atsuo; Takahira, Kenichi; Furuta, Shigeru; and Inoue, Takesi, to Mitsubishi Denki Kabushiki Kaisha. Memory with function test of error detection/correction device. 4,924,465, Cl. 371-3.000.
Matsuda, Hisashi: *See*—
Wollnik, Hermann; and Matsuda, Hisashi, 4,924,090, Cl. 250-296.000.
Matsuda, Mutsuhide: *See*—
Aihara, Yoshihiko; and Matsuda, Mutsuhide, 4,924,249, Cl. 354-286.000.
Matsuda, Tetsuo; and Kunishima, Iwao, to Kabushiki Kaisha Toshiba. Method of forming thin film by chemical vapor deposition. 4,923,715, Cl. 427-237.000.
Matsuhisa, Tadaaki: *See*—
Watanabe, Keiichiro; Matsuhisa, Tadaaki; and Sakai, Hiroaki, 4,923,308, Cl. 374-137.000.
Matsui, Hideki: *See*—
Iida, Yoshikazu; Hagiuda, Nobuyoshi; Yokonuma, Norikazu; Sakamoto, Hiroshi; and Matsui, Hideki, 4,924,252, Cl. 354-420.000.
Matsui, Isamu; and Ueda, Yutaka, to Murata Kikai Kabushiki Kaisha. Twist number setting device for a two-for-one twister. 4,922,703, Cl. 57-93.000.
Matsui, Kazuhiro; and Ito, Fuminori, to Kitagawa Industries Co., Ltd. Strip clamp. 4,923,153, Cl. 248-74.100.
Matsui, Kenji; and Uchida, Yasuo, to Omron Tateisi Electronics Company. Method of controlling communication in an ID system. 4,924,210, Cl. 340-572.000.
Matsui, Mitsuru: *See*—
Kurihara, Norimitsu; Asakura, Masahiko; Matsui, Mitsuru; Otsuka, Yasuhiko; and Tachikawa, Kazuhiko, 4,924,397, Cl. 364-426.040.
Matsuki, Yasuo; Kariya, Yosinobu; Endo, Masayuki; Ikeda, Hiroharu; and Hosaka, Yoshihiro, to Japan Synthetic Rubber Co., Ltd. Curable composition. 4,923,948, Cl. 528-26.000.
Matsumoto, Hiroshi: *See*—
Kato, Toshihiro; Kojima, Shinjiro; Emoto, Takao; and Matsumoto, Hiroshi, 4,924,351, Cl. 361-386.000.
Matsumoto, Nobuo; Shiraki, Keita; and Funahashi, Yoshiki, to Tokai Rubber Industries, Ltd. Fluid-filled cylindrical elastic mount. 4,923,178, Cl. 267-140.100.
Matsumoto, Takeo: *See*—
Masuhara, Eiichi; Kadoma, Yoshinori; Matsumoto, Takeo; Komai, Takeshi; Yamada, Eiichi; Nakachi, Osamu; and Irukayama, Godo, 4,923,905, Cl. 522-24.000.
Matsumoto, Tatsuji: *See*—
Fujioka, Hideaki; and Matsumoto, Tatsuji, 4,924,396, Cl. 364-426.030.
Matsumura, Hiromu; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masami, to Shionogi & Co., Ltd. Pyrrolo(1,4)benzodiazepine derivatives. 4,923,984, Cl. 540-496.000.
Matsumura, Tetsuya: *See*—
Yoshimoto, Masahiko; Segawa, Hiroshi; and Matsumura, Tetsuya, 4,924,314, Cl. 358-160.000.
Matsunaga, Fujihisa: *See*—
Fukuhara, Hiroshi; Matsunaga, Fujihisa; and Nakashima, Yasushi, 4,923,837, Cl. 502-84.000.
Matsuno, Hiroaki: *See*—
Kobayashi, Tadashi; Obuchi, Shouji; Matsuno, Hiroaki; Wada, Mitsuo; and Takayanagi, Hiroshi, 4,923,951, Cl. 528-48.000.
Matsuo, Hirofumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Macro lens system. 4,923,292, Cl. 350-463.000.
Matsuo, Hiroto; Kawamoto, Iwaji; Ishihara, Masamichi; and Nakagawa, Takaaki, to NGK Insulators, Ltd. Method of forming a zinc sleeve on an insulator pin. 4,922,993, Cl. 164-104.000.
Matsuoka, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Air bridge wiring for semiconductor devices. 4,924,289, Cl. 357-68.000.

Matsushima, Hiroaki: *See*—
Tanaka, Shinsuke; Takahashi, Jun; Ueda, Nobuo; and Matsushima, Hiroaki, 4,923,088, Cl. 220-468.000.
Matsushima, Yuzo, to Honda Giken Kogyo Kabushiki Kaisha. Method for shaping a resin coating of a wire harness. 4,923,537, Cl. 156-48.000.
Matsushita, Akira: *See*—
Matsumura, Hiromu; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masami, 4,923,984, Cl. 540-496.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Fukushima, Tetsuo; Inoue, Takao; and Kanashima, Keinosuke, 4,923,552, Cl. 156-273.700.
Hirao, Yoshiaki; Kuga, Ryuichiro; Yoneyama, Masayuki; and Ono, Shusuke, 4,924,317, Cl. 358-227.000.
Kameda, Keiichi; Takahashi, Kenichi; Horigami, Kouichi; and Iitsuka, Hiroyuki, 4,924,426, Cl. 364-900.000.
Kurosawa, Toshiharu; Tsuchiya, Hiroyoshi; Maruyama, Yuji; and Nakazato, Katsuo, 4,924,322, Cl. 358-448.000.
Matsushita Electric Works, Ltd.: *See*—
Honda, Kazuhiro; Yamashita, Kouji; Kawai, Masanori; Nakahi, Kazuo; and Tatetsuki, Kuniharu, 4,924,237, Cl. 343-702.000.
Imamura, Hiroshi; Toho, Makoto; Shiohama, Eiji; Morii, Shoiti; and Hiramatsu, Koji, 4,924,143, Cl. 313-493.000.
Okuzawa, Masayuki; Okudaira Yuzo; and Maeda, Futoshi, 4,923,034, Cl. 181-207.000.
Matsushita, Tetsuya: *See*—
Sawada, Shinichi; Isoyama, Toyoshiro; Matsushita, Tetsuya; and Saito, Hideo, 4,923,632, Cl. 252-299.610.
Matsushita, Yasuo: *See*—
Yasutomi, Yoshiyuki; Matsushita, Yasuo; and Nakamura, Kousuke, 4,923,829, Cl. 501-95.000.
Matsutani, Kinya, to Kabushiki Kaisha Toshiba. Magnet apparatus for use in magnetic resonance imaging system. 4,924,185, Cl. 324-319.000.
Matsuto, Takushi: *See*—
Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, 4,923,027, Cl. 180-219.000.
Matsuura, Ichiro; Ishimaru, Kiichiro; Mizuno, Hisayoshi; Omata, Youichi; and Soutome, Fumio, to Ikeda Bussan Co., Ltd. Method of molding skin-covered foamed plastic article. 4,923,653, Cl. 264-46.600.
Matsuura, Ichiro: *See*—
Omata, Youichi; Matsuura, Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, 4,923,378, Cl. 425-4.00R.
Matsuura, Kazuo: *See*—
Sano, Akira; Yokoyama, Shigeki; Miyazaki, Yasunosuke; Kuroishi, Tetsujiro; and Matsuura, Kazuo, 4,923,935, Cl. 526-73.000.
Matsuura, Shuji: *See*—
Kawamura, Hideaki; Sasaki, Takao; and Matsuura, Shuji, 4,924,403, Cl. 364-474.220.
Matsuzawa, Shigemi: *See*—
Kitazume, Masahiro; Aoki, Makoto; Nogi, Hiroshi; Homma, Kazuya; and Matsuzawa, Shigemi, 4,922,752, Cl. 73-146.000.
Matta, Ram K.; and Bhutiani, Pupinder K., to General Electric Company. Thrust reverser for high bypass turbofan engine. 4,922,712, Cl. 60-226.200.
Mattausch, Hans J., to Siemens Aktiengesellschaft. Semiconductor memory comprising a recognition circuit for signal changes. 4,924,443, Cl. 365-203.000.
Mattera, Eric: *See*—
Fruhauf, Serge; and Mattera, Eric, 4,924,212, Cl. 340-598.000.
Matteucci, Mark D., to Genentech, Inc. Method for identifying mutants secreting high levels of heterologous proteins. 4,923,808, Cl. 435-69.800.
Matthes, Reinhard: *See*—
Schork, Reinhold; Matthes, Reinhard; and Vahlensieck, Hans-Joachim, 4,923,687, Cl. 423-210.000.
Mattox, Elizabeth A. Baby chair sunshade. 4,923,249, Cl. 297-184.000.
Mattson, Gunnar: *See*—
Hedvall, Bertil; Mattson, Gunnar; Porrvik, Sten; and Sundstrom, Goran, 4,923,776, Cl. 430-111.000.
Matushita, Tetunori: *See*—
Yagihara, Morio; Matushita, Tetunori; Ukai, Toshinao; and Katoh, Kazunobu, 4,923,789, Cl. 430-517.000.
Matuz, Judit: *See*—
Fodor, Tamas; Dobay, Laaszlo ; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Saghy, Katalin; and Szpornj, Laaszlo , 4,923,888, Cl. 514-414.000.
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., to International Business Machines Corporation. Personal identification number processing using control vectors. 4,924,514, Cl. 380-24.000.
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., to International Business Machines Coprporation. Secure management of keys using extended control vectors. 4,924,515, Cl. 380-25.000.
Maul Technology Corporation: *See*—
Newkirk, Mark C., 4,923,499, Cl. 65-163.000.
Maxwell, Ronald K.; Zorzi, Karl J.; Yoshikawa, Harunori; Prasad, Venkat S.; Smith, Fred G.; and Hsieh, Ming-Chih, to Racal Data Communications, Inc. High speed modem. 4,924,456, Cl. 370-32.000.
May, Christian: *See*—
Peters, Dieter; Heymer, Gero; and May, Christian, 4,923,691, Cl. 423-412.000.
Mayer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. Pyridylsulfonamides. 4,923,995, Cl. 546-294.000.
Maykulsky, Joseph S. Combined oil filter and cooler. 4,923,603, Cl. 210-168.000.
McAllise, Gregg A.; and Ingersoll, Thomas L., to Hoover Company, The. Cooled cord reel. 4,924,039, Cl. 191-12.20R.
McAllister, Matthew: *See*—
Janko, Michael; and McAllister, Matthew, 4,924,362, Cl. 362-108.000.
McCarthy, Kevin I. Positive drive swim fin. 4,923,419, Cl. 441-64.000.
McClellan, Bingham A.: *See*—
Hannon, Douglas; and McClellan, Bingham A., 4,922,645, Cl. 43-42.400.
McClellan Industries, Inc.: *See*—
Hannon, Douglas; and McClellan, Bingham A., 4,922,645, Cl. 43-42.400.
McCormack, Robert T.: *See*—
Marshall, Albert H.; Wolff, Ronald S.; McCormack, Robert T.; and Purvis, Edward J., 4,923,401, Cl. 434-22.000.
Marshall, Albert H.; McCormack, Robert T.; Purvis, Edward J.; Wolff, Ronald S.; and Towle, Herbert C., 4,923,402, Cl. 434-22.000.
McCormick, Michael A., to Sherwood Medical Company. Suction control chamber having a filter for use in chest drainage devices. 4,923,451, Cl. 604-321.000.
McCormick, Randy M., to Du Pont de Nemours, E. I., and Company. Process for purifying nucleic acids. 4,923,978, Cl. 536-27.000.
McCullough, Francis P., Jr.; Brewster, Steven L.; and Snelgrove, R. Vernon, to Dow Chemical Company, The. Ceramic thermal barriers. 4,923,747, Cl. 428-312.600.
McCullough, Timothy J., to Food Industry Equipment International, Inc. Pneumatic control system for meat trimming knife. 4,922,613, Cl. 30-276.000.
McDonnell Douglas Corporation: *See*—
Calkins, Robert B.; and Rinke, Frederick F., 4,923,150, Cl. 244-151.00B.
McFadden, James A.: *See*—
Schoonover, Michael I.; and McFadden, James A., 4,923,098, Cl. 222-456.100.
McGuffie, Ian: *See*—
Stephenson, John; and McGuffie, Ian, 4,923,037, Cl. 188-188.000.
McGunn, Edward T. Safe with color-coded drawers emptying into color-coded containers. 4,922,837, Cl. 109-46.000.
McIntyre, Dennis A.; and Sullivan, Edward J., to Eastman Kodak Company. System and a method for detecting a malfunction in the operation of a parts assembly machine. 4,924,419, Cl. 364-551.020.
McKee, Jeffrey A.: *See*—
Russell, Joseph K.; and McKee, Jeffrey A., 4,922,731, Cl. 62-515.000.
McKinney, Steven J.; and Earnshaw, William E., to Modular Computer Systems, Inc. (Florida Corporation). Dual rotating priority arbitration method for a multiprocessor memory bus. 4,924,380, Cl. 364-200.000.
McLaughlin, David F.; and Talko, Francis, to Westinghouse Electric Corp. Electrochemical-metallothermic reduction of zirconium in molten salt solutions. 4,923,577, Cl. 204-64.00T.
McMahon, Ellen G.; and Manning, Robert E., to G. D. Searle & Co. Use of 8-azapurin-6-one derivatives for control of hypertension. 4,923,874, Cl. 514-258.000.
McManaman, James L.: *See*—
Appel, Stanley H.; McManaman, James L.; and Vaca, Kenneth W., 4,923,696, Cl. 424-548.000.
McMillan, Jim S., to Tarsha, Simon Sama'an. Method of lining tubular members including rolling and crushing a liner. 4,923,663, Cl. 264-229.000.
McMillen, Keith A.: *See*—
Horne, John G.; Dornfeld, David A.; and McMillen, Keith A., 4,922,754, Cl. 73-587.000.
McNeil, Sandy: *See*—
Petty, John; and McNeil, Sandy, 4,923,227, Cl. 285-319.000.
McShane, Michael B.: *See*—
Lesk, Israel A.; Hawkins, George W.; Thomas, Ronald E.; Hunter, William L.; and McShane, Michael B., 4,924,291, Cl. 357-70.000.
Mead Corporation, The: *See*—
Nelson, Erik K., 4,923,779, Cl. 430-138.000.
Meddaugh, Michael D., to Dow Corning Corporation. Composition and method for priming and coating silicone substrates. 4,923,946, Cl. 528-18.000.
Medical Data Electronics, Inc.: *See*—
Ruiter, Karl A., 4,922,918, Cl. 128-681.000.
Mediolanum farmaceutici, S.r.l.: *See*—
Terni, Patrizia; Maiorana, Stefano; Papagni, Antonio; and Pagella, Piergiuseppe, 4,923,859, Cl. 514-224.500.
Medrad, Inc.: *See*—
Weber, Otto K.; and Johansson, Lief A., 4,924,486, Cl. 378-173.000.
Medtronic, Inc.: *See*—
Doan, Phong D.; Upton, James E.; Hess, Douglas H.; Bass, Wayne R.; and Ufford, Keith A., 4,922,607, Cl. 29-879.000.
Meek, James F., to Sandvik Rock Tools, Inc. Percussion drill. 4,923,018, Cl. 173-78.000.
Meek, James L.: *See*—
Hobbs, Frank W.; and Meek, James L., 4,924,023, Cl. 558-162.000.

VOL
1114
ISS
2
MY
8
1990
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Meek, Roger L.; and Barry, Alan F., to Kinze Manufacturing, Inc. Hinge for vertically folding wing section of agricultural implement. 4,923,017, Cl. 172-776.000.
Meeuwssen, Marina M. J., to U.S. Philips Corporation. Unsaturated high-pressure sodium lamp. 4,924,146, Cl. 313-638.000.
Mehl, Donald N., to Creative Research and Manufacturing, Inc. Method of manufacturing a biopsy needle. 4,922,602, Cl. 29-460.000.
Mehmet, Ahmet, to Council of Mineral Technology. Fluid/solid contacting columns. 4,923,615, Cl. 210-661.000.
Meinander, Kerstin: *See*—
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,923,979, Cl. 536-32.000.
Meister, Jack B., to Beta Mfg. Co. Pneumatic solenoid valve. 4,922,965, Cl. 137-625.650.
Meketon, Mark S.: *See*—
Freedman, Barry A.; Meketon, Mark S.; and Vanderbei, Robert J., 4,924,386, Cl. 364-402.000.
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Shemitz, Sylvan R.; and Melling, James A., 4,924,366, Cl. 362-249.000.
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Blizzard, Timothy A.; and Mrozik, Helmut, 4,923,867, Cl. 514-250.000.
Durette, Philippe L., 4,923,852, Cl. 514-49.000.
Huff, Joel R.; and Oliff, Allen I., 4,923,878, Cl. 514-285.000.
Hupe, Donald; and Wyvratt, Matthew J., 4,923,885, Cl. 514-359.000.
Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, 4,923,982, Cl. 540-200.000.
Merck Patent Gesellschaft Mit Beschrankter Haftung: *See*—
Prucher, Helmut; Jonas, Rochus; Piulats, Jaime; and Klockow, Michael, 4,923,869, Cl. 514-253.000.
Merkel, Paul B.; and Hoke, David, to Eastman Kodak Company Photographic recording material containing a cyan dye-forming coupler. 4,923,791, Cl. 430-553.000.
Merkel, Paul B.: *See*—
Shuttleworth, Leslie; Merkel, Paul B.; and Brown, Glenn M., 4,923,788, Cl. 430-507.000.
Meroni, Roberto; Viol, Fred; Lancerotto, Fabio; and Gerin, Umberto to Scaglia SpA. Device to distribute sliver automatically to spinning machines. 4,922,707, Cl. 57-408.000.
Mersch, Josef: *See*—
Born, Eberhard; Korber, Helmut; and Mersch, Josef, 4,923,540, Cl. 156-86.000.
Mesia , Heikki: *See*—
Stormbom, Lars; Jalava, Jouko; Mesia , Heikki; Lehto, Ari; and Belt, Pekka, 4,924,064, Cl. 219-121.690.
Messer Griesheim Industries, Inc.: *See*—
Ludwigson, Robert G , 4,923,527, Cl. 148-9.00R.
Messerschmitt-Boelkow-Blohm GmbH: *See*—
Bartl, Josef; Schroettle, Wilhelm; and Puttinger, Dietmar, 4,922,799, Cl. 89-1.819.
Messerschmitt-Bolkow-Blohm Gmbh: *See*—
Lutz, Reinhold, 4,923,303, Cl. 356-375.000.
Metraux, Michel, to Autotyp S.A. Anti-skid device for wheels. 4,922,982, Cl. 152-216.000.
Meyer, Dana: *See*—
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; Curry, Sean; Lee, Scott; and Meyer, Dana, 4,924,505, Cl. 382-8.000.
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Micchelli, Albert L.: *See*—
Nowak, Frank A , Jr.; Micchelli, Albert L.; and Rouse, William M., III, 4,923,695, Cl. 424-71.000.
Michaels, David E.: *See*—
Casberg, John M.; and Michaels, David E., 4,923,618, Cl. 210-755.000.
Michaels, Leonard H., to Molex Incorporated. Environmentally sealed electrical connector. 4,923,413, Cl. 439-589.000.
Michal, Gerhard: *See*—
Deneke, Ulfert; Michal, Gerhard; and Beutler, Hans-Otto, 4,923,796, Cl. 435-15.000.
Michalos, Peter, to Sundrops Enterprises, Inc. Ultraviolet radiation screening method for eyes. 4,923,693, Cl. 424-59.000.
Michejda, Christopher J.; and Smith, Richard H., Jr., to Bionetics Research, Inc. Substituted 1-(2-chloroethyl)-3-acyl-3-alkyltriazenes. 4,923,970, Cl. 534-550.000.
Michel, Dieter; Parriaux, Olivier; and Voirin, Guy, to Dr. Johannes Heidenhain GmbH. Defraction photoelectric position measuring system. 4,923,300, Cl. 356-356.000.
Michel, Philippe: *See*—
Cossement, Eric; Geerts, Jean-Pierre; Gobert, Jean; Michel, Philippe; and Wulfert, Ernst, 4,923,865, Cl 514-235.800.
MicroComputer Accessories Incorporated: *See*—
Bartok, Stephen, 4,923,259, Cl. 312-208.000.
Microelectronics and Computer Technology Corporation: *See*—
Nelson, Richard D., 4,923,000, Cl. 165-122.000.
Microfuel Corporation: *See*—
Wiley, Allen C., 4,923,124, Cl. 241-5.000.
Micron Technology, Inc.: *See*—
Chen, Zhitong; Johnson, Gary M.; Parkinson, Ward D.; Chern, Wen-Foo; Lowrey, Tyler A.; and Trent, Thomas M., 4,924,442, Cl. 365-189.110.
Courtenay, Robert W., 4,923,294, Cl. 350-529.000.
Lee, Ruojia, 4,924,119, Cl. 307-469.000.
Microplastic Corp.: *See*—
Schaefer, Philipp, 4,923,732, Cl. 428-151.000.
Middleton, Christohper O.; and Robson, Colin L., to Spectra Physics. Method for automatic position control of a tool. 4,924,374, Cl. 364-167.010.
Miettinen, Veli V. A., to Finkomat Oy. Shoe sole cleaner. 4,922,578, Cl. 15-36.000.
Mifune, Hiroyuki: *See*—
Sasaki, Hirotomo; Shishido, Tadao; and Mifune, Hiroyuki, 4,923,794, Cl. 430-603.000.
Mihara, Masaaki; and Kobayashi, Toshifumi, to Mitsubishi Denki Kabushiki Kaisha. Arbiter circuit for processing concurrent requests for access to shared resources. 4,924,220, Cl. 340-825.510.
Mihara, Yuji: *See*—
Ohno, Shigeru; Mihara, Yuji; Adachi, Keiichi; Ukai, Toshinao; and Hayashi, Gouichi, 4,923,638, Cl. 252-587.000.
Mihashi, Yutaka: *See*—
Yagi, Shigenori; Myoi, Yasuhito; Kuzumoto, Masaki; Kuba, Kazuki; Seiwa, Yoshito; Aoyagi, Toshitaka; and Mihashi, Yutaka, 4,924,474, Cl. 372-75.000.
Mihayashi, Keiji: *See*—
Kato, Hirohiko; Mihayashi, Keiji; and Aikawa, Kazuhiro, 4,923,790, Cl. 430-523.000.
Mijnders, Gijsbert J., to Multinorm B.V. Agricultural implement with gas springs and control. 4,923,014, Cl. 172-2.000.
Miki, Nobuhiro; Fukudome, Toshiro; and Kaibori, Takesi. Brazing flux of stable suspension for aluminum material. 4,923,530, Cl. 148-26.000.
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Mikolajczak, Christopher, to Chrysler Corporation. Spring panel heat sink for electrical components. 4,923,179, Cl. 267-160.000.
Milewski, Slawomir: *See*—
Andruszkiewicz, Ryszard; Chmara, Henryk; Milewski, Slawomir; Borowski, Edward; Zaremba, Maria; and Borowski, Jerzy, 4,923,965, Cl. 530-331.000.
Miller, Arnold: *See*—
Herbison, B. J.; Lyman, Carter; Karger, Paul; Mann, Bruce; Lipner, Steve; and Miller, Arnold, 4,924,513, Cl. 380-21.000.
Miller, DuWayne A.; and Miller, George F. Chaff spreader. 4,923,431, Cl. 460-111.000.
Miller, Evelyn B. Weather window shield for automotive vehicles and the like. 4,923,241, Cl. 296-154.000.
Miller, George F.: *See*—
Miller, DuWayne A.; and Miller, George F., 4,923,431, Cl. 460-111.000.
Miller, Gregory W.: *See*—
Nasr, Ali M.; and Miller, Gregory W., 4,924,180, Cl. 324-207.150.
Miller, H. Laurie; and Marr, Donald W., to Marr Electric Limited. Twist on electrical connector. 4,924,035, Cl. 174-87.000.
Miller, John M.; and Barton, Richard O., to Grumman Aerospace Corporation. Compression fitted bushing installation. 4,922,573, Cl. 16-2.000.
Miller, Robert A., to J. E. Morgan Knitting Mills, Inc. Treating fabrics. 4,922,567, Cl. 8-151.000.
Milliken Research Corporation: *See*—
Stewart, William H., Jr., 4,923,743, Cl. 427-288.000.
Millipore Corporation: *See*—
Koester, Hubert; and Coull, James M., 4,923,901, Cl. 521-53.000.
Mims, William D.: *See*—
Caserta, Joseph N.; Mims, William D.; Reed, Joseph; and Bowen, James H., 4,924,080, Cl. 250-213.0VT.
Mimura, Shohei: *See*—
Shigeta, Masao; Choh, Tsutomu; Shimizu, Hiroyoshi; Hirai, Ippo; Mimura, Shohei; Makimura, Atsushi; and Hosaka, Hiroshi, 4,923,533, Cl. 148-304.000.
Minezaki, Etsuko: *See*—
Maruyama, Hiroshi; Kiryu, Naohiko; and Minezaki, Etsuko, 4,923,727, Cl. 428-40.000.
Minigrip, Inc.: *See*—
VanErden, Donald L., 4,923,701, Cl. 426-113.000.
MiniScribe Corporation: *See*—
Repphun, William; and Harper, David, 4,924,337, Cl. 360-128.000.
Minnesota Mining and Manufacturing Company: *See*—
Alm, Roger R.; and Stern, Richard M., 4,923,903, Cl. 521-65.000.
Chernega, John G.; Martens, John A.; Olsen, Roger A.; and Cottingham, Auburn B., deceased, 4,923,711, Cl. 427-44.000.
Gibb, James L.; Laird, James A.; and Berntson, Leslie G., 4,923,714, Cl. 427-221.000.
Grieve, Duncan M. A.; Poon, Stephen S. C.; Thien, Tran V.; Sakizadeh, Kumars; and Weigel, David C., 4,923,792, Cl. 430-559.000.

Jorgensen, Charles A.; and Kline, Robert J., 4,923,137, Cl. 242-68.500.
Sanocki, Stephen M.; Johnson, Donald D.; and Fischer, Edward M., 4,923,332, Cl. 405-63.000.
Minolta Camera Kabushiki Kaisha: *See*—
Arima, Jiro; and Okui, Yoshihiro, 4,924,081, Cl. 250-214.00R.
Hamada, Masataka; Ishida, Tokuji; Ishibashi, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 4,924,250, Cl. 354-402.000.
Hasegawa, Hirofumi, 4,924,269, Cl. 355-229.000.
Ishimura, Toshihiko; Tsuji, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 4,924,251, Cl. 354-418.000.
Ito, Masazumi; and Higashio, Kimihiko, 4,924,264, Cl. 355-204.000.
Ito, Masazumi; and Murata, Tomoji, 4,924,274, Cl. 355-313.000.
Sako, Mineyuki; Oka, Tateki; Hiromoto, Yasuyuki; Yokoyama, Tomoaki; and Toda, Kunio, 4,924,270, Cl. 355-246.000.
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,924,248, Cl. 354-195.100.
Miroshnichenko, Ivan I.: *See*—
Bogdanov, Vasily S.; Platonov, Viktor S.; Bogdanov, Nikolai S.; Bedko, Jury G.; Miroshnichenko, Ivan I.; and Vorobiev, Nikolai D., 4,923,127, Cl. 241-70.000.
Misawa, Hidenobu: *See*—
Oshima, Shinji; and Misawa, Hidenobu, 4,923,655, Cl. 264-60.000.
MIT: *See*—
Webb, Andrew C.; and Auron, Philip E., 4,923,807, Cl. 435-69.200.
Mitani, Tatsuro: *See*—
Endo, Kazuo; Noda, Noboru; and Mitani, Tatsuro, 4,924,281, Cl. 357-23.900.
Mitchell, Charles W.; and Rodriquez, Robert G., to Dell Corporate Services Corporation. Personal computer having expansion card adapter bracket. 4,924,355, Cl. 361-415.000.
Mitchell, Jack H. Fish hook with retractable barb. 4,922,649, Cl. 43-43.160.
Mitsuba Electric Mfg. Co., Ltd.: *See*—
Kurihara, Norimitsu; Asakura, Masahiko; Matsui, Mitsuru; Otsuka, Yasuhiko; and Tachikawa, Kazuhiko, 4,924,397, Cl. 364-426.040.
Ogino, Seiichi, 4,924,154, Cl. 318-286.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Banjo, Toshinobu; Murasawa, Yasuhiro; and Onoda, Shigeo, 4,924,077, Cl. 235-492.000.
Eshima, Taizo; and Kai, Yasuyoshi, 4,923,386, Cl. 425-450.100.
Fujisaka, Takahiko; Ohashi, Yoshimasa, and Kondo, Mithimasa, 4,924,235, Cl. 342-374.000.
Fujiwara, Toru, 4,924,398, Cl. 364-431.110.
Harada, Hiroshi; Hirata, Yoshihiro; and Tosa, Masanobu, 4,923,526, Cl. 148-6.300.
Hashimoto, Yoichi; and Inoue, Masami, 4,924,490, Cl. 378-145.000.
Hirano, Shigeaki; Maekawa, Hirotoshi; Kubozono, Tsutomu; and Tatemoto, Minoru, 4,924,391, Cl. 364-424.030.
Ishibashi, Kiyoshi, 4,924,286, Cl. 357-46.000.
Isozumi, Shuzoo, 4,923,229, Cl. 290-48.000.
Isozumi, Shuzoo, 4,924,108, Cl. 290-48.000.
Isozumi, Shuzoo, 4,924,126, Cl. 310-83.000.
Kazumoto, Yoshio; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,922,722, Cl. 62-6.000.
Kitamura, Mamoru, 4,924,076, Cl. 235-492.000.
Kohno, Yasutaka, 4,923,823, Cl. 437-41.000.
Matsubara, Toshiyuki; Fujioka, Shuzo; Yamaguchi, Atsuo; Takahira, Kenichi; Furuta, Shigeru; and Inoue, Takesi, 4,924,465, Cl. 371-3.000.
Matsuoka, Hiroshi, 4,924,289, Cl. 357-68.000.
Mihara, Masaaki; and Kobayashi, Toshifumi, 4,924,220, Cl. 340-825.510.
Nagao, Toshishige, 4,924,105, Cl. 250-560.000.
Onishi, Masayoshi; Ozawa, Hiromasa; and Umemaru, Hisato, 4,922,761, Cl. 73-862.330.
Sasao, Isao, 4,924,416, Cl. 364-550.000.
Seguchi, Yoshihiro, 4,924,421, Cl. 364-715.100.
Toya, Hideaki; Sasao, Hiroyuki; and Hayshi, Tatsuya, 4,924,102, Cl. 250-426.000.
Watanabe, Keiji; Fukuyama, Keiji; Ishida, Masako; Suzuki, Ryo; and Saito, Masato, 4,924,137, Cl. 313-337.000.
Yagi, Shigenori; Myoi, Yasuhito; Kuzumoto, Masaki; Kuba, Kazuki; Seiwa, Yoshito; Aoyagi, Toshitaka; and Mihashi, Yutaka, 4,924,474, Cl. 372-75.000.
Yoda, Kiyoshi, 4,924,184, Cl. 324-318.000.
Yoshimoto, Masahiko; Segawa, Hiroshi; and Matsumura, Tetsuya, 4,924,314, Cl. 358-160.000.
Mitsubishi Electric Corporation: *See*—
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 358-105.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Masumoto, Mitsuhiko; Asoh, Toshiaki; Ezaki, Youichirou; and Aibe, Hiroshi, 4,924,025, Cl. 560-072.000.
Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, 4,923,912, Cl. 523-466.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.
Mitsubishi Kasei Corporation: *See*—
Hara, Ryuichi; Kagizaki, Masami; Takakura, Tsuyoshi; and Tomono, Shigeki, 4,923,648, Cl. 264-29.200.
Nakagoshi, Akira; Tahara, Hiroshi; Yamada, Tetuo; Sekiguchi, Hiroyuki; and Murata, Hidemi, 4,923,692, Cl. 423-447.400.
Mitsubishi Petrochemical Company, Ltd.: *See*—
Hirata, Kentaro; Fukui, Yoshio; and Hayashi, Sadao, 4,923,616, Cl. 210-676.000.
Takeyama, Tadao; and Aritomi, Mitsutoshi, 4,923,942, Cl. 526-282.000.
Mitsui Petrochemical Industries, Inc.: *See*—
Kan, Kojiro; and Kaneko, Isao, 4,923,959, Cl. 528-322.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Fukuhara, Hiroshi; Matsunaga, Fujihisa; and Nakashima, Yasushi, 4,923,837, Cl. 502-84.000.
Kioka, Mamoru; and Kashiwa, Norio, 4,923,833, Cl. 502-9.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Kobayashi, Tadashi; Obuchi, Shouji; Matsuno, Hiroaki; Wada, Mitsuo; and Takayanagi, Hiroshi, 4,923,951, Cl. 528-48.000.
Murakawa, Norihiro; Isomura, Hisashi; Miura, Kazukiyo; and Aoki, Shinichi, 4,923,652, Cl. 264-62.000.
Miura, Kazukiyo: *See*—
Murakawa, Norihiro; Isomura, Hisashi; Miura, Kazukiyo; and Aoki, Shinichi, 4,923,652, Cl. 264-62.000.
Miura, Kyo: *See*—
Oguchi, Yoshihiro; Sugata, Hiroyuki; Miura, Kyo; Fukui, Tetsuro; and Takasu, Yoshio, 4,923,390, Cl. 430-270.000.
Miura, Tomoko: *See*—
Hirata, Keiichi; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; Ikeda, Yoshie; and Kawakami, Yasushi, 4,924,433, Cl. 364-900.000.
Miyagawa, Ichirou; and Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Method and apparatus for image read-out and reproduction, and multi-semiconductor-laser light source device for the same. 4,924,321, Cl. 358-296.000.
Miyahara, Kazuhiro: *See*—
Yasuda, Keiji; and Miyahara, Kazuhiro, 4,923,206, Cl. 280-504.000.
Miyairi, Yasuyuki: *See*—
Toya, Matsumi; and Miyairi, Yasuyuki, 4,923,449, Cl. 604-245.000.
Miyajima, Motoyasu, to Yazaki Corporation. Drive apparatus for a cross coil type meter. 4,924,178, Cl. 324-154.00R.
Miyama, Hiroshi: *See*—
Nozaka, Yoshiki; Katsuta, Tetsuro; and Miyama, Hiroshi, 4,922,821, Cl. 101-425.000.
Miyamoto, Kimiaki: *See*—
Morikawa, Masahiro; Kobayashi, Kiyoshi; and Miyamoto, Kimiaki, 4,922,851, Cl. 118-324.000.
Miyano, Kenmi: *See*—
Tanaka, Kenji; Miyano, Kenmi; Nishimaki, Hideo; and Iga, Yoshiro, 4,923,815, Cl. 435-183.000.
Miyawaki Incorporated: *See*—
Sekoguchi, Kotohiko; Noguchi, Keiichi; Muramoto, Mutsushi; and Ohata, Takayuki, 4,923,115, Cl. 236-12.110.
Miyazaki, Kazuo: *See*—
Asai, Nobuteru; Sakai, Yasuo; and Miyazaki, Kazuo, 4,924,432, Cl 364-900.000.
Miyazaki, Yasunosuke: *See*—
Sano, Akira; Yokoyama, Shigeki; Miyazaki, Yasunosuke; Kuroishi, Tetsujiro; and Matsuura, Kazuo, 4,923,935, Cl. 526-73.000.
Miyazawa, Takeshige: *See*—
Saito, Yoshihiro; Wada, Nobuhide; Kusano, Shoji; Miyazawa, Takeshige; Takahashi, Satoru; Toyokawa, Yasuhumi; and Kajiwaca, Ikuo, 4,923,501, Cl. 71-92.000.
Miyazawa, Yuzo; and Nakamura, Koichi, to Sharp Kabushiki Kaisha Rotor movement warning device for use in stepper motors. 4,924,167, Cl. 318-696.000.
Mizoguchi, Kenji; Takeuchi, Hitoshi; Nishigaki, Yoshiyasu; Kato, Yoshihiro; and Sakakibara, Shinichi, to Aisan Kogyo Kabushiki Kaisha. Fuel injection device. 4,922,876, Cl. 123-470.000.
Mizuguchi, Ryuzo: *See*—
Kanda, Kazunori; and Mizuguchi, Ryuzo, 4,923,894, Cl. 514-493.000.
Mizukusa, Takashi; and Yagi, Juzo, to NGK Spark Plug Co., Ltd Rotary valve made of ceramics. 4,922,949, Cl. 137-309.000
Mizuno, Hisayoshi: *See*—
Matsuura, Ichiro; Ishimaru, Kiichiro; Mizuno, Hisayoshi; Omata, Youichi; and Soutome, Fumio, 4,923,653, Cl. 264-46.600.
Omata, Youichi; Matsuura, Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, 4,923,378, Cl. 425-4.00R.
Mizuno, Yutaka; and Takamuku, Hideyuki, to Fanuc Ltd. Image display device displaying a composite character and graphic color image. 4,924,299, Cl. 358-22.000.
MKH Enterprises, Inc.: *See*—
Kramer, Donald R.; and Hayford, Eric M., 4,922,680, Cl. 52-713.000.
Moberg, Lennart; and Hedin, Asa, to Siemens Aktiengesellschaft Method for finding the parameters in a functional relationship between stimulation frequency and load condition sensor signals in a rate responsive heart pacemaker. 4,922,907, Cl. 128-419.00P.
Mobil Oil Corporation: *See*—
Graziani, Kenneth R.; Katzer, James R.; and Kyan, Chwan P., 4,923,591, Cl. 208-111.000.
Heilweil, Israel J.; and Shoemaker, Gerald L., 4,923,617, Cl. 210-698.000.
Sprunt, Eve S.; Davis, R. Michael; Kennedy, W. David; and Collins, Samuel H., 4,924,187, Cl. 324-376.000
Valyocsik, Ernest W.; Wong, Stephen S.; and Calvert, Robert B., 4,923,690, Cl. 423-328.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Mobley, Joseph G.: *See—*
Farmer, James O.; Schodowski, Blair J.; Mobley, Joseph G.; Cole, Gregory C.; Tumblin, John E.; Banker, Robert O.; and West, Lamar, 4,924,498, Cl. 380-15.000.

Mochida, Kenichi: *See—*
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.

Mochizuki, Kiyofumi: *See—*
Edagawa, Noboru; Mochizuki, Kiyofumi; and Iwamoto, Yoshinao, 4,923,291, Cl. 350-389.000.

Modular Computer Systems, Inc. (Florida Corporation): *See—*
McKinney, Steven J.; and Earnshaw, William E., 4,924,380, Cl. 364-200.000.

Moelzer, Peter: *See—*
Pollner, Juergen; Trummer, Gregor; Moelzer, Peter; and Fichtner, Karl, 4,923,253, Cl. 303-7.000.

Moessner, Helmut A.: *See—*
Brodie, Ivor; Gurnick, Henry R.; Holland, Christopher E.; and Moessner, Helmut A., 4,923,421, Cl. 445-24.000.

Moise, Rene F., to Forges des Margerides S.A. Scarifier and moss rake adapted to be fitted to a small power driven cultivator. 4,923,016, Cl. 172-21.000.

Molex Incorporated: *See—*
Michaels, Leonard H., 4,923,413, Cl. 439-589.000.

Molinari, Georges: *See—*
Balmisse, Michel; and Molinari, Georges, 4,923,746, Cl 428-309.900.

Mombrinie, Bruno, to Avec Scientific Utility Corporation. Radiolucent iliac crest support frame 4,923,187, Cl. 269-328.000.

Monarch Marking Systems, Inc.: *See—*
Janicki, Mark A.; and Schultz, Paul S., 4,923,542, Cl. 156-92.000.

Monberg, Eric M.: *See—*
Chemans, Jim E.; and Monberg, Eric M., 4,923,561, Cl. 156-616.400.

Mondeschka, Diana M.: *See—*
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877 Cl. 514-284.000.

Mondoy, Tiodoro: *See—*
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Rohringer, Thomas; and Schrage, Horst, 4,923,318, Cl. 401-225.000.

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Onishi, Takashi; Suzuki, Shigeaki; Mori, Toshiki; and Fujita, Yoshiji, 4,924,030, Cl. 568-34.000.

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Hirata, Keiichi; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; Ikeda, Yoshie; and Kawakami, Yasushi, 4,924,433, Cl. 364-900.000.

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Moser, Mark D.; and Lawson, R. Joe, to UOP. Trimetallic reforming catalyst. 4,923,595, Cl. 208-139.000.

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Anderson, Floyd E.; and Robb, Stephen P., 4,924,111, Cl. 307-270.000.
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Opas, George F.; and Porrett, Edward C., 4,924,194, Cl. 330-289.000.

Mottine, John J., Jr.: *See—*
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Sapega, Alexander A.; Moyer, Ray A.; and Rose, Donald, 4,922,897, Cl. 606-80.000.

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Freeman, Gary T., 4,924,304, Cl. 358-101.000.

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Blizzard, Timothy A.; and Mrozik, Helmut, 4,923,867, Cl. 514-250.000.

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Plamper, Gerhard R.; and Borling, Alan, 4,923,252, Cl. 301-63.0PW.

Muccioli, Luigi. Adjustable metal door and frame therefor. 4,922,659, Cl. 49-501.000.

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Hosoi, Nobuyuki; Hashimoto, Shigeru; Yoshida, Hiroshi; Watanabe, Yukio; Mukai, Yasuo; and Yamamoto, Michiko, 4,923,766, Cl. 428-694.000.

Mukasa, Shunsuke: *See—*
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Mulhauser, Michel: *See—*
Massonneau, Viviane; and Mulhauser, Michel, 4,924,007, Cl. 549-18.000.

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Riebel, Hans-Jochem; Fest, Christa; Muller, Klaus-Helmut; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,923,505, Cl. 71-93.000.

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Harding, George W.; and Mullett, Rodney M., 4,922,557, Cl. 4-477.000.

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Mijnders, Gijsbert J., 4,923,014, Cl. 172-2.000.

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Partilla, Stephen R.; and Mungenast, Mark F., 4,924,265, Cl. 355-204.000.

Munk, Kurt, to Ciba-Geigy Corporation. Curable mixtures. 4,923,911, Cl. 523-457.000.

Munsterman, Gregg H.; Geyer, Paul W.; and Zaverzence, Harry, to Chrysler Corporation. Printed circuit board, in line straight pin connector therefor. 4,923,405, Cl. 439-78.000.

Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, to Kyowa Hakko Kogyo Co., Ltd. Derivatives of physiologically active substance K-252. 4,923,986, Cl. 540-545.000.

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Muramoto, Mutsushi: *See—*
Sekoguchi, Kotohiko; Noguchi, Keiichi; Muramoto, Mutsushi; and Ohata, Takayuki, 4,923,115, Cl. 236-12.110.

Murasawa, Yasuhiro: *See—*
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Nakagoshi, Akira; Tahara, Hiroshi; Yamada, Tetuo; Sekiguchi, Hiroyuki; and Murata, Hidemi, 4,923,692, Cl. 423-447.400.

Murata Kikai Kabushiki Kaisha: *See—*
Hirai, Kazuyasu; Inoue, Yasuhiro; and Suzuki, Kazuyoshi, 4,923,132, Cl. 242-35.50A.
Matsui, Isamu; and Ueda, Yutaka, 4,922,703, Cl. 57-93.000.
Sakai, Shoji; and Iwai, Yukio, 4,922,705, Cl. 57-306.000.

Murata Manufacturing Co., Ltd.: *See—*
Uchida, Katsuyuki, 4,924,204, Cl. 338-22.00R.

Murata, Masayoshi; Chiba, Toshiyuki; and Yamada, Akira, to Fujisawa Pharmaceutical Company, Ltd. 3-Alkenyl-1-azabicyclo(3.2.0)hept-2-ene-2-carboxylic acid compounds. 4,923,857, Cl. 514-210.000.

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Nogami, Masaaki; Hasegawa, Akira; Nojima, Hiroshi; and Murata, Mitsuhiro, 4,922,872, Cl. 123-319.000.

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Ito, Masazumi; and Murata, Tomoji, 4,924,274, Cl. 355-313.000.

Murata, Yukiho: *See—*
Hirohama, Huji; Ono, Eiichi; and Murata, Yukiho, 4,922,570, Cl. 15-250.020.

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Coxhead, Bruce; Hughes, Gary; and Murchie, John R., 4,923,395, Cl. 432-5.000.

Murphy, R. Edward: *See—*
Pollock, Richard A.; and Murphy, R. Edward, 4,922,922, Cl. 128-760.000.

Murray Ohio Manufacturing Company, The: *See—*
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 4,922,696, Cl. 56-202.000.

Musa, Yoshikazu: *See—*
Ninomiya, Yasuo; Musa, Yoshikazu; Kainoh, Yoichi; and Komamura, Chiaki, 4,923,607, Cl. 210-490.000.

Musschoot, Albert: *See—*
Kraus, Richard B.; and Musschoot, Albert, 4,923,177, Cl. 266-44.000.

Mutez, Sylvain: *See—*
Mortreux, Andre ; Petit, Francis; Mutez, Sylvain; and Paumard, Eric, 4,923,840, Cl. 502-167.000.

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Weibel, Michael K.; and Myers, Chester D., 4,923,981, Cl. 536-56.000.

Myoi, Yasuhito: *See—*
Yagi, Shigenori; Myoi, Yasuhito; Kuzumoto, Masaki; Kuba, Kazuki; Seiwa, Yoshito; Aoyagi, Toshitaka; and Mihashi, Yutaka, 4,924,474, Cl. 372-75.000.

Naatz, David C.: *See—*
Christenson, Patrick J.; Hart, Robert J.; Naatz, David C.; Rowlance, Edward J.; and Wenz, David G., 4,924,434, Cl. 364-900.000.

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Given, Peter S., Jr., 4,923,708, Cl. 426-610.000.

Nagai, Kiyonori, to Sky Aluminum Co., Ltd. Apparatus for cutting metal sheet. 4,922,778, Cl. 83-501.000.

Nagaishi, Hatsuo, to Nissan Motor Company, Limited. System and method for controlling fuel injection quantity for internal combustion engine. 4,922,877, Cl. 123-478.000.

Nagao Company, Inc.: *See—*
Iwabuchi, Shigeru; Sato, Aritsune; and Ueno, Haruo, 4,922,885, Cl. 124-78.000.

Nagao, Toshishige, to Mitsubishi Denki Kabushiki Kaisha. Optical measuring device with alternately-activated detection. 4,924,105, Cl. 250-560.000.

Nagasawa, Kenichi: *See—*
Takimoto, Hiroyuki; Nagasawa, Kenichi; Fujimoto, Mikihiro; Kobayashi, Hiroyuki; and Takei, Masahiro, 4,924,326, Cl. 360-10.200.

Nagata, Osamu: *See—*
Horaguchi, Yoichi; Sakakibara, Kenji; Yamada, Makoto; Nagata, Osamu; Suzuki, Tsuyoshi; and Sugiura, Toshio, 4,924,255, Cl. 355-27.000.

Naggiar, Samir F., to Carter-Wallace, Inc. Cosmetic stick composition. 4,923,478, Cl. 8-161.000.

Nagler, Miriam: *See—*
Ophir, Zohar; Golstein, Michael; and Nagler, Miriam, 4,923,066, Cl. 209-538.000.

Nagura, Shigehiro: *See—*
Yamamoto, Akira; Saguchi, Ryuichi; and Nagura, Shigehiro, 4,923,119, Cl. 239-55.000.

Nahill, Thomas E.: *See—*
Collette, Wayne N.; Krishnakumar, Sappayan M.; and Nahill, Thomas E., 4,923,723, Cl. 428-35.700.

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Nail, James W., to Craftsman Printing Company. Method for compiling sheets in a bindery process. 4,923,189, Cl. 270-54.000.

Naka, Hideo: *See—*
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Naka, Hiromasa; Nakamura, Norio; Okushima, Takehiko; Okumura, Takao; and Shoji, Tatsuo, to Naka Technical Laboratory. Free access floor and method of constructing the same. 4,922,670, Cl. 52-126.600.

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Naka, Hiromasa; Nakamura, Norio; Okushima, Takehiko; Okumura, Takao; and Shoji, Tatsuo, 4,922,670, Cl. 52-126.600.

Nakachi, Osamu: *See—*
Masuhara, Eiichi; Kadoma, Yoshinori; Matsumoto, Takeo; Komai, Takeshi; Yamada, Eiichi; Nakachi, Osamu; and Irukayama, Godo, 4,923,905, Cl. 522-24.000.

Nakagawa, Atsushi; and Takeishi, Kazumi, to Hitachi Koki Company, Ltd. Sandpaper clamp mechanism for orbital finishing sander. 4,922,663, Cl. 51-170.0TL.

Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, to Hitachi, Ltd.; and Mitsubishi Electric Corporation. Motion detecting circuit for video signal processing using correlation techniques. 4,924,305, Cl. 358-105.000.

Nakagawa, Takaaki: *See—*
Matsuo, Hiroto; Kawamoto, Iwaji; Ishihara, Masamichi; and Nakagawa, Takaaki, 4,922,993, Cl. 164-104.000.

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Nakahashi, Masako: *See—*
Iyogi, Kiyoshi; Nakahashi, Masako; Takeda, Hiromitsu; and Shirokane, Makoto, 4,924,033, Cl. 174-259.000.

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Honda, Kazuhiro; Yamashita, Kouji; Kawai, Masanori; Nakahi, Kazuo; and Tatetsuki, Kuniharu, 4,924,237, Cl. 343-702.000.

Nakahigasi, Isamu; and Suzuki, Yoshio, to Shinano Pneumatic Industries Inc. Spot gun for a welder machine. 4,924,055, Cl. 219-86.210.

Nakai, Noboru: *See—*
Isozaki, Osamu; Nakai, Noboru; Ito, Satoru; and Takami, Seiji, 4,923,945, Cl. 528-16.000.
Nakajima, Akihiro: *See—*
Masuda, Kenmei; Ogiro, Kenji; Okada, Yoshinori; Nakajima, Akihiro; Kochi, Mashanori; and Konno, Kazutoshi, 4,924,329, Cl. 360-64.000.
Nakajima, Yasuhisa: *See—*
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.
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Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, 4,923,027, Cl. 180-219.000.
Nakamichi Corporation: *See—*
Inoue, Yoshihisa, 4,924,335, Cl. 360-93.000.
Nakamura, Hajime, to Sankyo Engineering Co., Ltd. Injection metal mold. 4,923,388, Cl. 425-577.000.
Nakamura, Hiroki; Yamada, Takashi; and Ouchi, Yoshiaki, to Kabushiki Kaisha Toshiba. Perpendicular magnetic recording medium. 4,923,763, Cl. 428-458.000.
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Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,922,861, Cl. 122-448.00R.
Nakamura, Kazuhiko: *See—*
Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, 4,923,027, Cl. 180-219.000.
Nakamura, Kiyoshi: *See—*
Inaba, Hiromi; Nakamura, Kiyoshi; Kimura, Akira; Hokari, Sadao; and Oouchi, Naoyuki, 4,924,373, Cl. 363-95.000.
Nakamura, Koichi: *See—*
Miyazawa, Yuzo; and Nakamura, Koichi, 4,924,167, Cl. 318-696.000.
Nakamura, Kousuke: *See—*
Yasutomi, Yoshiyuki; Matsushita, Yasuo; and Nakamura, Kousuke, 4,923,829, Cl. 501-95.000.
Nakamura, Norio: *See—*
Naka, Hiromasa; Nakamura, Norio; Okushima, Takehiko; Okumura, Takao; and Shoji, Tatsuo, 4,922,670, Cl. 52-126.600.
Nakamura, Yasuyuki; Hashimoto, Akio; Fujita, Toshiaki; and Kawakami, Makoto, to Sumitomo Special Metals Co., Ltd. Process for producing clad sheets. 4,923,100, Cl. 228-117.000.
Nakamura, Yozo: *See—*
Kadomukai, Yuzo; Yamakado, Makoto; and Nakamura, Yozo, 4,922,869, Cl. 123-192.00R.
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asasno, Kozo; Tomita, Fusao; Sano, Hiroshi, Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, to Kyowa Hakko Kogyo Co., Ltd. Pyrindamycins A and B and duocarmycin A antibiotics derived from certain streptomyces culture. 4,923,990, Cl. 546-84.000.
Nakano, Ichiro: *See—*
Toru, Suzuki; Kato, Atsuhiko; Hosoi, Mitsuo; and Nakano, Ichiro, 4,924,153, Cl. 318-587.000.
Nakashima, Yasushi: *See—*
Fukuhara, Hiroshi; Matsunaga, Fujihisa; and Nakashima, Yasushi, 4,923,837, Cl. 502-84.000.
Nakayama, Shiro; Kunimura, Satoshi; Takahashi, Shigemi; Takahashi, Katsuhiko; Hirayama, Toshimitu; and Akutsu, Masao, to Fujikura Ltd. Piezo-electric acceleration sensor. 4,924,131, Cl. 310-329.000.
Nakazato, Katsuo: *See—*
Kurosawa, Toshiharu; Tsuchiya, Hiroyoshi; Maruyama, Yuji; and Nakazato, Katsuo, 4,924,322, Cl. 358-448.000.
Nakazato, Yasushi: *See—*
Tanaka, Hidetake; Yamazaki, Shigeru; Yamanobe, Koji; Kotabe, Hiroaki; Nakazato, Yasushi; and Banno, Masahiko, 4,924,320, Cl. 358-296.000.
Nakazima, Hirokazu: *See—*
Komori, Nobutoshi; and Nakazima, Hirokazu, 4,923,918, Cl. 524-339.000.
Nalco Chemical Company *See—*
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., 4,923,634, Cl. 252-389.200.
Shawki, Shamel M.; and Van Oss, Richard N., 4,923,566, Cl. 162-135.000.
Nambu, Kyojiro, to Kabushiki Kaisha Toshiba. Stereotactics apparatus. 4,923,459, Cl. 606-130.00.0.
Namose, Isamu, to Seiko Epson Corporation. Forming trench in semiconductor substrate with rounded corners. 4,923,821, Cl. 437-38.000.
Nanamura, Masanori: *See—*
Ogino, Yoshitaka; Yanagisawa, Ryozo; Koumura, Noboru; and Nanamura, Masanori, 4,924,319, Cl. 358-296.000.
Narang, Rajendra K. Fuel burning furnace. 4,922,890, Cl. 126-110.00R.
Nare, Donald H.; and Schmeiser, Albert L. Portable smoke retention device. 4,922,931, Cl. 131-211.000.
Naruse, Hideaki: *See—*
Kobayashi, Hidetoshi; and Naruse, Hideaki, 4,923,783, Cl. 430-377.000.
Nasr, Ali M.; and Miller, Gregory W., to Liquiflo Equipment Company. Apparatus for detecting bearing shaft wear utilizing rotatable magnet means. 4,924,180, Cl. 324-207.150.
Nassetti, Roberto, to T.T.C. Termo Tecnica Ceramica S.P.A. Flat separation floor between two superposed chambers in kilns, in particular roller-hearth kilns for ceramic tiles. 4,923,397, Cl. 432-251.000.
Natale, Anthony: *See—*
Newman, Eugene E.; and Natale, Anthony, 4,922,806, Cl. 98-1.500.
National-Oilwell: *See—*
Johnson, Jerry E., 4,922,957, Cl. 137-516.290.
National Starch and Chemical Corporation: *See—*
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse, William M., III, 4,923,695, Cl. 424-71.000.
Naylor Industrial Services: *See—*
Bloch, Christopher J., 4,922,937, Cl. 134-22.120.
NCR Corporation: *See—*
Bray, John E.; and Poos, David, 4,924,522, Cl. 382-56.000.
Lee, Steven S., 4,923,563, Cl. 156-649.000.
Talvalkar, Shashi G., 4,923,749, Cl. 428-341.000.
NDC Company, Ltd.: *See—*
Shindo, Takeshi, 4,923,761, Cl. 428-550.000.
NEC Corporation: *See—*
Kashimura, Masahiko, 4,924,118, Cl. 307-468.000.
Kobatake, Hiroyuki, 4,924,438, Cl. 365-185.000.
Kurashita, Masahiro; and Nomizu, Nobuyoshi, 4,924,429, Cl. 364-578.000.
Ohki, Jun'ichi; and Koga, Toshio, 4,924,311, Cl. 358-138.000.
Okamoto, Toshiyuki, 4,924,223, Cl. 341-95.000.
Ooi, Yasushi, 4,924,376, Cl. 364-200.000.
Saito, Akio; and Ishigami, Masahiro, 4,924,193, Cl. 330-284.000.
Shimizu, Toshimitsu, 4,924,457, Cl. 370-56.000.
Shouda, Masahiro, 4,924,382, Cl. 364-200.000.
Tokuume, Takahiro, 4,924,381, Cl. 364-200.000.
Wake, Yasuhiro, 4,924,517, Cl. 381-40.000.
Necker, Douglas C.; and Linden, Shwn M. Y., to Bowling Green State University. Xanthene dye complexes. 4,924,009, Cl. 549-223.000.
Nedelk, John, to Aircraft Braking Systems Corporation. Method of increasing the service life of aircraft carbon disk brakes. 4,923,056, Cl. 188-71.100.
Negoro, Ikuo; and Kita, Masahiro, to Asahi Kogaku Kogyo K.K. Printer for continuous form. 4,924,266, Cl. 355-205.000.
Neidorff, Robert A., to Unitrode Corporation. High current-gain PNP transistor. 4,924,288, Cl. 357-68.000.
Neil, Brian K., to Advanced Input Devices. Double shuttle diffusion printer. 4,922,816, Cl. 101-41.000.
Neir, Kenneth E., to Spectra-Physics. Z-fold paper sheet carrier. 4,923,188, Cl. 270-39.000.
Nelles, Bruno; and Schwenn, Rainer, to Carl-Zeiss-Stiftung. Optical system for masking out a component region of an image. 4,923,293, Cl. 350-503.000.
Nelson, Charles A., to Williams International Corporation. Starting system for turbine engines. 4,922,708, Cl. 60-39.141.
Nelson, Erik K., to Mead Corporation, The. Color-correcting exposure system for a photosensitive media. 4,923,779, Cl. 430-138.000.
Nelson, Laurence A., to PI, Inc. Caps for milk bottles and an applicator for placing caps on bottles. 4,922,684, Cl. 53-314.000.
Nelson, Richard D., to Microelectronics and Computer Technology Corporation. Heat exchanger having piezoelectric fan means. 4,923,000, Cl. 165-122.000.
Nelson, Roger W., to Eastman Kodak Company. Test device containing an immunoassay filter with a flow-delaying polymer. 4,923,680, Cl. 422-58.000.
Nelson, Terence J., to Bell Communcations Research, Inc. Flat panel color display comprising backlight assembly and ferroelectric liquid crystal shutter assembly. 4,924,215, Cl. 340-701.000.
Nelson, Thomas C., to Storage Technology Corporation. Printer switchable between duplex and simplex mode on a page by page basis. 4,924,275, Cl. 355-319.000.
Nemirovsky, Robert, to Nemirovsky, Robert; and Deutsch, Joseph. High precision drive mechanism. 4,923,434, Cl. 474-101.000.
Nemoto, Shusuke: *See—*
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,922,787, Cl. 475-83.000.
Neste Oy: *See—*
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,923,979, Cl. 536-32.000.
Seppanen, Hanneli; and Krause, Outi, 4,923,937, Cl. 526-124.000.
Nestler, Heinz: *See—*
Barfurth, Dieter; and Nestler, Heinz, 4,924,016, Cl. 556-40.000.
Netherland, Robert B.: *See—*
Gresh, Richard D.; and Netherland, Robert B., 4,923,606, Cl. 210-275.000.
Neuerburg, Horst, to Kuhn S.A. Mower equipped with a cutting bar. 4,922,693, Cl. 56-13.600.
Neugebauer, Wolfgang; and Poll, Heinz-Guenter, to Huels Aktiengesellschaft. Molding compounds comprising a thermoplastically processible, aromatic polyester imide. 4,923,953, Cl. 528-170.000.
Neumann, Peter: *See—*
Leyrer, Reinhold J.; and Neumann, Peter, 4,924,003, Cl. 548-379.000.
Neumann, Rainer: *See—*
Lindae, Gerhard; Neumann, Rainer; and Perthus, Peter, 4,924,359, Cl. 362-61.000.
Neustadt, Ariel: *See—*
Weiss, Dale F.; and Neustadt, Ariel, 4,923,076, Cl. 220-1.500.
New, David M., to Carrier Corporation. Heat pump system. 4,922,726, Cl. 62-235.100.
New England Medical Center Hospitals Inc.: *See—*
Webb, Andrew C.; and Auron, Philip E., 4,923,807, Cl. 435-69.200.

Newell, Robert D. Interstitially capacitive absorptive articles. 4,923,738, Cl. 428-221.000.
Newkirk, Marc S.; and Kantner, Robert C., to Lanxide Technology Company, LP. Method of making shaped ceramic composites with the use of a barrier. 4,923,832, Cl. 501-128.000.
Newkirk, Mark C., to Maul Technology Corporation. Article transfer mechanism. 4,923,499, Cl. 65-163.000.
Newman, Eugene E.; and Natale, Anthony, to GPAC, Inc. Doors for negative air pressure enclosure. 4,922,806, Cl. 98-1.500.
Newville, Gerald E. Collapsible sawhorse. 4,923,051, Cl. 182-151.000.
NeXT, Inc.: *See—*
Seamons, John K.; and Grundy, Kevin P., 4,924,327, Cl. 360-48.000.
Seamons, John K.; and Grundy, Kevin P., 4,924,330, Cl. 360-66.000.
Neyraud, Rene , to ICBT Lyon. Device limiting ballooning in the unwinding or winding of a yarn. 4,922,706, Cl. 57-354.000.
NGK Insulators, Ltd.: *See—*
Horikita, Hiroyuki; Hattori, Nobuo; Takagi, Yahei; Kawaguchi, Gaku; and Maeda, Toshihiro, 4,923,812, Cl. 435-158.000.
Matsuo, Hiroto; Kawamoto, Iwaji; Ishihara, Masamichi; and Nakagawa, Takaaki, 4,922,993, Cl. 164-104.000.
Oshima, Shinji; and Misawa, Hidenobu, 4,923,655, Cl. 264-60.000.
Watanabe, Keiichiro; Matsuhisa, Tadaaki; and Sakai, Hiroaki, 4,923,308, Cl. 374-137.000.
Yasuda, Keiji; and Miyahara, Kazuhiro, 4,923,206, Cl. 280-504.000.
NGK Spark Plug Co., Ltd.: *See—*
Mizukusa, Takashi; and Yagi, Juzo, 4,922,949, Cl. 137-309.000.
Nishio, Hisaharu; and Hayashi, Hiromichi, 4,923,587, Cl. 204-424.000.
Nichol, Thomas W.; Gisske, Edward T.; and Johnson, Arlyn, to Nichol, Thomas W.; and Johnson, Arlyn. Electronic bag toss game. 4,923,201, Cl. 273-371.000.
Nicholson, Patrick S.: *See—*
Patel, Narenora; Van den Andel, Jan; Nicholson, Patrick S.; and Grzymer, Alicja H., 4,922,594, Cl. 29-25.350.
Nickel, Bernd: *See—*
Engel, Jurgen; Emig, Peter; Nickel, Bernd; and Szelenyi, Istvan, 4,923,858, Cl. 514-211.000.
Nieman, Ronald E.: *See—*
Lim, Git B.; Nieman, Ronald E.; and Banerjee, Sanjoy, 4,924,099, Cl. 250-390.040.
Niemi, Bill H., to Sermed Incorporated. Solid state optical relay. 4,924,343, Cl. 361-98.000.
Nies, Donald E.: *See—*
Belliotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,924,002, Cl. 548-206.000.
Nihon Medi-Physics Co., Ltd.: *See—*
Tanaka, Shinsuke; Takahashi, Jun; Ueda, Nobuo; and Matsushima, Hiroaki, 4,923,088, Cl. 220-468.000.
Niihara, Toshio: *See—*
Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, 4,923,765, Cl. 428-694.000.
Nike, Inc. and Nike International Ltd.: *See—*
Robinson, John R., 4,922,630, Cl. 36-89.000.
Nikon Corporation: *See—*
Iida, Yoshikazu; Hagiuda, Nobuyoshi; Yokonuma, Norikazu; Sakamoto, Hiroshi; and Matsui, Hideki, 4,924,252, Cl. 354-420.000.
Juen, Masahiro, 4,924,313, Cl. 358-140.000.
Niksa, Andrew J.: *See—*
Abrahamson, Donald W.; Harney, Marilyn J.; Vauss, Elvin W., Jr.; Niksa, Andrew J.; and Stewart, James J., 4,923,582, Cl. 204-255.000.
Nilsen, Carl J.; and Weiss, Hardy P., to PRC Corporation. Gas laser apparatus, method and turbine compressor therefor. 4,923,364, Cl. 415-55.600.
Nilssen, Ole K. Power-line control system. 4,924,150, Cl. 315-244.000.
Nilsson, Bjarne. Filter bag for a filter section. 4,923,605, Cl. 210-232.000.
Ninomiya, Yasuo; Musa, Yoshikazu; Kainoh, Yoichi; and Komamura, Chiaki, to Nitto Denko Corporation. Membrane containing a liquid active substance and process for the production of same. 4,923,607, Cl. 210-490.000.
Nippon Oil Co., Ltd.: *See—*
Sano, Akira; Yokoyama, Shigeki; Miyazaki, Yasunosuke; Kuroishi, Tetsujiro; and Matsuura, Kazuo, 4,923,935, Cl. 526-73.000.
Nippon Oil and Fats Co., Ltd.: *See—*
Masuhara, Eiichi; Kadoma, Yoshinori; Matsumoto, Takeo; Komai, Takeshi; Yamada, Eiichi; Nakachi, Osamu; and Irukayama, Godo, 4,923,905, Cl. 522-24.000.
Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, 4,923,956, Cl. 525-263.000.
Nippon Paint Co., Ltd.: *See—*
Kanda, Kazunori; and Mizuguchi, Ryuzo, 4,923,894, Cl 514-493.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Yamamoto, Kazuo, 4,923,213, Cl. 280-804.000.
Nippon Silica Glass Co., Ltd.: *See—*
Yamashita, Hiroshi; Fujii, Kanenaga; Fukunishi, Takumi; Shigeoka, Masafumi; and Sudo, Hiroshi, 4,924,357, Cl. 362-32.000.
Nippon Soken & Toyota Jidosha Kabushiki Kaisha: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Ishaihara, Toshihisa; Sugitani, Tatsuo; and Inoue, Hideo, 4,922,753, Cl. 73-516.00R.
Nippon Tansan Gas Co., Ltd.: *See—*
Fumino, Ichiro, 4,923,394, Cl. 431-343.000.
Nippondenso Co., Ltd.: *See—*
Kaji, Yasumasa; and Takaki, Toru, 4,922,879, Cl. 123-494.000.
Yamane, Hiroyuki; Higuchi, Yasushi; and Fujii, Tetsuo, 4,924,277, Cl. 357-23.300.
Nishida, Masami: *See—*
Ohtani, Masami; and Nishida, Masami, 4,923,054, Cl. 187-25.000.
Nishida, Rikio. Punching tool. 4,922,615, Cl. 30-360.000.
Nishida, Takao; and Kobayashi, Takeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus for controlling the charging of a main capacitor of a flash unit. 4,924,149, Cl. 315-241.00P.
Nishida, Yoshikazu: *See—*
Kadota, Yasushi; and Nishida, Yoshikazu, 4,923,435, Cl. 474-112.000.
Nishide, Seiichiro; and Usami, Shigeoki, to Bridgestone Corporation. Tire building apparatus. 4,923,553, Cl. 156-401.000.
Nishigaki, Hideo: *See—*
Kaneko, Hideo; and Nishigaki, Hideo, 4,923,768, Cl. 429-19.000.
Nishigaki, Yoshiyasu: *See—*
Mizoguchi, Kenji; Takeuchi, Hitoshi; Nishigaki, Yoshiyasu; Kato, Yoshihiro; and Sakakibara, Shinichi, 4,922,876, Cl. 123-470.000.
Nishihara, H. Keith: *See—*
Crossley, P. Anthony; Nishihara, H. Keith; and Hunt, Neil D., 4,924,506, Cl. 382-28.000.
Nishikawa, Kenjiro, to Maruni Kasei Kabushiki Kaisha. Bookbinding and its products. 4,923,351, Cl. 412-6.000.
Nishikawa, Masayuki: *See—*
Yagi, Shigeru; Ono, Masato; Takahashi, Noriyoshi; Nishikawa, Masayuki; Fukuda, Yuzuru; and Karakida, Kenichi, 4,923,773, Cl. 430-57.000.
Nishiki, Masayuki, to Kabushiki Kaisha Toshiba. X-ray diagnostic apparatus. 4,924,487, Cl. 378-190.000.
Nishimaki, Hideo: *See—*
Tanaka, Kenji; Miyano, Kenmi; Nishimaki, Hideo; and Iga, Yoshiro, 4,923,815, Cl. 435-183.000.
Nishio, Hisaharu; and Hayashi, Hiromichi, to NGK Spark Plug Co., Ltd. Terminal fixing structure for a ceramic base. 4,923,587, Cl. 204-424.000.
Nishioka, Toshio: *See—*
Yoneyoshi, Yukio; Suzukamo, Gohfu; Hamada, Kazuhiko; and Nishioka, Toshio, 4,923,999, Cl. 548-268.400.
Nishizawa, Yoshihiko: *See—*
Akao, Takeshi; Nishizawa, Yoshihiko; Yamada, Shiro; Fuse, Hisahumi; Ohsaki, Katsumichi; and Sakai, Morihiko, 4,922,650, Cl. 47-1.100.
Nissan Motor Co., Ltd.: *See—*
Hirohama, Huji; Ono, Eiichi; and Murata, Yukiho, 4,922,570, Cl. 15-250.020.
Nagaishi, Hatsuo, 4,922,877, Cl. 123-478.000.
Sasaki, Michiaki; and Masuda, Joji, 4,922,959, Cl. 137-587.000.
Nissho Corporation: *See—*
Ikeda, Kohji; Tsuji, Akira; and Sunaga, Yoshiyuki, 4,922,597, Cl. 29-240.000.
Nissimov, Jossif N.: *See—*
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.
Nittan Co., Ltd.: *See—*
Yuasa, Hayami, 4,924,417, Cl. 364-550.000.
Nitto Denko Corporation: *See—*
Ninomiya, Yasuo; Musa, Yoshikazu; Kainoh, Yoichi; and Komamura, Chiaki, 4,923,607, Cl. 210-490.000.
Wada, Shintaro; Nomura, Yoichi; Takahashi, Hisanori; and Konno, Masayuki, 4,922,911, Cl. 128-640.000.
Niven Marketing Group, The: *See—*
Jackle, William C.; and Czerkies, Tadeusz, 4,923,070, Cl. 211-59.200.
NKK Corporation: *See—*
Ishikawa, Hiroshi; Gunji, Naoki; Hoshino, Yoshinori; and Ohyama, Taro, 4,923,762, Cl. 428-551.000.
Ogura, Yasutsugu; and Maeda, Ryuichi, 4,922,994, Cl. 164-437.000.
Noda, Noboru: *See—*
Endo, Kazuo; Noda, Noboru; and Mitani, Tatsuro, 4,924,281, Cl. 357-23.900.
Nogami, Masaaki; Hasegawa, Akira; Nojima, Hiroshi; and Murata, Mitsuhiro, to Tokyo-Buhin Kogyo Co., Ltd.; and Isuzu Gidoshiya Kogyo Co., Ltd. Engine brake system. 4,922,872, Cl. 123-319.000.
Nogi, Hiroshi: *See—*
Kitazume, Masahiro; Aoki, Makoto; Nogi, Hiroshi; Homma, Kazuya; and Matsuzawa, Shigemi, 4,922,752, Cl. 73-146.000.
Noguchi, Keiichi: *See—*
Sekoguchi, Kotohiko; Noguchi, Keiichi; Muramoto, Mutsushi; and Ohata, Takayuki, 4,923,115, Cl. 236-12.110.
Noguchi, Masahiro: *See—*
Tamura, Kohji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, 4,923,626, Cl. 252-67.000.
Nohr, Ronald S.; and MacDonald, J. Gavin, to Kimberly-Clark Corporation. Surface-segregatable, melt-extrudable thermoplastic composition. 4,923,914, Cl. 524-99.000.
Nojima, Hiroshi: *See—*
Nogami, Masaaki; Hasegawa, Akira; Nojima, Hiroshi; and Murata, Mitsuhiro, 4,922,872, Cl. 123-319.000.

Noke, Adrian C.: *See—*
Bunce, Martin C.; Helps, David W.; Jenkins, Leonard A.; and Noke, Adrian C., 4,924,048, Cl. 219-10.55E.
Nomizu, Nobuyoshi: *See—*
Kurashita, Masahiro; and Nomizu, Nobuyoshi, 4,924,429, Cl. 364-578.000.
Nomura, Yoichi: *See—*
Wada, Shintaro; Nomura, Yoichi; Takahashi, Hisanori; and Konno, Masayuki, 4,922,911, Cl. 128-640.000.
Nonaka, Chiaki: *See—*
Fujiie, Kazuhiko; Nonaka, Chiaki; and Yoshida, Tadao, 4,924,455, Cl. 369-44.210.
Nonini Geremia: *See—*
Poloni, Alfredo; and Nonini Geremia, 4,922,740, Cl. 72-237.000.
Norand Corporation: *See—*
Sojka, Marvin L., 4,924,462, Cl. 370-95.200.
Nordco Limited: *See—*
Guigne, Jacques Y., 4,924,449, Cl. 367-104.000.
Nordica S.p.A.: *See—*
Pozzobon, Alessandro, 4,923,207, Cl. 280-613.000.
Sartor, Mariano, 4,922,633, Cl. 36-117.000.
Nordson Corporation: *See—*
Price, Richard P., 4,922,852, Cl. 118-683.000.
Northern Telecom Limited: *See—*
Lewis, Harry E.; Ritenour, Gibson D.; Wong, Cho L.; Gara, George; and Eddisford, Allen F., 4,924,500, Cl. 379-201.000.
Vea, Matthew J. J., 4,924,428, Cl. 364-900.000.
Northrop Corporation: *See—*
De La Torre, William, 4,923,737, Cl. 428-217.000.
Northrop, Donald P.; and Strauss, David P., to Duro-Test Corporation. Fluorescent lamp with protective shield. 4,924,368, Cl. 362-376.000.
Norwalk Innovation Lab, Inc.: *See—*
Malkin, Bruce, 4,923,138, Cl. 242-78.600.
Notvest, Ronald R.: *See—*
Abou-Gharbia, Magid A. M.; and Notvest, Ronald R., 4,924,008, Cl. 849-75.000.
Nova Technology Limited Partnership: *See—*
Stewart, John M.; and Vavrek, Raymond J., 4,923,963, Cl. 530-314.000.
Novack, Roger L., to Duke University. Method for measuring ocular oxidative metabolism. 4,922,919, Cl. 128-633.000.
Novak, Philip F.; Shannon, Robert D.; Pinckney, Robert L.; and Humphreys, James R., Jr., to Boeing Company. Aircraft construction. 4,924,228, Cl. 342-2.000.
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse, William M., III, to National Starch and Chemical Corporation. Hydrocarbon tolerant hair fixing compositions. 4,923,695, Cl. 424-71.000.
Nowlin, Charles H.: *See—*
Brashear, Hugh R.; Blair, Michael S.; Phelps, James E.; Bauer, Martin L.; and Nowlin, Charles H., 4,924,450, Cl. 367-118.000.
Nozaka, Yoshiki; Katsuta, Tetsuro; and Miyama, Hiroshi, to Dai Nippon Insatsu Kabushiki Kaisha. Cleaning system of printing press. 4,922,821, Cl. 101-425.000.
Nuernberger, Mark A. Ceiling panel sound system. 4,923,032, Cl. 181-150.000.
Nuesmeyer, David; and Brondt, Gary, to Thermic, Inc. Pelletized fuel burning heater. 4,922,889, Cl. 126-73.000.
Nugent, Adam, Jr.: *See—*
Klobucar, W. Dirk; Nugent, Adam, Jr.; and Zumstein, Ronald C., 4,923,954, Cl. 528-183.000.
Nukem GmbH: *See—*
Huschelrath, Gerhard, 4,924,181, Cl. 324-235.000.
Numakura, Iwao: *See—*
Numakura, Takashi; and Numakura, Iwao, 4,924,323, Cl. 358-456.000.
Numakura, Takashi; and Numakura, Iwao, to Yamatoya & Co., Ltd. Tonal conversion method for pictures. 4,924,323, Cl. 358-456.000.
Nuovopignone Industrie Meccanichee Fonderia S.p.A.: *See—*
Bergamini, Giorgio; and Cipriani, Tommaso, 4,924,406, Cl. 364-470.000.
Nussbaum, Avraham, to Crestmoore Ltd. Depilatory device for removing hair. 4,923,463, Cl. 606-133.000.
Nyman, Tapani; Rommi, Vesa; and Wikman, Kai, to Valmet-Ahlstrom, Inc. Hydraulic headbox with air attenuation chamber located under the stock flow route. 4,923,569, Cl. 162-339.000.
Oates, Robert M.: *See—*
Rozelle, Paul F.; Koch, Karl C.; Einolf, Charles W., Jr.; and Oates, Robert M., 4,922,757, Cl. 73-660.000.
Obara, Keiichi, to Kabushiki Kaisha Toshiba. Multiplex communication system. 4,924,458, Cl. 370-58.100.
Obermarck, Ronald L.: *See—*
Hao, Ming C.; Obermarck, Ronald L.; Trivett, Gene E.; and Trivett, Lynn, 4,924,384, Cl. 364-300.000.
Obuchi, Shouji: *See—*
Kobayashi, Tadashi; Obuchi, Shouji; Matsuno, Hiroaki; Wada, Mitsuo; and Takayanagi, Hiroshi, 4,923,951, Cl. 528-48.000.
Oda, Hiroji: *See—*
Katayose, Teruo; and Oda, Hiroji, 4,923,932, Cl. 525-391.000.
Odaka, Masanori: *See—*
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,924,439, Cl. 365-189.050.
O'Dwyer, James B.; Chang, Wen-Hsuan; Scriven, Roger L.; and Cherenko, Joseph, to PPG Industries, Inc. Bilayer windshield with an abrasion and solvent resistant polyurethane protective coating. 4,923,757, Cl. 428-425.600.
Oelschlaegel, Victor R., to Parker-Hannifin Corporation. Self venting drain valve. 4,922,960, Cl. 137-588.000.
Oertle, Konrad: *See—*
Howell, Frederick H.; Duthaler, Rudolf; Finter, Jurgen; Oertle, Konrad; and Ramanathan, Visvanathan, 4,924,015, Cl. 552-266.000.
Oesterreichische Investitions-Kredit Aktiengesellschaft: *See—*
Stengl, Gerhard; and Loschner, Hans, 4,924,104, Cl. 250-492.300.
Office National D'Etudes et de Recherches Aerospatiales: *See—*
Khan, Tasadduq; and Caron, Pierre, 4,923,525, Cl. 148-3.000.
Ogata, Naoya, to Goodyear Tire & Rubber Company, The. Low temperature synthesis of condensation polymers. 4,923,839, Cl. 502-159.000.
Ogino, Seiichi, to Mitsuba Electric Manufacturing Co., Ltd. Reversible motor drive control circuit. 4,924,154, Cl. 318-286.000.
Ogino, Yoshitaka; Okada, Shinjiro; and Inoue, Yutaka, to Canon Kabushiki Kaisha. Drive apparatus having a temperature detector. 4,923,285, Cl. 350-331.00T.
Ogino, Yoshitaka; Yanagisawa, Ryozo; Koumura, Noboru; and Nanamura, Masanori, to Canon Kabushiki Kaisha. Board-writing apparatus. 4,924,319, Cl. 358-296.000.
Ogiro, Kenji: *See—*
Masuda, Kenmei; Ogiro, Kenji; Okada, Yoshinori; Nakajima, Akihiro; Kochi, Mashanori; and Konno, Kazutoshi, 4,924,329, Cl. 360-64.000.
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, to Hitachi, Ltd. Semiconductor integrated circuit. 4,924,439, Cl. 365-189.050.
Oguchi, Yoshihiro; Sugata, Hiroyuki; Miura, Kyo; Fukui, Tetsuro; and Takasu, Yoshio, to Canon Kabushiki Kaisha. Optical recording medium IR-ray absorptive compound and optical recording medium by use thereof. 4,923,390, Cl. 430-270.000.
Oguchi, Yukio: *See—*
Uzaki, Nobuyuki; Ishii, Hiroaki; Tsuchiya, Ichiro; Oguchi, Yukio; and Kawakami, Tatsuo, 4,923,831, Cl. 501-108.000.
Ogura, Masahiko, to Kabushiki Kaisha Toshiba. Electronic copier with simultaneous charger and erasing array cleaning. 4,924,268, Cl. 355-219.000.
Ogura, Yasutsugu; and Maeda, Ryuichi, to NKK Corporation. Apparatus for pouring molten steel into a mold in continuous casting of steel. 4,922,994, Cl. 164-437.000.
Ohashi, Ryota: *See—*
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,922,787, Cl. 475-83.000.
Ohashi, Yoshimasa: *See—*
Fujisaka, Takahiko; Ohashi, Yoshimasa; and Kondo, Mithimasa, 4,924,235, Cl. 342-374.000.
Ohata, Takayuki: *See—*
Sekoguchi, Kotohiko; Noguchi, Keiichi; Muramoto, Mutsushi; and Ohata, Takayuki, 4,923,115, Cl. 236-12.110.
Ohi Seisakusho Co., Ltd.: *See—*
Takahashi, Jun; and Shimura, Ryoji, 4,923,246, Cl. 296-221.000.
Ohkanda, Masao, to Kioritz Corporation. Starting system. 4,922,868, Cl. 123-179.00P.
Ohki, Jun'ichi; and Koga, Toshio, to NEC Corporation. Dual-mode teleconferencing system. 4,924,311, Cl. 358-138.000.
Ohlendorf, Heinrich-Wilhelm; Kaupmann, Wilhelm; Kuehl, Ulrich; Buschmann, Gerd; and Magda, Stephen, to Kali-Chemie Pharma GmbH. 1-phenyl-2-aminocarbonylindole compounds, preparation thereof and pharmaceutical compositions containing them. 4,924,004, Cl. 548-431.000.
Ohlhauser, Bradley D. Long gun muzzle tether and protector. 4,922,642, Cl. 42-96.000.
Ohmura, Nobuhiko: *See—*
Hanada, Fumio; Ohmura, Nobuhiko; and Hirayama, Koki, 4,923,611, Cl. 210-638.000.
Ohno, Shigeru; Mihara, Yuji; Adachi, Keiichi; Ukai, Toshinao; and Hayashi, Gouichi, to Fuji Photo Film Co., Ltd. Near infrared absorbing composition. 4,923,638, Cl. 252-587.000.
Ohno, Tatsuyuki, to Kabushiki Kaisha Toshiba. Digital clipping circuit with soft clip characteristics. 4,924,121, Cl. 307-542.000.
Ohsaki, Katsumichi: *See—*
Akao, Takeshi; Nishizawa, Yoshihiko; Yamada, Shiro; Fuse, Hisahumi; Ohsaki, Katsumichi; and Sakai, Morihiko, 4,922,650, Cl. 47-1.100.
Ohshima, Toshio, to Fujitsu Limited. Heterojunction bipolar transistor and process for fabricating same. 4,924,283, Cl. 357-34.000.
Ohta, Atsuo: *See—*
Yamashita, Shoji; Ohta, Atsuo; and Hirosawa. Yoshiaki, 4,923,028, Cl. 180-219.000.
Ohta, Norio: *See—*
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.
Ohtani, Masami; and Nishida, Masami, to Dainippon Screen Mfg. Co., Ltd. Wafer transfer apparatus having an improved wafer transfer portion. 4,923,054, Cl. 187-25.000.
Ohwada, Takeo; and Kobayashi, Kengo, to Hitachi Chemical Co. Process for producing graft copolymer. 4,923,929, Cl. 525-126.000.
Ohwada, Yutaka: *See—*
Taniguchi, Yasuyuki; Ohwada, Yutaka; and Araki, Mitsunori, 4,923,730, Cl. 428-92.000.
Ohyama, Taro: *See—*
Ishikawa, Hiroshi; Gunji, Naoki; Hoshino, Yoshinori; and Ohyama, Taro, 4,923,762, Cl. 428-551.000.

Oiles Corporation: *See—*
Kamimura, Hiroto; Kubota, Shuichi; and Iwakura, Masaru, 4,923,312, Cl. 384-420.000.
Oka, Tateki: *See—*
Sako, Mineyuki; Oka, Tateki; Hiromoto, Yasuyuki; Yokoyama, Tomoaki; and Toda, Kunio, 4,924,270, Cl. 355-246.000.
Okada, Shinjiro: *See—*
Ogino, Yoshitaka; Okada, Shinjiro; and Inoue, Yutaka, 4,923,285, Cl. 350-331.00T.
Okada, Yoshinori: *See—*
Masuda, Kenmei; Ogiro, Kenji; Okada, Yoshinori; Nakajima, Akihiro; Kochi, Mashanori; and Konno, Kazutoshi, 4,924,329, Cl. 360-64.000.
Okai, Masakazu: *See—*
Kumagai, Seiichiro; Kono, Michikata; Okai, Masakazu; and Inaga, Hisashi, 4,922,865, Cl. 123-65.0VC.
Okamoto, Kikuhiko: *See—*
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.
Okamoto, Toshiyuki, to NEC Corporation. Digital code converter formed of a decreased number of circuit elements. 4,924,223, Cl. 341-95.000.
Okamura, Noriko: *See—*
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.
Okamura, Takashi: *See—*
Fujita, Shigeyoshi; Sekiya, Naobumi; Okamura, Takashi; and Watanabe, Yoshitaka, 4,922,830, Cl. 104-290.000.
Okashita, Kyohiko: *See—*
Tamura, Takumi; Shinoda, Shosuke; Yamashita, Tetsuo; and Okashita, Kyohiko, 4,923,352, Cl. 414-225.000.
Okatani, Toshiyuki: *See—*
Tomizawa, Osamu; and Okatani, Toshiyuki, 4,922,855, Cl. 119-14.150.
Okawa, Tadashi; and Suzuki, Toshio, to Toray Silicon Company, Ltd. Phthalic acid ester-modified organopolysiloxane and method for its preparation. 4,924,020, Cl. 556-441.000.
Okazaki, Yoji; and Kamiyama, Koji, to Fuji Photo Film Co., Ltd. Optical wavelength converter device. 4,923,277, Cl. 350-96.290.
Oki Electric Co., Ltd.: *See—*
Tanaka, Akira; Arima, Takanori; and Mori, Ryuji, 4,922,736, Cl. 70-277.000.
Oki Electric Industry Co., Ltd.: *See—*
Fukuda, Yasuhiro; and Kitazawa, Shooji, 4,924,280, Cl. 357-23.800.
Tanoi, Satoru, 4,924,440, Cl. 365-189.080.
Okino, Yoshiharu, to Fuji Photo Film Co., Ltd. Image forming method. 4,924,261, Cl. 355-35.000.
Oku, Teruo; Kawai, Yoshio; Kayakiri, Hiroshi; Kuratani, Kazuyoshi; and Hashimoto, Masashi, to Fujisawa Phatmaceutical Co., Ltd. Quinolyl methoxy compounds, processes for preparation thereof and pharmaceutical composition comprising the same. 4,923,881, Cl. 514-311.000.
Okudaira Yuzo: *See—*
Okuzawa, Masayuki; Okudaira Yuzo; and Maeda, Futoshi, 4,923,034, Cl. 181-207.000.
Okui, Yoshihiro: *See—*
Arima, Jiro; and Okui, Yoshihiro, 4,924,081, Cl. 250-214.00R.
Okumura, Fumio: *See—*
Koike, Naomasa; and Okumura, Fumio, 4,923,845, Cl. 503-226.000.
Okumura, Takao: *See—*
Naka, Hiromasa; Nakamura, Norio; Okushima, Takehiko; Okumura, Takao; and Shoji, Tatsuo, 4,922,670, Cl. 52-126.600.
Okuno, Yoshihiro, to Kabushiki Kaisha Daikin Seisakusho. Air cooling system for clutch. 4,923,043, Cl. 192-70.120.
Okura Industrial Co., Ltd.: *See—*
Kondo, Kazuo; and Ishiguro, Nobuya, 4,923,722, Cl. 428-34.900.
Okushima, Takehiko: *See—*
Naka, Hiromasa; Nakamura, Norio; Okushima, Takehiko; Okumura, Takao; and Shoji, Tatsuo, 4,922,670, Cl. 52-126.600.
Okuyama, Toru: *See—*
Hasegawa, Hajime; Koga, Taiji; Takei, Atsuo; and Okuyama, Toru, 4,923,904, Cl. 521-115.000.
Okuyama, Toshiharu: *See—*
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,924,482, Cl. 375-65.000.
Okuzawa, Masayuki; Okudaira Yuzo; and Maeda, Futoshi, to Matsushita Electric Works, Ltd. Vibration-controlling member. 4,923,034, Cl. 181-207.000.
Olave, Solozabal Y CIA, S.A.: *See—*
Echevarria, Jorge G., 4,923,107, Cl. 227-120.000.
Oldeman, Robert-Coen, to VMI Epe Holland B.V. Cutting device for cutting a strip of unvulcanized rubber. 4,922,774, Cl. 83-175.000.
Oliff, Allen I.: *See—*
Huff, Joel R.; and Oliff, Allen I., 4,923,878, Cl. 514-285.000.
Olin Corporation: *See—*
Canterberry, J. B.; and Katz, Lawrence E., 4,923,536, Cl. 149-19.400.
Casberg, John M.; and Michaels, David E., 4,923,618, Cl. 210-755.000.
Woodard, Kenneth E., Jr.; Fister, Julius C., Jr., Fair, David L.; and Dean, Robert A., 4,923,583, Cl. 204-286.000.
Olsen, Eskil H.: *See—*
Lillelund, Stig; and Olsen, Eskil H., 4,923,085, Cl. 220-282.000.
Olsen, Roger A.: *See—*
Chernega, John G.; Martens, John A.; Olsen, Roger A.; and Cottingham, Auburn B., deceased, 4,923,711, Cl. 427-44.000.
Olson, Ronald. Method and apparatus for remotely reversing electromechanical door openers. 4,924,159, Cl. 318-466.000.
Olson, William L.: *See—*
Karasek, Keith R.; Olson, William L.; and Donner, Jeffry T., 4,923,719, Cl. 427-387.000.
Olympic Homecare Products Company, The: *See—*
Adkins, Adrian S.; and Englund, Diane J., 4,923,760, Cl 428-541.000.
Olympus Optical Co., Ltd.: *See—*
Hashimoto, Akihiko; Kitahara, Toshihiro; Hashi. Hiroshi; and Rokutan, Takao, 4,924,199, Cl. 235-494.000.
Imai, Yuji; and Iwasa, Kazuyuki, 4,924,253, Cl. 354-400.000.
Omaha Printing Company: *See—*
Down, Douglas G., 4,923,111, Cl. 229-68.00R
Omata, Youichi; Matsuura, Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, to Ikeda Bussan Co., Ltd. Mold assembly for molding automotive seat. 4,923,378, Cl. 425-4.00R.
Omata, Youichi: *See—*
Matsuura, Ichiro; Ishimaru, Kiichiro; Mizuno, Hisayoshi; Omata, Youichi; and Soutome, Fumio, 4,923,653, Cl. 264-46.600.
Omelchuk, John, to Crown Forest Industries Limited. Plywood veneer dryer door. 4,922,660, Cl. 49-395.000.
Omron Tateisi Electronics Company: *See—*
Matsui, Kenji; and Uchida, Yasuo, 4,924,210, Cl. 340-572.000.
Tsuge, Kazuya, 4,924,047, Cl. 200-553.000.
O'Neill, Richard K. Manually operated pressure build-up pump sprayer. 4,923,094, Cl. 222-321.000.
Onishi, Masayoshi; Ozawa, Hiromasa; and Umemaru, Hisato, to Mitsubishi Denki Kabushiki Kaisha. Steering torque detector. 4,922,761, Cl. 73-862.330.
Onishi, Takashi; Suzuki, Shigeaki; Mori, Toshiki; and Fujita, Yoshiji, to Kuraray Company Ltd. Process for preparing cyclic terpenoids. 4,924,030, Cl. 568-34.000.
Onitsuka, Takuya: *See—*
Hasegawa, Takao; Onitsuka, Takuya; Suzuki, Minoru; Ehara, Yasuhiro; Hashimoto, Katsuhiro; and Ozaki, Tadamasa, 4,923,629, Cl. 252-181.000.
Ono, Eiichi: *See—*
Hirohama, Huji; Ono, Eiichi; and Murata, Yukiho, 4,922,570, Cl. 15-250.020.
Ono, Masato: *See—*
Yagi, Shigeru; Ono, Masato; Takahashi, Noriyoshi; Nishikawa, Masayuki; Fukuda, Yuzuru; and Karakida, Kenichi, 4,923,773, Cl. 430-57.000.
Ono, Shusuke: *See—*
Hirao, Yoshiaki; Kuga, Ryuichiro; Yoneyama. Masayuki; and Ono, Shusuke, 4,924,317, Cl. 358-227.000.
Onoda, Shigeo: *See—*
Banjo, Toshinobu; Murasawa, Yasuhiro; and Onoda, Shigeo, 4,924,077, Cl. 235-492.000.
Onoue, Akihiro, to Sanshin Kogyo Kabushiki Kaisha. Propeller housing retainer for marine propulsion device. 4,923,417, Cl 440-78.000.
Ontario Cancer Institute, The: *See—*
Mak, Tak W., 4,923,799, Cl. 435-6.000.
Ooi, Yasushi, to NEC Corporation. System for dynamically adjusting the accumulation of instructions in an instruction code prefetched pipelined computer. 4,924,376, Cl. 364-200.000.
Ooi, Yoshiharu; and Hara, Tsutomu, to Hamamatsu Photonics Kabushiki Kaisha. Spatial light modulating devices utilizing electro-optic crystal. 4,923,287, Cl. 350-355.000.
Ootsuka, Hiroshi: *See—*
Hamada, Masataka; Ishida, Tokuji; Ishibashi, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 4,924,250, Cl. 354-402.000.
Ishimura, Toshihiko; Tsuji, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 4,924,251, Cl. 354-418.000.
Oouchi, Naoyuki: *See—*
Inaba, Hiromi; Nakamura, Kiyoshi; Kimura, Akira; Hokari, Sadao; and Oouchi, Naoyuki, 4,924,373, Cl. 363-95.000.
Opas, George F.; and Porrett, Edward C., to Motorola, Inc. RF power amplifier. 4,924,194, Cl. 330-289.000.
Opheij, Willem G.; Coops, Peter; Duijvestijn, Adrianus J.; Van Eck, Dirk C.; and De Zoeten, Peter, to U.S. Philips Corporation. Apparatus for optically scanning an information plane. 4,924,079, Cl. 250-201.500.
Opheij, Willem G.; and Braat, Josephus J. M., to U.S. Philips Corporation. Optical scanning device, mirror objective suitable for use in said device and optical write and/or read apparatus provided with said device. 4,924,082, Cl. 250-216.000.
Ophir, Zohar; Golstein, Michael; and Nagler, Miriam, to Elor Optronics Ltd. Small arms ammunition inspection system. 4,923,066, Cl. 209-539.000.
Optyl Eyewear Fashion International Corporation: *See—*
Dianitsch, Franz, 4,924,245, Cl. 351-136.000.
Orbach, Zvi, to Pdahtzur, Avner. Personalizable CMOS gate array device and technique. 4,924,287, Cl. 357-51.000.
Organisation Europeenne pour la Recherche Nucleaire: *See—*
Bovet, Claude; and Rossa, Edward M., 4,923,266, Cl. 350-96.150.
Orion Machinery Co., Ltd.: *See—*
Tomizawa, Osamu; and Okatani, Toshiyuki, 4,922,855, Cl. 119-14.150.

Orlowsky, Kenneth J.: *See*—
Henry, Charles H.; Kazarinov, Rudolf F.; Kistler, Rodney C.; Orlowsky, Kenneth J.; Shani, Yosi; and Sudbo, Aasmund S., 4,923,271, Cl. 350-96.190.

Ornco, Mario M., to Illinois Tool Works Inc. Electrical switching apparatus. 4,924,040, Cl. 200-16.00A.

Orsborn, Jesse H.: *See*—
Covington, Michael J.; and Orsborn, Jesse H., 4,922,695, Cl. 56-40.000.

Ortho Pharmaceutical Corporation: *See*—
Goldstein, Gideon; and Audhya, Tapan, 4,923,964, Cl. 530-324.000.

Osabe, Akio: *See*—
Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,972, Cl. 141-4.000.
Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,974, Cl. 141-4.000.

Osaka, Tatsuhiko: *See*—
Katayama, Hideo; Yoshida, Yoshiaki; and Osaka, Tatsuhiko, 4,923,586, Cl. 204-403.000.

Osborn, John J.; and Litzaw, Edgar M. Polar co-ordinate digitizer. 4,922,618, Cl. 33-1.0MP

Oshima, Shinji; and Misawa, Hidenobu, to NGK Insulators, Ltd. Sealing of end faces of ceramic tubes. 4,923,655, Cl. 264-60.000.

Oshiro, Masayuki; Kozawa, Fusaaki; and Uchida, Akira, to Hitachi, Ltd. Wrist mechanism of industrial robot. 4,922,755, Cl. 74-479.000.

Oslin, G. Robert, to Delaware Capital Formation, Inc. Humidity control for oven chamber. 4,924,072, Cl. 219-401.000.

Ossur Hf: *See*—
Klasson, Bo; and Kristinsson, Ossur, 4,923,474, Cl. 623-33.000.

Ost, Christian: *See*—
Stoll, Wolfgang; Ost, Christian; and Schneider, Volker, 4,923,639, Cl. 252-632.000.

Ostertag, Alfred, to Wilhelm Hegenscheidt GmbH. Roller milling tool unit for a milling machine tool. 4,922,739, Cl. 72-80.000.

Ostrowski, Erroll B. Bale shredding and dispensing device for use with a tractor. 4,923,128, Cl. 241-101.700.

Otatsume, Yasuo: *See*—
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.600.

Otis Engineering Corporation: *See*—
Laky, Tibor; and Fowler, Stewart H., Jr., 4,923,005, Cl. 166-55.000.

Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, to KAO Corporation. Polysaccharide and process for preparing the same. 4,923,809, Cl. 435-101.000.

Otsuka, Yasuhiko: *See*—
Kurihara, Norimitsu; Asakura, Masahiko; Matsui, Mitsuru; Otsuka, Yasuhiko; and Tachikawa, Kazuhiko, 4,924,397, Cl. 364-426.040.

Ott, Albert: *See*—
Luhrsen, Ernst; Pohl, Siegfried; Ott, Albert, Parbel, Wilhelm; and Baum, Karl, 4,923,225, Cl. 285-189.000.

Otto Bock Orthopadische Industrie Besitz- Und Verwaltungs-KG *See*—
Horvath, Eduard;, 4,923,477, Cl. 623-57.000

Otto, Rainer J. R. W.: *See*—
Brinkmeyer, Ernst; Brennecke, Wolfgang; and Otto, Rainer J. R W., 4,923,290, Cl. 350-377.000.

Ouchi, Mitsuyuki: *See*—
Aono, Koichi; and Ouchi, Mitsuyuki, 4,922,789, Cl. 475-86.000.

Ouchi, Yoshiaki: *See*—
Nakamura, Hiroki; Yamada, Takashi; and Ouchi, Yoshiaki, 4,923,763, Cl. 428-458.000.

Ougarane, Lahcen: *See*—
Labat, Jean-Luc; Ougarane, Lahcen, and Gastiger, Michel, 4,924,061, Cl. 219-121.520.

Ovcharov, Radi G.: *See*—
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M., Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S., Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

Owens-Corning Fiberglas Corporation: *See*—
Weaver, A. Michael; Wiegand, Joseph R.; and Stickley, Dewey C., 4,923,081, Cl. 220-72.000.

Owens-Illinois Glass Container Inc.: *See*—
DiFrank, Frank J., 4,923,363, Cl. 414-752.000.

Oy Tampella Ab: *See*—
Hietikko, Erkki; and Kylmakorpi, Ilpo, 4,923,568, Cl. 162-301.000.
Snellman, Yrjo ; and Rantala, Mauri, 4,922,990, Cl. 162-273.000.

Ozaki, Keiichi: *See*—
Hayashi, Hideharu; Ozaki, Keiichi; and Sawai, Mamoru, 4,923,411, Cl. 439-540.000.

Ozaki, Tadamasa: *See*—
Hasegawa, Takao; Onitsuka, Takuya; Suzuki, Minoru: Ehara, Yasuhiro; Hashimoto, Katsuhiro; and Ozaki, Tadamasa, 4,923,629, Cl. 252-181.000.

Ozawa, Chiaki, to Bridgestone Corporation. Forming drum for building a tire. 4,923,554, Cl. 156-417.000.

Ozawa, Hiromasa: *See*—
Onishi, Masayoshi; Ozawa, Hiromasa, and Unemaru, Hisato, 4,922,761, Cl. 73-862.330.

Ozawa, Toshimitsu: *See*—
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 358-105.000.

Pacific Bell: *See*—
Lubarsky, Daniel P.; Weight, George A.; and Haisch, Mark E., 4,924,460, Cl. 370-84.000.

Pacific Scientific Company: *See*—
Marshall, James W.; Gotchy, David; Uffelman, Bradley L.; Leimbach, Wendell B.; and Wilhelmi, Albert A., 4,922,604, Cl. 29-598.000.

Page, Mary J.; Hamilton, Benton W.; Skiles, Bruce L.; and Reinhart, Robert V., Jr. Shield for devices capable of penetrating skin. 4,923,446, Cl. 604-198.000.

Pagella, Piergiuseppe: *See*—
Terni, Patrizia; Maiorana, Stefano; Papagni, Antonio; and Pagella, Piergiuseppe, 4,923,859, Cl. 514-224.500.

Pahl, Dietrich, to Braun Aktiengesellschaft. Shaving apparatus with a pivoted shearing head system. 4,922,608, Cl. 30-43.910.

Paiva, Anthony J.; and Paiva, Pamela J. Cutting attachment for rotary mower blades and use. 4,922,697, Cl. 56-295.000.

Paiva, Pamela J.: *See*—
Paiva, Anthony J.; and Paiva, Pamela J., 4,922,697, Cl. 56-295.000.

Pajares, Jose N.: *See*—
Ferrer, Jose M. S.; Pajares, Jose N.; and Torres, Manuel T., 4,923,024, Cl. 177-245.000.

Pall Corporation: *See*—
Pall, David B., 4,923,620, Cl. 210-767.000.

Pall, David B., to Pall Corporation. Device for depletion of the leukocyte content of blood and blood components. 4,923,620, Cl. 210-767.000.

Palotas, Laszlo : *See*—
Tatai, Ilona; Penzias, Tibor; Palotas, Laszlo ; Lantos, Elemer; Smaroglay, Peter; and Deak, Laszlo B., 4,923,647, Cl. 264-27.000.

Pampreen, Ronald C.: *See*—
Meyer, Robert H.; Pampreen, Ronald C.; and Sawyer, Kenneth W., 4,922,997, Cl. 165-8.000.

Panick, Karl; Widemann, Friedrich; Schoenberger, Hermann; Sperl, Johann; and Sondermeier, Johann, to Webasto AG Fahrzeugtechnik. Heating device, particularly automotive heating device, with an integrated muffler. 4,923,033, Cl. 181-211.000.

Panna, Vladimir A.. *See*—
Movchan, Boris A.; Panna, Vladimir A.; Chernenko, Evgeny V.; and Gorba, Naum A., 4,922,995, Cl. 164-469.000.

Pannier, Daniel, to Societe Anonyme Flush-type airport runway light, with removable optical unit. 4,924,364, Cl. 362-153.100.

Papagni, Antonio: *See*—
Terni, Patrizia; Maiorana, Stefano; Papagni, Antonio; and Pagella, Piergiuseppe, 4,923,859, Cl. 514-224.500.

Papailhau, Bernard. *See*—
Akcelrod, Patrick; and Papailhau, Bernard, 4,922,892, Cl. 128-25.00R.

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Anderson, Gordon W.; Boos, John B., Dietrich, Harry B.; Ma, David L.; Mack, Ingham A. G.; and Papanicolaou, Nicolas A., 4,924,285, Cl. 357-30.000.

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Zasio, John J.; Choy, Kenneth C.; and Parham, Darrell R., 4,924,430, Cl. 364-578.000.

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Heiligenthal, Charles H.; Slivon, George R.; and Parise, Jack A., 4,922,574, Cl. 16-35.00R.

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Oelschlaegel, Victor R., 4,922,960, Cl. 137-588.000.

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Tomminen, Hannu, 4,923,379, Cl. 425-63.000.

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Upchurch, James M.; and Patel, Dinesh R., 4,923,010, Cl. 166-297.000.

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Paterson, James L.; Wilmoth, David D.; and Riemenschneider, Bert R., to Texas Instruments Incorporated. Erasable programmable memory including buried diffusion source/drain lines and erase lines. 4,924,437, Cl. 365-185.000.

Patraw, Nils E., to Hughes Aircraft Company. Connector system for coupling to an integrated circuit chip. 4,924,353, Cl. 361-400.000.

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Adams, Wilmer L.; Bartels, James I.; Black, Robert A., Jr.; Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,923,117, Cl. 236-94.000.

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Mortreux, Andre ; Petit, Francis; Mutez, Sylvain; and Paumard, Eric, 4,923,840, Cl. 502-167.000.

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Orbach, Zvi, 4,924,287, Cl. 357-51.000.

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Boyd, Peter, 4,922,845, Cl. 114-39.200.

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Binley, Gary N.; Giles, Alan F.; Pearson, Christopher A.; and Baker, Terence P., 4,923,706, Cl. 426-516.000.

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Vassiliadis, Stamatis; Putrino, Michael; Huffman, Ann E.; Feal, Brice J.; and Pechanek, Gerald G., 4,924,422, Cl. 364-715.090.

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Menn, Roger; Brunel, Christian; and Pecile, Dario, 4,924,144, Cl. 313-505.000.

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Stursberg, Bernd, 4,922,744, Cl. 72-455.000.

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Krogsgaard-Larsen, Povl; Falch, Erik; and Pedersen, Henrik, 4,923,880, Cl. 514-301.000.

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Pitcher, Michael A.; Haugse, Albert L.; Pelfrey, Richard L.; and Sturtz, Gregory P., 4,922,991, Cl. 164-36.000.

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Bohen, Joseph M.; and Lovenguth, Ronald F., 4,923,916, Cl. 524-217.000.
Bohen, Joseph M., 4,923,917, Cl. 524-288.000.
Huber, Ludwig K.; and Monsimer, Harold G., 4,923,506, Cl. 71-121.000.

Penny, Glenn S., to Stim Lab, Inc. Cell assembly for determining conductivity and permeability. 4,922,758, Cl. 73-38.000.

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Rotolico, Anthony J.; and Maidhof, William H., 4,924,059, Cl. 219-121.480.

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Khulbe, Chandra P.; Belinko, Keith; Waugh, Richard J.; and Perreault, Michel, 4,923,838, Cl. 502-151.000.

Perrey, Hermann: *See*—
Scholl, Thomas; Perrey, Hermann; and Matner, Martin, 4,923,920, Cl. 524-501.000.

Persico, Joseph. Mountain climber fitness machine. 4,923,191, Cl. 272-69.000.

Personal Hygiene Research Associates: *See*—
Dean, Raymond S.; and Barabino, William A., 4,923,455, Cl. 604-385.100.

Perthus, Peter: *See*—
Lindae, Gerhard; Neumann, Rainer; and Perthus, Peter, 4,924,359, Cl. 362-61.000.

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Peters, Margaret A. Method for hanging curtains. 4,922,600, Cl. 29-433.000.

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Mottur, George P.; Cope, Hilbert J., Jr.; Kishbaugh, Dennis L.; Luebbers, Michael J.; and Peters, Norman E., 4,923,705, Cl. 426-438.000.

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Truesdale, Grant; and Petersen, Tommy, 4,924,034, Cl. 174-87.000.

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Hodges, Joseph T.; and White, Russell L., 4,924,367, Cl. 362-311.000.

Peterson, William A., to General Electric Company. Rectifier circuit provoding compression of the dynamic range of the output voltage. 4,924,371, Cl. 363-89.000.

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Knofel, Hartmut; Brockelt, Michael; Petinaux, Marcel; and Uchdorf, Rudolf, 4,924,028, Cl. 564-331.000.

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Mortreux, Andre ; Petit, Francis; Mutez, Sylvain; and Paumard, Eric, 4,923,840, Cl. 502-167.000.

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Petrisko, Robert A.: *See*—
Bank, Howard M.; and Petrisko, Robert A., 4,924,022, Cl. 556-471.000.

Petro-Canada Inc.: *See*—
Khulbe, Chandra P.; Belinko, Keith; Waugh, Richard J.; and Perreault, Michel, 4,923,838, Cl. 502-151.000.

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Lundin, Stig; and Pettersson, Birger, 4,923,374, Cl. 417-440.000.

Pettit, Frederick M. Fastener construction. 4,922,587, Cl. 24-453.000.

Petty, John; and McNeil, Sandy, to Eleonnex Lty Limited. Corrugated plastic pipe connector. 4,923,227, Cl. 285-319.000.

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Ellenberger, Bernd; Jennet, Friedrich; Schafer, Karlheinz; Spickermann, Rainer; and Lass, Gerhard, 4,923,558, Cl. 156-499.000.

Pfarrwaller, Erwin; Vezzu, Danilo; and Hubner, Oskar, to Sulzer Brothers Limited. Firing device for a projectile weaving machine and projectile therefor. 4,922,967, Cl. 139-145.000.

Pfeiler, Manfred: *See*—
Ermert, Helmut; Pfeiler, Manfred; and Barth, Karl, 4,922,916, Cl. 128-653.00R.

Pfizer Hospital Products Group, Inc.: *See*—
Vasconcellos, Alfred V.; and Keeler, Preston J., III, 4,923,438, Cl. 604-4.000.

Pfizer Inc.: *See*—
Rosati, Robert L., 4,923,864, Cl. 514-234.800.

Pham, Xuan M.: *See*—
Evers, Donald H.; and Pham, Xuan M., 4,923,059, Cl. 206-265.000.

Pharmachim: *See*—
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

Phelps, James E.: *See*—
Brashear, Hugh R.; Blair, Michael S.; Phelps, James E.; Bauer, Martin L.; and Nowlin, Charles H., 4,924,450, Cl. 367-118.000.

Philip Morris Incorporated: *See*—
Evers, Donald H.; and Pham, Xuan M., 4,923,059, Cl. 206-265.000.

Philipp, Bernhard: *See*—
Kuhn, Siegfried; Philipp, Bernhard; and Schulien, Hermann, 4,924,524, Cl. 384-537.000.

Philippe, Eric, to Valeo Vision. Mounting and adjusting apparatus for an illuminating device, more particularly a headlamp, especially for an automobile. 4,924,360, Cl. 362-61.000.

Phillips, Edward H., to Techco Corporation. Four-way valve. 4,922,803, Cl. 91-375.00R.

Phillips Petroleum Company: *See*—
Efner, Howard F., 4,923,643, Cl. 260-410.90R.
Hsieh, Eric T.; Yeh, Gene H. C.; and Donaldson, John R., 4,923,649, Cl. 264-37.000.
Patel, Bharat B.; and Stephens, Michael, 4,923,516, Cl. 106-90.000.
Ramsey, Bruce L., 4,923,971, Cl. 528-481.000.

PI, Inc.: *See*—
Nelson, Laurence A., 4,922,684, Cl. 53-314.000.

Picard, Joseph A.; and Sliskovic, Drago R., to Warner-Lambert Company. 6-(2-(2-(Substituted amino)-3-quinolinyl) ethenyl and ethyl) tetrahydro-4-hydroxypyran-2-one inhibitors of cholesterol biosynthesis. 4,923,861, Cl. 514-227.800.

Piejko, Karl-Erwin: *See*—
Struss, Klaus; Lindner, Christian; Piejko, Karl-Erwin; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,923,923, Cl. 525-64.000.

Pierman, David A.: *See*—
Benton, Kenneth C.; Pierman, David A.; and Fox, Joseph R., 4,923,578, Cl. 204-130.000.

Pietruszewski, Robert: *See*—
Brandon, Daniel; Dunlop, Kenneth N. B.; Jensen, Lester B.; Lucas, Richard M.; and Pietruszewski, Robert E., 4,924,303, Cl. 358-86.000.

Pietruszewski, Robert E.: *See*—
Brandon, Daniel; Dunlop, Kenneth N. B.; Jensen, Lester B.; Lucas, Richard M.; and Pietruszewski, Robert E., 4,924,303, Cl. 358-86.000.

Pietsch, Albert; and Boll, Wolf, to Daimler-Benz AG. Arrangement for supporting a crankshaft. 4,922,870, Cl. 123-195.00R.

Pikulski, Joseph L.: *See*—
Bailey, Wilbur M.; Hulderman, George H.; Jones, Vincent L.; Pikulski, Joseph L.; Standlee, Arlie G.; Tangonan, Gregory L.;

Vince, Michael R., and Wysocki, Joseph A., 4,924,087, Cl. 356-73.100.

Piltz, Manfred: *See—*
Grossmann, Werner; Herzing, Hans G.; and Piltz, Manfred, 4,922,820, Cl. 101-425.000.

Pinckney, Robert L.: *See—*
Novak, Philip F.; Shannon, Robert D.; Pinckney, Robert L.; and Humphreys, James R., Jr., 4,924,228, Cl. 342-2.000.

Pinkahsov, Eduard, to Vapor Technologies Inc. Electrode for vapor deposition and vapor-deposition method using same. 4,924,135, Cl. 313-326.000.

Pinney, J. Dana. Brush cutter blade. 4,922,791, Cl. 83-840.000.

Pintucci, Stefano. Kerato-prosthesis for transcorneal implantation and process of manufacture thereof. 4,923,466, Cl. 623-5.000.

Pioneer Electronic Corporation: *See—*
Ando, Hitoshi; Kashiwazaki, Takashi; Hosoi, Masayuki; and Fukushima, Atsuhiko, 4,924,402, Cl. 364-449.000.
Sasaki, Yoshio, 4,924,192, Cl. 330-279.000.

Pirotzky, Eduardo: *See—*
Braquet, Pierre; Dive, Georges; Godfroid, Jean-Jacques; Heymans, Francoise; and Pirotzky, Eduardo, 4,923,870, Cl. 514-255.000.

Pitcher, Michael A.; Haugse, Albert L.; Pelfrey, Richard L.; and Sturtz, Gregory P., to Ashland Oil, Inc. Composite core assembly for metal casting. 4,922,991, Cl. 164-36.000.

Pitney Bowes Inc.: *See—*
Dolan, Donald T.; Durst, Robert T., Jr.; Hubbard, David W.; and Silverberg, Morton, 4,923,023, Cl. 177-25.150.
Holodnak, Richard S., 4,922,817, Cl. 101-91.000.
Tolmie, Robert J., Jr., 4,924,106, Cl. 250-561.000.

Pitzen, Gerald; Garfield, Douglas; Beltz, Warren G.; Arntzen, Lawrence O.; and Bina, Joseph C., to Bioform Engineering, Inc. Upper and lower body exerciser. 4,923,193, Cl. 272-73.000.

Piulats, Jaime: *See—*
Prucher, Helmut; Jonas, Rochus; Piulats, Jaime; and Klockow, Michael, 4,923,869, Cl. 514-253.000.

Plamper, Gerhard R.; and Borling, Alan, to MTD Products, Inc. Tire assembly. 4,923,252, Cl. 301-63.0PW.

Plas Plugs Limited: *See—*
Hepworth, Paul S., 4,922,886, Cl. 125-23.010.

Plasson Maagan Michael Industries Ltd.: *See—*
Uri, Ehud, 4,922,955, Cl. 137-496.000.

Plastic Specialties and Technologies Investments, Inc : *See—*
Seckel, Peter H., 4,923,223, Cl. 285-175.000.

Platonov, Viktor S.: *See—*
Bogdanov, Vasily S.; Platonov, Viktor S.; Bogdanov, Nikolai S.; Bedko, Jury G.; Miroshnichenko, Ivan I.; and Vorobiev, Nikolai D., 4,923,127, Cl. 241-70.000.

Plessey Overseas Limited: *See—*
Carter, Andrew C., 4,923,270, Cl. 350-96.180.
Cooke, Michael P., 4,924,190, Cl. 330-86.000.

Ploeger, Walter. *See—*
Wuelknitz, Peter; Lehmann, Rudolf; Ploeger, Walter; Hill, Karlheinz; and Forg, Franz, 4,923,685, Cl. 424-54.000.

Ploussios, George. Electronically tunable antenna. 4,924,238, Cl. 343-802.000.

PNS Associates, Inc.: *See—*
Pressler, Philip B., 4,923,217, Cl. 283-62.000.

Pohl, Siegfried: *See—*
Luhrsen, Ernst; Pohl, Siegfried; Ott, Albert; Parbel, Wilhelm; and Baum, Karl, 4,923,225, Cl. 285-189.000.

Polanco, Domingo R.: *See—*
Layrisse R., Ignacio A., Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

Polaroid Corporation: *See—*
Shimizu, Kenichi, 4,924,260, Cl. 355-69.000.

Polaschegg, Hans-Dietrich, to Fresenius AG. Apparatus for making mixtures of pharmaceutical liquids. 4,922,975, Cl. 141-104.000.

Politechnika Gdanska: *See—*
Andruszkiewicz, Ryszard; Chmara, Henryk; Milewski, Slawomir; Borowski, Edward; Zaremba, Maria; and Borowski, Jerzy, 4,923,965, Cl. 530-331.000.

Poll, Heinz-Guenter: *See—*
Neugebauer, Wolfgang; and Poll, Heinz-Guenter, 4,923,953, Cl. 528-170.000.

Pollastrini, Sheila L.: *See—*
Bricker, Jeffery C.; Frame, Robert R.; Benedict, Bryan L.; and Pollastrini, Sheila L., 4,923,596, Cl. 208-207.000.

Pollner, Juergen; Trummer, Gregor; Moelzer, Peter; and Fichtner, Karl, to Krauss Maffei AG. Braking system for aircraft towing vehicle. 4,923,253, Cl. 303-7.000.

Pollock, Richard A.; and Murphy, R. Edward. Fluid monitoring apparatus. 4,922,922, Cl. 128-760.000.

Poloni, Alfredo; and Nonini Geremia, to Danieli & C. Officine Meccaniche SpA. Rolling unit supported as a cantilever. 4,922,740, Cl. 72-237.000.

Poly-John Enterprises Corp : *See—*
Harding, George W.; and Mullett, Rodney M., 4,922,557, Cl. 4-477.000.

Pompier, Jean-Pierre, to Campagnie Generale des Establissements Michelin-Michelin & Cie. Tire rim comprising a body to allow tire to roll in a deflated condition. 4,922,981, Cl. 152-158.000.

Pontani, Bernd: *See—*
Lahr, Helfrid; and Pontani, Bernd, 4,923,668, Cl. 376-261.000.

Poon, Stephen S. C.: *See—*
Grieve, Duncan M. A.; Poon, Stephen S. C.; Thien, Tran V.; Sakizadeh, Kumars; and Weigel, David C., 4,923,792, Cl. 430-559.000.

Poos, David: *See—*
Bray, John E.; and Poos, David, 4,924,522, Cl. 382-56.000.

Popat, Ghanshyam H.: *See—*
Bishop, Willis E.; Popat, Ghanshyam H.; Tien-Tsung, Chen; and Ruiz, Manuel W., 4,923,317, Cl. 401-205.000.

Popova, Diana D.: *See—*
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

Porco, Patricia A. Headrest for use in beauty shop shampoo bowls, sinks and the like. 4,922,558, Cl. 4-523.000.

Porrett, Edward C.: *See—*
Opas, George F.; and Porrett, Edward C., 4,924,194, Cl. 330-289.000.

Porrvik, Sten: *See—*
Hedvall, Bertil; Mattson, Gunnar; Porrvik, Sten; and Sundstrom, Goran, 4,923,776, Cl. 430-111.000

Porter, Marshall R., to Moog Automotive, Inc. Flexible boot for driving axle joints. 4,923,432, Cl. 464-175.000.

Porter, Rick A.; and Hoernle, Hans R., to Springs Industries, Inc. Coated fire barriers for upholstered furnishings. 4,923,729, Cl. 428-71.000.

Post, Joseph A.; and Stiles, Lorren, to United Technologies Corporation. Arrangement for controlling the performance of bob-up/bob-down maneuvers by a helicopter. 4,924,400, Cl. 364-433.000.

Potier, Pierre: *See—*
Colin, Michel; Guenard, Daniel; Gueritte-Voegelein, Francoise; and Potier, Pierre, 4,924,012, Cl. 549-510.000.

Potschin, Roger: *See—*
Grob, Ferdinand; Linder, Ernst; Kienzler, Dieter; Potschin, Roger, and Stutzenberger, Heinz, 4,922,714, Cl. 60-276.000.

Poulsen, Douglas, to White Consolidated Industries, Inc. Refrigerator shelf construction. 4,923,260, Cl. 312-214.000.

Pouyer, Joseph E. Assembly table for manufacturing of mats used in road construction. 4,922,598, Cl. 29-281.400.

Powell, Bettye J., aministratrix: *See—*
Powell, Levisky, deceased; Powell, Bettye J., aministratrix; and Powell, Johnese W., 4,923,702, Cl. 426-115.000.

Powell, Johnese W : *See—*
Powell, Levisky, deceased; Powell, Bettye J., aministratrix; and Powell, Johnese W., 4,923,702, Cl. 426-115.000.

Powell, Levisky, deceased; by Powell, Bettye J., aministratrix; and Powell, Johnese W. Communion container. 4,923,702, Cl. 426-115.000.

Pozzobon, Alessandro, to Nordica S.p.A. Middle binding particularly for ski shoes. 4,923,207, Cl. 280-613.000.

PPG Industries, Inc.: *See—*
Carley, Earl P.; and Schell, Philip L., 4,923,731, Cl. 428-131.000.
O'Dwyer, James B.; Chang, Wen-Hsuan; Scriven, Roger L.; and Cherenko, Joseph, 4,923,757, Cl. 428-425.600.

Prasad, Venkat S.: *See—*
Maxwell, Ronald K.; Zorzi, Karl J.; Yoshikawa, Harunori; Prasad, Venkat S.; Smith, Fred G.; and Hsieh, Ming-Chih, 4,924,456, Cl. 370-32.000.

PRC Corporation: *See—*
Nilsen, Carl J.; and Weiss, Hardy P., 4,923,364, Cl. 415-55.600.

Precision Image Corporation: *See—*
Day, Gene F., 4,923,581, Cl. 204-180.100.

Premier Gear & Machine Works: *See—*
Crabtree, Wayne L.; and Young, Robert C., 4,922,979, Cl. 144-357.000.

Premier Pan Products Co., Inc : *See—*
Stumpf, Sherri O., 4,922,811, Cl. 99-443.00C.

Prenat, Michel, to Thomson-CSF. Device for removing the ambiguity over range and speed, used more especially in combination with a doppler type radar receiver and a radar containing it. 4,924,231, Cl. 342-137.000.

President & Fellows of Harvard College: *See—*
Babior, Bernard M., 4,923,797, Cl. 435-2.000.

Pressler, Philip B., to PNS Associates, Inc. File converter assembly. 4,923,217, Cl. 283-62.000.

Price, Raymond: *See—*
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,923,686, Cl. 423-38.000.

Price, Richard P., to Nordson Corporation. Apparatus for dispensing fluid materials. 4,922,852, Cl. 118-683.000.

Priestley, Joseph B., Jr. Apparatus for altering the density of particles. 4,923,488, Cl. 55-100.000.

Prime Computer, Inc.: *See—*
Hershey, Antoinette F.; French, Andrew H.; and Boire, Christopher P., 4,924,378, Cl. 364-200.000.

Pring, David W.: *See—*
Lawrence, Peter J.; and Pring, David W., 4,924,489, Cl. 379-6.000.

Pringle, William L.: *See—*
Hochstein, Peter A.; and Pringle, William L., 4,922,718, Cl. 60-527.000.

Process Equipment Company: *See—*
Farmer, Jerry D., 4,922,625, Cl. 34-58.000.

Procter & Gamble Company, The: *See—*
Coffindaffer, Timothy W., 4,923,623, Cl. 252-8.800.
Seymour, Mark D.; LiCause, Michael F.; and Daugherty, Thomas H., 4,923,454, Cl. 604-368.000.

Proprietary Technology, Inc.: *See—*
Bartholomew, Donald D., 4,923,226, Cl. 285-242.000.

Provost, Jackie: *See—*
Stephan, Ronan; Doisy, Martine; Montfort, Yves; Robbes, Didier; Sing, Marc L. C.; Bloyet, Daniel; Provost, Jackie; and Raveau, Bernard, 4,923,850, Cl. 505-1.000.

Proxmire, Deborah L., to Kimberly-Clark Corporation. Adjustable combination fastener for a disposable diaper. 4,923,456, Cl. 604-391.000.

Prucher, Helmut; Jonas, Rochus; Piulats, Jaime; and Klockow, Michael, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Benzimidazolylpyridazinones. 4,923,869, Cl. 514-253.000.

Prymak, Rostislaw: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.

Psaar, Hubertus: *See—*
Eckstein, Udo; and Psaar, Hubertus, 4,923,641, Cl. 544-86.000.

Puddle, Mark W.; Davies, Nigel C.; Marwick, William F.; and Sheasby, Peter G., to Alcan International Limited. Method of forming a joint between aluminum workpieces with curable adhesive and resistance welding. 4,924,057, Cl. 219-118.000.

Puntar, Charles A.: *See—*
Grasso, Lawrence J.; Hoffman, Dale E.; Morgan, Carroll E.; Puntar, Charles A.; and Young, Diane K., 4,924,484, Cl. 377-116.000.

Puntener, Alois, to Ciba-Geigy Corporation. 1:2 Cobalt complexes of disazo dyes. 4,923,973, Cl. 534-684.000.

Purcell, Robert J., to Caterpillar Inc. Belted vehicle suspension system. 4,923,257, Cl. 305-29.000.

Purvis, Edward J.: *See—*
Marshall, Albert H.; Wolff, Ronald S.; McCormack, Robert T.; and Purvis, Edward J., 4,923,401, Cl. 434-22.000.
Marshall, Albert H.; McCormack, Robert T.; Purvis, Edward J.; Wolff, Ronald S.; and Towle, Herbert C., 4,923,402, Cl. 434-22.000.

Pusch, Richard H.: *See—*
Campman, Arthur R., deceased; Calamito, Dominic P., and Pusch, Richard H., 4,922,969, Cl. 139-408.000.

Putrino, Michael: *See—*
Vassiliadis, Stamatis; Putrino, Michael; Huffman, Ann E., Feal, Brice J.; and Pechanek, Gerald G., 4,924,422, Cl. 364-715.090.
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Puttinger, Dietmar: *See—*
Bartl, Josef; Schroettle, Wilhelm; and Puttinger, Dietmar, 4,922,799, Cl. 89-1.819.

PyMaH Corporation: *See—*
Van Iperen, Willem H. P.; Wilson, Edmund B., III; and Golabek, Robert S., Jr., 4,923,077, Cl. 220-3.100.

Pyramid Industries, Inc.: *See—*
Morris, William E., 4,923,412, Cl. 439-578.000.

Quan, Peter M.: *See—*
Dalton, Raymond F.; Price, Raymond; Quan, Peter M., and Stewart, David, 4,923,686, Cl. 423-38.000.

Quantametrics Inc.: *See—*
Remo, John L., 4,922,827, Cl. 102-496.000.

Quattrocchio S.r.l.: *See—*
De Pas, Jonathan; D'Urbino, Donato; and Lomazzi, Paolo, 4,922,669, Cl. 52-646.000.

Queen's University at Kingston: *See—*
Ley, Arthur N.; Rickey, Neil E.; and Taylor, Michael J., 4,923,804, Cl. 435-38.000.

Quintero, Lirio: *See—*
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

R J Reynolds Tobacco Company: *See—*
Brooks, Johnny L.; Roberts, Donald L.; and Simmons, Jerry S., 4,922,901, Cl. 128-203.260.
Jakob, Stephen W., 4,922,933, Cl. 131-299.000.
Williams, E. Lee, Jr.; and Thomasson, J. Sam, 4,922,932, Cl. 131-290.000.

Raatz, Francis: *See—*
Travers, Christine; Raatz, Francis; Guth, Jean-Louis; and Kessler, Henri, 4,923,835, Cl. 502-66.000.

Rabo, Jule A.: *See—*
Pellet, Regis J.; Coughlin, Peter K.; and Rabo, Jule A., 4,923,594, Cl. 208-114.000.

Racal Data Communications, Inc.: *See—*
Maxwell, Ronald K.; Zorzi, Karl J.; Yoshikawa, Harunori; Prasad, Venkat S.; Smith, Fred G.; and Hsieh, Ming-Chih, 4,924,456, Cl. 370-32.000.

Radiation Detectors, Inc.: *See—*
Wasserman, Philip D., 4,924,098, Cl. 250-380.000.

Raftis, Spiros G., to Red Valve Company, Inc. Pressure-reducing noise-abating control valve. 4,923,166, Cl. 251-4.000.

Rahnenfuhrer, Eckhard; Schulze, Albert; and Jaskolka, Heinz, to Rheinmetall GmbH. Ignition transfer charge for a propelling charge. 4,922,823, Cl. 102-288.000.

Raichle Sportschuh AG: *See—*
Seidel, Sigurd, 4,922,634, Cl. 36-119.000.

Rakovska, Rositza S.: *See—*
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

Ramadorai, Gopalan; Ball, Brian; Atwood, Ronald L.; Wan, Rong-Yu; and Acar, Sevket. Treatment of refractory carbonaceous sulfide ores for gold recovery. 4,923,510, Cl. 423-29.000.

Ramanathan, Visvanathan: *See—*
Howell, Frederick H.; Duthaler, Rudolf; Finter, Jurgen; Oertle, Konrad; and Ramanathan, Visvanathan, 4,924,015, Cl. 552-266.000.

Ramsey, Bruce L., to Phillips Petroleum Company. Treatment of arylene sulfide polymer fiber. 4,923,971, Cl. 528-481.000.

Randall, Mitchell A.: *See—*
Erb, Lee A.; Carr, Alan R.; Beaty, Paul G.; Bandhauer, Brian D.; and Randall, Mitchell A., 4,924,191, Cl. 330-130.000.

Rank Pullin Control Limited: *See—*
Moore, William T., 4,924,094, Cl. 250-334.000.

Ransburg-Gema AG: *See—*
Rutz, Guido; and Seiler, Daniel, 4,923,123, Cl. 239-691.000.

Rantala, Mauri: *See—*
Snellman, Yrjo; and Rantala, Mauri, 4,922,990, Cl. 162-273.000.

Rao, Matthew D.: *See—*
Burns, Stephen R.; Boesch, Timothy J.; Rao, Matthew D.; Cook, Stuart A.; Curtis, Jack M.; and Boone, Jack M., 4,922,696, Cl. 56-202.000.

Rao, Sailesh K.: *See—*
Gitlin, Richard D.; Rao, Sailesh K.; Werner, Jean-Jacques; and Zervos, Nicholas, 4,924,492, Cl. 379-93.000.

Rasmussen, Aaron P. Refrigerated mixing and dispensing machine for preparation of frozen dairy products. 4,922,725, Cl. 62-136.000.

Rasmussen, Vagn N.: *See—*
Fridh, Lars G.; Madsen, Benni; and Rasmussen, Vagn N., 4,922,677, Cl. 52-486.000.

Rasselstein AG: *See—*
Florian, Theodor, 4,923,573, Cl. 204-28.000.

Rath, Dieter: *See—*
Seidel, Dietrich, Wieland, Heinrich; Rosskopf, Gerhard, and Rath, Dieter, 4,923,439, Cl. 604-6.000.

Rau, Gunter: *See—*
Knoch, Martin; Reul, Helmut; and Rau, Gunter, 4,923,465, Cl. 623-2.000.

Ravaine, Lucienne; Armand, Michel B.; Charbouillot, Yves; and Hammou, Abdelkader, to Centre National de la Recherche Scientifique (CNRS). Compositions based on derivatives of silica modified by organic groups, preparation and application thereof, particularly as cationic conductors. 4,923,950, Cl. 528-38.000.

Raveau, Bernard: *See—*
Stephan, Ronan; Doisy, Martine; Montfort, Yves; Robbes, Didier; Sing, Marc L. C.; Bloyet, Daniel; Provost, Jackie; and Raveau, Bernard, 4,923,850, Cl. 505-1.000.

Ravensbergen, Daniel W. Method for optimizing flow and temperature in wash water when washing out fabric webs. 4,922,566, Cl. 8-151.000.

Ray, Claude; and Groothuis, Michiel, to Le Phare-Jean D'Eve S.A. Watch having a glass retaining strap. 4,924,453, Cl. 368-294.000.

Raychem Corporation: *See—*
Fang, Shou-Mean; and Camphouse, Charles H., 4,924,074, Cl. 219-548.000.
Truesdale, Grant; and Petersen, Tommy, 4,924,034, Cl. 174-87.000.

Raychem Limited: *See—*
Sweet, Martin, 4,924,340, Cl. 361-56.000.

Raynet Corporation: *See—*
Burgyan, Lajos; and Hand, Wilfred L., 4,924,473, Cl. 372-38.000.

Raytheon Company: *See—*
Schuss, Jack J.; and Hanfling, Jerome D., 4,924,236, Cl. 343-700.0MS

RCA Licensing Corporation: *See—*
Stockdale, George F.; Hook, Harvey O.; Browne, Robert G.; and Heyman, Philip M., 4,923,423, Cl. 445-40.000.

Red Valve Company, Inc.: *See—*
Raftis, Spiros G., 4,923,166, Cl. 251-4.000

Reddy, Gaddam P.; Kulka, Robert A.; Goring, Gregory P.; and Van Wagener, Raymond H., to Magnetek Universal MFG. Corporation. Retention clip for a thermal protection sensor. 4,924,350, Cl. 361-386.000.

Reddy, Vemuri B.; Hsiung, Nancy; Beck, Anton K.; and Berstine, Edward G., to Integrated Genetics, Inc. Fsh. 4,923,805, Cl. 435-69.400.

Redicon Corporation: *See—*
Bulso, Joseph D., Jr., and Lewers, William R., 4,923,139, Cl. 242-78.600.

Redmond, John P.; and Shaak, Ray N., to AMP Incorporated. Sealed chip carrier. 4,923,404, Cl. 439-71.000.

Reed, Alastair: *See—*
Stansfield, Peter W.; and Reed, Alastair, 4,924,388, Cl. 364-413.200.

Reed Devices, Inc.: *See—*
Decho, David R.; and Jones, William H., 4,924,213, Cl. 340-653.000.

Reed, Joseph: *See—*
Caserta, Joseph N.; Mims, William D.; Reed, Joseph; and Bowen, James H., 4,924,080, Cl. 250-213.0VT.

Rees, Cyril A. Method and apparatus for heat recovery from hydraulic oil. 4,922,996, Cl. 165-1.000.

Reeve, Kevan M.: *See—*
Turner, Philip J.; Jeff, Martin; and Reeve, Kevan M., 4,923,580, Cl. 204-157.970.

Reeve, Michael H.: *See—*
Kashyap, Raman; Reeve, Michael H.; Cassidy, Stephen A.; and Hornung, Stephen, 4,923,278, Cl. 350-96.300.

Rehrig, Houston, to Rehrig International, Inc. Cart with advertising panels. 4,922,639, Cl. 40-308.000.

Rehrig International, Inc.: *See—*
Rehrig, Houston, 4,922,639, Cl. 40-308.000.

Reiff, Helmut: *See—*
Scholl, Hans-Joachim; and Reiff, Helmut, 4,923,952, Cl. 528-60.000.

Reim, Gerhard: *See—*
Dopheide, Dietrich; Faber, Michael; Reim, Gerhard; and Taux, Guenter, 4,923,298, Cl. 356-28.500.

Reine, Marion B.: *See—*
Mroczkowski, Jacek A.; Reine, Marion B.; and Butler, Neal R., 4,924,096, Cl. 250-341.000.

Reinhart, Robert V., Jr.: *See—*
Page, Mary J.; Hamilton, Benton W.; Skiles, Bruce L.; and Reinhart, Robert V., Jr., 4,923,446, Cl. 604-198.000.

Reinke, Karl L., Jr., to K. Reinke, Jr & Company. Energy monitor. 4,924,404, Cl. 364-464.040.

Remo, John L., to Quantametrics Inc. Method and means for intercepting missiles. 4,922,827, Cl. 102-496.000.

Renato Brevini: *See—*
Goldenberg, Nahum, 4,922,804, Cl. 91-532.000.

Rene, Gauthier: *See—*
Sireul, Jacques; Herve, Jacob; and Rene, Gauthier, 4,923,295, Cl. 350-639.000.

Rensch, Jurgen. High-frequency fluorescent marine light. 4,924,147, Cl. 315-58.000.

Repphun, William; and Harper, David, to MiniScribe Corporation. Disk drive servo shield. 4,924,337, Cl. 360-128.000.

Rerup, Hans J.; Drake, Evelyn N., and Duvdevani, Ilan, to Exxon Research and Engineering Company. Glass fiber reinforced cement compositions. 4,923,517, Cl. 106-99.000.

Research Triangle Institute: *See—*
Lawless, Philip A.; and Viner, Andrew S., 4,923,491, Cl. 55-409.000.

Resuggan, Harold F., to Webley & Scott Limited. Spring energized air guns. 4,923,182, Cl. 267-169.000.

Retail Profits, Inc.: *See—*
Konkel, Richard D., 4,923,154, Cl. 248-131.000.

Rettig, John B.; Lueker, Jonathan; Carlson, John E.; Kaveckis, Stanley P.; and Lewallen, Roy W., to Tektronix, Inc. High speed step generator output circuit. 4,924,110, Cl. 307-227.000.

Retzlaff, Guenter: *See—*
Schulz, Guenter, Buschmann, Ernst; Sauter, Hubert, Zeeh, Bernd; Wuerzer, Bruno; Jung, Johann; and Retzlaff, Guenter, 4,923,503, Cl. 71-92.000.

Reul, Helmut: *See—*
Knoch, Martin; Reul, Helmut; and Rau, Gunter, 4,923,465, Cl. 623-2.000.

Revenaugh, Paul W.: *See—*
Shifflet, Glenn, Johnson, Herbert C., and Revenaugh, Paul W., 4,924,169, Cl. 320-21.000.

Reynolds, Howard: *See—*
Siemon, John A., and Reynolds, Howard, 4,924,345, Cl. 361-111.000.

Rhau, Siegfried: *See—*
Busch, Jurgen-Michael, Stammel, Georg; Rhau, Siegfried; Gundel, Bernd; and Rudolf, Karl, 4,922,826, Cl. 102-489.000.

Rheinmetall GmbH: *See—*
Groppe, Heiko, 4,922,802, Cl. 89-41.070.
Rahnenführer, Eckhard; Schulze, Albert; and Jaskolka, Heinz, 4,922,823, Cl. 102-288.000.

Rhodes, Larry F.: *See—*
Goodall, Brian L.; and Rhodes, Larry F., 4,923,936, Cl. 526-115.000.

Rhone-Poulenc Sante: *See—*
Colin, Michel; Guenard, Daniel; Gueritte-Voegelein, Francoise; and Potier, Pierre, 4,924,012, Cl. 549-510.000.
Massonneau, Viviane; and Mulhauser, Michel, 4,924,007, Cl. 549-18.000.

Rice, Delbert L.; and Soar, Steven E., to Tektronix, Inc. Adjustable low inductance probe. 4,923,407, Cl. 439-92.000.

Rice, Doris; Rice, Kevin A.; and Rice, Elvin T. Child carrier and protector. 4,923,104, Cl. 224-155.000.

Rice, Elvin T.: *See—*
Rice, Doris; Rice, Kevin A.; and Rice, Elvin T., 4,923,104, Cl. 224-155.000.

Rice, Kevin A.: *See—*
Rice, Doris; Rice, Kevin A.; and Rice, Elvin T., 4,923,104, Cl. 224-155.000.

Richards, Philip C.; and Evans, Robert T. Enhanced communication services and apparatus. 4,924,495, Cl. 379-127.000.

Richardson, Joseph W., Jr.: *See—*
Evans, Raymond G.; Earleson, Walter E., and Richardson, Joseph W., Jr., 4,924,395, Cl. 364-426.020.

Richartz, Erich: *See—*
Russwurm, Dieter; and Richartz, Erich, 4,923,528, Cl. 148-12.400.

Richter Gedeon Vegyeszeti Gyar RT: *See—*
Fodor, Tamas; Dobay, Laaszlo; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Saghy, Katalin; and Szporny, Laaszlo, 4,923,888, Cl. 514-414.000.

Richter, Wolfgang: *See—*
Voss, Gunter; Kurpjoweit, Martin; and Richter, Wolfgang, 4,923,575, Cl. 204-44.200.

Rickey, Neil E.: *See—*
Ley, Arthur N.; Rickey, Neil E.; and Taylor, Michael J., 4,923,804, Cl. 435-38.000.

Ricoh Company, Ltd.: *See—*
Fukawa, Kazumi, 4,924,242, Cl. 346-76.0PH
Hirose, Akira, 4,923,190, Cl. 271-3.100.
Takaoka, Tatsuo, 4,924,324, Cl. 358-468.000.
Tanaka, Hidetake; Yamazaki, Shigeru; Yamanobe, Koji; Kotabe, Hiroaki; Nakazato, Yasushi; and Banno, Masahiko, 4,924,320, Cl. 358-296.000.

Riddoch, Fiona G.: *See—*
Alexander, Michael; and Riddoch, Fiona G., 4,922,606, Cl. 29-839.000.

Ridgeway, Louis H. Membrane packing and retainer. 4,923,065, Cl. 206-583.000.

Riebel, Hans-Jochem; Fest, Christa; Muller, Klaus-Helmut; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Sulphonyliso(thio)ureas. 4,923,505, Cl. 71-93.000.

Riemann, Herbert F. Three ribbed torque handle. 4,922,575, Cl. 16-111.00R.

Riemenschneider, Bert R.: *See—*
Paterson, James L.; Wilmoth, David D.; and Riemenschneider, Bert R., 4,924,437, Cl. 365-185.000.

Ries, Gordon. Laser diode control apparatus. 4,924,470, Cl. 372-26.000.

Rieter Machine Works, Ltd.: *See—*
Slavik, Walter; and Wuermli, Arthur, 4,922,704, Cl. 57-261.000.

Riley, Ron J., to J. N. Fauver Company, Inc. Software zoning of conveyor control. 4,924,164, Cl. 318-587.000.

Rilliet, Francois, to Dematex Development & Investment Establishment. Tube, stopper and compression ring for blood sampling systems. 4,923,072, Cl. 215-247.000.

Rinke, Frederick F.: *See—*
Calkins, Robert B.; and Rinke, Frederick F., 4,923,150, Cl. 244-151.00B

Ritenour, Gibson D.: *See—*
Lewis, Harry E.; Ritenour, Gibson D.; Wong, Cho L.; Gara, George; and Eddisford, Allen F., 4,924,500, Cl. 379-201.000.

Ritsko, John J.: *See—*
Kirch, Steven J.; Lankard, John R.; Ritsko, John J.; Smith, Kurt A.; Speidell, James L.; and Yeh, James T., 4,923,772, Cl. 430-5.000.

Rittner, Siegbert: *See—*
Horoldt, Ernst; Grimm, Richard; Rittner, Siegbert; Kuckertz, Herbert; and Billmann, Wilfried, 4,923,485, Cl. 55-55.000.

Rivas, Hercilio: *See—*
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

Rivero, Mayela: *See—*
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

Rizzo, John R.; and Tao, Eddie V. P., to Eli Lilly and Company. Process for preparing 5-cyano-4, 5-dihydro-3,4-dicarboxypyrazole derivatives. 4,924,001, Cl. 548-356.000

RMI Company: *See—*
Fisher, Richard L., 4,923,531, Cl. 148-126.100.

Roan S.p.A.: *See—*
Gatti, Angelo, 4,922,934, Cl. 132-218.000.

Robb, Stephen P.: *See—*
Anderson, Floyd E.; and Robb, Stephen P., 4,924,111, Cl. 307-270.000
Anderson, Floyd E., Robb, Stephen P.; and Shaw, Pern, 4,924,112, Cl. 307-270.000.

Robbes, Didier: *See—*
Stephan, Ronan; Doisy, Martine; Montfort, Yves; Robbes, Didier; Sing, Marc L. C.; Bloyet, Daniel; Provost, Jackie; and Raveau, Bernard, 4,923,850, Cl. 505-1.000.

Robert Bosch GmbH: *See—*
Grob, Ferdinand; Linder, Ernst; Kienzler, Dieter; Potschin, Roger; and Stutzenberger, Heinz, 4,922,714, Cl. 60-276.000.
Kaes, Guenter; and Stegmaier, Alwin, 4,922,966, Cl. 137-627.500.
Kaiser, Gunther; Klotzner, Winfried; Krauter, Immanuel; and Jeenicke, Edmund, 4,924,399, Cl. 364-431.030.
Lindae, Gerhard; Neumann, Rainer; and Perthus, Peter, 4,924,359, Cl. 362-61.000.
Rollwage, Mathias, 4,923,365, Cl. 415-119.000.

Robert, Kearny Q.: *See—*
Sawhney, A. Paul S., Folk, Craig L., and Robert, Kearny Q., 4,922,701, Cl. 57-12.000.

Robert Krups Stiftung & Co. KG: *See—*
Fuhner, Hubert, 4,922,809, Cl. 99-283.000.

Robert, Michel: *See—*
Fuentes, Jean-Luc; and Robert, Michel, 4,923,565, Cl. 162-72.000.

Roberts, Donald L.: *See—*
Brooks, Johnny L.; Roberts, Donald L.; and Simmons, Jerry S., 4,922,901, Cl. 128-203.260.

Roberts, George L.; and Lawhorne, Earl R., to Kemira, Inc. Preparation of pure titanium dioxide with anatase crystal structure from titanium oxychloride solution. 4,923,682, Cl. 423-611.000.

Roberts, Richard E.: *See—*
Blanchard, Raymond A., Jr.; and Roberts, Richard E., 4,923,314, Cl. 409-63.000.

Roberts, Thomas G.; Wilkinson, Edward L.; and Webster, Lee O., to United States of America, Army. Tether power generator for earth orbiting satellites. 4,923,151, Cl. 244-158.00R.

Robertshaw Controls Company: *See—*
Asbill, Clarence M., III, 4,922,760, Cl. 73-861.480.

Robertson, William M.; Sharp, Charles A., III; and Burke, Edward J., to Marlow Industries, Inc. Transporter unit with communication media environmental storage modules. 4,922,721, Cl. 62-3.610.

Robinson, Don M.; and Davenport, Henry E., to Seagate Technology, Inc. Method for mapping around defective sectors in a disc drive. 4,924,331, Cl. 360-72.100.

Robinson, Frank: *See—*
Day, Gerald F.; Robinson, Frank; and Williams, Dennis J., 4,923,724, Cl. 428-36.100.

Robinson, John R., to Nike, Inc. and Nike International Ltd. Athletic shoe with inversion resisting device. 4,922,630, Cl. 36-89.000.

Robinson, William P., to HSC Controls Inc. Hydraulic servovalve. 4,922,963, Cl. 137-625.620.

Robson, Colin L.: *See—*
Middleton, Christopher O.; and Robson, Colin L., 4,924,374, Cl. 364-167.010.

Robson, Peter M.. Slide-type fastener. 4,922,586, Cl. 24-399.000.

Rock-Ola Manfacturing Corporation: *See—*
Rockola, Donald C.; and Haque, Shuja, 4,923,090, Cl. 221-312.00R

Rock-Tenn Company: *See—*
Wischusen, Henry, III; and Champion, William L., 4,923,239, Cl. 296-97.700.

Rockola, Donald C.; and Haque, Shuja, to Rock-Ola Manfacturing Corporation. Delivery assembly for coin-operated can vending machines. 4,923,090, Cl. 221-312.00R.

Rockwell International Corporation: *See—*
Adams, William J.; Zegler, Robert E.; and Monson, Conrad B., 4,923,147, Cl. 244-122.0AG.

Rode, Heinz: *See—*
Rohl, Jurgen; and Rode, Heinz, 4,923,075, Cl. 220-5.00A.

Rodero, Alejandro, to S. C. Johnson & Son, Inc. Bioactive film-forming composition for control of crawling insects and the like. 4,923,698, Cl. 424-405.000.

Rodi, Fritz; Kiemle, Peter; Eiling, Aloys; and Kathrein, Hendrik, to Bayer Aktiengesellschaft. Magnetic iron oxide pigments and a process for their preparation. 4,923,519, Cl. 106-459.000.

Rodite, Robert R.: *See—*
Dinan, Raymond F.; Dubil, James F.; Hillery, John R.; Rodite, Robert R.; and White, James M., 4,924,521, Cl. 382-54.000.

Rodriquez, Robert G.: *See—*
Mitchell, Charles W.; and Rodriquez, Robert G., 4,924,355, Cl. 361-415.000.

Rogers, H. David: *See—*
Davidson, Donald R.; Huang, Pao-Ter; and Rogers, H. David, 4,922,637, Cl. 38-15.000.

Rogers, Peter J.: *See—*
Jackson, Miles N.; Rogers, Peter J.; and Watson, Brenda L., 4,923,304, Cl. 366-184.000.

Rohl, Jurgen; and Rode, Heinz. Thermostatically controllable tank container. 4,923,075, Cl. 220-5.00A.

Rohm and Haas S.A.: *See—*
Arnaudis, Germaine, 4,923,976, Cl. 536-18.600.

Rohr, Harry: *See—*
Willenberg, Bernd; El Sayed. Aziz; Rohr, Harry; and Dicke, Hans-Rudolf, 4,923,660, Cl. 264-103.000.

Rohring, Daniel Z. Engine-spiraled, stabilized toy football. 4,923,196, Cl. 273-65.0EF.

Rohringer, Thomas; and Schrage, Horst, to Montblanc-Simplo GmbH. Ink feed for a fountain pen. 4,923,318, Cl. 401-225.000.

Rojas, Daysi: *See—*
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

Rokutan, Takao. *See—*
Hashimoto, Akihiko; Kitahara, Toshihiro; Hashi, Hiroshi; and Rokutan, Takao, 4,924,199, Cl. 235-494.000.

Roland, Jean-Pierre: *See—*
Vaillant de Guelis, Hubert; Jamain, Patrice; and Roland, Jean-Pierre, 4,924,128, Cl. 310-156.000.

Roland, Vincent. Surfing figurine. 4,923,427, Cl. 446-153.000.

Rolinx Limited: *See—*
Graves, James P., 4,922,652, Cl. 47-23.000.

Roller, Dieter: *See—*
Braschel, Volker; Schmitt, Hubert; and Roller, Dieter, 4,923,255, Cl. 303-97.000.

ROLLS-ROYCE plc: *See—*
Stewart, Peter A. E.; and Fowler, Peter H., 4,924,100, Cl. 250-390.090.

Rollwage, Mathias, to Robert Bosch GmbH. Impeller wheel for conveying a medium. 4,923,365, Cl. 415-119.000.

Romano, Antonio, to Campagnolo S.r.l. Device for preventing the rotation of a bicycle pedal relative to its pin. 4,922,786, Cl. 74-594.400.

Romek Figa d/b/a Abraham & Sons: *See—*
Figa, Romek; Cohen, Jonathan H.; and Cohen, Samuel G., 4,924,496, Cl. 379-142.000.

Romero Hernandez, Jose, to Albany International Corp. Press drying concept. 4,922,627, Cl. 34-116.000.

Rommi, Vesa: *See—*
Nyman, Tapani; Rommi, Vesa; and Wikman, Kai, 4,923,569, Cl. 162-339.000.

Roncari, Raymond A.: *See—*
Carniglia, Francis J., 4,923,851, Cl. 514-23.000.

Roosa, Vernon D., to Harp, Elwyn V.; and Baron, Glen H. Flushing means. 4,922,556, Cl. 4-378.000.

Ropak Corporation: *See—*
Foy, Dennis M., 4,923,079, Cl. 220-7.000.

Rorer Pharmaceutical Corporation: *See—*
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,924,010, Cl. 549-355.000.

Rosati, Robert L., to Pfizer Inc. Certain heterocyclic-hexanamides useful for treating hypertension. 4,923,864, Cl. 514-234.800.

Rose, Donald: *See—*
Sapega, Alexander A.; Moyer, Ray A.; and Rose, Donald, 4,922,897, Cl. 606-80.000.

Roselle, Paul L.: *See—*
Gluck, Ronald; and Roselle, Paul L., 4,923,828, Cl. 437-225.000.

Rosin-Schroder, Gerhard: *See—*
Heime, Axel; Rosin-Schroder, Gerhard; and Schairer, Werner, 4,924,276, Cl. 357-17.000.

Rossa, Edward M.: *See—*
Bovet, Claude; and Rossa, Edward M., 4,923,266, Cl. 350-96.150.

Rosskopf, Gerhard: *See—*
Seidel, Dietrich; Wieland, Heinrich; Rosskopf, Gerhard; and Rath, Dieter, 4,923,439, Cl. 604-6.000.

Rosso, Michele: *See—*
Crepy, Hubert, Elie, Philippe; Galand, Claude; Lancon, Emmanuel; Liethoudt, Thierry; and Rosso, Michele, 4,924,508, Cl. 381-38.000.

Rossouw, Jan H.: *See—*
Rossouw, Pieter J.; and Rossouw, Jan H., 4,923,131, Cl. 241-275.000.

Rossouw, Pieter J.; and Rossouw, Jan H. Rotary impact crusher rotor. 4,923,131, Cl. 241-275.000.

Roszkowski, Richard M.: *See—*
Landowski, Roger W.; Roszkowski, Richard M.; Christian, Donald J.; and Ansari, Assad A., 4,924,307, Cl. 358-107.000.

Roth Freres, Societe Anonyme: *See—*
Balmisse, Michel; and Molinari, Georges, 4,923,746, Cl. 428-309.900.

Rothaar, Stefan; and Stuck, Otfried, to Flutec Fluidtechnische Gerate GmbH. Hydraulic single piston pump for manual operation. 4,923,373, Cl. 417-439.000.

Rotival, Jacques, to U.S. Philips Corp. Device for ensuring the television compatability of picture sensors with optomechanical analysis. 4,924,312, Cl. 358-140.000.

Rotolico, Anthony J.; and Maidhof, William H., to Perkin-Elmer Corporation, The. Plasma gun apparatus and method with precision adjustment of arc voltage. 4,924,059, Cl. 219-121.480.

Rotter, Bernard J.; Whitten, Timothy M.; and Brown, Silas A. Porch with recessible windows. 4,922,666, Cl. 52-66.000.

Rouse, William M., III: *See—*
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse, William M., III, 4,923,695, Cl. 424-71.000.

Roussel, Pierre, to Jaeger. Circuit for shaping and making use of armature current ripple as generated by a D.C. motor, in particular for position control. 4,924,166, Cl. 318-608.000.

Roux, Jean-Pierre: *See—*
Creusot, Didier; and Roux, Jean-Pierre, 4,923,142, Cl. 244-3.100.

Rowberg, Alan H.: *See—*
Arnold, Ben A.; and Rowberg, Alan H., 4,922,915, Cl. 128-653.00R.

Rowen, Michael J.: *See—*
D'Aleo, Michael; Darragh, Denis; Ference, Jonathan; Luchaco, David; Rowen, Michael J.; and Spira, Joel S., 4,924,151, Cl. 315-295.000.

Rowen, William I.; and Withey, David J., to General Electric Company. Integrated boost compressor/gas turbine control. 4,922,710, Cl. 60-39.281.

Rowlance, Edward J.: *See—*
Christenson, Patrick J.; Hart, Robert J., Naatz, David C.; Rowlance, Edward J.; and Wenz, David G., 4,924,434, Cl. 364-900.000.

Roxas, Renato O.: *See—*
Haas, David A.; VanderSyde, Gary L.; Beatty, Paul J.; and Roxas, Renato O., 4,922,689, Cl. 53-569.000.

Rozelle, Paul F.; Koch, Karl C.; Einolf, Charles W., Jr.; and Oates, Robert M., to Westinghouse Electric Corp. Apparatus for precise detection of blade passing times in a steam turbine. 4,922,757, Cl. 73-660.000.

Rozniecki, Edward J.: *See—*
Taube, Frank A., Sr.; and Rozniecki, Edward J., 4,922,956, Cl. 137-504.000.

RRRR Products, Inc.: *See—*
Burrows, Roger A., 4,923,087, Cl. 220-404.000

Rubey, Wayne A., to University of Dayton. Gas chromatography methods and apparatus. 4,923,486, Cl. 55-67.000.

Ruch, Peter: *See*—
Bongartz, Heinrich; Ruch, Peter; and Voswinckel, Gerhard, 4,922,592, Cl. 28-183.000.

Rudd, David, and Cames, R. Scott, to Hoechst Celanese Corporation. Moisture-resistant, coated thermoplastic film having enhanced adhesion to inks and metallic layers. 4,923,713, Cl. 427-171.000.

Ruderman, Stephen: *See*—
Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, 4,922,842, Cl. 112-304.000.

Rudkin, Mark J., and Atkinson, David I. H. Fluid transducer 4,922,745, Cl. 73-32.00A

Rudolf, Karl: *See*—
Busch, Jurgen-Michael; Stammel, Georg; Rhau, Siegfried; Gundel, Bernd; and Rudolf, Karl, 4,922,826, Cl. 102-489.000.

Ruhle, Wolfgang, to Siemens Aktiengesellschaft. Temperature sensor. 4,924,114, Cl. 307-310.000.

Ruiter, Karl A., to Medical Data Electronics, Inc. Automatic non-invasive blood pressure reading device. 4,922,918, Cl. 128-681.000.

Ruiz, Manuel W.: *See*—
Bishop, Willis E.; Popat, Ghanshyam H., Tien-Tsung, Chen; and Ruiz, Manuel W., 4,923,317, Cl. 401-205.000.

Rumpf, Horst H.: *See*—
Klos-Hein, Karl, and Rumpf, Horst H., 4,924,336, Cl. 360-105.000.

Rundo, Mark C.: *See*—
Carlozzo, Ben J.; Janoski, Ronald J.; Sterk, James; and Rundo, Mark C., 4,923,348, Cl. 411-377.000.

Russ, David E., to Sundstrand Corporation. Interactive dual shaft input signal timing mechanism. 4,923,039, Cl. 192-7.000.

Russell, Joseph K.; and McKee, Jeffrey A., to Texas Instruments Incorporated. Quartz conductive baffles for heat removal and method 4,922,731, Cl. 62-515.000.

Russo, Sergio, to Abex Corporation. Method and apparatus for making brake pads. 4,923,661, Cl. 264-119.000.

Russwurm, Dieter; and Jungwirth, Dieter, to Dyckerhoff & Widmann AG; and Arbed S.A. Hot-rolled concrete reinforcing bar, in particular reinforcing ribbed bar. 4,922,681, Cl. 52-737.000.

Russwurm, Dieter; and Richartz, Erich, to Aicher, Max. Method for manufacturing rolled steel products. 4,923,528, Cl. 148-12.400.

Rutz, Guido; and Seiler, Daniel, to Ransburg-Gema AG. Spray coating device for atomization of fluid coating material. 4,923,123, Cl. 239-691.000.

Rutzen, Horst; Baumann, Horst; and Gruber, Bert, to Henkel Kommanditgesellschaft auf Aktien. Quaternary ammonium compounds, their production and use in fabric aftertreatment preparations. 4,923,642, Cl. 260-404.000.

Ryan, Dana W., to Ryan Medical, Inc. Safety needled medical devices. 4,923,445, Cl. 604-195.000

Ryan, James P.: *See*—
Gambale, Richard A.; Crittenden, James F.; and Ryan, James P., 4,922,923, Cl. 128-772.000

Ryan Medical, Inc.: *See*—
Ryan, Dana W., 4,923,445, Cl. 604-195.000.

Ryan, Robert R.: *See*—
Smith, Barbara F.; Jarvinen, Gordon D.; and Ryan, Robert R., 4,923,630, Cl. 252-184.000

Ryang, Hong-Son: *See*—
Boyd, Jack D.; and Ryang, Hong-Son, 4,923,928, Cl. 525-117.000.

Ryder, R. James, Jr.; and Barton, D. Michael. Pliant anchoring device for use with disposable ballast. 4,922,847, Cl. 114-299.000.

Ryobi Ltd.: *See*—
Ishii, Koji, 4,922,819, Cl. 101-177.000.
Sazaki, Konin; and Maruyama, Kenji, 4,923,141, Cl. 242-247.000.

S. C. Johnson & Son, Inc.: *See*—
Brown, Oliver M., 4,923,514, Cl. 106-11.000
Flashinski, Stanley J., 4,923,897, Cl. 514-531.000.
Frazee, Glenn R., 4,923,919, Cl. 524-460.000.
Rodero, Alejandro, 4,923,698, Cl. 424-405.000.

Sabarino, Giampiero: *See*—
Coassolo, Alfredo; Sabarino, Giampiero; Foa, Marco; and Chapoy, Larry L., 4,923,947, Cl. 528-193.000.
Coassolo, Alfredo; Sabarino, Giampiero; Foa', Marco; and Chapoy, L. Lawrence, 4,923,955, Cl. 528-193.000.

Sabraw, Richard J., to General Motors Corporation. Melt-holding vessel and method of and apparatus for countergravity casting. 4,922,992, Cl. 164-63.000.

Saforo, Emmanuel K.; Liu, Paul K. T.; Bergstrom, Robin K.; and Gatty, David G., to Aluminum Company of America. Peptized activated carbon/alumina composite. 4,923,843, Cl. 502-415.000.

Saghy, Katalin: *See*—
Fodor, Tamas; Dobay, Laaszlo; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Saghy, Katalin; and Szporny, Laaszlo, 4,923,888, Cl. 514-414.000

Saguchi, Ryuichi: *See*—
Yamamoto, Akira; Saguchi, Ryuichi; and Nagura, Shigehiro, 4,923,119, Cl. 239-55.000.

Saia, Louis P., III. Portable self-contained cooler/freezer apparatus for use on common carrier type unrefrigerated truck lines and the like. 4,922,729, Cl. 62-384.000.

Saisho, Satoru, to Koyo Fastener Co., Ltd. Legs for protecting furniture or other fittings. 4,923,158, Cl. 248-188.800.

Saito, Akio; and Ishigami, Masahiro, to NEC Corporation. Volume control circuit for use in portable telephone or the like. 4,924,193, Cl. 330-284.000.

Saito, Hideo: *See*—
Sawada, Shinichi; Isoyama, Toyoshiro; Matsushita, Tetsuya; and Saito, Hideo, 4,923,632, Cl. 252-299.610.

Saito, Kazumi: *See*—
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.

Saito, Keizo, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method and apparatus for treating exhaust gas for removal of fine particles. 4,923,484, Cl. 55-21.000.

Saito, Koichi: *See*—
Takaoka, Tokuro; Sasaki, Tsuto; Kobayashi, Yukio; Saito, Koichi; and Hamano, Satoshi, 4,923,170, Cl. 251-121.000.

Saito, Masanori: *See*—
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,923,847, Cl. 503-227.000.

Saito, Masato: *See*—
Watanabe, Keiji; Fukuyama, Keiji; Ishida, Masako; Suzuki, Ryo; and Saito, Masato, 4,924,137, Cl. 313-337.000.

Saito, Mitsuru: *See*—
Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, 4,923,027, Cl. 180-219.000.

Saito, Susumu: *See*—
Imai, Takashi; Saito, Susumu; and Takashima, Koichi, 4,923,777, Cl. 430-120.000.

Saito, Takashi: *See*—
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.

Saito, Yoshihiro; Wada, Nobuhide; Kusano, Shoji; Miyazawa, Takeshige; Takahashi, Satoru; Toyokawa, Yasuhumi; and Kajiwaca, Ikuo, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Company, Ltd. Pyrimidine derivatives, processes for their production, and herbicidal method and compositions. 4,923,501, Cl. 71-92.000.

Saito, Yoshikazu; and Yazawa, Yoshiaki, to Hitachi, Ltd. Semiconductor integrated circuit device. 4,924,293, Cl. 357-71.000.

Saitoh, Izumi; Kido, Shigeru; Doi, Yoshio; and Egawa, Shohei, to Shionogi & Co., Ltd. External preparation of vitamin-E. 4,923,893, Cl. 514-458.000.

Saka, Tsutomu, to Honda Giken Kogyo Kabushiki Kaisha. Non-circular cross-section coil spring. 4,923,183, Cl. 267-180.000.

Sakai, Hiroaki: *See*—
Watanabe, Kenichiro; Matsuhisa, Tadaaki; and Sakai, Hiroaki, 4,923,308, Cl. 374-137.000

Sakai, Morihiko: *See*—
Akao, Takeshi; Nishizawa, Yoshihiko; Yamada, Shiro; Fuse, Hisahumi; Ohsaki, Katsumichi; and Sakai, Morihiko, 4,922,650, Cl. 47-1.100.

Sakai, Shoji; and Iwai, Yukio, to Murata Kikai Kabushiki Kaisha. Cleaning device for a drafting device in a spinning machine. 4,922,705, Cl. 57-306.000.

Sakai, Shuzo: *See*—
Izumori, Ken; and Sakai, Shuzo, 4,923,803, Cl. 435-26.000.

Sakai, Yasuo: *See*—
Asai, Nobuteru; Sakai, Yasuo; and Miyazaki, Kazuo, 4,924,432, Cl. 364-900.000.

Sakakibara, Kenji: *See*—
Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, 4,923,027, Cl. 180-219.000.
Horaguchi, Yoichi; Sakakibara, Kenji; Yamada, Makoto; Nagata, Osamu; Suzuki, Tsuyoshi; and Sugiura, Toshio, 4,924,255, Cl. 355-27.000.

Sakakibara, Shinichi: *See*—
Mizoguchi, Kenji; Takeuchi, Hitoshi; Nishigaki, Yoshiyasu; Kato, Yoshihiro; and Sakakibara, Shinichi, 4,922,876, Cl. 123-470.000.

Sakamoto, Hiroshi: *See*—
Iida, Yoshikazu; Hagiuda, Nobuyoshi; Yokonuma, Norikazu; Sakamoto, Hiroshi, and Matsui, Hideki, 4,924,252, Cl. 354-420.000.

Sakamoto, Kiichiro: *See*—
Shiota, Kazuo; and Sakamoto, Kiichiro, 4,924,302, Cl. 358-75.000.

Sakamoto, Noriaki: *See*—
Fuji, Hiroshi; Maeda, Shigemi; Sakamoto, Noriaki; Terashima, Shigeo; Yamaguchi, Takeshi; Tsuji, Kentaro; and Kojima, Kunio, 4,924,447, Cl. 369-13.000.

Sakamoto, Shuji: *See*—
Shigematsu, Kazuyoshi; Shirouzu, Shigenori; Sakamoto, Shuji; and Suzuki, Toshiyasu, 4,923,962, Cl. 528-196.000.

Sakamoto, Takao; and Takizawa, Kiyotaka, to Tachi-S Co., Ltd. Method of controlling a side support for use with a vehicle seat and device for use in such method. 4,924,162, Cl. 318-569.000.

Sakamoto, Takao; and Takano, Tomio, to Tachi-S Company, Ltd. Side support control device for use in a vehicle seat. 4,924,163, Cl. 318-569.000.

Sakayori, Hiroyuki: *See*—
Sato, Masahiko; Mase, Akira; Sakayori, Hiroyuki; and Yamazaki, Shunpei, 4,924,243, Cl. 350-320.000.

Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,972, Cl. 141-4.000.
Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,974, Cl. 141-4.000.

Sakizadeh, Kumars: *See*—
Grieve, Duncan M. A.; Poon, Stephen S. C.; Thien, Tran V.; Sakizadeh, Kumars; and Weigel, David C., 4,923,792, Cl. 430-559.000.

Sako, Mineyuki; Oka, Tateki; Hiromoto, Yasuyuki; Yokoyama, Tomoaki; and Toda, Kunio, to Minolta Camera Kabushiki Kaisha. Toner supply device for use in image forming apparatus. 4,924,270, Cl. 355-246.000.

Sakudo, Noriyuki; and Tamura, Hifumi, to Hitachi, Ltd. Charged particle source. 4,924,101, Cl. 250-423.00R.

Sakuma, Shuji; and Atsumi, Kiminori, to Kabushiki Kaisha Sangi. Compositions for preventing tooth decay. 4,923,683, Cl. 424-52.000.

Sakurai, Masahiro: *See*—
Funakawa, Naoyoshi; Iida, Yasuharu; Moriki, Yasumitsu; and Sakurai, Masahiro, 4,923,251, Cl. 299-64.000.

Salazar P., Jose: *See*—
Layrisse R., Ignacio A.; Polanco, Domingo R.; Rivas, Hercilio; Jimenez G., Euler; Quintero, Lirio; Salazar P., Jose; Rivero, Mayela; Cardenas, Antonio; Chirinos, Maria L.; Rojas, Daysi; and Marquez, Humberto, 4,923,483, Cl. 44-51.000.

Salemme, Victor G.: *See*—
Ealey, Mark A.; and Salemme, Victor G., 4,923,302, Cl. 356-371.000.

Salisbury, Jeffery L.: *See*—
Weidner, Timothy B.; and Salisbury, Jeffery L., 4,922,576, Cl. 16-114.00R.

Salus S.r.l.: *See*—
Ugolini, Filippo, 4,923,472, Cl. 623-20.000.

Sampas, Nicholas: *See*—
Anderson, Dana Z.; and Sampas, Nicholas, 4,923,299, Cl. 356-350.000.

Samson AG: *See*—
Kemmler, Lothar, 4,922,952, Cl. 137-382.000.

Samsung Electronics Co. Ltd.: *See*—
Cho, Hun C., 4,924,483, Cl. 377-3.000.

Sandvik Rock Tools, Inc.: *See*—
Meek, James F., 4,923,018, Cl. 173-78.000.

Sandy Hill Corporation: *See*—
Cook, William G., 4,922,776, Cl. 83-398.000.

Sanford, Lawrence; and Stokley, Charles O., to Tam International. Inflatable packer with improved reinforcing members. 4,923,007, Cl. 166-187.000.

Sankyo Engineering Co., Ltd.: *See*—
Nakamura, Hajime, 4,923,388, Cl. 425-577.000.

Sano, Akira; Yokoyama, Shigeki; Miyazaki, Yasunosuke; Kuroishi, Tetsujiro; and Matsuura, Kazuo, to Nippon Oil Co., Ltd. Process for producing polyethylene of ultrahigh molecular weight. 4,923,935, Cl. 526-73.000.

Sano, Hiroshi: *See*—
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asasno, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.

Sano, Tutomu: *See*—
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 4,923,383, Cl. 425-150.000.

Sanocki, Stephen M.; Johnson, Donald D.; and Fischer, Edward M., to Minnesota Mining and Manufacturing Company. High temperature resistant oil boom flotation core. 4,923,332, Cl. 405-63.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Onoue, Akihiro, 4,923,417, Cl. 440-78.000.

Sant'Anselmo, Carl; Sant'Anselmo, Robert; and Hooper, David C. Identification symbol, system and method. 4,924,078, Cl. 235-494.000.

Sant'Anselmo, Robert: *See*—
Sant'Anselmo, Carl; Sant'Anselmo, Robert; and Hooper, David C., 4,924,078, Cl. 235-494.000.

Santel, Hans-Joachim: *See*—
Riebel, Hans-Jochem; Fest, Christa; Muller, Klaus-Helmut; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,923,505, Cl. 71-93.000.

Sanyo Electric Co., Ltd.: *See*—
Hineno, Kazuhiro; and Koike, Toshio, 4,923,089, Cl. 221-1.000.

Sapega, Alexander A.; Moyer, Ray A.; and Rose, Donald, to Temple University. Apparatus and method for reconstructive surgery. 4,922,897, Cl. 606-80.000.

Sartor, Mariano, to Nordica S.p.A. Ski boot, particularly of the rear-entry type, with securing and adjustment device. 4,922,633, Cl. 36-117.000.

Sasaki, Hirotomo; Shishido, Tadao; and Mifune, Hiroyuki, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,923,794, Cl. 430-603.000.

Sasaki, Michiaki; and Masuda, Joji, to Nissan Motor Co., Ltd. Filter arrangement for fuel tank. 4,922,959, Cl. 137-587.000.

Sasaki, Minoru: *See*—
Takeuchi, Mitsunori; and Sasaki, Minoru, 4,922,906, Cl. 128-419.00R.

Sasaki, Shosaku: *See*—
Yamada, Takateru; and Sasaki, Shosaku, 4,923,944, Cl. 528-15.000.

Sasaki, Takao: *See*—
Kawamura, Hideaki; Sasaki, Takao; and Matsuura, Shuji, 4,924,403, Cl. 364-474.220.

Sasaki, Tsuto: *See*—
Takaoka, Tokuro; Sasaki, Tsuto; Kobayashi, Yukio; Saito, Koichi; and Hamano, Satoshi, 4,923,170, Cl. 251-121.000.

Sasaki, Yoshio, to Pioneer Electronic Corporation. Adjusting apparatus for adjusting sound volume or sound quality. 4,924,192, Cl. 330-279.000.

Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, to Mitsubishi Gas Chemical Company, Inc. Epoxy resin composition. 4,923,912, Cl. 523-466.000

Sasao, Hiroyuki: *See*—
Toya, Hideaki; Sasao, Hiroyuki; and Hayshi, Tatsuya, 4,924,102, Cl. 250-426.000.

Sasao, Isao, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting relative crowding in a hall. 4,924,416, Cl. 364-550.000.

Sasazawa, Koji: *See*—
Yasunaga, Tadashi; Yanai, Akio; and Sasazawa, Koji, 4,923,748, Cl. 428-336.000.

Sato, Akira: *See*—
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.

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Iwabuchi, Shigeru; Sato, Aritsune; and Ueno, Haruo, 4,922,885, Cl. 124-78.000.

Sato, Keiji: *See*—
Tanaka, Hiroshi; and Sato, Keiji, 4,923,433, Cl. 474-11.000.

Sato Kogyo Co., Ltd.: *See*—
Funakawa, Naoyoshi; Iida, Yasuharu; Moriki, Yasumitsu; and Sakurai, Masahiro, 4,923,251, Cl. 299-64.000.

Sato, Kuniaki: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kumaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.

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Sato, Masami; Fujiyama, Masaaki; Iwasaki, Takashi; Suzuki, Masami; Yoneyama, Takashi; and Kosha, Hideaki, to Fuji Photo Film Co., Ltd. Abrasive tape. 4,922,675, Cl. 51-394.000.

Sato, Matsamitsu, to Kabushiki Kaisha Toshiba. Retrieval apparatus using logical operators. 4,924,219, Cl. 340-825.490.

Sato, Takanori, to Shimizu Construction Co., Ltd. Method for effectively restraining response of a structure to outside disturbances and apparatus therefor. 4,922,671, Cl. 52-167.0DF

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Kiefer, Kevin W.; and Satterness, Cynthia J., 4,923,237, Cl. 296-24.100.

Sattler, Heinz: *See*—
Kossatz, Gert; Heine, Wolfgang; Lempfer, Karsten; and Sattler, Heinz, 4,923,664, Cl. 264-256.000.

Sauber, Charles J. Ladder rack. 4,923,103, Cl. 224-42.45R.

Sauer, Donald J.: *See*—
Jastrzebski, Lubomir L.; Johansson, Ronald J.; and Sauer, Donald J., 4,923,826, Cl. 437-57.000.

Sauer, Wolfgang: *See*—
Kiske, Siegfried; Haase, Thorsten; Leyer, Thomas; and Sauer, Wolfgang, 4,922,900, Cl. 128-202.270.

Sauter, Hubert: *See*—
Schulz, Guenter; Buschmann, Ernst; Sauter, Hubert, Zeeh, Bernd; Wuerzer, Bruno; Jung, Johann; and Retzlaff, Guenter, 4,923,503, Cl. 71-92.000.

Savage, Shaun V.; and Harris, Johnny M., to Unisys Corporation. Direct memory access controller with direct memory to memory transfers. 4,924,427, Cl. 364-900.000.

Sawada, Shinichi; Isoyama, Toyoshiro; Matsushita, Tetsuya; and Saito, Hideo, to Chisso Corporation. Liquid crystal composition for twist nematic mode. 4,923,632, Cl. 252-299.610.

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Hayashi, Hideharu; Ozaki, Keiichi; and Sawai, Mamoru, 4,923,411, Cl. 439-540.000.

Sawdon, Floyd. Portable exercise kit. 4,923,192, Cl. 272-70.000.

Sawhney, A. Paul S.; Folk, Craig L.; and Robert, Kearny Q., to United States of America, Agriculture. System for producing yarn 4,922,701, Cl. 57-12.000.

Sawyer, Kenneth W.: *See*—
Meyer, Robert H.; Pamprecn, Ronald C.; and Sawyer, Kenneth W., 4,922,997, Cl. 165-8.000.

Sawyer, Willard H.: *See*—
Hamner, Glen P., deceased; and Sawyer, Willard H., 4,923,841, Cl. 502-230.000.

Saxer, Ulrich A.: *See*—
Buzzi, Carlo A.; Saxer, Ulrich A.; and Stager, Paul A., 4,922,936, Cl. 132-321.000.

Sayer, Matthew E., to Cinpres Limited. Method and apparatus for injection moulding. 4,923,667, Cl. 264-572.000.

Sazaki, Konin; and Maruyama, Kenji, to Ryobi Ltd. Spinning reel having reverse rotation preventing mechanism. 4,923,141, Cl. 242-247.000.

SBP, Inc.: *See—*
Weibel, Michael K.; and Myers, Chester D., 4,923,981, Cl. 536-56.000.
Scaglia SpA: *See—*
Meroni, Roberto; Viol, Fred; Lancerotto, Fabio; and Gerin, Umberto, 4,922,707, Cl. 57-408.000.
Schabmuller, Heinz. Stowing apparatus for the connection cable of a central system for power supply to aircraft. 4,923,135, Cl. 242-54.00R.
Schacht, James, to Horgen, Floyd, a part interest. Set of golf clubs. 4,923,197, Cl. 273-77.00A.
Schade, Otto H., Jr., to Harris Semiconductor Patents, Inc. Transistor base current compensation circuitry. 4,924,113, Cl. 307-296.600.
Schaefer, Philipp, to Schaefer, Philipp; and Microplastic Corp. Leather, in particular split leather provided with a dressing as a process and apparatus for producing dressed leather. 4,923,732, Cl. 428-151.000.
Schaeffer, Stephen W. Tent and method of erection. 4,922,942, Cl. 135-90.000.
Schafer, Karlheinz: *See—*
Ellenberger, Bernd; Jennet, Friedrich; Schafer, Karlheinz; Spickermann, Rainer; and Lass, Gerhard, 4,923,558, Cl. 156-499.000.
Schairer, Werner: *See—*
Heime, Axel; Rosin-Schroder, Gerhard; and Schairer, Werner, 4,924,276, Cl. 357-17.000.
Schal, Wilfried, to Fresenius AG. Apparatus for the treatment of blood in particular for hemodialysis and hemofiltration. 4,923,598, Cl. 210-87.000.
Schank, Richard L., to Xerox Corporation. Photoreceptor overcoated with a polysiloxane. 4,923,775, Cl. 430-59.000.
Schauss, Peter, to DE-STA-CO Metallerzeugnisse GmbH. Clamping device. 4,923,184, Cl. 269-32.000.
Scheel, Hans: *See—*
Fritz, Manfred; and Scheel, Hans, 4,922,779, Cl. 83-503.000.
Scheel, Russell H.: *See—*
Ziegenfus, Barry L.; and Scheel, Russell H., 4,922,831, Cl. 104-166.000.
Scheiwiller, Rolf. Structural assembly for producing interconnecting structures. 4,922,678, Cl. 52-570.000.
Schell, Philip L.: *See—*
Carley, Earl P.; and Schell, Philip L., 4,923,731, Cl. 428-131.000.
Schenck, Robert C., Jr.: *See—*
Bogart, Douglas A.; and Schenck, Robert C., Jr., 4,923,487, Cl. 55-482.000.
Schenck, Stephen R., to Texas Instruments Incorporated. Low noise output circuit. 4,924,120, Cl. 307-542.000.
Schering Aktiengesellschaft: *See—*
Bohlmann, Rolf; Laurent, Henry; Hofmeister, Helmut; and Wiechert, Rudolf, 4,923,640, Cl. 552-625.000.
Voss, Gunter; Kurpjoweit, Martin; and Richter, Wolfgang, 4,923,575, Cl. 204-44.200.
Schlotterbeck, Stephen C.: *See—*
Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., 4,924,405, Cl. 364-468.000.
Schluessler, Hans-Joachim, to Henkel Kommanditgesellschaft auf Aktien. Short-chain alkane sulfonic acids in cleaning preparations and disinfectants. 4,923,523, Cl. 134-25.300.
Schlumberger Industries, Inc.: *See—*
Leydier, Robert A., 4,924,412, Cl. 364-483.000.
Schlumberger Systems & Services, Inc.: *See—*
Crossley, P. Anthony; Nishihara, H. Keith; and Hunt, Neil D., 4,924,506, Cl. 382-28.000.
Schlumberger Technology Corporation: *See—*
Upchurch, James M.; and Patel, Dinesh R., 4,923,010, Cl. 166-297.000.
Schmeidl, Karl, to BASF Aktiengesellschaft. Preparation of liquid formulations of basic azo dyes in carboxylic acid solution and subsequent heating. 4,923,972, Cl. 534-677.000.
Schmeiser, Albert L.: *See—*
Nare, Donald H.; and Schmeiser, Albert L., 4,922,931, Cl. 131-211.000.
Schmid, Johann J.: *See—*
Thie, Werner; and Schmid, Johann J., 4,922,920, Cl. 128-699.000.
Schmidt, Alfred. Slide valve with dosage regulation means. 4,923,167, Cl. 251-25.000.
Schmidt, David A., to Schmidt Industries, Inc. Dock supporting apparatus. 4,923,336, Cl. 405-216.000.
Schmidt, George: *See—*
Lienard, Jean; Haesebrouck, Francis; Katz, Sol; Abolins, Andrew; and Schmidt, George. 4,922,832, Cl. 105-4 200.
Schmidt Industries, Inc.: *See—*
Schmidt, David A., 4,923,336, Cl. 405-216.000.
Schmidt, Matthew F.: *See—*
Fertig, Daniel J.; and Schmidt, Matthew F., 4,923,824, Cl. 437-44.000.
Schmidt, Olaf: *See—*
Heeg, Hubert; Werner, Hans-Peter; Fenner, Manfred; and Schmidt, Olaf, 4,923,816, Cl. 435-284.000.
Schmidt, Robert R.: *See—*
Riebel, Hans-Jochem; Fest, Christa; Muller, Klaus-Helmut; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,923,505, Cl. 71-93.000.
Schmitt, Hermann: *See—*
Elter, Claus; Hornischer, Edgar; Schmitt, Hermann; and Schoening, Josef, 4,923,670, Cl. 376-459.000.
Schmitt, Hubert: *See—*
Braschel, Volker; Schmitt, Hubert; and Roller, Dieter, 4,923,255, Cl. 303-97.000.
Schneider, John L.; and Manchester, Stephen T., to GTE Products Corporation. Non-cycling electrical circuit breaker. 4,924,202, Cl. 337-100.000.
Schneider, Volker: *See—*
Stoll, Wolfgang; Ost, Christian; and Schneider, Volker, 4,923,639, Cl. 252-632.000.
Schodowski, Blair J.: *See—*
Farmer, James O.; Schodowski, Blair J.; Mobley, Joseph G.; Cole, Gregory C.; Tumblin, John E.; Banker, Robert O.; and West, Lamar, 4,924,498, Cl. 380-15.000.
Schoenberg, Edgar A., to Kraft, Inc. Low oil mayonnaise and method of making. 4,923,707, Cl. 426-602.000.
Schoenberger, Hermann: *See—*
Panick, Karl; Widemann, Friedrich; Schoenberger, Hermann; Sperl, Johann; and Sondermeier, Johann, 4,923,033, Cl. 181-211.000.
Schoening, Josef: *See—*
Elter, Claus; Hornischer, Edgar; Schmitt, Hermann; and Schoening, Josef, 4,923,670, Cl. 376-459.000.
Scholl, Hans-Joachim; and Reiff, Helmut, to Bayer Aktiengesellschaft. Monoformylated 3,3'-diaminodipropylamines, a process for their production and their use. 4,923,952, Cl. 528-60.000.
Scholl, Thomas; Perrey, Hermann; and Matner, Martin, to Bayer Aktiengesellschaft. Mixtures of elastomer latices and dispersions of aromatic polycarbonates, polyesters or polyester carbonates and products produced therefrom. 4,923,920, Cl. 524-501.000.
Schoonover, Michael J.; and McFadden, James A. Fluid container. 4,923,098, Cl. 222-456.100.
Schork, Reinhold; Matthes, Reinhard; and Vahlensieck, Hans-Joachim, to Huels Aktiengesellschaft. Method for removing silane compounds from silane-containing exhaust gases. 4,923,687, Cl. 423-210.000.
Schrage, Horst: *See—*
Rohringer, Thomas; and Schrage, Horst, 4,923,318, Cl. 401-225.000.
Schreiber, Wolfgang: *See—*
Fink, Manfred; Schreiber, Wolfgang; Ludwig, Manfred; Hald, Ewald; and Kloss, Guenter, 4,923,047, Cl. 192-150.000.
Schroder, Erhard: *See—*
Kettelhoit, Johannes; Kunne, Hans W.; and Schroder, Erhard, 4,923,556, Cl. 156-498.000.
Schroettle, Wilhelm: *See—*
Bartl, Josef; Schroettle, Wilhelm; and Puttinger, Dietmar, 4,922,799, Cl. 89-1.819.
Schroff Gesellschaft mit beschrankter Haftung: *See—*
Hermanutz, Helmut; Koch, Fred; and Schwenk, Hans M., 4,924,354, Cl. 361-415.000.
Schubart, Rudolf, to Diehl GmbH & Co. Stand device for a mine. 4,922,824, Cl. 102-387.000.
Schueler, Ralf; Muegge, Joachim; Droescher, Michael; Bartz, Wilfried; and Feinauer, Roland, to Huels Aktiengesellschaft. Thermoplastic molding compositions, and a process for the production thereof. 4,923,926, Cl. 525-67.000.
Schulten, Hermann: *See—*
Kuhn, Siegfried; Philipp, Bernhard; and Schulten, Hermann, 4,924,524, Cl. 384-537.000.
Schultz, Paul S.: *See—*
Janicki, Mark A.; and Schultz, Paul S., 4,923,542, Cl. 156-92.000.
Schulz, Guenter; Buschmann, Ernst; Sauter, Hubert; Zeeh, Bernd; Wuerzer, Bruno; Jung, Johann; and Retzlaff, Guenter, to BASF Aktiengesellschaft. Agents for influencing plant growth. 4,923,503, Cl. 71-92.000.
Schulze, Albert: *See—*
Rahnenfuhrer, Eckhard; Schulze, Albert; and Jaskolka, Heinz, 4,922,823, Cl. 102-288.000.
Schumacher, Earl: *See—*
Szymaszek, Paul G.; and Schumacher, Earl, 4,923,173, Cl. 251-333.000.
Schupbach, Reto; and Wassermann, Carl U., to Sibir AG. Absorption refrigerating unit. 4,922,730, Cl. 62-476.000.
Schuss, Jack J.; and Hanfling, Jerome D., to Raytheon Company. Patch radiator element with microstrip balun circuit providing double-tuned impedance matching. 4,924,236, Cl. 343-700.0MS.
Schutte, Andreas: *See—*
Steiner, Karl; Schutte, Andreas; and Flamig, Hans, 4,923,570, Cl. 162-358.000.
Schutze, Herbert: *See—*
Hartnack, Wolfgang; Keesen, Heinz-Werner; and Schutze, Herbert, 4,924,309, Cl. 358-133.000.
Schwartz, James W., to Tektronix, Inc. High brightness panel display device. 4,924,148, Cl. 315-169.400.
Schwartz, Paul A., to Eastman Kodak Company. Photographic stabilizing bath containing hydrolyzed polymaleic anhydride. 4,923,782, Cl. 430-372.000.
Schwarz, Douglas B.: *See—*
Timm, Ed E.; and Schwarz, Douglas B., 4,923,512, Cl. 75-239.000.
Schwarz, Eric M.: *See—*
Vassiliadis, Stamatis; and Schwarz, Eric M., 4,924,423, Cl. 364-738.000.
Vassiliadis, Stamatis; Schwarz, Eric M.; Putrino, Michael; and Feal, Brice J., 4,924,424, Cl. 364-738.000.
Schweinfurth, Hermann, to Jacobs Suchard AG. Device for continuously decaffeinating raw coffee. 4,922,812, Cl. 99-495.000.
Schwenk, Hans M.: *See—*
Hermanutz, Helmut; Koch, Fred; and Schwenk, Hans M., 4,924,354, Cl. 361-415.000.

Schwenn, Rainer: *See—*
Nelles, Bruno; and Schwenn, Rainer, 4,923,293, Cl. 350-503.000.
Scientific Atlanta, Inc.: *See—*
Farmer, James O.; Schodowski, Blair J.; Mobley, Joseph G.; Cole, Gregory C.; Tumblin, John E.; Banker, Robert O.; and West, Lamar, 4,924,498, Cl. 380-15.000.
Scopes, David I. C.; and Bays, David E., to Glaxo Group Limited Morpholine derivatives, pharmaceutical compositions and use. 4,923,863, Cl. 514-235.500.
Scovill Japan Kabushiki Kaisha: *See—*
Hasegawa, Yoshihiko; and Suyama, Noriyoshi, 4,923,099, Cl. 227-114.000.
Scriven, Roger L.: *See—*
O'Dwyer, James B.; Chang, Wen-Hsuan; Scriven, Roger L.; and Cherenko, Joseph, 4,923,757, Cl. 428-425.600.
Scrowston, Richard M.: *See—*
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Coates, David; Jackson, Adam; and Scrowston, Richard M., 4,923,633, Cl. 252-299.650.
Seagate Technology, Inc.: *See—*
Robinson, Don M.; and Davenport, Henry E., 4,924,331, Cl 360-72.100.
Seal, Morton. Vertical cantilevering gate. 4,922,655, Cl. 49-131.000.
Seamons, John K.; and Grundy, Kevin P., to NeXT, Inc. System and method for improving the performance of high-density data storage media. 4,924,327, Cl. 360-48.000.
Seamons, John K.; and Grundy, Kevin P., to NeXT, Inc. System and method for improving the performance of high-density data storage media. 4,924,330, Cl. 360-66.000.
Sebzda, Jack, Sr. Split grip tip for mounting of electrode blanks. 4,924,051, Cl. 219-69.150.
Seckel, Peter H., to Plastic Specialties and Technologies Investments, Inc. Kink impeding hose for spraying water. 4,923,223, Cl. 285-175.000.
SeeColor Corporation: *See—*
Surbrook, Craig L., 4,924,301, Cl. 358-75.000.
Segal, Elizabeth O.; and Segal, William R. Disposable cover for tonometer. 4,922,914, Cl. 128-646.000.
Segal, William R.: *See—*
Segal, Elizabeth O.; and Segal, William R., 4,922,914, Cl. 128-646.000.
Segall, Paul E.; Waitz, Harold D.; and Sternberg, Hal, to Cryomedical Sciences Inc. Blood substitute. 4,923,442, Cl. 604-52.000.
Segawa, Hiroshi: *See—*
Yoshimoto, Masahiko; Segawa, Hiroshi; and Matsumura, Tetsuya, 4,924,314, Cl. 358-160.000.
Segota, Pietro, to W. R. Grace & Co. Vacuum packaging method. 4,922,686, Cl. 53-434.000.
Segredo, Guillermo T.: *See—*
Anderson, David N.; and Segredo, Guillermo T., 4,922,814, Cl. 99-510.000.
Seguchi, Yoshihiro, to Mitsubishi Denki Kabushiki Kaisha. Priority encoding system. 4,924,421, Cl. 364-715.100.
Seibt, Artur; Maly, Heinrich; Fleck, Harald; and Haider, Gottfried, to Voest-Alpine Automotive Gesellschaft MB. II. Fuel injector for internal combustion engines. 4,922,880, Cl. 123-509.000.
Seidel, Dietrich; Wieland, Heinrich; Rosskopf, Gerhard; and Rath, Dieter, to B. Braun-SSC AG. Process for the selective extracorporeal precipitation of low-density lipoproteins from whole serum or plasma. 4,923,439, Cl. 604-6.000.
Seidel, Sigurd, to Raichle Sportschuh AG. Ski boot. 4,922,634, Cl. 36-119.000.
Seiki Giken Kogyo Kabushiki Kaisha: *See—*
Takaoka, Tokuro; Sasaki, Tsuto; Kobayashi, Yukio; Saito, Koichi; and Hamano, Satoshi, 4,923,170, Cl. 251-121.000.
Seiko Epson Corporation: *See—*
Namose, Isamu, 4,923,821, Cl. 437-38.000.
Seiko Instruments Inc.: *See—*
Shimbo, Masafumi, 4,924,279, Cl. 357-23.700.
Seikosha Co., Ltd: *See—*
Hirose, Kouji; Ito, Hitoshi; and Yoshida, Kazuhito, 4,923,764, Cl. 428-632.000.
Seilaz, Leon: *See—*
Kohl, Albert; and Seilaz, Leon, 4,922,572, Cl. 15-320.000.
Seiler, Daniel: *See—*
Rutz, Guido; and Seiler, Daniel, 4,923,123, Cl. 239-691.000.
Seiwa, Yoshito: *See—*
Yagi, Shigenori; Myoi, Yasuhito; Kuzumoto, Masaki; Kuba, Kazuki; Seiwa, Yoshito; Aoyagi, Toshitaka; and Mihashi, Yutaka, 4,924,474, Cl. 372-75.000.
Sekiguchi, Hiroyuki: *See—*
Nakagoshi, Akira; Tahara, Hiroshi; Yamada, Tetuo; Sekiguchi, Hiroyuki; and Murata, Hidemi, 4,923,692, Cl. 423-447.400.
Sekiguchi, Yoshichika; and Kodama, Hideaki, to Daiichi Denshi Kogyo Kabushiki Kaisha; and Iwatsu Electrical Co., Ltd. Distributing connector. 4,923,310, Cl. 439-701.000.
Sekine, Noboru: *See—*
Yamabe, Hitoshi; Sekine, Noboru; Takagi, Shuichi; and Fujimoto, Sachito, 4,923,042, Cl. 192-0.096.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Yamaji, Katsuhiko; Ishida, Masahiko; and Tsukamoto, Masahiro, 4,923,547, Cl. 156-181.000.
Sekiya, Naobumi: *See—*
Fujita, Shigeyoshi; Sekiya, Naobumi; Okamura, Takashi; and Watanabe, Yoshitaka, 4 922,830, Cl. 104-290.000.
Sekoguchi, Kotohiko; Noguchi, Keiichi; Muramoto, Mutsushi; and Ohata, Takayuki, to Miyawaki Incorporated. Mixing valve apparatus. 4,923,115, Cl. 236-12.110.
Selin, Johan-Fredrik: *See—*
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,923,979, Cl. 536-32.000.
Semiconductor Energy Laboratory Co., Ltd.: *See—*
Sato, Masahiko; Mase, Akira; Sakayori, Hiroyuki; and Yamazaki, Shunpei, 4,924,243, Cl. 350-320.000.
Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,972, Cl. 141-4.000.
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Senn, Patrice; and Tawfik, Mohamed S., to L'Etat Francais, represente par la Ministre Delegue des Postes et Telecommunications, (Centre National d'Etudes des Telecommunications). Two-port switched capacitor filter netowrk with linearized phase/frequency response. 4,924,189, Cl. 328-167.000.
Senoh Kabushiki Kaisha: *See—*
Ishii, Kazuo; Yamashita, Satoshi; and Ishige, Hiroyuki, 4,922,673, Cl. 52-221.000.
Seong-Do Moon: *See—*
Ahn, Soon-Suk, 4,922,766, Cl. 74-385.000.
Seppanen, Hanneli; and Krause, Outi, to Neste OY. Method of polmerizing olefines. 4,923,937, Cl. 526-124.000.
Septfons, Rene , to Societe Anonyme dite: Alcatel CIT. Method and device for cooling an integrated circuit package. 4,924,352, Cl. 361-388.000.
Serby, Victor M. Timer control for telephone. 4,924,499, Cl. 379-200.000.
Sergel, Horst; Aschemann, Dieter; Gerloff, Klaus; Kay, Alexander; and Wedemeyer, Lutz, to Continental Aktiengesellschaft. Method and apparatus for checking the concentricity or correct contour of a pneumatic vehicle tire. 4,922,751, Cl. 73-146.000.
Sermed Incorporated: *See—*
Niemi, Bill H., 4,924,343, Cl. 361-98.000.
Seymour, Mark D.; LiCause, Michael F.; and Daugherty, Thomas H., to Procter & Gamble Company, The. Microfiber-containing absorbent structures and absorbent articles. 4,923,454, Cl. 604-368.000.
Seymour, Shaun A.: *See—*
Linde, Gilbert W.; Seymour, Shaun A.; and Webster, Emmett G., 4,922,692, Cl. 56 1.000.
SGS-Thomson Microelectronics S.A.: *See—*
Fruhauf, Serge; and Mattera, Eric, 4,924,212, Cl 340-598.000.
SGS-Thomson Microelectronics SpA: *See—*
Cini, Carlo; and Sisti, Luigi, 4,924,296, Cl. 357-72.000.
Shaak, Ray N.: *See—*
Redmond, John P.; and Shaak, Ray N., 4,923,404, Cl. 439-71.000.
Shaf, Dinesh T.: *See—*
Ainsworth, James; Hardie, William G.; Kozlowski, Edward L., Jr.; and Shaf, Dinesh T., 4,924,037, Cl. 174-117.00F.
Shaffer, John W., to GTE Products Corporation. Incandescent lamps including a combined getter. 4,923,424, Cl. 445-55.000.
Shani, Yosi: *See—*
Henry, Charles H.; Kazarinov, Rudolf F.; Kistler, Rodney C.; Orlowsky, Kenneth J.; Shani, Yosi; and Sudbo, Aasmund S., 4,923,271, Cl. 350-96.190.
Shannon, Robert D.: *See—*
Novak, Philip F.; Shannon, Robert D.; Pinckney, Robert L.; and Humphreys, James R., Jr., 4,924,228, Cl. 342-2.000.
Sharp, Charles A., III: *See—*
Robertson, William M.; Sharp, Charles A., III; and Burke, Edward J., 4,922,721, Cl. 62-3.610.
Sharp Kabushiki Kaisha: *See—*
Fuji, Hiroshi; Maeda, Shigemi; Sakamoto, Noriaki; Terashima, Shigeo; Yamaguchi, Takeshi; Tsuji, Kentaro; and Kojima, Kunio, 4,924,447, Cl. 369-13.000.
Miyazawa, Yuzo; and Nakamura, Koichi, 4,924,167, Cl. 318-696.000.
Shaw, Peru: *See—*
Anderson, Floyd E.; Robb, Stephen P.; and Shaw, Pern, 4,924,112, Cl. 307-270.000.
Shawki, Shamel M.; and Van Oss, Richard N., to Nalco Chemical Company. Method of pacifying stickies in paper. 4,923,566, Cl. 162-135.000.
Sheahan, James P., to J. P. Sheahan Assoicates, Inc. Method of securing multiple layered roof structures. 4,924,174, Cl. 324-696.000.
Sheasby, Peter G.: *See—*
Puddle, Mark W.; Davies, Nigel C.; Marwick, William F.; and Sheasby, Peter G., 4,924,057, Cl. 219-118.000.
Shell Agrar GMBH & Co., KG: *See—*
Albert, Guido; and Curtze, Jurgen, 4,923,866, Cl. 514-237.500
Shemes, David: *See—*
Morgulis, Alexander; Tilman, Menahem; and Shemes, David, 4,923,238, Cl. 296-97.600.
Shemitz, Sylvan R.; and Melling, James A., to Sylvan R. Shemitz Associates, Inc. Universal modular lighting system. 4,924,366, Cl. 362-249.000.
Shen, Hsin-Der. Separator of vaporizing oil and smoke. 4,922,691, Cl. 55-400.000.
Sherbondy, Donald C. Fishing line spool holder. 4,922,644, Cl. 43-25.000.
Sherif, Fawzy G., to Akzo America Inc. Process for forming metal oxide superconductors from a precursar material of the general formula $YBa_2Cu_3(OH)_3(Ox)_2O_3H_2O$ (where Ox is an oxalate). 4,923,849, Cl. 505-1.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Sherman, Leslie H. Method and apparatus for testing electronic devices. 4,924,179, Cl. 324-158.00F.
Sherman, Rudolf W.; and Stainer, Philip J., to Imperial Chemical Industries PLC. Fabric softener composition: concentrate of quaternary ammonium compound and an oil. 4,923,622, Cl. 252-8.600.
Sherwood Medical Company: *See*—
McCormick, Michael A., 4,923,451, Cl. 604-321.000.
Sherwood, Richard C.: *See*—
Jin, Sungho; Lambert, William R.; Moore, Robert C.; Mottine, John J., Jr.; Sherwood, Richard C.; and Tiefel, Thomas H., 4,923,739, Cl. 428-221.000.
Shibahara, Yoshihiko, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,923,793, Cl. 430-567.000.
Shibata, Hisanari: *See*—
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000.
Shibata, Tatsuo: *See*—
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 358-105.000.
Shibukawa, Takeo, to Yamaha Corporation. Electronic musical instrument having external memory devices. 4,922,794, Cl. 84-601.000.
Shifflet, Glenn; Johnson, Herbert C., and Revenaugh, Paul W., to Dana Corporation. Current regulator for a battery re-charging circuit. 4,924,169, Cl. 320-21.000.
Shigematsu, Kazuyoshi; Shirouzu, Shigenori; Sakamoto, Shuji; and Suzuki, Toshiyasu, to Idemitsu Kosan Co., Ltd. Optical disk substrate comprising aromatic polycarbonate. 4,923,962, Cl. 528-196.000.
Shigeoka, Masafumi: *See*—
Yamashita, Hiroshi; Fujii, Kanenaga; Fukunishi, Takumi; Shigeoka, Masafumi; and Sudo, Hiroshi, 4,924,357, Cl. 362-32.000.
Shigeta, Masao; Choh, Tsutomu; Shimizu, Hiroyoshi; Hirai, Ippo; Mimura, Shohei; Makimura, Atsushi; and Hosaka, Hiroshi, to TDK Corporation; and Tokyo Magnetic Printing Company, Ltd. Magnetic shield-forming magnetically soft powder, composition thereof, and process of making. 4,923,533, Cl. 148-304.000.
Shih, Jenn S.; and Smith, Terry E., to GAF Chemicals Corporation. Hydrolysis resistant vinyl lactam amino acrylamide polymers. 4,923,694, Cl. 424-70.000.
Shimbo, Masafumi, to Seiko Instruments Inc. Thin film transistor 4,924,279, Cl. 357-23.700.
Shimizu Construction Co., Ltd.: *See*—
Sato, Takanori, 4,922,671, Cl. 52-167.0DF.
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime, Okuyama, Toshiharu; and Wakatsuki, Yoshio, to Man Design Co., Ltd. Data-transmitting apparatus. 4,924,482, Cl. 375-65.000.
Shimizu, Hiroyoshi: *See*—
Shigeta, Masao; Choh, Tsutomu; Shimizu, Hiroyoshi; Hirai, Ippo; Mimura, Shohei, Makimura, Atsushi; and Hosaka, Hiroshi, 4,923,533, Cl. 148-304.000.
Shimizu, Kenichi, to Polaroid Corporation. Exposure system of image forming apparatus. 4,924,260, Cl. 355-69.000
Shimizu, Misao: *See*—
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,924,482, Cl. 375-65.000.
Shimizu, Toshimitsu, to NEC Corporation. Concentrator system with polling-response means for detecting failures to stop tariff charges on locally established intraoffice calls. 4,924,457, Cl. 370-56.000.
Shimoyama, Hiroshi; and Kawasaki, Katsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha Floor device for vehicles 4,923,026, Cl 180-215.000.
Shimura, Ryoji: *See*—
Takahashi, Jun; and Shimura, Ryoji, 4,923,246, Cl. 296-221.000.
Shin, Dong J.: *See*—
Lee, In W., and Shin, Dong J., 4,924,472, Cl. 372-29.000.
Shin-Etsu Chemical Co., Ltd. *See*—
Yamamoto, Akira, Saguchi, Ryuichi; and Nagura, Shigehiro, 4,923,119, Cl. 239-55.000.
Shinano Pneumatic Industries Inc.: *See*—
Nakahigasi, Isamu; and Suzuki, Yoshio, 4,924,055, Cl. 219-86.210.
Shindo, Takeshi, to NDC Company, Ltd. Bearing material having multiple layer therein and a method of manufacturing the same. 4,923,761, Cl. 428-550.000
Shinkai, Ichiro: *See*—
Lynch, Joseph E., Laswell, William L.; Volante, Ralph P., and Shinkai, Ichiro, 4,923,982, Cl. 540-200.000.
Shinoda, Hirotaka: *See*—
Inaba, Makoto; Shinoda, Hirotaka; and Iinuma, Fujio, 4,923,871, Cl. 514-255.000.
Shinoda, Shosuke: *See*—
Tamura, Takumi; Shinoda, Shosuke, Yamashita, Tetsuo; and Okashita, Kyohiko, 4,923,352, Cl. 414-225.000.
Shingle, Ronald D.; and Ausman, Thomas G., to Caterpillar Inc. Method and apparatus for controlling a solenoid operated fuel injector. 4,922,878, Cl. 123-490.000.
Shinomiya, Tomohiro: *See*—
Amemiya, Shigeo; Komine, Hiroaki; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, 4,924,461, Cl. 370-95.200.
Shinozuka, Akira: *See*—
Kitagawa, Katugi; and Shinozuka, Akira, 4,923,910, Cl. 523-428.000.
Shinzaki, Takashi: *See*—
Kato, Masayuji; Igaki, Seigo; Yamagishi, Fumio; Ikeda, Hiroyuki; Shinzaki, Takashi; and Eguchi, Shin, 4,924,085, Cl. 250-227.280.
Shiohama, Eiji: *See*—
Imamura, Hiroshi; Toho, Makoto; Shiohama, Eiji; Mori, Shoiti; and Hiramatsu, Koji, 4,924,143, Cl. 313-493.000.
Shiokawa, Youichi; Takimoto, Koichi; and Takenaka, Kohei, to Fujisawa Pharmaceutical Co., Ltd. Nitric ester derivative. 4,923,886, Cl. 514-365.000.
Shionogi & Co., Ltd.: *See*—
Matsumura, Hiromu; Hashizume, Hiroshi; Matsushita, Akira; and Eigyo, Masami, 4,923,984, Cl. 540-496.000.
Saitoh, Izumi; Kido, Shigeru; Doi, Yoshio; and Egawa, Shohei, 4,923,893, Cl. 514-458.000.
Shiota, Kazuo; and Sakamoto, Kiichiro, to Fuji Photo Film Co., Ltd. CRT color video printer which eliminates magnification changes due to chromatic aberrations. 4,924,302, Cl. 358-75.000.
Shiraki, Keita: *See*—
Matsumoto, Nobuo; Shiraki, Keita; and Funahashi, Yoshiki, 4,923,178, Cl. 267-140.100.
Shirokane, Makoto: *See*—
Iyogi, Kiyoshi; Nakahashi, Masako; Takeda, Hiromitsu, and Shirokane, Makoto, 4,924,033, Cl. 174-259.000.
Shirouzu, Shigenori: *See*—
Shigematsu, Kazuyoshi; Shirouzu, Shigenori; Sakamoto, Shuji; and Suzuki, Toshiyasu, 4,923,962, Cl. 528-196.000.
Shishido, Tadao: *See*—
Sasaki, Hirotomo; Shishido, Tadao; and Mifune, Hiroyuki, 4,923,794, Cl. 430-603.000.
Shivak, Tod A.: *See*—
Siegrist, Ronald R.; and Shivak, Tod A., 4,923,214, Cl. 280-806.000.
Shizukuishi, Makoto: *See*—
Kobayashi, Kiyotaka; Shizukuishi, Makoto; and Tabei, Masatoshi, 4,924,316, Cl. 358-213.260.
Shlichta, Paul J., to United States of America, National Aeronautics and Space Administration Ballast system: for maintaining constant pressure in a glove box. 4,922,807, Cl. 98-1.500.
Shoemaker, Gerald L.: *See*—
Heilweil, Israel J., and Shoemaker, Gerald L., 4,923,617, Cl. 210-698.000.
Shoji, Tatsuo: *See*—
Naka, Hiromasa; Nakamura, Norio; Okushima, Takehiko; Okumura, Takao; and Shoji, Tatsuo, 4,922,670, Cl. 52-126.600.
Shouda, Masahiro, to NEC Corporation. Debugging microprocessor capable of switching between emulation and monitor without accessing stack area 4,924,382, Cl. 364-200.000.
Shuler, Donald K., to Concept, Inc. Surgical cutting instrument with titanium nitride coating on an inner tubular member. 4,923,441, Cl. 604-22.000
Shung, Kevin, to Copam Electronics Corp. Fax machine equipped for simultaneous transmission and reception via two telephone lines. 4,924,494, Cl. 379-100.000.
Shuttleworth, Leslie; Merkel, Paul B.; and Brown, Glenn M., to Eastman Kodak Company. Filter dyes for photographic elements. 4,923,788, Cl. 430-507.000.
Shyu, June Y. Multi-purpose apparatus for distributing wires. 4,924,036, Cl. 174-97.000.
Sibir AG: *See*—
Schupbach, Reto; and Wassermann, Carl U., 4,922,730, Cl. 62-476.000.
Siccardi, Alberto. Automatic device for obtaining frothy milk. 4,922,810, Cl. 99-323.100.
Sidot, Christian: *See*—
Chevalier, Pierre; and Sidot, Christian, 4,923,921, Cl. 524-555.000
Siecor Corporation. *See*—
Dean, David L., 4,923,274, Cl. 350-96.210.
King, John A.; and Staber, Harley J., 4,924,407, Cl. 364-480.000.
Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,923,898, Cl. 514-557.000.
Siegemund, Gunter: *See*—
Fuss, Andreas; and Siegemund, Gunter, 4,924,014, Cl. 568-323.000.
Siegmund, Arthur J.; and Ladouceur, Henry E., to Siegmund, Inc. Apparatus for single side spray processing of printed circuit boards. 4,922,938, Cl. 134-126.000.
Siegmund, Inc.: *See*—
Siegmund, Arthur J.; and Ladouceur, Henry E., 4,922,938, Cl. 134-126.000.
Siegrist, Ronald R.; and Shivak, Tod A., to Hoover Universal, Inc. Seat belt anchorage. 4,923,214, Cl. 280-806.000.
Siemens Aktiengesellschaft: *See*—
Diepers, Heinrich; and Stephani, Dietrich, 4,924,334, Cl. 360-77.070.
Ermert, Helmut; Pfeiler, Manfred; and Barth, Karl, 4,922,916, Cl. 128-653.00R.
Hirschberg, Jakub; Botvidsson, Lars; and Fahlstroem, Ulf, 4,922,926, Cl. 128-785.000.
Kuecher, Peter, 4,924,295, Cl. 357-71.000.
Lischke, Burkhard; and Winkler, Dieter, 4,924,136, Cl. 313-336.000.
Magori, Valentin, 4,922,750, Cl. 73-118.200.
Mattausch, Hans J., 4,924,443, Cl. 365-203.000.
Moberg, Lennart; and Hedin, Asa, 4,922,907, Cl. 128-419.00P.
Ruhle, Wolfgang, 4,924,114, Cl. 307-310.000.
Siepmann, Richard, 4,924,197, Cl. 335-128.000.
Toelle, Hans-Juergen, 4,924,370, Cl. 363-57.000.
Varadi, Werner J., 4,924,369, Cl. 363-21.000.
von Brandt, Achim, 4,924,310, Cl. 358-136.000.

Siemens-Bendix Automotive Electronics L.P.: *See*—
Grieb, John H.; Joseph, J. Michael; Weaver, Richard D.; and Bata, George T., 4,923,169, Cl. 251-118.000.
Siemens Transmission Systems, Inc.: *See*—
Burns, Robert V.; and Gupta, Sanjay, 4,924,511, Cl. 379-418.000.
Siemon Company, The: *See*—
Siemon, John A.; and Reynolds, Howard, 4,924,345, Cl. 361-111.000.
Siemon, John A.; and Reynolds, Howard, to Siemon Company, The. Combined transient voltage and sneak current protector. 4,924,345, Cl. 361-111.000.
Siepmann, Richard, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,924,197, Cl. 335-128.000.
Silhouette Technology, Inc.: *See*—
Dwyer, Eugene J., III, 4,924,254, Cl. 355-20.000.
Silk Engineering (Derby) Limited: *See*—
Silk, George R., 4,922,772, Cl. 82-128.000.
Silk, George R., 4,923,343, Cl. 409-179.000.
Silk, George R., to Silk Engineering (Derby) Limited. Machine tools. 4,922,772, Cl. 82-128.000.
Silk, George R., to Silk Engineering (Derby) Limited. Machine tool. 4,923,343, Cl. 409-179.000.
Silva, Egberto, Filho, to Mamore Mineracao E Metalurgia S/A. Process for opening ores. 4,923,507, Cl. 423-68.000.
Silverberg, Morton: *See*—
Dolan, Donald T.; Durst, Robert T., Jr.; Hubbard, David W.; and Silverberg, Morton, 4,923,023, Cl. 177-25.150.
Silvestri, Victor J.: *See*—
Beyer, Klaus D.; and Silvestri, Victor J., 4,924,284, Cl. 357-49.000.
Sima Products Corporation: *See*—
Breslau, Steven M., 4,923,060, Cl. 206-316.200.
Simcoe, Robert J.: *See*—
Thomas, Robert E.; Cooper, Jeffrey L.; and Simcoe, Robert J., 4,924,463, Cl. 370-105.400.
Simion, F. Anthony; Warscjewski, Dirk; and Zyzyck, Leonard A., to Colgate-Palmolive Company. Liquid detergent composition containing alkylbenzene sulfonate, alkyl ethanol ether sulfate, alkanolamide foam booster and magnesium and triethanolammonium ions. 4,923,635, Cl. 252-545.000.
Simmons, Jerry S.: *See*—
Brooks, Johnny L.; Roberts, Donald L.; and Simmons, Jerry S., 4,922,901, Cl. 128-203.260.
Simon, Gilbert I.; and Witkin, Roy T., to Witkin, Roy T.; and Simon, Gilbert I. Chemical sterilization. 4,923,677, Cl. 422-37.000.
Simon, Helmut; and Guenther, Helmut, to BASF Aktiengesellschaft. Carrying out enzymatic oxidations. 4,923,811, Cl. 435-136.000.
Simon, Manfred: *See*—
Hover, Alexander; Simon, Manfred; and Weiss, Richard, 4,923,658, Cl. 264-76.000.
Simons, Michael J., to Eastman Kodak Company. Method of making a color filter array using light flash. 4,923,860, Cl. 503-227.000.
Simpson, Harold, to Ashland Products Company. Self-contained security lock for double-hung window. 4,923,230, Cl. 292-67.000.
Sims, Peter S.; and Carter, Peter, to Lever Brothers Company. Perfume and bleach compositions. 4,923,631, Cl. 252-186.420.
Sinco, Inc.: *See*—
Cole, Barry A., 4,923,048, Cl. 182-9.000.
Sindorf, John F.: *See*—
Jones, Kenneth R.; and Sindorf, John F., 4,923,769, Cl. 429-101.000.
Sing, Marc L. C.: *See*—
Stephan, Ronan; Doisy, Martine; Montfort, Yves; Robbes, Didier; Sing, Marc L. C.; Bloyet, Daniel; Provost, Jackie; and Raveau, Bernard, 4,923,850, Cl. 505-1.000.
Singer, Stephen P.: *See*—
Harder, John W.; and Singer, Stephen P., 4,923,784, Cl. 430-430.000.
Singleton, John S. Universal sundial. 4,922,619, Cl. 33-270.000.
Sintermetallwerk Krebsoge GmbH: *See*—
Weber, Manfred, 4,923,674, Cl. 419-27.000.
SIP-Societa Italiana Per L'Esercizio Telecommunicazione P.A.: *See*—
Braglia, Marco, 4,923,496, Cl. 65-30.130.
Sircar, Jagadish C.: *See*—
Kostlan, Catherine R.; and Sircar, Jagadish C., 4,923,872, Cl. 514-258.000.
Sireul, Jacques; Herve, Jacob; and Rene, Gauthier, to General Electric CGR SA. Device to monitor a patient in an apparatus for medical examination. 4,923,295, Cl. 350-639.000.
Sirti S.p.A.: *See*—
Braglia, Marco, 4,923,496, Cl. 65-30.130.
Sisti, Luigi: *See*—
Cini, Carlo; and Sisti, Luigi, 4,924,296, Cl. 357-72.000.
Sitzler, Fred C., to Du Pont de Nemours, E. I., and Company. Compliant section for circuit board contact elements. 4,923,414, Cl. 439-751.000.
Sizemore, Norman; and Gerritsen, Rudolf, to GSA Systems. Method and apparatus for preventing recognition of a telephone dialing signal. 4,924,512, Cl. 380-6.000.
Sjolund, Erik: *See*—
Wikstrom, Rolf; and Sjolund, Erik, 4,924,066, Cl. 219-142.000.
SKF Nova AB: *See*—
Adolfsson, Rune, 4,923,361, Cl. 414-541.000.
Skibinski, Bernard J. Device to aid persons rising from a seated position. 4,922,560, Cl. 5-81.00R.
Skiles, Bruce L.: *See*—
Page, Mary J.; Hamilton, Benton W.; Skiles, Bruce L.; and Reinhart, Robert V., Jr., 4,923,446, Cl. 604-198.000.
Skipper, Uvon. Drill stem mud wiping apparatus. 4,923,011, Cl. 166-311.000.
Skis Rossignol S.A.: *See*—
Zanco, Alain L., 4,922,635, Cl. 36-120.000.
Skoog, Mark A.: *See*—
Bice, Gregory W.; Skoog, Mark A.; and Howard, John D., 4,924,401, Cl. 364-433.000.
Sky Aluminum Co., Ltd.: *See*—
Nagai, Kiyonori, 4,922,778, Cl. 83-501.000.
Slavik, Walter; and Wuermli, Arthur, to Rieter Machine Works, Ltd. Method and apparatus for introducing a roving into a textile machine drafting frame. 4,922,704, Cl. 57-261.000.
Slavova, Emiliya D.: *See*—
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.
Slimak, Karen M. Processes for products from cassava. 4,923,709, Cl. 426-640.000.
Sliskovic, Drago R.: *See*—
Picard, Joseph A.; and Sliskovic, Drago R., 4,923,861, Cl. 514-227.800.
Slivon, George R.: *See*—
Heiligenthal, Charles H.; Slivon, George R.; and Parise, Jack A., 4,922,574, Cl. 16-35.00R.
SLR Inc.: *See*—
Weibel, Michael K.; and Myers, Chester D., 4,923,981, Cl. 536-56.000.
Smaroglay, Peter: *See*—
Tatai, Ilona; Penzias, Tibor; Palotas, Laszlo; Lantos, Elemer; Smaroglay, Peter; and Deak, Laszlo B., 4,923,647, Cl. 264-27.000.
Smith, Barbara F.; Jarvinen, Gordon D.; and Ryan, Robert R., to United States of America, Energy. Extractant composition. 4,923,630, Cl. 252-184.000.
Smith, Benjamin A.; and Hoback, Conaway K., to Digital Telecommunications Systems, Inc. Pay station telephone interface circuits. 4,924,497, Cl. 379-150.000.
Smith Corona Corporation: *See*—
Blanchard, Raymond A., Jr.; and Roberts, Richard E., 4,923,314, Cl. 400-63.000.
Smith, Fred G.: *See*—
Maxwell, Ronald K.; Zorzi, Karl J.; Yoshikawa, Harunori; Prasad, Venkat S.; Smith, Fred G.; and Hsieh, Ming-Chih, 4,924,456, Cl. 370-32.000.
Smith, Jerry D.: *See*—
Hartmann, Michael P.; and Smith, Jerry D., 4,923,006, Cl. 166-65.100.
Smith, Kurt A.: *See*—
Kirch, Steven J.; Lankard, John R.; Ritsko, John J.; Smith, Kurt A.; Speidell, James L.; and Yeh, James T., 4,923,772, Cl. 430-5.000.
Smith, Peter J., to Fomico International, Inc. Foldable concrete retaining wall structure. 4,923,339, Cl. 405-284.000.
Smith, Richard H., Jr.: *See*—
Michejda, Christopher J.; and Smith, Richard H., Jr., 4,923,970, Cl. 534-550.000.
Smith, Ronald M.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Smith, Stephen D. Radon and other gas ventilator. 4,922,808, Cl. 98-42.060.
Smith, Terry E.: *See*—
Shih, Jenn S.; and Smith, Terry E., 4,923,694, Cl. 424-70.000.
Smithkey, John C.: *See*—
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., 4,922,985, Cl. 152-543.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Fritz, Manfred; and Scheel, Hans, 4,922,779, Cl. 83-503.000.
Snap-on Tools Corporation: *See*—
Heiligenthal, Charles H.; Slivon, George R.; and Parise, Jack A., 4,922,574, Cl. 16-35.00R.
Snedeker, Richard S., to Titan Corporation. Protective armor and method of assembly. 4,923,728, Cl. 428-52.000.
Snelgrove, R. Vernon: *See*—
McCullough, Francis P., Jr.; Brewster, Steven L.; and Snelgrove, R. Vernon, 4,923,747, Cl. 428-312.600.
Snell, David: *See*—
Beckley, Philip; and Snell, David, 4,924,052, Cl. 219-75.000.
Snellman, Yrjo; and Rantala, Mauri, to Oy Tampella Ab. Press section frame in a paper machine. 4,922,990, Cl. 162-273.000.
Snyder, Douglas D.: *See*—
Koch, Russell W.; and Snyder, Douglas D., 4,923,543, Cl. 156-97.000.
Snyder, James M. Utility belt. 4,923,105, Cl. 224-255.000.
Snyder, Thomas S.; Stoltz, Richard A.; and Zuckerbrod, David, to Westinghouse Electric Corp. Electrochemical process for zirconium alloy recycling. 4,923,579, Cl. 204-140.000.
So, Tetsu: *See*—
Hiza, Misao; Yamazaki, Hajime; Sugihara, Kazuhiro; and So, Tetsu, 4,923,736, Cl. 428-212.000.
Soar, Steven E.: *See*—
Rice, Delbert L.; and Soar, Steven E., 4,923,407, Cl. 439-92.000.

Societa' Cavi Pierelli S.p.A.: *See—*
Braglia, Marco, 4,923,496, Cl. 65-30.130.

Societe Anonyme: *See—*
Pannier, Daniel, 4,924,364, Cl. 362-153.100.

Societe Anonyme dite: Alcatel CIT: *See—*
Septfons, Rene , 4,924,352, Cl. 361-388.000.

Societe Anonyme Dite Hispano-Suiza: *See—*
Barbarin, Jacques M. G ; and Lecoutre, Pascal B. G., 4,922,713, Cl. 60-226.200.

Societe d'Applications Generales d'Electricite et de Mecanique Sagem: *See—*
Jaquard, Paul; Lelay, Jean-Pierre; and Doreau, Jean, 4,922,801, Cl. 89-41.050.

Societe de Conseils de Reserches et d'Applications Scientifiques: *See—*
Braquet, Pierre; Dive, Georges; Godfroid, Jean-Jacques; Heymans, Francoise; and Pirotzky, Eduardo, 4,923,870, Cl. 514-255.000.

Societe Francaise Hoechst: *See—*
Chevalier, Pierre; and Sidot, Christian, 4,923,921, Cl. 524-555.000.

Societe Nationale Industrielle et Aerospatiale: *See—*
Aubry, Jacques A.; and Guillem, Andre , 4,924,043, Cl. 200-52.00R.

Sodano, Jeanette L.: *See—*
Ibrahim, Nader; and Sodano, Jeanette L., 4,923,684, Cl 424-52.000.

Soeda, Naohiko: *See—*
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.

Soejima, Tetsuo: *See—*
Amemiya, Shigeo; Konine, Hiroaki; Shinomiya, Tomohiro; Iguchi, Kazuo; and Soejima, Tetsuo, 4,924,461, Cl. 370-95.200.

Sojka, Marvin L., to Norand Corporation. Multiterminal communication system and method. 4,924,462, Cl. 370-95.200.

Solia, Franco, to AKZO S.r.l. Sailing-boat hull. 4,922,844, Cl. 114-39.100.

Solnuts B. V.: *See—*
van der Marel, Frans, 4,923,710, Cl. 426-634.000.

Solvay & Cie (Societe Anonyme): *See—*
Callens, Roland; and Collin, Andre , 4,923,966, Cl. 530-338.000.

Solve, Gerard: *See—*
Aubry, Julien; Durand, Richard J.; Kerdraon, Alain L.; and Solve, Gerard, 4,922,825, Cl 102-476.000.

Somar Corporation: *See—*
Kitagawa, Katugi; and Shinozuka, Akira, 4,923,910, Cl. 523-428.000.
Maruyama, Hiroshi; and Horii, Yoshiharu, 4,923,726, Cl. 428-40.000.
Maruyama, Hiroshi; Kiryu, Naohiko; and Minezaki, Etsuko, 4,923,727, Cl. 428-40.000.

Sonatech, Inc.: *See—*
Cyr, Reginald J., 4,924,446, Cl. 367-6.000.

Sondermeier, Johann: *See—*
Panick, Karl; Widemann, Friedrich; Schoenberger, Hermann; Sperl, Johann; and Sondermeier, Johann, 4,923,033, Cl. 181-211.000.

Sonoco Products Company: *See—*
Gelbard, Edward, 4,923,436, Cl. 493-194.000.

Sony Corporation: *See—*
Fujiie, Kazuhiko; Nonaka, Chiaki; and Yoshida, Tadao, 4,924,455, Cl. 369-44.210.

Sorokin, Gennady A.: *See—*
Svidunovich, Nikolai A ; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; and Verbitsky, Alexandr N., 4,923,675, Cl. 420-129.000.

Sorrento Engineer, Inc.: *See—*
Hill, Frank U., 4,923,534, Cl. 156-78.000.

Sorrento Engineering, Inc.: *See—*
Hill, Francis U., 4,923,651, Cl. 264-45.100.
Hill, Francis U., 4,923,907, Cl. 523-218.000.

South African Inventions Development Corp.: *See—*
Ferreira, Nicolaas P., 4,923,403, Cl. 435-125.000.

Southern Water Treatment Co., Inc.: *See—*
Bowers, Gregory S., 4,923,599, Cl. 210-96.100.

Soutome, Fumio: *See—*
Matsuura, Ichiro; Ishimaru, Kiichiro; Mizuno, Hisayoshi; Omata, Youichi; and Soutome, Fumio, 4,923,653, Cl. 264-46.600.

Souza, Therese R.: *See—*
Kroll, Harry; Butler, Florence; and Souza, Therese R., 4,923,576, Cl. 204-44.400.

Sowers, David A., to BSD Enterprises, Inc. Method and device for cleaning a spray gun assembly. 4,923,522, Cl. 134-22.100.

Spalink, Jan-Dieter: *See—*
Angell, Eric H.; Aprille, Thomas J.; Fang, Rong-Chin; Lee, Byeong G.; and Spalink, Jan-Dieter, 4,924,459, Cl. 370-84.000.

Sparfel, Jean-Claude. Draining method and a machine for implementing same. 4,923,329, Cl. 405-36.000.

Specialty Pet Products, Inc.: *See—*
Durell, Joseph M.; and Leathers, Don W., 4,922,859, Cl. 119-83.000.

Spectra Physics: *See—*
Middleton, Christohper O.; and Robson, Colin L., 4,924,374, Cl. 364-167.010.
Neir, Kenneth E., 4,923,188, Cl. 270-39.000.

Spectra-Physics, Inc.: *See—*
Wall, David L., 4,922,747, Cl. 73-61.10R.

Spectrospin AG: *See—*
Caravatti, Pablo, 4,924,089, Cl. 250-290.000.

Speidell, James L.: *See—*
Kirch, Steven J.; Lankard, John R.; Ritsko, John J.; Smith, Kurt A.; Speidell, James L.; and Yeh, James T., 4,923,772, Cl. 430-5.000.

Spengler, Ernst: *See—*
Spengler, Gerhard; and Spengler, Ernst, 4,923,539, Cl. 156-79.000.

Spengler, Gerhard; and Spengler, Ernst, to Stanztechnik GmbH R+S. Method and apparatus for manufacturing trim panels including several trim components. 4,923,539, Cl. 156-79.000.

Sperl, Johann: *See—*
Panick, Karl; Widemann, Friedrich; Schoenberger, Hermann; Sperl, Johann; and Sondermeier, Johann, 4,923,033, Cl. 181-211.000.

Sperry Marine Inc.: *See—*
Bird, Rebecca A., 4,924,233, Cl. 342-175.000.

Spickermann, Rainer: *See—*
Ellenberger, Bernd; Jennet, Friedrich; Schafer, Karlheinz; Spickermann, Rainer; and Lass, Gerhard, 4,923,558, Cl. 156-499.000.

Spinks, Arthur L.; and Woodson, Jerry P., to Whitemetal Inc. Liquid sand blast nozzle and method of using same. 4,922,664, Cl. 51-321.000.

Spira, Joel S.: *See—*
D'Aleo, Michael; Darragh, Denis; Ference, Jonathan; Luchaco, David; Rowen, Michael J.; and Spira, Joel S., 4,924,151, Cl. 315-295.000.

Spirac Engineering AB: *See—*
Bruke, Richard, 4,922,768, Cl. 74-89.000.

Spitzberg, Larry A. Magnifying apparatus and method. 4,923,282, Cl. 350-245.000.

Spoetzl, Markus, to Krauss-Maffei A.G. Blow molding machine. 4,923,385, Cl. 425-522.000.

Sponer, Gisbert: *See—*
Leinert, Herbert; Tsaklakidis, Chrstos; and Sponer, Gisbert, 4,923,889, Cl. 514-422.000.

Sprecker, Mark A.; Belko, Robert P.; and Hanna, Marie R., to International Flavors & Fragrances Inc. Trisobutylene alcohols and esters, uses thereof in perfumery and halogenated intermediates useful for preparing same. 4,924,026, Cl. 560-261.000.

Springs Industries, Inc.: *See—*
Porter, Rick A.; and Hoernle, Hans R., 4,923,729, Cl. 428-71.000.

Sprint Auto S.p.A.: *See—*
Casacci, Carlo, 4,922,862, Cl. 123-1.00A.

Spronken, John R. Closure and seal for prefabricated building panels. 4,922,676, Cl. 52-396.000.

Sprunt, Eve S.; Davis, R. Michael; Kennedy, W. David; and Collins, Samuel H., to Mobil Oil Corporation. Method for measuring electrical anisotrophy of a core sample from a subterranean formation. 4,924,187, Cl. 324-376.000.

Square D Company: *See—*
Bartee, Edward C.; Bartee, Edward C.; and Chapman, Donald L., 4,922,672, Cl. 52-221.000.
Harris, Geoffrey J., 4,924,122, Cl. 307-570.000.

SSMC Inc.: *See—*
Davidson, Donald R.; Huang, Pao-Ter; and Rogers, H. David, 4,922,637, Cl. 38-15.000.

Staber, Harley J.: *See—*
King, John A.; and Staber, Harley J., 4,924,407, Cl. 364-480.000.

Stacey, Tyrone B. Prolong VCR tape cassette. 4,924,338, Cl. 360-132.000.

Staerzl, Richard E.; and Stageman, Ronald D., to Brunswick Corporation. Fuel injector assembly. 4,922,866, Cl. 123-73.00A.

Stageman, Ronald D.: *See—*
Staerzl, Richard E.; and Stageman, Ronald D., 4,922,866, Cl. 123-73.00A.

Stager, Paul A.: *See—*
Buzzi, Carlo A.; Saxer, Ulrich A.; and Stager, Paul A., 4,922,936, Cl. 132-321.000.

Stainer, Philip J.: *See—*
Sherman, Rudolf W.; and Stainer, Philip J., 4,923,622, Cl. 252-8.600.

Stamicarbon B.V.: *See—*
Peerlkamp, Erik R., 4,923,735, Cl. 428-209.000.

Stammel, Georg: *See—*
Busch, Jurgen-Michael; Stammel, Georg; Rhau, Siegfried; Gundel, Bernd; and Rudolf, Karl, 4,922,826, Cl. 102-489.000.

Standard Oil Company, The: *See—*
Benton, Kenneth C.; Pierman, David A.; and Fox, Joseph R., 4,923,578, Cl. 204-130.000.
Grasselli, Robert K.; Harris, Jonathan H.; Henderson, Richard S.; and Tenhover, Michael A., 4,923,770, Cl. 429-101.000.

Standlee, Arlie G.: *See—*
Bailey, Wilbur M.; Hulderman, George H.; Jones, Vincent L.; Pikulski, Joseph L.; Standlee, Arlie G.; Tangonan, Gregory L.; Vince, Michael R.; and Wysocki, Joseph A., 4,924,087, Cl. 356-73.100.

Stansfield, Peter W.; and Reed, Alastair, to Crosfield Electronics Limited. Image movement processing for page planning. 4,924,388, Cl. 364-413.200.

Stanztechnik GmbH R+S: *See—*
Spengler, Gerhard; and Spengler, Ernst, 4,923,539, Cl. 156-79.000.

Stasz, Peter: *See—*
Welch, Daniel P.; and Stasz, Peter, 4,922,903, Cl. 606-37.000.

Stealey, Michael A.: *See—*
Deason, James R.; Stealey, Michael A.; and Weier, Richard M., 4,923,891, Cl. 514-433.000.

Stechschulte, David L.: *See—*
Fox, David A., and Stechschulte, David L., 4,924,372, Cl. 363-89.000.

Steele, Montgomerie C.: *See—*
Larson, C. Allan; and Steele, Montgomerie C., 4,923,370, Cl. 416-95.000.

Steffes, Thomas J.; Feyen, Paul A.; and Martin, Wesley R., to Brunswick Corporation. Engine crankshaft indexing method and tool 4,922,749, Cl. 73-116.000.

Stefkoo, Bela: *See—*
Fodor, Tamas; Dobay, Laaszlo ; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Saghy, Katalin; and Szporny, Laaszlo , 4,923,888, Cl. 514-414.000.

Stegmaier, Alwin: *See—*
Kaes, Guenter; and Stegmaier, Alwin, 4,922,966, Cl. 137-627.500.

Stein, Jeffrey; and Lapof, Ray C., to Bar Ray Products, Inc. Radiation protection apron. 4,924,103, Cl. 250-516.100.

Stein, Mark M.: *See—*
Trainor, Diane A.; and Stein, Mark M., 4,923,890, Cl. 424-46.000.

Steinbock, Rolf H. Threaded type fastener. 4,923,323, Cl. 403-261.000.

Steiner, Karl; Schutte, Andreas; and Flamig, Hans, to J. M. Voith GmbH. Long nip press roll arrangement. 4,923,570, Cl. 162-358.000.

Steiner, Kurt, to Flowtec AG. Vortex frequency flow meter. 4,922,759, Cl. 73-861.220.

Steinfeld, Ned: *See—*
Marks, Mortimer; and Steinfeld, Ned, 4,923,758, Cl. 428-437.000.

Stenberg, Richard A. Post support and anchor. 4,923,164, Cl. 248-530.000.

Stengl, Gerhard; and Loschner, Hans, to Ims Ionen Mikrofabrikations Systeme Gesellschaft m.b.H; and Oesterreichische Investitions-Kredit Aktiengesellschaft. Ion beam apparatus and method of modifying substrate. 4,924,104, Cl. 250-492.300.

Stenlund, Stig G., to Hypeco AB. Heat exchanger. 4,923,003, Cl. 165-165.000.

Stephan, Ronan; Doisy, Martine; Montfort, Yves; Robbes, Didier; Sing, Marc L. C.; Bloyet, Daniel; Provost, Jackie; and Raveau, Bernard, to Thomson-CSF. Superconducting DC SQUID magnetometer working in liquid nitrogen. 4,923,850, Cl. 505-1.000.

Stephani, Dietrich: *See—*
Diepers, Heinrich; and Stephani, Dietrich, 4,924,334, Cl. 360-77.070.

Stephens, Michael: *See—*
Patel, Bharat B.; and Stephens, Michael, 4,923,516, Cl. 106-90.000.

Stephenson, John; and McGuffie, Ian. Fall arrest device. 4,923,037, Cl. 188-188.000.

Stepper, Inc.: *See—*
Hannon, Charles N., 4,923,064, Cl. 206-554.000.

Sterk, James: *See—*
Carlozzo, Ben J.; Janoski, Ronald J.; Sterk, James; and Rundo, Mark C., 4,923,348, Cl. 411-377.000.

Stern, Richard M.: *See—*
Alm, Roger R.; and Stern, Richard M., 4,923,903, Cl. 521-65.000.

Sternberg, Hal: *See—*
Segall, Paul E.; Waitz, Harold D.; and Sternberg, Hal, 4,923,442, Cl. 604-52.000.

Steuer, Raimar; and Kraus, Manfred, to Diehl GmbH & Co. Projectile having extendable wings. 4,923,143, Cl. 244-3.280.

Stevens, Robert C., to Cordis Corporation. Catheter system having a small diameter rotatable drive member. 4,923,462, Cl. 606-159.000.

Stewart, David: *See—*
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,923,686, Cl. 423-38.000.

Stewart Hughes Limited: *See—*
Hadley, Maxwell R.; and Dudley, Richard P., 4,924,420, Cl. 364-569.000.

Stewart, James J.: *See—*
Abrahamson, Donald W.; Harney, Marilyn J.; Vauss, Elvin W., Jr.; Niksa, Andrew J.; and Stewart, James J., 4,923,582, Cl. 204-255.000.

Stewart, John M.; and Vavrek, Raymond J., to Nova Technology Limited Partnership. Bradykinin antagonist peptides. 4,923,963, Cl. 530-314.000.

Stewart, Peter A. E.; and Fowler, Peter H., to ROLLS-ROYCE plc. Strain and temperature measurement. 4,924,100, Cl. 250-390.090.

Stewart, Peter D., to Wolverine Aluminum Distributing Ltd., a part interest. Handle. 4,923,235, Cl. 294-141.000.

Stewart, Wilbur C.: *See—*
French, Park; and Stewart, Wilbur C., 4,924,356, Cl. 362-31.000.

Stewart, William H., Jr., to Milliken Research Corporation. Apparatus and method for spraying moving substrates. 4,923,743, Cl. 427-288.000.

Steyr-Daimler-Puch AG: *See—*
Hacker, Gerold, 4,922,976, Cl. 144-3.00D.
Lanzer, Heribert, 4,923,029, Cl. 180-248.000.
Stockmar, Jurgen, 4,923,041, Cl. 192-58.00B

Stickley, Dewey C.: *See—*
Weaver, A. Michael; Wiegand, Joseph R.; and Stickley, Dewey C., 4,923,081, Cl. 220-72.000.

Stiles, Lorren: *See—*
Post, Joseph A.; and Stiles, Lorren, 4,924,400, Cl. 364-433.000.

Stim Lab, Inc.: *See—*
Penny, Glenn S., 4,922,758, Cl. 73-38.000.

Stockdale, George F.; Hook, Harvey O.; Browne, Robert G.; and Heyman, Philip M., to RCA Licensing Corporation. Integrated thermal processing for kinescopes. 4,923,423, Cl. 445-40.000.

Stocker, Mark A.: *See—*
Colton, Peter; Willbond, Andrew D.; and Stocker, Mark A., 4,922,977, Cl. 144-230.000.

Stockmar, Jurgen, to Steyr-Daimler-Puch AG. Blade for liquid friction couplings. 4,923,041, Cl. 192-58.00B.

Stokes, Bennie J.; and Stokes, Dyrell K. Radiator with leak detecting and leak-isolating system. 4,922,999, Cl. 165-40.000.

Stokes, Dyrell K.: *See—*
Stokes, Bennie J.; and Stokes, Dyrell K., 4,922,999, Cl. 165-40.000.

Stokley, Charles O.: *See—*
Sanford, Lawrence; and Stokley, Charles O., 4,923,007, Cl. 166-187.000.

Stoll, Wolfgang; Ost, Christian; and Schneider, Volker, to Alkem GmbH. Method of processing plutonium and/or uranyl nitrate. 4,923,639, Cl. 252-632.000.

Stolt, Robert H.: *See—*
Parsons, Roger; and Stolt, Robert H., 4,924,390, Cl. 364-421.000.

Stolte, Friedrich, to Westfalia Separator AG. Device for closing off a liquid-supply channel. 4,922,854, Cl. 119-14.140.

Stoltz, Richard A.: *See—*
Snyder, Thomas S.; Stoltz, Richard A.; and Zuckerbrod, David, 4,923,579, Cl. 204-140.000.

Stone, Alan. Plant watering and feeding support system. 4,922,653, Cl. 47-45.000.

Stone, Steven G.: *See—*
Bachman, Wesley J.; and Stone, Steven G., 4,924,418, Cl. 364-550.000.

Storage Technology Corporation: *See—*
Nelson, Thomas C., 4,924,275, Cl. 355-319.000.

Stormbom, Lars; Jalava, Jouko; Mesia , Heikki; Lehto, Ari; and Belt, Pekka, to Vaisala Oy. Method for trimming a planar capacitor. 4,924,064, Cl. 219-121 690.

Stout, David M.; and Matier, William L., to Du Pont de Nemours, E. I., and Company. Quinazoline substituted aminomethyl benzene derivatives. 4,923,873, Cl. 514-259.000.

Stout, John F.: *See—*
Kennedy, Ronald R.; Manzitti, Michael T.; Bennett, Frank E.; Stout, John F.; and Vellam, Anthony M., 4,923,559, Cl. 156-523.000.

Strahosky, Melvin E.: *See—*
Grayson, William; and Strahosky, Melvin E., 4,922,724, Cl. 62-135.000.

Strand, David, to Energy Conversion Devices, Inc. Data storage device having a phase change memory medium reversible by direct overwrite and method of direct overwrite. 4,924,436, Cl. 365-113.000.

Strang, Harry: *See—*
Riebel, Hans-Jochem; Fest, Christa; Muller, Klaus-Helmut; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,923,505, Cl. 71-93.000.

Strauss, David P.: *See—*
Northrop, Donald P.; and Strauss, David P., 4,924,368, Cl. 362-376.000.

Strecker, Ernst P. Dilatation catheter. 4,922,905, Cl. 606-195.000.

Street Specialty Products Inc.: *See—*
Streett, James T., 4,923,181, Cl. 267-155.000.

Streett, James T., to Street Specialty Products Inc. Springs for a corvette rear-seat storage compartment cover opener. 4,923,181, Cl. 267-155.000.

Streit, Kenneth F.: *See—*
Breveglieri, Frank; and Streit, Kenneth F., 4,923,202, Cl. 280-47.350.

Strick Corporation: *See—*
Lienard, Jean; Haesebrouck, Francis; Katz, Sol; Abolins, Andrew; and Schmidt, George, 4,922,832, Cl. 105-4.200.

Strong, Scott A.: *See—*
Kulprathipanja, Santi; and Strong, Scott A., 4,924,027, Cl 562-580.000.

Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., to Ford New Holland, Inc. Round baler with continuous bale size monitoring. 4,924,405, Cl. 364-468.000.

Struss, Klaus; Lindner, Christian; Piejko, Karl-Erwin; Kress, Hans-Jurgen; and Wittmann, Dieter Powder compositions based on polyarylene sulphides. 4,923,923, Cl. 525-64.000.

Stuck, Otfried: *See—*
Rothaar, Stefan; and Stuck, Otfried, 4,923,373, Cl. 417-439.000.

Stumpf, Sherri O., to Premier Pan Products Co., Inc. Bread pan fabricated of liquid-crystal polymer. 4,922,811, Cl. 99-443.00C.

Stursberg, Bernd, to Peddinghaus, Carl Ullrich. U-shaped punch or stamper with anti-bending member. 4,922,744, Cl. 72-455.000.

Sturtz, Gregory P.: *See—*
Pitcher, Michael A.; Haugse, Albert L.; Pelfrey, Richard L.; and Sturtz, Gregory P., 4,922,991, Cl. 164-36.000.

Stutzenberger, Heinz: *See—*
Grob, Ferdinand; Linder, Ernst; Kienzler, Dieter; Potschin, Roger; and Stutzenberger, Heinz, 4,922,714, Cl. 60-276.000.

Styles, J. Cabot. Moisturized refrigerated produce rack covered by multiple curtains and strip connections. 4,923,258, Cl. 312-115.000.

Su, Shing-Fong, to GTE Laboratories Incorporated. Optical fiber shift register. 4,923,267, Cl. 350-96.160.

Suda, Koichiro: *See—*
Takahashi, Yoshiya; Suda, Koichiro; and Itoyama, Katumi, 4,924,044, Cl. 200-314.000.

Sudbo, Aasmund S.: *See—*
Henry, Charles H.; Kazarinov, Rudolf F.; Kistler, Rodney C.; Orlowsky, Kenneth J.; Shani, Yosi; and Sudbo, Aasmund S., 4,923,271, Cl. 350-96.190.

Sudo, Hiroshi: *See—*
Yamashita, Hiroshi; Fujii, Kanenaga; Fukunishi, Takumi; Shigeoka, Masafumi; and Sudo, Hiroshi, 4,924,357, Cl. 362-32.000.

Suffridge, Robert L., to Cincinnati Milacron Inc. Throttled exhaust outlet to reservoir for reducing noise resulting from release hydraulic pressure surges. 4,922,716, Cl. 60-378.000.

Sugata, Hiroyuki: *See*—
Oguchi, Yoshihiro; Sugata, Hiroyuki; Miura, Kyo; Fukui, Tetsuro; and Takasu, Yoshio, 4,923,390, Cl. 430-270.000.

Sugihara, Kazuhiro: *See*—
Hiza, Misao; Yamazaki, Hajime; Sugihara, Kazuhiro; and So, Tetsu, 4,923,736, Cl. 428-212.000.

Sugimura, Yukio: *See*—
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.

Sugita, Yutaka: *See*—
Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, 4,923,765, Cl. 428-694.000.

Sugitani, Tatsuo: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Ishaihara, Toshihisa; Sugitani, Tatsuo; and Inoue, Hideo, 4,922,753, Cl. 73-516.00R.
Uchida, Kiyoyuki; Inoue, Hideo; and Sugitani, Tatsuo, 4,924,394, Cl. 364-426.020.

Sugiura, Toshio: *See*—
Horaguchi, Yoichi; Sakakibara, Kenji; Yamada, Makoto; Nagata, Osamu; Suzuki, Tsuyoshi; and Sugiura, Toshio, 4,924,255, Cl. 355-27.000.

Sugiyasu Industries Co., Ltd.: *See*—
Isogai, Shunji, 4,923,357, Cl. 414-495.000.

Suido Kiko Kabushiki Kaisha: *See*—
Hasegawa, Takao; Onitsuka, Takuya; Suzuki, Minoru; Ehara, Yasuhiro; Hashimoto, Katsuhiro; and Ozaki, Tadamasa, 4,923,629, Cl. 252-181.000.

Sulexport-Intertrade A.G.: *See*—
Menar, Arnold B., 4,923,482, Cl. 23-308.00S.

Sullivan, Edward J.: *See*—
McIntyre, Dennis A.; and Sullivan, Edward J., 4,924,419, Cl. 364-551.020.

Sulzer Brothers Limited: *See*—
Griss, Peter; and Koch, Rudolf, 4,923,473, Cl. 623-22.000.
Pfarrwaller, Erwin; Vezzu, Danilo; and Hubner, Oskar, 4,922,967, Cl. 139-145.000.

Sumitomo Chemical Company, Limited: *See*—
Ueda, Yasuyoshi; Hattori, Hideo; Yamamoto, Jun; and Hashimoto, Kiyoyasu, 4,923,974, Cl. 534-799.000.
Yoneyoshi, Yukio; Suzukamo, Gohfu; Hamada, Kazuhiko; and Nishioka, Toshio, 4,923,999, Cl. 548-268.400.

Sumitomo Electric Industries, Ltd.: *See*—
Fujioka, Hideaki; and Matsumoto, Tatsuji, 4,924,396, Cl. 364-426.030.

Sumitomo Special Metals Co., Ltd.: *See*—
Nakamura, Yasuyuki; Hashimoto, Akio; Fujita, Toshiaki; and Kawakami, Makoto, 4,923,100, Cl. 228-117.000.

Summers, Jack C., to Allied-Signal Inc. Lanthanum containing catalyst for treating automotive exhaust. 4,923,842, Cl. 502-261.000.

Sunaga, Yoshiyuki: *See*—
Ikeda, Kohji; Tsuji, Akira; and Sunaga, Yoshiyuki, 4,922,597, Cl. 29-240.000.

Sundrops Enterprises, Inc.: *See*—
Michalos, Peter, 4,923,693, Cl. 424-59.000.

Sundstrand Corporation: *See*—
Russ, David E., 4,923,039, Cl. 192-7.000.

Sundstrom, Goran: *See*—
Hedvall, Bertil; Mattson, Gunnar; Porrvik, Sten; and Sundstrom, Goran, 4,923,776, Cl. 430-111.000.

Sunley, Raymond L.: *See*—
Elliott, Raymond; and Sunley, Raymond L., 4,923,502, Cl 71-92.000.

Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Analgesic Associates. Analgesic, anti-inflammatory and skeletal muscle relaxant compositions comprising non-steroidal anti-inflammatory drugs and musculoskeletal relaxants and methods of using same. 4,923,898, Cl. 514-557.000.

Surbrook, Craig L., to SeeColor Corporation. Apparatus and methods for digital halftoning. 4,924,301, Cl. 358-75.000.

Sutera, Carl M. Self-filling bottled-water cooler. 4,923,091, Cl. 222-67.000.

Sutton, David M., to British Gas Corporation. Fuel fired burner. 4,923,393, Cl. 431-328.000.

Suwannukul, Sakarin, to Hercules Computer Technology. Color conversion apparatus and method. 4,924,413, Cl. 364-521.000.

Suyama, Noriyoshi: *See*—
Hasegawa, Yoshihiko; and Suyama, Noriyoshi, 4,923,099, Cl. 227-114.000.

Suzaki, Toru: *See*—
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 358-105.000.

Suzukamo, Gohfu: *See*—
Yoneyoshi, Yukio; Suzukamo, Gohfu; Hamada, Kazuhiko; and Nishioka, Toshio, 4,923,999, Cl. 548-268.400.

Suzuki, Akira: *See*—
Kanai, Naritoshi; and Suzuki, Akira, 4,922,910, Cl. 128-642.000.

Suzuki, Hideo, to Yamaha Corporation. Tone signal forming device. 4,922,795, Cl. 84-608.000.

Suzuki, Hirosuke, to Junkosha Co., Ltd. Low-permittivity connector and flat-cable. 4,923,410, Cl. 439-492.000.

Suzuki, Kaoru, to Hitachi, Ltd. Method and apparatus for measuring performance of a multiprocessor. 4,924,383, Cl. 364-200.000.

Suzuki, Kazuyoshi: *See*—
Hirai, Kazuyasu; Inoue, Yasuhiro; and Suzuki, Kazuyoshi, 4,923,132, Cl. 242-35.50A.

Suzuki, Kunitomo; Kiyohara, Takao; and Kitoh, Shinya, to Lion Corporation. Dental adhesive composition. 4,923,400, Cl. 433-226.000.

Suzuki, Masami: *See*—
Sato, Masami; Fujiyama, Masaaki; Iwasaki, Takashi; Suzuki, Masami; Yoneyama, Takashi; and Kosha, Hideaki, 4,922,675, Cl. 51-394.000.

Suzuki, Minoru: *See*—
Hasegawa, Takao; Onitsuka, Takuya; Suzuki, Minoru; Ehara, Yasuhiro; Hashimoto, Katsuhiro; and Ozaki, Tadamasa, 4,923,629, Cl. 252-181.000.

Suzuki, Nobuharu; Aoki, Harumi; and Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus and method for correcting and adjusting parallax in electronic camera. 4,924,247, Cl. 354-164.000.

Suzuki, Nobuyoshi: *See*—
Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, 4,923,956, Cl. 525-263.000.

Suzuki, Ryo: *See*—
Watanabe, Keiji; Fukuyama, Keiji; Ishida, Masako; Suzuki, Ryo; and Saito, Masato, 4,924,137, Cl. 313-337.000.

Suzuki, Shigeaki: *See*—
Onishi, Takashi; Suzuki, Shigeaki; Mori, Toshiki; and Fujita, Yoshiji, 4,924,030, Cl. 568-34.000.

Suzuki, Takao: *See*—
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.000.

Suzuki, Takashi; and Kumano, Isamu, to Yoshida Kogyo K. K. Light-reflective slide fastener. 4,922,585, Cl. 24-381.000.

Suzuki, Toshio: *See*—
Okawa, Tadashi; and Suzuki, Toshio, 4,924,020, Cl. 556-441.000.

Suzuki, Toshiyasu: *See*—
Shigematsu, Kazuyoshi; Shirouzu, Shigenori; Sakamoto, Shuji; and Suzuki, Toshiyasu, 4,923,962, Cl. 528-196.000.

Suzuki, Toshiyuki: *See*—
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.

Suzuki, Tsuyoshi: *See*—
Horaguchi, Yoichi; Sakakibara, Kenji; Yamada, Makoto; Nagata, Osamu; Suzuki, Tsuyoshi; and Sugiura, Toshio, 4,924,255, Cl. 355-27.000.

Suzuki, Yoshio: *See*—
Nakahigasi, Isamu; and Suzuki, Yoshio, 4,924,055, Cl. 219-86.210.

Suzuki, Yoshiteru: *See*—
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 358-105.000

Suzuki, Yukio: *See*—
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,924,439, Cl. 365-189.050.

Svec, Frantisek; and Belenkii, Boris G., to Ceskoslovenska akademive ved and Akademia Nauk SSSR. Macroporous polymeric membranes for the separation of polymers and a method of their application. 4,923,610, Cl. 210-637.000.

Svenska Rotor Maskiner AB: *See*—
Lundin, Stig; and Pettersson, Birger, 4,923,374, Cl. 417-440.000.

Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; and Verbitsky, Alexandr N., to Belorussky Tekhnologichesky Institut Imeni S.M. Kirova. Wear-resistant steel and method of its production. 4,923,675, Cl. 420-129.000.

Swanson, Caleb V., Jr., to West Lodge Research. Remote gas analyzer for motor vehicle exhaust emissions surveillance. 4,924,095, Cl. 250-338.500.

Swanson, Thomas E. Apparatus for releasably securing a cover to a structure. 4,923,240, Cl. 296-100.000.

Swartvagher, Rita: *See*—
Buehler, David L.; Jacoby, Elliot G.; and Swartvagher, Rita, 4,924,349, Cl. 361-357.000.

Sweeney Enterprises, Inc.: *See*—
Sweeney, John W., Jr., 4,922,856, Cl. 119-51.040.

Sweeney, John W., Jr., to Sweeney Enterprises, Inc. Vibrationally activated control apparatus for detecting signals from fish to enable demand feeding. 4,922,856, Cl. 119-51.040.

Sweet, Martin, to Raychem Limited. Circuit protection device. 4,924,340, Cl. 361-56.000.

Swiss Aluminum Ltd.: *See*—
Everhart, Richard; Bosomworth, Paul; Butcher, Kenneth; and Hoffmann, Matthias, 4,923,830, Cl. 501-103.000.

Sylling, Truman V.; and Allen, Stephen L. Method for desalination and rehabilitation of irrigeted soil. 4,923,500, Cl. 71-27.000.

Sylvan R. Shemitz Associates, Inc.: *See*—
Shemitz, Sylvan R.; and Melling, James A., 4,924,366, Cl. 362-249.000.

Symbol Technologies Inc.: *See*—
Krichever, Mark; and Gofman, Yuri, 4,923,281, Cl. 350-245.000.

Synbiotics Corporation: *See*—
LeMoine, Eric D.; Bean, Eric S.; and Vodian, Morton A., 4,923,798, Cl. 435-5.000.

Synchro-Start: *See*—
Gaeti, Anthony J., 4,922,873, Cl. 123-357.000.

Syrylo, Stephen N., Jr.; and Deal, Madison L., to Westinghouse Electric Corp. Apparatus for precision forming of sheet metal parts. 4,922,742, Cl. 72-308.000.

Systems Specialties: *See*—
Taube, Frank A., Sr.; and Rozniecki, Edward J., 4,922,956, Cl. 137-504.000.

Szabo, Stephan L. Blade holder having a magazine. 4,922,610, Cl. 30-125.000.

Szathmari, Attila: *See*—
Ferenczi, Tibor; Kovacs, Laszlo; and Szathmari, Attila, 4,923,529, Cl. 148-20.300.

Szejtli, Jozsef; Tetenyi, Peter; Kiniczky, Marta; Bernath, Jeno; Tetenyi nee Erdosi, Magda; Dobos, Eva; and Banky nee Elod, Erzsebet, to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T. Process for enhancing the activity of plant protecting agents by using cyclodextrin. 4,923,853, Cl. 514-58.000.

Szelenyi, Istvan: *See*—
Engel, Jurgen; Emig, Peter; Nickel, Bernd; and Szelenyi, Istvan, 4,923,858, Cl. 514-211.000.

Szereto, Richard S.: *See*—
Krizan, James A.; and Szereto, Richard S., 4,923,511, Cl. 75-252.000.

Szporny, Laaszlo: *See*—
Fodor, Tamas; Dobay, Laaszlo; Fischer, Jaanos; Stefkoo, Bela; Ezer, Elemeer; Matuz, Judit; Saghy, Katalin; and Szporny, Laaszlo, 4,923,888, Cl. 514-414.000.

Szymaszek, Paul G.; and Schumacher, Earl, to Vilter Manufacturing Corporation. Seating seal means for disc-type valve. 4,923,173, Cl. 251-333.000.

T. N. T. Medi Corporation: *See*—
Birkeland, Robert L., 4,922,935, Cl. 132-309.000.

T.T.C. Termo Tecnica Ceramica S.P.A.: *See*—
Nassetti, Roberto, 4,923,397, Cl. 432-251.000.

Tabata, Kaoru: *See*—
Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,972, Cl. 141-4.000.
Watanabe, Toshio; Osabe, Akio; Mase, Akira; Sakayori, Hiroyuki; Sato, Masahiko; and Tabata, Kaoru, 4,922,974, Cl. 141-4.000.

Tabei, Masatoshi: *See*—
Kobayashi, Kiyotaka; Shizukuishi, Makoto; and Tabei, Masatoshi, 4,924,316, Cl. 358-213.260.

Taborga, Jorge R.: *See*—
Dang, Mieu-Hong; and Taborga, Jorge R., 4,924,493, Cl. 379-94.000.

Tachi-S Co., Ltd.: *See*—
Sakamoto, Takao; and Takizawa, Kiyotaka, 4,924,162, Cl. 318-569.000.
Sakamoto, Takao; and Takano, Tomio, 4,924,163, Cl. 318-569.000.

Tachikawa, Kazuhiko: *See*—
Kurihara, Norimitsu; Asakura, Masahiko; Matsui, Mitsuru; Otsuka, Yasuhiko; and Tachikawa, Kazuhiko, 4,924,397, Cl. 364-426.040.

Tacke, Peter; Grigo, Ulrich; and Idel, Karsten-Josef. Process for the production of aromatic polyesters. 4,923,957, Cl. 528-271.000.

Tahara, Hiroshi: *See*—
Nakagoshi, Akira; Tahara, Hiroshi; Yamada, Tetuo; Sekiguchi, Hiroyuki; and Murata, Hidemi, 4,923,692, Cl. 423-447.400.

Tait, Charles N.; and Volpe, Ralph A., to Warner-Lambert Company. Apparatus and method for sealing and banding capsules. 4,922,682, Cl. 53-139.300.

Takagi, Shuichi: *See*—
Yamabe, Hitoshi; Sekine, Noboru; Takagi, Shuichi; and Fujimoto, Sachito, 4,923,042, Cl. 192-0.096.

Takagi, Yahei: *See*—
Horikita, Hiroyuki; Hattori, Nobuo; Takagi, Yahei; Kawaguchi, Gaku; and Maeda, Toshihiro, 4,923,812, Cl. 435-158.000.

Takahashi, Hisanori: *See*—
Wada, Shintaro; Nomura, Yoichi; Takahashi, Hisanori; and Konno, Masayuki, 4,922,911, Cl. 128-640.000.

Takahashi, Isami: *See*—
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asasno, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.

Takahashi, Jun; and Shimura, Ryoji, to Ohi Seisakusho Co., Ltd. Lid regulating device of sun roof structure. 4,923,246, Cl. 296-221.000.

Takahashi, Jun: *See*—
Tanaka, Shinsuke; Takahashi, Jun; Ueda, Nobuo; and Matsushima, Hiroaki, 4,923,088, Cl. 220-468.000.

Takahashi, Katsuhiko: *See*—
Nakayama, Shiro; Kunimura, Satoshi; Takahashi, Shigemi; Takahashi, Katsuhiko; Hirayama, Toshimitu; and Akutsu, Masao, 4,924,131, Cl. 310-329.000.

Takahashi, Kenichi: *See*—
Kameda, Keiichi; Takahashi, Kenichi; Horigami, Kouichi; and Iitsuka, Hiroyuki, 4,924,426, Cl. 364-900.000.

Takahashi, Mitsuru: *See*—
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.

Takahashi, Noriyoshi: *See*—
Yagi, Shigeru; Ono, Masato; Takahashi, Noriyoshi; Nishikawa, Masayuki; Fukuda, Yuzuru; and Karakida, Kenichi, 4,923,773, Cl. 430-57.000.

Takahashi, Satoru: *See*—
Saito, Yoshihiro; Wada, Nobuhide; Kusano, Shoji; Miyazawa, Takeshige; Takahashi, Satoru; Toyokawa, Yasuhumi; and Kajiwaca, Ikuo, 4,923,501, Cl. 71-92.000.

Takahashi, Shigemi: *See*—
Nakayama, Shiro; Kunimura, Satoshi; Takahashi, Shigemi; Takahashi, Katsuhiko; and Hirayama, Toshimitu; and Akutsu, Masao, 4,924,131, Cl. 310-329.000.

Takahashi, Takehiko; and Katou, Hitoshi, to Combi Co., Ltd. Baby carriage also usable as shopping carrier. 4,923,208, Cl. 280-642.000.

Takahashi, Toshio: *See*—
Yamaguchi, Koshiro; Takahashi, Toshio; Kitazawa, Yasunori; and Hattori, Hiroshi, 4,923,315, Cl. 400-120.000.

Takahashi, Yoshiya; Suda, Koichiro; and Itoyama, Katumi, to Kabushiki Kaisha Toshiba. Light emitting push button switch for an electronic apparatus. 4,924,044, Cl. 200-314.000.

Takahasi, Kenichiro; and Ueno, Yukichi, to Hitachi, Ltd. High-accuracy A/D converter. 4,924,224, Cl. 341-155.000.

Takahira, Kenichi: *See*—
Matsubara, Toshiyuki; Fujioka, Shuzo; Yamaguchi, Atsuo; Takahira, Kenichi; Furuta, Shigeru; and Inoue, Takesi, 4,924,465, Cl. 371-3.000.

Takaki, Toru: *See*—
Kaji, Yasumasa; and Takaki, Toru, 4,922,879, Cl. 123-494.000.

Takakura, Tsuyoshi: *See*—
Hara, Ryuichi; Kagizaki, Masami; Takakura, Tsuyoshi; and Tomono, Shigeki, 4,923,648, Cl. 264-29.200.

Takami, Seiji: *See*—
Isozaki, Osamu; Nakai, Noboru; Ito, Satoru; and Takami, Seiji, 4,923,945, Cl. 528-16.000.

Takamiya, Hiroshi: *See*—
Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, 4,923,912, Cl. 523-466.000.

Takamuku, Hideyuki: *See*—
Mizuno, Yutaka; and Takamuku, Hideyuki, 4,924,299, Cl. 358-22.000.

Takano, Atsushi: *See*—
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,923,847, Cl. 503-227.000.

Takano, Satoshi: *See*—
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.

Takano, Tomio: *See*—
Sakamoto, Takao; and Takano, Tomio, 4,924,163, Cl. 318-569.000.

Takaoka, Tatsuo, to Ricoh Company Ltd. Facsimile machine which prevents the loss of recorded data in multiple cut sheet reports. 4,924,324, Cl. 358-468.000.

Takaoka, Tokuro; Sasaki, Tsuto; Kobayashi, Yukio; Saito, Koichi; and Hamano, Satoshi, to Honda Giken Kogyo Kabushiki Kaisha; and Seiki Giken Kogyo Kabushiki Kaisha. Hydraulic pressure control valve. 4,923,170, Cl. 251-121.000.

Takashima, Koichi: *See*—
Imai, Takashi; Saito, Susumu; and Takashima, Koichi, 4,923,777, Cl. 430-120.000.

Takasu, Yoshio: *See*—
Oguchi, Yoshihiro; Sugata, Hiroyuki; Miura, Kyo; Fukui, Tetsuro; and Takasu, Yoshio, 4,923,390, Cl. 430-270.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,923,998, Cl. 548-195.000.

Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Company, Ltd. Cephem and cepham compounds and processes for preparation thereof. 4,923,998, Cl. 548-195.000.

Takayama, Shinji; Niihara, Toshio; Kaneko, Katsuhiro; and Sugita, Yutaka, to Hitachi, Ltd. Magneto-optical recording medium. 4,923,765, Cl. 428-694.000.

Takayanagi, Hiroshi: *See*—
Kobayashi, Tadashi; Obuchi, Shouji; Matsuno, Hiroaki; Wada, Mitsuo; and Takayanagi, Hiroshi, 4,923,951, Cl. 528-48.000.

Takeda Chemical Industries, Ltd.: *See*—
Kameda, Yukihiko; and Horii, Satoshi, 4,923,975, Cl. 536-17.900.

Takeda, Hideichiro: *See*—
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,923,847, Cl. 503-227.000.

Takeda, Hiromitsu: *See*—
Iyogi, Kiyoshi; Nakahashi, Masako; Takeda, Hiromitsu; and Shirokane, Makoto, 4,924,033, Cl. 174-259.000.

Takeda, Mitsuru: *See*—
Akada, Masanori; Ito, Yoshikazu; Kanto, Jumpei; Takeda, Mitsuru; Kutsukake, Masaki; Egashira, Noritaka; Mukasa, Shunsuke; Suzuki, Takao; Hosoi, Hideo; and Otatsume, Yasuo, 4,923,848, Cl. 503-227.000.

Takei, Atsuo: *See*—
Hasegawa, Hajime; Koga, Taiji; Takei, Atsuo; and Okuyama, Toru, 4,923,904, Cl. 521-115.000.

VOL 1114 ISS 2 MY 8 1990 UMI

Takei, Masahiro: *See—*
Takimoto, Hiroyuki; Nagasawa, Kenichi; Fujimoto, Mikihiro; Kobayashi, Hiroyuki; and Takei, Masahiro, 4,924,326, Cl. 360-10.200.

Takeishi, Kazumi: *See—*
Nakagawa, Atsushi; and Takeishi, Kazumi, 4,922,663, Cl. 51-170.0TL.

Takema, Yoshinori: *See—*
Otsuji, Kazuya; Honda, Yasuki; Okamoto, Kikuhiko; Inaoka, Hakaru; Takano, Satoshi; Sugimura, Yukio; Okamura, Noriko; Saito, Kazumi; Takema, Yoshinori; and Suzuki, Toshiyuki, 4,923,809, Cl. 435-101.000.

Takenaka, Kohei: *See—*
Shiokawa, Youichi; Takimoto, Koichi; and Takenaka, Kohei, 4,923,886, Cl. 514-365.000.

Takeuchi, Hajime: *See—*
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,924,482, Cl. 375-65.000.

Takeuchi, Hitoshi: *See—*
Mizoguchi, Kenji; Takeuchi, Hitoshi; Nishigaki, Yoshiyasu; Kato, Yoshihiro; and Sakakibara, Shinichi, 4,922,876, Cl. 123-470.000

Takeuchi, Kunihiko: *See—*
Baba, Fujio; Takeuchi, Kunihiko; and Hornouchi, Shinichi, 4,924,171, Cl. 323-347.000.

Takeuchi, Mitsunori; and Sasaki, Minoru, to Kabushiki Kaisya Advance. Small-sized low frequency curing apparatus. 4,922,906, Cl. 128-419.00R.

Takeuchi, Naoki: *See—*
Kurumaji, Masanobu; Takeuchi, Naoki; Sano, Tutomu; Kajiyama, Kazuyuki; Kondo, Hiroaki; and Imanishi, Etujiro, 4,923,383, Cl. 425-150.000.

Takeyama, Tadao; and Aritomi, Mitsutoshi, to Mitsubishi Petrochemical Company, Ltd. Optical disc and method of manufacturing the same. 4,923,942, Cl. 526-232.000.

Takimoto, Hiroyuki; Nagasawa, Kenichi; Fujimoto, Mikihiro; Kobayashi, Hiroyuki; and Takei, Masahiro, to Canon Kabushiki Kaisha. Signal reproducing apparatus. 4,924,326, Cl. 360-10.200.

Takimoto, Koichi: *See—*
Shiokawa, Youichi; Takimoto, Koichi; and Takenaka, Kohei, 4,923,886, Cl. 514-365.000.

Takiron Co., Ltd.: *See—*
Iida, Kosuke; Yamato, Hiroshi; and Kadono, Yoji, 4,923,718, Cl. 427-386.000.

Takizawa, Kiyotaka: *See—*
Sakamoto, Takao; and Takizawa, Kiyotaka, 4,924,162, Cl. 318-569.000.

Talko, Francis: *See—*
McLaughlin, David F.; and Talko, Francis, 4,923,577, Cl. 204-64.00T.

Talley Automotive Products, Inc.: *See—*
Cuevas, Jess, 4,923,212, Cl. 280-736.000.

Talvalkar, Shashi G., to NCR Corporation. Thermal transfer ribbon. 4,923,749, Cl. 428-341.000.

Tam International: *See—*
Sanford, Lawrence; and Stokley, Charles O., 4,923,007, Cl. 166-187.000.

Tamaru, Kiichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Logic circuit having an error detection function. 4,924,117, Cl. 307-455.000.

Tamaru, Kiichiro; Tanaka, Koichi; Kanuma, Akira; and Yamada, Yasuo, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit device. 4,924,469, Cl. 371-22.400.

Tamba, Shinichi; and Ueda, Yoshiteru, to Kawasaki Jukogyo Kabushiki Kaisha. Breather device for an internal combustion engine. 4,922,881, Cl. 123-572.000.

Tameran, Inc.: *See—*
Wise, David S., 4,924,259, Cl. 355-57.000.

Tamura, Hifumi: *See—*
Sakudo, Noriyuki; and Tamura, Hifumi, 4,924,101, Cl. 250-423.00R.

Tamura, Kohji; Kashiwagi, Hiroshi; and Noguchi, Masahiro, to Daikin Industries, Ltd. Refrigerants. 4,923,626, Cl. 252-67.000.

Tamura, Takumi; Shinoda, Shosuke; Yamashita, Tetsuo; and Okashita, Kyohiko, to Kabushiki Kaisha N.M.B. Semiconductor. System for manufacturing semiconductor under clean condition. 4,923,352, Cl. 414-225.000.

Tanada, Kikuko: *See—*
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000.

Tanaka, Akira; Arima, Takanori; and Mori, Ryuji, to Honda Giken Kogyo Kabushiki Kaisha; and Oki Electric Co., Ltd. Key device incorporating an electronic circuit. 4,922,736, Cl. 70-277.000.

Tanaka, Fuminari: *See—*
Atsumi, Shigeru; Yoshida, Toru; Kawahara, Yasuo; and Tanaka, Fuminari, 4,924,339, Cl. 361-56.000.

Tanaka, Hidetake; Yamazaki, Shigeru; Yamanobe, Koji; Kotabe, Hiroaki; Nakazato, Yasushi; and Banno, Masahiko, to Ricoh Company, Ltd. Image system with connection to operational units. 4,924,320, Cl. 358-296.000.

Tanaka, Hiroshi; and Sato, Keiji, to Fuji Jukogyo Kabushiki Kaisha. Transmission ratio control system for a continuously variable transmission. 4,923,433, Cl. 474-11.000.

Tanaka, Kenji; Miyano, Kenmi; Nishimaki, Hideo; and Iga, Yoshiro, to Green Cross Corporation. Process for heat treating thrombin. 4,923,815, Cl. 435-183.000

Tanaka, Koichi: *See—*
Tamaru, Kiichiro; Tanaka, Koichi; Kanuma, Akira; and Yamada, Yasuo, 4,924,469, Cl. 371-22.400.

Tanaka, Shingo: *See—*
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,922,861, Cl. 122-448.00R.

Tanaka, Shinsuke; Takahashi, Jun; Ueda, Nobuo; and Matsushima, Hiroaki, to Nihon Medi-Physics Co., Ltd. Radiation-shielding container. 4,923,088, Cl. 220-468.000.

Tanaka, Tsutomu, to Kabushiki Kaisha Toshiba. Smart IC card. 4,924,075, Cl. 235-380.000.

Tanaka, Tsutomu: *See—*
Koga, Satoru; and Tanaka, Tsutomu, 4,924,425, Cl. 364-900.000.

Tangonan, Gregory L.: *See—*
Bailey, Wilbur M.; Hulderman, George H.; Jones, Vincent L.; Pikulski, Joseph L.; Standlee, Arlie G.; Tangonan, Gregory L.; Vince, Michael R.; and Wysocki, Joseph A., 4,924,087, Cl. 356-73.100.

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Kitahara, Satoru; Yasuda, Koichi; and Izu, Toshio, 4,924,200, Cl. 336-65.000.
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Phillips, Edward H., 4,922,803, Cl. 91-375.00R.

Technic, Inc.: *See—*
Kroll, Harry; Butler, Florence; and Souza, Therese R., 4,923,576, Cl. 204-44.400.

Technifor: *See—*
Therond, Marcel, 4,923,345, Cl. 409-237.000

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Carlin, Paolo, 4,923,922, Cl. 525-56.000.

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Adams, Gar M., 4,922,863, Cl. 123-52.0MC

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Blouke, Morley M.; Tran, Thaian N.; and Lust, Marjorie L., 4,923,825, Cl. 437-53.000.
Rettig, John B.; Lueker, Jonathan; Carlson, John E.; Kaveckis, Stanley P.; and Lewallen, Roy W., 4,924,110, Cl. 307-227.000.
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Guajardo, , 4,924,344, Cl. 361-101.000.
Wells, James A., 4,923,276, Cl. 250-206.200.

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Lee, Robert H., 4,924,342, Cl. 361-58.000.

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Heime, Axel; Rosin-Schroder, Gerhard; and Schairer, Werner, 4,924,276, Cl. 357-17.000.

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Galli, Roberto; and Tempel, Ernst, 4,923,481, Cl. 8-589.000.

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Grasselli, Robert K.; Harris, Jonathan H.; Henderson, Richard S.; and Tenhover, Michael A., 4,923,770, Cl. 429-101.000.

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Benedikt, George M.; and Tenney, Linwood P., 4,923,678, Cl. 428-209.000.

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Zasio, John J.; Choy, Kenneth C.; and Parham, Darrell R., 4,925,320, Cl. 364-578.000.

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Kurita, Kazuo; and Teramoto, Yoshihiko, 4,923,662, Cl. 264-178.00F.

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Fukasawa, Hiromichi; Katsura, Yoshiro; and Hagiwara, Kazuhiko, 4,923,679, Cl. 422-48.000.

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Gresh, Richard D.; and Netherland, Robert B., 4,923,606, Cl. 210-275.000.

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Weisse, Dick O., 4,923,544, Cl. 156-153.000.

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Taylor, Henry F., 4,923,273, Cl. 350-96.210.

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Culp, Norman L.; and Kwan, Stephen C., 4,924,341, Cl. 361-56.000.
Jucha, Rhett B.; and Davis, Cecil J., 4,923,562, Cl. 156-643.000.
Paterson, James L.; Wilmoth, David D.; and Riemenschneider, Bert R., 4,924,437, Cl. 365-185.000.
Russell, Joseph K.; and McKee, Jeffrey A., 4,922,731, Cl. 62-515.000.
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Tharpe, John M. Method and apparatus for drying lumber. 4,922,624, Cl. 34-29.000.

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Klein, Theodor, 4,923,382, Cl. 425-78.000.

Therm-O-Loc, Inc.: *See—*
Coddens, Donald L., 4,922,658, Cl. 49-458.000.

Therma-Tru Corp.: *See—*
Thorn, John E., 4,922,674, Cl. 52-309.150.

Thermal-Werke, Warme-Kalte-Klimatechnik GmbH *See—*
Haussmann, Roland, 4,923,002, Cl. 165-151.000.

Thermic, Inc.: *See—*
Nuesmeyer, David; and Brondt, Gary, 4,922,889, Cl. 126-73.000.

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Kiefer, Kevin W.; and Satterness, Cynthia J., 4,923,237, Cl. 296-24.100.
Viegas, Herman H., 4,922,727, Cl. 62-239.000.

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Damico, Frank M., 4,922,836, Cl. 108-144.000.

Thomas, Charles R. Therapeutic mattress and method of making. 4,922,564, Cl. 5-464.000.

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Binley, Gary N.; Giles, Alan F., Pearson, Christopher A., and Baker, Terence P., 4,923,706, Cl. 426-516.000.

Thomas, Julian: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.

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Thomasson, J. Sam: *See—*
Williams, E. Lee, Jr.; and Thomasson, J. Sam, 4,922,932, Cl. 131-290.000.

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Waters, George E., Jr.; and Thommen, Robert L., 4,922,913, Cl. 128-645.000.

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Grant, Thomas S.; Jalbert, Ronald L.; Whalen, David, Bartges, Brenda A.; and Thompson, Tracey L., 4,923,924, Cl. 525-66.000

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Creusot, Didier; and Roux, Jean-Pierre, 4,923,142, Cl. 244-3.100.

Thomson-CSF: *See—*
Prenat, Michel, 4,924,231, Cl. 342-137.000.
Stephan, Ronan; Doisy, Martine; Montfort, Yves; Robbes, Didier, Sing, Marc L. C.; Bloyet, Daniel; Provost, Jackie; and Raveau, Bernard, 4,923,850, Cl. 505-1.000.

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Feuchtwanger, David, 4,924,308, Cl. 358-133.000.

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Tiefel, Thomas H.: *See—*
Jin, Sungho; Lambert, William R.; Moore, Robert C.; Mottine, John J., Jr.; Sherwood, Richard C.; and Tiefel, Thomas H., 4,923,739, Cl. 428-221.000.

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Bishop, Willis E.; Popat, Ghanshyam H.; Tien-Tsung, Chen; and Ruiz, Manuel W., 4,923,317, Cl. 401-205.000.

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TiMesh, Inc.: *See—*
Morgan, Frank H., 4,923,471, Cl. 623-16.000.

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Backlund, Ake; Ferritsius, Olof; and Tistad, Goran, 4,922,989, Cl. 162-24.000.
Titan Corporation: *See*—
Snedeker, Richard S., 4,923,728, Cl. 428-52.000.
Titus Tool Company Limited: *See*—
Harley, David N., 4,923,163, Cl. 248-300.000.
Tochihara, Shinichi: *See*—
Koike, Shoji; Iwata, Kazuo; Tochihara, Shinichi; and Tomida, Yasuko, 4,923,515, Cl. 106-22.000.
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Sako, Mineyuki; Oka, Tateki; Hiromoto, Yasuyuki; Yokoyama, Tomoaki; and Toda, Kunio, 4,924,270, Cl. 355-246.000.
Todd, Jeffrey L., to Asten Group, Inc. Multilayer forming fabric with high open area. 4,923,740, Cl. 428-233.000.
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Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.
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Toho, Makoto: *See*—
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Tokai Rubber Industries, Ltd.: *See*—
Matsumoto, Nobuo; Shiraki, Keita; and Funahashi, Yoshiki, 4,923,178, Cl. 267-140.100.
Tokuume, Takahiro, to NEC Corporation. Microprocessor having a dynamic memory refresh circuit. 4,924,381, Cl. 364-200.000.
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Hanada, Fumio; Ohmura, Nobuhiko; and Hirayama, Koki, 4,923,611, Cl. 210-638.000.
Tokyo-Buhin Kogyo Co., Ltd.: *See*—
Nogami, Masaaki; Hasegawa, Akira; Nojima, Hiroshi; and Murata, Mitsuhiro, 4,922,872, Cl. 123-319.000.
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Baba, Fujio; Takeuchi, Kunihiko; and Hornouchi, Shinichi, 4,924,171, Cl. 323-347.000.
Kitazume, Masahiro; Aoki, Makoto; Nogi, Hiroshi; Homma, Kazuya; and Matsuzawa, Shigemi, 4,922,752, Cl. 73-146.000.
Tokyo Magnetic Printing Company, Ltd.: *See*—
Shigeta, Masao; Choh, Tsutomu; Shimizu, Hiroyoshi; Hirai, Ippo; Mimura, Shohei; Makimura, Atsushi; and Hosaka, Hiroshi, 4,923,533, Cl. 148-304.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Tamaru, Kiichiro, 4,924,117, Cl. 307-455.000.
Tolmie, Robert J., Jr., to Pitney Bowes Inc. Envelope flap profiling apparatus. 4,924,106, Cl. 250-561.000.
Toma, Hitoshi: *See*—
Komiyama, Katsumi; Fukaya, Masaki; Yokono, Kojiro; and Toma, Hitoshi, 4,924,282, Cl. 357-30.000.
Tomida, Yasuko: *See*—
Koike, Shoji; Iwata, Kazuo; Tochihara, Shinichi; and Tomida, Yasuko, 4,923,515, Cl. 106-22.000.
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Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asano, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.
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Tomkinson, Donald L.: *See*—
Walles, Wilhelm E.; and Tomkinson, Donald L., 4,923,753, Cl. 428-402.240.
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Tomono, Shigeki: *See*—
Hara, Ryuichi; Kagizaki, Masami; Takakura, Tsuyoshi; and Tomono, Shigeki, 4,923,648, Cl. 264-29.200.
Tompkins, Keith M. Fishing lure. 4,922,647, Cl. 43-42.440.
Toombs, Chauncey E. Breech bolt. 4,922,640, Cl. 42-16.000.
Topfer, Walter, to Dr. Ing. h.c.f. Porsche AG. Crankcase ventilation system. 4,922,882, Cl. 123-572.000.
Toray Industries, Inc.: *See*—
Chiba, Kazumasa; Kobayashi, Kazuhiko; and Ueno, Osamu, 4,923,925, Cl. 525-66.000.
Toray Silicon Company, Ltd.: *See*—
Okawa, Tadashi; and Suzuki, Toshio, 4,924,020, Cl. 556-441.000.
Toray Silicone Company, Ltd.: *See*—
Yamada, Takateru; and Sasaki, Shosaku, 4,923,944, Cl. 528-15.000.
Torotrak (Development) Ltd: *See*—
Greenwood, Christopher J., 4,922,788, Cl. 475-26.000.
Torres, Manuel T.: *See*—
Ferrer, Jose M. S.; Pajares, Jose N.; and Torres, Manuel T., 4,923,024, Cl. 177-245.000.
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Harada, Hiroshi; Hirata, Yoshihiro, and Tosa, Masanobu, 4,923,526, Cl. 148-6.300.
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Brinker, Barry; and Busse, John E., 4,922,569, Cl. 15-105.000.
Toto Ltd.: *See*—
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,922,861, Cl. 122-448.00R.
Towle, Herbert C.: *See*—
Marshall, Albert H.; McCormack, Robert T.; Purvis, Edward J.; Wolff, Ronald S.; and Towle, Herbert C., 4,923,402, Cl. 434-22.000.
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Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000.
Toyne, Kenneth J.: *See*—
Gray, George W.; Lacey, David; Toyne, Kenneth J.; Coates, David; Jackson, Adam; and Scrowston, Richard M., 4,923,633, Cl. 252-299.650.
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Uenishi, Masatoshi; Hashizume, Yoshiki; and Yokote, Takamasa, 4,923,689, Cl. 423-267.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Kurita, Kazuo; and Teramoto, Yoshihiko, 4,923,662, Cl. 264-178.00F.
Toyo Ink Mfg. Co., Ltd.: *See*—
Ishikawa, Hiroshi; Gunji, Naoki; Hoshino, Yoshinori; and Ohyama, Taro, 4,923,762, Cl. 428-551.000.
Toyokawa, Yasuhumi: *See*—
Saito, Yoshihiro; Wada, Nobuhide; Kusano, Shoji; Miyazawa, Takeshige; Takahashi, Satoru; Toyokawa, Yasuhumi; and Kajiwaca, Ikuo, 4,923,501, Cl. 71-92.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kurosawa, Ryuichi, 4,924,392, Cl. 364-424.050.
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Aono, Koichi; and Ouchi, Mitsuyuki, 4,922,789, Cl. 475-86.000.
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Hillegass, Norman W.; and Drone, Walter J., 4,922,743, Cl. 72-377.000.
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Johnston, William T., 4,923,074, Cl. 220-1.500.
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Vu, Tho T.; and Tran, Danh N., 4,924,116, Cl. 307-448.000.
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Chen, Zhitong; Johnson, Gary M.; Parkinson, Ward D.; Chern, Wen-Foo; Lowrey, Tyler A.; and Trent, Thomas M., 4,924,442, Cl. 365-189.110.
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Flottmann, Thomas; and Tretzel, Joachim, 4,923,608, Cl. 210-500.250.
Trimble, Brent J.; and Trimble, Richard H. Composite bicycle frame with crossed tubular portions. 4,923,203, Cl. 280-288.300.
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Dickey, Daniel M., 4,923,557, Cl. 156-86.000.
Trippe, Jerry C.: *See*—
Waters, Paul F.; Hadermann, Albert F.; and Trippe, Jerry C., 4,923,535, Cl. 149-19.100.
Triton Technologies, Inc.: *See*—
Henrion, W. S., 4,922,756, Cl. 73-517.00R.
Trivedi, Bharat K., to Warner-Lambert Company. N-(substituted aryl)-N'-(substituted alkoxy)-ureas and thioureas as antihypercholesterolemic and antiatherosclerotic agents. 4,923,896, Cl. 514-507.000.

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Caspari, Richard B.; Trott, Arthur F.; and Bays, F. Barry, 4,923,461, Cl. 606-146.000.
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Truesdale, Grant; and Petersen, Tommy, to Raychem Corporation. Re-enterable enclosure around splice. 4,924,034, Cl. 174-87.000.
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Pollner, Juergen; Trummer, Gregor; Moelzer, Peter; and Fichtner, Karl, 4,923,253, Cl. 303-7.000.
Trychest Pty., Limited: *See*—
Van Vliet, Michael; and Chester, Brian, 4,922,835, Cl. 108-114.000.
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Leinert, Herbert; Tsaklakidis, Christos; and Sponer, Gisbert, 4,923,889, Cl. 514-422.000.
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Uzaki, Nobuyuki; Ishii, Hiroaki; Tsuchiya, Ichiro; Oguchi, Yukio; and Kawakami, Tatsuo, 4,923,831, Cl. 501-108.000.
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Ikeda, Kohji; Tsuji, Akira; and Sunaga, Yoshiyuki, 4,922,597, Cl. 29-240.000.
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Ishimura, Toshihiko; Tsuji, Kenji; Taniguchi, Nobuyuki; and Ootsuka, Hiroshi, 4,924,251, Cl. 354-418.000.
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Tsuji, Kiyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,923,998, Cl. 548-195.000.
Tsukamoto, Masahiro: *See*—
Yamaji, Katsuhiko; Ishida, Masahiko; and Tsukamoto, Masahiro, 4,923,547, Cl. 156-181.000.
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, to Toto Ltd. Multiple-purpose instantaneous gas water heater. 4,922,861, Cl. 122-448.00R.
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Tucker, John W., to Ball Corporation. System for inspecting the inside surfaces of a container for defects and method therefor. 4,924,107, Cl. 250-572.000.
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Webb, Andrew C.; and Auron, Philip E., 4,923,807, Cl. 435-69.200.
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, to Hewlett-Packard Company. Apparatus for automated cassette handling. 4,923,353, Cl. 414-226.000.
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Farmer, James O.; Schodowski, Blair J.; Mobley, Joseph G.; Cole, Gregory C.; Tumblin, John E.; Banker, Robert O.; and West, Lamar, 4,924,498, Cl. 380-15.000.
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Ferenczi, Tibor; Kovacs, Laszlo; and Szathmari, Attila, 4,923,529, Cl. 148-20.300.
Turbo Consult B.V.: *See*—
Hendriks, Rudolf, 4,922,709, Cl. 60-39.183.
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Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., 4,922,583, Cl. 24-279.000.
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Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,923,979, Cl. 536-32.000.
Tury, Edward L., to Automotive Products (U.S.A.) Inc. Electrical control system for control of an automatic transmission apparatus. 4,922,769, Cl. 74-866.000.
U C B Societe Anonyme: *See*—
Cossement, Eric; Geerts, Jean-Pierre; Gobert, Jean; Michel, Philippe; and Wulfert, Ernst, 4,923,865, Cl. 514-235.800.
Uchdorf, Rudolf: *See*—
Knofel, Hartmut; Brockelt, Michael; Petinaux, Marcel; and Uchdorf, Rudolf, 4,924,028, Cl. 564-331.000.
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Oshiro, Masayuki; Kozawa, Fusaaki; and Uchida, Akira, 4,922,755, Cl. 74-479.000.
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Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,924,439, Cl. 365-189.050.
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Matsui, Kenji; and Uchida, Yasuo, 4,924,210, Cl. 340-572.000.
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Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,924,248, Cl. 354-195.100.
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Tanaka, Shinsuke; Takahashi, Jun; Ueda, Nobuo; and Matsushima, Hiroaki, 4,923,088, Cl. 220-468.000.
Ueda, Tomoaki, to Daikin Industries, Ltd. Apparatus and method for obtaining priority numbers for drawing figures forming a display figure. 4,924,414, Cl. 364-522.000.
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Tamba, Shinichi; ano Ueda, Yoshiteru, 4,922,881, Cl. 123-572.000.
Ueda, Yutaka: *See*—
Matsui, Isamu; and Ueda, Yutaka, 4,922,703, Cl. 57-93.000.
Uehara, Yasuhiko: *See*—
Morita, Yasukazu; and Uehara, Yasuhiko, 4,924,139, Cl. 313-468.000.
Ueki, Yasuhiro; and Fujimoto, Toru, to Victor Company of Japan, Ltd. Position and speed detecting device. 4,924,161, Cl. 318-567.000.
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Ueno, Haruo: *See*—
Iwabuchi, Shigeru; Sato, Aritsune; and Ueno, Haruo, 4,922,885, Cl. 124-78.000.
Ueno, Iwao: *See*—
Uetake, Tsuyoshi; and Ueno, Iwao, 4,922,904, Cl. 606-226.000.
Ueno, Osamu: *See*—
Chiba, Kazumasa; Kobayashi, Kazuhiko; and Ueno, Osamu, 4,923,925, Cl. 525-66.000.
Ueno, Yukichi: *See*—
Takahasi, Kenichiro; and Ueno, Yukichi, 4,924,224, Cl. 341-155.000.
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Marshall, James W.; Gotchy, David; Uffelman, Bradley L.; Leimbach, Wendell B.; and Wilhelmi, Albert A., 4,922,604, Cl. 29-598.000.
Ufford, Keith A.: *See*—
Doan, Phong D.; Upton, James E.; Hess, Douglas H.; Bass, Wayne R.; and Ufford, Keith A., 4,922,607, Cl. 29-879.000.
Ugolini, Filippo, to Salus S.r.l. Artificial knee-joint. 4,923,472. Cl 623-20.000.
Ukai, Toshinao: *See*—
Ohno, Shigeru; Mihara, Yuji; Adachi, Keiichi; Ukai, Toshinao; and Hayashi, Gouichi, 4,923,638, Cl. 252-587.000.
Yagihara, Morio; Matushita, Tetunori; Ukai, Toshinao; and Katoh, Kazunobu, 4,923,789, Cl. 430-517.000.
Ukita, Teruhiko, to Kabushiki Kaisha Toshiba. Phoneme similarity calculating apparatus. 4,924,518, Cl. 381-41.000.
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Onishi, Masayoshi; Ozawa, Hitomasa; and Umemaru, Hisato, 4,922,761, Cl. 73-862.330.
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Kinnan, Frank R., 4,923,134, Cl. 242-54.00R.
Unger, Henry M. Extensible handle bar. 4,922,577, Cl. 16-115.000.
Uni Corp.: *See*—
Burg, Robert J., 4,923,322, Cl. 403-190.000.
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Kao, Sun-Chueh; Cann, Kevin J.; Karol, Frederick J.; Marcinkowsky, Arthur E.; Goode, Mark G.; and Theobald, Eugene H., 4,923,938, Cl. 526-133.000.
Lee, Chinsoo; Hoy, Kenneth L.; and Donohue, Marc D., 4,923,720, Cl. 427-422.000.
Union Oil Company of California: *See*—
Abdo, Suheil F., 4,923,592, Cl. 208-111.000.
Kokayeff, Peter; and Abdo, Suheil F., 4,923,836, Cl. 502-74.000.
Watkins, David R., 4,923,009, Cl. 166-272.000.
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Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, 4,922,842, Cl. 112-304.000.
Union Special G.m.b.H.: *See*—
Hyca, Bohumil, 4,922,843, Cl. 112-318.000.
Uniroyal Goodrich Tire Company, The: *See*—
Kraus, Robert T., 4,922,834, Cl. 108-51.100.

Unisys Corporation: *See*—
Criswell, Peter B., 4,924,467, Cl. 371-68.100.
Henze, Christopher P., 4,924,170, Cl. 323-272.000.
Savage, Shaun V.; and Harris, Johnny M., 4,924,427, Cl. 364-900.000.

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Gray, George W.; Lacey, David; Toyne, Kenneth J.; Coates, David; Jackson, Adam; and Scrowston, Richard M., 4,923,633, Cl. 252-299.650.

United States of America
Administrator, National Aeronautics and Space Administration: *See*—
Kosmo, Joseph J.; and Dawn, Frederic S., 4,923,741, Cl. 428-252.000.

Agriculture: *See*—
Sawhney, A. Paul S.; Folk, Craig L.; and Robert, Kearny Q., 4,922,701, Cl. 57-12.000.

Air Force: *See*—
Bice, Gregory W.; Skoog, Mark A.; and Howard, John D., 4,924,401, Cl. 364-433.000.
Ceklovsky, Joseph P., 4,924,239, Cl. 343-882.000.
Martin, Raymond G., 4,924,230, Cl. 342-90.000.

Army: *See*—
Johnson, John L., 4,923,263, Cl. 350-6.900.
Roberts, Thomas G.; Wilkinson, Edward L.; and Webster, Lee O., 4,923,151, Cl. 244-158.00R.
Verona, Robert W.; Gillespie, J. Brian; and Brindle, James H., 4,922,550, Cl. 2-6.000.

Energy: *See*—
Eichel, Paul H.; Ghiglia, Dennis C.; and Jakowatz, Charles V., Jr., 4,924,229, Cl. 342-25.000.
Smith, Barbara F.; Jarvinen, Gordon D.; and Ryan, Robert R., 4,923,630, Cl. 252-184.000.

Health & Human Services: *See*—
Gansow, Otto A.; and Kumar, Krishan, 4,923,985, Cl. 540-474.000.

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Bluck, Raymond M.; Bush, Harold G.; and Johnson, Robert R., 4,923,751, Cl. 428-35.900.
Chao, Tien-Hsin; and Liu, Hua-Kuang, 4,924,507, Cl. 382-31.000.
Dickerson, George E., 4,923,545, Cl. 156-153.000.
Morgan, Gene E.; and Dyer, Gerald E., 4,924,053, Cl. 219-75.000.
Shlichta, Paul J., 4,922,807, Cl. 98-1.500.

Navy: *See*—
Anderson, Gordon W.; Boos, John B.; Dietrich, Harry B.; Ma, David I.; Mack, Ingham A. G.; and Papanicolaou, Nicolas A., 4,924,285, Cl. 357-30.000.
Marshall, Albert H.; Wolff, Ronald S.; McCormack, Robert T.; and Purvis, Edward J., 4,923,401, Cl. 434-22.000.
Marshall, Albert H.; McCormack, Robert T.; Purvis, Edward J.; Wolff, Ronald S.; and Towle, Herbert C., 4,923,402, Cl. 434-22.000.
Vernon, Susan N.; and Gammell, Paul M., 4,924,182, Cl. 324-237.000.

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Bernardet, Henri, 4,924,138, Cl. 313-361.100.
Brinkmeyer, Ernst; Brennecke, Wolfgang; and Otto, Rainer J. R. W., 4,923,290, Cl. 350-377.000.
Caporali, Didier Y. F.; and Geernickx, Frans L. A., 4,924,205, Cl. 338-227.000.
De With, Gijsbertus; and Van Dijk, Hendricus J. A., 4,923,420, Cl. 445-22.000.
Kaldenhoven, Lambert C. I., 4,924,142, Cl. 313-490.000.
Klos-Hein, Karl; and Rumpf, Horst H., 4,924,336, Cl. 360-105.000.
Kunz, Dietmar; Bomsdorf, Karl Georg H.; and Wieland, Jurgen S., 4,924,183, Cl. 324-309.000.
Meeuwssen, Marina M. J., 4,924,146, Cl. 313-638.000.
Opheij, Willem G.; Coops, Peter; Duijvestijn, Adrianus J.; Van Eck, Dirk C.; and De Zoeten, Peter, 4,924,079, Cl. 250-201.500.
Opheij, Willem G.; and Braat, Josephus J. M., 4,924,082, Cl. 250-216.000.
Rotival, Jacques, 4,924,312, Cl. 358-140.000.
van der Meer, Jan; Varshneya-Rohra, Kiran; and Vreeswijk, Franciscus W. P., 4,924,306, Cl. 358-105.000.
Verhulst, Antonius G. H.; Bruinink, Jacob; and Lenders, Emanuel J. W. M., 4,923,283, Cl. 350-269.000.
Vilard, Philippe, 4,924,300, Cl. 358-23.000.
Winser, Paul A., 4,924,415, Cl. 364-522.000.

United Technologies Corporation: *See*—
Hinchen, John J., 4,924,475, Cl. 372-89.000.
Post, Joseph A.; and Stiles, Lorren, 4,924,400, Cl. 364-433.000.

Unitrode Corporation: *See*—
Neidorff, Robert A., 4,924,288, Cl. 357-68.000.

Univ of Ga Rss. Foundation: *See*—
Browner, Richard F.; and de Haseth, James A., 4,924,097, Cl. 250-343.000.

University of California, The Regents of the: *See*—
Hansma, Paul K.; and Drake, Barney, 4,924,091, Cl. 250-306.000.

University of Colorado Foundation, Inc.: *See*—
Anderson, Dana Z.; and Sampas, Nicholas, 4,923,299, Cl. 356-350.000.

University of Dayton: *See*—
Rubey, Wayne A., 4,923,486, Cl. 55-67.000.

University of Illinois, The Board of Trustees of the: *See*—
Weber, Larry F.; and Younce, Richard C., 4,924,218, Cl. 340-776.000.

University of Minnesota, Regents of the: *See*—
Gladfelter, Wayne L.; and Boyd, David C., 4,923,717, Cl. 427-252.000.

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Ho, Monto; and Gupta, Phalguni, 4,923,895, Cl. 514-504.000.
Langer, Dietrich W.; and Chmielowski, Marek, 4,923,264, Cl. 350-96.140.

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Marshall, Barry J.; and Guerrant, Richard L., 4,923,801, Cl. 435-12.000.

Unverferth Manufacturing Co., Inc.: *See*—
Van Mill, Michael D., 4,923,358, Cl. 414-519.000.

UOP: *See*—
Bricker, Jeffery C.; Frame, Robert R.; Benedict, Bryan L.; and Pollastrini, Sheila L., 4,923,596, Cl. 208-207.000.
Kalnes, Tom N.; and James, Robert B., Jr., 4,923,590, Cl. 208-85.000.
Kulprathipanja, Santi; and Strong, Scott A., 4,924,027, Cl. 562-580.000.
Lomas, David A., 4,923,834, Cl. 502-41.000.
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Doan, Phong D.; Upton, James E.; Hess, Douglas H.; Bass, Wayne R.; and Ufford, Keith A., 4,922,607, Cl. 29-879.000.

Urby, Lars O., to ASSA AB. Lock arrangement. 4,922,737, Cl. 70-337.000.

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Nishide, Seiichiro; and Usami, Shigeoki, 4,923,553, Cl. 156-401.000.

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Lienard, Jean; Haesebrouck, Francis; Katz, Sol; Abolins, Andrew; and Schmidt, George, 4,922,832, Cl. 105-4.200.

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Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.

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Appel, Stanley H.; McManaman, James L.; and Vaca, Kenneth W., 4,923,696, Cl. 424-548.000.

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Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,924,021, Cl. 556-464.000.
Schork, Reinhold; Matthes, Reinhard; and Vahlensieck, Hans-Joachim, 4,923,687, Cl. 423-210.000.

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Boireau, Christian; and Larseneur, Patrick, 4,924,127, Cl. 310-90.000.
Gay, Christian; and Lassiaz, Philippe, 4,923,044, Cl. 192-98.000.

Valeo Vision: *See*—
Philippe, Eric, 4,924,360, Cl. 362-61.000.

Valine, Steven B.: *See*—
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 4,923,125, Cl. 241-20.000.

Valleylab, Inc.: *See*—
Wuchinich, David G.; Krawitt, Donald R.; Brendolan, Robert; and Katz, Louis, 4,922,902, Cl. 604-22.000.

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Nyman, Tapani; Rommi, Vesa; and Wikman, Kai, 4,923,569, Cl. 162-339.000.

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Liedes, Allan; Ilvespaa, Heikki; and Viitanen, Olavi, 4,923,567, Cl. 162-193.000.

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Stewart, John M.; and Vavrek, Raymond J., 4,923,963, Cl. 530-314.000.

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Klosin, John J.; and Venezia, J. William, 4,924,038, Cl. 174-135.000.

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Van der Auweraer, Mark G.; De Schrijver, Frans C.; Verbeek, Guy P.; Geelen, Carina; Terrell, David R.; and De Meutter, Stefaan K., 4,923,774, Cl. 430-59.000.

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Kitamura, Hiroyuki, 4,924,298, Cl. 358-12.000.
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Lawless, Philip A.; and Viner, Andrew S., 4,923,491, Cl. 55-409.000.

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Meroni, Roberto; Viol, Fred; Lancerotto, Fabio; and Gerin, Umberto, 4,922,707, Cl. 57-408.000.

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Addie, Graeme R.; and Visintainer, Robert J., 4,923,369, Cl. 415-206.000.

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LeMoine, Eric D.; Bean, Eric S.; and Vodian, Morton A., 4,923,798, Cl. 435-5.000.

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Seibt, Artur; Maly, Heinrich; Fleck, Harald; and Haider, Gottfried, 4,922,880, Cl. 123-509.000.

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Grasso, Albert P.; and Vogel, Wolfgang M., 4,923,767, Cl. 429-12.000.

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Michel, Dieter; Parriaux, Olivier; and Voirin, Guy, 4,923,300, Cl. 356-356.000.

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Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, 4,923,982, Cl. 540-200.000.

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Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; and Verbitsky, Alexandr N., 4,923,675, Cl. 420-129.000.

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Mahon, Terrence K.; and Matre, Daniel A., 4,923,086, Cl. 220-401.000.

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Chen, Paul N., Sr.; and Vora, Rohitkumar H., 4,923,960, Cl. 528-353.000.

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Segota, Pietro, 4,922,686, Cl. 53-434.000.

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Harsy, Stephen G., 4,924.029, Cl. 564-418.000.

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Kobayashi, Tadashi; Obuchi, Shouji; Matsuno, Hiroaki; Wada, Mitsuo; and Takayanagi, Hiroshi, 4,923,951, Cl. 528-48.000.

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Lodovico, Frank J.; and Wagner, John W., 4,923,126, Cl. 241-30.000.

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Segall, Paul E.; Waitz, Harold D.; and Sternberg, Hal, 4,923,442, Cl. 604-52.000.

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Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,924,482, Cl. 375-65.000.

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Bauer, Wolfgang; Bucking, Hans-Walter; and Wallhausser, Karl-Heinz, 4,923,887, Cl. 514-373.000.

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Compton, Merle F.; Vanacore, Vincent D.; and Walsh, Brian W., 4,924,491, Cl. 379-37.000.

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Ward, David: *See—*
Calviello, Joseph A.; Bie, Paul R.; and Ward, David, 4,923,827, Cl. 437-190.000.

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Belliotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,924,002, Cl. 548-206.000.
Hutt, Marland P., Jr.; and Kiely, John S., 4,923,879, Cl. 514-300.000.
Kostlan, Catherine R.; and Sircar, Jagadish C., 4,923,872, Cl. 514-258.000.
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Tait, Charles N.; and Volpe, Ralph A., 4,922,682, Cl. 53-139.300.
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Simion, F. Anthony; Warscjewski, Dirk; and Zyzyck, Leonard A., 4,923,635, Cl. 252-545.000.

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Crandall, Richard E.; Weeks, Paul M.; and Vannier, Michael W., 4,922,925, Cl. 128-782.000.
Goldberg, Gregory I.; and Eisen, Arthur Z., 4,923,818, Cl. 435-320.000.

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Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, 4,923,912, Cl. 523-466.000.

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Yamazaki, Kunio; and Watanabe, Tetsuzi, 4,923,666, Cl. 264-572.000.

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Hosoi, Nobuyuki; Hashimoto, Shigeru; Yoshida, Hiroshi; Watanabe, Yukio; Mukai, Yasuo; and Yamamoto, Michiko, 4,923,766, Cl. 428-694.000.

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Elliott, George M.; Watford, Ervin L., Jr.; and Howell, George W., 4,923,555, Cl. 156-497.000.

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Jackson, Miles N.; Rogers, Peter J.; and Watson, Brenda L., 4,923,304, Cl. 366-184.000.

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Khulbe, Chandra P.; Belinko, Keith; Waugh, Richard J.; and Perreault, Michel, 4,923,838, Cl. 502-151.000.

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Grieb, John H.; Joseph, J. Michael; Weaver, Richard D.; and Bata, George T., 4,923,169, Cl. 251-118.000.

Webasto AG Fahrzeugtechnik: *See—*
Panick, Karl; Widemann, Friedrich; Schoenberger, Hermann; Sperl, Johann; and Sondermeier, Johann, 4,923,033, Cl. 181-211.000.

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Tararuj, Christopher, 4,923,063, Cl. 206-484.000.

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Morini, Francesco; and Bortolotti, Paolo, 4,923,122, Cl. 239-585.000.

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Resuggan, Harold F., 4,923,182, Cl. 267-169.000.

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Webster, Emmett G.: *See—*
Linde, Gilbert W.; Seymour, Shaun A.; and Webster, Emmett G., 4,922,692, Cl. 56-1.000.

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Roberts, Thomas G.; Wilkinson, Edward L.; and Webster, Lee O., 4,923,151, Cl. 244-158.00R.

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Sergel, Horst; Aschemann, Dieter; Gerloff, Klaus; Kay, Alexander; and Wedemeyer, Lutz, 4,922,751, Cl. 73-146.000.

Weeks, Paul M.: *See—*
Crandall, Richard E.; Weeks, Paul M.; and Vannier, Michael W., 4,922,925, Cl. 128-782.000.

Weibel, Michael K.; and Myers, Chester D., to SBP, Inc.; and SLR Inc., a part interest. Use of parenchymal cell cellulose to improve comestibles. 4,923,981, Cl. 536-56.000.

Weible, Gary A.: *See—*
Allred, Floyd R.; Weible, Gary A.; and Weible, Ronald L., 4,922,562, Cl. 5-82.00R.

Weible, Ronald L.: *See—*
Allred, Floyd R.; Weible, Gary A.; and Weible, Ronald L., 4,922,562, Cl. 5-82.00R.

Weidner, Timothy B.; and Salisbury, Jeffery L., to White Consolidated Industries, Inc. Handle for appliances. 4,922,576, Cl. 16-114.00R.

Weier, Richard M.: *See—*
Deason, James R.; Stealey, Michael A.; and Weier, Richard M., 4,923,891, Cl. 514-433.000.

Weigel, David C.: *See—*
Grieve, Duncan M. A.; Poon, Stephen S. C.; Thien, Tran V.; Sakizadeh, Kumars; and Weigel, David C., 4,923,792, Cl. 430-559.000.

Weight, George A.: *See—*
Lubarsky, Daniel P.; Weight, George A.; and Haisch, Mark E., 4,924,460, Cl. 370-84.000.

Weiker, Donald E.: *See—*
Arps, David H.; Brown, Howard R.; Lanham, Roy J.; and Weiker, Donald E., 4,923,328, Cl. 404-69.000.

Weisburn, James T.: *See—*
Hehn, Bruce A.; and Weisburn, James T., 4,923,062, Cl. 206-387.000.

Weiss, Dale F.; and Neustadt, Ariel, to Air Cargo Equipment Corporation. Cargo container apparatus with thermally expanding panels. 4,923,076, Cl. 220-1.500.

Weiss, Hardy P.: *See—*
Nilsen, Carl J.; and Weiss, Hardy P., 4,923,364, Cl. 415-55.600.

Weiss, Richard: *See—*
Hover, Alexander; Simon, Manfred; and Weiss, Richard, 4,923,658, Cl. 264-76.000.

Weisse, Dick O., to Tetrahex, Inc. Method of manufacturing a tetrahexaconal truss structure. 4,923,544, Cl. 156-153.000.

Welch, Daniel P.; and Stasz, Peter, to Everest Medical Corporation. Handle for electro-surgical blade. 4,922,903, Cl. 606-37.000.

Welker, Brian H., to Welker Engineering Company. Constant pressure sample cylinder with spheroid mixer. 4,922,764, Cl. 73-864.620.

Welker Engineering Company: *See—*
Welker, Brian H., 4,922,764, Cl. 73-864.620.

Wella Aktiengesellschaft: *See—*
Braun, Hans-Jurgen, 4,923,479, Cl. 8-412.000.
Lang, Gunther; Maresch, Gerhard; and Lenz, Hans-Rudi, 4,923,977, Cl. 536-20.000.

Wellesley College: *See—*
Webb, Andrew C.; and Auron, Philip E., 4,923,807, Cl. 435-69.200.

Wells, James A., to Teledyne Industries, Inc. Tapered optical fiber telescope, tracking system apparatus and method incorporating tapered optical fiber telescopes. 4,923,276, Cl. 250-206.200.

Welsh, Michael F.: *See—*
Kelly, Jr., Joseph L.; and Welsh, Michael F., 4,923,020, Cl. 175-372.000.

Wentworth, Robert J.: *See—*
Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., 4,922,583, Cl. 24-279.000.

Wenz, David G.: *See—*
Christenson, Patrick J.; Hart, Robert J.; Naatz, David C.; Rowlance, Edward J.; and Wenz, David G., 4,924,434, Cl. 364-900.000.

Werner, Hans-Peter: *See—*
Heeg, Hubert; Werner, Hans-Peter; Fenner, Manfred; and Schmidt, Olaf, 4,923,816, Cl. 435-284.000.

Werner, Jean-Jacques: *See—*
Gitlin, Richard D.; Rao, Sailesh K.; Werner, Jean-Jacques; and Zervos, Nicholas, 4,924,492, Cl. 379-93.000.

Werner, Todd A. Interpenetrating polymer network of blocked urethane prepolymer, polyol, epoxy resin and anhydride. 4,923,934, Cl. 525-528.000.

West, Lamar: *See—*
Farmer, James O.; Schodowski, Blair J.; Mobley, Joseph G.; Cole, Gregory C.; Tumblin, John E.; Banker, Robert O.; and West, Lamar, 4,924,498, Cl. 380-15.000.

West Lodge Research: *See—*
Swanson, Caleb V., Jr., 4,924,095, Cl. 250-338.500.

West, Robert C.: *See—*
Iwahara, Takahisa; and West, Robert C., 4,923,949, Cl. 528-33.000.

Western Group International: *See—*
Allred, Floyd R.; Weible, Gary A.; and Weible, Ronald L., 4,922,562, Cl. 5-82.00R.

Westfalia Separator AG: *See—*
Stolte, Friedrich, 4,922,854, Cl. 119-14.140.

Westinghouse Electric Corp.: *See—*
Bridges, Joseph W.; Luzader, Homer W.; and Amin, Chandrakant P., 4,922,741, Cl. 72-306.000.
DeMario, Edmund E., 4,923,669, Cl. 376-442.000.
Fauske, Hans K., 4,923,306, Cl. 374-34.000.
Fox, David A.; and Stechschulte, David L., 4,924,372, Cl. 363-89.000.
McLaughlin, David F.; and Talko, Francis, 4,923,577, Cl. 204-64.00T.
Rozelle, Paul F.; Koch, Karl C.; Einolf, Charles W., Jr.; and Oates, Robert M., 4,922,757, Cl. 73-660.000.
Snyder, Thomas S.; Stoltz, Richard A.; and Zuckerbrod, David, 4,923,579, Cl. 204-140.000.
Syrylo, Stephen N., Jr.; and Deal, Madison L., 4,922,742, Cl. 72-308.000.

Westlund, Arnold E., Jr.; Boyd, John M.; and Fleming, Raymond T., to GTE Products Corporation. Internal lamp reflector. 4,924,134, Cl. 313-113.000.

Whalen, David: *See—*
Grant, Thomas S.; Jalbert, Ronald L.; Whalen, David; Bartges, Brenda A.; and Thompson, Tracey L., 4,923,924, Cl. 525-66.000.

Wheeler, Roger R.; and Martin, John R., to Martin Automatic Inc. Method and apparatus for forming a butt splice. 4,923,546, Cl. 156-159.000.

Whicomb, Gail: *See—*
Klaeger, Joseph H., 4,922,875, Cl. 123-46.0SC.

Whippey, Nigel R.: *See—*
Leber, Helmut; and Whippey, Nigel R., 4,923,497, Cl. 65-86.000.
White Consolidated Industries, Inc.: *See—*
Poulsen, Douglas, 4,923,260, Cl. 312-214.000.
Weidner, Timothy B.; and Salisbury, Jeffery L., 4,922,576, Cl. 16-114.00R.
White, Donald L., to American Telephone and Telegraph Company. Alignment of lithographic system. 4,923,301, Cl. 356-356.000.
White, James M.: *See—*
Dinan, Raymond F.; Dubil, James F.; Hillery, John R.; Rodite, Robert R.; and White, James M., 4,924,521, Cl. 382-54.000.
White, Russell L.: *See—*
Hodges, Joseph T.; and White, Russell L., 4,924,367, Cl. 362-311.000.
White, Steve R.: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.
Whitemetal Inc.: *See—*
Spinks, Arthur L.; and Woodson, Jerry P., 4,922,664, Cl. 51-321.000.
Whitten, Timothy M.: *See—*
Rotter, Bernard J.; Whitten, Timothy M.; and Brown, Silas A., 4,922,666, Cl. 52-66.000
Widemann, Friedrich: *See—*
Panick, Karl; Widemann, Friedrich; Schoenberger, Hermann; Sperl, Johann; and Sondermeier, Johann, 4,923,033, Cl. 181-211.000.
Wiechert, Rudolf: *See—*
Bohlmann, Rolf; Laurent, Henry; Hofmeister, Helmut; and Wiechert, Rudolf, 4,923,640, Cl. 552-625.000.
Wieczorek, Rudolf. *See—*
Horak, Dieter K.; and Wieczorek, Rudolf, 4,924,468, Cl. 371-22.100.
Wiegand, Joseph R.: *See—*
Weaver, A. Michael; Wiegand, Joseph R., and Stickley, Dewey C., 4,923,081, Cl. 220-72.000.
Wieland, Heinrich: *See—*
Seidel, Dietrich; Wieland, Heinrich; Rosskopf, Gerhard; and Rath, Dieter, 4,923,439, Cl. 604-6.000.
Wieland, Jurgen S.: *See—*
Kunz, Dietmar; Bomsdorf, Karl Georg H.; and Wieland, Jurgen S., 4,924,183, Cl. 324-309.000.
Wikman, Kai: *See—*
Nyman, Tapani; Rommi, Vesa; and Wikman, Kai, 4,923,569, Cl. 162 339.000.
Wikstrom, Rolf; and Sjolund, Erik. Cooling device. 4,924,066, Cl. 219-142.000.
Wilcox, Alun: *See—*
Cooper, John E.; and Wilcox, Alun, 4,923,476, Cl. 623-38.000.
Wild, Victor F. Intraocular lens with fluorescing support loops. 4,923,468, Cl. 623-6.000.
Wilde, Sheldon L., to H-C Industries, Inc. Tamper-indicating plastic closure. 4,923,073, Cl. 215-252.000.
Wiley, Allen C., to Microfuel Corporation. Method of pneumatic comminution. 4,923,124, Cl. 241-5.000.
Wilhelm Hegenscheidt GmbH *See—*
Ostertag, Alfred, 4,922,739, Cl. 72-80.000.
Wilhelmi, Albert A.: *See—*
Marshall, James W.; Gotchy, David; Uffelman, Bradley L.; Leimbach, Wendell B.; and Wilhelmi, Albert A., 4,922,604, Cl. 29-598.000.
Wilhelmson, Jack L., to Cooper Industries, Inc. Temperature controlled soldering resistor to change the set temperature. 4,924,067, Cl. 219-241.000.
Wilkins, John D.: *See—*
Matyas, Stephen M., Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D., Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Matyas, Stephen M.; Abraham, Dennis G.; Arnold, William C.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; White, Steve R.; and Wilkins, John D., 4,924,515, Cl. 380-25.000.
Wilkinson, Edward L.: *See—*
Roberts, Thomas G.; Wilkinson, Edward L.; and Webster, Lee O., 4,923,151, Cl. 244-158.00R.
Wilkinson Sword Gesellschaft mit beschrankter Haftung: *See—*
Grange, Kenneth, 4,922,609, Cl. 30-57.000.
Willbond, Andrew D.: *See—*
Colton, Peter; Willbond, Andrew D.; and Stocker, Mark A., 4,922,977, Cl. 144-230.000.
Willcoxen, Mark A.: *See—*
Dorfman, Jan L.; Dugan, Larry M.; Young, David C.; and Willcoxen, Mark A., 4,923,095, Cl. 222-386.500.
Willenberg, Bernd; El Sayed, Aziz; Rohr, Harry; and Dicke, Hans-Rudolf. Process for the production of mouldings and films from thermotropic polymers. 4,923,660, Cl. 264-103.000.
Willi Studer AB: *See—*
Thie, Werner; and Schmid, Johann J., 4,922,920, Cl. 128-699.000.
William Seroy Group, The: *See—*
Jensen, Ned L., 4,923,855, Cl. 514-188.000.
Williams, Dennis J.: *See—*
Day, Gerald F.; Robinson, Frank; and Williams, Dennis J., 4,923,724, Cl. 428-36.100.
Williams, E. Lee, Jr.; and Thomasson, J. Sam, to R. J. Reynolds Tobacco Company. Tobacco feeder. 4,922,932, Cl. 131-290.000.
Williams, F. R.: *See—*
Williams, Terry D., 4,923,215, Cl. 280-851.000.
Williams International Corporation: *See—*
Meyer, Robert H.; Pampreen, Ronald C.; and Sawyer, Kenneth W., 4,922,997, Cl. 165-8.000.
Nelson, Charles A., 4,922,708, Cl. 60-39.141.
Williams, John P., Jr.: *See—*
Marcie, Mark J.; and Williams, John P., Jr., 4,924,054, Cl. 219-85.140.
Williams, Paul. Convertible sofa-bed. 4,922,561, Cl. 5-9.00R.
Williams, Terry D., to Williams, F. R.; Martinez, Ruben C.; and Williams, Terry D. Attachment structure for mud flaps. 4,923,215, Cl. 280-851.000.
Williams, Thomas D.: *See—*
Herbert, Raymond J.; and Williams, Thomas D., 4,924,240, Cl. 346-1.100.
Wills, James H. Bow cover. 4,922,849, Cl. 114-361.000.
Wilmoth, David D.: *See—*
Paterson, James L.; Wilmoth, David D.; and Riemenschneider, Bert R., 4,924,437, Cl. 365-185.000.
Wilson, Anthony D.: *See—*
Fillingham, John F.; Hawkins, Ronald J.; and Wilson, Anthony D., 4,923,148, Cl. 244-137.100.
Wilson, Edmund B., III: *See—*
Van Iperen, Willem H. P.; Wilson, Edmund B., III; and Golabek, Robert S., Jr., 4,923,077, Cl. 220-3.100.
Wilson, Joey A. Braided eyeglass retainer and wristband. 4,922,581, Cl. 24-3.00C.
Wilson, Keith E.: *See—*
Brooks, Mark L.; and Wilson, Keith E., 4,923,759, Cl. 428-521.000.
Wiltgen, Bernard M.: *See—*
Lostumo, Arthur J.; and Wiltgen, Bernard M., 4,923,908, Cl. 523-220.000.
Winkler, Dieter: *See—*
Liechke, Burkhard; and Winkler, Dieter, 4,924,136, Cl. 313-336.000.
Winser, Paul A., to U.S. Philips Corporation. Apparatus for modifying data stored in a random access memory. 4,924,415, Cl. 364-522.000.
Winter, Horst, to Krones AG Hermann Kronseder Maschinenfabrik. Device for cutting contoured labels. 4,922,775, Cl. 83-333.000.
Wischusen, Henry, III; and Champion, William L., to Rock-Tenn Company. Vehicle sun screen. 4,923,239, Cl. 296-97.700.
Wise, David S., to Tameran, Inc. Microform printer. 4,924,259, Cl. 355-57.000.
Wisneski, Tony J.: *See—*
Killian, Thomas M.; and Wisneski, Tony J., 4,923,742, Cl. 428-283.000.
Withey, David J.: *See—*
Rowen, William I.; and Withey, David J., 4,922,710, Cl. 60-39.281.
Witkin, Roy T.: *See—*
Simon, Gilbert I.; and Witkin, Roy T., 4,923,677, Cl. 422-37.000.
Wittmann, Dieter: *See—*
Struss, Klaus; Lindner, Christian; Piejko, Karl-Erwin; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,923,923, Cl. 525-64.000.
Witucki, Gerald L., to Dow Corning Corporation. Organosilicone resin coating compositions. 4,923,755, Cl. 428-447.000.
Woehler, Hans-Juergen: *See—*
Armbrust, Eberhard, and Woehler, Hans-Juergen, 4,923,209, Cl. 280-689.000.
Wolfert, Barbara; and Dorman, Ira S., to Wolfert, Barbara. Insect repellent clothing bag. 4,923,745, Cl. 428-35.400.
Wolff, Ronald S.: *See—*
Marshall, Albert H.; Wolff, Ronald S.; McCormack, Robert T.; and Purvis, Edward J., 4,923,401, Cl. 434-22.000.
Marshall, Albert H.; McCormack, Robert T.; Purvis, Edward J.; Wolff, Ronald S.; and Towle, Herbert C., 4,923,402, Cl. 434-22.000.
Wolfle, Hans-Peter: *See—*
Gusewell, Eike; Wolfle, Hans-Peter; and Maier, Egon, 4,922,690, Cl. 53-587.000.
Wolfram, Thomas: *See—*
Clark, John H.; Fisher, James H.; and Wolfram, Thomas, 4,924,471, Cl. 372-34.000.
Wollnik, Hermann; and Matsuda, Hisashi. Double focusing mass spectrometer and MS/MS arrangement. 4,924,090, Cl. 250-296.000.
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, to Bayer Aktiengesellschaft. 1-Aminomethyl-3-aryl-4-cyano-pyrroles and their use as fungicides. 4,923,883, Cl. 514-343.000.
Wollweber, Detlef, to Bayer Aktienegesellschaft. 2-carboxy-3-cyano-4-aryl-pyrroles. 4,923,994, Cl. 546-281.000.
Wolverine Aluminum Distributing Ltd.: *See—*
Stewart, Peter D., 4,923,235, Cl. 294-141.000.
Wong, Cho L.: *See—*
Lewis, Harry E.; Ritenour, Gibson D.; Wong, Cho L.; Gara, George; and Eddisford, Allen F., 4,924,500, Cl. 379-201.000.
Wong, S. Simon: *See—*
Behfar-Rad, Abbas; and Wong, S. Simon, 4,924,476, Cl. 372-94.000.
Wong, Stephen S.: *See—*
Valyocsik, Ernest W.; Wong, Stephen S.; and Calvert, Robert B., 4,923,690, Cl. 423-328.000.
Wong, Y. H.: *See—*
Liu, Jay J.; and Wong, Y. H., 4,923,521, Cl. 134-5.000.
Wood, Antony J.; and Gocher, George F., to Ferranti International plc. Fluid control valve. 4,923,172, Cl. 251-282.000.

Woodard, Kenneth E., Jr., Fister, Julius C., Jr.; Farr, David L.; and Dean, Robert A., to Olin Corporation. Electrode elements for filter press membrane electrolytic cells. 4,923,583, Cl. 204-286.000.
Woodfold-Marco Mfg., Inc.: *See—*
Maronate, John D.; Jones, Ralph D.; and Lewis, Mark F., 4,922,987, Cl. 160-183.000.
Woodring, William J.: *See—*
Gladfelter, Jason; Woodring, William J.; Grube, Louis L.; and Horner, Charles J., Jr., 4,923,712, Cl. 427-140.000.
Woodroast Systems, Inc.: *See—*
Jacobs, Sheldon F., 4,924,071, Cl. 219-400.000.
Woodroffe, Jaime A.; and Abichandani, Jeevan S., to Avco Research Laboratory, Inc. Sulfur equilibrium desulfurization of sulfur containing products of combustion. 4,922,840, Cl. 110-345.000.
Woodson, Jerry P.: *See—*
Spinks, Arthur L.; and Woodson, Jerry P., 4,922,664, Cl. 51-321.000.
Woodville Polymer Engineering Limited: *See—*
Broadhurst, Jeffrey C., 4,923,145, Cl. 244-100.00A
Wright, Arthur J.: *See—*
Cheeseman, David S.; and Wright, Arthur J., 4,924,501, Cl. 379-201.000.
Wright, Edward S.; and Wright, Sonja J., to Wright Linear Pump, Inc. Method for promoting flow of a body fluid within a human limb. 4,922,893, Cl. 128-64.000.
Wright, Ian G., to Eli Lilly and Company. Method of resolving cis 3-amino-4-[2-(2-furyl)eth-1-yl]-1-methoxycarbonylmethyl-azetidin-2-one. 4,923,983, Cl. 540-363.000.
Wright, John L. Moineau pump with rotating closed end outer member and nonrotating hollow inner member. 4,923,376, Cl. 418-48.000.
Wright Linear Pump, Inc.: *See—*
Wright, Edward S.; and Wright, Sonja J., 4,922,893, Cl. 128-64.000.
Wright, Sonja J.: *See—*
Wright, Edward S.; and Wright, Sonja J., 4,922,893, Cl. 128-64.000.
Wu, Take: *See—*
Wang, Hsug-Fang; and Wu, Take, 4,923,159, Cl. 248-205.300.
Wuchinich, David G.; Kreuitt, Donald R.; Brendolan, Robert; and Katz, Louis, to Valleylab, Inc. Method for removing cellular material with endoscopic ultrasonic aspirator. 4,922,902, Cl. 604-22.000.
Wuelknitz, Peter; Lehmann, Rudolf; Ploeger, Walter; Hill, Karlheinz; and Forg, Franz, to Henkel Kommanditgesellschaft auf Aktien. Antimicrobial flavored compositions having particular utility as mouth washes. 4,923,685, Cl. 424-54.000.
Wuermli, Arthur: *See—*
Slavik, Walter; and Wuermli, Arthur, 4,922,704, Cl. 57-261.000.
Wuerzer, Bruno: *See—*
Schulz, Guenter; Buschmann, Ernst; Sauter, Hubert; Zeeh, Bernd; Wuerzer, Bruno; Jung, Johann; and Retzlaff, Guenter, 4,923,503, Cl. 71-92.000.
Wulfert, Ernst: *See—*
Cossement, Eric; Geerts, Jean-Pierre; Gobert, Jean; Michel, Philippe; and Wulfert, Ernst, 4,923,865, Cl. 514-235.800.
Wycech, Joseph, to Essex Composite Systems. Method of manufacturing a lightweight composite automotive door beam. 4,922,596, Cl. 29-897.200.
Wycech, Joseph, to Essex Composite Systems. Process and compositions for reinforcing structural members. 4,923,902, Cl. 521-54.000.
Wynn, Edward J.: *See—*
Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., 4,924,405, Cl. 364-468.000.
Wysocki, Joseph A.: *See—*
Bailey, Wilbur M.; Hulderman, George H.; Jones, Vincent L.; Pikulski, Joseph L.; Standlee, Arlie G.; Tangonan, Gregory L.; Vince, Michael R.; and Wysocki, Joseph A., 4,924,087, Cl. 356-73.100.
Wyvratt, Matthew J.: *See—*
Hupe, Donald; and Wyvratt, Matthew J., 4,923,885, Cl. 514-359.000.
Xerox Corporation: *See—*
Bares, Jan, 4,924,263, Cl. 355-203.000.
Brinton, Catherine A.; and Lux, Adalbert A., 4,924,271, Cl. 355-284.000.
Budnik, Roger W., 4,924,262, Cl. 355-75.000.
Partilla, Stephen R.; and Mungenast, Mark F., 4,924,265, Cl. 355-204.000.
Schank, Richard L., 4,923,775, Cl. 430-59.000.
Yazdy, Mostafa R., 4,924,115, Cl. 307-443.000.
Xu, Jisen, to Aster Corporation. Fiber optic coupler. 4,923,268, Cl. 350-96.150.
Yagi Juzo: *See—*
Mizukusa, Takashi; and Yagi, Juzo, 4,922,949, Cl. 137-309.000.
Yagi, Kiyoshi; Kanno, Toshiaki; and Inada, Toshio, to Yazaki Corporation. High conductivity carbon fiber. 4,923,637, Cl. 252-511.000.
Yagi, Shigenori; Myoi, Yasuhito; Kuzumoto, Masaki; Kuba, Kazuki; Seiwa, Yoshito; Aoyagi, Toshitaka; and Mihashi, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Laser device with high oscillation efficiency. 4,924,474, Cl. 372-75.000.
Yagi, Shigeru; Ono, Masato; Takahashi, Noriyoshi; Nishikawa, Masayuki; Fukuda, Yuzuru; and Karakida, Kenichi, to Fuji Xerox Co., Ltd. Multilayered electrophotographic photoreceptor of amorphous silicon having a surface layer of nitrogenated amorphous silicon. 4,923,773, Cl. 430-57.000.
Yagihara, Morio; Matushita, Tetunori; Ukai, Toshinao; and Katoh, Kazunobu, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,923,789, Cl. 430-517.000.
Yakigaya, Nobuyuki: *See—*
Hayashi, Tsutomu; Ichikawa, Tetsuya; Katahira, Kiyoshi; Tateshima, Yoshinobu; Matsuto, Takushi; Nakajima, Yoshihiro; Nakamura, Kazuhiko; Yakigaya, Nobuyuki; Saito, Mitsuru; and Sakakibara, Kenji, 4,923,027, Cl. 180-219.000.
Yamabe, Hitoshi; Sekine, Noboru; Takagi, Shuichi; and Fujimoto, Sachito, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method for an engine with a fluid torque converter clutch. 4,923,042, Cl. 192-0.096.
Yamada, Akira: *See—*
Murata, Masayoshi; Chiba, Toshiyuki; and Yamada, Akira, 4,923,857, Cl. 514-210.000.
Yamada, Eiichi: *See—*
Masuhara, Eiichi, Kadoma, Yoshinori; Matsumoto, Takeo; Komai, Takeshi; Yamada, Eiichi; Nakachi, Osamu; and Irukayama, Godo, 4,923,905, Cl. 522-24.000.
Yamada, Kazumasa: *See—*
Murata, Minoru; and Yamada, Kazumasa, 4,923,168, Cl. 251-75.000.
Yamada, Koji: *See—*
Murakata, Chikara; Sato, Akira; Takahashi, Mitsuru; Kobayashi, Eiji; Morimoto, Makoto; Akinaga, Shiro; Hirata, Tadashi; Mochida, Kenichi; Kase, Hiroshi; Yamada, Koji; and Iwashashi, Kazuyuki, 4,923,986, Cl. 540-545.000.
Yamada, Makoto: *See—*
Horaguchi, Yoichi; Sakakibara, Kenji; Yamada, Makoto; Nagata, Osamu; Suzuki, Tsuyoshi; and Sugiura, Toshio, 4,924,255, Cl. 355-27.000.
Yamada, Masahiro, to Asahi Research Corporation. Energizing system for video cameras and lights using adapter modules. 4,924,246, Cl. 354-126.000.
Yamada, Masayuki: *See—*
Hattori, Takahiro; Kojima, Yoshinobu; and Yamada, Masayuki, 4,922,595, Cl. 29-40.000.
Yamada, Shiro: *See—*
Akao, Takeshi; Nishizawa, Yoshihiko; Yamada, Shiro; Fuse, Hisahumi; Ohsaki, Katsumichi; and Sakai, Morihiko, 4,922,650, Cl. 47-1.100.
Yamada, Shunichi: *See—*
Kobori, Takuji; Yamada, Shunichi; and Kamagata, Shuichi, 4,922,667, Cl. 52-167.0DF.
Yamada, Takashi: *See—*
Nakamura, Hiroki; Yamada, Takashi; and Ouchi, Yoshiaki, 4,923,763, Cl. 428-458.000.
Yamada, Takateru; and Sasaki, Shosaku, to Toray Silicone Company, Ltd. Release agent composition. 4,923,944, Cl. 528-15.000.
Yamada, Tetuo: *See—*
Nakagoshi, Akira; Tahara, Hiroshi; Yamada, Tetuo; Sekiguchi, Hiroyuki; and Murata, Hidemi, 4,923,692, Cl. 423-447.400.
Yamada, Yasuo: *See—*
Tamaru, Kiichiro; Tanaka, Koichi; Kanuma, Akira; and Yamada, Yasuo, 4,924,469, Cl. 371-22.400.
Yamagishi, Fumio: *See—*
Kato, Masayuji; Igaki, Seigo; Yamagishi, Fumio; Ikeda, Hiroyuki; Shinzaki, Takashi; and Eguchi, Shin, 4,924,085, Cl. 250-227.280.
Yamaguchi, Atsuo: *See—*
Matsubara, Toshiyuki; Fujioka, Shuzo; Yamaguchi, Atsuo; Takahira, Kenichi; Furuta, Shigeru; and Inoue, Takesi, 4,924,465, Cl. 371-3.000.
Yamaguchi, Koshiro; Takahashi, Toshio; Kitazawa, Yasunori; and Hattori, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Printer with print head releasable after predetermined amount of successive printing or erasing. 4,923,315, Cl. 400-120.000.
Yamaguchi, Nobuyuki; and Kawashiro, Masayuki, to Daiwa Seiko, Inc. Bail reversing apparatus for fishing spinning reels. 4,923,140, Cl. 242-230.000.
Yamaguchi, Takeshi: *See—*
Fuji, Hiroshi; Maeda, Shigemi; Sakamoto, Noriaki; Terashima, Shigeo; Yamaguchi, Takeshi; Tsuji, Kentaro; and Kojima, Kunio, 4,924,447, Cl. 369-13.000.
Yamaha Corporation: *See—*
Masao, Kondo; and Ishida, Takashi, 4,922,796, Cl. 84-618.000.
Shibukawa, Takeo, 4,922,794, Cl. 84-601.000.
Suzuki, Hideo, 4,922,795, Cl. 84-608.000.
Yamaryo, Shigeru, 4,922,792, Cl. 84-382.000.
Yamaji, Katsuhiko; Ishida, Masahiko; and Tsukamoto, Masahiro, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for producing composite molded articles from nonwoven mat. 4,923,547, Cl. 156-181.000.
Yamakado, Makoto: *See—*
Kadomukai, Yuzo; Yamakado, Makoto; and Nakamura, Yozo, 4,922,869, Cl. 123-192.00R.
Yamamoto, Akira; Saguchi, Ryuichi; and Nagura, Shigehiro, to Shin-Etsu Chemical Co., Ltd. Sustained-release pheromone dispenser. 4,923,119, Cl. 239-55.000.
Yamamoto, Jun: *See—*
Ueda, Yasuyoshi; Hattori, Hideo; Yamamoto, Jun; and Hashimoto, Kiyoyasu, 4,923,974, Cl. 534-799.000.
Yamamoto, Kazuo, to Nippon Seiko Kabushiki Kaisha. Drive member for passive seat belt system. 4,923,213, Cl. 280-804.000.
Yamamoto, Michiko: *See—*
Hosoi, Nobuyuki; Hashimoto, Shigeru; Yoshida, Hiroshi; Watanabe, Yukio; Mukai, Yasuo; and Yamamoto, Michiko, 4,923,766, Cl. 428-694.000.
Yamamoto, Shinsaku: *See—*
Ishikawa, Kazushi; Yamamoto, Shinsaku; and Katogi, Hisao, 4,924,083, Cl. 250-223.00B.

Yamane, Hiroyuki; Higuchi, Yasushi; and Fujii, Tetsuo, to Nippondenso Co., Ltd. MIS transistor device. 4,924,277, Cl. 357-23.300.
Yamano, Shuichi: *See—*
Iwao, Hideki; Kato, Michio; and Yamano, Shuichi, 4,924,479, Cl. 375-7.000.
Yamanobe, Koji: *See—*
Tanaka, Hidetake; Yamazaki, Shigeru; Yamanobe, Koji; Kotabe, Hiroaki; Nakazato, Yasushi; and Banno, Masahiko, 4,924,320, Cl. 358-296.000.
Yamaoka, Akira: *See—*
Kuriyama, Kazunori; Wada, Kenichi; and Yamaoka, Akira, 4,924,377, Cl. 364-200.000.
Yamaryo, Shigeru, to Yamaha Corporation. Key mechanism for a wood wind. 4,922,792, Cl. 84-382.000.
Yamashita, Hiroshi; Fujii, Kanenaga, Fukunishi, Takumi; Shigeoka, Masafumi; and Sudo, Hiroshi, to Japan as represented by Director General of Agency of Industrial Science and Technology; Nippon Silica Glass Co., Ltd.; and Kondo Sylvania Ltd. Light source unit for a business machine. 4,924,357, Cl. 362-32.000.
Yamashita, Kouji: *See—*
Honda, Kazuhiro; Yamashita, Kouji; Kawai, Masanori; Nakahi, Kazuo; and Tatetsuki, Kuniharu, 4,924,237, Cl. 343-702.000.
Yamashita, Satoshi: *See—*
Ishii, Kazuo; Yamashita, Satoshi; and Ishige, Hiroyuki, 4,922,673, Cl. 52-221.000.
Yamashita, Shoji; Ohta, Atsuo; and Hirosawa, Yoshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Reverse driving device for an autobicycle. 4,923,028, Cl. 180-219.000.
Yamashita, Takahiro: *See—*
Hayakawa, Yoichi; Yamashita, Takahiro; Watanabe, Kazuaki; and Harada, Yoshiharu, 4,922,765, Cl. 74-15.880.
Yamashita, Tatsumaro, to Alps Electric Co., Ltd. Head position controlling method. 4,924,325, Cl. 360-10.200.
Yamashita, Tetsuo: *See—*
Tamura, Takumi; Shinoda, Shosuke; Yamashita, Tetsuo; and Okashita, Kyohiko, 4,923,352, Cl. 414-225.000.
Yamashita, Yasushi, to Kabushiki Kaisha Yamashita Denshi Sekkei. Video signal processing system. 4,924,315, Cl. 358-160.000.
Yamato, Hiroshi: *See—*
Iida, Kosuke; Yamato, Hiroshi; and Kadono, Yoji, 4,923,718, Cl. 427-386.000.
Yamatoya & Co., Ltd.: *See—*
Numakura, Takashi; and Numakura, Iwao, 4,924,323, Cl. 358-456.000.
Yamauchi, Mineo: *See—*
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,923,847, Cl. 503-227.000.
Yamazaki, Eiichi: *See—*
Hirai, Ryoji; Yamazaki, Eiichi; and Yonai, Fumiaki, 4,924,140, Cl. 313-477.00R.
Yamazaki, Hajime: *See—*
Hiza, Misao; Yamazaki, Hajime; Sugihara, Kazuhiro, and So, Tetsu, 4,923,736, Cl. 428-212.000.
Yamazaki, Kunio; and Watanabe, Tetsuzi, to Cinpres Limited. Method of injection moulding. 4,923,666, Cl. 264-572.000.
Yamazaki, Shigeru: *See—*
Tanaka, Hidetake; Yamazaki, Shigeru; Yamanobe, Koji; Kotabe, Hiroaki; Nakazato, Yasushi; and Banno, Masahiko, 4,924,320, Cl. 358-296.000.
Yamazaki, Shunpei: *See—*
Sato, Masahiko; Mase, Akira; Sakayori, Hiroyuki; and Yamazaki, Shunpei, 4,924,243, Cl. 350-320.000.
Yamazaki, Yoko: *See—*
Sasaki, Yukio; Watanabe, Takayuki; Takamiya, Hiroshi; Watanabe, Kazuo; and Yamazaki, Yoko, 4,923,912, Cl. 523-466.000.
Yanagi, Kenichi: *See—*
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,923,396, Cl. 432-59.000.
Yanagisawa, Ryozo: *See—*
Ogino, Yoshitaka; Yanagisawa, Ryozo; Koumura, Noboru; and Nanamura, Masanori, 4,924,319, Cl. 358-296.000.
Yanai, Akio: *See—*
Yasunaga, Tadashi; Yanai, Akio; and Sasazawa, Koji, 4,923,748, Cl. 428-336.000.
Yanatori, Hiromi, to Konishiroku Photo Industry Co. Ltd. Slit exposure type color image forming apparatus. 4,924,256, Cl. 355-28.000.
Yao, Masaharu: *See—*
Nakagawa, Isao; Kubota, Sadao; Suzaki, Toru; Ozawa, Toshimitsu; Yao, Masaharu; Ito, Hiroshi; Suzuki, Yoshiteru; and Shibata, Tatsuo, 4,924,305, Cl. 353-105.000.
Yashiro, Masahiko: *See—*
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, 4,924,267, Cl. 355-210.000.
Yasuda, Keiji; and Miyahara, Kazuhiro, to NGK Insulators, Ltd. Trolley transfer unit for tunnel furnace. 4,923,206, Cl. 280-504.000.
Yasuda, Koichi: *See—*
Kitahara, Satoru; Yasuda, Koichi; and Izu, Toshio, 4,924,200, Cl. 336-65.000.
Yasuda, Osamu: *See—*
Endoh, Kenjiro; and Yasuda, Osamu, 4,924,328, Cl. 360-60.000.
Yasunaga, Tadashi; Yanai, Akio; and Sasazawa, Koji, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,923,748, Cl. 428-336.000.
Yasutomi, Yoshiyuki; Matsushita, Yasuo; and Nakamura, Kousuke, to Hitachi, Ltd. Composite ceramics and method of making the same. 4,923,829, Cl. 501-95.000.
Yasuzawa, Toru: *See—*
Nakano, Hirofumi; Takahashi, Isami; Ichimura, Michio; Kawamoto, Isao; Asano, Kozo; Tomita, Fusao; Sano, Hiroshi; Yasuzawa, Toru; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,923,990, Cl. 546-84.000.
Yazaki Corporation: *See—*
Hayashi, Hideharu; Ozaki, Keiichi; and Sawai, Mamoru, 4,923,411, Cl. 439-540.000.
Ishii, Takashi, 4,923,409, Cl. 439-358.000.
Miyajima, Motoyasu, 4,924,178, Cl. 324-154.00R.
Yagi, Kiyoshi; Kanno, Toshiaki; and Inada, Toshio, 4,923,637, Cl. 252-511.000.
Yazawa, Yoshiaki: *See—*
Saito, Yoshikazu; and Yazawa, Yoshiaki, 4,924,293, Cl. 357-71.000.
Yazdy, Mostafa R., to Xerox Corporation. Integrated circuit RC filters with very large time constants. 4,924,115, Cl. 307-443.000.
Yearsley, David. Compact casket enclosure system and method. 4,922,590, Cl. 27-19.000.
Yee, Edgar, to General Electric Company. Universal circuit breaker interlock arrangement. 4,924,041, Cl. 200-50.00C.
Yeh, Gene H. C.: *See—*
Hsieh, Eric T.; Yeh, Gene H. C.; and Donaldson, John R., 4,923,649, Cl. 264-37.000.
Yeh, James T.: *See—*
Kirch, Steven J.; Lankard, John R.; Ritsko, John J.; Smith, Kurt A.; Speidell, James L.; and Yeh, James T., 4,923,772, Cl. 430-5.000.
Yeh, Phil C.: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; Yeh, Phil C.; and Smith, Ronald M., 4,924,514, Cl. 380-24.000.
Yoda, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Magnetic resonance apparatus. 4,924,184, Cl. 324-318.000.
Yokohama Rubber Co., Ltd., The: *See—*
Hiza, Misao; Yamazaki, Hajime; Sugihara, Kazuhiro; and So, Tetsu, 4,923,736, Cl. 428-212.000.
Yokomizo, Yoshikazu, to Canon Kabushiki Kaisha. Image processing apparatus. 4,924,509, Cl. 382-50.000.
Yokono, Kojiro: *See—*
Komiyama, Katsumi; Fukaya, Masaki; Yokono, Kojiro; and Toma, Hitoshi, 4,924,282, Cl. 357-30.000.
Yokonuma, Norikazu: *See—*
Iida, Yoshikazu; Hagiuda, Nobuyoshi; Yokonuma, Norikazu; Sakamoto, Hiroshi; and Matsui, Hideki, 4,924,252, Cl. 354-420.000.
Yokote, Takamasa: *See—*
Uenishi, Masatoshi; Hashizume, Yoshiki; and Yokote, Takamasa, 4,923,689, Cl. 423-267.000.
Yokoyama, Shigeki: *See—*
Sano, Akira; Yokoyama, Shigeki; Miyazaki, Yasunosuke; Kuroishi, Tetsujiro; and Matsuura, Kazuo, 4,923,935, Cl. 526-73.000.
Yokoyama, Tomoaki: *See—*
Sako, Mineyuki; Oka, Tateki; Hiromoto, Yasuyuki; Yokoyama, Tomoaki; and Toda, Kunio, 4,924,270, Cl. 355-246.000.
Yonai, Fumiaki: *See—*
Hirai, Ryoji; Yamazaki, Eiichi; and Yonai, Fumiaki, 4,924,140, Cl. 313-477.00R.
Yoneyama, Masayuki: *See—*
Hirao, Yoshiaki; Kuga, Ryuichiro; Yoneyama, Masayuki; and Ono, Shusuke, 4,924,317, Cl. 358-227.000.
Yoneyama, Takashi: *See—*
Sato, Masami; Fujiyama, Masaaki; Iwasaki, Takashi; Suzuki, Masami; Yoneyama, Takashi; and Kosha, Hideaki, 4,922,675, Cl. 51-394.000.
Yoneyoshi, Yukio; Suzukamo, Gohfu; Hamada, Kazuhiko; and Nishioka, Toshio, to Sumitomo Chemical Company, Limited. Optically active borane complex and a method for producing an optically active alcohol derivative by the use thereof. 4,923,999, Cl. 548-268.400.
Yoshida, Hiroshi: *See—*
Hosoi, Nobuyuki; Hashimoto, Shigeru; Yoshida, Hiroshi; Watanabe, Yukio; Mukai, Yasuo; and Yamamoto, Michiko, 4,923,766, Cl. 428-694.000.
Yoshida, Kazuhito: *See—*
Hirose, Kouji; Ito, Hitoshi; and Yoshida, Kazuhito, 4,923,764, Cl. 428-632.000.
Yoshida Kogyo K. K.: *See—*
Funakawa, Shigeru; and Horikawa, Mitsuo, 4,922,584, Cl. 24-381.000.
Suzuki, Takashi; and Kumano, Isamu, 4,922,585, Cl. 24-381.000.
Yoshida, Tadao: *See—*
Fujiie, Kazuhiko; Nonaka, Chiaki; and Yoshida, Tadao, 4,924,455, Cl. 369-44.210.
Yoshida, Toru: *See—*
Atsumi, Shigeru; Yoshida, Toru; Kawahara, Yasuo; and Tanaka, Fuminari, 4,924,339, Cl. 361-56.000.
Yoshida, Yoshiaki: *See—*
Katayama, Hideo; Yoshida, Yoshiaki; and Osaka, Tatsuhiko, 4,923,586, Cl. 204-403.000.

Yoshikawa, Harunori: *See—*
Maxwell, Ronald K.; Zorzi, Karl J.; Yoshikawa, Harunori; Prasad, Venkat S.; Smith, Fred G.; and Hsieh, Ming-Chih, 4,924,456, Cl. 370-32.000.
Yoshikawa, Masao; Saito, Takashi; Kobayashi, Tatuya; Kosugiyama, Otoya; Kubota, Atsushi; Waragai, Tuyoshi; Araki, Tomoyuki; Kobayashi, Hiroo; Yashiro, Masahiko; and Ishii, Hiroyuki, to Canon Kabushiki Kaisha. Process cartridge and multi-color image forming apparatus using same. 4,924,267, Cl. 355-210.000.
Yoshimoto, Masahiko; Segawa, Hiroshi; and Matsumura, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device containing video signal processing circuit. 4,924,314, Cl. 358-160.000.
Yotsuji, Minako: *See—*
Hirai, Shiro; Hirano, Hiroshi; Arai, Hirotoshi; Kiba, Yasuo; Shibata, Hisanari; Kusayanag, Yoshikazu; Yotsuji, Minako; Hashiba, Kazuhiko; and Tanada, Kikuko, 4,923,882, Cl. 514-326.000
Younce, Richard C.: *See—*
Weber, Larry F.; and Younce, Richard C., 4,924,218, Cl. 340-776.000.
Young, David C.: *See—*
Dorfman, Jan L.; Dugan, Larry M.; Young, David C.; and Willcoxen, Mark A., 4,923,095, Cl. 222-386.500.
Young, Diane K.: *See—*
Grasso, Lawrence J.; Hoffman, Dale E.; Morgan, Carroll E.; Puntar, Charles A.; and Young, Diane K., 4,924,484, Cl. 377-116.000.
Young, Robert C.: *See—*
Crabtree, Wayne L.; and Young, Robert C., 4,922,979, Cl. 144-357.000.
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., to Rorer Pharmaceutical Corporation. Benzoxepins as intermediates to $5HT_3$ antagonists. 4,924,010, Cl. 549-355.000.
Yuasa, Hayami, to Nittan Co., Ltd. Environmental abnormality alarm apparatus. 4,924,417, Cl. 364-550.000.
Zafiroglu, Dimitri, to Du Pont de Nemours, E. I., and Company. Article for absorbing cooking grease. 4,923,725, Cl. 428-36.400.
Zaman, Mohammad F.; and Gerencser, James, to Essex Group, Inc. Dancer assembly. 4,923,133, Cl. 242-45.000.
Zambrano, Adolfo R.: *See—*
Bateson, George F.; Chilcote, Dennis D.; Martinson, Michael M.; Valine, Steven B.; and Zambrano, Adolfo R., 4,923,125, Cl. 241-20.000.
Zanco, Alain L., to Skis Rossignol S.A. Ski boot with automatic closure. 4,922,635, Cl. 36-120.000.
Zantow, Timothy J.: *See—*
Chow, Carl S.; Zantow, Timothy J.; Fung, Mok-Wing; and Hartmann, Hansgregory C., 4,922,687, Cl. 53-472.000.
Zaremba, Maria: *See—*
Andruszkiewicz, Ryszard; Chmara, Henryk; Milewski, Slawomir; Borowski, Edward; Zaremba, Maria; and Borowski, Jerzy, 4,923,965, Cl. 530-331.000.
Zasio, John J.; Choy, Kenneth C.; and Parham, Darrell R., to Teradyne, Inc. Static timing analysis of semiconductor digital circuits. 4,924,430, Cl. 364-578.000.
Zaverzence, Harry: *See—*
Munsterman, Gregg H.; Geyer, Paul W.; and Zaverzence, Harry, 4,923,405, Cl. 439-78.000.
Zazzu, Victor: *See—*
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,924,225, Cl. 341-118.000.
Zedalis, Michael S.; and Gilman, Paul S., to Allied-Signal Inc. Heat treatment for aluminum-lithium based metal matrix composites. 4,923,532, Cl. 148-159.000.
Zeeh, Bernd: *See—*
Schulz, Guenter; Buschmann, Ernst; Sauter, Hubert; Zeeh, Bernd; Wuerzer, Bruno; Jung, Johann; and Retzlaff, Guenter, 4,923,503, Cl. 71-92.000.
Zegler, Robert E.: *See—*
Adams, William J.; Zegler, Robert E.; and Monson, Conrad B., 4,923,147, Cl. 244-122.0AG.
Zenith Electronics Corporation: *See—*
Capek, Raymond G.; and Danielson, David B., 4,923,422, Cl. 445-30.000.
Lostumo, Arthur J.; and Wiltgen, Bernard M., 4,923,908, Cl. 523-220.000.
Zervos, Nicholas: *See—*
Gitlin, Richard D.; Rao, Sailesh K.; Werner, Jean-Jacques; and Zervos, Nicholas, 4,924,492, Cl. 379-93.000.
Ziegenfus, Barry L.; and Scheel, Russell H., to Heico Inc. Lightweight car-on-track system. 4,922,831, Cl. 104-166.000.
Ziegler, Carl B.: *See—*
Moran, Daniel B.; Lin, Yang-I; and Ziegler, Carl B., 4,923,868, Cl. 514-253.000.
Ziegler, Horst, to W. C. Heraeus GmbH. Temperature sensitive quartz oscillator crystal with temperature coefficient controlled in manufacture. 4,924,132, Cl. 310-361.000.
Zikolova, Tatyana S.: *See—*
Markov, Marko T.; Ivanov, Chavdar B.; Jelyazkov, Deltcho G.; Mondeschka, Diana M.; Berova, Nikolina D.; Rakovska, Rositza S.; Todorova, Maria G.; Popova, Diana D.; Slavova, Emiliya D.; Zikolova, Tatyana S.; Marinova, Viola M.; Ovcharov, Radi G.; Uzunov, Petko D.; Nissimov, Jossif N.; and Gentcheva, Dobrinka G., 4,923,877, Cl. 514-284.000.
Zimmer, John E., to Flint & Walling, Inc. Submersible pump with plastic housing. 4,923,367, Cl. 415-199.100.
Zinn, Bernd, to Grote & Hartmann GmbH & Co. KG. Multipole electric plug and socket. 4,923,408, Cl. 439-341.000.
Zinn, Bernd, to Grote & Hartmann GmbH & Co. KG. Miniaturized, round, electric plug contacts with round plug sleeves and round plug prongs. 4,923,416, Cl. 439-877.000.
Zinser Textilmaschinen GmbH: *See—*
Bothner, Jakob; and Marg, Axel, 4,922,580, Cl. 19-288.000.
Zoeller, Joseph R.: *See—*
Blount, William W.; and Zoeller, Joseph R., 4,923,958, Cl. 528-272.000.
Zorzi, Karl J.: *See—*
Maxwell, Ronald K.; Zorzi, Karl J.; Yoshikawa, Harunori; Prasad, Venkat S.; Smith, Fred G.; and Hsieh, Ming-Chih, 4,924,456, Cl. 370-32.000.
Zuckerbrod, David: *See—*
Snyder, Thomas S.; Stoltz, Richard A.; and Zuckerbrod, David, 4,923,579, Cl. 204-140.000.
Zuidema, Blake K.: *See—*
Diehm, Randall S.; and Zuidema, Blake K., 4,923,508, Cl. 75-10.140.
Zumkeller, Oskar; and Fesenmeieir, Hugo, to Mannesmann Kienzle GmbH. Push button for a value input keyboard. 4,924,045, Cl. 200-341.000.
Zumstein, Ronald C.: *See—*
Klobucar, W. Dirk; Nugent, Adam, Jr.; and Zumstein, Ronald C., 4,923,954, Cl. 528-183.000.
Zurcher, Erwin, to Graf & Cie AG. Method for hardening discrete identical elements integral with a common structure and regularly separated from each other and device for embodying this method. 4,924,062, Cl. 219-121.600.
Zygiel, Stanley D. Reciprocating jig adapter for grinding mills. 4,922,662, Cl. 51-34.00C.
Zyzyck, Leonard A.: *See—*
Simion, F. Anthony; Warscjewski, Dirk; and Zyzyck, Leonard A., 4,923,635, Cl. 252-545.000.
501 Mitsubishi Paper Mills, Ltd.: *See—*
Koike, Naomasa; and Okumura, Fumio, 4,923,845, Cl. 503-226.000.
501 Yamada Yuki Seizo Co., Ltd.: *See—*
Murata, Minoru; and Yamada, Kazumasa, 4,923,168, Cl. 251-75.000.

VOL
1114
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MAY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allied-Signal Inc *See*—
Lapin, Stephen C.; and House, David W., Re. 33,211, Cl. 525-455.000.

Borden, Peter, to High Yield Technology. Light scattering particle detector for wafer processing equipment Re. 33,213, Cl. 250-574.000.

High Yield Technology: *See*—
Borden, Peter, Re. 33,213, Cl. 250-574.000.

House, David W.: *See*—
Lapin, Stephen C.; and House, David W., Re. 33,211, Cl. 525-455.000.

Kent-Moore Corporation: *See*—
Lower, Ralph C.; Manz, Kenneth W.; and Murray, Gary P., Re. 33,212, Cl. 62-126.000.

Lapin, Stephen C.; and House, David W., to Allied-Signal Inc. Vinyl ether terminated urethane resin.. Re. 33,211, Cl. 525-455.000.

Lower, Ralph C.; Manz, Kenneth W.; and Murray, Gary P., to Kent-Moore Corporation. Service station for refrigeration equipment Re. 33,212, Cl. 62-126.000.

Manz, Kenneth W.: *See*—
Lower, Ralph C.; Manz, Kenneth W.; and Murray, Gary P., Re. 33,212, Cl. 62-126.000.

Murray, Gary P.: *See*—
Lower, Ralph C.; Manz, Kenneth W.; and Murray, Gary P., Re. 33,212, Cl. 62-126.000.

Stoufer, Wilmer B. Cleaning composition of terpene hydrocarbon and a coconut oil fatty acid alkanolamide having water dispersed therein Re. 33,210, Cl. 252-153.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Albany International Corp. *See*—
DiTullio, Venanzio, B1 4,359,501, Cl. 428-245.000.

Angio-Medical Corporation: *See*—
Catsimpoolas, Nicholas; and Sinn, Robert S., B1 4,767,746, Cl. 514-25.000.

Ball, Douglas C.; and Walker, Marshall, to Hauserman, Inc. Space divider system. B1 4,224,769, 5-8-90, Cl. 52-36.000.

Blatz, Philip S.: *See*—
Tanny, Stephen R.; Blatz, Philip S.; and Wright, Kenneth Y., Jr., B1 4,230,830, Cl. 525-222.000.

Brenner, John A.: *See*—
Brueggemann, Walter H., and Brenner, John A., B1 4,205,028, Cl. 264-24.000.

Brueggemann, Walter H., and Brenner, John A., to Ferro Corporation. Forming protective skin on intricately molded product B1 4,205,028, 5-8-90, Cl. 264-24.000.

Bullock, Joseph J., III, to Cap Snap Co. Tamper-evident cap having plural diameters. B1 4,815,620, 5-8-90, Cl. 215-256.000.

Cadtrak Corporation: *See*—
Sukonick, Josef S.; and Tilden, Greg J., B1 4,197,590, Cl. 364-900.000.

Cap Snap Co. *See*—
Bullock, Joseph J., III, B1 4,815,620, Cl. 215-256.000

Catsimpoolas, Nicholas; and Sinn, Robert S., to Angio-Medical Corporation. Method for enhancement of healing of epithelial wounds in mammals. B1 4,767,746, 5-8-90, Cl. 514-25.000.

DiTullio, Venanzio, to Albany International Corp. Hydrolysis resistant polyaryletherketone fabric. B1 4,359,501, 5-8-90, Cl. 428-245.000.

Du Pont de Nemours, E. I., and Company: *See*—
Tanny, Stephen R.; Blatz, Philip S.; and Wright, Kenneth Y., Jr., B1 4,230,830, Cl. 525-222.000.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; and Izu, Masatsugu, B1 4,689,645, Cl. 357-2.000.

Ferro Corporation: *See*—
Brueggemann, Walter H., and Brenner, John A., B1 4,205,028, Cl. 264-24.000.

GTE Laboratories Incorporated: *See*—
Stoddard, James C., B1 3,943,451, Cl. 455-158.000.

Hauserman, Inc.: *See*—
Ball, Douglas C.; and Walker, Marshall, B1 4,224,769, Cl. 52-36.000.

Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, to Toyo Seikan Kaisha, Ltd. Plastic bottles and process for preparation thereof. B1 4,370,368, 5-8-90, Cl. 428-36.600.

Ichikawa Woolen Textile Co., Ltd.: *See*—
Kiuchi, Masao, B1 4,559,258, Cl. 428-156.000.

Izu, Masatsugu: *See*—
Ovshinsky, Stanford R.; and Izu, Masatsugu, B1 4,689,645, Cl. 357-2.000.

Kiuchi, Masao, to Ichikawa Woolen Textile Co., Ltd. Pressure belt for use with extended nip press in paper making machine. B1 4,559,258, 5-8-90, Cl. 428-156.000

Lemelson, Jerome H. Tape cartridge drive and transducing apparatus for the tape thereof B1 3,693,983, 5-8-90, Cl. 360-93.000.

Lemelson, Jerome H. Magnetic tape drive and transducing method B1 3,842,433, 5-8-90, Cl. 360-105.000.

Maruhashi, Yoshitsugu: *See*—
Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, B1 4,370,368, Cl. 428-36.600.

Maruhashi, Yoshitsugu: *See*—
Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, B1 4,370,368, Cl. 428-36.600.

Mason, William H., III, to Uncommon Conglomerates, Inc. Adhesive technology B1 4,702,783, 5-8-90, Cl. 156-64.000.

New Dyneer Corporation: *See*—
Thomey, Henry W., B1 4,551,120, Cl. 474-135.000.

Ovshinsky, Stanford R.; and Izu, Masatsugu, to Energy Conversion Devices, Inc. Current control device B1 4,689,645, 5-8-90, Cl. 357-2.000.

Portals Limited: *See*—
Tooth, Alan J., B1 4,183,989, Cl. 428-195.000.

Sinn, Robert S.: *See*—
Catsimpoolas, Nicholas; and Sinn, Robert S., B1 4,767,746, Cl. 514-25.000.

Stoddard, James C., to GTE Laboratories Incorporated. TV channel selector assemnly B1 3,943,451, 5-8-90, Cl. 455-158.000.

Sukonick, Josef S.; and Tilden, Greg J., to Cadtrak Corporation. Method for dynamically viewing image elements stored in a random access memory array. B1 4,197,590, 5-8-90, Cl. 364-900.000.

Tanikawa, Isao: *See*—
Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, B1 4,370,368, Cl. 428-36.600.

Tanny, Stephen R.; Blatz, Philip S.; and Wright, Kenneth Y., Jr., to Du Pont de Nemours, E. I., and Company. Adhesive blends containing thermally grafted ethylene polymer B1 4,230,830, 5-8-90, Cl. 525-222.000.

Thomey, Henry W., to New Dyneer Corporation. Belt tensioner. B1 4,551,120, 5-8-90, Cl. 474-135.000.

Tilden, Greg J.: *See*—
Sukonick, Josef S.; and Tilden, Greg J., B1 4,197,590, Cl. 364-900.000.

Tooth, Alan J., to Portals Limited Security papers. B1 4,183,989, 5-8-90, Cl. 428-195.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Hirata, Sadao; Tanikawa, Isao; and Maruhashi, Yoshitsugu, B1 4,370,368, Cl. 428-36.600.

Uncommon Conglomerates, Inc.: *See*—
Mason, William H., III, B1 4,702,783, Cl. 156-64.000.

Walker, Marshall: *See*—
Ball, Douglas C.; and Walker, Marshall, B1 4,224,769, Cl. 52-36.000.

Wright, Kenneth Y., Jr.: *See*—
Tanny, Stephen R.; Blatz, Philip S.; and Wright, Kenneth Y., Jr., B1 4,230,830, Cl. 525-222.000.

LIST OF DESIGN PATENTEES

AB SKF: *See*—
Abbestam, Goran; and Lachonius, Leif, 307,707, Cl. D8-499.000.

Abbestam, Goran; and Lachonius, Leif, to AB SKF. Conveyor chain link. 307,707, 5-8-90, Cl. D8-499.000.

Adams Mfg.: *See*—
Adams, William E., 307,745, Cl. D13-183.000.

Adams, William E., to Adams Mfg. Combined magnet and holder. 307,745, 5-8-90, Cl. D13-183.000.

Akla AB: *See*—
Qvennerstedt, Sigrid, 307,722, Cl. D9-455.000.

Alko, Ltd.: *See*—
Liss, Douglas M., 307,709, Cl. D9-300.000.

AM International Corporation: *See*—
Paik, Yong, 307,725, Cl. D10-46.000.

American Telephone & Telegraph Company: *See*—
Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 307,748, Cl. D14-115.000.

Amico, Frank. Swivel mounted tape measure. 307,726, 5-8-90, Cl. D10-72.000.

Amity Leather Products Co.: *See*—
Young, Raymond W., 307,668, Cl. D3-39.000.

Anderson, Bruce O.: *See*—
Bush, Paul; and Anderson, Bruce O., 307,681, Cl. D6-436.000.
Bush, Paul; and Anderson, Bruce O., 307,682, Cl. D6-436.000.

Andou, Takaharu: *See*—
Yoshida, Shin-ichiro; Himeno, Ryouichi; and Andou, Takaharu, 307,752, Cl. D14-240.000.

Armstrong, Daniel E.; Barker, John H.; Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., to International Business Machines Corporation. Control unit for a personal computer 307,746, 5-8-90, Cl. D14-100.000.

Armstrong, Timothy O.: *See*—
Birrell, James S.; Armstrong, Timothy O.; and Dalton, Cole J., 307,782, Cl. D21-194.000.

Ashkenazi, Saul E., to Soundesign Corp. Audio and video storage tray. 307,680, 5-8-90, Cl. D6-407.000.

Asics Corporation: *See*—
Kiyosawa, Junichi, 307,664, Cl. D2-320.000.

AT&T Information Systems: *See*—
Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 307,748, Cl. D14-115.000.

B & G Plastics, Inc.: *See*—
Kolton, Chester; and Spater, Stuart S., 307,679, Cl. D6-315.000.

Bally Manufacturing Corporation: *See*—
Cesaroni, William C.; Kulusic, Anthony M.; and Eckert, Michael P., 307,771, Cl. D21-38.000.

Band, Suzanne G. Gift box with a pocket. 307,719, 5-8-90, Cl. D9-432.000.

Bannister, Roger, to Helix Fragrances Inc. Combined box and tag. 307,717, 5-8-90, Cl. D9-430.000.

Barker, John H.: *See*—
Armstrong, Daniel E.; Barker, John H.; Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., 307,746, Cl. D14-100.000.

Barth, John M., to Hoover Universal, Inc. Base cup for a plastic container. 307,721, 5-8-90, Cl. D9-455.000.

Bayerische Motoren Werke, AG: *See*—
Boyer, Boyke, 307,737, Cl. D12-209.000.

Becker, Charles P., Jr., to Charles Becker Associates, Inc. Glass fire-screen door unit 307,793, 5-8-90, Cl. D23-406.000.

Bertrand, Vic, to Ritvik Group Inc., The. Construction toy block. 307,774, 5-8-90, Cl. D21-108.000.

Bike-O-Matic Ltd.: *See*—
Chappell, Gilmore H., 307,735, Cl. D12-124.000.

Billie, William C. Scoop. 307,694, 5-8-90, Cl. D7-691.000.

Birrell, James S.; Armstrong, Timothy O.; and Dalton, Cole J., to Precor Incorporated. Exercise cycle. 307,782, 5-8-90, Cl. D21-194.000.

Bjorkman, Gunnar; and Jarvenkyla, Jyri, to Oyuponor AB. Tube or the like. 307,790, 5-8-90, Cl. D23-266.000.

Blaser, Dean B., to Potter, Inc. Display tray for fruit or the like. 307,711, 5-8-90, Cl. D9-341.000.

Bloom, David H.: *See*—
Hart, Richard S.; Bloom, David H.; and Bransky, Jeffery D., 307,727, Cl. D10-94.000.

Bonie, John. Spray paint screen holder. 307,698, 5-8-90, Cl. D8-14.000.

Boucher, Pamela B.; and Kittle, Christopher, to Reebok International Ltd. Shoe upper. 307,663, 5-8-90, Cl. D2-314.000.

Boyer, Boyke, to Bayerische Motoren Werke, AG. Wheel for an automobile. 307,737, 5-8-90, Cl. D12-209.000.

Branco, Marlene. Clothing hamper. 307,811, 5-8-90, Cl. D32-37.000.

Bransky, Jeffery D.: *See*—
Hart, Richard S.; Bloom, David H.; and Bransky, Jeffery D., 307,727, Cl. D10-94.000.

Bray, James A.: *See*—
Saunders, William T.; and Bray, James A., 307,720, Cl. D9-438.000.

Brown, Frederick D. Pager carrier case. 307,673, 5-8-90, Cl. D3-106.000.

Bryant, Anna L. Doll. 307,779, 5-8-90, Cl. D21-166.000.

Buckhorn, Inc.: *See*—
Tabler, Charles P., 307,718, Cl. D9-432.000.

Bulgari, Paolo, to Partecipazioni Bulgari, S.p.A. Necklace. 307,728, 5-8-90, Cl. D11-13.000.

Bush Industries, Inc.: *See*—
Bush, Paul; and Anderson, Bruce O., 307,681, Cl. D6-436.000.
Bush, Paul; and Anderson, Bruce O., 307,682, Cl. D6-436.000.

Bush, Paul; and Anderson, Bruce O., to Bush Industries, Inc. Entertainment center. 307,681, 5-8-90, Cl. D6-436.000.

Bush, Paul; and Anderson, Bruce O., to Bush Industries, Inc. Entertainment center. 307,682, 5-8-90, Cl. D6-436.000.

Byar, Peter; and Spector, Edward, to Interdynamics, Inc. Flashlight for attachment to a portable air compressor. 307,806, 5-8-90, Cl. D26-37.000.

Cabiddu, John. Hair comb. 307,808, 5-8-90, Cl. D28-29.000.

Cadman, Christian B. Ornament or plate display holder 307,686, 5-8-90, Cl. D6-572.000.

Canon Kabushiki Kaisha: *See*—
Kojima, Tatsuo, 307,764, Cl. D18-13.000.

Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., to American Telephone & Telegraph Company; and AT&T Information Systems. Keyboard. 307,748, 5-8-90, Cl. D14-115.000.

Carrier Corporation: *See*—
Gilbert, Jeffrey S., 307,741, Cl. D13-162.000.

Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 307,809, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like 307,809, 5-8-90, Cl. D28-77.000.

Castelli, Clino T.: *See*—
Kelley, James O.; and Castelli, Clino T., 307,685, Cl. D6-484.000.

Cedergreen, Steven D., to Tempress Incorporated. Fishing rod holder 307,786, 5-8-90, Cl. D22-147.000

CertainTeed Corporation: *See*—
Westphal, Dennis; and Piles, Jonathan, 307,801, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,802, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,803, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,804, Cl. D25-124.000.

Cesaroni, William C.; Heilman, Gary L.; and Gremonprez, Daniel E., to Dart Industries Inc. Coffee maker 307,695, 5-8-90, Cl. D7-321.000.

Cesaroni, William C.; Kulusic, Anthony M.; and Eckert, Michael P., to Bally Manufacturing Corporation. Cabinet for gaming machine. 307,771, 5-8-90, Cl. D21-38.000.

Chan, Raymond, to Integrated Display Technology Limited. Travel clock. 307,723, 5-8-90, Cl. D10-15.000.

Chappell, Gilmore H., to Bike-O-Matic Ltd. Derailleur shifter. 307,735, 5-8-90, Cl. D12-124.000.

Charles Becker Associates, Inc.: *See*—
Becker, Charles P., Jr., 307,793, Cl. D23-406.000.

Colton, Donald R. Aerial toy. 307,773, 5-8-90, Cl. D21-82.000.

Combi Co., Ltd.: *See*—
Takahashi, Takehiko; Ishii, Yoshiyasu; and Hanashima, Taira, 307,772, Cl. D21-74.000.

Cook, Gerald, to Cook, Gerald. Portable condiment dispenser. 307,691, 5-8-90, Cl. D7-591.000.

Creative Technologies, Corporation: *See*—
Osrow, Harold; and Perry, Gordon, 307,754, Cl. D15-82.000.

Cunningham, Phillip J.; Slocomb, Leon F., Jr.; and Wilkie, George, to Slocomb Industries, Inc. Vent securing device for casement windows. 307,706, 5-8-90, Cl. D8-400.000

Daiwa Gold Co., Ltd.: *See*—
Iinuma, Kanji, 307,783, Cl. D21-214.000.

Daiwa Seico, Inc.: *See*—
Yoshikawa, Toshiaki, 307,785, Cl. D22-141.000.

Dalton, Cole J.: *See*—
Birrell, James S.; Armstrong, Timothy O.; and Dalton, Cole J., 307,782, Cl. D21-194.000.

Dana Corporation: *See*—
Otteson, Jack O., 307,736, Cl. D12-174.000.

Dart Industries Inc.: *See*—
Cesaroni, William C.; Heilman, Gary L.; and Gremonprez, Daniel E., 307,695, Cl. D7-321.000.

Davis, Lance S. Picture frame. 307,676, 5-8-90, Cl. D6-310.000.

DeKleine, Paul C.: *See*—
Pierce, Lawrence E.; Serr, Michael J.; DeKleine, Paul C.; and Shaw, Robert L., 307,743, Cl. D13-170.000.

deMare, Ada. Insect netting jacket or similar article 307,662, 5-8-90, Cl. D2-185.000.

DeRoyal Industries, Inc.: *See*—
Worley, James W., 307,799, Cl. D24-34.000.

Dubson, Paul T.; and Palmer, Lynn D., to Hewlett-Packard Company. Printer. 307,765, 5-8-90, Cl. D18-13.000.

Eckert, Michael P.: *See*—
Cesaroni, William C.; Kulusic, Anthony M.; and Eckert, Michael P., 307,771, Cl. D21-38.000.

Elsworth, Adrian J. Humidifying chamber 307,798, 5-8-90, Cl. D24-34.000.

Ernest, Richard B., to Penn Engineering & Manufacturing Corp. Electrical contact assembly. 307,744, 5-8-90, Cl. D13-171.000.

Ethicon, Inc.: *See*—
Spreckelmeier, Larry E.; and Hunt, John V., 307,797, Cl. D24-27.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Ethridge, Walter E. Fifth wheel latch release hook. 307,734, 5-8-90, Cl. D12-161.000.
Fisher, Patrick M. Combined cane and toiler paper holder. 307,666, 5-8-90, Cl. D3-9.000.
Fitzloff, Charles W.; and Regenscheid, Duane M., to Geo. A. Hormel & Co. Container. 307,716, 5-8-90, Cl. D9-424.000.
Fiust, Gwendolyn A. Stuffed toy figure. 307,781, 5-8-90, Cl. D21-171.000.
Foster, Keith. Interchangeable belt attachment. 307,730, 5-8-90, Cl. D11-200.000.
Frantz, Mark G., to Frantz Medical Development Ltd. Combined disposable medical pump cassette and connectors for enteral fluid delivery pump systems. 307,795, 5-8-90, Cl. D24-17.000.
Frantz Medical Development Ltd.: *See*—
Frantz, Mark G., 307,795, Cl. D24-17.000.
Fujitsu Limited: *See*—
Sakakura, Shigeki; and Otsuka, Masayoshi, 307,700, Cl. D18-40.000.
Fujiwara, Katsuhiro: *See*—
Shibayama, Masato; Tsuburaya, Kazuyuki; Kotsuka, Michiaki; Oshiga, Takayuki; and Fujiwara, Katsuhiro, 307,740, Cl. D13-164.000.
Garmon, Vincent S.; and Talerico, Joseph F., to International Business Machines Corporation. Floor standing computer. 307,747, 5-8-90, Cl. D14-102.000.
Gavin, Ellen, to L'Oreal, S.A. Duo eye shadow compact. 307,810, 5-8-90, Cl. D28-83.000.
Geckle, Billy R. Screw holding attachment for a screwdriver. 307,697, 5-8-90, Cl. D8-14.000.
Geis, David G.: *See*—
Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 307,748, Cl. D14-115.000.
General Electric Company: *See*—
Noe, Raymond J., 307,805, Cl. D26-2.000.
Geo. A. Hormel & Co.: *See*—
Fitzloff, Charles W.; and Regenscheid, Duane M., 307,716, Cl. D9-424.000.
Gilbert, Jeffrey S., to Carrier Corporation. Electronic control module case. 307,741, 5-8-90, Cl. D13-162.000.
Glass Dimensions, Inc.: *See*—
Perkins, David R., 307,807, Cl. D26-111.000.
Grant, Alexander D., to Tunstall Telecom Limited. Remote control 307,739, 5-8-90, Cl. D13-168.000.
Gremonprez, Daniel E.: *See*—
Cesaroni, William C.; Heilman, Gary L.; and Gremonprez, Daniel E., 307,695, Cl. D7-321.000.
Groves, Michael H., to Imperial Chemical Industries PLC. Capsule for paint tint. 307,713, 5-8-90, Cl. D9-349.000.
Hanashima, Taira: *See*—
Takahashi, Takehiko; Ishii, Yoshiyasu; and Hanashima, Taira, 307,772, Cl. D21-74.000.
Hanifl, Paul H.; Newton, John J., Jr.; and Ponsi, Lawrence G., to Sage Products, Inc. Blood needle holder. 307,796, 5-8-90, Cl. D24-25.000.
Hanks, Robert. Bottle cap removing tool. 307,766, 5-8-90, Cl. D8-33.000.
Hart, Richard S.; Bloom, David H.; and Bransky, Jeffery D., to Sunbeam Corporation. Scale base. 307,727, 5-8-90, Cl. D10-94.000.
Healzer, Gaylen D. Marble raceway. 307,780, 5-8-90, Cl. D21-143.000.
Heilman, Gary L.: *See*—
Cesaroni, William C.; Heilman, Gary L.; and Gremonprez, Daniel E., 307,695, Cl. D7-321.000.
Helix Fragrances Inc.: *See*—
Bannister, Roger, 307,717, Cl. D9-430.000.
Henkel Austria Gesellschaft m.b.H: *See*—
Rosenberg, Werner, 307,714, Cl. D9-373.000.
Herman Miller, Inc.: *See*—
Kelley, James O.; and Castelli, Clino T., 307,685, Cl. D6-484.000.
Hewlett-Packard Company: *See*—
Dubson, Paul T.; and Palmer, Lynn D., 307,765, Cl. D18-13.000.
High Q Manufacturing Co.: *See*—
Pierce, Lawrence E.; Serr, Michael J.; DeKleine, Paul C.; and Shaw, Robert L., 307,743, Cl. D13-170.000.
Serr, Michael J.; Serr, Carlyle; and Pierce, Lawrence E., 307,742, Cl. D13-141.000.
Himeno, Ryouichi: *See*—
Yoshida, Shin-ichiro; Himeno, Ryouichi; and Andou, Takaharu, 307,752, Cl. D14-240.000.
Hitachi, Ltd.: *See*—
Shibayama, Masato; Tsuburaya, Kazuyuki; Kotsuka, Michiaki; Oshiga, Takayuki; and Fujiwara, Katsuhiro, 307,740, Cl. D13-164.000.
Hoover Universal, Inc.: *See*
Barth, John M., 307,721, Cl. D9-455.000.
Hradisky, John L., to Rubbermaid Incorporated. Step stool. 307,800, 5-8-90, Cl. D25-65.000.
Hsu, An Sun. Handle for a saw or similar article. 307,702, 5-8-90, Cl. D8-97.000.
Hunt, John V.: *See*—
Spreckelmeier, Larry E.; and Hunt, John V., 307,797, Cl. D24-27.000.
Huntoon, Francis E.: *See*—
Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 307,748, Cl. D14-115.000.
Iinuma, Kanji, to Daiwa Gold Co., Ltd. Golf club head. 307,783, 5-8-90, Cl. D21-214.000.
Ima-Hong Kong Limited: *See*—
Schoenberg, Patricia, 307,750, Cl. D14-149.000.
Imperial Chemical Industries PLC: *See*—
Groves, Michael H., 307,713, Cl. D9-349.000.
Inouye, Chieko K. Multiple size automobile cup holder. 307,669, 5-8-90, Cl. D7-620.000.
Integrated Display Technology Limited: *See*—
Chan, Raymond, 307,723, Cl. D10-15.000.
Interdynamics, Inc.: *See*—
Byar, Peter; and Spector, Edward, 307,806, Cl. D26-37.000.
Interlego A.G.: *See*—
Pedersen, Niels M., 307,775, Cl. D21-108.000.
International Business Machines Corporation: *See*—
Armstrong, Daniel E.; Barker, John H.; Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., 307,746, Cl. D14-100.000.
Garmon, Vincent S.; and Talerico, Joseph F., 307,747, Cl. D14-102.000.
Ishida, Kimikazu; and Ishida, Tsuneo, to Saboten Co., Ltd. Pruning shears. 307,696, 5-8-90, Cl. D8-5.000.
Ishida, Tsuneo: *See*—
Ishida, Kimikazu; and Ishida, Tsuneo, 307,696, Cl. D8-5.000.
Ishii, Yoshiyasu: *See*—
Takahashi, Takehiko; Ishii, Yoshiyasu; and Hanashima, Taira, 307,772, Cl. D21-74.000.
Isogai, Shunji, to Isogai, Shunji. Container transfer lift. 307,813, 5-8-90, Cl. D34-28.000.
Iwatsu Electric Co., Ltd.: *See*—
Oshima, Takashi; and Nozawa, Kenji, 307,751, Cl. D14-151.000.
Jacobson, John Y. Combined rod and reel holder, or similar article. 307,787, 5-8-90, Cl. D22-147.000.
Jaquish, John, to Textron, Inc. Display case for watch bands. 307,683, 5-8-90, Cl. D6-457.000.
Jarvenkyla, Jyri: *See*—
Bjorkman, Gunnar; and Jarvenkyla, Jyri, 307,790, Cl. D23-266.000.
Johnson, Chris G.: *See*—
Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 307,748, Cl. D14-115.000.
Jordan, Willis Y. Picture frame. 307,675, 5-8-90, Cl. D6-300.000.
Kabushiki Kaisha Toshiba: *See*—
Nishida, Yoshiaki, 307,724, Cl. D10-46.000.
Yoshida, Shin-ichiro; Himeno, Ryouichi; and Andou, Takaharu, 307,752, Cl. D14-240.000.
Kabushikigaisha Taimu Kemikaru: *See*—
Suganami, Yasufumi, 307,699, Cl. D8-52.000.
Kawana, Yusuke, to Sugiyasu Industries, Co., Ltd. Compact lift for raising pallets or other loads. 307,814, 5-8-90, Cl. D34-31.000.
Kelley, James O.; and Castelli, Clino T., to Herman Miller, Inc. Table. 307,685, 5-8-90, Cl. D6-484.000.
Kerney, Jeffery E.; Koske, Charles E.; and Oen, Daniel E., to Paccar Inc. Truck cab. 307,731, 5-8-90, Cl. D12-96.000.
Kerr, Thomas C. Folding hub assembly for propeller blades. 307,738, 5-8-90, Cl. D12-214.000.
Kerr, William T. Shower filter. 307,789, 5-8-90, Cl. D23-209.000.
Kim, Harold Y. W. Ice cream cone. 307,660, 5-8-90, Cl. D1-101.000.
Kinco International, Inc.: *See*—
Kindler, Bruce R., 307,715, Cl. D9-415.000.
Kindler, Bruce R., to Kinco International, Inc. Package for gloves. 307,715, 5-8-90, Cl. D9-415.000.
Kittle, Christopher: *See*—
Boucher, Pamela B.; and Kittle, Christopher, 307,663, Cl. D2-314.000.
Kiyosawa, Junichi, to Asics Corporation. Shoe sole. 307,664, 5-8-90, Cl. D2-320.000.
Kojima, Tatsuo, to Canon Kabushiki Kaisha. Printer. 307,764, 5-8-90, Cl. D18-13.000.
Kolton, Chester; and Spater, Stuart S., to B & G Plastics, Inc. Hanger for suspenders. 307,679, 5-8-90, Cl. D6-315.000.
Koske, Charles E.: *See*—
Kerney, Jeffery E.; Koske, Charles E.; and Oen, Daniel E., 307,731, Cl. D12-96.000.
Kotsuka, Michiaki: *See*—
Shibayama, Masato; Tsuburaya, Kazuyuki; Kotsuka, Michiaki; Oshiga, Takayuki; and Fujiwara, Katsuhiro, 307,740, Cl. D13-164.000.
Kubota, Mineo; and Masuyama, Kenji, to Nippon Seimitsu Kogyo Kabushiki Kaisha. Image scanner. 307,749, 5-8-90, Cl. D14-116.000.
Kulusic, Anthony M.: *See*—
Cesaroni, William C.; Kulusic, Anthony M.; and Eckert, Michael P., 307,771, Cl. D21-38.000.
Kushitani, Hisashi. Bag for motorcycle. 307,733, 5-8-90, Cl. D12-158.000.
Lachonius, Leif: *See*—
Abbestam, Goran; and Lachonius, Leif, 307,707, Cl. D8-499.000.
Lam, Yu-Ho D., to Mascotte Industrial Associates. Carrying bag. 307,672, 5-8-90, Cl. D3-71.000.
Lee, Troy A.: *See*—
Armstrong, Daniel E.; Barker, John H.; Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., 307,746, Cl. D14-100.000.
Level, Jack R., to Tow Pro, Inc. Vehicle towing trailer. 307,732, 5-8-90, Cl. D12-101.000.
Levin, Monte L., to Trine Products Corporation. Electrically illuminated house sign. 307,768, 5-8-90, Cl. D20-17.000.

Lewinski, Kenneth F.: *See*—
Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 307,748, Cl. D14-115.000.
Libman Broom Company: *See*—
Saunders, Jolyon, 307,674, Cl. D4-138.000.
Liss, Douglas M., to Alko, Ltd. Bottle and dispensing cap. 307,709, 5-8-90, Cl. D9-300.000.
Lookerse, Jerry P. Positionally adjustable mirror. 307,678, 5-8-90, Cl. D6-312.000.
L'Oreal, S.A.: *See*—
Gavin, Ellen, 307,810, Cl. D28-83.000.
Mair, Bernard. Hook. 307,705, 5-8-90, Cl. D8-367.000.
Mascotte Industrial Associates: *See*—
Lam, Yu-Ho D., 307,672, Cl. D3-71.000.
Masuyama, Kenji: *See*—
Kubota, Mineo; and Masuyama, Kenji, 307,749, Cl. D14-116.000.
Mattson, Dean A. Fish handling tool or similar article. 307,788, 5-8-90, Cl. D22-150.000.
Mendel, Peter J.: *See*—
Armstrong, Daniel E.; Barker, John H.; Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., 307,746, Cl. D14-100.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Moriyama, Tatsurou; and Wakamatsu, Masaharu, 307,708, Cl. D13-164.000.
Mittleman, Frederick H., to Whitbread North America, Inc. Bottle. 307,710, 5-8-90, Cl. D9-307.000.
Mohasco Upholstered Furniture Corp.: *See*—
Williams, David P. G., 307,684, Cl. D6-484.000.
Moritani, Hiroshi, to Sharp Corporation. Air conditioner. 307,791, 5-8-90, Cl. D23-353.000.
Moriyama, Tatsurou; and Wakamatsu, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Controller for industrial instrumentation. 307,708, 5-8-90, Cl. D13-164.000.
Murphy, Debra L., to T. J. Style. Lockbox door protective shield with business card holder. 307,769, 5-8-90, Cl. D20-43.000.
Nava Milano S.P.A.: *See*—
Nava, Rinaldo, 307,670, Cl. D3-56.000.
Nava, Rinaldo, to Nava Milano S.P.A. Card dispenser. 307,670, 5-8-90, Cl. D3-56.000.
NEC Corporation: *See*—
Tsumuro, Yoshitaka, 307,767, Cl. D18-43.000.
Newton, John J., Jr.: *See*—
Hanifl, Paul H.; Newton, John J., Jr.; and Ponsi, Lawrence G., 307,796, Cl. D24-25.000.
Nippon Seimitsu Kogyo Kabushiki Kaisha: *See*—
Kubota, Mineo; and Masuyama, Kenji, 307,749, Cl. D14-116.000.
Nippon Telegraph and Telephone Corporation: *See*—
Yoshida, Shin-ichiro; Himeno, Ryouichi; and Andou, Takaharu, 307,752, Cl. D14-240.000.
Nishida, Yoshiaki, to Kabushiki Kaisha Toshiba. Defect inspection device for semiconductors. 307,724, 5-8-90, Cl. D10-46.000.
Noe, Raymond J., to General Electric Company. Lamp. 307,805, 5-8-90, Cl. D26-2.000.
Nozawa, Kenji: *See*—
Oshima, Takashi; and Nozawa, Kenji, 307,751, Cl. D14-151.000.
Oen, Daniel E.: *See*—
Kerney, Jeffery E.; Koske, Charles E.; and Oen, Daniel E., 307,731, Cl. D12-96.000.
Oliver, Anthony J. Handset telephone mouthpiece cover. 307,753, 5-8-90, Cl. D14-249.000.
Optyl Eyewear Fashion International Corporation: *See*—
Porsche, Ferdinand A., 307,756, Cl. D16-108.000.
Oshiga, Takayuki: *See*—
Shibayama, Masato; Tsuburaya, Kazuyuki; Kotsuka, Michiaki; Oshiga, Takayuki; and Fujiwara, Katsuhiro, 307,740, Cl. D13-164.000.
Oshima, Takashi; and Nozawa, Kenji, to Iwatsu Electric Co., Ltd. Telephone set. 307,751, 5-8-90, Cl. D14-151.000.
Osrow, Harold; and Perry, Gordon, to Creative Technologies, Corporation. Ice cream making machine. 307,754, 5-8-90, Cl. D15-82.000.
Otsuka, Masayoshi: *See*—
Sakakura, Shigeki; and Otsuka, Masayoshi, 307,700, Cl. D18-40.000.
Otteson, Jack O., to Dana Corporation. Steering column mounted control stalk. 307,736, 5-8-90, Cl. D12-174.000.
Oyuponor AB: *See*—
Bjorkman, Gunnar; and Jarvenkyla, Jyri, 307,790, Cl. D23-266.000.
Ozeki, Jiro, to Slidex Corporation. Case for receiving magnetic recording mediums. 307,667, 5-8-90, Cl. D3-35.000.
Paccar Inc.: *See*—
Kerney, Jeffery E.; Koske, Charles E.; and Oen, Daniel E., 307,731, Cl. D12-96.000.
Pagano, Raymond V. Housing for surveillance camera. 307,759, 5-8-90, Cl. D16-203.000.
Paik, Yong, to AM International Corporation. Graphic plotter. 307,725, 5-8-90, Cl. D10-46.000.
Palmer, Lynn D.: *See*—
Dubson, Paul T.; and Palmer, Lynn D., 307,765, Cl. D18-13.000.
Partecipazioni Bulgari, S.p.A.: *See*—
Bulgari, Paolo, 307,728, Cl. D11-13.000.
Pedersen, Niels M., to Interlego A.G. Toy construction element 307,775, 5-8-90, Cl. D21-108.000.
Penn Engineering & Manufacturing Corp.: *See*—
Ernest, Richard B., 307,744, Cl. D13-171.000.
Perkins, David R., to Glass Dimensions, Inc. Decorative oil lamp. 307,807, 5-8-90, Cl. D26-111.000.
Perry, Gordon: *See*—
Osrow, Harold; and Perry, Gordon, 307,754, Cl. D15-82.000.
Pierce, Lawrence E.; Serr, Michael J.; DeKleine, Paul C.; and Shaw, Robert L., to High Q Manufacturing Co. Slide switch. 307,743, 5-8-90, Cl. D13-170.000.
Pierce, Lawrence E.: *See*—
Serr, Michael J.; Serr, Carlyle; and Pierce, Lawrence E., 307,742, Cl. D13-141.000.
Piles, Jonathan: *See*—
Westphal, Dennis; and Piles, Jonathan, 307,801, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,802, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,803, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,804, Cl. D25-124.000.
Planchon, Paul O. Bottle plug remover. 307,701, 5-8-90, Cl. D8-40.000.
Ponsi, Lawrence G.: *See*—
Hanifl, Paul H.; Newton, John J., Jr.; and Ponsi, Lawrence G., 307,796, Cl. D24-25.000.
Porsche, Ferdinand A., to Optyl Eyewear Fashion International Corporation. Folding eyeglasses. 307,756, 5-8-90, Cl. D16-108.000.
Potter, Inc.: *See*—
Blaser, Dean B., 307,711, Cl. D9-341.000.
Poulsen, Leif A. Chimney cap component. 307,792, 5-8-90, Cl. D23-374.000.
Precor Incorporated: *See*—
Birrell, James S.; Armstrong, Timothy O.; and Dalton, Cole J., 307,782, Cl. D21-194.000.
Pressley, Robert C. Walking cane. 307,665, 5-8-90, Cl. D3-6.000.
Qvennerstedt, Sigrid, to Akla AB. Disposable magazine for a sticking plaster dispenser. 307,722, 5-8-90, Cl. D9-455.000.
R. Berchtold AG: *See*—
Vonlanthen, Benno, 307,704, Cl. D8-347.000.
Raburn, Richard W., to Span-America Medical Systems, Inc. Mattress pad material. 307,687, 5-8-90, Cl. D6-606.000.
Raburn, Richard W., to Span-America Medical Systems, Inc. Mattress pad material. 307,690, 5-8-90, Cl. D6-606.000.
Ralls, Craig; and Ralls, Robert. Bottle carrier. 307,712, 5-8-90, Cl. D9-344.000.
Ralls, Robert: *See*—
Ralls, Craig; and Ralls, Robert, 307,712, Cl. D9-344.000.
Reebok International Ltd.: *See*—
Boucher, Pamela B.; and Kittle, Christopher, 307,663, Cl. D2-314.000.
Regenscheid, Duane M.: *See*—
Fitzloff, Charles W.; and Regenscheid, Duane M., 307,716, Cl. D9-424.000.
Rezman, Mitchell. Portable beverage dispenser. 307,693, 5-8-90, Cl. D7-608.000.
Rhodes, Stephen C.; and Richmond, Jerry F. Support for filling bags or the like. 307,755, 5-8-90, Cl. D15-199.000.
Richmond, Jerry F.: *See*—
Rhodes, Stephen C.; and Richmond, Jerry F., 307,755, Cl. D15-199.000.
Ritvik Group Inc., The: *See*—
Bertrand, Vic, 307,774, Cl. D21-108.000.
Rodgers, Thomas E. Trot line guide. 307,784, 5-8-90, Cl. D22-134.000.
Rosenberg, Werner, to Henkel Austria Gesellschaft m.b.H. Combined container and dispenser. 307,714, 5-8-90, Cl. D9-373.000.
Rubbermaid Incorporated: *See*—
Hradisky, John L., 307,800, Cl. D25-65.000.
Ryan, Le Roi J. Housing for musical instrument. 307,760, 5-8-90, Cl. D17-6.000.
Ryan, Le Roi J. Housing for a wall mounted keyboard instrument with horizontally spaced speaker units. 307,761, 5-8-90, Cl. D17-6.000.
Ryan, Le Roi J. Modular wall mounted cabinet and bench unit for a keyboard instrument. 307,762, 5-8-90, Cl. D17-6.000.
Ryan, Le Roi J. Housing for a wall mounted keyboard instrument. 307,763, 5-8-90, Cl. D17-6.000.
Saboten Co., Ltd.: *See*—
Ishida, Kimikazu; and Ishida, Tsuneo, 307,696, Cl. D8-5.000.
Sage Products, Inc.: *See*—
Hanifl, Paul H.; Newton, John J., Jr.; and Ponsi, Lawrence G., 307,796, Cl. D24-25.000.
Sakakura, Shigeki; and Otsuka, Masayoshi, to Fujitsu Limited Process cartridge. 307,700, 5-8-90, Cl. D18-40.000.
Sanrio Company, Ltd.: *See*—
Tsuji, Shintaro, 307,758, Cl. D16-135.000.
Satterly, Karen J. Combined key ring and holder therefor. 307,671, 5-8-90, Cl. D3-61.000.
Saunders, Jolyon, to Libman Broom Company. Brush handle. 307,674, 5-8-90, Cl. D4-138.000.
Saunders, William T.; and Bray, James A., to Weirton Steel Corporation. Container end closure. 307,720, 5-8-90, Cl. D9-438.000.
Schaefer, Daniel J., to Span-America Medical Systems, Inc. Mattress pad material. 307,688, 5-8-90, Cl. D6-606.000.
Schaefer, Daniel J., to Span-America Medical Systems, Inc. Mattress pad material. 307,689, 5-8-90, Cl. D6-606.000.
Schoenberg, Patricia, to Ima-Hong Kong Limited. Two-piece telephone. 307,750, 5-8-90, Cl. D14-149.000.
Seaton, Douglas D. Game board. 307,770, 5-8-90, Cl. D21-34.000.
Seet, Wilson. Retainer for eye glasses. 307,757, 5-8-90, Cl. D16-123.000.
Seidlitz, Raymond R.: *See*—
Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 307,748, Cl. D14-115.000.

VOL
1114
ISS
2
MY
8
1990
UMI

Serr, Carlyle: *See—*
Serr, Michael J.; Serr, Carlyle; and Pierce, Lawrence E., 307,742, Cl. D13-141.000.
Serr, Michael J.; Serr, Carlyle; and Pierce, Lawrence E., to High Q Manufacturing Co. Electric plug with circuit breaker. 307,742, 5-8-90, Cl. D13-141.000.
Serr, Michael J.: *See—*
Pierce, Lawrence E.; Serr, Michael J.; DeKleine, Paul C.; and Shaw, Robert L., 307,743, Cl. D13-170.000.
Sharp Corporation: *See—*
Moritani, Hiroshi, 307,791, Cl. D23-353.000.
Shaw, Robert L.: *See—*
Pierce, Lawrence E.; Serr, Michael J.; DeKleine, Paul C.; and Shaw, Robert L., 307,743, Cl. D13-170.000.
Shibayama, Masato; Tsuburaya, Kazuyuki; Kotsuka, Michiaki; Oshiga, Takayuki; and Fujiwara, Katsuhiro, to Hitachi, Ltd. Programmable controller. 307,740, 5-8-90, Cl. D13-164.000.
Shinohara, Muneyoshi, to Takara Co., Ltd. Reconfigurable toy alligator. 307,776, 5-8-90, Cl. D21-150.000.
Shinohara, Muneyoshi, to Takara Co., Ltd. Reconfigurable toy bat. 307,777, 5-8-90, Cl. D21-150.000.
Shinohara, Muneyoshi, to Takara Co., Ltd. Reconfigurable toy wolf. 307,778, 5-8-90, Cl. D21-161.000.
Shoup, Randolph K. Insulated beverage container. 307,692, 5-8-90, Cl. D7-608.000.
Simaco Import Ltd.: *See—*
Tontarelli, Sergio, 307,677, Cl. D6-311.000.
Slidex Corporation: *See—*
Ozeki, Jiro, 307,667, Cl. D3-35.000.
Slocomb Industries, Inc.: *See—*
Cunningham, Phillip J.; Slocomb, Leon F., Jr.; and Wilkie, George, 307,706, Cl. D8-400.000.
Slocomb, Leon F., Jr.: *See—*
Cunningham, Phillip J.; Slocomb, Leon F., Jr.; and Wilkie, George, 307,706, Cl. D8-400.000.
Smith, Ronald A.: *See—*
Armstrong, Daniel E.; Barker, John H.; Lee, Troy A.; Mendel, Peter J.; and Smith, Ronald A., 307,746, Cl. D14-100.000.
Sokolowski, Eugene K.: *See—*
Cardona, Ramon M.; Geis, David G.; Huntoon, Francis E.; Johnson, Chris G.; Lewinski, Kenneth F.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 307,748, Cl. D14-115.000.
Soundesign Corp.: *See—*
Ashkenazi, Saul E., 307,680, Cl. D6-407.000.
Span-America Medical Systems, Inc.: *See—*
Raburn, Richard W., 307,687, Cl. D6-606.000.
Raburn, Richard W., 307,690, Cl. D6-606.000.
Schaefer, Daniel J., 307,688, Cl. D6-606.000.
Schaefer, Daniel J., 307,689, Cl. D6-606.000.
Spater, Stuart S.: *See—*
Kolton, Chester; and Spater, Stuart S., 307,679, Cl. D6-315.000.
Spector, Edward: *See—*
Byar, Peter; and Spector, Edward, 307,806, Cl. D26-37.000.
Spreckelmeier, Larry E.; and Hunt, John V., to Ethicon, Inc. Skin stapler. 307,797, 5-8-90, Cl. D24-27.000.
Suganami, Yasufumi, to Kabushikigaisha Taimu Kemikaru. Cutting pliers. 307,699, 5-8-90, Cl. D8-52.000.
Sugiyasu Industries, Co., Ltd.: *See—*
Kawana, Yusuke, 307,814, Cl. D34-31.000.
Sunbeam Corporation. *See—*
Hart, Richard S.; Bloom, David H.; and Bransky, Jeffery D., 307,727, Cl. D10-94.000.
Surgikos, Inc.: *See—*
Williams, Harold R.; and Wilson, Jay, 307,794, Cl. D24-9.000.
T. J. Style: *See—*
Murphy, Debra L., 307,769, Cl. D20-43.000.
Tabler, Charles P., to Buckhorn, Inc. Interfitting container. 307,718, 5-8-90, Cl. D9-432.000.
Takahashi, Takehiko; Ishii, Yoshiyasu; and Hanashima, Taira, to Combi Co., Ltd. Toy vehicle. 307,772, 5-8-90, Cl. D21-74.000.
Takara Co., Ltd.: *See—*
Shinohara, Muneyoshi, 307,776, Cl. D21-150.000
Shinohara, Muneyoshi, 307,777, Cl. D21-150.000.
Shinohara, Muneyoshi, 307,778, Cl. D21-161.000.
Talerico, Joseph F.: *See—*
Garmon, Vincent S.; and Talerico, Joseph F., 307,747, Cl. D14-102.000.
Tempress Incorporated: *See—*
Cedergreen, Steven D., 307,786, Cl. D22-147.000.
Tetzlaff, Kathy E. Cookie 307,661, 5-8-90, Cl. D1-128.000.
Textron, Inc.: *See—*
Jaquish, John, 307,683, Cl. D6-457.000.
Tomasula, Ronald L. Handle for a torque-applying tool. 307,703, 5-8-90, Cl. D8-107.000.
Tontarelli, Sergio, to Simaco Import Ltd. Picture display receptacle. 307,677, 5-8-90, Cl. D6-311.000.
Tow Pro, Inc.: *See—*
Level, Jack R., 307,732, Cl. D12-101.000.
Trine Products Corporation: *See—*
Levin, Monte L., 307,768, Cl. D20-17.000.
Tsuburaya, Kazuyuki: *See—*
Shibayama, Masato; Tsuburaya, Kazuyuki; Kotsuka, Michiaki; Oshiga, Takayuki; and Fujiwara, Katsuhiro, 307,740, Cl. D13-164.000.
Tsuji, Shintaro, to Sanrio Company, Ltd. Magnifying glass. 307,758, 5-8-90, Cl. D16-135.000.
Tsumuro, Yoshitaka, to NEC Corporation. Toner cartridge for computer output printers. 307,767, 5-8-90, Cl. D18-43.000.
Tunstall Telecom Limited. *See—*
Grant, Alexander D., 307,739, Cl. D13-168.000.
Vonlanthen, Benno, to R. Berchtold AG. Key. 307,704, 5-8-90, Cl. D8-347.000.
Wakamatsu, Masaharu. *See—*
Moriyama, Tatsurou; and Wakamatsu, Masaharu, 307,708, Cl. D13-164.000.
Weirton Steel Corporation: *See—*
Saunders, William T.; and Bray, James A., 307,720, Cl. D9-438.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 307,801, 5-8-90, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 307,802, 5-8-90, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 307,803, 5-8-90, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 307,804, 5-8-90, Cl. D25-124.000.
Whitbread North America, Inc.: *See—*
Mittleman, Frederick H., 307,710, Cl. D9-307.000.
Wilkie, George: *See—*
Cunningham, Phillip J., Slocomb, Leon F., Jr.; and Wilkie, George, 307,706, Cl. D8-400.000.
Williams, David P. G., to Mohasco Upholstered Furniture Corp. Corner table. 307,684, 5-8-90, Cl. D6-484.000.
Williams, Harold R.; and Wilson, Jay, to Surgikos, Inc. Fluid dispensing cassette for dispensing doses of sterilizing liquid. 307,794, 5-8-90, Cl. D24-9.000.
Wilson, Jay: *See—*
Williams, Harold R.; and Wilson, Jay, 307,794, Cl. D24-9.000.
Worley, James W., to DeRoyal Industries, Inc. Patient restraint jacket 307,799, 5-8-90, Cl. D24-34.000.
Yamaki, Akihiro. Garbage pail. 307,812, 5-8-90, Cl. D34-6.000.
Yoshida, Shin-ichiro; Himeno, Ryouichi; and Andou, Takaharu, to Nippon Telegraph and Telephone Corporation; and Kabushiki Kaisha Toshiba. Electronic private branch exchange housing or similar article. 307,752, 5-8-90, Cl. D14-240.000.
Yoshikawa, Toshiaki, to Daiwa Seico, Inc. Reel for fishing. 307,785, 5-8-90, Cl. D22-141.000.
Young, Raymond W., to Amity Leather Products Co. Travel kit. 307,668, 5-8-90, Cl. D3-39.000.
Zonni, Nick. Support stand. 307,729, 5-8-90, Cl. D11-130.100.

LIST OF PLANT PATENTEES

Fruit Board: *See—*
Stein, Abba, 7,226, Cl. 34.000.
Stein, Abba, 7,227, Cl. 34.000.
Stein, Abba, to Fruit Board. Early eating apple 'Or'. 7,226, 5-8-90, Cl. 34.000.
Stein, Abba, to Fruit Board. Apple 'Tomer'. 7,227, 5-8-90, Cl. 34.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 8, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
6 4,922,550
79 4,922,551
93 4,922,552
132 4,922,553

CLASS 4
191 4,922,554
257 4,922,555
378 4,922,556
477 4,922,557
523 4,922,558
662 4,922,559

CLASS 5
9 R 4,922,561
81 R 4,922,560
82 R 4,922,562
450 4,922,563
464 4,922,564
484 4,922,565

CLASS 8
151 4,922,566
4,922,567
161 4,923,478
412 4,923,479
507 4,923,480
589 4,923,481

CLASS 14
71.3 4,922,568

CLASS 15
36 4,922,578
105 4,922,569
250.02 4,922,570
302 4,922,571
320 4,922,572

CLASS 16
2 4,922,573
35 R 4,922,574
111 R 4,922,575
114 R 4,922,576
115 4,922,577

CLASS 19
105 4,922,579
288 4,922,580

CLASS 23
308 S 4,923,482

CLASS 24
3 C 4,922,581
71.1 4,922,582
279 4,922,583
381 4,922,584
4,922,585
399 4,922,586
453 4,922,587
576 4,922,588

CLASS 26
29 R 4,922,589

CLASS 27
19 4,922,590

CLASS 28
183 4,922,592
254 4,922,593

CLASS 29
25.35 4,922,594
26 A 4,922,591
40 4,922,595
240 4,922,597
281.4 4,922,598
401.1 4,922,599
433 4,922,600
450 4,922,601
460 4,922,602
568 4,922,603
598 4,922,604
727 4,922,605
839 4,922,606
879 4,922,607
897.2 4,922,596

CLASS 30
43.91 4,922,608
57 4,922,609
125 4,922,610
147 4,922,611
166.3 4,922,612
276 4,922,613
339 4,922,614
360 4,922,615
374 4,922,616
419 4,922,617

CLASS 33
1 MP 4,922,618
270 4,922,619
366 4,922,620
465 4,922,621
542 4,922,622
608 4,922,623

CLASS 34
29 4,922,624
58 4,922,625
80 4,922,626
116 4,922,627
156 4,922,628

CLASS 36
36 R 4,922,629
89 4,922,630
102 4,922,631
117 4,922,632
4,922,633
119 4,922,634
120 4,922,635
127 4,922,636

CLASS 38
15 4,922,637

CLASS 40
155 4,922,638
308 4,922,639

CLASS 42
16 4,922,640
74 4,922,641
96 4,922,642

CLASS 43
17.5 4,922,643
25 4,922,644
42.33 4,922,646
42.4 4,922,645
42.44 4,922,647
43.13 4,922,648
43.16 4,922,649

CLASS 44
51 4,923,483

CLASS 47
1.1 4,922,650
1.41 4,922,651
23 4,922,652
45 4,922,653
47 4,922,654

CLASS 49
131 4,922,655
161 4,922,656
181 4,922,657
395 4,922,660
458 4,922,658
501 4,922,659
504 4,922,661

CLASS 51
34 C 4,922,662
170 TL 4,922,663
298 4,923,490
321 4,922,664
392 4,922,665
394 4,922,675

CLASS 52
36 B1 4,224,769
66 4,922,666
126.6 4,922,670
167 DF 4,922,667
4,922,671
221 4,922,668
4,922,672
4,922,673
309.15 4,922,674
396 4,922,676
486 4,922,677
570 4,922,678
646 4,922,669
698 4,922,679
713 4,922,680
737 4,922,681

CLASS 53
139.3 4,922,682
296 4,922,683
314 4,922,684
429 4,922,685
434 4,922,686
472 4,922,687
525 4,922,688
569 4,922,689
587 4,922,690

CLASS 55
21 4,923,484
55 4,923,485
67 4,923,486
100 4,923,488
227 4,923,489
400 4,922,691
409 4,923,491
482 4,923,487

CLASS 56
1 4,922,692
13.6 4,922,693
16.7 4,922,694
40 4,922,695
202 4,922,696
295 4,922,697
4,922,698
367 4,922,699
370 4,922,700

CLASS 57
12 4,922,701
87 4,922,702
93 4,922,703
261 4,922,704
306 4,922,705
354 4,922,706
408 4,922,707

CLASS 60
39.141 4,922,708
39.183 4,922,709
39.281 4,922,710
204 4,922,711
226.2 4,922,712
4,922,713
276 4,922,714
329 4,922,715
378 4,922,716
456 4,922,717
527 4,922,718
562 4,922,719
641.8 4,922,720

CLASS 62
3.61 4,922,721
6 4,922,722
11 4,923,492
13 4,923,493
72 4,922,723
73 4,923,494
126 Re.33,212
135 4,922,724
136 4,922,725
235.1 4,922,726
239 4,922,727
278 4,922,728
384 4,922,729
476 4,922,730
515 4,922,731
525 4,922,732

CLASS 65
11.1 4,923,495
30.13 4,923,496
86 4,923,497
109 4,923,498
163 4,923,499

CLASS 68
205 R 4,922,733

CLASS 70
58 4,922,734
4,922,735
277 4,922,736
337 4,922,737

CLASS 71
27 4,923,500
92 4,923,501
4,923,502
4,923,503
4,923,504
93 4,923,505
121 4,923,506

CLASS 72
68 4,922,738
80 4,922,739
237 4,922,740
306 4,922,741
308 4,922,742
377 4,922,743
455 4,922,744

CLASS 73
32 A 4,922,745
38 4,922,758
49.3 4,922,746
61.1 R 4,922,747
86 4,922,748
116 4,922,749
118.2 4,922,750
146 4,922,751
4,922,752
516 R 4,922,753
517 R 4,922,756
587 4,922,754
660 4,922,757
861.22 4,922,759
861.48 4,922,760
862.33 4,922,761
862.48 4,922,762
864.41 4,922,763
864.62 4,922,764

CLASS 74
15.88 4,922,765
89 4,922,768
333 4,922,767
385 4,922,766
462 4,922,781
479 4,922,755
4,922,782
502.4 4,922,783
527 4,922,784
567 4,922,785
594.4 4,922,786
866 4,922,769

CLASS 75
10.14 4,923,508
239 4,923,512
245 4,923,513
252 4,923,511

CLASS 81
357 4,922,770
484 4,922,771

CLASS 82
128 4,922,772

CLASS 83
76.6 4,922,773
175 4,922,774
333 4,922,775
398 4,922,776
452 4,922,777
501 4,922,778
503 4,922,779
508.3 4,922,780
840 4,922,791

CLASS 84
382 4,922,792
384 4,922,793
601 4,922,794
608 4,922,795
618 4,922,796
650 4,922,797

CLASS 87
8 4,922,798

CLASS 89
1.819 4,922,799
8 4,922,800
41.05 4,922,801
41.07 4,922,802

CLASS 91
375 R 4,922,803
532 4,922,804

CLASS 92
166 4,922,805

CLASS 98
1.5 4,922,806
4,922,807
42.06 4,922,808

CLASS 99
283 4,922 809
323.1 4,922,810
443 C 4,922,811
495 4,922,812
510 4,922,813
4,922,814

CLASS 100
219 4,922,815

CLASS 101
41 4,922,816
91 4,922,817
148 4,922,818
177 4,922,819
425 4,922,820
4,922,821

CLASS 102
288 4,922,823
387 4,922,824
476 4,922,825
489 4,922,826
496 4,922,827

CLASS 104
9 4,924,042
10 4,922,828
127 4,922,829
166 4,922,831
290 4,922,830

CLASS 105
4.2 4,922,832
248 4,922,833

CLASS 106
11 4,923,514
22 4,923,515
90 4,923,516
99 4,923,517
429 4,923,518
459 4,923,519
490 4,923,520

CLASS 108
51.1 4,922,834
114 4,922,835
144 4,922,836

CLASS 109
46 4,922,837

CLASS 110
234 4,922,838
4,922,839
345 4,922,840
346 4,922,841

CLASS 112
304 4,922,842
318 4,922,843

CLASS 114
39.1 4,922,844
39.2 4,922,845
90 4,922,846
299 4,922,847
334 4,922,848
361 4,922,849

CLASS 116
222 4,922,850

CLASS 118
324 4,922,851
683 4,922,852
718 4,922,853

CLASS 119
14.14 4,922,854
14 15 4,922,855
51.04 4,922,856
51.12 4,922,857
73 4,922,858
83 4,922,859
96 4,922,860

CLASS 122
448 R 4,922,861

CLASS 123
1 A 4,922,862
46 SC 4,922,875
52 M 4,922,864
52 MC 4,922,863
65 VC 4,922,865
73 A 4,922,866
90.22 4,922,867
179 P 4,922,868
192 R 4,922,869
195 R 4,922,870
196 A 4,922,871
319 4,922,872
357 4,922,873
417 4,922,874
470 4,922,876
478 4,922,877
490 4,922,878
494 4,922,879
509 4,922,880
572 4,922,881
4,922,882
598 4,922,883

CLASS 124
20.1 4,922,884
78 4,922,885

CLASS 125
23.01 4,922,886

CLASS 126
41 R 4,922,887
42 4,922,888
73 4,922,889
110 R 4,922,890
544 4,922,891

CLASS 128
25 R 4,922,892
64 4,922,893
71 4,922,894
80 3 4,922,895
158 4,922,899
202.27 4,922,900
203.26 4,922,901
419 P 4,922,907
419 PG 4,922,930
419 R 4,922,906
422 4,922,908
630 4,922,909
633 4,922,919
640 4,922,911
642 4,922,910
4,922,912
645 4,922,913
646 4,922,914
653 R 4,922,915
4,922,916
660.01 4,922,917
681 4,922,918
699 4,922,920
717 4,922,921
760 4,922,922
772 4,922,923
4,922,924
782 4,922,925
785 4,922,926
786 4,922,927
832 4,922,928
892 4,922,929

CLASS 131
211 4,922,931
290 4,922,932
299 4,922,933

CLASS 132
218 4,922,934
309 4,922,935
321 4,922,936

CLASS 134
5 4,923,521

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22.1 4,923,522
22.12 4,922,937
25.3 4,923,523
126 4,922,938
140 4,922,939

CLASS 135

67 4,922,940
71 4,922,941
90 4,922,942

CLASS 136

204 4,922,822
250 4,923,524

CLASS 137

1 4,922,943
72 4,922,944
78.3 4,922,945
102 4,922,946
204 4,922,947
247.33 4,922,948
309 4,922,949
316 4,922,950
321 4,922,951
382 4,922,952
386 4,922,953
493 4,922,954
496 4,922,955
504 4,922,956
516.29 4,922,957
561 A 4,922,958
587 4,922,959
588 4,922,960
596.17 4,922,961
624.14 4,922,962
625.62 4,922,963
4,922,964
625.65 4,922,965
627.5 4,922,966

CLASS 139

145 4,922,967
384 R 4,922,968
408 4,922,969
446 4,922,970

CLASS 141

1 4,922,971
4 4,922,972
4,922,973
4,922,974
104 4,922,975

CLASS 144

3 D 4,922,976
230 4,922,977
332 4,922,978
357 4,922,979

CLASS 148

3 4,923,525
6.3 4,923,526
9 R 4,923,527
12.4 4,923,528
20.3 4,923,529
26 4,923,530
126.1 4,923,531
159 4,923,532
304 4,923,533
407 4,923,534

CLASS 149

19.1 4,923,535
19.4 4,923,536

CLASS 150

165 4,922,980

CLASS 152

158 4,922,981
216 4,922,982
379 3 4,922,983
415 4,922,984
543 4,922,985

CLASS 156

48 4,923,537
64 B1 4,702,783
78 4,923,538
79 4,923,539
86 4,923,540
4,923,557
87 4,923,541
92 4,923,542
97 4,923,543
153 4,923,544
4,923,545
159 4,923,546
181 4,923,547
182 4,923,548
229 4,923,549
242 4,923,550
244 11 4,923,551
273.7 4,923,552
401 4,923,553
417 4,923,554
497 4,923,555
498 4,923,556
499 4,923,558
523 4,923,559
555 4,923,560
616.4 4,923,561
643 4,923,562
649 4,923,563
655 4,923,564

CLASS 160

178.1 4,922,986
183 4,922,987
368.1 4,922,988

CLASS 162

24 4,922,989
72 4,923,565
135 4,923,566
193 4,923,567
273 4,922,990
301 4,923,568
339 4,923,569
358 4,923,570

CLASS 164

36 4,922,991
63 4,922,992
104 4,922,993
437 4,922,994
469 4,922,995

CLASS 165

1 4,922,996
8 4,922,997
10 4,922,998
40 4,922,999
122 4,923,000
140 4,923,001
151 4,923,002
165 4,923,003
175 4,923,004

CLASS 166

55 4,923,005
65.1 4,923,006
187 4,923,007
250 4,923,008
272 4,923,009
297 4,923,010
311 4,923,011
385 4,923,012

CLASS 169

90 4,923,013

CLASS 172

2 4,923,014
4 5 4,923,015
21 4,923,016
776 4,923,017

CLASS 173

78 4,923,018

CLASS 174

52 3 4,924,031
53 4,924,032
87 4,924,034
4,924,035
97 4,924,036
117 F 4,924,037
135 4,924,038
259 4,924,033

CLASS 175

14 4,923,019
372 4,923,020
382 4,923,021

CLASS 177

4 4,923,022
25 15 4,923,023
245 4,923,024

CLASS 180

65 2 4,923,025
215 4,923,026
219 4,923,027
4,923,028
248 4,923,029

CLASS 181

106 4,923,030
144 4,923,031
150 4,923,032
207 4,923,034
211 4,923,033
228 4,923,035

CLASS 182

9 4,923,048
45 4,923,049
127 4,923,050
151 4,923,051

CLASS 184

106 4,923,052

CLASS 187

1 R 4,923,053
25 4,923,054
109 4,923,055

CLASS 188

71.1 4,923,056
72.6 4,923,036
188 4,923,037
299 4,923,038
378 4,923,057

CLASS 191

12.2 R 4,924,039

CLASS 192

0.096 4,923,042
7 4,923,039
18 R 4,923,040
58 B 4,923,041
70.12 4,923,043
98 4,923,044
107 R 4,923,045
113 A 4,923,046
150 4,923,047

CLASS 198

459 4,923,571

CLASS 200

16 A 4,924,040
50 C 4,924,041
52 R 4,924,043
314 4,924,044
341 4,924,045
516 4,924,046
553 4,924,047

CLASS 204

6 4,923,572
28 4,923,573
40 4,923,574
44.2 4,923,575
44.4 4,923,576
64 T 4,923,577
130 4,923,578
140 4,923,579
157.97 4,923,580
180.1 4,923,581
255 4,923,582
286 4,923,583
298.04 4,923,585
298.25 4,923,584
403 4,923,586
424 4,923,587

CLASS 206

83 4,923,058
265 4,923,059
316 2 4,923,060
364 4,923,061
387 4,923,062
484 4,923,063
554 4,923,064
583 4,923,065

CLASS 208

27 4,923,588
66 4,923,589
85 4,923,590
111 4,923,591
4,923,592
113 4,923,593
114 4,923,594
139 4,923,595
207 4,923,596

CLASS 209

420 4,923,597
538 4,923,066
539 4,923,067

CLASS 210

87 4,923,598
96.1 4,923,599
107 4,923,600
4,923,601
117 4,923,602
168 4,923,603
180 4,923,604
232 4,923,605
275 4,923,606
490 4,923,607
500.25 4,923,608
636 4,923,609
637 4,923,610
638 4,923,611
646 4,923,612
647 4,923,613
648 4,923,614
661 4,923,615
676 4,923,616
698 4,923,617
741 4,923,068
755 4,923,618
764 4,923,619
767 4,923,620

CLASS 211

13 4,923,069
59.2 4,923,070

CLASS 212

266 4,923,071

CLASS 215

247 4,923,072
252 4,923,073
256 B1 4,815,620

CLASS 219

10.55 E 4,924,048
4,924,049
69.12 4,924,050
69.15 4,924,051
75 4,924,052
4,924,053
85.14 4,924,054
86.21 4,924,055
98 4,924,056
118 4,924,057
121.47 4,924,058
121.48 4,924,059
4,924,060
121.52 4,924,061
121.6 4,924,062
121.64 4,924,063
121.69 4,924,064
138 4,924,065
142 4,924,066
241 4,924,067
274 4,924,068
306 4,924,069
346 4,924,070
400 4,924,071
401 4,924,072
413 4,924,073
548 4,924,074

CLASS 220

1.5 4,923,074
4,923,076
3.1 4,923,077
4 R 4,923,078
5 A 4,923,075
7 4,923,079
66 4,923,080
72 4,923,081
85 H 4,923,082
90.2 4,923,083
4,923,084
282 4,923,085
401 4,923,086
404 4,923,087
468 4,923,088

CLASS 221

1 4,923,089
312 R 4,923,090

CLASS 222

67 4,923,091
129.4 4,923,092
145 4,923,093
321 4,923,094
386.5 4,923,095
391 4,923,096
394 4,923,097
456.1 4,923,098
510 4,923,101

CLASS 223

95 4,923,102

CLASS 224

42.45 R 4,923,103
155 4,923,104
255 4,923,105

CLASS 227

67 4,923,106
114 4,923,099
120 4,923,107

CLASS 228

117 4,923,100
126 4,923,108
181 4,923,109
214 4,923,110

CLASS 229

68 R 4,923,111
69 4,923,112
125 27 4,923,113

CLASS 232

34 4,923,114

CLASS 235

380 4,924,075
492 4,924,076
4,924,077
494 4,924,078
4,924,199

CLASS 236

12.11 4,923,115
12.12 4,923,116
94 4,923,117

CLASS 238

283 4,923,118

CLASS 239

55 4,923,119
252 4,923,120
434.5 4,923,121
585 4,923,122
691 4,923,123

CLASS 241

5 4,923,124
20 4,923,125
30 4,923,126
70 4,923,127
101.7 4,923,128
207 4,923,129
236 4,923,130
275 4,923,131

CLASS 242

35.5 A 4,923,132
45 4,923,133
54 R 4,923,134
4,923,135
59 4 923,136
68.5 4,923,137
78.6 4,923,138
4,923,139
230 4,923,140
247 4,923,141

CLASS 244

3.1 4,923,142
3.28 4,923,143
7 R 4,923,144
100 A 4,923,145
117 A 4,923,146
122 AG 4,923,147
137.1 4,923,148
151 B 4,923,150
151 R 4,923,149
158 R 4,923,151
172 4,923,152

CLASS 248

74 1 4,923,153
131 4,923,154
163.1 4,923,155
170 4,923,156
188 2 4,923,157
188 8 4,923,158
200 4,923,160
205.3 4,923,159
221.2 4,923,161
276 4,923,162
300 4,923,163
530 4,923,164
545 4,923,165

CLASS 250

201.5 4,924,079
206.2 4,923,276
213 VT 4,924,080
214 R 4,924,081
216 4,924,082
223 B 4,924,083
227.25 4,924,084
227.28 4,924,085
235 4,924,086
271 4,924,088
290 4,924,089
296 4,924,090
306 4,924,091
324 4,924,092
328 4,924,093
334 4,924,094
338.5 4,924,095
341 4,924,096
343 4,924,097
380 4,924,098
390.04 4,924,099
390.09 4,924,100
423 R 4,924,101
426 4,924,102
492.3 4,924,104
516.1 4,924,103
560 4,924,105
561 4,924,106
572 4,924,107
574 Re.33,213

CLASS 251

4 4,923,166
25 4,923,167
75 4,923,168
118 4,923,169
121 4,923,170
159 4,923,171
282 4,923,172
333 4,923,173

CLASS 252

2 4,923,621
8.6 4,923,622
8.8 4,923,623
10 4,923,624
32.5 4,923,625
67 4,923,626
108 4,923,627
135 4,923,628
153 Re.33,210
181 4,923,629
184 4,923,630
186.42 4,923,631
299.61 4,923,632
299.65 4,923,633
389.2 4,923,634
511 4,923,637
545 4,923,635
550 4,923,636
587 4,923,638
632 4,923,639

CLASS 254

105 4,923,174
419 4,923,175

CLASS 256

65 4,923,176

CLASS 260

404 4,923,642
410.9 R 4,923,643

CLASS 261

29 4,923,644

CLASS 264

4.3 4,923,645
13 4,923,646
24 B1 4,205,028
27 4,923,647
29.2 4,923,648
37 4,923,649
41 4,923,650
45.1 4,923,651
46.6 4,923,653
53 4,923,654
60 4,923,655
62 4,923,652
70 4,923,656
73 4,923,657
76 4,923,658
85 4,923,659
103 4,923,660
119 4,923,661
178 F 4,923,662
229 4,923,663
256 4,923,664
259 4,923,665
572 4,923,666
4,923,667

CLASS 266

44 4,923,177
4,923,180

CLASS 267

140.1 4,923,178
155 4,923,181
160 4,923,179
169 4,923,182
180 4,923,183

CLASS 269

32 4,923,184
181 4,923,185
282 4,923,186
328 4,923,187

CLASS 270

39 4,923,188
54 4,923,189

CLASS 271

3.1 4,923,190

CLASS 272

69 4,923,191
70 4,923,192
73 4,923,193
93 4,923,194
117 4,923,195

CLASS 273

65 EF 4,923,196
77 A 4,923,197
240 4,923,198
299 4,923,199
309 4,923,200
371 4,923,201

CLASS 280

47 35 4,923,202
288 3 4,923,203
407.1 4,923,204
491.3 4,923,205
504 4,923,206

613 4,923,207
642 4,923,208
689 4,923,209
707 4,923,210
727 4,923,211
736 4,923,212
804 4,923,213
806 4,923,214
851 4,923,215

CLASS 281

2 4,923,216

CLASS 283

62 4,923,217
4,923,218

CLASS 285

18 4,923,219
39 4,923,220
81 4,923,221
137.1 4,923,222
175 4,923,223
177 4,923,224
189 4,923,225
242 4,923,226
319 4,923,227
4,923,228

CLASS 290

48 4,923,229
4,924,108

CLASS 292

67 4,923,230
238 4,923,231
263 4,923,232
332 4,923,233

CLASS 294

99.2 4,923,234
141 4,923,235
161 4,923,236

CLASS 296

15 4,924,123
43 4,924,124
67 R 4,924,125
83 4,924,126
90 4,924,127
156 4,924,128
239 4,924,129
261 4,924,130
329 4,924,131
361 4,924,132

CLASS 312

115 4,923,258
208 4,923,259
214 4,923,260
303 4,923,261

CLASS 313

25 4,924,133
113 4,924,134
326 4,924,135
336 4,924,136
337 4,924,137
361.1 4,924,138
468 4,924,139
477 R 4,924,140
488 4,924,141
490 4,924,142
493 4,924,143
505 4,924,144
546 4,924,145
638 4,924,146

CLASS 315

58 4,924,147
169.4 4,924,148
241 P 4,924,149
244 4,924,150
295 4,924,151
363 4,924,152

CLASS 318

254 4,924,155
4,924,156
265 4,924,157
286 4,924,154
434 4,924,158
466 4,924,159
561 4,924,160
567 4,924,161
569 4,924,162
4,924,163
587 4,924,153
4,924,164
592 4,924,165
608 4,924,166
696 4,924,167
811 4,924,168

CLASS 320

21 4,924,169

CLASS 323

272 4,924,170
347 4,924,171

CLASS 324

73.1 4,924,175
133 4,924,176
4,924,177
154 R 4,924,178
158 F 4,924,179
207.15 4,924,180
235 4,924,181
237 4,924,182
309 4,924,183
318 4,924,184
319 4,924,185
320 4,924,186
376 4,924,187
664 4,924,172
690 4,924,173
696 4,924,174

CLASS 328

155 4,924,188
167 4,924,189

CLASS 330

86 4,924,190
130 4,924,191
279 4,924,192
284 4,924,193
289 4,924,194

CLASS 331

116 R 4,924,195

CLASS 333

101 4,924,196

CLASS 335

128 4,924,197
216 4,924,198

CLASS 336

65 4,924,200
210 4,924,201

CLASS 337

100 4,924,202
231 4,924,203

CLASS 338

22 R 4,924,204
227 4,924,205

CLASS 340

426 4,924,206
467 4,924,207
474 4,924,208
479 4,924,209
572 4,924,210
573 4,924,211
598 4,924,212
653 4,924,213
666 4,924,214
701 4,924,215
709 4,924,216
776 4,924,218
782 4,924,217
825 49 4,924,219
825.510 4,924,220
870.38 4,924,221

CLASS 341

33 4,924,222
95 4,924,223
118 4,924,225
155 4,924,224
157 4,924,226
159 4,924,227

CLASS 342

2 4,924,228
25 4,924,229
90 4,924,230
137 4,924,231
174 4,924,232
175 4,924,233
369 4,924,234
374 4,924,235

CLASS 343

700 MS 4,924,236
702 4,924,237
802 4,924,238
882 4,924,239

CLASS 346

1 1 4,924,240
75 4,924,241
76 PH 4,924,242

CLASS 350

3 71 4,923,262
6.9 4,923,263
96.14 4,923,264
4,923,265
96.15 4,923,266
4,923,268
4,923,269
96.16 4,923,267
96.18 4,923,270
96.19 4,923,271
96.20 4,923,272
96.21 4,923,273
4,923,274
96.24 4,923,275
96.29 4,923,277
96.30 4,923,278
4,923,279
128 4,923,280
245 4,923,281
4,923,282
269 4,923,283
276 R 4,923,284
320 4,924,243
331 T 4,923,285
340 4,923,286
355 4,923,287
4,923,288
357 4,923,289
377 4,923,290
389 4,923,291
432 4,924,244
463 4,923,292
503 4,923,293
529 4,923,294
639 4,923,295

CLASS 351

136 4,924,245
161 4,923,296
208 4,923,297

CLASS 354

126 4,924,246
164 4,924,247
195.1 4,924,248
286 4,924,249
400 4,924,253
402 4,924,250
418 4,924,251
420 4,924,252

CLASS 355

20 4,924,254
27 4,924,255
28 4,924,256
35 4,924,261
53 4,924,257
4,924,258
57 4,924,259
69 4,924,260
75 4,924,262
203 4,924,263
204 4,924,264
4,924,265
205 4,924,266
210 4,924,267
219 4,924,268
229 4,924,269
246 4,924,270
284 4,924,271
298 4,924,272
312 4,924,273
313 4,924,274
319 4,924,275

CLASS 356

28.5 4,923,298
73.1 4,924,087
350 4,923,299
356 4,923,300
4,923,301
371 4,923,302
375 4,923,303

CLASS 357

2 B1 4,689,645
17 4,924,276
23.3 4,924,277
23.5 4,924,278
23.7 4,924,279
23.8 4,924,280
23.9 4,924,281
30 4,924,282
4,924,285
34 4,924,283
46 4,924,286
49 4,924,284
51 4,924,287
68 4,924,288
4,924,289
4,924,290
70 4,924,291
4,924,292
71 4,924,293
4,924,294
4,924,295
72 4,924,296
74 4,924,297

CLASS 358

12 4,924,298
22 4,924,299
23 4,924,300
75 4,924,301
4,924,302
86 4,924,303
101 4,924,304
105 4,924,305
4,924,306
107 4,924,307
133 4,924,308
4,924,309
136 4,924,310
138 4,924,311
140 4,924,312
4,924,313
160 4,924,314
4,924,315
213.26 4,924,316
227 4,924,317
250 4,924,318
296 4,924,319
4,924,320
4,924,321
448 4,924,322
456 4,924,323
468 4,924,324

CLASS 360

10.2 4,924,325
4,924,326
48 4,924,327
60 4,924,328
64 4,924,329
66 4,924,330
72.1 4,924,331
72.2 4,924,332
75 4,924,333
77.07 4,924,334
93 4,924,335
B1 3,693,983
105 4,924,336
B1 3,842,433
128 4,924,337
132 4,924,338

CLASS 361

56 4,924,339
4,924,340
4,924,341
58 4,924,342
98 4,924,343
101 4,924,344
111 4,924,345
117 4,924,346
120 4,924,347
280 4,924,348
357 4,924,349
386 4,924,350
4,924,351
388 4,924,352
400 4,924,353
415 4,924,354
4,924,355

CLASS 362

31 4,924,356
32 4,924,357
4,924,358
61 4,924,359
4,924,360
96 4,924,361
108 4,924,362
125 4,924,363
153.1 4,924,364
224 4,924,365
249 4,924,366
311 4,924,367
376 4,924,368

CLASS 363

21 4,924,369
57 4,924,370
89 4,924,371
4,924,372
95 4,924,373

CLASS 364

167.01 4,924,374
200 4,924,375
4,924,376
4,924,377
4,924,378
4,924,379
4,924,380
4,924,381
4,924,382
300 4,924,383
4,924,384
4,924,385
402 4,924,386
409 4,924,387
413.2 4,924,388
413.29 4,924,389
421 4,924,390
424.03 4,924,391
424.05 4,924,392
4,924,393
426.02 4,924,394
4,924,395
426.03 4,924,396
426.04 4,924,397
431.03 4,924,399
431.11 4,924,398
433 4,924,400
4,924,401
449 4,924,402
464.04 4,924,404
468 4,924,405
470 4,924,406
474.22 4,924,403
480 4,924,407
483 4,924,412
513 4,924,408
518 4,924,409
4,924,410
4,924,411
521 4,924,413
522 4,924,414
4,924,415
550 4,924,416
4,924,417
4,924,418
551.02 4,924,419
569 4,924,420
578 4,924,429
4,924,430
709 16 4,924,431
715.09 4,924,422
715.1 4,924,421
738 4,924,423
4,924,424
900 4,924,425
4,924,426
4,924,427
4,924,428
4,924,432
4,924,433
4,924,434
4,924,435
B1 4,197,590

CLASS 365

113 4,924,436
185 4,924,437
4,924,438
189.05 4,924,439
189.08 4,924,440
189.11 4,924,442
203 4,924,443
222 4,924,441

CLASS 366

184 4,923,304
343 4,924,444
349 4,923,305

CLASS 367

4 4,924,445
6 4,924,446
88 4,924,448
104 4,924,449
118 4,924,450

CLASS 368

10 4,924,451
236 4,924,452
294 4,924,453

CLASS 369

13 4,924,447
44 11 4,924,454
44 21 4,924,455

CLASS 370

32 4,924,456
56 4,924,457
58 1 4,924,458
84 4,924,459
4,924,460
95.2 4,924,461
4,924,462
105 4 4,924,463
112 4,924,464

CLASS 371

3 4,924,465
12 4,924,466
22.1 4,924,468
22.4 4,924,469
68.1 4,924,467

CLASS 372

26 4,924,470
29 4,924,472
34 4,924,471
38 4,924,473
75 4,924,474
89 4,924,475
94 4,924,476

CLASS 374

34 4,923,306
55 4,923,307
4,924,477
121 4,924,478
137 4,923,308

CLASS 375

7 4,924,479
8 4,924,480
65 4,924,482

CLASS 376

261 4,923,668
442 4,923,669
459 4,923,670

CLASS 377

3 4,924,483
116 4,924,484

CLASS 378

59 4,924,481
102 4,924,485
145 4,924,490
173 4,924,486
190 4,924,487

CLASS 379

6 4,924,489
34 4,924,488
37 4,924,491
93 4,924,492
94 4,924,493
100 4,924,494
127 4,924,495
142 4,924,496
150 4,924,497
200 4,924,499
201 4,924,500
4,924,501
221 4,924,510
418 4,924,511

CLASS 380

6 4,924,512
15 4,924,498
21 4,924,513
24 4,924,514
25 4,924,515
46 4,924,516
59 4,924,520

CLASS 381

38 4,924,508
40 4,924,517
41 4,924,518
51 4,924,519
72 4,924,502
190 4,924,503
199 4,924,504

CLASS 382

8 4,924,505
28 4,924,506
31 4,924,507

VOL
1114
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MY
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1990
UMI

50 4,924,509
54 4,924,521
56 4,924,522

CLASS 383

5 4,923,309

CLASS 384

4,923,311
4,924,523
420 4,923,312
537 4,924,524
571 4,923,313

CLASS 400

63 4,923,314
120 4,923,315

CLASS 401

11 4,923,316
295 4,923,317
225 4,923,318

CLASS 403

2 4,923,319
5 4,923,320
6 4,923,321
190 4,923,322
261 4,923,323
359 4,923,324
361 4,923,325
371 4,923,326

CLASS 404

6 4,923,327
69 4,923,328

CLASS 405

36 4,923,329
4,923,330
45 4,923,331
63 4,923,332
128 4,923,333
203 4,923,334
204 4,923,335
216 4,923,336
224 4,923,337
229 4,923,338
284 4,923,339

CLASS 408

72 R 4,923,340
112 4,923,341

CLASS 409

143 4,923,342
179 4,923,343
234 4,923,344
237 4,923,345

CLASS 410

19 4,923,346

CLASS 411

182 4,923,347
377 4,923,348
433 4,923,349
45? 4,923,350

CLASS 412

6 4,923,351

CLASS 4

225 4,923,352
226 4,923,353
286 4,923,354
339 4,923,355
373 4,923,356
495 4,923,357
519 4,923,358
523 4,923,359
537 4,923,360
541 4,923,361
700 4,923,362
752 4,923,363

CLASS 415

55 6 4,923,364
119 4,923,365
152 1 4,923,366
199 1 4,923,367
202 4,923,368
206 4,923,369

CLASS 416

95 4,923,370
97 R 4,923,371

CLASS 417

53 4,923,372
439 4,923,373
440 4,923,374
477 4,923,375

CLASS 418

48 4,923,376
98 4,923,377

CLASS 419

8 4,923,671
13 4,923,672
20 4,923,673
27 4,923,674

CLASS 420

129 4,923,675
401 4,923,509
535 4,923,676

CLASS 422

37 4,923,677
48 4,923,679
58 4,923,680
116 4,923,681

CLASS 423

24 4,923,510
38 4,923,686
68 4,923,507
210 4,923,687
224 4,923,688
267 4,923,689
328 4,923,690
412 4,923,691
447 4 4,923,692
611 4,923,682

CLASS 424

46 4,923,890
52 4,923,683
4,923,684
54 4,923,685
59 4,923,693
70 4,923,694
71 4,923,695
195 1 4,923,697
405 4,923,698
427 4,923,699
4,923,700
548 4,923,696

CLASS 425

4 R 4,923,378
63 4,923,379
68 4,923,380
77 4,923,381
78 4,923,382
150 4,923,383
371 4,923,384
450.1 4,923,386
522 4,923,385
549 4,923,387
577 4,923,388

CLASS 426

113 4,923,701
115 4,923,702
118 4,923,703
243 4,923,704
438 4,923,705
516 4,923,706
602 4,923,707
610 4,923,708
634 4,923,710
640 4,923,709

CLASS 427

44 4,923,711
140 4,923,712
171 4,923,713
221 4,923,714
237 4,923,715
249 4,923,716
252 4,923,717
288 4,923,743
386 4,923,718
387 4,923,719
422 4,923,720

CLASS 428

11 4,923,721
34 2 4,923,744
34.9 4,923,722
35 4 4,923,745
35 7 4,923,723
35 9 4,923,751
36.1 4,923,724
36 4 4,923,725
36.6 B1 4,370,368
40 4,923,726
4,923,727
52 4,923,728
71 4,923,729
92 4,923,730
131 4,923,731
151 4,923,732
156 4,923,733
B1 4,559,258
195 B1 4,183,989
209 4,923,678
4,923,734
4,923,735
212 4,923,736
217 4,923,737
221 4,923,738
4,923,739
233 4,923,740
245 B1 4 359,501
252 4,923,741
283 4,923,742
309.9 4,923,746
312.6 4,923,747
336 4,923,748
341 4,923,749
349 4,923,750
367 4,923,752
402 24 4,923,753
423.7 4,923,756
425.6 4,923,757
429 4,923,754
437 4,923,758
447 4,923,755
458 4,923,763
521 4,923,759
541 4,923,760
550 4,923,761
551 4,923,762
632 4,923,764
694 4,923,765
4,923,766

CLASS 429

12 4,923,767
19 4,923,768
101 4,923,769
4,927 770

CLASS 430

1 4,923,771
5 4,923,772
57 4,923,773
59 4,923,774
4,923,775
111 4,923,776
120 4,923,777
137 4,923,778
138 4,923,779
257 4,923,780
264 4,923,389
270 4,923,390
281 4,923,781
372 4,923,782
377 4,923,783
430 4,923,784
4,923,785
450 4,923,786
489 4,923,787
507 4,923,788
517 4,923,789
523 4,923,790
553 4,923,791
559 4,923,792
567 4,923,793
603 4,923,794

CLASS 431

10 4,923,391
253 4,923,392
328 4,923,393
343 4,923,394

CLASS 432

5 4,923,395
59 4,923,396
251 4,923,397

CLASS 433

60 4,923,398
159 4,923,399
168 1 4,923,795
226 4,923,400

CLASS 434

22 4,923,401
4,923,402

CLASS 435

2 4,923,797
5 4,923,798
6 4,923,799
10 4,923,800
12 4,923,801
15 4,923,796
4,923,802
26 4,923,803
38 4,923,804
69 2 4,923,807
69 4 4,923,805
69 8 4,923,808
101 4,923,809
117 4,923,810
125 4,923,403
136 4,923,811
158 4,923,812
172.2 4,923,813
173 4,923,814
183 4,923,815
284 4,923,816
315 4,923,817
320 4,923,818

CLASS 436

39 4,923,806
518 4,923,819

CLASS 437

21 4,923,820
38 4,923,821
41 4,923,822
4,923,823
44 4,923,824
53 4,923,825
57 4,923,826
190 4,923,827
225 4,923,828

CLASS 439

71 4,923,404
77 4,923,406
78 4,923,405
92 4,923,407
341 4,923,408
358 4,923,409
492 4,923,410
540 4,923,411
578 4,923,412
589 4,923,413
701 4,923,310
751 4,923,414
755 4,923,415
877 4,923,416

CLASS 440

78 4,923,417

CLASS 441

57 4,923,418
64 4,923,419

CLASS 445

22 4,923,420
24 4,923,421
30 4,923,422
40 4,923,423
55 4,923,424
58 4,923,425

CLASS 446

19 4,923,426
153 4,923,427
175 4,923,428
197 4,923,429

CLASS 453

50 4,923,430

CLASS 455

158 B1 3,943,451

CLASS 460

111 4,923,431

CLASS 464

175 4,923,432

CLASS 474

11 4,923,433
101 4,923,434
112 4,923,435
135 B1 4,551,120

CLASS 475

26 4,922,788
83 4,922,787
86 4,922,789
271 4,922,790

CLASS 493

194 4,923,436

CLASS 501

95 4,923,829
103 4,923,830
108 4,923,831
128 4,923,832

CLASS 502

9 4,923,833
41 4,923,834
66 4,923,835
74 4,923,836
84 4,923,837
151 4,923,838
159 4,923,839
167 4,923,840
230 4,923,841
261 4,923,842
415 4,923,843

CLASS 503

207 4,923,844
226 4,923,845
227 4,923,846
4,923,847
4,923,848
4,923,860

CLASS 505

1 4,923,849
4,923,850

CLASS 514

23 4,923,851
25 B1 4,767,746
49 4,923,852
58 4,923,853
78 4,923,854
188 4,923,855
192 4,923,856
210 4,923,857
211 4,923,858
224 5 4,923,859
227 8 4,923,861
230.2 4,923,862
234 8 4,923,864
235 5 4,923,863
235 8 4,923,865
237 5 4,923,866
250 4,923,867
253 4,923,868
4,923,869
255 4,923,870
4,923,871
258 4,923,872
4,923,874
259 4,923,873
282 4,923,875
283 4,923,876
284 4,923,877
285 4,923,878
300 4,923,879
301 4,923,880
311 4,923,881
326 4,923,882
343 4,923,883
354 4,923,884
359 4,923,885
365 4,923,886
373 4,923,887
414 4,923,888
422 4,923,889
433 4,923,891
450 4,923,892
458 4,923,893
493 4,923,894
504 4,923,895
507 4,923,896
531 4,923,897
557 4,923,898
642 4,923,899
714 4,923,900

CLASS 521

53 4,923,901
54 4,923,902
65 4,923,903
115 4,923,904

CLASS 522

24 4,923,905

CLASS 523

107 4,923,906
218 4,923,907
220 4,923,908
333 4,923,909
428 4,923,910
457 4,923,911
466 4,923,912

CLASS 524

62 4,923,913
99 4,923,914
102 4,923,915
217 4,923,916
288 4,923,917
339 4,923,918
460 4,923,919
501 4,923,920
555 4,923,921

CLASS 525

56 4,923,922
64 4,923,923
66 4,923,924
4,923,925
67 4,923,926
100 4,923,927
117 4,923,928
126 4,923,929
168 4,923,930
222 B1 4,230,830
263 4,923,956
344 4,923,931
391 4,923,932
439 4,923,933
455 Re.33,211
528 4,923,934

CLASS 526

73 4,923,935
115 4,923,936
124 4,923,937
133 4,923,938
161 4,923,939
208 4,923,940
268 4,923,941
282 4,923,942
283 4,923,943

CLASS 528

15 4,923,944
16 4,923,945
18 4,923,946
26 4,923,948
33 4,923,949
38 4,923,950
48 4,923,951
60 4,923,952
170 4,923,953
183 4,923,954
193 4,923,947
4,923,955
196 4,923,962
271 4,923,957
272 4,923,958
322 4,923,959
353 4,923,960
4,923,968
481 4,923,971
482 4,923,961

CLASS 530

314 4,923,963
324 4,923,964
331 4,923,965
338 4,923,966
351 4,923,967

CLASS 534

14 4,923,969
550 4,923,970
677 4,923,972
684 4,923,973
799 4,923,974

CLASS 536

17 9 4,923,975
18.6 4,923,976
20 4,923,977
27 4,923,978
32 4,923,979
55.3 4,923,980
56 4,923,981

CLASS 540

200 4,923,982
363 4,923,983
474 4,923,985
496 4,923,984
545 4,923,986

CLASS 544

53 4,923,987
74 4,923,988
86 4,923,641
318 4,923,989

CLASS 546

84 4,923,990
152 4,923,991
186 4,923,992
250 4,923,993
281 4,923,994
294 4,923,995

CLASS 548

195 4,923,998
206 4,924,002
268.4 4,923,999
343 4,924,000
356 4,924,001
379 4,924,003
402 4,923,996
406 4,923,997
431 4,924,004
521 4,924,005
550 4,924,006

CLASS 549

18 4,924,007
223 4,924,009
355 4,924,010
510 4,924,011
4,924,012
514 4,924,013

CLASS 552

266 4,924,015
625 4,923,640

CLASS 556

40 4,924,016
85 4,924,017
179 4,924,018
187 4,924,019
441 4,924,020
464 4,924,021
471 4,924,022

CLASS 558

162 4,924,023
202 4,924,024

CLASS 560

072 4,924,025
261 4,924,026

CLASS 562

580 4,924,027

CLASS 564

331 4,924,028
418 4,924,029

CLASS 568

34 4,924,030
323 4,924,014

CLASS 600

12 4,923,437

CLASS 604

4 4,923,438
6 4,923,439
14 4,923,440
22 4,922,902
4,923,441
52 4,923,442
110 4,923,443
131 4,923,444
195 4,923,445
198 4,923,446
4,923,447
239 4,923,448
245 4,923,449
265 4,923,450
321 4,923,451
338 4,923,452
356 4,923,453
368 4,923,454
385.1 4,923,455

CLASS 606

391 4,923,456
891.1 4,923,457

CLASS 606

37 4,922,903
55 4,922,896
59 4,923,458
80 4,922,897
85 4,922,898
130 4,923,459
133 4,923,460
4,923,463
146 4,923,461
159 4,923,462
195 4,922,905
4,923,464
226 4,922,904

CLASS 623

2 4,923,465
5 4,923,466
4,923,467
6 4,923,468
10 4,923,469
11 4,923,470
16 4,923,471
20 4,923,472
22 4,923,473
33 4,923,474
37 4,923,475
38 4,923,476
57 4,923,477

CLASS 849

75 4,924,008

CLASSIFICATION OF DESIGNS

D1— 101 307,660
128 307,661
D2— 185 307,662
314 307,663
320 307,664
D3— 6 307,665
9 307,666
35 307,667
39 307,668
56 307,670
61 307,671
71 307,672
106 307,673
D4— 138 307,674
D6— 300 307,675
310 307,676
311 307,677
312 307,678
315 307,679
407 307,680
436 307,681
307,682
457 307,683
484 307,684
307,685
572 307,686
606 307,687
307,688
307,689
307,690
D7— 321 307,695
591 307,691
608 307,692
307,693
620 307,669
691 307,694
D8— 5 307,696
14 307,697
307,698
33 307,766
40 307,701
52 307,699
97 307,702
107 307,703
347 307,704
367 307,705
400 307,706
499 307,707
D9— 300 307,709
307 307,710
341 307,711
344 307,712
349 307,713
373 307,714
415 307,715
424 307,716
430 307,717
432 307,718
307,719
438 307,720
455 307,721
307,722
D10— 15 307,723
46 307,724
307,725
72 307,726
94 307,727
D11— 13 307,728
130.1 307,729
200 307,730
D12— 96 307,731
101 307,732
124 307,735
158 307,733
161 307,734
174 307,736
209 307,737
214 307,738
D13— 141 307,742
162 307,741
164 307,708
307,740
168 307,739
170 307,743
171 307,744
183 307,745
D14— 100 307,746
102 307,747
115 307,748
116 307,749
149 307,750
151 307,751
240 307,752
249 307,753
D15— 82 307,754
199 307,755
D16— 108 307,756
123 307,757
135 307,758
D17— 6 307,760
307,761
307,762
307,763
D18— 13 307,764
307,765
40 307,700
43 307,767
D20— 17 307,768
43 307,769
D21— 34 307,770
38 307,771
74 307,772
82 307,773
108 307,774
307,775
143 307,780
150 307,776
307,777
161 307,778
D26— 2 307,805
37 307,806
111 307,807
D28— 29 307,808
77 307,809
83 307,810
D32— 37 307,811
D34— 6 307,812
28 307,813
31 307,814
266 307,790
353 307,791
374 307,792
406 307,793
D24— 9 307,794
17 307,795
25 307,796
27 307,797
34 307,798
307,799
D25— 65 307,800
124 307,801
307,802
307,803
307,804

CLASSIFICATION OF PLANTS

P.— 34 7,226
7,227

VOL
1114
ISS
2
MY
8
1990
UMI

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	4,923,116		4,923,025		4,923,771	08	4,922,644		4,923,703		4,923,331
	4,923,151		4,923,053		4,923,797		4,922,719		4,923,725		4,923,369
	4,923,263		4,923,065		4,923,798		4,922,808		4,923,752		4,923,391
	4,923,276		4,923,076		4,923,800		4,923,095		4,923,832		4,923,399
	4,924,693		4,923,081		4,923,808		4,923,160		4,923,978		4,923,447
02	4,923,203		4,923,094		4,923,822		4,923,240		4,924,023		4,923,467
	4,923,319		4,923,101		4,923,836		4,923,299		4,230,830		4,923,549
04	4,923,212		4,923,105		4,922,855		4,923,563	11	4,922,611		4,923,555
	4,923,249		4,923,130		4,923,884		4,923,609		4,923,535		4,923,682
	4,923,330		4,923,147		4,923,907		4,923,814		4,923,985		4,923,688
	4,923,370		4,923,150		4,923,928		4,923,963		4,924,285		4,923,914
	4,923,412		4,923,154		4,924,053		4,924,107	12	Re.33,210		4,924,097
	4,923,488		4,923,162		4,924,069		4,924,172		4,922,557		4,924,346
	4,924,037		4,923,164		4,924,074		4,924,191		4,922,645		4,924,441
	4,924,087		4,923,188		4,924,078		4,924,303		4,922,655		4,924,498
	4,924,111		4,923,216		4,924,091		4,924,337		4,922,724	15	4,922,694
	4,924,112		4,923,233		4,924,095		4,924,491		4,922,757		4,922,845
	4,924,291		4,923,234		4,924,098		4,924,503		4,922,814		4,922,929
	4,924,511		4,923,244		4,924,115	09	4,922,556		4,922,899		4,923,200
05	4,922,887		4,923,258		4,924,160		4,922,575		4,922,986		4,923,248
06	Re.33,213		4,923,259		4,924,177		4,922,577		4,923,049	16	4,922,816
	4,922,551		4,923,261		4,924,196		4,922,582		4,923,114		4,923,294
	4,922,555		4,923,317		4,924,214		4,922,643		4,923,161		4,924,119
	4,922,563		4,923,324		4,924,232		4,922,817		4,923,272		4,924,442
	4,922,581		4,923,353		4,924,234		4,922,829		4,923,349	17	Re.33,211
	4,922,599		4,923,381		4,924,278		4,922,938		4,923,377		4,922,588
	4,922,603		4,923,406		4,924,327		4,923,023		4,923,392		4,922,625
	4,922,612		4,923,419		4,924,330		4,923,048		4,923,401		4,922,662
	4,922,616		4,923,421		4,924,331		4,923,096		4,923,402		4,922,689
	4,922,618		4,923,428		4,924,342		4,923,138		4,923,427		4,922,695
	4,922,636		4,923,442		4,924,343		4,923,429		4,923,441		4,922,698
	4,922,639		4,923,443		4,924,344		4,923,448		4,923,462		4,922,743
	4,922,646		4,923,444		4,924,353		4,923,470		4,923,522		4,922,777
	4,922,665		4,923,453		4,924,358		4,923,618		4,923,536		4,922,837
	4,922,687		4,923,468		4,924,374		4,923,716		4,923,820		4,922,842
	4,922,697		4,923,471		4,924,375		4,923,767		4,923,875		4,922,867
	4,922,725		4,923,482		4,924,384		4,923,819		4,924,038		4,922,873
	4,922,738		4,923,500		4,924,387		4,923,851		4,924,206		4,922,878
	4,922,754		4,923,538		4,924,401		4,923,864		4,924,211		4,922,895
	4,922,762		4,923,541		4,924,412		4,923,981		4,924,275		4,922,988
	4,922,783		4,923,544		4,924,413		4,923,997		4,924,361		4,923,039
	4,922,797		4,923,557		4,924,430		4,924,041		4,924,380		4,923,058
	4,922,803		4,923,574		4,924,444		4,924,070		4,924,516		4,923,060
	4,922,807		4,923,581		4,924,446		4,924,106		4,924,520		4,923,070
	4,922,896		4,923,589		4,924,456		4,924,332	13	4,922,624		4,923,090
	4,922,915		4,923,592		4,924,460		4,924,345		4,922,647		4,923,103
	4,922,918		4,923,603		4,924,473		4,924,366		4,922,696		4,923,175
	4,922,921		4,923,651		4,924,486		4,924,400		4,922,922		4,923,177
	4,922,960		4,923,654		4,924,506		4,924,475		4,922,948		4,923,230
	4,922,969		4,923,737		4,924,507		4,924,495		4,923,092		4,923,257
	4,922,980		4,923,744		4,924,519	10	4,922,593		4,923,112		4,923,306
	4,923,009		4,923,751		4,197,590		4,923,097		4,923,239		4,923,309
	4,923,015		4,923,760		4,815,620		4,923,650		4,923,247		4,923,325

	4,923,346		4,923,091		4,923,193		4,924,492		4,924,034		4,923,217
	4,923,413		4,923,262		4,923,237		3,693,983		4,924,173		4,923,264
	4,923,422		4,923,267		4,923,332		3,842,433		4,924,201		4,923,323
	4,923,437		4,923,268		4,923,458	35	4,923,376		4,924,521		4,923,404
	4,923,494		4,923,302		4,923,711		4,923,630	38	4,922,642		4,923,414
	4,923,546		4,923,311		4,923,714		4,923,876	39	Re.33,212		4,923,418
	4,923,585		4,923,327		4,923,717		4,924,229		4,922,552		4,923,424
	4,923,590		4,923,371		4,923,824		4,924,485		4,922,569		4,923,475
	4,923,595		4,923,425		4,923,903	36	4,922,573		4,922,613		4,923,506
	4,923,596		4,923,455		4,923,934		4,922,638		4,922,622		4,923,509
	4,923,604		4,923,584		4,924,071		4,922,640		4,922,657		4,923,511
	4,923,634		4,923,600		4,924,116		4,922,710		4,922,672		4,923,513
	4,923,701		4,923,645		4,924,159		4,922,726		4,922,674		4,923,559
	4,923,719		4,923,805		4,924,169		4,922,728		4,922,712		4,923,577
	4,923,834		4,923,807		4,924,170		4,922,776		4,922,716		4,923,579
	4,923,873		4,923,810		4,924,434		4,922,827		4,922,834		4,923,606
	4,923,891		4,923,901		4,924,467		4,922,850		4,922,852		4,923,621
	4,923,908		4,924,005		4,702,783		4,922,902		4,922,853		4,923,625
	4,923,961		4,924,019	28	4,923,055		4,922,931		4,922,890		4,923,690
	4,924,027		4,924,096		4,924,350		4,922,940		4,922,973		4,923,705
	4,924,040		4,924,109	29	4,922,771		4,922,941		4,922,985		4,923,731
	4,924,072		4,924,141		4,922,833		4,922,963		4,922,991		4,923,757
	4,924,092		4,924,221		4,922,925		4,922,964		4,923,038		4,923,778
	4,924,148		4,924,226		4,922,971		4,923,013		4,923,056		4,923,780
	4,924,150		4,924,227		4,923,432		4,923,146		4,923,062		4,923,843
	4,924,194		4,924,236		4,923,572		4,923,191		4,923,074		4,923,878
	4,924,213		4,924,238		4,923,818		4,923,199		4,923,139		4,923,890
	4,924,218		4,924,304		4,923,874		4,923,218		4,923,224		4,923,895
	4,924,241		4,924,378		4,924,203		4,923,275		4,923,252		4,923,916
	4,924,395		4,924,459	31	4,922,623		4,923,281		4,923,254		4,923,917
	4,924,404		4,924,463		4,923,051		4,923,296		4,923,328		4,924,008
	4,924,418		4,924,496		4,923,111		4,923,307		4,923,348		4,924,056
	4,924,471		4,924,513		4,923,157		4,923,314		4,923,363		4,924,151
	4,924,510		3,943,451	32	4,923,510		4,923,322		4,923,454		4,924,208
	4,924,512		4,767,746	33	4,922,649		4,923,339		4,923,486		4,924,349
18	4,922,658	26	4,922,560		4,922,683		4,923,434		4,923,487		4,924,405
	4,922,891		4,922,564		4,923,080		4,923,451		4,923,490		4,924,435
	4,922,913		4,922,576		4,923,657		4,923,464		4,923,495	44	4,923,576
	4,923,073		4,922,583		4,923,723		4,923,534		4,923,531	45	4,922,565
	4,923,093		4,922,591		4,924,195		4,923,594		4,923,542		4,922,720
	4,923,133		4,922,596		4,924,288		4,923,620		4,923,543		4,923,165
	4,923,174		4,922,601	34	4,922,637		4,923,677		4,923,550		4,923,194
	4,923,242		4,922,641		4,922,806		4,923,680		4,923,578		4,923,599
	4,923,367		4,922,708		4,922,928		4,923,693		4,923,582		4,923,669
	4,923,759		4,922,718		4,922,939		4,923,745		4,923,623		4,923,729
	4,923,933		4,922,734		4,922,965		4,923,758		4,923,678		4,923,740
	4,923,967		4,922,769		4,923,063		4,923,772		4,923,734		4,923,743
	4,923,983		4,922,785		4,923,077		4,923,775		4,923,749		4,924,067
	4,924,001		4,922,798		4,923,129		4,923,782		4,923,756	46	4,923,431
	4,924,158		4,922,847		4,923,187		4,923,784		4,923,770		4,923,597
19	4,922,858		4,922,874		4,923,223		4,923,787		4,923,779	47	4,922,626
	4,923,017		4,922,888		4,923,271		4,923,788		4,923,909		4,922,684
	4,923,124		4,922,956		4,923,301		4,923,791		4,923,936		4,922,780
	4,923,210		4,922,958		4,923,364		4,923,806		4,923,939		4,923,197
	4,923,358		4,922,992		4,923,389		4,923,813		4,923,940		4,923,241
	4,923,362		4,922,997		4,923,423		4,923,827		4,924,009		4,923,445
	4,924,462		4,923,031		4,923,438		4,923,828		4,924,039		4,923,583
20	4,922,600		4,923,079		4,923,440		4,923,849		4,924,046		4,923,702
	4,923,064		4,923,098		4,923,478		4,923,868		4,924,259		4,923,750
	4,923,236		4,923,110		4,923,480		4,923,898		4,924,356		4,923,958
	4,924,152		4,923,176		4,923,499		4,923,906		4,924,372		4,924,450
	4,924,228		4,923,179		4,923,504		4,923,912		4,924,481	48	4,922,598
	4,924,367		4,923,192		4,923,521		4,923,915		4,924,488		4,922,664
21	4,923,366		4,923,195		4,923,524		4,924,049		4,205,028		4,922,721
	4,923,426		4,923,202		4,923,532		4,924,059	40	4,922,758		4,922,731
	4,924,013		4,923,214		4,923,561		4,924,103		4,922,838		4,922,756
	4,924,134		4,923,226		4,923,564		4,924,135		4,922,909		4,922,764
	4,924,145		4,923,228		4,923,591		4,924,198		4,922,950		4,922,822
22	4,922,701		4,923,231		4,923,617		4,924,239		4,923,012		4,922,856
	4,922,729		4,923,260		4,923,627		4,924,246		4,923,196		4,922,875
	4,922,841		4,923,289		4,923,635		4,924,254		4,923,516		4,922,884
	4,922,848		4,923,316		4,923,684		4,924,257		4,923,518		4,922,894
	4,922,999		4,923,336		4,923,694		4,924,262		4,923,643		4,922,927
	4,923,021		4,923,405		4,923,695		4,924,263		4,923,649		4,922,930
	4,923,222		4,923,508		4,923,704		4,924,265		4,923,842		4,922,937
	4,923,699		4,923,512		4,923,708		4,924,271		4,923,971		4,922,957
	4,923,700		4,923,551		4,923,712		4,924,272		4,924,390		4,923,000
	4,923,841		4,923,753		4,923,728		4,924,273	41	4,922,630		4,923,005
	4,923,931		4,923,754		4,923,739		4,924,284		4,922,648		4,923,006
	4,924,018		4,923,755		4,923,826		4,924,338		4,922,791		4,923,007
	4,924,431		4,923,861		4,923,852		4,924,365		4,922,945		4,923,010
23	4,923,498		4,923,872		4,923,867		4,924,371		4,922,979		4,923,011
	4,924,202		4,923,879		4,923,885		4,924,419		4,922,987		4,923,018
	4,924,502		4,923,896		4,923,892		4,924,422		4,923,134		4,923,020
24	4,922,604		4,923,902		4,923,899		4,924,423		4,923,297		4,923,078
	4,922,742		4,923,946		4,923,913		1,924,424		4,923,356		4,923,121
	4,922,748		4,924,002		4,923,938		4,924,466		4,923,795		4,923,171
	4,922,914		4,924,022		4,923,960		4,924,476		4,923,825		4,923,215
	4,923,068		4,924,054		4,923,964		4,924,477		4,924,088		4,923,221
	4,923,155		4,924,164		4,923,982		4,924,499		4,924,110		4,923,273
	4,923,198		4,924,174		4,924,006	37	4,922,793	42	4,922,567		4,923,282
	4,923,941		4,924,362		4,924,010		4,922,815		4,922,590		4,923,372
	4,923,970		4,924,436		4,924,024		4,922,859		4,922,682		4,923,446
	4,924,029		4,689,645		4,924,026		4,922,901		4,922,692		4,923,492
	4,924,230	27	4,922,602		4,924,051		4,922,919		4,922,741		4,923,493
25	4,924,408		4,922,607		4,924,113		4,922,932		4,922,831		4,923,562
	4,922,553		4,922,666		4,924,157		4,922,933		4,922,893		4,923,663
	4,922,735		4,922,723		4,924,179		4,922,598		4,922,897		4,923,681
	4,922,746		4,922,727		4,924,180		4,923,057		4,923,052		4,923,696
	4,922,747		4,922,811		4,924,215		4,923,189		4,923,083		4,923,741
	4,922,805		4,922,849		4,924,225		4,923,274		4,923,084		4,923,747
	4,922,840		4,922,903		4,924,368		4,923,489		4,923,104		4,923,900
	4,922,923		4,922,908		4,924,386		4,923,491		4,923,126		4,924,032
	4,922,924		4,922,935		4,924,448		4,923,713		4,923,166		4,924,120
	4,922,942		4,923,117		4,924,464		4,923,738		4,923,181		4,924,187
	4,923,061		4,923,125		4,924,480		4,923,830		4,923,186		4,924,341

VOL
1114
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	4,924,355		4,922,760		4,924,207		4,923,342		4,922,628		4,923,333
	4,924,407		4,922,943		4,924,233		4,923,407		4,922,749		4,923,398
	4,924,428		4,923,059		4,924,514		4,923,802		4,922,770		4,923,456
	4,924,437		4,923,169		4,924,515		4,924,175		4,922,836		4,923,527
	4,924,470		4,923,326	53	4,922,558		4,924,294		4,922,863		4,923,698
	4,924,484		4,923,340		4,922,562		4,924,301		4,922,866		4,923,707
	4,924,493		4,923,461		4,922,680	54	4,923,087		4,922,954		4,923,742
	4,924,497		4,923,545		4,922,711		4,923,720		4,923,032		4,923,769
	4,924,500		4,923,646		4,922,800		4,923,924		4,923,040		4,923,897
49	4,922,898		4,923,709		4,922,839	55	4,922,568		4,923,086		4,923,919
	4,923,082		4,923,801		4,922,889		4,922,571		4,923,137		4,923,949
	4,924,427		4,924,080		4,923,067		4,922,574		4,923,173		4,924,292
51	4,922,550		4,924,182		4,923,243		4,922,621		4,923,201		4,924,307

DESIGN PATENTS

01	307,675		307,773		307,771		307,808		307,781		307,738
06	307,678		307,789		307,796	29	307,730		307,795		307,744
	307,691	13	307,759	18	307,692		307,780		307,809		307,745
	307,725		307,769	20	307,801		307,793		307,812	45	307,687
	307,729		307,799		307,802	32	307,701	37	307,736		307,688
	307,731	15	307,660		307,803	34	307,679	39	307,697		307,689
	307,757		307,669		307,804		307,680		307,711		307,690
	307,765	17	307,665	21	307,671		307,806		307,712		307,734
	307,787		307,693		307,746		307,810		307,718		307,755
	307,794		307,695	25	307,663	36	307,681		307,797	46	307,788
08	307,698		307,727		307,753		307,682		307,800	47	307,661
09	307,684		307,748		307,807		307,683		307,805	48	307,732
	307,811		307,750	26	307,685		307,709	40	307,779	53	307,782
10	307,706		307,760		307,719		307,710		307,784		307,786
12	307,666		307,761		307,721		307,726	41	307,715	54	307,720
	307,673		307,762		307,742		307,741	42	307,703	55	307,662
	307,694		307,763		307,743		307,754		307,735		307,668
	307,747		307,766	27	307,716		307,768				

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May 15, 1990 Volume 1114 Number 3

CONTENTS

Patent and Trademark Office Notices	Page
Patent Cooperation Treaty (PCT) Information	1114 OG 24
Notice of Maintenance Fees Payable	1114 OG 24
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1114 OG 25
Notification of Acceptance of Delayed Payment of Maintenance Fee	1114 OG 26
Reissue Applications Filed	1114 OG 26
Requests for Reexaminations Filed	1114 OG 27
Erratum	1114 OG 27
Reminders Concerning the Revised Rules of Practice in Trademark Cases	1114 OG 27
Notice of the Charter Renewal for the Public Advisory Committee for Trademark Affairs	1114 OG 28
Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures	1114 OG 29
Patent Certificates of Correction	1114 OG 52
Special Boxes for Mail	1114 OG 53
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1114 OG 54
Condition of Patent Applications	1114 OG 56
Reexaminations	1391
Reissue Patents Granted (33,214)	1393
Plant Patents Granted (7,228)	1395
Patents Granted	
General and Mechanical (4,924,525)	1397
Chemical (4,925,454)	1713
Electrical (4,926,007)	1877
Design Patents Granted (307,815)	2049
Index of Patentees	PI 1
Indices of Reissue, Reexaminations, Design and Plant Patentees	PI 80
Classification of	
Patents (Including Reissues, and Reexaminations)	PI 85
Designs, and Plants Applications	PI 88
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 89
Designs and Plant Applications	PI 90
Change of Address Form and Subscription Order Form	Back Page

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1114
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Jan. 26, 1990

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 12, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,663,779 through 4,665,560
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 10, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,382,301 through 4,383,334
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 4, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,678	06/930,544	5/31/88
(4,573,297)	(06/535,620)	(3/04/86)
4,317,303	06/235,147	3/02/82
4,317,325	06/217,730	3/02/82
4,317,417	06/221,974	3/02/82
4,317,426	06/240,917	3/02/82
4,317,667	06/222,427	3/02/82
4,317,683	06/239,783	3/02/82
4,317,796	06/246,090	3/02/82
4,317,914	06/215,965	3/02/82
4,317,922	06/236,081	3/02/82
4,317,939	06/237,008	3/02/82
4,318,163	06/220,655	3/02/82
4,573,218	06/635,891	3/04/86
4,573,220	06/641,867	3/04/86
4,573,222	06/591,085	3/04/86
4,573,223	06/746,507	3/04/86
4,573,227	06/607,447	3/04/86
4,573,228	06/672,687	3/04/86
4,573,231	06/599,078	3/04/86
4,573,232	06/651,169	3/04/86
4,573,237	06/598,838	3/04/86
4,573,241	06/677,719	3/04/86
4,573,247	06/590,382	3/04/86
4,573,248	06/270,574	3/04/86
4,573,259	06/678,208	3/04/86
4,573,269	06/638,768	3/04/86
4,573,271	06/589,659	3/04/86
4,573,274	06/537,274	3/04/86
4,573,285	06/636,094	3/04/86
4,573,307	06/462,624	3/04/86
4,573,315	06/610,584	3/04/86
4,573,321	06/668,755	3/04/86
4,573,323	06/397,749	3/04/86
4,573,330	06/728,436	3/04/86
4,573,332	06/608,702	3/04/86
4,573,343	06/605,203	3/04/86
4,573,347	06/598,011	3/04/86
4,573,357	06/610,859	3/04/86
4,573,362	06/629,299	3/04/86
4,573,369	06/534,131	3/04/86
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VOL 1114 ISS 3 MY 15 1990 UMI

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NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,510,924	06/457,731	4/16/85	1/13/83	4/10/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,716,403, Re. S. N. 07/457,414, Filed Dec. 26, 1989, Cl. 340/702, LIQUID CRYSTAL DISPLAY DEVICE, Shinji Morozumi, Owner of Record: *Seiko Epson Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Michael I. Wolfson, Ex. Gp.: 266

4,718,008, Re. S. N. 07/461,569, Filed Jan. 5, 1990, Cl. 364/300, METHOD TO CONTROL PAGING SUBSYSTEM PROCESSING IN A VIRTUAL MEMORY DATA PROCESSING SYSTEM DURING EXECUTION OF CRITICAL CODE SECTIONS, Albert Chang, et al., Owner of Record: *International Business Machines, Corp.*, Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 232

4,736,308, Re. S. N. 07/504,679, Filed Apr. 4, 1990, Cl. 364/521, SEARCH/RETRIEVAL SYSTEM, Paul C. Heckel, Owner of Record: *Quickview Systems, Los Altos, Calif.*, Attorney or Agent: Hugh D. Finley, Ex. Gp.: 231

4,737,978, 07/506,638, Filed Apr. 9, 1990, Cl. 379/60, NETWORKED CELLULAR RADIOTELEPHONE SYSTEMS, Michael Burke, et al., Owner of Record: *Motorola, Inc., Schaumburg, Ill.*, Attorney or Agent: F. John Motsinger, Ex. Gp.: 261

4,750,389, Re. S. N. 07/506,795, Filed Apr. 10, 1990, Cl. 81/64, STRAP WRENCH, Abraham Shuster, Owner of Record: *Inventor*, Attorney or Agent: Robert H. Montgomery, Ex. Gp.: 323

4,753,177, Re. S. N. 07/504,861, Apr. 5, 1990, Cl. 110/299, FLUIDIZED BED REACTOR, Folke Engstrom, et al., Owner of Record: *A. Ahlstrom Corp.*, Attorney or Agent: R. A. Vanderhye, Ex. Gp.: 344

4,778,058, Re. S. N. 07/505,347, Apr. 5, 1990, Cl. 206/610, POUCH OR SACK FOR PACKING AND LAMINATE FILM THEREFOR AND METHOD FOR PRODUCING THE POUCH, Shokichi Yamazaki, et al., Owner of Record: *Kabushiki Kaisha Hosokawa Yoko, Tokyo, Japan*, Attorney or Agent: William P. Berridge, Ex. Gp.: 241

4,820,956, Re. S. N. 07/506,861, Filed Apr. 9, 1990, Cl. 315/51, LIGHT MATRIX DISPLAY SYSTEM, Greg Slobodzian, et al., Owner of Record: *Integrated Systems Engineering, Inc., Logan, Utah*, Attorney or Agent: Rick D. Nydegger, Ex. Gp.: 252

4,834,716, Re. S. N. 07/504,650, Filed Apr. 4, 1990, Cl. 604/192, PROTECTIVE CANNULA, George B. Ogle, Owner of Record: *International Medication Systems, Ltd., El Monte, Calif.*, Attorney or Agent: Carl Kustin, Ex. Gp.: 336

4,865,024, Re. S. N. 444,782, Filed Dec. 1, 1989, Cl. 128/80C, EXTENSION DECELERATION ORTHOSIS, David E. Henley, et al., Owner of Record: *Inventor*, Attorney or Agent: Richard D. Multer, Ex. Gp.: 337

4,874,469, Re. S. N. 07/507,321, Filed Apr. 10, 1990, Cl. 162/359, HEAED EXTENDED NIP PRESS WITH ROLL LAYERS, J. H. Pulkowski, et al., Owner of Record: *Beloit Corp., Beloit, Wis.*, Attorney or Agent: David J. Archer, Ex. Gp.: 133

Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,336,554, Reexam No. 90/001,976, Requested Mar. 28, 1990, Cl. 358/124, CODE SIGNAL BLANKING APPARATUS, Masatake Okada, et al., Owner of Record: *Macrovision Corp., Cupertino, Calif.*, Attorney or Agent: A. H. MacPherson, Ex. Gp.: 220, Requester: Wm. Bruce Day, Overland Park, Kans.

4,368,560, Reexam No. 90/001,971, Requested Mar. 23, 1990, Cl. 17/21, ARRANGEMENT FOR REMOVING SKIN OF SLAUGHTERED ANIMALS, Ludwig Wetzel, et al., Owner of Record: *Schmid & Wezel, Maulbronn, Germany*, Attorney or Agent: Striker, Striker & Stenby, Ex. Gp.: 320, Requester: Owner

4,448,061, Reexam No. 90/001,975, Requested Mar. 26, 1990, Cl. 73/59, VISCOMETER WITH A CONTINUOUSLY VARIBLE ELECTRONIC READOUT, David A. Brookfield, Owner of Record: *Inventor*, Attorney or Agent: Unknown, Ex. Gp.: 260, Requester: Bell, Seltzer, Park & Gibson, Charlotte, N. C.

4,524,772, Reexam No. 90/001,970, Requested Mar. 21, 1990, Cl. 128/355, APPARATUS FOR HAIR REMOVAL, Yair Daar, et al., Owner of Record: *Improver Corp., Panama, Panama*, Attorney or Agent: Brumbaugh, Graves, Donohue, et al., Ex. Gp.: 330, Requester: The Firm of Karl F. Ross, New York, N. Y.

4,544,835, Reexam No. 90/001,977, Requested Mar. 28, 1990, Cl. 235/487, DATA SYSTEM CONTAINING A HIGH CAPACITY OPTICAL CONTRAST LASER RECORDABLE WALLET-SIZE PLASTIC CARD, Jerome Drexler, Owner of Record: *Drexler Technology Corp., Mountainview, Calif.*, Attorney or Agent: Thomas Schneck, Ex. Gp.: 230, Requester: Optical Recording Corp., Toronto, Ontario, Canada

4,680,456, Reexam No. 90/001,978, Requested Mar. 28, 1990, Cl. 235/454, DATA SYSTEM EMPLOYING WALLET-SIZE OPTICAL CARD, Jerome Drexler, Owner of Record: *Drexler Technology Corp., Mountainview, Calif.*, Attorney or Agent: Thomas Schneck, Ex. Gp.: 230, Requester: Optical Recording Corp., Toronto, Ontario, Canada

4,756,020, Reexam No. 90/001,974, Requested Mar. 28, 1990, Cl. 379/112, METHOD AND APPARATUS FOR DISALLOWING THE EXTENSION OF A CALL THROUGH A NETWORK, Joseph V. Fodale, Owner of Record: *AT & T Bell Laboratories, Murray Hill, N. J.*, Attorney or Agent: Unknown, Ex. Gp.: 260, Requester: Owner

4,830,505, Reexam No. 90/001,972, Requested Mar. 26, 1990, Cl. 366/2, PARTICLE WETTING PROCESS, Harvey Dunton, et al., Owner of Record: *Standard Concrete Products, Inc., Santa Ana, Calif.*, Attorney or Agent: David L. Horowitz, Ex. Gp.: 240, Requester: Workman, Nydegger & Jensen, Salt Lake City, Utah

4,860,537, Reexam No. 90/001,973 Requested Mar. 26, 1990, Cl. 60/226.100, HIGH BYPASS RATIO COUNTERROTATING GEARLESS FRONT FAN ENGINE, John B. Taylor, Owner of Record: *General Electric Co., Cincinnati, Ohio*, Attorney or Agent: Douglas E. Erikson, Ex. Gp.: 340, Requester: Owner.

Erratum

"All reference to Patent No. 4,911,875 to Heinz Vetter, et al., of Germany for METHOD FOR INJECTION MOLDING SHAPED RESIN BODIES HAVING A SCRATCH RESISTANT SURFACE appearing in the Official Gazette of March 27, 1990 should be deleted since no patent was granted."

Reminders Concerning the Revised Rules of Practice in Trademark Cases

The Office offers the following reminders concerning certain requirements under the revised Rules of Practice in Trademark Cases to ensure proper and efficient processing of trademark papers.

1 Statement of A Bona Fide Intention to Use in Commerce

The Office has received a number of applications filed based on Trademark Act Section 44 which contain no claim of bona fide intention to use the mark in commerce. Sections 44(d)(2) and 44(e), and revised Trademark Rule 2.21 state the requirements for filing a trademark application based on a foreign application or registration. These sections require, among other things, that all applications filed pursuant to Section 44 state a bona fide intention to use the mark in commerce. Therefore if the application is filed based only on Section 44, and applicant has not recited a claim of bona fide intention to use the mark in commerce, the application will not be accorded a filing date and will be returned to the applicant.

VOL
1114
ISS
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This statement must include the words "in commerce." The statement should be set forth in its entirety prominently in the opening statement of the application to ensure that the application is accorded a filing date. The applicant may repeat the statement in the application declaration, if desired.

2. Assertion of Two Bases

If the applicant wishes to file based on both a bona fide intention to use the mark in commerce under Trademark Act Section 1(b) *and* a foreign application or registration under Trademark Act Section 44, the applicant must clearly indicate its intention to do so. In a Section 44 filing the Office will not presume Trademark Act Section 1(b) as an additional basis for filing by the mere statement of a bona fide intention to use the mark in commerce. If the applicant wishes to claim an additional basis under Section 1(b) of the Act it should indicate its intention with a separate statement claiming a basis under Section 1(b).

3. Filing Papers Before Notification of Serial Number

The Office recommends that applicants wait until they have received the filing fee receipt before filing any papers related to a trademark application. The filing fee receipt includes the assigned application serial number. The applicant should refer to the serial number in filing any paper to ensure that the paper is associated with the correct application file. For example, if applicant has filed a photocopy of its application in order to receive a filing date and follows up the photocopy with an original document, the applicant should wait for the filing fee receipt in order to have a serial number with which to reference the second document. Without the reference number, the papers may be returned to the applicant or the papers may be identified as a new filing, and accorded a new serial number.

In the same manner, it is preferable that amendments to allege use under Trademark Act Section 1(c) should not be filed until a filing fee receipt has issued and applicant can reference the serial number of the appropriate application when it submits its amendment to allege use.

The filing of an amendment to allege use has important ramifications in the publication of the mark and production of the *Official Gazette*. Therefore it is especially important that the Office be able to identify and process those papers promptly.

If the applicant files an amendment to allege use along with other amendments, it would be helpful if the applicant provides some indication that the filing is both an amendment to allege use and other amendments.

4. Section 8 Affidavit Requirements

Trademark Act Section 8, as amended, and revised Trademark Rule 2.162 requires, among other things, that registrants set forth the "goods or services recited in the registration on or in connection with which the mark is in use in commerce." The goods and services must also be set forth in any affidavit asserting excusable nonuse. Formerly, applicants were not required to set forth the specific goods and services. Applicant may meet the requirement to specify the goods or services *either* by listing the goods or services *or* by incorporating the goods and services by reference, e.g., "The registered mark is in use in commerce with all the goods and services listed in the registration." The list of goods and services or applicant's incorporation of the goods and services by reference should appear somewhere in the body of the affidavit.

Applicants should also take note of the revised requirement for a specimen or facsimile for each class of goods or services in the registration. The specimen or facsimile for each class must be filed prior to the end of the sixth year. Failure to meet these revised requirements may result in cancellation of all or part of a registration.

5. Filing of Miscellaneous Papers

Every paper filed with the Office which relates to an application or registration should include the serial number of the application or the registration number of the registration. The best practice would be to have the application number or registration number appear on every single sheet of paper which an applicant or registrant files with the Office, including any substitute specimens which applicant may file. Those papers filed with the Office which do not have the application serial number or the registration number reference on them must be identified by Office personnel using alternative means such as looking up the mark or owner in the automated search system. However, if papers become detached, the information which the Office needs to join a particular piece of correspondence to the correct file may not be available.

6. Time for Filing Corrections to Amendments to Allege Use

Applicants should note that Rule 2.76(a) provides that filing an amendment to allege use of a mark in commerce under section 1(c) is only permitted between the time of filing the application and the time the examiner approves the mark for publication. If applicant's amendment to allege use fails to meet the minumum requirements for an amendment to allege use as set out in Rule 2.76(e)(3), applicant must correct those defects prior to approval of the mark for publication or the application will be published without any consideration of the amendment to allege use. If the file is approved for publication before applicant can correct its amendment to allege use, applicant will be required to wait until a notice of allowance issues before it can file its affidavit of use. In these circumstances the fee applicant submitted for its original amendment to allege use will not be refunded or applied to the later filed statement of use.

Apr. 12, 1990

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

NOTICE OF THE CHARTER RENEWAL FOR THE PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), and after consultation with GSA, it has been determined that the renewal of the charter of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.

The Committee was first established in September 1970, and is now being renewed. The renewal was signed on April 4, 1990. The Committee's purpose is to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing flow of knowledge from the private sector to the Government in the field of trademarks.

Subject to the approval of the Assistant Secretary and Commissioner of Patents and Trademarks, the Committee members will be drawn from the regular, associate, and supplementary membership of the United States Trademark Association. The membership is balanced and selected by the President of said association. The Committee will function solely as an advisory body, and in compliance with the provisions of the Federal Advisory Committee Act.

For Further Information Contact: Lynne Beresford, Committee Control Officer, Office of the Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone: (703) 557-7464, or Jan Jivatodi, Committee Management Analyst, U.S. Department of Commerce, Washington, D.C. 20230, telephone: (202) 377-4217.

Apr. 13, 1990

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

DEPARTMENT OF COMMERCE

Patent and Trademark Office
37 CFR Part 1
[Docket Number 90364-0071]
RIN: 0651-AA37

Requirements for patent applications containing nucleotide sequence and/or amino acid sequence disclosures

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending its regulations to establish a standardized format for descriptions of nucleotide and amino acid sequence data submitted as a part of patent applications, in conjunction with the required submission of this data in computer readable form. The standardized format is needed to permit proper examination and processing of such applications and to improve quality and efficiency of the examination process, promote conformity with usage of the scientific community, and improve dissemination of sequence data in electronic form. The standard symbols and format for sequence data, and the submission of this data in computer readable form, will be required for most disclosures of nucleotide and amino acid sequence data in patent applications filed after the effective date of the rule change.
Effective Date: October 1, 1990
For Further Information Contact: Lois E. Boland, Special Program Examiner, Office of the Assistant Commissioner for Patents, Crystal Park 2 - Suite 919, by telephone at (703) 557-8384 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Currently, problems exist in the presentation, examination and printing of nucleotide and amino acid sequence data because of the lack of uniformity in submission of sequence data to the PTO and the impracticality of properly searching and examining sequences submitted in paper form. For example, it is impractical for an examiner, searching a particularly lengthy sequence in a non-conforming format, to accurately key the query necessary to search the sequence in a computerized search. Further, the lack of standardized symbol use and standardized format results in a very difficult comparison, on the part of the examiner and the public, of what is claimed in a given patent application and what is disclosed in the prior art. Still further, the number of patent applications containing nucleotide and amino acid sequences is increasing every year. The major examination problems can be attributed to the volume of data and the use of inconsistent paper formats. The lack of consistency in symbols used and formatting requires examiners to attempt to convert the sequence data, as it appears in patent applications, into formats that are consistent with those appearing in the prior art in order to make proper evaluations of the patentability of the inventions claimed in the patent applications. Problems are also encountered in the printing of nucleotide and amino acid sequence data in patents because the data must be rekeyed under current patent printing procedures. This could easily result in the printing of erroneous sequences. In summary, the diversity and complexity of nucleotide and amino acid sequence data result in searching and analysis difficulties both within the PTO and outside the PTO, decreased accuracy of search and reproduction, and increased cost.

The PTO is amending its regulations to establish a standardized format for descriptions of nucleotide and amino acid sequence data submitted as a part of patent applications, in conjunction with the required submission of the data in computer readable form, which would result in the following advantages:

1. Cost savings in input of sequence data;
2. A practical and more accurate sequence search capability;
3. Improved interference detection;
4. More efficient examination;
5. Improved accuracy of printed sequences;
6. Creation of a PTO database of most patent-disclosed sequence data;
7. Improved public data access and dissemination in electronic form;
8. Exchange of published sequence data, in electronic form, with the Japanese Patent Office (JPO) and the European Patent Office (EPO) in a Trilateral Sequence Exchange Project;
9. Conformity with the scientific community; and
10. The encouragement of other government agencies and private vendors to include sequences appearing in patents in their data bases.

In those areas of biotechnology in which nucleotide and/or amino acid sequence information is significant, many patent applicants are accustomed to, or familiar with, the submission of such sequence information to various sequence databases, such as GenBank, which is produced by the National Institutes of Health. Information regarding GenBank can be obtained from GenBank/Intelligenetics, Inc., 700 East El Camino Real, Mountain View, California 94040, (415) 962-7364. In order to facilitate such submissions, or merely for the purpose of researching and developing sequence information, many eventual patent applicants also generate or encode sequence information in computer readable form. In view of this, compliance with the rules herein should not pose a significant additional burden for these applicants. In order to further facilitate compliance with the rules that follow, the PTO will make available to the public input programs that are based on the Authorin program produced by GenBank. These input programs are specifically tailored to the requirements herein. The PTO presently intends to offer training for applicants and/or their attorneys to aid in their compliance with these rules. Details regarding availability of the modified Authorin program and scheduling of training programs will be announced in the PTO's *Official Gazette*.

The standard symbols and format, as well as the submission of sequence data in computer readable form, will be required for all disclosures of nucleotide and amino acid sequence data in new patent applications filed after the effective date of the rule change. Compliance with the rules, on a voluntary basis, is encouraged for applications filed prior to the effective date of these final rules. It is envisioned that, for the great majority of applications affected by these rules, applicants will not be subjected to significant additional burdens, with regard to both time and/or costs, in order to comply with these rules. However, if exceptional circumstances do arise and certain applicants experience specific hardships in attempting to comply with these rules, the PTO will consider appropriate petitions, filed in accordance with 37 CFR §1.183, to waive the rules, for which any fees may be refunded or waived dependent upon the particular circumstances. The final rules will not apply to reissue applications or reexamination proceedings filed after the effective date unless the application which matured into the patent sought to be reissued or reexamined was subject to these rules. Further, the final rules will not apply, except on a voluntary basis, to continuation or divisional applications filed after the effective date unless any application upon which 35 U.S.C. 120 priority is claimed was also subject to these rules. The final rules will apply to continuation-in part applications filed after the effective date where any application upon which 35 U.S.C. 120 priority is claimed was subject to these rules or where the material that is newly added in the continuation-in-part includes sequence information that falls within the requirements of these rules. For those continuation-in-part applications that are filed after the effective date where the application upon which 35 U.S.C. 120 priority is claimed was not subject to these rules, compliance with these rules, on a voluntary basis, is encouraged.

The final rules define a set of symbols and procedures that will be both mandatory and the only way that an applicant will be permitted to submit certain information about a sequence that falls within the definitions used in these rules. Thus, §1.821 defines a sequence for the purpose of these final rules; sets forth the requirements for specific symbols, formats, paper and computer readable copies of the sequence; and specifies the deadlines for complying with the requirements. Sections 1.822 to 1.824 set forth detailed descriptions of the requirements that will be mandatory for the presentation of sequence data, and §1.825 sets forth procedures that will be available to an applicant in the event that amendments to the sequence information or replacement of the computer readable copy become necessary. There is nothing in these final rules that is intended to alter in any manner the prohibition against the introduction of new matter (35 U.S.C. 132 and 251), or the prohibition against the introduction of information that is not described in the application as originally filed (35 U.S.C. 112, first paragraph).

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With regard to the symbols and format to be used for nucleotide and/or amino acid sequence data set forth in § 1.822 and the form and format for sequence submissions in computer readable form set forth in § 1.824, the PTO intends to accommodate progress in the areas of both standardization and computerization as they relate to sequence data by subsequently amending the rules to take into account any such progress. This progress will probably be reflected in the refinement of or liberalization of these final rules. For example, progress in the area of the standardization of sequence data will likely result in a more comprehensive rule; and the branched sequences and the D-amino acids that are currently excluded from the rules may, in the future, be brought within the scope of the rules once the necessary standardization technology becomes available. As a further example, the computer readable form is currently limited to diskettes and tapes, but it readily can be seen that progress in the technology for developing databases of the type the PTO has envisioned will likely permit a broadening of the permissible types of computer readable forms that may be submitted. The same can be said for the computer/operating-system configurations that are currently permitted. As the PTO becomes able to provide greater refinement and liberality in these areas, the PTO will do so by appropriate amendments to the rules herein.

These final rules are part of an ongoing coordinated effort in the private sector and among the EPO, the JPO and the PTO to standardize the use of symbols and the format for sequence information, in order to permit the exchange and use of each other's published data. The PTO has signed a Memorandum of Understanding with the EPO and the JPO that calls for the capture and exchange of sequence data contained in patent applications filed with the three Offices from 1990 onward. A final agreement relating to the detaila of this undertaking was reached in October 1989. A briefing setting forth the PTO's intentions for handling patent applications containing sequence data was held for the benefit of interested bar and industry groups on July 14, 1988. Draft rules were circulated to interested bar and industry groups on September 23, 1988. Numerous organizations and individuals filed comments in response to both the briefing and the draft rules. Finally, a notice of proposed rulemaking relating to the Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures was published in the Federal Register, 54 FR 18671 (May 2, 1989), and in the *Official Gazette*, 1102 O.G. 34 (May 16, 1989).

In this notice of final rulemaking, a description of the changes in the text of the proposed rules is provided along with an explanation of the reasons supporting the changes. In addition, comments received in response to the notice of proposed rulemaking are analyzed. Finally, an explanation of the content of the final rules is provided.

Changes in Text of Proposed Rules

Seveval changes have been made in the text of the final rules from the text of the proposed rules which were published for comment in the notice of proposed rulemaking. Those changes are discussed below.

Section 1.821

In the preamble for paragraph (a) of this section as proposed, the phrase "a sequence" as proposed has been replaced with the phrase "an unbranched sequence", and the sentence "Branched sequences are specifically excluded from this definition," has been inserted between the first and second sentences of the preamble as proposed for the purpose of clearly excluding branched sequences from the scope of the final rule. Due to the lack of a generally accepted standardized method for the representation and search of branched sequences in computer databases, it was decided that, until the requisite standards are developed, branched sequences would be excluded from the scope of the final rule. As such, these regulations are not applicable to branched sequences. In the first sentence of the preamble, "is interpreted to mean" has been changed to "means." This latter change is considered to be editorial in nature and is not intended to change the meaning of the preamble in any way.

In paragraphs (a)(1) and (a)(2) of this section, the phrase "in the description and/or the separate part of the disclosure on paper copy corresponding to, but not including," as proposed has been replaced with the phrase "as set forth in § 1.822(b), but shall not be shown explicitly in". These changes and the changes, discussed below, that were made to § 1.822(b) and the addition of § 1.822(p) were made for the purpose of clarifying the treatment to be accorded modified nucleotide bases and modified and unusual amino acids.

In paragraph (a)(2) of this section, the sentence "Only peptides or proteins containing normal peptide bonds are embraced by this definition." as proposed has been replaced by the sentence "Any peptide or protein that can be expressed as a sequence using the symbols in § 1.822(b)(2) in conjunction with a description elsewhere in the "Sequence Listing" to describe, for example, modified linkages, cross links, end caps, non-peptidyl bonds, etc., is embraced by this definition." This change was made to clarify the scope of the rules relative to amino acids. Accordingly, an amino acid sequence will not be excluded from the scope of the rules merely due to the presence of one or several modified linkages, non-peptidyl bonds, etc. If an amino acid sequence, containing L-amino acids, can be represented by a string of amino acid abbreviations, with reference, where necessary, to a features table to explain modifications in the sequence, the sequence is embraced by the rules. The use of the terms "peptide or protein" implies, however, that the amino acids in a given sequence are linked by at least three consecutive peptide bonds.

In paragraph (b) of this section, the terms "above definition" have been changed to "definition in paragraph (a) of this section" to clearly identify the definition to which reference is being made.

In paragraph (e) of this section, third and fourth sentences have been added to explicitly set forth the procedure to be followed when a computer readable form of a new application is identical with a computer readable form of another application. In that situation, an applicant may make reference to the other application and computer readable form in lieu of filing a duplicate computer readable form in the new application.

In paragraphs (g) and (h) of this section, the phrases "the requirements of one or more of" have been changed to "any of the requirements of." A corresponding change has been made in the body of paragraphs (g) and (h) by deleting "one or more of" and "above." These changes are considered to be editorial in nature. No change in substance is intended.

In paragraph (g) of this section, the phrase "two months from the date of filing or" has been deleted from the paragraph as proposed to clearly indicate that notices will be sent by the PTO to applicants for all failures to comply with the rules. Further, the phrase "whichever is later, in which to comply, or the application will be considered to be abandoned" has been changed to "in order to prevent abandonment of the application." This latter change is considered to be editorial in nature. No change in substance is intended.

In paragraph (h) of this section, the phrase "or no international search report will be established by the United States Patent and Trademark Office as an International Searching Authority for those claims in the application that are directed to nucleotide and/or amino acid sequences" has been deleted from the paragraph as proposed. International applications that fail to comply with any of paragraphs (b) through (f) of this section will be searched to the extent possible without the benefit of the information in computer readable form. In the first sentence of this paragraph, "further" has been changed to "other" in view of the severely limited time constraints for processing PCT patent applications. In the second to the last sentence of this paragraph, the phrase "include new matter or" has been inserted before the phrase "go beyond the disclosure in the application as filed." This phrase was inserted to acknowledge the parallel, for later reference, between the U.S. and PCT standards for new matter. The last sentence of this paragraph, as proposed, has been deleted to more closely parallel paragraph (g) of this section.

Paragraph (i) has been added to this section to address the concerns of the private sector with respect to the weight that may ultimately be accorded an omission of an item of information which is not required under the rule, regardless of whether that item has been designated as "recommended" or "optional." This paragraph makes clear that neither the presence nor absence of information which is not required under the rules will create a presumption that such information is necessary to satisfy any of the requirements of 35 U.S.C. 112. Further, this paragraph states that the grant of a patent on an application that is subject to

§§ 1.821 through 1.825 constitutes a conclusive presumption that the granted patent complies with the requirements of these rules.

Paragraph (j) has been added to this section to facilitate administrative processing of all application papers, computer readable forms and fees filed under this section. Accordingly, all such application papers, computer readable forms and fees should be marked "Box SEQUENCE."

Section 1.822

In paragraph (a) of this section as proposed, "following requirements" has been changed to "requirements of paragraphs (b) through (p) of this section." This change was made to clearly delineate the requirements being referenced.

In the preamble for paragraph (b) of this section, various changes have been made to the rule as proposed to clarify the codes that may be used for the nucleotide and/or amino acid sequence characters in the representations of the nucleotide and amino acid sequences and to clarify the treatment to be accorded modified nucleotide bases and modified and unusual amino acids. The phrase "and (b)(2)" has been substituted for "through (b)(4)" because the lists of modified bases and modified and unusual amino acids that were set forth in paragraphs (b)(3) and (b)(4) of this section as proposed are now separately set forth in newly drafted paragraph (p) of this section as adopted. In conjunction with the separate listing of the modified bases and modified and unusual amino acids in paragraph (p) of this section, the substance of the second sentence of this paragraph as proposed has been deleted and has been set forth in paragraph (p) of this section as adopted. Three new sentences have been added to paragraph (b) of this section as proposed. The first new sentence sets forth the principle that only those codes listed in paragraphs (b)(1) and (b)(2) shall be used in the representation of the nucleotide and amino acid sequences. The second and third new sentences describe the manner in which modified bases and amino acids may be presented in nucleotide and amino acid sequences by virtue of the use of the codes set forth in paragraphs (b)(1) and (b)(2) of this section. The changes to paragraph (b) of this section as proposed serve to clearly delineate those codes that may be used in the representation of nucleotide and amino acid sequences from those that may be used elsewhere in the description or the "Sequence Listing." Accordingly, only those codes that are to be used in the representation of sequences are now set forth in paragraph (b) of this section as adopted whereas the controlled vocabulary for modified bases and modified and unusual amino acids is now separately set forth in paragraph (p) of this section as adopted. The second sentence of this paragraph, as proposed, has been deleted from this paragraph and now appears in 1.823(a), as adopted.

In paragraph (d) of this section, the term "above" has been replaced by the term "below". The fact that the representation of double stranded nucleotide sequences will not be permitted in the "Sequence Listings" has obviated the need to accommodate those situations in which the coding regions of the coding strand of a double stranded nucleotide sequence and the amino acids corresponding to the codons in the coding strand of that nucleotide are depicted. In those situations, it was considered that the correspondence between the amino acids and the codons in the coding strand could most clearly be illustrated by positioning the amino acids above the nucleotide rather than below the nucleotide, as is more conventionally done. This arrangement was then, for the purpose of consistency, extended to the representation of all amino acids that corresponded to codons in the coding regions of a nucleotide. As stated above, because double stranded nucleotides will not be permitted in the "Sequence Listings," there is no longer a need to depict amino acids above corresponding codons. As such, paragraph (d) as adopted requires the depiction of amino acids corresponding to codons in the coding parts of a nucleotide sequence immediately below, not above, the corresponding codons.

Further, in paragraph (d) of this section, the new sentence "Where a codon spans an intron, the amino acid symbol shall be typed below the portion of the codon containing two nucleotides." has been added to the end of the paragraph, as proposed. This sentence was added to clarify the representation of an amino acid that corresponds to a codon that spans an intron. It is considered to be self-explanatory.

In paragraph (e) of this section, the term "code" has been replaced by the term "abbreviation" for consistency with paragraph (b)(2) of this section.

In paragraph (f) of this section, the sentence "Leftover bases, fewer than 10 in number, at the end of noncoding parts of a sequence shall be grouped together and separated from adjacent groups of 10 or 3 bases by a space." has been added to the end of the paragraph as proposed. This sentence was added to clarify the representation of bases in a nucleotide sequence in those situations where an accumulation of bases, fewer than 10 in number, occur at the end of the non-coding part of a sequence.

Paragraphs (j) and (k) of this section as proposed have been changed to reflect the fact that the representation of double stranded nucleotide sequences will not be permitted in the "Sequence Listing." In paragraph (j) of this section as proposed, "single stranded" has been deleted, and ", only by a single strand," has been inserted between "presented" and "in." The effect of these changes, in conjunction with the deletion of paragraph (k) as proposed, is to preclude the presentation of double stranded nucleotides in the "Sequence Listing."

Insofar as paragraph (k) of this section as proposed has been deleted, paragraphs (l) through (p) as proposed have been redesignated as paragraphs (k) through (o), respectively, as adopted.

In paragraph (n) of this section as proposed (paragraph (m) as adopted), the procedure for numbering amino acid sequences has been changed. In the first sentence of the paragraph as proposed, "shall" has been changed to "may" to indicate that the numbering procedure dependent upon the identification of the mature protein is optional, not mandatory. This change was made to alleviate the concern that there may be instances when an applicant may not have identified the mature protein. As such, an alternative numbering procedure has been set forth for use when the numbering is not based upon the identification of the mature protein. The sentence "Otherwise, the enumeration of amino acids shall start at the first amino acid at the amino terminal as number 1." has been added to the paragraph as proposed to set forth this alternative numbering procedure. The second sentence of this paragraph as proposed has been moved to the end of the paragraph as adopted so as to be applicable to both of the numbering procedures that are set forth in the paragraph as adopted. The third sentence of this paragraph as proposed has been clarified to indicate that the pre-sequences, pro-sequences (newly added), pre-pro-sequences (newly added) and signal sequences referred to are, in fact, amino acids preceding the mature protein.

In paragraph (p) as proposed (paragraph (o) as adopted), the phrase "A partial sequence shall be numbered as a separate sequence and" has been deleted, "numbered" has been changed to "presented"; "separate sequence identifiers, with" has been added between "with" and "the"; and the sentence "A sequence that is made up of one or more noncontiguous segments of a larger sequence or segments from different sequences shall be presented as a separate sequence." has been added to the end of the paragraph as proposed. These changes have been made to address the concerns that the requirements for the presentation and numbering of partial, gapped and hybrid sequences were ambiguous.

Paragraph (p) as adopted is new relative to the text of this section as proposed. The substance of this new paragraph corresponds to that set forth in the second sentence of paragraph (b) as proposed. As such, the comments made above with regard to paragraph (b) of this section are applicable herein.

Section 1.823:

In paragraph (a) of this section as adopted, two new sentences have been added to the paragraph as proposed. The first new sentence sets forth requirements relating to page and line length. The second new sentence was transferred from § 1.822(b) in its entirety. This transfer was made to provide a more logical presentation of all of the requirements for the "Sequence Listing."

In paragraph (b) of this section, the second sentence as proposed has been replaced by three new sentences to more clearly set forth the required arrangement of information in the "Sequence Listing."

In paragraph (b)(1)(i) of this section as proposed, ": specify one name per line: SURNAME comma OTHER NAMES and/

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or INITIALS" has been added after "applicants" to clarify the format for the presentation of the applicants name in the "sequence Listing." similar changes have been made to name designations in paragraphs (b)(1)(vii)(A) and (b)(1)(ix)(A) as proposed.

In paragraph (b)(1)(ii) of this section as proposed, "four lines maximum" has been added to the parenthetical information to indicate that the response provided should not exceed four lines. Similar additions have been made throughout paragraph (b) of this section where the response provided may exceed the one line limitation now set forth in the preamble to paragraph (b) of this section.

In paragraph (b)(1) of this section as proposed, a new item of information has been added. This item of information relates to the number of sequences presented in the "Sequence Listing." The item is as follows: "(iii) NUMBER OF SEQUENCES (number of sequences in the "Sequence Listing" - M)." This item has been inserted after paragraph (b)(1)(ii), and paragraphs (b)(1)(iii) through (b)(1)(ix) as proposed have been redesignated as paragraphs (b)(1)(iv) through (b)(1)(x), respectively.

In paragraph (b)(1)(iii) as proposed (paragraph (b)(1)(iv) as adopted), a new information item has been added. This item relates to the addressee to which correspondence will be sent. The item is as follows: (A) ADDRESSEE (name of applicant, firm, company or institution, as may be appropriate). This item has been inserted before subheading (b)(1)(iii)(A) as proposed, and subheadings (b)(1)(iii)(A) through (E) as proposed have been redesignated accordingly.

In paragraph (b)(1)(v) as proposed (paragraph (b)(1)(vi) as adopted), ", if available" has been added after "M" to indicate that the submission of current application data is mandatory only if it is available to the applicant.

In paragraphs (b)(1)(v) and (b)(1)(vi) as proposed and paragraph (b)(2)(x) as adopted, the parenthetical information provided for application and document numbers, and, filing and publication dates has been expanded to encompass Patent Cooperation Treaty applications and publications.

In paragraphs (b)(1)(v)(B), (b)(1)(vi)(C) and (b)(1)(vi)(D) as proposed, ": specify as dd-MMM-yyyy" has been added after "available" to clarify the format for the presentation of date information in the "Sequence Listing." The lower case letters are employed to designate numeric responses, and the upper case letters are employed to designate alphabetical responses. As such, March 2, 1988, would be presented as 02-MAR-1988. In paragraph (b)(1)(ix)(G) as proposed (paragraph (b)(2)(x)(G) as adopted), "including month/date/year or season" has been changed to "specify as dd-MMM-yyyy, MMM-yyyy or Season-yyyy" to encompass all variations in date designations that may be encountered.

In paragraph (b)(1)(v)(C) as proposed (paragraph (b)(1)(vi)(C) as adopted) ", specify each designation, left justified, within an eighteen position alpha numeric field" has been inserted after "assigned", and ", to maximum of ten classification designations" has been inserted after "rep" to clarify the field length and maximum number of repetitions for the classification designations.

In paragraph (b)(1)(vi) as proposed (paragraph (b)(1)(vii) as adopted), the references to "DOCUMENT NUMBER", "document number", "document type", "PUBLICATION DATE" and "publication date" throughout this paragraph have been deleted and replaced with the appropriate references to "APPLICATION NUMBER", "application number", etc., so that the information collected in this paragraph relates only to prior applications and filing dates, not publications and publication dates. Publication information, including doucent numbers and publication dates, can be provided in paragraph (b)(2)(x) of this section as adopted. Further, subheading (b)(1)(vi)(B) as proposed has been deleted, and (b)(1)(vi)(A) as proposed has been clarified to include the pertinent country information. As such, subheading (b)(1)(vi)(C) has been redesignated as (b)(1)(vii)(B). Further, "specify as two letter country code and eight digit document number" has been inserted after "number,". Information regarding the manner in which PCT applications should be cited has aloo been added to this parenthetical. In view of the above deletion of references pertaining to publication dates, subheading (b)(1)(vi)(D) as proposed has been deleted. Further, since "PRIOR APPLICATION DATA" may repeat, the plural designations throughout the paragraph as proposed have been deleted.

Paragraph (b)(1)(ix) "PUBLICATION STATUS" as proposed has been moved to paragraph (b)(2) of this section as adopted and designated as paragraph (b)(2)(x) "PUBLICATION INFORMATION". This change permits publication information to be submitted specifically with respect to a given sequence. Further, in paragraph (b)(1)(ix) as proposed, "Have the data that are disclosed in SEQ ID NO:X been published" has been changed to "Repeat section for each relevant publication", and patent information fields have been added in the paragraph as adopted. The patent information fields are necessary to accommodate non-literature publications. Further, the format for the residue information collected in paragraph (b)(1)(ix)(H) as proposed has been changed so that this information can be collected in one line in paragraph (b)(2)(x)(K) as adopted. This last change was necessary to reduce the number of levels of information being collected so that the computer software that has been developed to manipulate the collected information can properly distinguish all of the items of information by the use of standard ASCII characters. The use of italics to designate items of information in the rules as proposed did not conform to this ASCII character requirement.

With the exception of the addition of the new item of information for "NUMBER OF SEQUENCES," all of the changes, as discussed above, to paragraph (b)(1) of this section as proposed are considered to be nonsubstantive. These changes clarify the information that is to be submitted and facilitate the collection and manipulation of the information for database purposes.

In paragraphs (b)(2)(i)(C) and (D) of this section as proposed, "both or unknown to applicant" have been added as possible responses for the items of information relating to "STRANDEDNESS" and "TOPOLOGY" in the paragraphs as adopted. These changes address the concerns that the strandedness and topology of sequences may not always be known with certainty. Further, in each of paragraphs (b)(2)(i)(C) and (D) as proposed, additional parenthetical information has been provided to clarify that strandedness and topology relate to those characteristics of the source organism molecule.

In paragraph (b)(2)(ii) as proposed, "KIND" has been changed to "MOLECULE TYPE" in the paragraph as adopted. This change corresponds to the same change made by GenBank for collecting sequence information. Further, "with subheadings, if any" has been inserted in the parenthetical because one of the molecule types that are listed has been modified to provide a subheading not previously provided for. Specifically, the subheading "(A) DESCRIPTION" has been provided for "Other nucleic acid." The molecule types listed in this paragraph as adopted differ slightly from those listed in the proposed rule. The adopted molecule types more closely correspond to the requisite controlled vocabulary currently in use in GenBank's Authorin submission program. Further, where separate alternative paragraphs (b)(2)(ii) were provided in this section as proposed for nucleotides and peptides or proteins, these separate paragraphs have been combined in the paragraph as adopted. These alternatives were considered to be unnecessary in light of the sequence type information collected in paragraph (b)(2)(i)(B) as proposed and adopted. Paragraphs (b)(2)(ii)(A), (B) and (C) as proposed have been deleted from this section of the rule as adopted. The information in paragraph (b)(2)(ii)(A) is not considered to be useful to the database and will not be collected. Paragraphs (b)(2)(ii)(B) and (C) are separately provided for in this section as adopted in paragraphs (b)(2)(v) and (b)(2)(iii), respectively.

New paragraphs (b)(2)(iii), (b)(2)(iv) and (b)(2)(v) have been provided in this section as adopted. Paragraph (b)(2)(iii) "HYPOTHETICAL (yes/no -R)" has been provided as a separate paragraph in this section as adopted because all of the molecule types in paragraph (b)(2)(ii) could be hypothetical, not just those previously designated as hypothetical. Paragraph (b)(2)(iv) "ANTI-SENSE (yes/no - R)" has been added to accommodate an emerging trend in the technology. Paragraph (b)(2)(v) "FRAGMENT TYPE ..." has been added as a separate paragraph in this section as adopted, whereas it was collected as an item of information under paragraph (b)(2)(ii) "KIND" in this paragraph as proposed, in order to clearly delineate "KIND" or "MOLECULE TYPE" information from other unrelated items of information such as "FRAGMENT TYPE."

Further, in paragraph (b)(2)(ii)(B) as proposed (paragraph (b)(2)(v) as adopted), the "FRAGMENT TYPE" responses have been changed to clearly indicate that fragments are indeed

intended by each response. As such, "N-terminal" and "C-terminal" are, in the paragraph as adopted, "N-terminal fragment" and "C-terminal fragment."

Paragraphs (b)(2)(iii)(A) through (C) as proposed will not be collected separately. Rather, in the rule as adopted, paragraph (b)(2)(vi)(A) will collect this information in "ORGANISM (scientific name of source organism)."

In paragraph (b)(2)(iii)(F) as proposed (paragraph (b)(2)(vi)(D) as adopted), the parenthetical has been expanded to incorporate the subheadings "(1) GERM LINE" and "(2) REARRANGED", and those subheadings have been deleted. This change was necessary to reduce the number of levels of information being collected so that the computer software that has been developed to manipulate the collected information can properly distinguish all of the items of information by the use of standard ASCII characters. The use of italics to designate items of information in the rules as proposed did not conform to this AsCII character requirement.

In paragraph (b)(2)(vi) as adopted (paragraph (b)(2)(iii) as proposed), "CELL LINE" and "ORGANELLE" have been added as paragraphs (b)(2)(vi)(H) and (I), respectively. These items of information were collected in paragraphs (b)(2)(iv)(A) and (b)(2)(ii), respectively, as proposed. It is considered that these items of information are more properly collected under the "ORIGINAL SOURCE" heading.

In paragraph (b)(2)(iv) as proposed, paragraph (h)(2)(iv)(A) has been deleted in view of its addition to paragraph (b)(2)(vi) as adopted.

Paragraph (b)(2)(vi) as proposed has been deleted and the corresponding information will be collected in the "FEATURE" information in paragraph (b)(2)(ix)(D) "OTHER INFORMATION." It is considered that these items of information are more properly collected under the "FEATURE" heading.

In paragraph (b)(2)(vii) as proposed (paragraph (b)(2)(ix) as adopted), "FEATURES" has been changed to "FEATURE" to indicate that one feature at a time is, in fact, being described, although multiple features may be described by virtue of repeating the field. Further, a new subheading "(A) NAME/KEY (provide appropriate identifier for feature):" has been added to the paragraph as adopted, and the remaining subpaaagraphs have been redesignated. This new subheading is necessary so that information relating to feature identifiers is positively requested and can, as such, be searched as a separate field. In this paragraph, the parenthetical for the subheading "LOCATION" has been expanded to encompass the information collected in the now deleted subheading "COMPLEMENT." Further, it is now explicitly stated that the location should be specified in accordance with the syntax of the DDBJ/EMBL/GenBank Feature Table Definition. This is the syntax that has been jointly developed by the three major sequence databases in Japan, Europe and the United States. As set forth above, a new subheading "(D) OTHER INFORMATION" has been added to collect the information collected in the now deleted paragraph (b)(2)(vi).

Section 1.824:

In paragraph (a) of this section as proposed, the phrase "required b § 1.821(e)" has been added after the terms "computer readable form" to provide a cross-reference to the section of the rules that requires the submission of the computer readable form.

In paragraph (b) of this section as proposed, the erroneous reference to "National" has been deleted in the paragraph as adopted.

In paragraph (d) of this section as proposed, the two sentences have been combined into a single sentence in the paragraph as adopted. This change is considered to be editorial in nature. No change in substance is intended.

In paragraph (f) of this section as proposed, the preamble has been changed to reiterate the fact that any means may be used to create the computer readable form as long as the conditions set forth in this paragraph are satisfied. Further, in order to clarify the tape requirements in this paragraph, the magnetic tape specification has been deleted from paragraph (f)(1) and a new paragraph (f)(4) has been added solely directed to magnetic tapes.

In paragraph (f)(2) as proposed, the spelling of "Xenix" has been corrected, the references to "Unix" or "System V" have been deleted, and the erroneous "LPR" designation has been changed to "lpr" in the paragraph as adopted.

In paragraph (f)(3)as proposed, a new media format has been inserted in the paragraph as adopted to accommodate the high capacity diskettes now available for the Apple Macintosh system. This new format is a "3.50 inch, 1.4 Mb storage" diskette.

In paragraph (h) as proposed, the word "phase" in the last sentence has been changed to "stage" in the paragraph as adopted to properly track the terminology currently in use in other sections of 37 CFR.

Section 1.825:

In paragraph (a) as proposed, a parenthetical cross-reference to the section and paragraph of these rules that establishes the requirement for the submission of the paper copy of the "Sequence Listing" has been provided in the paragraph as adopted.

In paragraph (b) as proposed, a parenthetical cross-reference to the section and paragraph of these rules that establishes the requirement for the submission of the computer readable form has been provided in the paragraph as adopted.

In paragraph (c) as proposed, the phrase "an application after the grant of a patent thereon" has been changed to "a patent, e.g., by reason of reissue or certificate of correction," to more properly state that patents, not applications, are the subject of the corrections referenced in the paragraph as adopted.

Response to and Analysis of Comments

Written comments from thirteen (13) sources were received in response to the notice of proposed rulemaking. Some suggestions made in the comments have been adopted as presented or in modified form, and others have not been adopted. A detailed analysis of the comments follows. There was no oral testimony presented at the public hearing conducted on July 12, 1989.

Comment: Two comments questioned the authority of the PTO to impose these regulations. The comments alleged that computer readable forms are not "in writing" as required by 35 U.S.C. 111, and that the rules represent a fundamental revision of 35 U.S.C. 111, 112, and 113, and cannot be reconciled with the requirements of law.

Response: 35 U.S.C. 6 gives the Commissioner the authority to establish regulations "not inconsistent with law." These rules require sequences to be submitted "in writing" as specified under 35 U.S.C. § 111. The additional requirement of the submission of a computer readable form is not inconsistent with 111. The rules do not alter, in any way, the requirements of 35 U.S.C. 112 and 35 U.S.C. 113.

Comment: One comment stated that the rules will have a significant impact on how the claims or disclosures will be interpreted. Further, it was stated that the rules preclude the applicant from being his/her own lexicographer.

Response: As stated above, the rules do not alter, in any way, the requirements of 35 U.S.C. 112. There will be no change in disclosure and/or claiming requirements after the implementation of the rules. The use of sequence identification numbers (SEQ ID No:X) only provides a shorthand way for applicants to claim their inventions. These identification numbers do not in any way restriet the manner in which an invention can be claimed.

Comment: One comment questioned the validity of requiring applicants to ensure that there is no added matter upon amendment, which until now had been the responsibility of the PTO.

Response: This is not the first instance in which the applicant is required to ensure that there is no new matter upon amendment. The requirement is analogous to that found in 37 C.F.R. § 1.125 regarding substitute specifications. When a substitute specification is required because the number or nature of amendments would make it difficult to examine the case, the applicant must include a statement that the substitute specification includes no new matter. The necessity of requiring a substitute "Sequence Listing" upon amendment is similar to the necessity of requiring a substitute specification and, likewise, the burden is on the applicant to ensure that no new matter is added. Applicants have a duty to comply with the statutory prohibition (35 U.S.C. 132 and 251) against the introduction of new matter.

Comment: Two comments recommended that the standardized format not be made mandatory, but optional, or a less rigid code should be adopted.

Response: The stated purpose and usefulness of these rules depends upon and requires that the resultant database be accu-

VOL
1114
ISS
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MY
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1990
UMI

rate, uniform and complete. The Office has determined that mandatory compliance with a single standardized format is the most efficient way of accomplishing this goal.

Comment: Four comments suggested that the proposed effective date of January 1, 1990, be postponed. The Authorin program should be available and in use. There should be a longer transition period where the standardized format serves as a guideline rather than a mandatory rule.

Response: As noted above, the effective date of the rules has been postponed. There will be a testing period after the publication but prior to the effective date of these final rules in which applicants may elect to participate on a voluntary basis.

Comment: Three comments were made to the effect that the PTO, the JPO, and the EPO should come to an agreement regarding a uniform standardized format among the three offices.

Response: The final rules are consistent with the harmonization that has been achieved among the EPO, the JPO and the PTO relating to the presentation and exchange of sequence data.

Comment: One comment expressed concern that the lack of inter-linkage with other major gene banks would cause more work and confusion rather than less.

Response: The PTO has consulted with the existing U.S. nucleotide and peptide and protein sequence data libraries during the development of the final rules presented herein. The EPO has also consulted with the major European sequence data libraries. It should also be noted that the existing nucleotide and peptide and protein sequence data libraries in the U.S., Europe and Japan have implemented regular exchanges of sequence data.

Comment: Two comments discussed differences between the proposed standard format and that of publication databases, and pointed out the difficulty to applicants in changing the way they currently submit sequence data. The comments alleged that the proposed rules indicate that the standardized format is similar to the GenBank format when, in fact, they are quite different. Also, the rules require separate listings for sequences derived from a single sequence, whereas publication databases do not.

Response: The standardized format is as close to the GenBank format as the Office could come while accommodating the special requirements of patent applications. Many applicants will have to change the way they currently submit sequence data in patent applications, but it will be a one-time change. The benefits to both the applicants and the PTO in terms of improved search capability and higher quality patents should more than compensate for any initial burden that may be experienced by some applicants. Further, GenBank is working with the PTO to produce software that will easily convert the standard GenBank presentation for nucleotides and the standard PIR presentation for peptides to the required PTO submission format. The PTO will make this modified program available to the public.

Comment: One comment questioned whether a DNA or amino acid sequence could still be part of a figure in a patent application, or whether it must be referred to in the format "SEQ ID NO."

Response: Any sequence may still be shown in a figure. Indeed, many significant sequence features may only be demonstrated by a figure. This is especially true in view of the fact that the representation of double stranded nucleotides is not permitted, according to the final rules, in the "Sequence Listing," and many significant nucleotide features, such as "sticky ends" and the like, will only be shown effectively by reference to a drawing figure. Similarly, drawing figures are recommended for use with amino acid sequences to depict structural features of the corresponding protein, such as finger regions and Kringle regions.

Comment: Two comments expressed concern over the need for all applicants to have access to the necessary computer equipment and programs.

Response. To facilitate compliance with the rules, the PTO will make a modified Authorin data input program available to all applicants for the cost of the media. Those applicants for whom compliance with the rules remains a significant hardship may petition for a waiver of the rules. See 37 CFR § 1.183.

Comment: Three comments questioned the use of a format which had advantages for production of a "hard copy" document, but would have to be reformatted for database storage and sequence searching. Separate "clean" listings of each nucleic acid and amino acid sequence were recommended.

Response: The software that has been developed for the purpose of the PTO's sequence database readily parses the requisite sequence information from the sequence data that has been formatted primarily for visual presentation and review.

Comment: Two comments stated that the "Recommended" and "Optional" information was unnecessary in identifying the sequence with particularity, would be provided elsewhere in the application and should be eliminated from the rules.

Response: The "Recommended" and "Optional" information has been retained for the purpose of developing, to the extent possible, the most comprehensive database possible for the purpose of searching applications containing sequence data. The "Recommended" and "Optional" information items constitute text database fields that will be text searchable by the search program that will be used by the PTO examiners. While this textual information may be available elsewhere in a given application, it would not be included in a sequence database and thus would not be searchable in the database if it is not included in the "Sequence Listing" and the computer readable copy of the "Sequence Listing."

Comment: Two comments suggested that the PTO train two or three clerks to convert computerized sequence data to the requested format. The comment further stated that it would be easier and cheaper for a clerk to learn to work the software and then use it every day, than to expect inventors and attorneys to relearn the system each time they file an application disclosing a sequence as herein defined.

Response: Conversion at the PTO would involve an unnecessary duplication of effort and would increase the opportunities for the introduction of errors into the database. It is not the intent of the PTO to convert data except in some, as yet unidentified, very exceptional circumstances. The service suggested in the comment can be met appropriately in the private sector.

Comment: Three comments said that the minimum thresholds for sequence length set out by § 1.821(a) were too low, encompassing amino acid sequences which are easily searchable without computer assistance and incidental nucleotide sequences, such as linkers, which are of no value to a PTO database.

Response: The minimum thresholds have been established for the purpose of developing a database that will facilitate computerized searching for both lengthy and relatively shorter sequences. The limit of four or more amino acids has been established for consistency with limits in place for industry database collections, whereas the limit of ten or more nucleotides, while lower than certain industry database limits, has been established to encompass those nucleotide sequences to which the shortest probe will bind in a stable manner. To raise the lower limit for amino acids to, for example, five amino acids, immediately illustrates the problems associated with higher thresholds. With a limit of five amino acids there would be 20^4 (160,000) possible combinations below this higher threshold versus 20^3 (8000) or fewer possible combinations below the current threshold. This difference in the number of possible combinations is significant, and plays an important role in effectively searching the applications under consideration.

Comment: Two comments recommended that sequences incidental to the invention not be subject to the rules, and that only claimed sequences be required to be listed. One comment stated that the requirements should not be limited to claimed sequences.

Response: Any disclosed sequence, whether claimed or not, is relevant for the purpose of assessing the prior art. Therefore, it is essential that all sequences, whether only disclosed or also claimed, be included in the PTO database.

Comment: Two comments suggested that sequences included as prior art not be subject to the rules.

Response: In many instances, prior art sequences may generally be referred to by name and a publication reference; in these situations, they need not be listed as part of the "Sequence Listing." However, if recitation of the sequence, i.e., as a string of particular bases or amino acids, is necessary to a discussion of these prior art sequences, it is required that these sequences be included in the "Sequence Listing" for examination purposes.

Comment: One comment inquired as to whether functionally defined sequences could be referred to by function or whether they must be listed.

Response: Any sequence that is disclosed as a sequence, i.e., as a string of particular bases or amino acids, and that otherwise meets the criteria of § 1.821(a), must be set forth as part of the "Sequence Listing." However, a sequence that is referred to only by function need not be listed.

Comment: One comment raised the question of how to deal with variations on listed sequences such as the following: Example (1) allelic variations or "conservatively modified variants thereof." and Example (2) where the sequence "may be deleted at the C-terminus by 1, 2, 3, 4, or 5 residues."

Response: The rules do not encompass the variations listed in Examples (1) or (2). In Example (1), the sequences may be described as SEQ ID NO:X and "conservatively modified variants thereof" or allelic variations, if desired. A situation such as that in Example (2), if encompassed by the rules, would introduce far too much complexity into the "Sequence Listings" and the searching database that is currently envisioned. The possible mathematical variations that result from this type of language could reasonably require a "Sequence Listing" that would be thousands of pages in length. In Example (2), only the undeleted sequence needs to be included in the "Sequence Listing," and the sequences may be described as SEQ ID NO:X from which deletions have been made at the C-terminus by 1, 2, 3, 4 or 5 residues. The sequence search database will only contain the undeleted sequence.

Comment: Two comments inquired as to the criteria the PTO would use to determine compliance, and what opportunities would be afforded the applicant to satisfy the regulations. One comment also stated that abandonment is an unduly harsh penalty for failure to comply with the rules.

Response: Applicants will be notified of easily detectable deficiencies early in the application process. Deficiencies of a more sophisticated nature will likely only be detected by the examiner to whom the application is assigned. Applicants whose computer readable forms are damaged in the mail, are not readable, or are missing mandatory elements will be so notified shortly after receipt of the application by the PTO. Other errors or inconsistencies will be noted by the examiner early in the examination process. Upon detection of damage or a deficiency, a notice will be sent to the applicant detailing the damage or deficiency and setting a one month period for response. Extensions of time in which to reply will be available pursuant to 37 CFR 1.136. When an action by the applicant, such as a response to a notice to comply from the PTO, is determined to be a bona fide attempt to comply with the rules and it is apparent that compliance with some requirement has inadvertently been omitted, the opportunity to explain and supply the omission will be given before the question of abandonment will be considered. See 37 CFR § 1.135(c).

Comment: Two comments questioned the legal significance of sequences in the description which differ from those in the "Sequence Listing."

Response: There should not be many instances where differences occur since sequences which are listed in the "Sequence Listing" should be referred to by the assigned SEQ ID No within the text of the description and claims. A sequence may be listed as part of a figure which may differ from that listed in the "Sequence Listing." In that case, the rules represent no change from current practice regarding inconsistencies within an application.

Comment: One comment expressed concern over the likelihood of error when referring to a sequence by ID number and the consequences to the applicant of such an error.

Response: There is the possibility that errors will occur. However, referring to sequences by ID number should prove to be less prone to error than actually repeatedly reproducing the sequences.

Comment: One comment suggested that the PTO furnish the applicant with a paper copy of the data as it appears in the PTO's database so that the applicant may ensure that no errors arose in the data transferal.

Response: The PTO will undertake the furnishing of such paper copies after the implementation date of the rules. However, the necessity of continuing this procedure indefinitely will be reviewed once the integrity of the system has been established.

Comment: One comment stated that either the paper copy or the computer readable copy of the "Sequence Listing" must not be correctable by reference to the other. The PTO should clearly state the policy, and needs the right to require (not just "permit") correction of one copy where there are discrepancies.

Response: As set forth in § 1.821(e), the paper copy of the "Sequence Listing" will serve as the official copy of the "Sequence Listing" for the purposes of the patent application file. The PTO would like to permit correction of the paper copy, at the least, during the pendency of a given application by reference to the computer readable copy thereof if both the paper and computer readable forms were submitted at the time of filing of the application and the totality of the circumstances otherwise substantiates the proposed correction. A mere discrepancy between the paper copy and the computer readable form may not, in and of itself, be sufficient to justify a proposed correction.

Comment: One comment said that if the paper copy is the official copy for priority purposes, it should be corrected (if necessary) within about nine months of the filing date in order to be used for filing under the Paris Convention.

Response: This comment is noted, but compliance with the recommended timing is, of course, contingent upon the discovery of inconsistencies within the Paris Convention priority period. It is expected that some, but certainly not all, discrepancies will be discovered within the priority period. The PTO cannot guarantee that all discrepancies in any part of an application will be discovered within the priority period.

Comment: One comment noted that although the PTO may not consider the computer readable copy to be part of the file wrapper for U.S. application purposes, the possible effect of this additional disclosure on foreign filings based upon the original filing document of the U.S. application has not been addressed or explained.

Response: The rules explicitly state that the computer readable form is merely a copy of the "Sequence Listing," and that the computer readable form will not necessarily be retained as a part of the application file. Section 1.821(e). A certified copy of a U.S. application that is obtained for the purpose of foreign filing will not include any information in computer readable form. However, it will include a copy of the "Sequence Listing." There should be no additional disclosure in the computer readable form relative to the "Sequence Listing." Section 1.821(f) clearly requires a statement that the content of the two is the same must be submitted. These sections were drafted with the foreign priority considerations in mind.

Comment: One comment recommended that the PTO state that an applicant will (rather than "may") be given the opportunity to meet the regulations when a bona fide attempt to comply has been made, but when some item has inadvertently been omitted.

Response: The grant of this further opportunity to comply is dependent upon the nature of the deficiency and the response received in attempt to cure the deficiency. If it is evident that a bona fide attempt to comply has been made, the opportunity to explain and supply the omission will be given before the question of abandonment is considered. No change to existing practice regarding inadvertent omissions is intended or contemplated. See 37 CFR § 1.135(c).

Comment: Two comments asked what an applicant should do, in view of the rule prohibiting the addition of new matter, if an error in sequencing were discovered after filing an application.

Response: The treatment accorded errors in sequencing will be no different after the implementation date of these rules than that currently accorded errors in sequencing or any other errors that are made in describing the invention in the application as originally filed.

Comment: One comment recommended that applicants not be required to submit additional computer readable copies of the "Sequence Listing" when filing a derivative application (continuation, continuation-in-part, or divisional).

Response: Additional computer readable forms will not be required in derivative or continuing applications if the sequence information is exactly the same as that in a parent application in which a complying computer readable form had been filed. In such situations, applicants must request that the previously submitted computer readable form, or the data thereon, be used in a subsequently filed application in much the same manner as applicants must now request the transfer of drawings in derivative or continuing applications. Section 1.821(c) now explicitly provides for this practice.

Comment: Four comments said the estimate that the proposed rule change would require only an additional 15 minutes was

VOL
1114
ISS
3
MY
15
1990
UMI

highly unrealistic. One comment noted that the time required to key in all the information other than the sequence data was less than one hour.

Response: The estimated time of approximately fifteen minutes for complying with these rules should not be interpreted as the amount of time necessary to formulate a "Sequence Listing" submission. Rather, the estimated time only relates to the additional amount of time applicants will have to expend to comply with these rules over and above that which they would have expended previously for patent applications. It is submitted that compliance with these rules will involve only the additional submission of relevant application and computer readable form information and a minor, one-time, revision of the format for presenting sequence data, after which no additional expenditure of time for format compliance will be necessary. The time required to submit sequence and any associated information is not included in the above estimate because it is properly assumed that this information would necessarily have been submitted, though possibly in a different format, in applications filed prior to the effective date of these rules.

Comment: One comment asked whether on-line access to the PTO database would be available to the public.

Response: On-line access to the PTO database is not immediately envisioned. The PTO does plan to disseminate the patented or published portion of the database by making the information available to the public.

Comment: Two comments asked whether adequate security measures would be taken to insure that diskettes are properly identified before separation from their files.

Response: Adequate measures will be taken to insure that computer readable forms are properly identified before separation from their files. The labeling procedures required by § 1.825(h) of these final rules should minimize any identification problems.

Comment: One comment asked how the PTO intended to dispose of the disks to insure the secrecy of their contents.

Response: The secrecy of the computer readable forms will be maintained in much the same manner as the secrecy of applications is currently maintained. If computer readable forms are disposed of by the PTO, they will be disposed of in a manner that will preserve the secrecy of their contents.

Comment: One comment recommended that all sequence data meeting the minimum length criteria be routinely subject to the rules, and that a petition should be required when an applicant believes particular sequences are exempt as per 37 CFR 1.821(a).

Response: The suggestion cannot be adopted because the PTO has the burden to establish a lack of compliance with the rules, and the suggested practice would have the effect of placing the burden of establishing the need for compliance with applicants. The burden of proof does not shift to the applicant until the PTO has established a prima facie case of noncompliance.

Comment: One comment suggested that the definition of nucleotide sequences be narrowed to exclude polymers containing other than typical 5' to 3' phosphodiester linkages.

Response: The rules have been drafted so as not to exclude the types of sequences that are specifically referred to. The PTO does not want to exclude linkages of the type commonly found in naturally occurring nucleotides, e.g., eukaryotic end capped sequences.

Comment: One comment suggested that the applicability of the rules is overbroad and ambiguous. It was stated that it was unclear whether a single non-peptidyl linkage removes a peptide from applicability.

Response: Every effort has been made to eliminate ambiguity from the rules. The rules are, nonetheless, procedurally and technologically complex. They must be carefully reviewed in order to gain a comprehensive understanding of them. With regard to the specific question that has been posed, § 1.821(a)(2) was changed to address the point in question. A single non-peptidyl bond does not exclude a given peptide from the scope of the rule.

Comment: Three comments recommended that the depiction of unusual or modified bases and amino acids should be clarified. One of these comments suggested specific language for clarification. The suggested language is as follows:

> A modified base or amino acid may be presented in a given sequence as the corresponding unmodified base or amino acid if the modified base or amino acid is one of those listed in paragraphs (p)(1) or (p)(2) of this section and the modification is also set forth elsewhere in the Sequence Listing (for example, FEATURES § 1.823(b)(2)(ix)). Otherwise, all bases or amino acids not appearing in paragraphs (b)(1) or (b)(2) of this section shall be listed in a given sequence as "N" or "Xaa," respectively, with further information, as appropriate, given elsewhere in the Sequence Listing.

Response: The suggested language has been adopted in § 1.822(b) of the final rule.

Comment: One comment asked that the PTO explicitly state that the rules do not apply to applications that are pending at the time of the rule change.

Response: Only new applications filed after the effective date of the rule change will be subject to the rules; applications which are pending at that time are exempt. Compliance with the rules, on a voluntary basis, is encouraged for applications filed prior to the effective date of these final rules. The final rules will not apply, except on a voluntary basis, to continuation or divisional applications filed after the effective date unless the application upon which 35 U.S.C. 120 priority is claimed was also subject to these rules. The final rules will apply to continuation-in-part applications filed after the effective date where the application upon which 35 U.S.C. 120 priority is claimed was subject to these rules or where the material that is newly added in the continuation-in-part includes sequence information that falls within the requirements of these rules. The final rules will not apply to reissue or reexamination applications filed after the effective date unless the application which matured into the patent sought to be reissued or reexamined was subject to these rules.

Comment: One comment asked whether it would be acceptable for the inventor or the person who actually compares sequence data to sign the statement that the "Sequence Listing" conforms to the computer readable form.

Response: A statement submitted by either of those persons is acceptable as long as it is a verified statement. Any person registered to practice before the PTO may make such a statement, and it does not need to be verified. The statement may be made by any person not registered to practice before the PTO if the statement is a verified statement, i.e., in oath or declaration form.

Comment: Three comments said that the time limits set for compliance in § 1.821(g) were too short and should be extended.

Response: The time limits set are considered reasonable, and those set in § 1.821(g) are extendable pursuant to 37 CFR 1.136.

Comment: One comment noted that the requirement to indicate coding regions of a nucleic acid sequence may be inappropriate.

Response: There has been a misunderstanding of the requirements relating to the depiction of the coding regions in nucleotide sequences as well as the amino acids corresponding to the codons in those coding regions. It should be noted that the rules do not, in any way, require the depiction of coding regions or the amino acids corresponding to the codons in those coding regions. Paragraph (d) of § 1.822 only requires that where amino acids corresponding to the codons in the coding parts of a nucleotide sequence are depicted, they must be depicted *below* the corresponding codons. (Emphasis added.) There is absolutely no requirement in the rules to depict coding regions. Nor is there a requirement to separately list the amino acid sequence unless the applicant desires to discuss the amino acids as a separate sequence. That is, when the coding parts of a nucleotide sequence and their corresponding amino acids have been identified, if applicant desires to discuss those amino acids in the coding parts of the nucleotide as a separate sequence, those amino acids must also be set forth as a separate sequence. These requirements do not alter, in any way, the requirements of 35 U.S.C. 112. The separate submission of the amino acid sequence that corresponds to the coding parts of a nucleotide sequence is, however, recommended and encouraged because the amino acid sequence may not be captured in the sequence database if it is only presented in the mixed-mode format.

Comment: One comment noted that the requirement to list nucleotide coding regions as groupings of codons becomes redundant when the same sequence must be listed for each reading frame, and may be irrational for those circumstances where a single base insertion or deletion causes a change in the reading frame.

Response: As noted above, there is no requirement in the rules to depict coding regions of nucleotides. However, when an applicant does elect to depict coding regions, the rules require that they be depicted in a uniform manner.

Comment: One comment noted that the term "mature protein" should be better defined. The requirement to number amino acids based on the determination of the mature protein is unnecessary and could lead to litigation problems. Further, the designation of pre- and pro- sequences may be impossible and is irrelevant to the search.

Response: Section 1.822(m) of the rules as adopted sets forth a procedure for numbering amino acid sequences that is an alternative to the procedure involving the identification of the mature protein. Sequences can either be numbered based upon the identification of the mature protein or based upon the first amino acid at the amino terminal as number 1.

Comment: Two comments noted that the rules did not provide for the depiction of codons that span intron/exon junctions.

Response: The rules as adopted now provide for the depiction of codons that span intron/exon junctions in § 1.822(d).

Comment: One comment asked how to represent regions where two proteins are coded on opposite strands of DNA and overlap.

Response: since the final rules do not permit the representation of double stranded nucleotides, each DNA strand must be listed separately. In this situation, each DNA strand may be listed with its corresponding amino acid sequence, and the relationship between the two may be shown in a drawing figure.

Comment: One comment noted that the rules do not provide for the representation of differentially spliced gene sequences which lead to the expression of two different amino acid sequences from a single gene or RNA.

Response: The rules do not contemplate the depiction of more than one amino acid sequence together with a single nucleotide sequence. Therefore, a differentially spliced nucleic acid sequence requires separate listings. The information may be represented by separate listings for each sequence, i.e., one nucleotide sequence and two amino acid sequences, or by listing the nucleic acid sequence twice, once with each of the different amino acid sequences. The relationship between them may also be shown in a drawing figure.

Comment: One comment recommended that applicants have the option of presenting the amino acid sequence in the one-letter form.

Response: The use of the three-letter code in the "Sequence Listing" is preferred for ease of examination. However, the modified Authorin program allows applicants to input amino acid sequences using one-letter codes or three letter codes, and will convert, where necessary, one-letter codes to the appropriate three-letter codes for the "Sequence Listing."

Comment: One comment suggested that the wording of § 1.822(p), regarding the presentation of partial sequences, subsequences and discontinuous sequences, be clarfied.

Response: This language has been clarified, and can be found in § 1.822(o) as adopted.

Comment: One comment noted that there are no known naturally occurring circular amino acid sequences and that § 1.822(o) need not distinguish between circular and linear polypeptide sequences.

Response: Section 1.822(o) as proposed is now set forth in § 1.822(n) as adopted. Sequences in patent applications are not limited to those that occur naturally. Synthetic sequences are encompassed by the rules.

Comment: Three comments recommended that the PTO state explicitly that the applicant will in no way be held liable for omissions of optional or recommended items, and that the PTO would make no interpretations therefrom.

Response: The suggestion has been adopted in § 1.821(i) of the rules.

Comment: One comment recommended that the number of sequences presented in the "Sequence Listing" be included under the GENERAL INFORMATION section as a check for completeness during application processing.

Response: The suggestion has been adopted in § 1.823(b)(1)(iii) of the rules.

Comment: One comment mentioned that it was confusing to describe the items CURRENT APPLICATION DATA and PRIOR APPLICATION DATA as mandatory while saying that they are to be omitted if the information is unknown or inapplicable.

Response: The requirement for this information is similar to that currently set forth in 37 CFR 1.5. Each of the above items of information must be submitted if they are known to applicant or applicable in a given application, respectively.

Comment: One comment suggested that the PUBLICATION STATUS section be revised to accommodate patent citations.

Response: The suggestion has been adopted in § 1.823(b)(2)(x).

Comment: One comment said that the many levels of identifiers and sub-identifiers introduced unnecessary complexity.

Response: The items of information in § 1.823 have been reviewed and several levels of identifiers and sub-identifiers have been deleted.

Comment: One comment recommended that § 1.823(b)(1)(ix) not include the items BASE PAIRS and AMINO ACIDS since that information would be known from the kind of sequence listed.

Response: The suggestion has been adopted in § 1.823(b)(2)(x) of the rules.

Comment: One comment suggested that § 1.823(b)(2)(i) include "Not known to applicant" as a valid response to TOPOLOGY and STRANDEDNESS items.

Response: The suggestion has been adopted in § 1.823(b)(2)(i).

Comment: One comment suggested that "anti-sense DNA" and "anti-sense RNA" be added as a valid response under KIND in § 1.823(h)(2)(ii).

Response: A separate information item has been provided for molecule types that have anti-sense characteristics. It is in § 1.823(b)(2)(iv) as adopted.

Comment: One comment said that "Specific Organelle" was not a proper response to KIND, but was a sub-identifier under "Organelle DNA" and "Organelle RNA."

Response: All organelle information will be collected in § 1.823(b)(2)(vi)(I) as adopted.

Comment: One comment recommended that the heading KIND be used only once and the "Peptide or protein" information be listed under that single heading.

Response: The suggestion has been adopted in § 1.823(b)(2)(ii).

Comment: One comment suggested that "Whole" be included as a proper response to Peptide or protein FRAGMENT TYPE.

Response: This suggestion has not been adopted because it is presumed that no response will be given for FRAGMENT TYPE if the sequence is "Whole."

Comment: One comment suggested that NAME be added as a sub-identifier under the FEATURES section.

Response: The suggestion has been adopted in § 1.823(b)(2)(ix)(A).

Comment: One comment suggested that § 1.824(f) be modified to include 1/4" tape cartridge as an acceptable magnetic medium. One comment suggested that computer readable forms produced by Digital Equipment Corporation (DEC) systems be acceptable.

Response: These suggestions have not been adopted. The initially acceptable computer readable forms and computer systems are limited to those set forth in § 1.824(a) and (f), respectively. It should be noted that any computer operating system may be utilized to produce a sequence submission, provided that the system is capable of producing a file having the characteristics specified in § 1.824 and capable of writing the properly formatted file to one of the acceptable diskettes or tapes.

Comment: One comment suggested that the PTO accept any computer readable form which is acceptable to the EPO or JPO.

Response: It is likely that, with the exception of the EPO's acceptance of optical character readable documents, the PTO will be more liberal than both the EPO and the JPO with regard to acceptable computer readable forms. The JPO will not accept any computer readable forms.

Comment: One comment recommended that where a yes/no response is desired for an item of information, it should be indicated in the parenthetical information following that item.

Response: The suggestion has been adopted throughout § 1.823(b) of the rules.

VOL
1114
ISS
3
MY
15
1990
UMI

Comment: One comment suggested that a provision be made to allow a sequence listing to be the figure published in the *Official Gazette* at issuance.

Response: The PTO is exploring the feasibility of adopting this suggestion. If adopted, the Manual of Patent Examining Procedure will be revised to accommodate this suggestion.

Discussion of Specific Sections

Nucleotide and/or amino acid sequence disclosures in patent applications. (Section 1.821)

Section 1.821(a) presents a definition for "nucleotide and/or amino acid sequences." This definition sets forth limits, in terms of numbers of amino acids and/or numbers of nucleotides, at or above which compliance with the rules that follow is required. Further, compliance with the rules is only required for unbranched sequences. Branched sequences are specifically excluded from the scope of the rules. The limit of four or more amino acids has been established herein for consistency with limits in place for industry database collections whereas the limit of ten or more nucleotides, while lower than certain industry database limits, has been established to encompass those nucleotide sequences to which the smallest probe will bind in a stable manner. Specifically, the amino acid limit is consistent with the limits in place in industry database collections, such as the National Biomedical Research Foundation Protein Identification Resource (NBRF-PIR; Washington, D.C.) database and the International Protein Information Database in Japan (JIPID; Tokyo). NBRF-PIR may include sequences having fewer than four amino acids but this is considered by the PTO to be too low because amino acid sequences with three amino acids can readily be manually searched as chemical structures rather than as sequences of the type to be submitted under these rules. The limits for amino acids and nucleotides are also consistent with those established for sequence data exchange with the JPO and the EPO.

Sections 1.821(a)(1) and 1.821(a)(2) present further definitions for those nucleotide and amino acid sequences that are intended to be embraced by the rules that follow. Nucleotide sequences are further limited to those that can be represented by the symbols set forth in § 1.822(b)(1). Amino acid sequences are further limited to those listed in § 1.822(b)(2) and those L-amino acids that are commonly found in naturally occurring proteins. The limitation to L-amino acids is based upon the fact that there currently exists no widely accepted standard nomenclature for representing the scope of amino acids encompassed by non-L-amino acids, and, as such, the process of meaningfully encoding these other amino acids for computerized searching and printing is not currently feasible. The previous limitation that "[o]nly peptides or proteins containing normal peptide bonds are embraced" by the rule has been deleted from the final rules in favor of a more liberal standard that states that the rules embrace "[a]ny peptide or protein that can be expressed as a sequence using the symbols in § 1.822(b)(2) in conjunction with a description elsewhere in the "Sequence Listing" to describe, e.g., modified linkages, cross links, end caps, non-peptidyl bonds, etc." The use of the terms "peptide or protein" implies, however, that the amino acids in a given sequence are linked by at least three consecutive peptide bonds. Accordingly, an amino acid sequence will not be excluded from the scope of the rules merely due to the presence of a single non-peptidyl bond. If an amino acid sequence can be represented by a string of amino acid abbreviations, with reference, where necessary, to a features table to explain modifications in the sequence, the sequence comes within the scope of the rules. However, the rules are not intended to encompass the subject matter that is generally referred to as synthetic resins.

Section 1.821(b) requires exclusive conformance, with regard to the manner in which the nucleotide and/or amino acid sequences are presented and described, with the rules that follow for all applications that include nucleotide and amino acid sequences that fall within the above definitions. This requirement is necessary to minimize any confusion that could result if more than one format for representing sequence data was employed in a given application. It is also expected that the preferred standard format will be more readily and widely accepted and adopted if its use is exclusive, as well as mandatory.

Section 1.821(c) requires that applications containing nucleotide and/or amino acid sequences that fall within the above definitions, contain, as a separate part of the disclosure on paper copy, a disclosure of the nucleotide and/or amino acid sequences, and associated information, using the format and symbols that are set forth in §§ 1.822 and 1.823. This separate part of the disclosure on paper copy will be referred to as the "Sequence Listing," and requires that each sequence disclosed in the application appear separately in the "Sequence Listing," with each sequence further being assigned a sequence identification number, referred to as "SEQ ID NO." A plurality of sequences may, if feasible, be presented on a single page, and this may be extended to the separate presentation of both nucleotide and amino acid sequences on the same page. The requirement for sequence identification numbers, at a minimum, requires that each sequence be assigned a different number for purposes of identification. However, where practical and for ease of reference, sequences should be presented in the separate part of the application in numerical order.

Section 1.821(d) requires the use of the assigned sequence identifier in all instances where the description or claims of a patent application discuss sequences regardless of whether a given sequence is also embedded in the text of the description or claims of an application. This requirement is also intended to permit references, in both the description and claims, to sequences set forth in the "Sequence Listing" by the use of assigned sequence identifiers without repeating the sequence in the text of the description or claims.

Section 1.821(e) requires the submission of a copy of the "Sequence Listing" in computer readable form. The computer readable form will be used by the PTO to establish a database for searching and printing nuoleotide and amino acid sequences. This electronic database will also enable the PTO to exchange patented sequence data, in electronic form, with the JPO and the EPO. It should be noted that the PTO's database will comply with the confidentiality requirement imposed by 35 U.S.C. 122. That is, the PTO will not exchange or make public any information on any sequence until the patent application containing that information matures into a patent.

The second sentence of § 1.821(e) indicates that, as between the paper copy of the "Sequence Listing" and the computer readable copy thereof, the paper copy would serve as the official copy. However, the PTO would like to permit correction of the paper copy, at the least, during the pendency of a given application by reference to the computer readable copy thereof if both the paper and computer readable forms were submitted at the time of filing of the application and the totality of the circumstances otherwise substantiate the proposed correction. A mere discrepancy between the paper copy and the computer readable form may not, in and of itself, be sufficient to justify a proposed correction. In this regard, the PTO will assume that the computer readable form has been incorporated by reference into the application, when the paper and computer readable forms were submitted at the time of filing of the application. The PTO will attempt to accommodate or address all correction issues, but it must be kept in mind that the real burden rests with the applicant to ensure that discrepancies between the paper copy and the computer readable form are minimized. Applicants should be aware that there will be instances where the applicant may have to suffer any consequences of discrepancies between the two. All corrections would be made by appropriate fee-paid petitions. The paper copy would also serve as the official copy for priority purposes. The PTO does not desire to be bound by a requirement to permanently preserve computer readable forms for support, priority or correction purposes. For example, the PTO will make corrections, where appropriate, by reference to the computer readable form as long as the computer readable form is still available to the PTO. However, once use to the PTO for processing has ended, i.e., once the PTO has entered the data contained on the computer readable form into the appropriate database, the PTO does not intend to further preserve the computer readable form submitted by the applicant.

The last two sentences of § 1.821(e) set forth the procedure to be followed when a computer readable form of a new application is identical with a computer readable form of another application. In that situation, an applicant may make reference to the other application and computer readable form in lieu of filing a duplicate computer readable form in the new application.

Section 1.821(f) requires that the paper and computer readable copies of the "Sequence Listing" be accompanied by a statement that the content of the paper and computer readable copies are the same, at the time when the computer readable form is submitted. This statement must be a verified statement if it is made by a person not registered to practice before the PTO. such a statement may be made by the applicant.

Section 1.821(g) requires compliance with the requirements of paragraphs (b) through (f), as discussed above, if they are not satisfied at the time of filing under 35 U.S.C. 111 or at the time of entering the national stage of an international application under 35 U.S.C. 371, within one month from the date of a notice requiring compliance. Failure to comply will result in the abandonment of the application. Submissions in response to requirements under this paragraph must be accompanied by a statement that the submission includes no new matter. This statement must be a verified statement if made by a person not registered to practice before the PTO. Again, such a statement may be made by the applicant. Extensions of time in which to reply to a requirement under this paragraph are available pursuant to 37 CFR 1.136. When an action by the applicant is a bona fide attempt to comply with these rules and it is apparent that compliance with some requirement has inadvertently been omitted, the opportunity to explain and supply the omission will be given before the question of abandonment is considered. See 37 CFR § 1.135(c).

Section 1.821(h) requires compliance with the requirements of paragraphs (b) through (f), as discussed above, within one month from the date of a notice requiring compliance in an international application filed in the United States Receiving Office under the Patent Cooperation Treaty (PCT), if the above noted requirements are not satisfied at the time of filing. Submissions in response to requirements under this paragraph must be accompanied by a statement that the submission does not include new matter or go beyond the disclosure in the international application as filed. This statement must be a verified statement if made by a person not registered to practice before the PTO. Such a statement may be made by an applicant. International applications that fail to comply with any of the requirements of paragraphs (b) through (f) of this section will be searched to the extent possible without the benefit of the information in computer readable form.

Section 1.821(i) makes clear that neither the presence nor absence of information which is not required under the rules will create a presumption that such information is necessary to satisfy any of the requirements of 35 U.S.C. 112. Further, this paragraph states that the grant of a patent on an application that is subject to §§ 1. 821 through 1.825 constitutes a conclusive presumption that the granted patent complies with the requirements of these rules. This paragraph has been added to address the concerns with respect to the weight that may ultimately be accorded an omission of an item of information which is not required under the rule, regardless of whether that item has been designated as "recommended" or "optional."

Section 1.821(j) has been added to facilitate administrative processing of all application papers, computer readable forms and fees filed under this section. Accordingly, all such application papers, computer readable forms and fees filed in the PTO should be marked "Box SEQUENCE."

Symbols and format to be used for, nucleotide and/or amino acid sequence data. (Section 1.822)

Section 1.822 sets forth the format and symbols to be used for listing nucleotide and/or amino acid sequence data. The codes for representing the nucleotide and/or amino acid characters in the sequences are set forth in the tables of paragraphs (b)(1) and(b)(2) of this section. For the purpose of setting forth the sequence in the "Sequence Listing," only those symbols in paragraph (b)(1) for "Base codes" and in paragraph (b)(2) for "Amino acids" are to be used, as further set forth in paragraphs (c) and (e) of this section. No other symbols shall be used in nucleotide and amino acid sequences. The "Modified base controlled vocabulary" in paragraph (p)(1) and the "Modified and unusual amino acids" in paragraph (p)(2) are not to be used in setting forth the sequences; but, they may be used in the description and/or the "Sequence Listing" corresponding to, but not including, the sequence itself. However, a modified base or amino acid may be presented in a given sequence as the corresponding unmodified base or amino acid if the modified base or amino acid is one of those listed in paragraphs (p)(1) or (p)(2) of this section and the modification is also set forth elsewhere in the "Sequence Listing;" for example, in the features table. Otherwise, all bases or amino acids not appearing in paragraphs (b)(1) or (b)(2) of this section must be listed in a given sequence as "N" or "Xaa," respectively, with further information given elsewhere in the "Sequence Listing."

In paragraphs (b)(2) and (e) of § 1.822, the use of three-letter codes for amino acids is required. The use of the three-letter codes for amino acids is preferred over the one-letter codes from the perspective of facilitating the examiner's review of the application papers, including the "Sequence Listing", and the public's, as well as the examiner's, use of the printed patents. The modified Authorin program that the PTO will make available to the public will have the capability of converting from one-to three-letter amino acid codes and printing the amino acid sequence in three-letter codes regardless of input.

Paragraphs (d) through (p) of § 1.822 set forth the format for presenting sequence data. These paragraphs set forth the manner in which the characters in sequences are to be grouped, spaced, presented and numbered.

It should be noted that paragraph (d) of this section requires that amino acids corresponding to codons in the coding parts of a nucleotide sequence be listed below the corresponding codons. This is the opposite of the location set forth in the proposed rules. The fact that the representation of double stranded nucleotide sequences will not be permitted in the "Sequence Listings" has obviated the need to accommodate those situations in which the coding regions of the primary coding strand of a double stranded nucleotide sequence and the amino acids corresponding to the codons in the coding strand of that nucleotide sequence are depicted. In those situations, it was considered that the correspondence between the amino acids and the codons in the primary coding strand could most clearly be illustrated by positioning the amino acids above the nucleotides rather than below the nucleotides, as is more conventionally done. This arrangement was then, for the purpose of consistency, extended to the representation of all amino acids that corresponded to codons in the coding regions of a nucleotide sequence. As stated above, because double stranded nucleotides will not be permitted in the "Sequence Listing," there is no longer a need to depict amino acids above corresponding codons. As such, paragraph (d) as adopted requires the depiction of amino acids corresponding to codons in the coding parts of a nucleotide sequence immediately below, not above, the corresponding codons. Further, in paragraph (d) of this section, the situation in which a codon spans an intron has been addressed. In those situations, the "amino acid symbol shall be typed below the portion of the codon containing two nucleotides." This sentence was added to clarify the representation of an amino acid that corresponds to a codon that spans an intron.

In view of the number of comments that were received in which there was a misunderstanding of the requirements relating to the depiction of the coding regions in nucleotide sequences as well as the amino acids corresponding to the codons in those coding regions, it should be noted that the rules do not, in any way, require the depiction of coding regions or the amino acids corresponding to the codons in those coding regions. Paragraph (d) of this section only requires that where amino acids corresponding to the codons in the coding parts of a nucleotide sequence *are* depicted, they must be depicted *below* the corresponding codons. (Emphasis added.) There is absolutely no requirement in the rules to depict coding regions. Nor is there a requirement to separately list the amino acids corresponding to the codons in the coding parts of a nucleotide sequence unless the applicant desires to discuss the amino acids as a separate sequence. That is, when the coding parts of a nucleotide sequence and their corresponding amino acids have been identified, if applicant desires to discuss those amino acids in the coding parts of the nucleotide as a separate sequence, those amino acids must also be set forth as a separate sequence. The separate submission of the amino acid sequence that corresponds to the coding parts of a nucleotide sequence is, however, recommended and encouraged because the amino acid sequence may not be captured in the sequence database if it is only presented in the mixed-mode format.

Paragraphs (f) through (i) of this section are considered to be self-explanatory.

Paragraph (j) of this section states that nucleotide sequences shall only be represented by a single strand, in the 5' to 3' direction, from left to right. That is, double stranded nucleotides

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shall not be represented in the "Sequence Listing." A double stranded nucleotide may be represented as two single stranded nucleotides, and any relationship between the two may be shown in the drawings.

The presentation and enumeration procedures for amino acid sequences are set forth in paragraphs (k) and (m) of this section. Two alternatives are presented for numbering amino acid sequences. Amino acid sequences may be numbered with respect to the identification of the first amino acid of the first mature protein or with respect to the first amino acid appearing at the amino terminal. The enumeration procedure for nucleotides is set forth in paragraph (l) of this section. Sequences that are circular in configuration are intended to be encompassed by these rules, and numbering procedures for them are provided in paragraph (n) of this section. The numbering procedures set forth in paragraphs (k) through (n) of this section are not necessarily intended to be consistent with all currently employed numbering procedures. The objective here is to establish a reasonable numbering procedure that can readily be followed and adhered to in the future. As a whole, these formatting procedures also reflect those that have been agreed to for electronic data exchange with the JPO and the EPO.

In paragraph (o) of this section the procedures for presenting and numbering gapped and hybrid sequences are set forth. The reference to partial sequences in the proposed rule has been deleted because a partial sequence would necessarily be numbered as a separate sequence. A sequence that is made up of one or more noncontiguous segments of a larger sequence or segments from different sequences shall be presented as a separate sequence. As previously noted, these changes have been made to address the concerns that the requirements for presentation and numbering of partial, gapped and hybrid sequences were ambiguous.

Paragraph (p) of this section provides the codes for representing modified nucleotide bases and modified and unusual amino acids. The use of the codes set forth in paragraph (p) of this section is discussed above.

Requirements for nucleotide and/or amino acid sequences as part of the application papers. (Section 1.82:.)

Section 1.823 sets forth the informational requirements for inclusion in the separate part of the disclosure on paper copy that would be submitted in accordance with §1.821(c). This section lists the items of information that are to be included in the "Sequence Listing," which constitutes the separate part of the disclosure on paper copy. The items of information are to be presented in the "Sequence Listing," immediately preceding the actual nucleotide and/or amino acid sequence, in the order in which those items are listed in this section. Page and line length requirements are set forth. The requirement to use a fixed width font to present sequence data is also set forth. This latter requirement is made to ensure that the desired sequence character spacing and numbering is maintained upon printing. The heading for each item of information shall not include the parenthetical explanatory information included in this section.

In §1.823, the items of information are broken down into two categories. The first category is directed to "GENERAL INFORMATION" and includes information relating to the application being filed and the diskette/tape being submitted. It is likely that this information will be applicable for all sequences and, as such, will need to be set forth only once in a given "Sequence Listing." The second category is directed to "INFORMATION FOR SEQ ID NO:X" and includes information that, most likely, will be specific for each sequence disclosed. Where more than one sequence is disclosed, this category will be repeated and subsequent headings should be set forth as:

"(2) INFORMATION FOR SEQ ID NO:2:," "(2) INFORMATION FOR SEQ ID NO:3:," etc. Throughout the above two categories, the items of information are further broken down into categories relating to whether their submission is mandatory (M), recommended (R) or optional (0). Certain items are also designated as those that may repeat (rep) in a given "Sequence Listing." The numbering of repeated items should remain constant so that the overall numbering scheme of the "Sequence Listing" conforms to that specified in this section. The first category includes those items for which inclusion in the "Sequence Listing" is mandatory. These mandatory items of information relate to the patent application, the computer readable form, basic sequence data and the applicable priority or PCT data. A new mandatory item of information, relative to those set forth in the proposed rules, has been added to these final rules. This item relates to the number of sequences set forth in the "Sequence Listing." The reference in paragraph (b)(1)(vi)(C) of §1.823 to "F-terms" relates to the key-word indexing of patents that is being undertaken by the JPO in conjunction with their automation plans. The second category includes those items for which inclusion in the "Sequence Listing" is recommended, but not required. These recommended items of information provide further information relating to the sequence listed. These additional items of information are of interest to examiners and will create a more comprehensive database; as a result, the items would serve to facilitate sequence searching. The third category includes items of information that are primarily for the purpose of providing more complete information upon dissemination, for which inclusion in the "Sequence Listing" is also optional.

Throughout paragraphs (b)(1) and (b)(2) of §1.823, the items of information relating to patent applications and patent publications should be provided, keeping in mind the appropriate standards that have been established by the World Intellectual Property Organization (WIPO).

In paragraph (b)(1)(i) of §1.823, the item of information relating to "APPLICANT" should be limited to a maximum of the first ten named applicants in the application. Similarly, in paragraph(b)(2)(x) of §1.823, the item of information relating to "AUTHORS" should be limited to to a maximum of the first ten named authors in the publication.

In paragraph (b)(2)(ix) of §1.823, relating to "FEATURES" or the description of the points of biological significance in a given sequence, it is recommended, but not required, that the information that is provided by the applicant conform to the controlled vocabulary that is set forth in GenBank's "Feature Representation in Nucleotide Sequence Data Libraries," Release 57.0, as may be amended. Further, the feature "LOCATION" should be specified using the syntax of the DDBJ/EMBL/GenBank Feature Table Definition.

In paragraph (b)(2)(x) of §1.823, publication information for a given sequence is collected. The publication information encompasses both patent-type publications and non-patent literature publications. Information item "(K) RELEVANT RESIDUES IN SEQ ID NO: X" is intended to collect information relating to the correspondence between a sequence set forth in the "Sequence Listing" and published sequence information. The starting (FROM) and end (TO) positions in the listed sequence that correspond to the published sequence information should be set forth.

A sample "Sequence Listing" is included as Appendix I, following this notice. As indicated in the sample "Sequence Listing," only information that is applicable to a given sequence need be listed in the "Sequence Listing." The sample "Sequence Listing" also serves to illustrate that when the coding parts of a nucleotide sequence and their corresponding amino acids have been identified, if applicant desires to discuss those amino acids in the coding parts of the nucleotide as a separate sequence, those amino acids must also be set forth as a separate sequence. In the given sample, it can be assumed that the applicant desired to discuss the amino acids as a separate sequence. This convention will minimize ambiguities that may result in those instances where the amino acids corresponding to the coding parts of a nucleotide sequence constitute two separate amino acid sequences. In those instances, if an applicant desires to discuss the two separate amino acid sequences, they must be separately presented in the "Sequence Listing." Further, in those instances when applicant desires to discuss, as separate sequences, all three reading frames of the coding regions of a nucleotide sequence, six separate sequences should be set forth in the "Sequence Listing" to minimize confusion. These six sequences would include three nucleotide sequences separately showing each of the three reading frames of the coding regions of the sequence and three separate amino acid sequences corresponding to the translation of the three reading frames of the nucleotide sequence. A complete listing of abbreviated headings for all items of information is provided in Appendix II, also following this notice. For purposes of clarity, the appropriate responses for "(ii) MOLECULE TYPE" are also set forth in Appendix II, but only those that are applicable should be included in a given "Sequence Listing." After the heading for each item in the "Sequence Listing," the appropriate information or a yes/no answer should be provided. Where "SEQ ID NO:X" appears, the appropriate sequence identification number should be provided.

Form and format for nucleotide and/or amino acid sequence submissions in computer readable form. (Section 1. 824)

Section 1.824 sets forth the form for sequence submissions in computer readable form. Any computer operating system may be utilized to produce a sequence submission, provided that the system is capable of producing a file having the characteristics specified in §1.824, and is capable of writing the properly formatted file to one of the acceptable diskettes or tapes. Currently, the computer readable form is being limited to diskettes or tapes. However, as noted above, it is contemplated that this may be broadened in the future in light of progress in the technology for developing and establishing databases of this type. That is, it is possible that this may be broadened in the future to encompass other media and formats. If a given sequence and its associated information cannot practically or possibly fit on a single diskette or tape, as is required in paragraph (d) of this section, an exeption via a non-fee petition to waive this provision will normally be granted. As set forth in paragraph (g) of §1.824, the computer readable forms that are submitted in accordance with these rules will not be returned to the applicant. Paragraph (h) of §1.824 requires the labeling, with appropriate identifying information, of the computer readable forms that are submitted in accordance with these rules.

Amendments to or replacement of sequence listing and computer readable copy thereof. (Section 1.825)

Section 1.825 sets forth the procedures for amending the "Sequence Listing" and the computer readable copy thereof. The procedures that have been defined in this section involve the submission of either substitute sheets of the "Sequence Listing" or substitute copies of the computer readable form, in conjunction with statements that indicate support for the amendment in the application, as filed, and that the substitute sheets or copies include no new matter. The requirement for statements regarding the absence of new matter follows current practice relating to the submission of substitute specifications, as set forth in 37 CFR 1.125. Paragraph (c) of §1.825 explicitly addresses the situation where amendments to the "Sequence Listing" are made after a patent has been granted, e.g., by a certificate of correction, reissue or reexamination. Paragraph (d) of §1.825 addresses the possibility and presents a remedy for the situation where the computer readable form may be found by the PTO to be damaged or unreadable.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) due to the limited number of entities, both small and otherwise, that are involved in the relevant technology. Further, the costs associated with the rule change would not have a significant impact on overall costs associated with filing patent applications because the rule change adopts standards, procedures, and formats which are becoming industry and international norms.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule contains a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. Collections of information relating to patent applications have previously been approved by the Office of Management and Budget under code 0651-0011. For the great majority of applications that will be filed having nucleotide and amino acid sequences falling within the limits defined herein, applicants will not have to expend any substantial extra time to comply with these rules over and above that previously approved for patent applications. For the most part and as noted above with regard to current practice in the industry, the required information will have already been keyed into a computer system. As such, compliance with these rules will involve only the additional submission of relevant application and computer readable form information and a minor, one-time, revision of the format for presenting sequence data, after which, no additional expenditure of time for format compliance will be necessary. Any burden that may be attributed to the submission of relevant application and computer readable form information may, in fact, be more than offset by the fact that compliance with these rules will have the substantial benefit of reducing the overall time necessary to prepare applications, because a given sequence will only have to be set forth once in an application and further references thereto will be made by means of a sequence identifier. Accordingly, compliance with these rules is estimated to take approximately fifteen additional minutes, including time for reviewing instructions, maintaining data needed, and completing and reviewing the collection of information. This collection of information has been approved by the Office of Management and Budget under code 0651-0024, due to expire on June 30, 1992. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Organization, Patent and Trademark Office, Washington, D.C. 20231; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D. C. 20503, Attention: Paperwork Reduction Project 0651-0024.

Lists of Subjects in 37 CFR Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record-keeping requirements, Small businesses.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. A new, undesignated center heading, new §§1.821 - 1.825, and new Appendices A and B are added to Subpart G - Biotechnology Invention Disclosures to read as follows:

APPLICATION DISCLOSURE8 CONTAINING NUCLEOTIDE AND/OR AMINO ACID SEQUENCES

§1.821 Nucleotide and/or amino acid seguence disolosures in patent applications

(a)"Nucleotide and/or amino acid sequences" as used in §§1.821 through 1.825 is interpreted to mean an unbraoched sequence of four or more amino acids or an unbranched sequence of ten or more nucleotides. Branched sequences are specifically excluded from this definition. Nucleotides and amino acids are further defined as follows:

(1)"Nucleotides" are intended to embrace only those nucleotides that can be represented using the symbols set forth in §1.822(b)(1). Modifications, e.g., methylated bases, may be de-

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scribed as set forth in §1.822(b), but shall not be shown explicitly in the nucleotide sequence.

(2) "Amino acids" are those L-amino acids commonly found in naturally occurring proteins and are listed in §1.822(b)(2). Those amino acid sequences containing D-amino acids are not intended to be embraced by this definition. Any amino acid sequence that contains post-translationally modified amino acids may be described as the amino acid sequence that is initially translated using the symbols shown in §1.822(b)(2) with the modified positions, e.g., hydroxylations or glycosylations, being described as set forth in §1. 822(b), but these modifications shall not be shown explicitly in the amino acid sequence. Any peptide or protein that can be expressed as a sequence using the symbols in §1.822(b)(2) in conjunction with a description elsewhere in the "Sequence Listing" to describe, for example, modified linkages, cross links and end caps, non-peptidyl bonds, etc., is embraced by this definition.

(b) Patent applications which contain disclosures of nucleotide and/or amino acid sequences, in accordance with the definition in paragraph (a) of this section, shall, with regard to the manner in which the nucleotide and/or amino acid sequences are presented and described, conform exclusively to the requirements of §§1.821 through 1.825.

(c) Patent applications which contain disclosures of nucleotide and/or amino acid sequences must contain, as a separate part of the disclosure on paper copy, hereinafter referred to as the "Sequence Listing," a disclosure of the nucleotide and/or amino acid sequences and associated information using the symbols and format in accordance with the requirements of §§1.822 and 1.823. Each sequence disclosed must appear separately in the "Sequence Listing." Each sequence set forth in the "Sequence Listing" shall be assigned a separate identifier written as SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, etc.

(d) Where the description or claims of a patent application discuss a sequence listing that is set forth in the "Sequence Listing" in accordance with paragraph (c) of this section, reference must be made to the sequence by use of the assigned identifier, in the text of the description or claims, even if the sequence is also embedded in the text of the description or claims of the patent application.

(e) A copy of the "Sequence Listing" referred to in paragraph (c) of this section must also be submitted in computer readable form in accordance with the requirements of §1.824. The computer readable form is a copy of the "Sequence Listing" and will not necessarily be retained as part of the patent application file. If the computer readable form of a new application is to be identical with the computer readable form of another application of the applicant on file in the Office, reference may be made to the other application and computer readable form in lieu of filing a duplicate computer readable form in the new application. The new application shall be accompanied by a letter making such reference to the other application and computer readable form, both of which shall be completely identified.

(f) In addition to the paper copy required by paragraph (c) of this section and the computer readable form required by paragraph (e) of this section, a statement that the content of the paper and computer readable copies are the same must be submitted with the computer readable form. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(g) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing under 35 U.S.C. 111 or at the time of entering the national stage under 35 U.S.C. 371, applicant has one month from the date of a notice which will be sent requiring compliance with the requirements in order to prevent abandonment of the application. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission includes no new matter. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(h) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing, in the United States Receiving Office, an international application under the Patent Cooperation Treaty (PCT) applicant has one month from the date of a notice which will be sent requiring compliance with the requirements, or such other time as may be set by the Commissioner, in which to comply. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission does not include new matter or go beyond the disclosure in the international application as filed. such a statement must be a verified statement if made by a person not registered to practice before the Office.

(i) Neither the presence nor the absence of information which is not required under §§1.821 through 1.825, in an application shall create any presumption that such information is necessary to satisfy one or more of the requirements of 35 U.S.C.112. Further, the grant of a patent on an application that is subject to the requirements of §§1.821 through 1.825 shall constitute a conclusive presumption that said patent complies with the requirements of §§1.821 through 1.825.

(j) Envelopes containing only application papers, computer readable forms and fees filed under this section should be marked "Box SEQUENCE."

§1.82 Symbols and format to be used for nucleotide and/or amino acid seguence data.

(a) The symbols and format to be used for nucleotide and/or amino acid sequence data shall conform to the requirements of paragraphs (b) through (p) of this section.

(b) The code for representing the nucleotide and/or amino acid sequence characters shall conform to the code set forth in the tables in paragraphs (b)(1) and (b)(2) of this section. No code other than that specified in this section shall be used in nucleotide and amino acid sequences. A modified base or amino acid may be presented in a given sequence as the corresponding unmodified base or amino acid if the modified base or amino acid is one of those listed in paragraphs (p)(1) or (p)(2) of this section and the modification is also set forth elsewhere in the Sequence Listing (for example, FEATURES § 1.823(b)(2)(ix)). Otherwise, all bases or amino acids not appearing in paragraphs (b)(1) or (b)(2) of this section shall be listed in a given sequence as "N" or "Xaa," respectively, with further information, as appropriate, given elsewhere in the Sequence Listing.

(1) Base codes:

Symbol	Meaning
A	A; adenine
C	C; cytosine
G	G; guanine
T	T; thymine
U	U; uracil
M	A or C
R	A or G
W	A or T/U
S	C or G
Y	C or T/U
K	G or T/U
V	A or C or G; not T/U
H	A or C or T/U; not G
D	A or G or T/U; not C
B	C or G or T/U; not A
N	(A or C or G or T/U) or (unknown or other)

(2) Amino acid three-letter abbreviations:

Abbreviation	Amino acid name
Ala	Alanine
Arg	Arginine
Asn	Asparagine
Asp	Aspartic Acid
Asx	Aspartic Acid or Asparagine
Cys	Cysteine
Glu	Glutamic Acid
Gln	Glutamine
Glx	Glutamine or Glutamic Acid
Gly	Glycine
His	Histidine
Ile	Isoleucine
Leu	Leucine
Lys	Lysine
Met	Methionine
Phe	Phenylalanine
Pro	Proline
Ser	Serine
Thr	Threonine
Trp	Tryptophan
Tyr	Tyrosine
Val	Valine
Xaa	Unknown or other

(c) A nucleotide sequence shall be listed using the one-letter code for the nucleotide bases, as in paragraph (b)(1) of this section.

(d) The amino acids corresponding to the codons in the coding parts of a nucleotide sequence shall be typed immediately below the corresponding codons. Where a codon spans an intron, the amino acid symbol shall be typed below the portion of the codon containing two nucleotides.

(e) The amino acids in a protein or peptide sequence shall be listed using the three-letter abbreviation with the first letter as an upper case character, as in paragraph (b)(2) of this section.

(f) The bases in a nucleotide sequence (including introns) shall belisted in groups of 10 bases except in the coding parts of a sequence. Leftover bases, fewer than 10 in number, at the end of noncoding parts of a sequence shall be grouped together and separated from adjacent groups of 10 or 3 bases by a space.

(g) The bases in the coding parts of a nucleotide sequence shall be listed as triplets (codons).

(h) A protein or peptide sequence shall be listed with a maximum of 16 amino acids per line, with a space provided between each amino acid.

(i) A nucleotide sequence shall be listed with a maximum of 16 codons or 60 bases per line, with a space provided between each codon or group of 10 bases.

(j) A nucleotide sequence shall be presented, only by a single strand, in the 5' to 3' direction, from left to right.

(k) An amino acid sequence shall be presented in the amino to carboxy direction, from left to right, and the amino and carboxy groups shall not be presented in the sequence.

(l) The enumeration of nucleotide bases shall start at the first base of the sequence with number 1. The enumeration shall be continuous through the whole sequence in the direction 5' to 3'. The enumeration shall be marked in the right margin, next to the line containing the one-letter codes for the bases, and giving the number of the last base of that line.

(m) The enumeration of amino acids may start at the first amino acid of the first mature protein, with number 1. The amino acids preceding the mature protein, e.g., pre-sequences, pro-sequences, pre-pro-sequences and signal sequences, when presented, shall have negative numbers, counting backwards starting with the amino acid next to number 1. Otherwise, the enumeration of amino acids shall start at the first amino acid at the amino terminal as number 1. It shall be marked below the sequence every 5 amino acids.

(n) For those nucleotide sequences that are circular in configuration, the enumeration method set forth in paragraph (1) of this section remains applicable with the exception that the designation of the first base of the nucleotide sequence may be made at the option of the applicant. The enumeration method for amino acid sequences that is set forth in paragraph (m) of this section remains applicable for amino acid sequences that are circular in configuration.

(o) A sequence with a gap or gaps shall be presented as a plurality of separate sequences, with separate sequence identifiers, with the number of separate sequences being equal in number to the number of continuous strings of sequence data. A sequence that is made up of one or more noncontiguous segments of a larger sequence or segments from different sequences shall be presented as a separate sequence.

(p) The code for representing modified nucleotide bases and modified and unusual amino acids shall conform to the code set forth in the tables in paragraphs (p)(1) and (p)(2) of this section. The modified base controlled vocabulary in paragraph (p)(1) of this section and the modified and unusual amino acids in paragraph (p)(2) of this section shall not be used in the nucleotide and/or amino acid sequences; but may be used in the description and/or the "Sequence Listing" corresponding to, but not including, the nucleotide and/or amino acid sequence.

(1) Modified base controlled vocabulary:

Abbreviation	Modified base description
ac4c	4-acetylcytidine
chm5u	5-(carboxyhydroxylmethyl)uridine
cm	2'-0-methylcytidine
cmnm5s2u	5-carboxymethylaminomethyl-2-thioridine
cmnm5u	5-carboxyaethylaminomethyluridine
d	dihydrouridine
fm	2'-0-methylpseudouridine
gal q	beta,D-galactosylqueosine
gm	2'-0-methylguanosine
i	inosine
i6a	N6-isopentenyladenosine
m1a	1-methyladenosine
m1f	1-methylpseudouridine
m1g	1-methylguanosine
m1i	1-methylinosine
m22g	2,2-dimethylguanosine
m2a	2-methyladenosine
m2g	2-methylguanosine
m3c	3-methylcytidine
m5c	5-methylcytidine
m6a	N6-methyladenosine
m7g	7-methylguanosine
mam5u	5-methylaminomethyluridine
mam5s2u	5-methoxyaminomethyl-2-thiouridine
man q	beta,D-mannosylqueosine
mcm5s2u	5-methoxycarbonylmethyluridine
mo5u	5-methoxyuridine
ms2i6a	2-methylthio-N6-isopentenyladenosine
ms2t6a	N-((9-beta-D-ribofuranosyl-2-methylthiopurine-6-yl)carbamoyl)threonine
mt6a	N-((9-beta-D-ribofuranosylpurine-6-yl)N-methylcarbamoyl) threonine
mv	uridine-5-oxyacetic acid methylester
o5u	uridine-5-oxyacetic acid (v)
osyw	wybutoxosine
p	pseudouridine
q	queosine
s2c	2-thiocytidine
s2t	5-methyl-2-thiouridine
s2u	2-thiouridine
s4u	4-thiouridine
t	5-methyluridine
t6a	N-((9-beta-D-riofuanosylpurine-6-yl) carbamoyl) threonine
tm	2'-0-methyl-5-methyluridine
um	2'-0-methyluridine
yw	wybutosine
x	3-(3-amino-3 carboxypropyl)uridine, (acp3)u

(2) Modified and unusual amino acids:

Abbreviation	Modified and unsual amino acid
Aad	2-Aminoadipic acid
bAad	3-aminoadipic acid
bAla	beta-Alanine, beta-Aminopropionic acid
Abu	2-Aminobutyric acid
4Abu	4-Aminobutyric acid, piperidinic acid
Acp	6-Aminocaproic acid
Ahe	2-Aminoheptanoic acid
Aib	2-Aminoisobutyric acid
bAib	3-Aminoisobutyric acid
Apm	2-Aminopimelic acid
Dbu	2,4-Diaminobutyric acid
Des	Desmosine
Dpm	2,2'-Diaminopimelic acid
Dpr	2,3-Diaminopropionic acid
EtGly	N-Ethylglycine
EtAsn	N-Ethylasparagine
Hyl	Hydroxylysine
aHyl	allo-Hydroxylysine
3Hyp	3-Hydroxyproline
4Hyp	4-Hydroxyproline
Ide	Isodesmosine
alle	allo-Isoleucine
MeGly	N-Methylglycine, sarcosine
Melle	N-Methylisoleucine
MeLys	N-Methylvaline
Nva	Norvaline

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Orn	Ornithine

§1.823 Requirements for nucleotide and/or amino acid sequences as part of the application papers.

(a) The "Sequence Listing," required by §1.821(c), setting forth the nucleotide and/or amino acid sequences, and associated information in accordance with paragraph (b) of this section, must begin on a new page and be titled "Sequence Listing" and appear immediately prior to the claims. Each page of the "Sequence Listing" shall contain no more than 66 lines and each line shall contain no more than 72 characters. A fixed-width font shall be used exclusively throughout the "Sequence Listing."

(b) The "Sequence Listing" shall, except as otherwise indicated, include, in addition to and immediately preceding the actual nucleotide and/or amino acid sequence, the following items of information. The order and presentation of the items of information in the "Sequence Listing" shall conform to the arrangement given below, except that parenthetical explanatory information following the headings (identifiers) is to be omitted. Each item of information shall begin on a new line, enumerated with the number/numeral/letter in parentheses as shown below, with the heading (identifier) in upper case characters, followed by a colon, and then followed by the information provided. Except as allowed below, no item of information shall occupy more than one line. Those items of information that are applicable for all sequences shall only be set forth once in the "Sequence Listing." The submission of those items of information designated with an "M" is mandatory. The submission of those items of information designated with an "R" is recommended, but not required. The submission of those items of information designated with an "O" is optional. Those items designated with "rep" may have multiple responses and, as such, the item may be repeated in the "Sequence Listing."

(1) GENERAL INFORMATION (Application, diskette/tape and publication information):
(i) APPLICANT (maximum of first ten named applicants; specify one name per line: SURNAME comma OTHER NAMES and/or INITIALS - M/rep):
(ii) TITLE OF INVENTION (title of the invention, as elsewhere in application, four lines maximum - M):
(iii) NUMBER OF SEQUENCES (number of sequences in the "Sequence Listing" - M):
(iv) CORRESPONDENCE ADDRESS (M):
(A) ADDRESSEE (name of applicant, firm, company or institution, as may be appropriate):
(B) STREET (correspondence street address, as elsewhere in applicaton, four lines maximum):
(C) CITY (correspondence city address, as elsewhere in application):
(D) STATE (correspondence state, as elsewhere in application):
(E) COUNTRY (correspondence country, as elsewhere in application):
(F) ZIP (correspondence zip or postal code, as elsewhere in application):
(v) COMPUTER READABLE FORM (M):
(A) MEDIUM TYPE (type of diskette/tape submitted):
(B) COMPUTER (type of computer used with diskette/tape submitted):
(C) OPERATING SYSTEM (type of operating system used):
(D) SOFTWARE (type of software used to create computer readable form):
(vi) CURRENT APPLICATION DATA (M, if available):
(A) APPLICATION NUMBER (U.S. application number, including a series code, a slash and a serial number, or U.S. PCT application number, including the letters PCT, a slash, a two letter code indicating the U.S. as the Receiving Office, a two digit indication of the year, a slash and a five digit number, if available):
(B) FILING DATE (U.S. or PCT application filing date, if available; specify as dd-MMM-yyyy):
(C) CLASSIFICATION (IPC/US classification or F-term designation, where F-terms have been developed, if assigned, specify each designation, left justified, within an eighteen position alpha numeric field - rep, to a maximum of ten classification designations):
(vii) PRIOR APPLICATION DATA (prior domestic, foreign priority or international application data, if applicable - M/rep):
(A) APPLICATION NUMBER (application number; specify as two letter country code and an eight digit application number; or if a PCT application, specify as the letters PCT, a slash, a two letter code indicating the Receiving Office, a two digit indication of the year, a slash and a five digit number):
(B) FILING DATE (document filing date, specify as dd-MMM-YYYY):
(viii) ATTORNEY/AGENT INFORMATION (O):
(A) NAME (attorney/agent name; SURNAME comma OTHER NAMEs and/or INITIALS):
(B) REGISTRATION NUMBER (attorney/agent registration number):
(C) REFERENCE/DOCKET NUMBER (attorney/agent reference or docket number):
(ix) TELECOMMUNICATION INFORMATION (O):
(A) TELEPHONE (telephone number of applicant or attorney/agent):
(B) TELEFAX (telefax number of applicant or attorney/agent):
(C) TELEX (telex number of applicant or attorney/agent):

(2) INFORMATION FOR SEQ ID NO: X (rep):
(i) SEQUENCE CHARACTERISTICS (M):
(A) LENGTH (sequence length, expressed as number of base pairs or amino acid residues):
(B) TYPE (sequence type, i.e., whether nucleic acid or amino acid):
(C) STRANDEDNESS (if nucleic acid, number of strands of source organism molecule, i.e., whether single stranded, double stranded, both or unknown to applicant):
(D) TOPOLOGY (whether source organism molecule is circular, linear, both or unknown to applicant)
(ii) MOLECULE TYPE (type of molecule sequenced in SEQ ID NO:X (at least one of the following should be included with subheadings, if any, in Sequence Listing - R)):
- Genomic RNA;
- Genomic DNA;
- mRNA
- tRNA;
- rRNA;
- snRNA;
- scRNA;
- preRNA;
- cDNA to genomic RNA;
- cDNA to mRNA;
- cDNA to tRNA;
- cDNA to rRNA;
- cDNA to snRNA;
- cDNA to scRNA;
- Other nucleic acid;
(A) DESCRIPTION (four lines maximum):
- protein and
- peptide.
(iii) HYPOTHETICAL (yes/no - R):
(iv) ANTI-SENSE (yes/no - R):
(v) FRAGMENT TYPE (for proteins and peptides only, at least one of the following should be included in the Sequence Listing - R):
- N-terminal fragment;
- C-terminal fragment and
- internal fragment.
(vi) ORIGINAL SOURCE (original source of molecule sequenced in SEQ ID NO:X - R):
(A) ORGANISM (scientific name of source organism):
(B) STRAIN:
(C) INDIVIDUAL ISOLATE (name/number of individual/isolate):
(D) DEVELOPMENTAL STAGE (give developmental stage of source organism and indicate whether derived from germ-line or rearranged developmental pattern):
(E) HAPLOTYPE:
(F) TISSUE TYPE:
(G) CELL TYPE:
(H) CELL LINE:
(I) ORGANELLE:
(vii) IMMEDIATE SOURCE (immediate experimental source of the sequence in SEQ ID NO:X - R):
(A) LIBRARY (library -type,name):
(B) CLONE (clone(s)):
(viii) POSITION IN GENOME (position of sequence in SEQ ID NO:X in genome - R):
(A) CHROMOSOME/SEGMENT (chromosome/segment - name/number):
(B) MAP POSITION:
(C) UNITS (units for map position, i.e., whether units are genome percent, nucleotide number or other/specify):
(ix) FEATURE (description of points of biological significance in the sequence in SEQ ID NO:X - R/rep):
(A) NAME/KEY (provide appropriate identifier for feature - four lines maximum):
(B) LOCATION (specify location according to syntax of DDBJ/EMBL/GenBank Feature Tables Definition, including whether feature is on complement of presented sequence; where appropriate state number of first and last bases/amino acids in feature - four lines maximum):
(C) IDENTIFICATION METHOD (method by which the feature was identified, i.e., by experiment, by similarity with known sequence or to an established consensus sequence, or by similarity to some other pattern - four lines maximum):
(D) OTHER INFORMATION (include information on phenotype conferred, biological activity of sequence or its product, macromolecules which bind to sequence or its product, or other relevant information - four lines maximum):
(x) PUBLICATION INFORMATION (Repeat section for each relevant publication - O/rep):
(A) AUTHORS (maximum of first ten named authors of publication; specify one name per line: SURNAME comma OTHER NAMES and/or INITIALS - rep):
(B) TITLE (title of publication):
(C) JOURNAL (journal name in which data published):
(D) VOLUME (journal volume in which data published):
(E) ISSUE (journal issue number in which data published):
(F) PAGES (journal page numbers in which data published):
(G) DATE (journal date in which data published; specify as dd-MMM-yyyy, MMM-YYYY or Season-YYYY):
(H) DOCUMENT NUMBER (document number, for patent type citations only; specify as two letter country code, eight digit document number (right justified), one letter and, as appropriate, one number or a space as a document type code; or if a PCT application, specify as the letters PCT, a slash, a two letter code indicating the Receiving Office, a two digit indication of the year, a slash and a five digit number; or if a PCT publication, specify as the two letters WO, a two digit indication of the year, a slash and a five digit publication number):
(I) FILING DATE (document filing date, for patent-type citations only; specify as dd-MMM-yyyy):
(J) PUBLICATION DATE (document publication date; for patent-type citations only, specify as dd-MMM-yyyy):
(K) RELEVANT RESIDUES In SEQ ID NO:X (rep): FROM (position) TO (position)
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:X:

§ 1.824 Form and format for nucleotide and/or amino acid sequence submissons In computer readable form.

(a) The computer readable form required by §1.821(e) shall contain a printable copy of the "Sequence Listing," as defined in §§1.821(c), 1.822 and 1.823, recorded as a single file on either a diskette or a magnetic tape. The computer readable form shall be encoded and formatted such that a printed copy of the "Sequence Listing" may be recreated using the print commands of the computer/operating-system configuration specified in paragraph (f) of this section.

(b) The file in paragraph (a) of this section shall be encoded in a subset of the American Standard Code for Information Interchange (ASCII). This subset shall consist of all the printable ASCII characters including the ASCII space character plus line-termination, pagination and end-of-file characters associated with the computer/operating-system configurations specified in paragraph (f) of this section. No other characters shall be allowed.

(c) The computer readable form may be created by any means, such as word processors, nucleotide/amino acid sequence editors or other custom computer programs; however, it shall be readable by one of the computer/operating-system configurations specified in paragraph (f) of this section, and shall conform to the specifications in paragraphs (a) and (b) of this section.

(d) The entire printable copy of the "Sequence Listing" shall be contained within one file on a single diskette or magnetic tape unless it is shown to the satisfaction of the Commissioner that it is not practical or possible to submit the entire printable copy of the "Sequence Listing" within one file on a single diskette or magnetic tape.

(e) The submitted diskette or tape shall be write-protected such as by covering or uncovering diskette holes, removing diskette write tabs or removing tape write rings.

(f) As set forth in paragraph (c), above, any means may be used to create the computer readable form, as long as the following conditions are satisfied. A submitted diskette shall be readable on one of the computer/operating-system configurations described in paragraphs (1) through (3), below. A submitted tape shall satisfy the format specifications described in paragraph (4), below.

(1) Computer: IBM PC/XT/AT, IBM PS/2 or compatibles;
Operating system: PC-DOS or MS-DOS (Versions 2.1 or above);
Line Terminator: ASCII Carriage Return plus ASCII Line Feed;
Pagination: ASCII Form Feed or Series of Line Terminators;
End-of-File: ASCII SUB (Ctrl-Z);
Media:
Diskette - 5.25 inch, 360 Kb storage;
Diskette - 5.25 inch, 1.2 Mb storage;
Diskette - 3.50 inch, 720 Kb storage;
Diskette - 3.5 inch, 1.44 Mb storage;
Print Command: PRINT filename.extension;
(2) Computer: IBM PC/XT/AT, IBM PS/2 or compatibles;
Operating system: Xenix;
Line Terminator: ASCII Carriage Return;
Pagination: ASCII Form Feed or Series of Line Terminators;
End-of-File: None;
Media:
Diskette - 5.25 inch, 360 Kb storage;
Diskette - 5.25 inch, 1.2 Mb storage;
Diskette - 3.50 inch, 720 Kb storage;
Diskette - 3.5 inch, 1.44 Mb storage;
Print Command; lpr filename;
(3) Computer: Apple Macintosh;
Operating System: Macintosh;
Macintosh File Type: text with line termination
Line Terminator: Pre-defined by text type file;
Pagination: Pre-defined by text type file;
End-of-file: Pre-defined by text type file;
Media:
Diskette - 3.50 inch, 400 Kb storage;
Diskette - 3.50 inch, 800 Kb storage;
Diskette - 3.50 inch, 1.4 Mb storage;
Print Command: Use PRINT command from any Macintosh Application that processes text files, such as MacWrite or TeachText;
(4) Magnetic tape: 0.5 inch, up to 2400 feet;
Density: 1600 or 6250 bits per inch, 9 track;
Format: raw, unblocked;

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Line Terminator: ASCII Carriage Return plus optional ASCII Line Feed;
Pagination: ASCII Form Feed or Series of Line Terminators;
Print Command (Unix shell version given here as sample response -mt/dev/rmt0;lpr</dev/rmt0):

(g) Computer readable forms that are submitted to the Office will not be returned to the applicant.

(h) All computer readable forms shall have a label permanently affixed thereto on which has been hand printed or typed, a description of the format of the computer readable form as well as the name of the applicant, the title of the invention, the date on which the data were recorded on the computer readable form and the name and type of computer and operating system which generated the files on the computer readable form. If all of this information can not be printed on a label affixed to the computer readable form, by reason of size or otherwise, the label shall include the name of the applicant and the title of the invention and a reference number, and the additional information may be provided on a container for the computer readable form with the name of the applicant, the title of the invention, the reference number and the additional information affixed to the container. If the computer readable form is submitted after the date of filing under 35 U.S.C. 111, after the date of entry in the national stage under 35 U.S.C. 371 or after the time of filing, in the United states Receiving Office, an international application under the PCT, the labels mentioned herein must also include the date of the application and the application number, including series code and serial number.

§1.825 Amendments to or replacement of sequence listing and computer readable copy thereof.

(a) Any amendment to the paper copy of the "Sequence Listing" (§1.821(c)) must be made by the submission of substitute sheets. Amendments must be accompanied by a statement that indicates support for the amendment in the application, as filed, and a statement that the substitute sheets include no new matter. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(b) Any amendment to the paper copy of the "Sequence Listing," in accordance with paragraph (a) of this section, must be accompanied by a substitute copy of the computer readable form (§1.821(e)) including all previously submitted data with the amendment incorporated therein, accompanied by a statement that the copy in computer readable form is the same as the substitute copy of the "Sequence Listing." Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(c) Any appropriate amendments to the "Sequence Listing" in a patent, e.g., by reason of reissue or certificate of correction, must comply with the requirements of paragraphs (a) and (b) of this section.

(d) If, upon receipt, the computer readable form is found to be damaged or unreadable, applicant must provide, within such time as set by the Commissioner, a substitute copy of the data in computer readable form accompanied by a statement that the substitute data is identical to that originally filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

April 20, 1990

HARRY F. MANBECK
Asst. Secretary and Commissioner of Patents and Trademarks

APPENDIX I

SAMPLE SEQUENCE LISTING

(1) **GENERAL INFORMATION:**

(i)**APPLICANT:** Doe, Joan X.
Doe, John Q.

(ii) **TITLE OF INVENTION:** Isolation and Characterization of a Gene Encoding a Protease from *Paramecium* sp.

(iii) **NUMBER OF SEQUENCES:** 2

(iv) **CORRESPONDENCE ADDRESS:**
(A) **ADDRESSEE:** Smith and Jones
(B) **STREET:** 123 Main Street
(C) **CITY:** Smalltown
(D) **STATE:** Anystate
(E) **COUNTRY:** USA
(F) **ZIP:** 12345

(v) **COMPUTER READABLE FORM:**
(A) **MEDIUM TYPE:** Diskette, 3.50 inch, 800 Kb storage
(B) **COMPUTER:** Apple Macintosh
(C) **OPERATING SYSTEM:** Macintosh 5.0
(D) **SOFTWARE:** MacWrite

(vi) **CURRENT APPLICATION DATA:**
(A) **APPLICATION NUMBER:** 09/999,999
(B) **FILING DATE:** 28-FEB-1989
(C) **CLASSIFICATION:** 999/99

(vii) **PRIOR APPLICATION DATA:**
(A) **APPLICATION NUMBER:** PCT/US88/99999
(B) **FILING DATE:** 01-MAR-1988

(viii) **ATTORNEY/AGENT INFORMATION:**
(A) **NAME:** Smith, John A.
(B) **REGISTRATION NUMBER:** 00001
(C) **REFERENCE/DOCKET NUMBER:** 01-0001

(ix) **TELECOMMUNICATION INFORMATION:**
(A) **TELEPHONE:** (909)999-0001
(B) **TELEFAX:** (909)999-0002

(2) **INFORMATION FOR SEQ ID NO:1:**

(i) **SEQUENCE CHARACTERISTICS:**
(A) **LENGTH:** 954 base pairs
(B) **TYPE:** nucleic acid
(C) **STRANDEDNESS:** single
(D) **TOPOLOGY:** linear

(ii) **MOLECULE TYPE:** genomic DNA

(iii) **HYPOTHETICAL:** yes

(iv) **ANTI-SENSE:** no

(vi) **ORIGINAL SOURCE:**
(A) **ORGANISM:** Paramecium sp
(C) **INDIVIDUAL/ISOLATE:** XYZ2
(G) **CELL TYPE:** unicellular organism

(iv) **IMMEDIATE SOURCE:**
(A) **LIBRARY:** genomic
(B) **CLONE:** Para-XYZ2/36

(x) **PUBLICATION INFORMATION:**
(A) **AUTHORS:** Doe, Joan X.
Doe, Joan Q.
(B) **TITLE:** Isolation and Characterization of a Gene Encoding a Protease from *Paramecium* sp.
(C)**JOURNAL:** Fictional Genes
(D) **VOLUME:** 1
(E) **ISSUE:** 1
(F) **PAGES:** 1-20
(G) **DATE:** 02-MAR-1988
(K) **RELEVANT RESIDUES IN SEQ ID NO:1:**FROM 1 TO 954

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

```
ATCGGGATAG TACTGGTCAA GACCGGTGGA CACCGGTTAA CCCCGGTTAA GTACCGGTTA 60

TAGGCCATTT CAGGCCAAAT GTGCCCAACT ACGCCAATTG TTTTGCCAAC GGCCAACGTT 120

ACGTTCGTAC GCACGTATGT ACCTAGGTAC TTACGGACGT GACTACGGAC ACTTCCGTAC 180

GTACGTACGT TTACGTACCC ATCCCAACGT AACCACAGTG TGGTCGCAGT GTCCCAGTGT 240

ACACAGACTG CCAGACATTC TTCACAGACA CCCC ATG ACA CCA CCT GAA CGT CTC 295
                                     Met Thr Pro Pro Glu Arg Leu
                                                     -30

TTC CTC CCA AGG GTG TGT GGC ACC ACC CTA CAC CTC CTC CTT CTG GGG 343
Phe Leu Pro Arg Val Cys Gly Thr Thr Leu His Leu Leu Leu Leu Gly
        -25          -20          -15

CTG CTG CTG GTT CTG CTG CCT GGG GCC CAT GTGAGGCAGC AGGAGAATGG 393
Leu Leu Leu Val Leu Leu Pro Gly Ala His
    -10              -5

GGTGGCTCAG CCAAACCTTG AGCCCTAGAG CCCCCCTCAA CTCTGTTCTC CTAG GGG 450
                                                          Gly

CTC ATG CAT CTT GCC CAC AGC AAC CTC AAA CCT GCT GCT CAC CTC ATT 498
Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His Leu Ile
1           5                  10                  15

GTAAACATCC ACCTGACCTC CCAGACATGT CCCCACCAGC TCTCCTCCTA CCCCTGCCTC 558

AGGAACCCAA GCATCCACCC CTCTCCCCCA ACTTCCCCCA CGCTAAAAAA AACAGAGGGA 618

GCCCACTCCT ATGCCTCCCC CTGCCATCCC CCAGGAACTC AGTTGTTCAG TGCCCACTTC 678

TAC CCC AGC AAG CAG AAC TCA CTG CTC TGG AGA GCA AAC ACG GAC CGT 726
Tyr Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg Ala Asn Thr Asp Arg
            20                  25                  30

GCC TTC CTC CAG GAT GGT TTC TCC TTG AGC AAC AAT TCT CTC CTG GTC 774
Ala Phe Leu Gln Asp Gly Phe Ser Leu Ser Asn Asn Ser Leu Leu Val
        35                  40                  45

TAGAAAAAAT AATTGATTTC AAGACCTTCT CCCCATTCTG CCTCCATTCT GACCATTTCA 834

GGGGTCGTCA CCACCTCTCC TTTGGCCATT CCAACAGCTC AAGTCTTCCC TGATCAAGTC 894

ACCGGAGCTT TCAAAGAAGG AATTCTAGGC ATCCCAGGGG ACCCACACCT CCCTGAACCA 954
```

(2) **INFORMATION FOR SEQ ID NO**:2:

(i) **SEQUENCE CHARACTERISTICS:**

(A) **LENGTH:** 82 amino acids
(B) **TYPE:** amino acid
(D) **TOPOLOGY:** linear

(ii) **MOLECULE TYPE:** protein

(vii) **FEATURE:**

(A) **NAME/KEY:** signal sequence
(B) **LOCATION:** -34 to -1
(C) **IDENTIFICATION METHOD:** similarity to other signal sequences, hydrophobic
(D) **OTHER INFORMATION:** expresses protease

(x) **PUBLICATION INFORMATION:**
(A) **AUTHORS:** Doe, Joan X.
Doe, John Q.
(B) **TITLE:** Isolation and Characterization of a Gene Encoding a Protease from *Paramecium* sp.
(C) **JOURNAL:** Fictional Genes
(D) **VOLUME:** 1
(E) **ISSUE:** 1
(F) **PAGES:** 1-20
(G) **DATE:** 02-MAR-1988
(K) **RELEVANT RESIDUES IN SEQ ID NO:**2:FROM -34 TO 48

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

```
Met Thr Pro Pro Glu Arg Leu Phe Leu Pro Arg Val Cys Gly Thr Thr
                -30                 -25                 -20

Leu His Leu Leu Leu Leu Gly Leu Leu Leu Val Leu Leu Pro Gly Ala
            -15                 -10                  -5

His Gly Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His
    1               5                  10

Leu Ile Tyr Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg Ala Asn Thr
15                  20                  25                  30

Asp Arg Ala Phe Leu Gln Asp Gly Phe Ser Leu Ser Asn Asn Ser Leu
                35                  40                  45

Leu Val
```

APPENDIX II

HEADINGS FOR INFORMATION ITEMS IN § 1.823

(1) **GENERAL INFORMATION:**

(i) **APPLICANT:**

(ii) **TITLE OF INVENTION:**

(iii) **NUMBER OF SEQUENCES:**

(iv) **CORRESPONDENCE ADDRESS:**

(A) **ADDRESSEE:**

(B) **STREET:**

(C) **CITY:**

(D) **STATE:**

(E) **COUNTRY:**

(F) **ZIP:**

(v) **COMPUTER READABLE FORM:**

(A) **MEDIUM TYPE:**

(B) **COMPUTER:**

(C) **OPERATING SYSTEM:**

(D) **SOFTWARE:**

(vi) **CURRENT APPLICATION DATA:**

(A) **APPLICATION NUMBER:**

(B) **FILING DATE:**

(C) **CLASSIFICATION:**

(vii) **PRIOR APPLICATION DATA:**

(A) **APPLICATION NUMBER:**

(B) **FILING DATE:**

(viii) **ATTORNEY/AGENT INFORMATION:**

(A) **NAME:**

(B) **REGISTRATION NUMBER:**

(C) **REFERENCE/DOCKET NUMBER:**

(ix) **TELECOMMUNICATION INFORMATION:**

(A) **TELEPHONE:**

(B) **TELEFAX:**

(C) **TELEX:**

(2) **INFORMATION FOR SEQ ID NO:X:**

(i) **SEQUENCE CHARACTERISTICS:**

(A) **LENGTH:**

(B) **TYPE:**

(C) **STRANDEDNESS:**

(D) **TOPOLOGY:**

(ii) **MOLECULE TYPE:**

-Genomic RNA;

-Genomic DNA;

-mRNA;

-tRNA;

-rRNA;

-snRNA;

-scRNA;

-preRNA;

-cDNA to genomic RNA;

-cDNA to mRNA;

-cDNA to tRNA;

-cDNA to rRNA;

-cDNA to snRNA;

-cDNA to scRNA;

-Other nucleic acid;

(A) **DESCRIPTION:**

-protein and

-peptide.

(iii) **HYPOTHETICAL:**

(iv) **ANTI-SENSE:**

(v) **FRAGMENT TYPE:**

(vi) **ORIGINAL SOURCE:**

(A) **ORGANISM:**

(B) **STRAIN:**

(C) **INDIVIDUAL ISOLATE:**

(D) **DEVELOPMENTAL STAGE:**

(E) **HAPLOTYPE:**

(F) **TISSUE TYPE:**

(G) **CELL TYPE:**

(H) **CELL LINE:**

(I) **ORGANELLE:**

(vii) **IMMEDIATE SOURCE:**

(A) **LIBRARY:**

(B) **CLONE:**

(viii) **POSITION IN GENOME:**

(A) **CHROMOSOME/SEGMENT:**

(B) **MAP POSITION:**

(C) **UNITS:**

(ix) **FEATURE:**

(A) **NAME/KEY:**

(B) **LOCATION:**

(C) **IDENTIFICATION METHOD:**

(D) **OTHER INFORMATION:**

(x) **PUBLICATION INFORMATION:**

(A) **AUTHORS:**

(B) **TITLE:**

(C) **JOURNAL:**

(D) **VOLUME:**

(E) **ISSUE:**

(F) **PAGES:**

(G) **DATE:**

(H) **DOCUMENT NUMBER:**

(I) **FILING DATE:**

(J) **PUBLICATION DATE:**

(K) **RELEVANT RESIDUES:**

(xi) **SEQUENCE DESCRIPTION:** SEQ ID NO:X:

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PATENT NOTICES

Certificates of Correction For Week of May 15, 1990

D. 301,644	4,808,231	4,835,083	4,847,438
D. 301,951	4,808,539	4,835,188	4,847,521
D. 302,156	4,809,117	4,836,075	4,847,637
PP. 6,923	4,811,279	4,837,818	4,847,855
Re. 32,936	4,812,669	4,838,268	4,847,880
Re. 32,964	4,814,450	4,838,521	4,847,944
Re. 32,976	4,817,523	4,839,532	4,848,006
4,247,411	4,817,563	4,839,990	4,848,017
4,640,727	4,818,013	4,840,248	4,848,511
4,707,664	4,819,237	4,840,549	4,848,539
4,716,449	4,820,120	4,840,582	4,848,669
4,716,744	4,820,713	4,840,638	4,848,898
4,735,739	4,820,860	4,840,922	4,849,039
4,738,847	4,821,387	4,841,263	4,849,074
4,749,380	4,821,757	4,841,433	4,849,667
4,750,177	4,821,848	4,841,442	4,849,747
4,756,914	4,822,182	4,841,652	4,849,856
4,758,778	4,823,026	4,841,824	4,849,896
4,760,745	4,823,880	4,842,189	4,849,905
4,761,264	4,823,914	4,842,382	4,849,927
4,761,541	4,824,050	4,842,446	4,850,127
4,764,723	4,824,400	4,842,574	4,850,169
4,764,784	4,824,564	4,842,602	4,850,284
4,774,543	4,824,677	4,842,739	4,850,297
4,776,655	4,825,247	4,843,077	4,850,302
4,778,260	4,825,737	4,843,496	4,850,367
4,780,742	4,825,781	4,843,504	4,850,774
4,780,870	4,826,076	4,844,135	4,851,196
4,780,882	4,826,857	4,844,166	4,851,389
4,786,311	4,827,248	4,844,592	4,851,858
4,786,574	4,827,296	4,844,687	4,852,357
4,789,752	4,827,623	4,845,034	4,852,662
4,791,904	4,828,034	4,845,265	4,852,791
4,792,189	4,829,295	4,845,289	4,852,971
4,793,979	4,829,970	4,845,315	4,852,987
4,797,062	4,830,323	4,845,442	4,853,258
4,797,357	4,830,607	4,845,732	4,853,581
4,798,014	4,830,701	4,845,733	4,854,590
4,799,180	4,831,052	4,845,959	4,854,643
4,799,761	4,831,408	4,846,004	4,858,188
4,802,659	4,833,266	4,846,092	4,859,005
4,802,797	4,833,748	4,846,119	4,860,335
4,804,568	4,834,061	4,846,166	4,866,109
4,805,398	4,834,242	4,846,299	4,866,253
4,805,873	4,834,338	4,846,815	4,873,259
4,807,183	4,834,825	4,846,939	4,873,636
4,807,448	4,834,877	4,847,169	4,878,640

Disclaimer

4,486,339.—*Richard G. Young*, Midland, Mich. SEQUESTERING AGENT. Patent dated Dec. 4, 1984. Disclaimer filed Feb. 9, 1990, by the assignee, The Dow Chemical Company.

Hereby enters this disclaimer to the remaining term of said patent.

4,676,394.—*Walter Hiersteiner*, Shawnee Mission, Kans. CARTON FOR RECEIVING AND SEALING AN INNER BAG. Patent dated June 30, 1987. Disclaimer filed Feb. 12, 1990, by the inventor.

Hereby enters this disclaimer to claims 1, 5, 6 and 7 of said patent.

4,695,533.—*Noritaka Nakayama; Satoshi Kawakatsu; Katsunori Katoh*, all of Hachioji; *Toshijumi Iijima*, Kokubunji; *Kenji Kumashiro*, Hachioji; *Hiroshi Kashiwagi*, Hino; *Koichi Hatta*; *Takashi Uchida*, both of Hachioji; *Hajime Wada*, Tokyo; *Fumio Ishii*, Akishima; *Satoshi Matsunaga*, Hino; *Yasuko Matsubara*, Akishima; *Kaoru Shinozaki*, Tokyo, all of Japan. SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL. Patent dated Sept. 22, 1987. Disclaimer filed Nov. 10, 1988, by the assignee, Konica Corp.

The term of this patent subsequent to May 12, 2004, has been disclaimed.

4,829,678.—*John D. Glorioso*, Clearwater, Fla. SLUDGE TREATMENT PROCESS. Patent dated May 16, 1989. Disclaimer filed May 9, 1989, by the assignee, Enviro-Gro Technologies.

The term of this patent subsequent to August 9, 2005, has been disclaimed.

4,866,344.—*Randall I. Ross*, Pleasanton; *Bradley Gunn*, Sunnyvale, both of Calif. HIGH VOLTAGE POWER SUPPLY FOR A MICROWAVE ELECTRON TUBE. Patent dated Sept. 12, 1989. Disclaimer filed Nov. 17, 1989, by the assignee, Varian Associates, Inc.

The term of this patent subsequent to October 11, 2005, has been disclaimed.

4,886,158.—*James M. Lapeyre*, New Orleans, La. MODULAR CENTER DRIVE CONVEYER BELT. Patent dated Dec. 12, 1989. Disclaimer filed Mar. 7, 1990, by the assignee, The Laitram Corp.

The term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Dedication

4,674,580.—*Frank J. Schuh*, Plano; *David D. Hearn*, Richardson, both of Tex. MEANS FOR REDUCING BENDING STRESSES IN DRILL PIPE. Patent dated June 23, 1987. Dedication filed Mar. 1, 1990, by the assignee, Atlantic Richfield Co.

Hereby dedicates to the Public the remaining term of said patent.

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Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

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Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
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	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
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	New York Public Library (The Research Libraries)	(212) 714-8529
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	Columbus: Ohio State University Libraries	(614) 292-6175
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	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF April 7, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-7-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	10-18-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	5-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	2-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M BLIX, Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	3-23-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	3-30-88
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-24-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during April 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,723,992 to 3,729,743 inclusive
Plant Patents ..... None

REEXAMINATIONS

MAY 15, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 32,552 (1280th)

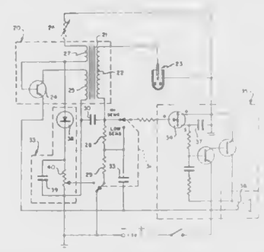
GASEOUS IMPURITY DETECTOR EMPLOYING CORONA DISCHARGE PHENOMENON

Leonard N. Liebermann, La Jolla, and Stanley H. Lai, San Diego, both of Calif., assignors to TIF Instruments, Miami, Fla.

Reexamination Request No. 90/001,742, Apr. 3, 1989.
Reexamination Certificate for Reissue Patent Re. 32,552, issued Dec. 1, 1987, Ser. No. 206,727, Nov. 14, 1980.
Original No. 3,742,475, dated Jun. 26, 1973, Ser. No. 124,794, Mar. 16, 1971.

Int. Cl.[5] **G08B** *21/00*

U.S. Cl. 340—632



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4**, **5**, **10**, **11** and **12** is confirmed.

Claims **1**, **2**, **3**, **6**, **7**, **8** and **9** were previously cancelled.

New claims **13**, **14**, **15**, **16**, **17** and **18** are added and determined to be patentable.

4. Apparatus for detecting halogen impurities in an ambient atmosphere comprising:

an asymmetrical electrode pair disposable in such ambient atmosphere,

a portable battery-operable source of voltage pulses including an oscillator connected to the electrode pair, the voltage of said pulses being sufficient to cause a negative corona discharge across the electrode pair in the continuous corona region; and

means for indicating the mean corona current of said discharge, which is representative of the concentration of such impurity.

B1 4,473,362 (1281st)

BELT TENSIONER WITH VARIABLY PROPORTIONAL DAMPING

Henry W. Thomey, Keswick; Klaus K. Bytzek, and Johannes H. Mevissen, both of Schomberg, all of Canada, assignors to Litens Automotive Inc., Ontario, Canada

Reexamination Request No. 90/001,853, Sep. 29, 1989.
Reexamination Certificate for Patent No. 4,473,362, issued Sep. 25, 1984, Ser. No. 281,501, Jul. 8, 1981.

Int. Cl.[5] **F16H** *7/12*

U.S. Cl. 474—135

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

New claim **21** is added and determined to be patentable.

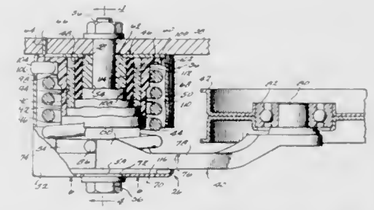
1. In a belt tensioning device comprising

a fixed structure,

a pivoted structure mounted with respect to said fixed structure for pivotal movement about a first axis between first and second limiting positions,

a belt engaging pulley rotatably carried by said pivoted structure for rotational movement about a second axis parallel with said first axis,

spring means of rigid material acting between said fixed and



pivoted structures for resiliently biasing said pivoted structure to move in a direction away from said first limiting position toward said second limiting position with a spring force which decreases as said pivoted structure is moved in a direction away from said first position toward said second position, and

damping means for (1) damping by elastomeric material displacement normal low amplitude operating movements of said pivoted structure and (2) damping sequentially by high friction surface sliding abnormal high amplitude movements of said pivoted structure beyond those which are damped by the elastomeric material displacement with a damping force which decreases as said pivoted structure is moved in a direction away from said first position toward said second position.

B1 4,732,583 (1282nd)

GAS SEPARATION

Bradley W. DeLong, Bartlesville, Okla., and Jeffrey R. Burkinshaw, Casper, Wyo., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Reexamination Request No. 90/001,816, Aug. 1, 1989.
Reexamination Certificate for Patent No. 4,732,583, issued Mar. 22, 1988, Ser. No. 677,668, Dec. 3, 1984.

Int. Cl.[5] **B01D** *53/24*

U.S. Cl. 55—16

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **2** are cancelled.

Claims **3–10** and **12** are determined to be patentable as amended.

Claim **11**, dependent on an amended claim, is determined to be patentable.

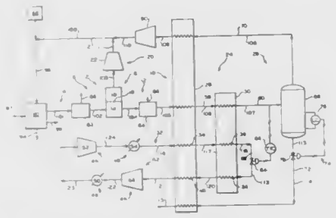
New claim 13 is added and determined to be patentable.

13. A process for retorting crushed oil shale in the presence of added hydrogen which comprises:

(a) reacting crushed oil shale with hydrogen in an oil shale retort under hydroretorting conditions of 200 to 2000 psig over a time period of 0.1 to 10 hours at a temperature in the range of 700° to 1100° F.;

(b) withdrawing a hydrogen-containing high-pressure first gas stream from the oil shale retort;

(c) introducing the high-pressure first gas stream into a separation zone containing a membrane which is selectively permeable to hydrogen, and which divides the separation zone into a high-pressure first chamber and a low-pressure second chamber, wherein the first gas stream is introduced into the first chamber;



(d) withdrawing low-pressure high purity hydrogen gas permeate from the second chamber;

(e) withdrawing a gas stream from the first chamber as a second gas stream, wherein the second gas stream has a lower concentration of hydrogen gas then the first gas stream, and is at a lower pressure than the first gas stream;

(f) cooling the second gas stream sufficiently to condense substantially all condensable components in the second gas stream so as to provide a partially condensed second gas stream; and

(g) separating the partially condensed second gas stream in a phase separator and withdrawing from the phase separator a high-purity hydrogen gas third stream.

B1 4,770,368 (1283rd)

TURBINE/AIR VENT REELING MACHINE

John S. Yates, Fountain Valley, and Roger D. Brum, Irvine, both of Calif., assignors to Southwest Aerospace Corporation

Reexamination Request No. 90/001,726, Mar. 3, 1989.

Reexamination Certificate for Patent No. 4,770,368, issued Sep. 13, 1988, Ser. No. 710,905, Mar. 12, 1985.

Int. Cl.[5] B64D *3/02*

U.S. Cl. 244—1 TD



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-5 is confirmed.

New claims 6-9 are added and determined to be patentable.

1. An air turbine driven reeling machine for selectively reeling a cable inwardly and outwardly of an aircraft to control the position of a device towed by the aircraft, comprising:

a housing adapted to be mounted to an aircraft, said housing having an air inlet adjacent one end thereof;

a turbine mounted within said housing, said turbine including a fixed blade rotor rotatably mounted within said housing and a stator for directing airflow from said air inlet to said rotor;

an output shaft connected to said rotor including means for attachment of said output shaft to a cable attachable to a device towed by the aircraft;

vent means for varying the flow of air passing through said rotor to provide a desired rotational speed of said rotor and said output shaft for reeling the cable inwardly and outwardly from the aircraft;



means for controlling the operation of said vent means to avoid undesirable surging and seeking speed response of said rotor about said desired rotational speed; said stator being stationary mounted within said housing between said air inlet and said rotor, and including a pluality of stator blades each having an angle of attack within the range of 65 to 85 degrees, said rotor including a plurality of fixed rotor blades each having an angle of attack within the range of 55 to 75 degrees, said angles of attack of said stator blades and said rotor blades cooperating to permit bi-directional rotation of said rotor without turbine stall, said vent means comprising a plurality of vents positioned downstream from said rotor, said vents being movable between open and closed positions, and

actuation means for moving said vents between their open and closed positions, said actuation means comprising a servo-motor actuated linkage connected to each of said plural vents and said servo-motor actuated linkage including means for providing an over-center locking configuration to resist airflow forces exerted on each of said plural vents.

REISSUES

MAY 15, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,214

PROCESS FOR CONTROLLED MIXING IN A HIGH INTENSITY MIXER

Zenas Crocker, Westmount, and Ved P. Gupta, Lasalle, both of Canada, assignors to Carlew Chemicals Limited, Montreal, Canada

Original No. 42,306,159, dated Oct. 28, 1980, Ser. No. 962,778, Nov. 21, 1978. Application for reissue Apr. 8, 1981, Ser. No. 252,248

Int. Cl.[5] C08J *3/28*

U.S. Cl. 523—303 **15 Claims**

1. A process for controlled mixing of a *thermoplastic or thermosetting* mixable *particulate* material in a high intensity batch mixer, comprising the steps of,

feeding a batch of the *thermoplastic or thermosetting particulate* material into the mixer,

agitating the batch of the material in the mixer *with mixing blades having tip speeds above 25 meters per second,*

continuously monitoring the infrared radiation produced by the batch of material so as to determine *instantaneously* the temperature of the batch of material separately from the temperature of the mixer, and

discharging the batch from the mixer *with a minimum time lag* when the batch temperature, *determined by the infrared radiation produced by the batch of material,* reaches a [final predetermined level] *preset level so as to produce uniform batches of mixed materials having short heat histories, optimum processing and physical property characteristics.*

Re. 33,215

METHOD OF ASSEMBLING TEXTILES

Paula J. Sweet, 270 Lafayette Street, New York, N.Y. 10012

Original No. 4,665,851, dated May 19, 1987, Ser. No. 911,725, Sep. 26, 1986. Application for reissue Jun. 27, 1988, Ser. No. 212,325

Int. Cl.[5] A41D *27/08;* **D05B** *1/00*

U.S. Cl. 2—243 R **15 Claims**



1. A method of making a composite fabric adapted to the manufacture of garments and the like, said method comprising the steps of:

spreading a given length of decorative fabric in a given spreading direction to form a plurality of layers of spread decorative fabric each lying in a horizontal plane;

cutting said layers of decorative fabric in a plurality of vertical cutting planes each parallel to said spreading direction to form a plurality of narrow strips of spread fabric each having said given length;

slitting opposite sides of each of said narrow strips of spread fabric in a plurality of slitting planes each normal to said spreading direction to form a plurality of center webs respectively extending the length of said strips and each bordered by a plurality of fringes, each of said fringes having a length less than one-half the width of said respective strips and extending in a direction parallel to said slitting planes;

unlayering each of said strips with said fringes formed thereon;

quilting each of said unlayered strips to a base fabric; and

washing said base fabric with said strips quilted thereto, thereby causing said fringes to curl.

13. A clothing manufacturing method comprising the steps of:

providing a plurality of narrow strips of fabric;

slitting at least one edge of each of said strips to form a plurality of fringes along at least one edge of each of said strips;

attaching each of said strips to a base fabric to form a composite fabric;

curling said fringes; and

employing said composite fabric to make a garment.

Re. 33,216

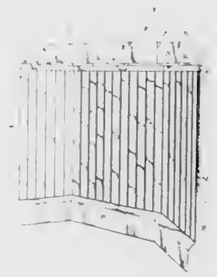
BLIND ASSEMBLY

Norbert Marocco, 46 Pennygrass Court, Woodbridge, Ontario, Canada L4L 3M6

Original No. 4,653,564, dated Mar. 31, 1987, Ser. No. 801,414, Nov. 25, 1985. Continuation-in-part of Ser. No. 628,223, Jul. 6, 1984, abandoned. Application for reissue Feb. 5, 1988, Ser. No. 152,812

Int. Cl.[5] E06B *9/36*

U.S. Cl. 160—168.1 **31 Claims**



1. A blind apparatus comprising:

at least two tracks having adjacent ends meeting at a corner defined therebetween, the tracks defining two opposite ends remote from such corner;

at least one corner junction member adapted to form said corner;

connection means on said corner junction member interengageable with said adjacent ends of said tracks;

an angle formation in said junction member whereby said tracks are located at an angle to one another;

[a] *first and second slat* rotation [shaft] *means extending* longitudinally [located] relative to [each track] *respective ones of said tracks;*

support means for supporting said *slat* rotation [shafts] *means;*

a plurality of travellers, forming at least two groups, said travellers being slidably received within respective tracks, each traveller having a rotatable slat shaft, each traveller in each said group being connected to a respective one of said *slat* rotation [shafts] *means* for rotation of said slat

shafts, adjacent travellers in the same group being connected to one another;

[flexible elements] *traverse drive means* engageable with said groups of travellers and operable to move said travellers along *respective ones of* said tracks between open and closed positions;

rotation control means connected to a said *slat* rotation [shaft] *means*, and,

flexible coupling means connecting adjacent *slat* rotation [shafts] *means* adjacent said corner.

Re. 33,217

BUCKLE RESISTANCE FOR METAL CONTAINER CLOSURES

Tuan A. Nguyen, Thornton, Colo., assignor to Ball Corporation, Muncie, Ind.

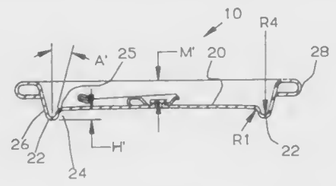
Original No. 4,577,774, dated Mar. 25, 1986, Ser. No. 711,001, Mar. 12, 1985. Continuation of Ser. No. 56,611, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 565,995, Dec. 27, 1983, abandoned, which is a division of Ser. No. 357,032, Mar. 11, 1982, Pat. No. 4,434,641. Application for reissue Aug. 19, 1988, Ser. No. 235,787

Int. Cl.[5] **B21D** *51/44;* **B65D** *8/08, 17/00*

U.S. Cl. 220—66 **8 Claims**

6. A metal closure comprising a circular central panel portion, a generally U-shaped sidewall having inner and outer legs, and an intermediate curved section integrally connecting said ponel portion to said inner leg, said metal closure having a thinned annular band of cold flowed metal formed thereon adjacent the upper surface of said intermediate curved section, the lower surface thereof immediately opposite said thinned annular band having an arcuate concave configuration, said thinned annular band being formed by the process of restraining said central panel and cold flowing metal from the outer surface of said intermediate curved section radially inwardly to form a substantially flat surface immediately opposite said arcuate concave configuration, said flat surface angling upwardly and away from the horizontal in the radially inward direction and to compression dome upwardly the panel portion.

8. A metal closure comprising a circular central panel portion, a generally U-shaped sidewall having inner and outer legs, and an intermediate curved section integrally connecting said panel portion to said inner leg, said metal closure having a thinned annular band of cold flowed metal formed on the outer upper surface of said intermediate curved section, the lower surface thereof immediately opposite said thinned annular band having an arcuate concave configuration, the metal in the band being cold flowed and defining a substantially flat frustoconical surface which angles upward and away from the horizontal in a radially inward direction, the circular central panel portion having an upwardly domed configuration.



PLANT PATENTS

GRANTED MAY 15, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,228

PECAN TREE (PRICE-FLEMING)

Jack W. Price, Rte. 3, Box 161, Rocky Mount, N.C. 27804

Filed Feb. 9, 1989, Ser. No. 323,611

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—31 **1 Claim**

1. A new and distinct variety of pecan tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of medium-early maturity of high quality, large, tasteful nuts on an annual basis, without the use of fungicide in an area where some pecan varieties are severely affected by pecan scab disease, said nuts having thin shells which separate very easily from the kernel, and a self-fertile and self-shaping habit which assures good annual nut crops even in the absence of any neighboring pecan trees.

7,229

POINSETTIA PLANT '130'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed Oct. 27, 1988, Ser. No. 263,493

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, distinguished by its bright yellow flower bracts and dark green foliage.

7,230

POINSETTIA PLANT '8-84'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed Oct. 27, 1988, Ser. No. 263,163

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, distinguished by its vigorous, self-branching characteristics, and large, bicolored, red with pink flecked flower bracts.

7,231

POINSETTIA PLANT '221'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed Oct. 27, 1988, Ser. No. 263,497

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, distinguished by its peppermint colored flower bracts, comprised of a pink base color with small, uniformly scattered, red flecks.

VOL 1114 ISS 3 MAY 15 1990 UMI

VOL
1114

ISS
3

MY
15

1990

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PATENTS

GRANTED MAY. 15, 1990

ERRATA

For CLASS	See PATENT NO.
015-328	4,924,550
017-074	4,924,555
126-512	4,924,564
029-402	4,924,581
029-434	4,924,582
029-460	4,924,583
029-509	4,924,584
029-527	4,924,585
029-723	4,924,586
029-723	4,924,587
029-726	4,924,588
029-832	4,924,589
029-848	4,924,590
051-320	4,924,643
072-049	4,924,684
475-207	4,924,729
475-166	4,924,730
606-027	4,924,863
606-142	4,924,864
606-077	4,924,865
606-216	4,924,866
194-253	4,924,994
221-279	4,925,058
271-115	4,925,062
224-155	4,925,064
228-049	4,925,074
232-034	4,925,075
222-211	4,925,090
241-169	4,925,128
266-270	4,925,150
264-185	4,925,166
180-170	4,925,169
423-022	4,925,196
422-202	4,925,485
208-210	4,925,535
208-361	4,925,554
209-166	4,925,558
208-100	4,925,559

VOL
1114
ISS
3
MY
15
1990
UMI

426-002 4,925,573
424-449 4,925,637
564-149 4,925,736
524-287 4,925,832
560-043 4,925,883
335-172 4,925,958
363-098 4,926,157
367-007 4,926,354
424-052 4,926,380

PATENTS

GRANTED MAY 15, 1990

GENERAL AND MECHANICAL

4,924,525
MULTILAYER FILM FOR CHEMICAL PROTECTIVE CLOTHING

James E. Bartasis, Gurnee, Ill., assignor to Bodigard Technologies, Inc., Buffalo Grove, Ill.

Filed May 16, 1988, Ser. No. 194,468
Int. Cl.[5] A41D *13/00;* **B32B** *27/08, 32/00, 36/00*
U.S. Cl. 2—2 **24 Claims**

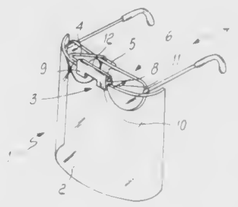


21. A protective garment for hazardous chemical environments comprising:
(a) a segment of material having an edge;
(b) said material segment including a multilayer film having an intermediate layer of substantially isotactic, biaxially oriented polypropylene homopolymer, a heat seal layer on one side of said oriented polypropylene layer, and an adhesive layer on an opposite side of said oriented polypropylene layer;
(c) said material segment also including a substrate;
(d) said multilayer film and said substrate being laminated together; and
(e) said garment being effective to protect a worker in a hazardous chemical environment.

4,924,526
PROTECTIVE VISOR

Stefano Parissenti, and Lino Parissenti, both of Agordo, Italy, assignors to M.P.A. Meccanica Plastica Agordina S.p.A., Agordo, Italy

Filed Apr. 11, 1988, Ser. No. 179,735
Claims priority, application Italy, May 8, 1987, 41598 A/87; Jun. 29, 1987, 41624 A/87
Int. Cl.[5] G02B *7/00, 7/22;* **G02C** *9/00, 9/02*
U.S. Cl. 2—13 **14 Claims**

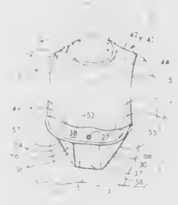


1. A protective visor comprising an interchangeable transparent sheet in a thermoformed plastic material upwardly associated with a monolithic supporting element, said monolithic element being associated by means of a coupling device with a front part of a spectacle frame, said spectacle frame having a connecting bridge, wherein said coupling device comprises at least two elongated elements mutually superimposable and arrangeable longitudinally in the rear part of said connecting bridge, a first one of said elements being rigidly associated with a rod, said rod being coupled with said monolithic element, a second one of said elements being rigidly associated with said bridge, both said elements being completely traversed by a thread hole in which a coupling screw is insertable.

4,924,527
GARMENT PROTECTOR

Marian G. Hintermeyer, 1121 E. Lexington Blvd., Eau Claire, Wis. 54701

Filed Jan. 23, 1989, Ser. No. 300,421
Int. Cl.[5] A41D *3/00, 27/00*
U.S. Cl. 2—49 R **23 Claims**



1. A garment protector comprising:
(a) a sheet of flexible material with a front surface and a back surface, two sides, a lower end and an upper end;
(b) means for fastening the upper end to a neck of an individual;
(c) a pocket formed by folding the lower end of the sheet upwardly about a first transverse folding zone extending across the sheet from one side to the other so that the front surface of the folded sheet is over upon itself with the sides of the folded sheet in edge to edge alignment and the back surface of the folded lower end of the sheet facing frontwardly to form a pocket front wall with an upper margin and a pocket rear wall with an upper margin, and folding lower corners of the folded sheet upwardly and inwardly about oblique folding zones so that the aligned sides of the folded sheet are extending transversely across and in front of the frontwardly facing back surface of the sheet in substantial alignment and in spaced relation to the bottom of the pocket formed by the folded sheet so that any foreign material contained in the bottom of the pocket will be retained by folded portions of the sheet; and
(d) fastening means located near the sides of the sheet near the upper margins of the pocket front and rear walls for connecting the pocket front wall to the pocket rear wall and fastening means located on the folded lower corners for attaching the folded lower corners to the pocket front wall and maintaining the sheet in said folded condition.

4,924,528
NURSING BIB

Pamela Trombetti-Dickens, 8064 Cammeray Ct., Citrus Heights, Calif. 95610

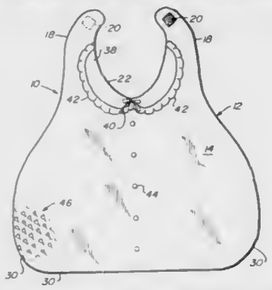
Filed Dec. 8, 1988, Ser. No. 281,064
Int. Cl.[5] A41B *13/10;* **A41D** *1/00, 1/20*
U.S. Cl. 2—104 **9 Claims**

1. A nursing mother's bib of washable textile fabric for covering her nursing baby comprising, in combination:
a. a primary panel, having outer and inner faces, of sufficient length to cover the area between the mother's neck and lap, and of sufficient width to afford complete privacy from all lateral angles while nursing, said primary panel being comprised of two similarly-shaped, edge-bound fabric layers, a facing panel and a liner panel, each having

VOL 1114 ISS 3 MY 15 1990 UMI

an exposed face, said exposed faces being, respectively, said outer and inner faces of said bib:

b. an upper edge on said primary panel shaped to fit the neck of the nursing mother, said neck fitting edge comprising



two narrow extensions from the upper edge of said primary panel; and

c. a plurality of open-topped pockets disposed upon said bib's inner face adjacent its lower edge.

4,924,529

FIREFIGHTER'S COAT HAVING SECURE WRIST PROTECTION

William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417

Filed Feb. 21, 1989, Ser. No. 312,463
Int. Cl.[5] A41B *7/00*
U.S. Cl. 2—123 **6 Claims**



1. A firefighter's coat of the type having a body portion and arm-length sleeves, the arm length sleeves being secured to the body portion, the body portion and the arm length sleeves having a plurality of layers of protective material, at least one of the layers of protective material being a layer of thermal protective material, the firefighter's coat including a pair of tubular members, each of the tubular members comprising a plurality of layers of protective material, at least one of the layers being a layer of thermal protective material, each of the tubular members being secured to a sleeve and extending therefrom, each of the tubular members being adapted to extend from the sleeve to a hand of a firefighter who wears the coat and to cover the wrist of the firefighter, the tubular member having an edge portion, the edge portion of the tubular member having spaced-apart attachment regions, the edge portion having a loop part between the spaced-apart attachment regions thereof, a flexible strip provided with a pair of spaced-apart end portions, means connecting the spaced-apart end portions of the flexible strip to the spaced-apart attachment regions of the edge portion of the tubular member, whereby a loop is formed by the flexible strip and by the loop part of the edge portion of the tubular member, the loop being adapted to receive a thumb of a firefighter as the firefighter dons the coat, whereby the flexible strip is positioned between the thumb and the index finger of the firefighter, and whereby the tubular member is continuously maintained in covering protective relationship over the wrist of the firefighterr as the firefighter's arms and hands are moved in a firefighting operation.

4,924,530

MEDICAL GLOVE

Mamoru Tagaya, 14-4-510 Gakuen-Nishimachi 2-chome, Kodaira-shi, Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 229,994
Claims priority, application Japan, Nov. 5, 1987, 62-168443[U]
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—163 **10 Claims**



1. A medical glove comprising:

a tight-fitting section which comprises at least a thumb and a forefinger of finger sections of said glove and tightly fitting at least the thumb and forefinger of a hand, said tight-fitting section being formed of an elastomeric film material closely contacting with the thumb and forefinger of the hand and extending between their tips and at least a second joint thereof; and

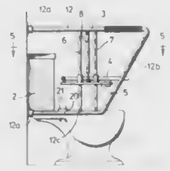
a loose-fitting section which comprises a remaining part of said glove and loosely fitting a remaining part of said thumb and said finger sections.

4,924,531

RESILIENTLY SUPPORTED TOILET SEAT

Nick J. Square, 6410 Middle Ridge Rd., Madison, Ohio 44057

Filed Dec. 3, 1987, Ser. No. 128,059
Int. Cl.[5] A47K *13/10*
U.S. Cl. 4—251 **7 Claims**



1. A toilet and seat support construction, comprising a toilet having a toilet bowl, a seat support member carried by a framework fixed separately from and with respect to said bowl, said member having a seat area, means to slidably position said support member for bodily non-tilting vertical upward and downward movement of the member when the weight of a person is imposed on and relieved from said seat area and said position means further including biasing means for biasing said support member toward said upward movement.

4,924,532

CLEANING AND SANITIZING SYSTEM FOR A TOILET SEAT

Domenick Pennestri, Bay Shore Yacht & Tennis Club, 19451 Gulf Blvd., Indian Shores, Fla. 34635

Filed May 9, 1989, Ser. No. 349,440
Int. Cl.[5] A47K *13/00*
U.S. Cl. 4—233 **7 Claims**



1. A cleaning and sanitizing system for a toilet comprising:

(A) a toilet seat having an outer perimeter and an upper surface, wherein said seat is adapted to be mounted on a toilet bowl having an inner volume;

(B) a toilet seat cover having an outer periphery and a lower surface wherein said cover is adapted to be pivotally mounted on the bowl to cover and uncover the toilet seat;

(C) locking and sealing means located on said cover and said seat for sealing said cover to said seat in a fluid tight manner when said cover is in a closed position, said locking and sealing means includes

(1) a groove defined in and extending adjacent to said toilet seat outer perimeter for the extent of the outer perimeter of said seat,

(2) a flange depending normally from said lower surface about said said outer periphery of said cover, said flange being located to engage the outer surface of said seat when said cover is in a closed position, and,

(3) an elongated tongue extending radially inwardly from said flange over substantially the entire length of said flange and located to be adjacent to said groove for releasably engaging said groove when said cover is in a closed position thereby forming a fluid-tight seal therebetween, such that when said cover is in a closed position said upper surface of said seat is spaced apart from said lower surface of said seat cover thereby defining a gap therebetween connected to the inner volume of said bowl;

(D) a gas source assembly adapted to be mounted on a tank of the toilet, said gas source assembly including

(1) a housing,

(2) a fan located within said housing,

(3) a gas inlet in said housing connected to said fan,

(4) a heater located within said housing,

(5) a gas outlet on said housing,

(6) a timer for stopping operation of said gas source assembly after a predetermined time of operation, and

(7) starting means for starting operation of said gas source assembly;

(E) a liquid source assembly adapted to be mounted on the tank of the toilet, said liquid source assembly including

(1) a container adapted to be mounted on the toilet tank,

(2) a liquid reservoir located within said container,

(3) a pump fluidically connected to said reservoir,

(4) a fluid outlet on said container fluidically connected to said reservoir,

(5) a timer for stopping operation of said liquid source assembly after a prescribed time of operation, and

(6) starting means for starting operation of said liquid source assembly;

(F) a control and power means adapted to be mounted on the toilet and including

(1) switch means connected to said toilet seat to be actuated when said seat has been closed,

(2) means connected to said liquid source assembly starting means for starting operation of said liquid source assembly when said toilet seat is closed,

(3) means connected to said gas source assembly starting means for starting operation of said gas source assembly after said liquid source assembly has been shut down,

(4) means connected to said gas source assembly to re-set said switch to an unactuated condition after said gas source assembly has been shut down, and

(5) power means connected to both of said liquid source assembly and said gas source assembly; and

(G) a hose mounted on the lower surface of said cover located in said gap above said upper surface of said seat when said cover is in a closed position, said hose including

(1) a liquid inlet fluidically connected to said liquid source assembly outlet,

(2) a gas inlet fluidically connected to said gas source assembly outlet,

(3) a multiplicity of fluid outlets in said hose located to direct gas and liquid against the upper surface of said toilet seat and being angled to direct such gas and liquid into the toilet bowl inner volume to wash and dry said toilet seat by impinging fluid thereagainst; and

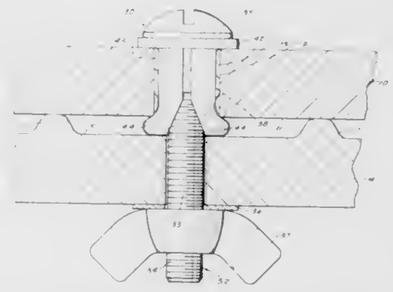
(H) fluid control means on said hose for preventing liquid from passing from said hose to said gas source assembly and for preventing gas from said hose from passing to said liquid source assembly.

4,924,533

COUPLING MEANS FOR TOILET TANK AND BOWL ASSEMBLY

Henry M. Stairs, Jr., Ligonier, Pa., assignor to American Standard Inc., New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,578
Int. Cl.[5] E03D *11/00*
U.S. Cl. 4—252 R **2 Claims**



1. A mounting assembly adapted to couple a water tank to a water closet, said assembly comprising:

an elastomeric seal member having a tubular body, one end of which is formed having a flanged head, the diameter of which is greater than the diameter of a tank mounting opening formed in the base of said water tank, and the

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other end is bifurcated, said bifurcated end portions having slots formed therebetween that extend longitudinally from said associated end to the midportion of said tubular body, said tubular body having an axial passage formed therethrough, and at least one longitudinal extending centering rib integrally formed on its external surface is positioned between said flanged head and one of said bifurcated end slots;

a bolt having an elongated shank which is threaded at one end and a flanged head formed at the other end is telescopically positioned in said passageway of elastomeric member; and

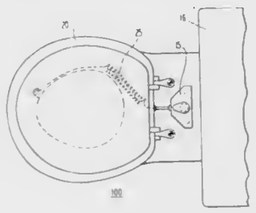
fastening means to threadedly connect said threaded end of said bolt when said tank and water closet are coupled together and to press said bifurcated end portions between the water tank and the water closet in order to form lateral stops that prevent said bolt and said seal member from removal from the water tank.

4,924,534

TOILET HAVING HYGIENIC CLEANING APPARATUS

Panline R. Basile, 418 S. Valley Rd., Devon, Pa. 19333

Filed Nov. 3, 1988, Ser. No. 266,568
Int. Cl.[5] A47K *3/22*
U.S. Cl. 4—447 **8 Claims**



1. A toilet seat having hygienic cleaning apparatus, comprising:

(a) means for attachment to a water source; and

(b) retractable flexible conduit means for transferring said flow of water from said water source to a point of application, said flexible conduit means resiliently extendable from a position integral with said toilet to a point of application, said toilet seat further including a substantially enclosed cavity disposed within said toilet seat to contain a substantial portion of said flexible conduit means, said seat having aperture means communicating with said cavity, and said flexible conduit extending through said aperture such that a selected amount of said portion is resiliently extendable therefrom.

4,924,535

HIGH-SPEED EMITTING APPARATUS OF MIXED FLUID FOR USE IN A BATHTUB

Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki, Osaka and Kabushiki Kaisha Japan Health, Tokyo, both of, Japan

Filed Dec. 6, 1988, Ser. No. 280,502
Int. Cl.[5] A61H *33/02*
U.S. Cl. 4—544 **10 Claims**

1. An apparatus for use in a bathtub for emitting a high-speed jet of liquid having air bubbles entrained therein, comprising:

a thin-wall hollow main body defining therein a contiguous and undivided vertically extending interior cavity and having a lower inlet for sucking the liquid, an upper inlet for sucking air, and an emitting nozzle;

a mechanism disposed within the main body for creating and emitting the jet including a pump communicating with the liquid inlet for sucking the liquid from the bathtub through the lower inlet and into the pump, a hose for supplying pressurized liquid from the pump to the emitting nozzle, and a hose for sucking air from the upper inlet into the emitting nozzle so that the air can be mixed with the liquid;

a filter mounted on the main body at the lower inlet and vertically aligned therewith, the emitting nozzle, the



pump, and the hoses each being positioned in the interior cavity of the main body and each being in vertical overlying relationship relative to the lower inlet and the filter;

suction discs mounted on the main body for releasably securing the main body to the bathtub; and

a source of electricity for operating the mechanism.

4,924,536

SYSTEM OF CONSERVING WATER IN A BUILDING

Connie H. Houghton, 1651 Timberwalk, Paradise, Calif. 95969

Filed Jun. 5, 1989, Ser. No. 361,650
Int. Cl.[5] A47K *4/00*
U.S. Cl. 4—665 **8 Claims**



1. A system of saving water in a building having at least one toilet with toilet reservoir tank, and at least one hot water dispensing fixture, said system being arranged to save normally wasted cold water flushed from a hot water line prior to dispensing of hot water, said system comprising in combination;

a water heater adapted to heat said water;

a pressured water supply line containing said water;

said pressured water supply line attached to an input opening of said water heater adapted to supply said water into said water heater;

said hot water line connected at one end thereof to a hot water output opening of said water heater, said hot water line being further connected to a first side of a manually operable faucet valve positioned adjacent said hot water dispensing fixture, said hot water line adapted to supply said water from said water heater to said faucet valve;

water conductive means between a second side of said faucet valve and said hot water dispensing fixture adapted to direct said water from said faucet valve to said hot water dispensing fixture for dispensing;

a manually operable water by-pass valve connected at a first side thereof to water piping, said water piping being further connected to said hot water line upstream of said faucet valve, said connected water piping adapted to direct said water in said hot water line to said by-pass valve;

by-pass piping connected at a first end thereof to a second side of said by-pass valve, a second end of said by-pass piping connected to a by-pass water storage tank;

said by-pass valve adapted to control water flow between said connected water piping and said by-pass piping;

said by-pass valve with said connected water piping and said connected by-pass piping adapted to provide a flow path for said water in said hot water line with said flow path being an alternative flow path to that formed by said faucet valve and said hot water dispensing fixture;

said water in said hot water line capable of being by-passed by manually opening said by-pass valve whereby said cold water is directed from said hot water line into said by-pass piping and said by-pass water storage tank;

said water by-passing capable of being terminated upon closing of said open by-pass valve, said closing of said open by-pass valve being normally subsequent to said cold water in said hot water line being flushed into said by-pass piping;

toilet reservoir piping adapted to conduct said by-pass water to said toilet reservoir tank whereat a water level control valve of said toilet reservoir tank regulates input of said by-pass water into said toilet reservoir tank;

said by-pass valve, said by-pass piping, said toilet reservoir piping, and said by-pass water storage tank forming a water by-pass system;

said pressured water supply line being further connected to said water by-pass system downstream of said by-pass valve, said connected water supply line adapted to automatically supply supplemental water to said by-pass water storage tank in order to maintain said by-pass water storage tank in a partially filled state;

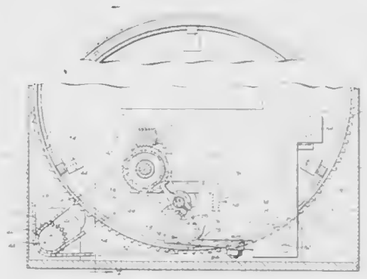
means adapted to limit said supplied supplemental water to said by-pass water storage tank to less than total storage capacity of said by-pass storage tank with remaining capacity of said storage tank being reserved for filling with said by-pass water.

4,924,537

THERAPEUTIC TABLE

Allen W. Alsip, Aurora; James N. Robinson, Addison, and Clayton E. Bossert, Aurora, all of Ill., assignors to Thomas J. Ring, Palos Heights, Ill.

Continuation of Ser. No. 120,410, Nov. 13, 1987, abandoned, which is a division of Ser. No. 724,409, Apr. 17, 1985, Pat. No. 4,852,193. This application Mar. 6, 1989, Ser. No. 320,065
Int. Cl.[5] A61G *7/00*
U.S. Cl. 5—61 **8 Claims**



1. In a therapeutic table having a frame and patient support mounted to the frame for rotary movement about its elongate pivot axis, an improved patient support and drive assembly, comprising:

a first connector assembly including a pivot axle and a pivot axle connector for pivotally mounting one end of the patient support to one end of the frame along said elongate axis;

a second connector assembly for pivotally mounting the other end of the patient support to the frame including

a drive ring,

means for fixedly attaching the other end of the patient support to the drive ring to rotate therewith; and

means in underlying support of the circumference of the drive ring for mounting the drive ring to the frame for rotary movement relative to the frame about an axis of rotation substantially aligned with said elongate pivot axis, said mounting means contacting and providing substantially all the support for the drive ring; and

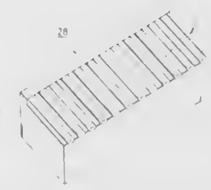
means connected with the drive ring and the frame for driving the ring for rotation relative to the frame.

4,924,538

APPARATUS FOR CONVEYING INCUMBENT PERSON

Masao Kume, Osaka, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,449
Claims priority, application Japan, Apr. 27, 1988, 63-102610
Int. Cl.[5] A61G *7/10*
U.S. Cl. 5—81 B **1 Claim**



1. An apparatus for conveying incumbent persons comprising:

a main body;

loading means movably supported on said main body for insertion between an incumbent person and a surface on which the person is supported, said loading means comprising a pipe structure and a bag-like loading sheet for constantly covering the outer surface of said pipe structure with one end thereof inserted from a leading end of said bag-like loading sheet to the inside of said pipe structure;

drive means for moving said pipe structure forward and backward;

a first wire having one end thereof connected to said one end of said bag-like loading sheet;

a second wire having one end thereof connected to another end of said bag-like loading sheet; and

wire wind-up means connected to other ends of said first and second wires for paying out said first wire when said pipe structure is moved forward and winding up said first wire when said pipe structure is moved backward.

4,924,539

CHILD'S CRIB

Roland A. Benoit, 93 S. Main St., Danielson, Conn. 06239

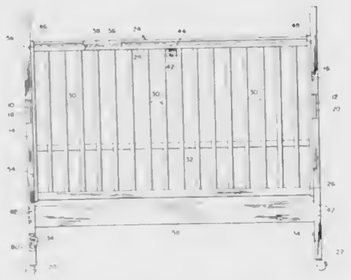
Filed Oct. 17, 1989, Ser. No. 422,535
Int. Cl.[5] A47D *7/02*
U.S. Cl. 5—100 **10 Claims**

1. A crib comprising a rear wall, two end panels, a front dropside, headed fasteners at the ends of the rear wall and cooperating head receivers on the panels for connection with the heads of the fasteners,

dropside latch structure for holding the dropside in an up position, said latch structure including a track on each panel, a latch operating rod, radially extending latch tabs

on the ends of the rod, said tabs being located respectively in the tracks,

a headed fastener at each end of the dropside in positions removed from the latch operating rod, and tracks on the panels to receive the heads of the last named fasteners, so that the latch tabs act as guides for the up and down motion of the dropside together with the heads on the headed fasteners on the dropside;



the latch structure including a pin in each of the first named tracks, the latch tabs being in the form of hooks that cooperate with the pins to latch the dropside in up position, and means to partially rotate the latch operating rod to free the hook-like tabs from the pins to allow the dropside to drop,

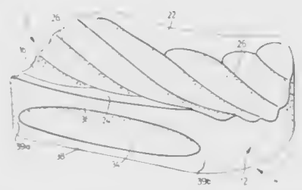
said last named means including a spring biassed button and a spur on the rod engaging the button so that the rod is turned to release the tabs from the pins.

4,924,540

PILLOW

Ewan J. Main, Brampton, Canada, assignor to The Woodbridge Group, Ontario, Canada

Filed Apr. 21, 1989, Ser. No. 341,324
Int. Cl.[5] A47G *9/00*
U.S. Cl. 5—436 21 Claims



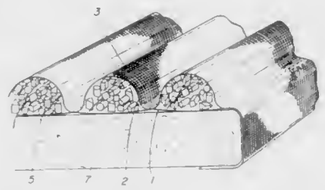
1. A pillow comprising: a body formed from a resilient material, said body including a generally concave upper surface for supporting a user's head and a pair of sides extending downwardly from said upper surface, one of said sides being raised with respect to the other of said sides, each of said sides having a generally ovate recess formed therein for receiving the shoulder of a user, the recess provided in said other side being of smaller dimensions than the recess provided in said one side, each of said recesses extending substantially along the length of said respective side to define substantially aligned upper and lower ridges.

4,924,541

BED PAD, AN AUTOMOBILE SEAT PAD, A PILLOW OR A SIMILAR CUSHIONLIKE ITEM

Jitsuo Inagaki, 71, Aza Kamiyashiki, Itsusikicho Hazugun, Aichi 444-04, Japan

PCT No. PCT/JP87/00146, § 371 Date Nov. 2, 1988, § 102(e) Date Nov. 2, 1988, PCT Pub. No. WO88/06857, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 10, 1987, Ser. No. 294,566
Int. Cl.[5] A47C *27/00, 27/10;* A47G *9/00*
U.S. Cl. 5—468 5 Claims



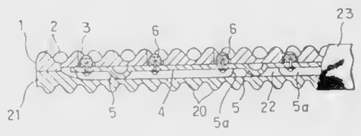
1. An item for use as a cushion such as a bed pad, an automobile seat pad, a pillow, a cushion and the like having a front surface and a back surface, both surfaces being made of a meshed cloth material, the item comprising a plurality of parallel and generally contiguous continuously arranged, generally elongated bag-like bodies each containing a large number of stuffing elements of hard synthetic resin, the front surface of the item being a series of ridges forming undulated convex portions and the back surface of the item being essentially flat.

4,924,542

SLEEPING MATTRESS

Tomoyoshi Yamaguchi, Tokyo, Japan, assignor to Japan Life Company, Ltd., Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,687
Claims priority, application Japan, Mar. 24, 1989, 1-72372
Int. Cl.[5] A47C *27/22*
U.S. Cl. 5—481 5 Claims



1. A sleeping mattress comprising:

an upper cushion member provided with a plurality of undulated projections and a plurality of through-holes;

a core member which is disposed under said upper cushion member while provided with a plurality of concave portions serving as reinforcing ribs together with a plurality of semi-spherical elements received in said through-holes of said upper cushion member, said semi-spherical elements being provided on an upper surface of said core member; and

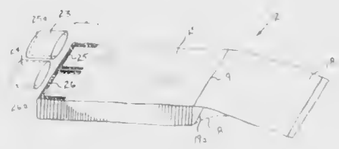
a lower cushion member a peripheral edge portion of which is fixed to a peripheral edge portion of said upper cushion member so that said core member is interposed between said upper cushion member and said lower cushion member.

4,924,543

SHEET WITH ATTACHED COVER AND REMOVABLE PILLOWCASES AND IMPERMEABLE SHEET

Margaret A. Hoss, and Paul F. Hoss, both of 1456 E. Philadelphia Ave. #6, Ontario, Calif. 91761

Filed Sep. 11, 1989, Ser. No. 406,028
Int. Cl.[5] A47G *9/04, 9/02*
U.S. Cl. 5—484 7 Claims



1. A sofabed sheet organization for securement to a mattress of an associated sofabed, wherein the organization comprises,

an elongate fitted covering sheet including a top surface and a bottom surface and including a perimeter skirt coextensively secured to and depending downwardly from a perimeter edge of the fitted sheet and further including a plurality of elastomeric strap members spanning adjacent corners of a lowermost edge of the skirt;

a flexible covering sheet hingedly mounted adjacent to a lower end of the fitted covering sheet;

a first pillow case and a second pillow case, each mounted to the top surface of the fitted covering sheet adjacent to an upper end thereof, each pillow case including respective first and second "U" shaped hook and loop fastener strip cooperative with a respective first and second "U" shaped covering sheet fastener strip, wherein the first and second covering sheet fastener strips are each fixedly mounted to the upper end of the fitted covering sheet on the top surface thereof;

each of the first and second pillow cases including a closed forward end and an open end opposed to the forward end for reception of a pillow within each of the first and second pillow cases;

the bottom surface of the fitted covering sheet further including a first hook and loop fastener patch mounted adjacent each corner of the fitted covering sheet and cooperative with second hook and loop fastener patches, the second hook and loop fastener patches fixedly mounted to an upper surface of a flexible and impermeable sheet member, the sheet member selectively securable to the bottom surface of the fitted covering sheet when the first hook and loop fastener patches are secured to the second hook and loop fastener patches.

4,924,544

EMERGENCY TOOL

Donald W. Culotta, 7563 Lockhaven Ave., Rancho Cucamonga, Calif. 91730

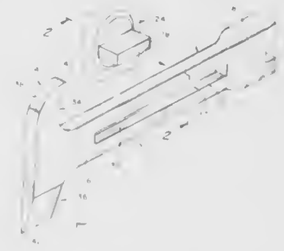
Filed Nov. 9, 1989, Ser. No. 435,034
Int. Cl.[5] B25F *1/00*
U.S. Cl. 7—138 20 Claims

1. An emergency tool comprising an elongate handle which is between about 6 inches and about 24 inches in length and has a circumference between about 2 inches and about 6 inches for gripping in one hand, wherein:

(a) the handle has a first end and a second end;

(b) the second end of the handle defines a rectangular open-end wrench socket having a width transverse to the handle of between about ⅜ inches and about ¾ inches and a longitudinal depth of at least about ⅜ inches; and

(c) the handle defines a rectangular box-end wrench socket intermediate between the first end of the handle and the second end of the handle, the box-end wrench socket having a width transverse to the handle of between about



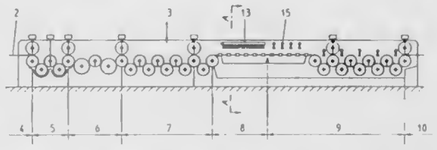
⅜ inches and about ¾ inches and a longitudinal length of at least about 1 inch.

4,924,545

PROCESS AND APPARATUS FOR MERCERIZING A FABRIC WEB

Susanne Machau, Jonschwil, Switzerland, assignor to Benninger AG, Uzwil, Switzerland

Filed Aug. 25, 1988, Ser. No. 237,306
Claims priority, application Switzerland, Aug. 26, 1987, 3273/87
Int. Cl.[5] D06B *7/08*
U.S. Cl. 8—151 11 Claims



11. A process for mercerising a fabric web in which the fabric web is stretched in respect of width after an impregnation operation by means of a pair of tentering chains in a tentering frame with a conical entry area wherein the fabric web is sprayed with a hot medium from spray nozzles arranged above the tentering frame, for stabilization purposes, the improvement wherein at least in the conical entry area of the tentering frame the edge zones of the fabric web are sprayed more heavily than the central zone thereof, whereby at least double the amount of hot medium is sprayed onto the edge zones, and said edge zones respectively make up at least 10% of the width of the article and at most 40% of the width of the article.

4,924,546

METHOD OF AND APPARATUS FOR PULLING OVER AND LASTING FOOTWEAR

Frank C. Price, Leicester; Gerhard Giebel, Bad Soden; Rudi Fichtner, Rossbach, and Manfred Broening, Frankfurt, all of Fed. Rep. of Germany, assignors to DVSG Patentverwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 247,108
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732224
Int. Cl.[5] A43D *7/00, 29/00*
U.S. Cl. 12—7.1 13 Claims

1. Apparatus for pulling over and lasting shoes comprising a pulling over assembly arranged at a first station and comprising a shoe support for supporting a shoe, comprising a shoe upper on a last with an insole on the last bottom, and an array of pincers arranged about the shoe support, whereby the upper of a shoe supported by the shoe sup-

port can be gripped by the pincers and, by relative movement being effected between the pincers and shoe support heightwise of the shoe bottom, can be tensioned about its last,

a lasting assembly arranged at a second station and comprising a pair of wiper plates by which lasting marginal portions of a shoe upper tensioned as aforesaid can be wiped over and pressed against corresponding marginal portions of the insole of such shoe, and

means for effecting relative movement of approach between the pulling over assembly and the lasting assembly to bring the assemblies into a cooperative relationship, in which a shoe upper tensioned as aforesaid is released by the pulling over assembly and control thereof is transferred to the lasting assembly without loss of tension in the



upper, and for effecting relative movement of separation therebetween, whereby the lasting operation can be completed at the second station while a further pulling over operation can be initiated at the first station,

wherein the pulling over assembly and the lasting assembly each comprises shoe retaining means for holding a shoe supported thereby against lengthwise displacement respectively in the pulling over and lasting operations whereby each assembly can perform its function independently of the other,

and further wherein said means for effecting relative movement between the assemblies is effective to move them into said cooperative relationship only after a shoe upper has been tensioned as aforesaid by the pulling over assembly and a previously treated shoe has been released by the lasting assembly.

4,924,547

PACKAGEABLE TOILET UTENSIL

Jean Louis Wachtel, deceased, late of Selestat, France; by Tom Wachtel, heir, Greenville, R.I.; by Irene Wachtel, heir, Santa Fe, N. Mex.; by Susan Erny, heir, Guebwiller, and by Dany Wachtel, heir, Selestat, both of France, assignors to Celluloid S.A., Selestat, France

Filed May 20, 1988, Ser. No. 196,506

Int. Cl.[5] A46B *17/00*

U.S. Cl. 15—185 **6 Claims**

1. A tooth brush, comprising:

an active head formed of brushing bristles;

a handle solid with the active head, the handle comprising a stem which carries the head and a handhold connected to the stem so that the assembly formed of the head and of the stem is retractable into the handhold, wherein the handhold comprises two hollow bodies articulated with respect to each other, one body forming an open holder intended to receive the brushing bristles of the head and consisting of a bottom-forming wall and two substantially side walls and one body forming a cover folding back on the holder-forming body, and the stem being mounted in pivoting relationship about a pivoting pin of the holder-forming body in a plane perpendicular to the longitudinal median plane of this body so that the assembly formed of the stem and the head can occupy an active position in the prolongation of the holder-forming body in which position said assembly is locked by folding back the cover-forming body and an inactive retracted position after folding back of the cover-forming body, and wherein said holder-forming body comprises one side opening provided through one side wall thereof for the passage of said brushing bristles of the active head, and said cover-forming body comprises near its open free end two side walls of inner width greater than the outer width of the sidewalls of the holder forming body so that when in a folded configuration, the sidewalls of the cover forming body serve both to prevent inadvertent deployment of the active head from its retracted position by covering the side opening in the side wall of holder forming body, and additionally to lock the stem into an extended position by securing a position of the stem between its walls so as to prevent movement of the stem about the stem's pivot.



4,924,548

PORTABLE VACUUM CLEANER

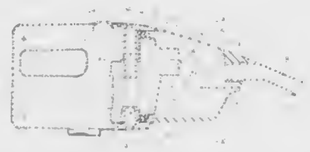
Syouichi Touya, and Hideki Kishi, both of Sumoto, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 6, 1987, Ser. No. 82,825

Claims priority, application Japan, Aug. 8, 1986, 61-187277; Aug. 8, 1986, 61-187278

Int. Cl.[5] A47L *9/10, 5/24*

U.S. Cl. 15—347 **7 Claims**



1. A portable vacuum cleaner for use in both dry and wet operations, comprising:

a main body case housing a fan motor and having intake and discharge openings therefor, said intake opening being disposed about a first axis;

a dust case having an intake portion and removably attached to the main body case around said intake opening; and

a filter housing removably installed in said dust case, said filter housing having a filter accommodating portion wherein a filter is accommodated to cover said intake opening, said filter accommodating portion including a front plate and a frame provided along the outer periphery of said front plate, said front plate having a tubular portion projecting therefrom and disposed about a second axis, said tubular portion being substantially opposed to the intake portion of said dust case, the second axis of said tubular portion being out of alignment with the first axis of the intake opening, and wherein the front plate further includes filter holding plates provided on the side of said front plate opposite the tubular portion, said filter holding plates being radially arranged from the second axis of the tubular portion so as to direct drawn-in air over the entire front surface of the filter;

said tubular portion being closed at an end opposed to said intake portion thereof and formed with apertures therethrough, and said dust case having a partition wall positioned under the intake portion thereof and extending from said intake portion toward said main body case for defining a water collection chamber at an interior lower portion of the dust case.

4,924,549

ADJUSTABLE STOP

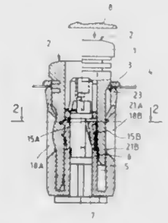
Henri Morel, Maule; Jean-Claude Agrimonti, Montreuil, and Bernard Massie, Levallois Perret, all of France, assignors to ITW de France, Beauchamp, France

Filed Apr. 5, 1989, Ser. No. 333,407

Claims priority, application France, Apr. 5, 1988, 88 04454

Int. Cl.[5] E05F *5/02*

U.S. Cl. 16—82 **15 Claims**



1. An adjustable stop for use between first and second elements, characterized in that it comprises:

a tubular socket (1, 1A) having an interior bore and an annular transverse end surface (2,2A) which forms a stop-surface;

a housing (3,3A) provided with holding means for engaging said first element (4) upon which said stop is to be fixed, and further comprising an exterior tube (5) having an interior bore, and an interior tube (6) arranged co-axially, wherein the exterior contour of said interior tube is substantially similar to the interior contour of said socket bore and the interior contour of said bore of said exterior tube is substantially similar to the exterior contour of said socket, an annular space defined between said tubes of said housing serving to receive said socket between the exterior tube and the interior tube; and

a clamping rod (7) disposed within said bore of said interior tube (6) of said housing, comprising, with said interior tube, means providing said clamping rod with a locking position where it produces a radial force intended to be applied to said socket so as to lock said socket with respect to said housing, and means for maintaining said socket in this locked position;

said stop being intended to be used in a pre-assembled state where said socket (1,1A) is partially inserted between said exterior tube (5) and said interior tube (6) of said housing in an initial starting position, from which it can be fully driven into said housing in accordance with an axial force applied thereto, the stop being disposed in place upon said first element (4) upon which it is then fixed by said housing holding means, said second element (8) being intended to bear against said stop as a result of being brought against said stop-surface (2,2A) of said socket, whereby said first and second elements (4,8) are moved toward each other so as to adjust their relative positions and thereby drive said socket (1,1A) into said housing (3,3A), whereupon said socket is locked within said housing by moving said clamping rod (7) to said locking position.

4,924,550

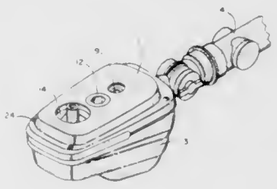
TRI-SHAFT TYPE MULTI-FUNCTION CLEANER

Dong Her Wu, 141, Chang Shui Road, Sec. 2, Pu Yen Hsiang, Changhua, Taiwan

Filed Oct. 19, 1988, Ser. No. 259,718

Int. Cl.[5] A46B *13/04;* **A47L** *5/00*

U.S. Cl. 15—328 **5 Claims**



1. A multi-function cleaner comprising:

(a) a housing, a driving mechanism, a cover plate and a handle;

(b) a pivotal joint connecting the handle to the housing;

(c) a water inlet at a rear end of the housing, a water outlet, and a water pipe connecting the water inlet to the water outlet;

(d) the cover plate including three holes, the driving mechanism being secured to an inner side of the cover plate and including a driving motor;

(e) three revolving shafts for rotation by the driving motor, the three revolving shafts extending through the three holes in the cover plate, and the cover plate being secured to the housing;

(f) gearing means for rotating the three revolving shafts at different speeds by the driving motor; and

(g) means for connecting a first shaft to an air extractor vane wheel, means for connecting a second shaft to a floor wax polisher, and means for connecting a third shaft to a scrubbing brush to permit the cleaner to function in a dust suction, floor polishing or scrubbing operation, respectively.

4,924,551

APPARATUS AND METHOD FOR CLOSING OR SEALING A FLEXIBLE TUBULAR CONDUIT

Robin A. Greenbank, Blenheim, and Arthur Van Der Velde, Christchurch, both of New Zealand, assignors to Elastrator Company Limited, Blenheim, New Zealand

Filed Feb. 23, 1989, Ser. No. 314,125

Claims priority, application New Zealand, Feb. 23, 1988, 223600

Int. Cl.[5] F16L *55/10*

U.S. Cl. 17—1 R **25 Claims**

1. An apparatus for sealing or substantially closing a flexible tubular conduit from within the conduit, the apparatus comprising:

an elongated member having an operative end which elongated member is insertable operative end first into the conduit from an open end of the conduit;

a mouth at the operative end of the elongated member;

ring supporting means provided on or by the elongated member for supporting a stretched elastic ring about the elongated member;

suction means for creating suction at the mouth to draw a flap of the conduit into the mouth; and

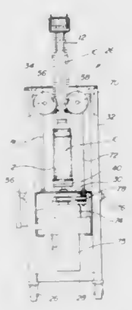
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ring releasing means for releasing the stretched elastic ring from the elongated member and over the mouth and flap



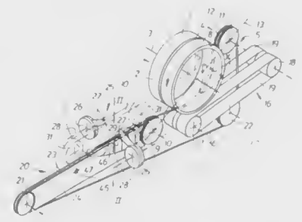
drawn thereinto whereby the ring can contract about the flap to seal or substantially close the conduit.

4,924,552
NET RUCKER
Michael J. Sullivan, Rochester Hills, Mich., assignor to The Brechteen Company, Mt. Clemens, Mich.
Filed Jun. 30, 1989, Ser. No. 374,266
Int. Cl.[5] A22C *21/00*
U.S. Cl. 17—1 R 15 Claims



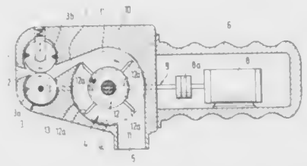
1. Apparatus for shirring food stuffing netting onto a temporary carrier sleeve, said apparatus comprising:
a movable platform for supporting the sleeve;
a plurality of rucking wheels;
guide means for initially guiding said netting between the wheels and onto the sleeve;
elevator means for raising the platform so that the wheels contact the netting on the sleeve; and
drive means for rotating the wheels in opposite directions to pull the netting over an end of the sleeve and shirr it in multiple folded layers about the circumference of the sleeve.

4,924,553
METHOD AND APPARATUS FOR DIVIDING UP UNSKINNED FISH FILLETS
Werner Grosseholz, Lübeck; Dirk Schmüser, Sereetz, and Werner Wenzel, Lübeck, all of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud.Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany
Filed Oct. 5, 1989, Ser. No. 417,708
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3833866; Feb. 4, 1989, 3903328
Int. Cl.[5] A22C *21/04, 25/16*
U.S. Cl. 17—50 24 Claims



1. A method for dividing up fish fillets, with skin still adhering to the fillets on one side thereof, into fillet pieces, the method comprising the steps of
(a) providing the unskinned fish fillets with incisions whilst leaving the skin at least partly in cohesive form, and
(b) subsequently skinning the thus incised fillets.

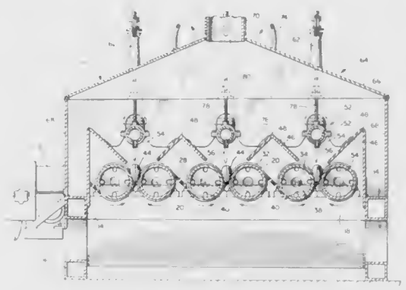
4,924,554
PROCESS AND MANIPULATOR FOR THE GUIDANCE OF RUNNING THREADS
Erwin Stolarski, Augsburg, and Hans-Rüdiger Schröder, Birkach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 8, 1988, Ser. No. 281,811
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741673
Int. Cl.[5] D01G *1/00, 37/00*
U.S. Cl. 19—0.6 6 Claims



1. A manipulator for the guidance of running threads, with a draw-in orifice for the threads, an out-let orifice and a gripping piece, including a narrow housing and a single knife roller rotating within the narrow housing for drawing in and cutting the threads, and a drive unit for rotating the single knife roller.

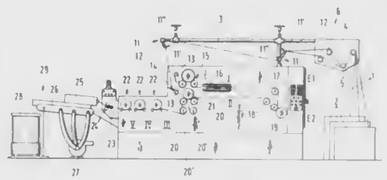
4,924,555
WATER COOLED ROLLER SHUCKER FOR SHELLFISH
William J. Gifford, 18 N. Franlin Blvd., Pleasantville, N.J. 08232
Filed Jul. 25, 1989, Ser. No. 384,424
Int. Cl.[5] A22C *29/04*
U.S. Cl. 17—74 14 Claims
1. An apparatus for shucking shellfish such as clams comprising at least one pair of parallel adjacent, cylindrical rollers

supported in generally horizontal position, means guiding shellfish into the area above the rollers, means positioning the shellfish in upright position, means- on each roller to move the shellfish longitudinally of the rollers as the rollers are rotated, means driving the rollers in opposite rotational directions, and



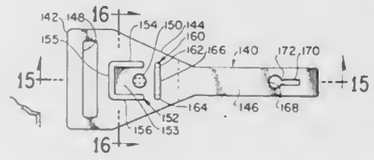
burner means positioned above the area between the rollers to impinge flame onto the upper edge of the upright shellfish as they move longitudinally by the rollers for causing the shellfish to open and to separate when "meat" of the shellfish from the shell when discharged into water in a separating tank.

4,924,556
STRETCH-BREAK MACHINE WITH DRAFTING AND BREAKING ZONES IN SUPERIMPOSED LEVELS
Konrad Gilhaus, Bielefeld, Fed. Rep. of Germany, assignor to Seydel Vermögensverwaltungsgesellschaft mit beschränkter Haftung, Bielefeld, Fed. Rep. of Germany
Filed Apr. 22, 1988, Ser. No. 184,973
Claims priority, application European Pat. Off., May 19, 1987, 087107252.6
Int. Cl.[5] D01G *1/08*
U.S. Cl. 19—0.35 19 Claims



1. In a machine for stretch-break converting man-made fibers or fiber slivers, with said machine having one or more distortion zones, one of which can be embodied as a heating zone, and one or more breaking zones, whereby said distortion and breaking zones can be disposed in several superimposed levels, and with said machine also having a tow-drafting mechanism, as well as a delivery mechanism for the stretch-break converted fiber slivers, the improvement therewith comprising:
said tow-drafting mechanism, in order to be able to process tows having a high line weight, is spread out such that a plurality of separate tows can be individually guided parallel to and independently of one another next to and-/or above one another;
means for determination of width of said distortion and breaking zones, as measured transverse to a direction of feed, which width is greater than 270 mm; and
said distortion and breaking zones being disposed in two superimposed levels, with said tows of one level being guided in a direction opposite to the direction in which they are guided in the other level, with the upper one of said two levels being provided with a distortion zone and being supplied with tows, and with the lower one of said levels being provided with breaking zones.

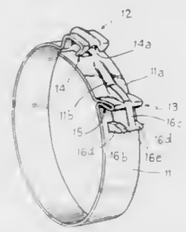
4,924,557
HARNESS
William L. Heckerman, 1815 Sourdough Rd., Bozeman, Mich. 59715, and Brad B. Heckerman, 3390 W. Hollyhock Dr., Belgrade, Mont. 59714
Division of Ser. No. 817,420, Jan. 10, 1986, Pat. No. 4,827,578.
This application May 8, 1989, Ser. No. 348,717
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—16 PB 6 Claims



1. A connector formed from a flexible resilient material comprising at least a strap, said strap having a nipple receiving opening communicating with a narrow rectangular slot through a constricted opening formed therein, a nipple on one surface of said strap, said nipple having a rounded dome and a narrow stem, said dome slightly larger than said nipple receiving opening, and said stem sized to slide snugly in said rectangular slot, said nipple spaced far enough away from said nipple receiving opening so the strap can be bent into a loop with said nipple overlying said nipple receiving opening whereby when the nipple is forced through said nipple receiving opening and said narrow stem of the nipple is forced through said constricted opening into said rectangular slot, said strap portion is locked into a looped position; said connector further comprising safety means for locking said strap in the looped position, said safety means including a stop wall formed on said one surface of said strap on an opposing side of said nipple from said opening, said stop wall positioned so it is transverse to the length of the strap, said strap positioned so when said nipple stem is slid into said rectangular slot with the strap locked in folded position, a distal edge of said strap beyond the rectangular slot engages a facing surface of said stop wall whereby forces exerted on said loop in a direction which would force the nipple stem to be moved out of said rectangular slot are prevented by the engagement between the distal end of said strap and the facing surface of said stop wall.

4,924,558
CLAMP HAVING BOSS AND LUG USED FOR FASTENING
Lionel Calmettes, and Michel Andre, both of Romorantin Lanthenay, France, assignors to Etablissements Caillau, Issy Les Moulineaux, France
Filed May 22, 1989, Ser. No. 354,873
Claims priority, application France, May 25, 1988, 88 06959
Int. Cl.[5] B65D *63/02*
U.S. Cl. 24—20 CW 6 Claims
1. In a clamp comprising a metal band wound on itself, of which one of the ends is shaped as a hook and of which the other end presents a projecting lug allowing fastening thereover of the free edge of the hook,
the lug includes a boss arranged on a front face of the lug that serves as bearing for the free edge of the hook after fastening, the boss being located substantially in the middle of the width of the lug and having a width less than the band width at a zone of connection between the boss and the lug, whilst the free edge of the hook comprises a notch

whose shape is complementary to that of the boss at the zone of connection , whereby said notch receives a portion of the boss upon fastening and ensures centering of the ends of the clamp.

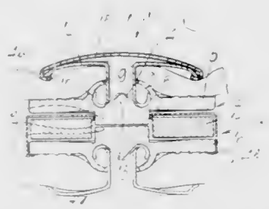


4,924,559

MONOLITHIC DISK-LIKE ELEMENT IN MATERIAL SENSITIVE TO MAGNETIC ATTRACTION, FOR MAGNETIC BUTTONS

Alberto Marchesi, Milan, Italy, assignor to Minu S.p.A., Busnago Mi, Italy

Filed Mar. 13, 1989, Ser. No. 322,257
Claims priority, application Italy, Mar. 18, 1988, 19850 A/88
Int. Cl.[5] A44B *21/00, 1/18*
U.S. Cl. 24—303 6 Claims



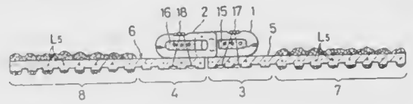
I. Monolithic disk-like element in material sensitive to magnetic attraction, for magnetic buttons of the type wherein the button has a male structural part and a female structural part connectable to one another as an effect of magnetic attraction, said monolithic disk-like element being adapted to be a component of at least one of said structural parts of the button and having a first magnetically attractable side centrally provided with a core protrusion defining the axis of the disk-like element and a second side, opposite to the first, having fixing configurations provided thereon, wherein said fixing configurations provided on said second side of the monolithic disk-like element are of the type which is unalterable in assembly and have the shape of at least one recess with lateral walls defining the opening of the recess and having at least partially a shape defining an undercut surrounding said opening, wherein said recess comprises a bottom surface and wherein said opening of the recess is above said bottom surface, said recess having, below said opening, a greater diameter than that of said opening so that said opening tapers towards said opening to form said undercut recess around said opening and wherein said bottom surface of the recess has a protrusion with lateral walls at least partially converging towards said opening.

4,924,560

STRETCHABLE SLIDE FASTENER

Yoshio Matsuda, Toyama; Mitsuo Horikawa, Kurobe, and Noritaka Tsubata, Uozu, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,050
Claims priority, application Japan, May 27, 1987, 62-130987
Int. Cl.[5] A44B *19/12*
U.S. Cl. 24—392 10 Claims



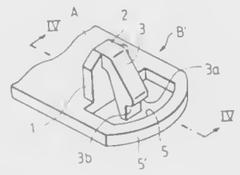
1. A stretchable slide fastener comprising a pair of stringer tapes stitched in a manner so as to be stretchable, each having a longitudinal edge, and a row of coupling elements mounted on said longitudinal edge at a pitch, said pitch of the row of coupling elements being variable with stretching of said longitudinal edge, each of said coupling elements including a coupling head having a height, each of said stringer tapes including thread means for controlling the stretching of at least said longitudinal edge to such an extent that said longitudinal edge is longitudinally stretchable by at least 10% and the pitch of the coupling elements remains smaller than an interval which is twice the height of the coupling head when said longitudinal edge is longitudinally stretched, said controlling thread means including covered yarns of spandex composed of spandex yarns allowing the stretching of said longitudinally edge, and covering yarns covering said spandex yarns and limiting the stretching of said longitudinal edge.

4,924,561

SINGLE-FIN FASTENER

Norihiro Yoneyama, Aichi, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 238,076
Claims priority, application Japan, Aug. 31, 1987, 62-133165[U]
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—453 13 Claims



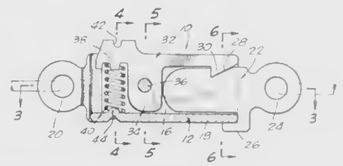
1. A single-fin fastener comprising:
a base member;
a support board projecting from said base member;
an engaging fin having a flexible hinging butt at a tip of said support board, said engaging fin extending from said flexible hinging butt in a direction opposite that of the projection of said support board, said engaging fin including an engaging notched portion and a stopper extending from said engaging notched portion to a movable tip of said fin; and
opening preventing means for preventing said stopper from opening more than a predetermined amount, said opening preventing means being in a fixed position with respect to said base member and facing said stopper through a gap.

4,924,562

JEWELRY CLASP

Mardig V. Pogharian, 8513 Fullbright Ave., Canoga Park, Calif. 91306

Filed Jul. 29, 1985, Ser. No. 760,113
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—647 2 Claims



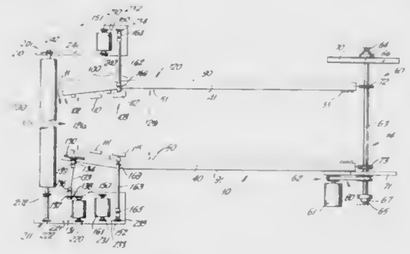
1. A jewelry clasp comprising:
a housing having parallel side walls connected to the bottom of said housing, and having one end (being) open;
a hook member with a top surface coplanar with the tops of said parallel side walls and pivotally mounted in said housing and having a hook at its outer end;
spring means located inside the inner end of said housing, and maintained in position by its upper end abutting against a projection formed at the bottom surface of the inner end of said hook member and by its lower end abutting against a detent in the bottom of said inner end of said housing; and
a latch member insertable into said housing and provided with an indentation engagable with said hook and a stop member abutting against the outer end of said bottom of said housing in the closed position of said jewelry clasp;
whereby said jewelry clasp is maintained in a closed position upon insertion of said latch member into said housing and is opened upon direct application of downward pressure to the top of said inner end of said hook member, thereby releasing said latch member.

4,924,563

APPARATUS FOR MOVING FABRIC THROUGH A FABRIC PROCESSING STEP

Frank Catallo, 75 Channel Dr., Port Washington, N.Y. 11050

Filed Aug. 10, 1988, Ser. No. 230,353
Int. Cl.[5] D06C *3/02*
U.S. Cl. 26—76 12 Claims



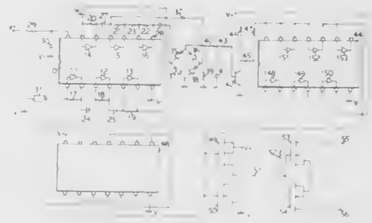
1. A tenter frame comprising
(a) a fabric web receiving end;
(b) a fabric web delivery end,
(c) means for gripping and moving a fabric web through a fabric processing step,
(d) a housing means for the means for gripping and moving the fabric web,
(e) means disposed on the housing and associated with the means for gripping and moving the fabric web and said means located between the fabric web receiving end and the fabric web delivery end to form a fabric entry zone,
(f) said fabric entry zone having a front entry end and a rear guiding end,
(g) said fabric entry zone being adjustable relative to the rear guiding end to adjust the front entry end to optimize the placement of said fabric web on said means for gripping and moving the fabric web,
(h) delivery means associated with said housing means for delivering said fabric web to the front entry end of the fabric entry zone,
(i) mechanical variable speed means for the delivery means,
(j) a drive train connected to the means for gripping and moving the fabric web to cooperate therewith to move the fabric web at pre-selected speeds through a processing step,
(k) a variable speed motor connected to said drive train,
(l) pinning means mounted relative to the rear guiding end of the fabric entry zone and relative to said means for gripping and moving the fabric web for receiving and placing said fabric web on said means for gripping and moving said fabric web,
(m) mechanical variable speed means for the pinning means,
(n) fabric edge sensing means disposed in said fabric entry zone to adjust said fabric web relative to said pinning means.
(o) an idler member adjustably connected in self aligning fashion to the means for gripping and moving the fabric web,
(p) mechanical variable speed means for the idler member cooperating with said variable speed motor to optimize the movement of said fabric web through said pre-selected processing step,
(q) the variable speed motor set to operate at a preselected speed,
(r) the mechanical variable speed means for the delivery means, the pinning means and the idler member, all being synchronized to the variable speed motor.

4,924,564

ULTRASONIC REMOTE CONTROLLED SWITCHING DEVICE

Reza H. Shah, 1176 Rutherford Road, Maple, Ontario, Canada L6A 1S2

Filed Jul. 25, 1989, Ser. No. 384,783
Int. Cl.[5] F24B *1/18;* G10K *11/00*
U.S. Cl. 126—512 12 Claims



1. A low power consumption remote controlled electronic switching device comprising,
a transducer means operative in response to a remote wave signal to generate an electrical signal,
a first digital integrated semiconductor means having a plurality of inverters therein, said inverters being connected in parallel with a plurality of bias resistor means and in combination therewith to form a plurality of amplifier means, said amplifier means being operative to amplify in serial said electrical signal fed from said transducer means to said digital integrated semiconductor means,
rectifier means operative to convert an amplified signal from said amplifier means to a direct current voltage signal,

VOL
1114
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MY
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charging means operative to be charged by said direct current voltage signal.

gating means operative in response to a selected charged voltage level of said charging means to actuate a second digital integrated semiconductor means for generating a square wave signal,

a third digital integrated semiconductor means connected to said second digital integrated semiconductor means and operative to generate a drive signal,

at least one semiconductor means responsive to receiving said drive signal at each instance from said third digital integrated semiconductor means to vary from an existing switch state to an opposite switch state.

4,924,565

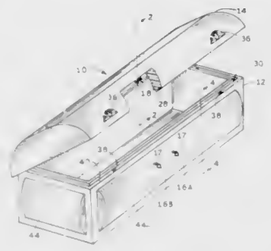
BODY CONTAINER

Fordyce Rathjen, 1500 Hwy 310, Manitowoc, Wis. 54220

Filed Mar. 28, 1989, Ser. No. 329,523

Int. Cl.[5] A61G *17/00*

U.S. Cl. 27—7 **23 Claims**



1. A body container, said body container comprising enclosing wall means defining an enclosure, said enclosure being sealable to form a seal, the combination of said wall means and said seal being effective to prevent gases from being transmitted freely into or out of said body container, and including valve means having attachment means extending to the outside of said body container, said valve means being adapted to facilitate transmission of gases through said wall means at said valve means.

4,924,566

METHOD FOR MANUFACTURING A REINFORCING ELEMENT FOR ASBESTOS FREE FRICTION MATERIAL

Hideo Shiraishi, Saitama, and Tsutomu Morita, Oota, both of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 132,241, Dec. 14, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 376,180

Claims priority, application Japan, Jan. 8, 1987, 62-2545

Int. Cl.[5] F16D *69/00*; B32B *17/04*; D02G *1/16, 3/40*

U.S. Cl. 28—143 **2 Claims**

1. A method of making asbestos free friction materials, comprising the steps of,

multiplying heterogenous strands to be used as a reinforcing element without twisting them, and simultaneously,

subjecting the resulting heterogenous yarns to a fluid jet to bulk said yarns, with at least one of said yarns being fed to the jet at an overfeed rate,

adhering a rubber compound material to said heterogenous yarns, and

forming the heterogenous yarns into an asbestos free friction material.

4,924,567

APPARATUS FOR CONTROLLING TENSION IN A TRAVELING YARN

John F. Hagewood, Matthews, and Julius Darigo, Charlotte, both of N.C., assignors to McCoy-Ellison, Inc., Monroe, N.C.

Filed Sep. 30, 1988, Ser. No. 252,497

Int. Cl.[5] B65H *59/00*; D02H *13/14*

U.S. Cl. 28—185 **11 Claims**



1. Apparatus for controlling tension in a traveling yarn being delivered to a driven winding apparatus, comprising a first idler roll and a second idler roll arranged for training of the traveling yarn in series peripherally about said rolls, said first roll being rotatably mounted about a stationary axis for driven rotation by the traveling movement of the yarn and said second roll being rotatably mounted about an axis movable in a defined path with respect to said first roll for corresponding driven rotation by the traveling movement of the yarn and for movement in opposite directions along said path in response to tension increases and decreases in the traveling yarn, means for applying a biasing force for urging movement of said second roll in said path into tensioning engagement with the yarn, said biasing force being generally constant at each position of said second roll along said path and means for sensing movement of said second roll in each direction along said path from a defined neutral point thereon, said sensing means being operatively associated with said driven winding apparatus for increasing its yarn winding speed in response to movement of said second roll in one direction responsive to a yarn tension decrease and for decreasing its yarn winding speed in response to movement of said second roll in the opposite direction responsive to a yarn tension increase.

4,924,568

BURNISHING DEVICE FOR EXTERNAL SURFACES OF WORKPIECES HAVING CIRCULAR SECTIONAL CONTOURS

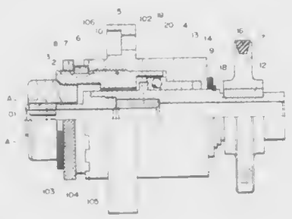
Kazuyoshi Sato, and Hideaki Okajima, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Sugino Machine, Uotsu, Japan

Filed Apr. 19, 1988, Ser. No. 183,244

Claims priority, application Japan, Apr. 21, 1987, 62-61209[U]

Int. Cl.[5] B24B *39/04*; B21C *37/30*

U.S. Cl. 29—90.01 **9 Claims**



1. A burnishing device for an external surface of a workpiece of a circular sectional contour, comprising:

a head formed with a truncated conical aperture arranged axially along a center of said head to pass therethrough a workpiece to be processed;

a hollow cylindrical cage having a plurality of slots arranged substantially axially and located within the aperture of said head;

a plurality of truncated conical rollers confined within said slots with inner edges thereof being parallel to each other and outer edges thereof being in contact with an inner surface of said aperture, with the rollers being rotatable on their own axes respectively in said slots;

a supporting mechanism for nonrotatably supporting said head about said cage; and

a power rotating mechanism for driving said cage in rotation about said workpiece and about the axial center of said cage such that said rollers make an orbital motion about a tool central axis to cause said rollers to rotate between the inner surface of said aperture and the external surface of said workpiece about the axes thereof, said power rotating mechanism including a hollow shank member fixedly attached to said cage by which said cage is interconnected with said power rotating mechanism, whereby rotation of said hollow shank member causes said cage to rotate about said workpiece.

4,924,569

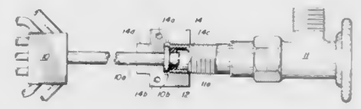
METHOD OF REPAIRING A LEAKING COOLING COIL-TO-EXPANSION VALVE COUPLING USING A CLAMP-ON NUT

Richard Kennedy, 954 Goodlette Rd., Apt. B-323, Naples, Fla. 33940

Filed Dec. 15, 1986, Ser. No. 941,705

Int. Cl.[5] F16L *19/00*

U.S. Cl. 29—890.14 **1 Claim**



1. A method of axially coupling together a first pipe having a flange closely adjacent to its end and a second externally threaded pipe whose end buts against the flange of the first pipe and whose internal diameter slightly exceeds the outer diameter of the end of the first pipe extending beyond its flange comprising

axially aligning the ends of the first and second pipes with the end of the second pipe encircling the end of the first pipe and abutting against the flange of the first pipe,

placing the two mirror-image halves of an axially split coupling nut around the ends of the two pipes, said two halves each having a semi-circular recess sized to fit snugly around one half of the two axially aligned pipe ends and including a female threaded portion of each recess which mates with the threaded end of the second pipe, and

clamping together said two nut halves solely by means of two screws threaded into two aligned holes in each of the nut halves, said aligned holes lying on opposite sides of the semi-circular recesses in the two nut halves.

4,924,570

FILTER FOR CLEANING EXHAUST GASES OF DIESEL ENGINES

Tiberiu Mizrah, Schaffhausen, Fed. Rep. of Germany; Albert Maurer, Thayngen, and Jean-Pierre Gabathuler, Schaffhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 264,265, Oct. 28, 1988. This application Apr. 5, 1989, Ser. No. 333,305

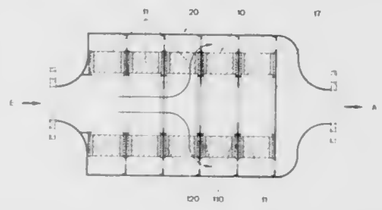
Claims priority, application Switzerland, Nov. 18, 1987, 4504/87

Int. Cl.[5] B23P *25/00*

U.S. Cl. 29—163.8 **4 Claims**

1. A method for preparing a filter assembly comprising:

providing a plurality of hollow cylindrical open-pore ceramic foam cylinder elements having opposed end faces; strengthening the end faces of the ceramic foam cylinder elements with intrinsic ceramics; applying a layer of plastic material to the end faces of each cylinder element each of, said plastic layers being a temperature-resistant and thermal shock-resistant layer which is plastic at room temperature; leveling said material until all layers are plane-parallel; drying and burning said cylinder elements with said plastic material thereon at a temperature between 1000°-1300° C. so as to bond the material to the end faces of the cylinder elements; providing a filter cup having an inlet and an outlet and an end plate of gas-impermeable material disposed between said inlet and said outlet; arranging said cylinder elements axially in said filter cup with the end faces of one cylinder element adjacent to the other end face of another cylinder element so that a gaseous stream entering the inlet passes through the cylinder elements around said end plate and out said outlet.



4,924,571

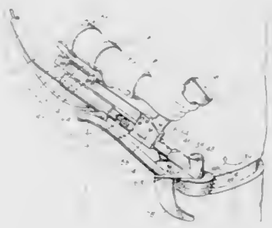
ARM CONTROLLED POWER CUTTER

Graham B. Albertson, 4340 Rumble Street, Burnaby, British Columbia, Canada V5J 2A1

Filed Jun. 17, 1988, Ser. No. 208,104

Int. Cl.[5] B26B *27/00*; A01G *3/03*; B23D *57/02*; A45C *13/30*

U.S. Cl. 30—121 **21 Claims**



1. A portable cutting apparatus, comprising:

a cutting tool;

a motor;

driving means for operatively connecting the motor to the tool for driving the tool;

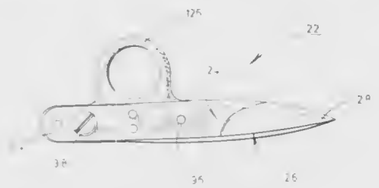
a control unit connected to said tool having mounting means for mounting the control unit to a person's arm; and

hinge means for connecting said mounting means to the control unit for lateral pivotal movement of the mounting means relative to the control unit about an axis substantially perpendicular to the axis of the driving means in the proximity of the control unit;

wherein said hinge means is a length of flat spring steel oriented width-wise between the mounting means and the control unit.

VOL
1114
ISS
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4,924,572
THREAD SNIPS
David S. Vogel, 3841 W. Wood Lake Ct., and Donald E. Vogel, 12390 E. 100 N., both of Columbus, Ind. 47201
Continuation of Ser. No. 293,991, Jan. 6, 1989, abandoned. This application Sep. 14, 1989, Ser. No. 407,320
Int. Cl.[5] B26B *13/00*
U.S. Cl. 30—253 16 Claims



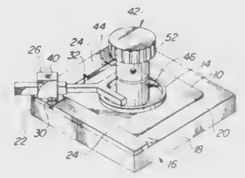
1. An improved thread snips comprising:
a first metal blade including: a first, front relatively pointed end; a second, generally rounded rear end; an inner facing side surface; an outer facing side surface; and first and second longitudinal edges extending between the first and second ends, with the first metal blade having a sharpened cutting edge that extends along a portion of its first longitudinal edge and rearwardly from its first end a first predetermined distance and also having a reduced thickness portion that has a different thickness, as measured from the inner facing side surface, with the reduced thickness portion extending between its first and second longitudinal edges and forwardly a second predetermined distance from its second end, facing the same direction as the inner facing side surface, having a predetermined shape, and having predetermined length and width dimensions;
a second metal blade including: a first, front relatively pointed end; a second, generally rounded rear end; an inner facing side surface; an outer facing side surface; and first and second longitudinal edges extending between the first and second ends, with the second metal blade having a sharpened cutting edge that extends along a portion of its first longitudinal edge and rearwardly from its first end a first predetermined distance;
a first plastic insert that has longitudinal edges, and that has an inner facing side surface and an oppositely facing side surface;
means for securing the first plastic insert within the reduced thickness portion of the first metal blade so that the inner facing side surface of the first plastic insert faces in the same direction as and is generally a continuation of the inner facing side surface of the first metal blade;
means for connecting the first and second metal blades together, between their ends, so that the metal blades are disposed side by side, with their respective inner facing side surfaces and their respective cutting edges being adjacent, so that the first and second ends of the first metal blade coincide with the first and second ends, respectively, of the second metal blade, so that the first and second metal blades may be moved, relative to each other, in planes generally parallel to their inner facing side surfaces and about an axis substantially perpendicular to their inner facing side surfaces whereby the cutting edges of the metal blades may cooperate together and provide a cutting action therebetween, with the axis being located between the ends of the first and second metal blades and between the longitudinal edges of the first and second metal blades;
means for biasing the first and second metal blades apart in the planes generally parallel to their inner facing side surfaces; and
means for limiting the angle, about the axis, through which the first and second metal blades may move, relative to each other, in the planes generally parallel to their inner facing side surfaces.

4,924,573
PRUNER WITH POWER DRIVEN EXTENSION
Earl M. Huddleston, deceased, late of Las Vegas, and by Anne W. Huddleston, executrix, 9029 Cypress Point Way, Las Vegas, both of Nev. 89117
Filed Mar. 15, 1989, Ser. No. 323,809
Int. Cl.[5] A01G *3/08*; B27B *17/02*
U.S. Cl. 30—272.1 4 Claims



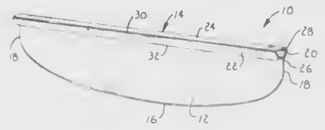
1. An improved pruner of the type having a telescoping drive shaft housing assembly, a rotatable telescoping drive shaft assembly contained within the housing assembly, cutting means interconnected at one end of the drive shaft assembly, and a power source interconnected at the other end of the drive shaft assembly, wherein said improvement comprises:
power driven extension means including a first bevel gear affixed to the drive shaft assembly adjacent the power source; a second bevel gear meshing with said first bevel gear; at least one reduction gear interconnected to said second bevel gear; a pair of reversing gears meshing with one another and one of said reversing gears meshing with said reduction gear; an elongated worm drive shaft interconnectible with a selected reversing gear; and a rack affixed to said drive shaft housing assembly and meshing with said worm drive shaft for reciprocal movement of at least a portion of said housing assembly; and
control means including a shift lever operable to connect said worm drive shaft to a selected reversing gear for extending or shortening the pruner and said shift lever operable to disengage from said reversing gears for holding the pruner at a set position.

4,924,574
SIZING UNIT FOR CUTTING STOMA WAFERS
Orville F. Jones, and Robert C. Simpson, both of Bettendorf, Iowa, assignors to O.S.T., Ltd., Bettendorf, Iowa
Filed Jul. 17, 1989, Ser. No. 380,410
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—115 14 Claims



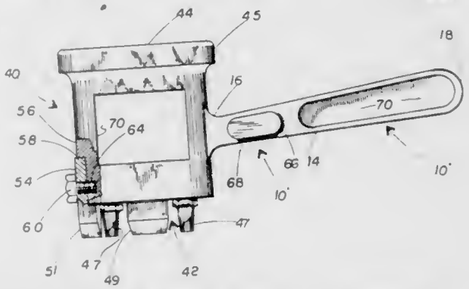
1. A sizing unit for cutting a circular central opening in a stoma wafer having a vertical center line, comprising: a base having a flat top surface area dimensioned to receive a stoma wafer flat-wise thereon and further having marginal portions laterally outwardly of said area, locator means on at least one of the marginal portions adapted to engage the wafer for positioning the wafer on said area, a support on one of the marginal portions, gage means carried by the support and projecting laterally over and in spaced relation above said area and having an inner portion adapted to center on the vertical center line of the wafer, and a cutter element of cylindrical configuration on a vertical axis and engageable with the gage means inner portion to dispose said axis coaxially with said center line of the wafer, said cutter element having a coaxial, lower, circular cutting edge for cutting a central, circular opening in the wafer.

4,924,575
PIZZA KNIFE WITH INTEGRAL HANDLE
Jeffrey P. James, Wichita, Kans., assignor to ICT Manufacturing, Inc., Wichita, Kans.
Filed May 15, 1989, Ser. No. 351,373
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—315 15 Claims



1. A pizza knife comprising:
a substantially flat blade having opposite ends and a cutting edge curving between said opposite ends, said cutting edge being sharpened to cut pizza; and
a handle integral with said blade and extending between said opposite ends, said handle having plural bends therein to present it with a size and shape to be gripped in the hands of a user while the cutting edge is applied to cut pizza, said handle including a first side integral with said blade and extending therefrom;
a top integral with said first side and extending therefrom, said top being substantially planar and lying in a plane oriented generally perpendicular to the plane of the blade; and
a second side integral with said top and extending therefrom.

4,924,576
TOOL HOLDER ASSEMBLY
Barry Schiller, 720 N. Flagler, Ft. Lauderdale, Fla. 33304
Filed Mar. 6, 1989, Ser. No. 319,272
Int. Cl.[5] B26F *1/00*
U.S. Cl. 30—358 12 Claims



1. A tool holder assembly designed to be handheld and removably support, in a work engaging position, a leather working tool for use in punching or stamping leather material, said assembly comprising:
(a) a head having an elongated configuration and structured to removably support the tool therein, said head including a striking surface formed on an outer exposed end thereof,
(b) a handle means for positioning said head and tool attached thereto and having a elongated configuration, said handle means including one end fixedly secured to said head and a free end disposed substantially opposite to said head and said one end attached thereto, said handle means extending in transverse relation to said head thereof,
(c) said handle means being of sufficient length to be gripped by a hand of the user in spaced, non-contacting relation to the head,
(d) a tool receiving portion formed on said head and defined by a channel configured and dimensioned to receive a base portion of the tool in supported engagement therein,
(e) securing means mounted on said head and structured for removable engaging relation with the tool disposed within said receiving portion,
(f) said securing means comprising an internally threaded surface along a length of said channel and an externally threaded surface formed along the tool, the threaded surfaces being cooperatively disposed for mating engagement with one another and for the removable securement of the tool within said channel,
(g) positioning means for determining an operative position of the tool within said channel and comprising a plug having an externally threaded surface for mating engagement with and selective positioning of said plug along a length of said internally threaded surface of said channel, said plug disposed in engaging relation with an inner end of the tool secured within said channel,
(h) a clearance opening formed in one wall of said head and disposed to establish open communication between exterior and interior portions of said head, whereby waste material deposited within said head can pass therethrough said clearance opening,
(i) deflector means formed within said head in communicating relation to waste material entering said head, said deflector means disposed and configured for directing the waste material to the exterior of the head through said clearance opening, and
(j) said tool receiving portion and said securing means cooperatively structured and configured with said tool to dispose a work engaging portion of the tool in outward

protruding relation from said head and into the work engaging position

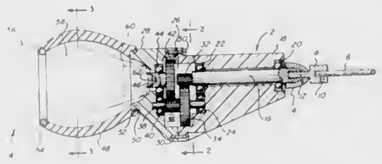
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4,924,577
CHAINSAW GUIDEBAR
Arvo Leini, Granvagen, Sweden, assignor to Sandvik AB, Sandviken, Sweden
Filed Jun. 9, 1988, Ser. No. 204,283
Claims priority, application Sweden, Jun. 10, 1987, 8702402
Int. Cl.[5] B27B *17/02*
U.S. Cl. 30—387 6 Claims



1. A chainsaw guidebar comprising a body and a nose part replaceably connected together to define a front-to-rear extending longitudinal axis, a forward end of said body being defined by a forwardly facing connecting edge of said body, a rearward end of said nose part being defined by a rearwardly facing connecting edge which mates with said forwardly facing connecting edge, said body including two longitudinally extending outer edges spaced from one another in a lateral direction relative to said axis, forward ends of said outer edges being interconnected by said forwardly facing connecting edge, said nose part includng two longitudinally extending outer edges spaced from one another in a lateral direction relative to said axis, rear ends of said outer edges of said nose part being interconnected by said rearwardly facing connecting edge, said outer edges of said body being aligned with respective outer edges of said nose part when said nose part is connected to said body so as to define first and second outer peripheral edges of said guidebar which are adapted to guide a movable sawchain, said rearwardly facing connecting edge including a front-to-rear extending recess which opens rearwardly toward said body, said forwardly facing connecting edge including a front-to-rear extending tongue received in said recess to define therewith a tongue-and-recess connection, said recess being defined by forwardly convergent linear first surface portions and said tongue including forwardly convergent linear second surface portions which engage said first surface portions, each of said first and second surface portions forming an acute angle with said axis in the range of 10 to 40 degrees, said forwardly facing connecting edge being in longitudinally overlapping relationship relative to said rearwardly facing connecting edge at two locations disposed on opposite lateral sides of said axis and separated by said tongue-and-recess connection, said rearwardly facing connecting edge including first and second sections situated at respective ones of said locations, each of said first and second sections including first and second edge portions spaced apart in a direction perpendicular to a plane of said guidebar, one of said first and second edge portions of each said section being inclined forwardly and laterally outwardly, and the other of said first and second edge portions of each said section being inclined rearwardly and laterally outwardly, said rearwardly and laterally outwardly inclined edge portion of each of said first and second sections being coplanar with said forwardly and laterally outwardly inclined edge portion of the other of said first and second sections, said forwardly facing connecting edge including laterally spaced third and fourth sections mating with said first and second sections, respectively, each of said third and fourth sections including third and fourth edge portions engaging said first and second edge portions, respectively, of an associated one of said first and second sections.

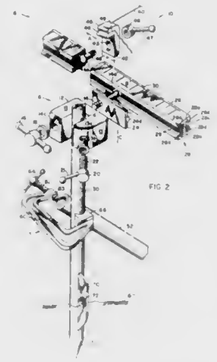
4,924,578
ADAPTOR TO CONVERT A SCREW GUN TO A ROTARY CUTTER
Kevin C. Chagnon, 455 E. Main St., Stratford, Conn. 06497, and Glenn W. Silkman, Silver Beach Dr., Danbury, Conn. 06811
Filed Jan. 11, 1989, Ser. No. 295,978
Int. Cl.[5] B24B *25/00*
U.S. Cl. 30—500 13 Claims



1. An adaptor for converting a rotary power tool having an axis of rotation with a rotating driving bit to a tool with a rotating cutter, comprising:
a rotatable driven element;
power transmission means for transferring rotational movement of said driven element to said cutter for rotation thereof;
a casing to which the power transmission means and the driven element are mounted said casing having an end with an opening through which operative contact between the driving bit and the driven element is obtained;
axially compressible and expandable support means mounted to the power tool for holding the casing; said support means extending towards the driving bit to terminate at a locking end that is shaped to receive and releasably-retain said casing end; said support means being compressible to vary the position of the locking end along the axis of rotation whereby said driven element engages the driving bit when the support is axially-compressed and said driven element is released from the driving bit when the support means is axially expanded.

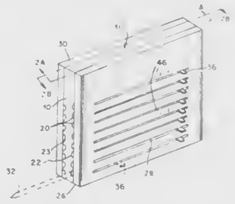
4,924,579
LAYOUT SYSTEM FOR CONSTRUCTION FOUNDATION PLACEMENT
Carol Berendsen, 133 Dodge La., Sonoma, Calif. 95370
Filed May 24, 1988, Ser. No. 198,770
Int. Cl.[5] E04G *21/18*
U.S. Cl. 33—1 LE 19 Claims

1. A layout system for defining wall boundaries when constructing a building, comprising in combination:
a single stake placed in the ground along the general line of a wall to be built,
a ray extending from said stake defining a line which is tangential to an outer surface of the wall to be built,
means to adjust vertical elevation of said ray with respect to said stake, including a "U" shaped body having a bight portion interposed between a pair of legs which straddle said stake, and
a threaded fastener passing through one said leg and frictionally retained against said stake,
and means to laterally offset said ray with respect to said stake, wherein said means to laterally offset said ray with respect to said stake include a bore passing through another of said "U" shaped body's legs, a bolt extending therethrough having an end constrained to ride within a track, fastening means associated with a free end of said



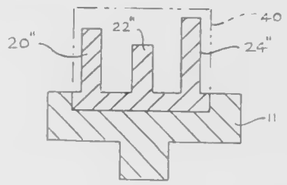
bolt as it exits said body leg, whereby said track can move with respect to said bolt whereby said ray serves as a guide for building the wall.

4,924,580
SKEWED FILLET WELD GAUGE
Mel V. Garofalo, 18-11 123 St., College Point, N.Y. 11356; William J. Taylor, 30 East Ave., Walden, N.Y. 12586, and Wayne T. Rheaume, 37 Fletcher Dr., Newburgh, N.Y. 12550
Filed Jan. 4, 1988, Ser. No. 140,548
Int. Cl.[5] G01B *5/02, 5/20*
U.S. Cl. 33—832 5 Claims



1. A fillet weld measuring gauge comprising
a base plate having at least one planar surface bounded by at least one linear base marginal perimetric edge,
said linear base marginal perimetric edge supporting the gauge on a surface of a structural member adjacent to a fillet weld thereon for measuring the fillet weld,
each said planar surface having a plurality of elongate uniformly spaced apart grooves embedded therein and disposed parallel to and in predetermined spaced measured relation with said base marginal edge,
a cover plate overlying each said grooved planar surface having a plurality of uniformly spaced, elongate slots therein disposed in selective overlying longitudinally aligned relation with said grooves in said planar surface, and
a slide member disposed in each of said grooves and engageable through said overlying slots in each said cover plate for permitted individual longitudinal displacement thereof within said grooves externally of said base plate into engagement with said fillet weld.

4,924,581
TURBINE AIR SEAL REPAIR PROCESS
Karl S. Jakobsen, Somers, Conn., assignor to Techniair, Inc., Tolland, Conn.
Filed Nov. 22, 1988, Ser. No. 275,230
Int. Cl.[5] B23P *15/02, 7/00*
U.S. Cl. 29—402.02 11 Claims



1. A repair process for repairing damaged turbine air seals which are formed from a seal assembly having at least one projecting seal member comprising:
(a) completely removing at least one damaged seal member from said seal assembly to form a base;
(b) machining said base to form a recess defining a mechanical seat;
(c) providing a replacement member which is dimensioned to be closely received in said seat;
(d) positioning said replacement member in said seat;
(e) bonding said replacement member to said seal base by a brazing process; and
(f) machining said replacement member to form a reconstructed seal member.

4,924,582
DOOR HANDLE ASSEMBLY METHOD
John F. Keller, Troy, Mich., assignor to Saturn Corporation, Troy, Mich.
Division of Ser. No. 138,566, Dec. 28, 1987, Pat. No. 4,834,433.
This application Feb. 23, 1989, Ser. No. 314,680
Int. Cl.[5] B23P *11/00;* E05C *3/26*
U.S. Cl. 29—434 2 Claims



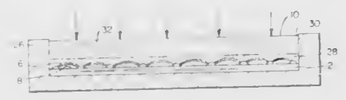
1. Method of installing a door handle having an axially contractible axle with axle ends on a vehicle door having a support panel underlying a door outer panel, said support panel having spaced apart coaxially arranged aperture means provided therein, comprising:
pivotally mounting the axle upon the support panel by positioning the ends of the axle in the aperture means of the support panel, said axle having integral attachment means thereon adapted to attach a handle thereto;
installing the door outer panel, said door outer panel having door panel aperture means therein overlying the integral attachment means of the axle,
and mounting the door handle on the vehicle door subsequent to the installing of the door outer panel, said door handle having integral attachment means cooperating with the attachment means of the axle to reach through the door panel aperture means and attach the door handle on the axle.

4,924,583

PROCESS FOR PRODUCING A DISC BRAKE PAD

Alan R. Hummel, and Ernst R. Welch, both of Winchester, Va., assignors to Abex Corporation, Ohio

Filed Mar. 9, 1989, Ser. No. 320,945
Int. Cl.[5] B23P *17/00*
U.S. Cl. 29—460 6 Claims



1. A method of forming and attaching a compacted friction material preform to a metal backing plate of a disc brake pad comprising the steps of:

providing a compacted friction material preform;

cleaning a top surface of the metal backing plate;

welding expanded metal mesh to the top surface of the backing plate such that an uppermost surface of said metal mesh exists substantially in a plane above said top surface;

grit blasting said expanded metal mesh and said backing plate, thereby increasing the surface area of said metal mesh and backing plate by roughening and cleaning the mesh and backing plate;

raising non-welded portions of the expanded metal mesh into a position above said plane, and maintaining said non-welded portions in this raised position;

applying adhesive to the expanded metal mesh and the top surface of the backing plate;

placing the backing plate in a cure mold;

pouring loose friction material having a total weight of less than about twenty per cent of the total weight of the compacted friction material preform over the expanded metal mesh and the backing plate, thereby filling the space between said mesh and said backing plate with said loose friction material;

placing the compacted friction material preform in the cure mold on top of the expanded metal mesh; and

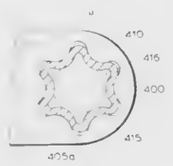
applying a combination of heat and pressure to the backing plate, adhesive, loose compacted friction material and the friction material preform in the mold, thereby causing the loose material and the preform to form a unitary friction member rigidly attached to the top surface of the backing plate and having the expanded metal mesh embedded therein.

4,924,584

METHOD OF FASTENING A TUBULAR ELEMENT TO A MEMBER AND JOINT PRODUCED THEREBY

William J. J. Harney, Willowdale, Canada, assignor to Magna International Inc., Markham, Canada

Filed Jul. 12, 1988, Ser. No. 217,949
Claims priority, application Canada, Jul. 13, 1987, 541927
Int. Cl.[5] B21D *39/00*
U.S. Cl. 29—509 10 Claims



1. A method of fastening, at least one tubular element at, at least one portion thereof to an at least one member of predetermined thickness, the method comprising establishing at least one opening through the at least one member, the at least one opening extending through the thickness of the at least one member, providing recesses within the at least one member, the recesses of predetermined configuration and being disposed about the perimeter of the at least one opening through the at least one member, the recesses extending radially away from the at least one opening and across at least a portion of the thickness of the at least one member, inserting the at least one tubular element within the at least one opening; holding the at least one tubular element and the at least one member within a jig: establishing recesses within the jig proximate each abutting edge of each of the tubular elements and the at least one opening through the at least one member; applying a predetermined force upon the ends of the at least one tubular element, the force being of a substantial predetermined magnitude to cause the wall portion of the at least one tubular element proximate the at least one opening and proximate the recesses established within the jig, to bead radially away from the at least one tubular element and further cause radial portions of each bead proximate the at least one opening to flow into the recesses formed within the at least one opening about the perimeter of the at least one opening; such beading providing fastening engagement between the at least one tubular element and the at least one member wherein no further fastening is required.

4,924,585

METHOD AND APPARATUS FOR CONTINUOUS COMPRESSION FORGING OF CONTINUOUSLY CAST STEEL

Takuo Imai; Shinji Kojima; Toshitane Matsukawa, and Toshio Fujimura, all of Okayama, Japan, assignors to Kawasaki Steel Corp., Japan

Continuation of Ser. No. 71,412, Jul. 9, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 342,705
Claims priority, application Japan, Sep. 4, 1986, 61-206693; Jan. 30, 1987, 62-18721
Int. Cl.[5] B21B *1/46*
U.S. Cl. 29—527.5 36 Claims



1. A method for compression forging a cast block drawn from a mold in a continuous caster comprising the steps of:

providing a means for applying compression forging on said cast block;

orienting said forging compression means at position where the solid phase ratio at the center of the block is in a range of 0.5:1 to 0.9:1 and the thickness reduction of the cast block due to said compression forging satisfies the following formula:

$$\delta/d \geqq 0.5$$

where

δ is the overall reduction (mm) in thickness of the cast block during forging compression; and

d is the thickness (mm) of the unsolidified layer in the cast block at the position where forging compression is performed.

20. An apparatus for compression forging a cast block drawn from a casting mold in a continuous caster comprising:

means for receiving a cast block from said continuous caster and feeding the same to a compression forging means;

said compression forging means being provided at a position where the solid phase ratio of the block is within a range between 0.5:1 to 0.9:1 and the thickness reduction of the cast block by said compression forging satisfies the following formula:

$$\delta/d \geqq 0.5$$

wherein

δ is the overall reduction (mm) in thickness of the cast block during compression forging; and

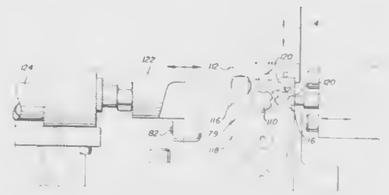
d is the thickness (mm) of the unsolidified layer in the cast block at the position where compression forging is performed.

4,924,586

AUTOMATED FORMING APPARATUS

Harold B. King, Jr., Wrightsville Beach; Donald G. Muncy, Wilmington, both of N.C., and Charles W. Sutherland, Nashville, Tenn., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 2, 1988, Ser. No. 279,009
Int. Cl.[5] G21C *21/00*
U.S. Cl. 29—723 10 Claims



1. Automated apparatus for forming inwardly projecting, dimpled surface formations at predetermined locations in the wall of a succession of tubular parts, said apparatus comprising, in combination:

A. a feeder for arranging the parts in a serial stream;

B. a first station for accepting successive parts from said feeder and arranging each part in a predetermined longitudinal, end-to-end orientation;

C. a second station for accepting successively parts from said first station and arranging each part in a predetermined angular orientation at a pickup position;

D. a punch press including

(1) a die having opposed die halves movable between open positions and closed positions embracing a part,

(2) a mandrel for insertion into the bore of a part in said die, and

(3) a plurality of punches movable into forming engagement with the part wall to create the dimpled surface formations; and

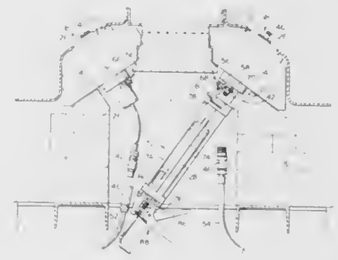
E. a transfer mechanism for picking each part from said pickup position in said second station and placing the part in said die.

4,924,587

SERVICES CONNECTIONS FOR WORKSTATIONS

Brian Spruce, Worsley; David P. Welsby, and John L. Bell, both of Astley, all of United Kingdom, assignors to British Nuclear Fuels Plc, Warrington, England

Filed Oct. 17, 1988, Ser. No. 258,720
Claims priority, application United Kingdom, Oct. 26, 1987, 8725032
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—723 5 Claims



1. A services connection assembly by which to effect sealed entry of service supplies, such as electrical, hydraulic, pneumatic and other supplies, to a controlled environment to be maintained isolated from its surroundings, the assembly comprising:

a. a unit having a throughbore elongated in the direction of entry and of constant cross section over its length,

b. a cartridge having sealing means associated therewith disposed sealingly but slidably in the throughbore and having connectors at opposite ends for coupling with services supply lines,

c. releasable means for fixing the position of the cartridge in the throughbore, and,

d. a cartridge replacement means detachably engageable with the unit externally of the controlled environment for feeding forwardly relative to itself, whilst so engaged, a replacement cartridge which by abutment, nose to tail, with the cartridge already in position in the throughbore displaces the latter out of the throughbore into the controlled environment, when the releasable means has been released, whilst at all times in the course of the replacement operation maintaining sealing of the throughbore and thereby preventing any loss therethrough of the isolation of the controlled environment from its surroundings.

4,924,588

TOOL FOR THE NON-DESTRUCTIVE REMOVAL OF TUBES FROM HEAT EXCHANGERS

Renato Stignani, and Francesco Ferrari, both of Mantova, Italy, assignors to Montedipe S.p.A., Milan, Italy

Filed Dec. 12, 1986, Ser. No. 941,087
Claims priority, application Italy, Dec. 18, 1985, 23265 A/85
Int. Cl.[6] B23B *41/10*; B23C *3/00*
U.S. Cl. 29—726 12 Claims

1. A tool for the non-destructive removal of tubes, or of tube portions, from heat exchangers, comprising:

(a) a milling-cutter-holder shank, at least equal in length to the depth of the cutting to be accomplished in the tube;

(b) a guide sleeve comprising a cylinder having a longitudinal bore, and a lateral opening intermediate its ends for housing a milling cutter, said longitudinal bore being offset relative to a longitudinal central axis of said guide sleeve by a length at least equal to the thickness of the tube to be removed and said shank slidably receiving said guide sleeve by insertion into said bore;

(c) an end milling cutter having an axially facing cutting means on a tube contacting end thereof to cut a straight length of tube, said end milling cutter being housed inside the opening of the guide sleeve; and



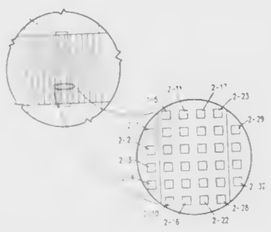
means for rigidly fastening said milling cutter to the milling cutter-holder shank.

4,924,589

METHOD OF MAKING AND TESTING AN INTEGRATED CIRCUIT

Gleun J. Leedy, 1061 E. Mountain Dr., Santa Barbara, Calif. 93108

Filed May 16, 1988, Ser. No. 194,596
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—832 20 Claims



1. A method of making an integrated circuit comprising the steps of:

testing simultaneously a plurality of individual logic units of said integrated circuit prior to interconnecting said logic units; with each of the units being electrically isolated from the other units during the test and

interconnecting said logic units so as to render said integrated circuit operable.

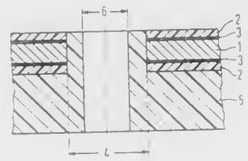
4,924,590

METHOD FOR MAKING METAL CORE PRINTLD CIRCUIT BOARD

Helmut Hadwiger, Munich, and Hans Schmidt, Eurasburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 28, 1988, Ser. No. 291,119
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800348
Int. Cl.[5] H05K *1/05*
U.S. Cl. 29—848 22 Claims

1. A method for the manufacturing of a metal core pc board whose core is composed of a metal with good thermal conductibility, preferably one of aluminum, copper, brass or steel, the thermal expansion coefficients of the metal core and other pc board materials being substantially equal, comprising manufacturing metal core pc boards of any form on a plastic by thermoforming, the metal core being laminated with a plastic foil at least on one side, and this laminated core being then placed into a shaping tool and enveloped at least on one side with an additional plastic layer on the plastic foil, and at the



same time, filling up holes present in the pc board to their final dimension, whereby the final contour of the pc board is created.

4,924,591

TURNTABLE DEVICE FOR MEASURING ANGLES OF LOCK OF A STEERABLE WHEEL OF AN AUTOMOBILE

Jacques Brodu, Paris, France, assignor to Etablissements M. Muller & Cie., Chelles, France

Filed Jul. 26, 1988, Ser. No. 224,398
Claims priority, application France, Aug. 10, 1987, 87 11353
Int. Cl.[5] G01B *5/24*
U.S. Cl. 33—203.14 4 Claims



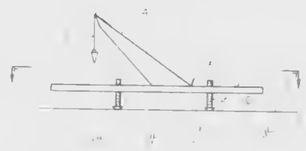
1. A turntable device which is intended to receive a steerable wheel of an automobile for measuring angles of lock of said wheel, comprising a horizontal turntable mounted so as to be capable of moving on a stationary support with a possibility of free pivotal motion and limited displacements in its own plane, the turntable having a spindle coupled with an angular displacement pickup carried by movable means which is subjected to translational displacements of the turntable, the translational displacements of the turntable being limited by the spindle coming into abutment with the stationary support, wherein said movable means is equipped with a detection element placed opposite to a stationary zone having physical characteristics which are different from those of a support of the stationary zone over only an area which corresponds to positions of the spindle when the spindle is out of abutment with the stationary support, the detection element being connected into an electric circuit for controlling a signal element for stopping the operation of the measuring device thereby to give a signal or to stop the measuring device when the spindle is in abutment with the stationary support.

4,924,592

PLATE SUNDIAL WITH INSTALLATION INDICIA

George L. Fuller, 444 E. Park Dr., Spartanburg, S.C. 29302

Filed Apr. 12, 1989, Ser. No. 337,071
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[5] G04B *49/02*; G01C *17/34, 21/02*
U.S. Cl. 33—270 3 Claims



1. A plate sundial for use at a site comprising:

(a) a dial plate having a top surface with a longitudinal centerline and with an index point on said longitudinal centerline;

(b) a gnomon perpendicular to said top surface of the dial plate with upper edge having a longitudinal centerline inclined to a plane defined by said top surface of the dial plate at an angle Δ of about 35° and with the vertex of said angle Δ of said index point on the dial plate, and with a reference point on said longitudinal centerline of the upper edge of the gnomon from which a plumb line can be extended to said dial plate;

(c) latitude indicia lines on said dial plate located a distance from said index point on the dial plate such that when said plumb line from the reference point on the longitudinal centerline of the upper edge of the gnomon intersects the latitude indicium line representing the latitude of the site, said centerline of the upper edge of the gnomon will be inclined to the horizontal at an angle equal to the latitude of the site;

(d) longitude displacement indicia lines on said dial plate representing the difference between the longitude of the plane of the site meridian and the longitude of the plane of a time zone meridian such that when said plumb line from the reference point on the centerline of the upper edge of the gnomon intersects the longitude displacement indicium line for the site, the plane defined by said longitudinal centerline of the upper edge of the gnomon and said longitudinal centerline of the dial plate will be inclined to a vertical plane through said longitudinal centerline of the upper edge of the gnomon at an angle equal to the longitude displacement of the site; and

(e) time indicia lines on said dial plate such that when said longitudinal centerline of the upper edge of the gnomon is inclined to the horizontal at said angle equal to the latitude of the site, and when said plane defined by said longitudinal centerline of the dial plate and said longitudinal centerline of the upper edge of the gnomon is parallel to said plane of the time zone meridian, the correct zone time will be indicated by the shadow of the gnomon from the sun.

4,924,593

METHOD FOR ALIGNING A TWO-AXIS PLATFORM

Horst Renker, Zur Pfrille, and Walter Bernard, Säntisblick, both of Fed. Rep. of Germany, assignors to Bodenseewek Geratetechnik GmbH, Uberlingen/Bodensee, Fed. Rep. of Germany

Filed Mar. 29, 1989, Ser. No. 329,986
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 3810617
Int. Cl.[5] G01C *19/38*
U.S. Cl. 33—324 6 Claims

1. A method for aligning a two-axis platform comprising an azimuth gimbal (**10**) rotatable about an azimuth axis (Y), an inner gimbal (**14**) rotatable relative to said azimuth gimbal (**10**) about a second axis (X), two-axis gyro (**18**) mounted on said inner gimbal, wherein the platform, after pre-alignment with horizontal spin axis (**22**) of the gyro (**18**), is rotated into a first position, in which the sum of the angular rates effective about one input axis (**20**) becomes zero, characterized by the steps of

(a) measuring the azimuth angle in said first position,

(b) rotating the azimuth gimbal (**10**) and the inner gimbal



(**14**) simultaneously about the respective platform axes (Y or X, respectively) through 180° each,

(c) rotating the platform into a second position, in which again the sum of the angular rates effective about said input axis (**20**) becomes zero, and

(d) measuring the azimuth angle in said second position,

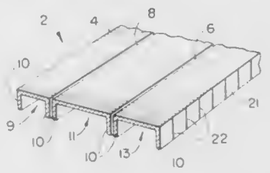
(e) an angle representing North direction being obtained in the middle between the positions of the spin axes in the two positions.

4,924,594

DOUBLE CUT EDGER

Manuel Fernandes, 7726 Taylor Pl., Burnaby, British Columbia, Canada V3N 3Z2

Filed Jun. 30, 1988, Ser. No. 214,177
Claims priority, application Canada, Jul. 24, 1987, 543003
Int. Cl.[5] B26B *29/02*
U.S. Cl. 33—483 7 Claims



1. An apparatus for assisting in cutting overlapping sections of adjacent surface coverings comprising:

(a) an elongated body portion having two elongated sides and first and second parallel straight edges along respective elongated sides;

(b) a first slot with vertical walls parallel with the first straight edge of the elongated body portion, said first slot being located at a specified distance from the first straight edge, and penetrating through the depth of and extending substantially the length of the elongated body portion;

(c) a second slot with vertical walls parallel with the second straight edge of the elongated body portion, said second different from the specified distance that the first slot is located from the first straight edge, and penetrating

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through the depth of and extending substantially the length of the elongated body portion; and

(d) elongated ridges located along each longitudinal side of the first and second slots on the underside of the elongated body portion, said ridges extending substantially the length of the elongated body portion.

4,924,595

MEASURING ARRANGEMENT FOR FORM MEASUREMENT

Manfred Wamser, Karlsruhe, and Knud Overlach, Ettingen, both of Fed. Rep. of Germany, assignors to Dr.-Ing. Ludwig Pietzsch GmbH & Co., Ettlingen, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 106,112

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1986, 3634816

Int. Cl.[5] G01B 7/12

U.S. Cl. 33—542 **5 Claims**



1. A measuring arrangement for form measurement of cylinders, comprising

a measuring arm insertable into a cylindrical space; a measuring sensor mounted on said measuring arm and being insertable via said measuring arm into said cylindrical space, said arm is movable translatorily with respect to the longitudinal axis of said measuring arm and is driveable independently of said translatory movement in a circumferential direction; a sensing pin displaceably mounted in said measuring arm and arranged for sensing a geometry of walls of cylinders; a driving arm which is movable translatorily and rotatably in said arrangement and having an end connected to said measuring arm, being formed as a relatively thin sensing body which is in operative connection with said end of said driving arm, and being formed bending-resistant, and extends parallel to said driving arm, said sensing body having a free end and said sensing pin being operatively mounted adjacent the free end of said thin sensing body; said driving arm has a guiding sleeve; and further comprising a first driving motor with which said guiding sleeve is in driving connection; a guiding pipe in which said guiding sleeve is arranged rotatably and axially movably; a spindle coaxially mounted in said guiding sleeve; a second drive motor driveably connected to said spindle and a spindle nut which cooperates with said spindle and is connected with said guiding sleeve to be fixed for joint rotation and axial connection therewith; and

a driver which engages in said guiding sleeve in a form-locking manner, said drive connecting said spindle nut to said guiding sleeve for joint rotation and to be axially fixed therewith;

and further comprising a driving shaft coaxially and rotatably mounted in said driving arm which provides the driving connection between said guiding sleeve of said driving arm and said first mentioned driving motor wherein said guiding sleeve is driven by said first mentioned driving motor and extends coaxially to said spindle, said driving shaft being provided with a drive fork which extends along said spindle inside said guiding sleeve.

4,924,596

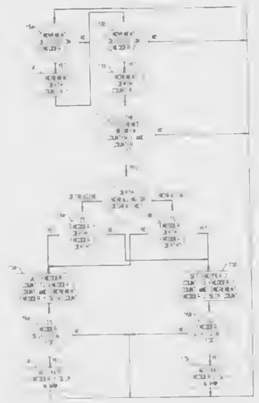
METHOD FOR CORRECTING SLIPPAGE DURING WIRELINE DEPTH MEASUREMENTS

Guy Vachon, Austin, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Apr. 27, 1989, Ser. No. 344,207

Int. Cl.[5] G01B 3/12

U.S. Cl. 33—715 **3 Claims**



1. A method for computing wireline depth measurements in a borehole using encoder wheels which frictionally engage the wireline so as to rotate in accordance with linear motion of the wireline and which also produce pulses in accordance therewith, comprising the steps of:

detecting pulses produced by the rotation of first and second encoder wheels whose rotation corresponds to linear motion of a wireline;

incrementing a first depth counter when a pulse is detected from the first encoder wheel and incrementing a second depth counter when a pulse is detected from the second encoder wheel;

comparing the depth count for each encoder wheel and determining whether a difference exists;

determining whether the wireline depth is increasing or decreasing; and

if a difference between the depth counts for the first and second encoder wheels exists, setting the value of the lesser depth counter equal to that of the greater depth counter if the wireline depth is currently increasing and setting the value of the greater depth counter equal to the lesser depth counter if wireline depth is currently decreasing.

4,924,597

TAPE MEASURE DEVICE

Angelo Tursi, 1553 Madison St., Elmont, N.Y. 11003

Filed Sep. 26, 1989, Ser. No. 412,349

Int. Cl.[5] G01B 3/10

U.S. Cl. 33—758 **8 Claims**

1. A tape measure device comprising:

(A) a casing which includes a top wall, a bottom wall, a front wall, a rear wall, a forward end wall and an aft end wall;

(B) a tape measure retractably mounted in said casing;

(C) a first permanent magnet mounted on said casing bottom wall;

(D) a bracket arm assembly movably mounted on said casing aft end wall and including

(1) an L-shaped body having a long leg abutting said housing aft end wall and a short leg disposed subadjacent to said first permanent magnet,

(2) a slot defined in said long leg, and

(3) a fastener attached to said casing aft end wall and extending through said slot;

(E) a chamber defined in said casing rear wall;

(F) a U-shaped clip mounted on said casing rear wall;

(G) an elongate nail-receiving bore defined in said casing aft end wall to extend toward said casing bottom wall;

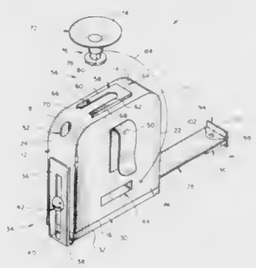
(H) a suction cup assembly which includes

(1) a U-shaped bracket mounted on said casing top wall, and having two spaced apart legs which are connected together by a bight section to define an open ended slot, and spacer means connecting said legs and said bight section to said casing top wall to space said legs and said bight section from said casing top wall, and

(2) a unitary suction cup element having

(a) a concave body,

(b) a base on said concave body, said base having a stepped outer surface to define a shoulder, and



(c) a circular flange on one end of said base, said flange having a diameter that is larger than the space between said bracket legs and having a thickness that is slightly less than the space between said bracket legs and said bracket bight section and said casing top wall, said flange being spaced from said shoulder a distance that is slightly greater than the thickness of said bracket legs and said bracket bight section whereby said flange is slidably and releasably mountable on said bracket with said shoulder, said casing top wall and said bracket controlling movement of said suction cup element, and

(d) a flexible connecting link connecting said base to said casing;

(I) a second permanent magnet mounted on said tape measure;

(J) a hook on said tape measure adjacent to said second permanent magnet; and

(K) a bore defined through said tape measure, said hook and said second permanent magnet.

4,924,598

HEIGHT MEASURING INSTRUMENT

Siegfried Gruhler, Oberndorf, Fed. Rep. of Germany, assignor to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

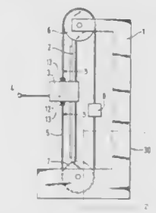
Filed Jun. 9, 1988, Ser. No. 204,389

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719509

Int. Cl.[5] G01B 5/02, 7/00

U.S. Cl. 33—832 **12 Claims**

1. A height measuring device in which a measuring pin is moved against an article with a predetermined measuring pressure, comprising an upright support, an endless belt moving system on said support including first and second vertically spaced guide rollers mounted at vertically spaced locations on said support, a measurement carriage having a measuring pin thereon extending substantially horizontally and which is movable with said endless belt moving system to a measuring site which may be moved upwardly and downwardly to bear against the article to be measured, said carriage having a hollow portion extending vertically therethrough with a base member closing each end of said hollow portion, said base members each having an opening therethrough, a ramrod extending through said hollow portion and each opening, said endless belt moving system including a belt guided over said rollers and having respective ends connected to respective ends of said ramrod, a ring piece divider in said hollow portion



dividing said hollow portion into upper and lower chambers, a coil spring around said ramrod in each of said upper and lower chambers having opposite ends braced against said ring piece divider and outer oppositely extending ends braced against a corresponding one of said base members, a drive motor connected to at least one of said rollers to drive said belt with said rollers, and control means connected to said motor and having sensing means for sensing a force acting on said ramrod and acting on said measuring pin, said control means driving said motor to effect a desired measuring pressure between the measuring pin and the article to be measured.

4,924,599

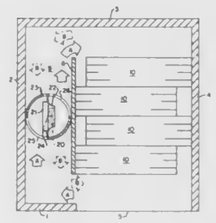
UV CURING APPARATUS

Henry J. Bobley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Continuation-in-part of Ser. No. 17,217, Feb. 20, 1987, which is a continuation of Ser. No. 794,940, Nov. 4, 1985, Pat. No. 4,646,446. This application Jul. 28, 1987, Ser. No. 78,916

Int. Cl.[5] F26B 3/28

U.S. Cl. 34—4 **7 Claims**



1. A UV curing apparatus at a curing station for irradiating ink on a substrate being conveyed through the apparatus at an increased speed to reduce the amount of energy absorption by the substrate, said apparatus comprising:

UV lamp means at the UV curing station comprising a single lamp providing a source of UV energy for irradiating the ink;

conveyor means to convey the substrate to and from the UV curing station; and

reflector means surrounding a portion of said UV lamp remote from said substrate for reflecting radiation from said lamp means onto ink and onto said substrate, a first

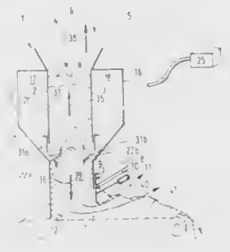
preheat section on said reflector means providing a first preheating region of IR radiation for raising substantially the temperature of the ink, a second downstream section on said reflector means for providing an intense UV radiation of the previously heated ink to cure the same more quickly and thus reducing the heat absorption by the substrate being conveyed, the preheat section of the reflector means and the second downstream section of the reflector means comprising first and second curved reflector portions opening towards said substrate, said first preheat section of said reflector means being substantially longer than the second focused section, said second section focusing the UV radiation to cure the heated ink.

4,924,600

FLUIDIZATION TREATMENT PROCESS AND INSTALLATION

André Lermuzeaux, Socy-en-Brie, France, assignor to L'Air Liquide, Paris, France

Filed Nov. 13, 1987, Ser. No. 119,953
Claims priority, application France, Nov. 21, 1986, 86 16220
Int. Cl.[5] F26B *3/08*
U.S. Cl. 34—10 **17 Claims**



1. Process for treating a product subdivided into particulate elements or grains, employing a fluidized bed of said particulate elements produced by an injected fluidization gas in a chamber open in an upper part thereof and having a bottom, said process comprising injecting fluidization gas through lateral inlet ports which are in facing relation to each other in pairs and located at a distance from said chamber bottom so as to form at least two currents which are convergent toward each other for producing a principal ascending recomposition current for fluidizing said particulate elements and an auxiliary recomposition current flowing through a substantially fixed bed of said particulate elements and escaping from the chamber through an opening in a low position in the chamber.

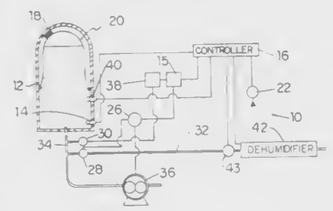
4,924,601

SYSTEM FOR CONDITIONING GRAIN

Willis M. Bercaw, Box 65, West York, Ill. 62478

Filed Jul. 27, 1989, Ser. No. 385,500
Int. Cl.[5] F26B *21/06*
U.S. Cl. 34—46 **7 Claims**

1. A system for conditioning grain comprising:
- a sealed container for storing several bushels of grain, each bushel of said grain having a fixed quantity of solid matter and a variable quantity of liquid;
- a first sensor located in said container for sensing the relative humidity in the said container and correspondingly the magnitude of the variable quantity of liquid in each bushel of grain to generate an actuation signal;
- a pump connected to said container;
- valve means connected to said container for allowing environmental air to be communicated to said container;
- control means responsive to said actuation signal for supplying said valve means and pump with operational signals to interrupt communication of environmental air to said container and allow said pump to evacuate air saturated with liquid from said container while creating a predetermined vacuum in said container; and
- pressure sensing means connected to said container and responsive to said predetermined vacuum for supplying said control means with a vacuum signal to terminate said operational signals and initiate actuation of said valve



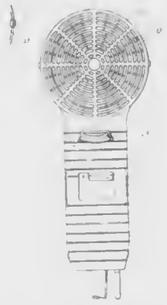
means to allow environmental air to reenter said container and thereafter be combined with said liquid therein to sequentially reduce said variable quantity of liquid in each bushel of grain, said first sensor continuing to generating said actuation signal until said fixed quantity of solid matter and liquid per bushel reaches an optimum relationship to sustain storage without deterioration.

4,924,602

PORTABLE HAIR DRYER

Heinz-Jürgen Ohlsen, Wuppertal, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,480
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 8704225
Int. Cl.[5] A45D *20/12*
U.S. Cl. 34—97 **15 Claims**



1. An electrically operated portable hair dryer comprising a housing having an air admitting inlet and an air discharging outlet and defining a path for the flow of air from said inlet to said outlet; motor-operated rotary impeller means provided in said housing and operable to convey air from said inlet to said outlet; means for heating the air in said path; and an apertured grid provided in said path between said heating means and said outlet, said grid preventing direct access to said heating means by way of said outlet and comprising an annular outer wall, at least one annular inner wall surrounded by and spaced apart from said outer wall, and webs connecting said walls to each other, inner wall being inclined with reference to said outer wall.

4,924,603

DEVICE FOR REMOVING CONDENSATE FROM A STEAM-HEATED DRYING CYLINDER OR SIMILAR BY MEANS OF A ROTATING SYPHON

Robert Wolf, Herbrechtingen, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 299,005
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1988, 3801815
Int. Cl.[5] D06F *58/00*
U.S. Cl. 34—125 **20 Claims**



1. Apparatus for removing condensate from a revolving steam-heated drying cylinder of a paper production machine, said drying cylinder being supported by journals for rotation about an axis of rotation and including a cylinder shell having an inner wall surface, said apparatus comprising:
- a condensate standpipe disposed within said drying cylinder, said standpipe arranged to rotate together with the drying cylinder, said standpipe having a longitudinal axis extending substantially radially from the axis of rotation of the cylinder to the inner wall surface of the cylinder shell and having thereat a suction mouthpiece with a suction opening forming an inlet gap with the inner wall of the cylinder shell;
- an outlet pipe extending through a journal of the drying cylinder and communicating with said standpipe for passing condensate from said standpipe outside said drying cylinder; and
- a condensate guide device contained in the suction mouthpiece, said condensate guide device including at least one reversal surface which imparts to steam/condensate mixture entering the condensate standpipe a rotation about the longitudinal axis of the condensate standpipe.

4,924,604

DRYING DEVICE FOR GARMENTS

Jesse L. Colodner, Pearl River, N.Y., and Irving Portnoy, 14 Eisenhower Dr., Yonkers, N.Y. 10710, assignors to Irving Portnoy, Yonkers, N.Y.

Filed Jan. 7, 1987, Ser. No. 1,142
Int. Cl.[5] F26B *13/00*
U.S. Cl. 34—151 **3 Claims**



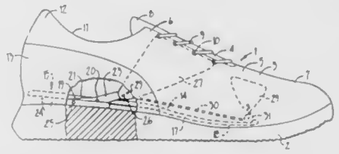
1. A garment drying device comprising an electrically heated garment support frame, a control box secured to said frame, and a brace rod to support said frame against a wall having an electrical wall outlet receptacle disposed therein;
- said garment support frame comprising a pair of heating elements being coupled electrically in series and fixedly secured to a pair of prongs projecting from and fixedly secured to said control box, said prongs being detachably receivable in said wall outlet receptacle;
- the end of said brace rod is disposed adjacent to said wall having a channel member fixedly attached thereto, said channel member including a rubber strip disposed therein which frictionally engages said wall to hold said device in place;
- the end of said brace rod that is disposed adjacent to the heating elements of said device being pivotally attached thereto by means of a brace clamp, said brace clamp being attached to said heating element in slideably engagement therewith, said brace clamp being adjustably secured to said heating elements by screw fastener means.

4,924,605

SHOE DYNAMIC FITTING AND SHOCK ABSORBTION SYSTEM

Richard G. Spademan, Box 6410, Incline Village, Nev. 89450

Continuation of Ser. No. 736,666, May 22, 1985, abandoned. This application Feb. 4, 1987, Ser. No. 11,409
Int. Cl.[5] A43B *5/00, 7/14*
U.S. Cl. 36—114 **23 Claims**



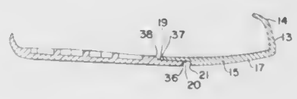
1. In a shoe including an upper shell and a lower sole secured to the upper shell, the improvement comprising means for sensing when a user of the shoe applies increased weight to the sole upon touching a support surface for the shoe, and tightening means responsive to the sensing means for increasing the tightness of the fit of the shoe on a foot of the user as the user applies the increased weight to the sole.

4,924,606

SPLIT-SOLE SHOE WITH A COMBINED TOE CAP AND FRONT OUTER SOLE

Thomas Montgomery, Durham, N.H., and Jeffrey Silverman, Scarsdale, N.Y., assignors to Toddler U, Inc., Westport, Conn.

Filed Nov. 1, 1988, Ser. No. 265,752
Int. Cl.[5] A43B *13/14*
U.S. Cl. 36—31 **55 Claims**



20. A shoe comprising:
(a) a combined toe cap and front outer sole having a toe cap portion for covering the front, sides and top of the toes of a foot, and an outer sole portion for covering the bottom of the toes and at least a substantial portion of the sole of a foot, said toe cap portion including a lateral side section, a medial side section, a front section and a top section, said outer sole portion extending rearwardly from said front section and being connected to said medial side section

VOL
1114
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and said lateral side section to thereby provide a substantially smooth and continuous transition from said top section to said front section, from said front section to said outer sole portion, and from said medial and lateral side sections to said outer sole portion, said outer sole portion including a first recessed section extending transversely across the end of said outer sole portion which is remote from said front section; and

(b) a heel member connected to said combined toe cap and front outer sole for covering the bottom heel and intermediate region of a foot, said heel member having a rear side, a lateral side, a medial side, and a sole section being connected to said rear, lateral and medial sides, said sole section including a second recessed section extending transversely across the side remote from said rear side, and said second recessed section of said sole section being connected to said first recessed section of said combined toe cap and front outer sole to thereby provide increased flexibility in the region of the connected recessed sections.

4,924,607

THREADED WEDGE RETAINER FOR TOP LIFT

Paul W. Harper, Rochester, N.Y., assignor to Heelox Corporation, Rochester, N.Y.

Filed Apr. 3, 1989, Ser. No. 332,164
Int. Cl.[5] A43B *21/36, 21/42*
U.S. Cl. 36—42 **20 Claims**



1. A releasable retainer system for holding a doweled top lift element on a heel of a shoe, said retainer system comprising:

a. said doweled top lift element including a dowel having a slip fit in a mounting hole in said heel and a top lift mounted on a lower end of said dowel;

b. said dowel having a slot open at a periphery of said dowel and extending axially down said open periphery of said dowel from an upper end of said dowel;

c. a threaded retainer receiver located in said heel for transversely intersecting said mounting hole;

d. a retainer element having external threads and a conical wedge tip, said retainer element being threaded into said retainer receiver so that said conical wedge tip extends transversely into said mounting hole in the region of said slot in said dowel; and

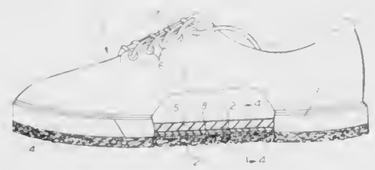
e. said conical wedge tip being advanceable into said dowel by turning of said threads, so that said wedge tip enters between and engages edges of said open slot at said periphery of said dowel and spreads said slot open to enlarge said dowel and retain said dowel against movement in said mounting hole, and said conical wedge tip being retractable from said slot edges by turning of said threads, so that said wedge tip stops spreading said slot and allows said dowel to contract and be removed axially from said mounting hole for replacing said top lift.

4,924,608

SAFETY FOOTWEAR WITH REPLACEABLE SOLE PAD

Jerry R. Mogonye, P.O. Box 55366, Houston, Tex. 77255

Filed Oct. 11, 1988, Ser. No. 255,312
Int. Cl.[5] A43C *15/02*
U.S. Cl. 36—62 **15 Claims**



1. Safety footwear having a replaceable sole pad for use in working on slippery surfaces to prevent the wearer from slipping comprising:

a shoe having an upper portion to substantially cover the foot of the wearer and a flexible sole portion secured at the bottom thereof,

flexible fastener means secured by a layer of water- and chemical-resistant adhesive covering the entire bottom surface of said flexible sole portion, which comprises one or more thin strip elements having a plurality of hooking elements projecting from the bottom surface, and

a flexible sole pad of non-woven synthetic fibrous material releasably attached to said fastener means and having the plan shape of said sole to substantially cover the entire bottom surface of the shoe,

the fibrous material of said sole pad being interengageable with said hooking elements by pressing said sole pad on said hooking elements to releasably secure said sole pad to the bottom of the shoe and removable therefrom by pulling said sole pad from said hooking elements,

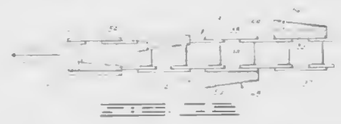
said sole pad material having fiber characteristics sufficient to provide the shoe wearer traction on a slippery surface when standing or walking and said adhesive, said flexible fastener means and said sole pad materials being resistant to water and to deterioration by floor cleaning compounds conventionally used in cleaning floors and in stripping wax from waxed floors.

4,924,609

DIGGING TOOTH AND TEETH ARRAYED IN COMBINATION WITH ENDLESS EXCAVATING CHAIN

J. Scott Martin, Perry, Okla., assignor to The Charles Machine Works, Inc., Perry, Okla.

Filed Dec. 12, 1988, Ser. No. 282,518
Int. Cl.[5] E02F *3/14, 5/06*
U.S. Cl. 37—191 A **16 Claims**



7. A trenching chain assembly for use in a trenching machine for digging elongated trenches and comprising:

an elongated, endless chain having opposite sides and having a lengthwise aspect and a width, and having a centrally disposed longitudinal axis extending along its length between opposite sides of the chain, said chain including a plurality of interconnected, articulated links having spaced, tooth-mounting plates each adapted to support a digging tooth, said tooth-mounting plates being located on opposite sides of the longitudinal axis of the chain and generally defining, by their separation, the width of the chain; and

an array of digging teeth secured to, and projecting from, the chain, the array of digging teeth including:

at least one trench face shearing tooth mounted on the chain and having a toe portion extending generally transversely with respect to the direction of the travel of the chain during the digging of a trench and projecting either inwardly toward the longitudinal axis of the chain, or outwardly away from the longitudinal axis of the chain, said toe portion being spaced from a plane containing the longitudinal axis of the chain; and

means for connecting said toe portion to at least one of said plates of the chain, and for spacing said toe portion from said plane containing the longitudinal axis of the chain, said toe portion including a hard-faced leading cutting edge, with the hard facing thereon including particles selected from the group consisting of titanium carbide, tungsten carbide, and ceramic material; and

at least one cup-shaped gauge tooth mounted on the chain and spaced longitudinally therealong from each of the trench face shearing teeth on the chain so as to follow and track at least one of the trench face shearing teeth, each of said cup-shaped teeth including a curved, convex outer side facing away from the longitudinal axis of the chain and a concave inner side facing toward the longitudinal axis of the chain, said curved, convex outer side being spaced outwardly from a plane containing the longitudinal axis of the chain and adapted for shearing away the side walls of a trench dug by the trenching chain assembly, and thus constituting gauging teeth for gauging the width of the trench; and

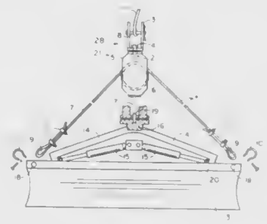
means for connecting said cup-shaped tooth to at least one of said plates of the chain.

4,924,610

APPARATUS FOR ROADWAY SNOW PLOW ATTACHMENT

Wayne N. Sodemann, 3981 Lake Dr., West Bend, Wis. 53095

Filed May 22, 1989, Ser. No. 355,293
Int. Cl.[5] E01H *5/06*
U.S. Cl. 37—231 **4 Claims**



2. Apparatus for roadway snow plow attachment wherein the improvement comprises:

a. a cable mount disc rigidly attached in a cable disc housing and

b. a cable hanger yoke vertically and pivotally attached to a cable holder disc housing and

c. said cable hanger yoke vertically hanging and attached to a hanger arm and

d. a cable threaded in one loop around said disc, said cable having a plurality of eyes, and

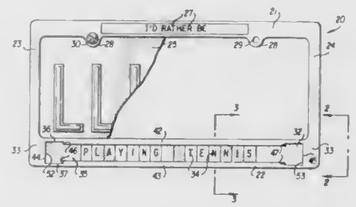
e. the eyes of said cable threaded in one loop around said disc attached to a snow plow blade mount beam at points outwardly from the vertical center line of said snow plow blade mount beam.

4,924,611

FRAMES FOR VEHICLES LICENSE PLATES AND THE LIKE

Stuart Shaw, 9400 Jongroner Ct., Potomac, Md. 20854

Filed Jul. 13, 1989, Ser. No. 379,316
Int. Cl.[5] G09F *7/00*
U.S. Cl. 40—210 **18 Claims**



1. A license plate frame for displaying a license plate and a message on a vehicle comprising:

upper and lower longitudinal bars and transverse side bars, the bars being integrally connected together to form a substantially rectangular integral body having longitudinal, transverse, and depth dimensions in respectively mutually normal longitudinal, transverse, and depth directions, the body outlining a central vacant rectangular display space for display of the license plate, at least one longitudinal body bar having a longitudinal front-facing track recessed in depth from front to rear, the track having a back planar in the longitudinal and transverse directions, the track having parallel upper and lower longitudinal margins and parallel side margins defining the longitudinal and transverse extent of the recessed track, the frame having means for attachment to the vehicle with the plate exposed to view through the display space;

a number of indicia;

a number of message elements each fitting closely within the upper and lower track margins, the number of message elements each having planar front and back surfaces separated in depth and extending parallel to each other in the longitudinal and transverse directions,

the number of message elements bearing indicia on the front message element surfaces and applied against the back of the track with the planar message element back surfaces in surface contact flush against the back of the track;

the frame including means for holding the number of elements against the back of the track comprising a substantially planar and transparent resilient cover having front and back planar surfaces extending parallel to each other in the longitudinal and transverse directions with the back planar surface of the resilient cover in contact with and flush against the front surface of the number of message elements and indicia, the number of message elements and indicia being changeable by virtue of the resilience of the cover affording withdrawal and replacement of cover, message elements and indicia;

whereby the cover holds the message elements in position in the track, whereby the margins prevent side and vertical motion of the elements relative to the track, and whereby indicia on the front surface of the message elements may be read through the transparent cover.

4,924,612

FIBER OPTIC SIGN

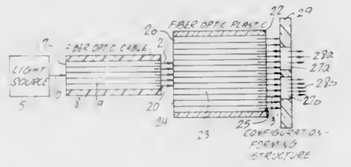
Robert Z. Kopelman, 121 Fountain Ave., Rockville Centre, N.Y. 11570

Filed Apr. 14, 1987, Ser. No. 37,964
Int. Cl.[5] G09F *13/00*
U.S. Cl. 40—547 **24 Claims**

2. A sign device comprising in combination: a configuration

VOL 1114 ISS 3 MY 15 1990 UMI

means comprising a visually-exposed substrate and opaque matter, said visually-exposed substrate having a surface, said substrate being positioned to be solely directly lightable by fiber optic light shone directly thereon directly from light-conveying fiber optic channels by the directing of fiber optic light directly thereon, said configuration means being for positioning said opaque matter to partially blocking light shone toward said surface such that at-least one of said visually-exposed substrate and said opaque matter substantially circumscribes a visually discernible configuration relative to a remaining other



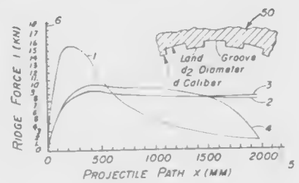
one of said visually-exposed substrate and said opaque matter; a light source means for providing light; and fiber optic means including a plurality of parallel light-conveying fiber-optic channels having opposite light-inlet ends and light-outlet ends thereof, for directing light from said light source means emitted from said light-outlet ends directly onto said visually-exposed substrate and said opaque matter, said substrate being positioned to directly receive light rays emitted from said light-outlet ends of said plurality of parallel fiber optic channels.

4,924,613
GARMENT WITH REPLACEABLE DISPLAYS
Morris A. Levin, 7884D Lexington Club Blvd., Delray Beach, Fla. 33446
Filed Apr. 24, 1989, Ser. No. 342,331
Int. Cl.[5] G09F *21/02*
U.S. Cl. 40—586 **2 Claims**



1. A garment for displaying interchangeable indicia, comprising:
- a garment having at least one substantially flat panel;
- a flat window means constructed of flexible and clear plastic sheet material and having a perimeter portion defining its outer edge, said perimeter portion including a top edge; and
- a first continuous gripping surface means permanently affixed to the entirety of said perimeter portion;
- a matching second continuous gripping surface means affixed to said flat panel of said garment in a pattern corresponding to that of said first continuous gripping surface means to provide a space upon said panel and within said pattern for receiving a sheet bearing said indicia, said first gripping surface means is removably engaged by said second gripping surface, in which said first gripping surface means and said second gripping surface means cooperate to seal the entire edge of said flat window means, including said top edge, to said panel and thereby completely seal said indicia therebetween.

4,924,614
GUN BARREL CONSTRUCTION
Dietrich Hoffmann, Schramberg, and Harald Weisser, Oberndorf, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany
Filed Mar. 12, 1985, Ser. No. 710,981
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409073
Int. Cl.[5] F41C *21/00*
U.S. Cl. 42—78 **5 Claims**



1. A gun barrel comprising: a rifled bore defining a projectile displacement path X and with a rifling twist Y running continuously from adjacent a gun barrel first end a first X coordinate value to a gun barrel muzzle having a muzzle X coordinate value, the rifling twist Y being described continuously over the entire projectile displacement path by a parabolic twist formula where $Y=A+BX+CX^2+DX^d$, where d is a variable between 4 and 12 with the rifling twist so described extending continuously over the entire projectile displacement path of the gun barrel between the first end and the muzzle where the second differential d^2Y/dX^2 of said twist formula at the muzzle X coordinate equals zero, thereby minimizing guide forces acting on a projectile at the muzzle.

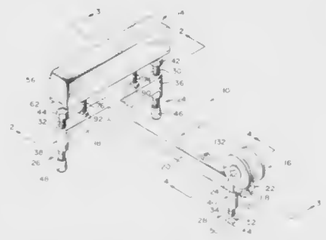
4,924,615
DETACHABLE SLING SWIVEL RETENTION DEVICE
Robert K. Ives, 44202 SE. Warriner Rd., Corbett, Oreg. 97019
Filed Jun. 8, 1989, Ser. No. 363,163
Int. Cl.[5] F41C *23/02*
U.S. Cl. 42—85 **8 Claims**



1. A sling swivel retention device, adapted for removable clip-on fastening to a sling swivel mechanism, comprising:
- an elongate rigid substantially non-flexing linear base;
- a pair of spaced elongate flex arms joined to said base adjacent its opposite ends to form with the base a generally U-shaped structure; and
- placement-cam-surfaced locking lugs joined to said arms adjacent the confronting sides thereof and toward the free ends of the arms,
- said base and arms being so constructed that, with the device in a retention position fastened to such a swivel mechanism, external pressure applied in any direction to said base is ineffective to cause relative lateral separating

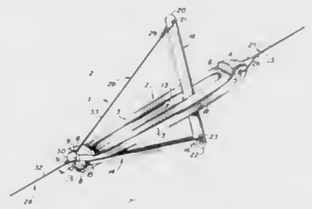
movement of said arms, with consequent accidental separation of the device from the swivel mechanism.

4,924,616
PORTABLE FIREARM REST
Ross A. Bell, 311 Frobisher Court, Saskatoon, Saskat Chewan, Canada S7K 4Y3
Filed Mar. 24, 1989, Ser. No. 328,295
Int. Cl.[5] F41C *29/00*
U.S. Cl. 42—94 **20 Claims**



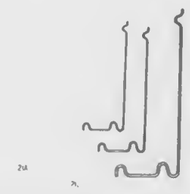
1. In a portable firearm rest comprising base means, fore rest means, aft rest means, a plurality of support post means projecting downward from said base means, said support post means being adapted to contact a substrate, said fore rest means being attached to fore rest support means mounted on said base means, the improvement comprising said fore rest means being fixedly mounted with respect to said base means, and said aft rest means being slidably mounted with respect to said base means, said aft rest means being attached to recoil slide means mounted slidably in recoil guide means in said base means, tension means including recoil spring means connecting said recoil slide means to said base means, whereby the recoil of a firearm mounted on said portable firearm rest is absorbed by said tension means.

4,924,617
HOOK SETTING DEVICE
Donald L. Parent, Rt. 1, Box 830, Karnack, Tex. 65661
Filed Jul. 27, 1989, Ser. No. 385,660
Int. Cl.[5] A01K *91/06*
U.S. Cl. 43—15 **19 Claims**



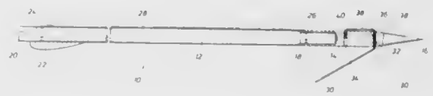
1. A hook setting device for securing a fishhook in a fish, comprising frame means adapted for suspension above a water body, a lever pivotally carried by said frame means, bias means connecting one end of said lever to said frame means, a thin flexible member carrying a fishhook at one end for receiving bait, said thin flexible member having the opposite end thereof connected to the opposite end of said lever, and trigger means provided on said thin flexible member, said trigger means adapted to..engage said frame means against the bias of said bias means to place said hook setting device in cocked configuration, whereby striking of the bait and the fishhook by a fish tensions said thin flexible member, disengages said trigger means from said frame means and sets the fishhook in the fish responsive to the tension in said bias means; said hook setting device comprising a ball seat provided in said frame means and wherein said trigger means further comprises a ball carried by said thin flexible member for seating in said ball seat and placing said hook device in said cocked configuration, wherein said ball is dislodged from said ball seat responsive to said striking of the bait and the fish hook by a fish.

4,924,618
REMOVABLE WEED GUARD AND REEF GUARD
Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.
Filed May 27, 1988, Ser. No. 199,377
Int. Cl.[5] A01K *83/00*
U.S. Cl. 43—43.6 **39 Claims**



1. Fishing apparatus comprising a set of weight-calibrated, removable and replaceable weed guards, each weed guard of said set being attachable to a single pointed hook attached to a lure whereby a weed guard of said set is a means for adjusting the effective density of said lure.

4,924,619
BOWFISHING BARBED TIP INCORPORATING POSITIVE BARB LATCH
Glen W. Dowell, 522 W. Nelda, Houston, Tex. 77037
Filed Jul. 22, 1988, Ser. No. 223,299
Int. Cl.[5] A01K *91/06*
U.S. Cl. 43—6 **7 Claims**



1. A game fishing tipped arrow including a latching barb which comprises:
- (a) an elongate arrow shaft;
- (b) a tip having a point on the forward end of said shaft;
- (c) rotatable spring wire latching barb means affixed to said tip and having a first position wherein said latching means positions a barb pointing backwardly from said tip, and further including locking tab means on said barb releasably engaging said tip at an opening in said tip for rotation to a second position such that said latching barb means can

be disengaged from a fish after said tip and said latching barb means have entered the fish;

(d) wherein said latching barb means is formed of a single piece of spring wire having four straight line segments and the fourth segment of said segments comprises said latching tab means at 90° with the connecting adjacent third straight line segment and is parallel with the second straight line segment; and

(e) wherein said tip incorporates first and second parallel drilled passages therethrough, one of said passages releasabiy engaging said latching tab means and the second of said passages engaging the parallel straight line segment and permits rotational movement of said latching barb means.

4,924,620

FLOATS FOR FISHING LINES

John B. Kimberley, 35 Linda Street, Hornsby, New South Wales 2077, Australia

Filed Apr. 14, 1989, Ser. No. 339,131
Claims priority, application Australia, Apr. 15, 1988, P17779
Int. Cl.[5] A01K *97/02*
U.S. Cl. 43—44.9 **10 Claims**



1. A fishing line float, comprising:

a substantially symmetrical body having two chambers with an axis of float symmetry passing through both chambers from one end of the float to the other end of the float, one of said chambers being a closed buoyancy chamber to provide buoyancy for the float when in use and the other chamber is a ballast chamber which is closed except for wall perforations comprising a plurality of purging perforations adjacent said other end of said float and remote from said buoyancy chamber and substantially larger in size than other perforations in said ballast chamber wall disposed between the purging perforations and said buoyancy chamber, said perforations allowing the ballast chamber to be loaded with material to temporarily weight the float and/or attract fish to the vicinity of the float when in use and allowing said material to be dispersed by water action when the float is in use; and,

means for mounting said float on a fishing line.

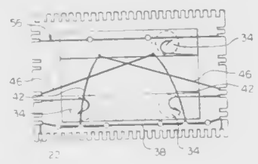
4,924,621

RIG HOLDER

Gerald C. Hawranik, Box 1150, and Norman Hiebert, Box 171, both of Beausejour, Manitoba, Canada R0E 0C0

Filed May 5, 1989, Ser. No. 347,586
Int. Cl.[5] A01K *97/06*
U.S. Cl. 43—57.2 **11 Claims**

1. A holder for fishing rigs and the like comprising a substantially flat panel of rigid material having a rectangular outline, notches spaced along each edge of the panel, a recess in a front face of the panel, two strips of one component of a two component hook and loop pile fastener secured to the front face of the



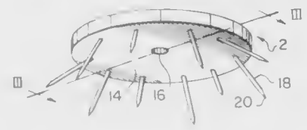
panel in the recess and a plurality of patches of the other component of the fastener.

4,924,622

BAIT PROTECTOR

Wordlow Goreham, P.O. Box 26, Woods Harbour, Shelburne County, Nova Scotia, Canada B0W 2E0

Filed Jun. 1, 1989, Ser. No. 360,096
Int. Cl.[5] A01K *69/06*
U.S. Cl. 43—100 **11 Claims**



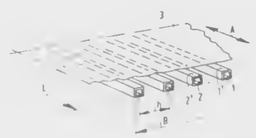
1. In a shellfish trap, a device for protecting bait impaled on a spike within said trap, said or the like, the device comprising a flat body having a centrally disposed spike receiving aperture for seating the device on the spike above the bait when impaled thereon, and a plurality of protector spikes secured to the body, the protector spikes downwardly and outwardly oriented about the body when seated on the spike.

4,924,623

SUPPORTING STRUCTURE FOR SEED BEDS

Jan L. M. van Rens, Tongerlestraat 12, 5975 NC Sevenum, Netherlands

Filed May 6, 1988, Ser. No. 190,794
Claims priority, application Netherlands, May 6, 1987, 8701062
Int. Cl.[5] A01G *1/04*
U.S. Cl. 47—18 **5 Claims**



1. Supporting structure for seed beds, in particular for cultivating mushrooms, said structure consisting of an elongated support supporting a number of transverse ribs making up a bearing surface for an elongated synthetic cloth which can be pulled in a longitudinal direction along the support by mechanical means, during which pulling of said cloth a garden mould, compost, manure and the like is deposited on said cloth or removed therefrom when during a cultivating session seed is cultivated, wherein said bearing surface for said cloth is provided by said ribs, said ribs having a length extending transverse to said longitudinal direction, and a width in said longitudinal direction, said ribs being spaced in relation to their width such that the cloth is wholly supported by the ribs, wherein the ribs are formed to describe a pattern comprising two different arrangements of ribs alternating along the longitudinal direction of the support structure, in order to reduce friction between said cloth and said support during said pulling of said cloth.

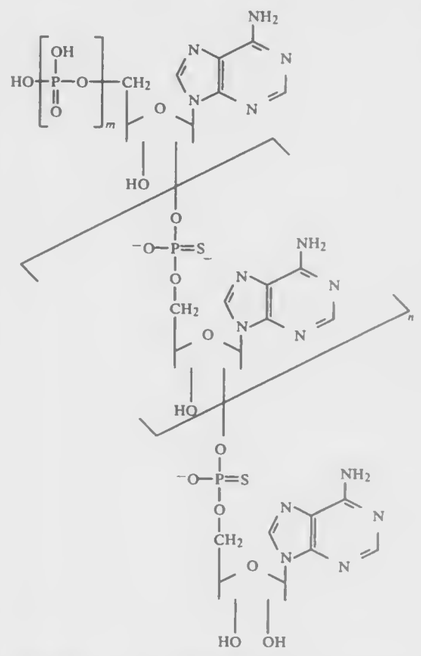
4,924,624

2,',5'-PHOSPHOROTHIOATE OLIGOADENYLATES AND PLANT ANTIVIRAL USES THEREOF

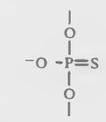
Robert J. Suhadolnik, Roslyn, Pa., and Wolfgang Pfleiderer, Konstanz, Fed. Rep. of Germany, assignors to Temple University-of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Oct. 22, 1987, Ser. No. 112,591
Int. Cl.[5] A01G *7/06*; C07H *19/167*
U.S. Cl. 47—58 **35 Claims**

1. A compound which is an optical isomer of the formula:



substantially free of contamination by other optical isomers of the same formula, wherein m is zero, 1,2 or 3; n is 1 or 2; and at least one of the internucleotide phosphorothioate groups



is of the Sp configuration; or water-soluble salt thereof.

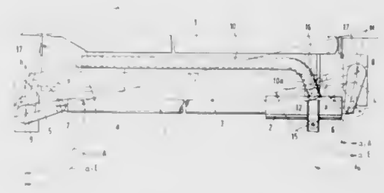
22. A method of inhibiting viral infection in plants comprising administering thereto an antiviral effective amount of a compound according to claim 1.

4,924,625

SWINGING AND SLIDING DOOR ROLLING STOCK

Dietmar Dilcher, Vellmar-West, Fed. Rep. of Germany, assignor to Gebr. Bode & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 281,113
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1987, 3742279
Int. Cl.[5] E05D *15/10*
U.S. Cl. 49—212 **10 Claims**



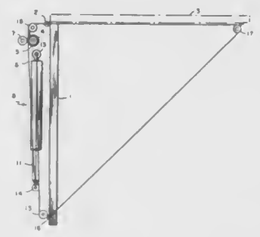
1. In a swinging and sliding door for rolling stock, having a frame, a panel, a guide along which the panel slides and means for pivoting the guide across the plane of the door including two cranks with vertical axes, the improvement wherein the means for pivoting the guide further comprises mears coupling the cranks to form a four member articulation with the frame wherein the cranks rotate in opposite directions including a rigid coupling on which the guide is mounted and connecting the cranks, and wherein the cranks have crank journals rigidly secured to the door frame.

4,924,626

DEVICE FOR AUTOMATICALLY OPENING AND CLOSING A DOOR

Si-Ling Ts'ao, Taipei, Taiwan

Filed Mar. 9, 1989, Ser. No. 321,010
Int. Cl.[5] E05F *11/04*
U.S. Cl. 49—347 **17 Claims**



1. A door opening and closing device for a door hinged for swinging movement from a closed position adjacent one wall to an open position adjacent a wall at right angles to the one wall and means for effecting swinging movement thereof, comprising a ring fixed to one wall adjacent the free edge of the door in its closed position, a first roller mounted to said one wall adjacent the hinged edge of the door, a second roller mounted to the other wall adjacent the free edge of the door when the latter is open, a rope fixed at one end to the free edge of the door and extending therefrom through the ring about the first roller, about the second roller, and back to the free edge of the door where it is fixed to the free edge of the door

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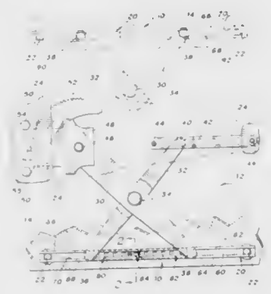
and means for traversing the rope in clockwise and counter-clockwise directions to alternately open and close the door.

4,924,627

DOWN STOP FOR CROSS ARM WINDOW REGULATOR

Michael K. Lam, Southfield, and Bohdan Kazewych, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 2, 1989, Ser. No. 415,838
Int. Cl.[5] E05F *11/44*
U.S. Cl. 49—351 **7 Claims**



1. In an automotive vehicle having a window reciprocably movable between closed and open positions and which carries a sash channel adjacent its lower edge,

a cross arm window regulator mechanism for reciprocably moving said window between its positions, said mechanism including a pair of arms pivotally connected together intermediate their ends and each being pivotally connected at one end to a guide means, said guide means being movably received within said sash channel at spaced locations, said guide means of said cross arms being movable relative to said sash channel away from each other during a first portion of travel of said window from its closed position toward its open position and then moving relative to said sash channel toward each other during the remaining portion of the travel of the window toward its open position, and a down stop means for preventing further opening movement of the window when the latter reaches its fully open position,

the improvement being that said down stop means comprises an elongated slider means which is slidably received within said sash channel between said guide means carried by said cross arms,

said slider means at its opposite ends being engageable by said guide means on said cross arms when the window is moved to its fully open position whereby said slider means prevents further movement of said guide means carried by said cross arms toward each other to provide a down stop for said window.

4,924,628

PREFABRICATED SLIDER WINDOW SYSTEM WITH LIFT-OUT WINDOWS

James A. Ruby, Fombell, Pa.; Rolf-Peter Lange, Nürnberg, Fed. Rep. of Germany, and Randy C. Hoover, Lovettsville, Va., assignors to Rehau AG & Co., Rehau, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 234,312
Int. Cl.[5] E06B *1/00*; E05D *13/00*
U.S. Cl. 49—380 **12 Claims**

1. A slider window system, comprising:

a first rectangular window with a top side and a bottom side and with a first end and a second end;

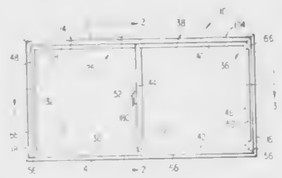
a second rectangular window with a top side and a bottom side and with a first end and a second end;

a rectangular main frame to mount the windows for horizontal sliding movement, the main frame including

an elongated bottom frame portion having a first channel in which the bottom side of the first window is slidably guided, and having a second channel in which the bottom side of the second window is slidably guided,

an elongated top frame portion having a first channel in which the top side of the first window is slidably guided and having a second channel in which the top side of the second window is slidably guided, the first and second channels of the top frame portion being deeper than the first and second channels of the bottom frame portion to permit the windows to be lifted upward by a predetermined distance into the channels of the top frame portion, the predetermined distance by which the windows can be lifted being sufficient to raise the bottom sides of the windows out of the channels of the bottom frame portion, and

first and second connecting frame portions joined to the



top and bottom frame portions, each connecting frame portion having a respective first channel which communicates with the first channels of the top and bottom frame portions and having a respective second channel which communicates with the second channels of the top and bottom frame portions;

a keeper attached to the first window adjacent the second end thereof; and

a manually operable latch attached to the second window adjacent the first end thereof, the latch being selectively engageable with the keeper when the windows are disposed at a predetermined position with respect to one another so as to selectively permit or prevent the windows from sliding with respect to one another,

wherein the first end of the first window is lodged in the first channel of one of the connecting frame portions and the second end of the second window is lodged in the second channel of the other of the connecting frame portions when the windows are disposed at the predetermined position with respect to one another.

4,924,629

ROLLING DIAPHRAGM SYSTEM FOR DEFLATING WEATHERSTRIPS

Jack E. Smith, Dayton, and Mark G. Pfeiffer, W. Alexandria, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1989, Ser. No. 329,173
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—477 **3 Claims**

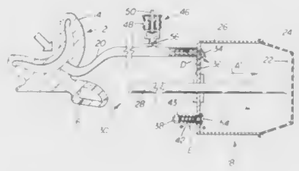
1. An apparatus for sealing between a closure and a body such as a trunk lid and body of a vehicle, comprising:

a deflatable sealing member providing resilient interference engagement between said closure and said body;

vacuum source means in the form of a rolling diaphragm pump for deflating said sealing member;

means connected to said closure to actuate said rolling diaphragm pump in response to movement of said closure; and

flow control means including an exhaust check valve and an intake check valve for regulating flow into and out of said pump, a flow line connected between said intake check valve and said sealing member for deflating said sealing member, and an atmospheric vent valve connecting said flow line to the atmosphere, said atmospheric vent valve being actuated to inflate said sealing member upon closing of said closure; said flow control means further including



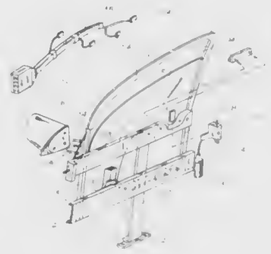
vacuum limiter means for limiting the vacuum in said rolling diaphragm pump during operation so as to maintain relatively low closing effort of said closure when there is no further available air flow from said sealing member to said pump.

4,924,630

FUNCTIONAL DOOR CARTRIDGE AND METHOD OF MANUFACTURING THEREOF

David J. Lomasney, Marine City; Robert H. Dietze, Bloomfield Hills, both of Mich., and Jeffrey D. Rohrback, Fairfield Glade, Tenn., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 177,765, Apr. 5, 1988. This application May 8, 1989, Ser. No. 349,283
Int. Cl.[5] B60J *5/04*
U.S. Cl. 49—502 **5 Claims**



1. A functional door cartridge for insertion into a motor vehicle door panel, said door panel having a door length, a bottom sill and being interconnectable with an intrusion beam, said cartridge comprising:

a reticulated frame including a plurality of vertically spaced members each extending laterally generally the same length as said door length and a plurality of laterally spaced upright frame members, one of said upright frame members extending lower than all of the other of said upright frame members and having a bottom surface positionable contiguous said bottom sill;

means for pivotally attaching the uppermost one of said vertically spaced members to said door panel, said pivotal attaching means accommodating pivoting motion of said cartridge with respect to said door panel and corresponding motion of said bottom surface with respect to said sill;

means for fixedly attaching said bottom surface to said sill subsequent to said corresponding motion;

a window mounted within said reticulated frame for up and down movement;

a window regulator mounted to said reticulated frame for moving said window up and down; and

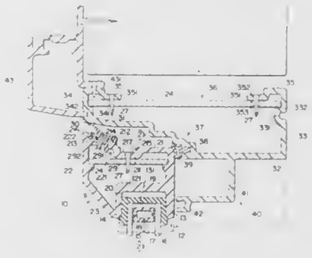
a latch mechanism mounted to said reticulated frame for latching said cartridge and door panel in a closed position with respect to said motor vehicle.

4,924,631

PULTRUDED WINDOW FRAME WITH RIGID CORNER INSERT

Lawrence W. Davies, Winnipeg, and Kenneth S. Church, Gimli, both of Canada, assignors to Omniglass Ltd., Winnipeg, Canada

Filed Nov. 7, 1988, Ser. No. 267,853
Int. Cl.[5] E06B *1/04*
U.S. Cl. 49—504 **13 Claims**



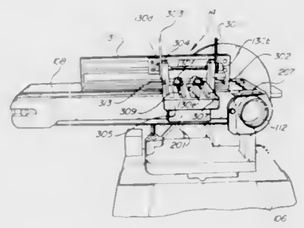
1. A window comprising a window frame having a plurality of frame parts each of said frame parts comprising an elongate substantially rigid structural member having a wall shaped to define a window pane receiving portion and at least partly enclosing a hollow interior of the frame part, each end of each of said plurality of frame parts being connected to an end of a respective one of the other frame parts to define said window frame with said receiving portions thereof cooperating to define a window pane receiving section, structural strength for each of said frame parts being provided solely by at least a portion thereof formed wholly of a thermosetting resin material reinforced by continuously longitudinally extending glass fiber reinforcing structures, said part having aperture means defining a recess in an outer surface of said wall extending longitudinally thereof for receiving a weather-stripping material extending outwardly from said recess, said window frame having a coating on an outer surface of the wall of the parts thereof, a window pane mounted in said window pane receiving section, said window pane comprising a sealed multiple glass sheet unit and a plurality of mechanical fastening members each being arranged to connect the end of one frame part to the end of a next adjacent frame part, each mechanical fastening member being rigid and including two legs at an angle each leg for projecting into a respective end of a one of the frame parts, the wall of each frame part defining a hollow box section having an inner wall part, an outer wall part and two side wall parts, each side wall part having an inwardly projecting shoulder and the outer wall part having at least one wall portion which is recessed relative to an outer surface of the outer wall part so that an inner surface of the wall portion cooperates with the shoulder to define a slot for slidingly receiving the respective leg of the member and a screw passing through said wall portion into said leg for clamping said member to said part.

4,924,632
CIRCULAR GRINDING MACHINE
Rudolf Beyer, Esslingen; Lutz-Peter Heerdt, Altbach, and Roland Schemel, Stuttgart, all of Fed. Rep. of Germany, assignors to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jun. 11, 1985, Ser. No. 743,604
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423558
Int. Cl.[5] B24B *5/00*
U.S. Cl. 51—105 R 15 Claims



1. A machine tool, particularly a circular grinding machine, comprising a base having an elongated front side, a rear side, a top side inclined relative to said front side, first guide means extending longitudinally of said front side and second guide means at said top side; a tool supporting unit movably mounted on said second guide means; and at least one work holding member mounted on said base and movable along said first guide means at the front side of said base.

4,924,633
APPARATUS FOR USE WITH STATIONARY BELT SANDER STATION
Thomas H. Hock; Michael L. O'Banion, both of Westminister, Md.; Heinrich P. F. Koehler, Hanover, Pa., and Joseph Wynes, Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.
Filed Aug. 12, 1988, Ser. No. 232,301
Int. Cl.[5] B24B *21/18*
U.S. Cl. 51—135 R 2 Claims



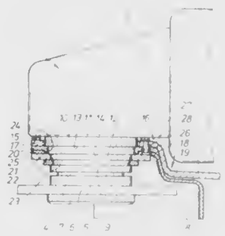
1. In a stationary belt sanding work station having an endless sanding belt engaging spaced apart rollers mounted to a belt support bed, an improved adjustable combined edge and end fence assembly comprising:
a first sanding fence member,
a second sanding fence member coupled to and extending transversely of the first member, the second member including means for effecting continuous adjustment of a position of the second member with respect to the belt support bed in a direction substantially parallel to an axis of movement of the sanding belt,
wherein the means for effecting continuous adjustment comprises first and second longitudinal slots in the second fence member respectively overlying first and second fastener receiving holes in the belt support bed and first and second fasteners respectively extending through the first and second slots into the first and second fastener receiving holes, the fence assembly being adjustable along the first and second slots upon loosening of the first and second fasteners, and the fence assembly being rotationally adjustable upon loosening of one of the first and second fasteners and removal of the other one of the first and second fasteners from its correspondingly engaged slot.

4,924,634
FINISHING ARTICLE HAVING AN INTEGRAL MOUNTING HUB AND IMPROVED BASE
Joseph H. MacKay, Jr., 17551 Cabela Dr., San Diego, Calif. 92127
Continuation-in-part of Ser. No. 5,812, Jan. 21, 1987, Pat. No. 4,760,670, which is a continuation-in-part of Ser. No. 847,793, Apr. 3, 1986, Pat. No. 4,694,615. This application Jun. 28, 1988, Ser. No. 212,448
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[5] B24B *45/00*
U.S. Cl. 51—168 18 Claims



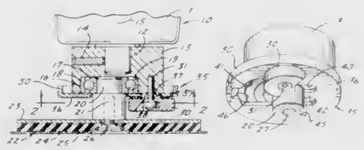
1. A finishing article having a disposable drive member non-removably affixed thereto for mounting on a threaded rotatable spindle for use with a power tool comprising:
a finishing article having a face and a back and having a first centrally disposed aperture therethrough;
a backing member having an inner and outer surface and a diameter smaller than the diameter of said finishing article and defining a second centrally disposed aperture therethrough, said backing member inner surface seated on said back of said finishing article with said first and second apertures aligned;
a retaining nut having a hollow internally threaded body having first and second ends and a first radially outwardly extending flange extending from said first end of said body, said body extending through said first and second apertures of said finishing article with said radial flange seated against said face;
means protruding outwardly from said second end of said body to non-removably secure said retaining nut and said backing member together on said finishing article without the use of adhesives and allowing relative axial movement between said retaining nub and said backing member; and
adapter means for applying force to said finishing article when said finishing article is threadably affixed to and seated on said spindle, whereby relative axial movement between said retaining nut and adapter means toward each other is permitted to thereby increasingly compress said finishing article as operative loads are applied to said finishing article during use on said power tool, said adapter means including an inverted generally cup shaped member.

4,924,635
PORTABLE GRINDER WITH ADJUSTABLE PROTECTIVE HOOD
Boris Rudolf, and Walter Blutharsch, both of Stuttgart, Fed. Rep. of Germany, assignors to C. & E. Feini GmbH & Co., Fed. Rep. of Germany
Filed Dec. 16, 1988, Ser. No. 285,795
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744219
Int. Cl.[5] B24B *23/00, 55/04*
U.S. Cl. 51—170 R 13 Claims



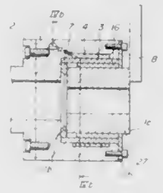
1. Portable machine tool, comprising:
a grinder housing having a clamping neck,
a protective hood mounted by means of a holding part for rotation on said clamping neck of said portable machine tool,
a locking part facing said holding part and held in a rotationally fixed manner on said grinder housing,
said holding part of said protective hood and said locking part being provided with locking elements, said holding part or said locking part comprising at least one first locking element and said respective other part several second locking elements, said first locking element being able to be brought into positive engagement with every one of said second locking elements, each engagement of said first locking element with one of said second locking elements fixing said protective hood in one definite position relative to said grinder housing and said locking elements being designed to be disengaged against the force of a spring member.

4,924,636
ORBITAL RUBBING MACHINE WITH IMPROVED SPINDLE LOCKING MEMBER
Roger T. Hoffman, Monroe Center, Ill., assignor to National-Detroit, Inc., Rockford, Ill.
Filed Oct. 20, 1989, Ser. No. 424,504
Int. Cl.[5] B24B *23/02*
U.S. Cl. 51—170 MT 8 Claims



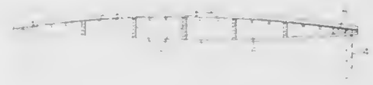
1. A rubbing machine comprising a generally circular head having a lower end, mechanism for rotating said head about a first upright axis which coincides with the axis of the head, a spindle extending downwardly from said head and supported by said head to rotate relative to said head about a second upright axis extending parallel to and offset radially from said first axis, a rubbing pad, a threaded fastener connecting said pad to the lower end of said spindle and adapted to be turned and loosened to permit removal of said pad from said spindle, and means for selectively locking said spindle against rotation relative to said head in order to permit turning and loosening of said fastener, said means comprising a generally circular plate underlying the lower end of said head and having an opening receiving said spindle, means clamping said plate to said head while permitting said plate to be selectively moved edgewise relative to said head between locked and unlocked positions, means on said plate and engageable with said spindle to prevent said spindle from rotating relative to said head when said plate is in said locked position, and abutment means on said plate and engageable with said head to keep said plate concentric with said first axis when said plate is in said unlocked position.

4,924,637
METHOD OF MACHINING CERAMIC ROTOR FOR PRESSURE WAVE TYPE SUPERCHARGER
Takahiro Ikimi, Komaki; Tsuneharu Taketomi, and Kiminari Kato, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Oct. 17, 1988, Ser. No. 258,706
Claims priority, application Japan, Oct. 21, 1987, 62-265982
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—290 5 Claims



1. A method of machining a ceramic rotor for a pressure wave supercharger, comprising the steps of:
fitting a metal cylinder on an outer circumferential surface of the ceramic rotor, such that the metal cylinder and the ceramic rotor are substantially coaxially aligned;
pressing a first end surface of said ceramic rotor against an inner bottom surface of a hydraulic chuck, such that a second end surface thereof is exposed;
hydraulically grasping said metal cylinder along an outer circumferential surface thereof with clamping means; and
machining said exposed second end surface and an inner diameter portion of said ceramic rotor.

4,924,638
DOMED SUPPORT STRUCTURE
Emil Peter, Dammweg, 8460 Marthalen, Switzerland
Filed Aug. 11, 1988, Ser. No. 231,312
Claims priority, application Switzerland, Aug. 12, 1987, 3104/87
Int. Cl.[5] E04B *7/12*
U.S. Cl. 52—86 6 Claims



1. A domed support structure comprising at least one compression dome arched in a first direction in a catenary line and extending between two opposite relatively spaced ends in said

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first direction, at least one tension dome also arched along said first direction in a catenary line and extending between said two ends, said tension dome being arranged below said compression dome, first bearing structure means arranged at said two ends for supporting said compression and said tension domes, a plurality of transverse beams extending in a second direction transverse to said first direction, said transverse beams having curved upper surfaces, said compression dome including individual elongated compression sheating elements extending along said first direction in a catenary configuration and additionally defining a curvature in said second transverse direction, said curvature corresponding to and being defined by said curved upper surfaces of said transverse beams, said tension dome including tension sheating arranged below said compression sheating of said compression dome, connection element means mounted between and connected to said compression sheating and said tension sheating for absorbing horizontal compression and tension forces of said compression and said tension sheating, respectively, and said connected compression and tension sheatings being supported at said two ends by said first bearing structure means.

4,924,639

METHOD FOR RESTRAINING VIBRATION OF A FLOOR AND APPARATUS THEREFOR

Takanori Sato, and Kazumitsu Takanashi, both of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,394
Claims priority, application Japan, Apr. 27, 1987, 62-103770; Apr. 27, 1987, 62-103771
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[5] E02D *27/34*
U.S. Cl. 52—167 DF 21 Claims



1. A vibration restraining apparatus for restraining vibrations in a floor structure of a building, wherein said floor structure is supported from structural members of said building, includes at least one floor panel, is loaded with equipment placed on said floor structure, and has a natural frequency independent of that of said building, said vibration restraining apparatus comprising:

(a) a reservoir means of prescribed dimensions;

(b) means for securing said reservoir means to said floor panel of said floor structure so that said reservoir means suspends therefrom; and

(c) liquid retained in the reservoir means, having a prescribed depth and a free surface, and being characterized by a sloshing natural frequency in which said sloshing natural frequency of the liquid is made generally equal to a dry natural frequency of the floor structure, said dry natural frequency of the floor structure corresponding to a condition in which the reservoir means without the liquid and equipment are loaded on the floor structure.

4,924,640

VIBRATION CONTROLLING APPARATUS FOR BUILDINGS

Yoji Suizu, Koganei; Nobuo Masaki, Tokorozawa; Takafumi Fujita, Nagareyama, and Hiroshi Kurabayashi, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo and Takafumi Fujita, Chiba, both of, Japan

Filed Oct. 14, 1988, Ser. No. 257,892
Claims priority, application Japan, Oct. 16, 1987, 62-261239
Int. Cl.[5] E02D *27/34*
U.S. Cl. 52—167 DF 7 Claims



1. A vibration controlling apparatus for a building, comprising; an additional mass attached to a building, elastic support means for attaching said additional mass to said building, said elastic support means comprising multi-stage elastic units each unit formed by piling plural laminated elastic bodies, each of the elastic bodies having alternately laminated elastomer layers and reinforcing plates, stabilizing plates each connecting one of said elastic units to another of said elastic units and means for applying an excitation force of a given waveform corresponding to vibration of said building to said additional mass, said means for applying an excitation force comprising a vibration sensor for detecting a vibration of said building, means for forming an excitation force of a given waveform based on the detected signal and means for transmitting said excitation force to an actuator.

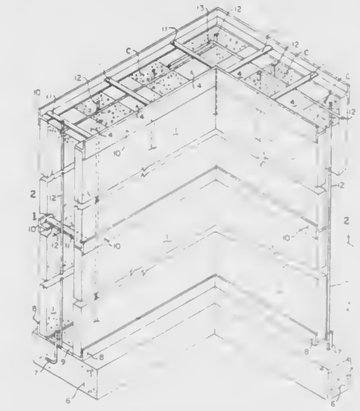
4,924,641

POLYMER BUILDING WALL FORM CONSTRUCTION

James H. Gibbar, Jr., 1100 Lottes Blvd., Perryville, Mo. 63775

Filed Apr. 1, 1988, Ser. No. 176,650
Int. Cl.[5] E04C *2/26*; E04B *2/44, 2/26*
U.S. Cl. 52—204 27 Claims

1. In an integral polymer and cement building or other structured wall form wherein forms prefabricated of polymer and the like are constructed and assembled as wall forms, and braced into position for reception of concrete therein for creation of such a composite wall, the improvement which comprises, each wall form fabricated of an extensively sized pair of sheets of polymer and spaced apart in the constructed wall a predetermined distance for forming a location for pouring of a quantity of concrete therein, a series of polymer blocks disposed between the arranged sheets, and with said blocks being integrally formed extending from the innerface of at least one of said sheets, said blocks being located at predetermined distances from each other so as to provide in the wall form construction a latticework of substantially sized communicating voids into which concrete may be deposited to form a monolithic wall constructed of concrete and the polymer wall forms, the constructed wall incorporating therein a latticework of formed concrete for reinforcement of said formed wall, and providing it with a degree of strength to function as a building wall, and for supporting of a roof or other structure thereon, said combination of the concrete latticework and the arranged polymer sheets and the blocks being integrally constructed into the formed wall for enhancement of its insulation, the formed polymer sheets and blocks being prefabricated of at least one of a polystyrene and urethane foam, the arranged sheets and blocks providing the wall forms having a series of reinforcing rods arranged therein for increasing the structural strength of any formed composite wall, there being a plurality of such wall forms forming each fabricated wall, wherein each adjacent set of vertically stacked wall forms having an exteriorly disposed and approximately horizontally arranged supporting tie between their polymer sheets to assure their alignment and the connection of said contiguous wall forms together during its assembly, wherein the supporting tie between each wall form sheet being a tee shaped tie, and a series of straps arranged across each pair of parallel arranged ties adjoining and aligning the pairs of sheets fabricated of the vertically arranged wall forms together, said wall forms at their bottom edges arranged upon a footing, and there being an



exteriorly disposed supporting tie resting upon the footing and positioning and locating each sheet of said arranged wall form upon the same, the supporting ties between each wall form and footing being an L-shaped tie, a series of straps arranged across each pair of parallel arranged L-shaped ties adjoining and aligning the pair of sheets of the contiguous wall form as supported upon the subjacent footing, said L-shaped ties setting the perimeter for the building wall, vertical bracing provided at each juncture between adjacent wall forms and aligned at their interior and exterior thereof, tie means extending between each aligned bracing and temporarily securing the same together, removable fasteners cooperating with the tie means to temporarily secured the bracings in place during wall formation, said fasteners and bracings being removable, and with said tie means remaining intact within the formed composite concrete the polymer wall.

4,924,642

DEVICE FOR MOUNTING DOORS AND WINDOWS

Per A. Juell, Kildeveien 21c, Oslo 5, Norway 0590

Filed Mar. 18, 1988, Ser. No. 170,176
Claims priority, application Norway, Mar. 20, 1987, 871152
Int. Cl.[5] E06B *1/04*
U.S. Cl. 52—217 5 Claims

1. A device for mounting a frame to an adjacent construction member, comprising:

an elongated strip of metal sheet including a hook at an end thereof;

said hook projecting from a plane of the strip end and being adapted to receive a compressive force from a tool for compressing said strip longitudinally;

said strip defining openings whose longitudinal edges form bending notches;

said strip bending into a zig-zag shape along said bending notches upon application of a compressive force at said



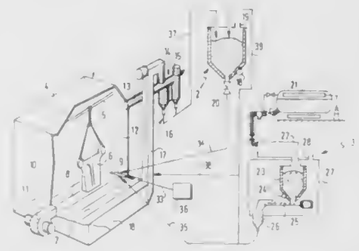
hook such that a space between said frame and adjacent construction member is filled by said bent strip.

4,924,643

METHOD AND APPARATUS FOR THE TREATMENT OF WORK PIECES BY SHOT BLASTING

Alexandre Bulguez, Aubagne, and Claude Gibot, Malakoff, both of France, assignors to Carboxyque Francaise, Puteaux, France

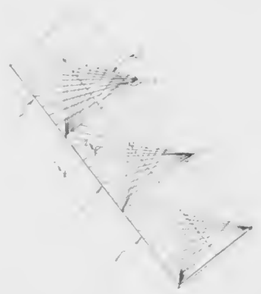
Filed Feb. 3, 1989, Ser. No. 307,128
Claims priority, application France, Feb. 12, 1988, 8801 694
Int. Cl.[5] B08B *7/00*
U.S. Cl. 51—320 2 Claims



2. Apparatus for treating workpieces by a simultaneous blasting of shot which is permanently solid at ambient temperature and particles of carbon dioxide ice, comprising a hopper for storing the shot, means for producing dry particles of carbon dioxide ice, another hopper for storing said carbon dioxide particles in dry condition, a nozzle having two lateral inlets and an axial inlet, means for conveying shot from said shop hopper to one said lateral inlet of said nozzle, means for conveying carbon dioxide particles from said another hopper to the other said lateral inlet of said nozzle, means to supply gas under pressure to said axial inlet of said nozzle, thereby to produce a high velocity stream carrying both shot and ice particles, a cabin for enclosing a workpiece against which said high velocity stream is directed, means for recovering from said cabin said shot and part of said carbon dioxide particles, means for returning said recovered shot to said shot hopper thereby to recycle said shot, and means for cooling said recovered shot with additional carbon dioxide particles prior to the feeding of the recycled shot to said nozzle.

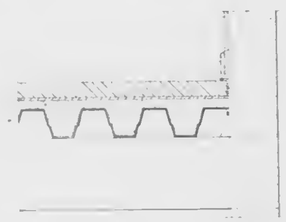
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4,924,644
CONSTRUCTION BOARD GRID SYSTEM WITH IMPRINT AND METHOD OF USING SAME
David L. Lewis, 36 Carol Dr., Cheshire, Conn. 06410
Filed May 3, 1988, Ser. No. 189,808
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—105 19 Claims



1. A building panel adapted to be cut to fit closely within a selected area of a building surface comprising an insulating member of generally rectangular configuration having a pair of essentially planar faces, said insulating member being formed from an insulating material providing insulating characteristics and readily cut, said insulating material being selected from the group consisting of wood fiber, cardboard and foamed synthetic resin, one face of said insulating member having printed thereon a grid pattern and a multiplicity of rectilinear lines extending from one corner of said panel at different angular relationships to one of the two sides thereof which intersect at said one corner, said rectilinear lines extending to the remaining sides of said panel, said panel being readily cut along any one of said rectilinear lines or of the lines of said grid for fitting of said panel to conform closely to the periphery of a selected area on a building surface.

4,924,645
COMPOSITE FLOOR STRUCTURE AND PROCESS FOR THE PRODUCTION THEREOF
Maarten A. M. Abeln, Istanbul, Turkey, assignor to Stichting Istaned, Woudenberg, Netherlands
Filed Mar. 3, 1989, Ser. No. 318,600
Claims priority, application Netherlands, Mar. 11, 1988, 8800611
Int. Cl.[5] B44D *5/08*
U.S. Cl. 52—177 8 Claims



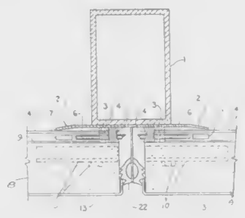
1. Composite floor structure, when installed comprising a metallic carrier section filled with sound-proofing granular material on which a cohesive covering layer is placed, wherein an elastically deformable separating layer is placed between the sound-proofing material and the covering layer.

4,924,646
WIRE GUARD
Wayne P. Marquardt, 1902 W. 6th St., Mishawaka, Ind. 46544
Filed Nov. 23, 1988, Ser. No. 275,786
Int. Cl.[5] E04B *5/48*
U.S. Cl. 52—221 5 Claims



1. A wire guard device comprising a generally C-shaped body having an interior formed by two generally parallel legs and an interconnecting web, each of said legs having first and second sides and terminating in an end spaceably located from the web, a projection member extending outwardly from each of said first and second sides of each leg away from the interior of said body and constituting means for overlying an edge of a stud to restrict transverse movement of said device relative to said stud.

4,924,647
EXTERIOR WALL PANEL DRAINAGE SYSTEM
Oscar Drucker, Bethpage, N.Y., assignor to E. G. Smith Construction Products Inc., Pittsburgh, Pa.
Filed Aug. 7, 1989, Ser. No. 393,377
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—235 9 Claims



1. In an exterior wall assembly comprising insulated wall panels, each having a core of insulating material covered with inner and outer metal coverings which are interfitted vertically by horizontal joints; the improvement comprising a vertically extending back-up flashing mounted on the side of a support mullion, fastening means and a spacer for mounting said wall panels on said back-up flashing and mullion in horizontally spaced relationship therewith with the sides of a pair of said panels spaced apart, forming a vertical gap therebetween, a gasket bridging said sides to form a vertical joint rain screen to prevent entry of rain water between said sides, horizontally extending gutters of substantially U-shape cross-section for channeling water horizontally in said gap between said back-up flashing and the inner metal coverings of said pair of panels, said gutters terminating short of said sides, a vertically extending strip of sealant adjacent the terminal ends of said gutters on each of said sides to serve as side dams for draining water and providing a primary seal, drain tubes lying in said gutters and extending through said vertically extending sealants to drain said gutters downwardly of said vertical joint.

4,924,648
STANDOFF TIMBER BASE CONNECTION
Tyrell T. Gilb, Berkeley, and Alfred D. Commins, Danville, both of Calif., assignors to Simpson Strong-Tie Company, Inc., San Leandro, Calif.
Filed Mar. 9, 1989, Ser. No. 321,186
Int. Cl.[5] E04H *12/22*
U.S. Cl. 52—295 15 Claims



1. A column base connection comprising:
a. foundation support means having a lower support means and an upper support surface;
b. a wood timber member having sides and a base;
c. a metal column base connector including:
1. a pair of laterally spaced upstanding stirrup members each formed with interconnection means positioned in registration with said sides of said wood timber member and extending upwardly from said foundation support means;
2. a standoff member having a seat member formed with a pair of spaced slot openings positioned adjacent opposite edges of said seat member each dimensioned for receipt therethrough of said respective stirrup members, and said seat is dimensioned and positioned for receipt of said base of said timber member and a pair of downwardly extending primary leg members connected to said seat member having a selected length and which bear upon said upper support surface of said foundation support means; and
3. each of said primary leg members is formed with releasable connection means preventing relative vertical movement between said standoff member and said stirrup members and formed for releasable connection to said interconnection means formed in said stirrup members; and
d. fastener means attaching said stirrup members to said wood timber member.

4,924,649
CORNER ASSEMBLY FOR A SKYLIGHT FRAME
John R. Taylor, Irving, Tex., assignor to Innovative Building Products, Inc., Dallas, Tex.
Filed Jul. 13, 1989, Ser. No. 379,479
Int. Cl.[5] E04C *2/38*
U.S. Cl. 52—656 33 Claims

1. A corner assembly for a skylight frame, comprising:
(a) first and second frame members having mitered ends and inner and outer surfaces;
(b) at least one inner joint member having first and second wings extending from a central rib;
(c) at least one outer joint member having two lateral members and walls defining a longitudinal, centrally located groove between said lateral members, with said groove walls being closely interfitted with said rib, said wings contacting end portions of said frame member inner surfaces and said lateral members contacting end portions of said frame member outer surfaces.



4,924,650
METHOD FOR THERMALLY INSULATING AN ENCLOSED VOLUME USING AN INFRA-RED RADIATION REFLECTING LAMINATE
Jürgen Dalliige, 1148 Sterling Ave., Berkeley, Calif. 94708
Filed Jun. 3, 1988, Ser. No. 202,139
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—741 9 Claims



1. A method for thermally insulating a predetermined enclosed volume defined by walls comprising the envelope of said volume comprising the step of lining at least one of said walls with an infra-red radiation-reflecting laminate, wherein said laminate comprises:
(a) an inner support layer comprising a cross-laminated polyethylene;
(b) a middle layer which is capable of reflecting infra-red radiation comprising a metallized material selected from the group consisting of aluminized polyethylene, polyethylene terephthalate and metallized polyester; and
(c) a protective outer layer which protects said middle metallized layer from corrosion, comprising:
a compound which is substantially transparent in the infra-red wavelength range selected from the group consisting of low molecular weight acrylates, low density polyethylene, polymethylene diazo methane, and isomerized cyclo-caoutchouc.

4,924,651
PROCESS OF ERECTING AN INFLATABLE BUILDING
David D. Plant, Toowoomba, Australia, assignor to Flexiplant USA, San Jose, Calif.
Division of Ser. No. 120,164, Nov. 13, 1987, Pat. No. 4,805,355.
This application Dec. 20, 1988, Ser. No. 286,737
Claims priority, application Australia, Apr. 24, 1985, PH00297
Int. Cl.[5] E04H *15/20*
U.S. Cl. 52—745 9 Claims

1. A process for erecting an inflatable building structure including the steps of:
(1) disposing a plurality of support posts on spaced opposite

VOL
1114
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sides of the building structure, at least one of said posts being pivotally mounted adjacent its lower end and at least initially disposed in a non-vertical position;

(2) attaching a roof structure formed from at least one flexible inflatable membrane to the distal ends of an opposed pair of support posts including said one pivoted post in its non-vertical position;



(3) after step (2), elevating said one post, with said one flexible inflatable membrane attached, by pivoting it from its non-vertical position into a vertical orientation and retaining said one post in fixed vertical orientation whereby said membrane is raised and spans between said pair of posts; and

(4) inflating the inflatable member.

4,924,652

INTEGRATED OFFICE MACHINE FOR FOLDING MAIL AND INSERTING IT INTO ENVELOPES

Marek Krasuski, Fontenay Aux Roses, and Bernard Prugnolle, Pantin, both of France, assignors to Societe Anonyme dite: Alcatel Satmam, Bagneux, France

Filed Jul. 17, 1989, Ser. No. 380,341

Claims priority, application France, Jul. 27, 1988, 88 10118

Int. Cl.[5] B65B *5/04, 59/04*

U.S. Cl. 53—55 **21 Claims**



1. An integrated office machine for folding items of mail and putting them into envelopes, the machine comprising a first path coupled to a mail inlet and feeding a folder having two folding pockets associated with a set of folding rollers, a second path coupled to an empty envelope inlet and feeding a filling station itself coupled to the folder to receive folded mail, and a third path fitted with means for closing the envelopes and coupled to the filling station and to an outlet for filled and closed envelopes, wherein the machine is mounted in a quasi-closed machine frame constituted by a top frame hinged to a bottom frame to open about a hinge axis at the rear end of the bottom frame, and:

said first and second paths are defined inside the top frame, and said third path is defined between said top and bottom frames, with said second path leading to said third path;

said filling station constitutes a functional filling module on said third path and at the opposite end to the envelope inlet on the second path, a portion of said functional module being mounted in the top frame and the remainder being mounted in the bottom frame; and

said folder constitutes a folding functional module between said first and third paths, with a portion of the set of folding rollers and one of the folding pockets being mounted in the top frame and with the remaining portion of the set of folding rollers and the other folding pocket being mounted in the bottom frame, the folding module having an inlet at the opposite end to the mail inlet on the first path and an outlet facing said filling module to which it is directly coupled.

4,924,653

APPARATUS FOR METERING A FOIL WEB FOR WRAPPING OBJECTS SUPPLIED ALONG A HORIZONTAL SUPPORT

Pieter J. Oly, Wormer, Netherlands, assignor to Solias Holland B.V., Netherlands

Filed Nov. 2, 1988, Ser. No. 266,118

Claims priority, application Netherlands, Nov. 3, 1987, 8702623

Int. Cl.[5] B65B *57/02, 11/06, 41/16*

U.S. Cl. 53—66 **5 Claims**



1. An apparatus for metering sheet material lengths to be wrapped around objects moving along a substantially horizontal supporting means, comprising:

a sheet material supply roll;

dispensing means for uncoiling the sheet material from the supply roll;

the sheet material having a free edge;

said dispensing means comprising driving means and metering rollers;

said metering rollers engaging the supply roll and being coupled with said driving means in such a manner that the driving action thereof is stopped after a given number of revolutions of said rollers which corresponds with a desired length of dispensed sheet material;

vertically movable guiding means for the sheet material, said guiding means being provided with gripping means adapted to frictionally engage the free edge of the sheet material;

the frictional engagement between said guiding means and the sheet material being such that the frictional engagement is released as soon as said drive means has been stopped;

the path of movement of said guiding means extending through a passage in said horizontal supporting means;

said guiding means being coupled with a driving means adapted to move said guiding means from an initial upper position above said supporting means downwards over a fixed distance towards a lower position below said supporting means, and to return said guiding means to said initial position; and

cutting means arranged between said metering rollers and the upper position of said guiding means;

said cutting means adapted to sever the sheet material portion below said cutting means from the remaining portion thereof.

4,924,654

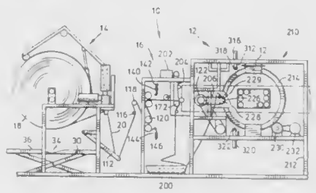
PACKAGING MACHINERY AND A METHOD OF MAKING A WRAP-AROUND SHIPPER PACKAGE

Marinus J. M. Langen, Toronto; Peter Guttinger, Rexdale, and Mihai M. Borza, North York, all of Canada, assignors to H. J. Langen & Sons Limited, Toronto, Canada

Division of Ser. No. 206,039, Jun. 13, 1988. This application Jul. 18, 1989, Ser. No. 381,373

Int. Cl.[5] B65B *9/10, 61/18*

U.S. Cl. 53—399 **4 Claims**



1. A method of forming a shipper package which comprises a plurality of load items which are arranged in a side-by-side array and a wrapper which surrounds the array of load items, the wrapper being formed from a first length of an elongated web of flexible material, said first length having a leading end and a trailing end, comprising the steps of;

(a) loading a plurality of load items into a load transfer passage of a wrapping mandrel to form a compressed assembled load therein, the load transfer passage having a discharge opening at one end thereof, the wrapping mandrel being located in a wrapping station and extending transversely thereof,

(b) locating a leading end of a first length of an elongated web of flexible material at the entrance to a wrapping station, said first length of elongated web also having a trailing end,

(c) grasping said leading end of said first length when it is located at said entrance and drawing the leading end of said first length around said mandrel along a wrapping path which is spaced from the mandrel to draw the leading length around the mandrel to substantially encircle the mandrel,

(d) severing the trailing end of said first length of web from the leading end of a subsequent length,

(e) folding the leading and trailing ends around the mandrel into an overlapping position and securing the leading and trailing ends of the first length to one another to form a sleeve,

(f) simultaneously discharging the assembled load through the discharge end of the mandrel and stripping the sleeve from the mandrel to allow the load to expand into contact with the sleeve such that the sleeve forms a wrapper which envelopes the assembled load items.

4,924,655

FLIM GUIDE SYSTEM

John L. Posey, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

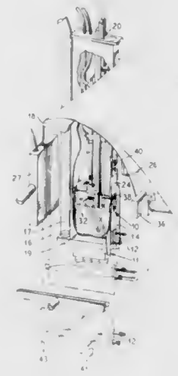
Filed Jun. 29, 1987, Ser. No. 67,346

Int. Cl.[5] B65B *9/08, 6/00*

U.S. Cl. 53—128 **23 Claims**

1. A guide system for improving the orientation of a web of film as it passes around a fill tube structure in a form, fill, seal packaging machine that includes a fitment attachment means in juxtaposition to a portion of the fill tube structure comprising:

means for placing at least a front surface of the web of film in a taut condition for at least a portion of the length of the fill tube structure it passes around, the means being removably coupled to at least one side of the fill tube structure and extending for at least a portion of its length along the side of the fill tube structure and place the web of film in



a taut condition at the portion of the fill tube structure in juxtaposition to the fitment attachment means.

4,924,656

FORMING, FILLING AND SEALING BAGS AND DEPOSITING THEM IN CARTONS

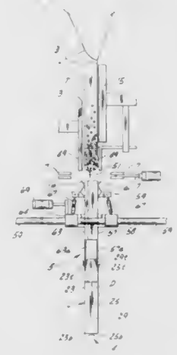
Lloyd Kovacs, and Matthew R. Lind, both of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 65,014, Jun. 19, 1987, Pat. No. 4,815,253. This application Sep. 23, 1988, Ser. No. 248,796

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] B65B *63/02*

U.S. Cl. 53—436 **25 Claims**



3. The method of forming, filling and sealing bags and depositing the bags in cartons, one bag per carton, each carton being one having front, back and side walls and closure flaps at the upper and lower ends of said walls and being of the type which may be supplied in a folded-flat collapsed condition and expanded to an open condition wherein it is substantially rectangular in transverse cross section, said method comprising:

forming flexible sheet packaging material into tubing;

intermittently feeding the tubing downwardly one bag length;

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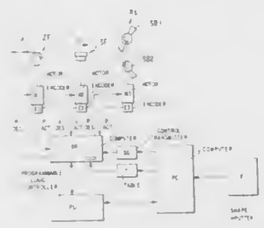
the tubing dwelling between successive feed cycles;
sealing the tubing transversely during the dwell following each downward feed of the tubing to form a seal for the top of a bag to be separated from the tubing and a bottom seal for the next bag to be formed;
delivering product into the lower end of the tubing for each bag being formed prior to the formation of the seal at the top of the bag;
positioning an opened carton at a carton loading station below and generally in line with the bag being formed for deposit of the bag in the carton;
the bag length at the lower end of the tubing, constituting a bag containing product, having a front, back and sides;
constraining said bag length at the lower end of the tubing, containing product, at the front, back and at the sides to a shape such as to fit in the said opened carton;
severing the tubing between said top and bottom seals to separate the bag from the tubing; and
removing the constraint on the said separated bag at the front and back for descent thereof into the carton;
wherein the carton is expanded in front-to-back direction for the descent of the completed filled, sealed and separated bag thereinto.

4,924,657

METHOD AND CIRCUITRY FOR CONTROLLING THE OPERATION OF A PACKING MACHINE

Martin Berti, Steckborn, and Max Frei, Mammern, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 5, 1988, Ser. No. 190,384
Claims priority, application Switzerland, May 5, 1987, 1706/87
Int. Cl.[5] B65B *9/06, 57/00*
U.S. Cl. 53—450 **7 Claims**



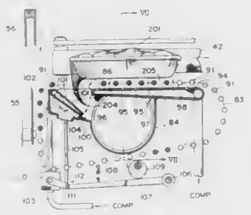
1. A method of operating a packaging machine including a supply conveyor arranged for advancing articles to be wrapped; a first motor drivingly connected to the supply conveyor; a second motor arranged for advancing a wrapper sheet codirectionally with the advance of articles; transverse sealing means for periodically providing a transverse sealing seam in front of and behind each article subsequent to wrapping the article in said wrapper sheet; and a third motor drivingly connected to said transverse sealing means; comprising the following steps:
(a) applying, to a computer means, data on consecutive rotational positions of said third motor;
(b) applying, to said computer means, data on dimensional characteristics of the articles and the wrapper sheet;
(c) calculating, with said computer means, synchronous rotary positions of said second and third motors from said data at least during periods when said transverse sealing means is in contact with said wrapper sheet; the rotary positions of said third motor being calculated such that the angular velocity of said third motor, related to corresponding angular positions of said first motor, decreases non-linearly from the beginning of an engagement phase and the angular velocity of said third motor varies during a sealing phase of said transverse sealing means for ensuring throughout a slippage-free contact between the transverse sealing means and the wrapper sheet; and
(d) applying, by said computer means, control signals, derived from the calculated rotary positions, to said first, second and third motors.

4,924,658

PACKAGING APPARATUS

Koichi Takehama, Takatsuki, Japan, assignor to Ibaraki Precision Machinery Co., Ltd., Osaka, Japan

Filed Feb. 3, 1989, Ser. No. 306,446
Claims priority, application Japan, May 16, 1988, 63-64100[U]
Int. Cl.[5] B65B *49/16*
U.S. Cl. 53—547 **10 Claims**



1. A packaging apparatus comprising:
means for transporting a plurality of articles to be packaged which are covered with a tubular film so that they are spaced from each other,
means for cutting the tubular film between adjacent articles to form a film end which is disposed forwardly as viewed in the transport direction and a film end which is disposed rearwardly as viewed in the transport direction for each article,
means for pulling both film ends respectively by air currents toward the bottom of the article,
fixed wall means adapted to engage the front film end to fold said front film end onto the bottom of the article by the force with which the article is transported,
bar-like roller means adapted to move along the bottom surface of the article at a higher speed than the transport speed of the articles, thereby catching the rear film end to fold the latter onto the bottom side of the article, and
means extending along the path of travel of said bar-like roller means and designed to blow air to urge the front and rear film ends against the bottom surface of the article.

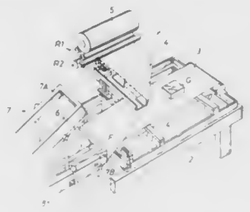
4,924,659

SEALING HEIGHT ADJUSTING DEVICE FOR PACKAGE WRAPPING APPARATUS

Haruml Watanabe, Urawa, Japan, assignor to International Sankoh Kabushiki Kaisha, Amiya Saitama, Japan

Filed Jul. 19, 1988, Ser. No. 221,327
Int. Cl.[5] B65B *9/06, 51/30*
U.S. Cl. 53—550 **5 Claims**

1. A film wrapping apparatus for wrapping articles in packages of a heat-sealable thermoplastic packaging film comprising, a film-hauling device having traveling clamping runs of upper and lower endless belts for clamping a marginal selvage of a part of a folded strip of said packaging film and advancing it longitudinally, an infeed device for positioning articles successively at a position in which longitudinal superposed parts of the folded packaging film travel respectively over and under the articles for enveloping the articles successively and packaging the articles in corresponding successively formed film packages along a path of travel of the packaging film, a heat-sealing device having an upper and a lower jaw operable to an open position for allowing successive lengths of the folded packaging film to be successively advanced thereinto and operable to a closed position for the jaws effecting heat sealing of the folded packaging film transversely across substantially the entire width along successive lengths of the film and simultaneously severing the corresponding widths of film heat sealed to form successively sealed ends of successive film packages corresponding to successive lengths of the film advanced to define the individual film packages with corresponding articles therein, the jaws having heat-sealing means for sealing in said closed position free sides of overlapping parts of the folded film along the length of the corresponding individual lengths of film defining individual packages and for simultaneously severing the marginal selvage corresponding to the individual lengths of film defining corresponding film packages with articles therein, means for taking up the severed marginal selvage in a roll as received from the film-hauling device, a discharge conveyor for receiving the successive film packages with articles therein after each successive sealing of a leading end of a corresponding film package and discharging successively the completed packages when corresponding trailing ends thereof and heat sealed and severed, and a height adjusting device for raising and lowering the heat-sealing device as a unit to selectively position the jaws thereof in relation to the height of the articles being packages and thereby in relation to the level of the film lengths ends at which a seal is effected to form the individual film packages.



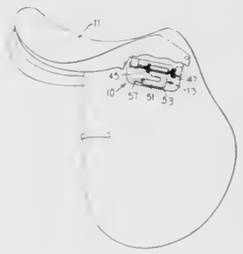
4,924,660

ADJUSTABLE STIRRUP BAR

Dennis L. Norman, and Melvin E. Norman, both of Battle Creek, Mich., assignors to Whitman Saddle Mfg., Inc., Battle Creek, Mich.

Filed Jan. 26, 1989, Ser. No. 302,433
Int. Cl.[5] B68C *1/16*
U.S. Cl. 54—46 **20 Claims**

1. An adjustable stirrup bar for a saddle, comprising:
an elongate member having first and second ends;
a stirrup hanger having means for hanging a stirrup strap therefrom, and means mounting said stirrup hanger on said elongate member for continuous adjustment along the length of said elongate member through an infinite number of use locations within a fixed range of travel between said first and second ends;
locking means for releasably locking said stirrup hanger at any desired one of said infinite number of use locations on said elongate member within said range of travel; and



mounting means for attaching said elongate member to a saddle.

4,924,661

CONSTANT CLEARANCE CONDITIONING ROLLS

Shaun A. Seymour, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Nov. 3, 1988, Ser. No. 266,618
Int. Cl.[5] A01D *43/10, 82/00*
U.S. Cl. 56—1 **3 Claims**



1. In a mower-conditioner having a mobile frame adapted for movement over a field; a crop gathering means supported from said frame to collect crop material from the field and convey the collected crop material rearwardly; a pair of opposing conditioning rolls rotatably supported by said frame rearwardly of said crop gathering means to receive said collected crop material and effect a conditioning of said collected crop material by the passage thereof between said rotating conditioning rolls, and power means for operatively powering said crop gathering means and said conditioning rolls, the improvement comprising:
each said conditioning roll is constructed with a convoluted exterior surface defining a plurality of radially outwardly extending lobes and corresponding troughs between the respective said lobes, said lobes and said troughs being configured such that the distance between the respective exterior surfaces of said opposing conditioning rolls as measured along a line of pressure interconnecting the axes of rotation of said conditioning rolls is substantially constant during the rotation of said conditioning rolls to effect a substantially uniform conditioning of said collected crop material passing between said opposing conditioning rolls, the exterior surface of each said conditioning roll being arcuate to define a mating surface with the opposing conditioning roll so that the lobes on the respective opposing conditioning rolls intermesh during rotation thereof, at least a portion of the arc defining each respective said lobe

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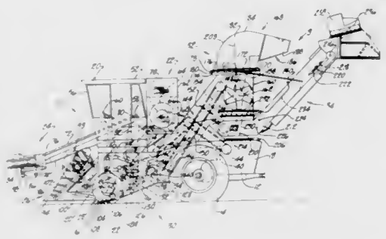
having a constant radius from a first center of curvature, at least a portion of the arc defining each said trough having a constant radius from a second center of curvature, the constant radius portion of each said lobe being connected to the constant radius portion of each adjacent trough by an arcuate surface having a variable radius of curvature.

4,924,662

CANE HARVESTER CLEANING SYSTEM

Donald J. Quick, Lot 2 Archimedes Ave., Lara, Victoria, Australia

Filed Jun. 5, 1989, Ser. No. 361,161
Int. Cl.[5] A01D *45/10*
U.S. Cl. 56—12.8 **12 Claims**



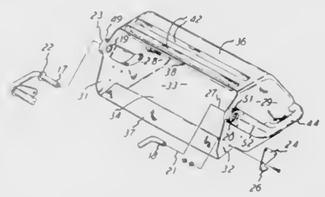
1. A sugar cane harvester including a frame, a cane stick severing assembly mounted on the frame, a cane stick chopper assembly mounted on the frame, and a billet cleaning assembly characterized by the billet cleaning assembly including a billet cleaning chamber with a front wall, a rear wall, a first side wall and a second side wall mounted on the frame, conveyor means to convey billets into an upper portion of the billet cleaning chamber, a first fan mounted on the frame, duct means to direct air from the fan into the first side wall of the billet cleaning chamber, a discharge conveyor mounted on the frame with a billet receiving end below the billet cleaning chamber and a trash discharge assembly attached to the upper portion of the billet cleaning chamber.

4,924,663

MOWER-MOUNTED GRASS CATCHER AND REEL LAWN MOWER ASSEMBLY AND METHOD OF MAKING SAME

Byron N. Ehn, Jr., Menomonee Falls, and James W. Mast, Racine, both of Wis., assignors to Textron, Inc., Providence, R.I.

Filed May 8, 1989, Ser. No. 348,967
Int. Cl.[5] A01D *34/70*
U.S. Cl. 56—202 **19 Claims**



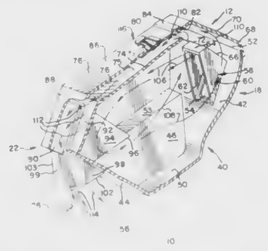
17. In a mower-mounted grass catcher and reel lawn mower assembly, a catcher and a reel mower, catcher mower-mounting means respectively on said catcher and said mower for removably mounting said catcher onto said mower, said catcher having a rigid body and being cantilever mounted on said mower to extend outward of said mower and having an opening facing said mower for receiving grass clippings thrown outwardly by said mower, said rigid body being defined by two side walls and a bottom panel and a top panel and with said panels extending between said side walls and with all being contiguous to said opening, the improvement comprising said catcher being molded to include a channel extending along each of said side walls for strength reinforcement of said side walls, said mower-mounting means of said catcher being molded in each of said channels for removably mounting said catcher onto said mower and including two axially aligned and spaced-apart pins extending along a common axis on a horizontal axis on said mower, and said catcher mower-mounting means having two bores in said channels axially aligned on a common axis for respectively sliding onto said pins in the cantilever mounting of said catcher onto said mower.

4,924,664

DUCTED COVER GRASS COLLECTION SYSTEM

John E. Hicks, 1940 Yorkshire Ct., Lincoln, Nebr. 68506, and Michael E. Allen, 5341 S. 68 St., Lincoln, Nebr. 68516

Filed Oct. 18, 1988, Ser. No. 259,163
Int. Cl.[5] A01D *34/12, 34/48, 34/70, 35/035*
U.S. Cl. 56—202 **15 Claims**



1. A ducted cover grass collection system for a lawn mower, comprising:

a hopper having a front end, a rear end, opposing sidewalls and an open upper end;

inlet means located at said front end of said hopper;

outlet means located at said rear end of said hopper;

deflector means attached to said front end of said hopper to partially cover said open upper end;

a solid hopper lid pivotally connected to said deflector means;

said hopper lid adapted to cover the remainder of said open upper end and having a duct with a front end and a rear end, said front end of said duct adapted to receive air deflected by said deflector means, said rear end of said duct being in communication with said outlet; and

said inlet means including an inlet hood projecting into said hopper to direct incoming air and entrained clippings generally horizontally toward said rear end of said hopper so that the incoming air impacts said rear end of said hopper and is deflected back towards said inlet hood and said deflector means, and eventually into said duct in said hopper lid.

4,924,665

LAWN MOWER BLADE ASSEMBLY

Gilbert O. Crosley, P.O. Box 878, Starke, Fla. 32091

Filed Dec. 19, 1988, Ser. No. 286,033
Int. Cl.[5] A01D *34/73*
U.S. Cl. 56—295 **19 Claims**

5. An improved lawn mower blade assembly adapted to rotate in a substantially horizontal plane about a vertically disposed motor shaft of a lawn mower comprising an enlarged circular rotor body having means for attachment to a motor shaft of a lawn mower and a smooth circular rim adapted to be spaced from a housing of a lawn mower, said rotor body further having an upper surface and a smooth planar lower surface having no downwardly extending protuberances, a plurality of spaced cutting elements each having a hook portion and projecting radially outwardly from said rim during normal rotation of said rotor body by a motor of a lawn mower, pivot means between each said element and adjacent said rim for freely mounting each said cutting element for unobstructed



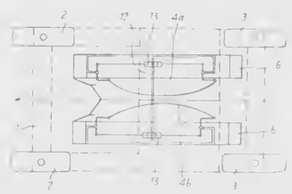
pivotable movement of each said element during normal rotation of said rotor body whereby uncuttable obstructions encountered by said cutting elements causes said elements to freely move about said pivot means, said pivot means consisting of a plurality of spaced passageways in said rotor body and adjacent said rim and a respective said hook portion of each said cutting element disposed in respective said passageway, each said cutting element being a rigid member, said elements being disposable entirely inboard of said rim when said rim is not rotating and during encounter with uncuttable obstructions.

4,924,666

MACHINE FOR HARVESTING BERRIES, AND PARTICULARLY, GRAPES

Bernard Poncet, Gradignan, France, assignor to Poly-Vecture, Langon, France

Filed Sep. 5, 1989, Ser. No. 402,189
Claims priority, application France, Sep. 5, 1988, 88 11590
Int. Cl.[5] A01D *46/28*
U.S. Cl. 56—330 **5 Claims**



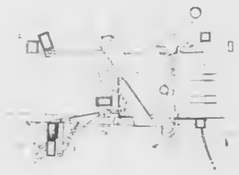
1. Machine for harvesting berries, and particularly, grapes, comprising a straddling frame (**1**) on which are mounted two sets of shaking elements (**4***a*, **4***b*), each on one side of median plane (**8**) of the machine, said shaking elements consisting of rods curved in an approximately horizontal plane and exhibiting their convexity in the direction of said median plane, characterized in that each end of each rod is jointed to a support (**10**;**10**–;**10**″) mounted to pivot around an approximately vertical pin (**11**), drive means (**12**;**12**′) being provided to move, in phase, the supports of rods on the same side of the median plane so as to move the rods parallel to themselves, and to move, in phase opposition, the supports of the rods located on one of the sides of the median plane relative to the supports of the rods located on the other side of the median plane so that, when one of the sets of rods approaches the median plane, the other set of rods moves away from it.

4,924,667

BALER WITH SUCCESSIVELY POSITIONED REACTION MECHANISM

Jan Wondergem, Rijsenhout, and Hermanus H. Vissers, Nieuw-Vennep, both of Netherlands, assignors to Multinorm B.V., Netherlands

Filed Jul. 10, 1984, Ser. No. 629,439
Claims priority, application Netherlands, Jul. 12, 1983, 8302489
Int. Cl.[5] A01D *15/08;* **B30B** *1/00*
U.S. Cl. 56—341 **10 Claims**



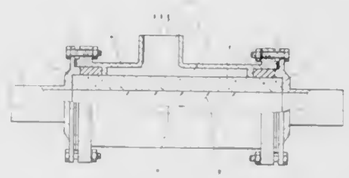
1. In an agricultural baling machine, the combination of a frame having a generally horizontally disposed baling chamber having an inlet for receiving a crop and an outlet end, means for loading crop into the baling chamber through the inlet, ram means within the baling chamber for advancing crop loaded within the baling chamber toward said outlet end thereof, reaction/guiding means for movement from a first position at said outlet end of the baling chamber extending across said outlet end in at least partially blocking relation thereto to form a reaction surface against which a bale being formed by said ram means is urged during formation of a first bale and for movement to a second position beyond said outlet end of said outlet end of the baling chamber forming a narrowing extension beyond said outlet end of the baling chamber to resist movement of said first bale out of said baling chamber so that it forms a reaction surface against which a second bale is urged by said ram means during formation of said second bale, and stop means against which said reaction/guiding means abuts when in said second position.

4,924,668

DEVICE FOR EXHAUST GAS RECIRCULATION IN DIESEL ENGINES

Detlef Panten, Korb, and Jürgen Jegelka, Aichwald, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Sep. 28, 1989, Ser. No. 413,603
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1988, 3833957
Int. Cl.[5] F02M *25/06*
U.S. Cl. 60—278 **11 Claims**



1. Device for exhaust gas recirculation in diesel engines which are equipped downstream of the internal-combustion

engine with a soot burn-off filter in the exhaust pipe of the exhaust gas stream, with an exhaust gas recirculation pipe which branches in the further course of the exhaust pipe and in which an exhaust filter for the recirculated exhaust gas is arranged, wherein the exhaust filter is arranged in the branch of the exhaust gas recirculation pipe in such a way that its surface on the contamination side lies at least approximately parallel to the direction of flow of the main exhaust gas stream and in the region and course of a normal flow line, preferably close to the wall, and the branch for the exhaust gas recirculation is fitted in the region of a pipe extension of the exhaust pipe which is restricted locally to an axial region and in the inside of which a tubular filter insert is inserted in a sealed manner, said insert having a clearance profile which coincides in position, shape and size approximately with the clearance profile of the exhaust pipe of the main exhaust gas stream, the pipe extension enclosing the filter insert on the outside at a distance.

4,924,669

COVER STRUCTURE FOR EXHAUST MANIFOLD INLET DUCTS

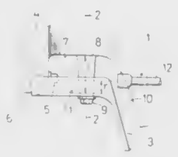
Masanori Tsutsumi, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 22, 1989, Ser. No. 354,715

Claims priority, application Japan, May 24, 1988, 63-68149[U]

Int. Cl.[5] F01N *7/10*

U.S. Cl. 60—323 **3 Claims**



1. In an exhaust manifold device comprising:

a plurality of exhaust manifold inlet ducts each bent downwards;

a cylinder head perforated with exhaust ports;

flanges integrally formed on said inlet ducts to adjust themselves to said exhaust ports and fixed to said cylinder head with bolts; and

sound-and-heat shielding covers fixed to upper and lower parts of said exhaust manifold inlet ducts in accordance with curvatures of said exhaust manifold inlet ducts,

each cover for said exhaust manifold inlet ducts being characterized in that a bent part for enabling insertion of a tool for turning said bolt in the axial direction of said bolt is formed in a lower portion of said cover, on which said lower cover portion projects in a direction of its tabular width with respect to said bolt of said flange.

4,924,670

HYDRAULIC UNIT FOR A MOTOR VEHICLE

Paul Bausch, Hattenheim, and Hans-Peter Hemmer, St. Augustin, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1988, Ser. No. 229,840

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726979

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—418 **1 Claim**

1. A hydraulic pump and accumulator assembly comprising:

a tubular housing open at a first end and at a second end and including a center wall perpendicular to the longitudinal axis of the tubular housing,

a first cover closing said first open end of said tubular housing and cooperating with said center wall in defining a first chamber in said tubular housing,

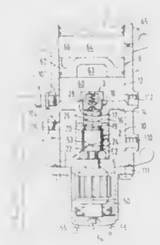
a second cover closing said second end of said tubular housing and cooperating with said center wall in defining a second chamber in said tubular housing,

means on said tubular housing for introducing into said second chamber a continuous supply of fluid at low pressure so that said second chamber defines a fluid reservoir of said pump and accumulator assembly,

a piston slidably disposed in said first chamber in said tubular housing and cooperating with said first cover in defining a variable volume accumulator gas chamber and cooperating with said center wall in defining a variable volume accumulator fluid chamber,

means on said tubular housing defining a discharge port from said accumulator fluid chamber,

means on said tubular housing defining a gas charging port for introducing gas under pressure into said accumulator gas chamber,



a cylindrical wall section in said second chamber integral with and perpendicular to said center wall and concentric with said tubular housing and cooperating with a portion of said center wall within said cylindrical wall section in defining a pump chamber,

a pump in said cylindrical wall section including an input member rotatable about the longitudinal axis of said tubular housing and an output member exposed to said pump chamber and movable in the direction of the longitudinal axis of said tubular housing,

means defining a plurality of holes in said cylindrical wall section between said reservoir and said pump chamber,

a one way valve in said center wall between said pump chamber and said accumulator fluid chamber, and

an electric motor in said second chamber having a rotor shaft aligned on the longitudinal axis of said tubular housing and connected to said rotary input member of said pump.

4,924,671

CONTROLLED SERIES HIGH-PRESSURE INTENSIFIERS FOR HYDRAULIC PRESS CYLINDED CIRCUIT

Michael Reinert, Lohr/Main, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lahr, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,661

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640236

Int. Cl.[5] F15B *3/00*

U.S. Cl. 60—428 **21 Claims**

1. Arrangement for producing high hydraulic pressures in a high pressure line for a load comprising first and second mechanically independent pressure intensifiers each having a differential piston having a smaller effective area piston face and larger effective area piston face, a respective high pressure cylinder chamber defined in part by its respective smaller piston face and connected to said high pressure line, and a

respective low-pressure cylinder chamber defined in part by its respective larger piston face; independent means for selectively communicating each of said lower pressure chambers via a respective directional control valve to a low-pressure fluid source or a tank, each of said differential pistons being moveable between a first retracted position and a second forward position, characterized in that valve means are provided for at least partially filling said high-pressure cylinder chamber



of said first pressure intensifier from a portion the volume displaced in actuating said second pressure intensifier for returning said differential piston of said first pressure intensifier to said first position when said second pressure intensifier is pressuring said high pressure line through its controlled movement and for connecting high-pressure cylinder chamber of said second pressure intensifier to said low-pressure fluid source or tank for refilling when said differential piston of said second pressure intensifier is returned to its first position.

4,924,672

HEAT EXCHANGER FOR LOWERING TEMPERATURE OF EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE

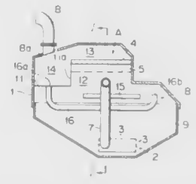
Kazuo Sekiya, and Tamotsu Kasuya, both of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 591,088

Claims priority, application Japan, Mar. 23, 1983, 58-40676[U]

Int. Cl.[5] F01N *3/04*

U.S. Cl. 60—310 **3 Claims**



1. A heat exchanger for lowering the temperature of exhaust gas emitted from an exhaust pipe of an internal combustion engine comprising a container body for storing water which serves as a heat exchanging medium therein; an exhaust gas discharging chamber for discharging hot gases in the form of gas bubbles into said water in said body and extending partially across said body; a substantially horizontal baffle plate in said container above said water in said container and above said exhaust gas discharge chamber and spaced at one side from the inner side wall of said container and forming a passage for ascending exhaust gas between said one side and said inner side wall for catching and condensing splashes of water, water bubbles and vapor generated by evaporation of water by said hot exhaust gas bubbles and drop said condensed water within the container body; an exhaust gas inlet in the peripheral side surface of said container body and connected to said exhaust pipe of said engine; an exhaust gas introduction passage connecting said exhaust gas inlet to said exhaust gas discharge chamber; an exhaust gas exit chamber in the uppermost part of the inside of said container body above said baffle plate for receiving exhaust gas bubbled through and cooled by said water; and exhaust gas outlet pipe connected to the top of said container body for discharging said exhaust gas cooled by said water to the outside of said container; a water reservoir in said container body formed by a downwardly recessed portion of said exhaust gas exit chamber for receiving said cooled exhaust gas and water droplets entrapped therein and for separating said entrapped water from said cooled exhaust gas; and an entrapped water return pipe, one end of which return pipe opens in the bottom surface of said water reservoir and the other end of which opens in said exhaust gas ascending passage between said baffle plate and the inner wall of said container body.

4,924,673

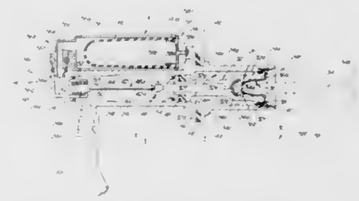
MASTER CYLINDER WITH PARALLEL-BORE RESERVOIR

David C. Barker, Utica, and Keith V. Leigh-Monstevens, Troy, both of Mich., assignors to Automotive Products plc, Warwickshire, United Kingdom

Filed Feb. 17, 1988, Ser. No. 156,820

Int. Cl.[5] B60T *11/16, 11/18, 11/22, 11/26*

U.S. Cl. 60—589 **18 Claims**



1. A hydraulic cylinder assembly comprising:

(A) a cylinder having a central axial bore and including a forward end, a rearward end, a discharge port adjacent said forward end, and a reservoir port adjacent said forward end;

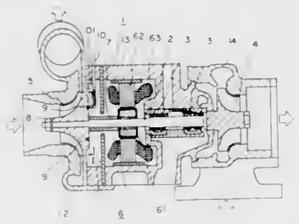
(B) a piston mounted for sliding reciprocal axial movement in said bore and operative to discharge pressure fluid through said cylinder discharge port in response to movement of said piston in said bore from a rearward retracted position to an extreme forward position spaced rearwardly of said cylinder reservoir port; and

(C) an elongated reservoir having an elongated body defining a central axial bore and including a rearward end and a discharge port adjacent its forward end;

(D) said reservoir being positioned in piggyback fashion on said cylinder with said bores extending generally parallel and in laterally offset relation to each other and with said reservoir discharge port connected to said cylinder reservoir port to provide fluid communication between said reservoir bore and said cylinder bore proximate the forward end of said cylinder assembly.

VOL
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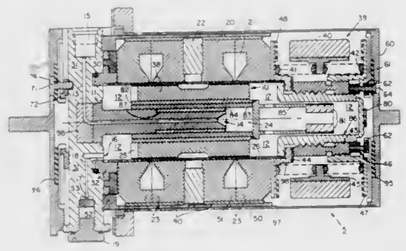
4,924,674
TURBOCHARGER WITH ROTARY ELECTRIC MACHINE
Shinji Hara, Fujisawa, and Yoshihisa Koizumi, Yokohama, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan
Filed Sep. 30, 1988, Ser. No. 251,525
Claims priority, application Japan, Sep. 30, 1987, 62-247587
Int. Cl.[5] F02B *37/00*
U.S. Cl. 60—608 **2 Claims**



1. A turbocharger with a rotary electric machine, including a turbine impeller drivable by the energy of exhaust gases emitted from an internal combustion engine, a rotatable shaft having one end coupled to the turbine impeller, a compressor impeller having blades and mounted on the other end of the rotatable shaft, a magnet rotor mounted on the rotatable shaft and having a first permanent magnet, and a stator core disposed around the magnet rotor, said turbocharger comprising:
detectable means in the form of a second permanent magnet embedded in at least one of said compressor blades for rotation therewith and positioned to identify an angular position of a magnetic pole of said magnetic rotor;
a magnetic sensor disposed in a position coacting with said second permanent magnet for detecting the angular position of said second permanent magnet upon rotation thereof; and
shield means for protecting and shielding said magnetic sensor from external magnetic and mechanical interference, said shield means comprising an annular magnetic thin steel plate disposed between said magnetic rotor and said second permanent magnet.

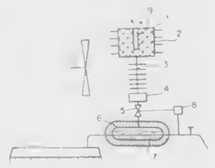
4,924,675
LINEAR MOTOR COMPRESSER WITH STATIONARY PISTON
Graham J. Higham, Ashland; Gerald R. Pruitt, Mendon; Ronald Morris, Acton, all of Mass.; Frank Heger, Burnt Hills, N.Y.; James Livingstone, Framingham, and David Tormey, Dorchester, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.
Continuation of Ser. No. 106,549, Oct. 8, 1987, abandoned. This application Jun. 26, 1989, Ser. No. 371,510
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—6 **27 Claims**

1. A cryogenic refrigerator having a compressor comprising a reciprocating armature which alternately compresses and expands to cool a portion of a working fluid to cryogenic temperatures, and a linear drive motor for driving the armature, the linear drive motor comprising;
a housing for hermetically sealing the gaseous fluid in a volume;
a coil assembly surrounding the housing;
a stationary piston within the volume and attached to the housing at one end; and



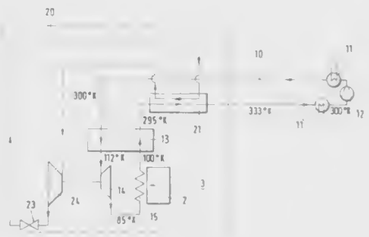
a permanent magnet armature which reciprocates within the volume, concentric about the stationary piston, and which forms a clearance seal along an outer surface of the piston.

4,924,676
ADSORPTION COOLER
Peter Maier-Laxhuber, Saumweberstrabe 14, D-8000 Munchen 60, and Fritz J. Kaubek, Heilmannstrasse 25, D-8000 Munchen 71, both of Fed. Rep. of Germany
Filed Jun. 12, 1986, Ser. No. 873,503
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521484
Int. Cl.[5] F25B *17/08*; **F25D** *3/00*
U.S. Cl. 62—59 **27 Claims**



1. A periodically operating dry adsorption cooler comprising:
an adsorption container containing a solid adsorption substance in the adsorption container, the solid adsorption substance being capable of desorbing an operating substance in the form of vapor at a relatively high vapor pressure and adsorbing during the subsequent adsorbing phase at a relatively low vapor pressure;
a condenser for liquefying the operating substance and being connected to the adsorption container;
a collection container connected to the condenser, and the adsorption container, condenser, and collection container being arranged so that the operating substance liquefied in the condenser is collected in the collection container;
an insulated cooling container for receiving the liquid operating substance from the collection container, the storage capacity of the insulated cooling container being sufficiently large so that the cooling container is capable of receiving therein operating substance in a sufficient quantity so that operating substance remains in the cooling container during the adsorption phase and at least a portion of the non-adsorbed liquefied operating substance solidifies in the insulated cooling container; and
a selectively operable shut-off member which can be opened and closed independently of the temperature and pressure of said adsorption cooler, and being located between the collection container and the insulated cooling container, whereby when the shut-off member is opened during the adsorption phase, the liquid operating substance in the collection container can flow into the insulated cooling container wherein a portion of the liquid operating substance evaporates into vapor, and the liquid operating substance can flow through the shut-off member in the form of vapor and be adsorbed back into the adsorption substance during the adsorption phase.

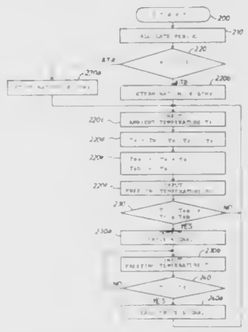
4,924,677
METHOD AND INSTALLATION FOR COOLING AN APPARATUS
Hans Quack, Pfaffikon, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Feb. 9, 1989, Ser. No. 308,263
Claims priority, application Switzerland, Mar. 18, 1988, 1034/88
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—87 **10 Claims**



8. In combination
an air-conditioned room having a computer therein; and
a cooling installation for cooling said computer, said installation including a cooling circuit for a coolant having means for work-performing expansion of the coolant to cool the coolant while generating work, a first heat exchanger downstream of said means for cooling said computer while heating the coolant and a second heat exchanger downstream of said first heat exchanger; and second means for transferring the generated work in the form of heat to said second heat exchanger to heat the coolant passing therethrough.

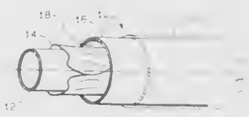
4,924,678
ELECTRIC CONTROL APPARATUS FOR ICE MAKING MACHINE
Yoshinori Ito, Shimane, Japan, assignor to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan
Filed Jul. 5, 1989, Ser. No. 375,440
Claims priority, application Japan, Jul. 5, 1988, 63-167120
Int. Cl.[5] F25B *41/00*; **F25C** *1/00*
U.S. Cl. 62—138 **2 Claims**

1. An ice making machine having an evaporator unit formed therein with a multiplicity of indivisual freezing cells and provided thereon with an evaporator in thermal exchange relationship with the freezing cells to freeze water circulated into the freezing cells during a freezing cycle, and means for supplying the water into the freezing cells, wherein an electric control apparatus for the ice making machine comprises;
first means for ascertaining a frequency of an electric power supplied to said ice making machine;
second means for detecting an actual freezing temperature of said evaporator unit;
third means for determining an optimum freezing temperature necessary for complete freezing of all the water in said freezing cells in operation under the power supply of the ascertained frequency; and
fourth means responsive to an electric signal indicative of the actual freezing temperature from said second means for maintaining the freezing cycle until the actual freezing temperature becomes lower than or equal to the optimum freezing temperature and for terminating the freezing cycle and initiating a harvest cycle for discharge of



formed ice cubes from said freezing cells when the actual freezing temperature has become lower than or equal to the optimum freezing temperature.

4,924,679
APPARATUS AND METHOD FOR EVACUATING AN INSULATED CRYOGENIC HOSE
William D. Brigham, and Eugene B. Zwick, both of Huntington Beach, Calif., assignors to Zwick Energy Research Organization, Inc., Huntington Beach, Calif.
Filed Oct. 2, 1989, Ser. No. 415,787
Int. Cl.[5] F17C *13/00*
U.S. Cl. 62—50.7 **20 Claims**



1. A cryogenic hose for use in ambient environments comprising:
a cryogenic tube for conducting the flow of a cryogenic fluid at a cryogenic temperature;
an insulating chamber thermally coupled with said cryogenic tube for insulating said cryogenic tube; and
a predetermined fluid disposed in said chamber, said predetermined fluid being gaseous at ambient temperatures and liquefying or solidifying at said cryogenic temperature, heat conducted from said predetermined fluid disposed in said chamber into said cryogenic tube causing said predetermined fluid to liquefy or solidify, thereby substantially evacuating said chamber, said evacuated chamber thermally insulating said cryogenic tube from said ambient environments,
whereby said hose provides for delivery of said cryogenic fluid without the need for repeated evacuation of said chamber by external pumping.

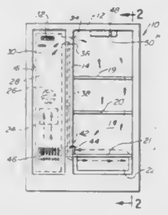
VOL
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4,924,680

REFRIGERATOR TEMPERATURE RESPONSIVE AIR OUTLET BAFFLE

Donald E. Janke, Benton Township, Berrien County, and Edwin H. Frobbieter, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 18, 1988, Ser. No. 221,038
Int. Cl.[5] F25D 17/06
U.S. Cl. 62—187 16 Claims



1. A refrigeration apparatus comprising:
a cabinet having a freezer compartment and a fresh food compartment to be cooled by refrigerated air, and a divider wall separating said compartments;
means for providing refrigerated air to cool said freezer compartment;
means for delivering air from said air providing means to said fresh food compartment comprising a first passage through said divider wall opening to a first air inlet and an elongated conduit extending from within said first passage through said divider wall and opening to a second air inlet;
means for returning air from said fresh food compartment to said air providing means comprising a second passage through said divider wall;
means associated with said air providing means for circulating refrigerated air from said air providing means through said delivering means to said fresh food compartment and from said fresh food compartment through said returning means to said air providing means; and
means for controlling the circulation of refrigerated air through said fresh food compartment by selectively opening and closing said air outlet.

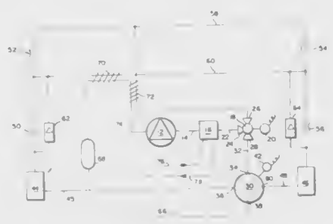
4,924,681

COMBINED HEAT PUMP AND DOMESTIC WATER HEATING CIRCUIT

Martin B. DeVit, 30 Marian Ave., Glens Falls, N.Y. 12803, and Jeffrey C. Shannon, Gansevoort, N.Y., assignors to Martin B. DeVlt, Glen Falls, N.Y.

Filed May 18, 1989, Ser. No. 354,901
Int. Cl.[5] F25B 27/00
U.S. Cl. 62—238.6 32 Claims

1. A refrigeration circuit for use in a space cooling and heating and liquid heating system comprising an indoor evaporator/condenser unit having first and second flow connections; an outdoor evaporator/condenser unit having first and second flow connections; a compressor having an inlet and an outlet; an accumulator; a pair of series arranged heat exchangers; a desuperheater/condenser unit having an inlet and an outlet; and valve means for directing refrigerant flow in different operating modes including:
(a) a first mode wherein the outlet of the compressor is connected to the inlet of the desuperheater/condenser; the outlet of the desuperheater/condenser is operatively connected to the first flow connection of the indoor evaporator/condenser unit; the second flow connection of the indoor evaporator/condenser unit is operatively connected to a first of said heat exchangers, and said first of said heat exchangers is operatively connected to the first flow connection of the outdoor evaporator/condenser unit; and the second flow connection of the outdoor evaporator/condenser is operatively connected to the accumulator and to the inlet of the compressor, and wherein refrigerant vapor is condensed in said indoor evaporator/condenser unit to thereby heat a space;
(b) a second mode wherein the liquid is diverted into said desuperheater/condenser while the refrigerant flows in a path corresponding to that in said first mode to thereby simultaneously heat the liquid by desuperheating and heat the space;
(c) a third mode wherein the outlet of the compressor is connected to the inlet of the desuperheater/condenser; the outlet of the desuperheater/condenser is operatively connected to the second flow connection of the outdoor evaporator/condenser unit; the first flow connection of the outdoor evaporator/condenser unit is operatively connected said first of said heat exchangers, and said first of said heat exchangers is operatively connected to the second flow connection of the indoor evaporator/condenser unit; and the first flow connection of said one of



said heat exchangers is operatively connected to the inlet of the indoor evaporator/condenser unit; and the outlet of the indoor evaporator/condenser unit is operatively connected to the accumulator and to the inlet of the compressor, and wherein liquid-refrigerant is evaporated in said indoor evaporator/condenser to thereby cool said space;
(d) a fourth mode wherein the liquid is diverted into said desuperheater/condenser while the refrigerant flows in a path corresponding to that in said third mode, to thereby simultaneously heat the liquid by desuperheating and cool the space; and
(e) a fifth mode wherein the outlet of the compressor is connected to the inlet of the desuperheater condenser; the outlet of the desuperheater/condenser is operatively connected to the outdoor evaporator/condenser units, to the accumulator, and to the inlet of the compressor, and wherein refrigerant vapor discharged from said compressor is condensed in said desuperheater/condenser to thereby transfer heat to liquid passing through said desuperheater/condenser; and further wherein said indoor and outdoor evaporator/condenser units are inoperative to affect air temperature of said space.

4,924,682

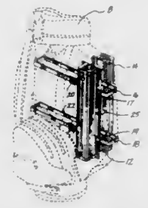
GOLF BAG BEVERAGE COOLER

Douglas B. Penner, 1-306 Ramptoo Street, Morden, Manitoba, Canada R0G 1J0

Filed May 23, 1989, Ser. No. 355,354
Int. Cl.[5] F25D 3/08
U.S. Cl. 62—372 6 Claims

1. A golf bag beverage cooler for attachment to a golf bag, comprising:
elongated base means;
strap means for securing said base means on a golf bag;

said base means having spaced parallel top and bottom portions;
can storage tube means extending between said top and bottom portions;
enclosed insulated chamber means formed adjacent said tube means;



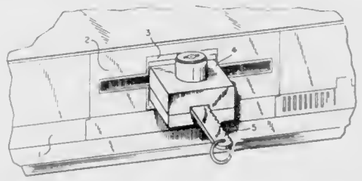
a circular access opening formed in said base top portion in alignment with an upper end of said tube means for dispensing beverage cans from said tube means;
cooling package means filled with a freezable fluid material received in said insulated chamber means;
a longitudinal slot formed in said tube means; and
a cylindrical beverage can support disk received for longitudinal sliding movement in said tube means.

4,924,683

LOCKING DEVICE FOR COMPUTER DISK DRIVES AND THE LIKE

Jay S. Derman, P.O. Box 949, Redondo Beach, Calif. 90277

Filed Jan. 2, 1990, Ser. No. 459,519
Int. Cl.[5] E05B 73/00
U.S. Cl. 70—14 4 Claims



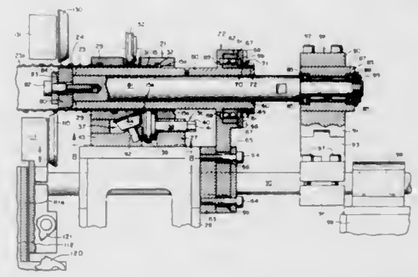
1. An improved locking device for computer disk drives, cassette tape decks or the like, for insertion into the disk drive or cassette chamber opening and for blocking access to said opening, the device comprising:
(a) a transverse block,
(b) a locking element, and
(c) a cylinder lock; said transverse block further comprising upper and lower sections, both being made of a rigid plastic material; said transverse block width being from 1.3 to 5 inches wide, depending on the device application; said upper section incorporating a rearward bearing member for the purpose of insertion in said disk drive or cassette chamber opening and also providing a surface against which said locking element bears; said upper section including a groove cut in its lower surface for accommodating and guiding said locking element, also having a hole cut vertically in its to surface of a diameter sufficient to accommodate said cylinder lock; said lower section having a circular cutout in its top surface sufficient to accommodate the bottom of said cylinder lock;
said locking element being made of 0.050 inches stainless steel or equivalent strength material, and having a width of approximately 0.375 inches and a length of approximately 3 inches; one end of said locking element being bent at a right angle to the plane of the element for a length of approximately 0.25 inches, forming a "hook" to enable hooking on to the inside wall of said disk drive or cassette chamber opening; said locking element having a sawtooth cut along one longitudinal edge, said sawtooth having a typical width, peak to valley, of 0.10 inches in order to obtain a fine adjustment in the position of said locking element when it is moved in said locking device; said cylinder lock being inserted in the hole in said upper section of said transverse block and said lower section then glued or otherwise fastened to said top section, securing said cylinder lock in place; said locking element being inserted in said groove in said upper section, completing assembly of said device; said cylinder lock, when a key is inserted in it and rotated, projecting a pin which acts against the sawtooth edge of said locking element, allowing said locking element to be pulled and ratcheted forward only;
said locking device, when said rearward member and said locking element are inserted in the opening of a disk drive, cassette tape deck or the like, being held in place by the positioning of said rearward member and the bent end of said locking element hooked over the disk drive wall; said locking element then being pulled forward until the rear surface of said transverse block bears hard against the front surface of said disk drive or cassette tape deck, blocking access to said opening, preventing device removal and unauthorized use of said disk, cassette tape deck or similar equipment.

4,924,684

APPARATUS FOR FORMING AND CUTTING SPIRAL PIPE

Wilhelmus P. H. Castricum, Rolling Meadows, Ill., assignor to Spiro America Inc., Wheeling, Ill.

Filed Feb. 23, 1989, Ser. No. 315,373
Int. Cl.[5] B21C 37/12
U.S. Cl. 72—49 4 Claims



1. An apparatus for cutting spirally formed pipe, wherein the pipe moves in an axial direction and rotates while it is being formed, comprising:
inner, rotatable knife means to be positioned inside the pipe;
outer, rotatable knife means to be positioned outside the pipe;
support roller means to be positioned outside of the pipe and opposite the outer knife means;
first means for moving the outer knife means to a position where it overlaps the inner knife means;
second means for moving the support roller means to a position where it will contact the pipe; and
guide means for allowing the inner knife means, the outer knife means, and the support roller means to move in the axial direction of the pipe, so that the inner and outer knife means will cooperate to cut the pipe when the outer knife means overlaps the inner knife means and the pipe moves

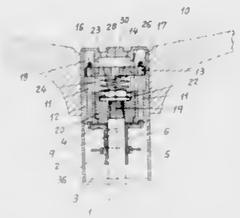
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axially and rotates between the inner and outer knife means.

4,924,685
STEERING WHEEL LOCKING MECHANISMS FOR CARS AND TRUCKS

Juan S. Usina, Avenida Joanot Martorell Nr. 38, 46600 Alcira, Valencia, Spain

Filed Feb. 17, 1989, Ser. No. 312,529
Int. Cl.[5] E05B *13/10*
U.S. Cl. 70—218 3 Claims

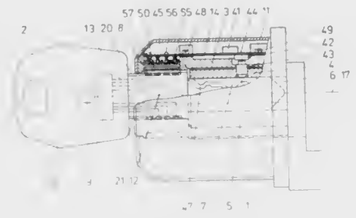


1. A steering wheel locking mechanism for vehicles, comprising:
a steering wheel, and a hub arranged centrally in said steering wheel and fixed thereto;
a steering shaft supported in said hub for relative rotation therewith and projecting in an axial direction from said hub, a hollow, spool-shaped bushing carried axially slidably on said steering shaft and axially alongside said hub, said steering shaft extending axially through said spool-shaped bushing, said spool-shaped bushing including a pair of axially spaced flanges which extend away from said steering shaft;
an ignition key switch supported stationarily relative to said hub and including a rotatably supported shaft, said shaft having at one end an eccentric cam, disposed snugly axially between said flanges of said spool-shaped bushing, eccentric rotation of said eccentric cam causing reciprocal axial displacement of said spool-shaped bushing along said steering shaft between respective locking and unlocking positions; and
locking means responsive to said axial displacement of said spool-shaped bushing for selectively locking said steering shaft to said hub and said steering wheel for rotation therewith when said spool-shaped bushing is in said locking position, said locking means including the one of said flanges of said spool-shaped bushing which faces said hub having a pair of axially extending rods mounted thereon, said rods being located on said flange so as to be substantially diametrically opposed to one another, said hub including a pair of axial through holes wherein said rods are respectively axially slidably received, each of said rods extending completely through said hub and having a reduced diameter free end portion, said locking means further including a spider extending between said reduced diameter free end portions of said rods and including a pair of holes in which said reduced diameter free end portions of said rods are respectively axially received, said free end portions of said rods being fixedly secured to said spider, said spider being carried on said rods for reciprocal axial displacement with said spool-shaped bushing.

4,924,686
CONTACT DEVICE FOR TRANSMITTING ELECTRICAL SIGNALS BETWEEN A LOCK AND KEY IN A CYLINDER LOCK

Benno Vonlanthen, Zollikofen, Switzerland, assignor to R. Bercbtold AG, Zollikofen, Switzerland

PCT No. PCT/CH88/00026, § 371 Date Oct. 4, 1988, § 102(e) Date Oct. 4, 1988, PCT Pub. No. WO88/05854, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 2, 1988, Ser. No. 279,155
Claims priority, application Switzerland, Feb. 9, 1987, 455/87; Jan. 7, 1988, 39/88
Int. Cl.[5] E05B *49/00*
U.S. Cl. 70—277 13 Claims



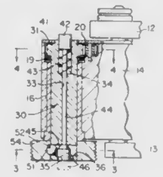
1. A contact device for the transmission of electric signals between a lock and key in a cylinder lock with a stator housing, a rotor arranged in said housing with mechanical holding devices, and a key channel within said rotor having a portion with contact elements for the transmission of signals, a key with an integrated electronic information carrier on a portion of the key barb having contact points being arranged beside mechanical codings, said key being insertable in said key channel and turnable together with said rotor, all the elements of said lock being arranged around an axis of said key channel in said rotor and being enclosed by a cylindrical protective sheath, with the distinction that on said stator housing (**3**) in the portion of contact elements (**15**, **55**) a segment of a mantle (**45**) is cut out, said cut-out (**45**) leaving free a portion of said mantle of said rotor (**5**), the portion of said key channel (**6**) serving to receive the key barb portion (**12**) with said contact points (**8**) into said opening (**45**) of said stator housing (**3**), within said protective sheath (**11**) being arranged a guide element (**16**, **50**) of electric insulation material for said mechanical contact elements (**15**, **55**) fastened to a bearing plate (**14**), said contact elements (**15**, **55**) engaging in said guide element (**15**, **50**) and including pairs of slide springs (**27**, **28** or **57**, **58**), said spring elements (**27**, **28** or **57**, **58**) in the freed portion of said rotor mantle each being placed on each side tangent to the rotor mantle and free of contact with the latter, said bearing plate (**14**) with said contact elements (**15**, **55**) and said guide elements (**16**, **50**) being set radially into said stator opening (**45**) and enclosed by said protective sheath (**11**).

4,924,687
QUICK RELEASE THREAD ROLL SUPPORT

Paul P. Francia, Rochester, N.Y., assignor to C. J. Winter Machine Works, Inc., Rochester, N.Y.

Filed Oct. 16, 1989, Ser. No. 421,947
Int. Cl.[5] B21H *3/04*
U.S. Cl. 72—102 8 Claims

1. In a thread rolling attachment for an automatic screw machine having thereon a pivotal roll supporting arm, improved means for rotatably supporting a pattern roll on one end of said arm, comprising
a shaft rotatably mounted in a bore which is formed in one end of said arm to extend transversely between opposite sides thereof, said shaft projecting at one end thereof beyond one side of said arm,
an annular pattern roll surrounding said one end of said shaft coaxially thereof, and having in its inner peripheral surface a recess which registers with a recess formed in the periphery of said one end of said shaft, and
quick release means releasably securing said roll in a predetermined axial position on said one end of said shaft,



said quick release means comprising a detent mounted between said recesses for limited radial movement relative to said roll and said one end of said shaft, and
a detent operating member mounted adjacent said detent for movement between a first position in which said member retains said detent in a locking position in which first and second portions of said detent project, respectively, into said recess in said roll and into said recess in said shaft, and a second position in which said detent is free to shift radially inwardly of one of said recesses thereby to withdraw from the other of said recesses and to permit removal of said roll axially off of said shaft.

4,924,688
MILL ROLL

John P. Cutmore, Townsville, Australia, assignor to Copper Refineries Pty. Limited, Australia

Filed Aug. 10, 1987, Ser. No. 83,241
Claims priority, application Australia, Aug. 11, 1986, PH7376
Int. Cl.[5] B21B *27/02*
U.S. Cl. 72—199 3 Claims

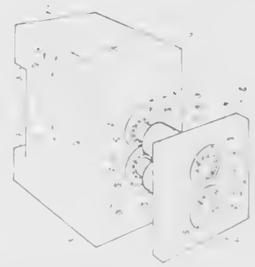


1. A mill roll for use in rolling copper intended for the production of copper wire consisting of:
a hub having a cylindrical peripheral surface on which is sleeved a ceramic annular formation to provide a mill roll working surface;
said ceramic formation having a radially inner surface, a radially outer working surface and angled side edges defining a trapezoidal cross-section,
the axial width dimension of the inner surface being greater than the axial width dimension of the outer surface and the axial width dimension of the outer surface being much greater than the radial thickness dimension,
and clamping means engaging the angled side edges of the ceramic formation and maintaining the ceramic formation under compression with a component of force pressing the inner surface of the formation against the hub peripheral surface sufficiently to take up roll forces and torque, a retaining rim mounted to one axial side of the hub by a plurality of axially extending threaded studs passing through a like plurality of stud apertures in said retaining rim and threaded into said hub;
said retaining rim having a tapered face on its axially inner surface, said face lying at an angle to correspond with the angled side edge of said ceramic annular formation.

4,924,689
ROLLING MILL

Alexander I. Wilson, Sheffield, England, assignor to Morgan Construction Company, Worcester, Mass.

Filed Mar. 2, 1988, Ser. No. 163,088
Claims priority, application United Kingdom, Mar. 4, 1987, 8705042; Mar. 4, 1987, 8705043
Int. Cl.[5] B21B *35/00*
U.S. Cl. 72—249 12 Claims



1. A rolling mill comprising:
a roll housing;
a pair of work rolls rotatable in said roll housing;
a main frame and gear housing;
respective drive gears located within said main frame and gear housing and in a first mode of operation of the mill drivably connected to said work rolls;
respective pinions located within said main frame and gear housing and in constant mesh with the respective drive gears,
means, in said first mode of operation of the mill, for causing the pinions to mesh together and for accomodating orbital adjustment of the respective drive gears towards or away from each other around the respective pinions to thereby suit the spacing of the rolls in the roll housing;
means for locating the main frame and gear housing in either one of two positions angularly spaced at 180 degrees;
and first adjustment means for adjusting the drive gears and pinions within the main frame and gear housing between said first mode of operation of the mill and a second mode of operation of the mill at which the drive gears are in mutually meshing positions and the pinions are spaced apart and orbitally adjustable towards or away from each other about their respective drive gears to thereby suit a different spacing of the rolls in the roll housing, so that, depending upon the orientation of the main frame and gear housing and the adjustment of the gearing, there is obtained either a speed increase or a gearing down through the main gearbox, this providing a speed differential between the different roll drives obtained so that rolls

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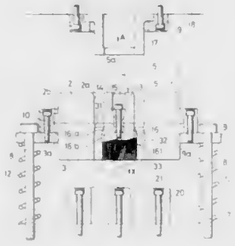
of widely varying diameters can be driven at appropriate speeds.

4,924,690

METHOD AND APPARATUS FOR PLASTICALLY FORMING HELICAL INTERNAL GEARS AND HELICAL GEARS

Hisanobu Kanamaru, Hitachi; Susumu Aoyama; Tsutomu Koike, both of Misato; Naotatsu Asahi, and Yoshiki Hirai, both of Matsudo, all of Japan, assignors to M. H. Center Limited, Saitama and Hitachi Powdered Metals Co., Ltd., Chiba, both of, Japan

Filed Dec. 20, 1988, Ser. No. 287,396
Claims priority, application Japan, Dec. 26, 1987, 62-330926
Int. Cl.[5] B21K *01/30*
U.S. Cl. 72—343 4 Claims



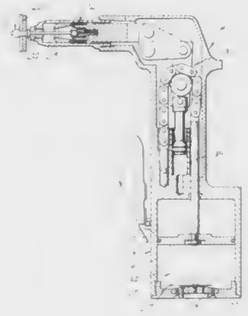
1. A method of plastically forming a helical internal gear, that employs a helical internal gear extruding die unit consisting of: an outer contour restraining container into which metal material blanks each having a central bore are to be inserted, a die placed contiguously below said container, said container and said die being arranged so as to be circumferentially rotatable relative to each other, an upper mandrel for guiding, and a lower mandrel formed on its outer circumference with a toothed section with a desired helical angle for forming helical teeth of the helical internal gear, said upper and lower mandrels being disposed inside said outer contour restraining container and said die in alignment with their axes, respectively, and being connected to be circumferentially rotatable relative to each other, said method comprising the steps of: pushing the metal material blanks successively into gaps between said upper mandrel and said outer contour restraining container and between said lower mandrel and said die by means of a punch; contracting each of the metal mandrels by an inwardly contracted portion of said die to define the sectional area as necessary to mold the helical internal gear when the metal material passes between said die and said lower mandrel; and subjecting the inner peripheral portion of the metal material to flow deformation from an incomplete toothed shape to a complete toothed shape as it goes from the upper end of an approach area in the toothed section of said lower mandrel toward the lower end thereof, when the metal material passes between said approach area and a material outer periphery expanding portion of said die located in facing relation to the former during said steps said lower mandrel being allowed to rotate due to relative rotational forces produced between the metal material and said lower mandrel caused by the helical angle of said toothed section, and also, due to effective expansion of the inner diameter of the metal material during the toothed shaped forming process, flow material being absorbed by said material outer periphery expanding portion; such portion being inclined expansively in complementary relation to said approach area of said lower mandrel, thereby keeping constant the horizontal sectional area of the metal material throughout the region of material flow deformation in said due unit.

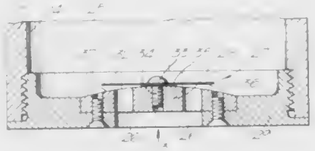
4,924,691

BREAKSTEM FASTENER INSTALLATION TOOL

Frederick A. Summerlin, Plymouth, and James C. Hendry, Barford, both of England, assignors to Avdel Systems Limited, A British Company, Hertfordshire, England

Filed Feb. 24, 1989, Ser. No. 314,777
Claims priority, application United Kingdom, Feb. 26, 1988, 8804613
Int. Cl.[5] B21J *15/34*
U.S. Cl. 72—391 8 Claims





1. A breakstem fastener installation tool, which tool comprises:

pulling means for applying tension to a stem of a fastener to cause the breakage thereof;

a pneumatically actuated piston and cylinder device for actuating said pulling means so as to tension the fastener stem, said piston and cylinder device comprising a cylinder defining first and second chambers located on either side of said piston;

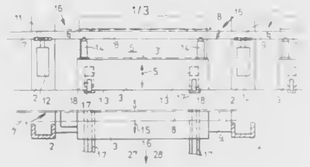
and a damping valve operatively connected to one of said chambers, said piston moving toward said one of said chambers when said piston and cylinder device actuates said pulling means so as to reduce the size of said one of said chambers, said damping valve comprising means for damping a flow of air from the piston and cylinder device and thereby applying resistance to the piston so as to restrict said movement of said piston towards said one of said chambers when the tension is suddenly released on breaking of said fastener stem, thereby to reduce mechanical shock to the tool when said fastener stem breaks.

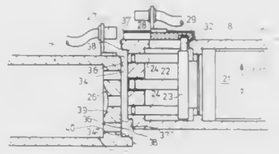
4,924,692

TRANSFER PRESS HAVING GRIPPER RAILS WHICH CAN BE TRANSVERSELY SEPARATED ALONG THEIR LENGTH

Walter Rieger, Göppingen, and Karl Thüdinm, Wäschenbeuren, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,758
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1988, 3812365
Int. Cl.[5] B21J *13/08;* B21D *43/10*
U.S. Cl. 72—405 16 Claims





1. A transfer press having connectable gripper rail parts that can be moved in a vertical lifting and lowering direction wherein the gripper rail parts comprise:

first gripper rail parts, located in the press and exchangeable gripper rail parts that can be moved out of engagement with said first gripper rail parts by sliding tables means;

coupling means for connecting the first and exchangeable gripper rail parts with one another by pressing flange facings located at front faces of the first and exchangeable gripper rails parts against one another when the first and exchangeable gripper rail parts are aligned for coupling;

the coupling means being inserted into end areas of the first and exchangeable gripper rail parts for pressing the flange facings against one another;

wherein the flange facings have flat plane surfaces, which extend parallel to the vertical lifting and lowering movement of the gripper rail parts;

control means for vertically lifting and lowering each of the first and exchangeable gripper rail parts with respect to one another and for vertically lifting and lowering the sliding table;

positioning means for controlling horizontal sliding movement of the sliding table into and out of the transfer press while the gripper rail parts are aligned for coupling without separating the gripper rail parts;

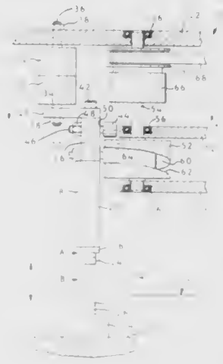
the flange facings comprising sets of complementary flange facings, which during the moving of the exchangeable gripper rail parts to coupling alignment with the first gripper rail parts, the flange faces are moved at right angles to their flat surfaces and in a direction of the vertical lifting and lowering movement or in a direction of the horizontal sliding movement of the sliding table into and out of the transfer press.

4,924,693

RAM ACTUATING MECHANISM IN A PRESS FOR TERMINATING WIRES

David A. College, Harrisburg; Keith Johnson, Jr., Manheim; Joseph F. Stachura, Palmyra, and Herman D. Walter, Marysville, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 16, 1988, Ser. No. 285,465
Int. Cl.[5] B21J *9/18*
U.S. Cl. 72—453.03 9 Claims



1. In a press for terminating wires, having a frame, a base, and a ram, said ram and base being associated with said frame and arranged for mutually opposed reciprocating movement with respect thereto,

actuating means for effecting said reciprocating movement comprising a first linkage means for causing a first portion of said movement and a second linkage means for causing a second portion of said movement which effects said termination, wherein said first portion of movement occurs over a substantially greater distance than does said second portion of movement, said second linkage means including a barrel cam having a camming surface circumscribing the cam 360° and cam follower operationally engaged therewith for effecting said second portion of movement, said second linkage means further including means for driving said cam one complete revolution of 360°.

4,924,694

APPARATUS FOR LEAK TESTING A FLUID CONTAINING CHAMBER

Donald C. Gates, Troy, Mich., assignor to Expertek, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 234,805, Aug. 22, 1988, Pat. No. 4,854,158. This application Apr. 17, 1989, Ser. No. 338,622
Int. Cl.[5] G01M *3/10*
U.S. Cl. 73—45.5 15 Claims

1. An apparatus for leak testing at least a portion of a fluid containing chamber by detecting bubbles of a gas rising from said portion when pressurized and submerged in a liquid comprising:

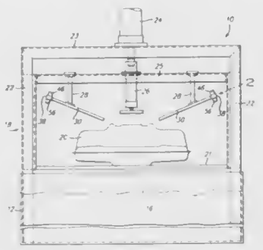
means in said liquid above said chamber for deflecting said bubbles past one of a plurality of predetermined locations;

light radiation means adjacent each of said predetermined locations for directing light radiation toward said predetermined locations;

first fiber optic means adjacent each of said predetermined locations opposite said light radiation means for receiving and transmitting a portion of said light radiation;

means operatively associated with said first fiber optic means for producing an electrical signal in response to an inter-

ruption of light radiation from said radiation means to said first fiber optic means when one of said bubbles passes one



of said predetermined locations, said electrical signal producing means being positionable out of said liquid; and means for counting the number of said electrical signals.

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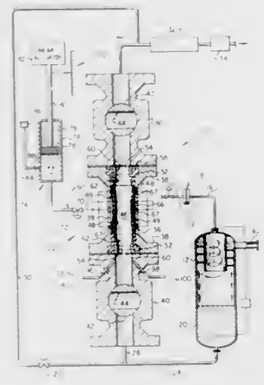
APPARATUS FOR COMPRESSING A FLUID SAMPLE TO DETERMINE GAS CONTENT AND THE FRACTION OF ONE LIQUID COMPOSITION IN ANOTHER

Miroslav M. Kolpak, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 281,421, Dec. 8, 1988, Pat. No. 4,852,395. This application Apr. 19, 1989, Ser. No. 340,607

Int. Cl.[5] G01N *33/28*

U.S. Cl. 73—61.1 R **8 Claims**



1. In a system for measuring a multiphase fluid flowstream including a water-oil-gas mixture:

separator means for separating the liquid phase of said flowstream from the gas phase, said separator means including a gas outlet conduit and a liquid outlet conduit; and

means for measuring the residual gas content of a liquid flowstream leaving said separator means through said liquid outlet conduit comprising:

a sampling apparatus including a housing section, valve means at opposite ends of said housing section and operable to be closed to define between said valve means a closed sample chamber in said housing section, a flexible liner disposed in said housing section and defining with said valve means said sample chamber and a fluid displacement chamber formed between said liner and said housing section, means for displacing fluid into said displacement chamber to cause said liner to reduce the volume of said sample chamber to determine the volumetric fraction of residual gas remaining in the sample trapped in said sample chamber.

4,924,696

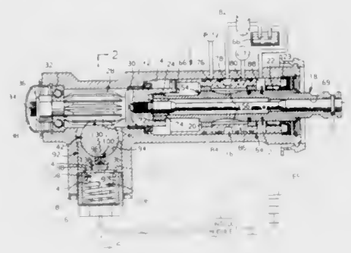
NONCONTACTING POSITION SENSOR FOR AN AUTOMOTIVE STEERING SYSTEM

Allen G. Schroeder, Livonia; Thaddeus Schroeder, Rochester Hills; Sam M. Karadsheh, Troy; Janet S. Goings, Milford, and Ronald T. Golebiewski, Romeo, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1989, Ser. No. 384,375

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—118.1 **6 Claims**



1. In a motor vehicle steering system in which steering is achieved via linear displacement of a rack mechanism with respect to a housing member along a longitudinal axis, apparatus for detecting the position of the rack mechanism as a measure of the steering angle, comprising:

sensor means including first and second magnetoresistor elements secured to said housing member in proximity the rack mechanism on an axis transverse to said longitudinal axis;

means defining a surface feature on the rack mechanism adjacent said magnetoresistor elements and on an axis diagonal to said longitudinal axis for the rack mechanism and the sensor means in relation to the displacement of said rack mechanism; and

means for developing an indication of rack position in relation to the consequent differential resistances of said magnetoresistor elements.

4,924,697

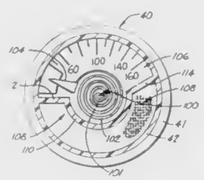
TIRE-MOUNTED AIR PRESSURE GAUGE ASSEMBLY

Glen R. Hunt, Cedar, and John F. McDaniel, Roseville, both of Minn., assignors to Permanent Tire Gauge Company, Inc., Roseville, Minn.

Continuation-in-part of Ser. No. 142,543, Jan. 1, 1988, abandoned. This application Oct. 5, 1988, Ser. No. 253,976

Int. Cl.[5] B60C *23/04*

U.S. Cl. 73—146.8 **12 Claims**



1. A tire-mounted air pressure gauge assembly for use on vehicles having inflatable tires wherein each tire has a valve stem with a conventional valve core therein, the pressure gauge assembly comprising:

an air pressure gauge having a dial face with a light-reflective background which covers substantially the entire dial face and has contrasting pressure indicia thereon for indicating the air pressure detected by the gauge; and

an adapter having means for affixing the gauge to the valve stem with an airtight connection, including means for depressing the valve core of the valve stem to allow air and pressure from the tire to pass through the adapter and to the gauge, with the adapter shaped to present the dial face in direction away from that portion of the tire adjacent the valve stem.

4,924,698

METHOD AND APPARATUS FOR REMOTE MONITORING OF OCEANOGRAPHIC CONDITIONS

Douglas C. Echert, 15917 SE. Fairwood Blvd., Renton, Wash. 98058; Edward W. Geller, 3750 79th Ave., SE., Mercer Island, Wash. 98040; Dennis J. Hanzlick, 7735 34th Ave., NE., Seattle, Wash. 98115, and James H. Morison, 7438 NE. 129th St., Kirkland, Wash. 98034

Filed Jan. 27, 1989, Ser. No. 303,165

Int. Cl.[5] G01W *1/00; B63B 22/00*

U.S. Cl. 73—170 A **28 Claims**



1. An apparatus for remote monitoring of oceanographic conditions comprising:

a surface buoy for residence on the surface; and,

a cable attached to said surface buoy suspended downward from said buoy; and,

a sensor package slidably attached to said cable for sensing oceanographic conditions; and,

movement means attached to said sensor package for moving said package along said cable in a vertical direction relative to said surface buoy.

4,924,699

POSITION MEASURING METHOD USING A SATELLITE

Hiroshi Kuroda, Hitachi; Nobuo Kurihara, Hitachiota, and Shinichi Sakamoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,664

Claims priority, application Japan, Oct. 13, 1986, 61-241308

Int. Cl.[5] G01C *21/00*

U.S. Cl. 73—178 R **4 Claims**



4. A method for position measurement in a system having a plurality of satellites wherein said position measurement is performed using positional information of each satellite which includes information of an orbital path of said satellite and information of time elapsed between transmitting a signal from said satellite and receiving said signal at a point a position of which is to be measured, said method comprising the steps of:

calculating said position of said point based on positional information from said satellites;

judging whether said position of said point is on a road of a map;

calculating a direction (O), a fluctuation from an arrangement of satellites using positional information of said arrangement of satellites when said position of said point is not on a road;

drawing a line having a gradient equal to the fluctuation direction (O) and passing through said position of said point calculated by said calculating step;

attaining an intersection between a line through passing a position of a point indicated by a result of the last position measurement and a position of a point indicated by a result of the second to the last position measurement; and

outputting as an appropriate position of said point position which exists on a road and is nearest to said intersection.

4,924,700

APPARATUS FOR MEASURING STORAGE PARAMETERS SUCH AS LEVEL AND TEMPERATURE OF LIQUIDS OR FLUIDS OF DIFFERENT DENSITIES IN A TANK

Philippe Habart, Marquise, France, assignor to Whessoe, S.A., Calais, France

Filed Dec. 13, 1988, Ser. No. 283,626

Claims priority, application France, Dec. 16, 1987, 87 17562

Int. Cl.[5] G01F *23/28; G01K 11/22*

U.S. Cl. 73—290 V **8 Claims**



1. Apparatus for measuring storage parameters such as level and temperature of fluids of different densities in a tank, the apparatus comprising:

a pulse generator for generating pulses at adjustable frequency and delivering a first clock signal at frequency f1, and a pulse shaping circuit delivering calibrated measurement pulses to a delay line constituted by a helical winding disposed substantially vertically inside the tank, whereby said winding is disposed substantially vertically in said fluids, with the end of said delay line disposed in the vicinity of the bottom of the tank being connected to a resistance;

comparator means having a comparison input terminal connected to the inlet terminal of said delay line and having an output for delivering a signal when a pulse is present on said comparison terminal;

a plurality of logic means connected in parallel to the output of said comparator means, with each logic means being firstly switched on by the appearance of a calibrated pulse at the input terminal of the delay line, and being secondly switched off by the corresponding reflection pulse gener-

ated by said line at the i-th transition between a medium of order i and a medium of order i+1;

integrator means, with each integrator means of order i being connected to the output of said logic means of corresponding order and serving to generate a voltage proportional to the time for which the corresponding logic means is switched on;

conditional inhibit means having one input receiving said pulses delivered by the comparator means, and n outputs, with outputs of order i and of lower order of the conditional inhibit means delivering a signal for switching off the corresponding logic means on the appearance of the corresponding reflected pulse Ii at the output from the comparator means;

circuit means for measuring the temperature at the top of the tank so as to determine the temperature of a first fluid;

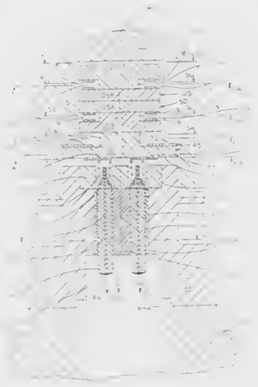
multiplexer means having multiplexing inputs connected to respective ones of the outputs from said integrator means and said circuit means.

4,924,701

PRESSURE MEASUREMENT SYSTEM

Leroy C. Delatorre, Sugar Land, Tex., assignor to Panex Corporation, Sugar Land, Tex.

Filed Sep. 6, 1988, Ser. No. 240,707
Int. Cl.[5] E21B *47/00*; G01L *9/12*
U.S. Cl. 73—151 **52 Claims**



1. A pressure transducer for measuring a media under pressure by a capacitor device comprising:

electrical capacitor means arranged for developing two interrelated capacitance measurements where such two capacitance measurements are a function of the temperature of a gaseous medium in the capacitor means, and where such two capacitance measurements provide a defined total capacitance as a function of the dielectric value of said gaseous medium,

said capacitor means having a temperature responsive element for affecting such two capacitance measurements as a function of a change in temperature in the gaseous medium in the capacitor means, and

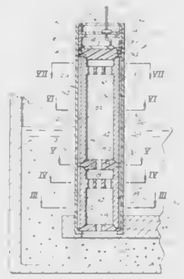
transfer means for translating a media under pressure to the gaseous medium as a function of the dielectric value of the gaseous medium.

4,924,702

LIQUID LEVEL SENSOR

Kyong Park, Thousand Oaks, Calif., assignor to Kavlico Corporation, Moorpark, Calif.

Filed Mar. 10, 1989, Ser. No. 321,892
Int. Cl.[5] G01F *23/26*; G01R *27/26*
U.S. Cl. 73—304 C **22 Claims**



1. A capacitive sensor insertable into a reservoir containing a liquid wherein said liquid undergoes indeterminable variation in contamination and electrical conductivity, said sensor comprising:

a first electrically conductive member having a first face region and a second face region elevationally displaced from said first region;

a second member of unitary construction including an electrically conductive portion and an electrically insulative portion to isolate electrically said conductive portion from said liquid when said sensor is immersed therein, said second member being in a facting relationship to said first face region to form a first capacitor having a first gap communicating externally of said sensor; and

a third member of unitary construction including an electrically conductive portion and an electrically insulative portion to isolate electricaly said conductive portion of said third member from said liquid when said sensor is immersed therein, said third member being in a facing relationship to said second face region to form a second capacitor having a second gap communicating externally of said sensor;

said sensor being adapted for positioning within said reservoir wherein said liquid entirely fills said first gap and said liquid elevationally varies in said second gap commensurately with said level of said liquid in said reservoir thereby varying capacitance of said second capacitor, such that said level of said liquid in said reservoir may be determined as a function of capacitance of said first capacitor and said second capacitor, said insulative portion of each of said second member and said third member electrically isolating said conductive portion of each of said second member and said third member from electrical conduction through said liquid between said second member and said third member.

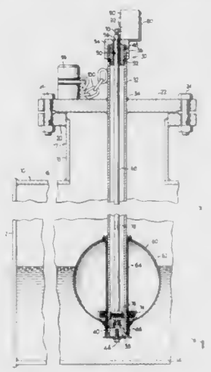
4,924,703

TANK-LEVEL ALARM CONTROL SYSTEM

John J. White, Wilmette, and Robert H. Dean, Evanston, both of Ill., assignors to Midland Manufacturing Corp., Skokie, Ill.

Filed May 5, 1989, Ser. No. 348,044
Int. Cl.[5] G01F *23/62*; H01H *35/18*
U.S. Cl. 73—308 **7 Claims**

1. Tank-level gauge for use in indicating the level of liquid in a tank, comprising an outer tube having a lower end for extending into the tank and an upper end for protruding from the tank, a float encircling said outer tube, whereby a rising level of liquid in the tank would cause said float to rise, an inner tube disposed inside the outer tube and axially movable therein and having lower and upper ends, first magnet means attached to said inner tube adjacent to the lower end thereof, second magnet means in said float generally of ring shape and encircling said outer tube and being adapted to magnetically couple to



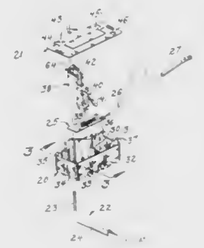
said first magnet means, whereby a rising level of liquid in the tank would cause said inner tube to rise, magnetically operable switch means laterally adjacent to said inner tube near said upper end of said outer tube, and third magnet means mounted within said inner tube and being adapted to magnetically operate said switch means when adjacent thereto.

4,924,704

FUEL SENDER ASSEMBLY REQUIRING NO CALIBRATION AND HAVING REDUCED WEAR

Robert D. Gaston, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 289,883, Dec. 27, 1988, Pat. No. 4,873,865. This application May 30, 1989, Ser. No. 359,016
Int. Cl.[5] G01F *23/32, 23/36*
U.S. Cl. 73—317 **5 Claims**



1. A fuel sender assembly comprising:

a float rod having a pivot portion and an arm portion;

a housing member having a rod hole rotatably securing said pivot portion and having an arcuate slot radially disposed from said rod hole, said rod hole being sized to substantially prevent radial movement of said pivot portion;

a resistance element secured to said housing member and having a first connection thereto;

a carrier element received by said housing member, said carrier element having an interior portion aligned with said rod hole and receiving said pivot portion of said float rod, said carrier element having an exterior portion extending through said arcuate slot for receiving said arm portion, said exterior portion permitting limited movement of said arm portion relative to said housing member in a direction substantially parallel with said pivot portion; and

spring contact means rigidly coupled to said interior portion of said carrier element for slidably contacting said resistance element as a second connection thereto;

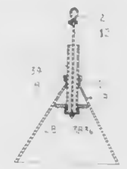
whereby vibrations of said arm portion substantially parallel with the pivotal axis of said float rod are substantially prevented from reaching said spring contact means, and said carrier element abuts the ends of said arcuate slot to provide stop limits for the rotation of said float rod.

4,924,705

PENDENT-TYPE WHEEL BALANCER

Leon R. Stanley, 40 Skyline Cir., Reno, Nev. 89509

Filed Feb. 13, 1989, Ser. No. 309,167
Int. Cl.[5] G01M *1/12*
U.S. Cl. 73—484 **1 Claim**



1. An apparatus for balancing wheels regardless of whether or not the mounting plate of the wheel is aligned with said wheel comprising:

a means for simultaneously centering and supporting said wheel in a generally horizontal position through a center hole of said wheel consisting of an upwardly tapering truncated conically-shaped body element, said element being open at the upper end;

a vertically elongated flexible suspension cable adapted to an appropriate lifting means;

a means of attachment of said cable centrally to said cone body said attaching means consisting of a disc affixed inside said cone body with the axis through the center of said disc coincident with the axis through the center of said cone body and the vertical position of said disc being above the center of gravity of said wheel when said balancing apparatus is operably engaged with said wheel;

a means for adjustment of the sensitivity of said balancing apparatus and for attachment of said cable to said disc consisting of a vertically adjustable hollow shaft, said hollow shaft being open at the upper end and having a cap on the lower end with a center hole in said cap;

said hollow shaft passing through the center of said disc and the center of said upper aperture of said cone body, said suspension cable being secured through said center hole in said cap, passing upwardly through said hollow shaft, through said open upper end of said hollow shaft for attachment to said lifting means, said shaft cap center hole being the universal pivot point about all horizontal axes whereby any imbalance condition results in tipping of said wheel, said imbalance condition being observable as lack of centrality of said cable within said open end of said shaft.

VOL 1114 ISS 3 MY 15 1990 UMI

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4,924,706

METHOD AND APPARATUS FOR DETERMINING RESONANT FREQUENCY OF A TURBINE BLADE MADE OF A METERIAL NOT RESPONSIVE TO A MAGNETIC FIELD

Donald W. Moore, Rural Hall, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 7,100,041, Sep. 23, 1987, abandoned. This application Apr. 7, 1989, Ser. No. 334,735
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—579 13 Claims



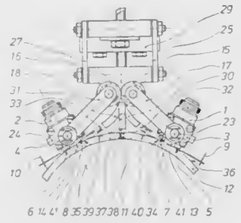
1. An apparatus for testing a turbine blade made of a material not responsive to a magnetic field, comprising:
excitation means for producing a magnetic field;
means, attached to the blade, for exciting the blade responsive to the magnetic field without substantially changing a natural resonance frequency of the blade and comprising a single steel shim; and
non-contact means for detecting twisting motion of the blade.

4,924,707

METHOD OF AND DEVICE FOR COUPLING AN ULTRASONIC PROBE TO A TEST PIECE

Wilfried Kliesch, Hagen, Fed. Rep. of Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,756
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 3725658
Int. Cl.[5] G01N *29/04*
U.S. Cl. 73—644 13 Claims



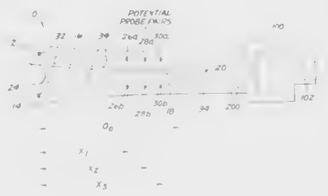
1. A method of coupling at least one ultrasonic sensor to an article to be tested by a liquid coupling medium in an automatic ultrasonic testing of strips, sheets, and pipes following each other as individual pieces, testing of said article including interior regions covered by all surfaces of said article as well as end regions and edges of said article, said method comprising the steps of: positioning said sensor along a testing path at a constant distance away from said article by a holder, said sensor having a sound emission surface with a central axis, said central axis being an axis of symmetry of said sound emission surface; positioning at least one separate free jet of coupling medium at a side of said sensor, said free jet having an axis of symmetry lying in a plane crossing said testing path, said free jet being free of exterior confining surfaces; said axis of said free jet intercepting said central axis of said sound emission surface; and forming a layer of coupling medium between said sound emission surface and the surface of said article by said jet.

4,924,708

METHOD FOR CALCULATING CRACK LENGTHS OF CONDUCTIVE SENSORS

Harvey D. Solomon, and William R. Catlin, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 9, 1989, Ser. No. 308,291
Int. Cl.[5] G01N *19/08*
U.S. Cl. 73—799 15 Claims



1. A method for measuring crack growth within a solid having a preformed crack and a crack mouth which comprises the steps of:
applying a current to the solid to produce a potential field within said solid;
making a first measurement of an initial crack length (a_o);
measuring a first set of potentials (V_o) across the crack using at least two pairs of probes positioned at predetermined distances from said crack mouth along a length of the crack, the two probes from each pair of probes being positioned on opposite sides of the crack at an equivalent distance from the mouth of the crack;
extrapolating an intercept value $(X_o)_o$ associated with said initial crack length (a_o), where said potential $V=0$, from a plot of said first set of potentials (V_o) measured as a function of said predetermined distances of the pairs of probes from said crack mouth;
making a measurement of a subsequent crack length (a_1);
measuring a second set of potentials (V_1) across the crack using the pairs of probes positioned at predetermined distances from said crack mouth;
extrapolating an intercept value $(X_o)_1$ associated with said crack length (a_1), where said potential $V=0$, from a plot of said second set of potentials (V_1) measured as a function of said predetermined distances of the pairs of probes from said crack mouth;
measuring a subsequent set of potentials (V_i) across the crack, said set of potentials (V_i) being associated with a subsequent crack length (a_i), using the pairs of probes positioned at predetermined distances from said crack mouth;
extrapolating an intercept value $(X_o)_i$ associated with said subsequent crack length (a_i), where said potential $V=0$, from a plot of said subsequent set of potentials (V_i) measured as a function of said distances of the pairs of probes from said crack mouth; and calculating said subsequent crack length (a_i) from the equation

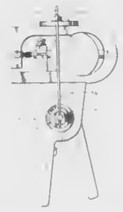
$$a_i = a_o\left[\frac{(X_o)_1 - (X_o)_i}{(X_o)_1 - (X_o)_o}\right] + a_1\left[\frac{(X_o)_i - (X_o)_o}{(X_o)_1 - (X_o)_o}\right].$$

4,924,709

TENSION TESTING TOOL

Walter J. Plyter, Maitland, Fla., assignor to Daniels Manufacturing Corporation, Orlando, Fla.

Filed May 15, 1989, Ser. No. 352,292
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—829 5 Claims



1. A hand tool for tension testing of flexible elongated members and connections thereto comprising:
a drawn cup roller clutch having a shaft and a bearing assembly, said bearing assembly and said shaft being coupled for relative concentric rotation about an axis through said shaft;
first and second plier-like handles connected for affecting unidirectional rotation of said shaft with respect to said bearing assembly, said handles being arranged in opposed relationship whereby movement of said handles towards one another effects relative rotation of said shaft and said bearing assembly in a preselected direction;
a compression gauge attached to an outer surface of an extended portion of one of said handles disposed oppositely from said handles, said gauge including a U-shaped compression beam and a dial indicator calibrated to read force as a function of relative displacement between opposed arms of said U-shaped beam;
first means attached to one of the arms of said beam for holding an end of a member to be tested for tensile strength, such first means being attached so as to cause relative displacement of said arms when the member is placed in tension; and
second means attached to said shaft for holding another end of the member, said second means being rotatable with said shaft upon closing motion of said handles to place the member in tension, said dial indicator providing a continuous indication of tension force exerted on the member.

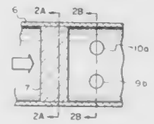
4,924,710

VORTEX FLOWMETER

Yutaka Inada, Tokyo; Kazumasa Kawasaki, Kanagawa; Shigeru Nishiyama, Kanagawa, and Hiroshi Yoshikura, Kanagawa, all of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed May 19, 1989, Ser. No. 354,222
Claims priority, application Japan, May 20, 1988, 63-123060
Int. Cl.[5] G01F *1/32*
U.S. Cl. 73—861.23 1 Claim

1. A vortex flowmeter comprising a ultrasonic wave transmitter and a ultrasonic wave receiver disposed to face each other on sides of a flow path defined by the wall of a pipe line which serve to cause ultrasonic waves transmitted by the ultrasonic wave transmitter to be propagated into the flow of fluid through the pipe line and to be received by said ultrasonic wave receiver, and adapted to measure the flow rate of said fluid by detecting any change in the phase of the ultrasonic waves due to generation of vortices by a vortex generator provided in said pipe line from the ultrasonic wave signals output from said ultrasonic wave receiver, said vortex flowmeter being characterized in that,
first and second ultrasonic wave transmitters which constitute said ultrasonic wave transmitter are disposed on the wall of said pipe line downstream of said vortex generator, first and second ultrasonic wave receivers which constitute said ultrasonic wave receiver are respectively disposed at position on the wall of said pipe line opposite to



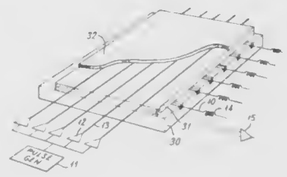
said first and second ultrasonic wave transmitters and in such a manner that the first propagation route for the ultrasonic waves propagating from said first ultrasonic wave transmitter to said first ultrasonic wave receiver and the second propagation route for ultrasonic waves propagating from said second ultrasonic wave transmitter to said second ultrasonic wave receiver intersect each other and extend in opposite directions, and the phases of the respective ultrasonic wave signals output from said first and second ultrasonic wave receivers are compared by a phase comparator so that the vortices generated by said vortex generator can be detected.

4,924,711

FORCE TRANSDUCERS FOR USE IN ARRAYS

Robert E. Reilly, London, England, assignor to National Research Development Corporation, London, United Kingdom

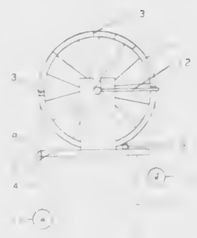
Filed Feb. 10, 1989, Ser. No. 308,676
Int. Cl.[5] G01L *5/16;* H03H *9/30;* G01R *33/12*
U.S. Cl. 73—862.04 24 Claims



1. A force transducer comprising
a magnetostrictive member which, in operation, acts as an acoustic delay line and is sensitive to changes in magnetic flux,
a conductor,
means for generating current pulses in the conductor, the conductor being positioned sufficiently close to the magnetostrictive member to cause an acoustic pulse to be launched in the magnetostrictive member each time one of the said current pulses is generated,
a force receiving member,
modifier means for varying the amplitudes of the acoustic pulses in dependence upon force applied to the force receiving member, and
detector means for deriving electrical output signals having values dependent on the amplitudes of the acoustic pulses.

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4,924,712
REACTION TIME DISPLAY DEVICE
John M. Lane, 12665 Fiori La., Sebastopol, Calif. 95472
Filed Jun. 5, 1989, Ser. No. 361,329
Int. Cl.[5] A63B 67/00
U.S. Cl. 73—865.4 1 Claim



1. A device to measure the reaction time of an individual, comprising:

a base; a freely rotatable wheel rotatable about a horizontal axis supported by the base, said wheel having indicia positioned on the rim of the wheel said indicia representative of fractions of a second; a cord means attached to the rim of the wheel at the midsection of the cord means, said cord means contacting the rim of the wheel along the circumference of at least the top half of the wheel, and having two ends, each end extending vertically downward below the horizontal axis; a first weight attached to one end of the cord means to apply a rotational force to the wheel in one direction, and a second heavier weight attached to the second end of the cord means to apply a greater rotational force to the wheel in a direction opposite to the first direction; braking means operable to stop wheel rotation; and a pointer operatively coupled to the base, and operably associated with the indicia to provide a reaction time value; whereby when the weights are released from a starting static position by an operator, the individual stops the rotation of the wheel as quickly as possible by applying the braking means, whereby the pointer and indicia provide a reaction time value.

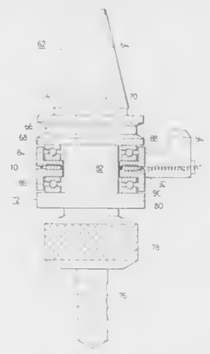
4,924,713
TRANSDUCER TO DETECT FORCE WHICH IS APPLIED TO MACHINE TOOL WHEN MACHINING WORKPIECE AND ITS ATTACHING STRUCTURE
Toshimichi Machino; Saiji Oda; Kihachirou Toubo, and Masahiro Kadosaki, all of Toyama, Japan, assignors to Elco Co., Ltd. and Toyama-ken, both of Toyama, Japan
Filed Feb. 28, 1989, Ser. No. 316,968
Claims priority, application Japan, Mar. 14, 1988, 63-59822; Mar. 14, 1988, 63-59823; Mar. 14, 1988, 63-59824
Int. Cl.[5] G01L 5/16, 1/16; B23Q 17/09
U.S. Cl. 73—862.06 5 Claims

4. A load detecting apparatus for detecting a cutting resistance or a cutting force applied to a machine tool, comprising:

a transducer comprising a film sheet type piezoelectric sensor; and

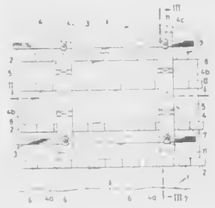
an adaptor for securing a cutting tool such as a drill bit, tap, or the like to a tool holder,

said adaptor having a bearing portion therein including a pair of thrust bearings between which said transducer is interposed, and rotation preventing means for preventing



portions of said thrust bearings between which the transducer is interposed from rotating.

4,924,714
APPARATUS FOR THE TRANSPORT OF PARTIALLY TEMPERATURE-CONTROLLED TEST MATERIAL IN STRIP FORM
Jürgen Gross, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 187,008, Apr. 27, 1988, abandoned.
This application Oct. 11, 1989, Ser. No. 423,579
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714294
Int. Cl.[5] G01N 1/00
U.S. Cl. 73—863.11 4 Claims



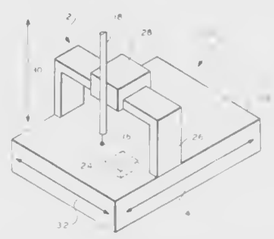
1. An apparatus for transporting test material in strip form underneath a measuring device, the test material having various test zones along the length of the strip, the apparatus comprising:

conveyor means for transporting the test material;

a retaining device disposed above the conveyor means at an angle transverse to the direction of movement of the conveyor means; and

at least one heating device movably disposed on said retaining device for selectively heating individual test zones on the test material as the test material is transported by the conveyor means.

4,924,715
CONTACT SENSING SYSTEM
Michael J. Schaffer, Mendham, N.J., assignor to Nawsir Inc., Peapack, N.J.
Continuation-in-part of Ser. No. 166,222, Mar. 10, 1988, abandoned. This application Mar. 9, 1989, Ser. No. 321,565
Int. Cl.[5] G01B 7/02
U.S. Cl. 73—865.8 4 Claims



4. A contact sensing system for a coordinate measuring machine comprising a Z-rail containing a transducer means and a stylus, said transducer means changes the energy transferred by a work piece contacting the stylus into an electrical signal; and an electrical circuit means remote from the Z-rail including an amplifier section which amplifies electrical signals from the transducer means and suppresses signals which come from sources other than from the transducer, a comparator section connected to the amplifier section for instantaneous triggering of a signal to indicate that contact has been made when the output from the amplifier section deviates from null by a preset amount, and including a timer section connected to the comparator section for preventing further signals after the initial signal of contact for a preset amount of time, and including an output section connected to the timer section for making the initial signal compatible with the desired output signal wherein the amplifier section comprises three op-amps, the first of which has a first potentiometer means for adjusting the offset of its output, the negative end of the transducer is connected to the non-inverting input of a first op-amp and is connected to ground through a second potentiometer means, the positive end of the transducer is connected to the non-inverting input of a second op-amp and is connected to ground through a resistor, the output of the first op-amp is connected to its inverting input through a resistor, the output of the second op-amp is connected to its inverting input through a resistor, the inverting inputs of the first and second op-amps are connected to each other through a resistor, the output of the first op-amp is connected to the inverting input of a third op-amp through a resistor, the output of the second op-amp is connected to the non-inverting input of the third op-amp through a resistor, the inverting input of the third op-amp is connected to its output through a resistor, the non-inverting input of the third op-amp is connected to ground through a resistor.

4,924,716
DISSOLUTION TESTING APPARATUS
Ortwin Schneider, Weiterstadt, Fed. Rep. of Germany, assignor to Erweka Apparatebau GmbH, Heusenstamm, Fed. Rep. of Germany
Filed May 16, 1989, Ser. No. 352,277
Claims priority, application European Pat. Off., May 19, 1988, 88107995.8
Int. Cl.[5] G01N 19/00
U.S. Cl. 73—866 13 Claims

1. A dissolution testing apparatus comprising in combination

a rinsing stand comprising at least one rotatable rinsing paddle capable of being lifted and lowered in a vertical direction relative to a measuring vessel,

a test stand comprising at least one rotatable test stand mixing paddle capable of being lifted and lowered in a vertical direction relative to a measuring vessel,

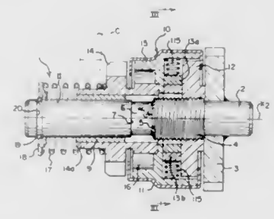
a movable support means including at least one measuring vessel, wherein by means of lowering said test stand mixing paddle, a liquid containing a substance to be examined with respect to its dissolution behaviour can be stirred, said support means being movable between said rinsing stand and said test stand during a lifted position of said test stand paddle and said rinsing paddle, and shiftable with respect to said rinsing stand and said test stand,



a suction pipe including a filter by means of which the liquid containing the substance to be examined is extractable when said support means is in the position of said test stand, said suction pipe being lifted and lowered together with the lifting and lowering of said test stand mixing paddle relative to the measuring vessel, and

a filter stripping means mounted on said movable support means by means of which said filter can be engaged by said filter stripping means in a first defined position of said movable support means.

4,924,717
STARTER FOR INTERNAL COMBUSTION ENGINES
Vittorio Aimo, Carignano, Italy, assignor to Efel S.p.A., Turin, Italy
Filed Mar. 14, 1989, Ser. No. 323,447
Claims priority, application Italy, Mar. 18, 1988, 67243 A/88
Int. Cl.[5] F02N 15/06
U.S. Cl. 74—7 B 28 Claims



1. In a starter for internal combustion engines, the starter including:

a main shaft which is selectively rotatable, said main shaft having a threaded portion;

a movable assembly fitted on the main shaft and provided with pinion means rotatable with the main shaft, said pinion means being for operatively engaging a rotatable member of an engine, said movable assembly further including a threaded member having threading means for

threadedly engaging said threaded portion of the main shaft and for moving said movable assembly, upon rotation of said main shaft, towards an advanced position at which the pinion means operatively engages the rotatable member of the engine, and

centrifugally acting means having members which move apart upon rotation of the main shaft, wherein the improvement comprises:

said main shaft has a tapered part which tapers in a direction of movement of the movable assembly towards its said advanced position;

said tapered part is defined by a tapered shoulder of the main shaft, and said tapered part tapers in the direction of movement of said movable assembly towards its said advanced position; and

said centrifugally acting means includes at least one profiled portion means for embracing the tapered part of the main shaft as said members of the centrifugally acting means move apart, whereby said movable assembly is held in said advanced position by said centrifugally acting members until the internal combustion engine has been started, after which said movable assembly is allowed to move out of said advanced position.

4,924,718

OMNIDIRECTIONAL OSCILLATOR (GLOVER GEAR)

Marvin J. Glover, 3900 16th St., NW., #501, Washington, D.C. 20011

Continuation-in-part of Ser. No. 923,618, Oct. 27, 1986, Pat. No. 4,757,722. This application Jul. 18, 1988, Ser. No. 220,262

Int. Cl.[5] F16H *37/12*

U.S. Cl. 74—25 **9 Claims**



1. A mechanism for transforming continuous unidirectional rotating motion into a plurality of arcuate motions intersecting through a common point, comprising:

a motor means;

a rotary drive shaft means having a rotational axis and being operatively connected to the motor means, said rotary drive shaft means supporting a shaft portion which has a longitudinal axis that forms an acute angle with an imaginary line continuous with the rotational axis of the rotary drive shaft means;

body means being continuously rotated around the longitudinal axis of the shaft portion and also being continuously revolved around said imaginary line; and

gearing means for providing two periods of rotation of the body means around said longitudinal axis during one period of revolution of the body means around said imaginary line;

wherein said body means has peripheral points which oscillate through the common point located on said imaginary line.

4,924,719

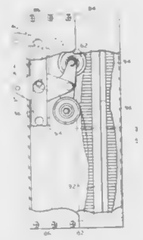
MECHANICAL LINKAGE CHARACTERIZER

Michael L. Hyde, 4352 E. Holtwood Ave., Anaheim Hills, Calif. 92807, and Donald F. Cart, 2009 S. Pacific Ave., Santa Ana, Calif. 92704

Filed Jan. 24, 1983, Ser. No. 460,624

Int. Cl.[5] F16H *21/44, 53/06*

U.S. Cl. 74—99 A **6 Claims**



1. A mechanical linkage characterizer for converting linear motion to complex linear motion comprising: housing means defining a linear track; a carriage mounted for reciprocating movement along said track; an output arm mounted for oscillation on said carriage; cam means comprising first and second elongated adjustable contour stationary cams extending parallel along said track and operatively connected to said output arm for moving said output arm relative to said carriage upon movement of said carriage along said track; and linkage means operatively connecting said cam means to said output arm, said linkage means comprising a lever pivotally mounted on said carriage, first and second follower means mounted on said lever for engagement respectively with said first and second cams, and a link member connected at opposite ends to said lever and said arm.

4,924,720

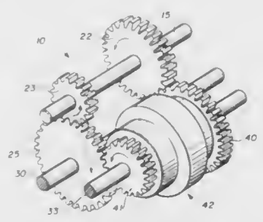
DRIVE REVERSER AND CLUTCH SELECTOR MECHANISM

Ryan E. Shust, Winnipeg, Canada, assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Oct. 5, 1989, Ser. No. 417,398

Int. Cl.[5] F16H *3/08*

U.S. Cl. 74—377 **5 Claims**



1. A drive reverser comprising an input shaft, first and second drive gears mounted on said input shaft, an idler gear driven by said second drive gear, a power take-off output shaft driven by said idler gear, a first driven gear driven by said first drive gear, a second driven gear driven by said idler gear in a rotational direction opposite to the direction of rotation of said first driven gear, and a clutch means mounted on an output shaft and operable to select one of said first and second driven gears, thereby transferring rotational power from said input shaft to said output shaft.

4,924,721

WORM GEAR ELEVATOR DRIVE AND ASSEMBLY METHOD

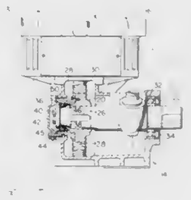
Alfonso Garrido, Madrid, Spain, and Fernando Rico, Rueil Malmaison, France, assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 2, 1987, Ser. No. 115,326

Claims priority, application Spain, Nov. 7, 1986, 8602958

Int. Cl.[5] F16H *57/02, 1/16*

U.S. Cl. 74—425 **7 Claims**



1. An elevator drive comprising an electric motor, a worm that is rotated by the motor to rotate a drive gear 90° thereto, a shaft attached to the drive gear, characterized in that:

the shaft is supported by bearings on a common axis placed in a single piece case that contains an access hole for inserting the drive gear;

a removable thrust plate on one end of the shaft, accessible from outside the case, and attached to the shaft by one or more bolts;

a bearing with an inner race that is forced towards the drive gear by the thrust plate which forces the drive gear on the shaft.

4,924,722

RECIRCULATING BALL MECHANISM

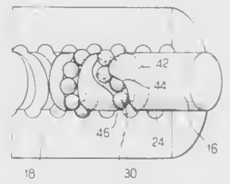
Juan S. Bacardit, and E. Cortes Guasch, both of Barcelona, Spain, assignors to Bendix Espana, Barcelona, Spain

Filed Jan. 17, 1989, Ser. No. 297,895

Claims priority, application European Pat. Off., Jan. 18, 1988, 88500003.4

Int. Cl.[5] F16H *25/22*

U.S. Cl. 74—459 **5 Claims**



1. A recirculating ball mechanism comprising a body, an actuator shaft mounted rotatably within said body and rotatable in response to rotation of an input shaft, an output piston mounted slidably in said body, a bore within said output piston in which is received an end of the actuator shaft, said bore having an internal threaded surface, said end of said actuator shaft being formed with a threaded surface, a series of balls located between said two threaded surfaces so as to connect operatively said actuator shaft to said output piston whereby a given rotation of said actuator shaft produces an associated displacement of said output piston in said body, and means for recirculating said balls to a point of origin in said thread of said end of said actuator shaft, said recirculating means formed at said actuator shaft, said thread of the actuator shaft comprising at least one closed loop extending around the circumference of said actuator shaft, said closed loop including a first part of part helical form corresponding to said thread of said output piston, a second part including a region whose radial depth is at least equal to the diameter of said balls, a third part and a fourth part corresponding respectively to the entry of a ball into and the exit of a ball from said second part, said third and fourth parts each being of part helical form with constant feed and a variable radius relative to a longitudinal axis of the actuator shaft, and the third and fourth parts comprising symmetrical arcs relative to a transverse axis of the actuator shaft.

4,924,723

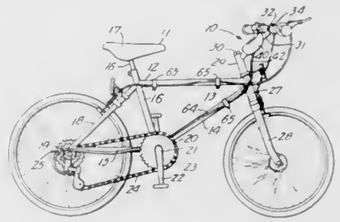
SHIFT CONSOLE FOR BICYCLES

Martin Cristie, 1445 Shore Parkway, Brooklyn, N.Y. 11214

Filed Mar. 20, 1989, Ser. No. 334,154

Int. Cl.[5] B62M *25/04;* **G05G** *7/10*

U.S. Cl. 74—473 R **1 Claim**



1. In a speed selecting shift console for use with a bicycle having a multi-speed rear hub, and mountable upon a forwardly directed extension projecting from an upper end of a front wheel stem, the improvement comprising: said forwardly directed extension having a length in the range of five to six inches; said console including a housing element of molded synthetic resinous material having a slotted upper wall, a pair of opposed side walls, and a pair of end walls defining a generally rectangularly shaped enclosure therebetween, said upper wall having a pair of threaded aligned openings extending downwardly therefrom, said side walls projecting downwardly to a greater degree than said end walls; a generally vertically oriented planar lower wall having a laterally extending member, said laterally extending member having openings in congruent relation relative to said pair of threaded openings, and screw means for maintaining said congruent relation, said lower wall having an elongated slot therein, said laterally extending member having a threaded opening; a U-shaped clamp having a first end engaging said slot, a second end having a through opening therein, and threaded means penetrating said last-mentioned opening and said threaded opening to surround said extension; a shift like lever pivotally supported by said lower wall and having means engaging a control cable at a lower end thereof, an upper end of said shift lever penetrating said slotted upper wall; said console, when mounted upon said extension, being so positioned that said housing at least partially encloses said extension, said lower wall being positioned on one side thereof, with said cable projecting rearwardly along said extension toward said stem.

4,924,724

SHIFT ASSISTING DEVICE

Tsuyoshi Yoshimura, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 2, 1988, Ser. No. 278,859

Claims priority, application Japan, Dec. 2, 1987, 62-303233

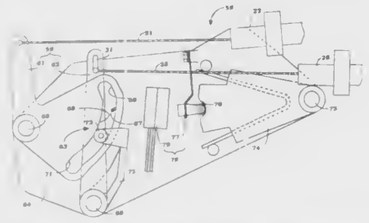
Int. Cl.[5] G05G *7/02;* **F16D** *23/12, 21/04*

U.S. Cl. 74—473 R **5 Claims**

4. In a shift mechanism as set forth in claim 3 wherein the

VOL
1114
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cam means comprises a slot having a first portion for effecting movement of the second lever and a second portion at one end



of said first portion curved about the pivot axis of the first lever for effecting no movement of the second lever.

4,924,725

MECHANISM FOR ADJUSTING HEIGHT OF HANDLE BAR OF PUSHCART

Takehiko Takahashi, and Hitoshi Kato, both of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,681
Claims priority, application Japan, Oct. 3, 1988, 63-128788
Int. Cl.[5] B62K *21/16*
U.S. Cl. 74—551.3 2 Claims



1. A mechanism for adjusting the height of a handle bar for a pushcart, said pushcart including a pair of upwardly-extending bars of a tubular construction, a handgrip bar of a hollow tubular construction having a U-shape with a pair of end portions, wherein each of said upwardly-extending bars is slidably fitted into a corresponding one of said end portions of said handgrip, said mechanism comprising:

a plurality of engaging apertures formed in the side of each of said upwardly-extending bars adjacent to an upper end thereof and spaced at predetermined intervals, said engaging apertures being connected together by connecting slots which are narrower than said engaging apertures;

a pair of retainer members each being engageable with a corresponding one of said end portions of said handgrip bar, and each being disposed at a position corresponding to said engaging apertures;

flanges projecting from opposite sides of each said retainer member in inclined relation being received respectively in inclined slide guide grooves formed in an elevation operating member; and

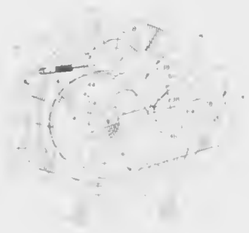
wherein each said retainer member is moved outwardly and inwardly in a direction perpendicular to the sliding movement of said elevation operating member when said elevation operating member is slidingly moved upwardly and downwardly.

4,924,726

REVERSE TO PARK MECHANISM WITH SECURE LATCHING

Deno J. Rogakos, Centerville; Harry C. Buchanan, Jr., Spring Valley, and Mark M. Benner, Xenia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 5, 1989, Ser. No. 361,611
Int. Cl.[5] B60S *1/24*; F16C *3/28*
U.S. Cl. 74—600 3 Claims



1. A reverse to park mechanism for use with a vehicle mounted wiper motor having a drive shaft that is normally rotated in a forward direction about a central axis, but which can be reversed, said mechanism comprising,

a crank arm pivoted relative to said drive shaft at a main pivot point offset from said drive shaft central axis,

stop means engageable between said drive shaft and one side of said crank arm when said drive shaft rotates in the forward direction, thereby preventing said crank arm from pivoting about said main pivot point in the reverse direction,

a latching pin with a generally cylindrical surface fixed relative to said drive shaft at a location spaced from the same side of said crank arm engaged by said stop means,

a latching lever pivoted to said crank arm at a secondary pivot point and having a generally straight keeper surface which, when said latching lever is in a latching position and said crank arm is engaged with said stop means, contacts the surface of said latching pin at a point of tangency offset from the top dead center point of said latching pin surface and in an orientation such that the angle formed by said keeper surface with a line normal to said point of tangency is sufficiently shallow that the mutual frictional force created is in turn sufficient to prevent said keeper surface from slipping off of said latching pin surface, whereby said crank arm is also prevented from pivoting about said main pivot point in the forward direction, and is thereby completely confined, in cooperation with said stop means, in a fixed angular position relative to said drive shaft central axis with a first effective crank arm radius, and,

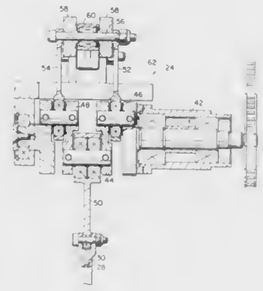
a torque means engageable with said latching lever only when said drive shaft rotates in the reverse direction so as to pivot said latching lever about said secondary pivot point away from said latching position and move said keeper surface freely away from said latching pin surface, by virtue of the location of said point of tangency, thereby freeing said crank arm to rotate about said main pivot point in the forward direction to a second effective crank arm radius.

4,924,727

CUTTING MACHINE HAVING BALANCED RECIPROCATING CUTTER DRIVE MECHANISM

David R. Pearl, and Lawrence S. Wolfson, both of West Hartford, Conn., assignors to Gerber Garment Technologies, Inc., Tolland, Conn.

Continuation-in-part of Ser. No. 94,823, Sep. 9, 1987, abandoned. This application Jul. 17, 1989, Ser. No. 380,752
Int. Cl.[5] B26D *7/00*
U.S. Cl. 74—603 4 Claims



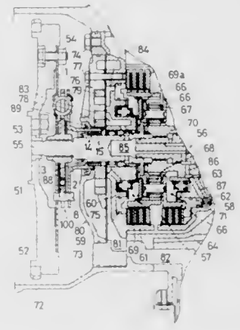
1. In a cutting machine having a crank mechanism, including an angularly balanced crankshaft journalled for rotation about its shaft axis and having a first crank, an active load including a cutting blade, means supporting said active load for reciprocal movement along a rectilinear path, a first connecting rod connected at one end to said first crank, and first connecting means for connecting said active load to an other end of said first connecting rod to reciprocate in said rectilinear path in response to rotation of said crankshaft about said shaft axis, the improvement comprising means for dynamically balancing said active load, said first connecting rod and said first connecting means and including said crankshaft having second and third cranks each having a throw equal to the throw of said first crank, said first crank being located on said crankshaft and intermediate said second and third cranks and in diametrically opposed relation to said second and third cranks, a second connecting rod connected at one end to said second crank, a third connecting rod connected at one end to said third crank, a connecting rod pin connected to an other end of said second connecting rod and to an other end of said third connecting rod and extending therebetween, a link pivotally connected at one end to said connecting rod pin intermediate said other end of said second connecting rod and said other end of said third connecting rod and supported at its opposite end for pivotal movement about a pivot axis spaced from and fixed relative to said shaft axis, and a pair of balance weights received on and carried by said connecting rod pin at opposite sides of said link, one of said balance weights being located between said one end of said link and said other end of said second connecting rod, the other of said balance weights being located between said one end of said link and said other end of said third connecting rod, said link cooperating with said second and third connecting rods and supporting said balance weights for reciprocal movement along an arcuate path, the opposite ends of said arcuate path being located along a rectilinear extension of said rectilinear path.

4,924,728

GEAR SHIFT MECHANISM WITH A DAMPER DEVICE

Masanori Mori, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Mar. 17, 1989, Ser. No. 325,318
Claims priority, application Japan, Mar. 17, 1988, 63-064068
Int. Cl.[5] F16H *35/12*
U.S. Cl. 74—640 2 Claims



1. A gear shift device for motor vehicles comprising an input member adapted to be driven by an engine;

a fluid pressure production means for producing fluid pressure;

a gear shift mechanism operable by the fluid pressure produced by the fluid pressure production means; and

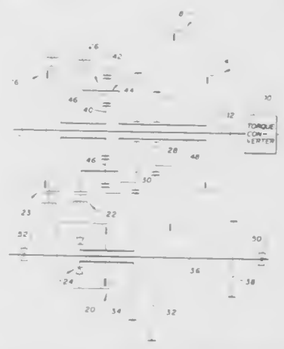
a damper means connected with the gear shift mechanism and the input member, said fluid pressure production means being disposed between the gear shift mechanism and the damper means and connected directly with the input member.

4,924,729

MULTISPEED POWER TRANSMISSION

James F. Sherman, Brighton, and Kenneth C. Hauser, Canton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1989, Ser. No. 329,217
Int. Cl.[5] F16H *37/00*
U.S. Cl. 475—207 3 Claims



1. A multispeed power transmission comprising: input drive means for delivering power to said transmission; output driven means for delivering power from said transmission; an input shaft drivingly connected with said input drive means; a planetary gear means mounted coaxial with said input shaft and having a plurality of members including a sun gear member, a

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ring gear member, a carrier member and pinion gears rotatably mounted on said carrier member in meshing relation with said sun and ring gears; first drive gear means mounted for rotation coaxial with said input shaft and being continuously connected with a first member of said planetary gear means; second drive gear means mounted for rotation coaxial with said input shaft; an output shaft mounted for rotation on an axis parallel with said input shaft; first driven gear means rotatably mounted on said output shaft and meshing with said first drive gear means; second driven gear means mounted on said output shaft and meshing with said second drive gear means; first selectively engageable friction drive establishing means for connecting a second member of said planetary gear means with said input shaft; second selectively engageable friction drive establishing means for connecting a third of said members of said planetary gear means with said input shaft; third selectively engageable friction drive establishing means for connecting said second drive gear means with said third member of said planetary gear means; fourth selectively engageable friction drive establishing means for connecting said first driven gear with said output shaft; and fifth and sixth selectively engageable friction drive establishing means for establishing said second member and said third member of said planetary gear means respectively as reaction members in said transmission; said friction drive establishing means being selected to establish four forward speed ratios and one reverse speed ratio between said input and output means; said first drive and driven gears cooperating with said planetary gear means to establish a reaction therefore during one forward speed ratio.

4,924,730

TRANSMISSION SYSTEMS

Bryan N. V. Parsons, Stoney Stanton, England, assignor to Jaguar Cars Limited, United Kingdom

Filed Aug. 10, 1988, Ser. No. 230,787

Claims priority, application United Kingdom, Aug. 25, 1987, 8720051; Aug. 25, 1987, 8720053

Int. Cl.[5] **F16H** *15/50*

U.S. Cl. 475—166 **23 Claims**



1. A transmission system comprising:
a first shaft;
a first disc mounted on said first shaft for rotation therewith, said first disc having a groove with frusto-conical walls, in its outer periphery;
a second annular disc mounted concentrically of the first disc and having a groove with frusto-conical walls in its inner periphery;
a second shaft drivingly connected to the second disc;
an annular element mounted so that its inner periphery engages in the groove in the first disc at one radius and its outer periphery engages in the groove in the second disc at diametrically opposed positions on another radius;
means for moving the annular element eccentrically relative to the first and second discs so that the radii at which the annular element engages the groove of each disc may be varied;
and means for maintaining the inner and outer peripheries of the annular element in driving engagement with the walls of the grooves in the first and second discs respectively.

4,924,731

HYDRAULIC CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION

Youichi Hayakawa, Toyoake; Yoshinari Kuwayama, Tokoname, and Yoshihiro Yamada, Anjo, all of Japan, assignors to Aisin Aw. Co., Ltd., Anjo, Japan

Filed Jan. 4, 1989, Ser. No. 293,266

Claims priority, application Japan, Aug. 31, 1988, 63-217952

Int. Cl.[5] **B60K** *41/06*

U.S. Cl. 74—869 **5 Claims**



1. A hydraulic control device for an automatic transmission, comprising:
a shift gear mechanism having frictional engaging elements,
a plurality of hydraulic servos for the frictional engaging elements, said hydraulic servos controlling the frictional engaging elements and including a first hydraulic servo with a first oil passage operating at reverse running and forward high speed running,
a plurality of shift valves for controlling oil pressure working on said hydraulic servos,
a manual valve having a D range port and a reverse range port,
a second oil passage for the forward high speed running, said second oil passage communicating to the first hydraulic servo from the D range port of the manual valve through the shift valves,
a third oil passage for the reverse running, said third oil passage communicating to the first hydraulic servo from the reverse range port of the manual valve,
an orifice formed at the third oil passage,
a three-way cock connected to the first, second and third oil passages, said three-way cock supplying oil to the first hydraulic servo from one of the second and third oil passages, and
an accumulator communicating with the first oil passage situated between the three-way cock and first hydraulic servo.

4,924,732

POWER DRIVEN SCREWDRIVER WITH VACUUM FOR REMOVING CONTAMINANTS

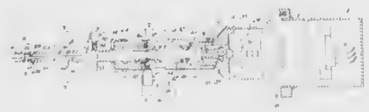
Robert G. Hoskins, Batavia, and Alan R. Krokenberger, Rochester, both of N.Y., assignors to Alliance Automation Systems, Inc., Rochester, N.Y.

Continuation of Ser. No. 78,133, Jul. 27, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,494

Int. Cl.[5] **B25B** *23/08, 21/00*

U.S. Cl. 81—54 **10 Claims**

1. In a device for driving an elongated headed screw fastener (90) into a threaded bore (97) of a workpiece (96) of the type including housing means (12,18,20,32), an elongated spindle (50), having a portion within said housing means, and a rotary drive motor (10) mounted in said housing means (12,18,20,32), said rotary drive motor (10) drivingly connected to said spindle (50) to enable rotation of said spindle (50) about its longitudinal axis, said spindle (50) having a forward end (52) extending out of said housing and away from said drive motor (10) configured to engage the head (94) of said fastener (90), a sleeve (60) having a forward end and a forward end face (72), said sleeve (60) provided with a bore (70*a,c*) surrounding said forward end (52) of said spindle (50) with a rearward portion (70*a*) of said bore defining a clearance space between said sleeve (60) and said spindle (50) to the rear of said forward end face (72) of said sleeve (60), bias means (74) mounting a rear portion of said sleeve (60) in said housing means so as to allow relative axial movement therebetween, said bias means (74) urging said forward end of said sleeve (60) in a direction away from said housing means, a source of vacuum, means (86,88) for connecting said source of vacuum to said clearance space to cause an air flow to be drawn into said forward end (72) of said sleeve (60) and through said clearance space to enable suction of the head (94) of said fastener (90) against said forward end (52) of said spindle (50) when said vacuum is activated and to enable rotation of said fastener (90) by rotation of



said spindle (50) by said drive motor, a forward portion (70*c*) of said bore (70*a,c*) spaced forwardly of said rearward portion (70*a*) to be adapted to enclose the shank of said fastener (90) when said head (94) thereof is drawn against said forward end (52) of said spindle (50), said device including means (51) carried within said housing means (12,18,20,32,) for mounting said spindle (50) for axial movement relative said housing means and said sleeve (60) allowing said forward end (52) of said spindle (50) to move between a retracted position within said forward portion (70*c*) of said bore remote from the forward end face (72) of said sleeve (60) and an advanced position therein adjacent said forward end face (72) of said sleeve (60) as said fastener is advanced into said workpiece; bias means (76) urging said spindle (50) towards said advanced position; said forward portion (70*c*) of said bore receiving said air flow passing into said sleeve clearance space; whereby said fastener (90) is driven into said workpiece (96) while air is drawn along the length of said fastener (90) within said forward portion (70*c*) of said bore, past the head (94) of said fastener (90) and into said sleeve clearance space and collected by said means (86,88) connecting said clearance space with said vacuum source.

4,924,733

MULTIPLE BIT SCREWDRIVER

Archibald M. McKenzie, 6344 Douglas Street, West Vancouver, British Columbia, Canada V7W 2E9

Continuation of Ser. No. 897,736, Aug. 18, 1986, abandoned. This applicatioo Dec. 16, 1988, Ser. No. 287,610

Claims priority, application Canada, Aug. 16, 1985, 488931

Int. Cl.[5] **B25B** *25/00*

U.S. Cl. 81—438 **11 Claims**



1. A multiple bit screwdriver comprising:
(a) a handle provided with a plurality of bores arrayed circumferentially about and parallel to the longitudinal axis of the said handle, each said bore being open at both ends thereof and adapted to store a screwdriver bit;
(b) a shaft secured to and extending from one end of said handle;
(c) means provided at one end of said shaft for securing said screwdriver bit; and
(d) means for releasably retaining said bit in said bores comprising an array of metal bands spaced radially about and fixed to a common circular element, one end of each of said band being fixed to said common element and the other end being free and located within said bores at a location spaced towards said one end of said handle from said fixed end of said band;
wherein a selected bit is removed from its bore by inserting a second bit into an open end of the bore containing said selected bit and forcing said second bit into said bore thereby displacing said selected bit.

4,924,734

QUICK RELEASE AND EXCHANGE SOCKET DRIVE

Harry L. Bochman, Jr., Seal Beach, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Jul. 28, 1988, Ser. No. 225,480

Int. Cl.[5] **B25B** *17/00*

U.S. Cl. 81—57.12 **3 Claims**



1. A quick release socket drive, comprising:
a base plate having a passage;
a drive collar rotatably mounted in said passage, said drive collar being adapted to be driven by power means, and having a non-circular receptacle;
a socket drive having an external surface array geometrically similar to said receptacle to be removably fitted therein, and to be driven by said drive collar, an array of driving surfaces to engage a fastener to be set, and a peripheral groove;
a retainer plate slidably mounted to said base plate, having a fork at one end adapted to enter said groove in one position to retain the socket in the drive collar and thereby to the base plate, and to be shifted to another position free of said groove to enable the socket to be removed or inserted;
releasable lock means to hold said retainer plate in one position; and
said retainer plate including a slot and in which a bridge plate incorporates two posts which engage in said slot to hold the retainer plate aligned, and in which said bridge plate supports a ball and bias spring which form part of said lock means, said bias spring biasing the ball against the retainer plate, said retainer plate having a hole to receive said ball when in said one position to hold the retainer plate in said one position.

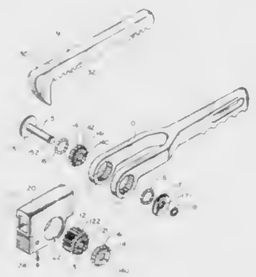
VOL
1114
ISS
3
MY
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4,924,735

REVERSIBLE PIPE WRENCH

Clark J. Lee, 429-6 Chung Cheng Rd., Fu Liao Li., Tsao Tun Town, Nantou Hsien, Taiwan

Filed Feb. 28, 1989, Ser. No. 316,817
Int. Cl.[5] B25B *13/14*
U.S. Cl. 81—133 7 Claims



1. A pipe wrench comprising:

(a) a jaw housing defining a generally longitudinally extending opening, a generally laterally extending opening and a fixed jaw face;

(b) a movable jaw member slidable received in the generally longitudinally extending opening, the jaw member having a movable jaw face portion and a sliding rod portion;

(c) a plurality of gear teeth formed on the sliding rod portion;

(d) a pinion gear member rotatably received in the generally laterally extending opening such that the pinion gears engage the gear teeth on the sliding rod portion;

(e) a handle member defining at least one laterally facing opening in alignment with the generally laterally extending opening in the jaw housing;

(f) pivot attaching means to pivotally attach the handle member to the jaw housing so as to pivot about a generally laterally extending pivot axis;

(g) ratchet means interconnecting the handle member and the pinion gear such that, when the handle member is pivoted in a first direction about the pivot axis the ratchet means rotates the pinion gear to move the movable jaw member so as to move the movable jaw face toward the fixed jaw face, and when the handle member is pivoted in an opposite direction about the pivot axis, the ratchet means disengages such that no movement of the pinion gear or movable jaw member takes place; and

(h) means to selectively prevent the disengagement of the ratchet means when the handle member is pivoted in the opposite direction such that the pinion gear is rotated to move the moveable jaw member and to move the movable jaw face away from the fixed jaw face.

4,924,736

GRIPPING SCREW DRIVE BIT

Ben V. Bonner, Bloomfield Hills, Mich., assignor to A.T. & G Company, Inc., Farmington Hills, Mich.

Filed May 4, 1989, Ser. No. 347,059
Int. Cl.[5] B25B *23/08*
U.S. Cl. 81—448 4 Claims

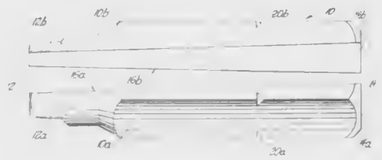
1. A gripping screw drive bit comprising:

(a) a first drive bit member substantially elongated in shape and having a first driving end, an oppositely disposed first driven end, and a first substantially planar surface that runs the longitudinal length of said first drive bit member interposed between said first driving end and said first driven end;

(b) a second drive bit member substantially elongated in shape and having a second driving end, an oppositely disposed second driven end, and a second substantially planar surface that runs the longitudinal length of said second drive bit member interposed between said second driving end and said second driven end;

(c) said first and second drive bit members being complementary and mating along said first and second planar surfaces so that said first and second driving ends and said first and second driven ends mate to form a composite gripping drive bit having a composite driving end and a composite driven end, respectively; and,

(d) said first and second planar surfaces being defined by a longitudinal plane which is disposed at a first predetermined longitudinal acute angle from the rotational axis of the composite gripping drive bit and which passes through the approximate center of said composite driving end and angles longitudinally and radially outward, from



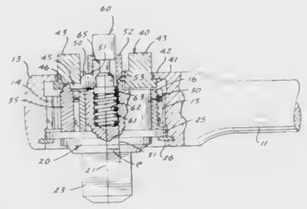
the composite driving end to the composite driven end, and said longitudinal plane is also disposed at the composite driving end at a second predetermined acute angle from a straight line, passing from side to side of the composite driving end through said rotational axis on a plane perpendicular to said rotational axis and which would normally divide the composite driving end into a pair of similarly disposed drive features, to bisect the composite driving end into a pair of oppositely disposed drive features of said composite driving end, said composite driving end being adapted to engage a screw head recess in a screw, and said composite driven end being adapted to be engaged by a socket drive, whereby, when a torque is exerted on the gripping screw drive bit, the first and second driving ends are forced outward laterally, in opposing diagonal directions along said longitudinal plane into a gripping engagement with the adjacent wall surface of the screw head recess.

4,924,737

POSITIVE DRIVE RATCHET

Stephen A. Gummow, Rockford, Ill., assignor to Gummow Tool Company, Rockford, Ill.

Filed Mar. 20, 1989, Ser. No. 325,767
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—63.2 13 Claims



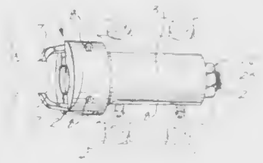
1. A ratchet comprising an elongated handle, a ring gear rigid with one end of said handle and having teeth spaced angularly around its inner periphery, said gear being circular and having a central axis, a center body supported for rotation about said axis and within said gear and having a driver which is concentric with said central axis, said center body having an eccentric with an axis which is offset radially with respect to said central axis, an inner gear having angularly spaced teeth and supported on said eccentric to rotate relative to the eccentric about the axis thereof, some of the teeth of said inner gear meshing with some of the teeth of said ring gear, means for locking said gears against relative rotation when said handle is turned in one direction whereby rotation of said handle in said one direction is transmitted to said center body and said driver by way of said gears, said locking means comprising a member adapted to wedge between the teeth of said ring gear and the teeth of said inner gear to lock the gears against relative rotation when said handle is turned in said one direction, said member releasing said gears for turning relative to one another when said handle is turned in the opposite direction whereby said handle may rotate without rotating said center body and said driver.

4,924,738

BAR PULLER WITH ADJUSTABLE JAW-OPENING

Hue N. Che, 5636 Adams St., Los Angeles, Calif. 90042, assignor to Hue Nguyen Che, Los Angeles, Calif.

Filed Nov. 25, 1988, Ser. No. 276,242
Int. Cl.[5] B23B *15/00*; B25B *7/02, 18/06*
U.S. Cl. 82—127 6 Claims



1. A bar puller for a bar supported for rotation by a numerically controlled lathe having a plurality of tool stations, the tool stations being movable along and transverse to the rotational axis of the bar, the bar puller comprising:

a housing, having a long axis, adapted to be mounted at a tool station;

at least two jaws having resilient fingers, the jaws being pivotally mounted on the housing, the fingers projecting forwardly from the housing, defining a jaw opening, with the ends of the fingers turned inwardly towards the long axis of the housing for gripping engagement with an end portion of the bar;

means for adjusting the jaws to a position wherein the ends of the fingers are disposed in a spaced apart relation to each other a distance slightly smaller than the diameter of the bar, so that the fingers resiliently receive and grip an end portion of the bar when the bar is forcibly inserted therebetween; and

the fingers each having guiding means at their ends for providing guiding and flexing forces upon abutting engagement with the bar, the forces respectively tending to center the bar between the fingers and to deflect the ends of the fingers in an outward direction from the bar axis by virtue of resilient flexion of said fingers, permitting the bar to move therebetween, said guiding means being configured to provide said guiding and flexing forces whether said abutting engagement takes place in a direction along or transverse to said along axis.

2. A bar puller for a bar supported for rotation by a numerically controlled lathe having a plurality of tool stations, the tool stations being movable along and transverse to the rotational axis of the bar, the bar puller comprising:

a hollow housing having a long axis adapted to be mounted at a tool station, the housing having a head portion and a shank portion, the shank portion open at one end having threads along at least a portion thereof;

at least two jaws having resilient fingers, the jaws being mounted for pivotal rotation about a point on the head portion of the housing, the fingers projecting forwardly from the housing, thereby defining a jaw opening, and having ends turned inwardly towards the along axis of the housing for gripping engagement with an associated end portion of a bar supported for rotation by the lathe, each jaw additionally having an adjusting arm extending beyond the pivot point of the jaw at an angle of about 90° to the finger, the adjusting arm extending into the head portion of the housing;

means operating the adjusting arms for adjusting the jaws to a position wherein the ends of the fingers are disposed in a spaced apart relation to each other so that the size of the jaw opening is slightly smaller than the size of the bar, so that the fingers resiliently receive and grip an end portion of the bar when the bar is forcibly inserted therebetween; and

the fingers each have guiding means at their ends for providing guiding and flexing forces upon abutting engagement with the bar, the forces respectively tending to center the bar between the fingers and to deflect the ends of the fingers in an outward direction from the bar axis by virtue of resilient flexion of said fingers, thereby permitting the bar to move therebetween.

4,924,739

METHOD AND APPARATUS FOR PRODUCING A CONTACT LENS

Martin K. Ademovic, Rochester, N.Y., assignor to CooperVision, Inc., Palo Alto, Calif.

Filed Jun. 22, 1984, Ser. No. 623,361
Int. Cl.[5] B23B *13/00, 3/00*; B29D *11/00*
U.S. Cl. 82—1.11 3 Claims



1. A method for machining a contact lens supported in a mold using a lathe having a hollow spindle terminating in a first end having a conical collet having an internal conical surface of decreasing diameter toward said first end of said spindle and adapted to mate with the external conical surface of a mold support element, and a second end of said spindle having an internal diameter sufficient to receive said mold, said method comprising

introducing said mold into the hollow interior of said spindle,

propelling said mold by pneumatic pressure toward the end of said spindle having said conical collet whereby said interior conical surface of said collet mates with said external conical surface of said mold support element,

maintaining pneumatic pressure within said spindle to hold said mold firmly in said collect during said machining.

VOL
1114
ISS
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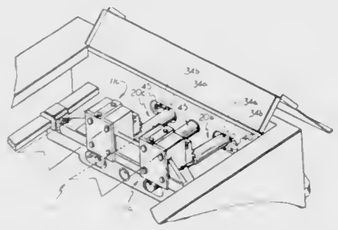
ADJUSTABLE MOUNTING FOR MULTIGOB APPARATUS FOR STRAIGHT LINE SHEARING

Douglas W. Wright, Tariffville, Conn., assignor to Emhart Industries, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 119,013, Nov. 10, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 229,057

Int. Cl.[5] **C03B** *5/38*

U.S. Cl. 83—527 **2 Claims**



1. A shear mechanism for shearing discrete gobs of molten glass from a single or a pair of spaced or three equally spaced vertically descending runners of molten glass discharged from a spout bowl assembly or the like comprising

central, second and third shear blade adjustment assemblies each including:

an indexing rod having a miter gear at one end,

an adjustment shaft having a miter gear at one end for operatively engaging with said indexing rod miter gear;

frame means having a vertical wall portion and a horizontal wall portion adapted to support said central shear blade adjustment assembly (20*b*) at a central location thereof,

a pair of horizontal slots defined in said vertical wall portion on either side of said central shear blade adjustment assembly for receiving the indexing rods of the second and third shear blade adjustment assemblies,

a pair of vertical slots defined in said horizontal wall portion on either side of said central shear blade adjustment assembly (20*b*) for receiving the adjustment shafts of the second and third shear blade adjustment assemblies and

first means for locating the indexing rod and adjustment shaft of said second assembly at either end of said associated vertical and horizontal slots and

second means for locating the indexing rod and adjustment shaft of said third assembly at either end of said associated vertical and horizontal slots

so that said second and third assemblies are adjustably located at the respective inner end of said slots for double gob operation and at the respective outer end of said slots for triple gob operation.

4,924,741

ELECTRONIC DRUM WITH CURVED PLAYING SURFACE

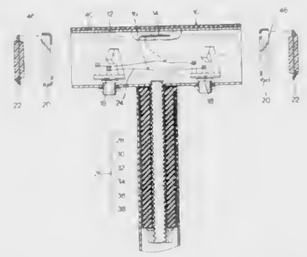
Mark Vollenweider, 946 Lincoln Blvd., Bridgeport, Conn. 06606

Continuation-in-part of Ser. No. 163,861, Mar. 3, 1988, abandoned. This application Jul. 22, 1988, Ser. No. 223,113

Int. Cl.[5] **G10H** *3/00, 1/00;* **G10D** *13/02*

U.S. Cl. 84—730 **15 Claims**

1. An electronic drum comprising: a rigid structure having a cylindrical non-planar playing surface, said cylindrical non-planar playing surface having a force sensing device attached to it that produces a signal when struck, and attachment means incorporated into said rigid structure for mounting said rigid structure on a support system mount shaft means wherein said



mount shaft means provides adjustable optimum sticking position.

4,924,742

MECHANICAL KEYBOARD INSTRUMENT WITH PEDAL MECHANISMS

Motoichi Numata; Kinya Nozaki; Hajime Hayashida, and Toshiaki Sakai, all of Shizuoka, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 6, 1989, Ser. No. 362,502

Claims priority, application Japan, Jun. 7, 1988, 63-141273; Aug. 11, 1988, 63-200349; Sep. 27, 1988, 63-126045[U]; Oct. 4, 1988, 63-250632

Int. Cl.[5] **G10C** *3/00*

U.S. Cl. 84—218 **12 Claims**



1. A mechanical keyboard for producing musical sounds, comprising:

(a) a key board having a plurality of keys grouped by note ranges, said keys being shifted between depressed states and released states, respectively;

(b) a plurality of key action mechanisms respectively coupled to said keys and respectively transferring forces produced by depressing said keys;

(c) a plurality of music wires respectively provided in association with said keys;

(d) a plurality of hammers respectively actuated by said key action mechanisms for striking said music wires;

(e) a plurality of damper mechanisms respectively having dampers and respectively shifted between contact states contacting said music wires and hold off states leaving from said music wires, said dampers being shifted to said contact states in said released states and to said hold off states in said depressed states, respectively, said dampers being associated with said keys, respectively;

(f) a loud pedal mechanism having a loud pedal and operative to cause all of said dampers to shift into said hold off states even if said keys are in said released states;

(g) a soft pedal mechanism having a soft pedal and operative to cause said sounds to be varied in quality or decreased in volume;

(h) a main sostenuto pedal mechanism having a main sostenuto pedal located between said loud pedal and said soft pedal and operative to cause one of or a plurality of said dampers to keep in said hold off states after said associated keys are depressed; and

(i) an auxiliary sostenuto pedal mechanism having an auxiliary sostenuto pedal and provided for said dampers associated with said keys of at least one of said note ranges, wherein said auxiliary sostenuto pedal mechanism is operative to allow one or a plurality of said dampers to keep in said hold off states even if said associated keys are released.

4,924,743

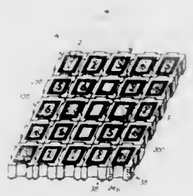
MUSICAL DANCING BLOCK SET

Chao-Hsiung Tsai, P.O. Box 10160, Taipei, Taiwan

Filed Apr. 13, 1989, Ser. No. 337,326

Int. Cl.[5] **G09B** *15/02*

U.S. Cl. 84—476 **14 Claims**



1. A musical dancing block set comprising:

a plurality of sounding blocks optionally assembled to form a block set, each sounding block capable of producing music with respect to a specific scale note, said sounding block comprising:

a casing having a vertical side wall circumferentially confining a downwardly-concave socket and a bottom plate formed on a bottom portion of said casing;

a treadle member having an upper plate printed or marked with a scale note on a central portion thereof, a second side wall protruding downwardly from said upper plate circumferentially confining an upwardly-concave socket, said second side wall resiliently received in said downwardly-concave socket in said casing retained on said bottom plate by a restoring spring;

a sounding means provided in said treadle member and said casing having a switch depressibly closed as trodden by a player's foot on said treadle member for producing a musical sound, whereby upon a continuous treading on a plurality of the sounding blocks of different scale notes, a musical composition can be completely played by a player's foot.

4,924,744

APPARATUS FOR GENERATING SOUND THROUGH LOW FREQUENCY AND NOISE MODULATION

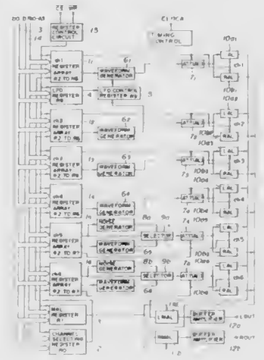
Kimio Yamamura, Tokyo, Japan, assignor to Hudson Soft Co., Ltd., Hokkaido, Japan

Filed Aug. 9, 1988, Ser. No. 230,342

Claims priority, application Japan, Aug. 27, 1987, 62-213978; Aug. 27, 1987, 62-213979; Aug. 27, 1987, 62-213980; Aug. 27, 1987, 62-213981; Aug. 27, 1987, 62-213982; Aug. 27, 1987, 62-213983

Int. Cl.[5] **G10H** *7/00, 1/06, 1/04, 1/08*

U.S. Cl. 84—601 **2 Claims**



1. An apparatus for generating sound comprising:

a plurality of sound generating channels each including means for storing waveform data at predetermined addresses,

means for mixing output sounds of said plurality of sound generating channels,

means for controlling said means for storing to be accessed by a predetermined frequency whereby waveform data for generating one of said output sounds are read therefrom,

wherein said output sounds are generated in channels selected from said plurality of sound generating channels, and then mixed in said means for mixing to provide mixed sound,

means for producing a low frequency signal in accordance with frequency control data stored in a register included in a first channel and frequency data of a frequency counter for output sound in a second channel, and

means for adding or subtracting said waveform data read from said means for storing in said second channel by an address frequency of said low frequency signal to or from frequency data of output sound which is now generated thereby producing frequency data for modulation,

wherein said means for controlling modulates said output sound which is now generated in accordance with said frequency data for modulation.

4,924,745

AUTOMATIC PERFORMANCE RECORDING APPARATUS

Mamoru Kimpara, and Tetsuji Ichiki, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 13, 1989, Ser. No. 297,610

Claims priority, application Japan, Jan. 14, 1988, 63-4987; Jan. 14, 1988, 63-4988; Jan. 14, 1988, 63-4989

Int. Cl.[5] **G10H** *1/36, 7/00*

U.S. Cl. 84—609 **4 Claims**

1. An automatic performance apparatus, comprising:

a performance data memory means for storing performance

VOL
1114
ISS
3
MY
15
1990
UMI

data for controlling generation of musical tones along with the progression of a music piece;

a performance data recording means for recording in said performance data memory the performance data sequentially generated along with the progression of the music piece;

a specific recording mode selection means for selecting a specific recording mode; and



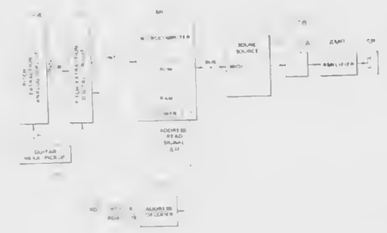
an operation mode control means for, when the specific recording mode is selected by said mode selection means, setting an operation mode of said performance data recording means to a recording preparation mode and for, when first key-on data indicating generation of a musical tone to be recorded is generated, switching and setting the operation mode to a recording mode.

4,924,746

INPUT APPARATUS OF ELECTRONIC DEVICE FOR EXTRACTING PITCH FROM INPUT WAVEFORM SIGNAL

Katsuhiko Obata, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,510
Claims priority, application Japan, Dec. 28, 1987, 62-336410
Int. Cl.[5] G10H *7/00, 1/18, 5/00*
U.S. Cl. 84—615 **13 Claims**



1. An input apparatus for an electronic device, comprising:

pitch extracting means for extracting a pitch period from an input waveform signal to determine a tone pitch;

pitch data generating means coupled to said pitch extracting means for generating first data for designating a tone pitch having a semitone unit, and second data for designating a tone pitch having an interval of not more than a semitone interval by using an extracted pitch period;

detecting means for detecting a starting of the input waveform signal;

tone pitch determining means for chromatically determining the tone pitch in accordance with the first data which designates a semitone unit after the second data is rounded to change the first data when the starting of the input waveform signal is detected by said detecting means; and

tone pitch updating means for designating the tone pitch after the starting of the input waveform signal by the pitch extracted by said pitch extracting means on a real-time basis to update the tone pitch from a chromatic tone pitch which is designated previously

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4,924,747

WAVE FORMING CIRCUIT OF AN ELECTRONIC TONE GENERATOR

Shyuh-Der Lin, Hsin-Chu, Taiwan, assignor to Industriai Technology Research Institute, Taiwan

Continuation of Ser. No. 31,893, Mar. 30, 1987, abandoned. This application Aug. 14, 1989, Ser. No. 394,319
Int. Cl.[5] G10H *1/057, 5/00*
U.S. Cl. 84—663 **4 Claims**



1. An electronic tone generator employing an RC network comprising a capacitor capable of being charged and discharged and a resistor through which said capacitor is discharged and in which the charging and discharging of the capacitor is utilized to amplitude modulate a tone signal, and the modulated tone signal is converted to audible sound by an electroacoustic output device, the improvement comprising a first MOS transistor in said RC network for limiting the discharge of said capacitor through said resistor, said transistor exhibiting a threshold voltage which enables said transistor to shut off to prevent complete discharge of said capacitor beyond the threshold voltage of said transistor, and means isolating said RC network from the impedance of said output device, said isolating means comprising a source follower second MOS transistor circuit between said RC network and said output device.

4,924,748

HAND-OPERATED LEVER FOR OPENING AND CLOSING A WEDGE-LIKE BREECHBLOCK

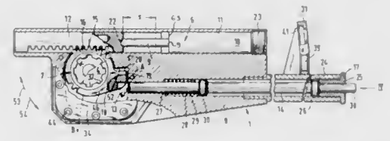
Heinz G. Breuer, Duisburg, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 364,092
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1988, 3822556
Int. Cl.[5] F41F *11/02*
U.S. Cl. 89—24 **10 Claims**

1. A hand-operated opening lever in a gun which is pivotal about an opener shaft for actuating the opener shaft to move a wedge-type breechblock between an open position and a closed position, comprising:

a lever body pivotally connected to a support for movement relative to said opener shaft, said lever body being movable between a first, rest position and a second position for respective manual opening and closing operations; said lever body including a manually displaceable locking bolt and an energy storing means which includes a receiving chamber;

transfer means in form-locking connection with said opener shaft for transferring stored energy between said opener shaft and said lever body for actuating said opener shaft to move the wedge-type breechblock between the open position and the closed position; said transfer means, causing energy to be stored in said energy storing means in said lever body, and transferring stored energy from said energy storing means to said breechblock; said transfer means including engaging means which are selectively engageable with said lever body during the manual opening and closing operations; said engaging means including a form-locking connection with said lever body during the manual opening operation of said wedge-type breechblock, and, during the manual closing process, including a



form-locking connection with said manually displaceable locking bolt mounted in said lever body housing;

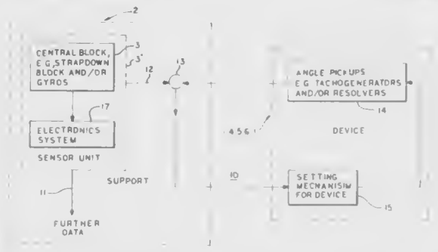
said energy storing means comprising a gas pressure spring having a piston and a toothed rod connected to said piston, said gas pressure spring being disposed in said receiving chamber within said lever body; said toothed rod being in engagement with said transfer means; said energy storing means, in said first, rest position of said lever body, being compressed by said transfer means and, during a movement of the breechblock to the closed position, said energy storing means drives said toothed rod to cause said breechblock to move to said closed position; said energy storing means being inactivated during manual opening and closing of said wedge-type breechblock by said lever body when the breechblock is unlocked and the locking bolt has been forwardly activated.

4,924,749

METHOD AND APPARATUS FOR STABILIZING HIGH-DYNAMICS DEVICES

Otto Beyer, Stuhr 2, and Bertold Kirst, Lilienthal, both of Fed. Rep. of Germany, assignors to LITEF GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 6,001
Claims priority, application European Pat. Off., Jan. 24, 1986, 86100960.3
Int. Cl.[5] F41G *5/16*
U.S. Cl. 89—41.09 **12 Claims**



1. Apparatus for the stabilization of a device which is movably mounted on a support, said device having, in comparison with the support, a high speed of response to deviations from a rest position, comprising:

(a) a control loop, said loop including a setting mechanism, associated with the device for control of deviations of the device from the rest position, said control loop having a bandwidth matched to the speed of response of the device, said setting mechanism being operably responsive to an input of a regulating quantity;

(b) a plurality of angle pickups in the control loop for detecting a position of the device relative to the support with respect to at least two axes and for generating output signals corresponding to that relative position;

(c) a sensor unit including a central sensor block mounted on the support and equipped with inertial sensors which have bandwidths matched to a relatively slow speed of response of the support, the sensor unit being capable of detecting changes of position of the support in an inertial system with respect to at least three measurement axes and of generating output signals corresponding to the position of the support in the inertial system; and

(d) means in the control loop for superposing the output signals of the sensor unit onto the output signals of the angle pickups to produce resulting signals such that the former serves as a reference or guide quantity on the latter, and for feeding the resulting signals to the setting mechanism as the regulating quantity.

4,924,750

ELECTROMAGNETIC LAUNCHER WITH IMPROVED CURRENT COMMUTATING SWITCH PERFORMANCE

Wendell Neugebauer, Ballston Spa, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 23, 1988, Ser. No. 288,938
Int. Cl.[5] F41F *1/02*
U.S. Cl. 89—8 **6 Claims**



1. An electromagnetic launcher for launching a mass equipped with a conductive armature, said launcher comprising, in combination:

A. a breech section including a pair of first rails extending along a first bore;

B. a launch section including a pair of second rails extending along a second bore longitudinally aligned with said first bore and communicating therewith at a launcher breech;

C. a commutating switch connected with said first and second rails;

D. a high DC current source and a storage inductor connected in series circuit across said switch;

E. means for establishing a magnetic field in said first bore including a pair of augmenting rails arranged in closely spaced, substantially coextensive relation with said first rails, said augmenting rails being connected in said source and inductor series circuit to conduct charging current for said inductor;

F. injector means including an explosive shell which is detonated to propel the mass through said first bore toward said breech with the armature completing a current path between said first rails;

G. actuating means including a recoil mechanism actuated by the detonation of said shell for opening said switch; and

H. whereby, with said switch closed, said source drives said charging current through said inductor and said switch, and, upon propulsion of the mass through said first bore by said injector means, the armature reacts with said magnetic field to generate a breech rail current in said first rails which flows through said switch in opposition to said

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charging current, said actuating means opening said switch to commutate inductor discharging current into said second rails when the current through said switch is depressed to a minimal level, said discharging current flowing through the armature to electromotively accelerate the mass through said second bore to a high exit velocity.

4,924,751

GUN BARREL RECOIL BRAKE WITH THROTTLED COUNTERRECOIL

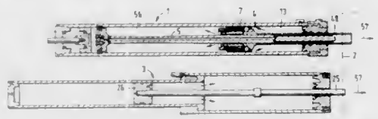
Josef Metz, Neuss, and Hans Hülsewis, Ratingen, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 12, 1989, Ser. No. 364,228

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824153

Int. Cl.[5] **F41F** *19/02;* **F16F** *9/10*

U.S. Cl. 89—43.01 **18 Claims**



1. A hydraulic recoil brake for use with a pneumatic recuperator on a breech ring for a gun barrel to be jointly movable with the breech ring, the brake comprising:

an axially extending brake cylinder;

recoil and counterrecoil damping means, disposed in said brake cylinder, for damping recoil and counterrecoil of the gun barrel, said recoil and counterrecoil means including:

a first damping means for damping the recoil, including a fluid stream control rod and a brake piston reciprocally axially movable relative to said control rod, said control rod having means for resisting a flow of hydraulic fluid in said brake cylinder during recoil,

a piston ring on said brake piston which is axially reciprocally displaceable relative to said brake piston between a first position and a second position,

spring means for elastically urging said piston ring toward said second position, brake pressure from the hydraulic fluid urging said piston ring into said first position against the force of said spring means during recoil, said spring means urging said piston ring into said second position following recoil, said piston ring having a second damping means for damping the counterrecoil by resisting a flow of hydraulic fluid therepast when said piston ring is in said second position, and

means for rendering said second damping means ineffective for damping when said piston ring is in said first position.

4,924,752

DRIVE SYSTEM FOR A GATLING TYPE GUN

Douglas P. Tassie, and Mark F. Folsom, both of St. George, Vt., assignors to General Electric Company, Burlington, Vt.

Filed Dec. 3, 1984, Ser. No. 677,415

Int. Cl.[5] **F41D** *7/04*

U.S. Cl. 89—160 **2 Claims**

1. A gun system including:

a gun housing;

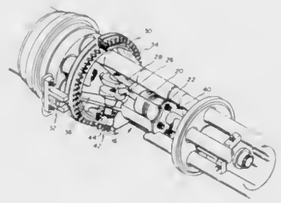
a rotor including a cluster, of gun barrels disposed in an annular row, journaled for rotation about a longitudinal axis with respect to said housing, each barrel having a projectile passing bore in which a respective round of ammunition is fired in sequence during rotation of said rotor;

a gun gas drive mechanism coupled to and between said rotor and said housing for receiving gun gas from said gun barrels and for thereby rotating said rotor with respect to said housing;

said mechanism including

a cylinder fixed to and rotating with said rotor,

a crank journaled to said rotor for rotation with said rotor about said rotor longitudinal axis and for rotation relative to said rotor about a crank axis which is perpendicular to said rotor longitudinal axis.



a pinion gear fixed to said crank for rotation therewith about said crank axis,

a piston having a head disposed and reciprocable within said cylinder and defining a chamber in said cylinder and a rod coupled to said crank whereby reciprocation of said piston causes rotation of said crank about said crank axis,

a ring gear fixed to said housing and meshed with said pinion gear whereby rotation of said crank about said crank axis provides rotation of said rotor about said rotor longitudinal axis.

4,924,753

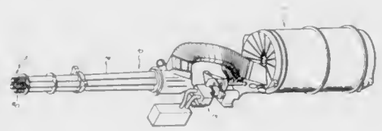
SELF POWERED DRIVE SYSTEM FOR A GATLING TYPE GUN

Douglas P. Tassie, St. George, and Stephen J. Bullis, Colchester, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Dec. 3, 1984, Ser. No. 677,416

Int. Cl.[5] **F41D** *7/04*

U.S. Cl. 89—160 **7 Claims**



1. A gun system, including:

a gun housing;

a cluster of gun barrels journaled for rotation with respect to said gun housing;

a gun gas drive coupled to and between said cluster and said housing for receiving gun gas seriatim from said gun barrels and for thereby rotating said cluster with respect to said gun housing; and

a regenerative, hydraulic starting subsystem, mechanically coupled to said cluster including:

hydraulic accumulator means and

a hydraulic motor hydraulically coupled to said accumulator means and mechanically coupled to said cluster

for being driven by said cluster and thereby when said cluster is driven by said gun gas drive

for pressurizing said accumulator means,

for providing rotational velocity control, including braking, of said cluster,

for driving said cluster under pressure from said accumulator and thereby

for starting and initially driving said cluster in its firing direction of rotation, or

for starting and driving said cluster in its reverse clearing direction of rotation.

4,924,754

CIRCUIT ARRANGEMENT FOR A HYDRAULIC DRIVE IN A POSITION CONTROL CIRCUIT

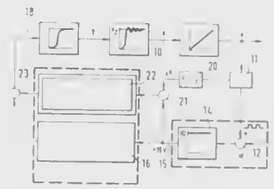
Alfred Feuser, Lohr-Rodenbach; Joachim Neumann, and Walter Voxbrunner, both of Lohr am Main, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lahr Postfach, Fed. Rcp. of Germany

Filed Mar. 6, 1989, Ser. No. 320,103

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808177

Int. Cl.[5] **F13B** *9/03*

U.S. Cl. 91—363 R **16 Claims**



1. Circuit arrangement for controlling a hydraulic system having a valve for controlling fluid paths between a drive, a fluid source and a tank, and a controller for driving the valve according to an output in dependence upon a control deviation, said circuit arrangement comprising:

a first comparator for forming the control deviation from a desired value and an actual value of the position of the drive;

a second comparator for computing a difference between the control deviation and a signal representing the speed of the drive;

an integrator for integrating the difference formed in the second comparator; and

means for adding the integrated result to the output of the controller.

4,924,755

HYDRAULIC POWER BOOSTER

Donald M. Flory, Arcanum, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1985, Ser. No. 728,279

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[5] **B60T** *13/00*

U.S. Cl. 91—376 R **3 Claims**

1. A hydraulic power booster having

a hydraulic fluid reservoir,

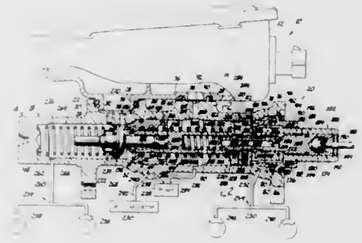
a source of hydraulic fluid pressure using hydraulic fluid from said reservoir,

a power piston reciprocably driven in a booster force applying direction by hydraulic fluid pressure from said pressure source selectively acting on one side of said power piston,

a hydraulic fluid reservoir return continuously provided on the other side of said power piston,

valve means in said power piston having valve operating means and controlling the application and release of hydraulic fluid pressure on said power piston one side to actuate and release said booster and to return hydraulic fluid to the booster fluid reservoir,

and a power piston return spring continuously urging said power piston toward the booster release position,



said power piston return spring being a fluid pressure conduit connected at one end to said power piston to deliver power hydraulic fluid under pressure from said pressure source to said valve means for booster power under control of said valve means and connected at the other end to receive hydraulic fluid under pressure from said source of fluid pressure so that booster actuating pressure is continuously available at said valve means but acts across said power piston only when said valve means is operated to actuate said booster.

4,924,756

BELLOWS CORE AND METHOD AND APPARATUS FOR FABRICATION THEREOF

Donald N. Berube, Tiverton, and Amitava Datta, East Greenwich, both of R.I., assignors to EG&G Sealol, Inc., Cranston, R.I.

Filed May 17, 1988, Ser. No. 194,910

Int. Cl.[5] **F01B** *19/00*

U.S. Cl. 92—45 **5 Claims**



1. An apparatus for fabricating a brazed metal bellows core from a plurality of resilient annular metal diaphragm members and a plurality of annular brazing filler material members for brazing the diaphragm members together, comprising:

means for positioning the diaphragm members and brazing material members in a stacked formation with the brazing material members interposed between adjacent diaphragm

VOL 1114 ISS 3 MY 15 1990 UMI

members, said means for positioning including a planar member having a cylindrical portion forming a peripheral surface for defining an inner circular boundary of a first supporting surface, said cylindrical portion having a planar second supporting surface parallel to the plane of the planar member and having a central axis and an outer diameter equal to the outer diameter of the diaphragm members, said second supporting surface for supporting in position thereon a stacked formation of diaphragm members and brazing material members;

means for coaxially aligning the stacked diaphragm members and brazing material members; and

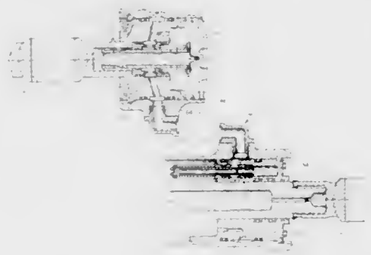
means for axially compressing the stacked and coaxing aligned diaphragm members and brazing material members for providing intimate contact therebetween and for maintaining the members in the stacked and coaxially aligned position during brazing.

4,924,757

LIGHTWEIGHT CYLINDER HEAD ATTACHMENT FOR FLUID ACTUATORS

Howard F. Keene, Renton, and Frank M. Wyckoff, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 13, 1987, Ser. No. 108,721
Int. Cl.[5] F01B *29/08*; F16J *15/16*
U.S. Cl. 92—128 **4 Claims**



4. A lightweight cylinder head attachment mechanism for use on hydraulic actuators of the type having a cylindrical housing and an internal reciprocating piston, comprising:

a hollow cylinder defining a cylinder axis and having a cylinder head end having an inner, circumferential, concave surface forming one half of a circular trough and also having an inwardly extruding lip;

a cylinder head having a cylinder plug received in the cylinder at the cylinder head end, the cylinder plug having an outer, circumferential, curved surface corresponding to the inner, circumferential, curved surface on the cylinder head end of the hollow cylinder so as to form the other half of the circular trough;

a plurality of cylindrical, arcuate shear ring segments positionable to prevent relative axial movement of the cylinder plug and the hollow cylinder; and

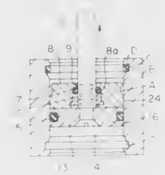
a retaining mechanism having a first portion connectable to the cylinder head and a second portion insertable between the shear ring segments and the inwardly extending lip to retain the shear ring segments in place, whereby hydraulic pressure in the cylinder and on the cylinder plug portion causes the shear ring segments to exert an outward force on the cylinder inner wall.

4,924,758

COMPACT FLUID OPERATED APPARATUS AND METHOD

Lawrence F. Yuda, P.O. Box 176, Westminster, S.C.

Continuation-in-part of Ser. No. 227,235, Aug. 1, 1988, and a continuation-in-part of Ser. No. 25,596, Mar. 13, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 318,852
Int. Cl.[5] F01B *29/00*
U.S. Cl. 92—128 **2 Claims**



1. For use in a fluid operated cylinder having a piston and a fluid port, an end cap receiving fluid under pressure through said fluid port and having a terminal recess opposite said piston comprising:

an annular seat in said end cap adjacent an end thereof remote from said piston;

a ring of resilient deformable material carried partially within said annular seat positioning said end cap within said cylinder;

an annular groove in said end cap adjacent to and in axially spaced relation to said annular seat;

an annular terminal recess in said end cap adjacent to and in axially spaced relation to said annular groove;

a first annular section having a first peripheral surface on said end cap between said annular seat and said annular groove;

a second annular section having a second peripheral surface on said end cap between said annular groove and said annular terminal recess;

a first passageway in said second annular section providing a connection for fluid flow between said annular groove and said annular terminal recess; and

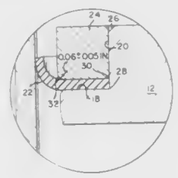
a second passageway extending from said annular terminal recess across an adjacent end of said end cap to said terminal recess.

4,924,759

PRESS-FIT RETAINING RING WITH EXTRUSION-HOLDING CHAMFER FOR WOBBLE-PISTON CUP SEAL

Darrill L. Plummer, Charlotte, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 1, 1988, Ser. No. 226,580
Int. Cl.[5] F16J *15/34, 15/32*
U.S. Cl. 92—240 **8 Claims**



1. A wobble assembly comprising:

a piston;

a seal retaining ring;

an annular seal having an innermost, peripheral edge;

said piston has a plate-type head, and a rod extending from said head;

said head has an annular land formed thereabout;

said seal is disposed upon said land;

said retaining ring is set upon said seal;

said head further has a circumferential wall;

said ring has an interference-fit engagement with said wall;

said wall and said ring have means cooperative for (a) facilitating said engagement of said ring with said wall, and (b) accommodating an extruded expansion of said innermost peripheral edge of said seal between said wall and said ring;

said wall has an uppermost portion;

said land and wall meet at, and define, a juncture;

said ring has a portion confronting said juncture;

said portions area chamfered; and

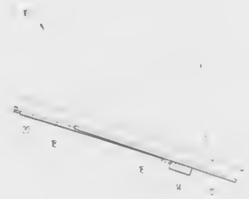
said cooperative means of said ring and said wall comprises said chamfered portions.

4,924,760

ROOF VENT DAMPER

Harvey E. Jobson, 2414 Rosedown Dr., Reston, Va. 22091

Filed Jul. 10, 1989, Ser. No. 377,075
Int. Cl.[5] F24F *11/00*
U.S. Cl. 98—42.15 **6 Claims**



1. A method of making a roof vent damper, comprising the steps of:

providing a generally rectangular elongated sheet metal plate;

forming a dumbbell shaped cut-out in a central portion of said plate;

forming two aligned notches in opposite longitudinal side edges in alignment with a central narrow portion of said cut-out;

folding a narrow width portion along each of said plate longitudinal side edges to form parallel guide track members;

securing said guide track members in said folded condition;

folding said plate along a transverse line extending across said central narrow portion of said cut-out to form two overlying plate members enclosing a hollow central guide channel;

providing a generally rectangular damper plate; and

mounting said damper plate in said guide channel.

4,924,761

ROOF VENT

Richard J. MacLeod, Milford; Charles E. Schiedegger, Metamora, and Norman L. Chubb, Dearborn, all of Mich., assignors to Tapco Products Company, Inc., Detroit, Mich.

Filed Jan. 5, 1989, Ser. No. 293,946
Int. Cl.[5] F24F *7/02*
U.S. Cl. 98—42.21 **12 Claims**

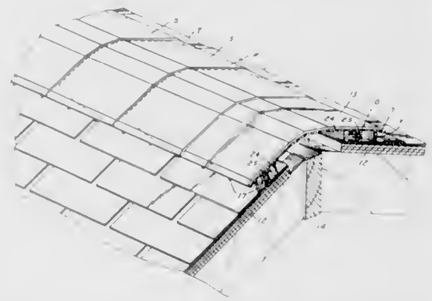
1. A roof vent comprising

a one-piece plastic body including a base wall having transversely spaced sets of rows of integral vanes extending from one surface thereof,

each vane having a free end adapted to engage the roof when the vent is in position on a roof,

the vanes in each row of vanes of each set of vanes being longitudinally spaced from one another, parallel to one another, and extending at an acute angle to the axis of the wall and the vanes of the other row of each set of rows being longitudinally spaced from one another, parallel to one another and extending at an oppositely directed acute angel to the longitudinal axis of the wall,

each outermost row of vanes being arranged such that the general plane of each vane intersects the general plane of an adjacent vane of an inner row,



each vane having an outer free edge and an inner free edge,

each vane having the inner free end thereof generally curved such that the free edge of said free end extends outwardly,

a layer of porous material positioned between adjacent rows of vanes,

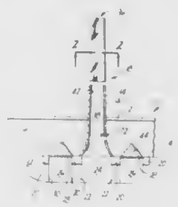
said layer having a height greater than the height of the vanes such that when the vent is positioned with the vanes engaging the roof and the base wall spaced from the roof, air is vented through sinuous paths defined by successive rows of vanes outwardly and water and snow are prevented from entry beneath the vent into the building by the vanes and the layer.

4,924,762

SOLAR POWERED AIR FILTER SYSTEM

William A. Lane, Jr., Lake Arrowhead, Calif., assignor to W. A. Lane, Inc., San Bernardino, Calif.

Filed Jul. 21, 1989, Ser. No. 382,490
Int. Cl.[5] E04F *17/02*
U.S. Cl. 98—58 **20 Claims**



1. A solar powered passive air filter system containing no mechanical air movers for filtering particulate matter from a particulate matter polluted air space comprising:

an elongated vertical chimney located in association with said polluted air space in a position exposed to solar radiation, said chimney having an outside surface, an inside

VOL
1114
ISS
3
MY
15
1990
UMI

surface, a base, an open top and a hollow interior connecting between said base and said open top, said chimney having passive means in response to exposure to solar radiation capable of passively maintaining an ascending air stream through its interior from its base to its open top and exhausting said air stream from said open top, said outside surface of said chimney having at least a south and north facing surface portions;

duct means for forming an air passageway from said polluted air space to said base of said chimney to conduct an air stream from said space to said base of said chimney; and

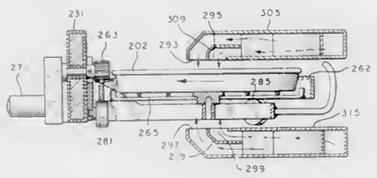
filter means for removing particulate matter air pollutants from said air stream, said filter means located in association with said duct means to remove particulate matter from air conducted through said duct means.

4,924,763

COMPACT PIZZA OVEN

Lynn R. Bingham, Tulsa, Okla., assignor to Pizza Hut, Wichita, Kans.

Filed Oct. 17, 1988, Ser. No. 258,967
Int. Cl.[5] A47J *37/04*; F24C *15/32*
U.S. Cl. 99—339 **20 Claims**



1. A compact pizza oven comprising:

a baking chamber;

means for heating air;

fan means for impelling heated air;

an oven door;

a turntable upon which a pizza is rotated about its center;

at least one top orifice in the baking chamber through which heated air is impelled toward the top of the pizza as it is rotated on the turntable; and

at least one bottom orifice in the baking chamber through which heated air is impelled toward the bottom of the pizza as it is rotated on the turntable.

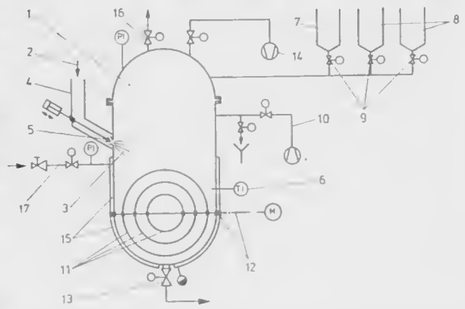
4,924,764

METHOD AND DEVICE FOR THE BATCHWISE PRODUCTION OF AERATED SWEETS IN A PRESSURE-BEATING MACHINE

Klaus Markwardt, Laatzen, and Reinhard Mergelsberg, Garbsen, both of Fed. Rep. of Germany, assignors to Otto Hänsel GmbH, Hnnover, Fed. Rep. of Germany

Division of Ser. No. 894,259, Aug. 7, 1986, Pat. No. 4,774,100. This application Jun. 3, 1988, Ser. No. 201,833
Int. Cl.[5] A47J *27/66*
U.S. Cl. 99—348 **10 Claims**

1. Apparatus for batchwise production of aerated sugar masses comprising: a pressure beating machine; a separate cooker connected to said pressure beating machine for boiling a sugar solution to be aerated at atmospheric pressure without subsequent vacuum treatment in said cooker; means for transferring the boiled solution into said pressure beating machine, and means for vacuumizing said solution in said pressure beating machine by an additional boiling under vacuum to obtain a substantially viscous sugar mass; means for mixing said solution in said pressure beating machine after vacuumizing with added whipping agent solution; means for beating thereafter the mixed solution in said pressure beating machine, and means for adding compressed air to produce an aerated sugar mass comprised substantially of cooked and vacuumized sugar solution, whipping agent solution, and air; said vacuumizing and



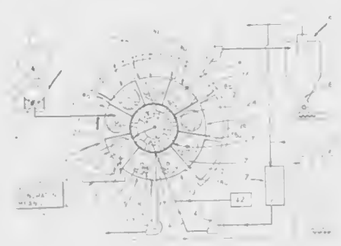
said beating being carried out only in said pressure bearing machine; said vacuumizing means reducing the water content of said sugar mass through vaporization.

4,924,765

EQUIPMENT FOR ROASTING COFFEE, HAZLENUTS, PEANUTS AND SIMILAR COMMODITIES

Benito Pera, Via del Pera, 1, Alessandria, Italy 15100

Filed Nov. 4, 1988, Ser. No. 267,084
Claims priority, application Italy, Nov. 6, 1987, 3680 A/87
Int. Cl.[5] A23B *9/00*; A23L *3/18*; F26B *11/04*
U.S. Cl. 99—348 **18 Claims**



1. Equipment for roasting coffee, hazelnuts, peanuts and similar commodities, comprising:

a feeder dispensing said raw commodity;

a treatment device for treatment of each charge of said raw commodity dispensed by the feeder, said treatment device including a carrier drum rotatable about its own axis and at least four distinctly embodied, independent and modular peripheral sectors, each said sector being designed to contain a prescribed quantity of said raw commodity and being provided with at least one fluid inlet and one fluid outlet for passage of a fluid, a sector inlet to admit said raw commodity, and a sector outlet from which to discharge said raw commodity after being treated;

hot fluid generating means for generating a hot fluid, and for connecting said hot fluid in communication with said treatment device so as to be capable of roasting said raw commodity in said treatment device and producing a roasted product from said raw commodity;

a separation and disposal unit for separation and disposal of waste matter that may be shed by said raw commodity during said roasting in said heat treatment device;

a cooling system for generating a cold fluid and for connecting said cold fluid in communication with said treatment device so as to be capable of lowering the temperature of said roasted product to produce a roasted end product;

a discharge outlet for discharging said roasted end product which has been discharged through said sector outlet;

a succession of distinct work stations comprising,

a charging station formed by said feeder being connected with said treatment device,

a heating and roasting station formed by said hot fluid generating means and said separation and disposal unit being connected with said treatment device,

a cooling station formed by said cooling system being connected with said treatment device, and

a discharge station formed by said discharge outlet being connected with said treatment device,

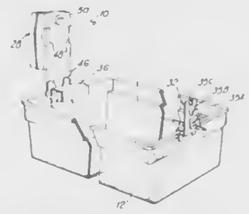
said sectors of said treatment device being conveyed and brought into operable association with each said work station by rotation of said drum and by way of said inlets and/or outlets, and said work stations being arranged with respect to said sectors such that each said work station is occupied by at least one sector at any given moment.

4,924,766

ROTISSERIE ASSEMBLY

Robert J. Hitch, Columbus, Ga., assignor tn W. C. Bradley Company, Columbus, Ga.

Continuation-in-part of Ser. No. 455, Jan. 5, 1987. This application Oct. 4, 1988, Ser. No. 253,051
Int. Cl.[5] A47J *37/04, 37/07*
U.S. Cl. 99—421 HV **7 Claims**



1. A rotisserie assembly for suspending food over a firebox of a barbecue grill having a heat source for cooking the food, said assembly comprising a motor for said assembly having a power source and spaced, opposing, clip means, a motor support bracket secured to one side of said firebox with a plurality of securing means disposed therethrough and against said firebox for leveling said motor support bracket thereon, said motor support bracket also having spaced arm means offset from said motor support bracket and extending outwardly therefrom for receiving said clip means of said motor, a rod support bracket secured to another side of said firebox opposite said motor support bracket, and a rod means having one end rotatably connected to said motor with an opposite end being received in said rod support bracket.

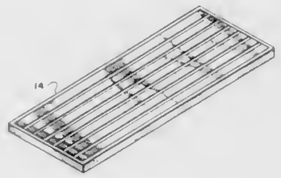
4,924,767

CONVEYORIZED COOKING APPARATUS

Robert M. Stuck, Clover, S.C., assignor to Marshall Air Syatems, Inc., Charlotte, N.C.

Filed May 23, 1986, Ser. No. 866,478
Int. Cl.[5] A47J *37/04*
U.S. Cl. 99—423 **10 Claims**

1. In a cooking apparatus having a housing enclosing a cooking zone for receiving foodstuff to be cooked and at least one electrical resistance heater for heating the cooking zone and for cooking foodstuff received therewithin, the heater being subject to fluctuation in thermal demand depending upon the absence and presence of thermal loads imposed by foodstuff in the cooking zone, an improvement in which said heater comprises a low thermal mass electrical resistance heater having thin strip emission surface means defining a planar surface for the emission of thermal energy and electrical resistance means for heating said surface means to a predetermined set point temperature, said surface means and resistance means together being characterized by having low thermal mass such that the temperature decay in said cooking zone upon removal of thermal load therefrom may be graphically represented by a line fitting the equation



$$y = mx + b$$

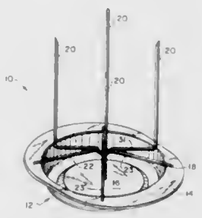
where y is the temperature reached at a time interval after de-energization of the heater, m is the slope of the line, x is the time elapsed after de-energization, and b is the temperature at de-energization, and further wherein the value of m is in a range of from about −0.25 to about −3.00.

4,924,768

MULTI-PURPOSE BAKING AND ROASTING RACK

Murray Jay, Woodsburgh, N.Y., assignor to Gemco-Ware Inc., Freeport, N.Y.

Filed Feb. 25, 1988, Ser. No. 160,206
Int. Cl.[5] A47J *43/18*
U.S. Cl. 99—425 **17 Claims**



1. A multi-purpose baking and roasting rack comprising a drip pan having a raised peripheral rim circumferentially extending about a downwardly recessed interior surface; a plurality of generally vertically oriented skewer rods positioned above said interior surface each adapted to pierce and support a food item to be baked or roasted; connecting means for connecting said skewer rods to said peripheral rim; and stabilizing means for stabilizing said skewer rods in relation to themselves to provide a generally rigid construction when assembled for use which facilitates the reliable and safe use of the rack, wherein said skewer rods being formed from two similarly shaped first rigid wire elements, each first rigid wire element being bent within a plane and being generally U-shaped to form two upwardly extending arms which define one pair of spaced generally parallel skewer rods and having an intermediate connecting rod portion extending between the lower ends of said skewer elements, said connecting means comprising a second wire element connected to an intermediate connecting rod portion of an associated first wire element, each second wire element being bent to form outwardly and downwardly flaring leg members having lowermost free ends detachably connectable to said peripheral rim.

VOL
1114
ISS
3
MY
15
1990
UMI

4,924,769

DEVICE FOR MANUFACTURING BUTTER

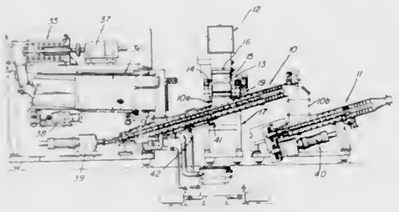
Hanno Lehmann; Arnold Uphus, and Johannes Kreimer, all of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator Aktiengesellschaft, Oelde, Fed. Rep. of Germany

Division of Ser. No. 144,831, Jan. 15, 1988, abandoned. This application Apr. 4, 1989, Ser. No. 333,823

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705643

Int. Cl.[5] A01J *15/12, 17/00;* A23C *17/00*

U.S. Cl. 99—455 20 Claims



1. In a device for manufacturing butter, comprising: a continuous-operation mechanical churn with at least one butter-making cylinder for producing a mixture of buttermilk and butter grain, means for removing butter milk from the mixture and at least one squeeze-off means downstream of the churn, the improvement comprising at least one chopping means receptive of a block of butter or fat and located above a most upstream of the at least one squeeze-off means in terms of the direction that the butter grain moved in for chopping fragments from the block, wherein the chopping means has means for advancing the block and means for introducing the chopped fragments into the at least one squeeze-off means with the butter grain to produce a homogeneous billet of butter therefrom.

4,924,770

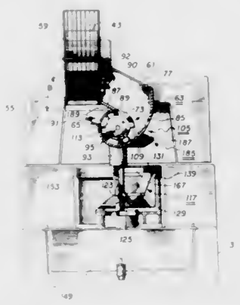
PORTABLE, AUTOMATIC JUICE EXTRACTION MACHINE

John R. Raub, San Marcos, Calif., assignor to Juice Tree, Garden Grove, Calif.

Filed May 5, 1989, Ser. No. 347,987

Int. Cl.[5] A23N *1/00*

U.S. Cl. 99—511 21 Claims



1. A portable, automatic juice-extraction machine, comprising:

(a) a cabinet defined by spaced-apart front and rear panels joined along their respective edges by spaced-apart side panels, said cabinet mounted on wheels for movement across a floor;

(b) hopper means supported on said cabinet having an open top at or below eye-level for receipt of the juice source material therein;

(c) conveying means in communication with said hopper;

(d) cutting means for receiving said source material from said conveying means and chopping it into small pieces, without allowing the chopped pieces or juice liberated therefrom to back flow into said conveying means, including first means for preventing pieces of source material from rotating up out of reach of said cutting means;

(e) centrifuge means in communication with said cutting means for further reducing the chopped pieces of source material to a pulp and subjecting said pulp to centrifugal forces to separate it into a stream of juice and a separate stream of waste material;

(f) holding means mounted adjacent said front panel of said cabinet at a convenient level above the floor for receiving the extracted juice for bottling or selective serving to customers;

(g) storage means inside said cabinet for receiving and storing the waste material; and,

(h) power means, including means for connection to a power source, for driving said conveying means, said cutting means and said centrifuge means.

4,924,771

DEVICE FOR THE INJECTION OF A QUANTITY OF MEAT

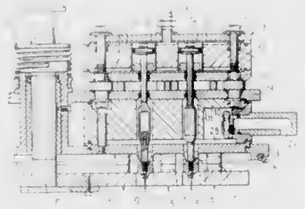
Christianus P. Langen, and Johannes C. Langen, both of Cuijk, Netherlands, assignors to Langen Research B.V., Netherlands

Filed Jan. 5, 1989, Ser. No. 293,324

Claims priority, application Netherlands, Jan. 14, 1988, 8800081

Int. Cl.[5] B02B *3/12, 23/00*

U.S. Cl. 99—533 6 Claims



1. In a machine for injecting a fluid into a piece of meat, the machine being of the type having a plurality of injection needle assemblies through which fluid is injected and in which individual dosing chambers are associated with each needle, each dosing chamber having an injection piston member and an injection cylinder member mounted for movement with respect to one another between an extended position in which a dose of fluid may be admitted to the dosing chamber and a retracted position in which the dose of fluid is expelled from the dosing chamber through its associated injection needle, one of the injector members being fixed and the other being moveable with respect to its associated needle, the improvement of:

drive means for driving each moveable member with respect to its associated fixed member comprising; a drive piston mounted on the moveable member and a drive cylinder receiving the drive piston in a close fitting sliding relationship, the drive pistons of the moveable members being free of attachment to one another whereby the drive pistons are independently moveable with respect of one another.

4,924,772

CALENDER WITH INDIVIDUALLY SUPPORTED ROLLS AND CONSTANT NIP ALIGNMENT

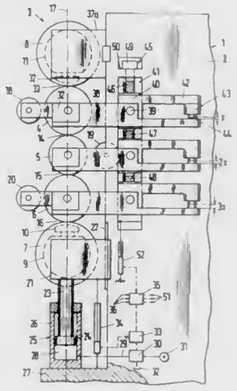
Jürgen Schlunke, Krefeld; Franz Kaiser, Geldern, and Hilmar Fenzau, Korschenbroich, all of Fed. Rep. of Germany, assignors to Kleinwefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Jan. 21, 1988, Ser. No. 147,356

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702245

Int. Cl.[5] B30B *3/04*

U.S. Cl. 100—163 R 25 Claims



1. A calendar comprising a frame; a stack of rolls in said frame, said stack including two outer rolls and at least one intermediate roll, said outer rolls including a first roll at a level above and a second roll at a level below said one intermediate roll and said rolls having axes disposed in or close to a common plane, said intermediate roll having coaxial first and second end portions; first and second bearings for the respective end portions of said intermediate roll; first and second levers for the respective bearings; and means for movably mounting said levers in said frame, including first and second ways provided in said frame, first and second carriages reciprocable along the respective ways, first and second pivot means angularly movably connecting said first and second levers to the respective carriages, and means for moving said carriages along the respective ways, said pivot means having a common axis which is parallel to the axis of said intermediate roll and said bearings being located at or close to the levels of said carriages. said ways extending transversely of said common axis and of said levers.

4,924,773

HAND STAMP WITH RESERVOIR

Terri L. Gwilliam, 626 Brown St., Healdsburg, Calif. 95448

Filed Feb. 10, 1989, Ser. No. 308,670

Int. Cl.[5] B41K *1/04, 1/52;* B05C *1/00, 17/12*

U.S. Cl. 101—327 2 Claims

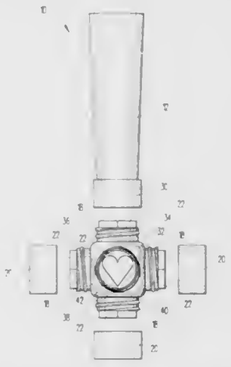
2. A marking device for use in playing bingo, comprising:

a cubical ink reservoir having six faces;

a tubular sleeve extending from each of said six faces;

a sponge applicator removably received in each of said sleeves and in fluid communication with said ink reservoir;

each of said applicators configured for forming a different design ink mark;



a removable cap for selectively covering each of said applicators; and

an elongated handle connected to one of said caps.

4,924,774

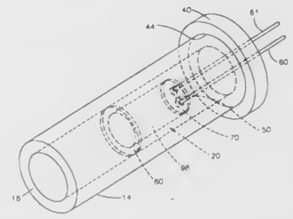
APPARATUS FOR IGNITING A PYROTECHNIC TRANSMISSION LINE

Reiner Lenzen, Almont, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed May 16, 1989, Ser. No. 352,389

Int. Cl.[5] F42B *3/12;* F42C *19/00*

U.S. Cl. 102—202.7 20 Claims



1. An apparatus comprising:

an ignitable pyrotechnic transmission line including a tube having reactive material therein which ignites when subjected to a pressure pulse of a predetermined magnitude for a predetermined time duration; and

an actuatable semiconductor bridge operatively connected with one end of said pyrotechnic transmission line for, when actuated, creating a pressure pulse of at least said predetermined magnitude for at least said predetermined time duration to ignite the reactive material in said tube.

4,924,775

INTEGRATED TWO STAGE ROCKET

John M. Humphrey, Monte Sereno, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 2, 1989, Ser. No. 431,604

Int. Cl.[5] F42B *4/14, 15/10*

U.S. Cl. 102—352 4 Claims

1. A rocket system, comprising,

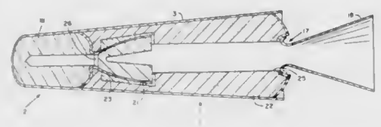
a. a frustoconical or cylindrical casing having an aft end and

VOL
1114
ISS
3
MY
15
1990
UMI

a forward end, said aft end having a larger or equal diameter than the forward end,

b. a first rocket stage positioned in said aft end of the casing and having a nozzle extending therefrom in an aft direction,

c. a second rocket stage positioned in the forward end of the



casing, and having a second nozzle extending therefrom in an aft direction, said first stage containing a solid fuel so positioned that a forward end of said fuel fills and surrounds the second nozzle such that when the case is severed along a plane aft of the second stage portion of the case pressurized products of combustion from the first stage portion of the case force the stages apart.

4,924,776

SWITCH FOR A FLOOR TRANSPORTATION SYSTEM

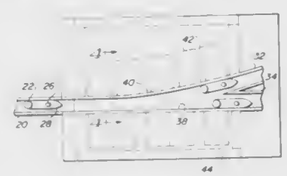
Georg Uttscheid, Madronstrasse 17, D-8200 Rosenheim, Fed. Rep. of Germany

Filed Oct. 25, 1988, Ser. No. 262,460

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 37368869

Int. Cl.[5] **E01B** *25/28;* **B65G** *43/00;* **B61L** *5/06;* **B60M** *7/00*

U.S. Cl. 104—130 **3 Claims**



1. In a switching system for an automotive electric floor transportation system, a vehicle, a guide rail beneath the level of the floor, said guide rail having a switch area for alternatively guiding said vehicle along one or the other of two paths of movement, a steering mechanism on the vehicle having a guide pin engageable with said guide rail, said steering mechanism further comprising a guide shoe comprised at least in part of ferromagnetic material, said guide shoe being positioned in advance of said guide pin and being pivotally mounted on a central vertical shaft, and electromagnets positioned along side said guide rail in said switch area, said electromagnets being selectively energizable to attract said guide shoes to direct said vehicle over one or the other of said two paths of movement.

4,924,777

MAXIMUM DENSITY CONVEYOR SYSTEM

Leon Linton, and Michael L. Campbell, both of Memphis, Tenn., assignors to Southern Systems, Inc., Memphis, Tenn.

Filed Nov. 16, 1988, Ser. No. 271,713

Int. Cl.[5] **B65G** *17/00*

U.S. Cl. 104—172.2 **8 Claims**

1. A conveyor system comprising in combination:

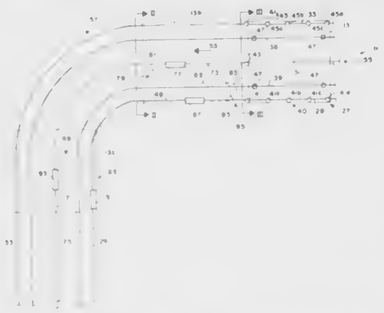
(a) at least one carrier;

(b) carrier guide means for guiding said carrier along a path of travel that includes at least one turn portion and at least one straight portion leading into said turn portion;

(c) power means for moving said carrier including power chain means and a plurality of pusher means attached to said chain means;

(d) tow means including at least one center tow means attached to said carrier substantially on the center line of said carrier, and at least one side tow means attached to said carrier on one side of said carrier; and

(e) chain guide means for guiding said chain means along at least a portion of said straight portion with at least one of said pusher means being positioned to engage said center



tow means to tow said carrier along a normal center towing position during the movement of said carrier along said portion of said straight portion, for guiding said chain means away from said center tow means at a first disengaging point to disengage said one of said pusher means from said center tow means and release towing power from said carrier, and for subsequently guiding said chain means to a first pick up point to engage one of said pusher means with said side tow means and move said carrier around said turn portion.

4,924,778

ATTRACTION TYPE MAGNETIC LEVITATING APPARATUS

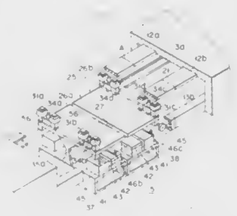
Mimpei Morishita, Fuchu, and Teruo Azukizawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1989, Ser. No. 329,255

Claims priority, application Japan, Mar. 30, 1988, 63-76921

Int. Cl.[5] **B60L** *13/06, 13/00*

U.S. Cl. 104—284 **16 Claims**



1. An attraction type magnetic levitating apparatus comprising:

a ferromagnetic guide;

a levitated object which is arranged below said guide, attracted by said guide, and levitated at a position where attraction and gravity corresponding to a weight of said levitated object are balanced, said levitated object having a magnetic support unit which is arranged to oppose said guide through a gap so as to simultaneously generate a supporting force for levitating said levitated object and a guiding force in a direction substantially perpendicular to a direction of the supporting force when said levitated object is stably levitated, said magnetic support unit including an electromagnet whose center is displaced from a center of said guide;

sensor means for detecting a state of a magnetic circuit constituted by said electromagnet, said guide, and the gap, and obtaining a single or plurality of first physical values required to control the supporting force;

calculating means for calculating a single or plurality of second physical values associated with said magnetic circuit and required to control the guiding force on the basis of the single or plurality of first physical values output from said sensor means; and

control means for controlling an exciting current of said electromagnet on the basis of outputs from said sensor means and said calculating means, and stabilizing said magnetic circuit by controlling the support and guiding forces, thereby magnetically levitating said levitated object.

4,924,779

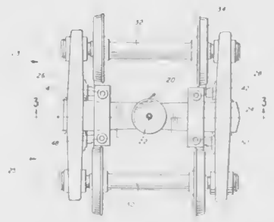
LONG-TRAVEL SIDE BEARING FOR AN ARTICULATED RAILROAD CAR

Richard D. Curtis, Munster, Ind., and Shaun Richmond, Orland Park, Ill., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Feb. 21, 1989, Ser. No. 312,957

Int. Cl.[5] **B61F** *5/14*

U.S. Cl. 105—4.1 **13 Claims**



1. An articulated railroad car having a standard railroad car side bearing and a long-travel side bearing, said standard railroad car side bearing having a housing and a first resilient means operatively connected to said housing, said first resilient means having a spring rate sufficiently high to prevent compression of said housing greater than ⅛ inch, said long-travel side bearing comprising:

a top cap member having an upper portion and a downwardly extending side portion;

a bottom member having a base portion and an upwardly extending sleeve member, said sleeve member slidably engaged within said side portion; and

second resilient means interposed between said top cap member and said bottom member, said second resilient means having a spring rate sufficiently low to permit greater than ⅛ inch displacement of said top cap member relative to said bottom member.

4,924,780

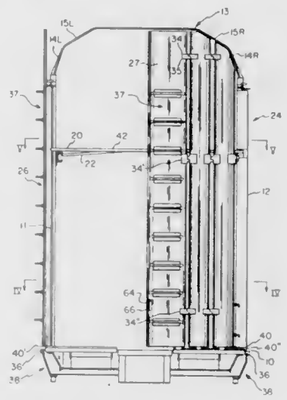
SLIDING END PANELS FOR A RAIL CAR

James D. Hart, Greenville, Pa., assignor to Trinity Industries, Inc., Dallas, Tex.

Filed Jul. 12, 1988, Ser. No. 218,576

Int. Cl.[5] **B61D** *3/18*

U.S. Cl. 105—378 **19 Claims**



1. A rail car comprising:

a bottom deck, sidewalls and a roof, the roof connecting one end of each sidewall and the deck connecting the opposite end of each sidewall to form an open end of the rail car;

at least one intermediate deck extending between and connecting the sidewalls;

a left and right door for closing the end opening, said doors sized to substantially conform to the profile of the end opening when they are in the closed position; and

a means for sliding the doors such that each can be moved from a closed position to a stowed position along the outside of the rail car, said sliding means including a bottom track mounted on said bottom deck and an upper track mounted on the uppermost of said intermediate deck(s), said upper track and said bottom track curving around the sidewalls and closely following the form of the end of the rail car to allow the doors to stand substantially in one plane in the closed position and parallel to and adjacent the exterior surface of the sidewalls in the stowed position.

4,924,781

PATIENT SUPPORT SYSTEM FOR RADIOTHERAPY

Francis J. Span, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1988, Ser. No. 168,353

Claims priority, application United Kingdom, Mar. 16, 1987, 8706153

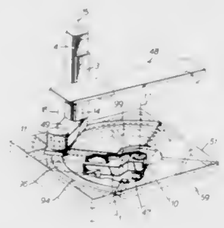
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] **A47B** *85/00*

U.S. Cl. 108—22 **16 Claims**

1. A patient support system for positioning a patient relative to an irradiation therapy or treatment simulation isocentre, comprising a main supporting arm rotationally attached at one end to a structural support by a first support bearing so as to be rotatable about a first first vertical axis, a further supporting arm rotationally attached at one end to the other end of the main supporting arm by a second support bearing so as to be rotatable about a second vertical axis, vertical support means rotationally attached to the other end of the further supporting arm by a third support bearing so as to be rotatable about a

third vertical axis, the first, second and third axes each being provided with corresponding motor drives and associated angular position and angular velocity sensing means, a patient support table top attached to supporting carrier means, the vertical support means including means for locating and vertically displacing the supporting carrier means, and control means including computing means arranged to control the respective motor drives in response to the associated angular position and velocity sensing means and to corresponding position demand values, characterised in that the position demand values include horizontal x- and y-cartesian coordinate set-point demand values for a predetermined reference



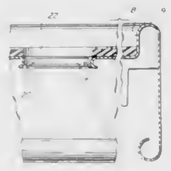
point associated with a patient on the patient support table top, relative to the isocentre, said computing means being arranged to calculate actual x- and y-coordinate values relating to said reference point from angular positions measured by the sensing means respectively associated with angular positions about at least two of said vertical axes, to compare these actual coordinate values using a differencing process, with the corresponding set-point cartesian coordinate demand values to form corresponding cartesian error values and to combine the corresponding cartesian error values so as to provide corresponding drive signals for the motor drives associated with rotation about said at least two vertical axes for reducing or nullifying said cartesian error values.

4,924,782

WHEELED TABLE

Donald L. Nicholds, Libertyville, Ill., assignor to Luxor Corporation, Wankegan, Ill.

Filed Aug. 25, 1989, Ser. No. 398,455
Int. Cl.[5] A47B *14/00*
U.S. Cl. 108—27 **16 Claims**



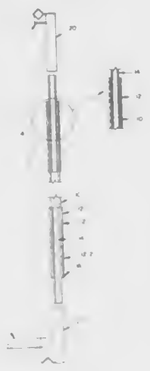
1. A wheeled table comprising:
a base section;
wheels mounted to said base section for selective positioning of the table on a subjacent floor surface;
a tabletop carried by an upper section on said base section, said tabletop defining a flat upper surface, and an edge portion provided with an elongated opening spaced inwardly from a peripheral edge thereof for extension of the fingers of a user's hand downwardly through said upper surface with the palm of the user's hand overlying said edge portion outwardly from said opening; and
upstanding means at said peripheral edge for causing the user's palm to be elevated from the flat plane of the tabletop upper surface.

4,924,783

KNOCK-DOWN STACKABLE CONTAINER

Thomas C. Weizer, South Russell, and Thomas P. Cerjak, Mentor, both of Ohio, assignors to AXIA, Inc., Oak Brook, Ill.

Filed Apr. 27, 1989, Ser. No. 344,205
Int. Cl.[5] B65D *19/38*
U.S. Cl. 108—53.3 **8 Claims**



1. A stackable container, adapted to be shipped in a knock down condition, comprising:
a top frame;
a bottom deck;
at least four columns being tubular members with through openings having an inside face and an outside face;
wherein the columns detachably connect the top frame to the bottom deck using a connection joint;
wherein the connection joint comprises a column portion and a top frame or a bottom deck portion;
wherein there is a column connection joint portion at each end of each column, a first column connection joint portion to connect to the top frame portion and a second column connection joint portion to connect to the bottom deck;
wherein the top frame or bottom deck connection joint portion comprises a column support tube being a tubular member with a through opening; and
wherein the column connection joint portion comprises an inner support, means, an outer support means and a column portion coaxially therebetween.

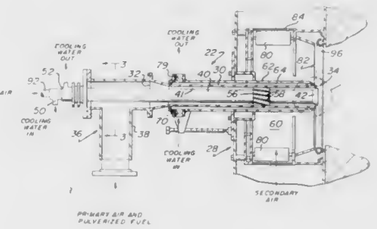
4,924,784

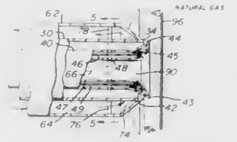
FIRING OF PULVERIZED SOLVENT REFINED COAL

George T. Bellas, Library; Richard B. Snedden, McKeesport; Dennis R. Lennon, Allentown, and Edward P. Foster, Macungie, all of Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Feb. 27, 1984, Ser. No. 584,046
Int. Cl.[5] F23D *1/02*
U.S. Cl. 110—261 **16 Claims**

1. Burner means for the firing of pulverized solvent refined coal fuel or the like comprising:
a burner tube having a fuel inlet end and a discharge end,
means for mounting said burner tube on a furnace wall with the discharge end thereof arranged to discharge the solvent refined coal into the furnace chamber for burning thereof,
a diffuser centrally located within said burner tube and extending axially along the length thereof to an end location inwardly of and adjacent to said burner tube discharge end,
said diffuser and burner tube defining an annular burner passage extending from said fuel inlet end of said burner tube to said discharge end thereof,
inlet means for delivering a mixture of primary air and fuel to the fuel inlet end of said burner tube for flow thereof uniformly through said burner passage,
said diffuser having an outwardly diverging conical portion at said discharge end for diverting the flow of the primary air-fuel mixture outwardly at an angle to the longitudinal axis of said burner tube, said conical portion extending from a location beyond said discharge end to a location inwardly of said discharge end,
said conical portion of said diffuser and said burner tube discharge end defining a single annular burner orifice through which said mixture of primary air and fuel passes, the diameter of said conical portion of said diffuser being such that the cross-sectional area of said annular burner





orifice is less than the cross-sectional area of said annular burner passage,
said conical portion of said diffuser having an outer diameter at its tip approximately the same as the inner diameter of said burner tube so as to shield the discharge end of said burner tube and the fuel passing therethrough from heat radiation from the burner flame,
means for water-cooling said diffuser along the length thereof adjacent said burner tube and at the conical portion thereof,
means for supplying a flow of secondary air for mixture with said primary air-fuel mixture,
means providing a water-cooled annulus eternally of said burner tube between said burner passage for the primary air-fuel mixture flow and said secondary air flow, and
means supplying a mixture of primary air and pulverized solvent refined coal fuel to said inlet means so as to maintain the velocity of said primary air-fuel mixture passing through said burner orifice in the range of about 125–400 ft/sec.

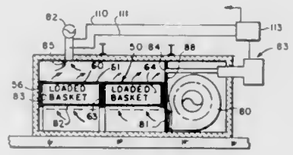
4,924,785

THERMAL CLEANING SYSTEM

Thomas J. Schultz, Maumee; Jay K. Shah, Sylvania, and Valdis R. Daiga, Toledo, all of Ohio, assignors to Surface Combustion, Inc., Maumee, Ohio

Filed Dec. 5, 1988, Ser. No. 280,014
Int. Cl.[5] F23G *5/00*
U.S. Cl. 110—346 **42 Claims**

1. A thermal reclamation process for recovering a base material from a composite material including said base material and organic compounds, said base material having a critical temperature higher than the volatilizing temperature of said organic compound, said process including the steps of:
(i) heating said composite material by controlling the temperature of the atmosphere in the furnace enclosure to produce an endothermic reaction of said organic material, said endothermic reaction occurring at a temperature less than said critical temperature;
(ii) continuing said endothermic reaction until substantially all the organic material has been volatilized and said composite material is transformed into fixed carbon and said base material;



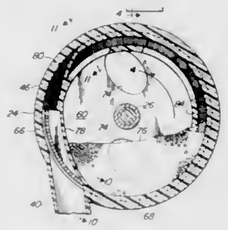
(iii) providing a substoichiometric concentration of oxygen to said atmosphere to produce an exothermic reaction between said atmosphere and said fixed carbon sufficient to maintain the temperature of said exothermic reaction to be less than said critical temperature, and
(iv) continuing to supply said substoichiometric concentration of oxygen to permit said exothermic reaction to proceed until substantially all of said fixed carbon becomes associated with said atmosphere whereby said base material may be recovered in a substantially pure form.

4,924,786

SEED DISPENSER WITH DUAL-FACED SEED PLATE

Eugene G. Keeton, 2180 Bells Chapel Rd., Trenton, Ky. 42286

Filed Jun. 14, 1989, Ser. No. 366,006
Int. Cl.[5] A01C *7/04*; B65G *29/02*
U.S. Cl. 111—184 **19 Claims**



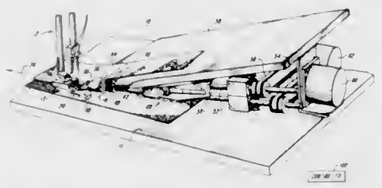
1. A planter seed dispenser, comprising: means providing a chamber having a cylindrical wall about a transverse horizontal axis and axially spaced apart side walls joined to the cylindrical wall, a circular seed plate having a continuous peripheral portion in close-running relation to the interior of the cylindrical wall and journalled within the chamber on the aforesaid axis and disposed midway between the side walls as a rotating partition completely dividing the chamber into first and second separate compartments, said plate having first and second separate sets of seed receiving cells, said first set of seed receiving cells disposed on one face of the seed plate and the second set of seed receiving cells disposed on the other face of the seed plate, the first and second sets of seed receiving cells receive seed respectively from the first and second compartments, means for supplying seed to both compartments, and seed outlet means in the casing and leading from both compartments.

4,924,787

APPARATUS FOR FORMING A SEAM

Mitchell L. Hansberry, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 3, 1989, Ser. No. 318,656
Int. Cl.[5] D05B *35/02*
U.S. Cl. 112—142 32 Claims



1. Seam forming apparatus for forming a seam near one lateral edge of each of one or more limp material segments, comprising:

A. a fold assembly extending along a reference axis from an input end of said fold assembly to an output end of said fold assembly and including means establishing a first segment guide channel including means for receiving a first of said limp material segments, said first segment guide channel extending from said input end to said output end, and being open at said input end and at one lateral side thereof, and having a cross-section extending about an associated first channel axis extending substantially parallel to said reference axis near said output end,

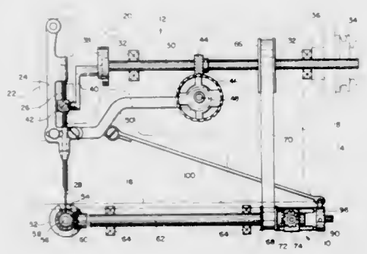
B. positioning means for actively bidirectionally controlling the position of said lateral edges of said segments to be at associated predetermined positions with respect to said reference axis at a point along said reference axis between said input end and said output end of said fold assembly.

4,924,788

HOOK TIMING ARRANGEMENT FOR ZIG ZAG SEWING MACHINES

Jerry D. Brown, Troy, N.C., assignor to Capel Incorporated, Troy, N.C.

Filed Mar. 22, 1989, Ser. No. 327,318
Int. Cl.[5] D05B *3/02, 57/00*
U.S. Cl. 112—182 12 Claims



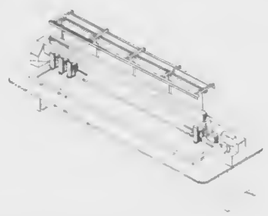
1. In a sewing machine of the type adapted for forming stitches in a zig-zag pattern, said sewing machine having a thread-carrying needle, needle manipulating means for reciprocating said needle longitudinally to form thread loops and for shifting said needle laterally between spaced first and second loop-forming positions to distribute the thread loops in a zig-zag pattern, a looptaker rotatable about a fixed axis and having a hook for cooperating with said needle to seize the thread loops, and means for rotating said looptaker, the improvement comprising means coupling said looptaker rotating means to said needle manipulating means for alternately accelerating and decelerating rotation of said looptaker in timed relation to lateral shifting movement of said needle between its first and second loop-forming positions to advance said hook of said looptaker into a first loop-seizing disposition in relation to said needle at its said first loop-forming position and to retard said hook of said looptaker into a second loop-seizing disposition in relation to said needle at its said second loop-forming position.

4,924,789

DEVICE FOR DRIVING A THREAD TAKE-UP LEVER IN A MULTI-HEAD SEWING MACHINE

Ikuo Tajima, Nagoya, and Tomoaki Anezaki, Kasugai, both of Japan, assignors to Tokai Kogyo Mishin Kabushiki Kaisha, Kasugai, Japan

Filed Jun. 21, 1989, Ser. No. 369,640
Claims priority, application Japan, Jul. 14, 1988, 63-175538
Int. Cl.[5] D05B *49/02*
U.S. Cl. 112—241 5 Claims



1. In a multi-head sewing machine having a frame, a plurality of sewing heads mounted on said frame in longitudinally spaced relation to each other, each of said sewing heads having a bracket arm, a needle bar case disposed in front of said bracket arm and one or more thread take-up levers mounted on said needle bar case, and a main shaft extending through and rotatably supported by said bracket arms of said sewing heads, a device for driving any desired one of said thread take-up levers comprising:

movement converting means located within each bracket arm for converting rotational movement of said main shaft onto reciprocating movement thereof;

transmission control means operatively associated with said movement converting means for transmitting and disconnecting the reciprocating movement produced by said movement converting means to one of said thread take-up levers selected for sewing operation; and

retaining means for retaining the selected take-up lever in a predetermined rest position when the reciprocating movement of said movement converting means is disconnected from the selected take-up lever by said transmission control means.

4,924,790

SEWING MACHINE WITH A CLOTH-EDGE DETECTOR

Ikuzo Kondo, Chita, and Tsutomu Makihara, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 16, 1989, Ser. No. 311,625
Claims priority, application Japan, Feb. 22, 1988, 63-38894
Int. Cl.[5] D05B *69/18*
U.S. Cl. 112—272 10 Claims

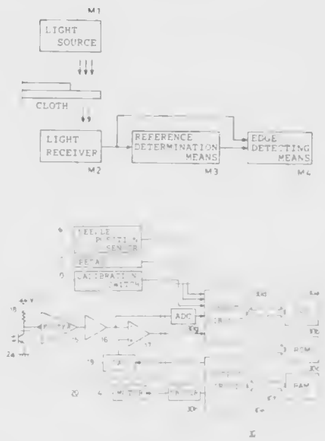
6. A sewing machine for sewing a cloth or a plurality of overlapping cloths comprising:

a light source for casting light on a preset sensing point in a path of the cloth or cloths,

a light receiver for receiving the light coming from the light source through the sensing point, and for generating an intensity signal corresponding to the intensity of the light, and

an edge-detecting means for detecting a cloth edge passing the sensing point during sewing by comparing the intensity signal from the light receiver with a reference signal, the cloth edge being either a free edge of one cloth or an overlapping edge of a plurality of cloths,

wherein the sewing machine further comprises:



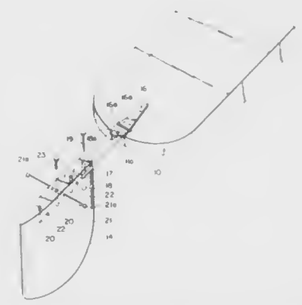
a reference determination means for receiving two intensity signals from said light receiver and for determining said reference signal based on said two intensity signals, said two intensity signals being generated by passing a cloth edge through said sensing point prior to a sewing operation and being representative of intensity signals generated before and after, respectively, an edge passes through the sensing point.

4,924,791

ADJUSTABLE SAILBOARD

Roger A. Scholle, 8 White Birch La., Scarsdale, N.Y. 10583, and Stephen R. Scholle, 5 Homewood Rd., Hartsdale, N.Y. 10530

Filed Jan. 6, 1989, Ser. No. 294,389
Int. Cl.[5] B63B *41/00*
U.S. Cl. 114—39.2 20 Claims



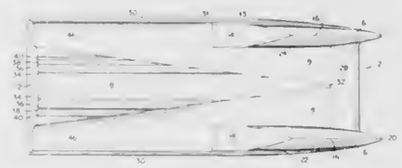
1. An adjustable sailboard comprising a hull, deck, mast and sail assembly and a foot-operated rudder, said rudder extending from the stern of said sailboard and being rotatably mounted about a vertical axis, said rudder further including an adjustable footbar removably mounted transverse to said rudder so as to accommodate sailboard users of different height and maintain a desired craft displacement when in use, said sailboard further including means mounting said footbar to said rudder for adjustment thereof along the rudder length.

4,924,792

HIGH SPEED PLANING BOAT

Samuel C. Sapp, Ocala, Fla., and Peter R. Payne, Stevensville, Md., assignors to Marine Technological Exchange, Inc., Ocala, Fla.

Continuation-in-part of Ser. No. 158,098, Feb. 16, 1988, which is a continuation of Ser. No. 720,289, Apr. 5, 1985, abandoned.
This application Jan. 9, 1989, Ser. No. 295,231
Int. Cl.[5] B63B *1/18*
U.S. Cl. 114—61 18 Claims



1. A high speed, high efficiency planing boat comprising:

a top area of said boat having a bottom defining the bottom of said boat,

a transom,

a pair of forward sponsons depending downwardly from said bottom of said boat and extending toward the transom about half the length of the boat,

said sponsons being spaced apart and lying on opposite sides of the longitudinal centerline of said boat,

each said sponson having a flat planing surface toward the rear thereof,

a generally flat wedge-shaped member extending downwardly along said bottom of said boat having its apex lying below and adjacent the bow between said sponsons along the longitudinal centerline of the boat and extending to the stern of the boat the width of the wedge at the transom approximating the spaced apart distance between said sponsons,

each said sponson having a wall along an inner side thereof adjacent said wedge and rising generally vertically toward the bottom of said boat,

said wedge having a generally vertical wall along each side thereof extending toward the bottom of said boat,

said generally vertical walls of said sponsons and said wedge shaped member defining in the forward half of the bottom of the boat tunnels whereby to reduce the wetted area of the boat.

4,924,793

STANDOFF BATTEN RIG FOR FLEXIBLE AIRFOIL CONFORMATION ON BOTH TACKS

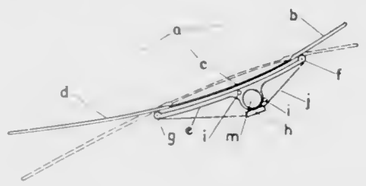
James S. Pritchard, P.O. Box N-885, Nassau, The Bahamas

Filed Apr. 24, 1989, Ser. No. 342,555
Int. Cl.[5] B63H *9/10*
U.S. Cl. 114—102 2 Claims

1. A standoff batten rig for providing a cambered configuration to a sail supported by a mast comprising a three part batten having a first rigid leading part continuous to a second flexible center part which is continuous to a third semi-rigid tailing part, a holder which has near its center a ring which is slidably supported by the mast and two pre-sprung arms which are attached respectively to the leading part and trailing part of the

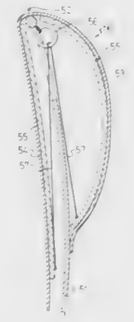
VOL 1114 ISS 3 MY 15 1990 UMI

batten by bolts or pins, the holder further has a control line which extends from the ends of the arms to a winch means which is fixed to the holder side opposite the batten, such that



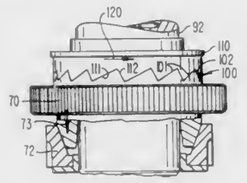
upon application of tension in the control line by the winch means causes the presprung arms to flex thereby causing a change in the amount of camber of the sail.

4,924,794
SAIL
Terence R. Duke, 9 Lucknow Place, Blockhouse Bay, Auckland, New Zealand
Filed Nov. 1, 1988, Ser. No. 265,541
Claims priority, application New Zealand, Jun. 29, 1987, 220881
Int. Cl.[5] B63H *9/06*
U.S. Cl. 114—102 **9 Claims**



1. A sail including two surfaces which in normal use form opposite faces of an aerofoil structure, each surface having resiliently flexible support means associated therewith, and interconnecting means interconnecting the two said surfaces at or about extremities of said support means, such that in normal use an increase in the distance between said extremities of support means associated with a first said surface by straightening of said first surface can cause by said interconnecting means a corresponding decrease in the distance between said extremities of support means associated with the second said surface, by bowing of said second surface; wherein said interconnecting means includes a line anchored at each end at or about corresponding extremities of said support means associated with each said surface, said line passing movably around an anchored retainer, such that in normal use when a first said surface is straightened, the length of line between said retainer and the end of the line anchored in association with support means for said first surface is increased, and the length of line between said retainer and the other end of the line anchored in association with support means for the second said surface is consequently decreased.

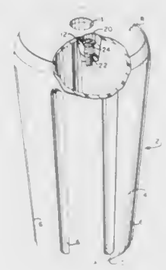
4,924,795
WINCH FOR ROLLER REEFING
William C. Ottemann, Fremont, Calif., assignor to International Marine Industries, Guilford, Conn.
Filed Nov. 18, 1988, Ser. No. 273,460
Int. Cl.[5] B63H *9/10*
U.S. Cl. 114—107 **6 Claims**



1. A winch for rotating a fairing about a stay on a sailing vessel, the fairing having a sail attached thereto for roller reefing of the sail in a spiral wind about the fairing, the winch comprising:
- a normally stationary shaft having a shaft for driving a clutch;
- a high mechanical advantage clutch member having a first clutch member and a second clutch member relatively movable with respect to each other between positions of normal engagement and a position of disengagement;
- said first clutch member mounted for one way rotation relative to the vessel in a first direction to permit said sail to be gathered to said fairing for the reefing of said sail;
- said second clutch member having a peripheral portion driven from said normally stationary shaft said second clutch member attached to said fairing for rotation with said fairing for reefing in and reefing out said sail;
- a clutch engagement member positioned between said normally stationary shaft and said fairing, said clutch engagement member urging said clutch into said normally engaged position responsive to torque transmitted between said normally stationary shaft and said fairing; and,
- driving means attached to said normally stationary shaft for maintaining said shaft stationary during nondriving operation, rotating said first and second clutch members in a first direction for engaging said clutch and taking in said sail, and rotating said second clutch member in a second and opposite direction for temporarily disengaging said clutch to permit release of said sail corresponding to the rotation of said normally stationary shaft.

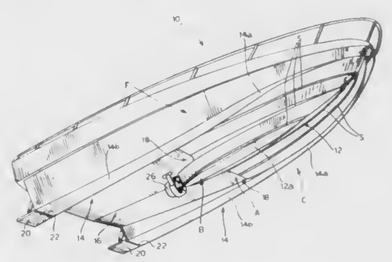
4,924,796
REPLACEABLE INFLATION VALVE
Keith Duffy, Gloversville, N.Y., assignor to Nelson A. Taylor Co., Inc., Gloversville, N.Y.
Filed Apr. 11, 1988, Ser. No. 180,339
Int. Cl.[5] B60C *23/10*
U.S. Cl. 114—219 **37 Claims**

1. A replaceable marine fender inflation valve comprising
- collar means provided with a bore extending therethrough along a longitudinal axis thereof;
- connection means formed on an exterior surface of said collar means and adapted for engagement with complimentary means provided in the marine fender such that said collar means may be seated within the fender; and



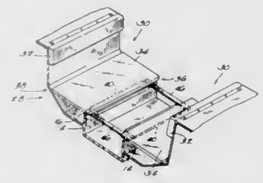
flexible means received within said bore including means for cooperating with said collar means such that said collar means may retain said flexible means within the fender.

4,924,797
MOTOR-BOAT HULL
Franco Solia, Milan, Italy, assignor to Akzo S.r.l., Milan, Italy
Filed Jul. 1, 1988, Ser. No. 213,949
Claims priority, application Italy, Jul. 1, 1987, 53488/87[U]
Int. Cl.[5] B63B *1/20*
U.S. Cl. 114—288 **3 Claims**



1. A motor-boat hull of the type having a planing bottom comprising:
- a V-shaped forward portion extending from the bow to a central zone of the bottom;
- two substantially flat-bottomed side portions which converge and decrease in width from the stern to the bow and are connected to the V-shaped forward portion of the bottom; and
- a substantially flat recessed aft portion delimited laterally by the side portions and forwardly by a transverse step connecting it with the V-shaped forward portion of the bottom;
- wherein the bottom has a deep central V-shaped zone having a tapered end portion which extends aft of the step in overlying relation with the recessed aft portion; and
- propeller means located in said central zone aft of the tapered end portion of the central V-shaped zone.

4,924,798
RECREATIONAL BOAT DINETTE/SLEEPER
Michael W. Lathers, Metamora, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Jul. 8, 1988, Ser. No. 216,889
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—363 **12 Claims**



1. Apparatus convertible between a first mode wherein said apparatus forms a pair of spaced-apart, facing seats, and a second mode wherein said apparatus forms a sleeper, said apparatus comprising first and second seat bottom members having respective forward and rearward ends, said forward ends being spaced apart to define therebetween a gap, means supporting said first seat bottom member for movement between a horizontal position wherein said first seat bottom member extends substantially horizontally, and a canted position wherein said first seat bottom member is inclined upwardly toward said forward end of said first seat bottom member, means supporting said second seat bottom member for movement between a horizontal position wherein said second seat bottom member extends substantially horizontally, and a canted position wherein said second seat bottom member is inclined upwardly toward said forward end of said second seat bottom member, first and second seat back members removably supported above said rearward ends of said first and second seat bottom members, respectively, when said apparatus is in said first mode, and means for supporting at least one of said seat back members across said gap when said apparatus is in said second mode.

4,924,799
INVERSION INDICATOR
John F. Rilling, Roswell, Ga., assignor to Universal Protection Corp., Roswell, Ga.
Filed Sep. 26, 1988, Ser. No. 248,922
Int. Cl.[5] G08B *5/00*; **G01D** *21/00*
U.S. Cl. 116—206 **16 Claims**



16. An inversion indicator comprising:
- a rectangular container having a depressible front wall, upper and lower walls, a rear wall, left and right side walls;
- a first partition comprising:
- a first panel projecting upward from said lower container

VOL
1114
ISS
3
MY
15
1990
UMI

wall toward said upper container wall and said first panel defining an aperture therein; and

a second panel extending upward from said first panel toward said upper wall, said second panel defining a first opening;

said first partition being disposed within said container to define a first reservoir and a second reservoir, said aperture providing fluid communication between said first and second reservoirs when said indicator is tilted beyond a critical angle;

a second partition comprising a third panel projecting upward from said lower container wall and terminating adjacent said first panel so as to define a second opening therebetween;

a first reactant disposed within a frangible vessel residing within said first reservoir for containing said first reactant until it is desired to activate said indicator; and

a second reactant disposed within an absorbant placed within said second reservoir and operative to combine with said first reactant to produce a visually detectable change,

whereby when said indicator is tilted beyond a critical angle or dropped, said first reactant will contact said second reactant and combine with said second reactant to produce a visually detectable change.

4,924,800

APPARATUS FOR APPLYING PHOTO-RESIST TO SUBSTRATE

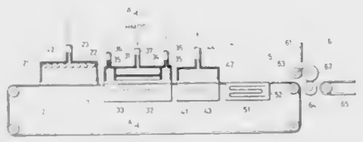
Masato Tanaka, Nagahama, Japan, assignor to Dainippon Screen Mfg. Co. Ltd., Japan

Division of Ser. No. 936,126, Dec. 1, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 296,389

Claims priority, application Japan, Dec. 2, 1985, 60-269322

Int. Cl.[5] B05C *11/02, 11/14, 5/02, 9/06*

U.S. Cl. 118—50.1 6 Claims



1. An apparatus for applying a photo-resist to the surface of a substrate to be treated comprising:

(i) conveyor means for conveying said substrate,

(ii) adhesion reinforcing agent feeding means, for feeding an adhesion reinforcing agent to said substrate, comprising a treatment chamber enclosing a portion of said conveyor feeding pipe for feeding said adhesion reinforcing agent to said treatment chamber, distributor means having a plurality of minute holes provided therein opposite to the substrate in said treatment chamber and being connected with said feeding pipe, an auxiliary chamber provided on the periphery of said treatment chamber and being connected to exhaust means for exhausting gases, and heating means for heating said substrate,

(iii) additional heating means, provided at a stage posterior to said adhesion reinforcing agent feeding means, for further heating said substrate, and

(iv) photo-resist feeding means, provided at a stage posterior to said additional heating means, for feeding the photo-resist to the surface of said substrate.

4,924,801

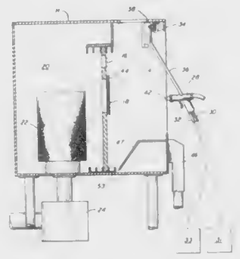
SPRAY BOOTH FOR LACQUER

Joseph A. Arnone, 258 Briggs St., Syracuse, N.Y. 13208

Filed Jun. 26, 1989, Ser. No. 371,605

Int. Cl.[5] B05C *11/00*

U.S. Cl. 118—58 19 Claims



4. A lacquer spraying apparatus of the type adapted to apply a clear protective coating to a photograph while capturing and containing the overspray and volatile components of the lacquer being sprayed which comprises:

a generally rectangular housing having one open side, mounted on a frame to support said housing at a convenient operating height;

an inner filter compartment;

an exhaust blower connected to said filter compartment for exhausting air therefrom;

a partition member removably mounted between said inner filter compartment and said open side;

photograph positioning means mounted on said partition member;

vent means disposed in said partition around said photograph positioning means; and

spray gun means slidably mounted at a predetermined distance from said photograph mounting means for back-and-forth movement parallel to the surface of the photograph to be sprayed at said predetermined distance therefrom.

4,924,802

COATER FOR COATING MATERIAL WEBS

Reinhard Knop, Bochum, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 17,190, Feb. 20, 1987. This application Aug. 29, 1988, Ser. No. 238,012

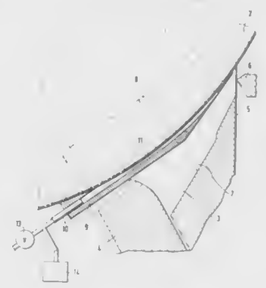
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605613

Int. Cl.[5] B05C *1/04*

U.S. Cl. 118—410 10 Claims

1. In a coater for coating a material web, such as a paper web, including a backing roller for the web, a chamber for receiving coating material, a doctor blade disposed where the web leaves the chamber, and an overflow plate located at the front end of the chamber, the improvement which comprises a coating edge limiting means disposed in the chamber and located at an edge of the web and including recesses extending generally circumferentially of the roller and facing the roller,

a means for supplying compressed air to the recesses, whereby the coating material is kept away from an edge of said web by



the compressed air, and insulating plates laterally sealing the chamber.

4,924,803

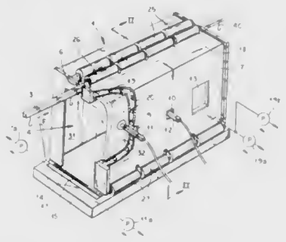
POWDER BOOTH FOR APPLYING COATING POWDER TO ARTICLES

Jean J. Celant, Serignan du Comtat, France, assignor to Lune, Vinzelles, France

Filed Mar. 28, 1989, Ser. No. 329,541

Int. Cl.[5] B05B *1/28*

U.S. Cl. 118—630 20 Claims



1. A powder-spray booth, comprising:

a housing having a plurality of walls defining a powder-spray compartment, each of said walls having a rigid outer wall member and an inner wall member defining a space between them, said inner wall members being rigid and permeable to air;

means defining a floor for said compartment through which air can be aspirated, whereby particles of powder sprayed onto an object in said compartment can be drawn to said floor;

cover means including at least one replaceable flexible web overlying said inner wall members and covering same to prevent contamination of said inner wall members with sprayed powder, said cover means covering at least some of the surfaces bounding said compartment with the exception of said floor;

means for spraying an object with powder in said compartment while said surfaces are covered by said web; and

means for evacuating said space to retain said web by suction against said inner wall members.

4,924,804

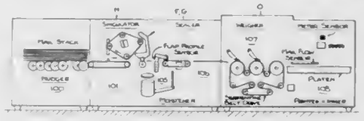
NOZZLE CONTROL SYSTEMS FOR MOISTENER

Kevin J. O'Dea, Sandy Hook; Donald T. Dolan, Ridgefield, and Norman J. Bergman, Danbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1988, Ser. No. 291,844

Int. Cl.[5] B05C *1/02, 5/00*

U.S. Cl. 118—669 6 Claims



1. In a moistening arrangement for moistening the flap of an envelope moving in a first direction in a given plane, said flap having an edge, said arrangement having a nozzle directed to spray a liquid at an envelope flap along a given locus in said plane, a source of first signals that are a function of the position of said edge in said plane and means responsive to said first signals for moving said nozzle in a direction substantially parallel to said plane for moistening said flap at positions thereof; the improvement wherein said source comprises a source of first signals corresponding to the edge positions of said flap at a position spaced a given distance from said locus in a second direction opposite said first direction, and further comprising means for producing a second signal corresponding to the velocity of said envelope, said means for moving comprising means for moving said nozzle as a function of said given distance and said first and second signals, such that said nozzle is moved to be substantially continuously positioned to be adjacent the edge of an envelope flap passing said locus.

4,924,805

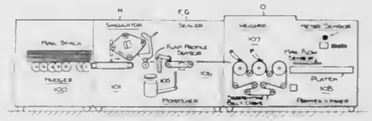
PUMP SYSTEM FOR MOISTENER NOZZLE

Kevin J. O'Dea, Sandy Hook, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1988, Ser. No. 291,037

Int. Cl.[5] B05C *1/02*

U.S. Cl. 118—680 4 Claims



1. A moistening arrangement for moistening the glue line of an envelope flap, said glue line being along the edge of the envelope flap and having a generally uniform cross-sectional width, said arrangement comprising:

support means for causing said envelope flap to be partially open and for causing said envelope to travel in a first direction;

a nozzle applicator slidably mounted to said support means for slidable displacement of said nozzle in a second direction generally perpendicular to said first direction and further mounted such that said nozzle is between said envelope and said envelope flap;

pump means for causing moistening fluid to be delivered to and through said nozzle; and,

control means for causing said pump to deliver a given volume of moistening fluid to said nozzle and for causing said nozzle applicator to displace in said second direction such that said nozzle is opposite said glue line of said envelope as said envelope is displaced in said first direct

VOL
1114
ISS
3
MY
15
1990
UMI

and further such that said moistening fluid is applied by said nozzle evenly applied to said glue line.

4,924,806

DEVELOPING APPARATUS

Hiroshi Mizuno; Hiroshi Murasaki; Akihito Ikegawa, and Kouichi Etou, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

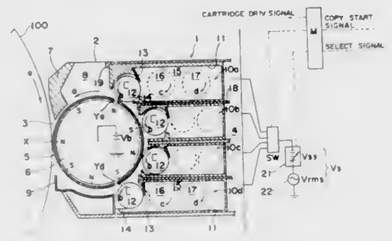
Filed Jan. 19, 1988, Ser. No. 145,816

Claims priority, application Japan, Jan. 20, 1987, 62-12739; Feb. 13, 1987, 62-32041; Feb. 13, 1987, 62-32042; Feb. 13, 1987, 62-32043

Int. Cl.[5] G03G *15/09, 15/01*

U.S. Cl. 118—658

4 Claims



1. A developing apparatus adjacent to an electrostatic latent image support member in an image forming apparatus, said developing apparatus comprising:

a rotatable developing sleeve confronting the electrostatic latent image support member;

a magnetic roller disposed inside said developing sleeve for holding magnetic carrier in a brush form on a peripheral surface of said developing sleeve, said magnetic roller accommodating a plurality of magnetic poles extending in a direction of its axis;

a plurality of toner supply units including a plurality of rotatable toner supply rollers, each of said toner supply units simultaneously confronting said developing sleeve for supplying toner thereto and including,

a respective one of said toner supply rollers arranged with respect to said developing sleeve so as to have a predetermined gap therebetween, said toner supply roller being in contact with a magnetic brush formed on the developing sleeve,

a toner storing portion for storing the toner therein;

means for selecting one of said toner supply units which stores the toner to be used;

a first means for selectively rotating a selected one of said toner supply rollers located in the toner supply unit selected by the selecting means;

a second means for forming a predetermined potential difference between said developing sleeve and said selected toner supply roller while said selected toner supply roller rotates during a developing operation when toner applied to the developing sleeve is transferred to the electrostatic latent image support member; and

a third means for controlling said first means and said second means in compliance with a selection by said selecting means wherein said second means includes means for applying a predetermined bias voltage to said developing sleeve and means for selectively applying direct current voltage to one of said toner supply rollers in compliance with the selection by said selecting means, further comprising means for controlling the direct current voltage applying means so that the amount of the direct current voltage applied to said toner supply roller changes during a predetermined period immediately prior to the beginning of development, wherein said controlling means changes the amount of the direct current voltage applied to the toner supply roller from a first negative value to a second negative value, the first value being closer to zero than the second value.

4,924,807

APPARATUS FOR CHEMICAL VAPOR DEPOSITION

Izumi Nakayama, Hiratsuka; Akitoshi Suzuki; Hiroyuki Nawa, both of Chigasaki; Motohiro Kaneko, Fujisawa; Yoshiro Kusumoto, Chigasaki; Kazuo Takakuwa, Chigasaki, and Tetsuya Ikuta, Chigasaki, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

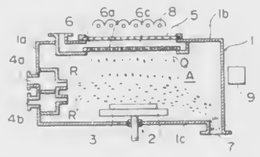
Filed Jul. 24, 1987, Ser. No. 77,621

Claims priority, application Japan, Jul. 26, 1986, 61-176227; Jul. 26, 1986, 61-176228

Int. Cl.[5] C23C *16/46, 16/52*

U.S. Cl. 118—725

28 Claims



1. An apparatus for a chemical vapor deposition, comprising a pressure reduced reaction chamber having means for supporting at least one substrate; means for feeding a first gas substantially parallel to the surface of said substrate under reduced pressure in a sheet-like flow; means for feeding a second gas opposed to the surface of said substrate to put said first gas flow into a laminar flow state in the vicinity of said substrate; and means for emitting a light beam to heat said substrate in said reaction chamber; thereby producing a chemical reaction to form a thin film having the component of said first gas on said substrate.

4,924,808

LITTER FOR SMALL ANIMALS

Wilhelm Pirotte, Postbox 4106, D-5202 Hennef, Fed. Rep. of Germany

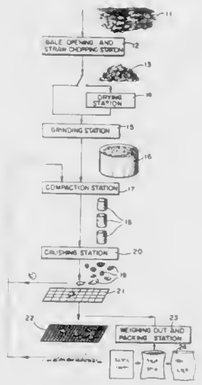
Filed Sep. 19, 1988, Ser. No. 245,556

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732807

Int. Cl.[5] A01K *29/00*

U.S. Cl. 119—1

6 Claims



1. Litter for small animals, of which at least a major fraction is in the form of ground and pressed straw, such straw material being in the form of irregular fragments of briquettes made from compacted ground straw.

4,924,809

METHOD FOR CLEANING A TEAT OF A FEMALE ANIMAL, MILKING METHOD AND CUP FOR USE WITH ABOVE MENTIONED METHODS

Jeroen K. Verbrugge, Delft, Netherlands, assignor to Multinorm B.V., Netherlands

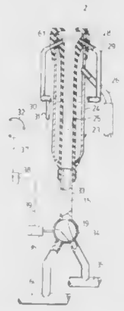
Filed Jan. 6, 1988, Ser. No. 141,194

Claims priority, application Netherlands, Feb. 2, 1987, 8700249

Int. Cl.[5] A01J *5/16*

U.S. Cl. 119—14.02

6 Claims



5. A cup for milking and cleaning the teat of a female animal comprising an outer casing, an inner casing of flexible material having an upper and lower end and defining a space for receiving the teat of an animal, said inner casing being sealed with respect to said outer casing and defining a chamber therebetween, pressure means for supplying varying pressure to said chamber to cause massage of a teat disposed within said space, cleaning means for supplying a cleansing agent into said space for cleaninng a teat disposed within said space, said cleaning means including an inlet opening formed in said inner casing, a source of liquid cleansing agent connected with said inlet opening, said inlet opening being disposed adjacent the upper end of said inner casing for introducing cleansing agent into said inner casing and into initial contact with the upper portion of a teat received within said inner casing, and a discharge disposed adjacent the lower end of said inner casing for removing cleansing agent from said inner casing whereby cleansing agent flows downward over a teat received in said inner casing from top to bottom of the teat to minimize the chance of dirt entering the teat orifice.

4,924,810

INSECT KEEPING AND OBSERVING CONTAINER

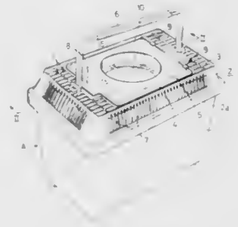
Kazutoshi Tominaga, Osaka, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Osaka, Japan

Filed Jul. 6, 1989, Ser. No. 376,399

Int. Cl.[5] A01K *1/00*

U.S. Cl. 119—15

4 Claims



1. An insect keeping and observing container; comprises a transparent main container, a removable lid covering said container, a round recessed part in the center of the upper side of said lid, a fringe part protruding inside from the lower edge of a circumference wall of said recessed part, a round plate inside said fringe part which is separated from the said fringe part by annular slits, and several breakable joint pieces which partially connect said round plate to said fringe part at several annular positions.

4,924,811

THERAPEUTIC DEVICE FOR CLEANING THE TEETH OF DOGS

Herbert R. Axelrod, 211 W. Sylvania Ave., Neptune, N.J. 07753

Filed Nov. 30, 1988, Ser. No. 278,247

Int. Cl.[5] A01K *15/00*

U.S. Cl. 119—29

8 Claims

1. A therapeutic device for cleaning the teeth of dogs, comprising:

a length of annealed Nylon rope formed by a plurality of strands braided together, said rope including know means disposed at an intermediate portion thereof for providing means to grip said rope, said rope having a distal portion wherein said plurality of strands are unbraided to define a

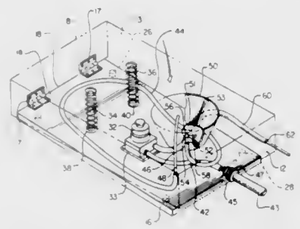
VOL
1114
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MY
15
1990
UMI

tassel, whereby the knot means is held by a human or by a dog as at least a portion of said strands of said tassel are



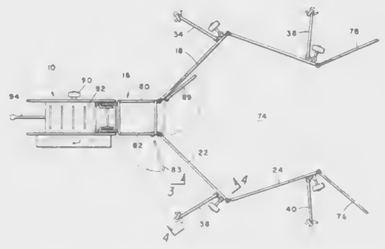
pulled through spaces between a dog's teeth to thereby clean the teeth by a flowing type action.

4,924,812
WATER BOWL FOUNTAIN
Robert L. Bernays, Jr., 7815 Yamini, Dallas, Tex. 75230
Filed Feb. 1, 1989, Ser. No. 305,393
Int. Cl.[5] A01K *7/06*
U.S. Cl. 119—76 **4 Claims**



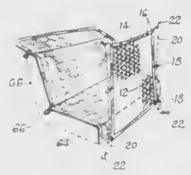
1. An animal watering device connected to a pressurized water supply, comprising:
- a rectangular platform having a top having four corners and three sides forming a cavity, and a first and second bore extending through said top proximate to one corner, said platform sized to accommodate the weight of a dog;
- a rectangular base having a top and a bottom having four legs attached thereto;
- a pressure activated valve connected to said water supply;
- fasteners for connecting said pressure activated valve to the top of said base;
- a hinge for pivotally attaching said base to said platform;
- at least one spring positioned between said platform and said base so that said platform is maintained above said pressure activated valve whereby force applied to the top of said platform will compress said spring, thereby activating said pressure activated valve;
- a bowl having a bottom having a hole therethrough, positioned on the top of said platform over said second bore aligning said hole and said second bore;
- a flow tube having a rigid first end, connected to said pressure activated valve said first end extending through the first bore of said platform proximate to said bowl so that water flowing through said flow tube is directed into said bowl;
- a drainage hose having a first and second end, said first end slidably mounted in said second bore whereby the location of said first end may be regulated in relation to the bottom of said bowl thereby determining the amount of water captured in said bowl before draining, said second end extending away from said device.

4,924,813
PORTABLE CORRAL
Dickie R. Bixler, Rte. 1, Box 33, Dacoma, Okla. 73731, and Phillip R. Sutter, 1111 Jester, Fairview, Okla. 73737
Filed Mar. 22, 1989, Ser. No. 327,260
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—82 **7 Claims**



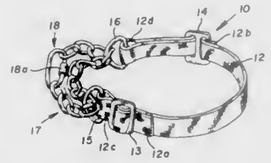
1. A portable loading chute and loading corral which comprises:
- a loading chute with wheels supporting it;
- a first side fence and a second side fence, each said side fence being composed of at least two panel sections, each supported by a wheel, the panel sections on each side fence being pivotally connected to each other;
- a horizontal axis for each said wheel;
- a vertical rod for each panel section, each vertical rod having a said wheel receiving horizontal axis extending therefrom;
- means to support each said vertical rod from its respective panel section such that said vertical rod has limited rotational movement; and
- means to connect each said side fence to said chute.

4,924,814
PET RESTRAINER FOR PASSENGER VEHICLES
Alain B. Beaudet, P.O. Box 33116, San Diego, Calif. 92103
Filed Sep. 19, 1988, Ser. No. 245,808
Int. Cl.[5] A01F *29/00*; **B60R** *21/06*
U.S. Cl. 119—96 **1 Claim**



1. An apparatus for constraining an animal behind the driver's seat of a vehicle comprising:
- (a) a flexible see-through sheet;
- (b) a securing means to secure said sheet in place and substantially transversely of the vehicle's longitudinal axis behind the driver's seat; and
- (c) a flexible protective cover attached to said sheet and being dimensioned to substantially cover both the seat and backrest of the rear seat of the vehicle, and wrap over the backrest, such that a pet can be constrained to the rear portion of the vehicle by said sheet, and the rear seat of the vehicle will be protected from the pet by said cover;
- (d) said securing means comprising a plurality of hooks connected to said sheet for attachment to various attachment points on the interior of said vehicle;
- (e) a cord connected to and passing along at least a portion of the periphery of said sheet and attaching said hooks, said cord being resilient such that said sheet can be stretched into place under tension;
- (f) a pair of strips having mounting eyelets for respective mounting eyelets for respective mounting to each side of the vehicle, said strips being adapted to being mounted to the lower interior molding of the vehicle to permit engagement of said hooks in said eyelets;
- (g) said cover being attached to said sheet with a substantially continuous zipper so said cover and said sheet are separable; and
- (h) said cover having an elongated transverse tuck therein to insert between the bottom and the backrest of the rear seat to hold said cover in place.

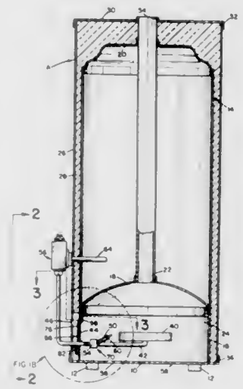
4,924,815
COLLAR
Mark Halla, 502 Chalfonte Dr., Catonsville, Md. 21228
Filed Aug. 22, 1988, Ser. No. 234,622
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—106 **3 Claims**



1. A dog collar, including:
- a. a relatively wide belt portion having a pair of ends;
- b. a pair of slide means engaging the respective ends of said belt portion and slideable upon the remainder of said belt to reduce the length of the belt and therefore reduce the diameter and circumference of the resultant collar and whereby forming loops at the respective ends of the belt;
- c. attachment means received within the formed belt loops;
- d. a continuous connector member receivable into said attachment means;
- e. means for removably connecting a leash to said continuous connector member; and,
- f. said continuous connector member including a chain with means for interconnecting selected links thereof.

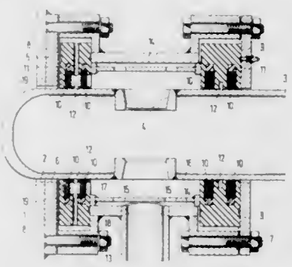
4,924,816
WATER HEATER WITH FLAME SPILL-OUT PREVENTION ARRANGEMENT
Henry J. Moore, Jr., Playa Del Rey, and Bijan Gidanian, Granada Hills, both of Calif., assignors to Mor-Flo Industries, Inc., Cleveland, Ohio
Filed May 1, 1989, Ser. No. 345,296
Int. Cl.[5] F22B *5/00*
U.S. Cl. 122—17 **22 Claims**

1. A water heater comprising a vertical water storage tank with an underlying combustion chamber comprised of a metal skirt member having an inner access opening into the side of said chamber, and a unitary manifold assembly mounted within and covering the said access opening to prevent spill-out therethrough of the burner flames, said manifold assembly including a main burner with its manifold gas supply tube, a pilot flame burner with its gas supply tube, a pilot burner control thermocouple with its support tube, and an inner door covering and closing off said access opening, said gas supply and support tubes extending through and sealed within apertures in said inner door to support the said burners and thermocouple in place thereon within said combustion chamber in horizontally



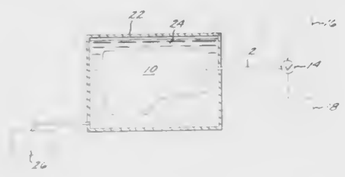
opposite exposed relation to said access opening, and said unitary manifold assembly being entirely removable as a unit from said combustion chamber through said access opening.

4,924,817
SEAL FOR BLAST PIPE OR SHAFT
Josef Seelen, Mittelstrasse 14, D-4232 Xanten 1, Fed. Rep. of Germany
Filed Mar. 6, 1989, Ser. No. 320,280
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1988, 3812533
Int. Cl.[5] F22B *37/18, 37/48*
U.S. Cl. 122—379 **5 Claims**



1. A seal for a shaft of a flue gas flap or a blast pipe of a soot blower for boilers or industrial furnaces subjected to excess pressure, said seal comprising:
- a shaft or pipe;
- at least two corotating coaxial sealing rings enclosing said shaft or pipe;
- an annular chamber for supplying barrier air bounded by said sealing rings;
- inside metal bristles bearing against said shaft or pipe and being contacted by said sealing rings, said bristles being arranged to form at least two brushes disposed in a circle one beside the other; and
- an annular coaxial gap disposed between said two brushes, opening in a direction of said shaft or pipe, and being acted upon by said barrier air.

4,924,818
INSULATED ENGINE
Craig L. Linden, 1335 Midway Dr., Alpine, Calif. 92001
Continuation-in-part of Ser. No. 657,205, Oct. 3, 1984, Pat. No. 4,657,290, and a continuation-in-part of Ser. No. 933,738, Nov. 21, 1986, Pat. No. 4,736,111. This application Apr. 4, 1988, Ser. No. 177,532
Int. Cl.[5] F01P *11/02*
U.S. Cl. 123—41.14 4 Claims



1. In combination with a prime mover whose operation is characterized by the production of mechanical power and heat energy, and further characterized by a cooling system for circulating a cooling medium through the prime mover to carry off heat energy, the improvement comprising:
thermal insulating means surrounding the prime mover during service for substantially preventing radiation of heat energy, for causing otherwise radiated heat energy to be absorbed by the cooling medium, on shut down of the prime mover, for reducing cooling of the prime mover below operating temperatures;
a heat exchanger;
heat storage means; and
conduit means coupled to the cooling system, the heat exchanger, and the heat storage means, and including valve means for selectively directing the cooling medium to one of the heat exchanger and the heat storage means.

4,924,819
ROTARY EXHAUST CONTROL VALVE FOR TWO-STROKE CYCLE ENGINES AND PROCESS FOR USING THE SAME
Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kemptoo, Pa.
Continuation-in-part of Ser. No. 96,551, Sep. 15, 1987, Pat. No. 4,829,946. This application May 15, 1989, Ser. No. 351,608
Claims priority, applicatioo Canada, Sep. 14, 1988, 577388
Int. Cl.[5] F02B *75/02*
U.S. Cl. 123—65 PE 20 Claims



1. In a two-stroke cycle internal combustion engine having an air intake passage, an exhaust port leading to an exhaust passage, a piston reciprocating in continuous cycles between top and bottom dead center positions in a cylinder, said piston being interconnected with a rotatable crankshaft, at least one transfer passage providing compressed air to a combustion chamber above the piston, and valve means within the exhaust passage adapted to control flow through the exhaust passage, the improvement in said valve means comprising
a rotary valve member oriented at least partially within said exhaust passage;
actuating means for said valve member to rotate said valve member continuously between an open position and a closed position; and
said actuating means being in timed relation with said crankshaft rotation and piston movement to move said valve member from said closed position toward said open position after the upper edge of said piston passes downward below the upper edge of the exhaust port, and to move said valve member from said open position toward said closed position when said piston is near its bottom dead center position.

4,924,820
EXHAUST GAS TREATMENT FOR A TWO STROKE ENGINE
Mark Lear, Tauranga, New Zealand; Christopher K. Schlunke, Kingsley, and Kenneth P. Seeber, Wanneroo, both of Australia, assignors to Orbital Engine Company Proprietary Limited, Balcatta, Australia
PCT No. PCT/AU88/00343, § 371 Date Jul. 5, 1989, § 102(e) Date Jul. 5, 1989, PCT Pub. No. WO89/02029, PCT Pub. Date Mar. 9, 1989
PCT Filed Sep. 5, 1988, Ser. No. 354,402
Claims priority, application Australia, Sep. 4, 1987, PI4154; Oct. 26, 1987, PI5103
Int. Cl.[5] F01N *3/28*
U.S. Cl. 123—65 PE 11 Claims

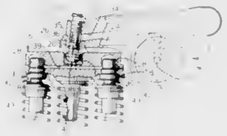


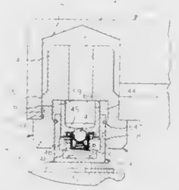


1. A two stroke cycle spark ignited internal combustion engine having for each combustion chamber an injector means to deliver fuel directly to the combustion chamber, an exhaust port through which gases pass from the combustion chamber to an exhaust system, and an inlet port through which a fresh charge of air enters the cylinder, the inlet and exhaust ports being arranged so that the inlet port opens prior to the closing of the exhaust port, characterised in that there is provided

catalyst means at or adjacent to each exhaust port at a location so that while the exhaust port is open, the catalyst means receives substantially only the gases that have been exhausted through that exhaust port, whereby the catalyst means will during each exhaust port open period alternately receive chemically reducing and chemically oxidizing gases, the catalyst means including an active catalyst material of a nature to reduce oxides of nitrogen (NOx) in the gases received from the exhaust port.

4,924,821
HYDRAULIC LASH ADJUSTER AND BRIDGE ASSEMBLY
Richard F. Teerman, Wyoming, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 22, 1988, Ser. No. 288,290
Int. Cl.[5] F01L *1/24, 1/26*
U.S. Cl. 123—90.22 15 Claims

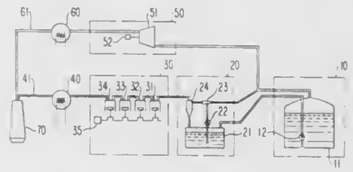




1. A hydraulic lash adjuster assembly comprising
a holder for mounting in a recess of a valve actuating member as part of a mounting assembly, said holder having support and mounting portions,
said support portion having a bore receiving an externally cylindrical reciprocable body member, and
said mounting portion having generally cylindrical external means engagable with said valve actuating member for maintaining said holder in said valve actuating member,
said mounting portion and the bore in said support portion being axially spaced from one another,
a recess in said mounting portion extending axially from said bore for receiving portions of said body member, and
means defining a clearance between the interior of said recess and the exterior of said body member to avoid any contact between said body member and the mounting portion.

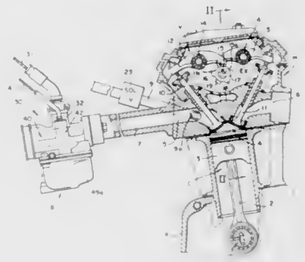
4,924,822
GAS FEED SYSTEM FOR A GAS-FIRED DIESEL ENGINE
Koetsu Asai; Hiroshi Nakagawa, and Mataji Tateishi, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 1, 1988, Ser. No. 200,707
Claims priority, application Japan, Jun. 2, 1987, 62-138638
Int. Cl.[5] F02B *3/00*
U.S. Cl. 123—27 GE 2 Claims

1. A gas feed system of a gas-fired diesel engine, said system comprising:
a high-pressure gas compressing apparatus for compressing gas to a high pressure, said high-pressure gas compressing apparatus disposed in a passageway defined in the system between a source of gas and an intake of the diesel engine; and
a low-pressure gas compressing apparatus for compressing



gas to a low pressure that is lower than said high pressure, said low-pressure gas compressing apparatus disposed in a passageway defined in the system between a source of gas and an intake of the diesel engine.

4,924,823
SIX STROKE INTERNAL COMBUSTION ENGINE
Yukihiro Ogura, Suzuka, and Yasuo Ikenoya, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 7, 1988, Ser. No. 254,818
Claims priority, application Japan, Oct. 7, 1987, 62-254500
Int. Cl.[5] F02B *75/02*
U.S. Cl. 123—64 11 Claims





1. A method of producing power from a fuel/air mixture in an internal combustion engine comprising:
conducting a four stroke internal combustion process, by,
intaking fuel/air mixture into a combustion chamber,
compressing said fuel/air mixture,
causing combustion of said fuel/air mixture, said step of combusting leaving burned and unburned gases in said combustion chamber,
exhausting said burned and unburned gases, said step of exhausting incompletely exhausting said burned and unburned gases from said combustion chamber; and
conducting a two stroke combustion chamber scavenging process by,

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introducing fresh air into said combustion chamber during a fresh air intake stroke by,

monitoring the temperature of the combustion chamber, and

controlling the amount of air introduced during said step of introducing fresh air by increasing said amount with increasing temperatures, and

exhausting said introduced fresh air with the remaining said burned and unburned gases to scavenge said combustion chamber.

4,924,824

TWO STROKE ENGINES

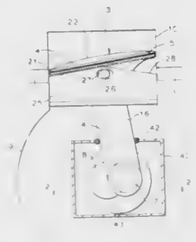
Bryan N. V. Parsons, Stoney Stanton, England, assignor to Jaguar Cars Limited, United Kingdom

Filed Jun. 27, 1989, Ser. No. 372,284

Claims priority, application United Kingdom, Jul. 1, 1988, 8815696

Int. Cl.[5] F02F *3/28*

U.S. Cl. 123—65 P **26 Claims**



1. A two stroke engine comprising a closed plane cylinder with an inlet and an exhaust port disposed on opposite sides of the cylinder towards the open end thereof, a piston slidable in the cylinder, said piston comprising a head portion which is slidingly sealed in the cylinder and a connecting rod portion which extends axially from the head portion, the end of the connecting rod portion remote from the head portion being connected to a crank on a crankshaft, the ports being disposed one on each side of the vertical axial plane of the crankshaft so that; upon downward movement the piston will tilt, opening the exhaust port before the inlet port and; upon upward movement the piston will tilt closing the exhaust port before the inlet port, the throw of the crank producing a maximum piston tilt of up to 10°.

4,924,825

OUTER GUIDE MEANS FOR A VALVE TAPPET

Walter Speil, Ingolstadt, Fed. Rep. of Germany, assignor to Motomak Motorenbau, Maschinen-und Werkzeugfabrik, Konstruktionen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 703,881, Feb. 21, 1985, abandoned.

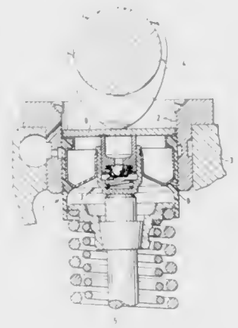
This application Mar. 15, 1989, Ser. No. 324,409

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409235

Int. Cl.[5] F01L *1/14*

U.S. Cl. 123—90.55 **14 Claims**

1. An outer guide means for a valve tappet receiving an automatic, hydraulic clearance compensation element for use in internal combustion engines, the tappet being disposed directly between a cam of a camshaft and a valve stem, the guide means comprising a wear-resistant, metallic end member cooperating with the cam, a hollow cylindrical stem part made of an extrudable polymeric substance and closed at one end by the end member and sliding in a guide bore in a cylinder head, and means coaxially disposed in the stem part thereof and adapted to receive the clearance compensation element, characterized in that a thin-walled unitary reinforcing element is provided which is drawn from sheet metal and which, on the one hand, is secured to the end member and, on the other hand,



is positively connected to the stempart by being embedded in the polymeric substance, and that the hydraulic clearance compensation element with its end remote from the valve stem directly bears against the end member.

4,924,826

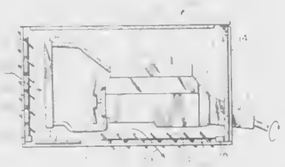
TEMPERATURE RESPONSIVE ENGINE COMPARTMENT

Paul S. Vinson, 3180 Avant Rd., Macon, Ga. 31206

Filed Apr. 27, 1989, Ser. No. 343,595

Int. Cl.[5] F02F *7/00;* **F02B** *77/00*

U.S. Cl. 123—195 C **5 Claims**



1. In a motor vehicle engine compartment having a plurality of walls forming a compartment housing an engine, the improvement comprising means for retaining engine heat between periods of operation of the engine, said means for retaining engine heat comprising:

a first wall having at least one opening therein and a second wall having at least one opening therein,

first movable closure means for covering and uncovering said one opening in said first wall;

second movable closure means for covering and uncovering said one opening in said second wall;

said first and second walls and the remainder of the plurality of walls forming a substantially sealed enclosure when said closure means covers said opening;

means responsive to low temperature ambient conditions for moving said first and second closure means into positions covering said openings and responsive to engine operation for moving said first and second closure means into positions uncovering said openings; and

insulating material lining each of said first and second walls; whereby in low temperature ambient conditions the enclosure is substantially sealed to retain engine heat therewithin from a prior period of engine operation to allow the engine to be more easily restarted and to facilitate engine warm up.

4,924,827

DIESEL ENGINE SHUT-DOWN DEVICE

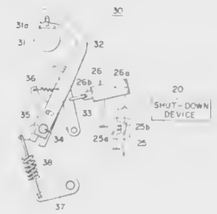
Masami Minegishi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1989, Ser. No. 366,677

Claims priority, application Japan, Jun. 24, 1988, 63-84353

Int. Cl.[5] F02B *77/08*

U.S. Cl. 123—198 DB **6 Claims**



1. A diesel engine shut-down device, provided on a fuel system comprising a solenoid having an excitation coil in a cylinder and a plunger to advance from and retreat in one end of said cylinder, a fuel injection pump mounted on an engine and having a control rack to regulate an injection quantity of the pump, a governor lever rotated by a stop lever mounted on an end of said plunger, a governor shaft for rotatably supporting said governor lever and for being moved by a governor weight, a control link being rotatably supported by said shaft and pulling said governor lever by a spring, and a control lever for regulating a position of said governor lever by rotation through a second spring, comprising:

timer means for outputting an engine stop signal for a predetermined time when a key switch is turned off; and

drive means for actuating said solenoid to stop the engine through a switching device in accordance with said engine stop signal from said timer means.

4,924,828

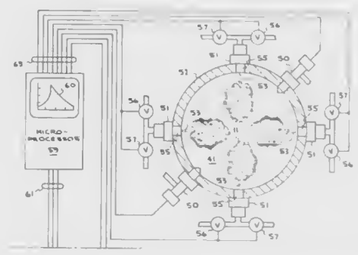
METHOD AND SYSTEM FOR CONTROLLED COMBUSTION ENGINES

A. K. Oppenheim, Berkeley, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Feb. 24, 1989, Ser. No. 315,403

Int. Cl.[5] F02B *3/06*

U.S. Cl. 123—299 **26 Claims**



1. A method for executing the combustion of reactants in internal combustion engines, which comprises the steps of:

compressing a gaseous working fluid, comprising at least a part of one or more said reactants;

sequentially injecting into said gaseous working fluid, at predetermined time intervals upon at least partially compressing said working fluid, a plurality of jets comprising the balance of said reactants under conditions leading to the formation of a plurality of plumes, each of said plumes having a fluid dynamic structure comprising a multiplicity of eddies entraining reactants from said working fluid and causing said reactants to be mixed within the interior of said eddies of said plumes; initiating thereupon the exothermic process of combustion to proceed in the interior of said plumes, each of said plurality of plumes occupying a fraction of the volume containing said working fluid, and the totality of plumes occupying upon their expansion due to the exothermic effects of combustion, essentially the entire head space.

4,924,829

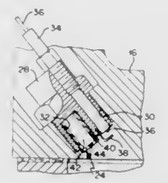
APPARATUS FOR TORCH JET ASSISTED SPARK IGNITION

Shi-wai S. Cheng, Troy; Wayne C. Nichols, Corunna, and Wayne R. Moore, Highland, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 11, 1989, Ser. No. 405,241

Int. Cl.[5] F02B *19/10*

U.S. Cl. 123—259 **12 Claims**



1. Torch jet assisted spark ignition means in combination in an internal combustion engine with a closed end cylinder and a piston in the cylinder defining a variable volume combustion chamber at the cylinder closed end, said ignition means comprising:

electrically conductive means supported on a wall of the cylinder and forming a spark gap adjacent the wall,

a torch chamber communicating with the combustion chamber through an orifice in said wall adjacent the spark gap and directed into the combustion chamber, the torch chamber volume being in the range of from 0.5 to 1.0 cc and the orifice diameter being in the range of from 0.1 to 0.2 cm.

4,924,830

CYLINDER DISCRIMINATING SYSTEM FOR AN AUTOMOTIVE ENGINE

Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 341,144

Claims priority, application Japan, Apr. 30, 1988, 63-109499

Int. Cl.[5] F02P *9/00*

U.S. Cl. 123—414 **3 Claims**

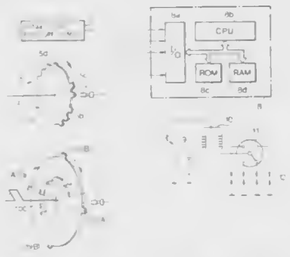
1. A system for discriminating cylinders of an internal combustion engine, comprising:

a rotary member provided to be rotated once while a crankshaft of said engine rotates twice;

indicator means formed on said rotary member disposed in angular ranges of the crankshaft which are out of angular ranges where said engine stops frequently, the indicator means in each range being arranged to indicate a specific cylinder of said engine;

VOL
1114
ISS
3
MY
15
1990
UMI

a sensor for sensing said indicator means and for producing cylinder representing signals; and



discriminator means responsive to said cylinder representing signals for producing discriminating signals representing respective cylinders.

4,924,831

CAPACITOR DISCHARGE IGNITION SYSTEM WITH MICROPROCESSOR TIMING CONTROL

Michael J. Piteo, Enfield, Conn., and Real L. Mercier, W. Springfield, Mass., assignors to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Jul. 10, 1989, Ser. No. 377,125
Int. Cl.[5] F02P *5/00*
U.S. Cl. 123—417 **10 Claims**



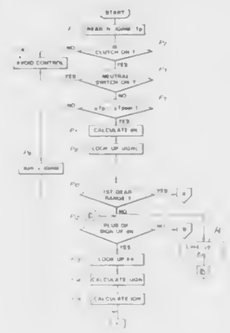
1. A capacitor discharge ignition system for an internal combustion engine having a generator coil, an ignition coil including a primary winding and secondary winding with a spark plug connected thereacross said coils being wound about a ferromagnetic core disposed in magnetically coupled relation with a rotating permanent magnet means whereby at least two pulses of one polarity and an intermediate pulse of opposite polarity are sequentially induced in the generator coil during a fractional portion of one revolution of the magnet means, an electronic circuit for said system comprising a microprocessor, means for energizing the microprocessor with a portion of the energy of said pulses, the two pulses of one polarity being supplied to the microprocessor to establish a time base for the computation of equally spaced clock pulses inversely proportional in number to the rotational speed of said engine, a capacitor charged by the intermediate pulse, electronic switch means connected in circuit with the primary winding and including a control electrode responsive to an output signal from the microprocessor to trigger the electronic switch means "ON" based upon the number of clock pulses so that, when switch means is triggered "ON", the voltage charge of said capacitor is discharged through the primary winding and switch means whereby an ignition pulse is induced in the secondary winding to provide an ignition spark across said spark plug.

4,924,832

SYSTEM AND METHOD FOR CONTROLLING IGNITION TIMING FOR INTERNAL COMBUSTION ENGINE

Toshiro Abe, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 26, 1989, Ser. No. 343,336
Claims priority, application Japan, Apr. 26, 1988, 63-105093
Int. Cl.[5] F02D *41/04, 41/26;* F02P *5/15*
U.S. Cl. 123—419 **20 Claims**





1. A system for controlling an ignition timing for a vehicular internal combustion engine, comprising:

(a) first means for detecting engine operating conditions, the first means including second means for detecting engine revolution speed

(b) third means for detecting any one of gear shift positions of a vehicular power transmission, the gear shift positions including a position at which engine driving force is not transmitted to a vehicular power train;

(c) fourth means for determining whether the engine falls into a predetermined transient state on the basis of the engine operating conditions;

(d) fifth means for setting a basic ignition timing angle value according to the detected engine operating conditions;

(e) sixth means for calculating a first correction coefficient according to engine revolution speed variation when the engine falls into the predetermined transient state, the vehicle in which the engine is mounted is moving;

(f) seventh means for determining an engine load on the basis of detected engine operating conditions and calculating a second correction coefficient which corrects the ignition timing depending on which of the gear positions in which the shift gear is placed and depending on the engine load;

(g) eighth means for correcting the basic ignition timing angle value on the basis of the first and second correction coefficients to determine a final ignition timing when the engine is transferred into the predetermined transient state during vehicle movement, the eighth means also halting the correction of the basic ignition timing angle value based on the first and second correction coefficients and determining the basic ignition timing angle as the final ignition timing when the engine does not fall into the predetermined transient state and when the gear shift is placed in a position in which no engine output power is transmitted to the vehicular power train; and

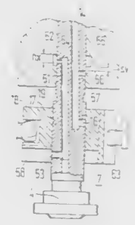
(h) ninth means for igniting an air-fuel mixture supplied to each engine cylinder at a timing in accordance with the final ignition timing determined by the eighth means.

4,924,833

FUEL-INJECTION PUMP FOR AN INTERNAL-COMBUSTION ENGINE

Gerald Höfer, Bad Aibling, and Franz Ebeim, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00570, § 371 Date Aug. 22, 1988, § 102(e) Date Aug. 22, 1988, PCT Pub. No. WO88/05128, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 4, 1987, Ser. No. 243,300
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1986, 3644583
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—449 **19 Claims**



1. In a fuel-injection pump for an internal-combustion engine, the pump comprising:

a pump cylinder;

a pump plunger subdividing the cylinder into a pump working space and a relief space and formed with a first relief duct opening into the working space and also opening radially at a first outlet opening into the relief space;

means for periodically feeding fuel to the working space and for periodically rotating and axially reciprocating the plunger;

an annular slide displaceable in the relief space on the plunger over the first outlet opening; and

means for axially shifting the annular slide to vary the venting of the working space to the relief space through the relief duct; the improvement comprising:

an annular groove formed in the cylinder and opening inward toward the plunger;

a second outlet opening of the first relief duct opening on the circumference of the plunger and being positionable at the annular groove;

a second relief duct in the plunger provided with a second outlet opening radially opening on the circumference of the plunger and also being positionable at the annular groove, the second outlet opening of the second relief duct being axially spaced relative to the second outlet opening of the first relief duct so that during a predetermined partial delivery stroke of the pump plunger said second outlet opening of said second relief duct communicates with said second outlet opening of said first relief duct via the annular groove;

a first outlet opening of the second relief duct which opens into the relief space in the vicinity of the annular slide;

a control opening in the annular slide, opening into the relief space, and alignable with the first outlet opening of the second duct; and

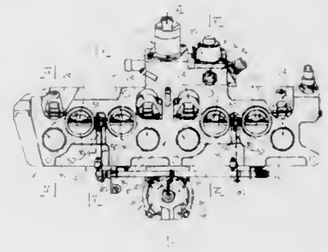
an interrupting device connected mechanically with an external load-controlling means which in a first operating state connects the first outlet opening of the second relief duct with the relief space via the control opening according to the position of said external throttling means and in a second operating state disconnects the connection of the first outlet opening of the second relief duct with the relief space via the control opening according to said external throttling means.

4,924,834

INTEGRAL DEVICE FOR FORMING AND METERING A MIXTURE OF AIR AND FUEL IN AN INTERNAL COMBUSTION ENGINE FED BY A MULTIPOINT INJECTION SYSTEM

Silverio Bonfiglioli, Zola Predosa, and Rino Stagni, S. Pietro In Casale, both of Italy, assignors to WEBER s.r.l., Turin, Italy

Continuation of Ser. No. 264,807, Oct. 31, 1988, abandoned. This application Jun. 14, 1989, Ser. No. 365,858
Claims priority, application Italy, Oct. 30, 1987, 67919 A/87
Int. Cl.[5] F02B *3/00;* F02M *39/00*
U.S. Cl. 123—470 **9 Claims**



1. A device for forming and metering a mixture of air and fuel in an internal combustion engine comprising a plurality of electromagnetically operated and electronically controlled bottom-feed fuel injectors (**24**), characterized by comprising:

at least one air manifold (**1**) connected to the engine air filter (**2**) by a duct (**3**) the passage of which is controlled by at least one main throttle valve (**4**);

an integral connection block (**5**) for connection to said manifold and to a wall (**7**) of the engine in which a plurality of holes (**8**) is provided, each of which communicates with a corresponding combustion chamber of the engine;

in said integral block there being provided a plurality of pairs of first (**15**) and second (**16**) main air feed holes disposed such that the two holes (**15**, **16**) of each pair connect the manifold (**1**) to one of said holes (**8**) in the engine, air passage through the second holes (**16**) of each pair being controlled by a corresponding second throttle valve (**17**);

in said integral block (**5**) there being provided a series of supplementary idling air ducts (**18***a*, **18***b*, **19***a*, **19***b*) which connect an air inlet hole in said block to said first main air feed holes (**15**), said block (**5**) comprising a first seat (**21**) for fixing a solenoid air modulating valve (**22**) between said air inlet hole and said supplementary idling air ducts (**18***a*, **18***b*, **19***a*, **19***b*);

in said integral block there being provided a series of second least one of said first main air feed holes (**15**);

in said integral block (**5**) there being provided a pair of fuel ducts (**26**, **27**), a first duct (**26**) of which communicates with fuel inlet apertures (**28**) in said injectors, and a second duct (**27**) of which communicates with fuel outlet apertures (**29**) in said injectors;

VOL
1114
ISS
3
MY
15
1990
UMI

in said integrated block (5) there being provided a third seat (30) for fixing a fuel regulator (31) interposed between a fuel inlet hole (32) provided in said block and said first fuel duct (26).

4,924,835

METHOD OF AND DEVICE FOR THE ELECTRONIC DETERMINATION OF THE FUEL AMOUNT FOR AN INTERNAL COMBUSTION ENGINE

Helmut Denz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

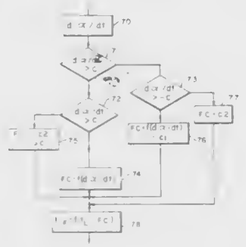
PCT No. PCT/DE87/00263, § 371 Date Mar. 28, 1988, § 102(e) Date Mar. 28, 1988, PCT Pub. No. WO88/02811, PCT Pub. Date Apr. 21, 1988

PCT Filed Jun. 6, 1987, Ser. No. 214,738

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634551

Int. Cl.[5] F02M *51/00*

U.S. Cl. 123—478 **8 Claims**



1. A method of eliminating interfering a.c. components from a fuel injection control signal of an electronically controlled internal combustion engine, comprising the steps of computing and generating a basic fuel quantity control signal in dependency on predetermined engine variables such as engine speed, air flow rate and the like, and filtering said basic control signal by a filter whose damping characteristic for the a.c. component is changed in response to predetermined values of at least one engine variable to produce a filtered fuel quantity control signal.

4,924,836

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH CORRECTION COEFFICIENT LEARNING FEATURE

Masaaki Uchida; Hideki Uema; Hiromichi Miwa, and Yoshihisa Kawamura, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 17, 1988, Ser. No. 194,936

Claims priority, application Japan, Jun. 26, 1987, 62-158989

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—489 **39 Claims**

8. An air/fuel ratio control system for an internal combustion engine comprising:

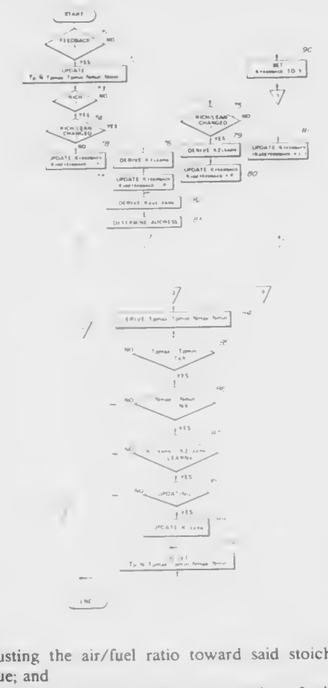
an induction system for supplying an air/fuel mixture to a combustion chamber in the engine, said induction system including a fuel injection system for injecting a controlled amount of fuel for forming a desired air/fuel mixture ratio;

a first sensor monitoring a basic engine driving condition indicative parameter to produce a first sensor signal indicative thereof;

a second sensor monitoring an air/fuel ratio indicative parameter to produce a second sensor signal indicative thereof, said second sensor signal varying cyclically across zero according to a cyclic change of air/fuel mixture ratio between rich and lean across a stoichiometric value;

third means for deriving a basic fuel injection amount on the basis of said first sensor signal value;

fourth means for correcting said basic fuel injection amount with a correction value, said correction value comprises a learnt component and a feedback component to be derived on the basis of said second sensor signal value for



adjusting the air/fuel ratio toward said stoichiometric value; and

fifth means, responsive to said zero-crossing of said second sensor signal, for deriving an updating value to be substituted for said learnt component, said updating value being calculated as a function of said feedback component.

4,924,837

INTERNAL COMBUSTION ENGINE HAVING ELECTRIC CONTROLLED FUEL INJECTION WITH OXYGEN SENSOR FOR DETECTING INTAKE AIR AMOUNT

Yoshiki Chujo, Mishima; Keiji Aoki, Susono; Yosbihiko Hyodo, and Toshiyasu Katsuno, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 1, 1989, Ser. No. 360,243

Claims priority, application Japan, Jun. 11, 1988, 63-142789

Int. Cl.[5] F02D *41/22*; F02M *51/00*

U.S. Cl. 123—494 **9 Claims**

1. An internal combustion engine comprising:

an engine body;

an intake system for introducing air into the engine body, said intake system having a throttle valve for controlling the amount of air introduced into the engine body;

control means for controlling an operating characteristic related to the amount of air introduced into the engine;

an exhaust system for removing resultant exhaust gases from the engine body;

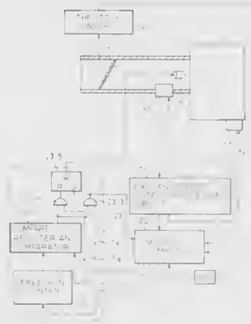
oxygen sensor means, arranged in the intake system and responsive to a partial pressure of oxygen in the intake system, for detecting an amount of air newly introduced into the engine;

heater means arranged in the oxygen sensor for activating the oxygen sensor;

heater control means for controlling the temperature of the oxygen sensor to a predetermined value;

determining means for determining whether the sensor has been activated;

first calculating means, responsive to the detected oxygen partial pressure by the oxygen sensor means, for calculating a value of said engine operating characteristic matching the detected amount of air newly introduced into the



engine when it is determined by the determining means that the sensor has been activated;

second detecting means for detecting, without using the detected oxygen partial pressure, a parameter indicating an amount of air newly introduced into the engine, and;

second calculating means, responsive to the detected parameter, for calculating a value of said engine operating characteristic matching the detected amount of air newly introduced into the engine when it is determined by the determining means that the sensor has not been activated.

4,924,838

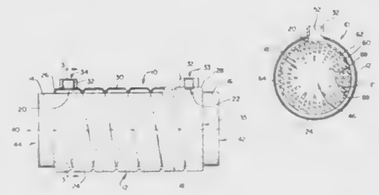
CHARGE AIR FUEL COOLER

James C. McCandless, Rolling Meadows, Ill., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Apr. 26, 1989, Ser. No. 343,989

Int. Cl.[5] F02M *31/20*

U.S. Cl. 123—541 **13 Claims**



4. In combination with a diesel engine having an intake manifold, an engine air intake conduit leading to said intake manifold, a source of fuel, and a circuitous fuel path having a section supplying fuel to the engine from the source and returning uncombusted fuel from the engine to the source, a fuel cooler mounted within said engine air intake conduit upstream of any intake air thermodynamic state changing device in a manner allowing intake air to flow through a central passageway of said cooler toward said intake manifold and further being engaged within said circuitous fuel path in a manner allowing heated fuel to travel through a peripheral passageway formed in said fuel cooler, said peripheral passageway being contiguous to said central passageway whereby heat from said heated fuel is transferred to said intake air, thus cooling the fuel.

4,924,839

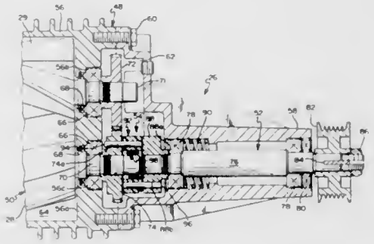
SUPERCHARGER WITH TORSION DAMPING

Robert S. Moeller, Birmingham, and Kevin M. McGovern, Dearborn Heights, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 31, 1988, Ser. No. 200,330

Int. Cl.[5] F02B *33/38*

U.S. Cl. 123—559.1 **11 Claims**



1. A rotary blower of the backflowtype including a housing; first and second rotors rotatably disposed in the housing and having meshed lobes for transferring relatively low pressure inlet port air to outlet port air controllable between relatively low and high pressures; first and second meshed timing gears respectively fixed to the first and second rotors for preventing contact of the meshed lobes and positioned for rotation about an axis common to the axis of their respective rotor; an input drive adapted to be rotatably driven about an axis common to the first timing gear and in one direction at speeds proportional to speed of a periodic combustion torque transmitting engine selectively controllable between relatively low and high speeds; the improvement comprising:

a torsion damping mechanism including drive means driven by the input drive and mounted for limited rotation relative to the first timing gear and resilient means drivingly interposed between the drive means and the first timing gear, said resilient means being flexibly operative to attenuate input drive torsionals in the torque and thereby reduce timing gear rattle, said damping mechanism further including:

an annular member positioned for rotation about the first timing gear axis and including at least first and second circumferentially spaced apart openings radially spaced from the first timing gear axis;

first and second drive pins respectively fixed at one end to the input drive and the first timing gear and received at the other end by one of the openings, the pin received by the first opening being free to move arcuately therein and the pin received by the second opening retained against such arcuate movement; and

said resilient means including a torsion spring having helical wound coils disposed in a central opening of said annular member, the opposite ends of the spring having first and second tangs extending radially outward, the first tang being positioned for contact with the pin free to move arcuately in the first opening and the second tang being secured against movement relative to the annular member.

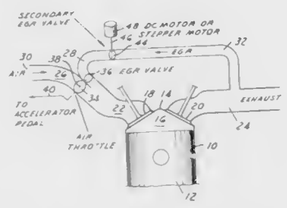
VOL
1114
ISS
3
MY
15
1990
UMI

4,924,840

FAST RESPONSE EXHAUST GAS RECIRCULATION (EGR) SYSTEM

Wallace R. Wade, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,523
Int. Cl.[5] F02M *25/06*
U.S. Cl. 123—571 **5 Claims**



1. An exhaust gas recirculation (EGR) control for an automotive type internal combustion engine comprising, a gas induction passage connected to the engine intake manifold at one end, an EGR passage connected at one end to exhaust gases from the engine combustion chamber, the other end of the induction passage being bifurcated to form ambient air and EGR branch passages, means connecting the ambient air branch passage to ambient air, means connecting the EGR branch passage to the other end of the EGR passage whereby ambient air and EGR gases combine to form a gas charge inducted into the engine, ambient air and EGR branch passage throttle valves movably mounted in their respective passages for variably controlling the flow therethrough, and mounting means mounting the throttle valves for concurrent movement to fix the ratio of EGR flow to ambient air flow at predetermined exhaust backpressure levels, with said exhaust gas recirculation control further comprising a second EGR throttle valve in the EGR branch passage upstream of the first mentioned EGR throttle valve, and means connected with the second EGR valve for venting to atmosphere the EGR passage downstream of the second EGR valve to equalize the pressures in the branch passages at predetermined exhaust gas backpressure levels.

4,924,841

ARROW GUIDE

Robert D. Smith, 1715 Oleander Ave., Chico, Calif. 95926

Filed Aug. 3, 1989, Ser. No. 389,677
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—44.5 **4 Claims**

1. An adjustable support for holding and guiding an arrow being launched from a bow, comprising;

a hinge base,

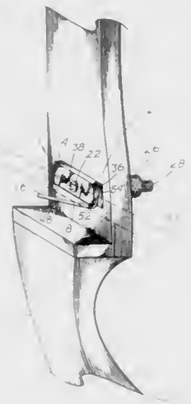
said hinge base being a substantially rectangular plate adapted for attachment to a bow riser on an archery bow longitudinally tranverse relative to said bow length;

an arrow rest lever rod adapted for non-restrictive resting of said arrow thereon;

said arrow rest lever rod inherently structured for self spring biasing in a right angled looping end thereof with a straightened terminal section of said looping end removably attachable to said hinge base for cooperative operational activating of said spring biasing and for maintaining said arrow rest lever rod hingedly angled laterally from said hinge base;

means in said hinge base accepting removable attachment of said straightened terminal section of said looping end of said arrow rest lever rod and providing said cooperative operational activating of said self spring biased inherent in said looping end with said removable attachment being pivotal hinging for said arrow rest lever rod allowing said arrow rest lever rod to be physically movable towards said hinge base and by material reslience providing said spring biasing returned to said angled position;

said hinge base centrally opened by a threaded aperture for said attachment to said bow riser with provisions incorporated in said attachment producing a rounded end protrusion of a spring loaded plunger with said rounded end of said plunger arranged for contacting said arrow and providing a non-restrictive cushion for horizontal alignment of said arrow;



said hinge base lipped along one short end providing a backstop edge and a recess for snap-fitting retention for a first section of said looped end of said arrow rest lever rod with said backstop aligned for use with said means for attachment of said terminal end section of said looping end of said rest lever rod allowing said arrow resting portion of said arrow rest lever rod parallel positioning with a longitudinal edge of said hinge base for checking alignment and adjusting alignment of said arrow rest lever rod;

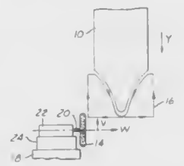
said snap-fitted retention reversible and said arrow rest lever rod entirely removable from said hinge base.

4,924,842

OPTIMIZATION METHOD AND APPARATUS FOR DRESSING A GRINDING WHEEL

Suren B. Rao, Troy, and Richard W. Schwartz, Mt. Clemens, both of Mich., assignors to National Broach & Machine Company, Mt. Clemens, Mich.

Continuation of Ser. No. 214,119, Jun. 30, 1988, abandoned.
This application Sep. 22, 1989, Ser. No. 411,244
Int. Cl.[5] B24B *53/00*
U.S. Cl. 125—11.01 **12 Claims**



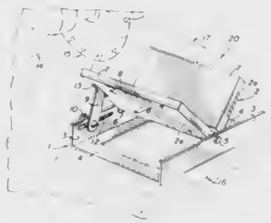
1. Apparatus for dressing a grinding wheel to produce or restore a predetermined profile on the periphery thereof, comprising a dresser, means for relatively guiding said dresser and said wheel along a path corresponding to said predetermined profile successively in identical cycles of motion, means for relatively moving said dresser and grinding wheel transversely of said path in increments between cycles causing said dresser to contact the periphery of said grinding wheel during such movement along said path and the duration of contact to increase with each cycle until said predetermined profile is produced on the periphery of said grinding wheel, and an optimization control system comprising means for determining the duration of contact during each cycle, and means for comparing the duration of contact in successive cycles to ascertain when the difference is minimal and the dressing operation may be discontinued.

4,924,843

MASONRY SAW JIG

Jerry B. Waren, 4044 Hampton La., Shreveport, La. 71107

Filed Nov. 28, 1988, Ser. No. 276,490
Int. Cl.[5] B28D *7/04*
U.S. Cl. 125—35 **13 Claims**



1. A masonry saw jig adapted for supporting a masonry work piece at various angles for cutting by a masonry saw, comprising:

(a) a frame;

(b) an elongated, substantially V-shaped work piece bed having a right plate and a left plate, said right plate and said left plate further characterized by an upper and lower edge and joined along said lower edge to form a "V", said V-shaped bed pivotally mounted to said frame; and

(c) a support bar having one end pivotally secured to a selected one of said right plate and said left plate in said V-shaped bed, a bolt carried by said lower end of said support bar, a horizontal slot located in said frame, with said bolt extending in slidable relationship through said horizontal slot, and tightening means threaded on said bolt for adjusting said bolt in said horizontal slot and adjusting and maintaining said V-shaped bed in said various angles and cutting the masonry work piece responsive to operation of the masonry saw.

4,924,844

PORTABLE GRILL WITH INTERCHANGEABLE ACCESSORIES

Jorge M. Bransburg, Malabia 2363 - 2d G, 1425 Buenos Aires, Argentina

Filed Oct. 5, 1989, Ser. No. 417,635
Claims priority, application Argentina, May 8, 1989, 313860
Int. Cl.[5] F24C *1/16*
U.S. Cl. 126—9 R **5 Claims**

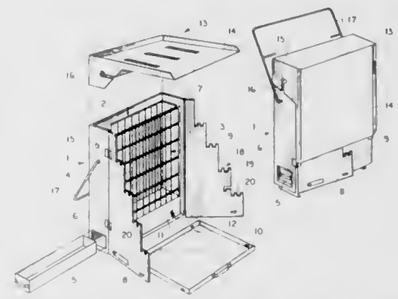
1. A portable grill with interchangeable accessories, of the type with a receptacle for the source of heat; means to put the products to be roasted at the outside of the heat generated; elements to re-collect the residues of combustion and also the fats of the broiled products; means to transport the complete appliance; and means to temporally affix such accessories that hold the products to be roasted; characterized by:

a mixture of a main receptacle for the source of heat, which is a rectangular volume of flat walls disposed in vertical position, with an ash box that moves transversally in its bottom;

the receptacle being internally covered with a metallic cord on all sides except the upper one;

with a removable cover with two main sides, a small one that closes the top of the receptacle when disposed in a storage or transport position and the other which is bigger and can be used as a roasting surface in the horizontal position;

including two equal lids fixed with hinges to the lateral sides of the main receptacle, which are used to support the accessories which hold the products to be broiled and



have their front border stair-shaped in vertical and horizontal alternating sections, with at least one U-shaped notch in the horizontal sections; and

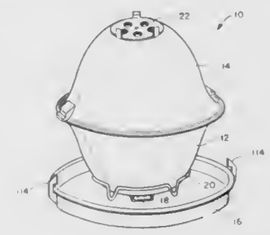
the whole appliance is complemented with a tray to recollect the fats which is disposed at the bottom, between the lateral lids, and connected to the main receptacle by means of wedges, being the aforementioned U-shaped notches to support the dice that the accessories have near their handles.

4,924,845

COOKER AND METHODS OF COOKING

Russell L. Johnson, Waupaca County; Frederick J. Hrubecky, and James E. Fay, III, both of Winnebago County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 13, 1987, Ser. No. 37,914
Int. Cl.[5] A47J *37/00*
U.S. Cl. 126—25 R **142 Claims**



106. A cooker comprising a receptacle member and a cooking surface including means for supporting said cooking surface from said receptacle member, said cooking surface being assembled in said cooker with resilient deformation of said cooking surface.

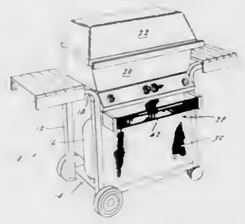
VOL
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4,924,846

DECORATOR BARBECUE GRILL WITH FABRIC PANEL ASSEMBLY

Dale Peacock, and Doyle Raymer, both of Freeport, Ill., assignors to The Thermos Company, Inc., Freeport, Ill.

Filed Sep. 12, 1989, Ser. No. 406,149
Int. Cl.[5] A47J *37/00*; F24C *3/00*
U.S. Cl. 126—41 R **7 Claims**



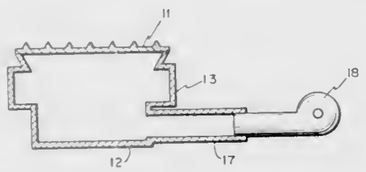
1. A decorator barbecue grill comprising:
a stand having a lower mounting portion and an upper mounting portion;
a burner housing structure disposed on said upper mounting portion having a burner disposed therein;
a fuel container disposed on said lower mounting portion and coupled to said burner for supplying fuel to said burner for combustion;
a panel supported by said stand and positioned to at least partially conceal said fuel container;
said panel comprising a generally rectangular frame having a first face and a second face, said first face defining an exterior edge and said second face having a longitudinally extending groove;
a fabric stretched across said first face of said frame and around said exterior edge, a portion of said fabric overlying said second face and pressed into said longitudinally extending groove to define a convolution of said fabric;
a resilient tubular spline pressed into said convolution to thereby hold said fabric on said frame.

4,924,847

COMBUSTION SYSTEM

Jean-Pierre Patenaude, 104 Guigues Street, Ottawa, Ontario, K1N 5H7, Canada

Continuation of Ser. No. 933,350, Nov. 19, 1986, Pat. No. 4,747,781, which is a continuation of Ser. No. 757,227, Jul. 22, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 181,576
Claims priority, application Canada, Mar. 27, 1985, 477685
Int. Cl.[5] F24C *1/14*; F23H *3/00*
U.S. Cl. 126—77 **14 Claims**



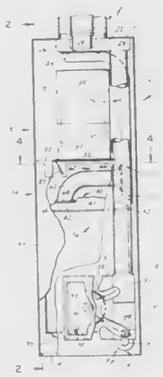
1. A system for promoting combustion of fuel comprising:
a diffusion manifold including a diffuser plate having an upper surface, a lower surface and a pattern of spaced apart openings therethrough, said openings having a predetermined diameter in the range of 0.6 to 1.4 mm and a distance between each other in the range of 7 mm to 15 mm;
a source of fuel on the upper surface of said diffuser plate, exclusively;
air pump means connected to said diffuser manifold for forcing air alone through said openings under such a pressure as to cause said air to exit on said upper surface of said diffuser plate in the form of small air jets of a given velocity; and
means for controlling said air pressure to adjust said velocity of said air jets so as to create a turbulence zone on said upper surface of said diffuser plate about each of said openings, all of said turbulence zones being adjacent and forming together a combustion zone in the vicinity of said upper surface of said diffuser plate;
the amount of air fed to said combustion zone to form with said fuel on said upper surface a proper amount of air/fuel mixture being determined by the size of said openings and the distance between each other, and being exclusively controlled by said air pressure controlling means.

4,924,848

HIGH-EFFICIENCY FURNACE FOR MOBILE HOMES

Thomas D. Vaughn, Bailwin, Mo., assignor to Nordyne, Inc., St. Louis, Mo.

Filed Aug. 21, 1989, Ser. No. 396,231
Int. Cl.[5] F24H *3/02*
U.S. Cl. 126—110 AA **10 Claims**



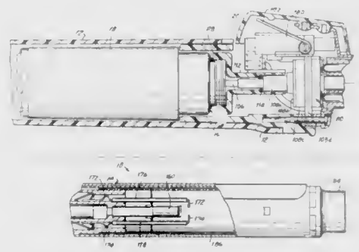
1. A furnace of the type having a generally rectangular cabinet within whose upper surface lies an upwardly presented flue connector for combustion gas,
said cabinet being divided by separator means into an upper compartment forwardly open to room air and mounting a centrifugal blower acting downward through an opening in said separator means, and a lower cabinet portion housing a combustion chamber positioned spacedly within the cabinet walls, further having a bottom outlet for heated room air,
a broad combustion gas radiator member extending from an inlet end below said separator means, upward into said upper compartment adjacent to said centrifugal blower and curvedly inward to said flue connector for combustion gas,
said combustion chamber containing burner means and having a top combustion gas outlet displaced from center of said opening in said separator means to the side thereof opposite to said lower end of said broad radiator member, in combination with
tubular heat exchange means extending from said combustion chamber top gas outlet, across and beneath said separator opening to communicate combustion gas to the lower end of said broad radiator member,
whereby for heat exchange, room air may pass over surfaces of said radiator member, through said centrifugal blower and separator opening, over the surfaces of said tubular heat exchange means, and then downward over and around the combustion chamber.

4,924,849

PORTABLE HEATING APPLIANCE HAVING FUEL CARTRIDGE WITH ON/OFF SWITCH

Thaddeus Zaborowski, Cambridge, Mass., assignor to The Schawbel Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 174,789, Nov. 9, 1987, Pat. No. 4,815,441, which is a continuation of Ser. No. 781,262, Sep. 27, 1985, Pat. No. 4,733,651. This application Aug. 9, 1988, Ser. No. 230,304
Int. Cl.[5] A45D *1/04*
U.S. Cl. 126—409 **22 Claims**



1. A fuel cartridge for supplying fuel to burner means of a portable heating appliance of the type having a member to be heated, comprising:
housing means for containing fuel;
a well in said housing means for permitting escape of said fuel;
fuel delivery valve means for controlling the flow of fuel from said fuel cartridge through said well, said fuel delivery valve means including:
control means for preventing the flow of fuel when in a first position and for permitting the flow of fuel when biased by an external force to a second, different position;
first biasing means for biasing said control means to said first position in a direction opposite to said external force; and
moving means for moving said fuel delivery valve means between an active position to enable actuation of said control means by said external force and an inactive position at which said control means is not actuated by said external force.

4,924,850

METHOD AND ADAPTOR FOR INSTALLING FLUE LINER TO A FIREPLACE INSERT

Heinz H. Rieger, 17 Martin Road, Toronto, Canada M4S 2V1

Filed Aug. 29, 1988, Ser. No. 237,067
Int. Cl.[5] F24C *15/30*
U.S. Cl. 126—500 **6 Claims**

1. A method of installing flue liner in a fireplace chimney for a fireplace insert firebox wherein said firebox having an exhaust opening formed in a top panel therein, comprising,
mounting at least two slider bracket means on said top panel of said firebox,
inserting a flue liner means slidably upwards into said chimney with a free lower end of said flue liner extending below said chimney,
connecting said lower end of said flue liner to a sleeve means mounted on a plate member of an adaptor means having an opening formed in said plate member in an area bounded by said sleeve means, said plate member being slidably engageable with said slider bracket means,



slidably mounting said plate member of said adaptor means onto said slider bracket means while insetting said firebox into said fireplace until said exhaust opening of said firebox aligning with said opening in said plate member.

4,924,851

SURGICAL APPARATUS

Jean-Francois Ognier, Saignes, and Hubert Manhes, Uicety, both of France, assignors to Societe dite Sinergy S.A., Cusset, France

Filed Jan. 5, 1989, Ser. No. 293,935
Claims priority, application France, Jan. 5, 1988, 88 00170
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 **11 Claims**



1. Operative coelioscopy surgical apparatus for receiving electrical instruments, flexible mechanical instruments and rigid mechanical instruments, the apparatus comprising, in combination:
a tubular canula for receiving said instruments and ior permitting the passage of irrigation fluid and body fluid therethrough; and
a handle removably connected to the canula and having a plurality of manually operable control means, said control means being operable either simultaneously or separately and including
first means for controlling the transmission of irrigation fluid through the canula,
second means for controlling the aspiration of body fluid through the canula,
third means for the electrical control said electrical instruments, and

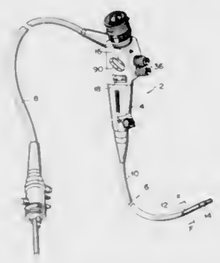
VOL
1114
ISS
3
MY
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fourth means for controlling said flexible mechanical instruments and said rigid mechanical instruments.

4,924,852
ENDOSCOPE

Akira Suzuki; Yoshikatsu Nagayama; Michio Sato; Koji Yamaya; Koji Kanbara; Akira Hasegawa, all of Tokyo; Masaaki Hayashi, Iruma; Hideo Adachi, Tokyo, and Takeaki Nakamura, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,373
Claims priority, application Japan, Sep. 11, 1987, 62-139196[U]; Oct. 16, 1987, 62-261199; Jan. 11, 1988, 63-1920[U]; Jan. 11, 1988, 63-3599; Feb. 3, 1988, 63-12559[U]
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 18 Claims



1. An endoscope having an insertion section with a moving part, comprising:
stator means for generating a surface wave as a combination of a transverse wave and a longitudinal wave;
rotor means rotatably disposed facing said stator means;
urging means for generating an urging force for bringing said rotor means intimately into contact with said stator means;
coupling means coupled to said rotor means for causing said moving part of the endoscope to operate as said rotor means rotates; and
disengaging means for weakening said urging force generated by said urging means, for thereby releasing said stator means and said rotor means from said intimate contact with each other to thereby permit said rotor means to rotate relative to said stator means when said urging force is weakened by said disengaging means.

4,924,853
STEREOSCOPIC MEDICAL VIEWING DEVICE

Edwin R. Jones, Jr., Columbia, and A. Porter McLaurin, Chapin, both of S.C., assignors to Medical Dimensions, Inc., Columbia, S.C.

Filed May 22, 1989, Ser. No. 354,761
Int. Cl.[5] A61B *1/04*
U.S. Cl. 128—6 16 Claims

1. A three-dimensional endoscopic viewing system, comprising;
a probe having a distal end and a viewing end;
a pair of image transmission elements positioned in parallel to each other within the probe, the elements extending from the viewing end of the probe to its distal end, the probe and image transmission elements at the distal end being terminated at an angle; whereby, upon rotating the probe, the image transmission elements transmit images of the entire region under observation to the viewing end of the instrument;
prismatic means for receiving images from the viewing end of the light transmission elements and maintaining these images fixed in spatial orientation regardless of the rotational position of the probe;
switching means for sequentially switching and transmitting

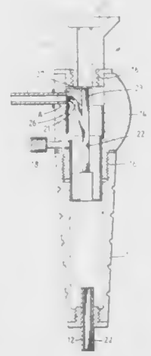


the image received from each light transmission element; and
means for converting these optical images to a three-dimensional visual display.

4,924,854
DETECTION DEVICES

Alan Pritchard, Bangor, Northern Ireland, assignor to Mectet Industries Limited, Belfast, Northern Ireland

Filed Jan. 30, 1989, Ser. No. 303,186
Claims priority, application United Kingdom, Jan. 29, 1988, 8801968
Int. Cl.[5] A61B *1/06*
U.S. Cl. 128—6 10 Claims



1. A detection device comprising a longitudinally extending hollow body having a light input position located transversely between the ends thereof, one end comprising an output or viewing window end and the other end comprising as output-/input window end, light transmissive fibres being provided to connect between the light input position and the output/input window end and between such output/input window end and the viewing window end, means being provided to facilitate varying the angle of incidence of light rays impinging on the fibres located at the light input position so as to facilitate focusing the length of focus of light rays emitted from the fibres at the output portion at the output/input window end to be reflected back to the fibres of the output portion at the output/input window end.

4,924,855
LARYNGOSCOPE BLADE

Albert Salerno, 10830 Carla Pl., Cerritos, Calif. 90701, and Gabor Racz, 4504 17th St., Lubbock, Tex. 79416

Filed Jul. 25, 1988, Ser. No. 223,388
Int. Cl.[5] A61B *1/06*
U.S. Cl. 128—11 17 Claims

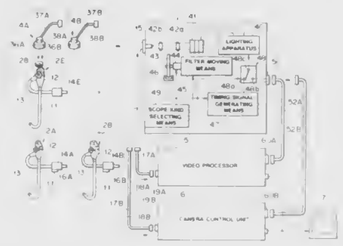


1. A laryngoscope blade comprising:
a base member; and
a blade portion having a first end and an opposing second end, a top surface and a length, said first end being mounted on said base member; said blade portion being curved throughout said length thereof, said blade portion defining a recessed channel within said top surface, said channel having a generally elliptical shape and a length which is dimensionally less than said blade portion length.

4,924,856
ENDOSCOPE LIGHT SOURCE APPARATUS

Toshiaki Noguchi, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1989, Ser. No. 333,653
Claims priority, application Japan, Apr. 8, 1988, 63-87522; Mar. 8, 1989, 63-057262
Int. Cl.[5] A61B *1/04*
U.S. Cl. 128—6 20 Claims

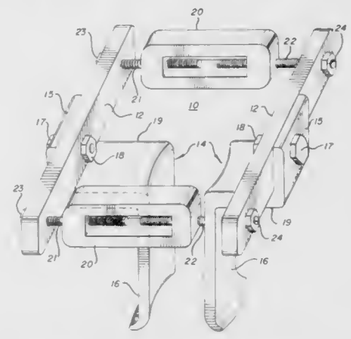


1. An endoscope light source apparatus which can feed an illuminating light to an endoscope requiring a white color light as an illuminating light and to an endoscope provided with a field sequential type imaging means and requiring as an illuminating light a field sequential light switched sequentially to lights in different wavelength ranges, comprising:
a light source emitting a white color light;
a light converting means interposed in the light path of the light emitted from said light source at least at the time of outputting a field sequential light and converting the white color light emitted from said light source to a field sequential light;
a selecting means selecting the kind of the emitted light from among a white color light and field sequential light; and
a light amount controlling means whereby, when a field sequential light is selected by said selecting means, during the exposure period of said field sequential type imaging means, the light amount of said light source can be increased to be larger than outside the exposure period.

4,924,857
SURGICAL RETRACTOR

Saeed Mahmoodian, 204 Ridge Rd., Clarksburg, W. Va.

Filed Dec. 23, 1988, Ser. No. 288,899
Int. Cl.[5] A61B *17/02*
U.S. Cl. 128—20 4 Claims



1. A retractor for vaginal surgery comprising:
a pair of support bars;
a pair of retractor blades each including an attachment portion fixed rigidly to one of said support bars, said blades each also including a blade portion and an offset portion between said blade portion and said attachment portion;
a pair of turnbuckle mechanisms, each having a central threaded link means, and a pair of oppositely threaded rods respectively rigidly fixed to said support bars at end portions thereof so as to form a frame;
said retractor blades offset portions being formed such that said blade portions are laterally displaced from said support bars centrally of said frame, said blade portions extending at substantially right angles to the plane of said frame; and
said support bars and retractor blades being moved toward and away from each other by adjustment of said threaded link means of said turnbuckle mechanisms, said frame maintaining a substantially rectangular configuration at all adjusted positions of said retractor blades.

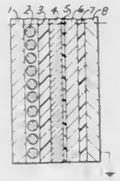
4,924,858
ELECTROMAGNETIC SHOCKWAVE GENERATOR TRANSDUCER

Josef Katona, Kreuzlingen, Switzerland, assignor to Dornier Medizintechnik GMBH, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,965
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743822
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 A 6 Claims

1. For use in a shock wave generator, a transducer comprising:
a base support;
at least one energizing coil mounted on said base;
at least one first, electrically good conducting membrane on the coil;

an outer, grounded metal membrane of lesser conductivity; and



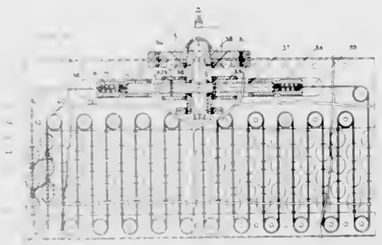
electrical insulation means interposed between the first and the second membrane.

4,924,859

PLANAR BODY STIMULATING ASSEMBLY

Paul D. Pajevic, 1461A W. Lunt Ave., Elk Grove Village, Ill. 60007

Filed Sep. 2, 1988, Ser. No. 239,648
Int. Cl.[5] A61H *7/00*
U.S. Cl. 128—52 **9 Claims**



1. A generally planar body stimulating device, comprising: a pair of spaced flexible planar housing covers, a plurality of parallel rows of generally spheroidal flexible body stimulating members mounted for reciprocation between the flexible housing covers, a pulley at each end of each row of spheroidal members mounted in frame members which surround the flexible housing covers, said pulleys being mounted for rotation about an axis perpendicular to the plane of the housing covers, a single cable supporting and interconnecting the spheroidal members and passing over the pulleys, means to impart a reciprocable movement to said cable to reciprocate the spheroidal members in a plane parallel to the plane of the housing covers with the spheroidal members of adjacent rows always being moved in opposite directions, said cable having first and second ends, said means to import a reciprocable movement including a reciprocating rod having ends connected to the cable for alternately pulling the first and second ends of the cable, and shock absorbing means between the rod and the first and second ends of the cable.

4,924,860

WATER TRAP AND ASSOCIATED CONTROL SYSTEM

Timothy P. Larsen, Wauwatosa; James A. Devine, Waukesha, and Michael T. Larsen, Wauwatosa, all of Wis., assignors to Criticare Systems, Inc., Waukesha, Wis.

Filed Aug. 26, 1988, Ser. No. 237,136
Int. Cl.[5] A62B *7/00*; A61B *5/08*
U.S. Cl. 128—205.12 **16 Claims**

1. A water trap for a respiration gas analyzer, said water trap comprising:

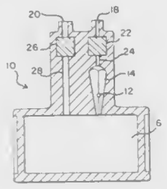
a tapered water separation chamber;

a sample inlet port connected to the water separation chamber;

a sample outlet port connected to the water separation chamber by a sample outlet conduit;

a water collection chamber connected to the water separation chamber;

a vacuum port connected to the water collection chamber by a vacuum conduit; and



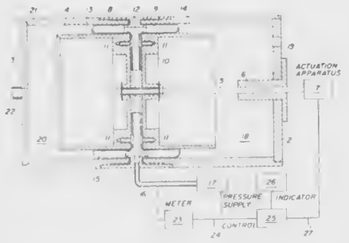
at least one self-sealing filter disposed in at least one of the sample outlet conduit and the vacuum conduit, said self-sealing filter comprising a porous matrix having pores characterized by a pore size less than about 100 microns and means, disposed in the porous matrix, for rendering the porous matrix substantially non-porous when exposed to water, said pores forming the only flow path through the filter.

4,924,861

PISTON AND CYLINDER UNIT AS SUPPLY DEVICE FOR THE RESPIRATORY AIR OF A RESPIRATOR

Siegfried Kiske, Gross Gronau; Erik Schwanbom, and Carl F. Wallroth, both of Lubeck, all of Fed. Rep. of Germany, assignors to Drägerwerk AG, Lübeck, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 366,470
Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817091
Int. Cl.[5] A62B *23/02*
U.S. Cl. 128—205.18 **8 Claims**



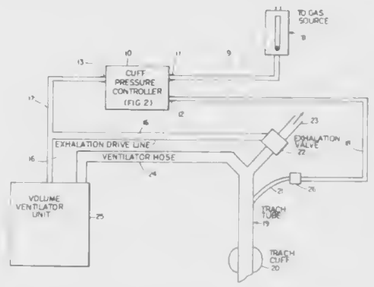
1. A piston and cylinder unit for supplying respiratory gas to a patient, comprising a cylinder having a cylindrical side wall, a delivery end with a delivery supply connection and an opposite base plate end, a piston movable in said cylinder and having a piston side wall, a piston rod journalled in said base plate end and connected to said piston, a pair of rolling membranes having cylinder engagement ends engaged with said cylinder side wall at spaced opposed locations, said membranes having an end opposite said cylinder engagement ends engaged with said side wall of said piston at spaced opposed locations on said piston and defining an enclosed pressure inner chamber between said rolling membranes and between said piston and said cylinder said rolling membranes having a concave side and an opposite convex side, said rolling membranes separating said cylinder into an antechamber and a working chamber leading to said delivery supply connection, and means connected to said inner chamber to maintain a pressure in said inner chamber keeping said concave side at a pressure which is higher than said convex side.

4,924,862

PRESSURE CONTROLLER AND LEAK DETECTOR FOR TRACHEAL TUBE CUFF

Gary Levinson, 2 Oar Rd., Rowe, Mass. 01367

Filed Aug. 19, 1987, Ser. No. 87,154
Int. Cl.[5] A61M *16/00*; A62B *9/02*
U.S. Cl. 128—207.16 **20 Claims**



1. An inflation control system for an inflatable cuff of a tracheal tube connected to a ventilator having alternating inspiration and exhalation cycles, comprising

an adjustable low pressure relief valve having an inlet and an outlet and a valved exhaust port urged toward the closed condition,

an adjustable high pressure relief valve having an inlet and an outlet and a valved exhaust port urged toward the closed condition requiring higher pressure to open than said exhaust port of said low pressure valve, and

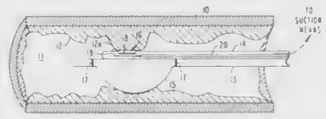
a cuff inflation line substantially continuously connecting the respective inlets and outlets of said low and high pressure valves in series between the cuff and a substantially continuous source of pressurized gas throughout inspiration and exhalation cycles of said ventilator.

4,924,863

ANGIOPLASTIC METHOD FOR REMOVING PLAQUE FROM A VAS

Fred Sterzer, Lawrence Township, Mercer County, N.J., assignor to MMTC, Inc., Princeton, N.J.

Filed May 4, 1988, Ser. No. 190,179
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—27 **8 Claims**



1. A transluminal balloon angioplastic method for removing at least a portion of fatty artherosclerotic plaque initially in non-removable form that partially occludes the lumen of a vas, thereby to increase the size of the lumen; said method comprising the steps of:

(a) inserting into said vas a catheter arrangement having:

(1) a deflated balloon disposed off-center of the longitudinal axis of said catheter arrangement in a first sidewall of said catheter arrangement, said deflated balloon being located at a given longitudinal position situated toward the distal end of said catheter arrangement;

(2) an aperture disposed off-center of the longitudinal axis of said catheter arrangement in a second sidewall of said catheter arrangement that is located substantially opposite to said first sidewall, said aperture being located substantially at said given longitudinal position; and

(3) means for preventing gas from entering said vas through said aperture while said balloon is deflated;

(b) positioning said catheter arrangement so that said aperture is in proximity to the fatty artherosclerotic plaque which includes said portion to be removed;

(c) inflating said balloon so that said balloon presses against a part of a wall of said vas located substantially opposite to the fatty artherosclerotic plaque which includes said portion to be removed, thereby causing said aperture to be pressed against the fatty artherosclerotic plaque that includes said portion to be removed with a first pressure that provides sufficient firmness to prevent any fluid in said vas from entering the interior of said catheter arrangement through said aperture while said balloon is inflated;

(d) while said balloon is inflated, applying heat energy for a limited time to the fatty artherosclerotic plaque which includes said portion to be removed, which applied heat energy raises the temperature of the fatty artherosclerotic plaque under said first pressure to a value which is sufficient to cause at least a portion thereof to liquify and rise to the surface of the plaque then in contact with said aperture, but which temperature is insufficient to cause death of underlying tissue of said vas; and

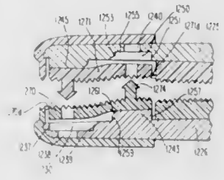
(e) while said balloon is inflated, applying sufficient suction to the interior of said catheter arrangement to reduce the relative pressure within the interior of said catheter arrangement in the vicinity of said aperture to a second pressure to cause said liquified plaque portion being sucked into the interior of said catheter arrangement through said aperture and then being sucked out of said catheter arrangement at the proximal end thereof.

4,924,864

APPARATUS AND ARTICLE FOR LIGATING BLOOD VESSELS, NERVES AND OTHER ANATOMICAL STRUCTURES

Fred G. Danzig, 573 Second St., Brooklyn, N.Y. 11215

Continuation-in-part of Ser. No. 798,425, Nov. 15, 1985, Pat. No. 4,667,671. This application Apr. 27, 1987, Ser. No. 42,897
Int. Cl.[5] A61B *17/12*
U.S. Cl. 606—142 **30 Claims**



1. An apparatus for ligating anatomical structures of a human being or other animal, comprising:

(a) A pair of opposing jaws adapted to close an anatomical structure therebetween;

(b) Means to close said jaws;

(c) Two plastic clip assembly members;

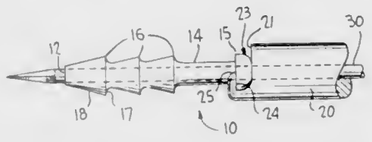
(d) Two plastic surgical clip members, one unitary and substantially coplanar with one clip assembly member and the other unitary and substantially coplanar with the other clip assembly member;

(e) At least one thin plastic web severably interconnecting each clip member and its corresponding clip assembly member;

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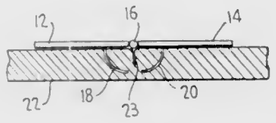
(f) At least one shearing means mounted on at least one of said jaws and projecting toward the other jaw, to sever each clip member from its corresponding clip assembly member upon closure of said jaws;
(g) Each web being aligned with a shearing means so that all webs are sheared upon closure of said jaws; and
(h) Said clip members having locking means to form an interlocking engagement over an anatomical structure upon closure of said jaws; whereby the closure and opening of said jaws over an anatomical structure creates a locking closure of said clip members and separates said clip members from said clip assembly members.

4,924,865
REPAIR TACK FOR BODILY TISSUE
F. Barry Bays, Seminole; Artbur F. Trott, Largo, and Sam R. Marchand, Dunedin, all of Fla., assignors to Concept, Inc., Largo, Fla.
Continuation of Ser. No. 865,184, May 20, 1986, abandoned.
This application May 16, 1988, Ser. No. 195,417
Int. Cl.[5] A61B *17/08;* **F16B** *35/00*
U.S. Cl. 606—77 **9 Claims**



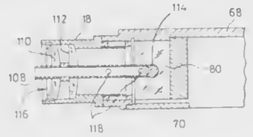
1. A tack for holding together severed or torn segments of the meniscus to permit healing in vivo comprising
a shaft having a proximal flange-like end, a distal end and a substantially cylindrical bore extending longitudinally from said proximal end to said distal end to allow a needle to pass freely entirely through said shaft to extend from said distal end for penetration in the meniscus segments; and
a plurality of tapered barbs disposed longitudinally in axial sequence along at least one-half of the length of said shaft, said barbs having substantially equal points of maximum width to be imbedded in the meniscus segments and including a distal barb tapering to terminate at a sharp circular edge at said distal end of said shaft, said sharp circular edge having a diameter substantially the same as said bore to facilitate penetration and imbedding of said barbs in the meniscus segments,
the entirety of said tack being made of a biodegradable material having a degradation time selected to be at least as long as the required healing time for the meniscus.

4,924,866
WOUND-CLOSING DEVICE
InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131
Filed Oct. 26, 1988, Ser. No. 262,980
Int. Cl.[5] A61B *17/08*
U.S. Cl. 128—335 **18 Claims**



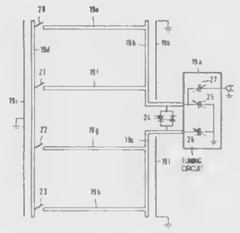
1. A wound-closing device which comprises:
first and second arms movably connected to one another at a joint at the inner ends thereof for movement between a first, open position and a second, closing position;
a first skin-engaging member connected at one end thereof to said first arm and having a free end which is capable of piercing skin;
a second skin-engaging member connected at one end thereof to said second arm and having a free end which is capable of piercing skin, said skin-engaging members being separated by a sufficient distance to span a wound when said arms are in said first, open position and said free ends being moved closer to one another when said arms are in said second, closed position wherein they pierce the skin surrounding a wound to close it, and
means for urging movement of said arms about said joint to said second, closed position.

4,924,867
TONOMETER APPARATUS
James R. A. Matthews, Old Windsor; Mervyn A. Little, Cambereley, and John Fisher, Royston, all of Great Britain, assignors to Keeler Limited, Windsor, United Kingdom
PCT No. PCT/GB87/00777, § 371 Date Jul. 23, 1988, § 102(e) Date Jul. 23, 1988, PCT Pub. No. WO88/03384, PCT Pub. Date May 19, 1988
PCT Filed Nov. 4, 1987, Ser. No. 225,718
Claims priority, application United Kingdom, Nov. 7, 1986, 8626601
Int. Cl.[5] A61B *3/16*
U.S. Cl. 128—645 **6 Claims**



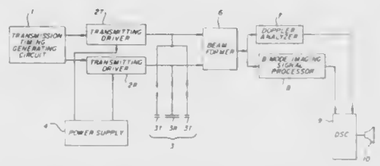
1. A tonometer for measuring the intra-ocular pressure of a eye in which a pulse of fluid is projected towards the cornea of the eye in use to distort the corneal surface by the pressure of the pulse, the distortion in the corneal surface being detected by change in the reflection of light directed onto the cornea characterised by:
(1) a source of light,
(2) a constant volume chamber forming part of a fluid delivery system,
(3) inlet means by which fluid under pressure can be supplied to the chamber when a fluid pulse is required,
(4) lens means fixed in a wall of the chamber for delivering light from the source to an eye under test,
(5) light detection means for receiving light reflected from the eye under test, and
(6) a tube which extends coaxially through the lens means and has a section which protrudes internally into the chamber where it is closed-off but includes a plurality of apertures in the internally protruding wall section to permit the controlled passage of fluid from the chamber into the tube.

4,924,868
SURFACE COIL FOR A NUCLEAR MAGNETIC RESONANCE APPARATUS
Norbert Krause, Heroldsbach, and Hermann Requardt, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Feb. 10, 1988, Ser. No. 154,314
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704996
Int. Cl.[5] A61B *5/05*
U.S. Cl. 128—653 SC **10 Claims**



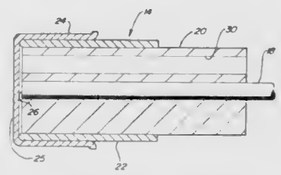
1. In a nuclear resonance apparatus for examining a patient having means for generating a fundamental magnetic field and means for generating a plurality of gradient fields in which said patient is disposed, and means for inducing nuclear magnetic resonance signals in said patient, a surface coil device adapted to be connected to a tuning circuit for detecting said nuclear magnetic resonance signals, said surface coil device comprising:
a plurality of conductor sections arranged relative to each other and adapted for circumscribing different areas and different regions of a patient in a plurality of respective combinations; and
switching means for selectively electrically connecting different groups of said plurality of conductor sections together to form said combinations so that said different areas and different regions of said patient can be examined without physical displacement of said conductor sections, said switching means adapted to electrically connect a combination so formed to said tuning circuit.

4,924,869
ULTRASONIC DIAGNOSTIC SYSTEM
Yasuhito Takeuchi; Takao Higashiizumi; Motoyoshi Ando, and Yoshiro Tamezumi, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan
PCT No. PCT/JP87/00130, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO87/05199, PCT Pub. Date Sep. 11, 1987
PCT Filed Feb. 27, 1987, Ser. No. 254,500
Claims priority, application Japan, Feb. 28, 1986, 61-43515
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.05 **2 Claims**



1. An ultrasonic diagnostic system comprising an array of ultrasonic vibrating elements comprising a first group of elements and a second group of elements;
first drive means for supplying low voltage continuous wave drive signals to said first group of elements for effecting a CW Doppler mode of imaging;
second drive means for supplying high voltage pulse wave drive signals to said second group of elements for effecting a B-mode of imaging;
first signal processing means for processing signals according to echo signals received by said second group of elements while effecting said CW Doppler mode of imaging;
second signal processing means for processing signals according to echo signals received by at least said second group of elements while effecting said B-mode of imaging; and
timing means for selectively causing said first drive means to supply said low voltage continuous wave drive signals to effect said CW Doppler mode of imaging, and for selectively causing said second drive means to supply said high voltage pulse wave drive signals to effect said B-mode of imaging, so that in said CW Doppler mode the first signal processing means obtains signals from said second group of elements and ion said B-mode the second processing means obtains signals from both said first and second group of elements.

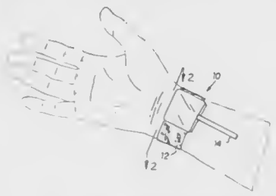
4,924,870
FIBER OPTIC SENSORS
Marek T. Wlodarczyk, Birmingham; Luciano Coletta, Ypsilanti; James A. Campbell, Ann Arbor, and Douglas G. Tomasko, Ypsilanti, all of Mich., assignors to Fiberoptic Sensor Technologies, Inc., Ann Arbor, Mich.
Filed Jan. 13, 1989, Ser. No. 297,069
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—667 **18 Claims**



1. A fiber optic sensing system comprising:
an optical fiber having first and second terminal ends,
first light emitting means for producing an input reference light signal,
second light emitting means for producing an input sensing light signal of a wavelength different from that produced by said first light emitting means,
optical means for inputting said reference and sensing light signals into said first fiber end,
a sensing tip fastened to said fiber second end and having measuring means for modulating said sensing light signal in response to a parameter to be measured,
a wavelength selective filter adjacent said second terminal end which allows said sensing light signal passing through said filter to be modulated by said measuring means while returning said reference signal,
photodetector means for sensing the intensity of said reference and sensing light signals returned through said second fiber end, and
controller and signal processing means for controlling said first and second light emitting means to produce alternate pulses of light from each of said light emitting means and for processing signals from said photodetector means to separate said returned reference light signal from said returned sensing light signal, and for comparing the inten-

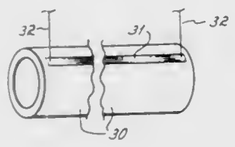
sity of said returned reference and sensing signals to provide an output related to said parameter to be measured.

4,924,871
MOTION ARTIFACT DETECTION FOR CONTINUOUS BLOOD PRESSURE MONITOR TRANSDUCER
Kevin S. Honeyager, San Antonio, Tex., assignor to Colin Electronics Co., Ltd., Japan
Filed Feb. 26, 1988, Ser. No. 160,573
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—672 1 Claim



1. A method for rejecting motion artifacts in data obtained from a blood pressure monitor transducer, comprising the steps of:
attaching a transducer to a person's wrist, said transducer comprising a pressurizable bellows and a sensor having a plurality of pressure sensing elements thereon, said sensor being positioned over an artery in said wrist to allow at least one of said pressure sensing elements to produce a pulse amplitude output signal indicative of the pulse waveform in said artery;
pressurizing said pressurizable bellows to a predetermined hold down pressure;
monitoring the pressure in said pressurizable bellows to detect a change therein above a predetermined limit, said predetermined limit being indicative of motion of said patient; and
interrupting the collection of data from said pressure sensing elements for a predetermined time upon detection of a change in pressure above said predetermined limit.

4,924,872
TUBULAR PRESSURE TRANSDUCER
Thomas P. Frank, Dublin, Ohio, assignor to Medex, Inc., Hilliard, Ohio
Continuation-in-part of Ser. No. 7086613, Aug. 18, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 341,822
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—673 3 Claims



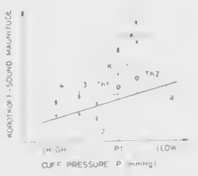
1. A fluid pressure transducer comprising,
a resilient insulative tube,
a semi-conductive stripe deposited on said tube,
and conductors connected to said stripe,
said combination of resilient tube and stripe creating a sensor that varies in resistance upon expansion and contraction of the stripe when the insulative tube expands and contracts under varying pressure.

4,924,873
PNEUMATIC CONTROL SYSTEM FOR NEONATAL BLOOD PRESSURE MONITORING
Jay R. Sorensen, Washington, Oreg., assignor to SpaceLabs, Inc., Bothell, Wash.
Filed Mar. 23, 1988, Ser. No. 172,287
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—677 9 Claims



1. A pneumatic control system for blood pressure monitors having an inflatable blood pressure cuff, said control system comprising:
an air pump generating pressurized air in its energized condition and allowing air to leak through said pump in a reverse direction when said pump is de-energized;
a first valve connected between said air pump and said blood pressure cuff, said first valve having a first position allowing airflow between said air pump and blood pressure cuff, and a second position isolating said air pump from said blood pressure cuff;
a pressure transducer measuring the air pressure in said blood pressure cuff;
a second valve connected between said blood pressure cuff and an atmospheric air vent, said second valve having a first position allowing airflow between said blood pressure cuff and said air vent, and a second position isolating said blood pressure cuff from said air vent; and
control means selectable between inflate, hold and deflate conditions, said control means energizing said air pump, switching said second valve to its second position in said inflate condition, said control means de-energizing said air pump and switching said first and second valves to their second positions in said hold condition, and said control means de-energizing said air pump and switching said first and second valves to their first positions in said deflate condition, said air pump being isolated from said blood pressure cuff in said hold condition and said blood pressure cuff being vented through both of said valves in said deflate condition.

4,924,874
AUTOMATIC BLOOD PRESSURE MEASURING APPARATUS
Tadashi Murase, Gifu, Japan, assignor to Colin Electronics Co., Ltd., Aichi, Japan
Filed Mar. 2, 1989, Ser. No. 317,953
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—682 8 Claims



1. An apparatus for automatically measuring a pressure of a subject based on heartbeat-synchronous pulses produced from the subject, the apparatus comprising:
detecting means including an inflatable cuff set around a body portion of the subject, said detecting means detecting a magnitude of each of the heartbeat-synchronous pulses produced from said body portion as pressure in said inflatable cuff is varied;
plotting means for collecting not less than a first predetermined number of the detected pulses, and plotting a corresponding number of points in a two-dimensional table defined by a first axis indicative of said pressure of the cuff and a second axis indicative of said magnitude of the pulses, such that each of the plotted points represents a cuff pressure at a time of detection of a corresponding one of the collected pulses and a pulse magnitude of said corresponding one pulse;
first determining means for selecting a second predetermined number of consecutive points from said plotted points, and determining a regression line of the selected consecutive points;
second determining means for determining, based on said regression line, at least one expected pulse magnitude regarding at least one point adjacent to said selected consecutive points in said plotted points;
third determining means for determining a temporary maximum blood pressure of the subject based, on said at least one point if a pulse magnitude represented by each of said at least one point is higher than a corresponding one of said at least one expected pulse magnitude;
fouth determining means for determining a proper maximum blood pressure of the subject; and
display means for displaying said temporary maximum blood pressure before displaying said proper maximum blood pressure.

4,924,875
CARDIAC BIOPOTENTIAL ANALYSIS SYSTEM AND METHOD
Nassib G. Chamoun, W. Roxbury, Mass., assignor to Biometrak Corporation, Cambridge, Mass.
Filed Oct. 9, 1987, Ser. No. 107,419
Int. Cl.[5] A61B 5/04
U.S. Cl. 128—696 25 Claims



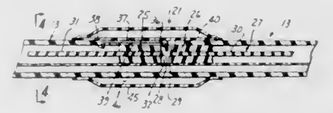
1. A method of noninvasively detecting heart disorders that affect cardiac electrical activity, said method comprising the steps of:
acquiring electrocardiographic signals from a surface of the body of a subject being analyzed through a surface electrode;
determining a waveform template representing a normal QRST waveform in said subject;
selecting a number of complexes that match said waveform template and storing said number of complexes for processing;
computing bispectral parameters from said stored number of selected complexes;
utilizing said bispectral parameters to quantify the contribution to overall cardiac physiologic function provided by the region probed by said surface electrode.

4,924,876
NASAL BREATH MONITOR
Peter Cameron, P.O. Box 404, Upton, N.Y. 11973
Filed Nov. 4, 1987, Ser. No. 116,697
Int. Cl.[5] A61B 5/08
U.S. Cl. 128—725 10 Claims



1. A device for monitoring the nasal breath which comprises:
a. means for seperately sensing the flow of air through the two nostrils; and
b. means for seperately amplifying the output of said means for sensing the flow of air; and
c. means for making the said seperate amplified outputs sensible to the user, thereby providing an indication of relative airflow through the two nostrils.

4,924,877
PRESSURE SENSING CATHETER
Albert E. Brooks, Carpinteria, Calif., assignor to Ambrook Medical Concepts, Inc., Carpinteria, Calif.
Filed Nov. 25, 1988, Ser. No. 276,269
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—748 6 Claims



1. A sensor for a pressure sensing catheter, said sensor having a longitudinal axis and a periphery, a first and a second optical fiber segment having light transmitting faces spaced from one another across a gap, a shutter having a shutter segment projecting into said gap between said faces, and also having a cantilever segment anchored to the sensor at one end, with said shutter segment projecting laterally therefrom at its other end and flexibly deflectable to move said shutter segment variably into said gap as a consequence of said deflection; a pressure membrane laid atop the cantilever segment and closing said gap; and a circumferential pressure transmitting membrane extending fully around the catheter on both sides of said gap, and enveloping a chamber filled with fluid between said membranes, said circumferential pressure transmitting membrane being normally spaced from said pressure membrane.

4,924,878
ACTUATING MECHANISM FOR BIOPSY NEEDLE
James E. Nottke, 8609 Piper La., Largo, Fla. 34647
Filed Nov. 7, 1988, Ser. No. 268,729
Int. Cl.[5] A61B 10/00
U.S. Cl. 128—751 23 Claims

1. An actuating device for use with a biopsy needle having:
a housing;
an elongated cannula extending from said housing and terminating in a distal end away from said housing;

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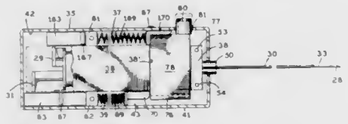
and an obturator extending from said housing longitudinally through said cannula and terminating in a distal end away from said housing, said obturator having a specimen-receiving recess near its distal end which is open along the outside of the obturator;

said obturator and said cannula being slidable with respect to each other between (a) a position in which said cannula covers said recess in the obturator and (b) a position in which said recess in the obturator is exposed beyond said distal end of the cannula for receiving a tissue specimen;

said actuating device comprising:

a base having a recess for receiving said housing of the biopsy needle and first and second guideways outside said recess;

a first needle slide slidably received in said first guideway and connectable to said obturator to determine the position of said distal end of the obturator from said housing of the biopsy needle received in said recess;



first spring means acting on said first needle slide to move said distal end of the obturator away from said housing of the biopsy needle received in said recess;

a second needle slide slidably received in said second guideway and connectable to said cannula to determine the position of said distal end of the cannula from said housing of the biopsy needle received in said recess;

second spring means acting on said second needle slide to move said distal end of the cannula away from said housing of the biopsy needle received in said recess;

and manually operable means for selectively releasing said first and second needle slides separately for movement of said obturator to said position in which said specimen-receiving recess is exposed, followed by movement of said cannula to said position covering said recess in the obturator after a time interval determined by the manual operation of said manually operable means.

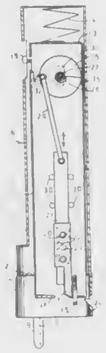
4,924,879

BLOOD LANCET DEVICE

Walter J. O'Brien, 736 Scotch Plains Ave., Westfield, N.J. 07090

Filed Oct. 7, 1988, Ser. No. 254,860
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—770 41 Claims

1. A device for puncturing the skin for blood sampling with a blade, comprising: a) blade holder means for holding said blade in said device; b) blade moving means connected to said blade holder means for rapidly moving said blade holder with said blade exclusively in a rectilinear motion in a first or puncturing direction motion immediately followed by a second or retracting direction motion for rapid puncturing and retraction to minimize pain; c) said blade moving means including a rotary to translatory motion conversion means including a rotary driving element, whereby said rotary driving element, while moving in a single continuous motion in one direction,



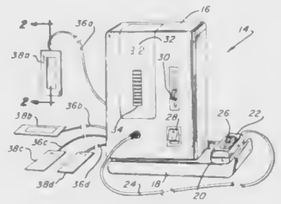
moves said blade holder through said first and then said second direction motions.

4,924,880

DENTAL ANESTHESIA APPARATUS

Michael W. O'Neill, Lakewood; Leon M. Silverstone, Denver, and Michael E. Halleck, Longmont, all of Colo., assignors to Sion Technology, Inc., Aurora, Colo.

Filed Nov. 16, 1988, Ser. No. 272,225
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—787 25 Claims



1. A dental anesthesia apparatus, comprising:

generating means for generating an electrical output signal;

intensity control means having an input and an output with said input being connected with said generating means to control the intensity of said electrical output signal, said intensity control means including first and second controllers connected in parallel with one another between said input and said output, said first controller being accessible to an operator of said apparatus for setting a threshold intensity of said electrical output signal independently of said second controller and said second controller being accessible to a patient for adjusting the intensity of said electrical output signal only in a range above said threshold intensity thereby assuring an operator controlled minimum intensity level for said output signal; and

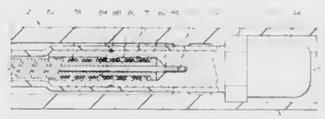
electrode means connected with said output of said intensity control means to receive said intensity controlled electrical output signal.

4,924,881

IMPLANTABLE ENDOCARDIAL LEAD WITH FIXATION DEVICE RETRACTABLE BY THREADED STYLET

Maurice A. Brewer, Houston, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Filed May 12, 1989, Ser. No. 351,444
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—785 5 Claims



1. A lead assembly for implantation in a patient, the assembly comprising:

an electrode adapted for insertion into a chamber of the patient's heart for electrical stimulation thereof;

a lead slidably but not rotatably enclosing, at a distal end of the lead, fixation means for securing the electrode to a wall of the heart chamber, said lead also enclosing means for transmitting electrical impulses between a proximal end of the lead and the electrode, the lead having a lumen extending through the lead from the proximal end to the distal end thereof; and

a removable stylet adapted for insertion in the lumen of the lead for displacing the fixation means along a longitudinal axis of the lead to selectively expose at least part of the fixation means outside the lead or withdraw the fixation means within the lead, said stylet having at a distal end thereof, means for releasably engaging the fixation means at a proximal end thereof and for effecting the exposing and withdrawing of said fixation means, said engaging means comprising a threaded male portion at the distal end of the stylet and the fixation means comprising a threaded bore located near the proximal end of the fixation means.

4,924,882

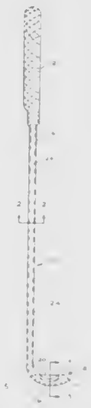
ELECTRONIC CUSPOTOME AND METHOD OF USING THE SAME

Thomas J. Donovan, 110 Westland St., Manchester, Conn. 06040

Filed Feb. 26, 1988, Ser. No. 161,175
Int. Cl.[5] A61B *17/36*
U.S. Cl. 128—898 6 Claims

1. A method of dividing the cusp in a venous valve using a cuspotome comprising electrically conductive handle means, an electrically conductive arm extending from the handle means, the arm having an outer surface and ending at a hook section which extends laterally from the arm, the hook section terminating at a bulbous member, a blade formed in the hook section adjacent to the bulbous member and electrically insulative material covering the entirety of said outer surface of the arm with the exception being that a portion of the hook section including the blade is free of the insulative material and a portion of said bulbous member which abuts said blade is free of said insulative material, including the steps of:

engaging the cusp of the venous valve with the hook section of the arm; and



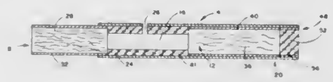
delivering a pre-selected pulse of electrical current to the blade wherein the blade divides the cusp.

4,924,883

SMOKING ARTICLE

Thomas A. Perfetti, and Amos E. Westmoreland, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Mar. 6, 1987, Ser. No. 23,051
Int. Cl.[5] A24D *3/00*
U.S. Cl. 131—336 29 Claims



2. A cigarette-type smoking article comprising:

(a) tobacco-containing fuel element positioned at one extreme end of the article and being capable of providing tobacco smoke upon combustion, the fuel element having a length of about 25 mm to about 40 mm;

(b) flavor source, physically separate from and in a spaced apart relationship with the fuel element, the flavor source capable of having mainstream tobacco smoke from the fuel element pass into contact therewith and thereby providing tobacco smoke with enhanced flavor, the flavor source having a length from about 15 mm to about 40 mm;

(c) at least one passageway positioned between the fuel element and the flavor source for providing a draw induced passage of tobacco smoke from the fuel element to the flavor source, the mainstream tobacco smoke undergoing essentially no filtration during passage along the length of the article from the fuel element to the flavor source, the passageway having a length from about 4 mm to about 40 mm;

(d) air dilution means for providing environmental air through the periphery of the article between the fuel element and the flavor source; and

(e) mouthend piece.

VOL
1114
ISS
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4,924,884
METHOD OF AND APPARATUS FOR MAKING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

Nikolaus Häusler, Wohltorf; Heidi Müller, Oststeinbek; Peter Pinck, Gross-Hansdorf, and Christina Straube, Hamburg, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 307,377
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803471
Int. Cl.[5] A24C *5/18, 5/31;* B31F *1/00*
U.S. Cl. 131—84.1 19 Claims

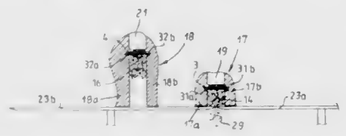


1. A method of making a continuous body of fibrous material, particularly for subdivision into rod-shaped articles of predetermined length, comprising the steps of advancing a continuous tow of fibrous material along a predetermined path including transporting the tow by an endless belt the thickness of which decreases as a result of wear; gradually condensing the running tow in a predetermined portion of said path to thus convert the tow into a rod-like filler; measuring a characteristic of the filler and generating first signals denoting the measured characteristic; monitoring the thickness of the belt and generating second signals denoting the monitored thickness; and modifying said first signals as a function of said second signals.

4,924,885
METHOD OF AND APPARATUS FOR BUILDING, GUIDING AND TRIMMING STREAMS OF FIBROUS MATERIAL

Uwe Heitmann, and Peter Brand, both of Hamburg, Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,070
Claims priority, application Japan, Nov. 25, 1987, 62-3739874
Int. Cl.[5] A24C *15/18*
U.S. Cl. 131—84.4 16 Claims

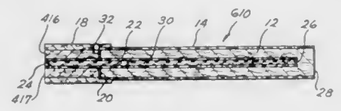


1. A method of building and manipulating a plurality of streams of fibrous material of the tobacco processing industry, comprising the steps of assembling fibrous material into a plurality of discrete streams each of which contains a surplus of fibrous material; conveying the streams in a predetermined direction along discrete paths; removing the surplus in predetermined portions of the respective paths; and maintaining at least the predetermined portion of each path at a different level.

4,924,886
SMOKING ARTICLE

Elmer F. Litzinger, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Nov. 21, 1988, Ser. No. 273,775
Int. Cl.[5] A24D *3/04*
U.S. Cl. 131—194 13 Claims

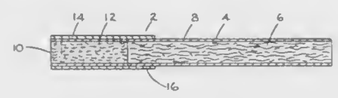


1. A smoking device comprising:
a tobacco column as the heat source for the smoking device when ignited;
a wrapper circumscribing the tobacco column;
a mouthpiece located at one end of the tobacco column coaxially therewith and connected thereto;
a rigid tube concentrically located within the tobacco column, the tube being fabricated of paper material which is gas impermeable and which is friable at the smoldering temperature of the tobacco of the tobacco column;
a substrate of heat absorbing porous non-tobacco materials disposed within the rigid tube;
a flavor releasing material mixed with the porous substrate, the flavor releasing material being volatile at the smoldering temperature of the tobacco of the tobacco column;
an aerosol generating material impregnating the porous substrate, the aerosol generating material being aerosolized by the heat generated by the smoldering tobacco column; and,
sealing means at the interface of the mouthpiece and tobacco column for preventing the passage of smoke from the tobacco column into the mouthpiece.

4,924,887
TOBACCO RODS AND FILTERS

Mark L. Raker; Andrew J. Sensabaugh, Jr., and Stephen W. Jakob, all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 3, 1986, Ser. No. 825,704
Int. Cl.[5] A24B *3/14;* A24D *3/02*
U.S. Cl. 131—331 40 Claims



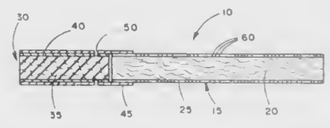
4. The process of claim 1 wherein said binding agent is dextrin.

4,924,888
SMOKING ARTICLE

Thomas A. Perfetti, Winston-Salem; Alan B. Norman, Clemmons, and Michael F. Dube, Pfafftown, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed May 15, 1987, Ser. No. 51,104
Int. Cl.[5] A24D *1/02*
U.S. Cl. 131—336 45 Claims

1. A cigarette comprising:
(a) a rod of smokable material contained in a circumscribing wrapping material, wherein
(i) a majority by weight of the smokable material is flue-cured tobacco material;
(ii) the wrapping material is a paper wrap containing inorganic oxide and/or inorganic hydroxide, has an inherent permeability of less than about 30 CORESTA units, and has a net permeability between about 80 CORESTA units and about 140 CORESTA units; and
(iii) the packing density of the smokable material within the rod is between about 100 mg/cm^3 and about 200 mg/cm^3;

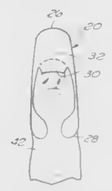


(b) mouthend piece in the form of a filter element which is capable of providing about 40 weight percent or less mainstream tobacco smoke particulate removal efficiency axially aligned with one end of the rod; and
(c) means for providing greater than about 30 percent air dilution to the cigarette.

4,924,889
FORM FOR EXTENDING FINGERNAILS AND METHOD OF USING THE SAME

George Schaeffer, Los Angeles, and William Lawrence, Orange, both of Calif., assignors to OPI Products, Inc., North Hollywood, Calif.

Filed Dec. 23, 1988, Ser. No. 289,197
Int. Cl.[5] A45D *29/00*
U.S. Cl. 132—73 6 Claims



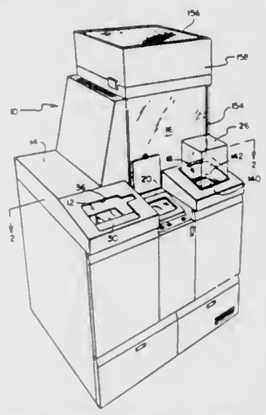
1. An artificial fingernail prosthesis form of the type having a generally horseshoe shape and having a platform member at one end of said form for providing a surface for the application of an artificial nail thereon and a pair of slightly curved arms which are spaced slightly apart from each other at the other end of said form, said form having adhesive material on one side thereof, the improvement comprising a lip member disposed on a portion of the platform member adjacent to the other end and being adapted to attach to the fingernail bed of a human finger, said lip member comprising on each end thereof a cutaway notch means separating said lip member from said curved arms of said horseshoe shape, said cutaway notch means being adapted to accommodate folds of skin on the sides of human nails.

4,924,890
METHOD AND APPARATUS FOR CLEANING SEMICONDUCTOR WAFERS

Brian A. Giles, Honeoye Falls, and Frederick J. Schwab, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 16, 1986, Ser. No. 864,633
Int. Cl.[5] B08B *3/10*
U.S. Cl. 134—61 4 Claims

1. Apparatus for cleaning and drying semiconductor wafers comprising a receiving station, a cleaning station, a drying station, and an output station;
said receiving station including:
means for receiving a cassette containing a plurality of wafers,
a liquid bath,
means for immersing said cassette containing said wafers in said liquid bath, and
means for raising said cassette to present the uppermost wafer therein one at a time above the top of the bath;
said output station including:
means for receiving a cassette having a plurality of generally vertically spaced horizontal slots each arranged to accept a cleaned wafer,
a container member arranged to accept a cassette and to protect any wafers in said cassette from contamination, and
means for lifting said cassette one slot at a time from a position below said container member into said container member;



means for introducing a cassette containing a plurality of wafers into said cassette receiving means;
means for lowering said cassette and said wafers into said bath;
means for raising said cassette to present the uppermost wafer therein one at a time above the top of the bath;
means for transporting the uppermost wafer from said cassette at said receiving station to said cleaning station;
means for cleaning said wafer;
means for transporting said cleaned wafer from said cleaning station to said drying station;
means for drying said wafer; and
means for transporting said dried wafer from said drying station to said output station and for disposing said dried wafer into the uppermost empty slot in said cassette at said output station whereby said cassette and the cleaned wafer therein are lifted into said container member.

4,924,891
APPARATUS FOR CLEANING AND/OR DECONTAMINATING A CONTINUOUS STRIP OF THERMOPLASTSIC FILM

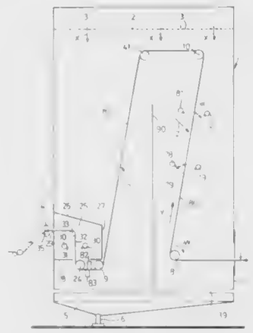
Pierre Soubrier, Brussels, and Bernard Desmet, Renaix, both of Belgium, assignors to Baxter International Inc., Deerfield, Ill.

PCT No. PCT/BE87/00009, § 371 Date Feb. 22, 1988, § 102(e) Date Feb. 22, 1988, PCT Pub. No. WO88/00158, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 23, 1987, Ser. No. 173,529
Claims priority, application Belgium, Jun. 26, 1986, 0/216844
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—64 R 18 Claims

1. A cleaning and/or decontaminating device for cleaning and/or decontaminating a continuous strip of film of thermoplastic material, comprising an enclosure having therein steril-

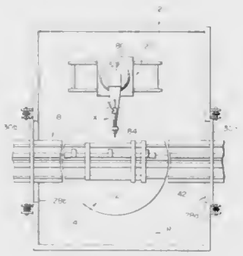
VOL
1114
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air maintained under pressure, the continuous strip is made to move along a sinuous trajectory inside the enclosure around return rollers between an inlet and an outlet of the enclosure, at least one approximately horizontal ramp, equipped with nozzles, is mounted in the enclosure for spraying, on at least one face of the strip, jets of a cleaning and/or decontaminating



liquid, with the liquid, after contact with the strip and therefore loaded with contaminating particles detached from the strip, being allowed to drip to a collector positioned below a lower end of the enclosure and designed to collect the spent liquid, and a slit of adjustable width for controlling the release of sterile air from the enclosure positioned between the lower end of the enclosure and the collector.

4,924,892
PAINTING TRUCK WASHING SYSTEM
Hiroshi Kiba; Kenzou Nagano, and Shigeru Sumiyoshi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jul. 28, 1988, Ser. No. 225,371
Claims priority, application Japan, Jul. 28, 1987, 62-115284; Aug. 27, 1987, 62-211373
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—123 **16 Claims**



13. A painting truck washing system, comprising:
(a) a painting truck which supported an object to be painted during painting of the object;
(b) fluid spraying means, disposed on one side of the painting truck, for spraying a high-pressure fluid to said painting truck from which the object is released, thereby washing said painting truck; and
(c) posture changing means for changing a posture of said painting truck subjected to washing with respect to said fluid spraying means, said posture changing means including a rotatable turntable on which said painting truck is placed;
(d) reverse-running preventing means, disposed on said turntable on a loading side of said painting truck, for preventing movement of said painting truck loaded on said turntable in a direction opposite to a loading direction; and
wherein said fluid spraying means is disposed on one side of said posture changing means and sprays the high-pressure fluid to surfaces of said painting truck on said turntable opposing said fluid spraying means, and said posture changing means turns said turntable to change the posture of said painting truck with respect to said fluid spraying means after said surfaces of said painting truck are completely washed by said fluid spraying means.

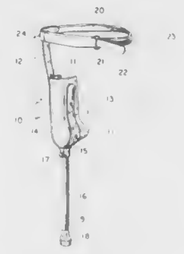
4,924,893
BEACH UMBRELLA SAFETY SYSTEM
Charles Furey, 633 Wyoming Dr., Toms River, N.J. 08753
Filed Aug. 3, 1988, Ser. No. 227,795
Int. Cl.[5] A45B *3/00, 5/00*
U.S. Cl. 133—16 **27 Claims**



1. A beach umbrella restraining device comprising:
a flexible, longitudinally extending cable member, said cable member having a first end and a second end;
first releasable attachment means, fixed to said first end of said cable, for releasably attaching said cable to a beach umbrella, said first releasable attachment means being connectably engageable of a beach umbrella support shaft, wherein said first releasable attachment means comprises: a pair of straps, each of said straps being connected to said cable member, said straps being adapted to wrap around said beach umbrella support shaft; and connection means for releasably locking said straps to one another;
second releasable attachment means, fixed to said second end of said cable, for releasably attaching said cable member to an anchor member;
third releasable attachment means, attached to said cable member intermediate said first and second ends, for releasably attaching said cable member to said beach umbrella.

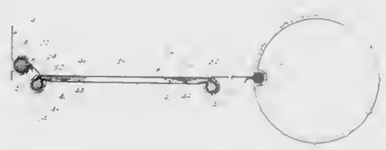
4,924,894
LEISURE BELOW BENT KNEE PYLON FOR AMPUTEE
Michael M. Martinez, 1223 E. Yandell Dr., El Paso, Tex. 79902
Filed Jun. 6, 1989, Ser. No. 362,278
Int. Cl.[5] A61H *3/02*
U.S. Cl. 135—65 **6 Claims**

1. A temporary pylon for a below knee amputee comprising:
a frame structure comprising inner and outer frame members, said frame members extending vertically up at either side of a wearer's knee and thigh, said outer frame member extending to a wearer's waist, said frame members being contoured to the shape of a wearer's thigh;
a containment means to hold a wearer's knee and thigh between said frame members;
a support means detachably affixed to the bottom of said frame structure and extending downward to the ground, allowing the wearer to stand; and



a securing means comprising an adjustable belt wrapped around the waist of the wearer to secure the temporary pylon to the wearer, said outer frame member pivotally affixed to said belt, whereby
said extended outer frame member and said pivoted waist belt serve to increase the stability and rigidity of the pylon and to keep the leg of the wearer aligned with the pylon.

4,924,895
AWNING COVER
David A. Bailie, Kent, Wash., assignor to The Fisher Group Inc., Ann Arbor, Mich.
Filed Sep. 12, 1988, Ser. No. 243,314
Int. Cl.[5] E04H *15/08*
U.S. Cl. 135—89 **9 Claims**



1. A cover for an awning adapted to be rolled for storage and unrolled during use comprising:
a generally rectangular awning guard having a length substantially equal to the exposed circumference of the awning when rolled, a width equal to the width of the awning, a pair of laterally extending edges, and a pair of longitudinally extending edges generally parallel to side edges of the unrolled awning; and
a pair of two-piece connectors separated by a distance substantially equal to said awning guard lateral length, one piece of each said connectors attached to said awning guard adjacent a separate one of said awning guard laterally extending edges, each said connector adapted to secure the awning to said awning guard without perforating the awning.

4,924,896
COLLAPSIBLE CANOPY STRUCTURE FOR USE IN ASSOCIATION WITH A CHAIR OR OTHER FREE-STANDING DEVICE
Mark C. Carter, 210 Payson St., San Dimas, Calif. 91773
Continuation of Ser. No. 155,072, Feb. 11, 1988, abandoned. This application Sep. 28, 1989, Ser. No. 415,446
Int. Cl.[5] A45B *11/00*
U.S. Cl. 135—90 **11 Claims**



6. A collapsible canopy for use in association with a chair or other free-standing structure, comprising:
a plurality of strut means including means for attaching said plurality of strut means to a chair or other free standing device;
a plurality of hoop means wherein each of said hoop means are covered with a material capable of blocking substantial amounts of sunlight; and
collapsible truss means coupled to said strut means and said hoop means for supporting said hoop means in open and closed positions, wherein said collapsible truss means comprise a plurality of truss members pivotally attached to said strut means and said hoop means forming a cross-truss with respect to said hoop means and further wherein at least one of said truss members butts against another when said collapsible canopy is in said open position, and further wherein said hoop means provide an area of coverage over said chair or other freestanding device when said collapsible truss means is in said open position.

4,924,897
VENT SYSTEM
Harold R. Brown, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.
Filed Apr. 29, 1985, Ser. No. 728,374
Int. Cl.[5] F16K *24/00;* **F16L** *55/07;* **F17D** *1/02*
U.S. Cl. 137—1 **4 Claims**



1. A container for transporting or storing a molten liquid, said container comprising a body having a vapor inlet and an outlet for said liquid, wherein said vapor inlet comprises: a conduit adapted for connection to said container so as to provide a vapor pathway through said body into said container and a valve means adapted for connection to said conduit so that vapor will flow through said valve means into said container through said conduit only in one direction and only

VOL
1114
ISS
3
MY
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1990
UMI

when a pressure differential across said valve means reaches some minimum value, wherein said conduit extends within said container a sufficient distance so that when there is molten liquid within said container, an opening at one end of said conduit extends below a free surface of said liquid and liquid level within said conduit remains sufficiently below said free surface of said liquid that material within said conduit remains molten during storage or transport due to heat transfer into said conduit from said molten liquid in said container; whereby clogging by material solidifying within said conduit is avoided, ensuring free passage of vapors into said container to replace any liquid removed.

3. A method for forming a vapor intake system during transport or storage of a liquid having a melting point at least 70° F. or above comprising:

A. introducing said liquid in a molten state into a container comprising: a body having a vapor inlet and an outlet for said liquid, wherein said vapor inlet comprises a conduit adapted for connection to said container so as to provide a vapor pathway through said body into said container by means of an opening at one end of said conduit; and a valve means adapted for connection to said conduit so that vapor will flow through said valve means into said container through said conduit only in one direction and only when a pressure differential across said valve means reaches some minimum value; and wherein said conduit extends a sufficient distance into the interior of said body so that when there is a liquid during storage or transport within said container, said opening at one end of said conduit extends below a free surface of said liquid so that even if the molten liquid partially solidifies during transport or storage, material within said conduit remains molten, and wherein the opening at one end of said conduit is sufficiently far from any surface upon which material will solidify to avoid said opening at said one end from becoming blocked due to such solidification; and

B. maintaining most of said molten liquid at a temperature which maintains it in a liquid state;

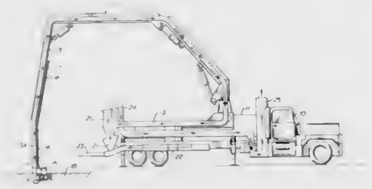
whereby molten liquid from said container can be withdrawn without creating an undesirably reduced pressure within the body of the container.

4,924,898

VACUUM ASSISTED MATERIAL MOVER

William R. Evenson, South Houston, Tex., assignor to The GNI Group, Inc., Webster, Tex.

Filed Jun. 16, 1987, Ser. No. 62,625
Int. Cl.[5] E03B *5/00*
U.S. Cl. 137—566 **7 Claims**



1. A pumping system for sludge and the like comprising,

a vacuum pump,

a sludge intake line connected with the vacuum pump and extending to a source of sludge requiring pumping,

a tank hopper connected with the sludge intake line and receiving sludge therefrom,

a sludge discharge line connected with and leading from the tank hopper to a remote point of sludge disposal,

a positive displacement pump connected with the tank hopper to pump sludge therefrom into and through said discharge line, and

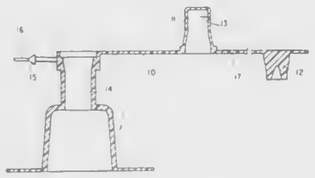
an independently operated booster pump on the sludge intake line adjacent to the mouth of such line and operating in conjunction with said vacuum pump to force sludge into and through the intake line in opposition to frictional resistance to material flow and the pressure head existing in the intake line.

4,924,899

GAS MOUTH

Tsai J. Po, 191, Minchuan Rd., Tamshui Taipei, Taiwan

Filed Sep. 25, 1989, Ser. No. 412,208
Int. Cl.[5] F16K *15/14, 15/20*
U.S. Cl. 137—232 **4 Claims**



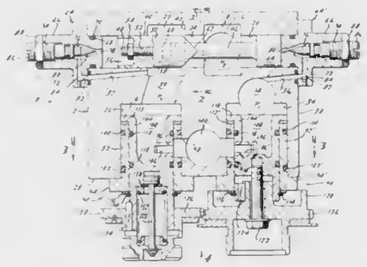
1. A gas mouth comprising a mouth body having a gas passage, a tube body and a plug body, said tube body and a plug body being connected to a top periphery of said mouth body via a thin strip, said tube body having a close end away from said strip and a cut and being suitable to be fitly fitted into said passage, said plug body being suitable to be closely plugged into said tube body.

4,924,900

ADJUSTABLE RATIO MIXING VALVE

Frank A. Taube, Sr., Birmingham, and Edward J. Rozniecki, St. Clair Shores, both of Mich., assignors to Systems Specialties, Royal Oak, Mich.

Filed Aug. 2, 1988, Ser. No. 227,644
Int. Cl.[5] G05D *11/00*
U.S. Cl. 137—101 **29 Claims**



1. An adjustable ratio mixing valve for mixing first and second fluids together in a predetermined ratio comprising:

a housing having first and second fluid inlets and a fluid outlet;

a first adjustable orifice within said housing for metering fluid flow entering from said first inlet;

a second adjustable orifice within said housing for metering fluid flow entering from said second inlet;

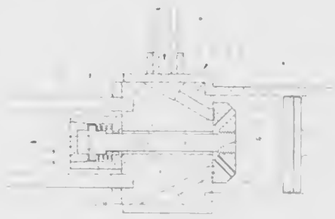
means within said housing defining a variable orifice, said variable orifice being disposed in a fluid flowpath between said second inlet and said second adjustable orifice, said variable orifice being operative to maintain a predetermined desired relationship between the pressure of said fluid entering said first inlet immediately upstream of said first adjustable orifice and the pressure of said fluid entering said second inlet between said variable orifice and said second adjustable orifice whereby said first and second adjustable orifices may operate to maintain a predetermined ratio at said fluid outlet between said fluid entering said first inlet and said fluid entering said second inlet.

4,924,901

IN LINE VALVE

Viljo K. Valavaara, Mississauga, Canada, assignor to Fluid Jet International Inc., Toronto, Canada

Continuation-in-part of Ser. No. 259,403, Oct. 19, 1988, abandoned. This application May 26, 1989, Ser. No. 357,294
Int. Cl.[5] F16K *11/10*
U.S. Cl. 137—102 **9 Claims**



1. A valve for use in association with a pressure chamber having a predetermined axis, and comprising:

valve body means and defining an upstream valve surface and a downstream valve surface said upstream valve surface being adapted to be located in communication with said pressure chamber;

valve passageway means extending through said valve body means whereby to permit flow of fluid from said pressure chamber;

inlet conduit means formed in said valve body means, and communicating with said upstream valve surface, and adapted to be connected to a supply of fluid;

valve stem means located within said valve passageway means, and having a predetermined cross-section whereby to permit flow of fluid;

upstream valve head means connected to said valve stem means and having discharge conduit means therethrough, and adapted to seal over said inlet conduit means in said upstream valve surface, and,

valve cap means connected to said valve stem means adjacent said downstream valve surface, said valve cap means being movable, whereby to permit flow of fluid downstream, through said valve passageway means.

4,924,902

HYDRAULIC CONTROL VALVES

Thomas F. Lewis, and John E. Ochsenreiter, both of Erie, Pa., assignors to Snap-Tire, Inc., Erie, Pa.

Filed Apr. 7, 1986, Ser. No. 849,150
Int. Cl.[5] F15B *13/02*
U.S. Cl. 137—270 **12 Claims**

1. A set of components for assembly of spool-type directional control valves, said set comprising

a spring;

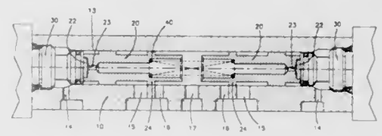
a first and a second spool;

wall means at a first end of said first spool and at both ends of said second spool, adapted to receive said spring, so that said spools and spring may be assembled in a first arrangement with said spring between said spools or in a second arrangement with said spools abutted and said spring at an end of said second spool;

a valve body having a bore adapted to receive said spools and spring slidingly therein and having port means opening directly into said bore;

first operator means adapted to move either of said spools in said bore, against said spring, when said spools and spring are assembled in said first arrangement, so that first, second and third positions are generated for said first arrangement;

second operator means adapted to move both of said spools together in said bore, against said spring, when said spools and spring are assembled in said second arrangement, so



that first and second positions are generated for said second arrangement;

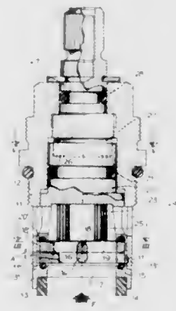
land means and annular chamber means upon said spools so disposed as to bring about a first, second and third desired flow pattern between said port means when said spools and spring are in said first, second and third positions, respectively, of said first arrangement, and to bring about a fourth and a fifth desired flow pattern between said port means when said spools and spring are in said first and second positions, respectively, of said second arrangement.

4,924,903

'BREECH-BLOCK' TAP FOR THE SUPPLY OF COLD OR HOT WATER WITH CERAMIC SEALING PLATES

Alessio Orlandi, Castiglione D/Stiviere, Italy, assignor to Galatron, S.r.l., Castiglione D/Stiviere, Italy

Filed Apr. 4, 1989, Ser. No. 333,301
Int. Cl.[5] F16K *3/16, 11/074*
U.S. Cl. 137—454.5 **7 Claims**



1. A breech-block valve connectable to a tap body in line with a pipe supplying water for delivery of cold or hot water, comprising:

a hollow cylindrical body;

a follower rotatably mounted within the hollow cylindrical body, the cylindrical body and the follower having radial passages for passage of water from the tap body towards a tap outlet;

an operating rod keyed to the follower and provided with a hand-held hand grip to control rotation of the follower;

a first ceramic plate positioned within said cylindrical body, said first ceramic plate having at least one hole for passage of water;

VOL
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a second ceramic plate in contact with said first ceramic plate and rotatable with respect to said first ceramic plate, said second ceramic plate having at least one hole which can be aligned with said first ceramic plate at least one hole, upon rotation of said second ceramic plate, said follower being keyed to said second ceramic plate;

a first deformable O-ring seal mounted between said second ceramic plate and said follower;

a second elastic deformable O-ring seal mounted adjacent said first ceramic plate; and

a ring connected to said cylindrical body by connection means for limited axial movement of said ring with respect to said cylinder body without rotation of said ring with respect to said cylindrical body, said second elastic deformable O-ring being positioned between said ring and said first ceramic plate and an opposite end of said engaging an additional sealing ring, said ring and connection means cooperating with said first and second O-rings to take up and compensate for defects or machining play independently of the compaction of the first and second ceramic plates, thereby allowing variable axial positioning of said ring with respect to said cylindrical body without limiting the movement of said second ceramic plate with respect to said first ceramic plate.

4,924,904

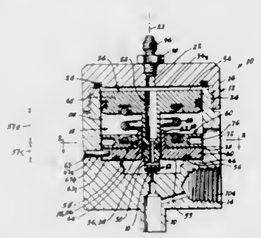
ADJUSTABLE PRESSURE REGULATOR DEVICE

William Carter, Indianapolis, Ind., assignor to Puritan-Bennett Corporation, Overland Park, Kans.

Filed Jun. 30, 1986, Ser. No. 880,275

Int. Cl.[5] F16K *31/22*

U.S. Cl. 137—505.11 **23 Claims**



1. A pressure regulator for a stream of fluid, the regulator being of a type and comprising features, components, and operativity as follows:

(a) a body member means having a hollow interior chamber and provided with an inlet and an outlet,

(b) a valve means in the chamber for controlling flow of the fluid stream inwardly into the chamber,

(c) a piston means in the chamber and movable axially within the chamber toward the inlet and the outlet,

(d) the piston means carrying the movable valve-closing member of the valve means,

(e) a relief valve plate in the chamber and operatively abutting the body member means in a manner by which movement of the relief valve plate toward the inlet is blocked,

(f) a spring means operatively bottomed between the piston means and the relief valve plate, and biasing the piston means toward the outlet and to open the valve means,

(g) the piston means providing communication means for communication of the fluid stream from the valve means to the outlet,

(h) the relief valve plate providing a closure of the chamber-portion downstream of the valve means and upstream of the entrance of the communication means of the piston means, the relief valve plate thus being subject to pressure in said chamber-portion and urged to venting position by the pressure in said chamber-portion, that pressure being the pressure of the regulator's outlet, by that chamber-portion and the outlet both being in communication with the communication means of the piston means,

(i) the operative area of the piston means end adjacent the outlet being larger than the operative area of the relief valve plate adjacent the inlet, thereby providing that the fluid pressure in the space between the outlet and the piston means acts against the piston means to produce a force which acts to close the valve means against the combined force of the spring means and of the force of the fluid pressure which exists in the chamber-portion downstream of the valve means and upstream of the entrance of the communication means of the piston means, and acts against the relief valve plate,

(j) a forced compression of the spring means by forcing the end of the spring means which is most adjacent the relief valve plate away from the relief valve plate, which thereby serves to add to the overall force acting to open the valve means, thus causing the outlet pressure to be correspondingly higher than without such compression of the spring means,

(k) the spring means also biasing the relief valve plate toward a non-venting position of operatively seating against the body member means, yet permitting its axial movement, against the bias of the said spring means, in its relief valve operativity, to move axially away from its said non-venting position to a venting position to permit the venting, through opening means provided in the body member means, of fluid in the chamber-portion downstream of the valve means and upstream of the entrance of the communication means of the piston means, if the pressure in said chamber-portion is excessive.

(l) the vent opening means being provided in a portion of the body member means to vent the chamber at a location downstream of the place of engagement of the relief valve plate with the body member means when seated thereagainst in non-venting position,

(m) the relief valve plate, when in its venting position away from seated engagement with the body member means, permitting communication of said chamber-portion downstream of the valve means and upstream of the entrance of the communication means of the piston means, with the said downstream portion of the chamber venting through the vent opening means, and

the improvement, in combination with the relief valve plate of such a pressure regulator, of providing for optional compression of the spring means, by providing an adjustment plate contiguous to the relief valve plate and operatively between the spring means and the relief valve plate, the spring means being between the piston and the adjustment plate, there being provided means for applying non-axial force to one of the adjustment plate and the relief valve plate, and

cam means operative between the relief valve plate and the adjustment plate for axially moving the adjustment plate in response to the non-axial force so applied, and providing abutment means abuttingly co-operating with the body member means for retaining, against rotation with respect to the body member means, the one of the adjustment plate and the relief valve plate other than the one which receives the non-axial force,

the cam means also providing a supportive interconnection between the adjustment plate and the relief valve plate such that the spring means operatively bottoms against the relief valve plate by the operative engagement of the spring means with the adjustment plate, but permitting axial movement of the relief valve plate for its venting operativity as to excess pressure,

thus providing that the application of non-axial force to the said one of the adjustment plate and relief valve plate, with the other plate being held against rotation by the abutment means, provides for adjustment of the compression of the spring means, by adjusting the relative axial position of the adjustment plate relative to the relief valve plate; yet nevertheless the relief valve plate, as biased by the spring means acting through the adjustment plate and the cam means, is movable axially toward and away from its said positions of venting and non-venting.

4,924,905

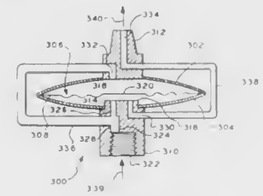
CONTROL DEVICES

Michael Mastromatteo, 305 Silver Lake-S. Cothtown Rd., Middletown, N.Y. 10940

Continuation of Ser. No. 578,956, Feb. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 937,968, Aug. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 676,335, Apr. 12, 1976, Pat. No. 4,111,056, which is a continuation-in-part of Ser. No. 591,423, Jun. 30, 1975, abandoned. This application Jan. 20, 1987, Ser. No. 4,906

Int. Cl.[5] F16K *7/14*

U.S. Cl. 137—510 **2 Claims**



1. A control device of the type employing a fluid therein, comprising:

(a) housing means having a cavity therein;

(b) a planar diaphragm secured to said housing and forming, together with said housing, first and second compartments of said cavity, said first compartment being so constructed as to receive therein the fluid, said diaphragm being so disposed as to move in response to pressure; said housing having a valve seat extending into said first compartment and a first and second fluid opening in said seat; said second compartment having a fluid opening; and

(c) said planar diaphragm having a part thereof for engaging said valve seat to thereby form a valve; said valve upon closing, substantially simultaneously closing said first and second fluid opening;

(d) a conduit connects said second compartment fluid opening to a first of said two fluid openings in said first compartment, such that, upon a surge of fluid entering said first compartment through said first fluid opening in excess of a predetermined pressure, said valve closes.

4,924,906

RING VALVE

Hans Hrabal, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaf, Austria

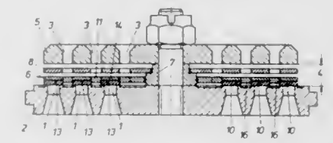
Filed May 25, 1989, Ser. No. 357,884

Claims priority, application Austria, May 31, 1988, 1424/88; Jul. 22, 1988, 1874/88

Int. Cl.[5] F16K *15/08*

U.S. Cl. 137—512.1 **18 Claims**

1. A ring valve, particularly for compressors, comprising a valve seat with passage channels disposed in ring formation for the controlled medium, a valve guard comprising outlet passages and arranged above the valve seat to leave an interspace therebetween, and a valve plate disposed in this interspace and urged against the valve seat by spring elements supported on the valve guard, characterised in that the valve plate consists of individual annular plates, each annular plate being disposed over each of the passage channels of the valve seat, and a support plate which lies jointly or all the annular plates on that side thereof facing away from the valve seat and transfers the force of the spring elements which act on it.



4,924,907

FLAP FOR AN AIR INLET OPENING AT A MOTOR VEHICLE

Reinhard Pälmer, Tiefenbronn, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 23, 1989, Ser. No. 327,598

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1988, 3812346

Int. Cl.[5] F16K *15/00*

U.S. Cl. 137—527.8 **6 Claims**



1. A flap for at least one of an air inlet and outlet opening at a motor vehicle, the flap being connected with an adjacent stationary carrier part made of plastic by a hinge, wherein a thin-walled foil or fabric strip, made of a plastic material, is used as the hinge which is connected with the flap and with the carrier part by welding or gluing, end areas of the flap and of the carrier part facing the hinge extending at a narrow distance from one another.

4,924,908

APPARATUS FOR WITHDRAWING LIQUID FROM A RESERVOIR BY MEANS OF A WATER JET DEVICE

Jan A. E. S. Weiland, Deventer, and Jan C. van Hattem, Amerongen, both of Netherlands, assignors to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Jan. 19, 1989, Ser. No. 299,154

Claims priority, application Netherlands, Jan. 19, 1988, 8800113

Int. Cl.[5] B67D *5/56; B01F 5/04*

U.S. Cl. 137—565 **5 Claims**

1. Apparatus for withdrawing liquid from a reservoir, comprising:

a reservoir box having a bottom wall provided with an opening;

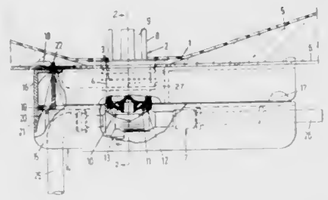
a flexible bag for containing a supply of liquid to be withdrawn from said flexible bag through said opening, said flexible bag being supported in said reservoir box;

a connector extending as an outlet opening means from within said flexible bag near said bottom wall, down and out of said flexible bag through said opening;

said connector being fitted with a valve mechanism including a normally closed lip seal which, while externally subjected to lowered pressure flexes to an open condition which permits liquid contained in the bag to flow out through the connector;

a water jet assembly comprising:

a water jet device arranged to be connected at an inlet end thereof to a supply of pressurized water and to be connected at an outlet end thereof to a drain for water



mixed with liquid withdrawn from said flexible bag by operation of said water jet device, said water jet device including a socket through which water is jetted, in use, for creating a lowered pressure on said lip seal, said lip seal arranged to be communicated by said socket, in use, to water jetted through said socket;

means defining a plurality of passages through said bottom wall of said reservoir box, said passages being spaced from said opening for said connector;

a clamping device at least partly housing said water jet assembly, and supporting said socket; and

a plurality of hook-shaped projections provided on said clamping device and extending through respective ones of said passages into said reservoir box and thereby securing said box bottom onto said clamping device at a plurality of locations around said opening.

4,924,909

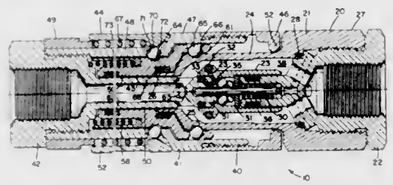
SEMI-BALANCED STAGGERED LOCKING COUPLING

Wayne Wilcox, Union City, Pa., assignor to Snap-Tite, Inc., Union City, Pa.

Filed Mar. 20, 1989, Ser. No. 325,863

Int. Cl.[5] F16L *37/28*

U.S. Cl. 137—614.05 **4 Claims**



1. A coupling comprising a nipple, said nipple having a valve sleeve with a seated position and a body with an outer diameter and a guide member and a pin, a first ball race in said body, said valve sleeve surrounding said guide member for longitudinal movement in respect thereto, said valve sleeve having an internal locking means, a coupler, said coupler having an opening and a first ball hole and an internal projection, said internal projection having an external diameter and an external locking means, said pin of said body of said nipple selectively locking said external locking means of said internal projection of said coupler to said internal locking means of said nipple when said valve sleeve is other than in its seated position, an intermediate member, said intermediate member being located in said opening in said coupler about said internal projection, said intermediate member having two sections, one section of said intermediate member having an inner diameter for acceptance of said body of said nipple therein and an outer diameter, said one section of said intermediate member having a first ball for engaging said first ball race in said body of said nipple, means to lock said first ball of said one section of said intermediate member into said first ball race in said body of said nipple to selectably retain said body of said nipple in respect to said intermediate member, the other section of said intermediate member having an outer diameter smaller than said outer diameter of said one section of said intermediate member, a second ball race, said second ball race being in said other section of said intermediate member, a second ball, said second ball being in said second ball hole in said coupler for selective engagement with said second ball race in said other section of said intermediate member, a locking sleeve, and said locking sleeve selectably moveable for locking said second ball in said second ball hole in said coupler in engagement with said second ball race in said other section of said intermediate member to selectably retain said intermediate member in respect to said coupler.

4,924,910

HYDRAULIC PRESSURE CONTROL VALVE

Kazumasa Tabata; Hiroshi Ooishi, and Manabu Takaoka, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Apr. 7, 1989, Ser. No. 335,080

Claims priority, application Japan, Apr. 12, 1988, 63-48863[U]; Aug. 10, 1988, 63-106281[U]

Int. Cl.[5] F15B *13/04*; F16K *11/076*

U.S. Cl. 137—625.23 **10 Claims**



1. A hydraulic pressure control valve comprising:

a cylindrical casing having a plurality of first grooves formed on its inner circumferential surface at specified intervals and being in communication with a plurality of pressurized oil destinations, and a land formed between each of said grooves, alternate lands being in communication with a high pressure source; and

a valve body rotatably disposed in said casing and having additional grooves of the same number as said first grooves and formed on the peripheral surface of the valve body at specified intervals, the additional grooves comprising second, third and fourth grooves;

said second grooves being disposed in a circumferential direction opposite to said alternate lands in communication with a high pressure source;

said third grooves being in communication with a low pressure source and disposed between alternate said second grooves;

said fourth grooves being disposed in the remaining grooves, between alternate said second grooves, said fourth grooves being disconnected from the low pressure source, and forming communicating portions between adjacent first grooves of said casing via said fourth grooves; and

notches disposed at corners of one of said valve body and said casing, said notches opposing each other across the communicating portions on both sides of said fourth grooves, said notches configured such that, until relative angular displacement between the valve body and casing reaches a predetermined magnitude, variations of the communicating portions is substantially not produced by said relative angular displacement.

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THREE-WAY VALVE

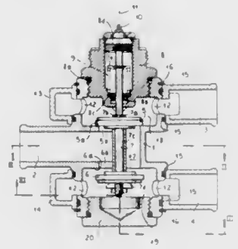
Dietrich Schmalenbach, Baltmannsweiler, and Bernhard Henke, Brilon, both of Fed. Rep. of Germany, assignors to F. W. Oventrop, KG., Olsberg, Fed. Rep. of Germany

Filed Aug. 8, 1989, Ser. No. 391,189

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 8810233[U]

Int. Cl.[5] F16K *11/048*

U.S. Cl. 137—625.5 **10 Claims**



1. A three-way valve, especially for a bivalent heating plant or heat storage, comprising:

a valve housing surrounding an axis of the valve housing and formed with an inlet at a fixed location on said housing extending transversely to said axis and opening into a valve chamber formed in said housing;

a pair of outlet fittings extending transversely to said axis and communicating with said chamber on opposite axial sides thereof, each of said outlet fittings being rotatable about said axis for establishing various relative angular positions of said fittings relative to one another and to said inlet about said axis, each of said outlet fittings being formed on an annular compartment surrounding said housing and communicating with said chamber through a plurality of radial openings formed in said housing;

respective axially displaceable valve members spaced apart along said axis and respectively positioned to alternately block communication between said inlet and one of said outlet fittings while communicating between the other outlet fitting and said inlet, and a stem extending along said axis and connecting said valve members for joint axial displacement into a double-valve assembly; and

means for axially shifting said assembly relative to said housing.

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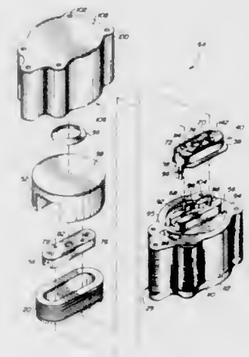
ELECTROFLUIDIC PIN TRANSDUCER WITH STABLE NULL SETTING

John T. Itamoto, Woodland Hills, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 8, 1989, Ser. No. 447,776

Int. Cl.[5] F15C *4/00*

U.S. Cl. 137—831 **6 Claims**



1. An electrofluidic pin transducer, comprising:

a laminate subassembly which forms a fluidic circuit component of said transducer, said component having a supply port from which, in operation, fluid is directed along a flow path toward a flow splitter which is positioned between two receiving channels, said subassembly being adapted to receive a pin just upstream from said flow splitter and to permit movement of said pin relative to said splitter:

an electromagnetic subassembly including said pin, said pin having a longitudinal axis, said electromagnetic subassembly being secured to said laminate subassembly such that said pin is received in said laminate subassembly and positioned just upstream from said flow splitter: said electromagnetic subassembly being operable in response to externally-supplied electrical signals to effect limited, bi-directional movement of said pin relative to said flow splitter, said movement being substantially rotational about a first axis which is substantially perpendicular to said longitudinal axis and substantially parallel to said flow path, at least a portion of said electromagnetic subassembly including said pin being bi-directionally and rotationally movable about a second axis which is substantially parallel to said longitudinal axis and substantially perpendicular to said flow path: and

manually operable cam means engaging said electromagnetic subassembly for moving said pin about said second axis to position said pin relative to said flow splitter.

4,924,913

TUBE COUPLING SYSTEM

Niels H. Pedersen, High Point, N.C., assignor to Nord Tech, Inc., Thomasville, N.C.

Filed Feb. 1, 1988, Ser. No. 150,959

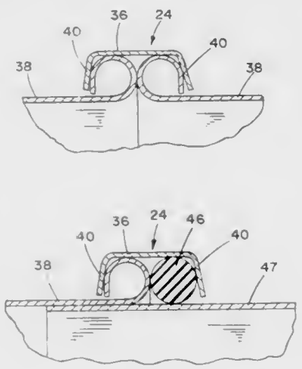
Int. Cl.[5] F16L *19/02*

U.S. Cl. 138—155 **13 Claims**

1. A tube coupling system comprising: at least two substantially rigid tubular members each having at least one unsupported curled end forming an abutting edge, at least one curled end being formed by rolling an end of said tubular member outwardly to create a circumferential ring having a substantially circular interrupted cross-section; a coupler for joining said tubular members in an abutting curled end interfacing

VOL
1114
ISS
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MY
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engagement; and means associated with said tubular members for providing a sealed connection between said curled ends, said coupler having a one-piece split clamping member having two free ends and removably and circumferentially surrounding said tubular members proximate said curled ends thereby limiting movement of said tubular members with respect to each other, a spring locking member connected to said clamping member free ends movable to join and release said free ends and latch and unlatch said clamping member from said tubular members, said clamping member having a flat body portion and straight leg members affixed to and depending from said flat body portion, said flat body portion and straight leg members configured to envelope and grip substantially all of said curled ends of said tubular members.



4,924,914

WEAVING A SLIDE-FASTENER STRINGER HALF WITH AN INTEGRAL COUPLING COIL

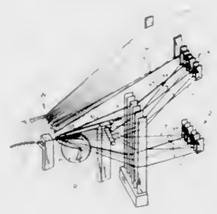
Helmut Heimberger, Cham, Switzerland, assignor to Opti Patent-, Forschungs-und Fabrikations-AG, Riedern-Allmeind, Switzerland

Continuation-in-part of Ser. No. 126,414, Nov. 25, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 329,670

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640194

Int. Cl.[5] D03D *41/00, 47/06*

U.S. Cl. 139—11 **1 Claim**



1. An apparatus for making a slide-fastener stringer half, the apparatus comprising:

means for forming a warp of warp filaments and for feeding same in a longitudinal warp direction to a weaving location;

means including a tubular guide terminating at a downstream end immediately longitudinally upstream of the weaving location for feeding to an edge of the warp at the weaving location a coupling coil formed by a multiplicity of turns each forming a coupling head directed transversely away from the warp and a coupling part extending at least generally longitudinally and a thick filler cord extending longitudinally within the turns of the coil;

a feed element closely juxtaposed with the weaving location at an upstream end of the guide, and having movable teeth engageable between the turns with the filler cord and longitudinally displaceable with same;

control means including a weight hung on the coupling coil and cord and connected thereby to the feed element for retarding advance of the teeth so as to create in both the coil and the filler cord a tension between the guide element and the weaving location; and

means including a shuttleless-loom needle for weaving at least one weft filament through the warp filaments and around the coupling parts and filler cord between the heads with sufficient force to at least partially overcome the tension in the filler cord and coil, whereby the warp and weft filaments are formed into a tape into which the coil and its filler cord are woven.

4,924,915

MODULATOR FOR CONTROLLING HIGH-SPEED ROTARY DOBBIES

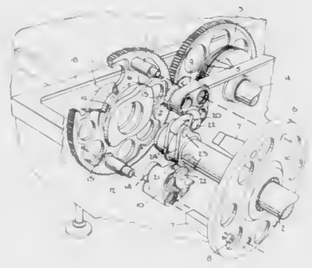
Costantino Vinciguerra, Florence, Italy, assignor to Nuovopignone-Industrie Meccaniche E Fonderia S.p.A., Italy

Filed Dec. 22, 1988, Ser. No. 288,558

Claims priority, application Italy, Jan. 5, 1988, 19003 A/88

Int. Cl.[5] D03C *1/12*

U.S. Cl. 139—76 **2 Claims**



1. A modulator for controlling a high-speed rotary dobby of the type having a drive shaft, a dobby main shaft bearing an appendix and having an axis, two superposed fixed conjugate cams, said cams being disposed coaxially to said dobby main shaft, two rocker supports each able to oscillate about a rocker support pivot point through a plurality of positions, including an intermediate position, each rocker support having wheels which cooperate with said cams, a disc coaxially disposed to said dobby main shaft, said rocker supports being hinged in diametrically opposite positions on said disc, said disc being rotated by said drive shaft, each said rocker support being connected to said dobby main shaft by the improvement comprising:

a connecting rod;

a rocker support pin;

an appendix pin;

said connecting rod being hingeably connected to said rocker arm by said rocker support pin and being hingeably connected to said appendix by said appendix pin;

said rocker support pivot point and said rocker support pin being separated by a first segment having a first length and said dobby main shaft axis and said appendix pin being separated by a second segment having a second length, said first and second lengths being approximately equal, said connecting rod having a length that is approximately one half of said first and second lengths, said connecting rod being dimensioned and disposed so that when said rocker support is in said intermediate position said connecting rod and said first and second segments form angles of 90°.

4,924,916

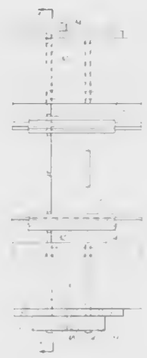
HARNESS FRAME WITH DROP-THROUGH BOLTED CENTERBRACE

Gene E. Faasse, Greer, and James E. Howard, Travelers Rest, both of S.C., assignors to Steel Heddle Mfg. Co., Greenville, S.C.

Filed May 19, 1989, Ser. No. 353,968

Int. Cl.[5] D03C *9/06*

U.S. Cl. 139—91 **7 Claims**



1. A heddle frame for holding a plurality of warp heddles, comprising:

(a) a top rail extending longitudinally of said frame, having a heddle bar for supporting the upper ends of said heddles;

(b) a bottom rail extending longitudinally of said frame and generally parallel to said top rail, having a heddle bar for supporting the lower ends of said heddles;

(c) end members connecting each end of said top rail to the adjacent end of said bottom rail to provide a frame which is generally rectangular for supporting said heddles;

(d) aligned openings extending transversely through said top and said bottom rails at at least one point intermediate the ends of said rails;

(e) a center brace extending through one of said openings in said top rail and into an opening in said bottom rail aligned therewith;

(f) a top sleeve disposed in at least one of said openings in said top rail for the length of said opening and extending about said center brace to separate it from said opening in said top rail;

(g) a bottom sleeve disposed in said bottom rail and threaded onto said center brace; and

(h) means disposed on the upper surface of said top rail to secure and retain said center brace within said openings to support and maintain the parallelism of said top and bottom rails.

4,924,917

WEFT THREAD BREAK MONITOR AND MOVEMENT LIMITING DEVICE

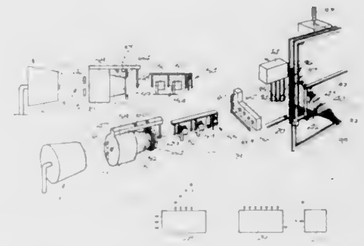
Henry Shaw, Woesten-Vleteren, Belgium, assignor to Picanol N.V., Belgium

Filed Mar. 16, 1989, Ser. No. 323,997

Claims priority, application Belgium, Mar. 16, 1988, 8800299

Int. Cl.[5] D03D *47/36, 51/34*

U.S. Cl. 139—452 **12 Claims**



1. A weaving machine of the type in which each weft thread remains attached to the edge of the cloth between successive picks, the weft threads moving along with the cloth as weaving progresses, comprising: at least two thread preparation mechanisms, each of which includes a thread package, a prewinder, and a thread braking device; at least one thread break detector positioned adjacent a path followed by the weft thread from a thread package to a thread braking device; a thread presentation mechanism placed between the thread preparation mechanisms and a shed, and including thread guide elements corresponding to respective thread preparation mechanisms; a control unit connected to the thread preparation mechanisms, the thread presentation mechanism, and the thread break detector, said control unit including means for deactivating both an active thread preparation mechanism and a corresponding thread guide element of the thread presentation mechanism if the thread break detector detects a thread break, after which weaving continues with one or more of the other thread preparation mechanisms and corresponding thread guide elements; and a monitoring device including means for setting a limit to how much a broken section of weft thread still attached to the cloth can move if the thread break detector detects a thread break, and means for supplying an output signal indicative of the moment when said limit is reached.

4,924,918

MACHINE FOR MANUFACTURING BUTTON CONNECTOR AND METHOD THEREFOR

Ming-fang Lin, and C. H. Cheng, both of Room 7, 17 Fl., No. 955, Tunhwa S. Rd., Taipei, Taiwan

Filed Mar. 17, 1989, Ser. No. 324,733

Int. Cl.[5] B21F *7/00*

U.S. Cl. 140—102 **10 Claims**

1. A machine for manufacturing button connectors, comprising:

(a) a wire supply means (**10**) having a rotatable spool (**12**) for mounting and supplying wire, the wire passing through a first suspended counterweight (**14**) pivotally attached to said wire supply means (**10**), said spool (**12**) being motor-driven;

(b) a knurling means (**20**) having a pair of rotatable knurling shafts (**22**) for knurling the wire pressing therebetween from said wire supply means (**10**); the knurled wire being guided to pass through a second suspended counterweight (**24**) attached to said knurling means (**20**), one of said knurling shafts (**22**) being motor-driven;

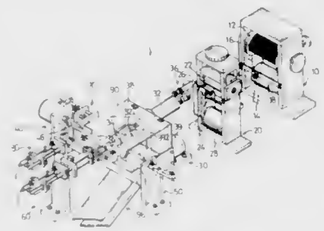
(c) a revolving drum means (**30**) having a rotatable drum (**32**) thereon, said drum (**32**) having a pair of forks (**34**)

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longitudinally extending from one end thereof, said drum (32) having a central hollow portion (322), a respective hole (344) being disposed on each of said forks (34), the wire from said knurling means (20) being guided through said central hollow portion (322) and selectively guided through one of said holes (344), said drum (32) being motor-driven;

(d) a spinning means (40) having a spinning arm (42), said spinning arm (42) having a first protruding needle (44) attached on one end thereof;

(e) a cutter means (50) having a motor-driven rotatable stationary arm (52) and a cutter (54), said stationary arm (52) having a second protruding needle (56) attached on one end thereof, the wire passing said hole (342) of said



revolving drum means (30) being wrappable around said second protruding needle (56) and said first protruding needle (44) of said spinning arm (40);

(f) a gripping means (60) having an upper gripper (62) and a lower gripper (64) thereon for firmly gripping a segment of the wire;

(g) a block plate means (70) having a horizontally protrudable block plate (72) thereon, said block plate (72) having a slot (722) for said first protruding needle (44) of said spinning arm (42) to pass through and a plane surface (724) for said cutter (54) to cut the wire abutting said plane surface (724); and

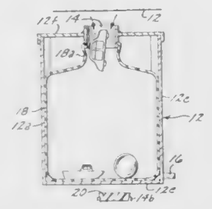
(h) an ejection means (80) having an ejector (82) thereon for ejecting the wire wrapped around said needles (44, 56).

4,924,919

METHOD OF FILLING A BALLOON WITH ARTICLES AND AIR

Lynn R. Oyler, Yorba Linda, Calif., assignor to Balloon Wrap, Inc., Yorba Linda, Calif.

Filed Nov. 3, 1988, Ser. No. 266,709
Int. Cl.[5] **B65B** *1/04*
U.S. Cl. 141—10 **5 Claims**



1. The method of filling an elastic balloon having its natural inflated balloon shape with an inflated volume and an opening of lesser diameter than the diameter of said inflated balloon to provide a package having said natural inflated balloon shape that contains irregularly shaped articles and air, comprising the steps of:

providing a container defining an airtight chamber with an internal volume greater than said inflated volume of said balloon, with a first opening and a second opening therein, said second opening receiving a tubular member having a passageway of dimensions sufficiently large to permit passage of said irregularly shaped articles but less than the dimensions of said chamber,

securing said opening of said elastic balloon to said tubular member, stretched sufficiently to expand said opening to said dimensions of said tubular member to thereby provide a through passageway into said balloon with dimensions sufficiently large to permit passage of said articles, and placing said balloon within said airtight chamber of said container,

causing an air pump to be operatively positioned at said first opening and to be operated to evacuate air from said chamber while permitting unrestricted flow of air at ambient pressure to enter said balloon through said tubular member and thereby inflate and expand said balloon into said natural inflated balloon shape,

filling said balloon with articles through said tubular member,

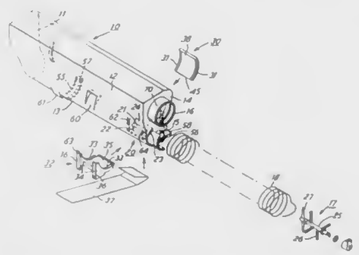
recovering said package from said container by the steps of: closing off said through passageway while said balloon is filled with air and restoring the pressure within said chamber to atmospheric pressure, and removing said balloon from said chamber.

4,924,920

SEALING ARRANGEMENT FOR A TONER DISPENSING CARTRIDGE

Anil G. Bhagwat, Hemel Hempstead, United Kingdom, assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 830,148, Feb. 18, 1986, abandoned. This application Jun. 23, 1989, Ser. No. 370,057
Claims priority, application United Kingdom, Dec. 11, 1985, 8530466
Int. Cl.[5] **B65B** *1/04;* **G03G** *15/08*
U.S. Cl. 141—98 **7 Claims**



1. An apparatus for dispensing material including:

a housing adapted to store a supply of material therein, said housing having an exit aperture for discharging the material therefrom;

means, adapted to be in communication with the exit aperture of said housing in an open position, for receiving the material being discharged from said housing;

means for sealing the exit aperture of said housing, said sealing means comprising a rigid inner sliding seal and a rigid outer sliding seal, said outer sliding seal covering and preventing access to said inner sliding seal covering the exit aperture when said sealing means is in a closed position and said inner sliding seal and said outer sliding seal being spaced from the exit aperture providing access to the exit aperture when said sealing means is in an open position, said housing, on insertion into a location where the exit aperture thereof is in communication with said receiving means, operating said sealing means to move said inner sliding seal and said outer sliding seal relative to one another from the closed position to the open position wherein the exit aperture is in communication with said receiving means for discharging material into said receiving means, and on removal of said housing from a position where the exit aperture thereof is in communication with said receiving means, said housing operating said sealing means to move said inner sliding seal and said outer sliding seal relative to one another from the open position to the closed position where said outer sliding seal covers said inner sliding seal preventing access to said inner sliding seal.

4,924,921

LIQUID DELIVERY/FILLING SYSTEM

Thomas L. Simmel, and Craig A. Baker, both of Milford, Conn., assignors to Link Racing, Inc., Milford, Conn.

Filed Jun. 27, 1988, Ser. No. 211,811
Int. Cl.[5] **B67C** *3/00;* **B65B** *39/04*
U.S. Cl. 141—286 **17 Claims**



1. A liquid delivery/filling system constructed for attachment to the sole portal of a first portable, independent storage container for transferring a desired liquid from the portable storage container to an active reservoir, the reservoir having a single inlet spaced away from the sidewalls thereof, for filling the reservoir in a controlled manner with overfilling being prevented and pressure build up in said storage reservoir controllably dispersed, said system comprising

A. a first liquid flow channel for delivering a substantially conically shaped liquid flow;

B. a second, separate and independent flow channel positioned for cooperative association with said first liquid flow channel;

C. actuation control means cooperatively associated with said first flow channel and said second flow channel for sequentially opening the first liquid flow channel prior to opening said second flow channel whenever said control means is activated; and

D. liquid flow interrupting means

a. extending through the conically shaped flow established by the liquid as the liquid is being transferred from the storage container to the active reservoir, and

b. creating an open zone extending completely through conically shaped liquid flow for allowing air displaced by the liquid entering the active reservoir to continuously exit from the active reservoir during the entire filling process.

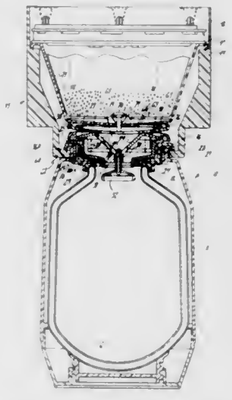
whereby pressure build up in said first storage container is safely dispersed into said second active reservoir and uninterrupted, continuous, liquid flow is established without spillage thereof, eliminating the need to use the sidewalls of the active reservoir to control the liquid flow.

4,924,922

BREW THROUGH LID FOR COFFEE MAKER

Paul D. Johnson, Hamden, Conn., assignor to Black & Decker, Inc., Newark, Del.

Filed Oct. 17, 1988, Ser. No. 258,773
Int. Cl.[5] **A47J** *31/24;* **B65B** *3/07*
U.S. Cl. 141—346 **8 Claims**



1. A carafe having a brew-through lid comprising:

means for engaging said lid atop said carafe;

a seal in said lid;

liquid dispensing apparatus;

means for permitting installation of said carafe into said liquid dispensing apparatus;

means responsive to installation of said carafe, with said lid engaged thereon into said liquid dispensing apparatus for unseating said seal;

means for permitting a liquid to flow from said liquid dispensing apparatus through said seal into said carafe once said seal is unseated, said permitting means including a funnel-shaped portion formed in said lid and including means defining at least one opening therethrough for enabling liquid to flow from said liquid dispensing apparatus to said carafe;

resilient means for seating said seal when said carafe; with said liquid engaged thereon is removed from said liquid dispensing apparatus;

said means responsive to installation includes a first element having a first contact surface on said liquid dispensing apparatus; a second contact surface on said lid operatively connected to said seal, said first and second contact surfaces engaging during installation of said carafe in said liquid dispensing apparatus for moving said second contact surface a predetermined distance to unseat said seal.

4,924,923

FUEL FILLER PIPE SEAL

Dennis A. Boehmer, Xenia, Ohio, and James W. Williams, Okemos, Mich., assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed May 17, 1989, Ser. No. 353,272
Int. Cl.[5] **B65B** *39/02;* **B60K** *15/04*
U.S. Cl. 141—312 **7 Claims**

1. A combination seal and check valve to be mounted in the

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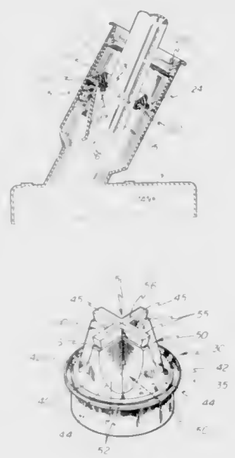
filler pipe of a fuel tank to minimize the escape of vapor from the tank, comprising:

(a) an annular body of elastomeric material including an axially outer end portion having a radially outer surface thereof configured for mounting in sealing engagement with an outer end of a filler pipe,

(b) said body having a radially inner surface proportioned to receive therethrough a fuel nozzle of predetermined outer peripheral dimensions and including an annular lip proportioned for sealing engagement with said fuel nozzle,

(c) said body having axially inner end portions defining a check valve for preventing passage of fluid through said body from a tank when no nozzle is inserted therethrough,

(d) said check valve comprising a continuous tubular portion intermediate ends of said body, said continuous tubular portion being of an inner diameter greater than that of said lip, and at least three fragmentary tubular portions extending in uniformly circumferentially spaced relation with each other from said continuous tubular portion to an axially inner end of said body,



(e) a gusset member interconnecting adjacent ones of said at least three fragmentary tubular portions and comprising pairs of web members extending radially inwardly of said body in converging relation from adjacent ones of said at least three fragmentary tubular portions and integrally connected with each other along radially inner edges thereof, and

(f) said pairs of web members being proportioned and configured to engage each other along axially inner edges thereof and thereby to define a closed position of said check valve,

(g) whereby upon insertion of a filler nozzle through said body, a discharge end of said nozzle will deflect said gusset members away from each other to provide space therebetween for said nozzle.

4,924,924

HAND-HELD TURNING TOOL SYSTEM

Dennis K Stewart, 2502 NW. 4th Ave., Hillsboro, Oreg. 97124

Filed Oct. 20, 1987, Ser. No. 111,687

Int. Cl.[5] B27C *7/06*

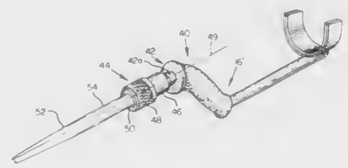
U.S. Cl. 142—49 **10 Claims**

1. A lathe tool holder for holding a lathe tool, tool holder and tool constituting an elongated lathe tool assembly in which the tool extends forwardly from the tool holder, the assembly being adapted for hand-held use by a turner for engagement of the tool with a surface of a rotating workpiece, the surface moving downwards relative to the tool assembly and the tool assembly being at least partially supported by a generally horizontally extending tool rest for operation in a generally horizontal plane of use, the tool holder comprising:

a forward tool receiving portion having a longitudinal axis approximately defining an axis of rotational adjustment;

a butt portion extending rearwardly from the tool receiving portion for holding by a turner to at least partially control the tool;

a handle included in the butt portion and extending obliquely from the tool receiving portion, the handle having a longitudinal axis and said axis diverging from the axis of rotational adjustment including a receptacle for receiving a tool and means for releasably holding the tool in the receptacle and operable to apply a torque about said axis, the tool assembly being adapted to receive the support of the tool rest at a forward portion of the assembly, said rest having a tool supporting surface defining approximately the generally horizontal plane of use;



an elongated rearward extension of the butt portion extending from the handle and approximately parallel to and offset from the tool receiving portion;

upwardly open cradle means carried by the rearward extension of the butt portion, engageable with a forearm of the turner for assisting the turner to control the tool in operation; and

wherein, in operation, the handle extends generally downwardly so that the rearward extension of the butt portion is offset downwardly.

4,924,925

HORIZONTAL LINK MEMBER FOR CONNECTING VERTICAL LINKS OF A TIRE CHAIN

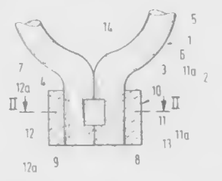
Wolfgang von Düsterlho, Herschweiler-Pettersheim, Fed. Rep. of Germany, assignor to Icis-Tirestar Vertrieb Montage Service W. von Düsterlho KG, Herschweiler-Pettersheim, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,213

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 3724538

Int. Cl.[5] B60C *27/20;* **A44B** *13/00*

U.S. Cl. 152—243 **9 Claims**



1. A horizontal link member for connecting vertical links of a tire chain employed as a tire anti-skid chain, with said horizontal link member in combination comprising:

a ring element as the horizontal link member including a ring body that, via respective transition portions joined to the ring body of said ring element, merges into two outwardly extending arms that contact one another in a closed position of said horizontal link member, with said arms centrally along inner sides thereof being provided with intermediate notches as radially recessed indentations disposed in a central portion of said arms, said recessed indentations of said arms being formed by a cut-through in said arms and forming a recess that is open in a direction toward the other of said arms; and

an annular closure part that is placed over said arms of said ring element to bring about said closed position of said horizontal link member and said contact of said arms in tight engagement with one another free of any play that would produce looseness and noise during employment of the tire chain; said annular closure part being deformed and crimped into said indentations via respective wall portions of said closure part, for effecting securement of said closure part directly complementary to said ring element forming holding portions extending transverse to a plane that contains longitudinal central axes of said arms therein, and with said holding portions extending directly into said recessed indentations of said arms to effect said securement of said closure part to said ring element with a short axial length for savings of material by elimination of any projecting tongue although retaining securement function plus avoiding noise problems completely due to elimination of play via any misaligned loose fit of parts.

4,924,926

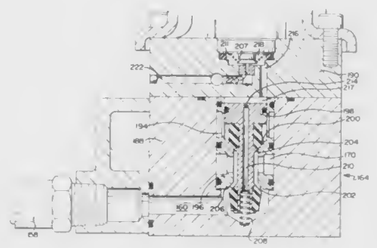
CENTRAL TIRE INFLATION SYSTEM

Gary R. Schultz, Kalamazoo, Mich., and Jerry M. Oltean, Windsor, Canada, assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 15, 1988, Ser. No. 232,262

Int. Cl.[5] B60C *23/10*

U.S. Cl. 152—417 **5 Claims**



1. A vehicle on board tire inflation and tire deflation air circuit having control means for selectively pressurizing and exhausting a first conduit in an air circuit to inflate a vehicle tire to a preselected higher pressure and to deflate the vehicle tire to a preselected lower pressure comprising;

a relief valve having an outlet port connected to atmosphere,

a normally closed solenoid valve for actuating a deflate valve having an inlet port fluidly connected to said first conduit, said deflate valve having an outlet port fluidly connected to an inlet port in said relief valve, said deflate valve effective to establish fluid communication between said first conduit and the inlet port of said relief valve,

said relief valve effective to connect the said outlet port thereof to atmosphere when the pressure in said first conduit is greater than a predetermined set pressure of said relief valve and to close said outlet port when the said set pressure is attained,

a normally closed solenoid valve for actuating a shut off valve having a port connected to said first conduit, said shut off valve having an outlet port connected to atmosphere, said shut off valve effective to establish fluid communication between said first conduit and atmosphere,

one of said solenoid valves effective to bleed pressurized air from said source to said first conduit via a small orifice and passageway means.

4,924,927

LOW-SECTION PNEUMATIC RADIAL TIRE

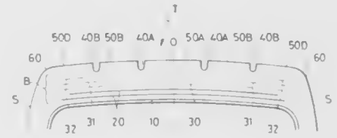
Misao Kawahata, Saitama; Hisao Ushikubo, and Teruyuki Tominaga, both of Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,638

Claims priority, application Japan, Oct. 21, 1987, 62-263943; Jun. 30, 1988, 63-163793

Int. Cl.[5] B60C *9/20*

U.S. Cl. 152—531 **8 Claims**



1. In a low-section pneumatic radial tire including:

(a) a cylindrical tread formed with two tread sidewalls and at least four circumferential grooves, for dividing the tread into at least five land portions;

(b) a radial carcass formed by arranging organic fiber cords at substantially right angles with respect to the tire circumferential direction, for reinforcing the sidewalls through the cylindrical tread;

(c) a belt structure disposed between the cylindrical tread and the radial carcass and composed of at least two belt layers formed by arranging inextensible metallic cords at a small inclination angle with respect to a tire equatorial plane so that the cords of different belt layers are laid one upon another in an intersectional relationship to each other;

(d) auxiliary layers formed by arranging heat-shrinkable fiber cords on the outer circumferential surface of the belt layers substantially in parallel to the tire equatorial plane, the improvement wherein said auxiliary layers comprises:

(1) a first auxiliary layer extending substantially completely over the belt layers;

(2) a pair of axially spaced second auxiliary layers formed on said first auxiliary layer; and

(3) a pair of axially spaced third auxiliary layers formed on said second auxiliary layer; said second and third auxiliary layers being arranged only in both axially outer sides of said cylindrical tread, respectively in such a way that an axially outer end of each of said second and third auxiliary layers axially extends to or beyond under at least an axially outermost circumferential groove formed on said cylindrical tread; said first, second and third auxiliary layers being formed by winding a ribbon including at least two heat-shrinkable fiber cords coated with a coating rubber in spiral fashion on the circumferential surface of said belt layers, respectively.

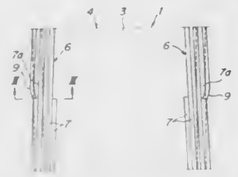
VOL 1114 ISS 3 MY 15 1990 UMI

4,924,928

PNEUMATIC TIRE

Tadashi Watanabe, and Yasuyuki Morita, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,819
Claims priority, application Japan, Nov. 16, 1987, 62-289014
Int. Cl.[5] B60C *9/20*
U.S. Cl. 152—533 5 Claims



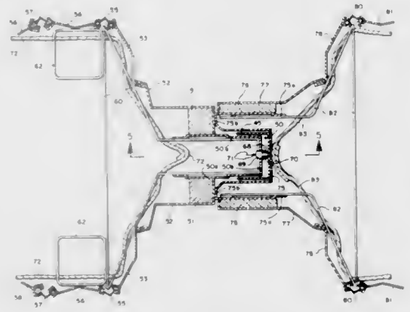
1. A pneumatic tire including a belt layer, a tread arranged radially outwardly of the belt layer, and reinforcing layers arranged between the tread and the belt layer at each lateral end of the belt layer, respectively, each of the reinforcing layers consisting of a vulcanizable member having a plurality of embedded cords in parallel with each other, and said vulcanizable member being spirally wound about said both lateral ends of the belt layer from inside to outside in a width wise direction of the belt layer, wherein an axially outer disposed terminal portion of each of the vulcanizable members is bent inwardly in the width wise direction of the belt layer to overlap at least one of cords of the axially outer disposed terminal portion and at least one of cords of the vulcanizable member adjacent thereto.

4,924,929

FOLDING FIREDOOR LEAD POST ASSEMBLY

Ronald F. Johnson; J. A. Smart; E. Carl Goodman, and Richard Bowles, all of Salt Lake City, Utah, assignors to Won-Door Corporation, Salt Lake City, Utah

Continuation of Ser. No. 72,986, Jul. 14, 1987, Pat. No. 4,834,161, which is a continuation of Ser. No. 828,635, Feb. 11, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 256,870
Int. Cl.[5] E06B *3/94*
U.S. Cl. 160—84.1 12 Claims



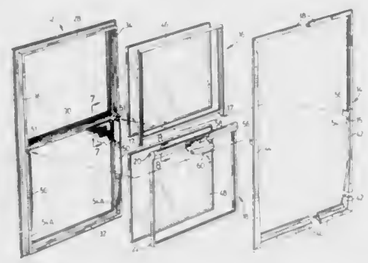
1. In a folding fire door including at least one folding door section having a lead post assembly, folding door panels secured to the lead post assembly, and a track for supporting the door panels as they move from a folded, open condition to an extended, closed condition, an improved lead post assembly for said at least one door section, comprising central lead post means having a front member and mutually opposite side members, said front member forming the leading edge of the door section and securing said side members together in spaced relationship along their leading edges, the side members extending rearwardly therefrom in spaced relationship; heat insulating means for each of said side members and positioned against a portion of the outside of the corresponding said side member of said central lead post means and extending outwardly therefrom; a pair of side extension means, each including a side extension member secured to each of said side members of said central lead post means and extending outwardly and generally rearwardly therefrom and being coupled to the corresponding door panel, said side extension members being spaced from each other to prevent direct heat transfer from one side extension member to the other and each being spaced from but overlapping a portion of the outside of the corresponding side member of the central lead post means so that the corresponding heat insulating means is disposed between said corresponding side extension member and said corresponding side member of said central lead post means to resist flow of heat between the side extension means and the central lead post means.

4,924,930

WINDOW ASSEMBLY

Craig Drennan, 2100 Sherobee Road, Mississauga, Ontario, Canada L5A 4C5

Continuation of Ser. No. 933,204, Nov. 21, 1986, abandoned. This application Aug. 16, 1988, Ser. No. 234,007
Int. Cl.[5] E06B *9/00*
U.S. Cl. 160—90 19 Claims



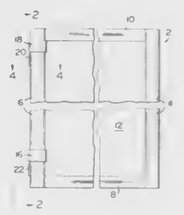
1. A window assembly comprising a frame having a window opening formed therein; a first window sash mounted in the frame at one end of the window opening; a second window sash mounted in the window opening of the frame for movement with respect to the first window sash between a closed position in which it is aligned with the first window sash and serves to close the window opening and at least one open position in which it extends in parallel relation to the first sash to open at least part of the window opening, said frame having a one-piece main frame of a one-piece moulded construction and an auxiliary frame of a one-piece moulded construction that mates with the main frame to define a common frame outline and to combine with said main frame and said first window sash to define guideways to guide said second sash as it moves between said closed position and said open position, each guideway having first and second oppositely disposed side faces, said first guideway having a first portion of its length formed on the main frame and a second portion formed on the second sash, said second side face being formed on said auxiliary frame, said main frame and auxiliary frame being initially separate from one another along a line of separation which extends along said guideways whereby said second face of each guideway which is formed on said auxiliary frame is initially out of cooperative engagement with said second side face.

4,924,931

PANEL DEVICE

Melvin M. Miller, Bloomington, Ind., assignor to Channel-Kor Systems Inc., Bloomington, Ind.

Continuation-in-part of Ser. No. 801,304, Nov. 25, 1985, abandoned. This application Jan. 15, 1988, Ser. No. 144,166
Int. Cl.[5] A47G *5/00*
U.S. Cl. 160—135 12 Claims



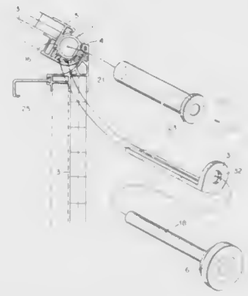
1. A panel device comprising a plurality of vertical supports, adjacent vertical supports being pivotally attached to each other by double hinge members, said double hinge members comprising at least two clip hinge elements, said clip hinge elements having a main body portion and 180 opposing attaching members and locking tabs integral with said attaching members, said vertical supports having integral means for receiving the integral attaching members and locking tabs of said clip hinge elements, panels being secured between non-adjacent pairs of vertical supports.

4,924,932

THERMOPLASTIC SHUTTER HAVING HORIZONTAL SECTIONS

Paul Esnault, Montardon, France, assignor to Peyrichou-Malan Societe Anonyme, Pau Cedex, France

Filed Jul. 27, 1988, Ser. No. 224,941
Claims priority, application France, Jul. 28, 1987, 87 11017; Jun. 15, 1988, 88 08400
Int. Cl.[5] E05D *15/20*
U.S. Cl. 160—201 6 Claims



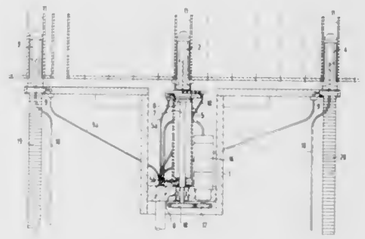
1. A thermoplastic shutter comprising:
a plurality of horizontal panels each having upper and lower horizontal sides and formed of a filler element of multiple thickness of polycarbonate resin;
a horizontal lower polycarbonate extrusion extending along the lower horizontal side of each panel;
a horizontal upper polycarbonate extrusion extending along the upper horizontal side of each panel;
a hinged connection connecting adjacent upper and lower extrusions of adjacent panels consisting of a ball joint having a male part connected to one of said upper and lower extrusions substantially at right angles to the plane of the panel and a female part connected to the other one of said upper and lower extrusions and having an engagement slot therein to engage said male part, said engagement slot facing away from the angular motion of the hinged connection;
a roller arranged in a guide on each lateral side of each upper extrusion adapted to run along vertical and horizontal tracks with a compensation spring facilitating the handling of the shutter; and
stiffening means for each panel consisting of a jaw-like horizontal recess having walls formed in the upper extrusion and strengthener having an enlarged horizontal element adapted for forcible insertion with said jawlike recess;
said adjacent upper and lower extrusions being aligned immediately prior to being hingedly coupled at an angle of 15° and then locked together at a rotation angle of 30°.

4,924,933

APPARATUS AND METHOD FOR INTRODUCING A DEVICE INTO A HEAT EXCHANGER

Bernd Richter, Uelzen, and Ulrich Rittler, Kirchberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,365
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 8712638[U]
Int. Cl.[5] F28G *13/00, 15/00;* G21C *17/00;* B25J *19/00*
U.S. Cl. 165—1 14 Claims



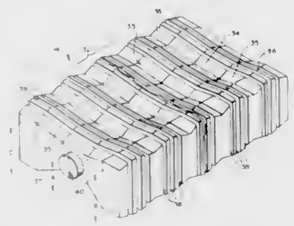
1. Apparatus for introducing and/or positioning a device in a chamber of a heat exchanger, comprising an assembly yoke with ends and a middle to be manually introduced into the chamber of the heat exchanger, at least three remotely-actuatable clamping fingers disposed on said assembly yoke, means for locking said clamping fingers in tubes of the heat exchanger, a lifting cylinder holding one of said clamping fingers at least approximately at said middle of said yoke, remotely-actuatable clamping devices each releasably holding at least one of said clamping fingers on a respective one of said ends of said yoke, toothed belts each having an end connected to a respective one of said clamping fingers on said ends of said yoke, two synchronously controllable elevators each having a toothed belt drive in engagement with a respective one of said toothed belts, and support elements and releasable connecting means for the device being disposed on said synchronously controllable elevators.

VOL
1114
ISS
3
MY
15
1990
UMI

4,924,934
ROTARY HEAT WHEEL CASSETTE ASSEMBLY
Donald F. Steele, Cohasset, Mass., assignor to Airxchange, Inc., Rockland, Mass.
Filed Mar. 14, 1988, Ser. No. 167,334
Int. Cl.[5] F28D *19/04*
U.S. Cl. 165—8 5 Claims

5. A rotary regenerative heat exchange wheel assembly comprising a mounting frame, a heat exchange wheel having a rotation axis, a wheel frame including an inner hub and an outer band and radially-extending bars extending between said hub and outer band, a plate secured to said frame and having an opening; means for mounting said heat exchange wheel and wheel frame in said mounting frame for rotation within said opening of said plate about said rotation axis and motor means, secured to siad mounting frame, for rotating said wheel about said axis, seal means disposed between said wheel and said plate within said opening for preventing air from passing between said wheel and said plate, said heat exchange wheel including a plurality of wedge-shaped elements made of heat exchange material and means for securing said wedge-shaped elements in said wheel, said means for securing including a plurality of flexible strips releasably secured to said hub and outer band and cooperative with said radially-extending bars so that select ones of said wedges can easily be removed and inserted by removing select ones of said strips by flexing said strips so as to release and secure said strips from and to said hub and outer band.

4,924,935
THERMAL ENERGY STORAGE CONTAINER SYSTEM
Walter Van Winckel, 75 Quaker Hill Rd., Monroe, N.Y. 10950
Filed Oct. 25, 1988, Ser. No. 261,889
Int. Cl.[5] F28D *20/00*
U.S. Cl. 165—10 20 Claims



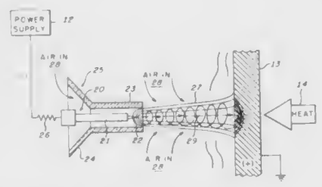
1. A thermal energy storage (TES) system, comprising a self-supporting stacked array of containers having a PCM medium therein, each of said containers being a generally rectilinear structure, channel means on said containers for facilitating the flow of a thermal transfer fluid around the outside surface of said containers, said containers each having a locking means thereon for cooperating with adjacent locking means on at least one pair of superimposed containers, whereby said containers of said stacked array are substantially locked in place with respect to one another.

4,924,936
MULTIPLE, PARALLEL PACKED COLUMN VAPORIZER
Clem McKown, Lake Hopatcong, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.
Filed Aug. 5, 1987, Ser. No. 82,011
Int. Cl.[5] C23C *16/00*; F02M *23/14, 31/00*
U.S. Cl. 165—47 17 Claims



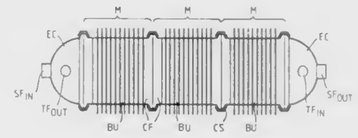
1. Apparatus for vaporizing a coating compound having a relatively low decomposition temperature to produce a coating mixture comprised of a high concentration of vaporized coating compound entrained in a gas, the vaporizer comprising:
a shell;
a plurality of vaporization columns arranged in said shell in a substantially vertical orientation, said vaporization columns having inner walls and upper and lower open ends;
distribution means for distributing said coating compound substantially equally to said upper open ends of said vaporization columns;
heating means for heating said vaporization columns to vaporize said coating compound therein; and
gas supply means for supplying said gas to said lower ends of said vaporization columns to produce said coating mixture.

4,924,937
ENHANCED ELECTROSTATIC COOLING APPARATUS
James B. Beal, and Michael A. Badinger, both of Slidell, La., assignors to Martin Marietta Corporation, Bethesda, Md.
Filed Feb. 6, 1989, Ser. No. 307,033
Int. Cl.[5] F28F *13/02, 7/00*
U.S. Cl. 165—96 11 Claims



1. Electrostatic cooling (ESC) apparatus including a metallic needle emitter adapted to be connected to a source of high electrical potential, said needle emitter having an emitter tip, said needle emitter providing an ESC ionic wind for cooling a target, comprising:
a tube of dielectric material, and
a coating of dielectric material coating said needle emitter, except for said emitter tip, thereby providing an insulated needle emitter,
said insulated needle emitter being deposed within said tube so as to enhance the velocity of said ionic wind.

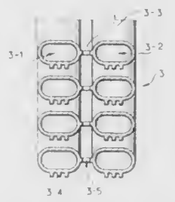
4,924,938
HEAT EXCHANGER BASE UNITS AND MODULES
Michael Plaschkes, Kibbutz Magen, Israel, assignor to Plastic Magen, Israel
Filed Oct. 23, 1987, Ser. No. 113,177
Claims priority, application Israel, Nov. 5, 1986, 80504
Int. Cl.[5] F28F *3/00*
U.S. Cl. 165—158 12 Claims





1. A base unit for a cross flow, tube and shell type heat exchanger comprising:
a substantially flat double frame consisting of an inner frame member delimiting an opening defining a constituent element of a shell flow space;
an outer frame member surrounding at least a portion of said inner member at a distance, which distance defines a constituent element of a header flow space;
at least two partition walls connecting said inner and said outer frame members and dividing said header element into an inlet header element and an outlet header element, said inlet and said outlet element being thereby separated from each other;
a plurality of juxtaposed tubular members extending from one side of said opening to another side thereof, the spacing of said juxtaposing tubular members being such as to leave a clearance therebetween, one end of each of said tubular members communicating with said inlet header element and the other end of each of said tubular members communicating with said outlet header element; and
said inner frame member being connected to its associated outer frame member by a plurality of relatively thin, striplike fingers.

4,924,939
HEAT-EXCHANGING MEMBER OF A DEHUMIDIFIER
Jung B. Kim, Kyunggi-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea
Filed Aug. 6, 1987, Ser. No. 82,193
Claims priority, application Rep. of Korea, Aug. 6, 1986, 11820
Int. Cl.[5] F28F *1/10*
U.S. Cl. 165—172 2 Claims



1. A heat-exchanging member of a dehumidifier, comprising:
a first coiled tube substantially oriented in a first plane;
a second coiled tube substantially oriented in a second plane spaced from and substantially parallel to said first plane;
a bridging member connecting said first and second coiled tubes and being oriented substantially perpendicular to the first and second planes; and
drainage means comprising openings arranged in said bridging member, to drain condensation formed on exterior portions of the heat-exchanging member.

4,924,940
DOWNHOLE CLEANOUT TOOL
Thomas C. Burroughs, and Roy S. Arterbury, both of Houston, Tex., assignors to The Cavins Corporation, Houston, Tex.
Filed Mar. 26, 1987, Ser. No. 30,128
Int. Cl.[5] E21B *37/00*
U.S. Cl. 166—105.1 1 Claim

1. A well cleanout tool connectable with apparatus, such as wire line, well string or the like for lowering the tool into and reciprocating it in a well bore to pump debris laden well bore fluid into the tool including:
an upper tubular member having upper and lower ends, with the upper end connectable with the apparatus;
a non-circular member connected with the lower end of said upper tubular member;
said upper and non-circular members having a longitudinal flow passage therethrough;
means forming a longitudinally extending cylindrical pump chamber with upper and lower ends and receiving through the upper end of said pump chamber said non-circular member for up and down movement in said pump chamber;
seal means on said non-circular member forming a piston assembly for movably and sealably engaging said piston assembly within said pump chamber for moving debris laden well bore fluid into the tool upon up and down movement of said piston assembly within said pump chamber;
travelling valve means adjacent the upper end of said non-circular member which closes off flow from said pump chamber and non-circular member to said upper tubular member on the up movement of said upper tubular member and non-circular member;
a lower tubular member connected to the lower end of said pump chamber, said lower tubular member having an open lower end for conducting debris laden well bore fluid into the pump chamber from said lower tubular member;

VOL
1114
ISS
3
MY
15
1990
UMI

upper standing valve means in said lower tubular member mounted adjacent the lower end of said pump chamber;

lower standing valve means in said lower tubular member and spaced from said upper standing valve means adjacent the lower end of said pump chamber, said upper and lower standing valve means opening on the up movement of said upper tubular and non-circular members for conducting debris laden well bore fluid into said pump chamber from said lower tubular member;



port means in close proximity adjacent said upper standing valve means and adjacent the bottom of said pump chamber for injecting relatively clean well fluid from the well bore into said pump chamber when said upper and lower standing valve means open on up movement of said upper and non-circular members to thereby inhibit clogging of said piston assembly by the debris laden fluid; and

port means in said upper tubular member for screening the debris laden fluid in the tool in said upper tubular member to retain the debris in said upper tubular member and discharging the fluid to the well bore.

4,924,941

BI-DIRECTIONAL PRESSURE ASSISTED SEALING PACKERS

David L. Farley, Lafayette, La., assignor to Completion Services, Inc., Lafayette, La.

Filed Oct. 30, 1989, Ser. No. 428,871

Int. Cl.[5] E21B *23/06*

U.S. Cl. 166—134 **32 Claims**

1. A packer for sealing the annulus between a string of pipe in a well and the wall of a casing or well bore surrounding the pipe string, comprising:

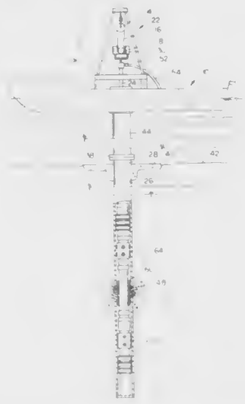
a tubular inner mandrel;

a tubular element mandrel disposed around said inner mandrel;

packer sealing means disposed on the outer circumferential periphery of said element mandrel for sealingly engaging the wall of the casing or well bore when energized;

a first shoulder disposed on said packer in engagement with one end of said packer sealing means;

a tubular shoe body slidingly disposed on said element mandrel and said inner mandrel, said shoe body having a second shoulder on one end in engagement with the other end of said packer sealing means, said first and second shoulders being movable toward one another to compress said packer sealing means between them and expand said packer sealing means radially into sealing engagement with said casing or well bore wall, said shoe body being in telescoping engagement with the outer surface of said element mandrel on said one end and the outer surface of said inner mandrel on its other end;



latch means for preventing substantial separation of said first and second shoulders when said packer sealing means is energized;

first self-energizing seal means disposed on one of said shoe body and said element mandrel at said one end of said shoe body for sealingly engaging the other of said shoe body and said element mandrel;

second self-energizing seal means disposed on one of said shoe body and said inner mandrel at said other end of said shoe body for sealingly engaging the other of said shoe body and said inner mandrel; and

slip means disposed on said inner mandrel for anchoring said packer to said casing or well bore wall when actuated.

4,924,942

WELL FORMING PROCESS

Jian-Chyun Shen, Irvine, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Feb. 28, 1989, Ser. No. 317,004

Int. Cl.[5] E21B *33/138, 33/14, 33/16*

U.S. Cl. 166—291 **43 Claims**

1. A process for forming a well, the process comprising the steps of:

(a) drilling a borehole in the ground;

(b) suspending a casing in the borehole;

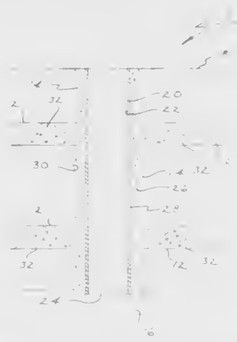
(c) contacting at least a portion of the region of the borehole around the outside of the casing with a preflush fluid comprising:

(i) water;

(ii) a cement;

(iii) calcium sulfate; and

(iv) a quick-hardening accelerator, the water, the cement, the calcium sulfate, and the quick-hardening accelerator each being present in the preflush fluid in a concentration sufficient to make the preflush fluid thixotropic; and



(d) injecting a cement slurry into the region of the borehole around the casing.

4,924,943

AGRICULTURAL PULLING MACHINE WITH AUTOMATIC PITCH VIBRATION DAMPING MECHANISM

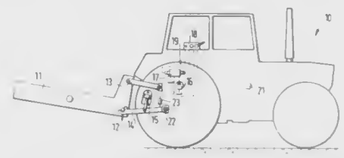
Josef Maichle, Kornwestheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 24, 1989, Ser. No. 329,015

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816166

Int. Cl.[5] A01B *63/11*

U.S. Cl. 172—1 **13 Claims**



1. An agricultural pulling machine, such as a tractor or construction machine vehicle, with an attachment, comprising a mounting device for coupling the attachment to the agricultural machine; a device for active damping of pitch vibrations about a transverse horizontal axis of the vehicle, said device for active damping including a power lift for vertically moving said mounting device, a regulating means which controls said power lift for moving said mounting device within a region of its lifted position in dependence upon sensed pitch vibrations of the vehicle during travel, and a force sensor to sense said pitch vibrations and produce signals to which said regulating means response, said mounting device comprising a lever connected at one end to a housing of the vehicle, a side guiding member connected between a mid portion of said lever and said housing of the vehicle, said force sensor being arranged in a force flux of said lever between its connecting point to said housing and a supporting point of said side guiding member, said regulating means including means for reducing disturbing influences on an operation of said vibration damping device caused by said side guiding member during travel over a curve by the vehicle.

4,924,944

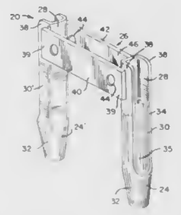
SIDE-EJECTING, DOUBLE CORING TINE

Mark L. Cozine, 5301 S. Coddington Ave., Lincoln, Nebr. 68523; Norval L. Papke, Jr., R.R. 1, Box 193, Cortland, Nebr. 68331, and Loren F. Hansen, 1629 N. 73rd St., Lincoln, Nebr. 68505

Filed Mar. 8, 1989, Ser. No. 320,464

Int. Cl.[5] A01B *45/02*

U.S. Cl. 172—22 **3 Claims**



1. A double coring tine for use in an automatic turf aerator machine, said tine comprising:

a pair of tubular coring tine members, each of which having an upper end portion, a lower end portion and a central portion, said upper end portion being substantially rectangular in cross-section and having a pair of opposing parallel flat side faces, said lower end portion being generally circular in cross-section, and said central portion being substantially open along one vertically extending side portion thereof; and

a pair of elongate mounting bars, each said bar having two ends, corresponding ends of said mounting bars being permanently secured to each of said tine members at said side faces so as to sandwich said tine members therebetween and to maintain said tine members in spaced parallel relationship to each other as an integral unit, said tine members being mounted to said mounting bars so that said open central side portions face laterally outward and opposite each other.

4,924,945

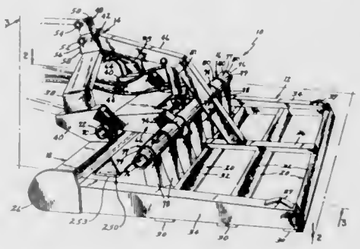
SOIL LEVELING APPARATUS WITH IMPROVED SCRAPER MEMBER

Orian H. Mork, 6029 - 25th St. W., Farmington, Minn. 55024

Continuation-in-part of Ser. No. 163,178, Feb. 26, 1988, which is a continuation of Ser. No. 6,856,818, Apr. 28, 1986, which is a continuation-in-part of Ser. No. 6,224,458, Jan. 12, 1981, Pat. No. 4,448,258. This application Oct. 13, 1988, Ser. No. 257,393

Int. Cl.[5] E02F *3/815*

U.S. Cl. 172—197 **13 Claims**



1. An apparatus for leveling soil, comprising:

a generally rectangular frame including a transverse elongate scraper member and at least one trailing transverse

VOL
1114
ISS
3
MY
15
1990
UMI

elongate ground engaging member each fixedly secured in mutually spaced apart relationship between a pair of longitudinal side members;

the scraper member including a leading lower edge, and each ground engaging member including a lower surface, with the leading edge of the scraper member and the lower surfaces of the ground engaging members being substantially coplanar;

a hitch means mounted on said frame which is adapted for releasable and generally rigid connection to a draft vehicle;

an elongate substantially horizontal plate mounted on and extending along a substantial portion of the length of said fixed scraper member for vertical movement on said scraper member; and

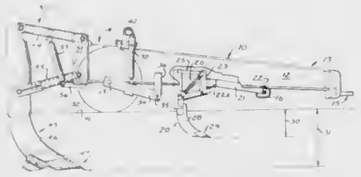
means for adjusting the vertical position of said horizontal plate, said adjusting means including means for permitting said horizontal plate to slide on said scraper member, whereby said apparatus is caused to float on the soil when said horizontal plate is lowered.

4,924,946

APPARATUS FOR DEEP PLOWING HIGHLY COMPACTED SOIL

William J. Dietrich, Sr., Congerville, Ill., assignor to Soycorp, Inc., Congerville, Ill.

Filed Jan. 31, 1989, Ser. No. 304,795
Int. Cl.[5] A01B *13/08*
U.S. Cl. 172—382 **5 Claims**



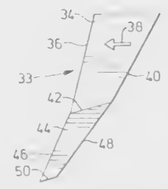
1. Apparatus for loosening compacted soil in a field to a desired depth greater than approximately thirty inches, said apparatus comprising: a main beam extending generally in the direction of travel: a transverse beam mounted intermediate the ends of said main beam and extending transverse of the direction of travel; a first plow point; means including a first curved shank for mounting said first point plow on the unplowed side of said transverse beam; a second plow point, means including a second curved shank for mounting said second point plow to said main beam, said second point plow having a chisel at the nose thereof, first and second forward wings extending laterally and toward the rear and inclined rearwardly and upwardly to lift and fracture soil, first and second soil lift plates respectively behind said first and second wings for further lifting soil passing over said first and second wings, and first and second rear wings located behind said first and second forward wings respectively and extending laterally thereof for further working soil beyond the lateral reach of said forward wings and adjacent the bottom of said fracture profile; said apparatus forming along a first swath a first trough of loosened soil to the desired depth and thereafter successively forming a plurality of troughs of loosened soil adjacent said first trough, each successive trough being formed immediately adjacent a previously formed trough and having a transverse vertical fracture profile of unplowed soil in the general shape of a parallelogram having sides inclined upwardly and toward the unplowed ground, each successive swath being formed by pulling said first point plow located on the unplowed portion of said successive trough and at a depth of approximately one-half said desired depth to loosen soil in the upper portion of said fracture profile, and by further pulling said second point plow located to the rear of said first point plow at said desired depth to loosen the remaining soil in the lower portion of said fracture profile.

4,924,947

BENTLEG PLOW

H. Page Harrison, Edmonton, Canada, assignor to The Governors of the University of Alberta, Edmonton, Canada

Filed May 6, 1988, Ser. No. 190,827
Int. Cl.[5] E02F *3/80*
U.S. Cl. 172—701.1 **5 Claims**



1. A bentleg plow apparatus having a forward direction, the apparatus comprising:

mounting means,

an upper blade-like portion secured to said mounting means and extending generally downward from said mounting means,

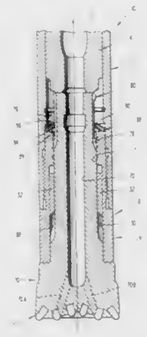
a lower blade-like portion connected to said upper portion and extending downwardly and laterally therefrom, the lower portion having a rake angle with respect to the forward direction, the rake angle being defined, when the plow apparatus is moving horizontally on a horizontal terrain, as the angle made to the horizontal by the intersection of the lower portion with a vertical plane parallel to said forward direction, the rake angle being such that the lower portion seeks to penetrate further into soil being plowed as the plow apparatus is moved in said forward direction.

4,924,948

SHOCK ABSORBING BIT RETAINING RING

Jo-Yu Chuang, Sugar Land, and Edward V. Fritsch, Palestine, both of Tex., assignors to Sandvik Rock Tools, Inc., Bristol, Va.

Filed Nov. 15, 1988, Ser. No. 271,293
Int. Cl.[5] B23B *45/16*
U.S. Cl. 173—139 **12 Claims**



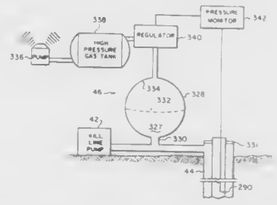
1. A percussion tool assembly comprising a casing, an impact member disposed partly inside the casing and partly outside a forward end of the casing, a portion of said impact member disposed inside the casing including a retaining shoulder, a piston disposed within the casing, said piston being adapted to drive the impact member forwardly relative to the casing and against an external object, and a retaining ring for engaging the impact member after a predetermined amount of forward movement of the impact member relative to the casing for retaining the impact member in the casing; said retaining ring comprising a split ring situated forwardly of said retaining shoulder and adapted to deflect resiliently to absorb energy when the impact member is driven forwardly by the piston such that said retaining shoulder is brought into engagement with the split ring.

4,924,949

DRILL PIPES AND CASINGS UTILIZING MULTI-CONDUIT TUBULARS

Harry B. Curlett, Farmers Branch, Tex., assignor to Pangaea Enterprises, Inc., Fort Worth, Tex.

Division of Ser. No. 72,053, Jul. 10, 1987, Pat. No. 4,799,544, which is a division of Ser. No. 730,831, May 6, 1985, Pat. No. 4,683,944. This application Aug. 31, 1988, Ser. No. 238,626
Int. Cl.[5] E21B *44/00*
U.S. Cl. 175—25 **1 Claim**



1. Apparatus for increasing the pressure of the drill fluid in an annulus in a wellbore, comprising:

confinement means for containing drill fluid in the annulus of said wellbore;

pressure means including a reservoir for holding a pressurized gas for applying a desired pressure on the drill fluid in said annulus; and

said reservoir further includes a flexible diaphragm fixed therein for forming two compartments, one said compartment being connected to said annulus and the other compartment being connected to said pressure means.

4,924,950

METHOD OF DRILLING A WELL BY UTILIZING AE/MA MEASUREMENT

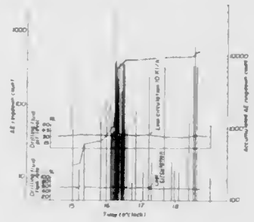
Hiroaki Niitsuma; Katsuto Nakatsuka; Hiroyuki Abe, all of Sendai; Morihiko Takanohashi; Ko Sato, both of Morioka, and Fumihiko Chiba, Iwate, all of Japan, assignors to K. Nakatsuka; H. Abe; Japan Metals & Chemicals Co., Ltd. and H. Niitsuma, Japan

Continuation of Ser. No. 917,956, Oct. 14, 1986, abandoned. This application Dec. 29, 1988, Ser. No. 291,357
Claims priority, application Japan, Oct. 16, 1985, 60-230391
Int. Cl.[5] E21B *49/00*
U.S. Cl. 175—50 **5 Claims**

1. A method of utilizing acoustic emission(AE)-microseismic activity (MA) measurement to predict and prevent lost circulation during drilling of a well, said method comprising the steps of:

installing an AE sonde in an observation well,

monitoring an AE wave emitted at the periphery of the well by the AE sonde, and drilling the well without lost circulation by providing lost circulation preventing means in a drilling fluid circulation



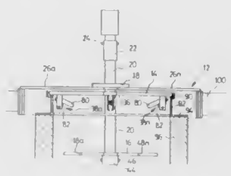
system if the energy of the AE wave emitted at the periphery of the well increases.

4,924,951

MANHOLE CUTTER

Roger W. Paulson, 12100 W. Marion La., Minnetonka, Minn. 55343

Filed Jan. 13, 1989, Ser. No. 297,099
Int. Cl.[5] E21B *3/00, 12/00*
U.S. Cl. 175—57 **6 Claims**



6. Method of cutting an annular grove about and removing a manhole casting having a lip for holding a cover plate comprising the steps of:

a. positioning a shaft carrying a cutter ring assembly, a manhole plate having gripping teeth and a plurality of levers, and a keyway disk into a manhole casting;

b. engaging the manhole plate against said lip of said manhole casting;

c. rotating the shaft and the cutter ring assembly secured thereon to cut an annular groove about the manhole casting down to a predetermined depth;

d. aligning the keyway disk to engage said plurality of levers against said gripping teeth; and,

e. engaging said gripping teeth against the inner circumference of the manhole casting.

4,924,952

DETONATING HEADS

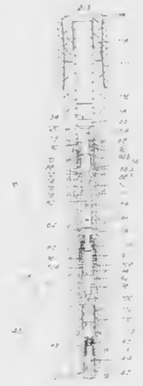
John L. Schneider, Beech Wood Place, West Hill, Skene, Aberdeenshire, United Kingdom

PCT No. PCT/GB87/00430, § 371 Date Dec. 16, 1988, § 102(e) Date Dec. 16, 1988, PCT Pub. No. WO87/07925, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 19, 1987, Ser. No. 288,037
Claims priority, application United Kingdom, Jun. 19, 1986, 8614911; Jul. 23, 1986, 8617971
Int. Cl.[5] E21B *43/116*
U.S. Cl. 175—4.54 **16 Claims**

1. A detonating head for detonating one or more perforating guns suspended in an oil, gas or water well from a tubing string, comprising a firing member reciprocable therein and arranged to be driven to detonate a detonating assembly, restraining means for restraining the firing member against a

VOL
1114
ISS
3
MY
15
1990
UMI

driving force until the restraining means are disengaged, and a displaceable element which is arranged to be displaceable in



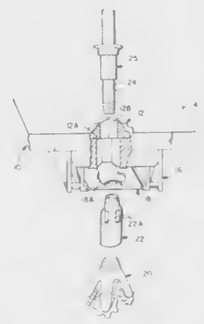
either sense in the longitudinal direction of the detonating head to a respective firing position in which it disengages the restraining means.

4,924,953
ROCK DRILL
Bernhard Moser, Altshausen, Fed. Rep. of Germany, assignor to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany
Filed Apr. 21, 1989, Ser. No. 341,206
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813849
Int. Cl.[5] E21B *17/22, 10/44, 10/40*
U.S. Cl. 175—323 9 Claims



1. A rock drill for producing percussive stress for use in drilling machines, comprising:
a solid shank having a feed spiral and a longitudinal axis, said feed spiral having horizontal feed sections with a pitch of 0° alternating with lead sections, said horizontal feed sections each extending about said longitudinal axis of said solid shank through an angle of approximately 90° and said lead sections extending about said longitudinal axis of said solid shank through an angle of approximately 90°.

4,924,954
BIT BREAKOUT SYSTEM
Raymond A. Mead, 1596 Kingsbury, Casper, Wyo. 82609
Filed Jul. 14, 1989, Ser. No. 380,623
Int. Cl.[5] E21B *19/18*
U.S. Cl. 175—315 14 Claims



1. A system for securing a drill bit against rotation in a drilling rig of the type having a rotary table with an opening therethrough which is smaller than said drill bit; wherein a drill string extends through said opening and is adapted to be rotated by said rotary table; wherein said system comprises:
(a) a breaker plate having front, rear, and side edges and an irregularly-shaped central opening therethrough;
(b) frame means carried by said drilling rig for supporting said breaker plate beneath said rotary table in a manner such that said drill string extends through said central opening of said breaker plate; and
(c) a sub member having upper and lower ends, wherein said lower end is adapted to be connected to said drill bit and said upper end is adapted to be connected to said drill string; wherein said sub member is further adapted to be engaged by said rotary table for rotational movement when said drill bit is engaged by said breaker plate;
wherein said breaker plate includes a slot extending between said front edge and said central opening, thereby enabling said breaker plate to be inserted into or removed from said support means when said drill string is supported vertically by said drilling rig; wherein said irregularly-shaped central opening in said breaker plate is adapted to engage said drill bit and secure it against rotation when said drill string is raised to a point where said drill bit extends into said central opening and said sub member is engaged by said rotary table.

4,924,955
ELECTRONIC WEIGHING DEVICE
Gilbert Dauge, Cormelles-Le-Royal, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France
Filed Jul. 25, 1989, Ser. No. 389,881
Claims priority, application France, Jul. 25, 1988, 88 10028
Int. Cl.[5] G01G *3/14, 23/14*
U.S. Cl. 177—210 C 5 Claims

1. Electronic weighing device adapted particularly to be mounted in a casing of a personal weighing scale and comprising a capacitative collector (C1) forming a measuring condenser whose capacitance varies as a function of the weight to be measured and which has for this purpose a first electrode (10) connected mechanically to a weighing platform (12) and a second electrode (14) mounted fixedly in the casing, said measuring condenser being connected to a measuring circuit, characterized in that the measuring circuit comprises: a reference condenser (CO) mounted in series with the measuring condenser (C1), each of these condensers having an electrode (14, 16) connected to a terminal (18) common to the two condensers and an electrode (20, 10) connected to an external non-common terminal (22, 24); a zero-voltage detector device (26) whose input (28) is connected to said common terminal (18) by means of a third entry condenser (C2), and whose output (30) is connected to the input (32) of a signal treatment device (34) whose first output (36) is connected to the input (38) of a display device (40) of the weighing results; and two electronic switches (42, 44) of which a reference one (42) is connected to the external terminal (22) of the reference condenser (CO) and of which the other measuring switch (44) is connected on the one hand to a second output (46) of the signal treatment device



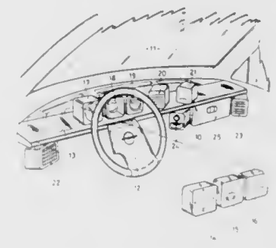
(44) and on the other hand to the external terminal (24) of said measuring condenser (C1), the two electronic switches (42, 44) being adapted each to have two successive states, namely, a first state in which the voltages of the external terminals (22, 24) are brought respectively to zero voltage and to an adjusted voltage (V1), and a second state in which the potentials of the external terminals (22, 24) are brought respectively to a reference voltage (VO) and to zero voltage, the adjusted voltage (V1) being taken from the second output (46) of the signal treatment device (34) so as to obtain a substantially zero voltage at the common terminal (18), said adjusted voltage (V1) being such that C1 V1=CO V0.

4,924,956
FREE-PISTON ENGINE WITHOUT COMPRESSOR
Yuan Q. Deng, and Kang Deng, both of New York, N.Y., assignors to RDG Inventions Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 923,085, Oct. 24, 1986, abandoned. This application Feb. 9, 1988, Ser. No. 154,145
Int. Cl.[5] B60K *1/04*
U.S. Cl. 180—65.3 13 Claims



1. A double-acting tandem free-piston engine comprising:
a housing including a cylinder having first and second combustion chambers at opposite ends thereof and a third combustion chamber between said ends,
a first double-acting piston displaceable between said first and third combustion chambers, and a second similar piston displaceable between said second and third combustion chambers,
each double acting piston including opposite piston heads and a connecting rod between said heads,
balancing means coupling said two pistons to move symmetrically,
each of said combustion chambers including an inlet valve and an exhaust valve, said valves being timed to open and close to produce a pressure-volume relationship in each of said combustion chambers wherein said pressure drops below atmospheric during at least a portion of the piston displacement.

4,924,957
ADJUSTABLE INSTRUMENT PANEL FOR VEHICLES
Joachim Gigla, Mainz, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed May 19, 1988, Ser. No. 195,984
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721289
Int. Cl.[5] B30K *37/06*
U.S. Cl. 180—90 3 Claims



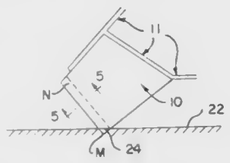
1. An instrument panel assembly for a vehicle body comprising:
an instrument panel having an outside and an inside and being mounted in the vehicle forward of the seat and having a round circular hole therein;
an instrument housing of molded plastic having a mounting base of hollow circular shape adapted to fit into the circular hole of the instrument panel, a holder portion integral with the mounting base and extending through the hole in the instrument panel and projecting radially therefrom into engagement with the inside of the instrument panel, and a circumferential groove formed in the hollow of the mounting base;
and a spring clip independent of the housing and removably seated in the hollow of the mounting base and engaged in the groove in the hollow to urge and maintain the holder portion into engagement with the inside of the instrument panel to thereby attach the housing on the instrument panel and enable turning of the instrument housing relative to the occupant.

4,924,958
FINGER SKIRT FOR AN AIR CUSHION VEHICLE
Ryuichi Yoshida, Takarazuka; Tokio Ohnishi, Ushiku; Tetsushi Yamamura, Takasago, and Kanta Nibei, Nishi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Jul. 15, 1988, Ser. No. 219,657
Claims priority, application Japan, Jul. 17, 1987, 62-109019
Int. Cl.[5] B60V *1/16*
U.S. Cl. 180—128 6 Claims

1. An air-cushion vehicle comprising a hull which is levitated above a pressure-receiving surface during operation by a cushion of pressurized air from an engine-driven propeller of the vehicle, said hull comprising a bottom hull wall and peripheral side hull walls extending around and connected to said bottom hull wall, said bottom hull and peripheral side hull walls forming an angle therebetween with said peripheral side hull walls being outermost and extending downwardly, a plurality of finger skirts attached to and extending around the periphery of the hull, each of said finger skirts comprising a plurality of connected walls forming a bag-like configuration, said finger skirt walls including an outermost finger skirt wall, two opposing side finger skirt walls and a top finger skirt wall,

VOL
1114
ISS
3
MY
15
1990
UMI

said outermost, side and top finger skirt walls closing the outermost, top and sides of each finger skirt and the bottom and innermost sides of each finger skirt being open, said outermost finger skirt wall having a bottom edge, said finger skirt when it is in a state of inflation by said pressurized air having said



bottom edge open and shaped to extend substantially horizontally where said bottom edge is engageable with said pressure-receiving surface, and said top and innermost finger skirt walls extending closely adjacent said bottom hull and peripheral side hull walls of said hull.

4,924,959

OFF-ROAD VEHICLE

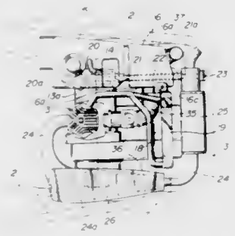
Akio Handa; Eiji Hosoya; Makoto Ishiwatari; Yoshihiro Kimura, and Seiji Watanabe, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 113,615, Oct. 26, 1987, abandoned. This application Dec. 6, 1988, Ser. No. 281,906

Claims priority, application Japan, Oct. 24, 1986, 61-253351; Oct. 27, 1986, 61-255053

Int. Cl.[5] B60K *5/04*

U.S. Cl. 180—297 **9 Claims**



1. A driver accommodating, buggy type, off-road vehicle comprising:

a vehicle frame;

an engine mounted on a rear portion of said vehicle frame behind a driver's seat, and said engine having a crankshaft;

a fuel tank disposed laterally of the engine on one side thereof; and

a recoil starter disposed on said one side of the engine for starting said engine;

an air cleaner case disposed rearwardly of said fuel tank and supported by said frame;

said recoil starter having a pulley operatively coupled to said crankshaft and a cord member wound around said pulley, said cord member having an outer end extending rearwardly from said recoil starter passing under said air cleaner case for allowing said cord member to be pulled from behind said vehicle;

the vehicle frame including a pair of laterally spaced lower frame members extending longitudinally of the vehicle, an auxiliary pipe member having two ends connected to the lower frame members and extending vertically therefrom between the engine and the driver's seat, a front roll bar connected at a rear end thereof to the upper end of the auxiliary pipe member and extending longitudinally of the vehicle, and a rear roll bar connected at a front end thereof to the upper end of the auxiliary pipe member and extending longitudinally of the vehicle; and

said recoil starter further having a grip fixed to the outer end of the cord member and positioned in a space surrounded by the lower frame members, the auxiliary pipe and the rear roll bar.

4,924,960

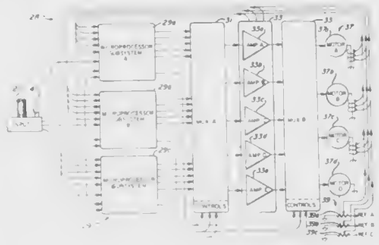
HIGHLY RELIABLE REMOTE CONTROL SYSTEM

Rikk J. Crill, Longmont, Colo., assignor to Robal, Inc., Boulder, Colo.

Filed Oct. 12, 1988, Ser. No. 256,735

Int. Cl.[5] B60K *31/00*

U.S. Cl. 180—333 **22 Claims**



16. A control system for a motor vehicle having a steering mechanism, a throttle, a brake, and a transmission control, said control system comprising:

command means including a bilateral device for providing electrical signals indicative of desired changes in direction and speed of said motor vehicle, and a second device for providing electrical signals indicative of desired changes in gearing of said motor vehicle;

signal processing means including a plurality of microprocessor subsystems connected with said command means to receive said electrical signals therefrom and separately process the same, said processing means also including switching means for controlling application of signals from said microprocessor subsystems so that said signal processing means provides output signals indicative of needed changes in direction, speed, and gearing to that desired; and

electrically responsive actuating means including a plurality of motors connected with said signal processing means to receive said output signals therefrom, and responsive thereto, causing said steering mechanism to effect desired steering, causing at least one of said throttle and said brake to effect desired speed, and causing said transmission control to effect desired gearing of said motor vehicle.

4,924,961

VEHICLE FOR GARDENING AND AGRICULTURAL WORK

Guido Bernardi, Milan, Italy, assignor to BCS S.p.A., Milan, Italy

Filed Jun. 27, 1988, Ser. No. 211,840

Claims priority, application Italy, Jul. 10, 1987, 21248 A/87

Int. Cl.[5] B60K *17/00*

U.S. Cl. 180—374 **14 Claims**

1. A vehicle for gardening and agricultural work, comprising:

(a) a frame comprising a beam extending longitudinally to the vehicle, said beam having a hollow cross section;

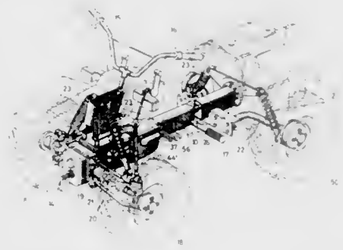
(b) an engine connected to said frame;

(c) a drive shaft operatively connected to said engine and housed within said hollow beam;

(d) a quick-reverse mechanism operatively connected to said drive shaft and housed within said hollow beam;

(e) a countershaft operatively connected and actuated by said quick-reverse mechanism, said countershaft being parallel to said drive shaft and housed within said hollow beam;

(f) a gear box operatively connected to said countershaft and housed within said hollow beam;



(g) a differential device operatively connected to said gearbox;

(h) four axles operatively connected to the vehicle wherein at least one front wheel axle is operatively connected to said differential device;

(i) four wheels operatively connected to said four axles, at least two of said four wheels being drive wheels; and

(j) at least one power takeoff operatively connected and actuated by said engine.

4,924,962

SOUND REPRODUCING APPARATUS FOR USE IN VEHICLE

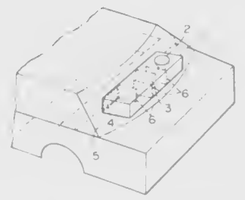
Kenichi Terai, Osaka; Shuji Saiki, Hirakata; Kousaku Murata, Kobe; Katsuaki Satoh, Osaka; Yoichi Kumura, Ashiya; Yasutoshi Nakama, Ikoma; Michiko Ogawa, Osaka, and Shnichi Obata, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jnl. 10, 1987, Ser. No. 71,829

Claims priority, application Japan, Jul. 11, 1986, 61-164108; Nov. 7, 1986, 61-266031; Nov. 7, 1986, 61-266032; Nov. 14, 1986, 61-272520; Dec. 4, 1986, 61-289265

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—141 **23 Claims**



1. A speaker system for use in a closed space, comprising:

at least one speaker unit having sidewalls, sound producing means, and a sound radiation surface; said sound radiation surface being disposed at a predetermined location in said closed space, said predetermined location having an acoustic impedance within said closed space which has an imaginary component equal to zero at a frequency Fs, said frequency Fs being a lowest frequency at which said acoustic impedance has an imaginary component which is zero, said speaker unit operating in said closed space with a relatively flat sound pressure frequency response in a low-frequency range below said frequency Fs, whereby said speaker unit has a first, low-range resonance frequency FO when in a free-field space, said first, low-range resonance frequency FO of said speaker unit being substantially equal to said frequency Fs, wherein sound distortion caused by vibration of said speaker unit is reduced in a low frequency range in a vicinity of said frequency Fs.

4,924,963

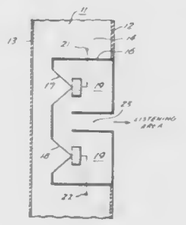
COMPACT AND EFFICIENT SUB-WOOFER SYSTEM AND METHOD FOR INSTALLATION IN STRUCTURAL PARTITIONS

Matthew S. Polk, Baltimore, Md., assignor to Polk Investment Corp., Wilmington, Del.

Filed Jan. 5, 1989, Ser. No. 294,150

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—144 **21 Claims**



1. A loudspeaker system for installation in a space defined by a front panel and an enclosed area behind the front panel of a structural partition fronting a listening area comprising:

electroacoustical transducing means having a two sided vibratory diaphragm;

means for coupling an electrical signal to said electroacoustical transducing means for driving same;

enclosure means for mounting said electroacoustical transducing means such that one side of said vibratory diaphragm is in contact with air outside said enclosure means and said enclosure means substantially enclosing and defining a specific volume of air within said enclosure having a predefined acoustic compliance and which is in contact with the other side of said vibratory diaphragm of said electroacoustical transducing means;

means for mounting said enclosure means to the structural partition such that said enclosure means extends into the space behind the front panel of the partition so that the one side of said vibratory diaphragm contacts a volume of air outside said enclosure means within the space behind the front panel of the partition;

passive radiating means characterized by having a predetermined acoustic mass for coupling the specific volume of air enclosed by said enclosure means to the air outside said enclosure means in the listening area;

whereby the volume of air outside said enclosure means within the space behind the front panel of the partition is substantially acoustically isolated over the approximate frequency range of operation of said electroacoustical transducing means from the volume of air outside said enclosure means within the listening area.

VOL
1114
ISS
3
MY
15
1990
UMI

4,924,964
LOUDSPEAKER ENCLOSURE
Michael P. Olsen, 3727 46th Ave. S., Minneapolis, Minn. 55406
Filed Jul. 24, 1989, Ser. No. 384,669
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—151 7 Claims



1. An isolating enclosure for retaining a loudspeaker to be mounted in a loudspeaker housing to reduce unwanted effects of said loudspeaker relative to said housing, said enclosure comprising:
a stiff front plate having a loudspeaker opening therein at which said loudspeaker can be mounted on an interior side thereof to be capable of directing sound energy therethrough;
a stiff rear plate having an interior side; and
a pair of stiff cylindrical tubes including an outer tube positioned substantially concentrically about an inner tube and together sealed between said interior sides of said front and rear plates with said inner tube being sufficiently smaller than said outer tube so as to leave a tube enclosed space therebetween, said tube enclosed space being substantially filled with dense particulate matter.

4,924,965
SPEAKER SYSTEM
Fumio Murayama, Tendou, and Takashi Suzuki, Tendo, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 10, 1989, Ser. No. 349,678
Claims priority, application Japan, Oct. 12, 1988, 63-132295[U]
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—156 5 Claims



1. A speaker system comprising:
an elongated cabinet having an elongate shape defining a longitudinal direction, the cabinet having an open front end;
an elongated baffle plate fixedly secured to the front open end, wherein the cabinet and the baffle plate having inner surfaces defining a cabinet chamber;
a woofer speaker disposed in the cabinet chamber and having a vibration surface that produces sound waves from a front and back of said vibration surface, and a speaker frame; and
woofer support means provided in the cabinet chamber for interposedly supporting the woofer speaker between the cabinet and the baffle plate, the vibration surface of the woofer speaker extending in a direction perpendicular to the longitudinal direction of the cabinet, and having one of said front or back of said vibration surface arranged to emanate said sound waves into a sealed portion of said cabinet chamber acting as an infinite baffle, wherein said woofer support means positions said woofer speaker within a middle one-third of a longitudinal length of said cabinet so as to minimize transmittance, by back pressure, of vibrations to a wall of said cabinet within said sealed portion confronting said one of said front or back of said vibration surface.

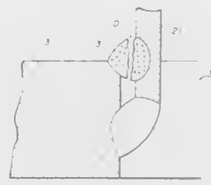
4,924,966
MUFFLER
Tetsuro Kanda, Yokohama, and Shizuo Yamamoto, Kawasaki, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Company Limited, Kanagawa, Japan
Filed Aug. 5, 1987, Ser. No. 81,722
Claims priority, application Japan, Aug. 20, 1986, 61-192853
Int. Cl.[5] F01N *1/06, 1/24, 7/08*
U.S. Cl. 181—228 4 Claims



1. A muffler comprising:
a muffler body;
an exhaust duct pipe connected to one end of said muffler body;
a tail pipe connected to another end of said muffler body;
at least one intermediate duct pipe installed inside said muffler body colinear with said exhaust and tail pipes, whereby exhaust gas from said exhaust duct pipe can pass through said intermediate duct pipe in a substantially straight line without reflecting; and
a resonance prevention body comprising an open ended inner pipe within at least one of said muffler body, said exhaust duct pipe and said tail pipe to form a main flow route and cooperates with said at least one of said muffler body, said exhaust duct pipe and said tail pipe to further form therein a by-pass flow route, said inner pipe having flow resistance means to provide flow resistance for gasses in said by-pass flow route.

4,924,967
EXHAUST MANIFOLD
Masahide Ike, and Kunio Kawai, both of Yokohama, Japan, assignors to Nissan Motor Company, Ltd., Japan
Filed Feb. 27, 1989, Ser. No. 315,861
Claims priority, application Japan, Mar. 29, 1988, 63-40284[U]
Int. Cl.[5] B23K *35/22*
U.S. Cl. 181—243 9 Claims

1. An exhaust manifold comprising: a plurality of steel members constituted from a material which reveals a body-centered cubic metallic crystal structure when exposed to a predetermined temperature range, said plurality of steel members comprise a plurality of pipes and a plurality of flanges which are arranged to form a unitary structure with first and second connecting portions between adjacent ones of said plurality of steel members, said first connecting portions comprising a plurality of spot welding beads constituted from a material which reveals a face-centered cubic metallic crystal when exposed to said predetermined temperature range and said second connecting portions comprising a permanent welding bead constituted from a material which reveals said body-centered metallic crystal structure when exposed to said predetermined temperature range.

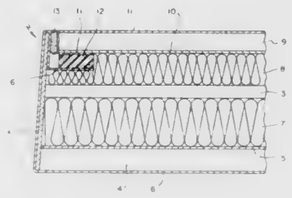


4,924,968
STAMP FORMED MUFFLER WITH REINFORCED OUTER SHELL
Walter G. Moring, III, and Jon W. Harwood, Toledo, both of Ohio, assignors to AP Parts Manufacturing Company, Toledo, Ohio
Filed Aug. 3, 1988, Ser. No. 227,807
Int. Cl.[5] F01N *1/02, 7/18*
U.S. Cl. 181—282 24 Claims



1. An exhaust muffler comprising:
an array of tubes comprising an inlet to the muffler and an outlet from the muffler; and
at least one external shell defining a peripheral portion and at least one chamber extending from the peripheral portion, said chamber comprising a plurality of chamber walls, including side and end walls extending from said peripheral portion and a connecting wall extending between and connecting portions of said side and end walls spaced from said peripheral portion, an array of generally V-shaped inwardly directed grooves, said generally V-shaped grooves of said array extending continuously between spaced apart locations on the peripheral portion of said chamber, each said V-shaped groove comprising a pair of opposed intersecting groove surfaces which respectively intersect the chamber walls at outwardly convex arcuate surfaces, the groove surfaces intersecting one another at an inwardly concave arcuate portion defining a radius of curvature smaller than the outwardly convex arcuate portions of the groove, whereby said grooves substantially prevent noise associated with vibration of said external shell.

4,924,969
ACOUSTIC DOOR
Ghislain L'Heureux, 911, rang St-Antoine, St Féréol Les Neiges (Quebec), Canada G0A 3R0
Filed Apr. 24, 1989, Ser. No. 342,360
Claims priority, application Canada, Nov. 9, 1988, 582657
Int. Cl.[5] E04B *1/82*
U.S. Cl. 181—290 14 Claims



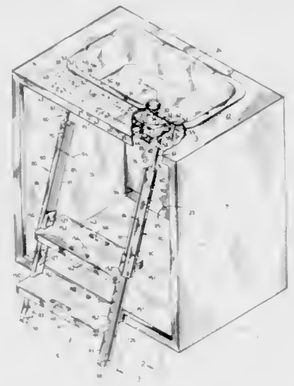
1. An acoustic door comprising:
a frame;
first and second opposite faces;
a first wall mounted on the said frame and comprising (a) a first panel including a rigid, dense and visco-elastic material, and having a first coincidence frequency, an outer face and an inner face, (b) a first sheet of metal applied on he outer face of the first panel to define the first face of the said door, and (c) a first layer of massive and very malleable material applied on the inner face of the said first panel and having a second coincidence frequency higher than the said first coincidence frequency;
a second wall comprising (a) a second panel including a rigid, dense and visco-elastic material, and having a third coincidence frequency, an outer face and an inner face, (b) a second sheet of metal applied on the outer face of the second panel to define the said second face of the door, and (c) a second layer of massive and very malleable material applied on the inner face of the second panel and having a fourth coincidence frequency higher than the said third coincidence frequency; and
means for mounting the second wall on an assembly formed of said frame and of the first wall while establishing no acoustic short circuit between the said assembly and the said second wall;
the first and second walls accordingly presenting a structure allowing the said first and second walls to be relatively thin while being sufficiently rigid, so as to maximize a space of air between the first and a second layers of massive and very malleable material and thereby reduce the frequency mass-air-mass at which acoustic waves can be transmitted from one of the first and second layers of massive and malleable material to the other of said layers through the air in the said space.

4,924,970
LADDER APPARATUS
William L. Seals, 652 E. Cornell Ave., Fresno, Calif. 93704, and Brad A. Seals, 6163 N. Dewey Ave., Fresno, Calif. 93711
Filed Mar. 9, 1989, Ser. No. 321,000
Int. Cl.[5] A47B *77/10;* E06C *1/12, 9/00*
U.S. Cl. 182—91 11 Claims

1. A ladder apparatus adapted to be borne by a fixture comprising a bracket adapted to be mounted on the fixture; a first support member substantially pivotally mounted on the bracket; a second support member slidably mounted on the first support member for movement therealong, the second support member having an elongated main body with substantially forwardly facing, rearwardly facing, inwardly facing, and outwardly facing exterior surfaces, and a longitudinally disposed channel formed in each of said surfaces; and a third

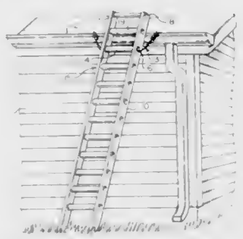
VOL
1114
ISS
3
MY
15
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UMI

support member mounting a step slidably mounted on the second support member and disposed in substantial alignment therewith, said channels formed in the forwardly facing, rearwardly facing, and inwardly facing surfaces of the second support member slidably receiving the third support member for movement longitudinally thereof and the channel formed



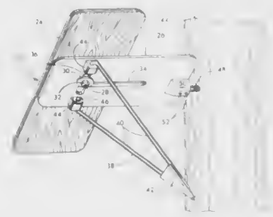
in the outwardly facing surface dimensioned slidably to receive the first support member for movement longitudinally thereof whereby the apparatus can be disposed in a collapsed attitude for storage on the fixture or, alternatively, in an operational attitude extending from the fixture for use in gaining access to an elevated area.

4,924,971
LADDER SAFETY APPARATUS
Billy M. Rice, 12741 Woodland Dr., Longmont, Colo. 80501
Filed May 9, 1989, Ser. No. 349,563
Int. Cl.[5] E06C *1/34, 5/36, 7/48*
U.S. Cl. 182—93 **21 Claims**



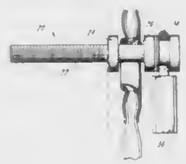
1. Ladder safety apparatus for use in stabilizing the position of a generally straight ladder as the ladder leans against a building or the like, the apparatus comprising;
flexible cable means of a length somewhat greater than the rail-to-rail dimension of the ladder,
first and second terminal means attached one to each end of said cable means, and
first and second building attachment means movably attached to said first and second terminal means, respectively, to thereby facilitate adjustment of the effective length of said ladder safety apparatus as said cable means encircles the ladder, and as said first and second building attachment means secure the two ends of said cable means to a building or the like.

4,924,972
PORTABLE TREE SEAT
Jerry B. Westbrock, White Bear Lake, Minn., assignor to Melvin J. Konietzki, Nekoosa, Wis.
Filed Aug. 31, 1989, Ser. No. 403,114
Int. Cl.[5] A45F *3/26;* **A47C** *9/10*
U.S. Cl. 182—187 **4 Claims**



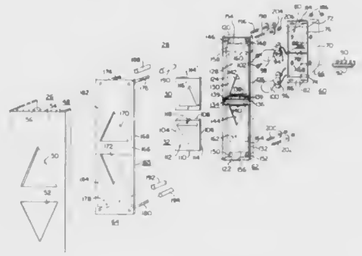
1. A portable tree seat comprising:
(a) a frame having portions defining a longitudinal slot;
(b) a brace rotatably mounted on the frame;
(c) a fastener adapted to fit within the longitudinal slot of the frame;
(d) mounting means for selectively and releasably mounting one end of the frame to a vertical structure such as a tree;
(e) a platform slidably mounted on the frame by the fastener in the slot whereby the platform may slide over the frame from a stored position parallel to and overlying the frame to an extended position perpendicular to the frame.

4,924,973
ELEVATOR PAD HANGING SYSTEM
Sydney L. Miller, 33 Lyman Rd., Chestnut Hill, Mass. 02167
Filed Jul. 11, 1988, Ser. No. 217,394
Int. Cl.[5] B66B *9/00*
U.S. Cl. 187—1 R **5 Claims**



1. A system for securely holding elevator pads against a wall of an elevator, said system comprising:
means for fastening said system to the wall;
a first groove in which the elevator pad rests when it is held by said system;
a first flange located between said means for fastening said system and said first groove;
a second groove surrounded by a second flange and a third flange, said second flange located between said first groove and said second groove, said third flange located on the side of said second groove opposite said second flange;
locking means attachable around said second groove for preventing the elevator pad from passing over said third flange.

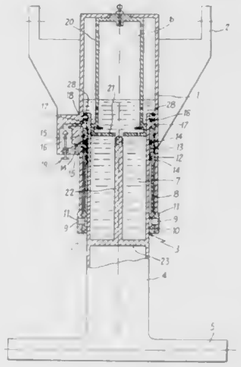
4,924,974
ELEVATOR SYSTEM HAVING HALL LANTERN ASSEMBLY FOR ELEVATOR CAR DOOR POST OF HATCH DOOR POST
Karl B. Orndorff, Bonneauville Boro, and Randall S. Lawson, Gettysburg, both of Pa., assignors to Inventio AG, Hergiswil NW, Switzerland
Filed Jan. 11, 1989, Ser. No. 295,697
Int. Cl.[5] B66B *9/00*
U.S. Cl. 187—1 R **11 Claims**



1. In an elevator system,
a door post,
said post including a flat jamb having inner and outer surfaces,
said flat jamb defining spaced upper and lower openings which extend between the inner and outer surfaces of the jamb,
and a hall lantern assembly fixed to the inner surface of said jamb,
said hall lantern assembly including a lens guide plate, spring means, lamp means, and upper and lower lenses having projecting portions which respectively extend through the upper and lower openings in the jamb,
said lens guide plate including a major flat portion having inner and outer surfaces, and spaced upper and lower openings which extend between said inner and outer surfaces,
said spring means resiliently biasing the outer surface of said lens guide plate towards the inner surface of said jamb,
said lamp means being fixed to the inner surface of said lens guide plate,
said upper and lower lenses being disposed between the outer surface of said lens guide plate and the inner surface of said jamb, with said spring means and the outer surface of said lens guide plate biasing said upper and lower lenses towards the inner surface of said jamb,
said upper and lower lenses each being actuatable to a service position by pressing the projecting portion of a lens to move the lens and lens guide plate inwardly against the bias of said spring means, and then moving the lens vertically in said lens guide plate to a position which provides access to said lamp means via the openings defined by said jamb and said lens guide plate.

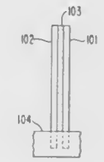
4,924,975
SHOCK ABSORBER WITH IMPROVED DYNAMIC SEALING
Pierre Woerner, Fontenay-Aux-Roses, and Jean-Pierre Hainaut, La Queue-en-Brie, both of France, assignors to Messier-Hispano-Bugatti, France
Filed Feb. 13, 1989, Ser. No. 309,265
Claims priority, application France, Mar. 9, 1988, 88 03037
Int. Cl.[5] F16F *9/36*
U.S. Cl. 188—322.18 **4 Claims**

1. A shock absorber comprising a strut having an opening in which a sliding rod is mounted, said rod and strut delimiting an internal volume containing a gas under pressure and a shock absorbing liquid, means for delimiting an annular chamber which is variable as a function of the degree to which the sliding rod penetrates into the strut and which communicates with the internal volume, at least one support bearing fixed with the strut and located between the strut and the sliding rod in the vicinity of the opening of the strut, and a sealing bearing operatively positioned between the strut and the sliding rod at a distance from the support bearing and disposed at a level corresponding to a top portion of the sliding rod when the



shock absorber is in the extended position, the annular chamber defined by one side of the sealing bearing, the sliding rod, and the strut, wherein the sealing bearing is provided with at least two sealing rings thereon that are separated by a groove in the sealing bearing that is connected to the annular chamber via a balance channel defined within said strut, the balance channel includes shut-off means that is accessible from outside the strut, and said sealing bearing is connected with said strut so that said sealing rings are carried by the strut to make contact with an outside surface of the sliding rod.

4,924,976
TUNED ARRAY VIBRATION ABSORBER
Frank Bernett, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Sep. 4, 1987, Ser. No. 93,219
Int. Cl.[5] F16F *7/10*
U.S. Cl. 188—378 **14 Claims**



1. A tuned vibration absorber mounted to an object to damp vibrations of the object, comprising;
at least first and second layers of rigid material;
at least one layer of elastomer material between said at least two rigid layers to form a laminated constrained layer beam;
means for rapidly accelerating and decelerating the object; and
a rigid base to support one end of said laminated constrained layer beam to form a cantilever constrained layer that vibrates at a predetermined resonance frequency, said base

VOL
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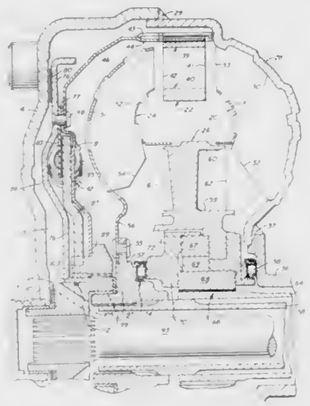
further securing said cantilever constrained layer beam to the object.

4,924,977

MULTI-STAGE TORQUE CONVERTER WITH INTEGRATED DAMPER

Steven A. Crawford, Dearborn, and James R. Wells, Sterling Heights, both of Mich., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Aug. 2, 1988, Ser. No. 227,351
Int. Cl.[5] F16D *33/00*
U.S. Cl. 192—3.28 10 Claims



1. A power transmission system comprising,
a plurality of bladed annular means defining a toroidal fluid circuit including
impeller means, main turbine means, circulatory turbine means, and reactor means in a series relationship in said fluid circuit and said reactor means being fixed against reverse rotation;
power input means operatively coupled to said impeller means;
first power output means operatively coupled to said main turbine means;
second power output means coupled to said first power output means through a gearset means; and,
a vibration damper assembly comprising damper input means fixedly connected to said circulatory turbine means, damper output means operatively connected to said second power output means, resilient means interposed between said damper input means and said damper output means to provide a resilient driving connection therebetween, and clutch means for selectively connecting said damper input means to said power input means at speeds above a predetermined speed.

4,924,978

LOCK-UP DEVICE FOR TORQUE CONVERTER

Masahiro Ohkubo, Kadoma, Japan, assignor to Kabushiki Kaisha Daiken Seisakusho, Neyagawa, Japan

Filed Apr. 8, 1988, Ser. No. 179,324
Claims priority, application Japan, Apr. 13, 1987, 62-90416; Apr. 13, 1987, 62-90417
Int. Cl.[5] F16H *45/02*
U.S. Cl. 192—3.3 8 Claims

1. A lock-up device for a torque converter wherein a piston activated by hydraulic pressure and a lock-up damper having a friction plate with friction surfaces thereon for engagement with a friction plate attached to the front cover of the torque converter are disposed between said front cover and a turbine wheel of the torque converter, and a pressing force of said piston causes said friction surfaces on said friction plate on said lock-up damper to engage with said friction plate attached to said front cover; characterized by that plural hydraulic chambers are provided by forming a pressure surface at the front cover side of said piston into a multiple-stage structure, a hydraulic chamber located at the inner peripheral side of said piston at said front cover side among said hydraulic chambers is connected to a passage for supplying hydraulic oil under pressure to said most inner hydraulic chamber, said plural hydraulic chambers are connected to each other through a fine clearance between said piston and said cover, said fine clearance between said piston and said cover forming an orifice



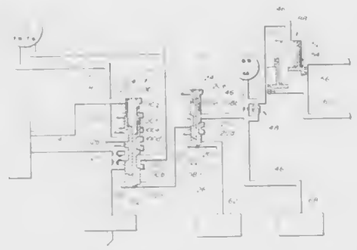
between said inner hydraulic chamber and the remainder of said plural hydraulic chambers, said orifice decreasing in length as said piston is moved away from said cover by said hydraulic oil supplied to said most inner hydraulic chamber, said pressure surface at said front cover side of said piston having stepped parts disposed in the vicinity of a position where the torque converter is attached to a crank shaft in such manner that the stepped parts project toward a constricted portion of an inner peripheral part of the turbine wheel of said torque converter, and a pressure area of said piston in the most inner peripheral side hydraulic chamber is set to a size which does not permit said piston to engage said friction plate on said front cover when said hydraulic oil supplied under pressure fills only said inner hydraulic chamber.

4,924,979

HYDRAULIC LOCK-UP CONTROL SYSTEM DURING SHIFTING IN AUTOMATIC TRANSMISSION

Kazuhiko Sugano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1988, Ser. No. 264,740
Claims priority, application Japan, Oct. 30, 1987, 62-273216
Int. Cl.[5] F16D *25/14, 67/02*
U.S. Cl. 192—3.31 2 Claims



1. In a hydraulic control system for an automatic transmission having a friction device including a chamber which is adapted to be supplied with hydraulic fluid when the automatic transission shifts up to a n th speed ratio, where: n is an integer, and a torque converter with a lock-up device:

a lock-up control valve including a spool with a pressure acting area, said spool having a first position where the lock-up device is caused to be released and a second position where the lock-up device is caused to be engaged;
means for biasing said spool of said lock-up control valve to said first position thereof;
means defining a hydraulic line having one end communicating with the chamber of the friction device and an opposite end;
shift valve means connected to said opposite end of said hydraulic line for allowing supply of hydraulic fluid to said opposite end of said hydraulic line upon shifting up to the n th speed ratio and discharge of hydraulic fliud from said opposite end of said hydraulic line upon shifting down from the n th speed ratio;
flow restrictor means provided in said hydraulic line dividing said hydraulic line into a first section on one side thereof near the chamber of the friction device and a second section on the opposite side thereof;
means for transmitting a hydraulic pressure building up solely in said second section of said hydraulic line to said lock-up control valve to have said hydraulic pressure to act on said pressure acting area of said spool in such a direction as to urge said spool against said biasing means;
accumulator means connected to said first section of said hydraulic line.

4,924,980

CONTROL CAR ROLLER CLUTCH WITH IMPROVED ASSEMBLY

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1989, Ser. No. 402,303
Int. Cl.[5] F16D *41/06*
U.S. Cl. 192—45 3 Claims



1. An overrunning roller clutch, comprising,
a plurality of generally rectangular roller pockets circumferentially arrayed about a central axis, each roller pocket having a pair of side rails with a pair of diagonally opposed surfaces and a predetermined axial width measured between said side rails,
a plurality of generally rectangular roller control cars, one for each pocket, each car having a lower side flange and a diagonally opposed upper side flange parallel thereto, said car side flanges and pocket side rail surfaces being disposable in mutually axially overlapping relation,
each of said cars also having a pair of parallel crossbars, said crossbars having an axial width approximately equal to said pocket width with at least one side of each of said crossbars having a notch large enough to clear one of said pocket side rails, and,
a plurality of cylindrical rollers, one for each control car, each of said rollers having a diameter sufficient to fit closely between said car crossbars and an end to end length approximately equal to said predetermined pocket width,
whereby, each car is installed in a respective pocket along a straight line in one radial direction as said notches clear said one pocket side rail and then moved at a right angle axially to the side to bring said pocket side rail surfaces and said car side flanges into axially overlapping relation, after which a roller may be inserted between said car crossbars, thereby maintaining said axially overlapping relation to cooperatively retain said cars and rollers in said pockets.

4,924,981

OVERRUNNING ROLLER CLUTCH WITH IMPROVED SHIPPING RETENTION

Albert D. Johnston, Huron, and Frederick E. Lederman, Sandusky, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1989, Ser. No. 397,924
Int. Cl.[5] F16D *41/06*
U.S. Cl. 192—45 3 Claims



1. An overrunning roller clutch of the type that is adapted to be installed between a cam race and a substantially coaxially disposed pathway race, said clutch comprising,
a plurality of rollers, each of which moves circumferentially back and forth between said races over a travel path during clutch operation,
a plurality of roller energizing springs, each of which is adapted to expand and compress so as to provide a continual bias to a respective roller as it travels to maintain said roller at a lock up ready position between said races, each of said springs also having a crush length beyond which it cannot be compressed without exceeding a spring crush force that is greater than the disturbing forces a roller will experience during normal shipping and handling,
a cage adapted to be installed non-turnably to said cam race, said cage including a plurality of axially disposed spring foundation members from which said springs can act as they bias said rollers and at least one guide track disposed generally along said roller travel path, said guide track further including a localized widened entry area spaced from said spring foundation member by a predetermined distance that is less than said spring crush length, and,
a plurality of roller control cars, each of which retains a roller, and each of which has a spring biasing surface that faces a respective cage spring foundation member and a guide member sized so as to fit slidably in said guide track and to fit with clearance through said localized widened area, said guide member further being spaced from said spring biasing surface by substantially said predetermined distance,
whereby, said clutch is assembled by fitting a guide member of each car through each of said track localized widened areas and then sliding said guide member into said guide track, after which a respective energizing spring may be assembled between each cage foundation member and its respective car spring biasing surface, thereby preventing said guide members from moving back into said widened entry area and retaining said cars and rollers to said cage as a unit.

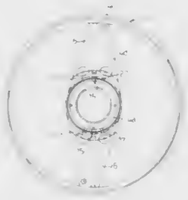
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4,924,982

OIL PRESSURE CLUTCH MECHANISM FOR AN AUTOMATIC TRANSMISSION

Kouhei Harada, Nagoya, and Hiromi Hasegawa, Obu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 17, 1988, Ser. No. 272,331
Claims priority, application Japan, Nov. 18, 1987, 62-175000[U]
Int. Cl.[5] F16D *21/04, 25/10*
U.S. Cl. 192—48.8 8 Claims



3. An oil pressure clutch mechanism for an automatic transmission, comprising:

a front drum including a first boss and inner and outer cylindrical walls coaxial with said first boss, said outer cylindrical wall and said inner cylindrical wall defining a first piston chamber, and said inner cylindrical wall and said first boss defining a second piston chamber;

an oil cover including a second boss coaxially disposed inside said first boss, an outer face of said second boss forming an interface with an inner face of said first boss;

first and second axially spaced oil conducting grooves formed in said outer face of said second boss;

first and second oil passages formed in said front drum for conducting oil from said first and second oil conducting grooves to said first and second piston chambers, respectively;

a drain groove formed in said interface for receiving leaked oil from said first and second oil conducting grooves; and

an oil drain passage formed in said front drum for conducting leaked oil from said drain groove to the exterior of said front drum.

4,924,983

PROPELLING CLUTCH APPARATUS FOR A WORKING VEHICLE

Yoshiyuki Katayama; Takeshi Ura, and Akio Inamori, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Dec. 6, 1988, Ser. No. 280,690
Claims priority, application Japan, Dec. 10, 1987, 62-313657; Dec. 11, 1987, 62-314859; Dec. 11, 1987, 62-314860; Dec. 11, 1987, 62-314864
Int. Cl.[5] F16D *11/06*
U.S. Cl. 192—52 15 Claims

1. A propelling clutch apparatus for a working vehicle comprising:

friction type hydraulic clutch means (C) mounted on a propelling line;

a valve mechanism (V) for adjusting an oil pressure applied to said hydraulic clutch means (C);

measuring means (S) for detecting angular acceleration of a rotary shaft (2a) included in the propelling line; and

control means (T) for controlling said hydraulic clutch means (C) in response to a change in a vehicle running state, said control means (T) including;

first control means (Ta) providing a first stage including a preliminary step of narrowing spaces between friction disks of said hydraulic clutch means (C) in advance by applying the oil pressure at a predetermined maximum level (Imax) to said hydraulic clutch means (C) for a predetermined time (T1) from receipt of a clutch engaging command, and a subsequent main step of applying the oil pressure with predetermined characteristics,

second control means (Tb) providing a second stage of maintaining said hydraulic clutch means (C) in a half-



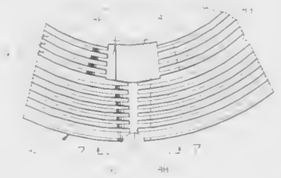
clutch state when the angular acceleration in an accelerating direction or a decelerating direction detected by said measuring means (S) reaches a predetermined value, and third control means (Tc) providing a third stage of fully engaging said hydraulic clutch means (C).

4,924,984

QUICK PUMP-OUT CLUTCH PLATE FOR A VISCOUS FLUID CLUTCH

Lawrence C. Kennedy, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 22, 1989, Ser. No. 355,537
Int. Cl.[5] F16D *33/12*
U.S. Cl. 192—58 B 18 Claims



1. A clutch plate for a viscous fluid clutch assembly, the clutch plate adapted to be rotatably driven by an input shaft comprising:

(a) a disk-like member having a central hub portion for receiving the input shaft and an annular circumference;

(b) a plurality of concentric, annular lands and grooves encircling the hub portion;

(c) a plurality of passages in the lands and grooves for directing fluid in the clutch assembly to the grooves;

(d) a radial expulsion channel leading from each passage to the circumference of the clutch plate for expelling fluid from the lands and grooves wherein each expulsion channel has a radially innermost end intersecting a respective passage and a radially outermost end intersecting the circumference of the disk-like member.

4,924,985

DUAL FACE WIPER FOR A VISCOUS FLUID CLUTCH

Lawrence C. Kennedy, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 22, 1989, Ser. No. 355,536
Int. Cl.[5] F16D *31/00*
U.S. Cl. 192—58 B 3 Claims



1. A pump plate assembly for separating a receiving chamber and a reservoir of a viscous fluid clutch, wherein the receiving chamber receives fluid from a shear zone, the pump plate comprising:

(a) a plate member having a front surface in communication with the reservoir and a rear surface in communication with the receiving chamber;

(b) at least one pair of first and second laterally-spaced openings provided in the plate member at approximately the same radial position for permitting the passage of fluid from the receiving chamber to the reservoir; and

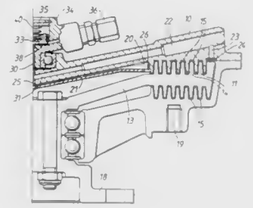
(c) a planar member having a central body and a pair of opposite scoop surfaces fixedly mounted on the pump plate rear surface in-between the first and second openings for pumping the fluid in the receiving chamber through either the first or second opening depending upon the rotational direction of the plate member.

4,924,986

VISCOUS FLUID CLUTCHES

Arthur E. H. Elmer, Nailsworth, Great Britain, assignor to Kysor Industrial Corporation, Cadillac, Mich.

PCT No. PCT/GB87/00643, § 371 Date May 13, 1988, § 102(e) Date May 13, 1988, PCT Pub. No. WO88/02075, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 16, 1987, Ser. No. 193,288
Claims priority, application United Kingdom, Sep. 17, 1986, 8622422
Int. Cl.[5] F16D *35/00, 43/25*
U.S. Cl. 192—58 B 8 Claims



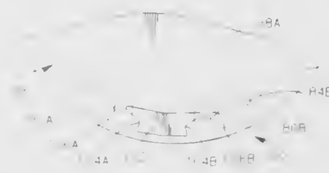
1. A viscous fluid shear clutch comprising a rotary casing containing an internal rotary element defining an annular clearance gap for transmitting torsional drive between said casing and said rotary element by shear force, a fluid reservoir adjacent the rotary axis having a fluid exit aperture communicating with the clearance gap, a pump for impelling fluid radially inwards from the outer periphery of the gap into the reservoir, a supply valve arranged to close or restrict the fluid path from the pump to the reservoir so as to vary the quantity of fluid in the gap and a servo-operated valve arranged to open a fluid exit from the reservoir to the clearance gap, and responsive to the increase in pressure in said fluid path when the aforementioned supply valve is closed.

4,924,987

PUMP PLATE ASSEMBLY FOR A VISCOUS FLUID CLUTCH

Lawrence C. Kennedy, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 22, 1989, Ser. No. 355,535
Int. Cl.[5] F16D *33/12*
U.S. Cl. 192—58 B 2 Claims



1. A pump plate assembly for separating a receiving chamber and a reservoir of a viscous fluid clutch, wherein the receiving chamber receives fluid from a shear zone, the pump plate assembly comprising:

(a) a plate member having a front surface in communication with the reservoir and a rear surface in communication with the receiving chamber;

(b) wiper means provided on the plate rear surface and projecting into the receiving chamber;

(c) at least first and second openings provided in the plate member on opposite circumferential sides of the wiper means for permitting the passage of a fluid from the receiving chamber to the reservoir;

(d) a first resilient arm having first and second ends, wherein the first end is secured to the plate front surface so that a planar surface of the second end covers and seals the first opening; and

(e) a second resilient arm having first and second ends, wherein the first end is secured to the plate front surface so that a planar surface of the second end covers and seals the second opening;

whereby, depending upon the direction of rotation of the pump plate, one of the resilient arms provides only one-way fluid flow from the receiving chamber to the reservoir at predetermined fluid pressures in the receiving chamber throughout the entire temperature range of the fluid.

4,924,988

CLUTCH

Rocky H. Page, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 19, 1989, Ser. No. 299,007
Int. Cl.[5] F16D *11/04*
U.S. Cl. 192—70.23 21 Claims

9. A clutch assembly comprising:

a shaft;

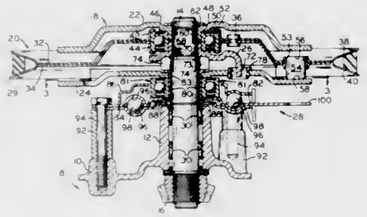
a pulley on said shaft adapted to be driven by a belt, said pulley being located at a substantially fixed axial position on said shaft and having a plurality of openings therein;

a pair of pressure plates disposed respectively on both sides of said pulley for engaging and rotating with said pulley,

a first said pressure plate being axially movable, and a second said pressure plate being fixed on said shaft;

friction pucks disposed in said openings, said friction pucks having opposite friction surfaces facing said first and second pressure plates respectively for selectively coupling said pulley to said first and second pressure plates; and

selectively actuable means coupled to at least one of said pressure plates for axially pressing said pressure plates into the respective facing friction surfaces to frictionally couple said pressure plates with said pulley.



4,924,989

AUTOMATIC CLUTCH CONTROL SYSTEM FOR COUPLING TWO ROTATING SHAFTS

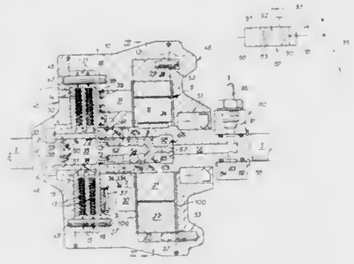
Rêné Filderman, Neuilly sur Seine, France, assignor to Valeo, Paris, France

Filed Nov. 22, 1988, Ser. No. 275,103

Claims priority, application France, Nov. 25, 1987, 87 16368

Int. Cl.[5] F16D *23/10, 31/04*

U.S. Cl. 192—103 F **8 Claims**





1. An automatic control system for a clutch for coupling two rotating shafts, of the kind comprising an element, such as a piston, axially movable towards a position of engagement to provide the axial clamping of at least one friction disc to said clutch for coupling said shafts, and a control member, responsive to a difference in speed between said shafts, to control the displacement of said piston towards its engaged position; wherein said control member is constituted by a lobed pump comprising a central pinion with teeth of which mesh with teeth of complementary shape provided on the internal periphery of an inner crown which is eccentric relative to the pinion; an outer crown the internal periphery of which is centred relative to the inner crown, and the external periphery of which is centred relative to the pinion; a chamber for admitting fluid defining an admission chamber, and a return chamber; said pinion being wedged on one of said shafts and said outer crown being integral in rotation with the other of said shafts, a connecting piece such as a hub being integral in rotation with one of said shafts, said clutch and said pump being housed in said hub by means of two bored recesses provided respectively in the two end surfaces of said hub.

4,924,990

DAMPER DISC

Hiroshi Takeuchi, Higashiosaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

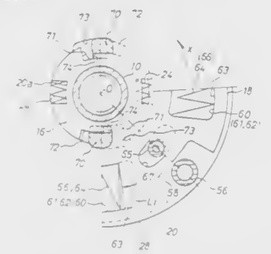
PCT No. PCT/JP87/00930, § 371 Date Jul. 27, 1988, § 102(e) Date Jul. 27, 1988, PCT Pub. No. WO88/04373, PCT Pub. Date Jun. 16, 1988

PCT Filed Nov. 30, 1987, Ser. No. 243,557

Claims priority, application Japan, Dec. 10, 1986, 61-294306

Int. Cl.[5] F16D *3/14*

U.S. Cl. 192—106.2 **2 Claims**



1. A damper disc, in which a hub flange of a spline hub is divided into an inner peripheral side flange having a hub and an outer peripheral side flange which are meshed with each other with a circumferential clearance therebetween, annular sub plates holding both said flanges are installed on opposite sides of both said flanges, a relatively weak torsion spring interposed in a recession and a rectangular hole at a position where said sub plates face on said inner peripheral side flange, inner peripheral parts of said sub plates are pressed on opposite side faces of said inner peripheral side flange, a retaining plate and a clutch plate are provided on outside faces of both said sub plates opposite to a flange through a first friction material having a relatively high friction coefficient, an intermediate member and a second friction material having a relatively low friction coefficient, said retaining plate and said clutch plate being coupled by a stop pin at an outer peripheral part so as to compress both said friction materials, said intermediate member having claws fitted in holes in said retaining plate and said clutch plate in such manner that said claws can move freely in a circumferential direction within a specified torsion angle, relatively strong torsion springs compressively installed in rectangular holes in said retaining plate, said clutch plate and said outer peripheral side flange at a position where said retaining plate and said clutch plate face the outer peripheral side flange, a key piercing said outer peripheral side flange, said inner peripheral side flange and both said sub plates in an approximately center line direction of said damper disc and positioned so as to be urged toward an outer periphery of said damper disc, notches on the inner peripheral side flange and said sub plate for holding said key freely slidingly in a radial direction of the disc, and a force for holding said key at circumferential end faces of said both notches for setting and holding said key between both said end faces for relatively high torsion angular velocity of said damper disc and for releasing said key from said end faces for relatively low torsion angular velocity of said damper disc.

4,924,991

CLUTCH COVER ASSEMBLY WITH SELF-ADJUSTING PRESSURE PLATE

Hiroshi Takeuchi, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

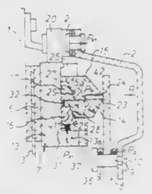
PCT No. PCT/JP88/00405, § 371 Date Dec. 6, 1988, § 102(e) Date Dec. 6, 1988, PCT Pub. No. WO88/08492, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 25, 1988, Ser. No. 335,090

Claims priority, application Japan, Apr. 27, 1987, 62-105000

Int. Cl.[5] F16D *13/75*

U.S. Cl. 192—111 A **2 Claims**



1. A clutch cover assembly comprising:

a pressure plate (7) having a plate body (13) and first and second fulcrum rings (14, 15) movable in an axial direction of said cover assembly, said first fulcrum ring (14) being disposed in sliding contact on an inner side surface of said second fulcrum ring (15),

fulcrum points (23, 24) formed on said first and second fulcrum rings (14, 15), respectively, and spaced from each other in the radial direction of said cover assembly,

stopper steps (14*a*, 15*a*) formed on said fulcrum rings (14, 15) so that the fulcrum point (24) of the second fulcrum ring (15) moves over the fulcrum point (23) of said first fulcrum ring (14) toward a diaphragm spring side,

inclined faces (26, 27) which incline outwardly toward said plate body (13) formed on a face of said fulcrum rings (14, 15) facing away from said plate body,

first and second slide keys (16, 17) slidable in a radial direction and disposed between said fulcrum rings (14, 15) and said pressure plate body (13),

a first spring (31) forcing said first slide key (16) outwardly, and

a second spring (32), weaker than said first spring (31) and disposed between said slide keys (16, 17).

4,924,992

ANTI-VIBRATION MECHANISM FOR A CLUTCH PEDAL

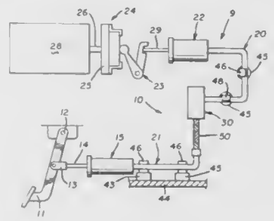
Kenneth L. Romig, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 14, 1989, Ser. No. 407,171

Int. Cl.[5] F16D *25/14*

U.S. Cl. 192—30 V **5 Claims**

1. An anti-vibration mechanism for a foot pedal of a hydraulically actuated clutch release system comprising: a foot pedal; a master cylinder operated by said foot pedal; a clutch; a slave cylinder located remotely of said master cylinder and operatively connected to said clutch; conduit means communicating between said master and said slave cylinders; and a canister interposed within said conduit means to define a first portion of said conduit means which extends between said slave cylinder and said canister and second portion of said conduit means which extends between said master cylinder and said canister; said canister having a hollow, cylindrical, interior chamber that is bounded by opposed, laterally spaced, generally planar, circular front and rear walls and a generally annular wall defining the perimeter of said canister; said first portion of said conduit means communicating with the hollow, interior chamber of said canister at approximately the center of said front wall; said second portion of said conduit means communicating with the hollow, interior chamber of said canister through said annular wall.



4,924,993

CONVEYOR ASSEMBLY

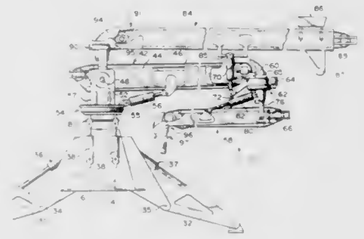
Robert W. Buxton, 4832 Turnbuckle Wind, Harbourside Townhouses, Ladner, BC, Canada (V4K 4A6)

Filed Nov. 8, 1988, Ser. No. 268,899

Claims priority, application Canada, Jun. 8, 1988, 568985

Int. Cl.[5] B65G *41/00*

U.S. Cl. 193—311 **19 Claims**



1. A conveyor assembly comprising:

a support structure;

a first conveyor extending radially from the support structure, and having opposite first and second ends;

a first connecting means for connecting the first end of the first conveyor to the support structure, said first connecting means including first pivotable means for permitting rotation of the first conveyor about the support structure through substantially 360 degrees in a first generally horizontal plane, said first pivotable means including:

(i) a first portion connected to the support structure;

(ii) a second portion rotatably connected to the first portion for rotation relative to the first portion, the second portion being connected to the first end of the first conveyor; and

first support means, connected to the second portion of the first pivotable means at one end and to the first conveyor at the other end, for maintaining the first conveyor at a required angle with respect to said generally horizontal plane;

a second conveyor extending from the second end of the first conveyor;

a second connecting means for connecting the second conveyor to the second end of the first conveyor, the second

VOL 1114 ISS 3 MY 15 1990 UMI

VOL 1114 ISS 3 MY 15 1990 UMI

connecting means including second pivotable means for permitting rotation of the second conveyor about the second end of the first conveyor through substantially 360 degrees in a generally horizontal plane, said second pivotable means including:

(i) a first portion connected to the first conveyor;

(ii) a second portion rotatably connected to the first portion for rotation relative to the first portion and connected to the second conveyor; and

second support means connected to the second portion of the second pivotable means at one end and to the second conveyor at the other end for maintaining the second conveyor at a required angle with respect a second generally horizontal plane.

4,924,994

CHAIN DEPOSIT DEVICE FOR A SHOPPING OR BAGGAGE TROLLEY

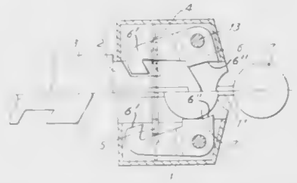
Daniel Pinsson, Lyons, and Bernard Rouesnel, Ecully, both of France, assignors to Ronis S.A., Courbevoie, France

Filed Feb. 25, 1988, Ser. No. 160,311

Claims priority, application France, Mar. 11, 1987, 87 03306

Int. Cl.[5] G07F *17/10, 7/02*

U.S. Cl. 194—253 **2 Claims**



1. In a chain deposit device for a shopping or baggage trolley of the type comprising a key mounted on one extremity of a chain the other extremity of which is secured to a trolley, the key cooperating with a deposit lock of another trolley to liberate a deposit piece which it contains by locking the two trolleys to one another, unlocking being produced by introduction of the deposit piece which opens the lock and remains imprisoned therein, the improvement comprising, forming the deposit lock with two opposing levers each pivoting about an axis, a first end of each lever having means for engaging within notches formed on the key and the opposite end of each lever cooperating to receive the deposit piece therebetween, said key having means to separate said levers, a locking tumbler being movable to a locking position in engagement with said first end of said levers to hold said deposit piece within the deposit lock between said opposite ends of said levers when the key if not inserted between said first ends of said levers of the deposit lock, and spring means for continuously urging said locking tumbler toward said locking position, said locking tumbler being urged from said locking position by the insertion of the key and said first end of said levers being simultaneously separated by the key so that said first ends engage within said notches of the key to thereby pivot said opposite ends about each axis to thereby permit said opposite ends to release the deposit piece.

4,924,995

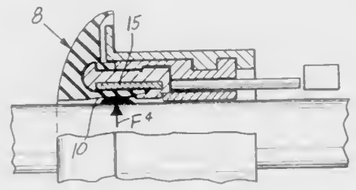
ESCALATOR HANDRAIL OBSTRUCTION DEVICE WITH SENSORS

Willy Adrian, Obernkirchen, and Detlev B. Moldenhauer, Stadthagen, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Sep. 29, 1989, Ser. No. 414,866

Int. Cl.[5] B66B *29/04*

U.S. Cl. 198—323 **3 Claims**



1. An escalator safety assembly for use at the reentry housing of a moving handrail on the escalator, said safety assembly comprising:

(a) rigid housing means movably mounted in the reentry housing and configured to embrace at least part of the handrail; and

(b) a deformable electrical conductor tape pressure sensor interposed between the handrail and the housing means, said sensor being operable, when sufficiently deformed by contact with foreign matter on the handrail, to change its electrical conductivity to initiate a turn-off signal for the escalator.

4,924,996

METHOD FOR POSITIONING A NUMBER OF WORKING IMPLEMENTS RELATIVE TO A CAR BODY

Dick L. Svensson, Nacka, and Claes-Erik Söderman, Saltsjöbaden, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

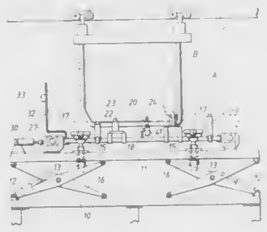
Division of Ser. No. 254,493, Oct. 6, 1988, Pat. No. 4,870,921.

This application Jul. 17, 1989, Ser. No. 380,901

Claims priority, application Sweden, Oct. 7, 1987, 8703858

Int. Cl.[5] B65G *43/00*

U.S. Cl. 198—341 **4 Claims**



1. Method for positioning a number of working implements relative to certain working or treatment points to a conveyor supported car body, wherein the working implements are carried on a frame (**18**) which is movably supported on a base structure (**10, 11**), comprising:

moving in a first step said frame (**18**) longitudinally in a horizontal plane to place said frame (**18**) in a preliminary horizontal position relative to the car body,

moving in a second step said frame (**18**) into a preliminary vertical position by effecting a parallel vertical displacement of said frame (**18**) toward the underside of the car body by raising said base structure (**10, 11**)

aligning in a third step said frame (**18**) relative to the car body by moving said frame (**18**) vertically in a non-parallel movement relative to said base structure (**10, 11**), and

arresting said frame (**18**) relative to the car body as said first, second and third steps are completed.

4,924,997

CONVEYING PLANT

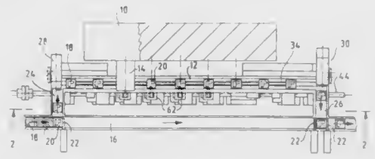
Adolf Wunsch, Ried 215 D-8959, Seeg, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,878

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3627866

Int. Cl.[5] B65G *15/64*

U.S. Cl. 198—345 **7 Claims**



1. A conveying plant for work-pieces to be processed or assembled one after another at different working positions comprising a guide rail extending longitudinally at said working positions, a push-in device arranged at one end of the guide rail and a push-out device at the other end thereof, a conveying rail arranged parallel with and adjacent to the guide rail, a plurality of dogs provided at the conveying rail at equal interspaces, a drive unit operatively connected to the conveying rail and moving the conveying rail along a continuously repeated substantially rectangular moving path consisting of a working stroke in longitudinal direction of the guide rail, a disengaging stroke, a return stroke parallel to the working stroke and a re-engaging stroke, a plurality of work-piece carriers guided at the guide rail and carrying at least one work-piece respectively, said plurality of work-piece carriers adapted to be simultaneously engaged by said dogs in a form-fit way and to be shifted forward during the working stroke of the conveying rail, and a plurality of clamping devices provided at said working positions respectively and operatively connected with drive means to simultaneously clamp the plurality of work-piece carriers at the guide rail during at least a portion of the rectangular moving path excluding said working stroke, said guide rail having a pair of opposed side walls spaced from one another by a distance substantially equal to the width of the work-piece carriers, a first one of said pair of walls having an inclined inner contact surface at the upper end thereof and each work-piece carrier having a complementary inclined side face and wherein the plurality of clamping devices are arranged on the side of the other one of the pair of side walls and during operation thereof urging the work-piece carriers into clamping contact with the first one of said pair of side walls, each one of the plurality of clamping devices comprising a slider having a tapered end which, in a clamping position, engages an opening of complementary shape of the work-piece carrier, and during movement of the slider into that clamping position, the slider is displaced toward the carrier and comes into engagement with the opening of complementary shape, whereby, firstly the carrier is adjusted in longitudinal direction of the guide rail and secondly the carrier is clamped.

4,924,998

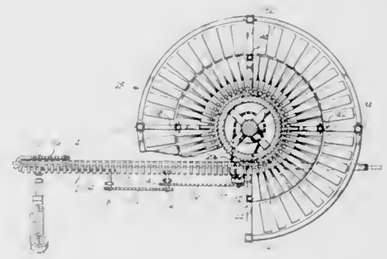
STORAGE MECHANISM FOR SORTED ARTICLES

Robert L. Fuller, Jr., Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 10, 1988, Ser. No. 269,991

Int. Cl.[5] B65G *47/46*

U.S. Cl. 198—365 **58 Claims**



1. An article storage mechanism, comprising:

frame positioned about a vertical axis;

a helical track supported on said frame, said helical track extending about said vertical axis and having a lower entrance end and an upper exit end;

an endless conveyor comprising a series of article carriers connected together and movable along an endless path; said helical track defining a portion of said endless path; and

a plurality of article receiving receptacles supported by said frame, radially outwardly from the helical track, each for receiving articles carried to it by said article carriers, wherein said plurality of article receiving receptacles is positioned in a helical pattern radially outwardly of the helical track.

4,924,999

PACKAGE TRANSFER SYSTEM

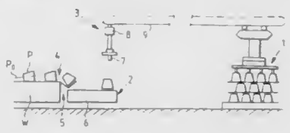
Shuichi Kikuchi, Shiga; Yoshio Yamamoto, and Yoshihiko Kawasaki, both of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 12, 1988, Ser. No. 217,873

Claims priority, application Japan, Jul. 21, 1987, 62-110602; Jul. 22, 1987, 62-180974

Int. Cl.[5] B65G *25/00*

U.S. Cl. 198—409 **14 Claims**



1. A package transfer system in which a plurality of packages, each having a longitudinal axis, are discharged from a discharge end of a winder with each respective longitudinal axis disposed substantially in a horizontal direction, for transferring the packages to a next stage with each respective axis aligned in a substantially vertical direction, comprising:

package aligning means located adjacent to the discharge end of the winder and adapted to align the discharged packages in a standby position with the respective axes in the vertical direction; and

a package transfer means for lifting and transferring the

VOL
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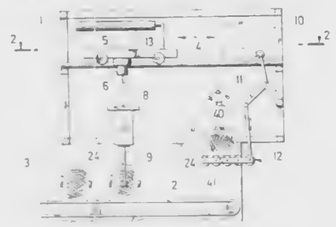
vertically aligned packages, wherein the package transfer means further comprises:
a guide rail defining a path between the winder and the next stage, the rail elevated above the winder and the next stage,
a movable carriage which is movable along the guide rail,
a lift plate vertically movably suspended from the carriage,
a bracket secured to the lift plate, and
a plurality of package holding devices provided on the bracket.

4,925,000

DEVICE FOR POSITIONING BOBBINS WITH YARN PACKAGES

Zdenka Pacáková , Cerven Kostelec; Pavel Brokl, Jiráskova, and Josef Kulhav , Zamberk, all of Czechoslovakia, assignors to Elitex, Koncern textilniho strojirenstvi, Czechoslovakia

Filed Jun. 30, 1989, Ser. No. 374,447
Claims priority, application Czechoslovakia, Jul. 4, 1988, 4814-88
Int. Cl.[5] B69G *47/24;* D01H *9/18*
U.S. Cl. 198—409 12 Claims



1. A system for handling bobbins with yarn packages prior to automated withdrawal of the bobbins from a textile spinning machine, said system comprising:
(A) a conveyor belt for conveying the bobbins to a first location;
(B) an automated barrier for automatically stopping said conveyor belt when one of the bobbins arrives at said first location;
(C) an independent withdrawal path for withdrawing the bobbin to a withdrawal location of the textile spinning machine;
(D) tilting means for tilting said independent withdrawal path into position to receive the bobbin;
(E) a movable transfer arm for lifting the bobbin from said first location and for positioning the bobbin on said independent withdrawal path in a desired orientation, said movable transfer arm including gripping arms for gripping the bobbin, said gripping arms including rotatable means for permitting the bobbin to rotate into the desired orientation when the bobbin is lifted from said first location; and
(F) a movable carriage for supporting and moving said movable transfer arm into position above said independent withdrawal path, said movable carriage including actuating means for causing said tilting means to tilt said independent withdrawal path into position to receive the bobbin when said movable transfer arm is moved by said movable carriage into position above said independent withdrawal path.

4,925,001

DEVICE FOR SUPPLYING GROUPS OF FILLED AND CLOSED CONTAINERS TO A DOWNSTREAM TREATMENT DEVICE

Daniël L. Möllenkamp, Amsterdam, Netherlands, assignor to Stork Amsterdam B.V., Netherlands

Filed May 12, 1988, Ser. No. 192,933
Claims priority, application Netherlands, May 13, 1987, 8701150
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—412 6 Claims



1. A device for supplying groups of filled and closed containers to a downstream treatment device, the device, comprising:
(a) a supply track, the containers being supplied by the supply track in a first position and in a closed relationship relative to each other for subsequent treatment;
(b) a distribution member which receives the containers disposed on the supply track, and separates the containers at a distance from each other;
(c) a positive-driven tilting wheel device, the positive-driven tilting wheel device having recesses disposed about the circumference for receiving containers, the containers being supplied to the positive-driven tilting wheel device from the distribution member spaced apart from each other, the positive-driven tilting wheel device being coupled to a first device;
(d) a downstream transport track which receives the containers from the positive-driven tilting wheel device disposed in a second position, the containers arriving on the downstream transport track with a predetermining spacing, the downstream transport track being coupled to the first drive; and
(e) a finger track extending along at least a section of the downstream transport track for moving the containers present on the downstream transport track to the downstream treatment device, the finger track being coupled to the first drive, the speed of the finger track being greater by a certain factor than the speed of the downstream transport track.

4,925,002

CONVEYORIZED SORTATION SYSTEM

John C. Williams, 770 Sweetbrier Dr., Memphis, Tenn. 38119

Filed Jun. 19, 1989, Ser. No. 367,871
Int. Cl.[5] B65G *47/12*
U.S. Cl. 198—445 6 Claims



1. Apparatus for sorting, conveying, and distributing packages comprising:
(a) An infeed conveyor having a belt which defines a package-supporting conveyor surface
(b) An inclined conveyor having a belt defining a package-supporting conveyor surface, said inclined conveyor being positioned in tandem and inclined with respect to said infeed conveyor;
(c) A divider plate assembly mounted above said infeed and inclined conveyors and having a plurality of divider plates extending longitudinally above said conveyor belts to divide said conveyor belts into a plurality of sort lanes: said divider plates being vertically adjustable with respect to said conveyor belts whereby said plates may be lowered to contact said conveyor belts to machine grooves therein;
(d) Conveyor end divider transition means having a sort lane aligned with each sort lane on said conveyor belts and positioned at the end of said inclined conveyor to receive packages conveyed thereon, said conveyor end divider transition section functioning to convey by gravity flow packages received from said inclined conveyor;
(e) Distribution transition means having a sort lane aligned with each sort lane in said conveyor end divider transition means and connected to said conveyor end divider transition means to receive packages conveyed therefrom and to convey by gravity flow such packages in pre-determined directions: and
(f) Discharge means having a chute aligned with each sort lane in said distribution transition means and connected to said distribution transition means to receive packages conveyed therefrom to convey by gravity flow packages received from said distribution transition section to desired locations.

4,925,003

APPARATUS FOR CONVERTING A MULTI-ROW STREAM OF UPRIGHT ARTICLES, IN PARTICULAR BOTTLES, TO A SINGLE ROW

Alfredo Limoni, Parma, Italy, assignor to Simonazzi A: & L. S.p.A., Parma, Italy

Filed Nov. 1, 1988, Ser. No. 265,597
Claims priority, application Italy, Dec. 4, 1987, 3718 A/87
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—452 1 Claim



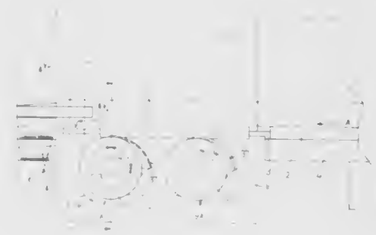
1. Apparatus for converting a multi-row stream of upright articles into a single row, comprising:
a rectilinear supply conveyor provided with two parallel guide surfaces,
an intermediate conveyor comprising a planar rotating disc,
a removal conveyor, and
a frame-fixed guide surface forming a spiral arc, said spiral arc having an originating point adjacent the center of said disc and extending spirally outwardly away from said originating point in a direction of the rotation of said disc, said spiral arc extending at least to the removal conveyor, one of said two parallel guide surfaces extending in an arc toward said originating point to merge with said spiral arc to form a continuous guide surface for guiding the articles from said supply conveyor to said rotating disc to said removal conveyor.

4,925,004

APPARATUS FOR CHANGING THE DIRECTION OF TRANSPORT OF ROD-SHAPED ARTICLES

Günter Menge, Hamburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 681,119
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346143
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—457 16 Claims



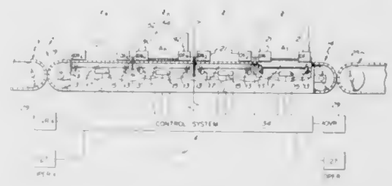
1. Apparatus for manipulating rod-shaped articles of the tobacco processing industry, comprising means for moving a file of rod-shaped articles in a first direction axially along a first path; means for advancing successive articles of the file along a second path and in a second direction at least substantially at right angles to said first direction; first and second hollow transfer members adjacent to said first path, rotatable about parallel axes and disposed one after the other, as considered in said first direction; said members having peripheral surfaces each including at least one first section of a smaller first radius and at least one second section of a gradually increasing second radius, at least said second sections being arranged to impart to oncoming articles a component of movement in said second direction, each of said transfer members including a foraminous wall defining a predetermining portion of the respective peripheral surface; drive means for rotating said transfer members in the same direction; and means for establishing a pressure differential at the opposite sides of said foraminous walls so that said predetermined portions of the respective peripheral surfaces attract the adjacent articles to the corresponding transfer members.

4,925,005

ACCUMULATING CONVEYOR

Daniel H. Keller, Sanford, Fla., assignor to Simplimatic Engineering Company, Lynchburg, Va.

Filed Oct. 13, 1988, Ser. No. 257,221
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—460 39 Claims



1. An accumulating conveyor having a plurality of zones between opposite ends of said conveyor, said conveyor having continuously operable drive means extending through said

VOL
1114
ISS
3
MY
15
1990
UMI

zones for engaging articles on said conveyor to propel said articles through said zones along a conveyor path from a generally upstream to a generally downstream position in either a first direction towards a selected one of said ends or a second direction opposite said first direction towards said opposite end, said conveyor comprising:

(a) means for selecting in which direction said drive means is to propel articles;

(b) a plurality of selectively operable means for disengaging said articles from said drive means to halt the progress of said articles along said conveyor in the direction of said drive means, there being at least one such disengaging means associated with each zone;

(c) means associated with each zone for sensing the presence or absence of an article within said zone of each sensing means;

(d) means for activating said disengaging means to halt an article in response to both said article being sensed by said sensing means associated with said zone and also another article being halted in an immediately downstream adjacent zone, said activating means being responsive to said selecting means to determine in which direction articles will be accumulated.

4,925,006

CONVEYOR APPARATUS HAVING MEANS FOR A SHOCK-FREE ARTICLE ACCELERATION

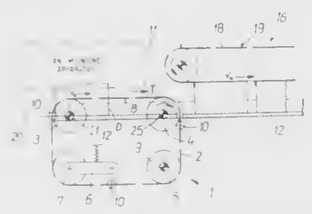
Norbert Lentz, and Harald Schmidt, both of Essen, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 24, 1988, Ser. No. 211,554

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1988, 3720804

Int. Cl.[5] B65G *47/31*

U.S. Cl. 198—461 5 Claims



1. A conveyor apparatus for sequentially advancing articles along a predetermined path along a conveying direction in which, beginning at a starting location, the velocity of the article in the conveying direction is progressively and continuously increased until it reaches a first conveying velocity which remains substantially constant along the predetermined path until the article reaches a second location along the predetermined path, after which the velocity of the article diminishes continuously and smoothly to a second conveying velocity when the article reaches a third location, comprising:

(a) two substantially parallel endless pulling elements, a pair of spaced first end wheels having a first rotary axis, a pair of spaced second end wheels having a second rotary axis, each of said pulling elements being supported about a respective one of said first end wheels and a respective one of said second end wheels; each of said pulling elements having a working flight extending between the respective first and second end wheels which is oriented parallel to said conveying direction;

(b) a plurality of substantially parallel article advancing bars each having two ends connected respectively to each of said two pulling elements, each advancing bar being oriented substantially perpendicularly to said conveying direction;

(c) drive means for effecting travel of said pulling elements at the first conveying velocity along said working flight and with a circumferential velocity about each of said first and second end wheels which equals said first conveying velocity; and

(d) a stationary article supporting surface extending in a direction which is substantially parallel to said conveying direction, said supporting surface having a portion which extends between said pair of first and second end wheels along the predetermined path beginning at said starting location and extending a fixed distance beyond said second end wheels in said conveying direction to said third location for supporting the articles as the articles are pushed along said article supporting surface in said conveying direction by respective ones of said article advancing bars; said starting location being disposed adjacent said pair of first end wheels for sequentially receiving the articles to be engaged by respective ones of said article advancing bars relative to said pair of first end wheels such that an article which is initially stationary and is located at said starting location is first contacted by an approaching one of said article advancing bars at an instant when said approaching one of said article advancing bars is moving at an angle to said conveying direction which is at most equal to 45°, such that, at said instant of contact between said respective article advancing bar and the article at said starting location, a velocity component in said conveying direction of said circumferential-velocity of said approaching one of said article advancing bars is at most approximately 71% of said first conveying velocity, and after said instant of contact said velocity component in said conveying direction of the one of said article advancing bars contacting the article progressively and continuously increases until reaching said first conveying velocity; when the respective one of said advancing bars advances the article to the second location, disposed adjacent said pair of second end wheels, the respective one of said advancing bars at said second location travels about said rotary axis of said second end wheels in a circumferential direction such that, beginning at said second location, the articles are advanced in said conveying direction at a progressively and continuously diminishing speed along said stationary article supporting surface until the article reaches the third location at which the velocity of the article in the conveying direction equals said second conveying velocity.

4,925,007

ELECTRICAL LEAD PARKING AND SORTING STATION

Michael Gerst, Worms; Horst J. T. Knapp, Gross-Zimmern, and Werner Maack, Seehelm, all of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 19, 1988, Ser. No. 158,963

Claims priority, application United Kingdom, Apr. 7, 1987, 8708279

Int. Cl.[5] B65G *47/86*

U.S. Cl. 198—470.1 10 Claims

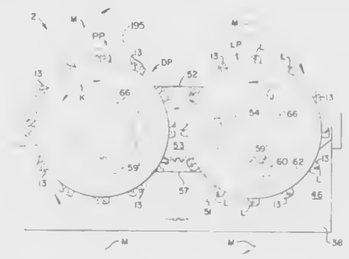
1. An electrical lead parking and sorting station for receiving electrical leads and presenting the leads for pick up, in a predetermined order according to a program, comprising a support structure;

a lead carrier support mounted to the support structure for swinging movement relative thereto;

a pair of lead carriers each connected to the lead carrier support for rotation relative thereto, and each having a series of pairs of lead gripping jaws constantly spaced from each other about its axis of rotation and jaw drive units for individually and sequentially opening and closing the pairs of jaws as determined by said program;

a lead carrier support drive unit actuable to swing the lead carrier support relative to said support structure thereby to swing each lead carrier in turn between a lead loading first position and a lead sorting and discharge second position; and

lead carrier drive means actuable intermittently to rotate each lead carrier through equal angular first steps about its



axis when the lead carrier is in its first position and bidirectionally through unequal, angular second steps about its axis as determined by the program, when the lead carrier is in its second position.

4,925,008

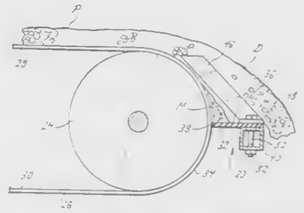
CONVEYOR BELT CLEANER AND METHOD FOR CLEANING A CONVEYOR BELT

Charles H. Blosser, Junction City, Ohio, assignor to Peabody Coal Company, St. Louis, Mo.

Filed Nov. 25, 1988, Ser. No. 275,963

Int. Cl.[5] B65G *45/00*

U.S. Cl. 198—497 9 Claims



1. A conveyor belt cleaner adapted for use with a conveyor for product such as broken-up coal comprising a frame, an endless belt, and means on the frame guiding the belt for travel in a forward-moving upper reach and a return reach for conveying product on the upper reach to a discharge end thereof, the guiding means including a generally horizontal roller at the discharge end around which the belt travels from the upper to the return reach, the conveyor belt cleaner adapted for cleaning the outer surface of the belt of particles of product which may otherwise cling to the outer surface of the belt and be carried around thereon past the roller, the conveyor belt cleaner comprising a member extending generally horizontally adjacent the outer surface of the portion of the belt travelling around the roller for supporting a mass of particles of product in wiping contact with the outer surface of the portion of the belt travelling around the roller, the member having an upwardly facing surface for supporting the mass of particles and an edge adjacent to but spaced at all times from the outer surface of the portion of the belt traveling around the roller so that the sole contact with the outer surface of the portion of the belt is that of the mass of particles, the mass of particles conforming to the contour of the outer surface of the portion of the belt, particles coming down and around the roller on the outer surface of the belt being trapped by the mass and the mass being packed against the outer surface of the portion of the belt for wiping the surface.

4,925,009

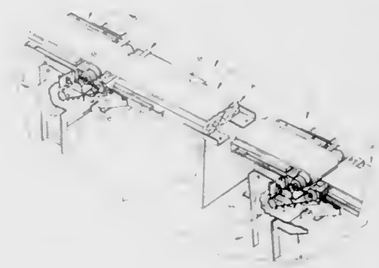
PORTABLE CONVEYOR

Reinler Hill, Hamilton, Canada, assignor to AEC Machinery Limited, Hamilton, Canada

Filed Nov. 2, 1987, Ser. No. 115,749

Int. Cl.[5] B65G *21/06*

U.S. Cl. 198—583 17 Claims



1. A conveyor device comprising a drive station and a follower station, each of which has a roller with a peripheral surface to carry a reversing portion of a continuous belt, and mounting means to mount each of said stations with one end portion of a plank defining a belt support surface so as to align said belt support surface with said peripheral surface, said plank having a structural integrity to support articles carried by said belt; said drive station including a support section to maintain said belt support surface at a given elevation; said drive station having a first coupling means and said follower station having a second coupling means complementary with said first coupling means for interconnection therewith when a pair of said conveyor devices are coupled together; said first and second coupling means being arranged to enable said support section to maintain the belt support surface of an adjacent conveyor at said given elevation; said first and second coupling means being arranged to connect said drive and follower end stations together in one of a number of alternative positions; said first and second coupling means including releasable locking means for releasably locking said drive and follower stations when coupled together; and wherein said releasable locking means includes a lever pivoted to said follower station and arranged for abutment with a frame portion of said drive station, so as to inhibit release of said first and second coupling means.

4,925,010

LOADING OF POURABLE GOODS

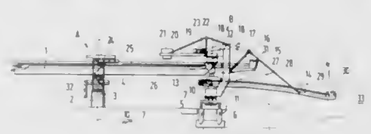
Jaakko T. Pallasvirta, Monheim, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 11, 1987, Ser. No. 61,703

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619548

Int. Cl.[5] B65G *15/26*

U.S. Cl. 198—588 14 Claims



1. Loading device including a bridge with a first conveyer

VOL
1114
ISS
3
MY
15
1990
UMI

belt, the device provided for delivering pourable goods to a particular destination comprising:

tower means for pivot-mounting and supporting the bridge, said bridge pivoting about a vertical axis and being provided for longitudinally sliding on the tower means;

one end of the bridge being provided for discharge and transfer of goods from the first conveyer;

a support carriage for running on straight rail means along a quay or the like, the rail means not being in line with said tower means, the carriage having wheel means to provide additional support points for the bridge on the rail means;

a carrier frame from mounting said end of the bridge to the carriage; and

a depositing device with extending structure being pivoted about a vertical axis in an area of said frame mounting, and receiving pourable goods from said first conveyer belt and delivering the goods for depositing by and at an end of said extended structure onto said particular destination.

4,925,011

METHOD AND APPARATUS FOR CONVEYING PLATE-LIKE PARTS OF DIFFERENT THICKNESS

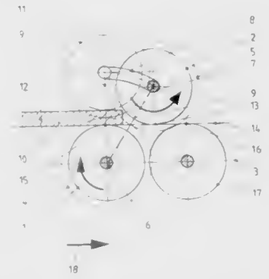
Thomas Kosikowski, Burgthann, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 6, 1989, Ser. No. 362,330

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1988, 3819570

Int. Cl.[5] **B65G** *29/00*

U.S. Cl. 198—624 **9 Claims**



1. In an apparatus for continuously conveying a plate-like object, especially a circuit board, having a variable thickness in a substantially horizontal direction, comprising an upper roller, having an upper roller bearing and an associated lower roller, having a lower roller bearing with a bearing center point between which said plate-like object is guided, and a gear-tooth system, having a plurality of gear teeth for driving said upper roller by said lower roller, the improvement wherein said gear-tooth system is structured to provide a constant axial spacing between said lower roller and said upper roller, and a circular arc-shaped coulisse is provided, having an arc center point and an arc radius, said upper roller bearing of said upper roller has a corresponding number of said gear teeth being mounted in said circular arc shaped coulisse, said arc center point of said circular arc-shaped coulisse is positioned at said bearing center point of said lower roller, and said arc radius corresponds to said axial spacing provided by said gear-tooth system.

4,925,012

DEVICE FOR THE POSITIONALLY ACCURATE TRANSPORT OF CONTAINERS

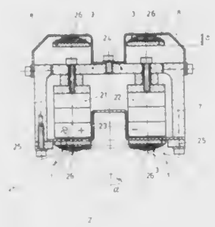
August Guntensperger, Ruti, Switzerland, assignor to Prazisions-Werkzeuge AG, Ruit, Switzerland

Filed May 9, 1988, Ser. No. 191,369

Claims priority, application Switzerland, May 11, 1987, 1783/87

Int. Cl.[5] **B65G** *15/58*

U.S. Cl. 198—690.1 **14 Claims**



1. Device for the positionally accurate transport of containers, characterized in that the device comprises an endless flat conveyor belt arrangement including two endless parallel belts having respective parallel convex load-bearing surfaces for taking into account differing cross-sectional contours of the containers, said convex load-bearing surfaces being steadily arched, crosswise to the transport direction of the conveyor arrangement, and wherein the radius of curvature of each of the convex load-bearing surfaces is substantially larger than the thickness of the associated flat conveyor belt in the zone of the load-bearing surfaces, wherein the flat conveyor belt arrangement comprises two flat conveyor belts arranged in parallel to each other, lying preferably in one plane, including in each case a convex load-bearing surface, and traveling at identical speed, the flatness of said flat conveyor belts being such that each belt has a width in a direction crosswise to the transport direction of the conveyor arrangement which is substantially larger than the thickness thereof.

4,925,013

CONVEYOR BELT HAVING A HIGH FRICTION CONVEYING SURFACE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.

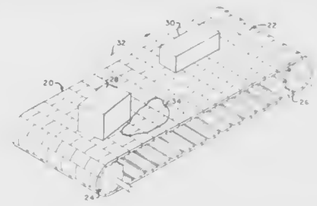
Continuation of Ser. No. 4,789, Jan. 8, 1987, abandoned, which is a continuation of Ser. No. 642,533, Aug. 20, 1984, abandoned. This application Sep. 6, 1988, Ser. No. 241,789

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] **B65G** *15/42*

U.S. Cl. 198—698 **25 Claims**

1. A pivotally linked conveyor belt comprising a plurality of similar modules having first and second pluralities of pivot ends adapted to be pivotally connected end-to-end and side-by-side, said first plurality of pivot ends located a selected pitch dimension from said second plurality of pivot ends and further joined and maintained parallel to said second plurality of pivot ends by an intermediate section, said modules being integrally molded from a low friction inherently slick plastic material, said intermediate section of selected ones of said modules defining a recess and an overhang extending over said recess on the upper side of the module for removably receiving a frictional member made of a resilient materials, said member having a dimension extending between said first and second pluralities which is fully within said intermediate section, the fictional characteristics of said resilient material being substantially greater than said inherently slick plastic material so that the belt has a low friction on its bottom side and a higher friction on the upper side of said selected modules.



4,925,014

TRANSPORT ROLLER FOR GLASS COOLING PASSAGES

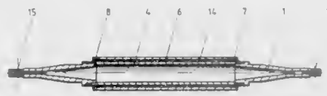
Michael Haite, Erkrath, Fed. Rep. of Germany, assignor to Pose-Marre Edelstahlwerk GmbH, Erkrath, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 156,292

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704744

Int. Cl.[5] **B65G** *13/02*

U.S. Cl. 198—780 **8 Claims**



1. A transport roller for glass cooling passages, comprising:

two trunnions;

a tube having one of the trunnions connected at each end thereof;

an outer cylinder arranged around the tube and between the trunnions so as to be axially displaceable at least in the region of one of the trunnions; and

support members arranged in the region of the ends of the outer cylinder so as to connect the outer cylinder to the trunnions so that the support members are the sole support of the outer cylinder on the tube, the support members supporting the outer cylinder so that a space exists radially between the outer cylinder and the tube, at least one of the support members being provided so as to prevent relative rotation between the outer cylinder and the tube.

4,925,015

VARIABLE POSITION CARRIER BODY

Robert M. Veida, Ellington, and Harold L. Osthus, West Willington, both of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Division of Ser. No. 216,094, Jul. 7, 1988, Pat. No. 4,848,538. This application Apr. 21, 1989, Ser. No. 342,229

Int. Cl.[5] **B65G** *47/90*

U.S. Cl. 198—803.7 **14 Claims**

1. A hanger for use in conveyor systems for transporting units of limp material from work station to work station, said hanger comprising:

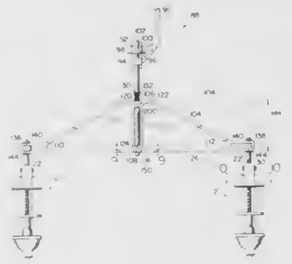
a carrier portion;

a carrier body having an opening formed therein, said opening having a first and second end;

a carrier shaft having a first end and a second end, said first end of said shaft having at least one transversely fixed and laterally extending projection, said carrier body being rotatably mounted on said carrier shaft such that said opening in said carrier body rotatably receives said carrier shaft with one of said carrier body first and second ends being oriented adjacently to the at least one transversely fixed projection,

a support portion fixed to said carrier portion and having means for attaching said carrier shaft second end thereto;

at least two diametrically opposed slots formed in the carrier body adjacent at least one of said first and second ends of said carrier body opening said at least two diametrically opposed slots cooperating respectively with said at least



one transversely fixed projection on said carrier shaft to prevent rotation of said carrier body when said at least two slots engage said at least one transversely fixed projection;

said carrier body further including gripping means for carrying work material; and

biasing means mounted on said carrier shaft for urging said at least two slots to engage said at least one transversely fixed projection such that the orientation of said gripping means can be changed by moving said carrier body against the bias of said biasing means and rotating it through to another selected orientation.

4,925,016

HEAVY DUTY MODULAR CONVEYOR BELT AND SPROCKET WITH UNIQUE TRACKING

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.

Continuation-in-part of Ser. No. 105,011, Oct. 6, 1987. This application Jan. 26, 1989, Ser. No. 302,452

Int. Cl.[5] **B65G** *23/06*

U.S. Cl. 198—834 **9 Claims**



1. Conveyor apparatus having a smooth top surface comprising:

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a multiplicity of modules each having a top and bottom, a pair of edges and a first and second end, said multiplicity of modules being aligned end-to-end in a direction of travel and further including,

first and second pluralities of link ends located at said first and second ends respectively,

said link ends of said first plurality defining pivotal apertures arranged along a first pivotal axis and said link ends of said second plurality defining pivotal apertures aligned along a second pivot axis, each plurality of link ends of each module being intermeshed with link ends of another module such that said first and second pivot axis are aligned,

said first and second pluralities of link ends having a topmost portion and a bottom portion, said topmost portion having a width selected such that said topmost portion of said intermeshed link ends are substantially in contact and provide a smooth top surface, and said bottom portion having a width selected such that a space of a selected size is provided between adjacent bottom portions of such intermeshed link ends,

an integrally molded connecting structure, having a lower portion and a smooth top surface, for joining said first and second pluralities of link ends, said connecting structure including a tooth member integrally molded to said lower portion, and located substantially midway between said first and second pluralities of link ends, said integrally molded tooth member having a driving surface defined on at least one side of said toothed member for receiving a driving force to move said module and a conveyor belt constructed from said multiplicity of modules in said direction of travel;

a multiplicity of pivot rods extending through said pivotal apertures of said intermeshed first and second pluralities of link ends to form a conveyor belt; and

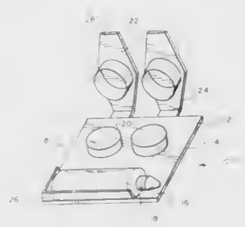
a plurality of drive sprockets arranged in driving relationship along a shaft oriented transverse to said direction of travel, each of said sprockets including a plurality of recesses located around the perimeter of said sprockets for receiving said tooth members of said modules and for providing driving forces to said module, and a plurality of teeth located between said recesses around said perimeter, said teeth having a width less than said space and extending radially from said perimeter such that said teeth extend into said spaces provided between said bottom portions of said intermeshed link ends.

4,925,017

CONTACT LENS STORAGE KIT

Kyle P. Jessen, Ogden, Utah, assignor to EEK, Inc., Ogden, Utah

Filed May 22, 1989, Ser. No. 355,453
Int. Cl.[5] A45C *11/04*
U.S. Cl. 206—5.1 9 Claims



1. A temporary storage contact lens kit comprising:

a. a storage case having a base with a bottle storage area surrounded by ridge structure defining an open topped storage compartment sized to accommodate at least one bottle containing contact lens cleaning and storage fluid, and a lens storage area upon which a pair of open topped storage cups are attached and structured to hold a pair of contact lenses,

b. a pair of removable caps attached to the base and sized to secure and fluid seal the opening of each respective storage cup to hold within said cup a contact lens and various types of lens cleaning and storage contact lens solutions,

c. an openable storage bottle containing desired lens cleaning and storage solutions removably mounted onto the bottle storage area, and

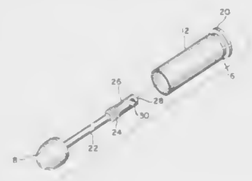
d. flaps attached to the caps which extend beyond said caps and cover the bottle to hold said bottle within the storage compartment when the cap covers the cup.

4,925,018

BULLET KEY BOB

Andrzej Hajduk, 307 E. Lake Shore Dr., Round Lake Park, Ill. 60073

Filed Aug. 21, 1989, Ser. No. 396,531
Int. Cl.[5] B65D *85/00;* A45C *11/00*
U.S. Cl. 206—38.1 7 Claims



1. A key ring bob comprising:

(a) a hollow body having an open end and an other end;

(b) a cap adapted to enclose said open end of said hollow body;

(c) a stem axially attached to said cap at generally the center thereof, said stem extending rearwardly from said cap and adapted to be inserted through said open end of said hollow body, said stem further having a threaded portion along its length;

(d) a base portion enclosing said other end of said hollow body, said base portion having a threaded hole to operatively engage said threaded portion of said stem, such that a portion of the free end of said stem protrudes through said threaded hole; and

(e) means for connecting said key ring bob to a key ring or the like.

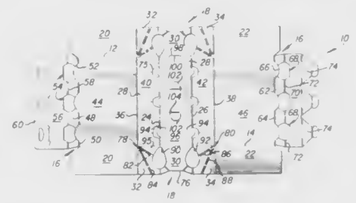
4,925,019

ARTICLE CARRIER WITH END PANELS

Robert H. Ganz, Saddle River, N.J., and Robert L. Sutherland, Campbell Hall, N.Y., assignors to Federal Paper Board, Montvale, N.J.

Filed Nov. 16, 1988, Ser. No. 271,854
Int. Cl.[5] B65D *65/12, 65/28*
U.S. Cl. 206—145 20 Claims

1. In a wraparound article carrier of the type including a central top panel, downwardly and outwardly sloping top panels, side panels, and interconnected bottom panels, an end panel construction comprising a trap gusset unit including panels hingedly connected to said central and sloping top



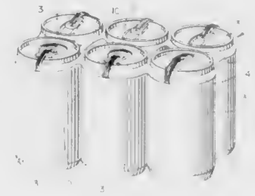
panels and to one another, and end doors hingedly connected to both said trap gusset and a respective one of said side panels.

4,925,020

ENVIRONMENTALLY SOUND CARRIER PACKAGE

Joan E. Gordon, 260 E. Chestnut St., Chicago, Ill. 60611

Filed Jul. 25, 1989, Ser. No. 385,228
Int. Cl.[5] B65D *75/58*
U.S. Cl. 206—150 26 Claims



1. A container package comprising:

a series of similarly configured containers;

a series of interconnected rings formed from a resilient deformable material, each surrounding and engaging one of said array of containers for maintaining said containers in adjacent relation and having a weakened portion extending across the girth of said ring; and

connection means for linking each said ring to the container with which it is engaged such that on removal of said container from said engaging ring, stress applied to said ring by said connection means ruptures said ring at said weakened portion.

4,925,021

THREE-SECTION SUITCASE

John V. Pulichino, Jr., Providence, R.I., assignor to American Tourister, Inc., Warren, R.I.

Filed Jun. 26, 1989, Ser. No. 371,107
Int. Cl.[5] A45G *5/12, 13/00*
U.S. Cl. 206—279 10 Claims

1. A suitcase comprising,

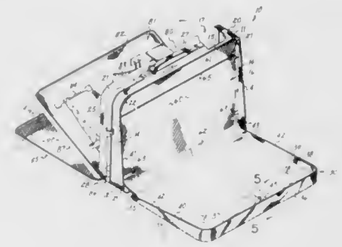
a generally rectangular container having a bottom wall, top wall, end walls, parallel side walls, and a central divider generally parallel to said side walls,

a lid forming one of said side walls of said container, means for hingedly connecting said lid along one edge to said bottom wall,

a slide fastener for connecting the remaining edges of said lid to said end and top walls,

said lid having a top edge and a wide top rim projecting from said top edge, said rim being terminated at its edge by said slide fastener,

said lid having side edges and, on each side edge, a side rim tapering from said wide top rim to said hinge adjacent the bottom edge of said lid, where said side rim is narrow,



whereby closing said slide fastener around corners adjacent said hinge connection is facilitated.

4,925,022

PANTYHOSE PACKAGE

Michael J. Hodges, High Wycombe, England, assignor to Detexomat Machinery Limited, Buckinghamshire, England

Division of Ser. No. 285,120, Dec. 16, 1988, which is a continuation of Ser. No. 73,017, Jul. 14, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 380,899
Claims priority, application United Kingdom, Sep. 11, 1986, 8621957
Int. Cl.[5] B65D *25/20*
U.S. Cl. 206—296 5 Claims



1. A pantihose garment packaged for sale, wherein a former inserted inside one of the legs of the pantihose maintains at least a portion of that leg stretched flat thereon, and the remainder of the garment is placed behind the portion of the leg containing the former so that a layer of the leg is exposed to view, stretched flat and backed by the former.

4,925,023

COMPACT DISC PACKAGE

Jeffrey P. Goldblatt, 128 Parkside Crescent, Rochester, N.Y. 14617, and Paul R. Gassman, 87 Berehaven Dr., Amherst, N.Y. 14120

Filed Jun. 6, 1989, Ser. No. 362,096
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—309 27 Claims

1. A blank for forming a package for a compact disc jewel box, comprising:

(a) a sheet;

(b) said sheet having a front panel, a first side panel adjacent said front panel, a back panel adjacent said first side panel, a second side panel adjacent said back panel, and a security panel adjacent said second side panel;

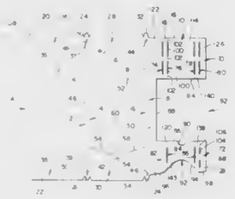
(c) each of said panels including a common hinge line interconnecting said adjacent panels;

(d) said sheet being adapted for forming a package having

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said front, back, first and second side panels, first and second ends, and an intermediate portion;
(e) said front, back, first and second side panels each having first and second end flaps;
(f) each of said end flaps including a common hinge line interconnecting each of said end flaps to its respective panel;
(g) said end flaps being adapted for closing said first and second ends of said package; and
(h) said security panel including a cut-out in an intermediate portion thereof substantially spaced from said first and second ends of said package when said sheet is erected into said package for forming a pocket means therein for positioning the jewel box in said intermediate portion of said package.

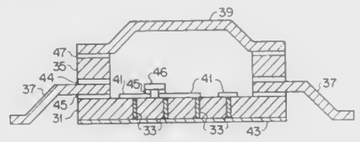
15. A package for a compact disc jewel box, comprising:
(a) a receptacle having a front panel, a back panel, opposed side panels, a closed first end and an open second end;



(b) said receptacle being adapted for the jewel box to fit therein;
(c) said receptacle being substantially longer than the length of the jewel box;
(d) said receptacle having an intermediate portion substantially spaced from said first and second ends for positioning the jewel box therein;
(e) means operably associated with said front and back panels and one of said opposed side panels for preventing the jewel box from shifting position within said receptacle when the jewel box is positioned in said intermediate portion;
(f) said preventing means including collapsible insertion means automatically operable from the passage of the jewel box into said intermediate portion for permitting the jewel box to be inserted into said receptacle from said open second end, and
(g) means for closing said open second end.

4,925,024
HERMETIC HIGH FREQUENCY SURFACE MOUNT MICROELECTRONIC PACKAGE
John C. Ellenberger; Inbae Yoo, both of Santa Clara, and Eugene V. Burdick, Santa Rosa, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 136,465, Dec. 21, 1987, abandoned, which is a continuation of Ser. No. 832,921, Feb. 24, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 239,018
Int. Cl.[5] B65D *73/02*
U.S. Cl. 206—328 **9 Claims**

1. A hermetically sealed package for microelectronic circuits comprising:
a ceramic base having a top surface for holding microelectronic circuit elements and a bottom surface, with hermetically sealed conductive vias extending through the base from the top surface to the bottom surface;
a plurality of conductive leads attached to circuit elements on the top surface of the base with a conductive heat flowable material that forms a hermetic seal, said leads extending from the sides of the package to provide electrical connections to the circuit in the package;
a ceramic frame forming the side walls of the package sealed to the top surface of the base and to the leads with a nonconducting heat flowable material that forms a hermetic seal and having a top surface with a metallized layer; and



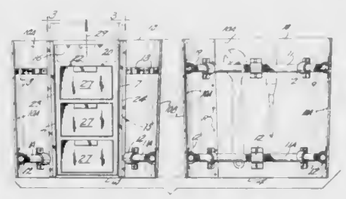
a lid having a solderable bottom surface hermetically sealed to the metallized top surface of the frame.

4,925,025
POINT OF PURCHASE DISPLAY
Lewis Anten, 17423 Rancho, and Arnold Rubio, 17437 Palora St., both of Encino, Calif. 91316
Filed May 26, 1989, Ser. No. 357,115
Int. Cl.[5] B65D *85/68*
U.S. Cl. 206—335 **9 Claims**



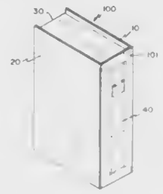
9. The point of purchase of claim 8 in which said means for activating said circuit is accessible through an opening in said packaging.

4,925,026
TOOL HOLDER INSERT FOR A BUCKET
Richard S. McKay, 1781 Sumner Rd., Coos Bay, Oreg. 97420
Filed Jun. 12, 1989, Ser. No. 364,113
Int. Cl.[5] B65D *85/20*
U.S. Cl. 206—373 **8 Claims**



1. An insert for a container having a circular interior surface and a handle, said insert comprising,
a wall component of frustoconical shape for engagement with said interior surface of the container, said wall component including a cabinet, and
tool retainer means on said wall component including a horizontal elongate spiral spring, bracket means on said wall component holding said spring against the wall component to bias tools inserted between the spring and the wall component against the latter.

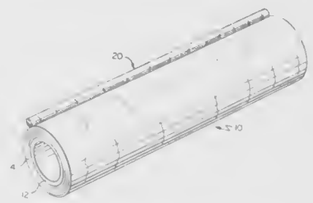
4,925,027
CASSETTE CONTAINER
Paul F. Roze, 8, rue de la Lande Seche, Cesson-Sevigne, France (35510)
Filed May 11, 1989, Ser. No. 350,439
Int. Cl.[5] A47B *81/06*
U.S. Cl. 206—387 **10 Claims**



1. A storage container for a plurality of items, such as cassettes comprising:
an open-top casing member including a bottom wall, a pair of side walls, and a pair of end walls and defining an interior storage compartment;
a top cover member pivotably connected to one side wall of said casing member and adapted to close said storage compartment;
first and second insert members disposed within said storage compartment, each of said insert members being supported along a side wall of said casing member, and each of said insert members having a partition wall extending parallel to and spaced from the adjacent side wall of said casing member, each of said partition walls having a top edge and a bottom edge;
a plurality of parallel, spaced-apart retaining members provided in said storage compartment and defining therebetween a plurality of allocated storage spaces in said storage compartment, each storage space being adapted for receiving therein an item to be stored; and
string means operatively associated with each of said allocated storage spaces for facilitating removal of the items from said storage spaces one end of said string means being secured to the partition wall of said first insert member at a position intermediate the top and bottom edges of said partition wall of said first insert member, said string means extending along the bottom wall of said casing member in said allocated storage space, and upwardly through an aperture in the partition wall of said second insert member, the opposite end of said string means extending outside said second insert member, said aperture being located in a position intermediate the top and bottom edges of the partition wall of said second insert member.

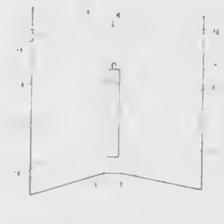
4,925,028
ROLL TAB FOR A ROLL OF PLASTIC FILM AND APPARATUS FOR PRODUCING SAME
Terry B. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 153,115, Feb. 8, 1988, Pat. No. 4,804,513. This application Oct. 31, 1988, Ser. No. 264,815
Int. Cl.[5] B65D *85/671*
U.S. Cl. 206—389 **4 Claims**

1. A roll of plastic film, wound on a core which comprises: a core; and,
plastic film wound on said core, and plastic film having a clinging surface and an untreated tail end portion on the surface of said roll, said tail end portion terminating at a tail edge, said tail edge being rolled back on said tail end portion to form a rolled tab containing said tail edge;



whereby, said rolled tab facilitates identifying and grasping said tail edge to initiate use of said roll.

4,925,029
COMBINATION MAILER
Dale Friedman, East Brunswick, and Louis P. Mennella, Princeton Junction, both of N.J., assignors to Innovative Sampling Technologies Inc., New York, N.Y.
Filed Mar. 17, 1989, Ser. No. 325,236
Int. Cl.[5] B65D *73/00, 81/02*
U.S. Cl. 206—473 **22 Claims**



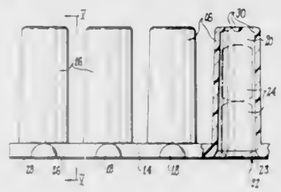
1. A package comprising
a jacket having a pair of opposable leaves, at least one of said leaves having a first sheet and a second sheet sealed along spaced sealing lines to form a storage cavity therebetween for retaining a first fluent material, and
means for retaining a product between said leaves so as to be protected from mechanical shock by said first fluent material stored within said at least one of said leaves.

4,925,030
CARTRIDGE
Keith V. Ball, Burwood, Australia, assignor to Schering Agrochemicals Limited, Cambridge, England
Filed Sep. 19, 1988, Ser. No. 246,345
Claims priority, application Australia, Sep. 21, 1987, PI4473
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—487 **17 Claims**

1. A cartridge adapted for use in transporting pellets for use in an implant gun and enabling at least one pellet to be ejected from the cartridge and dispensed by the gun in each successive actuation of the gun, the cartridge comprising:
(a) an elongate cartridge body having an elongate carrier strip with first and second major faces; and,
(b) spaced along and formed integrally with the carrier strip, a plurality of substantially uniformly spaced holders for respective pellets, each holder defining a respective cavity such that each holder is able to hold at least one pellet for transport through said implant gun;
(i) wherein each holder projects perpendicularly from the

first major face of the strip, along an axis of said holder extending away from said second major face;

(ii) each holder having first and second opposed openings communicating with said cavity, with the first opening of each holder being defined at an end thereof remote from said strip and the second opening thereof comprising a respective opening through said strip and accessible from said second major face of said strip; and,



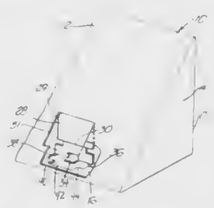
(iii) wherein said strip has a plurality of integrally formed tabs therealong at a spacing between successive tabs substantially corresponding to the spacing between the axes of successive said holders, said tabs providing means by which said cartridge body can be indexed along a guideway and projecting laterally from at least one side of said strip with respect to said major faces and the axes of said holders.

4,925,031

DISPLAY HAVING CONTAINER MEANS

Karen D. Collins, Muncie, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 27, 1989, Ser. No. 329,176
Int. Cl.[5] B65D *5/52*
U.S. Cl. 206—486 3 Claims



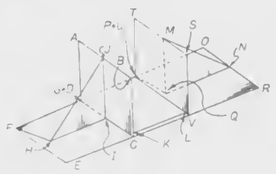
1. An advertising display having a container comprising, a display member having a lower support panel that is adapted to rest on a support and a front panel extending from said lower support panel, said lower support panel having an integral locking brace pivotally connected to said lower support panel and extending upwardly therefrom toward said front panel, the upper edge of said locking brace being completely disconnected from said front panel, an opening in said front panel, and a container have a box portion projecting through said opening in said front panel, the bottom of said box portion engaging portions of said lower support panel and a rear portion of said box portion engaging said locking brace, said locking brace preventing rearward movement of said container relative to said display member.

4,925,032

DEVICE FOR HOLDING TACOS AND OTHER FOODS

Donald T. Liles, Midland, Mich., assignor to D and D Enterprises, Midland, Mich.

Filed Jul. 23, 1986, Ser. No. 888,509
Int. Cl.[5] B65D *1/34*
U.S. Cl. 206—564 3 Claims



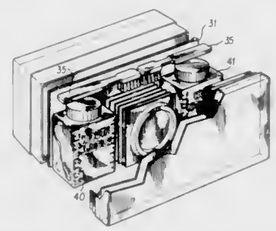
1. A holder for supporting a comestible product such as a taco or the like comprising a single piece body formed by folding a planar material into a shape having a pair of flaps forming flat rectangular, parallel walls projecting upwardly from, and perpendicular to, a horizontal base which extends outwardly from the junctures of the walls and the base, whereby the parallel vertical walls are supported and maintained upright by generally triangularly shaped vertical flaps which are perpendicular to both the walls and the base, whereby said parallel walls and base form a three sided receiving trough into which can be placed said comestible product so as to be vertically positioned and supported, whereby said comestible product is so maintained during both addition of fillings and consumption as to minimize loss of the fillings until the comestible product is completely consumed.

4,925,033

MICROBICIDAL CLEANSER/BARRIER KIT

Fred L. Stoner, P.O. Box 70570, Las Vegas, Nev. 89170-0570

Continuation-in-part of Ser. No. 184,842, Apr. 22, 1988. This application Aug. 18, 1988, Ser. No. 233,563
Int. Cl.[5] B65D *71/00*
U.S. Cl. 206—581 10 Claims



1. A prophylactic kit for use in connection with sexual intercourse and related intimate contacts between partners, which comprises:

a sealed enclosure, and therein:

a condom;

a first container holding a quantity of a first liquid solution of povidone-iodine;

a second container holding a quantity of a second liquid solution of povidone-iodine;

wherein said first solution is formulated for topical applications, and said second solution is formulated for use as a mouthwash; and

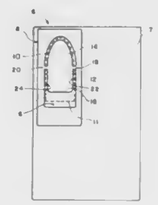
written indications and instructions for use of the kit before and after said sexual intercourse and related intimate contacts.

4,925,034

PACKAGE FITMENT

Arthur R. Robichaud, Worthington; Frank R. Wilgus; Warren C. Tyler, both of Powell, all of Ohio, and Jack Holmes, Cowiche, Wash., assignors to Combibloc, Inc., Columbus, Ohio

Filed May 19, 1989, Ser. No. 354,365
Int. Cl.[5] B65D *5/70*
U.S. Cl. 206—603 13 Claims



1. A fitment attachable to a package having a score line forming an openable flap, the fitment comprising:

a base having upper and lower surfaces and a longitudinally extending opening which at least partially overlies the openable flap of a package when the fitment is attached to the package, the opening having two longitudinal sides;

a tab pivotally connected to the base at the opposite sides of the base opening through a frangible connection and overlying the openable flap when the fitment is attached to the package and being normally co-planar with the base, and having upper and lower surfaces and forward and rearward portions, the forward and rearward portions being defined by a pivot axis of the tab; and

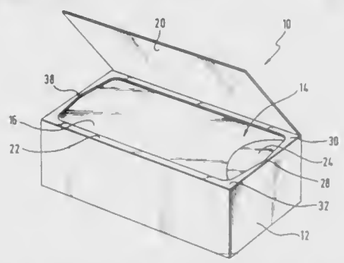
means for attaching the lower surface of the base and forward portion of the tab to a package.

4,925,035

PACKAGING FOR FOOD AND METHOD OF PRODUCING SAME

Werner Hünninghaus, and Werner Hünninghaus, both of Cologne, Fed. Rep. of Germany, assignors to Ludwig Schokolade GmbH, Aachen, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,141
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731277
Int. Cl.[5] B65D *51/20*
U.S. Cl. 206—633 24 Claims



1. In packaging for food, especially food such as individual pieces of chocolate or candy that keep for only a limited time, said packaging comprising an inner package, which includes a product holder sealed by a foil, and an outer package that surrounds said inner package and is made of a stiffening material such as cardboard, the improvement wherein:

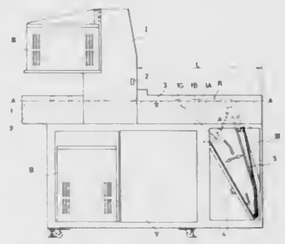
said outer package is provided, remote :rom a bottom thereof, with an inwardly directed flange that extends parallel to said sealing foil, whereby below said flange are disposed at least a rim portion of said product holder and an edge of said sealing foil, with a connecting seam being disposed between said sealing foil and said product holder at a distance from an outer edge of said rim portion of said product holder.

4,925,036

PLATE-LIKE MEMBER SELECTING AND ACCOMMODATING APPARATUS

Sigeo Sumi, Saitama, Japan, assignor to Somar Corporation, Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 133,394
Claims priority, application Japan, Dec. 15, 1986, 61-297951
Int. Cl.[5] B07C *5/00*
U.S. Cl. 209—552 9 Claims



1. A printed circuit board selecting and accommodating apparatus for selecting certain printed circuit boards from a plurality of printed circuit boards transferred along a path on the basis of a predetermined standard and accommodating the certain selected printed circuit boards in a container, which comprises:

a conveying path for conveying said printed circuit boards, the direction of a portion of said conveying path being adjustable from a first position to a second position disposed downwardly with respect to said first position;

a container for accommodating the selected printed circuit boards, said container comprising a flexible sheet-like member in the shape of a V or U in longitudinal section which is swingably provided under the adjustable portion of the conveyance path when said adjustable portion is disposed in said second position;

wherein when the selected printed circuit board is conveyed in the container, the selected printed circuit board contacts a side of said flexible container causing said container to swing such that the selected printed circuit board does not impact the bottom of the flexible container and become damaged.

4,925,037

STORAGE RACK FOR CANNED GOODS ACCOMMODATING VARYING DIAMETERS AND AXIAL LENGTHS

Nelson E. Holley, Jr., 838 Whittier Dr., Allentown, Pa. 18103

Filed Jan. 26, 1989, Ser. No. 303,269
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—59.2 15 Claims

1. A storage rack for articles, comprising:

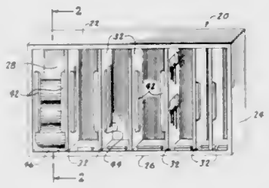
a frame having side walls disposed perpendicular to a back plane and an open front;

at least one partition perpendicular to the back plane mountable at least at two alternate spacings from the frame side walls and others of said partitions, the partitions being disposed at least partly vertically and the alternate spacings defining one of a height and a width of said articles when placed in a stack in a chute defined between said paritions; and,

at least one barrier panel mountable at a plurality of different

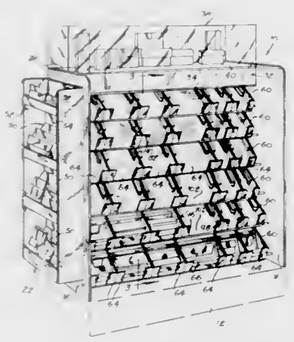
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1114
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spacings from the back plane, the barrier panel being fixable on said partition adjacent an edge thereof opposite said back plane, a space for the articles being defined between the barrier panel and the back plane, a bottom edge of said barrier panel being spaced from a bottom of said frame by substantially a corresponding dimension of the articles, the articles being movably captive in at least one stack, being confined between facing ones of the partitions and the side walls, and between the barrier member and the back plane, and wherein the means for



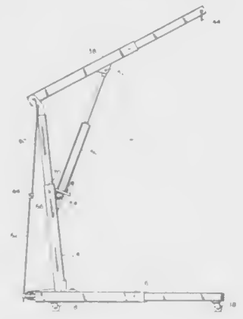
mounting the barrier panels at least at two alternate spacings from the back plane positions a bottom edge of the barrier panel at least at two alternate spacings from a bottom of said chute defined by the frame, said at least two alternate spacings from the bottom corresponding to said plurality of spacings from the back plane, whereby the back plane, frame, partitions and barrier panels define a chute for articles of different dimensions, opening at said bottom defined by the frame, the articles of different dimensions being confined in mutually perpendicular directions through and out of the chute.

4,925,038
DISPLAY FIXTURE WITH MODULAR DISPLAY UNITS
Dennis A. Gajewski, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.
Filed Jun. 17, 1988, Ser. No. 208,406
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—59.2 **11 Claims**



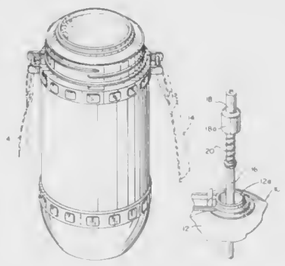
1. A display fixture for displaying and dispensing a plurality of product units, comprising:
a pair of opposed sidewalls;
a plurality of shelf-like tiers with front and rear support members extending between said sidewalls;
a plurality of tray-like carriers supported on each tier, so as to be removable from said tiers in a forward direction from said fixture, each carrier having forward and rearward end walls, a floor extending between the end walls for resting against said support members, hook means projecting from the floor adjacent the rearward wall, a stub wall projecting from the floor adjacent the forward wall and internal support means for supporting at least two levels of product units for sliding in a forward direction, one level above the other, each level including a serial succession of product units with a rearward-most product unit in a storage position and a forward-most product unit in a dispensing position from which the product unit may be removed from said carrier level; and
means for downwardly inclining said carriers so as to urge the product units of each level therein to slide toward said forward dispensing positions as product units are removed from said carrier, with said hook means lying behind and underneath said rear support member and said stub wall lying in front of said front support member so as to prevent accidental dislodgment of said carriers from said display fixture.

4,925,039
PORTABLE FOLDING CRANE
James Macris, 67 Horne St., Dover, N.H. 03820
Filed Nov. 18, 1988, Ser. No. 272,730
Int. Cl.[5] B66C *23/48*
U.S. Cl. 212—182 **4 Claims**



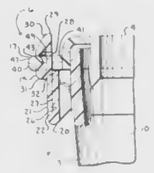
1. A folding portable crane apparatus which comprises:
an elongated base member having first and second axial extremities;
first and second elongated telescoping legs, each of said legs having first and second axial extremities, each of said first axial extremities being pivotally connected proximate to respective axial extremities of said base member;
a telescoping column member having first and second axial extremities, said first axial extremity of said telescoping column member being pivotally connected to said base member;
a boom member having first and second axial extremities, said second axially extremity of said telescoping column member and said first axial extremity of said boom member being pivotally connected;
means for urging said boom member to pivot with respect to said column member;
said column member being pivotable in a first plane and said first and second legs being pivotable in a second plane about said base member;
said apparatus also including a spanner member engaging said first and second legs at respective points and detachably engaging said first and second legs at respective points spaced from said first axial extremities thereof;
said column member including an elongated member having first and second axial sections disposed in oblique relationship, said member being disposed at said first axial extremity and said column member and said base member are pivotally connected on said member;
said apparatus also including a tensioning member extending from said second extremity of said column member to said base member, said tensioning member including first and second rods.

4,925,040
CANTEEN
Paul S. Wang, 22428 Steeple Chase La., Diamond Bar, Calif. 91705
Filed Jun. 6, 1989, Ser. No. 362,102
Int. Cl.[5] B65B *47/06*
U.S. Cl. 215—1 A **3 Claims**



1. A canteen, or the like, including a liquid drink container having a top and a bushing formed in said top; spring-loaded tubular means extending through the bushing in the top of said container, said spring-loaded tubular means including a resilient tubular member and a rigid nipple mounted at the upper end of said resilient tubular member and received in said bushing, and said spring-loaded tubular means including a coil spring coaxially mounted on said tubular member and contained in said bushing, one end of said coil spring engaging a shoulder formed by the end of said nipple and the other end of said coil spring engaging a shoulder formed in said bushing; and a cap pivotally mounted on the top of said container and movable between a closed position in which it engages said tubular means and forces said tubular means down into the top of said container to a retracted position, and an open position in which it enables said tubular means to pop up to an extended position to enable liquid in said container to be removed through said tubular means.

4,925,041
CLOSURE FOR CONTAINER
Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207
Continuation of Ser. No. 160,571, Feb. 26, 1988, Pat. No. 4,787,526. This application Nov. 29, 1988, Ser. No. 277,228
Int. Cl.[5] B65D *55/02*
U.S. Cl. 215—216 **8 Claims**



1. A latch mechanism for securing a closure member to a container body including:
(a) a latch adapted to be connected to a first of the closure member or the container body and having a closed position and an open position relative to the closure member;
(b) said latch comprises an elongate tongue connected near one end thereof to the first of the closure member or the container body and having a rear surface and further having a tooth extending outwardly opposite said rear surface from near a distal end thereof;
(c) a bar adapted to be attached to the second of the closure member or the container body and being positioned such that, when said latch is in the closed configuration thereof, said bar generally encircles said tongue in conjunction with the second of the closure member or container body and said tooth holds said bar and is adapted to prevent the closure member from being opened relative to the container body until said tooth is biased rearwardly relative to said bar and said tongue is axially moved, generally perpendicularly with respect to said bar so that the closure member is simultaneously biased to an open position relative to the container body to urge said bar past said tooth such that said tooth must be biased rearwardly and the closure member simultaneously biased open relative to the container body in order to move from said latch closed position to said latch open position;
(d) and further wherein said latch includes means thereon and said bar is configured relative to said latch such that said tooth cannot be depressed rearward and said bar moved from the closed position to the open position simultaneously by use of a single finger; and
(e) a projection adapted to extend outwardly from the second of the closure member or the container body in substantial circumferentially spaced relationship to said bar; said projection extending sufficiently outward to allow a user to grasp thereunder with a finger, so as to open the closure member relative to said container body when a different finger is depressing said latch tooth rearwardly whereby at least two fingers are required to be simultaneously used with some dexterity in order to open said latch mechanism.

4,925,042
INDEPENDENT INFANT BOTTLE FEEDING ENSEMBLE
Ray Chong, 52 D'Arcy Street, Toronto, Canada M5J 1J7
Continuation-in-part of Ser. No. 43,425, Apr. 28, 1987, abandoned. This application Jul. 27, 1988, Ser. No. 233,258
Int. Cl.[5] A61J *9/00, 9/06, 11/04*
U.S. Cl. 215—11.1 **10 Claims**



1. A feeding device comprising a receptable having a lip, a lid complementary with said lip and having a first aperture formed therein, a tubular handle including means for supporting a nipple and said handle being of such a rigidity as to constitute means for supporting said receptacle in different positions during feeding, said handle providing a passage for fluid communication between said first aperture and said nip-

VOL 1114 ISS 3 MY 15 1990 UMI

ple, coupling means for coupling said handle with said lid and constituting means to permit movement of said handle relative to said lid at a first position wherein said handle is movable relative to said lid about a transverse axis therethrough, and further including means, in coaxial alignment with said coupling means, for restricting said handle to a second position wherein the movement about said transverse axis is limited.

4,925,043

CLOSURE DEVICE FOR CONTAINERS

Pierre F. Dinand, Levallois-Perret, France, assignor to R. P. Denis S.p.A., Italy

Filed Mar. 17, 1989, Ser. No. 324,908
Claims priority, application Italy, Apr. 1, 1988, 20077 A/88
Int. Cl.[5] B65D *45/00*
U.S. Cl. 215—322 8 Claims



1. A closure device for a container (1) provided with an aperture (16), comprising

a slider (7) carrying a stopper (15) and slidable within guides (12) provided on said container (1),

at least one of said stopper (15) and a slide of said aperature (16) being elastically deformable such that, by using a suitable trajectory for said slider (7), snap-closure of said stopper (15) within said aperature (16) of said container (1) is obtained,

wherein said stopper (15) is constructed of elastically deformable material, and

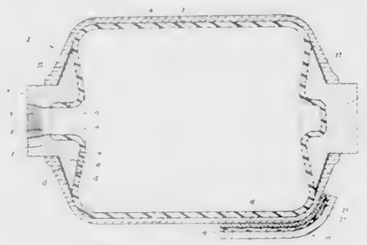
said aperature (16) is provided in an element (17) projecting from a body (2) of said container (1) and comprising a lead-in (81) proximate to said aperture (16).

4,925,044

FLUID TANK AND METHOD OF MANUFACTURING IT

Claude L. Hembert, Chemin du Fenouillet, 83400 Hyeres les Palmiers, France

Filed Jul. 21, 1988, Ser. No. 222,439
Claims priority, application France, Jul. 21, 1987, 87 10768; May 24, 1988, 88 07256
Int. Cl.[5] F17C *1/06*
U.S. Cl. 220—3 12 Claims



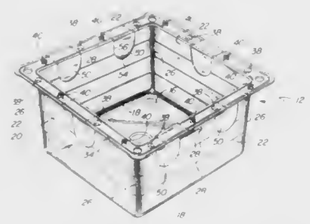
1. Fluid tank generally cylindrical in shape, of the type comprising an internal shell (3) made of thermoplastic material and intended to act as a seal and an external shell (4) made by filament winding and intended to provide mechanical strength, with the interposition between the two shells of a first cap (5) located at a bottom of the tank and a second cap (10) located at an open end of the tank, made in a single metal piece (6) with a connecting neck (7), characterized in that at least the part of the internal shell (3) located on the side of the open end of the tank (2) is fixed to the metal piece (6) forming the neck (7) and cap (10) over an entire contact surface (16) between the two elements (3, 6), while the external surface (13) of the cap (10) and a part of an exterior surface of the neck (7) are covered by the external shell (4), and in that it is covered by a fireproof and heatproof protective covering composed at least two layers, interior (18) and exterior (19), the interior layer (18) being formed by a sheet of paper made of ceramic fibres and being intended to be fixed by one of its faces to the external shell (4) of the tank (2) and to form a thermal barrier, the exterior layer (19) being composed of a glass cloth (20)/glass mat (21) complex forming a fireproof protection capable of being brought into contact with flames, said glass cloth (2) being mechanically bonded to the glass mat (21), which is itself fixed to the interior layer (18), this complex (19) being provided with a product reinforcing a chemical catalytic effect.

4,925,045

TUB BOXES

Duane D. Logsdon, Fullerton, Calif., assignor to Logsdon Foundation, Staton, Calif.

Filed Nov. 1, 1989, Ser. No. 430,721
Int. Cl.[5] B65D *6/00*
U.S. Cl. 220—4 E 6 Claims



1. A tub box including (1) a hollow body housing means having a bottom wall means, continuous perpherial wall means attached to the perimeter of said bottom wall means and extending upwardly therefrom, an open top, an edge flange attached to said perpherial wall means completely around said open top and extending outwardly from said open top and knock-out opening means in said wall means for use in creating an opening in said wall means leading into the interior of said housing and (2) closure means covering said open top, said closure means including an edge flange fitting against said flange on said housing,

in which the improvement comprises:

said housing and said closure means being identical to one another,

said housing and said closure means each including a plurality of said knockout means located in said perpherial wall means adjacent to said open top and extending thorough the edge flanges of said housing and said closure means,

each of said knockout means being of a "U" shaped configuration having a curved bottom connecting parallel sides, said sides being shaped so as to extend across said edge flanges and terminate at the peripheries of said said edge flanges,

said housing means and said closure means each including both male and female holding means for securing said housing means and said closure means with their edge flanges resting against one another in an assembled configuration so that the interiors of said housing means and said closure means are joined through the open tops of said

housing means and said closure means, said holding means securing said housing means and said closure means in said assembled configuration,

said male and female holding means being capable of being pushed together so as to engage one another in securing said housing means and said closure means together in said assembled configuration and being capable of being pried apart in separating said housing means and said closure means, and

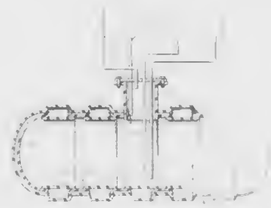
said edge flanges on said housing means and said closure means including sealing means which fit against one another when said housing means and said closure means are in said assembled configuration so as to seal off the interiors of said housing means and said closure means except where one of said knockout means has been removed.

4,925,046

DOUBLE WALLED RIBBED STORAGE TANK SYSTEMS

Bruce R. Sharp, 22375 Edgewater Dr. Unit 241, Charlotte Harbor, Fla. 33980

Continuation-in-part of Ser. No. 290,361, Dec. 27, 1988. This application Feb. 10, 1989, Ser. No. 308,463
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—5 A 29 Claims



16. A double walled ribbed storage tank system, comprising

(a) a fibrous reinforced resinous outer tank having a set of exterior protruding ribs extending circumferentially around the tank wherein the interior of each of the ribs is hollow; and

(b) an inner tank comprised of a series of anchor wall sections spaced laterally and circumferentially around the outer tank's interior wall and separated at least in a mid portion from the outer tank's wall, bridging wall sections attached at each edge to an anchor wall section, and inner end caps at each end, further wherein the anchor wall sections, bridging wall sections and inner end caps are bonded together to form an inner tank, said inner tank capable of storing liquid and said outer tank being a secondary containment means for leaked liquid.

4,925,047

MULTIPURPOSE SHAPED PITCHER AND SURGICAL KIT AND WRAP SYSTEM

A. H. Llynn Valentine, 15634 View Ridge La., Granada Hills, Calif. 91344, and William L. Noack, 83 N. Calle Vista, Camarillo, Calif. 93010

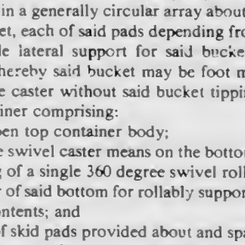
Filed Mar. 9, 1989, Ser. No. 321,224
Int. Cl.[5] B65D *6/00*
U.S. Cl. 220—23.83 20 Claims

12. A surgical kit comprising:

a circular basin having tapered side walls of a first radius and having a closed bottom;

a kidney-shaped pan within said basin, said kidney-shaped pan having tapered side walls and having a bottom, said tapered side walls including a first, convex side wall having a first radius so that said first convex side wall fits within and against the side wall of said basin, said kidney-shaped pan having a second concave side wall of a second radius;

a pitcher within said kit, said pitcher having tapered side walls and having a closed bottom, said pitcher being symmetrical about a center plane and having a portion of



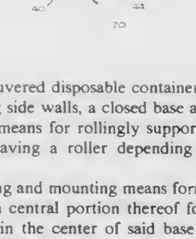
its side walls formed at said first radius so as to fit within said basin and a portion of its side walls at said second radius so as to fit against said concave side wall of said kidney-shaped pan, said kidney-shaped pan and said pitcher being sized to substantially engage together and fit within said basin.

4,925,048

FOOT MANEUVERED DISPOSABLE CONTAINER FOR OPERATING ROOM DISCARDS

William L. Noack, Camarillo, Calif., assignor to Devon Industries, Inc., Chatsworth, Calif.

Filed Apr. 27, 1989, Ser. No. 344,618
Int. Cl.[5] B62B *1/00;* **B65D** *81/00*
U.S. Cl. 220—70 16 Claims



1. A foot maneuvered disposable container comprising:

a bucket having side walls, a closed base and an open top;

a single caster means for rollingly supporting said bucket, said caster having a roller depending from a support frame;

caster positioning and mounting means formed integrally of said base in a central portion thereof for mounting said caster frame in the center of said base with said roller depending therefrom; and

a plurality of skid pads formed integrally of said bucket and provided in a generally circular array about the bottom of said bucket, each of said pads depending from said bucket to provide lateral support for said bucket relative said caster, whereby said bucket may be foot maneuvered on said single caster without said bucket tipping over.

10. A container comprising:

a hollow open top container body;

a 360 degree swivel caster means on the bottom of said body consisting of a single 360 degree swivel roller mounted at the center of said bottom for rollably supporting said body and its contents; and

a plurality of skid pads provided about and spaced from said caster means on the bottom of said body to give antitipping stability to said single roller supported body.

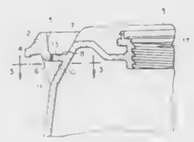
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4,925,049

BLOW-MOLDED THERMOPLASTIC DRUM HAVING IMPROVED INTEGRAL BEARING AND TRANSPORT RINGS

Dietmar Przytulla, Kerpen, Fed. Rep. of Germany, assignor to Mauser-Werke GmbH, Bruhl, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,625
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708432
Int. Cl.[5] B65D *7/44*
U.S. Cl. 220—72 6 Claims



1. In a blow-molded thermoplastic drum comprising a drum shell, having a generally cylindrical center section, conical end sections having predetermined heights and end faces at either end of the drum, and at least one carrying and transport ring formed integrally with said shell and extending around the drum a short distance from an associated end face of the drum, said ring having horizontal and vertical support surfaces meeting at a joinder for engagement by lifting prongs of mechanized drum handling equipment, the improvement comprising:

(a) a connecting web joining the carrying and transport ring to the shell along the conical section of the drum, said connecting web extending generally horizontally outwardly from the conical section of the drum to the joinder of the horizontal and vertical support surfaces of the ring, spacing the ring from the conical section of the drum and forming a wide bottomed groove between the vertical surface of the ring and said conical section of the drum, wherein the connecting web joins said conical section at an intermediate location along the height thereof and

(b) a carrying and transport ring support band disposed below the connecting web of the ring and supporting the connecting web on the conical section of the drum.

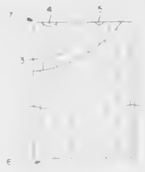
4,925,050

BEVERAGE CAN

Zhou Yu, Department of Physics; Northwestern University, Evanston, Ill. 60201

Filed Mar. 3, 1986, Ser. No. 839,167
Int. Cl.[5] A47G *19/00*
U.S. Cl. 220—90.2 24 Claims

1. A beverage container comprising: a top portion, a lateral portion, and a bottom portion, said top portion and said lateral portion of said container being integrally formed from a single inner sheet of metallic material, means joining said bottom portion to a lower edge of said lateral portion formed by said inner sheet; a second, outer sheet of metallic material overlying said top portion and at least an adjacent upper part of said lateral portion of said inner sheet; opening means enabling the content of said container to pass through an upper portion of said inner sheet; revealing means for enabling displacement of an upper portion of said outer sheet to reveal said opening



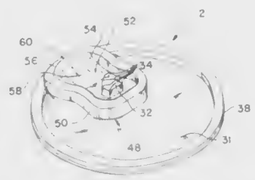
means; the upper portion of said inner sheet having a predetermined mouth-fit shape.

4,925,051

PUSH AND DRINK LID WITH POUR SPOUT

David H. Herbst, Salisbury, Md., assignor to Imperial Cup Corporation, Kenton, Ohio

Continuation-in-part of Ser. No. 163,623, Mar. 3, 1988. This application Aug. 25, 1988, Ser. No. 236,444
Int. Cl.[5] B65D *41/32*
U.S. Cl. 220—90.4 23 Claims



1. A detachable lid and integral pour spout means for open-mouthed containers having a peripheral rim defining the open-mouth thereof comprising:

peripheral curl means defining a rim receiving cavity extending around a periphery of said lid, said cavity detachably receiving said rim of said container in order to retain said container lid on said container;

well means located adjacent said peripheral curl means, said well means having a sloped portion rising in a direction toward said peripheral curl means and a well portion located adjacent said sloped portion; and

a raised element positioned in said well portion of said well means, said raised element having a plurality of corners and a top surface, said raised element including relatively frangible areas adjacent said corners, said well portion of said well means initially being sealed when said container lid is received on said container, whereafter a pressure exerted on said top surface of said raised element causes slits to be formed adjacent said corners in said relatively frangible areas while avoiding deformation of said peripheral curl means, said slits permitting contents within said container to be dispensed therethrough, and to thereafter pass over said sloped portion;

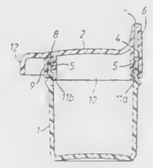
wherein said well means and said raised element comprise said integral pour spout means from which said contents of said container can be poured and/or ingested, said well means having a generally figure eight shape with said raised element and said well portion being located in one half of the area defined be said well means.

4,925,052

INFANT'S MUG

Malcolm Betka, 32, Inner Loop Road, Beachley, Chepstow, Gwent. NP6 7HF, and Robert Cross, 11, Monk Street, Monmouth, Gwent., both of United Kingdom

Filed Sep. 9, 1988, Ser. No. 244,517
Int. Cl.[5] B65D *41/00*
U.S. Cl. 220—90.4 3 Claims



1. A drinking vessel comprising a base receptacle with a circular rim and inwardly facing recesses in the rim portion, and a one-piece lid designed to fit retentively thereon but to be rotatable when so fitted, the lid having a mouthpiece, a vent separate from the mouthpiece, and two concentric annular flanges which closely embrace the rim of the receptacle, the inner flange having ducts to the mouthpiece and vent which is one rotated position of the lid are closed by the wall of the receptacle but which in another rotated position of the lid register with said recesses to provide communication between the interior of the receptacle and the mouthpiece and vent.

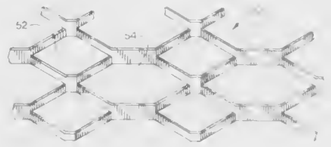
4,925,053

FUEL TANK VAPORIZATION AND EXPLOSION RESISTANT APPARATUS AND IMPROVED FILLER MASS

Ronald L. Fenton, Wood Dale, Ill., and Robert Brandt, New York, N.Y., assignors to Safetytech Corporation, Mount Prospect, Ill.

Filed Mar. 28, 1989, Ser. No. 330,354
Int. Cl.[5] B65D *25/02*
U.S. Cl. 220—88 A 6 Claims





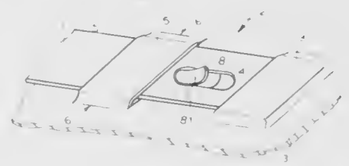
1. A thermally conductive filler mass insert for a container comprising multiple layers of thermally conductive sheet, each of said layers having a plurality of slit formed openings defined therein, the periphery of said openings forming edges projecting transversely to the plane of said layer wherein said insert comprises a stack of interleaved layers, wherein each of said layers exhibits an array of a plurality of openings in a pattern exhibiting a plurality of dimensions, said layers being arranged to juxtapose openings of differing dimension.

4,925,054

CARRYING ASSEMBLY WITH HANDGRIP FOR CONTAINERS, HOUSING AND THE LIKE

Georg Rau, Hohenmemmingen, and Werner Hitzler, Herbrechtingen, both of Fed. Rep. of Germany, assignors to Firma Georg Knoblauch, Giengen, Fed. Rep. of Germany

Filed May 12, 1989, Ser. No. 351,511
Claims priority, application Fed. Rep. of Germany, May 14, 1988, 3816530
Int. Cl.[5] A45C *13/76*
U.S. Cl. 220—94 R 7 Claims



1. A carrying assembly for a container or a housing and especially a tool box or tool chest, comprising:

a carrying grip strap having a central region and respective end regions at opposite extremities of said grip;

a wall provided with a pair of guide strips each attached to said wall at ends of said guide strips and extending transversely to said strap, said guide strips defining throughgoing gaps with said wall, said end regions of said strap passing respectively through said gaps and being slidable therein whereby said central region can be pulled away from said wall to form a loop providing a handle;

respective slots formed in said end regions at sides of said guide strips turned away from said central region and elongated in a direction of movement of said end regions; and

respective tongues projecting from said wall into said slots and forming camming ramps engageable by leading edges of the respective end regions as said end regions are inserted through said gaps to guide said free ends whereupon said tongues engage in said slots.

4,925,055

CONTAINER WITH UNITARY BLADDER AND ASSOCIATED DISPENSER CAP

Edward S. Robbins, III, 459 N. Court, Florence, Ala. 35630, and Theodore J. Onocki, Florence, Ala., assignors to Edward S. Robbins, III, Florence, Ala.

Continuation-in-part of Ser. No. 163,900, Mar. 4, 1988, Pat. No. 4,805,799. This application Nov. 28, 1988, Ser. No. 276,636
Int. Cl.[5] B65D *25/16*
U.S. Cl. 220—403 32 Claims



1. A container comprising:

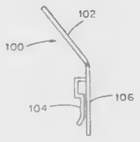
a rigid upper container segment which establishes one portion of a total volumetric capacity for the container;
a rigid lower container segment;
means for coupling said upper and lower container segments one to another; and
a flexible bladder which establishes a remaining portion of the total volumetric container capacity so that said upper container segment and said bladder collectively establish said total volumetric container capacity,
said bladder being integrally formed with said upper container segment such that said bladder depends from said upper container segment and is housed within said lower container segment, wherein
said upper container segment also defines an access opening to permit access to contents within said upper container segment and bladder; and wherein
a dispenser cap is removably attached to said upper container segment overlying said access opening, said dispenser cap including a self-closing dispensing aperture.

4,925,056

APPARATUS FACILITATING THE USE OF A PLASTIC GROCERY BAG AS A TRASH CONTAINER

James E. McCoig, Rte. #1, Box 270A, White Pine, Tenn. 37890

Filed Oct. 4, 1988, Ser. No. 253,569
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—404 **1 Claim**



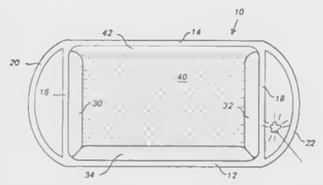
1. A clip for securing a plastic bag within a trash container wherein the plastic bag includes walls defining an opening providing ingress into and egress from the interior of the bag and an edge portion bordering so as to encircle the bag opening, which edge portion may define a pair of apertures located on diametrically-opposed sides of the bag for providing handles with which the bag can be carried, and wherein the trash container includes a receptacle defining an upwardly-directed mouth and a border section bordering the mouth, said clip comprising:
a body providing two joined arms adapted to be snugly secured about the border section of the trash container receptacle for attaching the bag edge portion to the mouth of the trash container receptacle as the bag edge portion is positioned between the arms of the clip and the receptacle border section and a tab portion about which a handle-providing aperture of a bag can be hooked for suspension of the bag from the mouth of the trash container so that the clip can be used to secure a plastic bag within a trash container receptacle whether or not the bag includes a handle-providing aperture;
each arm having two opposite ends and said arms being joined so that an end of one arm is attached to an end of the other arm and so that the two arms extend generally alongside one another for positioning on opposite sides of the border section of the trash container receptacle;
one arm being generally planar and straight as a path is traced from the joined end of said one arm to the opposite end thereof and the other arm having in sequence a U-shaped section, a planar intermediate section and a flared end section as a path is traced from the joined end of said other arm to the opposite end thereof, each of the U-shaped section, intermediate section and said flared end section being positioned adjacent corresponding sections of said one arm;
said flared section of said other arm cooperating with a corresponding section to said straight arm so as to provide an entrance between the arms which is substantially V-shaped in cross section and arranged so that its V opens downwardly to facilitate manipulation of the clip onto the border section of the trash container receptacle as the V-shaped entrance is positioned upon the receptacle border section and subsequently urged downwardly thereon;
the intermediate section being spaced from the plane of a corresponding section of the straight arm by a distance which is slightly smaller than the thickness of the container border section with which the clip is used so that when an edge portion of a plastic bag is draped across the border section of the trash container receptacle and the clip is operatively urged downwardly about the border section with the bag edge portion draped thereacross so that the arms of the clip are positioned on opposite sides of the border section, the bag edge portion and border section are tightly secured between the arms of the clip;
said clip being constructed of a resiliently flexible material so that the arms are adapted to flex apart as the clip is forced downwardly onto the border section of the trash container receptacle and so that the memory of the arms bias the arms toward their unflexed condition, said U-shaped section being arranged so as to open generally toward the plane of said straight arm for accommodating a relatively large amount of flexing per unit length of said other arm so that said clip can be secured about the border section of a trash container receptacle having a thickness within a broad range of thicknesses;
said tab portion being generally planar in shape and joined to said straight arm adjacent the joined end thereof so as to be arranged in an angular orientation with respect to the plane of said straight arm so that when the clip is operatively positioned upon the border section of a trash container receptacle and the straight arm is oriented substantially vertically, the tab portion is oriented at an angle with respect to the receptacle border section.

4,925,057

FUEL TANK HAVING BALLISTIC PROTECTION BLADDER

James J. Childress, Federal Way, Wash., and John Holtrop, Ridgecrest, Calif., assignors to The Boeing Company, Seattle, Wash.

Filed May 23, 1989, Ser. No. 355,698
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—426 **16 Claims**



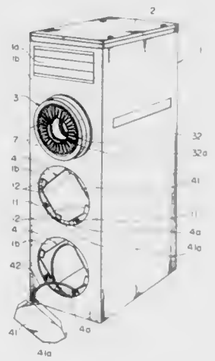
1. An apparatus for protecting a fuel tank from explosion and leaking after penetration by a ballistic projectile, comprising a flexible bladder lining the inside of said tank, said bladder being filled with a pressurized inert gas.

4,925,058

CUP DISPENSER

Isao Ozawa, Tokyo, Japan, assignor to Mizuno Sangyo Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,902
Claims priority, application Japan, Jul. 7, 1988, 63-167824; Jul. 7, 1988, 63-167825
Int. Cl.[5] B65H *1/08*
U.S. Cl. 221—279 **5 Claims**



1. A cup dispenser which comprises
a casing having at least one opening formed through a side facing of said casing,
a plurality of projections on said casing extending inwardly of said opening,
a receiving container within said casing for holding a stack of cups for dispensing through said opening,
means within said receiving container for urging said stack of cups toward said opening,
said means including a plate member secured to one end of a resilient spring member,
said spring member having its other end secured to said receiving container,
said plate member being of a size to engage said projections when no cups are in said receiving container,
an adaptor disposed about the said opening in said casing, said adaptor holding at least one flexible elastomeric membrane over said opening, said membrane having an annular opening therethrough, and
means for securing said adaptor and membrane externally of said casing.

5. A flexible elastomeric membrane for use in a cup dispenser, said membrane having an annular opening through which a cup is dispensed, the circumferential edge of said annular opening being of wavelike or corrugated shape formed by a plurality of depressions extending radially outwardly through a substantial portion of the radius of said membrane, whereby said circumferential edge of said membrane is in tight fitting contact with the outer surface of the cup being dispensed through said opening.

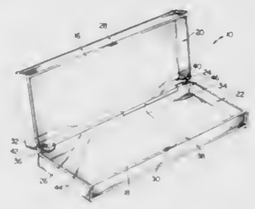
4,925,059

HINGED BOX CONSTRUCTION

Thomas J. Harvey, Pawtucket, and John D. Kilmartin, III, Providence, both of R.I., assignors to International Packaging Corporation, Pawtucket, R.I.

Filed Mar. 20, 1989, Ser. No. 326,527
Int. Cl.[5] B65D *43/24*
U.S. Cl. 220—335 **5 Claims**

1. A box construction comprising hingeably connected top and bottom sections, said top section including a top wall and a depending top sidewall portion on said top wall, said bottom section including a bottom wall and an upstanding bottom sidewall portion said bottom wall, and a hinge assembly including top and bottom hinge portions attached to said top and bottom sidewall portions, respectively, for hingeably connecting said top and bottom sections, said top hinge portion including spaced, substantially aligned first and second top hinge bars, said bottom hinge portion including spaced substantially aligned first and second bottom hinge bars, said first and second top hinge bars and said first and second bottom hinge bars each having opposite ends, said first top hinge bar being received in substantially aligned engagement between said first and second bottom hinge bars, said first bottom hinge bar being received in substantially aligned engagement between said first and second top hinge bars, first ball and socket means pivotably connecting an end of said first top hinge bar to an end of



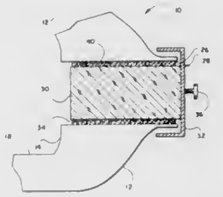
said second bottom hinge bar and second ball and socket means pivotably connecting an end of said first bottom hinge bar to an end of said second top hinge bar, said first and second ball and socket means cooperating to pivotably retain said first and second top hinge bars in substantially aligned relation with said first and second bottom hinge bars in order to hingeably connect said top and bottom sections together, said too sidewall portion terminating in a lower edge, said bottom sidewall portion terminating in an upper edge, said first and second top hinge bars being mounted on said lower edge, said first and second bottom hinge bars being mounted on said upper edge, said first top and bottom hinge bars being engageable with said lower and upper edges, respectively, to prevent said top section from being pivoted beyond a predetermined angular position relative to said bottom section.

4,925,060

CORK FOR CRYOGENIC DRY SHIPPER

Keith W. Gustafson, Station 1101, Lake Arrowhead, Waleska, Ga. 30183

Filed Aug. 17, 1989, Ser. No. 395,327
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—371 **2 Claims**



1. In an atmospheric pressure dewar having an outer vessel and an inner vessel with an insulating space between the inner and outer vessels, having an absorbent material in the inner vessel for holding a liquid cryogen, and having a neck tube with a neck opening for providing access to the interior of the inner vessel from outside the outer vessel, the improvement comprising closure means for the neck opening comprising an

VOL 1114 ISS 3 MY 15 1990 UMI

insulative cork for insertion through the neck opening into the neck tube and position and sized to provide an peripheral space around the cork and a fibrous material in the peripheral space, the fibrous material having a fibrous mass sufficient to inhibit convection flow of gas in the peripheral space and having a porosity sufficient to allow the escape of gas pressure resulting from the evaporation of the liquid cryogen inside the inner vessel.

4,925,061

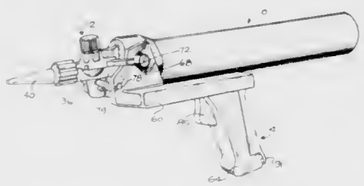
FLUID ACTUATED DISPENSER

James R. Jeromson, Jr., Aurora; J. Edward C. Anderson, Moreland Hills, and John H. Breisch, Lakewood, all of Ohio, assignors to Milbar Corporation, Chagrin Falls, Ohio

Continuation of Ser. No. 182,017, Apr. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 47,867, May 6, 1987, abandoned. This application Mar. 16, 1989, Ser. No. 325,092

Int. Cl.[5] B65D *83/14*

U.S. Cl. 222—1 17 Claims



15. A housing and valve sub-assembly for connection to a dispensing sub-assembly to form a liquefied gas actuating dispensing gun assembly comprising:

(a) a drawn housing comprising:

(i) an elongate generally cylindrically contoured imperforate tubular portion defining the perimeter of a viscous material containing tubular cartridge chamber;

(ii) an apertured end portion closing one end of the tube other than for a pair of valve receiving apertures;

(iii) the tubular portion having an open end opposite the apertured end portion; and

(iv) the tubular portion having an externally threaded section near the open end;

(b) a gas charging valve sealingly mounted in one of the closed end apertures and adapted for connection of a liquefied gas container to introduce a charge of liquefied gas into a charge receiving portion of the chamber;

(c) a charge receiving portion venting valve closing the other valve receiving aperture and including a venting valve actuator projecting outwardly from the apertured end portion whereby to provide a reminder to an operator disconnecting the housing and valve sub-assembly from a dispensing sub-assembly to actuate the venting valve actuator before effecting such disconnection; and

(d) the venting valve being constructed such that it may be selectively secured in an open position until returned to a closed position by operator action whereby to permit an operator to maintain the venting valve open as the sub-assembly is disconnected from a dispensing sub-assembly.

4,925,062

PAPER FEEDER

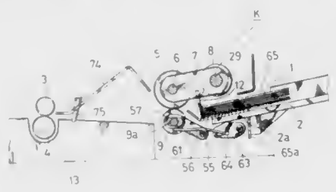
Kimihide Tsukamoto, Yamatokoriyama, and Masaru Tsuji, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1988, Ser. No. 263,913

Claims priority, application Japan, Oct. 30, 1987, 62-276827; Oct. 30, 1987, 62-167567

Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—115 7 Claims



1. A paper feeder comprising a paper feed table for placing paper thereon, a transport roller for transporting said paper, a first shaft supporting said transport roller thereon, feed rollers for forwarding said paper transported by said transport roller, a first arm pivotably supported by said first shaft and extending toward said paper feed table, a delivery roller mounted on said first arm for delivering said paper from said feed table to said transport roller, a second arm pivotably supported on a second shaft juxtapositioned to said delivery roller, a shutter attached to said second arm positioned between said delivery roller and said transport roller for preventing delivery of said paper to said transport roller, a first cam and a first cam shaft therefor for pivotally moving said first arm to thereby shift said delivery roller to an operative position, and a second cam and a second cam shaft therefor for pivotally moving said second arm to thereby shift said shutter to an operative position when said first arm is not pivotally moved, said first cam shaft and said second cam shaft being combined together in the form of a single rotary shaft.

4,925,063

CONTAINER HAVING A DUAL PURPOSE CAP AND A DRIPLESS SPOUT

Athar M. Ali, 4698 Highway 124, Hoschton, Ga. 30548; Darrell J. Watt, and Wendell G. Wilson, both of Atlanta, Ga., assignors to Athar Mohammad Ali, Hoschton, Ga.

Filed Dec. 1, 1988, Ser. No. 278,669

Int. Cl.[5] B65D *5/74*

U.S. Cl. 222—108 10 Claims



1. A container for liquids, comprising:

(a) an upstanding housing having side walls and a bottom wall, wherein the upper portion of said housing defines a filling orifice;

(b) a tubular spout defining a pouring orifice at one end, whereby said spout is mounted at its other end to the upper side wall of said housing so that the angle between the axis of said tubular spout and the vertical axis of said housing is approximately forty degrees to fifty degrees; and

(c) a dripless lip assembly mounted onto said spout at said pouring orifice, said lip assembly having conical side walls tapering to form an annular collar, whereby the angle between the conical side wall and the axis of said spout, plus the angle between the axis of said spout and the vertical axis of said housing equals approximately seventy degrees to ninety degrees.

9. A container for liquids, comprising:

(a) an upstanding housing having side walls and a bottom wall;

(b) a tubular spout defining a pouring orifice at one end, whereby said spout is mounted at its other end to the upper side wall of said housing;

(c) a dripless lip assembly mounted onto said spout at said pouring orifice, said dripless lip assembly including a conical side wall tapering to define an annular lip having an outer, convex surface; and

(d) a cap having side walls and a top wall and a retaining plug along its outer surface, and defining a hollow interior, wherein said cap is mounted over said pouring orifice by the outer end of said spout being received within the interior of said cap, and whereby said retaining plug can be alternatively received into said pouring orifice in order to plug said orifice.

4,925,064

BACKPACK CUSHIONING DEVICE

Michael E. Comora, 7424 E. Speedway Blvd., Tuscon, Ariz. 85710

Continuation-in-part of Ser. No. 64,008, Jun. 19, 1987, abandoned. This application May 12, 1988, Ser. No. 193,088

Int. Cl.[5] A45F *3/26*

U.S. Cl. 224—155 7 Claims



1. A cushioning device in combination with a backpack; the backpack comprising:

a pack, having a back surface; and

shoulder straps, connected to the pack;

the cushioning device comprising:

a first panel;

a second panel, the first panel and second panel each having an opposing edge, and non-opposing edges;

a hinge means connecting the opposing edges of the first panel and the second panel, the first panel and second panel capable of being separated at the hinge means;

locking elements connected to the first panel and the second panel to lock the panels against each other;

straps attached to at least one of the panels to secure the locked panels to the shoulder straps of the backpack with the panels adjacent to the back surface of the backpack.

4,925,065

DISPENSING APPARATUS

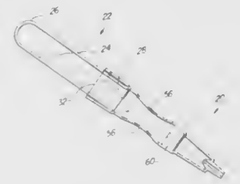
Tipton L. Golias, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Continuation-in-part of Ser. No. 266, Jan. 2, 1987, Pat. No. 4,811,866. This application Aug. 25, 1987, Ser. No. 89,275

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[5] B67D *5/58*

U.S. Cl. 222—189 9 Claims



1. Apparatus for dispensing liquid from a container having at least one opening, comprising:

a flexible, resilient elongated dispensing means for preventing jetting, said dispensing means having first and second outermost ends and a longitudinal bore therethrough, said first outermost end adapted to be engaged with said container at said opening to form a substantially fluid tight seal, said dispensing means having longitudinally spaced apart first and second tapering fluid constriction means interconnected by a body portion, the diameter of said bore being smaller at said first tapering fluid constriction means than at said second tapering fluid constriction means, said first tapering fluid constriction means for receiving a filter therein, said body portion being inwardly flexible whereby upon alternately applying force to and removing force from said resilient dispensing means to flex the resilient dispensing means, liquid is pumped from the container through the bore of said dispensing means; and

said dispensing means second outermost end including nozzle means for counteracting the inertia of liquid moving within said dispensing means to prevent accidental dispensing of liquid, said nozzle means having a bore therethrough in communication with the bore of said dispensing means, and including an external nozzle and an internal nozzle, said nozzle bore extending continuously through said external and internal nozzles.

4,925,066

COMBINED SPRAYER AND REFILL CONTAINER

Robert S. Rosenbaum, Los Angeles, Calif., assignor to Mission Kleensweep Products, Inc., Los Angeles, Calif.

Filed Oct. 26, 1988, Ser. No. 262,602

Int. Cl.[5] B67D *5/60*

U.S. Cl. 222—192 13 Claims

1. A combined sprayer container and refill container for containing a liquid concentrate for later dilution and which containers nest and interlock, including

a sprayer container including a sprayer head for spraying liquid contained in the sprayer container,

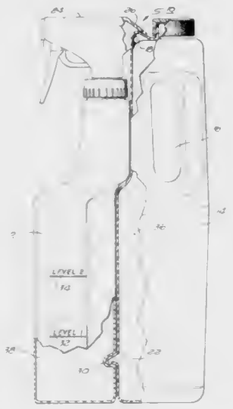
the sprayer container also including at least one level indicia for indicating a level to be filled to with the liquid concentrate for dilution,

a refill container for containing a liquid concentrate for use in repeated refilling of the sprayer container,

the sprayer container and refill container each including

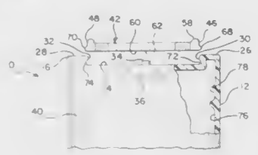
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complementary surfaces to provide nesting of the containers one against the other, and



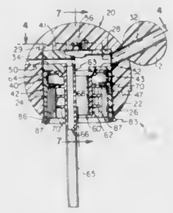
interlock means provided on both the sprayer container and refill container for interlocking the nested containers to resist separation of the nested containers.

4,925,067
DISPENSER CLOSURE
Bridgett Zemlo, Glendale Heights; Richard J. Petro, Mokena, and David N. Moore, Plainfield, all of Ill., assignors to Phoenix Closures, Inc., Naperville, Ill.
Filed Jun. 30, 1988, Ser. No. 213,332
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—480 **6 Claims**



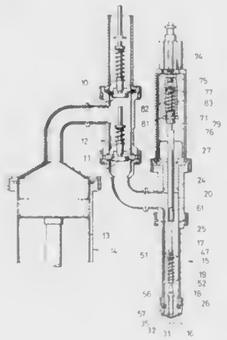
1. A dispenser closure for a container comprising:
a generally cylindrical body having a generally planar top portion with a peripheral edge margin and an annular skirt portion depending therefrom, said skirt portion having an interior threaded surface, said top portion being provided with at least one smaller sifter opening, a second larger generally "D-shaped" opening and a pair of diametrically opposed vertically projecting slide guides, said slide guides each having an elongate rounded recess located on opposing faces of said slide guides; and
a substantially planar solid slide plate having an underside, a front end, a rear end, and a pair of side edges and being dimensioned to slidingly engage said slide guides to selectively expose said smaller opening or said second opening or to cover said smaller and second openings, said side edges each having an elongate rib with a rounded exterior for projection-free mating sliding engagement within said rounded recess of said respective slide guide, and stop means adapted to limit the sliding motion of said slide plate between said slide guides, said stop means including a boss centrally located upon said top portion of said body and an elongate linear groove centrally located in said underside of said slide plate, said groove having first and second truncated ends, said boss adapted to slidingly engage said corresponding groove and configured so that said boss may engage either of said truncated ends to stop the reciprocal sliding motion of said plate, said engagement of said ends by said boss being the only means of retaining said plate from sliding off of said body in either reciprocal direction.

4,925,068
LIQUID DISPENSER
Schneider, Larry, Waukegan, Ill., assignor to Alko, Ltd., Finland
Filed Sep. 13, 1988, Ser. No. 244,063
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—484 **16 Claims**



1. A liquid dispenser for being affixed to the neck of a container or bottle, said container or bottle neck having a discharge opening including generally cylindrical inner and outer neck walls, comprising:
a cap having a spout and a vent, said cap having a substantially cylindrical inner cavity defined by a cylindrical inner side wall and an inner top wall, said inner cavity being connected to said spout and vent by a dispensing channel and venting channel, respectively, disposed in said cap;
an inner core having substantially cylindrical inner and outer walls and having an intermediate dispensing channel and intermediate venting channel, the outer wall of said core slidably engaging said inner side wall of said cap, said inner core being inserted in said cavity and rotatably attached to said cap, the inner wall of said core being dimensioned to engage the outer wall of said neck; and
a stopper assembly attached to said inner core, said stopper assembly having a venting conduit and a dispensing conduit, said stopper assembly being dimensioned and shaped to be received in said neck so as to engage the inner wall of said neck;
said cap being rotatable about said inner core and said stopper assembly between an open and closed position of the dispenser; in the open position, said dispensing conduit, intermediate dispensing channel and dispensing channel being connected together to form a dispensing path and said venting conduit, intermediate venting channel and venting channel being connected together to form a venting path so that liquid entering said dispensing conduit can be freely dispensed from said spout and, in the closed position, the vent and spout being disconnected from the venting conduit and dispensing conduit in said stopper assembly, respectively, to prevent flow of liquid from said spout or vent, said dispenser simultaneously and continuously engaging both the inner and outer neck walls when said dispenser is affixed to said bottle or container.

4,925,069
APPARATUS FOR FILLING SPECIFIED AMOUNT OF LIQUID
Kazuo Ueda; Shigeru Wakabayashi; Yoshihiro Saijo, and Yasuji Fujikawa, all of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan
Filed Sep. 13, 1988, Ser. No. 243,748
Claims priority, application Japan, Sep. 17, 1987, 62-141777[U]; Feb. 23, 1988, 63-23573[U]
Int. Cl.[5] B65D *5/72*
U.S. Cl. 222—500 **12 Claims**

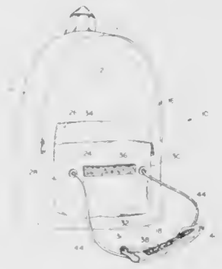


1. An apparatus for filling a specified amount of liquid comprising:
a metering cylinder having a piston therein;
a vertical filling nozzle having an upper portion and an opening at a lower end and forcibly chargeable with the liquid from said metering cylinder by operation of the piston;
a damper having a damper operating member and a free end for opening and closing the opening of the filling nozzle;
a spring biasing said damper so as to hold said damper closed against the gravity acting on the liquid filling said filling nozzle while said damper is closed with charging into said filling nozzle discontinued although permitting said damper to be opened with the pressure of the liquid forcibly charged into said filling nozzle from said metering cylinder; and
means connected to said damper for initially closing said damper when the charging into said filling nozzle of the liquid is discontinued and for subsequently releasing hold of the damper thereby allowing only the spring to hold the damper closed before the charging of the liquid is started

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4,925,070
BACKPACK INCLUDING RESTRAINT MEANS
Terri R. Tulgan, 342 Southwick Rd., Westfield, Mass. 01085
Filed Feb. 10, 1989, Ser. No. 308,530
Int. Cl.[5] A45F *3/04*
U.S. Cl. 224—202 **10 Claims**

6. In a backpack suitable for use by a child, said back pack having a main compartment for storing articles, a subcompartment smaller then said main compartment secured to an outside main wall of said main compartment, first means for opening and closing access to said main compartment second means for opening and closing said subcompartment, and strap means for securing the backpack to the back of a child, the improvement which comprises,
a handle attached to cord means, said cord means extending through an outside wall of said subcompartment,
means for securing said cord means within an interior portion of said subcompartment, and
means for securing said handle to an outside surface of said outside wall of said subcompartment and for removing



said handle by hand from said outside surface of said outside wall.

4,925,071
FRUIT PICKER'S BAG
Jerry A. Fleming, 1011 N. Western, Wenatchee, Wash. 98801, and Ronald W. Lytle, East Wenatchee, Wash., assignors to Jerry A. Fleming, Wenatchee, Wash.
Filed Feb. 27, 1989, Ser. No. 316,086
Int. Cl.[5] A01D *46/22*
U.S. Cl. 224—207 **19 Claims**



1. A fruit picker's bag, comprising:
a support frame having a top hoop including a rear section with opposite ends, a strap eye at each of said ends, a forward section extending from one end of the rear section over to the opposite end which with said rear section defines a hoop opening, and a brace portion extending generally vertically downwardly from said rear section;
a fruit receiving bag having upper and lower ends, a rear wall portion including a pocket at the upper end of the bag for receiving the brace portion of the support frame, a forward wall portion, and a hook strip connected to the forward wall portion at the upper end of the bag, said hook strip including a downwardly opening hook channel which is detachably hookable onto the forward section of the top hoop for easy removal and re-attachment of said bag to said frame; and
a carrying harness including a strap which extends through each of said strap eyes, said carrying harness serving to

VOL
1114
ISS
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MY
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support the fruit picker's bag on a person with the top hoop of the support frame in a substantially horizontal plane and the brace portion of the support frame against a midsection of the person.

4,925,072

LOCKING MECHANISM FOR A PIVOTABLE CLOSURE

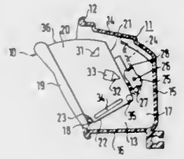
Gerhard Massler, Hemdingen, and Uwe Harder, Hamburg, both of Fed. Rep. of Germany, assignors to ITW-Ateco GmbH, Norderstedt, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,239

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3700961; May 15, 1987, 3716288

Int. Cl.[5] B60R *7/00*

U.S. Cl. 224—282 20 Claims



14. The combination as set forth in claim 11, further comprising:

spring means mounted upon said closure and interposed between said closure and said housing for biasing said closure toward said open, unlocked position.

4,925,073

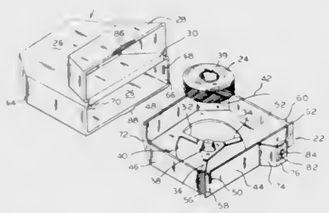
DENTAL FLOSS HOLDER

Emanuel B. Tarrson, and Dane Maric, both of Chicago, Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Apr. 20, 1989, Ser. No. 341,125

Int. Cl.[5] B26F *3/00*; **B65H** *35/00*

U.S. Cl. 225—44 20 Claims



1. A dental floss holder comprising a drawer and a shell into which said drawer slides with a fairly snug fit, said drawer being an integral plastic unit with bottom surface having a spider supporting a centrally located hub element inside said drawer, said plastic having a memory which gives said spider a spring bias for urging said hub toward an opposite side of said shell, and a bobbin of dental floss mounted on said hub, said hub having length which causes said bobbin to drag under said spring bias against an opposite side of said shell with a force which maintains a predetermined tension in said dental floss.

4,925,074

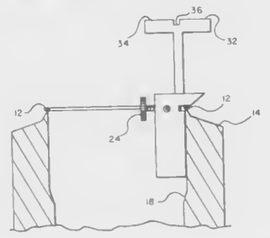
WELDING TOOL

Jerry W. Wood, Charlotte, N.C., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 21, 1989, Ser. No. 341,924

Int. Cl.[5] B23K *37/04*

U.S. Cl. 228—49.1 9 Claims



1. A tool for use in joining first and second ends of tubular members by welding using an insert ring, each of said first and second ends including an interior surface, said tool including a first surface for sequentially positioning at a plurality of locations in contact with said interior surface and adjacent said first end, a second surface extending radially outward and adjusting means for supporting said insert ring between said first end and said second surface at a predetermined radial position permitting said insert ring to be tack-welded to said first end at each of said plurality of locations; and a third surface including first and second aligned portions joined by a notched portion permitting said third surface to be sequentially positioned at a plurality of locations interior to said first and second ends such that said first and second aligned portions are respectively adjacent said interior surface of said first and second ends with said insert ring extending into said notched portion to permit said first and second ends to be checked for proper alignment prior to welding.

4,925,075

HANDGUN HOLSTER WITH TRIGGER GUARD RESTRAINT

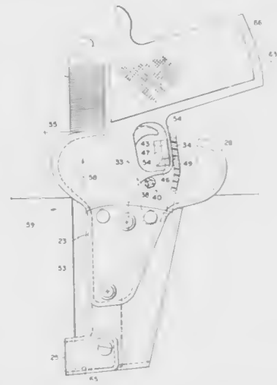
William H. Rogers, Jacksonville, Fla., assignor to Safariland Ltd., Inc., Monrovia, Calif.

Filed Mar. 2, 1989, Ser. No. 318,125

Int. Cl.[5] F41C *33/02*

U.S. Cl. 224—244 19 Claims

1. In a handgun holster adapted to permit withdrawal of a handgun having a trigger guard from the holster by a vertical upward movement of the handgun, said holster having with respect to the wearer an inner wall, an outer wall, a front, a back, a top, a bottom, an inside, an outside, and a loop for suspending said holster from a belt worn by the wearer, the improvement which comprises a handgun restraining device attached to the inside of said back of said holster adjacent said top, said device being an elongated channel member having a back wall and two generally parallel side walls attached to said back wall and spaced apart from each other so as to leave an open front slot, a leaf spring means in one of said side walls, a boss projecting outwardly from said leaf spring means; said boss terminating spacedly from the other said side wall, said leaf spring means being biased to urge said boss toward said other side wall and being sufficiently resilient that the movement of pushing said handgun into said holster will overcome said bias and cause said boss to be moved away from said other side wall to admit said trigger guard of said handgun to slide over said boss and when said handgun is fully holstered said bias will cause said boss to return to its original position spaced from said other side wall but inside said trigger guard.



4,925,076

PAPER FEEDER

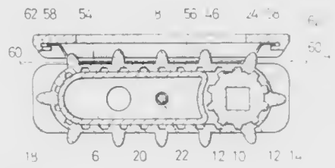
Sadao Unuma, Yokoemachi, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 6, 1989, Ser. No. 306,746

Claims priority, application Japan, Feb. 4, 1988, 63-14051[U]

Int. Cl.[5] G03B *1/30*

U.S. Cl. 226—74 6 Claims



1. A paper feeder, comprising:

frame means;

an endless belt mounted for movement in said frame means, said endless belt including a plurality of feed pins projecting from an outer circumferential surface thereof and adapted to engage perforations in paper to be fed;

a cover pivotably attached to said frame means, said cover being pivotable between an open position in which the paper can be inserted into said paper feeder and engage with said feed pins, and a closed position in which the paper can be fed and a lower surface is in facing relation with the paper engaged with said feed pins; and

an elastically deformable holding member extending from said lower surface of said cover, whereby when said cover is in said closed position said holding member urges the paper into engagement with said feed pins.

4,925,077

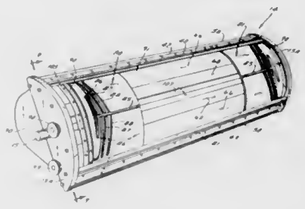
CONTACTLESS TURNING GUIDE FOR RUNNING WEB

Robert A. Daane, and Randall D. Helms, both of Green Bay, Wis., assignors to Advance Systems, Inc., Green Bay, Wis.

Filed May 4, 1989, Ser. No. 347,514

Int. Cl.[5] B65H *20/14*

U.S. Cl. 226—97 15 Claims



1. A contactless turning guide for a running web and having an arcuate surface extending in the direction web movement and over which arcuate surface the running web is floatingly suspended on a cushion of air, said guide extending transversely across the web, said guide having a pair of air nozzle slots positioned transversely along the guide and spaced circumferentially apart from one another, said slots being directed toward one another for providing pressurized air to said air cushion located therebetween and between said web and said arcuate surface, said guide having a pair of vane members, one located at each transverse end of the guide, adjustable means for selectively adjusting said vane members tranversely toward and away from one another, said guide having a series of transversely extending, extruded metal interlocking parts which together define said arcuate surface of said guide.

4,925,078

GRIPPER FEED DEVICE

Matthias Scheltza, Welterstadt, Fed. Rep. of Germany, assignor to Leinhaas Industrieberatuog, Gelnhausen, Fed. Rep. of Germany

Filed Dec. 8, 1988, Ser. No. 281,540

Claims priority, application European Pat. Off., Dec. 23, 1987, 87119094.8

Int. Cl.[5] B65H *20/16*

U.S. Cl. 226—108 17 Claims



1. Gripper feed device, comprising

a housing,

first and second tension grippers symmetrically disposed for movement along first and second linear axes respectively,

rotatable drive means interconnecting said first and second tension grippers, said rotatable drive means symmetrically driving said first and second tension grippers towards each other when said rotatable drive means rotates in one direction and away from each other when said rotatable drive means rotates in a counterdirection, cyclical rota-

VOL
1114
ISS
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MY
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tional movement of said rotatable drive means being converted into cyclical linear movement of said tension grippers in opposite directions,

a main shaft connected to said rotational drive means and cyclically driving said rotational drive means,

a crank disk connected to and driving said main shaft,

a first piston/cylinder arrangement including a first pressure cylinder and a first piston having a first piston rod pivotably connected at a first point to said crank disk for rotationally driving said crank disk and thereby said main shaft,

a second piston/cylinder arrangement including a second pressure cylinder and a second piston having a second piston rod pivotably connected at a second point to said crank disk for rotationally driving said crank disk and thereby said main shaft in a direction opposite to said first piston/cylinder arrangement, and

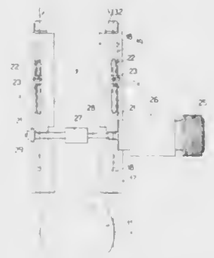
camming means associated with said crank disk for alternately actuating said first and second piston/cylinder arrangements.

4,925,079

APPARATUS FOR CORRECTLY FEEDING CONTINUOUS STRIPS WITH A SHAPED SIDE OUTLINE TO BLANKING MACHINES

Giovanni P. Castiglioni, Castellanza, Italy, assignor to F.I.C.I. Finanziaria Industriale Commerciale Immobiliare, Milan, Italy

Filed Oct. 11, 1988, Ser. No. 256,027
Claims priority, application Italy, Oct. 19, 1987, 22326 A/87
Int. Cl.[5] B65H *20/04*
U.S. Cl. 226—152 **20 Claims**



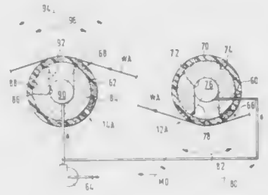
1. Apparatus for accurately feeding a continuous web having opposite generally sinuous longitudinal edges each defined by alternating convex and concave edge portions comprising a pair of rolls defining a bight therebetween for passage therethrough of a web, said pair of rolls including a drive roll, means for driving said drive roll to thereby feed the web in a predetermined direction, means for guiding the web during the feeding thereof, said guiding means including opposite lateral guides spaced a distance from each other corresponding generally to the distance between transversely opposite convex edge portions of the web, means for sensing along a line in chordal relationship to the concave and convex edge portions of said opposite sinuous longitudinal edges to thereby sense the presence and/or absence of the concave and/or convex edge portions, and means responsive to said sensing means for selectively intermittently actuating said driving means whereby said drive roll stepwise feeds said web in said predetermined direction.

4,925,080

SPREADER BAR APPARATUS

Jere W. Crouse, Beloit, Wis., and Stewart B. Olson, Lexington, Ky., assignors to Beloit Corporation, Beloit, Wis.

Filed Oct. 13, 1988, Ser. No. 257,679
Int. Cl.[5] B65H *23/24*
U.S. Cl. 226—196 **9 Claims**



1. A spreader bar apparatus for separating slit portions of a web, said apparatus comprising:

a first spreader bar extending in a cross-machine direction relative to the web and bowed relative to the slit portions such that the slit portions are separated axially relative to each other when the slit portions are guided around said first spreader bar;

a second spreader bar disposed downstream relative to said first bar and extending in a cross-machine direction relative to the web for guiding the separated slit portions, said second spreader bar being bowed relative to the separated slit portions such that each of the slit portions disposed downstream relative to said second bar is disposed parallel to each other;

a first and second porous layer connected to said first and second bars respectively such that when said bars are connected to a source of pressurized air, air flows through said bars and said porous layers towards the slit portions for generating respectively a first and second air cushion, said air cushions reducing the frictional resistance between the moving slit portions and said bars, said air cushions also reducing the noise level caused by movement of the slit portions when the slit portions move relative to and are guided by said spreader bars; and

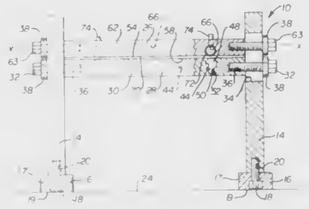
said porous layers having a porosity within the range 20–100 microns.

4,925,081

STRIP MATERIAL FEED GUIDE

John C. Vecchi, Natrona Heights, Pa., assignor to J. V. Manufacturing Company, Inc., Natrona Heights, Pa.

Filed Apr. 17, 1989, Ser. No. 339,224
Int. Cl.[5] B65H *23/04*
U.S. Cl. 226—199 **10 Claims**



1. A guide apparatus for guiding thin section sheet form material along a given path of movement comprising:

a rigid support means adapted to be positioned with respect to such a given path of movement;

a first elongated guide means supported by said support means adjacent such a given path of movement;

a second elongated guide means supported by said support means with respect to said first guide means such that an expanse of such sheet form material moving along such a given path will have the opposed surfaces thereof disposed in confronting relationship to said first and second guide means;

at least one of said first and second guide means including a plurality of laterally spaced elongated rod elements extending longitudinally of such a give path of movement and each said rod element having longitudinally opposed end portions;

said at least one of said guide means additionally including a pair of rod carrier means supported by said support means and engageable with the respective said opposed end portions of said rod elements to support said rod elements with respect to such a given path of movement;

said rod elements having surface portions extending longitudinally thereof which are adapted to engage one of the opposed surfaces of such an expanse of sheet for material; and

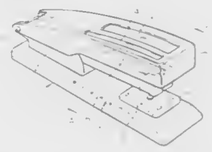
said rod carrier means including means cooperable with the respective said opposed end portions of said rod elements to permit selective positioning of said rod elements at any of a plurality of predetermined lateral positions with respect to such a given path of movement.

4,925,082

STAPLER WITH INDICATOR WINDOWS

Kwang-Shick Kim, #551, Dockpoong-7 Ri, Doogbu-Up, Kwang-ju-Gun, Kyungki-Do, Rep. of Korea

Filed Jul. 5, 1989, Ser. No. 375,831
Claims priority, application Rep. of Korea, Jul. 6, 1988, 88-11041
Int. Cl.[5] B25S *5/02;* **B25F** *7/00*
U.S. Cl. 227—120 **1 Claim**



1. A stapler which comprises a magazine and a cover case pivotally mounted at the frame on the base, where the scale is printed on the longer edge, the improvement comprising:

(a) a cover case made from transparent synthetic resin;

(b) two magnifying windows on the surface of the cover case;

a magnifying window to find the time for replenishing staples; and,

a magnifying window to determine the binding position.

4,925,083

BALL BONDING METHOD AND APPARATUS FOR PERFORMING THE METHOD

Farhad Farassat, Munich, and Walter Birgel, Feldkirchen, both of Fed. Rep. of Germany, assignors to Emhart Deutschland GmbH, Fed. Rep. of Germany

PCT No. PCT/EP87/00765, § 371 Date Oct. 5, 1988, § 102(e) Date Oct. 5, 1988, PCT Pub. No. WO88/05960, PCT Pub. Date Aug. 11, 1988
PCT Filed Dec. 9, 1987, Ser. No. 272,780
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703694
Int. Cl.[5] B23K *20/00, 31/00*
U.S. Cl. 228—102 **5 Claims**



1. A ball bonding method including the working steps of:

(a) positioning and lowering a bond capillary including a flame-scarfed bond wire ball from an upwardly retracted starting position onto a first bonding pad;

(b) welding the bond wire ball by heating and applying a defined bonding pressure and/or ultrasonic assistance;

(c) upward-retracting of the bond capillary;

(d) forming a loop in the bond wire;

(e) welding the bond wire in spaced relation to the bond wire ball to a second bonding pad by heating and applying a defined bonding pressure and/or ultrasonic assistance;

(f) upward-retracting of the bond capillary to a predetermined tail-length position, clamping and pulling on said bond wire to break the bond wire; and subsequent upward-retracting of the bond capillary to said starting position; and

(g) flame-scarfing the free bond wire end to form a fresh bond wire ball; and

the improvement comprising the steps of

(h) applying a voltage between said second bonding pad and said clamp exerting said pulling force on the bond wire as soon as the clamp is in the wire clamping position;

(i) measuring the distance travelled by the clamp until breakage of the bond wire in accordance with interruption of the electrical connection between the second bonding pad and the clamp, and;

(j) locating a flame-scarfing device spaced from the free bond wire end in accordance with distance travelled by the clamp and thereby spacing the flame-scarfing device a predetermined distance from the free bond wire end.

4,925,084

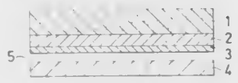
METHOD OF EXPLOSION WELDING ALLOY ALUMINIUM

Ingemar Persson, Nora, Sweden, assignor to Exploweld AB, Nora, Sweden

Filed Sep. 27, 1988, Ser. No. 249,961
Claims priority, application Sweden, Sep. 28, 1987, 8703732
Int. Cl.[5] F42B *13/12*
U.S. Cl. 228—107 **10 Claims**

1. A method of explosion welding magnesium-alloyed aluminium and high strength materials to form a high-quality, high strength joinder, wherein the magnesium-alloyed aluminium material forms a first base material and that said base material is clad with a thin cladding plate consisting of a high strength material; the method steps being that an explosive charge is caused to accelerate a drive plate consisting of a high

density, high strength material, which in turn engages and accelerates the cladding material towards and into engagement with the first base material, resulting in the amplitude of pressure generated between the cladding material and the first base material having a value which is so low that the temperature in the jointing surface between the cladding plate and the first base material is below the boiling point of the alloying substances of the alloying material in the alloyed aluminium, and



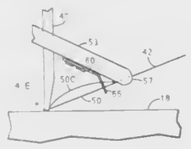
also assuring that the amplitude of said pressure is brought to a high value, of sufficient duration, to produce an impulse which will cause the cladding plate and the first base material to be explosion welded to one another; and wherein the free surface of the high-strength cladding sheet of the explosion welded joinder of the cladding plate and the first base material is caused, by a step of explosion welding, to be similarly explosion welded to a high strength metal material which becomes a second base material.

4,925,085

BONDING MEANS AND METHOD

Howard D. Buxton, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 25, 1989, Ser. No. 356,473
Int. Cl.[5] B23K *20/26, 31/00*
U.S. Cl. 228—179 **16 Claims**



1. An apparatus for attaching a wire to a bonding pad, comprising:
bonding means for bonding the wire to the bonding pad;
releasable clamping means for temporarily arresting longitudinal movement of the wire; and
guide means located between the bonding means and the clamping means for permitting the wire to move longitudinally and perpendicular to the bonding pad but preventing the wire from otherwise moving substantially transversely.

4,925,086

RESPONSE LETTER

Harold E. Stahlman, 4 Thoreau Rd., Winchester, Mass. 01898

Continuation of Ser. No. 281,897, Dec. 5, 1988, abandoned, which is a continuation of Ser. No. 203,530, May 17, 1988, abandoned, which is a continuation of Ser. No. 872,230, Jun. 9, 1986, abandoned. This applicatioo Jun. 16, 1989, Ser. No. 368,144

Int. Cl.[5] B65D *27/00*
U.S. Cl. 229—92.3 **4 Claims**

1. The combination of a unitary response letter and a mechanical inserter, the response letter comprising a rectangular body portion having an upper edge, first side edge, second side edge, a front face, a rear face and a rectangular extension, the second side edge in spaced parallel relation to the first side edge, the second side edge having a notch formed therein in opposed relation to the extension, a rectangular aperture formed through the body portion in close proximity to the notch, the extension having a terminal edge, a top edge, a bottom edge, an inside face and an outside face, the top edge spaced below the upper edge, the extension folded over the body portion with its inside face spaced from and facing the rear face, the terminal edge in close proximity to the first side



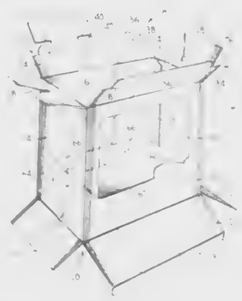
edge and the bottom edge attached to the body portion, the upper edge spaced from the top edge to provide an open top and the terminal edge spaced from the first side edge to provide an open side, the mechanical inserter having means of engaging the upper edge, whereby an insert card can be mechanically inseted by said inserter between the rectangular extension and body portion via said open top without jamming.

4,925,087

PACKAGING CONTAINER WITH DISPLAY WINDOW

Charles Ostrander, Bexley, Ohio, assignor to R. G. Barry Corporation, Pickerington, Ohio

Filed Sep. 6, 1989, Ser. No. 403,403
Int. Cl.[5] B65D *25/00*
U.S. Cl. 229—120.03 **24 Claims**



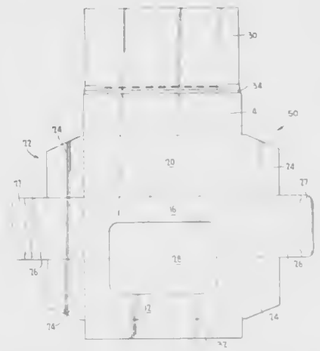
1. A packaging container comprising a front wall, a back wall, two side walls, means for forming a top and means for forming a bottom joined to each other so as to form an enclosure of a generally rectangular configuration, said front wall having an opening therein for display of an article contained within the enclosure, the container further including a shelf within the enclosure extending from and integral with the front wall to the back wall to provide a supporting surface for the displayed article, the shelf being supported by the front wall and being spaced upwardly from the means forming the bottom of the enclosure so as to provide a space for storage of one or more articles, wherein the shelf is formed by cutting the front wall and folding the shelf inwardly.

4,925,088

PACKAGING CONTAINER

Charles Ostrander, Bexley, Ohio, assignor to R. G. Barry Corporation, Pickerington, Ohio

Filed Sep. 6, 1989, Ser. No. 403,369
Int. Cl.[5] B65D *5/10*
U.S. Cl. 229—120.12 **17 Claims**



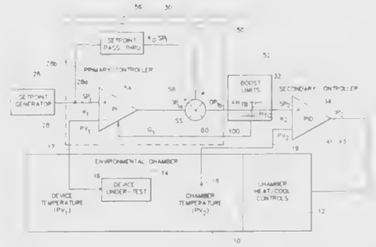
1. A packaging container comprising a front wall, a back wall, a top wall, a bottom wall and two end walls joined to each other to form an enclosure of a generally rectangular configuration, said front wall and said top wall having a contiguous opening therein for display of one or more articles contained within the enclosure, the container further including a slanted shelf extending from adjacent an edge between the top wall and the back wall to an area adjacent an edge between the front wall and the bottom wall, wherein the front wall includes an integral extension flange extending in a plane parallel to the bottom wall.

4,925,089

ENVIRONMENTAL RESPONSE CONTROL APPARATUS AND METHOD

John J. Chaparro, San Diego; Dirk De Kreek, Thousand Oaks, and Charles R. Holdaway, San Diego, all of Calif., assignors to JC Systems, Inc., San Diego, Calif.

Filed Jun. 30, 1989, Ser. No. 374,525
Int. Cl.[5] F24F *5/00*
U.S. Cl. 236—78 D **11 Claims**



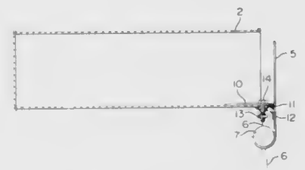
1. In an environmental test system in which a device under test is contained in an environmental chamber, said environmental chamber including means responsive to a chamber control signal for setting an environmental condition within said chamber, and signal means in said chamber for providing a first signal indicative of the reaction of said device under test to said environmental condition and a second signal indicative of said condition, a control apparatus for generating said chamber control signal, said apparatus comprising:
setpoint means for generating a test condition waveform;
a first control means connected to said setpoint means and to said chamber for generating a first operating point signal in response to said first signal and to said test condition signal;
limit means connected to said first control means and responsive to the magnitude of said first operating point signal for limiting said first operating point signal to a constant magnitude value when said magnitude exceeds a particular limit; and
a second control means connected to said limit means and to said chamber for generating said chamber control signal in response to said second signal and to said first operating point signal.

4,925,090

NEWSPAPER DELIVERY SIGNAL

Harold R. Barrett, 5270 Coomer Rd., Pontiac, Mich. 48054

Filed May 8, 1989, Ser. No. 348,684
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—34 **4 Claims**



1. An apparatus, which is attached to a substantially tubular roadside newspaper holder having at least one open end, which is usually supported by a post sunk into the ground, usually adjacent to a roadway, sidewalk or property boundary line, for signaling when a newspaper or like item is in the newspaper holder, comprising, in combination:
(a) a hinge operably engaged substantially near the open end of the newspaper holder having a portion remaining outside the newspaper holder;
(b) first means, for operably attaching said hinge to the open end of said newspaper holder, operably engaged with said hinge and newspaper holder;
(c) a plate operably engaged with said hinge;
(d) said plate rests in a substantially vertical position when the newspaper holder is empty;
(e) said plate is substantially triangular having a flattened peak and a base which is curved upwardly toward the peak;
(f) said plate when resting in the aforementioned vertical position substantially blocks the open end of the newspaper holder;
(g) said plate rotates on said hinge to a substantially horizontal position when a newspaper is placed in said newspaper holder;
(h) a cord having a first end and a second end is operably engaged at said first end thereof to said first means;
(i) second means, for signaling, are operably attached to the second end of said cord;
(j) said second means rest in the upwardly curved portion of said plate when the newspaper holder is empty; and
(k) said second means hangs from the cord when said plate is caused to rotate to a substantially horizontal position allowing said second means to be seen from a distance.

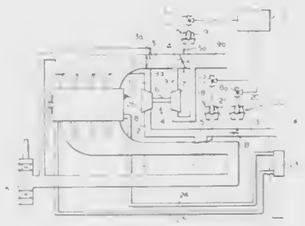
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4,925,091

VEHICLE ENGINE WARMING AND PASSENGER COMPARTMENT HEATING DEVICE

Hiromichi Yanagihara; Sumio Ito; Kazuhiro Sakurai, all of Gotemba, and Kouichi Akita, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 23, 1989, Ser. No. 299,417
Claims priority, application Japan, Feb. 8, 1988, 63-25757; Feb. 16, 1988, 63-31732; Feb. 16, 1988, 63-31733
Int. Cl.[5] G05D *23/00*
U.S. Cl. 237—2 A 19 Claims



1. A device for heating a passenger compartment and warming up an engine and having an intake passage and an exhaust passage, said device comprising:

a turbo heater means for drawing and heating air from an ambient air source and delivering hot, pressurized air, the turbo heater having a blower with an inlet side and a discharge side and turbine means for driving the blower including a turbine driven by exhaust gas discharged from the engine into the exhaust passage;

a hot air passage connected to the passage compartment;

selective connecting means for selectively connecting said discharge side of said blower to said hot air passage or the intake passage;

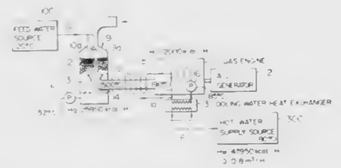
control means for controlling said selective connecting means to connect said discharge side of said blower to the intake passage during a predetermined period after the engine is started and to connect said discharge side of said blower to said hot air passage after said predetermined period has elapsed.

4,925,092

HOT WATER SUPPLY SYSTEM UTILIZING EXHAUST GAS OF ENGINE

Hiroshi Yoshida, Nagoya; Hiroshi Ikeya, Kosai; Kunihiro Kobayashi, Nagano, and Yasuhiko Kondo, Kasugai, all of Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed May 17, 1989, Ser. No. 353,309
Claims priority, application Japan, May 23, 1988, 63-123985; May 23, 1988, 63-123986; May 23, 1988, 63-123987; May 23, 1988, 63-123988
Int. Cl.[5] B60H *1/02*
U.S. Cl. 237—12.3 B 7 Claims



1. A hot water supply system utilizing exhaust gas of an engine comprising:

an exhaust gas supply pipe having one end connected to an exhaust pipe of said engine for introducing the exhaust gas;

a feed water source for supplying city water through a feed water pipe;

a latent heat recovery apparatus including a vessel having a top opening forming an exhaust port and having a warm water storage section at a bottom portion, and a filler layer of a porous member formed at an intermediate portion of said vessel to divide said vessel into an upper chamber and a lower chamber, said feed water pipe having an end protruding into said upper chamber to shower the city water above said filler layer, said exhaust gas supply pipe having the other end protruding into said lower chamber to supply the exhaust gas below said filler layer thereby to heat the city water by the exhaust gas and to store warm water thus produced in the warm water storage section; and

a cooling water heat exchanger having a primary side fed with cooling water of said engine as a heat source and having a secondary side supplied with the warm water from the storage section of said latent heat recovery apparatus to reheat the warm water to produce hot water to be supplied to a user.

4,925,093

FORCED DRAFT DIRECT VENT SYSTEM FOR A WATER HEATER

Henry J. Moore, Jr., Playa Del Ray, and Wouter J. Wiersma, Arcadia, both of Calif., assignors to Mor-Flo Industries, Inc., Cleveland, Ohio

Filed Nov. 9, 1988, Ser. No. 268,716
Int. Cl.[5] F24D *3/08;* F24H *1/22*
U.S. Cl. 237—19 25 Claims



1. An indoor domestic type gas water heater having a forced draft venting system and comprising:

an upright exterior body wall;

a tank for containing a quantity of water to be heated;

thermostat means responsive to the temperature of said water;

an atmospheric burner;

fuel supply means adapted to controllably supply gaseous fuel from a supply source to said atmospheric burner;

igniter means adapted to ignite said fuel supplied to said burner;

a combustion chamber adapted to convey heat of combustion from said burner to said water;

a housing associated with the exterior of said water heater to provide an air pressure chamber defined in part by said exterior body wall and in part by walls of said housing, said air pressure chamber having a first opening communicating with the exterior of said housing, and a second opening communicating with said combustion chamber;

a combustion air fan operatively associated with said first opening in said air pressure chamber to move air into said air pressure chamber and to increase the air pressure within said chamber to a value greater than the air pressure within said chamber when said fan is not operating, said fan being responsive to said thermostat means; and,

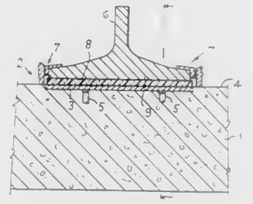
pressure sensing means adapted to detect said increased air pressure in said air pressure chamber and to activate said fuel supply means and said igniter means in response to said increased air pressure.

4,925,094

CONCRETE RAILROAD TIES

John Buckett, Kings Langley, England, assignor to Costain Concrete Company Limited, Hoddesdon, England

Filed Aug. 2, 1988, Ser. No. 227,405
Claims priority, application United Kingdom, Aug. 6, 1987, 8718665
Int. Cl.[5] E01B *9/68*
U.S. Cl. 238—265 3 Claims



1. In an assembly comprising a concrete railroad tie, at least one rail seat situated on a top surface of said tie, at least one railroad rail having a rail flange, and means securing said rail to said tie with said rail flange supported on said rail seat, the improvement which enhances abrasion resistance of said tie at said rail seat and which is characterised by:

a rectangular plate made from non-corrodible material and defining said rail seat,

said corrodible material being selected from the group comprising stainless steel, other non-corrodible metal and plastic,

said plate being of substantially the same width as said rail flange and extending substantially across the full width of said tie beneath said rail flange,

said plate having a stiffness less than that of said concrete tie and a smooth upper surface, and

a tie pad located between said rail and said plate and having said rail flange resting thereon, said tie pad being made from a material selected from the group comprising rubber, plastic and the like.

4,925,095

MULTI-ORIFICE MANIFOLD FOR BALANCING DISCHARGE OF LIQUIFIED GASES

Peter A. Students, Westchester, Ill., assignor to Liquid Air Corporation, Walnut Creek, Calif.

PCT No. PCT/US86/02368, § 371 Date Apr. 7, 1988, § 102(e) Date Apr. 7, 1988
PCT Filed Nov. 3, 1986, Ser. No. 193,087
Int. Cl.[5] B05B *1/14*
U.S. Cl. 239—1 2 Claims

1. A manifold for discharge of liquified gas comprising:

at least one main conduit, each conduit having a substantially central axis:

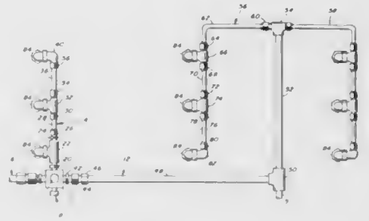
two or more openings within said main conduit;

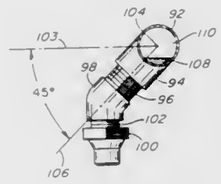
two or more discharge conduits each having a substantially central axis;

each of said discharge conduits extending exteriorly from one of said openings within said main conduit;

said discharge conduits having substantially the same diameter as the diameter of said main conduit; and,

said discharge conduits being positioned exteriorly about said central axis of said main conduit such that each central axis of a discharge conduit provides with respect to a substantially horizontal plane passing through said central axis of said main conduit, an included angle in the range of about −30° to about −60° relative to said horizontal plane.



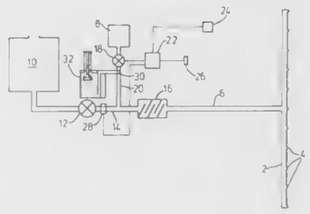


4,925,096

APPARATUS FOR DELIVERING A LIQUID

David C. Gill, Keynsham, United Kingdom, assignor to Nomix Manufacturing Company Limited, Bristol, United Kingdom

Continuation of Ser. No. 287,861, Dec. 21, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 404,009
Claims priority, application United Kingdom, Dec. 31, 1987, 8730326; Sep. 16, 1988, 8821719
Int. Cl.[5] B05B *7/26*
U.S. Cl. 239—10 10 Claims



1. Apparatus for delivering a liquid, the apparatus being adapted for travel over a surface to which the liquid is to be delivered, the apparatus comprising a source of liquid, a variable output reversible pump, delivery means to which the liquid is supplied by the pump from the source, control means for adjusting the output of the pump, and a travel speed sensor for transmitting a travel speed signal to the control means, a duct being provided for directing liquid from the pump to the lower region of a calibration vessel for determining the volu-

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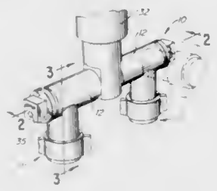
metric output of the pump, reversal of the pump causing liquid to be returned from the calibration vessel to the source.

4,925,097

MISTING SYSTEM

John E. Corrigan, Glenview, Ill., assignor to Carrot Top, Inc., Northbrook, Ill.

Filed May 25, 1989, Ser. No. 356,524
Int. Cl.[5] B05B *1/30*
U.S. Cl. 239—73 23 Claims



1. A misting head assembly comprising:

a cylindrical rotor defining a longitudinal axis and having a chordal flat;

a center post having an inlet portion, an annular housing portion extending coaxially about said rotor, and a flow passage extending through said inlet portion and about said rotor;

a swivel arm having a tubular portion having a radial through opening and being mounted for independent swiveling movement about the axis of said rotor and with respect to said center post, and a connecting portion; and

means for mounting a misting spray nozzle to said swivel arm connecting portion, said rotor flat defining with said center post housing portion and said swivel arm tubular portion a longitudinal flow passage for conducting water from said center post inlet portion to said swivel arm radial through opening to be sprayed outwardly therefrom through the nozzle when said swivel arm through opening is aligned with said chordal flat, communication between said longitudinal flow passage and said swivel arm through opening being prevented when said swivel arm radial opening is positioned out of alignment with said chordal flat, said swivel arm tubular portion being movably sealed to said rotor and said center post.

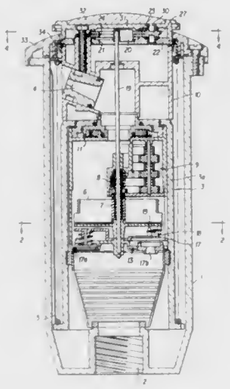
4,925,098

UNDERGROUND-INSTALLABLE ROTARY SPRAY IRRIGATOR DEVICE, WITH EMISSION ANGLE SELECTABLE FROM THE TOP

Jan C. Di Paola, Rome, Italy, assignor to James Hardie Irrigation (Italy), Fiano Romano RM, Italy

Filed Jan. 4, 1989, Ser. No. 293,501
Claims priority, application Italy, Jan. 29, 1988, 47576 A/88
Int. Cl.[5] B05B *3/16, 15/10*
U.S. Cl. 239—205 5 Claims

1. An underground-installable spray irrigator device with a piston-type spray element raisable and rotatable by the pressure of the irrigation water, comprising a turbine which is rotated by the water pressure to rotate the rotatable portion of the piston-type spray element by way of a reduction gear, wherein the turbine is fed in the lower part of the casing of the device by feed means which are orientated obliquely to the turbine axis in such a manner as to provide the same direction of rotation, and are mobile between two stable positions in which they are orientated in opposite directions, they being connected by a shaft coaxial to the turbine and to the casing of the device, to a rotation reversal member which is disposed at the top of the spray element and includes striker means which are accessible directly from the upper region of the device and are adjustable in position to set the size of the spray angle, wherein the feed means for the turbine, disposed below ths latter, include a lower plate carrying one or more nozzles of vertical axis parallel to the axis of the turbine and spaced radially from it, above them there being disposed a conveyor disc provided, in correspondence with each nozzle, with a pair of ducts which open upperly towards the turbine and have their axes oblique to the turbine axis in directions which pro-



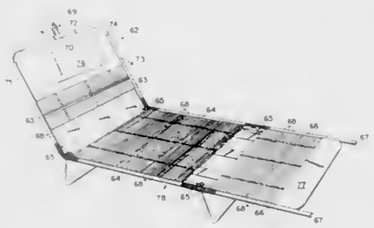
duce mutually opposite directions of rotation of the turbine, the conveyor disc being rotatable between two positions, in which it makes one or other of the oblique ducts of each pair face the corresponding nozzle, a bistable elastic means being provided to maintain its assumed position, the conveyor disc also being connected to turn with the rotation reversal member at the top of the spray element.

4,925,099

SUNBATHER SPRINKLER APPARATUS

Ronny C. Owen, 1147 Pin Oak Cir., Niceville, Fla. 32578

Continuation-in-part of Ser. No. 111,309, Oct. 22, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 280,986
Int. Cl.[5] A47C *7/74*
U.S. Cl. 239—289 21 Claims



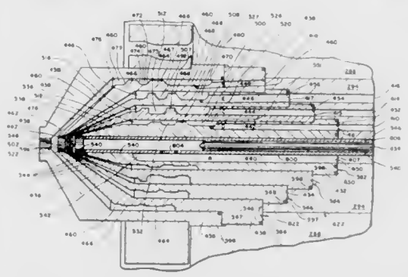
1. A sprinkler apparatus for use by sunbathers attachable to a lawn chair or recliner having oppositely disposed head and foot end portions comprising a pair of elongated hollow tubular rigid legs each having a first open end and a second closed end adjacent a foot end portion, each said leg including an inperforate angled section carrying said open end and being adjacent the head portion and a body section extending between said angled section and said closed end, said angled sections extending generally horizontally and in opposed directions to space said body sections apart, said body sections extending substantially parallel to each other and being adapted to be disposed on either side of a sunbather disposed on a lawn chair or recliner, said closed ends being located in alignment with respective said body sections of said legs, each said body section of said leg having a plurality of spaced water-emitting sprinkler passageways communicating between the hollow of said legs and outwardly thereof, connection means located substantially medially of and between said angled sections for connecting said first open end of each of said angled section to a single source of pressurized water, said connection means including valve means for controlling the passage of water into said legs, selective means for operating said valve means between a first closed position and a second open position, said selective means including a pivotal handle located above a head end portion.

4,925,100

METHODS AND APPARATUS FOR INJECTION MOLDING AND INJECTION BLOW MOLDING MULTI-LAYER ARTICLES, AND ARTICLES MADE THEREBY

Frederick G. Kudert, Niles; Maurice G. Latreille, Batavia; Robert J. McHenry, St. Charles; George F. Nahill, Crystal Lake, all of Ill.; Henry Pfutzenreuter, III, Alta Loma, Calif.; William A. Tennant, Schaumburg, Ill.; Thomas T. Tung, Hoffman Estates, Ill., and John Vella, Jr., Aurora, Ill., assignors to American National Can Company, Chicago, Ill.

Continuation of Ser. No. 909,402, Sep. 19, 1986, abandoned, which is a division of Ser. No. 6,484,707, Apr. 13, 1983, abandoned. This application Aug. 16, 1989, Ser. No. 394,295
Int. Cl.[5] B05B *7/12*
U.S. Cl. 239—416.4 9 Claims



1. Valve means for use in a co-injection nozzle of a multi-coinjection nozzle, multi-polymer injection molding or blow molding machine, wherein the nozzle has an axial central channel which in turn has a combining area, and has at least two orifices in communication with the axial central channel, at least one of the orifices being fixed and annular relative to the combining area of the central channel, comprising,

an elongated sleeve having a side wall with a port therein, an open end, and an elongated central passageway in communication with the port and the open end, said sleeve being adapted to reciprocate axially within the combining area of the central channel, and to block and unblock said at least two orifices, and

an elongated pin mounted in a close tolerance slip fit within and adapted to reciprocate axially within the central passageway, said pin having a side wall whose outer surface is adapted to close and open said port, and

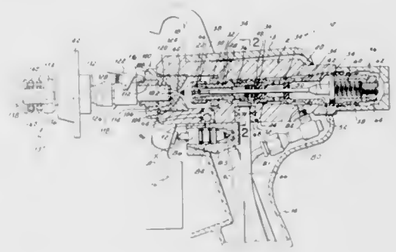
said nozzle central channel combining area and said sleeve having between them no area for significant accumulation of polymer material therein or passage of polymer material therethrough, and said sleeve and pin being adapted such that while the sleeve blocks or does not block the fixed annular orifice there can be an open polymer material flow path extending from another of the orifices through the sleeve central passageway.

4,925,101

WAX SPRAY GUN AND NOZZLE

Ronald D. Konieczynski, North Royalton, Ohio; Jo Pintelon, Lennik, Belgium; Robert J. Holland, Avon, Ohio; C. Peter Barth, Avon Lake, Ohio, and Jeff Gell, LaGrange, Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Aug. 26, 1988, Ser. No. 237,714
Int. Cl.[5] B05B *7/10, 1/26*
U.S. Cl. 239—8 15 Claims



1. Apparatus for spraying an atomized stream of liquid onto a substrate, comprising:

a gun body having an interior formed with a liquid supply passageway, said liquid supply passageway being effective to discharge a stream of liquid within said interior of said gun body;

means for impacting said stream of liquid discharged from said liquid supply passageway with atomizing air to form an atomized stream of liquid within said interior of said gun body;

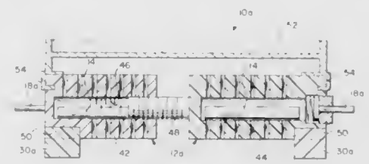
means for discharging said atomized stream of liquid from said interior of said gun body into an external nozzle assembly located exteriorly of said gun body, said external nozzle assembly including nozzle means for directing said atomized stream of liquid onto a substrate.

4,925,102

KITCHEN AND BATH USES

Christine B. Jones, Rte. 4, Box 355, Gate City, Va. 24251, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Sep. 23, 1988, Ser. No. 248,119
Int. Cl.[5] A61L *9/04*
U.S. Cl. 239—52 1 Claim



1. An air freshener holder which comprises:

(a) an elongated perforated housing for supporting consumable items therefrom; and

(b) material located within a central chamber in said housing for giving off a fragrance to the surrounding atmosphere; wherein said perforated housing is in the form of a longitudinal tubular roller having opposite ends with stub axles that can be journalled in sockets of a wall mounted bracket so that in one instance a toilet paper roll and in another instance a paper towel roll can be suspended therefrom and wherein said housing has transverse perfo-

rations which communicate with said chamber, wherein said perforated housing is divided into two segments, in which one of said segments having an internal threaded bore while the other of said segments having an external threaded shaft threadable into said bore so that said perforated housing can be adjustable into various longitudinal lengths to accommodate said toilet paper roll or paper towel roll, further comprising:

(c) a pair of legs each removably mounted on one of said segments below one of said stub axles of said perforated housing by a dove tail connection thereto; and

(d) a tray removably mounted on said perforated housing above said stub axles of said perforated housing by a clamp connection whereby said holder can be converted from an air freshener paper roll holder supported on said axles to a combined air freshener holder and tray supported on legs.

4,925,103

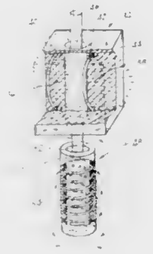
MAGNETIC FIELD-GENERATING NOZZLE FOR ATOMIZING A MOLTEN METAL STREAM INTO A PARTICLE SPRAY

George J. Muench, Hamden; Brian G. Lewis, Branford; Sankaranarayanan Ashok, Bethany; William G. Watson, Cheshire, and Harvey P. Cheskis, North Haven, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Mar. 13, 1989, Ser. No. 322,433

Int. Cl.[5] B05B *1/02*

U.S. Cl. 239—79 **18 Claims**



1. In a molten metal spray-depositing apparatus, the combination comprising:

(a) means for producing a stream of molten metal; and

(b) means for generating a magnetic field in a predetermined geometry relative to the molten metal stream to induce a torque in the stream which results in atomizing of the molten metal of the stream into a spray of metal particles when the stream exits said field.

4,925,104

COMPACT SPRAY GUN

James E. Smith, St. Petersburg, Fla., assignor to Graves Spray Supply, Inc., Clearwater, Fla.

Division of Ser. No. 150,142, Jan. 29, 1988, Pat. No. 4,848,665. This application Mar. 30, 1989, Ser. No. 330,460

Int. Cl.[5] B05B *7/12*

U.S. Cl. 239—71 **6 Claims**

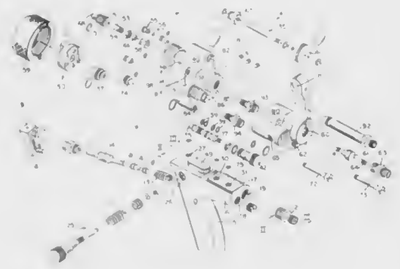
1. A compact spray gun for spraying airless, externally mixed resin-catalyst mixtures fluid stream comprising:

housing,

resin piston valve and catalyst piston valve for controlling the spraying of resin and catalyst respectively,

control means for providing air from a first air supply port to said resin and catalyst piston valves for opening and closing said resin and catalyst piston valves,

said resin piston valve having a packing seal which is adjustable from the exterior of said housing without disassembling said housing, and



said catalyst piston valve having a valve portion, including O-rings seals, separable from a piston portion, from the exterior of said housing without disassembling said housing.

4,925,105

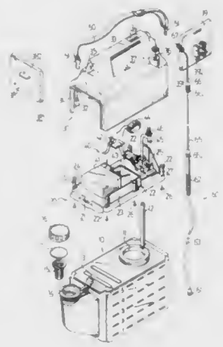
RECHARGEABLE GARDEN SPRAYER

Hsien C. Lin, No. 3, Lane 201, Kai Nan Street, Tainan City, Taiwan

Filed Apr. 14, 1989, Ser. No. 337,850

Int. Cl.[5] B05B *9/08*

U.S. Cl. 239—154 **12 Claims**



1. A rechargeable garden sprayer comprising:

a container having an opening on an upper face thereof, a lower suction tube being insertable in said container through said opening, an inlet formed at a lateral side of said container, said inlet cooperating internally with said container such that liquid poured in through said inlet flows to said container;

an engaging body mounted on said container, said engaging body including a plurality of upstanding hollow tubes along a periphery of a base thereof, a fixing panel to define a retaining recess, and a border panel;

a top cover being substantially an inverted U-shaped body having two fixing edges, said top cover including two side panels, each inner side of said two side panels being provided with a plurality of downwardly extending holes; said plurality of hollow tubes receive and retain said downwardly extending poles therein so as to secure said top cover to said engaging body, said top cover having a handle on an uppermost part thereof, a charging hole being formed beneath said handle; a first end cover and a second end cover being slidably engageable with said top cover, said first end cover including a plate, said second end cover including a holder;

a power unit including a closed-type battery retained in said retaining recess, a pump, a socket which is retained within said engaging body and in alignment with respect to said charging holes for recharging purposes, and a switch for controlling said pump, an upper suction tube which communicates with said lower suction tube being formed on an upper part of said pump; and

a telescopic nozzle tube including an engaging ring which engages with said upper suction tube, a gripping tube, a soft hose, an upper extension tube and, a nozzle head for spraying liquid, said nozzle tube being held by said holder of said second end cover.

4,925,106

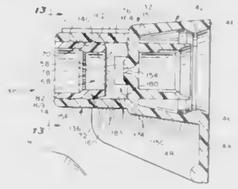
FOAM-OFF NOZZLE ASSEMBLY WITH BARREL SCREEN INSERT FOR USE IN A TRIGGER SPRAYER

Wilhelmus J. J. Maas, and Petrus L. W. Hurkmans, both of Someren, Netherlands, assignors to AFA Products, Inc., Forest City, N.C.

Continuation-in-part of Ser. No. 181,143, Apr. 13, 1988, Pat. No. 4,890,792, which is a continuation-in-part of Ser. No. 158,329, Feb. 19, 1988, Pat. No. 4,883,227, which is a continuation of Ser. No. 817,935, Jan. 10, 1986, Pat. No. 4,730,775. This application Sep. 29, 1988, Ser. No. 251,163

Int. Cl.[5] B05B *1/02, 1/12, 7/04*

U.S. Cl. 239—333 **29 Claims**



1. A foam nozzle assembly mounted to a trigger sprayer and comprising an outer barrel portion defining a foam generating chamber into which liquid is ejected in a conical spray from an orifice in a back wall of the foam generating chamber, the cone of the spray subtending a predetermined angle, and a perforated wall which is located in said outer barrel portion and which is spaced forwardly of said back wall having said orifice from which the conical spray is ejected, said perforated wall having ribs and slots therein and the back edges of the portions of said ribs between slots being rounded to provide a surface upon which the conical spray can impinge and be deflected in different directions to mix with air in the foam generating chamber to create foam, the rounded back edge of each of said ribs being defined by a generally circular round having a given radius R.

4,925,107

LOW COST MIXING AND DISPENSING GUN FOR REACTIVE CHEMICAL PRODUCTS

Daniel P. Brown, West Haven, Ill., assignor to Insta-Foam Products, Inc., Joliet, Ill.

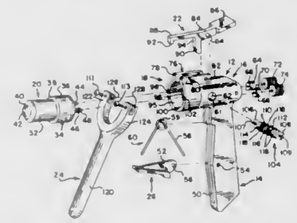
Continuation of Ser. No. 755,859, Jul. 17, 1985, Pat. No. 4,676,437. This application Jun. 26, 1987, Ser. No. 67,096

The portion of the term of this patent subsequent to Jun. 3, 2004, has been disclaimed.

Int. Cl.[5] F23D *11/46;* **B05B** *7/121, 7/02*

U.S. Cl. 239—414 **7 Claims**

1. A gun assembly for directing at least two individual streams of separate reactive liquid components toward an associated mixing and dispensing nozzle assembly, said components being adapted, upon reaction with each other, to produce a thermosetting resinous material, said gun assembly comprising, in combination, a gun body including means therein defining plural spaced apart liquid inlet passages, and plural, spaced apart liquid outlet passages positioned to receive liquid from said liquid inlet passages, said body also having a cylindrical sidewall defining a spool-receiving bore extending transversely of the axes of said inlet and outlet passages, means including an end wall and sidewalls formed in said body for defining an opening in said gun body for receiving a nozzle assembly in fluid-tight relation to said gun body interior, a gun handle extending downwardly from said gun body in position of use, a flow control valve spool rotatably received within said spool-receiving bore in fluid tight relation, passages extending through said valve spool transversely of the rotational axis thereof, said passages being spaced from each other and constructed and arranged so that, upon valve spool rotation, said passages become, respectively, fully registered, partially registered, and finally completely out of registry with said inlet and



outlet passages in said housing, said valve spool further including trigger mounting means on each end thereof, each of said outlet passages terminating at said end wall of said nozzle-receiving opening, whereby said components may be mixed within the end of a nozzle positioned within said nozzle-receiving opening in said gun body, a trigger unit having one end portion thereof actuable by the fingers of a user and having its other end bifurcated so as to form a yoke- having opposed, spaced apart end portions, each of said yoke end portions being affixed to one of said trigger mounting means on said valve spool ends, said yoke end portions also lying closely adjacent said gun body and being spaced apart therefrom only by a working clearance so as to prevent transverse movement of said valve spool within said gun body, and means normally biasing said trigger to a position wherein said valve spool passages are out of registry with said liquid inlet and outlet passages.

4,925,108

SPRAY HEAD FOR THE ADMINISTRATION OF A MULTI-COMPONENT MATERIAL BY MEANS OF GAS

Josef Zimmermann, Sulzbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 29, 1988, Ser. No. 226,327

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1987, 3725553

Int. Cl.[5] B05B *7/04*

U.S. Cl. 239—419.3 **10 Claims**

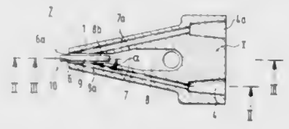
1. A spray head for dispensing a multi-component material, the spray head comprising:

a spray head body;

individual delivery channel means each including a distal end portion, each said delivery channel means for separately conveying a component of said multi-component material in a direction towards said distal end portions;

separating means disposed between said distal end portions of said delivery channel means for preventing the components of said multi-component material from mixing within said body;

gas channel means within said spray head body for providing gas pressure to each of the components of said multi-component material entrain each of said components



upstream of a downstream end of said separating means and to evacuate said components from said spray head body.

4,925,109

FOAMING APPARATUS

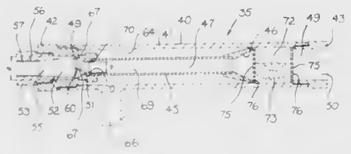
Thomas Flanagan, Loughrea; Robert V. McMurry, Ballybay; Patrick O'Donoghue, Bishopstown; Timothy O'Donoghue, Blackrock; Michael McKeon, Taney Rise, and John Breen, Rathmines, all of Ireland, assignors to Pandion Haliaetus Limited; Silver Security Limited; Champion Security Limited and Linara Investments Limited, all of Dublin, Northern Ireland

Filed Feb. 24, 1989, Ser. No. 314,856

Claims priority, application United Kingdom, Feb. 24, 1988, 496/88

Int. Cl.[5] **B05B** *7/26, 7/06*

U.S. Cl. 239—429 **17 Claims**



1. Apparatus for foaming a mixture of water and detergent, the apparatus comprising:

a housing having a main bore extending therethrough from an upstream end to a downstream end, the main bore having a tapered portion adjacent the upstream end tapering in a generally downstream direction,

a water and detergent inlet being provided at the upstream end of the main bore the water and detergent inlet being formed by a first orifice for delivering a mixture of water and detergent into the tapered portion of the main bore in a generally axial direction relative to the main bore,

at least one air inlet formed by a second orifice in a side wall of the tapered portion of the main bore for delivering compressed air into the tapered portion of the main bore for mixing with the water and detergent mixture,

an elongated mixing chamber for mixing the water and detergent mixture and compressed air, the mixing chamber being formed by a portion of the main bore extending from the tapered portion of the bore in a generally downstream direction, the cross sectional area of the main bore being substantially constant over the length of the mixing chamber and being greater than the smallest cross sectional area of the tapered portion of the bore, and

an outlet at the downstream end of the main bore for delivering the foamed water and detergent mixture.

4,925,110

FUEL INJECTION VALVE FOR AN INTERNAL COMBUSTION ENGINE HAVING A PILLAR OPPOSING A FUEL INJECTION HOLE

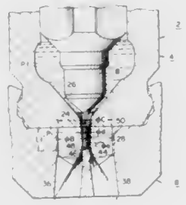
Keiso Takeda, Mishima; Kiyoshi Nakanishi, Susono; Taiyo Kawai, Susono, and Rio Shimizu, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 21, 1988, Ser. No. 287,346

Claims priority, application Japan, Dec. 28, 1987, 62-197544; Dec. 29, 1987, 62-200328; Dec. 29, 1987, 62-200330; Dec. 29, 1987, 62-200332; Dec. 29, 1987, 62-200327; Dec. 29, 1987, 62-200329; Dec. 29, 1987, 62-200331

Int. Cl.[5] **F02M** *69/00, 51/06*

U.S. Cl. 239—533.12 **14 Claims**



1. A fuel injection valve for mounting on an internal combustion engine, comprising:

an injector body having an end surface and a single fuel injection hole for metering fuel to be injected, the fuel injection hole having an axis common with a longitudinal axis of the injector body and opening at the end surface of the injector body; and

an adapter fixed to the injector body and having an axis common with the longitudinal axis of the injector body, the adapter including:

a recessed concave portion formed in the adapter so as to have an axis common with the axis of the adapter, a side surface and a bottom surface, the side and bottom surfaces of the concave portion of the adapter and the end surface of the injector body defining therebetween a dead volume portion located in a direction downstream of and communicating with the fuel injection hole formed in the injector body;

a plurality of injected fuel paths formed in the adapter and communicating with the dead volume portion, the injected fuel paths being arranged around the axis of the adapter so as to be equally spaced from each other, the injected fuel paths extending through the adapter in an axial direction of the adapter and being inclined radially outward in the downstream direction with respect to the axis of the adapter so as to be further spaced from the axis of the adapter in a direction perpendicular to the axis of the adapter at downstream portions of the injected fuel paths than at upstream portions of the injected fuel paths, all the injected fuel paths opening to the dead volume portion from a downstream side of the dead volume portion; and

a pillar extending from the bottom surface of the concave portion toward the fuel injection hole formed in the injector body to extend into the dead volume portion, the pillar having a longitudinal axis common with the axis of the adapter, a side surface and a top surface which is spaced from and opposite to the fuel injection hole formed in the injector body;

wherein each of the injected fuel paths includes an upstream end portion and a remaining portion connected to the upstream end portion, the upstream end portion being reduced in diameter in the upstream direction, the remaining portion having a constant cross-sectional area over an entire length of the remaining portion; and

wherein a diameter of a cross-section of a portion of the pillar, axially adjacent to the upstream end portions of the injected fuel paths, is larger than a diameter of a circle which has a center on the axis of the adapter and tangentially contacts an uppermost portion of the remaining portion of every injected fuel path from inside of a circumferential arrangement of the fuel injected fuel paths around the axis of the adapter, so that a step portion under-cut toward the axis of the adapter is formed between the side surface of the pillar and the remaining portion of every injected fuel path by a portion of a wall surface of the upstream end portion of every injected fuel path.

4,925,111

FUEL INJECTION VALVE

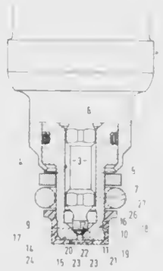
Manfred Foertsch, Oberhaid; Waldemar Hans, Bamberg, both of Fed. Rep. of Germany, and Volker Warnicke, Summerville, S.C., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1989, Ser. No. 304,637

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 8802464[U]

Int. Cl.[5] **F02M** *61/00*

U.S. Cl. 239—533.12 **10 Claims**



1. A fuel injection valve for internal combustion engines comprising a nozzle body (**5**), said nozzle body including a fuel injection end (**14**), said fuel injection end having an am and a downstream surface, a valve seat face (**10**) on said upstream surface of said fuel injection end, at least one metering opening (**11**) provided through said fuel injection end (**14**) of the fuel injection valve, a cup-shaped cap (**17**) secured onto said fuel injection end, an intermediate space (**20**) formed downstream of the metering opening between said fuel injection end downstream surface and said cup-shaped cup an defined on a side remote from said at least one metering opening by a preparation wall (**22**) which is embodied as thin-walled, at least two preparation openings (**23**) that penetrate said preparation wall and lead outward from said intermediate space, said cup-shaped cap fits over and snaps onto said fuel injection end, and said preparation wall is embodiment in a bottom (**19**) of said cup-shaped cap.

4,925,112

FUEL INJECTION

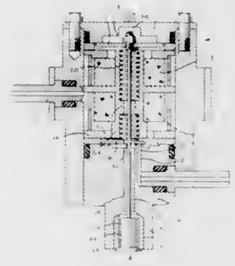
Brent J. Wahba, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1989, Ser. No. 369,502

Int. Cl.[5] **B05B** *1/30;* **F02M** *61/08*

U.S. Cl. 239—585 **1 Claim**

1. The injector for delivering a charge of fuel and air directly into an engine combustion chamber, the injector having an air inlet, a fuel inlet, a valve seat surrounding the fuel inlet, a fuel metering armature defining a fuel metering valve member, a fuel metering valve spring biasing the fuel metering armature to engage the fuel metering valve member with the fuel inlet valve seat, a charge delivery valve seat through which fuel and air are delivered to the engine, a charge delivery valve member, an operating rod extending from the charge delivery valve member, a charge delivery valve spring biasing the operating rod to engage the charge delivery valve member with the charge delivery valve seat, a charge delivery armature, a fuel metering solenoid coil, and a charge delivery solenoid coil, the



fuel metering armature being effective when the fuel metering coil is energized to displace the fuel metering valve member from the fuel inlet valve seat while the charge delivery valve spring maintains the charge delivery valve member in engagement with the nozzle body valve seat, the charge delivery armature being effective when the charge delivery coil is energized to displace the operating rod and thereby displace the charge delivery valve member from the nozzle body valve seat, and wherein the solenoid coils are aligned along a common axis and disposed between the armatures.

4,925,113

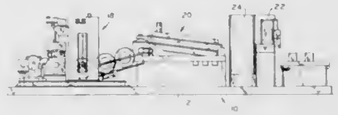
SCRAP TIRE PROCESSING APPARATUS

Terry L. Wissman, and John B. Bornhorst, both of New Bremen, Ohio, assignors to The Minster Machine Company, Minister, Ohio

Filed Apr. 20, 1989, Ser. No. 340,911

Int. Cl.[5] **B02C** *19/00*

U.S. Cl. 241—101.4 **26 Claims**



1. An apparatus for processing a scrap rubber tire carcass, the tire carcass having a circumferential crown and a pair of sidewalls extending generally radially inwardly from and generally perpendicular to the crown, each of the sidewalls having an inner circumferential edge, said edges defining a center opening, said apparatus comprising:

means for holding the tire carcass;

means for cutting radially at only one place the held tire carcass completely through from the inner circumferential edges to the crown;

means for advancing the cut tire carcass longitudinally in a direction being at least initially generally tangent to the circumference of the crown;

means for receiving the longitudinally advancing cut tire carcass and continuously flattening the sidewalls; and

means for receiving the longitudinal advancing flattened tire

VOL
1114
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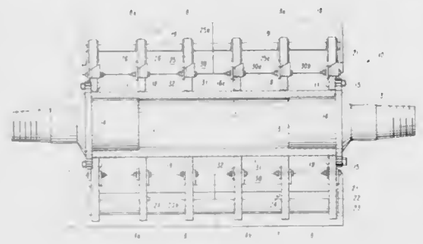
carcass and simultaneously reducing the received tire carcass to particles.

4,925,114

IMPELLER BAR INSTALLATION AND REPOSITIONING MEANS FOR IMPACT CRUSHERS HAVING "OPEN" TYPE ROTORS

David A. Ostergaard, Cedar Rapids, Iowa, assignor to Cedarapids, Inc., Cedar Rapids, Iowa

Continuation of Ser. No. 182,120, Apr. 15, 1988, abandoned.
This application Jun. 19, 1989, Ser. No. 368,975
Int. Cl.[5] B02C *13/28*
U.S. Cl. 241—191 **7 Claims**



1. A rotor assembly for an impact crusher, comprising a rotor having a rotational axis and at least one pair of axially spaced rotor discs extending radially of the rotor assembly with respect to said axis, the discs having axially aligned sets of recesses transversely therethrough and equally spaced thereabout, the recesses extending generally radially inwards from the periphery of each disc, each disc recess having a pair of opposed first and second spaced side walls and a radially inner end wall extending transversely of the disc, an axially extending impeller bar disposed in each disc recess, each impeller bar having first and second opposite, outward facing side walls, the bar first side wall being in opposed spaced relation to the disc recess first side walls, the disc recess first side wall and bar first side walls converging towards each other in a generally radially outwards direction, and first means operative between the disc recess first side wall and bar first side wall and second means operative between the disc recess second side wall and bar second side wall for retaining each impeller bar in its respective disc recess, the first retaining means for each disc recess including: first and second wedges, the first wedge being disposed between the disc recess first side wall and bar first side wall and movable therebetween in a generally radially outward direction into wedging engagement with the disc recess first side wall and bar first side wall, the first wedge having a radially inner end wall in spaced opposed relation to the disc recess end wall, the disc recess end wall and first wedge end wall converging towards each other in a direction transversely of the disc, the second wedge being disposed between the disc recess end wall and first wedge end wall and movable therebetween in a direction transversely of the disc into wedging engagement with the disc recess end wall and first wedge end wall, and means for urging the second wedge in said transverse direction and thereby urging the first wedge in said outward direction, said urging means including a bolt disposed in said transverse direction and a nut engaging the bolt, said urging means, upon the nut being tightened on the bolt, maintaining tension on said wedges and holding the wedges securely in said wedging engagement.

4,925,115

SUGAR CANE MILL

Kishor M. Pole, and Bhagawan S. Dhavlikar, both of Maharashtra, India, assignors to Walchandnagar Industries Limited, Bombay, India

Filed May 4, 1989, Ser. No. 347,459
Int. Cl.[5] B02C *4/02*
U.S. Cl. 241—222 **12 Claims**

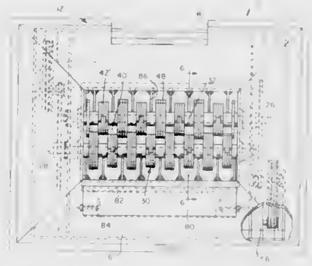
1. An improved sugar cane mill comprising a mill housing comprising of a pair of spaced apart upright frames fixed to the ground, a feed roller, a top roller and a discharge roller extending between said frames in a spaced apart relationship, the axes of said feed roller, top roller and discharge roller being parallel to one another, said mill including a trash plate disposed and extending between said feed roller and discharge roller, said feed roller being rotatably supported in a first pair of bearings, the housings of said first pair of bearings each being provided with a lateral lug at the bottom thereof towards the trash plate side, the trash plate side of the housings of said first pair of bearings being supported on the respective frames by at least one pair of first parallelogram link mechanisms, the pivot axes of said first parallelogram link mechanisms being parallel to the axis of said feed roller, said first parallelogram link mechanisms guiding the up and down movement of the housings of said first pair of bearings and the feed roller substantially linearly, the housings of said first pair of bearings being supported on and moved up and down by a pair of first constant pressure imparting means accommodated in the respective frames, said discharge roller being rotatably supported in a second pair of bearings, the trash plate side of the housings of the second pair of bearings being supported on the respective frames by at least one pair of second parallelogram link mechanisms, the pivot axes of said second parallelogram link mechanisms being parallel to the axis of said discharge roller, said second parallelogram link mechanisms guiding the up and down movement of the housings of said second pair of bearings and the discharge roller substantially linearly, the housings of said second pair of bearings being supported on and moved up and down by a pair of second constant pressure imparting means accommodated in the respective frames, said top roller being rotatably supported in a third pair of bearings, the housings of said third pair of bearings being mounted in said frames, the drive end of said top roller being coupled to a prime mover through a tail bar and box coupling assembly and gearing, the position of said top roller being fixed during operation of said mill, said trash plate being pivotally supported on said lateral lugs and abutting said feed roller and biased towards said feed roller, the axis passing through the pivots of said trash plate being parallel to the feed roller axis, said trash plate being movable up and down with said feed roller maintaining the set scrapping contact with said feed roller and the orientation thereof with respect to the confronting top roller surface, first stoppers being provided at the bottom of the housings of said third pair of bearings and at the confronting upper surface of the housings of said first pair of bearings and second pair of bearings to limit the upward movement of said feed roller and discharge roller and second stoppers being provided at the bottom of the housings of said first pair of bearings and said second pair of bearings and at the confronting surfaces of said frames to limit the downward movement of said feed roller and said discharge roller.

4,925,116

SLOW SPEED SHREDDER

Vernon J. Lundell, P.O. Box 171, Cherokee, Iowa 51012

Filed Mar. 7, 1989, Ser. No. 319,717
Int. Cl.[5] B02C *18/16*
U.S. Cl. 241—236 **14 Claims**



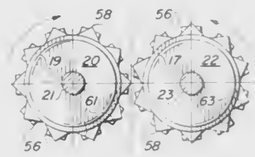
1. A slow speed shredder for waste material comprising an upwardly flared hopper having an open upper end and an open lower end, depending vertical walls connected with the periphery of the open lower end of a hopper, a pair of generally horizontally disposed, parallel shafts extending between opposed vertical walls with each of said shafts being independently driven by independent drive means, drive means for rotation in opposite directions, and a plurality of longitudinally spaced rotors mounted on each of said shafts, each of said rotors comprising a generally circular plate means having at least one portion spiralling inwardly to form at least one generally radially extending surface facing in the direction of rotation for engaging waste material placed on the rotors and shredding the waste material between opposed rotors and discharging it downwardly below the rotors, said generally radial surface on each plate means being inclined in the direction of rotation for engaging and retaining the waste material in position for shredding, each plate means including a plurality of side-by-side plates with the inclined radial surfaces on the outermost plates leading in the direction of rotation as compared with the inclined radial surfaces on the innermost plates.

4,925,117

BEVERAGE CONTAINER CRUSHER

Roy C. Ramos, 2062 W. Merlin Rd., Tucson, Ariz. 85713

Filed Apr. 7, 1989, Ser. No. 334,320
Int. Cl.[5] B02C *18/28*
U.S. Cl. 241—236 **9 Claims**



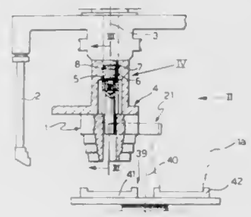
1. A beverage container crusher adapted to crush beverage containers holding liquids, the beverage container crusher comprising:
- an upper feed hopper to receive beverage containers;
- a pair of crushing drums receiving the beverage containers from said upper feed hopper, said crushing drums defining elongated rotating cylinders;
- a plurality of primary crushing teeth having a triangular cross section attached to said elongated rotating cylinders in longitudinal rows, said primary crushing teeth engaging the beverage containers for crushing;
- a plurality of secondary piercing teeth attached to said primary crushing teeth, said piercing teeth defining pyramidal shaped teeth having four triangular sides and a rectangular base, said piercing teeth adapted to pierce the beverage containers as the beverage containers are engaged by the primary crushing teeth to permit draining of the contained liquid while the beverage containers are being crushed;
- a wire mesh basket situated below said crushing drums, said wire mesh basket receiving the crushed beverage containers and liquid to hold the crushed beverage containers; and
- a sump pan situated below said wire mesh basket, said sump pan receiving the liquid which was formerly held in the beverage containers, said sump pan adapted to permit draining away of the liquid.

4,925,118

DEVICE FOR THE AUTOMATIC CHANGE-OVER OF THE FORM IN A COIL WINDER FOR FORMING THE WINDING OF A DYNAMO-ELECTRIC MACHINE

Giorgio Barbera, Leumann-Collegno, Italy, assignor to Officine Meccaniche Pavesi & C.S.p.A., Turin, Italy

Filed Oct. 20, 1988, Ser. No. 260,413
Claims priority, application Italy, Mar. 25, 1988, 67273 A/88
Int. Cl.[5] B21F *3/04;* **B65H** *81/06*
U.S. Cl. 242—1.1 R **6 Claims**



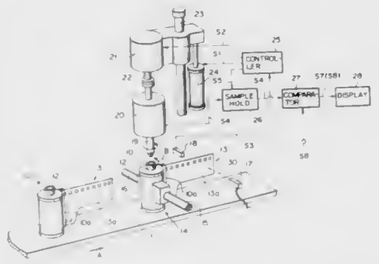
1. A device for the automatic change-over of a form of a coil winder for forming the winding of a dynamo-electric machine, comprising:
- rapid attachment means for the connection and disconnection of said form to said coil winder;
- a rotatable platform disposed beneath said form in said coil winder and movable along an axis of rotation thereof between a first position close to said form and a second position spaced therefrom, said platform defining two support zones, a first zone for receiving said form intended to be removed from said coil winder and a second zone for supporting a replacement form;
- driving means for moving said platform between said first and second positions;
- means for rotating said platform when said platform is in said second position for selectively positioning one of said zones in alignment with said coil winder; and
- operating means for operating the rapid attachment means when said platform is in said first position with said first zone in alignment with said coil winder for detaching said form from said coil winder and for operating said rapid attachment means when said platform is in said first position with said second zone in alignment with said coil winder to connect a replacement form on said second zone of said platform to said coil winder.

VOL
1114
ISS
3
MY
15,
1990
UMI

4,925,119
METHOD AND APPARATUS FOR INSPECTING RESISTANCE TO FILM DRAW-OUT

Makoto Shimizu; Katutoshi Nakamura, and Noriyuki Furusawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 18, 1989, Ser. No. 353,440
Claims priority, application Japan, May 18, 1988, 63-121189
Int. Cl.[5] B65H *18/10*
U.S. Cl. 242—57 6 Claims

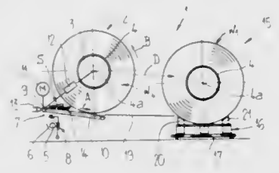


1. A method for inspecting resistance to film draw-out, which comprises the steps of:
(i) holding a magazine in which photographic film wound around a spool is accommodated,
(ii) rotating said spool in the direction that winds up said film around said spool,
(iii) detecting the movement of a film leader, which has been drawn out from said magazine, to said magazine, and
(iv) measuring the force required to rotate said spool when the movement of said film leader is detected.

4,925,120
METHOD OF, AND APPARATUS FOR, PROCESSING PRINTED PRODUCTS ARRIVING IN AN IMBRICATED FORMATION, ESPECIALLY NEWSPAPERS, PERIODICALS AND THE LIKE

Jacques Meier, Bäretswill, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Continuation of Ser. No. 42,343, Apr. 24, 1987. This application Dec. 9, 1988, Ser. No. 281,784
Claims priority, application Switzerland, Apr. 28, 1986, 1730/86
Int. Cl.[5] B65H *29/12;* B65G *7/00*
U.S. Cl. 242—59 26 Claims

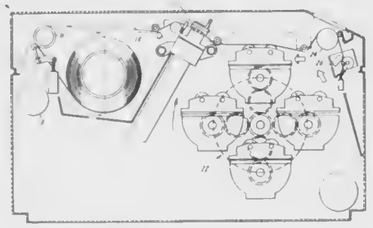


9. An apparatus for processing printed products, especially newspapers, periodicals and the like, wound in an imbricated formation and in conjunction with a winding band upon a hollow substantially cylindrical winding core to form wound product packages, comprising:
a stationary tilting device for the conjoint tilting through an angle of substantially 90° a plurality of wound product packages arranged adjacent one another on a movable transport element with lengthwise axes thereof extending in substantially horizontal direction;
said stationary tilting device comprising two supports disposed approximately at right angles with respect to one another;
means defining a pivot axis for said two supports;
said pivot axis extending substantially in horizontal direction;
means for pivoting said two supports conjointly through an angle of approximately 90° about said pivot axis;
a first one of said two supports receiving said movable transport element conjointly with said plurality of wound product packages to be conjointly tilted;
a second one of said two supports being provided with a number of mutually parallel support arms arranged in spaced relationship from one another for removably receiving and holding a support element for said plurality of wound product packages after tilting;
means for loading said movable transport element conjointly with said wound product packages onto said first one of said two supports of said tilting device; and
means for removing said support element conjointly with said tilted plurality of wound product packages from said second one of said two supports of said tilting device.

4,925,121
SENSING AMOUNT OF MEDIUM AND MEDIUM ROLL MALFUNCTION IN A PRINTER

Peter A. Tapscott, Portola Valley, and Thomas P. Courtney, Sunnyvale, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 880,767, Jul. 1, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 188,111
Int. Cl.[5] B65H *17/12*
U.S. Cl. 242—57 8 Claims

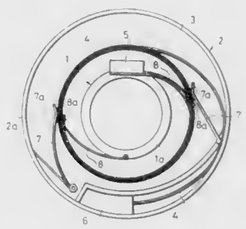


1. A method comprising the steps of:
rotating a drive means for unwinding a medium from a roll and for moving the medium along a path;
measuring drive means rotation;
during rotation of the drive means, detecting whether one of a series of elements that rotate when the roll rotates has reached a detecting position;
when one of the elements has reached the detecting position, updating a stored position value using the measured drive means rotation, the stored position value indicating the length of medium movement at the time the element reached the detecting position;
periodically obtaining a present position value using the measured drive means rotation, the present position value indicating the length of medium movement to a present time in the absence of a stopped roll condition; and
comparing the present position value with the stored position value to determine whether the roll has rotated while the drive means had rotated, failure of the roll to rotate indicating that the stopped roll condition has occurred.

4,925,122
CABLE REEL

Hiroyuki Bannai, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,926
Claims priority, application Japan, Apr. 24, 1988, 63-52101[U]
Int. Cl.[5] B65H *75/02;* H01R *39/00*
U.S. Cl. 242—85 2 Claims

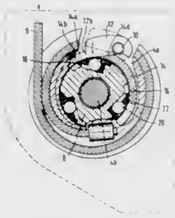


1. In a cable reel including a fixed member having an outer ring wall, a movable member having an inner ring wall and rotatably mounted to said fixed member in such a manner that a space is defined between said outer ring wall and said inner ring wall, a flexible cable received in said space under a wound condition with a plurality of turns, said flexible cable having opposite ends fixed to said fixed member and said movable member and extending outside, so as to effect electrical connection between said fixed member and said movable member; the improvement comprising a pressure member having a first elastic tongue provided on said fixed member for biasing said flexible cable toward said inner ring wall and a second elastic tongue provided on said movable member for biasing said flexible cable toward said outer ring wall, said first and second elastic tongues being formed of elastic material.

4,925,123
SAFETY BELT RETRACTOR WITH TIGHTENING MEANS

Bernhard Frei, Waldstetten, and Wolf-Dieter Hönl, Böblingen, both of Fed. Rep. of Germany, assignors to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,261
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715846
Int. Cl.[5] B60R *22/34;* B65H *75/48*
U.S. Cl. 242—107 14 Claims

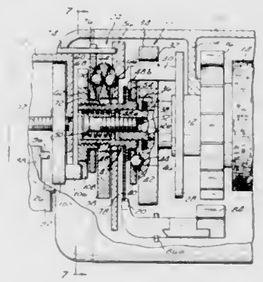


1. A safety belt retractor having a belt spool rotatably mounted in a frame and an associated belt retightening means which includes a drive pulley, flexible pulling means engaging the periphery of said drive pulley for transforming a pulling action occurring in a belt retightening operation into a rotary movement of said drive pulley, and coupling means provided between said belt spool and said drive pulley and selectively operable between a coupling state for interlocking said belt spool and said drive pulley for joint rotation and a release state wherein said belt spool is free to rotate with respect to said drive pulley, and control means for selectively controlling said coupling means between its coupling and its release state, said control means being responsive to the termination of a retightening operation to control said coupling means to said release state, said coupling means comprises at least one coupling element which is movable between a coupling position and a rest position, said control means being adapted to move said coupling element to its rest position in a constrained manner and having a ramplike control face which on rotation of the belt spool in a belt takeup direction imparts to the coupling element a constrained movement with a radial component in the direction of said rest position, said coupling element being a pawl which is pivotally mounted on a lateral flange of said belt spool and comprises an at least approximately radial coupling face which cooperates with a face opposite thereto of an intermediate ring releasably connected to said belt spool, said intermediate ring being adapted to be interlocked with said drive pulley for joint rotation by a clamping roller mechanism.

4,925,124
DUAL-MODE INERTIA REEL SYSTEM

Steven W. Hoyt, Garden Grove, and Sidney S. Thomas, Huntington Beach, both of Calif., assignors to Pacific Scientific Company, Anaheim, Calif.

Continuation-in-part of Ser. No. 34,408, Apr. 3, 1987, abandoned. This application Mar. 30, 1988, Ser. No. 175,059
Int. Cl.[5] B60R *22/38, 22/40*
U.S. Cl. 242—107.4 A 40 Claims



1. An inertia responsive mechanism, comprising:
a pair of spaced members mounted for rotation and for relative movement in an axial direction toward and away from each other;
means interconnecting said members in a manner such that one member rotates the other;
an inertia mass positioned between said members;
means for biasing said members towards each other; and
interengaging means on said mass and said members for supporting said mass between said members in a manner to rotate said mass at low acceleration and to permit the mass to move relative to said members in response to inertia forces at increased acceleration of said members, and in a manner such that movement of said mass relative to said members will cause relative displacement of said members away from each other in opposition to said biasing means.

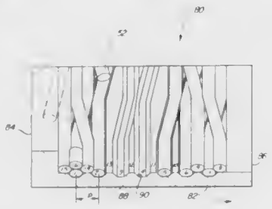
VOL
1114
ISS
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MY
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4,925,125

DEEP NESTED FILAMENT WINDING

George W. LeCompte, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 69,353, Jul. 2, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 270,885
Int. Cl.[5] B65H *75/18*
U.S. Cl. 242—117 1 Claim



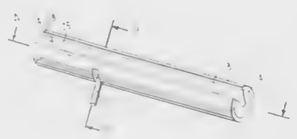
1. A spool useful for winding a filament thereupon, said spool comprising:
a center post, a flange, said flange being disposed at one end of said center post; and
a groove, said groove having an overall pitch along said center post about equal to the diameter of said filament times the square root of three, said groove including at least two discrete steps for each filament turn such that said pitch is provided in discrete steps about the periphery of said center post, each said step being paired axially along said center post and disposed such that the steps of each pair are proximate each other and adjacent pairs are spaced apart.

4,925,126

FIBER GUIDE

Daniel K. Schotter, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 15, 1988, Ser. No. 284,978
Int. Cl.[5] B65H *57/12*
U.S. Cl. 242—157 R 14 Claims



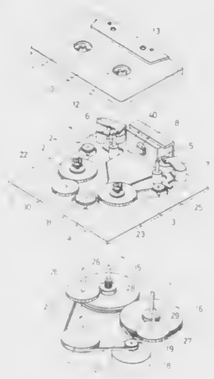
1. A fiber guide comprising:
a sleeve, said sleeve having a longitudinal opening therealong, said opening being sized to allow a fiber to pass therethrough;
a first member fixed within said sleeve proximate a first end thereof, said first member having a first notch extending thereinto, said first notch being substantially alligned with said longitudinal opening in said sleeve such that said fiber can be disposed into said first notch through said longitudinal opening;
a second member disposed within said sleeve, said second member being rotatable within said sleeve and having a second notch extending thereinto, said second notch being alignable with said longitudinal opening such that said fiber can be disposed into said second notch through said longitudinal opening;
said first and second notches having end portions confronting one another at an interface; and
means for rotating said second member to selectively vary the size of an opening formed at said interface between said first and second notches.

4,925,127

FF-REW CHANGING MECHANISM FOR TAPE RECORDING AND/OR REPRODUCING APPARATUS

Tatsuyuki Outou, and Hisanori Watanabe, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,435
Claims priority, application Japan, Jun. 30, 1987, 62-163354
Int. Cl.[5] G11B *15/18, 19/00*
U.S. Cl. 242—201 11 Claims



1. A mode change and drive mechanism for reel bases of a tape recorder having a plurality of operating modes, comprising:
movable change lever means to which a driver gear is rotatably affixed, said driver gear selectively engaging with and transmitting a torque to one of a pair of the reel bases;
change-lever controlling means for selectively setting said change lever means to a movable state or a fixed state in response to a mode change;
drive means for driving said change lever means in response to a mode change, whereby said driver gear selectively engages one of said pair of reel bases, or a non-engaged position where said driver is not engaged with either of said pair of reel bases;
reciprocating brake means for engaging said pair of reel bases to prevent rotation of said pair of reel bases;
brake controlling means for controlling said brake means and said change-lever controlling means in response to a mode change; and
wherein said change-lever controlling means comprises a first engagement portion formed on said change lever means, and a second engagement portion disposed in said brake means for selective engagement with said first engagement portion of said change lever means.

4,925,128

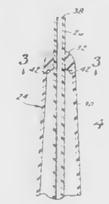
SPOUT FOR SQUEEZE BOTTLE

Harvey Brody, Costa Mesa, Calif., assignor to Norvey, Inc., Santa Ana, Calif.

Continuation of Ser. No. 41,858, Apr. 22, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 243,153
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—211 7 Claims

5. A spout assembly for a squeeze bottle or the like, of the

type including an extensible dispensing tube slidably disposed in an elongated hollow cap member, the distal end of the tube extending from the cap member to a selectable extended position, wherein the improvement comprises:
first and second bearing means, integral with, and extending radially inwardly from, the interior wall surface of the cap member near the distal end thereof, for slidably engaging the exterior surface of the tube, whereby the engagement between the tube and the first and second bearing means maintains the tube in a selected extended position;



the first bearing means comprising an annular bearing surface formed by the position of the interior wall surface surrounding the orifice, the annular bearing surface being dimensioned to provide and interference fit with the exterior surface of the tube, thereby forming a fluid-tight seal around the tube at the orifice; and
the second bearing means comprising a plurality of spaced-apart, rib-like bearing elements extending radially inwardly from the interior wall surface and formed contiguously with the annular bearing surface.

4,925,129

MISSILE DEFENCE SYSTEM

David Salkeld, and John W. Schofield, both of Stevenage, United Kingdom, assignors to British Aerospace public limited company, London, England

Filed Apr. 16, 1987, Ser. No. 41,125
Claims priority, application United Kingdom, Apr. 26, 1986, 8610291
Int. Cl.[5] F41G *7/30*
U.S. Cl. 244—3.11 12 Claims



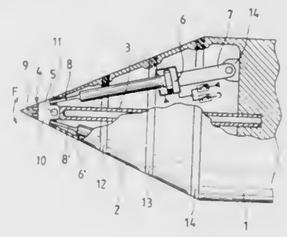
1. A missile defence system for intercepting a target, said system comprising:
a radar tracker for tracking a target at relatively large distances;
target track predictor means for receiving data output by said radar tracker to determine a predicted track of said target;
a guided projectile including at least one sub-projectile launchable from said projectile and optical tracker means for tracking the target at relatively small distances;
projectile guidance processing means for processing the output of said target track predictor means and for issuing guidance commands to guide the projectile onto a near reciprocal track; and
sub-projectile guidance processing means for processing the output of said optical tracker means and for issuing guidance commands to guide the sub-projectile to intercept said target.

4,925,130

FLIGHT PATH CONTROL APPARATUS FOR MISSILES

Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm, Munich, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 345,992
Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815290
Int. Cl.[5] F42B *15/027;* F41G *7/00*
U.S. Cl. 244—3.21 13 Claims



1. Apparatus for changing the flight path of a missile having a main body and a forward missile body structure coupled ahead of the main body comprising:
nose cone means coupled to the forward missile body structure and capable of pivoting in at least one plane;
actuator means coupled to the main body and to the nose cone means, capable of tilting the nose cone means about the at least one plane; and
a plurality of annular flexible element means located between the nose cone means and the main body and being disposed at spaced intervals in the forward missile body structure to allow deformation of said forward missile body structure upon tilting of said nose cone means.

VOL
1114
ISS
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4,925,131

AIRCRAFT WITH A PLURALITY OF PROPELLERS, A PIPE STRUCTURE FOR THEREON HOLDABLE WINGS, FOR VERTICAL TAKE OFF AND LANDING

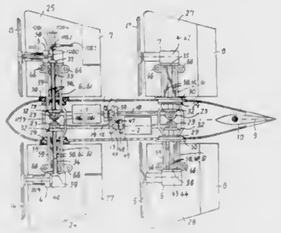
Karl Eickmann, 2420 Ishiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 828,115, Feb. 10, 1986, Pat. No. 4,784,351, and a continuation-in-part of Ser. No. 5,065, Jan. 20, 1987, and a continuation-in-part of Ser. No. 5,535, Jan. 20, 1987, and a continuation-in-part of Ser. No. 973,780, Dec. 27, 1978, abandoned, and a continuation-in-part of Ser. No. 760,005, Jan. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 487,272, Jul. 10, 1974, Pat. No. 4,009,849, which is a continuation-in-part of Ser. No. 104,676, Mar. 8, 1971, Pat. No. 3,823,898, which is a continuation-in-part of Ser. No. 782,349, Dec. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,023, May 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 328,395, Dec. 5, 1963, Pat. No. 3,320,898, and a continuation-in-part of Ser. No. 828,115, Feb. 10, 1986. This application Sep. 1, 1988, Ser. No. 239,234

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[5] B64C *29/00, 27/28*

U.S. Cl. 244—7 C **6 Claims**



1. An aircraft, which comprises, in combination,

a body, at least one power plant, at least two propellers, at least one pair of wing portions, a transmission between said power plant and said propellers with said transmission leading equal portions of power from said power plant to said propellers, whereby said transmission transfers at least four portions of equal power and rate of speed individually each one of said portions of power individually to one of said propellers to synchronize the rotary velocities of said two propellers to equal speeds and forces arrangements to pivot the axes of said propellers and of said wing portions from vertical to horizontal and vice versa in unison and and improvement,

wherein said improvement comprises, in combination, arrangements in said power plant and in said transmission,

wherein said power plant revolves an output shaft in excess of threethousand revolutions per minute,

wherein said transmission includes a horizontal shaft in said body with a first tapered gear, one front first gear and a rear first gear on the respective end of said shaft,

wherein a vertical shaft with second and third tapered gears on its ends is provided in said body,

wherein a lateral shaft with fourth and fifth tapered gears on its end is provided laterally extending from said body and extending into a wing portion of said wing portions,

wherein a propeller driving shaft is provided with a sixth tapered gear in said wing portion and with holding means to hold a propeller,

wherein said first gear engages and meshes with said second gear, said third gear engages and meshes with said fourth gear, said furth gear engages and meshes with said fifth gear and said fifth gear engages and meshes with said sixth gear,

wherein said propeller driving shaft is borne in bearings and carries said propeller to revolve said propeller,

whereby said two propeller driving shafts engage and drive said two propellers over said shafts and gears,

wherein a pipe structure is pivotably provided in said body, while each of said structures consists of at least three substantially parallel pipes which carry inner and outer bearings with said structures provided with holders to hold said wing portions, and;

wherein said lateral shaft is provided between portions of said pipes of said structure while said lateral shaft is borne in said inner and outer bearings.

4,925,132

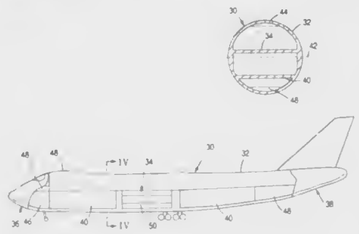
WIDE-BODY AIRCRAFT HAVING EFFICIENT UTILIZATION OF INTERIOR SPACE AND METHOD THEREFOR

Robert B. Zider, Portola Valley, Calif., assignor to The Beta Group, Palo Alto, Calif.

Filed Nov. 30, 1988, Ser. No. 277,862

Int. Cl.[5] B64C *1/18*

U.S. Cl. 244—118.1 **21 Claims**



1. A wide-body aircraft having a fuselage, a main deck extending substantially the entire length of the fuselage and a lower deck, each of the decks being vertically spaced apart such that each of the decks is equally suitable for carrying passengers or cargo, the main deck and the lower deck structurally interconnected to the fuselage, each deck providing substantially equivalent support to the fuselage, said fuselage having a cross-section the circumference of which is a single continuous convex curve, the combination of the main deck and the lower deck increasing the rigidity and strength of the fuselage while increasing the usable space within the aircraft without significant weight penalty.

4,925,133

HYDRAULIC BUOYANCY FORCE SUIT

Stephen G. Wurst, Orange; William J. Adams, Torrance, and Kenton M. Munson, Monrovia, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1988, Ser. No. 289,846

Int. Cl.[5] B64D *10/00, 25/02*

U.S. Cl. 244—118.5 **15 Claims**

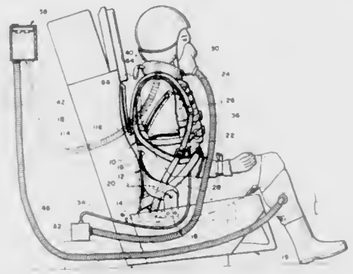
1. An apparatus for maintaining useful consciousness and reducing the risk of injury for a subject exposed to high levels of acceleration while in a vehicle, comprising:

a buoyancy force suite for supporting said subject with a buoyancy force, said force suit including at least two layers of flexible material, each layer being relatively impermeable to a substantially incompressible fluid having a specific gravity approximating blood being locatable in a space between said layers, said suit for fitting over substantially the entire subject, including the subject's neck, said space covering substantially the entire area of the suit;

a fluid reservoir in continuous fluid communication with said space between the layers of said buoyancy force suite for maintaining a constant fluid level within said buoyancy force suit during acceleration;

means for supporting said fluid reservoir within said vehicle at substantially the subject's eye level for maintaining an optimal fluid pressure gradient for ensuring an efficient blood supply to the subject's brain;

means for securely suspending said buoyancy suit within said vehicle; and



breathing assist means for sensing the pressure within said force suit and providing a regulator for breathing, thus compensating for any increased pressure exerted on the subject's rib cage at a result of the use of the force suit,

said force suit providing a balanced counterpressure to the force of acceleration, the force suit exerting pressure on substantially all body surface area underneath the suit, thereby reducing distension in the subject's blood vessels and the pooling of blood.

4,925,134

HIGH TEMPERATURE HEAT SHIELD SYSTEM

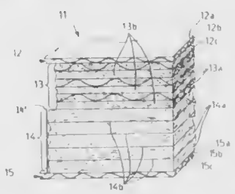
Karl Keller, Munich; Herbert Grallert, Unterhaching, and Wolfgang Keinath, Hoehenkirchen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 8, 1988, Ser. No. 281,817

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741733

Int. Cl.[5] B64G *1/00*

U.S. Cl. 244—158 A **23 Claims**



1. A high temperature heat shield system, especially for thermally protecting a flying body, comprising a laminate including a plurality of layered structures forming individual panels, each panel comprising at least a first outermost layered structure (12), a second intermediate layered structure (13), and a third innermost layered structure (15) arranged closest to said flying body, said first outermost layered structure (12) comprising an outer metal foil layer, an inner metal foil layer, and a dimpled metal foil layer arranged between said outer and inner metal foil layers, said second intermediate layered structure (13) comprising a plurality of corrugated metal foil layers stacked one on top of another and rotated respectively by 90°, whereby corrugations of neighboring corrugated metal foil layers cross each other perpendicularly to form spaces between said corrugations, and ceramic fiber material layers arranged respectively in each of said spaces between said corrugations, and said third innermost layered structure (15) comprising an outer metal foil layer, an inner metal foil layer, and a dimpled metal foil layer arranged between said outer and inner metal foil layers to form an integrally stiffened baseplate, and wherein said ceramic fiber material layers comprise a varying fiber material and layer composition with a higher content of Al_2O_3 in the fibers and a relatively low layer density of approximately 8 kg/m^3 and a relatively high average fiber diameter of approximately 4 μm near said first outermost layered structure, and a higher content of SiO_2 in the fibers and a relatively high layer density of approximately 40 kg/m^3 and a relatively low average fiber diameter of approximately 0.4 μm near said third innermost layered structure.

4,925,135

ARRANGEMENT FOR CONTROLLED GUIDANCE OF A WHEEL AXLE OR OF A BOGIE OF A RAIL VEHICLE PASSING OVER POINTS

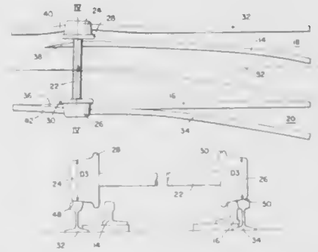
Rüdiger Ziethen, Friedrichsdorf; Sebastian Benenowski, Butzbach; Alfred Kais, Lich, and Erich Nuding, Linden, all of Fed. Rep. of Germany, assignors to BWG Butzbacher Weichenbau GmbH, Butzbach, Fed. Rep. of Germany

Filed Jan. 26, 1988, Ser. No. 148,735

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1987, 3719925; Oct. 26, 1987, 3736217

Int. Cl.[5] E01B *7/00*

U.S. Cl. 246—436 **12 Claims**



1. An arrangement for controllably guiding an axle means of a rail vehicle as it passes over a switch comprising a branch track and a main track wherein:

the branch track and the main track each include a rigid stock rail having a basic course, the stock rails of the branch and main tracks forming an angle;

the branch track and the main track each include movable blades;

the axle means includes an axle and a wheel at each end portion of the axle;

the wheels have frusto-conical portions that are supported on the stock rails at wheel contact points;

at least one of the stock rails has, in the region of the switch, a course change from the basic course by means of a bulge which guides the wheel rolling on said at least one stock rail so that it has the same effective rolling diameter as the other wheel, as the other wheel is rolling on the other stock rail, whereby both wheels roll along the rails without dragging thereon as the axle passes over the main track and as the axle passes over the branch track; and

the maximum distance between the bulge and the basic course of the at least one stock rail is between 5 and 30 mm.

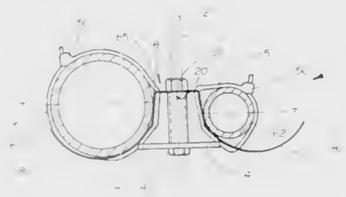
VOL 1114 ISS 3 MY 15 1990 UMI

4,925,136

PIPE SUPPORT APPARATUS AND/OR METHODS OF SUPPORTING PIPES

Frederick J. Knott, Auckland, New Zealand, assignor to Frank George Grundman, La Jolla, Calif.

Filed Jul. 8, 1988, Ser. No. 216,272
Claims priority, application New Zealand, Sep. 22, 1987, 221896
Int. Cl.[5] F16L *3/12*
U.S. Cl. 248—62 7 Claims



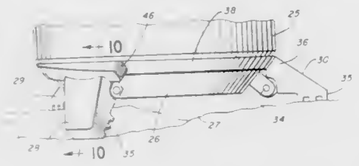
1. A pipe support apparatus, comprising:
a substantially vertical support member;
a substantially horizontally extending bracket member including a horizontal, planar portion with means to engage with said support member, said bracket member having at least one curved wing portion extending downwardly and curvilinearly away from an end of said planar portion;
load-bearing abutment means including at least one substantially planar flange extending substantially horizontally from said support member at a point displaced from the point of engagement of said bracket member with said support member whereby the end of said flange distal from said support member abuts an under surface of said wing portion of said bracket member and provides load-bearing support therefor at a point displaced from said support member.

4,925,137

LEVELING MECHANISM FOR TRIPOD BASE

Thomas C. Hastings, Willowdale, Canada, assignor to Coleman Outdoor Products, Inc., Wichita, Kans.

Filed Sep. 27, 1988, Ser. No. 249,701
Int. Cl.[5] A47G *23/02*
U.S. Cl. 248—148 12 Claims



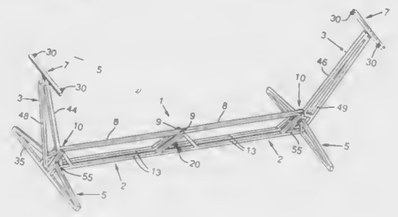
1. A leveling mechanism for a base having a plurality of legs pivotally attached to the base, the leveling mechanism comprising a ring-shaped band, means for securing the band on the base, and a camming ramp on the band which extends over a portion of the circumference of the band for increasing the thickness of the band along said portion of the circumference of the band, the thickness of the band being substantially uniform except in the area of the camming ramp, the camming ramp having a length which is shorter than the distance between any two legs.

4,925,138

COLLAPSIBLE HAMMOCK STAND

Mark W. Rawlins, #11 - 12240 Horseshoe Way, Richmond, British Columbia, Canada (V7A 4X9)

Filed Aug. 26, 1988, Ser. No. 237,236
Claims priority, application Canada, Sep. 18, 1987, 547228
Int. Cl.[5] F16M *11/32*
U.S. Cl. 248—165 11 Claims



1. A collapsible hammock stand, comprising:
(a) a main body frame comprising a pair of opposed frame sections, each such section having a longitudinally extending upper rail interconnected with a pair of narrowly spaced parallel lower rails, each of said lower rails having an inner end and an underside, said sections being pivotally interconnected at opposed corresponding ones of said inner ends to permit relative pivotal movement of the sections between an open position where corresponding rails of the sections extend in line with one another and a collapsed position where said undersides of corresponding lower rails of the sections abut one another;
(b) a pair of support arms, each being pivotally connected at a lower end between the lower rails of a different one of said frame sections for pivotal movement between an open position where the arm extends upwardly from its lower end to an upper end disposed above and outwardly from the upper rail of the frame section to which it is connected and a closed position where the arm is closely received through said narrow spaced between said lower rails of the frame section to which it is connected to a position within the region between the upper and lower rails of the frame section to which it is connected;
(c) a pair of support legs removably connectable with outer ends of said frame sections for providing upright support of said stand when said frame sections are in their open position; and.
(d) a pair of coupling means removably connectable with upper ends of said support arms for holding a hammock between said support arms when said frame sections are in their open position.

4,925,139

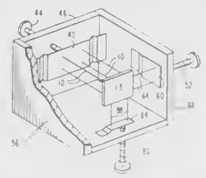
MECHANICAL STAGE SUPPORT FOR A SCANNING TUNNELING MICROSCOPE

Mark A. McCord, Yonkers, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1989, Ser. No. 345,609
Int. Cl.[5] F16M *11/12*
U.S. Cl. 248—179 13 Claims

1. A simplified apparatus for adjusting the position of a stage in a first direction comprising:
a stage;
a rigid support structure;
a plurality of axially rigid supports having first and second ends;
said plurality of axially rigid supports being attached to said stage at said first ends of said axially rigid supports and supporting said stage;
a first spring means including first and second ends;

said second ends of said axially rigid support being rigidly attached to said first spring means;
said first and second ends of said first spring means being rigidly attached to said rigid support structure; and



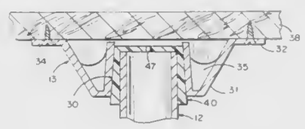
a first screw mechanism contacting said first spring means and movably attached to said rigid support structure.

4,925,140

DETACHABLE LEG ASSEMBLY

Richard J. Camarota, Holland, Mich., assignor to ITC Incorporated, Zeeland, Mich.

Filed Mar. 20, 1989, Ser. No. 325,989
Int. Cl.[5] F16M *11/16*
U.S. Cl. 248—188 9 Claims



1. A detachable pedestal for supporting an object, said pedestal having an elongated rigid leg member and a pair of brackets, one at each end; said leg being circular in cross section and of uniform diameter throughout its length, a tubular sleeve of synthetic resin material surrounding and bonded to each end of said leg, said sleeves each having a frusto-conical exterior surface characterized by a taper of about 2° whereby the exterior surface has its least diameter at the end of the sleeve adjacent the end of the leg; said brackets each having a socket the internal walls of which have a taper identical to that of the sleeve to be received therein and of a diameter large enough to receive therein the end of said leg with said sleeve thereon and of an axial length such that substantially all of the sleeve covering the end of said leg can be seated therein and when the sleeve has been pressed into the socket with sufficient force that the portion of the sleeve seated between the leg surface and the walls of the socket functions as a substantially incompressible lamina and supports the leg against lateral rocking movement relative to the central axis of the socket, said sleeves having a lubricious exterior surface whereby the sleeves and sockets can be separated and the leg withdrawn by an operator without the use of tools.

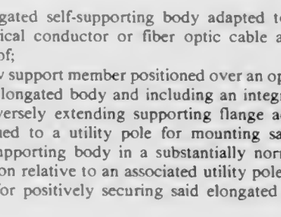
4,925,141

DECK CLIP

Mickey Classen, Box 782, Lloydminster, Saskatchewan, Canada S9V 1C1

Filed Oct. 17, 1988, Ser. No. 258,377
Int. Cl.[5] E04B *1/38*
U.S. Cl. 248—217.2 4 Claims

1. A deck bracket of the type used to mount deck planks on a joist comprising:
(a) planar body means, having ends and a top edge, for mounting on the joist to define a space between adjacent planks supported by the joist;
(b) planar arm means extending downwardly from one end of said body means in a vertical plane angled with respect to the plane of said body means for engaging one side of the joist;
(c) said planar arm means forming a rectangular flag extending in one direction along the joist away from said planar body means;
(d) said planar arm means including a hole for receiving a fastener to connect the bracket to the joist;
(e) said hole being located in said planar arm means and spaced horizontally from said planar body means;



(f) prong means extending outwardly from each side of said planar body means for penetrating a plank; and
(g) whereby, the planks can be accurately and firmly mounted on the joist in a precise spaced apart relationship determined by the thickness of said body means.
(h) Spacer means on said body means for bearing against adjacent planks to determine the spacing therebetween, said spacer means includes flanges extending outwardly from the ends of said body means.

4,925,142

ELECTRICAL UTILITY POLE DAVIT ARM

Marion R. Farmer, Germantown, Tenn., assignor to Aluma-Form, Inc., Memphis, Tenn.

Filed Sep. 29, 1988, Ser. No. 251,123
Int. Cl.[5] F16L *3/00*
U.S. Cl. 248—219.4 14 Claims



1. A davit arm for an electrical utility pole adapted to support an electrical conductor of fiber optic cable in laterally, outwardly offset relationship to an associate utility pole, comprising:
an elongated self-supporting body adapted to support an electrical conductor or fiber optic cable at a free end thereof;
a hollow support member positioned over an opposite end of said elongated body and including an integral, generally transversely extending supporting flange adapted to be attached to a utility pole for mounting said elongated self-supporting body in a substantially normal stand-off position relative to an associated utility pole;
means for positively securing said elongated body within

VOL
1114
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MY
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said hollow support member to maintain said elongated body in assembled relationship relative to said hollow support member during use of the davit arm on an associated utility pole, the hollow support member includes an inner circumferential wall which tapers inwardly from said supporting flange towards said elongated body, a wedging means positioned between said inner circumferential tapered wall and said elongated body for positively securing the elongated body within said hollow support member, said wedging means includes at least one mechanical wedge device between said inner circumferential tapered wall and said elongated self-supporting body, said wedging means further includes a cured polymer resin which extends around said mechanical wedge device and between said inner circumferential tapered wall and said elongated self-supporting body, and said mechanical wedge device includes at least one laterally outwardly offset rib for interlocking engagement relative to a complementary shaped recess provided in said elongated body.

4,925,143

MULTIPLE CLIP HOLDING ASSEMBLY

John J. Sandmeyer, 134 S. Courtland, Topeka, Kans. 66606

Filed Oct. 16, 1989, Ser. No. 421,854
Int. Cl.[5] A63F 9/00
U.S. Cl. 248—441.1 **6 Claims**



1. A multiple clip holding assembly adapted to rest on a support surface for releasably holding two pairs of bingo cards so that the cards are held in a position suitable for a user to visually inspect and manipulate the cards in a convenient fashion, the assembly comprising:

an integral body presenting a forward card-holding segment, a rearward card-holding segment, and wall means interconnecting said segments,

said forward segment including first and second, mated, spaced apart units of inverted verted, generally L-shaped configuration, each of said units presenting an upright member and a cantilevered member extending from the upper end thereof, said upright member of said second unit having a support port surface-engaging lower end, said cantilevered member of said second unit including flexible endmost portions distal from said upright member of said second unit, said endmost portions and said cantilevered member of said first unit defining respective planes, said cantilevered member of said first unit being rigidly, integrally formed with said wall means and vertically spaced above said cantilevered member of said second unit, said cantilevered member of said second unit being biased to a first orientation slightly inclined from a second orientation wherein said respective planes defined by said cantilevered members are substantially parallel,

said rearward segment including an upstanding support member of inverted, generally U-shaped configuration, presenting an uppermost bight and two spaced apart, support surface-engaging legs depending therefrom, said legs being rigidly fixed with respect to said wall means, the first of said legs being facially opposed to said upright member of said first unit, said first leg and flexible lowermost portions of said upright member of said first unit defining respective planes, said upright member of said first unit being biased to a first orientation slightly inclined from a second orientation wherein said respective planes defined by said first leg and lowermost portions of said upright member of said first unit are substantially parallel,

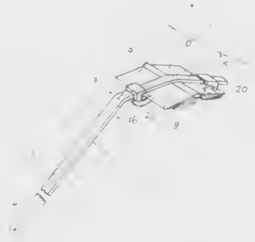
said wall means being substantially perpendicular to the planar surface and substantially equally dividing said first unit, said second unit and said support member, respectively intersecting each at about the midway point along the length thereof so as to form four holding compartments, The first pair of said holding compartments defined by respective portions of said first leg, said upright member of said first unit and said wall means, the second pair of said holding compartments defined by respective portions of said cantilevered member of said second unit, said first unit and said wall means, the first pair of said holding compartments being substantially perpendicular to the support surface and the second pair of said holding compartments being substantially parallel to the support surface, so that when the user selectively inserts corner portions of the four bingo cards respectively into said four holding compartments, said cantilevered member of said second unit and said upright member of said first unit are tilted into the respective second orientations such that the four bingo cards are frictionally and releasably held by said assembly in positions suitable for visual inspection and manipulation by the user.

4,925,144

PORTABLE BOOKHOLDER

Dennis E. White, 1916 - 23rd Ave., San Francisco, Calif. 94116-1213

Filed Nov. 27, 1987, Ser. No. 126,245
Int. Cl.[5] A47B 23/00
U.S. Cl. 248—445 **28 Claims**



1. A support for suspending reading matter in the field of view of a reclining reader, comprising:

a single, elongated support member, having a rectangular cross-section of high width to thickness ratio;

said support member having a first end portion capable of securely engaging the reader's environment;

said support member having a second, opposite end extending from said support member, whose longitudinal cross-section is in a shape resembling a shallow, inverted v defining an apex, said shape being generally complementary to the shape of a less than fully open book; and

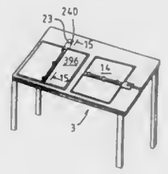
means for securely and releasably forcing and holding said reading matter in a slightly folded, less than fully open condition against the surface of said inverted v shape facing said person and centered about said apex, whereby said reading matter is held in a viewable relationship to said reader.

4,925,145

DOCUMENT SUPPORT STAND AND SECURABLE INTERLOCKING DOCUMENT HOLDER WITH LOCKING DOCUMENT RETAINER

David Hegarty, 36 Wyatt Rd., Garden City, N.Y. 11530

Continuation-in-part of Ser. No. 45,630, May 1, 1987, Pat. No. 4,787,595, which is a continuation-in-part of Ser. No. 791,743, Oct. 28, 1985, abandoned. This application Nov. 28, 1988, Ser. No. 276,932
Int. Cl.[5] A47G 1/24; 248 454
U.S. Cl. 248—454 **17 Claims**



1. A lockable document holder for being removably mounted and secured on a document support stand, which comprises:

a means for retaining documents, means for supporting the document retaining means, the document retaining means being mounted thereon, and means mounted on the document retaining support means for engageably cooperating with the document holder mounting means of a document support stand;

the document retaining support means including a control means, the control means adapted to retain and release the retaining means,

a lock receiving means, wherein the lock receiving means is a mounted flange having an opening, the lock receiving means being situated on the document retaining support means, to allow a lock to cooperate with the support means and the document support stand to secure both the document holder and the document retaining means.

4,925,146

MULTI-POSITIONABLE DOCUMENT SUPPORT STAND AND INTERLOCKING MODULAR DOCUMENT HOLDER

David Hegarty, 36 Wyatt Rd., Garden City, N.Y. 11530

Continuation-in-part of Ser. No. 45,630, May 1, 1987, Pat. No. 4,787,595, which is a continuation-in-part of Ser. No. 791,743, Oct. 28, 1985, abandoned. This application Nov. 18, 1988, Ser. No. 273,404
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[5] A47G 1/24
U.S. Cl. 248—454 **50 Claims**

1. A document support stand for removably mounting a document holder thereon, which comprises:

a main body, the body including a viewing side, a first support side and a second support side, the viewing side having at least first and second edges disposed transversely to each other, the first support side being joined to the viewing side at the first edge thereof, the second support side being joined to the viewing side at the second edge thereof, each of the viewing side and the first and second support sides being substantially planar, the first and second support sides extending angularly from the viewing side on the same side of the plane in which the viewing side resides, the first support side and the viewing side defining therebetween an acute first angle at the first edge, the second support side and the viewing side defining therebetween an acute second angle at the second edge; and

means for removably mounting a document holder on the body, the document holder mounting means being situated on the body at the viewing side thereof to allow the document holder to be mounted on the viewing side, the stand being selectively positionable to rest on one of the first support side, thereby supporting a document holder mounted thereon in a first viewing position, and the second support side, thereby supporting a document holder mounted thereon in a second viewing position which is transverse to the first viewing position, the viewing side residing in an x-y coordinate plane which is perpendicular to a z-axis of rotation, the document support stand being



adapted to be rotated about the z-axis of rotation so that the viewing side thereof is correspondingly turned within the x-y coordinate plane and adjusted in position within the x-y coordinate plane;

wherein the main body defines a hollow interior space; and

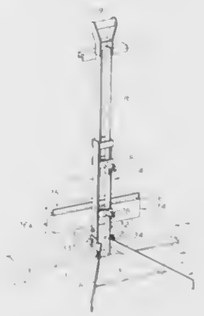
which further comprises weighted means disposed in the interior space of the main body, the weighted means being adapted to move within the interior space of the body whenever the document support stand is repositioned from one of the first and second support sides to the other of the first and second support sides so as to help lower the center of gravity of the document support stand.

4,925,147

ARTIST'S EASEL

David J. Potter, 13 High St., Loddon, Norfolk NR14 6ET GB , Great Britain

Filed Mar. 14, 1989, Ser. No. 322,919
Int. Cl.[5] A47B 97/04
U.S. Cl. 248—463 **7 Claims**



1. An artist's easel comprising

a framework comprising a horizontally oriented base member and upper and lower telescopically-connected, verti-

cally-extending members, the lower member being fixed centrally of said base member

a pair of wheels mounted on opposite ends of said base member enabling said easel framework to be wheeled to and from a place of use;

an upper clamping member fixed on said upper vertically-extending member, adjusable by movement of said upper vertically-extending member, and including means for securing a canvas to said framework,

a lower clamping member adjustably supported for vertical movement on said lower vertically-extending member and means for securing the same in a selected fixed position relative to said upper clamping member, said lower clamping means further including means to secure a canvas on said framework during movement,

means comprising an A-frame having its apex pivotally mounted on the lower end of said lower vertically-extending member and means to secure the same either in a position with the legs of the A-frame substantially coplanar with said vertically extending members permitting movement of said easel on said wheels, or in a downwardly and outwardly extending position to engage the ground and secure the easel against movement along the ground, and

said A-frame defines a planar support for a canvas when the easel is being wheeled when said A-frame is secured in said position against said vertically-extending members.

4,925,148

FISHING POLE HOLDER

Jerry Newton, R.R. B 3 Box 10, Owensburg, Ind. 47453; Chester Grogan, Jr., 3740 Woodyard Rd., Bloomington, Ind. 47401, and George Spector, 233 Broadway #3815, New York, N.Y. 10007

Filed Jun. 14, 1989, Ser. No. 365,792
Int. Cl.[5] F21I *7/00*
U.S. Cl. 248—542 **1 Claim**



1. A fishing pole holder comprising:

(a) an elongated post having a pointed end adapted to be inserted into the ground near a body of water;

(b) at least one bracket attached to said post opposite said pointed end adapted to engage a portion of a fishing pole when inserted between said bracket and said post so that the fishing pole can be used for hooking a fish when unattended; and

(c) means carried by said post, for illuminating said holder for night fishing; wherein said bracket includes:

(d) a blade member bent transversely in two spaced apart places to form a middle portion and two end portions wherein said middle portion is at an angle to each of said end portions and;

(e) at least one fastener for attaching one of said end portions of said blade member to said post so that other of said end portions will be positioned to provide space between the said pole and said middle portion for receiving said pole therebetween; wherein said illuminating means includes:

(f) an electric light carried on side of said post opposite said pointed end.

(g) a battery carried within said post and electrically connected to said light; and

(h) a manually operated switch carried on said post and electrically connected between said light and said battery so that a person can turn said light on and off; further including:

(i) said blade member having a normally closed spring biased hinge between said middle portion and lower of said end portions whereby said middle portion is normally biased towards said pole to engage and retain said pole against said holder;

(j) a flasher carried within said post and electrically connected to said light;

(k) a normally off fish actuated switch carried on said post on said lower of said end portions of said blade member above said manually operated switch and electrically connected between said light and said battery and

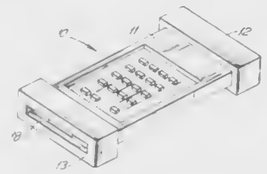
(l) a movable arm extending upwardly from lever of said fish actuated switch to a pivot point on said middle portion of said blade member and extending downwardly to bear against lever of said manually operated switch when said manually operated switch is on so that when a hooked fish pulls the fishing pole said movable arm will turn said fish actuated switch on and said manually operated switch off to activate said flasher to indicated visually that the fish is hooked.

4,925,149

SHOCK ABSORBING UNIT

Peter DiFrancesca, 25 Ringler Dr., East Northport, N.Y. 11731, and Richard O'Connor, 75 Edgewood Ave., Smithtown, N.Y. 11787

Filed Apr. 21, 1989, Ser. No. 341,499
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—687 **7 Claims**



1. An electronic remote control device and a shock absorbing unit capable of provided protection against external impact to an electronic remote control device wherein said shock absorbing unit comprises:

(a) a first housing structure defining a hollow cavity receiving in structural interfit one end of said electronic remote control device;

(b) a second housing structure defining a hollow cavity receiving in structural interfit the other end of said electronic remote control device;

(c) a band member structurally affixed to said first housing structure and said second housing structure so as to structurally connect same thereby resulting in there being defined in single unitary construction said first housing structure said second housing structure and said band member to receive and protect said electronic remote control device.

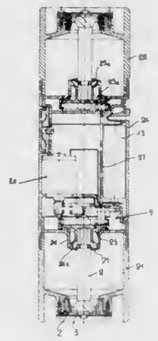
4,925,150

ELECTRIC GRINDER FOR PEPPER OR SALT

Pier G. Tedioli, Todi, Italy, assignor to Eugelo Bertagnoll, Cologno Monzese, Italy, a part interest

Filed Jan. 15, 1988, Ser. No. 144,053
Claims priority, application Italy, Jan. 15, 1987, 20513/87[U]
Int. Cl.[5] A47J *42/06*
U.S. Cl. 241—169.1 **16 Claims**

1. A grinding device, particularly for grinding pepper or salt grains, consisting of disengageable first, second and third bodies, said first body housing a motor unit comprising a motor, a reduction unit having an outlet gear, a feed battery and a control push-button, said second body consisting of a container having a grinder defining a fixed part and a rotary part mounted on its bottom, a drive shaft passing through said container of said second body, one end of which is fixedly connected to the rotary part of the grinder, and the other end of which is disengageably connected to said outlet gear, said outlet gear and drive shaft forming together a first reciprocal axially slidable connection means and said third body consisting of a container having a grinder defining a fixed part and a



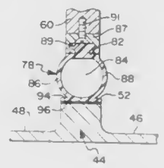
rotary part mounted on its bottom, a twin gear similar to the outlet gear of the reduction unit, a drive shaft passing through said container of said third body, one end of which is fixedly connected to the rotary part of the grinder and the other end of which is disengageably connected to said twin gear, said twin gear and drive shaft forming together a second reciprocal axially slidable connection means, the outlet gear of the reduction unit and the twin gear being reciprocally engaged by a spindle which passes through the motor unit, said second and third bodies having adjusting means mounted on the fixed parts of said grinders.

4,925,151

APPARATUS FOR MOLDING TWO-TONE COLORED PLASTIC SHELLS

John D. Gray, New Durham, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Continuation of Ser. No. 185,485, Apr. 25, 1988, abandoned.
This application May 22, 1989, Ser. No. 354,915
Int. Cl.[5] B29C *41/04, 41/22*
U.S. Cl. 249—65 **10 Claims**



1. Apparatus for molding a two tone colored, thin walled plastic shell including a heated mold and a powder charge box connected to the heated mold and seal means between said powder charge box and said heated mold to define a first powder casting surface on said heated mold for forming a shell of one color and to define a second powder casting surface on said heated mold forming a shell of another color comprising:

a divider wall and a perimeter wall on said powder charge box for separating said powder charge box into first and second chambers;

said divider wall having a horizontal surface and a vertical end surface on either end of said horizontal surface;

said heated mold having a perimeter wall generally congruent with said perimeter wall of said powder charge box; said perimeter wall of said heated mold horizontally spaced from each of said vertical end surfaces to form a gap therebetween; said heated mold further having a rib with a horizontal surface raised above the first and second powder casting surfaces, said horizontal surface located a fixed vertical distance from said horizontal surface of said divider wall;

a first seal member carried on said divider wall having a base segment secured to said horizontal and vertical end surfaces of said divider wall; a sealing bead surface on said first seal member having a first seal bead portion extending across the full length of said horizontal surface and having second and third seal bead portions extending across the full lengths of said vertical end surfaces; and a hollow, yieldable core on said first seal member connected to said base segment and to said sealing bead surface; said yieldable core expandable vertically to cause said first seal bead portion to bridge the fixed vertical distance between said horizontal surface on said rib and said horizontal surface of said divider wall to seal therebetween; said yieldable core expandable horizontally to cause said second and third seal bead portions to bridge the gap between the vertical end surfaces of said divider wall and said heated mold to seal therebetween;

a second seal member carried on said perimeter wall of said powder charge box; said second seal member having a hollow core compressible against said perimeter wall of said heated mold when the powder box is connected to said heated mold;

said hollow yieldable core of said first seal member having a vertically flattened position with a width greater than the width of said horizontal surface of said rib when deflated and a vertically expanded position when inflated with a width which is substantially the same as the width of said horizontal surface of said rib;

means for selectively inflating and deflating said hollow yieldable core of said first seal member from its vertically flattened position to said vertically expanded position and operative when the powder charge box is connected to said heated mold to cause said first seal member to inflate so as to cause said sealing bead surface to fully cover said horizontal surface of said rib without horizontally overlying the powder casting surfaces;

said means for selectively inflating and deflating said hollow yieldable core of said first seal member operative to deflate said hollow yieldable core to cause it to retract to its vertically flattened position while said second seal member expands following separation of said powder charge box and said heated mold upon formation of separated two tone color segments on said first and second casting surfaces so as to expose said horizontal surface of said rib for application of additional material thereagainst to form a connector bond between first and second color segments.

4,925,152

AIR TRAP FOR SHUTTING OFF FLEXIBLE PLASTIC TUBING

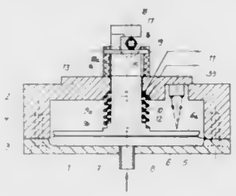
Karl-Alexander Hüber, Thüringer Strasse 28, D-7500 Karlsruhe - 41, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 299,883
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1988, 3801577
Int. Cl.[5] F16K *7/07*
U.S. Cl. 251—5 **5 Claims**

1. An air trap for shutting off flexible plastic tubing, comprising

VOL
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a body having a hollow interior and provided with an inlet port,
a diaphragm disposed in said hollow interior and defining in said hollow interior a pressure chamber, which communicates with said inlet port,
a guide stem, which is secured to said diaphragm on that side thereof that is opposite to said pressure chamber,
a flat head coupled to said guide stem,
valve means, which are connected to said inlet port and are operable to selectively pressurize and pressure-relieve said pressure chamber through said inlet port,
a receptacle defining outside said body a passage for receiving a flexible tubing,
squeezing means, which are operatively connected to and operable by said guide stem to release said tubing in said passage in response to gas pressure in said pressure chamber, and



spring means biasing said flat head and guide stem to operate said squeezing means by said guide stem to squeeze said tubing in said passage in response to a pressure relief of said pressure chamber,
wherein
said spring means comprise two concentric compression springs, which are arranged one in the other and engage said flat head and urge it toward said pressure chamber,
said valve means are electrically energizable to pressurize said pressure chamber and electrically deenergizable to pressure-relieve said pressure chamber,
a control circuit for energizing and deenergizing said valve means is connected to said valve means, and
said two compression springs are electrically connected in series in said control circuit.

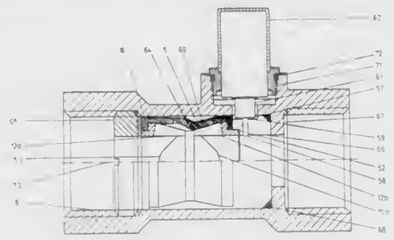
4,925,153

MEMBRANE VALVE FOR FLUIDS

Joachim C. Römer, Pullach, Fed. Rep. of Germany, assignor to AVS Ing. J.C. Romer GmbH, Strasslach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 70,943, Jul. 8, 1987, abandoned. This application May 10, 1988, Ser. No. 192,294
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1986, 3622816; European Pat. Off., Mar. 26, 1987, 87104487.1
Int. Cl.[5] F16K *7/07*
U.S. Cl. 251—30.01 **31 Claims**

1. A membrane valve for controlling fluids, the valve comprising a housing surrounding a substantially tubular chamber and having an inlet end and an outlet end; a sleeve-like resilient membrane extending within said tubular chamber from said inlet end to said outlet end; and a fluid permeable membrane support body disposed within said sleeve-like membrane and extending from said inlet end to said outlet end; wherein said support body has a length dimension measured in the absolute direction along its regular outer surface which is less than a corresponding length dimension in a relaxed state of a portion of said membrane adapted to contact said radially outer surface in said closed position; wherein said membrane support body has an annular sealing surface extending around it intermediate said inlet and outlet ends; wherein a partition wall divides said support body into a fluid permeable inlet portion, disposed between said inlet end and said annular sealing surface, and a fluid permeable outlet portion disposed between said sealing surface and said outlet end; wherein at least said outlet portion has a diverging substantially frustoconical shape with a narrower diameter region adjacent said sealing surface and a broader diameter region adjacent said outlet end; and wherein means is provided for producing movement of said membrane



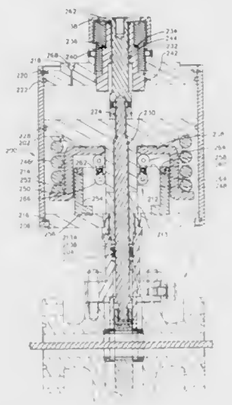
between a valve open position in which said membrane is spaced from said annular sealing surface and permits flow from said inlet end through said firm fluid permeable inlet portion over said annular sealing surface through said fluid permeable outlet portion and out of said outlet end, and a valve closed position in which said membrane sealingly contacts said annular surface and substantially prevents flow through said valve.

4,925,154

GATE VALVE WITH SUPPLEMENTAL ACTUATOR

Gerald S. Baker, Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 310,696, Feb. 15, 1989, Pat. No. 4,871,143. This application Aug. 18, 1989, Ser. No. 395,494
Int. Cl.[5] F16K *31/122, 31/52*
U.S. Cl. 251—58 **4 Claims**



1. A gate valve comprising
a body having a chamber with an inlet and an outlet extending through the body into the chamber,
a gate positioned for reciprocation in said chamber to open and close flow through said inlet and outlet,
a gate actuator connected to said gate for reciprocating said gate,
said gate actuator including
a housing,
means connecting said housing to said valve body,

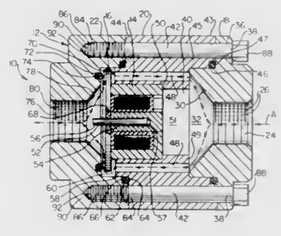
a piston mounted within the housing for reciprocation, said piston being connected to said gate,
a piston spring positioned within said housing and resisting the closing movement of said piston,
means for delivering and venting a pressure fluid to and from the interior of said housing above said piston,
a force supplementing structure positioned within said housing and including a plurality of lever-roller assemblies mounted on a roller support structure and a floating piston cup disposed between said piston spring and said roller support structure and supported by said lever-roller assemblies,
said lever-roller assembly coacting with said piston and said piston cup during all movement of said gate valve while permitting said spring to increase the closing force delivered by said piston during the last portion of its stroke whereby any structure extending through said inlet and outlet is positively sheared by the closing of the gate.

4,925,155

CONTROL VALVE AND METHOD OF CONTROLLING MATERIAL FLOW THROUGH A CONDUIT

Charles H. Carman, Lake Forest, Ill., assignor to Crane Electronics, Inc., Moline, Ill.

Filed Jul. 14, 1988, Ser. No. 219,097
Int. Cl.[5] F16K *31/02*
U.S. Cl. 251—117 **7 Claims**



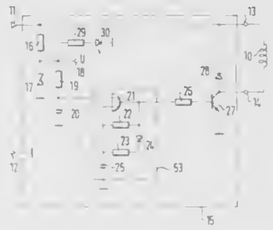
1. A control valve device comprising:
a housing having a material flow path therethrough, said housing having a first inlet end and a second outlet end;
a valve seat formed within said housing near said second outlet end of said housing and having said material flow path therethrough;
a disk member positioned within said material flow path through said housing having a first position against said valve seat that closes said material flow path through said housing and a second position spaced a predetermined distance away from said valve seat that opens said material flow path through said housing;
first means for moving said disk member within said housing said first means for moving being capable of moving said disk member to said first position against said valve seat and maintaining said disk member in said first position;
means for bleeding material from said first inlet end of said housing past said disk member in said first position to said second outlet end of said housing; and
second means for moving said disk member within said housing second means for moving including an electromagnet positioned within said housing capable of moving said disk member from said first position to said second position and maintaining said disk member in said second position wherein said material flow path is established around said electromagnet and a peripheral edge of said disk member and said electromagnet maintains said disk member in said second position against the flow of material and the material can flow around said electromagnet and said disk member through said valve seat and out of said second outlet end of said valve device.

4,925,156

CONTROL CIRCUIT ARRANGEMENT FOR SOLENOID VALVES

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany, and Hans H. Glä ttli, Seestrasse 252, CH-8700 Küsnacht, Switzerland

Filed Dec. 5, 1988, Ser. No. 279,947
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741619
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.01 **38 Claims**



1. A control circuit arrangement for a solenoid valve comprising a timer adapted to supply the solenoid valve with a higher attraction current for an adjustable time interval as from the commencement of a switching signal and for the supply of a lower hold current as from the end of said time interval until the end of the switching signal, a semiconductor switch adapted to switch a flow of current through the solenoid valve, a logic gate arrangement connected with an input of the semiconductor switch, said gate arrangement having means for the supply thereto of output signals from said timer, which is adapted to be triggered by said switching signal, and an oscillation generator, which is also arranged to supply an output signal thereof to the gate arrangement wherein the timer consists of a capacitor adapted to be charged via a resistor, such capacitor being connected with an input of the gate arrangement, wherein a negating gate included in said gate arrangement forms the only active component of the oscillation generator which is in the form of an astable multivibrator, the gate arrangement only comprising one type of gate, wherein in the case of positive supply voltage in relation to the zero potential the gate type is a NAND gate and in the case of a negative supply voltage in relation to the zero potential the gate type is a NOR gate, wherein the oscillation generator consists of the gate and a capacitor connected with its input, such capacitor being connected via charging and discharging connections with the output of the gate.

4,925,157

SOLENOID-OPERATED CONTROL APPARATUS

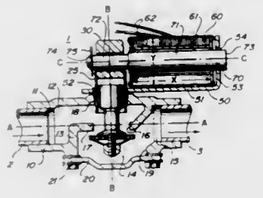
Leonard Troy, 212 Glenburn Rd., Clark Summit, Pa. 18411

Filed May 26, 1989, Ser. No. 357,364
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.15 **6 Claims**

1. Solenoid-operated apparatus comprising:
(A) a body including:
(i) a baffle having a port therein,
(ii) inlet and outlet openings in axial alignment with the longitudinal axis of said body;
(B) coil means having a longitudinally extending cavity with a central axis substantially parallel to the longitudinal axis of said body;
(C) core means extending at least partially through the cavity of said coil means;
(D) plunger means having a longitudinally extending axis

VOL
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substantially perpendicular to the central axis of said coil means cavity and the longitudinal axis of said body; and



(E) gate means within said body and connected with said plunger means for movement therewith for opening and closing the port of said body.

4,925,158

DETACHABLE MOTOR/AIR PUMP UNIT FOR A HYDRAULIC JACK ADAPTABLE FOR LIFTING AND PUMPING FUNCTIONS

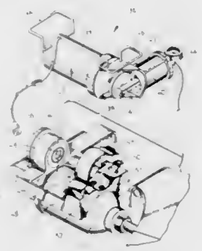
Tai-Her Yang, 5-1 Taipin St., Si-Hu, Town Dzan-Hwa, Taiwan

Division of Ser. No. 21,352, Mar. 3, 1987, Pat. No. 4,775,132, and a continuation-in-part of Ser. No. 817,245, Jan. 8, 1986, Pat. No. 4,678,164, which is a continuation-in-part of Ser. No. 791,503, Oct. 25, 1985, Pat. No. 4,678,162. This application Sep. 23, 1988, Ser. No. 248,145

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[5] B60P *1/48;* B66F *3/24*

U.S. Cl. 254—8 B 14 Claims



1. In a hydraulic jack having a motor, a motor shaft driven by the motor, the motor shaft having at least one end extending from the motor, a pumping mechanism and a means for operatively securing the motor to the jack, the improvement thereupon being the said means comprised of:

a saddle secured to the jack, the saddle having a recessed portion for receiving the motor therein;

a strap having one end secured to the saddle and a second, opposite end secured to a portion of the saddle remote from the one end of the strap, such that when the motor is received in the recessed portion of the saddle, the strap extends over the motor securing the motor to the saddle;

reduction gearing carried by the saddle, said reduction gearing being operatively connected to the pumping mechanism for driving said pumping mechanism, the reduction gearing being substantially aligned with the recessed portion, such that when the drive motor is received in the recessed portion of the body, the one end of the motor shaft is operatively connected to the reduction gearing, so that the reduction gearing is driven by the motor shaft.

4,925,159

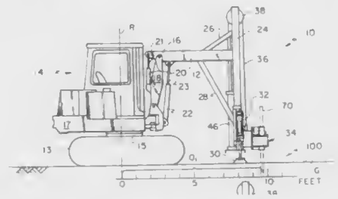
VERTICAL POWER PULLING DEVICE

Joseph F. Younes, 129 Brunswick Ave., Gardiner, Me. 04345

Filed Mar. 22, 1989, Ser. No. 326,920

Int. Cl.[5] E21B *9/00*

U.S. Cl. 254—30 8 Claims



1. A pulling device for use in withdrawing well points and the like comprising:

a boom;

a column fixedly mounted at an outer end of said boom;

means for adjustable positioning of said column adjacent a well point to be withdrawn from the ground;

means for disposing said column vertically during a well point pulling operation;

a gripping carriage mounted for vertical movement along said column;

said carriage comprising: a base plate having a face surface; mounted upon the face surface of said base plate in alignment with the center plane of said column, and spaced from the plane of the base plate surface, a first, fixed jaw comprising first and second vertically spaced apart first jaw elements, each said first jaw element defining an arcuate, well point-engaging surface; a second jaw mounted upon the face surface of said base plate, said second jaw comprising first and second vertically spaced apart second jaw elements, each said second jaw element defining an arcuate well point-engaging surface; and means mounted upon the face surface of said base plate for horizontal movement of said second jaw relative to said first jaw along the face surface of said base plate for disposing the arcuate surfaces of said first and second jaw elements in gripping engagement about a well point to be removed, said means for horizontal movement of said second jaw comprising a sleeve fixedly mounted upon the face surface of the base plate, a beam disposed for axial movement within said sleeve, said second jaw being fixedly joined to said beam, and power means connected to said second jaw for axially moving said beam and attached second jaw horizontally relative to said first fixed jaw; and

powered means for moving said carriage vertically along said column.

4,925,160

FLOATING FRAME

Anders Auvoja, Hässleholm, Sweden, assignor to Dinol Internationai Aktiebolag, Hassleholm, Sweden

Filed Sep. 14, 1988, Ser. No. 244,473

Claims priority, application Sweden, Sep. 16, 1987, 8703579

Iot. Cl.[5] B66F *7/26*

U.S. Cl. 254—101 4 Claims

1. A device in a floating frame for facilitating work on an underside of a car chassis comprising:

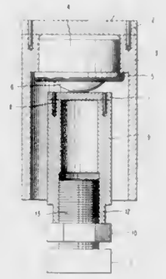
a frame plate;

an outer tube connected to the frame plate;

a unit plate attached to a unit carrying said chassis, said unit plate having a substantially flat surface;

a ball roller attached to the frame plate by way of the outer tube, said ball roller being positioned between the frame plate and the unit plate and being in contact with the substantially flat surface of the unit plate to allow the ball

roller to roll along the substantially flat surface and thereby permit the floating frame to move sideways relative to the unit carrying the chassis, whereby the distance



between said outer tube and said unit plate defines the adjustable distance between said chassis and said floating frame.

4,925,161

PROCESS FOR MOLDING DIRECTIONALLY-ORIENTATABLE MATERIAL USING SHEAR FORCE

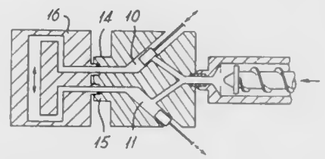
Peter S. Allan, 14 Lossie Drive, Iver, Buckinghamshire SL0 0JS, and Michael J. Bevis, 26 Water Tower Close, Uxbridge, Middlesex UB8 1XS, both of England

Continuation of Ser. No. 810,654, Dec. 18, 1985, abandoned. This application Mar. 8, 1989, Ser. No. 320,695

Claims priority, application United Kingdom, Dec. 21, 1984, 8432335; May 20, 1985, 8512708

Int. Cl.[5] B29C *45/00*

U.S. Cl. 264—69 17 Claims



1. A moulding process for moulding a solid product from molten material containing directionally-orientatable constituents in a mould having a mould cavity and at least one conduit communicating with said mould cavity, each said conduit entering said mould at a respective inlet, which comprises

supplying said molten material to said inlet of said at least one conduit and subjecting said supplied molten material to a force sufficient to propel it through said at least one conduit into said mould cavity;

providing in communication with said molten material in said mould at a plurality of spaced-apart regions of said molten material respective reciprocating means, each said reciprocating means comprising a member reciprocatable within and relative to a chamber, at least two of said regions being located such that molten material in said mould cavity lies between said at least two regions, and repetitively moving said molten material in said mould cavity in opposite directions by simultaneously reciprocating said reciprocatable members of said reciprocating means at said at least two regions at equal frequency but out of phase with each other to cause shear of said molten material within said mould cavity at least between said at least two regions; and

causing the said material to solidify while said shear is maintained, whereby causing alignment of the said directionally-orientatable constituents in the said solid product.

4,925,162

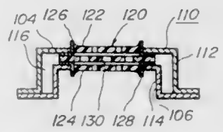
VIBRATION ISOLATING DEVICES

Hiroshi Kojima, Yokohama, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 207,938, Jun. 17, 1988, abandoned, which is a continuation of Ser. No. 32,971, Apr. 1, 1987, abandoned, which is a continuation of Ser. No. 816,649, Jan. 6, 1986, abandoned. This application Sep. 22, 1989, Ser. No. 412,534

Int. Cl.[5] F16F *9/00, 13/00;* B60G *15/06*

U.S. Cl. 267—140.1 4 Claims



1. A vibration isolating device comprising: two bodies connected to separate members, an elastic member disposed between the two frame bodies to form a closed chamber, a partition member secured at its peripheral edge to one of the two frame bodies and dividing the closed chamber into two small chambers, at least one restricted passage arranged in the partition member to establish liquid communication of the two small chambers with each other, wherein the partition member is further provided with a vibration insulating unit comprising a pair of flexible diaphragms each made of rubber and having at least one opening, and a perforated rigid plate sandwiched therebetween; each of said flexible diaphragms secured at its peripheral portion to said rigid plate, said flexible diaphragms spaced apart at central portions thereof from said rigid plate and deformable to oscillate in a direction substantially perpendicular to the plane of said rigid plate during high frequency small amplitude vibrations to suppress the rise of dynamic spring rate; and said restricted passage is arranged in at least a portion of said partition member around said vibration insulating unit.

4,925,163

SPRING ELEMENT

Franz J. Wolf, and Hubert Pietsch, both of Bad-Soden-Salmunster, Fed. Rep. of Germany, assignors to Woco Franz-Josef Wolf & Co, Fed. Rep. of Germany

Filed Feb. 9, 1989, Ser. No. 308,335

Claims priority, applicatioo Fed. Rep. of Germany, Feb. 9, 1988, 3803909

Int. Cl.[5] F16F *1/44*

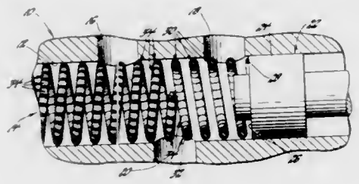
U.S. Cl. 267—153 22 Claims



1. A spring element comprising a resilient block interspersed with a plurality of channels uniformly distributed in the block, said channels intersecting cavities and wherein said channels

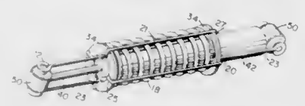
are arranged with their longitudinal axis extending obliquely with respect to the direction of a vector of a load to be supported.

4,925,164
COIL SPRING WITH GUIDE ROLLERS
Leonard F. Kopich, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 16, 1985, Ser. No. 776,612
Int. Cl.[5] F16F *1/06, 9/00*
U.S. Cl. 267—167 **10 Claims**



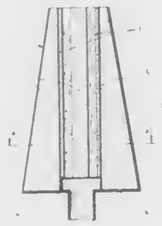
3. A coil spring having a plurality of coils and a series of rollers and spacers having axially extending passages therethrough and received in alternatively spaced relation on at least some of said plurality of spring coils, said rollers being individually freely rotatable on said spring and adapted to rollingly engage a spring guide surface area, said spacers being of lesser maximum diameter than said rollers and keeping said rollers spaced apart on said spring coils.

4,925,165
STEERING STABILIZER
James L. Sketo, 117 Oakland Blvd., Stockbridge, Ga. 30281
Continuation-in-part of Ser. No. 149,846, Jan. 29, 1988, Pat. No. 4,822,012. This application Oct. 31, 1988, Ser. No. 264,828
Int. Cl.[5] F16F *13/00, 1/00*
U.S. Cl. 267—221 **3 Claims**



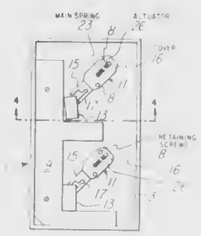
1. In a stabilizer for connection between a fixed portion of a vehicle and a movable portion of a vehicle steering linkage, the stabilizer having a cylinder, the improvement comprising:
(a) a compression spring of sufficient inner diameter for receiving the cylinder longitudinally;
(b) two sets of looped members, each looped member having an elongated loop and a connecting rod; the looped members encircling portions of the spring; the elongated loop having inner and outer arms disposed approximately parallel to each other, portions of the inner arms being disposed between the cylinder and the spring; the connecting rods extending longitudinally from the inner arm of each looped member; the rods of the first set of looped members being pivotally connected to the fixed portion of the vehicle, the rods of the second set of looped members being pivotally connected to the movable portion of the vehicle steering linkage;
(c) first and second slideable guide rings positioned contiguous opposite ends of the spring, each guide ring comprising an annular body with a plurality of pairs of notches formed in the inner and outer peripheral edges of said body; the notches in each pair being disposed radially with respect to each other, the space between the inner and outer arms of each looped member being approximately equal to the distance between the notches in each pair; both the first and second guide rings having the same number of pairs of notches; the distance between contiguous pairs of notches along said inner peripheral edges being approximately equal; the inner and outer arms of each looped member being slideable within a pair of notches in each of the guide rings;
(d) first means disposed proximate the first and second guide rings on the sides thereof away from the spring and connecting the inner and outer arms of each looped member of the first set for limiting the travel of the opposite ends of the spring;
(e) second means disposed proximate the first and second guide rings on the sides thereof away from the spring and connecting the inner and outer arms of each looped member of the second set for limiting the travel of the opposite ends of the spring; opposite ends of the spring simultaneously forcing the first guide ring against the first limiting means and the second guide ring against the second limiting means when the fixed portion of the vehicle and the movable portion of the vehicle steering linkage come together by moving in generally convergent directions; opposite ends of the spring simultaneously forcing the second guide ring against the first limiting means and the first guide ring against the second limiting means when the fixed portion of the vehicle and the movable portion of vehicle steering linkage move apart by moving in generally divergent directions, so that the steering linkage assumes a desired neutral position relative to the fixed portion of the vehicle upon the removal of external forces acting on the steering linkage.

4,925,166
GAS FLUSHING BRICK FOR METALLURGICAL VESSELS
Harry Zimmermann, Vaduz, Switzerland, assignor to PA-HAGE Hutten und Giessereibedarf GmbH & Co. KG, Viersen, Fed. Rep. of Germany
Filed Oct. 7, 1988, Ser. No. 255,549
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734713
Int. Cl.[5] C21C *5/48*
U.S. Cl. 266—270 **10 Claims**



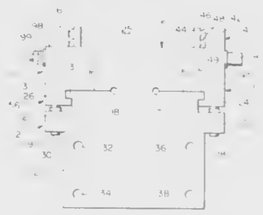
1. A flushing brick for metallurgical vessels comprising a shaped brick of refractory material having a wind box connected to a gas supply pipe and gas passages, wherein the gas passages lead from the wind box and are surrounded in a gastight manner by a protective tube arranged in the refractory material so that the gas passages are also directly surrounded by the refractory material.

4,925,167
UNIVERSAL TOOLING SYSTEM FOR MICROWAVE HYBRID DEVICES
Brad W. Larson; Dan Hockersmith, both of Garland; Thomas H. Taylor, Richardson; John M. Bedinger, Garland; Rick Kottman, Dallas, and Steve Pebley, Garland, all of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.
Filed Jan. 5, 1988, Ser. No. 140,853
Int. Cl.[5] B25B *5/14*
U.S. Cl. 269—112 **17 Claims**



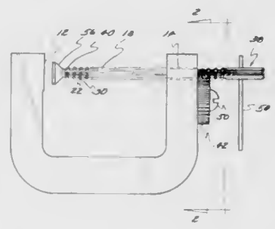
1. A part carrier comprising;
(a) a flat surface;
(b) a reference surface extending normal to said flat surface and secured thereto;
(c) a clamp secured on said flat surface, said clamp having first and second fingers, one of said fingers being relatively rigid and the other of said fingers being relatively resilient with respect to a part to be carried; and
(d) means in said clamp for applying a force on said fingers in the direction of said reference surface.

4,925,168
VISE
Börje K. H. Ramsbro, Djursholm, Sweden, assignor to System 3R USA, Inc., Pompton Plains, N.J.
Continuation of Ser. No. 839,947, Mar. 17, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 252,038
Claims priority, application Sweden, Mar. 18, 1985, 8501309
Int. Cl.[5] B23Q *3/02*
U.S. Cl. 269—136 **3 Claims**



1. Vice for clamping a workpiece with very high accuracy relative to a predetermined reference, comprising:
a bed having a reference surface upon which the workpiece may be adjusted and clamped,
a first fixed jaw formed from said bed and projecting above said reference surface,
a second jaw movable upon said reference surface towards and away from said first jaw when operating a drive means coupled to said second jaw and extending within a longitudinal channel, said channel being formed within said bed and being open to the reference surface through a longitudinal slot, wherein the first jaw, the second jaw and the bed, at least in the vicinity of said jaws, have a low outer profile,
at least two abutment surfaces provided on said bed,
at least two abutting surfaces provided on said second jaw, said abutment surfaces and said abutting surfaces extending parallel to said channel and being inclined with respect to said reference surface and during clamping a workpiece, cooperating to prevent walls of the bed which surround said channel and said slot from bending,
wherein the bed is formed from a base plate formed with at least one incut having a major portion which extends parallel to the reference surface,
wherein the incut follows a stepped line thereby forming a nose for stopping broadening of the incut transversely to the reference surface wherein narrowing of the incuts is adjustably limited by a screw element.

4,925,169
CLAMP WITH FAST-ACTING, ONE-HAND ADJUSTMENT
Lawrence E. Lodrick, Sr., 2436 Harrison Ave., North Rochester, Mich. 48063
Division of Ser. No. 16,855, Feb. 20, 1987, Pat. No. 4,753,427. This application May 9, 1988, Ser. No. 171,886
Int. Cl.[5] B25B *1/02*
U.S. Cl. 264—185 **13 Claims**



1. A clamp compising:
a member having an anvil at one end and at another end a bore with a longitudinal axis directed at the anvil;
a rod having threads, a first end and a second end, wherein the rod engages within the bore with the second end facing the anvil;
handle means connected to the first end of the rod for rotating the rod;
threaded means, matingly engagable with the threads on the rod, for longitudinally driving the rod through the bore as the threaded means is rotated with respect to the rod and the member, the threaded means permitting rotation of the rod with respect to the member and the threaded means for longitudinally moving the rod through the bore as the rod is rotated by the handle;
single means for restraining the threaded driving means adjacent the bore of the member and for biasing the rod against rotational movement while permitting longitudinal movement of the rod as the threaded means is rotated with respect to the rod and the member, the single means permitting rotation of the rod with respect to the member and the threaded means by rotating the handle to overcome the bias of the single means for longitudinally moving the rod through the bore as the rod is rotated.

VOL
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4,925,170

OVERHEAD FRAME FOR A FOLDER

Anton Weis, Lorsch, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Nov. 17, 1988, Ser. No. 272,707
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740923; Apr. 9, 1988, 3811909
Int. Cl.[5] B41F *13/58*
U.S. Cl. 270—5 8 Claims



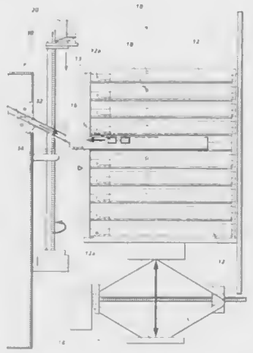
1. In an overhead frame for a folder placed transversely at the delivery end of web-feed printing press comprising a set of adjustable first angle bars running transversely in relation to the direction of feed of the paper web and arranged to cause a change in the direction of ribbons supplied to the folder intake at least during magazine production, a second, further set of second angle bars offset in relation to the first set of angle bars and which during production using a former for the ribbons deflect the web ribbons to at least one fold former during former production, and draw, register and angle bars, the improvement residing in that the second angle bars and bend rolls, which are used as an alternative to the second angle bars extend parallel to the folder intake, are offset in relation to the first angle bars, which are used during former and magazine production, in the same direction as the folder intake offset in relation to the first angle bars transversely in relation to the direction of paper feed in the press and between the first angle bars and the second angle bars and, respectively, the bend rolls, used alternatively thereto, for magazine production the draw-in and register rolls are provided which are also parallel to the folder intake, bend rolls, running transversely in relation to the folder intake, for former production, which bend rolls are associated with the second angle bars and are offset in relation to the latter in the longitudinal direction of the printing press, and parallel bend rolls which are adapted to be placed in position over the intake of the folder and under a zone with the second angle bars, such parallel bend rolls being arranged to be fed with web via juxtaposed draw-in rolls and partly via bend rolls offset from and parallel to the draw-in rolls, for magazine production, wherein the bend rolls aligned with the intake of the folder and the at least one fold former arranged to be placed alternatively over the intake of the folder are mounted on a carrier which is preferably adapted to be slid in the longitudinal direction of the printing press.

4,925,171

SORTER/STAPLER WITH HORIZONTAL BIN OPENING

William E. Kramer, Fairport; Terrence D. Charland, Pittsford; John E. Forward, Penfield; William R. Burger, and Barry P. Mandel, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 8, 1988, Ser. No. 241,999
Int. Cl.[5] B65H *39/11*
U.S. Cl. 270—53 10 Claims



1. In a sorting apparatus, for sorting sheets fed from a fixed position output providing a sequential source of sheets, comprising a closely vertically spaced and aligned superposed stacked array of generally horizontal individual sorter bins, with means to vertically move said array of sorter bins relative to said source of sheets for sequentially loading individual sheets into individual sorter bins; the improvement comprising: means for individually horizontally displacing, in coordination with said means for vertical bin array movement, with one selected said individual sorter bin vertically moved adjacent said fixed position output source of sheets, said one individual sorter bin at a time away from said superposed array towards said fixed position output source of sheets, by a substantial portion of the dimension of said one bin, to expose a substantial portion of said one displaced bin relative to the next adjacent bin to define a merged sheet path from said fixed position output source of sheets into said one substantially displaced bin by providing a substantially horizontally enlarged bin entry opening into said one substantially displaced bin for a sheet fed from said source of sheets into said one displaced bin without changing said vertical spacing between said bins, and for subsequently horizontally moving a bin so displaced back into said vertically superposed alignment with the other said bins of said array.

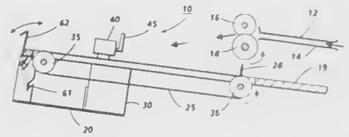
4,925,172

SMALL INEXPENSIVE FINISHER

Kenneth G. Christy, Webster; Thomas F. Cooper, Farmington, and Richard Dastin, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1988, Ser. No. 264,562
Int. Cl.[5] B42B *2/00*
U.S. Cl. 270—53 11 Claims

1. A finishing apparatus adapted to staple and transport compiled sheets therefrom, comprising: a tray positioned to receive copy sheets on a support surface thereof, said tray being tilted backwards at an acute angle in a downhill configuration with respect to the sheet feeding direction, skewed corrugation rolls positioned above and adapted to feed copy sheets into said tray, a plurality of resiliently biasable lead edge tamper members adapted to contact the lead edges of the copy sheets individually and be propelled by the sheets in the direction of movement of the sheets as the sheets enter said tray and subsequently drive the sheets in reverse to the sheet feed direction against a rear registration wall of said tray, stapler means positioned adjacent a corner of said tray formed by the intersection of said support surface and said rear wall for stapling the copy sheets, side tamper means for shifting each sheet



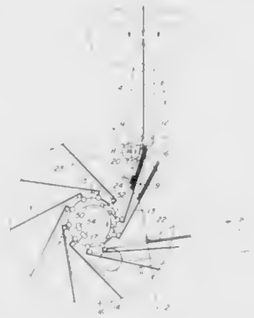
individually into said stapler means so that a complete set of copy sheets can be stapled by said stapler means, and wherein said tray means includes drive means adapted to drive the stapled set of copy sheet out of said tray while the first sheet of the next set of copy sheet is being feed into said tray by said corrugation rolls.

4,925,173

APPARATUS FOR ASSEMBLING AND DEPOSITING SIGNATURES

Kurt L. Lindblom, Trollhattan, Sweden; Jussi J. Similiä , and Seppo J. Kanervo, both of Järvenpää , Finland, assignors to Miller-Johannisberg Druckmaschinen GmbH, Weisbaden-Biebrich, Fed. Rep. of Germany

Filed Jul. 27, 1988, Ser. No. 225,245
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725225
Int. Cl.[5] B65H *39/02*
U.S. Cl. 270—54 19 Claims



1. In an apparatus for assembling and depositing signatures including input compartments formed by generally radially projecting vane means on an impeller wheel that is rotatably driven synchronically with a signature assembly cycle and ejecting means for ejecting the signatures from said input compartments and onto a removal means, the combination comprising:

pivotal mounting means mounting said vane means for pivotal movement thereon about respective axes which extend generally parallel to the rotary axis of said impeller wheel;

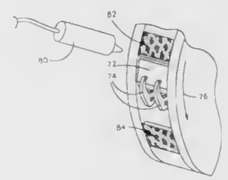
control means for controlling pivotal movement of said vane means about said respective axes during regular rotary movement of said wheel about said rotary axis such that the said vane means of each said compartment to be loaded with such signatures is initially moved independently of others of said vane means in a phase of quick insertion movement, with respect to the rotary movement of said wheel, to an initial signature input position to receive such signatures followed by a phase of relatively slower movement in an assembly angle region during assembly of such signatures therein and a subsequent phase of relatively quicker movement to a final signature input position.

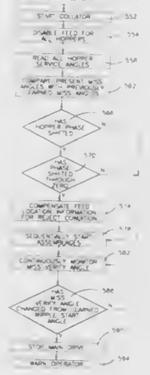
4,925,174

METHOD AND APPARATUS FOR CONTROLLING A COLLATOR

Andrew D. Bruce, Troy, Ohio, and Daniel A. Tucker, Plattsburgh, N.Y., assignors to AM International Incorporated, Chicago, Ill.

Continuation of Ser. No. 56,560, May 29, 1987, abandoned. This application Apr. 11, 1989, Ser. No. 336,577
Int. Cl.[5] B65H *39/02*
U.S. Cl. 270—54 6 Claims





1. An apparatus for verifying operation of a signature hopper of the type having a rotary drum and securing means for securing a signature to the drum, said drum transporting a signature from a first location to a second location, said apparatus comprising:

optical sensor means located adjacent to said drum for directing a beam of light toward said drum and monitoring for reflected light;

a miss reflector mounted to said drum at a location downstream of the securing means so that a signature held to the drum by the securing means covers the miss reflector as the miss reflector passes the sensor means;

a miss verify reflector mounted to said drum at a location spaced from the securing means such that a signature held to the drum by the securing means does not cover said miss verify reflector; and

control means electrically connected to said sensor means, said control means including means for determining when each said miss reflector and when said miss verify reflec-

tor are expected to pass by said sensor means during rotation of the drum and means for generating a first warning signal when the sensor means does receive reflected light from the miss reflector when the miss reflector is expected to pass by said sensor means as determined by the determining means and generating a second warning signal when the sensor means does not receive reflected light from the miss verify reflector when the miss verify reflector is expected to pass by said sensor means as determined by the determining means.

4,925,175

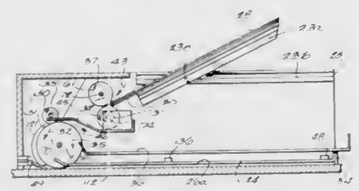
APPARATUS FOR FEEDING SHEETS TO A COPYING MACHINE

R. Clark DuBois, 332 Wakeman Rd., Fairfield, Conn. 06430

Continuation of Ser. No. 800,758, Nov. 22, 1985, abandoned. This application Mar. 28, 1988, Ser. No. 172,978

Int. Cl.[5] B65H *5/06*

U.S. Cl. 271—3 3 Claims



1. An automatic document feeder for a document copier having an image glass and a copy light, said document feeder arranged to be supported above the image glass and including:

a first document support member for supporting a stack of documents face-up thereon, and

a second document support member for receiving the documents thereon face-up after having been copied, and

means for removing a document from the first document support, passing it in one direction at a predetermined speed through a guide path and placing it face down on the image glass of the copier, and

feed rollers for moving the document along the image glass to a stop, whereupon the document comes to a halt while the feed rollers continue to rotate until the document is aligned against the stop, and

means for removing said document from the image glass after having been copied, passing it in the opposite direction through the aforesaid guide path substantially at the same pre-determined speed, and placing it face up in the second document support member.

4,925,176

SIGNATURE JOB COPYING SYSTEM

Thomas Acquaviva, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1989, Ser. No. 331,484

Int. Cl.[5] B65H *39/10*

U.S. Cl. 271—3.1 20 Claims



1. In a system for automatic signature printing for a copier with a recirculating document handler, in which a job set of plural conventional non-signature document sheets, which job set of document sheets is originally in a normal collated page order, are reordered into a signature printing page order, and placed into the document loading tray of the recirculating document handler, and are presented to the imaging station of the copier by the recirculating document handler, for producing plural image signature copy sheets from the copier suitable for folding and assembling into signature set booklets of proper page order, the improvement comprising:

an automatic job loading module operatively connecting with said recirculating document handler for signature loading the job set of document sheets into said recirculating document handler document loading tray by intermittent operation in coordination with the operation of the recirculating document handler;

said automatic job loading module including a job loading tray for stacking the job set of document sheets therein in a single stack in said normal collated page order, but with approximately one-half of the document sheets loaded in a first orientation and the other approximately one-half of the document sheets loaded in a second orientation;

said automatic job loading module having a single document feeder for feeding document sheets sequentially from only one side of said single stack to said recirculating document handler;

said recirculating document handler including a system for selectable inversion of documents being fed to said recirculating document handler document loading tray from said automatic job loading module;

said recirculating document handler selectable inversion being operated to automatically load approximately one-half of the document sheets from the automatic job loading module into the document loading tray of the recirculating document handler without inversion, and to load approximately one-half of the document sheets from the automatic job loading system to the document loading tray of the recirculating document handler with inversion, in correspondence with said first or second orientation of the document sheets loaded into the job loading tray of the automatic job loading module, so that all of the document sheets in the job set of document sheets are automatically loaded into the document loading tray of the recirculating document handler with the same orientation; and

wherein the first and second orientation document sheets are interleaved to reorder into a signature printing page order, and may be circulated in that same signature printing page order by the recirculating document handler for automatic signature printing.

4,925,177

AUTOMATIC PAPER FEEDER

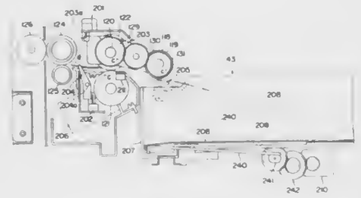
Minoru Nakamura, and Masazumi Ito, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 5, 1988, Ser. No. 152,839

Claims priority, application Japan, Feb. 13, 1987, 62-30950

Int. Cl.[5] B65H *7/14, 1/24*

U.S. Cl. 271—110 8 Claims



1. An automatic paper feeder that raises a paper loading plate in a paper cassette in order to press the upper surface of copying paper loaded on said paper loading plate against a paper feeding roller, for feeding the paper sheet by sheet in accordance with the rotation of said paper feeding roller, comprising:

means for raising and lowering said paper loading plate;

means for detecting the paper leaving the paper cassette, provided immediately downstream of said paper feeding roller;

controlling means for lowering said paper loading plate in order to release the pressure between the upper surface of the paper and said paper feeding roller when said paper detecting means does not detect the paper within a specified period of time after starting each paper feeding operation and then raising said paper loading plate in order to press the upper surface of the paper against said paper feeding roller to restart the paper feeding operation; and

driving means for rotating said paper feeding roller in the forward and reverse directions, and wherein said controlling means rotates said paper feeding roller in the reverse direction when said paper detecting means does not detect the paper within a specified period of time after starting the paper feeding operation.

4,925,178

DEVICE FOR CONVEYING SHEETS WITH INTERSECTING CONVEYOR PATHS

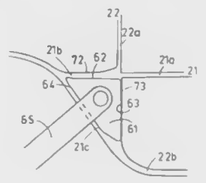
Wilhelmus G. M. Clabbers; Johannes H. A. Dinnissen, and Johannes H. B. Nabuurs, all of Venlo, Netherlands, assignors to Oce-Nederland B.V., Netherlands

Filed Sep. 16, 1988, Ser. No. 245,776

Claims priority, application Netherlands, Sep. 23, 1987, 8702263

Int. Cl.[5] B65H *29/58*

U.S. Cl. 271—186 3 Claims



1. In a device for conveying sheets having a plurality of guide means which form a first sheet conveyor path and a second sheet conveyor path such that the first and second sheet conveyor paths form an intersection and each sheet conveyor path has its own feed section and its own discharge section situated on either side of the intersection, the improvement comprising a guide member at the intersection which can be moved between two positions such that in a first position it keeps open an entrance to a discharge section of the first sheet conveyor path while at the same time it blocks an entrance to a discharge section of the second sheet conveyor path and in a second position it blocks the entrance to a discharge section of the first sheet conveyor path and keeps open the entrance to a discharge section of the second sheet conveyor path, and wherein the guide member further comprises a slidable element which extends over the working width of the device and has a plurality of adjoining sides, a first side forming part of the guide means of the first sheet conveyor path and a second side forming part of the guide means of the second sheet conveyor path such that in the first position, the second side is adjacent to a corresponding guide means of the second sheet conveyor path and thereby blocks the entrance to the discharge section of the second sheet conveyor path and in the second position, the first side is adjacent to a corresponding guide means of the first sheet conveyor path and thereby blocks the entrance to the discharge section of the first sheet conveyor path.

4,925,179

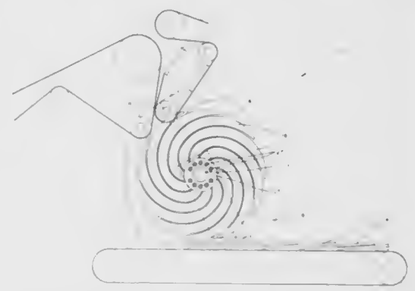
DELIVERY FAN WITH UNDULATED FAN POCKETS

Richard Breton, Rochester, N.H.; Ernest H. Treff, Groton, Conn., and Richard L. McKrell, Dover, N.H., assignors to Harris Graphics Corporation, Dover, N.H.

Filed Jun. 1, 1988, Ser. No. 200,927

Int. Cl.[5] B65H *29/20*

U.S. Cl. 271—187 7 Claims



1. An apparatus for receiving sheet material assemblages and for forming an overlapped stream of the sheet material assemblages, said apparatus comprising:

a plurality of blades;

said plurality of blades including a first set of blades, said blades of said first set of blades being rotatably mounted about an axis and being spaced axially apart from one another and having surfaces that define side of said pocket for engaging one side of a sheet material assemblage;

said plurality of blades including a second set of blades, said blades of said second set of blades being rotatably mounted about the axis and being spaced axially apart from one another and having surfaces defining the other side of said pocket for engaging the other side of the sheet material assemblage, said blades of first and second sets of blades being circumferentially spaced apart and rotating about the axis when receiving sheet material assemblages and forming the overlapped stream of the sheet material assemblages;

said surfaces of said blades of said first and second sets of blades deforming the sheet material assemblage into a series of undulations, the undulations extending in a direction transverse to the direction of movement of the sheet material assemblage; and

means for adjusting the extent of the circumferential spacing between said first and second sets of blades while said blades of said first and second sets of blades are rotating about the axis, the amount of deformation of the sheet material assemblage and the size of the undulations varying as a function of the amount of circumferential spacing between said first set of blades and said second set of blades.

4,925,180

FEEDING MECHANISM

Roman M. Golicz, Clinton, Conn., assignor to GBR Systems Corporation, Chester, Conn.

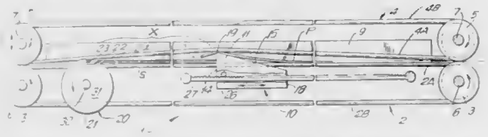
Continuation of Ser. No. 238,414, Aug. 31, 1988, which is a division of Ser. No. 878,642, Jun. 26, 1986, Pat. No. 4,799,663. This application Sep. 29, 1989, Ser. No. 414,662

Int. Cl.[5] B65H *29/18*

U.S. Cl. 271—198 13 Claims

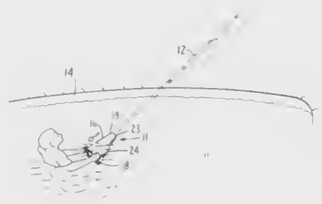
1. A feeding mechanism for stacking and moving sheets of

paper and the like comprising means for moving said sheets along a transport path to a stacking area, said stacking area being substantially parallel to said transport path, said stacking area being substantially on the same plane as said transport path, means for holding said sheets stationary in said stacking area and accumulating said sheets in a stack which is substantially on a plane parallel to said stacking area, means for releasing said stack after a predetermined number of sheets have accumulated in said stack to permit the stack to be moved from said stacking area, said moving means comprising a plurality of



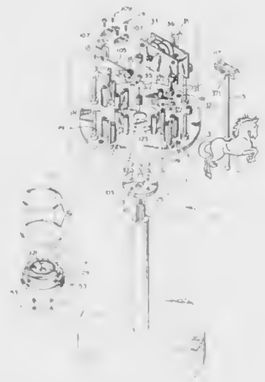
upper and lower transport belts located in transverse offset relationship to each other, means for supplying said sheets between said upper and lower belts to cause the belts to grasp and move the sheets, a deflecting mechanism having a pair of spaced planes, one of which is a deflecting plane, one of said transport belts having a run in juxtaposed position adjacent said deflecting mechanism in a plane between the pair of spaced planes of the deflecting mechanism whereby the movement of a sheet past said deflecting mechanism will move the belt beyond the deflecting plane of the deflecting mechanism.

4,925,181
SWIMMING POOL WATER CANNON
Russell W. Anderson, 2415 College Ave., #32, Berkeley, Calif. 94704
Filed Apr. 10, 1989, Ser. No. 335,862
Int. Cl.[5] A63G *31/00*
U.S. Cl. 272—1 B **5 Claims**



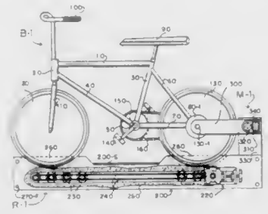
1. A device for forcibly propelling a water jet from the surface portion of a body of water, comprising
a truncated cone having a longitudinal axis together with an open large end communicating with an open smaller end, and
manually engageable handle means on said cone formed for grasping and pulling said cone in the direction of said large end with said large end at least partially submerged in said body of water and said small end above the surface of said body of water so as to forcibly eject a jet of the water through said small end of said cone substantially along said axis in the direction opposite to the direction said cone is pulled by said handle means.

4,925,182
CAROUSEL DEVICE
Jack Hou, P.O. Box 78-95, Taipei, Taiwan
Filed Mar. 10, 1989, Ser. No. 321,317
Int. Cl.[5] A63H *13/20*
U.S. Cl. 272—31 R **11 Claims**



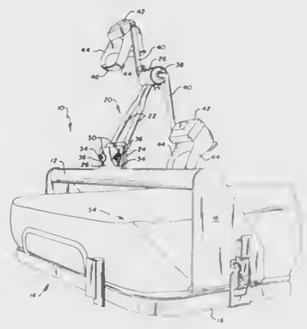
1. A carousel device comprising:
(a) a vertical column;
(b) a disc rotatably mounted on the column;
(c) a plurality of tappet rods spaced around the periphery of the disc for supporting a plurality of ornamental figures below the disc, each tappet rod including an upper end and a free lower end;
(d) first means for rotating the disc relative to the column;
(e) second means for raising and lowering each tappet rod during rotation of the disc, each second means including a cam assembly, a cam follower secured to the upper end of each tappet rod and driven by the cam assembly for imparting vertical reciprocating movement to each tappet rod, and guide means engaged by the cam follower for guiding the vertical movement of each tappet rod; and
(f) whereby the ornamental figures are caused to move up and down while revolving around the column during operation of the device.

4,925,183
INDOOR-ROLLBIKE APPARATUS
Sang-Sup Kim, 178 E. Columbia Ave., Des Plaines, Ill. 60016
Filed Jun. 1, 1987, Ser. No. 56,856
Int. Cl.[5] A63B *21/00*; G09B *9/04*
U.S. Cl. 272—73 **6 Claims**



1. Indoor exercising apparatus for use with a conventional rider-powered bike unit having a frame and having spaced front steering and rear drive wheels supported by the frame at a wheel base, the exercising apparatus comprising the combination of
a road device unit having a stationary frame structure including laterally spaced sides, and a non-powered substantially free-wheeling endless treadmill supported relative to the frame structure and defining a generally exposed upper run extended laterally between the spaced sides and longitudinally a distance greater than the wheel base of the bike unit, whereby both wheels of the bike unit may be simultaneously supported by and frictionally coupled to the upper treadmill run;
motion-coordinator means coupling said bike unit frame relative to the frame structure, with both wheels simultaneously supported on the treadmill, operable to hold the bike unit substantially fixed longitudinally on the treadmill while allowing unrestricted lateral steering movement of the bike unit; and
said motion-coordinator means including a transverse member on said frame structure disposed laterally of and elevated above the upper treadmill run, longitudinally extended bar means, means connecting the bar means at its front end relative to the bike unit frame in the region where the rear wheel is connected to the bike unit frame, and means coupling the bar means at its rear end to the transverse member and including means to allow limited twisting movement of the bike unit relative to the transverse member to limit bike unit tilting relative to the treadmill while precluding the bike unit from falling and including anti-friction means in the form of a roller mounted to rotate about its longitudinal axis relative to the longitudinally extended bar means, which axis is also angled transverse to the transverse member, adapted to engage and roll along the transverse member for allowing unrestricted lateral steering movement of the bike unit;
whereby the rider may power the drive wheel, to move the treadmill longitudinally, without the bike unit moving longitudinally off of the treadmill, and the rider may steer the front wheel laterally of the treadmill and balance the bike unit as in riding on a real road surface.

4,925,184
BED-MOUNTABLE LEG EXERCISE DEVICE
Howard P. McJunkin, Jr., 862 Alta Road, and David B. Gray, 1506 Chafton Road, both of Charleston, W. Va. 25314
Filed Feb. 15, 1989, Ser. No. 311,341
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—73 **18 Claims**



1. An exercise device comprising:
an elongated main body member having a longitudinal axis and first and second longitudinal ends;
means for coupling each longitudinal end of said main body member to a frame of a bed so that said longitudinal axis of said elongated main body member is disposed substantially transverse to a longitudinal axis of the frame of the bed;
means for rotatably mounting first and second pedal crank arm elements to said main body member intermediate the longitudinal ends thereof for rotation in a plane substantially perpendicular to the longitudinal axis of the frame of the bed; and
first and second pedal crank arm elements rotatably coupled to said means for mounting, said pedal crank arm elements being coupled to one another at proximal ends thereof by an axle portion so that longitudinal axes of said crank arm elements can be selectively offset at relative angles of 90 or 180°, said axle portion being rotatably coupled to said means for mounting
whereby an individual lying on the bed can engage the pedal crank arm elements and can rotate the same relative to the main body member and the bed.

4,925,185
EXERCISE METHOD
Calvin A. Gongwer, and Robert C. Gongwer, both of Glendora, Calif., assignors to Innerspace Corporation, Covina, Calif.
Continuation of Ser. No. 238,330, Aug. 30, 1988, abandoned, which is a division of Ser. No. 113,535, Oct. 26, 1987, Pat. No. 4,834,364. This application Jun. 27, 1989, Ser. No. 372,131
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—126 **7 Claims**



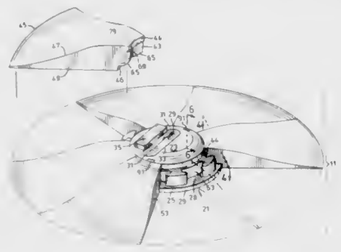
1. An exercise method comprising the steps of
grasping a means for transferring force with at least one hand while in a substantially erect position;
pressing each shin against the force transfer means;
simultaneously bending at the knee and resistively extending at least one arm while keeping each shin forcefully pressed against the force transfer means causing the force transfer means to transfer the force exerted by the leg muscles to the arm muscles;
repeatedly performing the previous bending and extending step.

4,925,186
PORTABLE PITCHER'S MOUND
James W. Stevenson, Toronto, Ontario, and Paul T. Arato, Willowdale, Ontario, both of Canada, assignors to James William Stevenson, Toronto, Ontario, Canada
Filed Sep. 22, 1988, Ser. No. 247,557
Int. Cl.[5] A63B *71/00*
U.S. Cl. 273—25 **25 Claims**

1. A portable pitcher's mount used to slightly elevate a selected portion of a common horizontal support plane from whereupon a pitcher pitches a ball, said pitcher's mound inserted; comprising a central hub and a plurality of individual components surrounding the central hub, which can be disassembled and separated, and connecting means for releasably connecting the individual components and the central hub together to form said pitcher's mound, wherein each of the

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components has a top layer and a bottom layer, whereby when assembled, the top layers of the components form a top surface



of the pitcher's mound, and at least part of the bottom layer of each component lies in said common horizontal support plane.

4,925,187

BOWLING HAND AND WRIST SUPPORT DEVICE

Charles R. Fleenor, and Shirley A. Fleenor, both of 1015 Hickory Hill Dr., Columbia, Mo. 65203

Division of Ser. No. 5,692, Jan. 22, 1987, Pat. No. 4,846,473. This application Jan. 10, 1989, Ser. No. 295,377

Int. Cl.[5] **A63B** *71/02*

U.S. Cl. 273—54 B **3 Claims**



1. A device for maintaining a bowler's hand, wrist and forearm in alignment, said device comprising:

a shell molded for application to the hand, wrist and forearm with inner and outer surfaces and having forearm, wrist and hand portions, said wrist portion being located intermediate the hand and forearm portions, said shell being rigid to restrict the downward flexure of the wrist when the bowler's hand is in the palm up position, said hand and forearm portions being angularly offset for placing the hand and wrist in a cupped position;

a pad coupled with the inner surface of the hand portion to cushion the hand and to increase the cupping of the hand and wrist;

yieldable means coupled with the inner surface of the shell to conform to the hand, wrist and forearm; and

fastening for securing the device about the wrist to allow substantially unrestricted movement of the hand in an upward direction when in a palm up position.

4,925,188

TOY RACE TRACK AND LAP COUNTER

Robert S. McKay, 7420 Beckwith Rd., Morton Grove, Ill. 60053, and William D. Nelson, 400 Bowen Ct., Elgin, Ill. 60120

Filed Sep. 29, 1989, Ser. No. 415,976

Int. Cl.[5] **A63K** *1/00;* **A63H** *18/00;* **G06M** *1/00;* **G07C** *11/00*

U.S. Cl. 273—86 R **12 Claims**

1. A toy race track comprising:

a track having at least two side-by-side lanes, each said lane making a complete circuit;

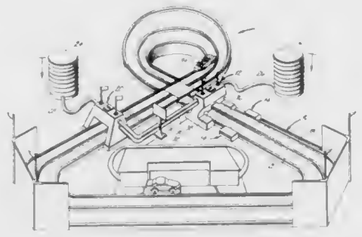
racing objects propellable along and atop said track;

a first propulsion tower connectable to said track;

said first propulsion tower having a plenum chamber end downwardly extending leg support means for positioning and supporting said plenum chamber centrally above and generally transversely spanning the width of said track whereby said racing objects can freely pass beneath said plenum chamber;

said plenum chamber having a first and second air inlet and a first and second air discharge nozzle;

said plenum chamber also having internal partitioning forming separate air passageways between said first inlet and said first nozzle and between said second inlet and said second nozzle, respectively;



said first and second nozzles parallel and spaced apart, each said nozzle configured to discharge air generally away from said first propulsion tower in the same direction one to another and generally horizontally above one said lane;

first and second air impulse means operably connectable to said first and second inlets, respectively for repeatedly providing a variable quantity of pressurized air for discharge from each of said first and second nozzles, respectively to propel said racing objects over said track.

4,925,189

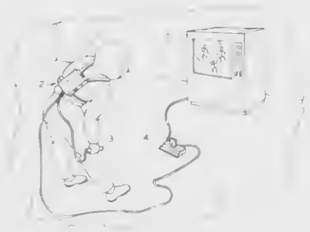
BODY-MOUNTED VIDEO GAME EXERCISE DEVICE

Thomas F. Braeunig, 1805 Pilgrim St., S.E., Salem, Oreg. 97302

Filed Jan. 13, 1989, Ser. No. 296,705

Int. Cl.[5] **A63B** *71/00, 23/00;* **G09G** *3/02*

U.S. Cl. 273—148 B **8 Claims**



1. A combination video game control and exercise apparatus comprising:

a. a tilt-detecting means with at least one electrical control element, where said control element is activated by tilt, and is capable of producing a control signal recognizable to a video game to control movement on a video screen;

b. an interface means to transmit said control signal to said video game;

c. an attachment means to attach said tilt-detecting means to a user's upper torso maintaining said electrical control element in a predetermined alignment and orientation with reference to said user's upper torso, whereby:

said electrical control element will be activated by the tilt of said user's upper torso, producing a control signal depending upon said tilt of said user's upper torso.

4,925,190

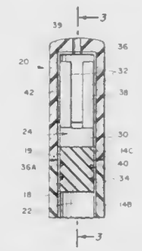
COMBINATION GOLF CLUB AND TURF REPAIR TOOL

Thomas J. Learned, 2127 Gillespie St., Santa Barbara, Calif. 93101

Filed Apr. 24, 1989, Ser. No. 342,734

Int. Cl.[5] **A01B** *1/04;* **A63B** *53/00*

U.S. Cl. 273—162 F **14 Claims**



1. In combination with a golf club having an elongated shaft with a ball striking clubhead mounted to an end of said shaft and a portion of an elongated hand grip mounted about a portion of said shaft adjacent to an opposite end of said shaft, a ball mark repair tool, comprising:

(a) fastening means secured to said opposite end of said shaft adjacent to said hand grip such that said shaft provides a handle extension for operating said tool to repair a ball mark;

(b) an elongated element attached to said fastening means and projecting therefrom and beyond an end of said hand grip of said club, said element having a configuration for prying turf to repair the ball mark as said tool is operated by a player holding said club by said clubhead in a ball mark repairing orientation being substantially the reverse of a normal playing orientation, said club shaft in providing said handle extension of said fastening means permitting the player to operate said tool while standing substantially erect; and

(c) a protective cover composed of an end portion of said club hand grip being removably mounted about said shaft opposite end and having a hollow interior for extending over and enclosing said turf prying element;

(d) said shaft opposite end to which said fastening means is secured extending beyond an end of said portion of said club hand grip mounted about said club shaft so as to define a seat which inserts into and engages said hollow interior of said cover for abutting said cover with said end of said hand grip portion mounted about said shaft and thereby for completing said hand grip of said club.

4,925,191

PUTTING TARGET

Garry J. Ogilvie, 2555 Hempstead, Anburn Hills, Mich. 48057

Filed Sep. 6, 1989, Ser. No. 403,576

Int. Cl.[5] **A63B** *69/36*

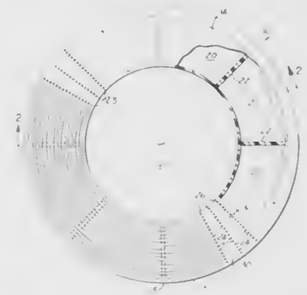
U.S. Cl. 273—178 A **10 Claims**

1. A target for a golf ball, comprising:

an inclined annulus of frustum shape, said inclined annulus having an inclined surface and a central hole; and

golf ball guidance means located on said inclined surface of said inclined annulus, said golf ball guidance means comprising a plurality of upstanding flexible resilient segments, each segment being oriented radially with respect to said central hole;

whereby, when the golf ball encounters the target after being putted theretoward, the golf ball will tend to continue in a straight path due to interaction with said golf ball guidance means, even in situations where the golf ball



encounters said inclined surface in a direction oriented off center of said central hole.

4,925,192

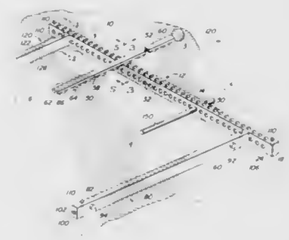
GOLF TRAINING APPARATUS

Vaughn T. Forbes, 905 W. Helena Dr., Phoenix, Ariz. 85023

Filed Mar. 20, 1989, Ser. No. 325,396

Int. Cl.[5] **A63B** *69/36*

U.S. Cl. 273—187 R **19 Claims**



1. Golf training apparatus, usable on the ground or inside, comprising, in combination:

base element means for providing a base against which a user stands;

first side panel means adjustably secured to the base element means for providing a first guide against which the user may place one foot to provide a proper stance;

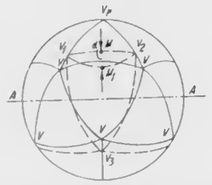
second side panel means adjustably secured to the base element means for providing a second guide against which the user may place a second foot to provide the proper stance;

locator bar means adjustably secured to the base element means for locating a golf ball relative to the base element means and to the first and second side panel means and to the user for providing a proper ball location for practice swinging; and

means for nesting the base element means, the first and second side panel means, and the locator bar means together for storage and transport purposes.

VOL
1114
ISS
3
MY
15
1990
UMI

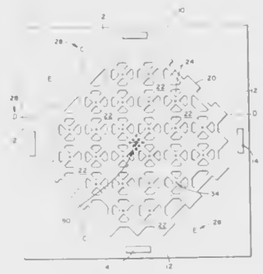
4,925,193
DIMPLED GOLF BALL
Terence Melvin, Somers, Conn., and R. Dennis Nesbitt, Westfield, Mass., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Continuation of Ser. No. 159,429, Feb. 17, 1988, abandoned, which is a continuation of Ser. No. 818,627, Jan. 14, 1986, abandoned. This application Apr. 10, 1989, Ser. No. 335,348
Int. Cl.[5] A63B *37/12*
U.S. Cl. 273—232 7 Claims

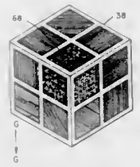


1. An aerodynamically symmetrical golf ball having two poles and an equator and having a preselected number of dimples arranged in a twenty triangular configuration based upon a modified icosahedron lattice, said lattice comprising
a plurality of adjacent triangles on either side of the equator with one vertice of each of said adjacent triangles being located at each pole of said ball;
all vertices other than the said polar vertices being displaced from their standard icosahedral location a predetermined distance towards the nearest pole, each of said vertices being interconnected by a constant radius arc on the surface of said ball;
the center point of each of said constant radius arcs which are substantially parallel to said equator being moved towards the equator a predetermined distance, said center points and adjacent vertices lying on a constant radius curve;
said preselected number of dimples being spaced within said modified lattice such that the dimples adjacent to and on opposite sides of said equator are substantially in-line and spaced a predetermined distance apart so as to provide a dimple-free equator.

4,925,194
BOARD GAME APPARATUS PLAYING PIECE AND METHOD OF PLAY
David M. Anderson, 13412 - 25th Avenue, White Rock, British Columbia, Canada V4A 6C1
Filed May 30, 1989, Ser. No. 358,662
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—271 17 Claims

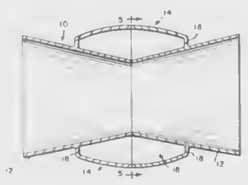
1. A game having as its object the orientation of rows of playing pieces to accumulate points for players, the game comprising:
(a) a game board with a playing surface having indicia including:
(i) colored peripheral regions which denote individual player locations and assigned game colors;
(ii) a symmetric pattern of playing piece placement spaces defined by a plurality of separation regions, the separation regions being arranged so that the playing piece placement spaces are linearly oriented to form rows of placement spaces;
(b) a plurality of playing pieces sized for placement on the game board playing surface placement spaces, each playing piece comprising multiple sides, and each playing piece side having a colored pattern comprising multiple colors;
(c) a control playing piece shaped for placement on one of the game board placement spaces and used for controlling priority of player moves and for placement within a row of playing pieces located on placement spaces;
(d) whereby players may in turn position the playing pieces





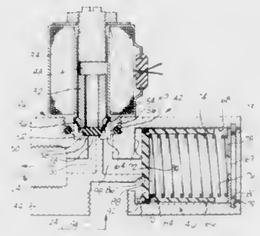
for scoring advantage through orienting rows of the playing pieces so that the color of a designated portion of each playing piece is aligned toward a player's colored peripheral region.

4,925,195
THROWING DEVICE
Carl M. Di Manno, Framingham, Mass., assignor to Throtonics Corporation, Leominster, Mass.
Filed Nov. 29, 1988, Ser. No. 277,356
Int. Cl.[5] A63B *65/00*
U.S. Cl. 273—428 7 Claims



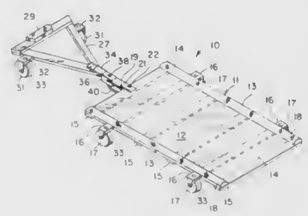
1. A throwing device comprising an elongate, hollow structure comprising two substantially frustoconical members joined small end to small end to form a throat, an annular gripping portion disposed about a portion of the hollow structure and defining therewith an annular space between the hollow structure and the annular gripping portion, and radially-spaced fins disposed in said annular space throughout the hollow structure, said fins being connected at their ends to the hollow structure and to the annular gripping portion and wherein the fins divide the annular space between the portion of the hollow structure adjacent the juncture and the annular gripping portion into closed cells.

4,925,196
VEHICLE SPEED CONTROL SYSTEM
Charles J. Green, Redondo Beach, Calif.; John M. Morris, Auburn, and Timothy L. Oliphant, Federal Way, both of Wash., assignors to GT Development Corporation, Tukwila, Wash.
Filed Nov. 30, 1988, Ser. No. 278,741
Int. Cl.[5] F02B *77/00*
U.S. Cl. 180—170 15 Claims



1. A speed control system for a vehicle having an engine and a fuel tank, comprising:
a fuel delivery line for delivering fuel under pressure to the engine;
a bypass line connected to the fuel delivery line and extending to the fuel tank;
an off-on valve in said bypass line including a solenoid for opening and closing the off-on valve, said off-on valve being normally closed and when closed preventing fuel flow from the fuel delivery line through the bypass line to the fuel tank;
a speed sensor for sensing vehicle speed connected to the solenoid for the off-on valve and in response to the vehicle speed exceeding a predetermined speed controlling said solenoid to open the off-on valve;
a line pressure response flow control valve in said bypass line in series with and upstream of said off-on valve, said line pressure responsive flow control valve including a closure member presenting a pressure surface in the upstream direction, and a spring normally biasing the closure member into a closed position, wherein fuel in the bypass line upstream of the closure member will exert pressure on the pressure surface of the closure member and when said pressure exceeds a predetermined pressure, will move the closure member into a valve opening position, said line pressure responsive flow control valve functioning to control fuel flow through the bypass line when the off-on valve is open;
said line pressure responsive flow control valve comprising a housing defining a piston chamber having first and second ends and a sidewall, an outlet passageway including a valve orifice positioned at the first end of the piston chamber, a valve seat surrounding said orifice, said closure member comprising a piston within said piston chamber having a sidewall and a piston end wall directed towards said orifice and said valve seat, seal means between said piston sidewall and said piston chamber sidewall, sealing against pressure leakage between the two sidewalls during piston movement, said spring being positioned between the second end of the piston chamber and said piston end wall and functioning to normally bias the piston end wall into contact with the valve seat, said housing including a vent opening on the spring side of the piston, communicating the chamber behind the piston with atmospheric pressure, and an inlet passageway for delivering fuel from the bypass line to the piston end wall against the side thereof opposite the spring, said inlet passageway communicating with said valve orifice and said outlet passageway when the piston end wall is moved away from the valve seat by fuel pressure acting on the piston end wall in opposition to the spring force.

4,925,197
PIVOTAL CREEPER
John W. Jones, Jr., 1220 Bethel Ave., Hampton, Va. 23669
Filed Feb. 16, 1989, Ser. No. 310,970
Int. Cl.[5] B62B *11/00*
U.S. Cl. 280—32.6 13 Claims



1. A creeper assembly for use by automotive repairmen when working beneath the vehicle comprising:
a first body portion for supporting the hip and lower spine area of an individual in the supine position;
a second body portion for supporting the upper spine, shoulder area and head of an individual in the supine position;
head rest means disposed on said second body portion in position to support the head of an individual disposed in the supine position on said creeper assembly;
a swivel joint pivotally and releasably connecting said first and said second body portions and permitting pivotal horizontal movement therebetween; and
means for limiting the pivotal horizontal distance movement of said first and said second body portions.

4,925,198
SHIMMY DAMPING SYSTEM FOR STEERABLE VEHICLES
Toshiaki Ito; Kazuhiro Numano, and Masami Suzuki, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Continuation of Ser. No. 183,602, Apr. 19, 1988, abandoned. This application Sep. 11, 1989, Ser. No. 406,187
Claims priority, application Japan, Feb. 12, 1988, 63-30554
Int. Cl.[5] B62K *21/08*
U.S. Cl. 280—89 4 Claims



1. A steering damping arrangement for a motorcycle comprising a frame, a front wheel, a front fork for supporting said wheel for steering movement about a steering axis relative to said frame, a front fender assembly carried by said front fork and being steerble therewith about said steering axis, said front fender assembly having a portion overlying said front wheel, an inertial mass and means for resiliently coupling said inertial mass directly to said front fender assembly for resilient movement relative to said front fender assembly and said front wheel about said steering axis for dampening shimmy forces.

VOL
1114
ISS
3
MY
15
1990
UMI

4,925,199

DRIVE DEVICE

Georg Hirmann, Griesernweg 14, 8037 Zürich, Switzerland

PCT No. PCT/CH87/00096, § 371 Date Apr. 6, 1988, § 102(e) Date Apr. 6, 1988, PCT Pub. No. WO88/00902, PCT Pub. Date Feb. 11, 1988

PCT Filed Aug. 6, 1987, Ser. No. 187,538

Claims priority, application Switzerland, Aug. 7, 1986, 3170/86; Oct. 14, 1985, 4107/86; May 13, 1987, 1835/87

Int. Cl.[5] B62M *1/04*

U.S. Cl. 280—216 55 Claims



1. A device for driving a rotatable part comprising:

a frame, said rotatable part being mounted on said frame;

first means mounted on said frame and receiving mechanical energy which is supplied to said device at one side of said first means, and having a drive member at the other side of said first means, such mechanical energy urging said drive member of said first means toward said rotatable part;

wedge means having a support surface and a drive surface which are angled with respect to each other to form a thicker part and a thinner part of said wedge means, said wedge means being secured to said drive member with the support surface of said wedge means being movable along said drive member, with said drive surface of said wedge means bearing against said rotatable part;

said wedge means being movable to a first position on said drive member wherein the thicker part of said wedge means is interposed between the drive member and the rotatable part, and to a second position wherein the thinner part of said wedge means is interposed between the drive member and the rotatable part;

means for biasing the wedge means toward the first position;

said wedge means being movable against the biasing of said biasing means from said first position to said second position by the urging of said drive member toward said rotatable part, said drive surface thereby moving tangentially of said rotatable part and driving the same.

4,925,200

TRICYCLE DRIVE MECHANISM

Micheal D. Jones, 3641 SE. Lambert, Portland, Oreg. 97202

Filed Jan. 1, 1989, Ser. No. 360,198

Int. Cl.[5] B62M *1/12*

U.S. Cl. 280—233 7 Claims

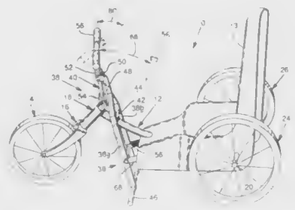
1. A drive mechanism for use on a self-propelled vehicle, wherein the vehicle includes a frame, at least one steerable wheel carried on a steering mechanism, an axle mounted on the frame and at least one driven wheel mounted on the axle, comprising:

first and second racheted gears drivingly disposed on the axle to produce rotary motion of the axle when each gear is rotated in a first direction and to coast relative to the axle when each of said gears is rotated in a second, opposite direction;

an oscillating handle/footrest assembly operable to provide a driving force for the driven wheel, said assembly including an elongate, vertically disposed pedal element which has a pivot point thereon intermediate the ends thereof and which is pivotably mounted on the frame at said pivot point, said pedal element having a footrest at the lower end thereof, and a sleeve at the upper end thereof above said pivot point, said assembly further having an elongate handle element secured, at one end thereof, to the steering mechanism, and a handle bar at the other end thereof, said handle element being slidably, rotatably received, intermediate the ends thereof, in said sleeve;

a first drive chain, which is secured at one end thereof to said pedal element, and which is trained over said first racheted gear, and is fixed to a spring at the other end thereof, said first chain producing rotary motion of said first racheted gear in a first direction when said chain is moved by motion of said pedal element;

a push rod secured to said pedal element and extending substantially horizontally away therefrom;







an idler gear located between the axle and said pedal element on the frame;

a second drive chain, which is secured at one end thereof to the free end of said push rod, and which is trained over said idler gear and said second racheted gear, seriatim, and which is fixed to a spring at the other end thereof, said second chain producing rotary motion of said second racheted gear in said first direction when said chain is moved by motion of said pedal element,

the driven wheel being rotated in the first direction by alternating back-and-forth motion of said pedal element and the action of said first and second chains on said first and second racheted gears, respectively.

4,925,201

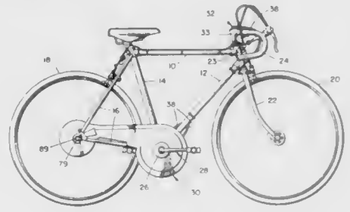
VARIABLE-RATIO TRANSMISSIONS, SEPARATELY AND IN BICYCLES

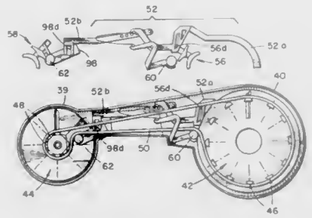
George H. Leonard, Darien, Conn., assignor to Hamlin Transmission Company, Wilton, Conn.

Division of Ser. No. 140,232, Dec. 31, 1987. This application Dec. 7, 1988, Ser. No. 281,265

Int. Cl.[5] B62M *25/02;* F16D *23/00*

U.S. Cl. 280—238 5 Claims





1. A bicycle including frame, wheels, ratio control, and ratio-changing mechanism comprising:

ratio-changing mechanism having driving and driven rotatable members supported by the frame, the driven member being connected to a wheel and the driving member being connected to a power source;

means for imparting motion to the driving means;

one-way driving clutch means between the driven member and said wheel, the clutch means including a driving clutch unit united to the driven member and a driven clutch unit united to said wheel, the driven clutch unit and said wheel forming a wheel assembly that is slidably removable from said driving clutch unit, with both said clutch units remaining united to their respective members after said removal, the clutch units being in operative relation to each other when the wheel assembly is assembled to the bicycle and the clutch units being separated from each other when the wheel assembly is removed from the bicycle.

4,925,202

THREE-WHEELED PEDAL-PROPELLED CYCLE WITH FRONT AND REAR BRAKES

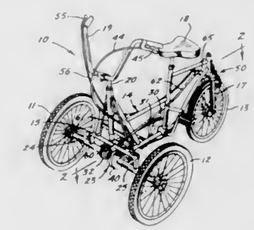
Fred E. Barker, 3022 10th St., Rockford, Ill. 61109

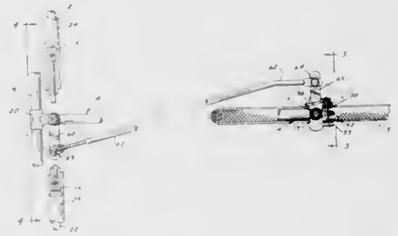
Filed Apr. 6, 1989, Ser. No. 334,163

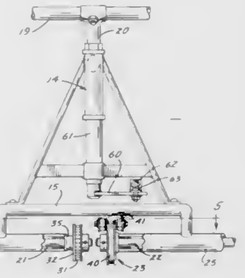
Int. Cl.[5] B62K *5/04;* B62M *1/02*

U.S. Cl. 280—261 5 Claims

1. A tricycle having a steerable rear wheel and having first and second front wheels, first and second independently rotatable axles, said first and second wheels being connected to rotate with said first and second axles, respectively, a front handle bar supported to turn to different positions, mechanism connecting said handle bar to said rear wheel and operable to steer said rear wheel in response to turning of said handle bar, a foot-pumpable pedal drive positioned between said front wheels and said rear wheel, means connecting said pedal drive to said first axle and operable to rotate said first axle and said first front wheel when said pedal drive is pumped, a brake connected to said second axle and operable when applied to retard rotation of said second axle and said second front wheel, a manually operable brake actuator on said handle bar, and means coupling said actuator to said brake for applying said brake in response to operation of said actuator.







4,925,203

SEMI-RECUMBENT BICYCLE WITH ADJUSTABLE FRAME

Clive E. Buckler, P.O. Box 3732, Chico, Calif. 95927

Filed Nov. 22, 1988, Ser. No. 274,769

Int. Cl.[5] B62K *15/00*

U.S. Cl. 280—278 6 Claims

1. A bicycle on which a rider sits in a semi-recumbent position, said bicycle having an adjustable frame adapted to accommodate differing sizes of a said rider and to provide various handling characteristics for differing riding surfaces and riding requirements, comprising;

a generally vertically oriented head tube frame member, a downward end of said head tube having wheel attachment means rotatably affixed thereto, said wheel attachment means retaining a rotatably affixed front wheel, said head tube having a rotatably affixed steering stem extending from an upper end thereof, said steering stem having an

VOL
1114
ISS
3
MY
15
1990
UMI

attached handlebar at an upper end thereof adapted for manual gripping by said rider, said steering stem adapted to rotate said wheel attachment means with rotation of said handlebar by said rider, said rotation of said wheel attachment means with said attached front wheel adapted to provide steering of said bicycle;

a top tube comprised of an inner member telescopically positioned within an outer member adapted to provide length adjustability of said top tube, said top tube affixed at a downward end thereof to a rearward side of said head tube, said top tube extending angled upward and rearward from said head tube;

a releasable clamping means adapted to secure said inner member stationary relative to said outer member of said top tube;

a generally vertically oriented seat post affixed by a seat post clamp to an upper rearward terminal end of said top tube with said seat post clamp adapted to provide vertical adjustability of said seat post;

a seat affixed to an upper end of said seat post;

said head tube and said attached top tube being a main framework of said bicycle;

said head tube and said top tube at said downward end adjacent said head tube being a front end of said main framework;

a rear wheel support framework affixed to said main frame-



work at a first and a second attachment, said first attachment being a forward end of said rear wheel support framework attached to said front end of said main framework, said second attachment being an upper rearward end of said rear wheel support framework attached to a rearward stationary end of said top tube;

a rear wheel rotatably affixed to said rear wheel support framework, said rear wheel positioned generally below said seat and aligned along a longitudinal axis with said front wheel;

said rear wheel having at least one sprocket attached thereto;

a manual powering assembly adapted to allow powering of said bicycle by said rider's legs with said rider sitting on said seat in said semi-recumbent position, said powering assembly comprised of a bottom bracket affixed to said front end of said main framework, said bottom bracket adapted to support two oppositely disposed rotatable crank arms, each said crank arm having a rotatably affixed foot pedal attached thereto, one said crank arm having at least one affixed front sprocket, said front sprocket connected by a drive chain to said rear sprocket adapted to rotate said rear wheel with rotation of said crank arms;

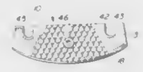
said rear wheel and said front wheel adapted to contact said riding surface allowing said bicycle to be propelled with said rider sitting on said seat applying power to said pedals of said manual powering assembly.

4,925,204

BICYCLE FORK PROTECTOR AND WHEEL REFLECTOR APPARATUS

George J. Lugo, 3215 E. Towner, Tucson, Ariz. 85716

Filed Jan. 27, 1989, Ser. No. 302,811
Int. Cl.[5] B62H *3/00*; B62J *23/00*
U.S. Cl. 280—295 10 Claims



1. A bicycle fork protector adapted to be secured in a bicycle front fork drop out slots to contact the ground when the bicycle front wheel has been removed and placed proximate the rear wheel for securing with a chain and lock, the fork protector comprising;

an elongated flat plate having four peripheral sides, a first side of which is placed and held within the bicycle front fork drop out slots; and

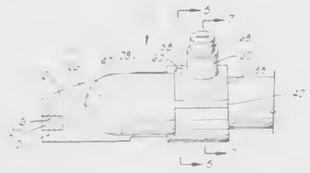
a second side contacting the ground, said second side opposite from and spaced away from said first side a distance greater than the length of the bicycle front fork drop out slots, said second side defining an arcuate shaped edge whereby the front fork does not contact the ground and the front fork will rock back and forth on said arcuate shaped edge if disturbed.

4,925,205

TAMPER RESISTANT TRAILER HITCH

S. Leonard Villalon; James D. Olds, and William H. Shoffner, all of Duncan, Okla., assignors to Guardian Hitch, Inc., Duncan, Okla.

Filed Nov. 3, 1987, Ser. No. 116,459
Int. Cl.[5] B60D *1/06*
U.S. Cl. 280—507 15 Claims



1. A trailer hitch for connection to a hitch ball, said trailer hitch comprising:

a housing at least partially defining an open sided ball receiving cavity therein;

coupling means on said housing for coupling engagement with said hitch ball when said hitch ball is positioned in said cavity, said coupling means being characterized by a gate member pivotally connected to said housing and forming a portion of said ball receiving cavity, said gate member having:

an uncoupled position pivoted away from said housing wherein said hitch ball may be inserted into and removed from said cavity; and

a coupled position pivoted toward said housing for couplingly engaging said hitch ball in said cavity and preventing removal of said hitch ball from said cavity; and

closure means for preventing undesired removal of said hitch ball from said cavity and for covering the open side of said cavity when said hitch ball is removed form said cavity, said closure means comprising:

a ring rotatably mounted with respect to a neck portion extending from said housing, said ring being rotatable between:

a first position spread from said gate member;

a second position engaging said gate member and retaining said gate member in said coupled position thereof; and

a third position; and

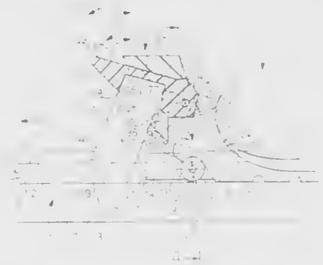
a cover extending from said ring, said cover being disposed across said open side of said cavity when said ring is in said third position.

4,925,206

CROSS-COUNTRY SKI BINDING

Gerard Graillat, Annecy, France, assignor to Salomon S.A., Annecy Cedex, France

Filed Aug. 15, 1988, Ser. No. 232,106
Claims priority, application France, Aug. 26, 1987, 87 11953
Int. Cl.[5] A63C *9/086*
U.S. Cl. 280—615 41 Claims



1. A cross-country binding adapted to assure the linkage between a front portion of a cross-country ski boot and a cross-country ski comprising:

at least one support element;

a linkage element swivel-mounted on said at least one support element around a first axis including a means for limiting rotation of said linkage element in a predetermined direction around said first axis with respect to said at least one support element in a manner so as to define a preferred angular position of said linkage element with respect to said at least one support element, said predetermined direction being oriented from front to rear above said first axis;

a latching element swivel-mounted on said linkage element around a second transverse axis between, respectively, a retention position and a release position with respect to a front portion of said ski boot, movement from said release position to said retention position occurring by rotation of said latching element in said predetermined direction around said second axis with respect to said linking element, said predetermined direction being oriented from front to rear above said second axis;

at least one journal surface extending around a third axis for supporting said front portion of said ski boot, with respect to said at least one support element and/or said linkage element by supporting said front portion of said ski boot, with respect to said at least one support element, and/or said linkage element in a radial direction with respect to said third axis, said at least one journal surface facing upwardly;

at least one support zone of said latching element for supporting in said retention position, said front portion of said ski boot opposite said third axis with respect to said front portion of said ski boot in said radial direction, said at least one support zone of said latching element being offset with respect to said second axis and facing in said predetermined direction and being positioned such that it likewise faces in said radial direction in said retention position and is removed from said front portion of said ski boot opposite said radial direction and in said release position; and

means for elastically biasing both of said latching element and said linkage element in said predetermined direction;

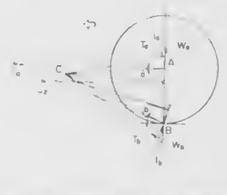
wherein said elastically biasing means comprises at least one element which is elastically compressible and is supported in compression on a zone of said at least one support element, offset with respect to said first axis and is supported on a portion of said latching element, offset with respect to said second axis.

4,925,207

REAR SUSPENSION OF VEHICLE CONTROLLABLE OF ROLLING UNDER BRAKING AND DRIVING

Tetsunori Haraguchi, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 17, 1989, Ser. No. 339,120
Claims priority, application Japan, Apr. 19, 1988, 63-95997
Int. Cl.[5] B60G *3/18*
U.S. Cl. 280—690 10 Claims



1. A rear suspension of a vehicle for mounting a rear wheel to a vehicle body in a manner of transmitting driving and braking forces therebetween while allowing bounding and rebounding of the rear wheel relative to the vehicle body, comprising: a wheel supporting member for supporting said rear wheel to be rotatable about a center of rotation, and a plurality of links each being pivotably connected at a first end thereof with said vehicle body at a determinate point thereof and at a second end thereof with said wheel supporting member at a determinate point thereof so as thereby in combination to define a first trace of movement of said center of rotation of said rear wheel relative to said vehicle body and a second trace of movement of a momentary ground contact point of said rear wheel relative to said vehicle body in the bounding and the rebounding of said rear wheel relative to said vehicle body, wherein an effective length of each said link between said first and second ends thereof and said determinate points in said vehicle body and in said wheel supporting member corresponding to each said link are so determined that, as seen in a side view of the vehicle, the point of intersection of a first normal line drawn to said first trace of movement with a second normal line drawn to said second trace of movement is, at a standard position thereof corresponding to no bounding and no rebounding of said rear wheel relative to said vehicle body, positioned on the front side of and at substantially the same level as said center of rotation of said rear wheel, said point of intersection shifting forward and upward from said standard position thereof along with the bounding of said rear wheel relative to said vehicle body and rearward and downward from said standard position thereof along with the rebounding of said rear wheel relative to said vehicle body.

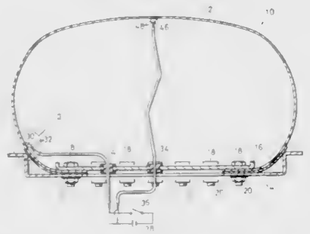
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4,925,208

AIR BAG DEVICE FOR PROTECTING A VEHICLE OCCUPANT

Kazuaki Shitanoki; Masaaki Kawaguchi, and Saburo Kobayashi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1989, Ser. No. 339,047
Claims priority, application Japan, Apr. 20, 1988, 63-95706
Int. Cl.[5] B60R *21/26*
U.S. Cl. 280—741 8 Claims



1. An air bag device for protecting a vehicle occupant, comprising:

a gas generating agent for generating gas when burned;

an igniter for igniting said gas generating agent; and

an inflatable bag to be inflated by the gas generated by said gas generating agent;

said gas generating agent being provided in the form of a thin layer on an inner surface of said inflatable bag;

said igniter being provided in a part of said thin layer of said gas generating agent.

4,925,209

ASSEMBLY FOR MOUNTING AIR BAG COVER

Hideyuki Sakurai, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 28, 1989, Ser. No. 316,801
Claims priority, application Japan, Mar. 11, 1988, 63-32364[U]
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—743 14 Claims



1. An assembly for mounting an air bag cover disposed to cover an opening formed in a panel in front of an occupant's seat of a vehicle, said cover being opened by an air bag when the air bag is expanded, said assembly comprising:

a plate-like member formed integrally with said cover and having a portion that extends from the cover to an outer edge of said plate-like member, said plate-like member having at least one bolt hole formed in its extended portion;

a reinforcement member fixed to said plate-like member at a location closer than said bolt hole to the outer edge of the extended portion; and

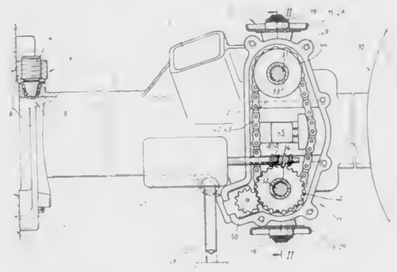
a bolt inserted in said bolt hole for connecting the cover to the vehicle body.

4,925,210

ADJUSTING DEVICE TO VARY THE INCLINATION OF A STEERING COLUMN OF A MOTOR VEHICLE

Karl Peitsmeier, Neuhausen, and Gottfried Schremmer, Tamm, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,675
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 3737225
Int. Cl.[5] B62D *1/18*
U.S. Cl. 280—775 11 Claims



1. Adjusting device to vary the inclination of a steering column of a motor vehicle which controls a pivoting movement of the steering column about a pivot bearing arranged remotely from a steering wheel at a lower region of the steering column, and wherein the movement of the steering column can be effected by an adjusting mechanism which acts in a straight line in the direction of the inclination adjustment and which is connected to a casing tube accommodating the steering column in an upper region of the steering column near the steering wheel, whereby the steering column can be braced against the vehicle body in this upper region, and wherein a sliding stroke of this connection relative to the vehicle body which is dictated by the pivoting movement is permitted by a guide lever mounted articulately to the vehicle body and acting articulately relative to the steering column;

wherein a rectangular frame surrounds the casing tube, with the inside cross-section of the rectangular frame permitting a pivoting movement of the steering column, said rectangular frame being fastened to the vehicle body by a frame body wall located transversely to the direction of the inclination adjustment, side walls of said rectangular frame located at right angles to this body wall serving as guide levers which are connected for this purpose by their end sections to the frame body wall and to a frame bearing wall opposite the frame body wall pivotably in their plane relative to the frame body wall, and wherein the adjusting mechanism, which is mounted stationary on the frame bearing wall, exhibits a fixed angular position with respect to the frame bearing wall and to the casing tube.

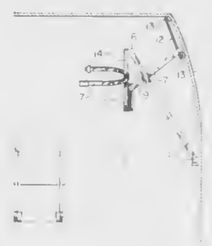
4,925,211

RETRACTABLE BRACE FOR AMBULANCE ATTENDANTS

Justin P. Whittaker, 121 University Avenue Unit 100, Waterloo, Ontario, Canada (N2J 4J6), and Paul H. Whittaker, 330 Northlake Drive, Waterloo, Ontario, Canada N2V 1R1

Filed Feb. 1, 1989, Ser. No. 304,462
Int. Cl.[5] B60R *22/24*
U.S. Cl. 280—801 6 Claims

1. A retractable brace for an ambulance attendant for use in an ambulance, comprising a plate having two sides and upper and lower ends, said plate being moveable between a fully extended substantially vertical position adjacent the attendant's work area, and a stowed fully retracted position against



the side wall of the ambulance, further comprising means for locking the plate in at least said extended and said stowed positions, and means for securing the ambulance attendant to said plate.

4,925,212

SEAT BELT TIGHTENING SYSTEM ADAPTED TO BE MOUNTED ON AN ADJUSTABLE SEAT

Yasuki Motozawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1989, Ser. No. 335,416
Claims priority, application Japan, Apr. 19, 1988, 63-52709[U]
Int. Cl.[5] B60R *22/40*
U.S. Cl. 280—807 6 Claims



1. A seat belt tightening system adapted to be used in conjunction with a vehicle seat whose position can be adjusted, comprising:

a deceleration sensor mounted on a vehicle body for detecting deceleration exceeding a threshold level indicative of a vehicle crash;

a drive unit mounted on said vehicle body for producing drive power in response to detection of deceleration exceeding said threshold level by said deceleration sensor;

a seat belt tightening unit mounted on said vehicle seat for applying tension to a seat belt with said drive power supplied from said drive unit; and

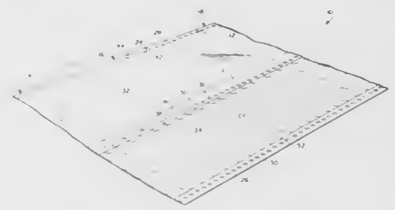
drive power transmitting means for transmitting said drive power from said drive unit to said seat belt tightening unit, said drive power transmitting means being provided with coupling means for transmitting said drive power from said drive unit to said seat belt tightening unit without interfering with adjustment movement of said seat.

4,925,213

MULTIPLE PART FORM FOR NON-IMPACT PRINTER AND RELATED PROCESS

Michael W. Anderson, Erie, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Mar. 31, 1989, Ser. No. 331,302
Int. Cl.[5] B41L *1/20*
U.S. Cl. 282—12 A 10 Claims



1. A business forms assembly blank comprising

a web having upper and lower surfaces, said web divided longitudinally into first and second form parts;

the lower surface of said web having first image transfer means applied thereto in an area corresponding to said first form part and the upper surface of said web having second cooperating image transfer means applied thereto in an area corresponding to said second form part.

4,925,214

COUNT DOWN SYSTEM FOR RECORDING CHARTS

Donald R. Hazelton, Chester, N.H.; Paul J. Latka, West Springfield, Mass.; Joseph N. Lyons, Jr., Springfield, Mass., and Eugene H. Spender, Jr., North Billerica, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 9, 1987, Ser. No. 60,130
Int. Cl.[5] B42D *15/00, 19/00;* G03B *1/04;* G11B *15/06*
U.S. Cl. 283—62 3 Claims



1. Paper for use in a recorder comprising:

a strip of paper adapted to be moved along its length during a recording process, said strip having a first predetermined length and a second predetermined length, said second length of said strip being adapted to be recorded upon, said second length being shorter than said first length; discrete signs formed at a plurality of successive locations along said strip, said signs being formed only within the last portion of said second length, said signs directly indicating the length of said strip remaining between the location of each said sign and the end of said second length.

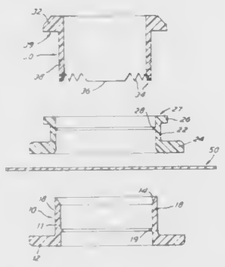
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4,925,215
CONCEALED MAGNETIC INDICIA
Martin S. Klaiber, Perrysburg, Ohio, assignor to Action Drive-Thru Inc., Toledo, Ohio
Filed Jun. 12, 1989, Ser. No. 365,008
Int. Cl.[5] F16L *35/00*
U.S. Cl. 283—82 2 Claims



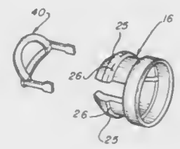
1. A magnetically coded token comprising:
(a) a sheet of non-magnetic substrate;
(b) a first layer of spaced indicia on said substrate formed with an ink containing particles of iron oxide;
(c) a second opaque layer of iron oxide-free ink overlying, concealing and bonded to said first layer; and,
(d) the ink of said first layer being I.P.I. Magnetic Black PL 401 and the ink of said second layer being Dence Black MSP 34220S; and,
(e) said layers being so connected that said second layer cannot be removed without at least partially destroying said spaced indicia of said first layer.

4,925,216
METHOD AND APPARATUS FOR ATTACHING A CATHETER TO A BAG SUCH AS A WOUND DRAINAGE BAG
Peter L. Steer, Surrey, England, assignor to E. R. Squibb and Sons, Inc., Princeton, N.J.
Filed Mar. 31, 1988, Ser. No. 175,977
Claims priority, application United Kingdom, Apr. 9, 1987, 8708493; Apr. 24, 1987, 8709816
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—3 9 Claims



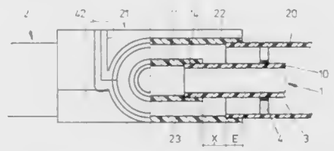
1. Apparatus for attaching a catheter to a bag comprising a pair of coupling rings for trapping a part of the bag wall between them, a cutter member having a blade of circular or closed loop form for making a cut in said part, and an elastomeric member for gripping a catheter which is connectable to said cutter member, said coupling rings comprising an internal ring for initial location within the bag, an external ring for initial location outside the bag and rib and groove arrangement for assisting a secure connection between the rings in one relative axial position, said internal ring and cutter member comprising a rib and groove arrangement for assisting a secure connection between the internal ring and cutter member in one relative axial position.

4,925,217
QUICK CONNECTOR WITH VISUAL CHECKING METHOD
Mark G. Ketcham, Marine City, Mich., assignor to Huron Products Corporation, Mt. Clemens, Mich.
Filed Oct. 24, 1988, Ser. No. 261,684
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—93 12 Claims



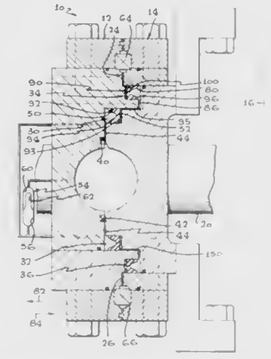
1. A visual inspection device for quick connectors comprising:
annular means adapted for positioning about a conduit within a connector housing such that in a first position said annular member being substantially vaulted and in a second position said annular member being substantially flat; and
means for indicating the position of said annular means, said indicating means being visible to an observer when said annular member is in its first vaulted position and moving to a second position when said annular member is in its second position wherein said indicating means visually indicates to the observer that the conduit is securely coupled within the connector housing.

4,925,218
DOUBLE-WALLED PIPELINE SYSTEM
Peter Kunz; Heinz Hunger, and Jörg Wermelinger, all of Schaffhausen, Switzerland, assignors to Georg Fischer AG, Schaffhausen, Switzerland
Filed Nov. 14, 1988, Ser. No. 270,954
Claims priority, application Switzerland, Nov. 11, 1987, 4399/87
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—93 12 Claims



1. A double-walled pipeline system for media comprising an inner pipeline conduit and an outer pipeline conduit arranged concentrically to the inner pipeline conduit, the inner pipeline conduit including fittings and instruments, the outer pipeline conduit having two-part fittings and instrument casings mounted such that a continuously connected outer annular space is formed surrounding the inner pipeline conduit, wherein the two-part fittings and instrument casings are each composed of two half shells, the outer pipeline conduit including pipes, the half shells being fixedly connected to each other and to the outer pipes by means of one of glued and welded connections, and wherein each half shell includes a sleeve portion with a semi-cylindrical connecting surface, the connecting surface having a radius adapted to an outer pipe, an outer pipe being inserted in the sleeve portion and being connected to the sleeve portion by one of a welded and a glued connection, the connection having a strength sufficient for the same rated pressure as the pipe.

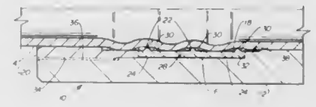
4,925,219
FLUID SWIVEL ASSEMBLY
Jack Pollack, 18709 Cohasset St., Reseda, Calif. 91335, and Tarlochan S. Mann, 8444 Geyser Ave., Northridge, Calif. 91324
Filed Jul. 21, 1988, Ser. No. 222,568
Int. Cl.[5] F16L *17/02*
U.S. Cl. 285—95 9 Claims



1. In a fluid swivel which includes ring-like inner and outer walls that form a fluid-carrying chamber between them and a pair of gap passages that lead from opposite sides of the chamber, bearing means which rotatably couple the walls during rotation of one wall with respect to the other about a predetermined axis, and a pair of face seals along each gap passage with each face seal capable of withstanding a high pressure difference across itself, each pair including a primary face seal closest to the chamber and a secondary face seal further from the chamber than the primary seal, the improvement wherein:
each pair of seals includes a primary seal having a high pressure end that faces in a first radial direction with respect to said axis, and an opposite low pressure end, each pair of seals includes a secondary seal having a high pressure end that faces in a second radial direction with respect to said axis, opposite to said first direction and a low pressure end, and each gap passage includes a connecting gap portion extending between the corresponding primary and secondary seals, said seals being spaced at least partially in an axial direction;
the low pressure end of each secondary seal is spaced from said axis by a distance substantially equal to the distance of the low pressure end of the corresponding primary seal from said axis.

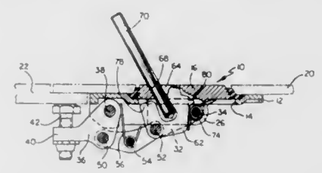
4,925,220
TUBULAR JOINT
Edward J. Szymczak, Spring, and Arthur H. T. Chin, Houston, both of Tex., assignors to Cameron Iron Works U.S.A., Inc., Houston, Tex.
Filed Dec. 16, 1988, Ser. No. 285,659
Int. Cl.[5] F16L *13/14*
U.S. Cl. 285—382.4 13 Claims

11. A tubular joint comprising
an outer tubular member having a central bore and a counterbore extending therein and terminating in a shoulder between the counterbore and the central bore,
an inner tubular member,
a sleeve positioned within said counterbore of said outer tubular member,
means for retaining said sleeve within said counterbore,
means on the interior of said sleeve for gripping and sealing against the exterior of said inner tubular member when it has been pressure formed outwardly into engagement with the sleeve gripping and sealing means,
said engagement between the inner tubular member and the sleeve being the sole means securing said inner tubular member to said outer tubular member,



means for sealing between the exterior of said sleeve and the interior of said counterbore in said outer tubular member,
said sleeve griping and sealing means includes
a plurality of insert rings of hard metal,
each of said insert rings being positioned within an internal recess in said sleeve,
said insert rings each includes
a body, and
inwardly extending ribs which are spaced apart by a recess.

4,925,221
TOGGLE LATCH WITH AUTOMATIC SAFETY CATCH
Timothy A. Carmody, Los Alamitos; William R. Bourne, Jr., Redondo Beach, and John Stammreich, Rancho Palos Verdes, all of Calif., assignors to VSI Corp., Chantilly, Va.
Filed Sep. 1, 1988, Ser. No. 242,021
Int. Cl.[5] E05C *5/02*
U.S. Cl. 292—200 14 Claims



1. In a toggle latch for retaining a first structure against a second structure, the toggle latch having a housing that pivotally mounts a latch actuator and a latch with a linkage joining said pivotable latch actuator and latch at further pivot points, one linkage pivot point going over-center from the other pivot points to form said toggle, the improvement comprising:
said latch actuator having a slotted aperture therein;
a safety catch mounted within said slotted aperture for engaging said housing in said over-center, latched position; and
said slotted aperture configured to allow removal of said safety catch from its engagement with said housing upon contact with said safety catch to permit actuation of said latch actuator thereby unlatching said latch.

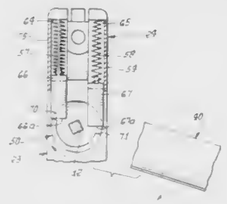
VOL 1114 ISS 3 MY 15 1990 UMI

4,925,222

DOOR LATCH ACTUATING MECHANISM

Freidrich Loock, Brakel, Fed. Rep. of Germany, assignor to Adams Rite Manufacturing Co., City of Industry, Calif.

Filed Aug. 29, 1988, Ser. No. 237,182
Int. Cl.[5] E05B *3/00*
U.S. Cl. 292—336.3 **9 Claims**



1. A door latch actuating mechanism, the combination comprising:

(a) a housing attachable to a door structure,

(b) a handle carried by the housing for rotation in either of two directions, and an output shaft rotatable in response to handle rotation,

(c) and mechanism in the housing to yieldably resist handle rotation in either direction, said mechanism including

(i) a rotor coupled to the handle to rotate therewith,

(ii) a first spring coupled to the rotor to resist rotor rotation in one direction, and

(iii) a second spring coupled to the rotor to resist rotor rotation in the opposite direction,

(d) said springs being everywhere spaced apart and coupled to different portions of the rotor, whereby the second spring is inactive when the rotor is rotated in said one direction, and said first spring is inactive when the rotor is rotated in said opposite direction,

(e) the housing being longitudinally elongated, and said springs extending generally longitudinally, in laterally spaced relation in the housing, the housing including a shell, and an insert in the shell mounting said springs and said rotor,

(f) the rotor having an axis and two cam shoulders, and including plungers extending between the ends of the respective springs and said cam shoulders defined by the rotor, the cam shoulders located at opposite sides of the rotor axis,

(g) there being longitudinally extending stepped guides on the insert to guide each plunger as it is moved longitudinally relative to the insert by a cam shoulder, that plunger having elongated guiding extent between its associated cam shoulder and spring.

4,925,223

CAP BRACE FOR HARDWOOD CASKETS

William K. Craft, North Bend, Ohio, assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Apr. 13, 1989, Ser. No. 339,207
Int. Cl.[5] E05C *17/24*
U.S. Cl. 292—339 **4 Claims**

1. In a wood casket body having a top edge and a cap pivoted to a casket body and adapted to close upon said top edge, a brace between casket body and cap to hold said cap open, said brace comprising:

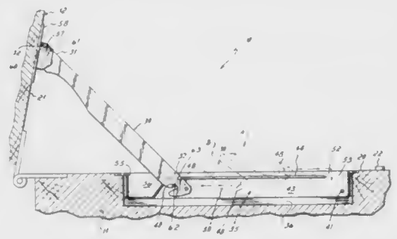
an elongated channel slot in the top edge of said casket body;

an elongated channel inserted in said slot,

a keeper projecting through said channel adjacent said lid,

an elongated one-piece rigid brace pivotally mounted at one end to said lid, said brace having a body end,

the body end of said brace being slidable in said channel and having a notch engageable with said keeper to hold said



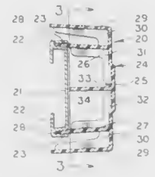
body end at said keeper and thus to hold said lid in a raised attitude.

4,925,224

ENERGY ABSORBING VEHICLE BUMPER

James L. Smiszek, Romeo, Mich., assignor to Romeo-Rim, Inc., Romeo, Mich.

Filed Mar. 6, 1989, Ser. No. 320,081
Int. Cl.[5] B60R *19/18, 19/03*
U.S. Cl. 293—120 **19 Claims**



1. An energy absorbing bumper for a vehicle comprising an elastomeric module having a longitudinally extending front impact face and upper and lower walls extending generally laterally from said impact face; a rear support plate attachable to the vehicle and engaging said upper and lower walls; said module also including a plurality of longitudinally spaced first ribs integral with and extending generally laterally from said impact face and along said upper wall toward said rear support plate, a plurality of similarly longitudinally spaced second ribs integral with and extending generally laterally from said impact face and along said lower wall toward said rear support plate; and a flexible longitudinal rail integral with and extending generally laterally from said impact face between said plurality of first and second ribs and toward said rear support plate, said rail being free of direct connection to said plurality of first and second ribs so that said rail can freely deflect relative to said plurality of first and second ribs, said module absorbing the energy of an impact against said impact face by the distortion of said walls and ribs and the buckling and subsequent deflection of said rail.

4,925,225

VACUUM LIFTING DEVICE FOR HANDLING SHEET MATERIAL

James A. Dost, Green Bay, Wis., assignor to Dost Incorporated, New Franken, Wis.

Filed Jun. 19, 1989, Ser. No. 367,935
Int. Cl.[5] B66C *1/02*
U.S. Cl. 294—64.1 **9 Claims**

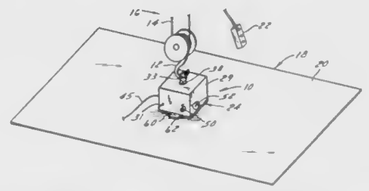
9. A vacuum lifting device suspendable from and movable by a crane or the like and releasably attachable to a smooth surface of an object to be moved comprising:

a support assembly having an upper end and a lower end;

attachment means at said upper end of said support assembly;

a vacuum pad connected to said lower end of said support assembly and having a cavity on its underside cooperable with a smooth surface of an object to define a vacuum chamber;

a vacuum pump assembly mounted in said device and selectively operable to control air pressure conditions in said vacuum chamber whereby said object adheres to or is released from said vacuum pad, a cover member mounted



on said support assembly above said vacuum pump assembly to define a protective housing for said vacuum pump assembly;

said support assembly comprising upper means connectable to said crane and having a threaded shank, a threaded rod, a threaded sleeve connecting said shank and said rod together in end-to-end relationship, said rod having a lower end which is threadedly engaged with said vacuum pad; said threaded shank of said upper means extending through said cover member, whereby said cover member is secured by entrapment between said threaded sleeve and said upper means.

4,925,226

MANUALLY OPERATED CARGO CONTAINER HOOK APPARATUS

Laurence E. Leonard, Jr., and Dennis A. Mostad, both of Honolulu, Hi., assignors to Hawaii Stevedores, Inc., Honolulu, Hi.

Filed Aug. 17, 1988, Ser. No. 232,937
Int. Cl.[6] B66C *1/22*
U.S. Cl. 294—82.1 **10 Claims**



1. A cargo container hook apparatus for engaging a hollow life fitting defining a cavity, said hollow lift fitting having a top wall having an elongated slot formed therethrough and comprising:

a hook member having a crossbar formed on one end of a shank, dimensioned to allow insertion of the crossbar through said elongated slot and to allow its subsequent rotation within said cavity of said lift fitting about an axis described by the shank, said crossbar having a pair of opposing distal ends formed in a substantially cylindrical crosssectional contour, whereby said hook member is free to rotate about an axis defined by said crossbar responsive to lifting forces applied thereto; and

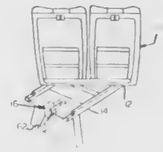
means for obstructing a sufficient amount of the cavity of said lift fitting to substantially limit rotation of the hook member from a position wherein the crossbar is substantially perpendicular to said elongated slot, said obstructing means includes a lock plug insertable into said cavity of said lift fitting through said elongated slot, wherein a first end of said lock plug is disposed external said cavity and an opposing second end is positioned in contiguous contact with a bottom wall surface of said cavity.

4,925,227

COACH SEAT LOCKING MECHANISM

Robert Bateman, Levittown, Pa., assignor to Trison Associates Incorporated, Feasterville, Pa.

Continuation of Ser. No. 215,361, Jul. 5, 1988, Pat. No. 4,871,207. This application Sep. 5, 1989, Ser. No. 402,795
Int. Cl.[5] B60N *1/02*
U.S. Cl. 296—65.1 **4 Claims**



1. A coach seat construction of the type including a seat lower frame affixed to the floor of the coach, a seat upper frame rotatively secured to the seat lower frame, the upper frame having a first forward end and a second, rearward end, a seat rotation mechanism positioned intermediate the upper and lower frames, the seat rotation mechanism being spaced from the said first and second ends and being centrally located relative to the frames comprising

a body secured to the seat lower frame, the body being positioned in transversely spaced relationship from the seat rotation mechanism and below the first end of the seat upper frame, the body being provided with a vertical bore;

pedal arm means pivotally attached to the body to selectively lock the forward end of the seat lower frame to either the first end or the second end of the seat upper frame, the pedal arm means comprising a pedal arm, a pivot pivotally connecting the pedal arm to the body, and a pedal cam,

the pedal arm being movable between a first, locked position and a second, unlocked position;

locking rod means vertically reciprocable within the said vertical bore between a first, upper, locked position and a second, lower, unlocked position,

the locking rod means comprising a locking rod and a lever connected to and extending outwardly from the locking rod,

the locking rod extending upwardly and engaging a portion of the seat upper frame when the locking rod means is reciprocated to the first position, the locking rod preventing rotation of the seat upper frame relative to the seat lower frame when in the first position,

spring means biasing between a portion of the body and the lever to continuously bias the locking rod to the first, locked position;

operating finger means extending from the pedal arm to contact the lever, the operating finger means urging the locking rod from its first, upper, locked position to its second, lower locked position against the bias of the spring means when the pedal arm is moved from its first, locked position to its second, unlocked position;

VOL
1114
ISS
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an extraction arm reciprocally movable relative to the body between a rearward position and a forward position, the extraction arm comprising a cam follower in contact with the pedal cam and an upper latch, the upper latch extending above the body and being of sufficient height to be contacted by a portion of the seat upper frame; and

first and second spaced flanges depending respectively from the first end and the second end of the seat upper frame, the first and second flanges being positioned to serially overfit and engage the said upper latch; whereby depressing the pedal arm will cause the pedal cam to depress the locking rod simultaneously to move the extraction arm to its said forward position through forces imposed upon the said cam follower whereby the forward movement of the extraction arm will cause the engagement of the upper latch with a depending flange to simultaneously pull the seat upper frame forwardly.

4,925,228

SIMPLE MEMORY MECHANISM COMPRISING A MECHANICAL JACK FOR TILTING OVER CONTROL ON THE FRONT OF A VEHICLE SEAT

Yves Pipon, and Georges Droulon, both of Flers, France, assignors to A. & M. Cousin-Etablissements Cousin Freres, Orne, France

Filed Aug. 4, 1988, Ser. No. 228,729
Claims priority, application France, Aug. 6, 1987, 87 11194
Int. Cl.[5] B60N *1/02*
U.S. Cl. 296—65.1 **9 Claims**



1. A simple memory mechanism including a mechanical jack for the tilting control on the front of a seat of a vehicle comprising:

for said seat, a base plate, with a longitudinal axis and including, below said base plate, a rack connector rod and a mechanical bolt, said connector rod cooperating with a box that is coupled to the floor of said vehicle via framing and brace means, with said box containing a blockable motor device collectively to form a unit cooperating with two parallel arms, each of which is joined both to a rear part of said seat, and to said floor of said vehicle via a spindle that contains a memory in the form of a ring with a notch that cooperates with a nose of a first lever that is pivotably mounted on said arm and is controlled by a single control device that is connected to said first lever and said mechanical bolt by Bowden cable means.

4,925,229

TILTABLE VEHICLE SEAT

Helmut Siebler, Fellbach, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 298,953
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 3801294
Int. Cl.[5] B60N *1/04*
U.S. Cl. 296—65.1 **17 Claims**

1. Tiltable vehicle seat comprising:

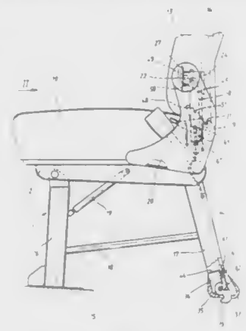
a seat-cushion frame having a seat cushion and being pivotable out of an approximately horizontal position of use into an approximately vertical access position making access to the vehicle easier,

a backrest which is pivotable on the seat-cushion frame and which can be tilted forwards onto the seat cushion after the release of a locking mechanism fixing it in an erected position of use,

catching claw means for retaining the seat-cushion frame in its position of use and which can be swung into and out of a mounting integral with the vehicle by means of an actuating mechanism, and

concealing means for concealing the catch claw means when swung out of the mounting,

wherein the actuating mechanism is coupled to the backrest



in such a way that the tilting movement of the backrest results in a swinging-out movement of the catching claw means and an erecting movement of the backrest results in a swinging-in movement of the catching claw means with respect to the mounting located on the vehicle, and wherein the catching claw means is arranged so that, in its swung-out position, it is arranged concealed, and

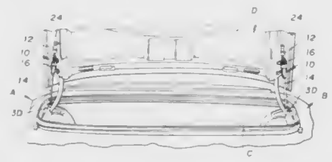
wherein the swinging out of the catching claw means takes place after approximately half the tilting travel of the backrest and the swinging in of the catching claw means takes place at the end of the erection travel of the backrest, and wherein the catching claw means is locked in its swung-out position during the intermediate pivoting travel of the backrest.

4,925,230

HOLD OPEN DEVICE FOR COMPARTMENT LID

Alan J. Shelton, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1988, Ser. No. 213,795
Int. Cl.[5] B62D *25/10*; E05C *17/44*
U.S. Cl. 296—76 **5 Claims**



1. In a vehicle body having a closure swingably mounted thereon for movement between open and closed positions and a support strut means for holding said closure in its open position, said support strut means comprising a pair of telescoping members, one of which has one end pivotally connected to said closure and the other of which has one end pivotally connected to said vehicle body, said telescoping members having

their adjacently located end portions slidably connected together so that the strut means can be collapsed when the closure is moved toward its closed position and can be extended when the closure is moved toward its open position, and a releasable latch means carried by one of said telescoping members and cooperably engageable with the other of said telescoping members to hold the closure in its open position when moved thereto,

the improvement being that said releasable latch means comprises

a latch member supported by one of said telescoping members for movement between a latched position in which a pawl thereof extends through an opening in said one telescoping member and engages a catch surface on the other of said telescoping members to hold said closure in its open position and an unlatched position in which the pawl is out of engagement with said catch surface to allow said strut means to be collapsed and said closure to be moved to its closed position,

first biasing means for biasing said latch member toward its latched position,

a release member cooperably engageable with said latch member and slidably supported on said one telescoping member for limited movement relative thereto, second biasing means having a biasing force for biasing said release member and said one telescoping member relative to each other toward a first position in which said latch member is allowed to move through said opening in said one telescoping member between its latched and unlatched positions,

said release member and said one telescoping member being relatively movable from their first position in opposition to the biasing force of said second biasing means toward a second position during which means on said one telescoping member engages said latch member to effect movement of said latch member from its latched to its unlatched position to allow said strut means to collapse in response to solely a closing direction force in excess of a given magnitude being exerted on the closure when the latter is initially being moved from its open position toward its closed position.

4,925,231

AIR CONDUCTING APPARATUS FOR A MOTORCYCLE

Kazumichi Hamaguchi, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 288,830
Claims priority, application Japan, Dec. 26, 1987, 62-198216
Int. Cl.[5] B62J *17/00*
U.S. Cl. 296—78.1 **4 Claims**



1. An air conducting apparatus for use on an engine guard formed in a frame of a motorcycle, in which the guard surrounds a cylinder head portion of an engine having a flat opposed cylinder configuration, with cylinder heads being disposed in front of foot steps of the motorcycle, said air conducting apparatus comprising:

a cover mounted on the engine guard, said cover at least partially enclosing said cylinder head and having a window opening therein;

an air guide plate disposed in said window opening and pivotable therein, such that in an opened position, a forward end of said plate is pivoted into an airstream on a side of the cover opposite from the cylinder head, and a rearward end of said plate is pivoted inward toward the cylinder head; and

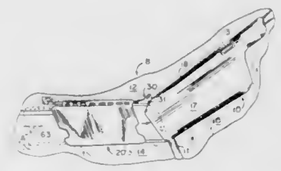
an over-center spring means, connected between said rearward end of said plate and said cover, for holding said plate in one of an opened position and a closed position.

4,925,232

VISOR

Ronald L. Hemmeke, and Scott A. Spykerman, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Continuation of Ser. No. 866,272, May 23, 1986, Pat. No. 4,783,111. This application Jun. 6, 1988, Ser. No. 202,519
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.8 **8 Claims**



5. A visor system for selectively providing simultaneous sun blocking protection for the windshield and an adjacent side window of a vehicle comprising:

a pair of brackets adapted to be mounted in spaced relationship above a vehicle windshield;

a first visor pivotally coupled to one of said brackets for movement of said visor in a generally horizontal direction to selectively provide sun blocking for either side window adjacent the windshield of the windshield;

a second visor including a body, a panel and means for slidably mounting said panel to said body for sliding movement along an axis parallel to the longitudinal axis of said second visor between a stored position at least partially aligned with said body and use positions extended from either side of said body; and

means for mounting said first and second visors to said brackets for urging and holding said first and second visors in a raised stored position as said visors are moved to a raised position and permitting movement of said visors to a lowered use position, wherein said means for slidably mounting said panel to said body includes interlocking arm means extending from facing surfaces of said body and said panel and engaging one another to hold said panel and body together; and

wherein said means for slidably mounting said panel to said body further includes generally concave guide channel means formed in one of said body and panel along the direction of sliding movement and a complementary generally convex projection means formed in the other of said body and panel for engaging said channel means to provide a sliding guide therebetween.

4,925,233

ADJUSTABLE VISOR

Russell L. Clark, Zeeland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Dec. 28, 1987, Ser. No. 138,368
Int. Cl.[5] B60J *3/02*
U.S. Cl. 296—97.11 **7 Claims**

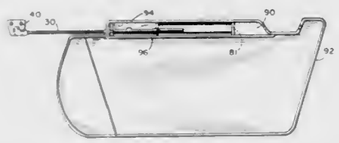
1. A vehicle visor comprising:

a visor panel including channel means formed therein adjacent one edge of said visor;

a visor pivot rod and means for mounting said pivot rod to a vehicle for movement of the visor attached to said pivot

rod between a forward windshield position to a side window position;

a pivot rod control mounted to said pivot rod in a fixed longitudinal position with respect to said pivot rod but rotatable about said pivot rod, said control positioned within said channel means for coupling said pivot rod to said visor panel to permit said visor panel to slide longitudinally along the axis of said pivot rod and move with respect to said control and for urging and holding the visor in a raised, stored position against the vehicle roof;



said pivot rod control comprises a torque fitting coupled to said visor pivot rod and cooperating therewith to provide an adjustable rotational torque for said visor panel with respect to said pivot rod and for urging said visor to a raised, stored position; said pivot rod control including guide elements; and separate guide means separate and apart from said channel means, located in said channel means, extending along the axis of said pivot rod, and cooperating with said guide elements for supporting and guiding said torque fitting as said visor panel is slid longitudinally along the axis of said pivot rod.

4,925,234

LENGTH ADJUSTABLE, TRUNK STOWABLE PROTECTIVE CAR COVER APPARATUS

Woo Park, #128 Inway Village Apartments, 6613 S. Hulen, Fort Worth, Tex. 76133, and Kirk M. Mullenax, 1130 Bear Creek Pkwy., Apt. 190 704, Euless, Tex. 76039

Filed Nov. 16, 1988, Ser. No. 272,118

Int. Cl.[5] B60J *11/00*

U.S. Cl. 296—136 **27 Claims**



1. For use with an automobile having a front end; an upper side portion extending along the length of said automobile; a trunk having a base section with a rear end portion, and a front-hinged lid having a rear edge portion adapted to close against said rear end portion of said base section; and cooperating, interengageable trunk latch means, positioned on said rear end portion of said base section and said rear edge portion of said lid, for locking said trunk, length adjustable, trunk stowable protective car cover apparatus comprising:

an elongated flexible car cover member formed from a sheet of foldable weatherproof material and sized to extend longitudinally along and cover said upper side portion of said automobile, said car cover member having an outer side surface, an inner side surface, opposite side edge poritons, a front end portion, a rear end portion, and an elongated, longitudinally extending opening formed through and along said rear end portion of said car cover member and positioned between opposite side portions thereof, said car cover member being stowable in a longitudinally folded orientation within said trunk;

adjustable means, including fastening means carried by said rear end portion for movement therewith, for directly securing a selectively variable portion of said rear end portion of said car cover member to an interior portion of the trunk when the folded, remaining effective covering length of said car cover member is removed from the opened trunk, the effective covering length of said car cover member being selectively variable by using said adjustable means to selectively vary the retained length of said rear end portion of said car cover member, said adjustable means being further operative to extend the retained car cover member length laterally across the width of the trunk interior and to laterally align said car cover member opening with said cooperating trunk latch means in a manner such that after the folded effective covering length of said car cover member is removed from the opened trunk, said upper side portion of said automobile may be rapidly and easily covered by:

closing said trunk lid to cause interengagement of said cooperating trunk latch means through said car cover member opening, and to lockingly clamp a longitudinal section of said rear end portion of said car cover member between said rear edge portion of said trunk lid and said rear end portion of said base section of said trunk, and

unfolding the effective covering length of said car cover member over said upper side portion of said automobile to position said front end portion of said car cover member adjacent said front end of said automobile; and

attachment means for removably attaching said front end portion of said car cover member to said front end of said automobile.

4,925,235

CAB FAIRING MOUNTING FOR TRUCK

Robert F. Fingerle, Fremont, Calif., assignor to PACCAR Inc, Bellevue, Wash.

Filed Aug. 25, 1989, Ser. No. 398,614

Int. Cl.[5] B60R *3/00*

U.S. Cl. 296—180.2 **6 Claims**



6. An assembly for mounting a cab skirt fairing panel in the region between the front and rear wheels of a truck, said region lying parallel to said truck's longitudinal main frame, wherein said region includes a cab step positioned adjacent to the front end of said region, and wherein a step arrangement is at the back end of said region, said assembly comprising:

means for attaching said cab step to said frame in a way which prevents said cab step from moving vertically relative to said frame but allows it to move to a limited extent in a region parallel to said frame;

means for attaching said step arrangement to said frame in a way which prevents said step arrangement from moving vertically relative to said frame but allows it to move to a limited extent in a region parallel to said frame; and

means for fixedly attaching opposite ends of said cab skirt fairing panel to said cab step and said step arrangement.

4,925,236

AUTOMOTIVE AIR SPOILER DEVICE

Norihisa Itoh; Kiyoshi Kawaguchi, both of Anjo, and Etsuji Nomura, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 20, 1988, Ser. No. 196,465

Claims priority, application Japan, May 22, 1987, 62-125555; Apr. 8, 1988, 63-85144

Int. Cl.[5] B62D *35/00*

U.S. Cl. 296—180.5 **1 Claim**



1. An automotive air spoiler device for an automobile having a body with a front and a rear comprising:

a pair of spoiler members on the left and right lateral sides of the upper side of the rear of the body of the automobile, said spoiler members being arranged at a distance therebetween within a range of from 75% to 83% of the width of said automobile body, each spoiler member extending along its corresponding lateral side and being inclinable laterally at an angle not smaller than 40° and not greater than 70° to the horizontal so as to extend obliquely outwardly from said automobile body thereby interrupting air tending to flow from the corresponding lateral side of the rear of said automobile body to at least one of an upper side and an underside of the rear of said automobile body, said automotive air spoiler device further comprising a rear spoiler, said rear spoiler being provided on an end of said upper side of said rear of said automobile body to extend widthwise thereof and connect at both ends of said rear spoiler with the respective spoiler members.

4,925,237

RIGID COVER FOR THE ROOF OF A VEHICLE

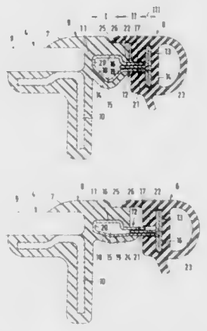
Horst Böhn, Frankfurt, and Rainer Grimm, Wetzlar, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany

Filed Nov. 10, 1988, Ser. No. 269,854

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738400; Aug. 26, 1988, 3828963

Int. Cl.[5] B60J *7/195;* **B60R** *13/06;* **F16J** *15/00*

U.S. Cl. 296—216 **9 Claims**



1. A rigid cover assembly for a vehicle roof opening which can be at least partly displaced out of the roof opening and which fills the roof opening when in a closed position comprising:

a cover plate,

a reinforcement frame supporting a lower peripheral edge of the cover plate,

a unitary plastic frame circumferentially surrounding the cover plate, said plastic frame covering an upper peripheral edge of the cover plate and enclosing said reinforcement frame,

a sealing strip extending around a periphery of said plastic frame, and

a metal gap compensating element between the peripheral edge of said cover plate and said sealing strip, said metal gap compensating element having an inner edge section facing said peripheral edge of the cover plate and embedded in said plastic frame, a deformation zone responsive to applied pressure to permanently deform said metal gap compensating element by increasing a transverse dimension of said element and an outer edge projecting out of said plastic frame, said outer edge being shaped to form fixing elements for supporting said sealing strip on said gap compensating element and responsive to deformation of said deformation zone to move at least a portion of said sealing strip outwardly relative to said peripheral edge of said cover plate.

4,925,238

VEHICLE SUNROOF SHADE

Doug Thaler, 2608 E. Sahuaro Rd., Phoenix, Ariz. 85028

Filed Jan. 31, 1989, Ser. No. 304,420

Int. Cl.[5] B60J *7/10*

U.S. Cl. 296—218 **8 Claims**



1. A vehicle sunroof shade for vehicles having T-tops with a pair of removable sections separated by a central T-bar, comprising:

a pair of parallel guide tracks;

a housing extending transversely between first ends of said guide tracks;

means for securing said housing to the central T-bar of a vehicle;

a retractable spring roller shade in said housing and having opposite longitudinal side edges dimensioned for reciprocal sliding movement in said guide tracks;

and means for securing said guide tracks to a vehicle T-roof portion.

4,925,239

FOLDING CHAIR AND METHOD OF CONSTRUCTION

Ronald H. Powers, 828 Production Pl., Newport Beach, Calif. 92663

Filed Aug. 9, 1989, Ser. No. 391,274

Int. Cl.[5] A47C *4/00*

U.S. Cl. 297—29 **14 Claims**

1. A folding chair, comprising:

a lower frame section formed generally as a U-shaped member;

an upper frame section formed generally as a U-shaped member;

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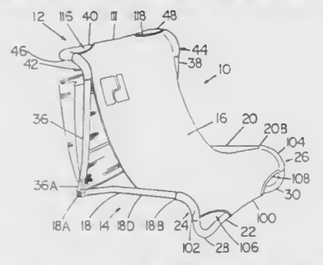
a pair of hinges for connecting the lower frame section and the upper frame section together, each hinge including:

a bolt;

a support ring mounted on the bolt;

an end of one of the frame sections pivotally mounted on the bolt adjacent the support ring;

an end of the other frame section pivotally mounted on the bolt, the support ring being formed to have an outer surface that extends beyond the end edges of the frame sections such that when the chair rests upon a hard, flat



surface such as a floor, the support ring contacts the floor while holding the ends of the frame sections above the floor;

means mounted on the bolt between the ends of the frame sections for permitting the frame sections to rotate about the bolt relative to one another while preventing frictional contact between the frame ends; and

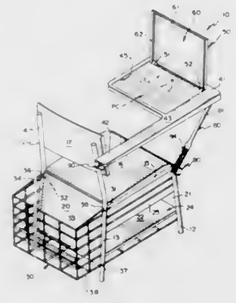
a covering mounted to the upper and lower frame sections such that a person occupying the chair may adjust the angle between the upper and lower frame sections by shifting his weight in the chair.

4,925,240

PERSONAL COMPUTER DESK

William T. Peters, 129 Wilson Ave., No. 6, Galax, Va. 24333

Filed Apr. 24, 1989, Ser. No. 342,139
Int. Cl.[5] A47C *7/62*
U.S. Cl. 297—161 30 Claims



1. A personal computer desk comprising a frame including a plurality of legs, a seat and a back rest; a desk top; means for adjusting the position of said desk top relative to said seat and back rest; means for defining an upwardly opening recess in said desk top which is adapted to house substantially entirely therein a personal computer; a lid corresponding generally in peripheral size and contour to the peripheral size and contour of said recess; means mounting said lid for movement between an upright generally open position and a closed position in which said lid generally mates with said recess and encloses a personal computer housed therein, and said lid carrying a liquid crystal screen which is adapted to be connected to a personal computer for displaying images thereon.

4,925,241

CUSHION FOR SPORTING EVENTS

Ronald J. Geraci, 62000 Schoenherr, Washington, Mich. 48094

Filed Apr. 22, 1985, Ser. No. 725,646
Int. Cl.[5] A47C *27/00*
U.S. Cl. 297—229 8 Claims



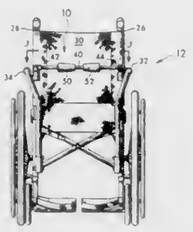
1. A portable cushion apparatus, comprising a pair of flexible enclosures each having resilient material disposed therein, one adapted to form a seat cushion and the other adapted to form either another seat cushion or a back cushion in cooperation with the one seat cushion, flexible means for joining together said flexible enclosures at generally one end thereof for folding of said cushions between an abutting, carrying position and either a parallel side by side relation as a pair of seat cushions or in perpendicular relation to form seat and back cushions, handle means connected to said flexible means for facilitating the carrying of said cushion apparatus, said flexible means having sufficient extent to permit said cushions to directly abut each other when positioned in their perpendicular relationship so that a user sitting thereon will not feel said handle means, and means for releasably joining together said flexible enclosures at generally the end of said flexible enclosures opposite to said flexible means.

4,925,242

ADJUSTABLE LUMBAR BACK SUPPORT SYSTEM FOR A WHEELCHAIR

Godfrey Harris, Littleton, and Leslie K. Hydle, Arvada, both of Colo., assignors to Scott Orthotic Labs, Inc., Arvada, Colo.

Filed Sep. 1, 1989, Ser. No. 401,799
Int. Cl.[5] A47C *4/42, 7/46;* A61G *5/02*
U.S. Cl. 297—284 14 Claims



1. An adjustable back support system for use with a wheelchair, said wheelchair having a flexible back rest extending between two upright back posts and said system providing adjustable support for the lumbar region of the back of the wheelchair occupant, said support system including:

an elongated member extending along a first axis and means for mounting said elongated member to said wheelchair with the first axis thereof substantially horizontal and with said elongated member extending substantially across the flexible back rest of said wheelchair between said two upright back posts and on the opposite side of said back rest from the wheelchair occupant, and

at least two cam members eccentrically mounted about said elongated member and means for adjustably positioning each of said cam members about and along said elongated member, said positioning means including means for selectively varying the position of each eccentric cam member about the first axis of said elongated member to selectively increase and decrease the lumbar support provided to the wheelchair occupant, said positioning means further including means for selectively varying the position of each cam member along the first axis of said elongated member relative to each other and to said elongated member to provide additional adjustability to the lumbar support provided to the wheelchair occupant.

4,925,244

CHAIR ELEMENT WHICH CAN BE PERSONALIZED

Paolo Nava, Lissone, Italy, assignor to SpA Tonon & C., Manzano, Italy

Filed Dec. 29, 1988, Ser. No. 291,651
Claims priority, application Italy, Apr. 29, 1988, 60352/88[U]
Int. Cl.[5] A47C *7/00*
U.S. Cl. 297—440 3 Claims



1. Chair element which can be personalized, comprising:

a bearing structure;

a self-supporting seatback removably attached to said bearing structure, wherein said self-supporting seatback is provided with a lower zone, a first lateral projection and a second lateral projection; and

a seat surface removably attached to said bearing structure; wherein said bearing structure comprises:

a support surface comprising a front cross-member, a rear cross-member, a first lateral member, and a second lateral member,

a pair of rear legs extending a short distance above said support surface and fixedly attached thereto, and

a pair of front legs fixedly attached to said support surface, wherein said pair of front legs slope away from said pair of rear legs and diverge in a downward direction,

wherein said rear legs slope away from said pair of front legs in a downward direction, and wherein said bearing structure has a gap between said rear cross-member and said pair of rear legs; and

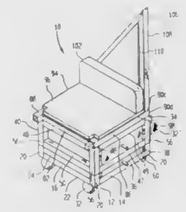
wherein said seat surface is supported by said support surface, wherein said lower zone of said self-supporting seatback is inserted in said gap between said rear cross member and said pair of rear legs, and wherein said first lateral projection communicates with said first lateral member, and said second lateral projection communicates with said second lateral member.

4,925,245

DEVICE CONVERTIBLE INTO A CHAIR, TABLE, BED OR STOOL

John H. Pendleton, P.O. Box 888 99893-131-G-Unit, and James Gabriel, P.O. Box 888 02858-068-E-Unit, both of Ashland, Ky. 41101

Filed Mar. 9, 1989, Ser. No. 321,418
Int. Cl.[5] A47C *7/00*
U.S. Cl. 297—440 20 Claims



1. A convertible weight supporting device, comprising:

a first frame, having a front end and a back end;

telescoping means, extendable forward of said front end, housed within said first frame, said telescoping means, when extended, defining a base;

a second frame, upon which said first frame is removably stackable;

a seat plate attached to and within said first frame and defining a horizontal surface therein;

a seat means, including a cushion, which is removably supportable upon said first frame with a lower surface of said cushion facing said seat plate, and which is also removably supportable upon said base;

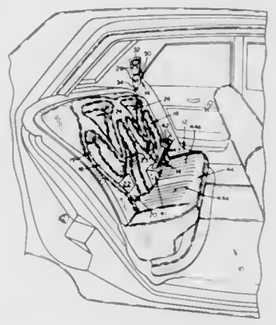
a backrest removably connected to said first frame, wherein said back end of said first frame includes vertical receiving means for removably receiving said backrest in an essentially vertical orientation with respect to said first frame, and horizontal receiving means for removably receiving said backrest in an essentially horizontal orientation with respect to said first frame.

4,925,246

PRISONER RESTRAINT SYSTEM

Dan E. Corcoran, 8310 SW. Greenway, No. 45, Beaverton, Oreg. 97005

Filed Oct. 14, 1988, Ser. No. 257,997
Int. Cl.[5] A47C *7/00*
U.S. Cl. 297—466 16 Claims



1. A seat back for providing lateral and rearward support to a rearwardly handcuffed occupant comprising:

VOL
1114
ISS
3
MY
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(a) an upright face for engaging the back of said occupant, said face including an upper portion and a lower portion; and

(b) pocket means arranged centrally in said lower portion of said face for receiving the rearwardly cuffed hands of the occupant, said pocket means defining a space between said seat back and the back of the occupant when the back of the occupant rests securely against said face of said seat back.

4,925,247

METHOD FOR PARTICLE STABILIZATION BY USE OF CATIONIC POLYMERS

Kenneth E. Hjelmstad, Richfield, Minn., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 27, 1988, Ser. No. 290,556
Int. Cl.[5] C09K *17/00;* **E21B** *43/28*
U.S. Cl. 299—5 **5 Claims**

1. A method of preventing particle dispersion, swelling of clays, and breakup of clay platelets to increase recovery of mineral and metals during chemical leaching of earth material, comprising the steps of:

forming a treating fluid which comprises cationic polymers, diluents, and including leaching agents; and

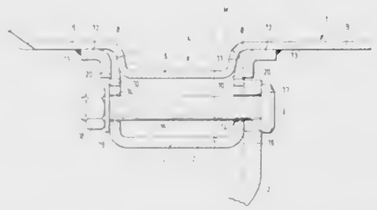
introducing said treating fluid into in-situ subterranean earth material such that swelling action is reduced and thus reducing permeability loss.

4,925,248

TRACK-ADJUSTING WHEEL

Peter Aderer, Koenigswinter-Thomasberg, Fed. Rep. of Germany, assignor to Lemmerz-Werke KGaA, Koenigswinter, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,612
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741640
Int. Cl.[5] B60B *3/00*
U.S. Cl. 301—9 TV **4 Claims**



1. A track adjusting wheel having an axis and a central plane perpendicular to said axis for tractors and the like comprising:

a double drop-well rim having a generally annular body and an inner drop-well offset from said central plane, said inner drop-well comprising an annular base, two drop-well flanks having axially outwardly facing surfaces approximately parallel to said central plane spaced a first fixed axial distance apart and two inner drop-well radii connecting said inner drop-well to said body;

retaining brackets of approximately U-shaped cross section comprising legs having axially inwardly facing surfaces approximately parallel to said central plane spaced a second fixed axial distance apart, said second axial distance being equal to or less than said first axial distance whereby said legs are tightly fitted against said drop-well flanks outwardly facing surfaces, radial outward, ends radial inward ends and bolt holes adapted to receive axially extending screws, axially extending flanges at said radial outward ends of said legs, said flanges abutting against and welded to said body of said rim, and a base connecting said radial inward ends of said legs; and,

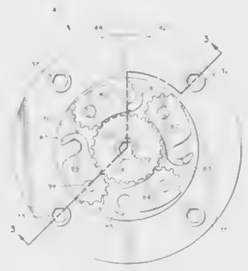
a wheel dish fastened to said retaining brackets by axially extending screws through said bracket bolt holes.

4,925,249

AUTOMOBILE HUB MOUNT

Wilfred C. Auspelmyer, Youngs Corners Rd., R.D. #1, Box 126, Amsterdam, N.Y. 12010

Filed Apr. 14, 1989, Ser. No. 338,153
Int. Cl.[5] B60B *3/14*
U.S. Cl. 301—111 **20 Claims**



19. A device for removably securing a first plate to a second plate, said first plate having a center hole and at least one other hole spaced from said center hole, said second plate having an outer face and at least one extension means projecting therefrom, said device comprising:

a rotatable gear means operatively mounted to said second plate, said rotatable gear means including turning means proximate its center whereby the gear can be rotated by an external force, and

at least one rotatable hook means also operatively mounted to said second plate, said hook means being pivotable about a point exterior to the diameter of said rotatable gear means, said hook means having a top hook-shaped portion and a bottom portion, said bottom portion having an exterior toothed portion, said toothed portion being meshed with said rotatable gear means,

whereby said first plate can be mounted to said second plate by engaging said extension means of the second plate with said other hole of the first plate and having the center hole of the first plate in line with the turning means of the gear means, applying an external force to the turning means and thereby rotating the gear means, rotation of said gear means causing the hook means to rotatably pivot whereby the hook-shaped portion can engage the extension means and sandwich the first plate between itself and the second plate thereby removably securing the first plate to the second plate.

4,925,250

DUAL WHEELS FOR A RADIO CONTROLLED TOY CAR

Michael Sorrentino, and John Kidd, both of 4 Ridgewood Ave., Selden, N.Y. 11784

Filed Oct. 31, 1988, Ser. No. 264,788
Int. Cl.[5] B60B *11/04*
U.S. Cl. 301—13 R **1 Claim**

1. A dual wheel set for a toy car, comprising:

a pair of rear wheels, each of said rear wheels having an elongated generally cylindrical hollow body portion;

said cylindrical body portion terminating in mirror symmetrical opposite end portions each having:

(a) an outer radially extending flange having an annular end face and a cylindrical side wall;

(b) a stepped circular annular groove formed interiorly of said outer flange, forming an outwardly facing annular abutment face;

(c) a first stepped intermediate diameter portion formed adjacent said outer flange, and having a diameter greater than said cylindrical body portion and less than said outer flange;

(d) an outer radially extending bead retaining flange formed adjacent said first intermediate stepped diameter portion, forming a first tire bead retaining groove;

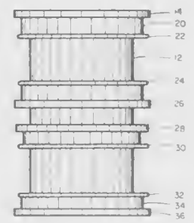
(e) an intermediate radially extending bead retaining flange spaced inwardly along said cylindrical body from said outer bead retaining flange;

(f) an inner radially extending bead retaining flange spaced inwardly along said cylindrical body from said intermediate retaining flange;

(g) a second stepped intermediate diameter portion formed between said intermediate and inner bead retaining flanges, and having a diameter greater than said cylindrical body portion and less than said intermediate and inner bead retaining flanges, forming a second tire bead retaining groove;

an interior transverse circular reinforcing wall in said cylindrical body disposed between said opposite ends;

a central cylindrical axial aperture formed through said reinforcing wall;



a pair of front wheels, each of said front wheels having an elongated cylindrical hollow body portion;

said cylindrical body portion terminating in mirror symmetrical opposite end portions, each having:

(a) an outer radially extending flange having an annular end face in a cylindrical side wall;

(b) first and second stepped circular grooves formed interiorly of said outer flange, forming first and second outwardly facing abutment faces joined by a curved circular surface;

(c) an outer radially extending bead retaining flange spaced inwardly along said cylindrical body from said outer flange, forming a first tire bead retaining groove;

(d) an intermediate radially extending bead retaining flange spaced inwardly along said cylindrical body portion from said outer bead retaining flange;

(e) an inner radially extending bead retaining flange spaced inwardly along said cylindrical body from said intermediate bead retaining flange, forming a second tire bead retaining groove;

a centrally disposed transverse circular reinforcing wall in said cylindrical body portion;

a central cylindrical axial aperture formed through said reinforcing wall;

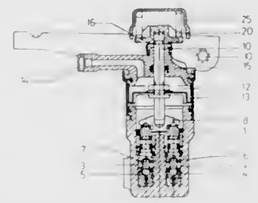
and a cylindrical bearing cup surrounding said axial aperture and extending from opposite faces of said reinforcing wall.

4,925,251

BRAKE CORRECTOR SUBJECT TO THE LOAD OF A VEHICLE AS A FUNCTION OF THE SEATING OF THE LATTER

Pascal Picot, Bonneuil Sur Marne, and Jean-Jacques Carré, Le Raincy, both of France, assignors to Bendix France, Drancy, France

Filed Mar. 27, 1989, Ser. No. 329,180
Claims priority, application France, Mar. 30, 1988, 88 04164
Int. Cl.[5] B60T *8/18*
U.S. Cl. 303—22.1 **7 Claims**



1. A brake corrector intended to be subject to the load of a vehicle despite the possible variation in the height of seating of said vehicle, comprising:

a fluidic pressure sensor arranged between the body of the vehicle and a corresponding end of a suspension spring of the vehicle,

a body in which is mounted slidably at least one piston connected with an end of an actuating rod and connected directly with a valve element in order to control a passage of brake fluid between an inlet and an outlet of the corrector, the body and the fluidic pressure sensor being connected fluidically in such a way that a variation in pressure determines a first force exerted on said piston, and

a sensor of the height of seating of the vehicle, the response of which determines a second force also exerted on said piston,

said first and second forces combining to act on said piston, wherein said actuating rod is capable of being driven longitudinally in a translational movement under the combined effects of a sealed flexible diaphragm connected with an intermediate portion of the actuating rod and of said sensor of the height of seating of the vehicle, said flexible diaphragm defining within said body a chamber of variable volume connected with said fluidic pressure sensor, and the sensor of the height of seating of said vehicle connected with an end of the rod opposite to said piston and projecting from said body.

4,925,252

AUTOMOBILE BRAKE SYSTEM

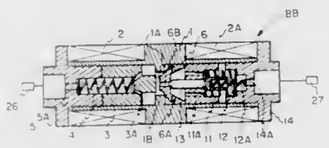
Nam Y. Hee, 88-284, Dae Jo Dong, Eun Pyung Gu, Seoul, Rep. of Korea

Filed Dec. 30, 1988, Ser. No. 292,557
Claims priority, application Rep. of Korea, Dec. 30, 1987, 87-15377; Mar. 19, 1988, 88-3697
Int. Cl.[5] B60T *17/16, 11/28*
U.S. Cl. 303—89 **1 Claim**

1. An automobile brake hydraulic system comprising an elongated electronic valve, a master cylinder hydraulically connected to one end of said valve, and a wheel cylinder hydraulically connected to the other end of said valve, said valve comprising a round tube having an inwardly projecting ring therein, a braking solenoid on said round tube, an apertured front stopper in said round tube and hydraulically connected to said master cylinder for connecting said valve thereto, a press pad in said round tube, a first spring between said press pad and said front stopper, an apertured rear stopper in said round tube at the opposite end thereof from said front

VOL
1114
ISS
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stopper and hydraulically connected to said brake cylinder for connecting said valve thereto, a switch rod in said round tube between said ring and said rear stopper, said switch rod having an axial passage therethrough and being receivable in sealing engagement with said ring, a release rod having an axial passage therethrough received in said round tube between said rear stopper and said switch rod, a small rod received in the axial passage in said release rod and receivable in sealing engagement in the axial passage in said switch rod, a second spring biasing said release rod toward a position wherein it engages said switch rod to position the latter is sealing engagement with said ring, a third spring biasing said small rod toward a position wherein it is received in sealing engagement in the axial passage in said switch rod, said first spring being operable against the combined force of said second and third springs for moving said press pad to a position wherein it



engages said switch rod to dislodge it from said position of sealing engagement with said ring to permit the flow of oil through said valve in the direction of said master cylinder, said press pad being engageable with said switch rod to dislodge it from said position of sealing engagement with said ring without engaging said small rod when said small rod is received in sealing engagement in the axial passage in said switch rod, said brake solenoid being actuatable for moving said press pad against the force of said first spring to a position wherein said press pad is disengaged from said switch rod to prevent the flow of oil through said valve in the direction of said master cylinder, and a release solenoid on said round tube actuatable for directly moving said small rod against the force of said third spring to dislodge said small rod from said position of sealing engagement in said axial passage in said switch rod and to thereby permit the flow of oil through said valve in the direction of said master cylinder.

4,925,253

METHOD AND ARRANGEMENT OF AUTOMATICALLY ACTUATING A VEHICLE WHEEL BRAKE WITH THE AIM OF PREVENTING THE WHEEL FROM SKIDDING

Bror Lennart A. Swiden, Box 38, S-590 61 Vreta Kloster, Sweden

PCT No. PCT/SE87/00097, § 371 Date Aug. 16, 1988, § 102(e) Date Aug. 16, 1988, PCT Pub. No. WO87/05270, PCT Pub. Date Sep. 11, 1987

PCT Filed Feb. 27, 1987, Ser. No. 235,898

Claims priority, application Sweden, Mar. 3, 1986, 8600943

Int. Cl.[5] B60T *8/64, 8/60*

U.S. Cl. 303—110 **13 Claims**

1. A method of automatically actuating a wheel brake of a vehicle during both braking and acceleration of the vehicle to prevent the wheel from skidding, comprising the steps of:

sensing an instantaneous speed of rotation of the wheel;

calculating an instantaneous absolute speed variation of the wheel based upon said sensed instantaneous speed of rotation of the wheel;

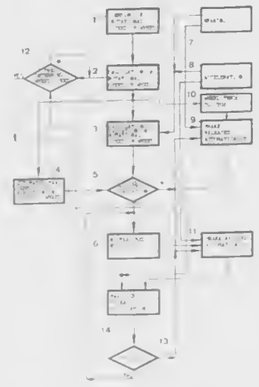
automatically releasing the wheel brake during braking of the vehicle when said instantaneous absolute speed variation is greater than a predetermined maximum permissible value;

after an automatic release of the wheel brake during braking of the vehicle, automatically applying the wheel brake during braking of the vehicle exclusively upon occurrence of the first to occur of the following conditions (a) and (b):

(a) when said instantaneous speed of rotation has increased to a predetermined application value, and

(b) once a first predetermined period has elapsed since said automatic release of the wheel brake, said first predetermined period being reckoned from said automatic release of the wheel brake and being calculated as a percentage increment of time to be added to the time period between a previous automatic release and application of the wheel brake during braking;

automatically applying the wheel brake during acceleration of the vehicle when said instantaneous absolute speed variation is greater than said predetermined maximum permissible value; and



after an automatic application of the wheel brake during acceleration of the vehicle, automatically releasing the wheel brake during acceleration of the vehicle exclusively upon occurrence of the first to occur of the following conditions (c) and (d):

(c) when said instantaneous speed of rotation has decreased to a predetermined release value, and

(d) once a second predetermined period has elapsed since said automatic application of the wheel brake, said second predetermined period being reckoned from said automatic application of the wheel brake and being calculated as a percentage increment of time to be added to the time period between a previous automatic application and release of the wheel brake during acceleration.

4,925,254

ANTI-LOCK BRAKE SYSTEM FOR VEHICLES

Hans Holst; Klaus Lindemann, both of Hanover; Manfred Saba, Ronnenberg; Hans-Harald Kaess, Isernhagen, and Erwin Petersen, Wunstorf, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 8, 1988, Ser. No. 242,027

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1987, 3731685; Oct. 7, 1987, 3733801

Int. Cl.[5] B60T *8/64, 8/60*

U.S. Cl. 303—111 **23 Claims**

1. A vehicle anti-lock brake system, said anti-lock brake system comprising:

(a) a solenoid control valve connectable at a fluid pressure inlet port to enable communication of fluid pressure thereto from a source of such fluid pressure, said solenoid control valve being connectable at a fluid pressure outlet port to a predetermined pair of brake cylinders positioned on such vehicle, said solenoid control valve controls communication of such fluid pressure to such predetermined pair of brake cylinders and evacuation of such fluid pressure from such predetermined pair of brake cylinders;

(b) a speed sensing means positionable on such vehicle adjacent each brakeable wheel for each of determining a rotational speed of such brakeable wheel and for generating an electrical signal having a value representative of such rotational speed and for transmitting said electrical signal;

(c) an electronic control system positionable on such vehicle and electrically connectable at an input terminal thereof to each said speed sensing means to enable receiving said electrical signal value generated by said speed sensing means, said electronic control system being electrically connectable at an output terminal thereof to enable transmission of an electrical control signal to an input terminal of said solenoid control valve;

(d) a means disposed in said electronic control system for determining when said electrical signal value received by said electronic control system from each said speed sensing means is representative of a deceleration signal value of a low wheel, said electronic control system in response to said electrical signal value being representative of said deceleration signal value transmits a pressure hold electrical control signal to said input terminal of said solenoid control valve;

(e) a means disposed in said electronic control system for determining when said electrical signal value received by said electronic control system from each said speed sensing means is representative of a slip signal value of a low wheel, said electronic control system in response to said electrical signal value being representative of said slip signal value transmits a pressure decrease electrical control signal to said input terminal of said solenoid control valve;

(f) a means disposed in said electronic control system for determining when said electrical signal value received by said electronic control system from each said speed sensing means is representative of a decrease in said electrical signal value of said slip signal value of such low wheel, said electronic control system in response to said decrease in said electrical signal value representative of said slip signal value of such low wheel transmits a pressure increase electrical control signal to said input terminal of said solenoid control valve;

(g) a switch means disposed in said electronic control system for switching to a select low control mode; and

(h) a timer means disposed in said electronic control system for determining a time duration of an electrical signal value being received by said electronic control system from each said speed sensing means and wherein said switching means in said electronic control system will switch to said select low control mode when said speed sensing means adjacent each of a high wheel and a low wheel transmits an electrical signal value representative of a slip signal value to said input terminal of said electronic control system for a duration of about 100 ms as determined by said timer means.

4,925,255

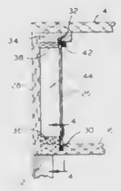
FURNITURE CONSTRUCTIONS INCLUDING HIDDEN COMPARTMENTS

William E. DeBlasy, Manlius, N.Y., assignor to L & JG Stickley, Manlius, N.Y.

Filed Jan. 6, 1989, Ser. No. 293,986

Int. Cl.[5] A47B *17/04*

U.S. Cl. 312—204 **2 Claims**



1. A furniture piece having at least one hidden compartment therein, said furniture piece comprising, in combination:

(a) frame means including supports for resting on a floor;

(b) a first wall fixed with respect to said frame and having an opening therein providing access to an interior space within said furniture piece;

(c) second and third walls fixed with respect to said frame and positioned within said interior space with facing, parallel surfaces spaced by a first, predetermined distance;

(d) a fourth wall fixed with respect to said frame and positioned within said interior space with a surface of said fourth wall perpendicular to and extending between said facing surfaces of said second and third walls;

(e) a pair of elongated, parallel grooves extending into the facing surfaces of said second and third walls to prespective bottom groove surfaces spaced by a second, predetermined distance, said grooves being parallel to and spaced equal distances from said fourth wall surface;

(f) a removable panel having a pair of parallel edges spaced by greater than said first distance and less than said second distance, whereby said panel may be positioned with said edges in said grooves to support said panel in spaced, parallel relation to said fourth wall with first and second surfaces of said panel respectively facing toward and away from said fourth wall surface, thereby forming a hidden compartment between the opposing surfaces of said fourth wall and said panel;

(g) handle means fixedly attached to said second panel surface for manual engagement as said panel edges are positioned in and removed from said grooves;

(h) a drawer slidably moveable into and out of said interior space with said removable panel remaining stationary in said grooves;

(i) said panel being positioned in a horizontal plane and providing a lower dust panel for said drawer;

(j) said handle means comprising an elongated member extending substantially the full distance between said pair of panel edges, perpendicularly thereto and centrally thereof, to provide a center guide for said drawer and including a forward end portion extending over a portion of said first wall; and

(k) a screw head fixedly attached to the upper surface of said forward end portion, thereby giving the appearance that said drawer guide is fixedly attached to said first wall.

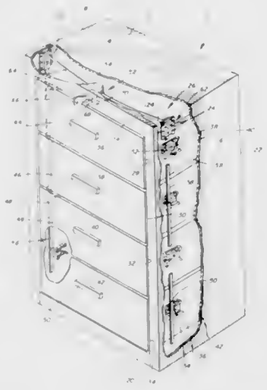
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4,925,256
CONVERTIBLE SOFA TABLE
Augustin Vargas, 144 Seaman Ave., New York, N.Y. 10034, and George Spector, 233 Broadway, #3815, New York, N.Y. 10007
Filed Sep. 27, 1989, Ser. No. 413,088
Int. Cl.[5] A47B *83/00*
U.S. Cl. 312—237 4 Claims



1. A convertible sofa table which comprises:
(a) a file cabinet shaped as a sofa having a backrest and a seat portion on one side and with a plurality of file draws on opposite side thereof;
(b) a seat cushion sized to fit upon said seat portion of said file cabinet;
(c) a backrest cushion sized to fit against said backrest of said file cabinet; and
(d) a foldable table top having two leaves hinged together so that in an unused position said leaves can be folded together and placed upon said seat portion of said file cabinet with said seat cushion placed thereupon and in a usable position said leaves can be opened with said first leaf placed against said backrest of said file cabinet with said backrest cushion against said first leaf, while said second leaf can rest at an angle against top of said filing cabinet to act as a drafting table.

4,925,257
SAFETY LOCK SYSTEM FOR CABINET WITH MULTIPLE DRAWERS
Bjarne Frederiksen, Villa Park, Ill.; John M. Allen, Tacoma, Wash., and Gregg W. Walla, Lake Bluff, Ill., assignors to Timberline Supply Ltd., Lake Bluff, Ill.
Filed Dec. 27, 1988, Ser. No. 290,571
Int. Cl.[5] E05C *7/06*
U.S. Cl. 312—221 14 Claims



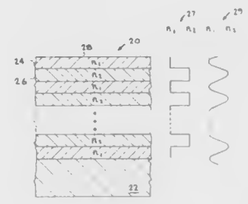
1. In a piece of furniture having a cabinet with first and second drawers each selectively slidable relative tot he cabinet between an open position and a closed position, the improvement comprising:
a lock bar;
means for mounting the lock bar to the cabinet for translatory movement relative to the cabinet in first and second opposite directions between first and second positions; and
cooperating means on the lock bar and first and second drawers for preventing simultaneous movement of said first and second drawers from their closed position to their open position,
said coopereating means including (a) interacting means on the lock bar and first drawer for moving the lock bar to the first position as an incident of the first a drawer being moved from its closed position to its open position with the second drawer in its closed position and (b) interacting means on the lock bar and second drawer for moving the lock bar to the second position as an incident of the second drawer being moved from its closed position to its open position with the first drawer in its closed position.

4,925,258
OFFICE CABINET WITH FLIPPER DOOR AND INTERLOCKING DRAWER AND SUSPENSION ASSEMBLIES
Gary L. Ludwig, Kitchner, Canada, and Edward M. Verschueren, Chula Vista, Calif., assignors to Haworth Sub, Inc., Holland, Mich.
Filed Jun. 10, 1988, Ser. No. 205,280
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—323 25 Claims



1. A cabinet comprising a housing, a door for closing an opening in said housing, a pair of door guide channels mounted in said housing at opposite sides of said door, and a pair of hinge blocks guided by said guide channels for movement between extended and retracted positions, said door being pivotally attached to said hinge blocks for swinging from a closed position covering said opening when said guide blocks are in said extended position to a position aligned with said guide channels for insertion into said guide channels and movement with said guide blocks to an open position inside said housing, wherein a bottom surface of each hinge block rests, at least partially, on the corresponding guide channel, and wherein said guide channels each include a laterally outer guide track for said door and a laterally inner guide track for a hinge blocks, and said rack is located laterally between said door guide track and said hinge block guide track, a pinion is rotatably mounted to the hinge block and is meshed with the rack.

4,925,259
MULTILAYER OPTICAL DIELECTRIC COATING
John L. Emmett, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Oct. 20, 1988, Ser. No. 260,429
Int. Cl.[5] G02B *5/26, 5/28*
U.S. Cl. 350—1.6 29 Claims



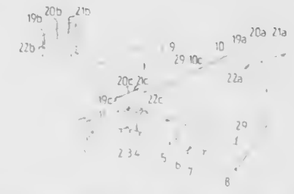
1. An optical interference coating resistant to damage by intense optical radiation and comprising a number of interference layers of a given parent dielectric material, wherein adjacent layers in the coating have slightly different indices of refraction produced by doping at least some of the layers with one or more dopants wherein said one or more dopants are used in small concentrations so that the coating layers substantially retain the same physical and chemical properties of the parent, undoped dielectric material and the coating layers are thereby thermomechanically and chemically compatible.

4,925,260
ONE STEP RAINBOW HOLOGRAPHY
Gary R. Fisher, 2041 Sawtelle Blvd., Los Angeles, Calif. 90025, and Murty V. Mantravadi, 21610 Villa Pacifica Cir., Carson, Calif. 90745
Filed Nov. 18, 1987, Ser. No. 122,360
Int. Cl.[5] G03H *1/10*
U.S. Cl. 350—3.67 4 Claims



1. An on-axis apparatus for making rainbow holograms of real objects in one step comprising:
(a) a spherical concave mirror and beamsplitter coupled to project a real image of an on-axis object to an on-axis holographic recording plane without left-to-right image reversal;
(b) means defining a slit aperture operatively related to said mirror and said beamsplitter to limit parallax to one axis and afford visibility of a hologram in white light;
(c) first support means including translational means to enable positioning of an illuminated object with respect to the center of curvature of said concave mirror;
(d) a holographic recording plane located with respect to the center of curvature of said mirror in a position to record a one-step rainbow hologram on a photosensitive medium;
(e) second support means including translational means to provide an expanded reference beam at a predetermined reference beam angle to illuminate the holographic recording plane;
(f) third support means including translational means for equalizing object and reference beam path lengths; and
(g) a source of coherent radiation coupled thereto for holographic recording.

4,925,261
METHOD FOR SCANNING A LASER BEAM BY NON-MECHANICAL DEFLECTORS
Eero Byckling, and Markus Kajanto, both of Espoo, Finland, assignors to Unda Oy, Espoo, Finland
PCT No. PCT/FI86/00065, § 371 Date Feb. 20, 1987, § 102(e) Date Feb. 20, 1987, PCT Pub. No. WO86/07640, PCT Pub. Date Dec. 31, 1986
PCT Filed Jun. 19, 1986, Ser. No. 27,205
Claims priority, application Finland, Jun. 20, 1985, 852453
Int. Cl.[5] G02B *5/32, 26/10*
U.S. Cl. 350—3.71 6 Claims



1. A method for making an image line with a laser beam, wherein
the laser beaim is created by a laser,
the intensity of the laser beam is modulated by an external modulator or by said laser,
said modulated laser beam is directed onto a coding element by means of which the amplitude, phase or direction of the laser beam is transformed using an electrical control signal,
the coded laser beam being directed onto a rectangular hologram at a deflection angle determined by said coding element by means of which the laser beam is transformed into focused image spots, and
an image line is formed from said image spots on the image plane and wherein
said laser beam is guided and transformed by optical elements, the method comprising the steps of:
providing two non-mechanical laser beam deflectors, one for vertical deflection and one for horizontal deflection, to form said coding element;
transforming and directing said laser beam by means of a lens and at least one grating, mirror or prism;
scanning through the deflection angle in a continuous manner in the direction of the image line and in a stepwise manner in a predetermined direction that is perpendicular to the direction of the image line; and
feeding the coded laser beam into said hologram which is comprised of a plurality of subholograms, each subhologram being capable of forming more than one said image spot so that different image spots are obtained by changing the incoming angle of the beam in the direction of the image line.

VOL 1114 ISS 3 MY 15 1990 UMI

4,925,262

METHOD AND APPARATUS FOR LIGHT BEAM SCANNING USING A HOLOGRAM

Fumio Yamagishi, Ebina; Shinya Hasegawa, Machida, and Hiroyuki Ikeda, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 82,947, Aug. 5, 1987, abandoned, which is a continuation of Ser. No. 599,243, Apr. 11, 1984, abandoned. This application Nov. 17, 1988, Ser. No. 273,624
Claims priority, application Japan, Apr. 13, 1983, 58-66145
Int. Cl.[5] G02B 26/10
U.S. Cl. 350—3.71 18 Claims



2. An apparatus for producing a scanning light beam, comprising:

a rotatable disk having a rotation axis and containing a hologram obtained by interference of a reference wave light beam and an object wave light beam, each of the reference and object wave light beams having a diverging spherical wave front, the reference wave light beam having been produced by a first point light source located on the rotatable disk and the object wave light having been produced with a first wavelength by a second point light source located at a second predetermined distance from the rotatable disk and a third predetermined distance from the rotation axis thereof, the hologram having interference fringes having spatial variation of spatial frequency, the spatial variation including a minimum rate of change of the spatial frequency;

a light beam source operable to generate a reconstruction beam for irradiating said hologram, the reconstruction beam having a second wavelength longer than the first wavelength and being incident on said rotatable disk in the vicinity of the minimum rate of change of the spatial frequency of the interference fringes of the hologram; and

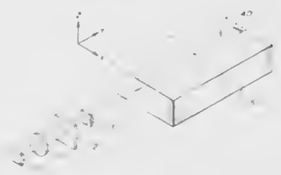
rotating means for rotating said rotatable disk to shift the hologram and obtain a scanning light beam directly usable in straight line scanning.

4,925,263

PROTON-EXCHANGED WAVEGUIDES FOR SUM-FREQUENCY GENERATION

Norman A. Sanford, Stillriver, and James M. Connors, Buzzards Bay, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 117,624, Nov. 5, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 273,058
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.12 12 Claims



1. An optical device for use in producing sum-frequency waves, including second harmonic waves, when laser light from at least one laser source is coupled thereinto, said optical device comprising:

a substrate made of a ferroelectric material; and

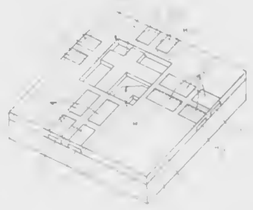
a channel waveguide formed in said substrate by either proton-exchange or in-diffusion of ions capable of raising the index of refraction of said substrate material in at least one azimuth, said channel waveguide having a width, depth, and effective index of refraction for propagating radiation of preselected wavelengths along the length of said channel waveguide in no more than two modes to maximize the power density of propagating radiation to generate sum-frequency, including second harmonic, Cerenkov radiation waves due to nonlinear interactions of propagating radiation, said sum-frequency radiation comprising one portion which radiates directly into said substrate and another portion that is directed into said substrate by total internal reflection at the top surface of said waveguide, a ratio of said preselected wavelengths to said depth of said channel waveguide being within the range between 0.4 and 0.55 so that said sum-frequency portions constructively interfer in phase with one another in said substrate so that said sum-frequency radiation is maximized.

4,925,264

OPTICAL SWITCHING ELEMENT COMPRISING TWO PARALLEL OPTICAL GUIDES AND SWITCHING MATRIX CONSTITUTED BY SUCH ELEMENTS

Marko Erman, Paris, and Réml Gamonal, Brunoy, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 29, 1988, Ser. No. 251,635
Claims priority, application France, Oct. 2, 1987, 87 13645
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.13 18 Claims



1. An optical switching element comprising two optical guides, whose opposite walls are separated by a small distance d, designated as coupling distance, and are parallel over a length D, designated as coupling length, these optical guides being each constituted by a linear strip G_{ii} and H_{ii}, respectively, of a semiconductor material having a first refractive index n_1 formed on a semiconductor substrate of a material having a second smaller refractive index n_o, the dimensions of these guides being such that they each transport a monomode wave and the operation of switching the light from one guide to the other guide being controlled by the effect of at least one of potentials and currents, to which electrode system E_{ii} and M applying to the guides are brought, characterized in that

the first guide G_{ii} designated as main guide is connected by means of one of its ends to the input of the switching element and by its other end to a direct output of the switching element and by its other end to a direct output of the switching element,

the second guide H_{ii} designated as a secondary guide is provided in a region situated beyond the zone of the electrodes E_{ii} with a mirror M_{ii} constituted by a flat lateral surface formed at 45° with respect to the optical axis of said guide,

the secondary guide H'_{ii} is connected to a guide portion designated as secondary guide H_{ii}, arranged at 90° with respect to the optical axis of H_{ii} in order to receive the light reflected by the mirror M_{ii},

the secondary guide H'_{ii} is coupled through a coupling distance d to a transverse main guide G'_{ii} parallel to H_{ii} crossing the main guide G_{ii} and connected by its end opposite to G_{ii} to a transverse output of the switching element,

the secondary guide H'_{ii} and the transverse main guide G'_{ii} are provided with electrode systems E'_{ii} for the application of at least one of potentials and currents permitting the switching of the light from one of these guides to the other,

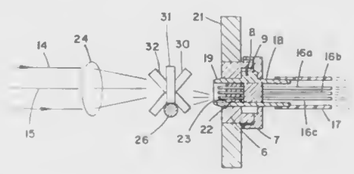
the guides and the substrate are covered by a planar layer (2) of semiconductor material having a third refractive index n_2 lower than that of the guides, on whose flat upper surface the electrode systems E_{ii} and E'_{ii} are arranged and which has an opening Q_{ii} exposing the structures of the guides as far as required to expose the substrate around the mirror M_{ii}.

4,925,265

APPARATUS FOR DIRECTING A LASER BEAM INTO OPTICAL FIBERS

John L. Rink, San Francisco; Dan L. Rink, Oakland, and Garrett Lee, Piedmont, all of Calif., assignors to Xintec Corporation, Oakland, Calif.

Filed Apr. 11, 1988, Ser. No. 180,950
Int. Cl.[5] G02B 6/32
U.S. Cl. 350—96.18 14 Claims



1. An apparatus for selectively directing a laser beam into a plurality of optical fibers and for selectively shifting the laser beam among the fibres, including; means for supporting input ends of the optical fibers in close proximity, means for directing said laser beam along a beam axis and focusing the laser beam in the area of said input ends of said optical fibers, refracting means interposed between said means for focusing and said input ends of the optical fibers, said refracting means including a plurality of planar, transparent refracting members each disposed at a selected angel with respect to said beam-axis to shift said laser beam parallel to said beam axis and into a respective one of said input ends of said optical fibers, and means for translating said refracting members into intersection with said laser beam.

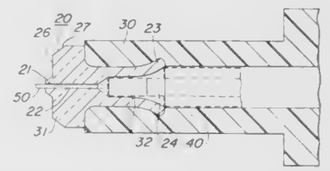
4,925,266

OPTICAL SLEEVE OR INSERT APPARATUS

Laszlo Huebscher, 22 Woodbridge Ave., New Brunswick, N.J. 08901, and Carmen Lanzetta, 2620 Pleasant Rd., Hatboro, Pa. 19040

Continuation-in-part of Ser. No. 142,565, Jan. 11, 1988, abandoned. This application Feb. 23, 1989, Ser. No. 314,689
Int. Cl.[5] G02B 6/36
U.S. Cl. 350—96.20 18 Claims

1. Insert apparatus having a channel for accommodating an optical fiber formed of a first material, said fiber having a face, said apparatus comprising a tubular member fabricated from a second material, different than said first material, exhibiting compatible polishing and thermal properties with that of said first material to enable polishing of said fiber face when said fiber is accommodated in said channel of said insert, said second material of said insert comprising a material which polishes at relatively the same rate as said first material and which when polished produces debris which is similar in abrasiveness to said first material so as to be incapable of damaging said optical fiber face, said insert having a front surface of a given



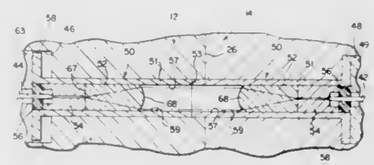
size and shape and having an aperture coextensive with said fiber accommodating channel to enable said fiber to be placed in said channel with the face of said fiber fixedly positioned at said front surface and polished at said front surface to produce an optically smooth and flat fiber surface, said optically smooth and flat fiber surface being in the same exact plane as said front surface of said insert due to the combined simultaneous polishing of said fiber face and said front surface of said insert.

4,925,267

STRUCTURE AND FABRICATION OF COMPONENTS FOR CONNECTING OPTICAL FIBERS

William T. Plummer, Concord, and Robert J. Boyea, Wellesley Hills, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 2, 1984, Ser. No. 627,053
Int. Cl.[5] G02B 6/36
U.S. Cl. 350—96.20 4 Claims



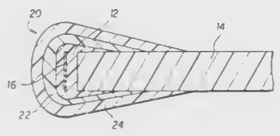
1. A miniature connector pin for use with plugs to connect optical fibers, said connector pin comprising:

a metal tube having a predetermined length, inside and outside surfaces precisely concentric, and an endface precisely perpendicular to the longitudinal axis of said tube; and

a converging plastic lens molded directly within said tube with its optical axis coincident with said longitudinal axis of said tube whereby said outside surface and said endface serve as reference for facilitating positioning said lens and said inside surface of said tube serves as a precise surface to facilitate molding said plastic lens in situ.

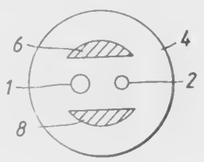
VOL
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4,925,268
FIBER-OPTIC PHYSIOLOGICAL PROBES
Lokanathan M. Iyer, Seattle; Jeffrey B. Yim, Woodinville, and Kenneth S. Lyon, Seattle, all of Wash., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jul. 25, 1988, Ser. No. 224,620
Int. Cl.[5] **G02B** *6/00, 6/02*
U.S. Cl. 350—96.29 **37 Claims**



1. A fiber-optic sensor suitable for monitoring physiological analyte concentration, comprising an analyte-permeable matrix disposed in the light path defined by the axial core at one end of an optical fiber segment the analyte-permeable matrix comprising an indicator molecule covalently linked to a polymer, the indicator molecule capable of responding to the analyte in an optically detectable manner, and the polymer selected from the group consisting of methyl methacrylate/methacrylamidopropyltrimethylammonium chloride, N-vinylpyrrolidone/p-aminostyrene, methyl methacrylate/hydroxymethyl methacrylate, methyl methacrylate/N-vinylpyrrolidone, and methyl methacrylate/acrylic acid.

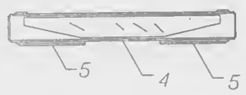
4,925,269
OPTICAL FIBRE STRUCTURE
Paul L. Scrivener, Shirley, England, assignor to Pirelli General plc, London, England
Filed Aug. 23, 1988, Ser. No. 236,038
Claims priority, application United Kingdom, Sep. 17, 1987, 8721860
Int. Cl.[5] **G02B** *6/22*
U.S. Cl. 350—96.33 **10 Claims**





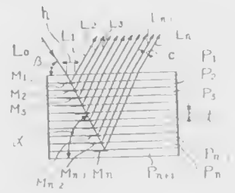
1. An electrically tunable optical fibre structure comprising a length of optical fibre which includes two uniformly spaced monomode optical cores (1,2) encircled by a common cladding (4) having a refractive index different from the refractive index of the cores so as to provide two optical guidance paths, the two guidance paths having different propagation constants the value of which coincide for a predetermined wavelength, so that optical energy at said wavelength will repeatedly transfer from one core to the other, characterised in that two electrodes (6,8;20) are provided within the cladding and are located with at least one core between them for applying an electrical field to that core whereby to alter its propagation constant by the electro-optic effect and hence to alter said wavelength, the structure thereby being turnable.

4,925,270
APPARATUS FOR ASSISTING VIEWING OF STEREOSCOPIC DISPLAYS
Rolfe Eckmann, 630 5th Ave., Ste. 204, Edmonds, Wash. 98020
Filed May 20, 1988, Ser. No. 196,442
Int. Cl.[5] **G02B** *27/22, 7/18*
U.S. Cl. 350—131 **7 Claims**



1. An apparatus for assisting viewing of stereoscopic displays comprising,
first and second prisms, said prisms including a first face and a second face, said second face lying in a plane that forms an acute angle with said first face,
mounting means for said first and second prisms, said mounting means including a window formed by an open space within said mounting means,
blinder means for covering a portion of said prisms and said window, said blinder means positioned in close proximity to said first and second prisms,
adjustment means for varying the width of said window,
wherein, said apparatus may be placed before a pair of human's eyes and said prisms induce a three dimensional central image when viewing superimposed images and wherein said adjustment means in combination with said blinder means allows the prisms to be adjusted to different ocular dimensions of different persons.

4,925,271
OPTICAL BEAM SPLITTER
Hiroshi Taniura, Ibaragi, Japan, assignor to Think Laboratory Co., Ltd., Chiba, Japan
Filed Dec. 16, 1988, Ser. No. 286,364
Claims priority, application Japan, May 16, 1988, 63-120169
Int. Cl.[5] **G02B** *27/14*
U.S. Cl. 350—172 **1 Claim**



1. An optical beam splitter characterized in that a prescribed number of transparent parallel plates, whose thicknesses are uniform to a high degree of precision, are stacked together, and the back surface of the transparent parallel plate which is the farthest from the side at which a light beam enters is coated with a totally reflective film, while the back surfaces of all of the remaining transparent parallel plates are coated with different semi-reflective films whose respective reflectivities gradually increase in the direction of the entering beam, the coating regions of said totally reflective film and semi-reflective films being positioned in an oblique arrangement which is struck by said light beam traveling obliquely through the interiors of said transparent parallel plates, said optical beam splitter being designed so that said incident light beam is converted into a number of split light beams which are of equal luminous intensity, said number of split light beams being equal to the number of said transparent parallel plates, by partial reflection by the respective semi-reflective films and totally reflection by said totally reflective film, and that the respective split light beams are emitted parallel to each other in a row in the direction of the side of the stack from which said incident light beam initially entered without any of said split light beams striking the preceding semi-reflective films.

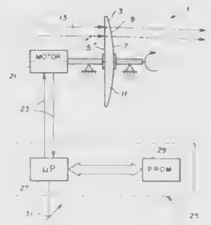
4,925,272
INDICATION DISPLAY UNIT FOR VEHICLES
Tsuyoshi Ohshima, and Kunimitsu Aoki, both of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Feb. 8, 1989, Ser. No. 307,722
Claims priority, application Japan, Feb. 15, 1988, 63-17463[U]; Feb. 15, 1988, 63-17464[U]
Int. Cl.[5] **G02B** *27/12*
U.S. Cl. 350—174 **4 Claims**



1. An indication display unit for a vehicle comprising:
indicating means, installed in a dash board, for providing an image thereon indicative of driving information;
partial reflector means, disposed forwardly of a driver of the vehicle, for reflecting said image at a first vehicle position toward the driver;
a first mirror pivotable, depending on a vehicle speed, between a raised position and a tilted position, said indicating means directing said image, on a first optical axis, toward a first vertical position when said first mirror is in the raised position, said first mirror blocking the first optical axis to reflect said image when said first mirror is in the tilted position;
a second mirror, installed opposite said first mirror, to reflect the image, reflected by the first mirror, on a second optical axis toward the partial reflector means when said first mirror is in the tiled position, said partial reflector means further reflecting said image at a second vertical position toward the driver.

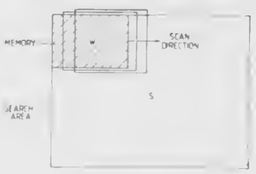
4,925,273
VARIABLE OPTICAL ATTENUATOR
Bernd Maisenbacher, Schomberg, and Siegmar Schmidt, Wildberg, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 21, 1987, Ser. No. 40,914
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1986, 3613688
Int. Cl.[5] **G02B** *5/22*
U.S. Cl. 350—315 **11 Claims**

1. An optical attenuator for receiving a light beam along an optical path and for attenuating the light beam, comprising:
an incoming optically transmissive surface which intersects the optical path and is axially symmetric about an axis of rotation;
an outgoing optically transmissive surface which intersects the optical path and is axially symmetric about an axis of rotation which is aligned with the axis of rotation of the incoming surface;
an attenuating coating affixed to one of the incoming and outgoing surfaces to form a coated surface;
wherein the axes of rotation are displaced from the optical path; and



wherein the incoming and outgoing surfaces are inclined relative to each other such that a portion of the light beam reflected by the coated surface is directed away from the optical path.

4,925,274
CORRELATION TECHNIQUES
Enoch James, and Raymond Stafford, both of Stevenage, United Kingdom, assignors to British Aerospace Public Limited Company, London, England
Continuation of Ser. No. 147,191, Jan. 22, 1988, abandoned. This application Dec. 30, 1988, Ser. No. 290,872
Claims priority, application United Kingdom, Jan. 22, 1987, 8701364
Int. Cl.[5] **G02B** *27/00*
U.S. Cl. 350—320 **1 Claim**



1. A method of forming a correlation array for a target within a viewed scene, the method comprising the steps of:
(a) forming a reference array containing the target;
(b) forming a scene array corresponding to the viewed scene;
(c) scanning the scene array with the reference array and determining a minimum value of (W/S, S/W) for each pixel pair of the scene and reference arrays, where W and S are pixel values of the reference array and scene array, respectively;
(d) summing the minimum values obtained to form a cumulative total for each pixel of the scene array;
(e) applying a conditional threshold value to the cumulative total to determine similarity and dissimilarity between the reference and scene arrays; and
(f) assigning a value of zero or one to the correlation array corresponding to whether its associated pixel in the scene array was found to be dissimilar or similar, respectively.

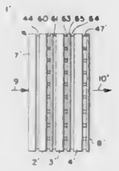
VOL 1114 ISS 3 MY 15 1990 UMI

4,925,275

LIQUID CRYSTAL COLOR DISPLAY AND METHOD

James L. Fergason, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Continuation of Ser. No. 707,486, Mar. 1, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 244,602
Int. Cl.[5] G01F *1/00*
U.S. Cl. 350—333 87 Claims



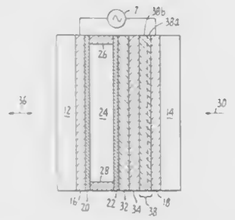
1. A liquid crystal apparatus, comprising
plural liquid crystal display means for selectively transmitting light or scattering or absorbing light in response to selective application of a prescribed input,
said liquid crystal display means being positioned in optical serial relation, and
light coloring means in at least one of said liquid crystal display means for coloring light therein.

4,925,276

LIQUID CRYSTAL LIGHT VALVE UTILIZING HYDROGENATED AMORPHOUS SILICON PHOTODIODE

Robert E. McMurray, Jr., Berkeley, and Steven M. Jarrett, Los Altos, both of Calif., assignors to Electrohome Limited, Canada

Filed May 1, 1987, Ser. No. 45,065
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—342 21 Claims



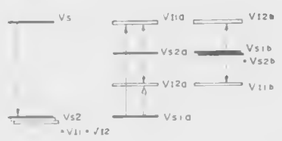
1. An ac-coupled liquid crystal light valve comprising:
a. a first transparent substrate plate having an interior surface;
b. a first transparent conductive electrode formed adjacent the interior surface of the first transparent substrate plate;
c. a first transparent insulating layer formed adjacent the first transparent electrode;
d. A nematic liquid crystal layer disposed between the first transparent insulating layer and a second transparent insulating layer;
e. a dielectric mirror positioned adjacent the second transparent insulating layer;
f. a light blocking layer formed adjacent the dielectric mirror;
g. a hydrogenated amorphous silicon layer formed between the light blocking layer and an interior surface of a second transparent conductive electrode, wherein the hydrogenated amorphous silicon layer is configured as a photodiode having a junction layer of one semi-conductive type at the interface with the second electrode of an opposite semi-conductive type and with a capacitance that varies in response to the level of light incident thereupon in order to change the resulting voltage across the liquid crystal layer;
h. a second transparent substrate plate having an interior surface adjacent the second electrode; and
i. a source of alternating current electrically connected between said first and second electrodes.

4,925,277

METHOD AND APPARATUS FOR DRIVING OPTICAL MODULATION DEVICE

Yutaka Inaba, Kawaguchi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 96,931, Sep. 15, 1987, abandoned. This application Sep. 6, 1989, Ser. No. 402,996
Claims priority, application Japan, Sep. 17, 1986, 61-218998
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—350 S 8 Claims



5. A driving method for an optical modulation device comprising scanning electrodes and signal electrodes disposed intersecting with each other to form pixels having a ferroelectric liquid crystal thereinbetween, the driving method comprising:
providing the scanning electrodes with three potential levels, V_1, V_2 and V_3, which satisfy the relation $V_1>V_2>V_3$;
providing the signal electrodes with potential levels, V_4, V_5 and V_6, which satisfy the relation $V_4>V_5>V_6$, wherein the potentials V_1, V_2, V_3, V_4 and V_6 are set to satisfy the relation $V_1-V_3=V_4-V_6$ and $V_4-V_2<(V_1-V_3)/2$;
simultaneously bringing all the pixels on one of the scanning electrodes to a first stable state in one vertical scanning period; and
converting only selected pixels on the one scanning electrode to a second stable state, wherein the potential level V_6 is provided in synchronism with the potential level V_1 and the potential level V_4 is provided after the potential level V_1, and in synchronism with the potential level V_3 to signal electrodes corresponding to the selected pixels on the one scanning electrode, and wherein the potential level V_6 is provided in synchronism with the potential level V_1 and the potential level V_5 is provided after the potential level V_1, and in synchronism with the potential level V_3 to signal electrodes corresponding to the non-selected pixels on the one scanning electrode.

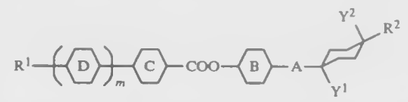
4,925,278

LIQUID CRYSTALLINE ESTERS

Richard Buchecker, Zurich, Switzerland; Hans-Jurgen Fromm, Lorrach, Fed. Rep. of Germany; Stephen Kelly, Kaiseraugst, and Martin Schadt, Seltisberg, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 52,659, May 20, 1987, Pat. No. 4,830,470. This application Dec. 13, 1988, Ser. No. 283,655
Claims priority, application Switzerland, May 22, 1986, 2066/86; Mar. 16, 1987, 972/87
Int. Cl.[5] G02F *1/13*; C07C *69/76*; C09K *19/30*
U.S. Cl. 350—350.5 9 Claims

1. A compound of the formula



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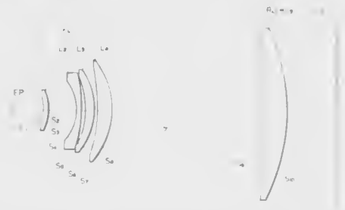
wherein m is zero; A is $—CH_2—CH_2$; rings B and C are 1,4-phenylene, unsubstituted; Y^1 and Y^2 are hydrogen; R^1 is C_4–C_{18}-alkoxy and R^2 is C_4–C_{18}-alkyl; in which R^1 and R^2 have a chiral atom.

4,925,279

TELECENTRIC F-θ LENS SYSTEM

Hiroyuki Shirota, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Sep. 19, 1989, Ser. No. 409,632
Claims priority, application Japan, Sep. 20, 1988, 63-237141
Int. Cl.[5] G02B *13/22*
U.S. Cl. 350—415 4 Claims



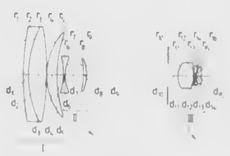
1. A telecentric f-θ lens system, comprising:
(a) a first lens group having an entrance pupil, which includes
(a-1) a first lens in the form of meniscus having a positive power, said first lens having a concave surface which is directed to said entrance pupil,
(a-2) a second lens having a negative power, and
(a-3) third and fourth lenses in the form of meniscus having a positive power, respectively; and
(b) a second lens group including a fifth lens having a positive power, said first through fifth lenses being successively disposed in order from said entrance pupil side.

4,925,280

VARI-FOCAL LENS SYSTEM

Takeshi Hashimoto, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1989, Ser. No. 308,311
Claims priority, application Japan, Feb. 8, 1988, 63-025615
Int. Cl.[5] G02B *15/14, 9/64*
U.S. Cl. 350—423 20 Claims



1. A vari-focal lens system comprising, in the order from the object side, a front lens group having negative refractive power and a rear lens group having positive refractive power, said front lens group consisting, in the order from the object side, of a first lens unit having positive refractive power, and a second lens unit having negative refractive power and shifted along the optical axis for varying focal length, said rear lens group having an imaging function and being at least partially shiftable during variation of focal length for correcting deviation of the image point caused due to variation of focal length, said second lens unit consisting, in the order from the object side, of a negative lens component and a positive lens component, and at least one of diverging surfaces arranged in the second lens unit being designed as an aspherical surface.

4,925,281

ZOOM LENS

James G. Baker, Bedford, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 156,409, Feb. 16, 1988. This application Oct. 26, 1989, Ser. No. 426,965
Int. Cl.[5] G02B *13/18*
U.S. Cl. 350—423 15 Claims



1. A zoom lens comprising at least two distinct groups of adjacent plates where each of said groups is spaced from the other along an optical axis by a distance, d, where the power of the zoom lens, taken as $\phi(x)$ is given by:
$\phi(x)=\phi_i(x)+\phi_{ii}(x)-d\phi_i(x)\phi_{ii}(x)$, where $\phi(x)_i$ and $\phi(x)_{ii}$ are the powers of the respective groups of said zoom lens and x is the displacement of the plates across said optical axis, each group of adjacent plates including at least two nonrotationally symmetric surfaces closely spaced to one another compared with the spacing, d, separating said groups along said optical axis and shaped so that said groups jointly image in a fixed plane behind said zoom lens and so that said nonrotationally symmetric surfaces of each of said groups individually can be moved within its respective groups relative to one another across said optical axis to provide said zoom lens with a continuously variable effective focal length over a predetermined range to change image scale, the power of said zoom lens, $\phi(x)$, being further related to the powers of said groups and said distance, d, by the following relationships:
$\phi(x)=\phi_i(x)/[1-\phi_{ii}(x)\times d]$,
so that the image focus throughout the zoom range is preserved in said fixed plane.

4,925,282

ZOOM LENS ASSEMBLY

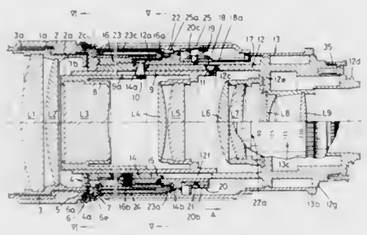
Hideo Kanno, Chiba; Hitoshi Imanari, Kawasaki; Hideshi Naito; Yoshiro Kodaka, both of Tokyo, and Naoto Ohta, Chigasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,714
Claims priority, application Japan, Jun. 4, 1987, 62-138999; Oct. 12, 1987, 62-254778
Int. Cl.[5] G02B *15/00*
U.S. Cl. 350—429 15 Claims

7. A zoom lens assembly comprising:
a photo-taking optical system having a focusing portion and

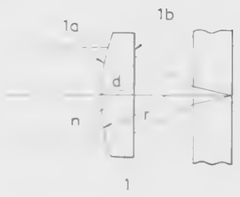
VOL 1114 ISS 3 MY 15 1990 UMI

a zooming portion adapted to be moved in the direction of an optic axis, respectively;
manual operating means movable in the direction of said optical axis for zooming and rotatable about said optic axis for focusing;
zoom intermediate means for moving said zooming portion of said photo-taking optical system for zooming in response to the movement of said manual operating means in the direction of the optic axis;
first focus intermediate means for moving said focusing portion of said photo-taking optical system in response to the rotation of said manual operating means;
an electrically rotated drive member;
second focus intermediate means for moving said focusing portion of said photo-taking optical system in response to the rotation of said drive member;



first clutch means provided between said manual operating means and said first focus intermediate means;
second clutch means provided between said drive member and said second focus intermediate means; and
change-over means for operating said first and second clutch means so that said drive member and said second focus intermediate means are disconnected by said second clutch means when said manual operating means and said first focus intermediate means are coupled together by said first clutch means and so that said manual operating means and said first focus intermediate means are disconnected by said first clutch means when said drive member and said second focus intermediate means are coupled together by said second clutch means.

4,925,283
OBJECTIVE LENS FOR OPTICAL MEMORY DEVICE
Ichiro Morishita, Iwazuma, and Hiroko Hanzawa, Shiroishi, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Aug. 2, 1989, Ser. No. 388,797
Claims priority, application Japan, Oct. 11, 1988, 63-256783
Int. Cl.[5] G02B *13/18*
U.S. Cl. 350—432 **1 Claim**



1. An objective lens for an optical memory device comprising a plane surface on one side thereof for emitting a luminous flux oppositely to a disk, and an aspherical surface on the other side thereof for receiving a luminous flux reversely to the disk in such a manner that the following conditions (1) and (2) are satisfied:

$$1.69 \leqq n \leqq 1.74 \quad (1)$$

$$n - 1 \geqq (n_C - n_{A'})/0.00056 \quad (2)$$

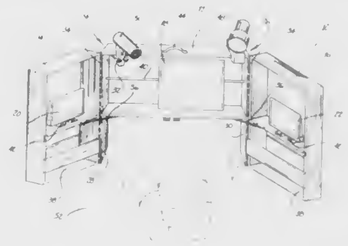
where n is a refractive index of a lens medium for the wavelength of an incident light, $n_{A'}$ is a refractive index of a lens medium for A' beam (768.2 nm of wavelength) of a refractive light beam, and n_C is a refractive index of a lens medium for a C beam (656.3 nm of wavelength).

4,925,284
ORBITAL SUPPORT STRUCTURE FOR MICROMANIPULATORS USED WITH COMPOUND MICROSCOPES
Frank Ward, 20910 NE. 156th St., Woodinville, Wash. 98072, and William J. Moody, 6746-2nd Ave. NW., Seattle, Wash. 98117
Filed Aug. 2, 1988, Ser. No. 227,352
Int. Cl.[5] G02B *21/32*
U.S. Cl. 350—532 **9 Claims**



1. An apparatus for use with a microscope for mounting one or more micromanipulators capable of carrying an electrical probe or the like, comprising:
a base element supported so that it is stable relative to a microscope, the microscope including a microscope stage portion on which is mounted an article being investigated, said base element being physically separate from and independent of the microscope stage portion and including a track portion which extends around a substantial portion of the microscope stage portion;
at least one positioning element removably mounted on the track portion of said base element so that, in operation, said positioning element can be moved along said track portion and conveniently mounted on and removed from the track portion, said base element being configured and arranged so as to receive a variable number of positioning elements, each positioning element including a portion thereof which is movable relative to the remainder of the positioning element, toward and away from the microscope stage portion; and
means on said movable portion of said positioning element for supporting a micromanipulator, wherein the means for supporting a micromanipulator is rotatable relative to said movable portion;
wherein said positioning element is mounted on the base element such that the base element is beneath and thereby directly supports said positioning means and the micromanipulator located thereon.

4,925,285
APPARATUS TO PERMIT ANATOMICAL SELF EXAMINATION
James F. Dowdell, 2523 - 106 St., Edmonton, Alberta, Canada (T6J 4K2), and Eleanora G. Wilson, 11626 - 92 Street, Edmonton, Alberta, Canada (T5G 0Z9)
Filed May 26, 1989, Ser. No. 357,346
Int. Cl.[5] A61B *1/00*
U.S. Cl. 350—621 **5 Claims**



1. An apparatus to permit anatomical self examination, comprising:
a. a support frame having opposed ends, the support frame having legs, whereby the support frame may straddle an anatomical frame of a person in a recumbent position;
b. a support arm secured to and extending from each of the ends of the support frame at an angle in an approximate range of between 85 and 150 degrees, the support arm being pivotally mounted to the support frame such that the support arm may be moved between an operative position at an angle in an approximate range to the support frame of between 85 and 150 degrees and a stored position parallel to the support frame;
c. a primary mirror mounted to the support frame for pivotal movement about an horizontal axis; and
d. a secondary mirror mounted to each of the support arms for omni-directional movement, such that by focusing one of the mirrors at another of the mirrors an anatomical self examination may be performed.

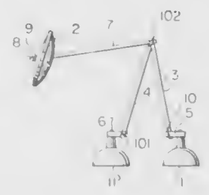
4,925,286
THREE-POINT SPHERICAL MIRROR MOUNT
Ronald W. Cutburth, Bulls Gap, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Continuation of Ser. No. 798,159, Nov. 15, 1985, abandoned, which is a continuation of Ser. No. 573,251, Jan. 23, 1984, abandoned. This applicatioo Jan. 23, 1987, Ser. No. 8,120
Int. Cl.[5] A47G *1/24;* **B60R** *1/02;* **H01S** *3/08;* **G02B** *7/00*
U.S. Cl. 350—632 **2 Claims**

1. A spherical mirror mount for supporting a mirror comprising
a spherical housing,
a pivot ring for supporting the mirror, said pivot ring having a substantially spherical outer peripheral surface, said outer surface being provided with a number of spaced apart mating members formed thereon where said number is at least three,
adjustment ring means affixed to said pivot ring and to said spherical housing to enable proper alignment of said pivot ring and said mirror,
said spherical housing having an inner substantially spherical surface adapted to engage each of said spaced apart mating members for mating said spherical housing to said pivot ring so as to establish at least three spaced apart locations of engagement therewith to thereby facilitate proper alignment between said housing and said pivot ring wherein said spaced apart mating members are spaced



equidistantly from one another, and wherein said mating members are formed by ball bearings.

4,925,287
MIRROR ASSEMBLY FOR FACILITATING TRAILER HITCH ELEMENT ALIGNMENT
Barbara Lord, Apt. 205, 316-1st Ave. N.E., Calgary, Alberta, Canada T2W 0B2 , and Tom Keightley, 1234 21 Ave. N.W., Calgary, Alberta, Canada (T2N 4R7)
Filed Oct. 31, 1988, Ser. No. 264,546
Claims priority, application Canada, Dec. 14, 1987, 554246
Int. Cl.[5] B60R *1/08;* **G02B** *7/18, 5/10*
U.S. Cl. 350—632 **7 Claims**



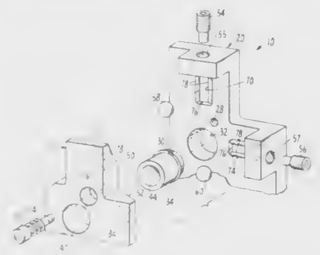
1. An apparatus for assisting a vehicle drive in coupling a trailer and a towing vehicle, said apparatus comprising:
a mirror;
a mirror base having two or more legs pivotally connected to form a multi-pod structure, each leg having a foot member at its free end;
means for detachably securing each foot member to a surface of said vehicle or said trailer;
a mirror support assembly upon which said mirror is mounted, said support assembly being pivotally mounted upon said base to enable orientation of said mirror as required; and means for inhibiting the movement of said assembly relative to said base to maintain said required orientation.

4,925,288
ADJUSTABLE MIRROR MOUNT
John R. Harris, San Carlos, Calif., assignor to Coherent, Inc., Palo Alto, Calif.
Filed May 23, 1989, Ser. No. 356,012
Int. Cl.[5] G02B *5/08*
U.S. Cl. 350—636 **18 Claims**

1. An adjustable mirror mount comprising:
a fixed plate;
a movable plate;
means for mounting a mirror to said movable plate;
pivot means interfacing between said plates, said pivot

VOL
1114
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means being defined by a ball joint having a hollow spherical member interacting with a conical surface and wherein said mirror mounting means is formed in said spherical member; and



wedge means interfacing between said plates at a location spaced from said pivot means, said wedge means for varying the angle between said plates about said pivot means.

4,925,289

REAR VIEW MIRROR ADJUSTABLE BY A SINGLE MOTOR

William L. Cleghorn, and Charles H. Cleghorn, both of 15 Rodney Blvd., Willowdale, Ontario M2N 4B5, Canada

Filed Oct. 3, 1989, Ser. No. 416,482
Int. Cl.[5] G02B *5/08*
U.S. Cl. 350—637 **6 Claims**



1. An adjustable rear-view mirror comprising:
(a) a shaft means medially supported for universal rotation;
(b) a cam supported by one end of said shaft means having an outwardly directed convex surface inscribed with a curvilinear endless groove;
(c) a mirror supported by the other end of said shaft means;
(d) a tongue drivable in a circular path, said tongue received by said endless groove; and
(e) drive means to drive said tongue in said circular path.

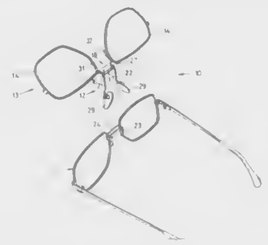
4,925,290

ADJUSTABLE SPECTACLE FRAME

David R. Engelhardt, Edwardstown, Australia, assignor to R. Engelhardt Nominees Pty. Ltd., Australia

PCT No. PCT/AU84/00153, § 371 Date Apr. 8, 1985, § 102(e) Date Apr. 8, 1985, PCT Pub. No. WO85/00900, PCT Pub. Date Feb. 28, 1985
Continuation of Ser. No. 198,660, May 23, 1988, abandoned, which is a continuation of Ser. No. 756,973, Apr. 8, 1985, abandoned. This PCT application Aug. 8, 1984, Ser. No. 331,015
Claims priority, application Australia, Aug. 8, 1983, 0713
Int. Cl.[5] G02C *7/06*
U.S. Cl. 351—55 **11 Claims**

1. A spectacle frame comprising a lens frame assembly, a separate nose-piece assembly, and an accessory,
the lens frame assembly comprising a pair of lens frames, a frame bridge connecting the lens frames, and a pair of laterally spaced generally vertical guide means,
the nose-piece assembly having a nose-piece bridge, and mounting means carried by the nose-piece bridge for supporting thereon the accessory for movement of the latter with respect to the nose-piece assembly between an in-use position and a retracted position, the nose-piece assembly also comprising a pair of laterally spaced generally vertical slide legs depending from the nose-piece bridge, each with a respective nose pad at its lower end, for stationary seating of said nose-piece assembly on the nose of the wearer,
said pair of legs being received in said pair of guide means, respectively, for supporting the lens frame assembly on



the nose-piece assembly for independent, generally vertical, sliding movement of said movable frame assembly relative to the stationary nose-piece assembly and accessory,
whereby adjustment of the vertical position of the movable lens frame assembly with respect to said stationary nose-piece assembly may be accomplished without interfering with the predetermined in-use position of said accessory with respect to the eyes of the user so that said accessory will be automatically returned to that same position relative to the eyes of the user whenever said accessory is moved from the retracted to the in-use position thereof irrespective of the vertical adjustment position of said lens frame assembly.

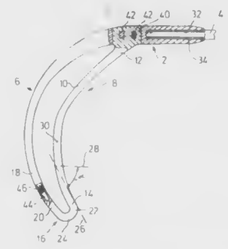
4,925,291

TEMPLE END PIECE FOR THE TEMPLE OF A SPECTACLE FRAME

Wilhelm Anger, St. Moritz, Switzerland, and Helmut Wiedman, Heilbronn, Fed. Rep. of Germany, assignors to Eyemetrics-Systems Ag, Chur, Switzerland

Continuation of Ser. No. 860,058, May 4, 1986, abandoned. This application Oct. 17, 1988, Ser. No. 258,086
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516956; Apr. 30, 1986, 3614637
Int. Cl.[5] G02C *5/16*
U.S. Cl. 351—123 **21 Claims**

1. Temple end piece for the temple of a spectacle frame comprising: a first essentially straight section extending in the longitudinal direction of the temple; a second segment which extends essentially downwardly with respect to said first segment, said second segment being firmly connected at its upper end to the first segment whereby the first and the second segment form a unit having an essentially stable form; and a third flexible segment which, when unstressed, has an arcuate configuration for fitting in the furrow between the head and the auricle of the wearer with the outer side of the curvature of said third segment facing the second segment, said third segment having an upper end attached to the first segment or to the second segment near its juncture with the first segment, and having a lower hook shaped region connected to the lower end of the second segment, said hook shaped region of said third segment being curved in such a manner that a tangent to the third segment in at least part of said region forms an angle of less than 90° with the longitudinal axis of the first segment,



said third segment being essentially unstretchable and incompressible in its longitudinal direction, and, when deformed while being worn, said third segment essentially adapting itself to the individual form of the furrow of the wearer.

4,925,292

FRAME FOR MULTIFOCAL SPECTACLES

Tohru Negishi, 264-2, Bonsai-cho, Ohmiya-shi, Saitama-ken, Japan

Division of Ser. No. 133,489, Dec. 15, 1987, Pat. No. 4,861,151. This application Apr. 11, 1989, Ser. No. 338,934
Claims priority, application Japan, Dec. 26, 1986, 61-198840; Oct. 12, 1987, 62-254709
The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.
Int. Cl.[5] G02C *5/04*
U.S. Cl. 351—128 **1 Claim**



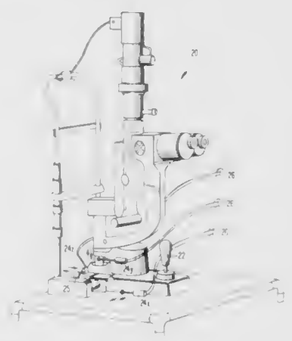
1. A frame for multifocal spectacles, comprising:
left and right lens rims for mounting left and right multifocal lenses therein;
a bridge connected between the inner sides of respective lens rims;
left and right guide portions on the inner sides of said left and right lens rims and in spaced opposed positions and having guide means forming a part thereof and extending downwardly from said bridge and gradually curving away from each other and each having a stop member therealong.
a nose pad member having left and right nose pads;
left and right flexible resilient pieces integrally connected to said left and right nose pads, respectively, at upper portions thereon, said left and right resilient pieces gradually curving downwardly and away from each other with a somewhat greater degree of curvature than the curvature of said guide means and having the lower ends thereof resiliently engaged in and being guided by said guide means, said resilient pieces being under tension for producing a small outward resilient force against said guide means for holding said resilient pieces in said guide means; and
a plurality of stop means spaced along said left and right resilient pieces for engaging said stop member for stopping said nose pad member at different positions along said guide means.

4,925,293

INTRAOCULAR BIOMETER FOR A SLIT LAMP

William C. Hurd, 1271 E. Parkway S., Memphis, Tenn. 38114

Filed Oct. 4, 1984, Ser. No. 657,873
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—214 **11 Claims**



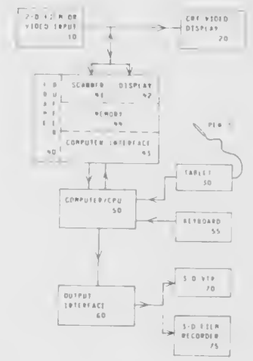
1. An intraocular biometer, mountable on a slit lamp used to examine an eye, said intraocular biometer comprising:
input means for detecting movement of the slit lamp;
calculating means, operatively connected to said input means, for calculating a distance measured in the eye in dependence upon the movement of the slit lamp; and
output means, operatively connected to said calculating means, for outputting the distance measured.

4,925,294

METHOD TO CONVERT TWO DIMENSIONAL MOTION PICTURES FOR THREE-DIMENSIONAL SYSTEMS

David M. Geshwind, 184-14 Midland Pkwy., Jamaica, N.Y. 11432, and Anthony H. Handal, Blue Chip La., Westport, Conn. 06880

Filed Dec. 17, 1986, Ser. No. 227,403
Int. Cl.[5] G03B *35/14*
U.S. Cl. 352—57 **44 Claims**



1. A method of converting a two-dimensional image frame into a three-dimensional image frame consisting of the steps of:

VOL
1114
ISS
3
MY
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1990
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a. inputing a frame of a two-dimensional image into a computer;
b. specifying at least two individual image elements in the two-dimensional image;
c. separating the two-dimensional image into said image elements;
d. specifying three-dimensional information for at least one of said image elements;
e. processing at least one of said image elements to incorporate said three-dimensional information and create at least one processed image element;
f. generating at least one processed image frame comprising at least one of said processed image elements.

4,925,295

PROJECTION DISPLAY APPARATUS

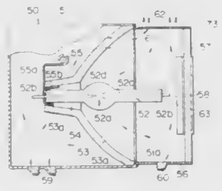
Masahiro Ogawa, Masashimurayama; Tatsuo Shimazaki, Nakano; Osamu Umeda, Gifu; Toshihiro Aoki, Higashiyamato, and Toru Nakakusu, Kunitachi, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Division of Ser. No. 26,672, Mar. 16, 1987, Pat. No. 4,787,737. This application Sep. 14, 1988, Ser. No. 244,805

Claims priority, application Japan, Mar. 17, 1986, 61-37492[U]; Mar. 26, 1986, 61-42975[U]; Sep. 26, 1986, 61-147232[U]; Sep. 26, 1986, 61-147234[U]

Int. Cl.[5] G03B *21/16*

U.S. Cl. 353—57 **6 Claims**



1. A projection display apparatus comprising:
a light source unit comprising a parabolic reflector, a lamp, and a metal plate, said lamp being provided with a light-emitting portion, an anode, and a cathode, said anode and said cathode being located to interpose said light-emitting portion, said light-emitting portion being located at a focal point of said reflector, and said anode and said cathode being present on an axis of said reflector, one of said anode and said cathode being connected to a thin plate-like connecting terminal parallel to an axis of a focal point of said reflector, and said metal plate being adapted to entirely cover at least sides of said reflector;
a display unit having a display device and a cooler coupled to said display device;
an optical unit having at least one lens to enlarge a image displayed on said display device;
cooling means for cooling at least said light source unit; and
a housing for accommodating said light source unit, said display unit, said optical unit and said cooling means.

4,925,296

METHOD OF, AND APPARATUS FOR MEASURING THE FLOW VELOCITY IN WIND TUNNELS

Johannes Reichmuth, Kastanienweg 3, 3400 Göttingen, Fed. Rep. of Germany

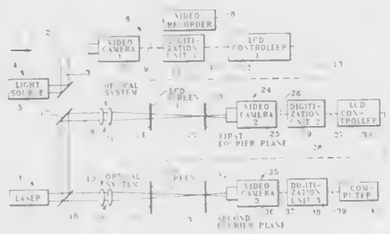
Filed Sep. 1, 1988, Ser. No. 239,594

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729648

Int. Cl.[5] G01P *3/36, 5/18*

U.S. Cl. 356—28 **14 Claims**

1. Method of measuring the flow velocity of a fluid in wind tunnels, in which a path travelled by particles located in the flow of fluid is employed as a measure of the flow velocity, with said method comprising the steps of illuminating the particles at least twice in a pre-determined time interval by means of a light beam; recording the light reflected by the particles and reproducing the light in the form of an image; transilluminating the image with a first coherent light beam focused in a first Fourier plane to produce a first Fourier-transformed image; displaying the first Fourier-transformed image; transilluminating the displayed first Fourier-transformed image with a second coherent light beam focused in a second Fourier plane to produce a second Fourier-transformed image; recording the second Fourier-transformed image and processing the recorded second Fourier-transformed image to extract flow velocity information therefrom.



4,925,297

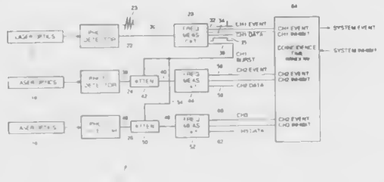
THREE-DIMENSIONAL LASER VELOCIMETER SIMULTANEITY DETECTOR

James L. Brown, Cupertino, Calif., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 14, 1988, Ser. No. 257,593

Int. Cl.[5] G01P *3/36*

U.S. Cl. 356—28.5 **9 Claims**



8. A process for detecting simultaneity of measured bursts in a three-dimensional laser velocimeter and of acquiring data of the three-dimensional laser velocimeter, which comprises detecting scattered light from a particle present in first, second and third measurement channels including laser optics, generating data signals from the scattered light in the first, second and third measurement channels, determining coincidence of the scattered light in the first and second measurement channels, and inhibiting the first, second and third measurement channels from supplying data signals obtained from the scattered light in the absence of coincidence of the scattered light in the first and second measurement channels.

4,925,298

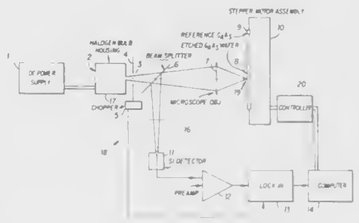
ETCH PIT DENSITY MEASURING METHOD

Paolo Dobrilla, 60 Smithfield Ct., Basking Ridge, N.J. 07920

Filed Aug. 5, 1988, Ser. No. 228,492

Int. Cl.[5] G01N *21/55*

U.S. Cl. 356—30 **11 Claims**



1. A method for measuring the etch pit density on the surface of an etched monocrystalline test wafer and plotting said density at numerous locations on said surface, comprising:
generating a beam of light;
focussing said beam of light on a polished reference wafer surface oriented in a plane perpendicular to said beam of light;
measuring the intensity of light reflected normally from said reference wafer surface to obtain a reference intensity R_o;
thereafter, focussing said beam of light on said etched test wafer surface oriented in said plane;
measuring the intensity R_e of light reflected normally from said etched test wafer surface;
computing the etch pit density on said test wafer surface from the ratio of said intensity to said reference intensity by employing the relation $EPD = -(1/A_p)\log(R_e/R_o)$, where EPD is etch pit density and A_p is the average area of the etch pits; and
repeating the computation of etch pit density at a plurality of locations on said test wafer surface automatically determined by stepwise movement of said etched test wafer in the plane perpendicular to said beam of light.

4,925,299

HEMOGLOBIN DETECTOR

Artur Meisberger, and Hans-Jürgen Neumann, both of St. Wendel, Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,599

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 3726524

Int. Cl.[5] G01N *33/48*

U.S. Cl. 356—40 **10 Claims**



1. An apparatus for photometrically investigating substances according to a two wavelength-method, in particular, for determining hemoglobin and other colored substance content in a substance specimen of blood plasma and blood serum, the apparatus comprising:
a first light source having a first wavelength of emission within a first range of absorption levels of the substance specimen;
a second light source having a second wavelength of emission within a second range of absorption levels of the substance specimen;
means for alternatingly activating said first and second light sources, said activating means including a first switch-over device and a second switch-over device;
a measuring photodetector means and a reference detector means, said measuring photodetector means and said reference photodetector means each for detecting emissions from both said first light source and said second light source, said measuring detector means for detecting light transmitted through the substance specimen and said reference photodetector means for detecting light directly from said first light source and said second light source; and
evaluation means coupled to said measuring and said reference photodetector means for determining the different absorption typical for the substance specimen, in both the first light wavelength and the second light wavelength, including means for determining exposure of light respectively transmitted by the first and second light sources to establish a first switch-over point in time for said first switch-over device for controlling said first light source upon attainment of a first predetermined exposure of light and to establish a second switch-over point in time for said second switch-over device for controlling said second light source upon attainment of a second predetermined exposure of light.

4,925,300

OPTICAL FINGERPRINT IMAGING DEVICE

Daniel J. Rachlin, 2251 Williams St., Palo Alto, Calif. 94306

Filed Aug. 2, 1988, Ser. No. 227,558

Int. Cl.[5] G06K *9/20, 9/28*

U.S. Cl. 356—71 **11 Claims**



1. Apparatus for acquiring the image of a fingerprint comprising:
a stationary conical lens formed of a solid transparent substrate and having a front surface in the shape of a partial cone tapering in a forward direction for allowing light rays interior to the conical lens to be refracted in said forward direction, and into which lens is formed a well, coaxial with said front surface along a central axis, into which well a finger to be imaged is placed, and which lens additionally possesses a side surface through which interrogating light rays may pass, the front surface and well together possessing the property that only light rays which arise off the surface of the well at an angle to its normal which is greater than the critical angle of light refracted through the air-substrate interface, emerge from said front surface and are refracted in said forward direction substantially, parallel to said central axis;
a stationary polychromatic light source for interrogating the object to be scanned such that light rays are directed through the substrate of the conical lens onto the internal surface of the well;
an imaging lens positioned such that it is coaxial with a central axis of the front conical surface and such that it

VOL
1114
ISS
3
MY
15
1990
UMI

creates a focused image surface of the well surface of the conical lens;
a photodetector array for converting light signals focused by the imaging lens into electrical signals corresponding to the image of papillary ridges and valleys of a finger positioned in the well of the conical lens;
a means for positioning the photodetector array such that it is tangential to the image surface of the well and such that a line through the endpoints of the array intersects the central axis;
a means for rotating the photodetector array such that the aforementioned relationship to the central axis is preserved, and such that it sweeps out in steps a surface of revolution corresponding to the image surface of the well in the conical lens;
a means for acquiring the electrical data generated by the photodetector array and processing the data in such a way as to create a complete fingerprint image for subsequent display and storage.

4,925,301

METHOD AND APPARATUS FOR SENSING THE FIGURE OF OPTICAL ELEMENTS

Gerard L. Rafanelli, Fountain Valley, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 17, 1988, Ser. No. 272,375
Int. Cl.[5] G01B *9/00*
U.S. Cl. 356—124 **12 Claims**



1. In an apparatus having an optical element with a curved surface, the improvement comprising:
light source means for generating a probe beam having a phase front with a desired curvature;
first means for directing the curved probe beam towards the curved surface along a first path; and
second means for detecting characteristics of the beam reflected from the surface to determine the relative differences between the curvatures of the beam and the optical surface and producing an output representative thereof.

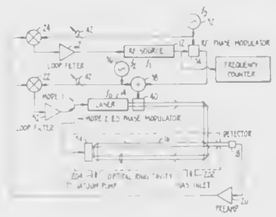
4,925,302

FREQUENCY LOCKING DEVICE

Gregory M. Cutler, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 13, 1988, Ser. No. 181,129
Int. Cl.[5] G01N *21/41;* **H03L** *7/00*
U.S. Cl. 356—128 **19 Claims**

19. A frequency locking method for measuring the refractive index of a gas, said method comprising:
supplying a beam of continuous wave, coherent radiation of frequency f_0;
phase modulating the beam, in response to a compound signal which is the sum of a signal at frequency f_2 and a FM subcarrier at frequency f_1 that is phase modulated at frequency f_3, to produce a phase modulated beam;
passing the phase modulated beam through an optical cavity, said cavity having a transfer function that has a characteristic frequency f_f;
detecting the filtered beam to produce a detector signal;
adjusting the ratio of f_0/f_f to a fixed value N in response to the component of the detector signal substantially at frequency $(Jf_1+Kf_2+Lf_3)$, where $(J+K)$ is an odd integer and L an even integer; and
adjusting the ratio of f_1/f_f to a fixed value M in response to the component of the detector signal substantially at frequency $(Qf_1+Rf_2+Sf_3)$, where $(Q+R)$ is an even integer and S and odd integer;



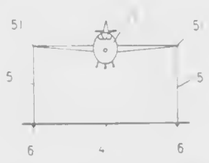
measuring the subcarrier frequency;
letting the gas into the optical cavity to change the transfer function as a function of the refractive index of the gas;
adjusting the ratio of f_0/f_f to a fixed value N in response to the component of the detector signal substantially at frequency $(Jf_1+Kf_2+Lf_3)$, where $(J+K)$ is an odd integer and L an even integer; and
adjusting the ratio of f_1/f_f to a fixed value M in response to the component of the detector signal substantially at frequency $(Qf_1+Rf_2+Sf_3)$, where $(Q+R)$ is an even integer and S an odd integer;
measuring the subcarrier frequency to determine the refractive index of the gas.

4,925,303

AIRCRAFT PILOTING AID LASER LANDING SYSTEM

Pavo Pusic, Moluntska 6, Dubrovnik, Yugoslavia 50000

Filed Dec. 27, 1988, Ser. No. 290,749
Int. Cl.[5] G01C *21/00*
U.S. Cl. 356—152 **5 Claims**



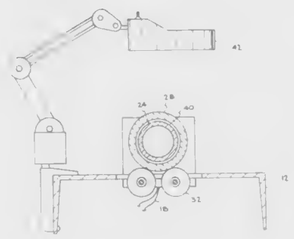
1. A method of determining an aircraft's actual position, speed, altitude, and distance from the landing runway said aircraft is approaching, comprising the steps of:
emitting laser beams from at least two laser transmitting means located in proximity of each wing tip of said aircraft;
reflecting a portion of said laser beams backwards to said aircraft in accordance with a predetermined pattern;
receiving said reflected laser beams by at least two on board laser receiving means;
processing data about said emitted laser beams and said reflected laser beams and transmitting said data to an avionic system for monitoring and correcting said aircraft's position, and detecting an accidental error of any of the other on board avionic system's means.

4,925,304

SMALL BORE CERAMIC LASER TUBE INSPECTION LIGHT TABLE

Earl O. Updike, Tracy, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,149
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—237 **6 Claims**



1. Apparatus for inspecting a ceramic laser tube comprising a support base,
a fluorescent tube having a certain diameter which is less than the diameter of the laser tube to be inspected,
means for providing visual inspection of said laser tube including
means for inserting said fluorescent tube within said laser tube,
a pair of electrical sockets located at the respective ends of said support base to provide for support of said laser tube and for illumination of said fluorescent tube,
one or more rollers located on said support base for providing rotational support of said laser tube, including maintaining a uniform gap between the interior of said laser tube and the exterior of said fluorescent tube so that the illuminated laser tube can be rotated incrementally about the axis of said illuminated fluorescent tube.

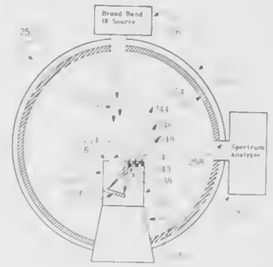
4,925,305

METHOD FOR THE PRESERVATION OF WHEAT AND DEVICE USEFUL THEREFORE

Ronald R. Erickson, 167 Garfield Pl., Brooklyn, N.Y. 11215

Filed Dec. 1, 1988, Ser. No. 278,564
Int. Cl.[5] G01J *3/00;* **G01N** *21/35*
U.S. Cl. 356—300 **17 Claims**

16. A method of determining the humidity of a sample of grain using a system comprising:
(a) at least one humidity standard, comprising:
(i) a housing;
(ii) a diffracting surface contained within said housing;
(iii) an input port defined by said housing; and
(iv) a plurality of output ports defined in said housing, said output ports being positioned with respect to said input port and said diffracting surface to allow light of certain selected indicative wavelengths to pass;
(b) a closed body with an internal reflective surface, said internal surface defining a chamber containing said standard;
(c) a light input port defined by said closed body;
(d) a light output port defined by said closed body;
(e) a broadband light source coupled to said input light port to send light to said input port of said standard; and
(f) a spectral analyzer coupled to said output light port to receive light passing through said output ports of said standard and reflected by said internal surface, said method comprising the steps of:
(I) measuring the amplitude of said indicative wavelengths with a sample of grain in said closed body;
(II) measuring the amplitude of said indicative wavelengths of a humidity standard;



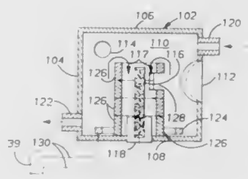
(III) comparing the measurement of step II with that of step one; and if the measurements do not match
(IV) repeating steps (II) and (III) with one or more standards until a match is substantially made between the sample and a standard.

4,925,306

ION BOMBARDMENT FURNACE FOR ATOMIC SPECTROSCOPY

Richard D. Sacks, and Suzanne L. Tanguay, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Oct. 28, 1988, Ser. No. 264,137
Int. Cl.[5] G01J *3/443;* **G01N** *21/67*
U.S. Cl. 356—311 **11 Claims**



1. An apparatus for analyzing a sample by atomic emission spectroscopy comprising:
a hollow chamber confining an ionizable gas, said chamber having at least one wall, said wall having a transparent portion;
an elongated cathode member fixed to said chamber and extending into said chamber, said member having a central axis;
a sample containing at least one trace element;
a ring shaped anode member mounted in said chamber and concentrically spaced from said cathode member;
a closable access port through said wall for inserting said sample into said chamber and depositing said sample onto said cathode;
a spectrometer optically coupled to said transparent portion;
means for supplying a constant electrical current between said anode and said cathode members establishing an electric field between said cathode and anode members to initially heat said cathode member and to ionize said gas into a plasma of positive ions and electrons, said positive

VOL
1114
ISS
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ions bombarding said cathode to further heat said cathode; and

means for forming a magnetic flux field in said chamber including at least one tubular magnet within said chamber coaxially positioned around said cathode member, said flux field being directed parallel to said axis and crossing said electric field so as to retain said electrons in said plasma whereby said positive ions bombarding said cathode vaporize said sample and cause emission of light from said vaporized sample which passes through said transparent portion to said spectrometer.

4,925,307

APPARATUS AND METHOD FOR THE SPECTROCHEMICAL ANALYSIS OF LIQUIDS USING THE LASER SPARK

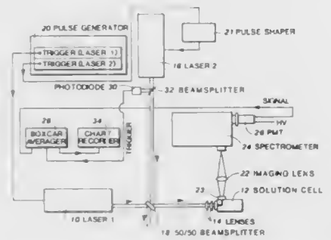
David A. Cremers, Los Alamos; Leon J. Radziemski, Las Cruces, and Thomas R. Loree, Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 1, 1984, Ser. No. 606,037

The portion of the term of this patent subsequent to Apr. 15, 2005, has been disclaimed.

Int. Cl.[5] G01J *3/00*

U.S. Cl. 356—318 **22 Claims**



1. An apparatus for the spectrochemical analysis of a liquid, which comprises in combination:

a. a first laser for generating a first pulsed electromagnetic radiation having sufficient intensity to produce optical dielectric breakdown in a volume of the liquid under investigation generating thereby excited atoms, molecules and ions characteristic of the liquid;

b. a second laser for generating a second pulsed electromagnetic radiation, said second pulsed electromagnetic radiation being directed into said breakdown volume after the elapse of a first time period after said first optical dielectric breakdown, said second pulsed electromagnetic radiation having sufficient intensity to produce a second optical dielectric breakdown in order to reexcite said excited atoms, molecules and ions in said breakdown volume which have become de-excited during said first time period, and to produce additional excited atoms, molecules and ions therein, whereby electromagnetic radiation is emitted from said breakdown volume, said electromagnetic radiation including continuum emission, discrete emission from said additional excited atoms, molecules and ions, and discrete emission from said reexcited atoms, molecules and ions; and

c. means for quantitatively detecting said discrete emitted electromagnetic radiation from at least one of said additional excited atoms, ions and molecules, and from at least one of said reexcited atoms, ions and molecules after a second time period, whereby sufficient time has elapsed following said second, pulsed electromagnetic radiation for said continuum emission to substantially subside, thereby permitting the signal-to-background ratio for said discrete electromagnetic radiation emission from at least one of said additional excited atoms, ions and molecules, and from at least one of said reexcited atoms, ions and molecules to become substantially maximized.

4,925,308

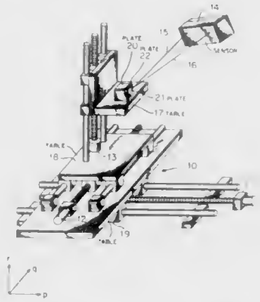
CALIBRATION OF THREE-DIMENSIONAL SPACE

Howard K. Stern, Greenlawn; William Yonescu, Dix Hills, and Daniel A. Briceno, Northport, all of N.Y., assignors to Robotic Vision System, Inc., Hauppauge, N.Y.

Filed Aug. 9, 1988, Ser. No. 230,443

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—375 **12 Claims**



1. A method for calibrating one dimension of an optical three-dimensional measurement sensor comprising the steps of aligning a flat plate perpendicular to a direction of controlled linear motion, said linear motion having a defined length of travel; aligning a sensor with a measurement center line located at a non-zero angle relative to said linear motion such that the surface of said plate is measurable by said sensor along said defined length of travel; recording measurements obtained from said sensor for specific locations of said plate along said length of travel; determining deviations from orthogonality of said plate from said direction of linear motion; and correcting the recorded measurements accordingly.

4,925,309

SYSTEM AND METHOD OF INSPECTING CONNECTOR COUPLING CONDITION

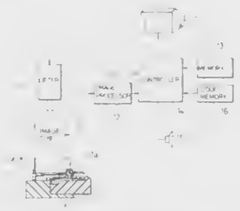
Takayoshi Endo; Shigemitsu Inaba, and Shigemi Hashizawa, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Nov. 14, 1988, Ser. No. 270,684

Claims priority, application Japan, Nov. 12, 1987, 62-284378

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—394 **7 Claims**



1. A connector coupling condition inspecting system, which comprises:

(a) a pair of matable connector housings constituting a connector, one of said housings being formed with a guide recessed portion on an upper surface thereof and an aperture at a center of the guide recessed portion through which connector housing coupling condition can be seen;

(b) an image tube, movably fitted and brought into contact with the guide recessed portion of said housing, for taking an image representative of connector coupling condition through the aperture;

(c) a first memory unit for storing reference patterns indicative of normal connector housing coupling conditions;

(d) a controller, connected to said image tube and said first memory unit, for comparing an image detected by said image tube with the reference patterns stored in said first memory unit to check whether said matable connector housings are coupled normally.

4,925,310

METHOD AND DEVICE TO MEASURE THE OPTICAL TRANSMISSION FACTOR OF A TINTED GLASS PANEL BY REFLECTION

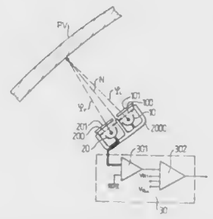
Philippe Feppon, Annecy, and Charles Rydel, Paris, both of France, assignors to Jaeger, Levallois-Perret, France

Filed Apr. 12, 1988, Ser. No. 180,823

Claims priority, application France, Apr. 14, 1987, 87 05272

Int. Cl.[5] G01J *1/10;* **F21M** *3/00*

U.S. Cl. 356—434 **12 Claims**



1. A method for determining the optical transmission factor of a tinted glass panel by reflection, said method comprising the steps of:

transmitting an incident electromagnetic radiation of given intensity (ϕ_i) towards one surface of the tinted glass panel for which the optical transmission factor is to be determined;

detecting and measuring the intensity of (ϕ_r) of the electromagnetic radiation reflected by the tinted glass panel;

storing a number of reflection coefficient reference values ($R_{r1}...R_{rn}$) in a memory means wherein said reflection coefficient reference values ($R_{r1}...R_{rn}$) having values within the following limit reference values corresponding to the range:

1 to 0.95 for a clear glass panel;

0.69 to 0.64 for a bronze-tinted glass panel;

0.45 to 0.40 for a green tinted glass panel for near infrared radiation;

each reflection coefficient reference value being uniquely related to and representing an associated transmission factor value ($T_{t1}...T_{tn}$) of tinted glass reference panels;

comparing the ratio ($R=\phi r/\phi i$) between the intensity of the reflected electromagnetic radiation measured and the intensity of the incident electromagnetic radiation with at least one reflection coefficient reference value in a number of reflection coefficient reference values ($R_{r1}...R_{rn}$), and

determining the optical transmission factor T of the glass panel by identification by selecting the value of T corresponding to the value of R within the range of said reflection coefficient reference values.

4,925,311

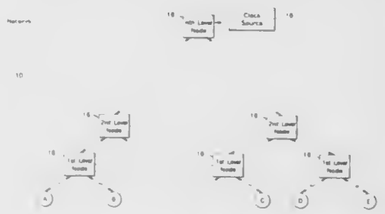
DYNAMICALLY PARTITIONABLE PARALLEL PROCESSORS

Philip M. Neches, Pasadena; David H. Hartke, Los Angeles; Richard J. Baran, Torrance; Darryl L. Woodcock, Manhattan Beach, all of Calif., and Alexandros C. Papachristidis, Gainesville, Fla., assignors to Teradata Corporation, Los Angeles, Calif.

Filed Feb. 10, 1986, Ser. No. 828,440

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—200 **20 Claims**



1. A system for dynamically partitioning a plurality of parallel processors into different subcombinations for the performance of specific transactions involving limited and variable groupings of processors, comprising:

a plurality of processors, at least some of the processors including means for establishing a sequence of steps for a given transaction, each of the processors including a network interface having a network accessible random access memory storing a fixed length status word at each of a plurality of dynamic grouping addresses;

a network coupled to each of the processors at the network interface thereof and providing messages from any processor concurrently to the processor network interface of all processors, the messages including data for testing the status words at selected dynamic grouping addresses and for establishing membership of a selected processor in one or more groups of a selected dynamic grouping;

the processors each including means for modifying the status words at selected dynamic grouping addresses in their network accessible memory in accordance with the transaction step being performed thereat;

such that a transaction can be carried out at selected processors using processing time only at the selected processors, other processors being isolated from messages received from the network by determining at the network interface whether or not the processor is a participant in a dynamic grouping, and its status relative to the transaction.

4,925,312

ROBOT CONTROL SYSTEM HAVING ADAPTIVE FEEDFORWARD TORQUE CONTROL FOR IMPROVED ACCURACY

Eimel M. Onaga, Brookfield Center; Richard J. Casler, Jr., Newton; Rajan C. Penkar, Woodbury; Roy E. Lancraft, Southbury, all of Conn., and Chi Sha, Pittsburgh, Pa., assignors to Staubli International AG, Switzerland

Filed Mar. 21, 1988, Ser. No. 171,500

Int. Cl.[5] G06F *15/46;* **G05B** *19/407*

U.S. Cl. 364—513 **10 Claims**

1. A control for a robot having a plurality of arm joints, said control comprising:

an electric motor for driving each of the robot arm joints;

a power amplifier operable to supply drive current to each motor;

means for sensing load force applied to at least a predetermined one of said robot joints;

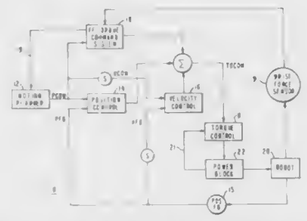
means for computing the actual load moment for each robot

VOL
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joint on the basis of the output from said force sensing means;

means for computing the dynamic/kinematic data moment for each robot joint on the basis of stored dynamic and kinematic data for the robor arm;

means for combining the data and load moments for each joint to generate a feedforward torque therefor; and



each joint motor having feedback control loop means including a torque control loop to generate motor commands for the associated power amplifier in accordance with position commands and in accordance with the feedforward torque.

4,925,313

MIXING SCREW FOR EXTRUSION AND INJECTION MOLDING

Robert E. Nunn, Londonderry, N.H., assignor to HPM Corporation, Mount Gilead, Ohio

Filed Apr. 6, 1988, Ser. No. 178,188
Int. Cl.[5] B01F *7/08*; B29B *7/42*
U.S. Cl. 366—81 **16 Claims**



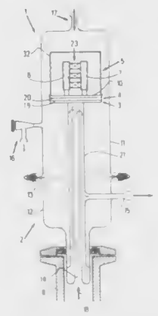
1. A method for mixing plastic material that has been at least partially plasticized and contains inhomogeneities comprising: during normal operation, feeding the material to a mixing section of a plasticating screw having at least two channels separated by at least two barrier flights each having a plurality of undercut sections spaced apart therealong, rotating the screw, and pumping the material both forwardly and rearwardly over undercut sections of the barrier flights to cause repetitive subdivision and distribution of any inhomogeneity in both the forward and back directions throughout substantially the entire length of the mixing section.

4,925,314

DEVICE FOR DETECTING A THERMAL PHENOMENON OCCURRING IN A PRODUCT

Pierre Claudy, Brignais; Jean-Marie Letoffe, Decines Charpieu, and Jean-Claude Commercon, Caluire et Cuire, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 19, 1988, Ser. No. 286,296
Claims priority, application France, Dec. 17, 1987, 87 17626
Int. Cl.[5] G01K *1/14*; G01N *25/12*
U.S. Cl. 374—16 **7 Claims**



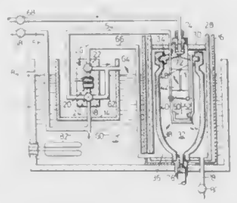
1. A device for detecting and/or measuring a thermal phenomenon occurring in a product having a liquid state at a temperature within a range of temperatures swept by the detecting and/or measuring device, comprising an enclosure means for accommodating a calorimetric head means including at least one measurement cell means and a reference cell means, means for transferring heat to said at least one measurement cell means, means for measuring a differential magnitude related to a temperature of said at least one measurement cell means, means for filling said at least one measurement cell and the reference cell means with liquid and emptying said cell means of said liquid, and means for adjusting a temperature of the enclosure means by changing the enclosure temperature within a predetermined temperature range.

4,925,315

CALORIMETRIC APPARATUS

John A. Bonnard, P O Box 781393, Sandton, 2146, South Africa

Filed Jun. 30, 1988, Ser. No. 213,674
Claims priority, application South Africa, Jul. 2, 1987, 87/4788
Int. Cl.[5] G01K *17/06*; G01N *25/44*
U.S. Cl. 374—31 **5 Claims**



1. Calorimetric apparatus comprising a tank which in use receives a liquid, a container which is located at least partly within the tank, the container being surrounded at least partly by liquid in the tank, a pressure vessel which is located in the container, the pressure vessel including a crucible which in use

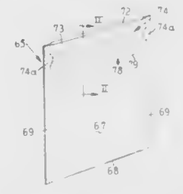
receives a sample of a substance which is combusted so that its calorific value can be determined, a pump for passing liquid from the tank into a volume which is in thermal contact with the pressure vessel, and back to the tank, thereby to stabilize the temperature of the pressure vessel at the temperature of the liquid in the tank, before combustion of the substance, a heat exchanger which is located inside the pressure vessel, a conduit which is in thermal contact with the heat exchanger, means for circulating liquid through the conduit after combustion of the sample, and a temperature sensor for monitoring the change in the temperature of the liquid circulating through the conduit due to combustion of the sample.

4,925,316

RECLOSABLE BAG HAVING AN OUTER RECLOSABLE ZIPPER TYPE CLOSURE AND INNER NON-RECLOSABLE CLOSURE

Donald L. Van Erden, Wildwood, and Hugo Boeckmann, Arlington Heights, both of Ill., assignors to Minigrip, Inc., Orangeburg, N.Y.

Continuation-in-part of Ser. No. 169,138, Mar. 10, 1988, Pat. No. 4,786,190, which is a continuation of Ser. No. 895,312, Aug. 11, 1986, abandoned. This application Aug. 6, 1987, Ser. No. 82,207
The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.
Int. Cl.[5] B65D *33/18, 33/20*
U.S. Cl. 383—61 **5 Claims**



1. A bag having opposed wall panels secured together and defining a receptacle space therebetween, and comprising:

a bag mouth defined between upper end portions of said wall panels which extend between opposite sides of the bag;

a one-time openable non-reclosable peel seal closure means extending in a relatively narrow band from side-to-side of the bag and securing said panels together substantially below the upper ends of said upper end portions and initially maintaining said mouth fixedly closed;

reclosable zipper means located below said upper ends of said upper end portions, but above said peel seal closure means and functioning for initially maintaining said upper end portions against access to said non-reclosable peel seal closure means;

said zipper means comprising complementary extruded plastic profiled fastener strips one of which is permanently connected to the inside surface of the upper end portion of one of said wall panels and the other of which is permanently connected to the inside surface of the upper end portion of the other of said wall panels;

said strips having profiles which are reclosably interlockable by digital pressure applied inwardly toward the strips on the outer faces of the wall panel areas in line with the fastener strips, one being adapted to be manually pulled open and reclosed for selectively opening and closing said mouth after said non-reclosable peel seal closure has been opened;

said zipper strips having opposite ends sealed into side edges of said bag;

said reclosable zipper means being openable responsive to digital pull apart force applied to said upper end portions of the wall panels for gaining access to said non-reclosable peel seal closure means; and

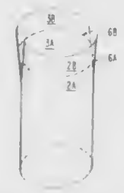
said non-reclosable peel seal closure means being operable by continuing pull apart force applied to said upper end portions of said wall panels, after said reclosable zipper means has been pulled open, for gaining complete access into said receptacle space, and said reclosable zipper means being thereafter reclosably closable as the sole closure for the bag mouth.

4,925,317

FLEXIBLE CONTAINER HAVING IMPROVED LIFTING LOOPS

Eirik Myklebust; Bjarne Omdal; Anders Juel; Olaf Strand, all of Porsgrunn, Norway, and Erik Jonsgard, Hong Kong, Hong Kong, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Aug. 31, 1988, Ser. No. 238,812
Claims priority, application Norway, Aug. 31, 1987, 873663; Jul. 22, 1988, 883257
Int. Cl.[5] B65D *33/06*
U.S. Cl. 383—8 **19 Claims**



1. In an intermediate bulk container made from fabric-like material and including a base, side walls, and at least one lifting loop formed by joining integral extensions of said side walls, the improvements wherein:

each said extension includes an end portion defining plural flaps integral with the remainder of said extension;

said flaps of one said extension being positioned alternately over and under corresponding said flaps of the other said extension, and said flaps of said extensions being joined along a seam, thereby forming said at least one lifting loop of overlapping layers of said material; and

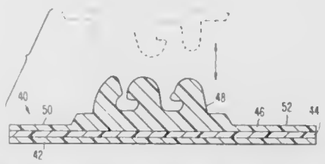
means, positioned below said seam, for creating friction between said overlapped layers and thereby for increasing the strength of said lifting loop.

4,925,318

PACKING, METHOD OF MANUFACTURING SAME, AND STRIP MATERIAL THEREFOR

Leif B. Sorensen, St. Joseph, Mo., assignor to Schurpack, Inc., St. Joseph, Mo.

Filed Nov. 4, 1988, Ser. No. 267,279
Claims priority, application Denmark, Oct. 17, 1988, 5768/88
Int. Cl.[5] B65D *33/34*
U.S. Cl. 383—63 **31 Claims**



8. A packing comprising first and second opposed surfaces in a closure area of the packing, said opposed surfaces including at least one profiled portion secured to and extending over each of said opposed surfaces in the closure area, said profiled portions being adapted to be releasably interlocked to permit

VOL 1114 ISS 3 MY 15 1990 UMI

connection and disconnection of said opposed surfaces in the closure area of the packing, at least one of said profiled portions being formed integrally with an outer layer of a strip material of the associated one of said first and second opposed surfaces, said outer layer being formed of a material well suited for forming a peel seal weld against the other opposed surface of said first and second opposed surfaces and being secured to the one of said first and second opposed surfaces via a base layer of said strip material to which said outer layer is secured by means of a non-peel seal type of connection.

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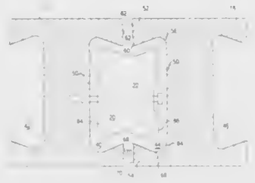
TABLESLIDE ASSEMBLY

Thomas J. Reiss, Jr., Watertown, Wis., assignor to Watertown Tableslide Company, a Div. of Consolidate Industries, Inc., Watertown, Wis.

Filed Nov. 22, 1988, Ser. No. 275,116

Int. Cl.[5] **F16C** *17/00*

U.S. Cl. 384—17 **7 Claims**



1. A guide block for use in an extendable tableslide mechanism of the type having at least two adjacent slide members disposed on opposite sides of said guide block, comprising: a first dovetail shaped projection having a first upper inclined surface, a first lower inclined surface, and a first side surface disposed therebetween; and a second dovetail shaped projection having a second upper inclined surface, a second lower inclined surface, and a second side surface disposed therebetween; wherein said first and second upper and lower inclined surfaces are inclined with respect to a horizontal plane at a predetermined angle and wherein the respective widths of said first upper and second lower inclined surfaces are greater than the width of said first lower and said second upper inclined surfaces.

4,925,320

FEED BEAM ARRANGEMENT FOR A ROCKDRILL

Bruce A. G. E. Foster, Nottingham; Andrew Ollerenshaw, Yorkshire, and Nigel W. Copestake, Nottingham, all of United Kingdom, assignors to Boart (UK) Limited, Littlemoor, England

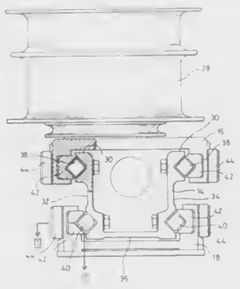
Filed Mar. 9, 1989, Ser. No. 320,943

Claims priority, application United Kingdom, Dec. 3, 1988, 8805918

Int. Cl.[5] **F16C** *29/02*

U.S. Cl. 384—42 **11 Claims**

1. A feed beam arrangement for a rock drill, the arrangement comprising a beam of light metal and a carriage slideable along the beam and adapted to carry a rock drill, wherein the beam has two opposite slide guides each in the from of an elongate member detachably mounted externally on the main body of the beam with the elongate member determining the profile of the slide guide and wherein the carriage has a corresponding



slide seat adapted to slide on the guides and to retain the carriage on the beam.

4,925,321

DYNAMIC PRESSURE AIR BEARING UNIT

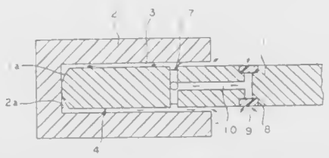
Teruo Maruyama, Hirakata, and Akira Takara, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 29, 1989, Ser. No. 374,207

Claims priority, application Japan, Jun. 29, 1988, 63-161616

Int. Cl.[5] **F16C** *32/06*

U.S. Cl. 384—114 **14 Claims**



1. A dynamic pressure air bearing unit comprising a rotating shaft and a bearing member fitted around the outer circumferential surface of said rotating shaft, wherein a first spiral groove is disposed on a part of one of two cylindrical bearing surfaces facing each other, one being of said rotating shaft and the other of said bearing member, said first spiral groove acting to impel lubrication air between the cylindrical bearing surfaces toward the innermost portion of said bearing member with the rotation of said rotating shaft, and a second spiral groove is disposed on a portion of said cylindrical bearing surface adjacent to the open end of said bearing member, said second spiral groove acting to discharge, air toward said open end of said bearing member, an air conducting passage being provided to connect the boundary portion between said first and second grooves with the outside of said bearing unit, and the air passage having a filter installed at the open end thereof.

4,925,322

BALL BEARING

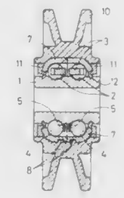
Tadashi Hishida, Sakai, Japan, assignor to VIV Engineering Inc., Osaka, Japan

Filed Mar. 3, 1989, Ser. No. 318,712

Claims priority, application Japan, Mar. 3, 1988, 63-29631; Aug. 23, 1988, 63-110834

Int. Cl.[5] **F16C** *33/64*

U.S. Cl. 384—486 **4 Claims**



1. A ball bearing comprising:
an inner ring having formed in the outer periphery thereof two ball guide grooves;
a plurality of balls in said ball guide grooves;
retainer means holding said balls in position in said guide grooves;
a pair of outer rings fitted over said inner ring to cover the respective rows of balls, said outer rings having adjacent inner edges butted together and each having a cross-sectional shape with a straight portion extending from said inner edge and an arcuate portion adjacent the edge on the opposite side of the ring from said inner edge, said cross-sectional shape substantially conforming to the contour of said balls, each outer ring having in the outer periphery thereof an eccentric groove; and
a resin molding around said outer rings with part of said resin molding engaging in said eccentric grooves so that said molding is integral with said outer rings.

4,925,323

UNITIZED SEALED THRUST BEARING ASSEMBLY

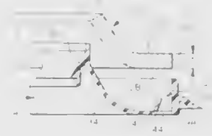
Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

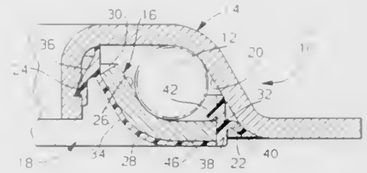
Filed Aug. 23, 1989, Ser. No. 397,203

Int. Cl.[5] **F16C** *19/10, 33/76*

U.S. Cl. 384—607 **2 Claims**

1. A unitized, sealed thrust ball bearing assembly, comprising,
a first curvilinear race having a ball pathway bordered by inner and outer sealing surfaces,
a second curvilinear race having an inner surface defining a ball pathway disposable in confronting relation to said first race pathway, an outer surface, and at least one generally cylindrical terminal edge having a predetermined thickness and joining said inner and outer surfaces that is disposed substantially vertically when said pathways confront one another, and,
a molded sealing member having a skin conformable to said second race outer surface and a generally cylindrical bordering wall molded integrally with said skin,
at least one flexible latching finger molded integrally to said bordering wall at a height above said skin approximately equal to said predetermined edge thickness and extending inwardly therefrom by a latching distance that is substantially less than said height, but sufficient to overlay said second race inner surface when said second race outer surface is conformed to said sealing member skin,
a molding access window opening through said skin below said latching finger and having a width measured from said bordering wall that is slightly more than said latching distance, and,
a closing flap integrally molded to said access window having substantially the same size and shape as said window, said closing flap extending up toward said latching finger but terminating short of said latching finger, by virtue of said window width being less than said finger height,





whereby, as said second race is moved toward said sealing member to bring its outer surface into conforming engagement with said skin, said second race terminal edge moves along said bordering wall and snaps past said latching finger as it simultaneously pushes said closing flap into said molding access window, thereby retaining said sealing member to said second race and completely enclosing said second race.

4,925,324

COLOR INK RIBBON FOR THERMAL PRINTER

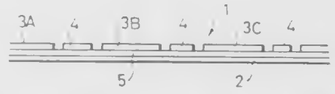
Toshinori Ichisawa, Takizawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 239,149

Claims priority, application Japan, Oct. 2, 1987, 62-247997; Oct. 2, 1987, 62-247999

Int. Cl.[5] **B41J** *31/05*

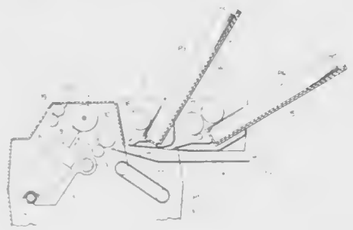
U.S. Cl. 400—240.3 **4 Claims**



1. In a color ink ribbon for use with a thermal transfer printer, including a base, a plurality of ink layers having different colors formed on said base and arranged at intervals in a longitudinal direction of said base, and a plurality of markers for detecting the colors of said ink layers, each marker being formed on said base and arranged just upstream of each corresponding ink layer in a moving direction of said color ink ribbon in longitudinally spaced relationship to said adjacent ink layers, the improvement comprising a wax base covering layer for entirely covering an upper surface of said base in such a manner that said base covering layer is interposed between said base and said ink layers as well as said markers, said base covering layer having a coefficient of friction not less than that of said ink layers.

VOL
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1990
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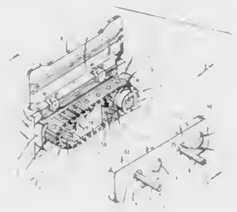
4,925,325
RECORDING PAPER TRANSPORTING DEVICE IN A RECORDING APPARATUS
Takeshi Niikawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan
Filed Apr. 25, 1988, Ser. No. 185,761
Claims priority, application Japan, Apr. 23, 1987, 62-100989; May 7, 1987, 62-111795
Int. Cl.[5] B41J *11/42*
U.S. Cl. 400—582 16 Claims



1. A recording apparatus comprising:
recording means for recording data on a recording medium having a leading edge;
accommodating means for accommodating at least said recording means;
transporting means for transporting said recording medium in a first direction along a transportation path to positions external to said accommodating means after the record of data and for transporting said recording medium of predetermined distance in a second direction opposite said first direction;
registration means for defining a reference line substantially perpendicular to said leading edge of said recording medium, said registration means being attached to said accommodating means and being visible from outside said accommodating means, said registration means further being spaced said predetermined distance from said recording means along said transportation path;
aligning means for positioning said leading edge a selected distance from said registration means to align a selected first print line position with said registration means; and
control means for controlling said transporting means to transport said first line position of said recording medium said predetermined distance in said second direction to align said selected first print line position with said recording means.

4,925,326
TRANSPORT DEVICE FOR EDGE-PERFORATED RECORDING SUPPORT MATERIAL
Stefan Bischof, Ulm-Jungingen; Gerhard Lohrmann, Elchingen-Thalfingen, and Michael Setz, Beimerstetten, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany
Filed Feb. 24, 1988, Ser. No. 159,776
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1987, 3705858
Int. Cl.[5] B41J *11/26*
U.S. Cl. 400—616.1 18 Claims

1. A transport device for edge-perforated recording-support materials comprising
a first casing part disposed in a first direction at a distance relative to perforation edges for drivable, endless pin belts, where the first casing part includes a base plate and hinge means for supporting a guide flap;
a second casing part disposed at a distance in a second direction relative to the perforation edges for drivable, endless pin belts;
a guide flap tiltably disposed on the first casing part for positioning recording-support material; inner and outer guide ribs attached to the first casing part provided for maintaining the perforation edge engaged by the pin belt where at least the inner guide rib forms a contact surface for the second casing part;
a hollow perpendicular standing body with a defined traversing bore hole penetrating the base plate of the first casing part formed on the first casing part inside of the inner guide rib; and



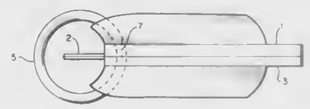
an expanding mandrel for a detachable attachment of the second casing part, which mandrel is guided through an aligned bore of the second casing part and which mandrel is pressed in the traversing bore hole of the hollow perpendicular standing body thereby providing a flush, detachable attachment of the first casing part and of the second casing part.

4,925,327
LIQUID APPLICATOR WITH METERING INSERT
David F. Wirt, Oak Grove Heights, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 904,788, Sep. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 798,989, Nov. 18, 1985, abandoned. This application Sep. 28, 1988, Ser. No. 252,021
Int. Cl.[5] A47L *13/17*; A61M *35/00*
U.S. Cl. 401—205 12 Claims



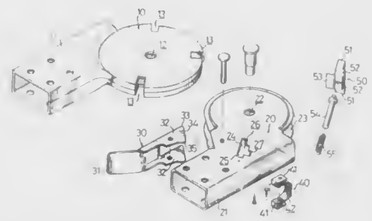
1. An article useful as a dispenser for the application of pre-operative surgical scrubs or paints to skin comprising
(a) a hollow elongate member having a major orifice at one end thereof;
(b) a layer of unfoamed, rigid, porous metering material disposed over said major orifice, said porous metering material having a reservoiring capacity of less than about 5.0 cc/gm and said layer capable of regulating the flow of liquid therethrough;
(c) a layer of sponge material having a permanent compression set ratio of about 1.5 to about 10 disposed over the exterior surface of said layer of porous metering material; and
(d) an air vent in said hollow elongate member capable of providing air flow between the exterior of said hollow elongate member and any solution to be applied by said applicator which is contained in said elongate member.

4,925,328
EXTERNAL RING BINDER
Stephen R. Jefferies, 500D Kawaihae St., Honolulu, Hi. 96825
Filed Aug. 3, 1988, Ser. No. 227,885
Int. Cl.[5] B42F *13/16*
U.S. Cl. 402—77 11 Claims



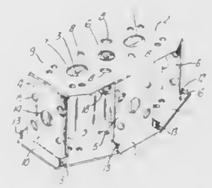
1. A binder for storing sheets of paper, comprising:
a substantially flat rear cover;
a plurality of sheet retainers, each comprising two portions;
pivoting means for connecting said sheet retainers adjacent to an edge of said rear cover whereby said sheet retainers pivot about a sheet retainer pivoting axis parallel to said edge;
latching means for selectively engaging and disengaging said portions of said sheet retainers, whereby said sheets of paper can be inserted and removed;
a spine having a front cover edge and a rear cover edge, rotatably attached to said rear cover edge to said rear cover, wherein said spine comprises a first plate and a second plate foldably attached to each other along a spine folding line, whereby said first plate and said second plate can be folded in relation to each other; and
a substantially flat front cover having apertures corresponding to said sheet retainers rotatably attached to said front cover edge of said spine.

4,925,329
JOINT FOR FOLDABLE LADDERS
Yuan-Chan Chuang, No. 106-1, Chang-Shan Rd., Wu-Jih Hsiang, Tai-Chung Hsien, Taiwan, Taiwan
Filed Nov. 25, 1988, Ser. No. 276,035
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—93 7 Claims



1. A joint for foldable ladder comprising:
a hollow disk body having a first hollow leg which connects said hollow disk body to said ladder and a plurality of circumferential cutouts for setting a predetermined angle of said ladder;
a casing having a circular part which rotatably encases said hollow disk body and a second hollow leg which connects said ladder, said circular part including two spaced apart circular plates which encase and rotatably engage with said hollow disk body, and said second hollow leg including a slot at each surface, each off said slots having a first end, a second end remote from said first end, and a third end intermediate said first and second ends;
a trigger pivotally provided on a lateral side of said casing;
an arcuate seat provided within said casing fixed at said first end of said slot; and
a lock piece movable along said casing with respect to said slot of said casing and which is fixed on said arcuate seat at one end and is fixed on said casing at the other end, said lock piece being substantially a symmetrical body having two outer edges, two protuberances, a shoulder extended laterally from the body of the lock piece, a spring-loaded supporting rod, and a spring which encompasses said supporting rod, said lock piece being fixable in said second end and third end of said slot.

4,925,330
SIX-WAY CONNECTOR
John R. E. Cornish, Chislehurst, United Kingdom, assignor to S.G.B. Holdings Limited, Mitcham, England
Filed Mar. 9, 1989, Ser. No. 320,961
Claims priority, application United Kingdom, Sep. 26, 1988, 8822566
Int. Cl.[5] E04B *7/02*
U.S. Cl. 403—171 12 Claims



1. A six-way connector for securing together structural formwork elements, said connector comprising:
an upper, generally rectangular plate and a lower, generally rectangular plate secured together in a planar spaced relation by at least four vertical plates so as to form a rigid structural unit,
both upper and lower plates having an elongate axis extending lengthwise through said rigid structural unit, said elongate axis parallel to both upper and lower plates,
each of said vertical plates having an elongate axis extending from the top plate to the bottom plate,
each of said plates having a generally planar contact surface for connecting a formwork element in an abutting relation thereto,
each of said plates having a plurality of aperture means so as to enable the connection of a formwork element centrally thereto,
at least two of the plate having further aperture means to enable the connection thereto of two formwork elements in a side-by-side relationship.

4,925,331
CONNECTOR MEMBER FOR WOOD CONSTRUCTION WORK
Peter Bertsche, Tafertsbergstr. 5, 8371 Prackenbach, Fed. Rep. of Germany
Filed Oct. 1, 1987, Ser. No. 103,288
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3634039
Int. Cl.[5] F16B *13/00*
U.S. Cl. 403—267 19 Claims

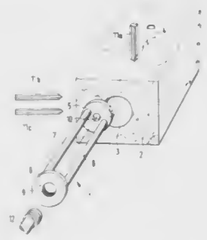
19. A connector member for wood construction work comprising:
(a) a first, inner end plate having an outer cross-section

VOL
1114
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3
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adapted to a cross-section of an aperture of a blind bore located in a wooden build component to take up the connector member;

(b) at least one dowel driven into said wooden building component on a plane perpendicular to a power-transmitting bar and penetrating said blind bore in such a way that its projection into a plane of said first end plate is located at least partly on said first end plate;

(c) at least one power-transmitting bar is a connector member directed out of said blind bore and extending parallel



to said longitudinal axis of said blind bore connected with said first end plate and extending toward an opening of said blind bore;

(d) a second outer end plate having an outer cross-section adapted to the cross-section of said aperture of said blind bore wherein said at least one power-transmitting bar is attached at ends to opposing sides of said first inner end plate and said second outer end plate; and

(e) a rigid casting compound body surrounding said power-transmitting bar an said dowel thereby forming a composite block.

4,925,332

SINGLE-PLANE T-CONNECTOR FOR A PAIR OF TAP CABLES

Charles E. Griffith, 112121 Whisperwood La., Rockville, Md. 20852

Filed Mar. 4, 1988, Ser. No. 164,467
Int. Cl.[5] F16B *7/04*
U.S. Cl. 403—373 **15 Claims**



1. A T-connector for connecting first and second tap cables to a service bus cable, the service bus cable having an axis and the tap cables having end segments with axes, comprising:

a front clamp member having a first end and a second end and having an axis running through the first and second ends, the front clamp member additionally having an inner face with a first contact region adjacent the first end, a second contact region adjacent the second end, and an arcuate region between the first and second contact regions;

first means for connecting the end segment of the first tap cable to the front clamp member so that the axis of the end segment of the first tap cable is parallel to the axis of the front clamp member;

a rear clamp member having a first end and a second end and having an axis running through the first and second ends, the rear clamp member additionally having an inner face with a first contact region adjacent the first end of the rear clamp member, a second contact region adjacent the second end of the rear clamp member, and an arcuate region between the first and second contact regions of the rear clamp member;

second means for connecting the end segment of the second tap cable to the rear clamp member so that the axis of the end segment of the second tap cable is parallel to the axis of the rear clamp member; and

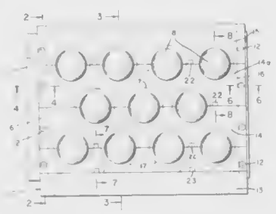
third means for connecting the front and rear clamp members around the service bus cable so that the arcuate regions of the clamp members engage the service bus cable and the contact regions of one clamp member engage the contact regions of the other clamp member, with the axes of the end segments of the tap cables being substantially parallel to one another and running through the service bus cable.

4,925,333

SECTIONAL SHOCK ABSORBING AND MOTORIST WARNING HIGHWAY BARRIERS

Robert J. Bishop, 1083 Bloomfield Ave., West Caldwell, N.J. 07006

Filed Jul. 31, 1989, Ser. No. 386,984
Int. Cl.[5] E01F *13/00, 15/00*
U.S. Cl. 404—6 **19 Claims**



1. A sectional shock-absorbing and motorist warning highway barrier comprising multi-component sections about four feet in length, and adapted to be joined together in end-to-end relation to form a continuous barrier, each section being made up of four vertically aligned horizontal components, providing a top component and two mid-components of uniform thickness, and a flared bottom component, such components having offsets at opposed ends thereof for aligning successive sections, with such offsets having transverse apertures for receiving bolts in securing together successive sections, abutting surfaces of the horizontal components having aligned offsets of semi-spherical contour to receive spherical plastic bumper members protrudingly and rotatably supported in the assembled section, the horizontal components being fashioned from concrete, suitably encased in plastic shells, the spherical plastic bumper members being of hollow structure having means for filling with compressed air, or for filling with water or sand for added weight, the offsets for aligning successive sections being for direct section-to-section engagement, or for reception of vertically oriented, and suitably flexible interfitting connecting members, and with either type of section-to-section connections the free ends of a multi-component sections being provided with appropriately contoured vertical connecting members interfitting with the offsets for aligning successive sections.

4,925,334

TRAFFIC MARKER WITH HANGER

James R. Beard, 400 Palm Valley Dr. West, Harlingen, Tex. 78552

Filed May 17, 1989, Ser. No. 355,721
Int. Cl.[5] E01F *9/10*
U.S. Cl. 404—9 **12 Claims**



1. A traffic marker, comprising:

an upright support member having a front panel and a rear panel disposed essentially parallel to each other;

said front panel having a substantially horizontal supporting edge;

said rear panel having a substantially horizontal supporting edge;

a support bracket having:

an internal member with first and second ends with an orifice formed therein,

a holding member having first and second ends with the first end thereof connected to the first end of said internal member at a junction such that said internal member is disposed at an angle with respect to said holding member and said junction is operable to be disposed proximate to said substantially horizontal supporting edge on said front panel; and

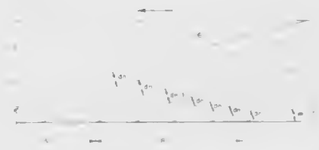
a longitudinal pin member for being inserted through the orifice in said internal member and having one end thereof contacting the interior surface of said front panel and the surface thereof contacting a substantially horizontal surface on said rear panel.

4,925,335

PREFABRICATED CONTINUOUS ROADMARKING TAPE HAVING OPTICAL AND ELECTROMAGNETIC FUNCTION

Ludwig Eigenmann, Via Dufour 3, CH 6900 Lugano, Switzerland

Continuation-in-part of Ser. No. 106,288, Oct. 9, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,521
Int. Cl.[5] E01F *9/06*
U.S. Cl. 404—12 **7 Claims**



7. Continuous prefabricated multilayer road-marking tape secured on the road surface including:

(a) a microswitch positioned in a compressible portion of the tape and activable by compression of the tape;

(b) an EPROM connected with said microswitch and a megaherz transmitter so as to transmit a message concerning a traffic jam;

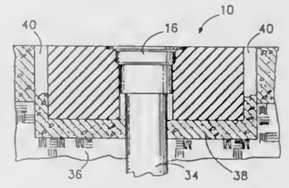
(c) a series of directional light emitting diodes (LEDs) activated by said microswitch as to direct the vehicular traffic away from the jam.

4,925,336

PAD FOR SUPPORTING A UTILITY ACCESS CONDUIT AND METHOD FOR INSTALLING SAME

Gerald R. Kennel, Hillsboro, Oreg., assignor to Riedel Omni Products, Inc., Portland, Oreg.

Filed Mar. 22, 1988, Ser. No. 171,822
Int. Cl.[5] E01C *11/22*
U.S. Cl. 404—25 **9 Claims**



1. A pad for supporting a utility access conduit having an upper end that is flush with the surface of the roadway it provides access through, said pad comprising:

(a) a block made from rubber or similar elastomeric material and having a planar upper surface;

(b) said block having defined therein opening means for snugly receiving a particular utility access conduit and for supporting said utility access conduit with its upper end coplanar with said upper surface, with said upper surface extending radially outwardly from the periphery of said conduit; and

(c) said opening means extending completely through said block.

5. A method for making a pad for supporting a utility access conduit comprising:

(a) providing an open-topped mold cavity having the shape of the desired pad;

(b) forming an opening in the center of a mat of virgin rubber having the same shape as the bottom of said cavity which will permit the utility access conduit to pass through said mat;

(c) placing said mat into the bottom of said cavity;

(d) placing a utility access conduit in said cavity coaxially with said opening so that the resulting pad will surround said utility access conduit and support it with the upper end thereof being coplanar with the outer surface of said mat and said outer surface extending radially outwardly from the periphery of said utility access conduit;

(e) filling said cavity with comminuted rubber or elastomeric material; and

(f) heating said material while applying pressure simultaneously thereto.

4,925,337

MANHOLE COVERING

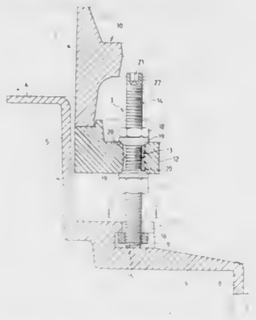
Hansruedi Spiess, Delemont, and Francois Galvanetto, Alle, both of Switzerland, assignors to Von Roll, AG, Ceriafingen, Switzerland

Filed Sep. 28, 1988, Ser. No. 250,344
Claims priority, application Switzerland, Oct. 12, 1987, 3974/87
Int. Cl.[5] E02D *29/14*
U.S. Cl. 404—26 **5 Claims**

1. Manhole covering for sewers, gullies and water intakes and which is laid on an upper end of a vertical manhole, the covering comprising a casing embedded in the ground, a base frame for mounting a manhole cover, said casing including a peripheral wall part and a bottom wall part inwardly extending

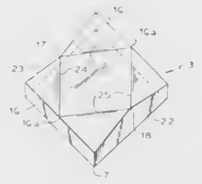
VOL 1114 ISS 3 MY 15 1990 UMI

from said peripheral wall part, and adjusting means provided on said base frame to enable an adjustment of the base frame in height and slope in respect to said casing, the base frame including bores and being inserted in said casing, said adjusting means including at least three threaded bolts traversing the base frame and extending through said bores and being spaced from each other on the base frame, said bolts having support means which fixedly support the bolts in the casing and each carrying a pair of threaded nuts which positively position and secure the base frame at a top and a bottom thereof, said adjust-



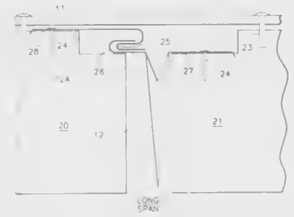
ing means further including one-piece washers inserted between said threaded nuts and said base frame and each having convexly curved external surfaces, said bores having sloped surfaces widening towards two opposing open ends of each bore and cooperating with and supporting said convexly curved external surfaces of said washers, said bottom wall part being provided with pockets each receiving a lower end of an associated threaded bolt, said bottom part being provided in a portion thereof above each pocket with an open slit to allow said lower end to pass therethrough.

4,925,338
DECORATIVE FUNCTIONAL ELEMENT FOR CONSTRUCTION AND THE LIKE
Janusz J. Kapusta, Brooklyn, N.Y., assignor to K-Dron, Inc., Brooklyn, N.Y.
Filed Nov. 18, 1988, Ser. No. 272,809
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[5] E01C *5/00*
U.S. Cl. 404—41 **5 Claims**



1. As an article of manufacture, a shape comprising a three-dimensional body having a rectangular base and further defined by:
(a) a zero plane through the body parallel to the base;
(b) a minus elevation point with respect to the zero plane;
(c) a plus elevation point with respect to the zero plane; said minus and plus elevation points equidistant in plus and minus elevation from said zero plane;
(d) a pair of first midpoints on said zero plane equidistant from two opposite edges of said body, one midpoint at one edge and another midpoint at the other edge
(e) a pair of second midpoints, one midpoint at said minus elevation point and the other midpoint located at the plus elevation point equidistant from two other opposite edges of said zero plane, each of the midpoints of the second pair of midpoints being equidistant from the zero plane; all of said midpoints located on a plane that intersects said zero plane at the first pair of midpoints, said body having a rear face extending from said base to said plus elevation point defining with the plus elevation point and zero plane a triangle, said body having a front face which includes the minus elevation point and two mirror image triangles, said body having two rectangular side faces which extend from the base to the zero plane in an array of same.

4,925,339
EXPANSION JOINT COVER AND DRAIN
Earl M. Smith, 545 S. Lexington Pkwy., St. Paul, Minn. 55116
Filed Apr. 10, 1989, Ser. No. 335,897
Int. Cl.[5] E01C *11/22;* **E04B** *1/68*
U.S. Cl. 404—47 **11 Claims**

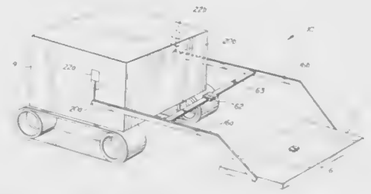


1. A system for protecting and draining expansion joints joining juxtaposed sections of construction materials of varying gap width comprising:
a pair of laterally disposed sheet members having free ends rebent into moveably interlocked curves, and having secured ends each of which is secured to the corresponding opposite one of said construction material sections, the pair of laterally disposed sheet members cooperating to form a liquid collector between the sections of construction material and wherein at least a portion of the compensation for change in the width of the gap is accomplished by relative movement of the interlocked curves; and
cover member spanning the expansion joint above said pair of laterally disposed sheet members, and fixed to at least one of said juxtaposed sections of construction material.

4,925,340
SCREED SLOPE CONTROLLER FOR A PAVER
Richard K. Heiser, Wayzata, and James R. Reed, Minneapolis, both of Minn., assignors to Sundstrand-Sauer, Ames, Iowa
Filed May 12, 1989, Ser. No. 351,379
Int. Cl.[5] E01C *23/01*
U.S. Cl. 404—75 **16 Claims**

1. A controller for controlling the slope of a screed supported by support arms wherein the screed is moved over a distance, comprising:
first means for developing a first sensor signal representing the slope of the screed;
second means for developing a second sensor signal representing the slope of the support arms;
third means coupled to the first developing means for developing an integrated error signal from the first sensor signal and a slope command signal indicative of a desired screed slope;
a summer coupled to the second and third developing means

which sums the integrated error signal with the second sensor signal to develop a second error signal; and
means responsive to the second error signal for adjusting the slope of the support arms.
14. A method of controlling the slope of a screed towed over a distance by a tractor having tow arms connected to the tractor at tow points wherein the elevations of the tow points are adjustable, comprising the steps of:
developing a first sensor signal representing the transverse slope of the screed;
developing a second sensor signal representing the transverse slope of the tow arms at a particular point along the tow arms;



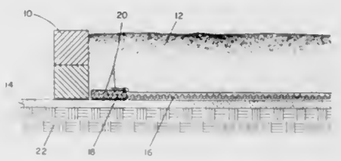
summing the first sensor signal and a slope command signal representing a particular desired screed slope to develop a first error signal;
integrating the first error signal over distance to develop an integrated error signal;
summing the integrated error signal with the second sensor signal to develop a second error signal; and
operating an actuator connected to each tow point to adjust the relative elevations thereof in accordance with the second error signal to in turn control the slope of the screed.

4,925,341
REPLACEABLE CEMENT-TROWEL BLADE TRAILING EDGE
Harold L. Neal, 5209 Culbreath Rd., Brooksville, Fla. 34601
Filed Mar. 20, 1989, Ser. No. 325,940
Int. Cl.[5] E01C *19/22*
U.S. Cl. 404—112 **18 Claims**



1. A replaceable cement-trowel blade that is rectangular with a forward edge, an aft edge, an inside edge and an outside edge and having:
a trowel-blade attachment member attached rigidly to a top surface of the trowel blade;
a means for attachment of the attachment member to a mechanized arm for moving the trowel selectively over the surface of cement to prepare the surface of the cement suitably while it is being dried and otherwise set up for hardening and;
a replaceable trowel-blade trailing-edge that is attachable to the trowel blade at an aft edge of the trowel blade.

4,925,342
WATER MANAGEMENT SYSTEM
Daniel M. Hendy, Cincinnati, Ohio, assignor to Site Masters, Inc., Cincinnati, Ohio
Filed Apr. 10, 1989, Ser. No. 335,776
Int. Cl.[5] E02B *11/00*
U.S. Cl. 405—45 **17 Claims**



1. An improved water management system comprising:
(a) an enclosing border;
(b) a first drainage means comprising a geocomposite material substantially covering the lower portion formed by said enclosing border, comprising a substantially planar , geometrically symmetrical and repeating core having at least a single repeating verticle cusp extending upward from the base of said core, and enclosed by a water pervious geosynthetic filter fabric;
(c) a second drainage means comprising a geocomposite material comprising a substantially planar, geometrically symmetrical and repeating core having at least a single repeating verticle cusp extending upward from the base of said core, said second drainage means being dimensionally thicker than said first drainage means, located adjacent at least one perimeter area formed by said enclosing borders;
(d) a third drainage means comprising a layer of resilient material, said third drainage means covering said first and second drainage means and being confined within said enclosing border and terminating near the upper surface of said enclosing border;
(e) attachment means for attaching said first drainage means to said second drainage means.

4,925,343
OIL SPILL CLEANUP COMPOSITIONS
Robert L. Raible, Box 521, and Johnnie L. Loggains, Box 276, both of Grady, Ark. 71644
Filed Jul. 24, 1989, Ser. No. 383,643
Int. Cl.[5] E02B *15/00*
U.S. Cl. 405—60 **20 Claims**

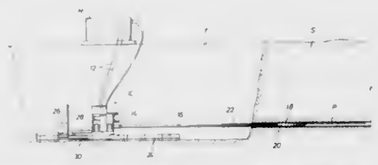
1. A biodegradable composition useful for spreading upon the surface of oil-contaminated water, or lands, for absorbing oil from the surface of said oil-contaminated water, or land, and the oil-contaminated composition then readily removed by sweeping, which comprises a particulate admixture of a wood fiber, and acid-treated hydrophobit, organophilic water wettable cotton linters.

4,925,344
METHOD AND APPARATUS FOR REPLACING BURIED PIPE
Steve U. Peres, deceased, late of La Porte, and by Sara F. Peres, executrix, 10106 Avenue P., La Porte, both of Tex. 77571
Filed Jan. 3, 1989, Ser. No. 292,761
Int. Cl.[5] F16L *1/00*
U.S. Cl. 405—184 **20 Claims**

1. A method of replacing buried pipe with replacement pipe comprising:
(a) locating pipe grinding and replacement apparatus in axial registry with the center line of the buried pipe to be replaced;
(b) rotating and linearly moving a tapered pipe grinding head having a pipe cutting member thereon against the

VOL 1114 ISS 3 MY 15 1990 UMI

end of the buried pipe to be replaced, thereby completely grinding the pipe to be replaced to a pulverant character forming a pulverant bedding composition for the replacement pipe and forming a replacement pipe passage of a



dimension exceeding the external dimension of the replacement pipe; and

(c) extending a replacement pipe endwise into the replacement pipe passage simultaneously with grinding away the buried pipe.

4,925,345

BUILDING FOUNDATION STABILIZING AND ELEVATING APPARATUS

William B. McCown, Jr., Allen, Tex., and William B. Bolin, Ada, Okla., assignors to Powerlift Foundation Repair, Ada, Okla.

Filed Feb. 10, 1989, Ser. No. 309,779
Int. Cl.[5] E02D *7/20*
U.S. Cl. 405—232 **13 Claims**



1. Apparatus for stabilizing and supporting a building foundation comprising:

a foundation bracket assembly comprising an elongated foundation support segment adapted to extend generally horizontally under a building foundation, and vertically oriented, guide means substantially at the level of said foundation support segment adapted to receive and guide foundation support pilings to be driven into the ground;

lower cross arm means on said foundation bracket assembly and extending laterally outwardly on opposite sides of said guide means;

an upper head assembly located above said foundation bracket assembly in vertically spaced relation thereto;

connecting rod means extending between and secured to said upper head assembly and said foundation bracket assembly said connecting rod means comprising two connecting rods extending vertically and secured at their lower ends to said lower cross arm means on opposite sides of said guide means;

at least one power cylinder connected at the upper end thereof to said upper head assembly and depending downwardly therefrom towards said foundation bracket assembly at a laterally offset position with respect to the vertical path of support pilings to be driven into the ground, said power cylinder comprising piston reciprocally moveable within a cylinder and a piston rod attached to said piston and extending downwardly therefrom outside of said cylinder; and

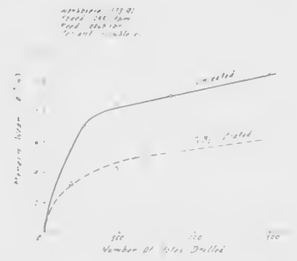
a clamp connected to said piston rod at a vertical location above said foundation bracket and below said upper head assembly and having clamp means adapted to engage and grip a length of foundation support piling extending through said guide means upon the downward, power extension stroke of said piston and piston rod.

4,925,346

METHOD OF INCREASING USEFUL LIFE OF TOOL STEEL CUTTING TOOLS

David Moskowitz, Southfield; David W. Hoffman, Ann Arbor, and Duane J. Schmatz, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 135,881, Dec. 21, 1987, Pat. No. 4,820,392. This application Apr. 3, 1989, Ser. No. 332,127
Int. Cl.[5] B23B *35/00, 1/00*
U.S. Cl. 408—1 R **5 Claims**



1. A method of machining aluminum-based workpieces at high-speeds, comprising:

moving an iron-based cutting tool against said aluminum-based workpiece at surface speeds exceeding 1000 sfm to continuously cut said workpiece, said tool having cutting surfaces coated with a single-phase crystal film of TiB_2.

4,925,347

METHOD OF CHAMFERING PLANAR PLATE

Kameharu Seki, and Isamu Kubo, both of Saitama, Japan, assignors to Nippon CMK Corp., Japan

Filed Jan. 3, 1989, Ser. No. 293,114
Claims priority, application Japan, Mar. 23, 1988, 63-68677
Int. Cl.[5] B23C *3/12*
U.S. Cl. 409—132 **16 Claims**



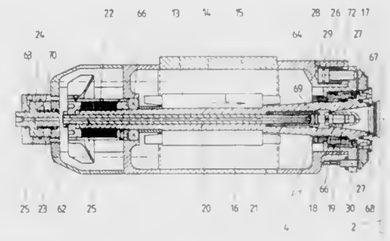
1. A method of chamfering the edges of plate members, comprising the steps of: providing a plurality of plate members which are alike in size and which have upper and lower outer peripheral edges to be chamfered; stacking the plate members in face-to-face vertically aligned relation so that for each two adjacent plate members the upper outer edge of the lower plate member is opposed to the lower outer edge of the upper plate member; simultaneously chamfering opposed outer edges of two adjacent plate members in the stack; and repeating the simultaneously chamfering step for each two successively adjacent plate members in the stack to thereby chamfer the upper and lower edges of the stacked plate members.

4,925,348

APPARATUS FOR MACHINING A WORKPIECE OF WOOD, IN PARTICULAR WOOD BEAMS

Fritz Krüsi, Dorf, CH-9105 Schönengrund, Switzerland

Division of Ser. No. 116,081, Nov. 3, 1987. This application May 8, 1989, Ser. No. 348,560
Claims priority, application Switzerland, Nov. 4, 1986, 4354/86
Int. Cl.[5] B23Q *3/12*
U.S. Cl. 409—231 **7 Claims**



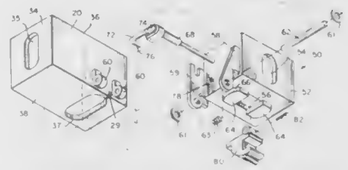
1. A drive means for a machining apparatus comprising an electric motor having a casing which contains a rotor and a stator, and a drive shaft mounted in the casing, the drive shaft being in the form of a hollow shaft which extends from both sides of the rotor and which is provided at one end with a receiving means for force-lockingly receiving a tool, a gripping means disposed in the hollow shaft for retaining a tool in the receiving means, said gripping means comprising a clamping claw which is fixed to a clamping rod which can be actuated against the force of a spring means by axial displacement of the clamping rod in the hollow shaft to open the clamping claw, a pressure fluid cylinder whose piston is arranged coaxially with respect to the clamping rod for axially displacing the clamping rod, wherein both the clamping rod and the piston are provided with a coaxial bore such that, when the piston is pressing against the clamping rod, the two bores communicate with each other, and the bore in the piston being connected to a compressed air source for blowing out the receiving means via the bore in the clamping rod, said receiving means including an entrainment disc which surrounds an inside cone member for receiving a Morse taper member, the entrainment disc being arrestable with an arresting pin which can engage into a recess in the entrainment disc in a predetermined position of the entrainment disc, and including means for moving the arresting pin into engagement with the recess, and wherein a rest position of the entrainment disc can be detected by a sensor which is stationary relative to the entrainment disc, and the arresting pin is activatable only when a rest position has been detected.

4,925,349

ADAPTER CASTING AND INTERLOCK

Howard J. Yurgevich, Monticello, Ind., assignor to Rosby Corporation, Monon, Ind.

Continuation-in-part of Ser. No. 183,940, Apr. 20, 1988, Pat. No. 4,844,672. This application Apr. 24, 1989, Ser. No. 341,845
Int. Cl.[5] B65D *90/12*
U.S. Cl. 410—54 **17 Claims**



12. An adapter for adapting a wide-body container having coupling members for coupling the container to an underlying support to permit the container to be supported upon a set of container supports spaced at a pre-established standard width narrower than the width of the container, the adapter comprising:

a generally rectangular enclosure having a plurality of apertures, pivot means for pivotally moving the enclosure from a position below a container coupling member to a position adjacent thereto, locking means for locking the enclosure below the container adjacent to a container coupling member when the adapter is not in use, and engagement means for engaging the enclosure to the container coupling member when situated therebelow including a shaft mounted to pivot within the adapter enclosure and a hook fix to the shaft for movement between a first position engaging a container coupling member and a second position disengaged from the container coupling member and generally within the adapter enclosure.

4,925,350

SCREW ANCHOR

Donald H. Kolseth, 304 Buckingham Ter., Louisville, Ky. 40222

Filed Nov. 14, 1989, Ser. No. 436,318
Int. Cl.[5] F16B *39/02*
U.S. Cl. 411—82 **5 Claims**



1. A screw anchoring device for aperture sealing attachment with an apertured panel to confine insulating material foamed in place between the panel and an attached spaced wall or other structure comprising:

a plate member having corners and a generally flat portion lying in a plane with a central aperture forming a helical screw receiving impression, a pair of upstanding tabs projecting from one face of the generally flat portion of said plate member at opposite sides of and adjacent to said

VOL
1114
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screw impression, said plate member having a raised portion formed from the plate member at the corners and along each of two opposite edges of said flat portion of said plate member, said raised portions each being convexly curved upwardly from the plane of the flat portion and from the face opposite from the face with the upstanding tabs and having the corners of the plate member semispherical shaped, and

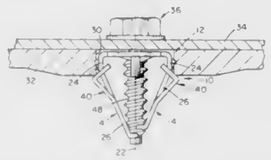
a continuous pad of a material capable of being penetrated by a screw and having an exposable adhesive surface substantially covering and carried by the plate member with the tabs projecting for entry into the panel aperture and through said pad and having the adhesive surface of the pad extending across the panel aperture for mounting and sealing adherence to the adjacent panel surface to prevent egress of trapped insulating material through the panel aperture, said screw impression being in position for threaded engagement with a screw passed through the panel aperture and the pad for attachment of a utility component to the opposite panel surface.

4,925,351

PUSH-IN FASTENER CLIP

Charles K. Fisher, Belford, N.J., assignor to TRW, Inc., Cleveland, Ohio

Filed Mar. 21, 1989, Ser. No. 326,312
Int. Cl.[5] F16B *37/04*
U.S. Cl. 411—182 **3 Claims**



1. A fastener clip for installation in an aperture in a first workpiece to provide a threaded opening for receiving the shank of an associated elongated threaded fastener; said fastener clip comprising a head portion having a threaded opening to receive the shank of the threaded fastener and a peripheral shape such as to prevent its passage through the aperture in the first workpiece;

a pair of spaced resilient legs extending outwardly from one face of said head portion on opposite sides of said threaded opening and terminating in free end portions adapted to engage the threaded fastener when said threaded fastener is installed in said opening;

each said leg carrying a pair of resilient elongated tabs which are joined to the respective leg at a location between said head and said free end portions, each tab comprising a first section bent outwardly and extending in a direction away from the free end of the leg portion on which it is carried and a terminal end section which is bent inwardly and extends generally toward said head portion; and

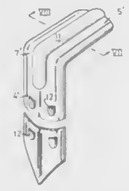
each leg further including a short finger bent radially outwardly at a location laterally intermediate the associated pair of tabs and axially between said head portion and said tabs, each said finger extending radially outwardly a distance greater than the width of the workpiece aperture for engaging the walls of the workpiece aperture irrespective of the presence or absence of said threaded fastener in said opening.

4,925,352

SHEET NAILS IN STRIPS

Ingvar Sundberg, Huddinge, Sweden, assignor to Nordisk Kartro AB, Farsta, Sweden

PCT No. PCT/SE86/00395, § 371 Date May 14, 1987, § 102(e) Date May 14, 1987, PCT Pub. No. WO87/02105, PCT Pub. Date Apr. 9, 1987
PCT Filed Sep. 8, 1986, Ser. No. 53,829
Claims priority, application Sweden, Oct. 2, 1985, 8504557
Int. Cl.[5] F16B *15/08*
U.S. Cl. 411—443 **1 Claim**



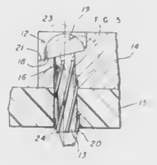
1. Sheet metal nails (2) linked side-by-side with each other in a metal strip (1), the nails being parallel to each other and extending at an angle to the longitudinal direction of the strip from one lateral edge of the strip to the other opposite lateral edge thereof, each sheet nail (2) having a profiled nail shank (4) having at one end a head (5), the nail end remote from the head having a penetration portion with at least one point, a transitional portion between the profiled shank (4) and the nail head (5'), wherein the transitional portion is a relatively gently curved portion (7') with a non-linear transverse cross-sectional profile, the head having also a non-linear transverse cross-sectional profile and being no wider than the shank, the profiling of the nail shank (4'), the curved portion (7') and the head (5') being such that these portions have substantially the same non-linear cross-sectional profile shape, the sheet metal in the nail being of substantially uniform thickness, and wherein at least the nail head (5') and said curved portion (7') have a longitudinal midportion in the form of a superimposed arcuate profile (11') whose cross section is arcuate, and portions on opposite sides of said midportion whose cross section is also arcuate but of a radius of curvature greater than the radius of curvature of said cross section of said longitudinal midportion.

4,925,353

DRIVE FASTENING SYSTEM

Michael N. Perugini, Southington, Conn., assignor to Litton Systems, Inc., Watertown, Conn.

Continuation-in-part of Ser. No. 54,957, May 28, 1987, abandoned. This application May 25, 1988, Ser. No. 201,253
Int. Cl.[5] F16B *15/08*
U.S. Cl. 411—453 **43 Claims**



1. A fastening system securing an article to a base with a drive fastener comprising:

an aperture formed in the article;

a drive fastener having an elongated splined body and an enlarged head, said head having a bearing surface formed on the underside thereof; and

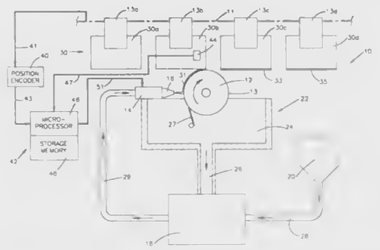
a planar reaction surface on the article which is nonperpendicular to the axis of the aperture, adjacent the aperture, and adapted to contact the bearing surface of the fastener head, said reaction surface causing said fastener head to tilt relative to the axis of the aperture and causing the body of the splined fastener to deform when it is fully driven into the article, whereby the retention force of the splined fastener is increased.

4,925,354

APPARATUS AND METHOD FOR APPLYING ADHESIVE TO BOOKS

Kevin L. Cote, Dayton, Ohio, assignor to AM International Incorporated, Chicago, Ill.

Filed Oct. 10, 1989, Ser. No. 419,014
Int. Cl.[5] B42C *9/00*
U.S. Cl. 412—8 **18 Claims**



1. An apparatus comprising:

means for moving books in a spaced apart relationship along a predetermined path along which each book receives a length of adhesive;

a roller rotatable about its longitudinal central axis and having an outer cylindrical surface for receiving lengths of adhesive;

means for supporting said roller so that said outer surface of said roller rotates in said predetermined path; and

a glue gun for applying adhesive to said outer surface of said roller;

means for controlling said glue gun to apply adhesive to said outer surface of said roller, the adhesive being applied to said outer surface of said roller being of lengths equal to lengths of adhesive to be applied to the books, the lengths of adhesive being spaced apart by nonadhesive lengths, a nonadhesive length being equal to the spacing between adjacent lengths of adhesive on the books, the adhesive being transferred from said outer surface of said roller to a book when the book moves along said predetermined path and into contact with said adhesive on said roller.

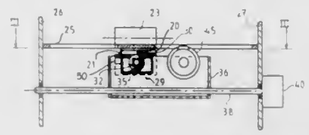
4,925,355

APPARATUS FOR BINDING A STACK OF SHEETS ALONG ONE PERIPHERAL SIDE

Pals G. Faber, Venlo; Stefanus P. E. A. Hermans, Steyl, and Gert Vegter, Baarlo, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Nov. 30, 1988, Ser. No. 277,856
Claims priority, application Netherlands, Dec. 7, 1987, 8702938
Int. Cl.[5] B42C *13/00*
U.S. Cl. 412—37 **5 Claims**

1. In apparatus for binding a stack of sheets along one peripheral side by means of a strip of binder material having a heat activated layer of glue, comprising a supply station for a web of binder material, a binder station, conveyor means for conveying said binder material from said supply station to said binder station, and a cutting device for cutting off a strip of binder material of the required length, the improvement in combination therewith comprising a selectively activated removal means for at least partially removing a layer of glue in a zone over the complete width of said binder material, and



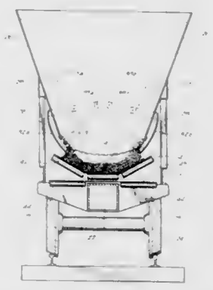
control means for temporarily activating said removal means with an interval related to the required length of said strip of binder material.

4,925,356

SELF-UNLOADING TRAIN FOR BULK COMMODITIES

Edwin D. Snead, and William B. Snead, both of P.O. Box 1000, Georgetown, Tex. 78626

Continuation of Ser. No. 47,005, May 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 741,695, Jun. 6, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 296,346
Int. Cl.[5] B61D *7/00;* **B65G** *21/00, 67/24*
U.S. Cl. 414—339 **27 Claims**



1. A self-unloading train for the transfer of bulk commodities comprising:

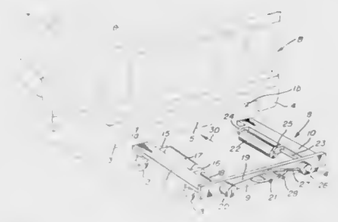
a plurality of hopper cars coupled together to form a train, each of said hopper cars including at least one hopper having side walls inclined at least seventy degrees from the horizontal and nearly vertical end walls, and a bottom discharge opening having a width of least fifty percent of a distance between wheels of said hopper cars to effect discharge of all material from said opening by gravity;

a train conveyor comprising an endless belt supported on said cars underlying said hopper discharge openings to receive material discharged therefrom and extending a length of said plurality of hopper cars, said train conveyor having a width greater than the width of said discharge openings; and

gate means positioned at the discharge opening of said hoppers, said gate means being operable selectively to discharge material from said hopper onto said train conveyor.

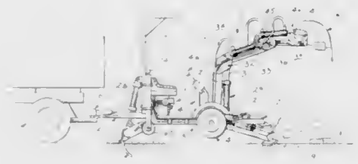
VOL 1114 ISS 3 MY 15 1990 UMI

4,925,357
LOAD TRANSPORT DOLLY
Andrew J. Cisternino, Marietta, and William S. Spamer, Roswell, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Apr. 17, 1989, Ser. No. 338,745
Int. Cl.[5] B65G *67/04*
U.S. Cl. 414—495 7 Claims



1. A dolly comprising a unitary frame including a U-shaped bight portion with a pair of parallel prongs, a plurality of casters mounted on said frame and engageable with a supporting surface to accommodate low friction movement of the dolly along said supporting surface, said frame and casters being adapted for insertion underneath a part of a load to be transported, and elevating means having a pair of cylindrical elongated elements each having an integral off center shaft rotatably mounted respectively on a pair of studs rigidly secured to an inner surface of each of said prongs and having an initial position in spaced relation below said part of said load an movable to an operated position of uplifting engagement with said part of said load whereby said load is moved upwardly away from said supporting surface and means for rotating said shafts.

4,925,358
TRAILERABLE EARTH DIGGING APPARATUS
Paul J. Cook, New Berlin, Wis., assignor to Spancrete Machinery Corporation, Milwaukee, Wis.
Continuation of Ser. No. 931,921, Nov. 14, 1986, abandoned, which is a continuation of Ser. No. 610,349, May 15, 1984, abandoned. This application Nov. 12, 1987, Ser. No. 122,544
Int. Cl.[5] E02F *3/00*
U.S. Cl. 414—685 12 Claims



1. A self-contained trailerable back-hoe apparatus adapted for direct over-the-road trailering by an automobile-type vehicle, comprising
a support frame having a front trailering hitch means,
a wheel assembly affixed to the frame and including back wheel means including laterally spaced rotating back wheels having an axis extending transversely of the front to back of the frame and supporting the back-hoe as a two-wheel trailer unit for over-the-road trailering at normal over-the-road speeds, said wheel assembly including laterally spaced front wheel means secured to the support frame forwardly of said rotating wheels and located above ground level during over-the-road travel and located to support the frame with the frame detached from the vehicle,
a three point dig-stabilizing means connected to said frame and including first and second individual support means secured in laterally spaced relation to the frame to the back of said wheel assembly and a third individual support means secured to the frame to the front of said wheel assembly and located centrally of said pair of individual support means, said stabilizing means including powered means connected between the frame and each of said individual support means for moving the support means between a raised transport position and a lowered ground-engaging digging position, said third support means having a lower cutting edge for forcing the third support means into the adjacent ground and projecting downwardly and rearwardly of the frame, and establishing a horizontal holding force opposing the horizontal and vertical forces of the bucket for digging,
a vertical pivot support secured to said frame rearwardly of said wheel assembly,
an articulated back-hoe digging arm assembly rotatably mounted on said vertical pivot support, a bucket secured to the outer end of said arm assembly, said arm assembly having a position to establish a balanced loading on the frame about said laterally spaced back wheels to permit convenient moving of the apparatus on-site, power means connected to said arm assembly for pivoting said arm assembly about said vertical support, said arm assembly including a plurality of articulated arm members adapted to be selectively extended and contracted and to selectively place said bucket in ground engagement for digging with said three point stabilizing means in ground engagement and for moving the apparatus with said frame supported by said wheel assembly, said apparatus being movable substantially directly perpendicular to the front to back of said frame by manipulation of said arm assembly and bucket with selective engagement of the bucket with the ground and by rotating said arm assembly about said vertical pivot support, and
bucket control powered means connected to said frame and to said arm assembly and connected to said arm members for positioning said bucket and said arm assembly and said arm members.

4,925,359
QUADFLEX BUCKET APPARATUS
Garry W. Dunnegan, 1310 E. Gretchen, Wichita, Kans. 67206
Continuation-in-part of Ser. No. 886,877, Jul. 18, 1986, abandoned. This application May 2, 1988, Ser. No. 189,217
Int. Cl.[5] E02F *3/04*
U.S. Cl. 414—722 12 Claims



1. A quadflex bucket apparatus operable to grasp and lift loose piles of material comprising
a lower jaw assembly having an upper part and a lower part, said lower jaw assembly having a plurality of lower horizontal support members and a plurality of lower vertical splines secured to said lower horizontal support members, said lower jaw assembly comprising a pair of outer lower box means with each lower box means defining a pair of parallel lower plates, one of said parallel plates in each pair being an outermost lower plate defining a side of the lower jaw assembly;
at least two finger members pivotally coupled to said lower vertical splines in the lower part of said lower jaw assembly;
a middle jaw assembly pivotally secured to the lower jaw assembly and comprising a plurality of intermediate horizontal support members and a plurality of intermediate vertical splines connected to the plurality of intermediate horizontal support members;
an upper jaw assembly pivotally secured to the middle jaw assembly and comprising a plurality of upper horizontal support members and a plurality of upper vertical splines connected to the plurality of upper horizontal support members;
a pair of first cylinder means pivotally secured to said upper part of said lower jaw assembly and to said middle jaw assembly; and
a pair of second cylinder means pivotally secured to said middle jaw assembly and to said upper jaw assembly.

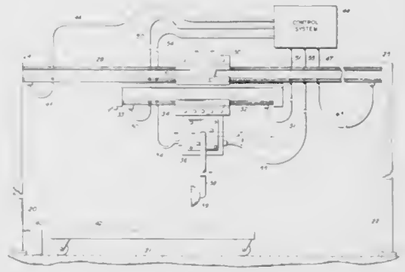
4,925,360
INDUSTRIAL ROBOT
Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Dec. 8, 1988, Ser. No. 281,398
Claims priority, application Japan, Dec. 10, 1987, 62-312519
Int. Cl.[5] B25J *19/00*
U.S. Cl. 414—730 8 Claims



1. An industrial robot having a hand operated through a point locus, said industrial robot comprising:
an arm;
a base body connected to said arm;
a base plate, the hand being mounted on said base plate;
a planarly displaceable coupling between said base plate and said base body, said planarly displaceable coupling connecting said base plate to said base body and substantially restricting sliding displacement of said base plate relative to said base body to movement within a plane;
detector means for detecting the coordinates of a position of said base plate and for obtaining an amount of slide displacement of the position of said base plate with respect to an initial reference position; and
correcting means for correcting the locus points by the amount of slide displacement.

4,925,361
METHOD FOR HANDLING SHEET MATERIAL
Benny J. Ellis, Gilbert, and Kurt H. Daniels, Higley, both of Ariz., assignors to Western Insulated Glass Company, Phoenix, Ariz.
Filed Dec. 15, 1988, Ser. No. 285,789
Int. Cl.[5] B65H *3/08*
U.S. Cl. 414—786 2 Claims

1. A method for transferring rigid, rectangular, flat sheets of glass from a substantially vertical storage position to a horizontal position includes the steps of:
storing a stack of sheets glass against an inclined surface such that the bottom of each sheet is located forward of the top thereof to cause the plane of the sheets to tilt a few degrees past vertical on one side of a vertical plane through the bottom of the top sheet of the stack;
engaging the top sheet of the stack near its top by means of a vacuum cup on a pivoted arm, the pivot point of which is located above the top of the sheets;



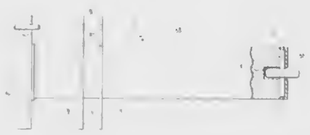
moving the top of such top sheet forward by moving the vacuum cup and arm away from the stack of sheets to pivot such top sheet about the bottom thereof a predetermined number of degrees past vertical on the other side of said vertical plane;
releasing the sheet to permit it to free fall to a horizontal position, pivoting about the bottom thereof; and
catching the sheet on a horizontal surface located in a plane substantially the same as the plane of the bottoms of the sheets in the stack in the storage position.

4,925,362
FEEDING MECHANISM
Roman M. Golicz, Clinton, Conn., assignor to GBR Systems Corporation, Chester, Conn.
Division of Ser. No. 878,642, Jun. 26, 1986, Pat. No. 4,799,663. This application Aug. 31, 1988, Ser. No. 238,414
Int. Cl.[5] B65H *29/12*
U.S. Cl. 414—790.7 3 Claims

1. A stop mechanism for a sheet stack-forming and feeding mechanism said sheet stack-forming mechanism comprising means for accumulating sheets in a stack between front and rear stop means, said front and rear stop means being substantially parallel to each other and perpendicular to the plane of the stack, said front stop means comprising stack stopping and stack releasing means incorporated therein, said stack releasing means comprise means for moving the front stop means away from the stack and means for moving the stack forward in a plane parallel to the plane of the stack, and means for moving the front stack means away from the front of the stack to permit the stack to move forward.

VOL
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4,925,363
BLADE RING ROLLOUT ROLLER
James R. Brown, Idaho Falls, Id., and Rick A. Olson, Apopka, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 13, 1989, Ser. No. 309,748
Int. Cl.[5] F04D *29/60*
U.S. Cl. 415—129 21 Claims



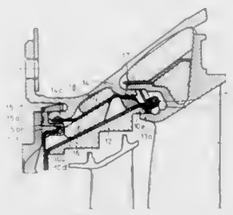
1. In a rotary machine which includes an inner casing structure having an outer peripheral surface portion of circular cross-section, an outer casing structure having an inner peripheral surface portion of circular cross-section, wherein the inner casing is received in the outer casing with its outer surface portion in mating relation with the inner surface portion, and wherein the outer and inner casings are each divided into upper and lower halves thereof respectively removably joined to each other, the lower half of the outer casing having one or more pairs of apertures bored radially therethrough, improved means for rollably supporting the inner casing in the outer casing comprising in combination therewith:
a shaft portion of substantially cylindrical cross-section adapted to be slidingly engaged within each of the apertures;
a roller bearing attached to an end of each said shaft portion, said end being adapted to be inserted in the aperture for abutment of said roller bearing to the outer peripheral surface of the inner casing;
(one or more shims engagable upon each said shaft portion to adjustably position each said roller bearing with respect to the outer peripheral surface of the inner casing; and
means for attaching each said shaft portion with its respective roller bearing positioned by said shims.

4,925,364
ADJUSTABLE SPACER
Ranjan Das, Hobe Sound, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 21, 1988, Ser. No. 287,353
Int. Cl.[5] F04D *29/60*
U.S. Cl. 415—150 7 Claims



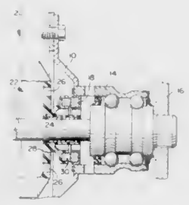
1. An adjustable spacer for maintaining a minimum normal displacement between a first member and a relatively flat surface disposed in a second member, comprising:
a cylindrical barrel having a threaded axial passage disposed therein, further having an external flange disposed about one end thereof, the barrel received within a close fitting hole disposed through the first member with the flanged end of the barrel engaging an annular shoulder within said hole,
an adjustable nut, disposed within the threaded passage and including an externally threaded surface engaged therewith, further including the first end projecting past the flanged end of the barrel and a second end projecting past the other end of the barrel opposite the flanged end thereof, a pad bolt, including a flattened pad end, for contacting the relatively flat surface, and a rod portion extending perpendicular to the flat surface and through the central passage in the adjusting nut, said bolt portion including an externally threaded portion at the end thereof opposite the pad end, and
a lock nut, having internal threads engaging the threaded portion of the pad bolt, said pad bolt contacting the first end of the adjusting nut when the lock nut is engaged securely against the second end of the adjusting nut.

4,925,365
TURBINE STATOR RING ASSEMBLY
Francois E. G. Crozet, Yerres, and Jean-Luc Soupizon, Vaux Le Penil, both of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "SNECMA", Paris, France
Filed Aug. 15, 1989, Ser. No. 393,796
Claims priority, application France, Aug. 18, 1988, 88 10977
Int. Cl.[5] F01D *11/02*; F04D *29/54*
U.S. Cl. 415—173.6 4 Claims



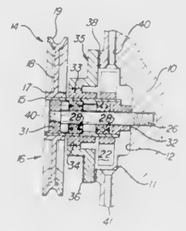
1. In a turbine stator ring assembly for mounting within a turbine casing
a plurality of sections built up to form the ring, each section comprising
a first sheet metal portion extending generally axially of the turbine and having a downstream edge portion and an upstream edge portion,
abradable sealing material supported by said first portion, and
a second sheet metal portion extending generally radially of the turbine and having a radially outer edge portion,
the radially inner edge portion of the second sheet metal portion being rigid with the upstream edge portion of the first sheet metal portion, and
a support ring of generally S-section defining a radially outer groove arranged to co-operate with a part of the turbine casing, and the radially outer edge portion of the second sheet metal portion co-operating with the support ring.

4,925,366
COMBINED COOLANT PUMP IMPELLER AND SEAL ASSEMBLY
Ronald L. Dorski, Marblehead, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 3, 1989, Ser. No. 375,152
Int. Cl.[5] F04D *29/12*
U.S. Cl. 415—174.3 2 Claims



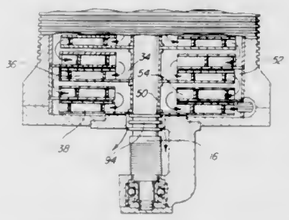
1. A combined impeller and seal assembly for use in an automotive coolant pump of the type having a liquid filled pump housing and a rotatable pump shaft extending coaxially through said housing, said housing further including a stationary seal face concentric to said shaft, comprising,
a pump impeller adapted to be fixed to said shaft, said impeller being molded of a partially resilient plastic material and further including a flexible seal mount molded integrally with said impeller and generally coaxial to said stationary seal face in its free state, and,
a rotatable seal face fixed to said flexible seal mount axially opposed to said stationary seal face, so as to be engageable therewith.
whereby, when said impeller is fixed to said shaft, it can be moved axially toward said stationary seal face until contact is made with said rotatable seal face and said flexible seal mount is axially deflected and compressed from its free state, thereby resiliently maintaining a pressurized sealing contact at the interface between said stationary and rotatable seal faces sufficient by itself to seal said liquid within said pump housing.

4,925,367
ENGINE BLOCK WATER PUMP ASSEMBLY
Joseph Paliwoda, West Bloomfield; Keith F. Hale, and Verle Propst, both of Rochester Hills, all of Mich., assignors to Deco-Grand, Inc., Royal Oak, Mich.
Filed May 19, 1989, Ser. No. 354,234
Int. Cl.[5] F01P *5/12*
U.S. Cl. 415—213.1 14 Claims



1. A vehicle engine water pump assembly comprising:
an engine block having a cavity formed in an external. exposed, block surface, with the cavity opening outwardly of the block surface and being defined by a peripheral wall surface and a base surface within the block;
a pump having a rotatable shaft with an impeller mounted at one end of the shaft and a drive wheel mounted at the other end of the shaft so that rotation of the drive wheel rotates the impeller therewith, said shaft being formed as a hollow tube;
a rigid rod extending through the tube and rotatably supporting the tube, with the rod having an end portion which extends through the cavity base surface and is rigidly secured to the engine block;
at least a portion of said impeller and the shaft portion upon which the impeller is mounted being located in the block cavity; the remainder of the shaft extending outwardly of the cavity opening, with the drive wheel being located outside of the cavity and adjacent the block surface;
a cover having a central opening through which the shaft extends, with the cover closing the cavity opening and being sealed to the block surface around the cavity opening;
sealing means for rotatably sealing the shaft to the cover;
whereby the engine block cavity defining wall and base surface together with the cover from a sealed housing for the water pump.

4,925,368
TURBO-COMPRESSOR HAVING AIR-COOLED BEARING
Denis W. Toth, Pontiac, Mich., assignor to Can-Am Engineered Products, Inc., Livonia, Mich.
Continuation-in-part of Ser. No. 67,305, Jun. 29, 1987, Pat. No. 4,780,056. This application Jun. 20, 1988, Ser. No. 208,590
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[5] F04B *39/00*; F04D *29/04*
U.S. Cl. 415—180 10 Claims



1. A turbo-compressor air supply system which supplies air to a paint spray system at an elevated pressure, the turbo-compressor includes a housing, a rotatable vertically-disposed drive shaft centrally disposed within the housing, a bearing housing which houses a concentrically disposed bearing, the drive shaft including a series of flanges disposed below the housing, the system comprising:
(a) a rotatable section centrally disposed about the shaft, the section including a first rotor and a second rotor, each rotor having a central passage for mounting about the shaft, each rotor having an air-inlet side and an air-outlet side, each rotor comprising a first series of blades spirally arrayed about the central passage, the first series of blades being sandwiched between a first pair of plates, the rotors being rotatably driven in the same direction as the shaft as the air is directed onto the blades, and the rotors being coaxial with the shaft, and the rotatable section also including a tubular sleeve which mounted about the shaft, the tubular sleeve separating the rotor, and the tubular sleeve being rotatable with the rotors and the shaft in the same direction as the rotors and the shaft, the air being expelled from the second rotor and circulated through the paint spray gun; and
(b) a stationary section centrally disposed about the shaft,

VOL
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the stationary section including a first stator, the stator having a central passage for mounting about the shaft, the stator comprising a series of vanes spirally arrayed around the stator central passage, the stator vanes being sandwiched between a pair of stator plates, the stator being coaxial with the shaft, the vanes of the stationary section guiding the air leaving the air-outlet side of the first rotor to the air-inlet side of the second rotor;

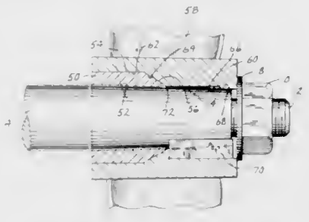
whereby, some of the circulated air being expelled from the turbo-compressor is diverted through the flanges on the drive shaft and across the plane bearing.

4,925,369

EASILY REMOVED MARINE PROPELLER

Ronald M. Steiner; Roger E. Koepsel, both of Oshkosh; Hubert S. Gilgenbach, Butte des Morts, and Terence C. Reinke, Oshkosh, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 28, 1987, Ser. No. 114,459
Int. Cl.[5] B63H *1/20*
U.S. Cl. 416—204 R 4 Claims



1. A marine drive comprising a propeller shaft having a tapered outer diameter, a thrust collar around said propeller shaft, said collar having a tapered nonthreaded inner diameter substantially matching and fitting around said propeller shaft and in flush contact therewith, said collar having a forward section of given outer diameter and a rearward section of tapered outer diameter which taper is substantially steeper than the taper of said inner diameter of said collar and said outer diameter of said propeller shaft, said forward and rearward sections of said collar forming a knee at an obtuse angle, a propeller hub received around said collar and said propeller shaft, said propeller hub having a forward enlarged inner diameter section engaging said outer diameter of said forward section of said collar, said propeller hub having a forward tapered inner diameter section of said substantially steeper taper engaging said outer diameter of said rearward section of said collar, said propeller hub having a rearward tapered inner diameter section substantially matching and fitting around said propeller shaft and in flush contact therewith, said forward enlarged inner diameter section and said forward tapered inner diameter section of said propeller hub forming a receiving knee at an obtuse angle substantially the same as said first mentioned obtuse angle and receiving said first mentioned knee.

4,925,370

ELECTRIC MOTOR DRIVEN PUMP WITH AN AUTOMATIC TRANSMISSION

Domenic A. Tallarita, 1302 Fremont St., Anaheim, Calif. 92804

Filed Dec. 9, 1988, Ser. No. 282,392
Int. Cl.[5] F04B *49/00*
U.S. Cl. 417—15 10 Claims

1. A portable pumping system, comprising:

a portable support structure;

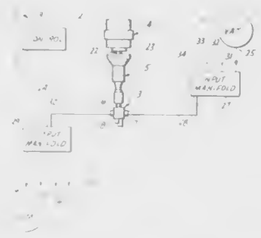
a pump mounted on the portable support structure for pumping a liquid;

a motor mounted on the portable support structure for driving the pump;

input means mounted on the portable support structure for connecting the pump to an input line;

output means mounted on the portable support structure for connecting the pump to an output line;

means defining an automatic transmission having a plurality of continuous ranges of operation that is operatively connected between the motor and the pump for coupling the pump to the motor so that the speed at which the pump is driven varies automatically over a selected one of the plurality of continuous ranges of operation of the automatic transmission according to the load the liquid imposes; and



control means operatively connected to the automatic transmission for enabling an operator to select a desired one of the plurality of continuous ranges of operation of the automatic transmission;

wherein:

the pump includes an inlet and an outlet;

the input means includes an input manifold having a plurality of differently sized inputs connected in fluid communication with the inlet of the pump; and

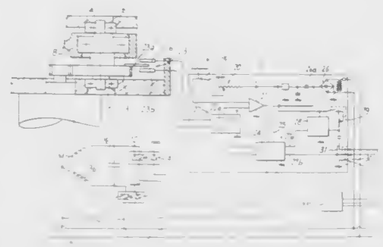
the output means includes an output manifold having a plurality of differently sized outlets connected in fluid communication with the outlet of the pump.

4,925,371

FLOW RATE CONTROL FOR A VARIABLE STROKE PUMP

André R. Griesmar, Alizay, France, assignor to Dosapro Milton Roy, France

Filed Dec. 14, 1988, Ser. No. 284,630
Claims priority, application France, Dec. 17, 1987, 87 17635
Int. Cl.[5] F04B *49/02*
U.S. Cl. 417—18 9 Claims



1. A system for controlling the throughput of a metering pump, the pump including a pumping member driven by a transmission member for converting rotary motion of a reversible drive motor into reciprocating motion of the pumping member, the system comprising means for adjusting the amplitude of the reciprocating motion and means for adjusting the

period of said motion, wherein the means for adjusting the amplitude of said reciprocating motion comprise:

an optical encoder constrained to rotate with a rotary component of the transmission member driven by the motor for emitting a plurality of pulses with the number of emitted pulses being converted into an analog value which is a function of the value of the amplitude of the displacement;

a comparator for comparing said analog value with an adjustable reference value and for emitting an output signal when the compared values are equal; and

an electronic control circuit for receiving the signal emitted by the comparator at an input, and responding to said signal firstly by switching over the power supply to the motor in order to reverse its direction of rotation, and secondly by activating a counter for counting pulses of the A.C. power supply to the motor, said counter being reset to zero each time a pulse is emitted by the optical encoder, said encoder including an inactive range in the vicinity of the origin position during which no pulses are emitted, the counter sending a signal to the electronic circuit when its pulse count is equal to a reference value, with the electronic circuit responding thereto by switching off the power supply to the motor;

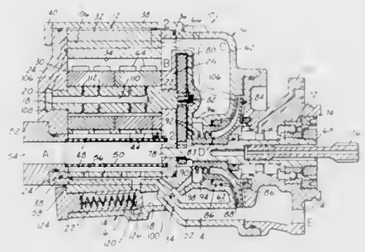
and wherein the means for adjusting the period of the motion are constituted by a pulse generator for sending pulses to the electronic circuit which responds thereto by powering the motor so as to move the transmission member away from said origin position.

4,925,372

POWER TRANSMISSION

Lowell D. Hansen, Jackson, Miss., assignor to Vickers, Incorporated, Troy, Mich.

Filed Apr. 7, 1989, Ser. No. 334,502
Int. Cl.[5] F04B *49/08*
U.S. Cl. 417—310 7 Claims



5. A fuel pump for aircraft turbine engines and like applications having a predetermined net liquid fuel fluid flow requirement and being adapted to operate at a predetermined maximum vapor/liquid inlet ratio without cavitation, said pump comprising a positive displacement vane pump that includes:

a housing,

a rotor mounted for rotation within said housing and having a plurality of radially extending peripheral slots,

a plurality of vanes individually slidably disposed in said slots,

means forming a cam ring within said housing radially surrounding said rotor and having a radially inwardly facing vane track defining at least one arcuate fluid pressure cavity between said rotor and said cam ring,

a fluid inlet in said housing including a first fluid inlet port opening into said cavity at a leading circumferential edge thereof with respect to direction of rotation of said rotor within said housing,

a fluid outlet in said housing including a fluid outlet port opening into said cavity adjacent to a trailing circumferential edge thereof with respect to said direction,

a second fluid inlet port opening into said cavity circumferentially between said first inlet port and said outlet port,

means directly connecting said second inlet port to said outlet port such that fluid at outlet pressure is available at said second inlet port,

a pressurization valve having a predetermined threshold pressure for permitting flow of fluid therethrough, and

means in said housing for feeding fluid from said outlet port through said pressurization valve to said first inlet port,

displacement of said pump cavity being such as to exceed said flow requirements at said maximum ratio, and said threshold pressure being such that fluid pressure at said second inlet port is sufficient to reabsorb inlet vapor available at said first inlet port at atmospheric pressure and at said maximum ratio.

4,925,373

LUBRICATION PUMP

Peter D. Moate, Hartley, England, assignor to Interlube Systems Limited, Devon, England

Filed Jun. 9, 1988, Ser. No. 204,596
Claims priority, application United Kingdom, Jun. 9, 1987, 8713438
Int. Cl.[5] F04B *35/00*
U.S. Cl. 417—372 8 Claims



1. A lubrication pump including a reservoir for a supply of lubricant, a pump motor situated within the reservoir, and a thermally-conducting heat distributor mounted in thermal communication with the motor and extending outwardly beyond the motor in the region of the bottom of the reservoir to distribute heat produced by operation of the motor to a region of the reservoir spaced from the motor.

4,925,374

DOWN HOLE HYDRAULICALLY ACTUATED PUMP

Donald E. Carrens, 5912 S. Richmond, Tulsa, Okla. 74135

Filed Jan. 9, 1989, Ser. No. 294,807
Int. Cl.[5] F04B *47/08*
U.S. Cl. 417—403 18 Claims

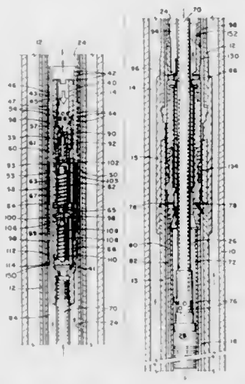
1. A hydraulic power fluid actuated engine for reciprocating an oil well pump, said pump having a reciprocable pump piston, said engine comprising:

an engine cylinder;

a power piston reciprocably received within said cylinder, said piston having an upstroke exhaust flow passageway and lower valve seat, said upstroke exhaust flow passageway capable of communicating power fluid to below said power piston;

a reciprocable reversing valve means having a lower valve

surface near a bottom end to close the flow of power fluid through said upstroke exhaust flow passageway; and



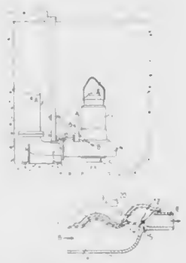
a valve lifter reciprocably positioned below said reversing valve, said lifter having means to impart a slight rotation during reciprocation thereof.

4,925,375

DEVICE FOR AUTOMATIC CIRCULATION IN A WASTE WATER PUMP STATION

Valdemar Carlsson, Solna, Sweden, assignor to Flygt AB, Solna, Sweden

Filed Jun. 22, 1989, Ser. No. 369,786
Claims priority, application Sweden, Sep. 13, 1988, 8803213-1
Int. Cl.[5] F04B *21/00*
U.S. Cl. 417—430 **12 Claims**



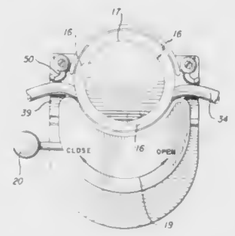
1. In a pumping station containing a submersible pump unit and a valve device which during a limited time period, connects the pressure side of the pump with the pump station for circulation of the pumped medium, said valve device (**6**) comprising a pipe formed part (**7**) with an inlet and an outlet nozzle, the part (**7**) having a first section area (**9**) and a second section area (**10**), said first and second section area being different and positioned between the inlet and outlet nozzles; and first closing means (**11**) and second closing means (**12**) which are respectively arranged within said first and second section areas to entirely or partly close the respective section area (**9**) and section area (**1**), said first closing means (**11**) and second closing means (**12**) communicating and cooperating such that when the section area (**9**) is open, the section area (**10**) is closed, and when the section area (**10**) is opened, the section area (**9**) is partly closed.

4,925,376

PERISTALTIC PUMP WITH TUBE HOLDING MECHANISM

William F. Kahler, Johns Island, S.C., assignor to Tek-Aids, Inc., Charleston, S.C.

Continuation-in-part of Ser. No. 66,759, Jun. 26, 1987, Pat. No. 4,813,855. This application Jul. 11, 1988, Ser. No. 217,232
Int. Cl.[5] F04B *43/12*
U.S. Cl. 417—477 **9 Claims**



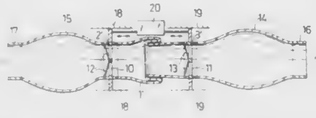
1. A peristaltic pump comprising: a housing, means for imparting rotational motion through a shaft to roller assembly means mounted on said housing for engaging and compressing a flexible tube to continuously displace fluid through said flexible tube, said flexible tube being held in contact with said roller assembly means by shoe means moveably mounted on said housing adjacent said roller assembly means and moveable cam means positioned on each side of said roller assembly means, said cam means comprising a shaft, a cam assembly rotatably mounted on said shaft, spring means engaging said cam assembly urging said cam assembly against said flexible tube, a second cam means connected to said shoe means moving said shoe means into a position of engagement with said tubing, said shoe means comprising a body defining an arcuate surface for contacting said flexible tube when moved to a position of engagement, said shoe means being adapted for displacement in one direction to engage a portion of said tube and hold it in engagement with said compressive roller assembly means or displacement in the other direction to disengage said tube from said roller assembly means and permit its removal from said pump.

4,925,377

PUMP

Jorge Inacio, Solna, and Erling Nilsson, Upplands Väsby, both of Sweden, assignors to Data Promeditech I.N.C. AB, Solna, Sweden

PCT No. PCT/SE86/00549, § 371 Date May 27, 1988, § 102(e) Date May 27, 1988, PCT Pub. No. WO87/03492, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 2, 1986, Ser. No. 199,260
Claims priority, application Sweden, Dec. 5, 1985, 8505753
Int. Cl.[5] F04B *43/00*
U.S. Cl. 417—472 **8 Claims**



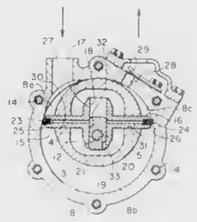
1. A blood pump for connection to the blood circulatory system of a living being, comprising a pump chamber having an inlet opening at one end and an outlet opening at the opposite end, a first non-return valve located in said pump chamber adjacent its inlet opening for permitting a blood flow solely in the direction into said pump chamber through said inlet opening, a second non-return valve located in said pump chamber adjacent said outlet opening for permitting a blood flow solely in the direction out from said pump chamber through said outlet opening, said first and second non-return valves being mutually spaced as seen in the direction of extension of said pump chamber between said inlet opening and said outlet opening and each of said first and second non-return valves being individually reciprocatingly movable in said direction of extension and the volume of said pump chamber enclosed between said first and second non-return valves being variable and commensurate with the mutual spacing of said first and second non-return valves in said direction of extension, and individual controllable drive means for reciprocatingly moving said first and second non-return valve means, respectively, independently of one another in accordance with a controllable and variable pattern of mutual displacement, whereby blood can be pumped from said inlet opening to said outlet opening with a net flow variable in a controlled manner down to substantially zero without creation of a complete standstill of the blood in the pump and without creation of a sub-pressure at the inlet opening.

4,925,378

ROTARY VANE COMPRESSOR WITH VALVE CONTROLLED PRESSURE BIASED SEALING MEANS

Kenichi Ushiku, Ibaraki, and Akira Tezuka, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,891
Claims priority, application Japan, Nov. 16, 1987, 62-287320; Dec. 21, 1987, 62-321290
Int. Cl.[5] F04C *18/344, 27/00*
U.S. Cl. 418—148 **9 Claims**



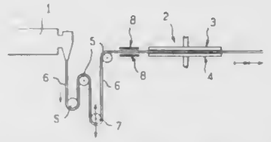
1. A rotary vane compressor comprising:
a cylinder,
a rotor rotatably mounted within the said cylinder and cooperating with an inner peripheral surface of said cylinder to define a compression chamber therebetween,
two side plates means for respectively closing opposite ends of said cylinder,
at least one pair of vanes slidably mounted on said rotor for movement radially toward and away from the rotor through an outer peripheral surface of the rotor and dividing said compression chamber into a plurality of compression spaces, said vanes being integrally interconnected and including a slide groove therebetween,
a slider slidably received in said slide groove,
sealing means provided on forward ends of said vanes for slidably engaging with the inner peripheral surface of said cylinder,
communication means for introducing pressure in a central portion of said rotor, said pressure being applied to a rear portion of said sealing means, and
valve means for controlling opening and closing of said communication means in response to movement of said slider.

4,925,379

DEVICE FOR PRODUCING A PLASTIC SHEET OF HIGH OPTICAL QUALITY

Claude Bourelier, Paris, France, assignor to Saint-Gobain Vitrage "Les Miroirs", Courbevoie, France

Filed Nov. 14, 1988, Ser. No. 270,807
Claims priority, application France, Nov. 12, 1987, 87 15626
Int. Cl.[5] B29C *47/06, 47/88;* **B32B** *31/20*
U.S. Cl. 425—94 **5 Claims**



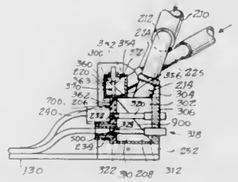
1. A device for producing a plastic sheet of high optical quality, said device comprising:
(a) an extruder for continuously extruding a plastic sheet;
(b) a press placed at fixed station downstream from said extruder, the working surfaces of said press being coated with an anti-adhering product that obtains optical quality on the plastic sheet, said press intermittently gripping the plastic sheet in use, whereby the movement of the plastic sheet downstream of said press is step-by-step;
(c) a heating means placed immediately upstream of said press for heating the plastic sheet to a temperature higher than the temperature of the softening point of the plastic sheet;
(d) a plurality of fixed rollers over which, in use, the plastic sheet is trained, said plurality of fixed rollers being located between said extruder and said heating means; and
(e) a waltzing roller located between said extruder and said heating means, said waltzing roller being vertically movable to maintain tension in the plastic sheet upstream of said press while said press is closed.

4,925,380

MULTICOLOR CONFECTION EXTRUSION SYSTEM

Robert J. Meisner, Hinsdale, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Oct. 20, 1986, Ser. No. 921,224
Int. Cl.[5] B29C *47/04;* **A23G** *3/04*
U.S. Cl. 425—131.1 **7 Claims**



1. A multi-orifice compound extrusion apparatus for extruding multicolored aerated confection strands comprising
confection pumping means for providing a first-colored pressurized, fluid, aerated confection blend of a first color at a temperature of at least about 120° F. and at a pressure in the range of at least about 30 psi, and for providing a second-colored pressurized, fluid, aerated confection blend of a second color different from said first color, at a temperature in the range of at least about 120° F. and at a pressure of at least about 30 psi,
first elongated diffusion chamber means for receiving said first-colored aerated, pressurized confection blend and for

VOL 1114 ISS 3 MY 15 1990 UMI

distributing said first-colored confection blend received therein along a first diffusion chamber zone having a width to length ratio of at least about 10,

first elongated extrusion chamber means for receiving said first-colored confection blend from said first elongated diffusion chamber means and for discharging said first-colored confection blend through a plurality of at least 10 separated extrusion ports,

a first elongated diffusion means positioned between said first elongated diffusion chamber means and said first elongated extrusion chamber means comprising a first elongated barrier sheet extending along the width of said first diffusion chamber means having one or more passageways therethrough of cross-sectional area along the length of said first barrier sheet varying as an inverse function of the pressure of the confection blend in said first diffusion chamber zone adjacent said first barrier sheet, for transmitting and equalizing the pressure distribution of said first-colored confection blend from said first elongated diffusion chamber means to said first elongated extrusion chamber means along the width of said first extrusion chamber means,

second elongated diffusion chamber means for receiving said second-colored aerated, pressured confection blend and distributing said second-colored confection blend received therein along a second diffusion chamber zone having a width to length ratio of at least about 10,

second elongated extrusion chamber means for receiving second-colored confection blend from said second elongated diffusion chamber means and for discharging said second-colored confection blend through each of said plurality of at least 10 separate extrusion ports separately from said first-colored confection blend,

a second elongated diffusion means positioned between said second elongated diffusion chamber means and said second elongated extrusion chamber means comprising a second elongated barrier sheet extending along the width of said second diffusion chamber means having one or more passageways therethrough of cross-sectional area along the length of said second barrier sheet varying as an inverse function of the pressure of the confection blend in said second diffusion chamber zone adjacent said second barrier sheet, for transmitting and equalizing the pressure distribution of said second-colored confection blend from said second elongated diffusion chamber means to said second elongated extrusion chamber means along the width of said second extrusion chamber means,

a plurality of at least 10 compound extrusion nozzles each positioned adjacent to one of said separate extrusion ports for receiving a stream of said first-colored confection blend and a stream of said second-colored confection blend discharged through each said port, for combining and forming said first-colored stream and said second-colored stream in each said nozzle into a single, multi-colored strand of predetermined cross-sectional shape without substantial blending of said first-colored and said second-colored streams, to provide a plurality of at least 10 multi-colored confection strands,

first-colored extrusion port valve means for individually adjusting the rate of flow of said first-colored aerated confection stream from said first elongated extrusion chamber through each said port, and

second-colored extrusion port valve means for individually adjusting the rate of flow of said second-colored aerated confection stream from said second elongated extrusion chamber through each said port to permit individual adjustment of the flow rate of each of the first-colored and the second-colored confection blend components of each of said plurality of confection strands.

4,925,381

MACHINE FOR PRESS-MOLDING THERMOPLASTIC RESIN

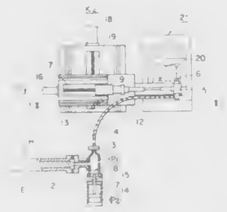
Kazuo Aoki, Chiba; Tsutomu Moteki, Sodegaura, and Kazuhiro Kimura, Ichihara, all of Japan, assignors to Chisso Corporation, Japan

Filed May 10, 1988, Ser. No. 192,348

Claims priority, application Japan, May 11, 1987, 62-113825

Int. Cl.[5] **B29C** *47/92, 45/02;* **B28B** *13/02*

U.S. Cl. 425—145 **13 Claims**



1. A machine for press-molding a plasticized resin extruded from a resin extruding machine and charged into a mold cavity of a mold comprising:

an accumulating means operatively connected to an outlet port of the extruding machine for accumulating the plasticized resin in an amount exceeding that required for one resin charging shot into a mold cavity;

means for supplying the accumulated resin from said accumulating means under a constant pressure;

means for measuring an amount of the supplied resin required for one molding operation under a regulated resin flow rate condition said measuring means comprising a rotary type volumetric meter for measuring the plasticized resin in accordance with the revolution number thereof;

means for charging the thus measured resin into a lower member of a mold cavity of a press-molding machine in an open state;

means for controlling operation of said measuring means;

means for controlling movement and operation of said measuring and charging means for charging the measured resin in predetermined portions into the mold cavity; and

means for clamping the mold halves after charging of the resin into the mold cavity.

4,925,382

ROLLER PRESS FOR COMPACTING FINE-GRAINED SALTS INTO SHEETS

Hans-Georg Bergendahl, Bochum; Kurt Zech, Unna, and Raimund Zisselmar, Erftstadt, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Koppern GmbH & Co. KG, Hattingen, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 223,224

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802173

Int. Cl.[5] **B30B** *11/18;* **B28B** *3/16*

U.S. Cl. 425—367 **13 Claims**

1. A roller press for compacting fine-grained chemical products, especially salts, into sheets, said roller press comprising:

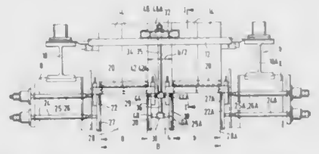
a press frame having upper and lower frame members;

two motor-driven roller bodies arranged side by side in said press frame and having parallel horizontal axes, the axial ends of said rollers being journaled for rotation in roller bearings in bearing housings, by means of which they are arranged between an upper and lower frame member, one of the rollers being displaceable with its bearing housing between said upper and lower frame member;

each roller body being provided with two profiled pressing surfaces, said two pressing surfaces being axially spaced on said roller bodies forming two roller nips, each roller body having radial shoulders at the axial ends of each of said pressing surfaces;

at least one screw feeder means being provided for each of said two pressing surfaces for feeding the fine-grained products into the roller nips of said two pressing surfaces;

inner and outer wedge-shaped wall elements having inner and outer surfaces, said wall elements closing the roller nips in the axial direction of said rollers on both ends of each of said pressing surfaces with said inner surfaces bearing against said radial shoulders, and means for applying pressure against said outer surfaces for causing said



wedge-shaped walls elements to bear against said radial shoulders;

said pressure applying means for said inner wedge-shaped wall elements bearing against shoulders between said two pressing surfaces facing each other comprising bars carried by said press frame arranged vertically in the space between said inner wedge-shaped walls elements and being vertically adjustable, said bars being provided with wedge-shaped surfaces adapted to contact corresponding wedge-shaped surfaces provided on said outsides of both of said inner wall elements, said bars causing said inner wedge-shaped wall elements to bear against said adjacent shoulders.

4,925,383

MACHINE FOR MANUFACTURING OF FLAT PRODUCTS

Bernt Jidell, Nyköping, Sweden, assignor to ABECE AB, Sweden

PCT No. PCT/SE87/00212, § 371 Date Jan. 13, 1989, § 102(e) Date Jan. 13, 1989, PCT Pub. No. WO87/06873, PCT Pub. Date Nov. 19, 1987

PCT Filed Apr. 24, 1987, Ser. No. 271,759

Claims priority, application Sweden, May 13, 1986, 86021565

Int. Cl.[5] **B28B** *5/02*

U.S. Cl. 425—453 **9 Claims**



1. A machine for manufacturing flat concrete products upon separate moulding trays which are moved in close succession from an inlet portion of the machine to an outlet portion of the machine, the machine comprising:

an endless conveyor comprising a pair of parallel and synchronously operated endless conveying chains, a front pair of rotating chain wheels located at the inlet portion, and a rear pair of rotating chain wheels located at the outlet portion, said pair of endless chains passing over said front and rear pair of chain wheels and an upper part of the chains being conveyed in a first direction from the inlet to the outlet;

a plurality of inter-connected bed plates for carrying the moulding trays in a predetermined position;

means for connecting a front part of each bed plate between the pair of endless conveyor chains such that a rear part of each bed plate is downwardly turnable as the front part passes over the pair of rear chain wheels;

a pair of carrying rollers located at the rear part of each bed plate;

means for guiding the carrying rollers during the downward turning of the rear part, said guiding means arranged between upper and lower parts of the conveying chains behind the rear wheels in the first conveying direction; and

a supporting track extending in a second conveying direction from approximately below the rear chain wheels to approximately below the front chain wheels;

whereby each bed plate may be conveyed in the second conveying direction from the outlet to the inlet by said connecting means and by said carrying rollers contacting said supporting track.

4,925,384

APPARATUS FOR ADMITTING HARDENABLE MATERIAL INTO THE DIES OF MOLDING MACHINES

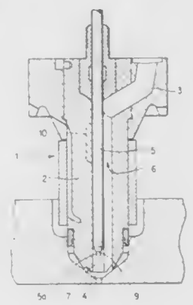
Otto Männer, Reetzestrasse 2, D-7836 Bahlingen, Fed. Rep. of Germany

Filed Apr. 20, 1989, Ser. No. 341,128

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3843035

Int. Cl.[5] **B29C** *45/23*

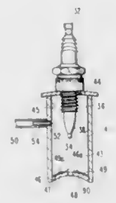
U.S. Cl. 425—564 **13 Claims**



1. Apparatus for admitting hardenable material into the die of a molding machine, said apparatus comprising a housing having an inlet for admission and an outlet for evacuation of hardenable material, an internal chamber communicating with said inlet, and guide means defining an elongated passage having an end communicating with said outlet, said guide means further defining an elongated gap which extends longitudinally of said passage and establishes communication between said passage and said chamber; and a reciprocable valving element disposed in said passage and movable between an extended position in which the end of said passage is sealed from said outlet and a retracted position in which hardenable material can flow from said chamber into said passage by way of said elongated gap and from the end of said passage into said outlet.

VOL
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4,925,385
FUEL IGNITER
Harry C. McCord, Jr., 6306 N. 500 W., Marion, Ind. 46952
Filed Jul. 31, 1989, Ser. No. 387,955
Int. Cl.[5] F23Q 7/06
U.S. Cl. 431—2 20 Claims



1. An apparatus for continuous ignition of a substantially aqueous fuel comprising:
a housing having a closed end, an open end and a continuous side wall;
means disposed at said closed end for generating a spark within said housing;
fuel intake means for supplying fuel into said housing; and
a cap covering said open end, said cap defining an exhaust port therethrough and including a cathodic surface, whereby the spark passes from said spark generating means to said cathodic surface through the fuel to ignite the fuel such that the ignited fuel is discharged from said housing through said exhaust port.

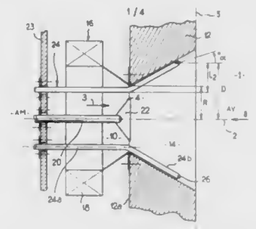
4,925,386
FUEL BURNER CONTROL SYSTEM WITH HOT SURFACE IGNITION
Donald E. Donnelly, Glen Carbon, Ill.; Bradley C. Zikes, St. Louis County; Dwain F. Moore, Marlborough; Jeffrey E. Price, St. Louis County, and Bartholomew L. Toth, Crestwood, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Feb. 27, 1989, Ser. No. 315,919
Int. Cl.[5] F23N 5/00
U.S. Cl. 431—28 16 Claims





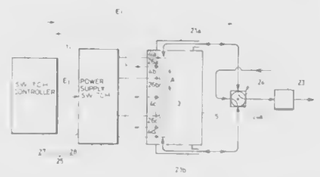
1. In a fuel burner control system including a burner, valve means controlling the flow of fuel to the burner, and an electrical resistance igniter connected across a power source for igniting fuel at the burner, the improvement comprising:
control means for effecting energizing of the igniter in a first burner cycle so as to cause said igniter to attain ignition temperature, for effecting reduction of said energizing in subsequent successive burner cycles in which ignition is successful until a burner cycle occurs in which ignition is not successful, and for subsequently effecting an increase of said energizing so as to cause said igniter to be heated to a desired value of said ignition temperature.

4,925,387
PROCESS AND APPARATUS INTENDED TO EFFECT STAGED COMBUSTION OF A MIXTURE OF FUEL AND COMBURENT TO REDUCE THE PRODUCTION OF NITROGEN OXIDES
Philippe Locanetto, 108, rue de Meaux, 93410 Vaujours; Frédéric Bury, Chemin de Gramenoue, 13190 Allauch, and Jacques Pizant, Les Demerures de Candole n° 8, 13821 La Penne Sur Huveaune, all of France
Filed Dec. 14, 1988, Ser. No. 284,098
Claims priority, application France, Dec. 24, 1987, 87 18144
Int. Cl.[5] F23C 7/00
U.S. Cl. 431—187 20 Claims
1. A burner for liquid or gaseous fuels which is mounted on a wall of a vessel substantially axially opposite an aperture provided through the wall, the burner comprising:
an air supply box and a duct in communication therewith;
said duct and said aperture forming a single air supply passage through which all air used for combustion circulates;
primary fuel supply means extending towards said vessel within said air supply passage; and
secondary fuel supply means extending towards said vessel within said air passage, said secondary fuel supply means



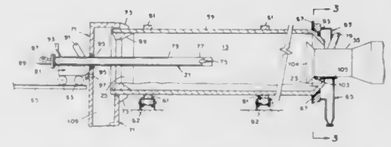
comprising at least one supply member having a main part disposed codirectionally with a flow axis of said air supply passage, and a terminal part extending towards said vessel, said terminal part being angularly positioned relative said main portion.
said terminal part extending towards said vessel further than said primary fuel supply means, a tip end of said terminal part being positioned at a radial distance from said air supply passage flow axis greater than a minimum radial dimension of said passage.

4,925,388
APPARATUS FOR HEAT TREATING SUBSTRATES CAPABLE OF QUICK COOLING
Izuru Iseki; Akihiro Higashi, and Seibiro Sasaki, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan
Continuation of Ser. No. 236,633, Aug. 25, 1988, abandoned.
This application Sep. 22, 1989, Ser. No. 411,224
Claims priority, application Japan, Aug. 26, 1987, 62-213515
Int. Cl.[5] F27D 15/02
U.S. Cl. 432—77 20 Claims



1. An apparatus for heat treating a substrate, said apparatus comprising:
container means extending in a longitudinal direction for containing a substrate to be heat treated;
heater means enclosing said container means for heating said substrate;
enclosing means enclosing both said container means and heater means for containing said container means and heater means;
means defining a space serving as a path of cooling air for cooling said container means along said longitudinal direction;
cooling means for circulating said cooling air through said space along said longitudinal direction, said cooling means including circulation direction switching means for reversing the direction of circulation of said cooling air along said longitudinal direction.

4,925,389
METHOD AND APPARATUS FOR TREATING WASTE CONTAINING ORGANIC CONTAMINANTS
Steven G. DeCicco, Knoxville; Sung K. Lee, Clinton; Rudy G. Novak, Knoxville; William E. Wass, and Kai K. Mak, both of Concord, all of Tenn., assignors to International Technology Corporation, Knoxville, Tenn.
Continuation of Ser. No. 125,379, Nov. 25, 1987, abandoned, which is a division of Ser. No. 869,200, May 29, 1986, Pat. No. 4,746,290. This application Jan. 23, 1989, Ser. No. 300,583
Int. Cl.[5] F27B 7/02
U.S. Cl. 432—106 11 Claims

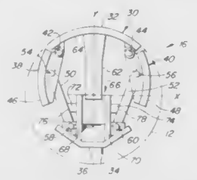


1. A countercurrent, direct fired rotary kiln for the decontamination for a variety of materials containing hazardous organic materials comprising an elongated open ended cylindrical shell having an infeed end and a discharge end, means for supporting said shell for rotation about its longitudinal axis, a non-rotary closure for each end of said shell, means for feeding material to be treated into one end of said shell through its associated closure, means for discharging treated material from the other end of said shell through its associated closure, a burner in the interior of said shell, an elongated support means for said burner extending through the discharge end of said shell, said support means being reciprocatable independently of and relative to said shell and to said discharge end closure to position said burner at selectable distances from said discharge end to define a first material treatment zone having a length dimension extending between said burner and said infeed end and a second material treatment zone having a length dimension extending between said burner and said discharge end, means associated with said support means for selectively supplying fuel and combustion air to said burner means such that the combination of burner combustion, burner position within the kiln, and the nature of the infeed material results in selective establishment or relatively different material treatment environments within said first and second material treatment zones and selectable residence times of said material in said zones, an off-gas conduit extending through the feed end closure of said shell, and seal means to minimize air flow between the atmosphere and the interior of said shell.

4,925,390
APPARATUS FOR RETAINING THE CONFIGURATION OF AN APERTURE FORMED THROUGH A COIL
Thomas J. Roman, Prophetstown, Ill., and Michael A. Ringle, Bettendorf, Iowa, assignors to Aluminum Company of America, Pittsburgh, Pa.
Continuation of Ser. No. 215,421, Jul. 5, 1988, abandoned, Division of Ser. No. 88,296, Aug. 24, 1987, Pat. No. 4,293,801.
This application Mar. 10, 1989, Ser. No. 323,105
Int. Cl.[5] F27D 5/00; F27B 9/14
U.S. Cl. 432—247 18 Claims
1. An apparatus for retaining the configuration of an aperture formed through a coil when said coil is supported on a saddle, said apparatus comprising:
(a) a first and a second member, said second member having a length sufficient to span said saddle;
(b) arm means pivotably attached to said first member; and

VOL
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(c) joining means for joining each of said arm means to said second member, said joining means enabling said arm means to move between a first position in which said arm means are spaced apart from the perimeter of said aperture



when said second member is not in contact with said saddle and a second position in which said arm means cooperate with said first member to support said coil when said second member is in contact with said saddle.

4,925,391

DENTAL INSTRUMENT

Göran Berlin, Strandvägen 28, S-198 00 Bålsta, Sweden

PCT No. PCT/SE86/00092, § 371 Date Nov. 4, 1986, § 102(e) Date Nov. 4, 1986, PCT Pub. No. WO86/05086, PCT Pub. Date Sep. 12, 1986
PCT Filed Mar. 4, 1986, Ser. No. 934,411
Claims priority, application Sweden, Mar. 7, 1985, 85011237
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—31 4 Claims



1. A dental instrument combined with a control wherein said dental instrument comprises: a shaft with two ends, a mirror having an upper and a lower surface, and a mirror housing firmly mounted on one end of said shaft, said housing being bowl-shaped and having an upper peripheral portion which encircles and receives said mirror so that no part of said housing distal from said shaft projects above the upper surface of said mirror, a portion of said bowl-shaped housing spaced from the shaft and disposed below the lower surface of the mirror is provided with at least one inlet opening, an internal channel provided through said housing under said mirror in fluid communication with said at least one inlet opening and in fluid communication with a first shaft channel located in the shaft, said first shaft channel being provided with means enabling connection to a suction source, characterized in that: said shaft (17) incorporates a second shaft channel (16) having two ends, one end of which opens from adjacent said one end of the shaft above said mirror to cause an air jet to be directed toward a tooth to cause an air syringe effect on the tooth as well as an air flow toward, over and past said mirror (2) and said upper peripheral distal portion of said mirror housing, and the other end of said second shaft channel (16) opens from the shaft at a location remote from said mirror; said control including an instrument holder (29) comprising a single control means connected to a source of pressurized air and having pressurized air outlet lines, one of which outlet lines is adapted to be connected to a turbine drill and another of which outlet lines (27) connects to the other end of said second shaft channel, whereby said single control means (23) simultaneously regulates the supply of pressurized air to said dental instrument and to a turbine drill, so that the supply of pressurized air to the instrument (1) is proportional to the supply of pressurized air to the turbine drill, and whereby the supply of pressurized air supplied to the instrument (1) is blown over the mirror (2), and said control further includes a suction control valve (34) connected to said instrument holder (29), a suction source connected to the outlet side of said suction control valve (34) and a suction line (32) connected between the inlet of said valve (34) and the said means in said first shaft channel which enables connection to a suction source; said valve (34) being closed when the instrument (1) is located in the holder (29) and open when said instrument is removed from said holder.

4,925,392

ELECTRICAL CONNECTORS FOR FLEXIBLE BUSSING SYSTEM

John L. Himes, Jr., Hummelstown, and James H. Wise, Palmyra, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 90,297, Aug. 31, 1987, Pat. No. 4,845,592. This application Feb. 21, 1989, Ser. No. 313,217
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—55 15 Claims



1. A vertical tap for use in a system for distributing power from a power supply to at least one circuit board, where bus means comprises relatively thin, substantially flat ribbons arranged in a stacked relationship, each ribbon being adapted to be bent away from the stack to a desired location on the board, the vertical tap being adapted to receive at least one ribbon, the vertical tap comprising:

an insulated base;

at least one electrical contact means carried by the base, the at least one contact means having respective portions extending above the base and further including an array of contact sections extending below the base for electrical connection to the circuit board;

the portions extending above the base including respective pairs of resiliently-biased electrical contact members, the members of each pair defining a slot therebetween, said pairs of said members being disposed in a parallel spaced relationship with each other and said slots being aligned and defining a bus receiving aperture means for receiving said at least one ribbon, continuously therethrough whereby the at least one ribbon makes an electrical connection with the at least one contact means in the vertical tap; and

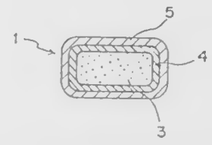
a cover for being fitted over the contact members and including latch means for latching to cooperating latch means of said base after placement of the bus means through said bus receiving aperture means, said cover including apertures at opposed ends defining exits for said bus means.

4,925,394

CERAMIC-COATED TERMINAL FOR ELECTRICAL CONNECTION

Kyozo Hayashi; Seiji Kawamura, and Hirosaka Ikeda, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

PCT No. PCT/JP87/01048, § 371 Date Dec. 15, 1988, § 102(e) Date Dec. 15, 1988, PCT Pub. No. WO88/08626, PCT Pub. Date Nov. 3, 1988
PCT Filed Dec. 28, 1987, Ser. No. 290,415
Claims priority, application Japan, Apr. 23, 1987, 62-102781
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—86 5 Claims



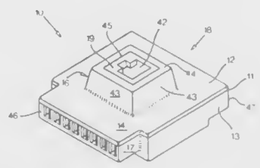
1. A ceramic-coated terminal for electrical connection characterized in that an electrically conductive ceramic coating layer is provided on a surface of a base material of the terminal.

4,925,393

66 BLOCK ADAPTER

David L. Ingalsbe, Hastings, Minn., assignor to Independent Technologies, Inc., Omaha, Nebr.

Filed Sep. 6, 1988, Ser. No. 240,967
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—76 15 Claims



1. An adapter system for use with a 66-type block telecommunications interface comprising:

a. modular connection means;

b. a housing structure with a central cavity enclosing said modular connection means and having an aperture to expose said modular connection means, at least one plug end for connection to the telecommunications interface, said plug end having elongated, separated and uniformly spaced apertures extending horizontally from said central cavity and terminating in flaired openings each plug end aperture having first and second lateral walls;

c. a plurality of contact blades extending from said central cavity and being vertically aligned through said plug end apertures, said blades further being exposed for mating with the telecommunications interface at said plug end; and

d. means to electrically connect said modular connection means and said blades, said electrical connection means being located in said housing structure central cavity.

4,925,395

CLAMP FOR ELECTRICALLY CONDUCTIVE STRIPS

George J. Franks, Jr., 664 Thompson Cir., Inverness, Ill.

Continuation-in-part of Ser. No. 234,975, Aug. 22, 1988, Pat. No. 4,884,976, which is a cootinuation-in-part of Ser. No. 116,899, Nov. 5, 1987, Pat. No. 4,828,504. This application Dec. 29, 1988, Ser. No. 291,702
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[5] H01R *4/34*
U.S. Cl. 439—100 16 Claims



1. A clamp for mechanically and electrically connecting together two strips of electrically conductive material to an electrical conductor, comprising:

a first leg and a second leg extending outwardly from a common base, with the base having an attachment hole for attaching the clamp to a surface by passing an attachment stud means therethrough and into the surface;

a threaded bore located in the first leg;

a threaded stud means rotatably mounted in the threaded bore and rotatable to affect axial movement toward the opposite leg, the two strips being positionable between the legs with one of the strips being engageable by the threaded stud means.

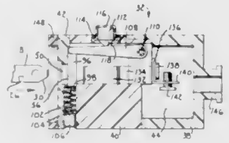
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4,925,396

LATCHING MECHANISM FOR ELECTRICAL PLUGS

Dennis L. Grover, 706 E. Greenwood, Springfield, Mo. 65807

Filed Jun. 30, 1989, Ser. No. 373,506
Int. Cl.[5] H01R *13/639*
U.S. Cl. 439—147 14 Claims



14. A female electrical socket for receiving an electrical plug having a pair of electrically conductive prongs each have a notch, said socket comprising:

a socket body having a face and a pair of slots in said face arranged to receive the prongs of the plug therein;

a pair of latch plates mounted in the socket body for sliding movement between latching and release positions, each latch plate having an edge engaged in the notch of the corresponding prong in the latching position to retain the prong in the slot and each plate releasing from the corresponding prong in the release position to permit withdrawal of the prong from the slot;

yieldable means for urging each latch plate toward the latching position;

means in said slots for establishing electrical connection with said prongs when the prongs are inserted in the slots; and

means accessible on the exterior of said socket body for selectively effecting the release position of each latch plate.

4,925,397

LATCH MECHANISM FOR COMPUTER MODULE

Mauricio Mirand, Lakewood, and Robert E. Gaskill, Santa Ana, both of Calif., assignors to American International Devices, Inc., Los Angeles, Calif.

Filed Jul. 24, 1989, Ser. No. 384,267
Int. Cl.[5] H01R *13/629*
U.S. Cl. 439—353 7 Claims



1. For use in securing a circuit module having opposed side edges and a front edge in a seated position within a pair of opposed support members having support slots therein, latch means comprising:

a first elongated slide member defining a first channel portion having a first internal channel extending its entire length and terminating at one end in an extending first locking tab and an extending first grip portion at the other end;

a second elongated slide member defining a second channel portion having a second internal channel extending its entire length and terminating at one end in an extending second locking tab and an extending second grip portion at the other end;

guide means for supporting said first and second slide members upon the front edge of the circuit module such that the front edge thereof is received within said first and second internal channels in a sliding engagement and said first and second locking tabs extend outwardly in opposed directions; and

spring means coupled to said first and second grip portions for urging said first and second slide members apart urging said first and second locking tabs into the opposed support slots.

4,925,398

CONNECTOR

Masakuni Samejima; Kiyohito Fukuda, and Mitsuru Matsumoto, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Nov. 4, 1988, Ser. No. 267,370
Claims priority, application Japan, Nov. 6, 1987, 62-169859[U]
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—357 4 Claims



1. A connector, comprising:

a female housing;

a male housing to be inserted and fitted into said female housing for establishing electrical connection therebetween;

a locking arm comprising a C-shaped member of flexible resin material having two leg portions and a first locking portion with a contact surface area, the first locking portion being provided between the leg portions, and said locking arm being flexibly supported to said female housing;

a locking projection provided on said male housing so as to engage and lock with said first locking portion when said female and male housings are properly fitted together, and said locking projection having first and second sides and having a first inclined surface provided on the first side of said projection and declining toward the insertion direction of said male housing and a second inclined surface provided on the second side of said projection and declining toward the opposite direction, and a peak being formed between the first and second surfaces, and the second side of said projection being formed into a wedge-shape; and

a second locking portion provided inside the first locking portion of said locking arm for increasing a thickness of said first locking portion of said locking arm, and said second locking portion having a rear edge and a V-shaped notch which is to be mated with the wedge-shaped second side of said locking projection;

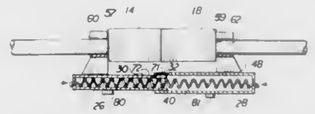
whereby when said male housing is inserted into said female housing, said locking arm is gradually cambered by a sliding contact of the contact surface area of said first locking portion with the first inclined surface of the locking projection so as to generate a restoring force in said locking arm until the rear edge of said second locking portion passes over the peak of the locking projection, at the time the restoring force reaches maximum, and when the rear edge of said second locking portion passes over the peak of said locking projection, the locking arm is suddenly restored to its original position so that the V-shaped notch is mated with the wedge-shaped second side of the locking projection, thereby ensuring a fitting between said locking arm and locking projection, and whereby said locking arm can be disengaged with the locking projection by lifting the locking arm until the V-shaped notch is disengaged from the wedge-shaped second side of the locking projection and then pulling apart the fitted housings.

4,925,399

CORD CLIP

Dean Bosworth, and Larry Herlth, both of 329 Mahogany Dr., Key Largo, Fla. 33037

Filed Jun. 6, 1988, Ser. No. 202,253
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—370 3 Claims



1. A clip for maintaining (a) a male electrical plug of a first axial length on a first electrical cord and (b) a female plug of a second axial length on a second electrical cord in mating electrical engagement, wherein each of the plugs has a surface confronting one another when the plugs are in electrical engagement and in opposite axial face about the first and second cords respectively,

said clip comprising:

a first and a second tubular length in telescopic engagement with one another, each tubular length having an inner and an outer end, one of said inner ends being sized for receipt in the inner end of the other of said inner ends,

a cord holding channel structure means on and adjacent the outer end of each tubular length, each of said structures including an axially aligned radially opening constricted mouth sized to receive and embrace one of said cords adjacent its associated plug, and each said channel structure means having an axial surface and said axial surface confronting one another,

tension spring means interconnecting the lengths and normally urging the tubular lengths and respective associated channel structure means and confronting axial surfaces toward one another and into a normal position with confronting axial surfaces being spaced apart less than the sum of the first and second axial lengths of the plugs, and yieldable for axial telescopic movement of the tubular lengths so that the axial facing surfaces are spaced from one another a distance greater than the sum of the first and second plug axial lengths to accommodate insertion of the male and female plugs, when in electrical engagement with one another between the channel structure means, with the first electrical cord in one of the radial openings and the second electrical cord in the other radial opening,

handle means attached to each of said tubular lengths to accommodate axial movement of said tubular lengths axially away from one another,

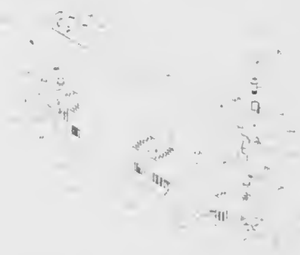
means to maintain opposite ends of said tension spring means in engagement with an inner surface of each of said tubular lengths.

4,925,400

ESD PROTECTED ELECTRICAL CONNECTOR AND ESD GROUNDING CLIP THEREFOR, AND CIRCUIT PANEL CONNECTOR ASSEMBLY AND METHOD OF ASSEMBLING SAME

Bryce W. Blair, Hummelstown; Jeffrey M. Norton, Lebanon, and Daniel E. Stahl, Dauphin, all of Pa., assignors to AMP Incorporated, Harriburg, Pa.

Filed Sep. 30, 1988, Ser. No. 252,220
Int. Cl.[5] H01R *13/629*
U.S. Cl. 439—374 19 Claims



1. A grounding clip for an electrical connector for being engaged by forward ends of conductive alignment posts of a mating connector to establish the first engagement of portions of the connectors during precision alignment just prior to mating of the connectors, to discharge electrostatic potential between the connectors to chassis ground, comprising:

a body portion defining a post-receiving cavity and being adapted to be disposed in a post-receiving passageway of a connector housing and be secured against axial movement therealong;

at least one spring arm extending forwardly from said body section and angled inwardly to a leading end located forwardly of the leading end of said body portion to be engageable by a forward end of an alignment post of a mating connector entering said passageway from a mating face of said connector and adapted to be deflected radially outwardly by the alignment post; and

means engageable with shielding around the connector upon complete assembly of the connector to groundingly engage the shielding,

whereby upon engagement of the forward end of the alignment post with the leading end of the forwardly extending clip spring arm discharge of electrostatic potential occurs to chassis ground through conductive engagement of the conductive alignment post with conductive framework containing the connectors, prior to other conductive portions of the connectors at least nearly engaging.

4,925,401

ELECTRICAL CONNECTOR ASSEMBLY WITH STRAIN RELIEF

Michael W. Fogg, Harrisburg; Michael J. Scully, Steelton, and Brian A. Wolfe, Jonestown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

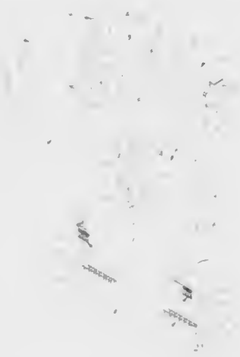
Filed May 23, 1989, Ser. No. 355,947
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—465 6 Claims

6. An electrical connector assembly for electrical conductors and a strain relief for the conductors, wherein the improvement comprises:

the connector assembly comprises an insulative housing

block, and electrical contacts in the housing block connected to corresponding conductors, and

bipartite parts of the strain relief pivot toward each other and clamp the cable therebetween and clamp opposite sides of the housing block therebetween, and



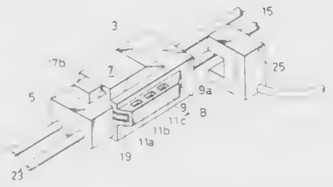
latch means on the housing block and the strain relief interengage to allow pivoting of the bipartite parts on the housing block about an axis normal to the planes of the opposite sides of the housing block.

4,925,402

CONNECTOR WITH FITTING CONFIRMATION DEVICE

Shigemitsu Inaba; Kazuto Ootaka, and Shigemi Hashizawa, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Oct. 21, 1988, Ser. No. 260,685
Claims priority, application Japan, Oct. 22, 1987, 62-265338
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—490 **11 Claims**



1. A connector comprising:

a female housing;

a male housing to be inserted and fitted into the female housing;

first guide means provided on the female housing, the first guide means including first confirmation means comprised of at least one first aperture formed on the first guide means; and

second guide means provided on the male housing to act cooperatively with the first guide means during the insertion of the male housing into the female housing, the second guide means including second confirmation means, the second confirmation means having at least one second aperture formed on the second guide means, whereby the fitting state of the female and male housings can be detected by detecting the relative positions of the first and second apertures;

wherein said first and second apertures have the same size and shape, respectively;

wherein said at least one first aperture of said first guide means and said at least one second aperture of said second guide means are provided such that said first and second apertures are precisely aligned when said male and female housings are properly fitted to each other; and

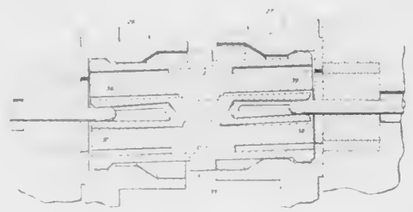
wherein said female and male housings having a side surface, respectively, and said first guide means comprise a guide channel member provided on the side surface of said female housing and said second guide means comprises a plate-like guide member provided on the side surface of said male housing slidably inserted into said guide channel member when said female and male housings are fitted to each other.

4,925,403

COAXIAL TRANSMISSION MEDIUM CONNECTOR

John Zorzy, Swampscott, Mass., assignor to Gilbert Engineering Company, Inc., Glendale, Ariz.

Filed Oct. 11, 1988, Ser. No. 255,458
Int. Cl.[5] H01R *17/18, 19/00*
U.S. Cl. 439—578 **16 Claims**



1. In a coaxial transmission medium connector, a female center conductor element having:

(a) a socket for receiving a male center conductor element, said socket including

(i) an open end;

(ii) a blind end; and

(ii) a tapered inner surface which diverges from a first position proximate said open end to a second position proximate said blind end; and

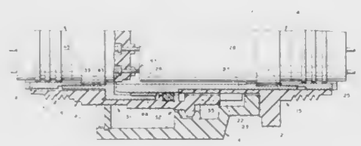
(b) a resilient wall region surrounding said socket, said wall region having a thickness which decreases from a maximum proximate said first position to a minimum proximate said second position.

4,925,404

ENVIRONMENTALLY PROTECTED EMI SHIELDED CONNECTOR

Clinton H. Dutcher, Camarillo, Calif., assignor to G & H Technology, Inc., Camarillo, Calif.

Continuation of Ser. No. 257,650, Oct. 14, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 451,572
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—607 **20 Claims**



1. In an EMI shielded electrical connector that terminates EMI shielded wires, wherein the improvement comprises:

a plug housing constructed of a dielectric material having an outer end, a midportion and an inner end, said housing including a plug inner surface and a plug exterior surface;

an electrically conductive plug sleeve located adjacent said inner surface having a forward section extending from proximate said outer end to a plug joint section proximate said midportion;

a receptacle shell constructed of dielectric material adapted for releasable connection with said plug housing having an outer end portion and an inner end portion with a shell inner surface and shell outer surface; and,

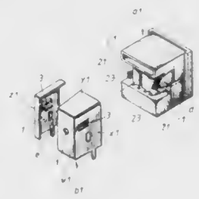
an electrically conductive shell sleeve located adjacent said shell inner surface having an outer part extending from proximate said outer end portion to a shell joint part extending beyond said inner end portion, said shell joint part and said plug joint section forming a joint connection at a location proximate said plug housing midportion when said plug housing and receptacle shell are engaged.

4,925,405

DIN-TYPE CONNECTOR

Mu K. Wei, No. 6, Alley 2, Lane 68, Min Feng Rd., Yang Mei Chen, Tao Yuan Hsien, Taiwan

Filed Mar. 17, 1989, Ser. No. 324,719
Int. Cl.[5] H01R *13/648*
U.S. Cl. 439—608 **2 Claims**



1. A DIN connector comprising a main body substantially in form of a cubic body with two elongate grounding terminals and a metallic hull which is engageable with said main body and is in electrical connection with said grounding terminals when engaged therewith, said hull shielding at least three sides of said main body, characterized in that said hull further comprises an additional side through which said grounding terminals pass and shields a fourth side of said main body, said hull being provided with two tongues which respectively resiliently urges on each one of said terminals when said main body and said hull are engaged.

4,925,406

ELECTRICAL CONNECTOR

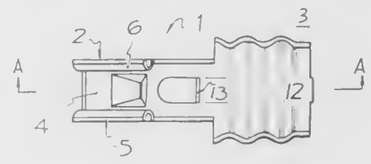
George Topolcsanyi, 44 Tadstan Drive, Tullamarine, Victoria 3943, and Salvators Dimasi, 18 Curee Avenue, Oak Park, Victoria 3046, both of Australia

Filed Jul. 26, 1988, Ser. No. 258,696
Claims priority, application Australia, Dec. 16, 1986, PH9538
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—839 **11 Claims**

1. An electrical connector, comprising:

a first connector section for connection to an electricity conducting means; and

a second connector section communicating with the first connector section for connection to an electrical terminal, the second connector section including a base section and at least two arms extending from the base section to free ends of the arms, each of the arms having a transverse engagement surface, the transverse engagement surface of one of the arms being substantially parallel to the transverse engagement surface of the other of the arms and defining a contact surface for engagement with the electrical terminal, the free ends of the arms defining an opening along lengths thereof opposite the base section through



which the terminal can pass in a direction generally parallel to the engagement surfaces.

4,925,407

NICKEL-BASED ELECTRICAL CONTACT

Joachim J. Hauser, Summit; John T. Plewes, Chatham, and Murray Robbins, Berkeley Heights, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Continuation-in-part of Ser. No. 761,402, Aug. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,707, Aug. 31, 1984. This application Jan. 30, 1986, Ser. No. 823,987
Int. Cl.[5] H01R *9/24*
U.S. Cl. 439—887 **14 Claims**



1. Apparatus comprising an electrical contact, said contact comprising a surface of a body of contact material,

said contact material comprising nickel and at least one glass-forming additive selected from the group consisting of boron, germanium, phosphorus, arsenic, antimony, and bismuth,

said at least one glass-forming additive being present in said contact material in an amount in the range from 2 to 10 atom percent of the combined amount of nickel and said at least one additional element,

said combined amount being greater than or equal to 70 atom percent of said contact material,

whereby at least a surface portion of said contact material is crystallographically disordered at least upon exposure to an oxidizing ambient.

4,925,408

INTAKE AND PUMP ASSEMBLY FOR AQUATIC VEHICLE

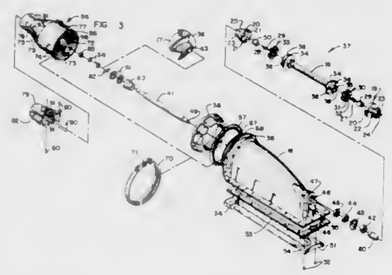
Edward Webb, Paynesville, Minn., and Marley Duclo, Hotchkiss, Colo., assignors to Koronis Parts, Inc., Paynesville, Minn.

Filed Sep. 14, 1987, Ser. No. 96,555
Int. Cl.[5] B63H *11/02*
U.S. Cl. 440—38 **6 Claims**

1. An intake and pump assembly for an aquatic vehicle of the type having a rotatable impeller mounted upon a drive shaft, comprising:

(a) a smooth streamlined intake housing having an opening through which water enters, said intake housing having a rear end proximate said impeller and an opposite front end;

(b) a removable wear ring surrounding said impeller, said wear ring being operatively connected proximate said rear end of said intake housing, wherein said wear ring has a tapered configuration to facilitate removal from said intake and pump assembly;
(c) a pump body operatively connected to said rear end of said intake housing and having an integral central vane



therewithin which directs water around said vane and in a longitudinal direction from said impeller and through said pump body, said vane including a plurality of webs; and
(d) a discharge nozzle operatively connected to said pump body through which a water jet is discharged to power the aquatic vehicle, said discharge nozzle being operatively connected to a steering mechanism.

4,925,409

TORSIONAL DAMPER FOR MARINE DRIVE UNIT

Harold C. Johnson, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 13, 1988, Ser. No. 243,675
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—52 **11 Claims**



1. In a marine drive unit including an engine having a crankshaft and a driveshaft disposed in axial alignment with, operatively connected to and driven by the crankshaft, a viscous torsional damper for directly connecting the engine crankshaft and the driveshaft comprising:
a damper housing having means at one end for attachment to one of the crankshaft and the driveshaft for rotation therewith;
a first set of damper plates attached to the inside of the housing for rotation therewith and disposed in spaced parallel relationship along the common axis of the crankshaft and driveshaft;
each of said first set of plates having a center opening defining an axial opening extending through the set on said common axis;
a driveshaft extension disposed within said axial opening and journalled for rotation relative to said housing on said common axis;
a second set of damper plates attached to said driveshaft extension for relative rotation therewith and disposed in spaced parallel relationship along said common axis;
the plates of said first and second sets interleaved and substantially overlapping one another in closely spaced parallel relation; and
a high viscosity fluid substantially filling said housing and in contact with said plates to absorb torsional vibrations transmitted by the engine, the viscosity of said fluid being high enough to substantially prevent fluid shear and slip between said plate sets at full engine operating power.

4,925,410

TILT MECHANISM LOCK FOR OUTBOARD MOTORS

James C. Boda, Winneconne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 24, 1989, Ser. No. 343,410
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—55 **10 Claims**



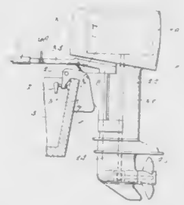
1. A tilt mechanism for a marine propulsion device comprising:
a. a transom bracket for attachment to a boat, said transom bracket having cam track means including a plurality of trim position notches circumferentially spaced about a first generally horizontal axis and an uppermost trailering position notch;
b. a swivel bracket pivotally attached to the transom bracket for rotation about the first horizontal axis;
c. a pawl assembly having one end pivotally attached to the swivel bracket for rotation about a second generally horizontal axis, the other end of said pawl assembly being movable along the cam track means into engagement with said notches to provide a series of angular trim positions and a trailering position for the swivel bracket;
d. said cam track means including return path means engagable by the other end of said pawl assembly for returning the swivel bracket from a higher position to a lower position;
e. biasing means for urging the other end of the pawl assembly into a selected one of said notches and for providing engagement of said other end with said return path means for return movement therealong from an upper trim position and from the trailering position; and,
f. locking means for selectively blocking movement of said other end along the return path means from the trailering position, thereby locking the swivel bracket in the trailering position.

4,925,411

MARINE PROPULSION DEVICE TILT AND TRIM MECHANISM

Scott N. Burmeister, Gurnee; Duane W. Harris, Lake Villa; Roger B. Whipple, Waukegan, and Martin J. Mondek, Wonder Lake, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 56,860, Jun. 1, 1987, abandoned. This application Sep. 6, 1989, Ser. No. 403,985
Int. Cl.[5] B03H *5/12*
U.S. Cl. 440—61 **39 Claims**



1. A marine propulsion device comprising a propulsion unit adapted to be mounted on the transom of a boat for pivotal movement relative to the transom about a generally horizontal tilt axis, and for pivotal movement relative to the transom about a generally vertical steering axis, said propulsion unit including an engine adapted to be drivingly connected to a propeller, a tiller arm connected to said propulsion unit for causing pivotal movement of said propulsion unit about said steering axis, a hydraulic assembly including a cylinder connected to one of said propulsion unit and the transom, a piston slideably received in said cylinder and dividing said cylinder into opposite first and second chambers, and a piston rod having one end fixedly connected to said piston and an opposite end extending outwardly of said cylinder and being connected to the other of said propulsion unit and the transom, valve means for alternatively permitting and preventing fluid flow between said chambers, operator actuatable means mounted on said tiller arm, and means for actuating said valve means in response to actuation of said operator actuatable means.

4,925,412

MARINE DRIVE WEED DEFLECTOR

Michael A. Karls, Hilbert, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 20, 1989, Ser. No. 326,025
Int. Cl.[5] B63H *5/16*
U.S. Cl. 440—71 **10 Claims**



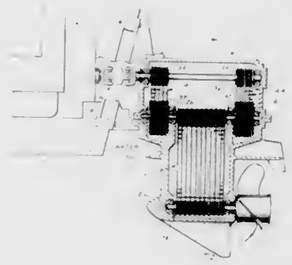
1. In a marine drive having a lower depending driveshaft housing including a strut portion having a leading edge and a side and extending downwardly to a torpedo housing, cooling water inlets on the side of said strut portion for supplying cooling water to said marine drive, and a propeller at the rear of said torpedo housing for propelling said marine drive, a weed deflector comprising a bar counted to said driveshaft housing and having a top portion extending forwardly from said driveshaft housing and parallel to water flow therepast, said top portion extending forwardly to a forward leading tip, and having a lower portion bent downwardly and rearwardly at an angle from said forward leading tip and back to and mounted to said driveshaft housing, the space between said forward leading tip of said bar and said leading edge of said driveshaft housing being open so that it does not affect steering of said marine drive, said lower portion of said bar forcing weeds to slide downwardly and rearwardly therealong and off of said driveshaft housing, said bar preventing weeds from wrapping around said strut portion and covering said cooling water inlets or interfering with said propeller or propeller efficiency, said bar having a frontal surface area with a cross sectional width substantially no wider than said leading edge of said driveshaft housing, said bar having a side surface area with a cross sectional width substantially the same as the cross sectional width of said frontal surface area, such that the increase in drag and steering resistance is minimized.

4,925,413

STERN DRIVE MARINE PROPULSION SYSTEM INCLUDING A CHAIN DRIVE MECHANISM

Neil A. Newman, Omro, and Daniel F. McCormick, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Sep. 15, 1988, Ser. No. 244,994
Int. Cl.[5] B63H *21/28*
U.S. Cl. 440—75 **7 Claims**



7. A stern drive marine propulsion system for a boat, comprising:
an engine including a rotatable crankshaft, said engine being disposed in the interior of the boat;
a stern drive lower unit housing adapted for mounting to the exterior of the boat adjacent the transom of the boat;
a propeller shaft rotatably mounted in the lower portion of the lower unit housing;
a propeller mounted to the propeller shaft;
an input shaft rotatably mounted in the upper portion of the lower unit housing and interconnected with said engine crankshaft so as to be rotatable in response to rotation thereof, said input shaft being substantially parallel to said propeller shaft;
an intermediate shaft mounted within the lower unit housing, said intermediate shaft being disposed between the propeller shaft and the input shaft and oriented so as to be substantially parallel to each, said intermediate shaft being disposed above the waterline during operation of the boat;
first drive means disposed between said input shaft and said intermediate shaft for transferring rotation of said input shaft to said intermediate shaft, said first drive means including reversing means for selectively imparting rotation to said intermediate shaft in either a first or second rotational direction, said reversing means being disposed above the waterline during operation of the boat; and

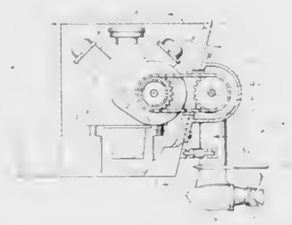
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second drive means disposed between said intermediate shaft and said propeller shaft for transferring rotation of said intermediate shaft to said propeller shaft and thereby to said propeller, said second drive means including first sprocket means mounted to said intermediate shaft and second sprocket means mounted to said propeller shaft, and chain means provided about said first and second sprocket means for driving said propeller shaft in response to rotation of said intermediate shaft.

4,925,414
MARINE PROPULSION SYSTEM

Neil A. Newman, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 8, 1988, Ser. No. 241,615
Int. Cl.[5] B63H *23/02*
U.S. Cl. 440—83 **8 Claims**

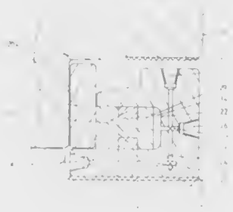


1. A marine propulsion system for use in a boat, comprising:
an engine adapted for mounting in the aft portion of the boat adjacent to transom, said engine being mounted within said boat by resilient mounting means for isolating said boat from engine vibrations, said engine including a rotatable crankshaft;
a drive unit adapted for mounting to the transom of the boat, said drive unit including a propeller interconnected with power transfer means;
drive means for drivingly interconnecting said engine crankshaft with said power transfer means, said drive means comprising a first rotatable member interconnected with said engine crankshaft and rotatable in response to rotation thereof, and a second rotatable member interconnected with said drive unit for inputting rotary power thereto, said first and second rotatable members being substantially fixed in position relative to each other and engageable with each other for transferring rotary power from said first rotatable member to said second rotatable member;
means associated with said drive means for accommodating movement of said engine crankshaft resulting from engine vibrations for isolating said drive unit from the effect of engine vibrations, said movement accommodating means comprising a drive shaft interconnected with said engine crankshaft through a first flexible joint, said drive shaft being interconnected with said first rotatable member through a second flexible joint, said first and second flexible joints acting to isolate said first rotatable member from movement of said engine crankshaft resulting from engine vibration;
wherein said drive unit is rigidly mounted to the exterior of the transom of the boat, and wherein said means for accommodating movement of said engine crankshaft is associated with said drive means; and
wherein said power transfer means includes a rotatable shaft disposed in the upper end of said drive unit defining a pivot axis about which said drive unit is pivotable, said drive unit rotatable shaft being interconnected with said second rotatable member for inputting rotary power to said drive unit.

4,925,415
FRICTIONAL JOINTS

Frank Sutcliffe, Dalton-in-Furness, United Kingdom, assignor to Vickers Shipbuilding & Engineering Limited, Cumbria, United Kingdom

Filed Jun. 29, 1988, Ser. No. 212,774
Claims priority, application United Kingdom, Jul. 2, 1987, 8715540
Int. Cl.[5] B63H *23/34*
U.S. Cl. 440—83 **8 Claims**



3. A tapered frictional joint comprising
(i) a hydraulic nut having an internal screw thread and capable, on actuation, of exerting an axial force,
(ii) a first member including a part having an external tapered cross-section and a cylindrical portion coaxial with said part of the first member and provided with an external screw thread to receive the screw thread of the hydraulic nut
(iii) a second member including a part having an internal tapered cross-section compatible with the tapered cross-section of said part of the first member and also including an annular recess which is coaxial with said part of the second member and has an internal screw thread, and
(iv) a separation ring having an external screw thread to be received by the internal screw thread of the recess of the second member wherein, when said hydraulic nut is threadably mounted on the external screw thread of the first member in a first sense and is actuated, axial movement of the second member occurs in a first direction with respect to the first member whereby said tapered parts of the members become nested together and form the joint and wherein, when the separation ring is screwed into said recess and said hydraulic nut is threadably mounted on the external screw thread of the first member in a second sense opposite to the first sense and actuated, the separation ring forms an abutment surface against which the hydraulic nut may react and axial movement of the second member occurs in a second direction, opposite to said first direction, with respect to the first member, whereby said tapered parts of the members become separated to dismantle the joint.

4,925,416
CLUTCH FOR MARINE PROPULSION

Hiroshi Oishi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 205,199, Jun. 10, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 414,727
Claims priority, application Japan, Jun. 12, 1987, 62-146801; Jun. 18, 1987, 62-152208
Int. Cl.[5] B63H *23/04*
U.S. Cl. 440—84 **28 Claims**

1. A marine outboard drive adapted to be affixed to the transom of a watercraft for propelling the watercraft, a controlled element carried by said outboard drive and moveable into selected positions for changing the state of operation of said outboard drive, first manually operable control means juxtaposed to said outboard drive in a location to be directly operated by an operator, motion transmitting means operatively connecting said first control means to said controlled element for moving said controlled element between said selected positions in response to movement of said first control means, second manually operable control means positioned at a different location relative to said outboard drive from said first control means and in a position to be directly operable by



an operator at said different location, and means operatively connecting said second control means to motion transmitting means for moving said controlled element between selected positions, in response to operation of said second control means, at least one of said operative connections between one of said control means and said controlled element including disconnectable means located between the point of connection of said second control means to said motion transmitting means and the respective control means for permitting the other of said control means to operate said control device without movement of the one control means and without necessitating removal of the one control means.

4,925,417
UNDERWATER VIEWING PADDLE BOARD

John R. Warren, 721 NW. 49th, Oklahoma City, Okla. 73118

Filed Sep. 22, 1988, Ser. No. 247,687
Int. Cl.[5] B63B *35/00*
U.S. Cl. 441—65 **8 Claims**

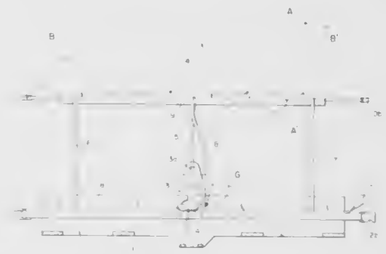


1. A substrate viewing paddle board comprising:
a platform of elongated shape and positive buoyancy having bow and stern ends with the bow end formed to include a rearwardly ascending cowl portion that terminates approximately one-third of the length toward the stern in a forward angled arch surface that extends over a rear wall transverse to the platform thereby to define an arcuate interior wall;
a central clearance of generally equi-dimensional shape formed vertically through the platform immediately rearward of the rear wall and generally within said arcuate interior wall and centrally in said platform; and
a viewing assembly of similar equi-dimensional shape retained within said central clearance, said viewing assembly being a sealed transparent volume having generally parallel top and bottom panels and continuous side panel.

4,925,418
INDIVIDUAL RESCUE APPARATUS

Monique Mariotto née Amiel, Toulouse, France, assignor to Claude Mariotto, Toulouse, France

PCT No. PCT/FR87/00059, § 371 Date Sep. 13, 1988, § 102(e) Date Sep. 13, 1988, PCT Pub. No. WO87/05578, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 9, 1987, Ser. No. 275,132
Claims priority, application France, Mar. 13, 1986, 86 03954
Int. Cl.[5] B63C *9/16*
U.S. Cl. 441—92 **12 Claims**



1. An individual rescue apparatus for use around the waist of a person comprising a support belt (**1**) having attaching means (*2a*, *2b*) at its extremities, an inflation system (**9–14**) adapted to be secured to said support belt, a pressurized gas reservoir adapted to be able to be placed in communication with the inflation system, and release means adapted to assure the inflation of said system from said reservoir from a passive, uninflated position to an active, inflated position,
said inflation system comprising a tubular portion (**9**) extending along the support belt and connected to said gas reservoir, and cells (**11–14**) distributed along the tubular portion and communicating therewith for inflating the cells by the action of the releasing means,
said support belt (**1**) comprising an upward extension (**3**) of a height adapted to extend approximately above the center of gravity of the person when the belt is worn around the waist, said extension (**3**) being provided with an attaching zone (*3a*) in its upper portion,
said inflation system (**9–14**) being maintained, in the passive position, along the support belt (**1**) by releasable securing means (**18**, **19**) capable upon inflation of releasing at least the cells (**11–14**) of said system,
connecting means (**15–17**) being provided between the support belt and the inflation system, comprising at least one connection (**15**) connecting the attaching zone (*3a*) of the extension and the inflation system.

4,925,419
LIFE PRESERVER COLLAR

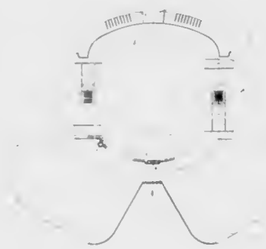
Luigi Susanna, San Dona' Di Piave, Italy, assignor to Giomama S.r.l., San Dona' Di Piave, Italy

Filed Dec. 9, 1988, Ser. No. 282,269
Claims priority, application Italy, Dec. 28, 1987, 15904 A/87; Nov. 15, 1988, 83515 A/88
Int. Cl.[5] B63C *9/08*
U.S. Cl. 441—123 **21 Claims**

1. Life preserver collar for use in preventing drowning and to be worn by an individual around the neck, comprising means to deliver fluid under pressure to an expansible envelope means having two identical elements which are separable from each other at a reciprocal joint,
wherein each identical element comprises a container of an expansible envelope and a container of fluid, and
wherein the container of an expansible envelope comprises a

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neck protector which acts as a connecting, protecting and containing structure and at least one outer protective cover capable of being opened by expansion of the expan-



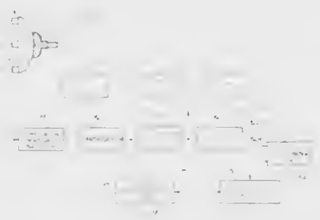
sible envelope means which is contained and anchored in its limp, inactive state within the container of an expansible envelope.

4,925,420

METHOD FOR THE AUTOMATIC MEASUREMENT OF CONVERGENCE AND FOR THE DETERMINATION OF CORRECTIONS TO BE MADE IN TRICHROMATIC CATHODE TUBE DEFLECTORS AND MACHINE FOR THE APPLICATION OF THIS METHOD

Jean-Pierre Fourche, Dijon; Guy Legrand, Ruff les Echirey; Michel Faivre, and Olivier Berthaut, both of Dijon, all of France, assignors to Videocolor, Montrouge, France

Filed Feb. 11, 1988, Ser. No. 155,054
Claims priority, application France, Feb. 13, 1987, 87 01864
Int. Cl.[5] H01T *21/06;* H01J *9/18*
U.S. Cl. 445—3 **13 Claims**



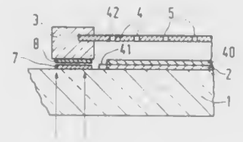
1. A method for the automatic measurement of convergence and for the determination of corrections to be made to deflectors for trichromatic cathode tubes, wherein each adjusted or pre-set deflector is placed mechanically and/or magnetically, always in the same position on the neck of a reference cathode tube, a crossed bar test pattern is produced on the screen of this tube, the absolute coordinates of the longitudinal axes of these bars are measured at several points (preferably 9 to 25 points) of these bars, the deviation values of coordinates for the beams of two different guns are computed, the values obtained are standardized so as to take into account a non-adjusted positioning of the deflector and/or convergence faults at the center of the tube and/or deviations between the tube used and a theoretical tube to thus obtain values corresponding to a correct theoretical positioning of the deflector and the convergence errors of the deflector are computed from these standardized values.

4,925,421

METHOD OF MANUFACTURING A COLOR CATHODE-RAY TUBE AND A COLOR CATHODE-RAY TUBE

Adrianus P. van den Broek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1989, Ser. No. 321,411
Claims priority, application Netherlands, Mar. 9, 1988, 8800581
Int. Cl.[5] H01J *29/07*
U.S. Cl. 445—4 **20 Claims**



1. A method of manufacturing a colour cathode-ray tube, in which in one process step two parts, comprised of a colour selection system and an at least substantially rectangular display window having a display screen of phosphor elements luminescing in different colours are secured to one another to form an assembly,

characterized by: securing the two parts to one another via a number of mounting elements and positioning elements; said mounting and positioning elements having cooperating parallel surfaces for permitting relative movement in a plane parallel to the display window; prior to securing the two parts to one another, moving the positioning elements

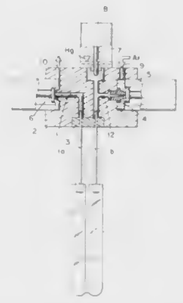
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4,925,422

EXHAUST HEAD FOR COMPACT FLUORESCENT LAMPS

Jozsef Tokes, and Laszlo Ugrosdy, both of Budapest, Hungary, assignors to Tungsram Reszvenytarsasag, Budapest, Hungary

Filed Oct. 25, 1988, Ser. No. 262,515
Claims priority, applicatioo Hungary, Dec. 7, 1987, 5462/87
Int. Cl.[5] H01J *9/395*
U.S. Cl. 445—73 **2 Claims**



1. An exhaust head unit for coupling with first and second exhaust tubes which respectively communicate with first and second ends of a compact fluorescent lamp, comprising a unitary exhaust head block, a double rubber seal arranged in said block, said first and second exhaust tubes being received in said seal, a vacuum valve, a gas valve and a throat means for regulating the gas flow, as well as a vacuum duct and a gas duct, wherein said first exhaust tube communicates with said vacuum duct and said second exhaust tube communicates with said throat means via said gas duct, said flow out of said vacuum duct is controlled by said vacuum valve, and said constitutes the seat for said gas valve and wherein said vacuum valve, said gas valve, said vacuum duct, and said gas duct are all arranged within said exhaust head block, whereby through flushing of said lamp is possible when said first and second exhaust tubes are respectively coupled to only said exhaust head.

4,925,423

FABRIC PAPER DOLL

Lisa V. Miller, and Virginia Lagow, both of Terrell, Tex., assignors to Lagow Enterprise, Inc., Terrell, Tex.

Filed Oct. 26, 1987, Ser. No. 112,515
Int. Cl.[5] A63H *3/02*
U.S. Cl. 446—98 **7 Claims**



1. A fabric doll comprising:

a substantially planar pad having head, neck, upper torso, lower torso, arms and legs regions;

first and second woven fabric sections configured for covering said substantially planar pad, said first woven fabric section being constructed with features which resemble a front part of said doll; and

means for resiliently stiffening said doll only in said head, neck and upper torso regions, said resilient stiffening means comprised of a thin, flexible and self-supporting stay secured to the head, neck and upper torso portions of said substantially planar pad;

said first and second woven fabric sections being peripherally stitched one to the other for sandwiching said substantially planar pad there between;

wherein said stiffening means prevents the frontal flexing and bending of said head region and wherein said regions of said doll not stiffened by said stiffening means remain soft and unstiffened.

4,925,424

TOY VEHICLE AND TRACK WITH TRACK MOUNTABLE COMMAND SEGMENTS

Tokuo Takahashi, Tokyo, Japan, assignor to Kawada Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 209,141
Claims priority, application Japan, Jun. 17, 1987, 62-092126
Int. Cl.[5] A63H *30/00, 17/40, 30/02;* E01F *9/00*
U.S. Cl. 446—175 **19 Claims**



1. An improved toy vehicle arrangement comprising, in combination;

tracking means defining a predetermined pathway having a preselected geometrical configuration;

toy vehicle means positionable on said track means for relative movement thereon;

motion producing means on said vehicle for providing preselected movement characteristics of said vehicle on said track means in response to receipt of a motion control signal;

motion command means in spaced apart relationship to said toy vehicle mountable on said track means and in detectable relationship to said toy vehicle for the condition of said toy vehicle in pattern detection relationship to said motion command means, and said motion command means comprising:

a standard pattern section; and

a movement pattern section; and said standard pattern section having a standard detectable pattern array and said movement pattern section having a detectable movement pattern array;

pattern detection means comprising electromagnetic radiation emitting and detecting means mounted on said toy vehicle and operatively connected to said motion producing means for selectively detecting said standard pattern array and said detection movement pattern array of said motion command means and generating said motion control signal in response thereto; and

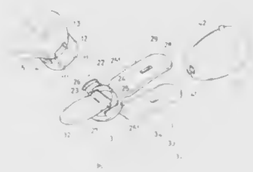
mounting means for mounting said motion command means on said track means.

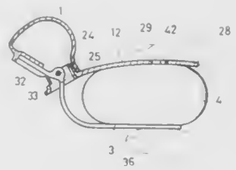
4,925,425

MOUTH STRUCTURE AND A SOUND GENERATING MEMBER FOR A DOLL

Shunsaku Ohta, 3-25-1, Nishi Asakusa Taitoku, Tokyo, Japan, and Mon-Cheng Yeh, 2nd/F No. 36-1, Lane 150, Min Teh Road, Pei Toe, Taipei, Taiwan

Filed Feb. 27, 1989, Ser. No. 315,742
Int. Cl.[5] A63H *3/28*
U.S. Cl. 446—185 **1 Claim**





1. A sound emitting doll with a mouth that opens to emit the sound and closes comprising:

a head figure having a circular protruding portion with a hole in the lower portion thereof to define a mouth-like structure and a depending connecting ring adjacent and behind the hole, the ring having opposed notches each

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extending upwardly toward said head figure and terminating in a slot extending across the notch;

an upper pressure plate having a ring-shaped front portion supporting the head figure and an elongated, pressure plate rear portion the plate having a centrally dispersed hole therethrough, the front portion mounting an upstanding circular flange which has opposed internal channels extending axially with said plate, each channel having a notch depending therefrom, the ring shaped front portion further having opposed, upwardly extending curved plates adapted to extend along the notches in said head figure and engage the slots therein;

a lower pressure plate having a protruding front portion defining the lower jaw of a doll and an elongated pressure plate rear portion the sides of the central portion immediately behind the front portion mounting laterally outwardly extending axles, each axle rotatably received in a respective channel notch in said upper plate flange so that front portion extends through the ring portion of said upper plate and is aligned with the mouthlike structure as the head figures lower jaw with said upper and lower pressure plates in spaced apart alignment when the lower jaw is closed against the mouth-like structure; and

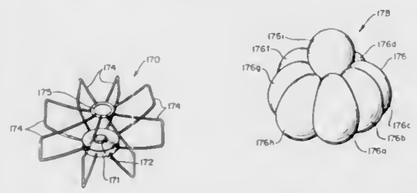
sound generating, resilient sack means disposed between said plates for emitting a sound when said plates are squeezed together and for expanding to return the plates to a spaced apart relationship when released.

4,925,426

BALLOON SCULPTURING METHODS, APPARATUS AND PRODUCTS

Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240

Division of Ser. No. 183,720, Apr. 19, 1988, Pat. No. 4,850,926.
This application Jun. 21, 1989, Ser. No. 369,456
Int. Cl.[5] **A63H** *13/06;* **A45B** *19/00*
U.S. Cl. 446—226 **8 Claims**



1. The method of forming a balloon sculpture from a single balloon of the type having a constricted neck portion terminating at one end in an inflation aperture and at the other end in an imperforate inflatable sidewall, said method comprising the steps of:

(a) forming a three-dimensional skeletal frame-like balloon former from a plurality of relatively thin, rigid, linear rod-like former elements coupled together and defining a plurality of relatively large closely spaced openings;

(b) inserting an uninflated balloon into the interior of the three-dimensional skeletal frame-like balloon former in such a manner as to permit coupling of the balloon's inflation aperture to an external source of inflation medium; and,

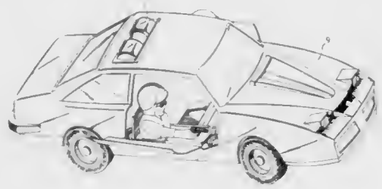
(c) inflating the balloon so as to cause the imperforate inflatable sidewall thereof to be distended outwardly through the plurality of relatively large closely spaced openings defined by the three-dimensional skeletal frame-like balloon former while conforming in shape to, and being in juxtaposition with, the rigid, linear rod-like former elements intermediate the spaced openings so as to form a plurality of outwardly projecting adjacent bulbous lobes which serve to define at least a portion of the shape of the balloon sculpture thus produced and which present the outward visual appearance of a plurality of separate balloons arranged in a cluster.

4,925,427

CONVERTABLE TOY CAR HAVING A TWO-LEVEL CAM

Hai-Ming Wu, No. 630, An Ping Road, An Ping Chie, Tainan, 70801, Taiwan

Filed May 9, 1988, Ser. No. 191,398
Int. Cl.[5] **A63H** *17/25, 17/26*
U.S. Cl. 446—409 **1 Claim**



1. In a toy car or the like with a chassis, outer body (9), electric motor means and transmission assembly (1) having an outer casing (12) mounted on the chassis (0), the improvement comprising:

(a) a two-level cam (2) consisting of an upper cam (21) and a lower cam (22) being driven by a series of gears (128); said series of gears (128) being driven by a first worm gear (127) which is coaxial with a gear (126); said gear (126) being driven by a second worm gear (125); said second worm gear (125) being driven by a first axle (123) of the transmission assembly (1); said transmission assembly (1) being driven by said electric motor means;

(b) a signal light activation arm (8) which alternately driven rearwardly by the lower cam (22) of said two-level cam (2) and retracted by a spring (501), said spring (501) being attached to said chassis (0); said signal light activation arm (8) having a bracket (83) thereon;

(c) a signal light (7) which is pivotally fixed on a rear portion of the chassis (0) and which has a protrusion (72) thereon which is urgeable by said bracket (83) so as to clockwise rotate said signal light (7) into a signal light "on" position;

(d) a sound assembly (4) being mounted on said outer casing (12) of said transmission assembly (1); said sound assembly (4) including a reverberation hole (42), and a sound-emission hole (43);

(e) a projection assembly (3) which is fixed on top of said sound assembly (4); said projection assembly (3) including a left arm (31), a right arm (32), and a motion transfer gear (33); said motion transfer gear (33) being rotatably fixed between said left and right arms (31 and 32) and said left arm (31) and right arm (32) having respective teeth (311 and 321) on mutually facing sides thereof engaged with said motion transfer gear (33) so that said right arm (32) moves inwardly when said left arm (31) moves inwardly and said right arm (32) moves outwardly when said left arm (31) moves outwardly; said left arm (31) being alternately driven outwardly with respect to said chassis by said upper cam (21) and retracted by a spring (312) and said right arm (32) being alternately driven outwardly by said motion transfer gear (33) and retracted by a spring (322); a muffle (101) being attached to said left arm (31) and covering said sound-emission hole (43) at its original position, said muffle (101) synchronously moving in the same direction to reveal or recover said sound-emission hole (43) as said left arm (31) moves outwardly or inwardly;

(f) a reverberation arm (6) having a pad (62) on one side thereof; said pad (62) abutting against said erverberation hole (42) of said sound assembly (4) at its original position, a first end of said reverberation arm (6) being fixed to another spring (63) mounted on said outer casing (12) for returning said pad (62) back to beat against said reverberation hole (42) in order to generate an alarm sound effect; and

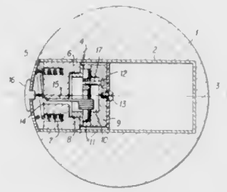
(g) a second cam (5) which is fixed to a second axle (124) of said transmission assembly (1); said second cam (5) intermittently driving a lever arm (61) which is pivotally attached to said outer casing (12) of said transmission assembly (1); said lever arm (61) having a first end which is driveable by said second cam (5) and a second end attached to a second end of said reverberation arm (6) for driving said reverberation arm (6) to reciprocate when said second cam (5) intermittently drives lever arm (61).

4,925,428

BALL WITH UNBALANCE MECHANISM

Harald V. Sonesson, Stenåldersvägen 131, S-222 54 Lund, Sweden

Filed Apr. 4, 1989, Ser. No. 333,035
Int. Cl.[5] **A63H** *11/08, 17/00;* **A63B** *37/00, 41/00*
U.S. Cl. 446—437 **5 Claims**



1. A toy comprising a rotation symmetrical outer shroud having a substantially elliptic periphery in a plane section through an axis of symmetry, said shroud containing a tube mounted coaxially with said axis of symmetry, said tube receiving an axially slidable member the axial length of which is substantially shorter than the length of said tube, resilient displacing means for exerting an axial force in one direction on said member, loading means for axially moving said member in the direction opposite to the force direction of said displacing means, and means for resisting axial movements of said member, in which said loading means comprises a handle outside said shroud, a line connected to said handle and passed through an opening in said shroud, a pin rotatably mounted in said slidable member perpendicular to the axis of the tube and connected to said line, and means for resiliently actuating said pin for rotation in one direction.

4,925,429

CONSTRUCTION TOY WITH CONNECTABLE PORTIONS

William P. Kaulfuss, Wilmette, and Robert H. Kaulfuss, Northbrook, both of Ill., assignors to Kaulfuss Designers, Inc., Chicago, Ill.

Filed May 31, 1988, Ser. No. 200,650
Int. Cl.[5] **A63H** *33/00*
U.S. Cl. 446—487 **8 Claims**

1. A toy figure of flexible planar material comprising

a transition portion including a transition-line;

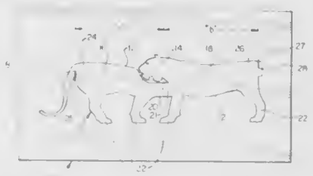
a first side extending from the transition-line, and having a first-side end and a slitted portion defining a first slit proximate the first-side end;

at least one first-side appendage adapted to depend from the first side;

a second side extending from the transition-line, having a second-side end and a slitted portion defining a second slit proximate the second-side end, and being generally opposed to the first side and adapted to cooperate with the first side to comprise hook means and to define a connection-point; and,

second-side appendages adapted to depend from the second side;

wherein the distance between the connection-point and the transition-line along the first side differs from a corresponding distance along the second side, so that when the material is flexed and the hook means are engaged to connect the ends, the connection-point and the transition-line define a chord-like axis, the sides bow outwardly of and are asymmetric relative to the axis, and the toy is adapted to stand on at least some of the appendages.

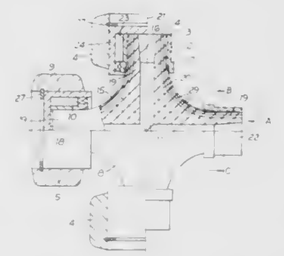


4,925,430

CROSS MEMBER FOR HOOKES UNIVERSAL JOINT

Dieter Heler, Gelsenkirchen, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 316,294
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 3806655
Int. Cl.[5] **F16D** *3/41*
U.S. Cl. 464—14 **9 Claims**



1. A cross member for a Hookes universal joint, comprising a body portion; four circumferentially spaced arms extending outwardly from the body portion, the arms comprising a first oppositely disposed pair thereof having a common axis and a second oppositely disposed pair thereof having a common axis which intersects the axis of the first pair at right angles thereto; the body portion and arms being made of a fibre reinforced plastics material; each arm being provided with a respective sleeve at least partly embracing the arm, said sleeve affording a cylindrical outer bearing surface; the body portion and arms being provided in the course of production of the cross member with internal lubricant passages.

VOL
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4,925,431

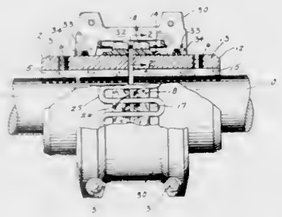
FLEXIBLE SHAFT COUPLING WITH POLYMERIC RESIN HUBS

Glenn C. Pokrandt, Menomonee Falls; William F. Busser, Pewaukee; Donald N. Timmermann, Wauwatosa, and Thomas N. Kuliga, West Allis, all of Wis., assignors to The Falk Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 166,431, Mar. 10, 1988, abandoned. This application Jan. 31, 1989, Ser. No. 302,750

Int. Cl.[5] F16D *3/52*

U.S. Cl. 464—54 25 Claims



1. In a flexible coupling having a pair of hubs each including a plurality of radially extending teeth whose adjacent side faces define slots therebetween, and a grid joining the hubs and which includes a plurality of metal rungs received in the slots and spanning the space between the hubs, the improvement wherein:

the side faces of the teeth in contact with the rungs are formed of a polymeric resin material which deforms relative to the rungs as the coupling is subjected to torque loads whereby the deformation of the teeth is sufficient to compensate for anticipated manufacturing error in the circumferential spacing between the teeth or the rungs.

4,925,432

BELT-TYPE CONTINUOUSLY VARIABLE TRANSMISSION AND ENGINE SPEED CONTROL DEVICE THEREFORE

Yukio Miyamaru; Akio Yagasaki, both of Tokyo; Shigeo Kimura, and Yoshimi Osanai, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

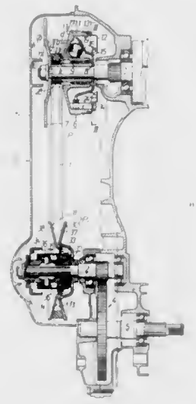
Filed Sep. 14, 1988, Ser. No. 244,003

Claims priority, application Japan, Sep. 25, 1987, 62-241898; Nov. 6, 1987, 62-280394

Int. Cl.[5] F16H *11/02*

U.S. Cl. 474—8 11 Claims

1. A belt-type continuously variable transmission comprising a variable-diameter V-pulley provided with a fixed pulley element and a movable pulley element on a drive shaft and a driven variable-diameter V-pulley provided with a fixed pulley element and a movable pulley element on a driven shaft, an endless V-belt wound around said V-pulleys, and a clutch spring provided in said driving variable-diameter V-pulley for biasing said movable pulley element in such a direction as to move away from said endless belt and thereby define a clutch gap between contact surfaces of said movable pulley element and said endless belt, wherein the frictional contact area between said driving and driven variable-diameter V-pulleys and said endless V-belt comprises a clutch operation portion for effecting clutch control between said V-pulleys and said endless belt and a speed change operation portion for effecting speed change control between said V-pulleys and said endless V-belt and wherein said clutch operation portion contains



means for generating slippage more easily than said speed change operation portion.

4,925,433

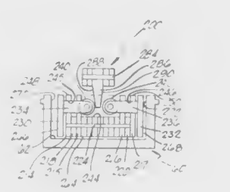
POWER TRANSMITTING SYSTEM

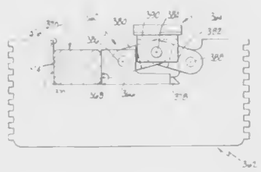
Lawrence G. Brown, 1629 Kuhilani St., Honolulu, Hi. 96816

Continuation of Ser. No. 372,142, Apr. 27, 1982, abandoned. This application Mar. 24, 1988, Ser. No. 172,364

Int. Cl.[5] F16H *55/56*

U.S. Cl. 474—9 20 Claims





1. A system for transmitting driving force from a power source to a driven device comprising:

at least one wheel-type rotatable drive means operably associated with said power source for transmitting power from said power source to said driven device;

at least one rotatable wheel-type driven means operably associated with said rotatable drive means and said driven device for transferring power from said rotatable drive means to said driven device;

endless loop-type power transmitting means operatively associated with said rotatable drive means and said rotatable driven means for transmitting power therebetween;

said endless loop power transmitting means having longitudinally extending oppositely laterally facing flat rigid side surface abutment means of substantial area for transmitting power between said endless loop power transmitting means and said drive means and said driven means;

radially inwardly and outwardly movable continuously variable diameter changing means associated with at least one of said rotatable drive means and said rotatable driven means for rotation therewith and in rigid force transfer relationship therewith and being radially inwardly and outwardly adjustable relative thereto for changing the power transmission ratio of said system by effecting force transmitting flat surface area contact with said endless loop-type power transmitting means at variable radially spaced locations; and

a plurality of separately operable circumferentially spaced clamping means associated with one of said endless loop power transmitting means and said diameter changing means for movement therewith to variable radially displaced locations and each of said clamping means having laterally facing flat rigid side surfaces of substantial area for clamping engagement by non-linear non-point contact with opposed circumferentially spaced laterally facing flat rigid side surface portions of substantial area on the other one of said endless loop-type power transmitting means and said diameter changing means, and holding said endless loop power transmitting means in fixed relationship to said diameter changing means in all radially displaced locations thereof by lateral movement of said clamping means between an open non-clamping non-force transfer position and a closed clamping force transfer position whereat the entire surface area of said oppositely laterally facing flat rigid side surface portions are held in fixed abutting non-linear non-point contacting relationship with the entire surface area of said laterally facing flat rigid side surfaces of said clamping means; and

said oppositely laterally facing flat rigid side surface portions and said laterally facing flat rigid side surfaces of said clamping means being constructed of essentially incompressible non-stretchable rigid materials and arranged to be engaged and disengaged essentially only by and during transverse non-radial lateral movement without sliding frictional radial movement therebetween and providing only flat abutment surface non-linear non-point contact areas of sufficient width and length to provide essentially simultaneous non-slidable positive non-slip area contact clamping engagement between said flat abutment surface contact areas during normal operating conditions.

4,925,434

TORSICONAL TENSIONING DEVICE

R. Todd Swinderman, Kewanee, and David W. Mueller, Neponset, both of Ill., assignors to Martin Engineering Co., Neponset, Ill.

Filed Aug. 31, 1989, Ser. No. 403,562

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—101 16 Claims

1. A tensioning arrangement for imparting torsional bias to a shaft, said tensioning arrangement including:

a first hub member connectable to said shaft;

a second hub member rotatable with respect to said first hub member;

a torsion coupling of elastomeric material connectable at one end to said first hub member and at said other end to said second hub member;

means to rotate said second hub member to simultaneously input a torsional biasing force into said coupling and to said shaft;

means to selectively connect said second hub member to a fixed frame member to thereby prevent rotation of said second hub member; whereby said tensioning arrangement provides for selecting and imparting a torsional biasing force on said shaft and simultaneously providing a shock absorbing mechanism to permit rotation of said



shaft when an external torsional force greater than said biasing force is applied to said shaft.

4,925,435

APPARATUS FOR WINDING AND UNWINDING WIRE

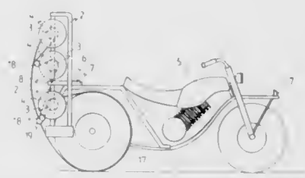
Peter G. Linklater, No 2 R.D., Owaka, New Zealand

Filed May 17, 1989, Ser. No. 353,448

Claims priority, application New Zealand, May 18, 1988, 224691

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—101 8 Claims



1. Apparatus for mounting on a vehicle comprising a plurality of drive pulleys, each drive pulley being removably connectable with mounting means for a detachable reel, an endless belt being provided to connect the drive pulleys, in one position the drive belt being positionable about the circumference of a driven wheel of the vehicle to provide a driving power to the drive pulleys, and to the reels associated with the drive pulleys.

4,925,436

TENSIONER

Masaharu Hayashi, Toyota; Hisashi Kodama, Nagoya; Yoshio Okabe, Chiryu; Yukimori Kobayashi, Gamagohri, and Eiji Shiral, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1988, Ser. No. 252,046

Claims priority, application Japan, Sep. 30, 1987, 62-246692

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—101 7 Claims

1. A tensioner comprising:

a body having formed therein an axially extended bore having an opening and a bottom end opposite the opening;

a collar fixed in said opening to define an operating chamber in said bore, said collar having a central hole which is coaxial with said bore;

a rod having one end portion which may be placed in operative engagement with an element to be tensioned, said rod passing through said hole in a fluid-tight manner and extending to said operating chamber;

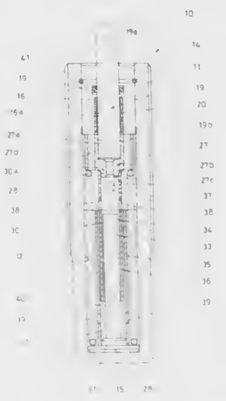
VOL 1114 ISS 3 MY 15 1990 UMI

a plunger connected to an other end portion of said rod in said operating chamber;

a spring comprising means for urging said plunger towards said collar;

tube means connected at one end thereof to said plunger and extended towards said bottom end of said bore;

stationary means positioned in said body and overlapping



with said tube means for defining annular clearance means therebetween; and

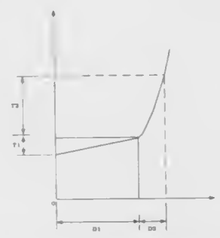
an amount of fluid filled in said annular clearance means, wherein said annular clearance means is sufficiently small for generating a shearing force between said tube means and said stationary means upon movement of said tube means relative to said bottom sufficient for substantially damping movement of said rod.

4,925,437

BELT TENSIONER DEVICE FOR LAWN MOWER

Takanori Suzuki, and Kazuyoshi Takada, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 16, 1989, Ser. No. 324,615
Claims priority, application Japan, Mar. 17, 1988, 63-64280
Int. Cl.[5] F16H *7/12*
U.S. Cl. 474—135 8 Claims



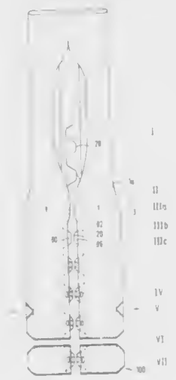
1. A tensioner arrangement for a flexible drive comprising a guide member engaging said flexible drive and biasing means acting upon said guide member for exerting a biasing force of a first magnitude during a first range of movement of said guide and a biasing force of a substantially greater magnitude upon movement of said guide in an amount greater than said first range.

4,925,438

BAGS MADE OF A THERMOPLASTIC SYNTHETIC RESIN SHEETING AND PROCESS FOR THE PRODUCTION OF SAID BAGS

Robert Wagner, Troisdorf-Sieglar, Fed. Rep. of Germany, assignor to Stiegler GmbH Maschinenfabrik, Troisdorf-Sieglar, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 228,506
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725878
Int. Cl.[5] B31B *31/86, 31/82*
U.S. Cl. 493—194 5 Claims



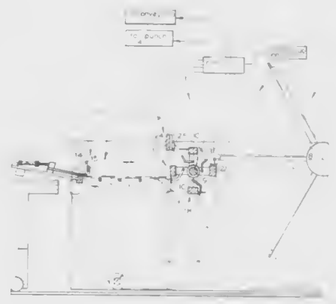
1. A process for the paired production of carrying bags having a front wall and a rear wall joined by lateral weld seams and a bottom pleat from thermoplastic synthetic resin sheeting which comprises the steps of conveying a tubular sheet with folded outer longitudinal edges and upper and lower film plies of synthetic resin film along a path; cutting open the tubular sheet in a straight cut at a central portion on the upper film ply of the tubular sheet thereby providing longitudinal straight edges at the resulting upper film plies; forming an opening gap by pulling the upper film plies apart transversely to the conveying direction of the severed film edges so that the opening gap formed is wider than the amplitude height of a sinusoidal severing cut to be executed on the lower film ply lying beneath the opening gap; continuously cutting open the lower film ply in a sinusoidal separating cut in the conveying direction to form longitudinal edges with wave crests and wave troughs within the opening gap and pulling apart the thus-created semitubular sheets transversely to the conveying direction; offsetting said semitubular sheets longitudinally with respect to each other until the wave crests and wave troughs of the two sheets are guided in a parallel side-by-side relationship; inserting W-folds with upper and lower fold portions bilaterally extending along outer longitudinal edges of each semitubular sheet thereby forming bottom pleats; folding upper film plies along straight edges over inwardly to form a flap to such an extent that a wave trough of the lower film ply edge extends outside of the resulting folded over film edge; then cyclically conveying the sheets intermittently; punching at least one handle hole in at least the lower film ply; punching pass-through slots successively along the folded-over flap edge and optionally punching tear-off perforations and hanging holes into the sinusoidal wave crest protruding with respect to the folded-over film edge; welding corner weld seams extending in the upper and lower fold portions of the W-folds of two successive bags in angular form surrounding corner sections of the fold; then producing lateral weld seams by transverse cut-off welding with separation of the corner weld seam angles; and separating the resulting bags in pairs.

4,925,439

APPARATUS FOR STACKING AND POSSIBLY BLOCKING PLASTIC BAGS

Jakob Schneider, Miederkassel-Mondorf, Fed. Rep. of Germany, assignor to Lemo M. Lehmacher & Sohm GmbH, Niederkassel-Mondorf, Fed. Rep. of Germany

Filed Jul. 5, 1989, Ser. No. 375,770
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3823009
Int. Cl.[5] B31B *23/98*
U.S. Cl. 493—204 5 Claims



1. An apparatus for stacking plastic bags, comprising:

radial arm transfer means having a wheel provided with a plurality of radial suction arms engageable with respective plastic bags along transport edges thereof and rotatable about a wheel axis for carrying said bags to a spindling position;

a spindling device adjacent said transfer means and comprising a needle basket rotatable about an axis parallel to said wheel axis and formed with a plurality of needle bars angularly equispaced about said axis of said basket and having respective needles thereon whereby the needles of each needle bar are oriented upwardly at said spindling position whereby each bag is threaded on the needles of a respective needle bar in said position until a stack of bags is formed of the respective needle bar, said bags hanging downwardly from the respective needle bar;

means for cyclically rotating said basket so that each of said needle bars, with a respective stack suspended therefrom is displaced cyclically into a smoothing and removal position;

a stack-smoothing device having an endless chain with rods engaging behind each stack suspended from a bar in said smoothing and removal position for lifting the respective stack into a horizontal orientation, and a beam movable back and forth above a stack in said horizontal orientation and provided with a smoothing brush for smoothing said stack; and

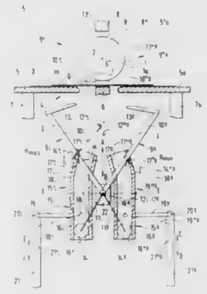
a stripping device effective in the smoothing and removal position of each of said needle bars for stripping the respective stack therefrom, said needle bars rotating successively in said basket from said spindling position into a lower intermediate position between said spindling position and said smoothing and removal position and into an upper waiting position between said smoothing and removal position and said spindling position.

4,925,440

APPARATUS FOR THE WINDING OF CONTAINER JACKETS

Bertbold Müller, Süssen, Fed. Rep. of Germany, assignor to Michael Hörauf Maschinenfabrik GmbH & Co. KG, Donzdorf, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 309,259
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809757
Int. Cl.[5] B31B *1/52*
U.S. Cl. 493—466 14 Claims



1. Apparatus for making container jackets wherein a blank is folded around a winding core and pressed thereagainst, said apparatus comprising:

a carrier movable relative to the core;

folding means for folding the blank around the core including a pair of folding fingers mounted on said carrier for movement therewith, each folding finger pivoted to said carrier for rotational movement about an axis disposed transversely to the direction of movement of said carrier and including first and second arm portions, one of said arm portions carrying a guidable member and the other arm portion including blank-folding element;

a pair of slide guides mounted independently of said carrier, each slide guide having a nonlinear guide passage in which a respective one of said guidable members is movably disposed, each of said slide guides being pivotable about an axis disposed transversely relative to the direction of movement of said carrier;

means for moving said carrier such that said folding fingers approach the core along opposite sides thereof and said guidable members travel along said guide passages, and means for pivoting said slide guides during said movement of said carrier to produce rotation of said folding fingers such that said blank-folding elements of said fingers are displaced toward each other in a manner folding the blank around the core.

4,925,441

CENTRIFUGAL CONTACTOR MODIFIED FOR END STAGE OPERATION IN A MULTISTAGE SYSTEM

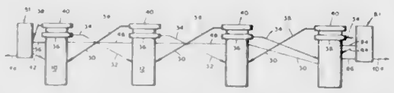
Robert T. Jubin, Powell, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 13, 1989, Ser. No. 365,636
Int. Cl.[5] B04B *5/00*
U.S. Cl. 494—32 10 Claims

1. A centrifugal contactor comprising housing means having inner wall portions defining an elongated vertically extending cylindrical cavity therein, elongated cylindrical rotor means disposed in said cavity with outer vertical wall portions thereon radially inwardly spaced from said inner wall portions of the housing for defining therewith a vertically oriented annular liquid mixing volume, inlet passageway means pene-

VOL
1114
ISS
3
MY
15
1990
UMI

trating said housing and in registry with said annular mixing volume at a location intermediate upper and lower ends of said annular mixing volume means for introducing liquid with multiple phases of different relative densities into said annular mixing volume for subsequent reception in said rotor means through an opening in a lower end thereof, further housing means having wall portions defining chamber means therein, further passageway means in registry with said chamber means and said annular mixing volume at a location therein overlying



the location where the inlet passageway means are in registry with the annular mixing volume for conveying liquid from said annular mixing volume to the chamber means, weir means disposed in the chamber means for separating phases of the liquid received in the chamber means according to the relative densities of the liquid phases, conduit means in registry with said chamber means for conveying therefrom liquid separated by said weir means, and still further passageway means in registry with said annular mixing volume for conveying liquid therefrom.

4,925,442

OPERATING SYSTEM FOR CENTRIFUGAL SEPARATOR

Berth Bodelson, Tullinge, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden

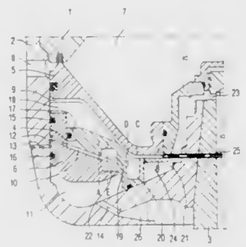
PCT No. PCT/SE87/00534, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO88/03839, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 16, 1987, Ser. No. 346,949

Claims priority, application Sweden, Nov. 17, 1986, 8604907

Int. Cl.[5] B04B *3/08*

U.S. Cl. 494—40 **7 Claims**



1. In a centrifugal separator having a rotor with an axis and a rotor body, an annular slide (5) coaxial with the rotor body and axially movable relative to said rotor body, an annular wall (4) connected to the rotor body and forming an annular chamber (9) with the slide (5), means for furnishing liquid to said annular chamber for exerting hydraulic pressure on said slide (5), said chamber (9) being adapted to retain said liquid upon rotation of the rotor, and an additional slide (6), axially movable relative to the rotor body and the annular wall (4), said additional slide (6) extending into the annular chamber (9) and having an axially facing surface in a radially outer part of the annular chamber (9), the improvement which comprises sealing means (15, 17) between the additional slide (6) and the rotor body and between the additional slide (6) and the annular wall (4), for sealing during axial movement of the additional slide (6), said additional slide (6) having a configuration such that during axial movement in one direction it takes up an increasing volume of the annular chamber (9) and during axial movement in the other direction it takes up a decreasing volume of said chamber (9), thereby displacing liquid radially inwardly and outwardly, respectively, in said chamber (9).

4,925,443

BIOCOMPATIBLE VENTRICULAR ASSIST AND ARRHYTHMIA CONTROL DEVICE

Marlin S. Heilman, 1016 Woodhill Dr., Gibsonia, Pa. 15044, and Steve A. Kolenik, Rd. 2, Box 509, Leechburg, Pa. 15656

Filed Feb. 27, 1987, Ser. No. 109,701

Int. Cl.[5] A61N *1/00*

U.S. Cl. 600—16 **43 Claims**



1. A ventricular assist device which can be implanted in patient user exterior to the heart adjacent at least one heart ventricle and which comprises:

a pumping means which includes one or more movable ventricle compression assemblies adapted for engaging an outer surface of the at least one heart ventricle;

operating means for cyclically actuating the one or more compression assemblies, such that a ventricle is, first, compressed to aid blood ejection therefrom, and second, released to permit refilling, the operating means including an electrical motor assembly connected to the one or more compression assemblies and including a rotary-to-axial drive-converting mechanism which includes a rotatable member and a reciprocating member driven axially by rotation of the rotatable member;

control means for regulating actuation of the operating means and enabling cyclical operation of the electrical motor assembly; and

an electrical power source.

4,925,444

CLOSED MULTI-FLUID DELIVERY SYSTEM AND METHOD

Fredric I. Orkin, Deerfield; Theodore Liber, Highland Park; Charles R. Smith, Libertyville; Kimball J. Knowlton, Lindenhurst, all of Ill., and Albin Huntley, Concord, Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 7, 1987, Ser. No. 83,843

Int. Cl.[5] A61M *5/14*

U.S. Cl. 604—80 **59 Claims**

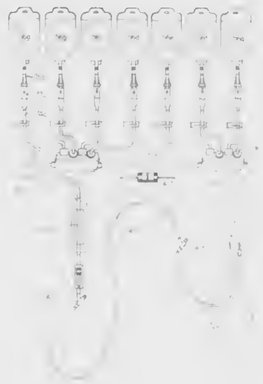
1. A multi-fluid delivery system for delivering a plurality of preselected fluids from a plurality of fluid flow sources to a fluid flow delivery port comprising:

a plurality of deformable flow means for receiving fluid flow from the plurality of fluid flow sources;

a plurality of flow control means with each of said deformable flow means closable by a corresponding one of said flow control means;

means for combining fluid flow from selected of said flow means to form a combined fluid flow output combination at said delivery port; and

programmable control means, coupled to each of said flow control means for storing, at least, one required fluid flow delivery schedule and for actuating one or more of said flow control means such that said selected fluids flow into



said combining means in accordance with said stored, fluid flow delivery schedule with said programmable control means including means for storing information relating to inter-fluid compatibility and for displaying an indicium of compatibility between at least two of said specified fluid types prior to activating any of said flow control means.

4,925,445

GUIDE WIRE FOR CATHETER

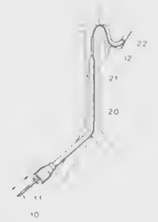
Hidetoshi Sakamoto, Fujinomiya; Kenjiro Uematsu, Numazu; Masashi Momota, Fujinomiya; Susumu Tanabe, Sagamihara; Tatsuo Suzuki, Yokohama, and Toshihiko Endo, Fuji, all of Japan, assignors to Fuji Terumo Co., Ltd., Fujinomiya, Japan

Continuation of Ser. No. 777,003, Sep. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 542,373, Oct. 14, 1983, abandoned. This application Feb. 9, 1989, Ser. No. 309,029

Claims priority, application Japan, Sep. 16, 1983, 58-169467; Sep. 16, 1983, 58-169468

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—95 **12 Claims**



1. A guide wire for inserting a surrounding tubular catheter into the body of a warm-blooded animal such as a human being, comprising:

an elongate body portion comparatively high in rigidity and a comparatively flexible elongate distal end portion coupled axially to said body portion, wherein at least a portion of said distal end portion is smaller in cross-section than said body portion, and a portion between said body portion and said distal end portion is progressively reduced in cross-section from said body portion toward distal end portion and said distal end portion is substantially more flexible than said body portion, and

at least a portion of at least one of said body portion and said distal end portion being formed of a super-elastic metallic member having a solid cross-section and being in a non-coiled monofilament form,

said super-elastic metallic member including an alloy having a temperature at which transformation to austenite is complete which is at most about 10° C. so that said metallic member exhibits pseudoelasticity when inserted into the body of said warm-blooded animal,

said alloy being selected from the group consisting of Ti-Ni alloy consisting essentially of 49–58 atom % Ni and the balance substantially Ti, Cu-Zn alloy consisting essentially of 38.5–41.5 wt. % Zn and the balance substantially Cu, Cu-Zn-alloy consisting essentially of 38.5–41.5 wt. % Zn, 1–10 wt. % X wherein X is Be, Si, Xn, Al or Ga, and the balance substantially Cu, and Ni-Al alloy consisting essentially of 36–38 atom % Al, and the balance substantially Ni.

4,925,446

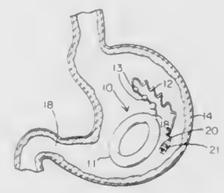
REMOVABLE INFLATABLE INTRAGASTROINTESTINAL DEVICE FOR DELIVERING BENEFICIAL AGENTS

Garbiel L. Garay, and Kathleen M. K. Garay, both of Atherton, Calif., assignors to Transpharm Group Inc., San Francisco, Calif.

Filed Jul. 6, 1988, Ser. No. 215,746

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—96 **9 Claims**



1. A removable inflatable intragastrointestinal beneficial agent delivery device adapted to reside within a stomach comprising:

(a) an inflatable member which is sized and shaped to pass through the esophagus in its deflated state and reside within the stomach and not pass through the pyloric sphincter in its inflated state;

(b) a hollow inflation tube for inflating the inflatable member once the inflatable member is within the stomach, one end of which is operably connected to the inflatable member and the other end of which carries a valve, said inflation tube having a length sufficient to extend from the mouth through the esophagus and into the stomach, providing a means by which the inflatable member may be inflated from outside the body and being adapted to reside within the stomach after the inflatable member is inflated;

(c) at least one cartridge member carried on the exterior of the inflatable member and/or the inflation tube, said member containing a beneficial agent and being capable of releasing said agent into the gastrointestinal tract.

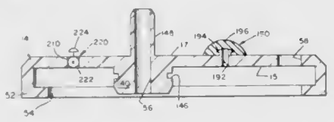
VOL
1114
ISS
3
MY
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1990
UMI

4,925,447

ASPIRATOR WITHOUT PARTITION WALL FOR COLLECTION OF BODILY FLUIDS INCLUDING IMPROVED SAFETY AND EFFICIENCY ELEMENTS

Richard Rosenblatt, Beverly Hills, Calif., assignor to Rosenblatt/Ima Invention Enterprises, Beverly Hills, Calif.

Filed Jun. 22, 1988, Ser. No. 210,076
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—133 **9 Claims**



1. An aspirator for removing bodily fluid through human suction and subsequent collection of the removed bodily fluids, comprising:

a. a container having a bottom wall and a side wall, defining an internal chamber;

b. a top having a first aperture therein and a second aperture therein spaced apart from the first aperture;

c. said first aperture opening into said internal chamber and said second aperture opening into said internal chamber;

d. a first hollow tube having two ends, with the first end inserted through said first aperture such that said first hollow tube opens into said internal chamber and said second end extends for a distance beyond the top and further comprises at least one opening adjacent the tip of the second end;

e. a flexible bellows member comprising an integrally formed flexible bellows and terminating in a sealed bottom at one end and affixed to a bellows cap at its other end;

f. said bellows cap having an opening extending into the bellows and attached to the top of said container such that the opening in the bellows cap is aligned with said second aperture in the top of the container;

g. the top of said container further comprising means for receiving a hollow tube in alignment with said second opening, the means comprising a central opening for fluid communication with the second aperture and bellows;

h. a second hollow tube having two ends, with the first end attached to said means for receiving a hollow tube aligned with said second opening and the second end attached to a mouthpiece, to thereby provide a closed system permitting gaseous communication between the mouthpiece, the second hollow tube, the bellows cap and the bellows; and

i. said flexible bellows extending into said internal chamber such that the flexible bellows is in its fully expanded position when in its equilibrium state, the flexible bellows providing a fluid barrier within the container between the first end of said first hollow tube and the first end of said second hollow tube;

j. the portion of said first hollow tube within said chamber residing external to said bellows;

k. whereby in use, the second end of said first hollow tube is inserted into the patient from which bodily fluid is to be removed and the mouthpiece of the second hollow tube is sucked on by the person treating the patient, and suction through the mouthpiece will cause said flexible bellows to contract to thereby create a vacuum in said internal chamber which through gaseous communication with first hollow tube causes air and bodily fluids from the patient to be sucked into and remain in the internal chamber while the airtight system from the mouthpiece through the flexible bellows prevents any direct communication of air or bodily fluids between the patient and the person treating the patient;

l. the top of said container further comprises a joining member attached to the underside of said top and extending into the internal chamber, and further including a slot therein;

m. the means for receiving a hollow tube is a nipple extending out of the upper surface of the top of the container; and

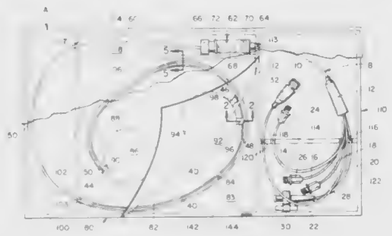
n. the opening in said bellows cap is attached to the joining member at the location of the slot.

4,925,448

CATHETER PACKAGE

Michael G. Bazaral, Cleveland, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Mar. 30, 1988, Ser. No. 176,227
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—171 **20 Claims**



1. A package for a catheter, the catheter having adjacent its distal end at least a first port, a catheter central portion having a sheath mounted thereon, and a catheter proximal end having a pigtail sheath which is connected to a plurality of inlet tubes, said package comprising:

a main housing compartment for housing a distal section of the catheter, said main housing compartment being substantially horizontally oriented and having a top opening allowing the removal of the catheter therethrough and comprising:

a first section for housing a distal end portion of the catheter including said catheter first port,

an absorbent means for absorbing a fluid flowing through said catheter first port, said absorbent means being located in said first section, and

a second section located adjacent said first section, for housing the catheter central section and the sheath mounted thereon, wherein said second section supports the catheter at a higher elevation than said first section to ensure that all the excess fluid used to flush the catheter remains in the first section of the main housing compartment;

a means for covering said main housing compartment opening to seal said housing compartment from microorganisms and particles in the surrounding environment but removable to expose the catheter;

a catheter proximal end holding section for holding the proximal end of the catheter; and

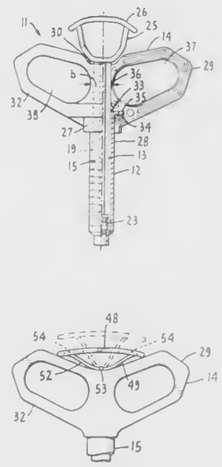
an enclosing means for enclosing both said main housing compartment and said catheter proximal end holding section to seal the catheter from microorganisms and particles in the surrounding environment.

4,925,449

MANUALLY DRIVEN SYRINGE

Carlos A. Saez, Irvine, and Robert P. Cooper, Yorba Linda, both of Calif., assignors to Applied Vascular Devices, Laguna Hills, Calif.

Continuation-in-part of Ser. No. 141,989, Jan. 11, 1988, abandoned. This application Aug. 2, 1988, Ser. No. 227,557
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—227 **8 Claims**



1. A manually driven syringe comprising:

(a) a barrel for housing a fluid to be injected having a front end having a fluid outlet and a rear end;

(b) a plunger comprising a shaft that is received within the barrel and ha a front end which carries a piston and a rear end which carries a head that is adapted to fit within the palm of the hand said head having a front surface and a rear surface; and

(c) a handle member having

(i) a central body having ga front surface and a rear surface through which an axial aperture extends, said aperture having a front end into which the rear end of the barrel is received, and

(ii) a pair of opposed wing-shaped finger grips each of which defines an enclosed opening elongated to accommodate two fingers that extends outwardly from the central body of the rear section and is angled rearwardly relative thereto so as to define a line of grip for said two fingers that is angled rearwardly relative to the axis of the body whereby the distance between the location on the grips where the second, third, fourth and fifth fingers are placed and the plunger head when the plunger is extended is lessened.

8. A manually driven syringe comprising:

(a) a barrel for housing a fluid to be injected having a front end having a fluid outlet and a rear end;

(b) a plunger comprising a shaft that is received in the barrel and has a front end which carries a piston and a rear end which carries a ring-shaped head that is adapted to fit within the palm of the hand, said head being collapsible under axial pressure from an uncollapsed configuration in which the head forms an enclosed opening that provides a thumb grip to a collapsed configuration in which the axial dimension of the head is diminished; and

(c) a handle member having

(i) a central body through which an axial aperture extends, said aperture having a front end into which the rear end of the barrel is received, and

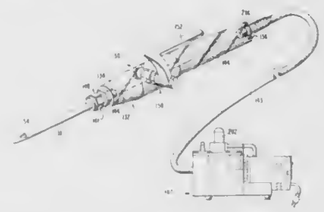
(ii) a pair of opposed finger grips that are elongated to each accommodate two fingers said finger grips extending outwardly from the central body.

4,925,450

SURGICAL ASPIRATOR CANNULA

Maurice M. Imonti, Dana Point, and Charles E. Beuchat, Irvine, both of Calif., assignors to The Cooper Companies, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 28,504, Mar. 20, 1987, Pat. No. 4,784,649. This application Mar. 21, 1988, Ser. No. 171,431
Int. Cl.[5] A61M *5/325*
U.S. Cl. 604—240 **60 Claims**



1. A surgical aspirator cannula comprising:

an elongated body member having a distal end and a proximal end,

said body member defining a longitudinal aspiration conduit passing therethrough between said distal end and said proximal end,

a securing means for securing a proximal end of an elongated cannula to said distal end to communicate the cannula proximal end with said aspiration conduit,

said proximal end being connectable to a source of vacuum,

a valve assembly positioned at least partially in said body member and in said aspiration conduit,

said valve assembly being positionable in a first valve position closing said conduit so that the source of vacuum is blocked relative to said distal end port, and in a second valve position opening said conduit so that the source of vacuum communicates with said distal end port,

a hand-operated switch means supported by said body member and operatively connected to said valve assembly for moving said valve assembly between said first and second valve positions,

said switch means being positionable in a first switch position wherein said valve assembly is in said first valve position and in a second switch position wherein said valve assembly is in said second valve position,

a biasing means for biasing said valve assembly into one of said first and second valve positions,

said switch means including a manually-movable switch pad,

said valve assembly including a piston disposed transversely to said aspiration conduit and having a bore extending transversely therethrough,

said piston closing said conduit when said valve assembly is in said first valve position,

said piston opening said conduit by having said bore aligned with said conduit when said valve assembly is in said second valve position, and

said biasing means biasing said piston relative to said conduit.

VOL
1114
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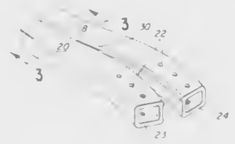
4,925,451
I.V. FLOW CONTROL DEVICE
Pasquale J. Amendolia, P.O. Box 475, St. James, N.Y. 11780
Filed Apr. 18, 1988, Ser. No. 182,421
Int. Cl.[5] A61M *5/05*
U.S. Cl. 604—246 18 Claims



1. Apparatus for the I.V. administration of a parenteral liquid to a patient comprising:
a. outlet means including an outlet orifice for discharging said parenteral liquid for application to said patient;
b. inlet means for receiving said parenteral liquid;
c. diaphragm means having a flange mounted between said inlet and outlet means and membrane means enclosed by said flange separating incoming parenteral liquid from outgoing parenteral liquid for maintaining the rate of discharge of said parenteral liquid through said outlet orifice;
d. means for bypassing flow of said parenteral liquid from said inlet means to said outlet means around said membrane means;
e. selecting means entirely contained within said apparatus for selecting the rate of flow of said liquid through said apparatus independent of the pressure of parenteral liquid at either the inlet or outlet side of said apparatus; and
f. said membrane means in the absence of liquid flow being shaped in the form of an annular arcuate torus the outer surface of which faces said inlet means, the portion of said membrane means surrounded by said torus forming a bulbous section which is curved outwardly in its resting state in the direction of and controls flow through said outlet orifice, said membrane means in the absence of any liquid in its resting state being unstressed and making no contact with any part of said apparatus thereby remaining unstressed during shipping and storage prior to use and permitting rolling of said torus during flow of liquid through said apparatus as a result of pressure differential across said membrane means so that said bulbous section moves toward and away from said outlet orifice in response to pressure differential across said membrane means.

4,925,452
MULTIPLE CONDUIT DRAINAGE DEVICE
Lev Melinyshyn, Mt. Prospect, and Edward M. Goldberg, Glencoe, both of Ill., assignors to Uresil Corporation, Skokie, Ill.
Filed Mar. 8, 1988, Ser. No. 165,623
Int. Cl.[5] A61M *27/00*
U.S. Cl. 604—284 12 Claims

1. A unitary multiple conduit flexible drainage device in which the individual conduits may be parted at their distal ends upon application of a parting force, comprising:
a common manifold,
a plurality of generally parallel adjacent conduits, said conduits being in fluid communication with said common manifold at their proximal ends; and



at least two generally parallel frangible membranes joining adjacent conduits,
whereby the adjacent conduits may be readily parted from their distal ends.

4,925,453
ABSORBENT BLOOD WIPE PAD AND METHOD
Charles P. Kannankeril, North Caldwell, N.J., assignor to Sealed Air Corporation, Saddle Brook, N.J.
Filed Aug. 10, 1988, Ser. No. 230,575
Int. Cl.[5] A61F *13/00*
U.S. Cl. 604—378 21 Claims

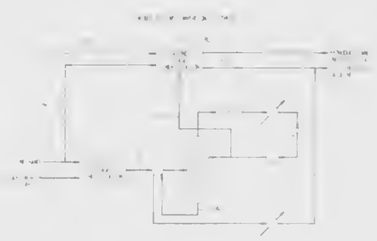


1. A medical sponge characterized by the ability to absorb body fluids, such as blood, while protecting persons using the sponge from contact with such body fluids, said sponge comprising:
(a) a pad of absorbent material for absorbing body fluids therein and having opposite faces and peripheral side edges;
(b) a fluid permeable cover sheet of nonabsorbent material covering one face of said absorbent pad;
(c) a fluid impervious cover sheet of flexible plastic film material covering at least the other face of said absorbent pad;
(d) at least one of said cover sheets also covering said side edges of said pad and extending into contiguous relation to said other cover sheet;
(e) said cover sheets being secured together where they are contiguous to enclose said absorbent pad therebetween; and
(f) handle means on the face of said fluid impervious cover sheet opposite from said pad of absorbent material and having a medially disposed grasping portion extending generally outwardly therefrom for ease in grasping and using said sponge to wipe wounds, incisions and the like to absorb body fluids, said handle means grasping portion being isolated from said pad of absorbent material by said fluid impervious cover sheet to protect the person using the sponge from contact with such body fluids.

4,925,454
ALUMINUM CHLORIDE GRANULES AND PROCESS TO OBTAIN THEM
Jacques Dugua, Charly Par Vernaison, France, assignor to Atochem, Paris, France
Continuation of Ser. No. 110,944, Oct. 20, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 317,143
Claims priority, application France, Oct. 31, 1986, 86 15171
Int. Cl.[5] B01D *7/00*; C01F *3/00, 7/48*; C22B *13/00*
U.S. Cl. 23—305 A 6 Claims

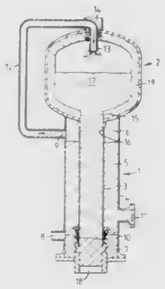
1. A process for obtaining essentially cone-shaped aluminum chloride granules free of fines from a gas current containing aluminum chloride, comprising contacting said gas current with a shape having vertical or substantially vertical surfaces and free of any horizontal surface at the top or sides of the shape, the temperature of said surfaces being below about 70° C., to deposit the aluminum chloride thereon in the form of cone-shaped granules having a height of about 0.5 to 5 cm and a ratio of height to diameter at the base of the cones being between 1 and 10 with the tips of the granules attached to said surfaces and the bases thereof extending therefrom, ceasing the flow of said gas current when the bases of the cones contact each other, then heating said surfaces for a time and at a temperature sufficient to detach said granules from said surfaces by sublimation of the cone tips attached to said surfaces, and recovering said cone-shaped granules.

4,925,455
PROCESS FOR THE ETHERIFICATION OF LINEAR AND BRANCHED OLEFINS
Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Mar. 17, 1989, Ser. No. 324,878
Int. Cl.[5] C10L *1/18*
U.S. Cl. 44—77 15 Claims



1. An integrated once through process for the production of ether-rich liquid fuels, comprising;
(a) contacting a fresh mixture of excess lower alkyl alcohol and a light hydrocarbon feedstock containing linear olefins and C_4+ tertiary olefins with an acidic etherification catalyst in a first etherification zone under tertiary olefin etherification conditions whereby an etherification effluent stream containing lower alkyl tertiary alkyl ethers is produced;
(b) separating said etherification effluent stream to provide a first stream comprising ether-rich C_5+ gasoline and a second stream comprising unreacted lower alkyl alcohol and linear olefinic C_5- hydrocarbons;
(c) contacting said second stream with an acidic metallosilicate catalyst in a second etherification zone under conditions effective to etherify said linear olefinic hydrocarbons; and
(d) recovering C_5+ ether-rich gasoline and unreacted hydrocarbons from said second etherification zone.

4,925,456
PROCESS AND APPARATUS FOR THE PRODUCTION OF SYNTHESIS GAS
Frederick Egglestone, Crawley, England, assignor to The Britsh Petroleum COmpany p.l.c., London, England
PCT No. PCT/GB87/00252, § 371 Date Nov. 24, 1987, § 102(e) Date Nov. 24, 1987, PCT Pub. No. WO87/06221, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 15, 1987, Ser. No. 128,829
Claims priority, application United Kingdom, Apr. 15, 1986, 8609099
Int. Cl.[5] B01J *12/00*; C01B *3/34, 3/38*
U.S. Cl. 48—127.9 16 Claims



1. Apparatus for the two-stage production of synthesis gas from hydrocarbons, said apparatus comprising:
a plurality of double pipe heat exchangers, each of said heat exchangers comprising an inner pipe having a central bore space with a first end and an opposite, second end and an outer pipe co-axial with said inner pipe and of an internal diameter larger than the external diameter of said inner pipe to define an annular space between said inner pipe and said outer pipe with a first end adjacent said first end of said bore space and an opposite, second end, one said space containing a primary reforming catalyst,
a shell defining a secondary reforming zone containing a secondary reforming catalyst bed, said shell having an inlet for receiving primary reforming effluent gas from said one said space and an outlet spaced from said inlet and at the opposite side of said catalyst bed from said inlet, said outlet permitting the passage of secondary reforming effluent;
means interconnecting said first end of said one said space of each of said plurality of heat exchangers with said inlet of said shell for the passage of said primary reforming effluent into said secondary reforming zone,
means interconnecting said first end of the other said space of each of said heat exchangers with said outlet of said shell for the passage of secondary reforming effluent into said other said space of each of said heat exchangers,
means for supplying steam and hydrocarbon containing gas to said second end of said one said space containing said primary reforming catalyst of each of said heat exchangers; and
means at said second end of said other said space of each of said heat exchangers for the passage of secondary reformer effluent out of said other said space of each of said heat exchangers,
whereby the effluent gases exiting from said secondary reforming zone flow countercurrently to the gases in the spaces containing the primary reforming catalyst and heat is transferred from the seconary reformer effluent to the materials within the spaces containing the primary reforming catalyst.

12. A process for producing synthesis gas by a sequence of primary and secondary reforming comprising:

VOL
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feeding hydrocarbon-containing gas and steam to a primary reforming zone, said zone comprising a plurality of double pipe heat exchangers, each of said heat exchangers comprising an inner pipe having a central bore space with a first end and an opposite second end and an outer pipe co-axial with said inner pipe and of an internal diameter larger than the external diameter of said inner pipe to define an annular space between said inner pipe and said outer pipe with a first end adjacent said first end of said bore space and an opposite second end, one of said space containing a primary reforming catalyst, said hydrocarbon containing gas and said steam being fed to the second end of said one said space containing said primary reforming catalyst of each said plurality of heat exchangers;

feeding the primary reformer effluent exiting from said first end of said one said space of each of said heat exchangers and an oxygen containing gas to a secondary reforming zone in the form of a single chamber having an inlet to which said effluent gas and said oxygen containing gas are fed, an outlet spaced from said inlet for the passage of secondary reformer effluent and a secondary reforming catalyst intermediate said inlet and said outlet,

feeding the secondary reformer effluent to said first end of the other said space of each of said heat exchangers; and

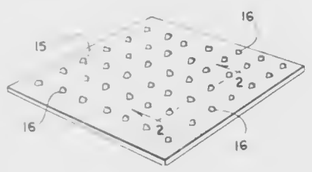
removing secondary reformer effluent from said second end of said other said space whereby the effluent gases exiting from said secondary reformer effluent flow countercurrently to the gases in the spaces containing said primary reforming catalyst and heat is transferred from the secondary reformer effluent to the materials within the spaces containing the primary reforming catalyst.

4,925,457

ABRASIVE TOOL AND METHOD FOR MAKING

Peter T. deKok, 74 Peachtree Way, and Naum N. Tselesin, 2900 Lookout Pl., both of Atlanta, Ga. 30305

Filed Jan. 30, 1989, Ser. No. 303,924
Int. Cl.[5] B24D *3/02*
U.S. Cl. 51—293 10 Claims



1. A method for producing an abrasive tool, wherein a plurality of particles is fixed to the tool, the particles providing the abrasive quality of the tool, said method including the steps of placing said plurality of particles on a flexible metallic mesh carrier and forcing said plurality of particles into said flexible metallic mesh carrier with said particles protruding from said flexible metallic mesh carrier on at least one side thereof, and for fixing said particles in said carrier.

4,925,458

CUTTING TOOL

Pankaj K. Mehrotra, Greensburg, and Elizabeth R. Billman, Pittsburgh, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 56,091, May 28, 1987, Pat. No. 4,852,999.
This application Nov. 14, 1988, Ser. No. 270,998
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 11 Claims

1. A method of machining steels, cast iron, superalloys and the like comprising the steps of:

(a) using a cutting tool insert comprised of sintered ceramic composition comprising 50 to 90 volume percent a polycrystalline alumina matrix having 10 to 50 volume percent single crystal titanium carbide whiskers distributed therein, and

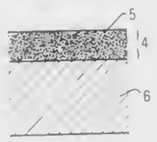
(b) maintaining the machining feed rate between 0.005 and 0.030 inch per revolution and the machining speed between 500 and 4000 surface feet per minute.

4,925,459

PROCESS FOR SEPARATION OF THE CONSTITUENTS OF A MIXTURE IN THE GAS PHASE USING A COMPOSITE MEMBRANE

Alexandre Rojey, Garches; André Deschamps, Noisy Le Roi; Alain Grehier, Paris, and Eric Robert, Rueil-Malmaison, all of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Jan. 10, 1989, Ser. No. 295,316
Claims priority, application France, Jan. 11, 1988, 88 00243
Int. Cl.[5] B01D *53/22, 53/04*
U.S. Cl. 155—16 31 Claims



1. Process for separation of a mixture of at least two constituents A and B in which (a) said mixture in the gas or vapor phase is contacted with the first face of a membrane composed of (i) at least one active layer less than 100 micrometers in thickness comprising a solid adsorbent phase, selective for constituent A, dispersed in a non-porous, non-elastomeric polymer constituting a continuous phase and (ii) a porous support adhering directly to said at least one active layer, (b) the partial pressure of constituent A is kept lower at the second face of the membrane than at the first face and a mixture enriched in constituent A and impoverished in constituent B is collected on the second face of said membrane without a change in phase and (c) a mixture enriched in constituent B and impoverished in constituent A is collected on the first side of said membrane, a process wherein the thickness of the active layer is less than 100 micrometers and the ratio of the mass of the dispersed phase to the mass of the continuous phase in the active layer is greater than 1.

23. A membrane less than 100 microns in thickness composed of (a) at least one active layer comprising a solid adsorbent phase dispersed in a permeable non-porous, non-elastomeric polymer constituting a continuous phase and (b) a porous support adhering directly to said at least one active layer, the ratio of the mass of the dispersed phase to the mass of the continuous phase in the active layer being greater than 1.

4,925,460

CHABAZITE FOR GAS SEPARATION

Charles G. Coe, Macungie; Thomas R. Gaffney, and Rajagopalan S. Srinivasan, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 20, 1989, Ser. No. 383,128
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—25 20 Claims

1. A process for separating a gas mixture comprising a first component and a second component wherein said first component has a higher heat of adsorption than the second component, said process comprising bringing said gas mixture into contact with lithium exchanged chabazite having a Si/Al ratio from about 2.1 to 2.8 wherein at least 65% of the exchangeable ion capacity is in the lithium form, such that said chabazite selectively adsorbs the first component from the gas mixture.

4,925,461

PROCESS FOR SEPARATING NITROGEN GAS BY PRESSURE SWING ADSORPTION SYSTEM

Tsuneo Gemba; Takeshi Tamaru, both of Okayama, and Tetsuhiko Matsuura, Bizen, all of Japan, assignors to Kuraray Chemical Co., Ltd., Bizen, Japan

Filed Feb. 1, 1989, Ser. No. 304,562
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—26 8 Claims



1. A process for separating nitrogen gas from a pressurized gas mixture predominantly composed of nitrogen gas and oxygen gas in a nitrogen gas separation apparatus comprising a plurality of adsorbers packed with a carbon molecular sieve and operable under the pressure swing adsorption system, which comprises the steps of:

(a) carrying out the transfer of the gas under pressure remaining in an adsorber A in which the adsorption step is complete to an adsorber B in which the regeneration step is complete simultaneously through a piping connecting the raw material gas inlet of adsorber A to that of adsorber B and through a piping connecting the product nitrogen outlet of adsorber A to that of adsorber B while adjusting the ratio of the gas transfer flow rate on the raw material gas inlet communication side to the gas transfer flow rate on the product nitrogen outlet communication side to about 3 to about 40%,

(b) discontinuing the gas transfer mentioned above under (a) when the absolute pressure ratio between the pressure inside the adsorber B, which is the gas receiving side, to the pressure inside the adsorber A, which is the gas supplying side, has arrived at a value within the range of about 0.10 to about 0.70, and

(c) then, just prior to starting the next adsorption step, causing back flow of product nitrogen from a product tank into adsorber B to an extent such that the sum total of the quantity of the gas transferred in the above step (b) and the quantity of back flow product nitrogen amounts to about ½ or more of the total gas quantity in adsorber B at the time when a maximum pressure is found during the adsorption step.

4,925,462

PROCESSES FOR REMOVING ORGANOCHEMICAL COMPONENTS

Reinhard Glass, and Uwe Penzel, both of Voerde, Fed. Rep. of Germany, assignors to Arasin GmbH, Voerde-Emmelsum, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 209,930
Int. Cl.[5] B01D *47/04, 53/14*
U.S. Cl. 55—37 31 Claims



1. A process for removing an organochemical component from a gas, comprising the steps of:

(a) flowing a gas that comprises an organochemical component through at least one perforated grid element in a froth scrubber tower into an area where froth can be introduced;

(b) introducing froth that comprises bubbles onto said grid element, wherein an amount of froth is introduced sufficient to cover an entire cross-sectional area of the froth scrubber tower;

(c) allowing the gas to interact with the froth bubbles;

(d) allowing the froth bubbles to settle to a liquid form;

(e) removing the liquid; and

(f) removing the organochemical component from the liquid; wherein said froth comprises an anhydrous or low-water content surfactant-containing liquid containing up to about 10% by weight of water, and a froth-generating gas or air; and wherein said organochemical component is soluble in said surfactant-containing liquid.

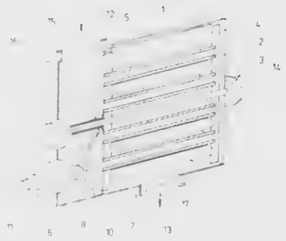
VOL
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4,925,463

EXHAUST GAS CLEANING SYSTEM FOR DIESEL ENGINES

Dieter Kuhnert, Fr.-Metz-Str. 18, D-6920 Sinsheim, Fed. Rep. of Germany

PCT No. PCT/DE87/00245, § 371 Date Jan. 30, 1989, § 102(e) Date Jan. 30, 1989, PCT Pub. No. WO87/07324, PCT Pub. Date Dec. 3, 1987
PCT Filed May 31, 1987, Ser. No. 314,368
Claims priority, application Luxembourg, May 30, 1986, 86448; Nov. 18, 1986, 86671
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—96 24 Claims



1. An exhaust gas cleaning system for Diesel engines including a filtration device for separating soot from the exhaust gases and a regeneration device for the filtration device, comprising a separate regeneration sector with the admission of regeneration means for the soot; said filtration device comprises a number of filter elements, preferably arranged equidistantly, the filter elements being located in a rotatable drum which can be pivoted on bearings within a housing which is sealed to prevent leakage of the exhaust gases and has an admission and discharge line; one wall of said drum subdivides the housing into two parts with holes to allow axial throughflow of the exhaust flow between the first section containing the filter elements and a second section towards which the filter elements are open ended and in which regeneration takes place relative to said filter elements, depending on the rotational position of the drum, in one single corresponding section of the filtration device; said filter elements (2) are tube-shaped and closed off at one end by a wall (4) such that the exhaust gases flow radially through the filter tube (2) and axially through a perforated wall (5), and include partitions (8 and 9) which run parallel to the filter tubes and are present between the perforated wall (5) of the drum and the housing wall and situated relative to the walls (4 and 5) of the drum, forming a chamber (10) in at least one of the sections (6, 7) for the regeneration means.

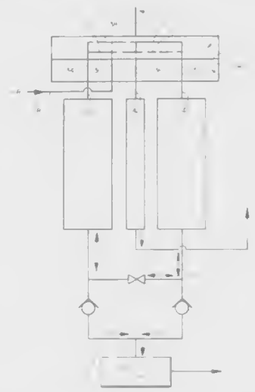
4,925,464

FLUID FLOW SWITCHING VALVE ASSEMBLY AND SYSTEM

Richard Rabenau, Arab; Rowland W. Kanner, and Donald W. Hunter, both of Guntersville, all of Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Nov. 17, 1988, Ser. No. 272,626
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—179 18 Claims

1. A valve assembly for providing selective flow communication between a plurality of fluid flow conduits, comprising: two valve members having respective engaged surfaces relatively rotatable to provide valving action, said valve members including a first valve member having a plurality of through apertures for respective communication with said flow conduits, and a second valve member including flow passage means for selectively interconnecting at least two of said apertures through said first valve member in order to enable fluid flow therebetween; and drive means for driving continuous relative rotation of said valve members in order to enable



rotationally cycled interconnection and fluid flow through said two apertures.

4,925,465

VAPOR CONTROL INSULATION BLANKET

Merle E. Liskey, Belleville, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 23, 1989, Ser. No. 299,210
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—267 4 Claims



1. A combination insulation blanket and fuel vapor storage envelope for mounting in overlying relationship to any large planar surface of a vehicle, the envelope having spaced walls of vapor impermeable and flexible material, the walls being edge sealed to define a thin enclosure between the walls; a layer of insulative material within the enclosure which separates and supports the walls apart from one another, the insulative material being permeable to air and fuel vapor; a fuel vapor absorbent material carried by the insulative material for storage of fuel vapors; means for fluidly connecting the enclosure with at least one source of fuel vapor adsorbate.

4,925,466

FILTER CARTRIDGE ASSEMBLY

Kenneth W. Overby, Hamilton, Ind., assignor to La-Man Corporation, Hamilton, Ind.

Filed Nov. 23, 1988, Ser. No. 275,773
Int. Cl.[5] B01D *36/02*
U.S. Cl. 55—319 32 Claims

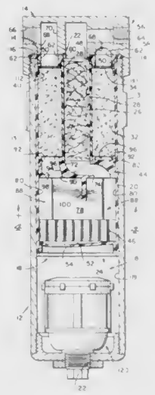
1. An apparatus for cleaning a compressed air stream in an air line, the apparatus comprising

a cartridge housing formed to include an interior region and a cartridge-receiving opening communicating with the interior region,

a filter cartridge in the interior region of the cartridge housing, the filter cartridge including means for filtering a compressed air stream to remove at least one selected contaminant therefrom, the filtering means including a pair of coaxially aligned filter elements, a first of the filter elements being formed to include a central aperture extending in an axial direction therethrough, and a second of the filter elements being situated in the central aperture,

a manifold formed to include means interconnecting the air line and the filter cartridge for conducting the compressed air stream in the air line between the air line and the filter cartridge, and

means for selectively connecting the manifold to the cartridge housing to cover the cartridge-receiving opening and to place the manifold adjacent to the filter cartridge to



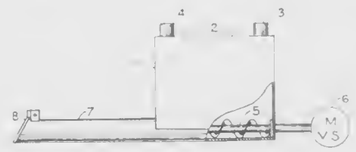
couple the conducting means to the filtering means, the filter cartridge including a tubular casing having an interior side wall, the filtering means being disposed in an axially upper portion of the casing, and enclosure means underlying the filtering means for defining an enclosed volume situated to conduct air between the first and second filter elements, the enclosure means including a pair of flat axially downwardly extending side walls aligned in spaced-apart parallel relation to intersect the interior side wall in chordally extending relation to define the enclosed volume therebetween.

4,925,467

SELF EMPTYING VACUUM VESSEL

Roland H. Jordan, and Mark R. Jordan, both of 1021 Ave. C, Redondo Beach, Calif. 90277

Continuation-in-part of Ser. No. 67,981, Jun. 9, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 248,621
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—430 6 Claims



1. Self emptying vacuum vessel comprising:

a chamber suitable for containing a vacuum therein having a removable top with an inlet connection for receiving wet or dry material;

said top having a first outlet connection to a vacuum source;

said chamber having three vertical and one slanted side walls;

a trough extending longitudinally along and connected to the lower end of said side walls;

a screw conveyor mounted, with bearings, in said trough having a second outlet at one end for disposing of said material from said chamber;

said slanted wall having an antibridging means for maintaining flow of said material to said screw conveyor, by preventing collected material within the vessel from adhering to said slanted wall,

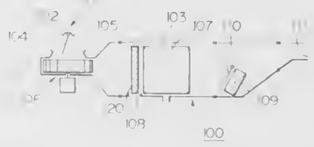
said second outlet having a cover, hinged at the top, as a means for allowing said material out of said second outlet when said cover is open and prevents air from coming in said second outlet when said cover is closed.

4,925,468

FILTER DEVICE PROVIDED IN AN AIR CONDITIONING DEVICE

Noriaki Kishi, Kariya; Kazuto Nosaka, Chita; Tadayoshi Terao, and Yukio Shibata, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 5, 1988, Ser. No. 253,697
Claims priority, application Japan, Oct. 14, 1987, 62-259329
Int. Cl.[5] B01D *46/12, 35/02*
U.S. Cl. 55—467 6 Claims



1. An air conditioning device for a vehicle, said air conditioning device causing air to be supplied by a blower into a room of said vehicle, and having a filter device for removing foreign matter from air flowing through an air passage, said air conditioning device comprising:

a duct serving as said air passage and leading said air from said blower to said room, said duct being provided with an opening for inserting said filter device therein, and

a cover for closing said opening,

said filter device including a filter and at least one connecting member,

said filter having a plurality of filter elements, each filter element having at least one connecting surface in parallel with a flow direction of said air, and being disposed in said air passage in such a manner that said at least one connecting surface of each said filter element is in parallel with a connecting surface of a next adjacent filter element,

at least one connecting member connecting said at least one connecting surface of each said filter element to said next adjacent filter element in such a manner that each pair of adjacent filter elements are movable relative to each other,

at least one connecting member being folded between said connecting surfaces of the adjacent filter elements which are in parallel with each other.

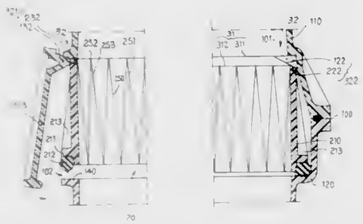
VOL
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ISS
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4,925,469

AIR FILTER FOR HEAT ENGINES

Pierre Clement, Pont-de-Roide, and Thierry Gourlot, Seloncourt, both of France, assignors to ECIA-Equipments Et Composants Pour L'Industrie Automobile, Audincourt, France

Filed Mar. 21, 1989, Ser. No. 326,767
Claims priority, application France, Mar. 22, 1988, 88 03729
Int. Cl.[5] B01D *46/52*
U.S. Cl. 55—480 21 Claims



1. An air filter for a heat engine, said filter comprising a non-cylindrical body defining a chamber, an opening in the body providing access to the chamber, a cover for closing the opening, an inlet nozzle for admission of the gas to be filtered opening onto the chamber, an outlet nozzle for discharge of the filtered gas opening onto the chamber, an interchangeabile filtering cartridge comprising a chassis-frame and a filter proper, the filtering cartridge being capable of being introduced in the chamber and remove from the chamber through said opening, the body comprising two semi-shells united in a junction plane extending across the chamber, said opening being astride the junction plane, and positioning means for placing the filtering cartridge in position and being carried by the body in such a manner as to permit selectively the introduction and the removal of the cartridge by a movement in translation of the cartridge in a direction substantially parallel to the junction plane and a positioning and a retraction of the cartridge by a displacement of the cartridge in a direction substantially perpendicular to said junction plane, said positioning means causing the translation to occur first, before the displacement, when said cartridge is inserted into said body, and conversely when said cartridge is withdrawn.

4,925,470

BOTTOM EJECTION TYPE INSTANT COOLING EASY-OPENER WITH AMUSEMENT EFFECT

Tien-Fa Chou, No. 117, San Dien Lane, Shui Li Hsiang, Nan Tou Hsien, Taiwan

Filed Apr. 14, 1989, Ser. No. 337,973
Int. Cl.[5] F25D *5/00*
U.S. Cl. 62—4 5 Claims

1. A bottom ejection type instant cooling easy-opener with amusement effect, including a circular concave seat made at the inner bottom at the center with a center hole made thereon and arranged in 1-3 m/m wide; a cylindrical cooler containing thereinside a kind of instant cooling agent, and comprising a resilient sealing element set at the bottom opening; a metal plate being be made of copper, aluminum or stainless steel particle powder by means of shape forming process to provide capillary action and having a retainer groove made on its outer wall surface, a hollow inner space, thereinside to communicate with its opening; and a metal injection needle comprising a rubber adapter set at one end for connection with a straw; wherein when said metal plate and said resilient sealing element are fixedly attached to the bottom end of said cylindrical cooler, said cooler is then firmly set in said circular concave seat and coated with one layer of non-toxic and dry type adhesive material to fully seal the connection, and wherein when said cylindrical cooler, said metal plate and said resilient sealing element are respectively set in said concave seat, and said circular concave seat is then processed to provide a first circular groove set at the upper part, a second and interrupted circular groove set at the middle part, and a third and interrupted circular groove set at the lower part, so as to let said circular concave seat, said adhesive material, said cylindrical



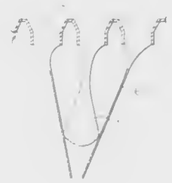
cooler, said sealing element, and said metal plate be firmly retained together; and wherein said metal injection needle is used to pierce from said opening of said circular concave seat through said resilient sealing element into said inner space of said metal plate to let said instant cooling agent be vaporized to exhaust from said cylindrical cooler through said metal injection needle to the atmosphere to cool down the easy-opener.

4,925,471

METHOD OF RESTARTING OPERATIONS FOR MANUFACTURING FILAMENTS OF A THERMOPLASTIC MATERIAL AFTER AN ACCIDENT OF THE BREAKING

Kiichi Yamatsuta, Kanagawa, Japan, assignor to Asahi Fiber Glass Company Limited, Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 308,464
Claims priority, application Japan, Feb. 12, 1988, 63-28944
Int. Cl.[5] C03B *37/02*
U.S. Cl. 65—2 3 Claims



1. A method of restarting operations for manufacturing filaments from a molten mass of a thermoplastic material after the occurrence of the breaking of a filament with the production of a bulbous bead, said filaments being drawn at a regular, high speed from a large number of orifices formed in the bottom of a bushing, said method of restarting comprising:

(a) a step of detecting the bead of said molten mass formed at an orifice where the breaking of a filament occurs, to thereby generate a signal;

(b) a step of reducing the speed of elongating said filaments upon receiving said signal so that a filament elongated in the vicinity of said bead at the reduced speed is brought into contact with said bead elongated by gravity and elongates the bead into a filament having a larger diameter, during which operations to produce a regular filament product are stopped, the reduction in speed being such that the filament elongated in the vicinity of said bead at the reduced speed grows to sufficient diameter to resist breakage when contacting said bead, but the reduction in speed not being so large that the filaments being formed grow to a diameter whereby the strand being formed is likely to break; and

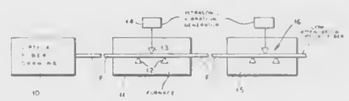
(c) step of increasing the speed of the elongating of said filaments to the regular speed.

4,925,472

METHOD OF REDUCING OPTICAL-FIBER ATTENUATION

Pietro Di Vita, Turin, Italy, assignor to Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A., Turin, Italy

Filed Nov. 3, 1988, Ser. No. 266,734
Claims priority, application Italy, Nov. 5, 1987, 67942 A/87
Int. Cl.[5] C03B *37/022, 37/075*
U.S. Cl. 65—2 11 Claims



1. A method of reducing attenuation in an optical fiber, comprising the steps of:

(a) heating an optical fiber to an elevated temperature below a softening temperature of the material of said optical fiber; and

(b) vibrating said optical fiber while it is at said elevated temperature with an ultrasonic vibration to effect atomic redistribution in said optical fiber to a lower energy condition than the atoms possess prior to vibrating of said optical fiber, thereby reducing sizes of inhomogeneity domains in said material.

4,925,473

PROCESS AND FURNACE FOR HEAT APPLICATION

Richard V. Jeskey, Fiskdale, Mass., and John R. Plocharczyk, Enfield, Conn., assignors to Incom, Inc., Southbridge, Mass.

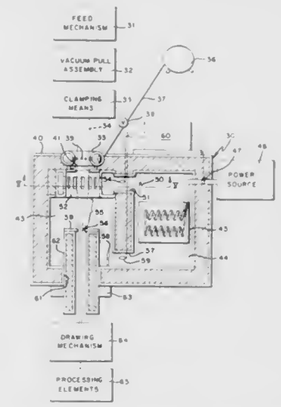
Continuation of Ser. No. 47,885, May 8, 1987, Pat. No. 4,778,501, which is a continuation of Ser. No. 798,585, Nov. 15, 1985, abandoned. This application Oct. 17, 1988, Ser. No. 258,994
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[5] C03B *37/025*
U.S. Cl. 65—12 23 Claims

1. A process for drawing a fiber or fiber-bundle product from a preform of heat-softenable drawable material having a drawing temperature and a working zone, comprising the steps of:

(a) feeding the preform into an inlet in a drawing chamber,

(b) heating a gaseous fluid to a temperature at or above the drawing temperature of the preform with substantially all of the heating occurring prior to step (3), below,

(c) causing the heated fluid to flow past the preform working zone until the preform is at drawing temperature in the working zone, and



(d) drawing the product from the preform through an outlet in the drawing chamber.

4,925,474

METHOD AND APPARATUS FOR ON-LINE LOI MEASUREMENT OF FIBERS

Reed H. Grundy, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 281,140, Dec. 7, 1988, abandoned. This application Oct. 23, 1989, Ser. No. 425,145
Int. Cl.[5] C03B *37/07, 37/12;* C03C *25/02*
U.S. Cl. 65—29 9 Claims



1. A method of measuring the volume of electrically conductive liquid present on a fiber bundle which is travelling at high speed along a path comprising contacting the bundle with a first and a second conductive element speed apart from each other along the fiber bundle path, producing a signal representative of the voltage drop along the bundle between the two said elements, contacting the bundle with a third conductive element spaced from the second element in the fiber bundle path and producing a signal representative of the voltage drop between the second and the third element, synchronously demodulating the first and second signals so produced to produce a third signal representing the volume of the said liquid in the fiber bundle length between the first and the third conductive element.

4,925,475

METHOD AND APPARATUS FOR MANUFACTURING PREFORM FOR FLUORIDE GLASS FIBER

Yoshinori Mimura, Wako; Yukio Noda, Saitama; Naoki Norimatsu, Tokyo; Hidetaru Tokiwa, Yono, and Osamu Shinbori, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,268

Claims priority, application Japan, Jan. 29, 1988, 63-17109

Int. Cl.[5] C03B *19/00;* C03C *27/00*

U.S. Cl. 65—48 **9 Claims**



1. A method for the manufacture of a preform for a fluoride glass fiber, characterized by:

a first step in which a cooling means and a liquid reservor are provided in association with a cylindrical vessel open at both ends, a crucible open at both ends is disposed in the cylindrical vessel, and cladding glass and core glass are loaded into the cylindrical vessel and the crucible, respectively, with their lower open ends plugged, and are molten by a heating means; and

a second step in which cladding glass melt in the cylindrical vessel is cooled by the cooling means, and when the outer portion of the cladding glass melt is cooled and solidified but its inner portion is still in the molten state, the plugged lower open ends of the cylindrical vessel and the crucible are opened to let the inner portion of the cladding glass melt run out into the liquid reservoir and to introduce the core glass melt into the void from which the cladding glass melt has run out, and then the glass is cooled and solidified in its entirety, thereby forming a core-cladding layer structure.

6. An apparatus for the manufacture of a preform for a fluoride glass fiber, comprising:

a cylindrical vessel open at both ends for loading cladding glass;

a crucible open at both ends for loading core glass, the crucible being disposed in the cylindrical vessel;

means for opening and closing the lower open ends of the cylindrical vessel and the crucible;

heating means for melting the cladding glass and the core glass;

cooling means for cooling and solidifying the cladding glass melt at a cooling rate such that the inner portion of the glass melt is still in the molten state when its outer portion is already cooled and solidified; and

a liquid reservoir for receiving the glass melt having run out of the cylindrical vessel through its lower open end.

4,925,476

AZOLE HEMIAMINAL DERIVATIVES AND THEIR USE AS NITRIFICATION INHIBITORS

Klaus Wagner, Neustadt; Norbert Rieber, Mannheim; Ernst-Heinrich Pommer, Limburgerhof, and Juergen Dressel, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

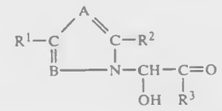
Filed Feb. 5, 1988, Ser. No. 152,553

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704359

Int. Cl.[5] C05C *11/00;* C07D *231/10, 249/08, 233/54*

U.S. Cl. 71—27 **7 Claims**

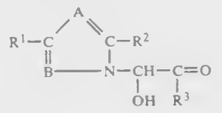
1. An azole hemiaminal derivative of the formula:



where R^1 and R^2 independently of one another are each hydrogen, C_1–C_4-alkyl, unsubstituted or substituted aryl or halogen, wherein the substituents on the aryl are selected from the group consisting of halogen and C_1–C_4 alkyl,

R^3 is hydroxyl or an open-chain or cyclic C_1–C_{10}-alkyl or C_1–C_4-alkoxy, C_2–C_4-alkenyl, C_3- or C_4-alkynyl or styryl radical or phenyl, naphthyl, or thiophenyl or aralkyl, where the aromatic radical of each aromatic radical containing group may be monosubstituted or polysubstituted by halogen, halo-C_1–C_4-alkyl, halo-C_1–C_4-alkoxy, C_1–C_4-alkyl, C_1–C_4-alkoxy, carboxyl, carboxy-C_1–C_4-alkyl, cyano, nitro, sulfoxyl or sulfonyl, A is CR^4 and B is N, and R^4 is hydrogen, C_1–C_4-alkyl, unsubstituted or substituted aryl or halogen wherein the substituents on the aryl are selected from the group consisting of halogen and C_1–C_4 alkyl.

2. A nitrification inhibitor comprising: an azole hemiaminal derivative of the formula (I)

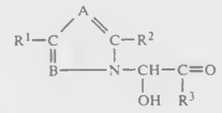


(I)

where R^1 and R^2 independently of one another are each hydrogen, C_1–C_4-alkyl, unsubstituted or substituted aryl or halogen, wherein the substituents on the aryl are selected from the group consisting of halogen and C_1–C_4 alkyl,

R^3 is hydroxyl or an open-chain or cyclic C_1–C_{10}-alkyl or C_1–C_4-alkoxy, C_2–C_4-alkenyl, C_3- or C_4-alkynyl or styryl radical or phenyl, naphthyl, or thiophenyl or aralkyl, where the aromatic radical of each aromatic radical containing group may be monosubstituted or polysubstituted by halogen, halo-C_1–C_4-alkyl, halo-C_1–C_4-alkoxy, C_1–C_4-alkyl, C_1–C_4-alkoxy, carboxyl, carboxy-C_1–C_4-alkyl, cyano, nitro, sulfoxyl or sulfonyl, A is CR^4 and B is N, and R^4 is hydrogen, C_1–C_4-alkyl, unsubstituted or substituted aryl or halogen wherein the substituents on the aryl are selected from the group consisting of halogen and C_1–C_4 alkyl, in combination with a carrier.

3. A process for inhibiting nitrification in the soil, wherein an azole hemiaminal derivative of the formula (I)



(I)

where

R^1 and R^2 independently of one another are each hydrogen, C_1–C_4-alkyl, unsubstituted or substituted aryl or halogen, wherein the substituents on the aryl are selected from the group consisting of halogen and C_1–C_4 alkyl,

R^3 is hydroxyl or an open-chain or cyclic C_1–C_{10}-alkyl or C_1–C_4-alkoxy, C_2–C_4-alkenyl, C_3- or C_4-alkynyl or styryl radical or phenyl napthyl orthiophenyl or aralkyl, where the aromatic radical of each aromatic containing group may be monosubstituted or polysubstituted by halogen, halo-C_1–C_4-alkyl, halo-C_1–C_4-alkoxy, C_1–C_4-alkyl, C_1–C_4-alkoxy, carboxyl, carboxy-C_1–C_4-alkyl, cyano, nitro, sulfoxyl or sulfonyl, A is CR^4 and B is N, and R^4 is hydrogen, C_1–C_4-alkyl, unsubstituted or substituted aryl or halogen, wherein the substituents on the aryl are selected from the group consisting of halogen and C_1–C_4 alkyl, is applied to the soil in an amount sufficient for inhibition.

4,925,477

CHEMICAL HYBRIDIZING AGENTS

Robert G. McDaniel, Tuscon, Ariz., assignor to Research Corporation, New York, N.Y.

Filed Aug. 29, 1986, Ser. No. 902,289

Int. Cl.[5] **A01N** *43/60*

U.S. Cl. 71—77 **6 Claims**

1. A method of inducing male sterility in plants which comprises treating seeds of a monocot plant receptive to said treatment by application of an effective amount of a compound of the formula:



wherein

R and R^1 are hydrogen, alkyl, alkenyl, alkynyl, benzyl, phenyl, halogen or boron and may be the same or different and said alkyl, alkenyl and alkynyl have no more than six carbon atoms;

X and X^1 are fluorine, chlorine, bromine or iodine; nitrate, sulfate, sulfonate, phosphate, citrate, or maleate;

n and n^1 are the integers 0 or 1, and may be the same or different;

m and m^1 are integers from 0 to 4, and may be the same or different;

for a period of time and under conditions sufficient to induce male sterility in adult plants which develop from said treated seeds.

4,925,478

NOVEL QUINOLINOXY COMPOUNDS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE AS ANTIDOTES

Erich Sohn, Essliogen; Reinhard Handte, Gablingen; Hilmar Mildenberger, Kelkheim; Klaus Bauer, Hanau, and Hermann Bieringer, Eppstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

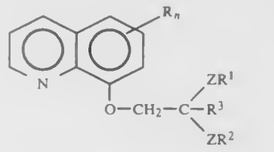
Filed Jul. 21, 1987, Ser. No. 76,111

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624859

Int. Cl.[5] **A01N** *43/42;* **C07D** *215/26*

U.S. Cl. 71—90 **12 Claims**

1. A herbicidal agent which contains a herbicide selected from the group consisting of carbamates, thiocarbamates, haloacetanilides, substituted phenoxy-, naphthoxy- and phenoxyphenoxy-carboxylic acid derivatives, heteroaryloxy-phenoxycarboxylic acid derivatives and dimedone oxime derivatives and an antidote compound of the formula I



I

wherein the individual radicals have the following meaning:

R is halogen or (C_1–C_4)alkyl,

Z, in each case independently of one another, is O or S,

R^1 and R^2, independently of one another, is H, (C_1–C_8) alkyl, (C_3–C_8) alkenyl, (C_1–C_4)alkoxy-(C_1–C_4-)alkyl, (C_1–C_{12}) haloalkyl having up to 17 halogen atoms, (C_3–C_{12}) haloalkenyl having up to 17 halogen atoms or phenyl-(C_1–C_2) alkyl,

R^3 is H or (C_1–C_4) alkyl, and

n is 0, 1 or 2,

and the salt and N-oxides thereof, in a ratio by weight of (0.01–10):1 of compound of formula I to herbicide.

4,925,479

CERTAIN 7-(2-SUBSTITUTED BENZOYL)-1-HETEROSPIRO-(4,5)DECANE-(6,8)-DIONES

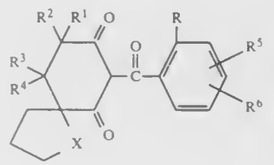
David L. Lee, Pleasant Hill, Calif., assignor to Imperial Chemical Industries PLC, London, England

Filed Nov. 21, 1988, Ser. No. 274,068

Int. Cl.[5] **A01N** *43/02, 43/00;* **C07D** *333/22, 333/16*

U.S. Cl. 71—91 **32 Claims**

1. Compounds of the formula



wherein

X is oxy, thio, sulfinyl or sulfonyl;

R is halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; trifluoromethoxy; difluoromethoxy; nitro; cyano; C_1–C_2 haloalkyl; R^aSO_n— wherein n is 0 or 2 and R^a is C_1–C_2 alkyl, trifluoromethyl or difluoromethyl;

R^1 is hydrogen, C_1–C_4 alkyl, phenyl or substituted phenyl;

R^2 is hydrogen or C_1–C_4 alkyl; or

R^1 and R^2 together are C_2–C_5 alkylene;

R^3 is hydrogen, C_1–C_4 alkyl, phenyl or substituted phenyl with the proviso that R^1 and R^3 are not both phenyl or substituted phenyl;

R^4 is hydrogen or C_1–C_4 alkyl; and

R^5 and R^6 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) R^eC-(O)— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are defined; and their salts.

4,925,480

HETEROCYCLICALLY SUBSTITUTED N-SULTAMSULFONAMIDES, AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Lothar Willms, Hillscheid; Klaus Bauer, Hanau; Hermann Bieringer, Eppstein/Taunus, and Helmut Bürstell, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

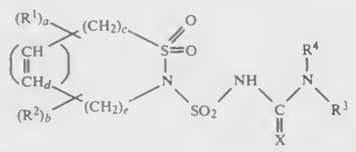
Filed Oct. 28, 1988, Ser. No. 263,817

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1987, 3736959

Int. Cl.[5] C07D *403/12, 417/12;* A01N *43/54, 43/72*

U.S. Cl. 71—91 8 Claims

1. A compound of formula I or a salt thereof



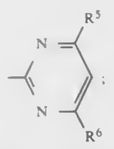
(I)

wherein:

R^1 and R^2 independently of one another are hydrogen, halogen, or (C_1–C_8)-alkyl, (C_2–C_8)-alkenyl, (C_2–C_8)-alkynyl or (C_1–C_8)-alkoxy each of which is unsubstituted or mono- or polysubstituted by halogen or mono- or disubstituted by (C_1–C_4)-alkoxy or (C_1–C_4)-alkylthio; or are —(CH_2-)$_n$—$COOR^{11}$, where n is an integer from 0 to 2;

R^3 is hydrogen, (C_1–C_8)-alkyl, (C_2–C_8)-alkenyl or (C_2–C_8)-alkynyl;

R^4 is a heterocyclic radical of formula



R^5 and R^6 independently of one another are hydrogen, halogen, or (C_1–C_4)-alkyl or (C_1–C_4)-alkoxy each of which is unsubstituted or mono- or polysubstituted by halogen; or are di-[(C_1–C_4)-alkoxy]-(C_1–C_2)-alkyl, (C_3–C_6-cycloalkyl, —$OCHR^8COOR^9$, —NR^9R^{10} or (C_1–C_4)-alkylthio;

R^8 is hydrogen or (C_1–C_4)-alkyl;

R^9 and R^{10} independently of one another are hydrogen, (C_1–C_4)-alkyl, (C_2–C_4)-alkenyl or (C_2–C_4)-alkynyl;

R^{11} is hydrogen, or (C_1–C_8)-alkyl, (C_2–C_4)-alkenyl or (C_2–C_4)-alkynyl each of which is mono- or polysubstituted by halogen or (C_1–C_4)-alkoxy radicals;

X is oxygen or sulfur; and

a, b, c, d and e independently of one another are 0, 1 or 2, with the proviso that the sum of c, d and e ≧ 2.

5. A herbicidal composition comprising a herbicidally effective amount of a compound of formula I, or a salt thereof, as claimed in claim 1 and a suitable carrier therefor.

4,925,481

SUBSTITUTED BICYCLIC TRIAZOLE HERBICIDES

Friedhelm Blume; Gabriele Dorfmeister; Wilfried Franke; Richard Rees; Gerhard Johann, and Friedrich Arndt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

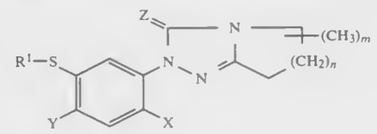
Filed Nov. 28, 1988, Ser. No. 276,611

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740837

Int. Cl.[5] A01N *43/90;* C07D *471/04*

U.S. Cl. 71—92 18 Claims

1. A substituted bicyclic triazole of the formula



in which

X is hydrogen or fluorine,

Y is halogen,

Z is oxygen or sulphur,

R^1 is C_1–C_6-alkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl, each of which is optionally substituted by one or more halogen and/or C_1–C_4-alkoxy groups; C_3–C_7-cycloalkyl, C_5–C_7-cycloalkenyl, C_3–C_7-cycloalkyl-C_1–C_3-alkyl or C_5–C_7-cycloalkenyl-C_1–C_3-alkyl, each of which is optionally substituted by one or more halogen and/or C_1–C_4-alkoxy groups, and in which one or two carbons are optionally replaced by oxygen; cyano-C_1–C_3-alkyl or the group CR^2R^3A,

R^2 and R^3 are the same or different hydrogen, fluorine or methyl,

A is the group CO_2R^4, $COSR^5$ or $CONR^6R^7$,

R^4 is C_1–C_6-alkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl, each of which is optionally substituted by one or more halogen and/or C_1–C_4-alkoxy groups; C_3–C_7-cycloalkyl, C_5–C_7-cycloalkenyl, C_3–C_7-cycloalkyl-C_1–C_3-alkyl or C_5–C_7-cycloalkenyl-C_1–C_3-alkyl, each of which is optionally substituted by one or more halogen and/or C_1–C_4-alkoxy groups, and in which one or two carbons are optionally replaced by oxygen; or cyano-C_1–C_3-alkyl,

R^5 is C_1–C_6-alkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl, each of which is optionally substituted by one or more halogen and/or C_1–C_4-alkoxy groups,

R^6 and R^7 are the same or different and are selected from the group consisting of hydrogen, C_1–C_6-alkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl, or together with the nitrogen to which they are attached are morpholino, piperidino or pyrrolidino,

n is 1, 2 or 3, and

m is 0, 1, 2 or 3.

4,925,482

FUNGICIDAL AND PLANT GROWTH-REGULATING HYDROXYALKYL-AZOLYL DERIVATIVES

Klaus Stroech, Solingen; Monika Frie, Odenthal; Thomas Himmler, Cologne; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

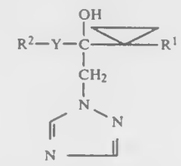
Filed Jul. 7, 1988, Ser. No. 216,690

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722794; Apr. 25, 1988, 3813874

Int. Cl.[5] A01N *43/653;* C07D *249/08*

U.S. Cl. 71—92 13 Claims

1. A hydroxyalkyl-azolyl derivative of the formula



in which

R^1 is fluorine, chlorine, bromine or phenyl which is optionally substituted by chlorine, or is dichloro-substituted phenoxy,

R^2 is alkyl with 1 to 4 carbon atoms, which is optionally mono- or di-substituted by methoxy, or is cycloalkyl having 3 to 7 carbon atoms, which is optionally mono-substituted by methyl, or is naphthyl, or the radical of the formula

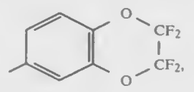


wherein

R^4 is fluorine, chlorine, bromine, methyl, ethyl, isopropyl, tert.-butyl, methoxy, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl, phenoxy or nitro, and

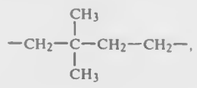
m is 0, 1, 2 or 3, or

R^2 is the radical of the formula



and

Y represents the groupings —CH_2—CH_2—, —CH=CH—, —C≡C— or



or an addition product thereof with an acid or metal salt.

4,925,483

TRIAZINONE SYNERGISTIC COMPOSITIONS

Walter M. Zeck, Vero Beach, Fla., and Joe Synek, Overland Park, Kans., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1984, Ser. No. 596,323

Int. Cl.[5] A01N *43/707*

U.S. Cl. 71—93 12 Claims

1. A selectively herbicidal composition of matter comprising a herbicidally effective amount of

(A) 4-amino-6-tert.-butyl-3-methylthio-1,2,4-triazin-5(4H)-one, and



(B) 4-amino-6-tert.-butyl-3-ethylthio-1,2,4-triazin-5(4H)-one, about 0.01 to 1 part by weight of (A) being present per part by weight of (B).

4,925,484

N-PHENYLTETRAHYDROPHTHALIMIDES

Lothar Rueb, Speyer; Karl Eicken, Wachenheim; Hans J. Pander, Roedesheim-Gronau; Peter Plath, Frankenthal; Barbara Schwalge, Ludwigshafen; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

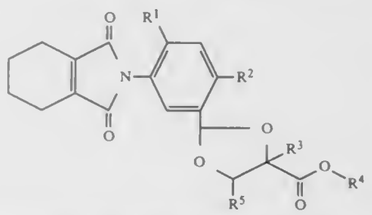
Filed Dec. 5, 1988, Ser. No. 279,563

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3741272

Int. Cl.[5] A01N *43/38;* C07D *209/32, 209/34, 209/48*

U.S. Cl. 71—96 4 Claims

1. An N-tetrahydrophthalimide of the general formula



where R^1 is hydrogen or halogen, R^2 is halogen, R^3 is hydrogen or C_1–C_4-alkyl, R^4 is unsubstituted or C_1–C_3-alkoxy-substituted C_1–C_8-alkyl, C_3–C_4-alkenyl or C_3–C_4-alkynyl, and R^5 is hydrogen or C_1–C_4-alkyl, independently of the steric configuration.

4,925,485

PROCESS FOR THE ISOLATION OF NOBLE METALS

Reinhold Schulze, Hamburg, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Dec. 26, 1984, Ser. No. 686,421

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1983, 3347165

Int. Cl.[5] C22B *11/04*

U.S. Cl. 423—22 13 Claims

1. In a process for the isolation of noble metals from ores containing noble metals by reaction of noble metals contained in the ores in the presence of a complex former in acid pH solutions, the improvement which comprises using cyclic

VOL
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thiourea as a complex former in the presence of an oxidizing agent.

4,925,486

HIGHLY COMPACTABLE ZIRCONIUM SPONGE AND ITS MANUFACTURE

John D. Leland, Corvallis, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Filed Aug. 9, 1989, Ser. No. 391,028
Int. Cl.[5] B22F 9/00
U.S. Cl. 75—360 6 Claims

1. The process for producing crushed zirconium sponge having particle configurations which enhance its compactability, comprising the steps of:
(a) loading as-reduced, non-sintered zirconium sponge pieces into a vacuum furnace;
(b) heating said sponge under partial vacuum at a temperature of up to about 400° C. for a sufficient period to essentially demoisturize and degas the sponge;
(c) raising the temperature to between about 700° C. and 750° C. and terminating the vacuum;
(d) feeding H_2 slowly into the furnace over a predetermined period of time in a total amount of from about 0.05 to about 0.8% by weight of the sponge;
(e) cooling the furnace;
(f) pacifying the cooled sponge;
(g) removing the cooled sponge from the furnace and crushing it;
(h) loading the crushed sponge into a vacuum furnace;
(i) heating the crushed sponge at from about 950° C. to about 1100° C. under partial vacuum for a sufficient period to dehydride the crushed sponge; and
(j) cooling and recovering the dehydrided crushed sponge, which is now capable of exhibiting enhanced compactability.

4,925,487

DUST COLLECTION IN SINTERING OF METALLURGICAL PRODUCTS

Hermann Schmidt, Bad Vilbel, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 312,672
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 3806591
Int. Cl.[5] C22B 1/20
U.S. Cl. 75—749 4 Claims



1. A method of producing a sintered iron-containing product, comprising the steps of:
(a) feeding a mixture of iron ore, lime, coke breeze and recycled dust to a rotating sintering belt at an upstream end thereof;
(b) driving said sintering belt to advance said mixture toward a downstream end of said belt while effecting reaction of said mixture on said belt with said coke serving as a fuel for sintering to form said sintered iron-containing product and an exhaust gas, and discharging said sintered iron-containing product from said belt at said downstream end thereof;
(c) drawing said exhaust gas from said belt through a plurality of suction boxes disposed below said belt and arrayed between said ends;
(d) separating a quantity of 0.5 to 15% of the amount of the coke breeze required as said fuel from a coke breeze stream supplied to said mixture;
(e) grinding the quantity of coke breeze separated in step (d);
(f) withdrawing said exhaust gas in an exhaust-gas stream from said suction boxes and supplying said exhaust-gas stream to an electrostatic precipitator for dedusting said exhaust-gas stream;
(g) collecting room gas from locations at which dust is generated and supplying said room gas in a room-gas stream to an electrostatic precipitator for dedusting thereof;
(h) feeding one portion of the quantity of coal breeze ground in step (e) and separated in step (d) to one of said suction boxes to condition said exhaust-gas stream prior to dedusting thereof;
(i) feeding another portion of the quantity of coal breeze ground in step (e) and separated in step (d) to said room-gas stream to condition said room-gas stream prior to de-dusting thereof;
(j) recovering coke with precipitated dust at said electrostatic precipitators in an amount substantially equal to the mount of coke breeze ground in step (e) and separated in step (d); and
(k) supplying the coke recovered in step (j) to the mixture fed in step (a) to said belt.

4,925,488

REMOVAL OF COPPER FROM FERROUS SCRAP

Milton Blander, 12833 S. 82nd Ct., Palos Park, Ill. 60464, and Shome N. Sinha, 5748 Drexel, 2A, Chicago, Ill. 60637

Filed Jul. 30, 1987, Ser. No. 79,389
Int. Cl.[5] C21C 7/76
U.S. Cl. 75—562 6 Claims

1. A process for reducing the content of a copper impurity in ferrous metal comprising the steps of:
providing a slag containing a polyvalent metal sulfide as an extractant having an affinity for copper sulfide above that in the metal, the slag being present in a weight ratio to the metal of about 1:2–1:10,
contacting the slag with the metal in the presence of an excess of a copper-sulfide forming additive sufficient in amount and time to convert the copper impurity to copper sulfide, the amount of the additive being greater than about 30 wt.% in excess of the reactive requirements for the reaction of the additive and copper to form copper sulfide and greater than about 2 wt.% of the slag, with the excess being sufficient to provide through the extraction of copper sulfide into the slag a ratio of copper in the slag to copper in the metal of at least about 20, and
separating the slag and metal having a reduced content of copper.

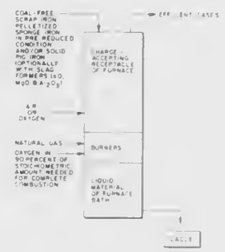
4,925,489

PROCESS FOR MELTING SCRAP IRON, SPONGE IRON AND/OR SOLID PIG IRON

Ludwig von Bogdandy, Linz; Gerhard Mitter, Traun, and Otto Köller, Leoben, all of Austria, assignors to Voest-Alpine Stahl Donawitz Gesellschaft m.b.H., Leoben-Donawitz, Austria

Filed Aug. 22, 1988, Ser. No. 234,550
Claims priority, application Austria, Aug. 21, 1987, 2101/87
Int. Cl.[5] C21B 11/00
U.S. Cl. 75—574 6 Claims

1. A process for melting a charge in a charge-accepting receptacle of a furnace above a plane of burners, for producing steel, comprising:
(a) introducing into the receptacle a coal-free charge including at least one major constituent selected from the group consisting of scrap iron, pelletized sponge iron and solid pig iron;
(b) introducing heat into said receptacle from below said charge, using burners at said plane of burners, by burning natural gas in an atmosphere containing a sub-stoichiometric amount of oxygen and thereby also introducing finely divided carbon into the resultingly liquified charge material which collects in a furnace bath below said plane of burners; and
(c) discharging the liquified charge material of the furnace bath into a ladle.



4,925,490

MECHANICAL SEAL USING PORE-DISPERSED MATERIAL, AND PORE-DISPERSED CEMENTED CARBIDE AND METHOD FOR MANUFACTURING SAME

Yataro Nagai; Mitsuyoshi Matsushita, both of Tokyo; Osamu Ishibashi, Fukuoka; Kiyoshi Terasaki, Fukuoka, and Kei Tokumoto, Fukuoka, all of Japan, assignors to Tanken Seiko Kabushiki Kaisha, Tokyo and Nihon Tungsten Kabushiki Kaisha, Fukuoka, both of, Japan

Filed Dec. 15, 1988, Ser. No. 284,983
Claims priority, application Japan, Dec. 28, 1987, 62-335423; Aug. 15, 1988, 63-202011
Int. Cl.[5] C22C 29/04
U.S. Cl. 75—238 4 Claims



1. A pore-dispersed cemented carbide comprising a sintered body consisting of at least one member selected from the group consisting of carbides, nitrides, borides of transition metals of Groups IV, V and VI of the Periodic Table, and solid solutions of at least two of the carbides, nitrides and borides, and incidental impurities; the sintered body containing pores in an amount of 0.5 to 20 volume %, the pores being formed in at least one shape selected from the group of a substantially spherical shape and a substantially cylindrical shape, the pores in the substantially spherical shape having an average diameter of 3 to 20 μm, the pores in the substantially cylindrical shape having an average diameter of 3 to 20 μm and an average length in the range from the average diameter up to 300 μm, and the pores being prevented from linking to each other to give a length greater than 2 mm.

4,925,491

SOLUTIONS AND CREAMS FOR SILVER PLATING AND POLISHING

Lawrence M. Perovetz, Stanmore, England; Jack Pickthall, deceased, late of Angmering-On-Sea, England, and Terence Pickthall, executor, Colchester, United Kingdom, assignors to Lamerie, N.V., Jersey, Channel Islands

Continuation-in-part of Ser. No. 913,491, Sep. 30, 1986, Pat. No. 4,798,626. This application Mar. 10, 1987, Ser. No. 24,307
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[5] C23C 3/02
U.S. Cl. 106—1.19 32 Claims

1. A non-toxic, anti-stain solution for silver plating a base metal or for restoring silver removed from a silver plated article by previous polishing comprising effective amounts of: (1) a water soluble silver salt as a silver generating compound selected from the group consisting of silver lactate and silver acetate; and (2) water, such solution in the absence of a reducing compound for said silver salt.

8. A non-toxic, anti-stain solution for polishing and silver plating a base metal or for restoring silver removed from a silver plated article by previous polishing comprising effective amounts of: (1) a water soluble silver salt as a silver generating compound selected from the group consisting of silver lactate and silver acetate; (2) a polyoxyalkylene ester surfactant; (3) a humectant selected from the group consisting of diethylene glycol, dipropylene glycol and triethylene glycol; (4) a diatomaceous earth as a polishing component; and (5) water, such solution in the absence of a reducing compound for said silver salt.

4,925,492

CERAMIC CORE FOR INVESTMENT CASTING AND METHOD FOR PREPARATION

Anant H. Kelkar, Nanuet, N.Y.; Frank A. Capodicasa, Woodcliff Lake, N.J., and Jerry G. Weinstein, Newark, Del., assignors to The Interlake Corporation, Oak Brook, Ill.

Filed Sep. 21, 1987, Ser. No. 99,080
Int. Cl.[5] B28B 7/28
U.S. Cl. 106—38.35 14 Claims

1. In the method for preparing a refractory water-disruptible core for use in investment casting, by the steps of forming a green mix including a water soluble salt, inert ceramic fillers and a temporary binder; molding the desired core from said mix; and firing the resultant molded core; enabling said core to possess increased resistance to steam autoclaving operations incident to the said investment casting; the improvement comprising the sequential steps of
(a) vacuum impregnating the fired core with a solution of ethyl silicate and drying the core;
(b) vacuum impregnating said core with a phenolic resin; and
(c) heating the impregnated core to cure the resin.

4,925,493

SOIL MIXTURE AND METHOD OF MAKING SAME

Michael A. Lamoreaux, 526 W. North, St. Marys, Ohio 45885

Filed Apr. 26, 1989, Ser. No. 344,312
Int. Cl.[5] C08L 91/06
U.S. Cl. 106—272 5 Claims

1. A method of producing an odorless soil mixture that will not freeze into a stiff mass and will remain loose and granulated, including the steps of:
sifting soil to provide a fine, granular soil;

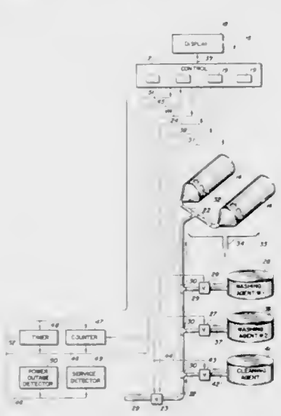
VOL 1114 ISS 3 MY 15 1990 UMI

heating said sifted soil to a temperature in the range of approximately 165°–180° F.;
melting wax to a temperature in the range of approximately 250°–300° F.;
mixing said melted wax with said heated soil; and
continuously stirring the resulting mixture until said mixture is cool.

4,925,494
FLAME RETARDANT ASPHALT COATING
John P. Hageman, 42 Susan Dr., Closter, N.J.
Filed Nov. 28, 1988, Ser. No. 276,517
Int. Cl.[5] C08L 95/00
U.S. Cl. 106—280 17 Claims

1. An additive for a mastic coating material useful in roofing and construction, comprising a cut-back, asphaltic-type base, said additive having the dual purpose of providing both an acceleration of curing time and flame retardancy for said mastic coating material, said additive comprising sodium bicarbonate which is added to said mastic coating material in a range of ratios from approximately between 1:8 to about 1: parts by weight.

4,925,495
WASHING APPARATUS AND METHOD
William E. Crisp, Phoenix; Melvyn Engel, Scottsdale; Richard C. Kudlicki, and Jucson L. Smith, both of Tempe, all of Ariz., assignors to Scientific Growth, Inc., Tempe, Ariz.
Filed Jan. 25, 1988, Ser. No. 147,369
Int. Cl.[5] B08B 7/04
U.S. Cl. 134—18 14 Claims



12. A method of operating washing apparatus having a washing chamber adapted to receive a portion of a human body comprising the steps of:
(a) circulating a washing liquid with a washing agent therein through the washing chamber to provide a washing cycle for said portion of said body under control of a user;
(b) counting by means of a counting mechanism the number of times step (a) is performed and initiating a signal when a predetermined number has been reached;
(c) measuring by means of a timing mechanism the length of time which has elapsed since the apparatus was last cleaned and for initiating a signal when a predetermined period of time has been measured;
(d) monitoring the servicing of the apparatus and initiating a signal when such servicing is detected;
(e) monitoring the supply of electrical power to the apparatus and initiating a signal when a discontinuity of power is detected; and
(f) circulating an apparatus cleaning fluid through said chamber in response to any of the signals generated in steps (b), (c), (d) or (e).

4,925,496
EVACUATION METHOD FOR MOTOR OPERATED VALVES LUBRICANT
R. Jon Stouky, Stuart, and John T. Hayburst, Dunedin, both of Fla., assignors to Apex Technologies, Inc., Clearwater, Fla.
Continuation-in-part of Ser. No. 158,455, Feb. 22, 1988, abandoned. This application May 3, 1988, Ser. No. 189,925
Int. Cl.[5] B08B 9/00
U.S. Cl. 134—22.18 8 Claims

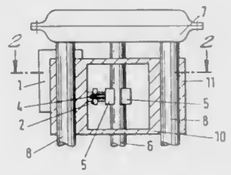


7. A method of removing lubricant grease being semi-solid or more consistent under ambient conditions, without the need of an external force to contain the same and having a National Lubricating and Grease Institute consistency of less than six from an enclosed multi-cavity gear train housing of a motor operated valve in which the housing contains at least one aperture in communication with lubricated surfaces comprising the steps of:
inserting an evacuation wand into said housing, said evacuation wand having ahead at one end and means adapted to communicate with a source of suction at the other end, and having an internal bore extending from the head to the means for communicating with the source of suction at the other end;
removing lubricant grease through the head of the wand by application of suction to the bore;
inserting fluid injection powered to deliver fluid under elevated pressures, to cyclically advance and retract or to oscillate and to deliver streams of fluid apparatus into said housing, said fluid injection apparatus having a plurality of apertures for delivery of the fluid into the housing and being capable of oscillating movement;
supplying fluid solvent to said fluid injection apparatus under elevated pressure;
establishing a fluid solvent stream from said fluid injection apparatus under elevated pressure to the interior of said housing through the plurality of apertures on the injection apparatus and with oscillating movement of the apparatus during application of the fluid solvent stream; and
evacuation of any remaining lubricant grease and solvent from the housing.

4,925,497
SOLVENT FOR PARAFFIN REMOVAL FROM OILFIELD EQUIPMENT
Charles L. Thierheimer, Jr., Corvallis, Oreg., assignor to Petrolite Corporation, St. Louis, Mo.
Continuation-in-part of Ser. No. 107,898, Oct. 13, 1987, abandoned, which is a continuation of Ser. No. 564,870, Dec. 23, 1983, abandoned. This application Mar. 6, 1989, Ser. No. 319,793
Int. Cl.[5] C11D 7/00, 7/50, 7/60
U.S. Cl. 134—40 9 Claims

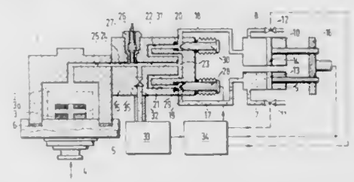
1. Process of removing flow obstructing paraffin and paraffin-like deposits from oilfield equipment comprising flushing said equipment with a solvent mixture comprising an aromatic hydrocarbon selected from the group consisting of toluene, xylene, mesitylene and mixtures thereof and petroleum naphtha, the weight ratio of said aromatic hydrocarbon to naphtha being about 10/90 to about 90/10.

4,925,498
PNEUMATIC CONTROL VALVE
Lothar Kemmler, Mörfelden, Fed. Rep. of Germany, assignor to Samson AG, Frankfurt, Fed. Rep. of Germany
Division of Ser. No. 232,501, Aug. 15, 1988. This application Mar. 31, 1989, Ser. No. 332,533
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3727008
Int. Cl.[5] G05B 11/44
U.S. Cl. 137—382 1 Claim



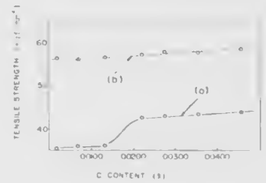
1. A valve arrangement comprising:
a valve housing for containing a movable valve member which is movable for opening and closing passage through the valve housing;
a valve rod movably engaged with said valve housing for moving the valve member therein for opening and closing passage through the valve housing;
a pneumatic servomotor connected to said valve rod for moving said valve rod;
yoke means connected between said servomotor and said valve housing for securing said servomotor to said valve housing;
a position controller having a controllable pneumatic output and a rotatable lever rotatable to control the controllable pneumatic output;
articulating means operatively connecting said rotatable lever to said valve rod for transmitting movement of said valve rod into rotation of said rotatable lever; and
a protective housing enclosing at least part of said valve rod, said rotatable lever and said articulating means for protecting said valve rod, said rotatable lever and said articulating means from outside influence, said protective housing including a plurality of brackets, said yoke means including a plurality of yoke bolts connected to said servomotor and valve housing and engaged with said brackets.

4,925,499
METHOD OF AND AN APPARATUS FOR CONTROLLING A QUANTITY OF AN EXPLOSIVE GAS MIXTURE IN A WORKPIECE TREATMENT CHAMBER
Rolf Wöhr, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE88/00423, § 371 Date Apr. 4, 1989, § 102(e) Date Apr. 4, 1989, PCT Pub. No. WO89/01377, PCT Pub. Date Feb. 23, 1989
PCT Filed Jul. 7, 1988, Ser. No. 347,772
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1987, 3726475
Int. Cl.[5] B23K 7/06
U.S. Cl. 148—9 R 15 Claims



10. A method of treating workpieces with temperature and pressure shocks, said method comprising the steps of:
loading the workpieces into a workpiece treatment chamber;
filling the workpiece treatment chamber with a signal gas having a predetermined initial pressure for determining a volume of the workpiece loaded into the workpiece treatment chamber;
determining the volume of the workpieces loaded into the workpiece treatment chamber by determining a pressure difference between the predetermined initial pressure of the signal gas and a filling pressure of the signal gas, said pressure difference defining the volume of the workpieces loaded into the workpiece treatment chamber;
metering a gas explosive mixture into the workpiece treatment chamber in accordance with the volume of workpieces loaded thereinto; and
igniting the gas explosive mixture for producing the temperature and pressure shock.

4,925,500
HIGH-STRENGTH HOT-ROLLED STEEL SHEET HAVING REMARKABLY EXCELLENT COLD WORKABILITY AND PROCESS FOR MANUFACTURING THE SAME
Koji Kishida, and Osamu Akisue, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
PCT No. PCT/JP88/00639, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/10318, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 27, 1988, Ser. No. 320,265
Claims priority, application Japan, Jun. 26, 1987, 62-157891; Feb. 8, 1988, 63-25767
Int. Cl.[5] C22C 38/16; C21D 8/04
U.S. Cl. 148—12 F 19 Claims



1. A heat-treatment hardenable hot-rolled steel sheet having

VOL 1114 ISS 3 MY 15 1990 UMI

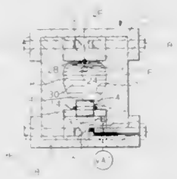
remarkably excellent cold workability comprising 0.0005 to 0.015% of carbon, 0.05 to 0.5% of manganese, 0.001 to 0.030% of sulfur, 1.0 to 2.2% of copper, 0.100% or less of phosphorus, 1.0% or less of silicon, 0.0050% or less of nitrogen, and 0.002 to 0.10% of sol. aluminum with the balance being iron and unavoidable elements and substantially comprising a ferritic single phase structure free from occurrence of pearlite.

4,925,501

EXPOLOSIVE COMPACTION OF RARE EARTH-TRANSITION METAL ALLOYS IN A FLUID MEDIUM

Elizabeth F. Harasek, Franklin, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 3, 1988, Ser. No. 163,557
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—101 **3 Claims**



1. A method of making an alloy body comprising one or more rare earth metals including at least one of Nd, Pr and Sm, one or more transition metals including at least one of Co and Fe and optionally B, said method comprising dispersing particles of said alloy having an average crystal grain size less than about 400 nM in a container, providing a bomb comprising a confined chamber having first and second chamber portions, positioning said container in sealing relation between said first and second chamber portions, evacuating said second chamber portion, locating an explosive charge and a fluid in said first chamber portion, exploding said charge to cause consolidation of said particles to substantially full density and flow of said consolidated particles into said second chamber and annealing said consolidated body as necessary to arrive at a crystal structure commensurate with creation of permanent magnetic properties therein.

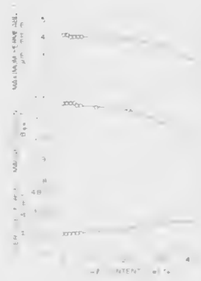
4,925,502

IRON-COBALT TYPE SOFT MAGNETIC MATERIAL

Wataru Yamagishi, Ebina, and Tsutomu Iikawa, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 7, 1988, Ser. No. 241,246
Claims priority, application Japan, Dec. 28, 1987, 62-330133
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—311 **3 Claims**

1. An iron-cobalt soft magnetic material consisting essentially of 35% to 60% by weight of cobalt, 0.03% to 2.0% by weight of aluminum, the remainder being iron, said iron-cobalt soft magnetic material being prepared by compacting and



sintering a mixture comprising cobalt powder, iron-rich iron-cobalt powder, and aluminum or iron-aluminum powder.

4,925,503

SOLID EXPLOSIVE AND PROPELLANT COMPOSITIONS CONTAINING A POLYURETHANE POLYACETAL ELASTOMER BINDER AND METHOD FOR THE PREPARATION THEREOF

J. B. Canterberry, Crawfordville, Fla., and Lawrence E. Katz, Orange, Conn., assignors to Olin Corporation, Chesbire, Conn.

Filed Feb. 17, 1988, Ser. No. 156,689
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.4 **16 Claims**

1. A solid explosive or propellant composition characterized by low vulnerability to unplanned stimuli and having desired mechanical properties, including a desired degree of hardness, said composition comprising between 51 and 99 weight percent of a high energy material and between 1 and 50 weight percent of a binder, said binder being a chain-extended polyurethane polyacetal elastomer made by a process of:

(a) reacting a dihydroxy-terminated polyacetal homopolymer with an alkylene diisocyanate in the presence of a urethane-forming catalyst in a reaction to produce an isocyanate-terminated prepolymer, said homopolymer having a weight average molecular weight of between about, 1,000 and about 60,000 as measured against a polystyrene standard by gel permeation chromatography and being produced by polymerizing a 4-lower alkyl substituted-1,3-dioxolane, said reaction employing between about 50 mole percent and about 70 mole percent of said alkylene diisocyanate based upon the total amount of said alkylene diisocyanate and said homopolymer employed,

(b) reacting said isocyanate-terminated prepolymer with a dihydroxy-terminated polyacetal copolymer in the presence of a solvent and a urethane forming catalyst to provide a polyurethane polyacetal elastomer, said copolymer having a weight average molecular weight of between about 1,000 and about 200,000 as measured against a polystyrene standard by gel permeation chromatography and being the reaction product of a formaldehyde-providing compound and 1,3-dioxolane, said copolymer being employed in an amount of between about 30 and about 50 mole percent based upon the total amount of said copolymer and said isocyanate-terminated prepolymer employed, and

(c) reacting said elastomer at an elevated temperature with an organic polyisocyanate to provide a chain-extended polyurethane polyacetal elastomer.

4,925,504

AMBIENT CURE CATALYST FOR SOLID PROPELLANTS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 14, 1989, Ser. No. 450,755
Int. Cl.[5] C06B *45/02*
U.S. Cl. 149—21 **2 Claims**

1. A composite propellant composition comprising:

(i) ammonium perchlorate of about 64.5 weight percent;

(ii) aluminum powder of about 14.0 weight percent;

(iii) an organic oxidizer compound of cyclotetramethylenetetranitramine of about 10.0 weight percent;

(iv) hydroxyl-terminated polybutadiene polymer of about 11.5 weight percent;

(v) isophorone diisocyanate to yield an isocyanate to hydroxyl ratio of about 0.92; and,

(vi) a fast-acting cure catalyst additive of tris(ethoxyphenyl)-bismuthine in an amount from about 0.015 about 0.025 weight percent, said fast-acting cure catalyst additive enabling said composite propellant composition to be ambient mixed and to bring about polymerization of said hydroxyl-terminated polybutadiene to achieve curing at an ambient temperature of about 80° F. or to achieve accelerated oven curing at about 140° F., said ambient and oven curing being more cost effective as compared with a like composite propellant composition that is cured by a conventional high temperature oven curing method which employs the conventional triphenylbismuthine as the cure catalyst.

4,925,505

FOAMED NITROPARAFFIN EXPLOSIVE COMPOSITION

Mark A. Baker, Hudson Heights, and C. John Anderson, Kingston, both of Canada, assignors to Her Majesty the Queen in Right of Canada as represented by the Minister of National Defence, Ottawa, Canada

Filed May 16, 1989, Ser. No. 352,336
Claims priority, application Canada, Aug. 10, 1988, 574385
Int. Cl.[5] C06B *25/36*
U.S. Cl. 149—89 **24 Claims**

1. A foamable fluid explosive composition, comprising

a suitable liquid foamable explosive	57–98%/w
a suitable liquid emulsifier	2–6%/w
a suitable stabilizer	0–5%/w
a suitable thickener	0–7%/w
a sensitizer	0–5%/w
energy enhancer/inert metals	0–20%/w

wherein the amounts of ingredients are expressed as percent by weight of the composition, excepting the sensitizer which is expressed as percent by weight of the explosive.

4,925,506

PRINTING PLATE MOUNTING DEVICE AND METHOD

A. Leroy Baker, Post Office Box 2137, Burlington, N.C. 27216

Filed Jul. 15, 1988, Ser. No. 219,357
Int. Cl.[5] B65C *9/06*; B41F *1/28*
U.S. Cl. 156—64 **6 Claims**

4. A method of mounting a transparent flexible printing plate on a press cylinder comprising the steps of:

(a) aligning the plate on a plate support,

(b) temporarily adhering the plate on the plate support,

(c) placing the plate support with the plate attached to a mounting device,

(d) placing a printing cylinder into first opposing slots in the mounting device,

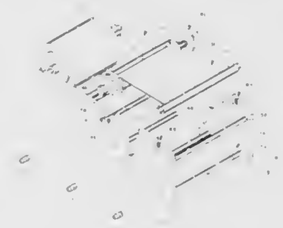
(e) attaching an end of a double sided tape to the printing cylinder,

(f) wrapping the printing cylinder with the tape while rotating the cylinder,

(g) placing a tape cutting guide on the tape,

(h) cutting the tape to form a butt joint of the tape on the cylinder,

(i) removing the cylinder from the first slots,



(j) placing the cylinder into second opposing slots in the mounting device,

(k) lowering a press cylinder into contact with the plate,

(l) attaching one end of the plate to the cylinder, and

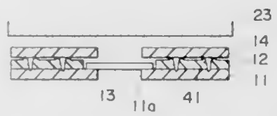
(m) rotating the cylinder to enwrap the cylinder with the plate while directing the plate support through the mounting device for removal therefrom.

4,925,507

LAMINATING METHOD OF THERMOPLASTIC RESIN MEMBERS

Akira Yamaguchi, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 19, 1988, Ser. No. 246,452
Claims priority, application Japan, Sep. 18, 1987, 234101
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[5] B29C *65/08*
U.S. Cl. 156—73.1 **5 Claims**



1. A method for laminating thermoplastic resin members which comprises superimposing on a first thermoplastic resin plate a second thermoplastic resin plate, bonding the second thermoplastic resin plate to the first thermoplastic resin plate by ultrasonic welding with an ultrasonic horn having a pressure face with projections and indentations thereon from the upside of the second thermoplastic resin plate, to produce corresponding indentations and projections, respectively, on the upside surface of the second plate, superimposing a third thermoplastic resin plate onto the upside surface of the second thermoplastic plate and bonding the third thermoplastic resin plate to said second thermoplastic resin plate by ultrasonic welding with an ultrasonic horn having a flat pressure face from the upside of the third thermoplastic resin plate.

VOL
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4,925,508

MOLDLESS PROCESS FOR MANUFACTURING FOAMED ARTICLES

Fumio Goto, and Taro Ogawa, both of Kurashiki, Japan, assignors to Namba Press Works Co., Ltd., Kurashiki, Japan

PCT No. PCTJP87/00980, § 371 Date Aug. 16, 1988, § 102(e) Date Aug. 16, 1988, PCT Pub. No. WO88/04604, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 15, 1987, Ser. No. 283,929

Claims priority, application Japan, Dec. 16, 1986, 61-297499

Int. Cl.[5] B32B *31/14, 5/20*

U.S. Cl. 156—79 **18 Claims**



1. A process for manufacturing a foamed article without use of a mold, comprising the steps of:

(a) preparing a cover composed of a facing material and a foamed backing material having a low melting point applied to the inner surface of said facing material, said cover having a shape substantially corresponding to a desired final contour of the article;

(b) heating said backing material to its softening temperature or its vicinities to plasticize said backing material;

(c) blowing air to the inside of said plasticized backing material, for pressing outwardly and inflating said backing material so as to conform said inflated cover to the final contour of the article and for hardening the backing material of the final contour to obtain a pre-shaped cover;

(d) placing a desired insert inside said pre-shaped cover and sealing an open end thereof;

(e) inserting a pouring nozzle having a predetermined length of residential passage into said sealed pre-shaped cover, and pouring a predetermined amount of reactive polyurethane composition through said nozzle to the inside of said cover;

(f) allowing the poured composition to foam and expand to fill substantially an entire space within the cover, and then externally heating said cover up to around the melting point of said backing material to significantly shrink the backing material; and

(g) allowing the foaming polyurethane composition to further expand to adhere to the inner surface of the facing material thereby to obtain a foamed article with the preshaped cover integrally enveloping the polyurethane foam.

4,925,509

METHOD OF MAKING A FRAMELESS REFRIGERATED STORAGE ENCLOSURE

Joseph J. Tippmann, P.O. Box 3007, Rapid City, S. Dak. 55701

Division of Ser. No. 476,777, Mar. 18, 1983, abandoned. This application Aug. 23, 1988, Ser. No. 235,272

Int. Cl.[5] B32B *7/00*

U.S. Cl. 156—92 **10 Claims**

1. A method of making a frameless, insulated storage enclosure having walls, a floor, and a roof comprising the steps of:

(a) providing a plurality of panels consisting of low density synthetic resinous material, at least one of said panels having an opening therethrough,

(b) applying a continuous layer of polyester resinous material reinforced with fiberglass to one side of each of said panels,

(c) applying a continuous layer of polyester resinous material reinforced with fiberglass to the other side of said panel forming said floor,

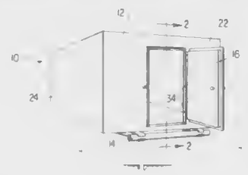
(d) providing skid means,

(e) securing said skid means to said panel forming said floor by means of said polyester resinous material reinforced with fiberglass applied over a portion of said skid means and said layer on said panel forming said floor,

(f) inverting said panel onto said skid means,

(g) initially joining said other panels above said panel forming said floor to form said walls and said roof,

(h) applying a layer of polyester resinous material reinforced with fiberglass across the junction of said initially joined



panels to permanently join said panels and form a continuous, seamless surface defining the inside of said enclosure, and

(i) applying a continuous layer of polyester resinous material reinforced with fiberglass to the other side of said panels forming said walls and said roof to join said panels and form a continuous, seamless outer surface of said enclosure.

4,925,510

METAL PARTS JOINT STRUCTURE AND METHOD FOR PRODUCING THE SAME

Nobuyoshi Hojo; Yoshiro Asai, both of Kyoto; Motoo Fujioka; Naotou Kobayashi, both of Hiroshima, and Takashi Yamaguchi, Hiroshima, all of Japan, assignors to Ryobi Ltd., Hiroshima and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 8, 1986, Ser. No. 894,532

Claims priority, application Japan, Aug. 12, 1985, 60-124138[U]; Feb. 6, 1986, 61-16709[U]; Jun. 30, 1986, 61-100921[U]

Int. Cl.[5] B23B *7/08*

U.S. Cl. 156—92 **22 Claims**

1. A method of producing a metal part joint structure comprising the steps of:

preparing at least two cast metal joint pieces, each of said pieces being formed with a joint surface;

applying adhesives between said joint pieces and joining said joint pieces so as to seal them together, said adhesive comprising 45 to 54 wt% of epoxy resin, 30 to 40 wt% of metal particles, each of said particles having a diameter of 0.1 to 0.2 mm, said particles functioning as a spacer, and 4 to 6 wt% of guanidine derivatives; and, heating said joined pieces for metallurgical integration between said pieces and said adhesive.

4,925,511

METHOD OF FITTING PLATE MEMBER WITH SUPPORTIVE OR PROTECTIVE MEMBER OF MOLDED RESIN

Hideo Ikeda, Tokyo; Yoshio Horiki; Yutaka Yamauchi, both of Matsusaka; Hiroshi Kasamatsu, Ota, and Akimasa Akao, Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube and Ikeda Glass Industrial Co., Ltd., Tokyo, both of, Japan

Filed Feb. 16, 1989, Ser. No. 310,876

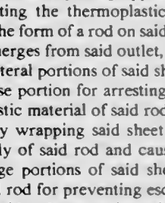
Claims priority, application Japan, Feb. 18, 1988, 63-35700

Int. Cl.[5] B29C *45/14*

U.S. Cl. 156—106 **13 Claims**

1. In a method of fitting a plate member with a supportive or protective member of a synthetic resin in a predetermined marginal region of the plate member, the method having the steps of placing the marginal region of the plate member in a cavity in a mold and then introducing a melt of the resin into the cavity,

the improvement comprising closely covering the two opposite surfaces and the edge face of said marginal region of



the plate member with at least one sheet of a plastic film, which has a thickness in the range from 5 to 250 μm and becomes a melt adhesive to both the plate member and said resin at a temperature in the range from 50° to 150° C., prior to the placement of said marginal region of the plate member in said cavity in the mold.

4,925,512

METHOD FOR CONTINUOUSLY MANUFACTURING PRODUCTS OF THERMOPLASTIC MATERIAL AND EQUIPMENT FOR CARRYING OUT SAID METHOD

Jean P. Briand, Fontaine-les-Luxeuil, France, assignor to Sonoco Gunther S.A., Fontaine-les-Luxeuil, France

Continuation of Ser. No. 502,031, Jun. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 398,520, Jul. 15, 1982, abandoned. This application Sep. 30, 1987, Ser. No. 105,471

Claims priority, application France, Jun. 11, 1982, 82 10287

Int. Cl.[5] B32B *31/20, 31/30*

U.S. Cl. 156—201 **17 Claims**



1. A method for continuously manufacturing products having an inner core of thermoplastic material enveloped and protected by an outer sheet of a flexible material, said method comprising in combination the steps of: heating said thermoplastic material to its softening temperature in a heating means having an outlet for the softened thermoplastic material, supplying an elongated flexible and protective sheet means longitudinally adjacent to said outlet, said sheet having a longitudinally extending intermediate base portion and longitudinally extending lateral portions adjoining opposite sides of said base portion for supporting the thermoplastic material emerging from said outlet in the form of a rod on said base portion of said sheet as said rod emerges from said outlet, raising said longitudinally extending lateral portions of said sheet adjoining opposite sides of said base portion for arresting lateral flow of said softened thermoplastic material of said rod, enclosing said rod within said sheet by wrapping said sheet completely around said rod transversely of said rod and causing each longitudinally extending edge portions of said sheet to overlap each other on top of said rod for preventing escape of said thermoplastic material of said rod, conveying said rod and said sheet to calendering rolls by pulling on said sheet, calendering said rod and said sheet enveloping said rod, and cutting the rod and the sheet enveloping said rod.

4,925,513

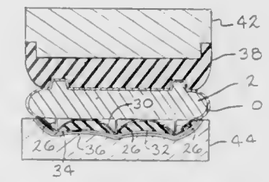
METHOD FOR MANUFACTURING CONTOURED SEATS

Duane W. Witzke, Adrian; Alan J. Selbert, Tecumseh, and Michael E. Lowe, Saline, all of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Oct. 17, 1988, Ser. No. 259,241

Int. Cl.[5] B29C *43/04*

U.S. Cl. 156—245 **4 Claims**



1. A method of forming at least a portion of a seat utilizing a molded foam pad having a portion of its surface shaped, a supporting frame, and an envelope cover member for the pad and the frame, said cover being of generally tubular shape and having an open end, inner and outer surfaces, a front panel and back panel, comprising the steps of:

turning said envelope cover member inside out so that said inner surface is at the outside of said cover member;

telescoping said cover member open end first over a forming tool;

shaping at least a portion of said front panel by pressing said portion of said front panel against said forming tool;

positioning said foam pad on said inner surface of said envelope cover member so that said portion of the shaped surface of said pad is adjacent to said inner surface of said front panel and in complementary relation to the shape of said inner surface of said front panel;

adhering said portion of said pad to said complementary shaped inner surface of said front panel;

adhering a foam sheet to said inner surface of said back panel, the face of said foam sheet opposite said back panel having an adhesive layer coating covered by a backing material, said adhesive being a heat activated adhesive;

pressing portions of said seat back panel and said foam sheet against said forming tool to compress said foam sheet such that said portions of said back panel contact said adhesive;

applying heat to said heat activated adhesive to activate said adhesive thereby bonding said portions of said back panel to said backing material to form contours in said back panel;

removing said cover member from said forming tool; and

manipulating said envelope cover member so that said outer surface is on the outside of said cover member and said foam pad and said foam sheet are enclosed therein and said envelope cover member can be telescoped open end first over said supporting frame.

4,925,514

LIGHT ATTENUATOR AND PROCESS FOR FABRICATION THEREOF

Hiroshi Okada, Tokyo; Shingo Suzuki, Zama; Manabu Kagami, Kawasaki, and Chiaki Snematsu, Tokyo, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed May 4, 1989, Ser. No. 347,030

Claims priority, application Japan, May 6, 1988, 63-108943; Oct. 14, 1988, 63-133379[U]

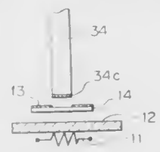
Int. Cl.[5] B32B *31/20*

U.S. Cl. 156—249 **1 Claim**

1. A process for the fabrication of a light attenuator, which comprises forming a light-attenuating layer composed of a thermoplastic resin, in which finely divided particles having a light-absorbing or light-scattering property are uniformly

VOL
1114
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incorporated, on a release film or paper; placing the light-attenuating layer formed on the release film or paper on a heating plate; press-bonding the end face of a rod or stick composed of a light-transmitting material inserted and set in



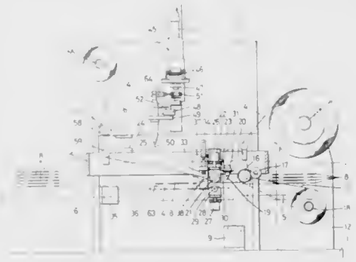
the interior of a ferrule to the surface of the released film or paper; cooling the bonded assembly; and then peeling the release film or paper to transfer the light-attenuating layer to the end face of the light-transmitting rod or stick.

4,925,515

METHOD AND APPARATUS FOR APPLYING A PROTECTIVE TAPE ON A WAFER AND CUTTING IT OUT TO SHAPE

Yoshitaka Yoshimura, Kitakatsuragi, and Yasuhiro Oura, Sakurai, both of Japan, assignors to Takatori Corporation and Takatori Hitech Co., Ltd., both of Nara, Japan

Filed Nov. 9, 1988, Ser. No. 268,965
Claims priority, application Japan, Nov. 27, 1987, 62-301189
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—250 **4 Claims**



1. A method for applying a protective tape on a wafer and cutting it out to shape, which comprises applying the protective tape drawn from a winder shaft on a wafer supported and fixed in position on a table by means of an application roller, cutting the protective tape along an orientation flat of the wafer by means of a subcutter which moves in conjunction with the application roller, then lowering a main cutter positioned above and causing it to swivel, whereby the protective tape is cut by the main cutter along the circular perimeter of the wafer, winding the remaining portion of the protective tape so cut onto an appropriate take-up shaft.

4,925,516

METHOD OF MAKING A DEVICE FOR CLEANING ELECTRIC KNIVES

James L. Phillips; Dale W. Richardson, both of Mattawan, Mich., and Lawrence M. Silverman, Danville, Calif., assignors to International Research & Development Corporation, Mattawan, Mich.

Division of Ser. No. 157,289, Feb. 17, 1988, Pat. No. 4,852,200.
This application Jan. 10, 1989, Ser. No. 295,307
Int. Cl.[5] A47L *25/00*
U.S. Cl. 156—252 **3 Claims**

1. A method for assembling an electric surgical knife-cleaning device comprising a laminated base comprising a first thin, flat, non-tacky, flexible and resilient plastic sheet adhered to an underlying second and thicker sheet of soft plastic material which has a tacky surface covered by a removable pull-off sheet, and a cleaning head comprising a coil spring having first and second legs at the ends thereof, which legs extend at an angle from end convolutions of the coil spring and which first and second legs have corresponding first and second foot portions at ends thereof, which foot portions are bent out at a substantially right angle to the leg to which attached, comprising the steps of providing first and second apertures in said first



plastic sheet in positions such that, if said legs were inserted therein, they would be substantially parallel to each other and substantially normal to said base, inserting said first foot portion into said first aperture provided for said first leg, rotating said second leg to place the spring under tension and to bring said second foot portion into alignment with said second aperture, bending said first plastic sheet on a centerline between said first and second apertures sufficiently to allow insertion of said second foot portion into said second aperture, and effecting said insertion, thereby to place said second leg in said second aperture.

4,925,517

METHOD OF FORMING FRAGRANCE RELEASING PULL-APART SHEETS

Jack W. Charbonneau, Somerset, Wis., and Jerold O. Bahls, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 211,870, Jun. 27, 1988, abandoned.
This application Jul. 10, 1989, Ser. No. 378,433
Int. Cl.[5] B32B *31/12, 5/16*
U.S. Cl. 156—276 **4 Claims**

1. A method of manufacturing liquid releasing devices comprising the steps of:
(1) providing two opposed surfaces,
(2) coating each of said two opposed surfaces with a binder,
(3) applying a composition between said opposed surfaces with a binder, said composition consisting essentially of microcapsules having a liquid fill therein and a liquid carrying medium free of adhesive, and
(4) bonding said surfaces together and trapping said microcapsules therebetween with said binder.

4,925,518

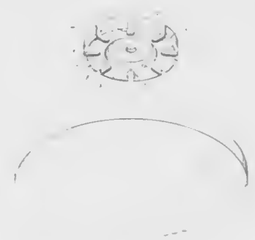
COMPLIANT LENS BLOCKS AND METHOD OF USING THEM

Nelson M. Wasserman, 32 Pickwick Rd., West Newton, Mass. 02165, and Irving Erlichman, 22 Wayland Hills Rd., Wayland, Mass. 01778

Filed Jul. 29, 1988, Ser. No. 226,379
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—295 **10 Claims**

10. A method of mounting an optical element onto a shaping machine, the method comprising:
disposing a compliant block in close proximity to an optical element, the block comprising a compliant receiving structure adapted to conform to a surface on an optical element to be shaped in a shaping machine, an adhesive

material on at least a portion of the receiving surface, an alignment means, and a mounting means for mounting the block onto a chuck of a shaping machine;
aligning said optical element with said block through the alignment means;
adhesively attaching the optical element to said compliant



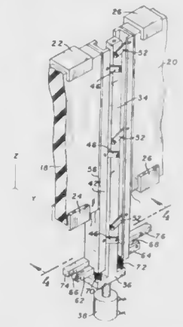
block in an aligned condition by applying the block to the optical element with sufficient pressure to bend the flexible lands and thereby conform the receiving structure to the surface of the optical element while said adhesive material joins the block and optical element together; and
mounting the block and the adhesively joined optical element onto the shaping machine.

4,925,519

COLLAPSIBLE CONTACT HEATING PLATEN

Raymond K. Newkirk, Plymouth, and William G. West, Edina, both of Minn., assignors to Forward Technology Industries, Inc., Minneapolis, Minn.

Filed Nov. 28, 1988, Ser. No. 276,887
Int. Cl.[5] B29C *65/20*
U.S. Cl. 156—304.1 **11 Claims**



1. An apparats for forming a fusion bond between a pair of thermoplastic articles, said apparatus including:
a contact heating platen assembly including a longitudinally extended support member, a contact heating platen means disposed along the support member, and a heating platen mounting means for supporting said contact heating platen means in a longitudinal orientation and further for reciprocating said contact heating platen means between a retracted position with the platen means proximate the support member, and an extended position with the platen means relatively transversely remote from the support member;
a workpiece carrying fixture means for supporting a pair of thermoplastic articles, each having a fusible surface portion, in transversely spaced apart relation with the respective fusible surface portions facing one another, with said contact heating platen means positioned between the workpieces in substantially centered and transversely spaced apart relation to said fusible surface portions when said platen means are in the retracted position, said platen means, when moved to the extended position while said fixture means maintains the workpieces stationary, expanding to engage said fusible surface portions; and
a heating means for heating said platen means to a temperature sufficient to fuse said fusible surface portions when said fusible portions and platen means are engaged, said mounting means retracting said platen means once said surface portions become fused.

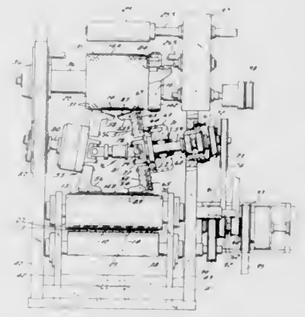
9. A process for forming a fusion bond between a pair of thermoplastic workpieces, including the steps of:
positioning a pair of thermoplastic workpieces, each workpiece having a fusible surface portion, in spaced apart relation with the respective fusible surface portions facing one another;
interposing a contact heating platen means between said workpieces in substantially centered and spaced apart relation to said fusible surface portions;
heating said platen means, and, while maintaining said workpieces stationary, expanding said platen means until said platen means engage said fusible surface portions;
maintaining said platen means so engaged for a sufficient time to fuse said fusible surface portions;
retracting said platen means to disengage said platen means and said fusible surface portions once said surface portions are fused, while maintaining said workpieces stationary; and
removing said platen means from between said workpieces, advancing said workpieces toward one another until said surface portions engage, and allowing said surface portions to cool and solidify.

4,925,520

APPARATUS FOR APPLYING AN ELASTIC WAISTBAND TRANSVERSELY OF A LONGITUDINALLY MOVING WEB

Henry J. Beaudoin, Sheboygan Falls; Donald W. Lammers, Oostburg, and John A. McCabe, Sheboygan Falls, all of Wis., assignors to Curt G. Joa, Inc., Boynton Beach, Fla.

Filed Aug. 11, 1988, Ser. No. 230,893
Int. Cl.[5] B32B *31/06*
U.S. Cl. 156—494 **2 Claims**



1. Apparatus for applying stretched elastic segments to the waist regions of a moving web of diapers or other body wearable garments of at least two interfacing sheets and absorbent pads arranged equally spaced apart between said sheets, said apparatus including:
a rotatable vacuum drum,

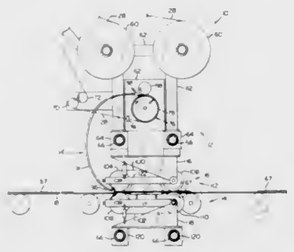
means for disposing unstretched segments of elastic material consecutively on the periphery of said drum, said segments being attracted to said drum by vacuum and rotatable with the drum,
a backup member over which at least one of said sheets comprising said web is run,
transfer means interposed between said vacuum drum and said member for transferring said segments directly from said drum to said sheet,
said transfer means comprising at least two segment grippers each having surfaces containing vacuum ports and means for mounting said grippers for simultaneously rotating in angular correspondence between said drum and said surface,
means for moving at least one of the grippers alternately nearer to and farther from the other as said grippers rotate, said grippers being nearer to each other when they are in proximity with said drum for attracting under the influence of vacuum an unstretched segment, and said grippers then becoming farther from each other to stretch the segment as the grippers rotate into proximity with said segment backup member for applying said segment to the sheet, and
the said surface of the gripper having said vacuum ports being presented generally radially outwardly of said gripper and there is another surface contiguous to said surface and at an acute angle to said surface, said surface being generally parallel to the vacuum drum when said grippers are proximate to the drum and said other surface being at an angle at the same time, said other surface becoming substantially parallel to said backup member when said grippers are proximate to said backup member to provide for pressing said segment onto the sheet running over said member.

4,925,521

APPARATUS FOR INTERMITTENTLY APPLYING LENGTHS OF THERMOPLASTIC TAPE

Charles E. Asbury, Jr.; Monmohan S. Gulati, both of Vancouver, Wash.; Earle C. Sherman, and Dan V. Calvert, both of Grand Junction, Colo., assignors to H.B. Fuller Company, Vancouver, Wash.

Filed Jul. 1, 1988, Ser. No. 214,727
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—517 6 Claims



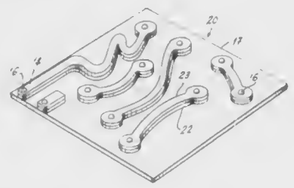
1. An apparatus for applying a thermoplastic tape to an article conveyed by a transport system comprising:
means for dispensing thermoplastic tape;
cutting means for cutting a length of said tape,
applicator means for receiving said cut length of thermoplastic tape from the cutting means and for thermobonding said length of tape to an article conveyed by the transport system;
guide means for guiding said cut length of tape from the cutting means to the applicator means; and
air driven motive means for moving said cut length of tape through the guide means;
wherein the cutting means includes:
an anvil wheel;
a knife wheel have an elastically deformable outer portion and having a knife blade recessed slightly from an outer periphery thereof;
drive means for rotating at least one of said wheels;
the anvil wheel cooperating with the knife wheel to advance a continuous piece of thermoplastic tape therebetween and to deform the elastic portion of the knife wheel to permit the knife blade to cut the thermoplastic tape against the anvil wheel.

4,925,522

PRINTED CIRCUIT ASSEMBLY WITH CONTACT DOT

Frank J. Avellino, Russell; Richard A. Case, Pittsfield, and David T. Swanson, Warren, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 21, 1989, Ser. No. 396,257
Int. Cl.[5] H05K *3/06*
U.S. Cl. 156—632 12 Claims



7. A method of applying discrete areas of a noble metal to individual pads on a printed circuit board comprising the steps of:
(a) preparing a given size, flexible sheet of etchable, electrically conductive foil from a first material;
(b) applying to said first material, a particular pattern of an electrically conductive, second material which is relatively non-etchable as compared with the etchability of the first material and which second material includes a number of individual pads;
(c) resistance welding at least one discrete area of a noble metal to at least one of said individual pads;
(d) bonding said first material with its particular pattern and noble metal areas to an electrically insulating substrate to form a composite board; and
(e) etching said composite board to remove undesired portions of said etchable material which are not masked by said pattern, to thereby form said printed circuit board having discrete areas of noble metal thereon.

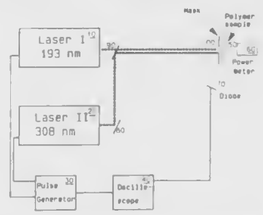
4,925,523

ENHANCEMENT OF ULTRAVIOLET LASER ABLATION AND ETCHING ORGANIC SOLIDS

Bodil E. Braren, Hartsdale, and Rangaswamy Srinivasan, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 264,476, Oct. 28, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 380,787
Int. Cl.[5] B44C *1/22;* B29C *37/00*
U.S. Cl. 156—643 30 Claims

1. A method of ablating a portion of a substrate, comprising the steps of:
exposing said substrate to a first radiation pulse at a first ultraviolet wavelength; and
exposing said substrate to a second radiation pulse at a second, longer ultraviolet wavelength, at least one of said first or second radiation pulses being of sufficient energy



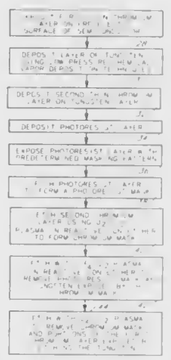
fluence to exceed the threshold for ablative photodecomposition of said substrate.

4,925,524

METHOD FOR FORMING TUNGSTEN STRUCTURES IN A SEMICONDUCTOR

Christopher C. Beatty, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 62,261, Jun. 12, 1987, abandoned. This application Jan. 4, 1989, Ser. No. 293,550
Int. Cl.[5] H01L *21/302*
U.S. Cl. 156—643 3 Claims



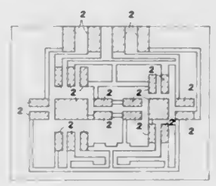
1. A method of forming tungsten structures in a multilevel integrated circuit metallization process, said method comprising the steps of:
forming a first layer of chromium on a preselected surface of an integrated circuit utilized in said multilevel integrated circuit metallization process to provide a protective etch stop layer over said preselected surface;
depositing a layer of tungsten over said first layer of chromium using low pressure chemical vapor deposition technique to uniformly cover said first layer of chromium;
forming a second layer of chromium over said layer of tungsten;
masking said second layer of chromium with a masking material in a predetermined masking pattern;
plasma etching unmasked portions of said second layer of chromium with chlorinated plasma ions that selectively etch chromium at a higher rate than said tungsten to form a chromium mask corresponding to said predetermined masking pattern;
plasma etching portions of said tungsten layer unmasked by said chromium mask to form tungsten structures and to remove said masking material using reactive oxygenated fluoridated plasma ions that selectively etch said tungsten layer at a higher rate than said chromium mask so that said tungsten layer can be etched for a sufficiently long period to remove tungsten stringers that form conductive paths between said tungsten structures with minimal lateral etching of said tungsten resulting and with protection of said preselected surface of said integrated circuit from said reactive fluorinated plasma ions by said first layer of chromium;
plasma etching said chromium mask and said first layer of chromium with chlorinated plasma ions that selectively etch chromium at a higher rate than tungsten to remove exposed portions of both said first and second layers of chromium to electrically isolate said tungsten structures so that said tungsten structures can be used as conductors in said integrated circuit while minimizing etching of said tungsten.

4,925,525

PROCESS FOR PRODUCING A PRINTED CIRCUIT BOARD

Shunji Oku; Yoshiyuki Mizumo, and Kiyoshi Seigenji, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1989, Ser. No. 335,599
Claims priority, application Japan, Apr. 11, 1988, 63-90133
Int. Cl.[5] B44C *1/22;* C03C *15/00;* C23F *1/02;* B29C *37/00*
U.S. Cl. 156—652 18 Claims



1. A method of making a printed circuit board comprising the steps of:
providing a substrate coated with a conductive layer;
developing a first photoresist layer on the conductive layer to define a first conductive pattern of a desired circuit configuration having a plurality of first and second discontinuous segments and a second conductive pattern interconnecting the discontinuous segments of the desired circuit configuration;
removing the exposed conductive layer to leave the first and second conductive patterns;
eliminating the first photoresist layer;
developing a second photoresist layer to cover the whole surface of the substrate except at least the first discontinuous segments of the first conductive pattern;
depositing a conductive material on the first discontinuous segments of the first conductive pattern by electrically connecting the first and second conductive patterns in a coating bath;
eliminating the second photoresist layer;
developing a third photoresist layer on the whole surface of the substrate to permit the exposure of only the second conductive pattern;
removing the second conductive pattern, and
eliminating the third photoresist layer.

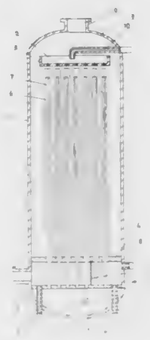
VOL 1114 ISS 3 MY 15 1990 UMI

4,925,526

TUBE-TYPE EVAPORATOR

Reino I. Havukainen, Varkaus, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland

Continuation of Ser. No. 66,253, Jun. 25, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 253,407
Claims priority, application Finland, Jun. 25, 1986, 862703
Int. Cl.[5] B01D *1/22, 3/04*
U.S. Cl. 159—13.3 3 Claims



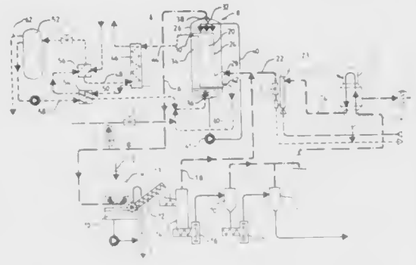
1. An evaporator comprising:
a vessel having an upper end and a lower end;
first and second spaced apart tube plates extending across said vessel adjacent said lower end thereof and defining a space therebetween, said first tube plate being above said second tube plate;
an intermediate wall connected to and extending between said first and second tube plates and dividing said space into an inlet compartment on one side of said intermediate wall and an outlet compartment on an opposite side of said intermediate wall;
a plurality of outer tubes having open lower ends connected to said first tube plate, said outer tubes extending in said vessel and having upper closed ends;
a plurality of inner tubes extending in said outer tubes, said inner tubes having open lower ends connected to said second tube plate and open upper ends spaced below said closed upper ends of said outer tubes wherein a number of said inner and outer tubes are connected to said inlet compartment and the remainder are connected to said outlet compartment;
a return chamber below said second tube plate communicating with said open lower ends of said inner tubes;
feed means comprising a distributor extending across said vessel above said upper closed ends of said outer tubes, said distributor having apertures therethrough for discharging material to be evaporated to form films of material on the outer surfaces of said outer tubes, and a feed pipe extending into said vessel above said distributor for supplying material to be evaporated to said distributor;
means for feeding heating steam to the inlet compartment of said vessel which steam travels from said inlet compartment upwardly through a passage between said inner and outer tubes to form condensate which flows down the passage and is cleaned by the upwardly moving heating steam from said inlet compartment, said heating steam thereafter flowing downwardly through said inner tubes of said inlet compartment, across said return chamber and upwardly through said inner tubes of said outlet compartment, the heating steam thereafter flowing downwardly through a passage between said inner and outer tubes of said outlet compartment to form contaminated condensate which flows into said outlet compartment along with an uncondensed gas;
a first condensate outlet means for discharging condensate from said inlet compartment;
a second condensate outlet means for discharging condensate from said outlet compartment;
a gas outlet means for discharging the uncondensed gas from said outlet compartment; and
a steam outlet means for discharging steam at the top end of said vessel.

4,925,527

METHOD FOR THE RECOVERY OF TURPENTINE AND HEAT IN A REFINER PULPING PROCESS

Rolf Ryham, Princeton, N.J., assignor to Ahlströmföretagen Svenska AB, Norrköping, Sweden

Filed Feb. 22, 1989, Ser. No. 313,797
Int. Cl.[5] D21C *11/06*
U.S. Cl. 162—15 22 Claims



7. A method for recovering turpentine and heat from a turpentine containing vapor in a pulping process wherein woodchips are presteamed and preheated prior to being refined in a refiner, said method comprising the steps of:
(a) generating turpentine containing vapor in the pulping process;
(b) causing at least a portion of said [steam]vapor to backflow from said refiner to said preheater;
(c) passing said turpentine containing vapor to a turpentine evaporator reboiler comprising a condensing vapor zone and a boiling liquid zone;
(d) introducing said turpentine containing vapor into said condensing vapor zone;
(e) generating steam and turpentine-rich vapor by introducing an aqueous medium into said boiling liquid zone in indirect heat exchanging contact with said turpentine containing vapor in said condensing vapor zone; and
(f) utilizing said steam for presteaming said woodchips.

4,925,528

MANUFACTURE OF WETLAID NONWOVEN WEBS

Stephen H. Tse, Midlothian, Va.; David H. Hollenberg, Neenah, Wis.; Richard L. Martin, Menasha, Wis., and James H. Manning, Appleton, Wis., assignors to James River Corporation of Virginia, Richmond, Va.

Continuation-in-part of Ser. No. 219,909, Jul. 18, 1988, Pat. No. 4,822,452, which is a continuation-in-part of Ser. No. 35,059, Apr. 6, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 334,604
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[5] D21H *5/12*
U.S. Cl. 162—146 12 Claims

1. In a method for the production of a fibrous web from natural synthetic fibers which comprises forming a fiber furnish by dispersing the fibers in water and supplying the fiber furnish to the wire of a papermaking machine forming a fibrous web, the improvement which comprises dispersing the fibers in an aqueous carrier in the presence of a polymeric surfactant associative thickener containing two or more of both hydrophobic and hydrophilic groupings per molecule and having a molecular weight in the range of from about 10,000 to about 400,000 in an amount within the range of from about 1 to about 150 pounds polymeric surfactant per pound of dry fiber.

4,925,529

LIGHT-WEIGHT BUILDING BOARDS BASED ON MINERAL FIBERS AND THERMOPLASTIC BINDERS

Bernhard Dotzauer, Maxdorf; Hans Kast, Mannheim; Wilhelm F. Beckerle, Bobenheim-Roxheim, and Rainer Hummerich, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,574
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438388
Int. Cl.[5] D21H *13/38*
U.S. Cl. 162—152 4 Claims

1. A light weight building board comprising mineral fibers and a thermoplastic binder, said thermoplastic binder, in an amount of from 4 to 20%, based on the weight of the mineral fibers, being a polymer having a glass transition temperature of from 60° to 110° C. and consisting of from 60 1 to 100% by weight, based on the polymer, of (meth)acrylates of alcohols of 1 to 4 carbon atoms, from 0–40% by weight, based on the weight of the polymer, of (meth)acrylonitrile, styrene, or mixtures thereof, from 0–5%, based on the weight of the polymer, of (meth)acrylic acid, (meth)acrylamide, or mixture thereof, and from 0–5%, based on the weight of the polymer, of a crosslinking monomer, and a salt of a carboxylic acid of 12 to 36 carbon atoms with a polyvalent metal.

4,925,530

LOADED PAPER

Peter Sinclair, and Angela J. Hayes, both of Buckinghamshire, England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Continuation of Ser. No. 943,082, Dec. 18, 1986, abandoned. This application Jul. 20, 1988, Ser. No. 222,346
Claims priority, application United Kingdom, Dec. 21, 1985, 8531558
Int. Cl.[5] D21H *17/33*
U.S. Cl. 162—164.1 37 Claims

1. A process for the production of loaded paper from papermaking fibre and filler, comprising the steps of:
(a) treating the papermaking fibre in an aqueous medium with a charged synthetic polymer;
(b) separately treating the filler in an aqueous medium with a charged synthetic polymer, with the proviso that if the charged synthetic polymer used to treat the filler is anionic it is selected from papermaking flocculents and retention aids;
(c) selecting the charged synthetic polymer used in step (a) and the charged synthetic polymer used in step (b) such that both have the same charge polarity;
(d) additionally treating the filler with a charged polymer of opposite charge polarity from that of the polymer(s) used in steps (a) and (b);
(e) mixing aqueous suspensions of treated filler and treated papermaking fibre from steps (a), (b) and (d) to form a papermaking stock, diluting as necessary before, during or after the mixing operation; and
(f) draining the papermaking stock to form a loaded paper web, wherein the filler, papermaking fibre and charged polymers are used in amounts effective to produce loaded paper.

4,925,531

TWIN WIRE FORMER FOR A PAPER MACHINE

Erkki Koski, Jyväskylä, Finland, assignor to Valmet Paper Machinery Inc., Finland

Filed May 22, 1989, Ser. No. 355,180
Claims priority, application Finland, May 23, 1988, 882422
Int. Cl.[5] D21F *1/00*
U.S. Cl. 162—301 16 Claims



1. A twin-wire former for a paper machine, having a twin-wire forming zone comprising, in the following sequence of twin-wire run,
(i) a downwardly curved forming zone confined to a sector of a first forming roll,
(ii) said twin wire run comprising a lower wire loop unit and an upper wire loop unit guided by guide rolls, the lower and upper wires being arranged to both run over said first forming roll and define a forming gap thereat, into which a slice part of a headbox is arranged to feed a pulp suspension jet,
(iii) a second forming roll situated after said first forming roll, being situated at a lower level than said first forming roll, and also arranged to curve the twin-wire run thereabout to become either
(a) substantially horizontal,
(b) slightly upwardly inclined, or
(c) slightly downwardly inclined, and
(iv) a third forming element fitted after said second forming roll,
said third forming element being either
(1) a forming shoe fitted inside the lower wire loop, mounted on the frame of the lower wire unit, and having a ribbed deck with a relatively large curved radius, or
(2) a combination of deflectors situated in the upper wire loop and in the lower wire loop
after which the twin-wire forming zone ends and wherein said first forming roll has a large diameter and said second forming roll has a diametet substantially smaller than the diameter of said first forming roll,
said first forming roll is mounted on a frame of the lower wire unit and is located within the lower wire unit,
magnitude of said sector of said first forming roll is less than about 90° , and
said second forming roll has a sector for the curving of the twin-wire zone which is less than about 90°.

4,925,532

APPARATUS FOR THERMAL CONVERSION OF ORGANIC MATTER

William E. Meuser, Springdale; Gary W. LaRue, Siloam Springs, both of Ark.; Windel L. Harris, Neosho, Mo.; James A. Donahue, Huntsville, Ark.; L. H. Bonney, Strongsville, Ohio, and Gene W. Glanton, Houston, Tex., assignors to PTO, Inc., Springdale, Ark.

Filed Apr. 24, 1989, Ser. No. 342,056
Int. Cl.[5] C10B *1/06, 49/14*
U.S. Cl. 202—219 13 Claims

1. An apparatus for thermal conversion of organic matter comprising;

VOL 1114 ISS 3 MY 15 1990 UMI

a tank having a substantially flat bottom wall joined to opposite end walls terminating in distal entrance and exit edges respectively,

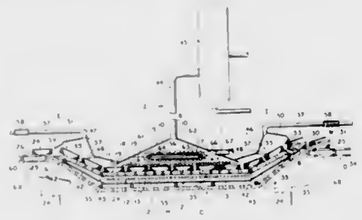
molten metal within said tank having a top surface disposed in a plane adjacent said distal edges, said molten metal capable of being heated to a temperature above 650 degrees F.,

a first heating array comprising a plurality of adjacent heating tubes within said tank adjacent said bottom wall and operable to maintain said molten metal at a temperature above 650 degrees F.,

conveying means within said tank atop said first heating array,

delivery means adjacent said entrance tank edge and exit means adjacent said exit tank edge,

a plurality of individual apertured containers for housing organic waste material, said delivery means operable to move said containers to said entrance tank edge for subsequent movement with said conveying means and transport through said heated molten metal in said tank,



means on said containers maintaining axial alignment of said containers during transport through said tank,

means within said tank preventing vertical displacement of said containers due to buoyancy during transport through said tank,

a second heating array within said tank comprising a plurality of heating tubes disposed in a substantially horizontal plane vertically spaced above said first heating array,

a hood for collecting hydrocarbon gasses and vapors overlying said tank bottom wall and having opposite lower edges disposed below the level of said top entrance and exit tank edges, and

means within said tank displaceable during said transport of said containers through said tank to agitate said molten metal to maximize the even distribution of heat within said molten metal and to encourage the maximum conversion of waste material to hydrocarbon components.

4,925,533

SEPARATION OF VINYL ACETATE FROM ETHYL ACETATE BY EXTRACTIVE DISTILLATION WITH ACIDS OR ACID AMIDES

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Mar. 6, 1989, Ser. No. 319,166

Int. Cl.[5] B01D *3/40;* **C07C** *67/54*

U.S. Cl. 203—51 **2 Claims**

1. A method for recovering vinyl acetate from mixtures of vinyl acetate and ethyl acetate which comprises distilling a mixture of vinyl acetate and ethyl acetate in a rectification column in the presence of about one part of an extractive agent per part of vinyl acetate-ethyl acetate mixture, recovering vinyl acetate as overhead product and obtaining the ethyl acetate and the extractive agent from the stillpot, wherein said extractive agent comprises formic acid and one material selected from the group consisting of formamide, acetophenone, adiponitrile, sulfolane and acetamide.

4,925,534

HEMODIALYSIS METHOD AND MEMBRANE

Hiroshi Kataoka; Tetsunosuke Kunitomo, both of Kamakura, and Takuichi Kobayashi, Shiga, all of Japan, assignors to Toray Industries Inc., Japan

Division of Ser. No. 59,548, Jun. 8, 1987, Pat. No. 4,834,882.

This application Dec. 2, 1988, Ser. No. 278,814

Claims priority, application Japan, Jun. 13, 1986, 61-136125; Jun. 30, 1986, 61-151679

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—647 **9 Claims**

1. In a method of purifying the blood of a patient, wherein said blood contains desirable proteins along with impurities including β_2-microglobulins and wherein said blood is subjected to the action of a dialysis membrane which removes impurities from the blood, the steps which comprise:

(a) subjecting said blood to a dialysis procedure controlled to remove impurities but to retain desirable proteins in the blood,

(b) controlling the dialysis to cause removal from the blood of β_2-microglobulin at a reduction rate of 5% or more while impeding significant losses of said desirable proteins, and

(c) said membrane having a total protein permeability of 0.2% or less, a β_2-microglobulin reduction rate of 5% or more, a total volume porosity of 35 to 75% and a pore volume porosity of 25% or more, said membrane including an active layer portion having pore radii of 4–15 nm.

4,925,535

PROCESS FOR THE PRODUCTION OF AN AROMATE CONCENTRATE SUITABLE FOR USE AS BLENDING COMPONENT FOR GASIFICATION FUEL

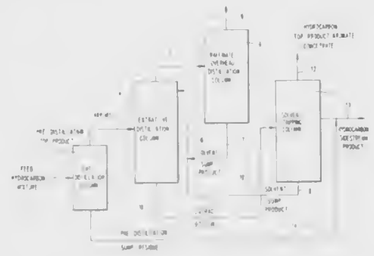
Gerhard Preusser; Gerd Emmrich, both of Essen, and Martin Schulze, Velbert, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 230,187

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1987, 3726449

Int. Cl.[5] B01D *3/40;* **C07C** *7/08*

U.S. Cl. 203—25 **3 Claims**



1. Improved process for production of an aromate concentrate for use as a blending component for gasification fuel, of the type employing a feed hydrocarbon mixture with a boiling range between 40° and 170° C., said feed hydrocarbon mixture containing a plurality of aromates as well as a plurality of non-aromates, whereby said feed hydrocarbon mixture is subjected to an extractive distillation using N-substituted morpholines, substituents of which display no more than seven carbon atoms, as selective solvent, in an extractive distillation column having a top and producing extract bottoms, and whereby a plurality of low-boiling non-aromates with a boiling range up to about 105° C. practically completely, and higher-boiling non-aromates with a boiling range between 105° and 160° C. to a major extent, are discharged as a raffinate overhead at said top of said extractive distillation column, whereupon said solvent is distillatively separated from a plurality of other hydrocarbons in said extract bottoms in a subsequently disposed solvent stripping column, said other hydrocarbons being employed at least partially as said bleeding component, the improvement wherein said process further comprises the step of predistilling another feed hydrocarbon mixture which contains components boiling above 170° C. in which the components that boil under normal conditions at up to 169° C. are distillatively separated as a predistillation top product and a distillation residue is also recovered as a predistillation sump product, introducing said pre-distillation top product to the extractive distillation column as the first-mentioned feed hydrocarbon mixture and adding the predistillation sump product to said other hydrocarbons employed as said blending component, wherein said other hydrocarbons include an aromate concentrate.

4,925,536

PROCESSES FOR ADHESION-BONDING BETWEEN METALLIC MATERIALS AND GALVANIC ALUMINUM LAYERS AND NON-AQUEOUS ELECTROLYTES EMPLOYED THEREIN

Herbert Lehmkuhl, and Klaus-Dieter Mehler, both of Mülheim/Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim/Ruhr, Fed. Rep. of Germany

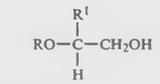
Filed Feb. 2, 1989, Ser. No. 305,838

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804303

Int. Cl.[5] C25D *5/10*

U.S. Cl. 204—58.5 **13 Claims**

1. A process for metal-plating of a metallic material, comprising electrodepositing on said metallic material from a non-aqueous electrolyte, an adhesion-bonding layer of iron, iron and nickel, nickel, cobalt, copper or an alloy of said metals or a tin-nickel alloy, and then electrodepositing aluminum thereon, the non-aqueous electrolyte containing an anhydrous supporting electrolyte and comprising a solution of an anhydrous metal salt of iron, cobalt, nickel, copper or tin in a water-free alkyl semi-ether of a C_2- to C_3-alkylene glycol of the formula



wherein

R represents C_1- to C_6-alkyl or phenyl,

R^1 represents a hydrogen atom or a methyl group.

4,925,537

PROCESS FOR SEPARATION OF HAFNIUM TETRACHLORIDE FROM ZIRCONIUM TETRACHLORIDE AND ELECTRODE

Tomoo Kirihara, Hirakocho-Higashi; Ippei Nakagawa, Aichi; Yoshinobu Seki, Ibaraki; Yutaka Honda, Ibaraki, and Yasuo Ichihara, Ibaraki, all of Japan, assignors to Mitsubishi Nuclear Fuel Company, Ltd., Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 330,893

Claims priority, application Japan, Apr. 1, 1988, 63-80416

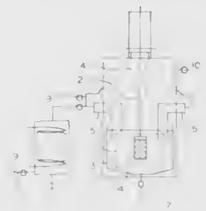
Int. Cl.[5] C25B *1/26, 11/04*

U.S. Cl. 204—61 **4 Claims**

1. A process for separation of hafnium tetrachloride from zirconium tetrachloride comprising the following steps:

(a) dissolving zirconium tetrachloride containing hafnium tetrachloride in natural ratio in a molten salt,

(b) producing zirconium trichloride containing a lower hafnium content than that of said zirconium tetrachloride at a cathode by electrolytic reduction of said zirconium tetrachloride in said molten salt using a substance formed by firing a mixture of more than one kind of compound selected from the group consisting of silica, silicate containing zirconium or zirconium oxide and carbon with a binder as an anode.



4,925,538

METHOD OF ELECTROLYTIC TREATMENT OF METALS

Yukiei Matsumoto; Yoshinori Nishiki; Kazuhiro Hirao, all of Kanagawa, and Takayuki Shimamune, Tokyo, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Continuation of Ser. No. 191,625, May 9, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 418,765

Claims priority, application Japan, May 8, 1987, 62-110455

Int. Cl.[5] B23H *3/00*

U.S. Cl. 204—129.4 **4 Claims**

1. A method of electrolytically etching aluminum or stainless steel, the method consisting of passing an a.c. current or alternating pulsive current through an electrolytic cell containing said metal to be etched as an electrode and an electrode comprising a metal substrate having a coating comprising an oxide of ruthenium, iridium or rhodium as a counter electrode.

4,925,539

METAL FIBERS OBTAINED BY BUNDLED DRAWING

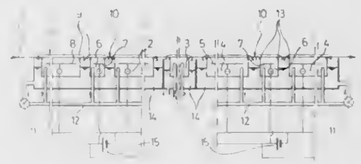
Roger Francois, St.-Eloois-Vijve, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Feb. 28, 1989, Ser. No. 316,917

Claims priority, application Belgium, Mar. 17, 1988, 88.00306

Int. Cl.[5] C25F *5/00*

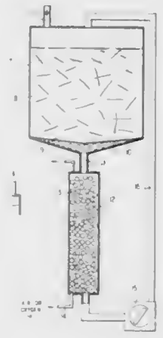
U.S. Cl. 204—146 **8 Claims**



1. A process for the manufacture of metal fibers by bundled drawing in which the metal matrix is removed by an electrolytic process and in which the embedded bundle acts as an anode characterized in that the embedded bundle (1) is continuously transported through successive electrolytic baths (2, 4) containing an electrolyte at a temperature of at least 20° C. without making mechanical contact with current carrying contact elements and in which cathodic transition cells (6) are present between these baths and in which the current runs through the bundle (1) between these paths and transition cells and in which at least part of the matrix material is deposited on cathodes (5) which are facing the bundle.

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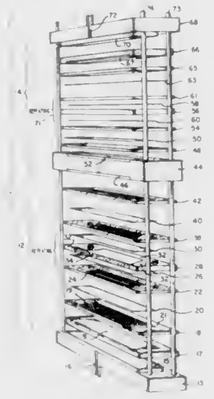
4,925,540
METHOD FOR TREATING ORGANIC WASTE MATERIAL AND AN OXIDATION CATALYST/COCATALYST COMPOSITION USEFUL THEREFOR
Patrick M. Dhooge, Corrales, N. Mex., assignor to Delphi Research Inc., Albuquerque, N. Mex.
Filed Oct. 4, 1988, Ser. No. 253,232
Int. Cl.[5] B01J *19/10;* **C01B** *31/20*
U.S. Cl. 204—157.42 **20 Claims**



1. A method for gasifying organic waste which comprises:
combining organic waste with a catalyst composition,
conducting an oxidation reaction between the organic waste and oxygen in a solution of the catalyst, and
maintaining an oxygen or air flow through the catalyst solution,
the catalyst solution containing a combination of (a) an oxidation catalyst and (b) a homogeneous cocatalyst.

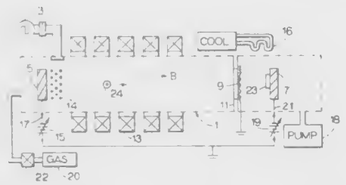
4,925,541
ELECTODEIONIZATION APPARATUS AND METHOD
Anthony J. Giuffrida, N. Andover; Anil D. Jha, and Gary C. Ganzi, both of Lexington, all of Mass., assignors to Millipore Corporation, Bedford, Mass.
Division of Ser. No. 762,804, Aug. 2, 1985, Pat. No. 4,632,745, which is a continuation of Ser. No. 628,930, Jul. 9, 1984, abandoned. This application Sep. 18, 1986, Ser. No. 908,513
The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.
Int. Cl.[5] B01D *13/02*
U.S. Cl. 204—182.5 **9 Claims**

1. The process for removing ions from a liquid in an electrodeionization apparatus adapted to remove ions from a liquid which include:
a cathode compartment at a first end of said apparatus,
an anode compartment at an end of said apparatus opposite said first end,
a plurality of alternating ion depletion compartments and ion concentration compartments positioned between said cathode compartment and said anode compartment,
each of said ion depletion compartments comprising a spacer and a plurality of subcompartments formed by a plurality of ribs extending along the length of each of said ion depletion compartments, each of said subcompartments containing a mixture of anion exchange resin and cation exchange resin,
each of said subcompartments having a width between about 0.3 and 4 inches and a thickness between about 0.05 and 0.25 inches and wherein the thickness of said subcompartments is defined by an anion permeable membrane and a cation permeable membrane being bonded to each of said ribs along the length of said ribs and to said spacer,
each of said concentration compartments being free of ion exchange solid composition,
means for passing a first liquid to be purified through said ion depletion compartments,
means for passing a second liquid for accepting ions from said first liquid, through said concentration compartments,
means for applying an electrical voltage between an anode in said anode compartment and a cathode in said cathode compartment and,



means for recovering purified liquid from said depletion compartment,
which comprises passing a first liquid to be purified through said depletion compartments, passing a second liquid adapted to accept ions through said concentration compartments, passing an electrolyte through each of said anode and cathode compartments and recovering purified liquid from said ion depletion compartments.

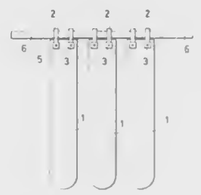
4,925,542
PLASMA PLATING APPARATUS AND METHOD
Philip W. Kidd, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Dec. 8, 1988, Ser. No. 281,436
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.31 **17 Claims**



10. The method of plating passage walls of passages formed in a substrate wherein the length of the passage in the substrate is substantially greater than the width of the passage opening thereby defining a high aspect ratio passage, comprising the steps of:
supporting said substrate on an electrically conductive substrate support within a confined evacuated region and applying a negative polarity voltage of a bias voltage source to said substrate support;

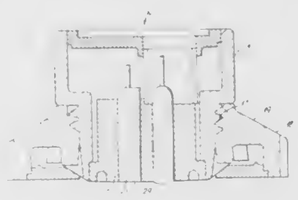
creating a magnetically confined electron cyclotron resonance heated plasma within said confined evacuated region with said plasma containing positively charged metal ions and permitting said metal ions to move in helical paths toward said substrate including the step of subjecting a metal atom source located at a predetermined position in said confined region to ion bombardment,
passing said plasma through an electrically grounded metal sieve like screen located longitudinally spaced from said metal atom source in the path of and confronting said plasma and longitudinally spaced from said substrate to place said plasma at electrical ground potential, whereby metal ions from said metal atom source traveling to said substrate must pass through said screen;
increasing the longitudinal velocity of said metal ions in said plasma from a location longitudinally spaced from said screen and in the proximity of said substrate prior to said ions reaching said substrate in an amount sufficient to permit metal ions of said plasma approaching a passage in said substrate to enter said substrate passage traveling longitudinally relatively in line with said passage, whereby said passage becomes relatively uniformly filled up following entry of successive quantities of metal ions over a period of time.

4,925,543
INSOLUBLE ANODES FOR EXTRACTING LEAD FROM THE ELECTROLYTE IN ELECTROCHEMICAL PROCESSES FOR RECOVERING THE METALS CONTAINED IN SPENT ACCUMULATIONS
Marco Ginatta, Turin, Italy, assignor to Snamprogetti S.p.A., Milan, Italy
Continuation-in-part of Ser. No. 676,611, Dec. 3, 1984, abandoned, which is a continuation of Ser. No. 493,629, May 11, 1983, abandoned. This application Oct. 16, 1985, Ser. No. 788,656
Claims priority, application Italy, May 27, 1982, 21509 A/82
Int. Cl.[5] C25B *11/00*
U.S. Cl. 204—288 **3 Claims**



1. An insoluble graphite anode system for extracting lead from an electrolyte in electrochemical processes and for recovering metals contained in spent accumulators comprising a plurality of graphite anodes having the form of parallelepiped plates rounded at their bottom end, said anodes having at their top end one or more copper strips bent over to contact said anodes so as to leave an annular space above each of said anodes, each copper strip having a semicircular shape at its mid-section and an inverted V-shape at its top-section, said copper strip being clamped adjacent to said anode by a pair of plates which is removably secured to said copper strip, said annular spaces formed by said copper strips clamped to the top end of said anodes having a steel tube of polygonal cross-section passing therethrough and contacting said copper strips along two points, said anodes being suspended from said steel tube, said steel tube being clad with sheet copper.

4,925,544
ELECTROCHEMICAL SENSOR WITH SOLID PHASE ELECTROLYTE
Lionel S. Goldring, Woodbridge, Conn., assignor to National Research Development Corporation, London, England
PCT No. PCT/GB88/00377, § 371 Date Feb. 23, 1989, § 102(e) Date Feb. 23, 1989, PCT Pub. No. WO88/08975, PCT Pub. Date Nov. 17, 1988
Continuation-in-part of Ser. No. 49,902, May 15, 1987, abandoned. This PCT application May 13, 1988, Ser. No. 303,653
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—421 **14 Claims**



1. An electrochemical sensor comprising an electrolyte and an analyte separated by a selectively permeable membrane where the electrolyte comprises an electrically conductive solid comprising a homogeneous dispersion of a polymeric matrix phase, where the polymeric matrix phase is plasticized, and an electrically conductive salt said dispersion being substantially free of water, the plasticizer forming a continuous phase in which the conductive salt is dissolved.

4,925,545
METHOD OF GENERATING PH FUNCTIONS IN ELECTROPHORESIS AND ISOELECTRIC FOCUSING
Andrew Murel, St. Louis, Mo., assignor to Amest, Inc., St. Louis, Mo.
Filed Jan. 31, 1989, Ser. No. 304,429
Int. Cl.[5] B01D *57/02;* **G01N** *27/28*
U.S. Cl. 204—182.9 **28 Claims**

1. A method of generating a pH function for use in electrophoresis or isoelectric focusing, comprising contacting a permeable medium with a selected acidic compound, wherein:
(a) the permeable medium comprises anchored molecules which form molecular complexes with the selected acidic compound, and
(b) the anchored molecules are present in different concentrations in different zones within the permeable medium.

4,925,546
HYDROCRACKING PROCESS
Simon G. Kukes; Christopher L. Marshall, both of Naperville; P. Donald Hopkins, St. Charles, all of Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Amoco Corporation, Chicago, Ill.
Filed Sep. 12, 1989, Ser. No. 406,262
Int. Cl.[5] C10G *47/20*
U.S. Cl. 208—111 **8 Claims**

1. A process for the hydrocracking of a hydrocarbon feedstock which comprises reacting the feedstock with hydrogen at hydrocracking conversion conditions in the presence of a catalyst comprising a hydrogenation component comprising a Group VIB metal component and a Group VIII metal component and a support component comprising a refractory inorganic oxide component and a crystalline molecular sieve component wherein the crystalline molecular sieve component consists essentially of a first ultrastable zeolite Y wherein the framework silica to alumina molar ratio varies from about 5 to

about 8 and the unit cell size varies from about 24.667 to about 24.524 Angstroms and a second more dealuminated ultrastable zeolite Y wherein the framework silica to alumina molar ratio varies from about 8 to about 20 and the unit cell size varies from about 24.524 to about 24.343 Angstroms, wherein the amount of said first zeolite Y varies from about 40 to about 80 wt. % based on the total amount of said crystalline molecular sieve component.

4,925,547

PROCESS FOR PRODUCING PITCH FOR THE MANUFACTURE OF HIGH-PERFORMANCE CARBON FIBERS TOGETHER WITH PITCH FOR THE MANUFACTURE OF GENERAL-PURPOSE CARBON FIBERS

Masatoshi Tsuchitani, Ichihara; Sakae Naito, Chiba; Hiroshi Morijiri, and Kiyotaka Suzuki, both of Ichihara, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1989, Ser. No. 397,135
Claims priority, application Japan, Aug. 25, 1988, 63-211494
Int. Cl.[5] C10C *3/00*
U.S. Cl. 208—39 **40 Claims**



1. A process for producing a pitch for the manufacture of high-performance carbon fibers together with a pitch for the manufacture of general-purpose carbon fibers, which comprises using, as a raw material, a heavy oil of coal origin or petroleum origin, or a heavy component obtained by the distillation, heat treatment or hydrogenation of the heavy oil of coal origin or petroleum origin, which contains essentially no component insoluble in a monocyclic aromatic hydrocarbon solvent or from which such component insoluble in a monocyclic aromatic hydrocarbon solvent has been essentially removed;

subjecting said raw material to a first step of continuously heat-treating said raw material in a tubular heater under an increased pressure at a temperature of 400°–600° C. to produce a heat-treated material containing essentially no quinoline insoluble component and 3–30% by weight of xylene insoluble component;

subjecting said heat-treated material produced in the first step to a second step of adding 1–5 parts by weight of a monocyclic aromatic hydrocarbon solvent or a solvent having the same degree of dissolving ability with the monocyclic aromatic hydrocarbon solvent to 1 part by weight of said heat-treated material, thus producing insoluble component and separating the insoluble component and the solution of soluble component in said solvent;

subjecting said insoluble component separated in the second step to a third step of hydrogenating said insoluble component with heating in the presence of a hydrogen-donating solvent to produce a hydro-treated mixture;

thereby obtaining a hydro-treated mixture from the third step and obtaining a solution of soluble component in the monocyclic aromatic hydrocarbon solvent from the second step;

treating said hydro-treated mixture to produce a substantially optically anisotropic pitch for the manufacture of high-performance carbon fibers; and

treating said solution of soluble component in said solvent to produce an essentially optically isotropic pitch for the manufacture of general-purpose carbon fibers.

4,925,548

SYNTHESIS OF CRYSTALLINE ZSM-35 STRUCTURE

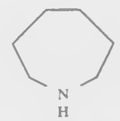
Mae K. Rubin, Bala Cynwyd, Pa., assignor to Mobil Oil Corp., New York, N.Y.

Filed Jul. 13, 1989, Ser. No. 379,308
Int. Cl.[5] C10G *1/00*
U.S. Cl. 208—46 **17 Claims**

1. A method for synthesizing a crystalline material exhibiting a characteristic X-ray diffraction pattern including the values shown in Table 1 of the specification, which comprises (i) preparing a mixture capable of forming said material, said mixture comprising sources of alkali or alkaline earth metal cations (M), an oxide of trivalent element (X), an oxide of tetravalent element (Y), water and a directing agent (R), and having a composition, in terms of mole ratios, within the following ranges;

YO_2/X_2O_3	15 to 35
H_2O/YO_2	10 to 100
OH^-/YO_2	0.15 to 0.5
M/YO_2	0.15 to 0.5
R/YO_2	0.1 to 1.0
R/M_2O	0.5 to 3.6

wherein R is an organic agent of the formula:



(ii) maintaining said mixture under sufficient conditions until crystals of said material are formed; and (iii) recovering said crystalline material from step (ii), said recovered crystalline material containing said R.

4,925,549

SULFUR REMOVAL SYSTEM FOR PROTECTION OF REFORMING CATALYST

Richard C. Rubinson, San Rafael; Robert L. Jacobson, Vallejo, and Leslie A. Field, Emeryville, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 667,505, Oct. 31, 1984, Pat. No. 4,741,819. This application Mar. 10, 1988, Ser. No. 166,588
Int. Cl.[5] C10G *35/06*
U.S. Cl. 208—65 **1 Claim**

1. A method for removing residual sulfur from a hydro-treated naptha feedstock containing organic sulfur compounds and for reforming the naphtha feedstock, comprising:

(a) contacting the naphtha feedstock, in the presence of hydrogen, with a less sulfur sensitive reforming catalyst, which comprises platinum or alumina; to conduct some reforming reactions and to convert the organic sulfur compounds to H_2S without substantially hydrocracking the naphtha feedstock, at a temperature lower than 480° C.; a pressure between 50 and 300 psig; a hydrogen recycle ratio between 2:1 and 6:1 H_2/HC; and a space velocity between 3 and 15 LHSV, thereby forming a first effluent;

(b) contacting the first effluent with a solid sulfur sorbent, comprising potassium on alumina, at a temperature between 300° and 450° C. to remove H_2S to less than 0.05 ppm thereby forming a second effluent; and

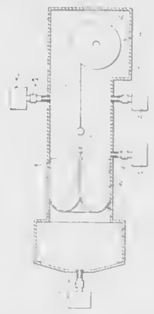
(c) contacting the second effluent, under reforming conditions, with a highly selective and highly sulfur sensitive reforming catalyst, which comprises platinum, L zeolite, and an alkaline earth metal selected from the group consisting of barium, calcium, or strontium.

4,925,550

BATCH-ACTION APPARATUS FOR FILTERING FLUID MEDIUM

Viktor V. Shishkin, ulitsa Festivalnaya, 16, kv. 5; Nikolai F. Kryazhevskikh, ulitsa Krasnykh Partizan 559, kv. 13, and Jury P. Shapovalov, ulitsa Turgeneva, 18, all of Krasnodar, U.S.S.R.

PCT No. PCT/SU86/00138, § 371 Date Jul. 28, 1987, § 102(e) Date Jul. 28, 1987, PCT Pub. No. WO87/03824, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 12, 1986, Ser. No. 113,817
Claims priority, application U.S.S.R., Dec. 24, 1985, 3988613; Dec. 24, 1985, 3988615; Dec. 24, 1985, 3988603; Dec. 24, 1985, 3988602; Dec. 24, 1985, 3988606; Dec. 24, 1985, 3988601; Dec. 24, 1985, 3988609; Dec. 24, 1985, 3988610; Dec. 24, 1985, 3988614
Int. Cl.[5] B01D *33/00, 29/12*
U.S. Cl. 210—106 **13 Claims**



1. A batch-action apparatus for filtering a fluid medium, comprising:

a sealed housing;

at least one flexible filtering element comprising an open ended generally cylindrical hose having a first end, which is turned inside out and secured along an inner perimeter of said housing at a point of attachment, and a second end, means connecting said second end to a hoisting mechanism, actuation means for driving said hoisting mechanism, said filtering element defines an annular cavity and divides the housing into an upper chamber and a lower chamber, said hoisting mechanism is positioned in the upper housing so that the second end is movable relative to the point of attachment so that the volume of the annular cavity can be changed;

a means for feeding a fluid medium to be filtered in fluid communication with the upper chamber;

a means for removing the filtered medium in fluid communication with said lower chamber; and

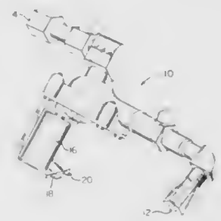
a means for removing the filter cake formed on the filtering element during filtration, said filter cake removimg means is in fluid communication with the upper chamber, means for supplying a washing fluid in fluid communication with said housing such that when said washing liquid is fed to said housing the liquid dislodges the filter cake from the filtering element and the means for removing the filter cake removes the filter cake from the housing.

4,925,551

PORTABLE WATER PURIFICATION SYSTEM INCLUDING ELECTRONIC MEMORY PANEL ASSEMBLY

Mitchell Lipshultz, Ft. Lauderdale, Fla., and Alfred J. Lipshultz, 4090 Lake Dr., Coconut Creek, Fla. 33309, assignors to Alfred J. Lipshultz, Coconut Creek, Fla.

Continuation-in-part of Ser. No. 842,165, Mar. 21, 1986, Pat. No. 4,759,844. This application Jul. 6, 1988, Ser. No. 215,495
The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.
Int. Cl.[5] C02F *9/00*
U.S. Cl. 210—140 **1 Claim**



1. A miniature portable domestic water purifying system adapted to operate under conventional water main pressure in a kitchen for dispensing purified water and comprising:

a housing provided with a reservoir for purified water and a process compartment,

a reverse osmosis unit in the form of a replaceable cartridge and positioned in the process compartment,

an ion exchange unit in the form of a replaceable cartridge and positioned in the process compartment,

an activated carbon filter in the form of a replaceable cartridge and positioned in the process compartment,

each of the reservoir and the reverse osmosis unit and the ion exchange unit and the activated carbon filter provided with an inlet and an outlet,

water communication connected between:

(i) the outlet of the reverse osmosis unit and the inlet of the ion exchange unit, and between

(ii) the outlet of the ion exchange unit and the inlet of the activated carbon filter, and between

(iii) the outlet of the activated carbon filter and the inlet of the reservoir,

the reservoir provided with a tap and an overflow port, the reverse osmosis unit provided with a brine disposal outlet for disposal of waste brine therefrom,

the water purifying system further comprising:

a control device including piping having an inlet end fitting for attachment to a water supply and an outlet end fitting for attachment to the inlet of the reverse osmosis unit,

a normally closed valve in the piping,

a solenoid in the control device and having male terminals which when energized activate the solenoid to open said valve to flush the reverse osmosis unit via the brine disposal outlet,

an adjustable presettable timer,

a relay, a first pair of electrical leads connecting the timer and the relay,

a second pair of electrical leads connecting the relay to female terminals which are releasably connectable to the male terminals for operation of the solenoid,

a third pair of electrical leads one of which is connected by a tap to one of the first pair of leads and the other of which is connected by a tap to one of the second pair of leads, and

the third pair of leads being connectable to a source of electrical power

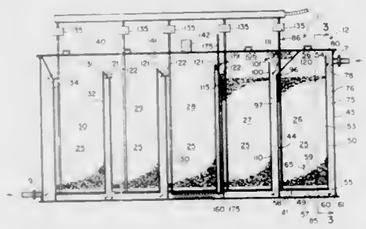
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4,925,552

ARRANGEMENT FOR WATER PURIFICATION

George F. Bateson, Roseville; Thomas J. Chresand, Minneapolis; Joel D. Moore, Bloomington, and Terrence L. Nayes, Eden Prairie, all of Minn., assignors to BioTrol, Inc., Chaska, Minn.

Filed May 12, 1988, Ser. No. 193,362
Int. Cl.[5] C02F *3/06*; B01D *29/08*
U.S. Cl. 210—150 17 Claims



1. An arrangement for operation to reduce organic contaminant concentration in water passing therethrough; said arrangement comprising:

(a) at least one reactor comprising a plurality of treatment chambers oriented in series; each treatment chamber: being defined by a bottom wall and a side wall arrangement; and including an upstream downcomer portion and a downstream column portion separated by a wall member;

(i) said column portion having a bottom wall and a downstream wall;

(ii) each chamber including a baffle member therein dividing said chamber into said downcomer portion and said column portion; each baffle member except for a first, most upstream baffle member, having less upward extension than a next upstream baffle member; and, each downstream portion, except for a first, most upstream downcomer portion, being defined between a column portion downstream wall and a next downstream baffle member; the downstream wall of each column portion having less upward extension than a next downstream baffle member;

(iii) each baffle member, except for said first, most upstream, baffle member, being at least about 0.25 inches shorter in upward extension than a next upstream baffle member;

(iv) each downstream wall being at least about 0.5 feet lower in upward extension than a next downstream baffle member; and,

(v) each of said baffle members and each of said downstream walls having less upward extension than said side wall arrangement;

(b) column biomass support material including immobilized biomass thereon contained within each chamber column portion;

(c) means for supporting biomass support material in each column portion, spaced from the associated column bottom wall, to define a feed space between the column bottom wall and the biomass support material;

(d) means for providing fluid flow communication between a lower portion of each downcomer and a feed space in the next downstream column portion;

(e) a drain arrangement associated with each column portion; each of said drain arrangements including mans for providing fluid flow outwardly from the associated column portion at a location above biomass support material within the column portion;

(i) for each chamber except a last downstream chamber in said reactor, the drain arrangement providing for fluid flow into a next downstream chamber downcomer portion;

(ii) for a last downstream chamber in said reactor, the drain arrangement providing for fluid flow into a fluid flow exit from said reactor;

(f) an upward extension of the column biomass support material within each column portion terminating lower than an associated baffle member and downstream wall; and,

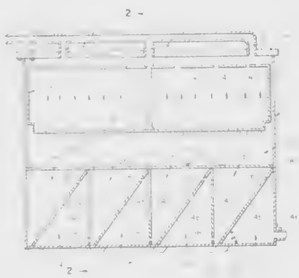
(g) a fluid inlet arrangement in operative association with each downcomer portion in said plurality of treatment chambers.

4,925,553

PRESSURIZED OIL FILTER/CARBON SEPARATOR

Ernest R. Smith, Leland, Miss., assignor to John H. Cox, III, Greenville and Charles W. Rochelle, Leland, both of, Miss., part interest to each

Filed Nov. 18, 1988, Ser. No. 273,062
Int. Cl.[5] B01D *17/028*
U.S. Cl. 210—186 6 Claims



1. Apparatus for cleaning lubricating oil from an internal combustion engine, comprising:

(a) a housing including a dirty oil inlet and a clean oil outlet;

(b) means for supplying a pressurized flow of oil to said housing inlet;

(c) gravity separation means located within said housing and arranged adjacent a bottom wall thereof, said separation means including a plurality of walls connected with said housing bottom wall, said walls comprising successive alternating normal and acutely angled walls relative to said bottom wall defining a plurality of chambers connected in series with said housing oil inlet, each of said walls containing an opening affording flow of oil successively through said chambers, said openings being provided adjacent the top and bottom of successive walls, respectively, whereby oil flows through said separation means in a serpentine path, each of said chambers having an outlet in said housing bottom wall through which carbon particles which become separated from the oil flow owing to gravity may exit the housing; and

(d) filter means located within said housing between said separation means and said housing outlet for filtering the oil following separation of carbon particles to remove further small particulates therefrom.

4,925,554

HYDROTREATING PROCESS FOR HEAVY HYDROCARBON OILS

Goro Sato; Hidehiro Higashi; Katsuhiro Shirono, and Yoshio Eto, all of Kitakyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,656
Int. Cl.[5] C10G *23/02*
U.S. Cl. 208—210 7 Claims

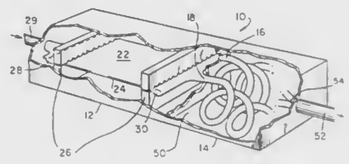
1. A hydrotreating process for heavy hydrocarbon oils comprising the steps of (a) passing a heavy hydrocarbon oil and hydrogen through a first fixed catalyst bed containing 1 to 5 vol% of the total catalyst bed volume under hydrotreating conditions for demetallation, said first fixed catalyst bed being charged with a catalyst comprising supporting on a porous inorganic oxide carrier, one or more metals selected from Group IIB, Group IVB, Group VB, Group VIB and Group VIII within the range of 0.2 to 3 wt.% in terms of oxide, and having a pore volume within the range of 0.4 to 1.5 ml/g and a void fraction of 55 vol% or more; (b) passing the efflux from said first fixed catalyst bed through a second fixed catalyst bed containing 4 to 70 vol% of the total catalyst bed volume under hydrotreating conditions for demetallation, said second fixed catalyst bed being charged with a demetallation catalyst, said demetallation catalyst comprising at least two kinds of metals selected from Group VB, Group VIB and Group VIII supported on a porous inorganic oxide carrier and having a pore volume of 0.57 to 0.95 ml/g and a void fraction of 55 vol% or less, the amount of said metals being 3 to 8 wt.% in terms of oxide, and (c) passing the efflux from the second fixed catalyst bed through a third fixed catalyst bed under hydrotreating conditions for hydrotreating, said third fixed catalyst bed containing 25 to 90 vol% of the total catalyst bed volume and charged with a hydrodesulfurizing catalyst, said catalyst of said first fixed catalyst bed having (1) a larger void fraction, (2) a larger pore volume and (3) a lower wt.% of catalyst metal in terms of oxide than the catalyst of said second fixed catalyst bed.

4,925,555

ULTRAFILTERING HYBRID ARTIFICIAL ORGAN

Theodore E. Spielberg, 10 Pinewood Cir., Wellesley, Mass. 02181

Continuation of Ser. No. 759,970, Jul. 29, 1985, abandoned, which is a continuation of Ser. No. 507,997, Jun. 27, 1983, abandoned, which is a continuation of Ser. No. 321,099, Nov. 13, 1981, abandoned. This application May 5, 1988, Ser. No. 193,156
Int. Cl.[5] B01D *63/06*
U.S. Cl. 210—137 11 Claims



1. An ultrafiltering hybrid artificial organ or gland, comprising

A. means forming an ultrafiltration chamber for receiving blood from a source and forming therefrom a first fraction comprising blood cells and proteins and a second fraction free of said blood cells and proteins,

B. means forming a cellular exchange chamber separate from, and serially connected to, said ultrafiltration chamber for receiving said first and second fractions in the separated state and configured to contain a cellular exchange medium for separately contacting said first and second fractions for treatment thereof by exchanging selected constituents therewith, and

c. means for recombing the treated fractions.

4,925,556

METHOD FOR THE MANUFACTURE OF FLOORS FOR FILTERS, AND FLOORS THUS MADE

Marie-Pierre Gaudin, Saint Germain en Laye; Daniel Meindre, Rueil Malmaison, and Vincent Savall, Velizy Villacoublay, all of France, assignors to Degremont, Rueil Malmaison, France

Filed Jan. 6, 1989, Ser. No. 294,113
Claims priority, application France, Jan. 15, 1988, 88 00433
Int. Cl.[5] B28B *1/16*; B01D *23/18*
U.S. Cl. 210—293 7 Claims



1. A method for forming a floor for filters, particularly for filters including granular filtrating material, said method comprising:

(a) forming a first stage of said floor by casting material into a plurality of pre-slabs having openings, said openings adapted to house nozzles for washing the filter;

(b) positioning said pre-slabs on supports of the filter; and

(c) casting material on said plurality of pre-slabs in a second stage to reach the required total thickness of the floor and to fill in any gaps between said pre-slabs, thereby providing a continuous slab to receive the granular filtrating material.

4,925,557

MULTI-PURPOSE ROTATING MEMBRANE FILTER

Walter F. Ahlberg, Jr., 7518 Buegoyne #343, Houston, Tex. 77063, and Joseph F. Long, 1335 Lost Creek Blvd., Austin, Tex. 78746

Filed Apr. 14, 1989, Ser. No. 338,098
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—321.68 9 Claims



1. A Multi-Purpose Rotating Membrane Filter Unit comprising:

(a) a closed cylindrical body with an upper head and a lower mounting means;

(b) a rotatable hollow shaft in said closed cylindrical body

VOL
1114
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with sealing means in said upper head and said lower mounting means;

(c) a power drive means to rotate said rotatable hollow shaft;

(d) a plurality of membrane-covered hollow disc means mounted on said rotatable hollow shaft with the interior of said membrane-covered hollow disc means communicating with the interior of said rotatable hollow shaft;

(e) a minimum of one vertical vent pipe through a doughnut shaped hub of each of said plurality of membrane-covered hollow disc means;

(f) an exterior feed means to provide multiple feed points through a vertical axis of said closed cylindrical body;

(g) means whereby materials may be withdrawn through said upper head and through a lower portion of said closed cylindrical body;

(h) means whereby material may be withdrawn from the interior of said rotatable hollow shaft;

(i) bearing support means in said closed cylindrical body for said rotatable hollow shaft.

4,925,558

PROCESS FOR THE FURTHER PROCESSING OF THE VACUUM DISTILLATION RESIDUE IN A CRUDE OIL REFINERY

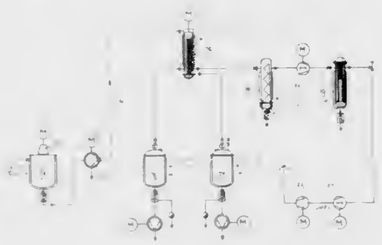
Peter Kappenberger, Zurich, Switzerland, assignor to Buss A.G., Switzerland

Filed Jul. 16, 1987, Ser. No. 74,360

Claims priority, application Switzerland, Jul. 23, 1986, 02954/86

Int. Cl.[5] B01D *3/12*

U.S. Cl. 208—361 **17 Claims**



1. A process for the further processing of a residue left behind during vacuum distillation in a crude oil refinery comprising the step of

subjecting the crude oil vacuum distillation residue to thin-film short-path distillation under vacuum at an evaporator surface in order to obtain a distillate and concentrated residue; said step entailing the passing of the crude oil vacuum distillation residue in the form of thin film along the evaporator surface in contact therewith, wherein the evaporator surface is heated to a temperature appreciably higher than the temperature of the crude oil vacuum distillation residue left behind during vacuum distillation and wherein the distillation residue is subjected to the combined action of vaporization and the thermal decomposition at the heated evaporator surface.

4,925,559

USE OF DERIVATIVES OF TRICYCLO-(5.2.1.02,6)-DEC-3-ENE AS FROTHERS IN THE FLOTATION OF COAL AND ORES

Manfred Biermann, Muelheim/Ruhr; Rita Koester, Neuss, and Horst Elerdanz, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,166

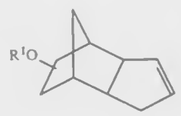
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707034

Int. Cl.[5] B03D *1/02*

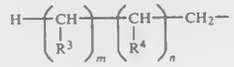
U.S. Cl. 209—166 **11 Claims**



1. In a process for the flotation of coal and ores, the improvement comprising the use therein of a frother effective quantity of at least one derivative of tricyclo-[5.2.1.0^{2,6}]-dec -3-ene corresponding to the following formula:



in which R^1 is selected from the group consisting of hydrogen, a linear or branched C1–C8 alkyl radical, an acyl radical, R^2—CO where R^2 selected from the group consisting of is hydrogen, or a linear C_1–C_{18} alkyl radical, a linear C_1–C_{18} alkenyl radical, a branched C_1–C_{18} alkyl radical, a branched C_1–C_{18} alkenyl radical, and a hydroxyalkyl radical



in which R^3 R^4 independently of one another are hydrogen or a hydroxy group, m and n are integers of 0 to 5 and the sum (M+n) is an integer of 1 to 5, with the proviso that at least one of the substituents R^3 and R^4 is a hydroxy group.

4,925,560

CLOG RESISTANT HIGH EFFICIENCY FILTER MEDIA

Charles H. Sorrick, 397 Winry, Rochester, Mich. 48063

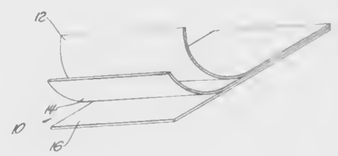
Filed Feb. 2, 1989, Ser. No. 305,187

Int. Cl.[5] B01D *25/04, 29/08*

U.S. Cl. 210—387 **20 Claims**

1. A filter media (10) of the type supported across a fluid flow passage for collecting particulate out of the flow passage after becoming congested with particulate, said filter media (10) comprising: means designed for effectively removing aluminum particles from machine coolant including a sheet-like fluid permeable top layer (12) for collecting particulate larger than a predetermined size out of the fluid; a sheet-like fluid permeable middle layer (14) disposed adjacent said top layer (12) for collecting particulate smaller than the particulate collected by said top layer (12); a sheet-like fluid permeable bottom layer (16) disposed adjacent said middle layer (14) and opposite said top layer (12) and having a greater resistance to tear than said top (12) and middle (14) layers; and characterized by said middle layer (14) including a support web (18) formed by entangled cellulose fibers (20) having a first predetermined range of thicknesses, and a mesh (22) supported by and interspersed throughout said cellulose web (20) and being formed by entangled glass microfibers (24) having a second predetermined range of thicknesses smaller than said cellulose fiber (20) first range of thicknesses, said middle layer (14) forming a plurality of relatively minute pore passages between adjacent glass microfibers (24) and cellulose fibers (20).

12. A method for making a filter media (10) comprising providing means designed for effectively removing aluminum particles from machine coolant by forming a sheet-like fluid permeable middle layer (14); forming a sheet-like bottom layer (16); fastening the top layer (12) and the middle layer (14) and the bottom layer (16) together in a sheet; and characterized by the step of forming the middle layer (14) including mixing a slurry of interspersed glass microfibers (24) and cellulose fibers (20) and an evaporatable liquid, depositing the slurry in a layer onto a generally planar surface, and then removing the liquid from the glass microfiber (24) and cellulose fiber (20) mixture to form a middle layer (14) having a plurality of relatively minute pore passages between adjacent glass microfibers (24) and cellulose fibers (20).



18. A filtration apparatus of the type for collecting aluminum particulate out of a liquid flow, said apparatus comprising: a filter chamber (26) having a top half (32) and a bottom half (34); a fluid inlet (36) associated with said top half (32); a fluid outlet (38) associated with said bottom half (34); means designed for effectively removing aluminum particles from machine coolant including a sheet-like filter media (10) supported across said filter chamber (26) between said top half (32) and said bottom half (34) in fluid sealing engagement; said filter media (10) including a top layer (12), a middle layer (14), and a bottom layer (16); said apparatus characterized by said middle layer (14) including a support web (18) formed by entangled cellulose fibers (20) having a first predetermined range of thicknesses, and a mesh (22) supported by and interspersed throughout said cellulose web (20) and being formed by entangled glass microfibers (24) having a second predetermined range of thicknesses, the mean value of said second predetermined range of thicknesses being not greater than one-fifth the mean value of said first predetermined range of thicknesses.

4,925,561

COMPOSITE PLANAR AND TRIANGULARLY PLEATED FILTER ELEMENT

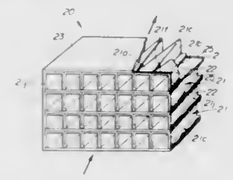
Yoshio Ishii, Kawagoe, and Shigeru Okaya, Fukaya, both of Japan, assignors to Tsuchiya Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 330,464

Claims priority, application Japan, Mar. 31, 1988, 63-41864[U]; Apr. 28, 1988, 63-56541[U]; Apr. 28, 1988, 63-56543[U]

Int. Cl.[5] B01D *46/02*

U.S. Cl. 210—493.3 **19 Claims**



1. A filter element comprising:

a roughly flat filtering medium formed of filtering material; and

a pleated filtering medium placed upon said roughly flat filtering medium;

said pleated filtering medium being formed of a filtering material folded to include alternate top and bottom sections of roughly triangular shape, the top sections tapering in one direction and the bottom sections tapering in the opposite direction, and side wall sections lying between the top and bottom sections and having their edges joined in the front and back at the apexes of the triangular top and bottom sections;

said bottom sections having edges defining an end of said pleated filtering medium and joined and sealed to said roughly flat filtering medium only at and near said edges of said bottom sections.

4,925,562

PERVAPORATION PROCESS AND MEMBRANE

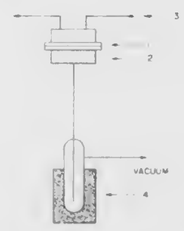
Hendrikus J. D. te Hennepe, Enschede; Marcellinus H. V. Mulder, Enschede; Cornelis A. Smolders; Derk Bargeman, both of Hengelo, and George A. T. Schröder, Voorschoten, all of Netherlands, assignors to GFT Gesellschaft fur Trenntechnik mbH, Homburg/Saar, Fed. Rep. of Germany

Filed Jul. 23, 1987, Ser. No. 76,733

Claims priority, application European Pat. Off., Jul. 29, 1986, 86110455.2

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—500.25 **12 Claims**



1. A pervaporation membrane for the separation of small molecules from a fluid or a gas, comprising material (a) embedded in a polymer matrix (b) that is comprised of silicone rubber, wherein said material (a) has molecular-sieve properties

VOL 1114 ISS 3 MY 15 1990 UMI

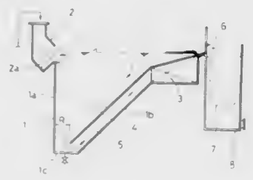
and comprises zeolite characterized by an Si:Al atomic ratio of at least 12 or an SiO_2:Al_2O_3 ratio of at least 35.

4,925,563

LIQUID WASTE PROCESSING APPARATUS

Hidetoshi Omori, Okazaki; Akira Shoji, Nagoya, and Hiroshi Akaza, Toyota, all of Japan, assignors to Trinity Industrial Corporation, Tokyo, Japan

Filed Dec. 12, 1988, Ser. No. 283,133
Claims priority, application Japan, Jun. 30, 1988, 63-85833
Int. Cl.[5] B01D *21/00*
U.S. Cl. 210—532.1 **1 Claim**



1. A liquid waste processing apparatus having a liquid waste processing vessel for separating and recovering floating sludges from liquid wastes, wherein the liquid waste processing vessel comprises:

an inlet disposed on one side wall of said processing vessel for receiving liquid wastes falling from above said processing vessel at a portion just beneath the liquid surface and turning them toward the other opposite side wall of the processing vessel;

an exit disposed on the side of the other opposite side wall of said processing vessel and opening at a location below said liquid surface,

the other opposite side wall being slanted downwardly toward said one side wall,

an inclined plate disposed above said exit on the side of said opposite side wall, to define a shallow portion below said liquid surface,

said inclined being extended along the inclination of said other opposite side wall toward said one side wall to define a narrow flow channel between said inclined plate and said other opposite side wall, which is in communication from the bottom to the exit of said liquid waste processing vessel, and

the cross-sectional area of said narrow flow channel being smaller than that of the opening formed between the lowermost end of said inclined plate and said one side wall.

4,925,564

BACTERIAL INCUBATOR AND METHOD OF USE

John Francis, Cherry Hill, N.J., assignor to Robert B. Grubbs, Orange, Calif.

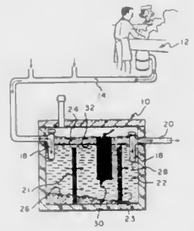
Continuation of Ser. No. 705,138, Feb. 25, 1985, Pat. No. 4,670,149. This application May 27, 1987, Ser. No. 54,735
The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.
Int. Cl.[5] C02F *3/10*
U.S. Cl. 210—608 **10 Claims**

1. A method of primary biological reduction of organic matter supported in an aqueous medium flowing through a flow system:

(a) choosing a passive median location in the flow system having minimal flow as a result of being a high volume collection area in the flow system, and having wall surface area in contact with the aqueous medium,

(b) constructing a bacterial incubator means providing a multiple increase in effective solid surface area in contact with the aqueous medium over the wall surface area, the size of the incubator being insufficient to affect the passive nature of the location,

(c) positioning the bacterial incubator means in the aqueous medium to float at the interface of the organic matter and aqueous medium, and



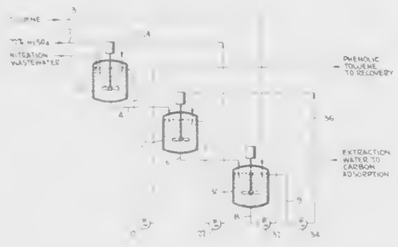
(d) adding to the aqueous medium a charge of bacteria cultures having a high capacity for specific organic reduction.

4,925,565

PROCESS FOR EXTRACTING AND DISPOSING OF NITROPHENOLIC BY-PRODUCTS

Earl G. Adams, Grand Bay, Ala., and Robert B. Barker, Gautier, Miss., assignors to First Chemical Corporation, Pascagoula, Miss.

Filed Sep. 12, 1988, Ser. No. 242,882
Int. Cl.[5] C02F *1/26*
U.S. Cl. 210—634 **16 Claims**



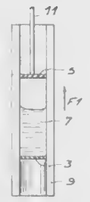
1. A process of disposing of nitrophenolic by-products contained in nitration waste water comprising (1) extracting said nitrophenolic by-products from nitration waste water by mixing said nitration waste water with a solvent and an acid to provide a mixture having an acidic pH; heating said mixture to an elevated temperature; subjecting said mixture to extraction at said elevated temperature and acidic pH to provide a solvent solution containing said nitrophenolic by-products, (2) subjecting said solvent solution containing said nitrophenolic by-products to distillation to recover said solvent from said solvent solution and produce a residue containing said nitrophenolic by-products and (3) incinerating said residue.

4,925,566

ULTRAFILTRATION, HYPERFILTRATION OR DEMINERALIZATION ELEMENT, ITS PRODUCTION PROCESS AND ITS USE FOR THE TREATMENT OF LIQUID RADIOACTIVE EFFLUENTS

Colette Bardot, Villeurbanne; Pierre Bergez, Paris; Charles Eyraud, and Lahcen Ilahiane, both of Lyons, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jun. 18, 1987, Ser. No. 64,316
Claims priority, application France, Jun. 20, 1986, 86 08947
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—651 **17 Claims**



1. An ultrafiltration element comprising a porous inorganic material support and a cellular, microporous organic polymer membrane produced on one of the faces of the porous support and fitted into the pores of the porous support flush with said surface and without projecting beyond the porous support surface, said microporous membrane having a thickness less than that of the porous support and the pores of said membrane having radii in the range of 1.5 to 100 nm.

4,925,567

BASELINE STABIILTY IN GRADIENT ION CHROMATOGRAPHY BY USING A NONIONIC MODIFIER

David L. McAleese, Cary, N.C., assignor to BASF Corporation, Parsippany, N.J.

Filed Mar. 2, 1989, Ser. No. 317,766
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—656 **25 Claims**



1. A method of ion chromatography with improved background stability for analyzing a sample solution containing a plurality of anions and using a gradient eluent, the method comprising:

A. flowing an electrolytic eluent through an anion exchange chromatographic column;

B. injecting, into the flowing electrolytic eluent, an anion solution to be analyzed, the injection taking place upstream of the chromatographic column, the anions being separated in the chromatographic column;

C. increasing the ionic strength of the electrolytic eluent as a function of time during the chromatographic separation;

D. adding an effective amount of a nonionic modifier to the electrolytic eluent at a point upstream of the detector, the nonionic modifier being a substantially water-soluble compound which is non-reactive with the electrolytic eluent and causes electrolyte anions to combine with hydrogen ions in solution, whereby the electrolyte anions are shifted more towards their nonionic form and which, upon suppression shifts the ionic/nonnionic balance of the electrolytic eluent towards the nonionic form, the shift in balance being controlled so that a substantially balanced baseline results;

E. suppressing, in a suppressor column, at least a portion of the ionic strength of an effluent from the chromatographic column;

F. passing at least a portion of the effluent emitted from the suppressor column through an electronic property detector, whereby the separated anions are detected.

4,925,568

POLYACRYLATE BLENDS AS BOILER SCALE INHIBITORS

Lewis D. Morse, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 122,988, Nov. 19, 1987, abandoned, which is a continuation of Ser. No. 897,189, Aug. 15, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 313,405
Int. Cl.[5] C02F *5/10*
U.S. Cl. 210—701 **1 Claim**

1. A method of inhibiting the precipitation of scale forming salts, including calcium carbonate and calcium sulfate in an aqueous boiler system comprising adding to said boiler system an effective amount of a composition comprising: (a) a homopolymer of acrylic acid having a molecular weight of about 1,500 to about 3,000, as determined by gel permeation chromatography; and (b) a homopolymer of acrylic acid having a molecular weight of about 7,000 to about 15,000, as determined by gel permeation chromatography; wherein the ratio of (a):(b) is about 1:1 by weight, and wherein the weight average molecular weight of said composition ranges from about 4,000 to about 7,000.

4,925,569

PROCESS FOR SORPTION AND CATALYTIC OXIDATION OF SULFIDES IN WATER

Charles C. Chou, and Donald C. Olson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1988, Ser. No. 291,717
Int. Cl.[5] C02F *1/74*
U.S. Cl. 210—713 **11 Claims**

1. A process for oxidation of an aqueous solution containing sulfide ions which process comprises:

(a) providing said sulfide ion-containing water having a pH value above 8.5 as feed to a reaction zone, and contacting said feed with molecular oxygen in the presence of a flocculent catalyst prepared by aerating a divalent manganese salt in aqueous solution having a pH value in the range from about 8.5 to 12, to obtain a heterogeneous reaction mixture having reduced level of sulfide ion,

(b) phase separating said reaction mixture from step (a) to obtain (1) a reaction product liquid having reduced sulfide content, and (2) a slurry containing said flocculent catalyst,

(c) withdrawing at least a portion of said reaction product liquid, and

(d) contacting said slurry from step (b) with fresh feed in said reaction zone.

VOL 1114 ISS 3 MY 15 1990 UMI

4,925,570

METHOD OF FILTERING

Helmut Schafft, Kellerstrasse 23, D-7074 Mogglingen, Fed. Rep. of Germany

Division of Ser. No. 915,227, Oct. 3, 1986, abandoned, which is a division of Ser. No. 696,454, Jan. 31, 1985, Pat. No. 4,647,415.
This application Apr. 4, 1989, Ser. No. 333,319
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403738
Int. Cl.[5] B01D *37/00*
U.S. Cl. 210—741 12 Claims



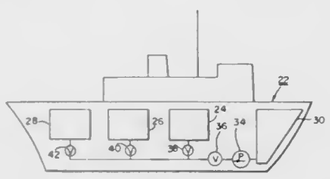
1. A process for filtering a liquid media, comprising the steps of:
(a) preparing a liquid suspension of one or a mixture of granular, fiberous, or fiber-containing filter aids;
(b) casting said suspension in a mold by depositing said suspension at a predetermined rate of flow on the order of at least 5 hl/m^2h while avoiding turbulence;
(c) adding a binder to the suspension and stabilizing said suspension by activation of said binder and thereby producing a bonded filter pad;
(d) placing the bonded filter pad from step (c) between rigid filter brackets;
(e) converting said bonded filter pad to a filter packing by removing said binder from said filter pad while maintaining a predetermined contact pressure on said filter bracket; and
(f) passing a liquid media to be filtered through said filter packing to effect the desired filtration while maintaining said contact pressure on said filter brackets at a predetermined pressure.

4,925,571

METHOD FOR THE SIMULTANEOUS TRANSPORT AND PASTEURIZATION OF SEWAGE SLUDGE

A. Kirk Jacob, Lansdowne, Pa.; M. Joseph Willis, Oxford, Md., and A. Pierce Hardman, Trenton, N.J., assignors to Organic Technology, Inc., Lansdowne, Pa.

Filed May 12, 1989, Ser. No. 351,155
Int. Cl.[5] C02F *11/18*
U.S. Cl. 210—742 20 Claims



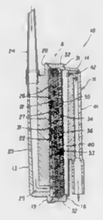
1. A process for treating sewage sludge having a predetermined water content to produce a soil conditioner, comprising
(a) transporting the sludge aboard a vehicle; and
(b) heating the sludge during the transporting step (a) to a temperature and for a time sufficient to pasteurize the sludge without substantially reducing the water content of the sludge.

4,925,572

DEVICE AND METHOD FOR DEPLETION OF THE LEUKOCYTE CONTENT OF BLOOD AND BLOOD COMPONENTS

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 110,413, Oct. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 218,169, Jul. 13, 1988, abandoned. This application Oct. 19, 1988, Ser. No. 259,773
Int. Cl.[5] B01D *27/02, 39/02*
U.S. Cl. 210—767 70 Claims



37. A device for the depletion of the leukocyte content of a blood product comprising at least one integral element preformed of synthetic fibers, the surfaces of said fibers having been grafted to give the element a CWST of from greater than 53 to less than 90 dynes/cm.

4,925,573

PROCESS FOR SEPARATING HYDROPROCESSED EFFLUENT STREAMS

Sotiris Vorlow, The Hague, Netherlands, assignor to Shell Internationale Research Maatschappij, B.V., The Hague, Netherlands

Filed Mar. 30, 1989, Ser. No. 330,813
Claims priority, application United Kingdom, Mar. 31, 1988, 8807807
Int. Cl.[5] C10G *35/04*
U.S. Cl. 208—100 20 Claims

1. A process for separating a mixed-phase hydrocarbonaceous effluent originating from the conversion of a hydrocarbonaceous feedstock in the presence of hydrogen at elevated temperature and pressure in a multiple separator system, which effluent contains hydrogen, normally liquid hydrocarbonaceous components and normally gaseous hydrocarbonaceous components, said process comprising the steps of:
(a) separating said effluent in a first separation zone into a first liquid phase (L1) and a first vapor phase (V1), said first separation zone being operated at a temperature in the range of 200° to 350° C. and in such a manner that between 25 and 75% by weight of said effluent is recovered as said first vapor phase (V1);
(b) cooling said first vapor phase (V1) to a temperature in the range of 25° to 85° C. and separating said cooled first vapor phase in a second separation zone into a second liquid phase (L2) and a second, hydrogen-rich vapor phase (V2), said second separation zone being operated at substantially the same pressure as said first separation zone;
(c) separating said first liquid phase (L1) in a third separation zone into a third liquid phase (L3) and a third vapor phase (V3), said third separation zone being operated at a pressure below 60 bar while substantially maintaining the temperature of said first separation zone; and
(d) separating said second liquid phase (L2) in a fourth separation zone into a fourth liquid phase (L4) and a fourth vapor phase (V4), said fourth liquid phase being at least partly recovered as a product, and wherein said fourth separation zone is operated at a pressure below 60 bar while substantially maintaining said zone at the temperature of said second separation zone.

4,925,574

PURIFICATION OF HEMOGLOBIN AND MODIFIED HEMOGLOBIN BY AFFINITY CHROMATOGRAPHY

Jen-chang Hsia, Concord, Canada, assignor to Canadian Patents & Development Limited, Canada

Filed Mar. 14, 1986, Ser. No. 839,539
Claims priority, application Canada, Jun. 26, 1985, 485392
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—635 26 Claims



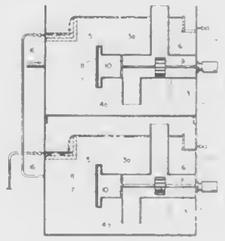
20. A method for the separation of unmodified hemoglobin from a liquid reaction mixture containing modified and unmodified hemoglobin, comprising:
(a) providing a chromatographic column;
(b) packing the column with a chromatographic affinity gel;
(c) immobilizing a ligand group capable of specific binding to the DPG site of hemoglobin, on the chromatographic gel to form a polyanion/affinity chromatographic gel complex;
(d) passing the reaction mixture through the column, whereby unmodified hemoglobin is retained in the gel complex and modified hemoglobin is eluted from the column; and
(e) introducing into the gel complex an anion which competes with the polyanion ligand originally in the gel complex, whereby purified unmodified hemoglobin is eluted from the column.

4,925,575

SYSTEM FOR SEPARATING PHASES OF A LIQUID STREAM

Gerard A. Just, 333 Holly Creek Ct., #1507, The Woodlands, Tex. 77381

Filed Jan. 9, 1989, Ser. No. 294,353
Int. Cl.[5] B01D *17/035*
U.S. Cl. 210—706 4 Claims



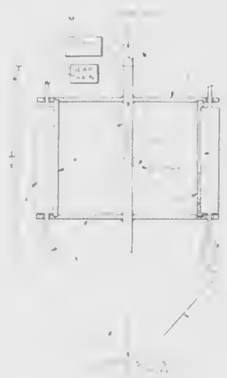
4. A method of treating a liquid comprising first and second fluid phases in order to effect separation of at least one of said phases from said liquid, comprising the steps of:
(1) providing a plurality of tanks, each tank having an inlet and an outlet and means connecting said tanks in series relationship, said tanks being horizontally or vertically stacked in relation to each other, each of said tanks being filled with a liquid to be treated and containing a vessel immersed in said liquid;
(2) introducing from one of said tanks at a controlled rate, a portion of said liquid into said vessel;
(3) introducing, at a controlled rate, a gaseous body in said vessel in a location upstream of said liquid portion introduction into said vessel, said upstream location being relative to the flow of said liquid portion;
(4) advancing said gaseous body and said liquid portion horizontally through the vessel at a controlled rate by the suction force producted by the rotating of an impeller;
(5) expelling said gaseous body and liquid portion from said vessel by said impeller into said tank at a level below the surface of the liquid in said tank to create a stream of rising gaseous bubbles;
(6) skimming the surface of said liquid to remove the liquid phase brought to the surface by said gaseous bubbles;
(7) introducing said skimmed liquid phase into the next sequential tank; and
(8) repeating steps 2–7 through each of the other of said plurality of tanks.

4,925,576

CONTINUOUS DISCHARGE CENTRIFUGE

Itzhak Gotlieb, 5 Balsam Ct., Roseland, N.J. 07068, and Aharon Zidon, 27 Hamaalot Street, Givataim, Israel

Filed Apr. 13, 1989, Ser. No. 337,417
Int. Cl.[5] B01D *33/06*
U.S. Cl. 210—781 13 Claims



1. A centrifugal method employing a cylindrically disposed, contiguous plurality of alternating filters and columns for continuously separating a slurry into a solid and liquid portion, comprising the steps of:
revolving said filters and said columns at a predetermined rate;
injecting said slurry radially outward onto said filters;
engaging the outside of said filters with said columns to conduct said solid portion upon said filter between it and said passage columns.

3. A continuous discharge centrifuge for separating a slurry into a solid and liquid portion, comprising:
a housing;
a rotor mounted in said housing to spin at a predetermined rate;

a spaced plurality of filter means peripherally mounted on said rotor for separating said liquid portion by admitting it under centrifugal force; and

a spaced plurality of passage means rotatably mounted on said rotor between adjacent pairs of said filter means for engaging the outside of said filter means and conducting said solid portion upon said filter means between it and said passage means.

4,925,577

SOIL RELEASE POLYMER COMPOSITIONS HAVING IMPROVED PROCESSABILITY

Thomas A. Borcher, Sr.; Rodolfo Delgado, and Toan Trinh, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 194,684, May 16, 1988, Pat. No. 4,863,619. This application May 17, 1989, Ser. No. 353,261

Int. Cl.[5] B05D *1/28, 3/12;* **D06M** *15/507, 21/02*

U.S. Cl. 252—8.9 **8 Claims**

1. A composition of matter comprising a mixture of:

(A) a soil release polymer having a viscosity at about 85? C. of greater than about 10,000 cps; and

(B) an effective amount, but an amount that gives a ratio of (A) to (B) of more than about 1:1, of a viscosity reducing agent selected from the group consisting of:

(a) polyhdroxy compounds containing from 2 to about 4 hydroxyl groups and from 2 to about 6 carbon atoms;

(b) alkyl ethers of propylene glycol containing from one to two alkyl groups wherein each alkyl groups contains from about 4 to about 6 carbon atoms;

(c) dialkyl ethers of ethylene glycol wherein each alkyl group contains from about 4 to about 6 carbons atoms; and

(d) mixtures thereof;

said muxture of (A) and (B) forming a phase stable mixture at about 85° C. with a viscosity of less than about 10,000 cps.

4,925,578

POLYMER-THICKENED AQUEOUS SOLUTIONS CONTAINING A MERCAPTOBENZOTHIAZOLE

Jeffrey G. Southwick, Lexington, Mass., and Richard C. Nelson, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 75,381, Jul. 20, 1987, Pat. No. 4,795,575, which is a continuation-in-part of Ser. No. 861,372, May 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 673,080, Nov. 19, 1984, abandoned. This application Jul. 29, 1988, Ser. No. 225,994

Int. Cl.[5] E21B *43/22*

U.S. Cl. 252—8.554 **9 Claims**

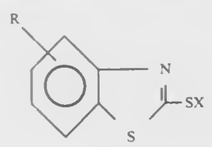
2. An aqueous alkaline polymer solution, suitable for use in an alkaline enhance oil recovery process, comprising:

an aqueous alkaline solution having a pH above about 10;

a partially hydrolyzed polyacrylamide copolymer which has a molecular weight exceeding about 5 million, and which, at least soon after entering the reservoir, contains more than about 50 mole percent carboxyl or acrylate groups;

a water-soluble, sulfur-containing oxygen scavenger;

an antioxidant stabilizer of the formula:



wherein R represents one or more hydrogen atoms or lower hydrocarbon radicals and X represents a hydrogen atom or other monovalent cation, and wherein said antioxidant stabilizer is present at a concentration of at least about 50 parts per million; and a readily-oxidizable alcohol or glycol.

4,925,579

LUBRICATING OIL CONTAINING HYDROPEROXIDIZED ETHYLENE COPOLYMERS AND TERPOLYMERS AS DISPERSANTS AND V.I. IMPROVERS

Jeffrey E. Stemke, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 505,661, Jun. 20, 1983. This application Oct. 21, 1982, Ser. No. 921,569

The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.

Int. Cl.[5] C10M *137/04*

U.S. Cl. 252—32.7 E **21 Claims**

1. A lubricating oil composition comprising:

(a) a major amount of an oil of lubricating viscosity; and

(b) an amount of each of the following:

1. about 1 to 20% bu weight of an alkenyl succinimide or succinate or mixtures thereof;

2. about 0.3 to 10% by weight of an overbased or neutral alkali or alkaline earth metal hydrocarbyl sulfonate or about 0.2 to 27% by weight of an overbased or neutral alkali or alkaline earth metal phenate or mixtures thereof;

3. about 0.05 to 2% by weight of a dispersancy and viscosity index improving hydroperoxidized copolymer of ethylene with one or more alpha-olefins or terpolymer of ethylene, one or more alpha-olefins and one or more non-conjugated diolefins wherein said copolymer and terpolymer has an excess of carboxylic acid to hydroxy groups and is prepared by dissolving in a solvent a copolymer of ethylene and a C_3-C_{18}-alpha-olefin or a terpolymer of ethylene, a C_3-C_{18} alpha-olefin and C_5-C_{12} non-conjugated diolefin, having a molecular weight in the range of 20,000 to 1,000,000, reacting the copolymer or terpolymer with oxygen in the presence of a free radical initiator, the reaction being carried out at a temperature of from 60° to 250° C. and under a pressure of 0 to 1000 psig.

4,925,580

THIADIAZOLE DERIVATIVES AS LUBRICANT ADDITIVES

Hugo Camenzind, Fribourg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

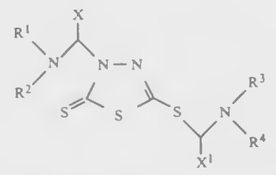
Filed Dec. 15, 1988, Ser. No. 284,569

Claims priority, application Switzerland, Dec. 23, 1987, 5033/87

Int. Cl.[5] C10M *133/38, 135/36*

U.S. Cl. 252—47 **20 Claims**

1. A lubricant composition or hydraulic oil composition containing at least one lubricant or one hydraulic oil and at least one 2,5-dimercapto-1,3,4-thiadiazole of the general formula I



(I)

wherein R^1, R^2, R^3 and R^4, which are identical or different, are alkyl having 1 to 24 C atoms, alkenyl having 3 to 12 C atoms or phenyl-(C_1-C_4)-alkyl which is unsubstituted or substituted in the phenyl radical by C_1-C_4-alkyl and X and X^1, which are identical or different, are H, alkyl having 1 to 23 C atoms,

phenyl, phenyl-(C_1-C_4)-alkyl or phenyl substituted by C_1-C_{12}-alkyl, C_1-C_{12}-alkoxy, hydroxyl, di(C_1-C_4-alkyl)amino, halogen and/or nitro.

4,925,581

MEADOWFOAM OIL AND MEADOWFOAM OIL DERIVATIVES AS LUBRICANT ADDITIVES

Frank L. Erickson, Seattle, Wash.; Robert E. Anderson, Pasadena, Calif., and Phillip S. Landis, Alexandria, Va., assignors to International Lubricants, Inc., Seattle, Wash.

Filed Jul. 19, 1988, Ser. No. 221,061

Int. Cl.[5] C10M *141/08, 141/10*

U.S. Cl. 252—48.2 **15 Claims**

MEADOWFOAM OIL (Unrefined)

CHEMICAL PROPERTIES	From Complete Seed	From Dehulled Seed
Fatty Acid Composition of the triglycerides		
20:1 Δ5	62.6%	62.8%
22:1 Δ5	2.6	2.4
22:1 Δ13	9.7	10.0
22:2 Δ5, 13	22.1	21.9
All Others	3.0	2.9
Iodine Value	87	87
Saponification Number	168	178
Peroxide Value	3.77	0.66
PHYSICAL PROPERTIES		
Melting Point	5 to 7°C	
Viscosity (Centipoises)	43	41
Density @23°C	0.913g/cm	0.909g/cm
Refractive Index @23/D	1.4738	1.4730
Color (amber)	0.4/5	0.2/1
absorbance @450nm, 20 mg/ml		
Flash Point	257-270°C	
TRACE CONSTITUENTS		
Free Fatty Acids	0.78%	0.68%
Phosphorus	246ppm	232ppm
Sulfur	840ppm	200ppm
Iron	< 6.5ppm	<0.5ppm
Copper	<0.5ppm	<0.5ppm

1. A lubricating composition consisting essentially of a lubricant base and a lubricant additive wherein the lubricant additive comprises a mixture of at least two ingredients from different classes of ingredients selected from the group consisting of three classes of ingredients:

wherein the first class of ingredients is selected from the group consisting of a triglyceride meadowfoam oil, a wax ester of meadowfoam oil, and a combination thereof;

wherein the second class of ingredients is selected from the group consisting of a sulfurized meadowfoam oil wax ester, a sulfurized triglyceride meadowfoam oil comprising from about 25% to about 75% triglyceride meadowfoam oil and from about 25% to about 75% of a wax ester, wherein said wax ester is derived from a C_{18-22} unsaturated acid and a C_{18-22} unsaturated alcohol or said wax ester is jojoba oil, and a combination thereof; and

wherein the third class of ingredients is selected from the group consisting of a phosphite adduct of triglyceride meadowfoam oil, a phosphite adduct of meadowfoam oil wax ester, and a combination thereof.

4,925,582

METHODS AND COMPOSITIONS FOR POTENTIATING THE ACTIVITY OF ANTIMICROBAL AGENTS IN INDUSTRIAL WATER BASED FLUIDS

Edward O. Bennett, Houston, Tex., assignor to OXID, Incorporated, Houston, Tex.

Filed Jun. 6, 1988, Ser. No. 202,891

Int. Cl.[5] C10M *173/02*

U.S. Cl. 252—49.3 **9 Claims**

1. An antimicrobial composition comprising an antimicrobial potentiating mixture of an antimicrobial agent and one or both of n-hexyl ethanolamine or n-amyl ethanolamine.

4,925,583

PERFLUOROPOLYETHER SOLID FILLERS FOR LUBRICANTS

Timothy J. Juhlke; Thomas R. Bierschenk, both of Roundrock, and Richard J. Lagow, Austin, all of Tex., assignors to Exfluor Research Corporation, Austin, Tex.

Continuation of Ser. No. 893,640, Aug. 6, 1986, Pat. No. 4,803,005. This application Feb. 6, 1989, Ser. No. 306,925

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.[5] C10M *105/52*

U.S. Cl. 252—58 **3 Claims**

1. A lubricant comprising a perfluoropolyether oil base and about 10 to about 70 weight percent of a perfluoropolyether solid as filler.

4,925,584

METHOD OF MANUFACTURING A MICROPOROUS THERMALLY INSULATING ROOF

Joseph A. McWilliams, Droitwich; Derek E. Morgan, Malvern, and James D. J. Jackson, Kidderminster, all of United Kingdom, assignors to Micropore International Limited, Worcestershire, United Kingdom

Continuation of Ser. No. 144,651, Jan. 11, 1988, abandoned, which is a continuation of Ser. No. 925,094, Sep. 19, 1986, abandoned. This application Jul. 31, 1989, Ser. No. 387,386

Claims priority, application United Kingdom, Mar. 13, 1985, 8506505

Int. Cl.[5] E04B *1/74*

U.S. Cl. 252—62 **19 Claims**

1. A method of manufacturing a compressed microporous thermally insulating body, which method comprises the steps of:

forming a solid particulate dry mixture consisting essentially of a finely divided substantially dry microporous insulating material with a substantially dry ammonia-generating compound in particulate form such that the ammonia-generating compound is dispersed evenly throughout the solid particulate mixture; and

compressing said solid, particulate substantially dry mixture to form a thermally insulating body.

4,925,585

DETERGENT GRANULES FROM COLD DOUGH USING FINE DISPERSION GRANULATION

Daniel L. Strauss, Mason; Thomas H. Taylor, Milford; Charles L. Stearns, Cincinnati, and Thomas E. Lobaugh, Fremont, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 29, 1988, Ser. No. 213,575

Int. Cl.[5] C11D *11/00*

U.S. Cl. 252—89.1 **10 Claims**

1. A process for making a free flowing granular detergent comprising:

A. mixing an effective amount of an aqueous surfactant paste having a detergency activity of at least 40% and an effective amount of a dry detergency builder, said surfactant paste active and builder having a ratio of 0.05:1 to 1.5:1;

B. rapidly forming a uniform dough from said mix at a dough temperature of from about 15° C. to about 35° C;

C. cooling said dough to a granulation temperature of from about −25° C. to about 20° C.;

D. granulating said cooled dough into discrete detergent granules using fine dispersion mixing at a tip speed of about 5–50 m/sec; and

wherein said surfactant is selected from the group consisting of anionic, zwitterionic, ampholytic and cationic surfactants and mixtures thereof; and wherein said mixing and granulating are conducted with a mixer residence time of from about 0.1 to about 10 minutes.

4,925,586

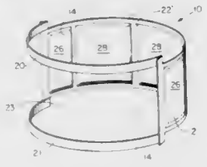
POUCHED GRANULAR DETERGENT COMPOSITIONS CONTAINING HYGROSCOPIC BUILDERS

Keith H. Baker; Stephen W. Snyder, and Allen D. Clauss, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 148,727, Jan. 26, 1988, abandoned. This application May 15, 1989, Ser. No. 355,044

Int. Cl.[5] **C11D** *17/00, 7/08*

U.S. Cl. 252—90 **10 Claims**



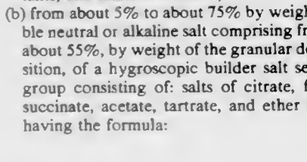
1. A through-the-wash disposable detergent dispenser comprising:

I. a porous, water-permeable, water-insoluble pouch said pouch comprising a spun-bonded polyester non woven;

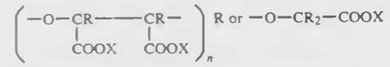
II. a unit dose amount of hygroscopic granular detergent composition contained in said pouch; said pouch having seals which are designed not to rupture during the wash; said composition comprising:

(a) from about 5% to about 45% by weight of an organic surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic and cationic surfactants, and mixtures thereof;

(b) from about 5% to about 75% by weight of water-soluble neutral or alkaline salt comprising from about 1% to about 55%, by weight of the granular detergent composition, of a hygroscopic builder salt selected from the group consisting of: salts of citrate, formate, malate, succinate, acetate, tartrate, and ether polycarboxylate having the formula:



wherein R is selected from the group consisting of H, and OH with no more than one OH group being attached to any one carbon atom; R^1 is either a group having the formula



R or $-O-CR_2-COOX$

wherein each X is selected from the group consisting of H and cations which make the ether polycarboxylate builder water soluble and n is from 0 to 4; and said composition contains less than about 10% by weight of phosphate materials, said composition being formed by drying a concentrated aqueous slurry comprising the above components; and

(c) from 0% to about 30% by weight of a finely divided aluminosilicate ion exchange material selected from the group consisting of:

(1) crystalline aluminosilicate material of the formula:

$$Na_z[(AlO_2)_z(SiO_2)_y]\cdot xH_2O$$

wherein z and y are at least 6, the molar ratio of z to y is from 1.0 to 0.5 and x is from 10 to 264, said material having a particle size diameter of from about 0.1 micron to about 10 microns, a calcium ion exchange capacity of at least about 200 mg $CaCO_3$ eq./g and a calcium ion exchange rate of at least about 2 grains Ca^{++}/gallon/minute/gram/gallon;

(2) amorphous hydrated aluminosilicate material of the empirical formula:

$$M_z(zAlO_2.ySiO_2)$$

wherein M is sodium, potassium, ammonium, or substituted ammonium, z is from about 0.5 to about 2 and y is 1, said material having a magnesium ion exchange capacity of at least about 50 milligram equivalents of $CaCO_3$ hardness per gram of anhydrous aluminosilicate and a Mg^{++} exchange rate of at least about 1 grain/gallon/minute/gram/gallon; and

(3) mixtures thereof; and

wherein said hygroscopic detergent is initially free flowing granules when first pouched, but said granules become lumpy/sticky upon storage at 27° C. and 60–80% relative humidity.

4,925,587

HYDROXY ETHERS, A PROCESS FOR THEIR PRODUCTION, AND METHODS FOR THEIR USE

Gilbert Schenker, Erkrath; Robert Piorr, Ratingen-Hoesel, and Sabine Luettge, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

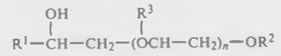
Filed Jul. 14, 1988, Ser. No. 219,423

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723323

Int. Cl.[5] **C11D** *1/72*

U.S. Cl. 252—174.22 **19 Claims**

1. A composition of the formula



(1)

wherein

R^1 is a linear C_6-C_{16} alkyl radical,

R^2 is a linear or branched, C_1-C_{22} alkyl or alkenyl radical

R^3 is hydrogen or a methyl group wherein at least one R^3 is hydrogen and at least one R^3 is methyl, and

n is a number of from 2 to 30.

4,925,588

ANTISOILING AND ANTI-REDEPOSITION LATICES FOR THE AQUEOUS WASHING OF TEXTILE ARTICLES

Gerard Berrod, Villeurbanne; Dominique Charmot, Paris; Robert Gresser, Le Pont de Claix, and Gilles Guerin, Sainte Foy les Lyon, all of France, assignors to Rhone-Poulenc Chimie, France

Filed Dec. 23, 1987, Ser. No. 137,232

Claims priority, application France, Dec. 24, 1986, 86 18471; May 20, 1987, 87 07279

Int. Cl.[5] **C11D** *3/37*

U.S. Cl. 252—174.23 **11 Claims**

1. A method of improving the antisoiling or anti-redeposition properties of a detergent composition comprising the step of adding to said detergent an amount of a latex which comprises a vinyl copolymer of at least one (meth)acrylic ester and at least one unsaturated carboxylic acid grafted with at least 1% polyester sulfonate effective for improving the antisoiling and anti-redeposition properties of said detergent.

4,925,589

AMIDE SIDE-CHAIN POLYMERS

Reinhard Lorenz, Bad Krozingen, Fed. Rep. of Germany, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

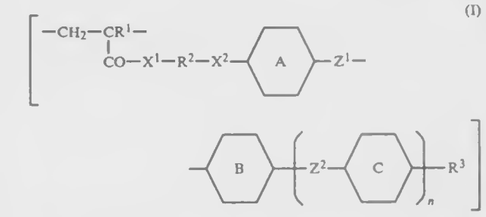
Filed Nov. 28, 1988, Ser. No. 276,746

Claims priority, application Switzerland, Dec. 29, 1987, 5098/87; Oct. 21, 1988, 3920/88

Int. Cl.[5] **C08F** *26/02;* **C09K** *19/52*

U.S. Cl. 252—299.01 **16 Claims**

1. A polymer comprising a monomeric unit of the formula



(I)

wherein R^1 is hydrogen, methyl, ethyl, fluorine, chlorine, bromine, cyano or phenyl; X^1 is oxygen, sulfur, —NH— or $—N(CH_3)—$; R^2 is alkylene with 3–15 carbon atoms, or alkylene with 3–15 carbon atoms in which a non-terminal methylene group thereof is replaced by oxygen or sulfur; X^2 is a single covalent bond, oxygen or sulfur; each of rings A and B independently is 1,4-phenylene which is unsubstituted or substituted with at least one of halogen, methyl, methoxy or cyano, or said unsubstituted or substituted 1,4-phenylene in which one CH group or two CH groups thereof is/are replaced by nitrogen; ring C is 1,4-phenylene which is unsubstituted or substituted with at least one of halogen, methyl, methoxy or cyano or said unsubstituted or substituted 1,4-phenylene in which optionally one CH group or two CH groups thereof is/are replaced by nitrogen or is trans-1,4-cyclohexylene; n is the integer 0, and Z^1 is —CONH— or —NHCO—; or n is the integer 1, one of the groups Z^1 and Z^2 is —CONH— or —NHCO—, and the other of the groups Z^1 and Z^2 is a single covalent bond, $—CH_2CH_2—$, $—CH_2O—$, $—OCH_2—$, —N=N—, —CONH— or —NHCO—; and R^3 is hydrogen, halogen, cyano, nitro, or alkyl in which one methylene group or two non-adjacent methylene groups thereof is/are replaced by at least one of oxygen or sulfur.

4,925,590

DERIVATIVES OF 4-CYANO-2,3-DIFLUOROPHENOL

Volker Reiffenrath, Rossdorf; Joachim Krause, Dieburg; Andreas Wächtler, Griesheim; Georg Weber, Erzhausen, and Ulrich Finkenzeller, Plankstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

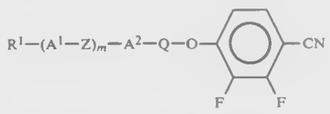
Filed Mar. 9, 1989, Ser. No. 321,045

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807822

Int. Cl.[5] **G02F** *1/13;* **C09K** *19/30, 19/34, 19/20;* **C07C** *121/75;* **C07D** *319/00, 239/34*

U.S. Cl. 252—299.61 **11 Claims**

1. A derivative of 4-cyano-2,3-difluorphenol of the formula



wherein

R^1 is C_{1-12}-alkyl or C_{1-12}-alkyl wherein one or two CH_2 groups are replaced by at least one of —O—, —CO—, —CO—O—, or —CH=CH—, where two O atoms are not directly attached to one another,

A^1 and A^2 are each independently 1,4-phenylene; 1,4-phenylene substituted by one or two F atoms; 1,4-phenylene or 1,4-phenylene substituted by 1 to 2 F atoms in which one or two CH groups are replaced by N; trans-1,4-cyclohexylene; or trans-1,4-cyclohexylene in which one or two non-adjacent CH_2 groups are replaced by O atoms, S atoms, or both,

Z is —CO—O—, —O—CO—, $—CH_2CH_2—$, $OCH_2—$, $—CH_2O—$, —C≡C— or a single bond,

m is 0, 1 or 2 and

Q is —CO— or $—CH_2—$.

4,925,591

MESOMORPHIC COMPOUND HAVING β-HYDROXYCARBOXYL GROUP AS CHIRAL SOURCE AND LIQUID CRYSTAL COMPOSITION

Jun Nakauchi, Tokyo; Mioko Uematsu, Kawasaki; Keiichi Sakashita, Akishima; Yoshitaka Kageyama, Tokyo; Seiji Hayashi, Kawasaki, and Kenji Mori, Tokyo, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

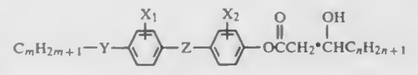
Filed Dec. 22, 1988, Ser. No. 288,379

Claims priority, application Japan, Dec. 22, 1987, 62-324532; Jan. 28, 1988, 63-18436

Int. Cl.[5] **C09K** *19/06, 19/12, 19/20;* **C07C** *69/76*

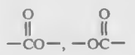
U.S. Cl. 252—299.66 **2 Claims**

1. A mesomorphic compound having a β-hydroxycarboxyl group as the chiral source, which is represented by the following general formula:

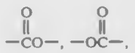


(1)

wherein m and n are integers of from 1 to 18, X_1 and X_2 independently represent fluorine, chlorine or hydrogen, Y represents



or —O—, Z represents a direct bond,



$—CH_2O—$ or $—OCH_2—$, and * indicates the asymmetric carbon.

4,925,592

LIQUID CRYSTAL COMPOSITION

Mitsuru Kano, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 206,458

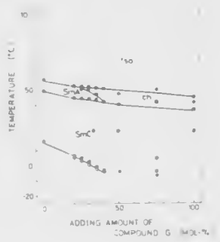
Claims priority, application Japan, Aug. 28, 1987, 62-214825

Int. Cl.[5] **C09K** *19/20*

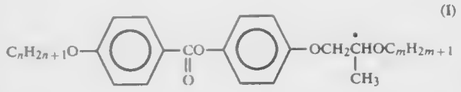
U.S. Cl. 252—299.67 **2 Claims**

1. A liquid crystal composition comprising at least a compound I represented by the following general formula (I), a compound II represented by the following general formula (II), and a compound IV represented by the following general formula (IV):

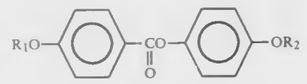
VOL 1114 ISS 3 MY 15 1990 UMI



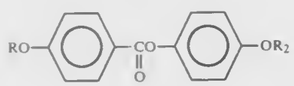
(I)



(II)

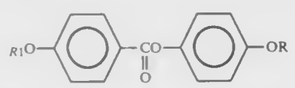


(IV)



wherein n is $2 \leqq n \leqq 12$, m is $2 \leqq m \leqq 12$, R is an alkyl group having no asymmetric (chiral) carbon structure and, R_1 and R_2 are alkyl groups each having an asymmetric (chiral) carbon structure, said R_1 being a different alkyl group with respect to said R_2, said R_1 inducing spiral twisting in an opposite direction to that induced by said R_2, said R_1 inducing spontaneous polarization in a direction identical to that induced by said R_2, said direction of spiral twisting and said direction of spontaneous polarization being defined by said R_1 and said R_2 in a compound III represented by the following general formula (III):

(III)



and said compound IV, respectively.

4,925,593

METHOD FOR PRODUCING CADMIUM FREE GREEN EMITTING CRT PHOSPHOR

Richard R. Borchardt; Richard G. W. Gingerich, and Michael J. Miller, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 27, 1989, Ser. No. 303,599
Int. Cl.[5] C09K *11/56*
U.S. Cl. 252—301.6 S **6 Claims**

1. A process for producing a cadmium free green emitting cathodoluminescent phosphor consisting essentially of zinc sulfide activated by copper and aluminum wherein the emission of the phosphor upon stimulation by cathode rays has CIE values of X of from 0.237 to 0.291 and y from 0.616 to 0.620 comprising:

(a) forming a relatively uniform admixture by blending essentially equal amounts of first and second zinc sulfides wherein the first zinc sulfide is essentially pure zinc sulfide containing no more than 0.01% of chloride and no more than 0.5% of other impurities and the second zinc sulfide contains from about 0.075% by weight to about 2% by weight of chloride ions and no more than 0.5% by weight of other impurities, a sufficient amount of a source of copper and a source of aluminum to yield concentrations of from about 0.015% by weight to about 0.025% by weight of copper and from about 0.02% by weight to about 0.04% by weight of aluminum and a sufficient amount of an alkali metal chloride flux to yield a concentration of from about 5 to about 8% by weight of the total admixture,

(b) firing the admixture at a temperature of from about 1775° C. to about 1825° C. for at least about 3 hours in an atmosphere of nitrogen and carbon disulfide,

(c) washing the resulting fired material with sufficient water until the conductivity of the supernatent water is below about 10 micromhos, and

(d) drying the washed phosphor to remove residual water.

4,925,594

HYDROLYSIS RESISTANCE OF RARE EARTH OXYSULFIDE PHOSPHORS PRODUCED BY THE ADDITION OF ZINC IN SYNTHESIS

Ramon L. Yale, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 24, 1989, Ser. No. 341,887
The portion of the term of this patent subsequent to Dec. 10, 2006, has been disclaimed.
Int. Cl.[5] C09K *11/84*
U.S. Cl. 252—301.6 S **2 Claims**

1. A process for producing a hydrolysis-resistant terbiumactivated rare-earth oxysulfide x-ray phosphor, said process comprising:

(a) forming a uniform mixture of one or more rare-earth oxides, sulfur, alkali carbonate, alkali phosphate, terbium oxide, and a zinc compound wherein said zinc compound is provided in an amount sufficient to result in a zinc concentration of from about 0.05% to about 1.0% by weight, in the mixture and terbium is present in an amount of from about 0.001 moles to about 0.10 moles per mole of rare earth oxysulfide

(b) heating said mixture in an air atmosphere in a covered vessel at a temperature of from about 900° C. to about 1400° C. for a sufficient time to form a terbium-activated rare-earth oxysulfide;

(c) washing said terbium-activated rare-earth oxysulfide with deionized water to remove essentially all of any water soluble impurities which are present; and

(d) annealing the resulting washed terbium-activated rare-earth oxysulfide in air at a temperature of from about 525° C. to about 590° C. for about 1 hour to about 3 hours to enhance the brightness of said phosphor, said phosphor having a resistance to hydrolysis that is at least about 35% greater than phosphor produced as above absent the zinc addition.

4,925,595

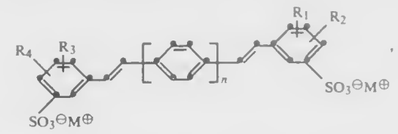
LIQUID DETERGENT COMPOSITIONS CONTAINING DISULFONATED FLUORESCENT WHITENING AGENTS: DI-STYRYL-BIPHENYL OR DI-STYRYL-BENZENE DERIVATIVES

Heinz Hefti, Reinach, Switzerland; Dieter Reinehr, Kandern, Fed. Rep. of Germany; Kurt Weber, Basle, Switzerland, and Claude Eckhardt, Riedisheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 27, 1988, Ser. No. 212,391
Claims priority, application Switzerland, Jul. 3, 1987, 2535/87
Int. Cl.[5] C07C *143/29;* C11D *3/42*
U.S. Cl. 252—301.21 **11 Claims**

1. A liquid non-spotting detergent composition containing a whitening agent, wherein the fluorescent whitening agent present in an amount of 0.01 to 2% consists of a disulfonic acid whitening agent or a mixture of disulfonic acid whitening agents of the formula (I)

(I)



wherein

R_1, R_2, R_3 and R_4 independently from each other is H, Hal and/or C_1–C_4alkyl,

n is 1 or 2,

$M^{\oplus}$ is hydrogen or an alkali metal ion,

except those compounds in which R_1 or R_2 and R_3 or R_4 are chlorine para to the stilbene residue and n is 2.

4,925,596

LUBRICATING OIL COMPOSITION CONTAINING MOLYBDENUM AND ZINC COMPOUNDS FOR INTERNAL COMBUSTION ENGINE

Yoshihiro Maeda; Kunihiko Hosonuma, and Keiichi Tamura, all of Toda, Japan, assignors to Kyodo Oil Technical Research Center Co., Ltd. and Nippon Mining Company, Limited, both of Tokyo, Japan

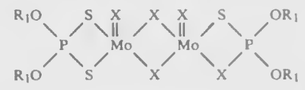
Filed Aug. 18, 1988, Ser. No. 233,749
Claims priority, application Japan, Aug. 19, 1987, 62-204267
Int. Cl.[5] C10M *135/04*
U.S. Cl. 252—32.7 E **4 Claims**

1. A lubricating oil composition for an internal combustion engine comprising:

(a) a mineral lubricating base oil, a synthetic lubricating base oil or mixtures thereof;

(b) from 0.005 to 0.2 wt.%, as a molybdenum concentration on the basis of the base oil, of at least one compound represented by formula (I):

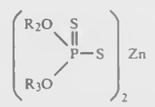
(I)



wherein R_1 is a secondary alkyl group having from 5 to 8 carbon atoms, X is O or S and are same or different, and the O/S ratio of the compound is from 3/1 to 1/3; and

(c) from 0.2 to 1.5 wt.%, as a zinc concentration on the basis of the base oil, of at least one compound represented by the formula (II):

(II)

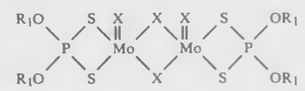


wherein R_2 and R_3 are a primary alkyl group having from 3 to 8 carbon atoms and are the same or different.

4. An additive of lubricating oil for an internal combustion engine comprising a combination of:

(A) at least one alkyl molybdenum dithiophosphate represented by formula (I):

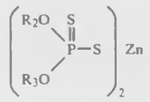
(I)



wherein R_1 is a secondary alkyl group having from 5 to 8 carbon atoms, X is O or S and are the same or different, and the O/S ratio of the compound is from 3/1 to 1/3; and

(B) at least one alkyl zinc dithiophosphate represented by formula (II):

(II)



wherein R_2 and R_3 are a primary alkyl group having from 3 to 8 carbon atoms and are the same or different.

4,925,597

METHOD FOR THE DECONTAMINATION OF RADIOACTIVELY CONTAMINATED LIQUIDS

Martin Ganter, Bischhof 3, 2213 Landrecht, Fed. Rep. of Germany

PCT No. PCT/DE87/00604, § 371 Date Oct. 12, 1988, § 102(e) Date Oct. 12, 1988, PCT Pub. No. WO88/05204, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 21, 1987, Ser. No. 275,137
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644396
Int. Cl.[5] G21F *9/08;* C09K *3/00;* C10M *175/00;* C10G *17/06*
U.S. Cl. 252—631 **16 Claims**

1. Method for the decontamination of radioactively contaminated lubricating oil, in which

(a) the lubricating oil to be decontaminated is mechanically filtered,

(b) afterwards an acid salt solution of the elements, whose radionuclids are to be removed is added and

(c) a precipitation partner, which results together with the elements whose radionuclids are to be removed in a relatively insoluble salt, is added in doses, characterized in that

(d) after step (b) the acid salt solution is thoroughly mixed with the lubricating oil,

(e) after step (b) and before step (c) the depositing aqueous phase is drained off,

(f) after the dosed addition in step (c) a further thorough mixing takes place, and

(g) finally the precipitation products are separated by centrifuge from the lubricating oil.

4,925,598

AERATOR FOR INDUSTRIAL AND DOMESTIC WASTEWATERS

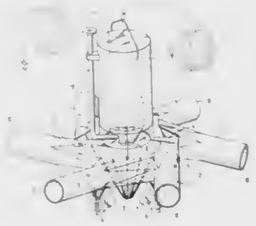
Tuomo V. J. Kivistö, Espoo; Tauno T. Koho, Helsinki, and Arvo E. Andersson, Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jun. 10, 1988, Ser. No. 204,721
Claims priority, application Finland, Jun. 11, 1987, 872615
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—87 **13 Claims**

1. An apparatuss for feeding some oxidous gas, such as air, into a slurry containing solid materials, which apparatus is formed of a stator and a rotor (3) suspended at the end of an axis, the rotor (3) having the shape of a downwards narrowing cone, characterized in that the stator placed coaxially around the rotor comprises a stator shell (4) directed outwards the top

VOL 1114 ISS 3 MY 15 1990 UMI

part of the rotor, stator ducts (7) directed outwards from the outer circumference of the stator shell, stator legs (5) directed



downwards from the stator shell (4) and triangular blade members (6) fastened to the said legs (5).

4,925,599

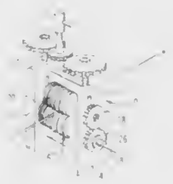
OPTICAL FIBERS FORMED BY ROLLING PROCESS

Roger R. Turk, Woodland Hills, and Nelson Ramirez, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 415,619, Sep. 7, 1982, abandoned. This application Apr. 24, 1986, Ser. No. 856,863

Int. Cl.[5] C03B *37/027*

U.S. Cl. 264—1.5 6 Claims



1. A process for forming an infrared optical fiber waveguide comprising the steps of:

forming a billet of material suitable for use as an infrared optical waveguide;

rolling the billet while heated between grooved rolls in a first roll opening having an elliptical cross-section to roll the billet into a rod having a longitudinal axis;

rotating the rod about 90 degrees on its longitudinal axis;

rolling the rod while heated between the grooved rolls in a second roll opening smaller than the first roll opening having an elliptical cross-section wherein the major diameter is parallel to the respective axes of the rolls, reducing the cross-sectional area of the rod by less than about 20 percent;

rotating the rod about 90 degrees on its longitudinal axis;

rolling the rod while heated between the grooved rolls in a third roll opening having an elliptical cross-section smaller than the second roll opening wherein the major diameter is parallel to the respective axes of the rolls, reducing the cross-sectional area of the rod by about or less than 20 percent

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4,925,600

PROCESS FOR THE PRODUCTION OF PARTICULATE AMMONIUM NITRATE FOR SOLID FUELS OR EXPLOSIVES

Horst Hommel, Karlsruhe, and Hiltmar Schubert, Walzbachtal, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,255

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642850

Int. Cl.[5] D03D *43/00*; C06B *21/00*

U.S. Cl. 264—3.4 5 Claims



1. A process for producing particulate ammonium nitrate for use as an oxidizer in solid propellants or explosives, wherein a solid mixture of ammonium nitrate and at least one additive for effecting phase stabilization is melted and reacted, said additive being selected from the group consisting of copper oxide, nickel oxide and mixtures thereof; the melt is atomized to form melt particles; and the melt particles are solidified in a cooling gas stream; said process being further characterized by successively producing the melt in several small batches, said batches being housed in a spatially separated arrangement; supplying the melt of each batch to a common spraying vessel; atomizing the melt; and cyclically supplying the mixture to each of the several batches.

4,925,601

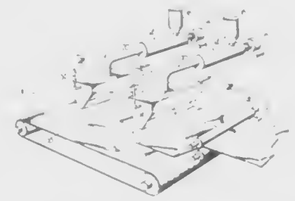
METHOD FOR MAKING MELT-BLOWN LIQUID FILTER MEDIUM

Clifford M. Vogt, Roswell; Nancy D. Twyman, Norcross, and Roe C. Allen, Jr., Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 19, 1988, Ser. No. 145,065

Int. Cl.[5] D04H *3/16*; B29D *7/00*

U.S. Cl. 264—6 3 Claims



1 In a process for making a melt-blown liquid filter medium which process includes heating a polymer resin to a melt temperature sufficient to produce an extrudable melt, extruding a stream of the melt at a through-put rate through a die orifice in a die head having a die width, directing fluid, having a fluid temperature, at a flow rate toward the melt exiting the die orifice to break up and attenuate the melt stream to form fibers,

and collecting the fibers on a collector to form a web by means of a vacuum drawn beneath the collector, which collector is displaced from the die orifice by a forming distance, the improvement comprising:

a. extruding the polymer melt through the die orifice wherein the through-put rate of the polymer resin is between 1.8 and 2.9 pounds per inch of die width per hour;

b. directing fluid toward the melt as it exits the die orifice, wherein the fluid flow rate is between 200 and 265 standard cubic feet per minute per square inch;

c. setting the forming distance between 12 and 23 inches; and

d. setting the vacuum between 0.5 and 1.0 inch of water.

4,925,602

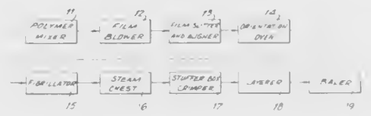
METHOD FOR IMPROVING THE CRIMPING OF POLYOLEFIN FILTER TOW

Michael Hill, Ascot, England, and Walter A. Nichols, Richmond, Va., assignors to Filter Materials Limited, New York, N.Y.

Filed Aug. 10, 1988, Ser. No. 231,148

Int. Cl.[5] D01D *5/22*, *5/42*

U.S. Cl. 264—25 19 Claims



1. A method of making polyolefin filter tow, said method comprising, in the listed order, the steps of:

forming a polyolefin film having a molecular structure;

orienting said molecular structure by heating said film to just below the melting point of said film and stretching said heated film;

fibrillating said oriented film to form an interconnected fiber web;

applying heat to said fibrillated web to raise its temperature above ambient temperature;

ending the application of heat to said fibrillated web;

crimping said heated fibrillated web to apply thereto a crimp having a crimp frequency of at least about 40 crimps per inch; and

forming said crimped fibrillated web into filter tow, said filter tow having a maximum yield of at least about 85%.

4,925,603

PROCESS FOR THE PREPARATION OF GEL FOR USE AS COOLING MEDIUM

Masao Nambu, Kanagawa, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 841,030, Mar. 17, 1987, abandoned, which is a continuation of Ser. No. 400,821, Jul. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 375,854, May 7, 1982, abandoned. This application Aug. 19, 1987, Ser. No. 88,473

Claims priority, application Japan, May 16, 1981, 56-73938; May 26, 1981, 56-78606; Aug. 28, 1981, 56-134311; Sep. 17, 1981, 56-145519

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.[5] B29C *35/16*

U.S. Cl. 264—28 17 Claims

1. A process for the preparation of a gel insoluble in water for use as a cooling medium, comprising only the steps of preparing an aqueous solution or suspension containing a polyvinyl alcohol having a degree of hydrolysis of not less than 95 mol % and a viscosity average polymerization degree of not less than 1500 , casting said solution or suspension into a mold having desired shape and dimensions, cooling the cast aqueous solution to a temperature of not higher than — (minus) 6° C., and then dehydrating without thawing the cooled mass of the cast aqueous solution in vacuum until the percentage dehydration rate reaches not less than 5 wt % to obtain a gel insoluble in water having a water content of 60 to 95 wt %, based on the weight of the swelled mass.

4,925,604

PROCESS FOR PREPARING A CARBON FIBER OF HIGH STRENGTH

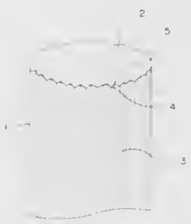
Takashi Ohsaki, Shimada; Koichi Imai, and Naomasa Miyahara, both of Fujieda, all of Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,428

Claims priority, application Japan, Oct. 16, 1984, 59-215207

Int. Cl.[5] D01F *9/22*

U.S. Cl. 264—29.2 3 Claims



1. A process for preparing a carbon fiber of high strength, which comprises the steps of:

(a) extruding from a nozzle a spinning solution of an aqueous polyacrylonitrile/pure zinc chloride solution having a polymer concentration of 1 to 8% into a coagulating bath at a draft ratio of more than 0.5, said spinning solution being kept at a temperature below 50° C., said coagulating bath being kept at a temperature below 20° C., and with a zinc chloride content of 25–30% by weight in the aqueous coagulating solution;

(b) washing, drying and stretching for setting a total stretching ratio of 10–20 to form a precursor having a diameter of not more than 10 μm; and

(c) stabilizing and carbonizing the precursor, said stabilizing comprising a stretching of more than 30%, thereby providing circumferential ruggedness of at least 10 pleats per filament on a surfacee of the carbon fiber after said carbonizing treatment, said ruggedness extending in parallel to an axis of the carbon fiber and having a depth of more than 0.1 μm.

4,925,605

METHOD OF FORMING A HEAT FOAM INSULATION JACKET

Dennis A. Petronko, Pittsburgh, Pa., assignor to Field Foam Incorporated, Pittsburgh, Pa.

Continuation of Ser. No. 88,967, Aug. 24, 1987, abandoned, which is a division of Ser. No. 914,379, Oct. 2, 1986, Pat. No. 4,696,324. This application Feb. 10, 1989, Ser. No. 309,313

Int. Cl.[5] B29C *67/22*

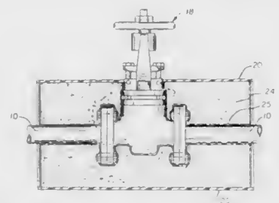
U.S. Cl. 264—46.6 1 Claim

1. A process for insulating pipe accouterments, comprising the steps of:

(a) wrapping a generally rectangular and essentially flat multi-layered removable insulation jacket, containing two independent pockets formed between an inner layer formed of a flexible, heat shrinkable plastic material and an outer layer formed of a flexible, non-shrinkable, non-elastic water resistant material, said pockets separated by a transverse seam joining said inner and outer layer layers,

VOL 1114 ISS 3 MY 15 1990 UMI

each pocket having a hole in its outer layer, around a pipe accouterment;
(b) fastening said jacket in a loose circular fashion around the accouterment whereby said pockets are positioned on opposite sides of the accouterment;
(c) simultaneously inserting and combining chemical ingredients through the holes provided in the outer layer of each pocket to form an insulating foam middle layer; and
(d) allowing said middle layer to expand uniformly around

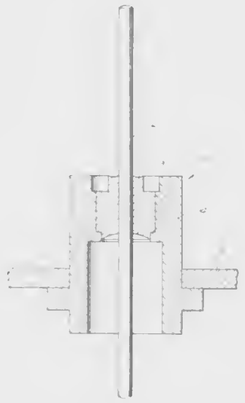


said pipe accouterment and harden, whereby said mixing of said chemical ingredients generates heat and a portion of said foam is urged inwardly by said outer layer during expansion, thereby causing said heat-shrinkable plastic material of said inner layer to shrink around and closely conform to the shape of the accouterment, and whereby said transverse seam provides a hinge allowing for removal and reapplication of the insulation jacket in a manner whereby said inner layer retains its close conformity to the shape of the accouterment.

4,925,606
METHOD FOR ENHANCING THERMAL EXPANDABILITY OF DIRECT-INJECTION FOAMS
Peter S. Francis, Wallingford, and Thomas M. Chapman, Downingtown, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.
Filed Oct. 10, 1989, Ser. No. 418,592
Int. Cl.[5] C08J *9/08, 9/36*
U.S. Cl. 264—50 **10 Claims**

1. A process for enhancing the expansion of foams of polystyrene, styrene copolymers, polymethyl methacrylate, methyl methacrylate copolymers, polyphenylene oxide, copolymers of styrene with from 5 to 35 mole percent of maleic anhydride and its derivatives, styrene-acrylonitrile, acrylonitrile-butadiene-styrene, styrene-methyl methacrylate, styrene-acrylic acid, styrene-methacrylic acid, the rubber modified high impact styrene copolymers, polyethylene, and polypropylene comprising the steps of
(a) impregnating the polymer with a blowing agent in a first extruder and immediately cooling the polymer in a second extruder;
(b) expanding the polymer by extrusion of the polymer to form a foamed sheet;
(c) aging the foam sheet in air for 1–100 days;
(d) impregnating the foamed sheet with gas, liquid, or solid carbon dioxide; and
(e) immediately heating the impregnated foam sheet to further expand the sheet.

4,925,607
ELECTRICAL INSULATING MATERIAL FORMED FROM AT LEAST ONE FLUX AND A CRYSTALLINE STUFFING MATERIAL
James C. Kyle, 2547 Fisher Rd., Roseburg, Oreg. 97470, assignor to James C. Kyle, Roseburg, Oreg.
Continuation of Ser. No. 840,740, Oct. 11, 1977, which is a division of Ser. No. 229,151, Jan. 28, 1981, Pat. No. 4,421,927.
This application Oct. 20, 1983, Ser. No. 543,534
Int. Cl.[5] C04B *37/00*
U.S. Cl. 264—60 **16 Claims**



1. In a method of producing a dielectric material, the steps of:
fritting a first flux having a first melting temperature,
fritting a second flux having a melting temperature separated by a particular temperature difference from the melting temperature of the first flux,
fritting a crystalline stuffing material having a melting temperature greater than the melting temperatures of the first and second fluxes,
mixing the first and second frits and the fritted crystalline stuffing material, heating the mixture to a temperature slightly above the melting temperature of the mixture for a first particular period of time to provide for an incomplete combination of the frits of the fluxes and the frit of the the crystalline stuffing material into a form partially crystalline but primarily amorphous,
fritting the heated mixture in water,
heating the fritted mixture at a temperature slightly above the melting temperature of the fritted mixture for a second particulate period of time to provide for further crystallization of the material with a substantial portion of the material still amorphous and to provide for a controlled coefficient of thermal expansion of the material in accordance with the duration of the second particular period of time, and
thereafter quenching the heated fritted mixture in water.

4,925,608
JOINING OF SIC PARTS BY POLISHING AND HIPPING
Guilio A. Rossi, Shrewsbury, Mass., and Paul J. Pelletier, Thompson, Conn., assignors to Norton Company, Worcester, Mass.
Filed Sep. 27, 1988, Ser. No. 249,791
Int. Cl.[5] C04B *35/56*
U.S. Cl. 264—60 **16 Claims**

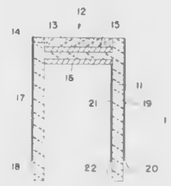
1. A method of joining two pre-densified predominantly beta-silicon carbide pieces which comprises (i) polishing a surface of each silicon carbide piece to a mirror-like condition,

(ii) fitting the polished surfaces to each other to form a partially bonded composite structure, and (iii) subjecting the structure to hot isostatic pressing conditions at a pressure of at least



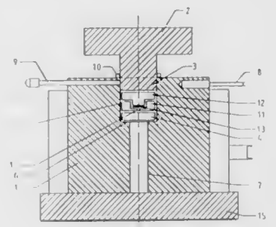
about 22,000 psi which preclude the entrance of any species into the joint and which are sufficient to form a uniform joint which is essentially indistinguishable from the original silicon carbide pieces.

4,925,609
OXYGEN-SENSING ELEMENT
Hisao Yamada, Orange, and Thomas Yuan, North Randall, both of Ohio, assignors to Stemcor Corporation, Cleveland, Ohio
Division of Ser. No. 20,446, Mar. 2, 1987, Pat. No. 4,740,288.
This application Apr. 18, 1988, Ser. No. 182,547
Int. Cl.[5] C04B *33/32*
U.S. Cl. 264—61 **16 Claims**



1. A method of making a sensing element for producing an electrical signal indicative of the oxygen content of a combusted air-fuel mixture comprising:
milling a mixture including a solid electrolyte powder, water and a binder to form a slip;
forming from said slip a green body having first and second opposed surfaces;
calcining said green body;
applying first, second and third metal electrodes to said calcined green body, said second electrode being disposed on said first surface, said third electrode being disposed on said second surface opposite said second electrode;
calcining a ceramic powder;
milling said calcined powder in a liquid;
forming a slurry with said milled, calcined powder;
disposing said slurry on said first surface covering said second electrode; and
firing said calcined green body and slurry to form a solid electrolyte body bearing a porous body covering said second electrode.

4,925,610
PROCESS FOR THE PRODUCTION OF CONDUCTIVE MOLDED ARTICLES
Bernhard M. Wessling, and Harald K. Volk, both of Bargteheide, Fed. Rep. of Germany, assignors to Zipperling Kessler & Co. (GmbH & Co.), Ahrensburg, Fed. Rep. of Germany
Continuation of Ser. No. 744,272, Jun. 13, 1985, abandoned.
This application May 28, 1987, Ser. No. 56,324
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3421993
Int. Cl.[5] B29C *35/00*
U.S. Cl. 264—101 **11 Claims**



1. A process for the production of molded articles from electrically conductive organic polymers and/or organic conductors, comprising:
well-degassed samples of substantially solvent-free and monomer-free conductive polymers and/or organic conductors are shaped, whilst excluding moisture and oxygen, at a temperature above 40° C. but below the decomposition temperature of the conductive polymers and/or organic conductors, at a pressure of at least 500 bar until a continuous phase forms, said phase having a highly lustrous surface, which appears metallic and visually shows a color which is different from the starting material.

4,925,611
MOLD MAKING METHOD
Charles H. Shockney, Huntsville; Roger L. Hill, Decatur, and William T. White, Huntsville, all of Ala., assignors to USBI Company, Huntsville, Ala.
Filed Oct. 19, 1987, Ser. No. 110,767
Int. Cl.[5] B29C *41/22*
U.S. Cl. 264—135 **1 Claim**

1. A method of manufacturing a mold particularly adapted for forming a complex shape comprising:
(a) applying at least one layer of gel to a male mandrel and curing said gel layer wherein said gel is selected from the group consisting of epoxy and polyester;
(b) curing at least one layer of polyester impregnated fabric to said gel layer;
(c) curing at least one layer of epoxy impregnated fabric to said polyester impregnated fabric;
(d) curing at least one layer consisting essentially of plaster impregnated fabric to said epoxy impregnated fabric;
(e) curing at least one layer of epoxy impregnated fabric to said plaster impregnated fabric to manufacture said mold; and
(f) removing said mold from said male mandrel; wherein said curing steps are capable of being accomplished at room temperature under atmospheric pressures.

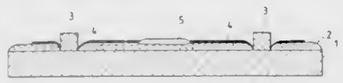
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4,925,612

METHOD FOR MAKING A THIN FILM OF POLYMER

Katsunori Waragai; Yukihiro Saito, both of Kawasaki, and Shiro Asakawa, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 5, 1989, Ser. No. 402,301
Claims priority, application Japan, Sep. 5, 1988, 63-221713
Int. Cl.[5] B29C *41/12, 41/24*
U.S. Cl. 264—154 5 Claims



1. A method for making a thin film of polymer which comprises:
casting a first polymer solution on a surface of a support liquid to form a first polymer thin film by evaporation of a solvent used;
placing a second polymer solution on part of the first polymer thin film; and
breaking the first polymer thin film to make a slit in the first polymer thin film so that the second polymer solution on the part of the first polymer thin film is cast from the slit on the surface of the support liquid thereby forming a thin film of the second polymer.

4,925,613

PROCESS FOR PREPARATION OF SYNTHETIC FAUJASITE MOLDED BODY

Masashi Harada, and Hiroshi Miyazaki, both of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,104
Claims priority, application Japan, Dec. 13, 1985, 60-279225
Int. Cl.[5] C04B *35/10*
U.S. Cl. 264—232 4 Claims

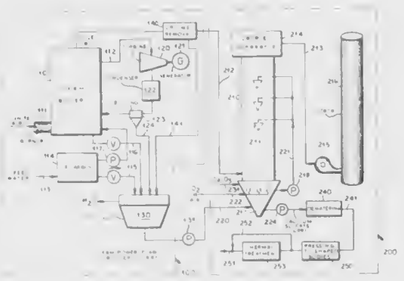
1. A process for the preparation of a synthetic faujasite molded body, which comprises:
(a) preparing a structure-inducing substance, which substance has a composition defined by the following oxide molar ratios:
$SiO_2/Al_2O_2 = 14$ to 60,
$M_2O/Al_2O_3 = 15$ to 40, and
$H_2O/M_2O = 12$ to 40,
wherein M is an alkali metal,
and which substance is prepared by:
(1) mixing together an aqueous solution of an alkali metal silicate, an aqueous solution of an alkali metal aluminate and an aqueous solution of an alkali metal hydroxide to prepare a liquid phase substance having a composition defined by the following oxide molar ratios:
$SiO_2/Al_2O_3 = 8$ to 14,
$M_2O/Al_2O_3 = 7$ to 30, and
$H_2O/M_2O = 10$ to 14,
wherein M is as defined above;
(2) aging the liquid phase substance at a temperature of 20° to 60° C. for 10 minutes to 6 hours; and
(3) incorporating an aqueous solution of an alkali metal silicate into the aged liquid phase substance to obtain the structure-inducing substance;
(b) mixing the structure-inducing substance with a starting material mixture comprising as the main components a silica source, an alumina source, an alkali source and water in such a manner that the amount of Al_2O_3 present in the structure-inducing substance is 1 to 30% by weight based on the total weight of Al_2O_3 present in the starting material mixture;
(c) kneading the starting material mixture and the structure-inducing substance;
(d) molding the kneaded mixture into a desired shape; and
(e) heating the molded body in an aqueous solution of an alkali metal silicate or an aqueous solution of an alkali metal hydroxide to form a synthetic faujasite molded body.

4,925,614

METHOD OF MAKING SHAPED BODIES FOR USE IN THE CONSTRUCTION TRADES FROM POWER-PLANT CLARIFIER SLUDGE

Georg Gebhard, Reichshof, Fed. Rep. of Germany, assignor to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 56,357, May 28, 1987, abandoned, which is a continuation of Ser. No. 828,841, Feb. 12, 1986, abandoned. This application Jul. 15, 1988, Ser. No. 220,019
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504775
Int. Cl.[5] B28B *3/00;* C01B *17/00*
U.S. Cl. 264—232 5 Claims



1. A method of making shaped bodies for the construction industry, comprising the steps of:
(a) recovering a power-plant clarifier sludge from a clarifier of a steam power plant with a chemical-analysis composition substantially of:

SiO_2	2 to 30 weight percent,
Fe_2O_3	2 to 20 weight percent,
Al_2O_3	0.5 to 5 weight percent,
CaO	15 to 50 weight percent,
MgO	1 to 8 weight percent,
MnO	0.01 to 0.5 weight percent,
Na_2O	0.1 to 0.5 weight percent,
K_2O	0.1 to 1 weight percent,
SO_3 in sulfate	0.1 to 2 weight percent, and
CO_2 in carbonate	5 to 40 weight percent;

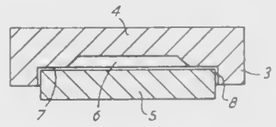
(b) feeding the power-plant clarifier sludge recovered in step (a) to a circulated scrubbing-water cycle of a wet desulfurization scrubber for fossil-fuel power plant flue gas as at least part of a sulfur oxide absorption component therefore;
(c) withdrawing a desulfurization sludge from the scrubbing-water cycle of the wet desulfurization scrubber which contains a solid phase consisting predominantly of calcium sulfate dihydrate;
(d) dewatering the desulfurization sludge withdrawn in step (c) to a predetermined residual moisture content; and
(e) pressing the dewatered desulfurization sludge of step (d) into shaped bodies for the construction industry at a pressure in excess of 10 N/mm^2 to a green compressive strength in excess of 5 N/mm^2.

4,925,615

METHOD OF MOLDING FIBER REINFORCED PLASTIC ARTICLES

Anthony J. Willis, Marlow; William T. H. Skelding, Kew, and Bronislaw Radvan, Flackwell Heath, all of England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Continuation of Ser. No. 924,760, Oct. 30, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 271,345
Claims priority, application United Kingdom, Nov. 1, 1985, 8527023
Int. Cl.[5] B29C *43/18*
U.S. Cl. 264—257 7 Claims



1. A process for moulding articles of fiber reinforced plastics material which consists essentially of preheating substantially uniform density sheet consisting essentially of consolidated thermoplastic material which has dispersed therein from 20% to 70% by weight of single discrete stressed reinforcing fibres which have a high modulus of elasticity and between about 7 and about 50 millimeters long to cause the sheet to expand due to relief of the stresses in the reinforcing fibres, placing the expanded sheet and an insert in a compression mould, closing the mould to differentially compress the expanded sheet, to form portions of different densities, and cooling the thermoplastic material in the mould to form an article of predetermined shape having portions of different density with said insert being retained in a portion of greater density.

4,925,616

METHOD OF PROTECTING A CASED PIPELINE FROM CORROSION

Ronald W. Brown, Broussard, La., and Roy F. House, Houston, Tex., assignors to Venture Innovations, Inc., Lafayette, La.

Filed Sep. 12, 1988, Ser. No. 242,807
Int. Cl.[5] B29C *39/02;* B32B *1/08*
U.S. Cl. 264—262 11 Claims

1. In a method of protecting a metallic underground pipeline from corrosion wherein the pipeline is encased within a casing pipe of larger diameter, and wherein the interstitial space between the pipeline and the casing pipe is filled with a non-conductive insulating material wherein the improvement comprises pumping into the interstitial space an insulating material which has a dielectric strength greater than 2000 volts as measured by the American Petroleum Institute's Recommended Procedure 13 B, a dielectric constant of about 2.26 as measured by ASTM D924, a volume resistivity of about 2.26×10^{12} ohm-centimeters as measured by ASTM D1169, and a flash point of at least about 500° F. as measured by ASTM D92, said insulating material having the characteristic that, if burning, it ceases to burn and the flame is extinguished once the source of ignition is removed, wherein said insulating material further comprising tall oil pitch.

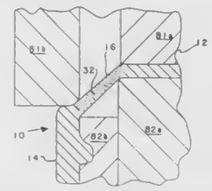
4,925,617

METHOD OF FORMING A CLOSURE CAP WITH A SEAL

Mortimer S. Thompson, Maumee, Ohio, assignor to Tri-Tech Systems International, Inc., Maumee, Ohio

Filed Jun. 10, 1987, Ser. No. 60,218
Int. Cl.[5] B29C *55/00*
U.S. Cl. 264—291 4 Claims

1. A method for forming a cap including a linerless seal, comprising:
molding a cap having a lid comprising plastic material and a peripheral skirt, and prior to engagement with a container opening,
engaging the lid and moving a portion of the lid adjacent to the skirt to pre-stretch the inner surface of said portion



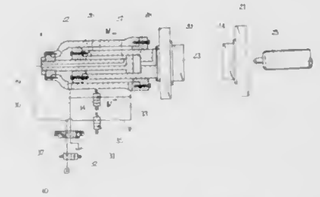
and thereby provide a lid with a pre-formed inner sealing surface adjacent the skirt which has been softened and is non-projecting, and which upon subsequent engagement with a container opening is adapted to compress and seal thereto.

4,925,618

MOLD CLAMPING METHOD

Minoru Takada, Sakaki, Japan, assignor to Nissei Jushi Kogyo Kabushiki Kaisha, Nagano, Japan

Division of Ser. No. 161,120, Feb. 26, 1988, abandoned. This application May 9, 1989, Ser. No. 349,921
Claims priority, application Japan, Feb. 28, 1987, 63-45983
Int. Cl.[5] B29C *45/67*
U.S. Cl. 264—328.1 1 Claim



1. A process for clamping a mold clamping device including a molding machine having a fixed mold with a fixed board and a movable mold with a movable board, a clamping cylinder slidably fitted with a clamping ram , a front end at said clamping ram is fixed on said movable board of said molding machine, an inner space of said clamping cylinder being divided into a rear chamber and a front chamber by a large-diameter piston section of said clamping ram, a mold opening piston having one end fixed to an inner rear wall of said clamping cylinder and the other end slidably positioned within an inner space of said clamping ram, said mold opening piston divides said inner space of said clamping ram into a first chamber and a second chamber, said second chamber constantly being open to the atmosphere at said front end of said clamping ram where said clamping ram is fixed to said movable board of said molding machine, said process comprising the steps of:
a step of high speed mold closure during which said rear chamber, said front chamber and said first chamber are pressurized by connecting to an oil pressure source , said front chamber and said first chamber are connected to said rear chamber, and the oil in said front chamber and said first chamber is introduced into said rear chamber;
a step of tight clamping during which said rear chamber is pressurized by connecting to said oil pressure source after mold closure, and said front chamber and said first chamber are connected to an oil tank to release pressure; and
a step of high speed mold opening during which said first

VOL
1114
ISS
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MY
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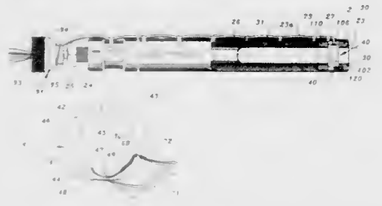
chamber is pressurized by connecting to said oil pressure source said rear chamber and said front chamber are connected to each other and said rear chamber is connected to said oil tank to introduce the oil in said rear chamber into said front chamber, and the rest of the oil is introduced into said oil tank.

4,925,619

ROD PRESSURIZATION SENSING APPARATUS

James A. Sparrow, and John J. McEvoy, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 18, 1989, Ser. No. 353,563
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—258 16 Claims



7. An apparatus for determining pressurization in a nuclear fuel rod and the like by measuring the increase in diameter of the fuel rod occasioned by the internal pressurization of the fuel rod comprising

an elongate receiving member having an outer surface and front and rear ends, said front end having an axial opening extending into said member and defining a central axis, and with said axial opening being adapted to receive at least one end of a fuel rod coaxially therein,

first and second axially spaced retaining means positioned within said receiving member, said retaining means having openings therethrough and aligned coaxially with said receiving member axial opening and being dimensioned to receive a fuel rod therethrough,

gauging means positioned in said axial opening between said first and second retaining means for measuring the increase in diameter of a fuel rod caused by a pressure increase within the rod, said gauging means comprising a substantially C-shaped bracket having spaced, distal end portions and a medial portion intermediate said distal end portions, spaced inner and outer surfaces circumferential to said central axis extending coaxially within said axial opening, said distal end portions being substantially greater in radial thickness than said medial portion, said inner bracket surface being dimensioned to frictionally receive the end of a nuclear fuel rod therethrough so that said distal end portions are biased inwardly around said fuel rod, and said outer bracket surface being dimensioned to permit limited radial movement of said C-shaped bracket within said axial opening so that said bracket can align itself with a fuel rod when inserted within said receiving member, a first electrical resistance strain gauge means mounted on the outer surface at said medial portion and a second electrical resistance strain gauge means mounted on said inside surface at said medial portion,

support means rotatably mounting the rear end of said receiving member allowing rotation of said receiving member when said support means is held stationary, and

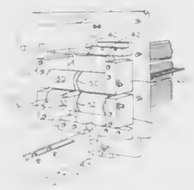
processing means electrically connected to said first and second strain gauge means for measuring electrical output from said strain gauge means, wherein changes in electrical output from said strain gauge means can be measured to determine the increase in the diameter of the fuel rod positioned within said axial opening upon pressurization of the fuel rod.

4,925,620

CONTROL ROD ABSORBER SECTION FABRICATION BY SQUARE TUBE CONFIGURATION AND DUAL LASER WELDING PROCESS

Louis L. Aiello, Castle Hayne, N.C.; James E. Charnley, Gilroy, Calif.; James A. Mees, Wilmington, N.C., and Robert C. Dixon, Morgan Hill, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 29, 1988, Ser. No. 250,631
Int. Cl.[5] G21C *21/18*
U.S. Cl. 376—260 9 Claims



1. A process for the assembly of a planar section of a cruciform shaped control rod from a plurality of tubes, said process comprising the steps of:

providing a plurality of tubes, said tubes having cylindrical interior volumes for the containment of neutron absorbing poisons and having square external sections for being joined by welding in side-by-side relation;

filling said cylindrical interior volumes with neutron absorbing poisons;

plugging said tubes to seal said neutron absorbing poisons within said tubes:

providing a jig for maintaining said tubes in side-by-side relation to form a planar section of said control rod, said jig having a leading end for holding the ends of said tubes in side-by-side relation and having a trailing end for holding said tubes in side-by-side relation;

placing said tubes in said jig with sides of adjacent square exterior sectioned tubes juxtaposed for welding;

providing a laser welding apparatus addressed to an interface between said square exterior sectioned tubes;

providing fixtures on either side of said laser welding apparatus, said provided fixtures having opposed rollers for bracing the planar surface of said tubes in said jig during passage of said fixture through said laser welding apparatus;

pulling said jig and tubes through said fixtures between said opposed rollers and past said laser welding apparatus; and,

welding said tubes together from said laser welding apparatus during said pulling step.

4,925,621

PRESSURE TUBE SAMPLING

Walter E. Muth, Pembroke; Roger Joynes, Deep River; Clair A. Cox, Chalk River; Brian A. Cheadle, Deep River; Don J. Burnett, Toronto, and Han Adema, Burlington, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Nov. 22, 1988, Ser. No. 275,017
Claims priority, application Canada, Nov. 23, 1987, 552530
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—262 6 Claims

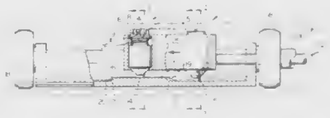
1. A sampling apparatus for obtaining a sample from a pressure tube in-situ, comprising a sampling tool for insertion into a pressure tube,

said sampling tool having tube follower means for engaging the inner surface of the pressure tube, surface removal means, surface material capturing means, sample removal means, and sample capturing means,

cam means for positioning the surface removal means into engagement with the pressure tube for removal of surface material,

cam means for positioning the sample removal means into engagement with the pressure tube in the region of surface material removal, and effecting removal of a sample,

means movably mounting the surface removal means and sample removal means on a carrier spaced from one another along a longitudinal axis parallel to the longitudinal axis of the pressure tube, and wherein the surface removal means and sample removal means are each movable rela-



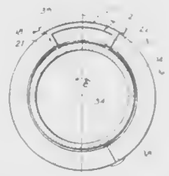
tive to the carrier along axes transverse to said longitudinal axis, a first cam follower associated with said surface removal means, and a second cam follower associated with said sample removal means, said sampling tool having a cam surface for engagement by said first and second cam follower, operative such that longitudinal motion of the carrier provides transverse motion of the surface removal means and sample removal means, and wherein said cam surface comprises a linear portion and a ramp portion at each end of the linear portion operative to provide gradual transverse motion of the surface removal means and sample removal means.

4,925,622

TREADABLE INSULATION SYSTEM WITH LAGGING SUPPORT

Latham B. Gray, III, Mecklenburg County, N.C., and Gordon H. Hart, Johnson County, Kans., assignors to Performance Contracting, Inc., Charlotte, N.C.

Filed Oct. 27, 1987, Ser. No. 114,223
Int. Cl.[5] G21C *11/08*
U.S. Cl. 376—289 21 Claims



17. A treadable length of thermal insulation for use on industrial piping such as piping within a nuclear power plant, said insulation comprising:

a plurality of insulation segments for end-to-end placement along a pipe and for at least partially encircling a pipe;

at least one jacket member for overlying said plurality of insulation segments placed on the pipe;

a plurality of jacket support assemblies for placement between adjacent ones of said insulation segments and for placement upon a pipe to support said jacket member at a distance from the pipe,

each said jacket support assembly of said plurality of jacket support assemblies comprising, at least:

a brace member including at least two opposing end portions and a top edge on which to support lagging;

first leg member attached to and protruding from one end portion of said brace member;

second leg member attached to and protruding from the other end portion of said brace member;

said first leg member and said second leg member protruding from said brace member in a radial direction toward a common center of curvature;

each said leg member including, at least, a spacer element engaging said brace member and a foot element extending from said spacer element; and

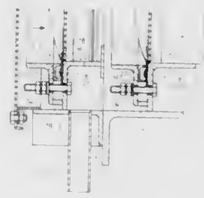
a clamping means for holding said first foot element and said foot element in a position adjacent a pipe.

4,925,623

CLAMPING ARRANGEMENT FOR STAINLESS STEEL FIBER FILTER ELEMENTS

Hans-Georg Dillmann, Eggenstein-Leopoldshafen; Horst Pasler, Hochstetten, and Hans Martinsteg, Roetgen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 214,123
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723888
Int. Cl.[5] G21C *9/00*
U.S. Cl. 376—314 3 Claims



1. A clamping arrangement for stainless steel fiber filter elements disposed on channels of pressure relief systems of safety containments of nuclear installations having ducts with walls defining said channels, said arrangement including a support frame extending around the inner surface of said duct walls and providing an inwardly projecting collar having a side surface normal to said duct walls and forming a support surface, a stainless steel fiber filter element extending across said support frame and having a peripheral area disposed on said support surface, a circumferential clamping structure engaging the stainless steel fiber filter element at its peripheral area, and including a clamping frame disposed over said support surface and bolted to said support frame, said clamping frame including a U-shaped frame component having legs projecting toward said support surface into firm engagement with the peripheral area of said filter element and a stop collar extending around said clamping frame in abutment with said support surface, and having a width adapted to provide for firm predetermined compression of said filter element peripheral area by the legs of said U-shaped frame component in series-parallel seal relationship, wherein the circumferentially outer ends of the filter elements are enclosed within the duct walls such that any leakage around the filter element edge is contained within said channel.

VOL 1114 ISS 3 MY 15 1990 UMI

4,925,624

PRESSURIZED WATER NUCLEAR REACTOR WITH SOLID PARTITIONING

Gérard Chevereau, Le Raincy; Claude Cauquelin, Neauphle le Chateau, and Alain Heuze, Paris, all of France, assignors to Framatome, Courbevoie, France

Filed Dec. 20, 1988, Ser. No. 286,820
Claims priority, application France, Dec. 22, 1987, 87 17923
Int. Cl.[5] G21C *11/06, 15/02*
U.S. Cl. 376—400 10 Claims



1. A pressurized water nuclear reactor having

a core formed by fuel assemblies of prismatic shape disposed side by side inside a cylindrical casing having a vertical axis;

a solid partitioning located in a space reserved between the core and the casing, the partitioning being formed as a vertical stack of rings each completely surrounding the core, whose external periphery is received in the casing and separated therefrom by a clearance and whose internal periphery matches the external contour of the core; and

keying means fixed to the casing and projecting into vertical grooves formed in the rings for centering said rings with respect to the core casing,

wherein said stack is formed with a plurality of vertical channels each consisting of a plurality of vertical mutually aligned passages each formed in a respective one of said rings, each channel containing a plurality of vertically aligned plugs and each of said plugs being devoid of connection with the other ones of the plugs, being individually supported by a respective one of said rings, being centered in the passage in the respective ring and defining therewith a restricted water flow passage, some at least of said plugs projecting upwardly above the respective ring into a cavity of the ring placed above said respective ring.

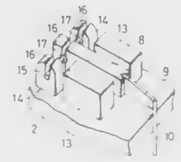
4,925,625

DOT PRINT HEAD HAVING A TORSION BAR WITH ELASTIC PORTIONS

Masashi Shimosato, and Kuniaki Ochiai, both of Mishima, Japan, assignors to Tokyo Electric Company, Ltd., Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,883
Claims priority, application Japan, Oct. 15, 1987, 62-260699; Jan. 8, 1988, 63-002087
Int. Cl.[5] B41J *3/02*
U.S. Cl. 400—124 4 Claims

1. A dot print head comprising: a plurality of cores; a plurality of solenoids mounted respectively on the cores, the magnetism of each solenoid being varied for printing; a plurality of supporting parts; a plurality of armatures disposed respectively opposite the cores and between the adjacent supporting parts, each armature being allowed to be turned so as to move a stylus held thereon toward a platen for printing by selectively varying the magnetism of the corresponding solenoid, and torsion bars each having elastic portions so as to extend on the opposite sides of the armature and connecting the armature and the adjacent supporting parts; wherein an open groove for receiving the torsion bar and for containing a brazing filler metal for brazing the torsion bar is formed at least in either the armature or each supporting part, and flanges are formed integrally with the torsion bar so as to be positioned between the elastic portions and the opposite ends of the open grooves



respectively, said open groove extending across the entire width of said armature and said supporting parts, whereby said torsion bar is inserted into said open groove in a direction transverse to the axial direction of said torsion bar.

4,925,626

METHOD FOR PRODUCING A WC-CO-CR ALLOY SUITABLE FOR USE AS A HARD NON-CORROSIVE COATING

Vidhu Anand, 120 Vista Dr., Apt. 5, Sayre, Pa. 18840, and David L. Houck, 5 Mix Ave., Towanda, Pa. 18848

Filed Apr. 13, 1989, Ser. No. 337,678
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—18 1 Claim

1. A method for producing a WC-Co-Cr suitable for use as a coating, said method comprising alloying a mixture consisting essentially of in percent by weight of from about 85 to about 90 tungsten carbide, wherein the particle size of said tungsten carbide is less than about 1 micrometer in diameter, from about 9 to about 11 percent by weight cobalt metal powder, wherein the particle size of said cobalt is from about 1 to about 5 micrometers in diameter, and from about 3.5 to about 4.5 percent by weight chromium wherein said chromium is provided as chromium carbide to produce a Wc-Co-Cr alloy said alloy capable of being used as a coating wherein the hardness of said coating is from about 1060 to about 1240 DPH carbide hardness and from about 870 to about 980DPH matrix hardness and wherein the roughness is from about 190 to about 200 AA.

4,925,627

OIL SAMPLING DEVICE

Gerald K. Johnson, 12908 Valleywood Dr., Woodbridge, Va. 22193

Filed Jan. 15, 1988, Ser. No. 144,138
Int. Cl.[5] B67C *3/16*
U.S. Cl. 422—99 11 Claims

1. An oil sampling device adapted for insertion through a tubular guide into the crankcase of an internal combustion engine to remove an oil sample from said crankcase, comprising:

(a) an elongated hollow tube having opposite first and seconds end sand a passageway connecting said first and second ends, said hollow tube being adapted to be inserted through a tubular guide in an internal combustion engine with said first end immersed in oil in the crankcase of said engine;

(b) means defining a chamber having a lower end, said walls and an open end, said lower end being connected to said second end of said hollow tube such that said passageway of said tube communicates with said chamber;

(c) valve actuating means in said chamber; and

(d) means defining a closed, vacuum filled sample receptacle for insertion into and withdrawal from said chamber through said open end thereof, said sample receptacle

comprising valve means arranged to be automatically opened by said valve actuating means when said sample receptacle is inserted in said chamber to connect said passageway in said tube with said sample receptacle and to be automatically closed when said sample receptacle is



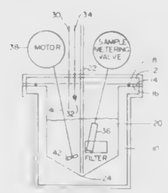
withdrawn from said chamber; whereby a sample of oil may be drawn by vacuum from said crankcase of said engine, when said vacuum filled sample receptacle is inserted in said chamber and said first end of said hollow tube is immersed in said oil, through said passageway in said tube and into said sample receptacle.

4,925,628

SAMPLE PREPARATION CHAMBER WITH MIXER/GRINDER AND SAMPLE ALIQUOT ISOLATION

Andre Metzger, Le Verger, France; Peter Grimm, Frenkendork, Switzerland; Andre J. Nohl, Menlo Park, and Vance J. Nau, Cupertino, both of Calif., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 942,198, Dec. 16, 1986. This application Jul. 7, 1987, Ser. No. 70,759
Int. Cl.[5] G01N *1/10*
U.S. Cl. 422—100 16 Claims



1. A sample preparation chamber for allowing samples of different compositions to be prepared for assay including a container having a bottom with at least one lowest region which is lower than all other regions in said bottom, said bottom having a configuration that tends to cause gravity to drive sample in said container to said at least one lowest region, comprising:

means insertable into said container for mixing non-homogeneous mixtures;

a fill/empty tube entering said container and having an inlet/outlet port located at said at least one lowest region; and

sample metering means coupled to said container for isolating a known volume of sample from sample in said container and for allowing the known volume of sample to be released back into said container;

wherein said container comprises a first cup having a lip defining a first opening, a second cup for receiving said first cup and having a flange defining a second opening and further having means for receiving said lip onto said flange, and a cap having an edge for compression against said lip for sealing said first opening; and

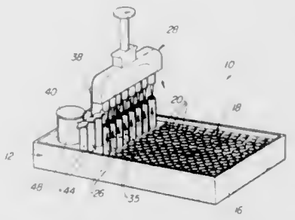
wherein said sample preparation chamber further comprises means for latching said cap against said first cup and said second cup, including a latch piece disposed adjacent said flange and said cap and having a notch for receiving said edge of said cap and said flange of said second cup, and a camming lever for compressing said cap edge against said flange and for compressing said lip of said first cup against said lip receiving means of said flange, with said camming lever rotatably carried by said latch piece and including a cam for contacting at least one of said cap edge and said flange of said second cup when said edge and said flange are positioned within said notch of said latch piece, where said cam is configured for compressing said cap edge against said flange of said second cup upon rotation of said camming lever.

4,925,629

DIAGNOSTIC DEVICE

Willfried Schramm, Ann Arbor, Mich., assignor to BioQuant, Inc., Ann Arbor, Mich.

Filed Jul. 28, 1988, Ser. No. 225,194
Int. Cl.[5] G01N *30/00*
U.S. Cl. 422—82.05 10 Claims



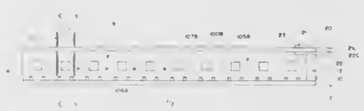
9. A device as set forth in claim 8 wherein said cover means (34) includes a plurality of interconnected plugs (34), each of said plugs (34) being seated within a respective one of said standard tubes (26).

4,925,630

SAMPLE VIALS TRAY

James L. Grunwald, 520 Young Dr., Owatonna, Minn. 55060

Filed May 16, 1989, Ser. No. 352,725
Int. Cl.[5] C12M *1/00*
U.S. Cl. 422—104 10 Claims



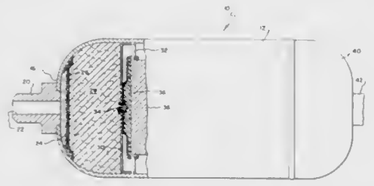
1. Sample vials tray having a finite-length extending between a lead-end and a trail-end, said tray having a midpoint located substantially midway said lead-end and trail-end and comprising:

(A) a first-channel extending lengthwise from said trail-end to said midpoint and comprising:

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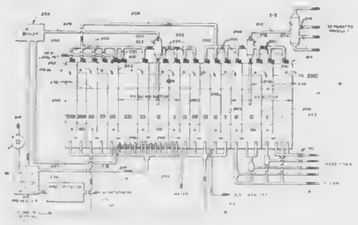
(Ai) a horizontal roof-panel having means defining a plurality of apertures spaced therealong to accommodate an upper portion of each of a plurality of sample vials,
(Aii) a horizontal floor-panel, and
(Aiii) an upright side-panel connection between said first-channel roof-panel and said floor-panel, said side-panel having a pair of upright planar opposed surfaces including an inner-surface and an outer-surface;
(B) a second-channel extending lengthwise from said lead-end to said midpoint and comprising:
(Bi) a horizontal roof-panel having means defining a plurality of apertures spaced therealong to accommodate an upper portion of each of a plurality of sample vials,
(Bii) a horizontal floor-panel, and
(Biii) an upright side-panel connection between said second-channel roof-panel and said floor-panel, said side-panel having a pair of upright planar opposed surfaces including an inner-surface and an outer-surface;
(C) at said tray midpoint, hinge means pivotably connecting said first-channel to said second-channel, said hinge means being located at the side-panels of both channels but being relegated inwardly from outer-surfaces of said side-panels whereby said tray can be alternatively employed:
(Ci) a stored vials, folded mode wherein the outer-surface of the first-channel side-panel lies alongside the outer-surface of the second-channel side-panel, and
(Cii) a vials laboratory analysis mode wherein the side-panels of the two channels extend colinearly in opposite directions from the tray midpoint; and
(D) located wholly remote from said hinge means, latch means attached to one channel to releasably latch the other channel into colinearity with the one channel and thereby releasably maintain the laboratory analysis mode for said sample vials tray.

4,925,631
METHOD OF CASTING A HOPCALITE FILTER AND CAST CERAMIC FIBER-HOPCALITE
Van N. Harwood, Jr., Williamsville, and Joseph F. Wojtasik, Buffalo, both of N.Y., assignors to Figgie International, Inc., Willoughby, Ohio
Filed Sep. 26, 1988, Ser. No. 249,414
Int. Cl.[5] A62B *7/08;* **B01D** *53/04;* **B01J** *27/232, 23/34*
U.S. Cl. 422—122 **9 Claims**



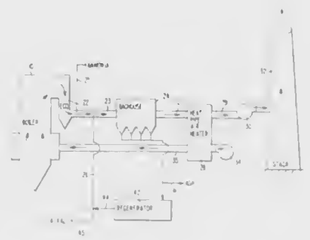
1. A method of making a cast filter comprising the following steps:
providing green hopcalite precipitate comprised of $CuCO_3 \cdot Cu(OH)_2$ and $MnCO_3$;
adding to the green hopcalite a given weight by percentage of ceramic fibers and water to make up a slurry wherein said fibers are added in an amount sufficient to hold a subsequently molded product together;
blending the above slurry briefly in a high speed blender;
introducing the resultant product into a mold of desired cross sectional shape and size to form a cast filter;
draining the water from the above product; and
calcining the above product at a temperature of approximately 600°–650° F. for approximately 90 minutes.

4,925,632
LOW PROFILE FLUID CATALYTIC CRACKING APPARATUS
Milton B. Thacker, 1590 Devonshire Dr., Salt Lake City, Utah 84108; John M. Limburg, 671 E. Walnut Brook Dr., Murray, Utah 84107, and Vincent J. Memmott, 335 W. Willowood Cir., Centerville, Utah 84104
Continuation of Ser. No. 150,188, Jan. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 12,285, Feb. 9, 1987, abandoned, and Ser. No. 127,945, Dec. 2, 1987, abandoned. This application Aug. 25, 1989, Ser. No. 399,433
Int. Cl.[5] B01J *8/18, 8/26;* **F27B** *15/00*
U.S. Cl. 422—142 **26 Claims**



26. An apparatus for cracking hydrocarbonaceous feedstock through contact of the feedstock with a catalyst, the apparatus comprising:
(a) a reactor section comprising at least one cell means for exposing feedstock to the catalyst, said reactor section receiving fresh catalyst at an input end thereof and discharging used catalyst from an output end thereof;
(b) a regenerator section comprising at least one cell means for removing impurities from the used catalyst discharged from said output end of said reactor section to produce therefrom fresh catalyst to be supplied to said input end thereof, said regenerator section being disposed at essentially the same vertical height as said reactor section;
(c) a first seal cell means being fixedly interposed between output end of said reactor section and said input end of said regenerator section, and a second seal cell means fixedly interposed between said output end of said regenerator section and said input end of said reactor section, said first and second seal cell means isolating the atmosphere in said reactor section from the atmosphere in said regenerator section while catalyst advances through said apparatus in a predetermined flow direction, said first and second seal cell means being at essentially the same vertical height as aligned with said reactor and regenerator sections so as to define in combination therewith a low profile catalytic cracker comprising a continuous flow closed loop through which said feedstock and catalyst flow during processing;
(d) first pneumatic means for supplying and introducing into said reactor section for cracking a fluidizing medium comprising hydrocarbonaceous feedstock;
(e) second pneumatic means for supplying and introducing into said reactor section a fluidizing medium comprising an oxidizing gas;
(f) third pneumatic means for supplying and introducing into said seal cell means a fluidizing medium comprising a nonoxidizing gas so as to form in said second seal cell cell means a first atmospheric seal within said closed loop which prevents said oxidizing gas in said regenerator section from entering said reactor section, and so as to form in said first seal cell cell means a second atmospheric seal within said loop which prevents said feedstock from entering said regenerator section. ; and
(g) each said cell means comprising a lift chamber and a drop chamber, each said chamber housing in the bottom thereof a catalyst reservoir, and housing in the top thereof an atmosphere reservoir, each of said chambers being connected at one side thereof to a succeeding chamber by a catalyst opening located at a lower end of each said chamber, and each said chamber being connected on the other side thereof to a preceding chamber by an opening located at the upper end of each said chamber.

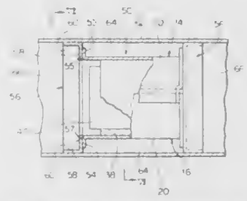
4,925,633
COMBINED CATALYTIC BAGHOUSE AND HEAT PIPE AIR HEATER
John B. Doyle, Massilon, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.
Division of Ser. No. 224,419, Jul. 25, 1988, Pat. No. 4,871,522. This application Mar. 10, 1989, Ser. No. 322,312
Int. Cl.[5] B01J *8/02*
U.S. Cl. 422—171 **3 Claims**



1. An apparatus for controlling emissions of a fossil fuel fired boiler which produces flue gases containing SO_x, NO_x and particulates, comprising:
a flue gas duct for carrying flue gases from the boiler;
a hot catalytic baghouse connected along the flue gas duct for removing the particulate from the flue gas passing along the flue gas duct;
an air heater connected along the flue gas duct downstream of the baghouse for being heated by the flue gases in the flue gas duct, said air heater having heating surfaces which are coated with a catalyst for catalyzing a reaction between ammonia and NO_x;
a combustion air duct connected to the air heater for carrying combustion air to be heated by heat in the air heater;
means for injecting ammonia into the flue gas duct upstream of the baghouse; and
means for injecting alkali into the flue gas duct upstream of the baghouse whereby alkali and ammonia react with SO_x and NO_x in the baghouse for cleaning the flue gas before it is supplied to the air heater.

4,925,634
CATALYTIC CONVERTER FOR USE WITH INTERNAL COMBUSTION ENGINE
Osamu Yokokoji, Tsu, and Masuo Fukuda, Omiya, both of Japan, assignors to Sankei Giken Kogyo Kabushiki Kaisha, Japan
Continuation of Ser. No. 599,280, Apr. 11, 1984, abandoned. This application Jul. 25, 1988, Ser. No. 225,567
Claims priority, application Japan, May 13, 1983, 58-83905
Int. Cl.[5] B01J *8/00;* **F01N** *3/10*
U.S. Cl. 422—179 **3 Claims**

1. An insulated, muffled, straight-line flow catalytic converter which is formed under a constant load for high quantity production, consisting essentially of:
a generally cylindrical catalyst carrier having an approximate dimension of length and an approximate dimension of diameter which may be less than, greater than or equal to a desired diameter and which falls within an expected diameter deviation, and having a longitudinal central axis;
a circumferential retainer member resiliently surrounding substantially the given length of said catalyst carrier;
a first generally hemicylindrical casing half extending through approximately 180° about said central axis and terminating in a pair of longitudinal ends each having a radially extending annular end flange, said casing half being longer than the length of said carrier and terminating at the side edges thereof in a pair of longitudinally extending end faces, said casing half having on each side thereof a longitudinal flange extending substantially the length of said casing half, each longitudinal flange including a generally planar coupling wall portion having said longitudinally extending end face;
a second generally hemicylindrical casing half extending through approximately 180° about said central axis and terminating in a pair of longitudinal ends each having a radially extending annular end flange; said second casing half being longer than the length of the carrier and terminating at the side edges thereof in a pair of longitudinally extending end faces, said second casing half having a radially outwardly extending longitudinal flange extending longitudinally substantially the length of said second casing half and having an inner face and each longitudinal flange terminating in a generally perpendicular flange including a generally planar coupling wall portion extending generally perpendicular to and substantially the length of said longitudinal flange and extending a tangential distance sufficient to overlap the adjacent coupling wall



portion with a clamping margin between each end face of said coupling wall portion of said first casing half and said inner face of said longitudinal flange of said second casing half defining a spacing which allows for different diameter catalyst carriers to be mounted within said first and second casing halves;
said first casing half and said second half being adapted to retain and circumferentially surround said carrier and said retainer member when a predetermined load is applied with said adjacent coupling wall portions being in mating and overlapping relationship and with the distance of overlap being greater than said clamping margin but sufficient to retain said carrier in a fixed position within the cylindrical casing having said annular end flanges and being formed by said mated casing halves regardless of the expected diameter deviation of the diameter of the catalyst carrier received in said casing and with said adjacent coupling wall portions having a sufficient amount of overlap to accommodate catalyst carriers of different diameters;
first an second short cylindrical tubes, each having the same diameter which is greater than a diameter of said, annular end flanges of said generally cylindrical casing and each having a radially inwardly extending flange surrounding an orifice which is in a plane perpendicular to said central axis, each short tube being individually affixed along an inner periphery of an outwardly facing surface of said flange of said tube to an adjacent outwardly facing surface of one of said annular end flanges of said generally cylindrical casing; and

VOL
1114
ISS
3
MY
15
1990
UMI

an elongate outer tube extending circumferentially about said central axis, said first and second short tubes having said cylindrical casing joined thereto between said first and second short tubes, and being received within said outer tube to form a heat insulating chamber between said cylindrical casing and said outer tube, said outer tube extending longitudinally beyond said short tubes to form at least two muffling chambers, one between said first short tube and a first end of said outer tube and another between said second short tube and a second end of said outer tube.

4,925,635

TEMPERATURE CONTROL FOR A KOH TREATER

Joe B. Hampton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 714,226, Mar. 21, 1985, Pat. No. 4,797,199. This application Oct. 24, 1988, Ser. No. 261,810

Int. Cl.[5] **G05D** *9/00, 23/00;* **F28D** *7/00*

U.S. Cl. 422—202 **5 Claims**



1. Apparatus comprising:

a KOH treater;

means for providing propane containing HF acid as a feed to said KOH treater;

means for withdrawing propane containing a substantially reduced concentration of HF acid with respect to the concentration of HF acid in said feed provided to said KOH treater, from said KOH treater;

means for passing a cooling fluid in heat exchange with the external surface of said KOH treater, wherein said cooling fluid withdraws heat caused by the reaction of KOH and HF acid from said KOH treater and wherein

said means for passing said cooling fluid in heat exchange with the external surface of said KOH treater comprises:

an external jacket surrounding said KOH treater;

means for passing said cooling fluid through said external jacket, wherein said cooling fluid passes in heat exchange with the external surface of said KOH treater;

means for establishing a first signal representative of the selected pressure in said external jacket;

means for establishing a second signal representative of the actual pressure in said external jacket;

means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal and said third signal is scaled so as to be representative of the rate in which vapor should be withdrawn from said external jacket so as to maintain the actual pressure in said external jacket substantially equal to the selected pressure represented by said first signal;

means for manipulating the withdrawal of vapor from said external jacket in response to said third signal;

means for establishing a fourth signal representative of the actual liquid level in said external jacket;

means for establish a fifth signal representative of the selected liquid level in said external jacket;

means for comparing said fourth signal and said fifth signal and for establishing a sixth signal which is responsive to the difference between said fourth signal and said fifth signal, wherein said sixth signal is scaled so as to be representative of the rate at which liquid should be withdrawn from said external jacket in order to maintain the actual liquid level in said external jacket substantially equal to the selected liquid level represented by said fifth signal; and

means for manipulating the withdrawal of liquid from said external jacket in response to said sixth signal.

4,925,636

APPARATUS FOR DIRECTIONAL SOLIDIFICATION OF A CRYSTAL MATERIAL

Louis H. Hemmerdinger, Old Bethpage, N.Y.; Gregory W. Knowles, Lexington, Va., and George B. Patterson, Bellport, N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 14, 1987, Ser. No. 132,224

Int. Cl.[5] **C30B** *13/16*

U.S. Cl. 422—248 **12 Claims**



1. A furnace for growing crystals, comprising:

a muffle for accepting an ampoule containing a crystal forming material, the muffle movable relative to the ampoule;

heating means encircling a substantial portion of the muffle for generating heat to melt the crystal material;

insulating means surrounding the heating means and the muffle for substantially sealing the heat within the muffle so as to substantially reduce the amount of heat needed for heating the same;

means for confining the insulating means around the muffle to support the muffle and ampoule against external vibrations;

cooling means in contact relationship with the confining means for providing cooling therealong,

means for establishing a first temperature gradient to solidify the melted crystal material; and

means for establishing steep short temperature gradients for providing a controlled but rapid drop in temperature in a short axial distance along the furnace to effect an equilibrium temperature, thereby shortening the length and reducing the weight and volume of the furnace.

4,925,637

LIQUID FEED SUPPLEMENT FOR MONOGASTRIC ANIMALS

William E. Julien, 3459 Lindenwood, Sioux City, Iowa 51104, and Stephen P. Krajicek, 4635 Calvert, No. 3, Lincoln, Nebr. 68506

Filed May 22, 1987, Ser. No. 53,315

Int. Cl.[5] **A23K** *1/00*

U.S. Cl. 426—2 **7 Claims**

1. A liquid feed supplement, consisting essentially of aromatic flavoring agents in a fat-soluble acid carrier solution uniformly blended with vegetable oils and fats from a blend of first and second fat sources which are in liquid form at ambient temperature; wherein said first fat source is selected from the group of fats structurally made up of fatty acids with a carbon chain length between 4 and 24 carbon atoms and said second fat source is selected from the group of fats structurally made up of fatty acids with a carbon chain length between 14 and 24 carbon atoms;

said blend overcoming caloric satiety in monogastric animals when coated on dry animal feed and fed to the animals.

4,925,638

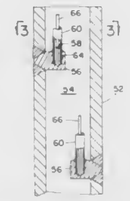
THERMOWELL ASSEMBLY FOR A VESSEL

Bhaven Chakravarti, Bloomfield, and Thomas W. Johnson, Kearny, both of N.J., assignors to Lummus Crest Inc., Bloomfield, N.J.

Filed Aug. 28, 1984, Ser. No. 644,994

Int. Cl.[5] **G01K** *13/02*

U.S. Cl. 422—310 **4 Claims**



1. A thermowell assembly for positioning a plurality of thermocouples at diverse longitudinal positions thereof, which comprises:

an elongated tube member including a channel;

a plurality of arm members mounted to said tube member and extending into said channel of said tube member, each of said arm members being formed with a cavity to receive a terminal end portion of a thermocouple guide tube; and

a plurality of thermocouple guide tubes including a passageway disposed within said channel of said elongated tube, each of said guide tubes being mounted to a respective arm member, each of said passageways of a thermocouple guide tube capable of receiving a thermocouple.

4,925,639

REMOVAL OF NITRIC OXIDE FROM WASTE GASES AND RECOVERY AS NITRIC ACID

John E. Stauffer, 6 Pecksland Rd., Greenwich, Conn. 06831

Continuation-in-part of Ser. No. 40,185, Apr. 17, 1987, Pat. No. 4,830,718, which is a continuation-in-part of Ser. No. 789,490, Oct. 21, 1985, abandoned. This application Jan. 27, 1989, Ser. No. 303,159

Int. Cl.[5] **C01B** *21/00, 21/38, 21/40;* **C25B** *1/22*

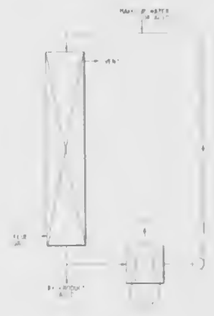
U.S. Cl. 423—235 **6 Claims**

1. A process for the mitigation and control of air pollution caused by the emission of nitric oxide in effluent vent, flue or exhaust gas, said process comprising the removal of nitric oxide from such effluent vent, flue or exhaust gas by means of the steps of:

scrubbing the gas in a column comprising means both for scrubbing and electrolyzing, with an acid stream comprising aqueous nitric acid to solubilize and remove nitric oxide from the gas, said means comprising packing material that is electrically conductive,

while, simultaneously with said scrubbing, subjecting the nitric acid stream containing the thus solubilized nitric oxide to electrolysis in the column such that the solubilized nitric oxide is oxidized to nitric acid, said electrolysis being conducted by applying a potential across two electrodes one of them being an anode in the column which comprises the electrically conductive packing material which serves both as the anode and as a gas-liquid contact surface for scrubbing,

removing from the column the nitric acid stream resulting from the electrolysis step and recycling the nitric acid stream to the column, while maintaining the concentration



of the nitric acid in the recycled stream by means of make-up water or acid.

4,925,640

METHOD FOR DENITRATION OF EXHAUST GAS CONTAINING ARSENIC COMPOUNDS BY CATALYSTS AND METHOD

Atsushi Morii; Toshio Koyanagi; Hiromu Takatsuka, and kouzou Iida, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1988, Ser. No. 232,610

Claims priority, application Japan, Aug. 14, 1987, 62-201878; Sep. 30, 1987, 62-244135

Int. Cl.[5] **B01J** *8/00;* **C01B** *17/00*

U.S. Cl. 423—239 **14 Claims**

1. In a dry denitration method for denitrating an exhaust gas containing arsenic compounds by contacting the gas with ammonia and a denitrating catalyst in a denitration reactor, the improvement which comprises adjusting the atmosphere of the denitration reactor so that the relative humidity is 40% and 100%.

4,925,641

PROCESS FOR PREPARING ALUMINUM BORATE WHISKERS

Takao Kitamura; Kohji Sakane; Hideo Wada, all of Takamatsu; Hajime Hata, and Hajime Kanbara, both of Marugame, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo and Shikoku Chemicals Corporation, Kagawa, both of, Japan

Filed Jun. 16, 1988, Ser. No. 207,538

Claims priority, application Japan, Jun. 20, 1987, 62-152418; Jun. 20, 1987, 62-152419

Int. Cl.[5] **C01B** *35/12*

U.S. Cl. 423—279 **5 Claims**

1. A process for the preparation of an aluminum borate whisker having a composition represented by the formula $9Al_2O_3.2B_2O_3$, a fiber diameter of 0.05 to 5 μm, a fiber length of 2 to 50 μm and an aspect ratio of 10 to 100, which comprises reacting (i) at least one aluminum-supplying component selected from the group consisting of aluminum hydroxides and inorganic salts of aluminum and (ii) at least one boric acid-supplying component selected from the group consisting of boron oxides, boron oxyacids and alkali metal salts of boron oxyacids, in the presence of at least one flux selected from the group consisting of sodium chloride, potassium chloride, alkali metal sulfates and alkali metal carbonates at a temperature of 1000° to 1200° C. for at least 30 minutes to effect growing of the whisker, wherein the aluminum-supplying component is mixed with the boric acid-supplying component so that the alumi-

VOL
1114
ISS
3
MY
15
1990
UMI

num/boron molar ratio is from 1/4 to 9/1, and the flux is added in an amount of 10 to 95% by weight based on the total mixture.

4. A process for the preparation of an aluminum borate whisker having a composition represented by the formula of $2Al_2O_3.B_2O_3$, a fiber diameter of 0.05 to 5 μm, a fiber length of 2 to 50 μm and an aspect ratio of 10 to 100 which comprises reacting (i) at least one aluminum-supplying component selected from the group consisting of aluminum hydroxides and inorganic salts of aluminum and (ii) at least one boric acid-supplying component selected from the group consisting of boron oxides, boron oxyacids and alkali metal salts of boron oxyacids, in the presence of at least one flux selected from the group consisting of sodium chloride, potassium chloride, alkali metal sulfates and alkali metal carbonates at a temperature of 600° to 1000° C. for at least 30 minutes to effect growing of the whisker, wherein the aluminum-supplying component and the boric acid-supplying component are mixed so that the aluminum/boron molar ratio is from 1/9 to 6/4 and the flux is added in an amount of 10 to 95% by weight based on the total mixture.

4,925,642

PROCESS FOR THE PREPARATION AND THE ISOLATION OF AROMATIC NITRILES

Hayman Stollar, Beer-Sheva, Israel, and Abram Becker, Paris, France, assignors to Bromine Compounds Limited, Israel

Filed May 24, 1988, Ser. No. 198,155
Claims priority, application Israel, May 29, 1987, 82694
Int. Cl.[5] C07C *253/14*
U.S. Cl. 423—364 27 Claims

1. A method for the isolation of aromatic nitriles from a reaction mixture provided by the Rosenmund-von Braun reaction of a ring halogenated aromatic compound with cuprous cyanide in an organic solvent in which said aromatic nitrile is soluble and said cuprous cyanide is insoluble, said method comprising:

(a) adding water to said reaction mixture after said reaction is substantially completed so that said reaction mixture includes an aqueous phase and an organic phase comprising said aromatic nitrile and said organic solvent;

(b) adding an alkaline metal cyanide to said reaction mixture, in a quantity substantially stoichiometric with said ring halogenated aromatic compound, thereby forming a suspension of said cuprous cyanide;

(c) separating said suspension of said cuprous cyanide; and

(d) separating said organic phase comprising said aromatic nitrile and said organic solvent.

17. A method for the isolation of CuCN from a reaction mixture comprising aromatic nitriles and copper halides provided by Rosemund-von Braun reaction of a ring halogenated aromatic compound with CuCN in an organic solvent in which said aromatic nitrile is soluble and said CuCN is insoluble, said method comprising;

(a) adding water to said reaction mixture after said reaction is substantially completed;

(b) adding an alkali metal cyanide to said reaction mixture, in a quantity substantially stoichiometric with said ring halogenated aromatic compound, thereby forming a suspension of said CuCN; and

(c) separating said suspension of said CuCN from said reaction mixture, thereby recovering said CuCN.

4,925,643

REGENERATION OF NITROUS ACID BY OXIDATION WITH DIRECT APPLICATION OF HEATED NITRIC ACID

David F. Steele, Caithness, United Kingdom, assignor to United Kingdom Atomic Energy Authority, London, England

Division of Ser. No. 205,848, Jun. 13, 1988, Pat. No. 4,874,485.
This application Jan. 23, 1989, Ser. No. 299,652
Claims priority, application United Kingdom, Jun. 29, 1987, 8715195; Jun. 29, 1987, 8715196
Int. Cl.[5] C01B *21/40*
U.S. Cl. 423—393 3 Claims



1. A method for regenerating an aqueous liquid comprising nitrous acid and/or oxides of nitrogen, comprising feeding the liquid to a column such that the liquid descends through the column, heating to its boiling point an aqueous solution comprising nitric acid such that the heated said nitric acid refluxes into the column, and passing an oxygen-containing gas into the liquid, whereby the liquid is converted substantially to nitric acid as it descends in the column.

4,925,644

PARTIAL OXIDATION OF SULFUR-CONTAINING SOLID CARBONACEOUS FUEL

Mitri S. Najjar, Hopewell Junction, and Roger J. Corbeels, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 62,018, Jun. 15, 1987, Pat. No. 4,801,438. This application Nov. 28, 1988, Ser. No. 276,735
The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.
Int. Cl.[5] B01D *53/34;* C10J *3/00;* C01B *31/18*
U.S. Cl. 423—415 A 8 Claims

1. In a process for the partial oxidation and desulfurization of sulfur and silicate-containing comminuted solid carbonaceous fuel including, basis solid fuel, 0.2 to 6.0 wt. % sulfur and 0.1 to 30 wt. % of silicate compounds including iron silicate the improvement comprising: (1) introducing into the reaction zone of a free-flow unobstructed vertical down-flowing refractory lined partial oxidation gas generator a feed mixture comprising said solid carbonaceous fuel and supplemental calcium-containing material entrained in a gaseous medium selected from the group consisting of steam, nitrogen, CO_2, recycle synthesis gas, free-oxygen containing gas, and mixtures thereof; and with or without a temperature moderator; (2) reacting in said reaction zone said feed mixture from (1) with a controlled amount of free-oxygen containing gas so that an equilibrium oxygen concentration is provided in the gas phase in the reaction zone with partial pressure which is less than about 10^{-12} atmosphere, the O/C atomic ratio is in the range of about 0.3 to 1.1, the H_2O/solid carbonaceous fuel weight ratio is in the range of about 0.03 to 0.70, the total moles of calcium in the reaction zone is at least equal to about 1.0 times the moles of sulfur in the solid carbonaceous fuel, and about 70 to 98 wt. % of the carbon in said solid carbonaceous fuel is converted into carbon oxides, thereby producing a hot raw product gas mixture comprising H_2, CO, CO_2, less than about

0.05 mole % of the H_2S and COS, at least one gas selected from the group consisting of H_2O, N_2, CH_4, and A, and entrained fly-ash in admixture with calcium sulfide and particulate carbon; wherein the mole ratio in the reaction zone for H_2O/H_2 is in the range of about 0.1 to 0.7, wherein the partial oxidation and desulfurization reactions take place at a temperature which is at least about 400° F. below the softening temperature o the ash in the solid fuel, and a pressure in the range of about 2 to 250 atmospheres; and wherein substantially no elemental iron is produced and there is substantially no formation of additional calcium silicates in the gas generator from said supplemental calcium-containing compound and the silicates from the said solid carbonaceous fuel, and at least about 90 wt. % of the sulfur in the solid carbonaceous fuel in the reaction zone is converted into said calcium sulfide particulate matter which leaves the reaction zone entrained in the hot raw product gas mixture from (1) along with said fly-ash and particulate carbon; and (3) cooling and cleaning the hot raw product gas mixture from (2) without direct contact with water.

4,925,645

METHOD OF PREPARING A MIXTURE OF CHLORINE CONTAINING SUBSTANCES INCLUDING CHLORINE DIOXIDE

James A. Mason, P.O. Box 605, Theodore, Ala. 36590

Filed Oct. 5, 1988, Ser. No. 253,852
Int. Cl.[5] C01B *11/02*
U.S. Cl. 423—477 9 Claims

1. A process for producing a mixture containing chlorine dioxide comprising the steps of:

(a) forming a first solution by introducing an organic acid into water in a reaction vessel said organic acid being selected from the group consisting of lactic acid or citric acid;

(b) mixing said first solution by stirring;

(c) thereafter forming a second solution by introducing sodium chlorite into said first solution following said mixing;

(d) mixing said second solution by stirring; and

(e) storing said stirred second solution containing chlorine dioxide at temperatures not exceeding 80° F. wherein the chlorine dioxide is stable and maintains its original concentration within 2% of its original value for at least 30 days.

4,925,646

PROCESS AND COMPOSITION FOR DRYING OF GASEOUS HYDROGEN HALIDES

Glenn M. Tom, New Milford, and Duncan W. Brown, Wilton, both of Conn., assignors to Advanced Technology Materials, Inc., New Milford, Conn.

Division of Ser. No. 29,631, Mar. 24, 1987, Pat. No. 4,853,148.
This application May 25, 1989, Ser. No. 357,049
Int. Cl.[5] B01D *53/02;* C01B *7/00*
U.S. Cl. 423—488 15 Claims

1. A process for drying a gaseous hydrogen halide of the formula HX, wherein X is selected from the group consisting of bromine, chlorine, fluorine, and iodine, to remove water impurity therefrom and produce an essentially completely water-free gaseous hydrogen halide effluent characterized by residual water concentration of below 0.1 part per million by volume, said process comprising the steps of:

(a) providing an alkylated precursor composition comprising: a support having a vapor pressure of less than 1 part per million by volume, and having associated therewith (i) partially or fully alkylated metal alkyl compounds dispersed in the support and/or (ii) partially or fully alkylated metal alkyl pendant functional groups convalently bonded to the support, which are reactive with gaseous hydrogen halide to form corresponding (i) metal halide compounds dispersed in the support, of the formula MX_y, and/or (ii) metal halide pendant functional groups convalently bonded to the support, of the formula $—MX_{y-1}$, wherein:

M is a y-valent metal selected from the group consisting of lithium (I), beryllium (II), magnesium (II), calcium (II), strontium (II), barium (II), cadmium (II), nickel (I), iron (II), iron (III), zinc (II), and aluminum (III);

y is an integer whose value is from 1 to 3;

M is selected such that the heat of formation of its hydrated halide, $MX_y(H_2O)_n$, is greater than or equal to 10.1 kilocalories per mole of such hydrated halide compound for each hydrated water molecule, wherein n is the number of water molecules bound to the metal halide in the metal halide hydrate;

(b) contacting gaseous hydrogen halide with said alkylated precursor composition for reaction of the gaseous hydrogen halide with said partially or fully alkylated compounds and/or partially or fully alkylated pendant functional groups associated with the support to yield a scavenger composition wherein said support has associated therewith (i) said metal halide compounds dispersed in the support, of the formula MX_y, and/or (ii) said metal halide pendant functional groups covalently bonded to the support, of the formula $—MX_{y-1}$;

(c) contacting water impurity-containing gaseous hydrogen halide with said scavenger composition for reaction of said metal halide compounds and/or metal halide pendant functional groups with the water impurity to yield the corresponding hydrates and/or oxides of the metal halide compounds and/or metal halide pendant functional groups; and

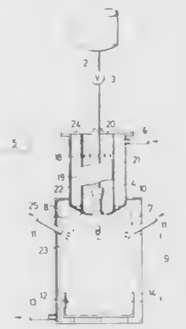
(d) recovering an essentially completely water-free gaseous hydrogen halide effluent characterized by residual water concentration of below 0.1 part per million by volume.

4,925,647

PROCESS FOR THE PRODUCTION OF METAL OXIDES OR METAL MIXED OXIDES

Hermann Kirchhöfer, Niedernberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 22, 1987, Ser. No. 99,909
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632396
Int. Cl.[5] C01B *13/14*
U.S. Cl. 423—592 20 Claims



1. A process for the production of a metal oxide or metal mixed oxide, comprising the steps of:

applying ultrasonic waves to an aqueous solution of at least one water soluble salt of a polyvalent metal in an inert gas atmosphere to disperse the aqueous solution into droplets;

passing the droplets through an outlet aperture into a reaction zone where they are brought into contact with a gas containing ammonia to at least partially precipitate the

VOL 1114 ISS 3 MY 15 1990 UMI

hydroxide of the polyvalent metal in the form of gel spherules which contain metal hydroxide and water; and

collecting the gel spherules; wherein an inert gas laminar flow oriented parallel to the outlet direction of the aqueous solution is generated radially symmetrically about the outlet aperture for the solution, and the gel spherules are dried and converted, by heating, into the metal oxide or metal mixed oxide.

4,925,648

DETECTION AND TREATMENT OF INFECTIOUS AND INFLAMMATORY LESIONS

Hans J. Hansen, Westfield, and Milton D. Goldenberg, Short Hills, both of N.J., assignors to Immunomedics, Inc., Warren, N.J.

Filed Jul. 29, 1988, Ser. No. 226,180
Int. Cl.[5] A61K *49/02, 49/00, 39/395*
U.S. Cl. 424—1.1 16 Claims

1. A polyspecific anti-leukocyte antibody conjugate for targeting foci of leukocyte accretion, comprising an immunoreactive polyspecific composite of at least two different substantially monospecific antibodies or antibody fragments, conjugated to at least one imaging agent, wherein at least two of said antibodies or antibody fragments specifically bind to different leukocyte cell types.

4,925,649

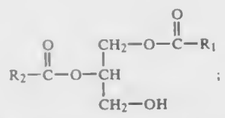
RADIOIODINATED DIACYLGLYCEROL ANALOGUES AND METHODS OF USE

Raymond E. Counsell, and Laurie Strawn, both of Ann Arbor, Mich., assignors to The University of Michigan, Ann Arbor, Mich.

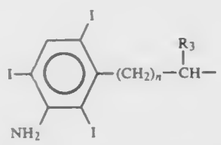
Filed Jun. 12, 1987, Ser. No. 62,530
Int. Cl.[5] A61K *49/02, 49/00*
U.S. Cl. 424—1.1 14 Claims



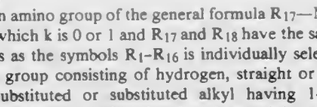
1. A site-specific radioactive tracer compound having the general formula:



wherein R_1 and R_2 are selected from the group consisting of (1) an amino-substituted-2,4,6-triiodophenyl of the general formula:



wherein R_3 is selected from the group of H and lower alkyls, and n is an integer from 1 to 10; (2) a monoiodophenyl of the general formula:



wherein m is an integer from 1 to 10 x is an integer from 0 to 5; and (3(saturated aliphatic hydrocarbon chains having 1 to 25 carbon atoms; wherein only one of R_1 and R_2 has at least one radioactive iodine atom.

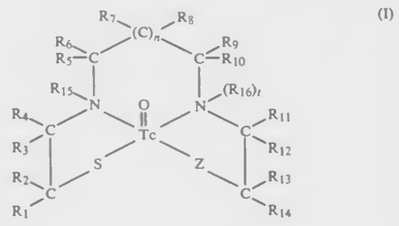
4,925,650

TECHNETIUM -99M COMPLEX FOR EXAMINING THE RENAL FUNCTION

Dennis L. Nosco, Florissant, Mo., and Alfons M. Verbruggen, Leuven, Belgium, assignors to Mallinckrodt, Inc., St. Louis County, Mo.

Filed Nov. 16, 1988, Ser. No. 272,177
Int. Cl.[5] A61K *49/02;* C07F *13/00*
U.S. Cl. 424—1.1 15 Claims

1. Technetium-99m complex of the general formula



(I)

wherein

Z is an amino group of the general formula R_{17}—N—$(R_{18})_k$, in which k is 0 or 1 and R_{17} and R_{18} have the same meanings as the symbols R_1–R_{16} is individually selected from the group consisting of hydrogen, straight or branched, unsubstituted or substituted alkyl having 1–4 carbon atoms, and ACOOH, wherein A is a straight or branched, unsubstituted or substituted alkyl group having 0–4 carbon atoms; and R_5 together with R_6 or R_9 together with R_{10} additionally may form an oxygen atom;

Tc represents technetium-99m;

t is 0 or 1; and

n is 0 or 1;

with the provisos that

(a) if at least one of R_{15}, R_{16}, R_{17} and R_{18} is ACOOH, A is a straight or branched, unsubstituted or substituted alkyl group having 1–4 carbon atoms;

(b) at least one of the symbols R_1–R_{18} is ACOOH; and

(c) if t is 1, at least two of the symbols R_1–R_{18} are ACOOH;

or a pharmaceutically acceptable salt of this compound.

4,925,651

RADIOFLUORO-TYROSINE DERIVATIVES, THE PREPARATION AND USE THEREOF

Heinz H. Coenen, Grevenbroich; Peer Kling, Aldenhoven, and Gerhard Stoecklin, Titz-Kalrath, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Juelich Gesellschaft mit beschrankter Haftung, Juelich, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,804
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800302
Int. Cl.[5] A61K *49/02;* C07C *101/72*
U.S. Cl. 424—1.1 5 Claims

1. Substantially pure 2-[^{18}F]-fluoro-a-methyltyrosine.

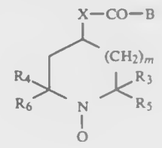
4,925,652

NITROXYL COMPOUNDS, AND DIAGNOSTIC MEDIA BASED THEREON USEFUL FOR ENHANCING NMR IMAGING

Heinz Gries; Ulrich Niedballa, and Hanns-Joachim Weinmann, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,085
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3328365
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] A61K *49/00;* G01N *31/00*
U.S. Cl. 424—9 30 Claims

1. A method of obtaining an MRI image of a patient comprising administering to the patient an amount effective as a contrast agent of a compound of the formula



wherein

B is a pharmacologically acceptable protein, sugar, or lipid residue, that selectively binds to a biological molecule,



is a single or double bond,

X is —$(CH_2)_n$— or, when is a single bond, also —NHCO$(CH_2)_n$— wherein n is an integer 0 to 4,

m is 0, 1, or 2,

R_1 is C_{2-8}-alkyl substituted by hydroxy, C_{2-6}-alkanoyloxy, 2-hydroxy-1,3-dioxolan-4-ylmethyl, 5-hydroxy-2,2-dimethyl-1,3-dioxepan-6-yl or C_{1-6}-alkylidenedioxy,

R_2 independently is one of the R_1 groups, hydrogen or C_{1-4}-alkyl,

R_3 and R_4 independently are C_{1-4}-alkyl, and

R_5 and R_6 independently are C_{1-4}-alkyl or C_{1-4}-alkyl substituted by hydroxy, and scanning to obtain an MRI image.

4,925,653

SUNSCREEN COMPOSITION CONTAINING POLYISOBUTYLENE AND ITS USE FOR THE PROTECTION OF HUMAN EPIDERMIS AGAINST ULTRAVIOLET RADIATIONS

Jean F. Grollier, Paris, and Jean Cotteret, Limay, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 931,043, Nov. 17, 1986, abandoned, which is a continuation of Ser. No. 721,673, Apr. 10, 1985, Pat. No. 4,668,505. This application Jan. 6, 1989, Ser. No. 294,985
Claims priority, application Luxembourg, Apr. 13, 1984, 85,304
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.[5] A61K *7/40, 7/42, 7/44, 9/12*
U.S. Cl. 424—47 5 Claims

1. In a sunscreen composition intended to be applied on human epidermis comprising 1 to 20% by weight of at least one oil-soluble agent absorbing UV-B rays selected from the group consisting of 2-ethylhexyl p-dimethylaminobenzoate, 2-ethylhexyl p-methoxycinnamate, 3-benzylidene-d,l-camphor, 3(4'-methylbenzylidene)-d,l-camphor, amyl 4-dimethylaminobenzoate, 2-ethylhexyl salicylate homomenthyl salicylate, 2-hydroxy-4-methoxybenzophenone, N-(2-ethylhexyl)-4-(3'-methylidenecamphor)benzenesulphonamide and N-(2-ethylhexyl)-3-benzylidene-10 -camphosulphonamide in a cosmetically acceptable medium comprising a fatty phase, said sunscreen composition being in the form of an emulsion, a fatty gel, an oily or oil-alcohol lotion, a solid stick or an aerosol, the improvement comprising adding to said sunscreen composition 1 to 20% by weight of at least one polyisobutylene which is liquid at ambient temperature and which has a viscosity-average molecular weight of between 30,000 and 60,000 in order to increase the sun protection index of said sunscreen composition.

4,925,654

ANTICALCULUS ORAL COMPOSITION

Abdul Gaffar, Princeton; Thomas G. Polefka, Somerset; Robert J. Ferlanto, Jr., Edison, and Rosemarie M. Crisafulli, East Windsor, all of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 842,101, Mar. 20, 1986, Pat. No. 4,806,340, which is a continuation-in-part of Ser. No. 775,851, Sep. 13, 1985, Pat. No. 4,627,977. This application Feb. 8, 1989, Ser. No. 307,448
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[5] A61K *7/16, 7/18*
U.S. Cl. 424—52 16 Claims

1. In an anticalculus oral composition in the form of a toothpaste, dental gel, toothpowder, dental tablet, chewing gum, or lozenge containing in an orally acceptable vehicle tetrapotassium pyrophosphate or mixtures of tetrapotassium and tetrasodium pyrophosphates as essential anticalculus agents; and an amount of a fluoride ion source sufficient to supply about 25 ppm to about 5,000 ppm of fluoride ion, the improvement whereby salivary hydrolysis of pyrophosphate by alkaline phosphatase is inhibited consisting essentially of including in said composition an effective inhibiting amount therefor within the range of about 0.05 to about 3 wt. % of a synthetic anionic polymeric polycarboxylate, said composition being substantially free from solid gritty particles composed of undissolved tetrasodium pyrophosphate.

VOL 1114 ISS 3 MY 15 1990 UMI

4,925,655

POWDER COMPOSITION FOR FORMING A MOUTHWASH

Irwin Smigel, New York, N.Y., and Said I. Raziq, St. Louis, Mo., assignors to Rebell Research

Filed Mar. 4, 1988, Ser. No. 164,248
Int. Cl.[5] A61K *7/18, 7/20, 7/26*
U.S. Cl. 424—52 13 Claims

1. A powder composition which is added to water to form a mouthwash comprising the following ingredients in percent by weight:

Ingredient	Amount
Calcium peroxide	0.5–80.0
Sodium perborate	0.5–80.0
Sodium bicarbonate	1.0–95.0
Tetrasodium pyrophosphate	0.5–50.0
Sodium lauryl sulfate	0.5–4.0
a sweetener	0.5–1.0
a gelling agent	1.0–10.0
an acid pH control agent	0.5–25.0
Potassium carbonate	0.5–10.0
Tea tree oil	0.5–10.0
Thymol, hexyl resorcinol and mixtures thereof	.05–10.0

4,925,656

METHOD FOR RETARDING FORMATION OF DENTAL PLAQUE

Perry A. Ratcliff, 7125 E. Lincoln Dr., Scottsdale, Ariz. 85253

Division of Ser. No. 88,609, Aug. 24, 1987, Pat. No. 4,818,519, which is a continuation-in-part of Ser. No. 24,329, Mar. 10, 1987, Pat. No. 4,837,009, which is a continuation-in-part of Ser. No. 947,079, Dec. 29, 1986, Pat. No. 4,689,215, which is a continuation of Ser. No. 846,342, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 636,027, Jul. 30, 1984, abandoned, and Ser. No. 17,241, Dec. 29, 1986, Pat. No. 4,696,811, said Ser. No. 846,342. This application Dec. 2, 1988, Ser. No. 279,421
Int. Cl.[5] A61K *7/20, 33/20*
U.S. Cl. 424—53 2 Claims

1. A method for retarding the formation of dental plaque caused by streptococcus sanguis bacteria, said method comprising the step of contacting said streptococcus sanguis bacteria within the oral cavity with 0.005% to 0.2% concentration of stabilized chlorine dioxide until the motility and mytotic activity of said streptococcus sanguis bacteria is reduced.

4,925,657

INSECTICIDAL COMPOSITION AND METHOD FOR COMBATTING APHIDS

Antonie A. Den Braber, Putten, and Evert R. Slootweg, Stroe, both of Netherlands, assignors to Denka Internationai B.V., Voorthuizen, Netherlands

Continuation of Ser. No. 815,619. This application Jun. 29, 1987, Ser. No. 70,137
Claims priority, application Netherlands, Jan. 4, 1985, 8500015
Int. Cl.[5] A61L *9/04;* A01N *25/00, 57/00, 57/26*
U.S. Cl. 424—45 17 Claims

1. An aphicidal composition containing a synergistically effective amount of 0.05–4.0% by weight of E-beta-farnesene, and an aphicidal insecticide in an amount ranging from the minimum amount of said aphicidal insecticide effective to kill aphids when said recited amount of said alarm pheromone is present to about 10% less than the minimum amount of said aphicidal insecticide effective to kill aphids when said aphicidal insecticide is used as a sole active ingredient in an aphicidal composition, wherein said aphicidal insecticide is selected from the group consisting of organic chloro insecticides, organic phosphate insecticides, carbamate insecticides, and pyrethroid insecticides.

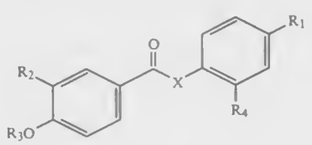
4,925,658

AROMATIC ESTERS AND THIOESTERS AND THEIR USE IN HUMAN OR VETERINARY MEDICINE AND IN COSMETIC COMPOSITIONS

Braham Shroot, Antibes; Jacques Eustache, Grasse, and Jean-Michel Bernardon, Nice, all of France, assignors to Centre International De Recherches dermatologiques (CIRD), Valbonne, France

Filed Jan. 19, 1989, Ser. No. 298,982
Claims priority, application Luxembourg, Jan. 20, 1988, 87109
Int. Cl.[5] A61K *31/255, 31/235;* C07C *69/78, 153/11*
U.S. Cl. 424—70 15 Claims

1. A compound having the formula



(I)

wherein

X represents oxygen or sulfur,

R_1 represents $-CH_2OH$, $-CH(OH)-CH_3$, or $-COOR_5$,

R_5 represents hydrogen, lower alkyl having 1-6 carbon atoms, lower alkenyl, monohydroxyalkyl or polyhydroxyalkyl,

R_2 represents α,α'-disubstituted alkyl having from 4-12 carbon atoms or mono- or polycyclic cycloalkyl having 5-12 carbon atoms whose linking carbon atom is trisubstituted,

R_3 represents hydrogen, lower alkyl having 1-6 carbon atoms and

R_4 represents hydrogen or lower alkyl having 1-6 carbon atoms or

a pharmaceutically acceptable salt of formula I when R_5 represents hydrogen.

13. A cosmetic composition for body and hair hygiene comprising in a cosmetically acceptable vehicle a cosmetically effective amount of at least one compound of formula (I) of claim 1.

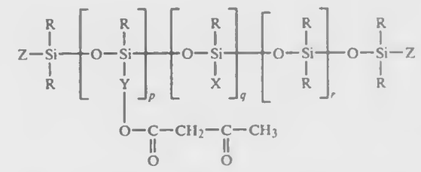
4,925,659

COSMETIC APPLICATION OF POLYSILOXANES CONTAINING A β-KETO ESTER GROUP AND COMPOSITIONS EMPLOYED

Jean F. Grollier, Paris, and Claude Dubief, Le Chesnay, both of France, assignors to L'Oreal, Paris, France

Filed Feb. 2, 1989, Ser. No. 305,640
Claims priority, application Luxembourg, Feb. 8, 1988, 87127
Int. Cl.[5] A61K *31/74, 7/06, 7/00*
U.S. Cl. 424—78 12 Claims

1. A cosmetic composition containing in a cosmetically acceptable medium water, at least one adjuvant chosen from solvents, perfumes, colorings, preservatives, thickeners, anionic, nonionic or amphoteric surfactants or mixtures thereof, sequestering agents, foam stabilizers, humectants, sunscreens, substances which are active in cosmetics and in dermatology and at least one diorganopolysiloxane containing a β-keto ester group, corresponding to the formula:



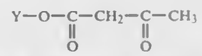
in which:

the groups R, which may be identical or different, denote, independently of one another, C_1–C_4 alkyl, 3,3,3-trifluoropropyl, vinyl or phenyl groups, at least 80%, in numerical terms of the groups R being methyl radicals;

the groups Y, which may be identical or different, denote, independently of one another, a C_1–C_{18} linear or branched alkylene link, optionally extended by a polyether chain;

the groups X, which may be identical or different, denote, independently of one another, a radical Y—OH or Y—O-COR', Y having the meaning stated above and R' being chosen from C_1–C_{18} linear or branched alkyl or alkenyl groups;

the group Z, which may be identical or different, denote, independently of one another, a group R as defined above or alternatively a radical



Y having the meaning stated above, it also being possible for Z to denote a group OR' in which R' has the meaning stated above;

p is an integer between 1 and 50 inclusive, and preferably between 1 and 16 inclusive;

q is an integer between 0 and 30 inclusive, and preferably between 0 and 8 inclusive; and

r is an integer between 0 and 500 inclusive, and preferably between 2 and 50 inclusive;

or a mixture of these copolymers of formula (I), in which case p, q and r can be decimal numbers.

4,925,660

CURABLE COMPOSITIONS FOR DENTAL DRUGS HAVING SUSTAINED RELEASE PROPERTY

Mitsuru Atsuta, Nagasaki; Takeshi Sakashita, Yamaguchi; Ryoichi Miyamoto, Kyoto; Yukinori Tanimura, Yamaguchi, and Saburo Fuji, Hiroshima, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 933,241. This application Apr. 7, 1988, Ser. No. 189,528
Claims priority, application Japan, Nov. 21, 1985, 60-259900; Jul. 18, 1986, 61-168096; Nov. 4, 1986, 61-260766
Int. Cl.[5] A61K *31/78;* C08F *2/48*
U.S. Cl. 424—81 11 Claims

1. A curable composition for dental drugs having sustained release property, which comprises:

(a) a (meth)acrylate monomer,

(b) a polymerization initiator, and

(c) a crude drug ingredient having bactericidal activity,

wherein said composition is polymerized by light irradiation.

4,925,661

TARGET-SPECIFIC CYTOTOXIC LIPOSOMES

Leaf Huang, 352 Dominion Cr., Knoxville, Tenn. 37922

Continuation-in-part of Ser. No. 602,177. This application Feb. 9, 1987, Ser. No. 12,240
Int. Cl.[5] A61K *39/00;* C12Q *1/02*
U.S. Cl. 424—85.91 14 Claims

8. A method of delivering cytotoxic reagents to cells comprising the steps of:

(a) preparing pH-sensitive immunoliposomes from phosphatidylethanolamine and oleic acid in a molar ratio of (8:2) and a fatty acid derivatized antibody;

(b) entrapping an effective amount of a cytotoxic reagent in the pH-sensitive immunoliposome; and

(c) administering said immunoliposomes containing the cytotoxic reagent to cells expressing an antigen which is recognized by said antibody.

4,925,662

ANTI-TUMOR SUBSTANCE AND PROCESS FOR PRODUCING THE SAME

Yoshiharu Oguchi, Tokyo; Koichi Nilmura, Sayama; Takayoshi Fujii, Tokyo; Masahiko Fujii, Komae; Kenichi Matsnnaga, Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 5,302, is a division of Ser. No. 595,037, Mar. 29, 1984. This application Jan. 14, 1988, Ser. No. 143,747
Claims priority, application Japan, Apr. 8, 1983, 58-61923
Int. Cl.[5] A61K *39/44*
U.S. Cl. 424—85.91 40 Claims

1. An anti-tumor substance manufactured by a process comprising:

(a) dissolving an anti-tumor agent selected from the group consisting of chlorambucil, ACNU and cyclophosphamide in aqueous solvent;

(b) adding a bonding agent, selected from the group consisting of carbodiimides, glutaraldehyde, diethylamlonimidate, isocyanate and polyglutamic acid, to the aqueous solution, and then adding human immunoglobulin obtained from a normal healthy person to said aqueous solution, and thereby reacting said human immunoglobulin and of said anti-tumor agent at a temperature of −30° to 50° C. for 1 minute to 48 hours; and

(c) subjecting the thus produced reaction product to purification by means of a method selected from the group consisting of salting out, precipitation, recrystallization, elution and column-fractionation.

4,925,663

BIOLOGICAL CONTROL OF IMPORTED FIRE ANTS WITH A FUNGAL PATHOGEN

Jerry L. Stimac, Gainesville, Fla., assignor to University of FLorida, Gainesville, Fla.

Filed Dec. 31, 1987, Ser. No. 140,018
Int. Cl.[5] C12N *1/14*
U.S. Cl. 424—93 13 Claims

1. A *Beauveria bassiana* which, when in its essentially biologically pure form, has the virulence against fire ants characteristic of *Beauveria bassiana* No. 447 culture deposit ATCC 2087, and mutants thereof.

VOL
1114
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4,925,664

SPIDER TOXINS AND METHODS FOR THEIR USE AS BLOCKERS OF CALCIUM CHANNELS AND AMINO ACID RECEPTOR FUNCTION

J. R. Hunter Jackson, and Thomas N. Parks, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Oct. 20, 1986, Ser. No. 921,218
Int. Cl.[5] A61K *35/58*
U.S. Cl. 424—537 49 Claims

1. A composition functioning as a calcium channel blocker comprising at least one toxin isolated from spider venom, said at least one toxin being capable of functioning as a calcium channel blocker.

4,925,665

GLUCOSE FREE PRIMARY ANTICOAGULANT FOR BLOOD CONTAINING CITRATE IONS

Scott Murphy, Ardmore, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed Jun. 22, 1989, Ser. No. 369,842
Int. Cl.[5] A61K *35/14*
U.S. Cl. 424—532 9 Claims

1. A primary anticoagulant preparation for addition to a human blood platelet preparation consisting essentially of sodium citrate and citric acid and being essentially free of glucose wherein the total amount of citrate anion in said anticoagulant for a blood donation of a unit of blood is between 12 and 50 meq.

4,925,666

SOLUBILIZED BENZOYL PEROXIDE AND COSMETIC SOLUTION INCLUDING SOLUBILIZED BENZOYL PEROXIDE

Donald F. Decker, Jr., 358 W. 46 St., Hialeah, Fla. 33012; Deborah A. Decker, 7425 SW. 12 Ct., North Lauderdale, Fla. 33068, and Kathleen S. Duggins, 4059 Wimbledon Dr., #14, Cooper City, Fla. 33026

Continuation of Ser. No. 16,839, Feb. 20, 1987, Pat. No. 4,857,302. This application Jan. 25, 1989, Ser. No. 301,625
Int. Cl.[5] A61K *7/00*
U.S. Cl. 424—401 3 Claims

1. A method for preparing a cosmetic composition with benzoyl peroxide, comprising the steps of:
- preparing a mixture comprising between about 2% and about 16%, by weight, benzoyl peroxide and between 23% and about 98%, by weight, silicone glycol copolymer; and
- heating said mixture to between about 35° and about 65° centigrade to obtain solubilized benzoyl peroxide in the silicone glycol copolymer.

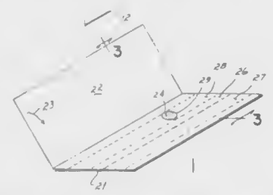
4,925,667

SUBSTRATE WITH PARTICULATE COSMETIC

Charles T. Fellows; George T. Brown, and Robert C. Haines, all of Dayton, Ohio, assignors to QMAX Technology Group, Inc., Dayton, Ohio

Division of Ser. No. 857,199, May 27, 1986, Pat. No. 4,752,496. This application Mar. 9, 1988, Ser. No. 165,999
Int. Cl.[5] A61K *7/035*
U.S. Cl. 424—401 19 Claims

1. A substrate with a particulate cosmetic applied thereto produced by a method comprising the following steps:
- (a) forming a slurry of microcapsules of said cosmetic by combining said cosmetic, a liquid carrier and a film forming component, said film forming component provided in an amount effective to microencapsulate and bind said cosmetic to a substrate when said carrier evaporates;
- (b) adding a plasticizer in an amount effective to prevent said film forming component from altering the texture of said cosmetic after said carrier has evaporated;
- (c) applying said slurry to said substrate;
- (d) evaporating said carrier to thereby form a microencapsulated cosmetic adhered to said substrate wherein said cosmetic comprises insert particulate matter, coloring agents and fragrances and wherein said effective amount



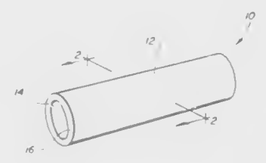
of the film forming component is less than about 12% based on the total of said film forming component o a solid basis and said inert particulate matter.

4,925,668

ANTI-INFECTIVE AND LUBRICIOUS MEDICAL ARTICLES AND METHOD FOR THEIR PREPARATION

Mohammad A. Khan, Sandy, Utah; Donald D. Solomon, Spring Valley, and Matthew P. Byron, Centerville, both of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 18, 1989, Ser. No. 298,393
Int. Cl.[5] A61L *33/00*
U.S. Cl. 424—422 19 Claims



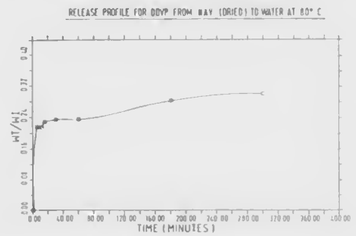
1. A method for preparing a medical article comprising:
- (a) preparing a blend of a first increment of chlorhexidine and pellets of a substantially hydrophilic polymer selected form the group consisting of polyurethane, polyurethaneurea and siloxane-urethane block copolymer;
- (b) heating said blend to a sufficient temperature and for a sufficient time to form a homogeneous melt of said polymer having said first increment of chlorhexidine uniformly distributed therein;
- (c) extruding said melt through a die to form a medical article having said first increment of chlorhexidine bulk distributed throughout said polymer; and
- (d) applying a coating of silicone lubricant and a second increment of chlorhexidine to the surface of said article having bulk distributed chlorhexidine.

4,925,669

THERAPEUTIC COMPOSITIONS FOR VETERINARY USE

Alan Dyer, 4 Park Road, Manchester M8 6HU; Phyllis D. Wells, 4 Monks Hall Grove, Eccles M30 9GL, and Craig D. Williams, 1 Whitburn Drive, Brandlesholme, Bury, Lancashire BL8 1EH, all of United Kingdom

PCT No. PCT/GB87/00147, § 371 Date Nov. 16, 1987, § 102(e) Date Nov. 16, 1987, PCT Pub. No. WO87/05504, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 3, 1987, Ser. No. 124,788
Claims priority, application United Kingdom, Mar. 15, 1986, 8606468
Int. Cl.[5] A23K *1/18*
U.S. Cl. 424—438 6 Claims



1. A therapeutic composition comprising at least one veterinary therapeutic agent, characterised in that the composition comprises at least one substrate selected from zeolites and pillared clays with which the therapeutic agent is associated by internal sorption and/or external adsorption.

4,925,670

ADMINISTRATION AND DOSAGE FORM FOR DRUG ACTIVE AGENTS, REAGENTS OR THE LIKE AND PROCESS FOR THE PREPARATION THEREOF

Wolfgang Schmidt, Hamburg, Fed. Rep. of Germany, assignor to Desitin Arzneimittel GmbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 94,442, Sep. 9, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 344,519
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630603
Int. Cl.[5] A61L *9/70*
U.S. Cl. 424—443 9 Claims

1. A drug dosage form having homogeneity and galenic stability comprising:
- (i) a non-ingestible surface carrier material, and
- (ii) an active agent-containing coating disposed on a first surface of said carrier material, and wherein said coating is subdivided into removable oral dosage units.

4,925,671

SILICONE PRESSURE SENSITIVE ADHESIVE AND USES

Herman Abber, Brockton; Elizabeth H. Gerry, Wellesley Hills, and John R. Pennace, Paxton, all of Mass., assignors to Flexcon Company, Inc., Spencer, Mass.

PCT No. PCT/US84/01068, § 371 Date May 5, 1986, § 102(e) Date May 5, 1986, PCT Pub. No. WO86/00532, PCT Pub. Date Jan. 30, 1986
Continuation-in-part of Ser. No. 324,362, Nov. 24, 1981, abandoned. This PCT application Jul. 7, 1984, Ser. No. 865,750
Int. Cl.[5] A61F *13/02*
U.S. Cl. 424—448 7 Claims

1. A combination of a medical device to be placed in adhesive contact with the skin and a pressure sensitive adhesive at least partially coated on said device, the adhesive permitting passage of medicinal liquids therethrough, said adhesive comprising a mixture of nitroglycerin and:
- the polymerization product of a mixture of reactants comprised of a linear methyl/phenyl polysiloxane gum,
- a linear dimethyl polysiloxane gum, and
- an MQ organopolysiloxane comprising monofunctional and quadrifunctional siloxane units,
- the adhesive permitting passage of nitroglycerin therethrough at substantially constant rate of at least 30 mg./hr./cm^2 as measured over a 27-hour period with the adhesive having a thickness of about 2.2±0.9 mil.

4,925,672

PRODUCTS CONTAINING A CALCIUM ANTAGONIST AND A LIPID-LOWERING AGENT

Dorothee Gremm, Mannheim, and Ingetraud Perstel, Mannheim-Feudenheim, both of Fed. Rep. of Germany, assignors to Knoll AG, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 318,825
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807895
Int. Cl.[5] A61K *9/48*
U.S. Cl. 424—451 7 Claims

7. A pharmaceutical product useful for treatment of disturbances of myocardial blood flow in coronary heart disease comprising a package containing a unit dosage as a tablet, coated tablet or capsule of verapamil copackaged in the package with a unit dosage as a tablet, coated tablet or capsule of fenofibrate, the ratio of the amount of verapamil to that of fenofibrate in the package being 10:1 to 1:10.

4,925,673

DELIVERY SYSTEMS FOR PHARMACOLOGICAL AGENTS ENCAPSULATED WITH PROTEINOIDS

Solomon Steiner, Mt. Kisco, and Robert Rosen, Rochester, both of N.Y., assignors to Clinical Technologies Associates, Inc., Elmsford, N.Y.

PCT No. PCT/US87/02025, § 371 Date Sep. 8, 1987, § 102(e) Date Sep. 8, 1987, PCT Pub. No. WO88/01213, PCT Pub. Date Feb. 25, 1988
Continuation-in-part of Ser. No. 897,361, Aug. 18, 1986, abandoned. This PCT application Aug. 14, 1987, Ser. No. 98,027
Int. Cl.[5] A61K *9/66;* A61J *5/04*
U.S. Cl. 424—455 23 Claims

1. Composition comprising a pharmacologically active agent encapsulated within protenoid microspheres having diameters predominantly less than about 10 microns and formed from linear thermal condensation polymers of mixed amino acids.

4,925,674

AMOXICILLIN MICROENCAPSULATED GRANULES

Robert P. Giannini, Plantation, and Daniel A. Bashour, Boynton Beach, both of Fla., assignors to hiMedics, Inc., Hollywood, Fla.

Filed Aug. 25, 1988, Ser. No. 236,375
Int. Cl.[5] A61K *9/26*
U.S. Cl. 424—469 32 Claims

1. A microencapsulated granule comprising a mixture of amoxicillin and a binder as an active coating in a ratio of about 5:1 to about 13:1 on a seed, said granule having an activity density greater than about 0.200 g/ml and a diameter less than 1000 microns, and said binder selected from the group consisting of hydroxypropyl methylcellulose phthalate, hydroxypropyl methylcellulose, polyvinyl pyrrolidone, polyethylene glycol, poleyethylene oxide, hydroxypropyl cellulose, cellulose acetate phthalate, polyvinyl acetate phthalate and combinations thereof.

VOL
1114
ISS
3
MY
15
1990
UMI

4,925,675

ERYTHROMYCIN MICROENCAPSULATED GRANULES

Robert P. Giannini, Plantation; Susan M. Fromm, Margate, and José Suarez, Miami, all of Fla., assignors to hiMedics, Inc., Hollywood, Fla.

Filed Aug. 19, 1988, Ser. No. 234,034
Int. Cl.[5] A61K *9/26*
U.S. Cl. 424—469 **31 Claims**

1. A microencapsulated granule comprising a mixture of erythromycin and a binder as an active coating in a ratio of about 5:1 to about 15:1 on a seed, said granule having an activity density greater than about 0.300 g/ml and a diameter less than about 1000 microns, and said binder selected from the group consisting of hydroxypropyl methylcellulose phthalate, hydroxypropyl methylcellulose, polyvinyl pyrrolidone, polyethylene glycol, polyethylene oxide, hydroxypropyl cellulose, cellulose acetate phthalate, polyvinyl acetate phthalate and combinations thereof.

4,925,676

EXTENDED RELEASE GEMFIBROZIL COMPOSITION

Isaac Ghebre-Sellassie, Stanhole; Uma Iyer, Mendham, and Mahdi B. Fawzi, Flanders, all of N.J., assignors to Warner-Lambert Company, Ann Arbor, Mich.

Filed Feb. 2, 1989, Ser. No. 305,083
Int. Cl.[5] A61K *9/26*
U.S. Cl. 424—470 **10 Claims**

1. A disintegratable formulation of gemfibrozil providing both immediate and enteric release and comprising a tablet compressed from a mixture of at least a first and second granulation, said first granulation comprising finely divided particles of gemfibrozil granulated with at least one acid-disintegratable binder and said second granulation comprising said first granulation regranulated or coated with an alkali-disintegratable formulation comprising at least one polymer which is substantially alkali-soluble and substantially acid-insoluble.

4,925,677

BIODEGRADABLE HYDROGEL MATRICES FOR THE CONTROLLED RELEASE OF PHARMACOLOGICALLY ACTIVE AGENTS

Jan Feijen, Oude Grensweg, Netherlands, assignor to Thera-Tech, Inc., Salt Lake City, Utah

Filed Aug. 31, 1988, Ser. No. 238,802
Int. Cl.[5] A61K *9/14*
U.S. Cl. 424—484 **31 Claims**



1. A drug delivery system comprising:
(a) a biodegradable endogenous hydrogel matrix comprising a protein, a polysaccharide, and a cross-linking agent providing network linkage therebetween, wherein the weight ratio of polysaccharide to protein in the matrix is in the range of about 10:90 to 90:10; and
(b) an effective amount of a drug contained within the matrix to provide the desired systemic or local effect.

14. A method for making a drug delivery system, comprising:
dissolving a protein and a polysaccharide in an aqueous medium wherein the weight ratio of polysaccharide to protein is in the range of 10:90 to 90:10;
cross-linking the protein and polysaccharide to provide a cross-linked hydrogel matrix; and
loading an effective amount of a drug in solution or in liquid form into said hydrogel matrix to a predetermined degree wherein the cross-linking is effected by admixture of the protein and polysaccharide components with a cross-linking agent.

4,925,678

ENDOTHELIAL ENVELOPMENT DRUG CARRIERS

David F. Ranney, 3539 Courtdale Dr., Dallas, Tex. 75234

Filed Apr. 1, 1987, Ser. No. 33,432
Int. Cl.[5] A61K *9/16, 45/05*
U.S. Cl. 424—493 **4 Claims**

1. A composition comprising a drug-carrier or diagnostic-carrier combination which contains a drug or diagnostic agent of amphotericin B, an amphotericin B-cyclodextrin complex, or amphotericin B entrapped in polyoxyethylene-polyoxypropylene block copolymer, and includes a multivalent binding agent surface coating specific for determinants of endothelial or epithelial cells;
wherein the drug-carrier or diagnostic carrier combination comprises a microsphere or microaggregate between 3 nanometers and 200 micrometers in diameter, and having a matrix which contains the drug or diagnostic agent at a content of at least 12% (w/w); and
wherein the multivalent binding agent consists essentially of carbohydrate, oligosaccharide, negatively charged polysaccharide, or negatively charged oligosaccharide, which induces rapid partial or total envelopment of said combination by endothelial or epithelial cells and facilitated migration across said cells to proximal tissues.

3. A composition comprising a drug-carrier or diagnostic-carrier combination which contains a drug or diagnostic agent of amphotericin B at a content of at least about 14% (w/w) in a controlled-release form within internally entrapped adducts of gamma cyclodextrin, and includes a multivalent binding agent surface coating specific for determinants of endothelial or epithelial cells;
wherein the drug-carrier or diagnostic carrier combination comprises a microsphere or microaggregate between 3 nanometers and 200 micrometers in diameter, and has a dextran matrix which contains the drug or diagnostic agent; and
wherein the multivalent binding agent is heparin at a content of about 10% (w/w) which induces rapid partial or total envelopment of said combination by endothelial or epithelial cells and facilitated migration across said cells to proximal tissues.

4,925,679

KOJI-MAKING METHOD BY KOJI-CUTTING

Michiro Kotegawa, and Yoshihiro Kuribayashi, both of Usuki, Japan, assignors to Fundokin Shoyu Kabushiki Kaisha, Oita, Japan

Filed May 27, 1988, Ser. No. 199,699
Claims priority, application Japan, May 28, 1987, 62-129977
Int. Cl.[5] A23L *1/20, 1/238*
U.S. Cl. 426—18 **5 Claims**

1. A koji-making method using a rotary type aeration koji-making apparatus having a culture floor on which a koji-substrate is placed, a plurality of cutting blade holders located at a position above the koji-substrate and a plurality of cutting holders attached side by side to each of the cutting holders, which comprises inserting the cutting blades deeply into the koji-substrate before or after a koji-substrate solidifying phenomenon takes place after a lapse of 22 to 25 hours from the beginning of koji-making to vertically cut the koji-substrate by



vertically moving the cutting blades and concentrically moving the culture floor.

4,925,680

PROCESS FOR ENZYMATIC PRODUCTION OF BIFIDOGENIC INFANT AND DIETETIC FOODS

Friedrich Schweikhardt, Friedrichsdorf; Günther Sawatzki, Butzbach, and Rainer Braun, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Milupa Aktiengesellschaft, Friedrichsdorf, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,756
Claims priority, application European Pat. Off., Jul. 7, 1988, 88110870
Int. Cl.[5] A23C *9/12, 9/13*
U.S. Cl. 426—42 **9 Claims**

1. A process for producing bifidogenic infant and dietetic foods from mammalian milk material containing a mixture of milk protein and milk protein degradation products, said milk material being selected from the group consisting of mammalian milk, mammalian milk components, and mammalian milk products which comprises adding sufficient neuraminidase enzyme to said milk material to cleave sialic acid from said milk protein and adding sufficient carbohydrate to obtain bifidogenicity.

4,925,681

PROCESS FOR INHIBITING LIPID OXIDATION IN FOOD AND COMPOSITION THEREBY

Jimbin Mai, New Milford; Laura J. Chambers, New Preston, and Richard E. McDonald, Brookfield Center, all of Conn., assignors to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 620,754, Jun. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 561,678, Dec. 15, 1983, abandoned. This application May 4, 1989, Ser. No. 347,484
Int. Cl.[5] A23B *7/155;* **A23F** *3/30*
U.S. Cl. 426—52 **6 Claims**

1. A process for inhibiting lipid oxidation in a food susceptible to lipid oxidation comprising:
treating an aqueous extract of black tea with tannase; and
incorporating the treated extract in a food susceptible to lipid oxidation.

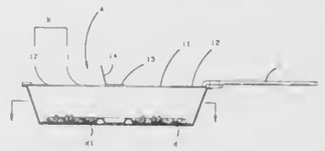
4,925,682

METHOD AND DEVICE FOR ROASTING COFFEE BEANS

Isamu Miya, Gunma, Japan, assignor to Ai Shi Denshi Kogyo Kabushiki Kaisha, Higashi-Ogogata, Japan

Filed Jan. 31, 1989, Ser. No. 303,446
Claims priority, application Japan, Mar. 10, 1988, 63-57282
Int. Cl.[5] B65D *81/34;* **A23F** *5/04*
U.S. Cl. 426—87 **13 Claims**

1. A device for simply roasting coffee beans, said device comprising:
an imperforate dish-shaped container of aluminum foil and raw or semi-roasted coffee beans requiring further roasting contained therein; said container having a plurality of upwardly raised ridges in the bottom surface thereof substantially the height of the coffee beans so as to assist in turning the beans upon shaking the container;
a handle mounted to said container;
an imperforate cover air-tightly secured to the upper edge of said container hermetically covering said coffee beans;
said cover including an annular-shaped peripheral portion formed of aluminum foil and a central portion formed of transparent material and bonded to said annular-shaped peripheral portion so that said coffee beans in said container can be observed during coasting, said cover further including cutout means disposes in said central portion for opening a ventilation hole to discharge the smoke that is generated in roasting, said cutout means being integrally formed with said cover and including an integral pull member to assist in effecting removal of said cutout means therefrom;
and one or more additional coffee beans that have been previously pigmented and mixed with said raw or semi-roasted coffee beans as marking beans to permit easy observation of the state of agitation of said coffee beans.



4,925,683

BEVERAGE CAPSULES

Eugene R. Fischbach, Fulton, and Stephen J. Destephen, Oswego, both of N.Y., assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 131,205, Dec. 10, 1987, abandoned. This application Aug. 18, 1989, Ser. No. 396,737
Int. Cl.[5] A23L *2/00;* **A23G** *3/00*
U.S. Cl. 426—103 **14 Claims**

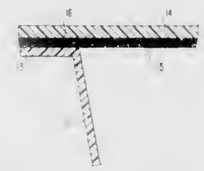
1. A composition for preparation of a beverage consisting essentially of a beverage base selected from a group consisting of a liquid and a syrup beverage base enveloped and contained in a shell coating consisting essentially of a continuous phase of fat of a fat-based confectionery material having a thickness of from 0.5 mm to 5 mm and wherein the composition of the beverage base is not saturated with sugar.

4,925,684

FOOD PACKAGE WITH A MICROWAVE RELEASABLE SEALED CLOSURE

Frederick E. Simon, Lindenwold, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Aug. 19, 1988, Ser. No. 234,149
Int. Cl.[5] B65B *25/22*
U.S. Cl. 426—107 **27 Claims**

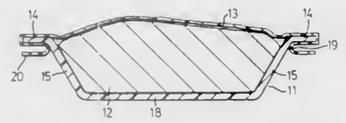


1. A food package which is useful for heating a food product in a microwave oven, said package comprising in combination:

VOL
1114
ISS
3
MY
15
1990
UMI

(a) a tray containing the food product before and during microwave heating, the tray having a continuous sealing surface which defines an opening for introducing the food product into the tray and for removing the food product therefrom;
(b) a closure covering the opening of said tray; and
(c) a microwave releasable adhesive seal in heat sealed contact with the continuous sealing surface of the tray and with the closure sealing the food product in said tray;
said microwave releasable adhesive seal comprising a microwave interactive material in close proximity to a heat-sealable resin containing a blowing agent which forms a gas during microwave heating of the package; wherein the seal is selectively releasable upon exposure of the package to microwave energy and resultant heating of the food product under microwave heating conditions.

4,925,685
LID FOR FOOD TRAYS
Ash K. Sahi, Aurora, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada
Filed Mar. 4, 1988, Ser. No. 164,475
Claims priority, application United Kingdom, Mar. 11, 1987, 8705712
Int. Cl.[5] **B65D** *85/00*
U.S. Cl. 426—123 **22 Claims**



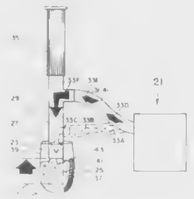
1. A tray having a floor, walls attached thereto, said walls having a rim distal to the floor, said tray having food placed therein and a film formed across the rim and extending down the outer portion of the wall adjacent to the rim in a vacuum-induced and thermally-set crimp, said film being selected from films of amorphous polyester, partially crystalline polyester and mixtures thereof; amorphous polyester, partially crystalline polyester and mixtures thereof admixed with a compatibilized polyolefin; and amorphous nylon and mixtures thereof with a compatibilized polyolefin.

4,925,686
LIQUID SHELF-STABLE FREEZABLE FRUIT JUICE CONTAINING COMPOSITION AND METHOD OF MAKING THE SAME
Howard Kastin, Atlantic Beach, N.Y., assignor to Leader Candies, Inc., New York, N.Y.
Filed Dec. 2, 1987, Ser. No. 128,202
Int. Cl.[5] **A23L** *2/16*
U.S. Cl. 426—131 **30 Claims**

1. A freezable fruit juice containing composition which is both a liquid and shelf stable at room temperature, said composition consisting essentially of:
(a) 10 to 99% by weight of fruit juice;
(b) a sweetener;
(c) 0.01 to 0.02% by weight of a non-alcoholic stabilizer; and
(c) a pH control agent.

4,925,687
TURKEY PACKAGE
Stephen L. Gray, Moore, and John E. Horner, Taylors, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.
Filed Aug. 8, 1988, Ser. No. 229,593
Int. Cl.[5] **B65B** *31/02*
U.S. Cl. 426—129 **2 Claims**

1. In a method to package discrete pieces of turkey meat together with a section of turkey skin, said method involving:
(a) providing a bag comprising a flexible thermoplastic container having an open neck end and opposing bag panels wherein the way vertically disposed with the open neck upward;
(b) inserting into the bag through the open neck end a second of turkey skin, the turkey skin section being vertically aligned against one bag panel;
(c) vertically extruding via a vacuum stuffing apparatus turkey meat pieces under pressure against the turkey skin section and opposite bag panel;

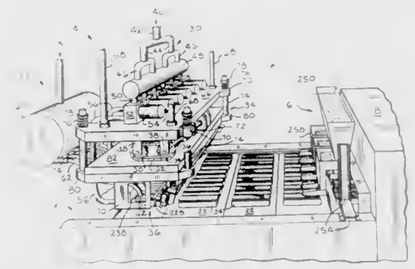


(d) vacuumizing the bag of turkey meat pieces and turkey skin section; and
(e) closing the open neck end of the bag, the improvement comprising prior to vertically extruding the turkey key meat pieces, inserting into the bag through the open neck end the section of turkey skin, said turkey skin section having been frozen, whereby bag neck area contamination is avoided during extruding.

4,925,688
METHOD OF DIFFUSING ESSENTIAL OILS AND OLEO-RESINS OF SPICES IN A CARRIER SOLUTION
Daniel Voituriez, 56 rue Gambetta, 59320 Haubourdin, France
Filed Sep. 8, 1988, Ser. No. 241,929
Int. Cl.[5] **A23L** *1/226*
U.S. Cl. 426—281 **11 Claims**

1. A process for diffusing essential oils and oleo-resins of spices in a carrier solution, comprising the steps of:
(a) forming a homogeneous first solution of a mixture of fatty oils, essential oils and oleo-resins of the spices, according to the desired concentration of the diffusion to be obtained;
(b) forming a colloidal-bearing second solution containing at least one emulsifier;
(c) vigorously mixing said first solution with said second solution so that the resultant mixture is emulsified producing an emulsion in which said essential oils and oles-resins of the spices are dispersed;
(d) homogenizing said emulsion by initially subjecting said emulsion to a relatively high pressure and then subjecting said emulsion to a relatively sudden venting and release of said pressure so as to reduce said essential oils and oleo-resins to microdroplets with droplet sizes on the order of about one micron or less and to surround said microdroplets with a peripheral layer of said emulsifier so as to prevent any subsequent reconstitution into a mass of said essential oils and oleo-resins.

4,925,689
METHOD FOR PRODUCING FROZEN CONFECTIONS
Harlan R. Getman, Toledo, Ohio, assignor to Vroman Foods, Inc., Toledo, Ohio
Division of Ser. No. 894,694, Aug. 8, 1986, Pat. No. 4,752,197, which is a continuation-in-part of Ser. No. 632,898, Jul. 20, 1984, abandoned. This application Mar. 14, 1988, Ser. No. 168,003
Int. Cl.[5] **B29C** *47/04;* **A23G** *9/04*
U.S. Cl. 426—289 **16 Claims**



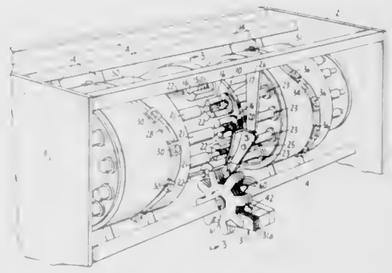
1. A method of producing confections comprising the steps of:
providing a first flow of a confectionary material,
providing a second flow of a confectionary material,
providing a pair of chambers having a pair of inlets for receiving a respective one of said flow of confectionary material and a pair of juxtaposed outlets
combining said first flow and said second flow of confectionary material into a common flow,
reciprocating said chambers,
severing such common flow of confectionary material into individual bodies in timed relation to said reciprocating of said chambers,
horizontally translating said individual bodies, and
intermittently providing a measured amount of edible particulate material and applying said measured amount on each individual body as said individual bodies translate.

4,925,690
METHOD OF PREPARING VEGETABLE OR FRUIT JUICES
Yoshinobu Odake, Toyonaka, Japan, assignor to San-Ei Chemical Industries, Ltd., Toyonaka, Japan
Filed Sep. 1, 1988, Ser. No. 239,596
Claims priority, application Japan, Sep. 4, 1987, 62-222386
Int. Cl.[5] **A23L** *2/02*
U.S. Cl. 426—330.5 **7 Claims**

1. A process for preparing a vegetable or fruit juice which comprises subjecting a vegetable or fruit squeezed fluid or extract to microfiltration and thereafter to at least one of ultrafiltration and reverse osmosis.

4,925,691
METHOD AND APPARATUS FOR PITTING AND SLICING OLIVES
Fred J. Cimperman, Castro Valley, Calif., assignor to Ashlock Company, San Leandro, Calif.
Continuation-in-part of Ser. No. 143,822, Jan. 13, 1988, Pat. No. 4,876,954. This application Sep. 2, 1988, Ser. No. 240,153
Int. Cl.[5] **D23N** *4/08*
U.S. Cl. 426—485 **31 Claims**

1. An olive pitting and slicing apparatus, including:
a rotatable drive shaft;
a plate fixedly attached to the drive shaft;
a first cup dimensioned to receive an olive, and fixedly mounted on the plate so that rotation of the drive shaft will cause the plate to translate the first cup, and any olive within the first cup, along a substantially circular cup path;
a first pitting means capable of extending toward the first cup when the first cup occupies a first segment of the cup path to extract an olive pit from an olive in the first cup, wherein the first pitting means is also capable of retracting



away from the first cup after extraction of the olive pit; and
a set of slicing elements mounted adjacent a second segment of the cup path, in such a position that the slicing elements engage with and slice a pitted olive in the first cup when the first cup occupies the second segment of the cup path.

4,925,692
FOOD COMPOSITION CONTAINING A SILOXANE POLYMER AND A PARTICULATE SILICA
John W. Ryan, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed Nov. 7, 1988, Ser. No. 267,949
Int. Cl.[5] **A23L** *1/307*
U.S. Cl. 426—531 **12 Claims**

1. A low calorie food composition comprising non-fat ingredients and fat ingredients wherein about 0.1% by weight to about 100% by weight of the total fat ingredients have been replaced by a fat substitute comprising:
(a) an edible, non-absorbable, non-digestible liquid siloxane polymer of the general formula $(CH_3)_3SiO((CH_3)_2SiO)_b$-$Si(CH_3)_3$ wherein b has an average value of 25 to 500; and
(b) sufficient particulate silica to prevent leakage of said liquid siloxane through the anal sphincter.

4,925,693
PRODUCTION OF A FOOD POWDER AND OF FOOD PRODUCTS CONTAINING THE POWDER
Alain Lauly, 22 boulevard Dardenne, 31110 Luchon, France
Filed Jul. 11, 1988, Ser. No. 217,626
Int. Cl.[5] **A21D** *2/08*
U.S. Cl. 426—549 **22 Claims**

1. A process for producing a food powder for use in the preparation of certain food products by mixing it with other food ingredients for obtaining products ready for a user, comprising
stripping and peeling of pineapple stems;
drying said stripped and peeled stems;
comminuting said dried stems for obtaining a powder of a predetermined grain size.

VOL
1114
ISS
3
MY
15
1990
UMI

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METHOD FOR PRODUCING HIGH SOLIDS FILLING MATERIAL

David L. Barry, Lewisville; Mark L. Dreher, Highland Village; Alan A. Johnson, Irving, and Otto E. Schroeder, Dallas, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Division of Ser. No. 911,358, Sep. 25, 1986, Pat. No. 4,824,684.
This application Dec. 23, 1988, Ser. No. 289,314
Int. Cl.[5] A23G *3/00*
U.S. Cl. 426—613 11 Claims

11. A method for producing a pumpable edible filling composition which comprises:

(a) heating a vegetable shortening to a temperature at least high enough to dissolve its crystal structure, said vegetable shortening having a Wiley melt point from about 90° F. to about 120° F. and a solid fat index from about 1% to about 6% at 92° F. and at 100° F.;

(b) dispersing whey solids and a solid flavoring material in the heated vegetable shortening so as to form a dispersion;

(c) cooling the dispersion to a temperature below the crystallization temperature of the vegetable shortening in a heat exchanger that effects cooling at a rate which is substantially uniform throughout the dispersion; and

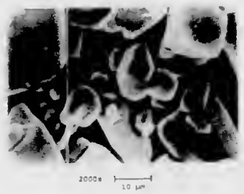
(d) reducing the particle size of the whey solids and solid flavoring material in the dispersion to a size from about 20 microns to about 100 microns.

4,925,695

PROCESS OF REFINING SACCHARIDE CRYSTALS DURING FOOD PROCESSING

Robert A. Martin, Jr., and David M. Stumpf, both of Palymra, Pa., assignors to Hershey Foods Corporation, Hershey, Pa.

Filed Aug. 4, 1988, Ser. No. 228,701
Int. Cl.[5] A23G *1/00, 3/00*
U.S. Cl. 426—660 7 Claims



1. A process for refining crystalline saccharide into an ingredient suitable for incorporation into a food product comprising the steps of:

(a) combining at least one crystalline saccharide with at least one edible fat and a minor amount of water to produce a blend;

(b) refining said blend to produce particles smaller than 50 micrometers to produce a refined product, the refining step otherwise producing an amount of crystalline saccharide fine particles having a size less than about 5 micrometers when the minor amount of water is absent, whereby said minor amount of water is effective to dissolve saccharide particles having a size less than about 5 micrometers;

(c) agitating the refined product of step (b) under the application of heat sufficient to evaporate the minor amount of water and thereby cause recrystallization of the dissolved saccharide;

thus producing a semi-processed ingredient which can be used to prepare a food product having improved viscosity characteristics.

4,925,696

PROCESSES FOR PRODUCTS FROM MALANGA

Karen M. Slimak, 9207 Shotgun Ct., Springfield, Va. 22153

Filed Jan. 31, 1986, Ser. No. 825,658
Int. Cl.[5] A23L *1/214*
U.S. Cl. 426—637 14 Claims

1. A non-grain edible malanga flour possessing the ability to maintain a risen structure in the absence of grain flour, legume flour, or added fiber, said non-grain edible flour consisting of comminuted particles of the entire malanga, including substantially all of the starch and fiber content of the malana, wherein said flour has a moisture content of less than 20% by weight.

4,925,697

PROCESS FOR PRODUCTS FROM SWEET POTATO

Karen M. Slimak, 9207 Shotgun Ct., Springfield, Va. 22153

Filed Jan. 31, 1986, Ser. No. 825,656
Int. Cl.[5] A23L *1/214*
U.S. Cl. 426—637 16 Claims

1. A non-grain edible flour of the white sweet potato of family Convolvulaceae wherein the flour consists of the entire white sweet potato, including all of the flesh and fiber portions of said white sweet potato, comminuted to a size so that said white sweet potato will pass through a screen of 0.02 inch mesh, said flour having a moisture content of less than 20% by weight.

4,925,698

SURFACE MODIFICATION OF POLYMERIC MATERIALS

Mitchell Klausner, Sharon; Michael P. Manning, Nahant, and Raymond F. Baddour, Belmont, all of Mass., assignors to Tekmat Corporation, Ashland, Mass. and Revlon, Inc., New York, N.Y.

Continuation of Ser. No. 159,344, Feb. 23, 1988, abandoned.
This application Mar. 8, 1989, Ser. No. 320,810
Int. Cl.[5] G02C *7/04;* B05D *5/06*
U.S. Cl. 427—2 17 Claims

1. A method of increasing the adsorption resistance of a polymer having surface carboxyl or hydroxyl groups comprising directly contacting the surface of said polymer with an acylating agent in the vapor phase under conditions sufficient to chemically react said carboxyl or said hydroxyl groups with said acylating agent without pretreating said surface with base.

4,925,699

METHOD OF FORMING A FILM OF COOKING OIL ON A PAN SURFACE

John E. Fagan, Norman, Okla., assignor to Burford Corp., Maysville, Okla.

Continuation of Ser. No. 937,961, Dec. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 796,083, Nov. 7, 1985, abandoned. This application Aug. 8, 1988, Ser. No. 231,588
Claims priority, application PCT Int'l Appl., Nov. 7, 1986, PCT/US86/02416
Int. Cl.[5] B05D *1/04*
U.S. Cl. 427—28 3 Claims

1. A method of forming a film of cooking oil on a pan surface comprising the steps of: atomizing a mass of cooking oil to form droplets; projecting the droplets between a pair of electrodes having curved surfaces charged to a potential in a range between four and six kilovolts at a velocity in a range between ten and twenty meters per second to electrically charge the droplets; and propelling the charged droplets along a trajectory to impinge against an oppositely charged pan surface at an



angle of greater than 45° relative to the plane of the bottom pan surface to form an oil film on the pan surface.

4,925,700

PROCESS FOR FABRICATING HIGH DENSITY DISC STORAGE DEVICE

Blasius Brezoczky, San Jose, Calif.; Jerome J. Cuomo, Lincolndale, N.Y.; C. Richard Guarnieri, Somers, N.Y.; Kumbakonam V. Ramanathan, Troy, N.Y.; Srinvasrao A. Shivashankar, Mt. Kisco, N.Y.; David A. Smith, Katonah, N.Y., and Dennis S. Yee, Pleasantville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1988, Ser. No. 263,839
Int. Cl.[5] H01F *10/02;* B05D *3/06*
U.S. Cl. 427—38 15 Claims



1. A process for forming thin films of metastable binary compounds of the form AB_X which comprises:

depositing both constituent materials on a substrate by evaporative techniques; and

concurrently bombarding the substrate with high energy ions of at least one of the materials to produce latent metastable sites in a latent AB_X film forming layer;

treating the as-grown latent film forming layer with a rapid thermal anneal heat treatment upon completion of the deposition step which causes the latent film forming layer to form the desired crystalline metastable AB_X compound.

4,925,701

PROCESSES FOR THE PREPARATION OF POLYCRYSTALLINE DIAMOND FILMS

Frank Jansen, and Mary A. Machonkin, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1988, Ser. No. 199,646
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 57 Claims

1. A process for the preparation of continuous polycrystalline diamond films which comprises applying to a substrate diamond powder in an amount of from about one particle per ten square microns to about 10 particles per square micron with an average particle diameter of from about 0.1 to about 0.4 micron; heating the resulting powdered substrate subsequent to incorporation in a processing apparatus; introducing a mixture of gases into the apparatus, which gases provide a supply of carbon and hydrogen; and decomposing the gas mixture.

4,925,702

PROCESS FOR IMPROVING THE LUMINESCENCE AND BULK DENSITY OF NIOBIUM ACTIVATED YTTRIUM TANTALATE X-RAY PHOSPHOR

Vaddi B. Reddy, Sayre, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 2, 1989, Ser. No. 416,199
Int. Cl.[5] C09K *11/79*
U.S. Cl. 427—65 3 Claims

1. A process for preparing a M' $YTaO_4$:Nb X-ray phosphor having a coating of silicon dioxide, said process comprising:

(a) forming a uniform mixture consisting essentially of Y_2O_3, Ta_2O_5, and Nb_2O_5 components, and a flux selected from the group consisting of lilthium chloride, lithium sulfate and a mix of lithium sulfate and potassium sulfate the mole ratio of lithium sulfate to potassium sulfate in said mmix being about 80 to 20, wherein said flux makes up from about 25% to about 50% by weight of said mixture, said components being provided in an amount equal to approximately the stoichiometric amounts required to form said phosphor;

(b) firing said mixture in a furnace by heating said mixture in said furnace from a temperature of about 300° C. to a temperature of from about 1200° C. to about 1300° C. at a heating rate of from about 1.0° C. per minute to about 1.5° C. per minute and maintaining said temperature for from about 10 hours to about 14 hours to react said components and produce a fired material containing luminescent material;

(c) cooling the resulting fired material by turning off the heat to said furnace and allowing said fired material to remain in said furnace until the temperature in said furnace is no higher than about 300° C.;

(d) washing the resulting cooled material with deionized water to remove essentially all of said flux therefrom and produce a washed M' niobium activated yttrium tantalate phosphor;

(e) removing the wash water from and drying said washed phosphor;

(f) classifying the resulting dried phosphor to obtain a −325 mesh particle size in said phosphor;

(g) forming a uniform blend consisting essentially of the resulting classified phosphor and silicon dioxide wherein the amount of said silicon dioxide is from about 0.01% to about 0.1% by weight of said blend, and wherein said silicon dioxide has a particle size of less than about 1 micrometer in diameter; and

(h) dry milling said blend to produce a silicon dioxide coated phosphor having a bulk density of at least about 50% greater than said classified phosphor produced absent said coating and having a luminescence improvement of at least about 4% over said classified phosphor produced absent said coating.

VOL
1114
ISS
3
MY
15
1990
UMI

4,925,703

FIRING AND MILLING METHOD FOR PRODUCING A MANGANESE ACTIVATED ZINC SILICATE PHOSPHOR

Anthony F. Kasenga, Towanda, Pa.; A. Gary Sigai, Lexington, Mass.; Thomas E. Peters, Chelmsford, Mass., and Roger B. Hant, Medfield, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,660
Int. Cl.[5] C09K *11/59*
U.S. Cl. 427—215 14 Claims

1. A method for producing manganese activated zinc silicate phosphor, particles said method comprising:

(a) dry blending a mixture of components consisting essentially of zinc oxide, silicic acid, a source of manganese, ammonium chloride, ammonium fluoride, tungstic oxide in amount sufficient to improve phosphor maintenance in a fluorescent lamp, and silica, and having a Zn +Mn /Si mole ratio of from about 1.95 to about 2.02, wherein said silica is colloidal and has a surface area of from about 50 to about 410 m^2 per gram, and wherein said colloidal silica makes up from about 0.01% to about 1.0% by weight of said mixture;

(b) firing the resulting dry blend of components in a nitrogen atmosphere at a temperature of from about 1200° C. to about 1300° C. for a sufficient time to produce said phosphor particles; and

(c) firing said phosphor particles in air at a temperature of from about 1175° C. to about 1275° C. for a sufficient time to diffuse the tungsten and manganese to the surfaces of the phosphor particles.

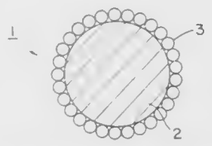
6. A method according to claim 1 comprising the additional step of coating the fired phosphor particles of step (c) with a continuous coating of aluminum oxide to form manganese activated zinc silicate phosphor particles having a continuous coating of aluminum oxide thereon, said coated phosphor particles having improved maintenance over said phosphor particles produced absent said coating.

4,925,704

PROCESSES FOR PREPARING MONO-DISPERSED PARTICLES

Goro Sato; Michio Komatsu; Hiroyasu Nishida; Yoshichika Tanaka; Tsuguo Koyanagi, all of Fukuoka, and Kei Mihara, Chiba, all of Japan, assignors to Catalsts & Chemicals Industries Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 13,422, Feb. 11, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 206,863
Claims priority, application Japan, Feb. 12, 1986, 61-28360; Aug. 20, 1986, 61-194936; Oct. 2, 1986, 61-235340; Oct. 9, 1986, 61-240431
Int. Cl.[5] B05D *7/00*
U.S. Cl. 427—221 19 Claims



1. In a process for preparing spherical particles of a metal oxide or hydroxide having a particle size of from 0.1 to 10 μm by adding a corresponding metal alkoxide to a dispersion of water-alcohol system having dispersed therein a metal oxide or hydroxide as a seed, under alkaline conditions and allowing a decomposition product from said metal alkoxide to attach onto said seed to effect particle growth of the seed, the improvement which comprises maintaining said dispersion at a substantially constant pH within the range between 10 and 13 during the addition of the metal alkoxide to said dispersion and the subsequent particle growth of the seed, thereby to prepare mono-dispersed particles substantially free from particle aggregation having a sharp particle size distribution of a standard deviation of not greater than 0.5.

6. The process as claimed in claim 1 wherein the particles so prepared are separated from the dispersion and are coated on the surface thereof with a synthetic resin.

4,925,705

METHOD OF PRINTING LAYERS HAVING SUBSTANTIALLY EXACT REGISTRATION

George R. Hill, Stockport, England, assignor to Contra Vision Limited, England

Filed Dec. 23, 1986, Ser. No. 945,849
Claims priority, application United Kingdom, Dec. 24, 1985, 8531804
Int. Cl.[5] B05D *3/10, 3/12, 5/00, 1/32*
U.S. Cl. 427—259 16 Claims

1. A method of producing superimposed layers with substantially exact registration in one or more areas on a substrate, said method comprising the steps of: placing a mask on the substrate, said mask defining said one or more areas; successively printing one or more of said layers on the substrate to extend beyond the boundaries of said one or more areas defined by the mask; leaving the mask in place during the entire time that the layers are applied; and removing the unwanted parts of the layers of printed material outside the boundaries of said one or more areas only after all the layers have been applied.

4,925,706

PROCESS FOR THE CHEMICAL METALLIZING OF TEXTILE MATERIAL

Holger Kistrup, Esslingen, and Claus von Benda, Nürtigen, both of Fed. Rep. of Germany, assignors to Deutsche Automobilgesellschaft mbH, Fed. Rep. of Germany

Continuation of Ser. No. 78,762, Jul. 28, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 257,120
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637130
Int. Cl.[5] B05D *3/04*
U.S. Cl. 427—305 22 Claims

1. Process for the chemical metallizing of textile material having pores by activating the textile material by means of an activating solution which contains tin (II) ions and palladium in ionic, colloidal of finely dispersed form and subsequently coating it with metal in a currentless fashion from an alkaline metallizing solution, consisting essentially of:

impregnating the textile material with the activating solution;

pressing out excess activating solution from the pores of the impregnated textile material to provide a textile material still wet with activating solution prior to plating with metal; and

bringing the textile material directly into contact with the metallizing solution without a washing and rinsing operation and coating the textile material with metal.

4,925,707

TREATMENT OF CARPETS

Yashavant V. Vinod, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1987, Ser. No. 136,035
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—393.4 29 Claims

1. A process of imparting stain-resistance to an installed nylon carpet, wherein said nylon is selected from the group consisting of nylon 66 and nylon 6 polymers, and the stain-resistance imparted is resistance to staining by an acid dye colorant, by a process that includes the steps of treating the installed nylon carpet by applying thereto a stain-blocker insufficient amount and in such manner as to obtain a significant improvement in stain-resistance, wherein said stain-blocker is selected from the group consisting of sulfonated phenol-formaldehyde condensate polymers, sulfonated naphthol-formaldehyde condensate polymers, and hydrolysed vinyl aromatic-maleic anhydride polymers, and of allowing the treated carpet to dry in the atmosphere.

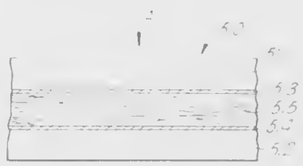


4,925,708

PROCESS FOR PRODUCING LIQUID CRYSTAL DEVICES

Colin M. Waters, Frodsham; Timothy J. Noakes, Selbourne, Near Alton, and Ian Pavey, Fernhurst, Near Haslemere, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 16, 1988, Ser. No. 285,447
Claims priority, application United Kingdom, Dec. 16, 1987, 8729344; May 23, 1988, 8812135
Int. Cl.[5] C09K *19/00*
U.S. Cl. 428—1 25 Claims



1. A method of making a liquid crystal device including the steps of:

(a) directing towards a first sheet which is to form a boundary wall of the device ligaments derived from a curable liquid and allowing the ligaments to deposit as such or as droplets resulting from breaking up of the ligaments;

(b) assembling a second sheet in superimposed relation with the first sheet so that the deposited ligaments or droplets occupy the space between the sheets; and

(c) applying liquid crystal material so that it permeates the spaces between the deposited ligaments or droplets.

25. A liquid crystal display device made by the method claimed in claim 1, wherein the deposited ligaments form a skeletal structure of intersecting fibers permeated by the liquid crystal material.

4,925,709

NET OF PLASTIC RINGS CONNECTED BY CONNECTOR MEANS

Itzhak Shmuell, Artits Village, Ein Hod, Israel

Filed Mar. 18, 1988, Ser. No. 169,991
Int. Cl.[5] F16B *2/00, 5/07, 5/10*
U.S. Cl. 428—33 16 Claims



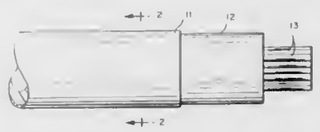
1. A net comprising of a plurality of plastic rings connected to each other by connector means, each connector means comprising a "V" shaped strip having a ratchet latch mechanism which, when closed, forms said connector means into a generally oval shape, said net being stretched across a space.

4,925,710

ULTRATHIN-WALL FLUOROPOLYMER TUBE WITH REMOVABLE FLUOROPOLYMER CORE

Thomas F. Buck, 3 Butternut Dr., Keene, N.H. 03431, and Diane P. Fukuda, Butterfly Hill, P.O. Box 174, Jaffrey, N.H. 03452

Filed Mar. 31, 1988, Ser. No. 175,975
Int. Cl.[5] F16L *11/00*
U.S. Cl. 428—34.5 53 Claims



1. An article comprising an ultrathin-wall sintered fluoropolymer catheter tube having a wall thickness less than about 0.0020 inch (0.051 mm), said tube having a controlled relatively uniform inner diameter.

4,925,711

PACKAGING BAG FOR PHOTOSENSITIVE MATERIALS AND BAG-MAKING METHOD THEREOF

Mutsuo Akao, and Koji Inoue, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Dec. 14, 1988, Ser. No. 284,329
Claims priority, application Japan, Dec. 15, 1987, 62-317170
Int. Cl.[5] B65D *30/08, 30/14;* B32B *27/08*
U.S. Cl. 428—35.2 6 Claims



1. A packaging bag for photosensitive materials comprising a cylindrical coextruded multilayer inflation film having a

VOL
1114
ISS
3
MY
15
1990
UMI

sidewall and first and second open ends and having at least one light-shielding layer containing a light-shielding material, said cylindrical coextruded multilayer inflation film being flattened and folded to form a bottom portion of the packaging bag extending between said first and second open ends, and said folded film being welded along said first and second open ends to form sides of the packaging bag whereby portions of side sidewall form an opening of the packaging bag.

4,925,712

CONTAINERS HAVING LOW PERMEABILITY TO HYDROCARBON VAPORS AND PROCESS OF PRODUCING SAME

Aldo Cicuta, Novara, and Amilcare Collina, Milan, both of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Aug. 2, 1988, Ser. No. 227,342
Claims priority, application Italy, Aug. 3, 1987, 21572 A/87
Int. Cl.[5] B65D *25/34*
U.S. Cl. 428—35.7 **6 Claims**

1. A tank, adapted to contain a fuel for cars, motorcycles and commercial vehicles, usually oozing through polyethylene walls consisting of high-density high molecular weight polyethylene, coated, on at least one of its surfaces, by a layer of at least one polymer of para-xylylene and/or of a derivative thereof.

4,925,713

LIGHTSAFE MASKING FILM

Naohiko Kiryu, Urawa; Kazutoshi Kimizuka, Kitakatsushika; Etsuko Minezaki, and Hiroshi Maruyama, both of Misato, all of Japan, assignors to Somar Corporation, Japan

Filed Dec. 15, 1988, Ser. No. 284,634
Claims priority, application Japan, Sep. 27, 1988, 63-243070
Int. Cl.[5] B30B *7/06*
U.S. Cl. 428—40 **12 Claims**



1. A lightsafe masking film comprising a transparent substrate, and a transparent, lightsafe layer peelably provided over the surface of said substrate and containing a yellow colorant capable of blocking light having a wavelength of 480 nm or less and a blue colorant so that (a) the color of the lightsafe layer is greenish, (b) the light transmissivity of the lightsafe layer is maximum at a wavelength of 540–570 nm, (c) the lightsafe layer can block light having a wavelength of 480 nm or less, and (d) the lightsafe layer has such a light transmission characteristic that the ratio of the integral light transmissivity in the wavelength range of 480–600 nm to that in the wavelength range of 480–700 nm is 0.6 or more.

4,925,714

COEXTRUDED CORE LAMINATES

Melvin S. Freedman, Beachwood, Ohio, assignor to Avery International Corporation, Pasadena, Calif.

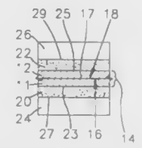
Division of Ser. No. 61,000, Jun. 9, 1987, Pat. No. 4,837,088, which is a continuation of Ser. No. 699,205, Feb. 5, 1985, abandoned. This application Mar. 20, 1989, Ser. No. 325,664
Int. Cl.[5] B32B *7/06*
U.S. Cl. 428—40 **2 Claims**

1. A multilayer flexible label assembly providing a pair of tack-free peelingly separable subassemblies comprising:

a flexible central core formed by a coextrusion process, said central core comprising a first polymeric film and a second polymeric film, said films being different in composition, each having an interior face formed during the coextrusion process by contact with the other, the interior faces mutually providing an interface between them which is devoid of interposed coatings, said interior faces forming a first peelable interface having a given interfacial peel strength, each said polymeric layer having an exterior face,

a layer of pressure-sensitive adhesive secured to an exterior face of one of said polymeric films,

a flexible release liner adhered by said pressure-sensitive adhesive to said exterior face to form a multilayer assembly, the interfacial peel strength between said adhesive



layer and said exterior face being substantially greater than said interfacial peel strength at said first peelable interface and the interfacial peel strength between said adhesive and said release liner being substantially less than said interfacial peel strength at said first peelable interface,

a second layer of pressure-sensitive adhesive adhesively associated with the exterior face of the other polymeric film, and

an additional flexible layer adhesively secured by said second pressure-sensitive adhesive layer to the exterior face of said other polymeric film and providing an interfacial peel strength substantially greater than said interfacial peel strength at said first peelable interface, said label assembly being die cut-to-shape from the side of said additional layer to but not through said release liner.

4,925,715

LINERLESS ROLL OF SELF FUSING TAPE

Kyosaku Sato, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Jun. 7, 1989, Ser. No. 362,563
Int. Cl.[5] B32B *7/06, 7/12*
U.S. Cl. 428—40 **9 Claims**

1. A tension-wound, linerless roll of tape, said tape having an unstretched thickness of from 0.1 to 2.0 mm and having insufficient tack to self-bond in the relaxed state and being capable of fusing into a homogeneous mass when elongated by at least about 50 percent and wrapped into overlapping layers wherein said tape comprises

(I) a polymer mixture selected from the group consisting of (all parts being parts by weight) (a) a mixture of from about 15 to about 30 parts of a polymer of ethylene having a density of from about 0.945 to about 0.965 grams/cm^3 with from about 70 to about 85 parts of elastomeric polymer, (b) a mixture of from about 15 to about 30 parts of a linear low density polymer of ethylene having a density of from about 0.91 to about 0.94 grams/cm^3 with from about 70 to about 85 parts of elastomeric polymer, and (c) a mixture of from about 15 to about 25 parts of isotactic polypropylene with from about 75 to about 85 parts of elastomeric polymer, said elastomeric polymer consisting of from about 50 to 100 parts by weight of an isobutylene-isoprene polymer and from 0 to about 50 parts by weight of one or more polymers selected from (i) natural rubber, (ii) a homopolymer of isobutylene having a molecular weight from about 50,000 to about 100,000, and (iii) a polymer of ethylene and propylene containing from about 50 to about 65 percent by weight ethylene, and

(II) from 0.4 to 4 parts (per 100 parts of said polymer mixture) of fatty amide anti-blocking agent, said roll of tape having a diameter of less than 12 cm.

4,925,716

PIN FEED BADGE

David J. Haas, 9 Margret Ann La., Suffern, N.Y. 10901

Filed Jan. 12, 1989, Ser. No. 296,228
Int. Cl.[5] B32B *7/06, 7/12, 3/10*
U.S. Cl. 428—41 **3 Claims**



1. An apparatus for computerized processing of identification badges for affixing to a wearer comprising:

badge carrier means having a plurality of sections, the sections coupled to each other via perforated connections, each of the sections being separable, one from the other, and each section comprising a central portion and removable apertured end portions for cooperating with carrier processing means for receiving sprockets in automated sheet feeding equipment; and

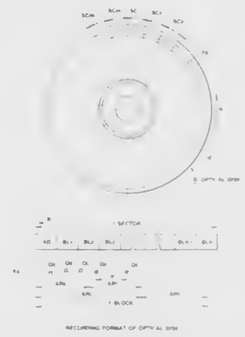
each central portion including a polymeric badge adhesively and removably mounted thereto, the badge having thereon a roughened writing surface and a means for affixing the badge to a wearer.

4,925,717

DISK-SHAPED RECORDING MEDIUM AND DISK APPARATUS

Yoshihiro Tsukamura, Kanagawa; Masataka Ogawa, Chiba, and Seiji Kobayashi, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP88/00826, § 371 Date Apr. 18, 1989, § 102(e) Date Apr. 18, 1989, PCT Pub. No. WO89/01686, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 19, 1988, Ser. No. 348,486
Claims priority, application Japan, Aug. 21, 1987, 62-207542; Dec. 22, 1987, 62-322958
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 **6 Claims**



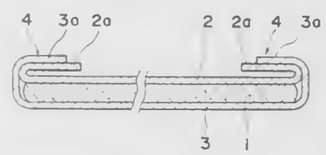
1. A disk-shaped recording medium in which recording tracks forming a large number of circular turns are formed on an annular recording surface section for surrounding a central hole formed in said annular recording surface section, each of said turns of said recording tracks including a predetermined number of recording regions, corresponding ones of said recording regions of said turns of said recording tracks being arrayed in the radial direction of the recording surface section, each of said recording sections including a control recording region and an information writing region consecutive thereto, characterized in that clock information pits arranged on a track center line, a pair of tracking information pits spaced by a predetermined distance from said clock information pits and positioned on the inner and outer sides of said track center line and a pair of traverse information pits spaced by a distance allocated to each of said recording tracks and arranged on said track center line, are provided in said control recording region.

4,925,718

SHEET-SHAPED MOLDING MATERIAL

Yasuhiro Tsujimoto; Masayuki Kurita, and Minoru Miki, all of Shimizu, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 28, 1988, Ser. No. 291,305
Claims priority, application Japan, Dec. 28, 1987, 62-333755
Int. Cl.[5] B32B *1/04, 3/04, 3/18*
U.S. Cl. 428—68 **5 Claims**



1. A sheet-shaped molding material to be wound on a roll comprising a sheet of a composition including a paste-like curable material and a reinforcing solid material, and a pair of carrier films covering the entire upper and lower faces of the sheet of composition, at least one of the films having a 1% or lower elongation at a tension of 20 kg/m.

5. The sheet-shaped molding material as defined in claim 1 or 2, wherein both ends in the width direction of at least one of the films covering the sheet of composition are folded back onto the other side of the sheet of composition.

4,925,719

REINFORCED POLYMERIC COMPOSITES

James M. Stanelunis, and Donald L. Rodenbeck, both of Bowling Green, Ohio, assignors to Centrite Corp., Bowling Green, Ohio

Continuation-in-part of Ser. No. 179,479, Apr. 8, 1988, Pat. No. 4,828,897. This application May 5, 1989, Ser. No. 348,214
Int. Cl.[5] B32B *3/02, 3/26, 5/12*
U.S. Cl. 428—71 **8 Claims**



1. A reinforced polymeric composite, comprising: a foam core of a first polymeric composition; a skin surrounding said core of a second polymeric composition; a three dimensional interface chemically and mechanically bonding said core to said skin comprising strands of a high modulus material including continuous longitudinal strands substantially uniformly peripherally spaced about the outer surface of said core and the

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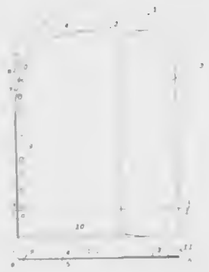
inner surface of said skin, continuous transverse strands substantially uniformly spaced along the length of said core adjacent to said longitudinal strands, a transverse layer of first chopped strands randomly contacting said longitudinal strands and said transverse strands, and second chopped strands inclined with respect to said core.

4,925,720

COVER FOR TRANSPARENCIES FOR USE IN PROJECTORS HAVING A HORIZONTAL IMAGE CARRYING FACE

Ole Hansen, Vallensbaek Strand, Denmark, assignor to OH Investments Limited, London, England

Filed Jun. 6, 1989, Ser. No. 362,155
Claims priority, application Denmark, Nov. 14, 1988, 6352/88
Int. Cl.[5] B32B *1/04, 3/04*
U.S. Cl. 428—77 **8 Claims**



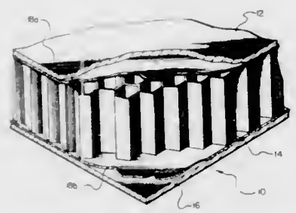
1. A cover for transparencies, said cover comprising a pocket of transparent, flexible web material which is open at at least one side edge and which is connected with a substantially non-transparent mask flap at a side edge, said mask flap being swingable about a folding line between a first position, in which it protrudes inwardly over the pocket, and a second position in which it protrudes from the said side edge substantially in continuation of the pocket, said pocket having a plurality of holes at a side edge, the mask flap being placed at the side edge which is opposite the side edge formed by holes.

4,925,721

HONEYCOMB SANDWICH STRUCTURE HAVING DISSIMILAR METAL FACE SHEETS

Jan Harper-Tervet, Palmdale; Rod F. Simenz, Sherman Oaks, and James C. George, Los Angeles, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Aug. 27, 1984, Ser. No. 644,755
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—116 **3 Claims**



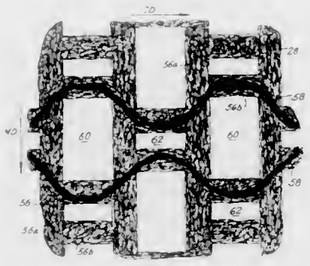
1. A honeycomb sandwich structure comprising:
an aluminum alloy first face sheet, said aluminum alloy being of the type that can accomodate immediate exposure to temperatures of up to 800° F. without significant degradation of structural properties upon return to room temperature;
a titanium alloy honeycomb core, having first and second opposed principle surfaces;
a titanium alloy second face sheet; and
a layer of thermoplastic as an adhesive joining said first and second face sheets to said first and second opposed principle surfaces of said core, said adhesive having an operational temperature in excess of 600° F.

4,925,722

DISPOSABLE SEMI-DURABLE NONWOVEN FABRIC

Cecil W. Jeffers, Norwood, and Richard Sewcyk, Stoughton, both of Mass., assignors to International Paper Company, Purchase, N.Y.

Filed Jul. 20, 1988, Ser. No. 221,816
Int. Cl.[5] B32B *3/10*
U.S. Cl. 428—131 **9 Claims**



1. A disposable semi-durable nonwoven fabric which comprises:
a symmetrical array of fluid entangled staple fibers fabricated of a composite web including top and bottom carded and randomized fiber web layers, said web including a blend of rayon and polyester fibers which includes at least 10% rayon fibers;
said symmetrical array including a lattice structure of spaced approximately parallel machine direction ("MD") oriented fibrous bands in one of said top and bottom web layers, and spaced cross-direction ("CD") oriented fibrous bands in the other of said top and bottom layers which intersect with and are interstitially entangled with said MD bands, said MD and CD bands interfacing with across substantially the entire length of said CD bands, said CD bands each having a generally sinusoidal configuration, said CD bands respectively being arranged in an array in which each band is 180° out of phase with respect to the adjoining bands in the array, and said MD and CD bands defining void areas in the fabric between the bands;
the fabric having a basis weight in the range of 45 to 70 gay, and an MD/CD fiber tensile strength ratio in the range of 1.5:1 to 21.5:1.

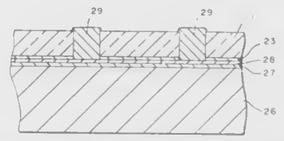
4,925,723

MICROWAVE INTEGRATED CIRCUIT SUBSTRATE INCLUDING METAL FILLED VIA HOLES AND METHOD OF MANUFACTURE

Marina Bujatti, and Franco N. Sechi, both of Palo Alto, Calif., assignors to Microwave Power, Inc., Santa Clara, Calif.

Filed Sep. 29, 1988, Ser. No. 251,538
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—137 **5 Claims**

1. A microwave integrated circuit substrate comprising:
a body of insulating material having upper and lower surfaces with one or more holes formed in said body to extend between the upper and lower surface; and



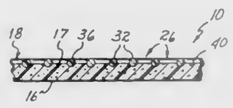
a metal substantially filling all of said holes and extending between and coplanar with the upper and lower surfaces.

4,925,724

SLIP-RESISTANT, CUSHIONING MATERIAL

John M. Ogden, Cincinnati, Ohio, assignor to Ogden Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 142,474, Jan. 11, 1988. This application Oct. 6, 1989, Ser. No. 294,173
Int. Cl.[5] B32B *3/10;* A43B *13/38*
U.S. Cl. 428—137 **24 Claims**



1. A sheet material, comprising:
a slip-resistant, non-absorbent and thermally nonconductive first layer formed with a plurality of apertures, said first layer having a first surface;
a second layer having cushioning properties and being moisture-absorbent and air pervious, said second layer having a second surface;
said slip-resistant first layer being at least partially embedded in said second layer so that said first surface of said slip-resistant first layer extends beneath said second surface of said second layer and a portion of said second layer extends at least partially into said apertures in said slip-resistant first layer;
whereby upon contact of moisture with said slip-resistant first layer, said second layer is effective to absorb and wick away the moisture from said first layer so that the slip-resistance of said first layer is substantially maintained in the presence of moisture.

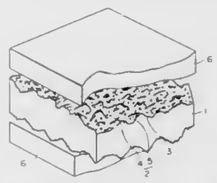
4,925,725

INTERLAYER FOR LAMINATED GLASS

Gen Endo, Moriyama; Hiroyuki Tateishi, Ohmihachiman; Yoshihiro Kawata, Hino; Isao Karasudani, Ohtsu, and Hirofumi Omura, Kusatsu, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 780,822, Sep. 27, 1985, abandoned. This application Jan. 4, 1989, Ser. No. 293,579
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—156 **4 Claims**

1. An interlayer for a laminated glass, said interlayer having a thickness of 0.1 to 2.0 mm. and being composed of a film or sheet of a thermoplastic resin, at least one surface of the film or sheet of a thermoplastic resin having numerous coarse raised and depressed portions and numerous fine raised and depressed portions existing on the surfaces of the coarse raised and depressed portions, the average distance between two adjacent coarse expressed or raised portions being about 2 to about 10 times the 10-point average roughness of the coarse raised and depressed portions measured in accordance with ISO-R468, wherein said interlayer is produced by using an embossing roll as a press-forming roll, said embossing roll having on its surface coarse raised and depressed portions formed by an engraving method and fine raised and depressed portions formed by a blasting method.



4,925,726

WALLCOVERING SUBSTRATE FORMED OF TEXTURED, CONTINUOUS, MULTI-FILAMENT YARNS HAVING HYDROPHILIC CHARACTERISTICS

James H. Whetstone, Greensboro, N.C., assignor to Unifi, Inc., Greensboro, N.C.

Filed Jan. 22, 1988, Ser. No. 146,968
Int. Cl.[5] B32B *5/02, 7/06;* D06N *7/02*
U.S. Cl. 428—196 **8 Claims**



1. An improved wallcovering comprising:
(a) a vinyl sheet material having a front decorative surface and a rear surface;
(b) a gauze substrate affixed to said rear surface of said sheet material;
(c) said gauze substrate formed primarily of a textured, continuous, multi-filament, polymeric yarn having a surfactant incorporated into the interfilamentary structure thereof;
(d) said surfactant having the following characteristics:
(i) water dispersible and water insoluble;
(ii) HLB factor in the range of 7–10;
(iii) heat stable to at least 350° F.

4,925,727

CURABLE TEMPERATURE INDICATING COMPOSITION

Andrew V. Brown, San Jose; Tamar G. Gen, Palo Alto, and Gary R. Weibe, Fremont, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 30, 1982, Ser. No. 403,451
Int. Cl.[5] C09K *3/00*
U.S. Cl. 428—199 **26 Claims**

1. An article, which comprises:
a recoverable substrate having on a surface thereof a temperature indicating composition applied as:
(a) a UV curable binder which on curing is capable of adhering to the substrate;
(b) a colorant which produces in the composition a substantial color change when the composition is heated; and

VOL
1114
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(c) an initiator which on exposure to UV radiation initiates a polymerization reaction in the binder.

4,925,728

MULTILAYER FILM SUITABLE AS A RELEASE SHEET IN THE PRODUCTION OF DECORATIVE LAMINATE PANELS

Guenther Crass, Taunusstein; Lothar Bothe, Mainz-Gonsenheim, and Gunter Schloegl, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 95,449

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631232

Int. Cl.[5] **B32B** *27/08; B29D 7/00;* **C09J** *7/02*

U.S. Cl. 428—216 **14 Claims**

1. A biaxially stretch-oriented multilayer film produced by coextrusion and suitable as a release sheet in the production of decorative laminate panels having a matte surface finish comprising:

a base layer comprising polypropylene and a fine-particulate pigment in an amount of from about 3% to 30% by weight, relative to the weight of the base layer, and

at least one top layer, having a peak-to-valley height R_z between about 1.0 to 3.0 μm, comprising:

(a) from about 98.5 to 99.6% by weight of a propylene homopolymer and

(b) from about 0.4 to 1.5% by weight of a polydiorganosiloxane, relative to the weight of said top layer.

4,925,729

FIBER REINFORCED THERMOPLASTIC ARTICLES AND PROCESS FOR THE PREPARATION THEREOF

James F. O'Connor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 36,622, Apr. 9, 1987, Pat. No. 4,800,113, which is a continuation of Ser. No. 672,762, Nov. 19, 1984, abandoned. This application Sep. 29, 1988, Ser. No. 250,600

Int. Cl.[5] **B32B** *7/00*

U.S. Cl. 428—245 **25 Claims**

9. A process for the preparation of a fiber reinforced thermoplastic article, said process comprising:

(a) intermingling at least one fibrous poly(arylene sulfide) material and at least one fibrous reinforcement material to produce a composite yarn;

(b) passing said composite yarn to a staple cutter to produce a composite staple;

(c) laying up said composite staple to produce a batt of said composite staple; and

(d) heating said batt to a temperature at least as high as the melting point of said poly(arylene sulfide) for a time sufficient to allow intimate contact between said poly(arylene sulfide) and said fibrous reinforcement material.

4,925,730

LIQUID ACTIVE SUBSTANCE SLOW RELEASING DEVICE

Shinji Yamada, and Yutaka Aoki, both of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Nov. 10, 1988, Ser. No. 269,337

Claims priority, application Japan, Nov. 12, 1987, 62-286788

Int. Cl.[5] **G01N** *21/17;* **B32B** *3/26*

U.S. Cl. 428—305.5 **4 Claims**

1. A liquid active substance slow releasing device comprising a thermoplastic polyester resin having a glass transition point of from 5° C. to 80° C. and an evaporative liquid active substance having a limited solubility for the aforesaid thermoplastic resin, said device being an opaque resin molding of the thermoplastic resin having dispersed therein the liquid active substance as fine droplets in an amount over the saturation solubility and becoming substantially transparent when the amount of the liquid active substance in the resin molding is reduced.

4,925,731

HEAT-SENSITIVE TRANSFER MATERIAL

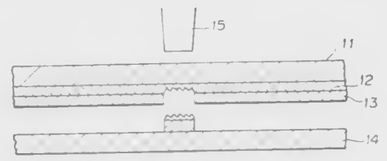
Koji Hanada, Chmiyashi; Masashi Sawamura, Shiraokamati; Takeshi Yoshikawa, Katushikaku; Hiroyuki Nihashi, Yonoshi, and Tsuneo Tanaka, Meguroku, all of Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Division of Ser. No. 170,308, Mar. 14, 1988, abandoned. This application Feb. 2, 1989, Ser. No. 305,608

Claims priority, application Japan, Mar. 17, 1987, 62-60215

Int. Cl.[5] **B32B** *9/04*

U.S. Cl. 428—336 **8 Claims**



1. In a heat-sensitive transfer material having a substrate and a heat-melting ink layer on one surface of said substrate, the improvement wherein there is provided, between said substrate and said heat-melting ink layer, an interlayer which breaks away within itself under heat at the time of heat transfer, said interlayer containing at least 4% by weight of a high fatty acid amide of the formula

$$C_nH_{2n+1}NHCO(CH_2)_mCONHC_nH_{2n+1} \text{ or}$$

$$C_nH_{2n+1}CONH(CH_2)_mNHCOC_nH_{2n+1}$$

wherein

n is an integer of from 12 to 32 and

m is an integer of from 1 to 6.

4,925,732

BREATHABLE FLEXIBLE LAMINATES ADHERED BY A BREATHABLE ADHESIVE

Kathleen R. Driskill, Townsend, and Robert L. Henn, Wilmington, both of Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jul. 27, 1988, Ser. No. 224,970

Int. Cl.[5] **B32B** *27/08, 27/40*

U.S. Cl. 428—336 **18 Claims**

1. A laminate comprising:

(i) flexible adherends having a combined moisture permeability of at least 140 $g/m^2 \times 24$ hr., and adhered by

(ii) an adhesive having a moisture permeability of at least 1000 $g/m^2 \times 24$ hr. in a continuous film of at least 25 micron thickness; said adhesive

being a one-component, hydrophilic, block polyurethane consisting of both hard and soft segments;

the soft segment being a polyol containing oxyethy units,

the hard segment being the reaction product of polyisocyanate and chain extender;

said polyol having a number average molecular weight of from about 600 to about 3500 and having a functionality of at least 2;

said isocyanate having a functionality of at least 2; and said chain extender having a molecular weight in a range lower than about 500 and having a functionality of at least 2; wherein the reactants are employed in such proportions so as to satisfy the following equations:

$$\frac{EqNCO}{EqOH + EqCE} \geq +0.99 \; EqCE > 0,$$

wherein EqNCO is the equivalent of the isocyanate species employed, and EqOH and EqCE denote the respective molar equivalents of the polyol and chain extended employed, the soft segments being provided by the polyol of primarily oxyethylene units, and the suitable hard segments being provided by the reaction product of the isocyanate and chain extender and which induce phase-separation of the hard and soft segments;

and wherein the laminate has a moisture permeability of at least 120 $g/m^2 \times 24$ hr., and a wet bond strength of at least 0.3kgf/cm.

4,925,733

MAGNETIC RECORDING MEDIUM

Hiroyuki Imataki, and Mizuho Hiraoka, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 763,713, Aug. 8, 1985, abandoned. This application Mar. 28, 1988, Ser. No. 173,042

Claims priority, application Japan, Aug. 18, 1984, 59-172239

Int. Cl.[5] **G11B** *5/64*

U.S. Cl. 428—336 **12 Claims**



1. A magnetic recording medium, comprising:

a substrate;

a recording layer composed of a magnetic film formed on said substrate;

an intermediate layer for protecting said magnetic film from monomer gas during plasma polymerization, said intermediate layer formed over said recording layer by either vacuum evaporation or sputtering and being composed of Al_2O_3, BaO, BeO, CeO_2, In_2O_3, SiO_2, SiO, SnO_2, Ta_2O_5, TiO_2, ThO_2, ZrO_2, MgF_2, CeF_4, LaF_3 or a mixture of two or more of the foregoing compounds; and

an anticorrosive layer formed on said intermediate layer by plasma-polymerization.

4,925,734

GLAZING LAMINATES

Heinrich Agethen; Paul Gesenhues, both of Herdecke; Helmer Rädisch, Aachen; Otto Jandeleit, Alsdorf, and Wolfgang Schäfer, Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Paris, France

Continuation of Ser. No. 844,882, Mar. 27, 1986, abandoned, which is a continuation of Ser. No. 659,025, Oct. 9, 1984, Pat. No. 4,643,944, which is a continuation of Ser. No. 274,547, Jun. 17, 1981, abandoned, which is a continuation of Ser. No. 190,341, Sep. 24, 1980, abandoned, which is a continuation of Ser. No. 70,732, Aug. 29, 1979, abandoned, which is a continuation of Ser. No. 811,430, Jun. 29, 1977, abandoned. This application May 4, 1988, Ser. No. 191,785

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629779

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.[5] **B32B** *27/00*

U.S. Cl. 428—349 **4 Claims**

1. A pre-formed polymeric sheet for use in preparing a glazing laminate, consisting essentially of one surface of said sheet comprising an amorphous thermoplastic material capable of adhering to a ply of said laminate and the other surface of said sheet comprising a thermoset material which imparts desired properties to said laminate, said thermoplastic material comprising a thermoplastic polyurethane comprised of the reaction product of

(A) one or more of the following aliphatic diisocyanates: (i) a branched chain alicyclic diisocyanate; (ii) a non-branched alicyclic diisocyanate; and (iii) a branched chain noncyclic diisocyanate; and



(B) a branched chain polyester diol or branched chain polyether diol or mixture thereof; said diols having a molecular weight of about 500–4000, and

wherein when reactant (A) comprises 85 to 100% of said non-branched alicyclic diisocyanate and when reactant (B) comprises said polyester diol, then said polyester diol is prepared from at least two different diols which result in chain branching in said polyester diol.

4,925,735

RESIN COMPOSITION FOR HEAT-SENSITIVE TRANSFER RECORDING MEDIUM AND HEAT-SENSITIVE TRANSFER RECORDING MEDIUM

Kunihiro Kosbizuka; Masao Asano; Toshiaki Tezuka; Tatsuichi Maehashi, and Yasuhiko Tanaka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 76,388, Jul. 22, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,692

Claims priority, application Japan, Jul. 29, 1986, 61-178375; Jan. 29, 1987, 62-19038

Int. Cl.[5] **B41M** *5/26*

U.S. Cl. 428—423.1 **17 Claims**

1. A heat-sensitive transfer recording medium comprising at least one colorant layer containing a heat-fusible substance on one surface of a support, and a backing layer formed from a component (A) wherein component (A) is a silicone modified resin having a softening point of 60° C. or higher and a component (B) wherein component (B) is at least one resin selected from the group consisting of polyester resins, polyamide resins, cellulose resins and acrylic resins provided on a surface of said support where no colorant layer is provided.

4,925,736

TOPICAL HEMATOPORPHYRIN

Mark J. Shikowitz, Dix Hills, N.Y., assignor to Long Island Jewish Medical Center, New Hyde Park, N.Y.

Filed Jul. 6, 1988, Ser. No. 215,837

Int. Cl.[5] **A61K** *31/40, 7/48;* **A61L** *15/04*

U.S. Cl. 424—449 **37 Claims**

1. A non-lyophilized topical composition for photodynamic therapy, comprising a photoreactive agent dispersed in a carrier vehicle which is capable of deep penetration when applied to mammalian skin or mucosa.

VOL 1114 ISS 3 MY 15 1990 UMI

4,925,737

LAMINATED STRUCTURE

Tsuyoshi Baba, Osaka; Akio Takigawa, Nishinomiya; Naoto Hirayama, Takarazuka, and Motoaki Yoshida, Kawanishi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Dec. 7, 1988, Ser. No. 281,254
Claims priority, application Japan, Dec. 11, 1987, 62-313626
Int. Cl.[5] B32B *17/10, 27/42, 27/08*
U.S. Cl. 428—437 16 Claims

1. A laminated structure comprising
(A) a layer comprising a polyester resin,
(B) an adhesive layer resulting from curing of a composition comprising
(i) the hydrolytic condensation product of an amino group-containing organosilicon compound represented by the following general formula (I)

$$R^1{}_m-Si-(OR^3)_{4-m-n} \quad \text{with } R^2{}_n \text{ on Si} \qquad (I)$$

wherein:
R^1 represents an organic group having a primary amino group at the end and an acrylic hydrocarbon group;
R^2 represents an alkyl group having 1 to 6 carbon atoms or a phenyl group;
R^3 represents an alkyl group having 1 to 6 carbon atoms, an alkoxyalkyl group having 1 to 6 carbon atoms, or an acetyl group; m represents 1 or 2, n represents 0 or 1, and
(ii) a diamine represented by the following general formula (II-a) or (II-b)

$$H_2N-NH_2 \qquad (II\text{-}a)$$

$$H_2N-R-NH_2 \qquad (II\text{-}b)$$

wherein R represents an alkylene group having 1 to 12 carbon atoms, or a phenylene group,
the proportion of the organosilicon compound of general formula (I) being 10 to 100% by weight based on the total weight of the organosilicon compound of general formula (I) and the diamine of general formulas (II-a) and (II-b), and
(C) a layer comprising polyvinylbutyral, the layers (A), (D) and (C) being laminated in this sequence.

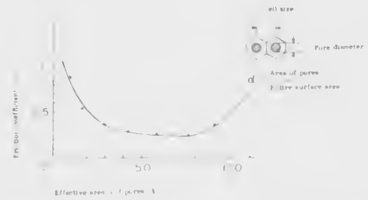
4,925,738

SUBSTRATE FOR A MAGNETIC DISK AND PROCESS FOR ITS PRODUCTION

Noboru Tsuya, 3-13-11 Hachimanyama, Setagaya-ku, Tokyo; Tadao Tokushima, 1-18-1 Izumi, Hamamatsu-shi, Shizuoka-ken, and toshiro Takahashi, 350-29 Ose-cho, Hamamatsu-shi, Shizuoka-ken, all of Japan

Filed Sep. 28, 1988, Ser. No. 250,088
Claims priority, application Japan, Sep. 30, 1987, 62-248771
Int. Cl.[5] G11B *5/82*
U.S. Cl. 428—472.2 2 Claims

1. A magnetic disk, comprising:
a substrate and a metallic thin magnetic film formed thereon, said substrate having an anodized aluminum layer thereon formed from coated aluminum having a (111) crystal face as the predominant face of the coated aluminum layer, with the pores of the anodized layer being widened by



dissolution so that the total area of pores ranges from 20 to 80% of the entire surface area.

4,925,739

SURFACE MODIFIED POLYMER ARTICLE AND PROCESS FOR MAKING SAME

Joseph Silbermann, Old Bridge, and Michael T. Burchill, Cranbury, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Jul. 23, 1987, Ser. No. 76,630
Int. Cl.[5] B32B *27/30*
U.S. Cl. 428—522 10 Claims



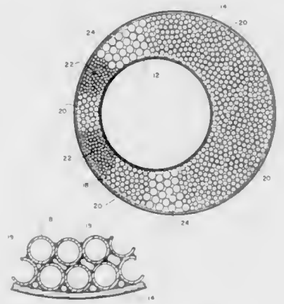
1. A U.V. stabilized article comprising: a polyvinyl chloride resinous sheet whose sides are both exposed to the air, the surface regions of at least one side of said sheet being modified with a stabilizing amount of an ultraviolet light stabilizer, the exposed surfaces being substantially free of stabilizer material, and the uniformity, appearance and degree of surface perfection of said modified side being substantially the same as that of untreated sheet,
wherein said stabilizing amount is at least 0.3 g/m^2 of a surface of said sheet, said surface region extends to a depth of up to 200 microns from said surface, and at least 70% of said stabilizer material is present in the first 100 microns of said surface region,
wherein said degree of surface perfection is characterized by said surface being non-tacky, non-streaking and having substantially its original shape and hardness.

4,925,740

HOLLOW METAL SPHERE FILLED STABILIZED SKIN STRUCTURES AND METHOD OF MAKING

Brian Norris, San Diego, and Francis J. Gojay, Bonita, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jul. 28, 1989, Ser. No. 386,344
Int. Cl.[5] B22F *3/00*
U.S. Cl. 428—547 21 Claims



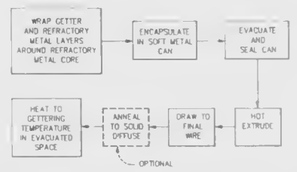
1. High strength, light weight, stabilized skin structures which comprise:
two spaced apart metal skins; and
a plurality of hollow metal spheres having diameters of from about 0.005 to 0.5 inch substantially filling the space between said metal skins;
said spheres having outside diameters varying from larger diameters in selected low load areas, through medium diameters in selected average load areas to relatively smaller diameters in selected high load areas and said spheres being bonded together at substantially all points of contact between adjacent spheres and between spheres and skins.

4,925,741

GETTER WIRE

James Wong, Wayland, Mass., assignor to Composite Materials Technology, Inc., Shrewsbury, Mass.

Filed Jun. 8, 1989, Ser. No. 363,634
Int. Cl.[5] C22F *1/18;* B32B *15/02;* H01J *19/70, 61/26*
U.S. Cl. 428—661 8 Claims



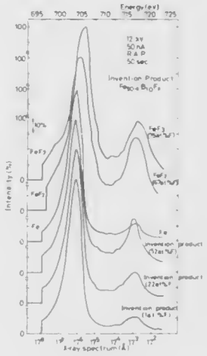
1. A product useful for manufacturing a wire for evaporating a reactive metal for use as a source of reactive metal vapors and as a getter wire comprising a refractory metal core and a plurality of layers of a getter metal interspersed with layers of a refractory metal surrounding the core, the reactive metal being selected from the group consisting of titanium, zirconium, hafnium and barium and the refractory metal being selected from the group of tantalum, niobium, molybdenum and tungsten and alloys thereof.

4,925,742

THIN-FILM HAVING LARGE KERR ROTATION ANGLE AND PRODUCTION PROCESS THEREOF

Eishu Sugawara; Taketoshi Nakayama, and Tsuyoshi Masumoto, all of Sendai, Japan, assignors to Research Development Corporation of Japan, Tokyo and Tokin Corporation, Sendai, both of, Japan

Continuation of Ser. No. 71,188, Jul. 8, 1987, abandoned. This application Oct. 18, 1988, Ser. No. 259,489
Claims priority, application Japan, Jul. 18, 1986, 61-168093
Int. Cl.[5] H01F *10/00*
U.S. Cl. 428—692 12 Claims



1. A thin film consisting of a composition represented by the following formula (I):

$$J_xL_yQ_{(100-x-y)} \qquad (I)$$

wherein
J: an element represented by any one of element symbols F, Cl, Br and I, or a combination thereof;
L: an element represented by any one of element symbols B, C, Al, Si, P, As, Sb, Bi, Se, Te, Ti, V, Cr, Mn, Ga, Ge, Zr, Nb and Mo, or a combination thereof;
Q: either one of Fe, Ni or Co, or a combination thereof;
x: a value of 3–80; and
y: a value satisfying the following equation (II):

$$3 \leqq x+y \leqq 80 \qquad (II),$$

and said composition excludes FeF_2 and FeF_3, the location of the peak energy value for L_α in the soft x-ray emission spectrum for said film being not shifted from the location of the corresponding value for said Q metal and being different from the location of the corresponding value for a compound of Q and J so that said film is metallic and ferromagnetic, said thin film being optically transparent and having an amorphous structure containing halide crystal phase.

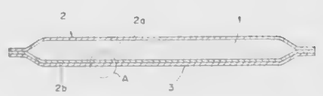
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4,925,743

DISPOSABLE BODY WARMER AND HEAT GENERATING MATERIAL THEREFOR

Tamehiko Ikeda, Izumisano, and Shusuke Yano, Akou, both of Japan, assignors to Nihon Food Culture Co., Ltd., Osaka and Tateho Chemical Industries Co., Ltd., Ako, both of, Japan

Continuation of Ser. No. 176,243, Mar. 31, 1988, abandoned.
This application Apr. 27, 1989, Ser. No. 344,490
Claims priority, application Japan, Mar. 31, 1987, 62-80118; Mar. 25, 1988, 63-72736
Int. Cl.[5] A61F *7/03*
U.S. Cl. 428—702 8 Claims



1. A disposable body warmer, comprising:
a heat generating material for generating moderate heat and far infrared rays, consisting essentially of a powder of magnesium oxide with a plate crystal structure;
retaining means for retaining said material so that it absorb moisture present in the surroundings; and
reflecting means provided on one side of said retaining means to reflect far infrared rays radiated from said heat generating material.

4,925,744

PRIMARY ALUMINUM-AIR BATTERY

Marilyn J. Niksa; Andrew J. Niksa, both of Concord, and Jay M. Noscal, Jefferson, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed Apr. 7, 1989, Ser. No. 335,005
Int. Cl.[5] H01M *12/06*
U.S. Cl. 429—27 30 Claims



1. A cell adapted for utilization in an aqueous electrolyte aluminum-air battery, said cell comprising:
a frame defining an electrolyte chamber having opposed sides, said frame being made of a rigid insulating material inactive to said electrolyte;
a consumable aluminum anode having a surface exposed to air currents external of said cell;
an air cathode spaced from said anode by said electrolyte chamber;
means for admitting electrolyte solution into said electrolyte chamber;
vent means exposing said electrolyte chamber to atmosphere;
and a hydrophobic membrane permeable to the passage of hydrogen closing said vent means.

4,925,745

SULFUR TOLERANT MOLTEN CARBONATE FUEL CELL ANODE AND PROCESS

Robert J. Remick, Naperville; Leonard G. Marianowski, South Holland, and Elias H. Camara, Clarendon Hills, all of Ill., assignors to Institute of Gas Technoloy, Chicago, Ill.

Filed Mar. 29, 1985, Ser. No. 717,447
Int. Cl.[5] H01M *8/14, 8/18*
U.S. Cl. 429—40 20 Claims

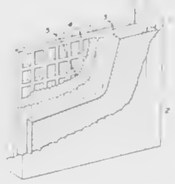
1. In a process for production of electricity in a molten alkali metal carbonates fuel cell using a fuel gas mixture obtained by gasification of naturally occurring carbonaceous material, the improvement comprising passing said fuel gas mixture comprising about 10 to about 35 volume percent CO and about 1 ppm to about 10 ppm H_2S on a volume basis through a porous anode comprising about 0.5 to about 20 weight percent of a sulfur tolerant water-gas-shift catalyst selected from the group consisting of Cr_2O_3, FeO, Fe_2O_3, Fe_3O_4, Al_2O_3, $LiAlO_2$, $LiCrO_2$, MoO_2, MoO_3, WO_3, and mixtures thereof and the remainder being substantially a metal selected from the group consisting of nickel, cobalt, and mixtures thereof whereby over about 25 volume percent of the water-gas-shift equilibrium conversion of CO to H_2 obtained with no H_2S present is maintained in the presence of said H_2S.

4,925,746

DEVICE FOR RECOMBING HYDROGEN AND OXYGEN RELEASED IN LEAD-ACID STORAGE BATTERIES

Dechko Pavlov; Todor V. Donchev; Ivan P. Nikolov; Veneta I. Nikolova; Geno P. Papazov, and Konstantin M. Petrov, all of Sofia, Bulgaria, assignors to Zentralna la Boratoria Po Elektrochimicheski Iztochnici Na Tok, Sofia, Bulgaria

Continuation-in-part of Ser. No. 109,382, Oct. 15, 1987, abandoned. This application Apr. 20, 1988, Ser. No. 183,798
Int. Cl.[5] H07M *10/34;* B01J *31/00*
U.S. Cl. 429—57 11 Claims



1. A device for rendering a lead-acid storage battery maintenance-free and suitable for sealing by recombining and electrochemically converting hydrogen and oxygen released in each battery cell having a positive and a negative pole, said device comprising
an electrode stack of catalytically active electrodes enveloped in a microporous sheath;
said electrodes each comprising a catalyst selected from the group consisting of tungsten carbide, a mixture of tungsten carbide and active carbon, and a mixture of tungsten carbide and activated carbon;
said electrodes each further comprising a binder and a mixture of catalyst and binder being pressed onto a support grid;
said support grid comprising an element selected from the group consisting of lead and lead alloy;
each electrode being separated from an adjacent electrode in said stack by a microporous sheet material;
said electrode stack being divided in two parts, one part being connected by means of a diode to the negative pole and the other part being connected by means of a diode and a resistor to the positive pole;
said electrode stack being partially immersed in electrolyte;

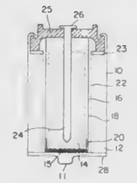
the potential of the part of the stack connected to the negative pole being kept between 0.3 and 0.5 V and the potential of the part of the stack connected to the positive pole being kept between 0.1 and 0.3 V versus a hydrogen electrode.

4,925,747

CATALYTIC RECOMBINATION OF CORROSION EVOLVED HYDROGEN IN ALKALINE CELLS

Karl Kordesch, Graz, Austria, and Klaus Tomantschger, Mississauga, Canada, assignors to Battery Technologies Inc., Mississauga, Canada

Continuation of Ser. No. 234,749, Aug. 22, 1988, abandoned.
This application Jul. 6, 1989, Ser. No. 375,888
Claims priority, application Canada, Oct. 27, 1987, 550336
Int. Cl.[5] H07M *10/34*
U.S. Cl. 429—59 13 Claims



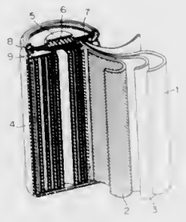
1. A primary or rechargable electrochemical sealed cell in which hydrogen may evolve, said cell having a manganese dioxide cathode, a zinc anode, an aqueous alkaline electrolyte contacting the anode and the cathode, and a further auxiliary cathode material comprising a porous substrate and a catalyst for the absorption of pressurized hydrogen within said cell;
wherein said pressurize hydrogen is absorbed at least by the said auxiliary cathode material in the presence of said alkaline electrolyte;
wherein said auxiliary cathode material is at least partially wetted by said alkaline electrolyte; and
wherein said auxiliary cathode material and said manganese dioxide cathode are in intimate physical contact one with the other, with no substantial electrical resistance therebetween.

4,925,748

ALKALINE STORAGE BATTERY USING HYDROGEN ABSORBING ALLOY

Munehisa Ikoma, Katano; Hiroshi Kawano, Ibaraki; Osamu Takahashi, Fujisawa; Isao Matsumoto, Osaka, and Masakazu Ikeyama, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 24, 1989, Ser. No. 356,229
Claims priority, application Japan, Feb. 23, 1989, 64-43710
Int. Cl.[5] H01M *10/24*
U.S. Cl. 429—59 18 Claims



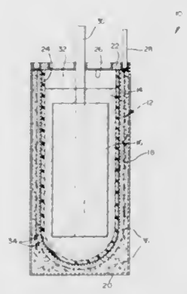
1. An alkaline storage battery using a hydrogen absorbing alloy, said battery comprising: a positive electrode including a metal oxide as a main constituent material; a negative electrode including, as a main constituent material, a hydrogen absorbing alloy capable of electrochemically absorbing/desorbing hydrogen serving as an active material; an alkaline electrolytic solution; a separator; and said hydrogen absorbing alloy of said negative electrode having a $CaCu_5$ type crystal structure and being represented by the general formula of $A_{1-x}B_xC_yD_z$, in which formula: A is selected from the group consisting of La, mixtures of rare-earth elements, and misch metal; B is selected from the group consisting of Ti, Zr, Ca, Y, Hf and mixtures thereof; x is an atomic ratio within the range $0 \leqq x \leqq 0.2$; C is selected from the group consisting of Ni, Co, Mn, Al, Fe, Cu, Cr and mixtures thereof; y has an atomic ratio within the range made up as follows, $y > 3.5$ for Ni, $y \leqq 1.0$ for Co, $y \leqq 0.6$ for Mn, $y \leqq 0.5$ for Al, $y \leqq 0.3$ for Fe, $y \leqq 1.0$ for Cu, and $y \leqq 0.3$ for Cr; D is selected from the group consisting of V, In, Tl, Ga and mixtures thereof; z is an atomic ratio within the range made up as follows, $0.02 \leqq z \leqq 0.3$ for V, $0.02 \leqq z \leqq 0.1$ for In, $0.02 \leqq z \leqq 0.1$ for Tl, and $0.02 \leqq z \leqq 0.1$ for Ga; and $(y+z)$ is an atomic ratio within the range of from 4.7 to 6.3.

4,925,749

ELECTROCHEMICAL CELL

Michael L. Wright, Allestree, England, assignor to Lilliwyte Societe Anonyme, Luxembourg, Luxembourg

Filed Dec. 8, 1988, Ser. No. 282,710
Claims priority, application United Kingdom, Dec. 24, 1987, 8730136
Int. Cl.[5] H01M *10/39*
U.S. Cl. 429—104 11 Claims



1. A rechargeable high temperature electrochemical power storage cell having a molten alkali metal anode and a cathode separated from the anode by a ceramic solid electrolyte separator which is a conductor of ions of the anode metal, the separator having, in contact with its surface exposed to the alkali metal of the anode, a lining of material which is porous to and permeable by the molten alkali metal of the anode, the molten alkali metal of the anode, when in contact with the surface of the material of the lining at the operating temperature of the cell, exhibiting a contact angle of at least 90° with respect to the surface of the lining material, said contact angle being such that any alkali metal passing through the separator during charging from a fully discharged state in which there is no sodium in contact with the lining, is held by the lining in contact with the surface of the separator exposed to the anode in the form of a layer of more or less uniform thickness which does not drain downwardly under gravity, regardless of the attitude or orientation of the cell.

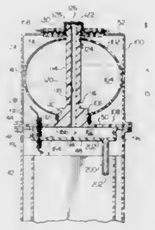
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4,925,750

RESERVE BATTERY

George H. Theiss, Dallas, Tex., assignor to Power Cell, Inc., Dallas, Tex.

Division of Ser. No. 72,112, Jul. 10, 1987, Pat. No. 4,794,058.
This application Sep. 19, 1988, Ser. No. 245,585
Int. Cl.[5] H01M 6/38
U.S. Cl. 429—116 3 Claims



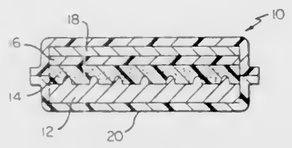
1. A reserve battery, comprising:
a battery cell compartment defined by housing walls surrounding rounding a plurality of battery cells and having an open top;
a lower bulkhead member spanning the open top of the battery cell compartment and having a plurality of fill tubes depending from a downwardly facing surface of the lower bulkhead member, one fill tube being provided for each of the battery cells, and each fill tube having internal walls defining a passageway between the interior of the battery cell compartment and an upwardly facing surface of the lower bulkhead member;
an upper bulkhead member having a downwardly facing surface opposite and spaced apart from the upwardly facing surface of the lower bulkhead member to form a bulkhead cavity;
an elastic reservoir bag in an expanded state containing an electrolyte fluid under pressure and having an opening connected to a passageway to the bulkhead cavity;
openable means for sealing the passageway between the reservoir bag opening and the cavity; and
housing walls defining a containment for the reservoir bag.

4,925,751

HIGH POWER SOLID STATE ELECTROCHEMICAL LAMINAR CELL

Dale R. Shackle; Denis G. Fauteux, and Jorgen S. Lundsgaard, all of The Mead Corporation, Mead World Headquarters, Courthouse Plaza Northeast, Dayton, Ohio 45463

Filed Apr. 26, 1989, Ser. No. 343,976
Int. Cl.[5] H01M 6/18
U.S. Cl. 429—191 27 Claims



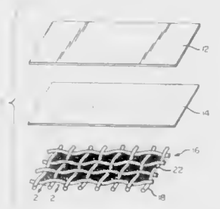
1. A solid state electrochemical laminar single cell comprising:
an alkali metal anode,
a solid ionically conductive electrolyte,
a composite cathode, and
a current collector,
wherein said electrolyte is interposed between said alkali metal anode and said cathode, and said cathode is interposed between said electrolyte and said current collector, said cell generating a discharge current per unit area greater than or equal to 50 milliamps/cm^2 at room temperature.

4,925,752

SOLID STATE ELECTROCHEMICAL CELL HAVING POROUS CATHODE CURRENT COLLECTOR

Denis G. Fauteux; Michael J. Moore, and Peter M. Blonsky, all of c/o MHB Inc., 3020 Newmark Dr., Miamisburg, Ohio 45342

Filed Mar. 3, 1989, Ser. No. 319,434
Int. Cl.[5] H01M 6/18
U.S. Cl. 429—191 12 Claims



1. A solid state laminar electrochemical cell comprising:
an alkali metal anode layer;
a solid ionically conducting electrolyte layer; and
a cathode/current collector layer;
wherein said electrolyte layer is interposed between said alkali metal anode layer and said cathode/current collector layer and wherein said cathode/current collector layer comprises an electrically conductive substrate having a plurality of surface voids and a radiation cured composite cathode composition comprising an intercalation compound, an electrically conductive filler and a radiation cured ionically conductive electrolyte, said cathode composition being coated and radiation cured on the surface of said substrate facing said electrolyte layer and being maintained in the voids of said surface.

4,925,753

LITHIUM/SULFUR DIOXIDE CELL

Carl R. Schlaikjer, 1636 Hyde Park Ave., Hyde Park, Mass. 02136

Filed Sep. 28, 1988, Ser. No. 250,109
Int. Cl.[5] H01M 6/14, 4/36
U.S. Cl. 429—196 6 Claims



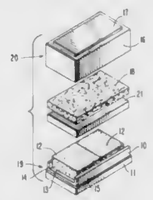
1. A substantially moisture free electrochemical cell comprising a lithium anode, an inorganic electrolyte including sulfur dioxide that provides a solvent for lithium tetrachloroaluminate and at least one alkaline earth tetrachloroaluminate and that functions in conjunction with dissolved aluminum and lithium to produce a discharge product and in which solution there is a mole equivalent ratio of lithium to alkaline earth to sulfur dioxide within the range of from 1 to 1 to 9, to lb 2 to 12, said cell having a cathode supported on a current collector, and said cathode consisting of a porous carbon for supporting the discharge product.

4,925,754

PALLADIUM PLATED CURRENT COLLECTOR

Thomas L. Dunham, Dodgeville, Wis., assignor to Rayovac Corporation, Madison, Wis.

Filed Jun. 1, 1989, Ser. No. 360,829
Int. Cl.[5] H01M 4/66
U.S. Cl. 429—245 8 Claims



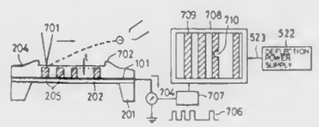
1. An alkaline electrochemical cell comprising a cathode subassembly, with a metal oxide cathode and collector means for collecting current from said cathode, a zinc anode., an electrolyte in contact with said zinc anode and a nonmetallic separator between the cathode and the anode, said collector means comprising a metal plated current collector additionally plated with a layer of palladium.

4,925,755

METHOD OF CORRECTING DEFECT IN CIRCUIT PATTERN

Hiroshi Yamaguchi, Fujisawa; Keiya Saito, Yokohama; Akira Shimase, Yokohama; Satoshi Haraichi, Yokohama; Susumu Aiuchi, Yokohama; Nobuyuki Akiyama, Yokohama; Shinji Kuniyoshi, Tokyo, and Takeshi Kimura, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1988, Ser. No. 152,159
Claims priority, application Japan, Feb. 27, 1987, 62-42542
Int. Cl.[5] G03F 1/00
U.S. Cl. 430—5 6 Claims



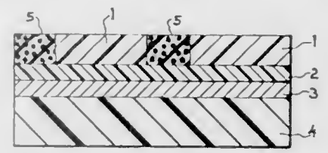
1. A circuit pattern correcting method comprising the steps of:
preparing a circuit pattern structure where a circuit pattern on a conductive film is coated with a protective film;
removing a wide area of the protective film of the circuit pattern structure so as to reduce a thickness of the protective film by irradiating with a scan of a high-intensity focused ion beam;
visually detecting a dropout portion of said circuit pattern by displaying an image of the circuit pattern for a wide area of the circuit pattern that was scanned in said step of removing a wide area of the protective film and by detecting a current flowing in said conductive film in accordance with the scanning of said ion beam, on a displaying means;
forming a hole or a slit in the protective film of reduced thickness by irradiating by scanning with the high-intensity focused ion beam aligned to the dropout defective portion detected by the display means; and
plating said hole or slit while utilizing said conductive film as a plating electrode, thereby forming a metal film to correct said dropout defective portion.

4,925,756

SILVER-BASED ELECTROSTATIC PRINTING MASTER

Allan Cairncross, Hockessin, Del., assignor to E. I. Dupont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 196,803, May 16, 1988, Pat. No. 4,868,081.
This application Jul. 21, 1989, Ser. No. 384,149
Int. Cl.[5] G03C 1/04, 1/94; G03G 5/026
U.S. Cl. 430—18 48 Claims



31. A conductive substrate that bears a coating consisting essentially of a silver grain image dispersed in a synthetic insulating polymeric binder that is swellable in aqueous solutions having a pH higher than approximately 8½, said binder being a copolymer of an unsaturated carboxylic acid monomer and an aromatic monomer and having ionizing carboxylic acid groups, said composition having an insulation value such that it will support an apparent macroscopic electric field of at least approximately five (5) volts/micron as measured 2 seconds following full charging of its surface that has been allowed to equilibrate to 50% relative humidity at 20° C. for 1 hour.

4,925,757

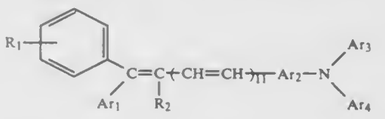
ELECTROPHOTOGRAPHIC PHOTORECEPTOR FOR NEGATIVE ELECTRIFICATION

Shigeki Takenouchi; Akira Hirano; Shiori Saito, and Yoshihide Fujimaki, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,287
Claims priority, application Japan, Aug. 12, 1987, 62-201124; Aug. 13, 1987, 62-202134
Int. Cl.[5] G03G 5/07
U.S. Cl. 430—31 17 Claims

1. An electrophotographic photoreceptor comprising an elecroconductive substrate, a photo-sensitive layer containing a compound represented by general formula [A];

[A]



wherein,
R_1 represents a hydrogen atom or a substituent; R_2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group; Ar_1 represents a hydrogen atom, a substituted or unsubstituted phenyl group, a substituted or unsubstituted naphthyl group; Ar_2 represents a substituted or unsubstituted phenylene group or a substituted or unsubstituted naphthy-

lene group; Ar_3 and Ar_4 independently represent a substituted or unsubstituted alkyl group, a substituted or unsubstituted phenyl group or a substituted or unsubstituted naphthyl group; and n represents an integer of 0 or 1; and a compound containing in its chemical structure a hindered phenolic structure unit.

4,925,758

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR

Mitsuru Hashimoto, Numazu, and Nasaomi Sasaki, Susono, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

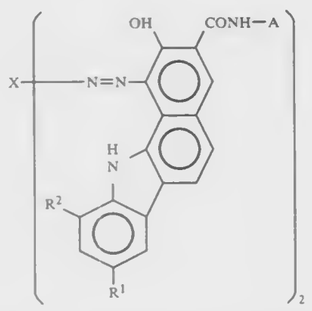
Filed Sep. 13, 1989, Ser. No. 406,604

Claims priority, application Japan, Jul. 8, 1987, 62-171625; Jul. 17, 1987, 62-178777

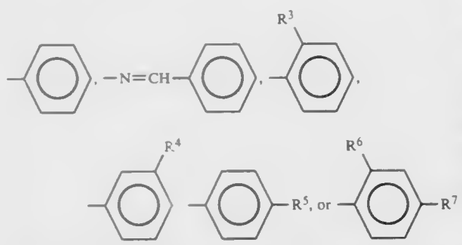
Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—57 **7 Claims**

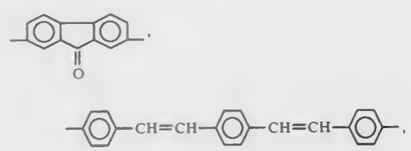
1. An electrophotographic photoconductor comprising an electroconductive support and a photoconductive layer formed thereon, said photoconductive layer comprising as a charge generating material an azo pigment having general formula (I):



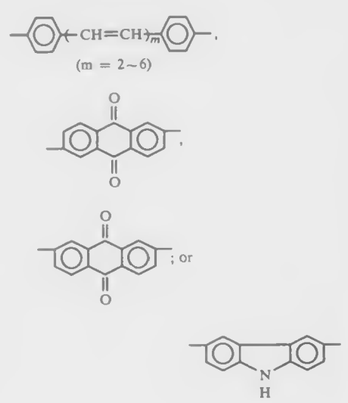
wherein R^1 represents H, Cl, CH_3, or OCH_3; R^2 represents H, Cl, or CH_3, provided that R^1 and R^2 may not be hydrogen at the same time; A represents



wherein R^3 represents a lower alkyl group or a nitro group; R^4 represents a lower alkyl group, a lower alkoxyl group or Cl; R^5 represents a lower alkyl group, a lower alkoxyl group, Cl or a nitro group; and R^6 and R^7 each represent a lower alkyl group or Cl; and X represents



-continued



4,925,759

ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL WITH PYRROLOPYRROLE AND BENZIDINE DERIVATIVES

Yasuyuki Hanatani, and Kaname Nakatani, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

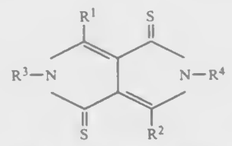
Continuation-in-part of Ser. No. 276,578, Nov. 28, 1988, abandoned. This application Oct. 5, 1989, Ser. No. 399,410

Claims priority, application Japan, Nov. 30, 1987, 62-301855

Int. Cl.[5] G03G *5/06, 5/14*

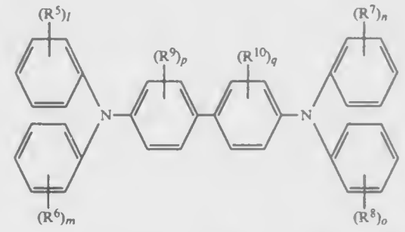
U.S. Cl. 430—59 **12 Claims**

1. An electrophotographic sensitive material having a photosensitive layer formed on an electroconductive substrate, and said photosensitive layer contains a pyrrolopyrrole type compound represented by the following general formula (1) and a benzidine derivative represented by the following general formula (2)



(1)

(wherein R^1 and R^2 are same or different, selected from the group consisting of aryl group, aryl group which contains a substituent, aralkyl group, aralkyl group which contains a substituent and heterocyclic group, and R^3 and R^4 are same or different, selected from the group consisting of hydrogen atom, alkyl group, aryl group and aryl group which contains a substituent)



(2)

(wherein R^5, R^6, R^7, R^8,R^9 , and R^{10} are same or different, selected from the group consisting of hydrogen atom, lower alkyl group, lower alkoxy group and halogen atom, l, m, n and o are integers in the range of 1 to 3, and p and q are 1 or 2).

3. An electrophotographic sensitive material according to claim 1, wherein said photosensitive layer is a laminate type photosensitive layer superposing an electric charge generating layer which contains said pyrrolopyrrole type compound upon an electric charge transferring layer which contains said benzidine derivative.

4,925,760

PYRANTHRONE PHOTOCONDUCTOR IMAGING MEMBERS

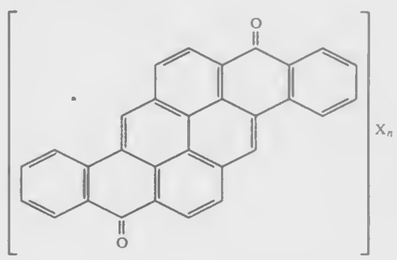
Giuseppa Baranyi; Ah-Mee Hor, both of Mississauga; Rafik O. Loutfy, Willowdale, and Zoran D. Popovic, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1988, Ser. No. 215,099

Int. Cl.[5] G03G *5/06*

U.S. Cl. 430—59 **35 Claims**

1. A photoconductive imaging member comprised of a supporting substrate; a vacuum evaporated photogenerating layer comprised of fractionally sublimed pyranthrone compounds of the following formula,



wherein X is halogen, and n is a number of from 3 to 4; and an aryl amine hole transport layer, wherein said fractionally sublimed pyranthrone compounds are subjected to a temperature of from about 200° to about 450° C. whereby impurities and decomposition products more volatile than the desired components are separated at a temperature zone of below 200° C., and there are obtained the purified pyranthrone compounds at a purity of at least about 95 percent at a temperature zone of from about 290° to 350° C., separated from the nonvolatile impurities which remain at a high temperature zone.

4,925,761

CONVERSION SOLUTIONS FOR LITHOGRAPHIC PRINTING PLATES CONTAINING PHYTIC ACID

Michael Kulisz, Sr., Roselle, and Robert N. Cooper, Northbrook, both of Ill., assignors to A. B. Dick, Chicago, Ill.

Filed Jun. 15, 1989, Ser. No. 366,680

Int. Cl.[5] G03G *13/26*

U.S. Cl. 430—97 **24 Claims**

1. A cyanide-free conversion or desensitizing solution for use in printing comprising:

(a) from about 1.0 to about 3.0 percent of phytic acid;

(b) from about 0.5 to about 2 percent of a water-soluble anionic polymer;

(c) from about 1.0 to about 3.0 percent of a water-soluble dibasic acid; and

(d) an aqueous carrier;

all percentages being based on the total weight of the solution, the pH of said solution ranging from about 3.5 to about 6.0.

4,925,762

CARRIER FOR REPROGRAPHY AND PRODUCTION OF THIS CARRIER

Werner Ostertag, Gruenstadt; Erwin Czech, Biblis; Franz-Ulrich Schmitt, Gerlingen, and Detlef Schulze-Hagenest, Stuttgart, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 17, 1988, Ser. No. 233,050

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727383

Int. Cl.[5] G03G *9/14;* B05D *7/00;* B32B *15/02*

U.S. Cl. 430—106.6 **20 Claims**

1. A carrier for a two-component dry developer, wherein the said carrier has, on particles of a ferrite core or a metallic iron core, a homogeneous metal oxide layer formed by a gas phase reaction of a volatile metal compound with oxygen or water or with oxygen and water in the presence of agitated core particles at elevated temperatures.

4,925,763

DEVELOPER FOR ELECTROPHOTOGRAPHY CONTAINING IONOMER RESIN

Kazuo Tsubuko; Shinichi Kuramoto, both of Numazu, and Kiyoshi Sakai, Mishima, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,878

Claims priority, application Japan, Mar. 13, 1987, 62-058202

Int. Cl.[5] G03G *9/08*

U.S. Cl. 430—106 **12 Claims**

1. A developer for electrophotography comprising toner particles which comprise a colorant prepared by a flushing method by using at least a pigment component and an ionomer resin.

4,925,764

POSITIVE SOLID BLOCK TONER

Dennis G. Madeleine, Cherry Hill, N.J.; Carol A. Senkler, Hockessin, and Loretta A. Grezzo Page, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 23, 1988, Ser. No. 288,917

Int. Cl.[5] G03G *9/08, 9/10*

U.S. Cl. 430—110 **13 Claims**

1. A positively chargeable solid toner composition comprising resin particles, pigment particles and charge enhancing additive,

the additive being selected from the group consisting of block polymers of the type AB, BAB, ABA, wherein B is a segment that is compatible with the resin particles, the monomer units of said A segment, when homopolymerized, having a polarity which is higher than the polarity of the monomer units of said B segment when homopolymerized,

(a) A is one or two blocks which comprise about from 0.5 to 50% by weight of the total copolymer, having a number average molecular weight of about from 200 to 10,000 and prepared from at least one monomer selected from compounds of the general form $CH_2{=}CCH_3CO_2R$ and $CH_2{=}CHCO_2R$ wherein R is alkyl of 1-20 carbon atoms, the block further contains at least 2 pendant ionic moieties in the block at the terminal end of R of the general formula $-Q(R_1)_mX$ wherein Q is selected from N, P, and S; R_1 are independently selected from alkyl of 1-20 carbon atoms, phenyl, benzyl or substituted phenyl, m is 3 when Q is N or P, and m is 2 when Q is S, and X is selected from halides and conjugate bases of organic acids, or $R\text{is-}Q(R_1)_{m-1}$ when no halide or conjugate bases of organic acids are present, and

(b) B is one or two blocks which are the balance of said copolymer, having a number average molecular weight of about from 200 to 100,000 and prepared from monomers selected from styrene, substituted styrene, butadiene or compounds of the general formulas $CH_2{=}CCH_3CO_2R$ and $CH_2{=}CHCO_2R$, wherein R is alkyl of 1-20 carbon atoms.

4,925,765

NEGATIVE SOLID BLOCK TONER

Dennis G. Madeleine, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1988, Ser. No. 288,913

Int. Cl.[5] G03G *9/08, 9/10*

U.S. Cl. 430—110 **9 Claims**

1. A negatively chargeable solid toner composition comprising resin particles, pigment particles and charge enhancing additive,

the additive being selected from the group consisting of block polymers of the type AB, BAB, ABA, wherein B is a segment that is compatible with the resin particles, the monomer units of said A segment, when homopolymerized, having a polarity which is higher than the polarity of the monomer units of said B segment when homopolymerized,

(a) A is one or two blocks which comprise about from 0.1 to 50% by weight of the copolymer, having a number average molecular weight of about from 200 to 10,000 and prepared from at least one monomer selected from compounds of the general formula $CH_2{=}CCH_3CO_2R$ or $CH_2{=}CHCO_2R$, wherein R is hydrogen, in which case adjacent carboxylic groups can be dehydrated to form anhydride units, or R is an inorganic or organic cation or R is an alkyl group of 1-20 carbon atoms where at least 2 pendant moieties in the block at the terminal end of R are of the general formula $-SO_2R_1$ or $-SO_2NHR_1$, wherein R_1 is an aryl group or an alkyl group of 1-20 carbon atoms, and

(b) B is one or two blocks which are the balance of said copolymer, having a number average molecular weight of about from 500 to 100,000 and prepared from monomers selected from styrene, substituted styrene, butadiene or compounds of the general formulas $CH_2{=}CCH_3CO_2R'$ and $CH_2{=}CHCO_2R'$, wherein R' is alkyl of 1-20 carbon atoms.

4,925,766

LIQUID ELECTROPHOTOGRAPHIC TONER

Mohamed A. Elmasry, Woodbury, and Kevin M. Kidnie, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 2, 1988, Ser. No. 279,438

Int. Cl.[5] G03G *9/12*

U.S. Cl. 430—115 **23 Claims**

1. A liquid toner for developing an electrostatic image comprising chelating copolymer particles dispersed in a non-polar carrier liquid, said chelating copolymer particles comprising a thermoplastic resinous core having a Tg of less than 25° C. and which is insoluble or substantially insoluble in said carrier liquid, and chemically anchored to said core a copolymeric steric stabilizer soluble in said carrier liquid and having covalently attached thereto moieties of a coordinating compound and at least one metal soap compound derived from metals which form strong coordinate bonds with said moieties, said stabilizer being chosen from the classes of block and graft copolymers.

4,925,767

GLOSS CONTROLLING PROCESS

Eddie R. Daems, and Luc H. Leenders, both of Herentals, Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 14, 1988, Ser. No. 284,363

Claims priority, application European Pat. Off., Jan. 12, 1988, 88200031

Int. Cl.[5] G03C *11/06, 1/76*

U.S. Cl. 430—258 **10 Claims**



1. Process for controlling the visual appearance of an image present on a permanent support in the form of a hydrophilic colloid layer, layer system or relief pattern, which comprises transferring a continuous non-photosensitive layer from a temporary support onto said permanent support either before or after said image is formed thereon by the steps comprising pre-wetting the permanent support either image-free or with the image already thereon, contacting said pre-wetted support with said continuous layer on its temporary support, and stripping off the temporary support to leave said continuous layer on said permanent support, said continuous layer being non-photosensitive and comprising hardened gelatin, said gelatin being applied at a coverage of at most 20 g/m2 and having a degree of hardening corresponding to that achieved by the addition of at least 0.001 g of formaldehyde per gram of gelatin.

4,925,768

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING A TETRAPOLYMER BINDER

Masayuki Iwasaki; Sadao Fujikura; Yuichi Wakata, and Yasunori Takata, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

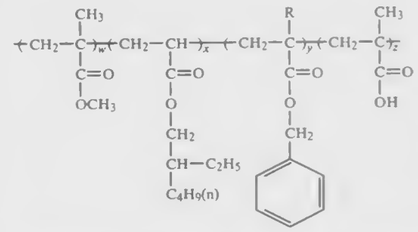
Continuation-in-part of Ser. No. 131,685, Dec. 11, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 364,599

Claims priority, application Japan, Dec. 11, 1986, 61-295441

Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—271 **15 Claims**

1. A photopolymerizable composition consisting essentially of an addition polymerizable unsaturated compound having at least two ethylenically unsaturated double bonds in the molecule, a photopolymerization initiator, and a binder, wherein said binder is a tetrapolymer having a weight average molecular weight of from about 10,000 to 500,000 represented by formula (I):



(I)

wherein R represents a hydrogen atom or a methyl group; and w, x, y and z each represents mol percent, w ranging from about 45 to 65; x ranging from about 5 to 18; y ranging from about 2 to 10; and z ranging from about 20 to 40, $C_4H_9(n)$ represents an n-butyl group, wherein said binder is present in an amount of from about 40 to 80% by weight based on the total weight of said composition, wherein said polymerizable unsaturated compound is present in an amountof from about 7.5 to 55% by weight based on the total weight of said composition and wherein said photopolymerization initiator is present in an amount of from about 0.1 to 10% by weight based on the total weight of said composition.

4,925,769

LIGHT-SENSITIVE PHOTOPOLYMERIZABLE LAMINATE MATERIAL

Wolfgang Huemmer, Limburgerhof; Bernd Bronstert, Otterstadt; Dieter Littmann, Hessheim, and Manfred Zuerger, Sinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

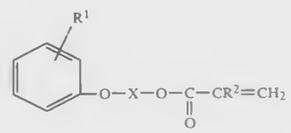
Filed Mar. 17, 1989, Ser. No. 324,709

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808952

Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—271 **10 Claims**

1. A light-sensitive photopolymerizable laminate material suitable for producing printing plates which on a dimensionally stable base carries at least one intermediate layer and on top thereof a relief-forming lightsensitive layer which consists essentially of a mixture of polymeric binder, at least one ethylenically unsaturated polymerizable compound, photoinitiator and thermal polymerization inhibitor, wherein at least one intermediate layer contains a compound of the general formula (I)



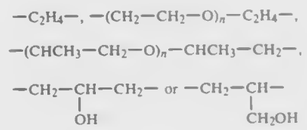
(I)

where

R^1 is hydrogen or alkyl of from 1 to 10 carbon

R^2 is hydrogen or methyl,

and X is



where n is from 1 to 8, in at least partially polymerized state.

4,925,770

CONTRAST-ENHANCING AGENT FOR PHOTOLITHOGRAPHY

Kunihiro Ichimura, Tsukuba; Teruhiko Youezawa, Kanagawa; Hideo Kikuchi, Chiba; Nariaki Tochizawa, and Keiichi Hayashi, both of Funabashi, all of Japan, assignors to Director General of Agency of Industrial Science and Technology, Tokyo and Toyo Gosei Kogyo Co., Ltd., Chiba, both of, Japan

Continuation-in-part of Ser. No. 47,187, May 6, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 284,251

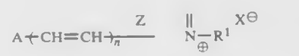
Claims priority, application Japan, May 20, 1986, 61-113508; Jun. 16, 1986, 61-138144

Int. Cl.[5] G03C *1/733*

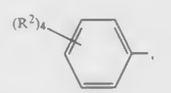
U.S. Cl. 430—273 **7 Claims**

1. A contranst-enhancing agent for a photoresist layer which comprises, in admixture:

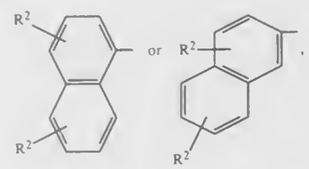
(a) a photo-bleachable compound represented by the general formula



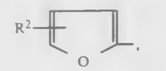
in which A is an aromatic group selected from the class consisting of an unsubstituted or substituted phenyl group of the general formula



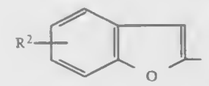
unsubstituted or substituted α- or β-napthyl group of the general formula



9-anthranyl group, unsubstituted or substituted furyl group of the general formula

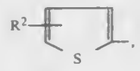


unsubstituted or substituted benzofuryl group of the general formula



and unsubstituted or substituted thienyl group of the general formula

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the subscript n is 1, 2 or 3, Z is a residue selected from the class consisting of pyridyl, quinolyl and benzothiazolyl groups forming a nitrogen-containing aromatic heterocyclic ring together with the nitrogen atom, X is an anionic group of monovalency and R^1 is a hydrogen atom or a group selected from the class consisting of alkyl, alkenyl and aralkyl groups, R^2 being an atom of hydrogen or a halogen or a group selected from the class consisting of alkyl, hydroxy, alkoxy, formyl and acyl groups; and

(b) a water-soluble polymer selected from the class consisting of poly(vinyl alcohol), poly(vinyl pyrrolidone) and pullulan.

4,925,771

PROCESS OF MAKING PHOTOSENSITIVE AQUEOUS DEVELOPABLE CERAMIC COATING COMPOSITION INCLUDING FREEZE DRYING THE CERAMIC SOLID PARTICLES

William J. Nebe, Wilmington, Del., and James J. Osborne, Kennett Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 200,401, May 31, 1988. This application Nov. 3, 1989, Ser. No. 431,225

Int. Cl.[5] G03C *1/68*

U.S. Cl. 430—281 **3 Claims**

1. In a method of making a photosensitive ceramic coating composition which is fireable in a substantially nonoxidizing atmosphere comprising an admixture of:

(a) finely divided particles of ceramic solids having a surface area-to-weight ratio of no more than 10 m^2/g and at least 80 wt. % of the particles having a size of 1–10 μm, and

(b) finely divided particles of an inorganic binder having a glass transition temperature in the range from of 550° to 825° C., a surface area-to-weight ratio of no more than 10 m^2/g and at least 90 wt. % of the particles having a size of 1–10 μm, the weight ratio of (b) to (a) being in a range from 0.6 to 2, dispersed in an organic medium comprising

(c) an organic polymeric binder, and

(d) a photoinitiation system, dissolved in

(e) photohardenable monomer, and

(f) an organic medium

wherein the improvement comprises an organic polymeric binder containing a copolymer or interpolymer of a C_1–C_{10} alkyl acrylate, C_1–C_{10} alkyl methacrylate, styrene, substituted styrene or combinations thereof and an ethylenically unsaturated carboxylic acid, wherein a moiety in the binder derived from the unsaturated carboxylic acid comprises at least 15 weight percent of the polymer and wherein the binder has a molecular weight not greater than 50,000 and wherein the composition upon imagewise exposure to actinic radiation is developable in an aqueous solution containing 1 percent by weight sodium carbonate.

wherein prior to mixing of component (a), (b), (c), (d), (e), (f), component (a) of finely divided particles of ceramic solids and component (b) of finely divided particles of an inorganic binder are freeze dried in formation of such particles.

4,925,772

ANTI-RADIATION COVERING FOR ELECTRONIC COMPONENTS

Ferdinand Quella, Neubiberg; Oskar Nuyken, Munich; Klaus Budde, Unterhaching, and Thomas Suefke, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich

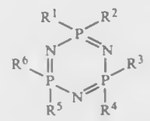
Filed Nov. 4, 1988, Ser. No. 267,179

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1987, 3740168

Int. Cl.[5] G03C *1/70;* **C07F** *9/65;* **C08F** *2/48*

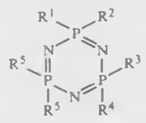
U.S. Cl. 430—281 **14 Claims**

1. A cover layer for micro-electronic components and VLSI circuits having a high absorbency for alpha radiation, wherein the cover layer is produced with an ultraviolet-initiated cross-linking of a negative resist structure, as an essential constituent for absorbing the alpha radiation, the negative resist contains a phosphazene derived from the general structure:



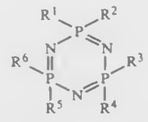
wherein: the radicals R1 through R6 are bonded to the phosphorus via oxygen atoms; on a statistical average, at least one of the radicals R1 through R6 carries a light-sensitive group capable of polymerization, the remaining radicals R1 through R6, independently of one another, are chosen from the group consisting of alkyloxy, aryloxy, alkylcarbonyloxy or arylcarbonyloxy groups; and the light-sensitive group is a substituted acrylate group.

7. A cover layer for micro-electronic components and VLSI circuits having a high absorbency for alpha radiation, wherein the cover layer is produced with an ultraviolet-initiated cross-linking of a negative resist structure, as an essential constituent for absorbing the alpha radiation, the negative resist contains a phosphazene derived from the general structure:



wherein the radicals R1 through R6 are bonded to the phosphorous via oxygen atoms, the radicals R1 through R6 of the phosphazene are allylalcoholates derived from allyl alcohol and from benzyl alcohol, wherein the ratio of the olefinic radicals (allyl alcohol) to saturated radicals is set between 1:3 and 1:6.

8. A negative resist for producing a cover layer for micro-electronic components and VLSI circuits having a high absorbency for alpha radiation, the negative resist containing a phosphazene derived from the general structure:



wherein: the radicals R1 through R6 are bonded to the phosphorus via oxygen atoms; at least one of the radicals R1 through R6 carries a light-sensitive group capable of polymerization; the remaining radicals R1 through R6, independently from one another, are chosen from the group consisting of alkyloxy, aryloxy, alkylcarbonyloxy and aryl-carbonyloxy groups; and the light-sensitive group is a substituted acrylate group.

4,925,773

SOLDER RESIST INK COMPOSITION

Masataka Miyamura, Kamakura; Yuusuke Wada, Tokyo; Kazuhiro Takeda, Higashine; Yuji Nakaizumi, Tokyo, and Teiji Kohara, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 18, 1987, Ser. No. 135,049

Claims priority, application Japan, Dec. 26, 1986, 61-315350; Oct. 13, 1987, 62-256247

Int. Cl.[5] C08G *8/30, 8/32;* **G03C** *1/68*

U.S. Cl. 430—285 **4 Claims**

1. A solder resist ink composition comprising:

a photo-curable resin (A2) obtained by causing an unsaturated monocarboxylic acid to react with a cresolnovolak- or phenolnovolak- epoxy resin, and causing a polybasic carboxylic anhydride to react with the resultant reaction product;

a photo-curable resin (B2) obtained by causing an unsaturated monocarboxylic acid to react with a bisphenol a novolak epoxy resin or epoxy vinyl cyclohexene-polyether resin, and causing a polybasic carboxylic anhydride to react with the resultant reaction product;

at least one photo-polymerizable compound (C) selected from photo-polymerizable monomers;

a photo-polymerization initiator;

an organic solvent; and

an inorganic filler,

and which composition contains 0.1 to 0.5 equivalents of the photo-curable resin B2 with respect to 1.0 equivalents of photo-curable resin A2, wherein the equivalents are the original epoxy equivalents in the said cresolnovolak- or phenolnovolak- epoxy resin and in the bisphenol A novolak epoxy resin or epoxy vinyl cyclohexane-polyether resin.

4,925,774

MICROLITHOGRAPHIC PROCESS FOR PRODUCING CIRCUITS USING CONDUCTIVE ORGANIC FILMS SENSITIVE TO ELECTROMAGNETIC RADIATION AND TO CHARGED PARTICLES, AS WELL AS TO THE CIRCUITS AND COMPONENTS OBTAINED BY THIS PROCESS

André Barrand, Bures-sur-Yvette; Joël Richard, Trappes, and Michel Vandevyver, Chatenay Malabry, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 24, 1988, Ser. No. 172,597

Claims priority, application France, Mar. 24, 1987, 8704075

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—296 **4 Claims**



1. Process for producing electrically conducting zones on a substrate, comprising defining these zones by a microlithographic process using a photosensitive coating comprising an electrically conducting, organic compound, which can be transformed into an insulating product by irradiation by means of charged particles and/or electromagnetic radiation, irradiating certain locations of the photosensitive coating of the organic compound other than the locations defining the electrically conducting zones by means of charged particles and/or electromagnetic radiation, so that the irradiated locations become insulating and directly forming the electrically conducting zones at the desired locations on the organic compound coating characterized in that the organic compound is a salt or a complex of tetracyanoquinodimethane or one of its derivatives.

4,925,775

PROCESS FOR IMPROVING THE OZONE RESISTANCE OF RELIEF PRINTING PLATES

Gerhard Hoffmann, Otterstadt, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 93,170, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 919,054, Oct. 15, 1986, abandoned. This application Nov. 23, 1988, Ser. No. 275,670

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1985, 3536957

Int. Cl.[5] G03F *7/02*

U.S. Cl. 430—306 **5 Claims**

1. In a process for improving the ozone resistance of the surface of flexographic relief printing plates, wherein the reliefs are prepared by imagewise exposure with actinic radiation and by liquid solvent washout development of the unexposed areas of a layer of a photopolymerizable elastomeric composition, the improvement which comprises: imagewise exposing to actinic radiation a photopolymerizable elastomeric composition consisting essentially of

(a) from 58 to 92% by weight, based on the sum of all the components of the photopolymerizable elastomeric composition, of a solvent soluble elastomeric diene block copolymer containing at least one vinylaromatic and at least one diene polymer block,

(b) from 2 to 16% by weight, based on the sum of elastomeric composition, of one or more photopolymerizable, ethylenically unsaturated monomers being compatible with the elastomeric diene block copolymer (a),

(c) from 0.4 to 6% by weight, based on the sum of all the components of the photopolymerizable elastomeric composition, of one or more photoinitiators, and

(d) from 3 to 22% by weight, based on the sum of all of the components of the photopolymerizable elastomeric composition, of a chloroalkane of 8 to 40 carbons which has a chlorine content of about 49% by weight

and then developing the unexposed areas to obtain a flexographic relief printing plate having improved ozone resistance.

4,925,776

OPTICAL MEMORY ELEMENT AND MANUFACTURING METHOD THEREOF

Kenji Ohta, Nara; Junji Hirokane, Tenri; Akira Takahashi; Tetsuya Inui, both of Nara; Shohichi Katoh, Yamatokoriyama, and Toshihisa Deguchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 901,132, Aug. 28, 1986, abandoned. This application Aug. 8, 1988, Ser. No. 229,753

Claims priority, application Japan, Aug. 30, 1985, 60-192937; Sep. 19, 1985, 60-207864; Sep. 26, 1985, 60-215909

Int. Cl.[5] G03C *5/16*

U.S. Cl. 430—321 **16 Claims**

1. A method for manufacturing an optical memory element having guide tracks and address tracks for storing information, which comprises the steps of:

applying a photo resist film onto a substrate which includes a center hole to form a coated substrate;

preparing a photo mask plate by,

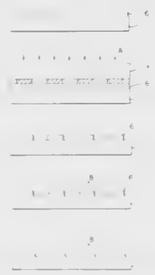
forming a mask pattern on said mask plate, said mask pattern comprising a guide track pattern and address track pattern, and

forming a position reference marker on said mask plate

with reference to said mask pattern for positioning said mask plate;

placing said mask plate on said coated substrate so as to position said position reference marker with reference to said center hole of said coated substrate;

transcribing, from said mask plate, a latent image of said mask pattern onto said photo resist film;



developing said latent image on said photo resist film to form a developed photo resist film; and

etching said substrate so as to form guide tracks and address tracks in said substrate in conformance with said mask pattern, whereby alignment between said center hole of said substrate and said tracks is improved.

4,925,777

DIRECT POSITIVE COLOR IMAGE FORMING METHOD

Noriyuki Inoue, and Takashi Ozawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 20, 1988, Ser. No. 260,081

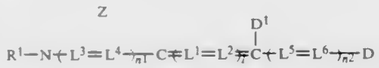
Claims priority, application Japan, Oct. 20, 1987, 62-264340

Int. Cl.[5] G03C *7/30, 1/22, 1/485*

U.S. Cl. 430—377 **16 Claims**

1. A direct positive color image forming method which comprises processing an imagewise exposed photographic light-sensitive material with a surface color developing solution containing an aromatic primary amine color developing agent, after fogging treatment and/or during fogging treatment, wherein the photographic light-sensitive material comprises a support having thereon at least one internal latent image type silver halide emulsion layer than has not been previously fogged, a color image forming coupler, colloidal silver, and at least one compound represented by general formula (I):

(I)



wherein Z represents an atomic group necessary for completing a 5-membered or 6-membered nitrogen-containing heterocyclic ring; D and D', which may be the same or different, each individually represents an atomic group necessary for completing an acidic nucleus, D and D' are be bonded to each other to form a cyclic structure, and wherein the nucleus formed by D and D' is selected from 2-pyrazolin-5-one, pyrazolidine-3,5-dione, imidazolin-5-one, hydantoin, 2- or 4-thiohydantoin, 2-iminooxazolin-4-one, 2-oxazolin-5-one, 2-thiooxazolindine-2,4-dione, isooxazolin-5-one, 2-thiazoline-4-one, thiazolidine-4-one, thiazolidine-2,4-dione, rhodanine, thiazolidine-2,4-dithione, isorhodanine, indane-1,3-dione, thiophen-3-one, thiophen-3-one-1,1-dioxide, isoindolin-2-one, isoindilin-3-one, indazolin-3-one, 2-oxoindazolinium, 3-oxoindazolium, 5,7-dioxo-6,7-dihydrothiazolo[3,2-a]pyrimidine, cyclohexane-1,3-dione, 3-4-dihydroisoquinolin-4-one, 1,3-dioxane-4,6-dione, barbituric acid, 2-thiobarbituric acid, chroman-2-4-dione, indazolin-2-one, and pyrido[1,2-a]pyrimidine-1,3-dione; R^1 represents a substituted or unsubstituted alkyl group which may form a salt with a metal atom or an organic compound; L^1, L^2, L^3, L^4, L^5 and L^6, which may be the same or different, each represents a substituted or unsubstituted methine group; n^1 and n^2 each represents 0 or 1; and l represents an integer from 0 to 3.

4,925,778

PROCESS FOR THE RAPID DEVELOPMENT OF COLOR MATERIALS

Ubbo Wernicke, Cologne, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 10, 1989, Ser. No. 321,967

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810348

Int. Cl.[5] G03C *7/20*

U.S. Cl. 430—383 **8 Claims**

1. Process for the rapid development of imagewise exposed silver halide recording materials which contain on a layer support at least three light-sensitive silver halide emulsion layers of different spectral sensitivity, with which a cyan coupler, a magenta coupler and a yellow coupler are in each case spectrally associated, comprising the following treatment steps:

1. treatment of the photographic material with a solution I of a color developing agent or a salt thereof at pH 1 to 8 over a period of 1 to 10 seconds,
2. treatment of the photographic material impregnated with the developing agent with a alkali-containing solution II at pH 10 to 14 over a period of 1 to 10 seconds.

4,925,779

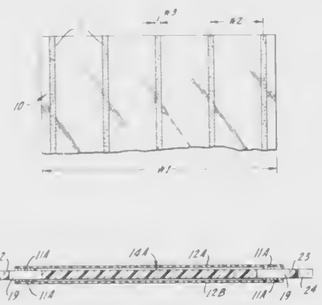
PHOTO STRIP PROTECTION METHOD AND PRODUCT

Stanislaw A. Policht, Closter, N.J., and Gerard Vernice, Whitestone, N.Y., assignors to Qualex, Inc., Durham, N.C.

Filed Dec. 22, 1988, Ser. No. 288,450

Int. Cl.[5] G03C *1/76, 3/00*

U.S. Cl. 430—403 **28 Claims**



1. A method of protecting a photo strip of predetermined overall length and width, including a sequence of individual image frames of given width distributed at spaced intervals longitudinally of the photo strip, the photo strip having at least one row of sprocket holes along one side of the photo strip between the image frames and the edge of the photo strip,

which method precludes engagement of adhesive within any image frame and allows removal of surface protection for uninhibited reproduction of images from the film strip,

the method comprising:

forming two transparent strips of protective film, each protective film strip having a width less than the width of the photo strip and a length at least sufficient to cover all image frames of the photo strip, and each protective film strip having two narrow pressure sensitive releasable adhesive stripes along opposite edges on one surface of the protective film strip, the adhesive stripes on each protective film strip being separated by a distance greater than the image frame width; and

applying the two protective film strips in aligned relation to opposite surfaces of the photo strip, with their adhesive stripes facing toward and adhering to the photo strip and one adhesive stripe on each protective film strip aligned over the perforations in the photo strip, so that an edge portion, not covered by either transparent protective film strip, remains on at least one edge of the photo strip.

4,925,780

DIRECT POSITIVE SILVER HALIDE LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Tomimi Yoshizawa; Keiji Ogi, and Atushi Kamitakahara, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Aug. 18, 1988, Ser. No. 234,023

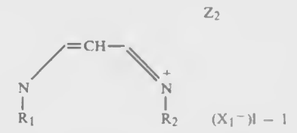
Claims priority, application Japan, Aug. 20, 1987, 62-207906

Int. Cl.[5] G03C *1/485, 1/12*

U.S. Cl. 434—589 **7 Claims**

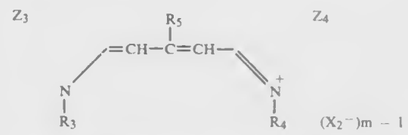
1. A direct positive silver halide light-sensitive color photographic material which comprises at least three light-sensitive silver halide emulsion layers containing internal latent image-type light-sensitive silver halide grains and sensitizing dyes having the following Formulas [I], [II] and [III], respectively, and at least one compound selected from the group consisting of those compounds having the following Formulas [IV], [V] and [VI];

Formula [I]



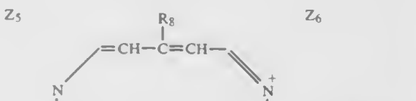
wherein Z_1 and Z_2 each is a group of atoms necessary to form a benzothiazole ring, naphthothiazole ring, benzoselenazole ring or naphthoselenazole ring: R_1 and R_2 each is a substituted or unsubstituted alkyl group, provided that at least one of the R_1 and R_2 is a sulfo or carboxyl group-substituted alkyl group; X_1^- is an anion; and l is an integer of 1 or 2;

Formula [II]



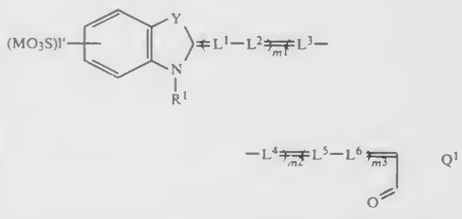
wherein Z_3 and Z_4 each is a group of atoms necessary to form a benzoxazole ring or naphthoxazole ring: R_3 and R_4 each is a substituted or unsubstituted alkyl group, and R_5 is an lower alkyl group, provided that at least one of the R_3 and R_4 is a sulfo or carboxyl group-substituted alkyl group; X_2^- is an anion; and m is an integer of 1 or 2;

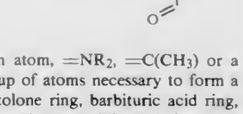
Formula [III]



wherein Z_5 and Z_6 each is a group of atoms necessary to form a benzothiazole ring, naphthothiazole ring, benzoselenazole ring or naphthoselenazole ring: R_6 and R_7 each is a substituted or unsubstituted alkyl group, and R_8 is an alkyl or aryl group, provided that at least one of the R_6 and R_7 is a sulfo or carboxyl group-substituted alkyl group; X_3^- is an anion; and n is an integer of 1 or 2;

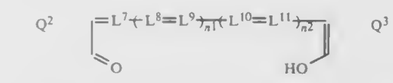
Formula [IV]



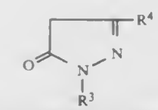


wherein Y is an oxygen atom, $=NR_2$, $=C(CH_3)$ or a sulfur atom; Q^1 is a group of atoms necessary to form a pyrazolone ring, isooxazolone ring, barbituric acid ring, thiobarbituric acid ring, tetrahydropyridine-2,6-dione ring or pyrazolo[3,4-b]pyridine-3,6-dione ring: R^1 and R^2 each is an alkyl group; M is a hydrogen atom or a cation; L^1, L^2, L^3, L^4, L^5 and L^6 each is a methine group: l' is an integer of 1 or 2; and m^1, m^2 and m^3 each is zero or 1;

Formula [V]

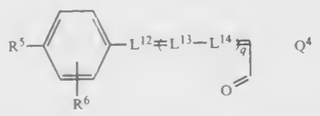


wherein Q^2 and Q^3 each is a group of atoms necessary to form an isooxazolone ring, barbituric acid ring, thiobarbituric acid ring, tetrahydropyridine-2,6-dione ring, pyrazolo[3,4-b]pyridine-3,6-dione ring or

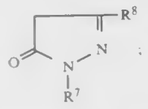


or a tautomer of each of these keto rings; R_3 is an aryl group; R_4 is a carbamoyl group, alkoxycarbonyl group, aryloxycarbonyl group, perfluoroalkyl group or cyano group; provided that at least one of the Q^2 and Q^3 has a sulfo or carboxyl group-substituted alkyl, aryl or heterocyclic group; L^7, L^8, L^9, L^{10} and L^{11} each is a methine group; and n^1 and n^2 each is an integer of zero or 1;

Formula [VI]



wherein Q^4 is a group of atoms necessary to form an isooxazolone ring, barbituric acid ring, thiobarbituric acid ring, pyrazolo[3,4-b]pyridine-3,6-dione ring or



R_7 and R_8 represent the same groups as defined in the R_3 and R_4, respectively, of Formula [V]; R_5 is an alkoxy group or amino group: R_6 is a hydrogen atom, halogen atom, alkyl or alkoxy group; L^{12}, L^{13} and L^{14} each is a methine group; and q is an integer of zero or 1.

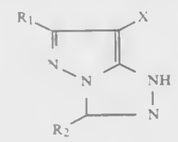
4,925,781

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

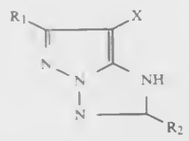
Genichi Furusawa; Takatoshi Ishikawa; Nobuo Furutachi, and Takeshi Hirose, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1986, Ser. No. 918,225
Claims priority, application Japan, Oct. 14, 1985, 60-228268
Int. Cl.[5] G03C *1/46, 7/38*
U.S. Cl. 430—505 **14 Claims**

1. A silver halide color photographic material comprising a support having thereon a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer, wherein the silver halide color photographic material contains at least one kind of pyrazoloazole type magenta coupler represented by the general Formulae (Va) or (VIa) described below and the total coating amount of silver in the photographic material is 0.75 g/m^2 or less:



(Va)



(VIa)

wherein R^1 represents a hydrogen atom or a substituent; X represents a hydrogen atom or a group capable of being released upon a coupling reaction with an oxidation product of an aromatic primary amine developing agent; R^1 or X may also form a polymer including a dimer or more and R_2 represents a ballast group.

4,925,782

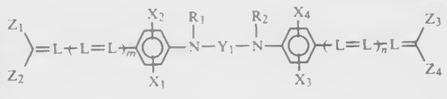
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT CONTAINING WATER SOLUBLE DYE COMPOUNDS

Masahiro Okada; Toshinao Ukai; Seiji Suzuki; Keiichi Adachi; Toshiyuki Watanabe, and Kunio Ishigaki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

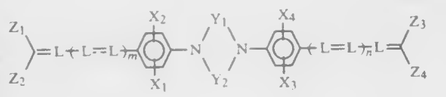
Continuatioo of Ser. No. 917,092, Nov. 24, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 309,905
Claims priority, application Japan, Feb. 6, 1985, 60-21306; May 30, 1985, 60-117456; Aug. 13, 1985, 60-178324
Int. Cl.[5] G03C *1/84*
U.S. Cl. 430—510 **15 Claims**

1. A silver halide photographic light-sensitive element comprising a support, at least one silver halide photographic light-sensitive layer, and at least one gelatin containing non-photosenisitive layer, wherein at least one of said light-sensitive layer and gelatin containing non-photosensitive layer contains 0.001 to 1 /m^2 of at least one of the water-soluble compounds selected from the group consisting of general formulas (I) and (II):

General formula (I)



General formula (II)



wherein:

X_1, X_2, X_3, and X_4 which may be the same or different, each represents a hydrogen atom, halogen atom, alkyl group, alkoxy group, hydroxl group, carboxyl group, substituted amino group, carbamoyl group, sulfamoyl group, or alkoxycarbonyl group;

R_1 and R_2 which may be the same or different, each represents a hydrogen atom, unsubstituted or substituted alkyl group, unsubstituted or substituted alkenyl group, unsubstituted or substituted aryl group, acyl group, and sulfonyl group;

Z_1, Z_2, Z_3, and Z_4 in the compound represented by general formula (I) represent rings selected from the group consisting of pyrazolone ring, pyrazolotriazole ring, pyrazoloimidazole ring, oxyindole ring, oxyimidazopyridine ring, isoxazolone ring, barbituric acid ring, dioxytetrahydropyridine ring, and indandione ring which are formed by connecting said Z_1 and Z_2 groups, or said Z_3 and Z_4 groups;

Z_1, Z_2, Z_3, and Z_4 in the compound represented by general formula (II), which may be the same or different, each represents an electron attracting group and Z_1 and Z_2, or Z_3 and Z_4 may connect to each other to form a ring;

Y_1 and Y_2 represent divalent linking groups:

L represents an unsubstituted or substituted methine group;

m and n are 0 or 1; and

compounds represented by general formula (I) have 2 to 4 sulfo groups, carboxyl groups, or salts thereof in the molecule.

4,925,783

HIGH SENSITIVITY LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH LITTLE STAIN

Iku Metoki; Chika Honda, and Yasunori Wada, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 2, 1988, Ser. No. 190,260
Claims priority, application Japan, May 15, 1987, 62-119381
Int. Cl.[5] G03C *1/12*
U.S. Cl. 430—569 **13 Claims**

1. In a light-sensitive silver halide photographic material having a photographic emulsion containing a spectral sensitizing dye and being prepared by respective steps of formation of silver halide grains in an aqueous gelatin solution, physical ripening and desalting followed further by chemical sensitization, the improvement wherein the spectral sensitizing dye is added to the emulsion during the desalting step, whereby little stain results and good pressure blackening performance is obtained for the photographic material.

4,925,784

EXPRESSION AND PURIFICATION OF AN HTLV-III GAG/ENV GENE PROTEIN

Robert M. Crowl, Cedar Grove, and Daru Young, Verona, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 4, 1986, Ser. No. 848,671
Int. Cl.[5] G01N *33/569*
U.S. Cl. 435—5 **6 Claims**

1. A protein having the amino acid sequence

10
Met Asn Arg Ile Arg Ile His Arg Trp Glu

20
Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys

30
Lys Tyr Lys Leu Lys His Ile Val Trp Ala

40
Ser Arg Glu Leu Glu Arg Phe Ala Val Asn

50
Pro Gly Leu Leu Glu Thr Ser Glu Gly Cys

60
Arg Gln Ile Leu Gly Gln Leu Gln Pro Ser

70
Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser

80
Leu Tyr Asn Thr Val Ala Thr Leu Tyr Cys

90
Val His Gln Arg Ile Glu Ile Lys Asp Thr

100
Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu

110
Gln Asn Lys Ser Lys Lys Lys Ala Gln Gln

120
Ala Ala Ala Asp Thr Gly His Ser Ser Gln

130
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn

140
Ile Gln Gly Gln Met Val His Gln Ala Ile

150
Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu

-continued

170
Val Ile Pro Met Phe Ser Ala Leu Ser Glu

180
Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

190
Leu Asn Thr Val Gly Gly His Gln Ala Ala

200
Met Gln Met Leu Lys Glu Thr Ile Asn Glu

210
Glu Ala Ala Glu Trp Asp Arg Val His Pro

220
Val His Ala Gly Pro Ile Ala Pro Gly Gln

230
Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile

250
Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

260
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

270
Leu Gly Leu Asn Lys Ile Val Arg Met Tyr

280
Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

290
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val

300
Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu

310
Gln Ala Ser Gln Glu Val Lys Asn Trp Met

320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn

330
Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

340
Gly Pro Ala Ala Thr Leu Glu Glu Met Met

350
Thr Ala Cys Gln Gly Val Gly Gly Pro Gly

360
His Lys Ala Arg Val Leu Ala Glu Ala Met

370
Ser Gln Val Thr Asn Thr Ala Thr Ile Met

380
Met Gln Arg Gly Asn Phe Arg Asn Gln Arg

390
Lys Met Val Lys Cys Phe Asn Cys Gly Lys

400
Glu Gly His Thr Ala Arg Asn Cys Arg Ala

410
Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

420
Lys Glu Gly His Gln Met Lys Asp Cys Thr

430
Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile

VOL 1114 ISS 3 MY 15 1990 UMI

-continued

440
Phe Arg Pro Gly Gly Gly Asp Met Arg Asp

450
Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys

460
Val Val Lys Ile Glu Pro Leu Gly Val Ala

470
Pro Thr Lys Ala Lys Arg Arg Val Val Gln

480
Arg Gly Lys Arg Ala Val Ala Ala Gly Ser

490
Thr Met Gly Ala Ala Ser Met Thr Leu Thr

500
Val Gln Ala Arg Gln Leu Leu Ser Gly Ile

510
Val Gln Gln Gln Asn Asn Leu Leu Arg Ala

520
Ile Glu Ala Gln Gln His Leu Leu Gln Leu

530
Thr Val Trp Gly Ile Lys Gln Leu Gln Ala

540
Arg Ile Leu Ala Val Glu Arg Tyr Leu Lys

550
Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys

560
Ser Gly Lys Leu Leu Cys Thr Thr Ala Val

570
Pro Trp Asn Ala Ser Trp Ser Asn Lys Ser

580
Leu Glu Gln Ile Trp Asn His Thr Thr Trp

590
Met Glu Trp Asp Arg Glu Ile Asn Asn Tyr

600
Thr Ser Phe Asn Ala Val Val Tyr His Ser

or a sequence related thereto by substitution of one or more amino acids, which protein contains at least one antigenic determinant reactive with antibodies against an AIDS virus corresponding to a sequence of each of a gag and env protein of an HTLV-III virus and its essentially free of other viral proteins.

3. A process for demonstrating the presence of antibodies against an AIDS virus in human serum, comprising:

(a) reacting a human serum sample suspected to contain antibodies against an AIDS virus with a protein of claim 2 labeled with a detectable label and allowing labeled protein-antibody complexes to form in the reaction mixture; and

(b) detecting the labeled protein-antibody complexes of step (a),

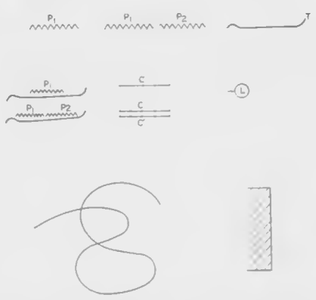
thereby demonstrating the presence of antibodies against an AIDS virus in the serum.

4,925,785

NUCLEIC ACID HYBRIDIZATION ASSAYS

Chang-Ning J. Wang, Chelmsford, and Lynn C. Klotz, Cambridge, both of Mass., assignors to Biotechnica Diagnostics, Inc., Cambridge, Mass.

Filed Mar. 7, 1986, Ser. No. 837,701
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 **35 Claims**



1. A method for carrying out a nucleic acid hybridization test to detect a target nucleic acid sequence, said method comprising the steps of

(1) providing a polymer molecule bonded to a first single stranded nucleic acid sequence comprising a first probe which hybridizes to a first target nucleic acid sequence when present, provided that, where said polymer molecule comprises DNA, said DNA is of heterogeneous base sequence;

(2) denaturing said target nucleic acid sequence;

(3) contacting said denatured target nucleic acid sequence with said polymer molecule bonded to said first single stranded nucleic acid sequence;

(4) separating out complexes between said target nucleic acid sequence and said polymer molecule by trapping said complexes on a two-dimensional surface; and

(5) detecting complexes between said target nucleic acid sequence and said polymer molecule;

wherein said polymer molecule is attached to a second single-stranded nucleic acid probe sequence which hybridizes to said target nucleic acid sequence when present; and

wherein the region of said target nucleic acid sequence to which said first probe hybridizes is adjacent to the region of said target nucleic acid sequence to which said second probe hybridizes.

4,925,786

METHOD OF DETERMINING BLOOD GROUPS BY THE SOLID-PHASE PROCEDURE WITH BLOOD-GROUP SPECIFIC ANTIBODIES OF THE IMMUNOGLOBULIN M. TYPE AND SUPPORT AND KIT FOR CARRYING OUT THE METHOD

Horst Uthemann, Frankfurt, Fed. Rep. of Germany, assignor to Biotest AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 4, 1989, Ser. No. 293,271
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802452
Int. Cl.[5] G01N *31/00, 33/48, 33/053, 33/53*
U.S. Cl. 435—7 **9 Claims**

1. In a method of determining blood groups with blood-group specific immunoglobulin-M antibodies, the improvement which comprises applying a solution of the immunoglobulin-M antibodies to a surface of the support and simultaneously applying to the surface of the support a suspension of erythrocytes that is being tested, and determining the blood group just after the contact occurs, the concentration of antibodies being just sufficient to create an irreversible or immobilized coating of antibody molecules on the surface that can specifically attach erythrocytes but insufficient to induce an agglutination reaction.

4,925,787

MONOCLONAL ANTI-IDIOTYPIC ANTIBODY, METHOD FOR PRODUCTION THEREOF, AND HYBRIDOMA PRODUCING SAID ANTIBODY

Masao Tanihara; Hideaki Yamada, both of Kurashiki; Toshihide Nakashima, Toyonaka; Yoshiaki Omura, Okayama, and Koichi Takakura, Nishinomiya, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,303
Claims priority, application Japan, Sep. 8, 1987, 62-223173
Int. Cl.[5] G01N *33/577, 33/535*
U.S. Cl. 435—7 **17 Claims**

11. A method for the detection of an antibody to a nicotinic acetylcholine receptor in a sample, comprising:

(1) combining said sample with a reagent for the detection of an antibody to a nicotinic acetylcholine receptor, said reagent containing a monoclonal anti-idiotypic antibody specific to a human IgG_1 type monoclonal antibody possessing specificity to a nicotinic acetylcholine receptor, said monoclonal anti-idiotypic antibody being produced by the cells of a strain selected from the group consisting of TA-1 strain (FERM BP-1793), TA-2 strain (FERM BP-1794), TA-3 strain (FERM BP-1795), and TA-5 strain (FERM BP-1796); and

(ii) detecting said antibody to a nicotinic acetylcholine receptor.

4,925,788

IMMUNOASSAY SYSTEM AND PROCEDURE BASED ON PRECIPITIN-LIKE INTERACTION BETWEEN IMMUNE COMPLEX AND CLQ OR OTHER NON-IMMUNOSPECIFIC FACTOR

Paul A. Liberti, Churchville, Pa., assignor to Immunicon Corporation, Huntingdon Valley, Pa.

Filed Oct. 24, 1986, Ser. No. 923,111
Int. Cl.[5] G01N *33/53, 33/543, 33/536, 33/527*
U.S. Cl. 435—7 **46 Claims**

1. A process for preparing an immunoassay for quantitatively assaying a biological material for an immunological substance by means of immunochemical binding of immune complexes to insolubilized non-immunospecific factor having binding affinity for said complexes, which are composed of said immunological substance and an immunospecific conjugate which interacts specifically with said immunological substance, the degree of immunochemical binding of said immune complexes to said insolubilized non-immunospecific factor being a function of composition of said immune complexes and representable by an generally bell-shaped binding curve established over a range of compositions of said immune complexes, said range including compositions in which the amount of said immunological substance and the amount of said immunospecific conjugate are in substantial equivalence, in which the amount of said immunological substance is in substantial excess of the amount of said immunospecific conjugate, and in which the amount of said immunospecific conjugate is in substantial excess of the amount of said immunological substance, said process comprising the steps of:

a. providing a test device comprising said insolubilized non-immunospecific factor;

b. establishing selected working limits for said immunoassay within said range of compositions of said immune complexes;

c. constructing a standard assay curve by plotting relative degree of immunochemical binding of said immune complex to said test device, said immune complex being formed in a reference system comprising varying concentrations of the immunological substance and a fixed concentration of the immunospecific conjugate of said substance, the composition of complexes resulting from said immunological substance and immunospecific conjugate being within the selected working limits of step b; and

d. providing a test system comprising said test device, said immunospecific conjugate and said immunological substance, the amount of said immunospecific conjugate being substantially equivalent to said fixed concentration of immunospecific conjugate, and the amount of said immunospecifically determinable substance being appropriate to produce a known degree of immunochemical binding corresponding to a predetermined point on said standard assay curve, thereby enabling quantitative assaying of biological material for said immunological substance.

4,925,789

METHOD AND MEDIUM FOR USE IN DETECTING TARGET MICROBES IN SITU IN A SPECIMEN SAMPLE OF A POSSIBLY CONTAMINATED MATERIAL

Stephen C. Edberg, 356 Woodland La., Orange, Conn. 06477

Filed Jun. 30, 1986, Ser. No. 880,305
Int. Cl.[5] C12Q *1/10, 1/08, 1/06, 1/04*
U.S. Cl. 435—38 **19 Claims**

1. A specific medium for combination with a specimen sample of a material suspected to be contaminated to determine the presence of absence of a target microbe in the specimen sample, and which can detect the presence of said target microbe without the need of performing a preliminary target microbe growth step, said medium comprising operative amounts of essential vitamins and elements needed to support growth of said target microbe and a nutrient-indicator which is the primary nutrient in the medium and which is substantially the only nutrient in said medium which can be metabolized by said target microbe to the extent needed to support continued reproductive growth thereof, and which cannot be metabolized by other viable microbes in the specimen, to that extent, said nutrient-indicator including a metabolizable moiety and a sample-altering moiety, the latter of which is released only when said nutrient-indicator is metabolized by said target microbe, whereupon a sensible characteristic of the sample is altered.

4,925,790

METHOD OF PRODUCING PRODUCTS BY ENZYME-CATALYZED REACTIONS IN SUPERCRITICAL FLUIDS

Harvey W. Blanch, San Francisco; Theodore Randolph, Berkeley, and Charles R. Wilke, El Cerrito, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 30, 1985, Ser. No. 771,366
Int. Cl.[5] C12P *33/00, 13/00*
U.S. Cl. 435—52 **9 Claims**

1. A method for producing a product or products by enzyme-catalyzed reaction, comprising the step of:

contacting a substrate(s) and an enzyme(s) in the presence of a fluid under supercritical conditions of temperature and pressure of said fluid, whereby said substrate(s) is substantially soluble in said fluid under said conditions wherein said enzyme is selected from the group consisting of alkaline phosphatase and cholesterol oxidase and said enzyme is entrapped with water in reverse micelles.

4,925,791

EUCARYOTIC EXPRESSION VECTORS

Kim A. Nasmyth, and Allan M. Miller, both of Cambridge, England, assignors to Celltech Limited, Slough, England

PCT No. PCT/GB85/00325, § 371 Date Mar. 18, 1986, § 102(e) Date Mar. 18, 1986, PCT Pub. No. WO86/00926, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 22, 1985, Ser. No. 852,456

Claims priority, application United Kingdom, Jul. 20, 1984, 8418511; Sep. 14, 1984, 8423301; Nov. 21, 1984, 8429392

Int. Cl.[5] C12P *21/00, 21/32;* C12N *15/00, 5/00*

U.S. Cl. 435—69.1 56 Claims

1. A eukaryotic expression vector comprising an expression control sequence including a functional eukaryotic promoter not normally under mating type control and a heterologous structural gene located relative to the expression control sequence such that the expression control sequence is capable of directing expression of the heterologous structural gene, wherein the expression control sequence includes a controllable repressor operator sequence comprising a DNA sequence which is capable of repressing expression in the presence of a gene product or a combination of gene products of the yeast mating type loci.

4,925,792

PROCESS FOR PRODUCING PROTEINS CORRELATED WITH THE DIPHTHERIC TOXIN

Rino Rappuoli, Quercegrossa Monteriggioni, Italy, assignor to Sclavo, S.p.A., Siena, Italy

Filed Jan. 31, 1984, Ser. No. 575,335

Claims priority, application Italy, Feb. 8, 1983, 19462 A/83; Dec. 5, 1983, 24020 A/83

Int. Cl.[5] C12P *21/00;* C12N *15/00, 7/00;* C12R *1/16*

U.S. Cl. 435—69.1 3 Claims

1. A process for the production of protein cross reacting with diptheria toxin comprising the step of culturing in a liquid nutrient medium with a concentration of iron ions of from 0.05 μg/ml to 0.5 μg/ml and at a temperature of from 30° C. to 40° C. at a neutral pH and under aerobic conditions, a microorganism belonging to *Corynebacterium diphtheriae* with two mutant phages encoding for the protein cross reacting with diphtheria toxin and integrated nontandemly at attachment sites B_1 and B_2 of the bacterial chromosome wherein the protein is CRM 197 protein and the microorganism is the C_7(197) M, ATCC-39255 strain with two 197 mutant phages integrated nontandemly in said attachments sites B_1 and B_2.

3. A process for the production of protein cross reacting with diptheria toxin comprising the step of culturing in a liquid nutrient medium with a concentration of iron ions of from 0.05 μg/ml to 0.5 μg/ml and at a temperature of from 30° C. to 40° at a neutral pH and under aerobic conditions, a microorganism belonging to *Corynebacterium diphtheriae* with two mutant phages encoding for the protein cross reacting diphteria toxin and integrated nontandemly at attachment sites B_1 and B_2 of the bacterial chromosome wherein the protein is CRM45 protein and the microorganism is the $C_7(45)$ M_8 ATCC 39526 strain with two mutant 45 phages integrated nontandemly in said attachment sites B_1 and B_2.

4,925,793

HUMAN IMMUNE INTERFERON

David V. Goeddel, Burlingame, and Patrick W. Gray, San Francisco, both of Calif., assignors to Genetech, Inc., San Francisco, Calif.

Continuation of Ser. No. 774,839, Sep. 11, 1985, abandoned, which is a division of Ser. No. 746,813, Jun. 20, 1985, Pat. No. 4,762,791, which is a continuation of Ser. No. 312,489, Oct. 19, 1981, abandoned. This application Aug. 4, 1987, Ser. No. 81,420

Int. Cl.[5] C12P *21/02, 21/00;* C12N *15/00, 5/00, 1/20;* C07H *21/04*

U.S. Cl. 435—69.51 9 Claims

1. A process for producing a polypeptide comprising the amino acid sequence of recombinant human immune interferon comprising growing a culture of a microorganism or cell culture, transformed with a replicable expression vehicle comprising DNA encoding said recombinant human immune interferon, under conditions sufficient to effect production of said recombinant human immune interferon and recovering said recombinant human immune interferon.

2. A process for producing a polypeptide comprising the amino acid sequence of des-CYS-TYR-CYS recombinant human immune interferon comprising growing a culture of a microorganism or cell culture, transformed with a replicable expression vehicle comprising DNA encoding said des-CYS-TYR-CYS recombinant human immune interferon, under conditions sufficient to effect production of said des-CYS-TYR-CYS recombinant human immune interferon and recovering said des-CYS-TYR-CYS recombinant human immune interferon.

4,925,794

HYBRID PLASMIDS AND MICROORGANISMS CONTAINING THEM

Takao Isogai, and Masaru Yoshida, both of Ibaraki, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 11, 1985, Ser. No. 807,734

Claims priority, application United Kingdom, Jan. 2, 1985, 8500040; Oct. 17, 1985, 8525667

Int. Cl.[5] C12P *19/34;* C12N *15/00, 1/16, 1/00;* C07H *15/12*

U.S. Cl. 435—91 7 Claims

1. A DNA fragment which functions as an autonomous replication sequence (ARS) in *Saccharomyces cerevisiae* and *Acremonium chrysogenum*, characterized as follows:

(a) said ARS is prepared by digesting partially a chromosomal DNA of the *Acremonium chrysogenum* ATCC 11550 with restriction enzyme Sau 3A,

(b) the molecular size of said ARS is about 1.39 Kbp, and

(c) the DNA sequence of said ARS is as follows:

```
                10                  20                  30
GATCTCGGCG          AGCGGGTGAC          GGACGGGTTG
CTAGAGCCGC          TCGCCCACTG          CCTGCCCAAC
            40                  50                  60
CTAGCGTTTA          CCAAGCCGGG          TCACACGCCG
GATCGCAAAT          GGTTCGGCCC          AGTGTGCGGC
            70                  80                  90
CGGCTTGGCA          GGEAGCAGCC          ACTGTTACTA
GCCGAACCGT          CCETCGTCGG          TGACAATGAT
           100                 110                 120
CTTGCATGTG          GGCTGATTGA          AAATCCCGGA
GAACGTACAC          CCGACTAACT          TTTAGGGCCT
           130                 140                 150
ACCGATGGAT          GCTTCCCCCG          GGGATGCCGC
TGGCTACCTA          CGAAGGGGGC          CCCTACGGCG
           160                 170                 180
TTCTTTCTCT          CTCTCGGCCG          CGGGAAGGTA
AAGAAAGAGA          GAGAGCCGGC          GCCCTTCCAT
           190                 200                 210
TGCGTTGCCC          CCGGCCATAA          TAGTCGTCAA
ACGCAACGGG          ACGCAACGGG          ATCAGCAGTT
           220                 230                 240
GCGGAAGGCC          AGCATTTGAT          CAGTAAAAAT
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CGCCTTCCGG          TCGTAAACTA          GTCATTTTTA
           250                 260                 270
ATCGGAATGA          TAAGTAATAG          ATTTTAAATT
TAGCCTTACT          ATTCATTATC          TAAAATTTAA
           280                 290                 300
TACTATATTA          TATTGTATTT          TTTTCCCTAT
ATGATATAAT          ATAACATAAA          AAAAGGGATA
           310                 320                 330
TATTAGTTCT          AATAAATAGG          TCAATTTAGA
ATAATCAAGA          TTATTTATCC          AGTTAAATCT
           340                 350                 360
TAATAATCTT          ACTTTATTAA          ATTTAAATTG
ATTATTAGAA          TGAAATAATT          TAAATTTAAC
           370                 380                 390
ATTTAAAGAA          TATAACAAAC          TATATTTTCT
TAAATTTCTT          ATATTGTTTG          ATATAAAAGA
           400                 410                 420
CAAATAATTA          AAATATTTCC          CTGATTCATT
GTTTATTAAT          TTTATAAAGG          GACTAAGTAA
           430                 440                 450
TTTAATTAAT          TCATTCCACA          TTTTTTTCAA
AAATTAATTA          AGTAAGGTGT          AAAAAAAGTT
           460                 470                 480
AATAAGATGA          TTTAATTTTA          AAAATGTATT
TTATTCTACT          AAATTAAAAT          TTTTACATAA
           490                 500                 510
TAAGTATTTA          AAAGTATAAT          TAATGTATTT
ATTCATAAAT          TTTCATATTA          AGAAAAAAAA
           520                 530                 540
TCTTTTTTTT          ATAAAATCTT          TTACAAAAAA
TATTTTAGAA          TATTTTAGAA          AATGTTTTTT
           550                 560                 570
ATACTCATCA          TACATTTTAT          ATTTTTTATA
TATGAGTAGT          ATGTAAAATA          TAAAAAATAT
           580                 590                 600
TAAAAGAGAA          TAAATATTTT          TTATATAATT
ATTTTCTCTT          ATTTATAAAA          AATATATTAA
           610                 620                 630
ATTGTACAAA          GAAGTATAAT          TCTTAAACAA
TAACATGTTT          CTTCATATTA          AGAATTTGTT
           640                 650                 660
GTTATAAGTT          ATTCTCATAT          TTAATAGATG
CAATATTCAA          TAAGAGTATA          AATTATCTAC
           670                 680                 690
ATATTTTCTT          TTTAATGCTT          TTTTTTCTTT
TATAAAAGAA          AAATTACGAA          AAAAAAGAAA
           700                 710                 720
ATTTATAGTA          AATAGTGTTA          TTTTTGCTTT
TAAATATCAT          TTATCACAAT          AAAAACGAAA
           730                 740                 750
ACTATTTGTA          TATTTTATAT          TAGCATCACT
TGATAAACAT          ATAAAATATA          ATCGTAGTGA
           760                 770                 780
TACAAAAATT          CTTCTTAAAA          AATTACGTCT
ATGTTTTTAA          GAAGAATTTT          TTAATGCAGA
           790                 800                 810
TTTTTTTAGA          TATATAAATT          TAGTTTTACC
AAAAAAATCT          ATATATTTAA          ATCAAAATGG
           820                 830                 840
TAAAAATTGA          CGGTTTTTAA          AAAATAAATT
ATTTTTAACT          GCCAAAAATT          TTTTATTTAA
           850                 860                 870
AAAATAACTT          TTAATTATTT          TATTTATATT
TTTTATTGAA          AATTAATAAA          ATAAATATAA
           880                 890                 900
TACAGTATTA          GCTGGTATAT          TTTTCATATT
ATGTCATAAT          CGACCATATA          AAAAGTATAA
           910                 920                 930
ATTTTTATTA          AAAGAATATA          TAACATTTTT
TAAAAATAAT          TTTCTTATAT          ATTGTAAAAA
           940                 950                 960
TCATTCTTTT          GAAAAAGCAG          GTAAATATTT
AGTAAGAAAA          CTTTTTCGTC          CATTTATAAA
           970                 980                 990
CATATTATTT          ATAACAGTTA          ATTTAGGTTT
GTATAATAAA          TATTGTCAAT          TAAATCCAAA
          1000                1010                1020
TAAACCAGAA          CTTCTGATAT          TTTTATTTAA
ATTTGGTCTT          CAAGACTATA          CAAGACTATA
          1030                1040                1050
ATTATTCTTA          AAAATTTTCA          TTTTTATTTA
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TAATAAGAAT          TTTTAAAAGT          AAAAATAAAT
          1060                1070                1080
TTATTTATTT          CTTTTTATTT          CTTTTTATAT
AATAAATAAA          GAAAAATAAA          GAAAAATATA
          1090                1100                1110
GCTTATTATA          GCTTTAACCT          ATAGCCATAA
CGAATAATAT          CGAAATTGGA          TATCGGTATT
          1120                1130                1140
AAATGTTGGG          TAGTTTAAAA          GGATTATCAT
TTTACAACCC          ATCAAATTTT          CCTAATAGTA
          1150                1160                1170
GTATTGCATA          ACATTCACCT          TATAGTCGTT
CATAACGTAT          TGTAACGTAT          ATATCAGCAA
          1180                1190                1200
GAACGTTTTT          ATTTTATAAC          ATATGCTAAA
CTTGCAAAAA          TAAAATATTG          TATACGATTT
          1210                1220                1230
ATAAATTCCG          CTTCAAATTT          ACTATCTTAA
TATTTAAGGC          GAAGTTTAAA          TGATAGAATT
          1240                1250                1260
GTAATTTTJG          AAATTTACCC          AATTTATATC
CATTAAAAKC          TTTAAATGGG          TTAAATATAG
          1270                1280                1290
AATTATTTTA          AGAGCTCTTA          GCTCAAATAA
TTAATAAAAT          TCTCGAGAAT          CGAGTTTATT
          1300                1310                1320
AATATTAAAG          GACAAACATC          CCTAGCGTAG
TTATAATTTC          CTGTTTGTAG          GGATCGCATC
          1330                1340                1350
CTTTTCCAAT          AATCCAAGAT          CCGTTAAATT
GAAAAGGTTA          TTAGGTTCTA          GGCAATTTAA
          1360                1370                1380
ATCGATGCTA          TTTATACCTT          AACAAGTGCT
TAGCTACGAT          AAATATGGAA          TTGTTCACGA
                    1390                1400
                CTGTTACGAG  ATC
                GACAATGCTC  TAG.
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4,925,795

METHOD OF USING G-4 AMYLASE TO PRODUCE HIGH MALTOTETRAOSE AND HIGH MALTOSE CONTENT STARCH HYDROLYSATES

Yoshiyuki Takasaki, Matsudo, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 946,785

Int. Cl.[5] C12P *19/22, 19/14;* C12N *9/26;* C12R *1/09*

U.S. Cl. 435—95 4 Claims

1. A method for the production of a starch hydrolyzate rich in maltotetraose, which comprises:

(i) aerobically culturing *Bacillus circulans* G-4 (FERM-BP 820) in a culture medium containing nitrogen sources and carbon sources at a pH of 5 to 9 and a temperature in the range of 20° to 60° C. to produce amylase G4 in said culture medium;

(ii) collecting a solution consisting essentially of said amylase G4 from said culture medium;

(iii) adding the collected amylase G4 to starch, amylopectin, glycogen or a partial hydrolyzate thereof to obtain a mixture; and

(iv) subjecting said mixture to saccharification reaction conditions at a pH of 5 to 9 and a temperature in the range of 40° to 60° C.

4. A method for the production of a starch hydrolyzate rich in maltose, which comprises:

(i) aerobically culturing *Bacillus circulans* G-4 (FERM-BP 820) in a culture medium containing nitrogen sources and carbon sources at a pH of 5 to 9 and a temperature in the range of 20° to 60° C. to produce amylase G4 in said culture medium;

(ii) collecting a solution consisting essentially of said amylase G4 from said culture medium;

(iii) adding β-amylase and the collected amylase G4 to starch to obtain a mixture; and

(iv) subjecting said mixture to saccharification reaction

VOL
1114
ISS
3
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conditions at a pH of 5 to 9 and a temperature in the range of 40° to 60° C.

4,925,796
METHOD FOR ENHANCING GLYCOPROTEIN STABILITY
Michel L. E. Bergh; S. Catherine Hubbard, both of Somerville, Mass., and James R. Rasmussen, Ithaca, N.Y., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Mar. 7, 1986, Ser. No. 837,604
Int. Cl.[5] C12P *19/18*
U.S. Cl. 435—97 28 Claims

1. A method for modifying a glycoprotein including at least one asparagine linked oligosaccharide chain comprising:
attaching a galactose residue to an N-acetylglucosamine residue which is linked to an asparagine through an N-glycosidic bond to form a Gal→GlcNAc→Asn(protein) sequence as part of a glycoprotein.

4,925,797
PROCESS FOR THE DECOMPOSITION OF ACRYLAMIDE
David Byrom, Middlesbrough, and Mark A. Carver, Stockton-on-Tees, both of England, assignors to Imperial Chemical Industries plc, London, England
Filed Dec. 14, 1987, Ser. No. 133,284
Claims priority, application United Kingdom, Dec. 16, 1986, 8630029
Int. Cl.[5] C12P *7/62, 7/40*
U.S. Cl. 435—135 6 Claims

1. A process for the decomposition of acrylamide in a medium containing it in which the medium is contacted with an enzyme capable of decomposing acrylamide under conditions suitable for the enzyme to decompose the acrylamide wherein the enzyme is an amidase enzyme which has been induced in a bacterium belonging to the species *Methylophilus methylotrophus*.

6. A process for the production of acrylic acid or a salt or ester thereof in which a medium containing acrylamide is contacted with an enzyme capable of decomposing acrylamide to acrylic acid under conditions suitable for the enzyme to decompose the acrylamide to acrylic acid or a salt or ester thereof wherein the enzyme is an amidase enzyme which has been induced in a bacterium belonging to the species *Methylophilus methylotrophus*.

4,925,798
3-HYDROXYDICARBOXYLIC ACIDS AND PROCESS FOR THEIR PRODUCTION
Frank F. Hill, Mettmann, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany
Division of Ser. No. 855,035, Apr. 23, 1986, Pat. No. 4,827,030. This application Jan. 3, 1989, Ser. No. 329,883
Int. Cl.[5] C12P *7/40, 7/44;* C12R *1/74*
U.S. Cl. 435—136 6 Claims

1. *Candida tropicalis* strain DSM 3152.

4,925,799
PLASMID CLONING VECTOR PAS1
Martin Rosenberg, Malvern, Pa., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Continuation-in-part of Ser. No. 457,352, Jan. 12, 1983, Pat. No. 4,578,355. This application Jan. 16, 1986, Ser. No. 819,406
Int. Cl.[5] C12N *15/00, 1/00*
U.S. Cl. 435—172.3 11 Claims

1. A method of modifying pAS1 which comprises converting the BamHI site into a blunt-ended cloning site.

4,925,800
MONOCLONAL ANTIBODY AGAINST HUMAN PNEUMOCYSTIS CARINII
Joseph A. Kovacs, Potomac, and Henry Masur, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed Dec. 4, 1986, Ser. No. 938,716
Int. Cl.[5] C12N *15/00*
U.S. Cl. 435—240.27 4 Claims

1. A monoclonal antibody having specific binding affinity against human *Pneumocystis carinii*, said monoclonal antibody being 2G2.

3. A hybridoma producing monoclonal antibodies having specific binding affinity against human *Pneumocystis carinii*, said hybridoma selected from the group consisting of HB9235, HB9236 and HB9237.

4,925,801
PROCESS FOR PRESERVING THE PHOSPHORYLATING ACTIVITY OF YEAST, APPLIED TO THE PRODUCTION OF FRUCTOSE-1,6-DIPHOSPHATE
Guillermo Bisso, Via A.G. Barriti, and Federico Melelli, Via Domodossola 26, both of Rome, Italy
Filed Mar. 23, 1987, Ser. No. 29,335
Claims priority, application Italy, Mar. 25, 1986, 19865 A/86
Int. Cl.[5] C12N *15/00, 5/00, 7/00*
U.S. Cl. 435—255 6 Claims

1. A process for preserving the phosphorylating activity of brewer's yeast applied to the production of fructose-1,6-diphosphate, wherein the following steps are provided:
(a) permeabilizing the cell wall, in order to allow fructose-1,6-diphosphate to flow out from the cytoplasm, by adding 0.5 volume hypertonic solution to 1 volume of a yeast suspension of 60% w/v yeast in tap water, and heating for one hour to 35° C. under slow stirring;
(b) preparing a disintegrated yeast extract suitable for use as a protecting agent against the oxidation of the SH groups of the glycolytic enzymes during the repeated phoshorylation cycles, by disintegrating a yeast suspension in a hypertonic solution of 1M glucose and 0.5M potassium phosphate by means of a glass ball homogenizer, incubating the disintegrated cell suspension for 2 h at 28° C., deproteinizing by heating at 100° C. for 10' and centrifuging 8000 revolutions for 30'; and
(c) immobilizing the glycolytic enzymes inside the cell, by cross-linking with intracellular proteins, wherein glutaraldehyde is added to the suspension of the permeabilized yeast cells, and to which is added disintegrated yeast extract at a final concentration of glutaraldehyde of 0.25–1% w/v, at 28° C. under constant and slow stirring.

4,925,802
METHOD FOR STIMULATING BIODEGRADATION OF HALOGENATED ALIPHATIC HYDROCARBONS
Michael J. K. Nelson, Redmond, and Al W. Bourquin, Seattle, both of Wash., assignors to Ecova Corporation, Redmond, Wash.
Filed Dec. 21, 1988, Ser. No. 288,614
Int. Cl.[5] D06M *16/00;* C02F *3/00*
U.S. Cl. 435—262 13 Claims

1. A method of biodegrading halogenated aliphatic hydrocarbons comprising incubating said hydrocarbons with microorganisms capable of degrading said hydrocarbons by components of an oxygenase-controlled pathway, together with at leastone aromatic amino acid that stimulates said biodegrading activity of said microorganisms.

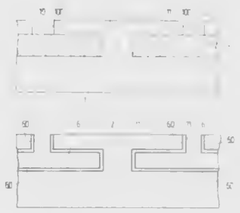
4,925,803
FIBROUS ROLL OF TUBULAR BRAID FOR IMMOBILIZATION OF CELLS AND ENZYMES
Tetsuro Suehiro, Tokyo; Aizo Yamauchi, Ibaraki; Hisao Ichijo, Ibaraki; Jun'ichi Nagasawa, Ibaraki, and Noboru Aisaka, Ibaraki, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan
Filed Oct. 13, 1987, Ser. No. 107,051
Claims priority, application Japan, Oct. 13, 1986, 61-242267
Int. Cl.[5] C12M *1/40;* C12N *11/00, 11/02, 11/08*
U.S. Cl. 435—288 11 Claims

1. A fibrous support prepared by:
providing a frame member having a tubular shape and having a plurality of through holes in the wall thereof;
forming a tubular braid from a plurality of rovings which in turn are prepared from thin long filaments having diameters in the range of 0.1 to 1.0 μm; and
cross-winding said tubular braid on said frame member and tightly squeezing all contacting, intersecting portions of the braid which flatly crushes these portions of the braid, thereby forming a roll of braid on said frame member with an external void ratio of the tubular braid in the roll ranging from 15 to 30%.

4,925,804
INTERLIGAND METAL TRANSFER ASSAY
Ron L. Hale, Woodside, and Irwin Wieder, Los Altos, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.
Filed Jun. 17, 1986, Ser. No. 875,449
Int. Cl.[5] G01N *33/566, 21/76*
U.S. Cl. 436—501 17 Claims

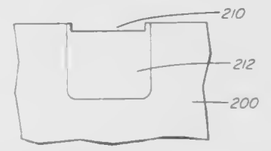
1. In a method of chemical analysis for determining an analyte in a test material comprising carrying out a biospecific reaction with the analyte and thereafter detecting the occurrence of the biospecific reaction and employing a reporter mechanism to indicate the occurrence of the biospecific reaction the improvement comprising employing as the reporter mechanism an interligand metal ion transfer in which a metal ion is directly transferred from a first chelate complex with a first ligand to a second ligand thereby forming a second chelate complex which is separate from and detectably different from the first chelate complex.

4,925,805
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING AN SOI STRUCTURE USING SELECTABLE ETCHING
Alfred H. van Ommen; Johanna M. L. Mulder, and Johannes F. C. M. Verhoeven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 3, 1989, Ser. No. 333,062
Claims priority, application Netherlands, Apr. 5, 1988, 8800847
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—21 14 Claims



1. A method of manufacturing a semiconductor device comprising the steps of
(a) forming lattice defects in at least one buried zone of a semiconductor substrate of monocrystalline semiconductor material by implanting ions through a main surface of said substrate, said ions being electrically inert relative to said monocrystalline semiconductor material, and said ions introducing said lattice defects into said buried zone to form semiconductor material at said buried zone different than said monocrystalline material,
(b) selectively etching away said different semiconductor material relative to said monocrystalline material to form a cavity at said buried zone, and
(c) at least partially filling said cavity with insulating material.

4,925,806
METHOD FOR MAKING A DOPED WELL IN A SEMICONDUCTOR SUBSTRATE
John K. Grosse, Encinitas, Calif., assignor to Northern Telecom Limited, Montreal, Canada
Filed Mar. 17, 1988, Ser. No. 169,542
Int. Cl.[5] H01L *21/265, 21/70*
U.S. Cl. 437—34 4 Claims

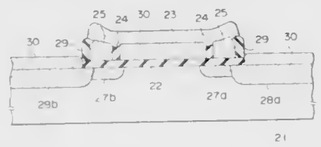


1. A method for making a doped well in a semiconductor, comprising the steps of:
forming a dopant-absorbing coating comprising a photoresist directly on a semiconductor susbtrate, the coating having an opening therethrough exposing the entire surface of the substrate which lies within the opening;
implanting a dopant into the substrate through the opening and the exposed surface of the substrate;
subsequent to the implanting step, etching the exposed surface of the substrate through the opening to form a recess in the substrate, whereby the etching removes a predetermined amount of the substrate and a predetermined amount of the implanted dopant;
removing the dopant-absorbing coating;
heating the substrate in an oxidizing ambient to drive the remaining implanted dopant further into the substrate and to grow an oxide on the substrate; and
removing the oxide from the substrate prior to further processing.

4,925,807
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE
Kuniyoshi Yoshikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 27, 1989, Ser. No. 371,795
Claims priority, application Japan, Jun. 30, 1988, 63-160827
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—44 15 Claims

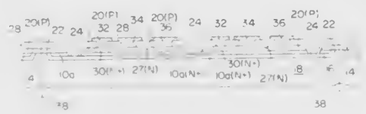
1. A method of manufacturing a semiconductor device comprising the steps of:
forming a first insulation film on a surface of a semiconductor region of a first conductivity type;
forming a first conductive film on said first insulation film;
patterning said first conductive film;
forming a second insulation film over the first conductive film;
forming a first and a second impurity-diffused layer of a second conductivity type by implanting impurity ions in

said semiconductor region with using said patterned first conductive film as a mask;
forming a second conductive film over said first and second insulation films;
forming a third insulation film over said second conductive film;
performing an anisotropic etching to cause a lamination film of said second conductive film and said third insulation film to remain in a region of a side wall of said patterned first conductive film;
forming a third and a fourth impurity-diffused layer of a second conductivity type by implanting impurity ions in said semiconductor region using said first and second



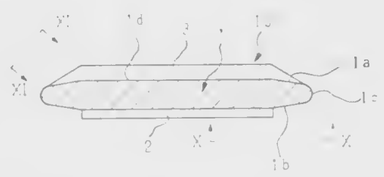
conductive films and said second and third insulation films as masks, the concentration of impurities in said third and fourth impurity-diffused layers being higher than that of impurities in said first and second impurity-diffused layers;
forming a fourth insulation film over the entire surface of the resulting structure;
performing an anisotropic etching to expose surfaces, being substantially parallel to said semiconductor region, of said first and second conductive films; and
selectively forming a third conductive film over said exposed first and second conductive films, said third conductive film connecting said first and second conductive films.

4,925,808
METHOD FOR MAKING IC DIE WITH DIELECTRIC ISOLATION
William E. Richardson, Rutland, Mass., assignor to Sprague Electric Company, North Adams, Mass.
Filed Mar. 24, 1989, Ser. No. 328,211
Int. Cl.[5] H01L *21/76, 21/80, 21/86, 29/80*
U.S. Cl. 437—62 **13 Claims**



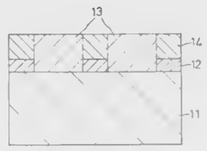
13. In a process for making an integrated semiconductor circuit of the kind including forming in one surface of a single-crystal semiconductor wafer a network of rows and columns of uniformly deep grooves, forming one insulating layer over said one surface and over the walls of said grooves, forming over the opposite wafer surface a thick self-supporting polysilicon layer, progressively removing portions of said single-crystal semiconductor material until the bottoms of at least portions of said grooves are removed and growing a thin epitaxial layer over the remaining exposed single-crystal material, the improvement comprising:
(a) forming at each patch of said epitaxial layer delineated by adjacent of said rows and columns, a figure-eight pattern of trenches completely through said epitaxial layer and said single-crystal semiconductor material, but not through said one insulating layer so that two islands made up of portions of said semiconductor material and said epitaxial layer are each separated by and surrounded by said trenches;
(b) forming another insulating layer over said epitaxial layer portions and the walls of said trenches;
(c) forming a transistor in each of said two semiconductor islands; and
(d) separating said wafer along said grooves to produce individual die with two dielectrically isolated semiconductor islands.

4,925,809
SEMICONDUCTOR WAFER AND EPITAXIAL GROWTH ON THE SEMICONDUCTOR WAFER WITH AUTODOPING CONTROL AND MANUFACTURING METHOD THEREFOR
Tetsujiro Yoshiharu, Amagasaki, and Haruo Kamise, Saga, both of Japan, assignors to Osaka Titanium Co., Ltd., Amagasaki and Kyushu Electronic Metal Co., Ltd., Kishima, both of, Japan
Division of Ser. No. 50,389, May 18, 1987. This application Jul. 1, 1988, Ser. No. 214,501
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—95 **6 Claims**



1. A manufacturing method for a semiconductor wafer, comprising the steps of forming a blocking film on the entirety of one of two opposite flat surfaces of said semiconductor wafer and along a peripheral surface thereof, and removing said blocking film from said peripheral surface, characterized by the further step of producing an epitaxial layer on the surface opposite said one flat surface, at which time said blocking film prevents volatilization of impurities which would otherwise cause autodoping.

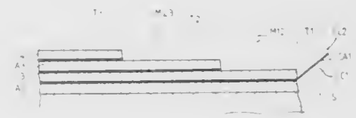
4,925,810
COMPOUND SEMICONDUCTOR DEVICE AND A METHOD OF MANUFACTURING THE SAME
Hiroyuki Kano, Aichi; Takatoshi Kato, and Masafumi Hashimoto, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan
Continuation of Ser. No. 97,843, Sep. 17, 1987, abandoned. This application Aug. 24, 1989, Ser. No. 397,367
Claims priority, application Japan, Oct. 25, 1986, 61-254141
Int. Cl.[5] H01L *21/203, 21/20*
U.S. Cl. 437—105 **6 Claims**



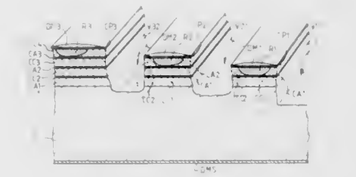
1. A method of manufacturing a compound semiconductor device comprising the steps of:
forming a layer of an insulator on one portion of a surface of a substrate formed from a single crystal of silicon;
removing an oxide on a different portion of said substrate surface from said insulator layer and some silicon atoms of said substrate surface under said oxide by heating said substrate at a temperature of at least 1000° C. in an ultra-high vacuum having a maximum pressure of 10^{-10} torr,
maintaining said substrate at a temperature of at least 1,000° C. for a time longer than required to desorb an oxide, said time being sufficient to obtain a structure of bi-atomic steps on the substrate surface,
lowering the temperature substantially to a range of 550° to 750° C. and then applying to said substrate a molecular beam of one compound semiconductor forming elements which is volatile at a temperature in the range of from 550°-750° C., and
applying molecular beams of all of said compound semiconductor forming elements together to said substrate to grow a compound semiconductor by epitaxy,
whereby a compound semiconductor layer having a regularly repeating arrangement of atoms is formed on a different portion of said substrate surface from said insulator layer, while a high resistance compound semiconductor layer is formed on said insulator layer.

4,925,811
METHOD OF MANUFACTURING A SEMICONDUCTOR STRUCTURE SUITABLE FOR PRODUCING A MULTI-WAVELENGTH LASER EFFECT
Louis Menigaux, Bures Sur Yvette, and Louis Dugrand, Chelles, both of France, assignors to L'Etat Francais represente par le Ministre Des Postes Et Telecommunications - Centre National d'Etudes des Telecommunications, Issy-Les-Moulineaux, France
PCT No. PCT/FR87/00414, § 371 Date Jun. 30, 1988, § 102(e) Date Jun. 30, 1988
PCT Filed Oct. 23, 1987, Ser. No. 224,879
Claims priority, applicatioo France, Oct. 23, 1986, 86 14740
Int. Cl.[5] H01L *21/20, 21/205*
U.S. Cl. 437—129 **21 Claims**

1. A method of manufacturing a semiconductor structure, in particular a structure suitable for producing a laser effect, the method being characterized in that it comprises the following steps:
(a) a monocrystaline double heterostructure stack is deposited on a substrate (S), said stack begin constituted by active layers (CA) having different compositions and having light radiating properties, each of said layers being sandwiched between two confinement layers (CC) having a microcrystal lattice size adjacent to that of the active layers, with all of said layers having the same conductivity type;
(b) the top of the stack is selectively etched in parallel strips which are adjacent to one another in order to lay bare confinement layers (CC) at different depths, at least on two adjacent strips, with the confinement layers (CC) thus laid bare defining parallel terraces (**T1, T2, T3**) separated from one another by transitions (**M12, M23**);
(c) a contact layer (CP) is formed on said terraces;
(d) an opposite conductivity type region (**R1, R2, R3**) is formed in the strip included in each terrace by inserting impurities through the contact layer, said impurities corresponding to the same conductivity type as the contact





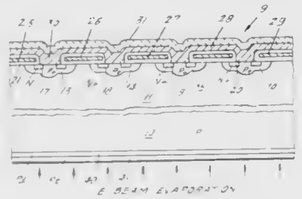


layer and said region extending through the top confinement layer (**CC2, CC3, CC4**) to the vicinity of the active layer therebeneath (**CA1, CA2, CA3**) in order to constitute a P-N junction therewith (**J1, J2, J3**);
(e) individual metal contacts (**DM1, Dm2, Dm3**) are deposited on each opposite conductivity type region;
(f) a common metal contact (DMS) is deposited on the substrate;
(g) the opposite conductivity type regions are electrically isolated from one another (**V10, V21, V32**) at the transitions therebetween, in order to form semiconductor structure stripes; and
(h) the opposite ends of said stripes are optically prepared transversely to the long dimension of the terraces.

4,925,812
PLATINUM DIFFUSION PROCESS
Herbert J. Gould, Sherman Oaks, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.
Filed Sep. 21, 1989, Ser. No. 410,323
Int. Cl.[5] H01L *21/72*
U.S. Cl. 437—142 **25 Claims**

12. A process for diffusing lifetime-reducing atoms of a heavy metal into a silicon body containing P-N junctions at a temperature too low to distort the positions of said P-N junctions; said process comprising the steps of depositing a silicide-

forming metal on a surface of said silicon body; said silicide-forming metal diffusing into silicon at a higher temperature than the temperature at which said heavy metal diffuses into silicon; and depositing a layer of said heavy metal atop said silicide-forming metal, and then heating said silicon body to a first temperature sufficient to form a silicide whereby atoms of said heavy metal disburse throughout said silicide, and thereafter heating said silicon body to a second and higher temperature and for a short time sufficient to cause said atoms of said heavy metal to diffuse into said silicon body but too low to cause movement of said P-N junctions within said silicon body.



20. A process for introducing platinum atoms into a silicon wafer to reduce minority carrier lifetime comprising the steps of forming a layer of platinum on the back surface of a silicon wafer which has a pattern of P-N junctions formed into its opposite surface; and immediately thereafter and before an oxide can form between said layer of platinum and said silicon wafer, heating said wafer to form a platinum silicide on said back surface which is free of an intervening oxide layer, and thereafter diffusing platinum atoms from said silicide into said wafer by heating said wafer to a temperature higher than about 850° C. but lower than the temperature at which said junctions will move within said wafer

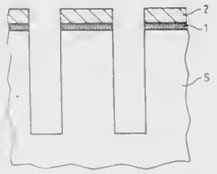
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4,925,813

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES INCLUDING AT LEAST A REACTIVE ION ETCHING STEP

Philippe Autier, Paris, and Jean-Marc Auger, Joinville-le-Pont, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 13, 1989, Ser. No. 366,107
Claims priority, application France, Jun. 24, 1988, 88 08504
Int. Cl.[5] H01L *21/00, 21/02, 21/285;* C23F *1/00*
U.S. Cl. 437—228 2 Claims



1. A method of manufacturing semiconductor devices including at least a reactive ion etching step of a substrate constituted by a means chosen among:

a solid wafer of a semiconductor compound having the general formula $Ga_{1-x}As_xIn_{t-y}P_y$,

a succession of layers of semiconductor compounds each having the general formulae $Ga_{1-x}As_xIn_{t-y}P_y$, in which formulae x and y are the concentrations and lie between 0 and 1, this method comprising for carrying out this etching step a masking system of the said substrate cooperating with a flow of reacting gases, characterized in that the masking system is formed by a first metallic layer of titanium (Ti) having a small thickness, on which a second metallic layer of nickel (Ni) is disposed having a thickness about ten times larger, and in that the flow of reacting gases is formed by the mixture of the gases $Cl_2/CH_4/H_2/Ar$, in which mixture Cl_2 is present in a quantity of about a quarter of the quantities of CH_4 and Ar as far as the partial pressures in the etching chamber are concerned.

4,925,814

ULTRAVIOLET TRANSMITTING GLASSES FOR EPROM WINDOWS

Gerald J. Fine, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Feb. 27, 1989, Ser. No. 316,184
Int. Cl.[5] C03C *3/091*
U.S. Cl. 501—66 3 Claims

1. An ultraviolet transmitting glass exhibiting a coefficient of thermal expansion between $46–52\times10^{-7}$/°C., a softening point below 700° C., and a transmittance at a thickness of 1 mm of at least 80% at a wavelength of 254 nm which is essentially free of fluoride and consists essentially, expressed in terms of mole percent on the oxide basis, of

SiO_2	60–70	Na_2O	2.5–5
B_2O_3	16–20	K_2O	0–3
Al_2O_3	1–8	Li_2O	1–6

wherein the mole ratio $R_2O:R_2O_3$ is greater than 0.3, but less than 0.5.

4,925,815

SILICON CARBIDE COMPOSITE CERAMIC

Toshihiko Tani, Aichi, and Shigetaka Wada, Mie, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Continuation of Ser. No. 84,164, Aug. 11, 1987, abandoned. This application Feb. 15, 1989, Ser. No. 310,469
Claims priority, application Japan, Sep. 3, 1986, 61-207004
Int. Cl.[5] C04B *35/54, 35/56*
U.S. Cl. 501—90 3 Claims

1. A high-toughness silicon carbide composite ceramic consisting essentially of silicon carbide, about 20 to 30 vol.% of graphite whiskers, and a sintering aid, wherein said graphite whiskers have a diameter of about 0.02 to 2 μm, the length of said graphite whiskers is within the range of 5 to 100 μm, and the ratio of the length to the diameter of said graphite whisker is not less than 5.

4,925,816

NOVEL SOLID SOLUTION, HEAT-RESISTANT SINTERED BODY AND METHOD OF PRODUCING THE SAME

Keiichiro Watanabe; Tsuneaki Ohashi, both of Nagoya, and Tadaaki Matsuhisa, Kasugai, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 16, 1988, Ser. No. 232,667
Claims priority, application Japan, Aug. 29, 1987, 62-215836; May 16, 1988, 63-118926; Jul. 28, 1988, 63-188798
Int. Cl.[5] C04B *35/48*
U.S. Cl. 501—104 8 Claims

2. A heat-resistant sintered body consisting essentially of a solid solution of the $R_yZr_4Si_xP_{6-x}O_{24}$ system, wherein R is at least one bivalent or trivalent element, x is a numerical value of greater than 0 but not greater than 2, and y is a numerical value of $\frac{x}{3}$ to 2 satisfying an electrically neutral condition of the chemical formula;

wherein said sintered body has a self-weight softening percentage of not more than 0.3% after a heat treatment at 1400° C. for 5 hours.

4,925,817

DIELECTRIC CERAMIC COMPOSITION

Masaaki Ikeda, and Wataru Takahara, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,998
Claims priority, application Japan, Sep. 20, 1988, 63-235649
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—138 5 Claims

1. A non-reducible dielectric ceramic composition consisting essentially of barium titanate as the main component and an additive expressed by the formula $Ba_\alpha Ca_{1-\alpha}SiO_3$ $(0.43 \leqq \alpha \leqq 0.62)$ in an amount of from 0.1 to 6 mol parts per 100 mol parts of the barium titanate.

4,925,818

METHOD OF PURIFYING BIOACTIVE SUBSTANCES BY BIOSPECIFIC ADSORPTION

Michel Schneider, Troinex, Switzerland; Christian Guillot, Saint-Julien en Genevois, France, and Bernard Lamy, Carouge, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Division of Ser. No. 23,861, Feb. 5, 1987, Pat. No. 4,824,578. This application Oct. 4, 1988, Ser. No. 252,994
Claims priority, application Switzerland, Jun. 10, 1985, 2436/85
Int. Cl.[5] B01J *20/22, 37/36*
U.S. Cl. 502—7 7 Claims

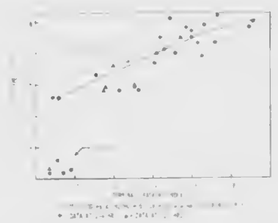
1. A method of preparing a mineral ligand carrier comprising silanizing mineral particles in aqueous medium, by a trialkoxy-alkyl silane wherein the mineral particles are comprised of non-porous silica, which is silanized by dispersing it in a liquid medium long enought to obtain particulate agglomerates measuring 100–1000 nm, after which the trialkoxy-alkyl silane is added with agitation at a temperature between 20° and 80° C., said alkyl group containing a reactive group coupled to the ligand, wherein the substance used for silanizing the starting material is either a silane comprising the previously-fixed ligand or is a silane not yet coupled to the ligand, which is subsequently fixed.

4,925,819

METHOD OF REGENERATING A DEACTIVATED CATALYST

Shun C. Fung, Bridgewater; Samuel J. Tauster, Englishtown, and Jay Y. Koo, Bridgewater, all of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 814,027, Dec. 23, 1985, abandoned, which is a continuation of Ser. No. 550,951, Nov. 10, 1983, abandoned. This application Jun. 15, 1988, Ser. No. 205,567
Int. Cl.[5] B01J *29/38, 38/44, 38/42;* C10G *35/095*
U.S. Cl. 502—37 4 Claims



1. A process for re-activating a coke containing zeolite L reforming catalyst containing at least one Group VIII noble metal and having exchangeable cations of which at least 75% are selected from the group consisting of lithium, sodium, potassium, rubidium, cesium and barium which process comprises:

(a) removing a substantial portion of the coke by contacting the catalyst with 0.2 to 15% by volume oxygen at a temperature from about 380° to 450° C.;

(b) dispersing the at least one noble metal on the surface of the zeolite by contacting the catalyst with a gaseous stream comprising 0.2 to 15% by volume oxygen, and 0.05 to 1.0% by volume HCl or Cl_2 at a temperature from about 400° to 530° C.;

(c) removing excess chlorine and stabilizing the catalyst by contacting the catalyst with a gaseous stream comprising 0.2 to 15.0% by volume oxygen at a temperature from about 400° to 540° C.;

(d) and thereafter reducing the at least one noble metal in the presence of hydrogen; and in which steps (a) through (d) are conducted in the presence of about 0.5 to 5.0% by volume water so that the particles of the at least one noble metal are well dispersed over the surface of the zeolite and at least about 90% of the at least one noble metal is dispersed in the form of particles having a diameter of less than about 7 Å as measured with bright field imaging on a transmission electron microscope with 4 Å point-to-point resolution.

4,925,820

HYDROCARBON CONVERSION PROCESS AND CATALYSTS

Arend Hoek; Tom Huizinga, and Ian E. Maxwell, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 55,672, May 29, 1987, Pat. No. 4,857,171. This application Apr. 28, 1989, Ser. No. 344,589
Claims priority, application United Kingdom, May 30, 1986, 8613131
Int. Cl.[5] B01J *29/06*
U.S. Cl. 502—66 16 Claims

14. A catalyst composition comprising a modified Y zeolite having a unit cell size below about 24.45 Å, a degree of crystallinity which is at least retained at increasing SiO_2/Al_2O_3 molar ratios, a SiO_2/Al_2O_3 molar ratio between about 8 to about 15, a water adsorption capacity (at 25° C. and a p/p_o value of 0.2) of between about 10–15% by weight of modified zeolite and a pore volume of at least about 0.25 ml/g wherein between about 10 to about 40% of the total pore volume is made up of pores having a diameter of at least about 8 nm; an amorphous cracking component comprising a silica-alumina containing 50–95% by weight of silica; a binder comprising alumina; from about 0.05 to about 10 percent by weight of nickel and from about 2 to about 40 percent by weight of tungsten, calculated as metals per 100 parts by weight of total catalyst, wherein the modified Y zeolite and amorphous cracking component comprises about 60–85% by weight of the total catalyst, the binder comprises about 15–40% by weight of the total catalyst and the amount of modified Y zeolite ranges between about 10–75% of the combined amount of modified Y zeolite and amorphous cracking component.

4,925,821

METHOD FOR UTILIZING TRIETHYALUMINUM TO PREPARE AN ALUMOXANE SUPPORT FOR AN ACTIVE METALLOCENE CATALYST

Maiu Chang, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 134,413, Dec. 17, 1987. This application Nov. 8, 1988, Ser. No. 268,834
The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.
Int. Cl.[5] C08F *4/64*
U.S. Cl. 502—107 19 Claims

1. A process for preparing a supported metallocene alumox-

ane catalyst for polymerization of olefins, comprising the steps of:

(a) adding undehydrated silica gel to a stirred solution containing triethylaluminum in an amount sufficient to provide a mole ratio of triethylaluminum to water of from about 0.7:1 to 1:1 and allowing the mixture to react;

(b) adding to the reacted mixture a solution of a metallocene to which trimethylaluminum has been added in an amount such that the mole sum of triethylaluminum and trimethylaluminum is in a mole ratio to the water content of the undehydrated silica gel of from about 3:1 to about 1:2;

(c) removing the solvent;

(d) drying the solids to a free flowing powder.

4,925,822

DISPROPORTIONATION CATALYST AND PROCESS

Lynn H. Slaugh, Cypress; Thomas H. Johnson, and Ronald J. Hoxmeier, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1989, Ser. No. 330,515

Int. Cl.[5] B01J *31/14*

U.S. Cl. 502—112 **13 Claims**

1. A catalyst composition prepared by reacting in a hydrocarbon solvent a molybdenum or tungsten halide with a siloxyalane selected from $[(CH_3CH_2)_2AlO]_2SiR_2$ and $(R'_3SiO)_2AlCH_2CH_3$ wherein R and R' are aryl or C_1–C_5 alkyl.

4,925,823

PROCESS AND CATALYST FOR THE PREPARATION OF METHACRYLIC ACID

Richard Krabetz, Kirchheim; Gerd Duembgen, Dannstadt-Schauernheim; Friedbert Nees, Stutensee; Franz Merger, Frankenthal, and Gerd Fonquet, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 470,947, Mar. 1, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 875,516

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208572

Int. Cl.[5] B01J *27/19*

U.S. Cl. 502—211 **3 Claims**

1. An oxidation catalyst of the formula:

$$Mo_{12}P_aW_bSb_cAs_dCu_eX_fO_x$$

wherein X is Nb, Fe, Mn, or a mixture thereof, and wherein a is 0.5–2, b is 0.5–3, c is 0.2–1.5, d is 0.01–0.5, e is 0.01–0.5 and f is 0–1.0, and wherein said catalyst further contains an alkali metal ion in an amount of less than 0.035 atoms per 12 atoms of molybdenum and wherein x is the number of oxygen atoms formally required to saturate the valencies of the other catalyst components.

4,925,824

IRON CATALYST FOR PREPARATION OF POLYMETHYLENE FROM SYNTHESIS GAS AND METHOD FOR PRODUCING THE CATALYST

Richard S. Sapienza, 1 Miller Ave., Shoreham, N.Y. 11786, and William A. Slegeir, 7 Florence Rd., Hampton Bays, N.Y. 11946

Filed Mar. 31, 1988, Ser. No. 175,781

Int. Cl.[5] B01J *21/04, 21/08, 23/84*

U.S. Cl. 502—262 **4 Claims**

1. A catalyst suitable for use in the synthesis of polymethylene from carbon monoxide and hydrogen or carbon monoxide and water or mixtures thereof comprising palladium or platinum or mixtures thereof supported on a solid phase, onto which is deposited iron, wherein iron comprises at least 40 weight percent and platinum or palladium or mixtures thereof comprise at least 1 weight percent, based on total catalyst weight.

4,925,825

CATALYST FOR REMOVING NITROGEN OXIDES

Takahiro Tachi; Akira Kato; Hiroshi Kawagoshi; Hisao Yamashita, and Tomoichi Kamo, all of Hitachi, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,330

Claims priority, application Japan, Dec. 28, 1987, 62-336182

Int. Cl.[5] B01J *21/06, 23/22, 23/28, 23/34*

U.S. Cl. 502—309 **8 Claims**

1. A catalyst for denitration by ammonia-catalytic reduction, comprising titanium oxide and a composite oxide of molybdenum and vanadium expressed by the formula MoV_xO_y wherein x represents 0.5 to 3 and y represents 3 to 10.

4,925,826

METHOD OF PRODUCING AN ADSORBENT FROM BLOATING MINERALS AND CALCIUM SULFATE HEMIHYDRATE

Heiner Hamm, Würzburg; Peter Hartmann, Mainbernheim; Karl-Heinz Kampner, Embsen, and Hans-Friedrich Kurandt, Lüneburg, all of Fed. Rep. of Germany, assignors to Firma Gipswerk Embsen GmbH & Co. Baustoffproduktion KG, Lüneburg and Firma Gebr. Knauf Westdeutsche Gipswerke, Iphofen, both of, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,889

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713742

Int. Cl.[5] B01J *20/10*

U.S. Cl. 502—407 **9 Claims**

1. A improved method for preparing an adsorbent material that is useful for adsorbing animal excretions wherein a granulated expanded mineral material and calcium sulfate hemihydrate are mixed to form a granulate in which said calcium sulfate hemihydrate is converted to calcium sulfate dihydrate by the addition of excess water, and wherein free water is removed by drying, said improvement comprising:

(a) mixing calcium sulfate hemihydrate and bloating mineral at a weight ratio of calcium sulfate to bloating material such that the weight ratio of calcium sulfate bloating material in the adsorbent is more than 5 to 1 and up to and including 10 to 1;

(b) stirring with a stirring tool to form a granulated mixture;

(c) adding an excess of water and allowing a retention time of at least about 4 minutes; and

(d) calcining the mixture at 120°-200° C. to convert the dry calcium sulfate dihydrate into calcium sulfate hemihydrate at a proportion such that the resulting adsorbent has a total water content of 1% to 16% by weight.

7. The method of claim 1, wherein perlite is used as a bloating mineral.

4,925,827

THERMOSENSITIVE RECORDING MATERIALS

Atsuo Goto, and Naomasa Kolke, both of Tsukuba, Japan, assignors to Mitsubishi Paper Mills Ltd., Tokyo, Japan

Filed May 1, 1989, Ser. No. 345,857

Claims priority, application Japan, May 12, 1988, 63-116052

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—207 **8 Claims**

1. A thermosensitive recording material comprising a support having provided thereon a thermosensitive recording layer comprising a dye precursor and a color developer capable of developing a color of said dye precursor upon heating and an undercoat layer comprising fine organic hollow particles having a ratio of wall thickness to particle diameter 0.15 or less.

4,925,828

LEUCO DYES AND RECORDING MATERIALS USING THE SAME

Kiyotaka Iiyama, Ibaragi; Kunio Hayakawa, Gotenba; Masahiro Nakata, Osaka; Kaoru Kodera, Osaka, and Osamu Miyazaki, Osaka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

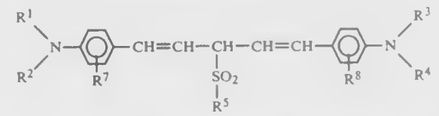
Filed May 31, 1988, Ser. No. 200,674

Claims priority, application Japan, May 30, 1987, 62-137340; May 30, 1987, 62-136055

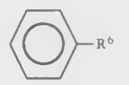
Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—218 **6 Claims**

1. A recording material, comprising a support and a recording layer formed thereon, said recording layer comprising a binder and a leuco dye having the formula (I), which is colored upon being brought into contact with a color developer capable of inducing color formation in said leuco dye, thereby forming images which absorb light in a near infrared region:



wherein R^1, R^2R^3 and R^4 each represent a lower alkyl group; R^5 represents an α-naphthyl group, β-naphthyl group or a group of the formula:



wherein R^6 represents —NHCOR[9], a halogen or an amino group which is unsubstituted or substituted by one or two C_1–C_4 alkyl groups which are the same or different; and R^7, R^8 and R^9 each represent hydrogen or a lower alkyl group, provided that when both R^7 and R^8 are hydrogen, R^6 represents —NHCOR[9] or bromine.

4,925,829

METHOD FOR PREPARING THIN FILM OF COMPOUND OXIDE SUPERCONDUCTOR BY ION BEAM TECHNIQUES

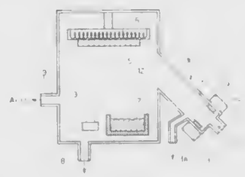
Nobuhiko Fujita; Hideo Itozaki; Saburo Tanaka; Shuji Yazu, and Tetsuji Jodai, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 25, 1988, Ser. No. 198,260

Claims priority, application Japan, May 26, 1987, 128773

Int. Cl.[5] B05D *5/12, 3/06; C23C 16/00*

U.S. Cl. 505—1 **19 Claims**



1. In a method for preparing a thin film of superconductor composed of a compound copper oxide on a substrate employing a physical vapor deposition technique, the improvement which comprises irradiating the substrate on which evaporated particles from a vapor source are deposited with an oxygen ion beam the intensity of which is varied in time while the evaporated particles are deposited on the substrate.

4,925,830

LASER BASED METHOD FOR FORMING A SUPERCONDUCTING OXIDE LAYER ON VARIOUS SUBSTRATES

Fraser Walsh, Arlington, Mass., assignor to Tracer Technologies, Inc., Somerville, Mass.

Filed Apr. 14, 1988, Ser. No. 181,656

Int. Cl.[5] B05D *3/06*

U.S. Cl. 505—1 **28 Claims**



22. The method for forming a superconducting ceramic layer on a substrate comprising:

applying a layer of dry salts to the surface of the substrate wherein the dry salts contain bismuth, calcium, strontium and copper in a 1:1:1:2 atomic ratio;

heating the substrate by passing the surface through the path of a laser beam;

producing reactive species from the salts at the surface of the substrate through the energy of the laser beam which causes the reactive species to react with the surface substrate.

4,925,831

AMINOALKYL NAPHTHALENEDIOLS AS HOST RESISTANCE ENHANCERS AGAINST VIRAL INFECTION

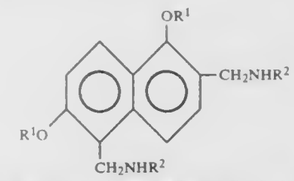
Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 11, 1987, Ser. No. 60,208

Int. Cl.[5] A61K *31/70, 31/505, 31/33*

U.S. Cl. 514—49 **3 Claims**

1. A method of enhancing human host resistance against opportunistic bacterial, fungal or viral infection in a human host immunocompromised by an AIDS-related virus compromising the step of administering to said host a composition comprising a compound of the formula:



where R^1 is independently selected from H, C_1-C_6 alkyl; R^2 is independently selected from the group consisting of: 1 adamantylmethyl, 2-adamantylmethyl, 3-methyl-1-adamantylmethyl, 3-methyl-2-adamantylmethyl, 3,5-dimethyl-1-adamantylmethyl, 3-ethyl -1-adamantylmenthyl, 3-propyl--1-adamantylmethyl, 3-methoxy-1-adamantylmethyl, 3-ethoxy- b 1- adamantylmethyl. cyclohexylmethyl-, 2-, 3, 4-trimethyl-cyclohexylmethyl-, 2,4-dimethylcyclohexylmethyl-,

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2-methoxycyclohexylmethyl-, 4-t-butoxycyclohexylmethyl-, 3-isopropoxycyclohexylmethyl-, tetrahydropyrandyl-4-methyl, 2-methyltetrahydropyranyl-4-methyl, 2,5-dimethoxytetrahydropyranyl-4-methyl, cyclopentylmethyl, methylcyclopentylmethyl, substituted monocycloalkyl, unsubstituted or substituted di- or tri- cycloalkyl, or hetero-cycloalkyl containing one oxygen heteroatom, or pharmaceutically acceptable acid addition salts thereof, and in combination, concurrently or separately, an anti-viral anti-AIDS therapeutic drug selected from the group consisting of: ansamycin, ribavirin, dideoxycytidine, HPA-23, AL-721, foscarnet and azidothymidine, in a physiologically acceptable medium in an amount effective to impart resistance against said opportunistic infection.

4,925,832

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE SYSTEMS

Kevin P. Hall, Essex, and Andrew W. Mott, Bishops Stortford, both of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 68,146, Jun. 29, 1987, Pat. No. 4,798,780. This application Oct. 31, 1988, Ser. No. 264,988

Claims priority, application United Kingdom, Jul. 16, 1986, 8617335

Int. Cl.[5] C07C *109/04, 109/10*

U.S. Cl. 564—149 9 Claims

1. A compound of the formula:

TABLE 6

Compound No.	Amount Used mol/mol AgX	Rel. log sensitivity at 0.1 above fog	Maximum density	Contrast
	Developer 1 pH 11.0			
6	8.3×10^{-3}	1.20	4.0	20
18	8.3×10^{-3}	0.94	3.4	3
2	8.3×10^{-3}	1.05	4.0	4

in which:

p and q are independently selected from 0 or 1 such that (p+q)=1

t is 0 through 3

R^{11} is alkyl of up to 12 carbon atoms, alkoxy of up to 12 carbon atoms, halogen or $NHCOR^{10}$ in which R^{10} is H, alkyl of up to 12 carbon atoms, or aryl of up to 12 carbon atoms

M is NH_2 or OH

with the proviso that when M is OH and p is zero, t is other than zero.

4. The compound of claim 1 which is 1(2'-aminophenylacetyl)-2-phenylhydrazine.

5. A hydrazine compound of the general formula

R^3-NR^4-NR^5-G-X (I)

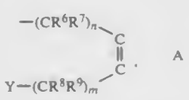
in which:

R^3 represents an aryl group,

one of R^4 and R^5 is a hydrogen and the other is selected from hydrogen, aryl sulphonyl and trifluoroacetyl,

G represents carbonyl and

X is a moiety such that at a pH in the range of 9.5 to 12.5 in the presence of an oxidised hydroquinone a cyclisation reaction takes place cleaving the moiety -G-X from the remainder of the molecule and forming a cyclic structure comprising atoms of the moiety -G-X in which X represents



A

in which:

R^6 to R^9 are independently selected from H, alkyl of up to 12 carbon atoms or aryl of up to 12 carbon atoms,

A represents the necessary atoms to complete a benzene ring which may possess substituents,

Y represents OH, and

n is 0 or 1, m is 0 or 1 and (n+m) is 1 or 2 with the proviso that the formula excludes 1(2'-hydroxymethylbenzoyl)-2-phenylhydrazine.

4,925,833

USE OF TETRACYCLINE TO ENHANCE BONE PROTEIN SYNTHESIS AND/OR TREATMENT OF OSTEOPOROSIS

Thomas F. McNamara, Port Jefferson; Lorne M. Golub, Smithtown, and Nungavaram S. Ramamurthy, Smithtown, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 699,048, Feb. 7, 1985, Pat. No. 4,704,383, which is a continuation-in-part of Ser. No. 566,517, Dec. 29, 1983, Pat. No. 4,666,897. This application Dec. 29, 1986, Ser. No. 946,726

Int. Cl.[5] A61K *31/65*

U.S. Cl. 514—152 19 Claims

1. A method of treating osteoporosis by enhancing bone protein synthesis in a human which comprises administering to the human an effective amount of a tetracycline.

4,925,834

3-METHYLENE-4-ANDROSTEN-17-ONES, PROCESS FOR THEIR PRODUCTION AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Rolf Bohlmann; Henry Laurent; David Henderson, and Yukishige Nishino, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

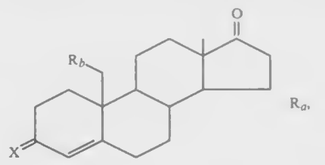
Filed Apr. 29, 1988, Ser. No. 188,569

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714965

Int. Cl.[5] A61K *31/56;* C07J *1/00*

U.S. Cl. 514—177 17 Claims

1. A 3-methylene-4-androsten-17-one of formula I



(I)

wherein

R_a is hydrogen; C_{1-6}-alkyl; C_{1-6}-alkenyl; C_{1-6}-alkyl or C_{1-6}-alkenyl substituted by hydroxyl, halo, C_{1-4}-alkanoyl, bis hydroxyl or bis C_{1-4}-alkanoyl, in which R_a is in the alpha- or beta-position;

R_b is hydrogen, hydroxyl or an $-S(O)_nR_c$ group, in which R_c id hydrogen, C_{1-4}-alkyl or C_{1-4}-alkanoyl, n=0, 1 or 2, and

X is CH_2, CHF, CHCl or CHBr, in which is R_a is hydrogen and R_b is hydroxyl, or R_a and R_b are each hydrogen, X is not CH_2.

4,925,835

AZIRIDINYL PUTRESCINE CONTAINING COMPOSITIONS AND THEIR USES IN TREATING PROSTATE CANCER

Warren D. W. Heston, Montrose, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 113,550

Int. Cl.[5] A61K *31/33*

U.S. Cl. 514—183 29 Claims

1. A method of inhibiting the proliferation of a human prostate cancer cells comprising contacting the cells with an amount of a cytotoxic polyamine selected from the group consisting of 1-(4-aminobutyl) aziridine, (N^1-(3-aminopropyl)-1,4-butanediamine) aziridine, and (N,N^1-bis (3-aminopropyl)-1,4-butanediamine) aziridine, effective to inhibit proliferation of the cells.

21. A two component therapeutic composition useful to inhibit proliferation of a human prostate cancer cells which



comprises separate first and second components, the first component comprising an effective prostate cancer cell proliferation inhibiting amount of a cytotoxic polyamine selected from the group consisting of 1-(4-aminobutyl) aziridine, (N-(3-aminopropyl)-1,4-butanediamine), and (N,N^1-bis (3-aminopropyl)-1,4-butanediamine) aziridine and the second component comprising an amount of a polyamine depleting agent selected from the group consisting of difluoromethylornithine, and (2R,5R)-6-heptyne-2,5-diamine.

4,925,836

ANTIBACTERIALLY EFFECTIVE METHODS AND COMPOSITIONS BASED UPON (1R,5S,6S)-2-[(6,7-DIHYDRO-5H-PYRAZOLO[1,2-A][1,2,4]TRIAZOLIUM-6-YL)]THIO-6-[R-1-HYDROXYETHYL]-1-METHYL-CARBAPENEM-3-CAROXYLATE AND SALTS THEREFORE

Toshio Kumagai; Hiroshi Matsunaga; Yoshisuke Machida; Yunosuke Nagase; Muneo Hikida, and Yoshimitsu Nagao, all of Shiki, Japan, assignors to Lederle (Japan), Ltd., Tokyo, Japan

Continuation of Ser. No. 130,121, Dec. 8, 1987, Pat. No. 4,866,171. This application May 26, 1989, Ser. No. 357,349

Claims priority, application Japan, Apr. 11, 1987, 62-89016

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] C07D *487/04;* A61K *31/40*

U.S. Cl. 514—210 2 Claims

1. A method of treatment for controlling or preventing a bacterial infection in a subject which comprises administering to said subject an antibacterially effective amount of (1R,5S,6S)-2-[(6,7-dihydro-5H-pyrazolo[1,2-a][1,2,4]triazolium-6-yl)]thio-6-[R-1-hydroxyethyl]-1-methyl-carbapenem-3-carboxylate or a pharmaceutically acceptable salt thereof.

4,925,837

PHARMACEUTICAL COMPOSITIONS

Icilio Cavero, Creteil; Jean-Louis Cazor, Paris; Peter Hicks, Cachan, and Salomon Langer, Paris, all of France, assignors to Synthelabo, Paris, France

Continuation of Ser. No. 846,032, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 817,262, Jan. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 692,767, Jan. 16, 1985, abandoned. This application Oct. 13, 1987, Ser. No. 106,968

Claims priority, application France, Sep. 14, 1984, 85 14088; Jan. 18, 1985, 85 00678; Feb. 26, 1985, 85 02725; Feb. 26, 1985, 85 02726

Int. Cl.[5] A61K *31/44, 31/55, 31/445, 31/505*

U.S. Cl. 514—211 2 Claims

1. A pharmaceutical composition comprising a combination of diltiazem and alfuzosin in an amount effective for the treatment of hypertension, the diltiazem being present in the amount of about 25 to 160 mg, the alfuzosin being present in the amount of about 0.1 to 10 mg, the diltiazem and alfuzosin being present in relative amounts such that the anti-hypertensive effect observed upon administration of the combination of diltiazem and alfuzosin is greater than the sum of the individual anti-hypertensive effects that would be observed upon separate administration of the diltiazem and alfuzosin alone, and a pharmaceutically acceptable carrier.

4,925,838

3-PYRROLIDINYLTHIO-1-AZABICYCLO[3.2.0]-HEPT-2-ENE-2-CARBOXYLIC ACID COMPOUNDS

Masayoshi Murata, Osaka; Hideo Tsutsumi, Toyonaka; Keiji Matsuda, Takatsuki; Kohji Hattori, Sakai, and Takashi Nakajima, Toyonoka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

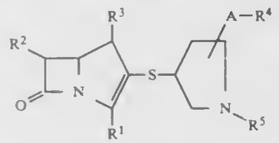
Filed Mar. 14, 1989, Ser. No. 323,404

Claims priority, application United Kingdom, Mar. 18, 1988, 8806428; May 23, 1988, 8812159; Sep. 16, 1988, 8821760

Int. Cl.[5] C27D *487/04;* A61K *31/40*

U.S. Cl. 514—210 9 Claims

1. A compound of the formula:



in which

R^1 is carboxy or protected carboxy,

R^2 is hydroxy(lower)alkyl or protected hydroxy(lower alkyl,

R^3 is hydrogen or lower alkyl,

R^4 is saturated, 5 or 6-membered heteromonocyclic group containing 1 to 4 nitrogen atom(s) and optionally 1 or 2 oxygen atom(s), which may be substituted by one or more suitable substituent(s) selected from amino, protected amino, carbamoyl, lower alkyl, oxo, lower alkylsulfonyl, hydroxy(lower)alkyl, carbamoyl(lower)alkyl and imino-protective group,

R^5 is hydrogen, lower alkyl or imino protective group, and

A is lower alkylene, or pharmaceutically acceptable salts thereof.

VOL 1114 ISS 3 MY 15 1990 UMI

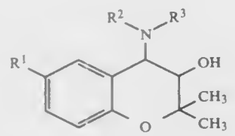
4,925,839

ANTIHYPERTENSIVE BENZOPYRAN DERIVATIVES

Dominick A. Quagliato, and Leslie G. Humber, both of North Brunswick, N.J., assignors to American Home Products Corporation, New York, N.Y.

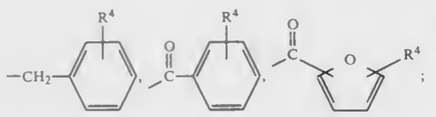
Continuation-in-part of Ser. No. 146,875, Jan. 22, 1988, abandoned. This application Jun. 24, 1988. Ser. No. 210,970
Claims priority, application Canada, Oct. 27, 1987, 550349
Int. Cl.[5] A61K *31/445;* **C07D** *405/04*
U.S. Cl. 514—212 **6 Claims**

1. A compound of formula (I)

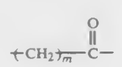


(I)

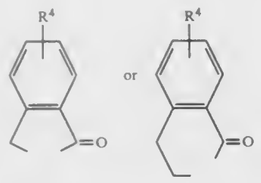
wherein R^1 is trifluoromethoxy or β,β,β-trifluoroethoxy; R^2 and R^3 are independently selected from the group consisting of hydrogen, lower alkyl containing 1 to 5 carbon atoms, cyclo lower alkyl containing 5 to 8 carbon atoms,



or R^2 and R^3 are joined to form CH_{2n} wherein n is 4 to 7; or R^2 and R^3 are joined together to form



wherein m is 3 to 6; or R^2 and R^3 are joined together to form



wherein R^4 is selected from the group consisting of hydrogen, alkoxy containing 1 to 5 carbon atoms, amino or mono- or disubstituted alkyl amino wherein said alkyl groups contain 1 to 5 carbon atoms and the pharmaceutically acceptable salts and solvates thereof.

5. A pharmaceutical composition comprising an effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt or solvate thereof and a pharmaceutically acceptable carrier for use in the treatment of hypertension.

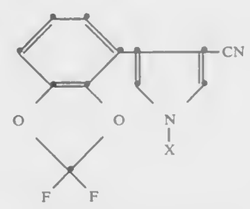
4,925,840

DIFLUOROBENZODIOXYL CYANOPYRROLE MICROBICIDAL COMPOSITIONS

Robert Nyfeler, Basel, and Josef Ehrenfraund, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

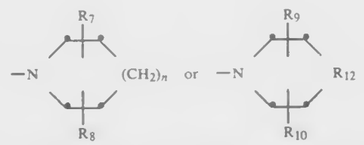
Filed Aug. 3, 1988, Ser. No. 228,763
Claims priority, application Switzerland, Jun. 21, 1985, 2649/85
Int. Cl.[5] C07D *317/48;* **A01N** *43/30*
U.S. Cl. 514—228.2 **8 Claims**

1. A compound of the formula

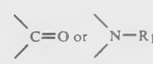


(I)

wherein X is CO-R_1, wherein R_1 is tetrahydrofur-2-yl, or X is CH(Y)R_3, wherein R_3 is hydrogen or C_1–C_8 haloalkyl and Y is tetrahydrofur-2-yl or tetrahydropyran-2-yl, or X is CH_2-Z wherein Z is



or



wherein R_{11} is hydrogen, C_1–C_6 alkyl, formyl, C_1–C_6 alkanoyl or C_1–C_6 alkoxycarbonyl; and n is 0 or 1.

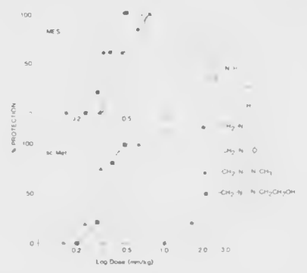
6. A method of controlling phytopathogenic microorganisms or of protecting cultivated plants from attack by said microorganisms, which method comprises applying to said plants, to parts of plants or to the locus thereof a compound of formula I according to claim 1.

4,925,841

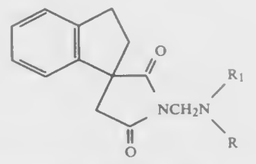
MANNICH BASES OF SPIROSUCCINIMIDES

Michael R. Borenstein, Philadelphia; Peter H. Doukas, Newtown, both of Pa., and Magid A. Abou-Gharbia, Wilmington, Del., assignors to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Continuation of Ser. No. 757,226, Jul. 22, 1985, abandoned. This application Jun. 27, 1988, Ser. No. 211,958
Int. Cl.[5] C07D *403/14, 31/495*
U.S. Cl. 514—235.5 **10 Claims**



1. A compound of the formula



wherein R and R_1 taken together with the nitrogen atom to which they are attached, represent a heterocyclic group selected from the group consisting of morpholino, piperidino, pyrrolidino, piperazino, and lower alkyl-, lower hydroxyalkyl-, lower haloalkyl-, lower haloalkoxy-, lower alkoxy-, aryl-, haloaryl-, pyridyl- and arylalkyl-substituted derivatives of said heterocyclic groups.

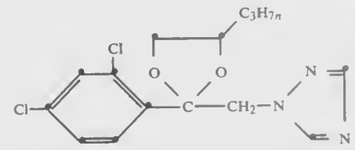
4,925,842

MICROBICIDES

Reinhard Janicke, and Robert Nyfeler, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

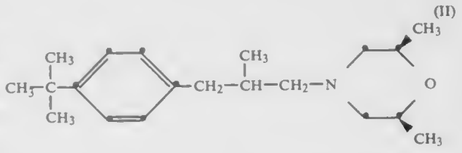
Continuation of Ser. No. 18,634, Feb. 25, 1987, abandoned. This application Mar. 28, 1988, Ser. No. 178,808
Claims priority, application Switzerland, Mar. 6, 1986, 917/86
Int. Cl.[5] A01N *43/64, 43/84*
U.S. Cl. 514—239.5 **7 Claims**

1. A fungicidal composition comprising at least two active components, one of which is propiconazol of formula I



(I)

or a salt thereof, and the other of which is fenpropimorph of formula II,



(II)

or a salt thereof, the amount of each being selected so that the weight ratio of I:II is 5:1 to 1:5.

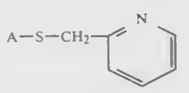
4,925,843

2-PYRIDYLMETHYLTHIO DERIVATIVES AS ANTIULCER AGENTS

Toshihiro Takahashi; Koichiro Hagihara; Koichi Nakamaru, and Yoshikuni Suzuki, all of Saitama, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 331,513
Claims priority, application Japan, Apr. 11, 1988, 63-87271
Int. Cl.[5] C07D *401/12, 401/14;* **A61K** *31/50, 31/505*
U.S. Cl. 514—248 **8 Claims**

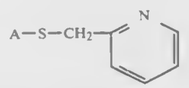
1. A compound of formula (I)



(I)

wherein A represents 4-methyl-2-quinazolinyl, 4-(2-pyridylmethylthio)-1-phthalazinyl or 4-oxo-3-phenyl-3,4-dihydropyrido[2,3-d)pyrimidine-2-yl, or a pharmaceutically acceptable acid addition salt thereof.

5. An antiulcer agent which comprises as an active ingredient a therapeutically effective amount of a compound of formula (I)



(I)

wherein A represents 4-methyl-2-quinazolinyl, 4-(2-pyridylmethylthio)-1-phthalazinyl or 4-oxo-3-phenyl-3,4-dihydropyrido[2,3-d]pyrimidine-2-yl, or a pharmaceutically acceptable acid addition salt thereof) in a pharmaceutically acceptable carrier.

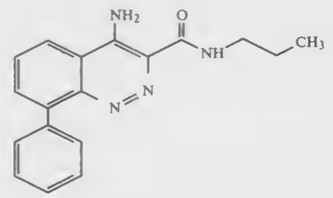
4,925,844

ANTAGONIZING THE PHARMACOLOGICAL EFFECTS OF A BENZODIAZEPINE RECEPTOR AGONIST

James F. Resch, Newark, Del., assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 153,864, Feb. 9, 1988, abandoned. This application Jan. 25, 1989, Ser. No. 301,781
Int. Cl.[5] A61K *31/50, 31/495*
U.S. Cl. 514—252 **2 Claims**

1. A method of antagonizing the pharmacological effects of a benzodiazepine receptor agonist which comprises administering to a mammal in need of such treatment a pharmaceutically effective amount of a compound of formula Ia



Ia

or a non-toxic pharmaceutically acceptable salt thereof.

4,925,845

2 HETEROARYL 3,3 DIALKYL-5-(3 OXO-2,3,4,5 TETRAHYDRO-6 PYRIDAZINYL)-3H-INDOLES

Alfred Mertens, Schriesheim; Wolfgang von der Saal, Weinheim; Lothar Kling, Mannheim, and Bernd Müller-Beckmann, Grünstadt, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

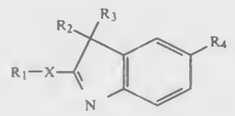
Filed Feb. 24, 1988, Ser. No. 159,744

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706427

Int. Cl.[5] **A61K** *31/50;* **C07D** *401/04*

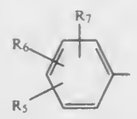
U.S. Cl. 514—254 **17 Claims**

1. Compound of the formula



(I)

wherein R_1 is a phenyl ring of the formula



(II)

wherein R_5, R_6 and R_7, which can be the same or different, each represents a hydrogen atom or a C_1–C_5 alkanesulphonyloxy, trifluoromethanesulphonyloxy, C_1–C_5 alkanesulphonylamino, trifluoromethanesulphonylamino, N-C_1–C_5-alkyl-C_1–C_5 alkanesulphonylamino, N-C_1–C_5 alkyltrifluoromethanesulphonylamino, C_1–C_5 alkyl-sulphenylmethyl, C_1–C_5 alkylsulphinylmethyl or C_1–C_5-alkylsulphonyl-methyl radical, carbonyl group substituted by hydroxyl, C_1–C_5 alkoxy, amino, C_1–C_5 alkylamino or di(C_1–C_5) alkylamino, a sulphonyl group substituted by amino, C_1–C_5-alkylamino or di(C_1–C_5) alkylamino, a C_1–C_5 alkylcarbonyl-amino, aminocarbonylamino or C_1–C_5-alkylaminocarbonylamino radical, a C_1–C_5 alkylthio, C_1–C_5-alkylsulphinyl or C_1–C_5 alkylsulphonyl radical, a nitro, halogen, amino, hydroxyl, C_1–C_5 alkyl, C_1–C_5 alkoxy, C_1–C_5 alkenyloxy, C_1–C_5 alkynyloxy, cyano (C_1C_5) alkoxy, carboxy-(C_1–C_5) alkoxy, C_1–C_5-alkoxycarbonyl(C_1–C_5) alkoxy, di(C_1–C_5) alkylamino, 1-imidazolyl, trifluoromethyl or cyano group; or R_1 is a naphthyl radical which is unsubstituted or substituted by at least one R_5 substituent; or $R_1$is a pyrrole, furan, thiophene, pyrazole, imidazole, thiazole, isothiazole, oxazole, isoxazole, triazole tetrazole, thiadiazole, oxadiazole, pyrazine, N,N-dioxypyrazine, pyrimidine, N-N-dioxypyrimidine, pyridazine, pyridine, N-oxypyridine, piperidine or piperazine radical unsubstituted or substituted by at least one substituent selected from the group comprising C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, hydroxyl, nitro, amino, halogen or cyano, R_2 is C_1–C_6 alkyl, C_1–C_6 alkenyl, C_3–C_7 cycloalkyl or phenyl radical, which is unsubstituted or substituted by at least one R_5 substituent; R_3 is an C_1–C_6 alkyl, C_1–C_6 alkenyl, C_3–C_7 cycloalkyl or phenyl radical, which is unsubstituted or substituted by at least one R_5 substituent; or R_3, together with R_2, is a C_3–C_7 cycloalkylene radical, R_4 is ditetrahydropyridazinyl unsubstituted or substituted by at least one substituent selected from the group comprising C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkoxy-(C_1–C_6) alkyl, C_1–C_6 alkylthio, hydroxy, C_1–C_6 hydroxyalkyl, amino, halogen, oxy or cyano groups, X is a valency bond, an C_1–C_4 alkylene or vinylene radical, an imino group—NH—or a carbonylamino group—CONH—; the tautomers thereof and the physiologically acceptable acid addition salts thereof with inorganic and organic acids.

7. A compound according to claim 1, which is 2-methylamino3,3-dimethyl-5-(3-oxo-2,3,4,5-tetrahydro-6-pyridazinyl)-3H-indole of a pharmaceutically acceptable salt thereof.

4,925,846

2-THIAZOLYL-IMIDAZO[1,2,-a]PYRIMIDINES

Robert M. J. Deacon; Roger J. Gillespie, both of Swindon Wilts; Colin R. Gardner, Newbury Berks, and Wilfred R. Tully, The Waterloo Cirencester, all of Great Britain, assignors to Rousel Uclaf, Paris, France

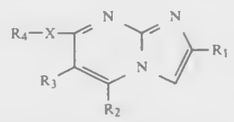
Filed Jun. 3, 1987, Ser. No. 57,493

Claims priority, application United Kingdom, Jun. 4, 1986, 8613591

Int. Cl.[5] **A61K** *31/505;* **C07D** *487/04*

U.S. Cl. 514—258 **10 Claims**

1. A compound selected from the group consisting of a compound of the formula



I

wherein R_1 is thiazol-2-yl or thiazol-2-yl substituted by 1 or 2 alkyl of 1 to 3 carbon atoms or alkyl of 1 to 3 carbon atoms subtituted by one or more fluorine or thiazol-2-yl substituted with —COOAlk, Alk is alkyl of 1 to 3 carbon atoms, R_2 and R_3 are individually selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms and alkenyl of 2 to 5 carbon atoms or R_2 and R_3 together form alkylene of 3 to 5 carbon atoms, X is oxygen or sulfur and R_4 is alkyl of 1 to 3 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

4,925,847

6-THIOXANTHINES

Peter Hofer, Liestal, Switzerland, assignor to Euroceltique, S.A., Luxembourg

Continuation-in-part of Ser. No. 699,254, Feb. 7, 1985, Pat. No. 4,710,503. This application Jul. 28, 1987, Ser. No. 78,545

Claims priority, application United Kingdom, Aug. 2, 1986, 8618931

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[5] **C07D** *473/06;* **A61K** *31/52*

U.S. Cl. 514—263 **11 Claims**

1. A compound selected from the group consisting of 3-(2-methylbutyl)-8-ethyl-6-thioxanthine, 3-ethyl-8-n-butyl-6-thioxanthine, 3-n-propyl-8-n-butyl-6-thioxanthine, 3-n-propyl-8-n-pentyl-6-thioxanthine, 3-n-propyl-8-cyclopropyl-6-thioxanthine, 3-n-propyl-8-cyclobutyl-6-thioxanthine 3-isobutyl-8-n-butyl-6-thioxanthine 3-n-pentyl-8-ethyl-6-thioxanthine and 3-isopentyl-8-ethyl-6-thioxanthine, and pharmaceutically acceptable salts thereof.

4,925,848

DERIVATIVE OF CODEINE USEFUL AS AN AGONIST AND PROCESS FOR THE PREPARATION OF IT

John W. Lewis, North Ferriby, and Colin F. C. Smith, Sproatley, both of United Kingdom, assignors to Reckitt & Colman Products Limited, London, England

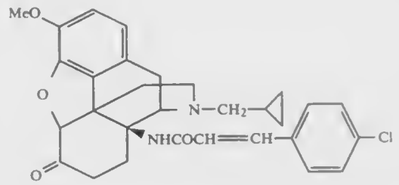
Filed Apr. 28, 1988, Ser. No. 187,648

Claims priority, application United Kingdom, May 15, 1987, 8711558

Int. Cl.[5] **A61K** *31/485;* **C07D** *489/06*

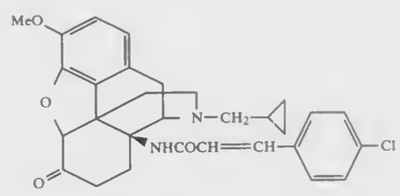
U.S. Cl. 514—282 **7 Claims**

1. A compound of the formula:



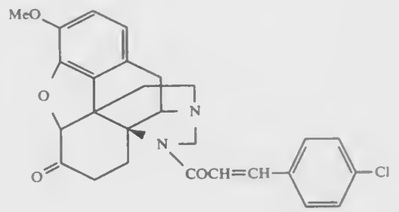
I

2. A process for the preparation of a compound having a formula I



I

wherein a compound of formula VII



VII

is hydrolyzed to form the nor derivative of the compound of formula I, which is then alkylated to provide the N-cyclopropyl methyl derivative, the compound of formula I.

4. A pharmaceutical composition in unit dosage form for delta agonist use which comprises a delta agonist effetive amount of the compound claimed n claim 1 or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable diluent or carrier.

4,925,849

PHARMACEUTICALLY USEFUL PYRAZOLOPYRIDINES

Youichi Shiokawa, Ibaraki; Atsushi Akahane, Hyogo; Hirohito Katayama, Nishinomiya, and Takafumi Mitsunaga, Ashiya, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

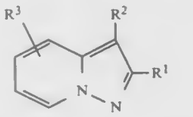
Filed Jun. 6, 1988, Ser. No. 202,526

Claims priority, application United Kingdom, Jun. 15, 1987, 8713908; Aug. 20, 1987, 8719724; Dec. 31, 1987, 8730330

Int. Cl.[5] **A61K** *31/44;* **C07D** *471/04*

U.S. Cl. 514—300 **9 Claims**

1. A pyrazolopyridine compound of the formula:



wherein

R^1 is a lower alkyl, phenyl which may have 1 to 3 substituents selected from the group consisting of halogen, lower alkoxy, nitro, amino and protected amino, or pyridyl,

R^2 is a group of the formula:

$$—A—R^6$$

wherein R^6 is a group of the formula:

$$—COR_N$$

wherein R_N is piperidino which may have 1 to 4 substituents selected from the group consisting of lower alkyl, hydroxy(lower)alkyl, lower alkoxy(lower)alkyl, lower alkanoyloxy(lower)alkyl, lower alkoxycarbonyl and carboxy; pyrrolidin-1-yl which may be substituted by lower alkoxy(lower)alkyl; perhydroazepin-1-yl; piperazin-1-yl which may have lower alkyl; morpholino; 7-azabicyclo[2.2.1]heptan-7-yl; or 3-azabicyclo[3.2.2]nonan-3-yl, and

A is lower alkyl, lower alkenyl or lower alkynyl, each of which may be substituted by halogen,

R^3 is hydrogen, lower alkyl, lower alkoxy or halogen,

or a pharmaceutically acceptable salt thereof.

4,925,850

DERIVATIVES OF 2-((4-PIPERIDINYL)METHYL)-1,2,3,4-TETRAHYDROISOQUINOLINE, THEIR PREPARATION AND THEIR APPLICATION IN THERAPEUTICS

Pascal George, St. Arnoult en Yvelines, Belgium; Mireille Sevrin, Paris, France; Christian Maloizel, Meudon, France; Arlette Tixidre, Gif sur Yvette, France, and Jacques Froissant, Moree, France, assignors to Synthelabo, Paris, France

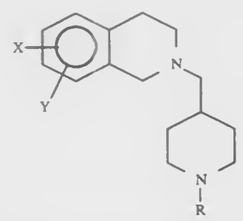
Filed Feb. 6, 1989, Ser. No. 306,497

Claims priority, application France, Jul. 12, 1988, 88 09447

Int. Cl.[5] **A61K** *31/47;* **C07D** *217/04*

U.S. Cl. 514—307 **7 Claims**

1. A compound of formula (I):



in which:
X is hydrogen or a methyl or methoxy group;
Y is a halogen or a methyl or methoxy group; and
is a group of formula —Z—R′ in which:
Z is a —CH_2— or —CO— group, and
R′ is a phenyl group unsubstituted or substituted by one, two or three substituents selected from halogen atoms and trifluoromethyl, linear or branched (C_1–C_3) alkyl and linear or branched (C_1–C_3) alkoxy groups;
or a pharmacologically acceptable acid addition salt thereof.

7. A method for the treatment of a depressive condition, a sleep disorder, a vascular, cardiovascular or cerebrovascular condition, an anxiety condition or for the regulation of food intake, which comprises administering to a subject in need of such treatment an effective amount of a compound as defined in claim 1.

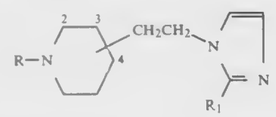
4,925,851

2- OR 4-SUBSTITUTED-[2-(1H-IMIDAZOL-1-YL)ETHYL]-PIPERIDINES

William J. Houlihan, Mountain Lake, N.J., assignor to Sandoz Pharmaceuticals Corp., E. Hanover, N.J.

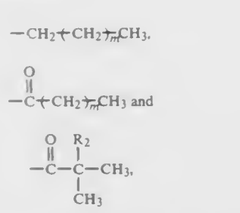
Filed May 23, 1989, Ser. No. 355,956
Int. Cl.[5] A61K *31/445;* **C07D** *401/06*
U.S. Cl. 514—326 **17 Claims**

1. A compound of formula I:



I

wherein
R is a group selected from



where m is an integer 2 to 18 and R_2 is hydrogen or methyl; and
R_1 is —$(CH_2)_nR_3$, where n is 0 or an integer 1 to 13, and R_3 is hydrogen, i-propyl or t-butyl, and the floating group is in the 2- or 4-position, with the provisos that: (1) the sum of the carbon atoms in R_1 does not exceed 13; and (2) the sum of the carbon atoms in R and R_1 does not exceed 25;
or a pharmaceutically acceptable acid addition salt thereof.

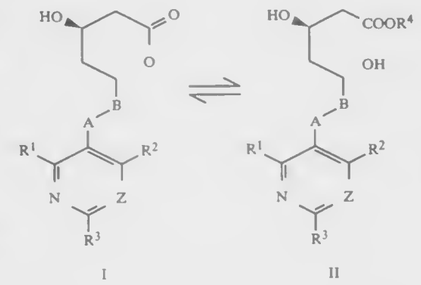
4,925,852

(I) 3-DEMETHYLMEVALONIC ACID DERIVATIVES, AND PHARMACEUTICAL PRODUCTS BASED ON THESE COMPOUNDS

Kurt Kesseler, Bad Soden am Taunus; Gerhard Beck, Frankfurt am Main; Wilhelm Bartmann, Bad Soden am Taunus, and Ernold Granzer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,458
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722808
Int. Cl.[5] A61K *31/44;* **C07D** *213/00, 413/00, 213/55*
U.S. Cl. 514—333 **9 Claims**

1. A 3-Demethylmevalonic acid derivative of the formula I (δ-lactone) or II (corresponding dihydroxy carboxylic acid derivative)



I II

in which
A—B denotes a radical of the formula —CH=CH— or —CH_2—CH_2—,
Z denotes a radical of the formula —CH,
R^1, R^2 and R^3, independently of one another, denote hydrogen, a saturated or unsaturated, straight-chain or branched hydrocarbon radical which has up to 6 carbon atoms and can optionally be substituted on the terminal carbon by a saturated or unsaturated, cyclic hydrocarbon radical having 3–6 carbon atoms, a cyclic hydrocarbon radical which has 3–7 carbon atoms and is saturated or is unsaturated once or twice, an aromatic radical selected from the group consisting of phenyl, furyl, thienyl and pyridinyl, which can optionally carry in the nucleus 1–3 identical or different substituents from the following groups: halogen, trifluoromethyl, alkyl or alkenyl, each having up to 6 carbon atoms, hydroxyl, alkoxy having 1–6 carbon atoms, carboxyl, or carbalkoxy having 1–6 carbon atoms in the alkoxy moiety,
R^4 denotes hydrogen, a straight-chain or branched, saturated or unsaturated hydrocarbon radical having up to 5 carbon atoms, a benzyl radical whose nucleus can be substituted 1–2 times by halogen or an alkyl radical having 1–4 carbon atoms, an alkali metal or an ammonium ion $NR^5R^6R^7R^8$, where R^5, R^6, R^7 and R^8 are identical or different and denote hydrogen, alkyl having 1–4 carbon atoms or hydroxyalkyl having 1–4 carbon atoms.

8. A pharmaceutical composition for the treatment or prophylaxis of arteriosclerosis or hypercholesterolemia which comprises an effective amount for said treatment of a compound of the formula I or II as claimed in claim 1, together with a pharmaceutically acceptable carrier.

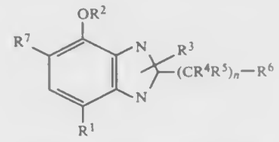
4,925,853

BENZIMIDAZOLES AS 5-LIPOXYGENASE INHIBITORS

Stephen A. Smith, Hertfordshire, and Roger E. Markwell, Essex, both of England, assignors to Beecham Group PLC, Brentford, England

Continuation of Ser. No. 766,275, Aug. 16, 1985, abandoned. This application Dec. 28, 1988, Ser. No. 290,858
Claims priority, application United Kingdom, Aug. 17, 1984, 8420919; Jun. 4, 1985, 8514016
Int. Cl.[5] A61K *31/44, 31/415*
U.S. Cl. 514—338 **6 Claims**

1. A method of treatment or prophylaxis of inflammatory conditions in mammals which comprises administering to the sufferer an effective amount of a compound of formula (I);



(I)

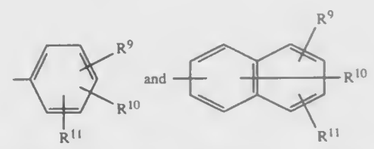
or a pharmaceutically acceptable salt thereof, in which R^1 represents hydrogen or a lower alkyl group,
R^2 represents hydrogen, a lower alkyl group, or



R^3 represents hydrogen, a lower alkyl group, or



R^4 represents hydrogen or a lower alkyl group,
R^5 represents hydrogen or a lower alkyl group,
R^6 represents hydrogen, a lower alkyl group, a carbocyclic or heterocyclic aryl group, or —$COOR^{15}$,
R^7 represents hydrogen, halogen or a lower alkyl group,
R^8 represents a lower alkyl group or a carbocyclic aryl group,
R^{15} represents hydrogen or a lower alkyl group, and n is 0 to 8, n being 0 when R^6 represents lower alkyl, wherein said carbocyclic aryl group is selected from groups of the formulae:

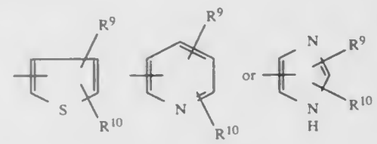


wherein R^9, R^{10}, and R^{11} independently represent hydrogen, hydroxy, lower alkoxy, lower alkyl, halogen, trifluoromethyl, nitrile, nitro, amino, $NR^{12}R^{13}$ (wherein R^{12} and R^{13} are independently hydrogen or lower alkyl), —COOH, —$COOR^{14}$,



or

(wherein R^{14} is lower alkyl), or wherein R^9 and R^{10} are linked and together represent methylenedioxy or C_3–C_4 alkylene, and wherein said heterocyclic aryl group is selected from groups of the formulae:



wherein R^9 and R^{10} are as defined above.

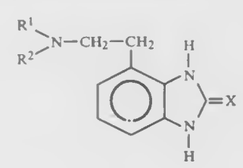
4,925,854

BENZIMIDAZOLE DERIVATIVES

Klaus Schöllkopf, and Helmut Wachtel, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,383
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728695
Int. Cl.[5] C07D *235/04;* **A61K** *31/415*
U.S. Cl. 514—338 **6 Claims**

1. A benzimidazole of the formula:



I

wherein
R^1 and R^2 are identical or different and each is hydrogen or a saturated aliphatic group, wherein said aliphatic group is a lower alkyl group having 1–6 carbon atoms, cycloalkyl of 3–6 carbon atoms or cycloalkylalkyl of 3–6 carbon atoms wherein said lower alkyl groups may be substituted with a phenyl, thiophene, furan, pyrrole, pyridine, thiazole, imidazole or pyrazole group, and wherein said phenyl group may be substituted by lower alkyl, lower alkoxy, hydroxy or halogen; and
is oxygen or sulfur, or a pharmacologically acceptable acid addition salt thereof.

4,925,855

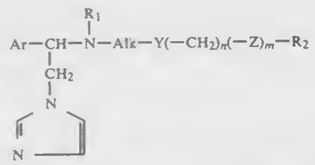
IMIDAZOLE DERIVATIVES AND ANTIMYCOTICS CONTAINING THEM

Karl Schermanz, Graz; Gerald Saischek, Weis; Robert Urmann, and Kurt Martetschlager, both of Linz, all of Austria, assignors to CL Pharma Aktiengesellschaft, Linz, Austria

Filed Dec. 23, 1987, Ser. No. 137,556
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1986, 3644616
Int. Cl.[5] A61K *31/415;* **C07D** *233/54, 403/00, 401/00*
U.S. Cl. 514—341 **13 Claims**

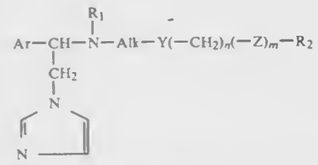
1. An imidazole derivative of the formula:

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in which Ar is phenyl, biphenylyl, naphthyl or thienyl, each of which is unsubstituted or substituted by halogen, lower alkyl or lower alkoxy, R_1 is hydrogen or lower alkyl, Alk is straight-chain or branched alkylene having 1 to 10 carbon atoms, Y is oxygen, sulfur, sulfinyl or sulfonyl, n is 0, 1 or 2, Z is sulfur or sulfinyl, m is 0 or 1, m being 1 when Y is oxygen and at least one of m and n being 1 or n being 2 when Y is sulfur, R_1 is hydrogen, Alk has 2 to 8 carbon atoms and both R_2 and Ar are phenyl or substituted phenyl when the substituent is as defined above, and R_2 is cyclohexyl, phenyl or naphthyl, each of which is unsubstituted or substituted by hydroxyl, halogen, trifluoromethyl, lower alkyl or lower alkoxy, or R_2 is biphenyl or pyridyl, or a pharmaceutically acceptable acid addition salt thereof.

13. A method for the treatment or prevention of a mycotic infection in a patient which comprises administering to the patient an antimycotic-effective amount of an imidazole derivative of the formula:



in which Ar is phenyl, biphenylyl, naphthyl or thienyl, each of which is unsubstituted or substituted by halogen, lower alkyl or lower alkoxy, R_1 is hydrogen or lower alkyl, Alk is straight-chain or branched alkylene having 1 to 10 carbon atoms, Y is oxygen, sulfur, sulfinyl or sulfonyl, n is 0, 1 or 2, Z is sulfur or sulfinyl, m is 0 or 1, m being 1 when Y is oxygen, and R_2 is cyclohexyl, phenyl or naphthyl, each of which is unsubstituted or substituted by hydroxyl, halogen, trifluoromethyl, lower alkyl or lower alkoxy, or R_2 is biphenyl or pyridyl, or a pharmaceutically acceptable acid addition salt thereof.

4,925,856

ALDOXIME-SUBSTITUTED IMIDAZOLIUM DERIVATIVES USEFUL IN THE TREATMENT OF POISONING BY PHOSPHORUS-CONTAINING CHEMICALS

Ralph N. Harris, III, Redwood City, Calif.; Clifford D. Bedford, Silver Spring, Md.; Dane A. Goff, Menlo Park, Calif.; Duane E. Hilmas, Worthington, Ohio; Robert A. Howd, Rancho Cordova, Calif.; Richard A. Kenley, Libertyville, Ill.; Gary A. Koolpe, Mountain View, Calif., and Robert O. Pick, Walkersville, Md., assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 78,922, Jul. 28, 1987, abandoned. This application Apr. 19, 1989, Ser. No. 341,489

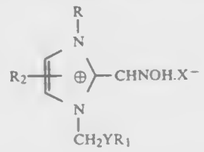
Int. Cl.[5] **A61K** *31/44; C07D 401/06*

U.S. Cl. 514—341 **19 Claims**

16. A method of reactivating acetylcholinesterase enzyme in living tissue inactivated by exposure to an organophosphorus chemical which comprises treating a mammal in vivo with a therapeutically effective amount of a low toxicity composition capable of countering inactivated acetylcholinesterase in living species poisoned by organophosphorus chemicals said composition comprising:

(a) a pharmaceutical excipient which includes one or more members selected from the class consisting of water, vegetable oils, polyethylene glycols, gelatin, lactose, amylose, magnesium stearate, talc, petroleum jelly, and cholesterol; and

(b) an aldoxime-substituted imidazolium compound selected from the class consisting of quaternary and protic 2-(hydroxyimino)methyl-1,3-(R,R_1)-trisubstituted imidazolium salts and 1,3,4-(R,R_1,R_2)-tetrasubstituted imidazolium salts having the following formula:



wherein:

Y is selected from the class consisting of methylene, oxygen, and sulfur;

R is selected from the class consisting of a 1–6 carbon alkyl, a 1–6 carbon alkenyl, and a 1–6 carbon alkynyl;

R_1, when Y equals methylene, is selected from the class consisting of nitro, azido, amido, halogen, loweralkylsulfonyl, sulfonamide, amino, dimethylamino, pyrrolidino, (3- or 4-carboxyamido)-1-pyridylmethyl, ethenyl, ethynyl, and a 1–6 carbon alkyl group substituted with loweralkylsulfonyl, halogen, nitro or azido;

R_1, when Y equals oxygen or sulfur, is a 1–10 carbon alkyl group substituted with one or more substituents selected from the class consisting of nitro, azido, amido, halogen, loweralkylsulfonyl, sulfonamide, ethenyl, and ethynyl;

R_2 is a moiety in the 4 or 5 position selected from the class consisting of hydrogen, alkyl, alkenyl, alkynyl, alkoxyalkyl, and alkylthioalkyl, with each of said groups other than hydrogen having from 1–8 carbon atoms total and wherein any of the members of the class other than hydrogen may be substituted with one or more substituents selected from the class consisting of hydrogen, nitro, azido, amido, halogen, loweralkylsulfonyl, sulfonamide, amino, dimethylamino and pyrrolidino; and

X is a therapeutically acceptable anion selected from the class consisting of a salt of an inorganic acid and a salt of an organic acid.

4,925,857

PYRIDINYL-1H-PYRAZOLE-1-ALKANAMIDES AS ANTIARRHYTHMIC AGENTS

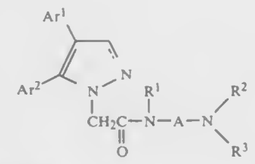
Denis M. Bailey, East Greenbush; Thomas E. D'Ambra, North Greenbush, and Alan M. Ezrin, Colonie, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 22, 1989, Ser. No. 327,219

Int. Cl.[5] **C07D** *401/04;* **A61K** *31/415*

U.S. Cl. 514—341 **15 Claims**

1. A compound of formula



or acid-addition salt thereof wherein R^1 is hydrogen or lower-alkyl; R^2 and R^3 are independently hydrogen, lower-alkyl, or hydroxy lower-alkyl; or R^2 and R^3 together form a straight or branches alkylene chain of four to six carbons; A is $CH_2CH(OH)CH_2$ or $(CH_2)_n$ wherein n is an integer from two to eight; Ar^1 and Ar^2 are independently pyridinyl, phenyl, or phenyl substituted with methoxy, hydroxy or halogen; and at least one of Ar^1 and Ar^2 is pyridinyl.

4,925,858

OXAZOLE AND THIAZOLE DERIVATIVES AND THEIR USE FOR TREATING DISORDERS CAUSED BY MALFUNCTION OF ACCH

Klaus P. Bogeso, Lyngby; Klaus G. Jensen; Ejner K. Moltzen, both of Frederiksberg, and Henrik Pedersen, Bronsboj, all of Denmark, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

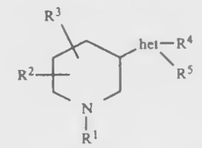
Division of Ser. No. 209,994, Jun. 22, 1988, Pat. No. 4,866,077. This application Apr. 26, 1989, Ser. No. 343,848

Claims priority, application United Kingdom, Jun. 24, 1987, 8714789

Int. Cl.[5] **A61K** *31/38, 31/44, 31/445;* **C07D** *401/04*

U.S. Cl. 514—342 **15 Claims**

1. A novel compound of the following formula, where the dotted line designates an optional bond:



wherein "het" designates oxazole or theazole;

R^1 is selected from hydrogen, lower alkyl which may be substituted with phenyl which may in turn be substituted with a substituent selected from halogen, lower alkyl, lower alkoxy, a group R^6—CO—NH—CH_2— or a group R^6—O—CO—, wherein the group R^6 is selected from lower alkyl, branched or unbranched, and phenyl which may be substituted with halogen, trifluoromethyl, lower alkyl, hydroxy, lower alkoxy, or lower acyloxy;

R^2 and R^3 are the same or different, each representing hydrogen, lower alkyl, cycloalkyl (3–6 C-atoms), lower alkenyl, lower alkadienyl, lower alkynyl, or any of the foregoing which may be substituted with hydroxy, halogen or phenyl, in which the phenyl group may be substituted with halogen, trifluoromethyl, lower alkyl, hydroxy, or lower alkoxy, trifluoromethyl or phenyl which may be substituted with halogen, trifluoromethyl, lower alkyl, hydroxy, lower alkoxy, or lower acyloxy, or R^2 and R^3 may respectively be a group OR^7 or SR^7 wherein R^7 is defined as R^2 or R^3, and

R^4 and R^5 are the same or different, and each is defined as R^2 or R^3,

as well as individual stereo isomers and pharmaceutically acceptable acid addition salts thereof.

10. A method of treating disorders caused by malfunctions of the acetylcholine (AcCh) or muscarinic system, comprising the step of administering to a subject suffering from such a disorder an effective amount of a compound of claim 1.

4,925,859

4-HYDROXY-3-PYRIDINE-CARBOXAMIDES USEFUL FOR TREATING INFLAMMATION AND RHEUMATISM

Francois Clemence; Odile Le Martret, both of Paris, and Francoise Delevallee, Footenay-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

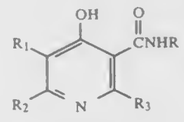
Filed Mar. 31, 1988, Ser. No. 167,375

Claims priority, application France, Mar. 13, 1987, 87 03465

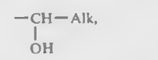
Int. Cl.[5] **C07D** *417/12;* **A61K** *31/425, 31/44*

U.S. Cl. 514—342 **13 Claims**

1. A pyridine compound of the formula



wherein R is selected from the group consisting of thiazolyl or 4,5-dihydrothiazolyl, substituted with alkyl of 1 to 5 carbon atoms, R_1 and R_2 are individually selected from the group consisting of (a) alkyl of 1 to 5 carbon atoms and (b) phenyl and naphthyl unsubstituted or substituted with a member of the group consisting of hydroxy, alkyl and alkoxy of 1 to 5 carbon atoms, halogen, $—NO_3$ and $—CF_3$, R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, $—(CF_2)_n—CF_3$ and



n is an integer from 0 to 4 and Alk is alkyl of 1 to 5 carbon atoms or their non-toxic, pharmaceutically acceptable salts thereof.

10. A method of treating inflammation or rheumatism in warm-blooded animals which comprises administering to warm-blooded animals in need of said treatment an anti-inflammatory or anti-rheumatically effective amount of a compound of claim **1**.

4,925,860

STABLE PHARMACEUTICAL COMPOSITION OF 3-(HYDROXYMETHYL)-5,5-DIPHENYLHYDANTOIN DISODIUM PHOSPHATE ESTER

Dale E. Herbranson, Lindenhurst; Earl R. Speicher, Buffalo Grove, both of Ill., and Leonard S. Rosenberg, Flemington, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 82,841, Aug. 5, 1987. This application May 25, 1989, Ser. No. 356,948

Int. Cl.[5] **A61K** *31/135*

U.S. Cl. 514—359 **6 Claims**

1. An injectable, aqueous pharmaceutical composition for the treatment of convulsive states comprising an effective amount of 3-(hydroxymethyl)-5,5-diphenylhydantoin disodium phosphate ester (phenytoin prodrug) for treating such convulsive states, said composition comprising about 35 mg to about 180 mg of prodrug/mL of solution and 0.05 to 0.2 M buffer; said composition having a pH range of about 8.3 to 9.4, the prodrug degrading in aqueous solution to produce diphenylglycinamide as the primary degradant with minimal quantities of phenytoin, the pH range of said composition acting to allow the degradation to proceed whereby the shelf-life of the prodrug in an aqueous composition is maximized.

6. A method for the treatment of a convulsive state in a mammal comprising administering by subcutaneous or intramuscular administration to a mammal in need of such treatment an anti-convulsive amount of a stable, pharmaceutical composition of the prodrug 3-(hydroxymethyl)-5,5-diphenylhydantoin disodium phosphase ester, said composition comprising from about 35 to 130 mg/mL of prodrug, and from about 0.05 to 2 M of a buffer effective to maintain a pH of about 8.3 to 9.4 the prodrug degrading in aqueous solution to produce diphenylgylcinamide as the primary degradant with minimal quantities of phenytoin, the pH range of said composition acting to allow the degradiation to proceed whereby the shelf-life of the prodrug in an aqueous composition is maximized.

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4,925,861

CARBOXYSTYRENE DERIVATIVES AND DRUGS CONTAINING THEM AS EFFECTIVE INGREDIENTS

Yoshio Hayashi; Oguri Tomei, both of Ushiku; Masaki Shinoda, Ami; Kazuo Takahashi, Komae, and Munehiro Hashimoto, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

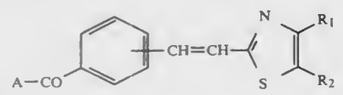
Filed Apr. 13, 1988, Ser. No. 181,156

Claims priority, application Japan, Apr. 16, 1987, 62-93797

Int. Cl.[5] **A61K** *31/38;* **C07D** *277/24, 277/64*

U.S. Cl. 514—367 **12 Claims**

1. A carboxystyrene represented by the formula (I):



(I)

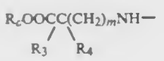
wherein:

A represents

a hydroxyl group,

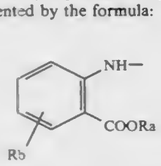
an alkoxy group having 1 to 5 carbon atoms,

a group represented by the formula:



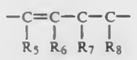
wherein R_a is a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, m is an integer of 0 to 2 inclusive, and each of R_3 and R_4 is independently a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, and R_3 and R_4 may together form a cyclopentane or cyclohexane ring, or

a group represented by the formula:



wherein R_a is as defined above, and R_b is a hydrogen atom, a halogen atom, a carboxyl group, a linear or branched alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 5 carbon atoms, an alkoxycarbonyl group having 2 to 6 carbon atoms, an acyl group having 1 to 4 carbon atoms, a hydroxyl group, an amino group, an acylamino group having 1 to 3 carbon atoms, or a nitro group;

and each of R_1 and R_2 independently represents a hydrogen atom, a linear or branched alkyl group having 1 to 5 carbon atoms, a phenyl group which may have one or more substituents, an alkoxycarbonyl group having 2 to 6 carbon atoms, or a carboxyl group, or R_1 and R_2 may together form abutadienylene group represented by the formula:



wherein each of R_5, R_6, R_7 and R_8 is independently a hydrogen atom, a halogen atom, a carboxyl group, a linear or branched alkyl group having 1 to 5 carbon atoms, an alkoxy group having 1 to 5 carbon atoms, an alkoxycarbonyl group having 2 to 6 carbon atoms, an acyl group having 1 to 4 carbon atoms, an amino group, an acylamino group having 1 to 3 carbon atoms, or a nitro group or a pharmaceutically acceptable salt thereof.

11. A method of antagonizing leucotrienes in a subject requiring such treatment which comprises administering to the subject a leucotriene antagonizing effective amount of a compound of claim 1.

4,925,862

NOVEL PYRETHRINOIDS

Jacques Demassey, Montevrain; Jean-Pierre Demoute, Montreuil-Sous-Bois, and Jean Tessier, Vincennes, all of France, assignors to Roussel Uclaf, Paris, France

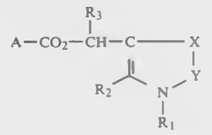
Filed Jul. 20, 1988, Ser. No. 221,948

Claims priority, application France, Jul. 20, 1987, 87 10202

Int. Cl.[5] **C07D** *277/34;* **A01N** *43/78, 53/00*

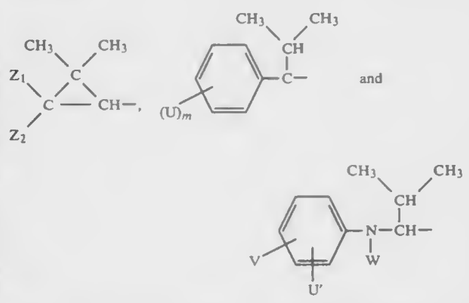
U.S. Cl. 514—369 **51 Claims**

1. All stereoisomeric forms and mixtures thereof of a compound of the formula

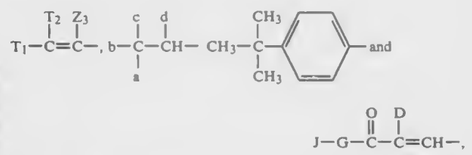


I

wherein X is —S—, Y is C=O, R_1 is selected from the group consisting of hydrogen, halogen, saturated, or unsaturated alkyl of 1 to 8 carbon atoms and saturated or unsaturated cycloalkyl of 3 to 8 carbon atoms, the latter two being unsubstituted or substituted with at least one halogen and aryl of 6 to 14 carbon atoms, R_2 is selected from the group consisting of hydrogen, $—CF_3$, $—NO_2$, —CN, halogen, alkoxy of 1 to 8 carbon atoms, aryl of 6 to 14 carbon atoms, saturated or unsaturated alkyl of 1 to 8 carbon atoms, saturated or unsaturated cycloalkyl of 3 to 8 carbon atoms, the latter two being unsubstituted or substituted with at least one halogen, R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, —CN and C=CH and A is selected from the group consisting of



wherein Z_1 and Z_2 are methyl or Z_1 is hydrogen and Z_2 is selected from the group consisting of



Z_3 is hydrogen or halogen, T_1 and T_2 are individually selected

from the group consisting of hydrogen, halogen, $—CF_3$, —CN, phenyl unsubstituted or substituted with a halogen and alkyl and alkoxy of 1 to 8 carbon atoms, B is —O— or —S—, a,b,c, and d are individually halogen, D is selected from the group consisting of hydrogen, halogen and alkoxy of 1 to 8 carbon atoms, G is —O— or —S— J is alkyl of 1 to 8 carbon atoms unsubstituted or substituted with at least one halogen, aryl of 6 to 14 carbon atoms, the latter unsubstituted or substituted with at least one functional group, U is selected from the group consisting of halogen and alkyl and alkoxy of 1 to 8 carbon atoms unsubstituted or substituted with at least one halogen, m is 0, 1 or 2 and if 2, the Us may be different, U' and V are individually selected from the group consisting of hydrogen, halogen, and $—CF_3$ and W is hydrogen or $—CH_3$.

4,925,863

ANTIFUGAL AZOLE COMPOUNDS

Richard W. Bayles, Bramhall; Francis T. Boyle, Congleton; Michael B. Gravestock, Bramhall, and James M. Wapdlewopth, Chelford, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

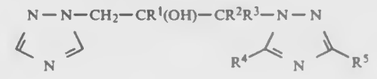
Division of Ser. No. 768,838, Aug. 23, 1985. This application Feb. 16, 1988, Ser. No. 156,017

Claims priority, application United Kingdom, Sep. 5, 1984, 8422414; Sep. 5, 1984, 8422415; Mar. 28, 1985, 8508111

Int. Cl.[5] **C07D** *249/08;* **A61K** *31/41;* **A01N** *43/653*

U.S. Cl. 514—383 **7 Claims**

1. A compound of the formula:



wherein:

R' is phenyl bearing one or more substituents selected from the group consisting of halogen and cyano;

R^2 and R^3, which may be the same or different, are each hydrogen or a 1–6C alkyl radical;

one of R^4 and R^5 is hydrogen and the other is a styryl radical substituted in the phenyl ring by one or more substituents selected from the group consisting of:

halogen atoms;

cyano, nitro, and 1–6C alkoxy, halogenoalkyl and halogenoalkoxy radicals;

provided that R^1 is a phenyl radical bearing at least one cyano substituent, or at least one of R^4 and R^5 is a styryl radical, substituted in the phenyl ring thereof by at least one substituent selected from cyano, nitro and 1–6C halogenoalkoxy or an acid addition salt of those compounds which contain a basic substituent.

4,925,864

PHENYLTRIAZOLE DERIVATIVE AND INSECTICIDE

Masahito Inamori, Shizuoka; Tetsuo Horii, Fujieda; Tomonori Shimazu, and Masaji Sugaya, both of Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

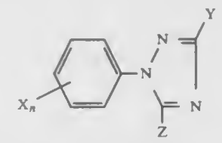
Filed Mar. 22, 1988, Ser. No. 171,777

Claims priority, application Japan, Mar. 27, 1987, 62-73636; Nov. 11, 1987, 62-284873

Int. Cl.[5] **C07D** *249/12, 249/14, 403/04;* **A01N** *43/26*

U.S. Cl. 514—383 **23 Claims**

1. A phenyltriazole derivative of the formula:



(I)

wherein X is a halogen atom, an alkyl group, a halogensubstituted alkyl group, an alkoxy group, a nitro group, a phenoxy group, an amino group, a cyano group, a 1-pyrrolyl group or a halogen-substituted alkoxy group, Y is a C_2–C_6 alkyl group which may be substituted by halogen, alkoxy, alkyl thio, alkylsulfonyl, alkoxycarbonyl or carbamoyl, a methyl-substituted cycloalkyl group, an alkenyl group, a C_1–C_4 alkylsulfinyl group or a 2-methyl-1,3-dithiolan-2-yl group, Z is, a



group, wherein each of R^1 and R^2 which may be the same or different is a hydrogen atom, an alkyl group, an alkoxy group, an acyl group, an amino group, a phenyl group, an alkenyl group, an alkynyl group, a dimethylcarbamoyl group, an alkoxycarbonyl group, a trichloromethylthio group or an alkylsulfonyl group which may be substituted by halogen, or R^1 and R^2 form together with the adjacent nitrogen atom, a pyrrole or a pyrazole ring, and n is an integer of 0 to 5.

10. An insecticide comprising an insecticidally effective amount of a phenyltriazole derivative of the formula I as defined in claim 1 and an agricultural carrier.

4,925,865

ANTIMYCOTIC AGENTS

Klaus Stroech, Solingen; Monika Frie, Odenthal; Thomas Himmler, Cologne, and Manfred Plempel, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 246,729

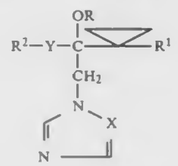
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732385

The portion of the term of this patent subsequent to May 15, 2004, has been disclaimed.

Int. Cl.[5] **A61K** *31/41;* **C07D** *249/08*

U.S. Cl. 514—383 **6 Claims**

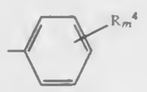
1. A method of combating mycoses in a patient in need thereof which comprises administering to such patient an antimycotically effective amount of a hydroxyalkyl-azolyl derivative of the formula



in which

R^1 is fluorine, chlorine, bromine or phenyl which is optionally mono-substituted by chlorine.

R^2 is alkyl with 1 to 4 carbon atoms, which is optionally mono-or di-substituted by methoxy, or is cycloalkyl having 3 to 7 carbon atoms, which is optionally mono-substituted by methyl, or is naphthyl, or the radical of the formula

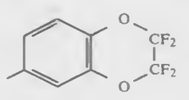


wherein

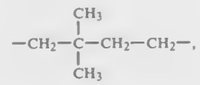
R^4 is fluorine, chlorine, bromine, methyl, ethyl, isopropyl, tert.-butyl, methoxy, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, phenyl, phenoxy or nitro, and

m is 0,1,2 or 3, or

R^2 is the radical of the formula



Y represents the groupings $-CH_2-CH_2-$, $-CH=CH-$, $-C\equiv C-$ or



or an acid addition salt thereof.

4,925,866

METHOD FOR CONTROLLING PLANT DISEASES AND MICROOGANISMS IN THE PRESENCE OF PLANTS

Roger E. Smith, West Lafayette, Ind., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

Continuation of Ser. No. 278,722, Dec. 2, 1988, abandoned, which is a continuation of Ser. No. 925,321, Oct. 31, 1986, abandoned. This application Jul. 11, 1989, Ser. No. 378,150

Int. Cl.[5] A01N *43/50*

U.S. Cl. 514—389 **28 Claims**

1. A method for controlling disease caused by microorganisms or growth of unwanted microorganisms in or on a growing higher order plant without harming the plant, the method comprising:

providing contact, in the presence of water, between an N-halohydantoin and the plant, the rhizosphere of the plant, or a grwoth medium in which a seed or bulb for the plant is planted, the N-halohydantoin being selected from the group consisting of a 1-bromo-3-chloro-5,5-dialkylhydantoin and a 1,3-dibromo-5,5-dialkylhydantoin, and being provided in an amount sufficient to control said disease or microorganisms.

4,925,867

HYDROCARBON SUBSTITUTED PYRROLIDINONES, INTERMEDIATES THEREFOR, AND ANTI-CONVULSANT USE THEREOF

Raymond Baker, Much Hadham; Paul D. Leeson, Cambridge; Tamara Ladduwahetty, Buckhurst Hill, and Brian J. Williams, Great Dunmow, all of England, assignors to Merck Sharp & Dohme Ltd., Hoddesdon, England

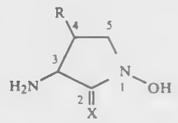
Filed Sep. 29, 1989, Ser. No. 414,227

Claims priority, application United Kingdom, Oct. 7, 1988, 8823605

Int. Cl.[5] C07D *207/273;* **A61K** *31/40*

U.S. Cl. 514—425 **8 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable acid addition salt thereof:



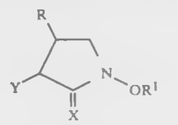
(I)

such that both the substituents R and $-NH_2$ are in a cis-configuration;

wherein R represents a hydrocarbon group or aryl optionally substituted with one or more halogen or C_1–C_6 alkoxy groups and X represents oxygen or sulphur.

7. A method for the treatment and/or prevention of convulsions, which method comprises administering to a patient in need of such treatment an effective amount of a compound according to claim 1.

8. A compound of formula (VI):



(VI)

wherein R and X are as defined in claim 1; R^1 represents hydrogen or a hydroxy-protecting group; and Y represents hydrogen or $-NHR^{12}$, in which R^{12} represents an amino-protecting group.

4,925,868

4-HYDROXY-3-PYRROLIN-2-ONES AND TREATMENT OF CIRCULATORY DISORDERS THEREWITH

Shinji Terao, and Minoru Hirata, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

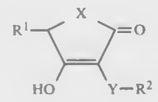
Filed Aug. 12, 1987, Ser. No. 84,177

Claims priority, application Japan, Aug. 29, 1986, 61-204833

Int. Cl.[5] C07D *207/38;* **A61K** *31/40*

U.S. Cl. 514—425 **15 Claims**

1. A compound of the formula:



wherein

X is an imino group substituted with a primary or secondary C_{1-6} alkyl, phenyl unsubstituted or substituted with hydroxyl, halogen, trihalogenomethyl, C_{1-3} alkoxy, or C_{1-3} alkyl; or phenyl-C_{1-3} alkyl unsubstituted or substituted with halogen, trihalogenomethyl, methylenedioxy, C_{1-3} alkyl, C_{1-3} alkoxy, C_{1-3} alkoxycarbonyl or carboxy; or thienyl or thienyl-C_{1-3} alkyl group;

Y is a chemical bond, oxygen, phenylene, phenyleneoxy, or oxyphenyleneoxy;

R^1 is hydrogen, primary C_{1-6} alkyl or phenyl unsubstituted or substituted with hydroxyl, phenyl or C_{1-3} alkoxycarbonyl;

R^2 is primary C_{6-20} alkyl or phenyl-C_{1-3} alkyl wherein the phenyl is unsubstituted or substituted with hydroxyl, halogen, trihalogenomethyl, C_{1-3} alkoxy or C_{1-3} alkyl.

15. A method of treatment of a circulatory disorder in a mammal with which comprises administration of a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier, excipient or diluent therefor.

4,925,869

THERAPEUTIC AGENTS

Michael J. Smithers, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries PLC, London, United Kingdom

Filed Nov. 3, 1987, Ser. No. 118,227

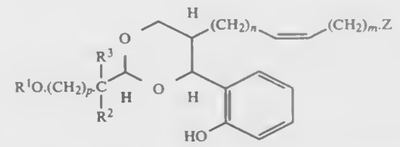
Claims priority, application United Kingdom, Nov. 4, 1986, 8626296

Int. Cl.[5] A61K *31/075*

U.S. Cl. 514—452 **14 Claims**

1. A pharmaceutical composition for use in a disease or medical condition in which thromboxane A2 and/or a related prostanoid constrictor substance is involved which comprises as active ingredients:

(i), an effective amount of 1,3-dioxane ether of the formula



I

wherein R^1 is (1-6C)alkyl, (3-8C)cycloalkyl, (3-8C)cycloalkyl-1-4C)alkyl, phenyl or phenyl-(1-4C)alkyl, the latter two of which may optionally bear one or two substituents selected from halogeno, (1-4C)alkyl, (1-4C)alkoxy, hydroxy, trifluoromethy, nitro and cyano; R^2 and R^3 are independently hydrogen or (1-4C)alkyl, or together form (3-6C)polymethylene optionally bearing one or two (1-4C)alkyl substituents; n is 1 or 2; m is 2, 3 or 4; p is zero, 1 or 2; and Z is carboxy or 1(H)-tetrazol-5-yl; and the group at positions 2, 4 and 5 of the dioxane ring have cis-relative stereochemistry; or a pharmaceutically acceptable salt thereof; and

(ii), an effective amount of an inhibitor of the synthesis of thromboxane A2 selected from the group consisting of

(1) 4-[2-(1H-imidazol-I-yl)ethoxy]benzoic acid (dazoxiben),

(2) sodium 5-(3-pyridylmethyl)benzofuran-2-carboxylic acid (furegrelate),

(3) 3-[3-(1H-imidazol-1-ylmethyl)-2-methyl-1H-indol-1-yl]propanoic acid (UK38485),

(4) 8-[3-methyl-2-(3-pyridyl)-1H-indol-1-yl]octanoic acid (CGS12970),

(5) 5-(5-carboxypentyl)imidazo[1,5-a]pyridine (CGS13080),

(6) 6-[5-chloro-3-methyl-2-(3-pyridyl)-1H-indol-1-yl]hexanoic acid (CGS14854),

(7) (E)-4-(1-imidazolylmethyl)cinnamic acid (OKY046),

(8) sodium (E)-3-[4-(3-pyridylmethyl)phenyl)methacrylate (OKY1580),

(9) (E)-3-[4-(3-pyridylmethyl)phenyl)methacrylic acid hydrochloride (OKY1581),

(10) (E)-7-phenyl-7-(3-pyridyl)-6-heptenoic acid (Cv4151),

(11) N-[(1H)-imidazol-1-yl)octyl]-4-chlorobenzamide,

(12) 1-(3-benzloxy-1(E)-octenyl)imidazole (CBS645),

(13) 2,2-dimethyl-6-[2-(1H-imidazol-1-yl)-1-([4-methoxyphenyl]methoxymethyl)-ethoxy]hexanoic acid (SC41156),

(14) sodium 4-[alpha-hydroxy-5-(1H-imidazol-1-yl)-2-methylbenzyl]-3,5-dimethyl-benzoate (Y20811); having the formulae set out hereinbefore; and the pharmaceutically acceptable salts thereof or, in the case of inhibitor (2), (8), (9) and (14), the salt free form thereof;

together with a pharmaceutically acceptable diluent or carrier.

4,925,870

THERAPEUTIC USE OF PROANTHOCYANIDINE A2 AS A CYTOPROTECTIVE AGENT

Bruno Gabetta; Maria J. Magistretti, both of Milan, Italy, and Philippe Dostert, Paris, France, assignors to Inverni Della Beffa SpA, Milan, Italy and Societe de Recherches Industrielles Sori, Paris, France

Division of Ser. No. 886,790, Jul. 18, 1986, Pat. No. 4,863,956. This application May 25, 1989, Ser. No. 356,895

Claims priority, application United Kingdom, Jul. 19, 1985, 8518289

Int. Cl.[5] A61K *31/35*

U.S. Cl. 514—453 **4 Claims**

1. A method of producing a cytoprotective action in a subject in need of such action, which method comprises administering to said subject an amount of proanthocyanidine A2, effective to produce such a cytoprotective effect.

4,925,871

THERAPEUTIC USE OF PROANTHOCYANIDINE A2 FOR TREATMENT OF VASCULAR SYSTEM

Bruno Gabetta, and Maria J. Magistretti, both of Milan, Italy, assignors to Inverni Della Beffa SpA, Milan, Italy and Societe de Recherches Industrielles Sori, Paris, France

Division of Ser. No. 886,790, Jul. 18, 1986, Pat. No. 4,863,956. This application May 25, 1989, Ser. No. 356,896

Claims priority, application United Kingdom, Jul. 19, 1985, 8518289

Int. Cl.[5] A61K *31/35*

U.S. Cl. 514—453 **4 Claims**

1. A method of producing a therapeutic action on the vascular system in a subject in need of such therapeutic action, said therapeutic action being selected from vasoprotective and veinotonic effects, which method comprises administering to said subject an amount of proanthocyanidine A2 effective to produce said therapeutic action.

4,925,872

BIPHENYL DERIVATIVE USEFUL AS A LIVER AILMENT MODERATING AGENT

Masayuki Kimura; Kunio Hosaka; Shigehumi Takeda, and Hiroshi Mitsuhashi, all of Tokyo, Japan, assignors to Tsumura & Co., Tokyo, Japan

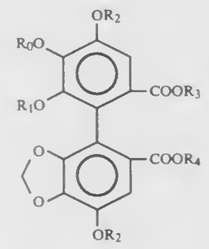
Division of Ser. No. 156,939, Jan. 19, 1988, Pat. No. 4,849,448. This application Apr. 24, 1989, Ser. No. 341,803

Claims priority, application Japan, May 27, 1986, 61-120129; Jun. 13, 1986, 61-136261; Sep. 30, 1986, 61-229767

Int. Cl.[5] A61K *31/36;* **C07D** *317/62*

U.S. Cl. 514—465 **10 Claims**

1. A biphenyl derivative represented by the following formula (I):



(I)

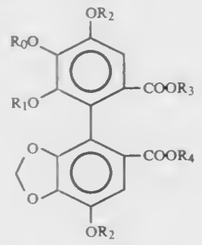
wherein R_0 and R_1 together represent a group O=C<, R_2 stands for an alkyl group having 1 to 3 carbon atoms, and R_3 and R_4 independently stand for a hydrogen atom or a lower alkyl group.

6. A liver ailment-moderating composition comprising an

VOL
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effective amount of a biphenyl derivative represented by the following formula (I):

(I)



wherein R_0 and R_1 together represent a group O=C<, R_2 stands for an alkyl group having 1 to 3 carbon atoms, and R_3 and R_4 independently stand for a hydrogen atom or a lower alkyl group together with a pharmaceutically acceptable carrier.

4,925,873

METHOD OF TREATING SKIN INJURIES USING THROMBOXANE A_2 RECEPTOR ANTAGONISTS

Lawrence T. Friedhoff, New York, N.Y., and Laura L. Bolton, Metuchen, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 1, 1988, Ser. No. 239,376
Int. Cl.[5] A61K *31/34, 31/19, 31/195*
U.S. Cl. 514—469 **14 Claims**

1. A method of treating skin injury in mammalian species caused by trauma or thermal burns, or skin pressure injuries, which comprises administering to a mammalian species in need of such treatment an effective amount of a thromboxane A_2 receptor antagonist.

4,925,874

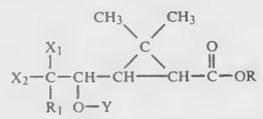
NOVEL CYCLOPROPANE CARBOXYLATES

Joseph Cadiergue, Aulnay Sous Bois; Jean-Pierre Demoute, Montreuil-Sous-Bois, and Jean Tessier, Vincennes, all of France, assignors to Roussel Uclaf, Paris, France

Filed Nov. 20, 1987, Ser. No. 123,374
Claims priority, application France, Nov. 20, 1986, 86 16155
Int. Cl.[5] A01N *41/02, 43/40*
U.S. Cl. 514—517 **34 Claims**

1. A compound of the formula

I

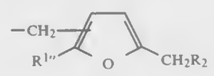


wherein X_1 and X_2 are individually halogen, R_1 is selected from the group consisting of halogen, alkyl of 1 to 8 carbon atoms, aryl of 6 to 14 carbon atoms unsubstituted or substituted with halogen, perfluoroalkyl of 1 to 8 carbon atoms, —CN and



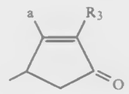
R′ is alkyl of 1 to 8 carbon atoms, Y is selected from the group consisting of $—SO_2Alk_1$ and $—SO_2Ar$, Alk_1 is alkyl of 1 to 8 carbon atoms unsubstituted or substituted with at least one member of the group consisting of halogen, $—CF_3$, hydroxyl, carboxyl, amino, ammonium and alkyl and alkoxy of 1 to 4 carbon atoms, Ar is aryl of 6 to 14 carbon atoms unsubstituted or substituted with at least one alkyl of 1 to 8 carbon atoms, and R is selected from the group consisting of (a) hydrogen, (b) alkyl of 1 to 8 carbon atoms, (c) benzyl unsubstituted or substituted with a member selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, alkadienyl of 4 to 8 carbon atoms, methylenedioxy and halogen,

(d)



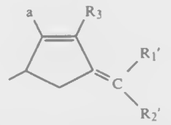
wherein R″ is hydrogen or methyl and R_2 is a monocyclic aryl or $—CH_2=CH—$

(e)



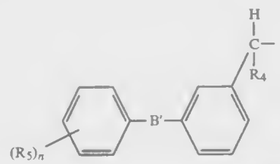
wherein a is hydrogen or methyl and R_3 is aliphatic organic radical of 2 to 6 carbon atoms and containing at least one carbon-carbon unsaturation

(f)

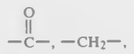


wherein a is hydrogen or methyl, R_3 has the above definition, R_1' and R_2' are individually selected from the group consisting of hydrogen, halogen, alkyl of 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms, alkoxycarbonyl of 2 to 5 carbon atoms and cyano,

(g)

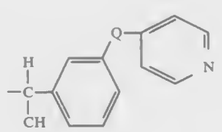


wherein B′ is selected from the group consisting of oxygen, sulfur,



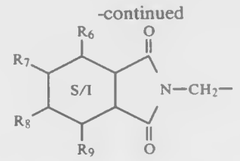
a sulfoxide and sulfone and R_4 is selected from the group consisting of —C≡N, methyl, $—CONH_2$, $—CSNH_2$ and —C≡CH, R_5 is halogen or methyl and n is a number equal to 0, 1 or 2,

(h)



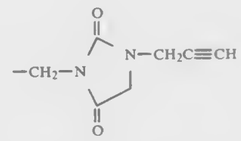
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(i)

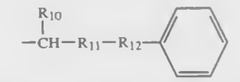


wherein R_6, R_7 R_8 and R_9 are hydrogen, chlorine, or methyl and S/I symbolizes an aromatic ring or a similar dihydro or tetrahydro ring,

(j)



(k)

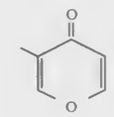


wherein R_{10} is hydrogen or —CN, R_{12} is $—CH_2—$ or oxygen, R_{11} is thiazolyl or thiadiazolyl wherein the bond with

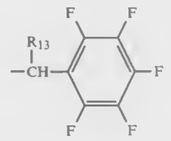


can be found at any one of the available positions, R_{12} being linked to R_{11} by the carbon atom included between the sulfur and nitrogen,

(l)

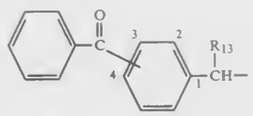


(m)



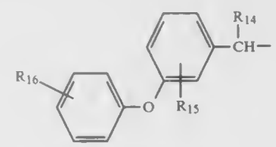
wherein R_{13} is hydrogen or CN,

(n)



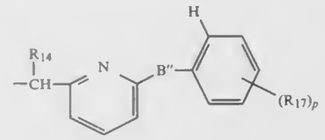
wherein R_{13} has the above definition and benzoyl is in position 3 or 4,

(o)



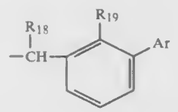
wherein R_{14} is hydrogen, methyl, ethynyl or cyano and R_{15} and R_{16}, being different, are hydrogen, fluorine or bromine,

(p)



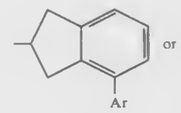
wherein R_{14} is defined as above, each R_{17} is independently selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, 3,4-methylenedioxy, chloro, fluoro and bromo, p is a number equal to 0, 1 or 2 and B″ is oxygen or sulfur

(q)

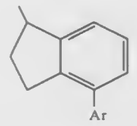


wherein R_{18} is hydrogen, methyl, ethynyl or cyano and R_{19} being different, is hydrogen, fluorine or bromine and Ar is aryl of 6 to 14 carbon atoms,

(r)



(s)



11. An insecticide composition comprising an insecticidally effective amount of at least one compound of claim 1 and an inert carrier.

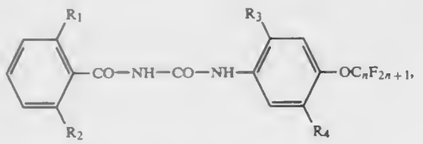
4,925,875

N-BENZOYL-N′-2,5-DIHALO-4-PERFLUOROALKOXY-PHENYLUREAS, PESTICIDAL COMPOSITIONS CONTAINING THEM AND THEIR USE IN THE CONTROL OF PESTS

Jozef Drabek, Oberwil, and Urs Siegrist, Eiken, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,191
Claims priority, application Switzerland, Jul. 21, 1987, 2751/88; May 20, 1988, 1920/89
Int. Cl.[5] A01N *47/28, 87/60, 127/22*
U.S. Cl. 514—594 **7 Claims**

1. A compound of the formula



(I)

in which
R_1 is hydrogen, fluorine, chlorine or bromine;
R_2 is fluorine or chlorine;
R_3 and R_4 is each chlorine; and
n is 2, 3 or 4.

4,925,876

N-BENZOLYL-N'-TRIHALO-HALOALKOXY-PHENYLUREAS AND PESTICIDAL COMPOSITIONS CONTAINING THEM

Jozef Drabek, Obervil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

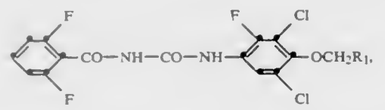
Filed Apr. 28, 1988, Ser. No. 187,173

Claims priority, application Switzerland, May 8, 1987, 1753/87

Int. Cl.[5] **C07C** *127/22;* **A01N** *37/24, 37/20, 33/06*

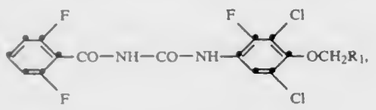
U.S. Cl. 514—594 **8 Claims**

1. A compound of the formula



wherein R_1 is CF_3, CF_2CF_3 or $CF_2CF_2CF_3$.

3. A method of controlling *Heliothis Virescens* larvae, which comprises contacting said larvae with an effective amount of a compound of formula I



(I)

wherein R_1 is CF_3, CF_2CF_3 or $CF_2CF_2CF_3$.

4,925,877

PHYSIOLOGICALLY ACTIVE ERBSTATIN ANALOGUE COMPOUNDS AND COMPOSITIONS

Hamao Umezawa, deceased, late of Tokyo (by Mieko Umezawa, Kazuo Umezawa, Yoji Umezawa, heirs); Tomio Takeuchi; Kuniaki Tatsuta, both of Tokyo; Kunio Isshiki, Fujisawa, and Masaya Imoto, Tokyo, all of Japan, assignors to Zaidanhojin Biseibutsu Kagaku Kenkyukai, Tokyo, Japan

Filed Feb. 20, 1987, Ser. No. 17,108

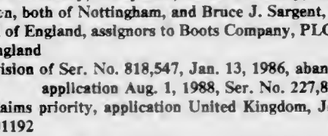
Claims priority, application Japan, Feb. 25, 1986, 61-39382; Apr. 8, 1986, 61-81522

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[5] **A61K** *31/165;* **C07C** *103/38*

U.S. Cl. 514—630 **2 Claims**

1. A compound of the following formula:



which is (2-formamidovinyl)-2,3-dihydroxybenzene.

4,925,878

METHOD TO PREVENT SEASICKNESS

György Bodó ; József Knoll; Éva Somfai; Sándor Virag, and Ferenc Zák, all of Budapest, Hungary, assignors to Chinoin Gyogyszer- Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU87/00058, § 371 Date Aug. 17, 1988, § 102(e) Date Aug. 17, 1988, PCT Pub. No. WO88/04552, PCT Pub. Date Jun. 30, 1988

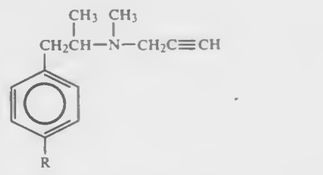
PCT Filed Dec. 18, 1987, Ser. No. 273,851

Claims priority, application Hungary, Dec. 19, 1986, 5338/86

Int. Cl.[5] **A61K** *31/135*

U.S. Cl. 514—646 **1 Claim**

1. A method for preventing motion sickness which comprises the step of orally administering to a patient in need of said treatment a therapeutically effective amount of the compound of the Formula (I)



(I)

wherein R is hydrogen or halogen; or a pharmaceutically acceptable acid addition salt thereof.

4,925,879

ARYLCYCLOBUTYLMETHYLAMINES

John R. Housley, Derbyshire; James E. Jeffery; David N. Johnston, both of Nottingham, and Bruce J. Sargent, Nottingham, all of England, assignors to Boots Company, PLC, Pennyfoot, England

Division of Ser. No. 818,547, Jan. 13, 1986, abandoned. This application Aug. 1, 1988, Ser. No. 227,869

Claims priority, application United Kingdom, Jan. 17, 1985, 85/01192

Int. Cl.[5] **A61K** *31/135;* **C07C** *87/28*

U.S. Cl. 514—650 **9 Claims**

1. A compound of formula

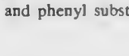


I

or a pharmaceutically acceptable salt thereof wherein $—NR_1R_2$ is selected from the group consisting of N,N-dimethylamino, N,N-diethylamino, N-tert-butylamino, N-butyl-N-methylamino, N-methyl-N(2-morpholinoethyl)amino, N-(2-hydroxyethyl)-N-methylamino, N-cyclohexyl-N-methylamino, piperidino, morpholino, tetrahydropyridyl and methylpiperidino;

R_3 is selected from the group consisting of phenyl, naphthyl and phenyl substituted by 1 to 3 fluoro, chloro, bromo, trifluoromethyl, methyl, methoxy, methylthio or phenyl moieties; and

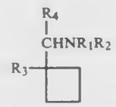
R_4 is a group of the formula



IV

wherein R_{10} is selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, isobutyl, 3-methylbutyl, pentyl, hexyl, heptyl, 4-pentenyl, 7-octenyl, cyclohexyl and cyclohexylmethyl.

5. A method of treating depression that comprises administering to a human in need thereof an antidepressantly effective amount of the compound of the formula

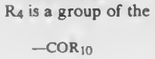


I

or a pharmaceutically acceptable salt thereof wherein $—NR_1R_2$ is selected from the group consisting of N,N-dimethylamino, N,N-diethylamino, N-tert-butylamino, N-butyl-N-methylamino, N-methyl-N(2-morpholinoethyl)amino, N-(2-hydroxyethyl)-N-methylamino, N-cyclohexyl-N-methylamino, piperidino, morpholino, tetrahydropyridyl and methylpiperidino;

R_3 is selected from the group consisting of phenyl, naphthyl and phenyl substituted by 1 to 3 fluoro, chloro, bromo, trifluoromethyl, methyl, methoxy, methylthio or phenyl moieties; and

R_4 is a group of the formula



wherein R_{10} is selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, isobutyl, 3-methylbutyl, pentyl, hexyl, heptyl, 4-pentenyl, 7-octenyl, cyclohexyl and cyclohexylmethyl.

4,925,880

COMPOSITION AND PROCESS FOR MAKING POROUS ARTICLES FROM ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE

Harvey L. Stein, Seabrook, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 173,988, Mar. 28, 1988. This application Aug. 3, 1989, Ser. No. 389,291

Int. Cl.[5] **C08K** *5/01;* **C08L** *23/06*

U.S. Cl. 521—98 **9 Claims**

1. A process for forming a porous article comprising:

(A) providing a molding powder comprising a uniform heterogeneous mixture of polyethylene polymer particles and polyethylene wax particles, said polyethylene polymer having a molecular weight within the range of about 1×10^6 to about 6×10^6 as determined by the intrinsic viscosity of a 0.5 weight percent solution in decahydronaphthalene at 135° C., and said polyethylene wax having a molecular weight within the range of about 1,000 to about 20,000 the particle size distribution of said particles of polyethylene polymer being within the range of at least about 95% by weight smaller than 0.5 millimeters and not greater than about 15% by weight smaller than 0.063 millimeters;

(B) forming said molding powder into a desired shape;

(C) heating said shape to a temperature within the range of about 175° C. to about 205° C. while maintaining said shape under pressure just sufficient to maintain the volume of the shape and for a period of time sufficient to melt said polyethylene wax and permit said polyethylene polymer to expand and soften; and

(D) thereafter cooling said shape.

4,925,881

HEAT RESISTANT FOAMABLE THERMOSETTING RESIN SYSTEMS

Anne C. Udding, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 12, 1988, Ser. No. 256,877

Claims priority, application United Kingdom, Nov. 5, 1987, 8725938

Int. Cl.[5] **C08J** *9/00;* **B12B** *7/00*

U.S. Cl. 521—129 **20 Claims**

1. A composition comprising:

(a) about 50 to about 85 weight percent, based on the weight of the composition, of a trimerisable polyisocyanate;

(b) about 5 to about 20 weight percent of a liquid epoxy resin having an epoxy group content in the range from about 3500 to about 7500 mmol/kg;

(c) about 5 to about 20 weight percent of a vinyl ester of a saturated aliphatic monocarboxylic acid in which the carboxyl group is attached to a tertiary or quarternary carbon atom;

(d) about 1 to about 20 weight percent of a foaming agent, and

(e) about 0.005 to about 5 weight percent of an isocyanate trimerization catalyst.

4,925,882

AQUEOUS MOLD RELEASE AGENT FOR THE PRODUCTON OF MOLDED POLYURETHANE ARTICLES

Zdzislaw Makus, Bad Wiessee, Fed. Rep. of Germany, assignor to Codal-Chemie GmbH, Fed. Rep. of Germany

Filed Dec. 13, 1988, Ser. No. 283,837

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1987, 3742370; Dec. 14, 1987, 3742368

Int. Cl.[5] **C08G** *18/14*

U.S. Cl. 521—132 **11 Claims**

1. An aqueous mold release agent for the production of molded polyurethane articles, especially molded soft foam articles, consisting essentially of water, substances effecting mold release, and emulsifiers, characterized in that as substance effecting mold release it contains at least a portion of one or more unsaturated oligomeric or polymeric hydrocarbons having molecular weights of at least 500 and iodine numbers of at least 60.

4,925,883

MOLDED VINYL HALIDE RESIN (PVC) FLOORING COMPOSITIONS HAVING REDUCED WATER ABSROPTION

Paulette Baker, Chardon, Ohio, assignor to Synthetic Products Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 321,505, Mar. 9, 1989, abandoned, which is a continuation of Ser. No. 149,532, Jan. 28, 1988, Pat. No. 4,814,369. This application May 30, 1989, Ser. No. 357,991

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[5] **C08K** *5/09*

U.S. Cl. 524—287 **9 Claims**

1. A vinyl halide resin flooring composition having reduced water absorption consisting essentially of a vinyl halide resin, a polyhydric alcohol, a metal salt stabilizer which is a metal salt from the group consisting of calcium, zinc, barium and cadmium salts of a higher fatty acid or mixtures thereof, a filler and an aromatic monocarboxylic acid as an anti-water absorption agent in an effective amount.

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4,925,884

PROCESS FOR THE PRODUCTION OF CONCENTRATED EMULSION POLYMERS

Wolfgang Hüboer, Kempen, and Otto Schroers, Krefeld, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GMBH, Krefeld, Fed. Rep. of Germany

PCT No. PCT/EP86/00362, § 371 Date Feb. 13, 1987, § 102(e) Date Feb. 13, 1987, PCT Pub. No. WO86/07596, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 19, 1986, Ser. No. 26,367

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1985, 3544419

Int. Cl.[5] C08K *3/20*

U.S. Cl. 523—340 **7 Claims**

1. In the production of a concentrated emulsion polymer that is water-soluble or that swells in water, comprising polymerising at least one water-soluble monomer in a water-oil dispersion employing a polymerisation initiator, optionally in the presence of a bi- or multi-functional vinyl or allyl compound, the improvement which comprises effecting the polymerisation by stirring a water-in-oil dispersion containing all the starting monomers and removing the polymerisation heat by distilling off water contained in the reaction mixture.

4,925,885

AQUEOUS COMPOSITIONS FOR USE IN THE PRODUCTION OF CROSSLINKED POLYURETHANES

James W. Rosthauser, Dormagen, Fed. Rep. of Germany, and Peter H. Markusch, McMurray, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 143,082, Jan. 12, 1988, abandoned. This application Mar. 30, 1989, Ser. No. 331,333

Int. Cl.[5] C08L *63/00, 75/04*

U.S. Cl. 523—415 **9 Claims**

1. An aqueously dispersed, heat-curable coating composition which comprises

(a) a water dispersible, blocked polyisocyanate having an average functionality, based on blocked NCO groups, of about 1.1 to 8 and containing

(i) about 2 to 20% by weight of blocked isocyanate groups, calculated as NCO,

(ii) about 2 to 30% by weight of urethane groups, calculated as —NH—CO—O—,

(iii) about 10 to 180 milliequivalents per 100 g of solids of chemically incorporated anionic hydrophilic groups, at least a portion of which are neutralized with volatile organic compounds and

(iv) optionally chemically incorporated unneutralized acid groups,

(b) a water dispersible, hydroxyl-terminated polyurethane prepolymer having an average functionality, based on hydroxyl groups, of about 1.1 to 8 and containing

(i) about 0.5 to 10% by weight of hydroxyl groups,

(ii) about 2 to 30% by weight of urethane groups, calculated as —NH—CO—O—,

(iii) about 10 to 180 milliequivalents per 100 g of solids of chemically incorporated anionic hydrophilic groups, at least a portion of which are neutralized with volatile organic compounds and

(iv) optionally chemically incorporated unneutralized acid groups and

(c) an epoxy resin which remains stably dispersed in said coating composition and contains one or more epoxide groups,

components (a) and (b) being present in an amount which corresponds to an equivalent ratio of blocked isocyanate groups of component (a) to hydroxyl groups of component (b) of about 0.6:1 to 2:1 and said epoxy resin being present in an amount such that the equivalent ratio of said unneutralized acid groups and said anionic groups neutralized with volatile organic compounds to epoxide groups is about 0.2:1 to about 20.0:1.

4,925,886

HIGH TEMPERATURE EPOXY TOOLING COMPOSITION OF BIFUNCTIONAL EPOXY, TRIFUNCTIONAL EPOXY, ANHYDRIDE, IMIDAZOLE AND INTERSTITIALLY MATCHED FILLER

Richard P. Atkins, Utica; Chen-Shih Wang, and Thomas J. Dearlove, both of Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 23, 1989, Ser. No. 300,401

Int. Cl.[5] C08G *59/38, 59/42, 59/68*

U.S. Cl. 523—443 **5 Claims**

2. A tough, durable, high temperature epoxy tooling composition for use in cast-to-size forming tools comprising 100 parts by weight of a bisphenol-A epoxy, 20 to 30 parts by weight of a trifunctional aromatic epoxy, 100 to 115 parts by weight of an anhydride curing agent, 2 to 6 parts by weight of a catalyst selected from the group consisting of 1,2-dimethylimidazole, 2-ethyl-4-methylimidazole, and 1-methylimidazole, and up to about 670 parts by weight of an interstitially-matched filler system, said filled epoxy tooling composition having a usable temperature of at least 160° C. and a tensile strength of at least 40 MPa when cured.

4,925,887

LATENT HARDENERS FOR MELAMINE RESIN MOULDING COMPOSITIONS

Peter Günther; Hermann O. Wirth, both of Bensheim, and Wilhelm Endlich, Heppenheim, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 7, 1989, Ser. No. 334,419

Claims priority, application Switzerland, Apr. 8, 1988, 1296/88

Int. Cl.[5] C08L *61/28*

U.S. Cl. 524—14 **9 Claims**

1. An injection moulding composition comprising

(a) a melamine/formaldehyde resin, a melamine/phenol/formaldehyde resin or a mixture of said resins,

(b) organic and/or inorganic fillers,

(c) a lubricant, and

(d) 0.1 to 2% by weight, based on the total composition, of 3-chloro-1,2-propanediol as latent hardener.

4,925,888

MIXTURE FOR STABILIZING POLYURETHANES

Alexander Aumueller, Deidesheim; Peter Neumann, Wiesloch; Peter Spang, St. Ingbert; Guenter Matzke, Heidelberg, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 260,612

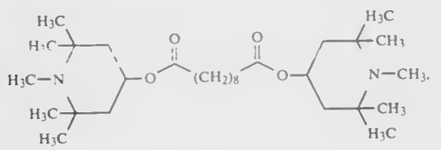
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735577

Int. Cl.[5] C08K *5/34, 5/51*

U.S. Cl. 524—91 **16 Claims**

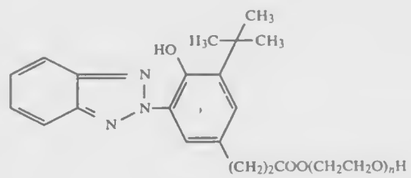
1. A mixture for stabilizing polyurethanes, containing:

(a) an amine of the formula (I):

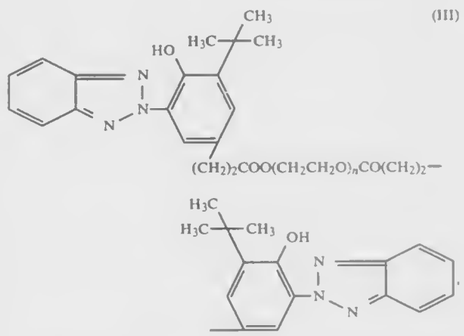


(I)

(b) a mixture of benzotriazoles (II) and (III)



(II)



(III)

in which n is chosen so that the mean molecular weight of the mixture is greater than 600; and

(c) α-tocopherol.

4,925,889

STABILIZED CARBON BLACK LOADED POLYOLEFINS

Janet D. Capolupo, Watertown, and Thomas M. Chucta, Naugatuck, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 101,708, Sep. 25, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 265,286

Int. Cl.[5] C08K *5/43, 3/04*

U.S. Cl. 524—169 **6 Claims**

1. A polyethylene composition stabilized against oxidative degradation comprising:

(a) a polyethylene;

(b) carbon black homogeneously incorporated in said polyethylene;

(c) up to 0.2 percent by weight of a stabilizing amount of a N-phenyl-N'-(p-toluenesulfonyl)-p-phenylenediamine first stabilizer component incorporated into said polyethylene; and

(d) up to 0.2 percent by weight of a second stabilizer component of 4,4'-bis-(alpha,alphadimethylbenzyl)diphenylamine, said first stabilizer and said second stabilizer both being present in synergistic amounts in a ratio between 1:2 and 2:1, all stabilizer percentages being based on weight of said composition.

4,925,890

PROCESS FOR PROCESSING THERMOPLASTIC POLYMERS

Pak S. Leung, Highland Mills, N.Y.; Errol D. Goddard, Haworth, and Fred H. Ancker, Warren, both of N.J., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Division of Ser. No. 165,536, Mar 8, 1988, Pat. No. 4,857,593. This application May 24, 1989, Ser. No. 356,204

Int. Cl.[5] C08L *53/00, 83/00, 51/08, 63/00*

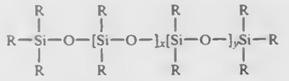
U.S. Cl. 524—133 **16 Claims**

1. A composition consisting essentially of:

(a) a thermoplastic polymer;

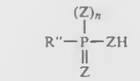
(b) 1 to 30 parts, per hundred parts of thermoplastic polymer, of a mixture comprising:

(i) a silicone-containing material having the formula:



wherein R is an alkyl group containing from 1 to 12 carbon atoms, R' is a monovalent organic group containing at least one alkylene oxide unit and an alkoxy, hydroxy, epoxy, carboxy or amino group; x has a value of at least 1 to 500, and y has a value of from 2 to 300, and

(ii) an organo derivative having at least one group having the formula:



wherein Z is either an oxygen or sulfur atom, n is 0 or 1, and R'' is selected from the group consisting of R''', ZR''', and ZH where R''' is an alkyl, aryl, alkenyl or alkynyl group containing from 1 to 24 carbon atoms; and

(c) 0 to 30 parts, per hundred parts of thermoplastic polymer, of an antiblocking agent, wherein (i) and (ii) are present in a ratio of from 50:1 to 1:20.

4,925,891

HIGH IMPACT STRENGTH FLAME-RETARDANT POLYCARBONATE MOULDING COMPOSITIONS

Hans-Jürgen Kress, Pittsburgh, Pa.; Christian Lindner, Cologne, Fed. Rep. of Germany; Friedemann Müller, Neuss, Fed. Rep. of Germany; Horst Peters, Leverkusen, Fed. Rep. of Germany; Dieter Wittmann, and Josef Buekers, both of Krefeld,, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 86,687, Aug. 18, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 331,064

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1986, 3628904

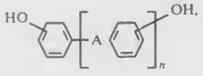
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[5] C08K *5/52, 5/53*

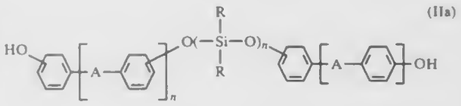
U.S. Cl. 524—139 **17 Claims**

1. A thermoplastic moulding composition comprising

(A) 60 to 90 parts by weight of a halogen-free polydiorganosiloxane-polycarbonate block copolymer with an average molecular weight $\overline{M}_w$ of 10,000 to 200,000 and with a content of aromatic carbonate structural units of between 75 and 99% by weight and a content of diorganosiloxane units of between 25 and 1.0% by weight, the block copolymer being prepared from halogen free diphenols of the formula (II) and of the formula (IIa)



(II)



(IIa)

wherein

A is a single bond, C_1-C_5-alkylene, C_2-C_5-alkylidene, C_5-C_6-cycloalkylidene, —S— or —SO_2—,

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n is 1 or zero,

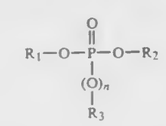
the symbols R are identical or different and are linear C_1–C_{20}-alkyl, branched C_3–C_{20}-alkyl or C_6–C_{20}-aryl, and

m is an integer between 5 and 100,

or a mixture of such a block copolymer with another siloxane-free thermoplastic halogen-free polycarbonate prepared only from diphenols of the formula (II), the content of diorganosiloxane units in said mixture being between 25 and 1.0% by weight,

(B) 10 to 40 parts by weight of a halogen-free thermoplastic copolymer of 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene or a mixture thereof and 5 to 50% by weight of (meth)acrylonitrile,

(C) 1 to 20 parts be weight per 100 parts by weight of the total weight of (A) and (B), of a halogen-free phosphorus compounds of the general formula



(I)

wherein

R_1, R_2 and R_3 independently or one another are C_1–C_8-alkyl or optionally alkyl-substituted C_6–C_{20}-aryl and

n is 0 or 1, and

(D) 0.05 to 5 parts by weight, again per 100 parts by weight of the total weight of (A) and (B), of a tetrafluoroethylene polymer with a density of 2.0 to 2.3 g/cm^3 and a particle size of 100 to 1,000 μm.

4,925,892

FLUOROELASTOMER COMPOSITIONS CONTAINING A TETRAALKYLAMMONIUM HALIDE AND VULCANIZATION ACCELERATOR

David L. Tabb, and Janet M. Wilson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

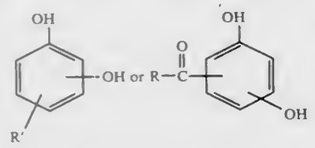
Division of Ser. No. 197,506, Apr. 27, 1988, Pat. No. 4,868,234, which is a continuation-in-part of Ser. No. 43,666, Apr. 28, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 368,086

Int. Cl.[5] **C08K** *5/17*

U.S. Cl. 524—236 **9 Claims**

1. A process for making a curable fluoroelastomer composition that has enhanced adhesion to metal when cured which comprises:

mixing an elastomeric copolymer of vinylide fluoride and at least one other fluorinated monomer with a vulcanization accelerator that is a quaternary phosphonium compound, a crosslinking agent selected from the group consisting of a bisphenol and a polyhydroxy phenol of the formula



where R is H or an alkyl group or an aryl group, and R′ is an alkyl group or an aryl group, and adding 0.02–0.8 weight percent based on the weight of the elastomeric copolymer of vinylidene fluoride of a metal adhesion promoter that is a tetraalkylammonium halide wherein each alkyl group contains 1–10 carbon atoms and the halide is a chloride, bromide or iodide.

4,925,893

CURABLE COATING COMPOSITIONS AND THEIR PREPARATION AND USE

John C. Padget, Frodsham; Stephen G. Yeates, MacClesfield, and Mary R. R. Marsh, Warrington, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 30, 1988, Ser. No. 214,127

Claims priority, application United Kingdom, Jun. 30, 1987, 8715309; Aug. 7, 1987, 8718729

Int. Cl.[5] **C08K** *5/13*

U.S. Cl. 524—337 **13 Claims**

1. An aqueous-based, film-forming and ambient-temperature autoxidisably crosslinkable coating composition comprising an aqueous latex of at least one film-forming and ambient-temperature autoxidisably crosslinkable copolymer formed by free-radical initiated addition polymerization of a monomer system comprising at least one ethylenically unsaturated comonomer providing when polymerized the basis of the film-formability of said film-forming compolymer, hereinafter to be termed the at least one "film-forming comonomer", and an autoxidation catalyst(s) incorporated into said composition for effecting ambient temperature autoxidaton of said at least one copolymer after application of the coating composition as a coating layer, wherein said film-forming copolymer has a gel fraction of at least 5% by weight which has been formed from the monomer system used to prepare said film-forming copolymer as a result of the inclusion therein of at least one multi-functional comonomer which has been added to the copolymerization reaction in at least an early part thereof, said early part being within the first 70% conversion reached in the copolymerization, and wherein said at least one film-forming addition copolymer is autoxidisably crosslinkable, having residual carbon-carbon double bond unsaturation therein susceptible to an autoxidation reaction, as a result of said monomer system including at least one lower reactivity multi-functional comonomer which has at least two unsaturated carbon-carbon double bonds which can each take part in a free-radical initiated copolymerization reaction and at least one which reacts at a significant slower rate that does the unsaturated bond(s) of said at least one film-forming comononer and is susceptible to an autoxidative crosslinking reaction in a subsequently formed film coating, which lower reactivity multi-functional comomoner has been added to the copolymerization reaction in at least a late part thereof, said late part being after 70% conversion in the copolymerization has been reached.

4,925,894

ELASTOMER COMPOSITIONS FOR TIRE TREADS HAVING LOW ROLLING RESISTANCE AND GOOD WET AND DRY GRIP TRACTION

Shingo Futamura, Wadsworth, Ohio, assignor to Bridgestone/-Firestone, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 488,966, Apr. 27, 1983. This application Feb. 14, 1986, Ser. No. 829,684

Int. Cl.[5] **C08K** *5/01*

U.S. Cl. 524—484 **16 Claims**

1. An elastomer composition adapted for use in forming the tread portion of tires having low rolling resistance and good wet and dry grip traction comprising:

(a) An elastomer having a Tg of −60° C. or higher selected from the group consisting of a polymer of a conjugated diene and a copolymer of a a conjugated diene and a vinyl aromatic hydrocarbon; and

(b) from about 10 to about 60 parts by weight per 100 parts by weight of said elastomer of an aromatic oil having an aromatic content of 60 percent or more and a viscosity at 100° F. of from about 50 to 2500 SUS.

4,925,895

HEAT STABILIZED SILICONE ELASTOMERS

George J. Heeks, Rochester; Arnold W. Henry, Pittsford, and Edward L. Schlueter, Jr., Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

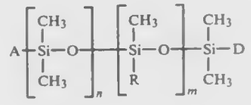
Division of Ser. No. 18,372, Feb. 24, 1987, Pat. No. 4,777,087, which is a continuation-in-part of Ser. No. 740,930, Jun. 3, 1985, abandoned. This application May 12, 1988, Ser. No. 194,068

Int. Cl.[5] **C08K** *9/08, 3/10;* **C08L** *83/07, 83/06*

U.S. Cl. 524—714 **52 Claims**

1. A composition curable to a heat stabilized crosslinked silicone elastomer when mixed with a crosslinking agent and crosslinking catalyst in amounts sufficient to promote crosslinking, comprising;

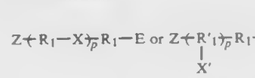
(a) 100 parts by weight of at least one polyorganosiloxane having the Formula "a":



where R is hydrogen or substituted or unsubstituted alkyl, alkenyl or aryl having less than 19 carbon atoms, each of A and D may be any of methyl, hydroxy or vinyl groups,

$0 < m/n \leq 1$ and $m+n > 350$,

(b) a complex comprising a transition metal sulfate, nitrate, phosphate, halide, acetate, carboxylate, nitrite or perfluoroborate and at least one polydentate chelating ligand of the formula



where each R_1 may be an alkyl biradical having 1 to 6 carbon atoms or an aryl biradical having less than 19 carbon atoms, R′$_1$, is an X′ substituted R_1, each of Z and E may be any of carboxy, thiocarboxy, dithiocarboxy, or $-N(R_2)_2$, $-A_s(R_2)_2$, $-S(R_2)$ where each R_2 may be any of hydrogen or an alkyl radical having 1 to 6 carbon atoms or an aryl radical having less than 19 carbon atoms, X′ may be any of hydrogen, carboxy, thiocarboxy, dithiocarboxy, $-N(R_2)_2$, $-A_s(R_2)_2$, or $-S(R_2)$, X is $-N(R_2)-$, $-A_s(R_2)-$, or $-S-$ and p is 0 to 4, said complex being present in an amount sufficient to inhibit oxidative degradation of said polyorganosiloxane,

(c) from about 5 to about 500 parts by weight of finely divided fillers.

9. The curable composition of claim 1 wherein said complex is present in an amount of from about 1 to about 20 parts by weight per 100 parts by weight of total polyorganosiloxane as designated in "a".

10. The curable composition of claim 9 wherein said complex is bis(ethylene diamine) copper (II) sulfate.

4,925,896

PROCESS FOR THE CONTINUOUS PRODUCTION IN SOLUTION OF STYRENE THERMOPLASTIC RESINS

Savino Matarrese, Verona; Anna Grazia Rossi, Mantova; Mauro Lo Consolo, Porto Mantovano; Giuseppe Cigna, Mantova, and Italo Borghi, Ferrara, all of Italy, assignors to Montedipe, S.p.A., Milan, Italy

Filed Apr. 4, 1988, Ser. No. 177,421

Claims priority, application Italy, Apr. 7, 1987, 41004 A/87

Int. Cl.[5] **C08F** *255/06, 279/04*

U.S. Cl. 525—53 **20 Claims**

1. A process for producing thermoplastic styrene resins having particle sizes less than 1 micrometer, by the continuous solution polymerization of styrene monomer and a vinyl cyanide, in the presence of an elastomeric compound and of a polymerization initiator, and in an inert solvent, which process comprises:

(a) dissolving the elastomeric compound and the polymerization initiator in the monomers and in the solvent;

(b) feeding the solution to one or more reactors arranged in series, operating at a temperature ranging from 70° to 150° C., under a pressure higher than the pressure at which the evaporation of the fed monomers and the fed solvent takes place and under gentle stirring conditions to ensure the heat exchange without influencing or modifying the size and structure of the particles within each reactor;

(c) feeding the reaction mass to a thin film evaporator which is heated at a temperature ranging from 150° to 300° C. and is equipped with rotary blades which exert on the polymer a cutting force sufficient to reduce the particle size to less than 1 micrometer; and

(d) feeding to the first reactor the unreacted monomers and the solvent which are recovered from the evaporator.

4,925,897

MODIFIED POLYACETYLENE

Herbert Naarmann, Wattenheim, and Gernot Koehler, Worms, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

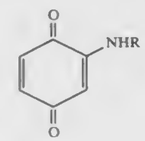
Filed Jan. 10, 1989, Ser. No. 295,395

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 3800578

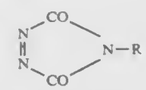
Int. Cl.[5] **C08F** *8/30*

U.S. Cl. 525—285 **5 Claims**

1. A polyacetylene which is modified by a Diels-Alder reaction with a dienophilic compound selected from the group consisting of dichloromaleic anhydride; dibromomaleic anhydride; dichloromaleimide or dibromomaleimide, wherein the nitrogen may be substituted by alkyl, cycloalkyl or aryl groups of not more than 12 carbon atoms; quinone; a halo- or dihaloquinone, halogen being chlorine or bromine; an aminoquinone I or a triazoline derivative II



I



II

where R is hydrogen or an alkyl, cycloalkyl or aryl group of not more than 12 carbon atoms, which may in turn be substituted by NO_2, chlorine or bromine; the reaction being conducted with a weight ratio of dienophile to polyacetylene of from 1:2 to 2:1, and at a temperature from 20° to 120° C.

4,925,898

ETHYLENE PROPYLENE RUBBER WITH POLYACRYLATES AND SULFUR

Yuji Itokazu, and Koichi Nishihira, both of Hyogo, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

Filed Sep. 12, 1988, Ser. No. 243,046

Int. Cl.[5] **C08F** *179/00, 255/04*

U.S. Cl. 525—305 **2 Claims**

1. An ethylene propylene rubber mixture highly adhesive to zinc-plated metals which comprises: an ethylene propylene rubber; an organic peroxide as a cross-linking agent in amounts of about 0.01–0.02 moles per 100 g of the ethylene propylene rubber; a polyhydric alcohol polyester of acrylic or meth-

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acrylic acid in amounts of about 0.01–0.02 moles per 100 g of the ethylene propylene rubber; a cobalt salt of an organic carboxylic acid in an amount of about 0.2–0.5% by weight as metallic cobalt based on the rubber mixture; and sulfur in an amount of about 0.2–0.4% by weight based on the rubber mixture.

4,925,899

BIMODAL STAR-BLOCK COPOLYMERS, SHOWING EXCELLENT OPTICAL PROPERTIES AND RESILIENCE, AND PROCESS FOR THEIR MANUFACTURE

Gabriele Rendina, Torino; Roberto Nocci, Novara; Andrea Callaioli, Mantova, and Francesco Corrado, Novara, all of Italy, assignors to Montedipe S.p.A., Milan, Italy

Continuation of Ser. No. 72,396, Jul. 13, 1987. This application Jul. 1, 1988, Ser. No. 214,831

Claims priority, application Italy, Jul. 17, 1986, 21165 A/86

Int. Cl.[5] C08F *297/04, 297/02*

U.S. Cl. 525—314 **10 Claims**

1. Bimodal star-block copolymers, containing from 60 to 90% by weight of recurring units of monovinyl aromatic monomer and from 40 to 10% by weight of recurring units of conjugated diene, having the formula:

$$(S—S_1—B/S_2—B_1)_m—X—(B_1—S_2/B—S_1)_n \quad (II)$$

wherein X is a polyfunctional radical, m and n are such that (with $m \leqq n$) the sum of $m+n$ is between 3 and 20 and is equal to the functionality degree of radical X, S and S_1 are polymer blocks of mono-vinyl aromatic monomer, B_1 is a block of conjugated dienic units of the copolymer, B/S_2 and S_2/B are copolymer blocks of the random and/or tapered type of the mono-vinyl aromatic compound and of the conjugated diene, the weight ratio of S_2 to B and B to S_2 being between 0.8 and 1.2, the sum of the units of aromatic vinylmonomer in blocks S and S_1 being 50 to 80% of all the vinylaromatic units in the copolymer.

4,925,900

HALOGENATED-HYDROGENATED ACRYLONITRILE-BUTADIENE RUBBER

Gilles J. Arsenault, Courtright, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Sep. 16, 1988, Ser. No. 245,323

Int. Cl.[5] C08F *8/04, 8/22*

U.S. Cl. 525—329.3 **8 Claims**

1. An adduct of a partially hydrogenated acrylonitrile-butadiene rubber and a halogen selected from bromine and chlorine wherein the adduct is characterized by having

(i) a gel content of less than 10% as measured by weight per cent insoluble in methyl ethyl ketone after 16 hours at 30° C. and

(ii) residual carbon-carbon double bond unsaturation of less than 10 mole per cent.

4,925,901

LATENT, CURABLE, CATALYZED MIXTURES OF EPOXY-CONTAINING AND PHENOLIC HYDROXYL-CONTAINING COMPOUNDS

James L. Bertram, Lake Jackson; Louis L. Walker, Clute, and John W. Muskopf, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 155,381, Feb. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 21,837, Mar. 4, 1987, Pat. No. 4,725,652, which is a continuation-in-part of Ser. No. 849,087, Apr. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 716,279, Mar. 25, 1985, Pat. No. 4,594,291, which is a continuation-in-part of Ser. No. 631,676, Jul. 17, 1984, abandoned. This application Nov. 18, 1988, Ser. No. 274,250

The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.[5] C08G *59/68*

U.S. Cl. 525—482 **142 Claims**

1. A composition comprising (A) at least one compound containing an average of more than one epoxide group per molecule; (B) at least one compound containing an average of more than one aromatic hydroxyl group per molecule other than an alkenylphenol polymer; and (C) a catalytic quantity at least one of (1) the product resulting from contacting (a) at least one onium compound of the element nitrogen, phosphorus or sulfur with (b) at least one inorganic acid or metal salt of an inorganic acid having a weak-nucleophilic anion; (2) the product resulting from contacting (a) at least one amine compound with (b) at least one inorganic acid having a weak-nucleophilic anion or a combination of such acids; or (3) the product resulting from contacting (a) at least one acid adduct of an amine compound, said acid having a relatively strong-nucleophilic anion with (b) an inorganic acid or metal salt of an inorganic acid, said acid having a weak-nucleophilic anion or a combination of such acids or metal salts; wherein (i) components (a) and (b) are contacted in quantities which permit the composition to satisfy the viscosity requirements of the composition after storage at 50° C. for 14 days; (ii) components (A) and (B) are present in quantities which provide a ratio of aromatic hydroxyl groups to epoxide group of from about 0.05:1 to about 20:1; and (iii) a mixture of components (A), (B), and (C), when dissolved in 20 to 40 percent by weight of a suitable solvent or solvent mixture, has a viscosity measured at 25° C. of 75% or less than the viscosity of a like composition except that the catalyst consists only of component (a), said viscosity being determined after storage for 14 days at 50° C.

4,925,902

COPOLYMERS OF PROPYLENE AND BUT-1-ENE AND USES THEREOF

Bernard Desvignes; Daniel Durand, and Bernard Milleliri, all of Martigues, France, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 206,989, Jun. 10, 1988, abandoned, which is a continuation of Ser. No. 905,832, Sep. 10, 1986, abandoned, which is a division of Ser. No. 799,206, Nov. 19, 1985, Pat. No. 4,663,238, which is a continuation of Ser. No. 475,449, Mar. 15, 1983, Pat. No. 4,604,412, which is a continuation of Ser. No. 280,380, Jul. 6, 1981, abandoned, which is a continuation of Ser. No. 108,845, Dec. 31, 1979, abandoned. This application Mar. 23, 1989, Ser. No. 328,725

Claims priority, application France, Jan. 17, 1979, 79 01123; Jul. 30, 1979, 79 19519

Int. Cl.[5] C08F *2/00, 10/04, 10/14*

U.S. Cl. 526—87 **4 Claims**

1. A polymerization process for preparing copolymers of propylene and but-1-ene, wherein the proportion by weight of units derived from but-1-ene is from 10 to 40%, the proportion, denoted by the symbol "PRE" of isolated ethyl branches is at least equal to the square of the proportion (P) of units derived from propylene contained in said copolymers, and the fusion enthalpy measured after heat treatment of said copolymers is not more than 15 cal/g, said process being characterized in that the polymerization is carried out at a temperature of 50° C. to 80° C. by bringing into contact (1) a catalytic system comprising (i) a titanium trichloride-base catalyst in the gamma crystallographic form which is stereospecific in the polymerization of propylene alone and is prepared by reducing titanium tetrachloride by means of hydrogen, aluminum, an aluminum hydride or an organoaluminum compound, and by subjecting the reduced solid to a treatment at a temperature from 100° to 160° C. and to a treatment with an electron-donor compound, and (ii) one or more cocatalysts consisting of organoaluminum compounds having the mean formula $AlR'_xZ_{(3-x)}$ wherein R' represents an alkyl group containing from 2 to 12 carbon atoms, Z represents a hydrogen or halogen atom and x is a integer or a fraction having any value from 1 to 3, in such amounts that the atomic ration of Al/Ti is from 1 to 50, with (2) a mixture of propylene and but-1-ene, in a liquid diluent comprising the liquid comonomers and/or a saturated aliphatic hydrocarbon, so that the ratio between the amounts of propylene and but-1-ene contained in the liquid polymerization medium is maintained at a constant value throughout the polymerization reaction.

4,925,903

PROCESS OF MAKING A POLYMER CONTAINING HINDERED AMINE LIGHT STABILIZING GROUPS AND POLYMER MADE THEREBY

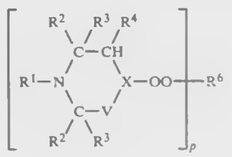
Terry N. Myers, Erie, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 295,870, Jan. 11, 1989, Pat. No. 4,885,347, which is a division of Ser. No. 87,473, Aug. 20, 1987, Pat. No. 4,822,883, which is a continuation-in-part of Ser. No. 831,393, Feb. 19, 1986, abandoned. This application Sep. 18, 1989, Ser. No. 408,982

Int. Cl.[5] C08F *2/00*

U.S. Cl. 526—204 **10 Claims**

1. A process of preparing a polymer containing hindered amine light stabilizer groups chemically connected to the backbone of the polymer comprising polymerizing any ethylenically unsaturated monomer capable of being polymerized by free radicals in the presence of an initiating amount of a compound having the formula



wherein

p is 1 or 2;

R^1 is hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, substituted or unsubstituted aliphatic acyl of 2–21 carbons, substituted or unsubstituted alicyclic acyl of 6–13 carbons, substituted or unsubstituted aryl acyl of 7–11 carbons, substituted or unsubstituted araliphatic acyl of 7–22 carbons, —C(=O)—$N(R^4)(R^5)$, —C(=O)—O—R^9 or —(C-H_2—$CH(R^4)$—O)$_r$—R^4, where r is 2–50;

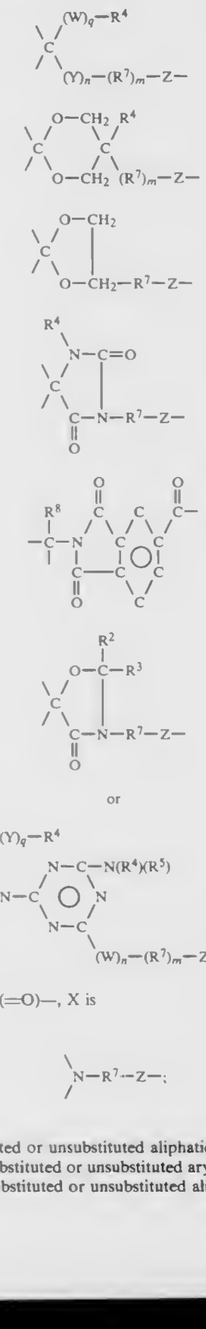
R^2 and R^3 may be the same or different and are independently substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons or substituted or unsubstituted araliphatic of 7–22 carbons;

R^2 and R^3 may be linked together to form a substituted or unsubstituted saturated alicylic group of 4–12 carbons;

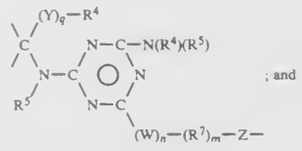
V is —$CH(R^5)$— or —C(=O)—;

R^4 and R^5 may be the same or different and are independently hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, substituted or unsubstituted alicyclic of 5–12 carbons which may optionally contain 1–3 oxygen, sulfur or nitrogen heteroatoms in the ring, the nitrogen heteroatom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteroatoms must be separated from each other and from the portion of the compound to which the alicyclic group is bonded by at least one carbon atom; and

when V is —$CH(R^5)$—, X is



or



; and

when V is —C(=O)—, X is

R^7 is a substituted or unsubstituted aliphatic diradical of 1–20 carbons, a substituted or unsubstituted aryl diradical of 6–10 carbons, a substituted or unsubstituted alicyclic diradical of

5–12 carbons or a substituted or unsubstituted araliphatic diradical of 7–22 carbons, where any R^7 diradical may contain 1–6 oxygen, sulfur or nitrogen heteroatoms, the nitrogen heteroatom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteratoms must be separated from each other and from the radical ends by at least one carbon atom;

R^8 is hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted aryl of 6–10 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, $-C(=O)-O-R^9$ or $-(CH_2-CH(R^4)-O)_4-R^5$;

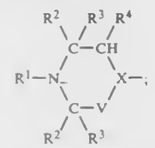
W is —O—, —S— or $-N(R^5)-$;

Y is —Z—, —O—, —S—, $-N(R^4)-$, $-S(=O)-$, —O—S(=O)—, —O—S(=O)$_2$—, —NH—C(=O)—NH—, —O—C(=O)—O, —C(=O)—O—, —O—C(=O)—C(=O)—O—, —O—C(=O)—C(=O)—N(R^4)—, —N(R^4)—C(=O)—C(=O)—O— or $-N(R^4)-C(=O)-C(=O)-N(R^4)-$;

n, m and q are independently 0 or 1 with the proviso that when m is 0, n must be 0;

Z is —C(=O)—, —S(=O)$_2$—, $-C(R^9)(R^{10})-$, —O—C(=O)—, $-N(R^4)-C(=O)-$, —O—C(=)—C(=O)—, $-N(R^4)-C(=O)-C(=)-$, $-Si(R^4)(R^5)-$, $-Si(O-R^4)(O-R^5)-$ or $-P(O)(O-R^4)(O-R^5)-$; and

when p is 1, R^6 is hydrogen, substituted or unsubstituted tertiary aliphatic of 4–24 carbons, substituted or unsubstituted tertiary alicyclic of 6–13 carbons, substituted or unsubstituted tertiary araliphatic of 9–24 carbons, substituted or unsubstituted aliphatic acyl of 2–21 carbons, substituted or unsubstituted aryl acyl of 7–11 carbons, substituted or unsubstituted araliphatic acyl of 8–22 carbons, —C(=O)—N(R^4)(R^5), —C(=O)—O—R^9, $-C(R^9)(R^{10})-C(=O)-O-R^4$, $-S(=O)_2-R^4$ or



and

when p is 2, R^6 is substituted or unsubstituted di-tertiary aliphatic of 6–27 carbons, substituted or unsubstituted di-tertiary alicyclic diradical of 7–14 carbons, substituted or unsubstituted di-tertiary araliphatic of 12–27 carbons, substituted or unsubstituted aliphatic diacyl of 3–21 carbons, substituted or unsubstituted alicyclic diacyl of 7–15 carbons, substituted or unsubstituted aryl diacyl of 8–12 carbons or substituted or unsubstituted araliphatic diacyl of 9–24 carbons;

R^9 and R^{10} are independently substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons, substituted or unsubstituted araliphatic of 7–22 carbons or substituted or unsubstituted alicyclic of 5–12 carbons which may contain 1–3 oxygen, sulfur or nitrogen heteroatoms in the ring, the nitrogen heteroatom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteroatoms must be separated from each other and from the portion of the compound to which the alicyclic group is bonded by at least one carbon atom; and

when both are present, R^9 and R^{10} may be linked together through an alkylene diradical bridge containing 4–9 carbons to form a cycloalkyl ring, in which the alkylene diradical bridge may contain 1–3 oxygen, sulfur or nitrogen heteroatoms, the nitrogen heteroatom having a hydrogen atom or a methyl group bonded thereto, with the provisos that multiple heteroatoms must be separated from each other and from the ends of the diradical bridge by at least one carbon atom; and

when R^6 is tertiary aliphatic, tertiary alicyclic or tertiary araliphatic, R^{10} may also be —OO—R^6 or —O—R^9; and

substituents for R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9 and R^{10} are one or more of halogen, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, —C≡N, —OH, epoxy, carboxy, alkyoxycarbonyl of 2–6 carbons, acyloxy of 1–4 carbons, acryloyl, acryloyloxy, methacryloyl, methacryloyloxy, hydroxymethyl, hydroxyethyl, alkylmercapto of 1–4 carbons or trialkoxysilyl of 3–12 carbons.

4,925,904

COMPOSITIONS CONTAINING STABIIZED UNSATURATED POLYESTER RESINS

Arno P. O. Schmidt, Abstatt, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Aug. 4, 1988, Ser. No. 228,247
Claims priority, application Japan, Aug. 31, 1987, 3729054
Int. Cl.[5] **C07D** *279/70*
U.S. Cl. 526—205 **15 Claims**

1. A cross linkable composition comprising unsaturated polyester and an inhibitor which is a phenothiazine in an amount effective to inhibit the gelling of the unsaturated polyester.

4,925,905

PREPARATION OF WATER-SOLUBLE COPOLYMERS BASED ON MONOETHYLENICALLY UNSATURATED CARBOXYLIC ACIDS

Dieter Boeckh, Limburgerhof; Hans-Peter Seelmann-Eggebert, Schriesheim; Heinrich Hartmann, Limburgerhof; Wolfgang Trieselt, Ludwigshafen, and Richard Baur, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 330,759
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1988, 3812402
Int. Cl.[5] **C08F** *2/14, 6/10, 220/06, 220/28*
U.S. Cl. 526—208 **13 Claims**

1. A process for the preparation of a water-soluble copolymer based on monoethylenically unsaturated carboxylic acids, having a K value of from 8 to 100 (determined on the Na salt of the copolymer according to H. Fikentscher in aqueous solution at 25° C., at a pH of 7 and at a concentration of the Na salt of the polymer of 1% by weight), by copolymerization of a monomer mixture of

(a) from 98.5 to 18.5 mol % of one or more monoethylenically unsaturated C_3–C_6-monocarboxylic acids,

(b) from 1.5 to 20 mol % of one or more comonomers which contain two or more ethylenically unsaturated, nonconjugated double bonds which are separated from one another by one one or more ester bonds,

(c) from 0 to 80 mol % of one or more monoethylenically unsaturated C_4–C_6-dicarboxylic acids or anhydrides of monoethylenically unsaturated dicarboxylic acids and

(d) from 0 to 20 mol % of other monoethylenically unsaturated comonomers which are copolymerizable with the monomers (a), (b) and (c), the sum of of the molar percentages (a) to (d) always being 100, in the presence of a polymerization initiator and a polymerization regulator in an amount of from 0.2 to 25% by weight, based on the amount of monomer, or a highly regulating solvent in an amount of not less than 20% by weight based on the monomers, at not more than 200° C., wherein the copolymerization is carried out in one or more inert organic solvents.

4,925,906

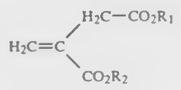
STAIN-RESISTANT POLYMERS DERIVED FROM THE ITACONIC ACID USEFUL AS COATINGS FOR FIBERS

George D. Green, Park Ridge, Ill.; Stephen A. Munk, West Lafayette, Ind., and Darryl K. Barnes, Bellwood, Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jan. 3, 1989, Ser. No. 292,862
Int. Cl.[5] **C08F** *20/22, 32/00*
U.S. Cl. 526—245 **1 Claim**

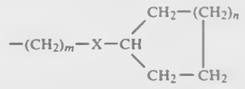
1. A fluorine-containing composition useful as a stain resistant coating on a substrate comprising copolymers of

(1) least one monomer having the formula (A)



(A)

where R_1 is H,C_5–C_{22} alkyl,



cyclobutyl, cyclopentyl, cyclohexyl, xyxloheptyl;

m=0–12;

n=0, 1, 2, 3;

X=CH_2, 0 when m>1,

R_2 is chosen from the list above and may or may not be the same as R_1,

R_1 and R_2 cannot both be H

(2) at least one monomer having the formula

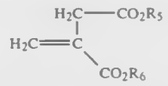
(D) $CF_3CF_2(CF_2)XCH_2YOC(O)C(R_3)=CH_2$

wherein

X is an integer from 2–18

Y is an integer from 1–15, R_3 is H or CH_3,

(3) and may contain a monomer having the formula



(E)

where R_5 and R_6 may be H, $CF_3CF_2(CF_2)X(CH_2)Y$, but and R_6 cannot both be H

wherein

X is an integer from 2–18

Y is an ,integer from 1–15.

4,925,907

VINYLIDENE FLUORIDE-ACRYLIC ACID ESTER COPOLYMER, PROCESS FOR PRODUCING THE SAME AND COMPOSITION CONTAINING THE SAME

Toshio Miyabayashi; Nobuyuki Sakabe, and Shinichiro Zen, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 145,103, Jan. 19, 1988, Pat. No. 4,861,851.
This application Apr. 7, 1989, Ser. No. 334,568
Claims priority, application Japan, Jan. 22, 1987, 62-12931
Int. Cl.[5] **C08F** *14/18*
U.S. Cl. 526—255 **2 Claims**

1. A crosslinkable rubber composition having excellent resistance to gasoline permeation comprising, as essential components, a crosslinking agent and a polymer obtained by polymerizing in the presence of a radical polymerization initiator a mixture of

(A') 27–95% by weight of vinylidene fluoride,

(B') 4.9–89.9% by weight of an alkyl acrylate, an alkoxy-substituted alkyl acrylate or both of them, and

(C') 0.1–10% by weight of a crosslinking monomer.

4,925,908

ACRYLIC BASED EMULSION POLYMERS

Margaret Bernard, La Verne, and Stansliv Berman, Granada Hills, both of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Filed Dec. 11, 1987, Ser. No. 131,819
Int. Cl.[5] **C08F** *220/04, 220/26, 220/56;* **C09J** *7/02*
U.S. Cl. 526—320 **11 Claims**

1. An emulsion polymer having a gel content of from about 70% to about 90%, said emulsion polymer comprising:

a. from about 90 to about 99.5 parts of at least one alkyl acrylate monomer having from one to about twelve carbon atoms in the alkyl chain;

b. a positive amount of up to about 2 parts of at least one polar monomer; and

c. a positive amount of up to about 1 part of at least one multifunctional acrylate monomer.

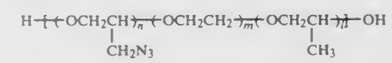
4,925,909

GAS-GENERATING AGENT FOR USE IN DUCTED ROCKET ENGINE

Naminosuke Kubota, Yokohama; Haruaki Shimizu; Tadashi Sonobe, both of Aichi, and Goro Nakashita, Mitaka, all of Japan, assignors to Japan as represented by Director General, Technical Research and Development Institute, Japan Defense Agency and Nippon Oil & Fats Co., Ltd., both of Tokyo, Japan

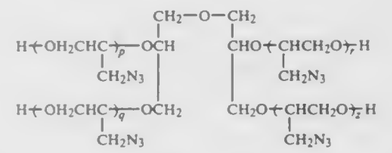
Filed Oct. 10, 1989, Ser. No. 418,558
Claims priority, application Japan, Oct. 26, 1988, 63-268132; May 30, 1989, 1-134561
Int. Cl.[5] **C08G** *18/38*
U.S. Cl. 528—55 **7 Claims**

1. A gas-generating agent for use in a ducted rocket engine, essentially consisting of one member selected from the group consisting of aliphatic polyethers represented by the formula:



(I)

wherein n is in the range of 10 to 50 and m +1 in the range of 1 to 10, and the general formula:



(II)

wherein p, q, r, and z are each not less than 1 and p + q +r +z is in the range of 10 to 50, and a curing agent.

4,925,910

HEAT-STABLE COPOLYCONDENSATE MOLDING MATERIALS

Gerhard Heinz, Weisenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

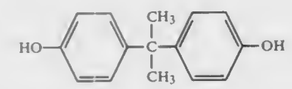
Filed Apr. 9, 1987, Ser. No. 36,446
Int. Cl.[5] **C08K** *3/34*
U.S. Cl. 528—171 **7 Claims**

1. A heat-stable copolycondensate molding material which contains polyarylene sulfone and polyarylene ether sulfone

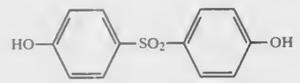
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units in random distribution and is obtainable by polycondensation of a mixture of

(A) from 2 to 98 mol %, based on the sum of (A)–(C), of

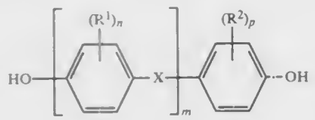


(B) from 2 to 98 mol %, based on te sum of (A)–(C), of

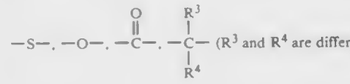


and

(C) from 0 to 96 mol %, based on the sum of (A)–(C), of

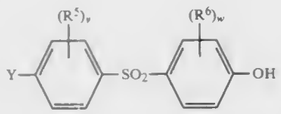


where X is a chemical bond or



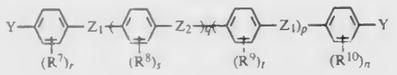
(only when n or p is 0), R^1 and R^2 are each alkyl or alkoxy, each of 1 to 6 carbon atoms, R^3 and R^4 are each hydrogen, alkyl of 1 to 6 carbons atoms, aryl or halogen-substituted alkyl of 1 to 4 carbon atoms, m is 0 or 1 and n and p are 0, 1, 2, 3 or 4, with

(D) from 1 to 100 mol %, based on the sum of (D) and (E), of



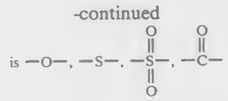
where R^5 and R^6 are each hydrogen or have the same meanings as R^1 and R^2, Y is Cl or F, and v and w are each 0, 1, 2, 3 or 4, and

(E) from 0 to 99 mol %, based on the sum of (D) and (E), of



where Y is Cl or F, Z_1 is  or , Z_2

-continued



or a chemical bond, R^7, R^8, R^9 and R^{10} are each hydrogen, Cl or F or may have the same meanings as R^1 and R^2, q and p are each 0 or 1 and r, s, t and u may each be an integer from 0 to 4, with the proviso that one or more of the components C and E are present and the molar ratio of B to the sum of A+C is not greater than 1.

4,925,911

MOLDABLE/EXTRUDABLE THERMOTROPIC AROMATIC COPOLYESTERAMIDES

Jean-Pierre Quentin, Lyons, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

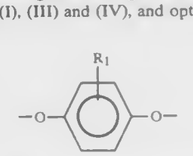
Continuation of Ser. No. 129,289, Dec. 7, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 312,752

Claims priority, application France, Dec. 5, 1986, 86 17248

Int. Cl.[5] **C08G** *69/44; C08L 77/12*

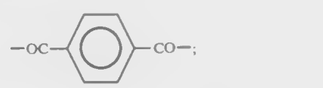
U.S. Cl. 528—184 **11 Claims**

1. A high molecular weight thermotropic aromatic polyesteramide having an inherent viscosity of at least 0.3 dl g^{-1}, consisting of recurring structural units of the following formulae (I), (III) and (IV), and optionally (II):

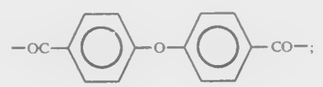


(I)

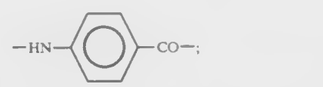
in which R_1 is a methyl or ethyl radical, or a chlorine or bromine atom, with said recurring structural units (I) either being identical or different;



(II)



(III)



(IV)

and further wherein the molar ratio of the units (I) relative to the sum of the units (II)+(III) ranges from 0.95 to 1.05; the number of units (II) in the mixture (II)+(III) ranges from 0 to 70 mol % and the number of units (III) relative to the same mixture ranges from 100 to 30 mol %; the number of units (IV) relative to the number of units (I) ranges from 5 to 100 mol %; and said copolyesteramides having a yield temperature ranging from 200° to 350° C.

4,925,912

AUTO-PHOTOCROSSLINKABLE COPOLYIMIDES AND POLYIMIDE COMPOSITIONS

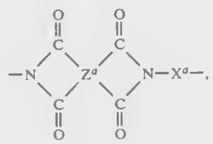
Ottmar Rohde, Basel, Switzerland; Stanley J. Jasne, Peekskill, N.Y., and Josef Pfeifer, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 133,407, Dec. 15, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,429

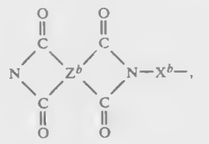
Int. Cl.[5] **C08G** *69/76*

U.S. Cl. 528—226 **11 Claims**

1. A copolyimide comprising 100–70 mol % of recurring structural units of the formula I and 0–30 mol % of recurring structural units of the formula II

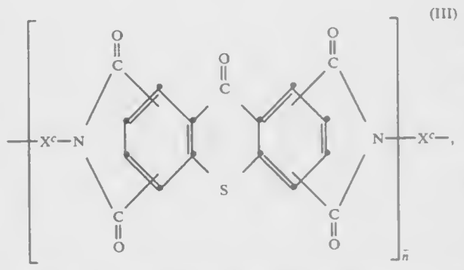


(I)



(II)

in which Z^a is a tetravalent aromatic tetracarboxylic acid radical other than that of thioxanthonetetracarboxylic acid, the carboxyl groups thereof in each case being located in pairs in the ortho-position or peri-position relative to one another, and X^a is a divalent aromatic diamine radical which, in at least one ortho-position relative to at least one nitrogen atom, carries a hydrocarbon substituent having at least one aliphatic α-hydrogen atom or X^a is a radical of the formula III



(III)

in which X^c is a divalent aromatic diamine radical which, in ortho-position relative to the two nitrogen atoms, carries in each case at least one monovalent hydrocarbon substituent having at least one aliphatic α-hydrogen atom, and $\bar{n}$ assumes an average value of 1.0 to 2.5, Z^b is as defined for Z^a and X^b is an aliphatic, cycloaliphatic, aromatic or araliphatic diamine radical, excluding a radical of the formula III, with the proviso that the proportion of radicals of the formula III in the formula I is selected such that the quantity of thioxanthonetetracarboxylic acid radicals, relative to the total quantity of tetracarboxylic acid units in the copolyimide, is between 5 and 30 mol %.

4,925,913

HEAT-RESISTANT UNSATURATED POLYESTER

Takero Teramoto, and Kazuhiro Watanabe, both of Kawasaki, Japan, assignors to Nippon Steel Corporation and Nippon Steel Chemical Co., Ltd., both of Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,965

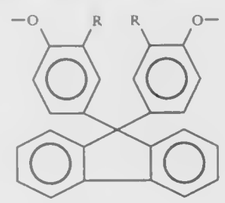
Int. Cl.[5] **C08G** *63/18*

U.S. Cl. 528—272 **3 Claims**

1. A heat-resistant unsaturated polyester having a structure represented by the formula (I):

$$(X—Y)_m\,(X—Y)_n \qquad (I)$$

wherein X represents a structure (A):



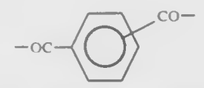
wherein

R represents hydrogen or an alkyl group having 1 or 2 carbon atoms:

Y represents a structure (B): **13** OC—CH=CH—CO—

represents a structure:

and



m and n independently represent a repeating number;

a mole ratio of Y/Z being 10/90 to 99/1;

said polyester having an inherent viscosity (η_{inh}) of at least 0.4 dl/g as determined at a temperature of 30° C. in a solution of 0.5g of the polyester in 100 ml of dimethylformamide.

4,925,914

CATALYTIC SUSPENSION/DISPERSION PREPARATION OF POLYAMIDES FROM POLYAMIDE FORMING SALT

John G. Dolden, Guildford, England; Gaynor P. Harris, and Matthew B. Studholme, both of Barry, Wales, assignors to BP Chemicals Limited, London, England

Filed Aug. 24, 1988, Ser. No. 235,671

Claims priority, application United Kingdom, Aug. 29, 1987, 8720490

Int. Cl.[5] **C08G** *69/30*

U.S. Cl. 528—336 **14 Claims**

1. A process for producing homopolyamides from a nylon forming salt formed from substantially equimolar proportions of a diamine and a dicarboxylic acid said process comprising:

(a) dispersing or suspending or dispersing and suspending in a liquid aliphatic hydrocarbon medium the nylon salt in a finely divided state thereof having uniformly preblended therein a solid hypophosphite catalyst and either,

(b) polycondensing the nylon salt containing the preblended catalyst so dispersed, suspended, or dispersed and suspended at a temperature above 100° C. but below the lower of the two temperatures representing the melting point of the nylon salt and the eventual polyamide product respectively where the polyamide product is a crystalline, or,

(c) polycondensing the nylon salt containing the preblended

VOL
1114
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catalyst so dispersed, suspended, or dispersed and suspended at
a temperature of about 15° to 20° C. below the melting point of the salt of at least 25° C. below the melting point of the crystalline product, whichever is the lower of the two.

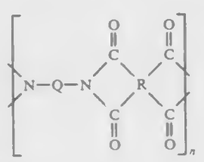
4,925,915

POLYMERS PREPARED FROM 4,4'-BIS(2-(AMINO(HALO) PHENOXYPHENYL) HEXAFLUOROISOPROPYL) DIPHENYL ETHER

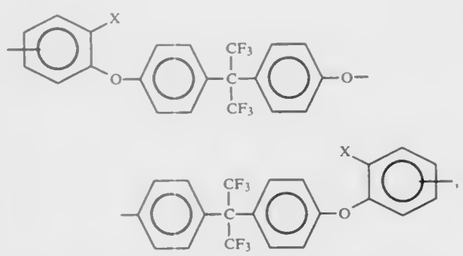
Werner H. Mueller, E. Greenwich; Dinesh N. Khanna; Rohitkumar H. Vora, both of W. Warwick, all of R.I., and Ruediger J. Erckel, Warren, N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Nov. 24, 1987, Ser. No. 124,704
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—353 **65 Claims**

1. A polyimide polymer having groups of the structure:



wherein
n is the number of repeating groups,
Q is



X is hydrogen or halogen,
R is a tetravalent organic radical having at least 4 carbon atoms.

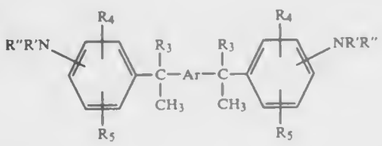
4,925,916

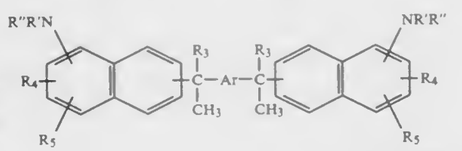
AMIDE AND/OR IMIDE CONTAINING POLYMERS AND MONOMERS FOR THE PREPARATION THEREOF

James E. Harris, Piscataway, N.J.; Abe Berger, Summit, N.J.; Vilas M. Chopdekar, Markus Matzner, both of Edison, N.J., and James Spanswick, Wheaton, Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 946,261, Dec. 24, 1986, Pat. No. 4,713,438, which is a continuation-in-part of Ser. No. 760,592, Jul. 30, 1985, abandoned, and Ser. No. 933,422, Nov. 21, 1986, abandoned, which is a continuation of Ser. No. 757,933, Jul. 23, 1985, abandoned. This application Nov. 18, 1987, Ser. No. 122,017
Int. Cl.[5] C08G *69/26*
U.S. Cl. 528—353 **8 Claims**

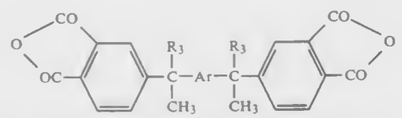
1. Polyimides derived from at least one of the following monomers:



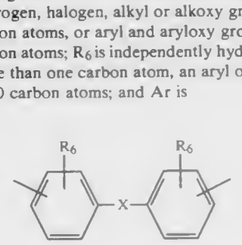


or isomers thereof,

and



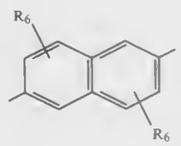
wherein R' and R'' are independently hydrogen, straight chain or branched C_1 to C_{10} alkyl and C_6 to C_{20} aryl groups; R' and R'' are hydrogens; R_3 is a phenyl, a CF_3 or an alkyl group having from 1 to 10 carbon atoms; R_4 and R_5 are independently hydrogen, halogen, alkyl or alkoxy groups having from 1 to 4 carbon atoms, or aryl and aryloxy groups having from 6 to 20 carbon atoms; R_6 is independently hydrogen or an alkyl having more than one carbon atom, an aryl or aryloxy having from 6 to 20 carbon atoms; and Ar is



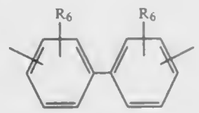
wherein X can be a chemical bond, O, S, SO, SO_2—,



CH_2, an alkylene or alkylidene having from 2 to 8 carbon atoms, a cycloalkylene or cycloalkylidene having from 5 to 14 carbon atoms, or a phenylene group which may be substituted by an alkyl or alkoxy group having from 2 to 4 carbon atoms, or by a halogen; the group Ar may also be selected from

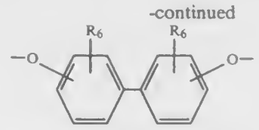


or an isomer thereof;



or an isomer thereof;

-continued



or an isomer thereof.

and wherein the subject monomers are used in an amount of at least 50 mole percent based on the total monomers used.

4,925,917

POLYMERIZATION OF OLEFIN/CARBON MONOXIDE WITH CATALYST COMPOSITION COMPRISING HALOGEN DICARBOXYLIC ACID

Richard L. Wife, and Pui K. Wong, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 30, 1988, Ser. No. 277,839
Claims priority, application Netherlands, Dec. 1, 1987, 8702879
Int. Cl.[5] C08G *67/02*
U.S. Cl. 528—392 **10 Claims**

1. A process for the preparation of alternating polymers of carbon monoxide and α-olefins, the process comprising contacting carbon monoxide and at least one α-olefin in the presence of a catalyst composition that comprises
(a) a palladium compound,
(b) a halogen dicarboxylic acid, and
(c) a phosphorus bidentate ligand of the general formula $R_1R_2P\text{-}R\text{-}PR_3R_4$, wherein R_1, R_2, R_3 and R_4 are similar or different aryl groups or polar substituted aryl groups and R is a bivalent organic bridging group containing at least two carbon atoms in the bridge.

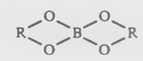
4,925,918

PROCESS FOR PREPARING POLYKETONES WITH BORON ANION

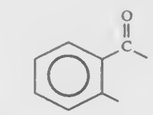
Stephen L. Brown, Middlesex, and Andrew R. Lucy, Surrey, both of England, assignors to The British Petroleum Company p.l.c., London, United Kingdom

Filed Sep. 27, 1988, Ser. No. 249,848
Claims priority, application United Kingdom, Oct. 8, 1987, 8723603
Int. Cl.[5] C08G *67/02*
U.S. Cl. 528—392 **9 Claims**

1. A process for preparing polyketones by polymerising a mixture of carbon monoxide and one or more olefins in the presence of a palladium catalyst characterised in that the palladium catalyst is prepared by reacting together:
(a) a source of palladium,
(b) a bidentate amine, phosphine, arsine or stibine having the formula $(R^1)_2M\text{-}R^2\text{-}M(R^1)_2$ wherein the M atoms are independently selected from nitrogen, phosphorus, arsenic or antimony, the R^1 groups are independently alkyl, cycloalkyl or aryl groups and R^2 is an alkylene group, and
(c) a source of an anion having the formula:



wherein the R groups are independently selected from the group consisting of C_1 to C_6 alkylene groups, ortho-phenylene or biphenylene groups or substituted derivatives thereof or groups having the formula:



or substituted derivatives thereof.

4,925,919

PURIFIED INTERLEUKIN 2

Roland Mertelsmann, 301 Millwood Rd., Chappaqua, N.Y. 10514; Karl Welte, 504 E. 81st St., New York, N.Y. 10028, and Salvatore Vennta, Via Cilea 183, 80127 Napoli, Italy

Division of Ser. No. 603,580, Apr. 25, 1984, Pat. No. 4,778,879, which is a continuation-in-part of Ser. No. 370,223, Apr. 20, 1982, abandoned. This application Jun. 10, 1988, Ser. No. 205,423
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[5] C07G *7/00*
U.S. Cl. 530—351 **22 Claims**

1. Purified human interleukin-2 having apparent homogeneity and characterized by:
(a) a molecular weight of about 14,500±2,000 daltons as measured by gel filtration and sodium dodecyl sulfate-polyacrylamide gel electrophoresis; and
(b) a specific activity of at least 9×10^5 U/mg in the murine interleukin-2 dependent cytotoxic T-cell line assay.

4,925,920

IMMUNOSUPPRESSIVE POLYPEPTIDES

John A. Mannick, Weston; Mary Rodrick, Beverly, and Richard Nimberg, Sharon, all of Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Filed May 29, 1987, Ser. No. 55,296
Int. Cl.[5] A61K *35/14*; C07C *103/52*
U.S. Cl. 530—387 **11 Claims**

1. Immunosuppressive polypeptide (ISP) and salts and derivatives thereof, substantially free of impurities, wherein said ISP has a molecular weight of about 5000 daltons and the following amino acid composition:

Amino Acid	Moles %
ASP	12
THR	3
SER	13
GLU	8
PRO	2.7
GLY	23
ALA	6
CYS	2.3
MET	4
VOL	3
ILE	1
LEU	2
TYR	1
PHE	2
HIS	1
LYS	3
ARG	13

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4,925,921

PRODUCTS OF COUPLING BIOLOGICAL SUBSTANCES BY COVALENT BONDS

Stratis Avrameas, Saint Cloud, and Thérèse M. F. Ternynck, Paris, both of France, assignors to Etablissement Declare d'Utilite Publique Dit. Institut Pasteur, Paris, France

Division of Ser. No. 561,629, Dec. 15, 1983, which is a continuation of Ser. No. 250,368, Apr. 2, 1981, abandoned, which is a continuation of Ser. No. 79,929, Sep. 28, 1979, abandoned, which is a division of Ser. No. 746,552, Dec. 1, 1976, Pat. No. 4,193,982. This application Mar. 24, 1986, Ser. No. 843,324
Claims priority, application France, Dec. 5, 1975, 75 37392
The portion of the term of this patent subsequent to Mar. 18, 1997, has been disclaimed.
Int. Cl.[5] C08G *83/00;* C07K *1/10;* C07H *21/00;* C12Q *1/68*
U.S. Cl. 530—389 1 Claim

1. The product of coupling two biological substances by covalent bonds by the steps of

(a) mixing a first substance dissolved in solution by at least about 200 times its molar amount of benzoquinone in a homogeneous liquid medium to activate said first substance, said first substance being selected from the group consisting of proteins, glycoproteins, polysaccharides and nucleic acids,

(b) removing the reaction products of step (a) and the excess benzoquinones and recovering the activated first substance; and

(c) contacting the activated first substance with the second substance to be coupled, said second substance being selected from the group consisting of proteins, glycoproteins, polysaccharides, nucleic acids and red blood cells, the product retaining a large proportion of the biological activities of the first and second substance.

4,925,922

POTENTIATION OF CYTOTOXIC CONJUGATES

Vera S. Byers, San Francisco, Calif.; Robert W. Baldwin, Long Eaton, England, and Patrick J. Scannon, Davis, Calif., assignors to Xoma Corporation, Berkeley, Calif.

Continuation of Ser. No. 7,045, Jan. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 896,999, Aug. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 875,256, Jun. 17, 1986, Pat. No. 4,708,862, which is a continuation of Ser. No. 468,193, Feb. 22, 1983, abandoned. This application May 8, 1989, Ser. No. 351,255
Int. Cl.[5] A61K *39/395*
U.S. Cl. 530—391 8 Claims

1. A method for potentiating the cytotoxicity of a cytotoxic immunoconjugate, said method comprising administering said immunoconjugate including a ribosomal inhibiting toxin bound to a first immunoglobulin which binds specifically to a first epitope of a tumor cell surface antigen and a potentiating amount of a second immunoglobulin which binds specifically to a second distinct epitope on said cell surface antigen, wherein said potentiating effect derives from the binding of said second immunoglobulin to said second distinct epitope.

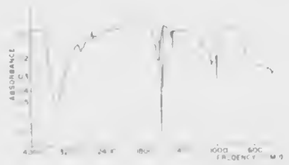
4,925,923

LIGNIN HAVING CHEMICALLY BOUND SULFUR AND PHOSPHORUS GROUPS MAINLY AS THIOPHOSPHATE, USING PHOSPHORUS PENTASULFIDE

Manssur Yalpani, Kirkland, and Leon Magdzinski, Montreal, both of Canada, assignors to Domtar Inc., Montreal, Canada

Continuation-in-part of Ser. No. 128,164, Dec. 3, 1987, abandoned. This application May 10, 1989, Ser. No. 350,051
Int. Cl.[5] C08H *5/02*
U.S. Cl. 530—506 14 Claims

1. A product comprising a lignin material substantially water insoluble, at neutral or acid pH, having a chemically bound sulfur content of at least 9.5% and a phosphorus content from 3.3 to 10% by weight of the lignin material, at least 50% by weight of said sulfur and phosphorus being in the form of thiophosphate, and wherein in said lignin material the mole ratio of sulfur to phosphorus S/P is at least 1.8, sulfur to aromatic unit, S/Ar is at least 0.7, and phosphorus to aromatic unit P/Ar is from 0.3 to 0.8, wherein said Ar in said mole ratios is arbitrary set to define an aryl propane unit having an average molecular weight of 242; said lignin material has infra-red absorption bands evidencing P=S groups in the vicinity of 730–750 cm^{-1}, P—S or Ar—S groups in the vicinity of 640–670 cm^{-1}, P—O—Ar groups in the vicinity of 1080–1110 cm^{-1} aromatic groups in the vicinity of 1490–1510 cm^{-1}, CH_2—S groups in the vicinity of 820–845 cm^{-1}, P—O—C groups in the vicinity of 965–995 cm^{-1}, said product being substantially free from sulfur which is not chemically bound to



said lignin material, said lignin material having chelating capacities for gold at pH 2 of at least 2.2 millimoles per gram of said lignin material, and wherein when said product is free from ether and other groups absorbing in the region of 1080–1110 cm^{-1}, the sum of the intensity of the bands in the vicinity of 640–670 cm^{-1} and 730–750 cm^{-1} over the intensity of the band in the vicinity of 1080–1110 cm^{-1} is greater than 1, and when said product comprises ether and other groups absorbing in the region of 1080–1110 cm^{-1}, the sum of the intensity of the bands in the vicinity of 640–670 cm^{-1} and 730–750 cm^{-1} over the intensity of the band in the vicinity of 1080–1110 cm^{-1} less the intensity in said region by said ether and said other groups absorbing in the region 1080–1110 cm^{-1}, is greater than 1.

4,925,924

BIOCOMPATIBLE SYNTHETIC AND COLLAGEN COMPOSITIONS HAVING A DUAL-TYPE POROSITY FOR TREATMENT OF WOUNDS AND PRESSURE ULCERS AND THERAPEUTIC METHODS THEREOF

Frederick H. Silver, Bangor, Pa.; Richard A. Berg, Lambertville, N.J.; charles J. Doillon, Edison, N.J.; Arkady Chernomorsky, Elizabeth, N.J., and Robert M. Olson, Princeton, N.J., assignors to University of Medicine and Dentistry of New Jersey, Newark, N.J.

Continuation-in-part of Ser. No. 843,828, Mar. 26, 1986, Pat. No. 4,703,108, which is a continuation-in-part of Ser. No. 593,733, Mar. 27, 1984, abandoned. This application Oct. 26, 1987, Ser. No. 113,547
Int. Cl.[5] C08F *220/32;* A61K *39/385, 15/00;* G01N *33/54*
U.S. Cl. 530—356 23 Claims

1. A collagen product comprising a porous mass of slices of porous collagen fibers, the porous mass having a dualtype porosity of channels and pores in which the channels form a labyrinthal-type structure extending between the slices and individual fibers, with some channels extending throughout the product, and in which the pores are contained in the fibers.

4,925,925

RADIOACTIVE RHENIUM LIGATED TO 2-HYDROXY ISOBUTYRIC ACID AND METHOD OF USE

Edward A. Deutsch, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Division of Ser. No. 206,880, Jun. 15, 1988, Pat. No. 4,839,467. This application Apr. 4, 1989, Ser. No. 332,735
Int. Cl.[5] C07F *13/00;* C01G *47/00*
U.S. Cl. 534—10 3 Claims

1. A method of bonding rhenium 186 or rhenium-188 to a chelating ligand comprising forming a complex $Re(O)L_1$-L_4-X^+ wherein L_1-L_4 represent 2-hydroxy isobutyric acid and X is an anion and reacting said $Re(O)L_1$-L_4-X^+ with a chelating ligand selected from the group consisting of multidentate ligands having chelating moieties selected from the group consisting of sulfur, nitrogen, phosphorous, arsenic, selenium, isonitrile, oxygen and combinations thereof.

4,925,926

PREPARATION OF CATIONIC AZO OR HYDRAZONE DYES IN WHICH THE ALKYLATION AND THE SEPARATION OF THE CATIONIC DYE ARE CARRIED OUT CONTINUOUSLY

Roland Ronco, Pfeffingen; Ermanno Ciapponi, Eiken, both of Switzerland, and Pierre Pessonneaux, Lyons, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1987, Ser. No. 129,575
Claims priority, application Switzerland, Dec. 15, 1986, 4986/86
Int. Cl.[5] C09B *43/00, 44/10, 67/34, 69/02*
U.S. Cl. 534—589 20 Claims

1. A process for the preparation of a cationic dye by alkylation of an azo or hydrazone dye that does not carry an electric charge, wherein the alkylation is carried out continuously and the reaction mixture, after the alkylation, contains sufficient electrolyte that a two-phase system forms, said system consisting of an aqueous eectrolyte solution which is substantially free from dye and a highly concentrated oily dyestuff phase or solid dye, and the dye is precipitated continuously from the two-phase system.

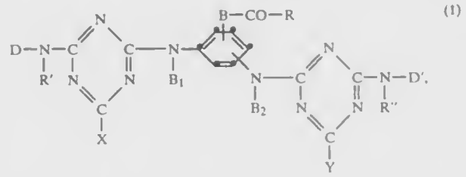
4,925,927

REACTIVE DYES CONTAINING A VINYLSULFONYLAMINOCARBONYL GROUP BOUND TO BIS-(TRIAZENYLAMINO)-BENZENE AS BRIDGING MEMBER OF TWO CHROMOPHORIC SYSTEMS

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

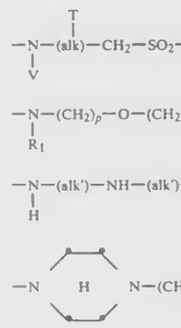
Filed Jun. 27, 1988, Ser. No. 212,393
Claims priority, application Switzerland, Jul. 3, 1987, 2542/87
Int. Cl.[5] C09B *62/002, 62/022, 62/04;* D06P *1/382*
U.S. Cl. 534—618 27 Claims

1. A reactive dye of the formula



(1)

in which D and D' are each independently of the other a radical of a monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone or perylenetetracarbimide dye, R', R'', B_1 and B_2 are independently of each other hydrogen or alkyl which has 1 to 4 carbon atoms and which is unsubstituted or substituted by halogen, hydroxyl, cyano, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, carboxyl, sulfamoyl, sulfo or sulfato, X and Y are independently of each other fluorine, chlorine, bromine, sulfo, C_1–C_4-alkylsulfonyl or phenylsulfonyl, B is a direct bond or a radical $—CH_{2n}$ or $—O—CH_{2n}$, n is 1 to 6; R is a radical of the formula



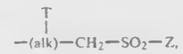
(1a)

(1b)

(1c)

(1d)

Z is β-sulfatoethyl, β-thiosulfatoethyl, β-phosphatoethyl, β-acetoxyethyl, β-haloethyl or vinyl; alk is alkylene having 1 to 6 carbon atoms or a branched isomer thereof; T is hydrogen, chlorine, bromine, fluorine, hydroxyl, sulfato, alkanoyloxy having 2 to 4 carbon atoms, cyano, carboxyl, alkoxycarbonyl having 1 to 5 carbon atoms, carbamoyl or a radical $—SO_2—Z$ in which Z is as defined above, V is hydrogen or alkyl which has 1 to 4 carbon atoms and is unsubstituted or substituted by carboxyl, sulfo, carbamoyl, N-methylcarbamoyl, N-ethylcarbamoyl, N,N-dimethylcarbamoyl, N,N-diethylcarbamoyl, cyano, acetyl, propionyl, butyryl, methoxycarbonyl, ethoxycarbonyl, propyloxycarbonyl, sulfamoyl, N-methylsulfamoyl, N-ethylsulfonyl, N,N-dimethylsulfamoyl, N,N-diethylsulfamoyl, methylsulfonyl, ethylsulfonyl, propylsulfonyl, alkoxy groups having 1 or 2 carbon atoms, halogen or hydroxyl, or a radical



(1e)

in which Z, alk and T are as defined above, R_1 is hydrogen or C_1–C_6-alkyl, each alk' is independently of the other one polymethylene having 2 to 6 carbon atoms or a branched isomer thereof, and m is 1 to 6, p is 1 to 6 and q is 1 to 6.

4,925,928

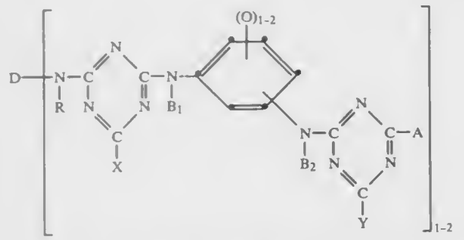
REACTIVE DYES CONTAINING VINYSULFONYLALKLYLAMINO BROUND TO A BIS-(TRIAZINYLAMINO)-BENZENE GROUP

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 23, 1988, Ser. No. 210,678
Int. Cl.[5] C09B *62/002, 62/022, 62/04;* D06P *1/382*
U.S. Cl. 534—618 40 Claims

1. A reactive dye of the formula

(1)



in which D is the radical of a monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthane, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone or perylenetetracarbimide dye, R, B_1 and B_2 are independently of each other hydrogen or alkyl which has 1 to 4 carbon atoms and which is unsubstituted or substituted by halogen, hydroxyl, cyano, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, carboxyl, sulfamoyl, sulfo or sulfato, X and Y independently of each other are fluorine, chlorine or bromine, sulfo C_1–C_4-alkylsulfonyl or phenylsulfonyl, A is an amino substituent which contains at least one group of the formula

$$-SO_2-Z \quad (2)$$

Z is β-sulfatoethyl, β-thiosulfatoethyl, β-phosphatoethyl, β-acetoxyethyl, β-haloethyl or vinyl, and Q is 1 or 2 substituents from the group consisting of hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, carboxyl or sulfo; except dyes of formula (1), wherein D is phthalocyanine and Y is fluorine.

4,925,929

GLUCOPYRANOSE DERIVATIVES

Masaaki Toda; Yntaro Sasaki, both of Osaka, and Katsuichi Shimoji, Kyoto, all of Japan, assignors to Ono Pharmaceutical Co. Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 938,308, Dec. 5, 1986, abandoned, and a continuation-in-part of Ser. No. 188,873, May 2, 1988, abandoned. This application Apr. 14, 1989, Ser. No. 338,090

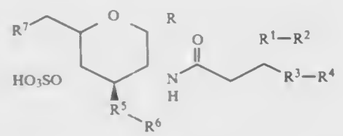
Claims priority, application Japan, Dec. 6, 1985, 60-273440; Sep. 6, 1986, 61-210379; May 1, 1987, 62-106298

Int. Cl.[5] **A61K** *31/00;* **C07H** *13/00, 11/00;* **C07D** *309/00*

U.S. Cl. 536—4.1 **29 Claims**

1. A glucopyranose compound of formula (I) or (IA):

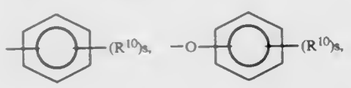
(I)



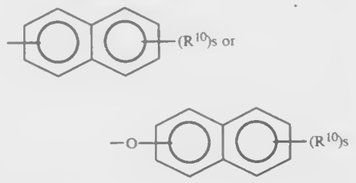
wherein R represents a hydrogen atom, a hydroxy group or an alkoxy group of from 1 to 4 carbon atom(s);

R^1 represents a single bond or an oxycarbonylalkylene group of from 2 to 20 carbon atoms;

R^2 and R^6, independently, represent a hydrogen atom or a general formula:



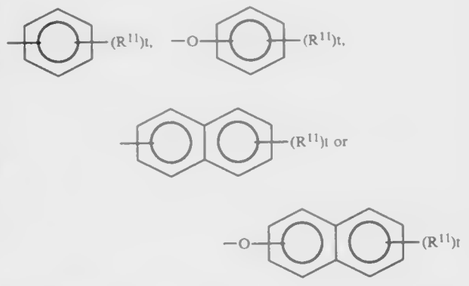
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wherein R^{10} represents a hydrogen atom, an alkyl or alkoxy group of from 1 to 7 carbon atom(s) or a halogen atom, and s represents 1, 2 or 3, respectively;

R^3 represents an alkylene group of from 1 to 20 carbon atom(s);

R^4 represents a hydrogen atom or a formula:



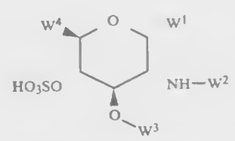
wherein R^{11} represents a hydrogen atom, an alkyl or alkoxy group of from 1 to 7 carbon atom(s) or a halogen atom, and t represents 1, 2 or 3;

R^5 represents an oxycarbonylalkylene group of from 2 to 20 carbon atoms;

R^7 represents a hydrogen atom or a hydroxy group;

with the proviso that R^2, R^4 and R^6 do not represent hydrogen atoms at the same time; or

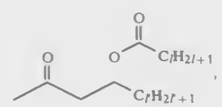
(IA)



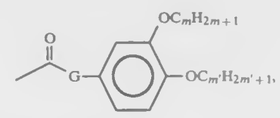
wherein W^1 represents a hydrogen atom, a hydroxy group or an alkoxy group of from 1 to 4 carbon atom(s);

W^2 represents a group represented by A, B, D or E:

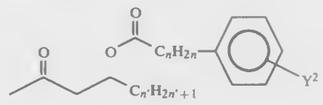
A represents a formula:



B represents a formula:

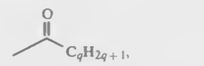


D represents a formula:



and

E represents a formula:



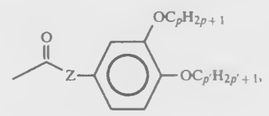
in each of A, B, D and E, l and q each represents an integer of 11∼15, m and m' each represents an integer of 6∼12, n represents an integer of 6–10, l' and n' each represents an integer of 9∼13,

G represents a single bond or an alkylene group of from 1 to 4 carbon atom(s);

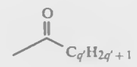
Y^2 represents a hydrogen atom, an alkyl or alkoxy group of from 1 to 7 carbon atom(s) or a halogen atom;

W^3 represents a group represented by L, M or Q:

L represents a formula:

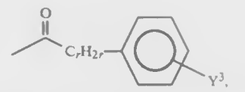


M represents a formula:



and

Q represents a formula:



in each of L, M and Q, Z represents a single bond or an alkylene group of from 1 to 4 carbon atom(s), p and p' each represents an integer of 6∼12, q' represents an integer of 11∼15, r represents an integer of 6∼10, Y^3 represents a hydrogen atom, an alkyl or alkoxy group of from 1 to 7 carbon atom(s) or a halogen atom;

W^4 represents a hydrogen atom, hydroxymethyl group or sulfoxymethyl group;

with the proviso that when W^4 represents hydroxymethyl group, (A,M), (A,Q), (D,M), (D,Q) and (E,M) as the combination of (W^2, W^3) are excluded, and when W^4 represents sulfoxymethyl group, (A,M) and (E,M) as the combination of (W^2, W^3) are excluded,

or a non-toxic salt of the glucopyranose compound.

4,925,930

SYNTHESIS AND ANTI-LEUKEMIC ACTIVITY OF ALKYL-1-(β-D-RIBOFURANOSYL)[1,2,4]TRIAZOLE-3-CARBOXIMIDATES

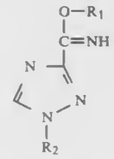
Roland K. Robins, Irvine, and Ganesh D. Kini, Costa Mesa, both of Calif., assignors to Nucleic Acid Research Institute, Costa Mesa, Calif.

Filed Nov. 2, 1988, Ser. No. 266,097

Int. Cl.[5] **C07H** *19/056*

U.S. Cl. 536—23 **5 Claims**

3. A compound of the structure:



wherein R_1 is methyl or ethyl and R_2 is β-D-ribofuranosyl.

4,925,931

N-HOMOCYSTEINE THIOLACTONYL RETINAMIDO COBALAMIN AND METHODS OF USE THEREOF

Kilmer S. McCully, 15 Wildwood St., Winchester, Mass. 01890

Filed Jul. 14, 1988, Ser. No. 219,499

Int. Cl.[5] **C07H** *19/167;* **C07D** *333/20;* **A61K** *31/365, 31/38*

U.S. Cl. 536—25 **5 Claims**

1. The compound homocysteine thiolactonyl retinamido cobalamin trans isomer characterized by the formula $(NHTR)_2Cob$, wherein NHTR is N-homocysteine thiolactonyl retinamide and Cob is cobalamin wherein the ultraviolet-vsible spectrum is represented by FIG. 1 with an absorption maximum at 640 nm.

4,925,932

PREPARATION OF DOUBLE SULFATE SALT OF DESOXYFRUCTOSYL SEROTONIN AND CREATININE

Raymond Bertholet, Blonay, and Pierre Hirsbrunner, Les Monts-de-Corsier, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 756,052, Jul. 17, 1985, Pat. No. 4,722,923. This application Nov. 13, 1987, Ser. No. 120,394

Claims priority, application Switzerland, Aug. 9, 1984, 3823/84

Int. Cl.[5] **C08B** *37/00;* **C07H** *5/04*

U.S. Cl. 536—55.3 **21 Claims**

1. A process for preparing a double sulfate salt of 1-desoxy-(5-hydroxytryptamino)-D-fructose and 1-methylhydantoin-2-imide comprising adding 1-methylhydantoin-2-imide to an aqueous solution of 1-desoxy-(5-hydroxytryptamino)-D-fructose and sulfuric acid having a pH of approximately 3 for forming a reaction medium including the double sulfate salt and then separating the double sulfate salt from mother liquor of the reaction medium.

19. A process for preparing 5-hydroxytryptamine comprising reacting a mixture of an excess of calcium hydroxide with 1-desoxy-(5-hydroxytryptamino)-D-fructose in the presence of water for obtaining an insoluble complex in the reaction mixture, separating the complex from mother liquor of the reaction mixture and adding sulfuric acid to the mother liquor for forming a calcium salt, separating the calcium salt from the mother liquor, adjusting the pH of the mother liquor to the isoelectric point of 5-hydroxytryptamine, extracting 5-hydroxytryptamine with an alcohol selected from the group consisting of a benzyl alcohol and an aliphatic alcohol containing from 4 to 8 carbon atoms eliminating the alcohol from the 5-hydroxytryptamine.

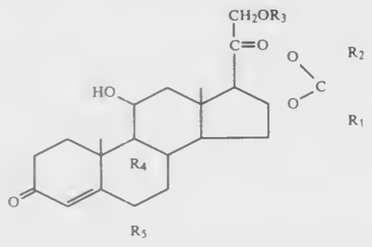
4,925,933

METHOD OF CONTROLLING THE EPIMERIC DISTRIBUTION IN THE PREPARATION OF 16,17-ACETALS OF PREGNANE DERIVATIVES

Edib Jakupovic, Nykvarn; Roy T. Sourander; Jan U. Stenhede, both of Södertälje, and Rolf P. Svensson, Rönninge, all of Sweden, assignors to Astra Pharmaceutical Production Aktiebolag, Sodertalje, Sweden

Filed Sep. 11, 1987, Ser. No. 96,598
Claims priority, application Sweden, Sep. 25, 1986, 8604059-9
Int. Cl.[5] C07J *17/00*
U.S. Cl. 540—63 **7 Claims**

1. A method of controlling the epimeric distribution in the preparation of 16,17-acetals of pregnane derivatives having the formula I



(I)

where in the 1,2-position is saturated or unsaturated;

R_1 represents a C_1–C_{12} straight chain or branched alkyl;

R_2 is different from R_1 and may be hydrogen, methyl or ethyl;

R_3 may be hydrogen or



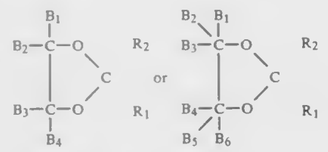
wherein R represents a C_1–C_{12} straight chain or branched alkyl group;

R_4 may be hydrogen, fluorine or chlorine;

R_5 may be hydrogen, methyl, fluorine or chlorine, comprising the steps wherein the corresponding 16,17-acetonides or 16,17-diols are reacted with an aldehyde or ketone having the formula

R_1COR_2

or its acetals



wherein R_1 and R_2 have the same meaning as in formula I and B_1–B_6 are the same or different and each representing hydrogen or an alkyl group with straight or branched hydrocarbon chains having 1–10 carbon atoms, in

(a) hydrocarbon solvent wherein the solubility of the pregnane derivative is less than 1 mg/l or in a halogenated hydrocarbon solvent together with a hydrohalogen acid or an organic sulphonic acid as catalyst and, when the solvent is a hydrocarbon, in the presence of small grains of an inert material or

(b) a halogenated hydrocarbon solvent together with a hydrohalogen acid or an organic sulphonic acid and as catalyst and in the presence of an epimeric distribution modifier selected from the group consisting of dimethylsulfoxide and N,N-dimethylformamide.

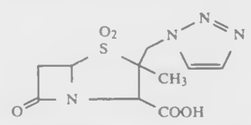
4,925,934

PROCESS FOR PREPARATION OF BETA-LACTAM DERIVATIVES

Masatoshi Taniguchi; Michio Sasaoka; Kiyotoshi Matsumura; Ichiro Kawahara; Kenji Kaze; Daisuke Suzuki, and Akihiro Shimabayashi, all of Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka and Taiho Pharmaceutical Co., Ltd., Tokyo, both of, Japan

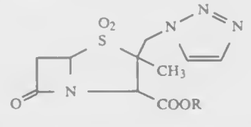
Filed Mar. 1, 1989, Ser. No. 317,322
Claims priority, application Japan, Mar. 2, 1988, 63-50230
Int. Cl.[5] C07D *499/08;* A61K *31/425*
U.S. Cl. 540—310 **6 Claims**

1. A process for preparing a β-lactam derivative represented by the formula



(I)

the process consisting essentially of reacting a β-lactam derivative represented by the following formula (II) and having a protected carboxyl group with a cresol;



(II)

wherein R represents a benzyl group having an electron-donating group as a substituent on the phenyl ring, a diphenylmethyl group which may have an electron-donating group as a substituent on the phenyl ring or a tert-butyl group.

4,925,935

METHODS FOR THE MANUFACTURE OF (1R,5S,6S)-2-[(6,7-DIHYDRO-5H-PYRAZOLO[1,2-A][1,2,4]TRIAZOLIUM-6-YL]THIO-6-[R-1-HYDROXYETHYL]-1-METHYL-CARBAPENEM-3-CARBOXYLATE

Toshio Kumagai; Hirosbi Matsunaga; Yoshisuke Machida; Yunosuke Nagase; Muneo Hikida, and Yoshimitsu Nagao, all of Shiki, Japan, assignors to Lederle (Japan), Ltd., Tokyo, Japan

Division of Ser. No. 130,121, Dec. 8, 1987, Pat. No. 4,866,171. This application May 26, 1989, Ser. No. 357,350
Claims priority, application Japan, Apr. 11, 1987, 62-89016
Int. Cl.[5] C07D *487/04;* A61K *31/40*
U.S. Cl. 540—350 **7 Claims**

1. A method for the preparation of (1R,5S,6S)-2-[(6,7-dihydro-5H-pyrazolo[1,2-a][1,2,4]triazolium-6-yl)]thio-6-[R-1-hydroxyethyl]-1-methyl-carbapenem-3-carboxylate, which comprises contacting (1R,5S,6S)-2-[4-pyrazolidinyl]thio-6-[R-1-hydroxyethyl]-1-methyl-carbapenem-3-carboxylic acid with ethyl formimidate hydrohalide under conditions to introduce iminomethyl substitution at each of the free hydrogen positions of the nitrogen atoms of the pyrazolidinyl nucleus.

4,925,936

RECOVERY OF NITRIC ACID AND SULFURIC ACIDS IN PRODUCTION OF BETA HMX

Michael L. Levinthal, Marshall, Tex., assignor to Thiokol Corporation, Chicago, Ill.

Filed Jun. 12, 1989, Ser. No. 365,105
Int. Cl.[5] C07D *225/02*
U.S. Cl. 540—475 **11 Claims**



1. In a process for the production of beta HMX by reacting hexamine, ammonia and acetic anhydride to produce diacetyl pentamethylenetetraamine (DAPT) in acetic acid and adding said DAPT to a mixture of nitric and sulfuric acids to convert the DAPT to 1,5-diacetyl-3,7-dinitro-1,3,5,7-tetraazacyclooctane (DADN), which DADN is nitrolyzed with nitrogen pentoxide and anhydrous nitric acid to form an HMX solution and the HMX solution is added to a dispersion of beta HMX seed crystals in water to precipitate beta HMX selectively from the HMX solution the improvement comprising recovering the spent sulfuric and nitric acid employed in said beta HMX production process by a process comprising maintaining the spent acid in the DAPT/DADN production steps separate from spent acid from the HMX production steps and treating the spent acid from the DAPT/DADN production steps in a sulfuric acid recovery unit to recover sulfuric acid of a concentration of at least 93% wt. and separately treating the spent acid from the HMX production steps in a magnesium nitrate nitric acid recovery unit to recover nitric acid of a concentration of at least about 90% wt.

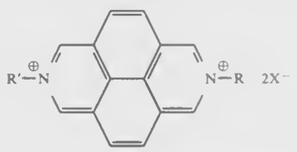
4,925,937

DIAZAPYRENE COMPOUNDS USEFUL FOR PHOTOCLEAVAGE OF NUCLEIC ACIDS

Jean M. Lehn; Jaroslaw Jazwinski, and John Blacker, all of Strasbourg, France, assignors to Compagnie Oris Industrie, Paris, France

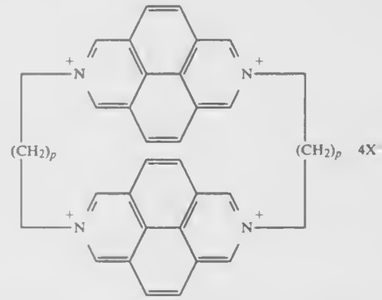
PCT No. PCT/FR87/00142, § 371 Date Dec. 15, 1987, § 102(e) Date Dec. 15, 1987, PCT Pub. No. WO87/06584, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 29, 1987, Ser. No. 141,607
Claims priority, application France, Apr. 29, 1986, 86 06212
Int. Cl.[5] C07D *401/14, 471/22;* C07H *21/00*
U.S. Cl. 540—477 **7 Claims**

1. A diazapyrene compound of the formula:



in which R is hydrogen or a lower alkyl group and R' is hydrogen or a substituted alkyl group selected from the group consisting of groups of the formulae $—(CH_2)_n—SH$, $—(CH_2)_n—OH$, and $—(CH_2)_n—NH_2$, in which n is from 1 to 10; X is an anion; and R and R' are not both hydrogen at the same time.

6. A compound of the formula



in which p is an integer from 1 to 15 and X is an anion.

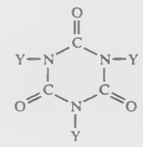
4,925,938

N-2,2-DIMETHYL-2-(2-HYDROXY-ALKYLPHENYL) HETEROCYCLES AND STABILIZED COMPOSITIONS

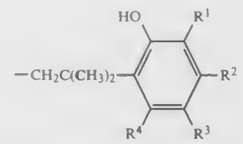
James P. Neilan, Bear, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Dec. 20, 1988, Ser. No. 287,253
Int. Cl.[5] C07D *251/04, 233/66, 207/40;* C08J *5/34*
U.S. Cl. 544—221 **7 Claims**

1. A hindered hydroxyphenyl alkyl isocyanurate having the formula:



wherein Y is



wherein R^1, R^2, R^3, R^4 are independently hydrogen or hydrocarbon radical containing 1–12 carbon atoms.

VOL 1114 ISS 3 MY 15 1990 UMI

4,925,939

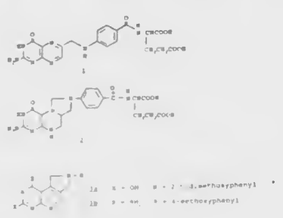
6,7-DIHYDROPYRROL[3,4-C]PYRIDO[2,3-D]PYRIMIDINE DERIVATIVES

Kyoichi A. Watanabe, Rye-Brook, assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

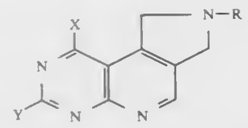
Filed Jan. 5, 1989, Ser. No. 293,940

Int. Cl.[5] **C07D** *239/000, 487/00*

U.S. Cl. 544—251 **5 Claims**



1. A compound having the structure:



wherein X and Y are the same or different and each is an OH, NH_2 or SH group; and

wherein R is a lower alkyl group, an aryl group, a substituted aryl group, an alkylaryl group or a substituted alkylaryl group and each substituent of the substituted aryl group or the substituted alkylaryl group is an lower alkyl group, an alkoxy group, or a halogen.

5. A compound of claim 1 selected from the group consisting of:

6-methyl-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-ethyl-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(n-propyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6(n-butyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-cyclopropyl-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-cyclopentyl-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-cyclohexyl-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-cyclohexylmethyl-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-phenyl-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2-methoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3-methoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(4-methoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,3-dimethoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,4-dimethoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,5-dimethoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,4-dimethoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,5-dimethoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,4,5-trimethoxyphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2-methylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3-methylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(4-methylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,3-dimethylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,4-dimethylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,5-dimethylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,4-dimethylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,5-dimethylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,4,6-trimethylphenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2-fluorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3-fluorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(4-fluorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2-chlorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3-chlorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(4-chlorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,3-difluorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,4-difluorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,5-difluorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,4-difluorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,5-difluorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,3-dichlorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,4-dichlorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,5-dichlorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,4-dichlorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,5-dichlorophenyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-benzyl-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2-methoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3-methoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(4-methoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,3-dimethoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,4-dimethoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,5-dimethoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,4-dimethoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(3,5-dimethoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione,

6-(2,4,5-trimethoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione, and

6-(3,4,5-trimethoxybenzyl)-6,7-dihydropyrrolo[3,4-c]pyrido[2,3-d]pyrimidine-2,4(1H,3H)-dione.

4,925,940

PREPARATION OF CYCLIC N,N'-DIMETHYLUREAS

Lothar Franz, Ludwigshafen; Manfred Eggersdorfer, Frankenthal, and Dieter Voges, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

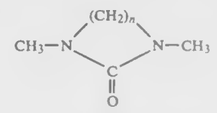
Filed Jan. 4, 1989, Ser. No. 293,358

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1988, 3800083

Int. Cl.[5] **C07D** *239/36, 233/34*

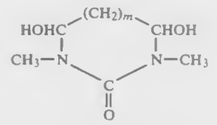
U.S. Cl. 544—315 **4 Claims**

1. A process for the preparation of a cyclic N,N'-dimethylurea of the formula (I)



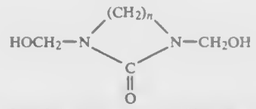
(I)

where n is 2 or 3, by hydrogenating a cyclic urea of the formula



(II)

where m is 0 or 1, or of the formula (III)



(III)

where n is 2 or 3, in the presence of hydrogen and of a hydrogenation catalyst, wherein the hydrogenation is carried out in the presence or absence of a mineral acid or an organic sulfonic acid or an acidic organic ion exchanger and in the presence of a palladium catalyst supported on an inorganic carrier selected from the carbonate, oxides, phosphates, silicates and sulfates of the elements of main groups II, III and IV of the Periodic Table, the palladium content of the catalyst ranging from 0.1 to 4% by weight, based on the total supported catalyst, the supported catalyst additionally may contain selenium and/or tellurium and/or oxides of rare earth metals, the content of the selenium and/or tellurium ranging from 0.1 to 5% by weight, based on the total supported catalyst and the content of the rare earth metal oxides, calculated as oxides and based on the total supported catalyst, ranging from 0.05 to 10% by weight.

4,925,941

PROCESS FOR THE MANUFACTURE OF A 2,3-DIHYDROXYQUINOXALINE, AND 2,3-DIHYDROXYQUINOXALINES THUS OBTAINED

Paul Deschrijver, Lennik, and Jean-Pierre Ganhy, Brussels, both of Belgium, assignors to Interox (Société Anonyme), Brussels, Belgium

Filed Mar. 4, 1988, Ser. No. 164,463

Claims priority, application France, Mar. 6, 1987, 87.03227

Int. Cl.[5] **C07D** *241/44*

U.S. Cl. 544—354 **6 Claims**

1. A process for the manufacture of a 2,3-dihydroxyquinoxaline by oxidation of an unsubstituted quinoxaline or a quinoxaline substituted on the benzene nucleus at positions 5, 6, 7, and 8 by means of hydrogen peroxide in an inert solvent, wherein the oxidation is performed in the presence of water and a catalyst consisting of selenium oxide.

4,925,942

PREPARATION OF QUINUCLIDINE-3-METHANOL

Josef Götz, Heidelberg; Winfried Orth, Hassloch; Wolfgang Weiss, Neckarhausen; Bernd Rapp, Ketsch, and Hans W. Kleffner, Battenberg, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Filed Jul. 24, 1989, Ser. No. 384,987

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1988, 3827117

Int. Cl.[5] **C07D** *453/02*

U.S. Cl. 546—133 **1 Claim**

1. A process for the preparation of quinuclidine-3-methanol comprising reacting quinuclidine-3-one acid addition salt with an alkali metal cyanide in an aqueous media to obtain 3-cyano-3-hydroxy-quinuclidine, reacting the latter with anhydrous methanol in the presence of hydrogen chloride gas followed by treatment with aqueous alkali to obtain methyl 3-hydroxy-quinuclidine-3-carboxylate, reacting the latter with thionyl chloride to form methyl 1-azabicyclo(2,2,2)oct-2-ene-3-carboxylate, hydrogenating the latter with Raney nickel to obtain methyl 1-azabicyclo(2,2,2)octane-3-carboxylate and reducing the latter to obtain quinuclidine-3-methanol.

4,925,943

2-(2-AMINOBENZYL OR 2-NITROBENZYL)-1,2,3,4-TETRAHYDROISOQUINOLINE DERIVATIVES

Isabelle Kanmacher, 12, rue Hardouin Mansart, Mittelhausbergen, F-67200 Strasbourg; Jean-Francois Stambach, 10, rue d'Andlau, F-67000 Strasbourg; Louis Jung, 205, route d'Oberhausbergen, F-67200 Strasbourg; Christa Schott, 7, square du Chateau, F-67300-Schiltigheim; Jean-Claude Stoclet, 13, boulevard Jean-Sebastian Bach, F-67000 Strasbourg, and Christiane Heitz, 3, rue des Bouvreuils, F-67100 Strasbourg, all of France

PCT No. PCT/FR87/00054, § 371 Date Jan. 5, 1988, § 102(e) Date Jan. 5, 1988, PCT Pub. No. WO87/05295, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 4, 1987, Ser. No. 124,793

Claims priority, application France, Mar. 5, 1986, 86 03201

Int. Cl.[5] **C07D** *217/04*

U.S. Cl. 546—149 **2 Claims**

1. 2-(2-amino-4,5-dimethoxybenzyl)-6-methoxy-1,2,3,4-tetrahydroisoquinoline, or a therapeutically acceptable acid addition salt thereof.

4,925,944

PROCESS FOR THE PREPARATION OF O-CARBOXYPYRIDYL- AND O-CARBOXYQUINOLYLIMIDAZOLINONES

Robert F. Doehner, Jr., East Windsor, N.J., assignor to American Cyanamid Company, Stamford, Conn.

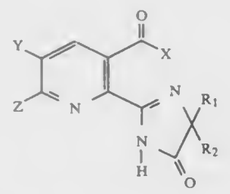
Filed Mar. 21, 1989, Ser. No. 326,846

Int. Cl.[5] **C07D** *401/04*

U.S. Cl. 546—167 **11 Claims**

1. A method for the preparation of o-carboxypyridiyl- and o-carboxyquinolylimidazolinones of formula I

VOL
1114
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I

wherein

X is OR_3 and or NR_4R_5;

Y is hydrogen, halogen, or C_1–C_6 alkyl optionally substituted by one or two C_1–C_4 alkoxy groups;

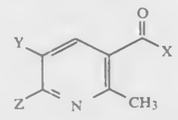
Z is hydrogen; and when Y and Z are taken together with the carbons to which they are attached, they may form a ring in which YZ is —CH=CH—CH=CH—;

R_1 and R_2 are C_1–C_4 alkyl or when taken together they may represent C_3–C_6 cycloalkyl optionally substituted with methyl and when R_1 and R_2 are not the same, the optical isomers thereof;

R_3 is C_1–C_6 alkyl, C_5–C_6 cycloalkyl or benzyl optionally substituted by one or two C_1–C_6 alkyl, C_1–C_4 alkoxy, or halo;

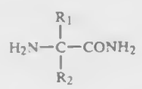
R_4 and R_5 are C_1–C_4 alkyl, or when taken together with the nitrogen to which they are attached, they may represent piperidinyl or morpholinyl;

comprising reacting a compound of formula II



II

wherein X, Y and Z are as described hereinabove for formula I; with one equivalent of a compound of formula III



III

wherein R_1 and R_2 are as described above for formula I; in the presence of about 50–300 weight%, based on the weight of the compound of formula II, of an aromatic solvent and in the presence of about 5.5–9.0 molar equivalents of sulfur at a temperature range of about 100° C. to 200° C.

4,925,945

CERTAIN -N-(AMINO BENZOYL)-N'-(PYRIDYLDITHIOALKANOYL)-HYDRAZINES AND DERIVATIVES THEREOF

Christian Klein, Weilheim, and Peter Kirch, Rott, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

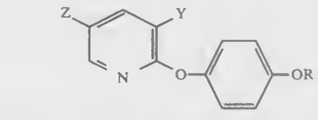
Filed Mar. 22, 1989, Ser. No. 327,304

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3809986

Int. Cl.[5] C07D *213/71;* C07K *15/00*

U.S. Cl. 546—292 **3 Claims**

1. A compound of the formula:



(I)

wherein A is an amino-substituted phenyl radical and X is a C_1–C_{10} hydrocarbon.

4,925,946

PREPARATION OF PYRAZOLO(5,1-B)QUINAZOLONES

Hartmut Kanter, Ludwigshafen, and Burkhard Ort, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

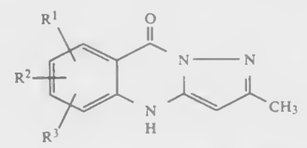
Filed Sep. 9, 1988, Ser. No. 242,132

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730535

Int. Cl.[5] C07D *487/04*

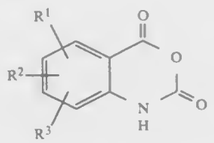
U.S. Cl. 544—250 **8 Claims**

1. A process for preparing a pyrazolo[5,1-b]quinazolone of the formula I



(I)

where R^1, R^2 and R^3 are identical or different and each is independently of the others hydrogen, fluorine, chlorine or bromine, by reacting an isatoic anhydride of the formula II



(II)

where R^1, R^2 and R^3 are each as defined above, with 3-methylpyrazol-5-one, which comprises performing the reaction in water as a reaction medium at from 40° to 150° C. under a pressure of from 1 to 5 bar.

4,925,947

PRECURSORS TO HERBICIDAL PYRIDINE COMPOUNDS

David Cartwright, Woodley, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 431,099, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 29,341, Apr. 11, 1979. This application Mar. 26, 1986, Ser. No. 843,839

Claims priority, application United Kingdom, Aug. 12, 1977, 34039/77; Oct. 26, 1977, 44541/77; Feb. 9, 1978, 5230/78

Int. Cl.[5] C07D *213/64*

U.S. Cl. 546—302 **1 Claim**

1. A compound of formula

wherein each of Z and Y, which may be the same or different, is hydrogen, fluorine, chlorine, bromine, iodine or halomethyl which is trifluoromethyl, difluoromethyl or chlorodifluoromethyl provided that at least one of Z and Y is halomethyl, and R is methyl.

4,925,948

2 AMINO 5 CHLORO THIAZOL-4-YL CYCLOALKENOXY IMINO ACETIC DERIVATIVES

Takao Takaya, Kawanishi; Hisashi Takasugi; Masayoshi Murata, both of Osaka, and Akiteru Yoshioka, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Division of Ser. No. 571,488, Jan. 17, 1984, Pat. No. 4,596,829, which is a division of Ser. No. 336,161, Dec. 31, 1981, Pat. No. 4,438,113. This application Mar. 28, 1986, Ser. No. 845,526

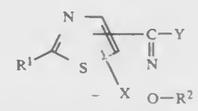
Claims priority, application United Kingdom, Dec. 31, 1980, 8041635; Mar. 23, 1981, 8108991; Sep. 1, 1981, 8126500

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[5] G07D *227/28*

U.S. Cl. 548—195 **2 Claims**

1. A compound of the formula:



wherein R^1 is amino or protected amino,

R^2 is C_3–C_8 cycloalkenyl,

X is halogen, and

Y is carboxy or protected carboxy, or a salt thereof

4,925,949

PROCESS FOR PREPARING 1-ALKYL-5-NITROIMIDAZOLES

Viviane Massonneau; Michel Mulhauser, both of Ecully; Claude Bonnamas, Communtry, and Noël Rony, Yerres, all of France, assignors to Rhone-Poulenc Sante, Antony, France

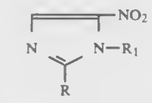
Filed Jan. 13, 1989, Ser. No. 296,709

Claims priority, application France, Jan. 15, 1988, 88 00414; Jun. 10, 1988, 88 07773

Int. Cl.[5] C07D *233/92, 405/06*

U.S. Cl. 548—336 **5 Claims**

1. A process for preparing 1-alkyl-5-nitroimidazoles of formula:



in which

R denotes hydrogen, alkyl of 1 to 4 carbon atoms or alkenyl of 2 to 4 carbon atoms, the said alkyl and alkenyl radicals being unsubstituted or substituted by one or more identical or different radicals chosen from phenyl, phenoxy and 5- or 6-membered oxygen-containing heterocyclic radicals;

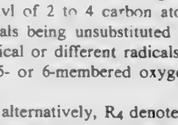
or alternatively R denotes aryl of 6 to 10 carbon atoms, unsubstituted or substituted by one or more identical or different substituents chosen from halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy, and nitro;

or alternatively R denotes cycloalkyl of 5 or 6 carbon atoms; the aforesaid phenyl, phenoxy and heterocyclic radicals being unsubstituted or substituted by one or more identical or different substituents chosen from halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy, and nitro;

and R_1 denotes alkyl of 1 to 12 carbon atoms in a straight or branched chain, which comprises: reacting an alkyl sulphate of formula:

$$R_1O—SO_2—OR_1$$

in which R_1 is defined as above, with an imidazole derivative of formula:



in which R is defined as above and X denotes a group which can be readily removed by hydrolysis or alcoholysis, in an organic solvent, and hydrolysing or alcoholysing the product obtained.

4,925,950

PROCESS FOR PREPARING 1-HYDROXYALKYL-5-NITROIMIDAZOLE

Viviane Massonneau; Michel Mulhauser, both of Ecully, and Albert Buforn, Lyons, all of France, assignors to Rhone-Poulenc Sante, Antony, France

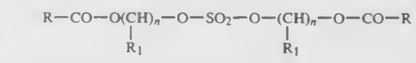
Filed Jan. 13, 1989, Ser. No. 296,688

Claims priority, application France, Jan. 15, 1988, 88 00416

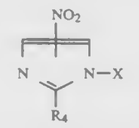
Int. Cl.[5] C07D *233/94, 405/06*

U.S. Cl. 548—338 **8 Claims**

1 A process for preparing a 1-hydroxyalkyl-5-nitroimidazole, which comprises: condensing a hydroxyalkylating agent of formula:



in which R denotes alkyl of 1 to 4 carbon atoms, *n* is 2 or 3, and the symbols R_1, which may be identical or different, denote hydrogen or alkyl of 1 to 4 carbon atoms, at 60 to 100° C. with an imidazole derivative of formula:



in which R_4 denotes hydrogen or alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, the said alkyl and alkenyl radicals being unsubstituted or substituted by one or more identical or different radicals chosen from phenyl, phenoxy, and 5- or 6-membered oxygen-containing heterocyclic radicals;

or alternatively, R_4 denotes aryl of 6 to 10 carbon atoms, unsubstituted or substituted by one or more identical or different substituents chosen from halogen, alkyl of 1 to 4

VOL
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carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy, and nitro;

or alternatively, R_4 denotes cycloalkyl of 5 or 6 carbon atoms: the aforesaid phenyl, phenoxy, or heterocyclic radicals being unsubstituted or substituted by one or more identical or different substituents chosen from halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy and nitro; and X denotes hydrogen or a hydroxymethyl radical, an alkoxymethyl radical in which the alkyl portion contains 1 to 4 carbon atoms, acyloxymethyl radical in which the acyl portion contains 1 to 4 carbon atoms, an allylic ethylenic radical, or an arylmethyl radical, hydrolysing or alcoholysing the product and isolating the 1-(hydroxyalkyl)imidazole.

4,925,951

PROCESS FOR PREPARING 1-HYDROXYALKYL-2-METHYL-5-NITROIMIDAZOLES

Viviane Massonneau; Michel Mulhauser, both of Ecully, and Albert Buforn, Lyon, all of France, assignors to Rhone-Poulenc Sante, Antony, France

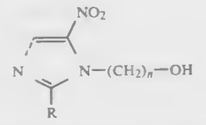
Filed Jan. 13, 1989, Ser. No. 296,708

Claims priority, application France, Jan. 15, 1988, 88 00417

Int. Cl.[5] **C07D** *233/94, 405/06*

U.S. Cl. 548—338 **6 Claims**

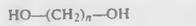
1. A process for preparing a 1-(hydroxyalkyl)nitroimidazole of formula:



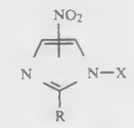
in which R denotes hydrogen, alkyl of 1 to 4 carbon atoms, or alkenyl of 2 to 4 carbon atoms, the said alkyl and alkenyl being unsubstituted or substituted by one or more identical or different radicals chosen from phenyl, phenoxy and 5- or 6-membered oxygen-containing heterocyclic radicals,

or alternatively, R denotes aryl of 6 to 10 carbon atoms, unsubstituted or substituted by one or more identical or different substituents chosen from halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy and nitro,

or alternatively R denotes cycloalkyl of 5 or 6 carbon atoms; the aforesaid phenyl, phenoxy and heterocyclic radicals being unsubstituted or substituted by one or more identical or different substituents chosen from halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy and nitro; and n is 2 or 3 and one of the carbon atoms of the alkylene chain $—(CH_2)_n—$ can be substituted by methyl, which comprises reacting a sulphite or diacetate of an alkylenediol of formula:



in which n is 2 or 3 and one of the carbon atoms of the alkylene chain $—(CH_2)_n—$ can be substituted by methyl at 80° to 140° C. with an imidazole derivative of formula:



in which R is defined as above and X denotes hydrogen or a radical which can be removed by hydrolysis or alcoholysis, in the proportion of one mole of said sulphite or diacetate per mole of said imidazole derivative and in the presence of one mole of a strong acid per mole of said imidazole derivative; hydrolysing or alcoholysing the condensation product obtained and isolating the 1-(hydroxyalkyl)nitroimidazole derivative.

4,925,952

PROCESS FOR PREPARING 1-HYDROXYALKYL-5-NITROIMIDAZOLES

Viviane Massonneau; Michel Mulhauser, both of Ecully; Albert Buforn, Lyons, and Bernadette Mandard-Cazin, Alfortville, all of France, assignors to Rhone-Poulenc Sante, Antony, France

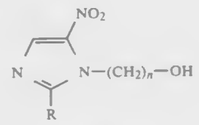
Filed Jan. 13, 1989, Ser. No. 296,710

Claims priority, application France, Jan. 15, 1988, 88 00415

Int. Cl.[5] **C07D** *233/94, 405/06*

U.S. Cl. 548—338 **7 Claims**

1. A process for preparing 1-(hydroxyalkyl)nitroimidazoles of formula:

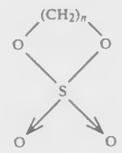


in which R denotes hydrogen, alkyl of 1 to 4 carbon atoms, or alkenyl of 2 to 4 carbon atoms, the said alkyl and alkenyl being unsubstituted or substituted by one or more identical or different radicals chosen from phenyl, phenoxy and 5- or 6-membered oxygen-containing heterocyclic radicals,

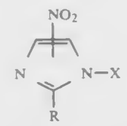
or alternatively, R denotes aryl of 6 to 10 carbon atoms, unsubstituted or substituted by one or more, identical or different, substituents chosen from halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy and nitro,

or alternatively, R denotes cycloalkyl of 5 or 6 carbon atoms;

the aforesaid phenyl, phenoxy and heterocyclic radicals being unsubstituted or substituted by one or more, identical or different, substituents chosen from halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenoxy or nitro; and n is 2 or 3 and one of the carbon atoms of the alkylene chain $(—CH_2—)_n$ can be substituted by methyl, which comprises reacting an alkylene sulphate of formula:



in which n is 2 or 3 and one or the carbon atoms of the alkylene chain $(—CH_2—)_n$ can be substituted by methyl, at 60° to 120° C. with a nitroimidazole of formula:



in which R is defined as above and X denotes a radical that can be removed by hydrolysis or alcoholysis; and hydrolysing or alcoholysing the product obtained and isolating the 1-(hydroxyalkyl)nitroimidazole product.

4,925,953

IMIDAZOLE DERIVATIVE

Minoru Tokizawa; Takemitsu Asaoka, both of Narita; Hideaki Matsuda, Abiko, and Tatsuhiko Katori, Ibaraki, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

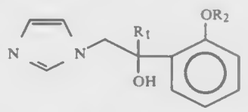
Filed Nov. 29, 1988, Ser. No. 277,308

Claims priority, application Japan, Dec. 9, 1987, 62-311576

Int. Cl.[5] **C07D** *233/60*

U.S. Cl. 548—341 **4 Claims**

1. An imidazole derivative represented by the following formula (I):



(I)

wherein R_1 represents an alkyl group, and R_2 represents a hydrogen atom or a nonheterocyclic aralkyl group which may have a substituent on the aryl moiety; or an acid adduct thereof.

4,925,954

VAT DYE BASED ON FLOURANTHENE

Manfred Patsch, Wachenheim; Gerhard Epple, Weisenheim; Helmut Flohr, Mainz; Helmut Degen, Frankenthal, and Uwe Nahr, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 913,377, Sep. 30, 1986, abandoned. This application Nov. 23, 1988, Ser. No. 275,601

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536259

Int. Cl.[5] **C07D** *209/56*

U.S. Cl. 548—417 **2 Claims**

1. A vat dye based on a condensate of monobromofluoranthene which contains not more than 7% dibromofluoranthene which is prepared by the process comprising:

reacting monobromofluoranthene containing no more than 7% by weight dibromofluoranthene with 1-amino-4-benzoylaminoanthraquinone in a 1:1 molar ratio;

condensing the reaction product of the first step at from 50°–70° C. in 83–88% strength by weight sulfuric acid to yield the carbazole compound; and

brominating the carbazole compound obtained to a bromine content of 20–23% by weight.

4,925,955

RESOLUTION OF (1S,4R)-1-ETHYL-1,3,4,9-TETRAHYDRO-4-(PHENYLMETHYL) PYRANO[3,4-B]INDOLE-1-ACETIC ACID USING BRUCINE

Andre A. Asselin, Lawrenceville, N.J., and Jean Schmid, Yardley, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 28, 1989, Ser. No. 316,623

Int. Cl.[5] **C07D** *493/04*

U.S. Cl. 548—432 **1 Claim**

1. An improved process for preparing (1S,4R)-(+)-1-ethyl-1,3,4,9-tetrahydro-4-(phenylmethyl)pyrano[3,4-b]indole-1-acetic acid which comprises

(a) dissolving one part by weight of (±)-1-ethyl-4-(phenylmethyl)-1,3,4,9-tetrahydro[3,4-b]indole-1-acetic acid and about 1.0 to 1.3 parts by weight of brucine in a minimal amount of hot ethanol;

(b) cooling the solution to crystallize the brucine salt of the distomer (1R,4S)-(−)-1-ethyl-1,3,4,9-tetrahydro-4-(phenylmethyl)pyrano[3,4-b]indole-1-acetic acid;

(c) removing said brucine salt of the distomer by filtration; wherein the improvement comprises

(d) concentrating the mother liquors;

(e) dissolving the brucine salt of the enriched eutomer in a mixture of ether and dilute aqueous hydrochloric acid;

(f) separating the ether layer; and

(g) isolating substantially pure (1S,4R)-(+)-1-ethyl-1,3,4,9-tetrahydro-4-(phenylmethyl)pyrano[3,4-b]indole-1-acetic acid by preferrential crystallization from ethanol water.

4,925,956

NOVEL PROCESS FOR MANUFACTURING OPTICALLY ACTIVE CARBACYCLIN INTERMEDIATES

Werner Skuballa, and Helmut Dahl, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Berghamen, Fed. Rep. of Germany

PCT No. PCT/DE87/00515, § 371 Date Jul. 13, 1988, § 102(e) Date Jul. 13, 1988, PCT Pub. No. WO88/03526, PCT Pub. Date May 19, 1988

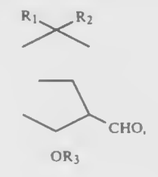
PCT Filed Nov. 12, 1987, Ser. No. 237,114

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638757

Int. Cl.[5] **C07D** *319/08;* **C07C** *177/00, 47/575;* **C07F** *7/18*

U.S. Cl. 549—214 **7 Claims**

1. A process for the manufacture of an optically active cis-bicyclo[3.3.0]octane-2-aldehyde of Formula I



(I)

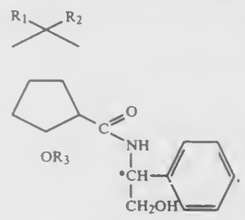
wherein

R_1 and R_2 jointly represent —O—X—O— where x is straight-chain or branched-chain alkylene of 1–7 carbon atoms, or

R_1 and R_2 individually represent the residue OR where R is straight-chain or branched-chain alkyl of 1–7 carbon atoms, and

R_3 is hydrogen, alkyl of 1–7 carbon atoms, aralkyl of 7–10 carbon atoms, tetrahydropyranyl, trialkylsilyl of 1–6 carbon atoms in the alkyl, which alkyl can also be substituted by phenyl, or dialkylphenylsilyl or alkyldiphenylsilyl each of 1–16 carbon atoms in the alkyl,

comprising separating diastereomeric amides of Formula II



(II)

wherein R_1, R_2 and R_3 have the meanings set forth above, and reducing the thus-obtained enantiomerically pure amide of Formula II to form said optically active compound of Formula I.

4,925,957

PROCESS FOR PRODUCING PYROMELLITIC DIANHYDRIDE

Norihide Enomoto, and Yoshihiro Naruse, both of Chiba, Japan, assignors to Kawasaki Steel Corp., Kobe, Japan

Filed Feb. 22, 1989, Ser. No. 314,367
Claims priority, application Japan, Feb. 24, 1988, 63-39472
Int. Cl.[5] C07D *307/91*
U.S. Cl. 549—239 7 Claims

1. A process for producing pyromellitic dianhydride by vapor-phase catalytic oxidation of durene with a molecular oxygen containing gas using a catalyst which comprises an inert support carrying vanadium oxide, sodium oxide, molybdenum oxide, and at least one additional component selected from among chromium oxide, manganese oxide, niobium oxide and titanium oxide, with the atomic ratios of the metallic elements in the supported oxides being within the following ranges: Na/V=0.1/10–1.0/10, Mo/V=0.3/10–3.0/10, Cr/V=0.2/10–2.0/10, Mn/V=0.1/10–1.5/10, Nb/V=0.5/10–3.0/10, and Ti/V=0.1/10–1.0/10.

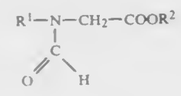
4,925,958

PROCESS FOR THE PREPARATION OF N-ALKOXYCARBONYLMETHYL-N-FORMYL-AMINES AND -ANILINES

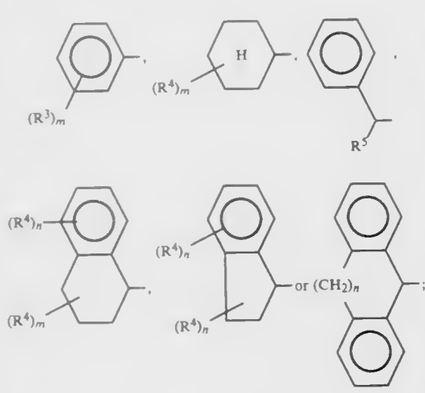
Roland Schmierer, Tottenweis, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 16, 1988, Ser. No. 207,766
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720245
Int. Cl.[5] C07C *101/44*
U.S. Cl. 560—43 8 Claims

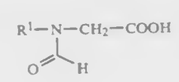
1. A process for the preparation of compound of the formula I



in which
R^1 is a radical of the formula



m is 0, 1, 2, 3 or 4;
n independently of one another area 0, 1 or 2;
R^2 is (C_1–C_6)-alkyl;
R^3 independently of one another are (C_1–C_3)-alkyl, halogen or (C_1–C_4)-alkoxy;
R^4 independently of one another are (C_1–C_3)-alkyl; and
R^5 is hydrogen, (C_1–C_4)-alkyl, phenyl or cyclohexyl, which comprises (a) reacting an amine of the formula II with at



II

III

least twice the molar amount of glyoxylic acid in the form of a 30 to 80% strength aqueous solution to give the carboxylic acid of the formula III and b) subsequently esterifying the carboxlyic acid of the formula III with an alcohol of the formula R^2OH.

4,925,959

DIOXANE ADDUCT OF 2-HYDROXYNAPHTHALENE-6-CARBOXYLIC ACID AND PROCESS FOR THE PREPARATION THEREOF

Helmold von Plessen, Königstein/Taunus, and Siegbert Rittner, Mörfelden-Walldorf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 9, 1989, Ser. No. 349,579
Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3815929
Int. Cl.[5] C07D *319/12*
U.S. Cl. 549—377 1 Claim

1. A dioxane adduct of 2-hydroxynaphthalene-6-carboxylic acid containing about 2 mol of 2-hydroxynaphthalene-6-carboxylic acid per mol of 1,4-dioxane.

4,925,960

PREPARATION OF D-α-TOCOPHEROL FROM NATURAL INTERMEDIATES

Peter Lechtken, Frankenthal; Ulrich Hoercher, Mannheim, and Barbara Jessel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,840
Claims priority, application Feu. Rep. of Germany, Apr. 22, 1988, 3813624
Int. Cl.[5] C07D *311/72*
U.S. Cl. 549—412 7 Claims

1. A process for the preparation of d-α-tocopherol from a mixture obtained from natural intermediates and containing α-, β, γ- and δ-tocopherols, by methylation at the aromatic ring of the tocopherols by reaction with formaldehyde or with a compound which donates formaldehyde under the reaction conditions, and subsequent catalytic hydrogenation, wherein the reaction with formaldehyde or with the formaldehyde donor is carried out at from 150° to 200° C. in the presence of an alkyl ester of phosphoric acid or of phosphorous acid.

4,925,961

PROCESS FOR THE PRODUCTION OF HEXAFLUOROPROPYLENE OXIDE

Masanori Ikeda; Morikazu Miura, both of Shizuoka, and Atsushi Aoshima, Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 72,189, Jul. 6, 1987, which is a continuation of Ser. No. 375,632, May 6, 1982, abandoned. This application May 3, 1989, Ser. No. 346,667
Claims priority, application Japan, May 6, 1981, 56-67834; Dec. 19, 1981, 56-205581; Dec. 26, 1981, 56-210487; Feb. 4, 1982, 57-15539
Int. Cl.[5] C07D *301/24*
U.S. Cl. 549—521 25 Claims

1. A process for producing hexafluoropropylene oxide from hexafluoropropylene using hypochlorite as an oxidizing agent, which comprises epoxidizing hexafluoropropylene in a two-phase system of an aqueous phase and an organic phase which is immiscible in the aqueous phase, said hypochlorite being dissolved or dispersed in the aqueous phase in the presence of an inorganic base at a temperature of between −25° C. and 60° C., in the presence of at least one lipophilic catalyst selected from the group consisting of (a) quaternary phosphonium salts, the total number of carbon atoms in quaternary phosphonium ion being not less than 10 per quaternary phosphonium ion, (b) quaternary arsonium salts, and (c) lipophilic complexing agents for cations contained in the hypochlorite, to produce hexafluoropropylene oxide.

4,925,962

TRIMETHYLALUMINUM PROCESS

William R. Beard, and Herbert M. Scull, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 24, 1988, Ser. No. 261,610
Int. Cl.[5] C07F *5/06*
U.S. Cl. 556—187 20 Claims

1. In a process for making trimethylaluminum by reacting a methyl halide with a trialkylaluminum compound having at least two carbon atoms in its alkyl groups under an inert atmosphere in the presence of a catalyst formed from a bismuth compound and recovering trimethylaluminum from the resultant reaction mixture, the improvement comprising adding said methyl halide to a reaction mixture at about atmospheric pressure containing said trialkylaluminum and said catalyst at a controlled rate such that said methyl halide reacts as it is added to form trimethylaluminum and an alkyl halide containing at least two carbon atoms while continuously distilling said alkyl halide and any unreacted methyl halide from the reaction zone thereby avoiding accumulation of either methyl halide or said alkyl halide in said reaction mixture and recovering trimethylaluminum from said reaction mixture.

4,925,963

PROCESS FOR REDUCTION OF ORGANOSILICON HALIDES

Everett M. Marlett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 12, 1989, Ser. No. 420,757
Int. Cl.[5] C07F *7/08*
U.S. Cl. 556—474 19 Claims

1. A process for reducing an organosilicon halide to an organosilicon hydride comprising reacting an amine alane with the organosilicon halide such that the organosilicon hydride is formed.

4,925,964

PROCESS FOR THE MANUFACTURE OF KETOXIMOSILANES

Günter Zoche, Bonn, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Mar, Fed. Rep. of Germany

Filed Nov. 7, 1989, Ser. No. 432,509
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1988, 3838897
Int. Cl.[5] C07F *7/10*
U.S. Cl. 556—422 2 Claims

1. In the method of preparing a ketoximosilane of the formula

$$(R_1)_nSi[O{-}N{=}C(R_2)_2]_{(4-n)} \quad (I),$$

wherein R_1 is alkyl of 1 to 18 carbon atoms or alkenyl of 2 to 18 carbon atoms,
n is an integer from 0 to 3, inclusive,
R_2 are identical or different alkyls of 1 to 6 carbon atoms, by reacting an acetoxysilane of the formula

$$(R_1)_nSi[OCOCH_3]_{(4-n)} \quad (II),$$

wherein R_1 and n have the meanings previously defined, with a ketoxime of the formula

$$HO{-}N{=}C(R_2)_2 \quad (III).$$

wherein R_2 has the meanings previously defined, which releases acetic acid, the improvement which comprises adding to the reaction mixture an aliphatic amine which forms with the released acetic acid an adduct which is liquid below +40° C., and isolating the ketoximosilane from the resulting 2-phase liquid system by separation of the adduct phase.

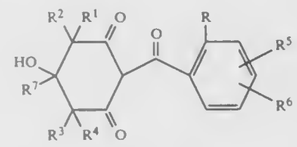
4,925,965

CERTAIN 2-BENZOYL-5-HYDROXY-4,4,6,6-TETRA-SUBSTITUTED-1,3-CYCLOHEXANEDIONES

Nhan H. Nguyen, San Francisco, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 19, 1987, Ser. No. 122,813
Int. Cl.[5] C07C *49/00*
U.S. Cl. 558—411 16 Claims

1. Compounds of the formula



wherein
R is hydrogen; halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; nitro; cyano; C_1–C_2 haloalkyl; or R^aSO_n— wherein n is 0 or 2 and R^a is C_1–C_2 alkyl, trifluoromethyl or difluoromethyl; or trifluoromethoxy or difluoromethoxy;
R^1 is hydrogen or C_1–C_4 alkyl;
R^2 is hydrogen or C_1–C_4 alkyl; or
R^1 and R^2 together are C_2–C_5 alkylene;
R^3 is C_1–C_4 alkyl;
R^4 is C_1–C_4 alkyl; or
R^3 and R^4 together are C_2–C_5 alkylene;
R^5 and R^6 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) R^eC-(O)— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined; and
R^7 is hydrogen, C_1–C_4 alkyl, C_2–C_5 alkenyl, C_2–C_5 alkynyl or cyano and their salts.

4,925,966

PROCESS FOR PRODUCING TRIFLUOROBENZENE COMPOUNDS

Hiroshi Kobayashi, Fukuoka, and Masaaki Shimizu, Kanagawa, both of Japan, assignors to SDS Biotech K.K., Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 243,753
Claims priority, application Japan, Sep. 14, 1987, 62-228286
Int. Cl.[5] C07C *121/54*
U.S. Cl. 558—419 6 Claims

1. A process for producing 2,4,5-trifluoroisophthalonitrile which comprises reacting tetrafluoroisophthalonitrile with a metal hydride at a temperature between −80° and 100° C. in an aprotic solvent.

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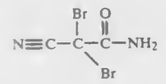
4,925,967

PROCESS FOR THE PREPARATION OF 2,2-DIBROMONITRILOPROPIONAMIDE

Joshua Hermolin, Ramat Hasharon, Israel, assignor to Bromine Compounds Limited, Israel

Filed Sep. 7, 1988, Ser. No. 241,493
Claims priority, application Israel, Sep. 15, 1987, 83902
Int. Cl.[5] C07C *121/417*
U.S. Cl. 558—445 14 Claims

1. A process for the preparation of a compound having the formula:



which process comprises:

contacting cyanoacetamide in aqueous solution with bromine or hydrobromic acid, in the presence of an oxidizing agent selected from the group consisting of hydrogen peroxide, $NaBrO_3$, $KBrO_3$, $NaClO_3$ and $KClO_3$, at a temperature above about 70° C.; and

cooling said reaction mixture so that said compound is precipitated.

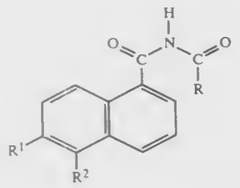
4,925,968

N-ACYL-N-NAPHTHOYLGLYCINES AS ALDOSE REDUCTASE INHIBITORS

Kazimir Sestanj, Monmouth Junction; Jay E. Wrobel, Lawrenceville, and Joseph M. Kelly, Bloomfield, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 137,479, Dec. 23, 1987. This application Jan. 9, 1989, Ser. No. 294,712
Int. Cl.[5] C07C *175/065*
U.S. Cl. 560—21 1 Claim

1. The chemical intermediate compounds of formula (VII)



VII

wherein R is hydrogen, lower alkyl containing 1 to 3 carbon atoms, lower alkoxy containing 1 to 6 carbon atoms, trifluoroethoxy, phenyl, benzyloxy, chloro- and nitro-substituted benzyloxy, or lower dialkylamino containing 1 to 3 carbon atoms; R^1 is hydrogen or lower alkoxy containing 1 to 3 carbon atoms and R^2 is halogen or lower perfluoroalkyl containing 1 to 3 carbon atoms.

4,925,969

PROCESS FOR PREPARING ETHYL-ALPHA-AMINO-GAMMA-OXO-GAMMA-PHENYBUTYRATE DERIVATIVES

Satomi Takahashi, Kobe; Yasuyoshi Ueda, Takasago; Kazuhiko Yamada, Akashi; Yukio Yamada, Kakogawa; Takehiko Yamane, Akashi; Yoshifumi Yanagita, Takasago; Yoshio Shimada, Kakogawa; Kiyoshi Watanabe, Akashi; Michio Nomura, Takasago; Takehisa Ohashi, and Kenji Inoue, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 289,421, Dec. 23, 1988, abandoned, and Ser. No. 246,007, Sep. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 28,939, Mar. 23, 1987, abandoned, said Ser. No. 289,421, is a continuation of Ser. No. 201;349, Jun. 1, 1988, abandoned, which is a continuation of Ser. No. 825,287, Feb. 3, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,497
Claims priority, application Japan, Feb. 4, 1985, 60-19483; Aug. 12, 1985, 60-178396; Mar. 27, 1986, 61-68970
Int. Cl.[5] C07C *101/10*
U.S. Cl. 560—41 14 Claims

1. A process for preparing (αS,1S)-ethyl-α-(1-carboxyethyl-)amino-γ-oxo-γ-phenylbutyrate from ethyl-β-benzoylacrylate and (S)-alanine, which comprises forming a lithium salt of (S)-alanine, reacting the obtained salt with at least an equivalent amount of trans-ethyl-β-benzoylacrylate based on the lithium salt in a solvent consisting essentially of ethanol at a temperature ranging from −10° C. to 60° C. to form a Michael addition product, and adding not less than an equivalent amount of acid after completion of the Michael addition to prevent conversion of the (αS,1S)-form of the product into the (αR,1S)-form.

7. A process for preparing N^2-(1-ethoxycarbonyl-3-oxo-3-phenylpropyl)-N^6-trifluoroacetyl-L-lysine from ethyl β-benzoylacrylate and N^6-trifluoroacetyl-L-lysine, which comprises forming a lithium, sodium or potassium salt of N^6-trifluoroacetyl-L-lysine reaction system in the presence of an alkali metal hydroxide from N^6-trifluoroacetyl-L-lysine, reacting the obtained salt with at least an equivalent amount of trans-ethyl-β-benzoylacrylate based on the lithium, sodium or potassium salt in a solvent consisting essentially of ethanol-water or ethanol at a temperature of not more than 10° C. to form a Michael addition product, and adding not less than an equivalent amount of acid after completion of the Michael addition to prevent conversion of the (S,S) form of the product into the (R,S) form.

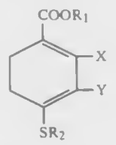
4,925,970

PROCESS FOR PRODUCING CYCLOHEXADIENE THIOETHER

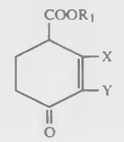
Richard W. Brown, 635 Amador St., Richmond, Calif. 94805

Filed Dec. 22, 1988, Ser. No. 290,018
Int. Cl.[5] C07C *67/30*
U.S. Cl. 560—125 8 Claims

1. A process for production of a cyclohexadiene thioether having the formula



in which R_1 is C_1–C_6 alkyl; R_2 is C_1–C_4 alkyl; X is C_1–C_4 alkyl or C_1–C_4 haloalkyl; and Y is hydrogen, halogen or C_1–C_4 alkyl, comprising reacting a compound having the formula



with a mercaptan having the formula R_2SH in the presence of an acid catalyst.

4,925,971

METHOD FOR PRODUCING ALIPHATIC O-ARYLURETHANES

Toshiya Aoki; Hiroshi Ishida, and Shinsuke Fukuoka, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1988, Ser. No. 279,177
Claims priority, application Japan, Dec. 8, 1987, 62-308744
Int. Cl.[5] C07C *125/075*
U.S. Cl. 560—137 14 Claims

1. A method for producing an aliphatic O-arylurethane from an aliphatic primary amine which comprises

(a) reacting an aliphatic primary amine with an aromatic hydroxyl compound and urea, and

(b) carrying out the reaction while removing ammonia by-produced in the reaction from the reaction system so that the ammonia concentration of the reaction solution is maintained at 2 wt% or less.

4,925,972

PREPARATION OF ALKYL PENTENOATES

Robert Maerkl, Fussgoenheim, and Wolfgang Harder, Weinheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 12, 1989, Ser. No. 378,794
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1988, 3825296
Int. Cl.[5] C07C *67/38*
U.S. Cl. 560—206 6 Claims

1. A process for preparing an alkyl pentenoate by

(a) reacting butadiene or a butadiene-containing hydrocarbon mixture with carbon monoxide and an alkanol in the presence of a tertiary aromatic heterocyclic nitrogen base and a cobalt carbonyl catalyst at from 80° to 160° C. under from 100 to 1,000 bar to obtain a reaction mixture which contains alkyl pentenoate, C_6-diester, tertiary nitrogen base, alkanol, butadiene, hydrocarbon and by-product,

(b) substantially removing from the reaction mixture obtained any excess hydrocarbon, nitrogen base, alkanol and alkyl pentenoate by distillation to obtain a residue which contains cobalt carbonyl catalyst,

(c) bringing the residue which contains cobalt carbonyl catalyst into contact with a mixture of carbon monoxide and hydrogen at elevated temperature and elevated pressure, and

(d) recycling the residue which contains cobalt carbonyl catalyst into alkyl pentenoate synthesis stage (a).

4,925,973

PREPARATION OF DIESTERS OF HEXENEDIOIC ACID

Helene Deweerdt, Toulouse; Jean Jenck, Chassieu, and Philippe Kalck, Castanet Tolosan, all of France, assignors to Rhone-Poulenc Chimie, Courbevole, France

Filed Jun. 13, 1989, Ser. No. 365,768
Claims priority, application France, Jun. 13, 1988, 88 08197
Int. Cl.[5] C07C *67/38*
U.S. Cl. 560—204 16 Claims

1. A process for the preparatron of a diester of 3-hexenedioic acid, comprising reacting carbon monoxide and an alcohol with at least one butene compound disubstituted by acyloxy groups, in the presence of (a) a catalytically effective amount of a palladium-based catalyst, and (b) a quaternary onium halide of nitrogen or phosphorus, said nitrogen or phosphorus being tetracoordinated to carbon atoms, with the proviso that the nitrogen may be coordinated to two pentavalent phosphorus atoms, and wherein the halide anion is the chloride or bromide.

4,925,974

PROCESS FOR PRODUCING BLOCKED, UREA GROUP-CONTAINING POLYISOCYANATES

Rainer Gras, Bochum, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,217
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739480
Int. Cl.[5] C07C *119/042, 119/045, 119/048;* C07D *211/56*
U.S. Cl. 560—336 20 Claims

1. A process for the production of a blocked urea group-containing polyisocyanate from a partially blocked polyisocyanate and a polyamine, comprising the steps of:

(i) reacting a partially blocked polyisocyanate, said polyisocyanate being made substantially free of monomeric polyisocyanate, by vacuum thin layer evaporation, with a primary polyamine, secondary polyamine, or mixtures thereof, in relative proportions such that the ratio of isocyanate groups to amino groups is in the range from about 1:1 to 1.3:1, and

(ii) isolating said urea group-containing polyisocyanate by wherein the vacuum boiling point of said polyisocyanate is lower than the deblocking temperature of said urea group-containing polyisocyanate.

4,925,975

METHOD OF PREPARING ALKALI METAL FLUOROALKYLSULFONATES OF HIGH PURITY

Minoru Aramaki; Kimitaka Okamoto; Hiroaki Sakaguchi, and Tamio Nakamura, all of Yamaguchi, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Apr. 21, 1989, Ser. No. 342,348
Claims priority, application Japan, Apr. 21, 1988, 63-96820
Int. Cl.[5] C07C *143/02*
U.S. Cl. 562—113 5 Claims

1. In a method of preparing a fluoroalkylsulfonate represented by the general formula $RfSO_3M$, where Rf is an perfluoroalkyl group having not more than 8 carbon atoms and M is an alkali metal, by reacting in liquid phase a fluoroalkylsulfonic acid represented by the general formula $RfSO_3H$, where Rf is as defined above, with carbonate or hydroxide of the alkali metal M,

the improvement comprising in carrying out the reaction between the fluoroalkylsulfonic acid and the alkali metal carbonate or hydroxide maintaining the reaction liquid acidic such that at the end of the reaction pH of the reaction liquid is lower than 6.

4,925,976

OLEFIN SULFONATION METHOD

Toshimi Terao, Chiba; Kentaro Kiyama, Chofu, and Kyozo Kitano, Narashino, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 616,025, May 31, 1984, abandoned. This application Mar. 26, 1986, Ser. No. 843,838
Claims priority, application Japan, May 31, 1983, 58-096725
Int. Cl.[5] C07C *143/02*
U.S. Cl. 562—123 3 Claims

1. A method for sulfonating olefins comprising the steps of: mixing (A) internal olefins having 8 to 22 carbon atoms with (B) alpha-olefins having an average carbon atom number larger by 3 to 7 than that of the internal olefins (A) in a weight ratio of (A)/(B)=95/5 to 5/95; and

sulfonating the resultant mixture with, as a sulfonating agent, at least one of liquid sulfur trioxide or gaseous sulfur trioxide.

4,925,977

METHOD FOR THE PREPARATION OF NAPHTHALENE DICARBOXYLIC ACIDS

Teruaki Yamada; Yoshiji Doko, and Kazuki Sugiura, all of Ibaraki, Japan, assignors to Sumikin Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,678
Claims priority, application Japan, Dec. 17, 1987, 62-319399
Int. Cl.[5] C07C *51/265*; B01J *38/64*
U.S. Cl. 562—416 **14 Claims**

1. In a method for the preparation of a naphthalene-dicarboxylic acid by catalytic oxidation of a diisopropylnaphthalene with molecular oxygen in a solvent containing a lower fatty acid in the presence of an oxidation catalyst system comprising a bromine compound and a compound of each of the heavy metals, cerium, cobalt, and manganese, the improvement wherein the oxidation catalyst further comprises a potassium compound.

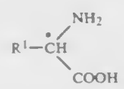
4,925,978

METHOD OF PREPARATION OF OPTICALLY ACTIVE ALPHA-AMINO-ACIDS

Sandro Di Gioacchino, Rome; Antonio Paolinelli, Monterotondo, and Luciano Re, Rome, all of Italy, assignors to Eniricerche S.p.A., Milan, Italy

Filed Apr. 14, 1988, Ser. No. 181,673
Claims priority, application Italy, Apr. 28, 1987, 20291 A/87
Int. Cl.[5] C07C *99/00*
U.S. Cl. 562—443 **12 Claims**

1. A process for the preparation of an optically active α-amino-acid of general formula (I)



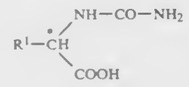
(I)

wherein

the asterisk denotes an asymmetric carbon atom having a particular stereo-chemical configuration, and

R^1 represents an optionally substituted alkyl, cycloalkyl, cycloalkenyl, aryl, or arylalkyl group,

via nitrosation of the corresponding N-carbamyl derivative of general formula (II)



(II)

wherein

R^1 is as defined above and the asterisk indicates that the absolute configuration of the starred carbon atom is the same as the corresponding carbon atom in the desired α-amino-acid (I), characterized in that

(a) the N-carbamyl derivative (II) is nitrosated first in a non-aqueous, aprotic system, by treatment with a nitrogen oxide, and

(b) the thus obtained intermediate product is then decomposed in acidic aqueous medium.

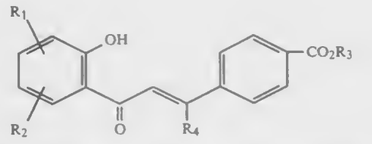
4,925,979

FLAVONE CARBOXYLIC ACID DERIVATIVES

Koichi Shudo, Tokyo, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan, a part interest

Division of Ser. No. 27,324, Mar. 18, 1987, Pat. No. 4,831,052.
This application Aug. 29, 1988, Ser. No. 237,787
Claims priority, application Japan, Mar. 18, 1986, 61-059850
Int. Cl.[5] C07C *59/76*
U.S. Cl. 562—462 **4 Claims**

1. An oxo-propenyl benzoic acid compound represented by the formula:



wherein R_1 and R_2, which may be the same or different, each represents hydrogen, lower-alkyl having C_3 to C_4, at least one of R_1 and R_2 being other than hydrogen, and being located at 5, 6, 7, or 8 positions, wherein R_1 and R_2 may be combined together at 6 and 7 positions optionally with an oxygen atom to form a 5–6 membered cycloalkyl or heterocyclic, which must be substituted with lower-alkyl (s), R_3 represents hydrogen or lower alkyl, and R_4 represents hydrogen or hydroxyl.

4,925,980

PROCESS FOR PRODUCING METHACRYLIC ACID AND A CATALYST

Mutsumi Matsumoto, and Yoshimasa Seo, both of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 363,008, Mar. 29, 1982, abandoned, which is a continuation of Ser. No. 44,269, May 31, 1979, abandoned. This application Feb. 1, 1985, Ser. No. 697,685
Claims priority, application Japan, Jun. 21, 1978, 53-74274
Int. Cl.[5] C07C *51/25, 57/055*
U.S. Cl. 562—534 **5 Claims**

1. A process for producing methacrylic acid by oxidation of methacrolein in vapor phase with molecular oxygen or a gas containing molecular oxygen characterized in that said oxidation of methacrolein is carried out in the presence of a catalyst of a mixture of a heteropolyacid and its salt which has a composition represented by the following formula:

$$Mo_aV_bP_cX_dY_eO_f$$

wherein Mo, V, P and O respectively represent molybdenum, vanadium, phosphorus and oxygen; X represents at least one element selected from the group consisting of potassium, rubidium, cesium and thallium; Y represents at least one element selected from the group consisting of copper, silver, tin, thorium, germanium, nickel, iron cobalt, titanium, rhenium, cerium and antimony and a, b, c, d, e and f represent the atomic ratio of said elements where a is 10, b is a number of 6 or less than 6 excluding 0, c is a number of 0.5 to 6, d is a number of 0.5 or less than 0.5 excluding 0, e is a number of 5 or less than 5 excluding 0 and f is a number determined by the valence and atomic ratio of the other elements.

4,925,981

METHOD OF ISOLATING METHACRYLIC ACID

Noboru Shimizu, Takatsuki; Hiroshi Yoshida, Toyonaka; Hiromiki Daigo, Minoo, and Shoichi Matsumoto, Ikeda, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 800,093, Nov. 20, 1985, which is a continuation of Ser. No. 458,536, Jan. 17, 1983, abandoned. This application Jan. 16, 1987, Ser. No. 3,864
Claims priority, application Japan, Jan. 22, 1982, 57-7492
Int. Cl.[5] C07C *51/48*
U.S. Cl. 562—600 **5 Claims**

1. A method of isolating and recovering methacrylic acid from a methacrylic acid-containing reaction product gas resulting from the vapor-phase catalytic oxidation of isobutylene, tertiary butanol or isobutyraldehyde, which comprises introducing the reaction product gas comprising methacrylic acid and various by-products including high boiling substances at a high temperature of 250° to 300° C. into a cooling zone constructed of sieve trays without a downcomer, rapidly cooling the gas therein to a temperature of not more than 100° C. to condense methacrylic acid and thus isolate methacrylic acid, while also converting the high boiling substances to fumes, thereafter introducing the cooled gas containing said fumes into a venturi scrubber, contacting it therein with an aqueous medium to remove said fumes, finally introducing the treated gas into a methacrylic acid-absorbing zone constructed of sieve trays without a downcomer and absorbing methacrylic acid by absorption into an aqueous medium.

4,925,982

PRODUCTION OF ISOCYANATE COMPOUNDS

Satoshi Urano, and Ryuzo Mizuguchi, both of Yawata, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation of Ser. No. 71,582, Jul. 9, 1987, abandoned, which is a continuation of Ser. No. 821,232, Jan. 22, 1986, abandoned, which is a continuation of Ser. No. 674,741, Nov. 26, 1984, abandoned. This application Jun. 16, 1988, Ser. No. 220,887
Claims priority, application Japan, Nov. 28, 1983, 58-225226; Nov. 15, 1984, 59-241876
Int. Cl.[5] C07C *145/02*
U.S. Cl. 562—871 **14 Claims**

1. A process for preparing acryloyl isocyanate, which comprises (a) reacting acrylamide with an oxalyl halide in a hydrogenated hydrocarbon at a temperature of −50° to 150° C. to give a reaction mixture comprising beta-halopropionyl isocyanate, (b) recovering beta-halopropionyl isocyanate from the reaction mixture by distillation and (c) reacting the recovered beta-halopropionyl isocyanate with a hydrogen halide-eliminating agent at a temperature of −50° to 200° C. to give acryloyl isocyanate.

4,925,983

BORONATED COMPOUNDS

Thomas F. Steckel, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 930,213, Nov. 12, 1986, abandoned. This application Apr. 14, 1988, Ser. No. 183,513
Int. Cl.[5] C07F *5/02*
U.S. Cl. 564—8 **19 Claims**

1. A process for boronating an amide, imide or Mannich base containing compound including the steps of mixing:

(a) a compound containing an amide, imide or Mannich base group which has present at least one amine group or salt thereof;

(b) a boronating agent, and;

(c) a protic compound in a weight ratio to the boronating agent of at least about 1:2, and;

(d) obtaining the boronated compound without removing the water of reaction as it is formed.

4,925,984

PARA-BROMINATION OF ORTHO-ALKYL ANILINES

John Y. Lee, and Lawrence H. Shepherd, Jr., both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 925,974, Nov. 3, 1986, abandoned. This application May 9, 1988, Ser. No. 191,349
Int. Cl.[5] C07C *85/24*
U.S. Cl. 564—412 **21 Claims**

1. A method of preparing a product predominant in p-bromo-o-alkylaniline, which process comprises, reacting an o-alkylaniline with unadsorbed bromine in a solvent selected from the group consisting of an inert di-, tri- or tetra-halogenated aliphatic hydrocarbon having from 1 to about 4 carbon atoms, an alkyl nitrile having 2 to about 4 carbon atoms, and mixtures thereof at a temperature sufficient to convert at least a portion of said o-alkylaniline to said p-bromo-o-alkylaniline.

4,925,985

NOVEL PROCESS FOR THE PRODUCTION OF 4,6-DIMETHYL-7-HYDROXYNONAN-3-ONE

David L. Williams; William B. Edwards, III, both of Richmond; Richard H. Cox; Daryl L. Faustini, both of Midlothian, and Surnease Drew, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 2, 1988, Ser. No. 266,162
Int. Cl.[5] C07C *45/67*
U.S. Cl. 568—384 **4 Claims**



1. In a process for the preparation of (±)-serricornin wherein 2,4-dimethyl-5-oxoheptanenitrile is converted to crude (±)-serricornin via a Grignard reaction the improvement which comprises

(1) subjecting said 2,4-dimethyl-5-oxoheptanenitrile to a base equilibration step by treatment of the same in an organic solvent in the presence of a base for a period of time sufficient to produce the thermodynamic diastereomer ratio dissolved in said organic solvent;

(2) reducing said dissolved 2,4-dimethyl-5-oxoheptanenitrile from step (1) to 2,4-dimethyl-5-hydroxyheptanenitrile with sodium borohydride in the presence of added base;

(3) subjecting said 2-4-dimethyl-5-hydroxyheptanenitrile from step (2) to a Grignard reaction to convert the same to crude (±)-serricornin;

(4) subjecting said crude (±)-serricornin to either of the following procedures

(a) treating said crude (±)-serricornin, dissolved in an organic solvent with an acid catalyst in order to produce an anhydroserricornin and then subjecting said anhydroserricornin to treatment with perchloric acid and dioxane in order to obtain purified (±)-serricornin; or

(b) forming the acetate from said crude (±)-serricornin followed by distillation and hydrolysis of the same to purified (±)-serricornin;

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(5) treating said purified (±)-serricornin from either A or B to a base equilibration step in order to obtain pure equilibrated (±)-serricornin.

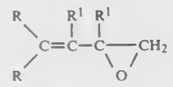
4,925,986

PREPARATION OF ALDEHYDES FROM UNSATURATED TERMINAL EPOXIDES

John R. Monnier, Fairport; Peter J. Muehlbauer, Spencerport, and Howard M. Low, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 13, 1989, Ser. No. 337,595
Int. Cl.[5] C07C *45/67, 45/70*
U.S. Cl. 568—450 **13 Claims**

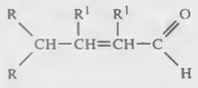
1. Process for the preparation of an unsaturated aldehyde, said process comprising isomerizing a terminal epoxide having an olefinic double bond on a carbon atom adjacent to a carbon atom in the epoxide ring, said epoxide having the formula:



wherein each substituent indicated by R is selected from the class consisting of hydrogen and alkyl radicals having up to about 4 carbon atoms, and each substituent indicated by R^1 is selected from hydrogen and alkyl groups of up to about 2 carbon atoms,

said process comprising contacting said epoxide at a temperature within the range of from about 100° C. to about 200° C., with a catalytic quantity of a catalyst selected from the class consisting of the chlorides, bromides and iodides of hydrogen, the iodides of alkali metals, and alkaline earth metals, and the chlorides and bromides of zinc, copper, aluminum, zirconium, titanium, vanadium, chromium, manganese and iron;

said unsaturated aldehyde product having the formula:



wherein R and R^1 each have the same significance as above.

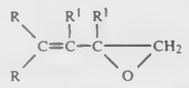
4,925,987

PREPARATION OF ALDEHYDES FROM UNSATURATED TERMINAL EPOXIDES

John R. Monnier, Fairport, and Howard M. Low, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 13, 1989, Ser. No. 337,493
Int. Cl.[5] C07C *45/67, 45/70*
U.S. Cl. 568—450 **10 Claims**

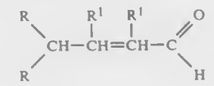
1. Process for the preparation of an unsaturated aldehyde, said process comprising isomerizing a terminal epoxide having an olefinic double bond on a carbon atom adjacent to a carbon atom in the epoxide ring, said epoxide having the formula:



wherein each substituent indicated by R is selected from the class consisting of hydrogen and alkyl radicals having up to about four carbon atoms, and each substituent indicated by R^1 is selected from the hydrogen and alkyl groups of up to about two carbon atoms.

said process comprising contacting said epoxide at a temperature within the range of from about 100° C. to about 350° C., with a catalytic quantity of a catalyst selected from binary metal oxides, mixed metal oxides, and mixtures of oxides of a Group IB or IIB metal;

said unsaturated aldehyde product having the formula:



wherein R and R^1 each have the same significance as above.

4,925,988

LOW FOAMING SURFACTANT

Brigitte H. Licht, Burlington; Roger T. Bentley, Guelph, and Frederick S. Schell, Kitchener, all of Canada, assignors to Hart Chemical Limited, Guelph, Canada

Continuation-in-part of Ser. No. 168,562, Mar. 7, 1988, abandoned, which is a continuation of Ser. No. 890,024, Jul. 28, 1986, abandoned. This application Aug. 17, 1988, Ser. No. 233,028
Int. Cl.[5] C07C *43/11*
U.S. Cl. 568—625 **3 Claims**

I. A liquid, low-foaming non-ionic surfactant composition having a molecular weight of about 1700 to about 2300 and having a structure represented by the formula:

R-O-X-Y-H

wherein R is a primary alkyl group having from about 6 to about 10 carbon atoms, X is a random mixture of oxyethylene and oxypropylene groups containing about 10 to about 12 oxyethylene groups and wherein the molar ratio of oxyethylene to oxypropylene groups is about 4:1, and Y is a polyoxypropylene block containing about 15 to about 25 oxypropylene groups.

4,925,989

MTBE PREPARATION FROM ISOBUTYLENE/TBA AND METHANOL IN PRESENCE OF AN ACID RESIN CATALYST

John J. Hagan, Spring, Tex., and Sheldon Herbstman, Spring Valley, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 1, 1987, Ser. No. 56,509
Int. Cl.[5] C07C *41/06*
U.S. Cl. 568—697 **1 Claim**

1. A method of producing methyl tertiary-butyl ether comprising feeding a mixture of tertiary-butyl alcohol and isobutylene with methanol into a distillation column having a packed sulfonic acid resin catalyst bed wherein said isobutylene is fed near the top of the bed, tertiary-butyl alcohol at the middle of the bed and methanol in the bottom of the bed to react said components and separate therefrom a substantially pure methyl tertiary-butyl ether product.

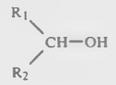
4,925,990

PROCESS FOR THE PREPARATION OF UNSATURATED ALCOHOLS

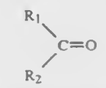
Jean-Michel Grosselin, and Claude Mercier, both of Lyons, France, assignors to Rhone-Poulenc Sante, Antony, France

Filed Nov. 29, 1988, Ser. No. 277,150
Claims priority, application France, Dec. 1, 1987, 87 16627
Int. Cl.[5] C07C *29/14, 27/04*
U.S. Cl. 568—862 **14 Claims**

1. A process for the preparation of an unsaturated alcohol of the formula:



in which each of R_1 and R_2, which are identical or different, represents a hydrogen atom, a saturated or unsaturated aliphatic radical of 1 to 30 carbon atoms, a saturated or ethylenically unsaturated aliphatic radical of 1 to 30 carbon atoms substituted by a saturated or ethylenically unsaturated alicyclic radical of 5 or 6 carbon atoms or by a phenyl radical, a saturated or ethylenically unsaturated alicyclic radical of 5 or 6 carbon atoms, or a phenyl radical, at least one of R_1 and R_2 containing an ethylenic double bond, or R_1 and R_2 together form an ethylenically unsaturated alicyclic radical of 5 or 6 carbon atoms, each of the aforesaid aliphatic, alicyclic or phenyl radicals being unsubstituted or substituted by one or more identical or different alkyl radicals of 1 to 4 carbons atoms each, hydroxyl radicals, or alkoxy radicals of 1 to 4 carbon atoms each, which comprises hydrogenating a carbonyl compound of the formula:



in which R_1 and R_2 are as defined above, with hydrogen in a two-phase medium consisting of an organic phase comprising the said carbonyl compound and an immiscible, essentially aqueous phase containing a water-soluble catalyst consisting of a ruthenium derivative associated with a water-soluble ligand or a complex of ruthenium with a water-soluble ligand.

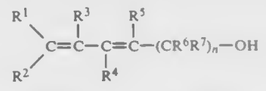
4,925,991

PREPARATION OF DIEN-1-OLS, 9-HYDROXYDODEC-10-ENYL 1-TERT-BUTYL ETHER AND USE THEREOF AS AN INTERMEDIATE FOR SYNTHESIZING 8,10-DODECADIENOL

Wolfgang Mackenroth, Bad Durkheim; Wolfgang Hoelderich, Frankenthal; Rainer Becker, Bad Durkheim, and Walter Seufert, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 235,478
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729225
Int. Cl.[5] C07C *29/60, 33/02*
U.S. Cl. 568—908 **5 Claims**

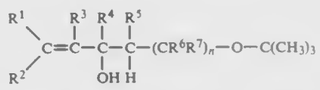
1. A process for preparing a dien-1-ol of the formula I



I

wherein the radicals R^1 to R^7 are identical to or different from each other and each is hydrogen or a straight-chain or branched alkyl of 1–12 carbon atoms and n is 1 to 14, which comprises:

dehydrating a hydroxyalkenyl t-butylether of formula II



II

in the presence of an acidic catalyst selected from the group consisting of a mineral acid, an organic acid, an acid anhydride and an aluminosilicate, borosilicate, iron silicate zeolite having a pentasil structure and combinations thereof at elevated temperatures and removing the t-butyl protective group from the compound by the presence of the acid catalyst.

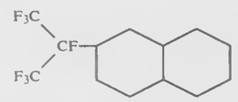
4,925,992

PERFLUORINATED 2-ISO PROPYL DERIVATIVE COMPOUNDS

Frank K. Schweighardt, Allentown; Webb I. Bailey, Fogelsville; John T. Lileck, Tamaqua; John K. Graybill, Macungie, and Eugene G. Lutz, Drums, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 89,293, Aug. 25, 1987, Pat. No. 4,873,315. This application Feb. 21, 1989, Ser. No. 313,129
The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.
Int. Cl.[5] C07C *17/02, 19/08*
U.S. Cl. 570—130 **1 Claim**

1. The perfluorinated compound having the formula:



wherein the carbon rings are fully fluorinated.

4,925,993

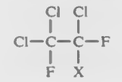
PROCESS FOR PREPARING CHLOROFLUOROCARBONS VIA AN IN SITU GENERATED ACTIVATED ALUMINUM TRICHLORIDE CATALYST AND PRODUCTS RESULTING THEREFROM

Robert C. Zawalski, Houston, Tex., assignor to Dixie Chemical Company, Pasadena, Tex.

Filed Jun. 14, 1989, Ser. No. 366,769
Int. Cl.[5] C07C *17/24, 17/20, 19/08*; B01J *31/00*
U.S. Cl. 570—151 **32 Claims**

9. A process for isomerizing chlorofluorocarbons comprising:

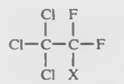
(i) contacting a chlorofluorocarbon of the formula:



(I)

wherein X is Cl or F with anhydrous $AlCl_3$ and a metal selected from the group consisting of stainless steel, chromium, manganese, molybdenum, tungsten and combinations thereof;

(ii) isomerizing said chlorofluorocarbon to the formula:

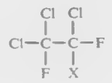


(II)

for a time and at a temperature sufficient for the compound of formula (I) to be less than approximately 10,000 ppm;

(iii) removing the organic layer from the product mixture of step (ii) and recovering the catalytic heel therefrom;

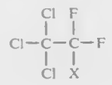
(iv) contacting with said catalytic heel, a second chlorofluorocarbon of the formula:



(III)

wherein X is Cl or F;

(v) isomerizing said chlorofluorocarbon of step (iv) to the formula:



(IV)

for a time and at a temperature sufficient for said second chlorofluorocarbon to be less than 450 ppm in the product mixture;

(vi) separating at least the majority of the organic phase from the resulting catalytic heel; and

(vii) isolating the isomerized chlorofluorocarbon of formula (IV) from said organic phase.

4,925,994

PROCESS FOR THE RING CHLORINATION OF AROMATIC HYDROCARBONS

Franz-Josef Mais, Duesseldorf, and Helmut Fiege, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

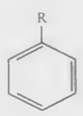
Filed Apr. 24, 1989, Ser. No. 342,500

Claims priority, application Fed. Rep. of Germany, May 6, 1988, 3815537; Jul. 15, 1988, 3824068

Int. Cl.[5] C07C *17/12*

U.S. Cl. 570—210 **20 Claims**

1. A process for the ring chlorination of an aromatic hydrocarbon of the formula



in which

R denotes straight-chain or branched C_1–C_{12}-alkyl or C_3–C_8-cycloalkyl, wherein said chlorination is conducted with chlorine or a chlorine-releasing substance in liquid phase and in the presence of at least one Friedel-Crafts catalyst and in the presence of at least one co-catalyst, wherein said at least one co-catalyst is a 1,6-benzothiazocin.

4,925,995

PROCESS FOR PREPARING LIQUID HYDROCARBONS

Karl H. Robschlager, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 16, 1989, Ser. No. 311,259

Claims priority, application United Kingdom, Mar. 21, 1988, 8806675

Int. Cl.[5] C07C *4/00*

U.S. Cl. 58.5—310 **6 Claims**

1. Process for preparing liquid hydrocarbons which comprises at least the following steps:

contacting an olefins-containing feed at oligomerization conditions with a solid oligomerization catalyst comprising nickel on a crystalline aluminum silicate carrier having the structure of a mordenite,

(ii) separating effluent from step (i) into at least two fractions of which at least one has a boiling range above that of the feed olefins,

(iii) recycling at least part of a higher boiling fraction obtained from step (ii) to step (i), and

(v) contacting at least part of a fraction from step (ii) having a boiling range above that of the feed olefins with a hydrocracking catalyst under hydrocracking conditions to produce a reaction effluent.

4,925,996

TWO STAGE PROCESS FOR CATALYTIC CONVERSION OF OLEFINS TO HIGHER HYDROCARBONS

Harry Mazurek, Bala Cynwyd, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

PCT No. PCT/US85/00770, § 371 Date Dec. 16, 1985, § 102(e) Date Dec. 16, 1985, PCT Pub. No. WO85/05102, PCT Pub. Date Nov. 21, 1985

PCT Filed Apr. 26, 1985, Ser. No. 817,853

Int. Cl.[5] C07C *2/12*

U.S. Cl. 585—312 **12 Claims**

1. A process for converting a feedstock comprising ethylene by catalytic oligomerization to produce heavier hydrocarbons in the gasoline or distillate boiling range which comprises:

(a) contacting the feedstock in a first catalytic reactor zone with a siliceous crystalline molecular sieve at an elevated temperature within the range of about 285° C. to about 425° C. and a relatively low ethylene partial pressure within the range of about 0.5 to about 5 atmospheres under conditions which maximize: (1) ethylene conversion and (2) selectivities to propylene, butylenes and normally liquid C_5+ hydrocarbons;

(b) separating the effluent stream from step (a) to produce a normally liquid C_5+ hydrocarbon fraction and a fraction comprising C_3–C_4 olefins; and

(c) contacting the fraction comprising C_3–C_4 olefins in a second reactor zone with a siliceous crystalline molecular sieve at a moderate temperature within the range of about 150° C. to about 330° C. under conditions favorable for conversion of C_3–C_4 olefins to a second reactor effluent stream rich in heavier hydrocarbons in the gasoline or distillate boiling range.

4,925,997

OXIDATIVE CONVERSION OF ORGANIC COMPOUNDS, TOLUENE AND ACETONITRILE

James B. Kimble, Bartlesville, and John H. Kolts, Ochelata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 947,235, Dec. 29, 1986, abandoned, Ser. No. 945,123, Dec. 22, 1986, Ser. No. 945,129, Dec. 22, 1986, abandoned, Ser. No. 938,907, Dec. 8, 1986, Pat. No. 4,774,216, Ser. No. 938,895, Dec. 8, 1986, Pat. No. 4,775,654, Ser. No. 891,009, Jul. 31, 1986, Pat. No. 4,895,823, Ser. No. 742,337, Jun. 7, 1985, and Ser. No. 742,335, Jun. 7, 1985, said Ser. No. 938,907, is a divisin of Ser. No. 742,340, Jun. 7, 1985, Pat. No. 4,658,077, said Ser. No. 938,895, is a division of Ser. No. 713,673, Mar. 19, 1985, Pat. No. 4,658,076, said Ser. No. 891,009, is a division of Ser. No. 713,674, Mar. 19, 1985, Pat. No. 4,672,145. This application Apr. 13, 1988, Ser. No. 180,873

Int. Cl.[5] C07C *2/00*

U.S. Cl. 585—428 **7 Claims**

1. A method for the oxidative conversion of feed organic compounds comprising at least one material selected from the group consisting of toluene and acetonitrile, comprising:

contacting said feed organic compounds and a free oxygen-containing gas with a solid contact material consisting essentially of: (A) at least one metal selected from the group consisting of Group IA metals; (B) at least one metal selected from the group consisting of Group IIA metals, Lanthanum Series metals, zinc, and titanium; and, (C) oxygen,

under reaction conditions wherein said toluene, when present, is converted to bibenzyl and stilbene, and said acetonitrile, when present, is converted to acrylonitrile.

4,925,998

PROCESS FOR DEHYDROHALOGENATING AROMATIC HALIDES

Thomas J. Abraham, Jr., Knoxville; Eric J. Fugate, Jonesborough; Guy R. Steinmetz, and Martin D. Dolfi, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,678

Int. Cl.[5] C07C *1/20*

U.S. Cl. 585—469 **22 Claims**

1. Process for dehydrohalogenating an aromatic halide which comprises contacting a reactant comprising one or more aromatic halides with hydrogen in the presence of a Group VIII metal catalyst and an alkyl halide-forming compound under dehydrohalogenation conditions of pressure and temperature, wherein the halide is bromide or iodide.

4,925,999

METHOD FOR NON-POLLUTION PROCESSING OF HALOGENATED ORGANIC COMPOUNDS

Taiji Yonezawa, Kyoto, Japan, assignor to Yonezawa Chemical Industry Co., Ltd., Kyoto, Japan

Filed Apr. 29, 1988, Ser. No. 188,565

Claims priority, application Japan, Aug. 11, 1987, 62-199223; Mar. 7, 1988, 63-5137

Int. Cl.[5] C07C *1/26*

U.S. Cl. 585—469 **5 Claims**

1. A method for non-pollution processing of a halogenated organic compound which comprises subjecting the said compound to combustion at a temperature of about 900°–1200° C. in the presence of charcoal, an oil and as a catalyst for cleaving the carbon halogen bonds in the halogenated organic compound, a compound of copper, nickel, manganese or iron.

4,926,000

BENZENE CONVERSION OVER ZSM-5

Roger A. Morrison, Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 30, 1988, Ser. No. 213,755

Int. Cl.[5] C07C *2/76*

U.S. Cl. 585—476 **49 Claims**

1. A process for converting benzene to a product comprising alkylbenzenes, alkylnaphthalenes and admixtures thereof, comprising reacting benzene with itself, in the presence of a catalyst composition comprising a zeolite, said zeolite exhibiting a Constraint Index of 1 to 12 and an alpha value of at least 50, by passing benzene over said catalyst at a temperature of 800°–1100° F., a pressure of 100–1500 psig, and a weight hourly space velocity of 0.1 to 5 WHSV; and recovering product.

4,926,001

METHOD FOR THE THERMAL CONVERSION OF METHANE TO HYDROCARBONS OF HIGHER MOLECULAR WEIGHTS

Jacques Alagy, Charbonnieres, and Christian Busson, Dardilly, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 7, 1986, Ser. No. 927,980

Claims priority, application France, Nov. 8, 1985, 85 16714; Mar. 18, 1986, 86 03970; Jun. 23, 1986, 86 09168

Int. Cl.[5] C07C *2/00*

U.S. Cl. 585—500 **17 Claims**

1. A method for the thermal conversion of methane to hydrocarbons of higher molecular weight in a continuous multichannel zone of ceramic material, consisting of a plurality of adjacent channels, said channels forming alternate rows of two different sets, the channels of the rows of the first set having means for introducing a fluid and means for discharging same, said channels extending over the entire length of the zone and the channels of the rows of the second set also extending over the entire length of the zone and being divided in at least one first and at least one second section, not communicating with one another, by an intermediate partition, each section having fluid introduction and discharge means, the channels of the rows of the first set not communicating with the channels of the rows of the second set, said method comprising circulating a gaseous mixture containing a molar percentage of methane of between 10 and 99% in the channels of the rows of the first set, circulating a heat exchange fluid in the channels of the first section of the rows of the second set, circulating a cooling fluid in the channels of said second section of the rows of the second set such that conversion of methane to higher hydrocarbons comprising a major amount of ethylene and aromatics takes place, and collecting said hydrocarbons of higher molecular weight at the end of the channels of the rows of the first set, wherein activated species of methane from a plasma torch are added to the gaseous mixture before said gaseous mixture is introduced into the channels of the rows of the first set.

11. A method for the thermal conversion of methane to hydrocarbons of higher molecular weight in a continuous multichannel zone of ceramic material, consisting of a plurality of adjacent channels, said channels forming alternate rows of two different sets, the channels of the rows of the first set having means for introducing a fluid and means for discharging



same, said channels extending over the entire length of the zone and the channels of the rows of the second set also extending over the entire length of the zone and being divided in at least one first and at least one second section, not communicating with one another, by an intermediate partition, each section having fluid introduction and discharge means, the channels of the rows of the first set not communicating with the channels of the rows of the second set, said method comprising circulating a gaseous mixture containing a molar percentage of methane of between 10 and 99% in the channels of the rows of the first set, circulating a heat exchange fluid in the channels of said first section of the rows of the second set, circulating a cooling fluid in the channels of said second section of the rows of the second set such that conversion of methane to higher hydrocarbons comprising a major amount of ethylene and aromatics takes place, and collecting said hydrocarbons of higher molecular weights at the end of the channels of the rows of the first set, wherein an effective amount of at least one initiator reagent comprising oxygen ozone or hydrogen peroxide is introduced into the gaseous mixture, said mixture being previously heated to a temperature of at least 300° C., before introducing said mixture into the channels of the rows of the first set, said initiator reagent being introduced in a quantity expressed in gram-atom oxygen percentage with respect to the quantity of methane expressed in mol of 0.01 to 10%.

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4,926,002

CATALYST FOR OLEFIN POLYMERIZATION

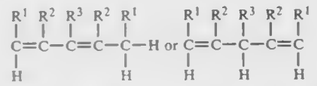
Tadanao Kohara, Kanagawa, and Satoshi Ueki, Saitama, both of Japan, assignors to Toa Nenryo Kogyo K. K., Tokyo, Japan

Division of Ser. No. 255,085, Oct. 7, 1988, Pat. No. 4,871,704. This application Jul. 11, 1989, Ser. No. 378,118
Claims priority, application Japan, Oct. 8, 1987, 62-252423
Int. Cl.[5] C07C *2/30*
U.S. Cl. 585—512 **6 Claims**

1. A process for the polymerization of one or more olefins having from 2 to 8 carbon atoms which comprises contacting the olefin(s) in a polymerization reactor under polymerization conditions in the presence of a catalyst comprising:

(i) a catalyst component obtained by reacting,

(a) a pentadiene represented by the formula:



wherein R^1 represents hydrogen, a hydrocarbyl group having from 1 to 8 carbon atoms, or a $-Si(OR^4)_3$ group, R^2 and R^3, which can be the same or different, each represents a hydrogen or hydrocarbyl group having one 1 to 8 carbon atoms and R^4 represents a hydrocarbyl group having 1 to 5 carbon atoms with

(b) an alkali metal, and contacting the product therefrom with,

(c) a Group 4b metal compound, and

(ii) an alumoxane.

4,926,003

PROCESS FOR COMBINING THE REGENERATORLESS OPERATION OF TANDEM SUPER-DENSE RISER AND FLUID-BED OLIGOMERIZATION REACTORS CONTAINING A ZEOLITE OLIGOMERIZATION CATALYST

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 184,465, Apr. 20, 1988, Pat. No. 4,877,921. This application Oct. 16, 1989, Ser. No. 422,325
Int. Cl.[5] C07C *2/02*
U.S. Cl. 585—517 **24 Claims**



1. A catalytic process for upgrading a C_2^+ olefin feedstream to a heavier product stream rich in C_{10}^+ aliphatic hyrocarbons in first and second oligomerization zones, said process comprising,

(a) contacting said olefin feedstream in said first zone with a finely divided medium pore size zeolite metallosilicate catalyst ('riser catalyst') having a silica:alumina ratio greater than 12, and a constraint index in the range from about 1 to about 12, at a weight hourly space velocity (WHSV) sufficient to maintain a transport zone, and, then with essentially the same catalyst maintained as a fluid bed, said first zone containing riser catalyst having a higher coke content than that of catalyst in said second zone maintained in a turbulent regime,

(b) producing a first distillate-rich gasoline effluent at a pressure above P_{max} and temperature T_{max}, under which conditions said first effluent is a super-dense fluid and there is no liquid phase present at least in the upper portion of said transport zone,

(c) separating riser catalyst from said first effluent, and separated riser catalyst, without stripping it, within said first oligomerization zone,

(d) maintaining said fluid bed with a lower average coke content than that of catalyst in said transport zone, so as to produce a second super-dense effluent having a higher C_{10}^+ aliphatic content than that of said first effluent,

(e) recovering said C_{10}^+ aliphatic hyrocarbons as a mixture which leaves about P_{max} and T_{max} for the mixture,

(f) withdrawing a minor fraction of spent fluid bed catalyst from said fluid-bed,

(g) replenishing said minor fraction of spent fluid bed catalyst with fresh catalyst, and,

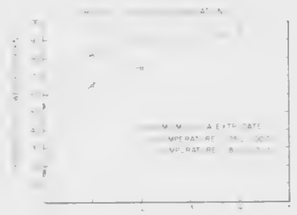
(h) withdrawing a minor fraction of spent riser catalyst from said first oligomerization zone; whereby regeneration of spent catalyst is avoided.

4,926,004

REGENERATION OF REDUCED SUPPORTED CHROMIUM OXIDE CATALYST FOR ALPHA-OLEFIN OLIGOMERIZATION

Bruce P. Pelrine, Trenton, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 9, 1988, Ser. No. 282,362
Int. Cl.[5] C07C *2/02*
U.S. Cl. 585—530 **12 Claims**



1. In a process for the preparation of liquid hydrocarbons suitable as lubricant basestocks from alpha olefin feedstock containing 6 to 20 carbon atoms, or mixtures of such olefins, comprising contacting said olefins under oligomerization conditions, at reaction temperature between 90° to 250° C. to vary product viscosity, and with a chromium catalyst on a porous support, which catalyst has been treated by oxidation at a temperature of 200° C. to 900° C. in the presence of an oxidizing gas and then by treatment with a reducing agent at a temperature and for a time sufficient to reduce said catalyst to a lower valence state to obtain an oligomeric liquid lubricant composition comprising C_{30}–C_{1300} hydrocarbons, said composition having a branch ratio of less than 0.19, weight average molecular weight between 420 and 45,000, number average molecular weight between 420 and 18,000, molecular weight distribution between 1 and 5 and pour point below −15° C., the improvement comprising; regenerating deactivated chromium catalyst under regenerating conditions in a process comprising the steps of:

(a) purging said deactivated catalyst with inert gas at elevated temperature and time sufficient to strip unreacted olefin and lubricant product;

(b) contacting said deactivated and purged catalyst with a stream of oxidizing gas while heating to elevated temperature at a rate and for a time sufficient to oxidize said catalyst and remove carbonaceous deposits;

(c) cooling said oxidized catalyst and contacting with a stream of reducing gas in an amount sufficient and at a temperature and for a time sufficient to reduce said oxidized catalyst to essentially lower valent chromium.

4,926,005

DEHYDROGENATION PROCESS

Michael E. Olbrich, Lake Jackson, Tex.; Dwight L. McKay, Bartlesville, Okla.; Dean P. Montgomery, deceased, late of Washington County, Okla., and by B. Jean, administratrix Montgomery, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 17, 1989, Ser. No. 353,849
Int. Cl.[5] C07C *5/327*
U.S. Cl. 585—632 **18 Claims**

1. In a process comprising the step of dehydrogenating a feed stream comprising at least one alkane having from 2 to 5 carbon atoms per molecule, in the presence of steam and a dehydrogenation catalyst composition comprising (i) at least one aluminate spinel selected from the group consisting of Group IIA metal aluminates and Group IIB metal aluminates, (ii) at least one metal selected from the group consisting of nickel, ruthenium, rhodium, palladium, osmium, iridium and platinum, and (iii) at least one compound of a metal selected from the group consisting of germanium, tin and lead, under such dehydrogenation conditions as to at least partially convert said at least one alkane to at least one alkene;

the improvement comprising a pretreating step which comprises passing said feed stream, prior to said step of dehydrogenating, through a fixed bed of a pretreating material comprising at least one aluminate spinel selected from the group consisting of Group IIA metal aluminates and Group IIB metal aluminates, under non-dehydrogenation conditions.

4,926,006

ALUMINOBOROSILICATE CONTAINING ALKALINE EARTH METAL, A METHOD FOR THE PREPARATION THEREOF AND A METHOD FOR THE CATALYTIC PREPARATION OF A LOWER OLEFIN THEREWITH

Kichinari Kawamura, Tsuchiura; Yasuo Kono, Tokuyama; Hideo Okado, Ushiku; Shigemitsu Shin, Yatabe, and Haruo Takaya, Abiko, all of Japan, assignors to Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 925,724, Oct. 30, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 221,109
Int. Cl.[5] C07C *1/00*
U.S. Cl. 585—640 **4 Claims**

1. A method for the catalytic conversion of methyl alcohol or dimethyl ether into lower olefins having 2 to 4 carbon atoms in a molecule which comprises bringing the vapor of methyl alcohol or dimethyl ether at a temperature in the range from 300° to 650° C. into contact with an aluminoborosilicate containing an alkaline earth metal element represented by the chemical composition of the formula

$$am^1_2O.bm^2O.Al_2O_3.dB_2O_3.cSiO_2.nH_2O,$$

in which M^1 is a monovalent atom selected from the group consisting of a hydrogen atom and atoms of alkali metals, M^2 is an atom of an alkaline earth metal, a is zero or a positive number not exceeding 2, b is a positive number in the range from 0.1 to 100, c is a positive number in the range from 12 to 3000, d is a positive number in the range from 0.06 to 120 and n is zero or a positive number not exceeding 30.

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4,926,007

SHIELDED FLEXIBLE CONNECTOR AND PROCESS THEREFOR

Brian E. Aufderheide, Cedarburg, and Gerald G. Hanauer, Mequon, both of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Mar. 3, 1989, Ser. No. 318,580
Int. Cl.[5] H01B 7/34, 7/08
U.S. Cl. 174—36 9 Claims



1. A flexible connector having a shielded portion, said connector comprising:

a flexible film substrate;

a base shield layer of an electrically conductive material on a surface of the substrate and including a first surface, side edges and end edges, said first surface of said base shield layer having an interior insulated area and an extending uninsulated area along each side edge for the length of the shielded portion of the connector;

a base insulating layer over the interior insulated area of the first surface of the base shield layer, said base insulating layer comprising an electrically insulating material;

a conductor layer including at least one electrical conductor extending through the shielded portion of the connector over at least a portion of the base insulating layer, said conductor being spaced apart and electrically insulated from the base shield layer by the base insulating layer;

a cover insulating layer extending for the shielded portion of the connector over at least a portion of the conductor layer and inside of the extending uninsulated areas along the side edges of the base shield layer; and

a cover shield layer of an electrically conductive material deposited over at least a portion of the cover insulating layer and being spaced apart and electrically insulated from the conductor layer by the cover insulating layer, said cover shield layer extending over the uninsulated areas along the side edges of the base shield layer to be in electrical and mechanical contact with said uninsulated areas for the length of the shielded portion of the connector;

wherein the base shield layer and the cover shield layer provide continuous shielding of the conductor against EMI and RFI for 360° around the conductor in a plane which is substantially normal to the flow of current through the conductor for the length of the shielded portion of the connector.

8. A method of making a flexible connector having a shielded portion, said method comprising the steps of:

applying a base shield layer of an electrically conductive material onto a flexible substrate;

applying a base layer of insulating material on top of an interior area of the base shield layer while leaving a longitudinal side edge area of the top of the base shield layer on each side of the interior area exposed for the length of the shielded portion of the connector;

applying over the base layer of insulating material at least one electrical conductor extending for at least the length of the shielded portion of the connector;

applying a cover layer of insulating material over the conductor while leaving the longitudinal side edge areas of the top of the base shield layer on each side of the interior area exposed; and

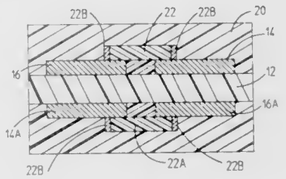
depositing a cover shield layer of electrically conductive material over the cover layer of insulating material and extending over the side edge areas of the top of the base shield layer so as to envelope the base and cover layers of insulating material and the conductor by the base and cover shield layers for the length of the shielded portion of the connector.

4,926,008

HIGH CAPACITANCE CABLE

Robert W. Shreeve, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 18, 1989, Ser. No. 353,949
Int. Cl.[5] H01B 7/08
U.S. Cl. 174—117 FF 16 Claims



1. A high capacitance cable comprising:

(a) a central continuous strip which is electrically insulating; said strip having upper and lower surfaces along its length;

(b) spaced-apart first and second conductors carried on said upper surface of said strip; said conductors extending along the length of said strip;

(c) spaced-apart third and fourth conductors carried on said lower surface of said strip; said conductors extending along the length of said strip;

(d) capacitors connected between said first and second conductors at periodic intervals; and

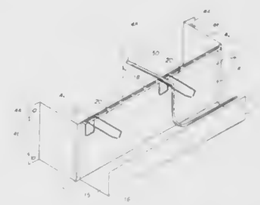
(e) electrical insulation surrounding said strip and said conductors.

4,926,009

APPARATUS FOR ORGANIZING EQUIPMENT CABLES

Robert J. Van Leeuwen, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 26, 1989, Ser. No. 357,243
Int. Cl.[5] H05K 7/14
U.S. Cl. 174—135 10 Claims



1. Apparatus for organizing equipment cables, comprising:

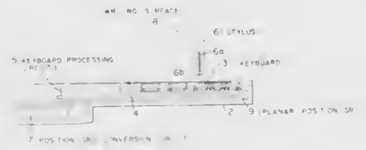
an elongate panel having a substantially flat face and a flange projecting substantially perpendicularly from an edge of the panel and extending along its length, the flange having therein a plurality of elongate slots spaced apart from and aligned with each other along the length of the flange; and

a plurality of resilient wire members, each having a substantially U-shaped base receivable in a respective slot of the flange, two substantially parallel arms projecting from the ends of the base, and two fingers projecting from the ends of the arms, said fingers having portions substantially

VOL
1114
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MY
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adjacent one another to form a resiliently openable gap for receiving a cable therebetween;
said elongate panel including means for engaging the base of each wire member to retain said member within the respective slot.

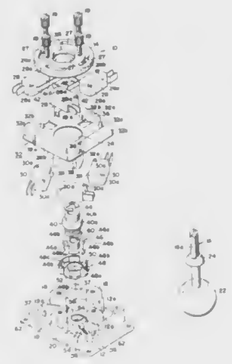
4,926,010
COMPACT KEYBOARD WITH ENTRY OF KEYED AND GRAPHIC INFORMATION
Howard M. Citron, Katonah, N.Y., assignor to Nynex Corporation, New York, N.Y.
Filed Jun. 30, 1989, Ser. No. 374,255
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 **12 Claims**



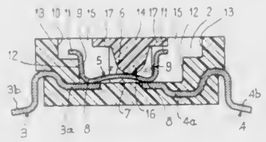
1. Apparatus for use in generating signals for inputting into a computer comprising:
a keyboard including:
first means comprising one or more actuatable keys for generating signals corresponding to each key which is actuated;
an extended two dimensional member positioned or positionable such that said extended two dimensional member and at least one or more of said keys are in overlapping relationship, said member capable of generating a signal designating a position on said member;
and said first means generating said signals corresponding to said keys independently of said extended two dimensional member.

4,926,011
MULTIOBJECTIVE SWITCH OPENING AND CLOSING APPARATUS
Takashi Saito, 29-4, Kumano-chyo, Itabashi-ku, Tokyo, Parkside Mansion 302, Japan
Filed Dec. 5, 1988, Ser. No. 279,951
Int. Cl.[5] H01H *25/04*
U.S. Cl. 200—6 A **6 Claims**

1. A multiobjective switch opening and closing apparatus comprising:
a support plate having a socket portion;
an operating lever pivotably and rotatably mounted on said socket portion, said operating lever having a gripping ball at one end portion thereof and a tube member at an opposite end portion thereof, said tube member having a small diameter portion and a large diameter portion;
a mounting plate fixed to said support plate;
a plurality of automatic-return first switches each having an actuator and each mounted on said mounting plate and spaced around said operating lever;
a plurality of automatic-return second switches each having an actuator and each mounted to said support plate and spaced around said operating lever, said mounting plate being positioned on said second switches;
a guide plate with guide hole arranged parallel to said support plate and mounted on said support plate upon said first switches;
a rotating member having a hole therein and rotatably mounted to said socket portion and loosely receiving said operating lever in said hole thereof, said rotating member having a circular pressing portion for pressing said second switches;
a turning force transmission member fixed to said operating lever, said transmission member being loosely engaged with said rotating member; and a coil spring arranged between said tube member and said transmission member, and surrounding said operating lever, whereby when said operating lever is pivotably moved, one or two first switches are operated by said tube member through actuators of said first switches, simultaneously one or two second switches are also operated through said transmission member and said pressing portion of said rotating member by rotating said operating member when said operating lever is rotatably moved, said one or two second switches are operated by said pressing portion of said rotating member through said transmission member, simultaneously said one or two first switches are operated through said tube member by pivoting said operating lever.

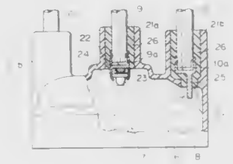


4,926,012
MINIATURE ELECTRIC SWITCH DESIGNED TO BE USED IN PARTICULAR IN PRINTED CIRCUITS
Hugues Pellerin de Beauvais, Paris, France, assignor to Societe d'Etude et de Construction de Materiel Electronique, Cedex, France
Filed May 25, 1989, Ser. No. 356,755
Claims priority, application France, Jun. 1, 1988, 88 07309
Int. Cl.[5] H01H *15/00*
U.S. Cl. 200—16 R **12 Claims**



1. An electric switch having a body of insulating material which contains at least one recess into which emerge first ends of at least two connection terminals second ends of which project outside said body and a switch mechanism comprising an electrically-conducting element fitted so as to slide in said recess between a first and second stable position, corresponding respectively to two states of the switch, characterized in that said electrically-conducting element comprises a stirrup having an elastic middle part which is substantially curved away from the bottom of said recess the ends of said middle part being in contact with said bottom and with said first ends of said connection terminals, and arms extending upwardly towards an opening of the recess in the body and appearing in windows defined by said opening on either side of an insulating element fixed to the body for retaining and elastically pressing said stirrup against the bottom of said recess by acting on said curved elastic middle part of said stirrup, said arms of said stirrup constituting the means for moving the latter between said first and second positions by action upon the ends of said arms through said windows.

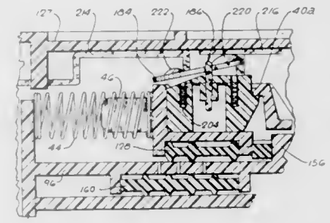
4,926,013
DISTRIBUTOR CAP WITH MOLDED CABLE TERMINALS
Seiki Kodama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 30, 1988, Ser. No. 238,078
Claims priority, application Japan, Sep. 16, 1987, 62-231522; Sep. 16, 1987, 62-141017[U]; Sep. 16, 1987, 62-141018[U]
Int. Cl.[5] H01H *19/00*; F02P *7/02*; H01F *31/00*
U.S. Cl. 200—19 DC **9 Claims**

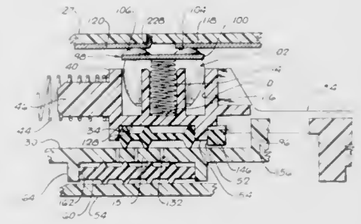


1. A distributor cap comprising:
a plurality of ignition cables;
a plurality of core wires individually extending through said ignition cables and having one ends thereof exposed at one ends of said ignition cables;
a plurality of terminal members individually fitted on outer peripheral surfaces of said one ends of said ignition cables, said terminal members being in electrical contact with said core wires;
a plurality of primary molds of a melt-adhesive resin material individually covering both said terminal members and said outer peripheral surfaces of said one ends of said ignition cables in such a manner that distal end portions of said terminal members are exposed; and
a synthetic resin cap body formed integral with said ignition cables and surrounding said primary molds.

4,926,014
PUSH BUTTON VACUUM-ELECTRIC AIR CONTROL DEVICE FOR AUTOMOTIVE VEHICLES
John G. Cummings, Cary, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.
Filed Jan. 4, 1989, Ser. No. 293,370
Int. Cl.[5] H01H *9/06*
U.S. Cl. 200—61.86 **12 Claims**

1. A vacuum-electric control device for automotive control systems, said device comprising
a housing,
a push button array including a plurality of push buttons for accomplishing various electrical and vacuum switching functions,
means in said housing for guiding each of said push buttons for sliding movement in a predetermined direction between extended and depressed positions,
each of said push buttons including a carriage member fixed thereon for sliding movement therewith and having first and second opposite sides facing away from each other,
said push buttons having respective soft resilient valve members fixedly mounted on the respective first sides of the respective carriage members for movement therewith,
a port member mounted fixedly in said housing and slidably engageable by said valve members and having port means traversed by at least certain of the valve members for accomplishing movement of the push buttons between extended and depressed positions,
said valve members having valve passage means therein for electively cooperating with said port means to accomplish the vacuum switching function,
respective movable electrical contactor means mounted on the respective second sides of the respective carriage members and movable therewith,
each contactor means including contactor point means having freedom of movement relative to the corresponding carriage member in a lateral direction relative to the predetermined direction of sliding movement of said carriage member,

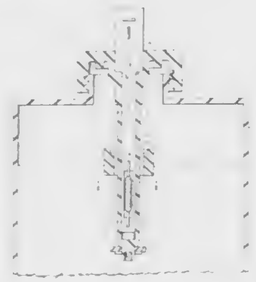




fixed contact means in said housing for selectively cooperating with said contactor point means of said contactor means for accomplishing at least one switching function in response to the movement of the push buttons between extended and depressed positions,
each of said contactor means including spring means for producing spring force between the corresponding carriage member and the corresponding contactor point means,
said spring force also producing spring pressure between the corresponding contactor point means and said fixed contact means,
said spring means additionally reacting against the corresponding carriage member and producing sealing force between the corresponding valve member and said port member to maintain said valve member in slidable sealing engagement with said port member.

VOL
1114
ISS
3
MY
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1990
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4,926,015
LIQUID LEVEL SENSOR HAVING A RETAINED BASE PLATE
Toshinori Takahashi; Chikahisa Hayashi; Yoshinori Takahashi, and Takanori Kantoh, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Filed Jun. 22, 1988, Ser. No. 209,905
Claims priority, application Japan, Jun. 22, 1987, 62-95688; Jun. 29, 1987, 62-100139
Int. Cl.[5] H01H *35/18*
U.S. Cl. 200—84 C **17 Claims**



2. The liquid level sensor as defined in claim 1, wherein said base plate has an accommodation hole, said switch member being partially mounted in said accommodation hole.

4,926,016
MOVING CONTACT BLADE BARRIER
David A. Leone; Clifford A. Buxton, both of Lawreoceville, and Don Quinton, Stone Mountain, all of Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.
Filed Sep. 8, 1988, Ser. No. 242,092
Int. Cl.[5] H01H *33/04, 33/12*
U.S. Cl. 200—144 R **8 Claims**



1. An insulating apparatus for spacing a plurality of contact blades, wherein the contact blades each define a bottom surface, comprising:
means for spacing the contact blades; and
means for shielding the bottom surfaces of the contact blades from an arc.

4,926,017
VACUUM BREAKER
Shinichi Aoki, and Eizo Naya, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 24, 1988, Ser. No. 172,490
Claims priority, application Japan, Mar. 24, 1987, 62-69480; May 29, 1987, 62-136672
Int. Cl.[5] H01H *33/66*
U.S. Cl. 200—144 B **18 Claims**

1. A vacuum breaker comprising:
a switch tube maintained under vacuum,
a first electrode arranged in said switch tube,
a first conductor connected to said first electrode through a first joining means,
a second electrode arranged in said switch tube such that it can come into contact with the first electrode and separate from it, and



a second conductor connected to said second electrode through a second joining means,
wherein at least part of one among the first and second electrodes, the first and second conductors, and the first and second joining means is made of material with vibration absorbing properties.

4,926,018
MOVING MAINS ARC MOVEMENT LOOP
Clifford A. Buxton, and David A. Leone, both of Lawrenceville, Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.
Filed Sep. 8, 1988, Ser. No. 242,094
Int. Cl.[5] H01H *33/18*
U.S. Cl. 200—147 R **6 Claims**



1. A movable contact blade comprising:
an elongated blade element having a top and bottom side;
a contact disposed on the bottom side of said element;
said element including a notch extending inwardly from the bottom side of said element adjacent to said contact; and
said element further including a depression extending inwardly from the top side of the element, offset from the notch and said contact such that the notch is between the depression and the contact;
said notch and depression being disposed to define a current path through said blade element disposed such that a current flow in the path will produce a magnetic field to force an electric arc away from the contact.

4,926,019
MOVING COPPER PIVOT
David A. Leone; Clifford A. Buxton, both of Lawrenceville; James A. Tharp, Conyers, and Neil A. McCord, Lawrenceville, all of Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.
Filed Sep. 8, 1988, Ser. No. 242,233
Int. Cl.[5] H01H *33/18*
U.S. Cl. 200—147 R **13 Claims**

1. A current carrying pivot for a circuit breaker comprising:
a contact comprising, a terminal, a first contact portion defining at least one substantially flat contact surface, and a second contact portion defining at least two substantially flat contact surfaces; and

a substantially circular contact member including a contact portion rotatable about an axis, the member being rotatably coupled with said contact, disposed to cooperate



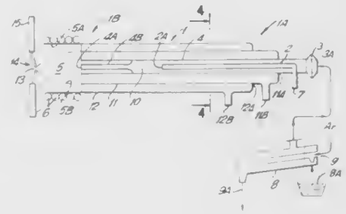
with the first and second contact portions to form at least three contact locations for carrying current and the axis is disposed between the first contact portion and the second contact portion.

4,926,020
MICROWAVE FOOD PRODUCTS AND METHOD OF THEIR MANUFACTURE
William A. Atwell, Spring Lake Park; Peter S. Pesheck, Brooklyn Center; Madonna M. Krawjecki, Coon Rapids, and George R. Anderson, Minneapolis, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.
Filed Sep. 2, 1986, Ser. No. 903,007
Int. Cl.[5] H05B *6/64*
U.S. Cl. 219—10.55 M **90 Claims**



1. A method of controlled microwave heating of a multicomponent food product, said food product having at least two distinct components that are to be provided desired degrees of heating before consumption, said method comprising:
(a) placing a food product in a microwave oven, said food product having at least two distinct components a first edible component and a second edible component in proximity to one another said food product having shield means associated therewith, said shield means shielding said first component during exposure of said food product to microwave radiation, said shield means including said second component, said second component being partially transmissive of incident microwave radiation with its thickness and dielectric properties having been selected to control the amount of transmitted microwave power to the first component and thereby control heating thereof to a preselected degree within a preselected time of exposure to microwave radiation, said second component has a shielding value just prior to exposure to microwave radiation in excess of about 70% of the first shielding inflection point value, and said second component has a free water content just prior to exposure to microwave radiation for consumption in the range of between about 20% and about 95% by weight of said second component; and
(b) exposing said food product to microwave radiation for a time period sufficient to heat at least said second component thereby achieving a predetermined temperature differential range between said first and second components during said exposure to microwave radiation.

4,926,021
REACTIVE GAS SAMPLE INTRODUCTION SYSTEM FOR AN INDUCTIVELY COUPLED PLASMA MASS SPECTROMETER
Barry J. Streusand, Westminster; Raymond H. Allen, Louisville; Darrell E. Coons, Boulder, all of Colo., and Robert C. Hutton, Nantwich, United Kingdom, assignors to AMAX Inc., New York, N.Y.
Filed Sep. 9, 1988, Ser. No. 242,798
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.59 **12 Claims**



9. A torch device for use in analyzing a gas or vapor comprising an elongated cylindrical body having an input section at one end and an output section at its other end cooperably associated with an inductively coupled plasma generating means which is cooperably associated with an analyzer which comprises:
means for feeding a sample of a reactive gas or vapor to be analyzed to the input section of said torch through a first tube located in said torch body, said tube extending from the input section to and terminating at a distance intermediate the input section and the output section,
a second tube concentrically and annularly surrounding said first tube extending from said input section to beyond the terminus of said first tube and to said output section,
said second tube being constricted near the output section and forward of the terminus of said first tube, the terminus of said first tube terminating at a distance before said constriction such as to provide a mixing chamber between said terminus and said constriction,
means for separately feeding an annular flow of a nebulized vapor comprising a plasma gas and including water or solvent vapor or aerosol thereof through said second tube surrounding and separated from said sample in said first tube and into said mixing chamber to thereby form a mixture thereof with the sample for immediate feeding to said inductively coupled plasma means,
means for feeding into and from said input section a first annular sheath of plasma gas concentrically surrounding said second tube and directly to said inductively coupled plasma means, and
means for feeding into and from said input section a second annular sheath of plasma gas as a coolant surrounding said first annular sheath directly to said inductively coupled plasma generating means,
whereby the integrity of said sample is maintained as it enters said inductively coupled plasma means for dissociation therein prior to entering the analyzer.

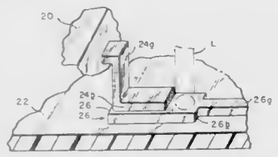
VOL
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4,926,022

LASER REFLOW SOLDERING PROCESS AND BONDED ASSEMBLY FORMED THEREBY

Gary M. Freedman, Stow, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 20, 1989, Ser. No. 368,598
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.63 2 Claims



1. A method of laser bonding a lead to a circuit contact pad comprising the steps of:
sizing the pad and lead relatively such that the lead can seat on a contact area of the pad which is less than the total pad area leaving a portion of the pad exposed;
applying a solder coating to said pad contact area;
momentarily directing a laser beam at a target area on said pad exposed portion which area is spaced from said contact area thereon so as to heat the pad to a temperature higher than the melting point of the solder, but less than the melting point of the pad so that the lead is heated last by thermal conduction through the solder.

4,926,023

HIGH-SPEED ROTATIVE ARC WELDING DEVICE

Yuji Sugitani; Yukio Kobayashi, both of Tsu; Yoshihisa Ikeda, Kameyama, and Masatoshi Murayama, Hisai, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00262, § 371 Date Dec. 21, 1988, § 102(e) Date Dec. 21, 1988, PCT Pub. No. WO88/08352, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 24, 1987, Ser. No. 295,039
Int. Cl.[5] B23K *9/12*
U.S. Cl. 219—125.12 4 Claims



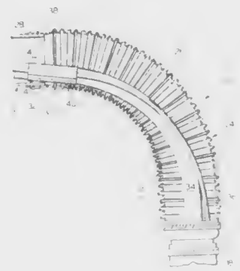
1. A rotative arc welding device comprising:
first supporting means for supporting an upper portion of an electrode as the supporting point of a circular conical motion;
second supporting means for supporting a middle portion of said electrode with an offset of a predetermined distance from a center of a disk;
driving means for driving said second supporting means to make a lower end of said electrode travel in a circular orbit; and
adjusting means for adjusting the distance between said first supporting mens and said second supporting means, thereby adjusting the diameter of said circular orbit of the electrode.

4,926,024

WELDING GUN CABLE SADDLE

Robert N. Mann, Mississauga, Canada, assignor to Mig Vac Inc., Mississauga, Canada

Filed Nov. 13, 1989, Ser. No. 434,274
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—137.31 11 Claims



1. A welding gun, comprising:
a welding gun head for applying a weld to a site and a welding gun handle,
a conduit for conveying an electrical power cable to said welding gun handle,
flexible bellows connector means connecting said welding gun handle to said conduit,
an electrical power cable passing through said conduit and said flexible bellows connecting means to said welding gun handle, and
abrasion-resistant sleeve means mounted to said power cable adjacent the location of connection of said bellows connector means to said welding gun handle.

4,926,025

ELECTRICALLY HEATED SEAT RESISTIVE HEATING ELEMENT ENERGIZATION SYSTEM

Daniel D. Wilhelm, Reed City, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Mar. 6, 1989, Ser. No. 319,922
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—202 13 Claims



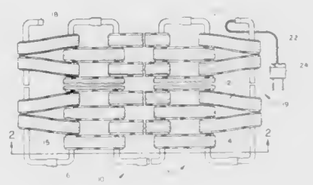
1. A method for energization a resistive heating element embedded within a motor vehicle seat comprising the steps of:
closing a user actuated switch to apply a direct current, vehicle battery energization voltage to an energization switch coupled across a heating circuit comprising a resistive heating element and a switching device for controlling current flow through the resistive heating element;
sensing the temperature of the resistive heating element and generating a sensed signal related to the temperature of the resistive heating element;
generating a control signal related to a motorist control input corresponding to a desired temperature of said motor vehicle seat;
comparing the control signal with the sensed signal and if the comparison indicates the temperature of the resistive heating element should be increased to cause the motor vehicle seat to reach the desired temperature, increasing current through the heating element by activating the switching device to increase current flow through the resistive heating element until the temperature of the motor vehicle seat reaches the desired temperature as indicated by the sensed signal;
monitoring a fault signal at a junction coupled to the heating circuit; and
if the fault signal indicates a dangerous rise in the current through the heating circuit indicating a short across either the resistive heating element or the switching device, opening the energization switch to remove the direct current vehicle battery energization voltage from the heating circuit until the user again actuates the user actuated switch.

4,926,026

ELECTRICAL DE-ICER DEVICE

Timothy A. Tarry, Hudson, Ohio, assignor to Maintenance Concepts, Inc., Hudson, Ohio

Filed Jan. 26, 1989, Ser. No. 302,791
Int. Cl.[5] H05B *3/02*; F24H *7/06*
U.S. Cl. 219—213 20 Claims





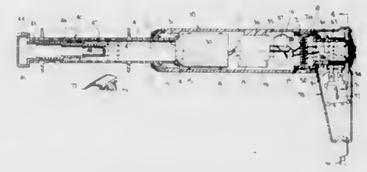
1. A de-icer device comprising:
a tread mat;
metal heat conducting members;
hollow metal tubing traversing the mat; and
electrical heating wire,
wherein said mat has a plurality of passageways passing therethrough for draining water from the upper surface of the mat to its lower surface, and said heat conducting members being adapted to transfer heat from said tubing to the exterior of the mat and being located between said surfaces, the top of said members being below, but substantially adjacent to said upper surface, and
wherein said heat conducting members are in contact with said tubing, and wherein further, said electrical heating wire is located on the inside of said tubing for generating heat upon energization of the wire to heat the tubing and the heat conducting members.

4,926,027

FORCED HOT AIR APPLIANCE WITH SWIVEL HANDLE

James G. Montagino; Betty Butzko, and Ronald L. Lerner, all of El Paso, Tex., assignors to Helen of Troy Corporation, El Paso, Tex.

Filed Aug. 2, 1989, Ser. No. 388,525
Int. Cl.[5] H05B *3/02*
U.S. Cl. 219—222 14 Claims



1. A forced hot air appliance which comprises:
a main handle assembly which includes a main handle housing that is generally tubular and which defines a front end and a rear end, a heater means which is mounted within the main handle housing for heating air which flows therepast, and a ventilator means which is mounted within the main handle housing for forcing air to flow through said main handle housing from the rear end to the front end thereof and past the heater means therein,
a bearing assembly which includes a generally tubular bearing sleeve having a front portion that is fixedly mounted in the rear end of the main handle housing and a rear portion that extends away from the rear end of the main handle housing, two separated metallic contact rings which are positioned around the rear portion of the bearing sleeve, and two electrical wires which are respectively connected to the two contact rings and which extend through the bearing sleeve and connect to the ventillation means and the heater means in the main handle housing, and
a swivel handle assembly which includes a swivel handle housing that provides a head portion and a body portion, the head portion having a rear end which defines an air inlet screen and a front end which defines a circular opening through which the rear portion of the bearing sleeve extends for enabling the bearing sleeve and the main handle housing to be rotatably supported by the swivel handle housing, and a submersible switch means which is mounted within the swivel handle housing, the submersible on/off switch means including a switch box and two spaced apart metallic contact paddles which extend away from the switch box and which contact the respective metallic contact rings on the bearing sleeve of the bearing assembly regardless of the rotational position of the bearing sleeve and the main handle housing relative to the head portion of the swivel handle housing.

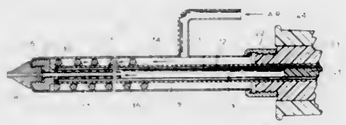
VOL
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ISS
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MY
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1990
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4,926,028

HOT AIR HEATED SOLDERING INSTRUMENT

William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265

Continuation of Ser. No. 665,725, Oct. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 625,449, Jun. 27, 1984, abandoned, which is a division of Ser. No. 471,098, Mar. 1, 1983, abandoned. This application May 8, 1987, Ser. No. 47,771
Int. Cl.[5] B23K *3/02*; H05B *3/00*; F24H *1/10*
U.S. Cl. 219—230 2 Claims



1. Hot air soldering - desoldering instrument comprising:

A. a handle body having disposed near its rear end a first input means for receiving gas from a pressurized supply and a second input means for receiving electrical energy from an electric source;

B. air heating apparatus carried by said handle near its front end and including

i. an outer tubular metallic support sheath carried by said handle body and extending forwardly therefrom and having a solder tip retaining means disposed at its forward end,

ii. an inner metallic support sheath carried by said handle body and extending forwardly therefrom concentrically within and radially spaced from said outer sheath and terminating in a forward end axially contiguous to said solder tip retaining means,

iii. a ceramic hollow cylindrical heating element support member carried by said handle body and extending forwardly therefrom concentrically within said inner sheath and terminating axially near but spaced axially from its said forward end to define a radial, hot gas passage gap,

iv. a deposited heating element disposed about the forward end portion of said hollow ceramic member and extending rearwardly to define a predetermined heater length and being coupled to said second, electrical, input means of said handle body,

v. an inner, hot gas tube carried by the forward end of at least one of said metallic support sheaths and extending concentrically rearwardly within said hollow ceramic member to at least substantially the rearward extent of said predetermined heater length.

the radial spacing between said ceramic heating element support member and said inner support sheath forming a first, outer heat exchange plenum, that between said inner, hot gas tube and said ceramic heating element support member forming a second, inner heat exchange plenum, and the two such plenums being gas flow coupled at their forward ends by said radial, hot gas passage gap over the forward end of said ceramic member, and

vi. gas flow connection means disposed at the rear of said first, outer heat exchange plenum for coupling said first plenum to said first gas receiving input means of said handle body; and

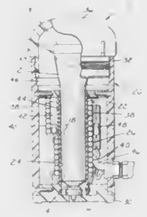
C. a soldering tip carried by said solder tip retaining means of said outer metallic support sheath and having an axial nozzle bore therethrough air flow coupled to the forward end of said inner, hot gas tube for providing a highly heated jet of gas for soldering-desoldering purposes.

4,926,029

METHOD AND COMBINATION FOR HEATING AND DISPENSING HOT MELT MATERIALS

Walter C. Pearson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 8, 1988, Ser. No. 216,798
Int. Cl.[5] H05B *3/58*
U.S. Cl. 219—421 7 Claims



7. A combination for heating and dispensing a hot melt moisture curing adhesive material, said combination including:

a tube comprising a conformable metal hollow tubular wall having an axis, a closed second end, and a first end, and an end wall having a central nozzle at said first end of said tubular wall, said tubular wall and said end wall defining a cavity, and said tubular wall having a cylindrical outer surface portion over a majority of the axial length of said tubular wall from said first end toward said second end;

a hot melt moisture curing adhesive material in said cavity; and

a heater assembly for said tube and hot melt material, said heater comprising:

a housing of thermally insulating material comprising a generally cylindrical portion having an axis, an upper end, and a base end adapted to be supported on a horizontal surface with the axis of said cylindrical portion projecting vertically upward;

a heat transfer member mounted coaxially within said cylindrical portion of said housing, said heat transfer member having an outer surface, a cylindrical inner surface having an axis and adapted to closely receive the cylindrical outer surface portion of said tubular wall, and an inlet end adjacent the upper end of said housing adapted to afford movement of the outer surface into and out of the heat transfer member with said end wall adjacent said base end of said cylindrical portion; and

means for applying heat to the outer surface of said heat transfer member to heat the hot melt material within said cavity to a predetermined temperature through said heat transfer member and said tube comprising an elongate heating element coiled around the outer surface of said heat transfer member, and a thermostat between said coiled heating element and said heat transfer member;

said housing further including a cover portion adapted to releasably engage the upper end of said cylindrical portion of the housing over the closed second end of the tube received in the heat transfer member.

4,926,030

END PIECE FOR TUBULAR HEATER

Hermann Knauss, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 303,573
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804326
Int. Cl.[5] H05B *3/40*
U.S. Cl. 219—541 24 Claims



1. An end piece for a tubular heater having a heating resistor inside a tube casing, said end piece comprising:

an insulator member having an engagement part for engaging the tube casing of said tubular heater and a passage for a connecting member connected to the heating resistor inside said tube casing, said insulator member having at least one engagement member located outside the tube casing, and wherein at least one said at least one engagement member is provided for receiving a fixing part of at least one connecting piece to be connected to the connecting member, said engagement member being axially spaced from an associated end of the tube casing and forming at least one connecting element providing a plug.

4,926,031

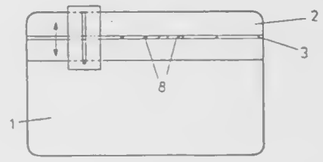
TOKEN SUCH AS CREDIT OR IDENTIFICATION CARD AND AN APPARATUS FOR TESTING THE TOKEN OR CARD

Gerhard Stenzel, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 738,618, May 28, 1985, abandoned, which is a continuation of Ser. No. 413,650, Sep. 1, 1982, Pat. No. 4,527,051, which is a continuation-in-part of Ser. No. 53,616, Jun. 19, 1979, abandoned. This application Apr. 27, 1987, Ser. No. 43,644
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829788
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.[5] G06K *5/00*
U.S. Cl. 235—380 5 Claims

1. A security document comprising a card body exhibiting a linear identification track;

a plurality of particles irregularly distributed along the length and across said track, whereby a random distribution of said particles and free spaces between said particles define a unique characteristic signal base and wherein said



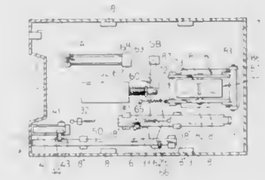
particles are smaller than said linear identification track width.

4,926,032

READER AND/OR WRITER FOR IC CARD

Norio Shimamura, and Taiji Sudo, both of Tokyo, Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 168,099
Claims priority, application Japan, Mar. 12, 1987, 62-58645
Int. Cl.[5] G06K *7/06*
U.S. Cl. 235—441 13 Claims



1. Reader and/or writer for an IC card having a plurality of contact points flush with the surface of one side of said card, comprising:

a casing having a front end wall formed with a slit for inserting said card, opposite side walls, a back end wall, a top wall and a bottom wall,

a contact head having a corresponding number of contact points adapted to be electrically connected with said contact points of said card and arranged in the casing near to said back end wall,

a carriage longitudinally movable in the casing between a waiting position near to said front end wall for receiving said card inserted through said slit and an operating position where the card held thereby may establish said electrical connection with said contact head,

spring means for normally keeping said carriage in said waiting position,

means for locking said carriage at said operating position to be actuated when said carriage is brought there by manually pushing said card against the force of said spring means,

means for locking said card at the trailing edge thereof to be actuated when said carriage holding said card is brought in said operating position, and

means for disengaging both said first and second locking means at the same time to be actuated when reading and/or writing is over so that said carriage is returned to the waiting position by said spring means and consequently said card held by said carriage may be taken out of the device through said slit.

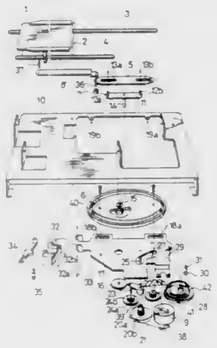
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4,926,033

LINEAR RECIPROCATING MOTION DEVICE AND OPTICAL CARD TRANSPORTING DEVICE WHICH EMPLOYS THE SAME

Koichi Kobayashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 886,907, Jul. 18, 1986, Pat. No. 4,733,572. This application Nov. 16, 1987, Ser. No. 120,966
Claims priority, application Japan, Nov. 27, 1985, 60-264943; Dec. 5, 1985, 60-272420
Int. Cl.[5] G06K *13/00, 13/08*
U.S. Cl. 235—480 7 Claims



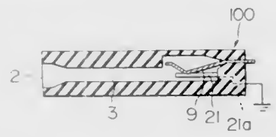
1. A transporting system for an optical card in an optical card processing device, comprising:
a shuttle for holding said optical card,
a first driving mechanism for shifting said shuttle from a first position where said optical card that is inserted from outside is received to a second position for carrying out reciprocating motion, and for returning said shuttle after said reciprocating motion to the first position, and
a second driving mechanism for performing a reciprocating motion on the shuttle from said second position.

4,926,034

CONNECTOR IN EXTERNAL DEVICE FOR CONNECTION TO IC CARD

Toshinobu Banjo; Tetsuya Ueda, and Shigeo Onoda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 25, 1988, Ser. No. 173,167
Claims priority, application Japan, Mar. 27, 1987, 62-75127
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—492 3 Claims



1. A connector provided in an external device for an IC card having a card shutter provided with at least one slide member, said shutter being capable of advancing and retreating and adapted to cover and protect external terminals of said IC card when said IC card is not used, said connector comprising:
a connector casing body forming a card-receiving portion in which said IC card is inserted;
a plurality of electrodes for contacting the external terminals of the IC card when the IC card is inserted in said card-receiving portion;
at least one electrically conductive pin adapted to move said shutter in the direction opposite to that of the insertion of said IC card so as to open said shutter by contacting said slide member of said card shutter when said IC card is inserted into said connector; and
grounding means for grounding said pin.

4,926,035

OPTICALLY READABLE CODE AND METHOD FOR COMMUNICATION

Seiro Fujisaki, 6-4, Fukushima 7-chome, Fukushima-Ku, Osaka-Shi, Osaka-Fu. 553, Japan

Filed Oct. 31, 1988, Ser. No. 265,400
Claims priority, application Japan, May 10, 1988, 63-113883
Int. Cl.[5] G06K *19/06*
U.S. Cl. 235—494 7 Claims



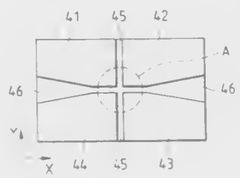
1. An optically readable code, comprising files of dots divided into eight groups perpendicular to the course of printing so that each group that consists of a plurality of files is separated from the other groups by divisions, each of which consists of one or several files ranks of dots are similarly divided; and each part divided up in this manner is regarded as a one bit mark.

4,926,036

LIGHT DETECTOR

Takanori Maeda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,074
Claims priority, application Japan, Sep. 13, 1988, 63-119266[U]
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.1 11 Claims



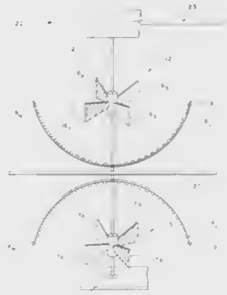
1. A light detector for receiving and detecting a beam of light, comprising:
at least two light-detecting areas; and
at least one separating area for separating said at least two light-detecting areas;
a portion of said at least two light-detecting areas and a portion of said at least one separating area which actually receives the beam of light being termed the actual light-receiving area;
a shape of said at least one separating area being such that a width of at least a portion of said at least one separating area which is outside of the actual light-receiving area is greater than the greatest width of said at least one separating area which is inside of the actual light-receiving area.

4,926,037

APPARATUS AND METHOD TO CONTROL THE PRECISIONAL POSITION OF A LIGHT WEIGHT MOTOR ENERGIZED BY RADIANT ENERGY

Fernando R. Martin-Lopez, 967-E La Mesa Ter., Sunnyvale, Calif. 94086

Filed Nov. 23, 1988, Ser. No. 276,105
Int. Cl.[5] G01J *1/32*
U.S. Cl. 250—205 29 Claims



1. In a motor energized by radiant energy, an apparatus to control motor drive rotation, comprising:
a drive member adapted to rotate in response to radiant energy,
a radiant energy emitting member adapted to emit radiant energy to said drive member,
a sensor means mounted adjacent said drive member and adapted to sense rotational movement of said drive member and to generate a member rotational speed and direction signal,
processor for comparing an input command signal representing desired speed and rotational direction of said motor drive shaft with said member rotational speed and direction signal and to generate a radiant energy control signal in response thereto, and
radiant energy distributing means, electrically connected to said processor means for receiving said radiant energy control signal, and responsive to said control signal to cause said radiant energy emitting member to vary the emission level of said radiant energy in response thereto.

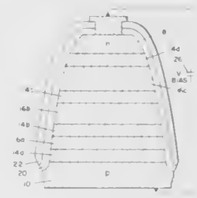
4,926,038

MODULATED MULTI-QUANTUM WELL COLLECTOR FOR HGCDTE PHOTODIODES

William L. Ahlgren, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Oct. 5, 1988, Ser. No. 254,347
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—211 J 29 Claims

1. An infrared radiation responsive photodiode comprising:
a radiation absorbing base region comprised of HgCdTe, said base region being operable for generating a photocurrent from the absorbed radiation;
a photocurrent collector region comprised of HgCdTe and forming a heterojunction with said base region; and
a quantum well region interposed between said base and said collector regions, said quantum well region comprising at least two layers of CdTe and at least one layer of HgTe disposed between said CdTe layers.



4,926,039

STREAKING OR FRAMING IMAGE TUBE WITH PLURAL GRID CONTROL

Brian R. C. Garfield, Basildon, and Mark J. Riches, Basildon, both of Great Britain, assignors to Imco Electro-Optics Limited, United Kingdom

Filed Nov. 2, 1988, Ser. No. 266,411
Claims priority, application United Kingdom, Nov. 4, 1987, 8725856
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—213 VT 10 Claims



1. A method of gating a streaking or framing image tube which includes a photocathode, an electrode assembly for forming a focussed image on a screen and first, second and third grid electrodes disposed successively along the image tube between the photocathode and the said electrode assembly, said method comprising:
raising the potential of the second grid electrode to allow the passage of electrons beyond the second grid electrode followed by raising the potential of the photocathode to stop the passage of electrons to the second grid electrode.

4,926,040

SHIFT SENSOR WITH OPTIC FIBER

Marc Turpin, Bures Sur Yvette; Michèle Brevignon, Cachan, and Dominique Rojas, Arcueil, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Apr. 18, 1989, Ser. No. 339,792
Claims priority, application France, Apr. 22, 1988, 88 05347
Int. Cl.[5] G02F *1/01*
U.S. Cl. 250—225 14 Claims

1. A shift sensor with optic fiber, said sensor comprising:
an optic source of light, plane polarized along an axis of polarization;
a birefringent optic fiber, one input face of which is coupled to the optical source with an axis of birefringence aligned with the axis of polarization of the light emitted by the optical source, said optic fiber having at least two local-

ized coupling points which are fixed and spaced out at a determined distance;

at least one movable coupling means, enabling a coupling to be induced at a movable coupling point of the fiber, between the two axes of polarization of the fiber;



an analyzing means coupled to the output of the fiber and enabling the detection of the interferences due to the different couplings induced in the fiber.

4,926,041

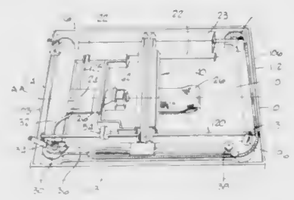
OPTICAL SCANNER

David W. Boyd, Greeley, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 20, 1989, Ser. No. 383,463

Int. Cl.[5] G01J *3/50*

U.S. Cl. 250—226 **10 Claims**



1. An optical scanner device for producing machine-readable data representative of color images of scanned objects, comprising:

(a) narrow width, elongate light slit means for enabling transmission of an imaging light beam from a narrow band portion of an object which is scanned;

(b) lens means for focusing said imaging light beam;

(c) beam splitter means for separating said imaging light beam into a plurality of color component beams;

(d) a plurality of parallel, linear photosensor array means located on a common sensor plane and spaced apart at equal intervals for accepting color component images projected by said color component beams; and

(e) said light slit means and said lens means being constructed and arranged whereby the width of each color component image on said common sensor plane is no more than about said interval spacing of said photosensor array means and no less than about one-half said interval spacing of said photosensor array means.

4,926,042

METHOD OF AND DEVICE FOR DETECTING LIGHT RECEIVING POSITION UTILIZING OPTICAL FIBERS

Masamitsu Naito, and Kenji Wada, both of Tokyo, Japan, assignors to Taisei Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 207,627, Jun. 16, 1988, abandoned. This application Aug. 17, 1988, Ser. No. 232,999

Claims priority, application Japan, Aug. 21, 1987, 62-208748

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.11 **8 Claims**

1. A method of detecting a light receiving position utilizing optical fibers comprising the steps of:

disposing end surfaces of a plurality of optical fibers which form light receiving surfaces in a straight line;

disposing said light receiving surfaces to form a plurality of rows;

dividing each of said rows into groups, each having a plurality of light receiving surfaces, to serve as output ports;



connecting light receiving sensors, each formed by one light detecting device, to each divided group; and

detecting laser beams from said light receiving surfaces by said light receiving sensors through said optical fibers.

4,926,043

APPARATUS AND METHOD FOR OPTICAL MEASURING AND IMAGING OF ELECTRICAL POTENTIALS

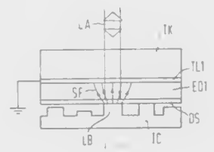
Gerald Sölkner, Ottobrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 155,103

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710662

Int. Cl.[5] G01R *23/16*

U.S. Cl. 250—231.1 **17 Claims**



1. An apparatus for optical measuring and imaging of electrical potentials, comprising:

a first electro-optic crystal disposed above a specimen;

a first conductive layer disposed immediately above said first electro-optic crystal, said first conductive layer being transparent at least to electromagnetic radiation used for measurement; and

a dielectric mirror at a specimen side surface of said first electro-optic crystal.

4,926,044

THERMAL DECAY TIME LOGGING METHOD AND APPARATUS

Peter D. Wraight, Missouri City, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Division of Ser. No. 4,764, Jan. 7, 1987, Pat. No. 4,721,853, which is a continuation of Ser. No. 825,182, Jan. 31, 1986, abandoned. This application Oct. 20, 1987, Ser. No. 112,208

Int. Cl.[5] G01V *5/10*

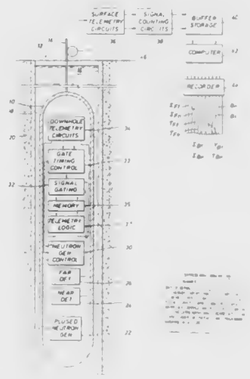
U.S. Cl. 250—264 **22 Claims**

1. In a logging system having a neutron generating means

and detecting means for detaching indications of thermal neutrons, a method for determining thermal neutron decay characteristics of borehole materials comprising the steps of:

irradiating at a first given location in said borehole, the borehole materials and earth formations with a first burst of neutrons,

detecting, at respective second and third given locations in said borehole, in one or more time intervals following said first burst, count rates of indications of the concentration of thermal neutrons in the formation and borehole materials and generating respective first signals representative thereof,



selecting the duration of said first burst such that after a first delay from the end of the first burst, the largest count rate detected at said second given location does not exceed the maximum counting rate of said detecting means and the thermal neutron count rate component due to borehole materials predominates in the total thermal neutron count rate detected at said second given location in one or more of said intervals associated with said first burst, and

determining from said first signals, associated with said second given location, a characteristic of the thermal neutron decay of the borehole.

4,926,045

RADIATION IMAGE READ-OUT APPARATUS

Yuichi Hosoi; Kenji Takahashi, and Satoshi Arakawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

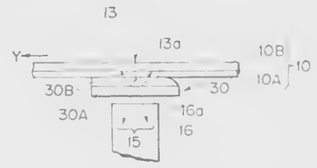
Continuation of Ser. No. 24,113, Mar. 10, 1987, abandoned. This application Jul. 13, 1988, Ser. No. 220,431

Claims priority, application Japan, Mar. 10, 1986, 61-51664; Mar. 10, 1986, 61-51665; Jan. 16, 1987, 62-8568

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[5] G01N *23/04*

U.S. Cl. 250—327.2 **18 Claims**



1. A radiation image read-out apparatus for two-dimensionally scanning a stimulable phosphor sheet, which carries a radiation image stored thereon, with stimulating rays which cause said stimulable phosphor sheet to emit light in proportion to the stored radiation energy, and photoelectrically reading out the light emitted by the scanning portion of said stimulable phosphor sheet by use of a photodetector,

wherein the improvement comprises a multi-layer optical filter which substantially reflects said stimulating rays and substantially transmits said light emitted by said stimulable phosphor sheet upon exposure to said stimulating rays, wherein said photodetector is disposed on the side opposite to the stimulating ray irradiation side with respect to said stimulable phosphor sheet, said multi-layer optical filter being disposed between said stimulable phosphor sheet and said photodetector.

4,926,046

VOLUMETRICALLY EFFICIENT CONTAINER APPARATUS

Bryan A. Roy, Harrison, N.J.; John G. Funk, Raleigh, N.C., and Bruce S. Rowe, Silver Spring, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 12, 1988, Ser. No. 283,412

Int. Cl.[5] G21F *5/00*

U.S. Cl. 250—506.1 **20 Claims**



1. An apparatus for containing radioactive matter, comprising:

(a) a vessel for holding the matter, said vessel having an outside surface;

(b) a plurality of pockets recessed into the outside surface of said vessel, each of said pockets having an inside surface;

(c) a plurality of lifting lugs each integrally attached to the inside surface of each of said pockets for providing lift points for said vessel; and

(d) container adaptor means connectable to said lifting lugs for reacting torque and lifting loads and for lifting said vessel, said container adaptor means mounted atop said vessel.

4,926,047

RADIATION IMAGE RECORDING AND REPRODUCING METHOD AND RADIATION IMAGE STORAGE PANEL EMPLOYED FOR THE SAME

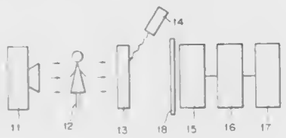
Kenji Takahashi, and Takashi Nakamura, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kaisei, Japan

Continuation of Ser. No. 857,512, Apr. 21, 1986, and a continuation of Ser. No. 543,326, Oct. 19, 1983. This application Oct. 15, 1987, Ser. No. 110,025

Claims priority, application Japan, Oct. 22, 1982, 57-184455

Int. Cl.[5] G01T *1/202*; C09K *11/46*

U.S. Cl. 250—484.1 12 Claims



1. A radiation image recording and reproducing method comprising steps of

causing a stimulable phosphor to absorb a radiation having passed through an object or radiated by an object,

exposing said stimulable phosphor to an electromagnetic wave having a wavelength within the range of 450–800 nm to release the radiation energy stored therein as light emission, and

detecting the emitted light,

in which said stimulable phosphor is a divalent europium activated complex halide phosphor having the formula (I):

$$M^{II}FX.aM^{I}X'.bM'^{II}X''_2.cM^{III}X'''_3.xA:yEu^{2+} \quad (I)$$

in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; M^{I} is at least one alkali metal selected from the group consisting of Li, Na, K, Rb and Cs; M'^{II} is at least one divalent metal selected from the group consisting of Be and Mg; M^{III} is at least one trivalent metal selected from the group consisting of Al, Ga, In and Tl; A is at least one metal oxide; X is at least one halogen selected from the group consisting of Cl, Br and I; each of X', X'' and X''' is at least one halogen selected from the group consisting of F, Cl, Br and I; a, b and c are numbers satisfying the conditions of $0 \leqq a \leqq 2$, $0 \leqq b \leqq 10^{-2}$, $0 \leqq c \leqq 10^{-2}$ and $a+b+c \geqq 10^{-6}$; and x and y are numbers satisfying the conditions of $0 < x \leqq 0.5$ and $0 < y \leqq 0.2$, respectively.

4,926,048

PROCESS OF PERFORMING WORK ON A CONTINUOUS WEB

Hershey Lerner, Hudson, and Bernard Lerner, Peninsula, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 378,079, May 14, 1982, abandoned, which is a division of Ser. No. 166,500, Jul. 7, 1980, abandoned. This application Jul. 26, 1985, Ser. No. 759,503

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—548 15 Claims

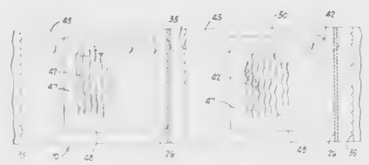
14. A process for making a web of like commodities comprising:

(a) imprinting a repetitive pattern on a plastic web;

(b) imprinting transparent indicia at least in part over the pattern, the indicia each including an electromagnetic wave shifting material which when stimulated by electromagnetic energy in a certain energy range emits electromagnetic energy in a different energy range;

(c) feeding the imprinted web along a workpiece path of travel at least in part illuminated by ambient illumination including electromagnetic energy in both of the certain and the different ranges;

(d) successively causing the indicia to emit energy in the different range by stimulating the indicia with energy in the certain range of an intensity greater than the energy of that portion of the ambient light in the certain range;



(e) successively detecting indicia emitted energy in the different range while intensity discriminating between reflected and indicia emitted energy in the different range and wavelength discriminating between stimulating and indicia emitted energy; and

(f) forming a transverse line of weakness in the web in response to each such detection and at a location determined by such detection.

4,926,049

REFLECTION TYPE PHOTOELECTRIC SWITCH

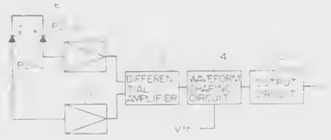
Arata Nakamura, Hazukashi, and Norio Onji, Uji, both of Japan, assignors to Omron Tateisi Electronics Company, Kyoto, Japan

Continuation of Ser. No. 55,286, May 29, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 344,558

Claims priority, application Japan, Jun. 2, 1986, 61-128971

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—548 7 Claims



1. A reflection type photoelectric switch adapted to project light to an object to be detected and to sense the object on the basis of reflected light therefrom, comprising a split-type composite light receiving means having two light receiving segments, a differential amplifier receiving the outputs of said two light receiving segments, and a single threshold waveform shaping means directly connected to said differential amplifier for discriminating the differential amplification output of said differential amplifier with a single predetermined level and generating a single detection output for said object.

4,926,050

SCANNING LASER BASED SYSTEM AND METHOD FOR MEASUREMENT OF DISTANCE TO A TARGET

David M. Shemwell, Seattle, Wash., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Mar. 2, 1988, Ser. No. 163,854

Int. Cl.[5] G01C *3/08*

U.S. Cl. 250—560 18 Claims

1. A system for measuring the distance D between a first location and a second location, comprising:

a transmitter located at the first location for producing an directing a scanning beam of electromagnetic energy toward the second location; and

a receiver, comprising

a plurality of signal-producing means placed in a predetermined spaced-apart configuration at the second location, each signal-producing means producing a signal when scanned by the scanning beam,

means for measuring the time interval between the signals produced by the signal-producing means in response to the scanning beam,

means for measuring the rotation of the transmitter relative to the configuration of the signal-producing means, and

means for calculating the distance D based on the time interval between signals produced by the signal-producing means and correcting the calculated distance for the measured rotation of the transmitter relative to the configuration of the signal-producing means.

4,926,051

THERMAL-IMAGE SENSING DEVICES AND THEIR MANUFACTURE

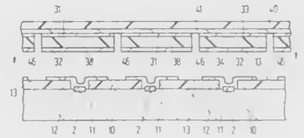
Andrew A. Turnbull, Reigate, England, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 166,141, Mar. 10, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 396,744

Claims priority, application United Kingdom, Mar. 13, 1987, 8705963

Int. Cl.[5] H01L *21/84*

U.S. Cl. 250—332 13 Claims



1. A method of manufacturing a thermal-image sensing device comprising a 2-dimensional array of ferroelectric or pyroelectric infrared detector elements which are mounted on an integrated circuit substrate via an intermediate layer of thermally and electrically insulating material, the substrate comprising electronic circuitry for processing signals from the detector elements in which method a corresponding 2-dimensional array of bores is formed in the insulating layer, and each of the detector elements is electrically connected to a respective electrode of the circuit substrate by means of a metal coating over the wall of its respective bore, characterised by the steps of:

(a) covering at least part of an upper surface of the circuit substrate comprising the electronic circuitry with plastics material to a thickness sufficient to form said insulating layer as a cushioning support for the detector elements and with a substantially planar upper surface,

(b) locally removing the plastics material from over said electrodes of the circuit substrate so as to form said bores in the insulating layer,

(c) depositing metal to form the metal coating in the bores and also on the upper surface of the plastics material at least around the bores, the metal coating being sufficiently thin as not to fill the bores, and

(d) mounting the array of detector elements on the metal-coated upper surface of the plastics material to form a rugged cushioning support for the detector elements on the circuit substrate.

4,926,052

RADIATION DETECTING DEVICE

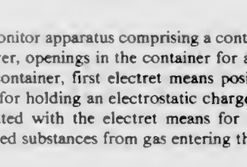
Tamotsu Hatayama, Matsudo, and Yujiro Naruse, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1987, Ser. No. 21,349

Claims priority, application Japan, Mar. 3, 1986, 61-45958; Apr. 24, 1986, 61-95413; Sep. 4, 1986, 61-206832

Int. Cl.[5] G01T *1/24*

U.S. Cl. 250—370.14 19 Claims



1. A solid state radiation detecting device comprising:

a semiconductor layer; and

a metal layer formed on said semiconductor layer for receiving radiation rays and for producing, based on interactions therewith, energy particles which are introduced into said semiconductor layer and excite said semiconductor layer so as to produce electron-hole pairs, said metal layer comprising metal selected from the group consisting of metals having atomic numbers of at least 30, said metal layer having a specific thickness smaller than a range of the energy particles produced therein to maximize the efficiency of production of the electron-hole pairs, said specific thickness being large enough to enable said metal layer to serve as a collector electrode for collecting the electron-hole pairs to provide carriers for producing an electrical radiation detecting signal.

4,926,053

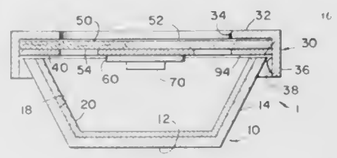
RADON MONITOR

John C. Dempsey, Salamanca, N.Y., and Lorin R. Stieff, Kensington, Md., assignors to Rad Elec., Inc., Washington, D.C.

Continuation of Ser. No. 529,772, Aug. 31, 1983, abandoned. This application Dec. 23, 1988, Ser. No. 289,438

Int. Cl.[5] G01T *1/00*

U.S. Cl. 250—376 13 Claims



1. Radon monitor apparatus comprising a container having a cup and a cover, openings in the container for allowing gases to enter the container, first electret means positioned within the container for holding an electrostatic charge and detector means associated with the electret means for receiving and holding charged substances from gas entering the container, a

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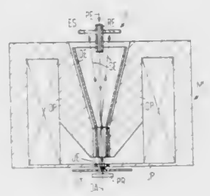
second electret means positioned within the container spaced from the first electret means, the second electret means having an electrostatic charge which is opposite to an electrostatic charge of the first electret means for repelling charged substances in the gas by the second electret means toward the first electret means.

4,926,054

OBJECTIVE LENS FOR FOCUSING CHARGED PARTICLES IN AN ELECTRON MICROSCOPE

Juergen Frosien, Ottobrunn, Fed. Rep. of Germany, assignor to ICT Integrated Circuit Testing Gesellschaft für Halbleiterprüftechnik mbH, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 318,970
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3809014
Int. Cl.[5] H01J *37/12, 37/145, 37/244*
U.S. Cl. 250—396 R 8 Claims



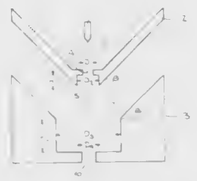
1. An objective lens for focusing charged particles on a specimen comprising, an electrostatic immersion lens which has a first electrode (OE) and a second electrode (UE) which are connected to potentials (U_{OE}, U_{UE}) so that the charged particles (PE) are decelerated in the field of the immersion lens from a first to a lower, second energy, a third electrode (ST) which is connected to a variable potential (U_{ST}) so as to control the intensity of the current of secondary particles (SE) emanating from said specimen (PR) and which are accelerated in a direction toward a detector (DT).

4,926,055

FIELD EMISSION ELECTRON GUN

Toshiaki Miyokawa, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,341
Claims priority, application Japan, Jan. 25, 1988, 63-15288
Int. Cl.[5] H01J *37/073*
U.S. Cl. 250—423 R 14 Claims



1. A field emission electron gun comprising:
a field emission tip;
an extraction electrode for producing an electron beam along an optical axis by extracting electrons from said tip, wherein said extraction electrode is shaped like an inverted cone the side of which is inclined at a first angle to a plane perpendicular to the optical axis of the electron beam; and
an accelerating electrode for accelerating the electrons extracted by said extraction electrode, wherein the side of said accelerating electrode is inclined at a second angle to a plane perpendicular to the optical axis of the electron beam.

4,926,056

MICROELECTRONIC FIELD IONIZER AND METHOD OF FABRICATING THE SAME

Charles A. Spindt, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jun. 10, 1988, Ser. No. 205,191
Int. Cl.[5] H01J *27/02*
U.S. Cl. 250—423 F 15 Claims



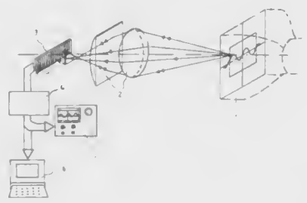
1. A microelectronic field ionizer comprising a planer substrate; means at a surface of said substrate defining a gas outlet, said means defining said gas outlet being capable of maintaining a first electric potential at said outlet; and a first electrically conductive material on said substrate spaced but adjacent said outlet providing a counterelectrode for a second, different electric potential to create an electrostatic field at said outlet for ionizing gas thereat.

4,926,057

ANALOG RECORDING AND INTEGRATION OF ELECTRIC SIGNALS

Danièle Fournier, 18, rue de la Procession, 75015 Paris; François Charbonnier, 11, rue Salvadore Allende, 92240 Malakoff, and Alberr-Claude Boccara, 14, rue des Meuniers, 75012 Paris, all of France

PCT No. PCT/FR88/00251, § 371 Date Jan. 13, 1989, § 102(e) Date Jan. 13, 1989, PCT Pub. No. WO88/08986, PCT Pub. Date Nov. 17, 1988
PCT Filed May 16, 1988, Ser. No. 309,767
Claims priority, application France, May 14, 1987, 8706773
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—578.1 9 Claims



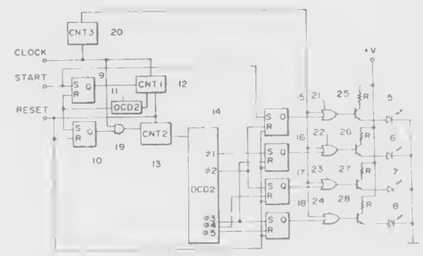
1. Method of recording an electric signal comprising the generation of an electronic beam providing x and y scanning representative of the amplitude variation of the signal as a function of time, characterized by recording the path of said beam on a strip of detectors each element of which, having the form of a narrow band of given abscissa and constant length, receives a flux proportional to the ordinate of the point of the path which corresponds to said abscissa.

4,926,058

IMAGE READING APPARATUS WITH BLOCK LIGHTING AND PULSING

Hirofumi Iwamoto, Machida; Tatsundo Kawai; Makoto Ogura, both of Hiratsuka; Katsumi Nakagawa, Kawasaki; Shinichi Seitoh, Atsugi, and Noriyuki Kaifu, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1987, Ser. No. 6,214
Claims priority, application Japan, Jan. 27, 1986, 61-13789
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—578.1 1 Claim



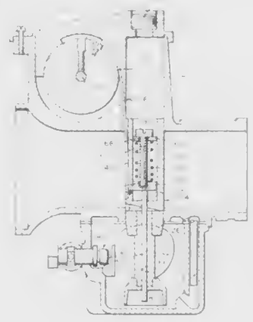
1. An image reading apparatus in which a plurality of light sources are provided and the lights emitted from said light sources are incident on photoelectric converting means from an object to be read, thereby reading an image of the object, comprising:
light-on control circuitry for dividing said light sources into a plurality of blocks, for sequentially divisionally lighting on the light sources every block, and for lighting on, in a pulse-like manner, the light sources of the blocks which are not divisionally lit on.

4,926,059

CARBURETOR

William H. Edmonston, 22264 Ottawa Rd., Unit 10, Apple Valley, Calif. 92308

Filed Jul. 12, 1989, Ser. No. 378,761
Int. Cl.[5] F02M *9/06*
U.S. Cl. 261—44.3 7 Claims



1. A carburetor, comprising:
a body having an inlet end, an outlet end, and a throat extending therethrough from said inlet end to said outlet end,
a fuel supply tube secured to the underside of said body and having an outlet in communication with said throat,
a throttle slide member movably mounted on the body intermediate said inlet and outlet ends thereof for substantially transverse movement across said throat to vary the unblocked portion thereof, and
a metering rod secured to said throttle slide member and extending downwardly into said fuel supply tube to control the flow of fuel therethrough,
said throttle slide member comprising a substantially vertical bore therethrough and means for adjusting the position of said metering rod in a substantially longitudinal direction, said metering rod comprising a head portion at the upper end thereof, said head portion being slidable and nonrotatably received within said bore, said head portion having a threaded bore in the upper end thereof, a plate member fixedly mounted within said slide member bore above said head portion, said plate member having an opening in the center portion thereof, an adjusting screw slidably extending through said plate member opening and having its lower end threadably received within said threaded bore in said head portion, said adjusting screw having a head at its upper end in engagement with the upper surface of said plate member, and spring means surrounding said adjusting screw, the upper end of said spring means being in engagement with the lower surface of said plate member and the lower end of said spring means being in engagement with the upper surface of said head portion so that said spring means urges said adjusting screw and said metering rod downwardly, whereby rotation of said adjusting screw causes sliding movement of said head portion in said slide member bore to adjust the position of said metering rod relative to said slide member.

4,926,060

LAUNDRY RECEPTACLE CONSTRUCTION

Kenneth W. Sittig, Greenfield, Mass., assignor to J. H. Smith Co., Inc., Greenfield, Mass.

Filed Mar. 31, 1989, Ser. No. 331,241
Int. Cl.[5] A63B *63/08;* A45C *11/00*
U.S. Cl. 273—400 6 Claims

1. A laundry receptacle formed in the shape of a basketball hoop comprising a backboard, a circular hoop, a bag opened at one end with the open end being mounted around the periphery of the hoop, and a bracket comprising a hook portion and two hoop supporting members wherein the hook portion removably connects the hoop to the backboard and hoop supporting members are disposed to support the hoop on each side of the hook.

4,926,061

WINDTRAP ENERGY SYSTEM

Jose L. Arreola, Jr., Galveston, Tex., assignor to ECM International Inc., Tacoma, Wash.

Filed Aug. 8, 1988, Ser. No. 229,229
Int. Cl.[5] F03D *9/00*
U.S. Cl. 290—55 5 Claims

1. A windtrap energy system which converts kinetic energy of the wind to the electrical energy usable for home, farm, or business comprised of:

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a structural frame that is supported by a base foundation and winch support system;
a rotary shaft that is attached to the frame via a bearing housing;
a series of three windtraps connected to the rotary shaft;
each windtrap consisting of two half disks that are attached to the rotary shaft and a pair of concave vanes attached to the disks in opposite directions and having partial overlap at the center of the disk;
each of the concave vanes are 60 degrees apart from each other on a horizontal plane thereby providing kinetic energy capture from wind in any direction and the windtrap energy system is capable of sustaining winds up to 75 miles per hour and also the windtrap energy system is capable of producing electricity at wind speeds less that 10 miles per hour;



a flywheel attached to the rotary shaft and carrying two belts that are attached to pairs multiple generator devices in pairs with one of the pair being a DC induction generator and the other an AC generator;
an electrical controller that analyzes electrical flow and develops a set required voltage and current at 60 hertz, said electrical controller utilizes as a primary source the windtrap energy system and as a secondary source battery packs which during low energy consumption are recharged by the windtrap energy system;
the winch support system is connected to the frame and can lower the windtrap energy system to a safe horizontal position in the event of severe wind conditions after a breaking device has been set.

4,926,062
TOUCH CONTROL CIRCUIT FOR ORNAMENTAL LAMPS AND METHOD THEREFORE
Wayne L. Ussery, 6320 W. Shaw Butte Dr., Glendale, Ariz. 85304, and Leonard Weiss, Milwaukee, Wis., assignors to Wayne L. Ussery, Glendale, Ariz., a part interest
Filed Aug. 9, 1988, Ser. No. 230,161
Int. Cl.[5] **H01H** *35/00;* **H03K** *3/17*
U.S. Cl. 307—116 **15 Claims**

1. A touch control circuit for at least one lamp wherein capacitance to ground of an electrode is increased in response to a person touching said electrode, comprising:
oscillator means connected to said electrode having a period directly related to said capacitance;
means coupled to said oscillator means for generating a digital signal that has a duty cycle directly related to said oscillator period; and



means coupled to said generating means for providing a current through said at least one lamp in response to an increased value of said duty cycle.

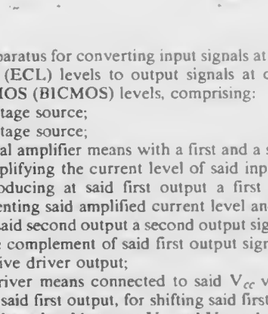
4,926,063
SQUARE ROOT DIGITAL-TO-ANALOG CONVERTER
Scott B. Donaldson, Blacksburg, Va., assignor to Kollmorgen Corporation, Simsbury, Conn.
Filed Nov. 14, 1988, Ser. No. 270,685
Int. Cl.[5] **H03M** *1/68*
U.S. Cl. 307—144 **6 Claims**



1. A digital-to-analog converter, comprising:
(a) first and second digital-to-analog converters;
(b) a first amplifier for amplifying the sum of the outputs of said first and second digital-to-analog converters;
(c) a third digital-to-analog converter;
(d) a second amplifier for amplifying the output of said third digital-to-analog converter; and
(e) a square-root amplifier for amplifying the sum of the outputs of said first and second amplifiers.

4,926,064
SLEEP REFRESHED MEMORY FOR NEURAL NETWORK
Carlos C. Tapang, Portland, Oreg., assignor to Syntonic Systems Inc., Portland, Oreg.
Continuation of Ser. No. 222,887, Jul. 22, 1988, abandoned. This application Jul. 26, 1989, Ser. No. 387,373
Int. Cl.[5] **G06G** *7/184*
U.S. Cl. 307—201 **62 Claims**

1. A neural network for use with a learning algorithm, a sleep refresh algorithm, and a plurality of environmental input signals, each of said environmental input signals having an activity level, comprising:
a plurality of N neuronal outputs, each carrying a signal having an activity level, said plurality including M first level neuronal outputs and N−M second level neuronal outputs;
feed-forward response means for generating on a j'th one of said second level neuronal outputs, $M < j \leqq N$, a j'th signal having an activity level responsive to the temporal and spatial sum of the activity levels of said signals on all i'th ones of said first level neuronal outputs, $i = 1, \ldots, M$, each as weighted by a respective connectivity weight w_{ij};
means for modifying at least one of said connectivity weights w_{ij} in accordance with said learning algorithm; and



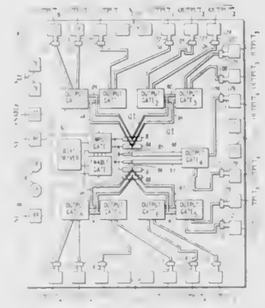
sleep activated means for, during a sleep period, isolating said neuronal outputs from said environmental inputs and adjusting at least some of said connectivity weights w_{ij} according to said sleep refreshed algorithm.

4,926,065
METHOD AND APPARATUS FOR COUPLING AN ECL OUTPUT SIGNAL USING A CLAMPED CAPACITIVE BOOTSTRAP CIRCUIT
Bruce H. Coy, San Diego, and David S. Rosky, Leucadia, both of Calif., assignors to Applied Micro Circuits Corporation, San Diego, Calif.
Continuation-in-part of Ser. No. 121,612, Nov. 17, 1984, Pat. No. 4,835,420. This application Sep. 2, 1988, Ser. No. 240,136
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[5] **H03K** *19/01*
U.S. Cl. 307—475 **13 Claims**



1. An apparatus for converting input signals at Emitter-Coupled-Logic (ECL) levels to output signals at corresponding Bipolar-CMOS (BICMOS) levels, comprising:
a V_{cc} voltage source;
a V_{ee} voltage source;
differential amplifier means with a first and a second output for amplifying the current level of said input signals and for producing at said first output a first output signal representing said amplified current level and for generating at said second output a second output signal representing the complement of said first output signal;
a capacitive driver output;
output driver means connected to said V_{cc} voltage source and to said first output, for shifting said first output signal to a voltage level between V_{cc} and V_{ee} and providing said shifted first output signal at said capacitive driver output;
a bootstrap transistor having a base, a collector connected to said driver output, and an emitter connected to said V_{ee} voltage source;
boost capacitive transfer means connecting said bootstrap transistor base to said second output for causing said bootstrap transistor to conduct current to discharge said capacitive driver output in response to variations in said second output signal; and
voltage clamping means connected to said bootstrap transistor base for establishing a predetermined voltage level at said bootstrap transistor base.

4,926,066
CLOCK DISTRIBUTION CIRCUIT HAVING MINIMAL SKEW
Rajnish Mainl, Chandler, and Harold L. Spangler, Mesa, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Sep. 12, 1988, Ser. No. 242,666
Int. Cl.[5] **H01L** *21/66;* **H03L** *7/00;* **H03K** *5/13*
U.S. Cl. 307—303.1 **8 Claims**



1. A monolithically integrated chip comprising:
a substrate having a planar surface;
input and output pads disposed at the periphery of said chip; said pads including pads for supply voltage for operating said chip; a circuit for providing a plurality of output clock signals in response to an input clock signal from one of said input pads, said output signals being transmitted substantially radially from substantially the center of said planar surface along metalization strips substantially equal in length from said circuit to said output for maintaining substantially equal propagation delays for said input clock signal and said output signals thereby substantially reducing the skew therebetween.

4,926,067
INTEGRATED SUPERCONDUCTING SAMPLING OSCILLOSCOPE
Steve R. Whiteley, Shrub Oak, N.Y., assignor to Hypres, Inc., Elmsford, N.Y.
Continuation of Ser. No. 101,418, Sep. 28, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,266
Int. Cl.[5] **H03K** *17/92, 19/195, 3/38*
U.S. Cl. 307—352 **14 Claims**

1. An integrated superconducting sampling oscilloscope, including a sampling gate connected to additional electronics, comprising:
means for producing a first trigger signal;
means for sensing said first trigger signal, said means for sensing producing a pulse signal when said first trigger signal is sensed;
means for gating said pulse signal, said means for gating producing an output signal when said pulse signal exists concurrently with a gating event;
means for producing a second trigger signal, having a variable delay, from said output signal of said means for gating;
means for receiving said second trigger signal and producing

a strobe pulse signal to the sampling gate in response to receipt of said second trigger signal; and



means for receiving said first trigger signal and producing a signal having a fixed delay signal to the sampling gate.

4,926,068

VOLTAGE COMPARATOR HAVING HYSTERESIS CHARACTERISTICS

Yasuhiko Fujita, Ninomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1988, Ser. No. 288,822

Claims priority, application Japan, Dec. 26, 1987, 62-330493

Int. Cl.[5] H03K *5/24, 3/15*

U.S. Cl. 307—359 **26 Claims**



1 A comparator circuit comprising:

level comparator means, coupled to a power source voltage and responsive to an input signal having a first input level higher than a predetermined first comparison level and to a second input level lower than a predetermined second comparison level, for generating an output signal which varies with level variation of the input signal between the first and second input levels, the output signal being varied from a first output level to a second output level when the level of the input signal is changed across the first comparison level, and being varied from the second output level to the first output level when the level of the input signal is changed across the second comparison level;

resistance circuit means, connected to said level comparator means, for providing a voltage drop corresponding to the first and second comparison levels; and

current circuit means, connected to said level comparator means and resistance circuit means, for supplying to said resistance circuit means a first current signal substantially free of variation caused by variation of the power source voltage, the first current signal providing a voltage drop corresponding to the first comparison level in said resistance circuit means after the output signal has been changed from the second output level to the first output level.

4,926,069

BI-MOS CIRCUIT CAPABLE OF HIGH SPEED OPERATION WITH LOW POWER CONSUMPTION

Toru Yamazaki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 17, 1988, Ser. No. 233,072

Claims priority, application Japan, Aug. 17, 1987, 62-203156; Jan. 29, 1988, 63-20278

Int. Cl.[5] H03K *17/04*

U.S. Cl. 307—446 **8 Claims**



1. A Bi-CMOS NAND circuit comprising:

a first input terminal;

a second input terminal;

an output terminal;

a first fixed potential source;

a second fixed potential source supplying a potential higher than said first fixed potential source;

a third fixed potential source having another potential between said first fixed potential and said second fixed potential;

a first NPN bipolar transistor and a second NPN bipolar transistor connected in series between said first fixed potential source and said second fixed potential source, a collector of said first NPN bipolar transistor being connected to said second fixed potential source, an emitter of said first NPN transistor and a collector of said second NPN transistor being connected to said output terminal and a emitter of said second NPN transistor being connected to said first fixed potential source;

a first P-channel MOS transistor and a second P-channel MOS transistor connected in parallel between said third fixed potential source and a base of said first NPN bipolar transistor, one of a source and a drain of said first P-channel MOS transistor and one of a source and a drain of said second P-channel MOS transistor being connected to said third fixed potential source, the other of the source and the drain of said first P-channel MOS transistor and the other of the source and the drain of said second P-channel MOS transistor being connected to the base of said first NPN bipolar transistor, a gate of said first P-channel MOS transistor being connected to said first input terminal and a gate of said second P-channel MOS transistor being connected to said second input terminal;

a first N-channel MOS transistor and a second N-channel MOS transistor connected in series between said first fixed potential source and the base of said first NPN bipolar transistor, one of a source and a drain of said first N-channel MOS transistor being connected to the base of said first NPN transistor, the other of the source and the drain of said first P-channel MOS transistor and the other of the source and the drain of said second P-channel MOS transistor, the other of the source and the drain of said first N-channel MO transistor being connected to one of a source and a drain of said second N-channel MOS transistor, the other of the source and the drain of said second N-channel MOS transistor being connected to said first fixed potential source, a gate of said first N-channel MOS transistor being connected to said first input terminal and the gate of said first P-channel MOS transistor and a gate of said second N-channel MOS transistor being connected to said second input terminal and the gate of said second P-channel MOS transistor;

a resistor; and

a third N-channel MOS transistor and a fourth N-channel MOS transistor connected in series between said output terminal and the base of said second NPN bipolar transistor, one of a source and a drain of said third N-channel MOS transistor being connected to said output terminal, the emitter of said first NPN transistor and the collector of said second NPN transistor, the other of the source and the drain of said third N-channel MOS transistor being connected to one of a source and a drain of said fourth N-channel MOS transistor, the other of the source and the drain of said fourth N-channel MOS transistor being connected to said first fixed potential source through said resistor and to the base of said second NPN bipolar transistor, a gate of said third N-channel MOS transistor being connected to said first input terminal, the gate of said first P-channel MOS transistor and the gate of said first N-channel MO transistor and a gate of said fourth N-channel MOS transistor being connected to said second input terminal, the gate of said second P-channel MOS transistor and the gate of said second N-channel MOS transistor.

4,926,071

COMPOUND SEMICONDUCTOR INTEGRATED CIRCUIT COMPATIBLE STANDARD LOGIC SIGNALS

David C. MacMillan, and Andrew C. Graham, both of Sunnyvale, Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Continuation of Ser. No. 51,987, May 19, 1987. This application Mar. 24, 1989, Ser. No. 329,149

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[5] H03K *19/094*

U.S. Cl. 307—475 **15 Claims**



1. A buffer circuit in integrated circuit form comprising an input signal lead for receiving an input signal, an output signal lead for providing an output signal, buffer circuitry means interconnecting said input signal lead and output signal lead, a first voltage supply terminal for receiving a voltage supply and operatively connected to said buffer circuitry means, a second voltage supply terminal for receiving a voltage supply more negative than that receivable by the first voltage supply terminal and operatively connected to said buffer circuitry means, and means on-chip operatively connected with said buffer circuitry means as part of said integrated circuit for generating a third voltage supply, said means for generating a third voltage supply being independent of radiative coupling in generating said third voltage supply, said circuitry being implemented in compound semiconductor technology.

4,926,070

VOLTAGE LEVEL CONVERTING CIRCUIT

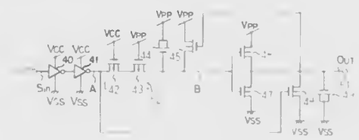
Sumio Tanaka, and Shigeru Atsumi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Dec. 30, 1988, Ser. No. 291,933

Claims priority, application Japan, Feb. 22, 1988, 63-39294

Int. Cl.[5] H03K *19/094, 19/092*

U.S. Cl. 307—475 **6 Claims**



1. A voltage level converting circuit which receives an input logic signal of either a "one" or "zero" level, wherein the logic "one" signal is represented by a first voltage level, and outputs an output logic signal as either a "zero" output signal or a "one" output signal, respectively, wherein the "one" output signal is represented by a second voltage level higher than said first voltage level, comprising:

gate means for receiving and transferring the input signal;

an output on which the output signal is provided;

inverter means biased with a voltage of said second voltage level for receiving the input signal from said gate means and for outputting the output signal responsive to the input signal;

pull-up means responsive to the "zero" output signal for raising the voltage level of the input signal to the inverter means; and

pull-down means coupled to the output and responsive to a "one" input signal for lowering the voltage level of the output signal.

4,926,072

NOISE ELIMINATION CIRCUIT

Hitoshi Hyodo, Okazaki, Japan, assignor to Aisin Seiki Kabushikikaisha, Aichi, Japan

Filed Sep. 16, 1988, Ser. No. 245,189

Claims priority, application Japan, Sep. 18, 1987, 62-234248; Sep. 18, 1987, 62-234249

Int. Cl.[5] H03K *5/01, 17/16*

U.S. Cl. 307—542.1 **3 Claims**

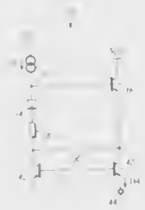


1. A noise elimination circuit comprising

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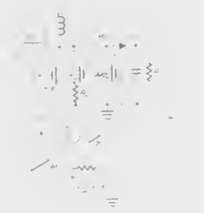
inverted output means for inverting the level of an output signal thereof in response to an inversion command signal;
decision means receiving an output signal from the inverted output means and an input signal to be detected and producing a coincidence signal when their levels coincide with each other and producing a non-coincidence signal when their levels are different from each other;
first time limit means for determining a length of time during which the decision means produces a non-coincidence signal and for delivering a first time-over signal when the length of time determined reaches a first given time interval;
second time limit means for determining a length of time during which the decision means produces a coincidence signal and for delivering a second time-over signal when the length of time determined reaches a second given time interval;
third time limit means for determining a length of time which passes after the decision means has produced a non-coincidence signal, for resetting the second time limit means whenever it delivers the second time-over signal and for delivering a third time-over signal when the length of time determined reaches a third given time interval;
and inversion command means for producing an inversion command signal applied to the inverted output means when the first time limit means delivers the first time-over signal and the third timing means delivers the third time-over signal, thereby providing a signal from which noises are moved as the output signal from the inverted output means.

4,926,073
NEGATIVE VOLTAGE CLAMP
John M. Pigott, Phoeniz, and Robert B. Jarrett, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed May 1, 1989, Ser. No. 345,321
Int. Cl.[5] H03K *5/08*
U.S. Cl. 307—544 **12 Claims**



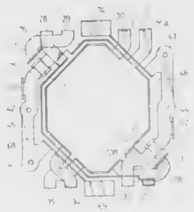
1. A voltage clamp circuit having an output, comprising:
current supply means for providing a first current of predetermined magnitude;
a first transistor having a base coupled to said current supply means and a collector-emitter conduction path for providing a second current;
first circuit means coupled in series to said current supply means including diode means and a resistor such that a voltage is developed across the resistor proportional to said first current; and
second circuit means having first and second inputs for receiving said first and second current respectively and an output which is coupled to the output of the voltage clamp circuit wherein said circuit means provides the appropriate magnitude of said second current to said output in response to a voltage applied thereto for clamping said applied voltage to a predetermined value approximately equal to said voltage developed across said resistor.

4,926,074
SEMICONDUCTOR SWITCH WITH PARALLEL LATERAL DOUBLE DIFFUSED MOS TRANSISTOR AND LATERAL INSULATED GATE TRANSISTOR
Barry M. Singer, New York; Gert W. Bruning, Tuckahoe, and Satyendranath Mukherjee, Yorktown Heights, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.
Division of Ser. No. 115,478, Oct. 30, 1987. This application Oct. 24, 1988, Ser. No. 262,564
Int. Cl.[5] H03K *17/04, 17/14, 17/284, 17/687*
U.S. Cl. 307—581 **7 Claims**



1. A semiconductor switch including a lateral double diffused MOS transistor which is transferable between a conducting state and a nonconducting state and which has a first gate, a source region and a drain region, a lateral insulated gate transistor which is transferable between a conducting state and a nonconducting state and which has a second gate, a cathode region and an anode region, said source region and said anode region being interconnected, said drain region and said anode region being interconnected, signal means connected to said second gate and capable of transmitting signals thereto for causing said lateral insulated gate transistor to transfer between its current conducting state and its nonconducting state, delay means connected to said first gate and capable of transmitting signals thereto to cause said double diffused MOS transistor to transfer between its current conducting state and its nonconducting state, and reference means for producing a reference signal representative of the current through said lateral insulated gate transistor, said delay means being responsive to a signal from said signal means for causing said lateral insulated gate transistor to transfer to its nonconducting state and to a signal representative of the current through said lateral insulated gate transistor to generate a signal to transfer said double diffused MOS transistor from its conducting state to its nonconducting state.

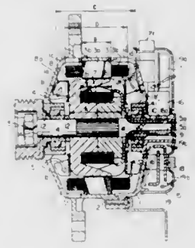
4,926,075
ELECTRIC MOTOR BRUSH ASSEMBLY ADAPTABLE TO DIFFERENT STATORS
Fusao Fushiya; Kenji Yoshida; Akira Naitoh, and Tetsuya Sawa, all of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Dec. 21, 1988, Ser. No. 288,073
Claims priority, application Japan, Dec. 28, 1987, 62-335233; Dec. 28, 1987, 62-335234; Jan. 20, 1988, 63-9791; Feb. 25, 1988, 63-43231
Int. Cl.[5] H02K *15/00, 13/10*
U.S. Cl. 310—50 **18 Claims**



1. An electric motor comprising:
a commutator; and
a brush assembly including
a pair of brushes each disposed in operative relation to said commutator,
a pair of brush holders each supporting at least one of said brushes, and
an assembly base for securing said brush holders thereto, said assembly base including a base plate of insulating material and at least two severable conductive passages each secured to said base plate, said conductive passages being adapted to supply electric current to said pair of brushes from different directions and drive said electric motor for rotation in either forward or reverse direction when either one of said passages is severed.

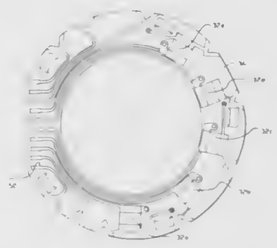
4,926,076
ALTERNATOR WITH ATTACHED DIODE REGULATOR HOUSING
Takayasu Nimura, Nagoya, and Tsutomu Shiga, Nukata, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Division of Ser. No. 57,733, Jun. 2, 1987, Pat. No. 4,794,285, which is a continuation of Ser. No. 665,496, Oct. 29, 1984, abandoned, and Ser. No. 213,491, Dec. 5, 1980, abandoned. This application Jul. 12, 1988, Ser. No. 218,571
Claims priority, application Japan, Dec. 14, 1979, 55-162439
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[5] H02K *9/00*
U.S. Cl. 310—68 D **7 Claims**

1. An alternator for use in a vehicle comprising:
a housing including a circumferential portion extending between spaced apart axial end portions, each of said axial end portions having a central portion and means defining a plurality of intake ports adjacent said central portion for permitting air passage therethrough, said circumferential portion further including means defining first and second air exhaust ports spaced from each other;
a stator assembly, including a stator core provided on an inner surface of said circumferential portion at a location between said first and second air exhaust ports, and a stator winding wound around said stator core;
a rotor assembly, including a rotor shaft, a rotor core fixed to the rotor shaft for rotation therewith and comprising interleaved pole members which define a plurality of angularly separated fingers having axially extending spaces therebetween, and a rotor coil wound around said rotor core;
bearing means in the central portion of each of said axial end portions for rotatably supporting said rotor shaft;
a pulley fixed on a first end of said rotor shaft, and driven by said vehicle;
a diode fin and a voltage regulator disposed round a second end of said rotor shaft;
a first fan provided on one end surface of said pole members of said rotor on said first end of said rotor shaft, whereby during rotation of the rotor core, said first fan draws air from the exterior of said housing through said intake ports in one of said axial end portions and directs the air radially



of the housing past said stator winding and through said first air exhaust ports in said circumferential portion and axially of said housing through said spaces between fingers, and between said rotor coil and said stator core; and
a second fan provided on the other end surface of said pole members of said rotor on said second end of said rotor shaft, whereby during rotation of the rotor core, said second fan draws air through said intake ports in the other of said axial end portions, said diode fin and said voltage regulator, and directs the air radially of the housing past said stator winding through said second air exhaust ports in said circumferential portion so that said diode fin and said voltage regulator are directly cooled by the air drawn by the second fan.

4,926,077
RESISTANCE COMPENSATION IN A MOTOR USING A THERMALLY VARIABLE RESISTIVE NETWORK
Raymond G. Gauthier, Santa Cruz County; James N. Krause, Santa Clara County, and David M. Lancisi, Santa Cruz County, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.
Filed Jul. 19, 1988, Ser. No. 221,335
Int. Cl.[5] H02K *11/00;* **H02P** *8/00*
U.S. Cl. 310—68 C **7 Claims**



1. In a stepper motor for a disc drive comprising a housing, a rotating shaft mounted in said housing for carrying a rotor, a

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plurality of stator coils mounted in parallel on the inner surface of said housing, a printed circuit board supported by said housing adjacent exposed ends of said coils, and a microprocessor for supplying controlling step pulses to said motor at periodic intervals established in an open-loop look-up table in a memory associated with said microprocessor, and at least one thermistor mounted on said printed circuit board adjacent said coils and connected to at least one of said coils and responsive to temperature changes in said coils to maintain total motor resistance at a constant level over a range of operating temperatures of said motor, whereby the controlling step pulses applied by said microprocessor accurately position said stepper motor over a wide range of temperatures.

4,926,078

BRUSH AND TERMINAL ASSEMBLY FOR ENGINE STARTER

Shuzoo Isozumi, and Keiichi Konishi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,605
Claims priority, application Japan, Apr. 21, 1988, 63-100486
Int. Cl.[5] H02K *13/00*; H01R *39/06*
U.S. Cl. 310—71 **2 Claims**



1. A brush and terminal assembly for use in an engine starter having a motor including a commutator mounted on an armature rotary shaft, comprising:

a support plate having two major surfaces and a central opening for receiving therein the commutator of the motor;

a plurality of positive and negative brushes mounted to one of said major surfaces of said support plate and spring biased in radially inward direction of said central opening;

a terminal bolt and a connection terminal unit mounted to said support plate;

a pair of stationary contacts projectingly mounted to the other of said major surfaces of said support plate for use as contacts of an on/off switch of the electric motor, one of said stationary contacts being electrically connected to said terminal bolt and the other of said stationary contacts being electrically connected to said connecting terminal unit; and

lead conductors having one end connected to said positive brushes and the other end connected together to said connecting terminal unit.

4,926,079

MOTOR FIELD WINDING WITH INTERMEDIATE TAP

Paul Niemela, Pickens, and David G. Peot, Easley, both of S.C., assignors to Ryobi Motor Products Corp., Pickens, S.C.

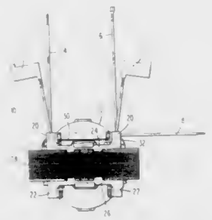
Filed Oct. 17, 1988, Ser. No. 258,884
Int. Cl.[5] H02K *11/00*
U.S. Cl. 310—71 **9 Claims**

1. In a field assembly of a motor having a lamination stack, a winding of magnet wire, and a terminal board structure including at least a pair of pockets for receiving ends of said winding and for receiving terminal means for making electrical contact with said ends, the improvement comprising:

intermediate contacting means located on said terminal board structure for making contact with said wire on an intermediate turn between said ends of said winding, including

gripping means for gripping a portion of said intermediate turn without severing same and

contact means for providing electrical contact to said portion of said intermediate turn of said winding,



wherein said terminal board structure comprises first and second terminal boards mounted to respective opposite ends of said lamination stack, said pair of pockets being located on one of said first and second terminal boards and said intermediate contacting means being located on the other of said first and second terminal boards.

4,926,080

LINEAR ACTUATOR SCREW CONNECTED WITH PARALLEL LINEAR BEARING

Satoru Koyama, 29-20, Kotubo 1-chome, Zushi-shi Kanagawa-ken, Japan 249

Continuation-in-part of Ser. No. 52,736, Apr. 30, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 276,782
Int. Cl.[5] F16D *1/06*; H02K *7/06*
U.S. Cl. 310—80 **4 Claims**

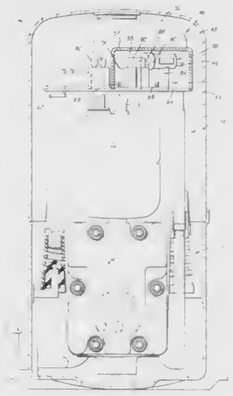
1. A linear actuator comprising in combination (a) a stepping motor having flanges on both faces in the axial direction of said motor for connecting with other devices and a hollow motor shaft the end of which is tapered to receive a coupling for application of a screw and (b) the coupling adapted to couple said shaft to means for causing rotation of said shaft to produce linear movement of said screw, an apertured plate member mounted on each said motor face through said flanges, a holder of a linear ball bearing mounted upon said apertured plate members in parallel to said motor shaft, a screw extending through said hollow motor shaft, and a bar extending through said bearing holder, wherein said bar and screw are connected to each other at an end thereof through a connecting member.

4,926,081

THERMALLY PROTECTED HERMETIC MOTOR COMPRESSOR

Michael A. DiFlora; James M. Brown, both of Sidney; Steven L. Rice, and Jeffery D. Ramsey, both of Dayton, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Feb. 11, 1988, Ser. No. 157,943
Int. Cl.[5] H02K *11/00*
U.S. Cl. 310—89 **37 Claims**



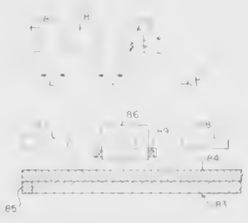
1. A motor compressor assembly comprising a motor having end turns extending upwardly from an annular face thereof, a heat sensitive circuit protector disposed in electrical circuit relationship with said end turns for protecting said motor from overheating, and a cover sized to enclose the end turns of said motor and said protector, characterized by a retainer rigidly secured to the annular face, a connector block secured to said retainer for retaining said protector below the upward extension of said end turns and interengaging fingers and slots releasably securing the cover to the retainer, said connector block disconnected from said cover.

4,926,082

SUPERCONDUCTOR DEVICES FOR DISK DRIVES

Frank S. Barnes, Boulder, Colo., assignor to University of Colorado Foundation, Inc., Boulder, Colo.

Division of Ser. No. 155,192, Feb. 12, 1988, Pat. No. 4,843,504. This application Apr. 12, 1989, Ser. No. 336,995
Int. Cl.[5] H02K *41/02*; G11B *5/55*
U.S. Cl. 310—90.5 **5 Claims**



1. Apparatus for positioning a carriage which is constrained to move along a predetermined path comprising:

a superconductor member and a variable magnetic field producing member,

means mounting one of said members on the carriage and the other said member relative to the predetermined path, said mounting means positioning said members relative to one another for interfacing said superconductor member with the magnetic field from said producing member for establishing a force on the carriage in a first direction along the path, and

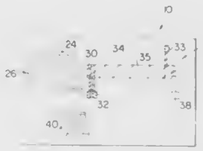
counter force producing means for applying a force to the carriage in a direction opposite said first direction whereby the carriage will move to a position along the path where the forces on the carriage are in balance.

4,926,083

OPTICALLY MODULATED ACOUSTIC CHARGE TRANSPORT DEVICE

Sears W. Merritt; Robert N. Sacks, and Arthur G. Foyt, all of Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1988, Ser. No. 283,624
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 R **12 Claims**



1. An acoustic charge transport device capable of responding to optical modulation comprising:

an acoustic charge transport structure formed on a piezoelectric semiconducting substrate including

a transducer means fabricated on a first surface of the substrate for launching surface acoustic waves along a propagation axis, said surface acoustic waves characterized by maxima and minima of electrical potential which transport electric charges provided thereto;

a reflector means formed in said surface at an end portion thereof adjacent to said transducer means for reflecting said surface acoustic waves;

a first electrode means for providing electrical charges to said surface acoustic waves,

a transport channel formed in said substrate to have a major dimension extending parallel to said propagation axis, said channel for receiving said charges and providing lateral and vertical confinement of said charges propagating with said surface acoustic waves;

a second electrode means receiving modulation signals and electrically configured with said transport channel to alter the electrical potential barrier height therein in accordance with said modulation signals, thereby controlling the amount of propagating charge,

a third electrode means for providing an electrical signal equivalent of said propagating electrical charge;

a fourth electrode means configured with said transport channel at an end thereof distal to said first electrode means for removing said propagating charge; and

a photoconverter means configured in said substrate for generating said modulation signals in accordance with a modulated optical beam received therein.

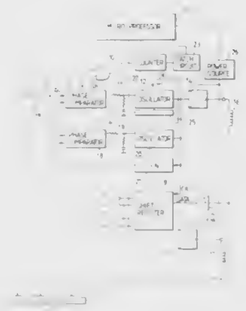
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4,926,084

DRIVING APPARATUS FOR A VIBRATION WAVE MOTOR

Etsuro Furutsu, Kawasaki, and Kazuhiro Izukawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1989, Ser. No. 346,917
Claims priority, application Japan, May 6, 1988, 63-111339
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—316 8 Claims



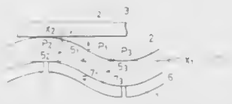
1. A vibration wave driven motor comprising:
(a) a first member having a friction surface;
(b) a vibration member arranged in contact with the friction surface of said first member;
(c) an electro-mechanical transducer arranged in contact with said vibration member to generate the travelling vibration wave to said vibration member in response to an applied driving signal with a predetermined frequency;
(d) monitoring means for monitoring the vibrating state of said motor and outputting a signal conforming to the amount of deviation from the resonancevibrating state; and
(e) frequency changing means responsive to the output signal from said monitoring means to change the frequency of the driving signal greatly when said amount of deviation is greater than a predetermined value, and to change the frequency of the driving signal small when said amount of deviation is smaller than said predetermined value.

4,926,085

VIBRATION WAVE MOTOR

Ippei Sawayama, Machida, and Masayuki Jinnai, Utsunomiya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1989, Ser. No. 346,657
Claims priority, application Japan, May 6, 1988, 63-109967
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 18 Claims



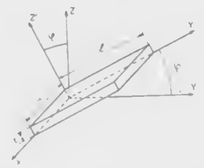
1. In a vibration wave motor having a vibrator and a movable body, a friction surface of the movable body being in contact with a friction surface of the vibrator, the movable body being driven by a traveling vibration wave produced by an electromechanical energy conversion element fixed on the vibrator, wherein the improvement comprises:
the friction surface of one of the vibrator and the movable body being a hard alumite-processed materials; and
the friction surface of the other of the vibrator and the movable body being an ultrahard material consisting of a nickel-phosphorus-base alloy which contains a material selected from the group consisting of silicon carbide, boron carbide, titanium boride and boron nitride.

4,926,086

PIEZOELECTRIC RESONATOR

Claude Bourgeois, Bole, and Jean Hermann, Neuchatel, both of Switzerland, assignors to Centre Suisse D'Electronique Et De Microtechnique S.A., Switzerland

Filed Jun. 30, 1989, Ser. No. 373,470
Claims priority, application France, Jul. 7, 1988, 88 09221
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—361 11 Claims



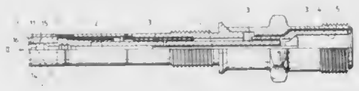
1. A thin quartz crystal piezoelectric resonator having the form of a rectangular parallelepiped whose width w is arranged along the electric axis X of the crystal, the length l is arranged along an axis Y' and the thickness t is arranged along an axis Z', wherein said axes Y' and Z' form an angle y equal to 24°24'±3' with the mechanical axis Y and the optical axis Z of the crystal respectively and the ratio w/l of the width to the length is equal to N× (0.64±0.03), where N is a whole number.

4,926,087

CAVITY DISCHARGE IGNITER

Chandra M. Kler, Wembley, and Jagdevinder S. Hanspal, Iver, both of England, assignors to Smiths Industries Public Limited Company, London, England

Filed Dec. 2, 1988, Ser. No. 278,982
Claims priority, application United Kingdom, Dec. 5, 1987, 8728491
Int. Cl.[5] H01T *13/32, 13/50, 13/54*
U.S. Cl. 313—131 A 7 Claims



1. In an electrical cavity discharge igniter of the kind having a cylindrical cavity at its operative tip, a semiconductive surface discharge path along said cavity, a first electrode located at one end of the discharge path, a second electrode located at the other end of the discharge path, and an outlet orifice opening from said cavity at the operative tip through which a plasma of discharge products produced in said cavity are ejected for ignition of a fuel-air mixture at a distance from said igniter, the improvement wherein the diameter of the cavity and the diameter of the outlet orifice are in the ratio of about 5 to 6.

4,926,088

IGNITERS AND METHODS OF MANUFACTURE OF IGNITERS

Chandra M. Kler, Wembley, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Dec. 2, 1988, Ser. No. 278,992
Claims priority, application United Kingdom, Dec. 5, 1987, 8728492
Int. Cl.[5] H01T *13/20, 21/02*
U.S. Cl. 313—131 A 12 Claims



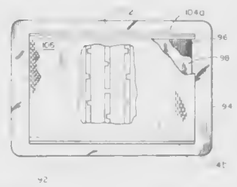
1. An electrical igniter of the kind having two electrodes and means spacing the two electrodes from one another at the operative tip of the igniter to provide a gap across which discharge is produced, the improvement wherein at least one of said electrodes is substantially of tungsten except for a surface layer that has been treated to be oxidation resistant at high temperatures by diffusion of chromium into the surface layer.

4,926,089

TIED SLIT FOIL SHADOW MASK WITH FALSE TIES

Melvin L. Moore, Woodlawn, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 2, 1988, Ser. No. 279,188
Int. Cl.[5] H01J *29/07*
U.S. Cl. 313—403 12 Claims



1. A front assembly for a color cathode ray tube including a glass faceplate having on its inner surface a centrally disposed phosphor screen, and a metal foil shadow mask mounted in tension on a mask-support structure located on opposed sides of said screen, said mask comprising a series of parallel strips separated by slits, the strips being coupled by widely spaced ties, the mask having between the ties one or more false ties extending partially between but not interconnecting adjacent strips.

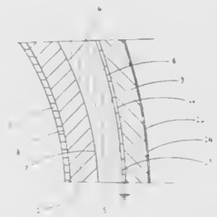
4,926,090

TELEVISION PICTURE TUBE HAVING A COMPOSITE FRONTAL PANE

Wilhelm Rein, Fürth, Fed. Rep. of Germany, assignor to Flabeg GmbH, Fürth, Fed. Rep. of Germany

PCT No. PCT/DE87/00591, § 371 Date Aug. 17, 1988, § 102(e) Date Aug. 17, 1988, PCT Pub. No. WO88/04828, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 12, 1987, Ser. No. 243,098
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3643088
Int. Cl.[5] H01J *29/89*
U.S. Cl. 313—478 9 Claims

1. A television picture tube including a composite frontal pane comprising:
a viewing screen which is spherically or aspherically convexly curved relative to a viewer thereof;
a convexly curved light-transparent supplementary pane spaced from said viewing screen; and
a transparent cast resin layer inserted between said viewing screen and said supplementary pane for gluing said screen and said pane to one another, said cast resin layer having



a refraction index which corresponds approximately to that of said supplementary pane and said viewing screen, wherein said supplementary pane is cylindrically curved only about the vertical axis of said pane and the radius of curvature of said pane is significantly larger than the radius of curvature of said viewing screen.

4,926,091

LUMINESCENT TERBIUM-ACTIVATED BORATE, LUMINESCENT SCREEN PROVIDED WITH SUCH A BORATE AND LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP PROVIDED WITH SUCH A SCREEN

Johannus G. Verlijsdonk; Robert J. Pet, and Bruno M. J. Smets, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 5, 1989, Ser. No. 403,219
Claims priority, application Netherlands, Sep. 7, 1988, 8802203
Int. Cl.[5] C09K *11/78*
U.S. Cl. 313—486 7 Claims

1. A luminescent terbium-activated alkaline earth metal rare earth metal borate, characterized in that the borate has a monoclinic crystal structure and is defined by the formula

$$M_3Ln_{1-x}Tb_x(BO_3)_3$$

in which M represents at least one of the elements Ba, Sr and Ca of which up to 34 mol % is replaceable by Mg, in which Ln is at least one of the elements La, Gd, Y and Sc and in which $0.005 \leqq x \leqq 1$.

4,926,092

STEM WITH MOLDED BACK-FILL GAS DIRECTIONAL DIFFUSER

Ray G. Gibson, III, Bath, and Albert E. Kowal, Corning, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Sep. 29, 1988, Ser. No. 251,629
Int. Cl.[5] H01J *61/30, 61/35, 61/42;* H01K *3/22*
U.S. Cl. 313—493 17 Claims

1. A lamp stem, comprising:
a tubular glass body defining a stem axis having an open end, a flared skirt extending from the open end of said tubular body and a stem press defining a closed end of said tubular body, said stem press merging into said tubular body at a thickened wall portion of said body, said tubular body enclosing an interior space between said stem press and said flared skirt;
an exhaust tube extending in the interior space of said tubular body having an end fused to said tubular body at said thickened wall portion, said thickened wall portion having a conduit extending from said exhaust tube end

VOL
1114
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through said thickened wall portion to the exterior of said thickened wall portion; and



directing means comprising an integral glass portion of said tubular body for directing a gas passing through said exhaust tube and said conduit in a direction towards said flared skirt at an acute angle relative to said stem axis.

4,926,093

GYROTRON DEVICE

Toru Sugawara, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1988, Ser. No. 172,802
Claims priority, application Japan, Mar. 31, 1987, 62-78519
Int. Cl.[5] H01J *25/00*
U.S. Cl. 315—4 **8 Claims**



1. A gyrotron device comprising:

electron gun means, having an axis, for emitting a beam of electrons which have an annular cross section along the axis;

means for applying an axial magnetic field to said electrons emitted from said electron gun means to produce cyclotron motion;

resonating means having a cavity for receiving said electron beam and converting energy of every electron within said electron beam into energy in the form of microwaves, said resonating means being provided with a substantially cylindrical outer conductor coaxially arranged along said axis on an outer surface of said resonating means, and a substantially columnar inner conductor coaxially arranged along said axis on an inner surface thereof, and extended portions of said substantially columnar inner conductor having a conical distal end which is coaxially with said columnar portion;

waveguide means having a coaxial waveguide along said axis for guiding said microwaves converted by said resonating means; and

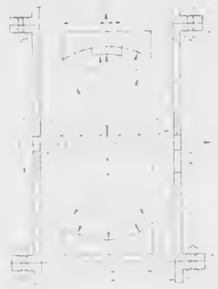
directional coupler means, having slots for performing an electromagnetic-wave coupling between said cavity and said waveguide, for guiding said microwaves from said cavity to said waveguide.

4,926,094

HIGH-PERFORMANCE GYROTRON FOR PRODUCTION OF ELECTROMAGNETIC MILLIMETER OR SUBMILLIMETER WAVES

Anders Bondeson, Gothenburg, Sweden; Bernhard Isaak, Lausanne; Andre Perrenoud, Nyon, both of Switzerland, and Minh Q. Tran, Lausanne, Switzerland, assignors to Centre for Recherches En Physique Des Plasmas, Lausanne, Switzerland

Filed Mar. 1, 1988, Ser. No. 162,510
Claims priority, application Switzerland, Mar. 3, 1987, 799/87
Int. Cl.[5] H01J *25/02*
U.S. Cl. 315—5 **10 Claims**



1. High-performance gyrotron for generating electromagnetic millimeter or submillimeter waves, comprising:

a quasi-optical resonator including two concave mirrors placed on an optical axis opposite one another, said optical axis being arranged perpendicular to a direction of a high-energy electron beam, and

a cylindrical housing, whose axis coincides with the optical axis, said housing surrounding the quasi-optical resonator and having at least predominantly electrically conducting walls, so that a closed resonator structure is formed and radiation into the environment of the quasi-optical resonator is substantially completely prevented and optical coupling efficiency is achieved.

4,926,095

THREE-COMPONENT GAS MIXTURE FOR FLUORESCENT GAS-DISCHARGE COLOR DISPLAY PANEL

Tsutae Shinoda, Akashi, and Toshiyuki Nanto, Kobe, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 18, 1988, Ser. No. 156,743
Claims priority, application Japan, Feb. 19, 1987, 62-036984
Int. Cl.[5] G09G *3/10;* **H01J** *1/62, 63/04, 17/20*
U.S. Cl. 315—169.4 **18 Claims**

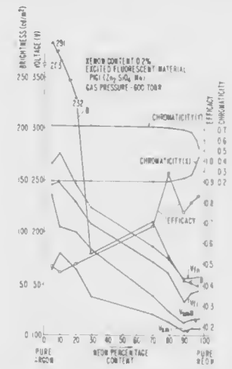
1. A fluorescent gas-discharge color display panel comprising:

first and second substrates positioned substantially in parallel relationship and sealed about the respective peripheries thereof for defining a gas-discharge space therebetween;

a discharge gas received in the gas-discharge space, the discharge gas mixture consisting essentially of a three-component mixture of neon, xenon and argon gases wherein the percentage content of argon gas is more than approximately 5 percent;

a plurality of electrodes for discharging said discharge gas, said electrodes being positioned on an inner surface of at least one of said substrates and defining a plurality of discharge cells; and

a layer of fluorescent material disposed in said discharge gas space and positioned relatively to the discharge cells so as



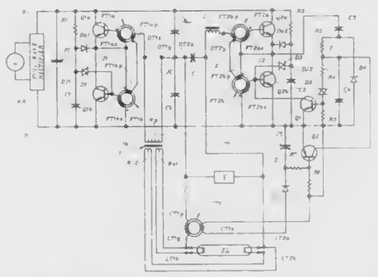
to be excited by the ultra violet light generated by gas discharges therein.

4,926,096

SHOCK-PROTECTED ELECTRONIC BALLAST

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Feb. 18, 1986, Ser. No. 830,270
Int. Cl.[5] H05B *37/00*
U.S. Cl. 315—225 **28 Claims**



1. A ballast comprising:

power input means operative to be connected with the power line voltage of an ordinary electric utility power line;

power conditioning means connected with the power input means and operative to provide a current-limited AC voltage between a first output terminal and a second output terminal;

control means connected in circuit with the power conditioning means and operative to cause a substantial reduction in the magnitude of the AC voltage in response to a control signal;

control signal means connected in circuit with the power conditioning means and operative in response to the AC voltage and after a relatively brief period to provide the control signal, except if provided with a prevention signal at a prevention signal input;

lamp terminal means connected with the first and second output terminals and operative to permit connection of a gas discharge lamp between the first and second terminals; and

sensor means connected in circuit with the lamp terminal means and operative to provide the prevention signal to the prevention input in response to lamp current flowing through the gas discharge lamp;

whereby: (i) a gas discharge lamp may be properly powered from the current-limited AC voltage provided between the first and second output terminals as long as lamp current results in response to this AC voltage within the relatively brief period, and (ii) the AC voltage exhibits a substantial reduction in magnitude in the event that no lamp current results within the relatively brief period.

4,926,097

BALLAST CIRCUIT FOR A FLUOROESCENT LAMP

Kim C. Taek, Plymouth, Mich., assignor to Saturn International, Inc., Plymouth, Mich.

Filed Mar. 28, 1988, Ser. No. 173,108
Int. Cl.[5] H05B *41/36*
U.S. Cl. 315—307 **11 Claims**



1. A ballast circuit for a fluorescent lamp, said lamp comprising an elongated envelope with an electrode at each end, said circuit comprising:

means for generating a high frequency square wave in excess of 10,000 Hertz,

means for modulating an electrical power source having a voltage in the range of 400–800 volts by said square waver so that the modulated voltage has a frequency at which the voltage polarity inverts equal to said square wave frequency,

means for electrically connecting said modulated voltage to the lamp electrodes, and

means for dimming said lamp, wherein said dimming means comprises means for varying said square wave frequency, wherein said square wave generating means comprises a fixed frequency oscillator, and wherein said dimming means comprises a variable frequency oscillator responsive to an input signal, means for varying the input signal, and means responsive to an output from the variable frequency oscillator for disabling said fixed frequency oscillator.

4,926,098

PUSH-PULL CLASS-E BI-DIRECTIONAL SCANNING CIRCUIT

Albert G. Tarrillo, Cincinnati, Ohio, assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 19, 1989, Ser. No. 409,554
Int. Cl.[5] H01J *29/70, 29/76*
U.S. Cl. 315—408 **22 Claims**

1. A scanning system for CRT horizontal deflection coil means which has an input terminal and a ground terminal, comprising:

(a) means for receiving a positive DC power input;

(b) a first switching device which has an input terminal coupled to said means for receiving a positive DC power input and which has an output terminal, said first switching device having a switching cycle which is characterized by an on-interval followed by an off-interval;

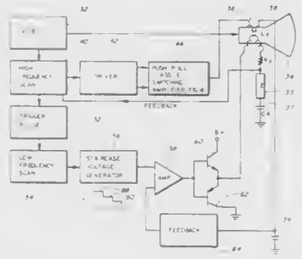
(c) means for receiving a negative DC power input;

(d) a second switching device which has an input terminal coupled to said means for receiving a negative DC power input and which has an output terminal, said second switching device having a switching cycle which is gener-

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1114
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ally the same as said switching cycle of said first switching device with the on-interval of said second switching device occurring during the off-interval of said first switching device; and

(e) matching network means, inter-coupling the input terminal of the CRT deflection coil means and said output terminal of said first switching device and said output terminal of said second switching device, for shaping the waveforms of the switch voltage and the switch current of said first switching device and said second switching device to have the transitions of those two waveforms for each of said switching devices displaced in time from each other and to have each of said switching devices not experience simultaneously high current and high voltage while switching.



4,926,099

BIMODAL CONTROLLER FOR A MULTI-PHASE BRUSHLESS DC MOTOR

Dennis J. Ricker, Huber Heights, and Richard L. Foster, Beavercreek, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1989, Ser. No. 334,417
Int. Cl.[5] H02P *6/02*
U.S. Cl. 318—254 **1 Claim**



1. In a brushless DC motor control system including a rotor, N motor stator windings mutually connected to a common terminal, and stator winding energization means having first and second sets of N transistors adapted to connect said stator windings to first and second terminals, respectively, of a source of direct current, control apparatus comprising:

common switch means effective when activated to connect the common terminal of said stator windings to the first terminal of said source, and when deactivated to disconnect said common terminal from said source;

control means effective (1) in a high torque, low speed mode of operation to deactivate said common switch means and to control said first and second sets of transistors in relation to the position of said rotor to effect full wave energization of said stator windings, and (2) in a high speed, low torque mode of operation to activate said common switch means, to disable said first set of transistors, and to control said second set of transistors in relation to the position of said rotor to effect half wave energization of said stator windings.

4,926,100

ZERO-TORQUE EDDY CURRENT MOTOR SYSTEM AND METHOD FOR CONTROLLING SAME

Karl M. Hink; Joseph R. Pottebaum, both of Brookfield; Jerome J. Reichard, Menomonee Falls; Bruce C. Wagner, Wauwatosa; Douglas B. Weber, Wauwatosa, and Theodore O. Wiesendanger, Germantown, all of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jun. 2, 1988, Ser. No. 201,551
Int. Cl.[5] G05B *5/01*
U.S. Cl. 318—269 **41 Claims**



1. A variable speed eddy current motor having an output shaft whose rotation may be controllably stopped or started, said eddy current motor comprising:

a constant speed motor having a rotatably supported constant speed motor output shaft;

a drum secured to said constant speed motor output shaft to rotate therewith;

an output assembly including said eddy current motor output shaft;

an inductor secured to one end of said eddy current motor output shaft to rotate therewith, said inductor being juxtaposed with said drum;

a field coil for applying a magnetic field to both said drum and said inductor when an electric current flows through said field coil, said drum rotating in the presence of said magnetic field causing said inductor to apply a torque to said eddy current motor output shaft, said torque being controlled by the magnitude of the current flowing through said field coil;

speed control means for sensing the rotation of said eddy current motor output shaft and for supplying a current having a controlled magnitude to said field coil, said speed control means also being adapted for receiving a speed control signal in response to which said speed control means regulates the current flowing through said field coil to control the rotation of said eddy current motor output shaft; and

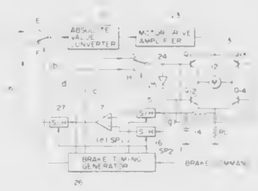
zero-torque regulating means responsive to the magnitude of the electrical current flowing through said field coil for supplying a remanent magnetism counterbalancing current to said field coil if said speed control means supplies no current to said field coil, upon the application of said remanent magnetism counterbalancing current said inductor no longer applies any torque to said eddy current motor output shaft.

4,926,101

DC MOTOR STOP DETECTOR AND DC MOTOR BRAKE APPARATUS

Akihiko Enomoto, Tokyo; Takashi Koga, Yokohama; Minoru Yoneda, and Hiroshi Kobata, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 20, 1989, Ser. No. 382,412
Claims priority, application Japan, Jul. 25, 1988, 63-183471; Mar. 31, 1989, 1-83539
Int. Cl.[5] H02P *3/10*
U.S. Cl. 318—374 **17 Claims**



1. A DC motor stop detector for detecting the stopping of a DC motor, comprising:

a motor driver for selectively supplying a forward drive voltage and a reverse drive voltage to a DC motor;

control means for supplying a control voltage to said motor driver to control output durations of said forward drive voltage and said reverse drive voltage of said motor driver;

current detecting means for detecting current from said motor driver proportional to current flowing through said DC motor; and

current value comparing means for comparing a first current value of current attained from said current detecting means at a first timing after a predetermined time from a timing at which said forward drive voltage is output, with a second current value of said current from said current detecting means at a second timing after said predetermined time from a timing at which said reverse drive voltage is output, said DC motor not running when said first current value equals said second current value.

4,926,102

INVOLUTE INTERPOLATION METHOD

Hideaki Kawamura, Hachioji; Kentaro Fujibayashi, Musashino, and Toshiaki Otsuki, Hino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00581, § 371 Date Feb. 6, 1989, § 102(e) Date Feb. 6, 1989, PCT Pub. No. WO88/10456, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 14, 1988, Ser. No. 309,664
Claims priority, application Japan, Jun. 24, 1987, 62-157303
Int. Cl.[5] G05B *19/25*
U.S. Cl. 318—573 **6 Claims**



1. An involute interpolation method for machining operations in a numerical control apparatus, comprising the steps of:

(a) obtaining, from a numerical control instruction, a rotational direction of an involute curve, one of an incremental distance along the involute curve and an incremental angle, a center position of a base circle of the involute curve and a radius of the base circle; and

(b) interpolating the involute curve using one of a predetermined distance and a predetermined angle.

4,926,103

SYSTEM FOR DYNAMICALLY DETERMINING POSITION OF MULTIPLE AUTOMATICALLY GUIDED VEHICLES

David F. Summerville, Garland; John P. Williston; Martin A. Wand, both of Plano; Thomas J. Doty, Dallas; Haradon J. Rice, Plano, and Pben-Lan Huang, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 129,914, Dec. 4, 1987, Pat. No. 4,887,013, which is a division of Ser. No. 771,379, Aug. 30, 1985, abandoned. This application Oct. 31, 1988, Ser. No. 265,070
Int. Cl.[5] B62D *1/24;* **G05D** *1/02*
U.S. Cl. 318—587 **6 Claims**



1. A system for monitoring the expected position of an AGV moving along a path between nodes, the path having path segments between adjacent nodes, comprising:

a computer having a memory, the memory containing a representation of the path and the last known position of the AGV;

a window defined in the memory overlying the representation of the path segment for encompassing the expected position of said AGV;

means for adjusting the size of the window based upon deviations of the AGV from the path;

navigation means for location said AGV;

means for updating the last known position of the AGV in the memory based on the location of the AGV determined by the navigation means; and

means for determining whether the last known position of the AGV is located within said window.

4,926,104

ADJUSTABLE SPEED AC DRIVE SYSTEM CONTROL FOR OPERATION IN PULSE WIDTH MODULATION AND QUASI-SQUARE WAVE MODES

Robert D. King, Schenectady, and Paul M. Szczesny, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1989, Ser. No. 423,169
Int. Cl.[5] H02P *5/34*
U.S. Cl. 318—599 **22 Claims**

1. An electrical drive system for an adjustable speed polyphase AC motor, comprising:

a source of DC electric power including first and second conductors;

a full-wave inverter including a plurality of parallel phase legs connected between said first and second conductors, each of said phase legs including an AC output terminal for connection to a different phase of said motor, upper and lower switching devices, and upper and lower flyback diodes, said upper switching device and said upper flyback diode being connected in parallel relationship between said first conductor and said AC output terminal, and said lower switching and said lower flyback diode being connected in parallel relationship between said AC output terminal and said second conductor;

a plurality of current sensing means for deriving current

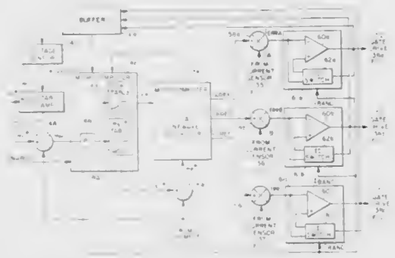
VOL
1114
ISS
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MY
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1990
UMI

feedback signals representative of the instantaneous magnitudes of currents in the respective phases of said motor;

reference waveform generating means for providing a plurality of reference AC waveforms normally representative of the desired currents in the respective motor phases, said waveforms having controllable fundamental frequency and amplitude;

chopping means associated with said generating means for turning on and off said upper and lower switching devices in each leg of said inverter so that each current feedback signal is normally maintained within a hysteresis band of the corresponding reference waveform by alternately decreasing and increasing the phase current magnitude as the feedback signal attains upper and lower limits of said hysteresis band during the conduction interval of the corresponding motor phase; and

control means for selectively controlling the operation of said chopping means in either a PWM mode or a quasi-square wave mode, said control means including means for counting the number of current chops caused by the turning on and off of a preselected one of said switching devices during a time interval that varies with the period of one of said reference waveforms, said control means changing the operation of said chopping means from PWM to quasi-square wave modes in response to said number of current chops decreasing below a first predetermined number and from quasi-square wave to PWM modes in response to said number of current chops increasing above a second predetermined number.



15. A method for controlling an adjustable speed polyphase AC motor drive including an inverter, said inverter comprising a plurality of parallel phase legs connected between first and second conductors of a source of DC electric power, each of said phase legs including an AC output terminal for connection to a different phase of said motor, upper and lower switching devices, and upper and lower flyback diodes, said upper switching device and said upper flyback diode being connected in parallel relationship between said first conductor and said AC output terminal, and said lower switching device and said lower flyback diode being connected in parallel relationship between said AC output terminal and said second conductor, the steps of said method comprising:

sensing the instantaneous magnitude of current through each respective phase leg of said inverter and producing a current feedback signal representative thereof;

providing a plurality of reference AC waveforms normally representative of the desired currents in the respective motor phases, said waveforms having controllable fundamental frequency and amplitude;

turning on and off said upper and lower switching devices in each leg of said inverter so as to normally maintain each current feedback signal within a hysteresis band of the corresponding reference waveform by alternately decreasing and increasing the phase current magnitude as the feedback signal attains upper and lower limits of said hysteresis band during the conduction interval of the corresponding motor phase;

counting the number of current chops caused by the turning on and off of a preselected one of said switching devices during a time interval that varies with the period of one of said reference waveforms; and

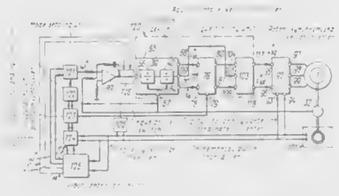
selectively controlling the operation of said inverter in either a PWM mode or a quasi-square wave mode including changing from PWM mode to quasi-square wave mode in response to said number of current chops decreasing below a first predetermined number and changing from quasi-square wave mode to PWM mode in response to said number of current chops increasing above a second predetermined number.

4,926,105

METHOD OF INDUCTION MOTOR CONTROL AND ELECTRIC DRIVE REALIZING THIS METHOD

Vladislav A. Mischenko, and Natalya I. Mischenko, both of Orekhovy bulvar 5, kv. 78, Moscow, Orekhovy bulvar, U.S.S.R.

Filed Feb. 17, 1987, Ser. No. 15,748
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—800 6 Claims



1. A method of induction motor control, wherein interrelated control is provided for the rotor speed, the torque of said induction motor, the amplitude of the rotor flux linkage, and steady-state, dynamic, electromagnetic, power and thermal processes in said induction motor by introducing vector phase-current control involving interrelated changes of the stator current phase and amplitude, the intensity and angular position of the magnetic field, which are defined by the phase and said amplitude of the rotor flux linkage as functions of the desired torque of said induction motor, and, to this end, comprises the steps of assigning a control input proportional to the desired amplitude of the rotor flux linkage; producing a first quadrature component of the desired stator current amplitude defined by the flux-producing component of said stator current amplitude as a function of said desired amplitude of the rotor flux linkage; assigning a second control input whose magnitude is proportional to said desired torque of said induction motor, as a function of the desired rotor speed and the actual magnitude of said rotor speed; producing a second quadrature component of said desired stator current amplitude, which defines the torque-producing component of said stator current amplitude, as a function of said magnitude of said desired torque of said induction motor; controlling, simultaneously with the step of producing the second quadrature component, the stator current synchronous frequency equal to the steady-state frequency of symmetrical instantaneous stator phase currents in steady-state conditions of said induction motor; generating the synchronization frequency defined by said stator current synchronous frequency equal to the sum of two components of said synchronization frequency; changing one component in proportion with said rotor speed; changing second component of said synchronization frequency as a function of the ratio of said desired torque of said induction motor to the square value of said desired amplitude of the rotor flux linkage; effecting phase-after-phase control of said symmetrical instantaneous stator phase currents in the phase windings of said stator of said

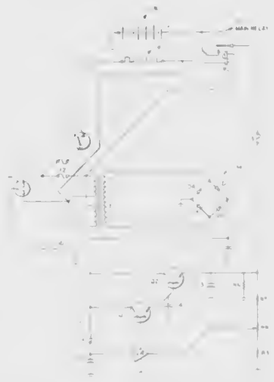
induction motor, as a function of the difference between the desired and said measured instantaneous stator phase currents; producing said desired stator current amplitude equal to said instantaneous phase current amplitude and said stator current amplitude equal to the quadrature sum of said first and second quadrature components of said desired stator current amplitude; producing said phase of the desired and measured instantaneous phase currents by sweeping said synchronization frequency into a synchronization phase equal to said phase of said rotor flux linkage and the synchronous stator current phase and defined by the instantaneous phase of said instantaneous stator current phase in one of said stator phase windings, which is a reference phase winding of said stator, with the zero value of said desired torque of said induction motor; producing said current phase of said stator, which is defined by said instantaneous phase of the instantaneous stator phase current in said reference phase winding of said stator of said induction motor; changing said stator current phase relative to said synchronous stator current synchronous phase to a value of the stator current phase shift proportional to the inverse tangent function of the ratio of said torque-producing component of the stator current amplitude to said flux-producing component of the stator current amplitude; controlling the stator current amplitude as a function of the desired torque of said induction motor by increasing said desired amplitude of the rotor flux linkage in response to the increase in said torque of said induction motor; and analogously and symmetrically controlling said instantaneous phase currents in other said stator windings.

4,926,106

AIRCRAFT BATTERY CHARGING DEVICE

Peter G. Tanis, P.O. Box 117, Glenwood, Minn. 56334

Continuation-in-part of Ser. No. 888,766, Jul. 22, 1986, Pat. No. 4,762,978. This application Aug. 9, 1988, Ser. No. 230,300
Int. Cl.[5] H02J *7/04;* **H05B** *3/36*
U.S. Cl. 320—35 14 Claims



1. Apparatus for charging an aircraft battery, comprising

(a) a power supply;

(b) transformer means connected with said power supply for producing an output voltage;

(c) transistor means including first and second transistors connected with said transformer means for converting said transformer output voltage to a given charging voltage which is supplied to the battery;

(d) voltage control means connected with said first transistor for controlling said first transistor to produce an amplified output used to control said second transistor for producing a constant charging voltage, said voltage control means comprising a feedback circuit including

(1) means for producing a reference voltage proportional to the output voltage of said second transistor; and

(2) voltage regulator means connected with said reference voltage producing means for controlling said first transistor in accordance with said reference voltage;

(e) a thermostat for sensing when the ambient temperature drops below a given value; and

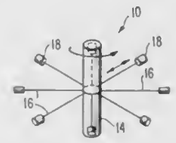
(f) a relay for connecting the output of said second transistor with the positive terminal of the battery, said relay being operated in response to operation of said thermostat, thereby to supply charging voltage to the battery.

4,926,107

VARIABLE INERTIA ENERGY STORAGE SYSTEM

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 890,928, Jul. 31, 1986, Pat. No. 4,730,154. This application Jun. 9, 1987, Ser. No. 59,807
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[5] G05G *1/00;* **H02K** *7/02;* **H02P** *9/04*
U.S. Cl. 322—4 17 Claims



1. A variable inertia energy storage system for mounting on land or on a vehicle, the storage system comprising:

an enclosed housing having a periphery;

a central hub mounted in the center of the housing and rotatably mounted therein;

a plurality of spokes attached to said central hub and extending outwardly toward the periphery of the housing;

a plurality of masses each movable mounted on a respective one of the spokes for moving inwardly and outwardly from said central hub, each of said movable masses being self-propelled;

a hoop disposed around and adjacent said periphery of the housing and adjacent the ends of the spokes, the hoop having electrical motor/generator elements mounted thereon; and

complimentary motor/generator elements mounted on said housing periphery adjacent said hoop for generating electricity or providing rotation force as said motor/generator elements rotate past said complementary elements.

4,926,108

VARIABLE SPEED/VARIABLE VOLTAGE GENERATOR SET

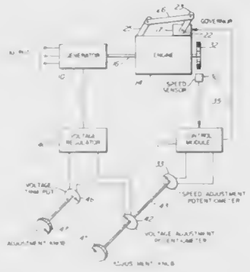
Arthur F. Schooley, Box 812; Wolf R. Eben-Ebenau, Box 2320, both of Slave Lake, Alberta, Canada T0G 2A0 , and Lloyd J. Nelson, 9523-64 Avenue, Edmonton, Alberta, Canada T6E 0J1

Filed Jan. 19, 1988, Ser. No. 145,429
Claims priority, application Canada, Mar. 11, 1987, 531701
Int. Cl.[5] H02P *9/04*
U.S. Cl. 322—15 3 Claims

1. A motor-generator set for producing, from the generator, comprising an AC generator having a voltage regulator, an engine coupled to drive said generator and having an electrically controlled governor, an electronic speed control module, first and second potentiometers, and speed sensing means for sensing rotational speed of the engine, said first potentiometer being connected to said speed control module and said second potentiometer being connected to said voltage regulator, said

VOL
1114
ISS
3
MY
15
1990
UMI

speed control module comparing a voltage set by said first potentiometer with a voltage produced by said speed sensing means and providing an output voltage to said governor to set rotational speed of the engine in accordance with the setting of said first potentiometer, said second potentiometer being connected to said voltage regulator to set the output voltage of said generator in accordance with the setting of said second



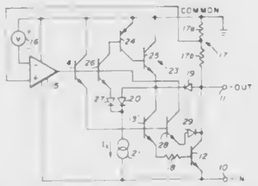
potentiometer, said first and second potentiometers being ganged for simultaneous adjustment whereby adjusting the potentiometers in one direction increases the speed of the engine and the output frequency and voltage of the generator while adjusting the potentiometers in the other direction decreases the speed of the engine and the output frequency and voltage of the generator.

4,926,109

LOW DROPOUT VOLTAGE REGULATOR WITH LOW COMMON CURRENT

Matsuro Koterasawa, Osaka, Japan, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jnn. 21, 1989, Ser. No. 369,421
Int. Cl.[5] G05F *1/59*
U.S. Cl. 323—274 **5 Claims**



1. A voltage regulator circuit having a common terminal, an input terminal for receiving an unregulated voltage, and an output terminal for supplying a regulated output voltage, said circuit comprising:

output transistor means having a base and having its collector-emitter electrodes connected between said input and output terminals;

driver transistor means having a transistor emitter coupled to said base of said output transistor and having collector and base electrodes;

control transistor means having a transistor emitter coupled to said base of said driver transistor, a collector returned to said common terminal and a base electrode by which said control transistor means operates as an emitter follower;

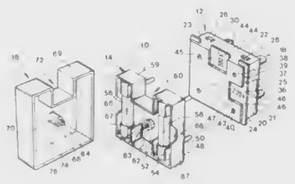
means, responsive to the potential across said output transistor, for switching the collector of said driver transistor to either said output terminal when said potential is below a predetermined value or to said common terminal when said potential exceeds said predetermined value.

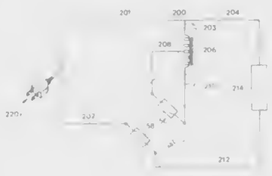
4,926,110

VOLTAGE SWITCHING DEVICE WITH PLURAL FUSES

Young R. Yoon, Inchon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 28, 1989, Ser. No. 387,484
Int. Cl.[5] G05F *3/04*
U.S. Cl. 323—345 **15 Claims**





1. A voltage switching device operable under a first and a second source voltages which comprises:

a connector including a body having four conductive terminals extending substantially forward in a symmetrical and parallel relationship from the front face of the body, a projecting flange extending slightly outwardly beyond the periphery of the body and positioned adjacent to the rear portion of the body, a plurality of conductive pieces secured to the internal surfaces of four pin receiving holes located in the body and corresponding to said conductive terminals, and a pair of voltage indicators having recesses located on the rear portion of the body and arranged in a perpendicular direction relative to each other;

a voltage switching plug including four conductive pins extending forward from the front face thereof and apt to be engaged in the respective pin receiving holes located in the body of the connector, a plurality of fuse holders secured to the respective pins, and a groove located at the upper portion of the plug and corresponding to one of the voltage indicators when the plug is selectively coupled with the connector in the first or the second selected voltage position;

a cover including a groove corresponding to said groove located in the plug, and a suitable space to accommodate the plug therein; and

fastening means for securing the plug inside the cover.

4,926,111

ELECTRIC COMPONENT WITH INDUCTIVE AND CAPACITIVE PROPERTIES

Cornelius Lungu, Rossbuehlstrasse 11, D-7582 Buehlertal, Fed. Rep. of Germany

Continuation of Ser. No. 128,826, Oct. 14, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 332,442
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604579; Aug. 26, 1986, 3628988
Int. Cl.[5] H01F *5/00*
U.S. Cl. 323—355 **13 Claims**



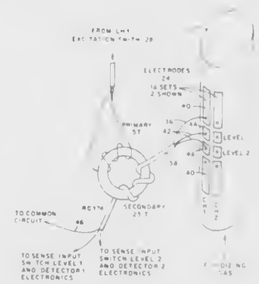
1. For use in an electric circuit, an electrical component having both inductive and capacitive properties comprising a winding wire being wound in a coil with at least one winding layer comprising several turns, in which component an inductive current is created by capacitive charges, wherein said winding wire comprises at least one core conductor formed as a wire serving as a capacitive and inductive conductor, an insulating layer being formed as dielectric and surrounding said core conductor, said insulating layer having a thickness substantially less than that of said core conductor, and at least one outer conductor serving as a common capacitor electrode for all turns of said core capacitor electrode for all turns of said core conductor, said outer conductor at least partly surrounding said insulating layer and electrically connected to a common contact at each turn, wherein electrical contacts for connecting the component to the electric circuit are connected to said core conductor and said outer conductor.

4,926,112

3-D CAPACITANCE DENSITY IMAGING OF FLUIDIZED BED

George E. Fasching, 653 Vista Pl., Morgantown, W. Va. 26505

Filed Mar. 18, 1988, Ser. No. 170,229
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—664 **13 Claims**



1. An apparatus for providing a three-dimensional capacitance density imaging of a gasified bed in a longitudinally extending containment vessel comprising:

a plurality of electrodes circumferentially spaced apart from one another about the bed in each of a plurality of longitudinally spaced apart levels along a longitudinal length of the bed;

excitation means for individually and selectively exciting said electrodes at each of said levels independently of the other levels to generate a plurality of current flux field patterns in the bed at each level;

sensing means for sensing the current flux patterns at each level;

determining means for determining a two-dimensional density pattern of the bed at each level from the sensed current flux patterns; and

combining means for combining the determined two-dimensional density patterns at each level to provide a three-dimensional density image of the bed over the longitudinal length thereof encompassed by the electrodes.

4,926,113

MEANS AND METHOD FOR CONDUCTOMETRIC PHASE TRANSITION POROSIMETRY

Brett W. Gunnink, Columbia, Mo., and Bekir V. Enüstün, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 26, 1989, Ser. No. 301,486
Int. Cl.[5] G01R *27/02*
U.S. Cl. 324—694 **10 Claims**



1. A method for determination of the pore structure and porosity characteristics of porous materials using electrical conductance comprising the steps of:

saturating a porous material, comprising a sample, with an electrolytic solution;

varying the temperature of the saturated sample to cause at least a portion of the electrolytic solution in the sample to change phase;

measuring the temperature and electrical conductance of the sample as temperature of the sample is varied.

4,926,114

APPARATUS FOR STUDYING PARTICLES HAVING AN APERTURE WHOSE CROSS-SECTIONAL AREA CHANGES PROGRESSIVELY ALONG AT LEAST PART OF ITS LENGTH

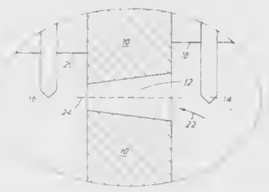
Don A. Doutre, Jonquiere, Canada, assignor to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 833,059, Feb. 24, 1986, abandoned. This application Sep. 8, 1989, Ser. No. 405,042
Claims priority, application United Kingdom, Feb. 27, 1985, 8505047
Int. Cl.[5] G01N *27/02*
U.S. Cl. 324—71.4 **5 Claims**

1. Apparatus for studying substantially spherical particles suspended in an electrically conducting fluid comprising an electrically insulating wall including an aperture therethrough,

VOL
1114
ISS
3
MY
15
1990
UMI

a pair of electrodes disposed on opposite sides of the wall to establish a current path between them through the fluid and passing through the aperture, means for causing the fluid to pass at a controlled rate through the aperture and for simultaneously passing an electric current between the two electrodes by means of the said current path, and means for detecting changes in electrical resistance (resistance pulses) across the wall resulting from particles suspended in the fluid passing through the aperture.



characterized in that the aperture has a finite length in the direction of flow of the fluid, the cross-sectional area of the aperture changes progressively along at least part of its said length, and the detecting means includes means for analysing the duration of the resistive pulses resulting from passage of substantially spherical particles through said last-mentioned part of said aperture length to provide information about the particle size.

4,926,115

UNIQUE PHASE DIFFERENCE MEASURING CIRCUIT

George K. Tarleton, Phoenix, Ariz.; Robert J. Abrant, and Bruce A. Oltman, both of Downers Grove, Ill., assignors to AG Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 19, 1988, Ser. No. 285,930
Int. Cl.[5] G01R *25/00*
U.S. Cl. 324—83 D **11 Claims**



1. A phase difference measuring circuit for measuring the phase difference between a first pulse train and a second pulse train, said phase difference measuring circuit comprising:

timing circuit means arranged to output timing signals in response to a received start phase measurement signal;

first and second clock buffer means, said first clock buffer means including a first input connected to said first pulse train, a second input connected to said timing signals and an output, and responsive to said first clock buffer means receiving said timing signal said first clock buffer means transmits said first pulse train from said output;

first delay line means for delaying said first pulse train, including an input connected to the output of said first clock buffer means, said first delay line means including a plurality of outputs, said outputs arranged to transmit signals representing a value of delay of said first pulse train;

first holding register means including a pulse train receiving input and a plurality of holding register inputs, said pulse train receiving input connected to said second clock buffer means output, and said plurality of holding register inputs connected to said plurality of outputs of said first delay line means, said holding register means arranged to latch the value of delay output by said first delay line means when said second pulse train changes logic level, and store the last delay measurement with respect to said second pulse train;

said second clock buffer means including a first input connected to said second pulse train, a second input connected to said timing signals and an output, and responsive to said second clock buffer means receiving said timing signal said second clock buffer means transmits said second pulse train from said output;

second delay line means for delaying said second pulse train, including an input connected to the output of said second clock buffer means, said second delay line means including a plurality of outputs, said outputs arranged to transmit signals representing a value of delay of said second pulse train, and;

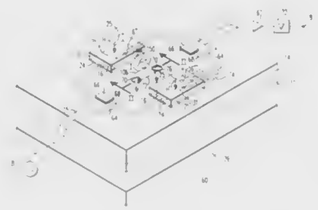
second holding register means including a pulse train receiving input and a plurality of holding register inputs, said pulse train receiving input connected to said first clock buffer means output, and said plurality of holding register inputs connected to said plurality of outputs of said second delay line means, said holding register means arranged to latch the value of delay output by said second delay line means outputs when said second pulse train changes logic level, and store the last delay measurement with respect to said first pulse train.

4,926,116

WIDE BAND LARGE DYNAMIC RANGE CURRENT SENSOR AND METHOD OF CURRENT DETECTION USING SAME

Salvador H. Talisa, Edgewood, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1988, Ser. No. 264,578
Int. Cl.[5] G01R *19/00, 33/02*
U.S. Cl. 324—117 R **19 Claims**



13. A current detector, comprising:

a magnetostatic delay line, said magnetostatic delay line having an input port, said input port operable to receive a signal of a predetermined frequency, said delay line comprising a voltage divider, said voltage divider operable to divide said signal received by said input port, said delay line further comprising a first and a second ferrite wave propagating means positioned parallel one to another, said first and said second ferrite wave propagating means having phase propagation coefficients and said first and said second ferrite wave propagating means operable to receive said divided signal, said delay line comprising a voltage combiner, said voltage combiner operable to receive said divided signals from said first and said second ferrite wave propagating means, and further operable to combine said divided signals and said delay line having an output port, said output port operable to receive said combined signals and output said combined signals;

a means for producing a first magnetic field, said magnetostatic delay line being positioned within said first magnetic field;

a means for producing a second magnetic field, said means for producing a second magnetic field being positioned between said parallel first and said second ferrite wave propagating means, said first and said second ferrite wave propagating means being subjected to said second magnetic field, said second magnetic field being proportional to the current in an external conductor, said known phase propagation coefficient of said first and said second ferrite wave propagating means increasing or decreasing in response to said second magnetic field; and

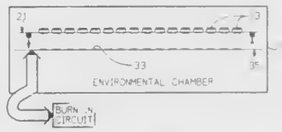
a means for detecting, said detecting means operable to detect said increase or said decrease in said known phase propagation coefficient of said first and said second ferrite wave propagating means.

4,926,117

BURN-IN BOARD HAVING DISCRETE TEST CAPABILITY

Leland R. Nevill, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 2, 1988, Ser. No. 189,413
Int. Cl.[5] G01R *31/02, 1/06*
U.S. Cl. 324—158 F **27 Claims**



1. Test equipment for exercising and performing multiple tests on a plurality of semiconductor devices characterized by:

(a) a first printed circuit board including an array of semiconductor device-receiving sockets thereon for receiving packaged semiconductor circuit parts, the sockets each containing a plurality of electrical contact terminals, the terminals being in electrical communication with respective electrical connections on the semiconductor devices when the semiconductor devices are installed in the sockets;

(b) a second circuit board adapted to be mounted in a planarly parallel configuration to the first printed circuit board, the second printed circuit board having a plurality of circuit traces thereon, the mounted boards being insertable into an environmental burn-in chamber;

(c) a plurality of electrical contacts on one side of said second printed circuit board, said electrical contacts being in electrical communication with respective ones of the electrical contact terminals when the second circuit board is mounted to the first printed circuit board, said mounting placing the second printed circuit to meet with the first printed circuit board, and connecting the plurality of electrical contact terminals on the first printed circuit board with the plurality of circuit traces on the second printed circuit board;

(d) an environmental chamber with a burn-in circuit;

(e) a connector on the second circuit board for connection to a burn-in circuit when the mounted boards are inserted into the environmental burn-in chamber, a plurality of said electrical contact terminals connected in parallel to the connector;

(f) the circuit traces being arranged to electrically communicate with ones of the contacts on the first board and with the connector; and

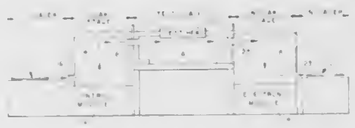
(g) a discrete circuit tester adapted to receive the first board, the first board being removable from the second circuit board and being mountable onto the discrete circuit tester.

4,926,118

TEST STATION

R. Bruce O'Connor, San Diego; Thomas E. Toth, El Cajon, and James A. Ross, Poway, all of Calif., assignors to Sym-Tek Systems, Inc., San Diego, Calif.

Filed Feb. 22, 1988, Ser. No. 158,941
Int. Cl.[5] G01R *31/28;* **B07C** *5/344*
U.S. Cl. 324—158 F **6 Claims**



3. A test station for electrical devices being transported in sets, each set being in or on a transport medium which holds the devices in a planar array with the leads of the devices all accessible from at least one common face of the array, comprising:

(a) a platen means having an upward facing flat surface upon which a transport medium containing an array of electrical devices is placed for testing with the leads of the devices accessible from above,

(b) a test head means having an planar array of electrical device lead contactors registerable with the leads of subsets of the devices and spaced above and in parallel with the platen means,

(c) means for moving the platen means to bring the contactors in registration and contact with the leads of the devices comprising an extensible post atop of which the platen means is affixed, and a base upon which the post is affixed and supported, the base being movable along two mutually orthogonal axes which are both normal to an axis of the post,

(d) means for thermally soaking each device array prior to its being placed upon the platen means for testing,

(e) means for thermally unsoaking each device array following testing,

(f) a thermally insulated chamber in which are disposed the platen means and the contactors of the test head means, the insulation being for the purpose of maintaining the temperature of the devices during test,

(g) means defined by walls of the chamber for ingress from the soak means and egress to the unsoak means of the electrical device arrays,

(h) means for closure of the means for egress,

(i) a lower wall of the chamber comprising a thermally insulated diaphragm means defining a central opening through which the extensible post extends, the diaphragm means being contractible in any given direction normal to the axis of the extensible post and simultaneously expandable in the opposite direction to permit full movement the trolley means, and

(j) means for thermally sealing the interface between the post and the diaphragm means.

4,926,119

CONTACT DEVICE FOR THE TESTING OF PRINTED CIRCUIT BOARDS OR THE LIKE

Manfred Prokopp, Am Felder 27, D-6980 Wertheim-Reicholzbeim, Fed. Rep. of Germany

Filed Mar. 3, 1989, Ser. No. 319,436
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807024; Mar. 4, 1988, 8802890[U]; Apr. 29, 1988, 3814620
Int. Cl.[5] G01R *1/06*
U.S. Cl. 324—158 P **18 Claims**

1. A contact device for electrical or electronic testing of a test article, said device comprising:

VOL 1114 ISS 3 MY 15 1990 UMI

a holder;
an array of electrically conductive countercontact elements on said holder, each of said countercontact elements including a tapering contact head biased by a spring force in a direction of taper of each head;
a plate assembly comprising at least two mutually parallel transversely spaced plates including a rear plate located proximal to said holder and a front plate located remote from said holder and juxtaposable with a test article, said plates being formed with arrays of throughgoing bores;
a plurality of contact needles received in said plate assembly, each of said needles passing slidable through one of the bores of each plate and having a front end formed as a contact tip for contacting said article and a rear end en-



gageable by a respective one of said heads, each of contact needles being constituted as a straight pin traversing a respective bore of said front plate and a tubular sleeve receiving an end of the respective pin at said rear end of the respective needle, each sleeve projecting beyond the respective pin and having a hollow opening at an end of the respective sleeve at a contact edge and receiving the respective head, whereby a taper of each head engages the respective contact edge to form an electrical connection between each head and the respective rear end of a respective contact needle, said contact needles being received in the respective bores of said plates so as to enable axial movement of said contact needles in said plates against the spring forces of the respective contact heads.

4,926,120

IN-LINE METALLIC DEBRIS PARTICLE DETECTION SYSTEM

William A. Veronesi, Glastonbury; Andrew P. Weise, Columbia; Robert W. Reed, South Windsor, and Harry I. Ringermacher, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1988, Ser. No. 290,531
Int. Cl.[5] G01V *3/00;* **G01R** *33/12*
U.S. Cl. 324—204 **3 Claims**

1. An arrangement for detecting metallic particles carried by a fluid, comprising
means for bounding at least one elongated passage for the flow of the fluid therethrough;
a metallic probe member stationary with respect to said bounding means and extending around said passage;
capacitor means including at least two mutually facing capacitor surfaces each electrically connected with a different portion of said probe member, and at least one dielectric layer interposed between said capacitor surfaces;
means for causing alternating electric current to flow in said probe member around said passage and to and from said two capacitor surfaces so that said probe member and said capacitor means form a tank circuit having resonance characteristics that are influenced by any inclusion then present in said passage in a manner dependent on the electromagnetic properties of said inclusion, including means for supplying an alternating electric excitation current to said probe member, said supplying means including a voltage controlled oscillator having a control input;
means for determining the character of any metallic particle then present in said passage from variations in said alternating electric current that reflect the influence of such metallic particle on said resonance characteristics, including means for mixing an alternating voltage of said alternating electric current separately in phase and in quadra-



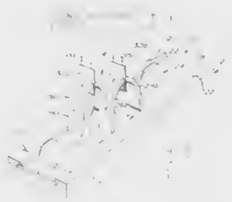
ture with an alternating voltage representative of said alternating electric excitation current, respectively, to obtain respective resistive and reactive error signals when any metallic particle is present in said passage, and means for evaluating said resistive and reactive error signals to obtain therefrom information about the size and magnetic properties of such metallic particle; and
reactive error feedback means for feeding said reactive error signal to said control input of said voltage controlled oscillator.

4,926,121

MAGNETIC TYPE POSITION SENSOR FOR USE IN THE CONSTRUCTION OF POSITION INDICATORS OR TORQUE METERS

Normand Guay, Boucherville, Canada, assignor to Consulab, Inc., Beauport, Canada

Continuation-in-part of Ser. No. 33,195, Apr. 2, 1987, Pat. No. 4,787,255. This application Sep. 13, 1988, Ser. No. 243,859
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[5] G01B *7/30, 7/24*
U.S. Cl. 324—208 **15 Claims**



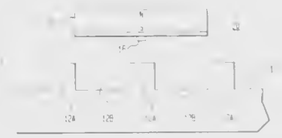
1. A position sensor, comprising:
a magnetic tape constituting a magnetic medium producing a magnetic field;
a pick-up head mounted adjacent said magnetic tape for detecting said magnetic field, said pick-up head and said magnetic medium being mounted for translational movement relative to one another, said magnetic field having a continuously variable intensity along the direction of said translational movement, said pick-up head comprising:
(a) a first magnetic field detector generating an output signal representative of the intensity of said magnetic field at the position of detection thereof by said first detector; and
(b) a second magnetic field detector generating an output signal representative of the intensity of said magnetic field at the position of detection thereof by said second detector, said second detector being spaced from said first detector by a predetermined distance along the direction of said translational movement, said first and second detectors being connected to a signal processing circuit deriving position information from said output signals; and
a guide bar, including:
(a) a metallic base plate, said magnetic tape being adhesively mounted on said base plate; and
(b) a pair of clamping bars mounted on said base plate and clamping the lateral edges of said tape.

4,926,122

HIGH SENSITIVITY MAGNETIC CIRCUIT

Thaddeus Schroeder, Rochester Hills, and Bruno P. B. Lequesne, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1988, Ser. No. 229,396
Int. Cl.[5] G01B *7/14;* **H01L** *43/00*
U.S. Cl. 324—207.13 **18 Claims**



1. A position sensor comprising:
a stationary portion and an exciter portion adapted to move past said stationary portion;
said stationary portion including a permanent magnet having a planar major surface normal to the polarization of the magnet, a ferromagnetic layer overlying said major surface, and a sensing element centered along the width of said surface over said layer, the width of said sensing element being substantially less than the width of said magnet; said exciter portion including a succession of teeth spaced apart by gaps that effectively define a tooth pitch, the width of each of said teeth being less than the width of each of said gaps and more than the width of said sensing element; and the width of said magnet being approximately one and one half times the tooth pitch of the exciter portion.

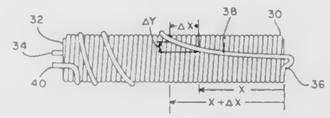
4,926,123

PRECISION VARIABLE PITCH COMPENSATION WINDING FOR DISPLACEMENT TRANSDUCER

Robert W. Redlich, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Continuation of Ser. No. 147,142, Jan. 22, 1988, abandoned. This application Mar. 31, 1989, Ser. No. 332,394
Int. Cl.[5] G01B *7/14;* **H01F** *21/06*
U.S. Cl. 324—208 **10 Claims**

1. An improved displacement measurement apparatus of the type having a current conducting coil for attachment to a first one of two relatively movable bodies, an electrically conducting, non-ferromagnetic wall in telescoping relationship to said coil and mounted to the second body for axial displacement relative to the coil for varying their relative overlap and thereby vary the inductance of the coil, an AC electrical energy source which is connected to apply an AC signal to the coil at a frequency which is at least high enough that the skin depth of the wall is less than the physical depth of the wall and a detector circuit means connected to the coil for detecting a signal which is proportional to coil inductance, the improvement comprising:
a compensation winding wound in coaxial relationship to said coil and connected to said AC source, the compensa-



tion winding having a pitch which is a continuous decreasing function of distance from the end of the coil which is nearest said wall when the wall and the coil are in their least overlapping relationship, said compensation winding extending along at least the entire operative length of the coil and decreasing the non-linearity of the inductance variation as a function of wall displacement.

4,926,124

METHOD FOR THE REMOVAL OF ARTIFACTS IN AN NMR IMAGING EXPERIMENT

Patrick Le Roux, Gif sur Yvette, France, assignor to General Electric CGR S.A., Issy les Moulineaux, France

Filed Jul. 6, 1988, Ser. No. 215,529
Claims priority, application France, Jul. 10, 1987, 87 09813
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **5 Claims**



1. A method for the removal of artifacts in NMR imaging experiment wherein
a 2DFT type imaging method is applied to reconstruct a normal image of a body to be examined,
with a phase encoding normal pitch of a phase encoding gradient,
said normal pitch being predetermined by a height of given value of a zone of interest of a NMR machine being used where the body to be imaged is positioned,
a dimension of said normal image corresponding to said height of given value,
and said experiment comprising a number N of sequences which is predetermined by an expected significant resolution of the normal image of said body,
said 2DFT imaging method being performed to reconstruct said normal image from said NMR experiment,
wherein the phase encoding pitch is modified by taking a sub-multiple of said normal pitch,
and wherein the number N of sequences is multiplied accordingly,
to permit the reconstruction of another image for a same significant resolution of said normal image of said body but with a different dimension, along a direction corresponding to this phase encoding pitch, wherein said differ-

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ent dimension is a multiple of said dimension of said normal image.

4,926,125

SURFACE GRADIENT ASSEMBLY FOR HIGH SPEED NUCLEAR MAGNETIC RESONANCE IMAGING

Peter B. Roemer, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 22, 1988, Ser. No. 234,729
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 23 Claims



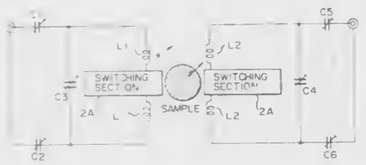
1. A surface gradient assembly, for providing a magnetic field gradient in a predetermined direction with respect to a plurality of directional axes defining a volume, comprises a single substantially planar gradient coil, lying substantially in a single plane, for generating a gradient magnetic field in said predetermined direction responsive to an externally-provided gradient current.

4,926,126

PROBEHEAD OF MAGNETIC RESONANCE APPARATUS

Motoji Haragashira, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 22, 1989, Ser. No. 355,025
Claims priority, application Japan, May 24, 1988, 63-124877
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 7 Claims



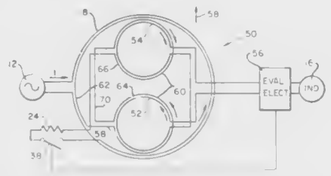
1. A probehead of a magnetic resonance (MR) apparatus, comprising:
transmitting coil means for transmitting an RF field;
receiving coil means for receiving an MR signal based on an MR phenomenon induced in an object to be examined; and
switching means, provided for each of said transmitting and receiving means, for decoupling,
wherein at least said switching means provided for said transmitting coil means comprises a plurality of PIN diodes connected in parallel with each other, and reactance elements connected in series with said plurality of PIN diodes and having reactance components, absolute values of which are sufficiently larger than resistance components of said PIN diodes in an on-state.

4,926,127

APPARATUS FOR THE DETECTION OF METAL OBJECTS LOCATED WITHIN A POOR ELECTRICALLY CONDUCTIVE ENVIRONMENT

Klaus Ausländer, Reutlingen; Hans-Jürgen Fabris, Pfullingen; Wolfgang Patzwald, Reutlingen, and Helmut Seichter, Pfullingen, all of Fed. Rep. of Germany, assignors to Institut Dr. Forster GmbH & Co. KG, Reutlingen, Fed. Rep. of Germany

Continuation of Ser. No. 33,205, Apr. 2, 1987, abandoned. This application May 10, 1989, Ser. No. 349,699
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705308
Int. Cl.[5] G01V *3/08, 3/10*
U.S. Cl. 324—329 2 Claims



1. Inductive search apparatus for the detection of metal objects located within an environment presenting poor conductor background disturbance having a search coil with excitation and receiver windings, the excitation coil being connected to an A.C. current source from which A.C. current is fed to the excitation coil to build up a penetrating magnetic field for thoroughly searching a region, metal objects contacted by the magnetic field producing signals in the receiver winding, and the receiver coil being connected to evaluation electronics via which the signals are evaluated and indicated, comprising:
a single wire loop in the magnetic effective range of the search coil having an ohmic resistance which is large with respect to its inductive reactance, said loop including a first component loop tightly coupled with the excitation coil and a second component loop tightly coupled with the receiver coil, said first and second component loops being serially interconnected; and
selectively actuatable switch means via which the wire loop can be closed which interacts with the search coil to eliminate background disturbances of a poor conductor character.

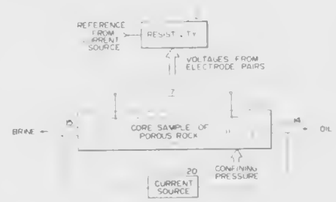
4,926,128

METHOD FOR UTILIZING MEASURED RESISTIVITIES OF POROUS ROCK UNDER DIFFERING FLUID SATURATIONS TO IDENTIFY FLUID DISTRIBUTION EQUILIBRIUM

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 13, 1989, Ser. No. 309,754
Int. Cl.[5] G01V *3/02*
U.S. Cl. 324—376 5 Claims

1. A method for measuring the fluid distribution equilibrium of a porous rock comprising the steps of:
(a) injecting a first fluid into a porous rock to effect a first fluid saturation throughout said porous rock,
(b) measuring resistivity along a selected length of said porous rock at said first fluid saturation,
(c) injecting a second fluid which is immiscible with and of opposite electrical conductance with said first fluid into an end of said porous rock at an injection pressure to displace a portion of said first fluid from said porous rock and thereby effect a fluid saturation within said porous rock which is a partial saturation with respect to said first fluid saturation,
(d) measuring resistivities of a plurality of subsections along said selected length of porous rock while maintaining said injection pressure,



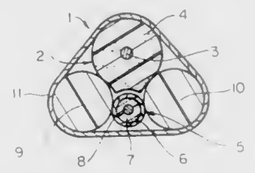
(e) determining resistivity gradients between select ones of said measured resistivities, and
(f) determining the distribution of said first and second fluids within said porous rock to be in equilibrium when each of said measured resistivity gradients becomes zero.

4,926,129

SENSOR ASSEMBLY FOR DETECTING MULTIPLE EVENTS AND DISTINGUISHING BETWEEN THEM

Robert S. Wasley, San Carlos, and James C. Holmes, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 12, 1988, Ser. No. 256,874
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—555 18 Claims



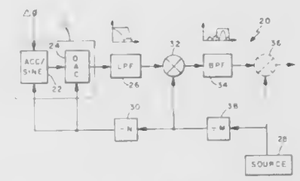
1. A sensor assembly for detecting a first event which involves the presence of an electrolyte and for detecting at least one second event which does not involve the presence of an electrolyte, and for distinguishing between the first and second events, the assembly comprising
(1) a first conductor;
(2) a second conductor which
(a) is electrically insulated from the first conductor in the absence of both first and second events,
(b) becomes electrically connected to the first conductor upon occurrence of the first event through an ionic connection, and
(c) becomes electrically connected to the first conductor upon occurrence of the second event through an electronic connection;
(3) means for determining whether the connection between the first and second conductors is an ionic connection or an electronic connection.

4,926,130

SYNCHRONOUS UP-CONVERSION DIRECT DIGITAL SYNTHESIZER

Lindsay A. Weaver, San Diego, Calif., assignor to Qualcomm, Inc., San Diego, Calif.

Filed Jan. 19, 1988, Ser. No. 144,904
Int. Cl.[5] H03K *3/80;* H03B *21/02*
U.S. Cl. 328—14 12 Claims



1. An apparatus for generating high frequency signals, comprising:
direct digital synthesizer means for generating a fundamental frequency signal over a predefined tuning range, said synthesizer having a digital to analog converter with a sample clock input and said converter operating at a sampling frequency determined by the frequency of an input sampling frequency signal provided at said sample clock input;
a high frequency reference source providing a reference signal at a frequency of M, an odd integer, times N, an integer, times said sampling frequency;
divide-by-M means connected to said high frequency reference source for, receiving said reference signal, dividing said reference signal in frequency by M and providing a first divided reference signal;
divide-by-N means connected between said divide-by-M means and said converter sample clock input for, receiving said first divided reference signal, dividing said first divided reference signal in frequency and providing a second divided reference signal as said sampling frequency signal;
first mixer means connected to an output of said synthesizer and said divide-by-M means for mixing said fundamental frequency signal and said first divided reference signal so as to generate an intermediate frequency output signal; and
second mixer means connected to an output of said first mixer means and said high frequency reference source for mixing said intermediate frequency output signal and said reference signal so as to generate a desired high frequency signal.

4,926,131

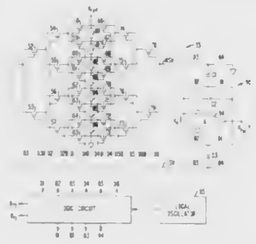
TRIANGLE WAVEFORM GENERATOR FOR PULSE-WIDTH AMPLITUDE MULTIPLIER

Robert A. Leydier, Mountain View, Calif., assignor to Schlumberger Industries, Inc., Norcross, Ga.

Filed Jun. 25, 1987, Ser. No. 66,795
Int. Cl.[5] H03B *19/14;* H03K *4/10, 4/86*
U.S. Cl. 328—181 26 Claims

1. A waveform generator comprising:
potential generating means for providing a plurality of different potentials, said potential generating means comprising a series of resistive elements having terminals serially connected between an upper potential and a lower potential;
switching means connected to receive input control signals and in response thereto couple a first potential from the potential generating means to a first node and a second potential from the potential generating means to a second node; and

summing means connected to each of the first node and the second node for providing an output signal at an output



terminal indicative of a weighted combination of the first and the second potentials.

4,926,132

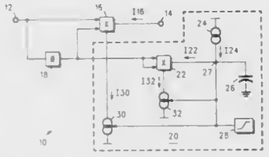
FM DETECTOR WITH REDUCED DISTORTION

William E. Main, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Aug. 28, 1989, Ser. No. 399,792

Int. Cl.[5] H03D *3/14*

U.S. Cl. 329—318 **14 Claims**



1. In an FM detection circuit comprising a first multiplier circuit which is resposive to an applied FM signal and a phase shifted FM signal and having a gain control input for providing a demodulated output signal containing undesirable harmonic distortion, the improvement comprising:

current supply means for providing a current at an output;

a second multiplier circuit receiving the phase shifted FM signal and having a gain control input for providing an output signal at an output which is proportional to the square of the phase shifted FM signal;

coupling means coupling said outputs of said current supply means and said second multiplier circuit such that an error signal is produced the magnitude of which is proportional to the harmonic distortion in the output signal of the FM detector circuit; and

circuit means responsive to said error signal for providing first and second gain control signals which are proportional to said error signal wherein said first gain control signal controls the magnitude of said output signal of said second multiplier circuit and said second gain control signal controls the magnitude of the output signal of the FM detection circuit so as to substantially eliminate the harmonic distortion thereof.

4,926,133

FM DEMODULATOR HAVING A FREQUENCY INDEPENDENT DELAY CIRCUIT

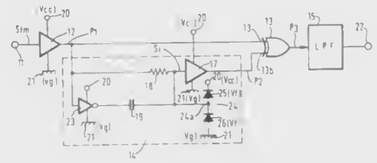
Takashi Koga, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 21, 1988, Ser. No. 274,263

Claims priority, application Japan, Nov. 20, 1987, 62-293451

Int. Cl.[5] H03D *3/04, 3/20*

U.S. Cl. 329—336 **8 Claims**



1. An FM signal demodulator for converting the frequency of an input signal to a corresponding voltage comprising:

delay circuit means responsive to the input signal for delaying the input signal by a fixed time, said delay circuit means including integrating circuit means for modifying the waveform of the input signal, delay wave-shaping means for reshaping the modified waveform into a substantially rectangular shape, and clamp circuit means for supplying a predetermined fixed voltage to the integrating circuit means;

exclusive-OR gate means responsive to the input signal and the delayed input signal from the delay circuit means for outputting a pulse signal having a duration corresponding to the fixed time; and

means responsive to the pulse signal for generating an output signal having a level which changes in response to changes in the frequency of the input signal.

4,926,134

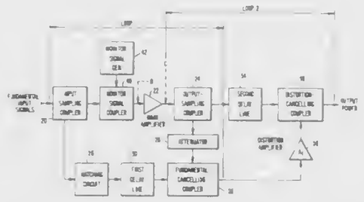
GAIN MONITORING OF DISTORTION CANCELLATION AMPLIFIERS IN A FEEDFORWARD LINEAR AMPLIFIER

Terence E. Olver, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1988, Ser. No. 291,599

Int. Cl.[5] H03F *1/32*

U.S. Cl. 330—2 **5 Claims**



1. A monitor signal injection system for monitoring defects in circuit in a feedforward cancellation amplifier, comprising:

an input sampling coupler;

a monitor signal generator for generating monitor signals;

a monitor signal coupler, connected to said monitor signal generator and said input sampling coupler, for injecting monitor signals for monitoring circuits in the feedforward cancellation amplifier;

a main amplifier connected to said monitor signal coupler;

an output sampling coupler connected to said main amplifier;

an attenuator connected to said output sampling coupler;

a matching circuit connected to said input sampling coupler;

a first delay line connected to said matching circuit;

a fundamental cancelling coupler connected to said attenuator and said first delay line;

a distortion amplifier connected to said fundamental cancelling coupler;

a second delay line connected to said output sampling coupler; and

a distortion cancelling coupler, connected to said second delay line and said distortion amplifier, for cancelling the monitor signals along with distortion and noise.

4,926,135

BALANCED INTEGRATOR-FILTER ARRANGEMENT

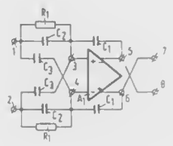
Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1989, Ser. No. 361,612

Claims priority, application Netherlands, Jun. 8, 1988, 8801469

Int. Cl.[5] H03F *1/34*

U.S. Cl. 330—107 **21 Claims**



1. A filter arrangement comprising a first balanced amplifier having a non-inverting and an inverting input and having a non-inverting and an inverting output, a first and a second input terminal, a first and a second output terminal, a first and a second feedback circuit, each comprising a first capacitor, the first feedback circuit being arranged between the inverting output and the non-inverting input of the first amplifier, and the second feedback circuit being arranged between the non-inverting output and the inverting input of the first amplifier, a first and a second input circuit, each comprising a parallel arrangement of a first resistor and a second capacitor, the first input circuit being arranged between the first input terminal and the non-inverting input of the first amplifier and the second input circuit being arranged between the second input terminal and the inverting input of the first amplifier, a connection between the inverting output of the first amplifier and the second output terminal and a connection between the non-inverting output of the first amplifier and the first output terminal, characterized in that the filter arrangement also comprises a third and a fourth input circuit, each comprising a third capacitor, the third input circuit being arranged between the first input terminal and the inverting input of the first amplifier, and the fourth input circuit being arranged between the second input terminal and the non-inverting input of the first amplifier.

4,926,136

POWER AMPLIFIER COMBINER FOR IMPROVING LINEARITY OF AN OUTPUT

Terence E. Olver, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1988, Ser. No. 291,601

Int. Cl.[5] H03F *1/26*

U.S. Cl. 330—149 **8 Claims**

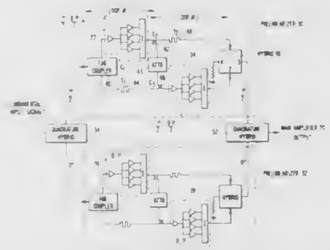
1. A power amplifier combiner for improving linearity, comprising:

first quadrature hybrid means for receiving fundamental input signals and outputting first and second signals;

first and second prelinearizer means, coupled to said first quadrature hybrid means, for respectively receiving said first and second output signals and outputting respective output signals, said first and second prelinearizer means including first and second separate, overlapping, feedforward cancellation loops, said first feedforward cancellation loop including:

a first coupler, connected to said first quadrature hybrid means, for receiving the first output signal and for dividing the signal into third and fourth signals;

a first amplifier, coupled to said first coupler, for receiving said third signal output from said first coupler and outputting an amplified fifth signal;



first delay means, connected to said first coupler, for receiving and delaying said fourth signal from said first coupler;

a second coupler, coupled to said first amplifier, for receiving said fifth signal output from said first amplifier; and

a third coupler, connected between said second coupler and said first delay means, for receiving said fifth signal and outputting a sixth signal; and

second quadrature hybrid means, coupled between said first and second prelinearizer means, for receiving and combining said respective output signals from said first and second prelinearizer means and outputting an output signal.

4,926,137

TRANSISTOR AMPLIFIER FOR OUTPUTTING A VOLTAGE WHICH IS HIGHER THAN A BREAKDOWN VOLTAGE OF THE TRANSISTOR

Toshihiro Shogaki, Takatsuki; Toyohiro Shibayama, Neyagawa, and Noriaki Omoto, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 3, 1989, Ser. No. 388,869

Claims priority, application Japan, Aug. 5, 1988, 63-196524; Aug. 5, 1988, 63-196525

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—252 **2 Claims**



1. An amplifier comprising:

a first transistor connected at the emitter to a circuit ground through a first resistor,

a second transistor connected at the emitter to the collector

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of said first transistor and connected at the collector to an output terminal and through a second resistor to a first power source of a voltage which is higher than the breakdown voltage of the transistors, and

a third transistor connected at the collector to the base of the second transistor and through a third resistor to a second power source, connected at the base to the base of said first transistor and connected at the emitter to said circuit ground through a fourth resistor.

4,926,138

FULLY-DIFFERENTIAL REFERENCE VOLTAGE SOURCE

Rinaldo Castello, Arcore; Marco Ferro, Turin; Franco Salerno, Alpignano, and Lucano Tomasini, Avullo, all of Italy, assignors to SGS-Thomson Microelectronics S.p.A., Catania, Italy

Filed Jul. 5, 1989, Ser. No. 375,771
Claims priority, application Italy, Jul. 12, 1988, 67656 A/88
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—253 **5 Claims**



1. A fully-differential reference voltage source comprising:

a source (GPTAT) of current proportional to temperature (PTAT) comprising a first current mirror (M8, . . . , M19) feeding a first voltage source ΔVbe (Q1T, . . . , Q4T);

a second voltage source ΔVbe (Q1, . . . , Q4), with a structure equal to that of the first;

an operational amplifier (OA) whose inputs are connected to the outputs of the second voltage source ΔVbe;

characterized in that it further comprises:

a second current mirror (M6,M7) which is driven by the current (PTAT) it receives from said first current mirror (M8, . . . , M19);

a third current mirror (M1,M2,M3), which is driven by current (PTAT) it receives from said second current mirror (M6,M7) and feeds a first and a second transistor (Q1,Q2) of said second voltage source ΔVbe, a third and a fourth transistor (Q3,Q4) being fed with the same current (PTAT) respectively by a first resistor (R3) and by a series of a second and third resistor (R1,R2);

and in that said operational amplifier (OA) is provided both with a differential non-inverting output (VR+) feeding the third current mirror (M1,M2,M3), the first resistor (R3) and the series of the second and third resistor (R1,R2) and with a differential inverting output (VR−) supplying bases of said first and second transistor (Q1,Q2), the inverting and non-inverting inputs being connected to outputs of the second source of voltage ΔVbe.

4,926,139

ELECTRONIC FREQUENCY FILTER

James R. Anderson, Chicago, and Richard Brander, Cicero, both of Ill., assignors to Beltone Electronics Corporation, Chicago, Ill.

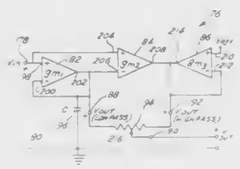
Division of Ser. No. 838,924, Mar. 12, 1986, Pat. No. 4,792,977.
This application Jun. 6, 1988, Ser. No. 203,334
Int. Cl.[5] H03F *1/34*
U.S. Cl. 330—294 **6 Claims**

1. A variable slope filter, for receiving an input signal at an input terminal and providing an output signal related to said input signal, comprising, in combination:

transconductance means, having an input interconnected to said terminal, for receiving said input signal and responsively providing a transconductance signal at a first output line ®, and having feedback input interconnected to said first output line;

a ground line;

a capacitor interconnected between said first output line and ground line;



amplifier means, interconneted to said input terminal and said line, for receiving said input signal and said transconductance signal and responsively providing an amplifier signal at a second output line; and

a potentiometer, interconnected between said first and second output lines, said potentiometer including a wiper for adjusting said potentiometer, said wiper providing said out signal.

4,926,140

HIGH GAIN ZERO OFFSET LINEAR PHASE DETECTOR APPARATUS

Alan N. Schenberg, Kinnelon, N.J., assignor to ITT Corporation, New York, N.Y.

Filed Jul. 19, 1989, Ser. No. 382,167
Int. Cl.[5] H03L *7/18*
U.S. Cl. 331—1 A **21 Claims**



1. A phase detector apparatus for providing an output error signal indicative of the phase difference between a stable reference frequency and a variable sample frequency with said error signal used to control the frequency of a voltage controlled oscillator (VCO) to enable the oscillator to lock to the reference frequency, comprising:

a ramp generator means operative to provide at an output a ramp voltage waveform having a positive slope portion and a negative slope portion for a phase difference between said sample and reference frequency, where the duration of said positive or negative slope portion differs according to said phase difference, a sample and hold circuit means having an input coupled to said output of said generator means for storing a voltage indicative of the amplitude and slope of said ramp waveform during a specified period and for providing an output voltage indicative of said stored voltage to be employed as said error signal.

4,926,141

FREQUENCY SYNTHESIZER WITH IMPROVED AUTOMATIC CONTROL OF LOOP BANDWIDTH SELECTION

Barry W. Herold, Boca Raton, and Omid Tahernia, Coconut Creek, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1989, Ser. No. 345,866
Int. Cl.[5] H03L *7/085, 7/107, 7/18*
U.S. Cl. 331—16 **18 Claims**



1. A frequency synthesizer governed by a frequency channel setting to generate a synthesized frequency signal, said frequency synthesizer including a phase lock loop (PLL) circuit operative in a first loop bandwidth state to maintain said synthesized frequency signal substantially at said frequency channel setting, said PLL circuit settable to a new frequency channel setting, said PLL circuit operative in a second loop bandwidth state to converge the synthesized frequency signal to said new frequency channel setting, said PLL circuit comprising:

phase detecting means governed by a reference frequency signal and a feedback frequency signal to generate at least one control signal based on said reference and feedback frequency signals, each of said reference and feedback frequency signals including one phase indication per frequency period, said feedback frequency signal being phase and frequency representative of said synthesized frequency signal, said at least one control signal for adjusting the frequency of the synthesized frequency signal; and

autobandwidth control means for controlling the switching from said first to said second loop bandwidth state based on an initial occurrence of three successive phase indications of a selected one of the reference and feedback frequency signals between successive phase indications of the other of the reference and feedback frequency signals, and for controlling the switching back from said second to said first loop bandwidth state based on an initial occurrence of two successive phase indications of the other frequency signal between successive phase indications of the selected frequency signal.

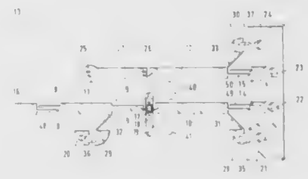
4,926,142

OSCILLATOR HAVING A DIELECTRIC RESONATOR, AND ELECTRONIC FREQUENCY TUNING USING A VARACTOR, IN PARTICULAR IN THE 22 GHZ RANGE

Isaac Mettoudi, Levallois Perret, France, assignor to Alcatel Thomson Faisceaux Hertziens, Levallois Perret Cedex, France

Filed Apr. 13, 1988, Ser. No. 181,010
Claims priority, application France, Apr. 15, 1987, 87 05359
Int. Cl.[5] H03B *5/18*
U.S. Cl. 331—99 **12 Claims**

1. An oscillator having a dielectric resonator and being electronically tuned in frequency by a varactor, in particular in the 22 GHz range, the oscillator comprising an active electronic component having negative resistance, at least two dielectric resonators, and a substrate on the surface of which there are three striplines, with the first and second striplines being in line and having their adjacent ends connected to two respective electrodes of the active component, wherein the third stripline which runs parallel to the first two striplines is



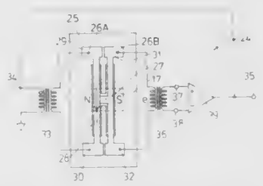
connected to the varactor, with all of the dielectric resonators being coupled to the first stripline.

4,926,143

OSCILLATOR USING H-SHAPED SINGLE CRYSTAL SILICON VIBRATOR

Kinji Harada; Kyoichi Ikeda; Hideki Kuwayama; Takashi Kobayashi; Tadashi Nishikawa; Tetsuya Watanabe, and Takashi Yoshida, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,681
Claims priority, application Japan, May 27, 1988, 63-129671
Int. Cl.[5] H03B *5/30*
U.S. Cl. 331—156 **4 Claims**



1. In a vibrating type transducer comprising

a vibrator body comprising a silicon single crystal provided on a silicon single crystal substrate,

an excitation means for exciting said vibrator body,

a vibration detection means for detecting an excited vibration of said vibrator body,

the improvement comprising

an H-shaped vibrator body having two first vibrators with opposite ends thereof fixed on said substrate, each being disposed in parallel with each other and a second vibrator mechanically coupled to central portions of said first vibrators,

a magnetic field impression means for impressing a DC magnetic field orthogonally to said vibrator body,

an excitation means for vibrating said first vibrators together with said DC magnetic field by carrying an alternate current to either the opposite ends of one of said first vibrators or, in the alternative, to the same one ends of said two first vibrators,

a vibration detection means for detecting an electromotive force generated either on the opposite ends of the other of said first vibrators or, in the alternative, on the same other ends of said two first vibrators, and

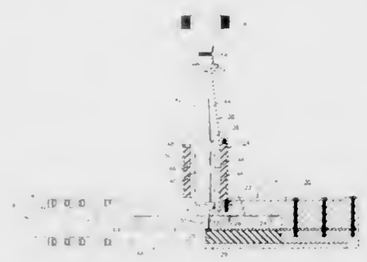
an amplification means connected between said excitation means and said vibration detection means.

4,926,144
MULTI-FUNCTION MODULATION AND CENTER FREQUENCY CONTROL PORT FOR VOLTAGE CONTROLLED OSCILLATOR
Robert K. Bell, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Sep. 29, 1988, Ser. No. 250,760
Int. Cl.[5] H03C *3/08, 3/09, 3/22*
U.S. Cl. 332—124 **20 Claims**



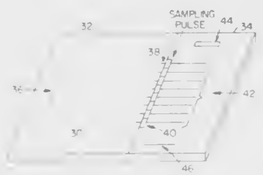
1. In a radio including a phase locked loop having a voltage controlled oscillator (VCO), said VCO including VCO tuning means for varying the VCO's output frequency, said VCO including a first port coupled to said VCO tuning means, apparatus coupled to said first port comprising:
modulation compensation means coupled to a modulation source and to said first port for boosting low frequency signals received from said modulation source for providing a compensated modulation signal to said VCO tuning means via said first port; and
means coupled to said first port and said modulation compensation means for providing a negative bias voltage to said VCO tuning means via said first port, said means for providing a negative bias voltage including means for adjusting the center frequency of the VCO.

4,926,145
RADIAL POWER COMBINER/DIVIDER WITH MODE SUPPRESSION
Richard P. Flam, Doylestown, and Jonathan P. MacGahan, Yardley, both of Pa., assignors to Flam & Russell, Inc., Horsham, Pa.
Filed Dec. 16, 1988, Ser. No. 285,537
Int. Cl.[5] H01P *5/12*
U.S. Cl. 333—125 **14 Claims**



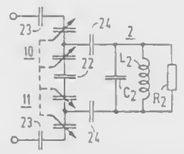
1. In a radial power combiner/divider in which a plurality of radial ports are coupled through a radial transmission line to a central, axially extending transmission line, the improvement comprising means permitting energy corresponding to a desired mode in the radial transmission line to be transmitted from the radial transmission line to the axially extending transmission line along with energy corresponding to at least one undesired mode in said radial transmission line, and mode-selective dissipative means, coupled directly to said axially extending transmission line so that it could suppress wave energy being propagated in said axially extending transmission line even if the radial transmission line were not present, said mode-selective dissipative means suppressing, in said axially extending transmission line, a mode corresponding to the energy of said at least one undesired mode.

4,926,146
PARALLEL-TO-SERIAL SIGNAL PROCESSOR USING SURFACE ACOUSTIC WAVES
Kuo-Hsuing Yen, Manhattan Beach; Reynold S. Kagiwada, Los Angeles; Robert B. Stokes, Torrance, and Marshall Y. Huang, Rancho Palos Verdes, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed May 9, 1988, Ser. No. 161,524
Int. Cl.[5] H03H *9/00*
U.S. Cl. 333—195 **3 Claims**



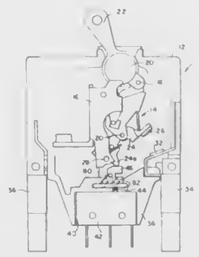
1. A monolithic surface acoustic wave (SAW) signal processing device, comprising:
a piezoelectric substrate;
a SAW channelizer formed on the substrate and having a focusing SAW input transducer for inputting a broadband electrical input signal and producing acoustic signals that are angularly dispersed in accordance with frequency, and having multiple output signals indicative of the spectral content of the input signal; and
SAW means for parallel-to-serial conversion, formed on the same substrate as the SAW channelizer, for converting the parallel electrical output signals.

4,926,147
ARRANGEMENT FOR TUNING A BALANCED-TO-GROUND RESONATOR
Ralph Oppelt, Weiher, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 29, 1989, Ser. No. 330,360
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3811984
Int. Cl.[5] H03J *3/20*
U.S. Cl. 334—81 **5 Claims**



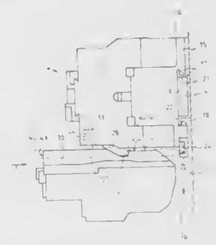
1. An arrangement for tuning a balanced-to-ground resonator, said resonator consisting of a capacitor and at least one radio-frequency coil having an inductance forming a resonant circuit with said capacitor, said resonator having two feed lines, said arrangement comprising two identical differential rotary capacitors each having a rotor plate accessible for electrical connection, said rotor plates being respectively connected to said feed lines and connected to each other, and means connected in common to said differential rotary capacitors for varying the respective capacitances of said differential rotary capacitors in a balanced-to-ground fashion.

4,926,148
AUXILIARY SWITCH RETAINER FOR CIRCUIT BREAKERS AND ACTUATOR MEMBER
Paul S. Cambreleng, Lambertville, N.J., assignor to Heinemann Electric Company, Lawrenceville, N.J.
Filed Oct. 3, 1988, Ser. No. 252,814
Int. Cl.[5] H01H *73/12*
U.S. Cl. 335—13 **19 Claims**



1. A circuit breaker structure comprising:
a housing of generally rectangular form having broad enclosing faces and at least four narrow edge walls;
a circuit breaker mechanism including switch contacts within the housing;
an actuator handle extending through an access opening through one of the edge walls of the housing;
switch terminals at an opposed edge wall of the housing for connecting the breaker mechanism switch contacts of the circuit to an electrical circuit;
an auxiliary switch receptacle connected to the housing along the edge wall adjacent the switch terminals and forming an extension for independently receiving said auxiliary switch into the receptacle and supporting the entire auxiliary switch so that the auxiliary switch terminals are left accessible for electrical connection, said edge wall having an opening allowing communication between the breaker mechanism and an actuating means of the auxiliary switch;
means separable from the housing for retaining and locking the auxiliary switch to the housing in the receptacle; and
an actuator member extending through the opening in the edge wall with the auxiliary switch receptacle between an actuating member for the auxiliary switch and a portion of the circuit breaker mechanism moving in response to breaker mechanism switch contacts opening and closing and retained in place laterally by a portion of the edge wall adjacent the opening.

4,926,149
PROTECTED ELECTRIC SWITCHING APPARATUS AND A DEVICE FOR FIXING SAME
Michel S. Saens, Poses; Bruno Jacquet, Saint Germain En Laye; Philippe Marie, Rouen; Frédèric Noirot, Asnieres, and Francois Tellier, Houilles, all of France, assignors to La Telemecanique Electrique, France
Filed Dec. 30, 1988, Ser. No. 292,170
Claims priority, application France, Dec. 30, 1987, 87 18346
Int. Cl.[5] H01H *51/08*
U.S. Cl. 335—132 **2 Claims**



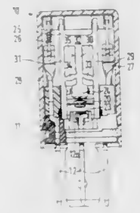
1. An electric apparatus with thermal protection comprising:
(i) a contactor having a fixing base provided with means for fixing said apparatus on a profiled rail, a front face which extends opposite said base, and lateral faces including a first associated face which extends between said base and said front face, said first association face comprising, in the vicinity of the front face a row of terminals including power terminals and at least one signaling terminal and said fixing means comprising a latch provided with a control means which projects from said first association face in a region thereof located under said signaling terminal near said base, so as to be accessible by an elongated tool;
(ii) a thermal relay comprising a second association face provided with conducting pins arranged so as to be engaged and fixed in the said power terminal when said thermal relay is in an assembled position, with the second association face facing the first association face and in a close vicinity thereof, said conducting pins thus serving to assume both an electric connection and a mechanical fixing between said contactor and said thermal relay, wherein said second association face is provided with a recess forming a passage extending perpendicularly to said base along an axis passing in front of said signaling terminal and through said control means.

4,926,150
ELECTROMAGNETIC RELAY
Emil Buchschmid, Rosstal; Anton Frenznick, Nuremberg; Klaus Lindner, Zirndorf; Olaf Schmid, Schwabach; Hans-Dieter Schmid, Nuremberg; Gerhard Schmidt, Weihenzell, and Theodor Sturm, Sachsen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
PCT No. PCT/DE87/00481, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO88/04466, PCT Pub. Date Jun. 16, 1988
PCT Filed Oct. 24, 1987, Ser. No. 343,258
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 3640997
Int. Cl.[5] H01H *1/00*
U.S. Cl. 335—196 **4 Claims**

1. An electromagnetic relay comprising a base plate made of insulating material; a magnetic yoke supported on said base plate; a coil core supported by said magnetic yoke and having a front face; a relay winding carried by said coil core; a hinge armature pivotably arranged at said front face of said coil core;

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a switching contact supported on said hinged armature; at least one fixed counter contact cooperating with said switching contact for actuating said electromagnetic relay; and a contact carrier supported on said base plate for supporting said one fixed counter contact, said contact carrier including a first portion extending in a direction of movement of said hinged armature and a second portion bent away at a right angle relative to said first portion for supporting said one fixed counter contact, said first portion having a stretchable zone for adjusting a position of said one fixed counter contact relative to the switching contact, said first portion including a center

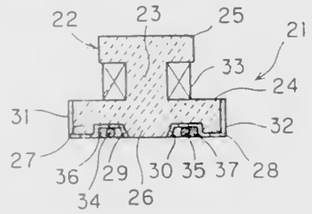


leg and two outer legs arranged on opposite sides of said center leg in spaced relationship relative thereto, a crossbar connecting said center and outer legs at one end thereof, said center leg having at an end thereof spaced from said crossbar a bent-away portion defining said second portion for supporting said one fixed counter contact, said first portion further including in the vicinity of said bent-away portion of said center leg laterally symmetrically extending webs for connecting said center leg to said center leg respectively, said center leg having a stretchable portion located between said crossbar and said connecting webs and defining said stretchable zone.

4,926,151
CHIP-TYPE COIL ELEMENT

Tetsuya Morinaga, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 21, 1988, Ser. No. 287,726
Claims priority, application Japan, Dec. 21, 1987, 62-194181[U]
Int. Cl.[5] H01F *3/00*
U.S. Cl. 335—296 **5 Claims**

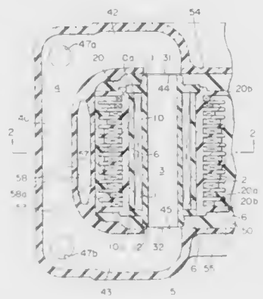


1. A chip-type coil element comprising:
a bobbin having a core and first and second flanges provided on end portions of said core respectively, said first flange having an end surface extending perpendicularly to the longitudinal direction of said core and a side surface extending parallel to said longitudinal direction, said end surface of said first flange being provided with a central projection on its center and first and second end projections on its opposite end portions respectively, thereby to define first and second cavities between said central projection and said first and second end projections respectively;
a coil being wound on said core and having first and second terminals; and
first and second electrodes provided to extend from said first and second end projections toward said side surface;
said first and second terminals being received in said first and second cavities to be electrically connected to said first and second electrodes respectively.

4,926,152
IGNITION COIL ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

Shigemi Ito, Kariya, and Katsunori Narita, Chiryu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 8, 1989, Ser. No. 404,494
Claims priority, application Japan, Dec. 27, 1988, 63-330676
Int. Cl.[5] H01F *27/02*
U.S. Cl. 336—90 **7 Claims**



1. An ignition coil assembly for an internal combustion engine comprising:
a primary coil;
a secondary coil coaxially disposed around the outside of said primary coil;
an internal iron core inserted through said primary and secondary coils to make part of a closed magnetic path:
an external iron core combined with said internal iron core to constitute said magnetic path and which has its central portion extended along said internal iron core with a distance kept therebetween;
a case made of a resin which has a mold space in which said primary coil, said secondary coil and said internal iron core are enclosed, a withstand voltage air gap of a predetermined shape between said mold space and said central portion of said external iron core, and a central partitioning wall portion between said withstand voltage air gap and said mold space, said case being integrally formed with said external iron core; and
a molded resin portion which is formed by injecting a resin material into said mold space so as to surround and fix said primary coil, said secondary coil and said internal iron core.

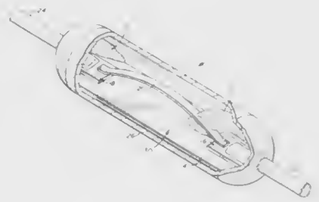
4,926,153
CERAMIC FUSE WIRE COATING

Leon Gurevich, St. Louis, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 2, 1989, Ser. No. 360,432
Int. Cl.[5] H01H *85/38, 85/44*
U.S. Cl. 337—273 **3 Claims**

1. A fuse, comprising:
a fusing link disposed between conductive areas and in electric engagement therewith;
leads attached to said conductive areas and projecting therefrom;
a ceramic coating enveloping said fusing link including forty

to eighty percent silicon dioxide having a maximum size of 120 mesh in a mixture with sufficient sodium silicate to make up one hundred percent of said ceramic coating; and

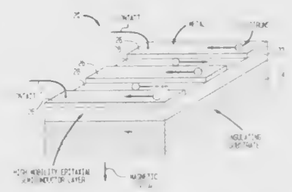


a plastic coating encapsulating said ceramic coating and substrate.

4,926,154
INDIUM ARSENIDE MAGNETORESISTOR

Joseph P. Heremans, Troy, and Dale L. Partin, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 289,634, Dec. 23, 1988. This application Oct. 25, 1989, Ser. No. 426,260
Int. Cl.[5] H01L *43/00*
U.S. Cl. 338—32 R **19 Claims**

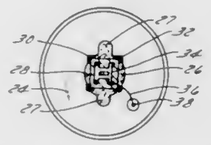


1. A magnetoresistive sensor providing unamplified electrical output changes of the order of one volt in response to changes in an applied magnetic field even when exposed up to temperatures as high as 300° C., said magnetoresistive sensor comprising:
a substantially electrically insulating monocrystalline indium phosphide substrate;
a film of monocrystalline indium arsenide disposed on said substrate, said thin film having inner and outer surfaces;
said monocrystalline indium arsenide film including a substantially rectangular sensing area for sensing a magnetic field applied perpendicularly to said film surfaces, said sensing area being defined as the entire area of said film disposed between the shorter, if they are not of equal length, of two parallel highly conductive portions in low electrical resistance contact with film portions adjacent the film outer surface;
said rectangular sensing area having two long edges of substantially equal length and two short edges of substantially equal length in which the length of the short edges is about 10% to 60% of the length of the long edges, and one of said two parallel conductors extends along the length of each long edge; and
said monocrystalline indium arsenide film being less than about 5 micrometers thick and nominally undoped;
effective to provide a monocrystalline indium arsenide film having an average electron density of the order of 10^{16} electrons per cubic centimeter or lower and an average electron mobility of about 10,000 to 32,000 cm^2 $volt^{-1}$ $second^{-1}$ but which exhibits a magnetic sensitivity and temperature insensitivity as if the indium arsenide film were at least an order of magnitude thinner, had an electron density at least an order of magnitude greater, and a significantly higher electron mobility.

4,926,155
INTEGRATED CIRCUIT SILICON PRESSURE TRANSDUCER PACKAGE

Jeannine O. Colla, Mequon; Paul E. Thomas, Wauwatosa, and Donald K. Showers, Madison, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Dec. 12, 1988, Ser. No. 282,604
Int. Cl.[5] H01L *10/10*
U.S. Cl. 338—36 **32 Claims**

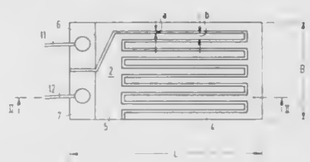


1. A sensor chip subassembly for use in a transducer assembly comprising:
(a) a support member;
(b) a pressure sensitive chip; and
(c) means for elastically bonding said chip at spaced predetermined points along a surface of said chip to said member so as to separate said chip from direct contact with said support member thereby reducing stress induced and vibration transmitted by said support member.

4,926,156
APPARATUS FOR MEASURING THE PARTIAL PRESSURE OF GASES OR VAPORS

Franz Dickert, Nuernberg; Heinz Kimmel, Buckenhof; Gert Mages, Hemhofen, and Sabine Schreiner, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellsc , Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 323,584
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 3808470; Mar. 14, 1988, 3808469
Int. Cl.[5] H01C *10/10*
U.S. Cl. 338—36 **27 Claims**



1. An apparatus for continuously measuring the partial pressure of gases or vapors with a chemically sensitive sensor material, having an electrical resistance or dielectric constant that changes in response to a change in the partial pressure of the gas or vapor, the sensor material comprising:
a dielectric material, having an ion mobility or ion concentration which changes in response to a change in the partial pressure of the gas or vapor, selected from the group consisting of a metal complex having at least one hydrophobing ligand and a mixture of at least one phthalide with at least one acidic component.

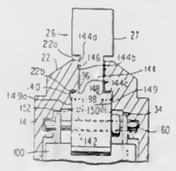
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4,926,157

CIRCUIT BREAKER

George S. Harper, Cambridge, Md., assignor to Airpax, Cambridge, Md.

Division of Ser. No. 848,169, May 22, 1986, which is a division of Ser. No. 486,716, Apr. 20, 1983, abandoned. This application May 3, 1988, Ser. No. 189,790
Int. Cl.[5] H01H *9/00*
U.S. Cl. 335—172 16 Claims



1. A circuit breaker, comprising:
a non-conductive casing, a plurality of electrically conductive elements within said casing, and a non-conductive handle for manipulating at least some of said electrically conductive elements;
means for pivotably mounting said handle in said casing for movement about a defined pivot axis;
said handle comprising a first portion which extends out of said casing for grasping by an operator, a second portion contained within said casing and containing said pivot axis, and an intermediate handle portion connecting said first and second handle portions;
said intermediate handle portion having a narrowed cross-sectional width relative to the cross-sectional width of said first handle portion to define a bridging surface extending between the face of said intermediate handle portion and the lateral outer surface of said first handle portion;
said second handle portion being shaped to define a combination of at least one ridge and at least one recess disposed radially outwardly of said pivot axis which together form a non-planar surface configuration;
said casing having an outer surface portion which cooperates with said bridging surface to define a first part of a tortuous path between the exterior and interior of said casing;
said casing further having a wall portion disposed radially outwardly of said pivot axis and extending adjacent to and facing said intermediate handle portion, the lateral outer surface of said first handle portion extending laterally outwardly of said casing wall portion, such that said facing case wall and intermediate handle portions together define a second part of said tortuous path; and
said casing further comprising a combination of at least one recess and at least one ridge disposed radially outwardly of said pivot axis which form a non-planar surface configuration adjacent and complementary to said non-planar surface configuration of said second handle portion to define a third part of said tortuous path.

4,926,158

POWERED COMMUNICATION LINK

John R. Zeigler, 17900 SW. Frances St., Aloha, Oreg. 97006

Filed Feb. 1, 1989, Ser. No. 305,871
Int. Cl.[5] H04M *11/04;* G08B *26/00*
U.S. Cl. 340—310 A 17 Claims

12. A powered communication link between a central controller and a remote substation comprising a single conductor having a movable or intermittent contact interacting therebetween, wherein said remote substation is powered by pulses of electrical power supplied by the central controller over the conductor, said pulses alternating with data messages transmitted between said central controller and said remote substation over said conductor, and including auxiliary signalling means for generating an alarm signal actuated by a switch at the remote substation mormally providing said alarm signal to the central controller over the conductor as part of a data message,



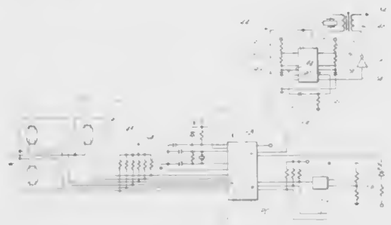
and failsafe relay means at the remote substation triggered by a loss of electrical power for connecting said auxiliary signalling means directly to said conductor in the event of a loss of electrical power at said remote substation to generate said alarm signal independently of said data message.

4,926,159

APPARATUS AND METHOD FOR THE GENERATION OF DIRECTIONALLY PERCEPTIBLE SOUND

Alan L. Bartlett, New Braunfels, Tex., assignor to Detex Corporation, New Braunfels, Tex.

Filed Jul. 15, 1988, Ser. No. 220,025
Int. Cl.[5] G08B *3/00*
U.S. Cl. 340—384 E 18 Claims



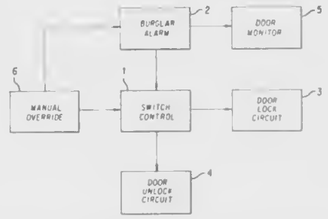
1. Apparatus for generating a directionally discernible sound comprising:
resonator means responsive to an A.C. signal for generating an audible sound and having resonant frequency in excess of 1200 Hz;
oscillator means for supplying a variable frequency A.C. signal to said resonator means and for frequency modulating said A.C. signal at a sweep rate over a frequency shift range that includes the resonant frequency of the resonator means,
the sweep rate of said frequency modulating over said shift range being less than about 1200 Hz.

4,926,160

MEANS FOR CONTROLLING POWER DOOR LOCKS WITH AN AUTOMOBILE BURGLAR ALARM

Shih-Ming Hwang, No. 11, Alley 12, Lane 7, Ching Tyan Street, Taipei, Taiwan

Filed Aug. 12, 1988, Ser. No. 231,264
Int. Cl.[5] B60R *25/00*
U.S. Cl. 340—426 5 Claims



1. A device for controlling power door locks of an automobile protected by an automotive burglar alarm, comprising:
an external switch circuit for generating a control signal for (a) manually arming and disarming said automotive burglar alarm and for (b) manually locking and unlocking said power door locks;
a switch control circuit for receiving an arm or disarm signal from said automotive burglar alarm and for receiving said control signal from said external switch circuit and, in response thereto, selectively generating lock and unlock control signals to respectively lock and unlock said power door locks;
a door unlock circuit for generating a door lock signal for locking the power door locks in response to said lock signal from said switch control circuit;
a door unlock circuit for generating a door unlock signal for unlocking said power door locks in response to said unlock control signal from said switch control circuit;
whereby said power door locks are automatically locked when said burglar alarm is armed and unlocked when said burglar alarm is disarmed.

4,926,161

METHOD OF MONITORING GOLF CARTS ON A GOLF COURSE

Ted W. Cupp, R.D. 6, Box 376, Rome, N.Y. 13440

Filed Oct. 23, 1989, Ser. No. 425,019
Int. Cl.[5] G08B *13/14*
U.S. Cl. 340—572 12 Claims



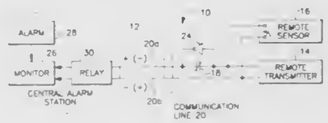
1. A method of monitoring the progress of each of a plurality of golf carts along a prescribed sequence of holes on a golf course in order to mitigate the effects of unacceptably slow play by golfers using said carts, said method comprising:
(a) transmitting from each of said carts by wireless means, a first signal, electrically perceptible at locations remote from said carts, each of said carts transmitting said first signal at first predetermined time intervals, said first signal transmitted by each of said carts including an identification code unique to the associated cart;
(b) receiving said first signal from each of said carts at a first, fixed location by receiving means adapted to distinguish said identification code and to provide a directional bearing between said first location and each of said carts from which said first signal is transmitted;
(c) determining from said identification code and directional bearing the location on said golf course of each of said carts, at least at periodic intervals;
(d) observing the occurrence of a plurality of carts in substantially the same location on said golf course, such observation indicating unacceptably slow play by the golfer(s) using one of said carts at said same location;
(e) identifying said one of said carts;
(f) transmitting from said first location by wireless means a second signal, electrically perceptible at said carts, said second signal including an identification code unique to said one of said carts;
(g) receiving said second signal and decoding said identification code at said one of said carts; and
(h) actuating an alarm device on said one of said carts in response to said second signal to provide a perceptible warning to individuals in the vicinity of said one of said carts that their play is unacceptably slow.

4,926,162

HIGH SECURITY COMMUNICATION LINE MONITOR

John D. Pickell, Roselle, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 28, 1988, Ser. No. 264,405
Int. Cl.[5] G08B *1/08*
U.S. Cl. 340—534 8 Claims



1. In a security or fire detection system of the type including a central alarm station and a plurality of remote sensors coupled to said central alarm station by a communication line comprised of a pair of lines, said system being selectively operable from said central alarm station to establish said communication line in a secure state wherein all remote sensors are activated or an access state wherein at least one of said remote sensors is deactivated, a communication line monitor for monitoring the condition of said communication line, comprising:
a remote transmitter coupled to said communication line at the remote end thereof, said remote transmitter being assigned one unalterable preassigned address out of a predetermined number of different addresses and including means for transmitting a series of electrical signals over said communication line corresponding to said one preassigned address and to the secure or access state of said communication line;
monitor means located at said central alarm station and being coupled to said communication line for indicating an alarm condition when the electrical signals received from said remote transmitter fails to correspond to said one preassigned address or to the state of said communication line established by said central alarm station;
means for maintaining said pair of lines opposite in polarity; and
means for reversing the polarity of said pair of lines when

VOL 1114 ISS 3 MY 15 1990 UMI

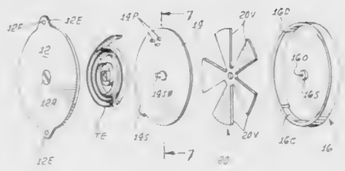
changing said communication line from one of said states to the other said state.

4,926,163

METHOD AND APPARATUS FOR ADVANCE WARNING SIGNALLING TO A MOTORIST OF AN ICE CONDITION ON A DRIVING SURFACE

Russell B. Beebe, Scotts Mills, Oreg., assignor to IceAlert, Inc., Scotts Mills, Oreg.

Filed Feb. 1, 1989, Ser. No. 305,304
Int. Cl.[5] G08B *19/02*
U.S. Cl. 340—581 **24 Claims**



1. A traffic signalling device for detecting the presence of a hazardous driving coodition and for signalling either a hazardous or safe driving condition at a preselected distance therefrom, the device comprising a bidirectional, thermal sensitive sensor adapted to provide preselected mechanical forces in response to a preselected temperature range relative to the freezing temperature, and signalling means coupled to said thermal sensitive sensor to be bilaterally movably responsive to the mechanical forces generated by the sensor with increases and decreases of temperatures over said temperature range, said signalling means being adapted for signalling the temperature changes sensed by the thermal sensor over the preselected temperature range to provide a visual signal representative of either a safe or hazardous driving condition in response to the mechanical forces generated by said sensor in response to the sensed temperatures whereby a "warm" sensed temperature provides a first signal and sensed freezing temperature provides a second signal and any sensed temperature between warm and freezing temperature provides a third signal that is a combination of the first and second signals proportioned in accordance to their relationship to the freezing temperature.

4,926,164

VEHICLE BREATH MONITORING DEVICE

Anthony Porter, Middle Dural, and Robert Breakspere, Yowie Bay, both of Australia, assignors to Lion Analytics Pty. Limited, Castle Hill, Australia

Filed Dec. 15, 1988, Ser. No. 285,544
Claims priority, application Australia, Dec. 15, 1987, PI5902; Dec. 24, 1987, PI6085
Int. Cl.[5] B60R *1/00*
U.S. Cl. 340—576 **14 Claims**

1. A vehicle breath monitoring device for a motor vehicle and its driver, said device comprising a breath monitoring means having an input for accepting a prescribed volume and an output connected as an input to a processing means, an ambient condition input sensing means located adjacent to said breath monitoring means to ensure accuracy of breath monitoring, said ambient condition input sensing means having an output connected as an input to said processing means, the output of said ambient condition sensing modifying the data received by said processing means to reflect changes in ambient temperature, and said processing means providing an output signal in accordance with said modified data to either a starter motor circuit control means, or to an indication means, starting of said starter motor being inhibited or said indication means being energized unless the alcohol concentration of respired air of said driver as detected by said breath monitoring



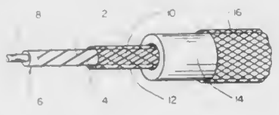
means and modified by said processing means is less than a predetermined limit stored in said processing means.

4,926,165

DEVICES FOR DETECTING AND OBTAINING INFORMATION ABOUT AN EVENT

John Lahlouh, San Jose; Ray F. Stewart, Redwood City; Robert S. Wasley, San Carlos; Paul D. Hauptly, Fremont, and Laurence M. Welsh, Palo Alto, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 787,278, Oct. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 744,170, Jun. 12, 1985, abandoned. This application Mar. 11, 1986, Ser. No. 838,725
Int. Cl.[5] G01M *3/16*; G01N *27/04*
U.S. Cl. 340—603 **17 Claims**



1. A device for detecting an event comprising:
(i) first and second conductive members which, in the absence of an event, are electrically insulated from each other,
(ii) a separator which has apertures passing therethrough, and
(iii) a swellable member which swells upon occurrence of the event, and on swelling causes an electrical path to be formed between the conductive members, through the apertures of the separator.

4,926,166

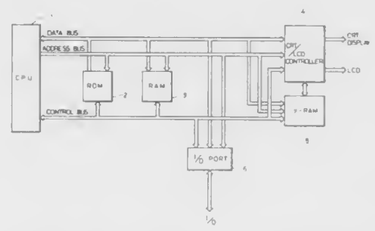
DISPLAY DRIVING SYSTEM FOR DRIVING TWO OR MORE DIFFERENT TYPES OF DISPLAYS

Isao Fujisawa, Nara, and Katsuhiko Hashimoto, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1985, Ser. No. 723,887
Claims priority, application Japan, Apr. 25, 1984, 59-84603
Int. Cl.[5] G09G *1/00*
U.S. Cl. 340—717 **9 Claims**

1. A display driving system for driving two or more different types of displays, each type having different driving requirements, comprising:

central processing means for producing data signals and control signals;
display memory means for storing display information to be displayed on a said display; and
controller means, connected to said central processing means and said display memory means, for selecting one of said different types of displays to be driven by said display drive system and for producing driver control



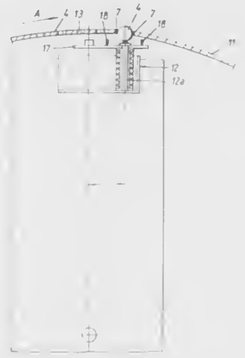
signals related to the different driving requirements of the two or more different types of displays, for developing driving signals tailored to the driving requirements of said selected type of display from said display information and said driver control signals, and for applying said driving signals to said selected one of the different types of displays to develop an image thereon from said driving signals.

4,926,167

INFORMATION DISPLAY APPARATUS

Stuart M. Jenkins, Bognor Regis, and Terence J. Harvey, Southsea, both of England, assignors to Bright-Tech (Developments) Limited, England

Filed Apr. 2, 1987, Ser. No. 34,126
Claims priority, application United Kingdom, Apr. 5, 1986, 8608363
Int. Cl.[5] G09G *3/16*
U.S. Cl. 340—764 **8 Claims**



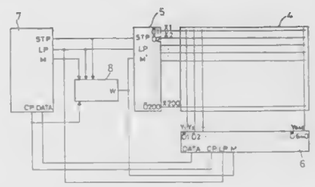
1. An information display apparatus comprising a frame molded from a magnetic material of low remanence in which are mounted a plurality of movable elements rotatable relative to the frame and having at least two display areas, and an array of activating means comprising an array of selectively energized electromagnets and leading and trailing brushes to assist in the alignment of the moveable elements and to minimize air flow over the elements, to prevent the air flow from disturbing the alignment, wherein the frame of elements is arranged on a fixed linear surface which is traversed by the array of activating means, the frame of elements and the array of activating means being movable relative to one another such the selective energization of the activating means rotate one or more of the movable elements to create a changeable display of information.

4,926,168

LIQUID CRYSTAL DISPLAY DEVICE HAVING A RANDOMLY DETERMINED POLARITY REVERSAL FREQUENCY

Kunihiko Yamamoto, and Yutaka Ishii, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 27, 1988, Ser. No. 198,870
Claims priority, application Japan, May 29, 1987, 62-133817
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **11 Claims**



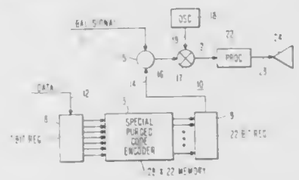
1. A liquid crystal display device containing an X-Y matrix type liquid crystal display panel having M (M>1) signal electrodes and N (N>1) scanning electrodes opposed to each other in the matrix, comprising:
polarity inverting means for inverting a polarity of a voltage waveform applied to the signal electrodes and signal electrodes of the liquid crystal display panel at intervals of a horizontal scanning periods, n being greater than 1 and less than N, and for randomly setting a timing for inverting the polarity of the voltage waveform for a predetermined number of frames.

4,926,169

CODER-DECODER FOR PURGED EXTENDED GOLAY (22,7) CODES

Po Tong, Alameda; Elwyn R. Berlekamp, Piedmont, both of Calif.; Robert J. Currie, Salt Lake City, and Craig K. Rushforth, Kaysville, both of Utah, assignors to UNISYS Corp., Blue Bell, Pa.

Filed Nov. 28, 1988, Ser. No. 276,757
Int. Cl.[5] H04Q *9/00*; G07F *11/12*
U.S. Cl. 340—825.57 **9 Claims**



1. Encoding system, having a transmitting apparatus and a receiving apparatus, comprising:
means for generating balanced-code-set signals,
means for generating digital data signals,
a purged code encoder coupled to said digital data signals for generating a purged extended Golay (22,7) code,
said encoder being adapted to generate 128 unbalanced codewords in a modified subset of the Golay (24,12) code,

VOL 1114 ISS 3 MY 15 1990 UMI

said subset of codewords all having a length of 22 bits, a weight of 7 and a minimum distance of 8,

means for combining said balanced-code-set signals and said unbalanced codewords to provide balanced digital signals defining said data signals and containing error correction bits for transmission,

transmitting means,

means for receiving said balanced digital signals containing error correction bits,

detector means comprising carrier tracking loop means connected to said receiving means for tracking said received signals,

said detector means adapted to remove said balanced-code-set signals and for recovering said unbalanced codewords and having bit synchronization signal means, word synchronization signal means and means for producing quantized data signals, and

purged code decoder means coupled to said bit synchronization signal means, said word synchronization signal means and said quantized data signals for producing a best estimate of said data signals as an output.

4,926,170

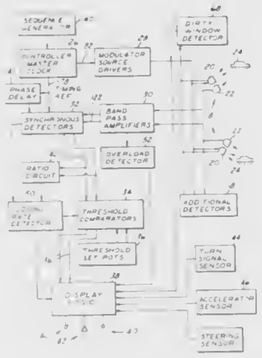
OBJECT DETECTION METHOD AND APPARATUS EMPLOYING ELECTRO-OPTICS

George Beggs, Boulder, and Richard Speck, Denver, both of Colo., assignors to Auto-Sense, Ltd., Englewood, Colo.

Continuation-in-part of Ser. No. 831,016, Feb. 19, 1986, Pat. No. 4,766,421. This application Feb. 12, 1987, Ser. No. 13,812

Int. Cl.[5] G08G *1/16*

U.S. Cl. 340—904 **21 Claims**



1. Apparatus for detecting the presence of an object in an area under surveillance comprising:

emitter means for emitting light into said area;

controller means coupled to said emitter means for generating an activating signal to control the intensity of said light such that said intensity has a keyed modulation;

detector means for receiving light from said area and generating an electrical signal proportional thereto, said electrical signal having said keyed modulation;

synchronous means coupled to said detector means and to said controller means for deriving a first portion of said electrical signal having said keyed modulation;

threshold means coupled to said synchronous means for generating an indicating signal when the magnitude of said first portion exceeds a threshold value;

delay means coupled to said controller means for generating a quadrature signal phase shifted by substantially 90° from said activating signal;

quadrature means coupled to said detector means and to said delay means for deriving a second portion of said electrical signal having a modulation corresponding to said quadrature signal; and

circuit means coupled to said quadrature means and to said synchronous means for comparing said first portion and said second portion.

4,926,171

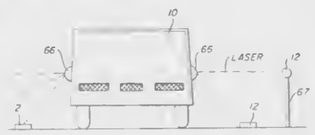
COLLISION PREDICTING AND AVOIDANCE DEVICE FOR MOVING VEHICLES

William L. Kelley, 4633 SW. 31st Dr., Hollywood, Fla. 33023

Filed Nov. 21, 1988, Ser. No. 273,919

Int. Cl.[5] G08G *5/04*

U.S. Cl. 340—961 **12 Claims**



1. Apparatus for avoiding collision between a moving vehicle and an object moving in a trajectory relative to the vehicle, comprising:

at least one transmitter mounted on the vehicle for transmitting a scanning beam of pulsed energy, the beam scanning a sector defining at least the space forward of the vehicle;

at least one receiver connected with said transmitter for receiving any echoes of the pulses from said object;

a clock for producing timing pulses triggering said transmitter in synchronism with the timing pulses;

a ranging device having inputs connected to said clock and said receiver for measuring the difference in time between the transmitted pulses and the respective echoes, said difference being proportional to the range to said object;

scanning means connected to said transmitter for directing the beam to scan said sector;

a direction device coupled to said scanning means for sensing the instant direction of said beam for the pulse transmitted;

a computer having inputs connected to said ranging device, said clock, and said direction device for computing for each echo received a set of coordinates of a vector to said object, means for computing the probability of a collision with said object on the basis of the last three sets of said coordinates defining a circle potentially intersecting said trajectory; and

an anuciator connected to the output of said computer having outputs for announcing the probability of a collision.

4,926,172

JOYSTICK CONTROLLER

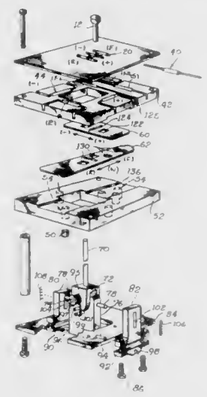
Edmund J. Gorsek, Springfield, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Sep. 2, 1988, Ser. No. 241,027

Int. Cl.[5] H01H *36/00*

U.S. Cl. 341—20 **8 Claims**

1. A joystick controller apparatus comprising: a lever, pivot means for journaling said lever for pivotal motion in two orthogonal directions; position indicating means responsive to the position of said lever for producing a digital logic representation of said position; said position indicating means comprising a plurality of energy actuated means positioned at predetermined locations relative to said lever, energy producing means positioned at locations relative to said energy actuated means for actuating the same, and shield means located for movement into positions interposed between said energy producing means and said energy actuated means for preventing actuation of the latter by the former; said shield means being coupled for movement in response to movement of said lever in a predetermined fashion for causing the shield means to be moved between positions for respectively preventing and permitting actuation of said energy actuated means in a predetermined pattern corresponding to the position of said lever such that a given combination of actuated ones and nonactuated ones of said energy actuated means defines a digital logical representation corresponding to the position of said lever; wherein said shield means comprises a pair of plates interposed between said energy producing means and said energy actuated means, each of said plates including a plurality of through apertures arranged in a predetermined pattern for actuating said energy actuated means in a pattern corresponding to the position of said lever; and mounting block means for respectively mounting said energy actuated means and said energy producing means and having orthogonally aligned recesses for mounting said pair of plates for a slidable movement in orthogonal directions so as to align said apertures for actuating said energy actuated means in said pattern corresponding to said lever position and for confining each said plate to movement in but one of said orthogonal directions; said plates further including motion limiting slots for receiving said shift lever therethrough to define limits of motion thereof and correspondingly limiting the motion of each of said plates to assure said alignment of said apertures with said energy actuated means and with said energy producing means at said limits of motion of said shift lever.



4,926,173

DATA ENTRY KEYBOARD APPARATUS

Franciscus J. Frielink, Nieuwegein, Netherlands, assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 3, 1989, Ser. No. 331,767

Claims priority, application United Kingdom, Nov. 10, 1988, 8826430

Int. Cl.[5] H03K *19/00*; H03M *11/00*

U.S. Cl. 341—22 **7 Claims**

1. A data entry keyboard apparatus, including an array of key switches connected between row and column conductors, and associated control means connected to said row and column conductors for detecting the actuation of a key switch and providing an output signal representing an actuated key switch, characterized in that said control means includes:

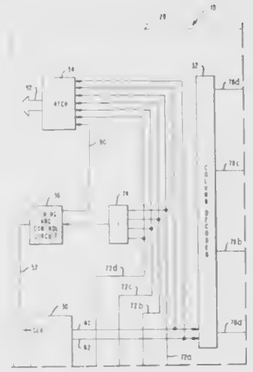
random pattern generating means adapted to generate successive random patterns of first and second type binary signals;

a plurality of first port circuits coupled to said random pattern generating means and to respective ones of said row conductors;

a plurality of second port circuits coupled respectively to said column conductors;

decoding means coupled to said random pattern generating means and to said plurality of second port circuits;

and detection means coupled to said random pattern generating means and to said plurality of first port circuits, whereby each generated random pattern operates said decoding means to cause said second port circuits to provide a first type binary signal to a selected one of said column conductors and a second type binary signal to the remaining ones of said column conductors, and operates said plurality of first port circuits such that a row conductor, associated with an actuated key switch in the selected column, has a first type binary signal applied thereto and the remaining row conductors have binary signals applied thereto corresponding to the random pattern operating the decoding means, said detection means being further adapted to detect a first port circuit which has a second type binary signal applied thereto by the random pattern operating the decoding means and which is coupled to a row conductor having a first type binary signal applied thereto thereby enabling the generation of said output signal representing the actuated key switch.



4,926,174

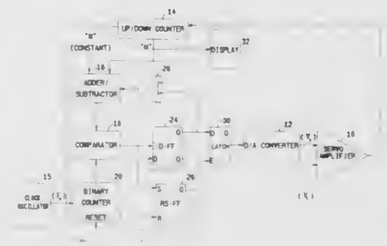
DIGITAL VOLTMETER

David Fiori, Jr., 140 Dollington Rd., Yardley, Pa. 19067

Filed Mar. 4, 1988, Ser. No. 164,399

Int. Cl.[5] H03M *1/00*

U.S. Cl. 341—110 **39 Claims**



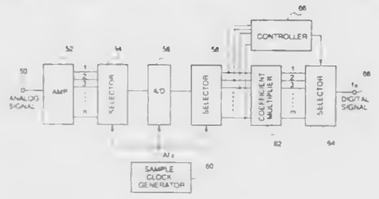
1. A digital voltmeter comprising:

means for supplying an input signal having an amplitude to be measured;

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means for supplying a digital reference signal representative of a fixed value;
means responsive to said input signal for developing a digital signal representative of the amplitude of said input signal;
pulse generating means responsive to said digital reference signal and said digital signal for developing an alternating series of oppositely directed first and second pulses, said first pulses having durations proportional to the fixed value of said digital reference signal plus the amplitude of said input signal and said second pulses having durations proportional to the fixed value of said digital reference signal minus the amplitude of said input signal;
and a digital-to-analog converter responsive to said series of first and second pulses for:
(a) developing an analog signal having an amplitude proportional to the difference in durations between said first and said second pulses divided by the sum of the durations of said first and said second pulses, and
(b) supplying said analog signal to said digital signal developing means to increase the value of said digital signal when the amplitude of said analog signal is less than the amplitude of said input signal and decrease the value of said digital signal when the amplitude of said analog signal is greater than the amplitude of said input signal.

4,926,175
ANALOG-DIGITAL CONVERTING CIRCUIT HAVING HIGH RESOLUTION AND LOW POWER CONSUMPTION
Yoshiro Ishizawa, and Hiroshi Morito, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Apr. 20, 1989, Ser. No. 341,563
Claims priority, application Japan, Apr. 20, 1988, 63-98702
Int. Cl.[5] H03M *1/20*
U.S. Cl. 341—131 **4 Claims**



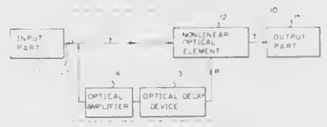
1. An analog-digital converting circuit comprising an analog signal input terminal; analog amplifying means having an input connected to the analog signal input terminal and having a plurality of outputs for generating a corresponding number of analog signals amplified by different amplification factors; first selection means having a corresponding number of inputs connected to receive the plurality of amplified analog signals outputted from the analog amplifying means, respectively, and having an output for outputting one analog signal selected from the received amplified analog signals; an analog-digital converter having an input connected to receive the amplified and selected analog signal and having an output for generating a digital signal; second selection means having an input connected to receive the digital signal from the analog-digital converter and having a plurality of outputs for outputting the received digital signal from one sequentially alternatively selected from the plurality of outputs; a sample clock generator for supplying a sample clock to the first and second selection means and the analog-digital converter so as to cause the first and second selection means and the analog-digital converter to operate in a manner timed to each other; coefficient multiplying means having a corresponding number of inputs connected to the plurality of outputs for generating a corresponding number of multiplied digital signals which are obtained by multiplying the plurality of outputs of the second selection means by different coefficients, respectively; a third selection means having a corresponding number of inputs connected to the plurality of outputs of the coefficient multiplying means so as to output, as a digital signal, one selected from the plurality of outputs of the coefficient multiplying means; and a controller having a corresponding number of inputs connected to the plurality of outputs of the second selection means, respectively, for monitoring respective levels of the plurality of outputs of the second selection means and for supplying a selection signal to the third selection means so as to cause the third selection means to select, from the plurality of outputs of the coefficient multiplying means, one multiplied digital signal in correspondence to a level of the analog signal inputted to the analog signal input terminal.

4,926,176
SELF-TIMING ANALOG-TO-DIGITAL CONVERTING SYSTEM
Lanny L. Lewyn, Laguna Beach, and Perry W. Lou, Carlsbad, both of Calif., assignors to Brooktree Corporation, San Diego, Calif.
Filed Aug. 25, 1988, Ser. No. 236,505
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—135 **20 Claims**



1. In combination,
a source of a constant current,
first means for providing an input voltage,
second means for providing a reference voltage,
third means responsive to the relative characteristics of the input voltage and the reference voltage for producing a flow of a first portion of the constant current in accordance with the relative characteristics of the input voltage and the reference voltage,
fourth means responsive to the relative characteristics of the reference voltage and the input voltage for producing a flow of the remaining portion of the constant current,
fifth means responsive to the first portion of the constant current for providing a first charge dependent upon the magnitude of such first portion,
sixth means responsive to the remaining portion of the constant current for providing a second charge dependent upon the magnitude of such remaining portion,
seventh means for accelerating the rate of producing an individual one of the first and second charges, and for decelerating the rate of producing the other one of the first and second charges, in accordance with the relative magnitudes of the first and second charges, and
eight means for providing an output indication when such individual one of the charges has reached a particular magnitude.

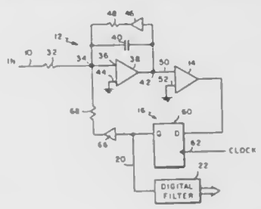
4,926,177
OPTICAL ANALOG-DIGITAL CONVERTER PROVIDED WITH A NONLINEAR OPTICAL ELEMENT AND AN OPTICAL FEEDBACK SYSTEM FOR THE OUTPUT LIGHTS OF SAID ELEMENT
Hajime Sakata, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 19, 1988, Ser. No. 195,950
Claims priority, application Japan, May 21, 1987, 62-124379; May 21, 1987, 62-124380; Oct. 5, 1987, 62-251076; Oct. 5, 1987, 62-251077; Apr. 23, 1988, 63-101026
Int. Cl.[5] H03M *1/12*
U.S. Cl. 341—137 **64 Claims**



1. An optical analog-digital converter comprising:
a nonlinear optical element having a threshold value for the intensity of an input light and producing a first and a second output light from said input light with said threshold value as a reference, said element producing a first output light of intensity corresponding to a digital signal meaning the digit 0 and a second output light of intensity proportional to the input light intensity when the intensity of said input light is smaller than said threshold value, and producing a first output light of intensity corresponding to a digital signal meaning the digit 1 and a second output light of intensity equal to the input light intensity minus the threshold value when the intensity of said input light is greater than said threshold value;
means for inputting to said nonlinear optical element a light having an intensity distribution corresponding to an analog signal;
an optical feedback system for causing the second output light of said nonlinear optical element produced from said input light to be again input to said nonlinear optical element; and
means provided in said feedback system for amplifying said second output light.

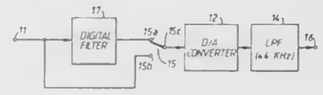
4,926,178
DELTA MODULATOR WITH INTEGRATOR HAVING POSITIVE FEEDBACK
A. Martin Mallinson, Billerica, Mass., assignor to Analog Devices, Inc., Norwood, Mass.
Filed Jul. 13, 1988, Ser. No. 218,645
Int. Cl.[5] H03M *3/02*
U.S. Cl. 341—143 **13 Claims**

1. A delta modulator for providing a digital output signal representative of an input signal amplitude, comprising:
integrator means responsive to said input signal for providing an integrator output signal at an output thereof, said integrator means including positive feedback means;
comparator means responsive to said integrator output signal for providing a comparator output signal having a first state when said integrator output signal is greater than a prescribed reference level and a second state when said integrator output signal is less than the prescribed reference level; and
synchronizing means for providing to an input of said integrator means an error signal representative of the output state of said comparator means and synchronized to a clock signal, said error signal having a first level which causes said integrator means to integrate in a positive direction and a second level which causes said integrator



means to integrate in a negative direction, said digital output signal corresponding to the levels of said error signal.

4,926,179
DIGITAL TO ANALOG DATA DEMODULATION CIRCUIT
Yo Yoshioka, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Aug. 5, 1988, Ser. No. 228,902
Int. Cl.[5] H03M *1/66*
U.S. Cl. 341—144 **7 Claims**



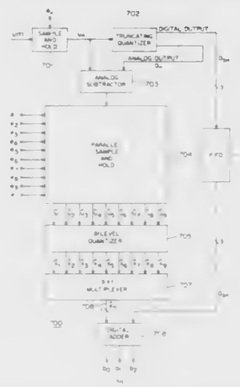
1. A digital to analog data demodulating circuit adapted for selectively demodulating analog data from a plurality of digital data each having a different sampling frequency comprising:
an input means provided for selectively receiving the plurality of digital data;
a shifting means coupled to the input means for shifting higher the sampling frequency of the digital data applied from the input means;
a digital to analog converter means coupled to the shifting means for generating first and second analog conversion data separated into a lower frequency band and a higher frequency band, the lower frequency band being almost coincident with the frequency band of the analog data digitized to the corresponding digital data and the higher frequency band having a center frequency coincident with the shifted sampling frequency: and
a filter means coupled to the digital to analog converter means for removing the second analog conversion data from the output of the digital to analog converter means.

4,926,180
ANALOG TO DIGITAL CONVERSION USING CORRELATED QUANTIZATION AND COLLECTIVE OPTIMIZATION
Dimitris Anastassiou, New York, N.Y., assignor to Trustees of Columbia University in the City of New York, New York, N.Y.
Filed Mar. 25, 1988, Ser. No. 173,441
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—159 **32 Claims**

1. A nonstandard analog-to-digital converter for converter a sampled analog signal u, having N samples $u_1, \ldots, u_N$ each with a value between a first and a second level, into a digital

signal x, having N corresponding 1-bit binary values $x_1, \ldots, x_N$, such that a distortion measure $d=(Au-Bx)^T(Au-Bx)$ is minimized, where u and x are N-dimensional vectors, A and B are N×N matrices, and N is an integer greater than 1, the converter comprising:

N nonlinear amplifying means $A_1, \ldots, A_N$, each having an output terminal supplying an output signal and input means operatively coupled to receive the output signals supplied by other amplifying means, one or more of the analog signal samples and a respective constant signal, the input means for taking the weighted sum of the signals received thereby, including applying respective weighting factors to the received signals, and providing the



weighted sum to the amplifying means, wherein for any two of the N amplifying means A_i and A_j, where i and j are independent integers having values i=1, 2, . . . N and j=1, 2, . . . , N, the weighting factor W_{ij} applied by the input means of A_i to the output signal supplied by A_j is the element of the ith row and j^{th} column of a matrix $-B^TB$, the weighting factor K_{ij} applied by the input means of A_i to analog signal example u_j is the element of the ith row and j_{th} column of a matrix B^T, the constant signal 1_i received by the input means of A_i is the element of the ith row and i^{th} column of the matrix $-B^TB$, and the output signal supplied by A_i operatively stabilizes to binary value x_i of the digital signal x.

4,926,181

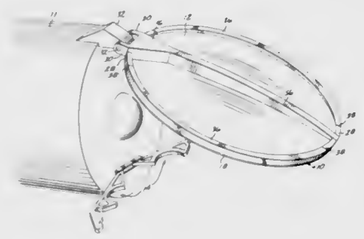
DEPLOYABLE MEMBRANE SHELL REFLECTOR

James E. Stumm, 4983 Southcrest, San Diego, Calif. 92110

Filed Aug. 26, 1988, Ser. No. 237,160

Int. Cl.[5] G01S *13/90*

U.S. Cl. 342—5 16 Claims



1. A reflector assembly to focus electromagnetic waves, said reflector assembly being capable of being released from stowed configuration to a deployed configuration, said reflector assembly comprising:

flexible reflector means for focusing said electromagnetic waves, said reflector means incorporating a desired surface contour in its deployed configuration for focusing said electromagnetic waves, said reflector means having an edge;

support means positioned adjacent said reflector means, said support means providing a reference edge capable of supporting said reflector in substantially the same contour as the desired surface contour of the reflector means in its deployed configuration, said support means further comprising a support ring pivotally mounted to an underlying structure for movement of said reflector assembly from its stowed configuration to its deployed configuration;

registration means interposed between said support means and said flexible reflector means for aligning said reflector means upon said support means;

restraining means sized to maintain said flexible reflector means in said stowed configuration and deploying said reflector means from said stowed configuration to the deployed configuration; and

guide means, engaged with said reflector means, for urging said flexible reflector means into said deployed configuration, whereby said restraining means releases said flexible reflector means from said stowed configuration and said registration means aligns said edge of said reflector means against said reference edge of said support means so that said reflector means deploys to said deployed configuration having the desired surface contour for focusing said electromagnetic waves.

4,926,182

MICROWAVE DATA TRANSMISSION APPARATUS

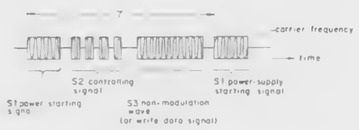
Tomozo Ohta, Ikoma; Hiroshi Nakano, Tenri; Kazutada Higashi, Tenri, and Hirohiko Yamamoto, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 29, 1987, Ser. No. 55,363

Claims priority, application Japan, May 30, 1986, 61-126729; May 30, 1986, 61-126730

Int. Cl.[5] G01S *13/80*

U.S. Cl. 342—44 9 Claims



1. A microwave data transmission apparatus comprising:

an interrogator including,

first transmitting means for transmitting modulated microwave signals during a modulation period and non-modulated microwave carrier signals during a non-modulation period, and

first receiving means for receiving microwave signals; and

an identification tag including,

a control processing unit having a built-in power supply, said power supply being periodically rendered operational upon receipt of a power starting signal transmitted during a first sub-period of said modulation period to activate said processing unit,

a memory portion, and

transceiving means including second receiving means for receiving the modulated microwave signals sent from said interrogator during a second sub-period of said modulation period and for receiving said non-modulated microwave carrier signals sent during said non-modulation period, and second transmitting means including modulating means for modulating said received non-modulated microwave carrier signals with data stored in said memory portion to provide return microwave signals for transmission back to said interrogator.

4,926,183

RADAR, NOTABLY FOR THE CORRECTION OF ARTILLERY FIRE

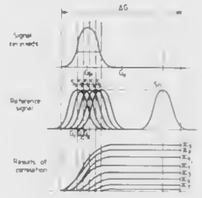
Louis Fourdan, Antony, France, assignor to LMT Radio Professionnelle, Boulogne Billancourt, France

Filed Jan. 27, 1989, Ser. No. 302,249

Claims priority, application France, Jan. 29, 1988, 88 01038

Int. Cl.[5] G01S *9/02*

U.S. Cl. 342—67 6 Claims



1. A radar, notably for correcting of artillery fire, including a directionally scanned antenna and a receiver, said radar comprising:

means for providing an alternate bearing can of said antenna, in a limited zone ΔG around a central position coinciding with a targeted object;

means for comparing the signals received by said receiver, during each scan of said zone ΔG, with a set of reference signals representing the responses awaited from virtual targets evenly spaced out, in bearing, within said zone ΔG; and

means for determining the one of said reference signals for which said comparing means delivers a maximum result in order to obtain the bearing of an eventual target in said zone.

4,926,184

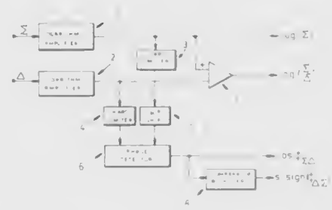
ANGLE MEASUREMENT DEVICE FOR AMPLITUDE MONOPULSE RECEIVERS

Gaspare Galati, and Giovanni Jacovitti, both of Rome, Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

Continuation of Ser. No. 931,734, Nov. 17, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 170,055

Int. Cl.[5] G01S *13/44*

U.S. Cl. 342—149 2 Claims



1. An angle-measurement device in an amplitude-modulated monopulse radar receiver, comprising:

two logarithmic amplifiers connected to an antenna system and responsive to two antenna-pattern signals in the form of a sum and of a difference denoted as a sigma signal and a delta signal, respectively, for generating log sigma and log delta signals;

respective hard limiters connected to outputs of said logarithmic amplifiers and having respective outputs representing the phases of said sigma and delta signals;

a 90° phase shifter connected to an output of one of said hard limiters to effect a 90° phase shift of the signal outputted thereby;

a phase detector connected to an output of said 90° phase shifter and the output of the other of said hard limiters for outputting a signal representing the cosine of the phase difference between said sigma and delta signals;

a first analog-to-digital converter connected to an output of said phase detector for digitalizing said cosine;

a subtractor connected to said outputs of said logarithmic amplifiers for outputting a signal representing the logarithm of the quotient of said sigma and delta signals;

a second analog-to-digital converter connected to an output of said subtractor for digitalizing said signal representing the logarithm of said quotient;

a first comparator connected with the output of one of said logarithmic amplifiers for comparing the respective log signal with a detection threshold to provide an enabling signal;

a second comparator connected with the output of said subtractor for comparing the logarithm of the quotient with another threshold to output a signal representing the existence of a predetermined condition; and

a third comparator connected with the output of said phase detector and having a zero input for generating a signal representing the sign of the cosine;

a decoder connected to said first and second analog-to-digital converters and to said first, second and third comparators and enabled by said enabling signal to provide angle measurement output selectively in accordance with the function:

$$\theta = SK_m b^{-z} \quad (1),$$

and

$$\theta = CK_m b^{-z} \quad (2),$$

where

θ is the measured azimuth angle,

b is the logarithm base,

z is the logarithm of the quotient,

S is the sign of the cosine,

C is the cosine, and

K_m is a constant system parameter,

in accordance with the output of said second comparator.

4,926,185

MULTIPLE RADIO FREQUENCY SINGLE RECEIVER RADAR OPERATION

Peter Wittenberg, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 26, 1988, Ser. No. 262,917

Int. Cl.[5] G01S *7/28*

U.S. Cl. 342—201 15 Claims

1. A pulse radar system comprising:

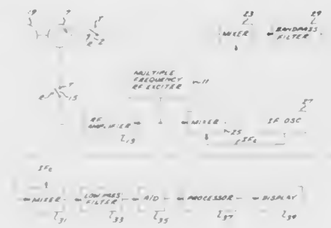
single RF generating means having a multiple frequency RF signal exciter for generating an internal RF repeating sequence of internal pulses of RF energy of different frequencies at different times;

means responsive to said internal repeating sequence of pulses of RF energy for generating a transmit radar signal comprising a transmit repeating sequence of transmit intervals during which pulses of RF energy are transmitted; and

means responsive to said internal RF repeating sequence of

VOL
1114
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pulses for receiving radar return signals based on all of said RF frequencies of said transmit radar signal in a single



receive port in a receive repeating sequence of receive intervals which do not occur at the same time as said transmit intervals.

4,926,186

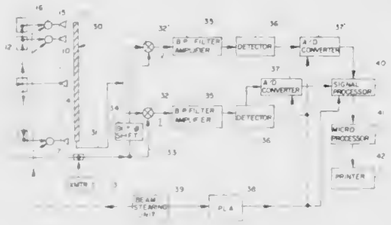
FFT-BASED APERTURE MONITOR FOR SCANNING PHASED ARRAYS

Robert J. Kelly, Ruxton, and Edward F. C. LaBerge, Towson, both of Md., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 20, 1989, Ser. No. 326,133

Int. Cl.[5] H01Q *3/00*

U.S. Cl. 342—360 **18 Claims**



1. The method of monitoring the performance of a scanning phased array antenna to identify faults in said antenna, said antenna having a plurality of radiating elements and plurality of phase shifters associated with said elements to control the direction of a beam of energy transmitted by said radiating elements, said antenna scanning between the maximum angles of $+\theta_o$ and $-\theta_o$, θ being the angle between the axis of said beam and the normal to the axis of the array of said antenna, comprising:

collecting, from a single detector of signals transmitted by said antenna, at equal increments of arcsin θ, a plurality of signal samples;

analyzing said collected samples by means of a Fourier transform to provide a sequence of data indicating the amplitude and phase of the signal radiated by each of said antenna radiating elements when the beam of said antenna was directed toward said detector; and

comparing the data of said sequence with known values of the amplitude and phase of the signal radiated by each of the radiating elements of said antenna when said antenna is perfectly functioning and the beam thereof is directed toward said detector.

4,926,187

RADIO-FREQUENCY IDENTIFICATION SYSTEM

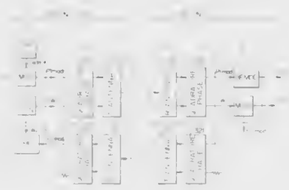
Hideo Sogawara, and Hideo Ashida, both of Ohtawara, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 26, 1988, Ser. No. 249,768

Claims priority, application Japan, Sep. 24, 1987, 62-239204; Feb. 4, 1988, 63-024178; Feb. 4, 1988, 63-024181

Int. Cl.[5] H01Q *21/06*; G01S *13/74*

U.S. Cl. 342—361 **24 Claims**



1. A radio frequency identification system, comprising:

a main unit, comprising:

a main modem portion outputting a first modulation signal generated by modulating a first carrier having a first frequency with a first transmission data, a second carrier having a second frequency close to said first frequency, a starting modulation signal generated by modulating the first carrier with start data;

a main transmission portion, operatively connected to said main modem portion, receiving the first modulation signal and the second carrier and generating a first circularly polarized wave having a first rotation, based on the first modulation signal, a second circularly polarized wave having a second rotation opposite to the first rotation, based on the second carrier and a starting circularly polarized wave, having the second rotation based on the starting modulation signal and the second carrier for initiating communication; and

a main reception portion, operatively connected to said main transmission portion, receiving a second circularly polarized wave and outputting a second modulation signal; and

a sub unit, radio communicatable with said main unit through a radio-communication channel, comprising:

a small size battery;

a sub reception portion, operatively connected to said small size battery, receiving the first circularly polarized wave and separating the first circularly polarized wave into the first modulation signal and the second carrier;

a sub transmission portion, operatively connected to said small size battery, generating the second circularly polarized wave having a rotation equal to the first rotation on the basis of the second modulation signal;

a sub modem portion including

a sub modulation portion, operatively connected to said sub transmission portion and said small size battery, but not supplied with power from said small size battery in a normal state; and

a sub demodulation portion, operatively connected to said sub reception portion, for demodulating the first modulation signal, detecting the starting circularly polarized wave and triggering said sub modulation portion in response to a reception of the starting circularly polarized portion, said main modem portion demodulating said second modulation signal to recover said second transmission data.

4,926,188

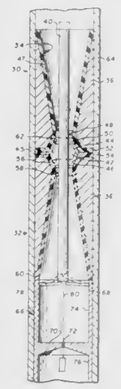
GIMBALLED ANTENNA

Henry S. More; Louis H. Rorden, both of Los Altos, Calif., and Neil H. Akkerman, Houston, Tex., assignors to Develco Incorporated, San Jose, Calif.

Filed May 21, 1986, Ser. No. 865,623

Int. Cl.[5] H01Q *1/04*

U.S. Cl. 343—719 **9 Claims**



1. A low frequency electromagnetic subterranean antenna for use with a borehole communication system including mounting means at the center of gravity of the antenna for mounting the antenna in a balanced, pivotally movable manner within the bore hole communication system so that the mechanical natural resonant frequency of the antenna is less than that of the lowest electromagnetic signal frequency to be received by the antenna, said antenna having separate winding and core members, said winding member having a hollow interior with said mounting means mounting said core member by means of a gimballed mounting device within said core member by means of a gimballed mounting device within said hollow winding member of the center of gravity of said core member, said gimballed mounting device including at least a pair of substantially stictionless gimball members on each of a pair of axis, each of said gimbal members having at least a support point.

4,926,189

HIGH-GAIN SINGLE- AND DUAL-POLARIZED ANTENNAS EMPLOYING GRIDDED PRINTED-CIRCUIT ELEMENTS

Amir I. Zaghloul, Bethesda, and Robert M. Sorbello, Potomac, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed May 10, 1988, Ser. No. 192,100

Int. Cl.[5] H01Q *1/38*

U.S. Cl. 343—700 MS **13 Claims**

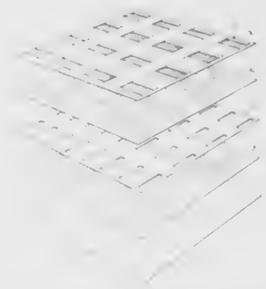
1. A printed circuit antenna comprising a ground plane, a first power divider array disposed over and capacitively coupled to said ground plane, a first array of radiating elements disposed over and capacitively coupled to the first power divider array, a second power divider array disposed over and capacitively coupled to said first array of radiating elements, and a second array of radiating elements disposed over and capacitively coupled to said second power divider array, wherein said first array of radiating elements comprises:

a substrate; and

a metallization layer formed over said substrate;

wherein each of said radiating elements in said first array of radiating elements comprises first, second, and third regions, at least one of said first through third regions comprising a gridded metallization region wherein metal is selectively removed and a plurality of parallel metal strips remain, said strips being separated at regular intervals by absences of said metal; and

wherein said each of said radiation elements in said second array of radiating elements comprises fourth, fifth and



sixth regions, at least one of said fourth through sixth regions comprising a gridded metallization region wherein metal is selectively removed and a plurality of parallel metal strips remain, said strips being separated at regular intervals by absences of said metal.

4,926,190

INK JET RECORDING PROCESS USING CERTAIN BENZOTRIAZOLE DERIVATIVES AS LIGHT STABILIZERS

Hugh Laver, Fribourg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,695

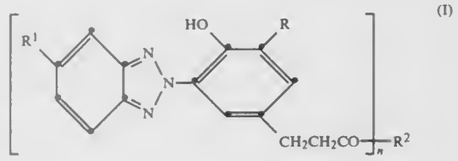
Claims priority, application Switzerland, Feb. 18, 1987, 599/87

Int. Cl.[5] B41M *5/00*

U.S. Cl. 346—1.1 **7 Claims**

1. An ink jet recording process wherein a recording material is stabilized against light-induced damage, comprising,

(a) providing a sheet of recording material having a printable surface and containing an effective stabilizing amount of at least one compound of formula (I)



(I)

in which

n is 1 or 2, R is hydrogen, C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl, phenyl or C_7–C_9-phenylalkyl, R' is hydrogen, chlorine or methoxy, and R^2, when n is 1, is a group of the formula

$$-O-(CH_2CH_2O)_u-H,\ -O-(CH_2\underset{\displaystyle CH_3}{\underset{|}{CH}}-O)_v-H \text{ or}$$

$$-O-(CH_2\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-O)_w-H,$$

in which u is 1–9, v is 1–6 and w is 1–6, or R^2, when n is 2, is a group of the formula

VOL 1114 ISS 3 MY 15 1990 UMI

$$-O-(CH_2CH_2O)_x- \text{ or } -O-(CH_2\underset{\displaystyle CH_3}{\underset{|}{CH}}-O)_y-,$$

in which x is 1–7 and y is 1–4, and

(b) imagewise applying an ink jet recording ink to said recording material.

4,926,191

IMAGE RECORDING APPARATUS AND METHOD OF CARRYING OUT INITIALIZING PROCESS IN IMAGE RECORDING APPARATUS

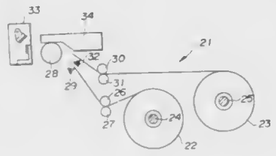
Eiji Takenaka, Isehara; Naoki Muraoka, and Yoshikazu Nakadai, both of Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 11, 1989, Ser. No. 350,221

Claims priority, application Japan, May 16, 1988, 63-120007; Aug. 26, 1988, 63-212402

Int. Cl.[5] G01D *9/00, 15/10, 15/34*

U.S. Cl. 346—24 **24 Claims**



15. An image recording apparatus comprising:

first support means for supporting a first roll of a first recording sheet;

second support means for supporting a second roll of a second recording sheet;

first transport means including a first roller for transporting the first recording sheet in forward and reverse directions;

second transport means including a second roller for transporting the second recording sheet in the forward and reverse directions;

a platen roller located at a position on a downstream side of said first and second transport means along the forward direction;

driver means for rotating said platen roller in directions for transporting the first and second recording sheets in the forward and reverse directions;

recording means for recording an image on one of the first and second recording sheets placed on said platen roller;

a cutter located at a position on the downstream side of said platen roller along the forward direction; and

control means for controlling said first and second transport means, said driver means, and said cutter,

in an initial state the first and second rolls of the first and second recording sheets being set in said image recording apparatus so that tip ends of the first and second recording sheets are located on the downstream side of said cutter along the forward direction,

said control means controlling an initializing process for adjusting and appropriately positioning the tip ends of the set first and second recording sheets by driving said cutter to cut a tip portion of each of the first and second recording sheets, driving said first and second transport means to transport the first and second recording sheets respective distances in the reverse direction until a cut end of the first recording sheet reaches a first predetermined position between said platen roller and the first roller of said first transport means and a cut end of the second recording sheet reaches a second predetermined position between said platen roller and the second roller of said second transport means.

4,926,192

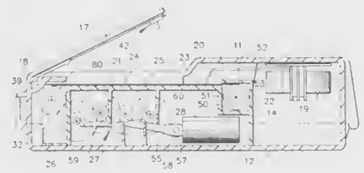
TAMPERPROOF STRIP CHART RECORDER WITH INACCESSIBLE COVER-MOUNTED TRANSDUCER

John C. Stires, III, 614 Camino De Clara, Solana Beach, Calif. 92075, and Charles A. Bastyr, San Diego, Calif., assignors to John C. Stires, III, Escondido, Calif.

Filed Sep. 28, 1988, Ser. No. 251,670

Int. Cl.[5] G01D *9/00*

U.S. Cl. 346—33 TP **14 Claims**



1. A strip chart recorder, comprising

a case having a base and a cover,

a chart dispenser mounted in the base;

a platen mounted in the base;

a writing table mounted in the base;

means mounted in the base for advancing a chart from the chart dispenser across the platen and the writing table;

a transducer mounted in the cover for sensing a predetermined variable condition; and

marking means coupled to the transducer, with the marking means being mounted in the cover and so disposed that when the cover is closed, the marking means mark that portion of the chart that is being advanced across the platen in a lateral position that is dependent upon the state of the sensed predetermined variable condition; and

wherein the cover includes a window and a lid for closing the window, with the window being disposed over the writing table for enabling that portion of the chart that has been advanced over the writing table to be written upon after the cover has been closed; and

wherein the cover is shaped for preventing access to the transducer and the marking means when the cover is closed with the window open.

4,926,193

THERMAL TRANSFER RIBBON CARTRIDGE INCLUDING RIBBON PERFORATING MEANS

William Berson, Westport; Julius Gluck, Norwalk; Patrick Murphy, Stamford; Christopher D. Smith, New Milford, and Duc H. Tran, Bridgeport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1987, Ser. No. 138,423

Int. Cl.[5] G01D *15/10;* **B41J** *35/28*

U.S. Cl. 346—76 PH **20 Claims**

1. A cassette adapted for use with printing apparatus of the type which includes means for thermally transferring ink from a ribbon, the cassette comprising:

(a) a frame defining first and second printing stations;

(b) a ribbon including a backing layer and an ink donor layer;

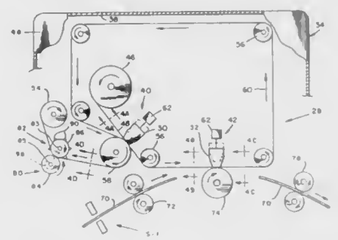
(c) a ribbon supply spool rotatably mounted on said frame;

(d) a ribbon take-up spool rotatably mounted on said frame;

(e) said ribbon extending in a feed path from said supply spool to said take-up spool;

(f) means in the feed path for perforating said ribbon, said perforating means including a perforator roller; and

(g) means for directly detecting rotation of said perforator roller;



(h) an enclosure connected to said frame for housing said supply and take-up spools and said perforating means.

4,926,194

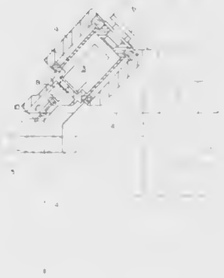
DEVICE FOR CONTROLLED DEFLECTION OF A LIGHT BEAM

Jakob Herrmann, Schillerstrasse 26, 8060 Dachau, Fed. Rep. of Germany

Filed Oct. 25, 1988, Ser. No. 262,356

Int. Cl.[5] G01D *15/14;* **G02B** *26/08*

U.S. Cl. 346—108 **2 Claims**



1. A device for the controlled, two dimensional deflection of a pulsable light beam emanating from a fixed light source such as a laser by means of an adjustable deflection mirror being journalled in a holding head for guiding the light beam along a meandering path for the purpose of marking specific points on small components, by arranging two drive means aligned one behind the other, the improvement comprising:

one of said drive means being a continuously running motor for tilting said deflection mirror within said holding head between two end positions, about an axis;

the other said drive means being a step motor for stepwise rotation of said holding head containing said deflection mirror about an axis perpendicular to said axis of tilt wherein said step motor's action is dependent upon said deflection mirror reaching a said end position of tilt.

4,926,195

IMAGE RECORDING APPARATUS

Takashi Murahashi; Hisao Fujita; Toshihiko Nakazawa; Toshihiro Takesue, and Toshihiro Motoi, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 13, 1988, Ser. No. 193,959

Claims priority, application Japan, May 14, 1987, 62-117684

Int. Cl.[5] G01D *15/14*

U.S. Cl. 346—108 **13 Claims**



1. An image recording apparatus comprising:

a light beam generator;

a focusing element for focusing a light beam generated by said light beam generator onto a recording media,

a deflector for deflecting the light beam after passage thereof through said focusing element, so that the light beam scans a recording medium to record predetermined image information; and

an image surface correcting optical means arranged between said deflector and said recording medium for correcting a curvature of field in the main scanning direction;

wherein at least one surface of said image surface correction optical means comprises an aspherical surface, and a deviationΔZ from a paraxial generating spherical surface to the aspherical surface is represented by the following relations:

$$\Delta(Y_j)=_i\Sigma\{\Delta Z_{ij1}(\phi_{ij1})-\Delta Z_{ij2}(\phi_{ij2})\}<0$$

$$\phi_{ij1}=L/3,\ \phi_{ij2}=L/3$$

where

Y_j, Y_k: image height on recording medium

$\Delta Z_{ij1}(\phi_{ij1})$: aspherical surface deviation at input surface of i-th image surface correction optical means at ϕ_{ij1},

$\Delta Z_{ij2}(\phi_{ij2})$: aspherical surface deviation at output surface of i-th image surface correction optical means at ϕ_{ij2},

ϕ_{ij1}: height at which major light beam of image height Y_j crosses input lens surface of i-th image surface correction optical means,

ϕ_{ij2}: height at which major light beam of image height Y_j crosses output lens surface of i-th image surface correction optical means,

L: a length from deflecting means to an aspherical surface.

4,926,196

INK JET PRINTER

Yoshiyuki Mizoguchi, Yokohama; Yoshitaka Watanabe; Hiroyuki Hiraga, both of Tokyo, and Shigeru Fukuyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,439

Claims priority, application Japan, Dec. 25, 1986, 61-307907; Feb. 2, 1987, 62-020561

Int. Cl.[5] G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—140 R **12 Claims**

1. An ink jet recording apparatus comprising:

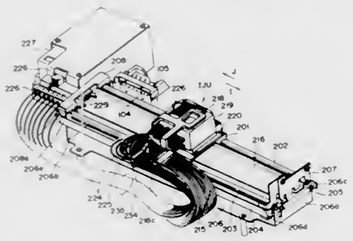
recording means having a discharge port for discharging ink an accordance with input information;

temperature detecting means for detecting temperature in the portion of the apparatus near said recording means;

capping means for closing and opening said discharge port;

VOL 1114 ISS 3 MY 15 1990 UMI

vacuum generating means, communicating with said capping means, for generating vacuum of a level high enough to induce the ink from said discharge port;
a valve mechanism for connecting and disconnecting communication of said capping means with said vacuum generating means; and
driving means for driving said valve mechanism for a period



of time determined in accordance with the result of detection by said temperature detecting means to connect said capping means with said vacuum generating means for a first period of time and in a second mode to connect said capping means with said vacuum generating means for a second period of time when power is first supplied to the apparatus, the first period of time being longer than the second period of time.

4,926,197

PLASTIC SUBSTRATE FOR THERMAL INK JET PRINTER

Winthrop D. Childers, San Diego; Chris Schantz, Redwood City, and Eric Hanson, Burlingame, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 16, 1988, Ser. No. 168,718
Int. Cl.[5] G01D *15/16*; B41J *3/04*
U.S. Cl. 346—140 R **12 Claims**





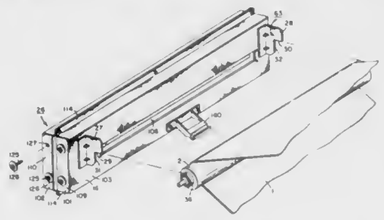
1. A thermal ink jet printer print head, comprising:
a plastic base;
a metallization layer overlying said plastic base;
a dielectric structure overlying said metallization layer, the dielectric structure including
a metallic adhesion layer overlying said metallization layer, and
a layer of a dielectric material overlying said metallic adhesion layer;
a resistor overlying the dielectric structure; and
an orifice plate with an orifice therein and an ink channel overlying the thin film resistor and the dielectric structure.

4,926,198

LINEAR PRINTHEAD WRITER ASSEMBLY

James T. Barton, Fairport, and Jimmy P. Walker, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1988, Ser. No. 291,834
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—155 **10 Claims**



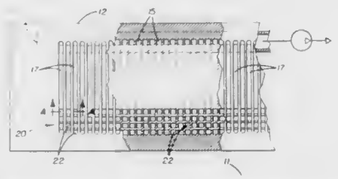
1. A linear printhead writer assembly comprising:
a linear printhead having a linearly arranged source of radiation,
a linear focusing means,
a rigid support housing, said support housing including
locating surface means for locating said support housing with respect to an exposure locus,
means for mounting said printhead directly to said support housing independent of said linear focusing means to be entirely supported thereby,
means for mounting said focusing means directly to said support housing independent of said linear printhead to be entirely supported thereby,
said focusing means and said printhead being positioned to project an image of said printhead at said exposure locus.

4,926,199

HIGH RESOLUTION ELECTROSTATIC PLOTTER, PRINTER OR THE LIKE INCORPORATING A STATIONARY WRITING HEAD

Andreas Bibl, Los Altos; John Higginson, Santa Clara, and Deane Gardner, Cupertino, all of Calif., assignors to Rastergraphics, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 166,716, Mar. 11, 1988, Pat. No. 4,878,071. This application Apr. 21, 1989, Ser. No. 341,694
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—157 **7 Claims**



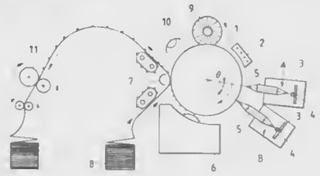
1. An improved high resolution plotter, printer or the like comprising:
writing head means for imprinting information on a recording medium;
continuous transport means for supporting said recording medium and for moving said recording medium substantially a complete revolution past said writing head means;
at least one roller means, having a central axis, for supporting and moving said transport means;
means for providing a vacuum to the entire surface of said recording medium adjacent said transport means such that said recording medium is stabilized invariantly in a desired alignment thereon;
means for varying the lateral position of said transport means with respect to said writing head means such that information is imprinted on said recording medium by moving only said transport means with respect to said writing head means.

4,926,200

ELECTROPHOTOGRAPHIC PRINTER

Mineo Ohyama; Shigenobu Katagiri; Hiroomi Kozawa, and Koutaro Yamada, all of c/o Hitachi Koki Co., Ltd., No. 1060, Takeda, Katsuta-shi, Ibaraki 312, Japan

Filed Jul. 28, 1989, Ser. No. 385,889
Claims priority, application Japan, Jul. 29, 1988, 63-191233
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—160 **4 Claims**



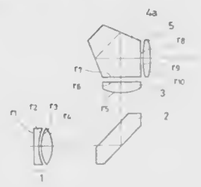
4. An electrophotographic printer as claimed in claim 1, wherein said print data comprise EDP data and image data, and one of said two scanning light sources being for the EDP data and the other being for the image data.

4,926,201

FINDER OPTICAL SYSTEM

Hiromu Mukai, and Ichiro Kasai, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1989, Ser. No. 361,233
Claims priority, application Japan, Jun. 7, 1988, 63-140759
Int. Cl.[5] G03B *13/02*
U.S. Cl. 354—219 **11 Claims**



1. A finder optical system comprising from the object side:
an objective lens having a positive refractive power as a whole;
a condenser lens arranged in the vicinity of an image plane of said objective lens;
an eyepiece consisting of a single lens element and having a positive refractive power; and further comprising:
a prism installed between said condenser lens and said eyepiece to introduce light fluxes having been passed through said condenser lens into said eyepiece;
and wherein the finder optical system fulfills the following conditions:

$$\nu < 50$$

$$15\text{mm} < fe < 50\text{mm}$$

$$0.7 < L/fe < 1$$

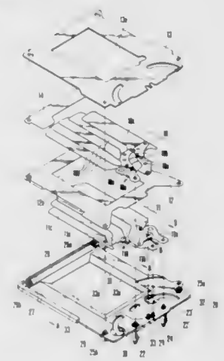
wherein,
ν represents an Abbe number of the prism;
fe represents a focal length of the eyepiece; and
L represents an optical path length of the prism defined as a ratio of thickness of the prism to the refractive index thereof.

4,926,202

SHUTTER FOR USE IN CAMERA

Tsuyoshi Fukuda, Kanagawa, and Fumio Shimada, Saitama, both of Japan, assignors to Canon Kabushiki Kaisha/Canon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,649
Claims priority, application Japan, Jul. 15, 1987, 62-177607; Jul. 15, 1987, 62-177608; Jul. 15, 1987, 62-177609; Jul. 15, 1987, 62-177610
Int. Cl.[5] G03B *9/18, 9/40*
U.S. Cl. 354—246 **21 Claims**



1. A shutter for use in a camera, comprising:
a shutter base plate for pivotally supporting blade groups each constituted by a plurality of blades carried by arms; and
a thick-walled portion being formed on the surface of said shutter base plate that carries said blade groups;
said thick-walled portion formed in an area which excludes a pivoting area in which said arms make their pivotal motions and which is adjacent to said pivoting area;
said shutter base plate and said thick-walled portion being integrally formed of a synthetic resin.

4,926,203

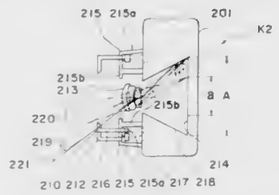
PSEUDO FORMAT CAMERA WITH LIGHT SHIELDING MEANS

Yoshiaki Hata; Nobuyuki Taniguchi, both of Nishinomiya; Takeo Hoda, Kawachinagano; Manabu Inoue, Kobe; Yoshinobu Kudo, Sakai, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 924,425, Oct. 29, 1986, Pat. No. 4,860,039. This application Jan. 3, 1989, Ser. No. 293,082
Claims priority, application Japan, Oct. 31, 1985, 60-242736; Oct. 31, 1985, 60-242738; Nov. 11, 1985, 60-252472; Nov. 27, 1985, 60-265008; Nov. 27, 1985, 60-265009
Int. Cl.[5] G03B *11/04, 17/24*
U.S. Cl. 354—287 **4 Claims**

1. A photographic camera system comprising:
a mode setting means for selectively setting said photo-

graphic camera system to a real focal length photographing mode for printing an ordinary photographic zone and a pseudo focal length photographing mode for printing a zone narrower than the ordinary photographic zone; and a light shielding means for blocking at least a portion of light which would otherwise pass through a taking lens and fall



upon a range of a screen frame outside a photographic zone to be printed as determined by said mode setting means, said light shielding means comprising a lens hood which is slidable, in operative association with said mode setting means, relative to a lens barrel of a camera body of said photographic camera system in a direction of an optical axis of said lens barrel.

4,926,204

PHOTOMETRIC APPARATUS FOR A CAMERA

Masaharu Kawamura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 319,876, Mar. 1, 1989, abandoned, which is a continuation of Ser. No. 140,101, Dec. 31, 1987, abandoned. This application Aug. 4, 1989, Ser. No. 393,115
Claims priority, application Japan, Jan. 12, 1987, 62-004592
Int. Cl.[5] G03B *3/00*
U.S. Cl. 354—400 **12 Claims**



1. Photometric apparatus for a camera body having a shutter release button, and adapted for use with a focus adjusting motor, said photometric apparatus comprising:

(a) automatic focusing means arranged to begin to drive the focus adjusting motor in response to an operation performed on the shutter release button, and to bring said motor to a stop upon detection of an in-focus state, and then to generate an in-focus signal;

(b) photometric means arranged to begin to operate in response to the operation on the shutter release button to obtain a photometric value by detecting the luminance of an object to be photographed, said photometric means being arranged to be capable of changing said photometric value in response to a change in the luminance of said object, said photometric means being further arranged to lock said photometric value in response to the generation of said in-focus signal; and

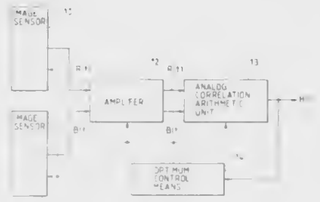
(c) control means for controlling said photometric means in response to cancellation of the operation of the shutter release button to unlock said photometric value kept at said photometric means, said control means being arranged to enable said photometric means to obtain another photometric value by detecting once again the luminance of said object during a predetermined period of time after a previously obtained photometric value is unlocked.

4,926,205

PHASE-DIFFERENCE DETECTOR

Takashi Miida, and Jin Murayama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Kanagawa, Japan

Filed Mar. 10, 1989, Ser. No. 321,379
Claims priority, application Japan, Mar. 10, 1988, 63-54790
Int. Cl.[5] G03B *3/12*
U.S. Cl. 354—402 **6 Claims**



1. A phase-difference detector for determining a focalization state by detecting relative positions of a pair of optical images of a subject, comprising:

sensor means having pixels, for detecting the pair of optical images and for generating analog signals associated with the pair of optical images formed on said pixels;

analog correlation arithmetic means, operatively connected to said sensor means, for performing a correlation arithmetic process on said analog signals outputted from said sensor means and for producing correlation values associated with said correlation arithmetic process; and

optimum control means, operatively connected to said sensor means and said analog correlation arithmetic means, for controlling said analog correlation arithmetic means to reperform said correlation arithmetic process by causing said sensor means to regenerate said analog signals with a new amplification factor when said correlation values computed by said analog correlation arithmetic means do not demonstrate distinguishable features.

4,926,206

FOCUS DETECTION SYSTEM AND LIGHTING DEVICE THEREFOR

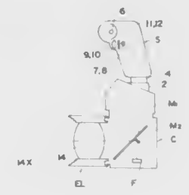
Tohru Matsui, Sakai, and Takeshi Egawa, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 84,938, Aug. 13, 1987, abandoned, which is a division of Ser. No. 940,190, Dec. 9, 1986, Pat. No. 4,690,538, which is a continuation of Ser. No. 807,642, Dec. 11, 1985, abandoned. This application Jan. 23, 1989, Ser. No. 300,237
Claims priority, application Japan, Dec. 11, 1984, 59-261194; Jan. 17, 1985, 60-7178; Jan. 19, 1985, 60-7686; Jan. 21, 1985, 60-9716
Int. Cl.[5] G03B *3/00;* G01J *1/20*
U.S. Cl. 354—403 **10 Claims**

1. A focus detection system for detecting focus condition of an objective lens of a camera with respect to an object within a focus detection area which spreads at a solid angle centering at the optical axis of said objective lens, comprising: a light projecting optical system for projecting a flux of light which crosses said focus detection area at a predetermined angle;

means for producing a difference in intensity distribution of said flux of light in a predetermined direction so that said flux of light has a higher intensity at a part thereof to illuminate a farther distance zone within said focus detection area than at a part thereof to illuminate a closer distance zone within said focus detection area; and

a projective pattern arranged in said projecting optical system so as to be projected on said object as a projective image, said projective pattern having a plurality of transparent portions and opaque portions alternatively arranged in a direction perpendicular to said predetermined direction.

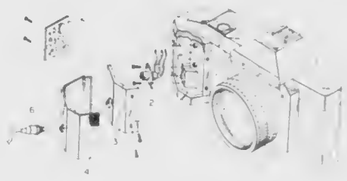


4,926,207

POSITIONING AND STRUCTURE OF CIRCUIT ELEMENTS IN A CAMERA

Masaharu Eguchi, and Akira Yamada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 913,600, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 648,702, Sep. 7, 1984, abandoned. This application Sep. 29, 1989, Ser. No. 414,721
Claims priority, application Japan, Sep. 9, 1983, 58-139811[U]; Oct. 20, 1983, 58-162353[U]
Int. Cl.[5] G03B *7/26, 15/05, 17/02*
U.S. Cl. 354—484 **16 Claims**



16. A camera body comprising:

(a) a spool positioned within the camera body;

(b) a grip protruding from a front plane of the camera body, said grip being positioned at said spool side of the camera body; and

(c) a booster circuit arrangement positioned within said grip and within a space arrangement in front of said spool.

4,926,208

PHOTOGRAPHIC VIEWFINDER ASSEMBLY

Togo Teramoto; Syunji Oku; Yasuhiro Miyoshi, and Mamoru Katsuragi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 9, 1989, Ser. No. 349,092
Claims priority, application Japan, May 9, 1988, 63-113372; May 9, 1988, 63-113373; May 9, 1988, 63-113374; May 9, 1988, 63-113375
Int. Cl.[5] G03B *13/08*
U.S. Cl. 354—485 **12 Claims**



1. A viewfinder assembly for a photographic camera, which comprises:

a viewfinding mirror module of one-piece construction formed by the use of a plastics molding technique, including a pair of major roof mirrors generally perpendicular to each other, first and second side walls continued from respective lower edges of the roof mirrors to support such roof mirrors, and a plurality of pawl means continued downwards from respective lower edges of the first and second side walls, each of said pawl means having a lower bent end, said lower bent end having an upper portion defining a first engagement face; and

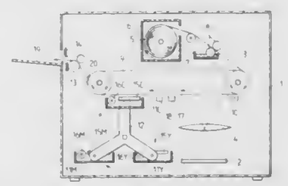
a viewfinder holder having a light opening defined therein for the passage of finder light fluxes therethrough, and also having engagement holes defined therein in a number equal to the number of the pawl means in the viewfinding mirror module, each of said engagement holes having a second engagement face engageable with the first engagement face of each of the pawl means.

4,926,209

IMAGE RECORDING APPARATUS USING PLANAR ILLUMINATOR AS A LIGHT SOURCE

Mikio Imaeda, Bisai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 14, 1988, Ser. No. 270,649
Claims priority, application Japan, Nov. 12, 1987, 62-287752; Nov. 12, 1987, 62-287753
Int. Cl.[5] G03B *27/32*
U.S. Cl. 355—27 **11 Claims**



1. An image recording apparatus for forming an image on a surface of a photosensitive recording medium according to an image information of an original, said apparatus comprising:

(a) a planar illuminator disposed in confronting relation to

VOL 1114 ISS 3 MY 15 1990 UMI

said surface of said photo-sensitive recording medium, said planar illuminator being a plate-like insulating substrate and including a multiplicity of illuminant elements arranged in a matrix for, each of said illuminant elements having positive and negative electrode terminals and being selectively energized according to the image information of the original to emit light toward said surface of said photosensitive recording medium to expose corresponding areas of said surface to thereby form on said surface of said photosensitive recording medium a latent image corresponding to an image of the original; and

(b) a developing device for developing said latent image to provide a visible image.

4,926,210

IMAGE FORMING APPARATUS

Mitsuru Ogura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1988, Ser. No. 222,881

Claims priority, application Japan, Jul. 23, 1987, 62-184350; Jul. 23, 1987, 62-184351

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—28 **6 Claims**



1. An image forming apparatus comprising:

means for providing a light-receiving sheet in roll sheet form to an exposure station and an image forming station, said light-receiving sheet being coated with a layer of microcapsules containing a colorless dye and a photopolymerization agent;

means for selectively exposing said light-receiving sheet to a light image;

means for providing an image forming sheet to said image forming station in cut sheet form, said image forming sheet being coated with a layer of a developing material for reacting with said colorless dye on said light-receiving sheet to produce a color image, said light-receiving sheet and image forming sheet being formed into a sandwich configuration at said image forming station;

means for compressing said light-receiving sheet and said image-receiving sheet to form a colored image on said image-receiving sheet at said image forming station;

means for separating said light-receiving sheet from said image forming sheet;

a cutter means disposed subsequent to said compressing means and sheet separating means for cutting said light-receiving roll sheet to convert said exposed portion of said roll sheet to a single sheet corresponding to said image portion;

a first discharge tray provided on one side of said apparatus for discharge thereto of said cut light-receiving sheet; and

a second discharge tray provided on the same side of said apparatus as said first discharge tray for discharge thereto of said image-receiving sheet.

4,926,211

PRINTING PAPER CONVEYING APPARATUS FOR PHOTOGRAPHIC PRINTING APPARATUS

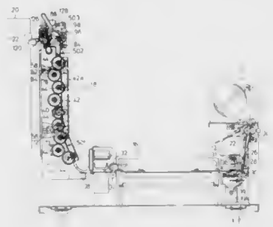
Yoshio Ozawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 12, 1988, Ser. No. 256,787

Claims priority, application Japan, Oct. 12, 1987, 62-256656; Oct. 12, 1987, 62-256657; Jan. 28, 1988, 63-17673; Feb. 22, 1988, 63-38940

Int. Cl.[5] G03B *27/72*

U.S. Cl. 355—28 **21 Claims**



1. A printing paper conveying apparatus for conveying a piece of printing paper unprinted with an image in a photographic printing section to a developing apparatus, comprising:

(a) a cutter for cutting the image printed paper for every image;

(b) a guide passage for directing the pieces of printing paper which have been cut out upwardly and then guiding them to said developing apparatus;

(c) holding and conveying means provided in said guide passage for holding the pieces of printing paper, and giving driving force thereof; and

(d) contacting and releasing a means for releasing holding force of said holding and conveying means, whereby a latter piece of the printing paper is fed at high speed in the state where a former piece of printing paper is being fed into said developing apparatus so as to narrow the interval between the former and latter pieces of the printing paper and prevent overlapping therebetween.

4,926,212

DRIVING APPARATUS FOR OPTICAL DEVICE OF PHOTOGRAPHIC PRINTER

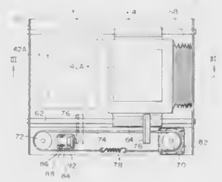
Yoshio Ozawa, and Takashi Yamamoto, both of Kanagawa, Japan, assignors to Fujl Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1989, Ser. No. 313,575

Claims priority, application Japan, Feb. 22, 1988, 63-38939

Int. Cl.[5] G03B *27/52, 27/70, 27/74, 27/80*

U.S. Cl. 355—43 **19 Claims**



1. A driving apparatus for an optical device of a photographic printer, comprising:

an optical device movably disposed in said photographic printer;

means for driving said optical device between an off-optical-axis position and an on-optical-axis position of said optical device;

means for stopping the motion of said driving means so as to surely stop said optical device at said on-optical-axis position after said optical device has been driven by a predetermined distance; and

means for controlling said driving means to cause said optical device to come to a halt after said optical device has stopped.

4,926,213

APPARATUS FOR HOLDING SENSITIZED MATERIAL IN SLITWISE EXPOSURE TYPE COPYING CAMERA

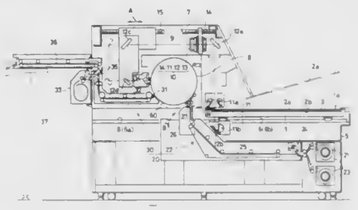
Shoji Komatsubara; Masahiko Takeuchi, and Yasuyuki Oka, all of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Sep. 8, 1988, Ser. No. 241,627

Claims priority, application Japan, Sep. 11, 1987, 62-229151; Sep. 22, 1987, 62-238236

Int. Cl.[5] G03B *27/50*

U.S. Cl. 355—49 **15 Claims**



1. A compact photomechanical slitwise exposure camera, comprising:

a movable holder for holding an original;

scanning means for optically scanning said original while said original is held by said holder and for exposing a sensitized material as a function of said scanned original, said scanning means including an optical system; and

a conveyor for conveying said sensitized material, said conveyor including a cylindrical drum and sensitized material holding means for releasably holding said sensitized material on said cylindrical drum, said conveyor conveying said sensitized material in synchronization with said movable holder to permit said scanning means to record slitwise images of said original on said sensitized material while said sensitized material is held on said cylindrical drum by said holding means.

4,926,214

ORIGINAL-HOLDING COVER

Mitsuo Nomura, Shijounawate, and Yukihiro Aikawa, Osaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 14, 1988, Ser. No. 270,776

Claims priority, application Japan, Nov. 16, 1987, 62-175460

Int. Cl.[5] G03B *27/62*

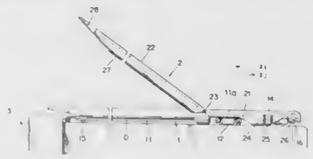
U.S. Cl. 355—75 **6 Claims**

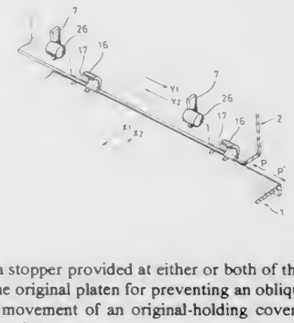
1. An original-holding cover for use in association with an image formation device consisting of an upper unit having an original platen and a lower unit, said upper unit being rotatably mounted on said lower unit about a pivotal axis so as to be opened and closed, which comprises:

a base part rotatably connected to said original platen of said upper unit,

an original-holding part disposed in contiguity with said base part and rotatable with respect to the latter,

at least an elastic engaging means provided at the opposing ends of the base part for engaging with the original platen at a predetermined position, and elastically deformable in a direction of disengagement,





at least a stopper provided at either or both of the base part and the original platen for preventing an obliquely downward movement of an original-holding cover when the upper unit is open,

said base part being removable from the original platen in a direction along the axis of rotation thereof with respect to the original platen, and obliquely upward when the upper unit is open.

4,926,215

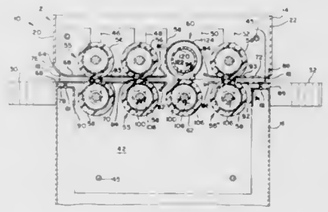
CONTACT EXPOSURE UNIT

Allen H. Rank, Jr., 1416 Brook Dr., Downers Grove, Ill. 60515

Filed Oct. 12, 1988, Ser. No. 256,876

Int. Cl.[5] G03B *27/04;* B65H *5/06*

U.S. Cl. 355—99 **21 Claims**



1. A contact exposure unit comprising:

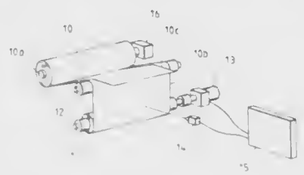
a housing having an inlet end, and outlet end, an upper portion and a lower portion, said upper and lower portions being substantially separated by a transverse slot extending through said housing from said inlet end to said outlet end;

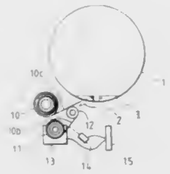
a plurality of lower rolls disposed for axial rotation in spaced parallel arrangement to each other in said lower portion of said housing and having portions projecting into said slot, said lower rolls being fixed in position along a generally

VOL 1114 ISS 3 MY 15 1990 UMI

horizontal line extending generally from said inlet end to said outlet end;
means for driving said lower rolls;
a like plurality of upper rolls disposed for axial rotation in spaced parallel arrangement to each other in said upper portion of said housing and having portions projecting into said slot;
said upper rolls being adapted to slide vertically in said housing to contact said lower rolls at said respective projecting portions, said upper and lower rolls forming a nip to support and convey sheet material through said slot from said inlet end to said outlet end; and
light means for exposing the sheet material inserted through said slot.

4,926,216
FEEDER OF SHEET-LIKE PHOTO-SENSITIVE MATERIAL
Yasushi Hashimoto; Yasuyuki Tsuji, and Akira Terakado, all of Ibaraki, Japan, assignors to Hitachi Koki Company, Tokyo, Japan
Filed Mar. 20, 1989, Ser. No. 325,587
Claims priority, application Japan, Mar. 18, 1988, 63-66045
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—212 **23 Claims**

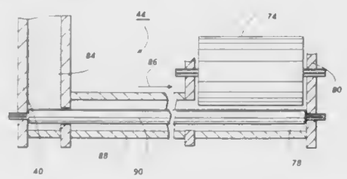




1. A feeder for a electrophotographic printer for feeding a sheet of photo-sensitive material onto a drum comprising:
a supply of photo-sensitive material;
a supply of release paper bonded to said supply of photo-sensitive material;
means to separate said photo-sensitive material from said release paper;
means to roll said separated photosensitive material onto said drum.

4,926,217
PARTICLE TRANSPORT
Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 11, 1986, Ser. No. 895,543
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—253 **2 Claims**

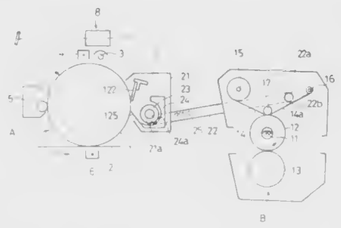
1. An apparatus arranged for use in an electrophotographic printing machine for moving marking particles from a storage container located at one end of a tube to a developer unit located at the other end thereof, including:
an elongated member disposed interiorly of said tube, said elongated member includes a rod having a multiplicity of fibers extending outwardly therefrom;
means for moving said elongated member to fluidize the particles in the tube without inducing any substantial linear movement of the particles along the tube; and





means for generating a pressure differential to move the fluidized particles in the tube from the storage container located at one end of the tube to the developer unit located at the other end of the tube.

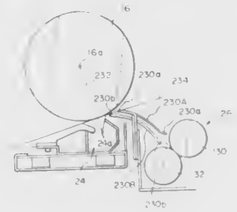
4,926,218
IMAGE FORMING APPARATUS
Hiroshi Fukao, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 245,292, Sep. 16, 1988, abandoned. This application Sep. 11, 1989, Ser. No. 405,051
Claims priority, applicatioo Japan, Sep. 19, 1987, 62-235586
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—283 **7 Claims**



1. An image forming apparatus, comprising:
an electrostatic latent image holding member on which an electrostatic latent image is formed;
a developing means for developing the electrostatic latent image on the holding member into a toner image;
a transferring means for transferring the toner image formed on the holding member onto a transfer material;
a fixing means having a pair of rollers for fixing the toner

image onto the transfer material by passing the toner image therebetween;
a first cleaning means for cleaning circumferential surface of the roller of the fixing means by a cleaning web, said first cleaning means including a take-up roller for rolling up used portion of the cleaning web;
a second cleaning means for removing the residual toner on the holding member; and
a transport means for transporting the toner removed by the second cleaning means onto the cleaning web of the first cleaning means.

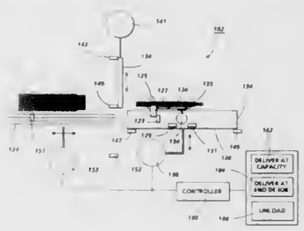
4,926,219
IMPROVED PAPER HANDLING MECHANISM IN CONJUNCTION WITH IMAGE FORMING APPARATUS SUCH AS LASER PRINTERS
Junichi Hirasawa, Yokohama; Yuichi Sato, Sendai, and Toru Iida, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 30, 1988, Ser. No. 251,394
Claims priority, application Japan, Sep. 30, 1987, 62-243899; Dec. 10, 1987, 62-311059; May 16, 1988, 63-116812
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—309 **31 Claims**



23. In an image forming apparatus including a photoconductive drum, a transfer charger unit having a charge wire, a register roller unit having a pair of register rollers, and a guide device having an upper guide plate and a curved lower guide plate for guiding toward said photoconductive drum and said transfer charger unit a paper sheet which is transported from said register roller unit, the improvement wherein an edge of said upper guide plate adjacent to said photoconductive element is positioned on a tangential line which is tangential to said photoconductive element and intersects a line which extends through the center of said photoconductive element and said charge wire.

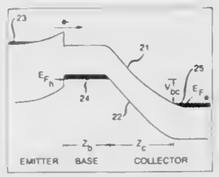
4,926,220
DUAL MODE SET DELIVERY APPARATUS
James F. Matysek, Fairport, and Charles E. Smith, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 17, 1988, Ser. No. 258,942
Int. Cl.[5] G03B *15/00*
U.S. Cl. 355—313 **12 Claims**

1. A dual mode apparatus for delivering sets of sheets to an operator, including:
means for selecting the mode of operation of the apparatus;
means for receiving and supporting the sets sheets at a loading station; and
means, responsive to said selecting means, for advancing the sets of sheets from the loading station to an unloading station for delivery to the operator, said advancing means, in one mode, moving the sets of sheets from the loading station to the unloading station after the completion of each job and, in another mode, after the maximum number of sets of sheets have been stacked at the loading station independent of the number of jobs with all of the sets of



sheets being either finished in the same manner or unfinished.

4,926,221
BIPOLAR HOT ELECTRON TRANSISTOR
Anthony F. J. Levi, Summit, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Continuation of Ser. No. 241,279, Sep. 7, 1988, abandoned. This application Sep. 7, 1989, Ser. No. 403,003
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—16 **10 Claims**



1. A bipolar hot electron transistor comprising
(a) an electron emission region (the first region), an electron collection region (the third region), and a second region intermediate the first and third regions, forming interfaces and being epitaxial therewith, the first, second, and third regions each consisting of semiconductor material, with the composition of the second region material differing at least from that of the first region material at the first-/second region interface, with at least a part of each of the first and third regions having n-type conductivity, and with at least a part of the second region having p-type conductivity, associated with the second region being a thickness Z_b, a base resistance R_b, an average dopant density n_b, and an inelastic scattering rate $1/\tau_{in}$ for the hot electrons;
(b) means for making electrical contact with the first, second, and third regions, respectively; and
(c) means adapted for causing injection of hot electrons of average energy E_i from the first into the second region, with at least a substantial portion of the injected hot electrons crossing the interface between the second and third region;
characterized in that
(d) the inelastic scattering rate $1/\tau_{in}$ varies as a function of n_b and has a maximum for a given value of E_i, with n_b at the maximum to be referred to as $n_{b,max}$; and
(e) n_b is selected to be greater than $n_{b,max}$ and at least 10^{20} cm^{-3}, whereby the transistor can have a relatively small Z_b and a relatively small base resistance R_b.

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4,926,222

SEMICONDUCTOR MEMORY DEVICE AND A METHOD OF MANUFACTURING THE SAME

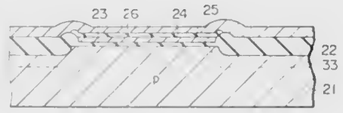
Yasunobu Kosa, Kodaira, and Shinji Shimizu, Koganei, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 241,539, Mar. 9, 1981, Continuation of Ser. No. 891,030, Mar. 28, 1978, abandoned. This application Oct. 26, 1983, Ser. No. 545,767

Claims priority, application Japan, Apr. 6, 1977, 52-38528

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.5 **40 Claims**



1. A semiconductor device comprising a semiconductor body of a first conductivity type having a major surface; a source region and a drain region of a second conductivity type extending to the major surface of said substrate so as to define a channel portion at the major surface therebetween; a relatively thick field insulator formed at the major surface of said substrate except for the surfaces of said source and drain regions and channel portions; a first thin insulating film formed on said surface of said channel portion; a first floating gate formed on said first insulating film; a second thin insulating film formed on said first floating gate; a second control gate formed on said second insulating film and extending along its length on said field insulator; said first floating gate covering substantially only the surface of said channel so as not to extend on said field insulator so that said field insulator is self-aligned by said first floating gate; said second control gate, said second insulating film and said first floating gate having a width substantially the same as the length of said channel portion, and being self-aligned with one another with respect to their respective widths on the channel portion.

4,926,223

DYNAMIC MEMORY OF THE INTEGRATED CIRCUIT TYPE

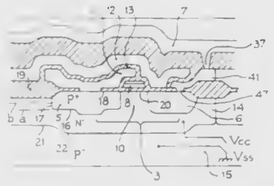
Albert Bergemont, Trets, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Continuation of Ser. No. 193,207, May 9, 1988, abandoned, which is a continuation of Ser. No. 827,730, Feb. 10, 1986, abandoned. This application Sep. 6, 1989, Ser. No. 403,792

Claims priority, application France, Feb. 12, 1985, 85 01975

Int. Cl.[5] H01L *29/78, 27/02, 29/04*

U.S. Cl. 357—23.6 **8 Claims**



1. A dynamic memory of the integrated circuit type fabricated in a silicon wafer and provided with memory cells for capacative data storage, wherein said dynamic memory comprises:

CMOS transistors fabricated in the CMOS technology for utilization as memory cells and provided with gate electrodes formed by a first level of deposited polysilicon and covered by a metallized layer to be utilized as a word line for the memory;

means for capacitive storage by putting in opposition to each other, at a second and a third levels, two polysilicon layers, said second and third polysilicon layers being separated from each other and from the first level by insulating layers of silicon dioxide;

regions of said second level polysilicon layer serving to form lower plate of capacitors of said cells, said regions of said second level polysilicon layer being separated by separations;

data transfer lines formed of vacuum-deposited metal;

the polysilicon layers of the second and third levels being formed so as to pass over the polysilicon layer of the first level wherein the transfer lines are superimposed over said separations but are not extended over said regions of said level polysilicon layer.

4,926,224

CROSSPOINT DYNAMIC RAM CELL FOR FOLDED BITLINE ARRAY

Donald J. Redwine, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 201,812, Jun. 3, 1988, abandoned. This application Mar. 6, 1989, Ser. No. 319,923

Int. Cl.[5] H01L *29/78, 27/02, 29/06*

U.S. Cl. 357—23.6 **28 Claims**



1. A dynamic random access memory cell formed on a semiconductor body having an upper surface and a trench region formed therein, the trench region including a trench upper portion extending toward the upper surface and a trench lower portion extending away from the upper surface into the semiconductor body, said cell comprising:

a transistor including a first source/drain region formed on the upper semiconductor surface and a channel region formed in the semiconductor body along the trench upper portion;

a first capacitor region formed in the trench lower portion;

a second capacitor region formed in the semiconductor body adjacent the first capacitor region and extending toward the transistor channel region;

an insulative layer position between said first and second capacitor regions to provide electrical isolation between said regions; and

a pair of overlapping conductive layers electrically isolated from one another each layer extending along the upper surface of the semiconductor body adjacent the first source/drain region, one of said layers including a segment protruding into the trench upper portion along the channel region forming a control gate for the transistor.

4,926,225

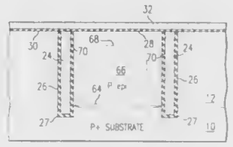
HIGH PERFORMANCE EXTENDED WAVELENGTH IMAGER AND METHOD OF USE

Harold H. Hosack, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 29, 1988, Ser. No. 212,765

Int. Cl.[5] H01L *29/78, 27/14, 31/00, 29/06*

U.S. Cl. 357—24 **20 Claims**



1. An imager cell formed at a face of a semiconductor layer and operable to record electromagnetic radiation including photons penetrating deeply into said layer comprising:

a charge collection region formed to extend from said face into said layer;

a clocked gate disposed near said face to control the transfer of charge collected in said charge collection region;

a conductive gate disposed adjacent said charge collection region and extending from the face into the semiconductor layer, said conductive gate electrically insulated from said clocked gate; and

a voltage source coupled to said conductive gate for selectively applying a bias voltage thereto, said conductive gate operable to induce a depletion region that substantially includes said charge collection region in response to the application of said bias voltage, such that charge generated from deeply penetrating photons will be collected in said collection region.

4,926,226

MAGNETIC FIELD SENSORS

Joseph P. Heremans, Troy, and Dale L. Partin, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 6, 1988, Ser. No. 240,778

Int. Cl.[5] H01L *27/12, 27/22, 29/06*

U.S. Cl. 357—27 **8 Claims**



1. A magnetic field sensor comprising a semiconductive crystalline element that includes at least one region of long carrier recombination times adjacent at least one region of short carrier recombination times for deflection of carriers between the regions of short and long carrier recombination times by a magnetic field to be sensed, wherein the improvement is that the semiconductive element comprises a doping superlattice of a plurality of layers formed by an n-i-p-i superstructure of a semiconductive material of a relatively short carrier recombination time in bulk but of a high mobility, and each layer has a thickness less than the Debye length of charge carriers in such layer.

4,926,227

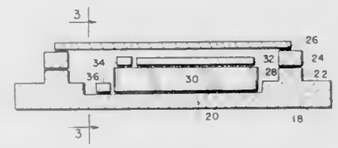
SENSOR DEVICES WITH INTERNAL PACKAGED COOLERS

Earl M. Jensen, San Jose, Calif., assignor to Nanometrics Inc., Sunnyvale, Calif.

Filed Aug. 1, 1986, Ser. No. 891,627

Int. Cl.[5] H01L *23/56*

U.S. Cl. 357—28 **2 Claims**



2. The package claimed in claim 1 wherein said heat sensitive sensor is a charge coupled device.

4,926,228

PHOTOCONDUCTIVE DETECTOR ARRANGED FOR BIAS FIELD CONCENTRATION AT THE OUTPUT BIAS CONTACT

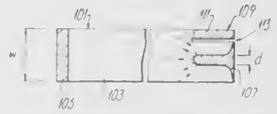
Timothy Ashley; Charles T. Elliott, and Anthony M. White, all of Malvern, England, assignors to Secretary of State for Defence (G.B.), England

Continuation of Ser. No. 658,461, Oct. 9, 1984, which is a continuation of Ser. No. 361,482, Mar. 24, 1982, abandoned. This application Dec. 16, 1985, Ser. No. 811,304

Claims priority, application United Kingdom, Mar. 30, 1981, 8109928

Int. Cl.[5] H01L *27/14*

U.S. Cl. 357—30 **16 Claims**



1. In a photoconductive detector of the kind having:

(1) a strip filament of semiconductor material of single conductivity type with a surface region transverse to its thickness dimension arranged for receiving radiation from a scene, and

(2) an input bias electrode and an output bias electrode forming Ohmic contacts to said filament and defining a bias current path in the filament transverse to said thickness dimension, the improvement comprising:

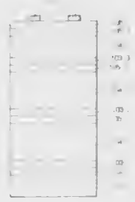
said output bias electrode being formed at least partly as a finger contacting and extending over part of said surface region towards said input bias electrode as appropriate to effect bias field concentration in the immediate vicinity of and bias current convergence on the output bias electrode with consequent enhanced responsivity without greatly degrading frequency response; said output bias electrode finger having two edges substantially parallel to two edges of said surface region; and said finger edges being equispaced from respective surface region side edges as appropriate to provide symmetrical bias field concentration.

4,926,229

PIN JUNCTION PHOTOVOLTAIC ELEMENT WITH P OR N-TYPE SEMICONDUCTOR LAYER COMPRISING NON-SINGLE CRYSTAL MATERIAL CONTAINING ZN, SE, H IN AN AMOUNT OF 1 TO 4 ATOMIC % AND A DOPANT AND I-TYPE SEMICONDUCTOR LAYER COMPRISING NON-SINGLE CRYSTAL SI(H,F) MATERIAL

Katsumi Nakagawa, Nagahama; Shunichi Ishihara, Hikone; Masahiro Kanai, Tokyo; Kozo Arao, Hikone; Yasushi Fujioka, and Akira Sakai, both of Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 272,926
Claims priority, application Japan, Nov. 20, 1987, 62-291685
Int. Cl.[5] H01L *45/00*
U.S. Cl. 357—30 10 Claims



1. An improved pin junction photvoltaic element comprising, in sequence, a p-type semiconductor layer, an i-type semiconductor layer and an n-type semiconductor layer characterized in that at least one of said p-type semiconductor layer and said n-type semiconductor layer is formed of a non-single crystal p-type or n-type semiconductor film comprising (a) zinc atoms and selenium atoms in a stoichiometric composition ratio of about 1:1; (b) hydrogen atoms in an amount of 1 to 4 atomic %; (c) crystal grain domains in a proportion of 65 to 85 volume percent per unit volume; and (d) atoms of a dopant capable of imparting p-type or n-type conductivity, and wherein said i-type semiconductor layer is a non-single crystal film containing silicon atoms as the matrix and at least one kind of atoms selected form the group consisting of hydrogen atoms and fluorine atoms.

4,926,230

MULTIPLE JUNCTION SOLAR POWER GENERATION CELLS

Hideo Yamagishi; Minori Yamaguchi; Keizo Asaoka; Akihiko Hiroe; Masataka Kondo; Kazunori Tsuge, and Yoshihisa Tawada, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 33,476, Apr. 2, 1987, abandoned. This application Jul. 10, 1989, Ser. No. 377,745
Claims priority, application Japan, Apr. 4, 1986, 61-78598
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 9 Claims

1. A semiconductor device substantially consisting of amorphous material, having a multijunction structure comprising:
- a first electrode;
- a first layer comprised of a plurality of layers that are P-type, intrinsic, and N-type to form a first P-I-N photovoltaic element having a first surface of one conductivity type adjacent said first electrode and a second surface;
- a second layer comprised of a plurality of layers that are P-type, intrinsic, and N-type to from a second P-I-N photovoltaic element having a first surface of an opposite conductivity type and a second surface;
- a semiconductor high impurity layer, having a higher impurity doping than either of said first and second p-I-N photovoltaic elements, said high impurity layer being disposed between said second surface of said first P-I-N element and said first surface of said second P-I-N element; and



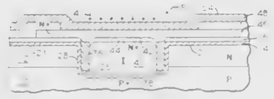
- a second electrode adjacent said second surface of said second P-I-N element.

4,926,231

INTEGRATED PIN PHOTO-DETECTOR

Bor-Yuan Hwang, Chandler; Carroll M. Casteel, Mesa, and Sal T. Mastroianni, Tempe, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 228,646, Aug. 5, 1988, Pat. No. 4,847,210. This application Dec. 28, 1988, Ser. No. 290,960
Int. Cl.[5] H01L *49/02, 27/14, 31/06*
U.S. Cl. 357—30 18 Claims



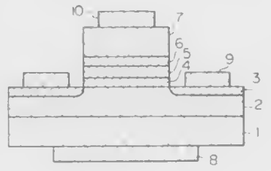
1. A light sensing device comprising:
- a substrate having a surface region of a first conductivity type, and having thereon an epi-layer of a second conductivity type, wherein the epi-layer comprises other integrated devices;
- a dielectric isolation wall extending through the epi-layer and through a portion of the substrate and providing a space separated from the epi-layer by the isolation walls; and
- an intrinsic semiconductor region in the space and electrically contacting the surface region of the substrate.

4,926,232

RESONANT-TUNNELING BIPOLAR TRANSISTOR

Yuji Ando, and Hideo Toyoshima, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Aug. 30, 1988, Ser. No. 238,625
Claims priority, application Japan, Sep. 2, 1987, 62-220644; Oct. 1, 1987, 62-249452
Int. Cl.[5] H01L *29/72*
U.S. Cl. 357—34 15 Claims



1. A resonant tunneling bipolar transistor comprising:

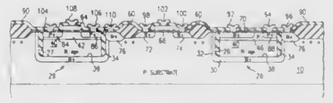
- (a) a collector region formed of a first compound semiconductor material of a first conductivity type;
- (b) an inversion forming region provided on one surface portion of said collector region and formed of a second compound semiconductor material of said first conductivity type;
- (c) a first potential barrier region provided on said inversion forming region and formed of a third compound semiconductor material which is larger in the sum of electron affinity and energy band gap or smaller in electron affinity than said second compound semiconductor material;
- (d) a quantum-well region provided on said first potential barrier region and formed of a fourth compound semiconductor material which is larger in electron affinity or smaller in the sum of electron affinity and energy bandgap than said third compound semiconductor material, said quantum-well region providing a quantum-well where an energy level of resonant state takes place;
- (e) a second potential barrier region provided on said quantumwell region and formed of a fifth compound semiconductor material which is smaller in electron affinity or larger in the sum of electron affinity and energy bandgap than said fourth compound semiconductor material;
- (f) an emitter region provided on said second potential barrier region and formed of a sixth compound semiconductor material of said first conductivity type which is larger in electron affinity or smaller in the sum of electron affinity and energy bandgap than said fifth compound semiconductor material, wherein a resonant-tunneling phenomenon takes place at a biasing state applied between said emitter region and said inversion forming region for injecting carriers through said energy level of resonant state into an inversion layer of a second conductivity type opposite to said first conductivity type, said inversion layer being produced at an interface between said first potential barrier region and said inversion forming region under said biasing state.

4,926,233

MERGED TRENCH BIPOLAR-CMOS TRANSISTOR FABRICATION PROCESS

Louis N. Hutter, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 29, 1988, Ser. No. 213,006
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—43 24 Claims



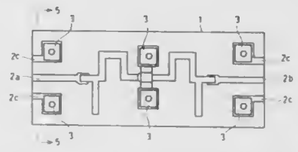
1. A transistor structure, comprising:
- a pair of trench depressions formed in a semiconductor substrate;
- a heavily doped layer of semiconductor material forming a shell around each said trench depression;
- an insulating layer formed on sidewalls of each said trench depression, a bottom portion of said trench depressions being defined by said heavily doped layer;
- a semiconductor material formed in a lower portion of each said trench depression;
- a bipolar transistor formed within said semiconductor material of one said trench depression; and
- a FET transistor formed within said semiconductor material of the other said trench depression.

4,926,234

SEMICONDUCTOR DEVICE OPERATING IN HIGH FREQUENCY RANGE

Takayuki Katoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1987, Ser. No. 81,709
Claims priority, application Japan, Aug. 6, 1986, 61-185715
Int. Cl.[5] H01L *23/14, 23/48, 21/66, 21/60*
U.S. Cl. 357—68 12 Claims



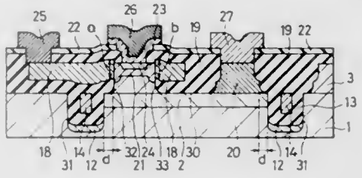
1. A semiconductor device operating in a high frequency range, comprising:
- a semiconductor substrate having a major surface and including integrated circuits;
- input electrode pad means formed on said major surface of said semiconductor substrate and connected with said integrated circuits;
- output electrode pad means formed on said major surface of said semiconductor substrate and connected with said integrated circuits; and
- grounding electrode pad means formed on said major surface of said semiconductor substrate for grounding said semiconductor substrate in a high frequency characteristic test, wherein said grounding electrode pad means comprises a first pair of grounding pads disposed to sandwich said input electrode pad means therebetween and a second pair of grounding pads disposed to sandwich said output electrode pad means therebetween, respectively.

4,926,235

SEMICONDUCTOR DEVICE

Yoichi Tamaki, 3-4-2-606, Izumicho; Tokuo Kure, 1-217, Higashikoigakubo, both of Kokubunji-shi, Tokyo; Tohru Nakamura, 6-6-16-614, Minamicho, Tanashi-shi, Tokyo; Tetsuya Hayashida, 2196-5, Hirai, Hindodemachi, Nishitama-gun, Tokyo; Kiyoji Ikeda, 1-48-18, Akatsukicho, Hachioji-shi, Tokyo; Katsuyoshi Washio, 1-26-39, Wada, Higashi-tokorozawa, Tokorozawa-shi, Saitama; Takahiro Onai, 2-32, Koyasumachi, Hachioji-shi, Tokyo; Akihisa Uchida, Wakaba-kopo 207, 1-3-17, Wakaba-cho, Tachikawa-shi, Tokyo, and Kunihiko Watanabe, Hitachi-fujimi-so A202, 2-1-16, Midorigaoka, Hamuracho, Nishitama-gun, Tokyo, all of Japan

Filed Oct. 13, 1987, Ser. No. 106,861
Claims priority, application Japan, Oct. 13, 1986, 61-241291; Feb. 5, 1987, 62-23605
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—68 30 Claims



1. A semiconductor device comprising:

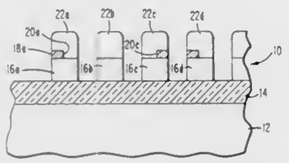
a semiconductor body of single crystal, of a first conductivity type, having a plurality of protruding portions, each of the protruding portions having an upper surface and opposed sides;
at least one of the protruding portions having an emitter region, a base region and a collector region therein so as to form a bipolar transistor;
insulation films on the semiconductor body between adjacent protruding portions;
a conductive film connected electrically to said base region and extending on one of the insulation films, said conductive film having first and second film portions in contact with the base region, the contact width of each of the first and second film portions to the base region being substantially the same; and
a respective trench extending into the semiconductor body, between each of the at least one protruding portion and an adjacent protruding portion, so as to isolate the bipolar transistor in the at least one protruding portion from an adjacent bipolar transistor, the trench being spaced from one of the opposed sides of the at least one protruding portion, in a direction parallel to the upper surface of the protruding portion.

4,926,236

MULTILAYER INTERCONNECT AND METHOD OF FORMING SAME

Alfred C. Ipri, Hopewell Township, Mercer County, and Roger G. Stewart, Hillsboro Township, Hunterdon County, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 12, 1986, Ser. No. 828,687
Int. Cl.[5] H01L *23/48, 29/04*
U.S. Cl. 357—71 **9 Claims**



1. A multilayer interconnect comprising a first conductive strip, an insulating layer having an aperture formed therethrough overlying the first strip, and a second conductive strip overlying the insulating layer and aperture, said second conductive strip electrically connected to the first conductive strip through said aperture wherein the improvement comprises;
at least one edge of the first strip is aligned with an overlying edge of the second strip.

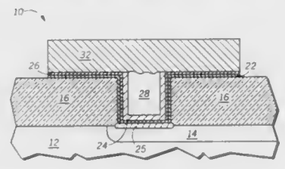
4,926,237

DEVICE METALLIZATION, DEVICE AND METHOD

Shih W. Sun, and Jen-Jiang Lee, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1988, Ser. No. 177,747
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 **18 Claims**

1. Metallization for contacting the silicon substrate of a semiconductor device comprising:
titanium silicide in contact with selected portions of the silicon substrate;
a layer of titanium nitride overlying said titanium silicide;
a layer of insitu sputtered tungsten disposed on and in intimate contact with said titanium nitride;
a localized layer of chemical vapor deposited tungsten overlying said layer of sputtered tungsten; and
a patterned layer comprising aluminum comtacting said layer of chemical vapor deposited tungsten.

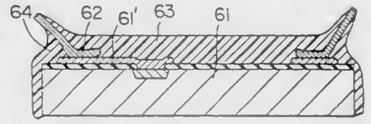


4,926,238

SEMICONDUCTOR DEVICE AND METHOD FOR PRODUCING THE SAME

Kiichiro Mukai, Hachioji; Atsushi Saiki, Musashimurayama, and Seiki Harada, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 908,782, Sep. 18, 1986, which is a continuation-in-part of Ser. No. 750,783, Jul. 1, 1985, which is a continuation of Ser. No. 351,665, Feb. 24, 1982, abandoned, which is a continuation of Ser. No. 92,512, Nov. 8, 1979, abandoned. This application Sep. 30, 1988, Ser. No. 252,701
Claims priority, application Japan, Nov. 20, 1978, 63-142375
Int. Cl.[5] H01L *23/28, 23/02*
U.S. Cl. 357—72 **25 Claims**



1. A semiconductor device comprising a semiconductor substrate having at least one memory element formed therein and a layer for preventing penetration of alpha particles therethrough provided over at least a region of said memory element, said layer consisting essentially of a resin material selected from the group consisting of a polyimide resin and a polyimide isoindoloquinazolinedione, said layer having a thickness of 20 μm or more to sufficiently prevent penetration of alpha particles therethrough which come from outside of the layer and to avoid soft errors in said memory element, and said resin material containing less than 40 ppb of impurities functioning as alpha ray generating sources so that the total amount of the impurities will not generate alpha rays of sufficient intensity to cause soft errors in said memory element.

4,926,239

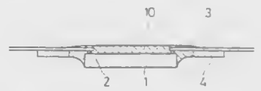
PLASTIC ENCAPSULANT FOR SEMICONDUCTOR

Kazuya Fujita, Nara; Takamichi Maeda, Yamatokoriyama, and Masao Hayakawa, Sorakn, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 7,127,405, Dec. 2, 1987, abandoned, which is a continuation of Ser. No. 6,618,455, Jun. 7, 1984, abandoned. This application Aug. 2, 1989, Ser. No. 390,448
Claims priority, application Japan, Jun. 7, 1983, 58-103452
Int. Cl.[5] H01L *23/28;* **C08F** *283/00;* **C08G** *77/04*
U.S. Cl. 357—72 **9 Claims**

1. A semiconductor device comprising:
a semiconductor chip;
a support for supporting said semiconductor chip; and
a plastic encapsulant for encasing said semiconductor chip to said supporter;

said encapsulant consisting essentially of:
a liquid epoxy resin;
an organosilicon compound having at least one methoxy group;
a resol-type phenol resin hardener;
a pigment; and



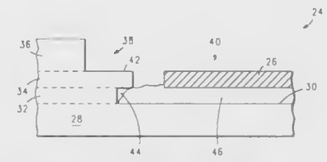
an organic solvent mixture in which the boiling points of the individual solvents differ;
wherein the amount of said organosilicon compound is less than 30% by weight based on the total weight of said liquid epoxy resin, said organosilicon compound and said hardener.

4,926,240

SEMICONDUCTOR PACKAGE HAVING RECESSED DIE CAVITY WALLS

Brian A. Regione, Mes, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1989, Ser. No. 329,741
Int. Cl.[5] H01L *23/12, 23/04*
U.S. Cl. 357—74 **17 Claims**



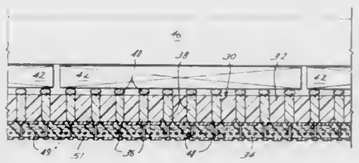
1. A semiconductor package comprising:
a base portion including a die attach area; and
a plurality of walls surrounding said die attach area to form a die cavity, at least one of said walls having a recessed areas to receive excess die attach material.

4,926,241

FLIP SUBSTRATE FOR CHIP MOUNT

David H. Carey, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Feb. 19, 1988, Ser. No. 157,778
Int. Cl.[5] H01L *23/16*
U.S. Cl. 357—75 **18 Claims**



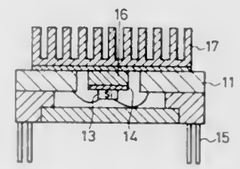
1. An integrated circuit packaging structure comprising:
an integrated circuit element including a plurality of internal circuits integrated into a single semi-conductor element, said integrated circuit element having an upper surface and a lower surface, and being formed having an array of conductive nodes protruding from said lower surface to provide electrical coupling to said internal circuits;
a support substrate having an upper surface and a lower surface, said substrate having a plurality of through vias formed therein and extending from said upper surface to said lower surface, said through vias being formed in a pattern corresponding to said array of conductive nodes on said lower surface of said integrated circuit element; said substrate further comprising conductor means within said through vias and extending from said substrate upper surface to said substrate lower surface;
an electrical interconnect layer comprising a plurality of electrically conductive interconnect elements distributed within an electrically insulating material, said interconnect layer having an upper surface and a lower surface, said interconnect layer further having a plurality of conductive coupling elements extending from said upper surface to said lower surface of said interconnect layer, said coupling elements being arranged in a pattern corresponding to said array of conductive nodes on said integrated circuit element and being adapted for coupling to said interconnect elements within said interconnect layer; and
wherein said lower surface of said integrated circuit element is formed adjacent to said upper surface of said substrate so as to align said conductive nodes with said through vias and to electrically couple said conductive nodes with said conductor means; said upper surface of said interconnect layer is formed adjacent to said lower surface of said substrate so as to align said coupling elements with said through vias and to electrically couple said coupling elements with said conductor means.

4,926,242

ALUMINUM-SILICON ALLOY HEATSINK FOR SEMICONDUCTOR DEVICES

Yoshiaki Itoh; Yusuke Odani; Kiyoaki Akechi, and Nobuhito Kuroishi, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 783,603, Oct. 3, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 39,714
Claims priority, application Japan, Oct. 3, 1984, 59-208471; Nov. 14, 1984, 59-240034; Nov. 29, 1984, 59-253497
Int. Cl.[5] H01L *23/36*
U.S. Cl. 357—81 **12 Claims**



1. A package comprising:
a substrate made of a ceramic material;
at least one heat generating component mounted on a first surface of said substrate; and
at least one heat sink fixed on a second surface of said substrate opposite said first surface, and made of an aluminum-silicon alloy material, said aluminum-silicon alloy material containing silicon in a weight percentage ranging from 30% through 40%.

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4,926,243

HIGH VOLTAGE MOS FIELD EFFECT SEMICONDUCTOR DEVICE

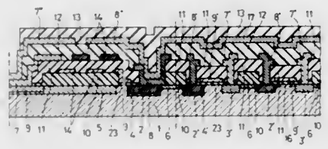
Kiyotoshi Nakagawa, Fukuyama, and Kenzo Kawano, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 819,216, Jan. 15, 1986, abandoned. This application Mar. 9, 1988, Ser. No. 169,160

Claims priority, application Japan, Jan. 19, 1985, 60-7776

Int. Cl.[5] H01L *25/04*

U.S. Cl. 357—84 14 Claims



1. A high voltage MOS field-effect semiconductor device, comprising:

a semiconductor substrate;

a high voltage MOS field-effect transistor formed on the substrate and operable for switching a relatively high voltage applied thereto, said high voltage transistor comprising a source electrode, a drain electrode and a region of high resistance layer between said source and drain electrodes;

a circuit including a low voltage MOS field-effect transistor formed of a plurality of electrically conductive and electrically insulating layers predeterminately stacked on said substrate for driving said high voltage MOS field-effect transistor;

electromagnetic shielding means comprising an electrically conductive layer overlying substantially the entirety of said circuit and entirely separated and spaced from said substrate by at least some of said plural stacked layers for screening said low voltage circuit portion from electromagnetic radiation from said high voltage transistor on the substrate and preventing electrical interference with said overlaid circuit by the electromagnetic field effects of the relatively high voltage operatively applied to said high voltage transistor;

an insulating layer interposed between said circuit and said electronically conductive layers of said shielding means;

said semiconductor device having an upper surface comprising a protective film;

a first conductive field plate extending from said source electrode, said first field plate being connected to said shielding means; and

a second conductive field plate extending from said drain electrode, said first and second field plates being disposed in overlying relation to said region of high resistance layer.

4,926,244

EXTENDED DEFINITION WIDESCREEN TELEVISION SIGNAL PROCESSING SYSTEM WITH ALTERNATE SUBCARRIER

Michael A. Isnardi, Plainsboro, N.J., assignor to General Electric Company, Princeton, N.J.

Division of Ser. No. 139,340, Dec. 29, 1987. This application Feb. 10, 1988, Ser. No. 154,559

Claims priority, application United Kingdom, Sep. 14, 1987, 8721565

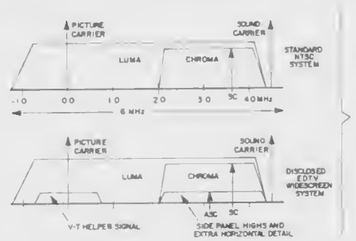
Int. Cl.[5] H04N *11/00, 11/12*

U.S. Cl. 358—12 13 Claims

1. In a system for processing a television-type signal representative of a widescreen image having a main component and a widescreen component containing spatially uncorrelated information relative to said main component, an image aspect ratio greater than that of a standard television image, and a chrominance subcarrier modulated with chrominance image information; apparatus comprising:

means for providing uncorrelated auxiliary image information derived from said widescreen component;

means for providing an alternate subcarrier in addition to said chrominance subcarrier; and



means for modulating said alternate subcarrier with said derived uncorrelated auxiliary image information, wherein

said alternate subcarrier exhibits a frequency within a band of baseband frequencies normally occupied by chrominance image information.

4,926,245

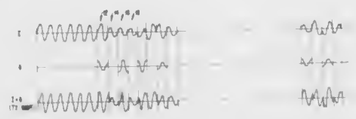
QUADRATURE AMPLITUDE MODULATION PRESERVING ONE CHANNEL ZERO CROSSING FOR VIDEO TELEPHONE

Yutaka Ueno, Kanagawa, Japan; Lawrence D. Emmons, Grass Valley, Calif.; Koji Kaneko, and Takayoshi Semasa, both of Kanagawa, Japan, assignors to Luma Telecom, Inc., Santa Clara, Calif.

Filed Jun. 28, 1988, Ser. No. 212,537

Int. Cl.[5] H04N *11/12*

U.S. Cl. 358—12 10 Claims



1. A method for transmitting color information using two channels so that inter-symbol zero crossings of a first channel are preserved in the combined signal, comprising:

assigning each cycle of a sine wave on said first channel as a symbol representing the luminance of at least one pixel;

assigning single cycles on a second channel as symbols representing color difference values, said color difference symbols being single cycles of a sine wave, said color difference symbols starting at every other luminance symbol and being 90° out of phase with said first channel sine wave;

inverting alternate ones of said color difference symbols; and

combining said symbols on said first and second channels to produce said combined signal,

3. A method for transmitting color information using two channels so that inter-symbol zero crossings of a first channel are preserved in the combined signal, comprising:

assigning each cycle of a sine wave on said first channel as a symbol representing the luminance of at least one pixel;

assigning single cycles of a cosine wave on a second channel as symbols representing color difference values with two successive cosine symbols being assigned to the same group of pixels;

inverting alternate ones of said color difference symbols, such that each group of pixels is represented by a noninverted and an inverted cosine symbol;

adding a constant DC value to each said cosine symbol to cause the zero crossings of said second channel to match the zero crossings of said first channel; and

combining said symbols on said first and second channels to produce said combined signal.

4. A method for transmitting color information using two channels so that inter-symbol zero crossings of a first channel are preserved in the combined signal, comprising:

assigning each cycle of a sine wave on said first channel as a symbol representing the luminance of at least one pixel;

assigning single cycles of a cosine wave on a second channel as symbols representing color difference values, said cosine symbols being combined with every other sine symbol to form said combined signal, each group of pixels being assigned only one cosine symbol;

inverting alternate ones of said color difference cosine symbols; and

combining said symbols on said first and second channels to produce said combined signal.

4,926,246

DITHER PROCESSING CIRCUIT

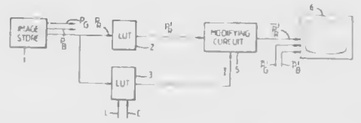
Angela M. Darling, Surrey, England, assignor to Crosfield Electronics Limited, London, England

Filed Jun. 8, 1989, Ser. No. 363,005

Claims priority, application United Kingdom, Jun. 8, 1988, 8813487

Int. Cl.[5] H04N *9/64, 5/91, 11/04*

U.S. Cl. 358—21 R 7 Claims



1. Apparatus for processing a first signal representing a colour component of a pixel of an image, said signal defining the value of said colour component as one of a first set of values defining a first scale of colour component values, the apparatus comprising a first Look-up Table (LUT) addressed by said colour component value for generating a second signal representing a modified colour component value chosen from a set of modified colour component values defining a second scale coarser than said first scale; adjustment means comprising a memory in which at least two sets of adjustment data are stored, each said set being associated with a respective dither threshold representing respective differences, hereinafter referred to as quantisation errors, between said first and second signals when compared on said first scale of colour component values, the data of each set defining an adjustment instruction for each possible quantisation error, said adjustment instruction being related to the difference between said quantisation error and the respective dither threshold, wherein said adjustment means receives said first signal so that said memory is addressed by a signal related to said quantisation error and related to the position of said pixel in said image so as to generate an adjustment control signal associated with said quantisation error and the dither threshold corresponding to said first signal pixel; and modifying means responsive to said adjustment control signal generated by said adjustment means to adjust said second signal to generate a final output signal representing one of said second set of the colour component values.

4,926,247

COLOR IMAGING APPARATUS INCLUDING A MEANS FOR ELECTRONICALLY NON-LINEARLY EXPANDING AND COMPRESSING DYNAMIC RANGE OF AN IMAGE SIGNAL

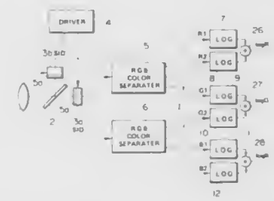
Tatsuo Nagasaki, Musashino; Hidetoshi Yamada, Tokyo, and Hiroyoshi Fujimori, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1987, Ser. No. 108,516

Claims priority, application Japan, Oct. 15, 1986, 61-244830; Sep. 18, 1987, 62-234133

Int. Cl.[5] H04N *9/09, 9/07, 9/077*

U.S. Cl. 358—43 21 Claims



1. A logarithmic color imaging apparatus comprising:

an imaging device for converting a light image of an object to at least one electric output signal;

a color separating means for separating each output signal of said imaging device into separate output signals for different primary colors or auxiliary colors;

a first logarithmic compressing means for logarithmically compressing the output signals of said color separating means for the different primary colors or auxiliary colors;

an inverse-logarithmic converting means for inverse-logrithmically converting output signals of said first logarithmic compressing means;

a matrix-converting means for linear-matrix-converting output signals of said inverse-logarithmic converting means;

a second logarithmic compressing means for logarithmically compressing output signals of said matrix-converting means; and

a color signal compounding means for producing a logarithmically compressed brightness signal from output signals of said second logarithmic compressing means.

7. A logarithmic color imaging apparatus comprising:

a field sequential type illuminating means for sequentially illuminating an object with light of a plurality of different colors;

an imaging device for converting a light image of said object to at least one electric output signal in coordination with said field sequential type illuminating means;

a memory means for switching each signal of said imaging device in synchronism with said field sequential type illuminating means to produce separate output signals for the different colors and memorizing the same;

a first logarithmic compressing means for logarithmically compressing output signals of said memory means;

an inverse-logarithmic converting means for inverse-logarithmically converting output signals of said first logarithmic compressing means;

a matrix-converting means for linear-matrix-converting output signals of said inverse-logarithmic converting means;

a second logarithmic compressing means for logarithmically compressing output signals of said matrix-converting means; and

a color signal compounding means for producing a logarithmically compressed brightness signal from output signals of said second logarithmic compressing means.

18. A logarithmic compression characteristic color imaging

apparatus comprising an imaging device including a pair of color imaging devices for converting a light image to electric output signals, a pair of RGB separating circuits for separating the output signals of said pair of color imaging devices into three primary color signals and a logarithmic amplifying means for amplifying the color signals such that they have an approximately logarithmic characteristic.

20. A logarithmically compressed color signal processing apparatus comprising:

a first logarithmic compressing means for logarithmically compressing input color signals for respective primary colors or auxiliary colors;

an inverse-logarithmic converting means for inverse-logarithmically converting output signals of said first logarithmic compressing means;

a matrix-converting means for linear-matrix-converting output signals of said inverse-logarithmic converting means;

a second logarithmic compressing means for logarithmically compressing output signals of said matrix-converting means; and

a color signal compounding means for producing a logarithmically compressed brightness signal from output signals of said second logarithmic compressing means.

21. An electronic camera reproducer comprising:

a first logarithmic compressing means for logarithmically compressing signals for respective primary colors of a video signal recorded in a recording medium;

an inverse-logarithmic converting means for inverse-logarithmically converting output signals of said first logarithmic compressing means;

a matrix-converting means for linear-matrix-converting output signals of said inverse-logarithmic converting means;

a second logarithmic compressing means for logarithmically compressing output signals of said matrix-converting circuit; and

a color signal compounding means for compounding output signals of said second logarithmic compressing circuit and output signals of said first logarithmic compressing circuit.

4,926,248

SCANNING RECORDING TYPE PRINTING METHOD AND APPARATUS FOR INCREASING IMAGE QUALITY BY CONTROLLING TONE DOT LOCATIONS WITHIN IMAGE PIXELS

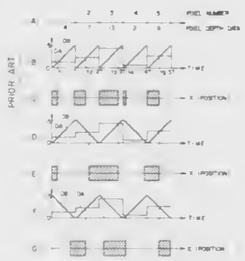
Shin'ya Kobayashi, Mito, and Masayasu Anzai, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 845,343, Mar. 28, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,096

Claims priority, application Japan, Mar. 30, 1985, 60-64966; Aug. 23, 1985, 60-184274

Int. Cl.[5] H04N *1/46, 1/40*

U.S. Cl. 358—75 12 Claims



1. In a pixel recording pulse signal generation method in which tone data signals representing respective pixels of an image are transformed into respective pixel recording pulse signals each having a time width proportional to the value of the respective tone data signal, and in which said pixel recording pulse signals are used to print respective dots in respective pixels along scanning lines to reproduce said image, wherein only one dot is printed in each pixel of the reproduced image, the improvement wherein the pixels along each scanning line of the reproduced image are divided into pairs of adjacent pixels, each pair consisting of a first pixel and a second pixel which succeeds the first pixel, and wherein the end of the pixel recording pulse signal corresponding to the first pixel is made to coincide with the beginning of the pixel recording pulse signal corresponding to the second pixel, thus causing the dots printed in the first and second pixels to be contiguous over the boundary between the first and second pixels.

2. A color recording method in which colors are recorded by effecting area-modulation of areas within each of a plurality of pixels of a recorded image by arranging colored inks of at least two colors within the pixels, comprising the steps of:

effecting a first area-modulation of areas within said pixels by arranging a colored ink of at least a first color at first positions within said pixels; and

effecting a second area-modulation of areas within said pixels by arranging a colored ink of at least a second color at second positions within said pixels;

wherein said colored ink of at least a first color is arranged from first ends of said pixels towards the centers of said pixels, and said colored ink of at least a second color is arranged from second ends of said pixels towards the centers of said pixels.

4,926,249

COLOR IMAGE READER HAVING A LENS AND PRISM INCORPORATED INTO A SINGLE UNIT

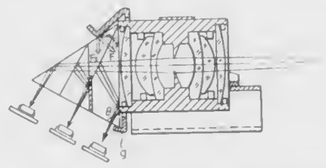
Yoshiyuki Ichihara; Kunio Ito; Tadashi Izawa, and Norihiro Wakui, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 209,416

Claims priority, application Japan, Jun. 23, 1987, 62-157006

Int. Cl.[5] H04N *1/028, 1/46, 9/097*

U.S. Cl. 358—75 6 Claims



1. A color image reading apparatus comprising a light source adapted to move relative to an original document whereby said document is illuminated,

a mirror means for reflecting light from the illuminated document to a lens, said light source being disposed on a first side of the optical axis of said lens, said lens focusing the reflected light to form an image,

a prism disposed in the optical axis of said lens, said prism separating the reflected light into a plurality of color lights, and

a plurality of photo-electric conversion means corresponding in number to the plurality of color lights,

said prism having surfaces for diverting said color lights to said plurality of photo-electric conversion means to form a plurality of color images, said plurality of color lights being diverted in substantially the same direction so that said plurality of photo-electric conversion means are disposed on a second side of the optical axis of said lens,

said lens and said prism being assembled as a single unit comprising:

said lens incorporated into a lens housing,

said prism,

a stop means for positioning said prism, said stop means being fixed to said lens housing and being adapted to come into contact with an edge of said prism,

a light projecting end surface of said lens housing adapted to come into contact with a first surface of said prism, said first surface including said edge, and

a prism fixing means capable of being coupled with said lens housing, said prism fixing means fixing a second surface of said prism, said second surface being opposite said edge.

2. An optical device assembly having a lens and a prism in one unit, comprising:

said lens incorporated into a lens housing,

said prism,

a stop means for positioning said prism,

said stop means being fixed to said lens housing and being adapted to come into contact with an edge of said prism,

a light projecting end surface of said lens housing adapted to come into contact with a first surface of said prism, said first surface including said edge, and

a prism fixing means capable of being coupled with said lens housing, said prism fixing means fixing a second surface of said prism, said second surface being opposite said edge.

4,926,250

COLOR IMAGE RECORDING AND REPRODUCING APPARATUS UTILIZING A MONOCHROMATIC RECORDING MEDIUM

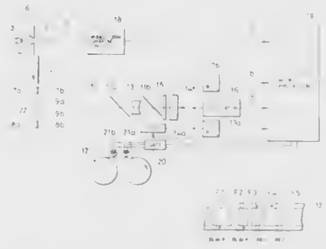
Motofumi Konishi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 184,015

Claims priority, application Japan, Apr. 24, 1987, 62-101618; Jan. 30, 1987, 62-160936

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—75 20 Claims



1. An image recording apparatus for monochromatically recording a color image, comprising:

image recording means for recording an original image onto a recording medium;

determination means for determining the color of the original image, said determination means including (a) detection means for detecting a characteristic of the color of the original image, and (b) setting means for setting the color of the original image in accordance with a detection signal of the detection means; and

information recording means for recording information corresponding to the color determined by said determination means onto said recording medium.

4,926,251

COLOR IMAGE PROCESSING APPARATUS WITH IMAGE CORRECTOR

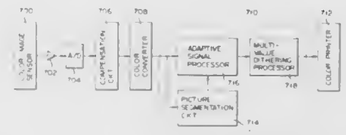
Hidekazu Sekizawa; Tutomu Saito, both of Yokohama; Naofumi Yamamoto, Tokyo; Kazuhiko Higuchi, Kawasaki, and Haruko Kawakami, Funabashi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 6, 1988, Ser. No. 178,431

Claims priority, application Japan, Apr. 7, 1987, 62-83814; Jun. 25, 1987, 62-156530; Jun. 25, 1987, 62-156531; Jun. 25, 1987, 62-156532; Jun. 26, 1987, 62-157933; Aug. 27, 1987, 62-213534

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—75 16 Claims



1. An image signal processing apparatus comprising:

image input means for optically scanning an input image and for generating an electrical image signal which represents the input image; and

image output means for producing a copy image which corresponds to the input image at limited levels of printing density, the improvement comprising:

(a) first processing means, connected to said image input means to receive the image signal, for at least partially discriminating a type of the input image based on a pattern matching technique, and for producing a discrimination signal which specifies a discriminated type of the input image in a pixel region thereof having a predetermined size;

(b) second processing means, connected to said image input means to receive the image signal and connected to said first processing means, for performing a different kind of image signal correction processing which is selected in accordance with the discriminated type of the input image, and for producing a corrected image signal in response to the discrimination signal; and

(c) third processing means, connected to said second processing means to receive the corrected image signal, for performing multi-value dither processing of the corrected image signal, and for producing a drive signal for said image output means, said drive signal defining a printing pixel pattern with respect to each pixel of the input image.

4,926,252

COLOR IMAGE READING AND RECORDING APPARATUS AND ITS IMAGE RECORDING METHOD FOR RECORDING FULL COLOR IMAGES FROM STORED COLORED INFORMATION CREATED BY A SINGLE SCAN PROCESS

Fumikazu Nagano, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1987, Ser. No. 110,336

Claims priority, application Japan, Oct. 20, 1986, 61-249838

Int. Cl.[5] H04N *1/46, 1/21*

U.S. Cl. 358—75 8 Claims

1. A color image reading and recording apparatus, comprising:

three light sources corresponding to blue, green, and red colors disposed at one side opposite to a side of an original to be read;

CCD image sensor means for obtaining signals, each signal representing a blue component, green component or red component, said CCD image sensor means sequentially

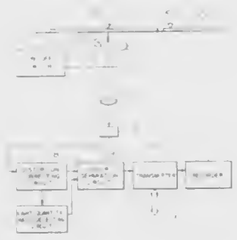
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lighting up and driving said three light sources and receiving light reflected from said original only once during a reading and recording operation;
memory means for storing said signals representing said blue component, green component and red component;
color converter means for converting the stored color component signals into yellow, magenta, cyan and black color signals;



means for recording the color signals converted by said color converter means onto a recording paper;
first control means for controlling the recording means to record yellow, magenta, cyan and black color images onto a recording paper in response to the color signals; and
second control means for controlling the recording means to record single individual color images onto individual recording papers in response to the individual color signals.

4,926,253
MULTI-COLOR DOCUMENT READING APPARATUS FOR FACSIMILE AND MULTI-COLOR FACSIMILE
Keisuke Nakashima, Hitachi; Saburo Yasukawa, Katsuta; Masaharu Tadauchi, Mito, and Yasuro Hori, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 6, 1989, Ser. No. 319,970
Claims priority, application Japan, Mar. 7, 1988, 63-51495
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 25 Claims



15. A multi-colour facsimile apparatus including a multi-colour document reading apparatus for reading a document, disposed at a predetermined position and containing a multi-colour representation, on a line-by-line basis while discriminately identifying the colours of the multi-colour representation, comprising:
an image sensor for sensing optical images in a predetermined area including at least one line on said document disposed at said predetermined position;
light source means for selectively illuminating at least said predetermined area in one of first and second energized states, the first energized state having different spectral characteristics than the second energized state;
switch means for selectively energizing said light source means for illuminating said document in one of said first and second states;
distortion correcting means including memory means for storing first and second shading waveforms derived from data sensed by said image sensor for optical images corresponding to a standard sheet having a specific colour disposed at said predetermined position and illuminated by said light source means in said first and second energized states, respectively, means for reading out said first and second shading waveforms from said memory means before said document is read by said image sensor on the line-by-line basis, correcting means for correcting first and second line data detected by said image sensor from an optical image on one line of said document illustrated by said light source means in said first and second states in accordance with said first and second shading waveforms read out from said memory means, respectively; and
colour separating means for discriminately identifying different colours of the multi-colour representation included in said one line of said document for generating colour-separated signals representing the different colours,
said facsimile apparatus further including transmitting means for externally transmitting said colour-separated signals generated by said multi-colour document reading apparatus, and recording means for recording an image represented by said colour-separated signals in one colour.

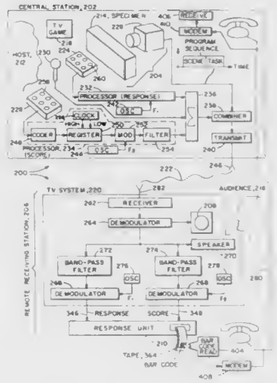
4,926,254
METHOD OF CORRECTING COLOR IMAGE DATA FOR OBTAINING PROOF IMAGE
Kimihiro Nakatsuka, and Fumihiro Hatayama, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan
Filed Sep. 22, 1988, Ser. No. 247,901
Claims priority, application Japan, Sep. 22, 1987, 62-238058
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—76 11 Claims



1. A method of correcting color image data to obtain therefrom a viewable proof image which is indicative of the colors that will appear in a printed image produced according to said color image data, said method comprising the steps of:
(a) providing reference color image data,
(b) printing a first reproduced image with color inks, according to said reference color image data,
(c) producing a second reproduced image with a non-ink-based image producing device based on said reference color image data, said image producing device having a color mixing result which is different from a color mixing result obtained with said color inks,

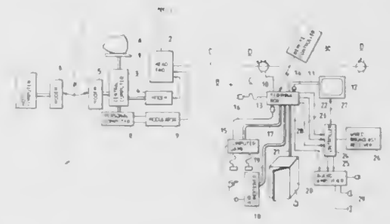
(d) comparing said first and second reproduced images and determining the difference between the respective color mixing results, obtained with said color inks and said image producing device,
(e) defining a correction rule for compensating said difference,
(f) reading an image of an original with a color image reader and obtaining first color image data consisting of chromatic and achromatic components, and
(g) correcting said first color image data using said correction rule to obtain second color image data consisting of chromatic components, and generating a colored proof image whose colors are indicative of the colors in a printed image which is reproduced on the basis of said first color image data.

4,926,255
SYSTEM FOR EVALUATION OF RESPONSE TO BROADCAST TRANSMISSIONS
Henry Von Kohorn, 945 Treasure La., Vero Beach, Fla. 32963
Continuation-in-part of Ser. No. 837,827, Mar. 10, 1986, Pat. No. 4,745,468. This application May 10, 1988, Ser. No. 192,355
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[5] H04H *9/00*
U.S. Cl. 358—84 93 Claims



7. A system for broadcasting a task-setting program signal from a central site to a plurality of receiving stations at remote sites, and for responding to said task-setting program signal at said receiving stations, said system comprising:
means at said central site for transmitting said task-setting program signal;
means at each of said receiving stations for presenting a program transmitted by said program signal to an audience, said program being a television program;
means at said central site for transmitting an instructional signal incorporating predetermined response criteria including a timing of a response;
means at said central site for encoding said instructional signal, said encoding means being suitable for operation by a host of said television program, said instructional-signal transmitting means including means for modulating encoded instructional signals upon a voice channel of said television program;
means at each of said receiving stations responsive to said instructional signal for storing said predetermined response criteria;
means at each of said receiving stations for entering responses by said audience to a task presented in said program;
means at each of said receiving stations for comparing individual ones of said audience responses to said predetermined response criteria;
means coupled to said comparing means for scoring said audience responses; and
demodulation means at said receiving station coupled to said predetermined response-criteria storing means for extracting said instructional signal from said voice channel of said transmitted program signal; and wherein
said entering means includes buffer storing means for storing said audience responses, said buffer storing means outputting the audience response to said comparison means;
said scoring means includes means for selectively altering a mode of scoring individual ones of said audience responses in response to said instructional signal; and wherein
said instructional signal can be altered to change criteria of said scoring mode independently of a transmission of the program signal.

4,926,256
BILLING DATA DISPLAY SYSTEM FOR A CLOSED CIRCUIT TELEVISION SYSTEM
Kelichiro Nanba, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 28, 1989, Ser. No. 386,479
Claims priority, application Japan, Aug. 8, 1988, 63-196128
Int. Cl.[5] H04N *7/10;* H04H *9/00*
U.S. Cl. 358—84 16 Claims

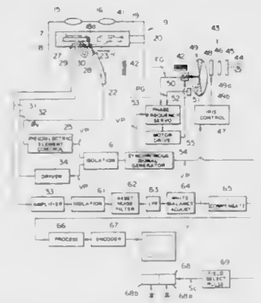


9. A billing data display method for a closed circuit TV system in which a central facility transmits video signals to a plurality of terminals which are each operated by a respective customer, said method comprising the steps of:
storing at said central facility monetary charge data corresponding to charges owned by said customers;
requesting transmission of said monetary charge data from said central facility to said terminals;
transmitting said monetary charge data to said terminals in response to said request on a "down" data channel;
transmitting a fixed picture from said central facility to said terminals on a predetermined frequency channel other than said "down" data channel;
converting said transmitted monetary charge data into billing picture data which is superposed on said fixed picture to obtain a composite billing picture; and
displaying said composite billing picture.

4,926,257
STEREOSCOPIC ELECTRONIC ENDOSCOPE DEVICE
Akihiko Miyazaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 18, 1987, Ser. No. 135,178
Claims priority, application Japan, Dec. 19, 1986, 61-303286
Int. Cl.[5] H04N *7/18, 13/00;* A61B *1/06*
U.S. Cl. 358—98 13 Claims

1. A stereoscopic electronic endoscope device comprising:
An electronic endoscope comprising an elongated inserting

part and an image pickup means located at a tip part of said inserting part and having a solid-state image sensor and an optical imagery system that works to create an image of a shooting object on said solid-state image sensor, and enabling stereoscopic observation at two positions where stereoscopic view is made possible;



an image signal processing means that processes an output signal from said image pickup means to an image signal; and

a stereoscopic image forming means for forming a stereoscopic image of the shooting object using an image signal generated by said image signal processing means based on each output signal at said two positions of the image pickup means.

4,926,258

ELECTRONIC ENDOSCOPE APPARATUS CAPABLE OF DRIVING SOLID STATE IMAGING DEVICES HAVING DIFFERENT CHARACTERISTICS

Masahiko Sasaki; Masao Uehara; Masahide Kanno; Shinji Yamashita; Katsuyoshi Sasagawa, all of Hachioji; Jun Hasegawa, Hino; Katsuyuki Saito, and Akinobu Uchikubo, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

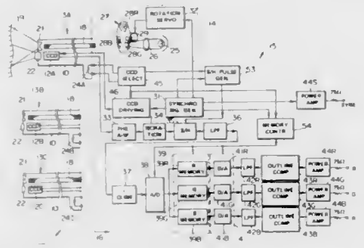
Filed Oct. 11, 1988, Ser. No. 255,228

Claims priority, application Japan, Oct. 20, 1987, 62-266061; Apr. 7, 1988, 63-86377

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[5] **H04N** *7/18;* **A61B** *1/06*

U.S. Cl. 358—98 **32 Claims**



1. An endoscope apparatus comprising:

first and second endoscope means having long, thin first and second insertion portions, first and second projection means each projecting illuminating light from one end of each of said insertion portions, first and second objective optical systems respectively provided at said ends of said first and second insertion portions to form an optical image of an object and first and second solid state imaging devices for respectively performing photoelectric conversion of the images based on said first and second objective optical systems, said first and second imaging devices having different numbers of picture elements;

a driving signal generating means for mixing outputs generated to at least one of a signal regardless of said number of said picture elements in said solid state imaging devices, and of another signal in accordance with said number of said picture elements of said imaging devices, and said driving signal generating means further outputting a driving signal containing a horizontal transfer clock signal with a given frequency for each of said first and second solid state imaging devices even if said number of said picture elements of said first and second solid state imaging devices are different to thereby produce said driving signal to each of said solid state imaging devices;

a picture signal processing means for performing signal processing of the signal read from each of said first and second solid state imaging devices using said driving signal applied thereto to produce a given picture signal; and

a monitor means for displaying said given picture signal.

4,926,259

IMAGE PROCESSING SYSTEM

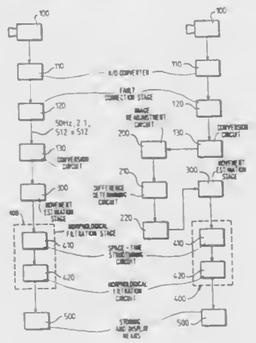
Didier Billard, Vitry-sur-Seine, and Bernard Poquillon, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1989, Ser. No. 401,700

Claims priority, application France, Sep. 13, 1988, 88 11913

Int. Cl.[5] **H04N** *7/18*

U.S. Cl. 358—105 **4 Claims**



1. An image processing system comprising means for the acquisition of video signals corresponding to a plurality of images, and means for processing these acquired signals, wherein said processing means comprise:

(a) a movement estimation stage;

(b) a morphological filtration stage;

(c) a storage and/or visual display stage; said morphological filtration stage itself including a circuit for the definition of a space-time structuring element from movement parameters estimated by the movement estimation stage, and a morphological filtration circuit.

4,926,260

VIDEO SIGNAL PROCESSING CIRCUIT

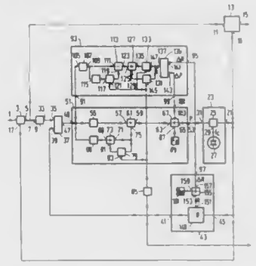
Peter H. Frencken; Antonius H. H. J. Nillesen, and Simon J. Brand, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1989, Ser. No. 345,394

Claims priority, application Netherlands, Jun. 2, 1988, 8801415

Int. Cl.[5] **H04N** *5/04*

U.S. Cl. 358—148 **3 Claims**



1. A video signal processing circuit including a clock signal generating circuit which comprises a phase detector having a first input for a line-synchronizing signal, a second input which is coupled to an output of a clock signal generator at least via a frequency divider and a control signal output which is coupled to a control signal input of the clock signal generator, characterized in that the signal path between the control signal output of the phase detector and the second input thereof incorporates a comb filter circuit by which the phase of a signal applied to the second input of the phase detector is controlled faster for jumps in an output signal of the phase detector at a frequency to which the comb filter circuit is tuned than for jumps in said output signal at different frequencies.

4,926,261

VIDEO NOISE REDUCTION CIRCUIT

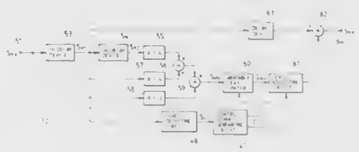
Hiroaki Matsumoto, Chiba; Tetsuya Senda, Kanagawa, and Tokuya Fukuda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 6, 1989, Ser. No. 306,382

Claims priority, application Japan, Feb. 10, 1988, 62-029824

Int. Cl.[5] **H04N** *5/21*

U.S. Cl. 358—167 **10 Claims**



1. A noise reduction circuit for reducing noise contained in an input signal, the circuit comprising:

input means for receiving an input signal that includes a signal component containing noise;

filter means connected to the input means for receiving the input signal and extracting the signal component containing noise from the input signal;

variable level limiting means connected to the filter means for limiting a level of the signal component extracted by the filter means to produce a noise suppressing signal;

level adjusting means connected to the level limiting means for adjusting a level of the noise suppressing signal;

level detecting means connected to the input means for receiving the input signal and producing a detection signal indicating a level of the input signal;

control signal generating means connected to said level detecting means for generating first and second control signals in response to said detection signal, supplying said first control signal to said level limiting means so as to control a limit level of said level limiting means, and supplying said second control signal to said level adjusting means so as to control a gain of said level adjusting means;

signal subtracting means connected to the input means and the level adjusting means and responsive to the input signal and the noise suppressing signal from said level adjusting means so that the noise suppressing signal is added with reversed polarity to the input signal so as to suppress the noise contained in the input signal; and

output means connected to said signal subtracting means for supplying an output signal derived from the signal subtracting means.

4,926,262

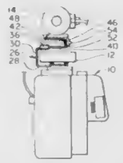
VIEW FINDER BRACKET FOR VIDEO CAMERA

Frank J. Rowens, Sr., 310 E. 116th St., Los Angeles, Calif. 90061

Filed Aug. 4, 1988, Ser. No. 228,067

Int. Cl.[5] **H04N** *5/225*

U.S. Cl. 358—229 **4 Claims**



1. A bracket for a video camera comprising a base portion, said base portion having an upper surface and a bottom surface, means on the bottom surface for engaging and locking the base portion of the bracket to the upper surface of the video camera, a wall integral with the base portion bent upward from one end of the base portion a distance greater than the height of any other attachment to be secured to the upper surface of the base portion of the bracket and then bent in a direction extending toward the opposite end of the base thereby defining an upper wall, a view finder support mounted over the upper wall, said view finder support having means for engaging and locking a view finder on the support in upwardly spaced relationship to the base portion of the bracket and above any attachment mounted on the base portion of the video camera.

4,926,263

SYNCHRONIZING CIRCUIT FOR OPTICAL SCANNING APPARATUS

Kenji Yokota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 19, 1988, Ser. No. 246,386

Claims priority, application Japan, Sep. 18, 1987, 62-234409

Int. Cl.[5] **H04N** *1/04, 1/36*

U.S. Cl. 358—474 **11 Claims**

7. A synchronizing signal generating circuit applied to an optical scanning apparatus, said synchronizing signal generating circuit generating a synchronizing signal used to achieve synchronization of writing of an image in the horizontal direction in response to a signal output from a photo sensor which outputs a signal when it detects a light moved in the horizontal

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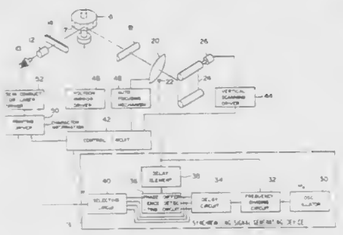
scanning direction by a horizontal scanning means, comprising:

an oscillator for generating a series of clock pulses having a predetermined frequency;

a frequency dividing circuit for receiving the output signal of said photo sensor and the clock pulse train and for dividing the frequency of said clock pulse train to a predetermined value when it receives the output signal of said photo sensor;

a delay circuit for receiving the clock pulse train whose frequency has been divided and for successively delaying the position of said clock pulse train by a predetermined time interval when it produces output signals;

a delay element for receiving the output signal of said photo



sensor and for producing a predetermined time interval between input said signal of said photo sensor and the appearance of the same signal at its output;

a phase difference detecting circuit for receiving the output signal of said delay circuit and the output signal of said delay element and for outputting a phase difference determining signal when it detects among the output signals of said delay circuit the output signal whose phase difference is at a minimum with respect to the output signal of said delay element; and

a selecting circuit for receiving the output signals of said delay circuit and said phase difference determining signal and for selecting among the output signals of said delay circuit said output signal which is most closest in phase on the basis of said phase difference determining signal.

4,926,264

ADDRESSABLE TERMINAL FOR CATV

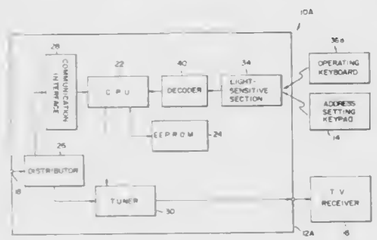
Tamio Ohno; Kousaku Yoshida, both of Tokyo, and Masaki Kitagawa, Osaka, all of Japan, assignors to NEC Corp. and NEC Home Electronics Ltd., both of, Japan

Filed Oct. 23, 1987, Ser. No. 112,819

Claims priority, application Japan, Oct. 27, 1986, 61-253722

Int. Cl.[5] H04N *7/167*

U.S. Cl. 358—349 **6 Claims**



1. An addressable terminal apparatus for cable television comprising: a terminal housing which contains a storage device for storing an address indicative of said terminal, said terminal including means for comparing the stored terminal address with an external terminal address which is part of an incoming terminal control signal and, means for operating said terminal as instructed by the control signal if said stored terminal address matches the incoming external terminal address received, thereby deciding that the control signal is meant for said terminal, the improvement wherein said storage device is electrically erasable to rewrite address data stored therein, and an exclusive remote control unit sets a new terminal address by writing the new terminal address into said storage device from a location outside of said terminal housing whereby the terminal address in said storage device is set and changed as needed.

4,926,265

APPARATUS AND METHOD FOR PREVENTING PAPER INTERFERENCE IN A RECORDING DEVICE

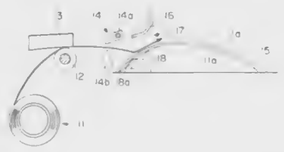
Kiyoshi Yamazaki, and Muneki Chnubachi, both of Hino, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jan. 13, 1989, Ser. No. 296,597

Claims priority, application Japan, Jan. 13, 1988, 63-2737[U]

Int. Cl.[5] H04N *1/21*

U.S. Cl. 358—304 **18 Claims**



1. A recording apparatus for recording information on a recording medium having a curved characteristic, said recording apparatus comprising:

recording means for recording information on a section of the recording medium thereby forming a recorded section;

cutting means for cutting off the recorded section of the recording medium at a cutting position;

transporting means for transporting the recorded section of the recording medium from said recording means to said cutting means; and

support means adjacent said cutting means for guiding the recorded section exiting said cutting means and for supporting the rear end of previously cut off recorded sections, said support means being wedge-shaped with a surface extendable along at least a portion of the rear end of cut off recorded sections to prevent the curling of any cut off recorded sections from interfering with the operation of said cutting means.

4,926,266

METHOD OF DECODING IN RUN REPRESENTATION

Yoshiaki Kurosawa, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 16, 1988, Ser. No. 246,117

Claims priority, application Japan, Sep. 21, 1987, 62-234779

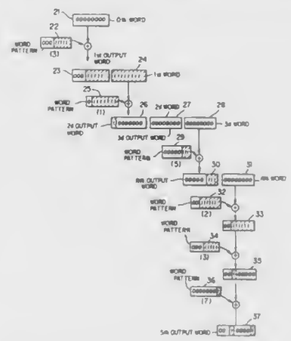
Int. Cl.[5] H04N *1/419*

U.S. Cl. 358—426 **14 Claims**

1. A method of decoding word units of image data in run representation including position information or length information into bit pattern data corresponding to an original image, comprising the steps of:

retrieving in response to the position information or length information at least one predetermined word pattern containing a plurality of bits arranged in a predetermined bit

pattern from a plurality of stored word patterns, each having a different predetermined bit pattern; and



processing each retrieved word pattern into bit pattern data corresponding to a word unit portion of the original image.

4,926,267

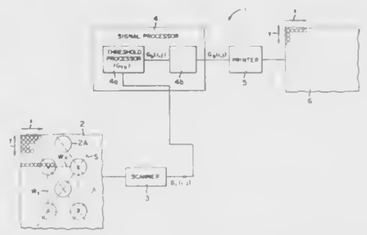
REPRODUCTION OF HALFTONE ORIGINAL WITH REDUCED MOIRE

Joseph S. Shu, White Plains, N.Y.; Robert Springer, Wyckoff, N.J., and Chia L. Yeh, Saratoga, Calif., assignors to Nynex Corporation, New York, N.Y.

Filed May 26, 1989, Ser. No. 358,061

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—454 **38 Claims**



1. A method for use in reproducing a halftone original having extent along first and second directions, the original being formed from halftone dots situated along a screen direction and having a spatial frequency f_{SCR} and period P_{SCR} in the screen direction comprising:

providing gray level values for an array of pixels extending over the original, the pixels having a first spatial frequency f_{SCA1} in said first direction and a corresponding first period P_{SCA1} in said first direction;

developing a first gray level value for each pixel of the array whose gray level value equals or exceeds a threshold gray level value and developing a second gray level value for each pixel of the array whose gray level value is less than the threshold gray level value, said first and second gray level values defining a set of thresholded gray level values for said pixels;

determining from said set of thresholded gray level values adjacent pairs of pixels of the array in the first direction whose thresholded gray level values are different, each adjacent pair of pixels bordering a corresponding halftone dot;

determining from the gray level values of the pixels an edge error e_1 equal to d_1/P_{SCA1}, where d_1 is the approximate distance along the first direction between the center of the pixel of the pair whose thresholded value is equal to said first gray level value and the closest edge of the corresponding halftone dot;

and processing said thresholded gray level values of said pixels of said array including: (a) using a processing window to define successive sub-arrays of said pixels and for each sub-array of pixels: (i) adding the edge errors $e_1$for the determined adjacent pairs of pixels included in the sub-array to form a sum S_1; and (ii) for the pixels having thresholded second gray level values and being in the determined adjacent pairs of pixels, starting with the pixel of the adjacent pair of pixels having the highest edge error and continuing with further pixels of the adjacent pairs of pixels in the order of descending edge error, changing the thresholded gray level values of the pixels from said second to said first threshold gray level value until the thresholded gray level values of M pixels have been changed, where M is the closest integer to the sum S_1.

4,926,268

IMAGE PROCESSING APPARATUS WHICH CONVERTS M-BIT IMAGE DATA TO N-BIT (N>M) IMAGE DATA

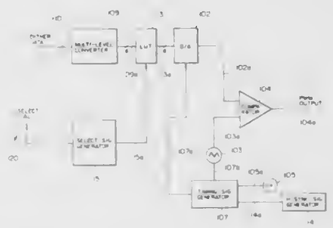
Naoto Kawamura, Yokohama; Yuji Nishigaki, Odawara, and Hidefumi Ohsawa, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 13,629, Feb. 11, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 282,896

Claims priority, application Japan, Feb. 14, 1986, 61-29071; Mar. 6, 1986, 61-49172; Apr. 4, 1986, 61-76680

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—458 **27 Claims**



1. An image processing apparatus comprising:

image data information means for generating m-bit halftone-processed image data;

conversion means for converting the m-bit image data generated by said image data generation means into n-bit (n>m) image data; and

pulse-width modulation signal generation means for processing the n-bit image data output from said conversion means and generatinq a pulse-width modulation signal.

4,926,269

METHOD OF READING AND DISPLAYING AN IMAGE IN AN INFORMATION FILING APPARATUS

Sakuharu Takano; Toshiki Nishibori, both of Nara, and Yuji Katsuta, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 31, 1988, Ser. No. 264,827

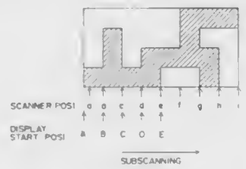
Claims priority, application Japan, Oct. 31, 1987, 62-276574

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—474 **2 Claims**

1. A method for scanning and displaying a plurality of image portions representative of an image in an information filing apparatus on display means capable of displaying a portion of the image, said method comprising the steps of:

(a) sequentially scanning a predetermined number of the plurality of image portions, said predetermined number of image portions corresponding to an image display in a predetermined area of the display means;
(b) displaying said predetermined number of image portions on said predetermined area of the display means in response to sequentially scanning each of said predetermined number of image portions;
(c) scanning a subsequent image portion in the plurality of image portions;
(d) sequentially scrolling said image portions being displayed on the display means in response to and synchronized with



step (c) said predetermined number of image portions including said subsequent image portion, but without a precedentially scanned image portion of said predetermined number of image portion for providing a scrolled image;
(e) displaying said scrolled image on the display means in synchronization with step (d);
(f) repeating steps (c)–(e) for the remainder of the plurality of image portions; and
(g) displaying a last image portion for the plurality of image portions in a remaining area of said predetermined area on the display means.

4,926,270

DRIVING METHOD FOR A STEPPING MOTOR AND SHEET CONVEYING APPARATUS USING THE DRIVING METHOD

Masahiro Sakamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 157,637
Claims priority, application Japan, Feb. 16, 1987, 62-31580
Int. Cl.[5] H04N *1/10*; H02P *8/00*
U.S. Cl. 358—498 **12 Claims**



1. A driving method for a stepping motor provided with:
the time detracting step of detecting the time interval between the generation of two drive commands;
the rate setting step of setting a pulse rate in conformity with the time interval detected by said time detecting step; and
the driving step of driving the stepping motor at the pulse rate set by said rate setting step.

5. A sheet conveying apparatus for conveying a sheet by the use of a stepping motor, having:
sheet conveying means for conveying a sheet;
a stepping motor for driving said sheet conveying means;
time detecting means for detecting the time interval between the generation of two sheet conveyance commands for conveying said sheet;
rate setting means for setting a pulse rate in conformity with the time interval detected by said time detecting means; and
driving means for driving said stepping motor at the pulse rate set by said rate setting means.

11. A reading apparatus for reading information on the surface of an original, having:
original conveying means for conveying the original:
a stepping motor for driving said original conveying means;
reading means for reading the image bearing surface of the original conveyed by said original conveying means; time detecting means for detecting the time interval between the generation of two conveyance commands for conveying said original;
rate setting means for setting a pulse rate in conformity with the time interval detected by said time detecting means; and
driving means for driving said stepping motor at the pulse rate set by said rate setting means.

4,926,271

RECORDING REPRODUCING CONTROL CIRCUIT FOR RECORDING APPARATUS

Hidehiko Aoki, and Yoshihiko Kanbara, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 27, 1988, Ser. No. 224,954
Claims priority, application Japan, Jul. 29, 1987, 62-189401
Int. Cl.[5] G11B *15/12*
U.S. Cl. 360—62 **5 Claims**



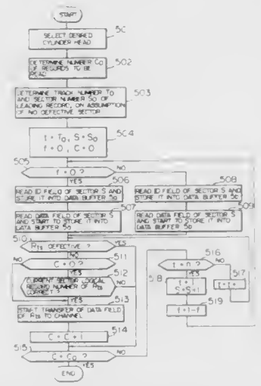
1. A control circuit for a recording and reproducing apparatus comprising:
a single magnetic head for recording and reproducing signals corresponding to data on a recording medium;
recording circuit means for supplying a recording signal to be recorded to the magnetic head;
reproducing circuit means for amplifying a reproduced signal detected from the recording medium by the magnetic head; and
switch means for selectively shifting the apparatus between a recording phase wherein the recording circuit means is activated, and a reproducing phase wherein the reproducing circuit means is activated;
wherein the reproducing circuit means includes capacitor means for storing an electric charge during operation of the apparatus, and buffer means coupled between the capacitor means and a DC bias source, for maintaining the charge stored by the capacitor means at a substantially constant level when the switch means shifts between the recording phase and the reproducing phase, said buffer means including an output coupled to the capacitor means, which presents a high impedance and a low impedance for the recording phase and the reproducing phase, respectively.

4,926,272

METHOD FOR CONTROLLING A ROTATING STORAGE UNIT

Hisashi Takamatsu; Hisaharu Takeuchi, and Mamoru Tohchi, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 39,571
Claims priority, application Japan, Apr. 16, 1986, 61-85910
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—49 **20 Claims**



1. An apparatus for in parallel transferring a logical arrangement of data records, the data records including data field data and identification field data, between a plurality of heads of the storage unit and a cylinder formed of at least one track of each of a plurality of coaxially stacked disks of a recording medium, the apparatus comprising:
means for accessing in parallel the data records in the logical arrangement of sectors in a different track of the same cylinder;
means for reading identification field data from each data record of sectors accessed in parallel by the accessing means;
means coupled to the reading means for ascertaining a defective sector of the cylinder from a data record in the logical arrangement on a basis of read identification field data to determine a next non-defective sector from a data record in the logical arrangement; and
means responsive to the determination of the ascertaining means for assigning the data record of the next non-defective sector to replace the data record of the defective sector.

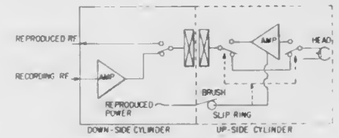
4,926,273

APPARATUS AND METHOD FOR RECORDING AND REPRODUCING INFORMATION SIGNALS

Koichi Tabochi, and Shigeo Kizu, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 10, 1988, Ser. No. 205,338
Claims priority, application Japan, Jun. 11, 1987, 62-144065
Int. Cl.[5] G11B *15/14*, *5/52*
U.S. Cl. 360—64 **11 Claims**

11. A method for supplying operating power to signal processing circuits mounted in a rotating head assembly of information signal recording and reproducing apparatus, the apparatus including a rotary transformer having a fixed winding and a rotating winding for transmitting information signals from the rotating head assembly, the head assembly operating over repetitive cycles, each cycle including a first time period when recording and reproducing operations may take place and a second time period when recording and reproducing operations are not possible, the method comprising the steps of:
generating power signals;
transmitting information signals from the rotating head assembly only during the first time period; and



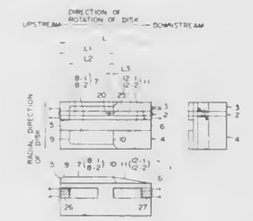
transmitting power signals to the rotating head assembly only during the second time period; and
converting the power signals to operating power for the signal processing circuits.

4,926,274

MAGNETIC HEAD APPARATUS HAVING SURFACES CONTOURED TO MINIMIZE FRICTION BETWEEN A MAGNETIC HEAD AND A MAGNETIC DISK

Mitsuyoshi Saitoh, Kanagawa, and Kunio Sekine, Yokohama, both, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 1, 1987, Ser. No. 127,090
Claims priority, application Japan, Dec. 4, 1986, 61-289284; Dec. 4, 1986, 61-289286; Dec. 4, 1986, 61-289287; Sep. 1, 1987, 62-216319
Int. Cl.[5] G11B *5/60*
U.S. Cl. 360—102 **31 Claims**



1. A magnetic head apparatus for recording and reproducing data, on and from a flexible magnetic disk, comprising:
a magnetic head; and
a support mechanism for supporting said magnetic head, said support mechanism having a first axis extending in a radial direction of the disk and passing through a rotating center of the head, which is capable of rotating the head around the first axis, and which applies a pressing force to the head, air flowing in a circumferential direction of the disk, when the disk is rotated;
said magnetic head comprising,
a leading edge located upstream of the air flow,
a trailing edge located downstream of the air flow,
a flat surface opposing to the disk, and having a leading end and a trailing end respectively located upstream and downstream of the air flow, a distance between said trailing edge and the disk being longer than a distance between the trailing end of said flat surface and the disk, said flat surface having a midpoint between the leading and trailing ends thereof,
a second surface opposing to the disk and connecting between said trailing edge and the trailing end of said flat surface, and
magnetic gaps arranged on that portion of said flat surface

VOL 1114 ISS 3 MY 15 1990 UMI

which is located between the midpoint and the trailing end thereof,

wherein, when the disk is rotated at a predetermined speed and the support mechanism applies a predetermined pressing force to the head, an air bearing force is generated and acts on said flat surface and produces a net moment about said first axis so that said head is thereby rotated around the first axis with the leading end moving away from the disk and the trailing end being pressed onto the disk, so that said portion of said flat surface can contact the disk and said magnetic gaps are located sufficiently close to the disk.

4,926,275

MAGNETIC HEAD CARRIAGE MECHANISM FOR A MAGNETIC DISK

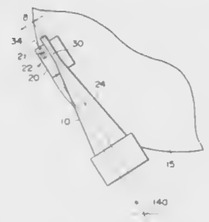
Hiroyuki Kuno, and Yujirou Iino, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1988, Ser. No. 172,404

Claims priority, application Japan, Mar. 30, 1987, 62-76720

Int. Cl.[5] G11B *5/55*

U.S. Cl. 360—106 **6 Claims**



1. A magnetic head carriage mechanism for a magnetic disk, comprising:

a head arm rotatable around a vertical axis;

a spring member fixed to the head arm;

a generally rectangular slider supported by the spring member, having a first longitudinal central axis perpendicular to the vertical axis of the head arm, said slider, spring member, and head arm being arranged in a generally straight line along the first longitudinal axis;

a generally rectangular magnetic head fixed to the slider offset a predetermined distance from the first longitudinal axis, said magnetic head including a magnetic gap having a width extending in a direction perpendicular to the first longitudinal axis, said magnetic head having a second longitudinal central axis extending through the center of and perpendicular to the width of the magnetic gap, said magnetic head being arranged such that an extension of the second longitudinal axis passes through the vertical axis of the head arm and is parallel to the first longitudinal axis; and

means for rotating the head arm.

4,926,276

MAGNETIC HEAD HAVING REINFORCING BLOCK

Tsuyoshi Orikasa, Kasukabe; Fujihiro Ito, Tsurugashima; Hiroyuki Suzuki, Yokohama; Makoto Kameyama, Urayasu; Kiyozumi Nitzuma, Ohmiya; Kazuyo Yoshida, and Toshio Yamanaka, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 155,084

Claims priority, application Japan, Feb. 20, 1987, 62-37203

Int. Cl.[5] G11B *5/16, 5/22*

U.S. Cl. 360—126 **8 Claims**

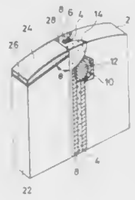
1. A magnetic head comprising:

(a) a block formed of a first magnetic material in which a groove for a winding is formed;

(b) a first magnetic film deposited on a surface of said block in which said groove is formed, being formed of a second magnetic material having a higher saturation magnetic flux density than that of said first magnetic material;

(c) a nonmagnetic film deposited on said first magnetic film serving as a magnetic gap;

(d) a second magnetic film formed of the second magnetic material deposited on said nonmagnetic film; and



(e) a reinforcing block contacting said second magnetic film;

wherein a portion of said reinforcing block on a side of a magnetic recording medium slide surface is formed of a nonmagnetic material and another portion is formed of a magnetic material, and

a magnetic material-side boundary surface between the nonmagnetic material portion and the magnetic material portion forming an acute angle with said nonmagnetic film in said reinforcing block.

4,926,277

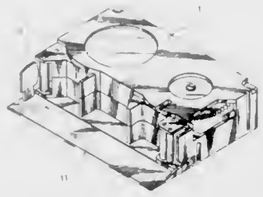
STRUCTURE IMPROVEMENT OF CLEANER TAPE CARTRIDGE FOR VIDEO TAPE RECORDER/PLAYER

Ku T. Huang, San Chung, Taiwan, assignor to Ku Te Haung, San Chung, Taiwan

Filed Sep. 21, 1988, Ser. No. 247,482

Int. Cl.[5] G11B *5/41*

U.S. Cl. 360—128 **1 Claim**



1. A cleaner tape cartridge for a video machine having a hinged cover on one edge of the cartridge and an ultraviolet opaque blockader plate for blocking the ultraviolet rays of an automatic rewinding mechanism from passing through a video cleaning tape to reach a cooperating receiver, the plate projecting from an inner surface of the cover and extending transversely of the cover and located adjacent and inwardly of one end of the cover so that the plate is located inside the cartridge when the cover is closed.

4,926,278

MAGNETIC TAPE CASSETTE APPARATUS HAVING REDUCED AZIMUTH ERROR

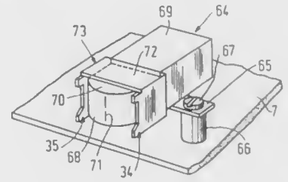
Johannes J. M. Schoenmakers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 558,069, Dec. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 537,893, Sep. 30, 1983, abandoned. This application Jan. 23, 1989, Ser. No. 302,078

Claims priority, application Netherlands, Feb. 28, 1983, 8300730

Int. Cl.[5] G11B *15/60*

U.S. Cl. 360—130.21 **22 Claims**



1. A magnetic tape cassette apparatus comprising:

a head mounting plate;

a magnetic head unit carried on said plate, said unit comprising a recording and/or playback magnetic head having a cylindrically curved head face in which at least one air gap terminates;

a head mount including two tape guides, arranged one to each side of the air gap in the direction of tape transport, said guides each having a cylindrically curved guide surface and a height limiter at an axial end of the guide surface, said height limiters adjoining the respective guide surfaces along a line through the two height limiters, said line being perpendicular to a plane through the air gap perpendicular to the head face at the air gap; and control means disposed at the other axial ends of the guide surfaces for guiding a lateral tape edge so as to cause the other lateral tape edge to be maintained in constant contact with the respective height limiter during tape transport; and

means for transporting a magnetic tape past said magnetic head and over said tape guides,

characterized in that said control means consist of an obliquely disposed control surface adjoining each of the respective guide surfaces arranged such that the distance from the control surface of the tape guide to the respective height limiter decreases in a direction toward the guide surface; and in that said control surfaces, guide surfaces and height limiters form an integral unit with the head mount.

4,926,279

MAGNETIC TAPE CASSETTE

Satoru Kurashina, and Hiroshi Meguro, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 281,761

Claims priority, application Japan, Dec. 29, 1987, 62-199244[U]

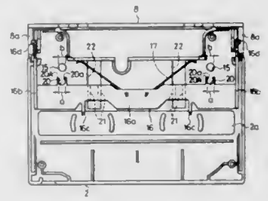
Int. Cl.[5] G11B *23/087*

U.S. Cl. 360—132 **5 Claims**

1. A magnetic tape cassette having a cassette housing formed of an upper part and a lower part combined during assembly to form a unit, a front lid that can be moved between an open position in which it opens the cassette housing and a closed position in which it closes the cassette housing, a pair of reel hubs rotatably mounted within the cassette housing for winding a tape thereon, a braking member mounted within the cassette housing in such a manner as to be slidable in a front to back direction, and means for moving said braking member slidably over a given range backward to lock the reel hubs from being rotated when the front lid is moved to the closed position and forward to release said reel hubs from a locked state when the front lid is moved to the open position, said magnetic tape cassette comprising:

a fixing portion provided on said upper part; and

an engaging portion provided on said braking member, said engaging portion being engageable with said fixing portion with a small pressure when said braking member is located at a position outside said range, whereby said braking member can be temporarily secured to said upper part by engaging said engaging portion with said fixing portion with a small pressure during assembly and released after said upper part and said lower part are combined to form said unit, said braking member then becoming slidable only within said range.



4,926,280

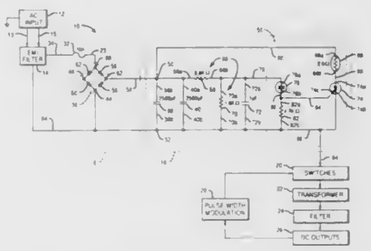
CAPACITOR PROTECTION CIRCUIT FOR PROTECTING STORAGE CAPACITORS IN AN ELECTRONIC POWER SUPPLY

Jeff T. Richter, Apopka, and Elbert E. Seignemartin, Altamonte Springs, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 6, 1989, Ser. No. 432,453

Int. Cl.[5] H02H *3/24*

U.S. Cl. 361—15 **21 Claims**



1. A capacitor protection circuit for protecting a capacitor in an electronic circuit, said electronic circuit comprising:

a fuse having a first end connected to an AC input; and

at least one diode connecting a second end of said fuse to a first end of said capacitor with a second end of said capacitor being connected to ground;

said capacitor protector circuit comprising:

a voltage divider connected across said capacitor;

first thyristor means also connected across said capacitor; and

second thyristor means coupling said voltage divider and said first thyristor means;

said second thyristor means triggering said first thyristor means to conduct, causing an excessive amount of current

VOL 1114 ISS 3 MY 15 1990 UMI

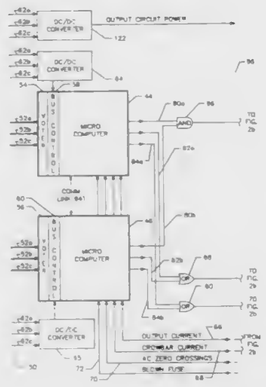
to flow through said fuse to uncouple said electronic circuit from said AC input when the voltage across said capacitor exceeds a predetermined voltage.

4,926,281

FAIL-SAFE AND FAULT-TOLERANT ALTERNATING CURRENT OUTPUT CIRCUIT

Kenneth J. Murphy, West Hills, Calif., assignor to Triplex, Torrance, Calif.

Filed Feb. 27, 1989, Ser. No. 316,172
Int. Cl.[5] H02H *3/20*
U.S. Cl. 361—55 **17 Claims**



1. A fail-safe output circuit for controlling an alternating-current (ac) load supplied from two lines from an ac power source, the circuit comprising:

two ac power lines;

a fuse connected in one of the ac power lines;

an output switch connected in series with the fuse;

two crowbar switches connected in series across the ac power lines;

means for closing the crowbar switches together and blowing the fuse to disconnect the load in the event that the output switch fails to open on command; and ,

wherein said means for closing includes means for closing the crowbar switches independently to test their operation without blowing the fuse.

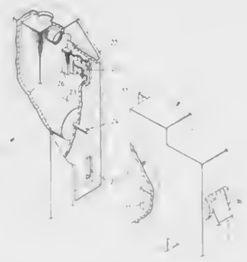
4,926,282

ELECTRIC CIRCUIT BREAKING APPARATUS

Terence V. McGhie, Blackburn, United Kingdom, assignor to BICC Public Limited Company, London, England

Filed Jun. 13, 1988, Ser. No. 206,103
Claims priority, application United Kingdom, Jun. 12, 1987, 8713791
Int. Cl.[5] H02H *3/08*
U.S. Cl. 361—102 **9 Claims**

1. An electric circuit breaker for protecting an electric circuit of an electrical installation of a building, which circuit breaker comprises a switching unit comprising a case of electrically insulating material housing a fixed contact and a movable contact, a tripping mechanism for causing the movable contact to move to the break position, and a manually operable spring-loaded dolly which protrudes through a wall of the case and which is operatively coupled to the tripping mechanism; an over-current release unit comprising a case of electrically insulating material, separately formed with respect to the case of the switching unit, housing an electromagnetic device which is detachably operatively mechanically coupled to the tripping mechanism of said switching unit and which is adapted to be electrically interconnected in a power circuit independent of the circuit to be protected and current sensing means for continuously providing an output signal which is a function of the current flowing through the circuit to be protected, said switching unit and said over-current release unit being so detachably electrically connected together that at least a predetermined proportion of current which will flow through the circuit to be protected will flow through the switching unit; and, electrically connected to the current sens-



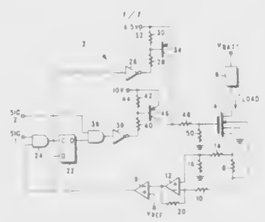
ing means, a microprocessor which can be so programmed that, in the event any one of an over-current at least equal to a predetermined instantaneous tripping current, a sustained overload reaching a predetermined unacceptable value of current for a predetermined time and a predetermined unacceptable combination thereof, a current is caused to flow through said independent power circuit to operate the electromagnetic device and thereby initiate operation of the tripping mechanism of the switching unit.

4,926,283

TEMPERATURE PROTECTED TRANSISTOR CIRCUIT AND METHOD OF TEMPERATURE PROTECTING A TRANSISTOR

John Qualich, Wheeling, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Aug. 30, 1989, Ser. No. 400,903
Int. Cl.[5] H02H *5/04*
U.S. Cl. 361—103 **11 Claims**



1. A temperature protected transistor circuit, comprising a first transistor;

first means for applying to the transistor a first voltage substantially less than a predetermined voltage required to render the transistor conductive at normal temperature;

second means for detecting whether the transistor conducts in response to the first voltage applied by the first means; and

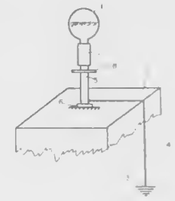
third means, responsive to the second means not detecting conduction of the transistor, for enabling the transistor by applying thereto a second voltage at least equal to the predetermined voltage, and, responsive to the second means detecting conduction of the transistor, for disabling the transistor so as to prevent damage thereto.

4,926,284

LIGHTNING PROTECTION DEVICE FOR INTERACTING WITH LEADER STROKE TO PREVENT RETURN STROKE

Manghi Eugenio, Varese, Italy, assignor to ISPE S.a.s. di Erminio GIANA e C., Busto Arsizio, Italy

Filed Mar. 21, 1985, Ser. No. 714,684
Int. Cl.[5] H02H *3/22*
U.S. Cl. 361—117 **3 Claims**



1. A lightning protection device for satisfying the charge requirements of an initial downwardly travelling leader stroke of a lightning flash to avoid the formation of a subsequent upwardly travelling return stroke, comprising an atmospheric electrode having a dome-shaped top area with a selected radius, a varistor connected to said atmospheric electrode, said varistor being structured to become conductive at an electric field value on the atmospheric electrode which is slightly less than a critical value at which the return stroke of the lightning flash would be formed, a conductor connected to said varistor and an earth electrode connected to said conductor; said atmospheric electrode, said varistor, said conductor and said earth electrode being connected in series, said atmospheric electrode being made of conductive material with said selected radius being sufficiently large to permit storage of sufficient charge from the leader stroke before a corona effluvium phenomenon occurs from the atmospheric electrode, whereby the charge of the downwardly travelling leader stroke is satisfied by said varistor becoming conductive to avoid formation of the following return stroke of the lightning flash.

4,926,285

ELECTROSTATIC DISCHARGE SIMULATOR WITH HIGHLY REPRODUCIBLE WAVE-FRONT

Nicholas Reinhardt, Lexington, and Geoffrey M. Weil, Cambridge, both of Mass., assignors to KeyTek Instrument Corp., Wilmington, Mass.

Filed Jun. 29, 1988, Ser. No. 212,954
Int. Cl.[5] H01T *23/00*
U.S. Cl. 361—230 **9 Claims**



1. In an apparatus for applying to equipment under test a test electrostatic discharge through a conductive test tip in direct physical and electrical contact with an electrically conductive point on said equipment, said apparatus including a discharge capacitor series-connected through a filter circuit to an input terminal of switching means for selectively applying a discharge from said capacitor to said test tip, the improvement wherein:

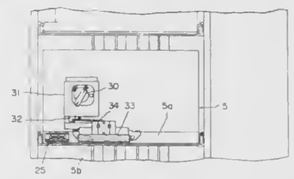
said switching means comprises a relay, the contacts of which are disposed in an atmosphere of a pressurized gas having a high dielectric strength relative to air at atmospheric pressure.

4,926,286

ENCLOSED SWITCHBOARD

Kazuyoshi Maki; Sadami Harada, and Takanori Nakashima, all of Saga, Japan, assignors to Togami Electric Mfg., Co., Ltd., Saga, Japan

Filed Sep. 16, 1988, Ser. No. 245,882
Claims priority, application Japan, Sep. 24, 1987, 62-240483
Int. Cl.[5] H02B *1/14*
U.S. Cl. 361—345 **15 Claims**



1. An enclosed switchboard comprising a panel frame means, fixed contacts on said panel frame means, moveable contact frame means moveably mounted on said panel frame means, said moveable contact frame having moveable contacts, said moveable contact frame means being moveable between at least one operable position wherein at least one of said moveable contacts is in contact with at least one of said fixed contacts and a second operable position wherein said at least one moveable contact is out of contact with said at least one fixed contact, operable means operably connected between said moveable contact frame means and said panel frame means for moving said moveable contact frame means between said first and second operable positions, said operable means having handle-receiving means for receiving a handle which is operable to move said moveable contact frame means between said first and second operable positions, said panel frame means having a handle access opening through which said handle extends when said handle is disposed in said handle-receiving means, a shutter means mounted on said panel frame means for movement between a blocking position and a non-blocking position, said shutter means in said non-blocking position being clear of said handle access opening to thereby permit said handle to be inserted into said handle-receiving means and to move said moveable contact frame means between said first and second operable positions, said shutter means in said blocking position blocking at least a portion of said handle access opening to prevent said handle from being inserted into said handle-receiving means and thereby precluding movement of said moveable contact frame means between said first and second operable positions, and actuating means for actuating said shutter means between said blocking and non-blocking positions.

4,926,287

SPRING LOADED HAND OPERATED EXTRACTION/INSERTION LINE REPLACEABLE MODULE (LRM) LEVER

Herman Rossman, Randallstown, Md., and Sharon A. Duggan, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

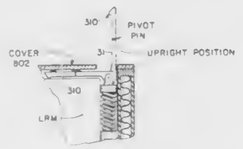
Filed Mar. 23, 1989, Ser. No. 327,939
Int. Cl.[5] H05K *7/14*
U.S. Cl. 361—392 **1 Claim**

1. In an electronic plug-in module which is mounted in a chassis which has a cover, and which has a positive locking mechanism with a lever/driver blade which permits the electronic plug-in module to be installed and removed from the

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chassis without tools, when said lever/driver blade is lifted into a vertical position by disengaging from said chassis, wherein the improvement comprises:

a pivotal thumb grip which is pivotally attached to said lever/driver blade and which permits personnel wearing gloves to lift said lever/driver blade into said vertical position by automatically springing into a graspable position when said cover is removed from said chassis, wherein said pivotal thumb grip and said lever/driver blade each have a set of interconnecting lugs which may be axially aligned so that they have a common axis through which a pin may be inserted to pivotally interconnect them;



a means for springing said pivotal thumb grip into said graspable position when said cover is removed from said chassis, wherein said springing means comprises a spring which is coiled around said hinge pin, said spring having ends that abut said lever/driver blade and said pivotal thumb grip so that it provides a constant impulse that tends to push said pivotal thumb grip into said graspable position; and

a compressible stop which is fixed to said cover and which depresses said pivotal thumb grip so that said positive locking mechanism locks said electronic plug-in module into said chassis when said cover is installed on said chassis.

4,926,288

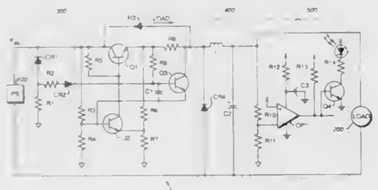
OVER-CURRENT PROTECTION CIRCUIT

Donald A. Bradley, Morgan Hill, Calif., assignor to Wiltron Company, Morgan Hill, Calif.

Filed Mar. 31, 1988, Ser. No. 175,957

Int. Cl.[5] H02H *3/08*

U.S. Cl. 361—101 **6 Claims**



1. A circuit for protecting an electronic system and its power supply from an over-current condition, comprising:

channel means responsive to a first control signal for passing an electric current from said power supply to said electronic system, said channel means including a first transistor having a first current electrode, a second current electrode and a first control electrode, said first current electrode being connectable to said power supply, said second current electrode being connectable to said electronic system and said first control electrode receiving said first control signal;

first control means for supplying said first control signal to said channel means, said first control means including a second transistor having a third current electrode, a fourth current electrode and a second control electrode, said first control means further including means for biasing said second control electrode at a first predetermined voltage and means for biasing said third current electrode at a second predetermined voltage so that a signal is provided at said fourth current electrode, said signal being provided to said first control electrode as said first control signal;

sensor means coupled to said channel means for sensing said electric current passing through said channel means; and

second control means coupled to said sensor means for disabling said first control means by positive feedback action of said electric current, when said electric current passing through said channel means exceeds a predetermined value.

4,926,289

ACTIVELY SHIELDED, SUPERCONDUCTING MAGNET OF AN NMR TOMOGRAPHY APPARATUS

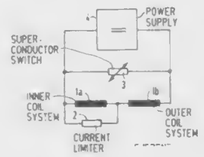
Thomas Reichert, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,210

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723741

Int. Cl.[5] G01R *33/20;* **H01F** *7/22*

U.S. Cl. 361—141 **8 Claims**



1. An actively shielded, superconducting magnetic system comprising:

an inner magnetic coil system operable in a superconducting state;

an outer magnetic coil system operable in a superconducting state connected in series with said inner magnetic coil system and having a magnetic field direction opposite to said inner magnetic coil system;

a superconducting permanent switch connected across said inner and outer coil systems in series; and

current limiter means connected across one of said inner or outer magnetic coil systems for carrying a difference current between said inner and outer magnetic coil systems at least during normal operation in a superconducting state of said inner and outer magnetic coil systems, said current limiter means consisting of superconductor material and becoming normally conductive when a predetermined difference current is exceeded to thereby limit the current difference between said inner magnetic coil system and said outer magnetic coil system.

4,926,290

SNAP ON FUSE COVER

Dennis S. Mizerak, Brunswick, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

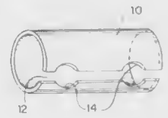
Division of Ser. No. 96,174, Sep. 11, 1987, Pat. No. 4,841,413. This application Feb. 6, 1989, Ser. No. 307,022

Int. Cl.[5] H02B *1/00*

U.S. Cl. 361—380 **3 Claims**

1. A fuse cover for covering spaced fuse connectors, on a circuit board, comprising:

a tubular member being made of resilient transparent insulating material and having opposite ends and an axially extending slot for receiving the connectors, said axially extending slot having recesses which are spaced apart in



said slot to conform to the spacing of the spaced fuse connectors on the board, said cover being adapted to slide across the spaced fuse connectors to allow said recesses to engage the connectors.

4,926,291

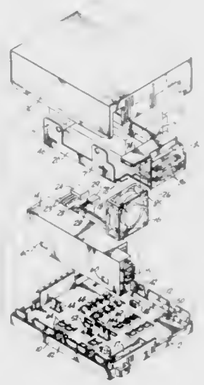
DATA STORAGE MOUNTING ASSEMBLY

Mohammad Sarraf, Irvine, Calif., assignor to Western Digital Corporation, Irvine, Calif.

Filed Jul. 31, 1989, Ser. No. 387,703

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—384 **14 Claims**



1. A data storage assembly comprising:

a base;

a receptacle having side walls integral with the base and projecting from the base, the receptacle being configured to fit around a portion of a fan housing so the fan housing is releasably contained on the base by surrounding walls of the receptacle;

a frame carried on the base and having a flange for extending over the fan housing; and

shock and vibration isolation means between the flange and the fan housing for dampening shock and fan vibrations when the fan contained in the fan housing is operated under conditions sufficient to cool electrical power consuming components carried on the base without significant vibrational energy being transmitted from the fan housing to the frame under normal operation of a data storage device mounted to the frame.

4,926,292

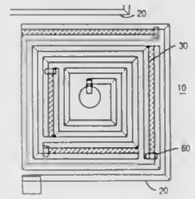
BROADBAND PRINTED SPIRAL

Marshall Maple, San Jose, Calif., assignor to Avantek, Inc., Milpitas, Calif.

Filed Aug. 9, 1989, Ser. No. 391,459

Int. Cl.[5] H05K *1/16;* **H01F** *5/00*

U.S. Cl. 361—402 **10 Claims**



1. A thin film printed circuit inductive element comprising:

(a) a substrate of insulating material having a principal planar surface;

(b) a layer of conducting material deposited on the planar surface in a spiral path;

(c) a plurality of resistive links which connect adjacent turns of the spiral path.

4,926,293

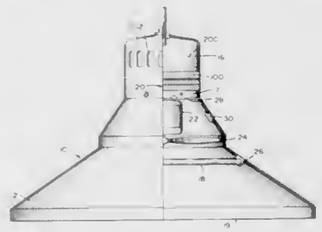
LIGHTING AND AIR FRESHENER FIXTURE

Mounir G. Saba, #1905, 1115 Sherbrooke W., Montreal, Quebec, Canada H3A 1H3

Continuation-in-part of Ser. No. 141,627, Jan. 6, 1988, Pat. No. 4,829,411, which is a continuation-in-part of Ser. No. 95,102, Sep. 10, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 305,382

Int. Cl.[5] F21V *33/00*

U.S. Cl. 362—96 **12 Claims**



1. A system for illuminating and for collecting air from an enclosure, the air in said enclosure being contaminated by a certain substance, said system comprising:

a plurality of lighting units mounted within said enclosure, each lighting unit including:

(a) a reflector defining an internal cavity;

(b) light producing means mounted to said reflector within said cavity; and

(c) conduit means mounted to said reflector and communicating with said internal cavity;

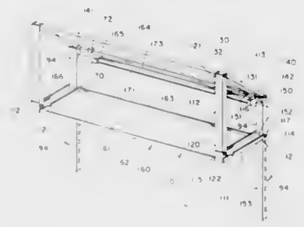
duct means communicating with the conduit means of each lighting unit;

air propelling means mounted within said duct means to convey therethrough contaminated air from said enclosure; and

filter means in said duct means to filter the contaminated air conveyed therethrough.

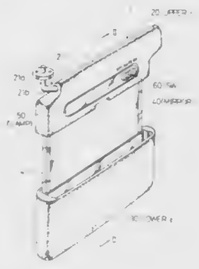
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4,926,294
PORTABLE EXHIBIT DISPLAY HEADER
Bryan J. Beaulieu, Burnsville, and Gary R. Sorenson, Apple Valley, both of Minn., assignors to Skyline Displays, Inc., Burnsville, Minn.
Filed Oct. 10, 1985, Ser. No. 419,498
Int. Cl.[5] A47F *11/10*
U.S. Cl. 362—125 13 Claims



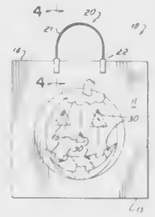
1. A box-like display header for a display frame having a pair of vertically extendable, spaced-apart mounting braces, the display header comprising:
a first and second set of braces respectively connected to the pair of mounting braces of the display frame, each set of braces including an upper brace, a lower brace, and a front brace,
means connected between the mounting braces for laterally connecting the mounting braces to each other,
means connected between the first and second sets of braces for laterally connecting the sets of braces to each other,
each upper brace being pivotally connected to a top portion of a mounting brace and being swingable to the front and rear sides of the mounting brace,
each lower brace being pivotally connected to a lower portion of a mounting brace and being swingable against said mounting brace, and
each front brace being pivotally connected to an upper and lower braces and being swingable about the mounting braces, whereby the display header may be collapsed to a substantially flat form against said mounting braces.

4,926,295
SUN VISOR FOR AUTOMOTIVE VEHICLE
Makoto Tamuraya, Isehara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Sep. 28, 1989, Ser. No. 413,716
Claims priority, application Japan, Oct. 17, 1988, 63-261073
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—144 5 Claims



1. A sun visor for an automotive vehicle comprising:
(a) an upper sun visor element pivotally supported near a front windshield;
(b) a mirror unit whose upper end is supported by said upper sun visor element; and
(c) a lower sun visor element slidably fitted to said mirror unit, said mirror unit being covered by said lower sun visor element when said lower sun visor element is slid to its uppermost position into contact with said upper sun visor element, and being exposed between said two upper and lower sun visor elements when said lower sun visor element is slid to its lowermost position away from said upper sun visor element.

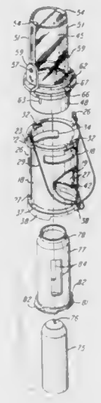
4,926,296
ILLUMINATED CARRYING BAG
Linda A. Blume, Apartment 105, 2504 Gulf Blvd., Indiana Rocks Beach, Fla. 34635; Kathy Y. Henn, 13520 Rustic Pines Blvd. S., Seminole, Fla. 34646, and John D. Osher, 3275 Warrensville Center Rd., Apartment 101, Shaker Heights, Ohio 44122
Filed Nov. 17, 1989, Ser. No. 438,591
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—156 11 Claims



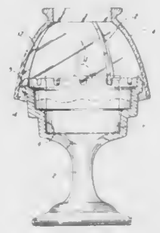
1. A bag comprising:
a flexible front wall of plastic film having side, bottom and top edges;
a flexible back wall of plastic film having side, bottom and top edges;
said side and bottom edges of the respective walls being joined to form a receptacle opened at said top edges;
at least a portion of said flexible front wall being transparent;
at least one light bulb mounted on said flexible front wall overlying said transparent portion; and
a power source connected to the light bulb.

4,926,297
COLLAPSIBLE LANTERN
Edward R. Masters, 7957 Treasury Dr., Dayton, Ohio 45429, and Peter C. Benjamin, 920 N. Ontare Rd., Santa Barbara, Calif. 93105
Filed May 30, 1989, Ser. No. 357,997
Int. Cl.[5] F21L *19/02*
U.S. Cl. 362—162 20 Claims

1. A collapsible lantern comprising a tubular housing having an upper end portion and a lower end portion, means forming a bottom for said lower end portion of said housing, a tubular transparent globe smaller than said housing and having opposite end portions, an annular coupling member, means for securing said coupling member to one of said end portions of said globe, means for releasably connecting said coupling member to said upper end portion of said housing with said globe projecting upwardly from said housing, a fuel source disposed within said housing and including a wick, said globe being insertable into said housing in surrounding relation to said fuel source after said coupling member is released from said housing and said globe and coupling member are inverted as a unit, and means for releasably connecting said coupling member to said upper end portion of said housing with said globe projecting downwardly into said housing.

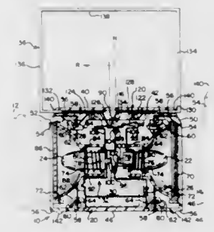


4,926,298
CANDLE LAMP
Robert C. Zimmerman, Manlius, N.Y., assignor to Hollowick, Inc., Manlius, N.Y.
Filed Feb. 27, 1989, Ser. No. 315,549
Int. Cl.[5] F21L *19/02;* F21V *35/00*
U.S. Cl. 362—163 10 Claims



1. A lamp of the type having a flame source and a shield to prevent extinguishing of the source comprising
a pedestal having a body portion and a central receptacle portion containing a flame source,
a generally horizontal top surface on an upper edge of the body portion of said pedestal,
a plurality of radial slots that pass downwardly through said horizontal top surface of said body, each to the same depth,
each slot having opposed side walls and a bottom wall contained in said body,
shield means mounted on said pedestal having at least three radial inwardly extending lugs mounted on an interior surface of said shield, and
each of said lugs having opposed side walls and a bottom wall and being slidably received in a slot so that the bottom wall of the lug rests upon the bottom wall of the receiving slot and the side walls of said lugs extend upwardly beyond the top surface of said body whereby at least two of said lugs are gripped by the side walls of their respective receiving slot when said shield means is moved laterally on said pedestal.

4,926,299
PORTABLE FLASHLIGHT
Warren E. Gilson, 601 N. Segoe Rd., Unit #104, Madison, Wis. 53705
Filed May 30, 1989, Ser. No. 358,425
Int. Cl.[5] F21L *7/00*
U.S. Cl. 362—184 28 Claims



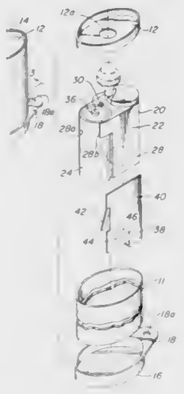
1. A battery powered flashlight, comprising:
a case holding a battery, a lamp, a reflector for said lamp and an electric circuit including switch means for connecting and disconnecting said battery to selectively energize and turn off said lamp; and
lens means supported in said case in front of said lamp and said reflector for forming a beam of light when said lamp is illuminated projecting outwardly of said case, said lens means having an essentially flat inside face in front of said reflector and lamp and a convex outer surface comprising a segment of a cylinder forming said beam to illuminate a generally rectangular area when said end of said case is pointed toward the same.

4,926,300
DISPOSABLE FLASHLIGHT WITH IMPROVED ACTIVATOR FIELD OF THE INVENTION
Gene O. Ralston, Toluca, Ill., assignor to Key Industries, Inc., East Peoria, Ill.
Filed Mar. 13, 1989, Ser. No. 322,655
Int. Cl.[5] F21L *7/00*
U.S. Cl. 362—189 8 Claims

1. A flexible miniature flashlight having an improved activator comprising;
a hollow flexible outer casing having first and second ends;
a top end cap member for attachment to the first end of the flexible outer casing and a bottom end cap member for attachment to a second end of said outer casing, said top end cap member having an aperture for receiving an electric lamp device;
battery holding means for placement within said outer casing, said holding means comprising concave jackets for holding respective first and second electric batteries, the positive terminal of said first battery being in proximity to said bottom end cap member and the positive terminal of said second battery being in proximity to said to end cap member;
electric lamp means in electrical contact with said batteries and extending through said aperture;
mechanical activation means comprising a contact member in electrical contact with the positive terminal of said first battery, a resilient metallic shield having a surface area substantially equal to a side of said outer casing and extending substantially parallel to the inside surface of said outer casing, said metallic shield being held rigid by said contact member, said metallic shield having an activator extending inwardly toward a negative terminal of said

VOL 1114 ISS 3 MY 15 1990 UMI

second battery, whereby when said outer casing is depressed, said metallic shield bends inwardly and said activator completes a circuit between said batteries and lights said flashlight.



4,926,301

HEADLAMP ASSEMBLY

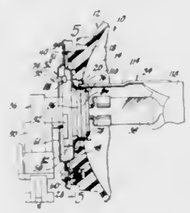
Martin K. Liverance, Royal Oak, Mich.; David R. McMahan, and Bartly A. Haydu, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 276,608, Nov. 20, 1988, Pat. No. 4,882,660, which is a continuation of Ser. No. 185,109, Apr. 18, 1988, abandoned, which is a continuation of Ser. No. 930,741, Nov. 13, 1986, Pat. No. 4,747,029. This applicatioo Sep. 18, 1989, Ser. No. 408,870

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[5] H01R *33/00*

U.S. Cl. 362—226 **3 Claims**



1. In combination, a vehicle headlamp assembly including a reflector formed with a pair of side-by-side cavities each of which has a parabolic reflecting surface and a circular opening formed in each of said reflecting surfaces and adapted to receive the light bulb of a replaceable light bulb assembly from the rear of said reflector, locator means and boss means formed on said reflector for assuring proper positioning of said light bulb assembly in said circular opening along a longitudinal axis of the light bulb and an axis angled relative to said longitudinal axis, a retainer located at the rear of said reflector and having a first portion and a second portion cooperating with said boss means and said locator means for positioning said light bulb assembly in a predetermined position relative to said circular opening, said light bulb of said replaceable light bulb assembly being smaller in diameter than said circular opening and said replaceable light bulb assembly having a collar and three circumferentially spaced retainer members projecting radially outwardly therefrom, said retainer having three access slots formed therein for selectively receiving said three retainer members of said replaceble bulb assembly, said retainer defining a ring-like cavity with an axial dimension sufficient to accommodate said retainer members on said light bulb assembly, a stop in said cavity, said access slots upon receiving said retainer members of said light bulb assembly permitting said collar and said retainer members to move into said ring-like cavity from the rear thereof after which said light bulb assembly is rotatable into engagement with said stop to orient said light bulb assembly rotationally with respect to said reflector, and means formed as a part of said retainer extending into said ring-like cavity and continuously engaging and pressing said retainer members inwardly towards said opening when said light bulb assembly is rotated to orient said light bulb axially with respect to said reflector.

4,926,302

SWITCHING POWER SOURCE DEVICE

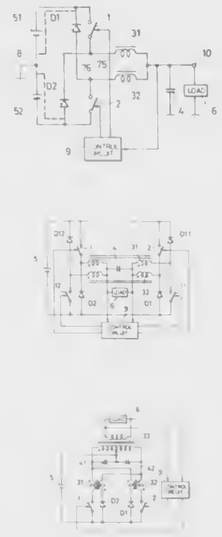
Koosuke Harada, and Hiroshi Sakamoto, both of Fukuoka, Japan, assignors to Nishimu Electronics Industries Co., Ltd., Fukuoka, Japan

Filed Apr. 28, 1988, Ser. No. 187,288

Claims priority, application Japan, May 7, 1987, 62-112218

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—16 **13 Claims**



1. A switching power source device comprising:

a first series circuit of a first switching element and a first smoothing choke coil connected between a first supply terminal adapted for electrical connection to a source of voltage and a first output terminal adapted for connection to a load device,

a second series circuit of a second switching element and a second smoothing choke coil connected between a second supply terminal adapted for electrical connection to a source of voltage and the first output terminal,

a smoothing capacitor one terminal of which is connected to said first output terminal, and another terminal of which is connected to a center tap terminal to serve as a second output terminal adapted for connection to a load device,

the center tap terminal also being adapted for electrical connection to a further source of voltage, and

means for ON-OFF controlling said first and second switching elements in such a manner that one of said switching elements assumes an ON status while the other switching element assumes an OFF status and vice versa.

4,926,303

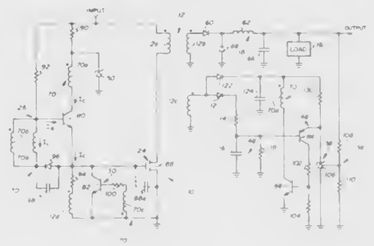
CONTROL CIRCUIT FOR A SWITCHING DC TO DC POWER CONVERTER INCLUDING A MULTI-TURN CONTROL TRANSFORMER

Clayton L. Sturgeon, Watauga, Tex., assignor to Qualitron, Inc., Dallas, Tex.

Filed Dec. 12, 1988, Ser. No. 283,153

Int. Cl.[5] H02M *3/338*

U.S. Cl. 363—19 **4 Claims**



1. A control circuit for a power converter, the converter including a power transformer including a primary transformer winding for receiving an input voltage signal and a secondary transformer winding for generating an output voltage, the control circuit controlling the on and off time of the power transformer, comprising:

a transformer having first, second, third and fourth windings, said first winding being connected to receive the input voltage signal;

first switch means connected to said second winding of said transformer and to said third winding of said transformer and to said power transformer primary winding for controlling the on and off time of the power transformer corresponding to the on and off time of said first switch means;

second switch means connected to said first, second, and third windings of said transformer for controlling the on time of said first switch means;

third switch means connected to said fourth winding of said transformer and to the secondary winding of the power transformer for receiving the output voltage signal and for controlling the off time of said first switch means;

said first switch means being rendered on when said second switch means is on, said second switch means being on due to current flowing in said transformer, and upon termination of current flow in said first winding due to conduction of said first switch means, said second switch means is rendered off causing the stored energy in said third winding to deactuate said first switch means to start the off time of the power transformer; and

said third switch means rendered conductive when said first switch means is off and when changes in the output voltage exceed a pre-determined reference level, said third switch means pulses said fourth winding which in turn pulses said second winding to activate said second switch means thereby turning said first switch means on to terminate the off time of said first switch means and the off time of the power transformer.

4,926,304

SWITCHED-MODE POWER SUPPLY WITH LOW LOSS INTERRUPTED OSCILLATION

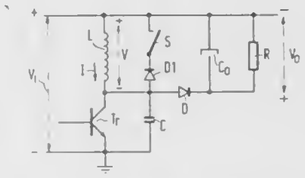
Antonius A. M. Marinus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1989, Ser. No. 347,554

Claims priority, application Netherlands, Jun. 30, 1988, 8801658; Taiwan, Nov. 29, 1988, 77108337

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—20 **17 Claims**



1. A switched-mode power supply circuit for converting a DC input voltage into a DC output voltage, comprising: a series arrangement of a controllable power switch and an inductive element coupled between input voltage terminals, control means for rendering the power switch alternately conducting and non-conducting, and a rectifier coupled to the inductive element for making the output voltage available, the inductive element and a capacitor coupled thereto forming a part of a resonant circuit in which a voltage oscillation is present in periods of time when the power switch and the rectifier are currentless, and means for interrupting the oscillation present in the resonant circuit at an instant when a voltage across the inductive element or a current through the capacitor is substantially zero.

4,926,305

HAVING A PLURALITY OF SECONDARY WINDINGS

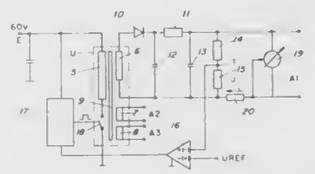
Martin Brahms, Hanover, and Christian Prenner, Langenhagen, both of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 312,026

Claims priority, applicatioo Fed. Rep. of Germany, Feb. 22, 1988, 3805460

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—21 **3 Claims**



2. An electric power station including a cycled, directed current, voltage transformer having a primary winding with an input terminal, and at least a first secondary winding with a first output terminal and a secondary winding with a second output terminal comprising

means for applying a direct current potential to said input terminal;

means for admitting direct current pulses to said primary winding from a direct current source;

means for sensing the voltage across said first output terminal;

means for regulating the width of said direct current pulses

VOL 1114 ISS 3 MY 15 1990 UMI

in dependency upon said sensed voltage for regulating the voltage at said first output terminal;

means for regulating the current permeability of a transistor connected with its current path in parallel to said first output terminal, said transistor having its control electrode connected to an output terminal of a comparison circuit having a first input terminal thereof connected to a reference voltage source and being controlled in response to a voltage drop across an impedance element disposed in the circuit of said first secondary winding, said transistor assuming an impermeable condition as long as said first secondary winding has a sufficient load connected thereto, and assuming a permeable condition in the absence of said sufficient load so that said voltage drop is so adjusted that the current through said current path of said transistor does not decrease below a predetermined value.

4,926,306

ELECTRIC POWER CONVERTER

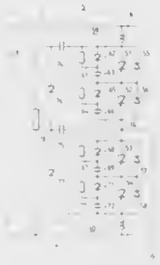
Shigeta Ueda, Hitachi; Mitsuyuki Hombu, Katsuta; Kazuo Honda, Hitachioota, and Daisaku Morinaga, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,295

Claims priority, application Japan, Aug. 12, 1988, 63-199904

Int. Cl.[5] H02H *7/122*

U.S. Cl. 363—58 **15 Claims**



1. An electric power converter having:

a bridge circuit of plural phases, which includes plural rectifying branches corresponding to the respective phases, which are coupled in parallel across dc terminals of the bridge circuit, wherein each of the rectifying branches comprises:

a first arm and a second arm, both including switching elements, which are connected in series with each other, in which a junction of the series-connected arms is coupled to one of ac terminals of the bridge circuit;

a free-wheel diode coupled in reverse parallel with every switching element of said first and second arms; and

a phase snubber circuit provided with a series connection of first and second diodes coupled across the series-connected arms through a first capacitor, in which a junction of the first and second diodes is coupled to the junction of the series-connected arms through a second capacitor and a junction of the first capacitor and the series-connected first and second diodes is coupled to one of the dc terminals through a discharge path, through which charge stored in the first capacitor is discharged,

characterized in that

the respective arms of each rectifying branch include plural switching elements connected in series, and each of the switching elements is provided with an individual snubber circuit including a third capacitor being charged during turn-off of a corresponding switching element and a resistor for consuming charge discharged from the third capacitor during turn-on of the corresponding switching element, in which the first capacitor has capacitance much larger than the second capacitor, which has capacitance much larger than the third capacitor.

4,926,307

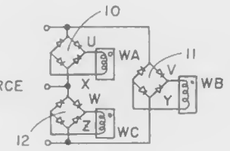
POLYPHASE A.C. MOTOR SUPPLIED WITH POWER VIA D.C. POWER SUPPLY

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Talwan

Continuation-in-part of Ser. No. 918,984, Oct. 15, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,937

Int. Cl.[5] H02M *5/257*

U.S. Cl. 363—161 **3 Claims**



1. In a three phase electric motor having a rotor, a stator, three individual windings on the stator, each of said windings having a start end and a finish end, and means including first, second and third input lines for providing three phase input power to the windings on the stator, first, second and third rectifier bridges coupled between individual, respective ones of said three windings and separate pairs of said input lines;

each of said rectifier bridges having first, second, third and fourth rectifier devices, each of said rectifier devices having an anode and a cathode;

in each of said bridges, the anode of said first device and the cathode of said fourth device being connected together to form a first bridge input terminal, the anode of said second device and the cathode of said third device being connected together to form a second bridge input terminal, the cathodes of said first and second devices being connected together to form a first bridge output terminal, the anodes of said third and fourth devices being connected together to form a second bridge output terminal;

said first one of said input lines being connected to said first input terminal of said first bridge;

said second one of said input lines being connected to said second input terminal of said first bridge;

said start end of a first one of said windings being connected to said first output terminal of said first bridge;

said finish end of said first winding being connected to said second output terminal of said first bridge;

said first one of said input lines being also connected to said first input terminal of said second bridge;

said third one of said input lines being connected to said second input terminal of said second bridge;

said start end of a second one of said windings being connected to said first output terminal of said second bridge;

said finish end of said second winding being connected to said second output terminal of said second bridge;

said second input line being also connected to said first input terminal of said third bridge;

said third input line being also connected to said second input terminal of said third bridge;

said start end of a third one of said windings being connected to said first output terminal of said third bridge; and

said finish end of said third winding being connected to said second output terminal of said third bridge.

4,926,308

PROGRAMMABLE MACHINE SYSTEM

Alan F. Giles, St. Neots, and James M. Moore, Welwyn Garden City, both of Great Britain, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

PCT No. PCT/EP87/00370, § 371 Date Feb. 10, 1988, § 102(e) Date Feb. 10, 1988, PCT Pub. No. WO88/00728, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 10, 1987, Ser. No. 167,859

Claims priority, application United Kingdom, Jul. 10, 1986, 8616790

Int. Cl.[5] G06F *9/06*

U.S. Cl. 364—147 **3 Claims**



1. A programmable machine comprising:

a number of actuators each having a controllable operation;

a display device for displaying information;

a data-input device adapted to receive input of programming language instructions of a type to control the operation of the actuators; and

programmed computer means, coupled to said actuators to control said operations of said actuators, coupled to said display device to operate same, and coupled to said data-input device to receive programming language instructions therefrom, for:

(1) arranging an operation program as high level language instructions received from said data input device as divided into separate display fields, each said display field including different types of information, and such that the instructions for each actuator or group of actuators in each of said separate display fields are arranged as vertical columns, each column defining a required movement for each actuator and a relationship between actuators,

(2) translating said instructions which are displayed into a machine code program which controls the operation of the actuators, and

(3) displaying said operation program formed of said programming language instructions so creating an operations sequence diagram on the display device illustrating a required operating sequence of the machine.

4,926,309

ARTIFICIAL INTELLIGENCE FOR ADAPTIVE MACHINING CONTROL OF SURFACE FINISH

Charles L. Wu, Bloomfield Hills, and Roger K. Haboush, Lathrup Village, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 12, 1988, Ser. No. 242,664

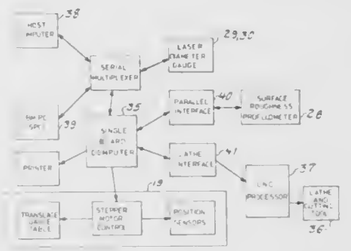
Int. Cl.[5] G06F *15/46;* **G05B** *13/04*

U.S. Cl. 364—149 **24 Claims**

1. A method of adaptively controlling feed for a cutting tool to improve the surface finish of a series of machined workpieces, comprising:

(a) sensing surface finish and feed information from the first of said workpieces which is undergoing or has undergone surface machining;

(b) recursively estimating a feed that would produce a desired surface finish solely as a function of surface roughness;



(c) using said estimated feed to machine the next of said series of workpieces; and

(d) repeating steps (a)–(c) for each successive workpiece.

4,926,310

IMAGE FORMING APPARATUS

Tsuneki Inuzuka, Machida; Koichi Murakami, Tokyo, and Kenji Kurita, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 823,284, Jan. 28, 1986, abandoned, which is a division of Ser. No. 627,723, Jul. 3, 1984, Pat. No. 4,734,739, which is a continuation of Ser. No. 483,189, Apr. 8, 1983, abandoned, which is a division of Ser. No. 329,017, Dec. 9, 1981, Pat. No. 4,392,741, which is a division of Ser. No. 68,483, Aug. 21, 1979, Pat. No. 4,315,685. This application Feb. 22, 1988, Ser. No. 161,381

Claims priority, application Japan, Aug. 24, 1978, 53-103044; Aug. 24, 1978, 53-103048; Aug. 24, 1978, 53-103050; Aug. 31, 1978, 53-106736; Sep. 1, 1978, 53-107094

Int. Cl.[6] G06F *11/04*

U.S. Cl. 364—186 **8 Claims**

1. A control apparatus comprising:

a plurality of image forming loads for processing which are collectively operable to form an image of an original onto an image bearing member;

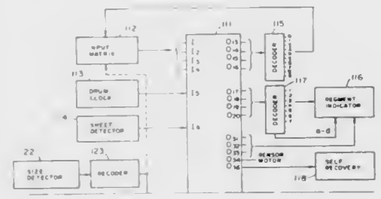
control means for controlling operation of said plurality of image forming loads, said control means including a first memory having a microprogram stored therein to operate said image forming loads sequentially, a second memory for storing data to be used for control of said image forming loads, means for generating a pulse repeatedly with execution of said microprogram, and an output port for outputting the pulse, said control means being operable to repeatedly output said pulse from said output port at the time of normal execution of said microprogram; and

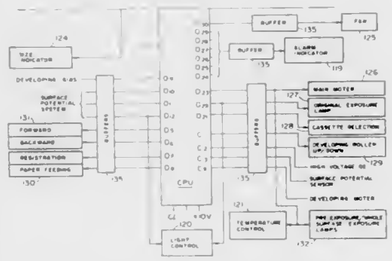
initialization means for initializing said control means, for detecting the pulse outputted from said output port of said control means, and for designating said control means as abnormal in the event that the pulse from said output port is not detected for a predetermined period of time;

wherein said control means initiates execution of said microprogram in response to the initialization by said initialization means and clears the data stored in said second memory, and said initialization means again initializes said control means in the event that said initialization means does not again detect said pulse after initialization of said control means, thereby repeatedly initializing said control

VOL 1114 ISS 3 MY 15 1990 UMI

means at intervals of the predetermined period of time during a period of time in which said pulse is not detected





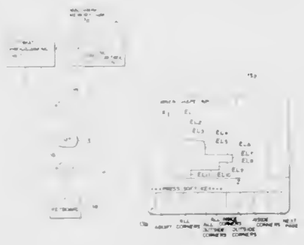
until said control means is no longer designated as abnormal.

4,926,311

PART PROFILE INPUT METHOD

Teruyuki Matsumura, and Noritake Nagashima, both of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00158, § 371 Date Oct. 18, 1988, § 102(e) Date Oct. 18, 1988, PCT Pub. No. WO88/06311, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 17, 1988, Ser. No. 265,799
Claims priority, application Japan, Feb. 20, 1987, 62-37277
Int. Cl.[5] G05B *19/18*
U.S. Cl. 364—191 4 Claims



1. A part profile input method for an NC data creating apparatus in which a part profile is defined by inputting profile elements of a part using arrow keys and creating NC data for performing machining in accordance with the defined part profile, said method comprising the steps of:

(a) displaying, by the NC data apparatus, a conversational display for input of a corner shape on a screen of a display unit when a part profile definition is terminated;

(b) determining positions of all intersections to be regarded as corners by comparing angles of intersection between two mutually adjacent profile elements with a set angle;

(c) determining positions of all intersections to be regarded as outside corners or inside corners by discriminating whether the corner defines a projection or a cavity;

(d) specifying whether shapes of all outside corner portions or inside corner portions or shapes of all corner portions including all inside and outside corner portions are to be defined collectively and whether the shapes are rounded or chamfered shapes; and

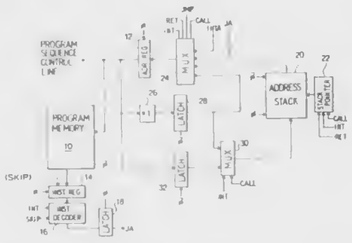
(e) defining the part profile by inserting the specified rounded shapes or chamfered shapes, being in the form of preset dimensions, at respective ones of all the specified outside corner portions or all the specified inside corner portions, or all the specified corner portions.

4,926,312

PROGRAM SKIP OPERATION CONTROL SYSTEM

Tomoji Nukiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 947,243, Dec. 29, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 253,442
Claims priority, application Japan, Dec. 25, 1985, 60-294282
Int. Cl.[5] G06F *9/38, 9/32*
U.S. Cl. 364—200 3 Claims



1. A processor of the delayed branch type comprising:

an address register for fetching and outputting an address supplied thereto in response to a first clock having a first phase;

a program memory storing a number of instructions and coupled to said address register, said program memory reading out an instruction at an address indicated by said address register in response to a second clock having a second phase different from said first phase of said first clock;

an instruction register coupled to said program memory for fetching and outputting said read out instruction from said program memory in response to said first clock;

a decoder coupled to said instruction register for decoding said instruction from said instruction register and generating a decoded output, said decoder further generating a jump destination address when said decoder decodes a jump instruction;

a first latch coupled to said decoder for latching said jump destination address;

a second latch for latching an address obtained by incrementing said address outputted from said address register; and

a multiplexor coupled to said first and second latches for selecting one of said addresses from said first and second latches and supplying said selected address to said address register, said multiplexor selecting said address from said first latch when a jump signal is supplied thereto and selecting said address from said second latch when said jump signal is not supplied thereto;

said program memory storing a jump instruction at a first address and a skip conditional discrimination instruction at a second address next to said first address,

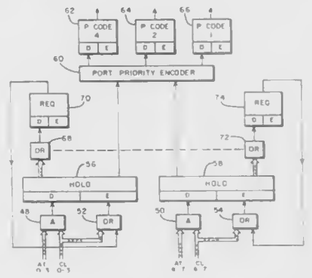
whereby, in the course of the execution of said jump instruction, said skip conditional discrimination instruction is executed before said jump destination address is fetched in said address register, and said decoder receives a skip signal if a skip condition is fulfilled as the result of the execution of said skip conditional discrimination instruction so that said decoder generates a no-operation instruction code even if said decoder receives said jump instruction, and whereby said jump signal is not supplied to said multiplexor with the result that a sequence advances an instruction next to said skip conditional discrimination instruction.

4,926,313

BIFURCATED REGISTER PRIORITY SYSTEM

Larry L. Byers, Apple Valley; Howard A. Koehler, Minneapolis, and Wayne A. Michaelson, Circle Pines, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 19, 1988, Ser. No. 246,510
Int. Cl.[5] G06F *13/34*
U.S. Cl. 364—200 9 Claims



1. A process for determining priority for data transferred from a source to a plurality of ports for receiving the data, including the steps of:

(a) loading data from a plurality of first priority sources and second priority sources into a register means having a first priority register including a plurality of first priority data latches for receiving data from said first priority sources, and a second priority register including a plurality of second priority data latches for receiving data from said second priority sources;

(b) initiating a first serial transfer of data from said first priority register and continuing the first serial transfer until all of the data has been transferred from said first priority register;

(c) after clearing said first data latches, initiating a second serial transfer of data from said second priority latches to said ports, continuing said second serial transfer for a selected amount of time to clear one of the second priority data latches, and enabling said first priority register to receive further data from said first priority sources;

(d) following said second serial data transfer, reinitiating said first serial data transfer and, to the extent that further data from the first priority sources is present in said first register, continuing said first serial transfer until all of said first priority data latches are again clear;

(e) re-instating said second serial data transfer after again clearing said first priority data latches, to clear another one of said second latches in said second priority register, and enabling said first priority register to receive further data from said first priority sources; and

(f) repeating steps (d) and (e) until all of said second latches have been cleared, thereby to enable said first priority and second priority registers to receive further data from said first and second sources, respectively.

4,926,314

METHOD AND APPARATUS FOR DETERMINING AVAILABLE MEMORY SIZE

Michael Dhuey, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 27,005, Mar. 17, 1987, abandoned. This application May 11, 1987, Ser. No. 48,362
Int. Cl.[5] G06F *13/06, 12/14, 9/00*
U.S. Cl. 364—200 17 Claims



1. In a computer system having a central processing unit (CPU) coupled to a memory bank A having a plurality of possible contiguous addresses ($\#M_0 - M_N$) and a memory bank B having a plurality of possible contiguous addresses ($\#M_{N+1} - M_{MAX}$) for storing data, said memory banks configured to receive a plurality of insertable memory devices, each of said devices having a plurality of storage locations identified by corresponding ones of said possible contiguous addresses, said CPU accessing data by providing a multi-bit address of a desired storage location, a method for determining the range of real memory addresses which exist in said memory banks and accessing said desired storage location, comprising the steps of:

dividing said memory banks into N binary increments having boundaries separated by a predetermined number of contiguous possible addresses;

said CPU sequentially storing the address value of each of said increment boundaries at locations corresponding to respective ones of said increment boundary addresses, from the highest possible increment boundary address to the lowest possible increment boundary address, said CPU storing the value of an address which does not physically exist in one of said memory banks at a location corresponding to the highest real address of said one memory bank;

said CPU, for each of said memory banks, sequentially reading each of said locations corresponding to said increment boundary addresses from the lowest possible increment boundary address to the highest possible increment boundary address;

said CPU comparing the address value stored in each of said locations with the respective address of such location such that an increment boundary address is considered to be real if such increment boundary address and said stored address value are equivalent, said highest real increment boundary address being the highest increment boundary address for each of said memory banks in which said stored address value is equivalent to said respective location address;

said CPU providing a bit value corresponding to the total memory size in Bank A to control logic coupled between said CPU and said memory banks; said control logic enabling one of said memory banks based on the logical state of a predefined one address bit of said multi-bit address provided by said CPU, said predefined one address bit identified by said bit value;

said control logic providing control signals to said storage location identified by said multi-bit address provided by said CPU, thereby accessing said desired storage location in said enabled memory bank.

VOL 1114 ISS 3 MY 15 1990 UMI

4,926,315

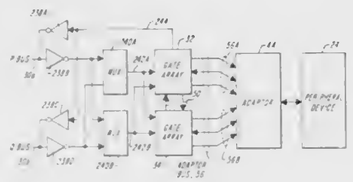
DIGITAL DATA PROCESSOR WITH FAULT TOLERANT PERIPHERAL BUS COMMUNICATIONS

William L. Long, Pembroke; Robert F. Wambach, Attleboro; Kurt F. Baty, Medway; Joseph M. Lamb, Hopedale, and John E. McNamara, Maynard, all of Mass., assignors to Stratus Computer, Inc., Marlboro, Mass.

Continuation-in-part of Ser. No. 904,827, Sep. 8, 1986, Pat. No. 4,750,177, which is a continuation of Ser. No. 307,436, Oct. 1, 1981, abandoned, and a continuation-in-part of Ser. No. 18,629, Feb. 25, 1987. This application Jul. 29, 1987, Ser. No. 79,297

Int. Cl.[5] G06F *13/00, 13/42*

U.S. Cl. 364—200 **15 Claims**



1. In a fault-tolerant digital data processing system of the type having plural functional units, including any of a central processing unit, a memory unit, a peripheral device, and a peripheral device controller, the improvement comprising

A. first and second bus means connected to at least selected ones of said functional units, each said bus means for transferring information-representative signals, including at least one of a data, address, and control signal between said selected functional units,

B. each of said selected functional units including, and being associated with, bus interface means for transferring said information-representative signals between the associated functional unit and at least one of said first and second bus means, and

C. the bus interface means of a first said selected functional unit including strobe means for normally applying duplicate timing signals synchronously and simultaneously to said first and second bus means for transfer to said other selected functional units, said timing signals being indicative of a timing of said transfer of information-representative signals on said first and second bus means,

D. each said other selected functional unit including

i. logic means coupled to said first and second bus means for monitoring timing signals received on them and producing tracking signals in response thereto,

said logic means including means for producing local strobe signals based on a logical combination of said timing signals and said tracking signals,

ii. means for responding to said local strobe signals for at least initiating processing of information-representative signals received by that functional unit on both said first and second bus means.

4,926,316

MEMORY MANAGEMENT UNIT WITH OVERLAPPING CONTROL FOR ACCESSING MAIN MEMORY OF A DIGITAL COMPUTER

Paul A. Baker, Los Altos, and Gary L. Marten, Cupertino, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 426,869, Sep. 29, 1982, abandoned. This application Dec. 17, 1986, Ser. No. 933,071

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—200 **5 Claims**

1. In a computer system which includes a central processing unit (CPU and a computer main memory, a memory management unit (MMU) coupled to said CPU and said main memory for translating a logical address from said CFU to provide a physical address for accessing said main memory, comprising:

a MMU memory for storing a plurality of relocation base addresses, wherein said relocation base addresses are segmented into sections of memory (contests) such that each said context has at least one relocation base address associated therewith;

each said relocation base address having corresponding limit bits and access bits associated therewith, said limit bits and access bits also store said MMU memory;

said MMU receiving a control signal from said CPU for selecting a predetermined one of said contexts when said logical address is provided by said CPU;

said MMU memory for receiving a first portion of said logical address from said CPU and said first portion of said logical address accessing a stored relocation base address of a selected context and corresponding to said limit and access bits;

an adder coupled to said MMU memory for receiving said accessed relocation base address of said selected context and combining it with a second portion of said logical address to output said physical address for accessing said main memory;



said adder also coupled to receive said limit bits corresponding to said accessed relocation base address and adding it to said second portion of said logical address and generating an indication signal if said second portion of said logical address exceeds a value set by said limit bits;

access check logic means coupled to said MMU memory and said adder for receiving said access bits corresponding to said accessed relocation base address and determining if said access bits permit access of said main memory for a type of access requested by said CPU and generating a fault signal to prevent access of said main memory if an illegal access of said main memory is attempted;

said access check logic means also generating said fault signal if said indication signal is received from said adder;

each said relocation base address for pointing to a corresponding mapped base address in said main memory, such that a given logical address is mapped into a plurality of physical addresses, wherein at least one physical address is provided for each context; and

wherein selected physical addresses of said main memory can be accessed by more than one context.

4,926,317

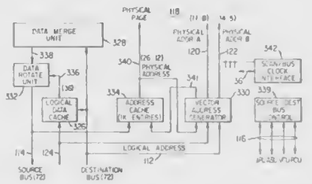
HIERARCHICAL MEMORY SYSTEM WITH LOGICAL CACHE, PHYSICAL CACHE, AND ADDRESS TRANSLATION UNIT FOR GENERATING A SEQUENCE OF PHYSICAL ADDRESSES

Steven J. Wallach, Dallas; David M. Chastain, Plano, and James R. Weatherford, Lake Dallas, all of Tex., assignors to Convex Computer Corporation, Richardson, Tex.

Continuation of Ser. No. 78,022, Jul. 24, 1987, abandoned, which is a continuation of Ser. No. 625,581, Jun. 20, 1984, abandoned. This application Apr. 12, 1988, Ser. No. 183,355

Int. Cl.[5] G06F *12/10, 15/16*

U.S. Cl. 364—200 **2 Claims**



1. A hierarchical address cache system for a computer which includes a central processor that manipulates operands by use of logical addresses and a main memory which stores and retrieves operands by use of physical addresses, comprising:

a logical cache for storing therein a plurality of operands identified by said logical addresses, said logical cache connected to exchange operands with said central processor wherein the exchanged operands are identified by said logical addresses,

an address translation unit connected to said central processor unit for translating said logical addresses received from said central processor into said physical addresses,

said address translation unit including means for storing address parameters and for generating a sequence of physical addresses derived from one of said logical addresses and said address parameters, and

a physical cache for storing therein a plurality of operands identified by said physical addresses, said physical cache connected to exchange operands with said main memory, said logical cache and said central processor, said physical cache connected to receive the physical addresses produced by said address translation unit, wherein operands are transferred through said cache system between said physical cache and said logical cache and are identified and manipulated by both physical and logical addresses which comprise a hierarchy of addresses, and utilization of said physical or logical address for an operand is a function of location of the operand in said cache system.

4,926,318

MICRO PROCESSOR CAPABLE OF BEING CONNECTED WITH A COPROCESSOR

Takashi Nakayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,601

Claims priority, application Japan, Nov. 12, 1986, 61-270143; Jan. 25, 1987, 62-14945

Int. Cl.[5] G06F *15/16*

U.S. Cl. 364—200 **11 Claims**

1. A micro processor, comprising:

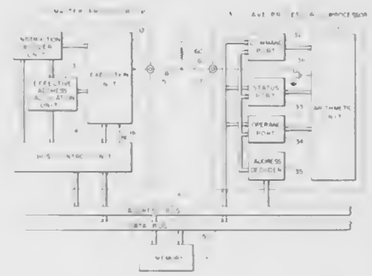
an execution unit executing a program;

a bus control unit coupled to said execution unit and performing a first bus cycle for supplying a command code to a coprocessor when said execution unit receives an instruction to be executed by said coprocessor;

a terminal connected to said execution unit;

said execution unit including detecting means for detecting a logic level of said terminal after said first bus cycle is performed, control means for controlling said bus control unit to perform a second bus cycle for reading status information of said coprocessor and to obtain status data relative to said status information of said coprocessor when the logic level of said terminal is detected to be a first logic level;

judging means, responsive to a content of said status data, for judging whether or not said coprocessor is connected to said micro processor; and



execution means for executing said instruction when said status data indicates that said coprocessor is not connected to said micro processor and for reading an executing result of said instruction from said coprocessor when said status data indicates that said coprocessor is connected to said micro processor.

4,926,319

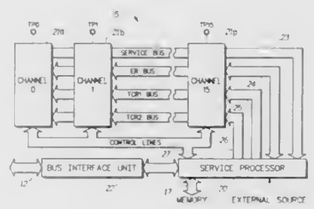
INTEGRATED CIRCUIT TIMER WITH MULTIPLE CHANNELS AND DEDICATED SERVICE PROCESSOR

Brian F. Wilkie; Vernon B. Goler, both of Austin; Stanley E. Groves, Round Rock, and John J. Vaglica, Austin, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Aug. 19, 1988, Ser. No. 234,104

Int. Cl.[5] G06F *1/04*

U.S. Cl. 364—200 **18 Claims**



1. An integrated circuit timer comprising:

timer reference signal generating means for producing at least two timer reference signals; and

a plurality of timer channels, each of said timer channels being identical and each comprising:

input means for performing an input function, said input means being responsive to any of said at least two timer reference signals; and

output means for performing an output function, said output means being responsive to any of said at least two timer reference signals.

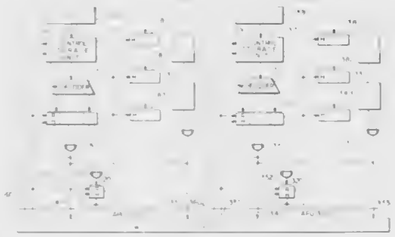
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4,926,320

INFORMATION PROCESSING SYSTEM HAVING MICROPROGRAM-CONTROLLED TYPE ARITHMETIC PROCESSING UNIT

Takashi Kanazawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,241
Claims priority, application Japan, Apr. 7, 1987, 62-83720
Int. Cl.[5] G06F *13/14, 15/16*
U.S. Cl. 364—200 5 Claims



1. An information processing system provided with at least one arithmetic processing unit and a microprogram stored in a storage unit of said at least one arithmetic processing unit and a system control unit exchanging information with said at least one arithmetic processing unit, wherein said at least one arithmetic processing unit comprises:

(a) communication information holding means, coupled to said storage unit and responsive to a demand by said microprogram, for holding information to be communicated to said system control unit;

(b) updating suppressing means, coupled to said communication information holding means and responsive to storing of communication information in said communication information holding means, for suppressing updating of internal state information stored in said arithmetic processing unit;

(c) communication demand means, coupled to said communication information holding means and to said system control unit and responsive to storing of said communication information in said communication information holding means, for outputting a communication demand to said system control unit;

(d) communication cancelling means, coupled to said system control unit and to said communication information holding means and responsive to an instruction from said system control unit, after processing by said system control unit in response to said communication demand from said communication demand means, for clearing communication information held in said communication information holding means, for cancelling said communication demand from said communication demand means, and for removing updating suppression by said updating suppressing means, thereby bringing operation of said microprogram into a state of waiting for reactuating; and

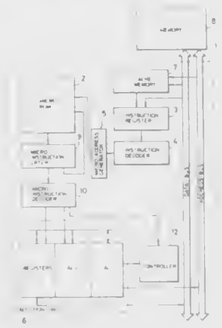
(e) microprogram actuating means, coupled to said system control unit, for reactuating operation of said microprogram, in said state of waiting for reactuating, in accordance with an instruction from said system control unit; whereby said microprogram operates to freeze the internal state of said at least one arithmetic processing unit whereupon said system control unit is notified of a demand for communication by said microprogram and, after processing by said system control unit, said microprogram is reactuated.

4,926,321

METHOD OF SEARCHING A QUEUE IN RESPONSE TO A SEARCH INSTRUCTION

Ken Sakamura, No. 105, 12-30, Shiroganedai 3-chome, Minato-ku, Tokyo; Kouzi Hashimoto, Mitaka; Ikuya Kawasaki, Kodaira; Atsushi Hasegawa, Koganei, and Kazuhiko Iwasaki, Hachiohji, all of Japan, assignors to Ken Sakamura; Hitachi, Ltd. and Hitachi Microcomputer, Engineering, Ltd., all of Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 89,818
Claims priority, application Japan, Aug. 27, 1986, 61-198869
Int. Cl.[5] G06F *7/00*
U.S. Cl. 364—200 5 Claims



1. A method of searching a memory of a data processing apparatus, said memory having an array data structure formed by a plurality of entries which are searched in response to execution of a search instruction having a predetermined field for holding a predetermined end condition indicating a predetermined relationship, each entry having plural fields for storage of information with one field of each entry storing an address of one field of another entry to link said entries in a predetermined sequence and another field of each entry having a designated offset from said one field and having stored therein a predetermined key, comprising the steps of:

performing a search operation indicated by said search instruction including the steps of

(a) storing the address of said one field of a selected entry in a first register,

(b) copying the address stored in said first register into a second register,

(c) adding said designated offset to the address stored in said first register to produce an offset address and reading out the predetermined key stored in said another field of said selected entry indicated by said offset address,

(d) comparing said predetermined key read out of said selected entry to a predetermined condition value to determine if a relationship therebetween satisfies said predetermined relationship indicated by said predetermined end condition,

(e) indicating completion of said search operation if the comparing in step (d) indicates that said predetermined end condition is satisfied,

(f) replacing the address stored in said first register by the address of said one field of said selected entry if the comparing in step (d) indicates that said predetermined end condition is not satisfied,

(g) comparing the address stored in said first register and the address stored in said second register, and

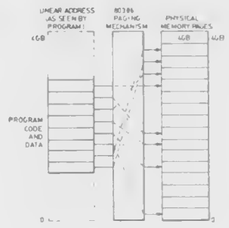
(h) repeating steps (c) through (g) until occurrence of one of said predetermined end condition being found to be satisfied in step (e) and the address stored in said first register and the address stored in said second register being found to be equal in step (g).

4,926,322

SOFTWARE EMULATION OF BANK-SWITCHED MEMORY USING A VIRTUAL DOS MONITOR AND PAGED MEMORY MANAGEMENT

Gary A. Stimac; William C. Crosswy, both of Houston; Stephen B. Preston, Spring, and James S. Flannigan, Cypress, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Aug. 3, 1987, Ser. No. 81,325
Int. Cl.[5] G06F *9/00, 13/00, 11/30*
U.S. Cl. 364—200 31 Claims



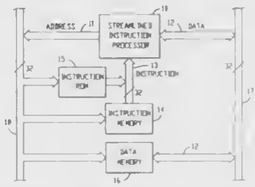
2. A method according to claim 1 wherein said expanded memory page frame is 64 Kbyte in size and includes four 16 Kbyte windows.

4,926,323

STREAMLINED INSTRUCTION PROCESSOR

Gigy Baror, Austin, Tex.; Brian W. Case, Sunnyvale, Calif.; Rod G. Fleck, Munich, Fed. Rep. of Germany; Philip M. Freidin, Sunnyvale, Calif.; Sneeta Gupta, Saratoga, Calif.; William M. Johnson, San Jose, Calif.; Cheng-Gang Kong, Saratoga, Calif.; Ole H. Moller, Lyngby, Denmark; Timothy A. Olson, Sunnyvale, and David I. Sorensen, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 3, 1988, Ser. No. 163,917
Int. Cl.[5] G06F *9/40, 9/00*
U.S. Cl. 364—200 40 Claims



1. An apparatus for processing data in response to a program composed of prespecified instructions in pipeline cycles, the data being stored in locations in a data memory addressed by data addresses and instructions being stored in locations in an instruction memory addressed by instruction addresses, and wherein instructions include file address field identifying sources of operand data and destinations for result data, the apparatus comprising:

channel means for transferring addresses and data to the instruction and data memories (14,15,16) and for receiving data and instructions from the data and instruction memories, including an instruction interface (20) adapted for receiving instructions from the instruction memory, a data interface (22) adapted for communicating data between the apparatus and the data memory, and an address interface (21) adapted for supplying data addresses to the data memory and instruction addresses to the instruction memory;

program addressing means (31), responsive to the program, for supplying a sequential instruction address or a non-sequential instruction address for an instruction to be executed according to the program;

buffering means (26), coupled to receive instructions from the instruction interface and to the program addressing means, for buffering a sequence of instructions supplied to the instruction interface in buffer locations accessible in response to the sequential instruction address supplied by the program addressing means;

caching means (29) coupled to the program addressing means, for storing sets of instructions in blocks of cache locations identified by a field in the instruction addresses and accessible in response to the non-sequential instruction address supplied by the program addressing means, the sets including instructions retrieved from sequential locations in the instruction memory, and a first instruction in each set being a target instruction of a non-sequential instruction address;

instruction register means (27), coupled to buffering means and the caching means, for staging under program control an instruction accessed from the buffering means or the caching means in response to the sequential or non-sequential instruction address, respectively, supplied by the program addressing means;

storage means (40) for storing data in a file of data locations identified by file addresses, the storage means including at least two read ports (A,B) and at least one write port (C), the read ports including means connected to receive file addresses in pipeline cycles for supplying data at the read port from data locations identified by the received file addresses, and the write port connected to receive data and including means connected to receive file addresses in pipeline cycles for writing data received at the write port to data locations identified by the received file addresses;

file addressing means (43), coupled to receive file address field of the instructions staged from the instruction register means and to the storage means, for supplying file addresses identified by the file address field to the read ports and the write port under program control;

executing means (42), responsive to the instructions staged from the instruction register means in pipeline cycles and coupled to the read ports, for executing the instructions and generating resulting data;

result register means (53), coupled to supply data to the write port and connected to the executing means, for staging the resulting data.

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I/O CONTROL SYSTEM AND METHOD

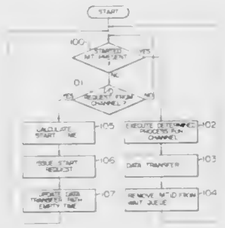
Akira Yamamoto; Miho Motoyama; Hiroyuki Kitajima, all of Yokohama; Takashi Doi, Hadano, and Toshifumi Nishimura, Minami-ashigara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 830,835, Feb. 19, 1986, abandoned. This application Jan. 5, 1989, Ser. No. 293,555

Claims priority, application Japan, Feb. 28, 1985, 60-39868; May 10, 1985, 60-97739

Int. Cl.[5] G06F *3/00*

U.S. Cl. 364—200 22 Claims



20. An I/O device control system according to claim 19, wherein said I/O control means further includes means for starting one of said I/O devices when none of said I/O devices is starting or transferring data.

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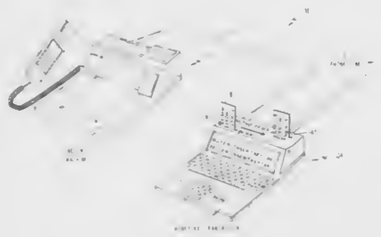
APPARATUS FOR CARRYING OUT FINANCIAL TRANSACTIONS VIA A FACSIMILE MACHINE

William M. Benton, Fort Lauderdale, and William Mee, Pompano Beach, both of Fla., assignors to Moneyfax, Inc., Ft. Lauderdale, Fla.

Filed Aug. 23, 1988, Ser. No. 236,614

Int. Cl.[5] G06F *15/21, 13/00*

U.S. Cl. 364—408 30 Claims



1. An electronic funds transfer system for carrying out financial transactions between local or remote users, comprising:

a portable identification module having an information storage means therein, said information storage means storing first data corresponding at least to a vendor/vendee identification number, transaction amounts, transaction times, an account balance and a vendor/vendee signature;

a facsimile machine comprising first means including a document printer for printing data on a recording medium, input means including a keyboard for receiving second data manually entered thereon, said facsimile machine further including means for formatting said first and second data, means for transmitting formatted data via a communication medium to other ones of said facsimile machine, said formatted data including text and graphics data, means for receiving formatted data incoming on said communication medium from said other ones of said facsimile machine and means for printing on said recording medium in formation including vendor/vendee signature corresponding to said formatted data;

interface means incorporated with said facsimile machine for receiving said identification module, said interface means including means for writing said second data to and reading said second data from said module; and

processor means in circuit with said keyboard and said interface means for carrying out vendor/vendee transactions, said processor means including means for coupling said first and second data to said formatting means and for updating said first data stored in said storage means in accordance with said transactions.

17. For a facsimile machine comprising a document reader for reading text and graphics data from a document provided thereto, a document printer for printing data on a recording medium, a keyboard for receiving and encoding first data manually entered thereon, means for formatting data received from said document reader and said keyboard, means for transmitting said formatted data via a communication medium to other facsimile machines, means for receiving formatted data incoming on said communication medium from said other facsimile machines and printer means for printing on said recording medium text and graphics information, an improvement for carrying out vendor/vendee transactions comprising:

receiving means incorporated with said facsimile machine for receiving a vendor/vendee identification module, said receiving means having means for writing data to and reading data including a vendor/vendee signature from said module; and processor means in circuit with said keyboard and said receiving means for carrying out vendor/vendee transactions, comprising means for determining whether a transaction requested via the keyboard is an authorized transaction, means for coupling data including said vendor/vendee signature carried by said identification module to said formatting means, means for updating said data carried by said identification module in accordance with said authorized transaction, means for generating transaction data associated with said authorized transaction and means for transmitting said transaction data to another facsimile machine.

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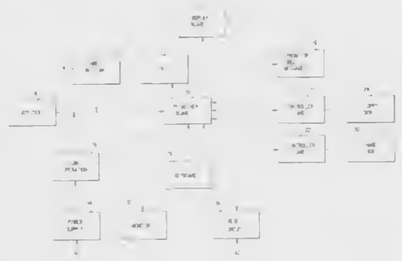
COIN-OPERATED MESSAGE DISPLAY SYSTEM

Robert E. McKinley, 7756 Whittington Dr., Richmond, Va. 23225

Filed Aug. 12, 1988, Ser. No. 231,477

Int. Cl.[5] G06F *3/033*

U.S. Cl. 364—410 9 Claims



1. A coin-operated display panel system which permits local users to deposit coins to gain access to a display panel which comprises:

a. a microprocessor having memory means for storing messages,

b. a first cathode ray tube for viewing messages during their course of preparation by a local use, said first cathode ray tube being connected to said microprocessor,

c. means to input a message to said microprocessor by said local user,

d. a second cathode ray tube for use by a system operator connected to said microprocessor in reviewing, approving, and censoring messages prepared by said local user,

i. input means to permit said system operator to input messages of his own to said microprocessor and to delete messages prepared by said local user from the memory of said microprocessor,

e. means to insert fixed messages such as advertisements to the memory of said microprocessor,

i. said means to insert fixed messages being controlled by clock means, and

f. display panel means to display messages stored in the memory of the microprocessor in sequential order with said messages being moved onto and off of said display panel means.

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COMPUTERIZED GAMING SYSTEM

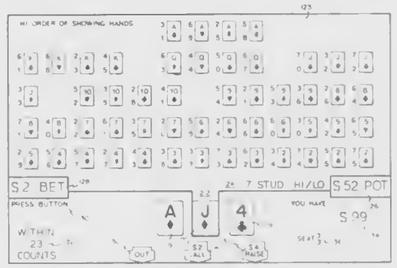
Joseph D. H. Sidley, 1710 Tyvale Ct., Vienna, Va. 22180

Continuation-in-part of Ser. No. 873,098, Jun. 5, 1986, Pat. No. 4,760,527, which is a continuation of Ser. No. 482,315, Apr. 5, 1983, abandoned. This application Mar. 29, 1988, Ser. No. 174,948

The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.

Int. Cl.[5] G06F *15/44*

U.S. Cl. 364—412 22 Claims



2. An electronic system for playing a card game of poker involving interactive wagering among a plurality of players comprising:

(a) a central processing unit having:

(i) means enabling all players to initiate a set of wagers to be responded to by a plurality of players;

(ii) means to electronically assign one or more cards to the plurality of players;

(iii) means to initiate and transmit all events relating to the playing of the poker card game;

(iv) means to tabulate, store and transmit data received from the plurality of players in response to the poker game events;

(v) means to tabulate, store and transmit interactive wagering data received from the plurality of players to each of the other players;

(vi) means to evaluate each player's cards and determine an order of finish of the players; and,

(vii) means to divide the total amount wagered in accordance with the order of finish of the players; and,

(b) a plurality of individual player consoles, one for each of the plurality of players, electrically connected to the central processing unit, each console having:

(i) processor means to determine and construct a rank element, suit element, and enclosure elements for said rank and suit elements for each card;

(ii) means to electronically receive and display the cards assigned to the individual player such that a rank, a suit and an enclosure element is displayed for each card so as to uniquely identify any improved poker hand which a plurality of cards for each individual player is capable of attaining with the addition of at least one card;

(iii) first input means to allow each player to respond to the game events initiated by the central processing unit;

(iv) second input means to allow each player to transmit wagering data to the central processing unit; and,

(v) means to receive and display wagering data relating to the other players.

4,926,328

METHOD OF CONTROLLING TRANSMISSION FOR VEHICLE

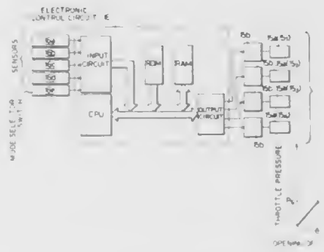
Koichi Funatsu, and Hiromi Aida, both of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1988, Ser. No. 148,738

Claims priority, application Japan, Jan. 29, 1987, 62-17242

Int. Cl.[5] B60K *41/18;* G06F *15/20;* F16H *5/66*

U.S. Cl. 364—424.1 1 Claim



1. A method of controlling an automatic transmission for a vehicle having a first speed-change range and a second speed-change range as ranges for effecting the automatic speed change of said transmission, each speed change range having change points as a function of vehicle operating parameters, wherein when said first speed-change range has been selected, the automatic speed change from a minimum-speed stage to a maximum-speed stage is effected in accordance with first predetermined speed-change characteristics such that the transmission speed changes in response to operating parameters of said vehicle, said method comprising the steps of:

effecting an automatic speed change from the minimum-speed stage to the maximum-speed stage in accordance with the second speed-change characteristics when the second speed-change range is selected, wherein speed changes in the second speed-change range occur at higher vehicle speeds than corresponding speed-changes in the first speed change range;

selecting an inhibiting or non-inhibiting mode of operation for the second speed range, wherein when the inhibiting mode is selected, the transmission is prevented from speed-changing to the maximum speed-stage; and

switching from the inhibiting mode to the non-inhibiting mode only when the second automatic speed-change range has been selected, and wherein when the selection of the second speed-change range has been changed to the first speed-change range, a change-over to the inhibiting mode can be effected even if the non-inhibiting mode has been selected, wherein change-over between the first speed-change range and the second speed-change range is made by operating a shift lever.

VOL
1114
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4,926,329

ARRANGEMENT FOR CONTROLLING THE POWER TRANSMISSION OF AN ALL-WHEEL DRIVE VEHICLE

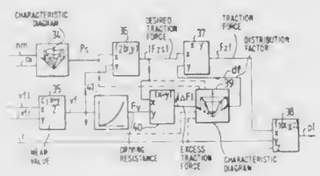
Norbert Stelter, Weissach; Goetz Richter, Muehlacker, and Juergen Schneider, Weissach, all of Fed. Rep. of Germany, assignors to Dr. Ing. H.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Mar. 10, 1987, Ser. No. 24,068

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3608059

Int. Cl.[5] B60K *17/34*

U.S. Cl. 364—424.01 16 Claims



1. An arrangement for controlling a power transmission to axles of an all-wheel drive motor vehicle, having a main driving axle equipped with a transverse differential, and an auxiliary driving axle that is driven by a longitudinal clutch and is continuously controllable by control element means and a control unit, said control unit receiving input signals from a plurality of sensors relating to current operational variables of the vehicle and generating a control quantity for controlling said control element means of said longitudinal clutch as a function of at least one traction force of wheels of the vehicle, the improvement comprising:

means for determining a desired traction force;

means for determining a driving resistance from a vehicle driving speed from at least one of said input signals from the plurality of sensors relating to current operational variables of the vehicle;

means for determining an excess traction force as a difference of an amount of said desired traction force and said driving resistance;

means for determining said traction force as a function of said desired traction force and a distribution factor; and

means for obtaining said distribution factor according to a first characteristic diagram stored in a memory area wherein said first characteristic diagram defines the distribution factor as a function of at least said excess traction force.

4,926,330

DIAGNOSIS SYSTEM FOR A MOTOR VEHICLE

Kunihiro Abe, and Tomoya Kobayashi, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,796

Claims priority, application Japan, Dec. 21, 1987, 62-324446

Int. Cl.[5] G01M *15/00*; F02D *41/26*; F02P *17/00*

U.S. Cl. 364—424.03 2 Claims

1. A system for diagnosing a motor vehicle and an electronic control system for controlling an engine mounted on the vehicle, the control system having sensors for detecting operating conditions of the engine, comprising:

a diagnosis device including a case and a computer having a central processing unit and a memory storing a plurality of programs for diagnosing the electronic control system disposed in said case;

a connector connecting the computer to the electronic control system;

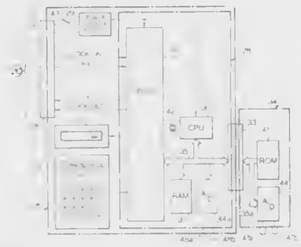
the diagnosis device including a keyboard for inputting a diagnosis mode and a tester mode;

means comprising terminals provided on the case of the diagnosis device for receiving an analog signal from a part of an electric system of the vehicle other than the electronic control system which controls the engine;

a converter disposed in said case for converting the analog signal received at the terminals to a digital signal and for applying the converted digital signal to the computer;

the computer including:

determining means for determining whether the diagnosis mode for diagnosing the electronic control system which controls the engine or the tester mode for testing the part of the electric system of the vehicle other than the electronic control system which controls the engine, which part produces the analog signal, is input through the keyboard and for producing a diagnosis mode signal or a tester mode signal in dependency on the determination;



data demand means responsive to the diagnosis mode signal for applying a data demand signal to the electronic control system;

data receiving means for receiving data from the electronic control system; and

receiving means responsive to the tester mode signal for receiving said analog signal from the vehicle through the terminals and applying the analog signal to the converter for diagnosing the analog signal; and

display means on the diagnosis device for displaying received data in a form of diagnosis data for both the tester mode and the diagnosis mode.

4,926,331

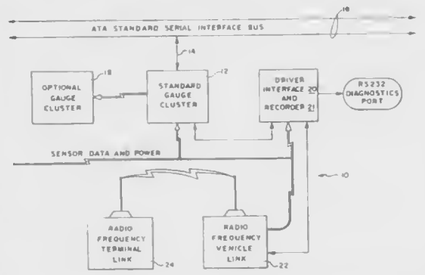
TRUCK OPERATION MONITORING SYSTEM

William E. Windle, Antwerp, Ohio; Robert E. Zimmerman, Woodburn, Ind.; Ronald W. Glotzbach, and Robert J. Onesti, both of Ft. Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Continuation of Ser. No. 833,298, Feb. 25, 1986, abandoned. This application Dec. 20, 1988, Ser. No. 287,691

Int. Cl.[5] G06F *13/00, 15/20*

U.S. Cl. 364—424.04 14 Claims



1. An on board truck operation monitoring system a portion of which is mounted in a truck cab and which comprises:

a plurality of sensors, each positioned to sense an operating parameter of the truck;

a primary instrumentation module including primary instrument gauges mounted in the truck cab and data processing means comprising microprocessor means and memory means including a RAM and ROM for processing data in accordance with an instruction set stored in said ROM, means for coupling said sensors to said microprocessor means, display means coupled to said microprocessor means for displaying operating parameter data such as data generated by said sensors, and said RAM and ROM being coupled to said microprocessor means for storing said operating parameter data from said sensors in said RAM and said instruction set in said ROM;

operator input means for actuating said microprocessor means for selectively displaying data on said display means, for altering and executing portions of the instruction set, for inputting operator data and for selectively displaying operating parameter data;

said operator input means further including a cab mounted driver interface module coupled to said primary instrument module and including a panel having a driver interface display for displaying said operator data and a driver interface keyboard on said panel including number keys, specific function keys and programmable function keys for inputting said operator data into said memory means;

radio frequency link means for communicating at least said operating parameter data and said operator data from said memory means to a larger off board data processing apparatus,

said larger off board data processing apparatus comprises radio transmitting and receiving means for polling said radio frequency link means for automatically retrieving data from said memory means, and

said microprocessor means including means for carrying out a self diagnostic mode of operation of the system in which all the sensors are checked to see if they are working properly and in which said radio frequency link means for communicating from said memory means to the larger off board processing apparatus is checked to make certain it is functioning properly.

4,926,332

LOCKING DEVICE FOR VEHICLES

Kenichi Komuro, Toyota; Taneichi Kawai, Anjo; Atsushi Kamei, Nagoya; Toru Asada, Takaoka; Nozomu Torii, Hekinan, and Ryoichi Fukumoto, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 888,168, Jul. 22, 1986, abandoned. This application Nov. 15, 1988, Ser. No. 271,670

Claims priority, application Japan, Jul. 22, 1985, 60-161367; Jul. 23, 1985, 60-162349

Int. Cl.[5] G08C *19/00*; G06F *7/04*

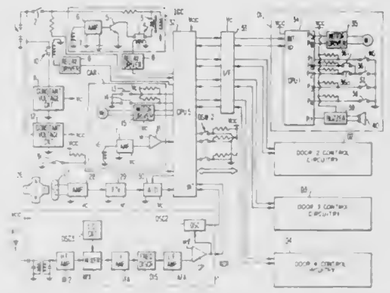
U.S. Cl. 364—424.05 9 Claims

1. A lock device for a vehicle comprising:

lock instruction means for selectively generating and transmitting a command to lock or unlock the lock device, said lock instruction means including register means for storing a base code and an update code, each of said base code and said update code identifying said lock instruction means, said lock instruction means for transmitting said command including a transmitter identification portion corresponding to said update code;

lock control means for storing a reference code and for establishing a locked state for the lock device in response to said reference code being equal to said transmitted transmitter identification portion and said command being to lock the lock device and an unlock state in response to said reference code being equal to said transmitted transmitter identification portion and said command being to unlock the lock device;

code changing transmission means responsive to said reference code being equal to said transmitted transmitter identification portion for transmitting to said lock instruction means information for modifying the transmitter identification portion and for modifying said reference code in accordance with said modifying information; and



code update means in said lock instruction means, responsive to said modifying information, for storing a modified transmitter identification portion as said update code in said update code register.

4,926,333

TRACTION CONTROL APPARATUS

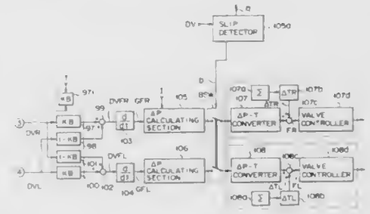
Masayuki Hashiguchi, Oobu; Kiichi Yamada, Nagoya; Masayoshi Ito, Okazaki; Atsuhiro Kawano, Oobu; Susumu Nishikawa, Okazaki; Takeshi Funakoshi, Oobu, and Shuji Ikeda, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1989, Ser. No. 339,144

Claims priority, application Japan, Apr. 20, 1988, 63-97274; Apr. 20, 1988, 63-97281; Sep. 5, 1988, 63-221603; Sep. 5, 1988, 63-221604; Sep. 5, 1988, 63-221608

Int. Cl.[5] B60T *8/32*

U.S. Cl. 364—426.02 12 Claims



1. A traction control apparatus comprising:

drive state detecting means for detecting a drive state of the vehicle;

acceleration slippage detecting means for, when it is detected that acceleration slippage occurs in driving wheels of a vehicle, outputting at least a braking control start instruction;

left driving wheel velocity detecting means for detecting a left driving wheel velocity of the vehicle;

right driving wheel velocity detecting means for detecting a right driving wheel velocity of the vehicle;

driven wheel velocity detecting means for detecting a driven wheel velocity of the vehicle;

reference velocity setting means for setting a reference velocity on the basis of the driven wheel velocity detected by said driven wheel velocity detecting means;

first slip value detecting means for detecting a slip value DVL of the left driving wheel on the basis of a difference between an output from said left driving wheel velocity

VOL 1114 ISS 3 MY 15 1990 UMI

detecting means and an output from said reference velocity setting means;

second slip value detecting means for detecting a slip value DVR of the right driving wheel on the basis of a difference between an output from said right driving wheel velocity detecting means and the output from said reference velocity setting means;

coefficient setting means for setting a fixed on variable coefficient KB having a value between 0 and 1 in accordance with the detected drive state from the drive state detecting means;

left driving wheel braking means for braking the left driving wheel;

right driving wheel braking means for braking the right driving wheel;

left braking control means for controlling the left driving wheel in accordance with a correction slip value DVFL of the left driving wheel calculated by the following equation on the basis of the output DVL from said first slip value detecting means, the output DVR from said second slip value detecting means, and the output KB of said coefficient setting means:

$$DVFL = KB \cdot DVL + (1 - KB) \cdot DVR$$

right braking control means for controlling the right driving wheel in accordance with a correction slip value DVFR of the right driving wheel calculated by the following equation on the basis of the output DVR, the output DVL, and the output KB:

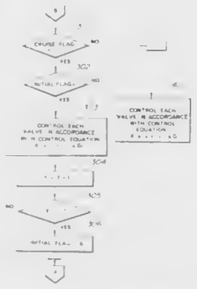
$$DVFR = KB \cdot DVR + (1 - KB) \cdot DVL$$

4,926,334

SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING A VEHICLE SPEED TO A DESIRED CRUISING SPEED

Kouichi Suzuki, Tokyo, and Kiyoshi Konishi, Kanagawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 28, 1987, Ser. No. 43,532
Claims priority, application Japan, May 1, 1986, 61-102442
Int. Cl.[5] B60K *31/00*
U.S. Cl. 364—426.04 **14 Claims**



1. A system for automatically controlling a running speed of a moving object to a desired cruising speed, comprising:

(a) first means for detecting the running speed of the moving object;

(b) second means for operatively generating and outputting a command signal to run the moving object at a cruising speed, the cruising speed being a running speed at the time of the output of the command signal by the second means;

(c) third mans for storing the cruising speed which comprises the running speed detected by the first means in response to the output of the command signal by the second means;

(d) fourth means responsive to the command signal for suppressing an overshoot of the running speed to a minimum which occurs immediately after the second means generates and outputs the command signal, wherein the fourth means controls the running speed of the moving object with first control constants Ki, Gi in a control equation $(Ki \times \alpha + \epsilon) \times Gi$, wherein (ϵ) denotes a difference between the stored cruising speed and the running speed detected by the first means, (α) denotes a rate of change in the running speed detected by the first means, and said first control constant Gi denotes a control gain, until a predetermined condition is satisfied; and

(e) fifth means for controlling the running speed so that the running speed is maintained at the stored cruising speed after the fourth means suppresses the overshoot and the predetermined condition is satisfied, wherein the fifth means controls the running speed of the moving object with second control constants K, G, which are different from and less than said first control constants Ki and Gi, in a control equation $(Ki \times \alpha + \epsilon) \times G$, wherein (ϵ) denotes a difference between the stored cruising speed and the running speed detected by the first means (α) denotes a rate of change in the running speed detected by the first means, and said second control constant G denotes a control gain.

4,926,335

DETERMINING BAROMETRIC PRESSURE USING A MANIFOLD PRESSURE SENSOR

Barbara A. Flowers, Canton; Richard A. Marsh, Birmingham; John C. Haraf, Livonia, and Alfred D. LePage, Plymouth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1988, Ser. No. 224,090
Int. Cl.[5] F02D *41/30;* **G06F** *15/20*
U.S. Cl. 364—431.05 **2 Claims**



1. For an engine having an intake manifold and an intake passage through which air is drawn from the atmosphere into the intake manifold, the intake passage including a throttle operable between wide open and closed angular positions to regulate the air flow through the intake passage into the intake manifold, a system for updating a determined barometric pressure value during part throttle angle conditions of the engine between first and second altitudes, the system comprising:

means for measuring the absolute pressure in the intake manifold;

means for measuring the angle of the throttle;

means for measuring the speed of the engine;

memory means including (A) a first lookup tabe storing predetermined pressure drop values between the atmosphere and the intake manifold at the first altitude as a function of throttle angle and engine speed and (B) a second lookup table storing predetermined pressure drop values between the atmosphere and the intake manifold at the second altitude as a function of throttle angle and engine speed; and

means for updating the determined barometric pressure including (A) means for retrieving the stored pressure drop value from the first lookup table corresponding to the measured throttle angle and the measured engine speed, (B) means for retrieving the stored pressure drop value from the second lookup table corresponding to the measured throttle angle and the measured engine speed, (C) means for interpolating between the retrieved pressure drop values based on the determined barometric pressure value to provide an estimated pressure drop value between the atmosphere and the intake manifold and (D) means for summing the measured intake manifold absolute pressure and the estimated pressure drop value the summed value comprising a new determined value of the barometric pressure.

4,926,336

ROUTE SEARCHING SYSTEM OF NAVIGATION APPARATUS

Takashi Yamada, Anjo, Japan, assignor to Aisin AW Co., Ltd., Aichi and Kabushiki Kaisha Shinsangyokaihatsu, Tokyo, both of, Japan

Filed Dec. 27, 1988, Ser. No. 290,207
Claims priority, application Japan, Dec. 28, 1987, 62-333039
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—444 **7 Claims**



1. A navigation apparatus for a vehicle having intersection data concerning positions of intersections, road data including data concerning distances of roads between said intersections and characteristic feature data about said roads,

input means for inputting departure and destination points,

course retrieval means for retrieving an optimum course from said departure point to said destination point, and

course guiding means for providing guidance along said retrieved course by at least one of a visual display output and a speech output; said course retrieval means including:

road weighing means for weighing said distances of roads between intersections by adding or subtracting distances corresponding to said characteristic feature data respectively to or from each of said distances; and

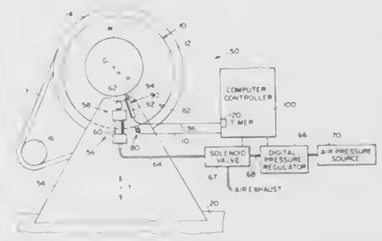
optimization means for providing said optimum course corresponding to a minimum distance between said input departure and destination points based on said weighed distances.

4,926,337

AUTOMATIC WORKPART CENTERING MECHANISM FOR A CHUCK

Richard H. Gile, North Clarendon, Vt., assignor to Bryant Grinder Corporation, Springfield, Vt.

Filed Jul. 13, 1988, Ser. No. 218,563
Int. Cl.[5] G06F *15/46;* **B23B** *15/00*
U.S. Cl. 364—474.06 **58 Claims**



45. A method for centering a plurality of workparts of the same type in succession on a rotating chuck having a chuck axis of rotation, comprising:

(a) rotating the chuck with the geometrical axis of each workpart offset from the chuck axis of rotation such that the workpart moves eccentrically,

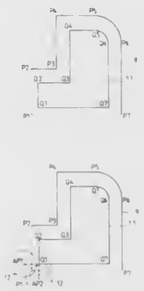
(b) striking each workpart positioned on the chuck with multiple, successive centering blows whose strike force is varied in accordance with a striking force magnitude versus workpart displacement magnitude relationship developed from the centering of preceding workparts on the chuck to effect movement of the axis of the workpart toward the chuck axis of rotation when struck with said blows.

4,926,338

NUMERICAL CONTROL APPARATUS

Shigeki Nankaku, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 208,718
Claims priority, application Japan, Jun. 19, 1987, 62-152871; Jun. 19, 1987, 62-152872; Jun. 19, 1987, 62-152876; Jun. 30, 1987, 62-161111
Int. Cl.[5] G05B *19/24;* **B23B** *39/26*
U.S. Cl. 364—474.32 **9 Claims**



1. A numerical control apparatus which produces at least

VOL
1114
ISS
3
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one of an approach path and a retract path by which a tool is directed to contact a workpiece to be machined based on input data to perform contour-machining, comprising:

means for inputting whether wall sections of a final machined version of said workpiece are one of air wall sections and real wall sections;

means for producing said at least one of said approach path and said retract path based on said wall category of said wall sections.

4,926,339

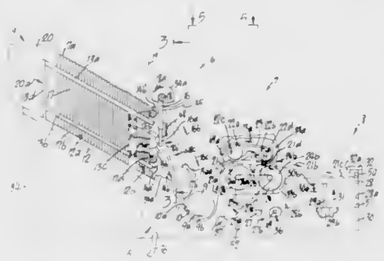
COMPUTER AUTOMATED MICROFILM JACKET FEED AND PRINTER DEVICE

Michael Naso, 2512 Leslie St., and Frank Naso, 476 Clark Pl., both of Union, N.J. 07083

Filed Jun. 8, 1989, Ser. No. 363,470

Int. Cl.[5] G06F *15/20*; B41J *13/10*

U.S. Cl. 364—478 **27 Claims**



1. In an automated printing device that includes a combination of a computer-type means inclusive of computer hardware and software thereof, for receiving and reading, responding to and sending signals responsive to preprogrammed hardware and software in the operating of a printer in combination therewith, the printer as a printer means for printing out data stored on software carried by the computer-type means, the improvement providing an automated microfilm jacket improved combination comprising: said printer means including a platen typing-surface adapted to support flexible substrate to be printed-on by said printing means, and a platen-roller having a longitudinal axis around which the platen-roller is revolvable and carrying said platen typing-surface circumferentially thereon, and a platen-roller line-feed drive means for advancing predetermined line-feed numbers of spaces responsive to programmed signals from said hardware and said software from said computer-type means, and printer support structure and guide structure positioned and adapted to receive and guide flexible substrate during advancement thereof, said guide structure and said platen-roller forming a grasping-bite position therebetween, said support structure and said guide structure being positioned and arranged at a predetermined downwardly-inclined angle of incidence such that a leading upper edge of a microfilm jacket is feedable along an imaginary aligned perpendicular to said grasping-bite position extending along a longitudinal axis of the platen roller located between the guide structure and said platen-roller such that said flexible substrate is gripable and advanceable by said platen typing-surface when said platen-roller by a computer signal from the computer-type means is caused to revolve intermittently in accordance with programming of said hardware and said software in an advancing direction, by the computer-type means being additionally for moving the flexible substrate toward, to and away from a typing state to an ejected state responsive to computer line-feed signal instructions; and a microfilm jacket-feed means for stacking a plurality of microfilm jackets resting on downwardly-directed top-edges thereof and for advancing the stack of plurality of microfilm jackets toward and feeding intermittently sequentially one-at-a-time a most forward one of said plurality toward and into said grasping-bite position between said guide structure and said platen-roller, said microfilm jacket-feed means including an elongated support tray elongated along a tray longitudinal axis, a take-off jacket-feed means including take-off structure forming an open-end feed-location positioned in an advanced position relative to said support tray, and support-tray side-guides thereof extending substantially parallel to said tray longitudinal axis providing support for and facilitating advancing said plurality when the plurality is resting thereon, and the microfilm jacket feed-means further including a feed-jacket stack-backing means for advancing said plurality toward said open-end feed location, said take-off structure including at-least two spaced-apart rollable elongated cylindrically-shaped members spaced-apart from one-another extending across said open end transversely to said tray longitudinal axis, and the take-off jacket-feed means including at-least one suction means including a vacuum-producing means for alternately providing vacuum and terminating vacuum and for providing a vacuum intake structure and vacuuming opening formed thereby through which vacuum acts, with movement of the vacuum intake structure to and from a vacuuming positionable between said two spaced-apart rollable elongated cylindrically-shaped members at said open-end feed location being controlled by the microfilm jacket feed-means responsive to signals from said computer-type means such that said vacuum-intake structure and vacuuming opening thereof is vacuum-graspable of a substantially flat face of a most forwardly-advanced one of said plurality at said open-end feed location along said tray longitudinal axis, and the suction means further including feed-transport means for moving said vacuum intake structure and a microfilm jacket vacuum-attached thereto to said grasping-bite position with the top edge of a vacuum-attached microfilm jacket having its upper end directed downwardly such that the jacket's longitudinal axis extends perpendicularly relative to said longitudinal axis of said platten-roller at said grasping-bite position.

4,926,340

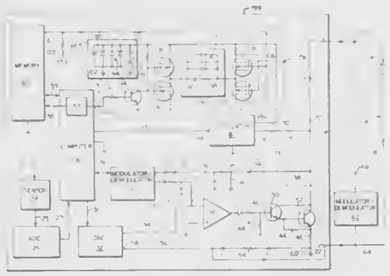
LOW POWER PROCESS MEASUREMENT TRANSMITTER

Charles E. Goetzinger, Bloomington, and Dale W. Borgeson, Minneapolis, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 883,982, Jul. 10, 1986, abandoned. This application Feb. 28, 1989, Ser. No. 317,017

Int. Cl.[5] G01R *19/00*; G06F *11/30, 1/00*

U.S. Cl. 364—483 **18 Claims**



1. A transmitter for deriving energization from, receiving input data modulated on, and transmitting output data by modulation of, a loop current provided by a external power source over a current loop, the transmitter having instantaneous power demands exceeding minimum instantaneous power available from the loop current, the transmitter comprising:

sensor means for generating measured values of a process variable;

computing means coupled to the sensor means for receiving the measured values, executing a function using the measured value and modulating an output signal with the loop current as determined by the result of execution of the function;

receiver means connected between the current loop and the computing means for coupling data received as modulated input signals on the current loop to the computing means, the data including parameters relating to execution of the function;

memory means coupled to the computing means for storing the coupled data when energized at a first energization rate; and

energization means coupled between the current loop and the memory means for receiving energization from the current loop at a second energization rate lower than the first energization rate and lower than the minimum instantaneous power available from the loop current and for selectively energizing the memory means at the first energization rate.

4,926,341

METHOD AND APPARATUS FOR CALIBRATION OF BALANCING UNIT

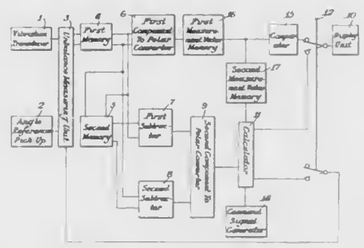
Volker Guyot, Buttelborn, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

Filed Oct. 14, 1987, Ser. No. 108,488

Claims priority, application European Pat. Off., Dec. 24, 1986, 86118074.3

Int. Cl.[5] G01M *1/16*; G06F *15/20*

U.S. Cl. 364—508 **4 Claims**



1. In a method for adjusting a balancing unit comprising the steps of providing unbalance measuring means having display units associated therewith for an angular position of unbalance and an unbalance magnitude, utilizing circuitry for processing of unbalance vibrations picked up by a vibration transducer and also for processing an angular position of unbalance, utilizing weights from a supply of graded unbalance compensating weights for compensating unbalance of a component under test, displaying in the display units and storing in a first memory unbalance information after a measurement run to compensate unbalance of a component under test with a compensating weight of a magnitude and angular position relating to the displayed unbalance information, performing a subsequent control run, displaying and storing the unbalance information of the control run, and terminating any further runs when the difference between the measurement run and subsequent control run does not exceed a predetermined amount, the improvement including the steps of positively transferring the stored unbalance information from the measurement run to a second memory during the subsequent control run, positively replacing the unbalance information of the measurement run with the unbalance information of the control run when the difference exceeds the predetermined amount so that the control run then becomes a calibration run, subtracting the unbalance information of the measurement run and the calibration run from one another to thereby provide differential unbalance information, converting the differential unbalance information into vectorial parameters and converting the unbalance information of the measurement run into vectorial parameters, calculating new unbalance information from the vectorial components of both the measurement run and the differential unbalance information from the measurement and control runs, indicating a new compensating weight and new angular position of unbalance based upon the new unbalance information, using the indicated compensating weight and angular position of unbalance to balance the component under test, and adjusting the balancing unit based upon the new unbalance information.

4,926,342

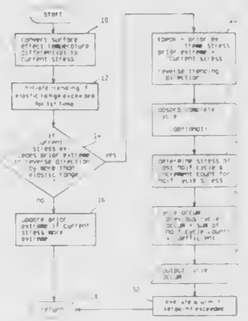
HIGH PRESSURE ROTOR STRESS DAMAGE ACCUMULATING METHOD

Edward Y. Hwang, Winter Park, and Michael P. Chow, Orlando, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1987, Ser. No. 140,064

Int. Cl.[5] G01M *7/00*; G01N *3/60*

U.S. Cl. 364—508 **13 Claims**



1. A method for accumulating stress damage induced by temperature change, comprising execution of the following steps in a computing apparatus:

(a) determining a representation of stress damage induced between beginning and end of a period of substantially continuous temperature change in one direction, including the substeps of

(ai) converting temperature differential to current stress;

(aii) detecting a most recent change, exceeding an elastic range, in direction of change in current stress;

(aiii) storing, as an extreme stress value, the most recent change detected in step (aii), together with previously detected extreme stress values, each corresponding to previous changes in direction of change in stress; and

(aiv) determining the representation of stress damage induced between the most recent change in direction of change in current stress detected in step (aii) and an immediately previously stored extreme stress value;

(b) incrementing one of a plurality of counter variables, the one counter variable corresponding to a range including the representation of stress damage determined in step (a);

(c) calculating accumulated stress damage by summing each of the plurality of counter variables multiplied by a coefficient of stress damage represented by the counter variable corresponding thereto; and

(d) repeating steps (a)–(c) for subsequent periods of substantially continuous temperature change in one direction.

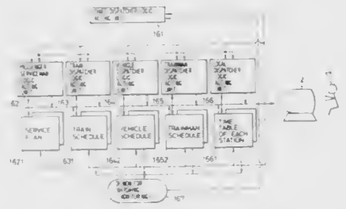
VOL
1114
ISS
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4,926,343

TRANSIT SCHEDULE GENERATING METHOD AND SYSTEM

Setsuo Tsuruta, Sagamihara, and Shoji Miyamoto, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 832,892, Feb. 26, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 255,253
Claims priority, application Japan, Feb. 28, 1985, 60-39869
Int. Cl.[5] G06F *15/60, 13/38*
U.S. Cl. 364—513 **29 Claims**



25. A transit schedule generating method in a computer system having a plurality of objects, comprising:

a first step of generating by a first logic acting unit a first schedule, through setting at least one of time and route for transportation, on the basis of a first active knowledge modeled for said first logic acting unit and having at least a train dispatching rule for specifying allowable ranges of a train starting time at a station;

a second step of deciding an information, related to said setting and a relevant logic acting unit, by an object watching said schedule on the basis of a first passive knowledge related to said first schedule and including a name of a datum to be monitored, said name of datum including a name including said train starting time;

a third step of transferring the generated first schedule from said first logic acting unit to said relevant logic unit by a second logic acting unit by way of message passing, so that said second logic acting unit generates a resource schedule on the basis of a second active knowledge, said second active knowledge having rules for available resources and for resource dispatching and said second active knowledge can be locally accessed by said second logic acting unit for revising said first schedule;

a fourth step of generating by said second logic acting unit, a resource schedule for allocating transportation resources needed for making said first schedule practicable, on the basis of said generated first schedule and said second active knowledge;

a fifth step of transferring by said second logic acting unit to said first logic acting unit by way of message passing a modification request for said resource schedule, when said second logic acting unit cannot generate resource schedules needed for said first schedule without problem;

a sixth step of modifying according to said modification request, said first schedule and said resource schedule on the basis of relaxed constraints in said first and second active knowledge; and

a seventh step of fixing said modified first schedule by said first logic acting unit when said modified resource schedule has no problem.

28. A logic acting unit in a transit schedule generating system in a computer system having at least objects therein comprising:

means for generating a first schedule through setting at least one of time and route for transportation, on the basis of a first active knowledge modeled for said first logic acting unit and having at least a train dispatching rule specifying allowable ranges of a train starting time at a station;

means for deciding an information related to said setting and a relevant logic acting unit, said means being in an object watching said schedule on the basis of a first passive knowledge related to said first schedule and including a name of a datum to be monitored, said name of datum which includes a name including said train starting time;

means for transferring the generated first schedule to said relative logic acting unit including another logic acting unit by way of message passing, so that said another logic acting unit generates a resource schedule on the basis of a second active knowledge, said second active knowledge having rules for available resources and for resource dispatching and can be locally accessed by said another logic acting unit for revising said first schedule;

means for estimating the generated first schedule and said resource schedule received from said another logic acting unit, when a resource schedule proposition message is received from another logic acting unit;

means for setting a value to its iteration counter, when a transportation schedule modification message is received from another logic acting unit;

means for generating a modified or completely alternative transportation schedule proposition message to said another logic acting unit or a coordination request message to a chief logic acting unit, when said iteration counter reaches said value;

means for sending a coordination request message, when a time-out problem message is received; and

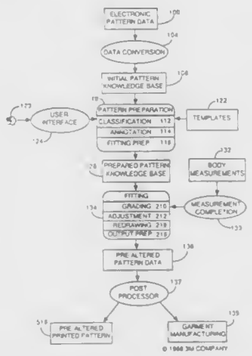
means for relaxing a specific constraint, and generating a modulated first schedule, when a coordination proposition message with said specified constraint is received from another logic acting unit and sending said modulated first schedule with a compromise request to said another logic acting unit.

4,926,344

DATA STORAGE STRUCTURE OF GARMENT PATTERNS TO ENABLE SUBSEQUENT COMPUTERIZED PREALTERATION

John E. Collins; Mitchell B. Grunes, and Darryn J. Kozak, all of Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 16, 1988, Ser. No. 168,648
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—513 **15 Claims**



1. A computerized data storage structure physically encoded in a storage medium for specifying garment pattern data in machine-readable form for use in connection with a computerized system for manipulating the garment pattern data, comprising:

coordinate data storage means for specifying points and lines depicting parts of a garment; and

garment description storage means for specifying a description of the garment, the garment description storage means comprising:

geometric constraint storage means for specifying constraint descriptions that define limits on relationships among the points and lines that depict the garment; and

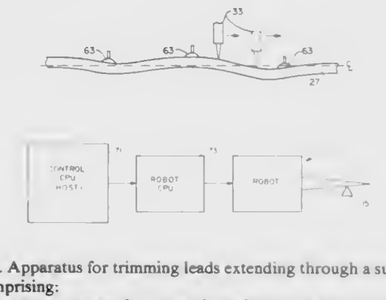
pattern measurement storage means for specifying one or more measurement constraints that map the physical dimensions of the garment onto the points and lines and specify relationships between the physical dimensions of the garment and standard or individual body measurements.

4,926,345

ROBOTIC COMPONENT LEAD TRIMMER

C. Tim Novak, Fullerton; Thomas J. Alt, Chino; Arnold D. Chapman, Orange, and David M. Driscoll, Brea, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 25, 1988, Ser. No. 173,685
Int. Cl.[5] B23P *19/00*
U.S. Cl. 364—513 **14 Claims**



1. Apparatus for trimming leads extending through a surface comprising:

first sensor means for contacting said surface and generating signals indicative of the contour of said surface;

trimmer means for trimming said leads; and

means for mounting said first sensor means and said trimmer means and for receiving said signals, and for causing said first sensor means to contact said surface and generate said signals, and further responsive to said signals to cause said trimmer means to simultaneously track said contour and trim said leads;

wherein said means mounting said trimmer means and first sensor means includes means for compensating for variations in the height of said trimmer means, said means for compensating including second sensor means responsive to said first sensor means and said lead trimmer means to determine an offset between said first sensor means and said lead trimmer means.

4,926,346

ROAD IMAGE INPUT SYSTEM FOR VEHICLE CONTROL

Shouji Yokoyama, Tokyo, Japan, assignor to Aisin-Warner Kabushiki Kaisha and Kabushiki Kaisha Shinsangyokaihatsu, both of Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,242
Claims priority, application Japan, Dec. 27, 1985, 60-294755
Int. Cl.[5] G06F *15/62*
U.S. Cl. 364—518 **5 Claims**

1. A road image input system for controlling an automotive vehicle, comprising:

pick-up means mounted on the vehicle for picking up an image of a road ahead of the vehicle;

sensing means for sensing the traveling condition of the vehicle; and

image processing means for obtaining information indicative of the road by adjusting the position of an image processing window in the x- and y-directions according to the output of said sensing means on a part of the image which has been picked up and processing data contained within said image processing window.

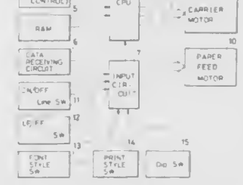


4,926,347

PRINTER WITH EMULATION CARD INSTALLATION REPORTING FEATURE

Noboru Uchida, Sayama; Masahiko Kaneko, Kawagoe, and Hisayoshi Matsumoto, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,034
Claims priority, application Japan, Oct. 7, 1986, 61-237178
Int. Cl.[5] G05F *3/12;* G06K *15/02*
U.S. Cl. 364—519 **12 Claims**



1. A printer having an integrated circuit (IC) card terminal to which an emulation IC card having storage means can be detachably mounted, comprising command means for generating a command signal for switching said printer to a maintenance more independent of a host processor, discrimination means for discriminating whether an emulation IC card storing card identification information is attached to said IC card terminal, and control means for controlling said printer to print the card identification information in said storage means on the emulation IC card responsive to said command signal switching said printer to said maintenance mode when an emulation IC card is attached to said IC card terminal.

4,926,348

PLOTTING APPARATUS USING A LIGHT SOURCE MOVED ON A PHOTOSENSITIVE SURFACE

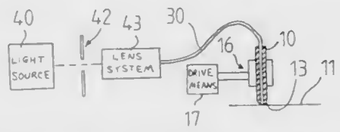
Philip S. Francis, Fitzroy, Australia, assignor to Royal Melbourne Institute of Technology Limited, Melbourne, Australia

Filed Dec. 4, 1987, Ser. No. 128,984
Claims priority, application Australia, Dec. 5, 1986, PH9355
Int. Cl.[5] G06K *15/12;* G06F *3/13;* G03B *41/00*
U.S. Cl. 364—520 **3 Claims**

1. A plotting implement for creating a record on a surface, the surface being photo-sensitive so that portions of the surface exposed to a predetermined type and amount of light undergo

VOL 1114 ISS 3 MY 15 1990 UMI

a change thereby creating a record of those exposed portions, the plotting implement including a first light source located within the implement, a contact tip for contacting and for moving between different positions on the surface, the contact tip having a light aperture for passing light therethrough, a light path within the implement for passing light from said first light source to said light aperture, the light path being surrounded by an opaque material, the light aperture having a predetermined width so that the light aperture at the contact tip constitutes a second effective light source which in use is located in contact with the photo-sensitive surface, whereby the second effective light source at the tip exposes portions of the surface which are points and/or lines of contact of the tip with the surface, the exposed portions having the width of the light aperture.



4,926,349

METHOD FOR DISPLAY PANEL PROCESSING

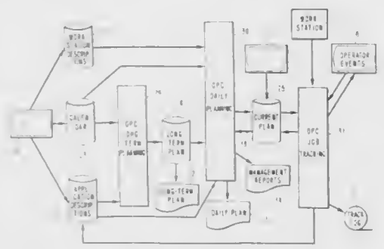
Leif R. Thor, Lidingö , Sweden, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1987, Ser. No. 44,692

Claims priority, application Sweden, Aug. 15, 1986, 8603442

Int. Cl.[5] G06F *15/20*; H04N *7/14*

U.S. Cl. 364—523 **13 Claims**



1. A method for display panel processing in an interactive terminal-host data processing system, the data processing system having a terminal connected to a host data processor, the host data processor being capable of storing a plurality of display-panel layout specifications, each display-panel layout specification specifying a display panel which the terminal is capable of displaying, the method comprising the steps of:

storing in a host data base in the host data processor data and a display panel library, the display panel library including a plurality of display-panel layout specifications comprising at least one selection-display-panel layout specification specifying a selection-display panel which includes a selection menu from which a user can select a desired processing option and at least one data-entry display-panel layout specification specifying a data-entry display panel for entering data from the terminal into the host data base,

displaying at the terminal connected to the host data processor a display-panel list of display-panel layout specifications stored in the library,

selecting one display-panel layout specification from the display-panel list and displaying the selected display panel on the terminal, modifying from the terminal the selected display-panel layout specification when the display panel specified by the selected display-panel layout specification is displayed,

storing the modified display-panel layout specification in the display-panel library, and

using the stored display-panel layout specifications, including the modified display-panel layout specification, in interactive data communication between the terminal and the host data base.

4,926,350

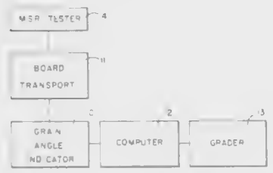
NON-DESTRUCTIVE TESTING METHODS FOR LUMBER

Friend K. Bechtel, Moscow, Id., and James R. Allen, Pullman, Wash., assignors to Metriguard, Inc., Pullman, Wash.

Filed Sep. 14, 1987, Ser. No. 96,922

Int. Cl.[5] G01R *27/00*; G01N *21/00*; B07C *5/14*

U.S. Cl. 364—550 **24 Claims**



10. An apparatus for nondestructively testing wooden boards, comprising:

grain angle indicator means for measuring grain angle values in a geometric pattern about each board;

transport means for providing relative movement between each board and the grain angle indicator means as the surface of the board is being scanned;

computer means connected to the grain angle indicator means for transforming the grain angle values measured with respect to each board to extract features indicative of knot identification, grain angle perturbations or strength of the board; and

grader means connected to the computer means for physically processing the individual boards as a function of the identified extracted features;

wherein the computer means is programmed to apply a search model to the measured grain angle values to define a series of potential failure paths starting at incremental points along one edge of a board surface and ending at its opposite edge by selecting path segments such that the cumulative failure distance for each path is minimized;

calculating a failure distance for each path as the sum of incremental failure distances or segments along the path;

selecting the potential failure path having minimum failure distance; and

wherein the grader means includes means for assigning a strength value to each board as a function of the failure distance along a selective potential failure path.

4,926,351

DIGITAL PROCESSING DEVICE FOR ANALOG INPUT

Peter Wratil, Bergisch-Gladbach, and Reinhard Schröter, Niederkassel, both of Fed. Rep. of Germany, assignors to Klöckner-Moeller, Bonn, Fed. Rep. of Germany

Filed Mar. 22, 1988, Ser. No. 171,670

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 3709805

Int. Cl.[5] G08B *21/00*; G06F *15/20*

U.S. Cl. 364—550 **15 Claims**

1. A processing module for capturing of analog input signals comprising

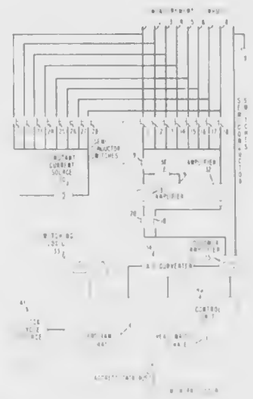
a measurement input;

an input amplifier having an input connected to the measurement input;

a follower amplifier having an input connected to the input amplifier and having an output;

a control unit connected to the output of the follower amplifier and provided with a read-write storage, and with a data storage which includes its own storage region for a corresponding measurement input and for performing a multiplexing function;

an input for the reception of analog signals where an analog signal range and the signal type is programmed as coordinated to a respective measurement input, where the measurement inputs are cyclically scanned according to the multiplexing function with respect to a measurement region, with respect to the signal type, and with respect to a momentary value of the analog <measurement parameter> signal type;



semiconductor switches, connected to the measurement input and controlled by the control unit, are switched for each measurement input within a measurement cycle depending on the storage contents of the program storage; and

an A/D converter connected to the control unit where the momentary value of the analog signal type is converted via the A/D converter and is written into the read-write storage of the control unit.

4,926,352

DIAGNOSTIC SYSTEM FOR CONTROL APPARATUS OF A MOTOR VEHICLE

Detlef Staffe, Vaihingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,474

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726344

Int. Cl.[5] G01M *15/00, 17/00*; G06F *15/20*

U.S. Cl. 364—550 **16 Claims**

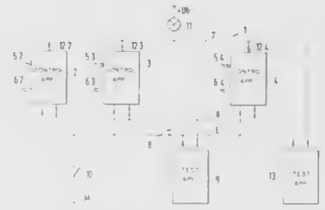
1. A diagnostic system for a plurality of control devices having decreasing priority of a motor vehicle, each equipped with a defect memory means and at least one self-diagnostic function means comprising:

a defect lamp;

defect lamp line means connecting said control apparatus to each other and to said defect lamp;

data but means including initialization line means connecting said control devices;

each control device being responsive to a first distinctive signal on said initialization line means to read-out diagnostic data as a flashing code word on said defect lamp line means to flash said defect lamp, said flashing code word including a start flashing pulse followed by four flashing sequences of up to nine flashing pulses each separated by pauses, each of the four flashing sequences in their timed sequence representing distinctive data;



each control device being addressed sequentially in decreasing priority to read-out said diagnostic data of respective control device in a diagnostic sequence with decreasing priority, and being responsive to a second distinctive signal on said initialization line means to discontinue said read-out from a respective control apparatus and begin read-out from a lower priority control device.

4,926,353

MEASURING APPARATUS FOR DETERMINING THE DEGREE OF UTILIZATION OF A MACHINE

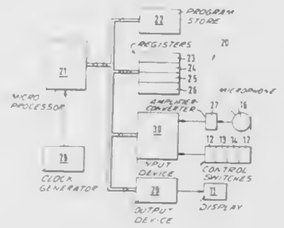
Gerhard Groezinger, Spaichingen, Fed. Rep. of Germany, assignor to Sipra Patententwicklungs-und Beteiligungsgesellschaft GmbH, Albstadt, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,157

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711439

Int. Cl.[5] G07C *3/08*; G06F *15/36*

U.S. Cl. 364—551.02 **7 Claims**



1. A measuring apparatus for determining the degree of utilization of a machine, comprising a microphone for detecting operational noise of the machine; means for converting signals from the microphone into binary data indicative of the presence or absence of the noise; a computerized evaluation circuit including a microprocessor, a clock pulse generator for timing the microprocessor, means for storing a program for controlling the microprocessor; input means for receiving the binary data from said converting means and delivering the same into said microprocessor; said program controlling said microprocessor to generate first digital values indicative of the total operational time of the measuring apparatus and to process said binary data into second digital values indicative of the total non-operative time of the machine and of the count and length of individual work interruptions of the machine; a plurality of registers for storing said first and second digital values; said program further controlling said microprocessor to divide said first digital values by said second digital values to

VOL
1114
ISS
3
MY
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1990
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generate a third digital value indicative of the degree of utilization of the machine; and output means connected to a display device for continuously displaying said third digital value.

4,926,354
POWER CONTROLLER WITH LOW STANDBY CURRENT DRAIN
Tamas Pattantyus, Birmingham, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Sep. 26, 1989, Ser. No. 412,727
Int. Cl.[5] H02M *3/335, 7/537*
U.S. Cl. 363—98 **12 Claims**



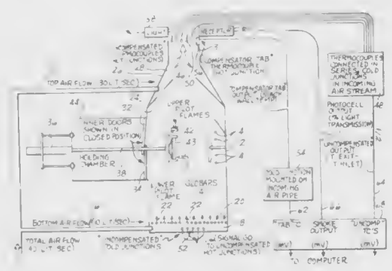
1. A power controller (30) for a load such as a DC motor comprising:
direction control means (Q5) including a first direction switch (Q5) comprising a MOSFET transistor adapted to be connected between a positive voltage potential (+V) and one terminal of the load (M) for causing the load to move, when activated, in a first direction;
first charge pump means (32a) associated with the first direction switch (Q5), including first means (Q1, D1, D3, C1) for generating a first voltage signal in a response to a first state of a first control signal, at the gate terminal of the first direction switch (Q5) substantially larger, in an absolute sense, than the value of the positive voltage potential (+V), for driving such switch between nonconductive and conductive states; and second means (Q9), operative when the first direction switch (Q5) is in a nonconductive state, for discharging the gate-to-source capacitance (CG), associated with the first direction switch.

4,926,355
DIGITAL SIGNAL PROCESSOR ARCHITECTURE WITH AN ALU AND A SERIAL PROCESSING SECTION OPERATING IN PARALLEL
Charles P. Boreland, Waterbury, Conn., assignor to General DataComm, Inc., Middlebury, Conn.
Filed Jul. 2, 1987, Ser. No. 69,433
Int. Cl.[5] G06F *15/31, 15/16*
U.S. Cl. 364—200 **8 Claims**



1. A digital signal processor, comprising:
(a) a data bus;
(b) a microinstruction sequencer means for controlling the functioning of the digital signal processor, including a coded ROM, means for addressing the ROM, means for decoding the ROM code into control and data signals, and means for sending the control and data signals to desired locations via said data bus;
(c) arithmetic logic unit (ALU) means coupled to said data bus for performing arithmetic and logic functions under the control of said control signals;
(d) an arithmetic processor section means coupled to said data bus for conducting under the control of said control signals arithmetically complex functions; and
(e) a RAM means coupled to said data bus for receiving and storing data which is sent to the RAM means via said data bus under control of said control signals from at least one of said microinstruction sequencer, said ALU means, said arithmetic processor section means, and circuitry exterior to said digital signal processor, and for sending data via said data bus to at least one of said ALU means, said arithmetic processor section means, said microinstruction sequencer and said circuitry exterior to said digital signal processor under control of said control signals, wherein
said data bus is written to and read by said arithmetic processor means, said ALU means, said microinstruction sequencer and said RAM means,
said arithmetic processor section means and said ALU means function in parallel,
said RAM means includes a RAM and a RAM data register coupled to said RAM for storing data output by said RAM and for storing data to be input into said RAM,
said arithmetic-logic unit means includes an arithmetic-logic core and first and second ALU data registers coupled to said arithmetic-logic core for at least storing data which is to be processed by said ALU means, and
said arithmetic processor section means includes a serial arithmetic processor and a serial arithmetic processor data register coupled to said serial arithmetic processor for storing data to be processed by said serial arithmetic processor.

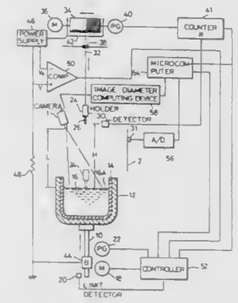
4,926,356
TEST APPARATUS FOR MEASURING HEAT RELEASE OF CERTAIN MATERIALS
Lawrence P. Kucera, Seattle, and Michael P. Thompson, Tacoma, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Feb. 29, 1988, Ser. No. 162,042
Int. Cl.[5] G01K *17/06;* **G06F** *15/20*
U.S. Cl. 364—557 **2 Claims**



1. A user-operated computer control system which calculates the amount of heat released by a burning material within a test apparatus, said apparatus including:
a calorimeter characterized in that it has certain hardware elements including a heating chamber through which a forced airflow passes, a chamber doorway operable to be opened and closed, a holding chamber positioned outside said doorway for holding a test sample of said material, said chamber doorway permitting access from said holding chamber into said heating chamber, an actuator operable to extend through said holding chamber in a manner so as to move said test sample through said doorway after said doorway has been opened and into said heating chamber airflow, said doorway being further operable to close around at least a portion of said extended actuator after said test sample is moved into said heating chamber, a plurality of electrical radiant heating elements positioned in said heating chamber for providing heat to said test sample, to heat and burn the same, said radiant heating elements being adjustably operable to vary the amount of heat they provide to said test sample, and including pilot burners normally positioned above and below said test sample when said test sample is in said heating chamber, and means for sensing the change in temperature of said chamber airflow caused by heating and burning said test sample, and said computer control system comprising:
a programmable computer operatively connected to said hardware elements of said calorimeter, said computer having input means operable by a user of said test apparatus to input user instructions into said computer, and output means for displaying information to said user,
said computer being programmed to cause said computer's output means to display a menu of user-selectible options for conducting a test, such options to be input into said computer by user operation of said input means, and said options at least including:
user selection of the times at which said chamber doorway is to be opened and closed, and said actuator is to be operated to move said test sample into said chamber,
user selection of the total time said test sample is to remain in said chamber, and
user selection of the rate of heat supplied by said heating elements to said test sample, and
user selection of at least one calibration constant for equating temperature changes of said chamber airflow into heat release of said test sample as it burns; and still further
said computer being programmed to operate said hardware elements of said calorimeter to conduct said test in accordance with said user-selected options, and to automatically sense changes in temperature of said chamber airflow caused by heating and burning said test sample, and to use said sensed temperature changes to automatically calculate the amount of heat released by said test sample during said test.

4,926,357
APPARATUS FOR MEASURING DIAMETER OF CRYSTAL
Nobuo Katsuoka, Takasaki; Yoshihiro Hirano, Annaka, and Tomohiro Kakegawa, Takasaki, all of Japan, assignors to Shin-Etsu Handotai Company, Limited, Tokyo, Japan
Filed Sep. 23, 1988, Ser. No. 249,004
Claims priority, application Japan, Sep. 25, 1987, 62-240361
Int. Cl.[5] C30B *15/28;* **G06F** *15/46*
U.S. Cl. 364—560 **10 Claims**

1. An apparatus for measuring a diameter of a monocrystalline rod which is pulled up and grown from a melt in a crucible by Czochralski method, comprising:
means for imaging a growing part of the monocrystalline rod and outputting a video signal, said means is mounted on a chamber in which the monocrystalline rod is grown;
means for determining diameter "d" of said monocrystalline rod at a melt surface with said video signal;
means for measuring an initial melt surface level;
means for computing an instant melt surface level with data of said initial melt surface level, growing volume of said monocrystalline rod, size of said crucible and a vertical displacement of said crucible;
means for detecting a temperature of said chamber;
means for correcting said instant melt surface level with the detected temperature; and



means for correcting said diameter "d" with said corrected instant melt surface level.

4,926,358
SYSTEM FOR CONTROLLING CURLS OF A PAPER
Tatsuo Tani, Urayasu; Hiroshi Yokoyama, Yokohama; Shoji Hayashi, Yokohama, and Takashi Murofushi, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 179,296, Apr. 8, 1988, abandoned. This application May 20, 1988, Ser. No. 196,482
Claims priority, application Japan, May 20, 1987, 62-121190; May 29, 1987, 62-83631[U]; May 29, 1987, 62-83632[U]; Jul. 3, 1987, 62-101845[U]; Sep. 3, 1987, 62-135006[U]; Sep. 14, 1987, 62-228576; Sep. 16, 1987, 62-140029[U]; Sep. 22, 1987, 62-143792[U]; Sep. 29, 1987, 62-147490[U]; Oct. 29, 1987, 62-165837[U]; Oct. 29, 1987, 62-165838[U]; Jan. 9, 1988, 63-1434[U]
Int. Cl.[5] G03G *15/00;* **G06F** *15/62*
U.S. Cl. 364—562 **62 Claims**



1. A curl control system, for controlling curl of a paper which is applicable to an image forming apparatus, comprising:
curl sensing means for sensing a curl of the paper; and
curl correcting means for correcting the curl, sensed by said curl sensing means on the basis of the sensed conditions of any curl.

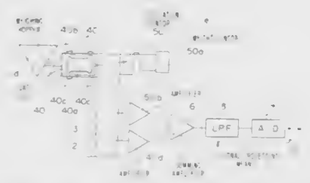
VOL 1114 ISS 3 MY 15 1990 UMI

4,926,359

WEIGHT SENSING APPARATUS

Satoshi Konishi, Kusatsu; Kazufumi Naito, Ohtsu, and Mitito Utsunomiya, Kusatsu, all of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Continuation of Ser. No. 243,190, Sep. 8, 1988, abandoned, which is a continuation of Ser. No. 75,259, Jul. 16, 1987, abandoned, which is a continuation of Ser. No. 599,782, Apr. 13, 1984, abandoned. This application May 1, 1989, Ser. No. 346,288
Claims priority, application Japan, Apr. 14, 1983, 58-66212; Apr. 14, 1983, 58-66213
Int. Cl.[5] G01G *23/10, 19/00*
U.S. Cl. 364—567 8 Claims



1. A weight sensing apparatus for sensing the weight of an article, comprising:

a weight sensor including a load cell for producing a respective output signal indicative of the weight of the article, said output signal including floor oscillations transmitted to said weight sensor;

oscillation sensing means different construction from said weight sensor and provided in the vicinity of the load cell, for producing a respective output signal indicative of said floor oscillations transmitted to said oscillation sensing means, said oscillation sensing means being located to provide a correspondence between said respective output signal of said oscillation sensing means and a respective component of said output signal of said weight sensor corresponding to said floor oscillations;

a single pair of single signal level matching amplifiers, one connected to the load cell and one connected to said oscillation sensing means and both producing output signals;

a single summing amplifier means for summing the output signal from the signal level amplifier corresponding to the load cell and the output signal from the signal level amplifier corresponding to said oscillation sensing means, and for generating a respective output corresponding to the weight of said article with the floor oscillations removed; and

signal processing means for removing a weight system oscillation component contained in the output from the summing amplifier means, which oscillation component is caused by weight system oscillations received by the weight sensor.

4,926,360

ELECTRONIC GAGE AMPLIFIER AND DISPLAY

Stanley T. Spink, Jr., North Kingstown, R.I., assignor to Brown & Sharpe Manufacturing Co., Kingstown, R.I.

Filed Apr. 8, 1988, Ser. No. 179,064
Int. Cl.[5] G01G *25/00*; G01R *17/06*
U.S. Cl. 364—571.01 32 Claims

1. An electronic gage amplifier comprising:

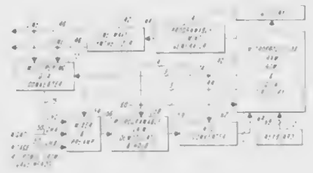
means for receiving electrical signals from a transducer of a type that converts measurement values to sinusoidal electrical signals;

means for generating and supplying at least one known sinusoidal reference signal to said means for receiving;

means, coupled to said means for receiving, for converting selectively said electrical signals and said reference signals to digital words representative of said measurement values and said reference values, respectively;

means, coupled to said means for converting, for storing said digital words;

means, coupled to said means for storing, for calculating error values as a function of the difference between said digital words representative of said reference values and predetermined digital words corresponding to said reference values;



means, coupled to said means for calculating error values and said means for converting, for digitally combining said error values with said digital words representative of said measurement values to produce corrected measurement values; and

means, coupled to said means for combining, for displaying said corrected measurement values.

4,926,361

DIGITAL NOISE REDUCER

Hiroyasu Ohtsubo; Michio Masuda, both of Yokohama; Hideo Nishijima; Hitoaki Owashi, both of Katsuta; Masataka Sekiya, Mito, and Kohji Minabe, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,208
Claims priority, application Japan, Sep. 22, 1987, 62-236289; Feb. 29, 1988, 63-44154
Int. Cl.[5] H04N *5/21*
U.S. Cl. 364—574 16 Claims



1. A digital noise reducer comprising:

an addition circuit for adding a digital input video signal supplied at a first input thereof and a signal supplied at a second input thereof and for outputting a resultant sum signal;

a delay circuit for delaying the resultant sum signal of said addition circuit by an input unit period of said digital input video signal;

a subtraction circuit supplied with said digital input video signal and an output signal of said delay circuit, said subtraction circuit forming and outputting a difference component signal based on said digital input video signal and the output signal of said delay circuit; and

a characteristic adjustment circuit for manipulating a signal characteristic of a difference component of said subtraction circuit in accordance with the characteristic of the difference component signal outputted from said subtraction circuit and a characteristic of a digital output video signal outputted from said addition circuit and for outputting a resultant manipulated signal to said second input of said addition circuit; wherein said characteristic adjustment comprises:

a variable coefficient multiplication circuit supplied with the difference component signal of said subtraction circuit, said variable coefficient multiplication circuit multiplying the difference component signal by a variable feedback coefficient K and outputting a resultant product signal to said second input of said addition circuit; and

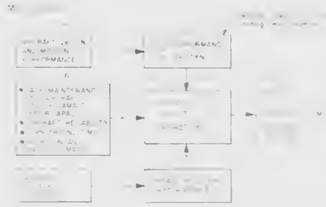
low level detection means for detecting a value of the difference component signal of said subtraction circuit, for determining a low level region in which the absolute value of said difference component signal is smaller than a preset value, and for controlling the feedback coefficient K of said variable coefficient multiplication circuit so as to decrease the feedback coefficient K upon determination of the low level region.

4,926,362

AIRBASE SORTIE GENERATION ANALYSIS MODEL (ABSGAM)

Richard A. Carns; Peter M. Flick, both of Fairborn, and John M. Byrnes, Centerville, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 7, 1988, Ser. No. 182,285
Int. Cl.[5] G06F *15/48, 15/74*
U.S. Cl. 364—578 8 Claims



2. A method of operation of a computer program model for analyzing the operations capabilities and support requirements of vehicle designs, comprising the steps:

reading data parameters relating to vehicle design features and base operations from an input source;

running a simulation of vehicle preparation operations including fueling, followed by simulation of performing a mission;

providing output of the results for a number of runs; and

repeating the step of running a simulation a given number of times.

4,926,363

MODULAR TEST STRUCTURE FOR SINGLE CHIP DIGITAL EXCHANGE CONTROLLER

Michael A. Nix, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 30, 1988, Ser. No. 251,309
Int. Cl.[5] G06F *11/00*
U.S. Cl. 364—579 9 Claims

1. A modular test structure for performing testing on a single chip having a plurality of different functional blocks comprising:

bus interface unit means (12) for communicating with a microprocessor-controlled diagnostic tester (26) via bidirectional data bus, address bus, and control signals;

said bus interface unit means (12) including I/O circuit means (34), read/write control circuit means (36), address decoder means (38), and test generation logic means (40);

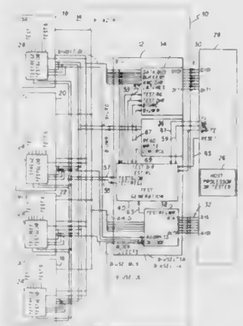
each of said plurality of different functional blocks (16-22) including test interface logic means (24) for communicating with said bus interface unit means (12);

said address decoder means (38) being coupled to said address bus for generating select signals to select one or more of the functional blocks (16-22) for testing and for generating a first test register write signal to place the selected functional blocks in a test mode;

said test generation logic means (40) being coupled to receive said first test register write signal and a first write signal for generating a first test register access enable signal;

said test interface logic means (24) being coupled to receive said first test register access enable signal, said select signals and a second write signal for receiving test information from said bidirectional data bus;

said test generation logic means (40) being coupled to receive a second test register write signal and a third write signal for generating a second test register access enable signal;



said test interface logic means (24) being coupled to receive said second test register access enable signal, said select signals and a read signal for transmitting direction information to direction latch means (39) over said bidirectional data bus;

said test generation logic means (40) being coupled to receive said read signal and a chip select signal for generating a test read signal and a test direction signal;

said direction latch means (39) being coupled to receive said test read signal for storing data direction information;

I/O driver means being coupled to receive said test direction signal for setting the data direction in said bidirectional data bus based upon the direction information stored in said directional latch means (39);

said test generation logic means (40) being coupled to receive a second read signal for generating a test activation signal; and

said test interface logic means (24) being coupled to receive said test activation signal for generating internal test signals for the selected functional blocks.

4,926,364

METHOD AND APPARATUS FOR DETERMINING WEIGHTED AVERAGE OF PROCESS VARIABLE

Walter W. Brotherton, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 25, 1988, Ser. No. 223,306
Int. Cl.[5] G08B *19/00*
U.S. Cl. 364—581 16 Claims

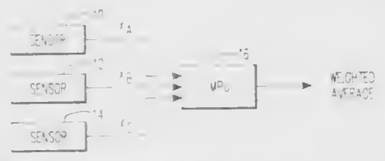
14. Apparatus for converting sensor signals into a combined

VOL 1114 ISS 3 MY 15 1990 UMI

sensor signal which is a weighted average of three input sensor values corresponding to a single process variable, comprising:

means for providing the three input sensor values; and

a processor for receiving the three input sensor values, for determining which of the three input sensor values is a median input value, the input sensor values other than the median input value being first and second input values,



said processor for calculating first and second weighting factors based on a predetermined median weighting factor and the three input sensor values, and for producing the combined sensor signal by calculating a weighted average based on the first and second weighting factors, the predetermined median weighting factor, the first and second input values, and the median input value.

4,926,365

PORTABLE COMPUTER SYSTEM

Lai-Fa Hsieh, Taipei, Taiwan, assignor to Great Electronics Corporation, Taipei, Taiwan

Filed Aug. 26, 1988, Ser. No. 236,836
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—708 **4 Claims**



1. A portable computer system having a central processing unit enclosed within a main housing, a keyboard, a display screen, a hard disk, a floppy disk drive and a battery box wherein the improvement comprises:

(a) a cover having said display screen forming an inner side of said cover, said cover being displaced with respect to said main housing to a closed position and an open position;

(b) a computer connector insert member secured to said main housing;

(c) a screen connector plate member for insert into and out of said computer connector insert member, and,

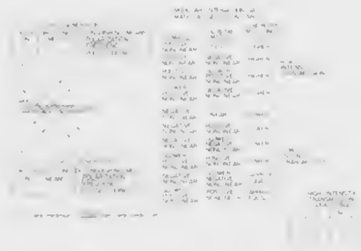
(d) a forked crevice fixed pin base member inserted within aligned openings formed in said screen connector plate member and said computer connector insert member, said battery box being attached to said main housing by means of a pair of sliding block members and a pair of substantially L-shaped key block members slidingly inserted and retracted into and out of said main housing, said portable computer system having a handle member formed on an outer surface of said cover for portability, said battery box includes a battery housing containing a plurality of batteries therein, said battery housing including a pair of spaced apart L-shaped key block members formed on a front surface of said battery housing for mating engagement with a pair of respective main housing key block members formed on said main housing at a rear section thereof, said battery housing having a plurality of contact terminals for contiguously interfacing with electrical contacts of said computer system, said contact terminals including at least two protruding contact terminals extending from said battery housing for initially contacting said computer system contact terminals when said battery housing is inserted into electrical contact with said computer system main housing for preventing an initial induction of an instantaneous voltage and current surge, said battery housing further including a pair of sliding block members being displaced by a control switch which responsively displaces a respective sliding block member into and out of said main housing.

4,926,366

THIN FILM OPTICAL COMPUTING

Robert R. Cuykendall, and Karlheinz Strobl, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Apr. 21, 1989, Ser. No. 341,697
Int. Cl.[5] G06F *7/56*
U.S. Cl. 364—713 **40 Claims**



1. A modular interaction gate, comprising:

a first material forming a first layer having a computing surface and an opposite multiplexing surface;

a second material forming a second layer and being disposed in intimate contact with said computing surface and forming a computing interface;

a third material forming a third layer and being disposed in intimate contact with said multiplexing surface and forming a multiplexing interface;

means for selectively generating and directing two distinguishable computing beams of approximately equal intensity upon said computing interface such that when said computing beams have a first total intensity said computing beams reflect from said computing interface and when said computing beams have a second total intensity said computing beams pass through said computing interface, through said first layer, and through said multiplexing interface at a point of exit from said first layer;

means for selectively generating and directing two distinguishable multiplexing beams of approximately equal intensity upon said multiplexing interface at said point of exit of said computing beams from said first layer, said multiplexing beams having a total intensity such that said multiplexing beams reflect from said multiplexing interface.

4,926,367

METHOD AND APPARATUS FOR PROGRAMMABLE OPTICAL CROSSBAR LOGIC ARRAY WITH DECODERS

Raymond Arrathoon, 1409 Chestnut La., Rochester Hills, Mich. 48309

Continuation of Ser. No. 912,353, Sep. 26, 1986, Pat. No. 4,821,222. This application Apr. 7, 1989, Ser. No. 335,214
Int. Cl.[5] G06F *7/56*
U.S. Cl. 364—713 **13 Claims**



1. A hybrid optical/electronic INVERT-OR-INVERT logic array, comprising:

decoder means for converting n binary input signals to m optical output signals, where m and n are each positive integers having a value of at least two;

first means for effecting a fan-out of said m optical output signals;

first means for effecting an optical INVERT of said m optical output signals, such that separate switching functions are performed on each of said m distinct optical signals;

first means for effecting a fan-in of said fanned-out optical signals from said first means for effecting an optical INVERT, including means for effecting individual optical OR operations such that q_1 output signals result, where q_1 is a positive integer of at least one; and

first means for INVERTING each of said q_1 output signals such that q_1 inverted signals are produced.

4,926,368

ELECTRONIC APPARATUS WITH CURRENCY CONVERSION FUNCTION

Akitaka Morita, Nara; Toshio Nishimura, Joyo, and Hiroshi Takada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 18, 1988, Ser. No. 170,014
Claims priority, application Japan, Mar. 20, 1987, 62-66830
Int. Cl.[5] G06F *7/00, 15/30*
U.S. Cl. 364—715.05 **9 Claims**



1. Electronic apparatus having a currency conversion function, comprising:

input means for inputting amounts of money in each of two different currencies;

calculating means coupled to said input means for calculating a currency conversion exchange rate according to the amounts of money inputted at said input means;

means included in said calculating means for subsequently calculating a currency conversion for a predetermined amount of money inputted at said input means based on said calculated conversion rate;

mode selection means coupled to said calculating means and being manually operated by a user for selecting an exchange rate calculating mode and a currency conversion mode; and

a visual display including exchange rate symbol means coupled to said calculating means, said exchange rate symbol means being activated in said exchange rate calculating mode upon the input of a money amount at said input means.

4,926,369

LEADING 0/1 ANTICIPATOR (LZA)

Erdem Hokenek, Yorktown Heights, N.Y., and Robert K. Montoye, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1988, Ser. No. 255,089
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 **16 Claims**



7. Apparatus for normalizing the result of a floating point addition in a computer by carrying out the leading zero detection (LZD) in parallel with the addition of the operands (A and B) to provide a leading zero anticipation (LZA), comprising:

means for sequentially comparing the bits in corresponding bit positions of the operands (A and B) being added and for producing appropriate XOR (P), AND (G) and NOR (Z) state signals resulting from the comparing, starting with the most significant bit (MSB) side of the addition;

means for detecting the state of the initial state signal produced and for detecting when said state becomes NOT TRUE;

means for outputting a shift amount signal for each successive state signal produced;

means for halting the outputting of said shift amount signals by said outputting means;

means, responsive to said detecting means, for actuating said halting means to halt the outputting of said shift amount signals by said outputting means when said initial state is G or Z and said state becomes NOT TRUE;

means, responsive to said detecting means, for actuating said halting means to halt the outputting of said shift amount signals by said outputting means when said initial state is P and the second state (G or Z) at the NOT TRUE bit position is followed by a state signal of the third state, and the third state becomes NOT TRUE;

means, responsive to said detecting means, for actuating said halting means to halt the outputting of said shift amount signals by said outputting means at one bit position following the NOT TRUE position when said initial state is P and the second state (G or Z) at the NOT TRUE bit position is not followed by a state signal of the third state;

means for producing an adjustment signal when the outputting of said shift amount signals is halted; and

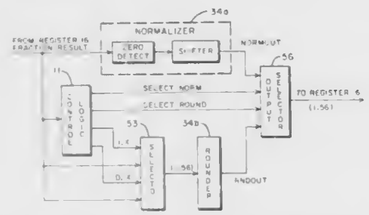
means for counting said shift amount signals and summing the count with said adjustment signal to determine the exponent of the sum of the floating point addition of the operands (A and B).

4,926,370

METHOD AND APPARATUS FOR PROCESSING POSTNORMALIZATION AND ROUNDING IN PARALLEL

Jeffrey D. Brown; Donald L. Freerksen; Scott A. Hilker, and Daniel L. Stasiak, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1989, Ser. No. 339,348
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 **5 Claims**



1. An apparatus for post-processing the exponent and fractional result of a floating point arithmetic operation for parallel operation of a rounding circuit and a normalization circuit, comprising

(a) a normalizer circuit having means for normalizing the fractional result and a rounding circuit having means for rounding the fractional result;

(b) a selector circuit connected to said rounding circuit, said selector circuit having a first selectable means for transferring said fractional result to said rounding circuit, and having a second selectable means for shifting said fractional result leftward by one bit position and transferring the shifted fractional result to said rounding circuit;

(c) means for parallel-transferring said fractional result to said selector circuit and to said normalizer circuit;

(d) an output circuit coupled to receive the output of the normalizer circuit and the output of the rounding circuit, said output circuit having a control signal input means for selecting either the normalizer circuit output or the rounding circuit output; and

(e) a control logic circuit having means for sensing the leftmost bits of the fractional result for the format 1. X or 0.1X, wherein "X" indicates any value, and having means for activating said selector circuit first selectable means if the format is 1.X and means for activating said selector circuit second selectable means if the forward is 0.1X, and having means for activating said output circuit control signal input means, for selecting one of either the normalizer circuit output or the rounding circuit output.

4,926,371

TWO'S COMPLEMENT MULTIPLICATION WITH A SIGN MAGNITUDE MULTIPLIER

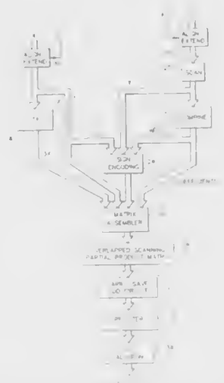
Stamatis Vassiliadis, Vestal; Eric M. Schwarz, Endicott, and Baik M. Sung, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1988, Ser. No. 291,659
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—760 **8 Claims**

1. In a system for multiplying a binary digital multiplicand operand X by a binary digital multiplier operand Y, X and Y both being either sign magnitude or complemented binary numbers, an improvement for multiplying said operands without pre- or post- complementation, said improvement comprising:

storage means for holding two n-bit operands, X and Y, the bits of each operand being in a sequence in which bit significance decreases from a most significant bit to a least significant bit, each operand including at least one sign bit;

overlapped scanning means connected to said storage means for multiplying operand X with a sequence of multiplier bit groups obtained from operand Y, each group including s successive bits of Y and overlapping an adjacent group by at least one bit, s being greater than 3;



matrix assembly means connected to said overlapped scanning means and responsive to successive scans of X for producing a sequence of partial products assembled into a matrix including m+1 offset rows, where $m=1NT[(n-1)/(s-1)]$, each row including one of said partial products;

sign encoding means in said matrix assembly means and connected to said overlapped scanning means and responsive to said sequence of multiplier bit groups or to a multiplicand sign bit for appending sign encoding bits onto said partial products to complete said rows; and

means connected to said matrix assembly means for adding said partial products, with said sign encoding bits appended, to produce a product of X multiplied by Y.

4,926,372

MEMORY CARTRIDGE BANK SELECTING

Katsuya Nakagawa, Kyoto, Japan, assignor to Nintendo Company Limited, Kyoto, Japan

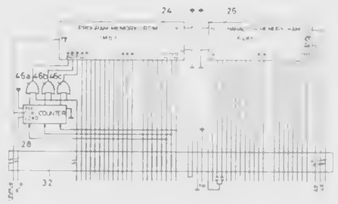
Filed May 5, 1987, Ser. No. 47,039
Claims priority, application Japan, May 6, 1986, 61-104175
Int. Cl.[5] G06F *12/06, 15/44*
U.S. Cl. 364—900 **4 Claims**

1. A memory cartridge attachable and detachable from to a main unit including a computer, said main unit having a data bus, address bus, and a central processing unit, said memory cartridge comprising:

a circuit board having address lines and data lines attachable to said address bus and said data bus, respectively, when said cartridge is attached to said main unit;

a first memory mounted on said circuit board and connected to said address lines and said data lines, said first memory being non-volatile and having a bank selecting input terminal, said first memory having a predetermined storage capacity and being divided into a plurality of banks, each of said banks having a plurality of address locations, at least one of said banks storing bank selecting data for selecting other of said banks; and

data holding means for holding said bank selecting data, said data holding means being mounted on said circuit board and connected to at least certain of said data lines and to said bank selecting input terminal of said first memory, said data holding means being loaded with bank selecting data read from said first memory in response to an enable signal for selecting or enabling said first memory and a write signal for writing data to said data holding means,



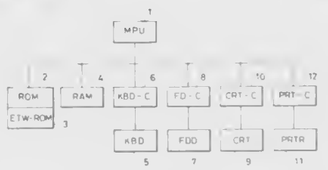
such that said first memory is conditioned for reading data in an address being addressed by said central processing unit in a bank which is selected by said bank selecting data previously loaded into and held by said data holding means, wherein said first memory includes address terminals and said data holding means includes a semiconductor device which receives said bank selecting data from said first memory and sends a bank-switching signal to said address terminals, and wherein said semiconductor device is a counter.

4,926,373

WORD PROCESSOR FOR SELECTING A CONTROL PROGRAM STORED IN THE WORD PROCESSOR WHEN A CONTROL PROGRAM IN AN EXTERNALLY DETACHABLE MEMORY IS NOT ABLE TO BE READ

Shunpei Takenaka, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 621,693, Jun. 18, 1984, abandoned.
This application Oct. 1, 1987, Ser. No. 104,540
Claims priority, application Japan, Jun. 27, 1983, 58-114427
Int. Cl.[5] G06F *15/00, 11/00, 3/12*
U.S. Cl. 364—900 **15 Claims**



10. A word processing apparatus for processing character data input by a keyboard, comprising:

data read out means adapted to detachably mount an external memory device thereon for reading out data from the external memory device when the external memory device is mounted on said data read out means, wherein the external memory device stores a first word processing program for processing said character data therein;

discrimination means for discriminating whether it is possible for said word processing apparatus to read out the first word processing program used for processing said character data from said external memory device by the data read out means;

memory means for storing a second character processing program used for processing a portion of said character data by said word processing apparatus;

processing means in response to said discrimination for processing character data input by the keyboard in accordance with the second character processing program stored in said memory means when it is not possible to read the first word processing program, and

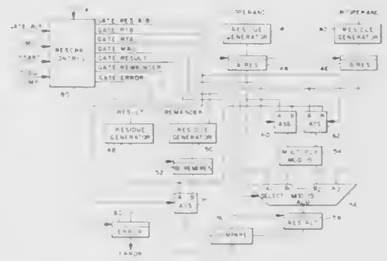
indicating means, responsive to said processing means, for providing data indicative of one of said first word processing program stored in said external memory device and said second character processing program stored in said memory means currently used for controlling processing by said processing means.

4,926,374

RESIDUE CHECKING APPARATUS FOR DETECTING ERRORS IN ADD, SUBTRACT, MULTIPLY, DIVIDE AND SQUARE ROOT OPERATIONS

Mark M. Schaffer, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1988, Ser. No. 276,200
Int. Cl.[5] G06F *11/10*
U.S. Cl. 364—739 **4 Claims**



1. In an arithmetic processor which performs arithmetic operations of addition, subtraction, multiplication, division, and square root, said operations being performed on a pair of binary operands A and B, said operations producing a result, at least said division and square root operations on producing a remainder, an improvement for residue checking said results, said improvement comprising:

means for producing residue signals, a first residue signal indicating a residue of A, a second residue signal indicating a residue of B, a third residue signal indicating a residue of said result, and a fourth residue signal indicating a residue of the difference produced by subtracting a remainder from B;

arithmetic means for multiplying two residue quantities to produce a residue result signal;

a first selection means attached to said means for producing said residue signals and to said arithmetic means for selectively providing a pair of said residue signals to said arithmetic means, a first pair of said residue signals including said first residue signal and said third residue signal, a second pair of said residue signals including said second residue signal and said third residue signal; and

compare means connected to said means for producing residue signals and to said arithmetic means for comparing said fourth residue signal with said residue result signal to produce an error signal when said fourth residue signal is not equal to said residue result signal.

VOL 1114 ISS 3 MY 15 1990 UMI

4,926,375

MULTIPLE NODES BROADCAST COMMUNICATION METHOD WITH RECEIVER IDENTIFICATION BY BIT POSITION IN TRANSFERRED MASSAGE

Ferrell L. Mercer; Earl J. Whitaker, and Christopher P. Cuthbert, all of Charlottesville, Va., assignors to GE Fanuc Automation North America, Inc., Charlottesville, Va.

Filed May 5, 1987, Ser. No. 46,992
Int. Cl.[5] G06F *13/14, 15/56;* H04Q *1/00;* H04J *3/02*
U.S. Cl. 364—900 1 Claim



1. A method for high speed data acquisition in a distributed process control system in response to data input request signals and data output request signals in which a plurality of control and monitoring nodes are coupled to a broadcast bus of a data communication system, a data service interface being connected between each of the nodes and the broadcast bus, the method comprising the steps of:

transferring from at least one of the nodes to a corresponding interface a data input request signal indicating data priority, update rate and a symbolic global variable name;

transferring from at least one of the nodes to a corresponding interface a data output request signal indicating data priority, update rate and a symbolic global variable name;

receiving said data input request signal in the interface and generating a formatted message comprising a plurality of message data blocks in which each message data block corresponds to a selected data field, the message data blocks including at least a priority field, a destination address field, a source address field, a global identifier field, a key field and a sequence of data fields;

broadcasting the formatted message onto the broadcast bus from the interface generating the formatted message;

evaluating the destination address field at each of the interfaces which have received a data input request signal for identifying data fields for passage to the nodes coupled to the respective interfaces;

for each data field identified for passage to a node, determining at the respective interface whether a prior formatted message having the same source address field and key field ad the present formatted message has been received;

identifying in the interface an offset number of bits from a predetermined point in the formatted message to each data field representing data identified for passage to a node;

for each formatted message having a source address field and/or key field different from any prior received formatted message, storing in memory in the respective one of the interfaces the offset number of data bits between the predetermined point in the formatted message and the data field identified for passage to the corresponding node;

stepping directly to the data field identified for passage to a node using the identified offset number of bits from the predetermined point to the data field; and

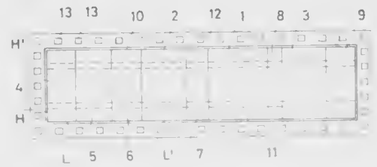
transferring from the interface the data field to the corresponding node.

4,926,376

METHOD OF DESIGNING INTEGRATED MICROCOMPUTERS AND INTEGRATED MICROCOMPUTER WITH MODULAR STRUCTURE OBTAINED BY SAID METHOD

Paolo Rosini, Monza, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Continuation of Ser. No. 30,137, Mar. 26, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 380,680
Claims priority, application Italy, Jun. 27, 1986, 20942 A/86
Int. Cl.[5] G06F *13/00*
U.S. Cl. 364—900 4 Claims



1. A method for forming a one-chip integrated microcomputer, comprising the steps of:

(a) designing a plurality of rectangular functional silicon chip modules each having a first side of the same length and a second side of variable length and provided with bus portions extending through each module parallel to said second side and at a distance therefrom which is the same in all modules with each said module capable of performing a different computing function;

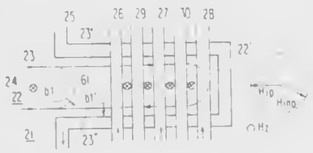
(b) assembling a selected number of said modules by arranging them with the respective first sides adjacent each other while electrically interconnecting them by coupling said bus portions to form at least one common bus extending through the module assembly parallel to said second side of the modules, wherein said selected number of said modules includes a required number of said modules to perform required computing functions and a variable number of said modules to perform specialized functions for a particular application thereby minimizing the silicon area used with the assembled modules.

4,926,377

MAGNETIC MEMORY DEVICE USING A DEFLECTED IN-PLANE MAGNETIC FIELD

Yasuharu Hidaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 11, 1989, Ser. No. 392,863
Claims priority, application Japan, Aug. 11, 1988, 63-201614
Int. Cl.[5] G11C *19/08*
U.S. Cl. 365—29 4 Claims



1. A magnetic memory device for use in selectively carrying out a write-in operation and a readout operation of a pair of vertical Bloch lines as an information unit in a domain wall of a stripe domain which is extended in a magnetic medium along a predetermined direction, said magnetic memory device comprising:

magnetic field applying means for applying a deflected in-plane magnetic field which is deflected at an angle relative to said predetermined direction; and

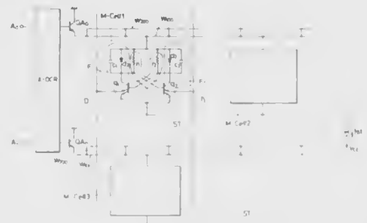
operation control means for selectively controlling said write-in and said readout operations of said vertical Bloch line pair with said deflected in-plane magnetic field applied onto said stripe domain to carry out said write-in and said readout operations.

4,926,378

BIPOLAR STATIC RAM HAVING TWO WIRING LINES FOR EACH WORD LINE

Akihisa Uchida, Tachikawa; Ichiro Mitamura, and Keiichi Higeta, both of Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,259
Claims priority, application Japan, Mar. 18, 1987, 62-61031
Int. Cl.[5] G11C *11/34*
U.S. Cl. 365—179 22 Claims



1. A semiconductor memory device comprising:

a semiconductor body having a main surface;

a plurality of memory cells formed on said main surface, each memory cell having a pair of bipolar transistors;

a memory cell array including a plurality of word lines and a plurality of pairs of complementary digit lines coupled to said memory cells so that each memory cell is coupled to a word line and to a pair of complementary digit lines;

means for selecting at least one memory cell from among a plurality of said memory cells and including a plurality of word driver circuits, each word driver circuit including a bipolar output transistor which has an emitter thereof coupled to a corresponding word line and which output transistor provides via said word line a current to memory cells of a row of memory cells in said array which are coupled to the corresponding word line; and

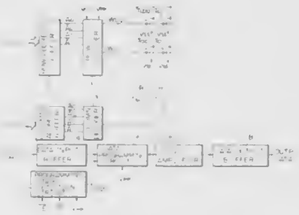
wherein each word line includes first and second lines each made of a separate conductive layer material whose principal component is aluminum, and wherein said first and second lines are electrically connected to each other at predetermined intervals along the lengths of said first and second lines through respective openings formed in an insulating film which is interposed between the separate conductive layer materials which form said first and second lines.

4,926,379

DATA READ CIRCUIT FOR USE IN SEMICONDUCTOR MEMORY DEVICE

Masanobu Yoshida, Kawaguchi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 1,780, Jan. 9, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 300,245
Claims priority, application Japan, Jan. 21, 1986, 61-8962
Int. Cl.[5] G11C *7/00, 11/42*
U.S. Cl. 365—189.01 6 Claims



1. A data read circuit for use in a semiconductor memory device comprising:

an input node connected to a bit line of said memory device;

an output node for outputting a read-out signal;

a first transistor connected between said input node and said output node and turned ON and OFF in accordance with a potential of the bit line connected to a selected memory cell transistor;

a power source terminal;

a second transistor connected between said power source terminal and said output node;

an address transition detection circuit for generating a pulse signal in response to transition of potential of an address signal, said second transistor being connected to said address transition detection circuit and being momentarily turned ON in response to said transition of said address signal; and

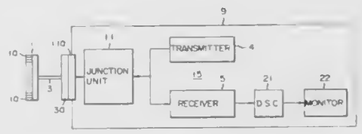
a third transistor having source and drain electrodes connected to said second transistor in parallel and turned ON and OFF in accordance with the read-out signal so that said third transistor is turned OFF when said selected memory cell transistor is turned ON.

4,926,380

ULTRASONIC IMAGING APPARATUS

Hideo Harada, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1988, Ser. No. 285,665
Claims priority, application Japan, Dec. 17, 1987, 62-317552
Int. Cl.[5] G03B *42/06*
U.S. Cl. 367—7 10 Claims



1. An ultrasonic imaging apparatus comprising:

ultrasonic probe means for directing an ultrasonic beam to a subject under examination, receiving an ultrasonic reflected wave from the subject and converting it into an echo signal;

transmitter/receiver circuit means coupled to said ultrasonic probe means for providing a driving signal to drive said

VOL 1114 ISS 3 MY 15 1990 UMI

ultrasonic probe means and for processing the echo signal to provide an ultrasonic imaging signal;

junction means coupled between said ultrasonic probe means and said transmitter/receiver circuit means and including impedance transforming means having a high input impedance and a low output impedance, for taking in the echo signal output from said ultrasonic probe means at high impedance and outputting the taken-in echo signal at low impedance; and

display means for displaying the ultrasonic imaging signal provided from said transmitter/receiver circuit means as a tomographic image.

4,926,381

SEMICONDUCTOR MEMORY CIRCUIT WITH SENSING ARRANGEMENT FREE FROM MALFUNCTION

Takeo Fujii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,736
Claims priority, application Japan, Nov. 30, 1987, 62-303517
Int. Cl.[5] G11C *7/00, 11/42*
U.S. Cl. 365—189.01 8 Claims



1. A semiconductor memory circuit comprising:

a plurality of first and second word lines arranged in rows;

a plurality of bit line pairs intersecting with said word lines, each of said bit line pairs having first and second bit lines arranged in columns so as to define a plurality of first bit lines and a plurality of second bit lines;

a plurality of first memory cells coupled to said first word lines and said first bit lines;

a plurality of second memory cells coupled to said second word lines and said second bit lines;

first and second dummy word lines arranged in rows;

a plurality of first dummy capacitors directly connected between said first bit lines and said first dummy word line;

a plurality of second dummy capacitors directly connected between said second bit lines and said second dummy word line, said first bit lines being capacitively coupled to each other through said first dummy capacitors and said first dummy word line, said second bit lines being capacitively coupled to each other through said second dummy capacitors and said second dummy word line;

a row decoder for selecting one of said first and second word lines;

a dummy row decoder for selecting said first dummy word line to adjust a potential of said first digit lines when one of said second word lines is selected by said row decoder, and for selecting said second dummy word line to adjust a potential of said second digit lines when one of said first word lines is selected by said row decoder;

a plurality of sense amplifiers provided for said bit line pairs, each of said sense amplifiers having first and second sense nodes and operatively amplifying a signal difference between said first and second sense nodes when enabled;

a plurality of transfer gate pairs connected between said bit line pairs and said sense amplifiers, each of said transfer gate pairs having first and second transfer gates connected between the first and second digit lines of one of said bit line pairs and the first and second sense nodes of one of said sense amplifiers, respectively;

first means coupled to said row decoder and said dummy decoder for enabling said row decoder and said dummy row decoder during a first period, said first period having a first sub-period, a second sub-period following said first sub-period and a third sub-period following said second sub-period;

second means for enabling said transfer gate pairs during said first and third sub-periods and disenabling said transfer gate pairs during said second sub-period; and

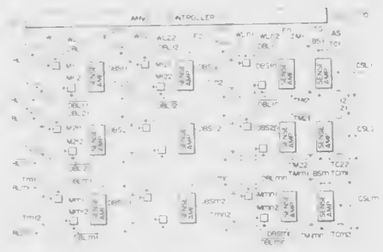
third means for enabling said sense amplifiers during said second and third sub-periods and disenabling said sense amplifiers during said first sub-period.

4,926,382

DIVIDED BIT LINE TYPE DYNAMIC RANDOM ACCESS MEMORY WITH CHARGING/DISCHARGING CURRENT SUPPRESSOR

Koji Sakui, Tokyo; Kazunori Ohuchi, and Fujio Masuoka, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 23, 1988, Ser. No. 275,395
Claims priority, application Japan, Nov. 25, 1987, 62-296824
Int. Cl.[5] G11C *7/00, 11/24*
U.S. Cl. 365—203 18 Claims



1. A dynamic semiconductor memory device comprising:

(a) a plurality of parallel main bit line pairs formed on a substrate;

(b) a plurality of sub-bit line pairs provided on each of said main bit line pairs;

(c) parallel word lines insulatively crossing said sub-bit line pairs;

(d) memory cells provided at cross points between said sub-bit line pairs and said word lines to constitute a memory cell matrix;

(e) first sense amplifier circuits respectively connected to said sub-bit line pairs;

(f) second sense amplifier circuits respectively connected to said main line pairs; and

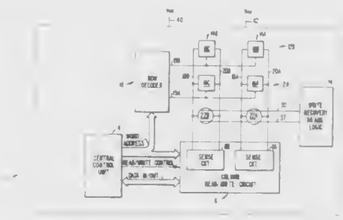
(g) electrical circuit means for, when a certain one of said memory cells is selected as a selected cell, electrically connecting a selected sub-bit line pair including said selected cell to a main bit line pair associated with said selected sub-bit line pair thereby to transfer a stored data of said selected cell to said main bit line pair, and for electrically disconnecting said main bit line pair from said second amplifier circuit provided therefor so as to amplify the transferred data and said selected sub-bit line pair before said main bit line pair completes its full range potential variation.

4,926,383

BICMOS WRITE-RECOVERY CIRCUIT

Robert A. Kertis, and Douglas D. Smith, both of Puyallup, Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 2, 1988, Ser. No. 151,377
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—203 12 Claims



12. In a BiMOS static memory system which includes a static MOS memory cell, first and second bit lines connected to the memory cell, first and second MOS load transistors coupling said first and second bit lines to a voltage supply, writing means, coupled to said first and second bit lines, for writing information into the memory cell by decreasing the voltage on a selected one of the first and second bit lines, and reading means, coupled to said first and second bit lines, for reading information from the cell through the voltage differential between said bit lines, the write-recovery circuit comprising:

first and second bipolar clamping transistors, each having a first electrode coupled to a supply voltage and a second electrode coupled to one of said first and second bit lines, and a base coupled to one of first and second control lines;

first and second MOS clamping transistors, each having a first electrode coupled to one of said second and first bit lines, respectively, a second electrode coupled to a low voltage and a gate electrode coupled to said first and second control lines, respectively;

third and fourth bipolar pull-up transistors, each having a first electrode coupled to said voltage supply, a second electrode coupled to one of said first and second bit lines, and a base electrode coupled to a third control line; and

an MOS shunt transistor coupling said first and second bit lines together;

whereby, while said information is being written, a non-selected bit line is pulled up to near said supply voltage by one of said bipolar and MOS clamping transistors and, after information is written into said memory cell, the selected bit line is pulled up to near said supply voltage by one of said bipolar pull-up transistors, such that the voltage level of said first and second bit lines are substantially equal after the writing of information.

4,926,384

STATIC RAM WITH WRITE RECOVERY IN SELECTED PORTION OF MEMORY ARRAY

Richard S. Roy, Pleasanton, Calif., assignor to Visic, Incorporated, San Jose, Calif.

Continuation-in-part of Ser. No. 148,279, Jan. 25, 1988, Pat. No. 4,878,198. This application Jul. 27, 1988, Ser. No. 224,929
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—230.03 12 Claims

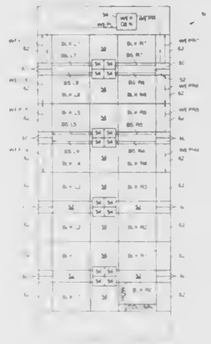
1. A static random access memory, comprising:

an array of memory cells arranged in multiplicity of separate memory blocks, the memory cells in each memory block being arranged in rows and columns, with the memory cells in each said column coupled to a pair of differential bit lines;

separate equalization means for each of said memory blocks, coupled to each said pair of differential bit lines in said memory block, for equalizing the bit line voltages in each said pair of differential bit lines in said memory block;

address input means for receiving memory access address signals, a subset of said memory access signals specifying one of said memory blocks to be accessed;

block decoder means coupled to said address input means for



decoding said subset of said memory access signals and for generating block signals denoting a selected one of said memory blocks;

write circuitry coupled to said address input means for storing specified data values at memory locations corresponding to said memory access address signals; and

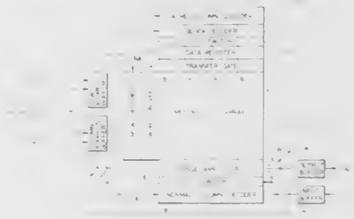
write recovery means coupled to said write circuitry, said block decoder means and said equalization means for activating said equalization means only for said selected memory block after said write circuitry stores data in said memory.

4,926,385

SEMICONDUCTOR MEMORY DEVICE WITH CACHE MEMORY ADDRESSABLE BY BLOCK WITHIN EACH COLUMN

Kazuyasu Fujishima; Hideto Hidaka; Mikio Asakura, and Yoshio Matsuda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,589
Claims priority, application Japan, Aug. 5, 1987, 62-196823
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—230.03 7 Claims



1. A semiconductor memory device for a simple cache system, comprising:

a memory cell array having a plurality of bit lines and a

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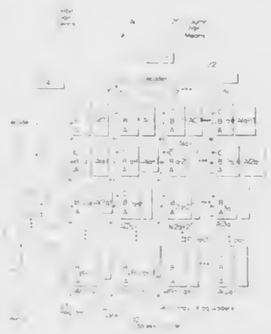
plurality of word lines arranged intersecting with the bit lines,
a plurality of memory cells arranged at intersections of the bit lines and the word lines, respectively,
address inputting means for receiving a row address and a column address,
word line selecting means responsive to said row address for selecting one of said word lines, to read out to each of said bit lines information stored in respective ones of said memory cells associated with the selected word line,
a plurality of sense amplifiers for detecting and amplifying the information stored in respective ones of said memory cells corresponding to one row read out to each of said bit lines,
first column selecting means for selecting the sense amplifiers corresponding to a column address when the column address is applied, to read out information held in the sense amplifier,
a plurality of block information transferring means each provided in each of blocks obtained by dividing said memory cell array into groups of said bit lines, each of said groups comprising a predetermined number of said bit lines, said block information transferring means for simultaneously transferring information from a corresponding one of said groups of bit lines of a selected blocks in response to application of said column address corresponding to the selected block,
a plurality of data registers for storing, for each respective block, information transferred by each of said block information transferring means, and
second column selecting means for reading out data corresponding to the column address from said data register in response to application of said column address.

4,926,386

MEMORY SYSTEM FOR IMAGE PROCESSING HAVING ADDRESS CALCULATING CIRCUITRY PERMITTING SIMULTANEOUS ACCESS TO BLOCK HORIZONTAL SEQUENCE AND VERTICAL SEQUENCE SUBARRAYS OF AN ARRAY OF DATA

Jong W. Park, 389-2 Sunwha 1 Dong, Jung Ku, Daejeon, Chung-Nam, Rep. of Korea

Filed Jun. 24, 1987, Ser. No. 66,074
Claims priority, application Rep. of Korea, Dec. 29, 1986, 1986-11454
Int. Cl.[5] G11C *7/00, 8/00*
U.S. Cl. 365—230.03 **4 Claims**



1. A memory system for storing an M×N array of data elements where M and N are predetermined integer values, and for permitting simultaneous access to p×q block subarrays of the M×N array, where p and q are predetermined values, said memory system comprising:
only (pq+1) memory modules for storing the M×N array of data elements;
register means for storing inputted data identifying the shape of, and coordinates i and j of a predetermined data element within, a selected subarray;
data register means for temporarily storing the data elements of the selected subarray identified by said register means;
address calculating means which does not use any modulo-(pq+1) operations for determining the distribution of the data elements of the selected subarray among said memory modules and for allocating different addresses to subarray data elements assigned to the same memory module according to memory module assignment and address assignment functions;
address routing means separate from said address calculating means for routing the addresses produced by said address calculating means to said memory modules;
data routing means for routing the data elements stored in said data register means to said memory modules; and
control and enabling means responsive to said register means for controlling said address calculating, address routing and data routing means and for enabling only pq of said (pq+1) memory modules for storage of the data elements of the selected subarray identified by said register means, only one modulo-(pq+1) operation being required for said address routing and memory module enabling functions;
said address caclulating means comprising block address calculating means for calculating the pq addresses of block subarray data elements in parallel, said block address calculating means comprising:
global logic means for calculating (i/p)s+j/q, where i and j are the coordinates of the upper left-hand element of a selected block subarray, s is an integer value satisfying the relationships s≧N/q and s M/p≦c, and the value of c corresponds to the capacity of each memory module;
column logic means for calculating column addresses comprising:
first calculating means for calculating (q−j//q);
decoding means responsive to said first calculating means for determining the data element position b within the block subarray at which the pattern DB(a,b)=1 when a=0, where DB(a,b) is the pattern of differences between the address of the upper left-hand block data elements α(i,j) and the addresses of the remaining block data elements α(i+a, j+b); and
(q−2) OR gates responsive to said decoding means for generating the pattern DB (0,b) for 0≦b≦q−1;
row logic means for calculating row addresses comprising:
second calculating means for calculating (p−i//p);
decoding means responsive to said second calculating means for determining the data element position a within the block subarray at which DB(a,0)=s;
(p−1) registers for storing the value s;
(p−2) OR gates responsive to said decoding means for selectively enabling said (p−1) registers; and
an array of pq adders, each adder in rows other than the first row having an input connected to the output of a corresponding one of said (p−1) registers, each adder having an input connected to the output of said global logic means, and each adder in columns other than the first column having an input connected to the output of a corresponding one of said (q−2) OR gates.

4,926,387

MEMORY TIMING CIRCUIT EMPLOYING SCALED-DOWN MODELS OF BIT LINES USING REDUCED NUMBER OF MEMORY CELLS

Paul D. Madland, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 27, 1988, Ser. No. 290,257
Int. Cl.[5] G11C *11/40, 13/00*
U.S. Cl. 365—233 **10 Claims**



1. In a memory having memory cells, a first plurality of said memory cells coupled to a bit line and a timing circuit for providing a plurality of control signals to control reading of data from said first plurality of memory cells, an improvement in said timing circuit comprising:
a bit line model comprising a second plurality of at least a portion of said memory cells, said second plurality being fewer in number than said first plurality, said bit line model having a scaled capacitance which is less than the capacitance of said bit line with said first plurality of memory cells;
driving means coupled to said bit line model for driving said bit line model to duplicate reading of data from one of said first plurality of memory cells, said driving means producing a stronger signal on said bit line model than is obtained on said bit line when reading one of said first plurality of memory cells,
detection means coupled to said bit line model for detecting said stronger signal on said bit line model, said detection means providing an output used in the generation of one of said control signals.

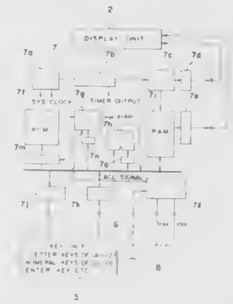
4,926,388

ELECTRONIC DEVICE FOR INDEPENDENTLY ERASING SECRET AND NON-SECRET DATA FROM MEMORY

Hisao Kunita, Mie; Akitaka Morita, Nara, and Eichika Matsuda, Yamatotakada, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 25, 1988, Ser. No. 198,247
Claims priority, application Japan, May 27, 1987, 62-130612
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—244 **9 Claims**

1. An electronic memory device comprising:
means for inputting alphanumeric and code data;
memory means for storing said input data;
means for storing said input data in said memory means as secret data, non-secret data, and secret code data;
means for recalling only said secret data from said memory means;
means for recalling only said non-secret data from said memory means;
means, responsive to said means for recalling, for displaying said secret and non-secret data;
means for resetting said device to clear only said secret data and said secret code data from said memory means; and



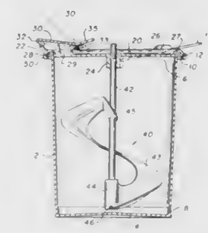
means for resetting said device to clear all remaining data in said memory means subsequent to clearing only said secret data and said secret code data, wherein said secret data and said secret code data is selectively input, stored, recalled and cleared by an operator, thereby controlling access to said secret data by an unauthorized operator of said electronic memory device.

4,926,390

PAINT MIXING CONTAINER

Laszlo Murzsa, 4279 Lakeshore Road, Kelowna, British Columbia, Canada V1W 1W2

Filed Jul. 8, 1988, Ser. No. 216,776
Claims priority, application Canada, Jul. 8, 1987, 541633
Int. Cl.[5] B01F *7/24;* **B65D** *47/14*
U.S. Cl. 366—249 **10 Claims**



1. A paint mixing container comprising:
a main body of circular cross-section with a base, side walls and an open top;
a stirring arm comprising a rotatable central shaft with a helical blade rigidly mounted about said central shaft;
a removable cover for covering the open top of said main body having a sealable opening and means to rotatably support said stirring arm in the interior of the main body wherein said sealable opening is an essentially rectangular hole in said removable cover, the perimeter of said rectangular hole being enclosed by a raised rim with an angled rim wall forming a spout, said sealable opening having a pivotally mounted flap shaped to correspond to the opening, said flap having an outer lip to tightly surround the raised rim to said opening when the flap is in a closed position in order to seal the opening; and

VOL
1114
ISS
3
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1990
UMI

locking means to allow said removable cover to be removably attached to the open top of said main body;

said locking means comprising a first set of spaced wedge tabs about the upper edge of said open top of said main body and second set of spaced wedge tabs about the edge of said removable cover, said first and second sets of wedge tabs being tapered in opposite directions whereby rotating said removable cover when placed atop the open end of said main body causes said first and second set of wedge tabs to lock together thereby sealing the cover onto the main body.

4,926,391

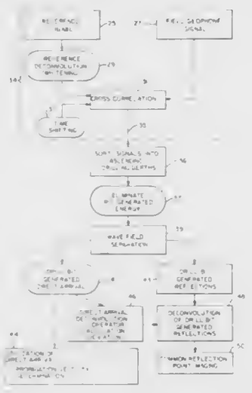
SIGNAL PROCESSING TO ENABLE UTILIZATION OF A RIG REFERENCE SENSOR WITH A DRILL BIT SEISMIC SOURCE

James Rector, Menlo Park; Bruce Marion, Mountain View; Bernard Widrow, Stanford, all of Calif., and Iraj A. Salehi, Naperville, Ill., assignors to Gas Research Institute, Inc., Chicago, Ill.

Continuation of Ser. No. 947,735, Dec. 30, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 260,784

Int. Cl.[5] G01V *1/28, 1/36*

U.S. Cl. 367—41 **23 Claims**



1. An apparatus for providing information on a subterranean geologic formation, which comprises a drill bit source of energy in a borehole, at least one seismic wave sensor spaced from the borehole in the earth for receiving seismic waves imparted into the earth by said drill bit source of energy, a reference sensor for acoustic waves imparted into the borehole by said drill bit source of energy, a means connected to receive a reference signal from said reference sensor and a signal from said at least one seismic wave sensor simultaneously, recorded during a period of time when said drill bit source of energy is activated at a selected source depth and to generate a cross-correlation function between the reference and seismic wave sensor signals, a means connected to receive the reference signal to derive a multipath filter, a means connected to receive the filter for postcorrelation removal of reference signal multipath from the cross-correlation function, the multipath filter being derived as a time reversed inverse to the reference signal, the multipath filter being convolved with the cross correlation function, said apparatus being configured to carry out its signal processing operations repetitively for a series of source depths, generating a series of filtered cross-correlation functions, said reference sensor being located at or proximate to a top of the borehole distant to said drill bit source of energy and being located at or proximate to a point where seismic waves generated by said drill bit source of energy are secondarily radiated into the earth as coherent interference, thus creating cross-correlation functions in which the interference has zero moveout over depth in the series of cross-correlation functions from different source depths, and a means for attenuating the zero moveout coherent interference from the series of cross-correlation functions either by averaging the cross-correlation functions and subtracting the average from each of the series of cross-correlation functions or by transforming the cross-correlation functions from the series of source depths to a domain of frequency-wavenumber with a two-dimensional Fourier transform and attenuating the zero moveout coherent interference through the use of a zero spatial frequency attenuation filter.

4,926,392

METHOD AND APPARATUS FOR OBTAINING SEISMIC VIBRATOR REFLECTION DATA

George E. Handley, Golden, Colo.; A. M. Moore, Houston, Tex., and Robert E. Dickman, Evergreen, Colo., assignors to Hand Geophysical, Houston, Tex.

Continuation-in-part of Ser. No. 910,446, Sep. 22, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 143,927

Int. Cl.[5] G01V *1/28*

U.S. Cl. 367—59 **41 Claims**



1. A method for obtaining seismic vibrator reflection data concerning the location of subsurface geological formations, comprising the steps of:

sinusoidally vibrating the earth with source vibrations in a single sweep having a frequency which is linearly varying over time between a first frequency limit and a second frequency limit;

sensing over time reflections of the source vibrations from subsurface geological formations;

mathematically multiplying over time the amplitude of the source vibrations by the amplitude of the sensed reflections;

storing, in computer-readable form, the product of the amplitude of the source vibrations and the amplitude of the sensed reflections in association with a point in time associated with each product, whereby a first representation of the product as a function of time is stored in one half plane of a time axis;

calculating, in computer-readable form, a second representation of the product of the amplitude of the source vibrations and the amplitude of the sensed reflections as a function of time in the opposite half plane of the time axis, by setting the product value of the second representation at the negative of the value of time associated with the first frequency limit equal to the product value of the first representation at the second frequency limit, by setting the product value of the second representation at the negative of the value of time associated with the second frequency limit equal to the product value of the first representation at the first frequency limit, and by sequentially associating the product values of the first representation with values of time in the opposite half plane between the negative of the value of time associated with the first frequency limit and the second frequency limit, so that when the second representation is viewed graphically, the second representation appears to be a copy of the first representation

placed in symmetrically located window in the opposite half plane of the time axis;

mathematically combining the first representation, the second representation, and the value of zero for all other points in time into a combined representation on the time axis, whereby the first representation is phase consistent with the second representation;

mathematically transforming the combined representation into a time domain representation of said waveform indicating the delay times between the source vibrations and the sensed reflections of the vibrations; and

displaying the results of the transforming step in a form adopted to geophysical analysis.

4,926,393

MULTIFOLD VERTICAL SEISMIC PROFILE ACQUISITION METHOD AND TECHNIQUE FOR IMAGING THE FLANK OF A SALT DOME

Bruce D. McClellan; Olan T. Adams, both of Katy, Tex., and Vernon D. Cox, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 23, 1989, Ser. No. 300,001

Int. Cl.[5] G01V *1/28*

U.S. Cl. 367—57 **21 Claims**



13. A method for imaging the flank of a salt dome comprising the steps of:

generating periodic acoustic pulses at a plurality of locations from a moving surface seismic source;

detecting said acoustic pulses at plural seismic receivers spaced apart within a wellbore located between said surface seismic source and said salt dome;

determining first break time data signals when said acoustic pulses first arrive at said receivers;

obtaining travel time data signals from said surface seismic source to said salt dome and reflected back to said seismic receivers;

subtracting said first break time data signals from the respective travel time data signals to obtain a two way travel time signal from said wellbore to said salt dome for all generated acoustic pulses; and

stacking said two way travel time data signals according to common depth point analysis.

4,926,394

MONTE CARLO METHOD FOR ESTIMATING LITHOLOGY FROM SEISMIC DATA

Philippe M. Doyen, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Oct. 27, 1989, Ser. No. 427,697

Int. Cl.[5] G01V *1/28*

U.S. Cl. 367—73 **7 Claims**

1. A method for modeling a continuous profile of the petrophysical properties of subsurface earth layers, comprising:

establishing the presence of, and measuring the petrophysical properties of a plurality of geologic rock classes in an earth layer, said rock classes including discrete ranges of petrophysical properties;

assigning one of at least two possible colors to each said rock class;

measuring the spatial transition statistics between said rock classes in said earth layer between a plurality of spaced-apart geological control points;

providing a continuous array of seismic stations between said plurality of spaced-apart geological control points, and recording seismic attributes that are indicative of the petrophysical properties of said rock classes;

calculating the means and variances of said seismic attributes for each said rock class;

creating an initial model of the substrate earth layers consisting of an N-dimensional array of pixels and randomly assigning one of at least two possible colors to each said pixel of said initial model;

choosing a pixel at random from said array;



for each possible color of said pixel, calculating the likelihood energy and the prior energy;

summing the likelihood energy and the prior energy to evaluate the global energy;

selecting the one of said at least two possible pixel colors that minimizes the global energy;

repeating the steps of choosing, calculating, summing and selecting for every other pixel in the array that forms the initial model thereby completing a first global iteration cycle;

executing additional global iteration cycles by perturbing the pixel coloring over all pixels until the global energy converges to a minimum to provide a final model; and

displaying said model.

4,926,395

METHOD AND SYSTEM FOR MEASURING SOUND VELOCITY

Dwight E. Boegeman; Carl D. Lowenstein, both of San Diego, and Fred N. Spiess, La Jolla, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 15, 1987, Ser. No. 108,794

Int. Cl.[5] G01H *29/00*

U.S. Cl. 367—89 **26 Claims**

1. A method for determining a travel time of a signal a predetermined distance comprising the steps of:

generating a cyclical reference signal;

transmitting a portion of said reference signal;

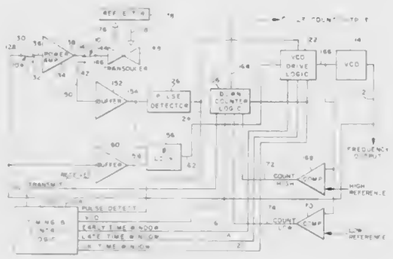
receiving said transmitted reference signal portion, said transmitted reference signal portion traveling a predetermined distance between transmission and reception;

setting said reference signal to a frequency where said received reference signal portion is in phase with respect to said reference signal;

counting a number of cycles in said reference signal during a period of time between the transmission and reception of said reference signal portion; and

VOL 1114 ISS 3 MY 15 1990 UMI

dividing said counted number of cycles by said reference signal frequency wherein said counted number of cycles



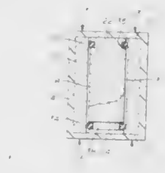
divided by said reference signal frequency is a travel time of said transmitted reference signal portion.

4,926,396

HIGH PRESSURE TRANSDUCER

Bob K. Robertson, Stafford, Tex., assignor to Teledyne Exploration, Houston, Tex.

Filed Oct. 10, 1989, Ser. No. 418,574
Int. Cl.[5] H01L *41/08*; H04R *17/00*
U.S. Cl. 367—159 **2 Claims**



1. A pressure transducer comprising:
a tubular ceramic piezoelectric element having opposite end faces and inner and outer wall surfaces;
means for minimizing an axial stress applied to said opposite end faces of said tubular ceramic piezoelectric element when the pressure transducer is subjected to a uniform pressure field;
said means for minimizing including a rigid core having an outer wall surface, mounted inside said tubular ceramic piezoelectric element, said core having opposite end faces that are flush with the opposite end faces of the tubular element, the clearance between the outer wall surface of said rigid core and the inner wall surface of said tubular element being less than one fifth of the wall thickness of said tubular element; and
a rigid encapsulating material enclosing said tubular ceramic piezoelectric element and said rigid core.

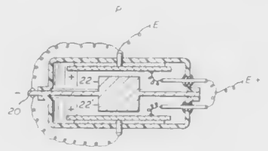
4,926,397

DEPTH ALARM FOR A SEISMIC SENSOR

Bob K. Robertson, Stafford, Tex., assignor to Teledyne Exploration, Houston, Tex.

Filed Nov. 13, 1989, Ser. No. 434,338
Int. Cl.[5] H04R *17/00*; H01L *41/08*
U.S. Cl. 367—157 **8 Claims**

1. A hydrophone for use in a body of water, comprising:
a hollow sealed case having parallel opposed conductive end portions, said end portions being deformable in proportion to variations in applied hydrodynamic pressures;
at least one polarized piezoelectric wafer, one pole of which is conductively cemented to the inner surface of a one of said deformable end portions, the free pole of which is coupled to an electrical signal output lead, said piezoelectric wafer generating an electrical output signal when flexed by hydrodynamic pressure variations applied to said deformable end portions; and



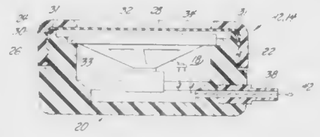
means, mounted internally of said case and electrically coupled to said conductive end portions, for disabling said electrical output signals when an externally applied excessive hydrostatic pressure exceeds a preselected pressure limit.

4,926,398

PRESSURE COMPENSATED COMMUNICATION SYSTEM

David S. Fincher, South Lake, Australia, assignor to Divelink Pty Ltd, Western Australia, Australia

Filed Oct. 28, 1988, Ser. No. 263,692
Claims priority, applicatioo Australia, Oct. 30, 1987, P1 5158
Int. Cl.[5] H04R *15/00*
U.S. Cl. 367—172 **10 Claims**



1. A pressure compensated system to be submerged in a surrounding liquid and having at least one audio transducer, the pressure compensated system comprising a fluid tight housing for containing the audio transducer, the housing having an orifice pressure compensation means connected to the orifice for receiving a continuous supply of gas at a pressure equal to or slightly greater than the pressure of liquid surrounding the housing, the housing comprising a base of relatively inflexible material having formed in the base a chamber to receive the audio transducer, an apertured cap fixable to the base, a fluid tight membrane disposed between the base and the apertured cap to overly the chamber and in communication with the surrounding liquid at a first surface and in communication with the supply of gas at a second surface, and sealing means disposed to seal the membrane to the base for preventing the surrounding liquid from coming into the chamber.

4,926,399

TRANSDUCER MOUNTING SYSTEM

Ravis S. Hickman, 10042 Mesita Dr., Dallas, Tex. 75217

Filed Mar. 30, 1989, Ser. No. 331,266
Int. Cl.[5] H04R *1/44*
U.S. Cl. 367—173 **5 Claims**

1. A signal transducer position control system for a signal transducer adapted to be mounted to a trolling motor secured to a boat and to be submerged beneath a water level thereabout, said system comprising:
a transducer mounting assembly adapted for the securement of said transducer thereto, said transducer mounting assembly comprising a first mounting bracket adapted for securement to the underneath of said trolling motor and a plurality of transducer mounting plates adapted for pivotal securement to said first mounting bracket and to said transducer, said transducer mounting plates comprising first and second panels each having a plurality of apertures fromed therethrough adapted for receiving mounting means for securement of said transducer thereto and for receiving pivoting means to permit pivotal movement of said mounting plates relative to said first mounting bracket;
means for securement of said mounting assembly to said trolling motor in predetermined alignment therewith;



pivot means associated with said mounting assembly for permitting relative pivotal movement of said transducer relative to said trolling motor; and
means for remotely actuating said transducer with said transducer mounting assembly, said remote actuation means comprising an actuation cable, one end of which is secured to said mounting assembly adjacent said transducer and the other end of which is positioned in said boat for the actuation thereof by the user, and wherein said panels are constructed with at least three apertures therethrough, said pivot shaft being adapted for passage through said first mounting bracket for the pivotal mounting of said panels therewith.

4,926,400

COMBINED TWENTY-FOUR (24)/TWENTY-FIVE (25) HOUR CLOCK

Morton Rachofsky, 5511 Stonegate Rd., Dallas, Tex. 75209, and Guy B. Irving, 2017 Crestside Dr., Carrollton, Tex. 75007

Filed Nov. 30, 1989, Ser. No. 443,918
Int. Cl.[5] G04C *19/00*
U.S. Cl. 368—82 **7 Claims**



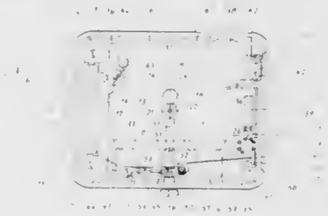
1. A clock for simultaneously displaying twenty-five (25) hour simulated time synchronized with twenty-four (24) hour real-time, comprising:
a digital processor for controlling the operation of the clock
a first display connected to the digital processor for displaying twenty-four (24) hour real-time representations;
a second display located proximate to the first display and connected to the digital processor for displaying twenty-five (25) simulated time representations;
storage means connected to the digital processor for storing data for use in converting twenty-four (24) hour real-time representations to their corresponding twenty-five (25) hour simulated time representations;
program control means controlled by the digital processor for receiving a twenty-four (24) hour real-time representation and generating a corresponding twenty-five (25) hour simulated time representation; and
program display means responsive to the program control means for displaying the twenty-four (24) real-time representation on the first display and the twenty-five (25) hour simulated time representation on the second display.

4,926,401

SKELETON WATCH ALLOWING SIGHT OF ALL OR SOME OF THE ELEMENTS FORMING IT

Cyril Vuilleumier, Bienne, and Jacques Müller, Reconvilier, both of Switzerland, assignors to ETA SA Fabriques, Grenchen, Switzerland

Filed Sep. 22, 1989, Ser. No. 410,886
Claims priority, application Switzerland, Sep. 23, 1988, 3555/88
Int. Cl.[5] G04C *23/02*; G04B *19/20*
U.S. Cl. 368—88 **16 Claims**



1. A skeleton watch allowing sight of all or some of the elements forming it including in combination:
a caseband bearing an upper crystal and a back cover,
a frame contiguous to the caseband and arranged in the space circumscribed by the caseband between the upper crystal and the back cover,
a leg contiguous to the frame and extending toward the center of rotation of the watch display organs, said leg covering at least said center,
a motor secured to the frame and including a rotor directly driving a minutes wheel bearing a minutes marker,
a fixed pinion driven into an orifice provided in the leg at the location of the center of rotation of the display organs.
a shaft united with said fixed pinion around which are pivotally mounted the minutes wheel and an hours wheel bearing an hours marker, said minutes wheel carrying first and second coaxial planet pinions displaced from its center, the first planet pinion meshing with the fixed pinion and the second planet pinion meshing with the hours wheel,
zones and conductors metallized on the internal face of the back cover intended respectively to accommodate the electrical and electronic components necessary for the operation of the watch and to establish connections among such components, and
a time setting arrangement

VOL
1114
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3
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1990
UMI

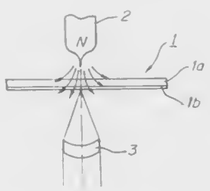
4,926,402

METHOD OF RECORDING BIVALENT SIGNALS ON OPTO-MAGNETIC RECORD MEDIUM

Yoshihiko Masakawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Sep. 8, 1988, Ser. No. 241,926
Claims priority, application Japan, Sep. 14, 1987, 62-228369
Int. Cl.[5] G11B *11/12, 13/04*
U.S. Cl. 369—13 8 Claims





1. A method of recording bivalent signals on an opto-magnetic record medium including a ferrimagnetic material whose compensation temperature is higher than an operating temperature, but is lower than a Curie temperature, by projecting a laser light beam upon the record medium and applying an external magnetic field, comprising:

modulating the intensity of the laser light beam in accordance with one of the bivalent signals into a high power level by means of which the ferrimagnetic material is heated to a first temperature which is higher than the Curie temperature, so that said one of the bivalent signals is recorded under such a condition that the direction of the magnetization is determined at a temperature higher than the compensation temperature, but lower than the Curie temperature; and

modulating the intensity of the laser light beam in accordance with the other of the bivalent signals into a low power level by means of which the ferrimagnetic material is heated to a second temperature which is higher than the operating temperature, but is lower than the compensation temperature, so that said other of the bivalent signals is recorded under such a condition that the direction of the magnetization is determined at a temperature higher than the operating temperature, but lower than the compensation temperature.

4,926,403

MAGNETO-OPTIC RECORDING APPARATUS FOR RECORDING INFORMATION SELECTIVELY ON BOTH SIDES OF THE RECORDING MEDIUM

Hiroshi Tsuyuguchi; Kenji Shimozawa, and Takashi Kamisaka, all of Tokyo, Japan, assignors to TEAC Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,370
Claims priority, application Japan, Sep. 10, 1987, 62-138562[U]; Sep. 24, 1987, 62-239701
Int. Cl.[5] G11B *7/00, 11/00, 11/14*
U.S. Cl. 369—13 6 Claims



1. A magneto-optical recording system for recording an information signal on both sides of a disk-shaped magneto-optical information recording medium by means of an optical beam comprising:

a first optical system at a first side of the recording medium, said first optical system being supplied with the optical beam and focusing the optical beam on a first recording surface of the recording medium at the first side, said first optical system further receiving the optical beam reflected back from the first recording surface as a result of reflection of the optical beam focused on the first recording surface of the recording medium and outputting the received optical beam;

a first electromagnetic actuator at the first side of the recording medium and carrying the first optical system in a movable manner in a direction to and from the first recording surface of the recording medium;

a second optical system at a second side of the recording medium, said second optical system being supplied with the optical beam and focusing the optical beam on a second recording surface of the recording medium at the second side, said second optical system further receiving the optical beam reflected back from the second recording surface as a result of reflection of the optical beam focused on the second recording surface of the recording medium and outputting the received optical beam;

a second electromagnetic actuator at the second side of the recording medium and carrying the second optical system in a movable manner in a direction to and from the second recording surface of the recording medium;

optical processing means being switched between a first and second states for selectively supplying the optical beam to either one of the first and second optical systems and for receiving the optical beams outputted from the first and second optical systems such that the optical beam is supplied to the first optical system and received from the first optical system when the optical processing means is in the first state and that the optical beam is supplied to the second optical system and received from the second optical system when the optical processing means is in the second state, said optical processing means including light source means for producing and radiating the optical beam modulated with the information signal, said optical processing means further including detection means supplied with the optical beam returned to the optical processing means for producing a focusing error signal indicating the deviation in the focusing of the optical beam;

focusing actuator driving means for producing a driving current to be supplied selectively to either one of the first and second electromagnetic actuators responsive to the focusing error signal for driving the electromagnetic actuators so as to minimize the focusing error signal;

biasing means for producing a biasing current to be supplied selectively to either one of the first and second electromagnetic actuators which is not supplied with the driving current from the focusing actuator driving means for producing a magnetic field to be applied to the recording medium; and

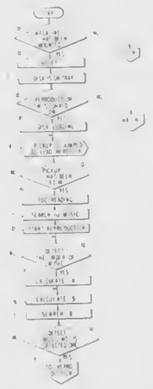
switching means supplied with a control signal specifying either one of the first and second side of the disk by a first and second electrical state of the signal for switching the state of the optical processing means to the first state when the control signal is in the first electrical state and to the second state when the control signal is in the second electrical state and for selectively supplying the drive current from the focusing actuator driving means to the first electromagnetic actuator when the control signal is in the first electrical state and to the second electromagnetic actuator when the control signal is in the second electrical state, said switching means further supplying the biasing current from the biasing means selectively to the second electromagnetic actuator when the control signal is in the first electrical state and to the first electromagnetic actuator when the control signal is in the second electrical state.

4,926,404

DISK PLAYING METHOD FOR DISK PLAYER

Toshiyuki Kimura; Yoshio Aoyagi, and Fumio Endo, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 253,472, Oct. 5, 1988, Pat. No. 4,882,719, which is a division of Ser. No. 164,353, Mar. 4, 1988, Pat. No. 4,855,979. This application Sep. 13, 1989, Ser. No. 406,498
Claims priority, application Japan, Mar. 4, 1987, 62-47790; Mar. 4, 1987, 62-42291; Mar. 4, 1987, 62-47793; Mar. 4, 1987, 62-47794
Int. Cl.[5] G11B *27/10, 21/10*
U.S. Cl. 369—32 1 Claim



1. A disk playing method fo a disk player, comprising the steps of: reading during the playback of a disk loaded in said disk player a total reproduction time and a total number of pieces of music from an accumulated total time code recorded in a lead-in region of said disk; detecting a selected order of a piece of music calculating an average reproduction time per piece of music from said total reproduction time and said total number of pieces of music; and searching for said selected piece of music according to said average reproduction time thus calculated.

4,926,405

HIGH-SPEED SEARCH METHOD FOR USE IN A DISC PLAYER SYSTEM

Toshimasa Hangai; Kiyoshi Tateishi; Koichi Ishitoya, and Haruyasu Sakata, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,628
Claims priority, application Japan, Sep. 8, 1987, 62-224962; Sep. 8, 1987, 62-224964; Sep. 18, 1987, 62-234179; Sep. 18, 1987, 62-234180; Sep. 18, 1987, 62-234181
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—32 11 Claims



1. A high-speed search method for searching a target address and for use in a disc player system having a slider for positioning a pickup for reading an information signal recorded on a disc as tracks, in a disc radius, and a tracking servo system for causing an information detecting point of said pickup to follow the track, said method comprising the steps of:

preparing an accelerating-and-decelerating move control mode in which said slider is accelerated and subsequently decelerated with said tracking servo loop open, and a constant speed move control mode in which said slider is moved at a constant speed by using address data obtained from a signal from said pickup;

detecting a distance from a present position of said pickup to said target address; and

executing operations of said accelerating-and-decelerating move control mode and subsequently said constant speed move control mode and closing said tracking servo loop when said distance is equal to or greater than a predetermined value, and executing said operation of said constant speed moe control mode without executing said operation of said accelerating-and-decelerating move control mode and closing said tracking servo loop when said distance is smaller than said predetermined value.

VOL 1114 ISS 3 MY 15 1990 UMI

4,926,406

DISK PLAYER

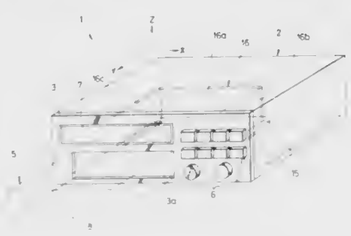
Yuji Ikedo; Tsutomu Miyakawa, both of Tokyo; Takahiro Okajima, and Masahiko Miyake, both of Saitama, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 14, 1986, Ser. No. 884,949

Claims priority, application Japan, Jul. 12, 1985, 60-153651; Jul. 12, 1985, 60-153652; Jul. 12, 1985, 60-153653; Jul. 12, 1985, 60-153654; Jul. 12, 1985, 60-153655; Jul. 12, 1985, 60-153656

Int. Cl.[5] G11B *17/22, 19/10, 33/04*

U.S. Cl. 369—36 6 Claims





1. A multidisk player for playing disks, said player comprising:

a housing;

playback means for reproducing signals recorded on said disks;

a magazine for holding a plurality of said disks arranged in order;

a magazine loader within which said magazine is detachably fitted within said housing;

a single adapter detachably fitted in said magazine loader for replaceably loading a single disk therein;

disk carrier means for carrying a disk held in said magazine in said single adapter to a playback position; and

means for driving said magazine and said single adapter outwardly out of said loader, said single adapter comprising:

a first member fitted directly in said magazine loader;

a second member on which said disk is loaded, said second member being movable within a fixed range relative to said first member and along a direction in which said first member is fitted in said magazine loader; and

means for driving said second member, wherein said first member is driven out of said magazine loader when said second member is moved relative to said first member, and wherein the total amount of protrusion of said first member from said magazine loader and protrusion said second member relative to said first member away from said multidisk player is slightly greater than an outer diameter of said disk, the amount of said protrusion of said second member relative to said first member being less than an outer diameter of said disk.

4,926,407

OPTICAL DATA PROCESSOR

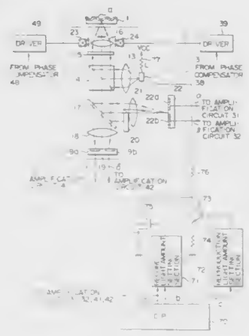
Mikio Yamamuro, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1987, Ser. No. 137,673

Claims priority, application Japan, Dec. 25, 1986, 61-311530

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.11 6 Claims



1. An optical data processor for recording and reproducing data to and from optical memory, comprising:

means for generating and emitting a recording light beam to effect the recording of the data to said optical memory and a reproducing light beam to effect the reproducing of the data from said optical memory;

means for focusing said light beam emitted from said emitting means onto said optical memory;

means for detecting the light beam reflected from said optical memory, and for obtaining first, second, third and fourth detect signals, said first detect signal representing a degree of shifting of a focal point of the light beam in a positive direction from an exact focal point on said optical memory, said second detect signal representing a degree of shifting of the focal point of the light beam in a negative direction from said exact focal point on said optical memory, said third detect signal representing a degree of shifting of said focal point in a positive direction orthogonal to said direction represented by said first and second signals, and said fourth detect signal representing a degree of shifting of said focal point in a negative direction orthogonal to said direction represented by said first and second detect signals;

means for amplifying the first through fourth detect signals derived from said detecting means at a first amplification degree when said emitting means emits said reproducing light beam, and at a second amplification degree different from said first amplification degree when said emitting means emits said recording light beam;

means for obtaining a first drive signal corresponding to the degree of shifting of said focal point of said light beam by processing the first and second detect signals from said amplifying means and a second drive signal corresponding to the degree of shifting of said focal point in the positive and negative directions orthogonal to said direction represented by said first and second detect signals, by processing said third and fourth detect signals from said amplifying means; and

means for focusing said light beam on said exact focal point on said optical memory, according to said first and second drive signals obtained by said obtaining means, so that the light beam emitted from said emitting means is focused on said exact focal point on said optical memory.

4,926,408

MAGNETO-OPTIC RECORDING/ERASING SYSTEM WITH SIMULTANEOUS DUAL HEAD CONTROL AND DISK ERROR DETECTION

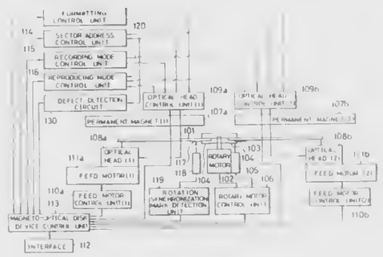
Teruo Murakami, Yokohama, and Naobumi Seo, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 871,558, Jun. 6, 1986, Pat. No. 4,841,502. This application Apr. 14, 1989, Ser. No. 338,168

Claims priority, application Japan, Jun. 14, 1985, 60-128265; Sep. 17, 1985, 60-203325; Oct. 7, 1985, 60-221771

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—58 5 Claims



1. A reproducing system which reproduces information that is recorded on a magneto-optical disk comprising:

a magneto-optical disk in which are formed a plurality of sectors along tracks in said magneto-optical disk;

a turntable for supporting and rotating said magneto-optical disk;

two optical heads for reading and writing information in said sectors; and

control means for controlling said two optical heads.

4,926,409

OPTICAL PERMITTING RECORD/PLAYBACK FROM BOTH SIDES OF AN OPTICAL DISK

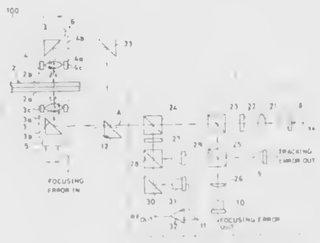
Hiroshi Tsuyuguchi, Tokyo; Kenji Shimozawa, Musashino, and Takashi Kamisaka, Kodaira, all of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,368

Claims priority, application Japan, Sep. 10, 1987, 62-138562[U]

Int. Cl.[5] G11B *7/00*

U.S. Cl. 309—112 6 Claims



1. An optical assembly of an optical recording/reproducing apparatus recording and/or reproducing an information signal on and from a recording surface of a disk-shaped information recording medium by means of an optical beam produced by an optical processing unit including a light source and optical beam detecting means, said optical assembly being supplied with the optical beam from the optical processing unit and focusing the optical beam on the recording surface of the recording medium and directing the optical beam reflected back from the recording medium to the optical processing unit comprising:

a first optical system located at a first side of the recording medium and supplied with the optical beam from the optical processing unit for focusing the supplied optical beam on a first recording surface of the recording medium at the first side, said first optical system further receiving the optical beam reflected back from the first recording surface of the recording medium and outputting the reflected optical beam to the optical processing unit;

a second optical system located at a second side of the recording medium and supplied with the optical beam from the optical processing unit for focusing the supplied optical beam on a second recording surface of the recording medium at the second side, said second optical system further receiving the optical beam reflected back from the second recording surface of the recording medium and outputting the reflected optical beam to the optical processing unit; and

optical path switching means located in a path of the optical beam radiated from the optical processing unit, said optical path switching means being supplied with a control signal and selectively establishing an optical path which extends from the optical processing unit to either one of the first and second optical systems and passing the optical beam from the optical processing unit selectively to either one of the first and second optical systems and for passing the optical beam reflected back from the first and second optical systems to the optical processing unit responsive to the state of the control signal.

4,926,410

DISK

Akira Suzuki, and Kenji Takahashi, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,293

Claims priority, application Japan, Apr. 6, 1987, 62-084313

Int. Cl.[5] G11B *17/02, 19/20*

U.S. Cl. 369—290 15 Claims



1. A disk for use with a recording and/or reproducing apparatus, comprising:

a substrate including a recording medium on and/or from which information signals may be recorded and/or reproduced by said reproducing and/or reproducing apparatus; and

a disk hub including a metal plate having engaging projections, said plate being attached by a magnet provided on a rotary drive means of said recording and/or reproducing apparatus, and a supporting member for said metal plate having a containing section formed on one surface thereof for containing said metal plate and having mating engag-

ing portions, said engaging projections being engaged with said mating engaging portions, another surface of said supporting member being secured to the disk adjacent to the center thereof, said metal plate being adapted for turning with respect to said supporting member in a prescribed direction so as to be attached to said supporting member,

said supporting member being formed with a retaining section at a central portion thereof for cooperating with a holding member separate from said disk for preventing said supporting member from turning when attaching the metal plate to said supporting member.

4,926,411

CASSETTE HAVING AN INFORMATION DISC

Cornelis Ouwerkerk, and Cornelis Beijersbergen Van Henegouwen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 2, 1989, Ser. No. 318,219

Claims priority, application Netherlands, Sep. 5, 1988, 8802185

Int. Cl.[5] G11B *23/02, 5/12*

U.S. Cl. 369—291 **13 Claims**



1. A cassette comprising a rotatable information disc whose information is readable by means of a pick-up which moves parallel to the disc surface and which forms part of an apparatus, a housing comprising first and second main walls parallel to the disc, side walls, a front wall, and a rear wall, which walls together bound a disc-receiving space in which the disc is rotatable, the first main wall being formed with a first opening to give a pick-up access to the disc surface, the first opening having a shape which is asymmetrical relative to a radius of the disc perpendicular to the front wall, a second opening in the first main wall for giving a drive spindle of a drive arrangement access to the center of the disc, the first opening having at least substantially the shape of a rectangle and the second opening being at least substantially circular, the width of the first opening being substantially equal to the diameter of the second opening, the two openings partly overlapping one another, and the first opening being offset in a direction perpendicular to a radius parallel to the long sides of the rectangle.

4,926,412

HIGH CHANNEL DENSITY WAVELENGTH DIVISION MULTIPLEXER WITH DEFINED DIFFRACTING MEANS POSITIONING

Thomasz P. Jannson; Joanna L. Jannson, and Peter C. Yeung, all of Redondo Beach, Calif., assignors to Physical Optics Corporation, Torrance, Calif.

Filed Feb. 22, 1988, Ser. No. 158,396

Int. Cl.[5] H04B *9/00*

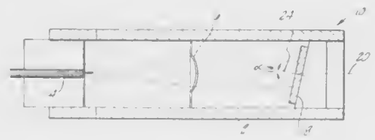
U.S. Cl. 370—3 **5 Claims**

1. A multiplexer/demultiplexer comprising

focusing means having a focal length f;

light signal carrying means for introducing light to and receiving light from the focusing means;

wavelength dependent light signal diffracting means positioned to receive light from and reflect diffracted light to the focusing means, said diffracting means comprising a



holographic volume Bragg dispersion grating comprising dichromated gelatin (DCG);

the focusing means being positioned between and spaced the optical path distance f from the light signal carrying means and the diffracting means.

4,926,413

SATELLITE COMMUNICATION SUBSYSTEM WITH THE CAPABILITY OF PERFORMING A NON-INTERFERRING OPERATIONAL TEST

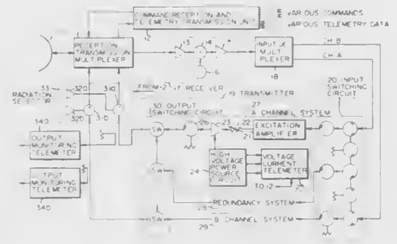
Toshimichi Ohtake, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 9, 1988, Ser. No. 242,182

Claims priority, application Japan, Sep. 10, 1987, 62-227323

Int. Cl.[5] H04J *3/14*

U.S. Cl. 370—13.1 **5 Claims**



4. A method for testing a satellite located in a satellite orbit, said satellite having means for receiving broadcasting waves transmitted from an earth station; means, including a frequency converting section, for changing the broadcasting waves into satellite broadcasting waves by converting the frequency of the broadcasting waves, means for transmitting the satellite broadcasting waves to a service area via an antenna; means for receiving command waves transmitted from the earth station and for detecting command data from the command waves; and means for supplying the command data to satellite telemetry means to be tested;

wherein, when the satellite telemetry means is being tested, the satellite broadcasting waves are prevented from being supplied to the antenna and are applied to a radiator and radiated into space other than toward the earth, and a result of testing of the satellite telemetry means is transmitted to earth.

4,926,414

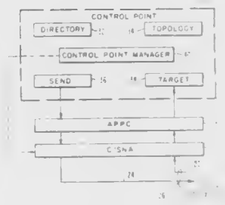
CONTROL POINT SESSION SYNCHRONIZATION IN A NETWORK

Alan E. Baratz, Chappaqua, and George A. Grover, Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 12, 1987, Ser. No. 62,003

Int. Cl.[5] H04L *5/14*

U.S. Cl. 370—31 **10 Claims**



1. In a computer network comprised of at least two nodes including control points capable of sustaining a logical duplex session between the control points of said at least two nodes, with each logical duplex session being comprised of two physical half duplex sessions, with a logical duplex session being up when both physical half duplex sessions are up, and being down when at least one of said two physical half duplex sessions is down, a method of establishing a new logical duplex session, comprising:

notifying the control point of one of said two nodes by the control point of the other one of said two nodes, that said control point of the other one of said two nodes has sensed that at least one of said two physical half duplex sessions is manifesting an error condition, and that said at least one physical half duplex session is down;

bringing the other one of said two physical half duplex sessions down in response to the notification that said at least one duplex session is manifesting an error condition and is down;

distinguishing by the control point at each of said two nodes of a down logical full duplex session from a new logical full duplex session based on the exchange of unique messages between the control points of said two nodes; and

establishing said new logical full duplex session in a finite period of time once no error conditions are sensed on either of said two physical half duplex sessions by either of the control points of said two nodes.

4,926,415

LOCAL AREA NETWORK SYSTEM FOR EFFICIENTLY TRANSFERRING MESSAGES OF DIFFERENT SIZES

Kiyoshi Tawara, Ootawara; Masakazu Osada, Utsunomiya, and Eitaro Nishihara, Ootawara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 4, 1988, Ser. No. 152,301

Claims priority, application Japan, Feb. 4, 1987, 62-23840; Feb. 7, 1987, 62-26767

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—60 **12 Claims**

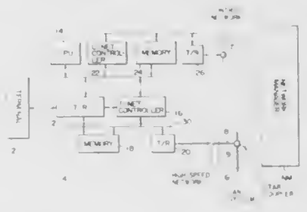
1. A local area network system for transferring a message from a first terminal to a second terminal at high speed, comprising:

a first network;

a second network;

first network interface means, connected to said first and second networks and said first terminal, for receiving the message from said first terminal, for detecting a size of the message, and for selectively sending the message onto one of said first and second networks in accordance with the detected size of the message; and

second network interface means, connected to said first and second networks and said second terminal, for selectively receiving the message from one of said first and second



networks and for sending the message to said second terminal.

4,926,416

METHOD AND FACILITIES FOR HYBRID PACKET SWITCHING

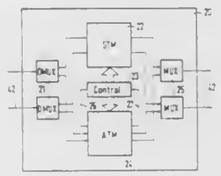
Hartmut Weik, Stuttgart, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Dec. 16, 1988, Ser. No. 286,306

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3742939

Int. Cl.[5] H04J *3/26*

U.S. Cl. 370—60.1 **9 Claims**



1. Method of switching in a multistage switching network both synchronous transfer mode (STM) messages and asychronous transfer mode (ATM) messages packets, said method comprising the steps

dividing the STM messages into STM packets of a first predetermined uniform length contained within a periodic sequence of transmission frames such that

STM packets derived from different STM messages are included within a single frame,

each frame comprises a predetermined number of predetermined time intervals, and

within each frame at least one time interval is made available to each STM message,

dividing each of said STM packets and said ATM message packets into a respective plurality of subpackets each having a second predetermined uniform length equal to said first length divided by a predetermined integer which is greater than one,

using said predetermined integer to divide each said frame into a corresponding predetermined number of subframes,

re-ordering the subpackets associated with a given frame such that successive subpackets derived from a particular said STM packet are separated by subpackets derived from other said packets, the number of subpacket in a subframe being equal to the number of packets in a frame,

sequentially switching each subframe of thus re-ordered subpackets through the multistage switching network, and

after the switching, recombining the subpackets belonging to each packet.

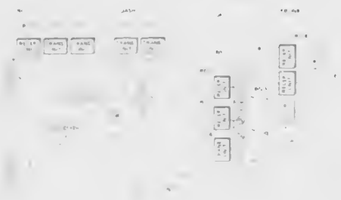
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4,926,417

INFORMATION TRANSMISSION AND RECEPTION SYSTEM FOR A VEHICLE

Toru Futami; Tadashi Suzuki, and Atsushi Sakagami, all of Kanagawa, Japan, assignors to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 896,337, Aug. 13, 1986, abandoned. This application May 11, 1989, Ser. No. 351,299
Claims priority, application Japan, Sep. 4, 1985, 60-193915
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—85.1 **13 Claims**



1. An information transmission and reception system, comprising:

(a) a plurality of information elements including information generating elements and information using elements grouped into information sources and information receivers, respectively;

(b) a plurality of information transmission units, each connected to a corresponding one of the information sources, each of said information transmission units including parallel-to-serial converting means for converting information in a parallel form from a corresponding information source into an electrical signal in a serial form;

(c) a plurality of information reception units, each connected to a corresponding one of the information receivers, each information reception unit including serial-to-parallel converting means for converting an electrical signal in serial form from a corresponding information transmission unit into information in a parallel form, a maximum number of information elements in an information source and in an information receiver limited to a bit-capacity of each of said parallel-to-serial and serial-to-parallel converting means; and

(d) means for connecting each of the information transmission units to a corresponding one of the information reception units, said connecting means including a plurality of electrical lines extended between respective ones of the information transmission units and the corresponding one of the information reception units for transmitting the information in a serial form from the information transmission unit to the corresponding information reception unit.

4,926,418

FAIRNESS ALGORITHM FOR FULL-DUPLEX BUFFER INSERTION RING

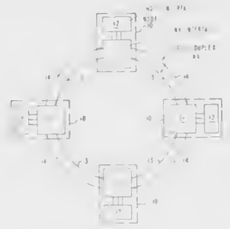
Israel Cidon, New York, and Yoram Ofek, Riverdale, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1989, Ser. No. 336,364
Int. Cl.[5] H04J *3/16*
U.S. Cl. 370—85.5 **20 Claims**

3. In a buffer insertion ring having a number of nodes with each node having insertion buffers, a method of regulating the transmission of packets from said nodes to prevent starvation on said ring, said method comprising the steps of:

a. forwarding a current control message on said ring indicating to said each node a first corresponding maximum number of packets that said each node is permitted to transmit in a time interval from when it receives said current control message to when it forwards a subsequent control message; and

b. holding, by said each node, said subsequent control message when received by said each node until said each station has transmitted at least a second corresponding number of packets, or until each said node has transmitted all packets in its output buffer if the number of said all packets is less than said each node's said second corresponding number of packets;



said each node transmitting packets as long as its insertion buffer has less than a predetermined number of bits therein and as long as said each node has not transmitted more than its first corresponding number of packets during said interval, said each node transmitting packets without having to hold any of said control messages at the time it transmits a packet.

4,926,419

PRIORITY APPARATUS

David L. Whipple, Braintree, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 97,775, Sep. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 712,492, Mar. 15, 1985, Pat. No. 4,719,622. This application Feb. 28, 1989, Ser. No. 317,100
Int. Cl.[5] H04L *5/22*
U.S. Cl. 370—85.6 **13 Claims**



1. Apparatus for determining priority of access to a bus among a set of devices coupled to the bus, each device being represented for priority purposes by a node in a group of nodes, each node being coupled to the bus and receiving a priority line from a first adjacent node and providing the priority line to a second adjacent node and having a priority relative to a single node with the highest priority,

the priority determining apparatus comprising in each node:

priority logic means for permitting access to the bus by a represented device if not other, higher priority, device has requested access, the higher priority device being represented by a node whose physical position on the priority line relative to the highest priority node gives it a higher priority; and

highest priority node specification means responsive to the bus for specifying whether the node is presently the highest priority node and, if the node is presently the highest priority node, dynamically giving the highest priority to another of the nodes in response to an access to the bus by one of the set of devices; wherein

the priority line couples the nodes together in a circular configuration; and

the priority of a node is determined from the node's position in the circular configuration relative to the highest priority node, and wherein

the highest priority node specification means gives the highest priority to an adjacent node in the circular configuration.

4,926,420

TRANSMISSION SYSTEM OF A PACKET SIGNAL IN AN INTEGRATED NETWORK SYSTEM USING A FRAME FORMAT FLEXIBLE FOR VARIOUS FORMS OF THE INTEGRATED NETWORK SYSTEM

Hiroshi Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,391
Claims priority, application Japan, Mar. 4, 1988, 63-52157
Int. Cl.[5] H04J *3/24*
U.S. Cl. 370—94.1 **12 Claims**

7. In a packet signal transmission system for transmitting the packet signal determined by a frame format and having a transmission information unit for use in transmission of, as the transmission information unit, one of a plurality of different-type information units from a transmission source to a transmission destination in an integrated network system of a plurality of different-type network systems, said different-type information units being associated with said different-type network systems, respectively, each of said different-type information units comprising a control information set and a transmission data unit, said control information set having a bit length inherent to an associated one of said different-type network systems, the improvement wherein said single frame format comprises:

a data field for carrying the transmission data unit of a specific one of said different-type transmission information units as a specific transmission data unit;

a control field for carrying the control information set in said specific transmission information unit as a specific control information set, said control field having a bit length which is variable from a zero length to a predetermined maximum length;

an address field comprising a source address field portion and a destination address field portion for carrying addresses assigned to the transmission source and the transmission destination in the integrated network system respectively; and

a frame identifier field comprising a control length identifier portion for carrying a control length identifier for indicating the bit length of said specific control information set.

4,926,421

MOBILE RADIO TELEPHONE SYSTEM

Minori Kawano; Kazuo Mitsui; Masaharu Hirooka; Yasushi Ozu; Nagayasu Harada, and Nobuhiro Kimura, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 262,938
Claims priority, application Japan, Oct. 23, 1987, 62-268921; May 6, 1988, 63-108965
Int. Cl.[5] H04J *3/16*
U.S. Cl. 370—95.1 **20 Claims**



1. A mobile radio telephone system comprising:

a plurality of base stations disposed in contiguous cellular zones and equipped for communication on a single, common control channel and on a plurality of voice channels, each of said voice channels communicating a voice signal to a corresponding base station within its respective cellular zone;

at least one mobile station equipped to access said common control channel when originating or answering a call from one of said base stations, to switch to one of said voice channels at the occurrence of the call, and to transmit a hand-off request on said common control channel if the quality of the voice signal becomes degraded during the call; and

a line control unit for centralized control of said base stations, equipped to switch a call from one of said plurality of base stations to an adjacent base station of said plurality of base stations in response to said hand-off request

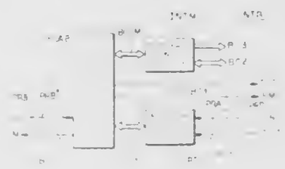
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4,926,422

ON-BOARD SWITCHING CONTROLLER FOR A SATELLITE WITH ON-BOARD SWITCHING

Gian B. Alaria; Cesare Poggio, both of Turin, and Giovanni Ventimiglia, Buttigliera Alta, all of Italy, assignors to Selenia Spazio S.p.A., L'Aquila, Italy

Filed Nov. 4, 1988, Ser. No. 267,492
Claims priority, application Italy, Nov. 4, 1987, 67935 A/87
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—97 **5 Claims**



1 An on-board switching controllr for a satellite with on-board switching for control of a base band switching matrix

VOL 1114 ISS 3 MY 15 1990 UMI

with one switching stage and a plurality of multiplexers, said matrix receiving uplink frames and sending downlink frames, said frames being divided into zones (T1 . . . . T6) including a first zone and a last zone comprising service channels and intermediate zones comprising traffic channels, each of said channels encompassing a certain number of states, said controller cooperating with a telecontrol and telemetering station (TLCS) capable of low-frequency bidirectional dialogue with an uplink telecontrol channel (TLC) and a down link telemetering channel (TLM), each of said channels having a preamble and a data message, said controller comprising:

means for directly receiving from said switching matrix (BSM) and processing said service channels (CH, IOTS) of said uplink frames and for directly supplying said switching matrix (BSM) with the service channels (FMC, IOTD) of said downlink frames, and for receiving via said uplink telecontrol channel (TLC) and processing words for control of operation o the controller and sending on said downlink telemetering channel (TLM) reply words;

a preprocessing unit (PREL) selecting, synchronizing and decoding said service channels (CH, IOTS) of the uplink frames and extracting therefrom decoded messages and provided with a first interface means (INC1, INC2) having first and second elements (INC1 and INC2, respectively), said first element receiving said decoded messages, said preprocessing unit (PREL) being provided with counters;

a matrix interface unit (INTM) comprising two memory units (MEMA, MEMB) storing matrix switching stages, and first control means determining an alternation of said memory units as an active memory unit and as a backup memory unit, respectively, the first control means controlling reading in said active memory unit of switching states and sending a reading of the switching states to said matrix (BSM) and updating switching states in both of said memory units; and

a processing unit (ELAB) operatively connected to said preprocessing unit (PREL) and to said matrix interface unit (INTM) and comprising:

said second element (INC2) of said first interface means checking existence and correctness of dialogue with said processing unit and checking veracity of received data messages,

second interface means (INTB) for receiving, decoding and checking data messages supplied by said telecontrol channel and for transmitting the telemetering channel, and

first decoding and executing means (GMS, GTLC) connected to said first and second interface means (INC1, INC2; INTB) for decoding and executing commands present in data messages receive from said first and second interface means (INC1, INC2; INTB), said first decoding and executing means (GMS, GTLC) managing, an a basis of said commands, a normal operation mode of the controller in which all functions are activated and a degraded operation mode in which said preprocessing unit (PREL) and said first interface means (INC1, INC2) are disabled, said first decoding and executing means (GMS, GTLC) controlling writing of said switching states selectively only into said backup memory unit or into both said memory units while reproducing frame subdivision into said channels and zones;

said first interface means (INC1, INC2) being constructed and arranged in said normal operation mode to:

write switching states to be transferred to both of said memory units (MEMA or MEMB) into a first buffer (BF10),

write switching states to be transferred only to said backup memory unit into a second buffer (BF11),

write information on frame zones of switching states written in in said second buffer (BF11) into a third buffer (BF12, BF13, BF14),

write control words for operation of said processing unit (ELAB) into a fourth buffer (BF15), and

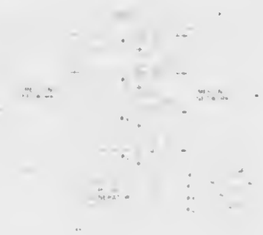
send to said second interface means (INTB) alarm messages generated upon a negative result of a check on said dialogue or in a case of overflow of said counters of said preprocessing unit (PREL) or reply messages from said preprocessing unit (PREL), said first interface means being disabled in said degraded operation mode.

4,926,423

TIME-DIVISION-MULTIPLEXED DATA TRANSMISSION SYSTEM

Charles Zukowski, Yorktown Heights, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Sep. 30, 1988, Ser. No. 252,576
Int. Cl.[5] H04J *3/00*
U.S. Cl. 370—112 **16 Claims**



1. A time-division multiplexer having a plurality of first conductors each for receiving a respective input signal having a first or second state, the state of each input signal changing no more frequently than a first periodic rate having a first period, and having an output conductor for providing a time-division-multiplexed signal derived from the input signals of the first conductors, comprising:

precoding means having a plurality of sequentially ordered channels, including a first, second and last channel, each one of the channels corresponding to a particular one of the first conductors, and a plurality of second conductors each corresponding to a particular one of the channels, each of the channels, except for the first channel, providing to its corresponding second conductor a signal having a first or second state, the signal being inverted from a present state to another state whenever the state of the input signal of the corresponding first conductor and the state of the input signal of the first conductor of a preceding channel differ, and the first channel providing to its corresponding second conductor a signal having a first or second state, the signal being inverted from a present state to another state whenever the state of the input signal of the corresponding first conductor during a current first period and the input signal of the first conductor corresponding to the last channel during a preceding first period differ;

skewing means receiving the signals of the second conductors and operatively connected to a plurality of third conductors each corresponding to a particular one of the second conductors, the skewing means sampling the signal of each of the second conductors at the first periodic rate and supplying samples of the signal of each second conductor to a corresponding third conductor, the sampling of the signal of each of the second conductors, except for the second conductor corresponding to the first channel being skewed by a common predetermined interval with respect to the sampling of the signal of the second conductor corresponding to a preceding channel; and

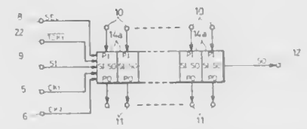
merging means having an output operatively coupled to the output conductor and a plurality of inputs operatively coupled to corresponding third conductors, and being responsive to the samples of the signal of each of the third conductors for providing at the output conductor an output signal having a first or second state, the output signal changing from a present state to another state whenever any one of the skewed sampled signals of the third conductors changes its state, wherein the merging means provides substantially equal propagation delays between each input and the output thereof.

4,926,424

TEST AUXILIARY CIRCUIT FOR TESTING SEMICONDUCTOR DEVICE

Hideshi Maeno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1988, Ser. No. 207,919
Claims priority, application Japan, Jun. 11, 1987, 62-146622
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—22.3 **12 Claims**



1. A test auxiliary circuit employed for testing a semiconductor device, comprising:

a plurality of data holding means connected in series stages each holding data,

a plurality of external parallel data input terminals respectively coupled to each data holding means stage,

an external serial data input terminal coupled to data holding means in a first data holding means stage,

an external serial data output terminal coupled to data holding means in a final data holding means stage,

means for transferring data held in each data holding means stage to data holding means in subsequent stages,

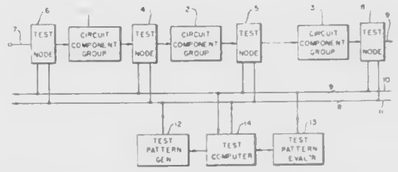
and means for holding data applied to the corresponding parallel data input terminal in place of said data held in the corresponding stage if the data applied to said corresponding parallel data input terminal is different from said data held therein.

4,926,425

SYSTEM FOR TESTING DIGITAL CIRCUITS

Rolf Hedtke, Darmstadt-Eberstadt; Rolf Loos, Münster; Roland Mester, and Jürgen Hänsel, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,622
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719497
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—22.6 **22 Claims**



1. System for testing digital circuit apparatus wherein said apparatus comprises circuit groups (1, 2, 3; 34) of digital signal processing components, said circuit component groups being connected in succession, with outputs of preceding circuit component groups being connectable and normally connected to inputs of succeeding circuit component groups, said system comprising:

a test computer (14) connected to a test pattern generator (12) and to a test pattern evaluator (13);

test bus means (10, 11, 31, 32) connected to said test computer (14), said test pattern generator (12) and said test pattern evaluator (13), and

test node circuits (4, 5) respectively connected between successive circuit component groups of said succession, each of said test node circuits being connectable to said test bus means and comprising switching means for selectively connecting together or disconnecting, under control of said test computer, a preceding and a succeeding circuit component group of said succession, a preceding component group and said test bus means and a succeeding component group and said test bus means;

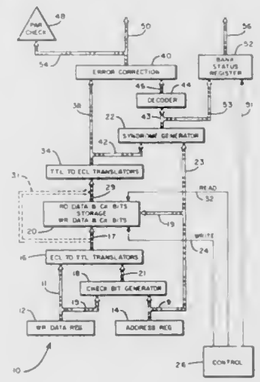
whereby the said succession of circuit component groups may be interrupted for passing test pattern signals through any of several portions thereof under control of said test computer.

4,926,426

ERROR CORRECTION CHECK DURING WRITE CYCLES

James H. Scheuneman, St. Paul; Michael E. Mayer, Fridley, and David M. Purdham, Brooklyn Park, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 30, 1988, Ser. No. 238,085
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—40.1 **2 Claims**



1. In a memory system comprising memory means for storing digital bits, input means coupled to said memory means for supplying bits to said memory means, output means coupled to said memory means for receiving bits from said memory means, write means for writing selected bits from said input means into said memory means during a write cycle, read means for reading selected bits out of said memory means to said output means during a read cycle, error checking and correction means coupled to said output means for checking and correcting errors upon the occurrence of said selected bits at said output means, control means coupled to said memory means to control the writing of selected bits into said memory means and the reading of selected bits from said memory means, syndrome generating means coupled to said output means for developing a syndrome code representative of said selected bits of said output means, and coupling means for coupling selected bits to be written into said memory means during write cycles to said error checking and correction means in a manner that bypasses said selected bits from said memory means,

VOL 1114 ISS 3 MY 15 1990 UMI

the improvement wherein said syndrome generating means is operable during during both read and write cycles, and said memory system further comprises status means coupled to said control means and to said syndrome generating means for indicating when an error is detected if said error occurred during a read cycle or during a write cycle, and for isolating errors which are generated in said memory means from errors which are generated in other elements of said memory system.

4,926,427

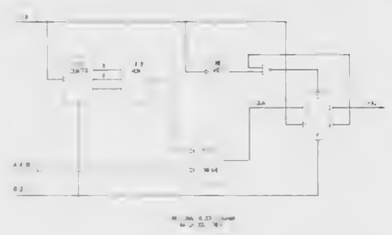
SOFTWARE ERROR DETECTION APPARATUS

Duane Remein, Rocky Point, N.Y., assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 913,799, Sep. 30, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 333,752

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—67.1 **3 Claims**



1. A circuit for the detection of software errors comprising:
- a timer circuit clocked by a clock pulse for providing an output when a predetermined period of time lapses;
- a control circuit for providing a sequence of data output values responsive to the clock pulse, comprising a counter responsive to said clock pulse, and a multiplexer;
- a comparator for comparing each one of said sequence of data output values from the control circuit with a data bus and for generating an output signal when the one of the data output values from the control circuit does not equal the corresponding one of the data input values from the data bus; and
- a decision circuit for generating an alarm signal when either the predetermined period of time lapses or the comparaator generates the output signal.

4,926,428

METHOD AND APPARATUS FOR SENSING THE WAVELENGTH OF A LASER BEAM

Koichi Kajiyama; Kaoru Saito, both of Fujieda; Yasuo Itakura, Hiratsuka; Osamu Wakabayashi, Hiratsuka; Masahiko Kowaka, Hiratsuka, and Tadayoshi Yamaguchi, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakucho, Tokyo, Japan

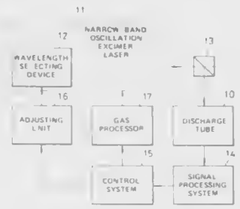
PCT No. PCT/JP87/00646, § 371 Date Jan. 29, 1988, § 102(e) Date Jan. 29, 1988, PCT Pub. No. WO89/02068, PCT Pub. Date Mar. 9, 1989

PCT Filed Aug. 31, 1987, Ser. No. 155,921

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—20 **11 Claims**

1. A method of sensing the wavelength of a laser beam as an object to be sensed, comprising the steps of irradiating predetermined atoms or molecules in plasma with the laser beam, sensing the impedance of the plasma at that time, and comparing the impedance with an impedance pattern measured in advance.



4,926,429

LIGHTWAVE COMMUNICATION SYSTEM HAVING SOURCES INDEPENDENTLY SYNCHRONIZED TO AN ABSOLUTE FREQUENCY STANDARD

Yun C. Chung, Aberdeen, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 13, 1989, Ser. No. 379,292

Int. Cl.[5] H01S *3/13*

U.S. Cl. 372—32 **11 Claims**



1. A lightwave communication system comprising a transmitter and a receiver for communicating with each other over a transmission medium, said transmitter and said receiver each including a laser and a laser stabilization arrangement for controlling said laser coupled thereto to generate an optical signal at a predetermined wavelength,

each said laser stabilization arrangement comprising a gas discharge element for generating an optogalvanic signal in response to said optical signal from the laser associated therewith, said gas discharge element including atomic species having an atomic transition line at said predetermined wavelength, and feedback control means responsive to said optogalvanic signal for dynamically adjusting a characteristic of said laser to correct a wavelength of the optical signal from said laser to be substantially equal to said predetermined wavelength.

4,926,430

LASER MODULE WITH A BUILT-IN OPTICAL ISOLATOR, AND METHOD OF ADJUSTING THE ANGULAR POSITION OF THE OPTICAL ISOLATOR

Hideki Isono, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 31, 1989, Ser. No. 429,476

Claims priority, application Japan, Nov. 18, 1988, 63-290045

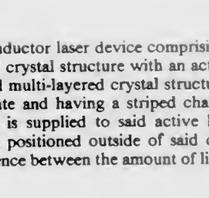
Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—33 **4 Claims**

1. In a laser module comprising a serial arrangement of a laser assembly for emitting a substnatially collimated beam of light, an optical isolator assembly haing an optical isolator housed in an isolator package for transmitting the collimated beam of light with less loss in one direction than in the opposite direction therethrough, with the optical isolator assembly having an optical axis set at an angle to the optical axis of the laser assembly, and an optical fiber assembly having a lens for converging and directing the beam from the optical isolator assembly into an optical fiber, a method of adjusting the angular position of the optical isolator assembly with respect to the laser assembly, which method comprises:

(a) making the optical isolator of the optical isolator assembly rotatable within limits about the optical axis of the optical isolator assembly relative to the isolator package;

(b) rotating the optical isolator of the optical isolator assembly to one extremity of the predetermined stroke relative to the isolator package;



(c) rotating the complete optical isolator assembly relative to the laser assembly in the same direction as the optical isolator was rotated relative to the isolator package, until the loss of the beam traveling through the optical isolator assembly in said one direction starts increasing;

(d) locking together the optical isolator assembly and the laser assembly against relative rotation in the relative angular positions that have been determined as a result of step (c); and

(e) rotating the optical isolator of the optical isolator assembly toward the other extremity of the predetermined stroke relative to the isolator package for optimizing the loss and isolation characteristics of the optical isolator assembly.

4,926,431

SEMICONDUCTOR LASER DEVICE WHICH IS STABLE FOR A LONG PERIOD OF TIME

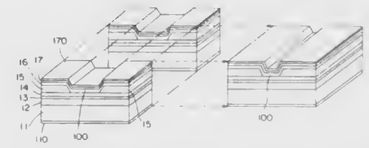
Hidenori Kawanishi, Higashiosaka; Hiroshi Hayashi, Kyoto; Taiji Morimoto; Shinji Kaneiwa, both of Nara, and Masahiro Yamaguchi, Tokai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 227,960, Aug. 3, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 415,417

Claims priority, application Japan, Aug. 4, 1987, 62-195722; Dec. 28, 1987, 62-335808; Dec. 29, 1987, 62-333967

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **6 Claims**



1. A semiconductor laser device comprising a substrate and a multi-layered crystal structure with an active layer for laser oscillation, said multi-layered crystal structure being disposed on said substrate and having a striped channel area through which current is supplied to said active layer and a light-absorbing area positioned outside of said channeled area by which a difference between the amount of light to be absorbed inside of said channel area and the amount of light to be absorbed outside of said channel area is created, which causes a difference in the effective refractive index of said active layer, resulting in an optical waveguide in said active layer,

wherein said active layer is flat and uniform and the width of the portion of said channel area in the vicinity of at least one facet is wider than that of the remaining portion of said channel area; and

wherein the ratio of the length of said portion of said channel area in the vicinity of at least one facet to that of the remaining portion of said channel portion is between approximately 0.04 and 0.12.

4,926,432

SEMICONDUCTOR LASER DEVICE

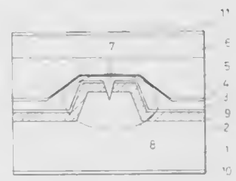
Ryo Hattori, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 14, 1989, Ser. No. 394,059

Claims priority, application Japan, Aug. 18, 1988, 63-205575

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—46 **4 Claims**



1. A semiconductor laser device comprising:
- a first electrode;
- a semiconductor substrate of a first conductivity-type disposed on said first electrode and having a ridge opposite the first electrode;
- a semiconductor current blocking layer of a second conductivity-type opposite the first conductivity-type disposed on said semiconductor substrate over said ridge;
- a semiconductor buffer layer of the first conductivity-type disposed on said current blocking layer;
- a current injection groove in said ridge penetrating said buffer and current blocking layers to said substrate; and
- a double heterojunction structure disposed on said buffer layer including a first semiconductor cladding layer of the first conductivity-type disposed on said buffer layer and in the groove, a semiconductor active layer disposed on said first cladding layer, a second semiconductor cladding layer of the second conductivity-type disposed on said active layer, and a second electrode disposed on said second cladding layer.

4,926,433

SEMICONDUCTOR LASER UNIT

Tomoatsu Imamura, Isehara; Kazuyuki Shimada, Chofu, and Toshitaka Senma, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 17, 1988, Ser. No. 258,479

Claims priority, application Japan, Oct. 19, 1987, 62-263042; Nov. 11, 1987, 62-284676; Dec. 7, 1987, 62-307442

Int. Cl.[5] H01S *3/19*

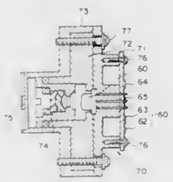
U.S. Cl. 372—50 **8 Claims**

1. A semiconductor laser unit comprising:
- a casing having a front portion including an aperture, and a rear portion having mounting projections;
- a printed circuit board fastened to said mounting projections of said rear portion of said casing;
- a laser diode unit comprising a laser diode emitting a laser

VOL
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beam forward and backward, and a photodiode for monitoring the laser beam emitted backward from said laser diode unit being accommodated in said casing and providing an output signal, said laser beam emitted forward from said laser diode passing through said aperture of said front portion;

monitor output amplifying means, mounted on said printed



circuit board, for amplifying said output signal of said photodiode to provide an output voltage signal; and

reference voltage generating means, mounted on said printed circuit board, for generating a reference voltage, signal which is to be compared with said output voltage signal of said monitor output amplifying means in order to set the light intensity of the laser beam to a predetermined value.

4,926,434

GAS LASER EXCITED WITH PULSED MICROWAVE ENERGY

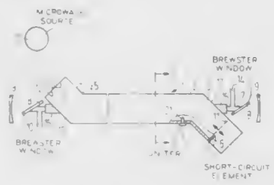
Wolfgang Renz, Prof. Angermaier-Ring 18, 8046 Garching, Fed. Rep. of Germany

Filed Jul. 21, 1989, Ser. No. 383,047

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825971

Int. Cl.[5] H01S *3/09*

U.S. Cl. 372—69 10 Claims



1. A gas laser for use with a source of pulsed microwave energy comprising:

a sealed waveguide having a straight section having a longitudinal axis;

a short-circuit element terminating one end of said waveguide;

a microwave input port adapted for connection to said pulsed microwave source and disposed in an end face at an opposite end of said waveguide with the distance between said short-circuit element and said end face being greater than one-half the wavelength of the microwaves from said pulsed microwave energy source;

a gas discharge tube extending through said straight section of said waveguide along said longitudinal axis and filled with laseable gas, the gas excited, from said waveguide, said gas discharge tube closed at opposite ends with Brewster windows and having a port adapted for connected to a gas source at each of said opposite ends; and

an igniter disposed in said straight section of said waveguide at an end thereof closest to said short-circuit element, said igniter being disposed a distance from said short-circuit element coinciding with a region of high electrical field strength of the microwave energy reflected by said short-circuit element so that ignition of the discharge in said gas discharge tube will occur in the region of igniter.

4,926,435

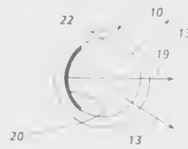
RADIOACTIVE LIGHT SOURCES

Benjamin Kazan, 557 Tyndall St., Los Altos, Calif. 94022

Filed Aug. 22, 1988, Ser. No. 234,924

Int. Cl.[5] H01S *3/09*

U.S. Cl. 372—73 16 Claims



1. In a radioactive light source comprising a vacuum tight envelope having a chamber containing a radioactive gas medium which emits beta rays, at least one other gas medium disposed in said chamber, the partial pressure of said radioactive gas intermixed with said other gas medium, sufficent to excite said other gas medium and generate continuous and substained electromagnetic radiation, effectively utilizing the limited range of said beta rays, the partial pressure of the radioactive gas medium being 5% or more compared to the partial pressure of said other gas medium.

4,926,436

ACCELERATOR FOR COHERENT BOSONS

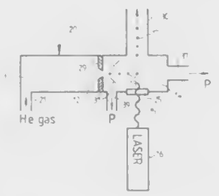
Shui-Yin Lo, Pasadena, Calif., assignor to Apricot S.A., Luxembourg, Luxembourg

Filed Aug. 11, 1988, Ser. No. 231,194

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.[5] H01S *3/09*

U.S. Cl. 372—73 20 Claims



1. A method of accelerating a first set of bosons comprised of coherent particles, comprising the steps of colliding a first set of boson clusters having coherent particles with a second energetic set of coherent bosons to accelerate said particles in said first set of bosons to yield an energetic coherent boson beam.

4,926,437

CERAMIC CATHODE FOR RING LASERS

Carol M. Ford, 3942 Main St., NE., Columbia Heights, Minn. 55421

Filed Dec. 21, 1988, Ser. No. 287,773

Int. Cl.[5] H01S *3/097*

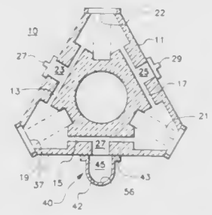
U.S. Cl. 372—87 6 Claims

1. A laser generator comprising:

a body for containing a gas;

a electric potential source;

a electrode secured to said body and providing a gas tight seal, said electrode being adapted to be electrically connected to the negative side of said source; and



wherein said electrode is a monolithic body of a sintered powder of a ceramic material substantially composed of a material selected from the group consisting of boron carbide and boron nitride, and mixtures thereof.

4,926,438

LASER POINTER

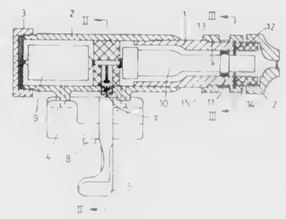
Félix V. Maes, Barchon, and Michel Baikrich, Tilff, both of Belgium, assignors to ARSOC S.p.r.l., Barchon, Belgium

PCT No. PCT/BE87/00016, § 371 Date Aug. 29, 1988, § 102(e) Date Aug. 29, 1988, PCT Pub. No. WO88/04024, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 18, 1987, Ser. No. 236,520

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—109 12 Claims



1. A laser pointer comprising:

a casing with a nosepiece having a longitudinal axis.

a laser generator for producing a laser beam.

said laser generator being contained in the nosepiece.

a voltage source contained in the casing.

said voltage source being connected to the laser generator.

an outer ring mounted about the nosepiece so as to provide rotation about the longitudinal axis of the nose piece.

laser generator positioning means connecting an outer surface of the laser generator and an inner surface of said ring such that rotation of said outer ring about the longitudinal axis of the nose piece causes axial displacement of the laser generator and the laser beam.

4,926,439

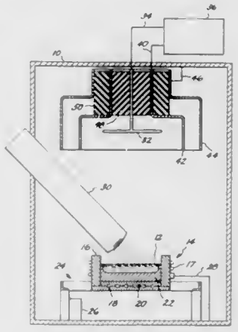
PROCESS FOR PREVENTING CONTAMINATION OF HIGH TEMPERATURE MELTS

Neil A. Johnson, Schenectady; Russell S. Miller, Ballston Spa, both of N.Y., and Gordon B. Hunter, Loveland, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 7, 1989, Ser. No. 404,398

Int. Cl.[5] H01J *37/305;* H05H *7/00*

U.S. Cl. 373—10 14 Claims



1. The method of reducing contamination of melts melted by high intensity heat sources which comprises,

providing a enclosure in which such melting is to be accomplished,

providing an inert atmosphere or vacuum in said enclosure,

applying heat at high intensity to a metal in a heating zone within said enclosure,

providing at least one electrode in said enclosure directly over the heating zone, and

applying a charge to said at least one electrode to create an electric field in said zone to induce repulsion of the particulate and vaporous material emanating from said heating zone and to preclude deposit of particulate matter above said melt.

4,926,440

SPREAD-SPECTRUM COMMUNICATION APPARATUS

Nobuo Mikoshiba, 30-18, Yagiyama-Honcho 2-chome; Kazuo Tsubouchi, 30-38, Hitokita 2-chome, both of Sendai-shi, Miyagi-ken, and Takeshi Tomioka, Sendai, all of Japan, assignors to Nobuo Mikoshiba and Kazuo Tsubouchi, both of Sendai, Japan

Filed Jan. 20, 1989, Ser. No. 300,568

Claims priority, application Japan, Jan. 21, 1988, 63-011567

Int. Cl.[5] H04K *1/00*

U.S. Cl. 375—1 7 Claims



5. A spread-spectrum communication apparatus comprising:

a transmitter apparatus including primary modulating means for modulating a carrier frequency by baseband informa-

tion of data to be transmitted; and secondary modulating means for effecting secondary modulation by a predetermined PN code and transmitting a spread-spectrum transmission signal; and

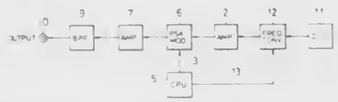
a receiver apparatus including a convolver supplied with a received spread-spectrum signal and a switchingly selected one of two reference signals which are different in the center frequency, non-synchronous with the carrier frequency and the PN code in said transmitter apparatus and time-inverted with respect to the PN code in said transmitter apparatus to correlate them; waveform shaping means for detecting and shaping a row of peak pulses outputted from said convolver; and a comparing demodulator for comparing output pulse rows corresponding to respective said center frequencies outputted from said waveform shaping means and demodulating said baseband information.

4,926,441

PHASE-SHIFT-KEYING TRANSMITTER

Satoshi Iwasaki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,459
Claims priority, application Japan, Nov. 20, 1986, 61-277502
Int. Cl.[5] H04L *25/49*
U.S. Cl. 375—60 **6 Claims**



4. A PSK transmitter comprising:

an oscillator producing an oscillation output signal at a frequency f_{osc} different from a carrier frequency f_c;

frequency converter means receiving said oscillation output signal as an input signal and outputting a frequency converter signal at a frequency equivalent to said carrier frequency f_c;

means for supplying a switching signal to said frequency converter means to ON/OFF control said frequency converter means so that an output of said converter means is zero when said converter means is off;

first amplifying means for amplifying said frequency converter signal;

a PSK modulator for PSK modulating said amplified frequency converted signal with a data signal to produce a modulated carrier signal;

second amplifying means for amplifying said modulated carrier signal to produce an amplified modulated carrier signal; and

filter means for receiving said amplified modulated carrier signal for allowing signals in a first frequency range to pass, and for blocking signals in a second frequency range, said ON/OFF control of said frequency converter means being carried out without provision of a separate switching stage, so as to maximize a desired-to-undesired signal ratio of said transmitter.

4,926,442

CMOS SIGNAL THRESHOLD DETECTOR

Eugene R. Bukowski, South Bend, Ind., and Charles R. Hoffman, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1988, Ser. No. 208,327
Int. Cl.[5] H04B *1/12*
U.S. Cl. 375—76 **13 Claims**

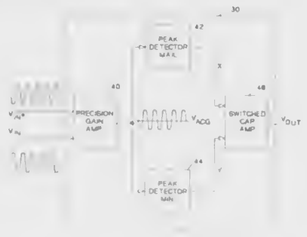
1. A data recovery system comprising:

first means for providing an input signal;

an amplifier means for receiving and processing the signal; said processing including adjusting any common mode components associated in said signal, setting a reference baseline about which positive peaks and negative peaks of said signal are being measured and amplifying said signal;

a maximum peak detecting means for detecting and storing first signal charges representative of the positive peaks of said input signal;

a first circuit means coupled to said maximum peak detecting means, said first circuit means discharging said maximum peak detecting means at a rate which varies in accordance with the magnitude of the first signal charges;



a minimum peak detecting means for detecting and storing second signal charges representative of the minimum peaks of said input signal;

a second circuit means discharging said minimum peak detecting means at a rate which varies in accordance with the magnitude of said second signal charges; and

a switched capacitive amplifier means for combining signals generated from the maximum and minimum peak detecting means and outputting an amplified signal-ended signal.

4,926,443

CORRECTION CIRCUIT FOR A DIGITAL QUADRATURE-SIGNAL PAIR

Werner Reich, Emmendingen, Fed. Rep. of Germany, assignor to Deutscne ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed May 4, 1989, Ser. No. 347,379
Claims priority, application European Pat. Off., May 27, 1988, 88108442.0
Int. Cl.[5] H04B *1/10*
U.S. Cl. 375—102 **10 Claims**



1. A correction circuit for a digital signal pair having an uncorrecting in-phase signal and an uncorrecting quadrature signal, comprising:

an offset-correcting stage that receives said uncorrected in-phase signal and said uncorrected quadrature signal and that generates an offset-corrected in-phase signal and an offset-corrected quadrature signal, said offset-correcting stage further receiving an in-phase-offset-correcting signal and a quadrature-offset-correcting signal;

a phase-correcting stage that receives said offset-corrected in-phase signal and said offset-corrected quadrature signal and that generates an phase-corrected quadrature signal, said phase-correcting stage further receiving a phase-correcting signal;

an amplitude-correcting stage that receives said phase-corrected quadrature signal and that generates an amplitude-corrected quadrature signal, said amplitude-correcting stage further receiving an amplitude-correcting signal;

a value-determining stage comprising:

a first minimum detector that receives said offset-corrected in-phase signal and that generates an in-phase minimum value;

a first maximum detector that receives said offset-corrected in-phase signal and generates an in-phase maximum value;

a second minimum detector that receives said amplitude-corrected quadrature signal and generates a quadrature minimum value;

a second maximum detector that receives said amplitude-corrected quadrature signal and that generates a quadrature maximum value;

a first hold circuit that receives said amplitude-corrected quadrature signal, said first hold circuit responsive to said first minimum detector to store a first held quadrature value on the occurrence of said in-phase minimum value;

a second hold circuit that receives said amplitude-corrected quadrature signal, said second hold circuit responsive to said first maximum detector to store a second held quadrature value on the occurrence of said in-phase maximum value;

an error-detecting stage comprising:

a first adder that receives said in-phase maximum value from said first maximum detector and said in-phase minimum value from said first minimum detector, said first adder generating an in-phase offset error signal;

a second adder that receives said quadrature maximum value from said second maximum detector and said quadrature minimum value from said second minimum detector, said second adder generating a quadrature offset error signal;

a first subtracter having a minuend input that receives said second held quadrature value and having a subtrahend input that receives said first held quadrature value, said first subtracter generating a phase-error signal;

a second subtracter having a minuend input that receives said in-phase maximum value from said first maximum detector and having a subtrahend input that receives said in-phase minimum value from said first minimum detector, said second subtracter generating an in-phase amplitude value;

a third subtracter having a minuend input that receives said quadrature maximum value from said second maximum detector and having a subtrahend input that receives said quadrature minimum value from said second minimum detector, said third subtracter generating a quadrature amplitude value; and

a fourth substrater used as an amplitude comparator, said fourth subtracter having a minuend input that receives said quadrature amplitude value from said third subtracter and having a subtrahend input that receives said in-phase amplitude value from said second subtracter, said fourth subtracter generating an amplitude error signal; and

a first controller that receives said in-phase offset signal from said first adder and that generates said in-phase offset-correcting signal received by said offset-correcting stage;

a second controller that receives said quadrature offset error signal from said second adder and that generates said quadrature offset-correcting signal received by said offset-correcting stage;

a third controller that receives said phase-error signal generated by said first subtracter and that generates said phase-correcting signal received by said phase-correcting stage; and

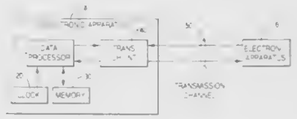
a fourth controller that receives said amplitude-error signal generated by said fourth subtracter and that generates said amplitude-correcting signal received by said amplitude-correcting stage.

4,926,444

DATA TRANSMISSION METHOD AND APPARATUS BY PERIOD SHIFT KEYING (TSK)

Scott L. Hamilton, Duluth; Michael P. Harney, Atlanta; David J. Naddor, Doraville; James Q. Farmer, Lilburn; Richard B. Frederick, Doraville, and Randolph J. Schaubs, Stone Mountain, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Apr. 29, 1988, Ser. No. 187,978
Int. Cl.[5] H04L *5/26*
U.S. Cl. 375—9 **33 Claims**



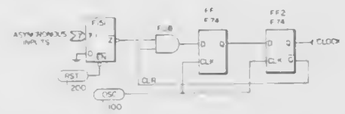
24. The data encoding and decoding apparatus of claim 21 wherein the plurality of data values comprises binary bit values, zero and one.

4,926,445

EXTERNAL ASYNCHRONOUS INPUT TESTER FOR BIT SLICE MACHINES

James R. Robb, Marion, Iowa, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 1, 1987, Ser. No. 68,864
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—106 **6 Claims**



6. A process of producing a clocking signal which has a value to synchronize a microprocessor with digital data input signals, said process comprising the steps of:

generating an oscillator frequency signal which has a value;

performing a divide-by-four on said oscillator frequency signal to produce said clocking signal composed of four cycles of said oscillator frequency signal;

using two of said four cycles of said oscillator frequency signal to synchronize said digital data input signals with said clocking signal; and

outputting said clocking signal as soon as said digital data input signals are synchronized with said clocking signal.

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4,926,446

METHOD AND APPARATUS FOR PRECISION TIME DISTRIBUTION IN TELECOMMUNICATION NETWORKS

Wayne D. Grover, and Thomas E. Moore, both of Edmonton, Canada, assignors to Alberta Telecommunications Research Centre, Edmonton, Canada

Filed Nov. 25, 1988, Ser. No. 275,888
Int. Cl.[5] H04L *7/10*
U.S. Cl. 375—109 **17 Claims**



1. A method of synchronizing a network, the network including a plurality of intermediate nodes serially bridged across an incoming transmission path and an outgoing transmission path, and including one loop node connected across the incoming and outgoing transmission paths and including a node furthest from the loop node, the method comprising:

(1) transmitting a first trigger signal along the outgoing transmission path from the node furthest from the loop node;

(2) on arrival of the first trigger signal at the loop node, returning a second trigger signal on the incoming transmission path, the second trigger signal having time information appended to it;

(3) at each intermediate node,

(a) detecting the first trigger signal on the outgoing transmission path and the second trigger signal on the incoming transmission path;

(b) counting the elapsed time between the detection of the first trigger signal on the outgoing transmission path and detection of the second trigger signal on the incoming transmission path;

(c) adjusting the elapsed time for two way travel time and for processing delays to produce adjusted time information representative of the one way travel time delay between the intermediate node and the loop node;

(d) latching the time information appended to the second trigger signal returning on the incoming transmission path from the loop node;

(e) adding the latched time information to the adjusted time information to produce synchronized time information; and

(f) storing the synchronized time information in a real time clock register.

4,926,447

PHASE LOCKED LOOP FOR CLOCK EXTRACTION IN GIGABIT RATE DATA COMMUNICATION LINKS

Craig Corsetto, Ijamsville, Md.; Tom Hornak, Portola Valley, Calif.; Rasmus Nordby, Horsholm, Fed. Rep. of Germany; Rick C. Walker, and Chu Yen, both of Palo Alto, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 18, 1988, Ser. No. 273,302
Int. Cl.[5] H04L *7/33*
U.S. Cl. 375—120 **35 Claims**

1. A structure for extracting a bit clock, a frame clock, and data from a data stream comprising:

an input port for receiving said data stream wherein:

said data stream is grouped into consecutive frames of N bits, where N is an integer,

each of said consecutive frames comprises at least two non-data bits, with two of said non-data bits being in consecutive bit positions and being of opposite logic values, the transition between said two non-data bits forming a master transition, said master transition being of the same polarity and located in the same position in each of said frames;

said consecutive frames are grouped into one or more groups of frames; and

an integral number of said consecutive frames at the beginning of each of said groups of frames constitute a training sequence comprising only said master transition and one transition of opposite polarity;

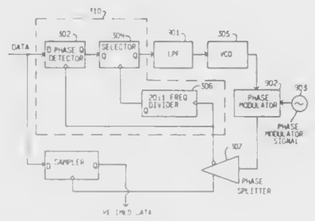
an output port for providing extracted data;

bit clock means for providing a bit clock signal which is adjusted in response to a binary clock control signal to match said data stream in frequency and phase;

a clock control source comprising:

an input lead connected to said input port;

a frame clock means for generating a frame clock signal having a frequency equal to 1/N times the bit clock signal



frequency as means for selecting one of every 2N-th transition in said bit clock signal; and

an output lead supplying said binary clock control signal, said binary clock control signal changing its level at most once per frame, and having a first binary value when said selected bit clock transition occurred before said master transition and a second binary value when said selected bit clock transition occurred after said master transition, said binary clock control signal, when of said first binary value influencing said bit clock means to decrease the frequency of said bit clock and when of said second binary value influencing said bit clock means to increase the frequency of said bit clock; and

sampler means having an input lead connected to receive said data stream, a clock input lead for receiving said bit clock signal, and an output lead for providing said extracted data on said output port.

4,926,448

METHOD AND APPARATUS FOR IMPLEMENTING AN ESCAPE SEQUENCE

Douglas R. Kranl, Duluth, and Stuart A. Cox, Woodstock, both of Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.

Division of Ser. No. 860,052, May 6, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 243,084
Int. Cl.[5] H04L *23/00*
U.S. Cl. 375—121 **18 Claims**

1. In an asynchronous data communications device of the type which is operable at a plurality of different data transmission rates, having at least a first port for connecting said asynchronous data communications device to data terminal equipment and a second port for connecting said asynchronous data communications device to a data utilization circuit, and further having two distinct modes of operation:

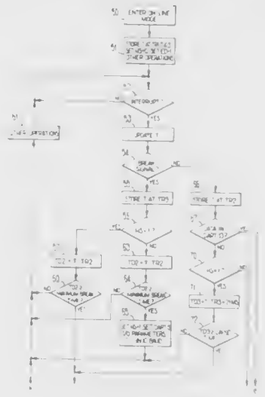
(a) a transparent mode of operation in which said data communications device provides output data signals to said second port, said output data signals corresponding to input data signals provided to said first port by said data terminal equipment; and

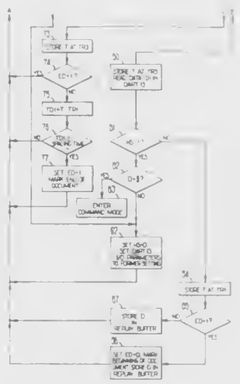
(b) a command mode of operation in which said data communications device responds to said input data signals provided to said first port by said data terminal equipment as instructions to said data communications device;

an improved escape apparatus, operable when said data communications device is in said transparent mode of operation, comprising:

detection means connected to said first port for detecting each occurrence of provision of a break signal to said first port by said data terminal equipment; and

timing means responsive to said detection means for providing a time out signal in response to each occurrence of said detection means detecting said break signal for at least a predetermined period of time;





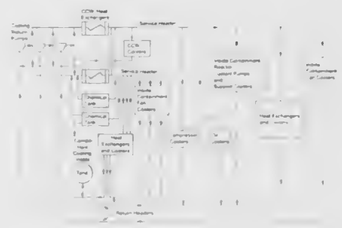
wherein said detection means is further responsive to said time out signal and said input data signals to cause said data communications device to switch to said command mode of operation if said input data signals following termination of said break signal corresponds to a predetermined character transmitted at a particular one of said plurality of different data transmission rates, and otherwise causes said data communications device to remain in said transparent mode of operation.

4,926,449

CORROSION INHIBITION OF CLOSED COOLING WATER AUXILIARY SYSTEM FOR NUCLEAR POWER PLANTS

Paul A. Burda, 213 Westvale Ct., San Ramon, Calif. 94583

Filed Feb. 22, 1988, Ser. No. 158,613
Int. Cl.[5] C09K *3/00;* **G21C** *19/28*
U.S. Cl. 376—306 **4 Claims**



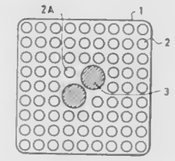
3. In a nuclear power plant cooling system having a liquid corrosion inhibitor, said inhibitor containing about 12% potassium molybdate and about 12% potassium nitrite and 2 to 2.5% potassium borate in aqueous solution and containing less than 160 ppm sodium ions.

4,926,450

FUEL ASSEMBLY

Yasuhiro Masuhara, Katsuta; Soamn Yokomizo; Kotaro Inoue, both of Ibaraki; Sadao Uchikawa, Katsuta; Motoo Aoyama, Hitachi; Junichi Yamashita, Hitachi; Yuichiro Yoshimoto, Hitachi; Tetsuo Yasuda, Hitachi, and Hiromasa Hirakawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

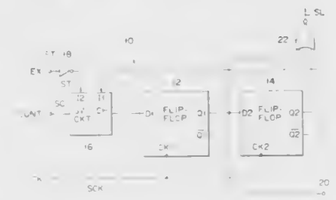
Filed Mar. 21, 1988, Ser. No. 171,452
Claims priority, application Japan, Mar. 20, 1987, 62-63886
Int. Cl.[5] G21C *3/32*
U.S. Cl. 376—444 **3 Claims**



1. A fuel assembly comprising a plurality of fuel rods and water rods, the fuel rods being disposed with a predetermined pitch, and two water rods each having an outer diameter greater than the pitch of the fuel rods being disposed adjacent to each other in a diagonal direction of the fuel assembly inside a region of the fuel assembly corresponding to a space sufficient for disposing seven fuel rods at the center of the fuel assembly.

VOL
1114
ISS
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4,926,451
TIMING CONTROLLER FOR HIGH-SPEED DIGITAL INTEGRATED CIRCUIT
Kunio Yoshihara, Kawasaki; Toshiyuki Terada, Tokyo; Chiaki Takubo, Yokohama; Nobuo Koide, Tokyo, and Shoichi Shimizu, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 19, 1988, Ser. No. 259,905
Claims priority, application Japan, Oct. 19, 1987, 62-263138
Int. Cl.[5] H03B *19/00*; H03K *21/00*
U.S. Cl. 377—48 **11 Claims**



1. A timing controller in a digital integrated circuit, said circuit including a selected type of active elements, said timing controller comprising:

a frequency dividing circuit for receiving a reference clock signal and for generating a first timing signal, said first timing signal being received by said digital integrated circuit as an internal timing signal, said frequency dividing circuit having an input and an output; and

switch circuit means connected to said output and said input of the said frequency dividing circuit, said switch circuit means further receiving a control signal and a second timing signal as an external timing signal, said switch circuit means being switched between two positions in response to the control signal so that in a first position said switch circuit means connects the output of said frequency dividing circuit to the input of said frequency dividing circuit as a signal feedback line, and in a second position connects the second timing circuit to the input of the frequency dividing circuit so that said frequency dividing circuit is controlled by said second timing signal.

4,926,452
AUTOMATED LAMINOGRAPHY SYSTEM FOR INSPECTION OF ELECTRONICS
Bruce D. Baker, Olivenhain; Robert L. Corey, San Diego; John A. Adams, and Edward W. Ross, both of Escondido, all of Calif., assignors to Four Pi Systems Corporation, San Diego, Calif.
Filed Oct. 30, 1987, Ser. No. 115,171
Int. Cl.[5] G01N *23/04*
U.S. Cl. 378—22 **45 Claims**

15. A laminographic apparatus for inspecting an electrical connection comprising:

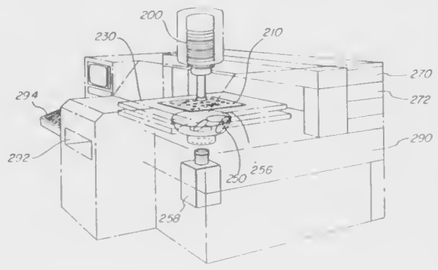
an imaging system for producing a cross-sectional image of said electrical connection, wherein said imaging system comprises:

a source of penetrating radiation at a first location for generating said cross-sectional image of said electrical connection; and

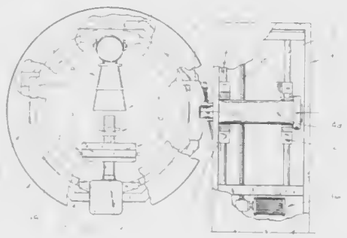
a detector at a second location for sensing the penetrating radiation representative of said cross-sectional image;

a fiducial element, which, when illuminated by said source of penetrating radiation forms a fiducial element image on said detector; and

a control system which coordinates the positions of said source of penetrating radiation and said detector utilizing information obtained from said fiducial element image.



4,926,453
MAMMOGRAPHY APPARATUS
Bruno Toniolo, Sasso Marconi, Italy, assignor to I.M.S. Internazionale Medico Scientifica s.r.l., Pontecchio Marconi, Italy
Filed Sep. 15, 1989, Ser. No. 407,529
Claims priority, application Italy, Mar. 17, 1989, 3386 A/89
Int. Cl.[5] A61B *6/04*
U.S. Cl. 378—37 **5 Claims**



1. Mammography apparatus, comprising:

an upright stand;

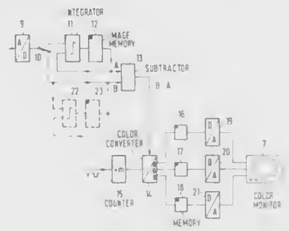
a slide supported by and adjustable for height in relation to the stand;

horizontal shaft associated with the slide and rotatable about its own longitudinal axis;

an X-ray appliance comprising means by which to support and compress the breasts of a patient under examination, means in which to contain X-ray film, and a source of X-rays located opposite the support and compression means;

a frame, to which the X-ray appliance is mounted, permanently associated with the horizontal shaft and adjustable for position by rotation about a given axis that is disposed skew and/or offset in relation to the longitudinal axis of the shaft.

4,926,454
X-RAY DIAGNOSTIC APPARATUS
Joerg Haendle, Erlangen, and Wolfgang Maass, deceased, late of Nuremberg, Fed. Rep. of Germany (by Dora Maass, Peter Maass, heirs), assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jun. 12, 1985, Ser. No. 744,161
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422875
Int. Cl.[5] H05G *1/64*
U.S. Cl. 378—100 **1 Claim**



1. In x-ray diagnostic apparatus comprising a video camera for producing a video signal representing an x-ray image of a subject; an image memory for storing said video signal; a subtraction stage coupled to the output of said image memory for producing a difference signal representing the difference between the stored video signal and another video signal chronologically following the stored signal; an evaluation circuit, including a time stage and a color converter, for time evaluation of said difference signal; and a video monitor coupled to said evaluation circuit; the improvement wherein said color converter is directly connected to the subtraction stage and converts a subtraction image represented by said difference signal into a monochrome intensity image whose image color is controlled by said time state in dependence upon the chronological occurrence of the subtraction image, said color converter having one output for each primary color and wherein one memory is coupled to each respective output of color converter for accumulating output signals of said color converter.

4,926,455
SPOT FILMER CASSETTE TRANSPORT VIBRATION SUPPRESSION
Mark Stojkov, Parma; Patrick M. Flanagan, Westlake; Victor Hrdlicka, Mayfield Heights; John Geither, Wickliffe, and Dennis Everett, Garfield Heights, all of Ohio, assignors to Picker International, Inc., Cleveland, Ohio
Division of Ser. No. 298,339, Jan. 13, 1989. This application Apr. 17, 1989, Ser. No. 339,891
Int. Cl.[5] G03B *42/02*
U.S. Cl. 378—176 **4 Claims**

1. A medical diagnostic spot film device comprising:

(a) a cassette carriage for accommodating a radiographic film cassette;

(b) structure defining a travel path of motion for said cassette carriage between a park position and an exposure position;

(c) an x-ray source for propagating x-rays toward said expose position;

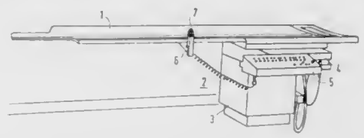
(d) an arm pivotally mounted and coupled to said cassette carriage for driving said carriage along said travel path in response to pivotal motion of said arm;

(e) power means including an output shaft and means for rotating said output shaft;

(f) mechanical linkage coupling said output shaft to said arm, said linkage including cam follower means coupled to said arm and a cycloidal cam mounted for rotation in response to rotation of said output shaft, said cam being coupled between said output shaft and said cam follower means.



4,926,456
X-RAY EXAMINATION TABLE
Hans-Christian Bock; Karlheinz Kaul, both of Uttenreuth, and Willi Schaefer, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 029,790, Mar. 25, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,407
Claims priority, application Fed. Rep. of Germany, May 7, 1986, 8612495[U]
Int. Cl.[5] G03B *42/02*
U.S. Cl. 378—177 **1 Claim**



1. In an x-ray examination table having a table top with one end of the table top mounted on a pedestal which has a control box having an inclined upper surface, said box containing a plurality of control elements for the examination procedure being disposed on said upper surface, and an additional control element being connected to the control box via a control cable, the improvements comprising said pedestal having means for mounting the control box for displaceable movement on said pedestal in a longitudinal direction of the table top between two longitudinally spaced work positions, and a holder for the additional control element being mounted on the table top at a position spaced from the pedestal said means for mounting including groove in a side of the pedestal extending in said longitudinal direction and a projection on said control box slidably received in said groove to allow movement between said work positions.

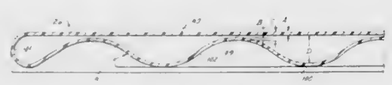
VOL 1114 ISS 3 MY 15 1990 UMI

4,926,457

RADIOLUCENT HOSPITAL BED SURFACE

Michael E. Poehner, West Harrison, Ind.; Michael J. Duwell, Cincinnati, Ohio, and Howard J. Boyd, Oldenburg, Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Jan. 29, 1988, Ser. No. 150,075
Int. Cl.[5] A61B 6/04
U.S. Cl. 378—209 36 Claims



27. A patient surface comprising:

a patient supporting member having a predetermined radiolucent area thereacross;

a non-planar radiolucent reinforcing member having portions disposed in operative, normally spaced-apart underlying relationship with said predetermined radiolucent area;

said reinforcing member portions providing deflection resisting support for said patient supporting member when it is loaded;

wherein said patient supporting member in said radiolucent area and said reinforcing member thereunder in operative combination uniformly attenuate electromagnetic waves passing therethrough; and

wherein said reinforcing member portions comprise a plurality of transversely extending projections defining crests and depressions underlying said radiolucent area of said patient supporting member.

4,926,458

LOW POWER CONTROL APPARATUS FOR A COIN OPERATED TELEPHONE

Philip R. Reger, Newtown Square; Patrick J. McGarry, West Chester, and Craig A. Lewis, Berwyn, all of Pa., assignors to Mars Incorporated, McLean, Va.

Filed May 26, 1988, Ser. No. 199,129
Int. Cl.[5] H04M 17/02, 1/24
U.S. Cl. 379—27 65 Claims



1. A low power, coin operated telephone controller for controlling a coin operated telephone which has an on-hook state and an off-hook state, said controller being energized with power from tip and ring lines of a loop circuit from a central office during said telephone's off-hook state, said controller having:

a standby mode during said telephone's on-hook state in which substantially no power is drawn by said controller from the tip and ring lines of the loop circuit;

an audio network;

a totalizer control means for signalling of accepted coin value to the central office;

an electric coin mechanism for electronically testing coins and for generating coin data in the form of electrical signals for each coin deposited into said telephone;

a power supply circuit having a plurality of outputs and which is energized with power from said tip and ring lines of the loop circuit for energizing said telephone controller during said telephone's off-hook state;

interface circuitry for set up of status indicators and for monitoring telephone conditions during periods when no current is available between the tip and ring lines; and

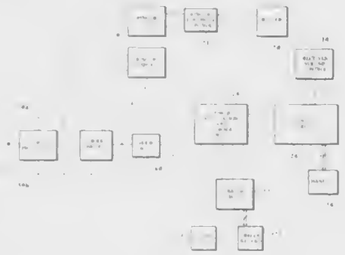
a single processing element comprising timing means for establishing times or durations of events or calls, and nonvolatile digital memory for storing a plurality of bits of data during both the off-hook state and on-hook state of the coin operated telephone, for processing said coin data and controlling the electronic coin mechanism, and for controlling operation of said audio network, said interface circuitry and said power supply circuit.

4,926,459

HEARING ASSIST TELEPHONE

Jai K. Advani, Aptos, and Robert J. Bernardi, Scotts Valley, both of Calif., assignors to Plantronics, Inc., Santa Cruz, Calif.

Filed May 26, 1989, Ser. No. 357,540
Int. Cl.[5] H04M 1/22, 1/60
U.S. Cl. 379—52 2 Claims



1. A telephone set, for communicating via a standard local loop telephone network, comprising:

a receiver amplifier;

a receiver converting an electrical receiver signal received from the receiver amplifier into an audible acoustical signal,

a receiver volume control providing adjustment of the gain and frequency response characteristic of the receiver amplifier, such that with the volume control at a first setting, the gain of the receiver amplifier is at a minimum, and the frequency response of the amplifier is substantially uniform throughout the audio spectrum, and such that with the volume control at a second setting, the gain of the receiver amplifier is at a maximum, and the frequency response of the amplifier is emphasized at the higher frequencies of the audio spectrum;

a visual indicator of incoming calls;

an electronic ringer producing an audible signal to herald incoming calls, the frequency response of said ringer emphasizing the lower frequencies of the audio spectrum; and

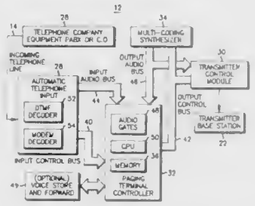
an illuminated, large-key dialing keypad.

4,926,460

UNIVERSAL PSTN PAGE ENTRY PROTOCOL

Jose Gotman, Boynton Beach; Steven J. Goldberg, Coral Springs, and Linda M. Trine, Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 26, 1988, Ser. No. 249,015
Int. Cl.[5] H04M 1/64, 11/00
U.S. Cl. 379—57 12 Claims



7. A method for accommodating calls from standard telephone sets as well as those from computer/VDT or page entry terminal (PET) devices by a paging terminal having at least one telephone input and predetermined voice and machine based protocols comprising the steps of:

providing paging terminal interface means having said at least one telephone input, a DTMF detector and a modem;

determining if any particular call is from a standard telephone set or a computer/VDT or PET terminal device;

the step of call determination further including setting an included inactivity time-out timer upon receiving an incoming call and determining whether DTMF signals are received during the interval the inactive time is set; and

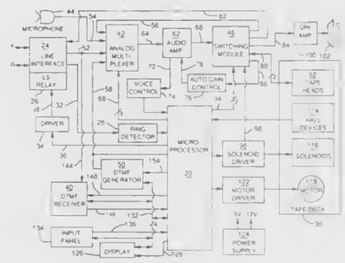
processing such particular call with the running of appropriate predetermined voice or machine based protocol in accordance with the type of the call after said determination of same.

4,926,461

TELEPHONE ANSWERING MACHINE HAVING CALL TRANSFER CAPABILITIES

Henry Kuok, Syracuse, N.Y., assignor to Code-A-Phone Corporation, Clackamas, Oreg.

Continuation-in-part of Ser. No. 2,222, Jan. 12, 1987, abandoned. This application Mar. 1, 1988, Ser. No. 162,482
Int. Cl.[5] H04M 1/65, 3/58
U.S. Cl. 379—67 8 Claims



5. A method for operating a telephone answering machine that is connectable to any selected one of a plurality of telephone station lines of a telephone switching system, wherein the telephone system connects a caller's outside telephone line with a telephone station line designated by the caller, and wherein the telephone system initiates the connection by providing a signal on the caller-designated telephone station line, the method comprising the steps of:

connecting a first telephone station line to a message mechanism for receiving and transmitting messages, wherein the connection is made in response to a first signal provided on the first telephone station line by the telephone system and wherein the connection is made in the absence of signals generated by the caller subsequent to the first signal;

monitoring the first telephone station line to detect a second signal generated by the caller whose outside line is connected with the first telephone station line, wherein the second signal includes an extension number for a second telephone station line;

storing the extension number included in the second signal; and

retrieving the stored extension number to generate transfer signals suitable for directing the telephone system to transfer the outside caller to the second telephone station line.

4,926,462

INTERFACE TO AND OPERATION OF A VOICE MESSAGING SYSTEM

David J. Ladd, Saratoga; Gregory E. Pounds, San Jose; Tim J. Kusumi, Los Gatos; Peter A. Bonee, Sunnyvale, and Robert R. Shepard, Fremont, all of Calif., assignors to VMX/OPCOM, San Jose, Calif.

Filed Feb. 24, 1988, Ser. No. 159,783
Int. Cl.[5] H04M 1/66, 3/50, 3/58; H04Q 3/72
U.S. Cl. 379—67 59 Claims



1. A telephone system, comprising:

a telephone switching means comprising a first port for supplying call information to a feature phone, said first port accepting calls directed to a plurality of extensions;

said telephone switching means further comprising a plurality of second ports, each of said second ports accepting calls directed to one of said plurality of extensions;

a voice messaging system coupled with said first port and said plurality of second ports for receiving said call information on said first port and further processing said call on one of said plurality of second ports.

27. In a telephone system, said telephone system comprising a plurality of extensions and a messaging means, said messaging means comprising a plurality of mailboxes associated with said plurality of extensions, a method comprising:

(a) accessing said messaging means from one of said extensions;

(b) supplying said messaging means with identifying information, said identifying information identifying a mailbox;

(c) said messaging means prompting a caller to supply a password under a first set of predetermined conditions; and

(d) said messaging means allowing said caller to receive immediate access to a set of predetermined functions under a second set of predetermined conditions.

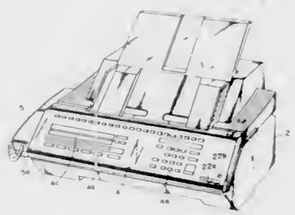
VOL 1114 ISS 3 MY 15 1990 UMI

4,926,463

DATA COMMUNICATION APPARATUS HAVING A REPROGRAMMABLE VOICE MEMORY

Takeshi Ukegawa, Hadano, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 29, 1988, Ser. No. 277,310
Claims priority, application Japan, Nov. 30, 1987, 62-183330[U]; Jul. 20, 1988, 63-96883[U]
Int. Cl.[5] H04M *1/64, 11/00*
U.S. Cl. 379—88 6 Claims



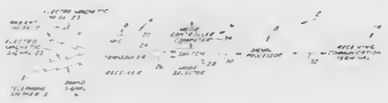
1. A data communication apparatus comprising:
an external fixed memory in which a plurality of messages are stored;
means for transmitting data to a remote station through a network and receiving data from a remote station through the network;
a reprogrammable voice memory for storing at least one voice message to be transmitted to said remote station by said means for transmitting through said network; and
means for arbitrarily selecting a message from said external fixed memory;
reading means for reading information stored in said external fixed memory at least partly for transferring said information read from said fixed memory to said reprogrammable voice memory, said external fixed memory including at least one voice message.

4,926,464

TELEPHONE COMMUNICATION APPARATUS AND METHOD HAVING AUTOMATIC SELECTION OF RECEIVING MODE

James T. Schley-May, Stow, Ohio, assignor to Telxon Corporation, Akron, Ohio

Filed Mar. 3, 1989, Ser. No. 318,730
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—99 14 Claims



1. Telephone communication interface apparatus for receiving data from a telephone network and directing the received data to a communication terminal, the telephone network including a telephone speaker that emits both a sound signal and an electromagnetic signal, both signals corresponding to the data carried by the telephone network, the apparatus comprising:
microphone means for receiving the sound signal and producing a corresponding microphone signal;
electromagnetic transducer means for receiving the electromagnetic signal and producing a corresponding transducer signal; and
mode selection means for detecting data errors in the microphone signal and the transducer signal and selectively directing either the microphone signal or the transducer signal to the communication terminal in accordance with the detected data errors.

4,926,465

METHOD FOR INDICATING A COMMUNICATING DURATION OF AN OFFICE LINE IN A KEYPHONE SYSTEM

Suk-Joon Kim, Seoul, Rep. of Korea, assignor to Samsnng Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 31, 1989, Ser. No. 359,342
Claims priority, application Rep. of Korea, May 31, 1988, 1988-6496
Int. Cl.[5] H04M *15/28, 15/34*
U.S. Cl. 379—131 11 Claims



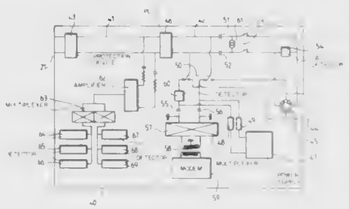
1. A method of indicating communicating duration of use of a public telephone office line, comprising:
driving in response to completion of the dialing of a first subscriber's number on a public telephone office line controlled via a central processor using a key telephone set assigned a second subscriber's number, and connection by the central processing unit of the key telephone set with a receiver addressed by the first subscriber's number via the public telephone office line, a timer of the central processing unit with a start signal to enable the timer to count time of the duration of a communication between the key telephone set and the receiver via the public telephone office line, and indicating that communication between the key telephone set and the receiver has started;
initializing a buffer storing the count of time of the duration of the communication when said start signal is generated, and driving the timer with a driving signal;
driving said timer and then checking whether the public telephone office line is in a reserved state, terminating the count of time when the public telephone office line is in a reserved state and producing communicating duration data representing the count of time when the public telephone office line is conducting communication with the key telephone set;
increasing the value of the count of time stored in the buffer in response to said driving signal, thereafter driving the timer with the driving signal, and repeating said step of checking; and
transmitting the data to the key telephone set if the public telephone office line is not in a reserved state.

4,926,466

PERMANENT CONNECTION PUBLIC TELEPHONE APPLIANCE

Jean-Clande Ayello, and Thierry Serradura, both of Valence, France, assignors to Crouzet, France

Continuation of Ser. No. 207,169, Jun. 15, 1988, abandoned.
This application May 12, 1989, Ser. No. 351,192
Claims priority, application France, Jun. 24, 1987, 87 08862
Int. Cl.[5] H04M *19/00*
U.S. Cl. 379—143 8 Claims



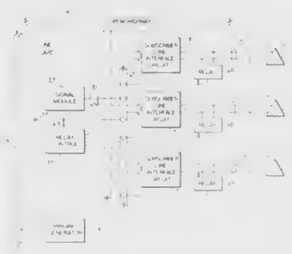
1. Permanent connection public telephone appliance, intended to be connected to the local switched telephone network through a connection unit, comprising a battery for supplying the different elements of the appliance with power, adapted for being recharged by a power supply source of the connection unit, and a line interface intended to be connected to the switched network during conversation periods, characterized by the fact that the appliance and the connection unit are adapted so that the battery of the appliance is permanently recharged by the power supply source of the connection unit, the switched network is galvanically isolated from the power supply source of the connection unit, and connection of the appliance to the switched network is provided exclusively by the connection unit.

4,926,467

LINE CARD WITH DISTRIBUTED SIGNALING VOLTAGES

Rolf Meier, Carp, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Aug. 3, 1989, Ser. No. 388,942
Claims priority, application Canada, Aug. 15, 1988, 574775
Int. Cl.[5] H04M *3/02, 13/00*
U.S. Cl. 379—146 8 Claims



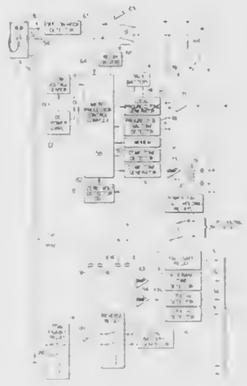
1. In a telephone system having a plurality of remote telephones connected thereto, and including a ringing generator for generating ringing signals for application to said remote telephones; a line card circuit for distributing and applying said ringing signals and predetermined control signals to said remote telephones, comprised of:
(a) a plurality of subscriber line interface circuits for connection to respective ones of said telephones via two-wire telephone lines,
(b) a signalling bus connected via first relay means to respective ones of said telephone lines and via second relay means to said ringing generator,
(c) a removable signal module for generating said predetermined control signals,
(d) a receptacle for receiving said signal module comprised of one or more terminals for connection to said signal module via third relay means to said bus, and
(e) means for selectively actuating said first, second and third relay means for selectively connecting one of either said ringing generator or said signal module to predetermined ones of said telephone lines via said bus,
whereby said ringing signals and said predetermined control signals are selectively distributed and applied to respective ones of said telephones connected to said two-wire telephone lines.

4,926,468

PAY STATION TELEPHONE COIN BOX APPARATUS

Benjamin A. Smith, Celeste, and Conaway K. Hoback, Dallas, both of Tex., assignors to Digital Telecommunications Systems, Inc., Dallas, Tex.

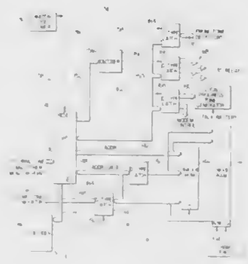
Division of Ser. No. 912,984, Sep. 29, 1986, Pat. No. 4,777,647.
This application Jun. 22, 1988, Ser. No. 210,072
Int. Cl.[5] H04M *17/02*
U.S. Cl. 379—147 20 Claims



1. Apparatus for use with a pay station telephone and a communication line for indicating an apparent damaged condition of the telephone, comprising
means for detecting the use of the pay station telephone by a user attempting to make a telephone call;
means for detecting whether a coin has been deposited in the telephone according to each said use; and
means for counting the number of times said telephone is used and no coin is deposited, and for providing an indication when said number exceeds a predetermined threshold.

VOL
1114
ISS
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4,926,469
PAY STATION TELEPHONE CALL ROUTING APPARATUS
Benjamin A. Smith, Celeste, and Conaway K. Hoback, Dallas, both of Tex., assignors to Digital Telecommunications Systems, Inc., Dallas, Tex.
Division of Ser. No. 917,984, Sep. 29, 1986, Pat. No. 4,777,647. This application Jun. 22, 1988, Ser. No. 210,074
Int. Cl.[5] H01M *17/00*
U.S. Cl. 379—155 13 Claims



1. Electrical apparatus for use with a pay station telephone, comprising:
a detector for detecting digit information dialed by a user of the pay station telephone;
a memory for storing a look-up table having plural data entries for categorizing types of calls based upon the digit information input by the user;
a comparator for comparing the digit information with the data entries of said look-up table to produce an indication of the category of the call; and
a processor for processing the call to completion according to said category indication.

4,926,470
TELEPHONE CALL SCREENING CIRCUIT
David M. Sanford, 7027 Twin Hill, Dallas, Tex. 75228
Filed Oct. 14, 1988, Ser. No. 257,739
Int. Cl.[5] H04M *1/66*
U.S. Cl. 379—199 25 Claims



1. A telephone interface circuit for interfacing a telephone line with at least one residential type standard telephone set, comprising:
switching means for normally disconnecting said telephone line from said telephone set;
sensing means connected to said telephone line for sensing ringing voltage on said telephone line and for producing a first signal when said ringing voltage is sensed;
coupling means for coupling audio signals to and from said telephone line and to and from said telephone set, said coupling means including means for presenting a low DC resistance to said telephone line when connected thereto;
said switching means including a first switch means connected between said telephone line and said low resistance presenting means for connecting said telephone line to said low resistance presenting means in response to said first signal;
ring signal generating means operatively coupled to said telephone set for selectively causing said telephone set to ring, said ring signal generating means including means for controlling the cadence of said telephone set ringing;
tone decoding means connected to said transformer means for and connected to receive DTMF tone sequences from said telephone line and for decoding said received tone sequences;
memory means for storing information representing plural decoded tone sequences corresponding to respective different callers and for also storing information representing plural different ring cadences respectively associated with said plural tone sequences;
processor means coupled to said ring signal generating means, said tone decoding means and said memory means, for testing whether information corresponding to a decoded received tone sequence corresponds to information stored in said memory means and if said testing step reveals such correspondence, for generating a second signal and controlling said ring signal generating means to cause said telephone set to ring with a cadence represented by information stored in said memory means associated with said decoded received tone sequence, said cadence thus corresponding to a particular caller;
said switching means further including a second switch connected between said telephone line and said telephone set for connecting said telephone line to said telephone set in response to said second signal.

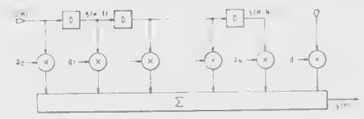
4,926,471
COMMUNICATION SYSTEM
Toshio Ikeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 55,022, May 28, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 311,362
Claims priority, application Japan, Jun. 2, 1986, 61-125663
Int. Cl.[5] H04M *3/42*
U.S. Cl. 379—216 6 Claims



1. A communication system comprising:
a plurality of communication terminals; and
an exchange unit for controlling switching between said communication terminals;
wherein said exchange unit comprises:

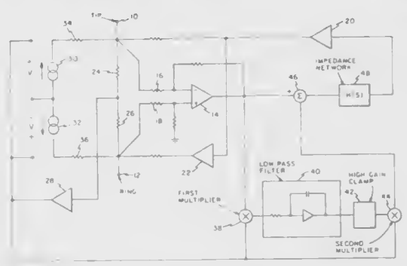
calling means for performing a calling operation in response to destination information from at least one of said communication terminals;
means for connecting said at least one communication terminal and another of said communication terminals called by said calling means; and
means for informing said at least one communication terminal of the identity of said other communication terminal called by said calling means.

4,926,472
REDUCTION OF SIGNAL PROCESSING REQUIREMENTS IN A 2B1Q-CODE ECHO CANCELLER OR EQUALIZER
Roy G. Batruni, Fremont, and Howard A. Wilson, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Filed Nov. 10, 1988, Ser. No. 269,670
Int. Cl.[5] H04B *3/23*
U.S. Cl. 379—411 12 Claims



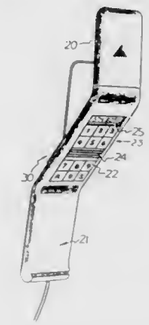
1. A signal processing method for a 2B1Q coded signal comprising 2B1Q symbols, the method comprising:
(a) mapping the 2B1Q symbols to corresponding symbols of a new symbol alphabet to provide a new signal;
(b) performing a convolution between the new signal and a plurality of gain coefficients to provide a plurality of amplified outputs;
(c) summing the amplified outputs to provide a convolution result; and
(d) subtracting an error factor from the convolution result to provide a compensated result that compensates for the mapping of the 2B1Q symbols to the new symbol alphabet.

4,926,473
LONGITUDINAL BALANCE SYSTEM
Harsh V. Bahl, Bolingbrook, and Laurence L. Sheets, St. Charles, both of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.
Continuation of Ser. No. 89,699, Aug. 25, 1987, abandoned. This application Apr. 27, 1989, Ser. No. 346,322
Int. Cl.[5] H04M *1/74*
U.S. Cl. 379—416 6 Claims



5. A method for longitudinal cancellation for use in a circuit providing a received differential signal containing a desired tone differential component and an undesired longitudinal component, comprising;
multiplying said received differential signal with said longitudinal component to produce a first signal having at least a substantially DC component;
filtering said first signal to produce a second signal containing substantially only said DC component;
multiplying said second signal with the undesired longitudinal component to produce a third signal substantially equal to the undesired longitudinal component; and
subtracting said third signal from said received differential signal to produce a final signal having said desired tone differential component and free of said longitudinal component.

4,926,474
ERGONOMIC TELEPHONE HANDSET
Peter J. Marks, 107 Park Street, South Melbourne, Victoria, Australia (3205)
PCT No. PCT/AU87/00161, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/07798, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 5, 1987, Ser. No. 165,268
Claims priority, application Australia, Jun. 5, 1986, PH06302
Int. Cl.[5] H04M *1/03*
U.S. Cl. 379—433 9 Claims



1. A telephone handset adapted for connection to a telecommunication system to allow a telephone conversation to be carried on by a user of the handset, said handset comprising a handle terminating at one end in a speaker portion and at its opposite end in a microphone portion spaced from said speaker portion, said handle being bent between its ends to enable said speaker portion to confront the ear of the user and the microphone portion to confront the mouth of the user, said speaker portion having a face adapted to confront an ear of the user, abutment means carried by said handle adjacent said speaker portion in a position to rest against the cheek of the user, said speaker portion being inclined to said handle at an angle such that when said face of said speaker portion engages the ear of the user and said handle extends alongside the cheek of the user said face is angled away from the skull of the user at substantially the angle of the ear to the skull.

4,926,475
DATA ENCRYPTION KEY FAILURE MONITOR
Mark G. Spiotta, Algonquin, and Erling Bjerga, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 30, 1988, Ser. No. 278,097
Int. Cl.[5] H04K *1/00*; H04L *9/02*
U.S. Cl. 380—2 10 Claims

1. An encryption key monitoring system for periodically testing an encryption key of at least one of a plurality of en-

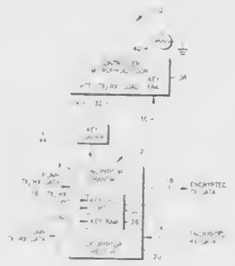
VOL
1114
ISS
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MY
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1990
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cryption circuit means, each of said encryption circuit means generating encrypted data from plain data using an encryption key, said system comprised of:

a plurality of encryption circuit means for generating encryption signals from unencrypted data signals, each of said encryption circuit means being comprised of:

volatile memory means for storing an encryption key;

encryption key testing means for determining when said encryption key is invalid in response to a test signal applied to a first input thereby producing a fail signal at



a first output when said encryption key is invalid, said volatile memory means and said encryption key testing means being integral components of said encryption circuit means; and

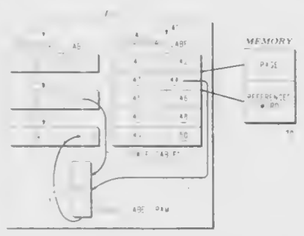
control means for periodically generating said ·· signal, said control means generating said test signal during inactive periods of said encryption circuit means and, for detecting said fail signals and for providing an indication of which of said plurality of encryption circuit means has an invalid encryption key.

4,926,476

METHOD AND APPARATUS FOR SECURE EXECUTION OF UNTRUSTED SOFTWARE

Carlin R. Covey, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1989, Ser. No. 305,576
Int. Cl.[5] H04L *9/00, 9/02*
U.S. Cl. 380—4 **23 Claims**



1. In a processing system including a security kernel, a central processing unit (CPU), internal registers, a memory, and a memory management unit for controlling the access to storage blocks of said memory by a software process, said memory management unit comprising:

page register means for indicating a location of each of said storage blocks of said memory;

variable label register means corresponding to said internal registers of said CPU and corresponding to said page register means, said variable label register means providing first and second address inputs in response to an instruction execution by said software process; and

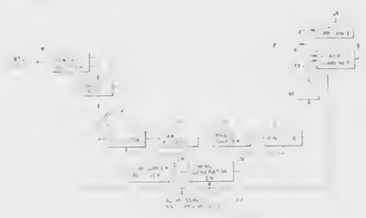
label calculation means connected to said variable label register means, said label calculation means providing an output in response to said first and second address inputs of said variable label register, said output updating said variable label register means for an allowed access to said memory by said software process, and said output further trapping to said security kernel for a non-allowed access to said memory by said software process.

4,926,477

CABLE TELEVISION DESCRAMBLER

Woo H. Paik, San Diego, Calif., assignor to General Instrument Corporation, New York, N.Y.

Filed Jun. 14, 1988, Ser. No. 206,612
Int. Cl.[5] H04N *5/04*
U.S. Cl. 380—15 **14 Claims**



1. A system for descrambling a scrambled channel in a TV signal which scrambled channel has a suppressed horizontal synchronization pulse and which TV signal also includes non-scrambled channels, said system comprising:

signal splitter means having an input to receive said TV signal, and first and second outputs, for splitting said TV signal into first and second signals which are provided at said first and second outputs, respectively, each of said first and second signals simultaneously containing said scrambled channel and said nonscrambled channels;

switch means coupled to said second output of said signal splitter means, for receiving said scrambled channel in said second signal, passing a horizontal synchronization pulse of said scrambled channel in said second signal and blocking a video signal of said scrambled channel in said second signal;

means for synchronizing said horizontal synchronization pulse passed through said switch means with a horizontal synchronization pulse of said scrambled channel in said first signal; and

combiner means having a first input coupled to said first output of said signal splitter means to receive said non-scrambled and scrambled channels in said first signal, and a second input coupled to receive the synchronized horizontal synchronization pulse passed through said switch means, for combining said first signal with the horizontal synchronization pulse passed through said switch means, and having an output to transmit the combined signal to a video appliance.

4,926,478

METHOD AND APPARATUS FOR CONTINUOUSLY ACKNOWLEDGED LINK ENCRYPTING

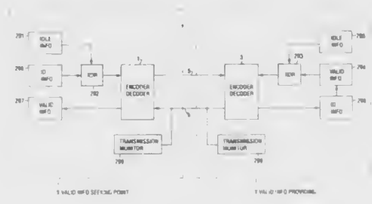
Elliot L. Gruenberg, 6040 Boulevard East, West New York, N.J. 07093

Filed Dec. 30, 1988, Ser. No. 292,505
Int. Cl.[5] H04L *9/04*
U.S. Cl. 380—21 **3 Claims**

2. An authentication system, comprising means for convert-

ing transaction documents at a selected transaction location into a binary sequence,

means to transmit said binary sequence to a validation location mixed, bit-by-bit, with a binary message sequence from said validation location; (means at said validation location for mixing each bit of said binary sequence with said binary message sequence originating at said validation location to decode an original binary message sequence originating at said selected transaction location, processing means at said validation location for locating and comparing a transaction message with identification data located at said validation location;



means to record said transaction message and means to compose, format and transmit a revised binary message to said transaction location mixed, bit-by-bit, with a second message from said transaction location;

means at said transaction location for mixing, bit-by-bit, a received message from said validation location with said second message originating at said transaction location to decode a third message from said validation location; and

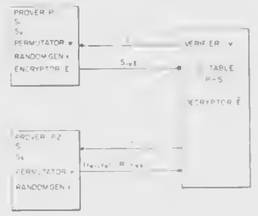
means at said transaction location for converting said third message into a validated transaction document.

4,926,479

MULTIPROVER INTERACTIVE VERIFICATION SYSTEM

Shafi Goldwasser; Joseph Kilian, both of Cambridge, Mass.; Avi Wigderson, and Michael Ben-Or, both of Jerusalem, Israel, assignors to Massachusetts Institute of Technology, Cambridge, Mass. and Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Filed Apr. 29, 1988, Ser. No. 188,284
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—23 **20 Claims**



1. A method in a multiparty verification system for processing respective outputs from a prover and a verifier, the prover comprising first and second prover units which share information, the method comprising:

limiting communications between the first and second prover units;

in the first prover unit encrypting identification information based on confidential verifier information from the verifier and confidential prover information shared by the first and second prover units;

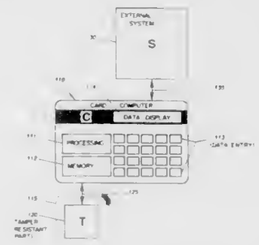
providing prover information required for decryption from the second prover unit to the verifier.

4,926,480

CARD-COMPUTER MODERATED SYSTEMS

David Chaum, 14652 Sutton St., Sherman Oaks, Calif. 91403

Continuation-in-part of Ser. No. 524,896, Aug. 22, 1983, Pat. No. 4,759,063, and Ser. No. 784,999, Oct. 7, 1985, Pat. No. 4,759,064, and Ser. No. 168,802, Mar. 16, 1988, abandoned, and Ser. No. 123,703, Oct. 23, 1987. This application May 24, 1988 Ser. No. 198,315
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—23 **18 Claims**



1. Apparatus for conducting cryptographic transactions comprising:

first information processing means that is in the possession of an individual,

that is tamper-resistant, and that includes memory means inaccessible to the individual;

second information processing means that is under the control of said individual;

interface means between said first information processing means and said second information processing means for allowing information interchange therebetween;

key creation means for a first party to create a first private key and a corresponding first public key and to supply the first public key to a second party through said interface means;

neutralizing value creation means for said second party to create a neutralizing value at least unpredictable to said first party;

neutralizing means for said second party to determine a second public key responsive to said first public key and said neutralizing value such that for said first public key there exists at least one said neutralizing value that would determine each said second public key; and

secret key determining means for deriving a secret key, by said first party, necessary for making digital signatures verifiable with said second public key.

4,926,481

COMPUTER ACCESS SECURITY CODE SYSTEM

Earl R. Collins, Jr., La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 5, 1988, Ser. No. 279,630
Int. Cl.[5] H02L *9/04*
U.S. Cl. 380—25 **20 Claims**

1. In a security access control system wherein a user at a remote station requires approval from a controlling computer to gain access, the improvement comprising:

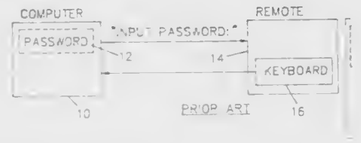
(a) a pair of matching first matrices of passwords located at the controlling computer and the remote station, respec-

VOL 1114 ISS 3 MY 15 1990 UMI

tively, each said first matrix of passwords comprising a plurality of individually unique symbols arranged in rows and columns to define a first virtual plane; and,

(b) access logic means located at the controlling computer and operably connected to read from and write to its associated said first matrix of passwords,

(b1) for transmitting a first pair of said passwords from its said first matrix to the remote station when the remote station attempts to gain access, said first pair of said passwords being chosen from different said columns and rows whereby they define diagonally opposite corners of a rectangle in said first virtual plane,



(b2) for receiving a first pair of said passwords transmitted from the remote station as obtained from the remote station's said first matrix,

(b3) for comparing said first pair of passwords transmitted from the remote station to the said passwords located in the controlling computer's said first matrix at corners of said rectangle other than those defined by said transmitted first pair of said passwords,

(b4) for granting access if said compared passwords are a match, and

(b5) for denying access if said compared passwords are not a match.

4,926,482

APPARATUS AND METHOD FOR REAL TIME DATA COMPRESSOR

Richard L. Frost, Bountiful; Kenneth S. Morley, Sandy, and Dennis C. Pulsipher, Farmington, all of Utah, assignors to Unisys Corp., Blue Bell, Pa.

Filed Jun. 26, 1987, Ser. No. 66,587

Int. Cl.[5] **G10L** *3/02*

U.S. Cl. 381—31 **15 Claims**



1. Apparatus for performing real time data compression of blocks of digital or analog data of the type having an input data stream converted to a desired digital format data stream of time domain estimated variance samples comprising:

high speed computing means coupled to said digital data stream for allocating a digital bit to individual estimated variance samples and calculating marginal return values for said samples

comparator means,

high speed storage means coupled to said high speed computing means and to said comparator means,

look-up table means coupled to said computing means for storing predetermined mean-squared error constants employed for computing the highest marginal return for said digital data samples

address generation means coupled to said high speed storage means and to said look-up table means, and

control means coupled to said computing means, said comparator means and said address generation means for presenting a sequence of commands to provide a real time stream of blocks of compressed data samples from said computing means, said blocks of compressed data each having

a predetermined number of bits to be allocated for each block of compressed data,

each said block of compressed data having an optimum allocation of bits to the highest marginal return samples, and

a minimum bit error rate and the highest average marginal return for each block of compressed data.

4,926,483

PATTERN RECOGNITION SYSTEM USING HUERISTIC SEARCH TECHNIQUE

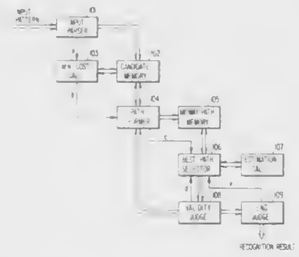
Kaichiro Hatazaki, and Takao Watanabe, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 14, 1984, Ser. No. 671,352

Claims priority, application Japan, Nov. 15, 1983, 58-214544

Int. Cl.[5] **G10L** *5/06*

U.S. Cl. 381—43 **10 Claims**



1. A pattern recognizing system comprising:

input pattern parsing means for parsing an input pattern to produce a candidate graph composed of several possible valid category segmenting nodes (n) which segment the input pattern into possibly valid category segments, the graph starting from a start node and ending at a terminal node, successive segmenting nodes being interconnected through at least one branch, each branch defining a possibly valid category segment and a cost as a measure of recognition accuracy being assigned to each branch by said input pattern parsing means, to thereby produce a plurality of possibly valid category strings each composed of a plurality of category segments successively connected through segmenting nodes (n);

candidate graph memory means for storing said candidate graph;

minimum cost calculating means receiving the candidate graph stored in the candidate graph memory means and for calculating for each node (n) of the segmenting nodes in the candidate graph, the minimum cost c(n) to reach the terminal node from the node (n) through any branches and midway nodes between the node (n) and the terminal node;

midway path memory means for storing midway paths (p), each of which is a sequence of branches and nodes from the start node to each segmenting node (n);

estimation calculating means for calculating an estimation value f (p, n) for each midway path (p), stored in the midway path memory, from the start node to the segmenting node (n) on the basis of the costs g(p) assigned to the branches constituting the midway path between the start node and the segmenting node (n) and the minimum cost (c)n calculated for that segmenting node (n) according to the formula, $f(p, n)=g(p)+h(n)$, wherein:

g(p) designates the sum of the costs assigned to branches included in a midway path p; and h(n) designates an estimation value of a cost from a midway segmenting node (n), which is an end node of the midway path p to the terminal node;

best path selecting means for selecting as the best midway path to the segmenting node (n) the path given the lowest estimation value by said estimation calculating means; and

validity judgment means for determining if the best midway path selected by said best path selecting means is a valid portion of a category string for a recognition result and outputting the path as a recognition result if it is valid.

4,926,484

CIRCUIT FOR DETERMINING THAT AN AUDIO SIGNAL IS EITHER SPEECH OR NON-SPEECH

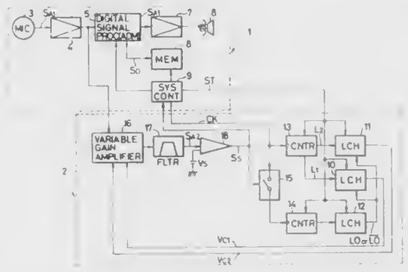
Yoshitomo Nakano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,581

Claims priority, application Japan, Nov. 13, 1987, 62-286764

Int. Cl.[5] **H04R** *29/00*

U.S. Cl. 381—56 **11 Claims**



1. A circuit for distinguishing between speech and non-speech signals for judging an input audio signal to be a non-speech signal when a level of the input audio signal is lower than a predetermined level and judging the input audio signal to be a speech signal when the level of the input audio signal is higher than the predetermined level, comprising:

a comparator for comparing the level of the input audio signal with the predetermined level; and

level changing control means for raising or lowering the predetermined level by a predetermined amount in accordance wit a ratio of a total non-speech time duration of the input audio signal to a time period having a value equal to a predetermined constant.

4,926,485

OUTPUT LEVEL CONTROL APPARATUS

Masayasu Yamashita, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 293,784

Claims priority, application Japan, Mar. 11, 1988, 63-58980

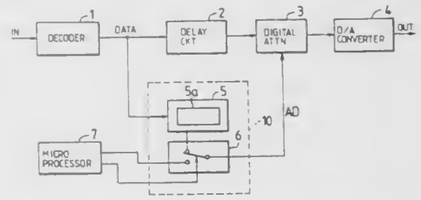
Int. Cl.[5] **H03G** *3/00*

U.S. Cl. 381—107 **10 Claims**

1. An output level control apparatus which operates according to the level of a reproduced digital signal from a digital signal reproducing apparatus, the output level control apparatus comprising:

(a) signal level detection means which compares the level of the reproduced digital signal to be supplied to a digital attenuator with a predetermined reference level to determine if the level of the reproduced digital signal should be changed; and

(b) output signal level adjusting means which outputs a command signal representing an attenuation level to the digital . 'enuator when said signal level detection means



determines that the level of the reproduced digital signal should be changed.

4,926,486

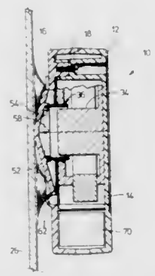
TRANSDUCER ASSEMBLY FOR AUTOMATIC MESSAGE SYSTEM

Bruce R. Barsumian, 890 Dago Rd., Cookeville, Tenn. 38501

Continuation of Ser. No. 74,928, Jul. 17, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,511

Int. Cl.[5] **H04R** *9/06*

U.S. Cl. 381—152 **22 Claims**



1. A sound transducer for converting energy between electrical signals and sound comprising a housing, a field magnet mounted in the housing the field magnet producing a magnetic field in the space surrounding the field magnet, a voice coil positioned adjacent to the field magnet and a location under the influence of the field produced by the field magnet, and a vibration transmitting baffle connected to the voice coil and arranged substantially coaxially with the voice coil, the vibration transmitting baffle including means defining a generally conically-shaped portion and a bellows fold extending along the periphery of the larger end of the conically-shaped portion so that the shape of the conically-shaped portion and the bellows fold cooperate to limit transmitted vibration of the conically-shaped portion to movement along a substantially linear path oriented along the axis of the voice coil;

the vibration transmitting baffle including means for evenly contacting a sounding surface and the conically-shaped portion of the vibration transmitting baffle including a truncated portion which is truncated at a location near the apex of the conically-shaped portion, the truncated portion defining a substantially flat surface extending transverse to the axis of the voice coil, and the substantially flat surface providing said means for evenly contacting a sounding surface.

VOL 1114 ISS 3 MY 15 1990 UMI

4,926,487

SPEAKER SYSTEM

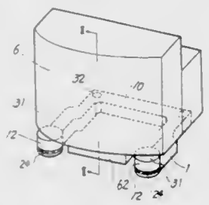
Tetsuji Yoshida, Toyonaka; Yoshiaki Teracka, Daito; Yoji Ogawa, Kobe; Ken Kozaki, Nishiyodogawa; Kenji Hara, Higashiosaka; Hiroshi Satou, Kadoma, and Akira Yoshino, Daito, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 15, 1989, Ser. No. 322,731

Claims priority, application Japan, Mar 16, 1988, 63-34640[U]; Jul. 27, 1988, 63-99435[U]; Aug. 5, 1988, 63-104209[U]

Int. Cl.[5] H04R *1/02*

U.S. Cl. 381—186 5 Claims



1 A speaker system having a low frequency speaker driver and formed with sound radiation outlets having direction to be oriented forward, the speaker system comprising:

a tube body having a tubular straight portion and a pair of tubular arms, each of the arms attached to the straight portion integrally therewith and bent at the end portion of the straight portion and extending in the forward direction to provide therebetween a wide space opening for accommodation, each arm further having sound radiation outlets formed in its forward end portion;

a speaker driver attached to the forward end of one of the arms and communicating with the other of the sound radiation outlets; and

a drone cone attached to the forward end of the other of the arms and communicating with the other of the sound radiation outlets.

4,926,488

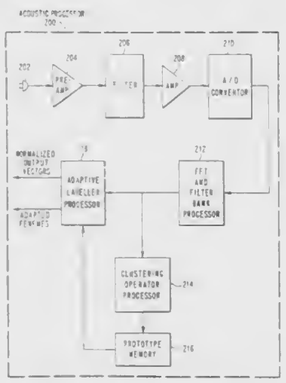
NORMALIZATION OF SPEECH BY ADAPTIVE LABELLING

Arthur J. Nadas, Rock Tavern, and David Nahamoo, White Plains, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 9, 1987, Ser. No. 71,687

Int. Cl.[5] G10L *5/04, 9/16*

U.S. Cl. 381—41 8 Claims



1. A speech coding apparatus comprising:

means for measuring the value of at least one feature of an utternace, said utternace occurring over a series of successive time intervals, said means measuring the feature value of the utterance during each time interval to produce a series of feature vector signals representing the feature values;

means for storing a plurality of prototype vector signals, each prototype vector signal having at least one parameter value and having a unique identification value;

means for generating a first modified feature vector signal having a modified feature value, said modified feature value being related, by a modification function, to the feature value of a first feature vector signal in the series of feature vector signals;

means for comparing the modified feature value of the first modified feature vector signal to the parameter values of the prototype vector signals to determine the associated prototype vector signal which is best matched to the first modified feature vector signal;

means for altering the modification function to improve the match between the modified feature vector signal and its associated prototype vector signal determined by the comparison;

means for generating a second modified feature vector signal having a modified feature value, said modified feature value of the second modified feature vector being related, by the altered modification function, to the feature value of a second feature vector signal in the series of feature vector signals, said second feature vector signal following the first feature vector signal;

means for comparing the modified feature value of the second modified feature vector signal to the parameter values of the prototype vector signals to determine the associated prototype vector signal which is best matched to the second modified feature vector signal; and

means for outputting the identification value of the prototype vector signal associated with the second modified feature vector as a coded representation of the second feature vector signal.

4,926,489

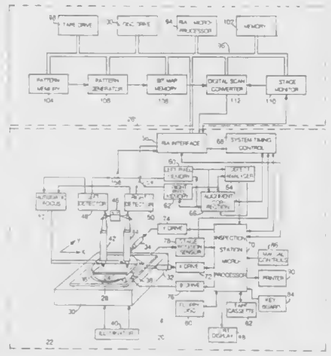
RETICLE INSPECTION SYSTEM

Donald L. Danielson, Palo Alto; Mark J. Wihl, Tracy, and David A. Joseph, Santa Cruz, all of Calif., assignors to KLA Instruments Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 891,638, Aug. 1, 1986, which is a continuation of Ser. No. 474,461, Mar. 11, 1983, abandoned. This application Oct. 5, 1987, Ser. No. 104,740

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—8 42 Claims



1. Optical inspection apparatus for scanning a patterned object and comparing it to information contained in an electronic data base, comprising:

optical scanning means responsive to a first timing control signal and operative to scan the patterned object and to develop a first data signal including a sampled and quantitized electronic representation of the patterned object;

data base means responsive to a second timing control signal and operative to generate a second data signal corresponding to a design database description of the patterned object scanning by said scanning means, said second data signal having a variable time relationship to said first data signal; data signal to

data alignment means for comparing said first said second data signal and for developing an excess alignment signal which corresponds to any misalignment of said second data signal exceeding a predetermined limit, and for adjusting said time relationship between said first data signal and said second data signal to provided aligned first and second data signals which are time coincident with each other;

timing control means responsive to said excess alignment signal and operative to develop said first and second timing control signals, said first and second timing control signals being used to adjust the relative output data signal rates of said optical scanning means and said data base means for the purpose of maintaining the alignment of said first and second data signals within predetermined limits; and

defect detector means for comparing said aligned first data signal and said aligned second data signal and for developing defect data signals corresponding to differences therebetween having predetermined characteristics.

4,926,490

METHOD AND APPARATUS FOR RECOGNIZING CHARACTERS ON A DOCUMENT

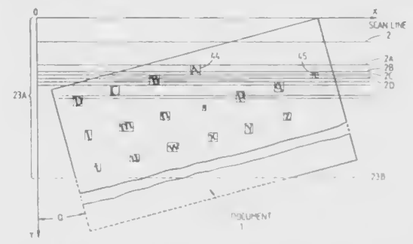
Takashi Mano, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,894

Claims priority, application Japan, Apr. 17, 1987, 62-93435

Int. Cl.[5] G06K *9/34*

U.S. Cl. 382—9 12 Claims



1. A method for recognizing characters on a document comprising steps of:

storing an image of said document in an image storage means:

detecting position of rectangles in XY coordinates of said image storage means, which contact outer boundaries of character images, respectively in plural character rows stored in said image storage means, to generate position data representing said positions of said rectangles;

forming a list in which said position data of the rectangles are arranged in the order from one end to the other end along the direction of X axis of said XY coordinates;

detecting a range in Y axis for one character row based upon Y axis information of said position data of said rectangles in said list; and

fetching said character images stored in said image storage means by using said position data of said rectangles which fall into said range, to recognize said fetched character images.

4,926,491

PATTERN RECOGNITION DEVICE

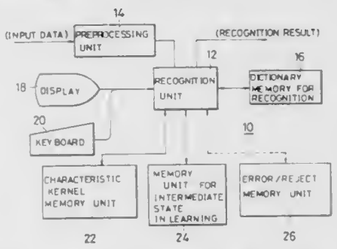
Kenichi Maeda, Kamakura; Hiroyuki Tsuboi, Yokohama, and Yoichi Takebayashi, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 775,392, Sep. 12, 1985, abandoned. This application Jun. 6, 1988, Ser. No. 203,505

Claims priority, application Japan, Sep. 17, 1984, 59-194411

Int. Cl.[5] G06K *9/67*

U.S. Cl. 382—14 7 Claims



1. A pattern recognition device which carries out a recognition of input patterns by matching input patterns that are inputted successively with reference patterns, each reference pattern prepared in the form of a pattern vector by use of KL expansion for a characteristic kernel, comprising:

said pattern recognition device;

a reference pattern memory registering reference patterns in advance;

a recognition means for carrying out recognition by matching between an input pattern and a reference pattern in said reference pattern memory;

a learning means for carrying out learning of reference patterns by adjusting elements of each kernel in accordance with input patterns, said recognition means and learning means sharing one multiply and accumulate operator;

a control unit constructed to control said recognition means and said learning means such that learning of reference patterns is carried out in said multiply and accumulate operator when recognition in said recognition means is halted for absence of input patterns and wherein learning of said reference patterns is interrupted when recognition is resumed; and

an intermediate memory storing an intermediate state of learning which is interrupted by resuming recognition such that recognition and learning is successively performed.

4,926,492

OPTICAL CHARACTER READING APPARATUS AND METHOD

Hideaki Tanaka, Daoto, and Yoshihiko Kitamura, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1988, Ser. No. 222,782

Claims priority, application Japan, Jul. 24, 1987, 62-186327

Int. Cl.[5] G06K *9/46*

U.S. Cl. 382—18 2 Claims

1. An optical character reading comprising:

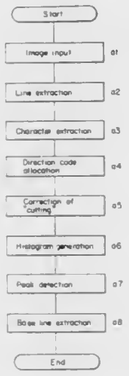
means for dividing an image read from a document into character lines;

means for counting a number of picture elements in series with each picture element forming each character on each character line for each direction of a plurality of predetermined directions;

means for providing each picture element with a code data indicating a direction having a largest number of picture elements forming a character;

means for replacing said code data of a series of picture

elements between two picture elements being allotted with a specific code data in the direction along each character line with said specific code data of the two picture elements;



means for counting a number of picture elements allotted with said specific code data for each character line; and means for detecting a position with a largest number of picture elements forming a character.

4,926,493

BEARING SYSTEM FOR HIGH SPEED SPINDLES OF MACHINE TOOLS

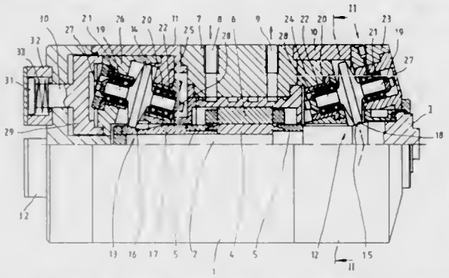
Erwin Junker, Junkerstrasse 1, 7618 Nordach, Fed. Rep. of Germany

Filed Dec. 20, 1988, Ser. No. 286,846

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744040; Dec. 30, 1987, 3744522

Int. Cl.[5] F16C *19/00, 19/54*

U.S. Cl. 384—490 **12 Claims**



1. A bearing system for a high speed spindle of machine tools, the bearing system comprising at least one front bearing means positioned near a flange means of the spindle, a rear bearing means, each of said front bearing means and rear bearing means including at least three support roll means equal angularly disposed with respect to the spindle and acting thereon, each of said support roll means having a diameter larger than a diameter of the spindle, and roll journal means for fixedly mounting said support roll means, said roll journal means being provided on either side in small diameter precision bearing means in a casing means for receiving the spindle and the support roll means, wherein the spindle includes conical bearing surface portions inclined against one another, said support roll means are arranged such that a rotational axis thereof is parallel to a circumferential surface of the conical bearing surface portions, and wherein at least the support roll means of at least one of the front bearing means and the rear bearing means are adjustable axially parallel to the spindle.

4,926,494

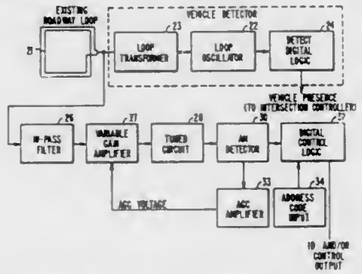
VEHICLE COMMUNICATION SYSTEM USING EXISTING ROADWAY LOOPS

Thomas Potter, 11404 Harrisburg, Los Alamitos, Calif. 90720

Continuation of Ser. No. 854,376, Apr. 21, 1986, Pat. No. 4,731,867. This application Dec. 28, 1987, Ser. No. 138,122

Int. Cl.[5] H04B *5/00*

U.S. Cl. 455—41 **14 Claims**



1. A communication system for enabling transfer of information between a vehicle and a stationary information location having a vehicle detector system with a loop antenna, said loop antenna comprising part of a circuit containing conventional vehicle detector system signals normally lying within a given frequency range, said conventional vehicle detector system signals normally being present within said loop antenna, said communication system comprising:

a vehicle mounted transmitter means for enabling transmission of a preselected information signal over a relatively small distance range; and

stationary receiver means for receiving said information signal transmitted by said transmitter means when within said distance range,

said vehicle mounted transmitter means including means for generating a carrier frequency signal lying within a transmitting frequency range different from the frequency range of the vehicle detector system loop signals and containing said preselected information signal,

said receiver means including the vehicle detector system loop antenna and means for distinguishing said preselected information signal from the conventional vehicle detector signals concurrently present in said vehicle detector system loop antenna.

4,926,495

COMPUTER AIDED DISPATCH SYSTEM

Richard A. Comroe, East Dundee; Richare H. Coe, Arlington Heights; Katherine B. Roane, Glenview, and Lewis H. Rosenthal, Buffalo Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 11, 1986, Ser. No. 940,321

Int. Cl.[5] H04B *7/26*

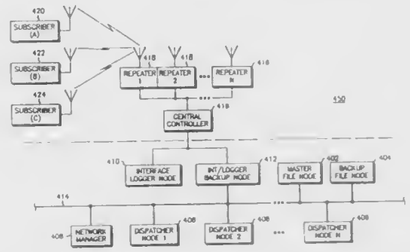
U.S. Cl. 455—54 **8 Claims**

1. In a trunked communication system having at least one central controller for allocating a limited number of communication channels among a plurality of subscriber units each having an identification (ID) code stored therein and constructed and arranged to communicate information on any of said communication channels, a computer aided dispatch system comprising:

a local area network;

master node means coupled to said local area network for maintaining at least a plurality of records corresponding one each to the plurality of subscriber units, each of said records having a plurality of fields at least some of which represent at least a portion of said ID code of a subscriber unit;

user node means coupled to said local area network for monitoring at least a predetermined subset of said plurality of subscriber units depending upon predetermined ID codes or a portion thereof;



interface node means for interfacing said central controller to said local area network.

4,926,496

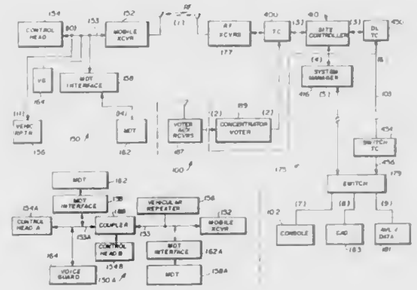
METHOD AND APPARATUS FOR INFREQUENT RADIO USERS TO SIMPLY OBTAIN EMERGENCY ASSISTANCE

Robert E. Cole, Lynchburg, and Fredrick E. Spangler, Huddleston, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Aug. 14, 1987, Ser. No. 85,491

Int. Cl.[5] H04B *1/40;* **H01J** *7/04*

U.S. Cl. 455—77 **15 Claims**



1. A method of operating a mobile radio transceiver comprising:

(1) selecting a system comprising a preset plurality of groups of radio transceivers, each of said groups corresponding to a different identifier, from among at least two different systems each comprising preset pluralities of groups;

(2) selecting one of the plurality of groups of radio transceivers within the system selected by said selecting step (1); and

(3) generating a code identifying an emergency radio station whenever said selecting step (2) selects a group corresponding to a specific predetermined identifier regardless of the system selected by said selecting step (1).

4,926,497

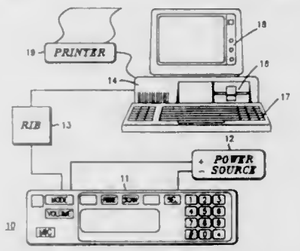
RADIO ALIGNMENT/PROGRAMMING DEVICE

Thomas F. Shirley, Jr., John S. Ruppel, both of Fort Worth; Thomas J. Zuiss, Watauga, and Jeffrey A. Battin, Haltom City, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1988, Ser. No. 175,003

Int. Cl.[5] H04B *17/00*

U.S. Cl. 455—67 **16 Claims**



1. A device for programming radios, which radios include:

memory means for storing at least some radio control parameters; and

means for controlling at least some radio control functions in response to said radio control parameters;

said device comprising:

(A) coupling means for coupling to said memory means; and

(B) programming means for connecting to said coupling means and for:

accessing said memory means to read at least one of said radio control parameters;

displaying a relative minimum value for said read radio control parameter, a relative maximum value for said read radio control parameter, and a relative present value for said read radio control parameter;

changing said radio control parameter;

storing said changed radio control parameter in said memory means.

4,926,498

FM DIVERSITY RECEIVER

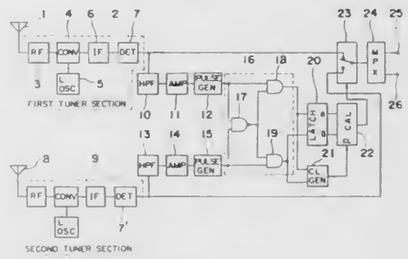
Hirohisa Suzuki, and Masaya Tanno, both of Ora, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 14, 1988, Ser. No. 244,675

Claims priority, application Japan, Sep. 17, 1987, 62-232922

Int. Cl.[5] H04B *11/16*

U.S. Cl. 455—133 **6 Claims**



1. An FM receiver comprising:

first antenna means;

second antenna means;

first pulse generator for producing a first pulse according to a noise signal included in the signal received by the first antennas means;

second pulse generator for producing a second pulse accord-

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ing to a noise signal included in the signal received by the second antennas means;

a calculation circuit including shift register means for shifting data in one direction in accordance with the first pulse from said first pulse generator and for shifting the data in another direction in accordance with the second pulse from said second pulse generator; and

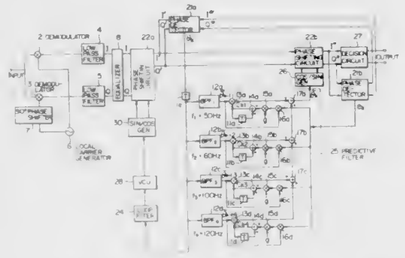
a switch circuit for switching on a transmission line for a signal received at either one of said first and second antenna means in response to a predetermined number of said first or said second pulses shifting the data of the calculation circuit.

4,926,499

CARRIER PHASE CONTROLLER FOR A RECEIVER OF PHASE MODULATED SIGNALS

Naoya Kobayashi, Musashino; Makoto Ohnishi, Tokyo, and Yoshiro Kokuryo, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,318
Claims priority, application Japan, Nov. 19, 1986, 61-274082
Int. Cl.[5] H04B *1/10*
U.S. Cl. 455—306 **5 Claims**



1. A carrier phase control apparatus used in a modem demodulating a quadrature amplitude modulated data signal comprising:

a first phase shift means for shifting phase of output signals from an equalizer for correcting these signals for carrier frequency offset;

a second phase shift means for shifting phases of output signals from said first phase shift means;

a decision circuit for determining phase and amplitude of the output signal of said second phase shift means;

a first phase detector for detecting a phase error depending on a phase jitter by using output signals of said first phase shifting means and said decision circuit;

a second phase detector for detecting an error signal between the output signals of said second phase shifting means and said decision circuit;

a predictive filter for predicting a carrier phase jitter using the output signals of said first phase detector and said second phase detector;

a sinusoidal generator for producing sin and cos signals from the output signal of said predictive filter and for applying said cos and sin signals to said second phase shifting circuit; and

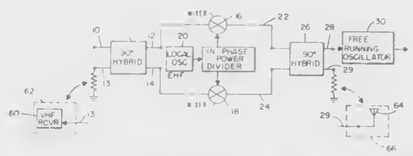
a control circuit for controlling said first phase shifting circuit by using output signal of a loop filter receiving an output signal of said first phase detector.

4,926,500

FREQUENCY CONVERTER

George I. Tsuda, Fullerton, and Kernel S. Tsuhako, Cerritos, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 10, 1988, Ser. No. 230,638
Int. Cl.[5] H04B *1/10, 1/26*
U.S. Cl. 455—302 **9 Claims**



1. In a frequency converter for converting an input signal frequency into an output signal frequency, said frequencies being widely separated, the combination comprising:

a local oscillator having a signal frequency near said output signal frequency;

mixing means connected to said local oscillator for mixing said local oscillator signal frequency with said input signal frequency to produce signals containing sets of sideband signal frequencies which are both above and below said local oscillator frequency, each said set having a highest amplitude sideband signal frequency and lower amplitude sideband signal frequencies arrayed to one side of said highest amplitude sideband signal frequency;

means connected to said mixing means for combining said signals from said mixing means to produce a signal which includes only one said set of sideband signal frequencies; and

a free running output oscillator connected to said combining means and having an output signal frequency spectrum centered on another side of said highest amplitude sideband signal frequency, whereby said output oscillator produces an output signal which is frequency-locked to said highest amplitude sideband signal frequency.

DESIGN PATENTS

GRANTED MAY. 15, 1990

ERRATA

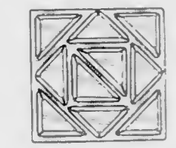
For CLASS	See PATENT NO.
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D28-050	307,957

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DESIGNS

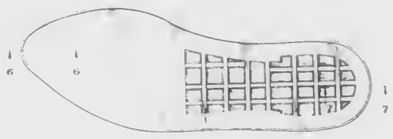
MAY 15, 1990

307,815
BAR OF CHOCOLATE
Marja Pärri, Kerava, and Teija Andersen, Helsinki, both of Finland, assignors to OY Karl Fazer AB, Helsinki, Finland
Filed Jun. 15, 1987, Ser. No. 62,561
Claims priority, application Finland, Dec. 30, 1986, 1253/86
Term of patent 14 years
U.S. Cl. D1—127

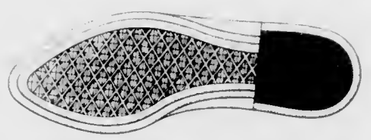




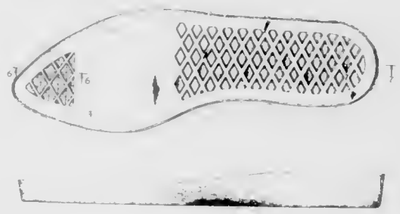
307,816
SHOE SOLE
Jules Schneider, New York, N.Y., assignor to What's What, Inc., New York, N.Y.
Filed Aug. 28, 1989, Ser. No. 399,784
Term of patent 14 years
U.S. Cl. D2—320







307,817
SHOE SOLE
Jules Schneider, New York, N.Y., assignor to What's What, Inc., New York, N.Y.
Filed May 18, 1989, Ser. No. 353,736
Term of patent 14 years
U.S. Cl. D2—320

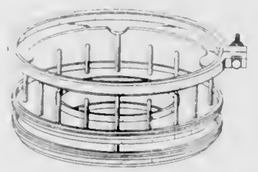




307,818
EMERGENCY UMBRELLA
Blair F. Baldwin, New York, N.Y., and William C. Lamson, Huntington, Conn., assignors to Bexel Corporation
Filed Nov. 27, 1987, Ser. No. 126,292
Term of patent 14 years
U.S. Cl. D3—5

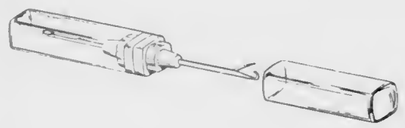


307,819
EMBROIDERY WORK STATION
Gerald A. Peters, Box 1020, Carnegie, Okla. 73015
Filed Mar. 18, 1987, Ser. No. 27,496
Term of patent 14 years
U.S. Cl. D3—25



VOL 1114 ISS 3 MY 15 1990 UMI

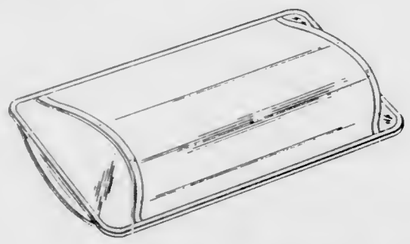
307,820
DOUBLE LATCH NEEDLE GARMENT MARKER
Kathleen K. Ullom, 1560 Oak Creek Dr., and Patricia A. Dooley, 3097 Sycamore La., both of Marietta, Ga. 30066
Filed Oct. 9, 1987, Ser. No. 107,521
Term of patent 14 years
U.S. Cl. D3—28



307,821
TWIN BABY CARRIER
Mary C. Fallon, 2006 Reed St., San Diego, Calif. 92109
Filed Oct. 20, 1986, Ser. No. 920,955
Term of patent 14 years
U.S. Cl. D3—31



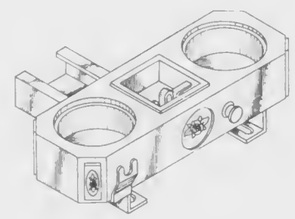
307,822
SPECTACLE CASE FOR ATTACHMENT TO A SUNVISOR
Robert J. Marks, Las Vegas, Nev., assignor to California Optical Leather, Inc., San Leandro, Calif.
Filed Jul. 18, 1986, Ser. No. 886,888
Term of patent 14 years
U.S. Cl. D3—34



307,823
TAPE CASSETTE CARRYING CASE
Wayne W. Cook, Jr., 3818 Wier Ave., W. Phoenix, Ariz. 85041
Filed Dec. 12, 1986, Ser. No. 941,280
Term of patent 14 years
U.S. Cl. D3—35



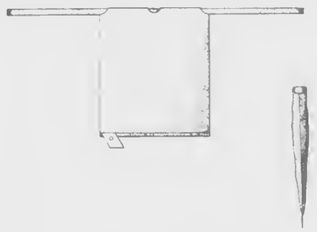
307,824
AUTO SNACK TRAY
Charles P. Warren, P.O. Box 1473, Hays, Kans. 67601
Filed Aug. 20, 1986, Ser. No. 898,088
Term of patent 14 years
U.S. Cl. D3—40



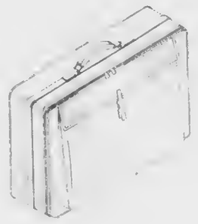
307,825
TOTE BAG
George A. Makrauer, Cincinnati, and Donald R. Graham, Fairfield, both of Ohio, assignors to Amko Plastics Inc., Cincinnati, Ohio
Filed Sep. 15, 1986, Ser. No. 907,638
Term of patent 14 years
U.S. Cl. D3—42



307,826
TOTE BAG
George A. Makrauer, Cincinnati, Ohio, assignor to Amko Plastics Inc., Cincinnati, Ohio
Filed Nov. 7, 1986, Ser. No. 928,176
Term of patent 14 years
U.S. Cl. D3—42



307,827
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 18, 1986, Ser. No. 886,626
The portion of the term of this patent subsequent to May 15, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—71



307,828
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 18, 1986, Ser. No. 886,628
Term of patent 14 years
U.S. Cl. D3—71



307,829
SUIT-CASE
Makio Hasuike, Viale Sabotino 24, Milan, Italy
Filed Jul. 14, 1986, Ser. No. 885,052
Claims priority, application Italy, Jan. 16, 1986, 20508 B/86
Term of patent 14 years
U.S. Cl. D3—76

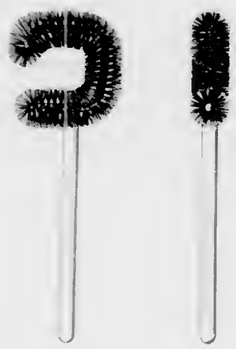


307,830
PRESSURE-FED PAINTBRUSH HEAD
Edward P. Murphy, Coons Rapids, Minn., assignor to Graco Inc., Minneapolis, Minn.
Filed Nov. 9, 1987, Ser. No. 120,004
Term of patent 14 years
U.S. Cl. D4—114



VOL
1114
ISS
3
MY
15
1990
UMI

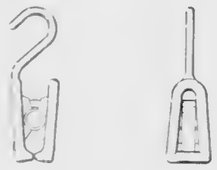
307,831
TOILET BOWL BRUSH
Jewel A. Crane, P.O. Box 1021, Belle Glade, Fla. 33430
Filed Oct. 28, 1987, Ser. No. 44,131
Term of patent 14 years
U.S. Cl. D4—131



307,832
HANGER OR THE LIKE
Peter Eberhardt, 28 Sarena, Irvine, Calif. 92715
Filed Sep. 7, 1988, Ser. No. 241,553
Term of patent 14 years
U.S. Cl. D6—317



307,833
CLIP CLOTHES HANGER
Isao Maki, Tokyo, Japan, assignor to Soko Co., Ltd., Japan
Filed Aug. 24, 1987, Ser. No. 88,193
Term of patent 14 years
U.S. Cl. D6—326



307,834
CHILD CAR SEAT
Kunio Sudoh, Tokyo, and Kohei Nogami, Narashino, both of Japan, assignors to Nippon Seiko K.K., Tokyo, Japan
Filed Dec. 18, 1986, Ser. No. 943,919
Term of patent 14 years
U.S. Cl. D6—333



307,835
OUTDOOR CHAIR FRAME
Donald D. Corning, and Andrew C. Hill, both of Hendersonville, Tenn., assignors to Almet/Lawnlite, Inc., Portland, Tenn.
Filed Nov. 28, 1986, Ser. No. 936,403
Term of patent 14 years
U.S. Cl. D6—364



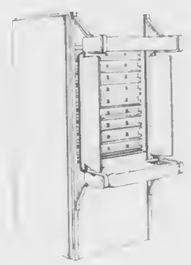
307,836
CHAIR
Paolo Favaretto, Via Lovarini N.31, 35100 Padova, Italy
Filed Feb. 5, 1987, Ser. No. 12,714
Term of patent 14 years
U.S. Cl. D6—372



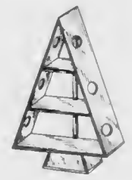
307,837
CHAIR
Kjell Grant, 4 Roystoo Ct., Mount Eliza 3930, Victoria, Australia
Filed Mar. 5, 1987, Ser. No. 23,046
Claims priority, application Australia, Sep. 5, 1986, 6575/86
Term of patent 14 years
U.S. Cl. D6—380



307,838
DISPLAY CONSOLE
Jimmie L. Johnston, 1450 Fashioo Island Blvd., San Mateo, Calif. 94404
Filed Oct. 22, 1987, Ser. No. 112,431
Term of patent 14 years
U.S. Cl. D6—421



307,839
SHELF UNIT
Roy L. Johnson, Jr., Plymouth, Minn., assignor to RBI Royal Builders, Inc., Plymouth, Minn.
Filed Feb. 17, 1987, Ser. No. 15,611
Term of patent 14 years
U.S. Cl. D6—450



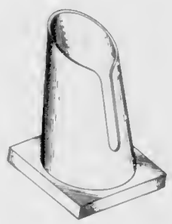
307,840
ETAGERE
H. Thomas Keller, High Point, N.C., assignor to Kosalco, Inc., Louisville, Ky.
Filed Apr. 24, 1989, Ser. No. 342,427
Term of patent 14 years
U.S. Cl. D6—479



307,841
COMBINED NEEDLE DISPOSAL CONTAINER AND GLOVE DISPENSER
Paul H. Hanifl, Barrington; John J. Newton, Jr., Palatine, both of Ill., and Donald J. Mosior, Lake Geneva, Wis., assignors to Sage Products, Inc., Cary, Ill.
Filed Apr. 15, 1988, Ser. No. 182,330
Term of patent 14 years
U.S. Cl. D6—515



307,842
PAPER CUP DISPENSER
Barbara J. Bieganski, 1021 Sixth St., Schenectady, N.Y. 12303
Filed Jun. 6, 1988, Ser. No. 202,423
Term of patent 14 years
U.S. Cl. D6—516

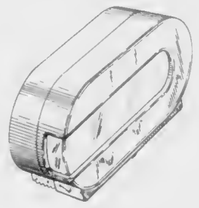


VOL
1114
ISS
3
MY
15
1990
UMI

307,843
COMBINED CLEANING FLUID SPRAY CONTAINER AND ROLLED TOWEL SUPPORT
Belinda K. Parshall, Rte. 1 Box 262, Byars, Okla. 74831
Filed Jun. 13, 1988, Ser. No. 206,441
Term of patent 14 years
U.S. Cl. D6—521



307,845
TOILET TISSUE DISPENSER
Paul A. Omdoll, Palmyra, Wis., assignor to San Jamar, Inc., Elkhorn, Wis.
Filed Feb. 1, 1988, Ser. No. 150,724
Term of patent 14 years
U.S. Cl. D6—520

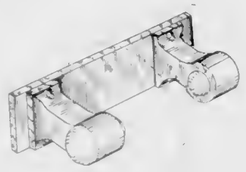


307,846
TOOTH PILLOW
Kathryn L. Saeger, 1222 Bubbling Well Rd., West Covina, Calif. 91790
Filed Jan. 25, 1988, Ser. No. 147,685
Term of patent 14 years
U.S. Cl. D6—597





307,844
TOILET PAPER HOLDER
Philip Romeka, 106 Bay Meadows, Rancho Mirage, Calif. 92270
Filed Aug. 20, 1987, Ser. No. 87,447
Term of patent 14 years
U.S. Cl. D6—523



307,847
CHILD'S CAR SEAT SLIP COVER
Nancy C. Hird, 6 McClintock Court, Whitby, Ontario L1P 1E9, Canada
Filed Oct. 11, 1988, Ser. No. 255,694
Claims priority, application Canada, Jul. 14, 1988, 14-07-88-5
Term of patent 14 years
U.S. Cl. D6—611



307,848
CONFECTION MOLD
Jerrilyn C. Kiyokane, Costa Mesa, Calif., assignor to Namkung Promotions, Inc., Costa Mesa, Calif.
Filed Nov. 30, 1987, Ser. No. 126,946
Term of patent 14 years
U.S. Cl. D7—676

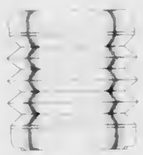


307,849
CONFECTION MOLD
Jerrilyn C. Kiyokane, Costa Mesa, Calif., assignor to Namkung Promotions, Inc., Costa Mesa, Calif.
Filed Nov. 30, 1987, Ser. No. 126,947
Term of patent 14 years
U.S. Cl. D7—676

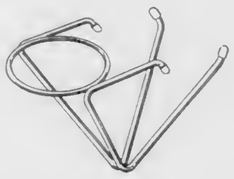


307,850
CAN HOLDER
Sanae Aoki, and Tsunataka Konoike, both of Tokyo, Japan, assignors to Tanaka Manufacturing Company Limited, Tokyo, Japan
Filed Aug. 21, 1987, Ser. No. 88,103
Term of patent 14 years
U.S. Cl. D7—624





307,851
ICE BUCKET HOLDER
Nicolas Polidoros, 135 Landscape Dr., East Doncaster, Victoria, Australia 3109
Filed Feb. 6, 1987, Ser. No. 12,043
Term of patent 14 years
U.S. Cl. D7—601



VOL
1114
ISS
3
MY
15
1990
UMI

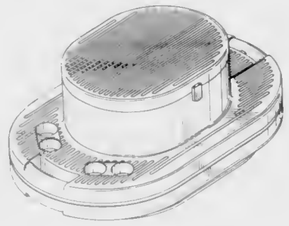
307,852
DRINK CUP HOLDER FOR ARENA SEATS
Bruce D. Clark, 625 Old Long Lake Road, Wayzata, Minn. 55391
Filed Feb. 17, 1988, Ser. No. 157,310
Term of patent 14 years
U.S. Cl. D7—620



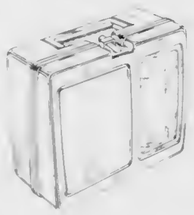




307,854
FLOATING COOLER CHEST
Kenneth E. Doucette, 5431 Barber Loop, Baytown, Tex. 77580, and Chris W. Jennings, 810 Bayview Dr., Baytown, Tex. 77520
Filed May 3, 1988, Ser. No. 189,961
Term of patent 14 years
U.S. Cl. D7—605



307,853
LUNCH BOX
Theodore Tyberg, Montreal, Canada, assignor to Creations Dina Inc., Montreal, Canada
Filed Apr. 15, 1987, Ser. No. 38,799
Term of patent 14 years
U.S. Cl. D7—626

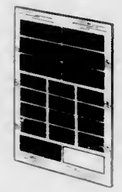


307,855
SCOOP
Walter M. Light, Jr., 4647 Redfield Ct., Norwood Court Apts., St. Louis, Mo. 63121
Filed Oct. 22, 1987, Ser. No. 111,169
Term of patent 14 years
U.S. Cl. D7—691

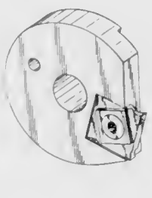
307,856
HANDLE FOR AN ARTICLE OF FLATWARE
Henry Bouilhet, Paris, France, assignor to Société Orfevrerie Christofle, Paris, France
Filed Apr. 1, 1987, Ser. No. 32,715
Claims priority, application France, Nov. 28, 1986, 866 332
Term of patent 14 years
U.S. Cl. D7—653



307,858
CONTROL PANEL FOR A MICROWAVE OVEN
Sang H. Yoo, 118-2, Bon-Dong, Dongjak-Ku, Seoul, Rep. of Korea
Filed Feb. 18, 1987, Ser. No. 16,196
Claims priority, application Rep. of Korea, Oct. 21, 1986, Des.86-14791
Term of patent 14 years
U.S. Cl. D7—406



307,859
CUTTER
William J. Morrissey, 1045 Cooke St., Waterbury, Conn. 06704
Filed Mar. 9, 1987, Ser. No. 23,464
Term of patent 14 years
U.S. Cl. D8—98



307,857
COFFEE MAKER
Donald C. Grome, Columbus; Terry L. Myers, Chillicothe, both of Ohio; Thomas J. Ryan, San Diego, Calif., and Kenneth E. Wilkinson, Round Lake, Ill., assignors to Proctor-Silex, Inc., Glen Allen, Va.
Filed Dec. 23, 1986, Ser. No. 946,244
Term of patent 14 years
U.S. Cl. D7—317

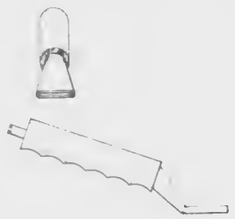


307,860
GRASS TRIMMER
Todd D. Ellis, Danbury, Conn., assignor to International Consumer Brands, Inc., Trumbull, Conn.
Filed Jul. 12, 1988, Ser. No. 218,383
Term of patent 14 years
U.S. Cl. D8—8

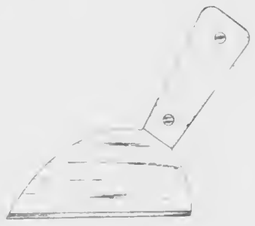


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ISS
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MY
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1990
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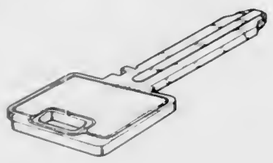
307,861
LIFT TAB CAN OPENER
Allan M. Howell, 2215 47th Ave., SW., Seattle, Wash. 98116
Filed Jun. 22, 1988, Ser. No. 209,795
Term of patent 14 years
U.S. Cl. D8—40



307,862
MULTIPURPOSE SCRAPER
James Masotta, 96 Camden St., Methuen, Mass. 01844
Filed Sep. 8, 1986, Ser. No. 905,025
Term of patent 14 years
U.S. Cl. D8—45



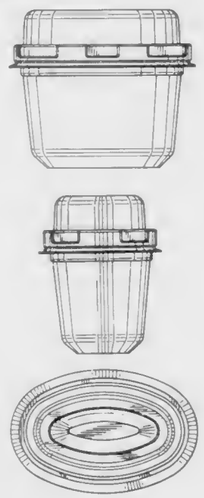
307,863
KEY BLANK
Nigel Boag, Costa Mesa, Calif., assignor to Masco Building Products Corp., Taylor, Mich.
Filed Aug. 22, 1988, Ser. No. 235,070
Term of patent 14 years
U.S. Cl. D8—347



307,864
FOOD SERVICE TRAY
Kirk M. Sorensen, 8601 N. Zuni St., #169, Westminster, Colo. 80221
Filed Nov. 25, 1987, Ser. No. 125,058
Term of patent 14 years
U.S. Cl. D7—554



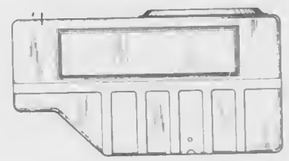
307,865
PACKAGING CONTAINER
Audri J. Conner, Niles, and Christopher P. Guzowski, Hoffman Estates, both of Ill., assignors to Kraft, Inc., Glenview, Ill.
Filed Jun. 24, 1987, Ser. No. 66,102
Term of patent 14 years
U.S. Cl. D9—352



307,866
BOTTLE WITH CAP
Jeff Pink, Tarzana, Calif., assignor to Orly International Inc., Chatsworth, Calif.
Filed Oct. 19, 1987, Ser. No. 109,608
Term of patent 14 years
U.S. Cl. D9—413



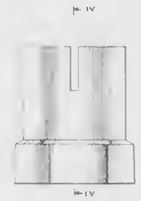
307,867
LIQUID SPRAY CONTAINER
Kit R. Lewis, P.O. Box 23, Duke, Okla. 73532
Filed Jan. 25, 1988, Ser. No. 148,403
Term of patent 14 years
U.S. Cl. D9—424



307,868
PACKAGE CONTAINER
Mark W. Van Sumeren, Midland, Mich., assignor to Packaging Resources Incorporated, New Vienna, Ohio
Filed Jun. 23, 1986, Ser. No. 877,925
Term of patent 14 years
U.S. Cl. D9—428



307,869
LABORATORY FLASK HOLDER
Robert J. Miskinis, 9330 Stevens Rd., Santee, Calif. 92071
Filed Nov. 18, 1987, Ser. No. 122,347
Term of patent 14 years
U.S. Cl. D9—455



307,870
NOVELTY TIMING DEVICE
Myron Irgang, and Robert Gedan, both of 2343 Stirling Rd., Ft. Landerdale, Fla. 33312
Filed May 1, 1989, Ser. No. 346,009
Term of patent 14 years
U.S. Cl. D10—44

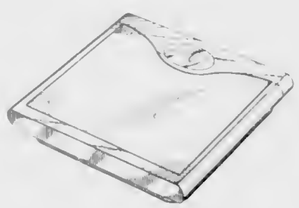


VOL
1114
ISS
3
MY
15
1990
UMI

307,871
ULTRASONIC MEASURING TOOL
Theodore P. Ciccone, III, West Hartford, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jan. 13, 1988, Ser. No. 143,609
Term of patent 14 years
U.S. Cl. D10—70



307,872
SCALE
Rido Busse, Elchingen, Fed. Rep. of Germany, assignor to SOEHNLE-Waagen GmbH & Co., Murrhardt, Fed. Rep. of Germany
Filed Apr. 5, 1988, Ser. No. 178,073
Claims priority, application World Int. Prop. O., Jan. 14, 1988, DM/010 061
Term of patent 14 years
U.S. Cl. D10—92



307,873
DOMESTIC SCALE WEIGHT DISPLAY MODULE
Richard S. Hart, Elgin; David H. Bloom, Vernon Hills, and Jeffery D. Bransky, LaGrange, all of Ill., assignors to Sunbeam Corporation, Downers Grove, Ill.
Division of Ser. No. 939,492, Dec. 8, 1986. This application Oct. 12, 1989, Ser. No. 420,401
Term of patent 14 years
U.S. Cl. D10—94



307,874
DOOR/WINDOW INTRUSION DETECTOR TRANSMITTER
John Mallory, Mississauga, Canada, assignor to Dicon Systems Limited, Toronto, Canada
Filed Nov. 16, 1987, Ser. No. 121,575
Claims priority, application Canada, Sep. 17, 1987, 17-09-87-14
Term of patent 14 years
U.S. Cl. D10—106



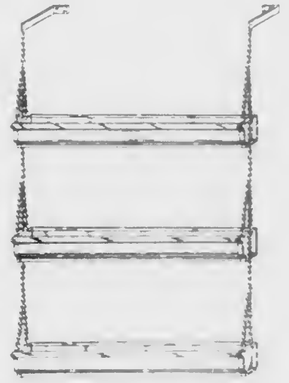
307,875
PERIMETER INTRUSION DETECTOR TRANSMITTER
John Mallory, Mississauga, Canada, assignor to Dicon Systems Limited, Toronto, Canada
Filed Nov. 16, 1987, Ser. No. 121,574
Term of patent 14 years
U.S. Cl. D10—106



307,876
EXPANSION BRACELET
Murray L. Cowan, Norwood, Mass., assignor to Textron, Inc., Providence, R.I.
Filed Dec. 29, 1987, Ser. No. 139,248
Term of patent 14 years
U.S. Cl. D11—25



307,877
HANGING PLANTER
Robert E. White, Jr., 62 Tanglewood Dr., West Yarmouth, Mass. 02673
Filed Oct. 19, 1987, Ser. No. 110,477
Term of patent 14 years
U.S. Cl. D11—148



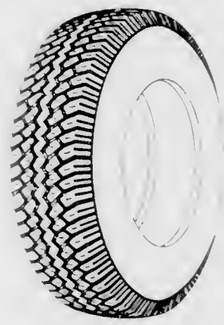
307,878
TRUCK CAB BODY
Werner K. Lechner, Sao Paulo, Brazil, assignor to Mercedez-Benz Do Brasil S.A., Sao Paulo, Brazil
Filed Aug. 26, 1986, Ser. No. 900,659
Claims priority, application Brazil, Apr. 22, 1986, MI 4600268
Term of patent 14 years
U.S. Cl. D12—96



307,879
BABY CARRIAGE
Harry J. Giambrone, Kettering, Ohio, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Oct. 20, 1988, Ser. No. 260,336
Term of patent 14 years
U.S. Cl. D12—129



307,880
TIRE
Frederick W. Miller; Richard L. Galante, both of Akron; Richard W. Harden, Jr., Tallmadge; Terry J. Waibel, Wadsworth, all of Ohio; André E. J. Baus, Bettembourg, Luxembourg, and Terrell D. Windham, Hartville, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 28, 1987, Ser. No. 114,261
Term of patent 14 years
U.S. Cl. D12—147



VOL
1114
ISS
3
MY
15
1990
UMI

307,881
TIRE
Frederick W. Miller; Richard L. Galante, both of Akron; Richard W. Harden, Jr., Tallmadge; Terry J. Waibel, Wadsworth, all of Ohio; André E. J. Baus, Bettembourg, Luxembourg, and Terrell D. Windham, Hartville, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 28, 1987, Ser. No. 114,263
Term of patent 14 years
U.S. Cl. D12—147



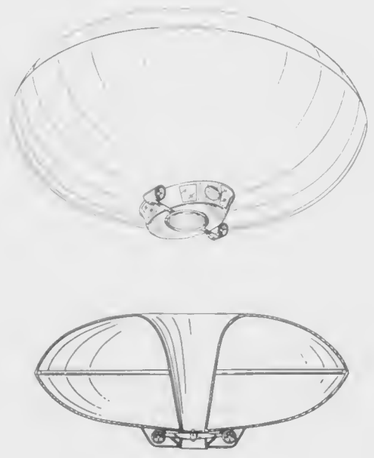
307,882
ROLL-UP PICK-UP CARGO COVER
Barry S. Daniel, 17 Pineneedle Ct., Albany, Ga. 31705
Filed Sep. 24, 1987, Ser. No. 160,708
Term of patent 14 years
U.S. Cl. D12—156



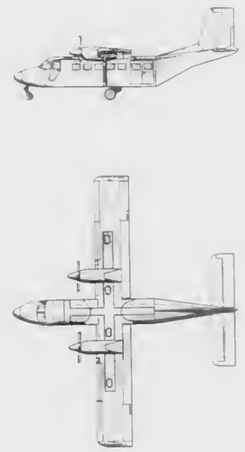
307,883
BRACKET FOR SUPPORTING A MOUNTING BAR ON A VEHICLE
Jeff A. Carr, 10433 Samoline Ave., Downey, Calif. 90241
Filed Jul. 10, 1987, Ser. No. 71,716
Term of patent 14 years
U.S. Cl. D12—157



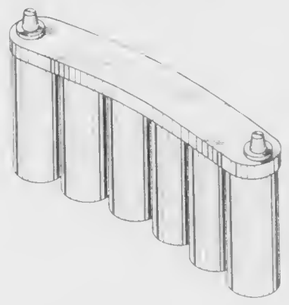
307,884
AIR VEHICLE
George Ninkovich, Richmond, Canada, assignor to Hystar Aerospace Development Corporation, Vancouver, Canada
Filed Apr. 8, 1987, Ser. No. 35,947
Claims priority, application Japan, Feb. 17, 1986, 62-5777
Term of patent 14 years
U.S. Cl. D12—325



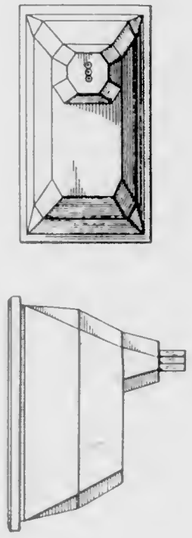
307,885
AIRCRAFT
John J. Dupont, Lee's Summit, Mo., assignor to Skytrader Corporation, Kansas City, Mo.
Filed Jun. 29, 1987, Ser. No. 67,551
Term of patent 14 years
U.S. Cl. D12—344



307,886
BATTERY
Larry K. W. Ching, Jr., Littleton, and Neil Puester, Aurora, both of Colo., assignors to Gates Energy Products, Inc., Gainesville, Fla.
Filed May 13, 1988, Ser. No. 194,075
The portion of the term of this patent subsequent to Apr. 10, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—103



307,887
RECEPTACLE PLUG COMBINATION
Douglas Hyde, Nepean, Canada, assignor to Electec, Ltd., Ontario, Canada
Filed May 23, 1986, Ser. No. 866,300
Claims priority, application Canada, Nov. 26, 1985, 26-11-85-1
Term of patent 14 years
U.S. Cl. D13—139

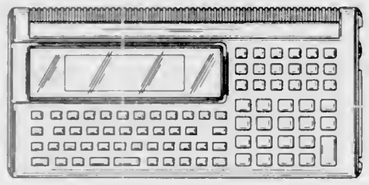


307,888
PROGRAMMING DEVICE FOR SEQUENCE CONTROLLER
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 12, 1988, Ser. No. 180,809
Claims priority, application Japan, Oct. 23, 1987, 62-43549
Term of patent 14 years
U.S. Cl. D14—100



VOL
1114
ISS
3
MY
15
1990
UMI

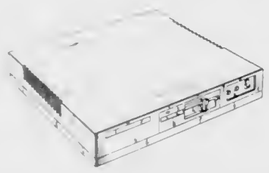
307,889
COMPUTER
Hiroshi Sakaguchi, and Toshiya Takahashi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 22, 1988, Ser. No. 171,913
Claims priority, application Japan, Sep. 28, 1987, 62-39873
Term of patent 14 years
U.S. Cl. D14—100



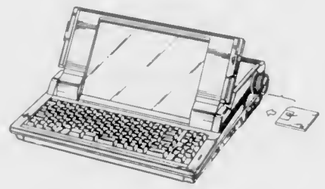
307,890
HAND HELD DATA ENTRY TERMINAL
Young Kim, Sunnyvale, Calif., assignor to Spectrum Concepts, Inc., New York, N.Y.
Filed Dec. 21, 1988, Ser. No. 289,584
Term of patent 14 years
U.S. Cl. D14—100



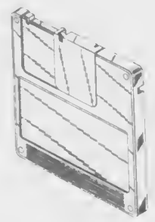
307,891
COMPACT ENCLOSURE FOR PERSONAL COMPUTERS
Peter K. Toedter, Trabuco Canyon, Calif., assignor to AST Research, Inc., Irvine, Calif.
Filed Jan. 15, 1988, Ser. No. 144,862
Term of patent 14 years
U.S. Cl. D14—100



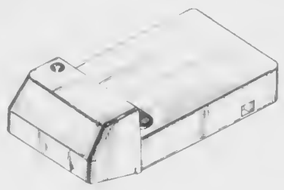
307,892
WORD PROCESSOR HAVING FUNCTION OF ELECTRONIC COMPUTER
Hideyuki Horie, Chiba, Japan, assignor to Toshiba Corporation, Kanagawa, Japan
Filed Dec. 8, 1987, Ser. No. 130,158
Claims priority, application Japan, Jul. 6, 1987, 62-27198
Term of patent 14 years
U.S. Cl. D14—106



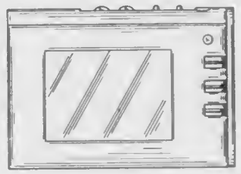
307,893
MAGNETIC RECORDING DISK CARTRIDGE
Arthur K. Kato, St. Paul; Vurnen J. Leonard, Minneapolis, both of Minn.; Osamu Sakurai, Tokyo, and Osamu Koizumi, Miyagi, both of Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 2, 1988, Ser. No. 279,141
Term of patent 14 years
U.S. Cl. D14—114



307,894
HAND-HELD LASER SCANNER
Bish Siemiatkowski, Los Gatos, Calif., assignor to Symbol Technologies, Inc., Bohemia, N.Y.
Filed Dec. 14, 1988, Ser. No. 284,450
Term of patent 14 years
U.S. Cl. D14—116



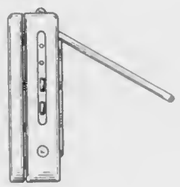
307,895
TELEVISION SET
Ryunosuke Kitagawa, and Shimizu Osamu, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 11, 1988, Ser. No. 193,485
Claims priority, application Japan, Nov. 17, 1987, 62-47162
Term of patent 14 years
U.S. Cl. D14—126



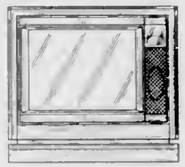


307,896
TELEVISION SET
Ryunosuke Kitagawa, and Osamu Shimizu, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 11, 1988, Ser. No. 193,487
Claims priority, application Japan, Nov. 17, 1987, 62-47163
Term of patent 14 years
U.S. Cl. D14—126

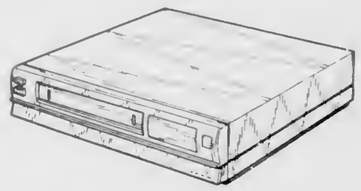




307,897
TELEVISION SET
Takeo Hashiba, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 14, 1988, Ser. No. 144,852
Claims priority, application Japan, Jul. 17, 1987, 62-29328
Term of patent 14 years
U.S. Cl. D14—133

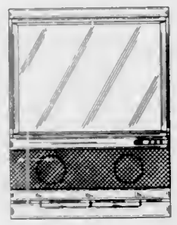


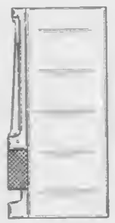
307,898
VIDEO CASSETTE RECORDER
Kue S. Shim, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 14, 1987, Ser. No. 108,412
Claims priority, application Rep. of Korea, Apr. 21, 1987, 5746/1987
Term of patent 14 years
U.S. Cl. D14—135



VOL
1114
ISS
3
MY
15
1990
UMI

307,899
TELEVISION SET
Kouji Satake, and Tokuko Sato, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 14, 1988, Ser. No. 144,851
Claims priority, application Japan, Jul. 17, 1987, 62-29329
Term of patent 14 years
U.S. Cl. D14—133

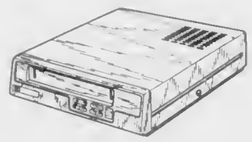




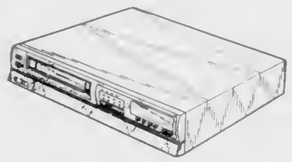
307,900
VIDEO CASSETTE RECORDER
Doo S. Yang, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 27, 1987, Ser. No. 19,866
Claims priority, applicatioo Rep. of Korea, Nov. 11, 1986, 15859/86
Term of patent 14 years
U.S. Cl. D14—135



307,901
VIDEO CASSETTE RECORDER
Doo S. Yang, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 14, 1987, Ser. No. 108,561
Claims priority, application Rep. of Korea, Apr. 27, 1987, 5129/1987
Term of patent 14 years
U.S. Cl. D14—135

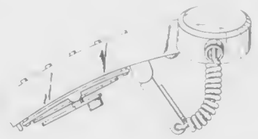


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VIDEO CASSETTE RECORDER
Kue S. Shim, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 14, 1987, Ser. No. 108,571
Claims priority, application Rep. of Korea, Apr. 21, 1987, 5747/1987
Term of patent 14 years
U.S. Cl. D14—135



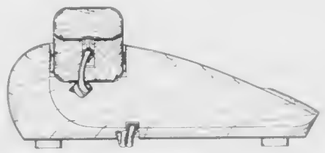
307,903
TELEPHONE SET
Andrew P. Davey, London, United Kingdom, assignor to Browns Holdings Limited, London, United Kingdom
Filed Nov. 10, 1988, Ser. No. 270,108
Claims priority, application United Kingdom, May 10, 1987, 1050607
Term of patent 14 years
U.S. Cl. D14—149





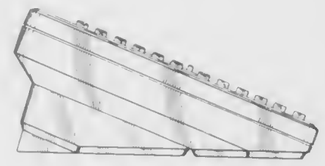
307,904
DESK TOP TELEPHONE SET
Thomas J. Zimmerman, Seattle, Wash., assignor to Wood Communications Corp., Camano Island, Wash.
Filed Dec. 23, 1988, Ser. No. 289,588
Term of patent 14 years
U.S. Cl. D14—149



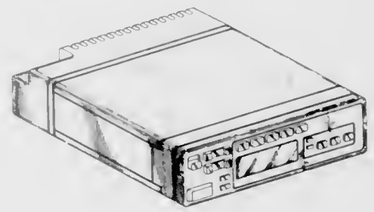


307,905
BASE FOR A TELEPHONE SET
Edmond J. Helstab, Ottawa, and Michael Brown, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Jan. 6, 1989, Ser. No. 294,131
Term of patent 14 years
U.S. Cl. D14—151





307,906
TWO-WAY MOBILE RADIO
Thomas G. Beaumont, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 30, 1987, Ser. No. 32,197
Term of patent 14 years
U.S. Cl. D14—157

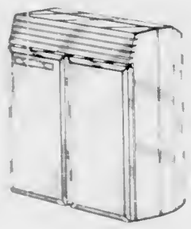


VOL
1114
ISS
3
MY
15
1990
UMI

307,907
MICROPHONE OR SIMILAR ARTICLE
Craig F. Siddoway, Fort Lauderdale; James H. Curtis, Coral Springs, both of Fla., and Christopher J. Reitz, Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 25, 1987, Ser. No. 66,687
Term of patent 14 years
U.S. Cl. D14—225



307,908
HOUSING FOR TELEPHONIC EQUIPMENT
Floyd J. Pushelberg, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Mar. 8, 1988, Ser. No. 165,679
Term of patent 14 years
U.S. Cl. D14—240





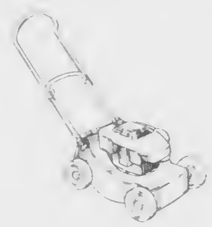
307,909
FRONT PANEL FOR A COMPACT DISC PLAYER
Mark A. Dobies, Dearborn Heights; Carol M. Repasky, Ann Arbor; Thomas R. Clark, West Bloomfield, all of Mich.; Masaharu Kobayashi, Ohmiya, and Keisuke Tejima, Nerima, both of Japan, assignors to Ford Motor Company, Dearborn, Mich.
Filed May 26, 1987, Ser. No. 54,151
Term of patent 14 years
U.S. Cl. D14—258



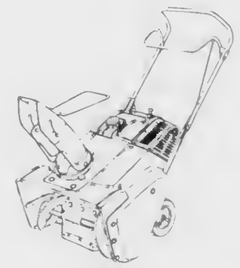
307,910
CONTROLLER FOR TELEVISION CAMERA
Tomonori Tominaga; Toshio Aizawa, both of Kamakura, and Satoshi Shinya, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 20, 1987, Ser. No. 51,586
Claims priority, application Japan, Nov. 24, 1986, 61-46485
Term of patent 14 years
U.S. Cl. D14—299



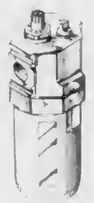
307,911
WALKING OPERATOR TYPE LAWN MOWER
Manabu Miyawaki, Sakai; Takao Katayama, Sennan; Jinnosuke Takakura, Sakai; Hirofumi Sadagane, Kawachinagano, and Hisato Katoh, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Oct. 24, 1986, Ser. No. 922,637
Claims priority, application Japan, Jun. 20, 1986, 61-23980
Term of patent 14 years
U.S. Cl. D15—14



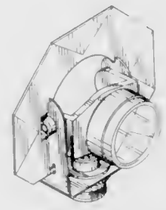
307,912
SNOWBLOWER
Isao Yoshida, Kamifukuoka, and Joji Maeda, Hoya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1988, Ser. No. 288,752
Claims priority, application Japan, Jul. 22, 1988, 63-29324
Term of patent 14 years
U.S. Cl. D15—12



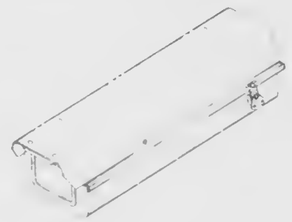
307,913
LUBRICATOR
Yoshinari Ogasawara, Kasugai, and Kouichi Miyake, Kani, both of Japan, assignors to CKD Kabushiki Kaisha, Komaki, Japan
Filed Jul. 3, 1986, Ser. No. 882,625
Claims priority, application Japan, Feb. 5, 1986, 61-3783
The portion of the term of this patent subsequent to May 10, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—150



307,914
PRISM ASSEMBLY
Galen L. Buckley, Dana Point; Kenneth G. Selesky, San Juan Capistrano, and Daniel M. Houston, Costa Mesa, all of Calif., assignors to Pyramid Optical, Irvine, Calif.
Filed Sep. 19, 1988, Ser. No. 245,054
Term of patent 14 years
U.S. Cl. D16—137

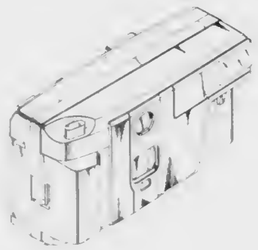


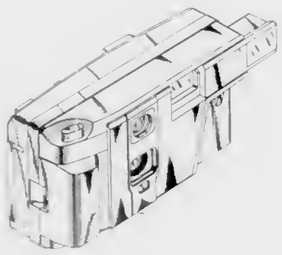
307,915
CAMERA HOUSING
William F. Kuester, III, Fresno, Calif., assignor to Pelco, Clovis, Calif.
Filed Feb. 25, 1988, Ser. No. 160,095
Term of patent 14 years
U.S. Cl. D16—203



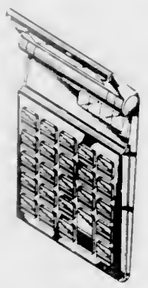
VOL
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ISS
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MY
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1990
UMI

307,916
STILL CAMERA WITH BUILT-IN FLASH UNIT
Bruce A. Leonard, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 6, 1987, Ser. No. 82,392
Term of patent 14 years
U.S. Cl. D16—209



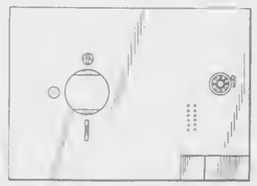


307,917
CALCULATOR OR SIMILAR ARTICLE
Ray Chen, Taipei, Tsiwan, assignor to Cal-Comp Electronics, Inc., Taipei, Taiwan
Filed Dec. 21, 1987, Ser. No. 135,281
Term of patent 14 years
U.S. Cl. D18—7



307,918
CASSETTE FOR A THERMICLY PRINTING MACHINE OR THE LIKE
Hiroyuki Goda, Toyonaka, Japan, assignor to General Company Limited, Osaka, Japan
Filed Feb. 27, 1987, Ser. No. 1,507
Claims priority, application Japan, Jui. 21, 1986, 61-28191
Term of patent 14 years
U.S. Cl. D18—12





307,919
GRIP PORTION FOR A WRITING INSTRUMENT
Norman D. Poisson, Andover, Mass.; Walter B. Herbst, Evanston, and Kurt Peterson, Park Ridge, both of Ill., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 9, 1987, Ser. No. 12,707
Term of pateot 14 years
U.S. Cl. D19—55

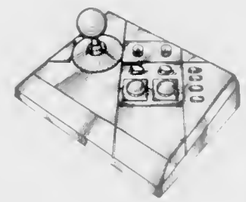


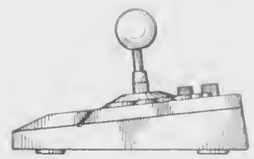


307,920
PROTECTIVE END CAP FOR A BALL POINT PEN
Kazuhiko Sekiguchi, Nerimaku, Japan, assignor to Zebra Co., Ltd., Tokyo, Japan
Filed Sep. 26, 1986, Ser. No. 911,984
Claims priority, application Japan, Mar. 26, 1986, 61-010649
Term of patent 14 years
U.S. Cl. D19—57

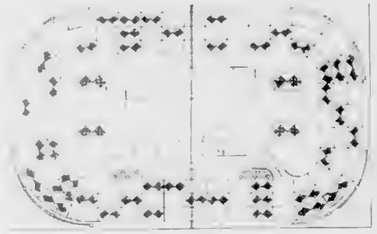


307,921
JOY STICK CONTROLLER FOR VIDEO GAME
Lance N. Barr, Renton, Wash., assignor to Nintendo of America, Inc., Redmond, Wash.
Filed Oct. 13, 1987, Ser. No. 108,319
Term of patent 14 years
U.S. Cl. D21—13





307,922
GAME BOARD
Dana C. Rose, 1082 E. Sidney Rd., Stanton, Mich. 48888
Filed May 14, 1987, Ser. No. 49,462
Term of patent 14 years
U.S. Cl. D21—27



307,923
TOY SPACESHIP
Andrew G. Probert, Burbank, Calif., assignor to Paramount Pictures Corporation, New York, N.Y.
Filed Sep. 23, 1987, Ser. No. 100,137
Term of patent 14 years
U.S. Cl. D21—87

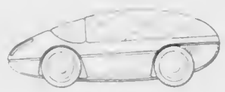


307,924
CONSTRUCTION TOY GABLE BLOCK
Thomas E. Fish, Jr., Wickliffe, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Sep. 1, 1988, Ser. No. 240,557
Term of patent 14 years
U.S. Cl. D21—108



VOL
1114
ISS
3
MY
15
1990
UMI

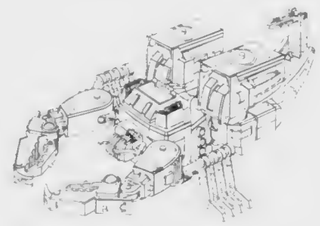
307,925
TOY CAR
Patrick Rylands, London, United Kingdom, assignor to Simon Gompes and Herman Schpektor, both of Amsterdam, Netherlands
Filed May 27, 1988, Ser. No. 199,582
Claims priority, application United Kingdom, Nov. 30, 1987, 1046716
Term of patent 14 years
U.S. Cl. D21—136

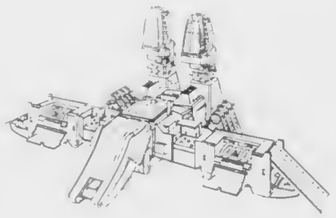


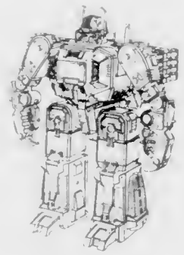




307,926
RECONFIGURABLE TOY SCORPION
Muneyoshi Shinohara, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 13, 1987, Ser. No. 14,911
Claims priority, application Japan, Dec. 17, 1986, 61-50019
Term of patent 14 years
U.S. Cl. D21—150



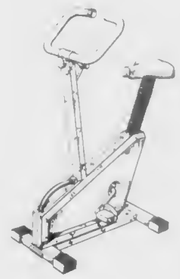




307,927
BIRD FIGURE
Donald H. Woodman, and Lucille L. Woodman, both of 1909 Big Horn Dr., Safford, Ariz. 85546
Filed Apr. 10, 1987, Ser. No. 36,696
Term of patent 14 years
U.S. Cl. D21—160



307,928
EXERCISE BICYCLE
Edward H. Meisner, Short Hills, N.J., assignor to Volt Sports Incorporated, Fairport, N.Y.
Filed Aug. 4, 1988, Ser. No. 228,238
Term of patent 14 years
U.S. Cl. D21—194



307,929
GOLFER'S AIMING AID FOR A TEE
Charles R. Parkerson, 8729 Alder Ave., Fontana, Calif. 92335
Filed Mar. 3, 1986, Ser. No. 840,709
Term of patent 14 years
U.S. Cl. D21—208



307,930
PADDLE
Howard Sokol, 1919 Brentwood La., Wheaton, Ill. 60187; Leonard H. Palmer, 1168 Westwood Trail, Addison, Ill. 60101, and Robert H. Salvesen, 212 Yuma La., Carol Stream, Ill. 60188
Filed Jul. 16, 1986, Ser. No. 886,525
Term of patent 14 years
U.S. Cl. D21—213



307,931
GOLF PUTTER HEAD
Brian A. Doran, Bueliton, Calif., and Robert H. Redkey, 1630 Maple, Solvang, Calif. 93463, assignors to Robert H. Redkey, Solvang, Calif.
Filed Mar. 11, 1987, Ser. No. 24,548
Term of patent 14 years
U.S. Cl. D21—215



307,932
FISHING BOBBER
Gerald D. Reed, 14501 Berkshire Dr., Independence, Mo. 64055
Filed Oct. 13, 1987, Ser. No. 107,539
Term of patent 14 years
U.S. Cl. D22—146



VOL
1114
ISS
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MY
15
1990
UMI

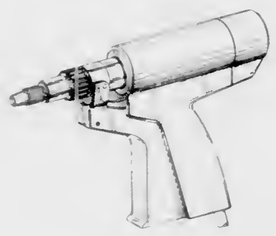
307,933
COUNTERTOP WATER FILTER
Kenneth Baer, 1231 NE. 26th Ave., Pompano Beach, Fla. 33062
Filed Jun. 24, 1988, Ser. No. 210,777
Term of patent 14 years
U.S. Cl. D23—209



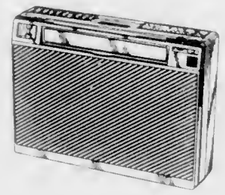
307,934
TOILET BOWL DEODORANT HOLDER
Nicholas B. Verebelyi, London, United Kingdom, assignor to Reckitt & Colman Products Limited, London, United Kingdom
Filed May 27, 1988, Ser. No. 199,575
Term of patent 14 years
U.S. Cl. D23—208



307,935
SPRAY GUN
Edwin W. Trefzger, Ilion, N.Y., assignor to D. B. Smith and Company, Inc., Utica, N.Y.
Filed Mar. 17, 1988, Ser. No. 169,352
Term of patent 14 years
U.S. Cl. D23—226



307,936
AIR CLEANER
Yukio Hirano, Osaka; Tadakazu Narikawa, Kanagawa, and Junichi Yamada, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 21, 1987, Ser. No. 87,948
Claims priority, application Japan, May 11, 1987, 62-18359
Term of patent 14 years
U.S. Cl. D23—364



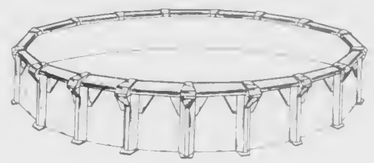
307,937
AIR REFRESHENER
Anne W. Ten Wolde, Bentveld, Netherlands, assignor to Williams Trading B.V., Netherlands
Filed May 20, 1987, Ser. No. 52,349
Claims priority, applicatioo Netherlands, Nov. 20, 1986, DM/007818
Term of patent 14 years
U.S. Cl. D23—366



307,938
DISPENSER FOR AN AIR FRESHENER
Darrell D. Fish, Baltimore, Md., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Nov. 2, 1987, Ser. No. 115,102
Term of patent 14 years
U.S. Cl. D23—367



307,939
SWIMMING POOL
John T. Laputka, New York, N.Y., assignor to Home & Roam Leisure Inc., Fairfield, N.J.
Filed Apr. 8, 1987, Ser. No. 36,093
Term of patent 14 years
U.S. Cl. D25—2



307,940
REVOLVING DOOR ENCLOSURE
Lew V. Hewitt, Corpus Christi, Tex., assignor to Dallas Corporation, Dallas, Tex.
Filed Apr. 16, 1986, Ser. No. 852,898
Term of patent 14 years
U.S. Cl. D25—48



307,941
COMBINED DRAPERY ROD AND BRACKET
Robert S. Rodinski, 72 Del Mesa Carmel, Carmel, Calif. 93921
Filed Sep. 29, 1986, Ser. No. 913,186
Term of patent 14 years
U.S. Cl. D25—55



307,942
DECORATIVE GLASS PANEL
B. Jeremiah Shaffer, Worthington, Ohio, assignor to Pease Industries, Inc., Fairfield, Ohio
Filed Jul. 7, 1986, Ser. No. 882,814
Term of patent 14 years
U.S. Cl. D25—103



307,943
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corportation, Valley Forge, Pa.
Filed Sep. 12, 1989, Ser. No. 406,752
Term of patent 14 years
U.S. Cl. D25—124

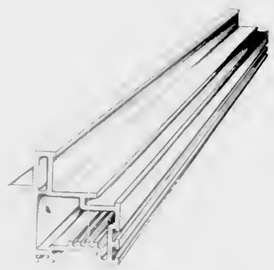


VOL
1114
ISS
3
MY
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1990
UMI

307,944
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 12, 1989, Ser. No. 406,952
Term of patent 14 years
U.S. Cl. D25—124



307,945
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Jan. 13, 1989, Ser. No. 297,531
Term of patent 14 years
U.S. Cl. D25—124



307,946
EXTERIORLY MOUNTED SUPPORT PLATE FOR A VEHICLE REAR BRAKE LIGHT
Steven R. Snow, 586 N. Pine St., Hemlock, Mich. 48626
Filed Jun. 2, 1987, Ser. No. 38,913
Term of patent 14 years
U.S. Cl. D26—138



307,947
PORTABLE DISPOSABLE ASHTRAY
Gae Wells, 825 S. Grand Ave., Ft. Lupton, Colo. 80621, and Bill Hagen, P.O. Box 7046, Golden, Colo. 80403
Filed May 18, 1988, Ser. No. 195,544
Term of patent 14 years
U.S. Cl. D27—113

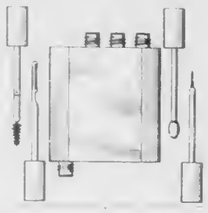




307,948
VICTORIAN KEEPSAKE ORNAMENT
Judy Francis, 15 Glenwood Ave., Woburn, Mass. 01801-5846
Filed Oct. 28, 1987, Ser. No. 113,722
Term of patent 14 years
U.S. Cl. D28—5



307,949
SKIN LOTION APPLICATOR
Nancy L. Wong, 3892 Corina Way, Palo Alto, Calif. 94303
Filed May 4, 1987, Ser. No. 45,308
Term of patent 14 years
U.S. Cl. D28—7



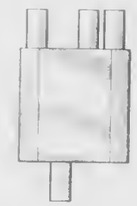
307,950
DRY SHAVER
Olivier Sterk, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 24, 1987, Ser. No. 100,811
Claims priority, application Benelux, Mar. 31, 1987, G2005-00
Term of patent 14 years
U.S. Cl. D28—50





307,951
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 790,517, Oct. 23, 1985. This application Mar. 10, 1989, Ser. No. 321,556
Term of patent 14 years
U.S. Cl. D28—77



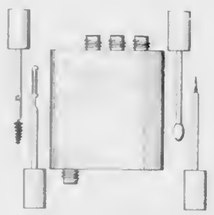




VOL
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ISS
3
MY
15
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307,952
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 790,517, Oct. 23, 1985. This application Mar. 10, 1989, Ser. No. 321,554
Term of patent 14 years
U.S. Cl. D28—77





307,953
LIPSTICK CASE WITH DECO BAND
Karen McCready, New City, N.Y., assignor to Elleance Ltd., New City, N.Y.
Filed Dec. 3, 1987, Ser. No. 128,519
Term of patent 14 years
U.S. Cl. D28—85





307,954
COSTUME MASK
John I. Alber, Rte. 1, Box 180, Highland, Ill. 62249
Filed Nov. 5, 1987, Ser. No. 117,132
Term of patent 14 years
U.S. Cl. D29—17

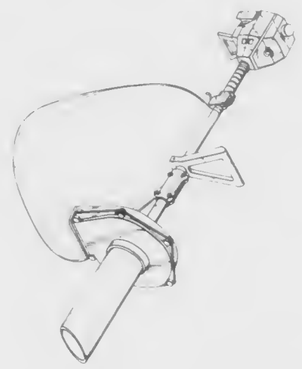




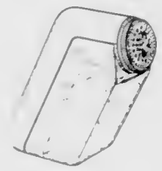
307,955
CAGE FOR ANIMALS
Kazutoshi Tominaga, Higashi Osakashi, Japan, assignor to Kabushiki Kaisha Tominaga Jyushi Kogyosho, Higashi, Japan
Filed May 19, 1988, Ser. No. 196,111
Term of patent 14 years
U.S. Cl. D30—112



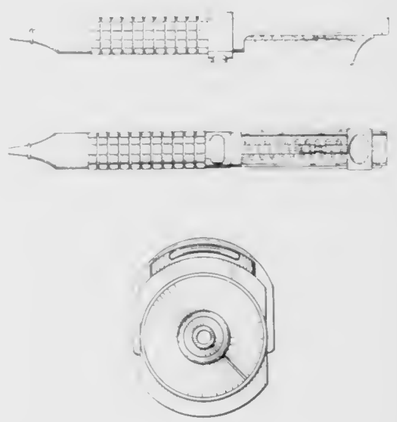
307,956
SUCTION CLEANER
Robert G. Everts, Chandler, Ariz., assignor to Inertia Dynamics Corp., Chandler, Ariz.
Filed May 27, 1986, Ser. No. 868,303
Term of patent 14 years
U.S. Cl. D32—15



307,957
LINT REMOVER
Robert A. Mockovak, Newton, Conn., assignor to Remington Products, Inc., Bridgeport, Conn.
Filed Mar. 30, 1987, Ser. No. 32,189
Term of patent 14 years
U.S. Cl. D28—50



307,958
DESOLDERING TOOL OR THE LIKE
William S. Fortune, 29866 Cuthbert Rd., Malibn, Calif. 90265
Continuation-in-part of Ser. No. 627,067, Jul. 2, 1984, Pat. No. 4,765,229. This application Aug. 22, 1986, Ser. No. 899,396
Term of patent 14 years
U.S. Cl. D32—17

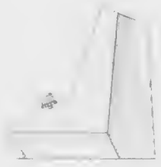


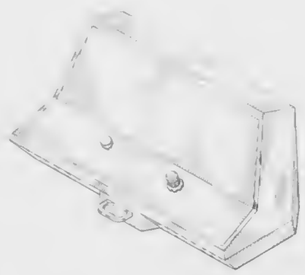
VOL
1114
ISS
3
MY
15
1990
UMI

307,959
GARMENT STEAMER
Richard Rosa, Sebastopol; Thomas B. Armstrong, Santa Rosa; David Bacigalupi, III, Sebastopol, and Deborah Cunningham-Blank, Tiburon, all of Calif., assignors to Hybrinetics, Inc., Santa Rosa, Calif.
Filed Jun. 22, 1987, Ser. No. 64,346
Term of patent 14 years
U.S. Cl. D32—17



307,960
CONTROL PANEL FOR STREET SWEEPER
Mario J. Martinez, Elgin; Roger B. Parsons, Barrington, both of Ill., and William A. Lee, Battle Creek, Mich., assignors to Elgin Sweeper Company, Elgin, Ill.
Filed Aug. 28, 1987, Ser. No. 90,772
Term of patent 14 years
U.S. Cl. D32—28





307,961
HOT WATER TANK HELICAL COIL CLEANER
Edward B. Howell, 15431 W. Lacey, Pocatello, Id. 83202
Filed Feb. 25, 1987, Ser. No. 18,978
Term of patent 14 years
U.S. Cl. D32—35

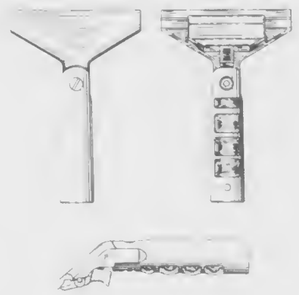




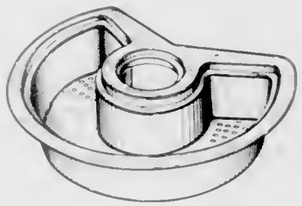
307,962
WALL HAMPER
Pamela Phelps, 30 Quentin Ave., New Brunswick, N.J. 08901, and Roberta White, 511 Algair Ave., North Brunswick, N.J. 08902
Filed May 13, 1988, Ser. No. 193,636
Term of patent 14 years
U.S. Cl. D32—37



307,963
SQUEEGEE HANDLE
Robert D. Newman, Sr., and Robert D. Newman, Jr., both of Greenwood, Mo., assignors to Mr. Longarm, Inc., Greenwood, Mo.
Filed Nov. 10, 1987, Ser. No. 119,324
Term of patent 14 years
U.S. Cl. D32—41

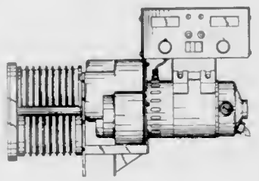


307,964
SINK INSERT
Bruce M. Sauter, Kohler, Wis., and James G. Bruni, Glendale, Calif., assignors to Kohler Co., Kohler, Wis.
Filed Apr. 30, 1987, Ser. No. 44,457
Term of patent 14 years
U.S. Cl. D32—55



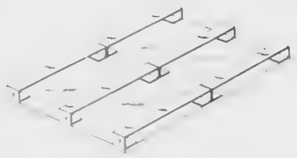


307,965
DUAL CAPSTAN ELECTRIC PULLER
David L. Eley, Beloit, Wis.; Jeffrey J. Plummer, Rockford, and George P. Gill, Loves Park, both of Ill., assignors to Greenlee Textron Inc., Rockford, Ill.
Filed Mar. 5, 1987, Ser. No. 22,324
Term of patent 14 years
U.S. Cl. D34—33

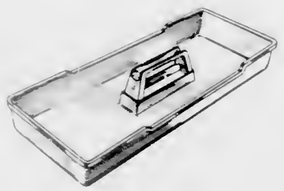


VOL
1114
ISS
3
MY
15
1990
UMI

307,966
PALLET
Karl J. Back, Sigtuna, Sweden, assignor to Stretch Machinery AB, Sigtuna, Sweden
Filed Dec. 29, 1987, Ser. No. 139,056
Claims priority, application Sweden, Jul. 1, 1987, 87-1517
Term of patent 14 years
U.S. Cl. D34—38



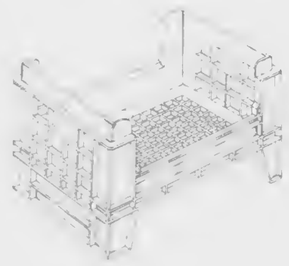
307,967
TOOL BOX TRAY
Charles A. Lanius, Prairie du Sac, Wis., assignor to Flambeau Corporation, Baraboo, Wis.
Filed Jul. 20, 1987, Ser. No. 75,317
Term of patent 14 years
U.S. Cl. D34—40



307,968
PORTABLE RECEPTACLE FOR ACCOMMODATING RIGID REFUSE BAGS
William Neal, 1629-5th St. NW., Birmingham, Ala. 35215
Filed Apr. 28, 1987, Ser. No. 43,297
Term of patent 14 years
U.S. Cl. D34—40



307,969
BEVERAGE CASE
Thomas Box, Tinton Falls, N.J., assignor to Spectrum International, Inc., Tinton Falls, N.J.
Filed May 6, 1987, Ser. No. 47,401
Term of patent 14 years
U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF MAY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See*—
Haas, David J., 4,925,716, Cl. 428-41.000.
A. Ahlstrom Corporation: *See*—
Havukainen, Reino I., 4,925,526, Cl. 159-13.300.
A. B. Dick: *See*—
Kulisz, Michael, Sr.; and Cooper, Robert N., 4,925,761, Cl. 430-97.000.
A. & M. Cousin-Etablissements Cousin Freres: *See*—
Pipon, Yves; and Droulon, Georges, 4,925,228, Cl. 296-65.100.
A. O. Smith Corporation: *See*—
Hink, Karl M.; Pottebaum, Joseph R.; Reichard, Jerome J.; Wagner, Bruce C.; Weber, Douglas B.; and Wiesendanger, Theodore O., 4,926,100, Cl. 318-269.000.
A.T. & G Company, Inc.: *See*—
Bonner, Ben V., 4,924,736, Cl. 81-448.000.
Abber, Herman; Gerry, Elizabeth H.; and Pennace, John R., to Flexcon Company, Inc. Silicone pressure sensitive adhesive and uses. 4,925,671, Cl. 424-448.000.
Abbott Laboratories: *See*—
Iyer, Lokanathan M.; Yim, Jeffrey B.; and Lyon, Kenneth S., 4,925,268, Cl. 350-96.290.
Abe, H.: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.
Abe, Hiroyuki: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.
Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Cylinder discriminating system for an automotive engine. 4,924,830, Cl. 123-414.000.
Abe, Kunihiro; and Kobayashi, Tomoya, to Fuji Jukogyo Kabushiki Kaisha. Diagnosis system for a motor vehicle. 4,926,330, Cl. 364-424.030.
Abe, Toshiro, to Nissan Motor Company, Limited. System and method for controlling ignition timing for internal combustion engine. 4,924,832, Cl. 123-419.000.
ABECE AB: *See*—
Jidell, Bernt, 4,925,383, Cl. 425-453.000.
Abeln, Maarten A. M., to Stichting Istaned. Composite floor structure and process for the production thereof. 4,924,645, Cl. 52-177.000.
Abex Corporation: *See*—
Hummel, Alan R.; and Welch, Ernst R., 4.924,583, Cl. 29-460.000.
Abou-Gharbia, Magid A.: *See*—
Borenstein, Michael R.; Doukas, Peter H.; and Abou-Gharbia, Magid A., 4,925,841, Cl. 514-235.500.
Abraham, Thomas J., Jr.; Fugate, Eric J.; Steinmetz, Guy R.; and Dolfi, Martin D., to Eastman Kodak Company. Process for dehydrohalogenating aromatic halides. 4,925,998, Cl. 585-469.000.
Abrant, Robert J.: *See*—
Tarleton, George K.; Abrant, Robert J.; and Oltman, Bruce A., 4,926,115, Cl. 324-83.00D.
Acquaviva, Thomas, to Xerox Corporation. Signature job copying system. 4,925,176, Cl. 271-3.100.
Action Drive-Thru Inc.: *See*—
Klaiber, Martin S., 4,925,215, Cl. 283-82.000.
Adachi, Hideo: *See*—
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.
Adachi, Keiichi: *See*—
Okada, Masahiro; Ukai, Toshinao; Suzuki, Seiji; Adachi, Keiichi; Watanabe, Toshiyuki; and Ishigaki, Kunio, 4,925,782, Cl. 430-510.000.
Adams, Earl G.; and Barker, Robert B., to First Chemical Corporation. Process for extracting and disposing of nitrophenolic by-products. 4,925,565, Cl. 210-634.000.
Adams, John A.: *See*—
Baker, Bruce D.; Corey, Robert L.; Adams, John A.; and Ross, Edward W., 4,926,452, Cl. 378-22.000.
Adams, Olan T.: *See*—
McClellan, Bruce D.; Adams, Olan T.; and Cox, Vernon D., 4,926,393, Cl. 367-57.000.
Adams Rite Manufacturing Co.: *See*—
Loock, Freidrich, 4,925,222, Cl. 292-336.300.
Adams, William J.: *See*—
Wurst, Stephen G.; Adams, William J.; and Munson, Kenton M., 4,925,133, Cl. 244-118.500.
Adema, Han: *See*—
Muth, Walter E.; Joynes, Roger; Cox, Clair A.; Cheadle, Brian A.; Burnett, Don J.; and Adema, Han, 4,925,621, Cl. 376-262.000.
Ademovic, Martin K., to CooperVision, Inc. Method and apparatus for producing a contact lens. 4,924,739, Cl. 82-1.110.
Aderer, Peter, to Lemmerz-Werke KGaA. Track-adjusting wheel. 4,925,248, Cl. 301-9.0TV.
Adrian, Willy; and Moldenhauer, Detlev B., to Otis Elevator Company. Escalator handrail obstruction device with sensors. 4,924,995, Cl. 198-323.000.
Advance Systems, Inc.: *See*—
Daane, Robert A.; and Helms, Randall D., 4,925,077, Cl. 226-97.000.
Advanced Micro Devices, Inc.: *See*—
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.
Nix, Michael A., 4,926,363, Cl. 364-579.000.
Advanced Technology Materials, Inc.: *See*—
Tom, Glenn M.; and Brown, Duncan W., 4,925,646, Cl. 423-488.000.
Advani, Jai K.; and Bernardi, Robert J., to Plantronics, Inc. Hearing assist telephone. 4,926,459, Cl. 379-52.000.
AEC Machinery Limited: *See*—
Hill, Reinier, 4,925,009, Cl. 198-583.000.
AFA Products, Inc.: *See*—
Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., 4,925,106, Cl. 239-333.000.
AG Communication Systems Corporation: *See*—
Tarleton, George K.; Abrant, Robert J.; and Oltman, Bruce A., 4,926,115, Cl. 324-83.00D.
Agency of Industrial Science & Technology: *See*—
Kitamura, Takao; Sakane, Kohji; Wada, Hideo; Hata, Hajime; and Kanbara, Hajime, 4,925,641, Cl. 423-279.000.
Kume, Masao, 4,924,538, Cl. 5-81.00B.
Takasaki, Yoshiyuki, 4,925,795, Cl. 435-95.000.
Tanihara, Masao; Yamada, Hideaki; Nakashima, Toshihide; Omura, Yoshiaki; and Takakura, Koichi, 4,925,787, Cl. 435-7.000.
Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Suehiro, Tetsuro; Yamauchi, Aizo; Ichijo, Hisao; Nagasawa, Jun'ichi; and Aisaka, Noboru, 4,925,803, Cl. 435-288.000.
Agethen, Heinrich; Gesenhues, Paul; Radisch, Helmer; Jandeleit, Otto; and Schafer, Wolfgang, to Saint-Gobain Vitrage. Glazing laminates. 4,925,734, Cl. 428-349.000.
Agfa-Gevaert Aktiengesellschaft: *See*—
Wernicke, Ubbo, 4,925,778, Cl. 430-383.000.
AGFA-Gevaert, N.V.: *See*—
Daems, Eddie R.; and Leenders, Luc H., 4,925,767, Cl. 430-258.000.
Agrimonti, Jean-Claude: *See*—
Morel, Henri; Agrimonti, Jean-Claude; and Massie, Bernard, 4,924,549, Cl. 16-82.000.
Ahlberg, Walter F., Jr.; and Long, Joseph F. Multi-purpose rotating membrane filter. 4,925,557, Cl. 210-321.680.
Ahlgren, William L., to Santa Barbara Research Center. Modulated multi-quantum well collector for HgCdTe photodiodes. 4,926,038, Cl. 250-211.00J
Ahlstromforetagen Svenska AB: *See*—
Ryham, Rolf, 4,925,527, Cl. 162-15.000.
Ai Shi Denshi Kogyo Kabushiki Kaisha: *See*—
Miya, Isamu, 4,925,682, Cl. 426-87.000.
Aida, Hiromi: *See*—
Funatsu, Koichi; and Aida, Hiromi, 4,926,328, Cl. 364-424.100.
Aiello, Louis L.; Charnley, James E.; Mees, James A.; and Dixon, Robert C., to General Electric Company. Control rod absorber section fabrication by square tube configuration and dual laser welding process. 4,925,620, Cl. 376-260.000.
Aikawa, Yukihiro: *See*—
Nomura, Mitsuo; and Aikawa, Yukihiro, 4,926,214, Cl. 355-75.000.
Aimo, Vittorio, to Efel S.p.A. Starter for internal combustion engines. 4,924,717, Cl. 74-7.00B.
Air Products and Chemicals, Inc.: *See*—
Coe, Charles G.; Gaffney, Thomas R.; and Srinivasan, Rajagopalan S., 4,925,460, Cl. 55-25.000.
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,925,992, Cl. 570-130.000.
Airpax: *See*—
Harper, George S., 4,926,157, Cl. 335-172.000.
Airxchange, Inc.: *See*—
Steele, Donald F., 4,924,934, Cl. 165-8.000.
Aisaka, Noboru: *See*—
Suehiro, Tetsuro; Yamauchi, Aizo; Ichijo, Hisao; Nagasawa, Jun'ichi; and Aisaka, Noboru, 4,925,803, Cl. 435-288.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Aisin Aw. Co., Ltd.: *See*—
Hayakawa, Youichi; Kuwayama, Yoshinari; and Yamada, Yoshihiro, 4,924,731, Cl. 74-869.000.
Yamada, Takashi, 4,926,336, Cl. 364-444.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Harada, Kouhei; and Hasegawa, Hiromi, 4,924,982, Cl. 192-48.800.
Hayashi, Masaharu; Kodama, Hisashi; Okabe, Yoshio; Kobayashi, Yukimori; and Shirai, Eiji, 4,925,436, Cl. 474-101.000.
Komuro, Kenichi; Kawai, Taneichi; Kamei, Atsushi; Asada, Toru; Torii, Nozomu; and Fukumoto, Ryoichi, 4,926,332, Cl. 364-424.050.
Mori, Masanori, 4,924,728, Cl. 74-640.000.
Aisin Seiki Kabushikikaisha: *See*—
Hyodo, Hitoshi, 4,926,072, Cl. 307-542.100.
Aisin-Warner Kabushiki Kaisha: *See*—
Yokoyama, Shouji, 4,926,346, Cl. 364-518.000.
Aiuchi, Susumu: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, 4,925,755, Cl. 430-5.000.
Akahane, Atsushi: *See*—
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 4,925,849, Cl. 514-300.000.
Akao, Akimasa: *See*—
Ikeda, Hideo; Horiki, Yoshio; Yamauchi, Yutaka; Kasamatsu, Hiroshi; and Akao, Akimasa, 4,925,511, Cl. 156-106.000.
Akao, Mutsuo; and Inoue, Koji, to Fuji Photo Film Co., Ltd. Packaging bag for photosensitive materials and bag-making method thereof. 4,925,711, Cl. 428-35.200.
Akaza, Hiroshi: *See*—
Omori, Hidetoshi; Shoji, Akira; and Akaza, Hiroshi, 4,925,563, Cl. 210-532.100.
Akebono Brake Industry Co., Ltd.: *See*—
Shiraishi, Hideo; and Morita, Tsutomu, 4,924,566, Cl. 28-143.000.
Akechi, Kiyoaki: *See*—
Itoh, Yoshiaki; Odani, Yusuke; Akechi, Kiyoaki; and Kuroishi, Nobuhito, 4,926,242, Cl. 357-81.000.
Akisue, Osamu: *See*—
Kishida, Koji; and Akisue, Osamu, 4,925,500, Cl. 148-12.00F.
Akita, Kouichi: *See*—
Yanagihara, Hiromichi; Ito, Sumio; Sakurai, Kazuhiro; and Akita, Kouichi, 4,925,091, Cl. 237-2.00A
Akiyama, Nobuyuki: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, 4,925,755, Cl. 430-5.000.
Akkerman, Neil H.: *See*—
More, Henry S.; Rorden, Louis H.; and Akkerman, Neil H., 4,926,188, Cl. 343-719.000.
Akzo S.r.l.: *See*—
Solia, Franco, 4,924,797, Cl. 114-288.000.
Alagy, Jacques; and Busson, Christian, to Institut Francais du Petrole. Method for the thermal conversion of methane to hydrocarbons of higher molecular weights. 4,926,001, Cl. 585-500.000.
Alaria, Gian B.; Poggio, Cesare; and Ventimiglia, Giovanni, to Selenia Spazio S.p.A. On-board switching controller for a satellite with on-board switching. 4,926,422, Cl. 370-97.000.
Albert-Frankenthal AG: *See*—
Weis, Anton, 4,925,170, Cl. 270-5.000.
Alberta Telecommunications Research Centre: *See*—
Grover, Wayne D.; and Moore, Thomas E., 4,926,446, Cl. 375-109.000.
Albertson, Graham B. Arm controlled power cutter 4,924,571, Cl. 30-121.000.
Alcan International Limited: *See*—
Doutre, Don A., 4,926,114, Cl. 324-71.400.
Alcatel N.V.: *See*—
Weik, Hartmut, 4,926,416, Cl. 370-60.100.
Alcatel Thomson Faisceaux Hertziens: *See*—
Mettoudi, Isaac, 4,926,142, Cl. 331-99.000.
Alfa-Laval Separation AB: *See*—
Bodelson, Berth, 4,925,442, Cl. 494-40.000.
Ali, Athar M.; Watt, Darrell J.; and Wilson, Wendell G., to Ali, Athar Mohammad. Container having a dual purpose cap and a dripless spout. 4,925,063, Cl. 222-108.000.
Ali, Athar Mohammad: *See*—
Ali, Athar M.; Watt, Darrell J., and Wilson, Wendell G., 4,925,063, Cl. 222-108.000.
Alko, Ltd.: *See*—
Schneider, Larry, 4,925,068, Cl. 222-484.000.
Allan, Peter S.; and Bevis, Michael J. Process for molding directionally-orientatable material using shear force. 4,925,161, Cl. 264-69.000.
Allen, James R.: *See*—
Bechtel, Friend K.; and Allen, James R., 4,926,350, Cl. 364-550.000.
Allen, John M.: *See*—
Frederiksen, Bjarne; Allen, John M.; and Walla, Gregg W., 4,925,257, Cl. 312-221.000.
Allen, Michael E.: *See*—
Hicks, John E.; and Allen, Michael E., 4,924,664, Cl. 56-202.000.
Allen, Raymond H.: *See*—
Streusand, Barry J.; Allen, Raymond H.; Coons, Darrell E.; and Hutton, Robert C., 4,926,021, Cl. 219-121.590.
Allen, Roe C., Jr.: *See*—
Vogt, Clifford M.; Twyman, Nancy D.; and Allen, Roe C., Jr., 4,925,601, Cl. 264-6.000.
Alliance Automation Systems, Inc.: *See*—
Hoskins, Robert G.; and Krokenberger, Alan R., 4,924,732, Cl. 81-54.000.
Allied-Signal Inc.: *See*—
Green, George D.; Munk, Stephen A.; and Barnes, Darryl K., 4,925,906, Cl. 526-245.000.
Itamoto, John T., 4,924,912, Cl. 137-831.000.
Kelly, Robert J.; and LaBerge, Edward F. C., 4,926,186, Cl. 342-360.000.
Pattantyus, Tamas, 4,926,354, Cl. 363-98.000.
Alps Electric Co., Ltd.: *See*—
Bannai, Hiroyuki, 4,925,122, Cl. 242-85.000.
Ichisawa, Toshinori, 4,925,324, Cl. 400-240.300.
Kano, Mitsuru, 4,925,592, Cl. 252-299.670.
Morishita, Ichiro; and Hanzawa, Hiroko, 4,925,283, Cl. 350-432.000.
Alsip, Allen W.; Robinson, James N.; and Bossert, Clayton E., to Ring, Thomas J. Therapeutic table. 4,924,537, Cl. 5-61.000.
Alt, Thomas J.: *See*—
Novak, C. Tim; Alt, Thomas J.; Chapman, Arnold D.; and Driscoll, David M., 4,926,345, Cl. 364-513.000.
Aluma-Form, Inc.: *See*—
Farmer, Marion R. 4,925,142, Cl. 248-219.400.
Aluminum Company of America: *See*—
Roman, Thomas J.; and Ringle, Michael A., 4,925,390, Cl. 432-247.000.
AM International Incorporated: *See*—
Bruce, Andrew D.; and Tucker, Daniel A., 4,925,174, Cl. 270-54.000.
Cote, Kevin L., 4,925,354, Cl. 412-8.000.
AMAX Inc.: *See*—
Streusand, Barry J.; Allen, Raymond H.; Coons, Darrell E.; and Hutton, Robert C., 4,926,021, Cl. 219-121.590.
Ambrook Medical Concepts, Inc.: *See*—
Brooks, Albert E., 4,924,877, Cl. 128-748.000.
Amendolia, Pasquale J. I.V. flow control device. 4,925,451, Cl. 604-246.000.
American Cyanamid Company: *See*—
Doehner, Robert F., Jr., 4,925,944, Cl. 546-167.000.
American Home Products Corporation: *See*—
Asselin, Andre A.; and Schmid, Jean, 4,925,955, Cl. 548-432.000.
Quagliato, Dominick A.; and Humber, Leslie G., 4,925,839, Cl. 514-212.000.
Sestanj, Kazimir; Wrobel, Jay E.; and Kelly, Joseph M., 4,925,968, Cl. 560-21.000.
American International Devices, Inc.: *See*—
Mirand, Mauricio; and Gaskill, Robert E., 4,925,397, Cl. 439-353.000.
American National Can Company: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,925,100, Cl. 239-416.400.
American Screen Printing Equipment Company: *See*—
Bubley, Henry J., 4,924,599, Cl. 34-4.000.
American Standard Inc.: *See*—
Stairs, Henry M., Jr., 4,924,533, Cl. 4-252.00R
American Telephone and Telegraph Company: *See*—
Hauser, Joachim J.; Plewes, John T.; and Robbins, Murray, 4,925,407, Cl. 439-887.000.
American Tourister, Inc.: *See*—
Pulichino, John V., Jr., 4,925,021, Cl. 206-279.000.
Amest, Inc.: *See*—
Murel, Andrew, 4,925,545, Cl. 204-182.900.
Amity Leather Products Co.: *See*—
Gajewski, Dennis A., 4,925,038, Cl. 211-59.200.
Amoco Corporation: *See*—
Harris, James E.; Berger, Abe, Chopdekar, Vilas M.; Matzner, Markus; and Spanswick, James, 4,925,916, Cl. 528-353.000.
Kukes, Simon G.; Marshall, Christopher L.; Hopkins, P. Donald, and Hensley, Albert L., Jr., 4,925,546, Cl. 208-111.000.
AMP Incorporated: *See*—
Blair, Bryce W.; Norton, Jeffrey M.; and Stahl, Daniel E., 4,925,400, Cl. 439-374.000.
College, David A.; Johnson, Keith, Jr.; Stachura, Joseph F.; and Walter, Herman D., 4,924,693, Cl. 72-453.030.
Fogg, Michael W.; Scully, Michael J.; and Wolfe, Brian A., 4,925,401, Cl. 439-465.000.
Gerst, Michael; Knapp, Horst J. T., and Maack, Werner, 4,925,007, Cl. 198-470.100.
Hime, John L., Jr.; and Wise, James H., 4,925,392, Cl. 439-55.000.
Analog Devices, Inc.: *See*—
Mallinson, A. Martin, 4,926,178, Cl. 341-143.000.
Anand, Vidhu; and Houck, David L. Method for producing a Wc-Co-Cr alloy suitable for use as a hard non-corrosive coating. 4,925,626, Cl. 419-18.000.
Anastassiou, Dimitris, to Columbia University in the City of New York, Trustees of. Analog to digital conversion using correlated quantization and collective optimization. 4,926,180, Cl. 341-159.000.
Ancker, Fred H.: *See*—
Leung, Pak S.; Goddard, Errol D.; and Ancker, Fred H., 4,925,890, Cl. 524-133.000.
Anderson, C. John: *See*—
Baker, Mark A.; and Anderson, C. John, 4,925,505, Cl. 149-89.000.
Anderson, David M. Board game apparatus playing piece and method of play. 4,925,194, Cl. 273-271.000

Anderson, George R.: *See*—
Atwell, William A.; Pesheck, Peter S.; Krawjecki, Madonna M.; and Anderson, George R., 4,926,020, Cl. 219-10.55M.
Anderson, J. Edward C.: *See*—
Jeromson, James R., Jr.; Anderson, J. Edward C.; and Breisch, John H., 4,925,061, Cl. 222-1.000.
Anderson, James R.; and Brander, Richard, to Beltone Electronics Corporation. Electronic frequency filter. 4,926,139, Cl. 330-294.000.
Anderson, Michael W., to Moore Business Forms, Inc. Multiple part form for non-impact printer and related process. 4,925,213, Cl. 282-12.00A.
Anderson, Robert E.: *See*—
Erickson, Frank L.; Anderson, Robert E.; and Landis, Phillip S., 4,925,581, Cl. 252-48.200.
Anderson, Russell W. Swimming pool water cannon. 4,925,181, Cl 272-1.00B.
Andersson, Arvo E.: *See*—
Kivisto, Tuomo V. J.; Koho, Tauno T.; and Andersson, Arvo E., 4,925,598, Cl. 261-87.000.
Ando, Motoyoshi: *See*—
Takeuchi, Yasuhito; Higashiizumi, Takao; Ando, Motoyoshi; and Tamezumi, Yoshiro, 4,924,869, Cl. 128-660.050.
Ando, Yuji; and Toyoshima, Hideo, to NEC Corporation. Resonant-tunneling bipolar transistor. 4,926,232, Cl. 357-34.000.
Andre, Michel: *See*—
Calmettes, Lionel; and Andre, Michel, 4,924,558, Cl. 24-20.0CW.
Anezaki, Tomoaki: *See*—
Tajima, Ikuo; and Anezaki, Tomoaki, 4,924,789, Cl. 112-241.000.
Anger, Wilhelm; and Wiedman, Helmut, to Eyemetrics-Systems Ag. Temple end piece for the temple of a spectacle frame. 4,925,291, Cl 351-123.000.
Anten, Lewis; and Rubin, Arnold. Point of purchase display. 4,925,025, Cl. 206-335.000.
Anzai, Masayasu: *See*—
Kobayashi, Shin'ya; and Anzai, Masayasu, 4,926,248, Cl. 358-75.000.
Aoki, Hidehiko; and Kanbara, Yoshihiko, to Kabushiki Kaisha Toshiba. Recording reproducing control circuit for recording apparatus. 4,926,271, Cl. 360-62.000.
Aoki, Kazuo; Moteki, Tsutomu; and Kimura, Kazuhiro, to Chisso Corporation. Machine for press-molding thermoplastic resin. 4,925,381, Cl. 425-145.000.
Aoki, Keiji: *See*—
Chujo, Yoshiki; Aoki, Keiji; Hyodo, Yoshihiko; and Katsuno, Toshiyasu, 4,924,837, Cl. 123-494.000.
Aoki, Kunimitsu: *See*—
Ohshima, Tsuyoshi; and Aoki, Kunimitsu, 4,925,272, Cl. 350-174.000.
Aoki, Shinichi; and Naya, Eizo, to Mitsubishi Denki Kabushiki Kaisha Vacuum breaker. 4,926,017, Cl. 200-144.00B
Aoki, Toshihiro: *See*—
Ogawa, Masahiro; Shimazaki, Tatsuo; Umeda, Osamu; Aoki, Toshihiro; and Nakakusu, Toru, 4,925,295, Cl. 353-57.000.
Aoki, Toshiya; Ishida, Hiroshi; and Fukuoka, Shinsuke, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for producing aliphatic o-arylurethanes. 4,925,971, Cl. 560-137.000.
Aoki, Yutaka: *See*—
Yamada, Shinji; and Aoki, Yutaka, 4,925,730, Cl 428-305.500.
Aoshima, Atsushi: *See*—
Ikeda, Masanori; Miura, Morikazu; and Aoshima, Atsushi, 4,925,961, Cl. 549-521.000.
Aoyagi, Yoshio: *See*—
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,926,404, Cl. 369-32.000.
Aoyama, Motoo: *See*—
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.
Aoyama, Susumu: *See*—
Kanamaru, Hisanobu; Aoyama, Susumu; Koike, Tsutomu; Asahi, Naotatsu; and Hirai, Yoshiki, 4,924,690, Cl. 72-343.000.
AP Parts Manufacturing Company: *See*—
Moring, Walter G., III; and Harwood, Jon W., 4,924,968, Cl. 181-282.000.
Apex Technologies, Inc.: *See*—
Stouky, R. Jon; and Hayhurst, John T., 4,925,496, Cl. 134-22.180.
Apple Computer, Inc.: *See*—
Baker, Paul A.; and Marten, Gary L., 4,926,316, Cl. 364-200.000.
Dhuey, Michael, 4,926,314, Cl. 364-200.000.
Applied Micro Circuits Corporation: *See*—
Coy, Bruce H.; and Rosky, David S., 4,926,065, Cl. 307-475.000.
Applied Vascular Devices: *See*—
Saez, Carlos A.; and Cooper, Robert P., 4,925,449, Cl. 604-227.000.
Apricot S.A.: *See*—
Lo, Shui-Yin, 4,926,436, Cl. 372-73.000.
Arakawa, Satoshi: *See*—
Hosoi, Yuichi; Takahashi, Kenji; and Arakawa, Satoshi, 4,926,045, Cl. 250-327.200.
Aramaki, Minoru; Okamoto, Kimitaka; Sakaguchi, Hiroaki; and Nakamura, Tamio, to Central Glass Company, Limited. Method of preparing alkali metal fluoroalkylsulfonates of high purity. 4,925,975, Cl. 562-113.000.
Arao, Kozo: *See*—
Nakagawa, Katsumi; Ishihara, Shunichi; Kanai, Masahiro; Arao, Kozo; Fujioka, Yasushi; and Sakai, Akira, 4,926,229, Cl. 357-30.000.
Arasin GmbH: *See*—
Glass, Reinhard; and Penzel, Uwe, 4,925,462, Cl. 55-37.000.
Arato, Paul T.: *See*—
Stevenson, James W.; and Arato, Paul T., 4,925,186, Cl. 273-25.000.
Arco Chemical Technology, Inc.: *See*—
Francis, Peter S.; and Chapman, Thomas M., 4,925,606, Cl. 264-50.000.
Arndt, Friedrich: *See*—
Blume, Friedhelm; Dorfmeister, Gabriele; Franke, Wilfried; Rees, Richard; Johann, Gerhard; and Arndt, Friedrich, 4,925,481, Cl. 71-92.000.
Arnone, Joseph A. Spray booth for lacquer. 4,924,801, Cl. 118-58.000.
Arrathoon, Raymond. Method and apparatus for programmable optical crossbar logic array with decoders. 4,926,367, Cl. 364-713.000.
Arreola, Jose L., Jr., to ECM International Inc. Windtrap energy system. 4,926,061, Cl. 290-55.000.
Arsenault, Gilles J., to Polysar Limited. Halogenated-hydrogenated acrylonitrile-butadiene rubber. 4,925,900, Cl. 525-329.300.
ARSOC S.p.r.l.: *See*—
Maes, Felix V.; and Baikrich, Michel, 4,926,438, Cl. 372-109.000.
Arterbury, Roy S.: *See*—
Burroughs, Thomas C.; and Arterbury, Roy S., 4,924,940, Cl. 166-105.100.
Asada, Toru: *See*—
Komuro, Kenichi; Kawai, Taneichi; Kamei, Atsushi; Asada, Toru; Torii, Nozomu; and Fukumoto, Ryoichi, 4,926,332, Cl. 364-424.050.
Asahi Fiber Glass Company Limited: *See*—
Yamatsuta, Kiichi, 4,925,471, Cl. 65-2.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Aoki, Toshiya; Ishida, Hiroshi; and Fukuoka, Shinsuke, 4,925,971, Cl. 560-137.000.
Ikeda, Masanori; Miura, Morikazu; and Aoshima, Atsushi, 4,925,961, Cl. 549-521.000.
Asahi, Naotatsu: *See*—
Kanamaru, Hisanobu; Aoyama, Susumu; Koike, Tsutomu; Asahi, Naotatsu; and Hirai, Yoshiki, 4,924,690, Cl. 72-343.000.
Asai, Koetsu; Nakagawa, Hiroshi; and Tateishi, Mataji, to Mitsubishi Jukogyo Kabushiki Kaisha. Gas feed system for a gas-fired diesel engine. 4,924,822, Cl. 123-27.0GE.
Asai, Yoshiro: *See*—
Hojo, Nobuyoshi; Asai, Yoshiro; Fujioka, Motoo; Kobayashi, Naotou; and Yamaguchi, Takashi, 4,925,510, Cl. 156-92.000.
Asakawa, Shiro: *See*—
Waragai, Katsunori; Saito, Yukihiro; and Asakawa, Shiro, 4,925,612, Cl. 264-154.000.
Asakura, Mikio: *See*—
Fujishima, Kazuyasu; Hidaka, Hideto; Asakura, Mikio; and Matsuda, Yoshio, 4,926,385, Cl. 365-230.030.
Asano, Masao: *See*—
Koshizuka, Kunihiro; Asano, Masao; Tezuka, Toshiaki; Machashi, Tatsuichi; and Tanaka, Yasuhiko, 4,925,735, Cl. 428-423.100.
Asaoka, Keizo: *See*—
Yamagishi, Hideo; Yamaguchi, Minori; Asaoka, Keizo; Hiroe, Akihiko; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,926,230, Cl. 357-30.000.
Asaoka, Takemitsu: *See*—
Tokizawa, Minoru; Asaoka, Takemitsu; Matsuda, Hideaki; and Katori, Tatsuhiko, 4,925,953, Cl. 548-341.000.
Asbury, Charles E., Jr.; Gulati, Monmohan S.; Sherman, Earle C.; and Calvert, Dan V., to H.B. Fuller Company. Apparatus for intermittently applying lengths of thermoplastic tape. 4,925,521, Cl. 156-517.000.
Ashida, Hideo: *See*—
Sugawara, Hideo; and Ashida, Hideo, 4,926,187, Cl 342-361.000.
Ashland Oil, Inc.: *See*—
Brown, Harold R., 4,924,897, Cl. 137-1.000
Ashley, Timothy; Elliott, Charles T.; and White, Anthony M., to Secretary of State for Defence (G.B.). Photoconductive detector arranged for bias field concentration at the output bias contact. 4,926,228, Cl. 357-30.000.
Ashlock Company: *See*—
Cimperman, Fred J., 4,925,691, Cl. 426-485.000.
Ashok, Sankaranarayanan: *See*—
Muench, George J.; Lewis, Brian G.; Ashok, Sankaranarayanan; Watson, William G.; and Cheskis, Harvey P., 4,925,103, Cl 239-79.000.
Asselin, Andre A.; and Schmid, Jean, to American Home Products Corporation. Resolution of (1S,4R)-1-ethyl-1,3,4,9-tetrahydro-4-(phenylmethyl) pyrano[3,4-B]indole-1-acetic acid using hrucine. 4,925,955, Cl. 548-432.000.
Astra Pharmaceutical Production Aktiebolag: *See*—
Jakupovic, Edib; Sourander, Roy T.; Stenhede, Jan U.; and Svensson, Rolf P., 4,925,933, Cl. 540-63.000.
AT&T Bell Laboratories: *See*—
Chung, Yun C., 4,926,429, Cl. 372-32.000.
Levi, Anthony F. J., 4,926,221, Cl. 357-16.000.
Atkins, Richard P.; Wang, Chen-Shih; and Dearlove, Thomas J., to General Motors Corporation. High temperature epoxy tooling composition of bifunctional epoxy, trifunctional epoxy, anhydride, imidazole and interstitially matched filler. 4,925,886, Cl. 523-443.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Atlantic Richfield Company: *See*—
Kolpak, Miroslav M., 4,924,695, Cl. 73-61.10R.
Mazurek, Harry, 4,925,996, Cl. 585-312.000.

Atlas Copco Aktiebolag: *See*—
Svensson, Dick L.; and Soderman, Claes-Erik, 4,924,996, Cl. 198-341.000.

Atochem: *See*—
Dugua, Jacques, 4,925,454, Cl. 23-305.00A.

Atomic Energy of Canada Limited: *See*—
Muth, Walter E.; Joynes, Roger; Cox, Clair A.; Cheadle, Brian A.; Burnett, Don J.; and Adema, Han, 4,925,621, Cl. 376-262.000.

Atsumi, Shigeru: *See*—
Tanaka, Sumio; and Atsumi, Shigeru, 4,926,070, Cl. 307-475.000.

Atsuta, Mitsuru; Sakashita, Takeshi; Miyamoto, Ryoichi; Tanimura, Yukinori; and Fuji, Saburo, to Mitsui Petrochemical Industries, Ltd. Curable compositions for dental drugs having sustained release property. 4,925,660, Cl. 424-81.000.

Atwell, William A.; Pesheck, Peter S.; Krawjecki, Madonna M.; and Anderson, George R., to Pillsbury Company, The. Microwave food products and method of their manufacture. 4,926,020, Cl. 219-10.55M.

Aufderheide, Brian E.; and Hanauer, Gerald G., to W. H. Brady Co. Shielded flexible connector and process therefor. 4,926,007, Cl. 174-36.000.

Auger, Jean-Marc: *See*—
Autier, Philippe; and Auger, Jean-Marc, 4,925,813, Cl. 437-228.000.

Aumueller, Alexander; Neumann, Peter; Spang, Peter; Matzke, Guenter; and Trauth, Hubert, to BASF Aktiengesellschaft. Mixture for stabilizing polyurethanes. 4,925,888, Cl. 524-91.000.

Ausimont S.p.A.: *See*—
Cicuta, Aldo; and Collina, Amilcare, 4,925,712, Cl. 428-35.700.

Auslander, Klaus; Fabris, Hans-Jurgen; Patzwald, Wolfgang; and Seichter, Helmut, to Institut Dr. Forster GmbH & Co. KG. Apparatus for the detection of metal objects located within a poor electrically conductive environment. 4,926,127, Cl. 324-329.000.

Auspelmyer, Wilfred C. Automobile hub mount. 4,925,249, Cl. 301-111.000.

Autier, Philippe; and Auger, Jean-Marc, to U.S. Philips Corporation. Method of manufacturing semiconductor devices including at least a reactive ion etching step. 4,925,813, Cl. 437-228.000.

Auto-Sense, Ltd.: *See*—
Beggs, George; and Speck, Richard, 4,926,170, Cl. 340-904.000.

Automated Packaging Systems, Inc.: *See*—
Lerner, Hershey; and Lerner, Bernard, 4,926,048, Cl. 250-548.000.

Automotive Products plc: *See*—
Barker, David C.; and Leigh-Monstevens, Keith V., 4,924,673, Cl. 60-589.000.

Auvoja, Anders, to Dinol International Aktiebolag. Floating frame. 4,925,160, Cl. 254-101.000.

Avantek, Inc.: *See*—
Maple, Marshall, 4,926,292, Cl. 361-402.000.

Avdel Systems Limited, A British Company: *See*—
Summerlin, Frederick A.; and Hendry, James C., 4,924,691, Cl. 72-391.000.

Avellino, Frank J.; Case, Richard A.; and Swanson, David T., to GTE Products Corporation. Printed circuit assembly with contact dot. 4,925,522, Cl. 156-632.000.

Avery International Corporation: *See*—
Bernard, Margaret; and Berman, Stansliv, 4,925,908, Cl. 526-320.000.
Freedman, Melvin S., 4,925,714, Cl. 428-40.000.

Avrameas, Stratis; and Ternynck, Therese M. F., to Etablissement Declare d'Utilite Publique Dit. Institut Pasteur. Products of coupling biological substances by covalent bonds. 4,925,921, Cl. 530-389.000.

AVS Ing. J.C. Romer GmbH: *See*—
Romer, Joachim C., 4,925,153, Cl. 251-30.010.

Axelrod, Herbert R. Therapeutic device for cleaning the teeth of dogs. 4,924,811, Cl. 119-29.000.

AXIA, Inc.: *See*—
Weizer, Thomas C.; and Cerjak, Thomas P., 4,924,783, Cl. 108-53.300.

Ayello, Jean-Claude; and Serradura, Thierry, to Crouzet. Permanent connection public telephone appliance. 4,926,466, Cl. 379-143.000.

Azukizawa, Teruo: *See*—
Morishita, Mimpei; and Azukizawa, Teruo, 4,924,778, Cl. 104-284.000.

Baba, Tsuyoshi; Takigawa, Akio; Hirayama, Naoto; and Yoshida, Motoaki, to Nippon Sheet Glass Co., Ltd. Laminated structure. 4,925,737, Cl. 428-437.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Tachi, Takahiro; Kato, Akira; Kawagoshi, Hiroshi; Yamashita, Hisao; and Kamo, Tomoichi, 4,925,825, Cl. 502-309.000.

Babcock & Wilcox Company, The: *See*—
Doyle, John B., 4,925,633, Cl. 422-171.000.
Mizerak, Dennis S., 4,926,290, Cl. 361-380.000.

Bacardit, Juan S.; and Guasch, E. Cortes, to Bendix Espana. Recirculating ball mechanism. 4,924,722, Cl. 74-459.000.

Baddour, Raymond F.: *See*—
Klausner, Mitchell; Manning, Michael P.; and Baddour, Raymond F., 4,925,698, Cl. 427-2.000.

Badinger, Michael A.: *See*—
Beal, James B., and Badinger, Michael A., 4,924,937, Cl. 165-96.000.

Bahl, Harsh V.; and Sheets, Laurence L., to Rockwell International Corporation. Longitudinal balance system. 4,926,473, Cl. 379-416.000.

Bahls, Jerold O.: *See*—
Charbonneau, Jack W.; and Bahls, Jerold O., 4,925,517, Cl. 156-276.000.

Baikrich, Michel: *See*—
Maes, Felix V.; and Baikrich, Michel, 4,926,438, Cl. 372-109.000.

Bailey, Denis M.; D'Ambra, Thomas E.; and Ezrin, Alan M., to Sterling Drug Inc. Pyridinyl-1H-pyrazole-1-alkanamides as antiarrhythmic agents. 4,925,857, Cl. 514-341.000.

Bailey, Webb I.: *See*—
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,925,992, Cl. 570-130.000.

Bailie, David A., to Fisher Group Inc., The. Awning cover. 4,924,895, Cl. 135-89.000.

Baker, A. Leroy. Printing plate mounting device and method. 4,925,506, Cl. 156-64.000.

Baker, Bruce D.; Corey, Robert L.; Adams, John A.; and Ross, Edward W., to Four PI Systems Corporation. Automated laminography system for inspection of electronics. 4,926,452, Cl. 378-22.000.

Baker, Craig A.: *See*—
Simmel, Thomas L.; and Baker, Craig A., 4,924,921, Cl. 141-286.000.

Baker, Gerald S., to Cameron Iron Works USA, Inc. Gate valve with supplemental actuator. 4,925,154, Cl. 251-58.000.

Baker, James G., to Polaroid Corporation. Zoom lens. 4,925,281, Cl. 350-423.000.

Baker, Keith H.; Snyder, Stephen W.; and Clauss, Allen D., to Procter & Gamble Company, The. Pouched granular detergent compositions containing hygroscopic builders. 4,925,586, Cl. 252-90.000.

Baker, Mark A.; and Anderson, C. John, to Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence. Foamed nitroparaffin explosive composition. 4,925,505, Cl. 149-89.000.

Baker, Paul A.; and Marten, Gary L., to Apple Computer, Inc. Memory management unit with overlapping control for accessing main memory of a digital computer. 4,926,316, Cl. 364-200.000.

Baker, Paulette, to Synthetic Products Company. Molded vinyl halide resin (PVC) flooring compositions having reduced water absorption. 4,925,883, Cl. 524-287.000.

Baker, Raymond; Leeson, Paul D.; Ludduwahetty, Tamara; and Williams, Brian J., to Merck Sharp & Dohme Ltd. Hydrocarbon substituted pyrrolidinones, intermediates therefor, and anti-convulsant use thereof. 4,925,867, Cl. 514-425.000.

Baldwin, Robert W.: *See*—
Byers, Vera S.; Baldwin, Robert W.; and Scannon, Patrick J., 4,925,922, Cl. 530-391.000.

Ball, Keith V., to Schering Agrochemicals Limited. Cartridge. 4,925,030, Cl. 206-487.000.

Balloon Wrap, Inc.: *See*—
Oyler, Lynn R., 4,924,919, Cl. 141-10.000.

Bando Chemical Industries, Ltd.: *See*—
Itokazu, Yuji; and Nishihira, Koichi, 4,925,898, Cl. 525-305.000.

Banjo, Toshinobu; Ueda, Tetsuya; and Onoda, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Connector in external device for connection to IC card. 4,926,034, Cl. 235-492.000.

Bannai, Hiroyuki, to Alps Electric Co., Ltd. Cable reel. 4,925,122, Cl. 242-85.000.

Baran, Richard J.: *See*—
Neches, Philip M.; Hartke, David H.; Baran, Richard J.; Woodcock, Darryl L.; and Papachristidis, Alexandros C., 4,925,311, Cl. 364-200.000.

Baranyi, Giuseppa; Hor, Ah-Mee; Loutfy, Rafik O.; and Popovic, Zoran D., to Xerox Corporation. Pyranthrone photoconductor imaging members. 4,925,760, Cl. 430-59.000.

Baratz, Alan E.; and Grover, George A., to International Business Machines Corporation. Control point session synchronization in a network. 4,926,414, Cl. 370-31.000.

Barbera, Giorgio, to Officine Meccaniche Pavesi & C.S.p.A. Device for the automatic change-over of the form in a coil winder for forming the winding of a dynamo-electric machine. 4,925,118, Cl. 242-1.10R.

Bardot, Colette; Bergez, Pierre; Eyraud, Charles; and Ilahiane, Lahcen, to Commissariat A L'Energie Atomique. Ultrafiltration, hyperfiltration or demineralization element, its production process and its use for the treatment of liquid radioactive effluents. 4,925,566, Cl. 210-651.000.

Bares, Jan, to Xerox Corporation. Particle transport. 4,926,217, Cl. 355-253.000.

Bargeman, Derk: *See*—
te Hennepe, Hendrikus J. D.; Mulder, Marcellinus H. V.; Smolders, Cornelis A.; Bargeman, Derk; and Schroder, George A. T., 4,925,562, Cl. 210-500.250.

Barker, David C.; and Leigh-Monstevens, Keith V., to Automotive Products plc. Master cylinder with parallel-bore reservoir. 4,924,673, Cl. 60-589.000.

Barker, Fred E. Three-wheeled pedal-propelled cycle with front and rear brakes. 4,925,202, Cl. 280-261.000.

Barker, Robert B.: *See*—
Adams, Earl G.; and Barker, Robert B., 4,925,565, Cl. 210-634.000.

Barnes, Darryl K.: *See*—
Green, George D.; Munk, Stephen A.; and Barnes, Darryl K., 4,925,906, Cl. 526-245.000.

Barnes, Frank S., to University of Colorado Foundation, Inc. Superconductor devices for disk drives. 4,926,082, Cl. 310-90.500.

Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., to Advanced Micro Devices, Inc. Streamlined instruction processor. 4,926,323, Cl. 364-200.000.

Barraud, Andre; Richard, Joel; and Vandevyver, Michel, to Commissariat a l'Energie Atomique. Microlithographic process for producing circuits using conductive organic films sensitive to electromagnetic radiation and to charged particles, as well as to the circuits and components obtained by this process. 4,925,774, Cl. 430-296.000.

Barrett, Harold R. Newspaper delivery signal. 4,925,090, Cl. 232-34.000.

Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., to Frito-Lay, Inc. Method for producing high solids filling material. 4,925,694, Cl. 426-613.000.

Barsumian, Bruce R. Transducer assembly for automatic message system. 4,926,486, Cl. 381-152.000.

Bartasis, James E., to Bodigard Technologies, Inc. Multilayer film for chemical protective clothing. 4,924,525, Cl. 2-2.000.

Barth, C. Peter: *See*—
Konieczynski, Ronald D.; Pintelon, Jo; Holland, Robert J.; Barth, C. Peter; and Gell, Jeff, 4,925,101, Cl. 239-8.000.

Bartlett, Alan L., to Detex Corporation. Apparatus and method for the generation of directionally perceptible sound. 4,926,159, Cl. 340-384.00E.

Bartmann, Wilhelm: *See*—
Kesseler, Kurt; Beck, Gerhard; Bartmann, Wilhelm; and Granzer, Ernold, 4,925,852, Cl. 514-333.000.

Barton, James T.; and Walker, Jimmy P., to Eastman Kodak Company. Linear printhead writer assembly. 4,926,198, Cl. 346-155.000.

BASF Aktiengesellschaft: *See*—
Aumueller, Alexander; Neumann, Peter; Spang, Peter; Matzke, Guenter; and Trauth, Hubert, 4,925,888, Cl. 524-91.000.
Boeckh, Dieter; Seelmann-Eggebert, Hans-Peter; Hartmann, Heinrich; Trieselt, Wolfgang; and Baur, Richard, 4,925,905, Cl. 526-208.000.
Dotzauer, Bernhard; Kast, Hans; Beckerle, Wilhelm F.; and Hummerich, Rainer, 4,925,529, Cl. 162-152.000.
Franz, Lothar; Eggersdorfer, Manfred; and Voges, Dieter, 4,925,940, Cl. 544-315.000.
Heinz, Gerhard, 4,925,910, Cl. 528-171.000.
Hoffmann, Gerhard, 4,925,775, Cl. 430-306.000.
Huemmer, Wolfgang; Bronstert, Bernd; Littmann, Dieter; and Zuerger, Manfred, 4,925,769, Cl. 430-271.000.
Kanter, Hartmut; and Ort, Burkhard, 4,925,946, Cl. 544-250.000.
Krabetz, Richard; Duembgen, Gerd; Nees, Friedbert; Merger, Franz; and Fouquet, Gerd, 4,925,823, Cl. 502-211.000.
Lechtken, Peter; Hoercher, Ulrich; and Jessel, Barbara, 4,925,960, Cl. 549-412.000.
Mackenroth, Wolfgang; Hoelderich, Wolfgang; Becker, Rainer; and Seufert, Walter, 4,925,991, Cl. 568-908.000.
Maerkl, Robert; and Harder, Wolfgang, 4,925,972, Cl. 560-206.000.
Naarmann, Herbert; and Koehler, Gernot, 4,925,897, Cl. 525-285.000.
Ostertag, Werner; Czech, Erwin; Schmitt, Franz-Ulrich; and Schulze-Hagenest, Detlef, 4,925,762, Cl. 430-106.600.
Patsch, Manfred; Epple, Gerhard; Flohr, Helmut; Degen, Helmut; and Nahr, Uwe, 4,925,954, Cl. 548-417.000.
Rueb, Lothar; Eicken, Karl; Pander, Hans J.; Plath, Peter; Schwalge, Barbara; Wuerzer, Bruno; and Meyer, Norbert, 4,925,484, Cl. 71-96.000.
Wagner, Klaus; Rieber, Norbert; Pommer, Ernst-Heinrich; and Dressel, Juergen, 4,925,476, Cl. 71-27.000.

BASF Corporation: *See*—
McAleese, David L., 4,925,567, Cl. 210-656.000.

Bashour, Daniel A.: *See*—
Giannini, Robert P.; and Bashour, Daniel A., 4,925,674, Cl. 424-469.000.

Basile, Pauline R. Toilet having hygienic cleaning apparatus. 4,924,534, Cl. 4-447.000.

Bastyr, Charles A.: *See*—
Stires, John C., III; and Bastyr, Charles A., 4,926,192, Cl. 346-33.0TP.

Bateman, Robert, to Trison Associates Incorporated. Coach seat locking mechanism. 4,925,227, Cl. 296-65.100.

Bateson, George F.; Chresand, Thomas J.; Moore, Joel D.; and Nayes, Terrence L., to BioTrol, Inc. Arrangement for water purification. 4,925,552, Cl. 210-150.000.

Batesville Casket Company, Inc.: *See*—
Craft, William K., 4,925,223, Cl. 292-339.000.

Batruni, Roy G.; and Wilson, Howard A., to National Semiconductor Corporation. Reduction of signal processing requirements in a 2B1Q-code echo canceller or equalizer. 4,926,472, Cl. 379-411.000.

Battelle Memorial Institute: *See*—
Schneider, Michel; Guillot, Christian; and Lamy, Bernard, 4,925,818, Cl. 502-7.000.

Battery Technologies Inc.: *See*—
Kordesch, Karl; and Tomantschger, Klaus, 4,925,747, Cl. 429-59.000.

Battin, Jeffrey A.: *See*—
Shirley, Thomas F., Jr.; Ruppel, John S.; Zuiss, Thomas J.; and Battin, Jeffrey A., 4,926,497, Cl. 455-67.000.

Baty, Kurt F.: *See*—
Long, William L.; Wambach, Robert F.; Baty, Kurt F.; Lamb, Joseph M.; and McNamara, John E., 4,926,315, Cl. 364-200.000.

Bauer, Klaus: *See*—
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, 4,925,478, Cl. 71-90.000.
Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,925,480, Cl. 71-91.000.

Baur, Richard: *See*—
Boeckh, Dieter; Seelmann-Eggebert, Hans-Peter; Hartmann, Heinrich; Trieselt, Wolfgang; and Baur, Richard, 4,925,905, Cl. 526-208.000.

Bausch, Paul; and Hemmer, Hans-Peter, to General Motors Corporation. Hydraulic unit for a motor vehicle. 4,924,670, Cl. 60-418.000.

Baxter International Inc.: *See*—
Hale, Ron L.; and Wieder, Irwin, 4,925,804, Cl. 436-501.000.
Soubrier, Pierre; and Desmet, Bernard, 4,924,891, Cl. 134-64.00R.

Baxter Travenol Laboratories, Inc.: *See*—
Orkin, Fredric I.; Liber, Theodore; Smith, Charles R.; Knowlton, Kimball J.; and Huntley, Albin, 4,925,444, Cl. 604-80.000.
Posey, John L., 4,924,655, Cl. 53-128.000.

Bayer Aktiengesellschaft: *See*—
Kress, Hans-Jurgen; Lindner, Christian; Muller, Friedemann; Peters, Horst; Wittmann, Dieter; and Buekers, Josef, 4,925,891, Cl. 524-139.000.
Mais, Franz-Josef; and Fiege, Helmut, 4,925,994, Cl. 570-210.000.
Stroech, Klaus; Frie, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,925,482, Cl. 71-92.000.
Stroech, Klaus; Frie, Monika; Himmler, Thomas; and Plempel, Manfred, 4,925,865, Cl. 514-383.000.

Bayles, Richard W.; Boyle, Francis T.; Gravestock, Michael B.; and Wapdlewopth, James M., to Imperial Chemical Industries PLC. Antifugal azole compounds. 4,925,863, Cl. 514-383.000.

Bays, F. Barry; Trott, Arthur F.; and Marchand, Sam R., to Concept, Inc. Repair tack for bodily tissue. 4,924,865, Cl. 606-77.000.

Bazaral, Michael G., to Cleveland Clinic Foundation, The. Catheter package. 4,925,448, Cl. 604-171.000.

BCS S.p.A.: *See*—
Bernardi, Guido, 4,924,961, Cl. 180-374.000.

Beal, James B.; and Badinger, Michael A., to Martin Marietta Corporation. Enhanced electrostatic cooling apparatus. 4,924,937, Cl. 165-96.000.

Beard, James R. Traffic marker with hanger. 4,925,334, Cl. 404-9.000.

Beard, William R.; and Scull, Herbert M., to Ethyl Corporation. Trimethylaluminum process. 4,925,962, Cl. 556-187.000.

Beatty, Christopher C., to Hewlett-Packard Company. Method for forming tungsten structures in a semiconductor. 4,925,524, Cl. 156-643.000.

Beaudet, Alain B. Pet restrainer for passenger vehicles. 4,924,814, Cl. 119-96.000.

Beaudoin, Henry J.; Lammers, Donald W.; and McCabe, John A., to Curt G. Joa, Inc. Apparatus for applying an elastic waistband transversely of a longitudinally moving web. 4,925,520, Cl. 156-494.000.

Beaulieu, Bryan J.; and Sorenson, Gary R., to Skyline Displays, Inc. Portable exhibit display header. 4,926,294, Cl. 362-125.000.

Bechtel, Friend K.; and Allen, James R., to Metriguard, Inc. Nondestructive testing methods for lumber. 4,926,350, Cl. 364-550.000.

Beck, Gerhard: *See*—
Kesseler, Kurt; Beck, Gerhard; Bartmann, Wilhelm; and Granzer, Ernold, 4,925,852, Cl. 514-333.000.

Becker, Abram: *See*—
Stollar, Hayman; and Becker, Abram, 4,925,642, Cl. 423-364.000.

Becker, Rainer: *See*—
Mackenroth, Wolfgang; Hoelderich, Wolfgang; Becker, Rainer; and Seufert, Walter, 4,925,991, Cl. 568-908.000.

Beckerle, Wilhelm F.: *See*—
Dotzauer, Bernhard; Kast, Hans; Beckerle, Wilhelm F.; and Hummerich, Rainer, 4,925,529, Cl. 162-152.000.

Becton, Dickinson and Company: *See*—
Khan, Mohammad A.; Solomon, Donald D.; and Byron, Matthew P., 4,925,668, Cl. 424-422.000.

Bedford, Clifford D.: *See*—
Harris, Ralph N., III; Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A.; Koolpe, Gary A.; and Pick, Robert O., 4,925,856, Cl. 514-341.000.

Bedinger, John M.: *See*—
Larson, Brad W.; Hockersmith, Dan; Taylor, Thomas H.; Bedinger, John M.; Kottman, Rick; and Pebley, Steve, 4,925,167, Cl. 269-112.000.

Beebe, Russell B., to IceAlert, Inc. Method and apparatus for advance warning signalling to a motorist of an ice condition on a driving surface. 4,926,[illegible]3, Cl. 340-581.000.

Beecham Group p'LC: *See*—
Smith, Stephen A.; and Markwell, Roger E., 4,925,853, Cl. 514-338.000.

Beggs, George; and Speck, Richard, to Auto-Sense, Ltd. Object detection method and apparatus employing electro-optics. 4,926,170, Cl. 340-904.000.

Beijersbergen Van Henegouwen, Cornelis: *See*—
Ouwerkerk, Cornelis; and Beijersbergen Van Henegouwen, Cornelis, 4,926,411, Cl. 369-291.000.

Bell, John L.: *See*—
Spruce, Brian; Welsby, David P.; and Bell, John L., 4,924,587, Cl. 29-723.000.

Bell, Robert K., to General Electric Company. Multi-function modulation and center frequency control port for voltage controlled oscillator. 4,926,144, Cl. 332-124.000.

Bell, Ross A. Portable firearm rest. 4,924,616, Cl. 42-94.000.

Bellas, George T.; Snedden, Richard B.; Lennon, Dennis R.; and Foster, Edward P., to International Coal Refining Company. Firing of pulverized solvent refined coal. 4,924,784, Cl. 110-261.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Beloit Corporation: *See*—
Crouse, Jere W.; and Olson, Stewart B., 4,925,080, Cl. 226-196.000.
Beltone Electronics Corporation: *See*—
Anderson, James R., and Brander, Richard, 4,926,139, Cl. 330-294.000.
Ben-Or, Michael: *See*—
Goldwasser, Shafi; Kilian, Joseph; Wigderson, Avi; and Ben-Or, Michael, 4,926,479, Cl. 380-23.000.
Bendix Espana *See*—
Bacardit, Juan S., and Guasch, E. Cortes, 4,924,722, Cl. 74-459.000.
Bendix France: *See*—
Picot, Pascal; and Carre, Jean-Jacques, 4,925,251, Cl 303-22.100.
Benenowski, Sebastian: *See*—
Ziethen, Rudiger; Benenowski, Sebastian; Kais, Alfred; and Nuding, Erich, 4,925,135, Cl. 246-436.000.
Benjamin, Peter C.. *See*—
Masters, Edward R.; and Benjamin, Peter C., 4,926,297, Cl 362-162.000.
Benner, Mark M.: *See*—
Rogakos, Deno J.; Buchanan, Harry C., Jr., and Benner, Mark M., 4,924,726, Cl. 74-600.000.
Bennett, Edward O., to OXID, Incorporated. Methods and compositions for potentiating the activity of antimicrobal agents in industrial water based fluids. 4,925,582, Cl. 252-49.300.
Benninger AG: *See*—
Machau, Susanne, 4,924,545, Cl 8-151.000.
Benoit, Roland A Child's crib. 4,924,539, Cl. 5-100.000.
Bentley, Roger T : *See*—
Licht, Brigitte H.; Bentley, Roger T., and Schell, Frederick S., 4,925,988, Cl. 568-625.000.
Benton, William M.; and Mee, William, to Moneyfax, Inc. Apparatus for carrying out financial transactions via a facsimile machine 4,926,325, Cl. 364-408.000.
Bercaw, Willis M System for conditioning grain. 4,924,601, Cl. 34-46.000.
Berendsen, Carol. Layout system for construction foundation placement 4,924,579, Cl. 33-1.0LE.
Berg, Lloyd, to Berg, Lloyd Separation of vinyl acetate from ethyl acetate by extractive distillation with acids or acid amides 4,925,533, Cl. 203-51.000.
Berg, Richard A.. *See*—
Silver, Frederick H., Berg, Richard A.; Doillon, charles J., Chernomorsky, Arkady; and Olson, Robert M., 4,925,924, Cl. 530-356.000.
Bergemont, Albert, to SGS-Thomson Microelectronics S.A Dynamic memory of the integrated circuit type. 4,926,223, Cl 357-23.600.
Bergendahl, Hans-Georg; Zech, Kurt, and Zisselmar, Raimund, to Maschinenfabrik Koppern GmbH & Co. KG Roller press for compacting fine-grained salts into sheets 4,925,382, Cl 425-367.000.
Berger, Abe: *See*—
Harris, James E., Berger, Abe; Chopdekar, Vilas M.; Matzner, Markus; and Spaniswick, James, 4,925,916, Cl. 528-353.000.
Bergez, Pierre: *See*—
Bardot, Colette; Bergez, Pierre; Eyraud, Charles; and Ilahiane, Lahcen, 4,925,566, Cl 210-651.000.
Bergh, Michel L. E., Hubbard, S. Catherine, and Rasmussen, James R., to Massachusetts Institute of Technology Method for enhancing glycoprotein stability 4,925,796, Cl 435-97.000.
Bergman, Norman J *See*—
O'Dea, Kevin J., Dolan, Donald T.; and Bergman, Norman J., 4,924,804, Cl 118-669.000.
Berlekamp, Elwyn R *See*—
Tong, Po; Berlekamp, Elwyn R.; Currie, Robert J.; and Rushforth, Craig K., 4,926,1n9, Cl. 340-825.570
Berlin, Goran. Dental instrument. 4,925,391, Cl 433-31.000.
Berman, Stansliv: *See*—
Bernard, Margaret; and Berman, Stansliv, 4,925,908, Cl. 526-320.000.
Bernard, Margaret, and Berman, Stansliv, to Avery International Corporation Acrylic based emulsion polymers 4,925,908, Cl. 526-320.000.
Bernard, Walter *See*—
Renker, Horst, and Bernard, Walter, 4,924,593, Cl. 33-324.000
Bernardi, Guido, to BCS S.p.A. Vehicle for gardening and agricultural work 4,924,961, Cl 180-374.000
Bernardi, Robert J *See*—
Advani, Jai K.; and Bernardi, Robert J., 4,926,459, Cl. 379-52.000.
Bernardon, Jean-Michel: *See*—
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 4,925,658, Cl. 424-70.000.
Bernays, Robert L., Jr Water bowl fountain. 4,924,812, Cl 119-76.000.
Bernett, Frank, to Digital Equipment Corporation. Tuned array vibration absorber 4,924,976, Cl. 188-378.000.
Berrod, Gerard; Charmot, Dominique; Gresser, Robert; and Guerin, Gilles, to Rhone-Poulenc Chimie. Antisoiling and anti-redeposition latices for the aqueous washing of textile articles. 4,925,588, Cl. 252-174.230.
Berson, William; Gluck, Julius, Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., to Pitney Bowes Inc. Thermal transfer ribbon cartridge including ribbon perforating means. 4,926,193, Cl. 346-76.0PH
Bertagnoli, Eugeio: *See*—
Tedioli, Pier G., 4,925,150, Cl. 241-169.100
Berthaut, Olivier. *See*—
Fourche, Jean-Pierre; Legrand, Guy; Faivre, Michel; and Berthaut, Olivier, 4,925,420, Cl. 445-3.000.
Bertholet, Raymond; and Hirsbrunner, Pierre, to Nestec S.A Preparation of double sulfate salt of desoxyfructosyl serotonin and creatinine. 4,925,932, Cl. 536-55.300.
Berti, Martin; and Frei, Max, to SIG Schweizerische Industrie-Gesellschaft. Method and circuitry for controlling the operation of a packing machine. 4,924,657, Cl. 53-450.000.
Bertram, James L.; Walker, Louis L.; and Muskopf, John W., to Dow Chemical Company, The. Latent, curable, catalyzed mixtures of epoxy-containing and phenolic hydroxyl-containing compounds. 4,925,901, Cl. 525-482.000.
Bertsche, Peter. Connector member for wood construction work 4,925,331, Cl. 403-267.000.
Berube, Donald N.; and Datta, Amitava, to EG&G Sealol, Inc. Bellows core and method and apparatus for fabrication thereof. 4,924,756, Cl. 92-45.000.
Beta Group, The. *See*—
Zider, Robert B., 4,925,132, Cl. 244-118.100
Betka, Malcolm; and Cross, Robert Infant's niug. 4,925,052, Cl. 220-90.400.
Beuchat, Charles E.: *See*—
Imonti, Maurice M., and Beuchat, Charles E., 4,925,450, Cl 604-240.000.
Bevis, Michael J.: *See*—
Allan, Peter S., and Bevis, Michael J., 4,925,161 Cl. 264-69.000.
Beyer, Otto; and Kirst, Bertold, to LITEF GmbH Method and apparatus for stabilizing high-dynamics devices. 4,924,749, Cl. 89-41.090.
Beyer, Rudolf; Heerdt, Lutz-Peter; and Schemel, Roland, to Schaudt Maschinenbau GmbH Circular grinding machine. 4,924,632, Cl. 51-105.00R.
Bhagwat, Anil G., to Xerox Corporation. Sealing arrangement for a toner dispensing cartridge 4,924,920, Cl. 141-98.000.
Bibl, Andreas; Higginson, John; and Gardner, Deane, to Rastergraphics, Inc. High resolution electrostatic plotter, printer or the like incorporating a stationary writing head. 4,926,199, Cl 346-157.000.
BICC Public Limited Company *See*—
McGhie, Terence V., 4,926,282, Cl 361-102.000.
Bieringer, Hermann *See*—
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, 4,925,478, Cl. 71-90.000.
Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,925,480, Cl. 71-91.000.
Biermann, Manfred, Koester, Rita, and Eierdanz, Horst, to Henkel Kommandtgesellschaft auf Aktien. Use of derivatives of tricyclo-(5.2.1.02,6)-dec-3-ene as frothers in the flotation of coal and ores. 4,925,559, Cl 209-166.000.
Bierschenk, Thomas R.. *See*—
Juhlke, Timothy J.; Bierschenk, Thomas R.; and Lagow, Richard J., 4,925,583, Cl. 252-58.000.
Billard, Didier, and Poquillon, Bernard, to U.S. Philips Corporation. Image processing system. 4,926,259, Cl 358-105.000.
Billman, Elizabeth R *See*—
Mehrotra, Pankaj K., and Billman, Elizabeth R 4,925,458, Cl 51-293.000.
Bingham, Lynn R., to Pizza Hut Compact pizza oven. 4,924,763, Cl 99-339.000.
Biometrak Corporation: *See*—
Chamoun, Nassib G., 4,924,875, Cl 128-696.000
BioQuant, Inc.: *See*—
Schramm, Willfried, 4,925,629, Cl 422-82.050.
Biotechnica Diagnostics, Inc.. *See*—
Wang, Chang-Ning J.; and Klotz, Lynn C., 4,925,785, Cl. 435-6.000
Biotest AG: *See*—
Uthemann, Horst, 4,925,786, Cl 435-7.000.
BioTrol, Inc.: *See*—
Bateson, George F.; Chresand, Thomas J.; Moore, Joel D., and Nayes, Terrence L., 4,925,552, Cl. 210-150.000.
Birgel, Walter: *See*—
Farassat, Farhad; and Birgel, Walter, 4,925,083, Cl. 228-102.000
Bischof, Stefan; Lohrmann, Gerhard; and Setz, Michael, to Mannesmann Aktiengesellschaft. Transport device for edge-perforated recording support material. 4,925,326, Cl. 400-616.100.
Bishop, Robert J Sectional shock absorbing and motorist warning highway barriers. 4,925,333, Cl. 404-6.000.
Bisso, Guillermo; and Melelli, Federico. Process for preserving the phosphorylating activity of yeast, applied to the production of fructose-1,6-diphosphate 4,925,801, Cl 435-255.000.
Bixler, Dickie R.; and Sutter, Phillip R Portable corral. 4,924,813, Cl. 119-82.000.
Bjerga, Erling: *See*—
Spiotta, Mark G.; and Bjerga, Erling, 4,926,475, Cl 380-2.000
Black & Decker Inc.. *See*—
Hock, Thomas H., O'Banion, Michael L.; Koehler, Heinrich P. F., and Wynes, Joseph, 4,924,633, Cl. 51-135.00R
Johnson, Paul D., 4,924,922, Cl. 141-346.000.
Blacker, John: *See*—
Lehn, Jean M.; Jazwinski, Jaroslaw; and Blacker, John, 4,925,937, Cl. 540-477.000.
Blair, Bryce W.; Norton, Jeffrey M., and Stahl, Daniel E., to AMP Incorporated. ESD protected electrical connector and ESD grounding clip therefor, and circuit panel connector assembly and method of assembling same. 4,925,400, Cl. 439-374.000.
Blanch, Harvey W.; Randolph, Theodore; and Wilke, Charles R., to University of California, The Regents of the. Method of producing products by enzyme-catalyzed reactions in supercritical fluids. 4,925,790, Cl 435-52.000

Blander, Milton; and Sinha, Shome N. Removal of copper from ferrous scrap. 4,925,488, Cl. 75-562.000.
Blonsky, Peter M.: *See*—
Fauteux, Denis G.; Moore, Michael J.; and Blonsky, Peter M., 4,925,752, Cl. 429-191.000.
Blosser, Charles H., to Peabody Coal Company. Conveyor belt cleaner and method for cleaning a conveyor belt. 4,925,008, Cl. 198-497.000.
Blume, Friedhelm; Dorfmeister, Gabriele; Franke, Wilfried; Rees, Richard; Johann, Gerhard; and Arndt, Friedrich, to Schering Aktiengesellschaft. Substituted bicyclic triazole herbicides. 4,925,481, Cl. 71-92.000.
Blume, Linda A.; Henn, Kathy Y.; and Osher, John D. Illuminated carrying bag. 4,926,296, Cl. 362-156.000.
Blutharsch, Walter: *See*—
Rudolf, Boris; and Blutharsch, Walter, 4,924,635, Cl. 51-170.00R.
Boart (UK) Limited: *See*—
Foster, Bruce A. G. E.; Ollerenshaw, Andrew; and Copestake, Nigel W., 4,925,320, Cl. 384-42.000.
Boccara, Alberr-Claude: *See*—
Fournier, Daniele; Charbonnier, Francois; and Boccara, Alberr-Claude, 4,926,057, Cl. 250-578.100.
Bochman, Harry L., Jr., to Hi-Shear Corporation. Quick release and exchange socket drive. 4,924,734, Cl. 81-57.120.
Bock, Hans-Christian; Kaul, Karlheinz; and Schaefer, Willi, to Siemens Aktiengesellschaft. X-ray examination table. 4,926,456, Cl. 378-177.000.
Boda, James C., to Brunswick Corporation. Tilt mechanism lock for outboard motors. 4,925,410, Cl. 440-55.000.
Bodelson, Berth, to Alfa-Laval Separation AB. Operating system for centrifugal separator 4,925,442, Cl. 494-40.000.
Bodenseewek Geratetechnik GmbH: *See*—
Renker, Horst; and Bernard, Walter, 4,924,593, Cl. 33-324.000.
Bodigard Technologies, Inc.: *See*—
Bartasis, James E., 4,924,525, Cl. 2-2.000.
Bodo , Gyorgy; Knoll, Jozsef; Somfai, Eva; Virag, Sandor; and Zak, Ferenc, to Chinoin Gyogyszer- Es Vegyeszeti Termekek Gyara Rt. Method to prevent seasickness. 4,925,878, Cl. 514-646.000.
Boeckh, Dieter; Seelmann-Eggebert, Hans-Peter; Hartmann, Heinrich; Trieselt, Wolfgang; and Baur, Richard, to BASF Aktiengesellschaft. Preparation of water-soluble copolymers based on monoethylenically unsaturated carboxylic acids. 4,925,905, Cl. 526-208.000.
Boeckmann, Hugo: *See*—
Van Erden, Donald L.; and Boeckmann, Hugo, 4,925,316, Cl 383-61.000.
Boegeman, Dwight E.; Lowenstein, Carl D.; and Spiess, Fred N., to University of California, The Regents of the. Method and system for measuring sound velocity. 4,926,395, Cl 367-89.000.
Boehmer, Dennis A.; and Williams, James W., to Vernay Laboratories, Inc. Fuel filler pipe seal. 4,924,923, Cl. 141-312.000.
Boehringer Mannheim GmbH: *See*—
Klein, Christian; and Kirch, Peter, 4,925,945, Cl. 546-292.000.
Mertens, Alfred; von der Saal, Wolfgang; Kling, Lothar; and Muller-Beckmann, Bernd, 4,925,845, Cl. 514-254.000.
Boeing Company, The: *See*—
Childress, James J.; and Holtrop, John, 4,925,057, Cl. 220-426.000.
Fuller, Robert L., Jr., 4,924,998, Cl. 198-365.000.
Keene, Howard F.; and Wyckoff, Frank M. 4,924,757, Cl. 92-128.000.
Kucera, Lawrence P.; and Thompson, Michael P., 4,926,356, Cl. 364-557.000.
Pinson, George T., 4,926,107, Cl. 322-4.000.
Bogeso, Klaus P.; Jensen, Klaus G.; Moltzen, Ejner K.; and Pedersen, Henrik, to H. Lundbeck A/S Oxazole and thiazole derivatives and their use for treating disorders caused by malfunction of AcCh 4,925,858, Cl. 514-342.000.
Bohlmann, Rolf; Laurent, Henry; Henderson, David; and Nishino, Yukishige, to Schering Aktiengesellschaft 3-methylene-4-androsten-17-ones, process for their production and pharmaceutical preparations containing them. 4,925,834, Cl 514-177.000.
Bohn, Horst; and Grimm, Rainer, to Rockwell-Golde G.m.b.H Rigid cover for the roof of a vehicle 4,925,237, Cl 296-216.000.
Bolin, William B.: *See*—
McCown, William B., Jr., and Bolin, William B., 4,925,345, Cl. 405-232.000.
Bolton, Laura L.: *See*—
Friedhoff, Lawrence T.; and Bolton, Laura L., 4,925,873, Cl. 514-469.000.
Bondeson, Anders, Isaak, Bernhard; Perrenoud, Andre; and Tran, Minh Q., to Centre for Recherches En Physique Des Plasmas High-performance gyrotron for production of electromagnetic millimeter or submillimeter waves. 4,926,094, Cl 315-5.000.
Bonee, Peter A.: *See*—
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J., Bonee, Peter A.; and Shepard, Robert R., 4,926,462, Cl. 379-67.000.
Bonfiglioli, Silverio; and Stagni, Rino, to WEBER s.r.l Integral device for forming and metering a mixture of air and fuel in an internal combustion engine fed by a multipoint injection system 4,924,834, Cl. 123-470.000.
Bonnamas, Claude: *See*—
Massonneau, Viviane; Mulhauser, Michel; Bonnamas, Claude; and Rouy, Noel, 4,925,949, Cl 548-336.000.
Bonnard, John A. Calorimetric apparatus. 4,925,315, Cl. 374-31.000.
Bonner, Ben V., to A.T. & G Company, Inc. Gripping screw drive bit 4,924,736, Cl. 81-448.000.
Bonney, L. H.: *See*—
Meuser, William E.; LaRue, Gary W.; Harris, Windel L.; Donahue, James A.; Bonney, L. H.; and Glanton, Gene W., 4,925,532, Cl. 202-219.000.
Boots Company, PLC: *See*—
Housley, John R.; Jeffery, James E.; Johnston, David N.; and Sargent, Bruce J., 4,925,879, Cl. 514-650.000.
Borchardt, Richard R.; Gingerich, Richard G W.; and Miller, Michael J., to GTE Products Corporation. Method for producing cadmium free green emitting CRT phosphor. 4,925,593, Cl. 252-301.60S
Borcher, Thomas A., Sr.; Delgado, Rodolfo; and Trinh, Toan, to Procter & Gamble Company, The. Soil release polymer compositions having improved processability. 4,925,577, Cl. 252-8.900.
Boreland, Charles P., to General DataComm, Inc. Digital signal processor architecture with an ALU and a serial processing section operating in parallel. 4,926,355, Cl. 364-200.000.
Borenstein, Michael R.; Doukas, Peter H.; and Abou-Gharbia, Magid A., to Temple University of the Commonwealth System of Higher Education. Mannich bases of spirosuccinimides. 4,925,841, Cl. 514-235.500.
Borg-Warner Automotive, Inc.: *See*—
Crawford, Steven A.; and Wells, James R., 4,924,977, Cl. 192-3.280.
Borgeson, Dale W.: *See*—
Goetzinger, Charles E.; and Borgeson, Dale W., 4,926,340, Cl 364-483.000.
Borghi, Italo: *See*—
Matarrese, Savino; Rossi, Anna Grazia; Lo Consolo, Mauro; Cigna, Giuseppe; and Borghi, Italo, 4,925,896, Cl. 525-53.000.
Bornhorst, John B.: *See*—
Wissman, Terry L.; and Bornhorst, John B., 4,925,113, Cl. 241-101.400.
Borza, Mihai M.: *See*—
Langen, Marinus J. M., Guttinger, Peter; and Borza, Mihai M., 4,924,654, Cl. 53-399.000.
Bossert, Clayton E.: *See*—
Alsip, Allen W.; Robinson, James N.; and Bossert, Clayton E., 4,924,537, Cl. 5-61.000.
Bosworth, Dean; and Herlth, Larry. Cord clip. 4,925,399, Cl 439-370.000.
Bothe, Lothar: *See*—
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,925,728, Cl 428-216.000.
Bourelier, Claude, to Saint-Gobain Vitrage "Les Miroirs" Device for producing a plastic sheet of high optical quality. 4,925,379, Cl 425-94.000.
Bourgeois, Claude; and Hermann, Jean, to Centre Suisse D'Electronique Et De Microtechnique S.A Piezoelectric resonator 4,926,086, Cl. 310-361.000.
Bourne, William R., Jr.: *See*—
Carmody, Timothy A.; Bourne, William R., Jr., and Stammreich, John, 4,925,221, Cl. 292-200.000.
Bourquin, Al W.: *See*—
Nelson, Michael J. K., and Bourquin, Al W., 4,925,802, Cl. 435-262.000.
Bowles, Richard: *See*—
Johnson, Ronald F.; Smart, J. A., Goodman, E. Carl, and Bowles, Richard, 4,924,929, Cl. 160-84.100.
Boyd, David W., to Hewlett-Packard Company Optical scanner 4,926,041, Cl. 250-226.000.
Boyd, Howard J.: *See*—
Poehner, Michael E.; Duwell, Michael J., and Boyd, Howard J., 4,926,457, Cl. 378-209.000
Boyea, Robert J.: *See*—
Plummer, William T., and Boyea, Robert J., 4,925,267, Cl 350-96.200.
Boyesen, Eyvind, to Performance Industries, Inc. Rotary exhaust control valve for two-stroke cycle engines and process for using the same. 4,924,819, Cl. 123-65.0PE.
Boyle, Francis T.: *See*—
Bayles, Richard W.; Boyle, Francis T.; Gravestock, Michael B., and Wapdlewopth, James M., 4,925,863, Cl. 514-383.000
BP Chemicals Limited *See*—
Desvignes, Bernard; Durand, Daniel, and Millelin, Bernard, 4,925,902, Cl. 526-87.000.
Dolden, John G.; Harris, Gaynor P.; and Studholme, Matthew B., 4,925,914, Cl. 528-336.000
Bradley, Donald A., to Wiltron Company Over-current protection circuit. 4,926,288, Cl. 361-101.000.
Braeunig, Thomas F. Body-mounted video game exercise device 4,925,189, Cl. 273-148.00B
Brahms, Martin; and Prenner, Christian, to Kabelmetal Electro GmbH Having a plurality of secondary windings. 4,926,305, Cl 363-21.000.
Brand, Peter: *See*—
Heitmann, Uwe; and Brand, Peter, 4,924,885, Cl 131-84.400
Brand, Simon J *See*—
Frencken, Peter H.; Nillesen, Antonius H. H. J., and Brand, Simon J., 4,926,260, Cl. 358-148.000.
Brander, Richard *See*—
Anderson, James R., and Brander, Richard, 4,926,139, Cl 330-294.000
Brandes, Wilhelm: *See*—
Stroech Klaus, Frie, Monika; Himmler, Thomas, Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,925,482, Cl 71-92.000.
Brandt, Robert: *See*—
Fenton, Ronald L., and Brandt, Robert, 4,925,053, Cl 220-86.00A

VOL
1114
ISS
3
MY
15
1990
UMI

Bransburg, Jorge M. Portable grill with interchangeable accessories. 4,924,844, Cl. 126-9.00R.
Braren, Bodil E.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. Enhancement of ultraviolet laser ablation and etching organic solids. 4,925,523, Cl. 156-643.000.
Braun, Rainer: *See—*
Schweikhardt, Friedrich; Sawatzki, Gunther; and Braun, Rainer, 4,925,680, Cl. 426-42.000.
Breakspere, Robert: *See—*
Porter, Anthony; and Breakspere, Robert, 4,926,164, Cl. 340-576.000.
Brechteen Company, The: *See—*
Sullivan, Michael J., 4,924,552, Cl. 17-1.00R.
Breen, John: *See—*
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.
Breisch, John H.: *See—*
Jeromson, James R., Jr.; Anderson, J. Edward C.; and Breisch, John H., 4,925,061, Cl. 222-1.000.
Breton, Richard; Treff, Ernest H.; and McKrell, Richard L., to Harris Graphics Corporation. Delivery fan with undulated fan pockets. 4,925,179, Cl. 271-187.000.
Breuer, Heinz G., to Rheinmetall GmbH Hand-operated lever for opening and closing a wedge-like breechblock. 4,924,748, Cl 89-24.000.
Brevignon, Michele: *See—*
Turpin, Marc; Brevignon, Michele; and Rojas, Dominique, 4,926,040, Cl. 250-225.000.
Brewer, Maurice A., to Intermedics, Inc. Implantable endocardial lead with fixation device retractable by threaded stylet. 4,924,881, Cl 128-785.000.
Brezoczky, Blasius; Cuomo, Jerome J.; Guarnieri, C. Richard; Ramanathan, Kumbakonam V.; Shivashankar, Srinvasrao A.; Smith, David A.; and Yee, Dennis S., to International Business Machines Corporation. Process for fabricating high density disc storage device. 4,925,700, Cl. 427-38.000.
Briand, Jean P., to Sonoco Gunther S.A. Method for continuously manufacturing products of thermoplastic material and equipment for carrying out said method. 4,925,512, Cl. 156-201.000.
Briceno, Daniel A.: *See—*
Stern, Howard K.; Yonescu, William; and Briceno, Daniel A., 4,925,308, Cl. 356-375.000.
Bridgestone Corporation: *See—*
Kawabata, Misao; Ushikubo, Hisao; and Tominaga, Teruyuki, 4,924,927, Cl. 152-531.000.
Kojima, Hiroshi, 4,925,162, Cl. 267-140.100.
Suizu, Yoji; Masaki, Nobuo; Fujita, Takafumi; and Kurabayashi, Hiroshi, 4,924,640, Cl. 52-167.0DF.
Watanabe, Tadashi; and Morita, Yasuyuki, 4,924,928, Cl. 152-533.000.
Bridgestone/Firestone, Inc.: *See—*
Futamura, Shingo, 4,925,894, Cl. 524-484.000.
Brigham, William D.; and Zwick, Eugene B., to Zwick Energy Research Organization, Inc. Apparatus and method for evacuating an insulated cryogenic hose. 4,924,679, Cl. 62-50.700.
Brigham and Women's Hospital: *See—*
Mannick, John A.; Rodrick, Mary; and Nimberg, Richard, 4,925,920, Cl. 530-387.000.
Bright-Tech (Developments) Limited: *See—*
Jenkins, Stuart M.; and Harvey, Terence J., 4,926,167, Cl 340-764.000.
British Petroleum COmpany p.l.c., The: *See—*
Egglestone, Frederick, 4,925,456, Cl. 48-127.900.
British Aerospace Public Limited Company: *See—*
James, Enoch; and Stafford, Raymond, 4,925,274, Cl. 350-320.000.
Salkeld, David; and Schofield, John W., 4,925,129, Cl. 244-3.110.
British Nuclear Fuels Plc: *See—*
Spruce, Brian; Welsby, David P.; and Bell, John L., 4,924,587, Cl. 29-723.000.
British Petroleum Company p.l.c., The: *See—*
Brown, Stephen L.; and Lucy, Andrew R., 4,925,918, Cl. 528-392.000.
Brodu, Jacques, to Etablissements M. Muller & Cie. Turntable device for measuring angles of lock of a steerable wheel of an automobile. 4,924,591, Cl. 33-203.140.
Brody, Harvey, to Norvey, Inc. Spout for squeeze bottle. 4,925,128, Cl. 222-211.000.
Broening, Manfred: *See—*
Price, Frank C.; Giebel, Gerhard; Fichtner, Rudi; and Broening, Manfred, 4,924,546, Cl. 12-7.100.
Brokl, Pavel: *See—*
Pacakova, Zdenka; Brokl, Pavel; and Kulhavy, Josef, 4,925,000, Cl. 198-409.000.
Bromine Compounds Limited. *See—*
Hermolin, Joshua, 4,925,967, Cl. 558-445.000.
Stollar, Hayman; and Becker, Abram, 4,925,642, Cl 423-364.000.
Bronstert, Bernd: *See—*
Huemmer, Wolfgang; Bronstert, Bernd; Littmann, Dieter; and Zuerger, Manfred, 4,925,769, Cl. 430-271.000.
Brooks, Albert E., to Ambrook Medical Concepts, Inc. Pressure sensing catheter. 4,924,877, Cl. 128-748.000.
Brooktree Corporation: *See—*
Lewyn, Lanny L.; and Lou, Perry W., 4,926,176, Cl. 341-135.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Imaeda, Mikio, 4,926,209, Cl. 355-27.000
Kondo, Ikuzo; and Makihara, Tsutomu, 4,924,790, Cl. 112-272.000.
Niikawa, Takeshi, 4,925,325, Cl. 400-582.000.
Brotherton, Walter W., to Westinghouse Electric Corp. Method and apparatus for determining weighted average of process variable. 4,926,364, Cl. 364-581.000.
Brown, Andrew V.; Gen, Tamar G.; and Weihe, Gary R., to Raychem Corporation. Curable temperature indicating composition. 4,925,727, Cl. 428-199.000.
Brown, Daniel P., to Insta-Foam Products, Inc. Low cost mixing and dispensing gun for reactive chemical products. 4,925,107, Cl. 239-414.000.
Brown, Duncan W.: *See—*
Tom, Glenn M.; and Brown, Duncan W., 4,925,646, Cl. 423-488.000.
Brown, George T.: *See—*
Fellows, Charles T.; Brown, George T.; and Haines, Robert C., 4,925,667, Cl 424-401.000.
Brown, Harold R., to Ashland Oil, Inc. Vent system. 4,924,897, Cl. 137-1.000.
Brown, James L., to United States of America, Administrator, National Aeronautics and Space Administration. Three-dimensional laser velocimeter simultaneity detector. 4,925,297, Cl. 356-28.500.
Brown, James M.: *See—*
DiFlora, Michael A.; Brown, James M.; Rice, Steven L.; and Ramsey, Jeffery D., 4,926,081, Cl. 310-89.000.
Brown, James R.; and Olson, Rick A., to Westinghouse Electric Corp. Blade ring rollout roller. 4,925,363, Cl. 415-129.000.
Brown, Jeffrey D.; Freerksen, Donald L.; Hilker, Scott A.; and Stasiak, Daniel L., to International Business Machines Corporation. Method and apparatus for processing postnormalization and rounding in parallel. 4,926,370, Cl. 364-748.000.
Brown, Jerry D., to Capel Incorporated. Hook timing arrangement for zig zag sewing machines. 4,924,788, Cl. 112-182.000.
Brown, Lawrence G. Power transmitting system. 4,925,433, Cl 474-9.000.
Brown, Richard W. Process for producing cyclohexadiene thioether. 4,925,970, Cl 560-125.000.
Brown, Ronald W.; and House, Roy F., to Venture Innovations, Inc. Method of protecting a cased pipeline from corrosion. 4,925,616, Cl 264-262.000.
Brown & Sharpe Manufacturing Co.: *See—*
Spink, Stanley T., Jr., 4,926,360, Cl. 364-571.010.
Brown, Stephen L.; and Lucy, Andrew R., to British Petroleum Company p.l.c., The. Process for preparing polyketones with boron anion. 4,925,918, Cl. 528-392.000.
Brown & Williamson Tobacco Corporation: *See—*
Litzinger, Elmer F., 4,924,886, Cl 131-194.000.
Bruce, Andrew D., and Tucker, Daniel A., to AM International Incorporated. Method and apparatus for controlling a collator. 4,925,174, Cl. 270-54.000.
Bruning, Gert W.: *See—*
Singer, Barry M.; Bruning, Gert W.; and Mukherjee, Satyendranath, 4,926,074, Cl. 307-581.000.
Brunswick Corporation: *See—*
Boda, James C., 4,925,410, Cl. 440-55.000.
Johnson, Harold C., 4,925,409, Cl 440-52.000
Karls, Michael A., 4,925,412, Cl. 440-71.000.
Newman, Neil A.; and McCormick, Daniel F., 4,925,413, Cl. 440-75.000.
Newman, Neil A., 4,925,414, Cl. 440-83.000.
Steiner, Ronald M., Koepsel, Roger E.; Gilgenbach, Hubert S.; and Reinke, Terence C., 4,925,369, Cl 416-204.00R.
Bryant Grinder Corporation: *See—*
Gile, Richard H., 4,926,337, Cl. 364-474.060.
Bubley, Henry J., to American Screen Printing Equipment Company. UV curing apparatus. 4,924,599, Cl. 34-4.000.
Buchanan, Harry C., Jr.: *See—*
Rogakos, Deno J.; Buchanan, Harry C., Jr.; and Benner, Mark M., 4,924,726, Cl. 74-600.000.
Buchecker, Richard; Fromm, Hans-Jurgen; Kelly, Stephen; and Schadt, Martin, to Hoffmann-La Roche Inc. Liquid crystalline esters. 4,925,278, Cl. 350-350.500.
Buchschmid, Emil; Frenznick, Anton; Lindner, Klaus; Schmid, Olaf; Schmid, Hans-Dieter; Schmidt, Gerhard; and Sturm, Theodor, to Robert Bosch GmbH Electromagnetic relay. 4,926,150, Cl. 335-196.000.
Buck, Thomas F.; and Fukuda, Diane P. Ultrathin-wall fluoropolymer tube with removable fluoropolymer core. 4,925,710, Cl. 428-34.500.
Buckler, Clive E. Semi-recumbent bicycle with adjustable frame. 4,925,203, Cl. 280-278.000.
Budde, Klaus: *See—*
Quella, Ferdinand, Nuyken, Oskar; Budde, Klaus; and Suefke, Thomas, 4,925,772, Cl. 430-281.000.
Buekers, Josef: *See—*
Kress, Hans-Jurgen; Lindner, Christian; Muller, Friedemann; Peters, Horst; Wittmann, Dieter; and Buekers, Josef, 4,925,891, Cl. 524-139.000.
Buekett, John, to Costain Concrete Company Limited. Concrete railroad ties. 4,925,094, Cl. 238-265.000.
Buforn, Albert. *See—*
Massonneau, Viviane; Mulhauser, Michel; and Buforn, Albert, 4,925,950, Cl. 548-338.000.
Massonneau, Viviane; Mulhauser, Michel; and Buforn, Albert, 4,925,951, Cl. 548-338.000.
Massonneau, Viviane; Mulhauser, Michel; Buforn, Albert; and Mandard-Cazin, Bernadette, 4,925,952, Cl 548-338.000.

Buiguez, Alexandre; and Gibot, Claude, to Carboxyque Francaise. Method and apparatus for the treatment of work pieces by shot blasting. 4,924,643, Cl. 51-320.000.
Bujatti, Marina; and Sechi, Franco N., to Microwave Power, Inc. Microwave integrated circuit substrate including metal filled via holes and method of manufacture. 4,925,723, Cl. 428-137.000.
Bukowski, Eugene R.; and Hoffman, Charles R., to International Business Machines Corporation. CMOS signal threshold detector. 4,926,442, Cl. 375-76.000.
Bullis, Stephen J.: *See—*
Tassie, Douglas P.; and Bullis, Stephen J., 4,924,753, Cl. 89-160.000.
Burchill, Michael T.: *See—*
Silbermann, Joseph; and Burchill, Michael T., 4,925,739, Cl. 428-522.000.
Burda, Paul A. Corrosion inhibition of closed cooling water auxiliary system for nuclear power plants. 4,926,449, Cl. 376-306.000.
Burdick, Eugene V.: *See—*
Ellenberger, John C.; Yoo, Inbae; and Burdick, Eugene V., 4,925,024, Cl. 206-328.000.
Burford Corp.: *See—*
Fagan, John E., 4,925,699, Cl. 427-28.000.
Burger, William R.: *See—*
Kramer, William F.; Charland, Terrence D.; Forward, John E.; Burger, William R.; and Mandel, Barry P., 4,925,171, Cl. 270-53.000.
Burmeister, Scott N.; Harris, Duane W.; Whipple, Roger B.; and Mondek, Martin J., to Outboard Marine Corporation. Marine propulsion device tilt and trim mechanism. 4,925,411, Cl 440-61.000.
Burnett, Don J.: *See—*
Muth, Walter E.; Joynes, Roger; Cox, Clair A.; Cheadle, Brian A.; Burnett, Don J.; and Adema Han, 4,925,621, Cl. 376-262.000.
Burroughs, Thomas C.; and Arterbury, Roy S., to Cavins Corporation, The. Downhole cleanout tool. 4,924,940, Cl. 166-105.100.
Burstell, Helmut: *See—*
Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,925,480, Cl. 71-91.000.
Bury, Frederic: *See—*
Locanetto, Philippe; Bury, Frederic; and Pizant, Jacques, 4,925,387, Cl. 431-187.000.
Buss A.G.: *See—*
Kappenberger, Peter, 4,925,558, Cl. 208-361.000.
Busser, William F.: *See—*
Pokrandt, Glenn C.; Busser, William F.; Timmermann, Donald N.; and Kuliga, Thomas N., 4,925,431, Cl. 464-54.000.
Busson, Christian: *See—*
Alagy, Jacques; and Busson, Christian, 4,926,001, Cl. 585-500.000.
Butzko, Betty: *See—*
Montagino, James G.; Butzko, Betty; and Lerner, Ronald L., 4,926,027, Cl. 219-222.000.
Buxton, Clifford A.; and Leone, David A., to Siemens Energy & Automation, Inc. Moving mains arc movement loop. 4,926,018, Cl. 200-147.00R.
Buxton, Clifford A.: *See—*
Leone, David A.; Buxton, Clifford A.; and Quinton, Don, 4,926,016, Cl. 200-144.00R.
Leone, David A.; Buxton, Clifford A.; Tharp, James A.; and McCord, Neil A., 4,926,019, Cl. 200-147.00R.
Buxton, Howard D., to Motorola Inc. Bonding means and method. 4,925,085, Cl. 228-179.000.
Buxton, Robert W. Conveyor assembly. 4,924,993, Cl. 193-311.000.
BWG Butzbacher Weichenbau GmbH: *See—*
Ziethen, Rudiger; Benenowski, Sebastian; Kais, Alfred; and Nuding, Erich, 4,925,135, Cl. 246-436.000.
Byckling, Eero; and Kajanto, Markus, to Unda Oy. Method for scanning a laser beam by non-mechanical deflectors. 4,925,261, Cl 350-3.710.
Byers, Larry L.; Koehler, Howard A.; and Michaelson, Wayne A., to Unisys Corporation. Bifurcated register priority system. 4,926,313, Cl. 364-200.000.
Byers, Vera S.; Baldwin, Robert W.; and Scannon, Patrick J., to Xoma Corporation. Potentiation of cytotoxic conjugates. 4,925,922, Cl. 530-391.000.
Byrnes, John M.: *See—*
Carns, Richard A.; Flick, Peter M.; and Byrnes, John M., 4,926,362, Cl. 364-578.000.
Byrom, David; and Carver, Mark A., to Imperial Chemical Industries plc. Process for the decomposition of acrylamide. 4,925,797, Cl. 435-135.000.
Byron, Matthew P.: *See—*
Khan, Mohammad A.; Solomon, Donald D.; and Byron, Matthew P., 4,925,668, Cl. 424-422.000.
C. & E. Feini GmbH & Co.: *See—*
Rudolf, Boris; and Blutharsch, Walter, 4,924,635, Cl. 51-170.00R
C. J. Winter Machine Works, Inc.: *See—*
Francia, Paul P., 4,924,687, Cl. 72-102.000.
Cadiergue, Joseph; Demoute, Jean-Pierre; and Tessier, Jean, to Roussel Uclaf. Novel cyclopropane carboxylates. 4,925,874, Cl. 514-517.000.
Cairncross, Allan, to Du Pont de Nemours, E. I., and Company. Silver-based electrostatic printing master. 4,925,756, Cl. 430-18.000.
Calgon Corporation: *See—*
Morse, Lewis D., 4,925,568, Cl. 210-701.000.
Callaioli, Andrea: *See—*
Rendina, Gabriele; Nocci, Roberto; Callaioli, Andrea; and Corrado, Francesco, 4,925,899, Cl. 525-314.000.
Calmettes, Lionel, and Andre, Michel, to Etablissements Caillau. Clamp having boss and lug used for fastening. 4,924,558, Cl. 24-20.0CW.
Calvert, Dan V.: *See—*
Asbury, Charles E., Jr., Gulati, Monmohan S.; Sherman, Earle C.; and Calvert, Dan V., 4,925,521, Cl 156-517.000.
Camara, Elias H.: *See—*
Remick, Robert J.; Marianowski, Leonard G.; and Camara, Elias H., 4,925,745, Cl 429-40.000.
Camarota, Richard J., to ITC Incorporated. Detachable leg assembly. 4,925,140, Cl. 248-188.000.
Cambreleng, Paul S., to Heinemann Electric Company. Auxiliary switch retainer for circuit breakers and actuator member. 4,926,148, Cl. 335-13.000.
Camenzind, Hugo, to Ciba-Geigy Corporation. Thiadiazole derivatives as lubricant additives. 4,925,580, Cl 252-47.000.
Cameron Iron Works U.S.A., Inc.: *See—*
Szymczak, Edward J., and Chin, Arthur H. T., 4,925,220, Cl 285-382.400.
Cameron Iron Works USA, Inc.: *See—*
Baker, Gerald S., 4,925,154, Cl. 251-58.000.
Cameron, Peter. Nasal breath monitor. 4,924,876, Cl. 128-725.000.
Campbell, James A.: *See—*
Wlodarczyk, Marek T.; Coletta, Luciano, Campbell, James A.; and Tomasko, Douglas G., 4,924,870, Cl. 128-667.000.
Campbell, Michael L.: *See—*
Linton, Leon; and Campbell, Michael L., 4,924,777, Cl 104-172.200.
Campbell Soup Company. *See—*
Simon, Frederick E., 4,925,684, Cl. 426-107.000.
Can-Am Engineered Products, Inc.: *See—*
Toth, Denis W., 4,925,368, Cl. 415-180.000.
Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence: *See—*
Baker, Mark A.; and Anderson, C. John, 4,925,505, Cl. 149-89.000.
Canadian Patents & Development Limited. *See—*
Hsia, Jen-chang, 4,925,574, Cl. 210-635.000.
Canon Kabushiki Kaisha: *See—*
Eguchi, Masaharu; and Yamada, Akira, 4,926,207, Cl. 354-484.000.
Furutsu, Etsuro; and Izukawa, Kazuhiro, 4,926,084, Cl 310-316.000.
Ikeda, Toshio, 4,926,471, Cl. 379-216.000.
Imataki, Hiroyuki; and Hiraoka, Mizuho, 4,925,733, Cl 428-336.000
Inaba, Yutaka, 4,925,277, Cl. 350-350.00S
Inuzuka, Tsuneki; Murakami, Koichi; and Kurita, Kenji, 4,926,310, Cl. 364-186.000.
Iwamoto, Hirofumi; Kawai, Tatsundo; Ogura, Makoto, Nakagawa, Katsumi; Seitoh, Shinichi; and Kaifu, Noriyuki, 4,926,058, Cl 250-578.100.
Kawamura, Masaharu, 4,926,204, Cl. 354-400.000.
Kawamura, Naoto, Nishigaki, Yuji; and Ohsawa, Hidefumi, 4,926,268, Cl. 358-458.000.
Konishi, Motofumi, 4,926,250, Cl. 358-75.000.
Mizoguchi, Yoshiyuki; Watanabe, Yoshitaka; Hiraga, Hiroyuki; and Fukuyama, Shigeru, 4,926,195, Cl. 346-140.00R.
Nakagawa, Katsumi; Ishihara, Shunichi; Kanai, Masahiro; Arao, Kozo; Fujioka, Yasushi; and Sakai, Akira, 4,926,229, Cl. 357-30.000.
Orikasa, Tsuyoshi; Ito, Fujihiro; Suzuki, Hiroyuki, Kameyama, Makoto; Niizuma, Kiyozumi; Yoshida, Kazuyo; and Yamanaka, Toshio, 4,926,276, Cl. 360-126.000.
Sakamoto, Masahiro, 4,926,270, Cl. 358-498.000.
Sakata, Hajime, 4,926,177, Cl 341-137.000.
Sawayama, Ippei; and Jinnai, Masayuki, 4,926,085, Cl 310-323.000.
Takenaka, Shunpei, 4,926,373, Cl 364-900.000.
Canon Kabushiki Kaisha/Canon Denshi Kabushiki Kaisha: *See—*
Fukuda, Tsuyoshi; and Shimada, Fumio, 4,926,202, Cl. 354-246.000.
Canterberry, J. B.; and Katz, Lawrence E., to Olin Corporation. Solid explosive and propellant compositions containing a polyurethane polyacetal elastomer binder and method for the preparation thereof. 4,925,503, Cl. 149-19.400.
Capel Incorporated: *See—*
Brown, Jerry D., 4,924,788, Cl. 112-182.000.
Capodicasa, Frank A.: *See—*
Kelkar, Anant H.; Capodicasa, Frank A.; and Weinstein, Jerry G., 4,925,492, Cl. 106-38.350.
Capolupo, Janet D.; and Chucta, Thomas M., to Uniroyal Chemical Company, Inc. Stabilized carbon black loaded polyolefins. 4,925,889, Cl. 524-169.000.
Carboxyque Francaise: *See—*
Buiguez, Alexandre; and Gibot, Claude, 4,924,643, Cl. 51-320.000.
Carey, David H., to Microelectronics and Computer Technology Corporation. Flip substrate for chip mount. 4,926,241, Cl. 357-75.000.
Carl Schenck AG: *See—*
Guyot, Volker, 4,926,341, Cl. 364-508.000.
Carlsson, Valdemar, to Flygt AB. Device for automatic circulation in a waste water pump station. 4,925,375, Cl. 417-430.000.
Carman, Charles H., to Crane Electronics, Inc. Control valve and method of controlling material flow through a conduit. 4,925,155, Cl. 251-117.000.
Carmody, Timothy A.; Bourne, William R., Jr.; and Stammreich, John, to VSI Corp. Toggle latch with automatic safety catch. 4,925,221, Cl. 292-200.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Carns, Richard A., Flick, Peter M.; and Byrnes, John M., to United States of America, Air Force. Airbase sortie generation analysis model (ABSGAM). 4,926,362, Cl. 364-578.000.
Carre, Jean-Jacques: *See*—
Picot, Pascal; and Carre, Jean-Jacques, 4,925,251, Cl. 303-22.100.
Carrens, Donald E. Down hole hydraulically actuated pump. 4,925,374, Cl. 417-403.000.
Carrot Top, Inc.: *See*—
Corrigan, John E., 4,925,097, Cl 239-73.000.
Cart, Donald F.: *See*—
Hyde, Michael L.; and Cart, Donald F., 4,924,719, Cl. 74-99.00A.
Carter, Mark C. Collapsible canopy structure for use in association with a chair or other free-standing device. 4,924,896, Cl. 135-90.000.
Carter, William, to Puritan-Bennett Corporation. Adjustable pressure regulator device. 4,924,904, Cl. 137-505.110.
Cartwright, David, to Imperial Chemical Industries PLC. Precursors to herbicidal pyridine compounds. 4,925,947, Cl. 546-302.000.
Carver, Mark A.: *See*—
Byrom, David; and Carver, Mark A., 4,925,797, Cl. 435-135.000.
Case, Brian W.: *See*—
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.
Case, Richard A.: *See*—
Avellino, Frank J., Case, Richard A.; and Swanson, David T., 4,925,522, Cl. 156-632.000.
Casio Computer Co., Ltd.: *See*—
Obata, Katsuhiko, 4,924,746, Cl. 84-615.000.
Ogawa, Masahiro; Shimazaki, Tatsuo; Umeda, Osamu; Aoki, Toshihiro; and Nakakusu, Toru, 4,925,295, Cl. 353-57.000.
Casler, Richard J., Jr.: *See*—
Onaga, Eimei M.; Casler, Richard J., Jr.; Penkar, Rajan C.; Lancraft, Roy E.; and Sha, Chi, 4,925,312, Cl. 364-513.000.
Casteel, Carroll M.: *See*—
Hwang, Bor-Yuan; Casteel, Carroll M.; and Mastroianni, Sal T., 4,926,231, Cl. 357-30.000.
Castello, Rinaldo; Ferro, Marco; Salerno, Franco; and Tomasini, Lucano, to SGS-Thomson Microelectronics S.p.A. Fully-differential reference voltage source. 4,926,138, Cl. 330-253.000.
Castiglioni, Giovanni P., to F.I.C.I. Finanziaria Industriale Commerciale Immobiliare. Apparatus for correctly feeding continuous strips with a shaped side outline to blanking machines. 4,925,079, Cl. 226-152.000.
Castricum, Wilhelmus P. H., to Spiro America Inc. Apparatus for forming and cutting spiral pipe. 4,924,684, Cl. 72-49.000.
Catallo, Frank. Apparatus for moving fabric through a fabric processing step. 4,924,563, Cl. 26-76.000.
Catalsts & Chemicals Industries Co., Ltd.: *See*—
Sato, Goro; Komatsu, Michio; Nishida, Hiroyasu; Tanaka, Yoshichika; Koyanagi, Tsuguo; and Mihara, Kei, 4,925,704, Cl 427-221.000.
Catalysts & Chemicals Industries Co., Ltd.: *See*—
Sato, Goro; Higashi, Hidehiro; Shirono, Katsuhiro; and Eto, Yoshio, 4,925,554, Cl. 208-210.000.
Catlin, William R.: *See*—
Solomon, Harvey D. and Catlin, William R., 4,924,708, Cl 73-799.000.
Cauquelin, Claude: *See*—
Chevereau, Gerard; Cauquelin, Claude; and Heuze, Alain, 4,925,624, Cl. 376-400.000.
Cavero, Icilio; Cazor, Jean-Louis; Hicks, Peter; and Langer, Salomon, to Synthelabo. Pharmaceutical compositions. 4,925,837, Cl. 514-211.000.
Cavins Corporation, The: *See*—
Burroughs, Thomas C.; and Arterbury, Roy S., 4,924,940, Cl 166-105.100.
Cazor, Jean-Louis: *See*—
Cavero, Icilio; Cazor, Jean-Louis; Hicks, Peter; and Langer, Salomon, 4,925,837, Cl. 514-211.000.
Cedarapids, Inc.: *See*—
Ostergaard, David A., 4,925,114, Cl. 241-191.000.
Celant, Jean J., to Lune. Powder booth for applying coating powder to articles. 4,924,803, Cl. 118-630.000.
Celltech Limited: *See*—
Nasmyth, Kim A.; and Miller, Allan M., 4,925,791, Cl 435-69.100.
Celluloid S.A.: *See*—
Wachtel, Jean Louis, deceased; Wachtel, Tom, heir; Wachtel, Irene, heir; Erny, Susan, heir; and Wachtel, Dany, heir, 4,924,547, Cl. 15-185.000.
Central Glass Company, Limited: *See*—
Aramaki, Minoru; Okamoto, Kimitaka, Sakaguchi, Hiroaki; and Nakamura, Tamio, 4,925,975, Cl. 562-113.000.
Ikeda, Hideo; Horiki, Yoshio; Yamauchi, Yutaka; Kasamatsu, Hiroshi; and Akao, Akimasa, 4,925,511, Cl. 156-106.000.
Centre for Recherches En Physique Des Plasmas: *See*—
Bondeson, Anders; Isaak, Bernhard; Perrenoud, Andre; and Tran, Minh Q., 4,926,094, Cl. 315-5.000.
Centre International De Recherches dermatologiques (CIRD): *See*—
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 4,925,658, Cl. 424-70.000.
Centre Suisse D'Electronique Et De Microtechnique S.A.: *See*—
Bourgeois, Claude; and Hermann, Jean, 4,926,086, Cl. 310-361.000
Centrite Corp.: *See*—
Staneluis, James M.; and Rodenbeck, Donald L., 4,925,719, Cl. 428-71.000
Cerjak, Thomas P.: *See*—
Weizer, Thomas C.; and Cerjak, Thomas P., 4,924,783, Cl. 108-53.300.
Chagnon, Kevin C.; and Silkman, Glenn W. Adaptor to convert a screw gun to a rotary cutter. 4,924,578, Cl. 30-500.000.
Chakravarti, Bhaven; and Johnson, Thomas W., to Lummus Crest Inc. Thermowell assembly for a vessel. 4,925,638, Cl. 422-310.000.
Chambers, Laura J.: *See*—
Mai, Jimbin; Chambers, Laura J.; and McDonald, Richard E., 4,925,681, Cl. 426-52.000.
Chamoun, Nassib G., to Biometrak Corporation. Cardiac biopotential analysis system and method. 4,924,875, Cl. 128-696.000.
Champion Security Limited: *See*—
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.
Chang, Main, to Exxon Chemical Patents Inc. Method for utilizing triethyaluminum to prepare an alumoxane support for an active metallocene catalyst. 4,925,821, Cl. 502-107.000.
Channel-Kor Systems Inc.: *See*—
Miller, Melvin M., 4,924,931, Cl. 160-135.000.
Chaparro, John J.; De Kreek, Dirk; and Holdaway, Charles R., to JC Systems, Inc. Environmental response control apparatus and method. 4,925,089, Cl. 236-78.00D
Chapman, Arnold D.: *See*—
Novak, C. Tim; Alt, Thomas J.; Chapman, Arnold D.; and Driscoll, David M., 4,926,345, Cl 364-513.000.
Chapman, Thomas M.: *See*—
Francis, Peter S.; and Chapman, Thomas M., 4,925,606, Cl. 264-50.000.
Charbonneau, Jack W.; and Bahls, Jerold O., to Minnesota Mining and Manufacturing Company. Method of forming fragrance releasing pull-apart sheets. 4,925,517, Cl. 156-276.000.
Charbonnier, Francois: *See*—
Fournier, Daniele; Charbonnier, Francois; and Boccara, Alberr-Claude, 4,926,057, Cl. 250-578.100.
Charland, Terrence D.: *See*—
Kramer, William E., Charland, Terrence D.; Forward, John E.; Burger, William R.; and Mandel, Barry P., 4,925,171, Cl. 270-53.000.
Charles Machine Works, Inc., The. *See*—
Martin, J. Scott, 4,924,609, Cl 37-191.00A.
Charles Stark Draper Laboratory, Inc., The: *See*—
Hansberry, Mitchell L., 4,924,787, Cl. 112-142.000.
Charmot, Dominique: *See*—
Berrod, Gerard; Charmot, Dominique; Gresser, Robert; and Guerin, Gilles, 4,925,588, Cl. 252-174.230.
Charnley, James E.: *See*—
Atello, Louis L.; Charnley, James E.; Mees, James A.; and Dixon, Robert C., 4,925,620, Cl 376-260.000.
Chastain, David M.: *See*—
Wallach, Steven J.; Chastain, David M.; and Weatherford, James R., 4,926,317, Cl. 364-200.000.
Chaum, David. Card-computer moderated systems. 4,926,480, Cl. 380-23.000.
Che, Hue N., to Hue Nguyen Che. Bar puller with adjustable jaw-opening. 4,924,738, Cl. 82-127.000.
Cheadle, Brian A.: *See*—
Muth, Walter E.; Joynes, Roger; Cox, Clair A.; Cheadle, Brian A.; Burnett, Don J., and Adema, Han, 4,925,621, Cl. 376-262.000.
Chemische Fabrik Stockhausen GmbH: *See*—
Hubner, Wolfgang; and Schroers, Otto, 4,925,884, Cl. 523-340.000.
Cheng, C. H.: *See*—
Lin, Ming-fang; and Cheng, C. H., 4,924,918, Cl. 140-102.000.
Cheng, Shi-wai S.; Nichols, Wayne C.; and Moore, Wayne R., to General Motors Corporation. Apparatus for torch jet assisted spark ignition. 4,924,829, Cl. 123-259.000.
Chernomorsky, Arkady: *See*—
Silver, Frederick H.; Berg, Richard A., Doillon, charles J.; Chernomorsky, Arkady; and Olson, Robert M., 4,925,924, Cl. 530-356.000
Cheskis, Harvey P.: *See*—
Muench, George J.; Lewis, Brian G.; Ashok, Sankaranarayanan; Watson, William G.; and Cheskis, Harvey P., 4,925,103, Cl. 239-79.000.
Chevereau, Gerard; Cauquelin, Claude; and Heuze, Alain, to Framatome. Pressurized water nuclear reactor with solid partitioning. 4,925,624, Cl. 376-400.000.
Chevron Research Company: *See*—
Robinson, Richard C.; Jacobson, Robert L.; and Field, Leslie A., 4,925,549, Cl 208-65.000.
Stemke, Jeffrey E., 4,925,579, Cl. 252-32.70E.
Chiba, Fumihiko: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.
Childers, Winthrop D.; Schantz, Chris; and Hanson, Eric, to Hewlett-Packard Company. Plastic substrate for thermal ink jet printer. 4,926,197, Cl. 346-140.00R.
Childress, James J.; and Holtrop, John, to Boeing Company, The. Fuel tank having ballistic protection bladder. 4,925,057, Cl. 220-426.000.
Chin, Arthur H. T.: *See*—
Szymczak, Edward J.; and Chin, Arthur H. T., 4,925,220, Cl 285-382.400.

Chinoin Gyogyszer- Es Vegyeszeti Termekek Gyara Rt.: *See*—
Bodo, Gyorgy; Knoll, Jozsef; Somfai, Eva; Virag, Sandor; and Zak, Ferenc, 4,925,878, Cl. 514-646.000.
Chisso Corporation: *See*—
Aoki, Kazuo; Moteki, Tsutomu; and Kimura, Kazuhiro, 4,925,381, Cl. 425-145.000.
Chiyoda Chemical Engineering & Construction Company Limited *See*—
Kanda, Tetsuro; and Yamamoto, Shizuo, 4,924,966, Cl. 181-228.000.
Chong, Ray. Independent infant bottle feeding ensemble. 4,925,042, Cl. 215-11.100.
Chopdekar, Vilas M.: *See*—
Harris, James E.; Berger, Abe; Chopdekar, Vilas M.; Matzner, Markus; and Spanswick, James, 4,925,916, Cl. 528-353.000.
Chou, Charles C.; and Olson, Donald C., to Shell Oil Company. Process for sorption and catalytic oxidation of sulfides in water. 4,925,569, Cl. 210-713.000.
Chou, Tien-Fa. Bottom ejection type instant cooling easy-opener with amusement effect. 4,925,470, Cl. 62-4.000.
Chow, Michael P.: *See*—
Hwang, Edward Y.; and Chow, Michael P., 4,926,342, Cl. 364-508.000.
Chresand, Thomas J.: *See*—
Bateson, George F.; Chresand, Thomas J.; Moore, Joel D.; and Nayes, Terrence L., 4,925,552, Cl. 210-150.000.
Christy, Kenneth G.; Cooper, Thomas F.; and Dastin, Richard, to Xerox Corporation. Small inexpensive finisher. 4,925,172, Cl. 270-53.000.
Chrysler Corporation: *See*—
Liskey, Merle E., 4,925,465, Cl. 55-267.000.
Chuang, Jo-Yu; and Fritsch, Edward V., to Sandvik Rock Tools, Inc. Shock absorbing bit retaining ring. 4,924,948, Cl. 173-139.000
Chuang, Yuan-Chan. Joint for foldable ladders. 4,925,329, Cl. 403-93.000.
Chubb, Norman L.: *See*—
MacLeod, Richard J.; Schiedegger, Charles E.; and Chubb, Norman L., 4,924,761, Cl. 98-42.210.
Chueta, Thomas M.: *See*—
Capolupo, Janet D.; and Chucta, Thomas M., 4,925,889, Cl. 524-169.000.
Chujo, Yoshiki; Aoki, Keiji; Hyodo, Yoshihiko; and Katsuno, Toshiyasu, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine having electric controlled fuel injection with oxygen sensor for detecting intake air amount. 4,924,837, Cl. 123-494.000.
Chung, Yun C., to AT&T Bell Laboratories. Lightwave communication system having sources independently synchronized to an absolute frequency standard. 4,926,429, Cl. 372-32.000.
Church, Kenneth S.: *See*—
Davies, Lawrence W.; and Church, Kenneth S., 4,924,631, Cl. 49-504.000.
Chuubachi, Muneki: *See*—
Yamazaki, Kiyoshi; and Chuubachi, Muneki, 4,926,265, Cl 358-304.000.
Ciapponi, Ermanno: *See*—
Ronco, Roland; Ciapponi, Ermanno; and Pessonneaux, Pierre, 4,925,926, Cl. 534-589.000.
Ciba-Geigy Corporation: *See*—
Camenzind, Hugo, 4,925,580, Cl. 252-47.000.
Drabek, Jozef; and Siegrist, Urs, 4,925,875, Cl. 514-594.000.
Drabek, Jozef, 4,925,876, Cl. 514-594.000.
Gunther, Peter; Wirth, Hermann O.; and Endlich, Wilhelm, 4,925,887, Cl. 524-14.000.
Hefti, Heinz; Reinehr, Dieter; Weber, Kurt; and Eckhardt, Claude, 4,925,595, Cl. 252-301.210.
Janicke, Reinhard; and Nyfeler, Robert, 4,925,842, Cl. 514-239.500.
Laver, Hugh, 4,926,190, Cl. 346-1.100.
Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J., 4,925,628, Cl. 422-100.000.
Nyfeler, Robert; and Ehrenfraund, Josef, 4,925,840, Cl. 514-228.200.
Rohde, Ottmar; Jasne, Stanley J.; and Pfeifer, Josef, 4,925,912, Cl. 528-226.000.
Ronco, Roland; Ciapponi, Ermanno; and Pessonneaux, Pierre, 4,925,926, Cl. 534-589.000.
Tzikas, Athanassios, 4,925,927, Cl. 534-618.000
Tzikas, Athanassios, 4,925,928, Cl. 534-618.000.
Cicuta, Aldo; and Collina, Amilcare, to Ausimont S.p.A. Containers having low permeability to hydrocarbon vapors and process of producing same. 4,925,712, Cl. 428-35.700.
Cidon, Israel; and Ofek, Yoram, to International Business Machines Corporation. Fairness algorithm for full-duplex buffer insertion ring. 4,926,418, Cl. 370-85.500.
Cigna, Giuseppe: *See*—
Matarrese, Savino; Rossi, Anna Grazia; Lo Consolo, Mauro; Cigna, Giuseppe; and Borghi, Italo, 4,925,896, Cl. 525-53.000.
Cimperman, Fred J., to Ashlock Company. Method and apparatus for pitting and slicing olives. 4,925,691, Cl. 426-485.000.
Cisternino, Andrew J.; and Spamer, William S., to Mead Corporation, The. Load transport dolly. 4,925,357, Cl. 414-495.000.
Citizen Watch Co., Ltd.: *See*—
Uchida, Noboru; Kaneko, Masahiko; and Matsumoto, Hisayoshi, 4,926,347, Cl. 364-519.000.
Citron, Howard M., to Nynex Corporation. Compact keyboard with entry of keyed and graphic information. 4,926,010, Cl. 178-18.000.
CL Pharma Aktiengesellschaft: *See*—
Schermanz, Karl; Saischek, Gerald; Urmann, Robert, and Martetschlager, Kurt, 4,925,855, Cl. 514-341.000.
Clabbers, Wilhelmus G. M.; Dinnissen, Johannes H. A.; and Nabuurs, Johannes H. B., to Oce-Nederland B.V. Device for conveying sheets with intersecting conveyor paths. 4,925,178, Cl. 271-186.000.
Clark, Russell L., to Prince Corporation. Adjustable visor. 4,925,233, Cl. 296-97.110.
Classen, Mickey. Deck clip. 4,925,141, Cl. 248-217.200.
Claudy, Pierre; Letoffe, Jean-Marie; and Commercon, Jean-Claude, to Institut Francais du Petrole. Device for detecting a thermal phenomenon occurring in a product. 4,925,314, Cl. 374-16.000.
Clauss, Allen D.: *See*—
Baker, Keith H.; Snyder, Stephen W.; and Clauss, Allen D., 4,925,586, Cl. 252-90.000.
Cleghorn, Charles H.: *See*—
Cleghorn, William L.; and Cleghorn, Charles H., 4,925,289, Cl 350-637.000.
Cleghorn, William L.; and Cleghorn, Charles H. Rear view mirror adjustable by a single motor. 4,925,289, Cl. 350-637.000.
Clemence, Francois; Le Martret, Odile; and Delevallee, Francoise, to Roussel Uclaf. Novel 4-hydroxy-3-pyridine-carboxamides useful for treating inflammation and rheumatism. 4,925,859, Cl. 514-342.000.
Clement, Pierre; and Gourlot, Thierry, to ECIA-Equipments Et Composants Pour L'Industrie Automobile. Air filter for heat engines. 4,925,469, Cl. 55-480.000.
Cleveland Clinic Foundation, The: *See*—
Bazaral, Michael G., 4,925,448, Cl. 604-171.000.
Clinical Technologies Associates, Inc.: *See*—
Steiner, Solomon; and Rosen, Robert, 4,925,673, Cl. 424-455.000
Codal-Chemie GmbH: *See*—
Makus, Zdzislaw, 4,925,882, Cl. 521-132.000.
Code-A-Phone Corporation: *See*—
Kuok, Henry, 4,926,461, Cl. 379-67.000.
Coe, Charles G.; Gaffney, Thomas R.; and Srinivasan, Rajagopalan S., to Air Products and Chemicals, Inc. Chabazite for gas separation. 4,925,460, Cl. 55-25.000.
Coe, Richare H.: *See*—
Comroe, Richard A.; Coe, Richare H.; Roane, Katherine B.; and Rosenthal, Lewis H., 4,926,495, Cl. 455-54.000.
Coenen, Heinz H.; Kling, Peer; and Stoecklin, Gerhard, to Kernforschungsanlage Juelich Gesellschaft mit beschrankter Haftung. Radiofluoro-tyrosine derivatives, the preparation and use thereof 4,925,651, Cl. 424-1.100.
Coherent, Inc.: *See*—
Harris, John R., 4,925,288, Cl 350-636.000.
Cole, Robert E.; and Spangler, Fredrick E., to General Electric Company. Method and apparatus for infrequent radio users to simply obtain emergency assistance. 4,926,496, Cl. 455-77.000.
Coleman Outdoor Products, Inc.: *See*—
Hastings, Thomas C., 4,925,137, Cl 248-148.000.
Coletta, Luciano: *See*—
Wlodarczyk, Marek T.; Coletta, Luciano; Campbell, James A.; and Tomasko, Douglas G., 4,924,870, Cl. 128-667.000.
Colgate-Palmolive Company: *See*—
Gaffar, Abdul; Polefka, Thomas G.; Ferlauto, Robert J., Jr.; and Crisafulli, Rosemarie M., 4,925,654, Cl. 424-52.000.
Colin Electronics Co., Ltd.: *See*—
Honeyager, Kevin S., 4,924,871, Cl. 128-672.000.
Murase, Tadashi, 4,924,874, Cl. 128-682.000.
Colla, Jeannine O.; Thomas, Paul E.; and Showers, Donald K., to Johnson Service Company. Integrated circuit silicon pressure transducer package. 4,926,155, Cl. 338-36.000.
College, David A.; Johnson, Keith, Jr.; Stachura, Joseph F.; and Walter, Herman D., to AMP Incorporated. RAM actuating mechanism in a press for terminating wires. 4,924,693, Cl. 72-453.030.
Collina, Amilcare: *See*—
Cicuta, Aldo; and Collina, Amilcare, 4,925,712, Cl. 428-35.700.
Collins, Earl R., Jr., to United States of America, National Aeronautics and Space Administration. Computer access security code system 4,926,481, Cl. 380-25.000.
Collins, John E.; Grunes, Mitchell B.; and Kozak, Darryn J., to Minnesota Mining and Manufacturing Company. Data storage structure of garment patterns to enable subsequent computerized prealteration. 4,926,344, Cl. 364-513.000.
Collins, Karen D., to General Motors Corporation. Display having container means. 4,925,031, Cl. 206-486.000.
Colodner, Jesse L.; and Portnoy, Irving, to Portnoy, Irving. Drying device for garments. 4,924,604, Cl. 34-151.000.
Columbia University in the City of New York, Trustees of: *See*—
Anastassiou, Dimitris, 4,926,180, Cl. 341-159.000.
Zukowski, Charles, 4,926,423, Cl. 370-112.000.
Combi Co., Ltd.: *See*—
Takahashi, Takehiko; and Kato, Hitoshi, 4,924,725, Cl. 74-551.300.
Combibloc, Inc.: *See*—
Robichaud, Arthur R.; Wilgus, Frank R.; Tyler, Warren C.; and Holmes, Jack, 4,925,034, Cl. 206-603.000.
Commercon, Jean-Claude: *See*—
Claudy, Pierre; Letoffe, Jean-Marie; and Commercon, Jean-Claude, 4,925,314, Cl. 374-16.000.
Commins, Alfred D.: *See*—
Gilb, Tyrell T.; and Commins, Alfred D., 4,924,648, Cl. 52-295.000.
Commissariat A L'Energie Atomique: *See*—
Bardot, Colette; Bergez, Pierre; Eyraud, Charles; and Hahiane, Lahcen, 4,925,566, Cl. 210-651.000.

VOL 1114 ISS 3 MY 15 1990 UMI

Barraud, Andre ; Richard, Joel; and Vandevyver, Michel, 4,925,774, Cl. 430-296.000.
Communications Satellite Corporation: *See—*
Zaghloul, Amir I.; and Sorbello, Robert M., 4,926,189, Cl. 343-700.0MS.
Comora, Michael E. Backpack cushioning device. 4,925,064, Cl. 224-155.000.
Compag Computer Corporation: *See—*
Stimac, Gary A.; Crosswy, William C.; Preston, Stephen B.; and Flannigan, James S., 4,926,322, Cl. 364-200.000.
Compagnie Oris Industrie: *See—*
Lehn, Jean M.; Jazwinski, Jaroslaw; and Blacker, John, 4,925,937, Cl. 540-477.000.
Completion Services, Inc.: *See—*
Farley, David L., 4,924,941, Cl. 166-134.000.
Composite Materials Technology, Inc.: *See—*
Wong, James, 4,925,741, Cl. 428-661.000.
Comroe, Richard A.; Coe, Richare H.; Roane, Katherine B.; and Rosenthal, Lewis H., to Motorola, Inc. Computer aided dispatch system. 4,926,495, Cl. 455-54.000.
Concept, Inc.: *See—*
Bays, F. Barry; Trott, Arthur F.; and Marchand, Sam R., 4,924,865, Cl. 606-77.000.
Connors, James M.: *See—*
Sanford, Norman A.; and Connors, James M., 4,925,263, Cl. 350-96.120.
Conoco Inc.: *See—*
McClellan, Bruce D.; Adams, Olan T.; and Cox, Vernon D., 4,926,393, Cl. 367-57.000.
Consulab, Inc.: *See—*
Guay, Normand, 4,926,121, Cl. 324-208.000.
Contra Vision Limited: *See—*
Hill, George R., 4,925,705, Cl. 427-259.000.
Convex Computer Corporation: *See—*
Wallach, Steven J.; Chastain, David M.; and Weatherford, James R., 4,926,317, Cl. 364-200.000.
Cook, Paul J., to Spancrete Machinery Corporation. Trailerable earth digging apparatus. 4,925,358, Cl. 414-685.000.
Coons, Darrell E.: *See—*
Streusand, Barry J.; Allen, Raymond H.; Coons, Darrell E.; and Hutton, Robert C., 4,926,021, Cl 219-121.590.
Cooper Companies, Inc., The: *See—*
Imonti, Maurice M.; and Beuchat, Charles E., 4,925,450, Cl. 604-240.000.
Cooper Industries, Inc.: *See—*
Gurevich, Leon, 4,926,153, Cl. 337-273.000.
Cooper, Robert N.: *See—*
Kulisz, Michael, Sr.; and Cooper, Robert N., 4,925,761, Cl. 430-97.000.
Cooper, Robert P.: *See—*
Saez, Carlos A.; and Cooper, Robert P., 4,925,449, Cl. 604-227.000.
Cooper, Thomas F.: *See—*
Christy, Kenneth G.; Cooper, Thomas F.; and Dastin, Richard, 4,925,172, Cl. 270-53.000.
CooperVision, Inc.: *See—*
Ademovic, Martin K., 4,924,739, Cl. 82-1.110.
Copeland Corporation: *See—*
DiFlora, Michael A.; Brown, James M.; Rice, Steven L.; and Ramsey, Jeffery D., 4,926,081, Cl. 310-89.000.
Copestake, Nigel W.: *See—*
Foster, Bruce A. G. E.; Ollerenshaw, Andrew; and Copestake, Nigel W., 4,925,320. Cl 384-42.000.
Copper Refineries Pty. Limited: *See—*
Cutmore, John P., 4,924,688, Cl. 72-199.000.
Corbeels, Roger J.: *See—*
Najjar, Mitri S.; and Corbeels, Roger J., 4,925,644, Cl 423-415.00A
Corcoran, Dan E. Prisoner restraint system. 4,925,246, Cl. 297-466.000.
Corey, Robert L.: *See—*
Baker, Bruce D.; Corey, Robert L., Adams, John A.; and Ross, Edward W., 4,926,452, Cl. 378-22.000.
Corning Incorporated. *See—*
Fine, Gerald J., 4,925,814, Cl 501-66.000.
Cornish, John R. E., to S.G.B. Holdings Limited. Six-way connector. 4,925,330, Cl. 403-171.000.
Corrado, Francesco: *See—*
Rendina, Gabriele; Nocci, Roberto; Callaioli, Andrea; and Corrado, Francesco, 4,925,899, Cl. 525-314.000.
Corrigan, John E., to Carrot Top, Inc. Misting system. 4,925,097, Cl. 239-73.000.
Corsetto, Craig; Hornak, Tom; Nordby, Rasmus; Walker, Rick C.; and Yen, Chu, to Hewlett-Packard Company. Phase locked loop for clock extraction in gigabit rate data communication links. 4,926,447, Cl. 375-120.000.
Costain Concrete Company Limited: *See—*
Buekett, John, 4,925,094, Cl. 238-265.000.
Cote, Kevin L., to AM International Incorporated. Apparatus and method for applying adhesive to books. 4,925,354, Cl. 412-8.000.
Cotteret, Jean: *See—*
Grollier, Jean F.; and Cotteret, Jean, 4,925,653, Cl. 424-47.000.
Counsell, Raymond E.; and Strawn, Laurie, to University of Michigan, The. Radioiodinated diacylglycerol analogues and methods of use. 4,925,649, Cl. 424-1.100.
Courtney, Thomas P.: *See—*
Tapscott, Peter A.; and Courtney, Thomas P., 4,925,121, Cl 242-57.000.
Covey, Carlin R., to Motorola, Inc. Method and apparatus for secure execution of untrusted software. 4,926,476, Cl. 380-4.000.
Cox, Clair A.: *See—*
Muth, Walter E.; Joynes, Roger; Cox, Clair A.; Cheadle, Brian A.; Burnett, Don J.; and Adema, Han, 4,925,621, Cl. 376-262.000.
Cox, John H., III: *See—*
Smith, Ernest R., 4,925,553, Cl. 210-186.000.
Cox, Richard H.: *See—*
Williams, David L.; Edwards, William B., III, Cox, Richard H.; Faustini, Daryl L.; and Drew, Surnease, 4,925,985, Cl. 568-384.000.
Cox, Stuart A.: *See—*
Kraul, Douglas R.; and Cox, Stuart A., 4,926,448, Cl. 375-121.000.
Cox, Vernon D.: *See—*
McClellan, Bruce D.; Adams, Olan T.; and Cox, Vernon D., 4,926,393, Cl. 367-57.000.
Coy, Bruce H.; and Rosky, David S., to Applied Micro Circuits Corporation. Method and apparatus for coupling an ECL output signal using a clamped capacitive bootstrap circuit. 4,926,065, Cl. 307-475.000.
Cozine, Mark L.; Papke, Norval L., Jr.; and Hansen, Loren F. Side-ejecting, double coring tine. 4,924,944, Cl. 172-22.000.
Craft, William K., to Batesville Casket Company, Inc. Cap brace for hardwood caskets. 4,925,223, Cl. 292-339.000.
Crane Electronics, Inc.: *See—*
Carman, Charles H., 4,925,155, Cl. 251-117.000.
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, to Hoechst Aktiengesellschaft. Multilayer film suitable as a release sheet in the production of decorative laminate panels. 4,925,728, Cl. 428-216.000.
Crawford, Steven A.; and Wells, James R., to Borg-Warner Automotive, Inc. Multi-stage torque converter with integrated damper. 4,924,977, Cl. 192-3.280.
Cremers, David A.; Radziemski, Leon J.; and Loree, Thomas R., to United States of America, Energy. Apparatus and method for the spectrochemical analysis of liquids using the laser spark. 4,925,307, Cl. 356-318.000.
Crill, Rikk J., to Robal, Inc. Highly reliable remote control system. 4,924,960, Cl. 180-333.000.
Crisafulli, Rosemarie M.: *See—*
Gaffar, Abdul; Polefka, Thomas G.; Ferlauto, Robert J., Jr.; and Crisafulli, Rosemarie M., 4,925,654, Cl. 424-52.000.
Crisp, William E.; Engel, Melvyn, Kudlicki, Richard C.; and Smith, Judson L., to Scientific Growth, Inc. Washing apparatus and method. 4,925,495, Cl. 134-18.000.
Cristue, Martin. Shift console for bicycles. 4,924,723, Cl. 74-473.00R.
Criticare Systems, Inc.: *See—*
Larsen, Timothy P.; Devine, James A.; and Larsen, Michael T., 4,924,860, Cl. 128-205.120.
Crosfield Electronics Limited: *See—*
Darling, Angela M., 4,926,246, Cl. 358-21.00R
Crosley, Gilbert O. Lawn mower blade assembly. 4,924,665, Cl. 56-295.000.
Cross, Robert: *See—*
Betka, Malcolm; and Cross, Robert, 4,925,052, Cl. 220-90.400.
Crosswy, William C.: *See—*
Stimac, Gary A.; Crosswy, William C.; Preston, Stephen B.; and Flannigan, James S., 4,926,322, Cl. 364-200.000.
Crouse, Jere W.; and Olson, Stewart B., to Beloit Corporation. Spreader bar apparatus. 4,925,080, Cl. 226-196.000.
Crouzet: *See—*
Ayello, Jean-Claude; and Serradura, Thierry, 4,926,466, Cl. 379-143.000.
Crowl, Robert M.; and Young, Daru, to Hoffmann-La Roche Inc. Expression and purification of an HTLV-III gag/env gene protein. 4,925,784, Cl. 435-5.000.
Crozet, Francois E. G.; and Soupizon, Jean-Luc, to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "SNECMA". Turbine stator ring assembly. 4,925,365, Cl. 415-173.600.
Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A.: *See—*
Di Vita, Pietro, 4,925,472, Cl. 65-2.000.
Culotta, Donald W. Emergency tool. 4,924,544, Cl. 7-138.000.
Cummings, John G., to Indak Manufacturing Corp. Push button vacuum-electric air control device for automotive vehicles. 4,926,014, Cl. 200-61.860.
Cuomo, Jerome J.: *See—*
Brezoczky, Blasius; Cuomo, Jerome J.; Guarnieri, C. Richard, Ramanathan, Kumbakonam V.; Shivashankar, Srinvasrao A.; Smith, David A.; and Yee, Dennis S., 4,925,700, Cl. 427-38.000.
Cupp, Ted W. Method of monitoring golf carts on a golf course. 4,926,161, Cl. 340-572.000.
Curlett, Harry B., to Pangaea Enterprises, Inc. Drill pipes and casings utilizing multi-conduit tubulars. 4,924,949, Cl. 175-25.000.
Currie, Robert J.: *See—*
Tong, Po; Berlekamp, Elwyn R.; Currie, Robert J., and Rushforth, Craig K., 4,926,169, Cl. 340-825.570.
Curt G. Joa, Inc.: *See—*
Beaudoin, Henry J.; Lammers, Donald W., and McCabe, John A., 4,925,520, Cl. 156-494.000.
Curtis, Richard D.; and Richmond, Shaun, to Thrall Car Manufacturing Company. Long-travel side bearing for an articulated railroad car. 4,924,779, Cl. 105-4.100.
Cutburth, Ronald W., to United States of America, Energy. Three-point spherical mirror mount. 4,925,286, Cl. 350-632.000.
Cuthbert, Christopher P.: *See—*
Mercer, Ferrell L.; Whitaker, Earl J.; and Cuthbert, Christopher P., 4,926,375, Cl. 364-900.000.

Cutler, Gregory M., to Hewlett-Packard Company. Frequency locking device. 4,925,302, Cl. 356-128.000.
Cutmore, John P., to Copper Refineries Pty. Limited. Mill roll. 4,924,688, Cl. 72-199.000.
Cuykendall, Robert R.; and Strobl, Karlheinz, to University of Iowa Research Foundation. Thin film optical computing. 4,926,366, Cl. 364-713.000.
Czech, Erwin: *See—*
Ostertag, Werner; Czech, Erwin; Schmitt, Franz-Ulrich; and Schulze-Hagenest, Detlef, 4,925,762, Cl. 430-106.600.
D and D Enterprises: *See—*
Liles, Donald T., 4,925,032, Cl. 206-564.000.
Daane, Robert A.; and Helms, Randall D., to Advance Systems, Inc. Contactless turning guide for running web. 4,925,077 Cl. 226-97.000.
Daems, Eddie R.; and Leenders, Luc H. to AGFA-Gevaert, N.V. Gloss controlling process. 4,925,767, Cl. 430-258.600.
Daewoo Electronics Co., Ltd.: *See—*
Yoon, Young R., 4,926,110, Cl. 323-345.000.
Dahl, Helmut: *See—*
Skuballa, Werner; and Dahl, Helmut, 4,925,956, Cl. 549-214.000
Daiga, Valdis R.: *See—*
Schultz, Thomas J.; Shah, Jay K., and Daiga, Valdis R., 4,924,785, Cl. 110-346.000.
Daigo, Hiromiki: *See—*
Shimizu, Noboru; Yoshida, Hiroshi; Daigo, Hiromiki; and Matsumoto, Shoichi, 4,925,981, Cl. 562-600.000.
Daimler-Benz AG: *See—*
Panten, Detlef; and Jegelka, Jurgen, 4,924,668, Cl. 60-278.000.
Peitsmeier, Karl; and Schremmer, Gottfried, 4,925,210, Cl. 280-775.000.
Siebler, Helmut, 4,925,229, Cl. 296-65.100.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Iseki, Izuru; Higashi, Akihiro; and Sasaki, Seihiro, 4,925,388, Cl. 432-77.000.
Komatsubara, Shoji; Takeuchi, Masahiko; and Oka, Yasuyuki, 4,926,213, Cl. 355-49.000.
Nakatsuka, Kimihiro; and Hatayama, Fumihiro, 4,926,254, Cl. 358-76.000.
Shirota, Hiroyuki, 4,925,279, Cl. 350-415.000.
Tanaka, Masato, 4,924,800, Cl. 118-50.100.
Dalluge, Jurgen. Method for thermally insulating an enclosed volume using an infra-red radiation reflecting laminate. 4,924,650, Cl. 52-741.000.
D'Ambra, Thomas E.: *See—*
Bailey, Denis M.; D'Ambra, Thomas E.; and Ezrin, Alan M., 4,925,857, Cl. 514-341.000.
Daniels, Kurt H.: *See—*
Ellis, Benny J.; and Daniels, Kurt H., 4,925,361, Cl. 414-786.000
Daniels Manufacturing Corporation: *See—*
Plyter, Walter J., 4,924,709, Cl. 73-829.000.
Danielson, Donald L.; Wihl, Mark J.; and Joseph, David A., to KLA Instruments Corporation. Reticle inspection system. 4,926,489, Cl. 382-8.000.
Danzig, Fred G. Apparatus and article for ligating blood vessels, nerves and other anatomical structures. 4,924,864, Cl. 606-142.000.
Darigo, Julius: *See—*
Hagewood, John F.; and Darigo, Julius, 4,924,567, Cl. 28-185.000.
Darling, Angela M., to Crosfield Electronics Limited. Dither processing circuit. 4,926,246, Cl. 358-21.00R.
Das, Ranjan, to United Technologies Corporation. Adjustable spacer. 4,925,364, Cl. 415-150.000.
Dastin, Richard: *See—*
Christy, Kenneth G.; Cooper, Thomas F.; and Dastin, Richard, 4,925,172, Cl. 270-53.000.
Data Promeditech I.N.C. AB: *See—*
Inacio, Jorge; and Nilsson, Erling, 4,925,377, Cl. 417-472.000.
Datta, Amitava: *See—*
Berube, Donald N.; and Datta, Amitava, 4,924,756, Cl. 92-45.000.
Dauge, Gilbert, to Moulinex, Societe Anonyme. Electronic weighing device. 4,924,955, Cl. 177-210.00C.
Davidson Textron Inc.: *See—*
Gray, John D., 4,925,151, Cl. 249-65.000.
Davies, Lawrence W.; and Church, Kenneth S., to Omniglass Ltd. Pultruded window frame with rigid corner insert. 4,924,631, Cl. 49-504.000.
Deacon, Robert M. J.; Gillespie, Roger J.; Gardner, Colin R.; and Tully, Wilfred R., to Roussel Uclaf. 2-thiazolyl-imidazo[1,2,-a]pyrimidines. 4,925,846, Cl. 514-258.000
Dean, Robert H.: *See—*
White, John J.; and Dean, Robert H., 4,924,703, Cl. 73-308.000.
Dearlove, Thomas J.: *See—*
Atkins, Richard P.; Wang, Chen-Shih, and Dearlove, Thomas J., 4,925,886, Cl. 523-443.000.
DeBlaay, William E., to L & JG Stickley. Furniture constructions including hidden compartments. 4,925,255, Cl. 312-204.000.
DeCicco, Steven G.; Lee, Sung K.; Novak, Rudy G.; Wass, William E.; and Mak, Kai K., to International Technology Corporation. Method and apparatus for treating waste containing organic contaminants. 4,925,389, Cl. 432-106.000.
Decker, Deborah A.: *See—*
Decker, Donald F., Jr.; Decker, Deborah A.; and Duggins, Kathleen S., 4,925,666, Cl. 424-401.000.
Decker, Donald F., Jr.; Decker, Deborah A.; and Duggins, Kathleen S. Solubilized benzoyl peroxide and cosmetic solution including solubilized benzoyl peroxide. 4,925,666, Cl. 424-401.000
Deco-Grand, Inc.: *See—*
Paliwoda, Joseph; Hale, Keith F., and Propst, Verle, 4,925,367, Cl. 415-213.100.
Degen, Helmut: *See—*
Patsch, Manfred; Epple, Gerhard; Flohr, Helmut; Degen, Helmut; and Nahr, Uwe, 4,925,954, Cl. 548-417.000.
Degremont: *See—*
Gaudin, Marie-Pierre; Meindre, Daniel; and Savall, Vincent, 4,925,556, Cl. 210-293.000.
Deguchi, Toshihisa: *See—*
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 4,925,776, Cl. 430-321.000.
deKok, Peter T.; and Tselesin, Naum N. Abrasive tool and method for making. 4,925,457, Cl. 51-293.000.
De Kreek, Dirk: *See—*
Chaparro, John J.; De Kreek, Dirk; and Holdaway, Charles R., 4,925,089, Cl. 236-78.00D.
Delatorre, Leroy C., to Panex Corporation. Pressure measurement system. 4,924,701, Cl. 73-151.000
Delevallee, Francoise: *See—*
Clemence, Francois; Le Martret, Odile; and Delevallee, Francoise, 4,925,859, Cl. 514-342.000
Delgado, Rodolfo: *See—*
Borcher, Thomas A., Sr.; Delgado, Rodolfo; and Trinh, Toan, 4,925,577, Cl. 252-8.900
Delphi Research Inc.: *See—*
Dhooge, Patrick M., 4,925,540, Cl. 204-157.420.
Demassey, Jacques; Demoute, Jean-Pierre, and Tessier, Jean, to Roussel Uclaf. Novel pyrethrinoids. 4,925,862, Cl 514-369.000
Demoute, Jean-Pierre: *See—*
Cadiergue, Joseph; Demoute, Jean-Pierre; and Tessier, Jean, 4,925,874, Cl. 514-517.000
Demassey, Jacques; Demoute, Jean-Pierre, and Tessier, Jean, 4,925,862, Cl. 514-369.000.
Dempsey, John C.; and Stieff, Lorin R., to Rad Elec, Inc. Radon monitor. 4,926,053, Cl 250-376.000.
Den Braber, Antonie A.; and Slootweg, Evert R., to Denka International B.V. Insecticidal composition and method for combatting aphids. 4,925,657, Cl. 424-45.000.
Deng, Kang: *See—*
Deng, Yuan Q.; and Deng, Kang, 4,924,956, Cl. 180-65.300.
Deng, Yuan Q.; and Deng, Kang, to RDG Inventions Corporation. Free-piston engine without compressor. 4,924,956, Cl. 180-65.300
Denka International B.V.: *See—*
Den Braber, Antonie A.; and Slootweg, Evert R., 4,925,657, Cl. 424-45.000.
Denz, Helmut, to Robert Bosch GmbH. Method of and device for the electronic determination of the fuel amount for an internal combustion engine. 4,924,835, Cl. 123-478.000.
Derman, Jay S. Locking device for computer disk drives and the like. 4,924,683, Cl. 70-14.000.
Deschamps, Andre: *See—*
Rojey, Alexandre; Deschamps, Andre; Grehier, Alain; and Robert, Eric, 4,925,459, Cl. 155-16.000
Deschrijver, Paul; and Ganhy, Jean-Pierre, to Interox (Societe Anonyme). Process for the manufacture of a 2,3-dihydroxyquinoxaline, and 2,3-dihydroxyquinoxalines thus obtained. 4,925,941, Cl 544-354.000.
Desitin Arzneimittel GmbH: *See—*
Schmidt, Wolfgang, 4,925,670, Cl. 424-443.000
Desmet, Bernard: *See—*
Soubrier, Pierre; and Desmet, Bernard, 4,924,891, Cl 134-64.00R
Destephen, Stephen J.: *See—*
Fischbach, Eugene R., and Destephen, Stephen J., 4,925,683, Cl 426-103.000.
Desvignes, Bernard; Durand, Daniel; and Millelin, Bernard, to BP Chemicals Limited. Copolymers of propylene and but-1-ene and uses thereof. 4,925,902, Cl. 526-87.000.
Detex Corporation: *See—*
Bartlett, Alan L., 4,926,159, Cl 340-384.00E.
Detexomat Machinery Limited: *See—*
Hodges, Michael J., 4,925,022, Cl 206-296.000.
Deutsch, Edward A., to University of Cincinnati. Radioactive rhenium ligated to 2-hydroxy isobutyric acid and method of use. 4,925,925, Cl. 534-10.000.
Deutsche Automobilgesellschaft mbH: *See—*
Kistrup, Holger; and von Benda, Claus, 4,925,706, Cl 427-305.000.
Deutsche ITT Industries GmbH: *See—*
Reich, Werner, 4,926,443, Cl. 375-102.000
Develco Incorporated: *See—*
More, Henry S.; Rorden, Louis H.; and Akkerman, Neil H., 4,926,188, Cl. 343-719.000
Devine, James A.: *See—*
Larsen, Timothy P.; Devine, James A.; and Larsen, Michael T., 4,924,860, Cl. 128-205.120.
DeVit, Martin B.; and Shannon, Jeffrey C., to DeVit, Martin B. Combined heat pump and domestic water heating circuit. 4,924,681, Cl 62-238.600.
Devon Industries, Inc.: *See—*
Noack, William L., 4,925,048, Cl. 220-70.000
Deweerdt, Helene; Jenck, Jean; and Kalck, Philippe, to Rhone-Poulenc Chimie. Preparation of diesters of hexenedioic acid. 4,925,973, Cl 560-204.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Dhavlikar, Bhagawan S.: *See*—
Pole, Kishor M.; and Dhavlikar, Bhagawan S., 4,925,115, Cl. 241-222.000.
Dhooge, Patrick M., to Delphi Research Inc. Method for treating organic waste material and an oxidation catalyst/cocatalyst composition useful therefor. 4,925,540, Cl. 204-157.420.
Dhuey, Michael, to Apple Computer, Inc. Method and apparatus for determining available memory size. 4,926,314, Cl. 364-200.000.
Dickert, Franz; Kimmel, Heinz; Mages, Gert; and Schreiner, Sabine, to Siemens Aktiengesellschaft. Apparatus for measuring the partial pressure of gases or vapors. 4,926,156, Cl. 338-36.000.
Dickey-john Corporation: *See*—
Gorsek, Edmund J., 4,926,172, Cl. 341-20.000.
Dickman, Robert E.: *See*—
Handley, George E.; Moore, A. M.; and Dickman, Robert E., 4,926,392, Cl. 367-59.000.
Dietrich, William J., Sr., to Soycorp, Inc. Apparatus for deep plowing highly compacted soil. 4,924,946, Cl. 172-382.000.
Dietze, Robert H.: *See*—
Lomasney, David J.; Dietze, Robert H., and Rohrback, Jeffrey D., 4,924,630, Cl. 49-502.000.
DiFlora, Michael A.; Brown, James M.; Rice, Steven L.; and Ramsey, Jeffery D., to Copeland Corporation. Thermally protected hermetic motor compressor. 4,926,081, Cl. 310-89.000.
DiFrancesca, Peter; and O'Connor, Richard. Shock absorbing unit. 4,925,149, Cl. 248-687.000.
Di Gioacchino, Sandro; Paolinelli, Antonio; and Re, Luciano, to Enricerche S.p.A. Method of preparation of optically active alpha-amino-acids. 4,925,978, Cl. 562-443.000.
Digital Equipment Corporation: *See*—
Bernett, Frank, 4,924,976, Cl. 188-378.000.
Freedman, Gary M., 4,926,022, Cl. 219-121.630
Digital Telecommunications Systems, Inc.: *See*—
Smith, Benjamin A.; and Hoback, Conaway K., 4,926,468, Cl. 379-147.000.
Smith, Benjamin A.; and Hoback, Conaway K., 4,926,469, Cl. 379-155.000.
Dilcher, Dietmar, to Gebr. Bode & Co. GmbH. Swinging and sliding door rolling stock. 4,924,625, Cl. 49-212.000.
Dillmann, Hans-Georg; Pasler, Horst; and Martinsteg, Hans, to Kernforschungszentrum Karlsruhe GmbH. Clamping arrangement for stainless steel fiber filter elements. 4,925,623, Cl. 376-314.000.
Di Manno, Carl M., to Throtonics Corporation. Throwing device. 4,925,195, Cl. 273-428.000
Dimasi, Salvators: *See*—
Topolcsanyi, George; and Dimasi, Salvators, 4,925,406, Cl. 439-839.000.
Dinand, Pierre F., to R. P. Denis S.p.A. Closure device for containers. 4,925,043, Cl. 215-322.000.
Dinnissen, Johannes H. A.: *See*—
Clabbers, Wilhelmus G. M.; Dinnissen, Johannes H. A.; and Nabuurs, Johannes H. B., 4,925,178, Cl. 271-186.000.
Dinol International Aktiebolag: *See*—
Auvoja, Anders, 4,925,160, Cl. 254-101.000.
Di Paola, Jan C., to James Hardie Irrigation (Italy). Underground-installable rotary spray irrigator device, with emission angle selectable from the top. 4,925,098, Cl. 239-205.000.
Director General of Agency of Industrial Science and Technology: *See*—
Ichimura, Kunihiro; Yonezawa, Teruhiko; Kikuchi, Hideo; Tochizawa, Nariaki; and Hayashi, Keiichi, 4,925,770, Cl. 430-273.000.
Kawamura, Kichinari; Kono, Yasuo; Okado, Hideo; Shin, Shigemitsu; and Takaya, Haruo, 4,926,006, Cl. 585-640.000.
Divelink Pty Ltd: *See*—
Fincher, David S., 4,926,398, Cl. 367-172.000.
Di Vita, Pietro, to Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A. Method of reducing optical-fiber attenuation. 4,925,472, Cl. 65-2.000.
Dixie Chemical Company: *See*—
Zawalski, Robert C., 4,925,993, Cl. 570-151.000.
Dixon, Robert C.: *See*—
Aiello, Louis L.; Charnley, James E.; Mees, James A.; and Dixon, Robert C., 4,925,620, Cl. 376-260.000.
Dobrilla, Paolo. Etch pit density measuring method. 4,925,298, Cl. 356-30.000.
Dr. Ing. h.c. F. Porsche AG: *See*—
Palmer, Reinhard, 4,924,907, Cl. 137-527.800.
Stelter, Norbert; Richter, Goetz; and Schneider, Juergen, 4,926,329, Cl. 364-424.010.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Staffe, Detlef, 4,926,352, Cl. 364-550.000.
Dr.-Ing. Ludwig Pietzach GmbH & Co.: *See*—
Wamser, Manfred; and Overlach, Knud, 4,924,595, Cl. 33-542.000.
Doehner, Robert F., Jr., to American Cyanamid Company. Process for the preparation of o-carboxypyridyl- and o-carboxyquinolylimidazolinones. 4,925,944, Cl. 546-167.000.
Doi, Takashi: *See*—
Yamamoto, Akira; Motoyama, Miho; Kitajima, Hiroyuki; Doi, Takashi; and Nishimura, Toshifumi, 4,926,324, Cl. 364-200.000.
Doillon, charles J.: *See*—
Silver, Frederick H.; Berg, Richard A.; Doillon, charles J.; Chernomorsky, Arkady; and Olson, Robert M., 4,925,924, Cl. 530-356.000
Doko, Yoshiji: *See*—
Yamada, Teruaki; Doko, Yoshiji; and Sugiura, Kazuki, 4,925,977, Cl. 562-416.000.
Dolan, Donald T.: *See*—
O'Dea, Kevin J.; Dolan, Donald T., and Bergman, Norman J., 4,924,804, Cl. 118-669.000
Dolden, John G.; Harris, Gaynor P.; and Studholme, Matthew B., to BP Chemicals Limited. Catalytic suspension/dispersion preparation of polyamides from polyamide forming salt. 4,925,914, Cl. 528-336.000.
Dolfi, Martin D.: *See*—
Abraham, Thomas J., Jr., Fugate, Eric J.; Steinmetz, Guy R.; and Dolfi, Martin D., 4,925,998, Cl. 585-469.000.
Domtar Inc.: *See*—
Yalpani, Manssur; and Magdzinski, Leon, 4,925,923, Cl. 530-506.000.
Donahue, James A.: *See*—
Meuser, William E., LaRue, Gary W.; Harris, Windel L.; Donahue, James A.; Bonney, L. H., and Glanton, Gene W., 4,925,532, Cl. 202-219.000.
Donaldson, Scott B., to Kollmorgen Corporation. Square root digital-to-analog converter. 4,926,063, Cl. 307-144.000.
Donchev, Todor V.: *See*—
Pavlov, Dechko; Donchev, Todor V.; Nikolov, Ivan P.; Nikolova, Veneta I.; Papazov, Geno P.; and Petrov, Konstantin M., 4,925,746, Cl. 429-57.000.
Donnelly, Donald E.; Zikes, Bradley C., Moore, Dwain F.; Price, Jeffrey E.; and Toth, Bartholomew L., to Emerson Electric Co. Fuel burner control system with hot surface ignition. 4,925,386, Cl. 431-28.000.
Donovan, Thomas J. Electronic cuspotome and method of using the same. 4,924,882, Cl. 128-898.000.
Dorfmeister, Gabriele: *See*—
Blume, Friedhelm; Dorfmeister, Gabriele, Franke, Wilfried; Rees, Richard; Johann, Gerhard; and Arndt, Friedrich, 4,925,481, Cl. 71-92.000.
Dornier Medizintechnik GMBH: *See*—
Katona, Josef, 4,924,858, Cl. 128-24.00A
Dorski, Ronald L., to General Motors Corporation. Combined coolant pump impeller and seal assembly. 4,925,366, Cl. 415-174.300.
Dosapro Milton Roy: *See*—
Griesmar, Andre R., 4,925,371, Cl. 417-18.000.
Dost Incorporated: *See*—
Dost, James A., 4,925,225, Cl. 294-64.100.
Dost, James A., to Dost Incorporated. Vacuum lifting device for handling sheet material. 4,925,225, Cl. 294-64.100.
Dostert, Philippe: *See*—
Gabetta, Bruno; Magistretti, Maria J.; and Dostert, Philippe, 4,925,870, Cl. 514-453.000.
Doty, Thomas J.: *See*—
Summerville, David F., Williston, John P., Wand, Martin A.; Doty, Thomas J.; Rice, Haradon J.; and Huang, Phen-Lan, 4,926,103, Cl. 318-587.000.
Dotzauer, Bernhard, Kast, Hans; Beckerle, Wilhelm F.; and Hummerich, Rainer, to BASF Aktiengesellschaft. Light-weight building boards based on mineral fibers and thermoplastic binders. 4,925,529, Cl. 162-152.000.
Doukas, Peter H.: *See*—
Borenstein, Michael R.; Doukas, Peter H.; and Abou-Gharbia, Magid A., 4,925,841, Cl. 514-235.500
Doutre, Don A., to Alcan International Limited. Apparatus for studying particles having an aperture whose cross-sectional area changes progressively along at least part of its length. 4,926,114, Cl. 324-71.400.
Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V.: *See*—
Weiland, Jan A. E. S.; and van Hattem, Jan C., 4,924,908, Cl. 137-565.000.
Dow Chemical Company, The: *See*—
Bertram, James L.; Walker, Louis L., and Muskopf, John W., 4,925,901, Cl. 525-482.000.
Smith, Terry B., 4,925,028, Cl. 206-389.000.
Dow Corning Corporation: *See*—
Ryan, John W., 4,925,692, Cl. 426-531.000.
Dowdell, James F.; and Wilson, Eleanora G. Apparatus to permit anatomical self examination. 4,925,285, Cl. 350-621.000.
Dowell, Glen W. Bowfishing barbed tip incorporating positive barb latch. 4,924,619, Cl. 43-6.000.
Doyen, Philippe M., to Western Atlas International, Inc. Monte Carlo method for estimating lithology from seismic data. 4,926,394, Cl. 367-73.000.
Doyle, John B., to Babcock & Wilcox Company, The. Combined catalytic baghouse and heat pipe air heater. 4,925,633, Cl. 422-171.000.
Drabek, Jozef, and Siegrist, Urs, to Ciba-Geigy Corporation. N-benzoyl-N'-2,5-dihalo-4-perfluoroalkoxyphenylureas, pesticidal compositions containing them and their use in the control of pests. 4,925,875, Cl. 514-594.000.
Drabek, Jozef, to Ciba-Geigy Corporation. N-benzolyl-N'-trihalohaloalkoxyphenylureas and pesticidal compositions containing them. 4,925,876, Cl. 514-594.000.
Dragerwerk AG: *See*—
Kiske, Siegfried; Schwanbom, Erik; and Wallroth, Carl F., 4,924,861, Cl. 128-205.180

Dreher, Mark L.: *See*—
Barry, David L.; Dreher, Mark L., Johnson, Alan A.; and Schroeder, Otto E., 4,925,694, Cl. 426-613.000.
Drennan, Craig. Window assembly. 4,924,930, Cl. 160-90.000.
Dressel, Juergen: *See*—
Wagner, Klaus; Rieber, Norbert; Pommer, Ernst-Heinrich; and Dressel, Juergen, 4,925,476, Cl. 71-27.000.
Drew, Surnease: *See*—
Williams, David L.; Edwards, William B., III; Cox, Richard H.; Faustini, Daryl L.; and Drew, Surnease, 4,925,985, Cl. 568-384.000.
Driscoll, David M.: *See*—
Novak, C. Tim; Alt, Thomas J.; Chapman, Arnold D.; and Driscoll, David M., 4,926,345, Cl. 364-513.000.
Driskill, Kathleen R.; and Henn, Robert L., to W. L. Gore & Associates, Inc. Breathable flexible laminates adhered by a breathable adhesive. 4,925,732, Cl. 428-336.000.
Droulon, Georges: *See*—
Pipon, Yves; and Droulon, Georges, 4,925,228, Cl. 296-65.100.
Drucker, Oscar, to E. G. Smith Construction Products Inc. Exterior wall panel drainage system. 4,924,647, Cl. 52-235.000.
Du Pont Canada Inc.: *See*—
Sahi, Ash K., 4,925,685, Cl. 426-123.000.
Dube, Michael F.: *See*—
Perfetti, Thomas A.; Norman, Alan B.; and Dube, Michael F., 4,924,888, Cl. 131-336.000.
Dubief, Claude: *See*—
Grollier, Jean F.; and Dubief, Claude, 4,925,659, Cl. 424-78.000.
DuBois, R. Clark. Apparatus for feeding sheets to a copying machine 4,925,175, Cl. 271-3.000.
Duclo, Marley: *See*—
Webb, Edward; and Duclo, Marley, 4,925,408, Cl. 440-38.000.
Duembgen, Gerd: *See*—
Krabetz, Richard; Duembgen, Gerd, Nees, Friedbert; Merger, Franz; and Fouquet, Gerd, 4,925,823, Cl. 502-211.000.
Duffy, Keith, to Nelson A. Taylor Co., Inc. Replaceable inflation valve. 4,924,796, Cl. 114-219.000.
Duggan, Sharon A.: *See*—
Rossman, Herman; and Duggan, Sharon A., 4,926,287, Cl. 361-392.000.
Duggins, Kathleen S.: *See*—
Decker, Donald F., Jr.; Decker, Deborah A., and Duggins, Kathleen S., 4,925,666, Cl. 424-401.000.
Dugrand, Louis: *See*—
Menigaux, Louis; and Dugrand, Louis, 4,925,811, Cl. 437-129.000.
Dugua, Jacques, to Atochem. Aluminum chloride granules and process to obtain them. 4,925,454, Cl. 23-305.00A.
Duke, Terence R. Sail. 4,924,794, Cl. 114-102.000.
Dunham, Thomas L., to Rayovac Corporation. Palladium plated current collector. 4,925,754, Cl. 429-245.000.
Dunnegan, Garry W. Quadflex bucket apparatus. 4,925,359, Cl. 414-722.000.
Du Pont de Nemours, E. I., and Company: *See*—
Cairncross, Allan, 4,925,756, Cl. 430-18.000.
Herbranson, Dale E.; Speicher, Earl R.; and Rosenberg, Leonard S., 4,925,860, Cl. 514-359.000.
Madeleine, Dennis G.; Senkler, Carol A.; and Grezzo Page, Loretta A., 4,925,764, Cl. 430-110.000.
Madeleine, Dennis G., 4,925,765, Cl. 430-110.000.
Nebe, William J.; and Osborne, James J., 4,925,771, Cl. 430-281.000.
Tabb, David L.; and Wilson, Janet M., 4,925,892, Cl. 524-236.000.
Vinod, Yashavant V., 4,925,707, Cl. 427-393.400.
Durand, Daniel: *See*—
Desvignes, Bernard; Durand, Daniel; and Millelin, Bernard, 4,925,902, Cl. 526-87.000.
Durette, Philippe L., to Merck & Co., Inc. Aminoalkyl naphthalenediols as host resistance enhancers against viral infection. 4,925,831, Cl. 514-49.000.
Dutcher, Clinton H., to G & H Technology, Inc. Environmentally protected EMI shielded connector. 4,925,404, Cl. 439-607.000.
Dutzmann, Stefan: *See*—
Stroech, Klaus; Frie, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,925,482, Cl. 71-92.000.
Duwell, Michael J.: *See*—
Poehner, Michael E.; Duwell, Michael J.; and Boyd, Howard J., 4,926,457, Cl. 378-209.000.
DVSG Patentverwaltungs GmbH: *See*—
Price, Frank C.; Giebel, Gerhard; Fichtner, Rudi; and Broening, Manfred, 4,924,546, Cl. 12-7.100.
Dyer, Alan; Wells, Phyllis D.; and Williams, Craig D. Therapeutic compositions for veterinary use. 4,925,669, Cl. 424-438.000.
E.G.O. Elektro-Gerate Blanc u. Fischer: *See*—
Knauss, Hermann, 4,926,030, Cl. 219-541.000.
E. G. Smith Construction Products Inc.: *See*—
Drucker, Oscar, 4,924,647, Cl. 52-235.000.
E. R. Squibb & Sons, Inc.: *See*—
Friedhoff, Lawrence T.; and Bolton, Laura L., 4,925,873, Cl. 514-469.000.
Steer, Peter L., 4,925,216, Cl. 285-3.000.
Eastman Kodak Company: *See*—
Abraham, Thomas J., Jr.; Fugate, Eric J.; Steinmetz, Guy R.; and Dolfi, Martin D., 4,925,998, Cl. 585-469.000.
Barton, James T.; and Walker, Jimmy P., 4,926,198, Cl. 346-155.000.
Giles, Brian A.; and Schwab, Frederick J., 4,924,890, Cl. 134-61.000.
Monnier, John R.; Muehlbauer, Peter J.; and Low, Howard M., 4,925,986, Cl. 568-450.000.
Monnier, John R.; and Low, Howard M., 4,925,987, Cl. 568-450.000.
Eaton Corporation: *See*—
Mueller, Robert S.; and McGovern, Kevin M., 4,924,839, Cl. 123-559.100.
Schultz, Gary R.; and Oltean, Jerry M., 4,924,926, Cl. 152-417.000.
Eben-Ebenau, Wolf R.: *See*—
Schooley, Arthur F.; Eben-Ebenau, Wolf R.; and Nelson, Lloyd J., 4,926,108, Cl. 322-15.000.
Echert, Douglas C.; Geller, Edward W.; Hanzlick, Dennis J.; and Morison, James H. Method and apparatus for remote monitoring of oceanographic conditions. 4,924,698, Cl. 73-170.00A.
ECIA-Equipments Et Composants Pour L'Industrie Automobile: *See*—
Clement, Pierre; and Gourlot, Thierry, 4,925,469, Cl. 55-480.000
Eckhardt, Claude: *See*—
Hefti, Heinz; Reinehr, Dieter; Weber, Kurt; and Eckhardt, Claude, 4,925,595, Cl. 252-301.210.
Eckmann, Rolfe. Apparatus for assisting viewing of stereoscopic displays. 4,925,270, Cl. 350-131.000.
ECM International Inc.: *See*—
Arreola, Jose L., Jr., 4,926,061, Cl. 290-55.000.
Ecova Corporation: *See*—
Nelson, Michael J. K.; and Bourquin, Al W., 4,925,802, Cl. 435-262.000.
Edberg, Stephen C. Method and medium for use in detecting target microbes in situ in a specimen sample of a possibly contaminated material. 4,925,789, Cl. 435-38.000.
Edmonston, William H. Carburetor. 4,926,059, Cl. 261-44.300.
Edwards, William B., III: *See*—
Williams, David L.; Edwards, William B., III, Cox, Richard H.; Faustini, Daryl L.; and Drew, Surnease, 4,925,985, Cl. 568-384.000.
EEK, Inc.: *See*—
Jessen, Kyle P., 4,925,017, Cl. 206-5.100.
Efel S.p.A.: *See*—
Aimo, Vittorio, 4,924,717, Cl. 74-7.00B
EG&G Sealol, Inc.: *See*—
Berube, Donald N.; and Datta, Amitava, 4,924,756, Cl. 92-45.000
Egawa, Takeshi: *See*—
Matsui, Tohru; and Egawa, Takeshi, 4,926,206, Cl. 354-403.000
Eggersdorfer, Manfred: *See*—
Franz, Lothar; Eggersdorfer, Manfred; and Voges, Dieter, 4,925,940, Cl. 544-315.000.
Egglestone, Frederick, to Bristish Petroleum COmpany p.l.c., The Process and apparatus for the production of synthesis gas. 4,925,456, Cl. 48-127.900.
Eguchi, Masaharu; and Yamada, Akira, to Canon Kabushiki Kaisha. Positioning and structure of circuit elements in a camera. 4,926,207, Cl. 354-484.000.
Eheim, Franz: *See*—
Hofer, Gerald; and Eheim, Franz, 4,924,833, Cl. 123-449.000.
Ehn, Byron N., Jr.; and Mast, James W., to Textron, Inc. Mower-mounted grass catcher and reel lawn mower assembly and method of making same. 4,924,663, Cl. 56-202.000
Ehrenfraund, Josef: *See*—
Nyfeler, Robert; and Ehrenfraund, Josef, 4,925,840, Cl. 514-228.200.
Eicken, Karl: *See*—
Rueb, Lothar; Eicken, Karl; Pander, Hans J.; Plath, Peter, Schwalge, Barbara; Wuerzer, Bruno; and Meyer, Norbert, 4,925,484, Cl. 71-96.000.
Eickmann, Karl. Aircraft with a plurality of propellers, a pipe structure for thereon holdable wings, for vertical take off and landing. 4,925,131, Cl. 244-7.00C.
Eierdanz, Horst: *See*—
Biermann, Manfred; Koester, Rita; and Eierdanz, Horst, 4,925,559, Cl. 209-166.000.
Eigenmann, Ludwig. Prefabricated continuous roadmarking tape having optical and electromagnetic function. 4,925,335, Cl. 404-12.000.
Elastrator Company Limited: *See*—
Greenbank, Robin A.; and Van Der Velde, Arthur, 4,924,551, Cl. 17-1.00R.
Elco Co., Ltd.: *See*—
Machino, Toshimichi; Oda, Saiji; Toubo, Kihachirou; and Kadosaki, Masahiro, 4,924,713, Cl. 73-862.060.
Electric Power Research Institute, Inc.: *See*—
Wood, Jerry W., 4,925,074, Cl. 228-49.100.
Electrohome Limited: *See*—
McMurray, Robert E., Jr.; and Jarrett, Steven M., 4,925,276, Cl. 350-342.000.
Elitex, Koncern textilniho strojirenstvi: *See*—
Pacakova, Zdenka; Brokl, Pavel; and Kulhavy, Josef, 4,925,000, Cl. 198-409.000.
Ellenberger, John C.; Yoo, Inbae; and Burdick, Eugene V., to Hewlett-Packard Company. Hermetic high frequency surface mount microelectronic package. 4,925,024, Cl. 206-328.000.
Elliott, Charles T.: *See*—
Ashley, Timothy; Elliott, Charles T.; and White, Anthony M., 4,926,228, Cl. 357-30.000.
Ellis, Benny J.; and Daniels, Kurt H., to Western Insulated Glass Company. Method for handling sheet material. 4,925,361, Cl. 414-786.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Elmasry, Mohamed A., and Kidnie, Kevin M., to Minnesota Mining and Manufacturing Company. Liquid electrophotographic toner. 4,925,766, Cl. 430-115.000.
Elmer, Arthur E. H., to Kysor Industrial Corporation. Viscous fluid clutches. 4,924,986, Cl. 192-58.00B.
Eltech Systems Corporation: *See*—
Niksa, Marilyn J.; Niksa, Andrew J.; and Noscal, Jay M., 4,925,744, Cl. 429-27.000.
Emerson Electric Co.: *See*—
Donnelly, Donald E.; Zikes, Bradley C.; Moore, Dwain F.; Price, Jeffrey E.; and Toth, Bartholomew L., 4,925,386, Cl. 431-28.000.
Emhart Deutschland GmbH: *See*—
Farassat, Farhad; and Birgel, Walter, 4,925,083, Cl. 228-102.000.
Emhart Industries, Inc.: *See*—
Wright, Douglas W., 4,924,740, Cl. 83-527.000.
Emmett, John L., to United States of America, Energy. Multilayer optical dielectric coating. 4,925,259, Cl. 350-1.600.
Emmons, Lawrence D.: *See*—
Ueno, Yutaka; Emmons, Lawrence D.; Kaneko, Koji; and Semasa, Takayoshi, 4,926,245, Cl. 358-12.000.
Emmrich, Gerd: *See*—
Preusser, Gerhard; Emmrich, Gerd; and Schulze, Martin, 4,925,535, Cl. 203-25.000.
Endlich, Wilhelm: *See*—
Gunther, Peter; Wirth, Hermann O.; and Endlich, Wilhelm, 4,925,887, Cl. 524-14.000.
Endo, Fumio: *See*—
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,926,404, Cl. 369-32.000.
Endo, Gen; Tateishi, Hiroyuki; Kawata, Yoshihiro; Karasudani, Isao; and Omura, Hirofumi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Interlayer for laminated glass. 4,925,725, Cl. 428-156.000.
Endo, Takayoshi; Inaba, Shigemitsu; and Hashizawa, Shigemi, to Yazaki Corporation. System and method of inspecting connector coupling condition. 4,925,309, Cl. 356-394.000.
Endo, Toshihiko: *See*—
Sakamoto, Hidetoshi; Uematsu, Kenjiro; Momota, Masashi; Tanabe, Susumu; Suzuki, Tatsuo; and Endo, Toshihiko, 4,925,445, Cl. 604-95.000.
Engel, Melvyn: *See*—
Crisp, William E.; Engel, Melvyn; Kudlicki, Richard C.; and Smith, Judson L., 4,925,495, Cl. 134-18.000.
Engelhardt, David R., to R. Engelhardt Nominees Pty. Ltd. Adjustable spectacle frame. 4,925,290, Cl. 351-55.000.
Enircerche S.p.A.: *See*—
Di Gioacchino, Sandro; Paolinelli, Antonio; and Re, Luciano, 4,925,978, Cl. 562-443.000.
Enomoto, Akihiko; Koga, Takashi; Yoneda, Minoru; and Kobata, Hiroshi, to Kabushiki Kaisha Toshiba. DC motor stop detector and DC motor brake apparatus. 4,926,101, Cl. 318-374.000.
Enomoto, Norihide; and Naruse, Yoshihiro, to Kawasaki Steel Corp. Process for producing pyromellitic dianhydride. 4,925,957, Cl. 549-239.000.
Enustun, Bekir V.: *See*—
Gunnink, Brett W., and Enustun, Bekir V., 4,926,113, Cl. 324-694.000.
Epple, Gerhard: *See*—
Patsch, Manfred; Epple, Gerhard; Flohr, Helmut; Degen, Helmut; and Nahr, Uwe, 4,925,954, Cl. 548-417.000.
Erckel, Ruediger J.: *See*—
Mueller, Werner H.; Khanna, Dinesh N.; Vora, Rohitkumar H.; and Erckel, Ruediger J., 4,925,915, Cl. 528-353.000.
Erickson, Frank L.; Anderson, Robert E.; and Landis, Phillip S., to International Lubricants, Inc. Meadowfoam oil and meadowfoam oil derivatives as lubricant additives. 4,925,581, Cl. 252-48.200.
Erickson, Ronald R. Method for the preservation of wheat and device useful therefore. 4,925,305, Cl. 356-300.000.
Erlichman, Irving: *See*—
Wasserman, Nelson M., and Erlichman, Irving, 4,925,518, Cl. 156-295.000.
Erman, Marko; and Gamonal, Remi, to U.S. Philips Corp. Optical switching element comprising two parallel optical guides and switching matrix constituted by such elements. 4,925,264, Cl. 350-96.130.
Erny, Susan, heir: *See*—
Wachtel, Jean Louis, deceased; Wachtel, Tom, heir; Wachtel, Irene, heir; Erny, Susan, heir; and Wachtel, Dany, heir, 4,924,547, Cl. 15-185.000.
Erweka Apparatebau GmbH: *See*—
Schneider, Ortwin, 4,924,716, Cl. 73-866.000.
Esnault, Paul, to Peyriehou-Malan Societe Anonyme. Thermoplastic shutter having horizontal sections. 4,924,932, Cl. 160-201.000.
Establissements Caillau: *See*—
Calmettes, Lionel; and Andre, Michel, 4,924,558, Cl. 24-20.0CW
ETA SA Fabriques: *See*—
Vuilleumier, Cyril; and Muller, Jacques, 4,926,401, Cl. 368-88.000.
Etablissement Declare d'Utilite Publique Dit. Institut Pasteur: *See*—
Avrameas, Stratis; and Ternynck, Therese M. F., 4,925,921, Cl. 530-389.000.
Etablissements M. Muller & Cie.: *See*—
Brodu, Jacques, 4,924,591, Cl. 33-203.140.
Ethyl Corporation: *See*—
Beard, William R.; and Scull, Herbert M., 4,925,962, Cl. 556-187.000.
Lee, John Y.; and Shepherd, Lawrence H., Jr., 4,925,984, Cl. 564-412.000.
Marlett, Everett M., 4,925,963, Cl. 556-474.000.
Eto, Yoshio: *See*—
Sato, Goro; Higashi, Hidehiro; Shirono, Katsuhiro; and Eto, Yoshio, 4,925,554, Cl. 208-210.000.
Etou, Kouichi: *See*—
Mizuno, Hiroshi; Murasaki, Hiroshi; Ikegawa, Akihito; and Etou, Kouichi, 4,924,806, Cl. 118-658.000.
Eugenio, Manghi, to ISPE S.a.s. di Erminio GIANA e C. Lightning protection device for interacting with leader stroke to prevent return stroke. 4,926,284, Cl. 361-117.000.
Euroceltique, S.A.: *See*—
Hofer, Peter, 4,925,847, Cl. 514-263.000.
Eustache, Jacques: *See*—
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 4,925,658, Cl. 424-70.000.
Evenson, William R., to GNI Group, Inc., The. Vacuum assisted material mover. 4,924,898, Cl. 137-566.000.
Everett, Dennis: *See*—
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, 4,926,455, Cl. 378-176.000.
Exfluor Research Corporation: *See*—
Juhlke, Timothy J.; Bierschenk, Thomas R., and Lagow, Richard J., 4,925,583, Cl. 252-58.000.
Expertek, Inc.: *See*—
Gates, Donald C., 4,924,694, Cl. 73-45.500.
Exploweld AB: *See*—
Persson, Ingemar, 4,925,084, Cl. 228-107.000.
Exxon Chemical Patents Inc.: *See*—
Chang, Main, 4,925,821, Cl. 502-107.000.
Exxon Research & Engineering Company: *See*—
Fung, Shun C.; Tauster, Samuel J., and Koo, Jay Y., 4,925,819, Cl. 502-37.000.
Eyemetrics-Systems Ag: *See*—
Anger, Wilhelm; and Wiedman, Helmut, 4,925,291, Cl. 351-123.000.
Eyraud, Charles: *See*—
Bardot, Colette; Bergez, Pierre; Eyraud, Charles; and Hahiane, Lahcen, 4,925,566, Cl. 210-651.000.
Ezrin, Alan M.: *See*—
Bailey, Denis M.; D'Ambra, Thomas E.; and Ezrin, Alan M., 4,925,857, Cl. 514-341.000.
F.I.C.I. Finanziaria Industriale Commerciale Immobiliare: *See*—
Castiglioni, Giovanni P., 4,925,079, Cl. 226-152.000.
F. W. Oventrop, KG.: *See*—
Schmalenbach, Dietrich; and Henke, Bernhard, 4,924,911, Cl. 137-625.500.
Faasse, Gene E.; and Howard, James E., to Steel Heddle Mfg. Co. Harness frame with drop-through bolted centerbrace. 4,924,916, Cl. 139-91.000.
Faber, Pals G.; Hermans, Stefanus P. E. A.; and Vegter, Gert, to Oce-Nederland B.V. Apparatus for binding a stack of sheets along one peripheral side. 4,925,355, Cl. 412-37.000.
Fabris, Hans-Jurgen: *See*—
Auslander, Klaus; Fabris, Hans-Jurgen; Patzwald, Wolfgang; and Seichter, Helmut, 4,926,127, Cl. 324-329.000.
Fagan, John E., to Burford Corp. Method of forming a film of cooking oil on a pan surface. 4,925,699, Cl. 427-28.000.
Faivre, Michel: *See*—
Fourche, Jean-Pierre; Legrand, Guy; Faivre, Michel; and Berthaut, Olivier, 4,925,420, Cl. 445-3.000.
Falk Corporation, The: *See*—
Pokrandt, Glenn C.; Busser, William F.; Timmermann, Donald N.; and Kuliga, Thomas N., 4,925,431, Cl. 464-54.000.
Fanuc Ltd.: *See*—
Kawamura, Hideaki; Fujibayashi, Kentaro; and Otsuki, Toshiaki, 4,926,102, Cl. 318-573.000.
Matsumura, Teruyuki; and Nagashima, Noritake, 4,926,311, Cl. 364-191.000.
Farassat, Farhad; and Birgel, Walter, to Emhart Deutschland GmbH. Ball bonding method and apparatus for performing the method. 4,925,083, Cl. 228-102.000.
Farley, David L., to Completion Services, Inc. Bi-directional pressure assisted sealing packers. 4,924,941, Cl. 166-134.000.
Farmer, James Q.: *See*—
Hamilton, Scott L.; Harney, Michael P.; Naddor, David J.; Farmer, James Q.; Frederick, Richard B.; and Schaubs, Randolph J., 4,926,444, Cl. 375-9.000.
Farmer, Marion R., to Aluma-Form, Inc. Electrical utility pole davit arm. 4,925,142, Cl. 248-219.400.
Fasching, George E. 3-D capacitance density imaging of fluidized bed. 4,926,112, Cl. 324-664.000.
Faustini, Daryl L.: *See*—
Williams, David L.; Edwards, William B., III; Cox, Richard H.; Faustini, Daryl L.; and Drew, Surnease, 4,925,985, Cl. 568-384.000.
Fauteux, Denis G.; Moore, Michael J.; and Blonsky, Peter M. Solid state electrochemical cell having porous cathode current collector. 4,925,752, Cl. 429-191.000.
Fauteux, Denis G.: *See*—
Shackle, Dale R.; Fauteux, Denis G.; and Lundsgaard, Jorgen S., 4,925,751, Cl. 429-191.000.
Fawzi, Mahdi B.: *See*—
Ghebre-Sellassie, Isaac; Iyer, Uma; and Fawzi, Mahdi B., 4,925,676, Cl. 424-470.000.
Fay, James E., III: *See*—
Johnson, Russell L.; Hrubecky, Frederick J.; and Fay, James E., III, 4,924,845, Cl. 126-25.00R.

Federal Paper Board: *See*—
Ganz, Robert H.; and Sutherland, Robert L., 4,925,019, Cl. 206-145.000.
Feijen, Jan, to TheraTech, Inc. Biodegradable hydrogel matrices for the controlled release of pharmacologically active agents. 4,925,677, Cl. 424-484.000.
Fellows, Charles T.; Brown, George T.; and Haines, Robert C., to QMAX Technology Group, Inc. Substrate with particulate cosmetic. 4,925,667, Cl. 424-401.000.
Fenton, Ronald L.; and Brandt, Robert, to Safetytech Corporation. Fuel tank vaporization and explosion resistant apparatus and improved filler mass. 4,925,053, Cl. 220-88.00A.
Fenzau, Hilmar: *See*—
Schlunke, Jurgen; Kaiser, Franz; and Fenzau, Hilmar, 4,924,772, Cl. 100-163.00R.
Feppon, Philippe; and Rydel, Charles, to Jaeger. Method and device to measure the optical transmission factor of a tinted glass panel by reflection. 4,925,310, Cl. 356-434.000.
Ferag AG: *See*—
Meier, Jacques, 4,925,120, Cl. 242-59.000.
Fergason, James L., to Manchester R & D Partnership. Liquid crystal color display and method. 4,925,275, Cl. 350-333.000.
Ferlauto, Robert J., Jr.: *See*—
Gaffar, Abdul; Polefka, Thomas G.; Ferlauto, Robert J., Jr.; and Crisafulli, Rosemarie M., 4,925,654, Cl. 424-52.000.
Fernandes, Manuel. Double cut edger. 4,924,594, Cl. 33-483.000.
Ferrari, Francesco: *See*—
Stignani, Renato; and Ferrari, Francesco, 4,924,588, Cl. 29-726.000.
Ferro, Marco: *See*—
Castello, Rinaldo; Ferro, Marco; Salerno, Franco; and Tomasini, Lucano, 4,926,138, Cl. 330-253.000.
Feuser, Alfred; Neumann, Joachim; and Voxbrunner, Walter, to Mannesmann Rexroth GmbH. Circuit arrangement for a hydraulic drive in a position control circuit. 4,924,754, Cl. 91-363.00R.
Fiberoptic Sensor Technologies, Inc.: *See*—
Wlodarczyk, Marek T.; Coletta, Luciano; Campbell, James A.; and Tomasko, Douglas G., 4,924,870, Cl. 128-667.000.
Fichtner, Rudi: *See*—
Price, Frank C.; Giebel, Gerhard; Fichtner, Rudi; and Broening, Manfred, 4,924,546, Cl. 12-7.100.
Fiege, Helmut: *See*—
Mais, Franz-Josef; and Fiege, Helmut, 4,925,994, Cl. 570-210.000.
Field Foam Incorporated: *See*—
Petronko, Dennis A., 4,925,605, Cl. 264-46.600.
Field, Leslie A.: *See*—
Robinson, Richard C.; Jacobson, Robert L.; and Field, Leslie A., 4,925,549, Cl. 208-65.000.
Figgie International, Inc.: *See*—
Harwood, Van N., Jr.; and Wojtasik, Joseph F., 4,925,631, Cl. 422-122.000.
Filderman, Rene, to Valeo. Automatic clutch control system for coupling two rotating shafts. 4,924,989, Cl. 192-103.00F.
Filter Materials Limited: *See*—
Hill, Michael; and Nichols, Walter A., 4,925,602, Cl. 264-25.000.
Fincher, David S., to Divelink Pty Ltd. Pressure compensated communication system. 4,926,398, Cl. 367-172.000.
Fine, Gerald J., to Corning Incorporated. Ultraviolet transmitting glasses for EPROM windows. 4,925,814, Cl. 501-66.000.
Fingerle, Robert F., to PACCAR Inc. Cab fairing mounting for truck. 4,925,235, Cl. 296-180.200.
Finkenzeller, Ulrich: *See*—
Reiffenrath, Volker; Krause, Joachim; Wachtler, Andreas; Weber, Georg; and Finkenzeller, Ulrich, 4,925,590, Cl. 252-299.610.
Fiori, David, Jr. Digital voltmeter. 4,926,174, Cl. 341-110.000.
First Chemical Corporation: *See*—
Adams, Earl G.; and Barker, Robert B., 4,925,565, Cl. 210-634.000.
Fischbach, Eugene R.; and Destephen, Stephen J., to Nestec S.A. Beverage capsules. 4,925,683, Cl. 426-103.000.
Fisher, Charles K., to TRW, Inc. Push-in fastener clip. 4,925,351, Cl. 411-182.000.
Fisher, Gary R.; and Mantravadi, Murty V. One step rainbow holography. 4,925,260, Cl. 350-3.670.
Fisher Group Inc., The: *See*—
Bailie, David A., 4,924,895, Cl. 135-89.000.
Fisher, John: *See*—
Matthews, James R. A.; Little, Mervyn A.; and Fisher, John, 4,924,867, Cl. 128-645.000.
Flabeg GmbH: *See*—
Rein, Wilhelm, 4,926,090, Cl. 313-478.000.
Flam, Richard P.; and MacGahan, Jonathan P., to Flam & Russell, Inc. Radial power combiner/divider with mode suppression. 4,926,145, Cl. 333-125.000.
Flam & Russell, Inc.: *See*—
Flam, Richard P.; and MacGahan, Jonathan P., 4,926,145, Cl. 333-125.000.
Flanagan, Patrick M.: *See*—
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, 4,926,455, Cl. 378-176.000.
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, to Pandion Haliaetus Limited; Silver Security Limited; Champion Security Limited; and Linara Investments Limited. Foaming apparatus. 4,925,109, Cl. 239-429.000.
Flannigan, James S.: *See*—
Stimac, Gary A.; Crosswy, William C.; Preston, Stephen B.; and Flannigan, James S., 4,926,322, Cl. 364-200.000.
Fleck, Rod G.: *See*—
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.
Fleenor, Charles R.; and Fleenor, Shirley A. Bowling hand and wrist support device. 4,925,187, Cl. 273-54.00B.
Fleenor, Shirley A.: *See*—
Fleenor, Charles R.; and Fleenor, Shirley A., 4,925,187, Cl. 273-54.00B.
Fleming, Jerry A.; and Lytle, Ronald W., to Fleming, Jerry A. Fruit picker's bag. 4,925,071, Cl. 224-207.000.
Flexcon Company, Inc.: *See*—
Abber, Herman; Gerry, Elizabeth H.; and Pennace, John R., 4,925,671, Cl. 424-448.000.
Flexiplant USA: *See*—
Plant, David D., 4,924,651, Cl. 52-745.000.
Flick, Peter M.: *See*—
Carns, Richard A.; Flick, Peter M.; and Byrnes, John M., 4,926,362, Cl. 364-578.000.
Flohr, Helmut: *See*—
Patsch, Manfred; Epple, Gerhard; Flohr, Helmut; Degen, Helmut; and Nahr, Uwe, 4,925,954, Cl. 548-417.000.
Flory, Donald M., to General Motors Corporation. Hydraulic power booster. 4,924,755, Cl. 91-376.00R.
Flowers, Barbara A.; Marsh, Richard A.; Haraf, John C.; and LePage, Alfred D., to General Motors Corporation. Determining barometric pressure using a manifold pressure sensor. 4,926,335, Cl. 364-431.050.
Fluid Jet International Inc.: *See*—
Valavaara, Viljo K., 4,924,901, Cl. 137-102.000.
Flygt AB: *See*—
Carlsson, Valdemar, 4,925,375, Cl. 417-430.000.
Foertsch, Manfred; Hans, Waldemar; and Warnicke, Volker, to Robert Bosch GmbH. Fuel injection valve. 4,925,111, Cl. 239-533.120.
Fogg, Michael W.; Scully, Michael J.; and Wolfe, Brian A., to AMP Incorporated. Electrical connector assembly with strain relief. 4,925,401, Cl. 439-465.000.
Folsom, Mark F.: *See*—
Tassie, Douglas P.; and Folsom, Mark F., 4,924,752, Cl. 89-160.000.
Forbes, Vaughn T. Golf training apparatus. 4,925,192, Cl. 273-187.00R.
Ford, Carol M. Ceramic cathode for ring lasers. 4,926,437, Cl. 372-87.000.
Ford Motor Company: *See*—
Gaston, Robert D., 4,924,704, Cl. 73-317.000.
Moskowitz, David; Hoffman, David W.; and Schmatz, Duane J., 4,925,346, Cl. 408-1.00R.
Wade, Wallace R., 4,924,840, Cl. 123-571.000.
Wu, Charles L.; and Haboush, Roger K., 4,926,309, Cl. 364-149.000.
Ford New Holland, Inc.: *See*—
Seymour, Shaun A., 4,924,661, Cl. 56-1.000.
Shust, Ryan E., 4,924,720, Cl. 74-377.000.
Fortune, William S. Hot air heated soldering instrument. 4,926,028, Cl. 219-230.000.
Forward, John E.: *See*—
Kramer, William E.; Charland, Terrence D.; Forward, John E.; Burger, William R.; and Mandel, Barry P., 4,925,171, Cl. 270-53.000.
Forward Technology Industries, Inc.: *See*—
Newkirk, Raymond K.; and West, William G., 4,925,519, Cl. 156-304.100.
Foster, Bruce A. G. E.; Ollerenshaw, Andrew; and Copestake, Nigel W., to Boart (UK) Limited. Feed beam arrangement for a rockdrill. 4,925,320, Cl. 384-42.000.
Foster, Edward P.: *See*—
Bellas, George T.; Snedden, Richard B.; Lennon, Dennis R.; and Foster, Edward P., 4,924,784, Cl. 110-261.000.
Foster, Richard L.: *See*—
Ricker, Dennis J.; and Foster, Richard L., 4,926,099, Cl. 318-254.000.
Fouquet, Gerd: *See*—
Krabetz, Richard; Duembgen, Gerd; Nees, Friedbert; Merger, Franz; and Fouquet, Gerd, 4,925,823, Cl. 502-211.000.
Four PI Systems Corporation: *See*—
Baker, Bruce D.; Corey, Robert L.; Adams, John A.; and Ross, Edward W., 4,926,452, Cl. 378-22.000.
Fourche, Jean-Pierre; Legrand, Guy; Faivre, Michel; and Berthaut, Olivier, to Videocolor. Method for the automatic measurement of convergence and for the determination of corrections to be made in trichromatic cathode tube deflectors and machine for the application of this method. 4,925,420, Cl. 445-3.000.
Fourdan, Louis, to LMT Radio Professionnelle. Radar, notably for the correction of artillery fire. 4,926,183, Cl. 342-67.000.
Fournier, Daniele; Charbonnier, Francois; and Boccara, Alberr-Claude. Analog recording and integration of electric signals. 4,926,057, Cl. 250-578.100.
Foyt, Arthur G.: *See*—
Merritt, Sears W.; Sacks, Robert N.; and Foyt, Arthur G., 4,926,083, Cl. 310-313.00R.
Framatome: *See*—
Chevereau, Gerard; Cauquelin, Claude; and Heuze, Alain, 4,925,624, Cl. 376-400.000.
Francia, Paul P., to C. J. Winter Machine Works, Inc. Quick release thread roll support. 4,924,687, Cl. 72-102.000.
Francis, John, to Grubbs, Robert B. Bacterial incubator and method of use. 4,925,564, Cl. 210-608.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Francis, Peter S.; and Chapman, Thomas M., to Arco Chemical Technology, Inc. Method for enhancing thermal expandability of direct-injection foams. 4,925,606, Cl. 264-50.000.
Francis, Philip S., to Royal Melbourne Institute of Technology Limited. Plotting apparatus using a light source moved on a photosensitive surface. 4,926,348, Cl. 364-520.000.
Francois, Roger, to N. V. Bekaert S.A. Metal fibers obtained by bundled drawing. 4,925,539, Cl. 204-146.000.
Frank George Grundman: *See—*
Knott, Frederick J., 4,925,136, Cl. 248-62.000.
Frank, Thomas P., to Medex, Inc. Tubular pressure transducer. 4,924,872, Cl. 128-673.000.
Franke, Wilfried: *See—*
Blume, Friedhelm; Dorfmeister, Gabriele; Franke, Wilfried, Rees, Richard; Johann, Gerhard; and Arndt, Friedrich, 4,925,481, Cl. 71-92.000.
Franks, George J., Jr. Clamp for electrically conductive strips. 4,925,395, Cl. 439-100.000.
Franz, Lothar; Eggersdorfer, Manfred; and Voges, Dieter, to BASF Aktiengesellschaft. Preparation of cyclic N,N'-dimethylureas. 4,925,940, Cl. 544-315.000.
Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Hommel, Horst; and Schubert, Hiltmar, 4,925,600, Cl. 264-3.400.
Frederick, Richard B.: *See—*
Hamilton, Scott L.; Harney, Michael P.; Naddor, David J.; Farmer, James Q.; Frederick, Richard B.; and Schaubs, Randolph J., 4,926,444, Cl. 375-9.000.
Frederiksen, Bjarne; Allen, John M.; and Walla, Gregg W., to Timberline Supply Ltd. Safety lock system for cabinet with multiple drawers. 4,925,257, Cl. 312-221.000.
Freedman, Gary M., to Digital Equipment Corporation. Laser reflow soldering process and bonded assembly formed thereby. 4,926,022, Cl. 219-121.630.
Freedman, Melvin S., to Avery International Corporation. Coextruded core laminates. 4,925,714, Cl. 428-40.000.
Freerksen, Donald L.. *See—*
Brown, Jeffrey D.; Freerksen, Donald L.; Hilker, Scott A.; and Stasiak, Daniel L., 4,926,370, Cl. 364-748.000.
Frei, Bernhard; and Honl, Wolf-Dieter, to TRW Repa GmbH. Safety belt retractor with tightening means. 4,925,123, Cl. 242-107.000.
Frei, Max: *See—*
Berti, Martin; and Frei, Max, 4,924,657, Cl. 53-450.000.
Freidin, Philip M.: *See—*
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.
Frencken, Peter H.; Nillesen, Antonius H. H. J., and Brand, Simon J., to U.S. Philips Corporation. Video signal processing circuit. 4,926,260, Cl. 358-148.000.
Frenznick, Anton. *See—*
Buchschmid, Emil; Frenznick, Anton; Lindner, Klaus; Schmid, Olaf; Schmid, Hans-Dieter; Schmidt, Gerhard; and Sturm, Theodor, 4,926,150, Cl. 335-196.000.
Fresenius AG: *See—*
Meisberger, Artur; and Neumann, Hans-Jurgen, 4,925,299, Cl. 356-40.000.
Frie, Monika *See—*
Stroech, Klaus; Frie, Monika, Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,925,482, Cl. 71-92.000.
Stroech, Klaus; Frie, Monika; Himmler, Thomas; and Plempel, Manfred, 4,925,865, Cl. 514-383.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Lentz, Norbert; and Schmidt, Harald, 4,925,006, Cl. 198-461.000.
Friedhoff, Lawrence T.; and Bolton, Laura L., to E. R. Squibb & Sons, Inc. Method of treating skin injuries using thromboxane A_2 receptor antagonists. 4,925,873, Cl. 514-469.000.
Friedman, Dale; and Mennella, Louis P., to Innovative Sampling Technologies Inc. Combination mailer. 4,925,029, Cl. 206-473.000.
Frielink, Franciscus J., to NCR Corporation. Data entry keyboard apparatus. 4,926,173, Cl. 341-22.000.
Frito-Lay, Inc.: *See—*
Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., 4,925,694, Cl. 426-613.000.
Fritsch, Edward V.: *See—*
Chuang, Jo-Yu; and Fritsch, Edward V., 4,924,948, Cl. 173-139.000.
Frohbieter, Edwin H.: *See—*
Janke, Donald E.; and Frohbieter, Edwin H., 4,924,680, Cl. 62-187.000.
Froissant, Jacques: *See—*
George, Pascal; Sevrin, Mireille; Maloizel, Christian; Tixidre, Arlette; and Froissant, Jacques, 4,925,850, Cl. 514-307.000.
Fromm, Hans-Jurgen: *See—*
Buchecker, Richard; Fromm, Hans-Jurgen; Kelly, Stephen; and Schadt, Martin, 4,925,278, Cl. 350-350.500.
Fromm, Susan M.: *See—*
Giannini, Robert P.; Fromm, Susan M.; and Suarez, Jose , 4,925,675, Cl. 424-469.000.
Frosien, Juergen, to ICT Integrated Circuit Testing Gesellschaft fur Halbleiterpruftechnik mbH. Objective lens for focusing charged particles in an electron microscope. 4,926,054, Cl. 250-396.00R.
Frost, Richard L.; Morley, Kenneth S.; and Pulsipher, Dennis C., to Unisys Corp. Apparatus and method for real time data compressor. 4,926,482, Cl. 381-31.000.
Fugate, Eric J.: *See—*
Abraham, Thomas J., Jr.; Fugate, Eric J.; Steinmetz, Guy R.; and Dolfi, Martin D., 4,925,998, Cl. 585-469.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Abe, Kunihiro, 4,924,830, Cl. 123-414.000.
Abe, Kunihiro; and Kobayashi, Tomoya, 4,926,330, Cl. 364-424.030.
Minegishi, Masami, 4,924,827, Cl. 123-198.0DB.
Fuji Photo Film Co.: *See—*
Miida, Takashi; and Murayama, Jin, 4,926,205, Cl. 354-402.000.
Fuji Photo Film Co., Ltd.: *See—*
Akao, Mutsuo; and Inoue, Koji, 4,925,711, Cl. 428-35.200.
Furusawa, Genichi; Ishikawa, Takatoshi; Furutachi, Nobuo; and Hirose, Takeshi, 4,925,781, Cl. 430-505.000.
Hosoi, Yuichi; Takahashi, Kenji; and Arakawa, Satoshi, 4,926,045, Cl. 250-327.200.
Inoue, Noriyuki; and Ozawa, Takashi, 4,925,777, Cl. 430-377.000.
Iwasaki, Masayuki; Fujikura, Sadao; Wakata, Yuichi; and Takata, Yasunori, 4,925,768, Cl. 430-271.000.
Okada, Masahiro; Ukai, Toshinao; Suzuki, Seiji; Adachi, Keiichi; Watanabe, Toshiyuki; and Ishigaki, Kunio, 4,925,782, Cl. 430-510.000.
Ozawa, Yoshio, 4,926,211, Cl. 355-28.000.
Ozawa, Yoshio; and Yamamoto, Takashi, 4,926,212, Cl. 355-43.000.
Shimizu, Makoto; Nakamura, Katutoshi; and Furusawa, Noriyuki, 4,925,119, Cl. 242-57.000.
Takahashi, Kenji; and Nakamura, Takashi, 4,926,047, Cl. 250-484.100.
Yamaguchi, Akira, 4,925,507, Cl. 156-73.100.
Yokota, Kenji, 4,926,263, Cl. 358-474.000.
Fuji, Saburo: *See—*
Atsuta, Mitsuru; Sakashita, Takeshi; Miyamoto, Ryoichi; Tanimura, Yukinori, and Fuji, Saburo, 4,925,660, Cl. 424-81.000.
Fuji Terumo Co., Ltd.: *See—*
Sakamoto, Hidetoshi; Uematsu, Kenjiro; Momota, Masashi; Tanabe, Susumu; Suzuki, Tatsuo; and Endo, Toshihiko, 4,925,445, Cl. 604-95.000.
Fujibayashi, Kentaro: *See—*
Kawamura, Hideaki; Fujibayashi, Kentaro; and Otsuki, Toshiaki, 4,926,102, Cl. 318-573.000.
Fujii, Masahiko: *See—*
Oguchi, Yoshiharu; Niimura, Koichi; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; and Yoshikumi, Chikao, 4,925,662, Cl. 424-85.910.
Fujii, Takayoshi: *See—*
Oguchi, Yoshiharu; Niimura, Koichi; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; and Yoshikumi, Chikao, 4,925,662, Cl. 424-85.910.
Fujii, Takeo, to NEC Corporation. Semiconductor memory circuit with sensing arrangement free from malfunction. 4,926,381, Cl. 365-189.010.
Fujikawa, Yasuji: *See—*
Ueda, Kazuo; Wakabayashi, Shigeru; Saijo, Yoshihiro; and Fujikawa, Yasuji, 4,925,069, Cl. 222-500.000.
Fujikura, Sadao: *See—*
Iwasaki, Masayuki; Fujikura, Sadao; Wakata, Yuichi; and Takata, Yasunori, 4,925,768, Cl. 430-271.000.
Fujimaki, Yoshihide: *See—*
Takenouchi, Shigeki; Hirano, Akira; Saito, Shiori; and Fujimaki, Yoshihide, 4,925,757, Cl. 430-31.000.
Fujimori, Hiroyoshi: *See—*
Nagasaki, Tatsuo; Yamada, Hidetoshi; and Fujimori, Hiroyoshi, 4,926,247, Cl. 358-43.000.
Fujimura, Toshio: *See—*
Imai, Takuo; Kojima, Shinji; Matsukawa, Toshitane; and Fujimura, Toshio, 4,924,585, Cl. 29-527.500.
Fujioka, Motoo: *See—*
Hojo, Nobuyoshi; Asai, Yoshiro; Fujioka, Motoo; Kobayashi, Naotou; and Yamaguchi, Takashi, 4,925,510, Cl. 156-92.000.
Fujioka, Yasushi: *See—*
Nakagawa, Katsumi; Ishihara, Shunichi; Kanai, Masahiro; Arao, Kozo; Fujioka, Yasushi; and Sakai, Akira, 4,926,229, Cl. 357-30.000.
Fujisaki, Seiro. Optically readable code and method for communication. 4,926,035, Cl. 235-494.000.
Fujisawa, Isao; and Hashimoto, Katsuhiko, to Sharp Kabushiki Kaisha. Display driving system for driving two or more different types of displays. 4,926,166, Cl. 340-717.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Isogai, Takao; and Yoshida, Masaru, 4,925,794, Cl. 435-91.000.
Murata, Masayoshi; Tsutsumi, Hideo, Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,925,838, Cl. 514-210.000.
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 4,925,849, Cl. 514-300.000.
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,925,948, Cl. 548-195.000.
Fujishima, Kazuyasu; Hidaka, Hideto; Asakura, Mikio; and Matsuda, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device with cache memory addressable by block within each column. 4,926,385, Cl. 365-230.030.
Fujita, Hisao: *See—*
Murahashi, Takashi; Fujita, Hisao; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 4,926,195, Cl. 346-108.000.

Fujita, Kazuya; Maeda, Takamichi; and Hayakawa, Masao, to Sharp Kabushiki Kaisha. Plastic encapsulant for semiconductor. 4,926,239, Cl. 357-72.000.
Fujita, Nobuhiko; Itozaki, Hideo; Tanaka, Saburo; Yazu, Shuji; and Jodai, Tetsuji, to Sumitomo Electric Industries, Ltd. Method for preparing thin film of compound oxide superconductor by ion beam techniques. 4,925,829, Cl. 505-1.000.
Fujita, Takafumi: *See—*
Suizu, Yoji; Masaki, Nobuo; Fujita, Takafumi; and Kurabayashi, Hiroshi, 4,924,640, Cl. 52-167.0DF.
Fujita, Yasuhiko, to Kabushiki Kaisha Toshiba Voltage comparator having hysteresis characteristics. 4,926,068, Cl. 307-359.000.
Fujitsu Limited: *See—*
Isono, Hideki, 4,926,430, Cl. 372-33.000.
Shinoda, Tsutae; and Nanto, Toshiyuki, 4,926,095, Cl. 315-169.400.
Sugawara, Hideo; and Ashida, Hideo, 4,926,187, Cl. 342-361.000.
Yamagishi, Fumio; Hasegawa, Shinya; and Ikeda, Hiroyuki, 4,925,262, Cl. 350-3.710.
Yamagishi, Wataru; and Iikawa, Tsutomu, 4,925,502, Cl. 148-311.000.
Yoshida, Masanobu, 4,926,379, Cl. 365-189.010.
Fukao, Hiroshi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 4,926,218, Cl. 355-283.000.
Fukuda, Diane P.: *See—*
Buck, Thomas F.; and Fukuda, Diane P., 4,925,710, Cl. 428-34.500.
Fukuda, Kiyohito: *See—*
Samejima, Masakuni; Fukuda, Kiyohito; and Matsumoto, Mitsuru, 4,925,398, Cl. 439-357.000.
Fukuda, Masuo: *See—*
Yokokoji, Osamu; and Fukuda, Masuo, 4,925,634, Cl. 422-179.000.
Fukuda, Tokuya: *See—*
Matsumoto, Hiroaki; Senda, Tetsuya; and Fukuda, Tokuya, 4,926,261, Cl. 358-167.000.
Fukuda, Tsuyoshi; and Shimada, Fumio, to Canon Kabushiki Kaisha/-Canon Denshi Kabushiki Kaisha. Shutter for use in camera. 4,926,202, Cl. 354-246.000.
Fukumoto, Ryoichi: *See—*
Komuro, Kenichi; Kawai, Taneichi; Kamei, Atsushi; Asada, Toru; Torii, Nozomu; and Fukumoto, Ryoichi, 4,926,332, Cl. 364-424.050.
Fukuoka, Shinsuke: *See—*
Aoki, Toshiya; Ishida, Hiroshi; and Fukuoka, Shinsuke, 4,925,971, Cl. 560-137.000.
Fukuyama, Shigeru: *See—*
Mizoguchi, Yoshiyuki; Watanabe, Yoshitaka; Hiraga, Hiroyuki; and Fukuyama, Shigeru, 4,926,196, Cl. 346-140.00R.
Fuller, George L. Plate sundial with installation indicia. 4,924,592, Cl. 33-270.000.
Fuller, Robert L., Jr., to Boeing Company, The Storage mechanism for sorted articles. 4,924,998, Cl. 198-365.000.
Funakoshi, Takeshi: *See—*
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,926,333, Cl. 364-426.020.
Funatsu, Koichi; and Aida, Hiromi, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling transmission for vehicle. 4,926,328, Cl. 364-424.100.
Fundokin Shoyu Kabushiki Kaisha: *See—*
Kotegawa, Michiro; and Kuribayashi, Yoshihiro, 4,925,679, Cl. 426-18.000.
Fung, Shun C.; Tauster, Samuel J.; and Koo, Jay Y., to Exxon Research & Engineering Company. Method of regenerating a deactivated catalyst. 4,925,819, Cl. 502-37.000.
Funk, John G.: *See—*
Roy, Bryan A.; Funk, John G.; and Rowe, Bruce S., 4,926,046, Cl. 250-506.100.
Furey, Charles. Beach umbrella safety system. 4,924,893, Cl. 133-16.000.
Furusawa, Genichi; Ishikawa, Takatoshi; Furutachi, Nobuo; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,925,781, Cl. 430-505.000.
Furusawa, Noriyuki: *See—*
Shimizu, Makoto; Nakamura, Katutoshi; and Furusawa, Noriyuki, 4,925,119, Cl. 242-57.000.
Furutachi, Nobuo: *See—*
Furusawa, Genichi; Ishikawa, Takatoshi; Furutachi, Nobuo; and Hirose, Takeshi, 4,925,781, Cl. 430-505.000.
Furutsu, Etsuro; and Izukawa, Kazuhiro, to Canon Kabushiki Kaisha. Driving apparatus for a vibration wave motor. 4,926,084, Cl. 310-316.000.
Fushiya, Fusao; Yoshida, Kenji; Naitoh, Akira; and Sawa, Tetsuya, to Makita Electric Works, Ltd. Electric motor brush assembly adaptable to different stators. 4,926,075, Cl. 310-50.000.
Futami, Toru; Suzuki, Tadashi; and Sakagami, Atsushi, to Nissan Motor Company, Ltd. Information transmission and reception system for a vehicle. 4,926,417, Cl. 370-85.100.
Futamura, Shingo, to Bridgestone/Firestone, Inc. Elastomer compositions for tire treads having low rolling resistance and good wet and dry grip traction. 4,925,894, Cl. 524-484.000.
G & H Technology, Inc.: *See—*
Dutcher, Clinton H., 4,925,404, Cl. 439-607.000.
Gabathuler, Jean-Pierre: *See—*
Mizrah, Tiberiu; Maurer, Albert; and Gabathuler, Jean-Pierre, 4,924,570, Cl. 29-163.800.
Gabetta, Bruno; Magistretti, Maria J.; and Dostert, Philippe, to Inverni Della Beffa SpA; and Societe de Recherches Industrielles Sori. Therapeutic use of proanthocyanidine A2 as a cytoprotective agent. 4,925,870, Cl. 514-453.000.
Gabetta, Bruno; and Magistretti, Maria J., to Inverni Della Beffa SpA; and Societe de Recherches Industrielles Sori. Therapeutic use of proanthocyanidine A2 for treatment of vascular system. 4,925,871, Cl. 514-453.000.
Gabriel, James: *See—*
Pendleton, John H.; and Gabriel, James, 4,925,245, Cl. 297-440.000.
Gaffar, Abdul; Polefka, Thomas G.; Ferlauto, Robert J., Jr.; and Crisafulli, Rosemarie M., to Colgate-Palmolive Company. Anticalculus oral composition. 4,925,654, Cl. 424-52.000.
Gaffney, Thomas R.: *See—*
Coe, Charles G.; Gaffney, Thomas R.; and Srinivasan, Rajagopalan S., 4,925,460, Cl. 55-25.000.
Gajewski, Dennis A., to Amity Leather Products Co. Display fixture with modular display units. 4,925,038, Cl. 211-59.200.
Galati, Gaspare; and Jacovitti, Giovanni, to Selenia Industrie Elettroniche Associate S.p.A. Angle measurement device for amplitude monopulse receivers. 4,926,184, Cl. 342-149.000.
Galatron, S.r.l.: *See—*
Orlandi, Alessio, 4,924,903, Cl. 137-454.500.
Galvanetto, Francois: *See—*
Spiess, Hansruedi; and Galvanetto, Francois, 4,925,337, Cl. 404-26.000.
Gamonal, Remi: *See—*
Erman, Marko; and Gamonal, Remi, 4,925,264, Cl. 350-96.130.
Ganhy, Jean-Pierre: *See—*
Deschrijver, Paul; and Ganhy, Jean-Pierre, 4,925,941, Cl. 544-354.000.
Ganter, Martin. Method for the decontamination of radioactively contaminated liquids. 4,925,597, Cl. 252-631.000.
Ganz, Robert H.; and Sutherland, Robert L., to Federal Paper Board Article carrier with end panels. 4,925,019, Cl. 206-145.000.
Ganzi, Gary C.: *See—*
Giuffrida, Anthony J.; Jha, Anil D.; and Ganzi, Gary C., 4,925,541, Cl. 204-182.500.
GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Stenzel, Gerhard, 4,926,031, Cl. 235-380.000.
Garay, Garbiel L.; and Garay, Kathleen M. K., to Transpharm Group Inc. Removable inflatable intragastrointestinal device for delivering beneficial agents. 4,925,446, Cl. 604-96.000.
Garay, Kathleen M. K.: *See—*
Garay, Garbiel L.; and Garay, Kathleen M. K., 4,925,446, Cl. 604-96.000.
Gardner, Colin R.: *See—*
Deacon, Robert M. J.; Gillespie, Roger J.; Gardner, Colin R., and Tully, Wilfred R., 4,925,846, Cl. 514-258.000.
Gardner, Deane: *See—*
Bibl, Andreas; Higginson, John; and Gardner, Deane, 4,926,199, Cl 346-157.000.
Garfield, Brian R. C.; and Riches, Mark J., to Imco Electro-Optics Limited. Streaking or framing image tube with plural grid control 4,926,039, Cl. 250-213.0VT.
Garofalo, Mel V.; Taylor, William J.; and Rheaume, Wayne T. Skewed fillet weld gauge. 4,924,580, Cl. 33-832.000.
Garrido, Alfonso; and Rico, Fernando, to Otis Elevator Company. Worm gear elevator drive and assembly method. 4,924,721, Cl. 74-425.000.
Gas Research Institute, Inc.: *See—*
Rector, James; Marion, Bruce; Widrow, Bernard; and Salehi, Iraj A., 4,926,391, Cl. 367-41.000.
Gaskill, Robert E.: *See—*
Mirand, Mauricio; and Gaskill, Robert E., 4,925,397, Cl 439-353.000.
Gassman, Paul R.: *See—*
Goldblatt, Jeffrey P.; and Gassman, Paul R., 4,925,023, Cl 206-309.000.
Gaston, Robert D., to Ford Motor Company. Fuel sender assembly requiring no calibration and having reduced wear. 4,924,704, Cl. 73-317.000.
Gates, Donald C., to Expertek, Inc. Apparatus for leak testing a fluid containing chamber. 4,924,694, Cl. 73-45.500.
Gaudin, Marie-Pierre; Meindre, Daniel; and Savall, Vincent, to Degremont. Method for the manufacture of floors for filters, and floors thus made. 4,925,556, Cl. 210-293.000.
Gauthier, Raymond G.; Krause, James N.; and Lancisi, David M., to Seagate Technology, Inc. Resistance compensation in a motor using a thermally variable resistive network. 4,926,077, Cl. 310-68.00C.
Gazelle Microcircuits, Inc.: *See—*
MacMillan, David C.; and Graham, Andrew C., 4,926,071, Cl. 307-475.000.
GBR Systems Corporation: *See—*
Golicz, Roman M., 4,925,180, Cl. 271-198.000.
Golicz, Roman M., 4,925,362, Cl. 414-790.700.
GE Fanuc Automation North America, Inc.: *See—*
Mercer, Ferrell L.; Whitaker, Earl J.; and Cuthbert, Christopher P., 4,926,375, Cl. 364-900.000.
Gebhard, Georg, to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft. Method of making shaped bodies for use in the construction trades from power-plant clarifier sludge. 4,925,614, Cl 264-232.000.
Gebr. Bode & Co. GmbH: *See—*
Dilcher, Dietmar, 4,924,625, Cl. 49-212.000.
Gebr. Knauf Westdeutsche Gipswerke, Firma: *See—*
Hamm, Heiner; Hartmann, Peter; Kampner, Karl-Heinz; and Kurandt, Hans-Friedrich, 4,925,826, Cl. 502-407.000

VOL
1114
ISS
3
MY
15
1990
UMI

Geither, John: *See—*
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, 4,926,455, Cl. 378-176.000.
Gelenkwellenbau GmbH. *See—*
Heier, Dieter, 4,925,430, Cl. 464-14.000.
Gell, Jeff: *See—*
Konieczynski, Ronald D.; Pintelon, Jo; Holland, Robert J.; Barth, C. Peter; and Gell, Jeff, 4,925,101, Cl. 239-8.000.
Geller, Edward W.: *See—*
Echert, Douglas C.; Geller, Edward W.; Hanzlick, Dennis J.; and Morison, James H., 4,924,698, Cl. 73-170.00A.
Gemba, Tsuneo; Tamaru, Takeshi; and Matsuura, Tetsuhiko, to Kuraray Chemical Co., Ltd. Process for separating nitrogen gas by pressure swing adsorption system. 4,925,461, Cl. 55-26.000.
Gemco-Ware Inc.: *See—*
Jay, Murray, 4,924,768, Cl. 99-425.000.
Gen, Tamar G.: *See—*
Brown, Andrew V.; Gen, Tamar G.; and Weihe, Gary R., 4,925,727, Cl. 428-199.000.
General DataComm, Inc.: *See—*
Boreland, Charles P., 4,926,355, Cl. 364-200.000.
General Electric CGR S.A.: *See—*
Le Roux, Patrick, 4,926,124, Cl. 324-309.000.
General Electric Company: *See—*
Aiello, Louis L.; Charnley, James E.; Mees, James A.; and Dixon, Robert C., 4,925,620, Cl. 376-260.000.
Bell, Robert K., 4,926,144, Cl. 332-124.000.
Cole, Robert E.; and Spangler, Fredrick E., 4,926,496, Cl. 455-77.000.
Ipri, Alfred C.; and Stewart, Roger G., 4,926,236, Cl. 357-71.000.
Isnardi, Michael A., 4,926,244, Cl. 358-12.000.
Johnson, Neil A.; Miller, Russell S.; and Hunter, Gordon B., 4,926,439, Cl. 373-10.000.
King, Harold B., Jr.; Muncy, Donald G.; and Sutherland, Charles W., 4,924,586, Cl. 29-723.000.
King, Robert D.; and Szczesny, Paul M., 4,926,104, Cl. 318-599.000.
Neugebauer, Wendell, 4,924,750, Cl. 89-8.000.
Roemer, Peter B., 4,926,125, Cl. 324-318.000.
Solomon, Harvey D.; and Catlin, William R., 4,924,708, Cl. 73-799.000.
Tassie, Douglas P.; and Folsom, Mark F., 4,924,752, Cl. 89-160.000.
Tassie, Douglas P.; and Bullis, Stephen J., 4,924,753, Cl. 89-160.000.
General Instrument Corporation: *See—*
Paik, Woo H., 4,926,477, Cl. 380-15.000.
General Motors Corporation: *See—*
Atkins, Richard P.; Wang, Chen-Shih; and Dearlove, Thomas J., 4,925,886, Cl. 523-443.000.
Bausch, Paul; and Hemmer, Hans-Peter, 4,924,670, Cl. 60-418.000.
Cheng, Shi-wai S.; Nichols, Wayne C.; and Moore, Wayne R., 4,924,829, Cl. 123-259.000.
Collins, Karen D., 4,925,031, Cl. 206-486.000.
Dorski, Ronald L., 4 925,366, Cl. 415-174.300.
Flory, Donald M., 4,924,755, Cl. 91-376.00R.
Flowers, Barbara A ; Marsh, Richard A.; Haraf, John C.; and LePage, Alfred D., 4,926,335, Cl. 364-431.050.
Gigla, Joachim, 4,924,957, Cl. 180-90.000.
Harasek, Elizabeth F., 4,925,501, Cl. 148-101.000.
Heremans, Joseph P.; and Partin, Dale L., 4,926,154, Cl. 338-32.00R.
Heremans, Joseph P.; and Partin, Dale L., 4,926,226, Cl. 357-27.000.
Johnston, Albert D.; and Lederman, Frederick E., 4,924,981, Cl. 192-45.000.
Kennedy, Lawrence C., 4,924,984, Cl. 192-58.00B.
Kennedy, Lawrence C., 4,924,985, Cl. 192-58.00B.
Kennedy, Lawrence C., 4,924,987, Cl. 192-58.00B.
Kopich, Leonard F., 4,925,164, Cl. 267-167.000.
Lam, Michael K.; and Kazewych, Bohdan, 4,924,627, Cl 49-351.000.
Lederman, Frederick E., 4,924,980, Cl. 192-45.000.
Lederman, Frederick E., 4,925,323, Cl. 384-607.000.
Liverance, Martin K.; McMahan, David R.; and Haydu, Bartly A., 4,926,301, Cl. 362-226.000.
Ricker, Dennis J.; and Foster, Richard L., 4,926,099, Cl. 318-254.000.
Rogakos, Deno J.; Buchanan, Harry C., Jr.; and Benner, Mark M., 4,924,726, Cl. 74-600.000.
Romig, Kenneth L., 4,924,992, Cl. 192-30.00V.
Schroeder, Allen G.; Schroeder, Thaddeus; Karadsheh, Sam M.; Goings, Janet S.; and Golebiewski, Ronald T., 4,924,696, Cl. 73-118.100.
Schroeder, Thaddeus; and Lequesne, Bruno P. B., 4,926,122, Cl. 324-207.130.
Shelton, Alan J., 4,925,230, Cl. 296-76.000.
Sherman, James F.; and Hauser, Kenneth C., 4,924,729, Cl. 475-207.000.
Smith, Jack E.; and Pfeiffer, Mark G., 4,924,629, Cl. 49-477.000.
Teerman, Richard F , 4,924,821, Cl. 123-90.220.
Wahba, Brent J., 4,925,112, Cl. 239-585.000.
Genetech, Inc.: *See—*
Goeddel, David V.; and Gray, Patrick W., 4,925,793, Cl. 435-69.510.
Georg Fischer AG. *See—*
Kunz, Peter; Hunger, Heinz; and Wermelinger, Jorg, 4,925,218, Cl. 285-93.000.
Georg Knoblauch, Firma: *See—*
Rau, Georg; and Hitzler, Werner, 4,925,054, Cl. 220-94.00R
George, James C.: *See—*
Harper-Tervet, Jan; Simenz, Rod F.; and George, James C., 4,925,721, Cl. 428-116.000.
George, Pascal; Sevrin, Mireille; Maloizel, Christian; Tixidre, Arlette; and Froissant, Jacques, to Synthelabo. Derivatives of 2-((4-pipendinyl)methyl)-1,2,3,4-tetrahydroisoquinoline, their preparation and their application in therapeutics. 4,925,850, Cl. 514-307.000.
Geraci, Ronald J. Cushion for sporting events. 4,925,241, Cl. 297-229.000.
Gerber Garment Technologies, Inc.: *See—*
Pearl, David R.; and Wolfson, Lawrence S., 4,924,727, Cl. 74-603.000.
Gerber Garment Technology, Inc.: *See—*
Vaida, Robert M.; and Osthus, Harold L., 4,925,015, Cl. 198-803.700.
Gerry, Elizabeth H.: *See—*
Abber, Herman; Gerry, Elizabeth H.; and Pennace, John R., 4,925,671, Cl. 424-448.000.
Gerst, Michael; Knapp, Horst J. T.; and Maack, Werner, to AMP Incorporated. Electrical lead parking and sorting station. 4,925,007, Cl. 198-470.100.
Gesenhues, Paul: *See—*
Agethen, Heinrich; Gesenhues, Paul; Radisch, Helmer; Jandeleit, Otto; and Schafer, Wolfgang, 4,925,734, Cl. 428-349.000.
Geshwind, David M.; and Handal, Anthony H. Method to convert two dimensional motion pictures for three-dimensional systems. 4,925,294, Cl. 352-57.000.
Getman, Harlan R., to Vroman Foods, Inc. Method for producing frozen confections. 4,925,689, Cl. 426-289.000.
GFT Gesellschaft fur Trenntechnik mbH: *See—*
te Hennepe, Hendrikus J. D.; Mulder, Marcellinus H. V.; Smolders, Cornelis A.; Bargeman, Derk; and Schroder, George A. T., 4,925,562, Cl. 210-500.250.
Ghebre-Sellassie, Isaac; Iyer, Uma; and Fawzi, Mahdi B., to Warner-Lambert Company. Extended release gemfibrozil composition. 4,925,676, Cl. 424-470.000.
Giannini, Robert P.; and Bashour, Daniel A., to hiMedics, Inc. Amoxicillin microencapsulated granules. 4,925,674, Cl. 424-469.000.
Giannini, Robert P.; Fromm, Susan M.; and Suarez, Jose , to hiMedics, Inc. Erythromycin microencapsulated granules. 4,925,675, Cl. 424-469.000.
Gibbar, James H., Jr. Polymer building wall form construction. 4,924,641, Cl. 52-204.000.
Gibot, Claude: *See—*
Buiguez, Alexandre; and Gibot, Claude, 4,924,643, Cl. 51-320.000.
Gibson, Ray G., III; and Kowal, Albert E., to North American Philips Corporation. Stem with molded back-fill gas directional diffuser. 4,926,092, Cl. 313-493.000.
Gidanian, Bijan: *See—*
Moore, Henry J., Jr.; and Gidanian, Bijan, 4,924,816, Cl. 122-17.000.
Giebel, Gerhard: *See—*
Price, Frank C.; Giebel, Gerhard; Fichtner, Rudi; and Broening, Manfred, 4,924,546, Cl. 12-7.100.
Gifford, William J. Water cooled roller shucker for shellfish. 4,924,555, Cl. 17-74.000.
Gigla, Joachim, to General Motors Corporation. Adjustable instrument panel for vehicles. 4,924,957, Cl. 180-90.000.
Gilb, Tyrell T.; and Commins, Alfred D., to Simpson Strong-Tie Company, Inc. Standoff timber base connection. 4,924,648, Cl. 52-295.000.
Gilbert Engineering Company, Inc.: *See—*
Zorzy, John, 4,925,403, Cl. 439-578.000.
Gile, Richard H., to Bryant Grinder Corporation. Automatic workpart centering mechanism for a chuck. 4,926,337, Cl. 364-474.060.
Giles, Alan F.; and Moore, James M., to Unilever Patent Holdings B.V. Programmable machine system. 4,926,308, Cl. 364-147.000.
Giles, Brian A.; and Schwab, Frederick J., to Eastman Kodak Company. Method and apparatus for cleaning semiconductor wafers. 4,924,890, Cl. 134-61.000.
Gilgenbach, Hubert S.: *See—*
Steiner, Ronald M.; Koepsel, Roger E.; Gilgenbach, Hubert S.; and Reinke, Terence C., 4,925,369, Cl. 416-204.00R.
Gilhaus, Konrad, to Seydel Vermogensverwaltungsgesellschaft mit beschrankter Haftung. Stretch-break machine with drafting and breaking zones in superimposed levels. 4,924,556, Cl. 19-0.350.
Gill, David C., to Nomix Manufacturing Company Limited. Apparatus for delivering a liquid. 4,925,096, Cl. 239-10.000.
Gillespie, Roger J.: *See—*
Deacon, Robert M. J.; Gillespie, Roger J.; Gardner, Colin R.; and Tully, Wilfred R., 4,925,846, Cl. 514-258.000.
Gilson, Warren E. Portable flashlight. 4,926,299, Cl. 362-184.000.
Ginatta, Marco, to Snamprogetti S.p.A. Insoluble anodes for extracting lead from the electrolyte in electrochemical processes for recovering the metals contained in spent accumulations. 4,925,543, Cl. 204-288.000.
Gingerich, Richard G. W.: *See—*
Borchardt, Richard R.; Gingerich, Richard G. W.; and Miller, Michael J., 4,925,593, Cl. 252-301.60S.
Giomama S.r.l.: *See—*
Susanna, Luigi, 4,925,419, Cl. 441-123.000.
Gipswerk Embsen GmbH & Co. Baustoffproduktion KG, Firma: *See—*
Hamm, Heiner; Hartmann, Peter; Kampner, Karl-Heinz; and Kurandt, Hans-Friedrich, 4,925,826, Cl. 502-407.000.
Giuffrida, Anthony J.; Jha, Anil D.; and Ganzi, Gary C., to Millipore Corporation. Electodeionization apparatus and method. 4,925,541, Cl. 204-182.500.

Givens, Wyatt W., to Mobil Oil Corporation. Method for utilizing measured resistivities of porous rock under differing fluid saturations to identify fluid distribution equilibrium. 4,926,128, Cl. 324-376.000.
Gla / ttli, Hans H.: *See—*
Stoll, Kurt; and Gla / ttli, Hans H., 4,925,156, Cl. 251-129.010.
Glanton, Gene W.: *See—*
Meuser, William E.; LaRue, Gary W.; Harris, Windel L.; Donahue, James A.; Bonney, L. H ; and Glanton, Gene W., 4,925,532, Cl 202-219.000.
Glass, Reinhard; and Penzel, Uwe, to Arasin GmbH. Processes for removing organochemical components. 4,925,462, Cl. 55-37.000.
Glotzbach, Ronald W.: *See—*
Windle, William E.; Zimmerman, Robert E.; Glotzbach, Ronald W.; and Onesti, Robert J., 4,926,331, Cl. 364-424.040.
Glover, Marvin J. Omnidirectional oscillator (glover gear). 4,924,718, Cl. 74-25.000.
Gluck, Julius: *See—*
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,926,193, Cl. 346-76.0PH.
GNI Group, Inc., The: *See—*
Evenson, William R., 4,924,898, Cl 137-566.000.
Goddard, Errol D.: *See—*
Leung, Pak S.; Goddard, Errol D.; and Ancker, Fred H., 4,925,890, Cl. 524-133.000.
Goeddel, David V.; and Gray, Patrick W., to Genetech, Inc. Human immune interferon. 4,925,793, Cl. 435-69.510.
Goetzinger, Charles E.; and Borgeson, Dale W., to Rosemount Inc. Low power process measurement transmitter. 4,926,340, Cl. 364-483.000.
Goff, Dane A.: *See—*
Harris, Ralph N., III; Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A.; Koolpe, Gary A.; and Pick, Robert O., 4,925,856, Cl. 514-341.000.
Goings, Janet S.: *See—*
Schroeder, Allen G.; Schroeder, Thaddeus; Karadsheh, Sam M.; Goings, Janet S.; and Golebiewski, Ronald T., 4,924,696, Cl. 73-118.100.
Gojny, Francis J.: *See—*
Norris, Brian; and Gojny, Francis J., 4,925,740, Cl. 428-547.000.
Goldberg, Edward M.: *See—*
Melinyshyn, Lev; and Goldberg, Edward M., 4,925,452, Cl 604-284.000.
Goldberg, Steven J.: *See—*
Gutman, Jose; Goldberg, Steven J.; and Trine, Linda M., 4,926,460, Cl. 379-57.000.
Goldblatt, Jeffrey P.; and Gassman, Paul R. Compact disc package. 4,925,023, Cl. 206-309.000.
Goldenberg, Milton D.: *See—*
Hansen, Hans J.; and Goldenberg, Milton D., 4,925,648, Cl. 424-1.100.
Goldring, Lionel S., to National Research Development Corporation. Electrochemical sensor with solid phase electrolyte. 4,925,544, Cl. 204-421.000.
Goldwasser, Shafi; Kilian, Joseph; Wigderson, Avi; and Ben-Or, Michael, to Massachusetts Institute of Technology; and Yissum Research Development Company of the Hebrew University of Jerusalem. Multiprover interactive verification system. 4,926,479, Cl. 380-23.000.
Golebiewski, Ronald T.: *See—*
Schroeder, Allen G.; Schroeder, Thaddeus; Karadsheh, Sam M.; Goings, Janet S.; and Golebiewski, Ronald T., 4,924,696, Cl. 73-118.100.
Goler, Vernon B.: *See—*
Wilkie, Brian F.; Goler, Vernon B.; Groves, Stanley E.; and Vaglica, John J., 4,926,319, Cl. 364-200.000.
Golias, Tipton L., to Helena Laboratories Corporation. Dispensing apparatus. 4,925,065, Cl. 222-189.000.
Golicz, Roman M., to GBR Systems Corporation. Feeding mechanism. 4,925,180, Cl. 271-198.000.
Golicz, Roman M., to GBR Systems Corporation. Feeding mechanism. 4,925,362, Cl. 414-790.700.
Golub, Lorne M.: *See—*
McNamara, Thomas F.; Golub, Lorne M.; and Ramamurthy, Nungavaram S., 4,925,833, Cl. 514-152.000.
Gongwer, Calvin A.; and Gongwer, Robert C., to Innerspace Corporation. Exercise method. 4,925,185, Cl. 272-126.000.
Gongwer, Robert C.: *See—*
Gongwer, Calvin A.; and Gongwer, Robert C., 4,925,185, Cl. 272-126.000.
Goodman, E. Carl: *See—*
Johnson, Ronald F.; Smart, J. A.; Goodman, E. Carl; and Bowles, Richard, 4,924,929, Cl. 160-84.100.
Gordon, Joan E. Environmentally sound carrier package. 4,925,020, Cl. 206-150.000.
Goreham, Wordlow. Bait protector. 4,924,622, Cl. 43-100.000.
Gorsek, Edmund J., to Dickey-john Corporation. Joystick controller 4,926,172, Cl. 341-20.000.
Gotlieb, Itzhak; and Zidon, Aharon. Continuous discharge centrifuge. 4,925,576, Cl. 210-781.000.
Goto, Atsuo; and Koike, Naomasa, to Mitsubishi Paper Mills Ltd Thermosensitive recording materials. 4,925,827, Cl. 503-207.000.
Goto, Fumio; and Ogawa, Taro, to Namba Press Works Co., Ltd. Moldless process for manufacturing foamed articles. 4,925,508, Cl. 156-79.000.
Gotz, Josef, Orth, Winfried, Weiss, Wolfgang; Rapp, Bernd; and Kleffner, Hans W., to Rutgerswerke AG. Preparation of quinuclidine-3-methanol. 4,925,942, Cl. 546-133.000.
Gould, Herbert J., to International Rectifier Corporation. Platinum diffusion process. 4,925,812, Cl. 437-142.000.
Gourlot, Thierry: *See—*
Clement, Pierre; and Gourlot, Thierry, 4,925,469, Cl. 55-480.000.
Graham, Andrew C.: *See—*
MacMillan, David C.; and Graham, Andrew C., 4,926,071, Cl. 307-475.000.
Graillat, Gerard, to Salomon S.A. Cross-country ski binding. 4,925,206, Cl. 280-615.000.
Grallert, Herbert: *See—*
Keller, Karl; Grallert, Herbert, and Keinath, Wolfgang, 4,925,134, Cl. 244-158.00A.
Granzer, Ernold: *See—*
Kesseler, Kurt; Beck, Gerhard; Bartmann, Wilhelm; and Granzer, Ernold, 4,925,852, Cl. 514-333.000.
Gras, Rainer, to Huels Aktiengesellschaft. Process for producing blocked, urea group-containing polyisocyanates. 4,925,974, Cl. 560-336.000.
Graves Spray Supply, Inc.: *See—*
Smith, James E., 4,925,104, Cl. 239-71.000.
Gravestock, Michael B.: *See—*
Bayles, Richard W.; Boyle, Francis T.; Gravestock, Michael B.; and Wapdlewopth, James M., 4,925,863, Cl. 514-383.000.
Gray, David B.: *See—*
McJunkin, Howard P., Jr.; and Gray, David B., 4,925,184, Cl. 272-73.000.
Gray, John D., to Davidson Textron Inc. Apparatus for molding two-tone colored plastic shells. 4,925,151, Cl. 249-65.000.
Gray, Latham B., III; and Hart, Gordon H., to Performance Contracting, Inc. Treadable insulation system with lagging support. 4,925,622, Cl. 376-289.000.
Gray, Patrick W.: *See—*
Goeddel, David V.; and Gray, Patrick W., 4,925,793, Cl. 435-69.510.
Gray, Stephen L.; and Horner, John E., to W. R. Grace & Co.-Conn Turkey package. 4,925,687, Cl. 426-129.000.
Graybill, John K.: *See—*
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,925,992, Cl. 570-130.000.
Great Electronics Corporation: *See—*
Hsieh, Lai-Fa, 4,926,365, Cl. 364-708.000.
Great Lakes Chemical Corporation: *See—*
Smith, Roger E., 4,925,866, Cl. 514-389.000.
Green, Charles J.; Morris, John M.; and Oliphant, Timothy L., to GT Development Corporation. Vehicle speed control system. 4,925,196, Cl. 180-170.000.
Green, George D.; Munk, Stephen A.; and Barnes, Darryl K., to Allied-Signal Inc. Stain-resistant polymers derived from the itaconic acid useful as coatings for fibers. 4,925,906, Cl. 526-245.000.
Greenbank, Robin A.; and Van Der Velde, Arthur, to Elastrator Company Limited. Apparatus and method for closing or sealing a flexible tubular conduit. 4,924,551, Cl. 17-1.00R.
Grehier, Alain: *See—*
Rojey, Alexandre; Deschamps, Andre , Grehier, Alain; and Robert, Eric, 4,925,459, Cl. 155-16.000.
Gremm, Dorothee; and Perstel, Ingetraud, to Knoll AG. Products containing a calcium antagonist and a lipid-lowering agent. 4,925,672, Cl. 424-451.000.
Gresser, Robert: *See—*
Berrod, Gerard; Charmot, Dominique; Gresser, Robert, and Guerin, Gilles, 4,925,588, Cl. 252-174.230.
Grezzo Page, Loretta A.: *See—*
Madeleine, Dennis G.; Senkler, Carol A.; and Grezzo Page, Loretta A., 4,925,764, Cl. 430-110.000.
Gries, Heinz; Niedballa, Ulrich; and Weinmann, Hanns-Joachim, to Schering Aktiengesellschaft. Nitroxyl compounds, and diagnostic media based thereon useful for enhancing NmR imaging. 4,925,652, Cl. 424-9.000.
Griesmar, Andre R., to Dosapro Milton Roy. Flow rate control for a variable stroke pump. 4,925,371, Cl. 417-18.000.
Griffith, Charles E. Single-plane T-connector for a pair of tap cables. 4,925,332, Cl. 403-373.000.
Grilliot, Mary I.: *See—*
Grilliot, William L.; and Grilliot, Mary I., 4,924,529, Cl. 2-123.000.
Grilliot, William L.; and Grilliot, Mary I. Firefighter's coat having secure wrist protection. 4,924,529. Cl. 2-123.000.
Grimm, Peter: *See—*
Metzger, Andre; Grimm, Peter; Nohl, Andre J., and Nau, Vance J., 4,925,628, Cl. 422-100.000.
Grimm, Rainer: *See—*
Bohn, Horst; and Grimm, Rainer, 4,925,237, Cl. 296-216.000.
Groezinger, Gerhard, to Sipra Patententwicklungs-und Beteiligungsgesellschaft GmbH. Measuring apparatus for determining the degree of utilization of a machine. 4,926,353, Cl. 364-551.020.
Grogan, Chester, Jr.: *See—*
Newton, Jerry; Grogan, Chester, Jr., and Spector, George, 4,925,148, Cl. 248-542.000
Grollier, Jean F.; and Cotteret, Jean, to L'Oreal. Sunscreen composition containing polyisohutylene and its use for the protection of human epidermis against ultraviolet radiations. 4,925,653, Cl. 424-47.000.
Grollier, Jean F.; and Dubief, Claude, to L'Oreal. Cosmetic application of polysiloxanes containing a β-keto ester group and compositions employed. 4,925,659, Cl. 424-78.000.

VOL 1114 ISS 3 MY 15 1990 UMI

Gross, Jurgen, to Hoechst Aktiengesellschaft. Apparatus for the transport of partially temperature-controlled test material in strip form. 4,924,714, Cl. 73-863.110.

Grosse, John K., to Northern Telecom Limited. Method for making a doped well in a semiconductor substrate. 4,925,806, Cl. 437-34.000.

Grosseholz, Werner; Schmuser, Dirk; and Wenzel, Werner, to Nordischer Maschinenbau Rud.Baader GmbH & Co. KG. Method and apparatus for dividing up unskinned fish fillets. 4,924,553, Cl. 17-50.000.

Grosselin, Jean-Michel and Mercier, Claude, to Rhone-Poulenc Sante. Process for the preparation of unsaturated alcohols. 4,925,990, Cl. 568-862.000.

Grover, Dennis L. Latching mechanism for electrical plugs. 4,925,396, Cl. 439-147.000.

Grover, George A.: *See*—
Baratz, Alan E.; and Grover, George A., 4,926,414, Cl. 370-31.000.

Grover, Wayne D.; and Moore, Thomas E., to Alberta Telecommunications Research Centre. Method and apparatus for precision time distribution in telecommunication networks. 4,926,446, Cl. 375-109.000.

Groves, Stanley E.: *See*—
Wilkie, Brian F.; Goler, Vernon B.; Groves, Stanley E.; and Vaglica, John J., 4,926,319, Cl. 364-200.000.

Grubbs, Robert B.: *See*—
Francis, John, 4,925,564, Cl. 210-608.000.

Gruenberg, Elliot L. Method and apparatus for continuously acknowledged link encrypting. 4,926,478, Cl. 380-21.000.

Gruhler, Siegfried, to Mauser-Werke Oberndorf GmbH. Height measuring instrument. 4,924,598, Cl. 33-832.000.

Grumman Aerospace Corporation: *See*—
Hemmerdinger, Louis H.; Knowles, Gregory W., and Patterson, George B., 4,925,636, Cl. 422-248.000.

Grundy, Reed H., to PPG Industries, Inc. Method and apparatus for on-line LOI measurement of fibers. 4,925,474, Cl. 65-29.000.

Grunes, Mitchell B.: *See*—
Collins, John E.; Grunes, Mitchell B.; and Kozak, Darryn J., 4,926,344, Cl. 364-513.000.

Grunwald, James L. Sample vials tray. 4,925,630, Cl. 422-104.000

GT Development Corporation: *See*—
Green, Charles J.; Morris, John M.; and Oliphant, Timothy L., 4,925,196, Cl. 180-170.000.

GTE Products Corporation: *See*—
Avellino, Frank J.; Case, Richard A.; and Swanson, David T., 4,925,522, Cl. 156-632.000.
Borchardt, Richard R.; Gingerich, Richard G. W.; and Miller, Michael J., 4,925,593, Cl. 252-301.60S
Kasenga, Anthony F.; Sigai, A. Gary; Peters, Thomas E.; and Hunt, Roger B., 4,925,703, Cl. 427-215.000.
Reddy, Vaddi B., 4,925,702, Cl. 427-65.000.
Yale, Ramon L., 4,925,594, Cl. 252-301.60S.

Guardian Hitch, Inc.: *See*—
Villalon, S. Leonard; Olds, James D.; and Shoffner, William H., 4,925,205, Cl. 280-507.000.

Guarnieri, C. Richard: *See*—
Brezoczky, Blasius; Cuomo, Jerome J.; Guarnieri, C. Richard; Ramanathan, Kumbakonam V.; Shivashankar, Srinvasrao A.; Smith, David A.; and Yee, Dennis S., 4,925,700, Cl. 427-38.000.

Guasch, E. Cortes: *See*—
Bacardit, Juan S.; and Guasch, E. Cortes, 4,924,722, Cl. 74-459.000.

Guay, Normand, to Consulab, Inc. Magnetic type position sensor for use in the construction of position indicators or torque meters. 4,926,121, Cl. 324-208.000.

Guerin, Gilles: *See*—
Berrod, Gerard; Charmot, Dominique; Gresser, Robert, and Guerin, Gilles, 4,925,588, Cl. 252-174.230.

Guillot, Christian: *See*—
Schneider, Michel; Guillot, Christian; and Lamy, Bernard, 4,925,818, Cl. 502-7.000.

Gulati, Monmohan S.: *See*—
Asbury, Charles E., Jr.; Gulati, Monmohan S.; Sherman, Earle C.; and Calvert, Dan V., 4,925,521, Cl. 156-517.000.

Gummow, Stephen A., to Gummow Tool Company. Positive drive ratchet. 4,924,737, Cl. 81-63.200.

Gummow Tool Company: *See*—
Gummow, Stephen A., 4,924,737, Cl. 81-63.200.

Gunnink, Brett W.; and Enustun, Bekir V., to Iowa State University Research Foundation, Inc. Means and method for conductometric phase transition porosimetry. 4,926,113, Cl. 324-694.000.

Guntensperger, August, to Praztsions-Werkzeuge AG. Device for the positionally accurate transport of containers. 4,925,012, Cl. 198-690.100.

Gunther, Peter; Wirth, Hermann O.; and Endlich, Wilhelm, to Ciba-Geigy Corporation. Latent hardeners for melamine resin moulding compositions. 4,925,887, Cl. 524-14.000.

Gupta, Smeeta: *See*—
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H., Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.

Gurevich, Leon, to Cooper Industries, Inc. Ceramic fuse wire coating. 4,926,153, Cl. 337-273.000.

Gustafson, Keith W. Cork for cryogenic dry shipper. 4,925,060, Cl. 220-371.000.

Gutman, Jose; Goldberg, Steven J.; and Trine, Linda M., to Motorola, Inc. Universal PSTN page entry protocol. 4,926,460, Cl. 379-57.000.

Guttinger, Peter: *See*—
Langen, Marinus J. M.; Guttinger, Peter; and Borza, Mihai M., 4,924,654, Cl. 53-399.000.

Guyot, Volker, to Carl Schenck AG. Method and apparatus for calibration of balancing unit. 4,926,341, Cl. 364-508.000.

Gwilliam, Terri L. Hand stamp with reservoir. 4,924,773, Cl. 101-327.000.

H.B. Fuller Company: *See*—
Asbury, Charles E., Jr.; Gulati, Monmohan S.; Sherman, Earle C.; and Calvert, Dan V., 4,925,521, Cl. 156-517.000.

H. J. Langen & Sons Limited: *See*—
Langen, Marinus J. M.; Guttinger, Peter, and Borza, Mihai M., 4,924,654, Cl. 53-399.000.

H. Lundbeck A/S: *See*—
Bogeso, Klaus P.; Jensen, Klaus G.; Moltzen, Ejner K.; and Pedersen, Henrik, 4,925,858, Cl. 514-342.000.

Haas, David J., to. Pin feed badge. 4,925,716, Cl. 428-41.000.

Habart, Philippe, to Whessoe. S.A. Apparatus for measuring storage parameters such as level and temperature of liquids or fluids of different densities in a tank. 4,924,700, Cl. 73-290.00V.

Haboush, Roger K.: *See*—
Wu, Charles L.; and Haboush, Roger K., 4,926,309, Cl. 364-149.000.

Hadwiger, Helmut; and Schmidt, Hans, to Siemens Aktiengesellschaft. Method for making metal core printed circuit board. 4,924,590, Cl. 29-848.000.

Haendle, Joerg; and Maass, Wolfgang, deceased (by Maass, Dora, Peter Maass, heirs), to Siemens Aktiengesellschaft. X-ray diagnostic apparatus. 4,926,454, Cl. 378-100.000.

Hagan, John J.; and Herbstman, Sheldon, to Texaco Inc. MTBE preparation from isobutylene/TBA and methanol in presence of an acid resin catalyst. 4,925,989, Cl. 568-697.000.

Hageman, John P. Flame retardant asphalt coating. 4,925,494, Cl. 106-280.000.

Hagewood, John F.; and Darigo, Julius, to McCoy-Ellison, Inc. Apparatus for controlling tension in a traveling yarn. 4,924,567, Cl. 28-185.000.

Hagihara, Koichiro: *See*—
Takahashi, Toshihiro; Hagihara, Koichiro; Nakamaru, Koichi; and Suzuki, Yoshikuni, 4,925,843, Cl. 514-248.000.

Hainaut, Jean-Pierre: *See*—
Woerner, Pierre; and Hainaut, Jean-Pierre, 4,924,975, Cl. 188-322.180.

Haines, Robert C.: *See*—
Fellows, Charles T.; Brown, George T.; and Haines, Robert C., 4,925,667, Cl. 424-401.000.

Haite, Michael, to Pose-Marre Edelstahlwerk GmbH. Transport roller for glass cooling passages. 4,925,014, Cl. 198-780.000.

Hajduk, Andrzej. Bullet key bob. 4,925,018, Cl. 206-38.100.

Hale, Keith F.: *See*—
Paliwoda, Joseph; Hale, Keith F.; and Propst, Verle, 4,925,367, Cl. 415-213.100.

Hale, Ron L.; and Wieder, Irwin, to Baxter International Inc. Interligand metal transfer assay. 4,925,804, Cl. 436-501.000.

Hall, Kevin P.; and Mott, Andrew W., to Minnesota Mining and Manufacturing Company. Silver halide photographic light-sensitive systems. 4,925,832, Cl. 564-149.000.

Halla, Mark. Collar. 4,924,815, Cl. 119-106.000

Halleck, Michael E.: *See*—
O'Neill, Michael W.; Silverstone, Leon M.; and Halleck, Michael E., 4,924,880, Cl. 128-787.000.

Hamaguchi, Kazumichi, to Honda Giken Kogyo Kabushiki Kaisha. Air conducting apparatus for a motorcycle. 4,925,231, Cl. 296-78.100.

Hamilton, Scott L.; Harney, Michael P.; Naddor, David J.; Farmer, James Q.; Frederick, Richard B.; and Schaubs, Randolph J., to Scientific-Atlanta, Inc. Data transmission method and apparatus by period shift keying (TSK). 4,926,444, Cl. 375-9.000.

Hamlin Transmission Company: *See*—
Leonard, George H., 4,925,201, Cl. 280-238.000.

Hamm, Heiner; Hartmann, Peter; Kampner, Karl-Heinz; and Kurandt, Hans-Friedrich, to Gipswerk Embsen GmbH & Co. Baustoffproduktion KG, Firma; and Gehr. Knauf Westdeutsche Gipswerke, Firma. Method of producing an adsorbent from bloating minerals and calcium sulfate hemihydrate. 4,925,826, Cl. 502-407.000.

Hampton, Joe B., to Phillips Petroleum Company. Temperature control for a KOH treater. 4,925,635, Cl. 422-202.000.

Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nihashi, Hiroyuki; and Tanaka, Tsuneo, to Toyo Ink Manufacturing Co., Ltd. Heat-sensitive transfer material. 4,925,731, Cl. 428-336.000.

Hanatani, Yasuyuki; and Nakatani, Kaname, to Mita Industrial Co., Ltd. Electrophotographic sensitive material with pyrrolopyrrole and benzidine derivatives. 4,925,759, Cl. 430-59.000.

Hanauer, Gerald G.: *See*—
Aufderheide, Brian E.; and Hanauer, Gerald G., 4,926,007, Cl. 174-36.000.

Hand Geophysical: *See*—
Handley, George E.; Moore, A. M.; and Dickman, Robert E., 4,926,392, Cl. 367-59.000.

Handa, Akio: Hosoya, Eiji; Ishiwatari, Makoto; Kimura, Yoshihiro; and Watanabe, Seiji, to Honda Giken Kogyo Kabushiki Kaisha. Off-road vehicle. 4,924,959, Cl. 180-297.000.

Handal, Anthony H.: *See*—
Geshwind, David M.; and Handal, Anthony H., 4,925,294, Cl. 352-57.000.

Handley, George E.; Moore, A. M.; and Dickman, Robert E., to Hand Geophysical. Method and apparatus for obtaining seismic vibrator reflection data. 4,926,392, Cl. 367-59.000.

Handte, Reinhard: *See*—
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, 4,925,478, Cl. 71-90.000.

Hangai, Toshimasa; Tateishi, Kiyoshi; Ishitoya, Koichi; and Sakata, Haruyasu, to Pioneer Electronic Corporation. High-speed search method for use in a disc player system. 4,926,405, Cl. 369-32.000.

Hans, Waldemar: *See*—
Foertsch, Manfred; Hans, Waldemar; and Warnicke, Volker, 4,925,111, Cl. 239-533.120.

Hansberry, Mitchell L., to Charles Stark Draper Laboratory, Inc., The. Apparatus for forming a seam. 4,924,787, Cl. 112-142.000.

Hansel, Jurgen: *See*—
Hedtke, Rolf; Loos, Rolf; Mester, Roland; and Hansel, Jurgen, 4,926,425, Cl. 371-22.600.

Hansen, Hans J.; and Goldenberg, Milton D., to Immunomedics, Inc. Detection and treatment of infectious and inflammatory lesions. 4,925,648, Cl. 424-1.100.

Hansen, Loren F.: *See*—
Cozine, Mark L.; Papke, Norval L., Jr.; and Hansen, Loren F., 4,924,944, Cl. 172-22.000.

Hansen, Lowell D., to Vickers, Incorporated. Power transmission. 4,925,372, Cl. 417-310.000.

Hansen, Ole, to OH Investments Limited. Cover for transparencies for use in projectors having a horizontal image carrying face. 4,925,720, Cl. 428-77.000.

Hanson, Eric: *See*—
Childers, Winthrop D.; Schantz, Chris; and Hanson, Eric, 4,926,197, Cl. 346-140.00R.

Hanspal, Jagdevinder S.: *See*—
Kler, Chandra M.; and Hanspal, Jagdevinder S., 4,926,087, Cl. 313-131.00A.

Hanssler, Gerd: *See*—
Stroech, Klaus; Frie, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,925,482, Cl. 71-92.000.

Hanzawa, Hiroko: *See*—
Morishita, Ichiro; and Hanzawa, Hiroko, 4,925,283, Cl. 350-432.000.

Hanzlick, Dennis J.: *See*—
Echert, Douglas C.; Geller, Edward W.; Hanzlick, Dennis J.; and Morison, James H., 4,924,698, Cl. 73-170.00A.

Hara, Kenji: *See*—
Yoshida, Tetsuji; Teraoka, Yoshiaki; Ogawa, Yoji; Kozaki, Ken; Hara, Kenji; Satou, Hiroshi; and Yoshino, Akira, 4,926,487, Cl. 381-186.000.

Hara, Shinji; and Koizumi, Yoshihisa, to Isuzu Motors Limited. Turbocharger with rotary electric machine. 4,924,674, Cl. 60-608.000.

Harada, Hideo, to Kabushiki Kaisha Toshiba. Ultrasonic imaging apparatus. 4,926,380, Cl. 367-7.000.

Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, to Yokogawa Electric Corporation. Oscillator using H-shaped single crystal silicon vibrator. 4,926,143, Cl. 331-156.000.

Harada, Koosuke; and Sakamoto, Hiroshi, to Nishimu Electronics Industries Co., Ltd. Switching power source device. 4,926,302, Cl. 363-16.000.

Harada, Kouhei; and Hasegawa, Hiromi, to Aisin Seiki Kabushiki Kaisha. Oil pressure clutch mechanism for an automatic transmission. 4,924,982, Cl. 192-48.800.

Harada, Masashi; and Miyazaki, Hiroshi, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of synthetic faujasite molded body. 4,925,613, Cl. 264-232.000.

Harada, Nagayasu: *See*—
Kawano, Minori; Mitsui, Kazuo; Hirooka, Masaharu; Ozu, Yasushi; Harada, Nagayasu; and Kimura, Nobuhiro, 4,926,421, Cl. 370-95.100.

Harada, Sadami: *See*—
Maki, Kazuyoshi; Harada, Sadami; and Nakashima, Takanori, 4,926,286, Cl. 361-345.000.

Harada, Seiki: *See*—
Mukai, Kiichiro; Saiki, Atsushi; and Harada, Seiki, 4,926,238, Cl. 357-72.000.

Haraf, John C.: *See*—
Flowers, Barbara A.; Marsh, Richard A.; Haraf, John C.; and LePage, Alfred D., 4,926,335, Cl. 364-431.050

Haragashira, Motoji, to Kabushiki Kaisha Toshiba. Probehead of magnetic resonance apparatus. 4,926,126, Cl. 324-322.000.

Haraguchi, Tetsunori, to Toyota Jidosha Kabushiki Kaisha. Rear suspension of vehicle controllable of rolling under braking and driving. 4,925,207, Cl. 280-690.000.

Haraichi, Satoshi: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, 4,925,755, Cl. 430-5.000.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Process for the etherification of linear and branched olefins. 4,925,455, Cl. 44-77.000.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Process for combining the regeneratorless operation of tandem superdense riser and fluid-bed oligomerization reactors containing a zeolite oligomerization catalyst. 4,926,003, Cl. 585-517.000.

Harasek, Elizabeth F., to General Motors Corporation. Expolosive compaction of rare earth-transition metal alloys in a fluid medium. 4,925,501, Cl. 148-101.000.

Harder, Uwe: *See*—
Masler, Gerhard; and Harder, Uwe, 4,925,072, Cl. 224-282.000.

Harder, Wolfgang: *See*—
Maerkl, Robert; and Harder, Wolfgang, 4,925,972, Cl. 560-206.000.

Hardman, A. Pierce: *See*—
Jacob, A. Kirk; Willis, M. Joseph; and Hardman, A. Pierce, 4,925,571, Cl. 210-742.000.

Harney, Michael P.: *See*—
Hamilton, Scott L.; Harney, Michael P.; Naddor, David J.; Farmer, James Q.; Frederick, Richard B.; and Schaubs, Randolph J., 4,926,444, Cl. 375-9.000.

Harney, William J. J., to Magna International Inc. Method of fastening a tubular element to a member and joint produced thereby. 4,924,584, Cl. 29-509.000.

Harper, George S., to Airpax. Circuit breaker. 4,926,157, Cl. 335-172.000.

Harper, Paul W., to Heelox Corporation. Threaded wedge retainer for top lift. 4,924,607, Cl. 36-42.000.

Harper-Tervet, Jan; Simenz, Rod F.; and George, James C., to Lockheed Corporation. Honeycomb sandwich structure having dissimilar metal face sheets. 4,925,721, Cl. 428-116.000.

Harris, Duane W.: *See*—
Burmeister, Scott N.; Harris, Duane W.; Whipple, Roger B.; and Mondek, Martin J., 4,925,411, Cl. 440-61.000.

Harris, Gaynor P.: *See*—
Dolden, John G.; Harris, Gaynor P., and Studholme, Matthew B., 4,925,914, Cl. 528-336.000.

Harris, Godfrey; and Hydle, Leslie K., to Scott Orthotic Labs, Inc. Adjustable lumbar back support system for a wheelchair. 4,925,242, Cl. 297-284.000.

Harris Graphics Corporation: *See*—
Breton, Richard; Treff, Ernest H.; and McKrell, Richard L., 4,925,179, Cl. 271-187.000.

Harris, James E.; Berger, Abe; Chopdekar, Vilas M.; Matzner, Markus; and Spanswick, James, to Amoco Corporation. Amide and/or imide containing polymers and monomers for the preparation thereof. 4,925,916, Cl. 528-353.000.

Harris, John R., to Coherent, Inc. Adjustable mirror mount. 4,925,288, Cl. 350-636.000.

Harris, Ralph N., III, Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A., Koolpe, Gary A.; and Pick, Robert O., to SRI International. Aldoxime-substituted imidazolium derivatives useful in the treatment of poisoning by phosphorus-containing chemicals. 4,925,856, Cl. 514-341.000.

Harris, Windel L.: *See*—
Meuser, William E.; LaRue, Gary W.; Harris, Windel L.; Donahue, James A.; Bonney, L. H.; and Glanton, Gene W., 4,925,532, Cl. 202-219.000.

Harrison, H. Page, to University of Alberta, The Governors of the. Bentleg plow. 4,924,947, Cl. 172-701.100.

Hart Chemical Limited: *See*—
Licht, Brigitte H.; Bentley, Roger T.; and Schell, Frederick S., 4,925,988, Cl. 568-625.000.

Hart, Gordon H.: *See*—
Gray, Latham B., III; and Hart, Gordon H., 4,925,622, Cl. 376-289.000.

Hart, James D., to Trinity Industries, Inc. Sliding end panels for a rail car. 4,924,780, Cl. 105-378.000.

Hartke, David H.: *See*—
Neches, Philip M., Hartke, David H.; Baran, Richard J., Woodcock, Darryl L.; and Papachristidis, Alexandros C., 4,925,311, Cl. 364-200.000.

Hartmann, Heinrich: *See*—
Boeckh, Dieter; Seelmann-Eggebert, Hans-Peter; Hartmann, Heinrich; Trieselt, Wolfgang; and Baur, Richard, 4,925,905, Cl. 526-208.000.

Hartmann, Peter: *See*—
Hamm, Heiner; Hartmann, Peter; Kampner, Karl-Heinz; and Kurandt, Hans-Friedrich, 4,925,826, Cl. 502-407.000.

Harvey, Terence J.: *See*—
Jenkins, Stuart M.; and Harvey, Terence J., 4,926,167, Cl. 340-764.000

Harvey, Thomas J.; and Kilmartin, John D., III, to International Packaging Corporation. Hinged box construction. 4,925,059, Cl. 220-335.000.

Harwood, Jon W.: *See*—
Moring, Walter G., III; and Harwood, Jon W., 4,924,968, Cl. 181-282.000.

Harwood, Van N., Jr.; and Wojtasik, Joseph F., to Figgie International, Inc. Method of casting a hopcalite filter and cast ceramic fiber-hopcalite. 4,925,631, Cl. 422-122.000.

Hasegawa, Akira: *See*—
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki, Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.

Hasegawa, Atsushi: *See*—
Sakamura, Ken; Hashimoto, Kouzi; Kawasaki, Ikuya; Hasegawa, Atsushi; and Iwasaki, Kazuhiko, 4,926,321, Cl. 364-200.000.

Hasegawa, Hiromi: *See*—
Harada, Kouhei; and Hasegawa, Hiromi, 4,924,982, Cl. 192-48.800

VOL
1114
ISS
3
MY
15
1990
UMI

Hasegawa, Jun: *See*—
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, 4,926,258, Cl. 358-98.000.

Hasegawa, Shinya: *See*—
Yamagishi, Fumio; Hasegawa, Shinya; and Ikeda, Hiroyuki, 4,925,262, Cl. 350-3.710.

Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Traction control apparatus. 4,926,333, Cl. 364-426.020.

Hashimoto, Katsuhiko: *See*—
Fujisawa, Isao; and Hashimoto, Katsuhiko, 4,926,166, Cl. 340-717.000.

Hashimoto, Kouzi: *See*—
Sakamura, Ken; Hashimoto, Kouzi; Kawasaki, Ikuya; Hasegawa, Atsushi; and Iwasaki, Kazuhiko, 4,926,321, Cl. 364-200.000.

Hashimoto, Masafumi: *See*—
Kano, Hiroyuki; Kato, Takatoshi; and Hashimoto, Masafumi, 4,925,810, Cl. 437-105.000.

Hashimoto, Mitsuru; and Sasaki, Nasaomi, to Ricoh Company, Ltd. Electrophotographic photoconductor. 4,925,758, Cl. 430-57.000.

Hashimoto, Munehiro: *See*—
Hayashi, Yoshio; Oguri Tomei; Shinoda, Masaki; Takahashi, Kazuo; and Hashimoto, Munehiro, 4,925,861, Cl. 514-367.000.

Hashimoto, Takeshi, to Olympus Optical Co., Ltd. Vari-focal lens system. 4,925,280, Cl. 350-423.000.

Hashimoto, Yasushi; Tsuji, Yasuyuki; and Terakado, Akira, to Hitachi Koki Company. Feeder of sheet-like photo-sensitive material. 4,926,216, Cl. 355-212.000.

Hashizawa, Shigemi: *See*—
Endo, Takayoshi; Inaba, Shigemitsu; and Hashizawa, Shigemi, 4,925,309, Cl. 356-394.000.
Inaba, Shigemitsu; Ootaka, Kazuto; and Hashizawa, Shigemi, 4,925,402, Cl. 439-490.000.

Hastings, Thomas C., to Coleman Outdoor Products, Inc. Leveling mechanism for tripod base. 4,925,137, Cl. 248-148.000.

Hata, Hajime: *See*—
Kitamura, Takao; Sakane, Kohji; Wada, Hideo; Hata, Hajime; and Kanbara, Hajime, 4,925,641, Cl. 423-279.000.

Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Pseudo format camera with light shielding means. 4,926,203, Cl. 354-287.000.

Hatayama, Fumihiro: *See*—
Nakatsuka, Kimihiro; and Hatayama, Fumihiro, 4,926,254, Cl. 358-76.000.

Hatayama, Tamotsu; and Naruse, Yujiro, to Kabushiki Kaisha Toshiba. Radiation detecting device. 4,926,052, Cl. 250-370.140.

Hatazaki, Kaichiro; and Watanabe, Takao, to NEC Corporation. Pattern recognition system using hueristic search technique. 4,926,483, Cl. 381-43.000.

Hattori, Kohji *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,925,838, Cl. 514-210.000.

Hattori, Ryo, to Mitsubishi Denki Kabushiki Kaisha Semiconductor laser device. 4,926,432, Cl. 372-46.000.

Hauptly, Paul D. *See*—
Lahlouh, John; Stewart, Ray F.; Wasley, Robert S., Hauptly, Paul D.; and Welsh, Laurence M., 4,926,165, Cl. 340-603.000.

Hauser, Joachim J.; Plewes, John T.; and Robbins, Murray, to American Telephone and Telegraph Company. Nickel-based electrical contact. 4,925,407, Cl. 439-887.000.

Hauser, Kenneth C. *See*—
Sherman, James F., and Hauser, Kenneth C., 4,924,729, Cl. 475-207.000.

Hausler, Nikolaus; Muller, Heidi; Pinck, Peter; and Straube, Christina, to Korber AG. Method of and apparatus for making rod-shaped articles of the tobacco processing industry. 4,924,884, Cl. 131-84.100.

Havukainen, Reino I., to A. Ahlstrom Corporation. Tube-type evaporator. 4,925,526, Cl. 159-13.300.

Hawaii Stevedores, Inc. *See*—
Leonard, Laurence E., Jr.; and Mostad, Dennis A., 4,925,226, Cl. 294-82.100.

Hawera Probst GmbH & Co.: *See*—
Moser, Bernhard, 4,924,953, Cl. 175-323.000.

Haworth Sub, Inc.: *See*—
Ludwig, Gary L.; and Verschueren, Edward M., 4,925,258, Cl. 312-323.000.

Hawranik, Gerald C.; and Hiebert, Norman, Rig holder. 4,924,621, Cl. 43-57.200.

Hayakawa, Kunio: *See*—
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 4,925,828, Cl. 503-218.000.

Hayakawa, Masao: *See*—
Fujita, Kazuya; Maeda, Takamichi; and Hayakawa, Masao, 4,926,239, Cl. 357-72.000.

Hayakawa, Youichi; Kuwayama, Yoshinari; and Yamada, Yoshihiro, to Aisin Aw. Co., Ltd. Hydraulic control device for an automatic transmission. 4,924,731, Cl. 74-869.000.

Hayashi, Chikahisa: *See*—
Takahashi, Toshinori; Hayashi, Chikahisa; Takahashi, Yoshinori; and Kantoh, Takanori, 4,926,015, Cl. 200-84.00C.

Hayashi, Hiroshi: *See*—
Kawanishi, Hidenori; Hayashi, Hiroshi; Morimoto, Taiji; Kaneiwa, Shinji; and Yamaguchi, Masahiro, 4,926,431, Cl. 372-45.000.

Hayashi, Keiichi: *See*—
Ichimura, Kunihiro; Yonezawa, Teruhiko; Kikuchi, Hideo; Tochizawa, Nariaki; and Hayashi, Keiichi, 4,925,770, Cl. 430-273.000.

Hayashi, Kyozo; Kawamura, Seiji; and Ikeda, Hirosaka, to Sumitomo Electric Industries, Ltd. Ceramic-coated terminal for electrical connection. 4,925,394, Cl. 439-86.000.

Hayashi, Masaaki: *See*—
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.

Hayashi, Masaharu; Kodama, Hisashi; Okabe, Yoshio; Kobayashi, Yukimori; and Shirai, Eiji, to Aisin Seiki Kabushiki Kaisha. Tensioner 4,925,436, Cl. 474-101.000.

Hayashi, Seiji: *See*—
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; Hayashi, Seiji; and Mori, Kenji, 4,925,591, Cl. 252-299.660.

Hayashi, Shoji: *See*—
Tani, Tatsuo; Yokoyama, Hiroshi; Hayashi, Shoji; and Murofushi, Takashi, 4,926,358, Cl. 364-562.000.

Hayashi, Yoshio; Oguri Tomei; Shinoda, Masaki; Takahashi, Kazuo; and Hashimoto, Munehiro, to Mitsubishi Kasei Corporation. Carboxystyrene derivatives and drugs containing them as effective ingredients. 4,925,861, Cl. 514-367.000.

Hayashida, Hajime: *See*—
Numata, Motoichi; Nozaki, Kinya; Hayashida, Hajime; and Sakai, Toshiaki, 4,924,742, Cl. 84-218.000.

Hayashida, Tetsuya *See*—
Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi, Onai, Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko, 4,926,235, Cl. 357-68.000.

Haydu, Bartly A. *See*—
Liverance, Martin K., McMahan, David R.; and Haydu, Bartly A., 4,926,301, Cl. 362-226.000.

Hayes, Angela J.: *See*—
Sinclair, Peter; and Hayes, Angela J., 4,925,530, Cl. 162-164.100.

Hayes Microcomputer Products, Inc.: *See*—
Kraul, Douglas R.; and Cox, Stuart A., 4,926,448, Cl. 375-121.000.

Hayhurst, John T. *See*—
Stouky, R. Jon; and Hayhurst, John T., 4,925,496, Cl. 134-22.180.

Hayssen Manufacturing Company *See*—
Kovacs, Lloyd; and Lind, Matthew R., 4,924,656, Cl. 53-436.000.

Hazelton, Donald R.; Latka, Paul J.; Lyons, Joseph N., Jr.; and Spender, Eugene H., Jr., to Hewlett-Packard Company. Count down system for recording charts. 4,925,214, Cl. 283-62.000.

Heckerman, Brad B. *See*—
Heckerman, William L.; and Heckerman, Brad B., 4,924,557, Cl. 24-16.0PB.

Heckerman, William L.; and Heckerman, Brad B. Harness. 4,924,557, Cl. 24-16.0PB.

Hedtke, Rolf; Loos, Rolf; Mester, Roland; and Hansel, Jurgen, to Robert Bosch GmbH. System for testing digital circuits. 4,926,425, Cl. 371-22.600.

Hee, Nam Y. Automobile brake system. 4,925,252, Cl. 303-89.000.

Heeks, George J.; Henry, Arnold W., and Schlueter, Edward L., Jr., to Xerox Corporation. Heat stabilized silicone elastomers. 4,925,895, Cl. 524-714.000.

Heelox Corporation: *See*—
Harper, Paul W., 4,924,607, Cl. 36-42.000.

Heerdt, Lutz-Peter *See*—
Beyer, Rudolf; Heerdt, Lutz-Peter; and Schemel, Roland, 4,924,632, Cl. 51-105.00R.

Hefti, Heinz, Reinehr, Dieter, Weber, Kurt, and Eckhardt, Claude, to Ciba-Geigy Corporation. Liquid detergent compositions containing disulfonated fluorescent whitening agents: di-styryl-biphenyl or di-styryl-benzene derivatives. 4,925,595, Cl. 252-301.210.

Hegarty, David. Document support stand and securable interlocking document holder with locking document retainer. 4,925,145, Cl. 248-454.000.

Hegarty, David. Multi-positionable document support stand and interlocking modular document holder. 4,925,146, Cl. 248-454.000.

Heger, Frank *See*—
Higham, Graham J.; Pruitt, Gerald R.; Morris, Ronald; Heger, Frank; Livingstone, James; and Tormey, David, 4,924,675, Cl. 62-6.000.

Heier, Dieter, to Gelenkwellenbau GmbH. Cross member for hookes universal joint. 4,925,430, Cl. 464-14.000.

Heilman, Marlin S.; and Kolenik, Steve A. Biocompatible ventricular assist and arrhythmia control device. 4,925,443, Cl. 600-16.000.

Heimberger, Helmut, to Opti Patent-, Forschungs-und Fabrikations-AG. Weaving a slide-fastener stringer half with an integral coupling coil. 4,924,914, Cl. 139-11.000.

Heinemann Electric Company: *See*—
Cambreleng, Paul S., 4,926,148, Cl. 335-13.000.

Heinz, Gerhard, to BASF Aktiengesellschaft. Heat-stable copolycondensate molding materials. 4,925,910, Cl. 528-171.000.

Heiser, Richard K.; and Reed, James R., to Sundstrand-Sauer. Screed slope controller for a paver. 4,925,340, Cl. 404-75.000.

Heitmann, Uwe; and Brand, Peter, to Korber AG. Method of and apparatus for building, guiding and trimming streams of fibrous material. 4,924,885, Cl. 131-84.400.

Heitz, Christiane: *See*—
Kanmacher, Isabelle; Stambach, Jean-Francois; Jung, Louis; Schott, Christa; Stoclet, Jean-Claude; and Heitz, Christiane, 4,925,943, Cl. 546-149.000.

Helen of Troy Corporation: *See*—
Montagino, James G.; Butzko, Betty; and Lerner, Ronald L., 4,926,027, Cl. 219-222.000.

Helena Laboratories Corporation: *See*—
Golias, Tipton L., 4,925,065, Cl. 222-189.000.

Helix Technology Corporation: *See*—
Higham, Graham J.; Pruitt, Gerald R.; Morris, Ronald; Heger, Frank; Livingstone, James; and Tormey, David, 4,924,675, Cl. 62-6.000.

Helms, Randall D.: *See*—
Daane, Robert A.; and Helms, Randall D., 4,925,077, Cl. 226-97.000.

Hembert, Claude L. Fluid tank and method of manufacturing it. 4,925,044, Cl. 220-3.000.

Hemmeke, Ronald L.; and Spykerman, Scott A., to Prince Corporation. Visor. 4,925,232, Cl. 296-97.800.

Hemmer, Hans-Peter: *See*—
Bausch, Paul; and Hemmer, Hans-Peter, 4,924,670, Cl. 60-418.000.

Hemmerdinger, Louis H.; Knowles, Gregory W.; and Patterson, George B., to Grumman Aerospace Corporation. Apparatus for directional solidification of a crystal material. 4,925,636, Cl. 422-248.000.

Henderson, David: *See*—
Bohlmann, Rolf; Laurent, Henry; Henderson, David; and Nishino, Yukishige, 4,925,834, Cl. 514-177.000.

Hendry, James C.: *See*—
Summerlin, Frederick A.; and Hendry, James C., 4,924,691, Cl. 72-391.000.

Hendy, Daniel M., to Site Masters, Inc. Water management system. 4,925,342, Cl. 405-45.000.

Henke, Bernhard: *See*—
Schmalenbach, Dietrich; and Henke, Bernhard, 4,924,911, Cl. 137-625.500.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Schenker, Gilbert; Piorr, Robert; and Luettge, Sabine, 4,925,587, Cl. 252-174.220.

Henkel Kommandtgesellschaft auf Aktien: *See*—
Biermann, Manfred; Koester, Rita; and Eierdanz, Horst, 4,925,559, Cl. 209-166.000.

Henn, Kathy Y.: *See*—
Blume, Linda A.; Henn, Kathy Y.; and Osher, John D., 4,926,296, Cl. 362-156.000.

Henn, Robert L.: *See*—
Driskill, Kathleen R.; and Henn, Robert L., 4,925,732, Cl. 428-336.000.

Henry, Arnold W.: *See*—
Heeks, George J.; Henry, Arnold W.; and Schlueter, Edward L., Jr., 4,925,895, Cl. 524-714.000.

Hensley, Albert L., Jr.: *See*—
Kukes, Simon G.; Marshall, Christopher L.; Hopkins, P. Donald; and Hensley, Albert L., Jr., 4,925,546, Cl. 208-111.000.

Herbranson, Dale E.; Speicher, Earl R.; and Rosenberg, Leonard S., to Du Pont de Nemours, E. I., and Company. Stable pharmaceutical composition of 3-(hydroxymethyl)-5,5-diphenylhydantoin disodium phosphate ester. 4,925,860, Cl. 514-359.000.

Herbst, David H., to Imperial Cup Corporation. Push and drink lid with pour spout. 4,925,051, Cl. 220-90.400.

Herbstman, Sheldon: *See*—
Hagan, John J.; and Herbstman, Sheldon, 4,925,989, Cl. 568-697.000.

Heremans, Joseph P.; and Partin, Dale L., to General Motors Corporation. Indium arsenide magnetoresistor. 4,926,154, Cl. 338-32.00R.

Heremans, Joseph P.; and Partin, Dale L., to General Motors Corporation. Magnetic field sensors. 4,926,226, Cl. 357-27.000.

Herlth, Larry: *See*—
Bosworth, Dean; and Herlth, Larry, 4,925,399, Cl. 439-370.000.

Hermann, Jean: *See*—
Bourgeois, Claude; and Hermann, Jean, 4,926,086, Cl. 310-361.000.

Hermans, Stefanus P. E. A.: *See*—
Faber, Pals G.; Hermans, Stefanus P. E. A.; and Vegter, Gert, 4,925,355, Cl. 412-37.000.

Hermolin, Joshua, to Bromine Compounds Limited. Process for the preparation of 2,2-dibromonitrilopropionamide. 4,925,967, Cl. 558-445.000.

Herold, Barry W.; and Tahernia, Omid, to Motorola, Inc. Frequency synthesizer with improved automatic control of loop bandwidth selection. 4,926,141, Cl. 331-16.000.

Herrmann, Jakob. Device for controlled deflection of a light beam. 4,926,194, Cl. 346-108.000.

Hershey Foods Corporation: *See*—
Martin, Robert A., Jr.; and Stumpf, David M., 4,925,695, Cl. 426-660.000.

Heston, Warren D. W., to Sloan-Kettering Institute for Cancer Research. Aziridinyl putrescine containing compositions and their uses in treating prostate cancer. 4,925,835, Cl. 514-183.000.

Heuze, Alain: *See*—
Chevereau, Gerard; Cauquelin, Claude; and Heuze, Alain, 4,925,624, Cl. 376-400.000.

Hewlett-Packard Company: *See*—
Beatty, Christopher C., 4,925,524, Cl. 156-643.000.
Boyd, David W., 4,926,041, Cl. 250-226.000.
Childers, Winthrop D.; Schantz, Chris; and Hanson, Eric, 4,926,197, Cl. 346-140.00R.
Corsetto, Craig; Hornak, Tom; Nordby, Rasmus; Walker, Rick C.; and Yen, Chu, 4,926,447, Cl. 375-120.000.
Cutler, Gregory M., 4,925,302, Cl. 356-128.000.
Ellenberger, John C.; Yoo, Inbae; and Burdick, Eugene V., 4,925,024, Cl. 206-328.000.
Hazelton, Donald R.; Latka, Paul J.; Lyons, Joseph N., Jr.; and Spender, Eugene H., Jr., 4,925,214, Cl. 283-62.000.
Maisenbacher, Bernd; and Schmidt, Siegmar, 4,925,273, Cl. 350-315.000.
Shreeve, Robert W., 4,926,008, Cl. 174-117.0FF.

Hi-Shear Corporation: *See*—
Bochman, Harry L., Jr., 4,924,734, Cl. 81-57.120.

Hickman, Ravis S. Transducer mounting system. 4,926,399, Cl. 367-173.000.

Hicks, John E.; and Allen, Michael E. Ducted cover grass collection system. 4,924,664, Cl. 56-202.000.

Hicks, Peter: *See*—
Cavero, Icilio; Cazor, Jean-Louis; Hicks, Peter; and Langer, Salomon, 4,925,837, Cl. 514-211.000.

Hidaka, Hideto: *See*—
Fujishima, Kazuyasu; Hidaka, Hideto; Asakura, Mikio; and Matsuda, Yoshio, 4,926,385, Cl. 365-230.030.

Hidaka, Yasuharu, to NEC Corporation. Magnetic memory device using a deflected in-plane magnetic field. 4,926,377, Cl. 365-29.000.

Hiebert, Norman: *See*—
Hawranik, Gerald C.; and Hiebert, Norman, 4,924,621, Cl. 43-57.200.

Higashi, Akihiro: *See*—
Iseki, Izuru; Higashi, Akihiro; and Sasaki, Seihiro, 4,925,388, Cl. 432-77.000.

Higashi, Hidehiro: *See*—
Sato, Goro; Higashi, Hidehiro; Shirono, Katsuhiro; and Eto, Yoshio, 4,925,554, Cl. 208-210.000.

Higashi, Kazutada: *See*—
Ohta, Tomozo; Nakano, Hiroshi; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,926,182, Cl. 342-44.000.

Higashiizumi, Takao: *See*—
Takeuchi, Yasuhito; Higashiizumi, Takao; Ando, Motoyoshi; and Tamezumi, Yoshiro, 4,924,869, Cl. 128-660.050.

Higeta, Keiichi: *See*—
Uchida, Akihisa; Mitamura, Ichiro; and Higeta, Keiichi, 4,926,378, Cl. 365-179.000.

Higginson, John: *See*—
Bibl, Andreas; Higginson, John; and Gardner, Deane, 4,926,199, Cl. 346-157.000.

Higham, Graham J.; Pruitt, Gerald R.; Morris, Ronald; Heger, Frank; Livingstone, James; and Tormey, David, to Helix Technology Corporation. Linear motor compresser with stationary piston. 4,924,675, Cl. 62-6.000.

Higuchi, Kazuhiko: *See*—
Sekizawa, Hidekazu; Saito, Tutomu; Yamamoto, Naofumi; Higuchi, Kazuhiko; and Kawakami, Haruko, 4,926,251, Cl. 358-75.000.

Hikida, Muneo: *See*—
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,836, Cl. 514-210.000.
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,935, Cl. 540-350.000.

Hilker, Scott A.: *See*—
Brown, Jeffrey D.; Freerksen, Donald L.; Hilker, Scott A.; and Stasiak, Daniel L., 4,926,370, Cl. 364-748.000.

Hill, Frank F., to Huels Aktiengesellschaft. 3-hydroxydicarboxylic acids and process for their production. 4,925,798, Cl. 435-136.000.

Hill, George R., to Contra Vision Limited. Method of printing layers having substantially exact registration. 4,925,705, Cl. 427-259.000.

Hill, Michael; and Nichols, Walter A., to Filter Materials Limited. Method for improving the crimping of polyolefin filter tow. 4,925,602, Cl. 264-25.000.

Hill, Reinier, to AEC Machinery Limited. Portable conveyor. 4,925,009, Cl. 198-583.000.

Hill, Roger L.: *See*—
Shockney, Charles H.; Hill, Roger L.; and White, William T., 4,925,611, Cl. 264-135.000.

Hill-Rom Company, Inc.: *See*—
Poehner, Michael E.; Duwell, Michael J.; and Boyd, Howard J., 4,926,457, Cl. 378-209.000.

Hilmas, Duane E.: *See*—
Harris, Ralph N., III; Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A.; Koolpe, Gary A.; and Pick, Robert O., 4,925,856, Cl. 514-341.000.

Hilti Aktiengesellschaft: *See*—
Schmidt, Arno P. O., 4,925,904, Cl. 526-205.000.

hiMedics, Inc.: *See*—
Giannini, Robert P.; and Bashour, Daniel A., 4,925,674, Cl. 424-469.000.
Giannini, Robert P.; Fromm, Susan M.; and Suarez, Jose, 4,925,675, Cl. 424-469.000.

Himes, John L., Jr.; and Wise, James H., to AMP Incorporated. Electrical connectors for flexible bussing system. 4,925,392, Cl. 439-55.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Himmler, Thomas: *See*—
Stroech, Klaus; Fric, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,925,482, Cl. 71-92.000.
Stroech, Klaus; Frie, Monika; Himmler, Thomas; and Plempel, Manfred, 4,925,865, Cl. 514-383.000.

Hink, Karl M.; Pottebaum, Joseph R.; Reichard, Jerome J.; Wagner, Bruce C.; Weber, Douglas B.; and Wiesendanger, Theodore O., to A. O. Smith Corporation. Zero-torque eddy current motor system and method for controlling same. 4,926,100, Cl. 318-269.000.

Hintermeyer, Marian G. Garment protector. 4,924,527, Cl. 2-49.00R.

Hiraga, Hiroyuki: *See*—
Mizoguchi, Yoshiyuki; Watanabe, Yoshitaka; Hiraga, Hiroyuki; and Fukuyama, Shigeru, 4,926,196, Cl. 346-140.00R.

Hirai, Yoshiki: *See*—
Kanamaru, Hisanobu; Aoyama, Susumu; Koike, Tsutomu; Asahi, Naotatsu; and Hirai, Yoshiki, 4,924,690, Cl. 72-343.000.

Hirakawa, Hiromasa: *See*—
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.

Hirano, Akira: *See*—
Takenouchi, Shigeki, Hirano, Akira; Saito, Shiori; and Fujimaki, Yoshihide, 4,925,757, Cl. 430-31.000.

Hirano, Yoshihiro: *See*—
Katsuoka, Nobuo; Hirano, Yoshihiro; and Kakegawa, Tomohiro, 4,926,357, Cl. 364-560.000.

Hirao, Kazuhiro: *See*—
Matsumoto, Yukiei; Nishiki, Yoshinori; Hirao, Kazuhiro; and Shimamune, Takayuki, 4,925,538, Cl. 204-129.400.

Hiraoka, Mizuho: *See*—
Imataki, Hiroyuki; and Hiraoka, Mizuho, 4,925,733, Cl. 428-336.000.

Hirasawa, Junichi; Sato, Yuichi; and Iida, Toru, to Ricoh Company, Ltd. Improved paper handling mechanism in conjunction with image forming apparatus such as laser printers. 4,926,219, Cl. 355-309.000.

Hirata, Minoru: *See*—
Terao, Shinji; and Hirata, Minoru, 4,925,868, Cl. 514-425.000.

Hirayama, Naoto: *See*—
Baba, Tsuyoshi; Takigawa, Akio; Hirayama, Naoto; and Yoshida, Motoaki, 4,925,737, Cl. 428-437.000.

Hirmann, Georg. Drive device. 4,925,199, Cl. 280-216.000.

Hiroe, Akihiko: *See*—
Yamagishi, Hideo; Yamaguchi, Minori; Asaoka, Keizo; Hiroe, Akihiko; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,926,230, Cl. 357-30.000.

Hirokane, Junji: *See*—
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 4,925,776, Cl. 430-321.000.

Hirooka, Masaharu: *See*—
Kawano, Minori; Mitsui, Kazuo; Hirooka, Masaharu; Ozu, Yasushi; Harada, Nagayasu; and Kimura, Nobuhiro, 4,926,421, Cl. 370-95.100.

Hirose, Takeshi: *See*—
Furusawa, Genichi; Ishikawa, Takatoshi; Furutachi, Nobuo; and Hirose, Takeshi, 4 925,781, Cl. 430-505.000.

Hirsbrunner, Pierre: *See*—
Bertholet, Raymond; and Hirsbrunner, Pierre, 4,925,932, Cl. 536-55.300.

Hishida, Tadashi, to VIV Engineering Inc. Ball bearing. 4,925,322, Cl. 384-486.000.

Hitachi Koki Company: *See*—
Hashimoto, Yasushi; Tsuji, Yasuyuki; and Terakado, Akira, 4,926,216, Cl. 355-212.000.

Hitachi, Ltd.: *See*—
Kobayashi, Naoya; Ohnishi, Makoto; and Kokuryo, Yoshiro, 4,926,499, Cl. 455-306.000.
Kobayashi, Shin'ya; and Anzai, Masayasu, 4,926,248, Cl. 358-75.000.
Kosa, Yasunobu; and Shimizu, Shinji, 4,926,222, Cl. 357-23.500.
Kuroda, Hiroshi; Kurihara, Nobuo; and Sakamoto, Shinichi, 4,924,699, Cl. 73-178.00R.
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.
Mukai, Kiichiro; Saiki, Atsushi; and Harada, Seiki, 4,926,238, Cl. 357-72.000.
Nakashima, Keisuke; Yasukawa, Saburo; Tadauchi, Masaharu; and Hori, Yasuro, 4,926,253, Cl. 358-75.000.
Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; Owashi, Hitoaki; Sekiya, Masataka; and Minabe, Kohji, 4,926,361, Cl. 364-574.000.
Sakamura, Ken; Hashimoto, Kouzi; Kawasaki, Ikuya; Hasegawa, Atsushi; and Iwasaki, Kazuhiko, 4,926,321, Cl. 364-200.000.
Takamatsu, Hisashi; Takeuchi, Hisaharu; and Tohchi, Mamoru, 4,926,272, Cl. 360-49.000.
Tsuruta, Setsuo; and Miyamoto, Shoji, 4,926,343, Cl. 364-513.000.
Uchida, Akihisa; Mitamura, Ichiro; and Higeta, Keiichi, 4,926,378, Cl. 365-179.000.
Ueda, Shigeta; Hombu, Mitsuyuki; Honda, Kazuo; and Morinaga, Daisaku, 4,926,306, Cl. 363-58.000.
Ushiku, Kenichi; and Tezuka, Akira, 4,925,378, Cl. 418-148.000.
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, 4,925,755, Cl. 430-5.000.
Yamamoto, Akira; Motoyama, Miho; Kitajima, Hiroyuki; Doi, Takashi; and Nishimura, Toshifumi, 4,926,324, Cl. 364-200.000.

Hitachi Microcomputer, Engineering, Ltd.: *See*—
Sakamura, Ken; Hashimoto, Kouzi; Kawasaki, Ikuya; Hasegawa, Atsushi; and Iwasaki, Kazuhiko, 4,926,321, Cl. 364-200.000.

Hitachi Powdered Metals Co., Ltd.: *See*—
Kanamaru, Hisanobu; Aoyama, Susumu; Koike, Tsutomu; Asahi, Naotatsu; and Hirai, Yoshiki, 4,924,690, Cl. 72-343.000.

Hitch, Robert J., to W. C. Bradley Company. Rotisserie assembly. 4,924,766, Cl. 99-421.0HV.

Hitzler, Werner: *See*—
Rau, Georg; and Hitzler, Werner, 4,925,054, Cl. 220-94.00R.

Hjelmstad, Kenneth E., to United States of America, Interior. Method for particle stabilization by use of cationic polymers. 4,925,247, Cl. 299-5.000.

Hoback, Conaway K.: *See*—
Smith, Benjamin A.; and Hoback, Conaway K., 4,926,468, Cl. 379-147.000.
Smith, Benjamin A.; and Hoback, Conaway K., 4,926,469, Cl. 379-155.000.

Hock, Thomas H.; O'Banion, Michael L.; Koehler, Heinrich P. F.; and Wynes, Joseph, to Black & Decker Inc. Apparatus for use with stationary belt sander station. 4,924,633, Cl. 51-135.00R.

Hockersmith, Dan: *See*—
Larson, Brad W.; Hockersmith, Dan; Taylor, Thomas H.; Bedinger, John M.; Kottman, Rick; and Pebley, Steve, 4,925,167, Cl. 269-112.000.

Hoda, Takeo: *See*—
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,926,203, Cl. 354-287.000.

Hodges, Michael J., to Detexomat Machinery Limited. Pantyhose package. 4,925,022, Cl. 206-296.000.

Hoechst Aktiengesellschaft: *See*—
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,925,728, Cl. 428-216.000.
Gross, Jurgen, 4,924,714, Cl. 73-863.110.
Kesseler, Kurt; Beck, Gerhard; Bartmann, Wilhelm; and Granzer, Ernold, 4,925,852, Cl. 514-333.000.
Kirchhofer, Hermann, 4,925,647, Cl. 423-592.000.
Schmierer, Roland, 4,925,958, Cl. 560-43.000.
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, 4,925,478, Cl. 71-90.000.
Stolarski, Erwin; and Schroder, Hans-Rudiger, 4,924,554, Cl. 19-0.600.
von Plessen, Helmold; and Rittner, Siegbert, 4,925,959, Cl. 549-377.000.
Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,925,480, Cl. 71-91.000.
Zimmermann, Josef, 4,925,108, Cl. 239-419.300.

Hoechst Celanese Corp.: *See*—
Mueller, Werner H.; Khanna, Dinesh N.; Vora, Rohitkumar H.; and Erckel, Ruediger J., 4,925,915, Cl. 528-353.000.
Stein, Harvey L., 4,925,880, Cl. 521-98.000.

Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., to Shell Oil Company. Hydrocarbon conversion process and catalysts. 4,925,820, Cl. 502-66.000.

Hoelderich, Wolfgang: *See*—
Mackenroth, Wolfgang; Hoelderich, Wolfgang; Becker, Rainer; and Seufert, Walter, 4,925,991, Cl. 568-908.000.

Hoerbiger Ventilwerke Aktiengesellschaf: *See*—
Hrabal, Hans, 4,924,906, Cl. 137-512.100.

Hoercher, Ulrich: *See*—
Lechtken, Peter; Hoercher, Ulrich; and Jessel, Barbara, 4,925,960, Cl. 549-412.000.

Hoesch Aktiengesellschaft: *See*—
Kliesch, Wilfried, 4,924,707, Cl. 73-644.000.

Hofer, Gerald; and Eheim, Franz, to Robert Bosch GmbH. Fuel-injection pump for an internal-combustion engine. 4,924,833, Cl. 123-449.000.

Hofer, Peter, to Euroceltique, S.A. 6-thioxanthines. 4,925,847, Cl. 514-263.000.

Hoffman, Charles R.: *See*—
Bukowski, Eugene R.; and Hoffman, Charles R., 4,926,442, Cl. 375-76.000.

Hoffman, David W.: *See*—
Moskowitz, David; Hoffman, David W.; and Schmatz, Duane J., 4,925,346, Cl. 408-1.00R.

Hoffman, Roger T., to National-Detroit, Inc. Orbital rubbing machine with improved spindle locking member. 4,924,636, Cl. 51-170.0MT.

Hoffmann, Dietrich; and Weisser, Harald, to Mauser-Werke Oberndorf GmbH. Gun barrel construction. 4,924,614, Cl. 42-78.000.

Hoffmann, Gerhard, to BASF Aktiengesellschaft. Process for improving the ozone resistance of relief printing plates. 4,925,775, Cl. 430-306.000.

Hoffmann-La Roche Inc.: *See*—
Buchecker, Richard; Fromm, Hans-Jurgen; Kelly, Stephen; and Schadt, Martin, 4,925,278, Cl. 350-350.500.
Crowl, Robert M.; and Young, Daru, 4,925,784, Cl. 435-5.000.
Lorenz, Reinhard, 4,925,589, Cl. 252-299.010.

Hojo, Nobuyoshi; Asai, Yoshiro; Fujioka, Motoo; Kobayashi, Naotou; and Yamaguchi, Takashi, to Ryobi Ltd.; and Mitsubishi Jidosha

Kogyo Kabushiki Kaisha. Metal parts joint structure and method for producing the same. 4,925,510, Cl. 156-92.000.

Hokenek, Erdem; and Montoye, Robert K., to International Business Machines Corporation. Leading 0/1 anticipator (LZA). 4,926,369, Cl. 364-748.000.

Holdaway, Charles R.: *See*—
Chaparro, John J.; De Kreek, Dirk; and Holdaway, Charles R., 4,925,089, Cl. 236-78.00D.

Holland, Robert J.: *See*—
Konieczynski, Ronald D.; Pintelon, Jo; Holland, Robert J.; Barth, C. Peter; and Gell, Jeff, 4,925,101, Cl. 239-8.000.

Hollenberg, David H.: *See*—
Tse, Stephen H.; Hollenberg, David H.; Martin, Richard L.; and Manning, James H., 4,925,528, Cl. 162-146.000.

Holley, Nelson E., Jr. Storage rack for canned goods accommodating varying diameters and axial lengths. 4,925,037, Cl. 211-59.200.

Hollowick, Inc.: *See*—
Zimmerman, Robert C., 4,926,298, Cl. 362-163.000.

Holmes, Jack: *See*—
Robichaud, Arthur R.; Wilgus, Frank R.; Tyler, Warren C.; and Holmes, Jack, 4,925,034, Cl. 206-603.000.

Holmes, James C.: *See*—
Wasley, Robert S.; and Holmes, James C., 4,926,129, Cl. 324-555.000.

Holst, Hans; Lindemann, Klaus; Saba, Manfred; Kaess, Hans-Harald; and Petersen, Erwin, to WABCO Westinghouse Fahrzeugbremsen GmbH. Anti-lock brake system for vehicles. 4,925,254, Cl. 303-111.000.

Holtrop, John: *See*—
Childress, James J.; and Holtrop, John, 4,925,057, Cl. 220-426.000.

Hombu, Mitsuyuki: *See*—
Ueda, Shigeta; Hombu, Mitsuyuki; Honda, Kazuo; and Morinaga, Daisaku, 4,926,306, Cl. 363-58.000.

Hommel, Horst; and Schubert, Hiltmar, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Process for the production of particulate ammonium nitrate for solid fuels or explosives. 4,925,600, Cl. 264-3.400.

Honda, Chika: *See*—
Metoki, Iku; Honda, Chika; and Wada, Yasunori, 4,925,783, Cl. 430-569.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Funatsu, Koichi; and Aida, Hiromi, 4,926,328, Cl. 364-424.100.
Hamaguchi, Kazumichi, 4,925,231, Cl. 296-78.100.
Handa, Akio; Hosoya, Eiji; Ishiwatari, Makoto; Kimura, Yoshihiro; and Watanabe, Seiji, 4,924,959, Cl. 180-297.000.
Miyamaru, Yukio; Yagasaki, Akio; Kimura, Shigeo; and Osanai, Yoshimi, 4,925,432, Cl. 474-8.000.
Motozawa, Yasuki, 4,925,212, Cl. 280-807.000.
Ogura, Yukihiro; and Ikenoya, Yasuo, 4,924,823, Cl. 123-64.000.
Shitanoki, Kazuaki; Kawaguchi, Masaaki; and Kobayashi, Saburo, 4,925,208, Cl. 280-741.000.

Honda, Kazuo: *See*—
Ueda, Shigeta; Hombu, Mitsuyuki; Honda, Kazuo; and Morinaga, Daisaku, 4,926,306, Cl. 363-58.000.

Honda, Yutaka: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 4,925,537, Cl. 204-61.000.

Honeyager, Kevin S., to Colin Electronics Co., Ltd. Motion artifact detection for continuous blood pressure monitor transducer. 4,924,871, Cl. 128-672.000.

Honeywell Inc.: *See*—
Pickell, John D., 4,926,162, Cl. 340-534.000.

Honl, Wolf-Dieter: *See*—
Frei, Bernhard; and Honl, Wolf-Dieter, 4,925,123, Cl. 242-107.000.

Hoover, Randy C.: *See*—
Ruby, James A.; Lange, Rolf-Peter; and Hoover, Randy C., 4,924,628, Cl. 49-380.000.

Hoover Universal, Inc.: *See*—
Lomasney, David J.; Dietze, Robert H.; and Rohrback, Jeffrey D., 4,924,630, Cl. 49-502.000.
Witzke, Duane W.; Selbert, Alan J.; and Lowe, Michael E., 4,925,513, Cl. 156-245.000.

Hopkins, P. Donald: *See*—
Kukes, Simon G.; Marshall, Christopher L.; Hopkins, P. Donald; and Hensley, Albert L., Jr., 4,925,546, Cl. 208-111.000.

Hor, Ah-Mee: *See*—
Baranyi, Giuseppa; Hor, Ah-Mee; Loutfy, Rafik O.; and Popovic, Zoran D., 4,925,760, Cl. 430-59.000.

Hori, Yasuro: *See*—
Nakashima, Keisuke; Yasukawa, Saburo; Tadauchi, Masaharu; and Hori, Yasuro, 4,926,253, Cl. 358-75.000.

Horii, Tetsuo: *See*—
Inamori, Masahito; Horii, Tetsuo; Shimazu, Tomonori; and Sugaya, Masaji, 4,925,864, Cl. 514-383.000.

Horikawa, Mitsuo: *See*—
Matsuda, Yoshio; Horikawa, Mitsuo; and Tsubata, Norntaka, 4,924,560, Cl. 24-392.000.

Horiki, Yoshio: *See*—
Ikeda, Hideo; Horiki, Yoshio; Yamauchi, Yutaka; Kasamatsu, Hiroshi; and Akao, Akimasa, 4,925,511, Cl. 156-106.000.

Hornak, Tom: *See*—
Corsetto, Craig; Hornak, Tom; Nordby, Rasmus; Walker, Rick C.; and Yen, Chu, 4,926,447, Cl. 375-120.000.

Horner, John E.: *See*—
Gray, Stephen L.; and Horner, John E., 4,925,687, Cl. 426-129.000.

Hosack, Harold H., to Texas Instruments Incorporated. High performance extended wavelength imager and method of use. 4,926,225, Cl. 357-24.000.

Hosaka, Kunio: *See*—
Kimura, Masayuki; Hosaka, Kunio; Takeda, Shigehumi; and Mitsuhashi, Hiroshi, 4,925,872, Cl. 514-465.000.

Hoshizaki Denki Kabushiki Kaisha: *See*—
Ito, Yoshinori, 4,924,678, Cl. 62-138.000.

Hoskins, Robert G.; and Krokenberger, Alan R., to Alliance Automation Systems, Inc. Power driven screwdriver with vacuum for removing contaminants. 4,924,732, Cl. 81-54.000.

Hosoi, Yuichi; Takahashi, Kenji; and Arakawa, Satoshi, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,926,045, Cl. 250-327.200.

Hosonuma, Kunihiko: *See*—
Maeda, Yoshihiro; Hosonuma, Kunihiko; and Tamura, Keiichi, 4,925,596, Cl. 252-32.70E.

Hosoya, Eiji: *See*—
Handa, Akio; Hosoya, Eiji; Ishiwatari, Makoto; Kimura, Yoshihiro; and Watanabe, Seiji, 4,924,959, Cl. 180-297.000.

Hoss, Margaret A.; and Hoss, Paul F. Sheet with attached cover and removable pillowcases and impermeable sheet. 4,924,543, Cl. 5-484.000.

Hoss, Paul F.: *See*—
Hoss, Margaret A.; and Hoss, Paul F., 4,924,543, Cl. 5-484.000.

Hou, Jack. Carousel device. 4,925,182, Cl. 272-31.00R.

Houck, David L.: *See*—
Anand, Vidhu; and Houck, David L., 4,925,626, Cl. 419-18.000.

Houghton, Connie H. System of conserving water in a building. 4,924,536, Cl. 4-665.000.

Houlihan, William J., to Sandoz Pharmaceuticals Corp. 2- or 4-substituted-[2-(1H-imidazol-1-yl)ethyl]piperidines. 4,925,851, Cl. 514-326.000.

House, Roy F.: *See*—
Brown, Ronald W.; and House, Roy F., 4,925,616, Cl. 264-262.000.

Housley, John R.; Jeffery, James E.; Johnston, David N.; and Sargent, Bruce J., to Boots Company, PLC. Arylcyclobutylmethylamines. 4,925,879, Cl. 514-650.000.

Howard, James E.: *See*—
Faasse, Gene E.; and Howard, James E., 4,924,916, Cl. 139-91.000.

Howd, Robert A.: *See*—
Harris, Ralph N., III; Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A.; Koolpe, Gary A.; and Pick, Robert O., 4,925,856, Cl. 514-341.000.

Hoxmeier, Ronald J.: *See*—
Slaugh, Lynn H.; Johnson, Thomas H.; and Hoxmeier, Ronald J., 4,925,822, Cl. 502-112.000.

Hoyt, Steven W.; and Thomas, Sidney S., to Pacific Scientific Company. Dual-mode inertia reel system. 4,925,124, Cl. 242-107.40A

HPM Corporation: *See*—
Nunn, Robert E., 4,925,313, Cl. 366-81.000.

Hrabal, Hans, to Hoerbiger Ventilwerke Aktiengesellschaf. Ring valve. 4,924,906, Cl. 137-512.100.

Hrdlicka, Victor: *See*—
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, 4,926,455, Cl. 378-176.000.

Hrubecky, Frederick J.: *See*—
Johnson, Russell L.; Hrubecky, Frederick J.; and Fay, James E., III, 4,924,845, Cl. 126-25.00R.

Hsia, Jen-chang, to Canadian Patents & Development Limited. Purification of hemoglobin and modified hemoglobin by affinity chromatography. 4,925,574, Cl. 210-635.000.

Hsieh, Lai-Fa, to Great Electronics Corporation. Portable computer system. 4,926,365, Cl. 364-708.000.

Huang, Ku T., to Ku Te Haung. Structure improvement of cleaner tape cartridge for video tape recorder/player. 4,926,277, Cl. 360-128.000.

Huang, Leaf. Target-specific cytotoxic liposomes. 4,925,661, Cl. 424-85.910.

Huang, Marshall Y.: *See*—
Yen, Kuo-Hsuing; Kagiwada, Reynold S.; Stokes, Robert B.; and Huang, Marshall Y., 4,926,146, Cl. 333-195.000.

Huang, Phen-Lan: *See*—
Summerville, David F.; Williston, John P.; Wand, Martin A., Doty, Thomas J.; Rice, Haradon J.; and Huang, Phen-Lan, 4,926,103, Cl. 318-587.000.

Hubbard, S. Catherine: *See*—
Bergh, Michel L. E.; Hubbard, S. Catherine; and Rasmussen, James R., 4,925,796, Cl. 435-97.000.

Huber, Karl-Alexander. Air trap for shutting off flexible plastic tubing. 4,925,152, Cl 251-5.000.

Hubner, Wolfgang; and Schroers, Otto, to Chemische Fabrik Stockhausen GmbH. Process for the production of concentrated emulsion polymers. 4,925,884, Cl. 523-340.000.

Huddleston, Anne W., executrix: *See*—
Huddleston, Earl M., deceased; and Huddleston, Anne W., executrix, 4,924,573, Cl. 30-272.100.

Huddleston, Earl M., deceased; and by Huddleston, Anne W., executrix. Pruner with power driven extension. 4,924,573, Cl. 30-272.100.

Hudson Soft Co., Ltd.: *See*—
Yamamura, Kimio, 4,924,744, Cl 84-601.000.

Hue Nguyen Che: *See*—
Che, Hue N., 4,924,738, Cl. 82-127.000.

Huebscher, Laszlo; and Lanzetta, Carmen. Optical sleeve or insert apparatus. 4,925,266, Cl. 350-96.200.

Huels Aktiengesellschaft: *See*—
Gras, Rainer, 4,925,974, Cl. 560-336.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Hill, Frank F., 4,925,798, Cl. 435-136.000.
Zoche, Gu / nter, 4,925,964, Cl. 556-422.000.
Huemmer, Wolfgang; Bronstert, Bernd; Littmann, Dieter; and Zuerger, Manfred, to BASF Aktiengesellschaft. Light-sensitive photopolymerizable laminate material. 4,925,769, Cl. 430-271.000.
Hughes Aircraft Company: *See—*
LeCompte, George W., 4,925,125, Cl. 242-117.000.
Novak, C. Tim; Alt, Thomas J.; Chapman, Arnold D.; and Driscoll, David M., 4,926,345, Cl. 364-513.000.
Rafanelli, Gerard L., 4,925,301, Cl. 356-124.000.
Schotter, Daniel K., 4,925,126, Cl. 242-157.00R.
Tsuda, George I.; and Tsuhako, Kernel S., 4,926,500, Cl. 455-302.000.
Turk, Roger R.; and Ramirez, Nelson, 4,925,599, Cl. 264-1.500.
Wittenberg, Peter, 4,926,185, Cl. 342-201.000.
Huizinga, Tom: *See—*
Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., 4,925,820, Cl. 502-66.000.
Hulsewis, Hans: *See—*
Metz, Josef; and Hulsewis, Hans, 4,924,751, Cl. 89-43.010.
Humber, Leslie G.: *See—*
Quagliato, Dominick A.; and Humber, Leslie G., 4,925,839, Cl. 514-212.000.
Hummel, Alan R.; and Welch, Ernst R., to Abex Corporation. Process for producing a disc brake pad 4,924,583, Cl. 29-460.000.
Hummerich, Rainer: *See—*
Dotzauer, Bernhard; Kast, Hans; Beckerle, Wilhelm F.; and Hummerich, Rainer, 4,925,529, Cl. 162-152.000.
Humphrey, John M., to United States of America, Army. Integrated two stage rocket. 4,924,775, Cl. 102-352.000.
Hunger, Heinz: *See—*
Kunz, Peter; Hunger, Heinz; and Wermelinger, Jorg, 4,925,218, Cl. 285-93.000.
Hunninghaus, Werner; and Hunninghaus, Werner, to Ludwig Schokolade GmbH. Packaging for food and method of producing same 4,925,035, Cl. 206-633.000.
Hunninghaus, Werner: *See—*
Hunninghaus, Werner; and Hunninghaus, Werner, 4,925,035, Cl 206-633.000.
Hunt, Glen R.; and McDaniel, John F., to Permanent Tire Gauge Company, Inc. Tire-mounted air pressure gauge assembly 4,924,697, Cl. 73-146.800.
Hunt, Roger B.: *See—*
Kasenga, Anthony F., Sigai, A. Gary; Peters, Thomas E.; and Hunt, Roger B., 4,925,703, Cl. 427-215.000.
Hunter, Donald W.: *See—*
Rabenau, Richard; Kanner, Rowland W.; and Hunter, Donald W., 4,925,464, Cl. 55-179.000.
Hunter, Gordon B.: *See—*
Johnson, Neil A.; Miller, Russell S.; and Hunter, Gordon B., 4,926,439, Cl. 373-10.000.
Huntley, Albin: *See—*
Orkin, Fredric I.; Liber, Theodore; Smith, Charles R.; Knowlton, Kimball J.; and Huntley, Albin, 4,925,444, Cl. 604-80.000.
Hurd, William C. Intraocular biometer for a slit lamp. 4,925,293, Cl. 351-214.000.
Hurkmans, Petrus L. W. *See—*
Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., 4,925,106, Cl. 239-333.000.
Huron Products Corporation: *See—*
Ketcham, Mark G., 4,925,217, Cl. 285-93.000.
Hutter, Louis N., to Texas Instruments Incorporated. Merged trench bipolar-CMOS transistor fabrication process. 4,926,233, Cl. 357-43.000.
Hutton, Robert C.: *See—*
Streusand, Barry J.; Allen, Raymond H.; Coons, Darrell E.; and Hutton, Robert C., 4,926,021, Cl. 219-121.590.
Hwang, Bor-Yuan; Casteel, Carroll M.; and Mastroianni, Sal T., to Motorola Inc. Integrated pin photo-detector. 4,926,231, Cl 357-30.000.
Hwang, Edward Y.; and Chow, Michael P., to Westinghouse Electric Corp. High pressure rotor stress damage accumulating method. 4,926,342, Cl. 364-508.000.
Hwang, Shih-Ming. Means for controlling power door locks with an automobile burglar alarm. 4,926,160, Cl. 340-426.000.
Hyde, Michael L.; and Cart, Donald F. Mechanical linkage characterizer. 4,924,719, Cl. 74-99.00A.
Hydle, Leslie K.: *See—*
Harris, Godfrey; and Hydle, Leslie K., 4,925,242, Cl. 297-284.000.
Hyodo, Hitoshi, to Aisin Seiki Kabushikikaisha. Noise elimination circuit. 4,926,072, Cl. 307-542.100.
Hyodo, Yoshihiko: *See—*
Chujo, Yoshiki; Aoki, Keiji; Hyodo, Yoshihiko; and Katsuno, Toshiyasu, 4,924,837, Cl. 123-494.000.
Hypres, Inc.: *See—*
Whiteley, Steve R., 4,926,067, Cl. 307-352.000.
I.M.S. Internazionale Medico Scientifica s.r.l.: *See—*
Toniolo, Bruno, 4,926,453, Cl. 378-37.000.
Ibaraki Precision Machinery Co., Ltd.: *See—*
Takehama, Koichi, 4,924,658, Cl. 53-547.000.
IceAlert, Inc.: *See—*
Beebe, Russell B., 4,926,163, Cl. 340-581.000.
Ichihara, Yasuo: *See—*
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 4,925,537, Cl. 204-61.000.
Ichihara, Yoshiyuki; Ito, Kunio; Izawa, Tadashi; and Wakui, Norihiro, to Konica Corporation. Color image reader having a lens and prism incorporated into a single unit. 4,926,249, Cl. 358-75.000.
Ichijo, Hisao: *See—*
Suehiro, Tetsuro; Yamauchi, Aizo; Ichijo, Hisao; Nagasawa, Jun'ichi; and Aisaka, Noboru, 4,925,803, Cl. 435-288.000.
Ichiki, Tetsuji: *See—*
Kimpara, Mamoru; and Ichiki, Tetsuji, 4,924,745, Cl. 84-609.000.
Ichimura, Kunihiro; Yonezawa, Teruhiko; Kikuchi, Hideo; Tochizawa, Nariaki; and Hayashi, Keiichi, to Director General of Agency of Industrial Science and Technology; and Toyo Gosei Kogyo Co., Ltd. Contrast-enhancing agent for photolithography. 4,925,770, Cl. 430-273.000.
Ichisawa, Toshinori, to Alps Electric Co., Ltd. Color ink ribbon for thermal printer. 4,925,324, Cl. 400-240.300.
ICI Americas Inc.: *See—*
Neilan, James P.; and Stephen, John F., 4,925,938, Cl 544-221.000.
Nguyen, Nhan H., 4,925,965, Cl. 558-411.000.
Resch, James F., 4,925,844, Cl. 514-252.000.
Icis-Tirestar Vertrieb Montage Service W. von Dusterlho KG: *See—*
von Dusterlho, Wolfgang, 4,924,925, Cl. 152-243.000.
ICT Integrated Circuit Testing Gesellschaft fur Halbleiterpruftechnik mbH *See—*
Frosien, Juergen, 4,926,054, Cl. 250-396.00R
ICT Manufacturing, Inc.: *See—*
James, Jeffrey P., 4,924,575, Cl. 30-315.000
Ihara Chemical Industry Co., Ltd.: *See—*
Inamori, Masahito; Horii, Tetsuo; Shimazu, Tomonori; and Sugaya, Masaji, 4,925,864, Cl. 514-383.000.
Iida, kouzou: *See—*
Morii, Atsushi; Koyanagi, Toshio; Takatsuka, Hiromu; and Iida, kouzou, 4,925,640, Cl. 423-239.000.
Iida, Toru: *See—*
Hirasawa, Junichi; Sato, Yuichi; and Iida, Toru, 4,926,219, Cl. 355-309.000.
Iikawa, Tsutomu: *See—*
Yamagishi, Wataru; and Iikawa, Tsutomu, 4,925,502, Cl. 148-311.000.
Iino, Yujirou: *See—*
Kuno, Hiroyuki; and Iino, Yujirou, 4,926,275, Cl. 360-106.000.
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, to Ricoh Company, Ltd. Leuco dyes and recording materials using the same. 4,925,828, Cl. 503-218.000.
Ike, Masahide; and Kawai, Kunio, to Nissan Motor Company, Ltd Exhaust manifold. 4,924,967, Cl. 181-243.000.
Ikeda Glass Industrial Co., Ltd.: *See—*
Ikeda, Hideo; Horiki, Yoshio; Yamauchi, Yutaka; Kasamatsu, Hiroshi; and Akao, Akimasa. 4,925,511, Cl. 156-106.000.
Ikeda, Hideo; Horiki, Yoshio; Yamauchi, Yutaka; Kasamatsu, Hiroshi; and Akao, Akimasa, to Central Glass Company, Limited; and Ikeda Glass Industrial Co., Ltd. Method of fitting plate member with supportive or protective member of molded resin 4,925,511, Cl. 156-106.000.
Ikeda, Hirosaka: *See—*
Hayashi, Kyozo; Kawamura, Seiji; and Ikeda, Hirosaka, 4,925,394, Cl. 439-86.000.
Ikeda, Hiroyuki: *See—*
Yamagishi, Fumio; Hasegawa, Shinya; and Ikeda, Hiroyuki, 4,925,262, Cl. 350-3.710.
Ikeda, Kiyoji: *See—*
Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi; Onai Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko. 4,926,235, Cl. 357-68.000.
Ikeda, Kyoichi: *See—*
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi, Watanabe, Tetsuya; and Yoshida, Takashi, 4,926,143, Cl. 331-156.000.
Ikeda, Masaaki; and Takahara, Wataru, to TDK Corporation. Dielectric ceramic composition. 4,925,817, Cl. 501-138.000.
Ikeda, Masanori; Miura, Morikazu; and Aoshima, Atsushi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the production of hexafluoropropylene oxide. 4,925,961, Cl. 549-521.000.
Ikeda, Shuji: *See—*
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,926,333, Cl. 364-426.020.
Ikeda, Tamehiko; and Yano, Shusuke, to Nihon Food Culture Co., Ltd.; and Tateho Chemical Industries Co., Ltd. Disposable body warmer and heat generating material therefor. 4,925,743, Cl. 428-702.000.
Ikeda, Toshio, to Canon Kabushiki Kaisha. Communication system. 4,926,471, Cl. 379-216.000.
Ikeda, Yoshihisa: *See—*
Sugitani, Yuji; Kobayashi, Yukio; Ikeda, Yoshihisa; and Murayama, Masatoshi, 4,926,023, Cl. 219-125.120.
Ikedo, Yuji; Miyakawa, Tsutomu; Okajima, Takahiro; and Miyake, Masahiko, to Pioneer Electronic Corporation. Disk player. 4,926,406, Cl. 369-36.000.
Ikegawa, Akihito: *See—*
Mizuno, Hiroshi; Murasaki, Hiroshi; Ikegawa, Akihito; and Etou, Kouichi, 4,924,806, Cl. 118-658.000.
Ikenoya, Yasuo: *See—*
Ogura, Yukihiro; and Ikenoya, Yasuo, 4,924.823, Cl. 123-64.000.
Ikeya, Hiroshi: *See—*
Yoshida, Hiroshi; Ikeya, Hiroshi; Kobayashi, Kunihiro; and Kondo, Yasuhiko, 4,925,092, Cl. 237-12.30B.

Ikeyama, Masakazu: *See—*
Ikoma, Munehisa; Kawano, Hiroshi; Takahashi, Osamu; Matsumoto, Isao; and Ikeyama, Masakazu, 4,925,748, Cl. 429-59.000.
Ikimi, Takahiro; Taketomi, Tsuneharu; and Kato, Kiminari, to NGK Insulators, Ltd. Method of machining ceramic rotor for pressure wave type supercharger. 4,924,637, Cl. 51-290.000.
Ikoma, Munehisa; Kawano, Hiroshi; Takahashi, Osamu; Matsumoto, Isao; and Ikeyama, Masakazu, to Matsushita Electric Industrial Co., Ltd. Alkaline storage battery using hydrogen absorbing alloy. 4,925,748, Cl. 429-59.000.
Ikuta, Tetsuya: *See—*
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; Kaneko, Motohiro; Kusumoto, Yoshiro; Takakuwa, Kazuo; and Ikuta, Tetsuya, 4,924,807, Cl. 118-725.000.
Ilahiane, Lahcen: *See—*
Bardot, Colette; Bergez, Pierre; Eyraud, Charles; and Ilahiane, Lahcen, 4,925,566, Cl. 210-651.000.
Imaeda, Mikio, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus using planar illuminator as a light source. 4,926,209, Cl. 355-27.000.
Imai, Koichi: *See—*
Ohsaki, Takashi; Imai, Koichi; and Miyahara, Naomasa, 4,925,604, Cl. 264-29.200.
Imai, Takuo; Kojima, Shinji; Matsukawa, Toshitane; and Fujimura, Toshio, to Kawasaki Steel Corp. Method and apparatus for continuous compression forging of continuously cast steel. 4,924,585, Cl 29-527.500.
Imamura, Tomoatsu; Shimada, Kazuyuki; and Senma, Toshitaka, to Ricoh Company, Ltd. Semiconductor laser unit. 4,926,433, Cl. 372-50.000.
Imanari, Hitoshi: *See—*
Kanno, Hideo; Imanari, Hitoshi; Naito, Hideshi; Kodaka, Yoshiro; and Ohta, Naoto, 4,925,282, Cl. 350-429.000.
Imataki, Hiroyuki; and Hiraoka, Mizuho, to Canon Kabushiki Kaisha. Magnetic recording medium. 4,925,733, Cl. 428-336.000.
Imco Electro-Optics Limited: *See—*
Garfield, Brian R. C.; and Riches, Mark J., 4,926,039, Cl 250-213.0VT.
Immunicon Corporation: *See—*
Liberti, Paul A., 4,925,788, Cl. 435-7.000.
Immunomedics, Inc.: *See—*
Hansen, Hans J.; and Goldenberg, Milton D, 4,925,648, Cl. 424-1.100.
Imonti, Maurice M.; and Beuchat, Charles E., to Cooper Companies, Inc., The. Surgical aspirator cannula. 4,925,450, Cl. 604-240.000
Imoto, Masaya: *See—*
Umezawa, Hamao, deceased; Takeuchi, Tomio; Tatsuta, Kuniaki; Isshika, Kunio; and Imoto, Masaya, 4,925,877, Cl. 514-630.000.
Imperial Chemical Industries PLC: *See—*
Bayles, Richard W.; Boyle, Francis T.; Gravestock, Michael B.; and Wapdlewopth, James M., 4,925,863, Cl. 514-383.000.
Byrom, David; and Carver, Mark A., 4,925,797, Cl. 435-135.000.
Cartwright, David, 4,925,947, Cl. 546-302.000.
Lee, David L., 4,925,479, Cl. 71-91.000.
Padget, John C.; Yeates, Stephen G.; and Marsh, Mary R R, 4,925,893, Cl. 524-337.000.
Smithers, Michael J., 4,925,869, Cl. 514-452.000.
Waters, Colin M.; Noakes, Timothy J.; and Pavey, Ian, 4,925,708, Cl. 428-1.000.
Imperial Cup Corporation: *See—*
Herbst, David H., 4,925,051, Cl. 220-90.400.
Inaba, Shigemitsu; Ootaka, Kazuto; and Hashizawa, Shigemi, to Yazaki Corporation. Connector with fitting confirmation device. 4,925,402, Cl. 439-490.000.
Inaba, Shigemitsu: *See—*
Endo, Takayoshi; Inaba, Shigemitsu; and Hashizawa, Shigemi, 4,925,309, Cl. 356-394.000.
Inaba, Yutaka, to Canon Kabushiki Kaisha. Method and apparatus for driving optical modulation device. 4,925,277, Cl. 350-350.00S
Inacio, Jorge; and Nilsson, Erling, to Data Promeditech I.N.C. AB. Pump. 4,925,377, Cl. 417-472.000.
Inada, Yutaka; Kawasaki, Kazumasa; Nishiyama, Shigeru; and Yoshikura, Hiroshi, to Tokico Ltd Vortex flowmeter. 4,924,710, Cl. 73-861.230.
Inagaki, Jitsuo. Bed pad, an automobile seat pad, a pillow or a similar cushionlike item. 4,924,541, Cl. 5-468.000.
Inamori, Akio: *See—*
Katayama, Yoshiyuki; Ura, Takeshi; and Inamori, Akio, 4,924,983, Cl. 192-52.000.
Inamori, Masahito; Horii, Tetsuo; Shimazu, Tomonori; and Sugaya, Masaji, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. Phenyltriazole derivative and insecticide. 4,925,864, Cl. 514-383.000.
Incom, Inc.: *See—*
Jeskey, Richard V.; and Plocharczyk, John R., 4,925,473, Cl. 65-12.000.
Indak Manufacturing Corp.: *See—*
Cummings, John G., 4,926,014, Cl. 200-61.860.
Independent Technologies, Inc.: *See—*
Ingalsbe, David L., 4,925,393, Cl. 439-76.000.
Industrial Technology Research Institute: *See—*
Lin, Shyuh-Der, 4,924,747, Cl. 84-663.000.
Ingalsbe, David L., to Independent Technologies, Inc. 66 Block adapter. 4,925,393, Cl. 439-76.000.
Ingersoll-Rand Company: *See—*
Plummer, Darrill L., 4,924,759, Cl. 92-240.000.
Innerspace Corporation: *See—*
Gongwer, Calvin A.; and Gongwer, Robert C., 4,925,185, Cl. 272-126.000.
Innovative Building Products, Inc.: *See—*
Taylor, John R., 4,924,649, Cl. 52-656.000.
Innovative Sampling Technologies Inc.: *See—*
Friedman, Dale; and Mennella, Louis P., 4,925,029, Cl. 206-473.000.
Inoue, Kenji: *See—*
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Inoue, Koji: *See—*
Akao, Mutsuo; and Inoue, Koji, 4,925,711, Cl. 428-35.200.
Inoue, Kotaro: *See—*
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi, Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.
Inoue, Manabu: *See—*
Hata, Yoshiaki; Taniguchi, Nobuyuki, Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,926,203, Cl. 354-287.000.
Inoue, Noriyuki; and Ozawa, Takashi, to Fuji Photo Film Co., Ltd. Direct positive color image forming method 4,925,777, Cl. 430-377.000.
Insta-Foam Products, Inc.: *See—*
Brown, Daniel P., 4,925,107, Cl. 239-414.000.
Institut Dr. Forster GmbH & Co. KG: *See—*
Auslander, Klaus; Fabris, Hans-Jurgen; Patzwald, Wolfgang; and Seichter, Helmut, 4,926,127, Cl. 324-329.000.
Institut Francais du Petrole: *See—*
Alagy, Jacques; and Busson, Christian, 4,926,001, Cl. 585-500.000.
Claudy, Pierre; Letoffe, Jean-Marie; and Commercon, Jean-Claude, 4,925,314, Cl. 374-16.000.
Rojey, Alexandre; Deschamps, Andre; Grehier, Alain; and Robert, Eric, 4,925,459, Cl. 155-16.000.
Institute of Gas Technoloy: *See—*
Remick, Robert J.; Marianowski, Leonard G; and Camara, Elias H., 4,925,745, Cl. 429-40.000.
Intel Corporation: *See—*
Madland, Paul D., 4,926,387, Cl. 365-233.000.
Interlake Corporation, The: *See—*
Kelkar, Anant H.; Capodicasa, Frank A; and Weinstein, Jerry G., 4,925,492, Cl 106-38.350.
Interlube Systems Limited: *See—*
Moate, Peter D., 4,925,373, Cl 417-372.000.
Intermedics, Inc.: *See—*
Brewer, Maurice A., 4,924,881, Cl. 128-785.000.
International Business Machines Corporation: *See—*
Baratz, Alan E.; and Grover, George A., 4,926,414, Cl. 370-31.000
Braren, Bodil E.; and Srinivasan, Rangaswamy, 4,925,523, Cl. 156-643.000.
Brezoczky, Blasius; Cuomo, Jerome J.; Guarnieri, C. Richard; Ramanathan, Kumbakonam V.; Shivashankar, Srinvasrao A.; Smith, David A.; and Yee, Dennis S., 4,925,700, Cl. 427-38.000.
Brown, Jeffrey D.; Freerksen, Donald L.; Hilker, Scott A.; and Stasiak, Daniel L., 4,926,370, Cl. 364-748.000.
Bukowski, Eugene R.; and Hoffman, Charles R., 4,926,442, Cl. 375-76.000.
Cidon, Israel; and Ofek, Yoram, 4,926,418, Cl 370-85.500.
Hokenek, Erdem; and Montoye, Robert K., 4,926,369, Cl. 364-748.000.
Mano, Takashi, 4,926,490, Cl. 382-9.000.
McCord, Mark A., 4,925,139, Cl. 248-179.000.
Nadas, Arthur J.; and Nahamoo, David, 4,926,488, Cl 381-41.000
Schaffer, Mark M., 4,926,374, Cl 364-739.000.
Thor, Leif R., 4,926,349, Cl. 364-523.000.
Vassiliadis, Stamatis; Schwarz, Eric M.; and Sung, Baik M., 4,926,371, Cl. 364-760.000.
International Coal Refining Company: *See—*
Bellas, George T.; Snedden, Richard B.; Lennon, Dennis R., and Foster, Edward P., 4,924,784, Cl. 110-261.000.
International Lubricants, Inc.: *See—*
Erickson, Frank L.; Anderson, Robert E.; and Landis, Phillip S., 4,925,581, Cl. 252-48.200.
International Marine Industries: *See—*
Ottemann, William C., 4,924,795, Cl. 114-107.000.
International Packaging Corporation: *See—*
Harvey, Thomas J.; and Kilmartin, John D., III, 4,925,059, Cl. 220-335.000.
International Paper Company: *See—*
Jeffers, Cecil W.; and Sewcyk, Richard, 4,925,722, Cl. 428-131.000.
International Rectifier Corporation: *See—*
Gould, Herbert J., 4,925,812, Cl. 437-142.000.
International Research & Development Corporation: *See—*
Phillips, James L.; Richardson, Dale W.; and Silverman, Lawrence M., 4,925,516, Cl. 156-252.000.
International Sankoh Kabushiki Kaisha: *See—*
Watanabe, Harumi, 4,924,659, Cl. 53-550.000.
International Technology Corporation: *See—*
DeCicco, Steven G.; Lee, Sung K.; Novak, Rudy G.; Wass, William E.; and Mak, Kai K., 4,925,389, Cl. 432-106.000.
Interox (Societe Anonyme): *See—*
Deschrijver, Paul; and Ganhy, Jean-Pierre, 4,925,941, Cl 544-354.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Inui, Tetsuya: *See*—
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 4,925,776, Cl. 430-321.000.
Inuzuka, Tsuneki; Murakami, Koichi; and Kurita, Kenji, to Canon Kabushiki Kaisha. Image forming apparatus. 4,926,310, Cl. 364-186.000.
Inventio AG: *See*—
Orndorff, Karl B.; and Lawson, Randall S., 4,924,974, Cl. 187-1.00R.
Inverni Della Beffa SpA: *See*—
Gabetta, Bruno; Magistretti, Maria J.; and Dostert, Philippe, 4,925,870, Cl. 514-453.000.
Gabetta, Bruno; and Magistretti, Maria J., 4,925,871, Cl 514-453.000.
Iowa State University Research Foundation, Inc.: *See*—
Gunnink, Brett W.; and Enustun, Bekir V., 4,926,113, Cl. 324-694.000.
Ipri, Alfred C.; and Stewart, Roger G., to General Electric Company. Multilayer interconnect and method of forming same. 4,926,236, Cl. 357-71.000.
Irving, Guy B.: *See*—
Rachofsky, Morton, and Irving, Guy B., 4,926,400, Cl. 368-82.000.
Isaak, Bernhard: *See*—
Bondeson, Anders; Isaak, Bernhard; Perrenoud, Andre; and Tran, Minh Q., 4,926,094, Cl. 315-5.000.
Iseki, Izuru; Higashi, Akihiro; and Sasaki, Seihiro, to Dainippon Screen Mfg. Co., Ltd. Apparatus for heat treating substrates capable of quick cooling. 4,925,388, Cl. 432-77.000.
Ishibashi, Osamu: *See*—
Nagai, Yataro; Matsushita, Mitsuyoshi; Ishibashi, Osamu; Terasaki, Kiyoshi, and Tokumoto, Kei, 4,925,490, Cl. 75-238.000
Ishida, Hiroshi: *See*—
Aoki, Toshiya; Ishida, Hiroshi; and Fukuoka, Shinsuke, 4,925,971, Cl. 560-137.000.
Ishigaki, Kunio: *See*—
Okada, Masahiro; Ukai, Toshinao; Suzuki, Seiji; Adachi, Kenichi; Watanabe, Toshiyuki; and Ishigaki, Kunio, 4,925,782, Cl. 430-510.000.
Ishihara, Shunichi: *See*—
Nakagawa, Katsumi; Ishihara, Shunichi; Kanai, Masahiro; Arao, Kozo; Fujioka, Yasushi; and Sakai, Akira, 4,926,229, Cl. 357-30.000.
Ishii, Yoshio; and Okaya, Shigeru, to Tsuchiya Mfg. Co., Ltd. Composite planar and triangularly pleated filter element. 4,925,561, Cl. 210-493.300.
Ishii, Yutaka: *See*—
Yamamoto, Kunihiko; and Ishii, Yutaka, 4,926,168, Cl. 340-784.000.
Ishikawa, Takatoshi: *See*—
Furusawa, Genichi Ishikawa, Takatoshi; Furutachi, Nobuo; and Hirose, Takeshi, 4,925,781, Cl. 430-505.000.
Ishitoya, Koichi: *See*—
Hangai, Toshimasa; Tateishi, Kiyoshi; Ishitoya, Koichi, and Sakata, Haruyasu, 4,926,405, Cl. 369-32.000.
Ishiwatari, Makoto: *See*—
Handa, Akio; Hosoya, Eiji; Ishiwatari, Makoto; Kimura, Yoshihiro; and Watanabe, Seiji, 4,924,959, Cl. 180-297.000.
Ishizawa, Yoshiro; and Morito, Hiroshi, to NEC Corporation. Analog-digital converting circuit having high resolution and low power consumption. 4,926,175, Cl. 341-131.000.
Isnardi, Michael A., to General Electric Company. Extended definition widescreen television signal processing system with alternate subcarrier. 4,926,244, Cl. 358-12.000.
Isogai, Takao; and Yoshida, Masaru, to Fujisawa Pharmaceutical Co., Ltd Hybrid plasmids and microorganisms containing them. 4,925,794, Cl. 435-91.000.
Isono, Hideki, to Fujitsu Limited. Laser module with a built-in optical isolator, and method of adjusting the angular position of the optical isolator. 4,926,430, Cl. 372-33.000.
Isozumi, Shuzoo; and Konishi, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Brush and terminal assembly for engine starter. 4,926,078, Cl. 310-71.000.
ISPE S.a.s. di Erminio GIANA e C.: *See*—
Eugenio, Manghi, 4,926,284, Cl. 361-117.000.
Isshiki, Kunio: *See*—
Umezawa, Hamao, deceased; Takeuchi, Tomio; Tatsuta, Kuniaki; Isshiki, Kunio; and Imoto, Masaya, 4,925,877, Cl. 514-630.000
Isuzu Motors Limited: *See*—
Hara, Shinji; and Koizumi, Yoshihisa, 4,924,674, Cl. 60-608.000.
Itakura, Yasuo: *See*—
Kajiyama, Koichi; Saito, Kaoru; Itakura, Yasuo; Wakabayashi, Osamu; Kowaka, Masahiko; and Yamaguchi, Tadayoshi, 4,926,428, Cl. 372-20.000.
Itamoto, John T., to Allied-Signal Inc. Electrofluidic pin transducer with stable null setting. 4,924,912, Cl. 137-831.000.
ITC Incorporated: *See*—
Camarota, Richard J., 4,925,140, Cl. 248-188.000.
Ito, Fujihiro: *See*—
Orikasa, Tsuyoshi; Ito, Fujihiro; Suzuki, Hiroyuki; Kameyama, Makoto; Niizuma, Kiyozumi; Yoshida, Kazuyo; and Yamanaka, Toshio, 4,926,276, Cl. 360-126.000.
Ito, Kunio: *See*—
Ichihara, Yoshiyuki; Ito, Kunio; Izawa, Tadashi; and Wakui, Norihiro, 4,926,249, Cl. 358-75.000.
Ito, Masayoshi: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,926,333, Cl. 364-426.020.
Ito, Masazumi: *See*—
Nakamura, Minoru; and Ito, Masazumi, 4,925,177, Cl. 271-110.000.
Ito, Shigemi; and Narita, Katsunori, to Nippondenso Co., Ltd. Ignition coil assembly for internal combustion engine. 4,926,152, Cl. 336-90.000.
Ito, Sumio: *See*—
Yanagihara, Hiromichi; Ito, Sumio; Sakurai, Kazuhiro; and Akita, Kouichi, 4,925,091, Cl. 237-2.00A.
Ito, Toshiaki; Numano, Kazuhiro; and Suzuki, Masami, to Yamaha Hatsudoki Kabushiki Kaisha. Shimmy damping system for steerable vehicles. 4,925,198, Cl. 280-89.000.
Ito, Yoshinori, to Hoshizaki Denki Kabushiki Kaisha. Electric control apparatus for ice making machine. 4,924,678, Cl. 62-138.000.
Itoh, Norihisa; Kawaguchi, Kiyoshi; and Nomura, Etsuji, to Nippondenso Co., Ltd. Automotive air spoiler device. 4,925,236, Cl. 296-180.500.
Itoh, Yoshiaki; Odani, Yusuke; Akechi, Kiyoaki; and Kuroishi, Nobuhito, to Sumitomo Electric Industries, Ltd. Aluminum-silicon alloy heatsink for semiconductor devices. 4,926,242, Cl. 357-81.000.
Itokazu, Yuji; and Nishihira, Koichi, to Bando Chemical Industries, Ltd. Ethylene propylene rubber with polyacrylates and sulfur. 4,925,898, Cl. 525-305.000.
Itozaki, Hideo: *See*—
Fujita, Nobuhiko; Itozaki, Hideo; Tanaka, Saburo; Yazu, Shuji; and Jodai, Tetsuji, 4,925,829, Cl. 505-1.000.
ITT Corporation: *See*—
Schenberg, Alan N., 4,926,140, Cl. 331-1.00A.
ITW-Ateco GmbH. *See*—
Masler, Gerhard; and Harder, Uwe, 4,925,072, Cl. 224-282.000.
ITW de France: *See*—
Morel, Henri; Agrimonti, Jean-Claude; and Massie, Bernard, 4,924,549, Cl. 16-82.000.
Ives, Robert K. Detachable sling swivel retention device. 4,924,615, Cl. 42-85.000.
Iwamoto, Hirofumi; Kawai, Tatsundo; Ogura, Makoto; Nakagawa, Katsumi; Seitoh, Shinichi; and Kaifu, Noriyuki, to Canon Kabushiki Kaisha. Image reading apparatus with block lighting and pulsing 4,926,058, Cl. 250-578.100.
Iwasaki, Kazuhiko: *See*—
Sakamura, Ken; Hashimoto, Kouzi; Kawasaki, Ikuya; Hasegawa, Atsushi; and Iwasaki, Kazuhiko, 4,926,321, Cl. 364-200.000.
Iwasaki, Masayuki; Fujikura, Sadao; Wakata, Yuichi; and Takata, Yasunori, to Fuji Photo Film Co., Ltd. Photopolymerizable composition containing a tetrapolymer binder. 4,925,768, Cl. 430-271.000.
Iwasaki, Satoshi, to Pioneer Electronic Corporation. Phase-shift-keying transmitter. 4,926,441, Cl. 375-60.000.
Iyer, Lokanathan M.; Yim, Jeffrey B.; and Lyon, Kenneth S., to Abbott Laboratories. Fiber-optic physiological probes. 4,925,268, Cl. 350-96.290.
Iyer, Uma: *See*—
Ghebre-Sellassie, Isaac; Iyer, Uma; and Fawzi, Mahdi B., 4,925,676, Cl. 424-470.000.
Izawa, Tadashi: *See*—
Ichihara, Yoshiyuki; Ito, Kunio; Izawa, Tadashi; and Wakui, Norihiro, 4,926,249, Cl. 358-75.000.
Izukawa, Kazuhiro: *See*—
Furutsu, Etsuro; and Izukawa, Kazuhiro, 4,926,084, Cl. 310-316.000.
J. H. Smith Co., Inc.: *See*—
Sittig, Kenneth W., 4,926,060, Cl. 273-400.000.
J.M. Voith GmbH: *See*—
Wolf, Robert, 4,924,603, Cl. 34-125.000.
J. V. Manufacturing Company, Inc.: *See*—
Vecchi, John C., 4,925,081, Cl. 226-199.000.
Jackson, J. R. Hunter; and Parks, Thomas N., to University of Utah. Spider toxins and methods for their use as blockers of calcium channels and amino acid receptor function 4,925,664, Cl. 424-537.000.
Jackson, James D. J.: *See*—
McWilliams, Joseph A.; Morgan, Derek E.; and Jackson, James D. J., 4,925,584 Cl. 252-62.000.
Jacob, A. Kirk; Willis, M. Joseph; and Hardman, A. Pierce, to Organic Technology, Inc. Method for the simultaneous transport and pasteurization of sewage sludge. 4,925,571, Cl. 210-742.000.
Jacobson, Robert L.: *See*—
Robinson, Richard C.; Jacobson, Robert L.; and Field, Leslie A., 4,925,549, Cl. 208-65.000.
Jacovitti, Giovanni: *See*—
Galati, Gaspare; and Jacovitti, Giovanni, 4,926,184, Cl. 342-149.000.
Jacquet, Bruno: *See*—
Saens, Michel S.; Jacquet, Bruno; Marie, Philippe; Noirot, Frederic; and Tellier, Francois, 4,926,149, Cl. 335-132.000.
Jaeger: *See*—
Feppon, Philippe; and Rydel, Charles, 4,925,310, Cl. 356-434.000.
Jagenberg Aktiengesellschaft: *See*—
Knop, Reinhard, 4,924,802, Cl. 118-410.000.
Jaguar Cars Limited: *See*—
Parsons, Bryan N. V., 4,924,730, Cl. 475-166.000.
Parsons, Bryan N. V., 4,924,824, Cl. 123-65.00P
Jakob, Stephen W.: *See*—
Raker, Mark L.; Sensabaugh, Andrew J., Jr.; and Jakob, Stephen W., 4,924,887, Cl. 131-331.000.

Jakobsen, Karl S., to Techniair, Inc. Turbine air seal repair process. 4,924,581, Cl. 29-402.020.
Jakupovic, Edib; Sourander, Roy T.; Stenhede, Jan U.; and Svensson, Rolf P., to Astra Pharmaceutical Production Aktiebolag. Method of controlling the epimeric distribution in the preparation of 16,17-acetals of pregnane derivatives. 4,925,933, Cl. 540-63.000.
James, Enoch; and Stafford, Raymond, to British Aerospace Public Limited Company. Correlation techniques. 4,925,274, Cl. 350-320.000.
James Hardie Irrigation (Italy): *See*—
Di Paola, Jan C., 4,925,098, Cl. 239-205.000.
James, Jeffrey P., to ICT Manufacturing, Inc. Pizza knife with integral handle. 4,924,575, Cl. 30-315.000.
James River Corporation of Virginia: *See*—
Tse, Stephen H.; Hollenberg, David H.; Martin, Richard L.; and Manning, James H., 4,925,528, Cl. 162-146.000.
James William Stevenson: *See*—
Stevenson, James W.; and Arato, Paul T., 4,925,186, Cl. 273-25.000.
Jandeleit, Otto: *See*—
Agethen, Heinrich; Gesenhues, Paul; Radisch, Helmer; Jandeleit, Otto; and Schafer, Wolfgang, 4,925,734, Cl. 428-349.000.
Janicke, Reinhard; and Nyfeler, Robert, to Ciba-Geigy Corporation. Microbicides. 4,925,842, Cl. 514-239.500.
Janke, Donald E.; and Frohbieter, Edwin H., to Whirlpool Corporation. Refrigerator temperature responsive air outlet baffle. 4,924,680, Cl. 62-187.000.
Jannson, Joanna L.: *See*—
Jannson, Thomasz P.; Jannson, Joanna L.; and Yeung, Peter C., 4,926,412, Cl. 370-3.000.
Jannson, Thomasz P.; Jannson, Joanna L.; and Yeung, Peter C., to Physical Optics Corporation. High channel density wavelength division multiplexer with defined diffracting means positioning. 4,926,412, Cl. 370-3.000.
Jansen, Frank; and Machonkin, Mary A., to Xerox Corporation. Processes for the preparation of polycrystalline diamond films. 4,925,701, Cl. 427-38.000.
Japan as represented by Director General, Technical Research and Development Institute, Japan Defense Agency: *See*—
Kubota, Naminosuke; Shimizu, Haruaki; Sonobe, Tadashi; and Nakashita, Goro, 4,925,909, Cl. 528-55.000.
Japan Life Company, Ltd.: *See*—
Yamaguchi, Tomoyoshi, 4,924,542, Cl. 5-481.000.
Japan Metals & Chemicals Co., Ltd.: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Miyabayashi, Toshio; Sakabe, Nobuyuki; and Zen, Shinichiro, 4,925,907, Cl. 526-255.000.
Jarrett, Robert B.: *See*—
Pigott, John M.; and Jarrett, Robert B., 4,926,073, Cl. 307-544.000.
Jarrett, Steven M.: *See*—
McMurray, Robert E., Jr.; and Jarrett, Steven M., 4,925,276, Cl. 350-342.000.
Jasne, Stanley J.: *See*—
Rohde, Ottmar; Jasne, Stanley J.; and Pfeifer, Josef, 4,925,912, Cl. 528-226.000.
Jay, Murray, to Gemco-Ware Inc. Multi-purpose baking and roasting rack. 4,924,768, Cl. 99-425.000.
Jazwinski, Jaroslaw: *See*—
Lehn, Jean M.; Jazwinski, Jaroslaw; and Blacker, John, 4,925,937, Cl. 540-477.000.
JC Systems, Inc.: *See*—
Chaparro, John J.; De Kreek, Dirk; and Holdaway, Charles R., 4,925,089, Cl. 236-78.00D.
Jefferies, Stephen R. External ring binder. 4,925,328, Cl. 402-77.000.
Jeffers, Cecil W.; and Seweyk, Richard, to International Paper Company. Disposable semi-durable nonwoven fabric. 4,925,722, Cl. 428-131.000.
Jeffery, James E.: *See*—
Housley, John R.; Jeffery, James E.; Johnston, David N.; and Sargent, Bruce J., 4,925,879, Cl. 514-650.000.
Jegelka, Jurgen: *See*—
Panten, Detlef; and Jegelka, Jurgen, 4,924,668, Cl. 60-278.000.
Jenck, Jean: *See*—
Deweerdt, Helene; Jenck, Jean; and Kalck, Philippe, 4,925,973, Cl. 560-204.000.
Jenkins, Stuart M.; and Harvey, Terence J., to Bright-Tech (Developments) Limited. Information display apparatus. 4,926,167, Cl. 340-764.000.
Jensen, Earl M., to Nanometrics Inc. Sensor devices with internal packaged coolers. 4,926,227, Cl. 357-28.000.
Jensen, Klaus G.: *See*—
Bogeso, Klaus P.; Jensen, Klaus G.; Moltzen, Ejner K.; and Pedersen, Henrik, 4,925,858, Cl. 514-342.000.
Jeol Ltd.: *See*—
Miyokawa, Toshiaki, 4,926,055, Cl. 250-423.00R.
Jeromson, James R., Jr.; Anderson, J. Edward C.; and Breisch, John H., to Milbar Corporation. Fluid actuated dispenser. 4,925,061, Cl. 222-1.000.
Jeskey, Richard V.; and Plocharczyk, John R., to Incom, Inc. Process and furnace for heat application. 4,925,473, Cl. 65-12.000.
Jessel, Barbara: *See*—
Lechtken, Peter; Hoercher, Ulrich; and Jessel, Barbara, 4,925,960, Cl. 549-412.000.
Jessen, Kyle P., to EEK, Inc. Contact lens storage kit. 4,925,017, Cl. 206-5.100.
Jha, Anil D.: *See*—
Giuffrida, Anthony J.; Jha, Anil D.; and Ganzi, Gary C., 4,925,541, Cl. 204-182.500.
Jidell, Bernt, to ABECE AB. Machine for manufacturing of flat products. 4,925,383, Cl. 425-453.000.
Jinnai, Masayuki: *See*—
Sawayama, Ippei; and Jinnai, Masayuki, 4,926,085, Cl. 310-323.000.
Jobson, Harvey E. Roof vent damper. 4,924,760, Cl. 98-42.150.
Jodai, Tetsuji: *See*—
Fujita, Nobuhiko; Itozaki, Hideo; Tanaka, Saburo; Yazu, Shuji; and Jodai, Tetsuji, 4,925,829, Cl. 505-1.000.
Johann, Gerhard: *See*—
Blume, Friedhelm; Dorfmeister, Gabriele; Franke, Wilfried; Rees, Richard; Johann, Gerhard; and Arndt, Friedrich, 4,925,481, Cl 71-92.000.
John O. Butler Company: *See*—
Tarrson, Emanuel B.; and Marie, Dane, 4,925,073, Cl. 225-44.000.
Johnson, Alan A.: *See*—
Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., 4,925,694, Cl. 426-613.000.
Johnson, Gerald K. Oil sampling device. 4,925,627, Cl. 422-99.000.
Johnson, Harold C., to Brunswick Corporation. Torsional damper for marine drive unit. 4,925,409, Cl. 440-52.000.
Johnson, Keith, Jr.: *See*—
College, David A.; Johnson, Keith, Jr.; Stachura, Joseph F.; and Walter, Herman D., 4,924,693, Cl. 72-453.030.
Johnson, Neil A.; Miller, Russell S.; and Hunter, Gordon B., to General Electric Company. Process for preventing contamination of high temperature melts. 4,926,439, Cl. 373-10.000.
Johnson, Paul D., to Black & Decker, Inc. Brew through lid for coffee maker. 4,924,922, Cl. 141-346.000.
Johnson, Ronald F.; Smart, J. A.; Goodman, E. Carl; and Bowles, Richard, to Won-Door Corporation. Folding firedoor lead post assembly. 4,924,929, Cl. 160-84.100.
Johnson, Russell L.; Hrubecky, Frederick J.; and Fay, James E., III, to Kimberly-Clark Corporation. Cooker and methods of cooking. 4,924,845, Cl. 126-25.00R.
Johnson Service Company: *See*—
Colla, Jeannine O.; Thomas, Paul E.; and Showers, Donald K., 4,926,155, Cl. 338-36.000.
Johnson, Thomas H.: *See*—
Slaugh, Lynn H.; Johnson, Thomas H.; and Hoxmeier, Ronald J., 4,925,822, Cl. 502-112.000.
Johnson, Thomas W.: *See*—
Chakravarti, Bhaven; and Johnson, Thomas W., 4,925,638, Cl. 422-310.000.
Johnson, William M.: *See*—
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.
Johnston, Albert D.; and Lederman, Frederick E., to General Motors Corporation. Overrunning roller clutch with improved shipping retention. 4,924,981, Cl. 192-45.000.
Johnston, David N.: *See*—
Housley, John R.; Jeffery, James E.; Johnston, David N.; and Sargent, Bruce J., 4,925,879, Cl. 514-650.000.
Jones, Christine B.; and Spector, George. Kitchen and bath uses. 4,925,102, Cl. 239-52.000.
Jones, Edwin R., Jr.; and McLaurin, A. Porter, to Medical Dimensions, Inc. Stereoscopic medical viewing device. 4,924,853, Cl. 128-6.000.
Jones, John W., Jr. Pivotal creeper. 4,925,197, Cl. 280-32.600.
Jones, Micheal D. Tricycle drive mechanism. 4,925,200, Cl. 280-233.000.
Jones, Orville F.; and Simpson, Robert C., to O.S.T., Ltd. Sizing unit for cutting stoma wafers. 4,924,574, Cl. 30-115.000.
Jonsgard, Erik: *See*—
Myklebust, Eirik; Omdal, Bjarne; Juel, Anders; Strand, Olaf, and Jonsgard, Erik, 4,925,317, Cl. 383-8.000.
Jordan, Mark R.: *See*—
Jordan, Roland H.; and Jordan, Mark R., 4,925,467, Cl. 55-430.000.
Jordan, Roland H.; and Jordan, Mark R. Self emptying vacuum vessel. 4,925,467, Cl. 55-430.000.
Joseph, David A.: *See*—
Danielson, Donald L.; Wihl, Mark J.; and Joseph, David A., 4,926,489, Cl. 382-8.000.
Joynes, Roger: *See*—
Muth, Walter E.; Joynes, Roger; Cox, Clair A.; Cheadle, Brian A.; Burnett, Don J.; and Adema, Han, 4,925,621, Cl. 376-262.000.
Jubin, Robert T., to United States of America, Energy. Centrifugal contactor modified for end stage operation in a multistage system. 4,925,441, Cl. 494-32.000.
Juel, Anders: *See*—
Myklebust, Eirik; Omdal, Bjarne; Juel, Anders; Strand, Olaf; and Jonsgard, Erik, 4,925,317, Cl. 383-8.000.
Juell, Per A. Device for mounting doors and windows. 4,924,642, Cl. 52-217.000.
Juhlke, Timothy J.; Bierschenk, Thomas R.; and Lagow, Richard J., to Exfluor Research Corporation. Perfluoropolyether solid fillers for lubricants. 4,925,583, Cl. 252-58.000.
Juice Tree: *See*—
Raub, John R., 4,924,770, Cl. 99-511.000.
Julien, William E.; and Krajicek, Stephen P. Liquid feed supplement for monogastric animals. 4,925,637, Cl. 426-2.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Jung, Louis: *See—*
Kaumacher, Isabelle; Stambach, Jean-Francois; Jung, Louis; Schott, Christa; Stoclet, Jean-Claude; and Heitz, Christiane. 4,925,943, Cl. 546-149.000.
Junker, Erwin. Bearing system for high speed spindles of machine tools. 4,926,493, Cl. 384-490.000.
Just, Gerard A. System for separating phases of a liquid stream. 4,925,575, Cl. 210-706.000.
K-Dron, Inc.: *See—*
Kapusta, Janusz J., 4,925,338, Cl. 404-41.000.
Kabelmetal Electro GmbH: *See—*
Brahms, Martin; and Prenner, Christian, 4,926,305, Cl. 363-21.000.
Kabushiki Kaisha Daiken Seisakusho: *See—*
Ohkubo, Masahiro, 4,924,978, Cl. 192-3.300.
Kabushiki Kaisha Daikin Seisakusho: *See—*
Takeuchi, Hiroshi, 4,924,990, Cl. 192-106.200.
Takeuchi, Hiroshi, 4,924,991, Cl. 192-111.00A.
Kabushiki Kaisha Fuji Tryoki: *See—*
Yamasaki, Yoshikiyo, 4,924,535, Cl. 4-544.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Konishi, Satoshi; Naito, Kazufumi; and Utsunomiya, Mitito, 4,926,359, Cl. 364-567.000.
Kabushiki Kaisha Japan Health: *See—*
Yamasaki, Yoshikiyo, 4,924,535, Cl. 4-544.000.
Kabushiki Kaisha Komatsu Seisakucho: *See—*
Kajiyama, Koichi; Saito, Kaoru; Itakura, Yasuo; Wakabayashi, Osamu; Kowaka, Masahiko; and Yamaguchi, Tadayoshi, 4,926,428, Cl. 372-20.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Sekiya, Kazuo; and Kasuya, Tamotsu, 4,924,672, Cl. 60-310.000.
Kabushiki Kaisha Shinsangyokaihatsu: *See—*
Yamada, Takashi, 4,926,336, Cl. 364-444.000.
Yokoyama, Shouji, 4,926,346, Cl. 364-518.000.
Kabushiki Kaisha Sugino Machine: *See—*
Sato, Kazuyoshi; and Okajima, Hideaki, 4,924,568, Cl. 29-90.010.
Kabushiki Kaisha Tominaga Jyushi Kogyosho: *See—*
Tominaga, Kazutoshi, 4,924,810, Cl. 119-15.000.
Kabushiki Kaisha Toshiba: *See—*
Aoki, Hidehiko; and Kanbara, Yoshihiko, 4,926,271, Cl. 360-62.000.
Enomoto, Akihiko; Koga, Takashi; Yoneda, Minoru; and Kobata, Hiroshi, 4,926,101, Cl. 318-374.000.
Fujita, Yasuhiko, 4,926,068, Cl. 307-359.000.
Harada, Hideo, 4,926,380, Cl. 367-7.000.
Haragashira, Motoji, 4,926,126, Cl. 324-322.000.
Hatayama, Tamotsu; and Naruse, Yujiro, 4,926,052, Cl. 250-370.140.
Kobayashi, Koichi, 4,926,033, Cl. 235-480.000.
Koga, Takashi, 4,926,133, Cl. 329-336.000.
Kuno, Hiroyuki; and Iino, Yujirou, 4,926,275, Cl. 360-106.000.
Kurosawa, Yoshiaki, 4,926,266, Cl. 358-426.000.
Maeda, Kenichi; Tsuboi, Hiroyuki; and Takebayashi, Yoichi, 4,926,491, Cl. 382-14.000.
Miyamura, Masataka; Wada, Yuusuke; Takeda, Kazuhiro; Nakaizumi, Yuji; and Kohara, Teiji, 4,925,773, Cl. 430-285.000.
Morishita, Mimpei; and Azukizawa, Teruo, 4,924,778, Cl. 104-284.000.
Murakami, Teruo; and Seo, Naobumi, 4,926,408, Cl. 369-58.000.
Ohtake, Toshimichi, 4,926,413, Cl. 370-13.100.
Saitoh, Mitsuyoshi; and Sekine, Kunio, 4,926,274, Cl. 360-102.000.
Sakui, Koji; Ohuchi, Kazunori; and Masuoka, Fujio, 4,926,382, Cl. 365-203.000.
Sekizawa, Hidekazu; Saito, Tutomu; Yamamoto, Naofumi; Higuchi, Kazuhiko; and Kawakami, Haruko, 4,926,251, Cl. 358-75.000.
Sugawara, Toru, 4,926,093, Cl. 315-4.000.
Tabuchi, Koichi; and Kizu, Shigeo, 4,926,273, Cl. 360-64.000.
Tanaka, Sumio; and Atsumi, Shigeru, 4,926,070, Cl. 307-475.000.
Tawara, Kiyoshi; Osada, Masakazu; and Nishihara, Eitaro, 4,926,415, Cl. 370-60.000.
Yamamuro, Mikio, 4,926,407, Cl. 369-44.110.
Yamazaki, Kiyoshi; and Chuubachi, Muneki, 4,926,265, Cl. 358-304.000.
Yoshihara, Kunio; Terada, Toshiyuki; Takubo, Chiaki; Koide, Nobuo; and Shimizu, Shoichi, 4,926,451, Cl. 377-48.000.
Yoshikawa, Kuniyoshi, 4,925,807, Cl. 437-44.000.
Yoshioka, Yo, 4,926,179, Cl. 341-144.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Kano, Hiroyuki; Kato, Takatoshi; and Hashimoto, Masafumi, 4,925,810, Cl. 437-105.000.
Tani, Toshihiko; and Wada, Shigetaka, 4,925,815, Cl. 501-90.000.
Kadosaki, Masahiro: *See—*
Machino, Toshimichi; Oda, Saiji; Toubo, Kihachirou; and Kadosaki, Masahiro, 4,924,713, Cl. 73-862.060.
Kaess, Hans-Harald: *See—*
Holst, Hans; Lindemann, Klaus; Saba, Manfred; Kaess, Hans-Harald; and Petersen, Erwin, 4,925,254, Cl. 303-111.000.
Kagami, Manabu: *See—*
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, 4,925,514, Cl. 156-249.000.
Kageyama, Yoshitaka: *See—*
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; Hayashi, Seiji; and Mori, Kenji, 4,925,591, Cl. 252-299.660.
Kagiwada, Reynold S.: *See—*
Yen, Kuo-Hsiung; Kagiwada, Reynold S.; Stokes, Robert B.; and Huang, Marshall Y., 4,926,146, Cl. 333-195.000.
Kahler, William F., to Tek-Aids, Inc. Peristaltic pump with tube holding mechanism. 4,925,376, Cl. 417-477.000
Kaifu, Noriyuki: *See—*
Iwamoto, Hirofumi; Kawai, Tatsundo; Ogura, Makoto; Nakagawa, Katsumi; Seitoh, Shinichi; and Kaifu, Noriyuki, 4,926,058, Cl. 250-578.100.
Kais, Alfred: *See—*
Ziethen, Rudiger; Benenowski, Sebastian; Kais, Alfred; and Nuding, Erich, 4,925,135, Cl. 246-436.000.
Kaiser, Franz: *See—*
Schlunke, Jurgen; Kaiser, Franz; and Fenzau, Hilmar, 4,924,772, Cl. 100-163.00R.
Kajanto, Markus: *See—*
Byckling, Eero; and Kajanto, Markus, 4,925,261, Cl. 350-3.710.
Kajiyama, Koichi; Saito, Kaoru; Itakura, Yasuo; Wakabayashi, Osamu; Kowaka, Masahiko; and Yamaguchi, Tadayoshi, to Kabushiki Kaisha Komatsu Seisakucho. Method and apparatus for sensing the wavelength of a laser beam. 4,926,428, Cl. 372-20.000.
Kakegawa, Tomohiro: *See—*
Katsuoka, Nobuo; Hirano, Yoshihiro; and Kakegawa, Tomohiro, 4,926,357, Cl. 364-560.000.
Kalck, Philippe: *See—*
Deweerdt, Helene; Jenck, Jean; and Kalck, Philippe, 4,925,973, Cl. 560-204.000.
Kamei, Atsushi: *See—*
Komuro, Kenichi; Kawai, Taneichi; Kamei, Atsushi; Asada, Toru; Torii, Nozomu; and Fukumoto, Ryoichi, 4,926,332, Cl. 364-424.050.
Kameyama, Makoto: *See—*
Orikasa, Tsuyoshi; Ito, Fujihiro; Suzuki, Hiroyuki; Kameyama, Makoto; Niizuma, Kiyozumi; Yoshida, Kazuyo; and Yamanaka, Toshio, 4,926,276, Cl. 360-126.000.
Kamisaka, Takashi: *See—*
Tsuyuguchi, Hiroshi; Shimozawa, Kenji; and Kamisaka, Takashi, 4,926,403, Cl. 369-13.000.
Tsuyuguchi, Hiroshi; Shimozawa, Kenji; and Kamisaka, Takashi, 4,926,409, Cl. 309-112.000.
Kamise, Haruo: *See—*
Yoshiharu, Tetsujiro; and Kamise, Haruo, 4,925,809, Cl. 437-95.000.
Kamitakahara, Atushi: *See—*
Yoshizawa, Tomimi; Ogi, Keiji; and Kamitakahara, Atushi, 4,925,780, Cl. 434-589.000.
Kamo, Tomoichi: *See—*
Tachi, Takahiro; Kato, Akira; Kawagoshi, Hiroshi; Yamashita, Hisao; and Kamo, Tomoichi, 4,925,825, Cl. 502-309.000.
Kampner, Karl-Heinz: *See—*
Hamm, Heiner; Hartmann, Peter; Kampner, Karl-Heinz; and Kurandt, Hans-Friedrich, 4,925,826, Cl. 502-407.000.
Kanai, Masahiro: *See—*
Nakagawa, Katsumi; Ishihara, Shunichi; Kanai, Masahiro; Arao, Kozo; Fujioka, Yasushi; and Sakai, Akira, 4,926,229, Cl. 357-30.000.
Kanamaru, Hisanobu; Aoyama, Susumu; Koike, Tsutomu; Asahi, Naotatsu; and Hirai, Yoshiki, to M H. Center Limited; and Hitachi Powdered Metals Co., Ltd Method and apparatus for plastically forming helical internal gears and helical gears. 4,924,690, Cl. 72-343.000.
Kanazawa, Takashi, to NEC Corporation. Information processing system having microprogram-controlled type arithmetic processing unit. 4,926,320, Cl. 364-200.000.
Kanbara, Hajime: *See—*
Kitamura, Takao; Sakane, Kohji; Wada, Hideo; Hata, Hajime; and Kanbara, Hajime, 4,925,641, Cl. 423-279.000.
Kanbara, Koji: *See—*
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.
Kanbara, Yoshihiko: *See—*
Aoki, Hidehiko; and Kanbara, Yoshihiko, 4,926,271, Cl. 360-62.000.
Kanda, Tetsuro; and Yamamoto, Shizuo, to Chiyoda Chemical Engineering & Construction Company Limited. Muffler 4,924,966, Cl. 181-228.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Yamagishi, Hideo; Yamaguchi, Minori; Asaoka, Keizo; Hiroe, Akihiko; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,926,230, Cl. 357-30.000.
Kaneiwa, Shinji: *See—*
Kawanishi, Hidenori; Hayashi, Hiroshi; Morimoto, Taiji; Kaneiwa, Shinji; and Yamaguchi, Masahiro, 4,926,431, Cl. 372-45.000.
Kaneko, Koji: *See—*
Ueno, Yutaka; Emmons, Lawrence D.; Kaneko, Koji; and Semasa, Takayoshi, 4,926,245, Cl. 358-12.000.
Kaneko, Masahiko: *See—*
Uchida, Noboru; Kaneko, Masahiko; and Matsumoto, Hisayoshi, 4,926,347, Cl. 364-519.000.
Kaneko, Motohiro: *See—*
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; Kaneko, Motohiro; Kusumoto, Yoshiro; Takakuwa, Kazuo; and Ikuta, Tetsuya, 4,924,807, Cl. 118-725.000.

Kanervo, Seppo J.: *See—*
Lindblom, Kurt L.; Simila , Jussi J.; and Kanervo, Seppo J., 4,925,173, Cl. 270-54.000.
Kanmacher, Isabelle; Stambach, Jean-Francois; Jung, Louis; Schott, Christa; Stoclet, Jean-Claude; and Heitz, Christiane. 2-(2-aminobenzyl or 2-nitrobenzyl)-1,2,3,4-tetrahydroisoquinoline derivatives. 4,925,943, Cl. 546-149.000.
Kannankeril, Charles P., to Sealed Air Corporation. Absorbent blood wipe pad and method. 4,925,453, Cl. 604-378.000.
Kanner, Rowland W.: *See—*
Rabenau, Richard; Kanner, Rowland W.; and Hunter, Donald W., 4,925,464, Cl. 55-179.000.
Kanno, Hideo; Imanari, Hitoshi; Naito, Hideshi; Kodaka, Yoshiro; and Ohta, Naoto, to Nikon Corporation. Zoom lens assembly. 4,925,282, Cl. 350-429.000.
Kanno, Masahide: *See—*
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, 4,926,258, Cl. 358-98.000.
Kano, Hiroyuki; Kato, Takatoshi; and Hashimoto, Masafumi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Compound semiconductor device and a method of manufacturing the same. 4,925,810, Cl. 437-105.000.
Kano, Mitsuru, to Alps Electric Co., Ltd. Liquid crystal composition. 4,925,592, Cl. 252-299.670.
Kanter, Hartmut; and Ort, Burkhard, to BASF Aktiengesellschaft. Preparation of pyrazolo(5,1-B)quinazolones. 4,925,946, Cl. 544-250.000.
Kantoh, Takanori: *See—*
Takahashi, Toshinori; Hayashi, Chikahisa; Takahashi, Yoshinori; and Kantoh, Takanori, 4,926,015, Cl. 200-84.00C.
Kappenberger, Peter, to Buss A.G. Process for the further processing of the vacuum distillation residue in a crude oil refinery. 4,925,558, Cl. 208-361.000.
Kapusta, Janusz J., to K-Dron, Inc. Decorative functional element for construction and the like. 4,925,338, Cl. 404-41.000.
Karadsheh, Sam M.: *See—*
Schroeder, Allen G.; Schroeder, Thaddeus; Karadsheh, Sam M.; Goings, Janet S.; and Golebiewski, Ronald T., 4,924,696, Cl. 73-118.100.
Karasudani, Isao: *See—*
Endo, Gen; Tateishi, Hiroyuki; Kawata, Yoshihiro; Karasudani, Isao; and Omura, Hirofumi, 4,925,725, Cl. 428-156.000.
Karls, Michael A., to Brunswick Corporation. Marine drive weed deflector. 4,925,412, Cl. 440-71.000.
Kasai, Ichiro: *See—*
Mukai, Hiromu; and Kasai, Ichiro, 4,926,201, Cl. 354-219.000.
Kasamatsu, Hiroshi: *See—*
Ikeda, Hideo; Horiki, Yoshio; Yamauchi, Yutaka; Kasamatsu, Hiroshi; and Akao, Akimasa, 4,925,511, Cl. 156-106.000.
Kasenga, Anthony F.; Sigai, A. Gary; Peters, Thomas E.; and Hunt, Roger B., to GTE Products Corporation. Firing and milling method for producing a manganese activated zinc silicate phosphor. 4,925,703, Cl. 427-215.000.
Kast, Hans: *See—*
Dotzauer, Bernhard; Kast, Hans; Beckerle, Wilhelm F.; and Hummerich, Rainer, 4,925,529, Cl. 162-152.000.
Kastin, Howard, to Leader Candies, Inc. Liquid shelf-stable freezable fruit juice containing composition and method of making the same. 4,925,686, Cl. 426-131.000.
Kasuya, Tamotsu: *See—*
Sekiya, Kazuo; and Kasuya, Tamotsu, 4,924,672, Cl. 60-310.000.
Katagiri, Shigenobu: *See—*
Ohyama, Mineo; Katagiri, Shigenobu; Kozawa, Hiroomi; and Yamada, Koutaro, 4,926,200, Cl. 346-160.000.
Kataoka, Hiroshi; Kunitomo, Tetsunosuke; and Kobayashi, Takuichi, to Toray Industries Inc. Hemodialysis method and membrane. 4,925,534, Cl. 210-647.000.
Katayama, Hirohito: *See—*
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 4,925,849, Cl. 514-300.000.
Katayama, Yoshiyuki; Ura, Takeshi; and Inamori, Akio, to Kubota, Ltd. Propelling clutch apparatus for a working vehicle. 4,924,983, Cl. 192-52.000.
Kato, Akira: *See—*
Tachi, Takahiro; Kato, Akira; Kawagoshi, Hiroshi; Yamashita, Hisao; and Kamo, Tomoichi, 4,925,825, Cl. 502-309.000.
Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot. 4,925,360, Cl. 414-730.000.
Kato, Hitoshi: *See—*
Takahashi, Takehiko; and Kato, Hitoshi, 4,924,725, Cl. 74-551.300.
Kato, Kiminari: *See—*
Ikimi, Takahiro; Taketomi, Tsuneharu; and Kato, Kiminari, 4,924,637, Cl. 51-290.000.
Kato, Takatoshi: *See—*
Kano, Hiroyuki; Kato, Takatoshi; and Hashimoto, Masafumi, 4,925,810, Cl. 437-105.000.
Katoh, Shohichi: *See—*
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 4,925,776, Cl. 430-321.000.
Katoh, Takayuki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device operating in high frequency range. 4,926,234, Cl. 357-68.000.
Katona, Josef, to Dornier Medizintechnik GMBH. Electromagnetic shockwave generator transducer. 4,924,858, Cl. 128-24.00A.
Katori, Tatsuhiko: *See—*
Tokizawa, Minoru; Asaoka, Takemitsu; Matsuda, Hideaki; and Katori, Tatsuhiko, 4,925,953, Cl. 548-341.000.
Katsuno, Toshiyasu: *See—*
Chujo, Yoshiki; Aoki, Keiji; Hyodo, Yoshihiko; and Katsuno, Toshiyasu, 4,924,837, Cl. 123-494.000.
Katsuoka, Nobuo; Hirano, Yoshihiro; and Kakegawa, Tomohiro, to Shin-Etsu Handotai Company, Limited. Apparatus for measuring diameter of crystal. 4,926,357, Cl. 364-560.000.
Katsuragi, Mamoru: *See—*
Teramoto, Togo; Oku, Syunji; Miyoshi, Yasuhiro; and Katsuragi, Mamoru, 4,926,208, Cl. 354-485.000.
Katsuta, Yuji: *See—*
Takano, Sakuharu; Nishibori, Toshiki; and Katsuta, Yuji, 4,926,269, Cl. 358-474.000.
Katz, Lawrence E.: *See—*
Canterberry, J. B.; and Katz, Lawrence E., 4,925,503, Cl. 149-19.400.
Kaubek, Fritz J.: *See—*
Maier-Laxhuber, Peter; and Kaubek, Fritz J., 4,924,676, Cl. 62-59.000.
Kaul, Karlheinz: *See—*
Bock, Hans-Christian; Kaul, Karlheinz; and Schaefer, Willi, 4,926,456, Cl. 378-177.000.
Kaulfuss Designers, Inc.: *See—*
Kaulfuss, William P.; and Kaulfuss, Robert H., 4,925,429, Cl. 446-487.000.
Kaulfuss, Robert H.: *See—*
Kaulfuss, William P.; and Kaulfuss, Robert H., 4,925,429, Cl. 446-487.000.
Kaulfuss, William P.; and Kaulfuss, Robert H., to Kaulfuss Designers, Inc. Construction toy with connectable portions. 4,925,429, Cl. 446-487.000.
Kavlico Corporation: *See—*
Park, Kyong, 4,924,702, Cl. 73-304.00C.
Kawabata, Misao; Ushikubo, Hisao; and Tominaga, Teruyuki, to Bridgestone Corporation. Low-section pneumatic radial tire. 4,924,927, Cl. 152-531.000.
Kawada Co., Ltd.: *See—*
Takahashi, Tokuo, 4,925,424, Cl. 446-175.000
Kawagoshi, Hiroshi: *See—*
Tachi, Takahiro; Kato, Akira; Kawagoshi, Hiroshi; Yamashita, Hisao; and Kamo, Tomoichi, 4,925,825, Cl. 502-309.000
Kawaguchi, Kiyoshi: *See—*
Itoh, Norihisa; Kawaguchi, Kiyoshi; and Nomura, Etsuji, 4,925,236, Cl. 296-180.500.
Kawaguchi, Masaaki: *See—*
Shitanoki, Kazuaki; Kawaguchi, Masaaki; and Kobayashi, Saburo, 4,925,208, Cl. 280-741.000.
Kawahara, Ichiro: *See—*
Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi; Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, 4,925,934, Cl. 540-310.000.
Kawai, Kunio: *See—*
Ike, Masahide; and Kawai, Kunio, 4,924,967, Cl. 181-243.000.
Kawai, Taiyo: *See—*
Takeda, Keiso; Nakanishi, Kiyoshi; Kawai, Taiyo; and Shimizu, Rio, 4,925,110, Cl. 239-533.120.
Kawai, Taneichi: *See—*
Komuro, Kenichi; Kawai, Taneichi; Kamei, Atsushi; Asada, Toru; Torii, Nozomu; and Fukumoto, Ryoichi, 4,926,332, Cl. 364-424.050.
Kawai, Tatsundo: *See—*
Iwamoto, Hirofumi; Kawai, Tatsundo; Ogura, Makoto; Nakagawa, Katsumi; Seitoh, Shinichi; and Kaifu, Noriyuki, 4,926,058, Cl. 250-578.100.
Kawakami, Haruko: *See—*
Sekizawa, Hidekazu; Saito, Tutomu; Yamamoto, Naofumi; Higuchi, Kazuhiko; and Kawakami, Haruko, 4,926,251, Cl. 358-75.000.
Kawamura, Hideaki; Fujibayashi, Kentaro; and Otsuki, Toshiaki, to Fanuc Ltd. Involute interpolation method. 4,926,102, Cl. 318-573.000.
Kawamura, Kichinari; Kono, Yasuo; Okado, Hideo; Shin, Shigemitsu; and Takaya, Haruo, to Director General of Agency of Industrial Science and Technology. Aluminoborosilicate containing alkaline earth metal, a method for the preparation thereof and a method for the catalytic preparation of a lower olefin therewith. 4,926,006, Cl. 585-640.000.
Kawamura, Masaharu, to Canon Kabushiki Kaisha. Photometric apparatus for a camera. 4,926,204, Cl. 354-400.000.
Kawamura, Naoto; Nishigaki, Yuji; and Ohsawa, Hidefumi, to Canon Kabushiki Kaisha. Image processing apparatus which converts m-bit image data to n-bit (n>m) image data 4,926,268, Cl. 358-458.000.
Kawamura, Seiji: *See—*
Hayashi, Kyozo; Kawamura, Seiji; and Ikeda, Hirosaka, 4,925,394, Cl. 439-86.000.
Kawamura, Yoshihisa: *See—*
Uchida, Masaaki; Uema, Hideki; Miwa, Hiromichi; and Kawamura, Yoshihisa, 4,924,836, Cl. 123-489.000.
Kawanishi, Hidenori; Hayashi, Hiroshi; Morimoto, Taiji; Kaneiwa, Shinji; and Yamaguchi, Masahiro, to Sharp Kabushiki Kaisha. Semiconductor laser device which is stable for a long period of time 4,926,431, Cl. 372-45.000.

VOL 1114 ISS 3 MY 15 1990 UMI

Kawano, Atsuhiro: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,926,333, Cl. 364-426.020.

Kawano, Hiroshi: *See*—
Ikoma, Munehisa; Kawano, Hiroshi; Takahashi, Osamu; Matsumoto, Isao; and Ikeyama, Masakazu, 4,925,748, Cl. 429-59.000.

Kawano, Kenzo: *See*—
Nakagawa, Kiyotoshi; and Kawano, Kenzo, 4,926,243, Cl. 357-84.000.

Kawano, Minori; Mitsui, Kazuo; Hirooka, Masaharu; Ozu, Yasushi; Harada, Nagayasu; and Kimura, Nobuhiro, to Mitsubishi Denki Kabushiki Kaisha. Mobile radio telephone system. 4,926,421, Cl. 370-95.100.

Kawasaki, Ikuya: *See*—
Sakamura, Ken; Hashimoto, Kouzi; Kawasaki, Ikuya; Hasegawa, Atsushi; and Iwasaki, Kazuhiko, 4,926,321, Cl. 364-200.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Yoshida, Ryuichi; Ohnishi, Tokio; Yamamura, Tetsushi; and Nihei, Kanta, 4,924,958, Cl. 180-128.000.

Kawasaki, Kazumasa: *See*—
Inada, Yutaka; Kawasaki, Kazumasa; Nishiyama, Shigeru; and Yoshikura, Hiroshi, 4,924,710, Cl. 73-861.230.

Kawasaki Steel Corp.: *See*—
Enomoto, Norihide; and Naruse, Yoshihiro, 4,925,957, Cl 549-239.G00.
Imai, Takuo; Kojima, Shinji; Matsukawa, Toshitane; and Fujimura, Toshio, 4,924,585, Cl. 29-527.500.

Kawasaki, Yoshihiko: *See*—
Kikuchi, Shuichi; Yamamoto, Yoshio; and Kawasaki, Yoshihiko, 4,924,999, Cl. 198-409.000.

Kawata, Yoshihiro: *See*—
Endo, Gen; Tateishi, Hiroyuki; Kawata, Yoshihiro; Karasudani, Isao; and Omura, Hirofumi, 4,925,725, Cl. 428-156.000.

Kazan, Benjamin. Radioactive light sources. 4,926,435, Cl. 372-73.000.

Kaze, Kenji: *See*—
Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi; Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, 4,925,934, Cl. 540-310.000.

Kazewych, Bohdan *See*—
Lam, Michael K., and Kazewych, Bohdan, 4,924,627, Cl. 49-351.000.

Keeler Limited: *See*—
Matthews, James R. A.; Little, Mervyn A. and Fisher, John, 4,924,867, Cl. 128-645.000.

Keene, Howard F.; and Wyckoff, Frank M., to Boeing Company, The. Lightweight cylinder head attachment for fluid actuators. 4,924,757, Cl. 92-128.000.

Keeton, Eugene G Seed dispenser with dual-faced seed plate. 4,924,786, Cl. 111-184.000.

Keightley, Tom: *See*—
Lord, Barbara; and Keightley, Tom, 4,925,287, Cl. 350-632.000.

Keinath, Wolfgang: *See*—
Keller, Karl; Grallert, Herbert; and Keinath, Wolfgang, 4,925,134, Cl. 244-158.00A

Kelkar, Anant H.; Capodicasa, Frank A.; and Weinstein, Jerry G., to Interlake Corporation, The. Ceramic core for investment casting and method for preparation. 4,925,492, Cl. 106-38.350.

Keller, Daniel H., to Simplimatic Engineering Company. Accumulating conveyor. 4,925,005, Cl. 198-460.000.

Keller, John F., to Saturn Corporation. Door handle assembly method 4,924,582, Cl. 29-434.000.

Keller, Karl; Grallert, Herbert; and Keinath, Wolfgang, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. High temperature heat shield system. 4,925,134, Cl. 244-158.00A

Kelley, William L. Collision predicting and avoidance device for moving vehicles. 4,926,171, Cl. 340-961.000.

Kelly, Joseph M.: *See*—
Sestanj, Kazimir; Wrobel, Jay E.; and Kelly, Joseph M., 4,925,968, Cl. 560-21.000.

Kelly, Robert J.; and LaBerge, Edward F C., to Allied-Signal Inc. FFT-based aperture monitor for scanning phased arrays. 4,926,186, Cl. 342-360.000.

Kelly, Stephen: *See*—
Buchecker, Richard; Fromm, Hans-Jurgen; Kelly, Stephen; and Schadt, Martin, 4,925,278, Cl. 350-350.500.

Kemmler, Lothar, to Samson AG Pneumatic control valve. 4,925,498, Cl. 137-382.000.

Kenley, Richard A.: *See*—
Harris, Ralph N., III, Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A.; Koolpe, Gary A.; and Pick, Robert O., 4,925,856, Cl. 514-341.000.

Kennametal Inc.: *See*—
Mehrotra, Pankaj K.; and Billman, Elizabeth R., 4,925,458, Cl. 51-293.000.

Kennedy, Lawrence C., to General Motors Corporation. Quick pump-out clutch plate for a viscous fluid clutch. 4,924,984, Cl. 192-58.00B.

Kennedy, Lawrence C., to General Motors Corporation. Dual face wiper for a viscous fluid clutch. 4,924,985, Cl. 192-58.00B.

Kennedy, Lawrence C., to General Motors Corporation. Pump plate assembly for a viscous fluid clutch. 4,924,987, Cl. 192-58.00B.

Kennedy, Richard. Method of repairing a leaking cooling coil-to-expansion valve coupling using a clamp-on nut. 4,924,569, Cl. 29-890.140.

Kennel, Gerald R., to Riedel Omni Products, Inc. Pad for supporting a utility access conduit and method for installing same. 4,925,336, Cl. 404-25.000.

Kernforschungsanlage Juelich Gesellschaft mit beschrankter Haftung: *See*—
Coenen, Heinz H.; Kling, Peer; and Stoecklin, Gerhard, 4,925,651, Cl. 424-1.100.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Dillmann, Hans-Georg; Pasler, Horst; and Martinsteg, Hans, 4,925,623, Cl. 376-314.000.

Kertis, Robert A.; and Smith, Douglas D., to National Semiconductor Corporation. BiCMOS write-recovery circuit. 4,926,383, Cl. 365-203.000.

Kesseler, Kurt; Beck, Gerhard; Bartmann, Wilhelm; and Granzer, Ernold, to Hoechst Aktiengesellschaft. 3-demethylmevalonic acid derivatives, and pharmaceutical products based on these compounds. 4,925,852, Cl. 514-333.000.

Ketcham, Mark G., to Huron Products Corporation. Quick connector with visual checking method. 4,925,217, Cl. 285-93.000.

Key Industries, Inc.: *See*—
Ralston, Gene O., 4,926,300, Cl. 362-189.000.

KeyTek Instrument Corp.: *See*—
Reinhardt, Nicholas; and Weil, Geoffrey M., 4,926,285, Cl 361-230.000.

Khan, Mohammad A.; Solomon, Donald D.; and Byron, Matthew P., to Becton, Dickinson and Company. Anti-infective and lubricious medical articles and method for their preparation. 4,925,668, Cl. 424-422.000.

Khanna, Dinesh N. *See*—
Mueller, Werner H.; Khanna, Dinesh N.; Vora, Rohitkumar H.; and Erckel, Ruediger J., 4,925,915, Cl. 528-353.000.

Kiba, Hiroshi; Nagano, Kenzou; and Sumiyoshi, Shigeru, to Mazda Motor Corporation. Painting truck washing system. 4,924,892, Cl. 134-123.000.

Kidd, John: *See*—
Sorrentino, Michael; and Kidd, John, 4,925,250, Cl. 301-13.00R

Kidd, Philip W., to TRW Inc. Plasma plating apparatus and method. 4,925,542, Cl. 204-192.310.

Kidnie, Kevin M.: *See*—
Elmasry, Mohamed A.; and Kidnie, Kevin M., 4,925,766, Cl. 430-115.000.

Kikuchi, Hideo: *See*—
Ichimura, Kunihiro; Yonezawa, Teruhiko; Kikuchi, Hideo; Tochizawa, Nariaki; and Hayashi, Keiichi, 4,925,770, Cl. 430-273.000.

Kikuchi, Shuichi; Yamamoto, Yoshio; and Kawasaki, Yoshihiko, to Murata Kikai Kabushiki Kaisha. Package transfer system. 4,924,999, Cl. 198-409.000.

Kilian, Joseph: *See*—
Goldwasser, Shafi; Kilian, Joseph; Wigderson, Avi; and Ben-Or, Michael, 4,926,479, Cl. 380-23.000.

Kilmartin, John D., III: *See*—
Harvey, Thomas J.; and Kilmartin, John D., III, 4,925,059, Cl. 220-335.000.

Kim, Jung B., to Samsung Electronics Co., Ltd. Heat-exchanging member of a dehumidifier. 4,924,939, Cl. 165-172.000.

Kim, Kwang-Shick Stapler with indicator windows. 4,925,082, Cl. 227-120.000.

Kim, Sang-Sup. Indoor-rollhike apparatus. 4,925,183, Cl. 272-73.000.

Kim, Suk-Joon, to Samsung Electronics Co., Ltd. Method for indicating a communicating duration of an office line in a keyphone system. 4,926,465, Cl. 379-131.000.

Kimberley, John B. Floats for fishing lines. 4,924,620, Cl. 43-44 900.

Kimberly-Clark Corporation: *See*—
Johnson, Russell L.; Hrubecky, Frederick J.; and Fay, James E., III, 4,924,845, Cl. 126-25.00R.
Vogt, Clifford M.; Twyman, Nancy D.; and Allen, Roe C., Jr., 4,925,601, Cl. 264-6.000.

Kimble, James B.; and Kolts, John H., to Phillips Petroleum Company. Oxidative conversion of organic compounds, toluene and acetonitrile. 4,925,997, Cl. 585-428.000.

Kimizuka, Kazutoshi: *See*—
Kiryu, Naohiko; Kimizuka, Kazutoshi; Minezaki, Etsuko; and Maruyama, Hiroshi, 4,925,713, Cl. 428-40.000.

Kimmel, Heinz: *See*—
Dickert, Franz; Kimmel, Heinz; Mages, Gert; and Schreiner, Sabine, 4,926,156, Cl. 338-36.000.

Kimpara, Mamoru; and Ichiki, Tetsuji, to Yamaha Corporation. Automatic performance recording apparatus. 4,924,745, Cl. 84-609.000.

Kimura, Kazuhiro: *See*—
Aoki, Kazuo; Moteki, Tsutomu; and Kimura, Kazuhiro, 4,925,381, Cl. 425-145.000.

Kimura, Masayuki; Hosaka, Kunio; Takeda, Shigehumi; and Mitsuhashi, Hiroshi, to Tsumura & Co. Biphenyl derivative useful as a liver ailment moderating agent. 4,925,872, Cl. 514-465.000.

Kimura, Nobuhiro: *See*—
Kawano, Minori; Mitsui, Kazuo; Hirooka, Masaharu; Ozu, Yasushi; Harada, Nagayasu; and Kimura, Nobuhiro, 4,926,421, Cl. 370-95.100.

Kimura, Shigeo: *See*—
Miyamaru, Yukio; Yagasaki, Akio; Kimura, Shigeo; and Osanai, Yoshimi, 4,925,432, Cl. 474-8.000.

Kimura, Takeshi: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, 4,925,755, Cl. 430-5.000.

Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, to Pioneer Electronic Corporation. Disk playing method for disk player. 4,926,404, Cl. 369-32.000.

Kimura, Yoshihiro: *See*—
Handa, Akio; Hosoya, Eiji; Ishiwatari, Makoto; Kimura, Yoshihiro; and Watanabe, Seiji, 4,924,959, Cl. 180-297.000.

King, Harold B., Jr.; Muncy, Donald G.; and Sutherland, Charles W., to General Electric Company. Automated forming apparatus. 4,924,586, Cl. 29-723.000.

King, Robert D.; and Szczesny, Paul M., to General Electric Company. Adjustable speed AC drive system control for operation in pulse width modulation and quasi-square wave modes. 4,926,104, Cl. 318-599.000.

Kini, Ganesh D.: *See*—
Robins, Roland K.; and Kini, Ganesh D., 4,925,930, Cl. 536-23.000.

Kirch, Peter: *See*—
Klein, Christian; and Kirch, Peter, 4,925,945, Cl. 546-292.000.

Kirchhofer, Hermann, to Hoechst Aktiengesellschaft. Process for the production of metal oxides or metal mixed oxides. 4,925,647, Cl. 423-592.000.

Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, to Mitsubishi Nuclear Fuel Company, Ltd. Process for separation of hafnium tetrachloride from zirconium tetrachloride and electrode. 4,925,537, Cl. 204-61.000.

Kirst, Bertold: *See*—
Beyer, Otto; and Kirst, Bertold, 4,924,749, Cl. 89-41.090.

Kiryu, Naohiko; Kimizuka, Kazutoshi; Minezaki, Etsuko; and Maruyama, Hiroshi, to Somar Corporation. Lightsafe masking film. 4,925,713, Cl. 428-40.000.

Kishi, Hideki: *See*—
Touya, Syouichi; and Kishi, Hideki, 4,924,548, Cl. 15-347.000.

Kishi, Noriaki; Nosaka, Kazuto; Terao, Tadayoshi; and Shibata, Yukio, to Nippondenso Co., Ltd. Filter device provided in an air conditioning device. 4,925,468, Cl. 55-467.000.

Kishida, Koji; and Akisue, Osamu, to Nippon Steel Corporation. High-strength hot-rolled steel sheet having remarkably excellent cold workability and process for manufacturing the same. 4,925,500, Cl. 148-12.00F.

Kiske, Siegfried; Schwanbom, Erik; and Wallroth, Carl F., to Dragerwerk AG. Piston and cylinder unit as supply device for the respiratory air of a respirator. 4,924,861, Cl. 128-205.180.

Kistrup, Holger; and von Benda, Claus, to Deutsche Automobilgesellschaft mbH. Process for the chemical metallizing of textile material. 4,925,706, Cl. 427-305.000.

Kitagawa, Masaki: *See*—
Ohno, Tamio; Yoshida, Kousaku; and Kitagawa, Masaki, 4,926,264, Cl. 358-349.000.

Kitajima, Hiroyuki: *See*—
Yamamoto, Akira; Motoyama, Miho; Kitajima, Hiroyuki; Doi, Takashi; and Nishimura, Toshifumi, 4,926,324, Cl. 364-200.000.

Kitamura, Takao; Sakane, Kohji; Wada, Hideo; Hata, Hajime; and Kanbara, Hajime, to Agency of Industrial Science & Technology; and Shikoku Chemicals Corporation. Process for preparing aluminum borate whiskers. 4,925,641, Cl. 423-279.000.

Kitamura, Yoshihiko: *See*—
Tanaka, Hideaki; and Kitamura, Yoshihiko, 4,926,492, Cl. 382-18.000.

Kitano, Kyozo: *See*—
Terao, Toshimi; Kiyama, Kentaro; and Kitano, Kyozo, 4,925,976, Cl. 562-123.000.

Kivisto, Tuomo V. J.; Koho, Tauno T.; and Andersson, Arvo E., to Outokumpu Oy. Aerator for industrial and domestic wastewaters. 4,925,598, Cl. 261-87.000.

Kiyama, Kentaro: *See*—
Terao, Toshimi; Kiyama, Kentaro; and Kitano, Kyozo, 4,925,976, Cl. 562-123.000.

Kizu, Shigeo: *See*—
Tabuchi, Koichi; and Kizu, Shigeo, 4,926,273, Cl. 360-64 000.

KLA Instruments Corporation: *See*—
Danielson, Donald L.; Wihl, Mark J.; and Joseph, David A., 4,926,489, Cl. 382-8.000.

Klaiber, Martin S., to Action Drive-Thru Inc. Concealed magnetic indicia. 4,925,215, Cl. 283-82.000.

Klausner, Mitchell; Manning, Michael P.; and Baddour, Raymond F., to Tekmat Corporation; and Revlon, Inc. Surface modification of polymeric materials. 4,925,698, Cl. 427-2.000.

Kleffner, Hans W.: *See*—
Gotz, Josef; Orth, Winfried; Weiss, Wolfgang; Rapp, Bernd; and Kleffner, Hans W., 4,925,942, Cl. 546-133.000.

Klein, Christian; and Kirch, Peter, to Boehringer Mannheim GmbH. Certain -N-(amino benzoyl)-N'-(pyridyldithioalkanoyl)-hydrazines and derivatives thereof. 4,925,945, Cl. 546-292.000.

Kleinwefers GmbH: *See*—
Schlunke, Jurgen; Kaiser, Franz; and Fenzau, Hilmar, 4,924,772, Cl. 100-163.00R.

Kler, Chandra M.; and Hanspal, Jagdevinder S., to Smiths Industries Public Limited Company. Cavity discharge igniter. 4,926,087, Cl. 313-131.00A.

Kler, Chandra M., to Smiths Industries Public Limited Company. Igniters and methods of manufacture of igniters. 4,926,088, Cl. 313-131.00A.

Kliesch, Wilfried, to Hoesch Aktiengesellschaft. Method of and device for coupling an ultrasonic probe to a test piece. 4,924,707, Cl. 73-644.000.

Kling, Lothar: *See*—
Mertens, Alfred; von der Saal, Wolfgang; Kling, Lothar; and Muller-Beckmann, Bernd, 4,925,845, Cl. 514-254.000.

Kling, Peer: *See*—
Coenen, Heinz H.; Kling, Peer; and Stoecklin, Gerhard, 4,925,651, Cl. 424-1.100.

Klockner-Moeller: *See*—
Wratil, Peter; and Schroter, Reinhard, 4,926,351, Cl. 364-550.000.

Klotz, Lynn C.: *See*—
Wang, Chang-Ning J.; and Klotz, Lynn C., 4,925,785, Cl. 435-6.000.

Knapp, Horst J. T.: *See*—
Gerst, Michael; Knapp, Horst J. T.; and Maack, Werner, 4,925,007, Cl. 198-470.100.

Knauss, Hermann, to E.G.O. Elektro-Gerate Blanc u. Fischer. End piece for tubular heater. 4,926,030, Cl. 219-541.000.

Knoll AG: *See*—
Gremm, Dorothee; and Perstel, Ingetraud, 4,925,672, Cl. 424-451.000.

Knoll, Jozsef: *See*—
Bodo, Gyorgy; Knoll, Jozsef; Somfai, Eva; Virag, Sandor; and Zak, Ferenc, 4,925,878, Cl. 514-646.000.

Knop, Reinhard, to Jagenberg Aktiengesellschaft. Coater for coating material webs. 4,924,802, Cl. 118-410.000.

Knott, Frederick J., to Frank George Grundman. Pipe support apparatus and/or methods of supporting pipes. 4,925,136, Cl. 248-62.000.

Knowles, Gregory W.: *See*—
Hemmerdinger, Louis H.; Knowles, Gregory W.; and Patterson, George B., 4,925,636, Cl. 422-248.000.

Knowlton, Kimball J.: *See*—
Orkin, Fredric I.; Liber, Theodore; Smith, Charles R.; Knowlton, Kimball J.; and Huntley, Albin, 4,925,444, Cl 604-80.000.

Kobata, Hiroshi: *See*—
Enomoto, Akihiko; Koga, Takashi; Yoneda, Minoru; and Kobata, Hiroshi, 4,926,101, Cl. 318-374.000.

Kobayashi, Hiroshi; and Shimizu, Masaaki, to SDS Biotech K.K. Process for producing trifluorobenzene compounds. 4,925,966, Cl. 558-419.000.

Kobayashi, Koichi, to Kabushiki Kaisha Toshiba. Linear reciprocating motion device and optical card transporting device which employs the same. 4,926,033, Cl. 235-480.000.

Kobayashi, Kunihiro: *See*—
Yoshida, Hiroshi; Ikeya, Hiroshi; Kobayashi, Kunihiro; and Kondo, Yasuhiko, 4,925,092, Cl. 237-12.30B.

Kobayashi, Naotou: *See*—
Hojo, Nobuyoshi; Asai, Yoshiro; Fujioka, Motoo; Kobayashi, Naotou; and Yamaguchi, Takashi, 4,925,510, Cl. 156-92.000.

Kobayashi, Naoya; Ohnishi, Makoto; and Kokuryo, Yoshiro, to Hitachi, Ltd. Carrier phase controller for a receiver of phase modulated signals. 4,926,499, Cl. 455-306.000.

Kobayashi, Saburo: *See*—
Shitanoki, Kazuaki; Kawaguchi, Masaaki; and Kobayashi, Saburo, 4,925,208, Cl. 280-741.000.

Kobayashi, Seiji: *See*—
Tsukamura, Yoshihiro; Ogawa, Masataka; and Kobayashi, Seiji, 4,925,717, Cl. 428-64.000.

Kobayashi, Shin'ya; and Anzai, Masayasu, to Hitachi, Ltd. Scanning recording type printing method and apparatus for increasing image quality by controlling tone dot locations within image pixels. 4,926,248, Cl. 358-75.000.

Kobayashi, Takashi: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 4,926,143, Cl. 331-156.000.

Kobayashi, Takuichi: *See*—
Kataoka, Hiroshi; Kunitomo, Tetsunosuke; and Kobayashi, Takuichi, 4,925,534, Cl. 210-647.000.

Kobayashi, Tomoya: *See*—
Abe, Kunihiro; and Kobayashi, Tomoya, 4,926,330, Cl. 364-424.030.

Kobayashi, Yukimori: *See*—
Hayashi, Masaharu; Kodama, Hisashi; Okabe, Yoshio; Kobayashi, Yukimori; and Shirai, Eiji, 4,925,436, Cl. 474-101.000.

Kobayashi, Yukio: *See*—
Sugitani, Yuji; Kobayashi, Yukio; Ikeda, Yoshihisa; and Murayama, Masatoshi, 4,926,023, Cl. 219-125.120.

Kodaka, Yoshiro: *See*—
Kanno, Hideo; Imanari, Hitoshi; Naito, Hideshi; Kodaka, Yoshiro; and Ohta, Naoto, 4,925,282, Cl. 350-429.000.

Kodama, Hisashi: *See*—
Hayashi, Masaharu; Kodama, Hisashi; Okabe, Yoshio; Kobayashi, Yukimori; and Shirai, Eiji, 4,925,436, Cl. 474-101.000.

Kodama, Seiki, to Mitsubishi Denki Kabushiki Kaisha. Distributor cap with molded cable terminals. 4,926,013, Cl. 200-19.0DC.

Kodera, Kaoru: *See*—
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 4,925,828, Cl. 503-218.000.

Koehler, Gernot: *See*—
Naarmann, Herbert; and Koehler, Gernot, 4,925,897, Cl. 525-285.000.

Koehler, Heinrich P. F.: *See*—
Hock, Thomas H.; O'Banion, Michael L.; Koehler, Heinrich P. F.; and Wynes, Joseph, 4,924,633, Cl. 51-135.00R.

Koehler, Howard A.: *See*—
Byers, Larry L.; Koehler, Howard A.; and Michaelson, Wayne A., 4,926,313, Cl. 364-200.000.

Koepsel, Roger E.: *See*—
Steiner, Ronald M.; Koepsel, Roger E.; Gilgenbach, Hubert S.; and Reinke, Terence C., 4,925,369, Cl. 416-204.00R.

VOL
1114
ISS
3
MY
15
1990
UMI

Koester, Rita: *See—*
Biermann, Manfred Koester, Rita; and Eierdanz, Horst, 4,925,559, Cl. 209-166.000.
Koga, Takashi, to Kabushiki Kaisha Toshiba. FM demodulator having a frequency independent delay circuit. 4,926,133, Cl. 329-336.000.
Koga, Takashi: *See—*
Enomoto, Akihiko; Koga, Takashi; Yoneda, Minoru; and Kobata, Hiroshi, 4,926,101, Cl. 318-374.000.
Kohara, Tadanao; and Ueki, Satoshi, to Toa Nenryo Kogyo K. K. Catalyst for olefin polymerization. 4,926,002, Cl. 585-512.000.
Kohara, Teiji: *See—*
Miyamura, Masataka; Wada, Yuusuke; Takeda, Kazuhiro; Nakazumi, Yuji; and Kohara, Teiji, 4,925,773, Cl. 430-285.000.
Koho, Tauno T.: *See—*
Kivisto, Tuomo V. J., Koho, Tauno T.; and Andersson, Arvo E., 4,925,598, Cl. 261-87.000.
Koide, Nobuo: *See—*
Yoshihara, Kunio; Terada, Toshiyuki; Takubo, Chiaki; Koide, Nobuo; and Shimizu, Shoichi, 4,926,451, Cl. 377-48.000.
Koike, Naomasa: *See—*
Goto, Atsuo; and Koike, Naomasa, 4,925,827, Cl. 503-207.000.
Koike, Tsutomu *See—*
Kanamaru, Hisanobu; Aoyama, Susumu; Koike, Tsutomu; Asahi, Naotatsu; and Hirai, Yoshiki, 4,924,690, Cl. 72-343.000.
Koizumi, Yoshihisa: *See—*
Hara, Shinji; and Koizumi, Yoshihisa, 4,924,674, Cl. 60-608.000.
Kojima, Hiroshi, to Bridgestone Corporation. Vibration isolating devices. 4,925,162, Cl. 267-140.100.
Kojima, Shinji: *See—*
Imai, Takuo; Kojima, Shinji; Matsukawa, Toshitane; and Fujimura, Toshio, 4,924,585, Cl. 29-527.500.
Kokuryo, Yoshiro: *See—*
Kobayashi, Naoya Ohnishi, Makoto; and Kokuryo, Yoshiro, 4,926,499, Cl. 455-306.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Mimura, Yoshinori; Noda, Yukio; Norimatsu, Naoki; Tokiwa, Hideharu; and Shinbori, Osamu, 4,925,475, Cl. 65-48.000.
Kolenik, Steve A. *See—*
Heilman, Marlin S. and Kolenik, Steve A., 4,925,443, Cl. 600-16.000.
Koller, Otto: *See—*
von Bogdandy, Ludwig, Mitter, Gerhard, and Koller, Otto, 4,925,489, Cl. 75-574.000.
Kollmorgen Corporation *See—*
Donaldson, Scott B., 4,926,063, Cl. 307-144.000.
Kolpak, Miroslav M., to Atlantic Richfield Company. Apparatus for compressing a fluid sample to determine gas content and the fraction of one liquid composition in another. 4,924,695, Cl. 73-61.10R
Kolseth, Donald H. Screw anchor 4,925,350, Cl. 411-82.000.
Kolts, John H. *See—*
Kimble, James B. and Kolts, John H., 4,925,997, Cl. 585-428.000.
Komatsu, Michio: *See—*
Sato, Goro; Komatsu, Michio; Nishida, Hiroyasu; Tanaka, Yoshichika; Koyanagi, Tsuguo; and Mihara, Kei, 4,925,704, Cl. 427-221.000.
Komatsubara, Shoji; Takeuchi, Masahiko; and Oka, Yasuyuki, to Dainippon Screen Mfg. Co., Ltd. Apparatus for holding sensitized material in slitwise exposure type copying camera. 4,926,213, Cl. 355-49.000.
Komuro, Kenichi; Kawai, Taneichi; Kamei, Atsushi; Asada, Toru; Toru, Nozomu; and Fukumoto, Ryoichi, to Aisin Seiki Kabushiki Kaisha. Locking device for vehicles. 4,926,332, Cl. 364-424.050.
Kondo, Ikuzo; and Makihara, Tsutomu, to Brother Kogyo Kabushiki Kaisha. Sewing machine with a cloth-edge detector 4,924,790, Cl. 112-272.000.
Kondo, Masataka. *See—*
Yamagishi, Hideo; Yamaguchi, Minori; Asaoka, Keizo; Hiroe, Akihiko; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,926,230, Cl. 357-30.000.
Kondo, Yasuhiko: *See—*
Yoshida, Hiroshi; Ikeya, Hiroshi; Kobayashi, Kunihiro; and Kondo, Yasuhiko, 4,925,092, Cl. 237-12.30B.
Kong, Cheng-Gang: *See—*
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M., Gupta, Smeeta; Johnson, William M., Kong, Cheng-Gang; Moller, Ole H., Olson, Timothy A.; and Sorensen, David L., 4,926,323, Cl. 364-200.000.
Konica Corporation: *See—*
Ichihara, Yoshiyuki; Ito, Kunio; Izawa, Tadashi; and Wakui, Norihiro, 4,926,249, Cl. 358-75.000.
Metoki, Iku; Honda, Chika; and Wada, Yasunori, 4,925,783, Cl. 430-569.000.
Murahashi, Takashi; Fujita, Hisao; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 4,926,195, Cl. 346-108.000.
Takenouchi, Shigeki; Hirano, Akira; Saito, Shiori; and Fujimaki, Yoshihide, 4,925,757, Cl. 430-31.000.
Yoshizawa, Tomimi; Ogi, Keiji; and Kamitakahara, Atushi, 4,925,780, Cl. 434-589.000.
Konieczynski, Ronald D.; Pintelon, Jo; Holland, Robert J.; Barth, C. Peter; and Gell, Jeff, to Nordson Corporation. Wax spray gun and nozzle. 4,925,101, Cl. 239-8.000.
Konietzki, Melvin J. *See—*
Westbrock, Jerry B., 4,924,972, Cl. 182-187.000.
Konishi, Kenichi: *See—*
Isozumi, Shuzoo; and Konishi, Kenichi, 4,926,078, Cl. 310-71.000.
Konishi, Kiyoshi *See—*
Suzuki, Kouichi; and Konishi, Kiyoshi, 4,926,334, Cl. 364-426.040
Konishi, Motofumi, to Canon Kabushiki Kaisha. Color image recording and reproducing apparatus utilizing a monochromatic recording medium. 4,926,250, Cl. 358-75.000.
Konishi, Satoshi; Naito, Kazufumi; and Utsunomiya, Mitito, to Kabushiki Kaisha Ishida Koki Seisakusho. Weight sensing apparatus. 4,926,359, Cl. 364-567.000.
Konishiroku Photo Industry Co., Ltd. *See—*
Koshizuka, Kunihiro; Asano, Masao; Tezuka, Toshiaki; Maehashi, Tatsuichi; and Tanaka, Yasuhiko, 4,925,735, Cl. 428-423.100.
Kono, Yasuo: *See—*
Kawamura, Kichinari, Kono, Yasuo; Okado, Hideo; Shin, Shigemitsu; and Takaya, Haruo, 4,926,006, Cl. 585-640.000.
Koo, Jay Y.: *See—*
Fung, Shun C., Tauster, Samuel J., and Koo, Jay Y., 4,925,819, Cl. 502-37.000.
Koolpe, Gary A.: *See—*
Harris, Ralph N., III, Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A.; Koolpe, Gary A.; and Pick, Robert O., 4,925,856, Cl. 514-341.000.
Kopelman, Robert Z. Fiber optic sign. 4,924,612, Cl. 40-547.000.
Kopich, Leonard F., to General Motors Corporation. Coil spring with guide rollers. 4,925,164, Cl. 267-167.000.
Korber AG: *See—*
Hausler, Nikolaus, Muller, Heidi; Pinck, Peter; and Straube, Christina, 4,924,884, Cl. 131-84.100.
Heitmann, Uwe; and Brand, Peter, 4,924,885, Cl. 131-84.400.
Menge, Gunter, 4,925,004, Cl. 198-457.000.
Kordesch, Karl; and Tomantschger, Klaus, to Battery Technologies Inc. Catalytic recombination of corrosion evolved hydrogen in alkaline cells. 4,925,747, Cl. 429-59.000.
Koronis Parts, Inc *See—*
Webb, Edward; and Duclo, Marley, 4,925,408, Cl. 440-38.000.
Kosa, Yasunobu; and Shimizu, Shinji, to Hitachi, Ltd. Semiconductor memory device and a method of manufacturing the same. 4,926,222, Cl. 357-23.500.
Koshizuka, Kunihiro; Asano, Masao; Tezuka, Toshiaki; Maehashi, Tatsuichi; and Tanaka, Yasuhiko, to Konishiroku Photo Industry Co., Ltd. Resin composition for heat-sensitive transfer recording medium and heat-sensitive transfer recording medium. 4,925,735, Cl. 428-423.100.
Kosikowski, Thomas, to Schering Aktiengesellschaft. Method and apparatus for conveying plate-like parts of different thickness. 4,925,011, Cl. 198-624.000.
Koski, Erkki, to Valmet Paper Machinery Inc. Twin wire former for a paper machine. 4,925,531, Cl. 162-301.000.
Kotegawa, Michiro; and Kuribayashi, Yoshihiro, to Fundokin Shoyu Kabushiki Kaisha. Koji-making method by koji-cutting. 4,925,679, Cl. 426-18.000.
Koterasawa, Matsuro, to National Semiconductor Corporation. Low dropout voltage regulator with low common current. 4,926,109, Cl. 323-274.000.
Kottman, Rick. *See—*
Larson, Brad W.; Hockersmith, Dan; Taylor, Thomas H.; Bedinger, John M.; Kottman, Rick; and Pebley, Steve, 4,925,167, Cl. 269-112.000.
Kovacs, Joseph A.; and Masur, Henry, to United States of America, Health and Human Services. Monoclonal antibody against human pneumocystis carinii. 4,925,800, Cl. 435-240.270.
Kovacs, Lloyd; and Lind, Matthew R., to Hayssen Manufacturing Company. Forming, filling and sealing bags and depositing them in cartons. 4,924,656, Cl. 53-436.000.
Kowaka, Masahiko: *See—*
Kajiyama, Koichi; Saito, Kaoru; Itakura, Yasuo; Wakabayashi, Osamu; Kowaka, Masahiko; and Yamaguchi, Tadayoshi, 4,926,428, Cl. 372-20.000.
Kowal, Albert E.: *See—*
Gibson, Ray G. III; and Kowal, Albert E., 4,926,092, Cl. 313-493.000.
Koyama, Satoru. Linear actuator screw connected with parallel linear bearing. 4,926,080, Cl. 310-80.000.
Koyanagi, Toshio: *See—*
Morii, Atsushi; Koyanagi, Toshio; Takatsuka, Hiromu; and Iida, kouzou, 4,925,640, Cl. 423-239.000.
Koyanagi, Tsuguo: *See—*
Sato, Goro; Komatsu, Michio; Nishida, Hiroyasu; Tanaka, Yoshichika; Koyanagi, Tsuguo; and Mihara, Kei, 4,925,704, Cl. 427-221.000.
Koyo Seiko Co., Ltd.: *See—*
Tabata, Kazumasa; Ooishi, Hiroshi; and Takaoka, Manabu, 4,924,910, Cl. 137-625.230.
Kozak, Darryn J.: *See—*
Collins, John E.; Grunes, Mitchell B.; and Kozak, Darryn J., 4,926,344, Cl. 364-513.000.
Kozaki, Ken: *See—*
Yoshida, Tetsuji; Teraoka, Yoshiaki; Ogawa, Yoji; Kozaki, Ken; Hara, Kenji; Satou, Hiroshi; and Yoshino, Akira, 4,926,487, Cl. 381-186.000.
Kozawa, Hiroomi: *See—*
Ohyama, Mineo; Katagiri, Shigenobu; Kozawa, Hiroomi; and Yamada, Koutaro, 4,926,200, Cl. 346-160.000.
Krabetz, Richard; Duembgen, Gerd; Nees, Friedbert; Merger, Franz; and Fouquet, Gerd, to BASF Aktiengesellschaft. Process and catalyst for the preparation of methacrylic acid. 4,925,823, Cl. 502-211.000.

Kraft, Inc.: *See—*
Meisner, Robert J., 4,925,380, Cl. 425-131.100.
Krajicek, Stephen P.: *See—*
Julien, William E.; and Krajicek, Stephen P., 4,925,637, Cl. 426-2.000.
Kramer, William E.; Charland, Terrence D.; Forward, John E.; Burger, William R.; and Mandel, Barry P., to Xerox Corporation. Sorter/stapler with horizontal bin opening. 4,925,171, Cl. 270-53.000.
Kranz, Walter, to Messerschmitt-Bolkow-Blohm. Flight path control apparatus for missiles. 4,925,130, Cl. 244-3.210.
Krasuski, Marek; and Prugnolle, Bernard, to Societe Anonyme dite: Alcatel Satmam. Integrated office machine for folding mail and inserting it into envelopes. 4,924,652, Cl. 53-55.000.
Kraul, Douglas R.; and Cox, Stuart A., to Hayes Microcomputer Products, Inc. Method and apparatus for implementing an escape sequence. 4,926,448, Cl. 375-121.000.
Krause, James N.: *See—*
Gauthier, Raymond G.; Krause, James N.; and Lancisi, David M., 4,926,077, Cl. 310-68.00C.
Krause, Joachim: *See—*
Reiffenrath, Volker; Krause, Joachim; Wachtler, Andreas; Weber, Georg; and Finkenzeller, Ulrich, 4,925,590, Cl. 252-299.610.
Krause, Norbert; and Requardt, Hermann, to Siemens Aktiengesellschaft. Surface coil for a nuclear magnetic resonance apparatus. 4,924,868, Cl. 128-653.05C.
Krawjecki, Madonna M.: *See—*
Atwell, William A.; Pesheck, Peter S.; Krawjecki, Madonna M.; and Anderson, George R., 4,926,020, Cl. 219-10.55M.
Kreimer, Johannes: *See—*
Lehmann, Hanno; Uphus, Arnold; and Kreimer, Johannes, 4,924,769, Cl. 99-455.000.
Kress, Hans-Jurgen; Lindner, Christian; Muller, Friedemann; Peters, Horst; Wittmann, Dieter; and Buekers, Josef, to Bayer Aktiengesellschaft. High impact strength flame-retardant polycarbonate moulding compositions. 4,925,891, Cl. 524-139.000.
Krokenberger, Alan R.: *See—*
Hoskins, Robert G.; and Krokenberger, Alan R., 4,924,732, Cl. 81-54.000.
Krupp Koppers GmbH: *See—*
Preusser, Gerhard; Emmrich, Gerd; and Schulze, Martin, 4,925,535, Cl. 203-25.000.
Krusi, Fritz. Apparatus for machining a workpiece of wood, in particular wood beams. 4,925,348, Cl. 409-231.000.
Kryazhevskikh, Nikolai F.: *See—*
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P., 4,925,550, Cl. 210-106.000.
Ku Te Haung: *See—*
Huang, Ku T., 4,926,277, Cl. 360-128.000.
Kubo, Isamu: *See—*
Seki, Kameharu; and Kubo, Isamu, 4,925,347, Cl. 409-132.000.
Kubota, Ltd.: *See—*
Katayama, Yoshiyuki; Ura, Takeshi; and Inamori, Akio, 4,924,983, Cl. 192-52.000.
Kubota, Naminosuke; Shimizu, Haruaki; Sonobe, Tadashi; and Nakashita, Goro, to Japan as represented by Director General, Technical Research and Development Institute, Japan Defense Agency; and Nippon Oil & Fats Co., Ltd. Gas-generating agent for use in ducted rocket engine. 4,925,909, Cl. 528-55.000.
Kucera, Lawrence P.; and Thompson, Michael P., to Boeing Company, The. Test apparatus for measuring heat release of certain materials. 4,926,356, Cl. 364-557.000.
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., to American National Can Company. Methods and apparatus for injection molding and injection blow molding multi-layer articles, and articles made thereby. 4,925,100, Cl. 239-416.400.
Kudlicki, Richard C.: *See—*
Crisp, William E.; Engel, Melvyn; Kudlicki, Richard C.; and Smith, Judson L., 4,925,495, Cl. 134-18.000.
Kudo, Yoshinobu: *See—*
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,926,203, Cl. 354-287.000.
Kuhnert, Dieter. Exhaust gas cleaning system for diesel engines. 4,925,463, Cl. 55-96.000.
Kukes, Simon G.; Marshall, Christopher L.; Hopkins, P. Donald; and Hensley, Albert L., Jr., to Amoco Corporation. Hydrocracking process. 4,925,546, Cl. 208-111.000.
Kulhavy, Josef: *See—*
Pacakova, Zdenka; Brokl, Pavel; and Kulhavy, Josef, 4,925,000, Cl. 198-409.000.
Kuliga, Thomas N.: *See—*
Pokrandt, Glenn C.; Busser, William F.; Timmermann, Donald N.; and Kuliga, Thomas N., 4,925,431, Cl. 464-54.000.
Kulisz, Michael, Sr.; and Cooper, Robert N., to A. B. Dick. Conversion solutions for lithographic printing plates containing phytic acid. 4,925,761, Cl. 430-97.000.
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, to Lederle (Japan), Ltd. Antibacterially effective methods and compositions based upon (1R,5S,6S)-2-[(6,7-dihydro-5H-pyrazolo[1,2-a][1,2,4]triazolium-6-yl)]thio-6-[R-1-hydroxyethyl]-1-methyl-carbapenem-3-caroxylate and salts therefore. 4,925,836, Cl. 514-210.000.
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, to Lederle (Japan), Ltd. Methods for the manufacture of (1R,5S,6S)-2-[(6,7-dihydro-5H-pyrazolo[1,2-a][1,2,4]triazolium-6-yl]thio-6-[R-1-hydroxyethyl]-1-methyl-carbapenem-3-carboxylate. 4,925,935, Cl. 540-350.000.
Kume, Masao, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Apparatus for conveying incumbent person. 4,924,538, Cl. 5-81.00B.
Kumiai Chemical Industry Co., Ltd.: *See—*
Inamori, Masahito; Horii, Tetsuo; Shimazu, Tomonori; and Sugaya, Masaji, 4,925,864, Cl. 514-383.000.
Kumura, Yoichi: *See—*
Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi; Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, 4,924,962, Cl. 181-141.000.
Kunita, Hisao; Morita, Akitaka; and Matsuda, Eichika, to Sharp Kabushiki Kaisha. Electronic device for independently erasing secret and non-secret data from memory. 4,926,388, Cl. 365-244.000.
Kunitomo, Tetsunosuke: *See—*
Kataoka, Hiroshi; Kunitomo, Tetsunosuke; and Kobayashi, Takuichi, 4,925,534, Cl. 210-647.000.
Kuniyoshi, Shinji: *See—*
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, 4,925,755, Cl. 430-5.000.
Kuno, Hiroyuki; and Iino, Yujirou, to Kabushiki Kaisha Toshiba. Magnetic head carriage mechanism for a magnetic disk. 4,926,275, Cl. 360-106.000.
Kunz, Peter; Hunger, Heinz; and Wermelinger, Jorg, to Georg Fischer AG. Double-walled pipeline system. 4,925,218, Cl. 285-93.000.
Kuok, Henry, to Code-A-Phone Corporation. Telephone answering machine having call transfer capabilities. 4,926,461, Cl. 379-67.000.
Kurabayashi, Hiroshi: *See—*
Suizu, Yoji; Masaki, Nobuo; Fujita, Takafumi; and Kurabayashi, Hiroshi, 4,924,640, Cl. 52-167.0DF.
Kuramoto, Shinichi: *See—*
Tsubuko, Kazuo; Kuramoto, Shinichi; and Sakai, Kiyoshi, 4,925,763, Cl. 430-106.000
Kurandt, Hans-Friedrich: *See—*
Hamm, Heiner; Hartmann, Peter; Kampner, Karl-Heinz; and Kurandt, Hans-Friedrich, 4,925,826, Cl. 502-407.000.
Kuraray Chemical Co., Ltd.: *See—*
Gemba, Tsuneo; Tamaru, Takeshi; and Matsuura, Tetsuhiko, 4,925,461, Cl. 55-26.000.
Kurashina, Satoru; and Meguro, Hiroshi, to Sony Corporation. Magnetic tape cassette. 4,926,279, Cl. 360-132.000.
Kure, Tokuo: *See—*
Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi; Onai, Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko, 4,926,235, Cl. 357-68.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Oguchi, Yoshiharu; Niimura, Koichi; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; and Yoshikumi, Chikao, 4,925,662, Cl. 424-85.910.
Kuribayashi, Yoshihiro: *See—*
Kotegawa, Michiro; and Kuribayashi, Yoshihiro, 4,925,679, Cl. 426-18.000.
Kurihara, Nobuo: *See—*
Kuroda, Hiroshi; Kurihara, Nobuo; and Sakamoto, Shinichi, 4,924,699, Cl. 73-178.00R.
Kurita, Kenji: *See—*
Inuzuka, Tsuneki; Murakami, Koichi; and Kurita, Kenji, 4,926,310, Cl. 364-186.000.
Kurita, Masayuki: *See—*
Tsujimoto, Yasuhiro; Kurita, Masayuki; and Miki, Minoru, 4,925,718, Cl. 428-68.000.
Kuroda, Hiroshi; Kurihara, Nobuo; and Sakamoto, Shinichi, to Hitachi, Ltd. Position measuring method using a satellite. 4,924,699, Cl. 73-178.00R.
Kuroishi, Nobuhito: *See—*
Itoh, Yoshiaki; Odani, Yusuke; Akechi, Kiyoaki; and Kuroishi, Nobuhito, 4,926,242, Cl. 357-81.000.
Kurosawa, Yoshiaki, to Kabushiki Kaisha Toshiba. Method of decoding in run representation. 4,926,266, Cl. 358-426.000.
Kusumi, Tim J.: *See—*
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 4,926,462, Cl. 379-67.000
Kusumoto, Yoshiro: *See—*
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; Kaneko, Motohiro; Kusumoto, Yoshiro; Takakuwa, Kazuo; and Ikuta, Tetsuya, 4,924,807, Cl. 118-725.000.
Kuwayama, Hideki: *See—*
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 4,926,143, Cl. 331-156.000.
Kuwayama, Yoshinari: *See—*
Hayakawa, Youichi; Kuwayama, Yoshinari; and Yamada, Yoshihiro, 4,924,731, Cl. 74-869.000.
Kyle, James C., to Kyle, James C. Electrical insulating material formed from at least one flux and a crystalline stuffing material. 4,925,607, Cl. 264-60.000.
Kyodo Oil Technical Research Center Co., Ltd.: *See—*
Maeda, Yoshihiro; Hosonuma, Kunihiko; and Tamura, Kenichi, 4,925,596, Cl. 252-32.70E.
Kysor Industrial Corporation: *See—*
Elmer, Arthur E. H., 4,924,986, Cl. 192-58.00B.

VOL
1114
ISS
3
MY
15
1990
UMI

Kyushu Electronic Metal Co., Ltd.: *See—*
Yoshiharu, Tetsujiro; and Kamise, Haruo, 4,925,809, Cl. 437-95.000.
L & JG Stickley: *See—*
DeBlaay, William E., 4,925,255, Cl. 312-204.000.
L. Schuler GmbH: *See—*
Rieger, Walter; and Thudium, Karl, 4,924,692, Cl. 72-405.000.
La-Man Corporation: *See—*
Overby, Kenneth W., 4,925,466, Cl. 55-319.000.
La Telemecanique Electrique: *See—*
Saens, Michel S.; Jacquet, Bruno; Marie, Philippe; Noirot, Frederic; and Tellier, Francois, 4,926,149, Cl. 335-132.000.
LaBerge, Edward F. C.: *See—*
Kelly, Robert J.; and LaBerge, Edward F. C., 4,926,186, Cl. 342-360.000.
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., to VMX/OPCOM. Interface to and operation of a voice messaging system. 4,926,462, Cl. 379-67.000.
Lagow Enterprise, Inc.: *See—*
Miller, Lisa V.; and Lagow, Virginia, 4,925,423, Cl. 446-98.000.
Lagow, Richard J.: *See—*
Juhlke, Timothy J.; Bierschenk, Thomas R.; and Lagow, Richard J., 4,925,583, Cl. 252-58.000.
Lagow, Virginia: *See—*
Miller, Lisa V.; and Lagow, Virginia, 4,925,423, Cl. 446-98.000.
Lahlouh, John; Stewart, Ray F.; Wasley, Robert S.; Hauptly, Paul D.; and Welsh, Laurence M., to Raychem Corporation. Devices for detecting and obtaining information about an event. 4,926,165, Cl. 340-603.000.
L'Air Liquide: *See—*
Lermuzeaux, Andre , 4,924,600, Cl. 34-10.000.
Laitram Corporation, The: *See—*
Lapeyre, James M., 4,925,013, Cl. 198-698.000.
Lapeyre, James M., 4,925,016, Cl. 198-834.000.
Lam, Michael K.; and Kazewych, Bohdan, to General Motors Corporation. Down stop for cross arm window regulator 4,924,627, Cl. 49-351.000.
Lamb, Joseph M.: *See—*
Long, William L.; Wambach, Robert F.; Baty, Kurt F.; Lamb, Joseph M.; and McNamara, John E., 4,926,315, Cl. 364-200.000.
Lamerie, N.V.: *See—*
Perovetz, Lawrence M.; Pickthall, Jack, deceased; and Pickthall, Terence, executor, 4,925,491, Cl. 106-1.190.
Lammers, Donald W.: *See—*
Beaudoin, Henry J.; Lammers, Donald W.; and McCabe, John A., 4,925,520, Cl. 156-494.000.
Lamoreaux, Michael A Soil mixture and method of making same. 4,925,493, Cl. 106-272.000.
Lamy, Bernard: *See—*
Schneider, Michel; Guillot, Christian; and Lamy, Bernard, 4,925,818, Cl. 502-7.000.
Lancisi, David M.: *See—*
Gauthier, Raymond G.; Krause, James N.; and Lancisi, David M., 4,926,077, Cl. 310-68.00C.
Lancraft, Roy E.: *See—*
Onaga, Eimei M.; Casler, Richard J., Jr.; Penkar, Rajan C.; Lancraft, Roy E.; and Sha, Chi, 4,925,312, Cl. 364-513.000.
Landis, Phillip S : *See—*
Erickson, Frank L.; Anderson, Robert E.; and Landis, Phillip S., 4,925,581, Cl. 252-48.200.
Lane, John M. Reaction time display device. 4,924,712, Cl. 73-865.400.
Lane, William A., Jr., to W. A. Lane, Inc. Solar powered air filter system. 4,924,762, Cl. 98-58.000.
Lange, Rolf-Peter: *See—*
Ruby, James A.; Lange, Rolf-Peter; and Hoover, Randy C., 4,924,628, Cl. 49-380.000.
Langen, Christianus P.; and Langen, Johannes C., to Langen Research B.V. Device for the injection of a quantity of meat. 4,924,771, Cl. 99-533.000.
Langen, Johannes C.. *See—*
Langen, Christianus P.; and Langen, Johannes C., 4,924,771, Cl. 99-533.000.
Langen, Marinus J. M.; Guttinger, Peter; and Borza, Mihai M., to H. J. Langen & Sons Limited. Packaging machinery and a method of making a wrap-around shipper package. 4,924,654, Cl. 53-399.000.
Langen Research B.V.: *See—*
Langen, Christianus P.; and Langen, Johannes C., 4,924,771, Cl. 99-533.000.
Langer, Salomon: *See—*
Cavero, Icilio; Cazor, Jean-Louis; Hicks, Peter; and Langer, Salomon, 4,925,837, Cl. 514-211.000.
Lanzetta, Carmen: *See—*
Huebscher, Laszlo; and Lanzetta, Carmen, 4,925,266, Cl. 350-96.200.
Lapeyre, James M., to Laitram Corporation, The. Conveyor belt having a high friction conveying surface. 4,925,013, Cl. 198-698.000.
Lapeyre, James M., to Laitram Corporation, The. Heavy duty modular conveyor belt and sprocket with unique tracking. 4,925,016, Cl. 198-834.000.
Larsen, Michael T.: *See—*
Larsen, Timothy P.; Devine, James A.; and Larsen, Michael T., 4,924,860, Cl. 128-205.120.
Larsen, Timothy P.; Devine, James A.; and Larsen, Michael T., to Criticare Systems, Inc. Water trap and associated control system. 4,924,860, Cl. 128-205.120.
Larson, Brad W.; Hockersmith, Dan; Taylor, Thomas H.; Bedinger, John M.; Kottman, Rick; and Pebley, Steve, to Texas Instruments, Incorporated. Universal tooling system for microwave hybrid devices. 4,925,167, Cl. 269-112.000.
LaRue, Gary W.: *See—*
Meuser, William E.; LaRue, Gary W.; Harris, Windel L.; Donahue, James A.; Bonney, L. H.; and Glanton, Gene W., 4,925,532, Cl. 202-219.000.
Lathers, Michael W., to Outboard Marine Corporation. Recreational boat dinette/sleeper. 4,924,798, Cl. 114-363.000.
Latka, Paul J.: *See—*
Hazelton, Donald R.; Latka, Paul J.; Lyons, Joseph N., Jr.; and Spender, Eugene H., Jr., 4,925,214, Cl. 283-62.000.
Latreille, Maurice G.: *See—*
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,925,100, Cl. 239-416.400.
Lauly, Alain. Production of a food powder and of food products containing the powder. 4,925,693, Cl. 426-549.000.
Laurent, Henry: *See—*
Bohlmann, Rolf; Laurent, Henry; Henderson, David; and Nishino, Yukishige, 4,925,834, Cl. 514-177.000.
Laver, Hugh, to Ciba-Geigy Corporation. Ink jet recording process using certain benzotriazole derivatives as light stabilizers. 4,926,190, Cl. 346-1.100.
Lawrence, William: *See—*
Schaeffer, George; and Lawrence, William, 4,924,889, Cl. 132-73.000.
Lawson, Randall S.: *See—*
Orndorff, Karl B.; and Lawson, Randall S., 4,924,974, Cl. 187-1.00R.
Leader Candies, Inc.: *See—*
Kastin, Howard, 4,925,686, Cl. 426-131.000.
Lear, Mark; Schlunke, Christopher K.; and Seeber, Kenneth P., to Orbital Engine Company Proprietary Limited. Exhaust gas treatment for a two stroke engine. 4,924,820, Cl. 123-65.0PE.
Learned, Thomas J. Combination golf club and turf repair tool. 4,925,190, Cl. 273-162.00F.
Lechtken, Peter; Hoercher, Ulrich; and Jessel, Barbara, to BASF Aktiengesellschaft. Preparation of d-α-tocopherol from natural intermediates. 4,925,960, Cl. 549-412.000.
LeCompte, George W., to Hughes Aircraft Company. Deep nested filament winding. 4,925,125, Cl. 242-117.000.
Lederle (Japan), Ltd.: *See—*
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,836, Cl. 514-210.000.
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,935, Cl. 540-350.000.
Lederman, Frederick E., to General Motors Corporation. Control car roller clutch with improved assembly. 4,924,980, Cl. 192-45.000.
Lederman, Frederick E., to General Motors Corporation. Unitized sealed thrust bearing assembly. 4,925,323, Cl. 384-607.000.
Lederman, Frederick E.. *See—*
Johnston, Albert D.; and Lederman, Frederick E., 4,924,981, Cl. 192-45.000.
Lee, Clark J. Reversible pipe wrench. 4,924,735, Cl. 81-133.000.
Lee, David L., to Imperial Chemical Industries PLC. Certain 7-(2-substituted benzoyl)-1-heterospiro-(4,5)decane-(6,8)-diones. 4,925,479, Cl. 71-91.000.
Lee, Garrett: *See—*
Rink, John L.; Rink, Dan L.; and Lee, Garrett, 4,925,265, Cl. 350-96.180.
Lee, Jen-Jiang: *See—*
Sun, Shih W.; and Lee, Jen-Jiang, 4,926,237, Cl. 357-71.000.
Lee, John Y.; and Shepherd, Lawrence H., Jr., to Ethyl Corporation. Para-bromination of ortho-alkyl anilines. 4,925,984, Cl. 564-412.000.
Lee, Sung K.: *See—*
DeCicco, Steven G.; Lee, Sung K.; Novak, Rudy G.; Wass, William E.; and Mak, Kai K., 4,925,389, Cl. 432-106.000.
Leedy, Glenn J. Method of making and testing an integrated circuit. 4,924,589, Cl. 29-832.000.
Leenders, Luc H.: *See—*
Daems, Eddie R.; and Leenders, Luc H., 4,925,767, Cl. 430-258.000.
Leeson, Paul D.: *See—*
Baker, Raymond; Leeson, Paul D.; Ludduwahetty, Tamara; and Williams, Brian J., 4,925,867, Cl. 514-425.000.
Legrand, Guy: *See—*
Fourche, Jean-Pierre; Legrand, Guy; Faivre, Michel; and Berthaut, Olivier, 4,925,420, Cl. 445-3.000.
Lehmann, Hanno; Uphus, Arnold; and Kreimer, Johannes, to Westfalia Separator Aktiengesellschaft. Device for manufacturing butter. 4,924,769, Cl. 99-455.000.
Lehmkuhl, Herbert; and Mehler, Klaus-Dieter, to Studiengesellschaft Kohle mbH. Processes for adhesion-bonding between metallic materials and galvanic aluminum layers and non-aqueous electrolytes employed therein. 4,925,536, Cl. 204-58.500.
Lehn, Jean M.; Jazwinski, Jaroslaw; and Blacker, John, to Compagnie Oris Industrie. Diazapyrene compounds useful for photocleavage of nucleic acids. 4,925,937, Cl. 540-477.000.
Leigh-Monstevens, Keith V.: *See—*
Barker, David C.; and Leigh-Monstevens, Keith V., 4,924,673, Cl. 60-589.000.
Leinhaas Industrieberatung: *See—*
Scheitza, Matthias, 4,925,078, Cl. 226-108.000.

Leini, Arvo, to Sandvik AB. Chainsaw guidebar. 4,924,577, Cl. 30-387.000.
Leland, John D., to Teledyne Industries, Inc. Highly compactable zirconium sponge and its manufacture. 4,925,486, Cl. 75-360.000.
Le Martret, Odile: *See—*
Clemence, Francois; Le Martret, Odile; and Delevallee, Francoise, 4,925,859, Cl. 514-342.000.
Lemmerz-Werke KGaA: *See—*
Aderer, Peter, 4,925,248, Cl. 301-9.0TV.
Lemo M. Lehmacher & Sohm GmbH: *See—*
Schneider, Jakob, 4,925,439, Cl. 493-204.000.
Lennon, Dennis R.: *See—*
Bellas, George T.; Snedden, Richard B.; Lennon, Dennis R.; and Foster, Edward P., 4,924,784, Cl. 110-261.000.
Lentz, Norbert; and Schmidt, Harald, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Conveyor apparatus having means for a shock-free article acceleration. 4,925,006, Cl. 198-461.000.
Lenzen, Reiner, to TRW Vehicle Safety Systems Inc. Apparatus for igniting a pyrotechnic transmission line. 4,924,774, Cl. 102-202.700.
Leonard, George H., to Hamlin Transmission Company. Variable-ratio transmissions, separately and in bicycles. 4,925,201, Cl. 280-238.000.
Leonard, Laurence E., Jr.; and Mostad, Dennis A., to Hawaii Stevedores, Inc. Manually operated cargo container hook apparatus. 4,925,226, Cl. 294-82.100.
Leone, David A.; Buxton, Clifford A.; and Quinton, Don, to Siemens Energy & Automation, Inc. Moving contact blade barrier. 4,926,016, Cl. 200-144.00R.
Leone, David A.; Buxton, Clifford A.; Tharp, James A.; and McCord, Neil A., to Siemens Energy & Automation, Inc. Moving copper pivot. 4,926,019, Cl. 200-147.00R.
Leone, David A.: *See—*
Buxton, Clifford A.; and Leone, David A., 4,926,018, Cl. 200-147.00R.
LePage, Alfred D.: *See—*
Flowers, Barbara A.; Marsh, Richard A.; Haraf, John C.; and LePage, Alfred D., 4,926,335, Cl. 364-431.050.
Lequesne, Bruno P. B.: *See—*
Schroeder, Thaddeus; and Lequesne, Bruno P. B., 4,926,122, Cl. 324-207.130.
Lermuzeaux, Andre , to L'Air Liquide. Fluidization treatment process and installation. 4,924,600, Cl. 34-10.000.
Lerner, Bernard: *See—*
Lerner, Hershey; and Lerner, Bernard, 4,926,048, Cl. 250-548.000.
Lerner, Hershey; and Lerner, Bernard, to Automated Packaging Systems, Inc. Process of performing work on a continuous web. 4,926,048, Cl. 250-548.000.
Lerner, Ronald L.: *See—*
Montagino, James G.; Butzko, Betty; and Lerner, Ronald L., 4,926,027, Cl. 219-222.000.
Le Roux, Patrick, to General Electric CGR S.A. Method for the removal of artifacts in an NMR imaging experiment. 4,926,124, Cl. 324-309.000.
L'Etat Francais represente par le Ministre Des Postes Et Telecommunications - Centre National d'Etudes des Telecommunications: *See—*
Menigaux, Louis; and Dugrand, Louis, 4,925,811, Cl. 437-129.000.
Letoffe, Jean-Marie: *See—*
Claudy, Pierre; Letoffe, Jean-Marie; and Commercon, Jean-Claude, 4,925,314, Cl. 374-16.000.
Leung, Pak S.; Goddard, Errol D.; and Ancker, Fred H., to Union Carbide Chemicals and Plastics Company Inc. Process for processing thermoplastic polymers. 4,925,890, Cl. 524-133.000.
Levi, Anthony F. J., to AT&T Bell Laboratories. Bipolar hot electron transistor. 4,926,221, Cl. 357-16.000.
Levin, Morris A. Garment with replaceable displays. 4,924,613, Cl. 40-586.000.
Levinson, Gary. Pressure controller and leak detector for tracheal tube cuff. 4,924,862, Cl. 128-207.160.
Levinthal, Michael L., to Thiokol Corporation. Recovery of nitric acid and sulfuric acids in production of beta HMX. 4,925,936, Cl. 540-475.000.
Lewis, Brian G.: *See—*
Muench, George J.; Lewis, Brian G.; Ashok, Sankaranarayanan; Watson, William G.; and Cheskis, Harvey P., 4,925,103, Cl. 239-79.000.
Lewis, Craig A.: *See—*
Reger, Philip R.; McGarry, Patrick J.; and Lewis, Craig A., 4,926,458, Cl. 379-27.000.
Lewis, David L. Construction board grid system with imprint and method of using same. 4,924,644, Cl. 52-105.000.
Lewis, John W.; and Smith, Colin F. C., to Reckitt & Colman Products Limited. Derivative of codeine useful as an agonist and process for the preparation of it. 4,925,848, Cl. 514-282.000.
Lewis, Thomas F.; and Ochsenreiter, John E., to Snap-Tire, Inc. Hydraulic control valves. 4,924,902, Cl. 137-270.000.
Lewyn, Lanny L.; and Lou, Perry W., to Brooktree Corporation. Self-timing analog-to-digital converting system. 4,926,176, Cl. 341-135.000.
Leydier, Robert A., to Schlumberger Industries, Inc. Triangle waveform generator for pulse-width amplitude multiplier. 4,926,131, Cl. 328-181.000.
L'Heureux, Ghislain. Acoustic door. 4,924,969, Cl. 181-290.000.
Liber, Theodore: *See—*
Orkin, Fredric I.; Liber, Theodore; Smith, Charles R.; Knowlton, Kimball J.; and Huntley, Albin, 4,925,444, Cl. 604-80.000.
Liberti, Paul A., to Immunicon Corporation. Immunoassay system and procedure based on precipitin-like interaction between immune complex and Clq or other non-immunospecific factor. 4,925,788, Cl. 435-7.000.
Licht, Brigitte H.; Bentley, Roger T.; and Schell, Frederick S., to Hart Chemical Limited. Low foaming surfactant. 4,925,988, Cl. 568-625.000.
Lileck, John T.: *See—*
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,925,992, Cl. 570-130.000.
Liles, Donald T., to D and D Enterprises Device for holding tacos and other foods. 4,925,032, Cl. 206-564.000.
Lilliwyte Societe Anonyme: *See—*
Wright, Michael L., 4,925,749, Cl. 429-104.000.
Limburg, John M.: *See—*
Thacker, Milton B.; Limburg, John M.; and Memmott, Vincent J., 4,925,632, Cl. 422-142.000.
Limoni, Alfredo, to Simonazzi A: & L. S.p.A. Apparatus for converting a multi-row stream of upright articles, in particular bottles, to a single row. 4,925,003, Cl. 198-452.000.
Lin, Hsien C. Rechargeable garden sprayer. 4,925,105, Cl. 239-154.000.
Lin, Ming-fang; and Cheng, C. H. Machine for manufacturing button connector and method therefor. 4,924,918, Cl. 140-102.000.
Lin, Shyuh-Der, to Industrial Technology Research Institute. Wave forming circuit of an electronic tone generator. 4,924,747, Cl. 84-663.000.
Linara Investments Limited: *See—*
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.
Lind, Matthew R.: *See—*
Kovacs, Lloyd; and Lind, Matthew R., 4,924,656, Cl. 53-436.000.
Lindblom, Kurt L.; Simila , Jussi J.; and Kanervo, Seppo J., to Miller-Johannisberg Druckmaschinen GmbH. Apparatus for assembling and depositing signatures. 4,925,173, Cl. 270-54.000.
Lindemann, Klaus: *See—*
Holst, Hans; Lindemann, Klaus; Saba, Manfred; Kaess, Hans-Harald; and Petersen, Erwin, 4,925,254, Cl. 303-111.000.
Linden, Craig L. Insulated engine. 4,924,818, Cl. 123-41.140.
Lindner, Christian: *See—*
Kress, Hans-Jurgen; Lindner, Christian; Muller, Friedemann; Peters, Horst; Wittmann, Dieter; and Buekers, Josef, 4,925,891, Cl 524-139.000.
Lindner, Klaus: *See—*
Buchschmid, Emil; Frenznick, Anton; Lindner, Klaus; Schmid, Olaf; Schmid, Hans-Dieter; Schmidt, Gerhard; and Sturm, Theodor, 4,926,150, Cl. 335-196.000.
Link Racing, Inc.: *See—*
Simmel, Thomas L.; and Baker, Craig A., 4,924,921, Cl. 141-286.000.
Linklater, Peter G. Apparatus for winding and unwinding wire. 4,925,435, Cl. 474-101.000.
Linton, Leon; and Campbell, Michael L., to Southern Systems, Inc. Maximum density conveyor system. 4,924,777, Cl. 104-172.200.
Lion Analytics Pty. Limited: *See—*
Porter, Anthony; and Breakspere, Robert, 4,926,164, Cl. 340-576.000.
Lion Corporation: *See—*
Terao, Toshimi; Kiyama, Kentaro; and Kitano, Kyozo, 4,925,976, Cl. 562-123.000.
Lipshultz, Alfred J.: *See—*
Lipshultz, Mitchell; and Lipshultz, Alfred J., 4,925,551, Cl. 210-140.000.
Lipshultz, Mitchell; and Lipshultz, Alfred J., to Lipshultz, Alfred J. Portable water purification system including electronic memory panel assembly. 4,925,551, Cl. 210-140.000.
Liquid Air Corporation: *See—*
Students, Peter A., 4,925,095, Cl. 239-1.000.
Liskey, Merle E., to Chrysler Corporation. Vapor control insulation blanket. 4,925,465, Cl. 55-267.000.
LITEF GmbH: *See—*
Beyer, Otto; and Kirst, Bertold, 4,924,749, Cl. 89-41.090.
Little, Mervyn A.: *See—*
Matthews, James R. A.; Little, Mervyn A.; and Fisher, John, 4,924,867, Cl. 128-645.000.
Littmann, Dieter: *See—*
Huemmer, Wolfgang; Bronstert, Bernd; Littmann, Dieter; and Zuerger, Manfred, 4,925,769, Cl. 430-271.000.
Litton Systems, Inc.: *See—*
Perugini, Michael N., 4,925,353, Cl. 411-453.000.
Litzinger, Elmer F., to Brown & Williamson Tobacco Corporation. Smoking article. 4,924,886, Cl. 131-194.000.
Liverance, Martin K.; McMahan, David R.; and Haydu, Bartly A., to General Motors Corporation. Headlamp assembly. 4,926,301, Cl. 362-226.000.
Livingstone, James: *See—*
Higham, Graham J.; Pruitt, Gerald R.; Morris, Ronald; Heger, Frank; Livingstone, James; and Tormey, David, 4,924,675, Cl. 62-6.000.
LMT Radio Professionnelle: *See—*
Fourdan, Louis, 4,926,183, Cl. 342-67.000.
Lo, Shui-Yin, to Apricot S.A. Accelerator for coherent bosons. 4,926,436, Cl. 372-73.000.
Lobaugh, Thomas E.: *See—*
Strauss, Daniel L.; Taylor, Thomas H.; Stearns, Charles L.; and Lobaugh, Thomas E., 4,925,585, Cl. 252-89.100.
Locanetto, Philippe; Bury, Frederic; and Pizant, Jacques. Process and apparatus intended to effect staged combustion of a mixture of fuel

VOL
1114
ISS
3
MY
15
1990
UMI

and comburent to reduce the production of nitrogen oxides. 4,925,387, Cl. 431-187.000.
Lockheed Corporation: *See—*
Harper-Tervet, Jan; Simenz, Rod F.; and George, James C., 4,925,721, Cl. 428-116.000.
Lo Consolo, Mauro: *See—*
Matarrese, Savino; Rossi, Anna Grazia; Lo Consolo, Mauro; Cigna, Giuseppe; and Borghi, Italo, 4,925,896, Cl. 525-53.000.
Lodrick, Lawrence E., Sr. Clamp with fast-acting, one-hand adjustment. 4,925,169, Cl. 264-185.000.
Loggains, Johnnie L.: *See—*
Raible, Robert L.; and Loggains, Johnnie L., 4,925,343, Cl. 405-60.000.
Logsdon, Duane D., to Logsdon Foundation. Tub boxes. 4,925,045, Cl. 220-4.00E.
Logsdon Foundation: *See—*
Logsdon, Duane D., 4,925,045, Cl. 220-4.00E.
Lohrmann, Gerhard: *See—*
Bischof, Stefan; Lohrmann, Gerhard; and Setz, Michael, 4,925,326, Cl. 400-616.100.
Lomasney, David J.; Dietze, Robert H.; and Rohrback, Jeffrey D., to Hoover Universal, Inc. Functional door cartridge and method of manufacturing thereof 4,924,630, Cl. 49-502.000.
Long Island Jewish Medical Center: *See—*
Shikowitz, Mark J., 4,925,736, Cl. 424-449.000.
Long, Joseph F.: *See—*
Ahlberg, Walter F., Jr.; and Long, Joseph F., 4,925,557, Cl. 210-321.680.
Long, William L.; Wambach, Robert F.; Baty, Kurt F.; Lamb, Joseph M.; and McNamara, John E., to Stratus Computer, Inc. Digital data processor with fault tolerant peripheral bus communications. 4,926,315, Cl. 364-200.000.
Loock, Freidrich, to Adams Rite Manufacturing Co. Door latch actuating mechanism. 4,925,222, Cl. 292-336.300.
Loop-A-Line, Inc.: *See—*
McGahee, Welbourne D., 4,924,618, Cl. 43-43.600.
Loos, Rolf: *See—*
Hedtke, Rolf; Loos, Rolf; Mester, Roland; and Hansel, Jurgen, 4,926,425, Cl. 371-22.600.
Lord, Barbara; and Keightley, Tom. Mirror assembly for facilitating trailer hitch element alignment. 4,925,287, Cl. 350-632.000.
L'Oreal: *See—*
Grollier, Jean F.; and Cotteret, Jean, 4,925,653, Cl. 424-47.000.
Grollier, Jean F.; and Dubief, Claude, 4,925,659, Cl. 424-78.000.
Loree, Thomas R.: *See—*
Cremers, David A.; Radziemski, Leon J.; and Loree, Thomas R., 4,925,307, Cl. 356-318.000.
Lorenz, Reinhard, to Hoffmann-La Roche Inc. Amide side-chain polymers. 4,925,589, Cl. 252-299.010.
Lou, Perry W.: *See—*
Lewyn, Lanny L.; and Lou, Perry W., 4,926,176, Cl. 341-135.000.
Loutfy, Rafik O.: *See—*
Baranyi, Giuseppa; Hor, Ah-Mee; Loutfy, Rafik O.; and Popovic, Zoran D., 4,925,760, Cl. 430-59.000.
Lovik, Craig J. Balloon sculpturing methods, apparatus and products. 4,925,426, Cl. 446-226.000.
Low, Howard M.: *See—*
Monnier, John R.; Muehlbauer, Peter J.; and Low, Howard M., 4,925,986, Cl. 568-450.000.
Monnier, John R.; and Low, Howard M., 4,925,987, Cl. 568-450.000.
Lowe, Michael E.: *See—*
Witzke, Duane W.; Selbert, Alan J.; and Lowe, Michael E., 4,925,513, Cl. 156-245.000.
Lowenstein, Carl D.: *See—*
Boegeman, Dwight E.; Lowenstein, Carl D.; and Spiess, Fred N., 4,926,395, Cl. 367-89.000.
Lubrizol Corporation, The: *See—*
Steckel, Thomas F., 4,925,983, Cl. 564-8.000.
Lucy, Andrew R.: *See—*
Brown, Stephen L.; and Lucy, Andrew R., 4,925,918, Cl. 528-392.000.
Ludduwahetty, Tamara: *See—*
Baker, Raymond; Leeson, Paul D.; Ludduwahetty, Tamara; and Williams, Brian J., 4,925,867, Cl. 514-425.000.
Ludwig, Gary L.; and Verschueren, Edward M., to Haworth Sub, Inc. Office cabinet with flipper door and interlocking drawer and suspension assemblies. 4,925,258, Cl. 312-323.000.
Ludwig Schokolade GmbH: *See—*
Hunninghaus, Werner; and Hunninghaus, Werner, 4,925,035, Cl. 206-633.000.
Luettge, Sabine: *See—*
Schenker, Gilbert; Piorr, Robert; and Luettge, Sabine, 4,925,587, Cl. 252-174.220.
Lugo, George J. Bicycle fork protector and wheel reflector apparatus. 4,925,204, Cl. 280-295.000.
Luma Telecom, Inc.: *See—*
Ueno, Yutaka; Emmons, Lawrence D.; Kaneko, Koji; and Semasa, Takayoshi, 4,926,245, Cl. 358-12.000.
Lummus Crest Inc.: *See—*
Chakravarti, Bhaven; and Johnson, Thomas W., 4,925,638, Cl. 422-310.000.
Lundell, Vernon J. Slow speed shredder. 4,925,116, Cl. 241-236.000.
Lundsgaard, Jorgen S.: *See—*
Shackle, Dale R.; Fauteux, Denis G.; and Lundsgaard, Jorgen S., 4,925,751, Cl. 429-191.000.
Lune: *See—*
Celant, Jean J., 4,924,803, Cl. 118-630.000.
Lungu, Cornelius. Electric component with inductive and capacitive properties. 4,926,111, Cl. 323-355.000.
Lutz, Eugene G.: *See—*
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,925,992, Cl. 570-130.000.
Luxor Corporation: *See—*
Nicholds, Donald L., 4,924,782, Cl. 108-27.000.
Lyon, Kenneth S.: *See—*
Iyer, Lokanathan M.; Yim, Jeffrey B.; and Lyon, Kenneth S., 4,925,268, Cl. 350-96.290.
Lyons, Joseph N., Jr.: *See—*
Hazelton, Donald R.; Latka, Paul J.; Lyons, Joseph N., Jr.; and Spender, Eugene H., Jr., 4,925,214, Cl. 283-62.000.
Lytle, Ronald W.: *See—*
Fleming, Jerry A.; and Lytle, Ronald W., 4,925,071, Cl. 224-207.000.
M. H. Center Limited: *See—*
Kanamaru, Hisanobu; Aoyama, Susumu; Koike, Tsutomu; Asahi, Naotatsu; and Hirai, Yoshiki, 4,924,690, Cl. 72-343.000.
M.P.A. Meccanica Plastica Agordina S.p.A.: *See—*
Parissenti, Stefano; and Parissenti, Lino, 4,924,526, Cl. 2-13.000.
M&T Chemicals Inc.: *See—*
McKown, Clem, 4,924,936, Cl. 165-47.000.
Silbermann, Joseph; and Burchill, Michael T., 4,925,739, Cl. 428-522.000.
Maack, Werner: *See—*
Gerst, Michael; Knapp, Horst J. T.; and Maack, Werner, 4,925,007, Cl. 198-470.100.
Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., to AFA Products, Inc. Foam-off nozzle assembly with barrel screen insert for use in a trigger sprayer. 4,925,106, Cl. 239-333.000.
Maass, Dora, Peter Maass, heirs: *See—*
Haendle, Joerg; and Maass, Wolfgang, deceased, 4,926,454, Cl. 378-100.000.
Maass, Wolfgang, deceased: *See—*
Haendle, Joerg; and Maass, Wolfgang, deceased, 4,926,454, Cl. 378-100.000.
MacGahan, Jonathan P.: *See—*
Flam, Richard P.; and MacGahan, Jonathan P., 4,926,145, Cl 333-125.000.
Machau, Susanne, to Benninger AG. Process and apparatus for mercerizing a fabric web. 4,924,545, Cl. 8-151.000.
Machida, Yoshisuke: *See—*
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,836, Cl. 514-210.000.
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,935, Cl. 540-350.000.
Machino, Toshimichi; Oda, Saiji; Toubo, Kihachirou; and Kadosaki, Masahiro, to Elco Co., Ltd. Transducer to detect force which is applied to machine tool when machining workpiece and its attaching structure. 4,924,713, Cl. 73-862.060.
Machonkin, Mary A.: *See—*
Jansen, Frank; and Machonkin, Mary A., 4,925,701, Cl. 427-38.000.
MacKay, Joseph H., Jr. Finishing article having an integral mounting hub and improved base. 4,924,634, Cl. 51-168.000.
Mackenroth, Wolfgang; Hoelderich, Wolfgang; Becker, Rainer; and Seufert, Walter, to BASF Aktiengesellschaft. Preparation of dien-1-ols, 9-hydroxydodec-10-enyl 1-tert-butyl ether and use thereof as an intermediate for synthesizing 8,10-dodecadienol. 4,925,991, Cl. 568-908.000.
MacLeod, Richard J.; Schiedegger, Charles E.; and Chubb, Norman L., to Tapco Products Company, Inc. Roof vent. 4,924,761, Cl. 98-42.210.
MacMillan, David C.; and Graham, Andrew C., to Gazelle Microcircuits, Inc. Compound semiconductor integrated circuit compatible standard logic signals. 4,926,071, Cl. 307-475.000.
Macris, James. Portable folding crane. 4,925,039, Cl. 212-182.000.
Madeleine, Dennis G.; Senkler, Carol A.; and Grezzo Page, Loretta A., to Du Pont de Nemours, E. I., and Company. Positive solid block toner. 4,925,764, Cl. 430-110.000.
Madeleine, Dennis G., to Du Pont de Nemours, E. I., and Company. Negative solid block toner. 4,925,765, Cl. 430-110.000.
Madland, Paul D., to Intel Corporation. Memory timing circuit employing scaled-down models of bit lines using reduced number of memory cells. 4,926,387, Cl. 365-233.000.
Maeda, Kenichi; Tsuboi, Hiroyuki; and Takebayashi, Yoichi, to Kabushiki Kaisha Toshiba. Pattern recognition device. 4,926,491, Cl. 382-14.000.
Maeda, Takamichi: *See—*
Fujita, Kazuya; Maeda, Takamichi; and Hayakawa, Masao, 4,926,239, Cl. 357-72.000.
Maeda, Takanori, to Pioneer Electronic Corporation. Light detector. 4,926,036, Cl. 250-201.100.
Maeda, Yoshihiro; Hosonuma, Kunihiko; and Tamura, Keiichi, to Kyodo Oil Technical Research Center Co., Ltd.; and Nippon Mining Company, Limited. Lubricating oil composition containing molybdenum and zinc compounds for internal combustion engine. 4,925,596, Cl. 252-32.70E.
Maehashi, Tatsuichi: *See—*
Koshizuka, Kunihiro; Asano, Masao; Tezuka, Toshiaki; Maehashi, Tatsuichi; and Tanaka, Yasuhiko, 4,925,735, Cl. 428-423.100.

Maeno, Hideshi, to Mitsubishi Denki Kabushiki Kaisha. Test auxiliary circuit for testing semiconductor device. 4,926,424, Cl. 371-22.300.
Maerkl, Robert; and Harder, Wolfgang, to BASF Aktiengesellschaft. Preparation of alkyl pentenoates. 4,925,972, Cl. 560-206.000.
Maes, Felix V.; and Baikrich, Michel, to ARSOC S.p.r.l. Laser pointer. 4,926,438, Cl. 372-109.000.
Magdzinski, Leon: *See—*
Yalpani, Manssur; and Magdzinski, Leon, 4,925,923, Cl. 530-506.000.
Mages, Gert: *See—*
Dickert, Franz; Kimmel, Heinz; Mages, Gert; and Schreiner, Sabine, 4,926,156, Cl. 338-36.000.
Magistretti, Maria J.: *See—*
Gabetta, Bruno; Magistretti, Maria J.; and Dostert, Philippe, 4,925,870, Cl. 514-453.000.
Gabetta, Bruno; and Magistretti, Maria J., 4,925,871, Cl. 514-453.000.
Magna International Inc.: *See—*
Harney, William J. J., 4,924,584, Cl. 29-509.000.
Mahmoodian, Saeed. Surgical retractor. 4,924,857, Cl. 128-20.000.
Mai, Jimbin; Chambers, Laura J.; and McDonald, Richard E., to Nestec S.A. Process for inhibiting lipid oxidation in food and composition thereby. 4,925,681, Cl. 426-52.000.
Maichle, Josef, to Robert Bosch GmbH. Agricultural pulling machine with automatic pitch vibration damping mechanism. 4,924,943, Cl. 172-1.000.
Maier-Laxhuber, Peter; and Kaubek, Fritz J. Adsorption cooler. 4,924,676, Cl. 62-59.000.
Main, Ewan J., to Woodbridge Group, The. Pillow. 4,924,540, Cl. 5-436.000.
Main, William E., to Motorola Inc. FM detector with reduced distortion. 4,926,132, Cl. 329-318.000.
Maini, Rajnish; and Spangler, Harold L., to Motorola Inc. Clock distribution circuit having minimal skew. 4,926,066, Cl. 307-303.100.
Maintenance Concepts, Inc.: *See—*
Tarry, Timothy A., 4,926,026, Cl. 219-213.000.
Mais, Franz-Josef; and Fiege, Helmut, to Bayer Aktiengesellschaft. Process for the ring chlorination of aromatic hydrocarbons. 4,925,994, Cl. 570-210.000.
Maisenbacher, Bernd; and Schmidt, Siegmar, to Hewlett-Packard Company. Variable optical attenuator. 4,925,273, Cl. 350-315.000.
Mak, Kai K.: *See—*
DeCicco, Steven G.; Lee, Sung K.; Novak, Rudy G.; Wass, William E.; and Mak, Kai K., 4,925,389, Cl. 432-106.000.
Maki, Kazuyoshi; Harada, Sadami; and Nakashima, Takanori, to Togami Electric Mfg., Co., Ltd. Enclosed switchboard. 4,926,286, Cl. 361-345.000.
Makihara, Tsutomu: *See—*
Kondo, Ikuzo; and Makihara, Tsutomu, 4,924,790, Cl. 112-272.000.
Makita Electric Works, Ltd.: *See—*
Fushiya, Fusao; Yoshida, Kenji; Naitoh, Akira; and Sawa, Tetsuya, 4,926,075, Cl. 310-50.000.
Makus, Zdzislaw, to Codal-Chemie GmbH. Aqueous mold release agent for the producton of molded polyurethane articles. 4,925,882, Cl. 521-132.000.
Mallinckrodt, Inc.: *See—*
Nosco, Dennis L.; and Verbruggen, Alfons M., 4,925,650, Cl. 424-1.100.
Mallinson, A. Martin, to Analog Devices, Inc. Delta modulator with integrator having positive feedback. 4,926,178, Cl. 341-143.000.
Maloizel, Christian: *See—*
George, Pascal; Sevrin, Mireille; Maloizel, Christian; Tixidre, Arlette; and Froissant, Jacques, 4,925,850, Cl. 514-307.000.
Manchester R & D Partnership: *See—*
Fergason, James L., 4,925,275, Cl. 350-333.000.
Mandard-Cazin, Bernadette: *See—*
Massonneau, Viviane; Mulhauser, Michel; Buforn, Albert; and Mandard-Cazin, Bernadette, 4,925,952, Cl. 548-338.000.
Mandel, Barry P.: *See—*
Kramer, William E.; Charland, Terrence D.; Forward, John E.; Burger, William R.; and Mandel, Barry P., 4,925,171, Cl. 270-53.000.
Manhes, Hubert: *See—*
Ognier, Jean-Francois; and Manhes, Hubert, 4,924,851, Cl. 128-4.000.
Mann, Robert N., to Mig Vac Inc. Welding gun cable saddle. 4,926,024, Cl. 219-137.310.
Mann, Tarlochan S.: *See—*
Pollack, Jack; and Mann, Tarlochan S., 4,925,219, Cl. 285-95.000.
Manner, Otto. Apparatus for admitting hardenable material into the dies of molding machines. 4,925,384, Cl. 425-564.000.
Mannesmann AG: *See—*
Pallasvirta, Jaakko T., 4,925,010, Cl. 198-588.000.
Mannesmann Aktiengesellschaft: *See—*
Bischof, Stefan; Lohrmann, Gerhard; and Setz, Michael, 4,925,326, Cl. 400-616.100.
Mannesmann Rexroth GmbH: *See—*
Feuser, Alfred; Neumann, Joachim; and Voxbrunner, Walter, 4,924,754, Cl. 91-363.00R.
Reinert, Michael, 4,924,671, Cl. 60-428.000.
Mannick, John A.; Rodrick, Mary; and Nimberg, Richard, to Brigham and Women's Hospital. Immunosuppressive polypeptides. 4,925,920, Cl. 530-387.000.
Manning, James H.: *See—*
Tse, Stephen H.; Hollenberg, David H.; Martin, Richard L.; and Manning, James H., 4,925,528, Cl. 162-146.000.
Manning, Michael P.: *See—*
Klausner, Mitchell; Manning, Michael P.; and Baddour, Raymond F., 4,925,698, Cl. 427-2.000.
Mano, Takashi, to International Business Machines Corporation. Method and apparatus for recognizing characters on a document. 4,926,490, Cl. 382-9.000.
Mantravadi, Murty V.: *See—*
Fisher, Gary R.; and Mantravadi, Murty V., 4,925,260, Cl. 350-3.670.
Maple, Marshall, to Avantek, Inc. Broadband printed spiral. 4,926,292, Cl. 361-402.000.
Marchand, Sam R.: *See—*
Bays, F. Barry; Trott, Arthur F.; and Marchand, Sam R., 4,924,865, Cl. 606-77.000.
Marchesi, Alberto, to Minu S.p.A. Monolithic disk-like element in material sensitive to magnetic attraction, for magnetic buttons. 4,924,559, Cl. 24-303.000.
Marianowski, Leonard G.: *See—*
Remick, Robert J.; Marianowski, Leonard G.; and Camara, Elias H., 4,925,745, Cl. 429-40.000.
Maric, Dane: *See—*
Tarrson, Emanuel B.; and Maric, Dane, 4,925,073, Cl. 225-44.000.
Marie, Philippe: *See—*
Saens, Michel S.; Jacquet, Bruno; Marie, Philippe; Noirot, Frederic; and Tellier, Francois, 4,926,149, Cl. 335-132.000.
Marine Technological Exchange, Inc.: *See—*
Sapp, Samuel C.; and Payne, Peter R., 4,924,792, Cl. 114-61.000.
Marinus, Antonius A. M., to U.S. Philips Corporation. Switched-mode power supply with low loss interrupted oscillation. 4,926,304, Cl. 363-20.000.
Marion, Bruce: *See—*
Rector, James; Marion, Bruce; Widrow, Bernard; and Salehi, Iraj A., 4,926,391, Cl. 367-41.000.
Mariotto, Claude: *See—*
Mariotto nee Amiel, Monique, 4,925,418, Cl. 441-92.000.
Mariotto nee Amiel, Monique, to Mariotto, Claude. Individual rescue apparatus. 4,925,418, Cl. 441-92.000.
Marks, Peter J. Ergonomic telephone handset. 4,926,474, Cl. 379-433.000.
Markusch, Peter H.: *See—*
Rosthauser, James W.; and Markusch, Peter H., 4,925,885, Cl. 523-415.000.
Markwardt, Klaus; and Mergelsberg, Reinhard, to Otto Hansel GmbH. Method and device for the batchwise production of aerated sweets in a pressure-beating machine. 4,924,764, Cl. 99-348.000.
Markwell, Roger E.: *See—*
Smith, Stephen A.; and Markwell, Roger E., 4,925,853, Cl. 514-338.000.
Marlett, Everett M., to Ethyl Corporation. Process for reduction of organosilicon halides. 4,925,963, Cl. 556-474.000.
Marquardt, Wayne P. Wire guard. 4,924,646, Cl. 52-221.000.
Mars Incorporated: *See—*
Reger, Philip R.; McGarry, Patrick J.; and Lewis, Craig A., 4,926,458, Cl. 379-27.000.
Marsh, Mary R. R.: *See—*
Padget, John C.; Yeates, Stephen G.; and Marsh, Mary R. R., 4,925,893, Cl. 524-337.000.
Marsh, Richard A.: *See—*
Flowers, Barbara A.; Marsh, Richard A.; Haraf, John C.; and LePage, Alfred D., 4,926,335, Cl. 364-431.050.
Marshall Air Systems, Inc.: *See—*
Stuck, Robert M., 4,924,767, Cl. 99-423.000.
Marshall, Christopher L.: *See—*
Kukes, Simon G.; Marshall, Christopher L.; Hopkins, P. Donald; and Hensley, Albert L., Jr., 4,925,546, Cl. 208-111.000.
Marten, Gary L.: *See—*
Baker, Paul A.; and Marten, Gary L., 4,926,316, Cl. 364-200.000.
Martetschlager, Kurt: *See—*
Schermanz, Karl; Saischek, Gerald; Urmann, Robert; and Martetschlager, Kurt, 4,925,855, Cl. 514-341.000.
Martin Engineering Co.: *See—*
Swinderman, R. Todd; and Mueller, David W., 4,925,434, Cl. 474-101.000.
Martin, J. Scott, to Charles Machine Works, Inc., The. Digging tooth and teeth arrayed in combination with endless excavating chain. 4,924,609, Cl. 37-191.00A.
Martin-Lopez, Fernando R. Apparatus and method to control the precisional position of a light weight motor energized by radiant energy. 4,926,037, Cl. 250-205.000.
Martin Marietta Corporation: *See—*
Beal, James B.; and Badinger, Michael A., 4,924,937, Cl. 165-96.000.
Martin, Richard L.: *See—*
Tse, Stephen H.; Hollenberg, David H.; Martin, Richard L.; and Manning, James H., 4,925,528, Cl. 162-146.000.
Martin, Robert A., Jr.; and Stumpf, David M., to Hershey Foods Corporation. Process of refining saccharide crystals during food processing. 4,925,695, Cl. 426-660.000.
Martinez, Michael M. Leisure below bent knee pylon for amputee. 4,924,894, Cl. 135-65.000.
Martinsteg, Hans: *See—*
Dillmann, Hans-Georg; Pasler, Horst; and Martinsteg, Hans, 4,925,623, Cl. 376-314.000.
Maruyama, Hiroshi: *See—*
Kiryu, Naohiko; Kimizuka, Kazutoshi; Minezaki, Etsuko; and Maruyama, Hiroshi, 4,925,713, Cl. 428-40.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Maruyama, Teruo; and Takara, Akira, to Matsushita Electric Industrial Co., Ltd. Dynamic pressure air bearing unit. 4,925,321, Cl. 384-114.000.
Maruzen Petrochemical Co., Ltd.: *See*—
Tsuchitani, Masatoshi; Naito, Sakae; Morijiri, Hiroshi; and Suzuki, Kiyotaka, 4,925,547, Cl. 208-39.000.
Masakawa, Yoshihiko, to Olympus Optical Co., Ltd. Method of recording bivalent signals on opto-magnetic record medium. 4,926,402, Cl. 369-13.000.
Masaki, Nobuo: *See*—
Suizu, Yoji; Masaki, Nobuo; Fujita, Takafumi; and Kurabayashi, Hiroshi, 4,924,640, Cl. 52-167.0DF.
Maschinenfabrik Koppern GmbH & Co. KG: *See*—
Bergendahl, Hans-Georg; Zech, Kurt; and Zisselmar, Raimund, 4,925,382, Cl. 425-367.000.
Masler, Gerhard; and Harder, Uwe, to ITW-Ateco GmbH. Locking mechanism for a pivotable closure. 4,925,072, Cl. 224-282.000.
Mason, James A. Method of preparing a mixture of chlorine containing substances including chlorine dioxide. 4,925,645, Cl. 423-477.000.
Massachusetts Institute of Technology: *See*—
Bergh, Michel L. E.; Hubbard, S. Catherine; and Rasmussen, James R., 4,925,796, Cl. 435-97.000.
Goldwasser, Shafi; Kilian, Joseph; Wigderson, Avi; and Ben-Or, Michael, 4,926,479, Cl. 380-23.000.
Massie, Bernard: *See*—
Morel, Henri; Agrimonti, Jean-Claude; and Massie, Bernard, 4,924,549, Cl. 16-82.000.
Massonneau, Viviane; Mulhauser, Michel; Bonnamas, Claude; and Rouy, Noel, to Rhone-Poulenc Sante. Process for preparing 1-alkyl-5-nitroimidazoles. 4,925,949, Cl. 548-336.000.
Massonneau, Viviane; Mulhauser, Michel; and Buforn, Albert, to Rhone-Poulenc Sante Process for preparing 1-hydroxyalkyl-5-nitroimidazole. 4,925,950, Cl. 548-338.000.
Massonneau, Viviane; Mulhauser, Michel; and Buforn, Albert, to Rhone-Poulenc Sante. Process for preparing 1-hydroxyalkyl-2-methyl-5-nitroimidazoles. 4,925,951, Cl. 548-338.000.
Massonneau, Viviane; Mulhauser, Michel; Buforn, Albert, and Mandard-Cazin, Bernadette, to Rhone-Poulenc Sante. Process for preparing 1-hydroxyalkyl-5-nitroimidazoles. 4,925,952, Cl. 548-338.000.
Mast, James W.: *See*—
Ehn, Byron N., Jr.; and Mast, James W., 4,924,663, Cl. 56-202.000.
Masters, Edward R.; and Benjamin, Peter C. Collapsible lantern. 4,926,297, Cl. 362-162.000.
Mastroianni, Sal T.: *See*—
Hwang, Bor-Yuan, Casteel, Carroll M., and Mastroianni, Sal T., 4,926,231, Cl. 357-30.000.
Mastromatteo, Michael. Control devices. 4,924,905, Cl. 137-510.000.
Masuda, Michio: *See*—
Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; Owashi, Hitoaki; Sekiya, Masataka, and Minabe, Kohji, 4,926,361, Cl. 364-574.000.
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro, Yasuda, Tetsuo; and Hirakawa, Hiromasa, to Hitachi, Ltd. Fuel assembly. 4,926,450, Cl. 376-444.000.
Masumoto, Tsuyoshi: *See*—
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, 4,925,742, Cl. 428-692.000.
Masuoka, Fujio: *See*—
Saku, Koji; Ohuchi, Kazunori, and Masuoka, Fujio, 4,926,382, Cl. 365-203.000.
Masur, Henry: *See*—
Kovacs, Joseph A., and Masur, Henry, 4,925,800, Cl. 435-240.270.
Matarrese, Savino; Rossi, Anna Grazia; Lo Consolo, Mauro; Cigna, Giuseppe; and Borghi, Italo, to Montedipe, S.p.A. Process for the continuous production in solution of styrene thermoplastic resins 4,925,896, Cl. 525-53.000.
Matsuda, Eichika: *See*—
Kunita, Hisao; Morita, Akitaka, and Matsuda, Eichika, 4,926,388, Cl. 365-244.000.
Matsuda, Hideaki: *See*—
Tokizawa, Minoru; Asaoka, Takemitsu; Matsuda, Hideaki; and Katori, Tatsuhiko, 4,925,953, Cl. 548-341.000.
Matsuda, Keiji: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,925,838, Cl. 514-210.000.
Matsuda, Yoshio; Horikawa, Mitsuo; and Tsubata, Noritaka, to Yoshida Kogyo K. K. Stretchable slide fastener. 4,924,560, Cl. 24-392.000.
Matsuda, Yoshio: *See*—
Fujishima, Kazuyasu; Hidaka, Hideto; Asakura, Mikio, and Matsuda, Yoshio, 4,926,385, Cl. 365-230.030.
Matsuhisa, Tadaaki: *See*—
Watanabe, Keiichiro; Ohashi, Tsuneaki; and Matsuhisa, Tadaaki, 4,925,816, Cl. 501-104.000.
Matsui, Tohru; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Focus detection system and lighting device therefor. 4,926,206, Cl. 354-403.000.
Matsukawa, Toshitane: *See*—
Imai, Takuo; Kojima, Shinji; Matsukawa, Toshitane; and Fujimura, Toshio, 4,924,585, Cl. 29-527.500.
Matsumoto, Hiroaki; Senda, Tetsuya, and Fukuda, Tokuya, to Sony Corporation. Video noise reduction circuit 4,926,261, Cl. 358-167.000.
Matsumoto, Hisayoshi: *See*—
Uchida, Noboru; Kaneko, Masahiko; and Matsumoto, Hisayoshi, 4,926,347, Cl. 364-519.000.
Matsumoto, Isao: *See*—
Ikoma, Munehisa; Kawano, Hiroshi; Takahashi, Osamu; Matsumoto, Isao; and Ikeyama, Masakazu, 4,925,748, Cl. 429-59.000.
Matsumoto, Mitsuru: *See*—
Samejima, Masakuni; Fukuda, Kiyohito; and Matsumoto, Mitsuru, 4,925,398, Cl. 439-357.000.
Matsumoto, Mutsumi; and Seo, Yoshimasa, to Nippon Kayaku Kabushiki Kaisha. Process for producing methacrylic acid and a catalyst. 4,925,980, Cl. 562-534.000.
Matsumoto, Shoichi: *See*—
Shimizu, Noboru; Yoshida, Hiroshi; Daigo, Hiromiki; and Matsumoto, Shoichi, 4,925,981, Cl. 562-600.000.
Matsumoto, Yukiei; Nishiki, Yoshinori; Hirao, Kazuhiro; and Shimamune, Takayuki, to Permelec Electrode Ltd. Method of electrolytic treatment of metals. 4,925,538, Cl. 204-129.400.
Matsumura, Kiyotoshi: *See*—
Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi, Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, 4,925,934, Cl. 540-310.000.
Matsumura, Teruyuki; and Nagashima, Noritake, to Fanuc Ltd. Part profile input method. 4,926,311, Cl. 364-191.000.
Matsunaga, Hiroshi: *See*—
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,836, Cl. 514-210.000.
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,935, Cl. 540-350.000
Matsunaga, Kenichi: *See*—
Oguchi, Yoshiharu; Niimura, Koichi; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; and Yoshikumi, Chikao, 4,925,662, Cl. 424-85.910.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ikoma, Munehisa; Kawano, Hiroshi; Takahashi, Osamu; Matsumoto, Isao; and Ikeyama, Masakazu, 4,925,748, Cl. 429-59.000.
Maruyama, Teruo; and Takara, Akira, 4,925,321, Cl. 384-114.000.
Shogaki, Toshihiro; Shibayama, Toyohiro; and Omoto, Noriaki, 4,926,137, Cl. 330-252.000.
Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi, Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, 4,924,962, Cl. 181-141.000
Waragai, Katsunori; Saito, Yukihiro; and Asakawa, Shiro, 4,925,612, Cl. 264-154.000.
Matsushita, Mitsuyoshi: *See*—
Nagai, Yataro; Matsushita, Mitsuyoshi; Ishibashi, Osamu; Terasaki, Kiyoshi; and Tokumoto, Kei, 4,925,490, Cl. 75-238.000.
Matsuura, Tetsuhiko: *See*—
Gemba, Tsuneo; Tamaru, Takeshi; and Matsuura, Tetsuhiko, 4,925,461, Cl. 55-26.000
Matthews, James R. A., Little, Mervyn A., and Fisher, John, to Keeler Limited Tonometer apparatus. 4,924,867, Cl. 128-645.000.
Matysek, James F.; and Smith, Charles E., to Xerox Corporation. Dual mode set delivery apparatus. 4,926,220, Cl. 355-313.000.
Matzke, Guenter: *See*—
Aumueller, Alexander; Neumann, Peter; Spang, Peter; Matzke, Guenter; and Trauth, Hubert, 4,925,888, Cl. 524-91.000.
Matzner, Markus: *See*—
Harris, James E.; Berger, Abe; Chopdekar, Vilas M.; Matzner, Markus, and Spanswick, James, 4,925,916, Cl. 528-353.000.
Maurer, Albert: *See*—
Mizrah, Tiberiu; Maurer, Albert; and Gabathuler, Jean-Pierre, 4,924,570, Cl. 29-163.800.
Mauser-Werke GmbH: *See*—
Przytulla, Dietmar, 4,925,049, Cl. 220-72.000.
Mauser-Werke Oberndorf GmbH: *See*—
Gruhler, Siegfried, 4,924,598, Cl. 33-832.000.
Hoffmann, Dietrich, and Weisser, Harald, 4,924,614, Cl. 42-78.000.
Maxwell, Ian E.: *See*—
Hoek, Arend; Huizinga, Tom, and Maxwell, Ian E., 4,925,820, Cl. 502-66.000.
Mayer, Michael E.: *See*—
Scheuneman, James H., Mayer, Michael E., and Purdham, David M., 4,926,426, Cl. 371-40.100
Mazda Motor Corporation: *See*—
Kiba, Hiroshi; Nagano, Kenzou; and Sumiyoshi, Shigeru, 4,924,892, Cl. 134-123.000.
Mazurek, Harry, to Atlantic Richfield Company. Two stage process for catalytic conversion of olefins to higher hydrocarbons. 4,925,996, Cl. 585-312.000.
McAleese, David L., to BASF Corporation. Baseline stability in gradient ion chromatography by using a nonionic modifier. 4,925,567, Cl. 210-656.000.
McCabe, John A.: *See*—
Beaudoin, Henry J., Lammers, Donald W., and McCabe, John A., 4,925,520, Cl. 156-494.000.
McCandless, James C., to Navistar International Transportation Corp. Charge air fuel cooler. 4,924,838, Cl. 123-541.000.
McClellan, Bruce D.; Adams, Olan T.; and Cox, Vernon D., to Conoco Inc. Multifold vertical seismic profile acquisition method and technique for imaging the flank of a salt dome. 4,926,393, Cl. 367-57.000.
McCoig, James E. Apparatus facilitating the use of a plastic grocery bag as a trash container. 4,925,056, Cl. 220-404.000.
McCord, Harry C., Jr. Fuel igniter. 4,925,385, Cl. 431-2.000.
McCord, Mark A., to International Business Machines Corporation. Mechanical stage support for a scanning tunneling microscope 4,925,139, Cl. 248-179.000.

McCord, Neil A.: *See*—
Leone, David A.; Buxton, Clifford A.; Tharp, James A., and McCord, Neil A., 4,926,019, Cl. 200-147.00R.
McCormick, Daniel F.: *See*—
Newman, Neil A.; and McCormick, Daniel F., 4,925,413, Cl. 440-75.000.
McCown, William B., Jr.; and Bolin, William B., to Powerlift Foundation Repair. Building foundation stabilizing and elevating apparatus. 4,925,345, Cl. 405-232.000.
McCoy-Ellison, Inc.: *See*—
Hagewood, John F.; and Darigo, Julius, 4,924,567, Cl. 28-185.000.
McCully, Kilmer S. N-homocysteine thiolactonyl retinamido cobalamin and methods of use thereof. 4,925,931, Cl. 536-25.000.
McDaniel, John F.: *See*—
Hunt, Glen R.; and McDaniel, John F., 4,924,697, Cl. 73-146.800.
McDaniel, Robert G., to Research Corporation. Chemical hybridizing agents. 4,925,477, Cl. 71-77.000.
McDonald, Richard E.: *See*—
Mai, Jimbin; Chambers, Laura J.; and McDonald, Richard E., 4,925,681, Cl. 426-52.000.
McEvoy, John J.: *See*—
Sparrow, James A.; and McEvoy, John J., 4,925,619, Cl. 376-258.000.
McGahee, Welbourne D., to Loop-A-Line, Inc. Removable weed guard and reef guard. 4,924,618, Cl. 43-43.600.
McGarry, Patrick J.: *See*—
Reger, Philip R.; McGarry, Patrick J.; and Lewis, Craig A., 4,926,458, Cl. 379-27.000.
McGhie, Terence V., to BICC Public Limited Company. Electric circuit breaking apparatus. 4,926,282, Cl. 361-102.000.
McGovern, Kevin M.: *See*—
Mueller, Robert S.; and McGovern, Kevin M., 4,924,839, Cl. 123-559.100.
McHenry, Robert J.: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,925,100, Cl. 239-416.400.
McJunkin, Howard P., Jr.; and Gray, David B. Bed-mountable leg exercise device. 4,925,184, Cl. 272-73.000.
McKay, Dwight L.: *See*—
Olbrich, Michael E.; McKay, Dwight L.; Montgomery, Dean P., deceased; and Montgomery, B. Jean, administratrix, 4,926,005, Cl. 585-632.000.
McKay, Richard S. Tool holder insert for a bucket. 4,925,026, Cl. 206-373.000.
McKay, Robert S.; and Nelson, William D. Toy race track and lap counter. 4,925,188, Cl. 273-86.00R.
McKenzie, Archibald M. Multiple bit screwdriver. 4,924,733, Cl. 81-438.000.
McKeon, Michael: *See*—
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.
McKinley, Robert E. Coin-operated message display system. 4,926,326, Cl. 364-410.000.
McKown, Clem, to M&T Chemicals Inc. Multiple, parallel packed column vaporizer. 4,924,936, Cl. 165-47.000.
McKrell, Richard L.: *See*—
Breton, Richard; Treff, Ernest H.; and McKrell, Richard L., 4,925,179, Cl. 271-187.000.
McLaurin, A. Porter: *See*—
Jones, Edwin R., Jr.; and McLaurin, A. Porter, 4,924,853, Cl. 128-6.000.
McMahan, David R.: *See*—
Liverance, Martin K.; McMahan, David R.; and Haydu, Bartly A., 4,926,301, Cl. 362-226.000.
McMurray, Robert E., Jr.; and Jarrett, Steven M., to Electrohome Limited. Liquid crystal light valve utilizing hydrogenated amorphous silicon photodiode. 4,925,276, Cl. 350-342.000.
McMurry, Robert V.: *See*—
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.
McNamara, John E.: *See*—
Long, William L.; Wambach, Robert F.; Baty, Kurt F.; Lamb, Joseph M.; and McNamara, John E., 4,926,315, Cl. 364-200.000.
McNamara, Thomas F.; Golub, Lorne M.; and Ramamurthy, Nungavaram S., to Research Foundation of State University of New York, The. Use of tetracycline to enhance bone protein synthesis and/or treatment of osteoporosis. 4,925,833, Cl. 514-152.000.
McWilliams, Joseph A.; Morgan, Derek E.; and Jackson, James D. J., to Micropore International Limited. Method of manufacturing a microporous thermally insulating roof. 4,925,584, Cl. 252-62.000.
Mead Corporation, The: *See*—
Cisternino, Andrew J.; and Spamer, William S., 4,925,357, Cl. 414-495.000.
Mead, Raymond A. Bit breakout system. 4,924,954, Cl. 175-315.000.
Mectet Industries Limited: *See*—
Pritchard, Alan, 4,924,854, Cl. 128-6.000.
Medex, Inc.: *See*—
Frank, Thomas P., 4,924,872, Cl. 128-673.000.
Medical Dimensions, Inc.: *See*—
Jones, Edwin R., Jr.; and McLaurin, A. Porter, 4,924,853, Cl. 128-6.000.
Mee, William: *See*—
Benton, William M.; and Mee, William, 4,926,325, Cl. 364-408.000.
Mees, James A.: *See*—
Aiello, Louis L.; Charnley, James E.; Mees, James A.; and Dixon, Robert C., 4,925,620, Cl. 376-260.000.
Meguro, Hiroshi: *See*—
Kurashina, Satoru; and Meguro, Hiroshi, 4,926,279, Cl. 360-132.000.
Mehler, Klaus-Dieter: *See*—
Lehmkuhl, Herbert; and Mehler, Klaus-Dieter, 4,925,536, Cl. 204-58.500.
Mehrotra, Pankaj K.; and Billman, Elizabeth R., to Kennametal Inc. Cutting tool. 4,925,458, Cl. 51-293.000.
Meier, Jacques, to Ferag AG. Method of, and apparatus for, processing printed products arriving in an imbricated formation, especially newspapers, periodicals and the like. 4,925,120, Cl. 242-59.000.
Meier, Rolf, to Mitel Corporation. Line card with distributed signaling voltages. 4,926,467, Cl. 379-146.000.
Meindre, Daniel: *See*—
Gaudin, Marie-Pierre; Meindre, Daniel; and Savall, Vincent, 4,925,556, Cl. 210-293.000.
Meisberger, Artur; and Neumann, Hans-Jurgen, to Fresenius AG. Hemoglobin detector. 4,925,299, Cl. 356-40.000.
Meisner, Robert J., to Kraft, Inc. Multicolor confection extrusion system. 4,925,380, Cl. 425-131.100.
Melelli, Federico: *See*—
Bisso, Guillermo; and Melelli, Federico, 4,925,801, Cl. 435-255.000
Melinyshyn, Lev; and Goldberg, Edward M., to Uresil Corporation. Multiple conduit drainage device. 4,925,452, Cl. 604-284.000.
Melvin, Terence; and Nesbitt, R. Dennis, to Spalding & Evenflo Companies, Inc. Dimpled golf ball. 4,925,193, Cl. 273-232.000.
Memmott, Vincent J.: *See*—
Thacker, Milton B., Limburg, John M.; and Memmott, Vincent J., 4,925,632, Cl. 422-142.000
Menge, Gunter, to Korber AG. Apparatus for changing the direction of transport of rod-shaped articles. 4,925,004, Cl. 198-457.000.
Menigaux, Louis; and Dugrand, Louis, to L'Etat Francais represente par le Ministre Des Postes Et Telecommunications - Centre National d'Etudes des Telecommunications. Method of manufacturing a semiconductor structure suitable for producing a multi-wavelength laser effect. 4,925,811, Cl. 437-129.000.
Mennella, Louis P.: *See*—
Friedman, Dale; and Mennella, Louis P., 4,925,029, Cl. 206-473.000.
Mercer, Ferrell L.; Whitaker, Earl J.; and Cuthbert, Christopher P., to GE Fanuc Automation North America, Inc. Multiple nodes broadcast communication method with receiver identification by bit position in transferred massage. 4,926,375, Cl. 364-900.000.
Mercier, Claude: *See*—
Grosselin, Jean-Michel; and Mercier, Claude, 4,925,990, Cl. 568-862.000.
Mercier, Real L.: *See*—
Piteo, Michael J.; and Mercier, Real L., 4,924,831, Cl. 123-417.000.
Merck & Co., Inc.: *See*—
Durette, Philippe L., 4,925,831, Cl. 514-49.000.
Merck Patent Gesellschaft Mit Beschrankter Haftung: *See*—
Reiffenrath, Volker; Krause, Joachim, Wachtler, Andreas; Weber, Georg; and Finkenzeller, Ulrich, 4,925,590, Cl. 252-299.610.
Merck Sharp & Dohme Ltd.: *See*—
Baker, Raymond; Leeson, Paul D.; Ludduwahetty, Tamara; and Williams, Brian J., 4,925,867, Cl. 514-425.000.
Mergelsberg, Reinhard: *See*—
Markwardt, Klaus; and Mergelsberg, Reinhard, 4,924,764, Cl. 99-348.000.
Merger, Franz: *See*—
Krabetz, Richard; Duembgen, Gerd; Nees, Friedbert, Merger, Franz; and Fouquet, Gerd, 4,925,823, Cl. 502-211.000.
Merritt, Sears W.; Sacks, Robert N.; and Foyt, Arthur G., to United Technologies Corporation. Optically modulated acoustic charge transport device. 4,926,083, Cl. 310-313.00R
Mertelsmann, Roland; Welte, Karl; and Venuta, Salvatore. Purified interleukin 2. 4,925,919, Cl. 530-351.000.
Mertens, Alfred; von der Saal, Wolfgang; Kling, Lothar; and Muller-Beckmann, Bernd, to Boehringer Mannheim GmbH. 2 heteroaryl 3,3 dialkyl-5-(3 oxo-2,3,4,5 tetrahydro-6 pyridazinyl)-3H-indoles. 4,925,845, Cl. 514-254.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Keller, Karl; Grallert, Herbert; and Keinath, Wolfgang, 4,925,134, Cl. 244-158.00A.
Messerschmitt-Bolkow-Blohm: *See*—
Kranz, Walter, 4,925,130, Cl. 244-3.210.
Messier-Hispano-Bugatti: *See*—
Woerner, Pierre; and Hainaut, Jean-Pierre, 4,924,975, Cl. 188-322.180.
Mester, Roland: *See*—
Hedtke, Rolf; Loos, Rolf; Mester, Roland; and Hansel, Jurgen, 4,926,425, Cl. 371-22.600.
Metallgesellschaft Aktiengesellschaft: *See*—
Schmidt, Hermann, 4,925,487, Cl. 75-749.000.
Metoki, Iku; Honda, Chika; and Wada, Yasunori, to Konica Corporation. High sensitivity light-sensitive silver halide photographic material with little stain. 4,925,783, Cl. 430-569.000.
Metriguard, Inc.: *See*—
Bechtel, Friend K.; and Allen, James R., 4,926,350, Cl. 364-550.000.

VOL 1114 ISS 3 MY 15 1990

Mettoudi, Isaac, to Alcatel Thomson Faisceaux Hertziens. Oscillator having a dielectric resonator, and electronic frequency tuning using a varactor, in particular in the 22 GHz range. 4,926,142, Cl. 331-99.000.
Metz, Josef, and Hulsewis, Hans, to Rheinmetall GmbH. Gun barrel recoil brake with throttled counterrecoil. 4,924,751, Cl. 89-43.010.
Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J., to Ciba-Geigy Corporation. Sample preparation chamber with mixer/grinder and sample aliquot isolation. 4,925,628, Cl. 422-100.000.
Meuser, William E.; LaRue, Gary W.; Harris, Windel L.; Donahue, James A.; Bonney, L. H., and Glanton, Gene W., to PTO, Inc. Apparatus for thermal conversion of organic matter. 4,925,532, Cl 202-219.000.
Meyer, Norbert. *See*—
Rueb, Lothar; Eicken, Karl; Pander, Hans J., Plath, Peter; Schwalge, Barbara; Wuerzer, Bruno; and Meyer, Norbert, 4,925,484, Cl 71-96.000.
Michael Horauf Maschinenfabrik GmbH & Co. KG. *See*—
Muller, Berthold, 4,925,440, Cl. 493-466.000.
Michaelson, Wayne A.. *See*—
Byers, Larry L.; Koebler, Howard A., and Michaelson, Wayne A., 4,926,313, Cl. 364-200.000.
Microelectronics and Computer Technology Corporation: *See*—
Carey, David H., 4,926,241, Cl. 357-75.000
Micron Technology, Inc.: *See*—
Nevill, Leland R., 4,926,117, Cl 324-158.00F
Micropore International Limited. *See*—
McWilliams, Joseph A.; Morgan, Derek E., and Jackson, James D J., 4,925,584, Cl. 252-62.000.
Microwave Power, Inc.: *See*—
Bujatti, Marina; and Sechi, Franco N., 4,925,723, Cl. 428-137.000
Midland Manufacturing Corp.: *See*—
White, John J.; and Dean, Robert H., 4,924,703, Cl 73-308.000
Mig Vac Inc.: *See*—
Mann, Robert N., 4,926,024, Cl. 219-137.310.
Mihara, Kei. *See*—
Sato, Goro; Komatsu, Michio; Nishida, Hiroyasu; Tanaka, Yoshichika; Koyanagi, Tsuguo; and Mihara, Kei, 4,925,704, Cl. 427-221.000.
Miida, Takashi; and Murayama, Jin, to Fuji Photo Film Co. Phase-difference detector. 4,926,205, Cl 354-402.000.
Miki, Minoru. *See*—
Tsujimoto, Yasuhiro; Kurita, Masayuki; and Miki, Minoru, 4,925,718, Cl. 428-64.000.
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Tomioka, Takeshi, to Mikoshiba, Nobuo; and Tsubouchi, Kazuo. Spread-spectrum communication apparatus. 4,926,440, Cl. 375-1.000
Milbar Corporation: *See*—
Jeromson, James R., Jr.; Anderson, J. Edward C.; and Breisch, John H., 4,925,061, Cl. 222-1.000
Mildenberger, Hilmar. *See*—
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar, Bauer, Klaus; and Bieringer, Hermann, 4,925,478, Cl. 71-90.000.
Milleliri, Bernard. *See*—
Desvignes, Bernard, Durand, Daniel, and Milleliri, Bernard, 4,925,902, Cl. 526-87.000.
Miller, Allan M. *See*—
Nasmyth, Kim A., and Miller, Allan M., 4,925,791, Cl. 435-69.100.
Miller-Johannisberg Druckmaschinen GmbH. *See*—
Lindblom, Kurt L.; Simila, Jussi J., and Kanervo, Seppo J., 4,925,173, Cl. 270-54.000.
Miller, Lisa V.; and Lagow, Virginia, to Lagow Enterprise, Inc. Fabric paper doll. 4,925,423, Cl. 446-98.000
Miller, Melvin M., to Channel-Kor Systems Inc. Panel device. 4,924,931, Cl. 160-135.000.
Miller, Michael J. *See*—
Borchardt, Richard R.; Gingerich, Richard G. W., and Miller, Michael J., 4,925,593, Cl 252-301.60S
Miller, Russell S. *See*—
Johnson, Neil A.; Miller, Russell S., and Hunter, Gordon B., 4,926,439, Cl 373-13.000
Miller, Sydney L. Elevator pad hanging system. 4,924,973, Cl. 187-1.00R
Millipore Corporation: *See*—
Giuffrida, Anthony J.; Jha, Anil D., and Ganzi, Gary C., 4,925,541, Cl 204-182.500.
Milupa Aktiengesellschaft. *See*—
Schweikhardt, Friedrich; Sawatzki, Gunther; and Braun, Rainer, 4,925,680, Cl. 426-42.000
Mimura, Yoshinori; Noda, Yukio; Norimatsu, Naoki; Tokiwa, Hideharu; and Shinbori, Osamu, to Kokusai Denshin Denwa Kabushiki Kaisha. Method and apparatus for manufacturing preform for fluoride glass fiber. 4,925,475, Cl. 65-48.000.
Minabe, Kohji. *See*—
Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; Owashi, Hitoaki; Sekiya, Masataka; and Minabe, Kohji, 4,926,361, Cl. 364-574.000.
Minegishi, Masami, to Fuji Jukogyo Kabushiki Kaisha. Diesel engine shut-down device. 4,924,827, Cl. 123-198.0DB.
Minezaki, Etsuko: *See*—
Kiryu, Naohiko; Kimizuka, Kazutoshi; Minezaki, Etsuko; and Maruyama, Hiroshi, 4,925,713, Cl. 428-40.000.
Mimigrip, Inc.: *See*—
Van Erden, Donald L., and Boeckmann, Hugo, 4,925,316, Cl 383-61.000.
Ministry of International Trade & Industry. *See*—
Kume, Masao, 4,924,538, Cl. 5-81.00B
Takasaki, Yoshiyuki, 4,925,795, Cl. 435-95.000.
Tanihara, Masao; Yamada, Hideaki; Nakashima, Toshihide; Omura, Yoshiaki; and Takakura, Koichi, 4,925,787, Cl. 435-7.000.
Minnesota Mining and Manufacturing Company: *See*—
Charbonneau, Jack W.; and Bahls, Jerold O., 4,925,517, Cl. 156-276.000.
Collins, John E.; Grunes, Mitchell B. and Kozak, Darryn J., 4,926,344, Cl. 364-513.000.
Elmasry, Mohamed A.; and Kidnie, Kevin M., 4,925,766, Cl. 430-115.000.
Hall, Kevin P.; and Mott, Andrew W., 4,925,832, Cl. 564-149.000.
Pearson, Walter C., 4,926,029, Cl. 219-421.000
Wirt, David F., 4,925,327, Cl. 401-205.000.
Minolta Camera Kabushiki Kaisha: *See*—
Fukao, Hiroshi, 4,926,218, Cl. 355-283.000.
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,926,203, Cl. 354-287.000.
Matsui, Tohru; and Egawa, Takeshi, 4,926,206, Cl. 354-403.000.
Mizuno, Hiroshi; Murasaki, Hiroshi; Ikegawa, Akihito; and Etou, Kouichi, 4,924,806, Cl. 118-658.000.
Mukai, Hiromu; and Kasai, Ichiro, 4,926,201, Cl. 354-219.000.
Nakamura, Minoru; and Ito, Masazumi, 4,925,177, Cl. 271-110.000.
Oku, Shunji; Mizumo, Yoshiyuki; and Seigenji, Kiyoshi, 4,925,525, Cl. 156-652.000.
Teramoto, Togo; Oku, Syunji; Miyoshi, Yasuhiro; and Katsuragi, Mamoru, 4,926,208, Cl. 354-485.000
Minster Machine Company, The. *See*—
Wissman, Terry L.; and Bornhorst, John B., 4,925,113, Cl. 241-101.400.
Minu S.p.A.. *See*—
Marchesi, Alberto, 4,924,559, Cl. 24-303.000.
Mirand, Mauricio; and Gaskill, Robert E., to American International Devices, Inc. Latch mechanism for computer module. 4,925,397, Cl. 439-353.000.
Mischenko, Natalya I. *See*—
Mischenko, Vladislav A.; and Mischenko, Natalya I., 4,926,105, Cl. 318-800.000.
Mischenko, Vladislav A., and Mischenko, Natalya I. Method of induction motor control and electric drive realizing this method. 4,926,105, Cl. 318-800.000.
Mission Kleensweep Products, Inc. *See*—
Rosenbaum, Robert S., 4,925,066, Cl. 222-192.000.
Mita Industrial Co., Ltd. *See*—
Hanatani, Yasuyuki; and Nakatani, Kaname, 4,925,759, Cl 430-59.000.
Nomura, Mitsuo, and Aikawa, Yukihiro, 4,926,214, Cl. 355-75.000.
Mitamura, Ichiro. *See*—
Uchida, Akihisa, Mitamura, Ichiro; and Higeta, Keiichi, 4,926,378, Cl. 365-179.000.
Mitel Corporation: *See*—
Meier, Rolf, 4,926,467, Cl. 379-146.000.
Mitsubishi Denki Kabushiki Kaisha. *See*—
Aoki, Shimichi; and Naya, Eizo, 4,926,017, Cl. 200-144.00B
Baijo, Toshinobu; Ueda, Tetsuya; and Onoda, Shigeo, 4,926,034, Cl. 235-492.000.
Fujishima, Kazuyasu; Hidaka, Hideto; Asakura, Mikio; and Matsuda, Yoshio, 4,926,385, Cl. 365-230.030.
Hattori, Ryo, 4,926,432, Cl. 372-46.000.
Isozumi, Shuzoo; and Konishi, Keiichi, 4,926,078, Cl. 310-71.000.
Kato, Hisao, 4,925,360, Cl. 414-730.000.
Katoh, Takayuki, 4,926,234, Cl. 357-68.000.
Kawano, Minori; Mitsui, Kazuo; Hirooka, Masaharu; Ozu, Yasushi; Harada, Nagayasu; and Kimura, Nobuhiro, 4,926,421, Cl. 370-95.100.
Kodama, Seiki, 4,926,013, Cl. 200-19.0DC.
Maeno, Hideshi, 4,926,424, Cl. 371-22.300.
Nankaku, Shigeki, 4,926,338, Cl. 364-474.320.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,926,333, Cl. 364-426.020.
Hojo, Nobuyoshi; Asai, Yoshiro; Fujioka, Motoo; Kobayashi, Naotou; and Yamaguchi, Takashi, 4,925,510, Cl. 156-92.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Asai, Koetsu; Nakagawa, Hiroshi; and Tateishi, Mataji, 4,924,822, Cl. 123-27.0GE.
Mori, Atsushi; Koyanagi, Toshio; Takatsuka, Hiromu; and Iida, kouzou, 4,925,640, Cl. 423-239.000.
Mitsubishi Kasei Corporation: *See*—
Hayashi, Yoshio; Oguri Tomei, Shinoda, Masaki; Takahashi, Kazuo; and Hashimoto, Munehiro, 4,925,861, Cl. 514-367.000.
Mitsubishi Nuclear Fuel Company, Ltd.: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 4,925,537, Cl. 204-61.000.
Mitsubishi Paper Mills Ltd.: *See*—
Goto, Atsuo; and Koike, Naomasa, 4,925,827, Cl. 503-207.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; Hayashi, Seiji; and Mori, Kenji, 4,925,591, Cl. 252-299.660.
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, 4,925,514, Cl. 156-249.000.
Mitsuhashi, Hiroshi: *See*—
Kimura, Masayuki; Hosaka, Kunio; Takeda, Shigehumi; and Mitsuhashi, Hiroshi, 4,925,872, Cl. 514-465.000.

Mitsui, Kazuo: *See*—
Kawano, Minori; Mitsui, Kazuo; Hirooka, Masaharu; Ozu, Yasushi; Harada, Nagayasu; and Kimura, Nobuhiro, 4,926,421, Cl. 370-95.100.
Mitsui Petrochemical Industries, Ltd.: *See*—
Atsuta, Mitsuru; Sakashita, Takeshi; Miyamoto, Ryoichi; Tanimura, Yukinori; and Fuji, Saburo, 4,925,660, Cl. 424-81.000.
Mitsunaga, Takafumi: *See*—
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, 4,925,849, Cl. 514-300.000.
Mitter, Gerhard: *See*—
von Bogdandy, Ludwig; Mitter, Gerhard; and Koller, Otto, 4,925,489, Cl. 75-574.000.
Miura, Morikazu: *See*—
Ikeda, Masanori; Miura, Morikazu; and Aoshima, Atsushi, 4,925,961, Cl. 549-521.000.
Miwa, Hiromichi: *See*—
Uchida, Masaaki; Uema, Hideki; Miwa, Hiromichi; and Kawamura, Yoshihisa, 4,924,836, Cl. 123-489.000.
Miya, Isamu, to Ai Shi Denshi Kogyo Kabushiki Kaisha. Method and device for roasting coffee beans. 4,925,682, Cl. 426-87.000.
Miyabayashi, Toshio; Sakabe, Nobuyuki; and Zen, Shinichiro, to Japan Synthetic Rubber Co., Ltd. Vinylidene fluoride-acrylic acid ester copolymer, process for producing the same and composition containing the same. 4,925,907, Cl. 526-255.000.
Miyahara, Naomasa: *See*—
Ohsaki, Takashi; Imai, Koichi; and Miyahara, Naomasa, 4,925,604, Cl. 264-29.200.
Miyakawa, Tsutomu: *See*—
Ikedo, Yuji; Miyakawa, Tsutomu; Okajima, Takahiro; and Miyake, Masahiko, 4,926,406, Cl. 369-36.000.
Miyake, Masahiko: *See*—
Ikedo, Yuji; Miyakawa, Tsutomu; Okajima, Takahiro; and Miyake, Masahiko, 4,926,406, Cl. 369-36.000.
Miyamaru, Yukio; Yagasaki, Akio; Kimura, Shigeo; and Osanai, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Belt-type continuously variable transmission and engine speed control device therefore. 4,925,432, Cl. 474-8.000.
Miyamoto, Ryoichi: *See*—
Atsuta, Mitsuru; Sakashita, Takeshi; Miyamoto, Ryoichi; Tanimura, Yukinori; and Fuji, Saburo, 4,925,660, Cl. 424-81.000.
Miyamoto, Shoji: *See*—
Tsuruta, Setsuo; and Miyamoto, Shoji, 4,926,343, Cl. 364-513.000.
Miyamura, Masataka; Wada, Yuusuke; Takeda, Kazuhiro; Nakaizumi, Yuji; and Kohara, Teiji, to Kabushiki Kaisha Toshiba. Solder resist ink composition. 4,925,773, Cl. 430-285.000.
Miyazaki, Akihiko, to Olympus Optical Co., Ltd. Stereoscopic electronic endoscope device. 4,926,257, Cl. 358-98.000.
Miyazaki, Hiroshi: *See*—
Harada, Masashi; and Miyazaki, Hiroshi, 4,925,613, Cl. 264-232.000.
Miyazaki, Osamu: *See*—
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 4,925,828, Cl. 503-218.000.
Miyokawa, Toshiaki, to Jeol Ltd. Field emission electron gun. 4,926,055, Cl. 250-423.00R.
Miyoshi, Yasuhiro: *See*—
Teramoto, Togo; Oku, Syunji; Miyoshi, Yasuhiro; and Katsuragi, Mamoru, 4,926,208, Cl. 354-485.000.
Mizerak, Dennis S., to Babcock & Wilcox Company, The. Snap on fuse cover. 4,926,290, Cl. 361-380.000.
Mizoguchi, Yoshiyuki; Watanabe, Yoshitaka; Hiraga, Hiroyuki; and Fukuyama, Shigeru, to Canon Kabushiki Kaisha. Ink jet printer. 4,926,196, Cl. 346-140.00R.
Mizrah, Tiberiu; Maurer, Albert; and Gabathuler, Jean-Pierre, to Swiss Aluminium Ltd. Filter for cleaning exhaust gases of diesel engines. 4,924,570, Cl. 29-163.800.
Mizuguchi, Ryuzo: *See*—
Urano, Satoshi; and Mizuguchi, Ryuzo, 4,925,982, Cl. 562-871.000.
Mizumo, Yoshiyuki: *See*—
Oku, Shunji; Mizumo, Yoshiyuki; and Seigenji, Kiyoshi, 4,925,525, Cl. 156-652.000.
Mizuno, Hiroshi; Murasaki, Hiroshi; Ikegawa, Akihito; and Etou, Kouichi, to Minolta Camera Kabushiki Kaisha. Developing apparatus. 4,924,806, Cl. 118-658.000.
Mizuno Sangyo Co., Ltd.: *See*—
Ozawa, Isao, 4,925,058, Cl. 221-279.000.
MMTC, Inc.: *See*—
Sterzer, Fred, 4,924,863, Cl. 606-27.000.
Moate, Peter D., to Interlube Systems Limited. Lubrication pump. 4,925,373, Cl. 417-372.000.
Mobay Corporation: *See*—
Rosthauser, James W.; and Markusch, Peter H., 4,925,885, Cl. 523-415.000.
Zeck, Walter M.; and Synek, Joe, 4,925,483, Cl. 71-93.000.
Mobil Oil Corporation: *See*—
Givens, Wyatt W., 4,926,128, Cl. 324-376.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,925,455, Cl. 44-77.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,926,003, Cl. 585-517.000.
Morrison, Roger A., 4,926,000, Cl. 585-476.000.
Pelrine, Bruce P.; and Wu, Margaret M., 4,926,004, Cl. 585-530.000.
Rubin, Mae K., 4,925,548, Cl. 208-46.000.
Mogonye, Jerry R. Safety footwear with replaceable sole pad. 4,924,608, Cl. 36-62.000.
Moldenhauer, Detlev B.: *See*—
Adrian, Willy; and Moldenhauer, Detlev B., 4,924,995, Cl. 198-323.000.
Mollenkamp, Daniel L., to Stork Amsterdam B.V. Device for supplying groups of filled and closed containers to a downstream treatment device. 4,925,001, Cl. 198-412.000.
Moller, Ole H.: *See*—
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.
Moltzen, Ejner K.: *See*—
Bogeso, Klaus P.; Jensen, Klaus G.; Moltzen, Ejner K.; and Pedersen, Henrik, 4,925,858, Cl. 514-342.000.
Momota, Masashi: *See*—
Sakamoto, Hidetoshi; Uematsu, Kenjiro; Momota, Masashi; Tanabe, Susumu; Suzuki, Tatsuo; and Endo, Toshihiko, 4,925,445, Cl. 604-95.000.
Mondek, Martin J.: *See*—
Burmeister, Scott N.; Harris, Duane W.; Whipple, Roger B.; and Mondek, Martin J., 4,925,411, Cl. 440-61.000.
Moneyfax, Inc.: *See*—
Benton, William M.; and Mee, William, 4,926,325, Cl. 364-408.000.
Monnier, John R.; Muehlbauer, Peter J.; and Low, Howard M., to Eastman Kodak Company. Preparation of aldehydes from unsaturated terminal epoxides. 4,925,986, Cl. 568-450.000.
Monnier, John R.; and Low, Howard M., to Eastman Kodak Company. Preparation of aldehydes from unsaturated terminal epoxides. 4,925,987, Cl. 568-450.000.
Montagino, James G.; Butzko, Betty; and Lerner, Ronald L., to Helen of Troy Corporation. Forced hot air appliance with swivel handle. 4,926,027, Cl. 219-222.000.
Montedipe, S.p.A.: *See*—
Matarrese, Savino; Rossi, Anna Grazia; Lo Consolo, Mauro; Cigna, Giuseppe; and Borghi, Italo, 4,925,896, Cl. 525-53.000.
Rendina, Gabriele; Nocci, Roberto; Callaioli, Andrea; and Corrado, Francesco, 4,925,899, Cl. 525-314.000.
Stignani, Renato; and Ferrari, Francesco, 4,924,588, Cl 29-726.000.
Montgomery, B. Jean, administratrix: *See*—
Olbrich, Michael E.; McKay, Dwight L.; Montgomery, Dean P., deceased; and Montgomery, B. Jean, administratrix, 4,926,005, Cl. 585-632.000.
Montgomery, Dean P., deceased: *See*—
Olbrich, Michael E.; McKay, Dwight L.; Montgomery, Dean P., deceased; and Montgomery, B. Jean, administratrix, 4,926,005, Cl. 585-632.000.
Montgomery, Thomas; and Silverman, Jeffrey, to Toddler U, Inc. Split-sole shoe with a combined toe cap and front outer sole. 4,924,606, Cl. 36-31.000.
Montoye, Robert K.: *See*—
Hokenek, Erdem; and Montoye, Robert K., 4,926,369, Cl 364-748.000.
Moody, William J.: *See*—
Ward, Frank; and Moody, William J., 4,925,284, Cl. 350-532.000.
Moore, A. M.: *See*—
Handley, George E.; Moore, A. M.; and Dickman, Robert E., 4,926,392, Cl. 367-59.000.
Moore Business Forms, Inc.: *See*—
Anderson, Michael W., 4,925,213, Cl. 282-12.00A.
Moore, David N.: *See*—
Zemlo, Bridgett; Petro, Richard J.; and Moore, David N., 4,925,067, Cl. 222-480.000.
Moore, Donald W., to Westinghouse Electric Corp. Method and apparatus for determining resonant frequency of a turbine blade made of a meterial not responsive to a magnetic field. 4,924,706, Cl. 73-579.000.
Moore, Dwain F.: *See*—
Donnelly, Donald E.; Zikes, Bradley C.; Moore, Dwain F.; Price, Jeffrey E.; and Toth, Bartholomew L., 4,925,386, Cl. 431-28.000.
Moore, Henry J., Jr.; and Gidanian, Bijan, to Mor-Flo Industries, Inc. Water heater with flame spill-out prevention arrangement. 4,924,816, Cl. 122-17.000.
Moore, Henry J., Jr.; and Wiersma, Wouter J., to Mor-Flo Industries, Inc. Forced draft direct vent system for a water heater. 4,925,093, Cl. 237-19.000.
Moore, James M.: *See*—
Giles, Alan F.; and Moore, James M., 4,926,308, Cl. 364-147.000.
Moore, Joel D.: *See*—
Bateson, George F.; Chresand, Thomas J.; Moore, Joel D.; and Nayes, Terrence L., 4,925,552, Cl. 210-150.000.
Moore, Melvin L., to Zenith Electronics Corporation. Tied slit foil shadow mask with false ties. 4,926,089, Cl. 313-403.000.
Moore, Michael J.: *See*—
Fauteux, Denis G.; Moore, Michael J.; and Blonsky, Peter M., 4,925,752, Cl. 429-191.000.
Moore, Thomas E.: *See*—
Grover, Wayne D.; and Moore, Thomas E., 4,926,446, Cl. 375-109.000.
Moore, Wayne R.: *See*—
Cheng, Shi-wai S.; Nichols, Wayne C.; and Moore, Wayne R., 4,924,829, Cl. 123-259.000.
Mor-Flo Industries, Inc.: *See*—
Moore, Henry J., Jr.; and Gidanian, Bijan, 4,924,816, Cl 122-17.000.
Moore, Henry J., Jr.; and Wiersma, Wouter J., 4,925,093, Cl 237-19.000.

UMI

VOL
1114
ISS
3
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15
1990
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More, Henry S.; Rorden, Louis H.; and Akkerman, Neil H., to Develco Incorporated. Gimballed antenna. 4,926,188, Cl. 343-719.000.
Morel, Henri; Agrimonti, Jean-Claude; and Massie, Bernard, to ITW de France. Adjustable stop. 4,924,549, Cl. 16-82.000.
Morgan Construction Company: *See*—
Wilson, Alexander 1., 4,924,689, Cl. 72-249.000.
Morgan, Derek E.: *See*—
McWilliams, Joseph A., Morgan, Derek E.; and Jackson, James D. J., 4,925,584, Cl. 252-62.000.
Mori, Kenji: *See*—
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; Hayashi, Seiji; and Mori, Kenji, 4,925,591, Cl 252-299.660.
Mori, Masanori, to Aisin Seiki Kabushiki Kaisha. Gear shift mechanism with a damper device. 4,924,728, Cl. 74-640.000.
Morii, Atsushi; Koyanagi, Toshio; Takatsuka, Hiromu; and Iida, kouzou, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for denitration of exhaust gas containing arsenic compounds by catalysts and method. 4,925,640, Cl. 423-239.000.
Morijiri, Hiroshi: *See*—
Tsuchitani, Masatoshi; Naito, Sakae; Morijiri, Hiroshi; and Suzuki, Kiyotaka, 4,925,547, Cl. 208-39.000.
Morimoto, Taiji: *See*—
Kawanishi, Hidenori, Hayashi, Hiroshi; Morimoto, Taiji; Kaneiwa, Shinji; and Yamaguchi, Masahiro, 4,926,431, Cl. 372-45.000.
Morinaga, Daisaku: *See*—
Ueda, Shigeta; Hombu, Mitsuyuki; Honda, Kazuo; and Morinaga, Daisaku, 4,926,306. Cl. 363-58.000.
Morinaga, Tetsuya, to Murata Manufacturing Co., Ltd. Chip-type coil element. 4,926,151, Cl. 335-296.000.
Moring, Walter G., III; and Harwood, Jon W., to AP Parts Manufacturing Company. Stamp formed muffler with reinforced outer shell. 4,924,968, Cl. 181-282.000.
Morishita, Ichiro; and Hanzawa, Hiroko, to Alps Electric Co., Ltd. Objective lens for optical memory device. 4,925,283, Cl. 350-432.000.
Morishita, Mimpei; and Azukizawa, Teruo, to Kabushiki Kaisha Toshiba. Attraction type magnetic levitating apparatus. 4,924,778, Cl. 104-284.000.
Morison, James H.: *See*—
Echert, Douglas C.; Geller, Edward W.; Hanzlick, Dennis J.; and Morison, James H., 4,924,698, Cl. 73-170.00A.
Morita, Akitaka; Nishimura, Toshio; and Takada, Hiroshi, to Sharp Kabushiki Kaisha. Electronic apparatus with currency conversion function. 4,926,368, Cl. 364-715.050.
Morita, Akitaka: *See*—
Kunita, Hisao; Morita, Akitaka, and Matsuda, Eichika, 4,926,388, Cl. 365-244.000.
Morita, Tsutomu: *See*—
Shiraishi, Hideo; and Morita, Tsutomu, 4,924,566, Cl. 28-143.000.
Morita, Yasuyuki: *See*—
Watanabe, Tadashi and Morita, Yasuyuki, 4,924,928, Cl. 152-533.000.
Morito, Hiroshi: *See*—
Ishizawa, Yoshiro; and Morito, Hiroshi, 4,926,175, Cl. 341-131.000.
Mork, Orlan H. Soil leveling apparatus with improved scraper member. 4,924,945, Cl. 172-197.000.
Morley, Kenneth S.: *See*—
Frost, Richard L.; Morley, Kenneth S.; and Pulsipher, Dennis C., 4,926,482, Cl. 381-51.000.
Morris, John M.: *See*—
Green, Charles J.; Morris, John M.; and Oliphant, Timothy L., 4,925,196, Cl. 180-170.000.
Morris, Ronald: *See*—
Higham, Graham J., Pruitt, Gerald R., Morris, Ronald; Heger, Frank; Livingstone, James; and Tormey, David, 4,924,675, Cl. 62-6.000.
Morrison, Roger A., to Mobil Oil Corporation. Benzene conversion over ZSM-5. 4,926,000, Cl. 585-476.000.
Morse, Lewis D., to Calgon Corporation. Polyacrylate blends as boiler scale inhibitors. 4,925,568, Cl. 210-701.000.
Moser, Bernhard, to Hawera Probst GmbH & Co. Rock drill. 4,924,953, Cl. 175-323.000.
Moskowitz, David; Hoffman, David W.; and Schmatz, Duane J., to Ford Motor Company. Method of increasing useful life of tool steel cutting tools. 4,925,346, Cl. 408-1.00R
Mostad, Dennis A.: *See*—
Leonard, Laurence E., Jr.; and Mostad, Dennis A., 4,925,226, Cl. 294-82.100.
Moteki, Tsutomu: *See*—
Aoki, Kazuo; Moteki, Tsutomu; and Kimura, Kazuhiro, 4,925,381, Cl. 425-145.000.
Motoi, Toshihiro: *See*—
Murahashi, Takashi; Fujita, Hisao; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 4,926,195, Cl. 346-108.000.
Motomak Motorenbau, Maschinen-und Werkzeugfabrik, Konstruktionen GmbH: *See*—
Speil, Walter, 4,924,825, Cl. 123-90.550.
Motorola Inc.: *See*—
Buxton, Howard D., 4,925,085, Cl. 228-179.000.
Comroe, Richard A.; Coe, Richare H.; Roane, Katherine B.; and Rosenthal, Lewis H., 4,926,495, Cl. 455-54.000.
Covey, Carlin R., 4,926,476, Cl. 380-4.000.
Gutman, Jose; Goldberg, Steven J.; and Trine, Linda M., 4,926,460, Cl. 379-57.000.
Herold, Barry W.; and Tahernia, Omid, 4,926,141, Cl. 331-16.000.
Hwang, Bor-Yuan; Casteel, Carroll M., and Mastroianni, Sal T., 4,926,231, Cl. 357-30.000.
Main, William E., 4,926,132, Cl. 329-318.000.
Maini, Rajnish; and Spangler, Harold L., 4,926,066, Cl. 307-303.100.
Pigott, John M.; and Jarrett, Robert B., 4,926,073, Cl. 307-544.000.
Qualich, John, 4,926,283, Cl. 361-103.000.
Regione, Brian A., 4,926,240, Cl. 357-74.000.
Shirley, Thomas F., Jr.; Ruppel, John S.; Zuiss, Thomas J., and Battin, Jeffrey A., 4,926,497, Cl. 455-67.000.
Spiotta, Mark G.; and Bjerga, Erling, 4,926,475, Cl. 380-2.000.
Sun, Shih W.; and Lee, Jen-Jiang, 4,926,237, Cl. 357-71.000.
Wilkie, Brian F.; Goler, Vernon B.; Groves, Stanley E.; and Vaglica, John J., 4,926,319, Cl. 364-200.000.
Motoyama, Miho: *See*—
Yamamoto, Akira; Motoyama, Miho; Kitajima, Hiroyuki; Doi, Takashi; and Nishimura, Toshifumi, 4,926,324, Cl. 364-200.000.
Motozawa, Yasuki, to Honda Giken Kogyo Kabushiki Kaisha. Seat belt tightening system adapted to be mounted on an adjustable seat. 4,925,212, Cl. 280-807.000.
Mott, Andrew W.: *See*—
Hall, Kevin P.; and Mott, Andrew W., 4,925,832, Cl. 564-149.000.
Moulinex, Societe Anonyme: *See*—
Dauge, Gilbert, 4,924,955, Cl. 177-210.00C.
Muehlbauer, Peter J.: *See*—
Monnier, John R.; Muehlbauer, Peter J., and Low, Howard M., 4,925,986, Cl. 568-450.000.
Mueller, David W.: *See*—
Swinderman, R. Todd; and Mueller, David W., 4,925,434, Cl. 474-101.000.
Mueller, Robert S.; and McGovern, Kevin M., to Eaton Corporation. Supercharger with torsion damping. 4,924,839, Cl. 123-559.100.
Mueller, Werner H.; Khanna, Dinesh N.; Vora, Rohitkumar H.; and Erckel, Ruediger J., to Hoechst Celanese Corp. Polymers prepared from 4,4'-bis(2-(amino(halo) phenoxyphenyl) hexafluoroisopropyl) diphenyl ether. 4,925,915, Cl. 528-353.000.
Muench, George J.; Lewis, Brian G.; Ashok, Sankaranarayanan; Watson, William G.; and Cheskis, Harvey P., to Olin Corporation. Magnetic field-generating nozzle for atomizing a molten metal stream into a particle spray. 4,925,103, Cl. 239-79.000.
Mukai, Hiromu; and Kasai, Ichiro, to Minolta Camera Kabushiki Kaisha. Finder optical system. 4,926,201, Cl. 354-219.000.
Mukai, Kiichiro; Saiki, Atsushi; and Harada, Seiki, to Hitachi, Ltd. Semiconductor device and method for producing the same. 4,926,238, Cl. 357-72.000.
Mukherjee, Satyendranath: *See*—
Singer, Barry M.; Bruning, Gert W.; and Mukherjee, Satyendranath, 4,926,074, Cl. 307-581.000.
Mulder, Johanna M. L.: *See*—
van Ommen, Alfred H., Mulder, Johanna M. L.; and Verhoeven, Johannes F. C. M., 4,925,805, Cl. 437-21.000.
Mulder, Marcellinus H. V.: *See*—
te Hennepe, Hendrikus J. D.; Mulder, Marcellinus H. V.; Smolders, Cornelis A.; Bargeman, Derk; and Schroder, George A. T., 4,925,562, Cl. 210-500.250.
Mulhauser, Michel: *See*—
Massonneau, Viviane; Mulhauser, Michel; Bonnamas, Claude; and Rouy, Noel, 4,925,949, Cl. 548-336.000.
Massonneau, Viviane; Mulhauser, Michel; and Buforn, Albert, 4,925,950, Cl. 548-338.000.
Massonneau, Viviane; Mulhauser, Michel; and Buforn, Albert, 4,925,951, Cl. 548-338.000.
Massonneau, Viviane; Mulhauser, Michel; Buforn, Albert; and Mandard-Cazin, Bernadette, 4,925,952, Cl. 548-338.000.
Mullenax, Kirk M.: *See*—
Park, Woo; and Mullenax, Kirk M., 4,925,234, Cl. 296-136.000.
Muller-Beckmann, Bernd: *See*—
Mertens, Alfred; von der Saal, Wolfgang; Kling, Lothar; and Muller-Beckmann, Bernd, 4,925,845, Cl. 514-254.000.
Muller, Berthold, to Michael Horauf Maschinenfabrik GmbH & Co. KG. Apparatus for the winding of container jackets. 4,925,440, Cl. 493-466.000.
Muller, Friedemann: *See*—
Kress, Hans-Jurgen; Lindner, Christian; Muller, Friedemann; Peters, Horst; Wittmann, Dieter; and Buekers, Josef, 4,925,891, Cl. 524-139.000.
Muller, Heidi: *See*—
Hausler, Nikolaus; Muller, Heidi; Pinck, Peter; and Straube, Christina, 4,924,884, Cl. 131-84.100.
Muller, Jacques: *See*—
Vuilleumier, Cyril; and Muller, Jacques, 4,926,401, Cl. 368-88.000.
Multinorm B.V.: *See*—
Verbrugge, Jeroen K., 4,924,809, Cl. 119-14.020.
Wondergem, Jan; and Vissers, Hermanus H., 4,924,667, Cl. 56-341.000.
Muncy, Donald G.: *See*—
King, Harold B., Jr.; Muncy, Donald G.; and Sutherland, Charles W., 4,924,586, Cl. 29-723.000.
Munk, Stephen A.: *See*—
Green, George D.; Munk, Stephen A.; and Barnes, Darryl K., 4,925,906, Cl. 526-245.000.
Munson, Kenton M.: *See*—
Wurst, Stephen G.; Adams, William J.; and Munson, Kenton M., 4,925,133, Cl. 244-118.500.

Murahashi, Takashi; Fujita, Hisao; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, to Konica Corporation. Image recording apparatus. 4,926,195, Cl. 346-108.000.
Murakami, Koichi: *See*—
Inuzuka, Tsuneki; Murakami, Koichi; and Kurita, Kenji, 4,926,310, Cl. 364-186.000.
Murakami, Teruo; and Seo, Naobumi, to Kabushiki Kaisha Toshiba. Magneto-optic recording/erasing system with simultaneous dual head control and disk error detection. 4,926,408, Cl. 369-58.000.
Muraoka, Naoki: *See*—
Takenaka, Eiji; Muraoka, Naoki; and Nakadai, Yoshikazu, 4,926,191, Cl. 346-24.000.
Murasaki, Hiroshi: *See*—
Mizuno, Hiroshi; Murasaki, Hiroshi; Ikegawa, Akihito; and Etou, Kouichi, 4,924,806, Cl. 118-658.000.
Murase, Tadashi, to Colin Electronics Co., Ltd. Automatic blood pressure measuring apparatus. 4,924,874, Cl. 128-682.000.
Murata Kikai Kabushiki Kaisha: *See*—
Kikuchi, Shuichi; Yamamoto, Yoshio; and Kawasaki, Yoshihiko, 4,924,999, Cl. 198-409.000.
Murata, Kousaku: *See*—
Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi; Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, 4,924,962, Cl. 181-141.000.
Murata Manufacturing Co., Ltd.: *See*—
Morinaga, Tetsuya, 4,926,151, Cl. 335-296.000.
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, to Fujisawa Pharmaceutical Company, Ltd. 3-pyrrolidinylthio-1-azabicyclo[3.2.0]-hept-2-ene-2-carboxylic acid compounds. 4,925,838, Cl. 514-210.000.
Murata, Masayoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,925,948, Cl. 548-195.000.
Murayama, Fumio; and Suzuki, Takashi, to Pioneer Electronic Corporation. Speaker system. 4,924,965, Cl. 181-156.000.
Murayama, Jin: *See*—
Miida, Takashi; and Murayama, Jin, 4,926,205, Cl. 354-402.000.
Murayama, Masatoshi: *See*—
Sugitani, Yuji; Kobayashi, Yukio; Ikeda, Yoshihisa; and Murayama, Masatoshi, 4,926,023, Cl. 219-125.120.
Murel, Andrew; to Amest, Inc. Method of generating pH functions in electrophoresis and isoelectric focusing. 4,925,545, Cl. 204-182.900.
Murofushi, Takashi: *See*—
Tani, Tatsuo; Yokoyama, Hiroshi; Hayashi, Shoji; and Murofushi, Takashi, 4,926,358, Cl. 364-562.000.
Murphy, Kenneth J., to Triplex. Fail-safe and fault-tolerant alternating current output circuit. 4,926,281, Cl. 361-55.000.
Murphy, Patrick: *See*—
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,926,193, Cl. 346-76.0PH.
Murphy, Scott, to Thomas Jefferson University. Glucose free primary anticoagulant for blood containing citrate ions. 4,925,665, Cl. 424-532.000.
Murzsa, Laszlo. Paint mixing container. 4,926,390, Cl. 366-249.000.
Muskopf, John W.: *See*—
Bertram, James L.; Walker, Louis L.; and Muskopf, John W., 4,925,901, Cl. 525-482.000.
Muth, Walter E.; Joynes, Roger; Cox, Clair A.; Cheadle, Brian A.; Burnett, Don J.; and Adema, Han, to Atomic Energy of Canada Limited. Pressure tube sampling. 4,925,621, Cl. 376-262.000.
Myers, Terry N., to Pennwalt Corporation. Process of making a polymer containing hindered amine light stabilizing groups and polymer made thereby. 4,925,903, Cl. 526-204.000.
Myklebust, Eirik; Omdal, Bjarne; Juel, Anders; Strand, Olaf; and Jonsgard, Erik, to Norsk Hydro a.s. Flexible container having improved lifting loops. 4,925,317, Cl. 383-8.000.
N. V. Bekaert S.A.: *See*—
Francois, Roger, 4,925,539, Cl. 204-146.000.
Naarmann, Herbert; and Koehler, Gernot, to BASF Aktiengesellschaft. Modified polyacetylene. 4,925,897, Cl. 525-285.000.
Nabuurs, Johannes H. B.: *See*—
Clabbers, Wilhelmus G. M.; Dinnissen, Johannes H. A.; and Nabuurs, Johannes H. B., 4,925,178, Cl. 271-186.000.
Nadas, Arthur J.; and Nahamoo, David, to International Business Machines Corporation. Normalization of speech by adaptive labelling. 4,926,488, Cl. 381-41.000.
Naddor, David J.: *See*—
Hamilton, Scott L.; Harney, Michael P.; Naddor, David J.; Farmer, James Q.; Frederick, Richard B.; and Schaubs, Randolph J., 4,926,444, Cl. 375-9.000.
Nagai, Yataro; Matsushita, Mitsuyoshi; Ishibashi, Osamu; Terasaki, Kiyoshi; and Tokumoto, Kei, to Tanken Seiko Kabushiki Kaisha; and Nihon Tungsten Kabushiki Kaisha. Mechanical seal using pore-dispersed material, and pore-dispersed cemented carbide and method for manufacturing same. 4,925,490, Cl. 75-238.000.
Nagano, Fumikazu, to Sharp Kabushiki Kaisha. Color image reading and recording apparatus and its image recording method for recording full color images from stored colored information created by a single scan process. 4,926,252, Cl. 358-75.000.
Nagano, Kenzou: *See*—
Kiba, Hiroshi; Nagano, Kenzou; and Sumiyoshi, Shigeru, 4,924,892, Cl. 134-123.000.
Nagao, Yoshimitsu: *See*—
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,836, Cl. 514-210.000.
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,935, Cl. 540-350.000.
Nagasaki, Tatsuo; Yamada, Hidetoshi; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Color imaging apparatus including a means for electronically non-linearly expanding and compressing dynamic range of an image signal. 4,926,247, Cl. 358-43.000.
Nagasawa, Jun'ichi: *See*—
Suehiro, Tetsuro; Yamauchi, Aizo; Ichijo, Hisao; Nagasawa, Jun'ichi; and Aisaka, Noboru, 4,925,803, Cl. 435-288.000.
Nagase, Yunosuke: *See*—
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,836, Cl. 514-210.000.
Kumagai, Toshio; Matsunaga, Hiroshi; Machida, Yoshisuke; Nagase, Yunosuke; Hikida, Muneo; and Nagao, Yoshimitsu, 4,925,935, Cl. 540-350.000.
Nagashima, Noritake: *See*—
Matsumura, Teruyuki; and Nagashima, Noritake, 4,926,311, Cl. 364-191.000.
Nagayama, Yoshikatsu: *See*—
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.
Nahamoo, David: *See*—
Nadas, Arthur J.; and Nahamoo, David, 4,926,488, Cl. 381-41.000.
Nahill, George F.: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,925,100, Cl 239-416.400.
Nahr, Uwe: *See*—
Patsch, Manfred; Epple, Gerhard; Flohr, Helmut; Degen, Helmut, and Nahr, Uwe, 4,925,954, Cl. 548-417.000.
Naito, Hideshi: *See*—
Kanno, Hideo; Imanari, Hitoshi; Naito, Hideshi; Kodaka, Yoshiro; and Ohta, Naoto, 4,925,282, Cl. 350-429.000.
Naito, Kazufumi: *See*—
Konishi, Satoshi; Naito, Kazufumi, and Utsunomiya, Mitito, 4,926,359, Cl. 364-567.000.
Naito, Masamitsu; and Wada, Kenji, to Taisei Corporation. Method of and device for detecting light receiving position utilizing optical fibers. 4,926,042, Cl. 250-227.110.
Naito, Sakae: *See*—
Tsuchitani, Masatoshi; Naito, Sakae; Morijiri, Hiroshi; and Suzuki, Kiyotaka, 4,925,547, Cl. 208-39.000.
Naitoh, Akira: *See*—
Fushiya, Fusao; Yoshida, Kenji; Naitoh, Akira; and Sawa, Tetsuya, 4,926,075, Cl. 310-50.000.
Najjar, Mitri S.; and Corbeels, Roger J., to Texaco Inc. Partial oxidation of sulfur-containing solid carbonaceous fuel. 4,925,644, Cl. 423-415.00A.
Nakadai, Yoshikazu: *See*—
Takenaka, Eiji; Muraoka, Naoki; and Nakadai, Yoshikazu, 4,926,191, Cl. 346-24.000.
Nakagawa, Hiroshi: *See*—
Asai, Koetsu; Nakagawa, Hiroshi, and Tateishi, Mataji, 4,924,822, Cl. 123-27.0GE.
Nakagawa, Ippei: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 4,925,537, Cl. 204-61.000.
Nakagawa, Katsumi; Ishihara, Shunichi; Kanai, Masahiro; Arao, Kozo; Fujioka, Yasushi; and Sakai, Akira, to Canon Kabushiki Kaisha. Pin junction photovoltaic element with P or N-type semiconductor layer comprising non-single crystal material containing Zn, Se, H in an amount of 1 to 4 atomic % and a dopant and I-type semiconductor layer comprising non-single crystal Si(H,F) material. 4,926,229, Cl. 357-30.000.
Nakagawa, Katsumi: *See*—
Iwamoto, Hirofumi; Kawai, Tatsundo; Ogura, Makoto; Nakagawa, Katsumi; Seitoh, Shinichi; and Kaifu, Noriyuki, 4,926,058, Cl. 250-578.100.
Nakagawa, Katsuya, to Nintendo Company Limited. Memory cartridge bank selecting. 4,926,372, Cl. 364-900.000.
Nakagawa, Kiyotoshi; and Kawano, Kenzo, to Sharp Kabushiki Kaisha. High voltage MOS field effect semiconductor device. 4,926,243, Cl. 357-84.000.
Nakaizumi, Yuji: *See*—
Miyamura, Masataka; Wada, Yuusuke; Takeda, Kazuhiro; Nakaizumi, Yuji; and Kohara, Teiji, 4,925,773, Cl. 430-285.000.
Nakajima, Takashi: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,925,838, Cl. 514-210.000.
Nakakusu, Toru: *See*—
Ogawa, Masahiro; Shimazaki, Tatsuo; Umeda, Osamu; Aoki, Toshihiro; and Nakakusu, Toru, 4,925,295, Cl. 353-57.000.
Nakama, Yasutoshi: *See*—
Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi; Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, 4,924,962, Cl. 181-141.000.
Nakamaru, Koichi: *See*—
Takahashi, Toshihiro; Hagihara, Koichiro; Nakamaru, Koichi; and Suzuki, Yoshikuni, 4,925,843, Cl. 514-248.000.
Nakamura, Arata; and Onji, Norio, to Omron Tateisi Electronics Company. Reflection type photoelectric switch. 4,926,049, Cl. 250-548.000.

VOL 1114 ISS 3 MY 15 1990 UMI

Nakamura, Katutoshi: *See*—
Shimizu, Makoto; Nakamura, Katutoshi; and Furusawa, Noriyuki, 4,925,119, Cl. 242-57.000.
Nakamura, Minoru; and Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Automatic paper feeder. 4,925,177, Cl. 271-110.000.
Nakamura, Takashi: *See*—
Takahashi, Kenji; and Nakamura, Takashi, 4,926,047, Cl. 250-484.100.
Nakamura, Takeaki: *See*—
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.
Nakamura, Tamio: *See*—
Aramaki, Minoru; Okamoto, Kimitaka; Sakaguchi, Hiroaki; and Nakamura, Tamio, 4,925,975, Cl. 562-113.000.
Nakamura, Tohru: *See*—
Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi; Onai, Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko, 4,926,235, Cl. 357-68.000.
Nakanishi, Kiyoshi: *See*—
Takeda, Keiso; Nakanishi, Kiyoshi; Kawai, Taiyo; and Shimizu, Rio, 4,925,110, Cl. 239-533.120.
Nakano, Hiroshi: *See*—
Ohta, Tomozo; Nakano, Hiroshi; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,926,182, Cl. 342-44.000.
Nakano, Yoshitomo, to Sony Corporation. Circuit for determining that an audio signal is either speech or non-speech. 4,926,484, Cl. 381-56.000.
Nakashima, Keisuke; Yasukawa, Saburo; Tadauchi, Masaharu; and Hori, Yasuro, to Hitachi, Ltd. Multi-color document reading apparatus for facsimile and multi-color facsimile. 4,926,253, Cl. 358-75.000.
Nakashima, Takanori: *See*—
Maki, Kazuyoshi; Harada, Sadami; and Nakashima, Takanori, 4,926,286, Cl. 361-345.000.
Nakashima, Toshihide: *See*—
Tanihara, Masao; Yamada, Hideaki; Nakashima, Toshihide; Omura, Yoshiaki; and Takakura, Koichi, 4,925,787, Cl. 435-7.000.
Nakashita, Goro: *See*—
Kubota, Naminosuke; Shimizu, Haruaki; Sonobe, Tadashi; and Nakashita, Goro, 4,925,909, Cl. 528-55.000.
Nakata, Masahiro: *See*—
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 4,925,828, Cl. 503-218.000.
Nakatani, Kaname: *See*—
Hanatani, Yasuyuki; and Nakatani, Kaname, 4,925,759, Cl. 430-59.000.
Nakatsuka, K.: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.
Nakatsuka, Katsuto: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.
Nakatsuka, Kimihiro; and Hatayama, Fumihiro, to Dainippon Screen Mfg. Co., Ltd. Method of correcting color image data for obtaining proof image. 4,926,254, Cl. 358-76.000.
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; Hayashi, Seiji; and Mori, Kenji, to Mitsubishi Rayon Co., Ltd. Mesomorphic compound having β-hydroxycarboxyl group as chiral source and liquid crystal composition. 4,925,591, Cl. 252-299.660.
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; Kaneko, Motohiro; Kusumoto, Yoshiro; Takakuwa, Kazuo; and Ikuta, Tetsuya, to Nihon Shinku Gijutsu Kabushiki Kaisha. Apparatus for chemical vapor deposition. 4,924,807, Cl. 118-725.000.
Nakayama, Takashi, to NEC Corporation. Micro processor capable of being connected with a coprocessor. 4,926,318, Cl. 364-200.000.
Nakayama, Taketoshi: *See*—
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, 4,925,742, Cl. 428-692.000.
Nakazawa, Toshihiko: *See*—
Murahashi, Takashi; Fujita, Hisao; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 4,926,195, Cl. 346-108.000.
Namba Press Works Co., Ltd.: *See*—
Goto, Fumio; and Ogawa, Taro, 4,925,508, Cl. 156-79.000.
Nambu, Masao, to Nippon Oil Co., Ltd. Process for the preparation of gel for use as cooling medium. 4,925,603, Cl. 264-28.000.
Nanba, Keiichiro, to Pioneer Electronic Corporation. Billing data display system for a closed circuit television system. 4,926,256, Cl. 358-84.000.
Nankaku, Shigeki, to Mitsubishi Denki Kabushiki Kaisha Numerical control apparatus. 4,926,338, Cl. 364-474.320.
Nanometrics Inc.: *See*—
Jensen, Earl M., 4,926,227, Cl. 357-28.000.
Nanto, Toshiyuki: *See*—
Shinoda, Tsutae; and Nanto, Toshiyuki, 4,926,095, Cl. 315-169.400.
Narita, Katsunori: *See*—
Ito, Shigemi; and Narita, Katsunori, 4,926,152, Cl. 336-90.000.
Nartron Corporation: *See*—
Wilhelm, Daniel D., 4,926,025, Cl. 219-202.000.
Naruse, Yoshihiro: *See*—
Enomoto, Norihide and Naruse, Yoshihiro, 4,925,957, Cl. 549-239.000.
Naruse, Yujiro: *See*—
Hatayama, Tamotsu; and Naruse, Yujiro, 4,926,052, Cl. 250-370.140.
Nasmyth, Kim A.; and Miller, Allan M., to Celltech Limited Eucaryotic expression vectors. 4,925,791, Cl. 435-69.100.
Naso, Frank: *See*—
Naso, Michael; and Naso, Frank, 4,926,339, Cl. 364-478.000.
Naso, Michael; and Naso, Frank. Computer automated microfilm jacket feed and printer device. 4,926,339, Cl. 364-478.000.
National Broach & Machine Company: *See*—
Rao, Suren B.; and Schwartz, Richard W., 4,924,842, Cl. 125-11.010.
National-Detroit, Inc.: *See*—
Hoffman, Roger T., 4,924,636, Cl. 51-170.0MT.
National Research Development Corporation: *See*—
Goldring, Lionel S., 4,925,544, Cl. 204-421.000.
Reilly, Robert E., 4,924,711, Cl. 73-862.040.
National Semiconductor Corporation: *See*—
Batruni, Roy G.; and Wilson, Howard A., 4,926,472, Cl. 379-411.000.
Kertis, Robert A.; and Smith, Douglas D., 4,926,383, Cl. 365-203.000.
Koterasawa, Matsuro, 4,926,109, Cl. 323-274.000.
Nau, Vance J.: *See*—
Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J., 4,925,628, Cl. 422-100.000.
Nava, Paolo, to SpA Tonon & C. Chair element which can be personalized. 4,925,244, Cl. 297-440.000.
Navistar International Transportation Corp.: *See*—
McCandless, James C., 4,924,838, Cl. 123-541.000.
Windle, William E.; Zimmerman, Robert E.; Glotzbach, Ronald W.; and Onesti, Robert J., 4,926,331, Cl. 364-424.040.
Nawa, Hiroyuki: *See*—
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; Kaneko, Motohiro; Kusumoto, Yoshiro; Takakuwa, Kazuo; and Ikuta, Tetsuya, 4,924,807, Cl. 118-725.000.
Nawsir Inc.: *See*—
Schaffer, Michael J., 4,924,715, Cl. 73-865.800.
Naya, Eizo: *See*—
Aoki, Shinichi; and Naya, Eizo, 4,926,017, Cl. 200-144.00B.
Nayes, Terrence L.: *See*—
Bateson, George F.; Chresand, Thomas J.; Moore, Joel D.; and Nayes, Terrence L., 4,925,552, Cl. 210-150.000.
NCR Corporation: *See*—
Frielink, Franciscus J., 4,926,173, Cl. 341-22.000.
Richter, Jeff T.; and Seignemartin, Elbert E., 4,926,280, Cl. 361-15.000.
Neal, Harold L. Replaceable cement-trowel blade trailing edge. 4,925,341, Cl. 404-112.000.
Nebe, William J.; and Osborne, James J., to Du Pont de Nemours, E. I., and Company. Process of making photosensitive aqueous developable ceramic coating composition including freeze drying the ceramic solid particles. 4,925,771, Cl. 430-281.000.
NEC Corporation: *See*—
Ando, Yuji; and Toyoshima, Hideo, 4,926,232, Cl. 357-34.000.
Fujii, Takeo, 4,926,381, Cl. 365-189.010.
Hatazaki, Kaichiro; and Watanabe, Takao, 4,926,483, Cl. 381-43.000.
Hidaka, Yasuharu, 4,926,377, Cl. 365-29.000.
Ishizawa, Yoshiro; and Morito, Hiroshi, 4,926,175, Cl. 341-131.000.
Kanazawa, Takashi, 4,926,320, Cl. 364-200.000.
Nakayama, Takashi, 4,926,318, Cl. 364-200.000.
Nukiyama, Tomoji, 4,926,312, Cl. 364-200.000.
Ohno, Tamio; Yoshida, Kousaku; and Kitagawa, Masaki, 4,926,264, Cl. 358-349.000.
Shimizu, Hiroshi, 4,926,420, Cl. 370-94.100.
Yamazaki, Toru, 4,926,069, Cl. 307-446.000.
NEC Home Electronics Ltd.: *See*—
Ohno, Tamio; Yoshida, Kousaku; and Kitagawa, Masaki, 4,926,264, Cl. 358-349.000.
Neches, Philip M.; Hartke, David H.; Baran, Richard J.; Woodcock, Darryl L.; and Papachristidis, Alexandros C., to Teradata Corporation. Dynamically partitionable parallel processors. 4,925,311, Cl. 364-200.000.
Nees, Friedbert: *See*—
Krabetz, Richard; Duembgen, Gerd; Nees, Friedbert; Merger, Franz; and Fouquet, Gerd, 4,925,823, Cl. 502-211.000.
Negishi, Tohru. Frame for multifocal spectacles. 4,925,292, Cl. 351-128.000.
Neilan, James P.; and Stephen, John F., to ICI Americas Inc. N-2,2-dimethyl-2-(2-hydroxy-alkylphenyl) heterocycles and stabilized compositions. 4,925,938, Cl. 544-221.000.
Nelson A. Taylor Co., Inc.: *See*—
Duffy, Keith, 4,924,796, Cl. 114-219.000.
Nelson, Lloyd J.: *See*—
Schooley, Arthur F.; Eben-Ebenau, Wolf R.; and Nelson, Lloyd J., 4,926,108, Cl. 322-15.000.
Nelson, Michael J. K.; and Bourquin, Al W., to Ecova Corporation. Method for stimulating biodegradation of halogenated aliphatic hydrocarbons. 4,925,802, Cl. 435-262.000.
Nelson, Richard C.: *See*—
Southwick, Jeffrey G.; and Nelson, Richard C., 4,925,578, Cl. 252-8.554.
Nelson, William D.: *See*—
McKay, Robert S.; and Nelson, William D., 4,925,188, Cl. 273-86.00R.

Nesbitt, R. Dennis: *See*—
Melvin, Terence; and Nesbitt, R. Dennis, 4,925,193, Cl. 273-232.000.
Nestec S.A.: *See*—
Bertholet, Raymond, and Hirsbrunner, Pierre, 4,925,932, Cl. 536-55.300.
Fischbach, Eugene R.; and Destephen, Stephen J., 4,925,683, Cl. 426-103.000.
Mai, Jimbin; Chambers, Laura J., and McDonald, Richard E., 4,925,681, Cl. 426-52.000.
Neugebauer, Wendell, to General Electric Company. Electromagnetic launcher with improved current commutating switch performance. 4,924,750, Cl. 89-8.000.
Neumann, Hans-Jurgen: *See*—
Meisberger, Artur; and Neumann, Hans-Jurgen, 4,925,299, Cl. 356-40.000.
Neumann, Joachim: *See*—
Feuser, Alfred; Neumann, Joachim; and Voxbrunner, Walter, 4,924,754, Cl. 91-363.00R.
Neumann, Peter: *See*—
Aumueller, Alexander; Neumann, Peter; Spang, Peter, Matzke, Guenter; and Trauth, Hubert, 4,925,888, Cl. 524-91.000.
Nevill, Leland R., to Micron Technology, Inc. Burn-in board having discrete test capability. 4,926,117, Cl. 324-158.00F
Newkirk, Raymond K.; and West, William G., to Forward Technology Industries, Inc. Collapsible contact heating platen. 4,925,519, Cl. 156-304.100.
Newman, Neil A.; and McCormick, Daniel F., to Brunswick Corporation. Stern drive marine propulsion system including a chain drive mechanism. 4,925,413, Cl. 440-75.000.
Newman, Neil A., to Brunswick Corporation. Marine propulsion system. 4,925,414, Cl. 440-83.000.
Newton, Jerry; Grogan, Chester, Jr.; and Spector, George. Fishing pole holder. 4,925,148, Cl. 248-542.000.
NGK Insulators, Ltd.: *See*—
Ikimi, Takahiro; Taketomi, Tsuneharu; and Kato, Kiminari, 4,924,637, Cl. 51-290.000.
Watanabe, Keiichiro; Ohashi, Tsuneaki; and Matsuhisa, Tadaaki, 4,925,816, Cl. 501-104.000.
Nguyen, Nhan H., to ICI Americas Inc. Certain 2-benzoyl-5-hydroxy-4,4,6,6-tetra-substituted-1,3-cyclohexanediones. 4,925,965, Cl. 558-411.000.
Nichoalds, Donald L., to Luxor Corporation. Wheeled table. 4,924,782, Cl. 108-27.000.
Nichols, Walter A.: *See*—
Hill, Michael; and Nichols, Walter A., 4,925,602, Cl. 264-25.000.
Nichols, Wayne C.: *See*—
Cheng, Shi-wai S.; Nichols, Wayne C.; and Moore, Wayne R., 4,924,829, Cl. 123-259.000.
Niedballa, Ulrich: *See*—
Gries, Heinz; Niedballa, Ulrich; and Weinmann, Hanns-Joachim, 4,925,652, Cl. 424-9.000.
Niemela, Paul; and Peot, David G., to Ryohi Motor Products Corp. Motor field winding with intermediate tap. 4,926,079, Cl. 310-71.000.
Nihashi, Hiroyuki: *See*—
Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nihashi, Hiroyuki; and Tanaka, Tsuneo, 4,925,731, Cl. 428-336.000.
Nihei, Kanta: *See*—
Yoshida, Ryuichi; Ohnishi, Tokio; Yamamura, Tetsushi; and Nihei, Kanta, 4,924,958, Cl. 180-128.000.
Nihon Food Culture Co., Ltd.: *See*—
Ikeda, Tamehiko; and Yano, Shusuke, 4,925,743, Cl. 428-702.000.
Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; Kaneko, Motohiro; Kusumoto, Yoshiro; Takakuwa, Kazuo; and Ikuta, Tetsuya, 4,924,807, Cl. 118-725.000.
Nihon Tungsten Kabushiki Kaisha: *See*—
Nagai, Yataro; Matsushita, Mitsuyoshi; Ishibashi, Osamu; Terasaki, Kiyoshi; and Tokumoto, Kei, 4,925,490, Cl. 75-238.000.
Niikawa, Takeshi, to Brother Kogyo Kabushiki Kaisha Recording paper transporting device in a recording apparatus. 4,925,325, Cl. 400-582.000.
Niimura, Koichi: *See*—
Oguchi, Yoshiharu; Niimura, Koichi; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; and Yoshikumi, Chikao, 4,925,662, Cl. 424-85.910.
Niitsuma, H.: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, to Nakatsuka, K.; Abe, H.; Japan Metals & Chemicals Co., Ltd.; and Niitsuma, H. Method of drilling a well by utilizing AE/MA measurement. 4,924,950, Cl. 175-50.000.
Niizuma, Kiyozumi: *See*—
Orikasa, Tsuyoshi; Ito, Fujihiro; Suzuki, Hiroyuki; Kameyama, Makoto; Niizuma, Kiyozumi; Yoshida, Kazuyo; and Yamanaka, Toshio, 4,926,276, Cl. 360-126.000.
Nikkiso Co., Ltd.: *See*—
Ohsaki, Takashi; Imai, Koichi; and Miyahara, Naomasa, 4,925,604, Cl. 264-29.200.
Nikolov, Ivan P.: *See*—
Pavlov, Dechko; Donchev, Todor V.; Nikolov, Ivan P.; Nikolova, Veneta I.; Papazov, Geno P.; and Petrov, Konstantin M., 4,925,746, Cl. 429-57.000.
Nikolova, Veneta I.: *See*—
Pavlov, Dechko; Donchev, Todor V.; Nikolov, Ivan P.; Nikolova, Veneta I.; Papazov, Geno P.; and Petrov, Konstantin M., 4,925,746, Cl. 429-57.000.
Nikon Corporation: *See*—
Kanno, Hideo; Imanari, Hitoshi; Naito, Hideshi; Kodaka, Yoshiro; and Ohta, Naoto, 4,925,282, Cl. 350-429.000.
Niksa, Andrew J.: *See*—
Niksa, Marilyn J.; Niksa, Andrew J.; and Noscal, Jay M., 4,925,744, Cl. 429-27.000.
Niksa, Marilyn J.; Niksa, Andrew J.; and Noscal, Jay M., to Eltech Systems Corporation. Primary aluminum-air battery. 4,925,744, Cl. 429-27.000.
Nillesen, Antonius H. H. J.: *See*—
Frencken, Peter H.; Nillesen, Antonius H. H. J.; and Brand, Simon J., 4,926,260, Cl. 358-148.000.
Nilssen, Ole K. Shock-protected electronic ballast. 4,926,096, Cl. 315-225.000.
Nilsson, Erling: *See*—
Inacio, Jorge; and Nilsson, Erling, 4,925,377, Cl. 417-472.000.
Nimberg, Richard: *See*—
Mannick, John A.; Rodrick, Mary; and Nimberg, Richard, 4,925,920, Cl. 530-387.000.
Nimura, Takayasu; and Shiga, Tsutomu, to Nippondenso Co., Ltd. Alternator with attached diode regulator housing. 4,926,076, Cl. 310-68.00D.
Nintendo Company Limited: *See*—
Nakagawa, Katsuya, 4,926,372, Cl. 364-900.000.
Nippon CMK Corp.: *See*—
Seki, Kameharu; and Kubo, Isamu, 4,925,347, Cl. 409-132.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Matsumoto, Mutsumi; and Seo, Yoshimasa, 4,925,980, Cl. 562-534.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Sugitani, Yuji; Kobayashi, Yukio; Ikeda, Yoshihisa; and Murayama, Masatoshi, 4,926,023, Cl. 219-125.120.
Nippon Mining Company, Limited: *See*—
Maeda, Yoshihiro; Hosonuma, Kunihiko; and Tamura, Keiichi, 4,925,596, Cl. 252-32.70E.
Nippon Oil Co., Ltd.: *See*—
Nambu, Masao, 4,925,603, Cl. 264-28.000.
Nippon Oil & Fats Co., Ltd.: *See*—
Kubota, Naminosuke; Shimizu, Haruaki; Sonobe, Tadashi; and Nakashita, Goro, 4,925,909, Cl. 528-55.000.
Nippon Paint Co., Ltd.: *See*—
Urano, Satoshi; and Mizuguchi, Ryuzo, 4,925,982, Cl. 562-871.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Baba, Tsuyoshi; Takigawa, Akio; Hirayama, Naoto; and Yoshida, Motoaki, 4,925,737, Cl. 428-437.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Shimizu, Noboru; Yoshida, Hiroshi; Daigo, Hiromiki; and Matsumoto, Shoichi, 4,925,981, Cl. 562-600.000.
Nippon Steel Chemical Co., Ltd.: *See*—
Teramoto, Takero; and Watanabe, Kazuhiro, 4,925,913, Cl. 528-272.000.
Nippon Steel Corporation: *See*—
Kishida, Koji; and Akisue, Osamu, 4,925,500, Cl. 148-12.00F.
Teramoto, Takero; and Watanabe, Kazuhiro, 4,925,913, Cl. 528-272.000.
Nippondenso Co., Ltd.: *See*—
Ito, Shigemi; and Narita, Katsunori, 4,926,152, Cl. 336-90.000.
Itoh, Norihisa; Kawaguchi, Kiyoshi; and Nomura, Etsuji, 4,925,236, Cl. 296-180.500.
Kishi, Noriaki; Nosaka, Kazuto; Terao, Tadayoshi; and Shibata, Yukio, 4,925,468, Cl. 55-467.000.
Nimura, Takayasu; and Shiga, Tsutomu, 4,926,076, Cl. 310-68.00D.
Nishibori, Toshiki: *See*—
Takano, Sakuharu; Nishibori, Toshiki; and Katsuta, Yuji, 4,926,269, Cl. 358-474.000.
Nishida, Hiroyasu: *See*—
Sato, Goro; Komatsu, Michio; Nishida, Hiroyasu, Tanaka, Yoshichika; Koyanagi, Tsuguo; and Mihara, Kei, 4,925,704, Cl. 427-221.000.
Nishigaki, Yuji: *See*—
Kawamura, Naoto; Nishigaki, Yuji; and Ohsawa, Hidefumi, 4,926,268, Cl. 358-458.000.
Nishihara, Eitaro: *See*—
Tawara, Kiyoshi; Osada, Masakazu; and Nishihara, Eitaro, 4,926,415, Cl. 370-60.000.
Nishihira, Koichi: *See*—
Itokazu, Yuji; and Nishihira, Koichi, 4,925,898, Cl. 525-305.000.
Nishijima, Hideo: *See*—
Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; Owashi, Hitoaki; Sekiya, Masataka; and Minabe, Kohji, 4,926,361, Cl. 364-574.000.
Nishikawa, Susumu: *See*—
Hashiguchi, Masayuki; Yamada, Kuchi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,926,333, Cl. 364-426.020.
Nishikawa, Tadashi: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 4,926,143, Cl. 331-156.000.
Nishiki, Yoshinori: *See*—
Matsumoto, Yukiei; Nishiki, Yoshinori; Hirao, Kazuhiro, and Shimamune, Takayuki, 4,925,578, Cl. 204-129.400.

VOL
1114
ISS
3
MY
15
1990
UMI

Nishimu Electronics Industries Co., Ltd.: *See—*
Harada, Koosuke; and Sakamoto, Hiroshi, 4,926,302, Cl. 363-16.000.

Nishimura, Toshifumi: *See—*
Yamamoto, Akira; Motoyama, Miho; Kitajima, Hiroyuki; Doi, Takashi; and Nishimura, Toshifumi, 4,926,324, Cl. 364-200.000.

Nishimura, Toshio: *See—*
Morita, Akitaka; Nishimura, Toshio; and Takada, Hiroshi, 4,926,368, Cl. 364-715.050.

Nishino, Yukishige: *See—*
Bohlmann, Rolf; Laurent, Henry; Henderson, David; and Nishino, Yukishige, 4,925,834, Cl. 514-177.000.

Nishiyama, Shigeru: *See—*
Inada, Yutaka; Kawasaki, Kazumasa; Nishiyama, Shigeru; and Yoshikura, Hiroshi, 4,924,710, Cl. 73-861.230.

Nissan Motor Company, Limited: *See—*
Abe, Toshiro, 4,924,832, Cl. 123-419.000.
Futami, Toru; Suzuki, Tadashi; and Sakagami, Atsushi, 4,926,417, Cl. 370-85.100.
Ike, Masahide; and Kawai, Kunio, 4,924,967, Cl. 181-243.000.
Sugano, Kazuhiko, 4,924,979, Cl. 192-3.310.
Suzuki, Kouichi; and Konishi, Kiyoshi, 4,926,334, Cl. 364-426.040.
Tamuraya, Makoto, 4,926,295, Cl. 362-144.000.
Uchida, Masaaki; Uema, Hideki; Miwa, Hiromichi; and Kawamura, Yoshihisa, 4,924,836, Cl. 123-489.000.

Nissei Jushi Kogyo Kabushiki Kaisha: *See—*
Takada, Minoru, 4,925,618, Cl. 264-328.100.

Nisshin Flour Milling Co., Ltd.: *See—*
Takahashi, Toshihiro; Hagihara, Koichiro; Nakamaru, Koichi; and Suzuki, Yoshikuni, 4,925,843, Cl. 514-248.000.

Nitto Denko Corporation: *See—*
Yamada, Shinji; and Aoki, Yutaka, 4,925,730, Cl. 428-305.500.

Nix, Michael A., to Advanced Micro Devices, Inc. Modular test structure for single chip digital exchange controller. 4,926,363, Cl. 364-579.000.

Noack, William L., to Devon Industries, Inc. Foot maneuvered disposable container for operating room discards. 4,925,048, Cl. 220-70.000.

Noack, William L.: *See—*
Valentine, A. H. Llynn; and Noack, William L., 4,925,047, Cl. 220-23.830.

Noakes, Timothy J.: *See—*
Waters, Colin M., Noakes, Timothy J.; and Pavey, Ian, 4,925,708, Cl. 428-1.000.

Nocci, Roberto: *See—*
Rendina, Gabriele; Nocci, Roberto; Callaioli, Andrea; and Corrado, Francesco, 4,925,899, Cl. 525-314.000

Noda, Yukio: *See—*
Mimura, Yoshinori; Noda, Yukio; Norimatsu, Naoki; Tokiwa, Hideharu; and Shinbori, Osamu, 4,925,475, Cl. 65-48.000.

Noguchi, Toshiaki, to Olympus Optical Co., Ltd. Endoscope light source apparatus. 4,924,856, Cl. 128-6.000.

Nohl, Andre J.: *See—*
Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J. 4,925,628, Cl. 422-100.000.

Noirot, Frederic: *See—*
Saens, Michel S.; Jacquet, Bruno; Marie, Philippe; Noirot, Frederic; and Tellier, Francois, 4,926,149, Cl. 335-132.000.

Nomix Manufacturing Company Limited: *See—*
Gill, David C., 4,925,096, Cl. 239-10.000.

Nomura, Etsuji: *See—*
Itoh, Norihisa; Kawaguchi, Kiyoshi; and Nomura, Etsuji, 4,925,236, Cl. 296-180.500.

Nomura, Michio: *See—*
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio, Watanabe Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.

Nomura, Mitsuo; and Aikawa, Yukihiro, to Mita Industrial Co., Ltd. Original-holding cover. 4,926,214, Cl. 355-75.000.

Nord Tech, Inc.: *See—*
Pedersen, Niels H., 4,924,913, Cl. 138-155.000.

Nordby, Rasmus: *See—*
Corsetto, Craig; Hornak, Tom; Nordby, Rasmus; Walker, Rick C.; and Yen, Chu, 4,926,447, Cl. 375-120.000.

Nordischer Maschinenbau Rud Baader GmbH & Co. KG: *See—*
Grosseholz, Werner; Schmuser, Dirk; and Wenzel, Werner, 4,924,553, Cl. 17-50.000.

Nordisk Kartro AB: *See—*
Sundberg, Ingvar, 4,925,352, Cl. 411-443.000.

Nordson Corporation: *See—*
Konieczynski, Ronald D.; Pintelon, Jo; Holland, Robert J; Barth, C. Peter; and Gell, Jeff, 4,925,101, Cl. 239-8.000.

Nordyne, Inc.: *See—*
Vaughn, Thomas D, 4,924,848, Cl. 126-110.0AA.

Norimatsu, Naoki: *See—*
Mimura, Yoshinori; Noda, Yukio; Norimatsu, Naoki; Tokiwa, Hideharu; and Shinbori, Osamu, 4,925,475, Cl. 65-48.000.

Norman, Alan B.: *See—*
Perfetti, Thomas A; Norman, Alan B.; and Dube, Michael F., 4,924,888, Cl. 131-336.000.

Norman, Dennis L.; and Norman, Melvin E., to Whitman Saddle Mfg., Inc. Adjustable stirrup bar. 4,924,660, Cl. 54-46.000.

Norman, Melvin E.: *See—*
Norman, Dennis L.; and Norman, Melvin E., 4,924,660, Cl. 54-46.000.

Norris, Brian; and Gojny, Francis J., to Rohr Industries, Inc. Hollow metal sphere filled stabilized skin structures and method of making. 4,925,740, Cl. 428-547.000.

Norsk Hydro a.s.: *See—*
Myklebust, Eirik; Omdal, Bjarne; Juel, Anders; Strand, Olaf; and Jonsgard, Erik, 4,925,317, Cl. 383-8.000.

North American Philips Corporation: *See—*
Gibson, Ray G., III; and Kowal, Albert E., 4,926,092, Cl. 313-493.000.
Singer, Barry M.; Bruning, Gert W.; and Mukherjee, Satyendranath, 4,926,074, Cl. 307-581.000.

Northern Telecom Limited: *See—*
Grosse, John K., 4,925,806, Cl. 437-34.000.
Van Leeuwen, Robert J., 4,926,009, Cl. 174-135.000.

Norton Company: *See—*
Rossi, Guilio A.; and Pelletier, Paul J., 4,925,608, Cl. 264-60.000.

Norton, Jeffrey M.: *See—*
Blair, Bryce W.; Norton, Jeffrey M.; and Stahl, Daniel E., 4,925,400, Cl. 439-374.000.

Norvey, Inc.: *See—*
Brody, Harvey, 4,925,128, Cl. 222-211.000.

Nosaka, Kazuto: *See—*
Kishi, Noriaki; Nosaka, Kazuto; Terao, Tadayoshi; and Shibata, Yukio, 4,925,468, Cl. 55-467.000.

Noscal, Jay M: *See—*
Niksa, Marilyn J.; Niksa, Andrew J.; and Noscal, Jay M., 4,925,744, Cl. 429-27.000.

Nosco, Dennis L.; and Verbruggen, Alfons M., to Mallinckrodt, Inc. Technetium -99m complex for examining the renal function. 4,925,650, Cl. 424-1.100.

Nottke, James E. Actuating mechanism for biopsy needle. 4,924,878, Cl. 128-751.000.

Novak, C. Tim; Alt, Thomas J.; Chapman, Arnold D.; and Driscoll, David M., to Hughes Aircraft Company. Robotic component lead trimmer. 4,926,345, Cl. 364-513.000.

Novak, Rudy G.: *See—*
DeCicco, Steven G.; Lee, Sung K.; Novak, Rudy G.; Wass, William E.; and Mak, Kai K. 4,925,389, Cl. 432-106.000.

Nozaki, Kinya: *See—*
Numata, Motoichi; Nozaki, Kinya; Hayashida, Hajime; and Sakai, Toshiaki, 4,924,742, Cl. 84-218.000.

Nucleic Acid Research Institute: *See—*
Robins, Roland K.; and Kini, Ganesh D., 4,925,930, Cl. 536-23.000.

Nuding, Erich: *See—*
Ziethen, Rudiger; Benenowski, Sebastian; Kais, Alfred; and Nuding, Erich, 4,925,135, Cl. 246-436.000.

Nukiyama, Tomoji, to NEC Corporation. Program skip operation control system. 4,926,312, Cl. 364-200.000.

Numano, Kazuhiro: *See—*
Ito, Toshiaki; Numano, Kazuhiro; and Suzuki, Masami, 4,925,198, Cl. 280-89.000.

Numata, Motoichi; Nozaki, Kinya; Hayashida, Hajime; and Sakai, Toshiaki, to Yamaha Corporation. Mechanical keyboard instrument with pedal mechanisms. 4,924,742, Cl. 84-218.000.

Nunn, Robert E., to HPM Corporation. Mixing screw for extrusion and injection molding. 4,925,313, Cl. 366-81.000.

Nuovopignone-Industrie Meccaniche E Fonderia S.p.A.: *See—*
Vinciguerra, Costantino, 4,924,915, Cl. 139-76.000.

Nuyken, Oskar: *See—*
Quella, Ferdinand; Nuyken, Oskar; Budde, Klaus; and Suefke, Thomas, 4,925,772, Cl. 430-281.000.

Nyfeler, Robert; and Ehrenfraund, Josef, to Ciba-Geigy Corporation. Difluorobenzodioxyl cyanopyrrole microbicidal compositions. 4,925,840, Cl. 514-228.200.

Nyfeler, Robert: *See—*
Janicke, Reinhard; and Nyfeler, Robert, 4,925,842, Cl. 514-239.500.

Nynex Corporation: *See—*
Citron, Howard M., 4,926,010, Cl. 178-18.000.
Shu, Joseph S.; Springer, Robert; and Yeh, Chia L., 4,926,267, Cl. 358-454.000.

O.S.T., Ltd.: *See—*
Jones, Orville F.; and Simpson, Robert C., 4,924,574, Cl. 30-115.000.

O'Banion, Michael L.: *See—*
Hock, Thomas H.; O'Banion, Michael L.; Koehler, Heinrich P. F.; and Wynes, Joseph, 4,924,633, Cl. 51-135.00R.

Obata, Katsuhiko, to Casio Computer Co., Ltd. Input apparatus of electronic device for extracting pitch from input waveform signal. 4,924,746, Cl. 84-615.000.

Obata, Shuichi: *See—*
Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi; Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, 4,924,962, Cl. 181-141.000.

O'Brien, Walter J. Blood lancet device. 4,924,879, Cl. 128-770.000.

Oce-Nederland B.V.: *See—*
Clabbers, Wilhelmus G. M.; Dinnissen, Johannes H. A.; and Naburs, Johannes H. B., 4,925,178, Cl. 271-186.000.
Faber, Pals G.; Hermans, Stefanus P. E. A.; and Vegter, Gert, 4,925,355, Cl. 412-37.000.

Ochiai, Kuniaki: *See—*
Shimosato, Masashi; and Ochiai, Kuniaki, 4,925,625, Cl. 400-124.000.

Ochsenreiter, John E.: *See—*
Lewis, Thomas F.; and Ochsenreiter, John E., 4,924,902, Cl. 137-270.000.

O'Connor, James F., to Phillips Petroleum Company. Fiber reinforced thermoplastic articles and process for the preparation thereof. 4,925,729, Cl. 428-245.000.

O'Connor, R. Bruce; Toth, Thomas E.; and Ross, James A., to Sym-Tek Systems, Inc. Test station. 4,926,118, Cl. 324-158.00F.

O'Connor, Richard: *See—*
DiFrancesca, Peter; and O'Connor, Richard, 4,925,149, Cl. 248-687.000.

Oda, Saiji: *See—*
Machino, Toshimichi; Oda, Saiji; Toubo, Kihachirou; and Kadosaki, Masahiro, 4,924,713, Cl. 73-862.060.

Odake, Yoshinobu, to San-Ei Chemical Industries, Ltd. Method of preparing vegetable or fruit juices. 4,925,690, Cl. 426-330.500.

Odani, Yusuke: *See—*
Itoh, Yoshiaki; Odani, Yusuke; Akechi, Kiyoaki; and Kuroishi, Nobuhito, 4,926,242, Cl. 357-81.000

O'Dea, Kevin J.; Dolan, Donald T.; and Bergman, Norman J., to Pitney Bowes Inc. Nozzle control systems for moistener. 4,924,804, Cl 118-669.000.

O'Dea, Kevin J., to Pitney Bowes Inc. Pump system for moistener nozzle. 4,924,805, Cl. 118-680.000.

O'Donoghue, Patrick: *See—*
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick, O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.

O'Donoghue, Timothy: *See—*
Flanagan, Thomas; McMurry, Robert V., O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.

Ofek, Yoram: *See—*
Cidon, Israel; and Ofek, Yoram, 4,926,418, Cl. 370-85.500.

Officine Meccaniche Pavesi & C.S.p.A.: *See—*
Barbera, Giorgio, 4,925,118, Cl. 242-1.10R.

Ogawa, Masahiro; Shimazaki, Tatsuo; Umeda, Osamu; Aoki, Toshihiro; and Nakakusu, Toru, to Casio Computer Co., Ltd. Projection display apparatus. 4,925,295, Cl. 353-57.000.

Ogawa, Masataka: *See—*
Tsukamura, Yoshihiro; Ogawa, Masataka; and Kobayashi, Seiji, 4,925,717, Cl. 428-64.000

Ogawa, Michiko: *See—*
Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi; Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, 4,924,962, Cl. 181-141.000.

Ogawa, Taro: *See—*
Goto, Fumio; and Ogawa, Taro, 4,925,508, Cl. 156-79.000.

Ogawa, Yoji: *See—*
Yoshida, Tetsuji; Teraoka, Yoshiaki; Ogawa, Yoji; Kozaki, Ken; Hara, Kenji; Satou, Hiroshi; and Yoshino, Akira, 4,926,487, Cl. 381-186.000.

Ogden Inc.: *See—*
Ogden, John M., 4,925,724, Cl. 428-137.000.

Ogden, John M., to Ogden Inc. Slip-resistant, cushioning material. 4,925,724, Cl. 428-137.000.

Ogi, Keiji: *See—*
Yoshizawa, Tomimi; Ogi, Keiji; and Kamitakahara, Atushi, 4,925,780, Cl. 434-589.000.

Ogilvie, Garry J. Putting target. 4,925,191, Cl. 273-178.00A

Ognier, Jean-Francois; and Manhes, Hubert, to Societe dite Sinergy S.A. Surgical apparatus. 4,924,851, Cl. 128-4.000.

Oguchi, Yoshiharu; Niimura, Koichi; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Anti-tumor substance and process for producing the same. 4,925,662, Cl. 424-85.910.

Ogura, Makoto: *See—*
Iwamoto, Hirofumi; Kawai, Tatsundo; Ogura, Makoto; Nakagawa, Katsumi; Seitoh, Shinichi; and Kaifu, Noriyuki, 4,926,058, Cl. 250-578.100.

Ogura, Mitsuru, to Sharp Kabushiki Kaisha. Image forming apparatus. 4,926,210, Cl. 355-28.000.

Ogura, Yukihiro; and Ikenoya, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Six stroke internal combustion engine. 4,924,823, Cl. 123-64.000.

Oguri Tomei: *See—*
Hayashi, Yoshio; Oguri Tomei; Shinoda, Masaki; Takahashi, Kazuo; and Hashimoto, Munehiro, 4,925,861, Cl. 514-367.000.

OH Investments Limited: *See—*
Hansen, Ole, 4,925,720, Cl. 428-77.000.

Ohashi, Takehisa: *See—*
Takahashi, Satomi; Ueda, Yasuyoshi, Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.

Ohashi, Tsuneaki: *See—*
Watanabe, Keiichiro; Ohashi, Tsuneaki; and Matsuhisa, Tadaaki, 4,925,816, Cl. 501-104.000.

Ohkubo, Masahiro, to Kabushiki Kaisha Daiken Seisakusho. Lock-up device for torque converter. 4,924,978, Cl. 192-3.300.

Ohlsen, Heinz-Jurgen, to Robert Krups Stiftung & Co. KG. Portable hair dryer. 4,924,602, Cl. 34-97.000.

Ohnishi, Makoto: *See—*
Kobayashi, Naoya; Ohnishi, Makoto; and Kokuryo, Yoshiro, 4,926,499, Cl. 455-306.000.

Ohnishi, Tokio: *See—*
Yoshida, Ryuichi; Ohnishi, Tokio; Yamamura, Tetsushi; and Nihei, Kanta, 4,924,958, Cl. 180-128.000.

Ohno, Tamio; Yoshida, Kousaku; and Kitagawa, Masaki, to NEC Corp.; and NEC Home Electronics Ltd. Addressable terminal for CATV. 4,926,264, Cl. 358-349.000.

Ohsaki, Takashi; Imai, Koichi; and Miyahara, Naomasa, to Nikkiso Co., Ltd. Process for preparing a carbon fiber of high strength. 4,925,604, Cl. 264-29.200.

Ohsawa, Hidefumi: *See—*
Kawamura, Naoto; Nishigaki, Yuji; and Ohsawa, Hidefumi, 4,926,268, Cl. 358-458.000.

Ohshima, Tsuyoshi; and Aoki, Kunimitsu, to Yazaki Corporation Indication display unit for vehicles. 4,925,272, Cl. 350-174.000.

Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, to Sharp Kabushiki Kaisha. Optical memory element and manufacturing method thereof. 4,925,776, Cl. 430-321.000.

Ohta, Naoto: *See—*
Kanno, Hideo; Imanari, Hitoshi; Naito, Hideshi; Kodaka, Yoshiro; and Ohta, Naoto, 4,925,282, Cl. 350-429.000.

Ohta, Shunsaku; and Yeh, Mon-Cheng. Mouth structure and a sound generating member for a doll. 4,925,425, Cl. 446-185.000.

Ohta, Tomozo; Nakano, Hiroshi; Higashi, Kazutada; and Yamamoto, Hirohiko, to Sharp Kabushiki Kaisha. Microwave data transmission apparatus. 4,926,182, Cl. 342-44.000.

Ohtake, Toshimichi, to Kabushiki Kaisha Toshiba. Satellite communication subsystem with the capability of performing a non-interfering operational test. 4,926,413, Cl. 370-13.100.

Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; Owashi, Hitoaki; Sekiya, Masataka, and Minabe, Kohji, to Hitachi, Ltd. Digital noise reducer. 4,926,361, Cl. 364-574.000.

Ohuchi, Kazunori: *See—*
Sakui, Koji; Ohuchi, Kazunori; and Masuoka, Fujio, 4,926,382, Cl 365-203.000.

Ohyama, Mineo; Katagiri, Shigenobu; Kozawa, Hiroomi; and Yamada, Koutaro. Electrophotographic printer. 4,926,200, Cl. 346-160.000.

Oishi, Hiroshi, to Sanshin Kogyo Kabushiki Kaisha. Clutch for marine propulsion. 4,925,416, Cl. 440-84.000.

Oka, Yasuyuki: *See—*
Komatsubara, Shoji; Takeuchi, Masahiko; and Oka, Yasuyuki, 4,926,213, Cl. 355-49.000.

Okabe, Yoshio: *See—*
Hayashi, Masaharu; Kodama, Hisashi; Okabe, Yoshio; Kobayashi, Yukimori; and Shirai, Eiji, 4,925,436, Cl. 474-101.000.

Okada, Hiroshi; Suzuki, Shingo; Kaganii, Manabu; and Suematsu, Chiaki, to Mitsubishi Rayon Company, Ltd. Light attenuator and process for fabrication thereof. 4,925,514, Cl. 156-249.000.

Okada, Masahiro; Ukai, Toshinao; Suzuki, Seiji; Adachi, Keiichi; Watanabe, Toshiyuki; and Ishigaki, Kunio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive element containing water soluble dye compounds. 4,925,782, Cl. 430-510.000.

Okado, Hideo: *See—*
Kawamura, Kichinari, Kono, Yasuo; Okado, Hideo; Shin, Shigemitsu; and Takaya, Haruo, 4,926,006, Cl. 585-640.000.

Okajima, Hideaki: *See—*
Sato, Kazuyoshi; and Okajima, Hideaki, 4,924,568, Cl. 29-90.010

Okajima, Takahiro: *See—*
Ikedo, Yuji; Miyakawa, Tsutomu; Okajima, Takahiro; and Miyake, Masahiko, 4,926,406, Cl. 369-36.000.

Okamoto, Kimitaka: *See—*
Aramaki, Minoru; Okamoto, Kimitaka, Sakaguchi, Hiroaki; and Nakamura, Tamio, 4,925,975, Cl. 562-113.000

Okaya, Shigeru: *See—*
Ishii, Yoshio; and Okaya, Shigeru, 4,925,561, Cl. 210-493.300.

Oku, Shunji; Mizumo, Yoshiyuki; and Seigenji, Kiyoshi, to Minolta Camera Kabushiki Kaisha. Process for producing a printed circuit board. 4,925,525, Cl. 156-652.000.

Oku, Syunji: *See—*
Teramoto, Togo; Oku, Syunji; Miyoshi, Yasuhiro; and Katsuragi, Mamoru, 4,926,208, Cl. 354-485.000.

Olbrich, Michael E.; McKay, Dwight L.; Montgomery, Dean P., deceased, and by Montgomery, B Jean, administratrix, to Phillips Petroleum Company. Dehydrogenation process. 4,926,005, Cl. 585-632.000.

Olds, James D.: *See—*
Villalon, S. Leonard; Olds, James D.; and Shoffner, William H, 4,925,205, Cl. 280-507.000.

Olin Corporation: *See—*
Canterberry, J. B.; and Katz, Lawrence E., 4,925,503, Cl. 149-19.400.
Muench, George J.; Lewis, Brian G.; Ashok, Sankaranarayanan; Watson, William G; and Cheskis, Harvey P., 4,925,103, Cl. 239-79.000.

Oliphant, Timothy L.: *See—*
Green, Charles J.; Morris, John M., and Oliphant, Timothy L., 4,925,196, Cl. 180-170.000.

Ollerenshaw, Andrew: *See—*
Foster, Bruce A. G. E.; Ollerenshaw, Andrew; and Copestake, Nigel W., 4,925,320, Cl. 384-42.000.

Olsen, Michael P. Loudspeaker enclosure. 4,924,964, Cl. 181-151.000.

Olson, Donald C.: *See—*
Chou, Charles C.; and Olson, Donald C., 4,925,569, Cl 210-713.000.

Olson, Rick A.: *See—*
Brown, James R.; and Olson, Rick A., 4,925,363, Cl. 415-129.000.

VOL 1114 ISS 3 MY 15 1990 UMI

Olson, Robert M.: *See—*
Silver, Frederick H.; Berg, Richard A.; Doillon, charles J.; Chernomorsky, Arkady; and Olson, Robert M., 4,925,924, Cl. 530-356.000.

Olson, Stewart B.: *See—*
Crouse, Jere W.; and Olson, Stewart B., 4,925,080, Cl. 226-196.000.

Olson, Timothy A.: *See—*
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.

Oltean, Jerry M.: *See—*
Schultz, Gary R.; and Oltean, Jerry M., 4,924,926, Cl. 152-417.000.

Oltman, Bruce A.: *See—*
Tarleton, George K.; Abrant, Robert J.; and Oltman, Bruce A., 4,926,115, Cl. 324-83 00D.

Olver, Terence E., to Westinghouse Electric Corp. Gain monitoring of distortion cancellation amplifiers in a feedforward linear amplifier. 4,926,134, Cl. 330-2.000.

Olver, Terence E., to Westinghouse Electric Corp. Power amplifier combiner for improving linearity of an output. 4,926,136, Cl. 330-149.000.

Oly, Pieter J., to Sollas Holland B.V. Apparatus for metering a foil web for wrapping objects supplied along a horizontal support. 4,924,653, Cl. 53-66.000.

Olympus Optical Co., Ltd.: *See—*
Hashimoto, Takeshi, 4,925,280, Cl. 350-423.000.
Masakawa, Yoshihiko, 4,926,402, Cl. 369-13.000.
Miyazaki, Akihiko, 4,926,257, Cl. 358-98.000.
Nagasaki, Tatsuo; Yamada, Hidetoshi; and Fujimori, Hiroyoshi, 4,926,247, Cl. 358-43.000.
Noguchi, Toshiaki, 4,924,856, Cl. 128-6.000.
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, 4,926,258, Cl. 358-98.000.
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.

Omdal, Bjarne: *See—*
Myklebust, Eirik; Omdal, Bjarne; Juel, Anders; Strand, Olaf; and Jonsgard, Erik, 4,925,317, Cl. 383-8.000.

Omniglass Ltd.: *See—*
Davies, Lawrence W., and Church, Kenneth S., 4,924,631, Cl. 49-504.000.

Omori, Hidetoshi; Shoji, Akira; and Akaza, Hiroshi, to Trinity Industrial Corporation. Liquid waste processing apparatus. 4,925,563, Cl. 210-532.100.

Omoto, Noriaki: *See—*
Shogaki, Toshihiro; Shibayama, Toyohiro; and Omoto, Noriaki, 4,926,137, Cl. 330-252.000.

Omron Tateisi Electronics Company: *See—*
Nakamura, Arata; and Onji, Norio, 4,926,049, Cl. 250-548.000.

Omura, Hirofumi: *See—*
Endo, Gen; Tateishi, Hiroyuki; Kawata, Yoshihiro; Karasudani, Isao; and Omura, Hirofumi, 4,925,725, Cl. 428-156.000.

Omura, Yoshiaki: *See—*
Tanihara, Masao; Yamada, Hideaki; Nakashima, Toshihide; Omura, Yoshiaki; and Takakura, Koichi, 4,925,787, Cl. 435-7.000.

Onaga, Eimei M.; Casler, Richard J., Jr.; Penkar, Rajan C.; Lancraft, Roy E.; and Sha, Chi, to Staubli International AG. Robot control system having adaptive feedforward torque control for improved accuracy. 4,925,312, Cl. 364-513.000.

Onai, Takahiro: *See—*
Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi; Onai, Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko, 4,926,235, Cl. 357-68.000.

O'Neill, Michael W.; Silverstone, Leon M.; and Halleck, Michael E., to Sion Technology, Inc. Dental anesthesia apparatus. 4,924,880, Cl. 128-787.000.

Onesti, Robert J.: *See—*
Windle, William E.; Zimmerman, Robert E.; Glotzbach, Ronald W.; and Onesti, Robert J., 4,926,331, Cl. 364-424.040.

Onji, Norio: *See—*
Nakamura, Arata; and Onji, Norio, 4,926,049, Cl. 250-548.000.

Ono Pharmaceutical Co. Ltd.: *See—*
Toda, Masaaki; Sasaki, Yutaro; and Shimoji, Katsuichi, 4,925,929, Cl. 536-4.100.

Onocki, Theodore J.: *See—*
Robbins, Edward S., III; and Onocki, Theodore J., 4,925,055, Cl. 220-403.000.

Onoda, Shigeo: *See—*
Banjo, Toshinobu; Ueda, Tetsuya; and Onoda, Shigeo, 4,926,034, Cl. 235-492.000.

Ooishi, Hiroshi: *See—*
Tabata, Kazumasa; Ooishi, Hiroshi; and Takaoka, Manabu, 4,924,910, Cl. 137-625.230.

Ootaka, Kazuto: *See—*
Inaba, Shigemitsu; Ootaka, Kazuto; and Hashizawa, Shigemi, 4,925,402, Cl. 439-490.000.

OPI Products, Inc.: *See—*
Schaeffer, George; and Lawrence, William, 4,924,889, Cl. 132-73.000.

Oppelt, Ralph, to Siemens Aktiengesellschaft. Arrangement for tuning a balanced-to-ground resonator. 4,926,147, Cl. 334-81.000.

Oppenheim, A. K., to University of California, The Regents of the. Method and system for controlled combustion engines. 4,924,828, Cl. 123-299.000.

Opti Patent-, Forschungs-und Fabrikations-AG: *See—*
Heimberger, Helmut, 4,924,914, Cl. 139-11.000.

Orbital Engine Company Proprietary Limited: *See—*
Lear, Mark; Schlunke, Christopher K.; and Seeber, Kenneth P., 4,924,820, Cl. 123-65.0PE.

Organic Technology, Inc.: *See—*
Jacob, A. Kirk; Willis, M. Joseph; and Hardman, A. Pierce, 4,925,571, Cl. 210-742.000.

Orikasa, Tsuyoshi; Ito, Fujihiro; Suzuki, Hiroyuki; Kameyama, Makoto; Niizuma, Kiyozumi; Yoshida, Kazuyo; and Yamanaka, Toshio, to Canon Kabushiki Kaisha. Magnetic head having reinforcing block. 4,926,276, Cl. 360-126.000.

Orkin, Fredric I.; Liber, Theodore; Smith, Charles R.; Knowlton, Kimball J.; and Huntley, Albin, to Baxter Travenol Laboratories, Inc. Closed multi-fluid delivery system and method. 4,925,444, Cl. 604-80.000.

Orlandi, Alessio, to Galatron, S.r.l. 'Breech-block' tap for the supply of cold or hot water with ceramic sealing plates. 4,924,903, Cl. 137-454.500.

Orndorff, Karl B.; and Lawson, Randall S., to Inventio AG. Elevator system having hall lantern assembly for elevator car door post of hatch door post. 4,924,974, Cl. 187-1.00R.

Ort, Burkhard: *See—*
Kanter, Hartmut; and Ort, Burkhard, 4,925,946, Cl. 544-250.000.

Orth, Winfried: *See—*
Gotz, Josef; Orth, Winfried; Weiss, Wolfgang; Rapp, Bernd; and Kleffner, Hans W., 4,925,942, Cl. 546-133.000.

Osada, Masakazu: *See—*
Tawara, Kiyoshi; Osada, Masakazu; and Nishihara, Eitaro, 4,926,415, Cl. 370-60.000.

Osaka Titanium Co., Ltd.: *See—*
Yoshiharu, Tetsujiro; and Kamise, Haruo, 4,925,809, Cl. 437-95.000.

Osanai, Yoshimi: *See—*
Miyamaru, Yukio; Yagasaki, Akio; Kimura, Shigeo; and Osanai, Yoshimi, 4,925,432, Cl. 474-8.000.

Osborne, James J.: *See—*
Nebe, William J.; and Osborne, James J., 4,925,771, Cl. 430-281.000.

Osher, John D.: *See—*
Blume, Linda A.; Henn, Kathy Y.; and Osher, John D., 4,926,296, Cl. 362-156.000.

Ostergaard, David A., to Cedarapids, Inc. Impeller bar installation and repositioning means for impact crushers having "open" type rotors. 4,925,114, Cl. 241-191.000.

Ostertag, Werner; Czech, Erwin; Schmitt, Franz-Ulrich; and Schulze-Hagenest, Detlef, to BASF Aktiengesellschaft. Carrier for reprography and production of this carrier. 4,925,762, Cl. 430-106.600.

Osthus, Harold L.: *See—*
Vaida, Robert M.; and Osthus, Harold L., 4,925,015, Cl. 198-803.700.

Ostrander, Charles. to R. G. Barry Corporation. Packaging container with display window. 4,925,087, Cl. 229-120.030.

Ostrander, Charles, to R. G. Barry Corporation. Packaging container. 4,925,088, Cl. 229-120.120.

Otis Elevator Company: *See—*
Adrian, Willy; and Moldenhauer, Detlev B., 4,924,995, Cl. 198-323.000.
Garrido, Alfonso; and Rico, Fernando, 4,924,721, Cl. 74-425.000.

Otsuka Kagaku Kabushiki Kaisha: *See—*
Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi; Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, 4,925,934, Cl. 540-310.000.

Otsuki, Toshiaki: *See—*
Kawamura, Hideaki; Fujibayashi, Kentaro; and Otsuki, Toshiaki, 4,926,102, Cl. 318-573.000.

Ottemann, William C., to International Marine Industries. Winch for roller reefing. 4,924,795, Cl. 114-107.000.

Otto Hansel GmbH: *See—*
Markwardt, Klaus; and Mergelsberg, Reinhard, 4,924,764, Cl. 99-348.000.

Oura, Yasuhiro: *See—*
Yoshimura, Yoshitaka; and Oura, Yasuhiro, 4,925,515, Cl. 156-250.000.

Outboard Marine Corporation: *See—*
Burmeister, Scott N.; Harris, Duane W.; Whipple, Roger B.; and Mondek, Martin J., 4,925,411, Cl. 440-61.000.
Lathers, Michael W., 4,924,798, Cl. 114-363.000.

Outokumpu Oy: *See—*
Kivisto, Tuomo V. J.; Koho, Tauno T.; and Andersson, Arvo E., 4,925,598, Cl. 261-87.000.

Outou, Tatsuyuki; and Watanabe, Hisanori, to Sony Corporation. FF-rew changing mechanism for tape recording and/or reproducing apparatus. 4,925,127, Cl. 242-201.000.

Ouwerkerk, Cornelis; and Beijersbergen Van Henegouwen, Cornelis, to U.S. Philips Corporation. Cassette having an information disc. 4,926,411, Cl. 369-291.000.

Overby, Kenneth W., to La-Man Corporation. Filter cartridge assembly. 4,925,466, Cl. 55-319.000.

Overlach, Knud: *See—*
Wamser, Manfred; and Overlach, Knud, 4,924,595, Cl. 33-542.000.

Owashi, Hitoaki: *See—*
Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; Owashi, Hitoaki; Sekiya, Masataka; and Minabe, Kohji, 4,926,361, Cl. 364-574.000.

Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 4,925,455, Cl. 44-77.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,926,003, Cl. 585-517.000.

Owen, Ronny C. Sunhather sprinkler apparatus. 4,925,099, Cl. 239-289.000.

OXID, Incorporated: *See—*
Bennett, Edward O., 4,925,582, Cl. 252-49.300.

Oyler, Lynn R., to Balloon Wrap, Inc. Method of filling a balloon with articles and air. 4,924,919, Cl. 141-10.000.

Ozawa, Isao, to Mizuno Sangyo Co., Ltd. Cup dispenser. 4,925,058, Cl. 221-279.000.

Ozawa, Takashi: *See—*
Inoue, Noriyuki; and Ozawa, Takashi, 4,925,777, Cl. 430-377.000.

Ozawa, Yoshio, to Fuji Photo Film Co., Ltd. Printing paper conveying apparatus for photographic printing apparatus. 4,926,211, Cl. 355-28.000.

Ozawa, Yoshio; and Yamamoto, Takashi, to Fuji Photo Film Co., Ltd. Driving apparatus for optical device of photographic printer. 4,926,212, Cl. 355-43.000.

Ozu, Yasushi: *See—*
Kawano, Minori; Mitsui, Kazuo; Hirooka, Masaharu; Ozu, Yasushi; Harada, Nagayasu; and Kimura, Nobuhiro, 4,926,421, Cl. 370-95.100.

PA-HA-GE Hutten und Giessereibedarf GmbH & Co. KG: *See—*
Zimmermann, Harry, 4,925,166, Cl. 266-270.000.

Pacakova , Zdenka; Brokl, Pavel; and Kulhavy , Josef, to Elitex, Koncern textilniho strojirenstvi. Device for positioning bobbins with yarn packages. 4,925,000, Cl. 198-409.000.

PACCAR Inc: *See—*
Fingerle, Robert F., 4,925,235, Cl. 296-180.200.

Pacific Scientific Company: *See—*
Hoyt, Steven W.; and Thomas, Sidney S., 4,925,124, Cl. 242-107.40A.

Padget, John C.; Yeates, Stephen G.; and Marsh, Mary R. R., to Imperial Chemical Industries PLC. Curable coating compositions and their preparation and use. 4,925,893, Cl. 524-337.000.

Page, Rocky H., to Tecumseh Products Company. Clutch. 4,924,988, Cl. 192-70.230.

Paik, Woo H., to General Instrument Corporation. Cable television descrambler. 4,926,477, Cl. 380-15.000.

Pajevic, Paul D. Planar body stimulating assembly. 4,924,859, Cl. 128-52.000.

Paliwoda, Joseph; Hale, Keith F.; and Propst, Verle, to Deco-Grand, Inc. Engine block water pump assembly. 4,925,367, Cl. 415-213.100.

Pall Corporation: *See—*
Pall, David B., 4,925,572, Cl. 210-767.000.

Pall, David B., to Pall Corporation. Device and method for depletion of the leukocyte content of blood and blood components. 4,925,572, Cl. 210-767.000.

Pallasvirta, Jaakko T., to Mannesmann AG. Loading of pourable goods. 4,925,010, Cl. 198-588.000.

Palmer, Reinhard, to Dr. Ing. h.c.F. Porsche AG. Flap for an air inlet opening at a motor vehicle. 4,924,907, Cl. 137-527.800.

Pander, Hans J.: *See—*
Rueb, Lothar; Eicken, Karl; Pander, Hans J.; Plath, Peter; Schwalge, Barbara; Wuerzer, Bruno; and Meyer, Norbert, 4,925,484, Cl. 71-96.000.

Pandion Haliaetus Limited: *See—*
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.

Panex Corporation: *See—*
Delatorre, Leroy C., 4,924,701, Cl. 73-151.000.

Pangaea Enterprises, Inc.: *See—*
Curlett, Harry B., 4,924,949, Cl. 175-25.000.

Panten, Detlef; and Jegelka, Jurgen, to Daimler-Benz AG. Device for exhaust gas recirculation in diesel engines. 4,924,668, Cl. 60-278.000.

Paolinelli, Antonio: *See—*
Di Gioacchino, Sandro; Paolinelli, Antonio; and Re, Luciano, 4,925,978, Cl. 562-443.000.

Papachristidis, Alexandros C.: *See—*
Neches, Philip M.; Hartke, David H.; Baran, Richard J.; Woodcock, Darryl L.; and Papachristidis, Alexandros C., 4,925,311, Cl. 364-200.000.

Papazov, Geno P.: *See—*
Pavlov, Dechko; Donchev, Todor V.; Nikolov, Ivan P.; Nikolova, Veneta I.; Papazov, Geno P.; and Petrov, Konstantin M., 4,925,746, Cl. 429-57.000.

Papke, Norval L., Jr.: *See—*
Cozine, Mark L.; Papke, Norval L., Jr.; and Hansen, Loren F., 4,924,944, Cl. 172-22.000.

Parent, Donald L. Hook setting device. 4,924,617, Cl. 43-15.000.

Parissenti, Lino: *See—*
Parissenti, Stefano; and Parissenti, Lino, 4,924,526, Cl. 2-13.000.

Parissenti, Stefano; and Parissenti, Lino, to M.P.A. Meccanica Plastica Agordina S.p.A. Protective visor. 4,924,526, Cl. 2-13.000.

Park, Jong W. Memory system for image processing having address calculating circuitry permitting simultaneous access to block horizontal sequence and vertical sequence subarrays of an array of data. 4,926,386, Cl. 365-230.030.

Park, Kyong, to Kavlico Corporation. Liquid level sensor. 4,924,702, Cl. 73-304.00C.

Park, Woo; and Mullenax, Kirk M. Length adjustable, trunk stowable protective car cover apparatus. 4,925,234, Cl. 296-136.000.

Parks, Thomas N.: *See—*
Jackson, J. R. Hunter; and Parks, Thomas N., 4,925,664, Cl. 424-537.000.

Parsons, Bryan N. V., to Jaguar Cars Limited. Transmission systems. 4,924,730, Cl. 475-166.000.

Parsons, Bryan N. V., to Jaguar Cars Limited. Two stroke engines. 4,924,824, Cl. 123-65.00P.

Partin, Dale L.: *See—*
Heremans, Joseph P.; and Partin, Dale L., 4,926,154, Cl. 338-32.00R.
Heremans, Joseph P.; and Partin, Dale L., 4,926,226, Cl. 357-27.000.

Pasler, Horst: *See—*
Dillmann, Hans-Georg; Pasler, Horst; and Martinsteg, Hans, 4,925,623, Cl. 376-314.000.

Patenaude, Jean-Pierre. Combustion system. 4,924,847, Cl. 126-77.000.

Patsch, Manfred; Epple, Gerhard; Flohr, Helmut; Degen, Helmut; and Nahr, Uwe, to BASF Aktiengesellschaft. Vat dye based on flouranthene. 4,925,954, Cl. 548-417.000.

Pattantyus, Tamas, to Allied-Signal Inc. Power controller with low standby current drain. 4,926,354, Cl. 363-98.000.

Patterson, George B.: *See—*
Hemmerdinger, Louis H.; Knowles, Gregory W.; and Patterson, George B., 4,925,636, Cl. 422-248.000.

Patzwald, Wolfgang: *See—*
Auslander, Klaus; Fabris, Hans-Jurgen; Patzwald, Wolfgang; and Seichter, Helmut, 4,926,127, Cl. 324-329.000.

Paulson, Roger W. Manhole cutter. 4,924,951, Cl. 175-57.000.

Pavey, Ian: *See—*
Waters, Colin M.; Noakes, Timothy J.; and Pavey, Ian, 4,925,708, Cl. 428-1.000.

Pavlov, Dechko; Donchev, Todor V.; Nikolov, Ivan P.; Nikolova, Veneta I.; Papazov, Geno P.; and Petrov, Konstantin M., to Zentralna la Boratoria Po Elektrochimicheski Iztochnici Na Tok. Device for recombing hydrogen and oxygen released in lead-acid storage batteries. 4,925,746, Cl. 429-57.000.

Payne, Peter R.: *See—*
Sapp, Samuel C.; and Payne, Peter R., 4,924,792, Cl. 114-61.000.

Peabody Coal Company: *See—*
Blosser, Charles H., 4,925,008, Cl. 198-497.000.

Peacock, Dale; and Raymer, Doyle, to Thermos Company, Inc., The. Decorator barbecue grill with fabric panel assembly. 4,924,846, Cl. 126-41.00R.

Pearl, David R.; and Wolfson, Lawrence S., to Gerber Garment Technologies, Inc. Cutting machine having balanced reciprocating cutter drive mechanism. 4,924,727, Cl. 74-603.000.

Pearson, Walter C., to Minnesota Mining and Manufacturing Company. Method and combination for heating and dispensing hot melt materials. 4,926,029, Cl. 219-421.000.

Pebley, Steve: *See—*
Larson, Brad W.; Hockersmith, Dan; Taylor, Thomas H.; Bedinger, John M.; Kottman, Rick; and Pebley, Steve, 4,925,167, Cl. 269-112.000.

Pedersen, Henrik: *See—*
Bogeso, Klaus P.; Jensen, Klaus G.; Moltzen, Ejner K.; and Pedersen, Henrik, 4,925,858, Cl. 514-342.000.

Pedersen, Niels H., to Nord Tech, Inc. Tube coupling system. 4,924,913, Cl. 138-155.000.

Pehr, Harold T. Closure for container. 4,925,041, Cl. 215-216.000.

Peitsmeier, Karl; and Schremmer, Gottfried, to Daimler-Benz AG. Adjusting device to vary the inclination of a steering column of a motor vehicle. 4,925,210, Cl. 280-775.000.

Pellerin de Beauvais, Hugues, to Societe d'Etude et de Construction de Materiel Electronique. Miniature electric switch designed to be used in particular in printed circuits. 4,926,012, Cl. 200-16.00R.

Pelletier, Paul J.: *See—*
Rossi, Guilio A.; and Pelletier, Paul J., 4,925,608, Cl. 264-60.000.

Pelrine, Bruce P.; and Wu, Margaret M., to Mobil Oil Corporation. Regeneration of reduced supported chromium oxide catalyst for alpha-olefin oligomerization. 4,926,004, Cl. 585-530.000.

Pendleton, John H.; and Gabriel, James. Device convertible into a chair, table, bed or stool. 4,925,245, Cl. 297-440.000.

Penkar, Rajan C.: *See—*
Onaga, Eimei M.; Casler, Richard J., Jr.; Penkar, Rajan C.; Lancraft, Roy E.; and Sha, Chi, 4,925,312, Cl. 364-513.000.

Pennace, John R.: *See—*
Abber, Herman; Gerry, Elizabeth H.; and Pennace, John R., 4,925,671, Cl. 424-448.000.

Penner, Douglas B. Golf bag beverage cooler. 4,924,682, Cl. 62-372.000.

Pennestri, Domenick. Cleaning and sanitizing system for a toilet seat. 4,924,532, Cl. 4-233.000.

Pennwalt Corporation: *See—*
Myers, Terry N., 4,925,903, Cl. 526-204.000.

Penzel, Uwe: *See—*
Glass, Reinhard; and Penzel, Uwe, 4,925,462, Cl. 55-37.000.

Peot, David G.: *See—*
Niemela, Paul; and Peot, David G., 4,926,079, Cl. 310-71.000.

Pera, Benito. Equipment for roasting coffee, hazlenuts, peanuts and similar commodities. 4,924,765, Cl. 99-348.000.

Peres, Sara F., executrix: *See—*
Peres, Steve U., deceased; and Peres, Sara F., executrix, 4,925,344, Cl. 405-184.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Peres, Steve U., deceased; and by Peres, Sara F., executrix. Method and apparatus for replacing buried pipe. 4,925,344, Cl. 405-184.000.
Perfetti, Thomas A.; and Westmoreland, Amos E., to R. J. Reynolds Tobacco Company. Smoking article. 4,924,883, Cl. 131-336.000.
Perfetti, Thomas A.; Norman, Alan B.; and Dube, Michael F., to R. J. Reynolds Tobacco Company. Smoking article. 4,924,888, Cl. 131-336.000.
Performance Contracting, Inc.: *See*—
Gray, Latham B., III; and Hart, Gordon H., 4,925,622, Cl. 376-289.000.
Performance Industries, Inc.: *See*—
Boyesen, Eyvind, 4,924,819, Cl. 123-65.0PE.
Permanent Tire Gauge Company, Inc.: *See*—
Hunt, Glen R.; and McDaniel, John F., 4,924,697, Cl. 73-146.800.
Permelec Electrode Ltd.: *See*—
Matsumoto, Yukiei; Nishiki, Yoshinori; Hirao, Kazuhiro; and Shimamune, Takayuki, 4,925,538, Cl. 204-129.400.
Perovetz, Lawrence M.; Pickthall, Jack, deceased; and Pickthall, Terence, executor, to Lamerie, N.V. Solutions and creams for silver plating and polishing. 4,925,491, Cl. 106-1.190.
Perrenoud, Andre: *See*—
Bondeson, Anders; Isaak, Bernhard; Perrenoud, Andre; and Tran, Minh Q., 4,926,094, Cl. 315-5.000.
Persson, Ingemar, to Exploweld AB. Method of explosion welding alloy aluminium. 4,925,084, Cl. 228-107.000.
Perstel, Ingetraud: *See*—
Gremm, Dorothee; and Perstel, Ingetraud, 4,925,672, Cl. 424-451.000.
Perugini, Michael N., to Litton Systems, Inc. Drive fastening system. 4,925,353, Cl. 411-453.000.
Pesheck, Peter S.: *See*—
Atwell, William A.; Pesheck, Peter S.; Krawjecki, Madonna M., and Anderson, George R., 4,926,020, Cl. 219-10.55M
Pessonneaux, Pierre: *See*—
Ronco, Roland; Ciapponi, Ermanno; and Pessonneaux, Pierre, 4,925,926, Cl. 534-589.000.
Pet, Robert J.: *See*—
Verlijsdonk, Johannus G.; Pet, Robert J.; and Smets, Bruno M. J., 4,926,091, Cl. 313-486.000.
Peter, Emil. Domed support structure. 4,924,638, Cl. 52-86.000.
Peters, Horst: *See*—
Kress, Hans-Jurgen; Lindner, Christian; Muller, Friedemann; Peters, Horst; Wittmann, Dieter; and Buekers, Josef, 4,925,891, Cl. 524-139.000.
Peters, Thomas E.: *See*—
Kasenga, Anthony F.; Sigai, A. Gary; Peters, Thomas E.; and Hunt, Roger B., 4,925,703, Cl. 427-215.000.
Peters, William T. Personal computer desk. 4,925,240, Cl. 297-161.000.
Petersen, Erwin: *See*—
Holst, Hans; Lindemann, Klaus; Saba, Manfred; Kaess, Hans-Harald; and Petersen, Erwin, 4,925,254, Cl. 303-111.000.
Petro, Richard J.: *See*—
Zemlo, Bridgett; Petro, Richard J.; and Moore, David N., 4,925,067, Cl. 222-480.000.
Petrolite Corporation: *See*—
Thierheimer, Charles L., Jr., 4,925,497, Cl. 134-40.000.
Petronko, Dennis A., to Field Foam Incorporated. Method of forming a heat foam insulation jacket. 4,925,605, Cl. 264-46.600.
Petrov, Konstantin M.: *See*—
Pavlov, Dechko; Donchev, Todor V.; Nikolov, Ivan P.; Nikolova, Veneta I.; Papazov, Geno P.; and Petrov, Konstantin M., 4,925,746, Cl. 429-57.000.
Peynchou-Malan Societe Anonyme: *See*—
Esnault, Paul, 4,924,932, Cl. 160-201.000.
Pfeifer, Josef: *See*—
Rohde, Ottmar; Jasne, Stanley J.; and Pfeifer, Josef, 4,925,912, Cl. 528-226.000.
Pfeiffer, Mark G.: *See*—
Smith, Jack E.; and Pfeiffer, Mark G., 4,924,629, Cl. 49-477.000.
Pfleiderer, Wolfgang: *See*—
Suhadolnik, Robert J.; and Pfleiderer, Wolfgang, 4,924,624, Cl. 47-58.000.
Pfutzenreuter, Henry, III: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F., Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,925,100, Cl. 239-416.400.
Philip Morris Incorporated: *See*—
Williams, David L., Edwards, William B., III; Cox, Richard H.; Faustini, Daryl L.; and Drew, Surnease, 4,925,985, Cl. 568-384.000.
Phillips, James L.; Richardson, Dale W.; and Silverman, Lawrence M., to International Research & Development Corporation. Method of making a device for cleaning electric knives. 4,925,516, Cl. 156-252.000.
Phillips Petroleum Company: *See*—
Hampton, Joe B., 4,925,635, Cl. 422-202.000.
Kimble, James B.; and Kolts, John H., 4,925,997, Cl. 585-428.000.
O'Connor, James F., 4,925,729, Cl. 428-245.000.
Olbrich, Michael E.; McKay, Dwight L.; Montgomery, Dean P., deceased; and Montgomery, B. Jean, administratrix, 4,926,005, Cl. 585-632.000.
Phoenix Closures, Inc.: *See*—
Zemlo, Bridgett; Petro, Richard J.; and Moore, David N., 4,925,067, Cl. 222-480.000.
Physical Optics Corporation: *See*—
Jannson, Thomasz P.; Jannson, Joanna L.; and Yeung, Peter C., 4,926,412, Cl. 370-3.000.
Picanol N.V.: *See*—
Shaw, Henry, 4,924,917, Cl. 139-452.000.
Pick, Robert O.: *See*—
Harris, Ralph N., III; Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A.; Koolpe, Gary A.; and Pick, Robert O., 4,925,856, Cl. 514-341.000.
Pickell, John D., to Honeywell Inc. High security communication line monitor. 4,926,162, Cl. 340-534.000.
Picker International, Inc.: *See*—
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, 4,926,455, Cl. 378-176.000.
Pickthall, Jack, deceased: *See*—
Perovetz, Lawrence M.; Pickthall, Jack, deceased; and Pickthall, Terence, executor, 4,925,491, Cl. 106-1.190.
Pickthall, Terence, executor: *See*—
Perovetz, Lawrence M.; Pickthall, Jack, deceased; and Pickthall, Terence, executor, 4,925,491, Cl. 106-1.190.
Picot, Pascal; and Carre, Jean-Jacques, to Bendix France. Brake corrector subject to the load of a vehicle as a function of the seating of the latter. 4,925,251, Cl. 303-22.100.
Pigott, John M.; and Jarrett, Robert B., to Motorola Inc. Negative voltage clamp. 4,926,073, Cl. 307-544.000.
Pillsbury Company, The: *See*—
Atwell, William A.; Pesheck, Peter S.; Krawjecki, Madonna M.; and Anderson, George R., 4,926,020, Cl. 219-10.55M
Pinck, Peter: *See*—
Hausler, Nikolaus; Muller, Heidi; Pinck, Peter; and Straube, Christina, 4,924,884, Cl. 131-84.100.
Pinson, George T., to Boeing Company, The. Variable inertia energy storage system. 4,926,107, Cl. 322-4.000.
Pinsson, Daniel; and Rouesnel, Bernard, to Ronis S.A. Chain deposit device for a shopping or baggage trolley. 4,924,994, Cl. 194-253.000.
Pintelon, Jo: *See*—
Konieczynski, Ronald D.; Pintelon, Jo; Holland, Robert J.; Barth, C. Peter; and Gell, Jeff, 4,925,101, Cl. 239-8.000.
Pioneer Electronic Corporation: *See*—
Hangai, Toshimasa; Tateishi, Kiyoshi; Ishitoya, Koichi; and Sakata, Haruyasu, 4,926,405, Cl. 369-32.000.
Ikedo, Yuji; Miyakawa, Tsutomu; Okajima, Takahiro; and Miyake, Masahiko, 4,926,406, Cl. 369-36.000.
Iwasaki, Satoshi, 4,926,441, Cl. 375-60.000.
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,926,404, Cl. 369-32.000.
Maeda, Takanori, 4,926,036, Cl. 250-201.100.
Murayama, Fumio; and Suzuki, Takashi, 4,924,965, Cl. 181-156.000.
Nanba, Keiichiro, 4,926,256, Cl. 358-84.000.
Yamashita, Masayasu, 4,926,485, Cl. 381-107.000.
Piorr, Robert: *See*—
Schenker, Gilbert, Piorr, Robert; and Luettge, Sabine, 4,925,587, Cl. 252-174.220.
Pipon, Yves; and Droulon, Georges, to A. & M. Cousin-Etablissements Cousin Freres. Simple memory mechanism comprising a mechanical jack for tilting over control on the front of a vehicle seat. 4,925,228, Cl. 296 65.100.
Pirelli General plc: *See*—
Scrivener, Paul L., 4,925,269, Cl. 350-96.330.
Pirotte, Wilhelm. Litter for small animals. 4,924,808, Cl. 119-1.000.
Piteo, Michael J.; and Mercier, Real L., to R. E. Phelon Company, Inc. Capacitor discharge ignition system with microprocessor timing control. 4,924,831, Cl. 123-417.000.
Pitney Bowes Inc.: *See*—
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,926,193, Cl. 346-76.0PH.
O'Dea, Kevin J.; Dolan, Donald T.; and Bergman, Norman J., 4,924,804, Cl. 118-669.000.
O'Dea, Kevin J., 4,924,805, Cl. 118-680.000.
Pizant, Jacques: *See*—
Locanetto, Philippe; Bury, Frederic; and Pizant, Jacques, 4,925,387, Cl. 431-187.000.
Pizza Hut: *See*—
Bingham, Lynn R., 4,924,763, Cl. 99-339.000.
Plant, David D., to Flexiplant USA. Process of erecting an inflatable building. 4,924,651, Cl. 52-745.000.
Plantronics, Inc.: *See*—
Advani, Jai K.; and Bernardi, Robert J., 4,926,459, Cl. 379-52.000.
Plaschkes, Michael, to Plastic Magen. Heat exchanger base units and modules. 4,924,938, Cl. 165-158.000.
Plastic Magen: *See*—
Plaschkes, Michael, 4,924,938, Cl. 165-158.000.
Plath, Peter: *See*—
Rueb, Lothar; Eicken, Karl; Pander, Hans J.; Plath, Peter; Schwalge, Barbara; Wuerzer, Bruno; and Meyer, Norbert, 4,925,484, Cl. 71-96.000.
Plempel, Manfred: *See*—
Stroech, Klaus; Frie, Monika; Himmler, Thomas; and Plempel, Manfred, 4,925,865, Cl. 514-383.000.
Pletsch, Hubert: *See*—
Wolf, Franz J.; and Pletsch, Hubert, 4,925,163, Cl. 267-153.000.
Plewes, John T.: *See*—
Hauser, Joachim J.; Plewes, John T.; and Robbins, Murray, 4,925,407, Cl. 439-887.000.

Plocharczyk, John R.: *See*—
Jeskey, Richard V.; and Plocharczyk, John R., 4,925,473, Cl. 65-12.000.
Plummer, Darrill L., to Ingersoll-Rand Company. Press-fit retaining ring with extrusion-holding chamfer for wobble-piston cup seal. 4,924,759, Cl. 92-240.000.
Plummer, William T.; and Boyea, Robert J., to Polaroid Corporation. Structure and fabrication of components for connecting optical fibers. 4,925,267, Cl. 350-96.200.
Plyter, Walter J., to Daniels Manufacturing Corporation. Tension testing tool. 4,924,709, Cl. 73-829.000.
Po, Tsai J. Gas mouth. 4,924,899, Cl. 137-232.000.
Poehner, Michael E.; Duwell, Michael J.; and Boyd, Howard J., to Hill-Rom Company, Inc. Radiolucent hospital bed surface. 4,926,457, Cl. 378-209.000.
Poggio, Cesare: *See*—
Alaria, Gian B.; Poggio, Cesare; and Ventimiglia, Giovanni, 4,926,422, Cl. 370-97.000.
Pogharian, Mardig V. Jewelry clasp. 4,924,562, Cl. 24-647.000.
Pokrandt, Glenn C.; Busser, William F.; Timmermann, Donald N.; and Kuliga, Thomas N., to Falk Corporation, The. Flexible shaft coupling with polymeric resin hubs. 4,925,431, Cl. 464-54.000.
Polaroid Corporation: *See*—
Baker, James G., 4,925,281, Cl. 350-423.000.
Plummer, William T.; and Boyea, Robert J., 4,925,267, Cl. 350-96.200.
Sanford, Norman A.; and Connors, James M., 4,925,263, Cl. 350-96.120.
Pole, Kishor M.; and Dhavlikar, Bhagawan S., to Walchandnagar Industries Limited. Sugar cane mill. 4,925,115, Cl. 241-222.000.
Polefka, Thomas G.: *See*—
Gaffar, Abdul; Polcfka, Thomas G.; Ferlauto, Robert J., Jr.; and Crisafulli, Rosemarie M., 4,925,654, Cl. 424-52.000.
Policht, Stanislaw A.; and Vernice, Gerard, to Qualex, Inc. Photo strip protection method and product. 4,925,779, Cl. 430-403.000.
Polk Investment Corp.: *See*—
Polk, Matthew S., 4,924,963, Cl. 181-144.000.
Polk, Matthew S., to Polk Investment Corp. Compact and efficient sub-woofer system and method for installation in structural partitions. 4,924,963, Cl. 181-144.000.
Pollack, Jack; and Mann, Tarlochan S. Fluid swivel assembly. 4,925,219, Cl. 285-95.000.
Poly-Vecture: *See*—
Poncet, Bernard, 4,924,666 Cl. 56-330.000.
Polysar Limited: *See*—
Arsenault, Gilles J., 4,925,900, Cl. 525-329.300.
Sato, Kyosaku, 4,925,715, Cl. 428-40.000.
Pommer, Ernst-Heinrich: *See*—
Wagner, Klaus; Rieber, Norbert; Pommer, Ernst-Heinrich; and Dressel, Juergen, 4,925,476, Cl. 71-27.000.
Poncet, Bernard, to Poly-Vecture. Machine for harvesting berries, and particularly, grapes. 4,924,666, Cl. 56-330.000.
Popovic, Zoran D.: *See*—
Baranyi, Giuseppa; Hor, Ah-Mee; Loutfy, Rafik O.; and Popovic, Zoran D., 4,925,760, Cl. 430-59.000.
Poquillon, Bernard: *See*—
Billard, Didier; and Poquillon, Bernard, 4,926,259, Cl. 358-105.600.
Porter, Anthony; and Breakspere, Robert, to Lion Analytics Pty. Limited. Vehicle breath monitoring device. 4,926,164, Cl. 340-576.000.
Portnoy, Irving: *See*—
Colodner, Jesse L.; and Portnoy, Irving, 4,924,604, Cl. 34-151.000.
Pose-Marre Edelstahlwerk GmbH: *See*—
Haite, Michael, 4,925,014, Cl. 198-780.000.
Posey, John L., to Baxter Travenol Laboratories, Inc. Flim guide system. 4,924,655, Cl. 53-128.000.
Pottebaum, Joseph R.: *See*—
Hink, Karl M.; Pottebaum, Joseph R.; Reichard, Jerome J.; Wagner, Bruce C.; Weber, Douglas B.; and Wiesendanger, Theodore O., 4,926,100, Cl. 318-269.000.
Potter, David J. Artist's easel. 4,925,147, Cl. 248-463.000.
Potter, Thomas. Vehicle communication system using existing roadway loops. 4,926,494, Cl. 455-41.000.
Pounds, Gregory E.: *See*—
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 4,926,462, Cl. 379-67.000.
Power Cell, Inc.: *See*—
Theiss, George H., 4,925,750, Cl. 429-116.000.
Powerlift Foundation Repair: *See*—
McCown, William B., Jr.; and Bolin, William B., 4,925,345, Cl. 405-232.000.
Powers, Ronald H. Folding chair and method of construction. 4,925,239, Cl. 297-29.000.
PPG Industries, Inc.: *See*—
Grundy, Reed H., 4,925,474, Cl. 65-29.000.
Prazisions-Werkzeuge AG: *See*—
Guntensperger, August, 4,925,012, Cl. 198-690.100.
Prenner, Christian: *See*—
Brahms, Martin; and Prenner, Christian, 4,926,305, Cl. 363-21.000.
Preston, Stephen B.: *See*—
Stimac, Gary A.; Crosswy, William C.; Preston, Stephen B.; and Flannigan, James S., 4,926,322, Cl. 364-200.000.
Preusser, Gerhard; Emmrich, Gerd; and Schulze, Martin, to Krupp Koppers GmbH. Process for the production of an aromate concentrate suitable for use as blending component for gasification fuel 4,925,535, Cl. 203-25.000.
Price, Frank C.; Giebel, Gerhard; Fichtner, Rudi; and Broening, Manfred, to DVSG Patentverwaltungs GmbH. Method of and apparatus for pulling over and lasting footwear. 4,924,546, Cl. 12-7.100.
Price, Jeffrey E.: *See*—
Donnelly, Donald E.; Zikes, Bradley C.; Moore, Dwain F.; Price, Jeffrey E.; and Toth, Bartholomew L., 4,925,386, Cl. 431-28.000.
Prince Corporation: *See*—
Clark, Russell L., 4,925,233, Cl. 296-97.110.
Hemmeke, Ronald L.; and Spykerman, Scott A., 4,925,232, Cl. 296-97.800.
Pritchard, Alan, to Mectet Industries Limited. Detection devices. 4,924,854, Cl. 128-6.000.
Pritchard, James S. Standoff batten rig for flexible airfoil conformation on both tacks. 4,924,793, Cl. 114-102.000.
Procter & Gamble Company, The: *See*—
Baker, Keith H.; Snyder, Stephen W.; and Clauss, Allen D., 4,925,586, Cl. 252-90.000.
Borcher, Thomas A., Sr.; Delgado, Rodolfo; and Trinh, Toan, 4,925,577, Cl. 252-8.900.
Strauss, Daniel L.; Taylor, Thomas H.; Stearns, Charles L.; and Lobaugh, Thomas E., 4,925,585, Cl. 252-89.100.
Prokopp, Manfred. Contact device for the testing of printed circuit boards or the like. 4,926,119, Cl. 324-158.00P.
Propst, Verle: *See*—
Paliwoda, Joseph; Hale, Keith F.; and Propst, Verle, 4,925,367, Cl. 415-213.100.
Prugnolle, Bernard: *See*—
Krasuski, Marek; and Prugnolle, Bernard, 4,924,652, Cl. 53-55.000.
Pruitt, Gerald R.: *See*—
Higham, Graham J.; Pruitt, Gerald R.; Morris, Ronald; Heger, Frank; Livingstone, James; and Tormey, David, 4,924,675, Cl. 62-6.000.
Przytulla, Dietmar, to Mauser-Werke GmbH. Blow-molded thermoplastic drum having improved integral bearing and transport rings. 4,925,049, Cl. 220-72.000.
PTO, Inc.: *See*—
Meuser, William E.; LaRue, Gary W.; Harris, Windel L.; Donahue, James A.; Bonney, L. H.; and Glanton, Gene W., 4,925,532, Cl. 202-219.000.
Pulichino, John V., Jr., to American Tourister, Inc. Three-section suitcase. 4,925,021, Cl. 206-279.000.
Pulsipher, Dennis C.: *See*—
Frost, Richard L.; Morley, Kenneth S.; and Pulsipher, Dennis C., 4,926,482, Cl. 381-31.000.
Purdham, David M.: *See*—
Scheuneman, James H.; Mayer, Michael E.; and Purdham, David M., 4,926,426, Cl. 371-40.100.
Puritan-Bennett Corporation: *See*—
Carter, William, 4,924,904, Cl. 137-505.110.
Pusic, Pavo. Aircraft piloting aid laser landing system. 4,925,303, Cl. 356-152.000.
QMAX Technology Group, Inc.: *See*—
Fellows, Charles T.; Brown, George T.; and Haines, Robert C., 4,925,667, Cl. 424-401.000.
Quack, Hans, to Sulzer Brothers Limited. Method and installation for cooling an apparatus. 4,924,677, Cl. 62-87.000.
Quagliato, Dominick A.; and Humber, Leslie G., to American Home Products Corporation. Novel antihypertensive benzopyran derivatives. 4,925,839, Cl. 514-212.000.
Qualcomm, Inc.: *See*—
Weaver, Lindsay A., 4,926,130, Cl. 328-14.000.
Qualex, Inc.: *See*—
Policht, Stanislaw A.; and Vernice, Gerard, 4,925,779, Cl. 430-403.000.
Qualich, John, to Motorola Inc. Temperature protected transistor circuit and method of temperature protecting a transistor. 4,926,283, Cl. 361-103.000.
Qualitron, Inc.: *See*—
Sturgeon, Clayton L., 4,926,303, Cl. 363-19.000.
Quella, Ferdinand; Nuyken, Oskar; Budde, Klaus; and Suefke, Thomas, to Siemens Aktiengesellschaft. Anti-radiation covering for electronic components. 4,925,772, Cl. 430-281.000.
Quentin, Jean-Pierre, to Rhone-Poulenc Chimie. Moldable/extrudable thermotropic aromatic copolyesteramides. 4,925,911, Cl. 528-184.000.
Quick, Donald J. Cane harvester cleaning system. 4,924,662, Cl. 56-12.800.
Quinton, Don: *See*—
Leone, David A.; Buxton, Clifford A.; and Quinton, Don, 4,926,016, Cl. 200-144.00R.
R. Berchtold AG: *See*—
Vonlanthen, Benno, 4,924,686, Cl. 70-277.000.
R. E. Phelon Company, Inc.: *See*—
Piteo, Michael J.; and Mercier, Real L., 4,924,831, Cl. 123-417.000.
R. Engelhardt Nominees Pty. Ltd.: *See*—
Engelhardt, David R., 4,925,290, Cl. 351-55.000.
R. G. Barry Corporation: *See*—
Ostrander, Charles, 4,925,087, Cl. 229-120.030.
Ostrander, Charles, 4,925,088, Cl. 229-120.120.
R. J. Reynolds Tobacco Company: *See*—
Perfetti, Thomas A.; and Westmoreland, Amos E., 4,924,883, Cl. 131-336.000.
Perfetti, Thomas A.; Norman, Alan B.; and Dube, Michael F., 4,924,888, Cl. 131-336.000.
Raker, Mark L.; Sensabaugh, Andrew J., Jr.; and Jakob, Stephen W., 4,924,887, Cl. 131-331.000.

VOL
1114
ISS
3
MY
15
1990
UMI

R. P. Denis S.p.A.: *See—*
Dinand, Pierre F., 4,925,043, Cl. 215-322.000.
Rabenau, Richard; Kanner, Rowland W.; and Hunter, Donald W., to Ryder International Corporation. Fluid flow switching valve assembly and system. 4,925,464, Cl. 55-179.000.
Rachlin, Daniel J. Optical fingerprint imaging device. 4,925,300, Cl. 356-71.000.
Rachofsky, Morton; and Irving, Guy B. Combined twenty-four (24)/twenty-five (25) hour clock. 4,926,400, Cl. 368-82.000.
Racz, Gabor: *See—*
Salerno, Albert; and Racz, Gabor, 4,924,855, Cl. 128-11.000.
Rad Elec., Inc.: *See—*
Dempsey, John C.; and Stieff, Lorin R., 4,926,053, Cl. 250-376.000.
Radisch, Helmer: *See—*
Agethen, Heinrich; Gesenhues, Paul; Radisch, Helmer; Jandeleit, Otto; and Schafer, Wolfgang, 4,925,734, Cl. 428-349.000.
Radvan, Bronislaw: *See—*
Willis, Anthony J.; Skelding, William T. H.; and Radvan, Bronislaw, 4,925,615, Cl. 264-257.000.
Radziemski, Leon J.: *See—*
Cremers, David A.; Radziemski, Leon J.; and Loree, Thomas R., 4,925,307, Cl. 356-318.000.
Rafanelli, Gerard L., to Hughes Aircraft Company. Method and apparatus for sensing the figure of optical elements. 4,925,301, Cl. 356-124.000.
Raible, Robert L.; and Loggains, Johnnie L. Oil spill cleanup compositions. 4,925,343, Cl. 405-60.000.
Raker, Mark L.; Sensabaugh, Andrew J., Jr.; and Jakob, Stephen W., to R. J. Reynolds Tobacco Company. Tobacco rods and filters. 4,924,887, Cl. 131-331.000.
Ralston, Gene O., to Key Industries, Inc. Disposable flashlight with improved activator field of the invention. 4,926,300, Cl. 362-189.000.
Ramamurthy, Nungavaram S.: *See—*
McNamara, Thomas F.; Golub, Lorne M.; and Ramamurthy, Nungavaram S., 4,925,833, Cl. 514-152.000.
Ramanathan, Kumbakonam V.: *See—*
Brezoczky, Blasius; Cuomo, Jerome J.; Guarnieri, C. Richard; Ramanathan, Kumbakonam V.; Shivashankar, Srinvasrao A.; Smith, David A.; and Yee, Dennis S., 4,925,700, Cl. 427-38.000.
Ramirez, Nelson: *See—*
Turk, Roger R.; and Ramirez, Nelson, 4,925,599, Cl. 264-1.500.
Ramos, Roy C. Beverage container crusher. 4,925,117, Cl. 241-236.000.
Ramsbro, Borje K. H., to System 3R USA, Inc. Vise. 4,925,168, Cl. 269-136.000.
Ramsey, Jeffery D.: *See—*
DiFlora, Michael A.; Brown, James M.; Rice, Steven L.; and Ramsey, Jeffery D., 4,926,081, Cl. 310-89.000.
Randolph, Theodore: *See—*
Blanch, Harvey W.; Randolph, Theodore; and Wilke, Charles R., 4,925,790, Cl. 435-52.000.
Rank, Allen H., Jr. Contact exposure unit. 4,926,215, Cl. 355-99.000.
Ranney, David F. Endothelial envelopment drug carriers. 4,925,678, Cl. 424-493.000.
Rao, Suren B.; and Schwartz, Richard W., to National Broach & Machine Company. Optimization method and apparatus for dressing a grinding wheel. 4,924,842, Cl. 125-11.010.
Rapp, Bernd: *See—*
Gotz, Josef; Orth, Winfried; Weiss, Wolfgang; Rapp, Bernd; and Kleffner, Hans W., 4,925,942, Cl. 546-133.000.
Rappuoli, Rino, to Selavo, S.p.A. Process for producing proteins correlated with the diphtheric toxin. 4,925,792, Cl. 435-69.100.
Rasmussen, James R.: *See—*
Bergh, Michel L. E.; Hubbard, S. Catherine; and Rasmussen, James R., 4,925,796, Cl. 435-97.000.
Rastergraphics, Inc.: *See—*
Bibl, Andreas; Higginson, John; and Gardner, Deane, 4,926,199, Cl. 346-157.000.
Ratcliff, Perry A. Method for retarding formation of dental plaque. 4,925,656, Cl. 424-53.000.
Rathjen, Fordyce. Body container. 4,924,565, Cl. 27-7.000.
Rau, Georg; and Hitzler, Werner, to Georg Knoblauch, Firma. Carrying assembly with handgrip for containers, housing and the like. 4,925,054, Cl. 220-94.00R.
Raub, John R., to Juice Tree. Portable, automatic juice extraction machine. 4,924,770, Cl. 99-511.000.
Rawlins, Mark W. Collapsible hammock stand. 4,925,138, Cl. 248-165.000.
Raychem Corporation: *See—*
Brown, Andrew V., Gen, Tamar G.; and Weihe, Gary R., 4,925,727, Cl. 428-199.000.
Lahlouh, John; Stewart, Ray F.; Wasley, Robert S.; Hauptly, Paul D.; and Welsh, Laurence M., 4,926,165, Cl. 340-603.000.
Wasley, Robert S.; and Holmes, James C., 4,926,129, Cl. 324-555.000.
Raymer, Doyle: *See—*
Peacock, Dale; and Raymer, Doyle, 4,924,846, Cl. 126-41.00R
Rayovac Corporation: *See—*
Dunham, Thomas L., 4,925,754, Cl. 429-245.000.
Raziq, Said I.: *See—*
Smigel, Irwin; and Raziq, Said I., 4,925,655, Cl. 424-52.000.
RDG Inventions Corporation: *See—*
Deng, Yuan Q.; and Deng, Kang, 4,924,956, Cl. 180-65.300.
Re, Luciano: *See—*
Di Gioacchino, Sandro; Paolinelli, Antonio; and Re, Luciano, 4,925,978, Cl. 562-443.000.
Reckitt & Colman Products Limited: *See—*
Lewis, John W.; and Smith, Colin F. C., 4,925,848, Cl. 514-282.000.
Rector, James; Marion, Bruce; Widrow, Bernard; and Salehi, Iraj A., to Gas Research Institute, Inc. Signal processing to enable utilization of a rig reference sensor with a drill bit seismic source. 4,926,391, Cl. 367-41.000.
Reddy, Vaddi B., to GTE Products Corporation. Process for improving the luminescence and bulk density of niobium activated yttrium tantalate X-ray phosphor. 4,925,702, Cl. 427-65.000.
Redlich, Robert W., to Sunpower, Inc. Precision variable pitch compensation winding for displacement transducer. 4,926,123, Cl. 324-208.000.
Redwine, Donald J., to Texas Instruments Incorporated. Crosspoint dynamic ram cell for folded bitline array. 4,926,224, Cl. 357-23.600.
Reed, James R.: *See—*
Heiser, Richard K.; and Reed, James R., 4,925,340, Cl. 404-75.000.
Reed, Robert W.: *See—*
Veronesi, William A.; Weise, Andrew P.; Reed, Robert W.; and Ringermacher, Harry I., 4,926,120, Cl. 324-204.000.
Rees, Richard: *See—*
Blume, Friedhelm; Dorfmeister, Gabriele; Franke, Wilfried; Rees, Richard; Johann, Gerhard; and Arndt, Friedrich, 4,925,481, Cl. 71-92.000.
Reger, Philip R.; McGarry, Patrick J.; and Lewis, Craig A., to Mars Incorporated. Low power control apparatus for a coin operated telephone. 4,926,458, Cl. 379-27.000.
Regione, Brian A., to Motorola, Inc. Semiconductor package having recessed die cavity walls. 4,926,240, Cl. 357-74.000.
Rehau AG & Co.: *See—*
Ruby, James A.; Lange, Rolf-Peter; and Hoover, Randy C., 4,924,628, Cl. 49-380.000.
Reich, Werner, to Deutsche ITT Industries GmbH. Correction circuit for a digital quadrature-signal pair. 4,926,443, Cl. 375-102.000.
Reichard, Jerome J.: *See—*
Hink, Karl M.; Pottebaum, Joseph R.; Reichard, Jerome J.; Wagner, Bruce C.; Weber, Douglas B.; and Wiesendanger, Theodore O., 4,926,100, Cl. 318-269.000.
Reichert, Thomas, to Siemens Aktiengesellschaft. Actively shielded, superconducting magnet of an NMR tomography apparatus. 4,926,289, Cl. 361-141.000.
Reichmuth, Johannes. Method of, and apparatus for measuring the flow velocity in wind tunnels. 4,925,296, Cl. 356-28.000.
Reiffenrath, Volker; Krause, Joachim; Wachtler, Andreas; Weber, Georg; and Finkenzeller, Ulrich, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Derivatives of 4-cyano-2,3-difluorophenol. 4,925,590, Cl. 252-299.610.
Reilly, Robert E., to National Research Development Corporation. Force transducers for use in arrays. 4,924,711, Cl. 73-862.040.
Rein, Wilhelm, to Flabeg GmbH. Television picture tube having a composite frontal pane. 4,926,090, Cl. 313-478.000.
Reinehr, Dieter: *See—*
Hefti, Heinz; Reinehr, Dieter; Weber, Kurt; and Eckhardt, Claude, 4,925,595, Cl. 252-301.210.
Reinert, Michael, to Mannesmann Rexroth GmbH. Controlled series high-pressure intensifiers for hydraulic press cylinded circuit. 4,924,671, Cl. 60-428.000.
Reinhardt, Nicholas; and Weil, Geoffrey M., to KeyTek Instrument Corp. Electrostatic discharge simulator with highly reproducible wave-front. 4,926,285, Cl. 361-230.000.
Reinke, Terence C.: *See—*
Steiner, Ronald M.; Koepsel, Roger E.; Gilgenbach, Hubert S.; and Reinke, Terence C., 4,925,369, Cl. 416-204.00R.
Reiss, Thomas J., Jr., to Watertown Tableslide Company, a Div. of Consolidate Industries, Inc. Tableslide assembly. 4,925,319, Cl. 384-17.000.
Remein, Duane, to Siemens Aktiengesellschaft. Software error detection apparatus. 4,926,427, Cl. 371-67.100.
Remick, Robert J.; Marianowski, Leonard G.; and Camara, Elias H., to Institute of Gas Technoloy. Sulfur tolerant molten carbonate fuel cell anode and process. 4,925,745, Cl. 429-40.000.
Rendina, Gabriele; Nocci, Roberto; Callaioli, Andrea; and Corrado, Francesco, to Montedipe S.p.A. Bimodal star-block copolymers, showing excellent optical properties and resilience, and process for their manufacture. 4,925,899, Cl. 525-314.000.
Renker, Horst; and Bernard, Walter, to Bodenseewek Geratetechnik GmbH. Method for aligning a two-axis platform. 4,924,593, Cl. 33-324.000.
Renz, Wolfgang. Gas laser excited with pulsed microwave energy. 4,926,434, Cl. 372-69.000.
Requardt, Hermann: *See—*
Krause, Norbert; and Requardt, Hermann, 4,924,868, Cl. 128-653.0SC.
Resch, James F., to ICI Americas Inc. Antagonizing the pharmacological effects of a benzodiazepine receptor agonist. 4,925,844, Cl. 514-252.000.
Research Corporation: *See—*
McDaniel, Robert G., 4,925,477, Cl. 71-77.000.
Research Development Corporation of Japan: *See—*
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, 4,925,742, Cl. 428-692.000.
Research Foundation of State University of New York, The: *See—*
McNamara, Thomas F.; Golub, Lorne M.; and Ramamurthy, Nungavaram S., 4,925,833, Cl. 514-152.000.
Revlon, Inc.: *See—*
Klausner, Mitchell; Manning, Michael P.; and Baddour, Raymond F., 4,925,698, Cl. 427-2.000.

Rheaume, Wayne T.: *See—*
Garofalo, Mel V.; Taylor, William J.; and Rheaume, Wayne T., 4,924,580, Cl. 33-832.000.
Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft: *See—*
Gebhard, Georg, 4,925,614, Cl. 264-232.000.
Rheinmetall GmbH: *See—*
Breuer, Heinz G., 4,924,748, Cl. 89-24.000.
Metz, Josef; and Hulsewis, Hans, 4,924,751, Cl. 89-43.010.
Rhone-Poulenc Chimie: *See—*
Berrod, Gerard; Charmot, Dominique; Gresser, Robert; and Guerin, Gilles, 4,925,588, Cl. 252-174.230.
Deweerdt, Helene; Jenck, Jean; and Kalck, Philippe, 4,925,973, Cl. 560-204.000.
Quentin, Jean-Pierre, 4,925,911, Cl. 528-184.000.
Rhone-Poulenc Sante: *See—*
Grosselin, Jean-Michel; and Mercier, Claude, 4,925,990, Cl. 568-862.000.
Massonneau, Viviane; Mulhauser, Michel; Bonnamas, Claude; and Rouy, Nocl, 4,925,949, Cl. 548-336.000.
Massonneau, Viviane; Mulhauser, Michel; and Buforn, Albert, 4,925,950, Cl. 548-338.000.
Massonneau, Viviane; Mulhauser, Michel; and Buforn, Albert, 4,925,951, Cl. 548-338.000.
Massonneau, Viviane; Mulhauser, Michel; Buforn, Albert; and Mandard-Cazin, Bernadette, 4,925,952, Cl. 548-338.000.
Rice, Billy M. Ladder safety apparatus. 4,924,971, Cl. 182-93.000.
Rice, Haradon J.: *See—*
Summerville, David F.; Williston, John P.; Wand, Martin A.; Doty, Thomas J.; Rice, Haradon J.; and Huang, Phen-Lan, 4,926,103, Cl. 318-587.000.
Rice, Steven L.: *See—*
DiFlora, Michael A.; Brown, James M.; Rice, Steven L.; and Ramsey, Jeffery D., 4,926,081, Cl. 310-89.000.
Richard, Joel: *See—*
Barraud, Andre ; Richard, Joel; and Vandevyver, Michel, 4,925,774, Cl. 430-296.000.
Richardson, Dale W.: *See—*
Phillips, James L.; Richardson, Dale W.; and Silverman, Lawrence M., 4,925,516, Cl. 156-252.000.
Richardson, William E., to Sprague Electric Company. Method for making IC die with dielectric isolation. 4,925,808, Cl. 437-62.000.
Riches, Mark J.: *See—*
Garfield, Brian R. C.; and Riches, Mark J., 4,926,039, Cl. 250-213.0VT.
Richmond, Shaun: *See—*
Curtis, Richard D.; and Richmond, Shaun, 4,924,779, Cl. 105-4.100.
Richter, Bernd; and Rittler, Ulrich, to Siemens Aktiengesellschaft. Apparatus and method for introducing a device into a heat exchanger. 4,924,933, Cl. 165-1.000.
Richter, Goetz: *See—*
Stelter, Norbert; Richter, Goetz; and Schneider, Juergen, 4,926,329, Cl. 364-424.010.
Richter, Jeff T.; and Seignemartin, Elbert E., to NCR Corporation. Capacitor protection circuit for protecting storage capacitors in an electronic power supply. 4,926,280, Cl. 361-15.000.
Ricker, Dennis J.; and Foster, Richard L., to General Motors Corporation. Bimodal controller for a multi-phase brushless DC motor. 4,926,099, Cl. 318-254.000.
Rico, Fernando: *See—*
Garrido, Alfonso; and Rico, Fernando, 4,924,721, Cl. 74-425.000.
Ricoh Company, Ltd.: *See—*
Hashimoto, Mitsuru; and Sasaki, Nasaomi, 4,925,758, Cl. 430-57.000.
Hirasawa, Junichi; Sato, Yuichi; and Iida, Toru, 4,926,219, Cl. 355-309.000.
Iiyama, Kiyotaka; Hayakawa, Kunio; Nakata, Masahiro; Kodera, Kaoru; and Miyazaki, Osamu, 4,925,828, Cl. 503-218.000.
Imamura, Tomoatsu; Shimada, Kazuyuki; and Senma, Toshitaka, 4,926,433, Cl. 372-50.000.
Takenaka, Eiji; Muraoka, Naoki; and Nakadai, Yoshikazu, 4,926,191, Cl. 346-24.000.
Tani, Tatsuo; Yokoyama, Hiroshi; Hayashi, Shoji; and Murofushi, Takashi, 4,926,358, Cl. 364-562.000.
Tsubuko, Kazuo; Kuramoto, Shinichi; and Sakai, Kiyoshi, 4,925,763, Cl. 430-106.000.
Ukegawa, Takeshi, 4,926,463, Cl. 379-88.000.
Rieber, Norbert: *See—*
Wagner, Klaus; Rieber, Norbert; Pommer, Ernst-Heinrich; and Dressel, Juergen, 4,925,476, Cl. 71-27.000.
Riedel Omni Products, Inc.: *See—*
Kennel, Gerald R., 4,925,336, Cl. 404-25.000.
Rieger, Heinz H. Method and adaptor for installing flue liner to a fireplace insert. 4,924,850, Cl. 126-500.000.
Rieger, Walter; and Thudium, Karl, to L. Schuler GmbH. Transfer press having gripper rails which can be transversely separated along their length. 4,924,692, Cl. 72-405.000.
Rilling, John F., to Universal Protection Corp. Inversion indicator. 4,924,799, Cl. 116-206.000.
Ring, Thomas J.: *See—*
Alsip, Allen W.; Robinson, James N.; and Bossert, Clayton E., 4,924,537, Cl. 5-61.000.
Ringermacher, Harry I.: *See—*
Veronesi, William A.; Weise, Andrew P.; Reed, Robert W.; and Ringermacher, Harry I., 4,926,120, Cl. 324-204.000.
Ringle, Michael A.: *See—*
Roman, Thomas J.; and Ringle, Michael A., 4,925,390, Cl. 432-247.000.
Rink, Dan L.: *See—*
Rink, John L.; Rink, Dan L.; and Lee, Garrett, 4,925,265, Cl. 350-96.180.
Rink, John L.; Rink, Dan L.; and Lee, Garrett, to Xintec Corporation. Apparatus for directing a laser beam into optical fibers. 4,925,265, Cl. 350-96.180.
Rittler, Ulrich: *See—*
Richter, Bernd; and Rittler, Ulrich, 4,924,933, Cl. 165-1.000.
Rittner, Siegbert: *See—*
von Plessen, Helmold; and Rittner, Siegbert, 4,925,959, Cl. 549-377.000.
Roane, Katherine B.: *See—*
Comroe, Richard A.; Coe, Richare H.; Roane, Katherine B.; and Rosenthal, Lewis H., 4,926,495, Cl. 455-54.000.
Rohal, Inc.: *See—*
Crill, Rikk J., 4,924,960, Cl. 180-333.000.
Robb, James R., to United States of America, Air Force. External asynchronous input tester for bit slice machines. 4,926,445, Cl. 375-106.000.
Robbins, Edward S., III; and Onocki, Theodore J., to Robbins, Edward S., III. Container with unitary bladder and associated dispenser cap. 4,925,055, Cl. 220-403.000.
Robbins, Murray: *See—*
Hauser, Joachim J.; Plewes, John T.; and Robbins, Murray, 4,925,407, Cl. 439-887.000.
Robell Research: *See—*
Smigel, Irwin; and Raziq, Said I., 4,925,655, Cl. 424-52.000.
Robert Bosch GmbH: *See—*
Buchschmid, Emil; Frenznick, Anton; Lindner, Klaus; Schmid, Olaf; Schmid, Hans-Dieter; Schmidt, Gerhard; and Sturm, Theodor, 4,926,150, Cl. 335-196.000.
Denz, Helmut, 4,924,835, Cl. 123-478.000.
Foertsch, Manfred; Hans, Waldemar; and Warnicke, Volker, 4,925,111, Cl. 239-533.120.
Hedtke, Rolf; Loos, Rolf; Mester, Roland; and Hansel, Jurgen, 4,926,425, Cl. 371-22.600.
Hofer, Gerald; and Eheim, Franz, 4,924,833, Cl. 123-449.000.
Maichle, Josef, 4,924,943, Cl. 172-1.000.
Wohr, Rolf, 4,925,499, Cl. 148-9.00R.
Robert, Eric: *See—*
Rojey, Alexandre; Deschamps, Andre ; Grehier, Alain; and Robert, Eric, 4,925,459, Cl. 155-16.000.
Robert Krups Stiftung & Co. KG.: *See—*
Ohlsen, Heinz-Jurgen, 4,924,602, Cl. 34-97.000.
Robertson, Bob K., to Teledyne Exploration. High pressure transducer. 4,926,396, Cl. 367-159.000.
Robertson, Bob K., to Teledyne Exploration. Depth alarm for a seismic sensor. 4,926,397, Cl. 367-157.000.
Robichaud, Arthur R.; Wilgus, Frank R., Tyler, Warren C.; and Holmes, Jack, to Combibloc, Inc. Package fitment. 4,925,034, Cl. 206-603.000.
Robins, Roland K.; and Kini, Ganesh D., to Nucleic Acid Research Institute. Synthesis and anti-leukemic activity of alkyl-1-(β-D-ribofuranosyl)[1,2,4]triazole-3-carboximidates. 4,925,930, Cl. 536-23.000.
Robinson, James N.: *See—*
Alsip, Allen W.; Robinson, James N.; and Bossert, Clayton E., 4,924,537, Cl. 5-61.000.
Robinson, Richard C.; Jacobson, Robert L.; and Field, Leslie A., to Chevron Research Company. Sulfur removal system for protection of reforming catalyst. 4,925,549, Cl. 208-65.000.
Robotic Vision System, Inc.: *See—*
Stern, Howard K.; Yonescu, William; and Briceno, Daniel A., 4,925,308, Cl. 356-375.000.
Robschlager, Karl H., to Shell Oil Company. Process for preparing liquid hydrocarbons. 4,925,995, Cl. 58.5-310.000.
Rochelle, Charles W.: *See—*
Smith, Ernest R., 4,925,553, Cl. 210-186.000.
Rockwell-Golde G.m.b.H.: *See—*
Bohn, Horst; and Grimm, Rainer, 4,925,237, Cl. 296-216.000.
Rockwell International Corporation: *See—*
Bahl, Harsh V.; and Sheets, Laurence L., 4,926,473, Cl. 379-416.000.
Wurst, Stephen G.; Adams, William J.; and Munson, Kenton M., 4,925,133, Cl. 244-118.500.
Rodenbeck, Donald L.: *See—*
Staneluis, James M.; and Rodenbeck, Donald L., 4,925,719, Cl. 428-71.000.
Rodrick, Mary: *See—*
Mannick, John A.; Rodrick, Mary; and Nimberg, Richard, 4,925,920, Cl. 530-387.000.
Roemer, Peter B., to General Electric Company. Surface gradient assembly for high speed nuclear magnetic resonance imaging. 4,926,125, Cl. 324-318.000.
Rogakos, Deno J.; Buchanan, Harry C., Jr.; and Benner, Mark M., to General Motors Corporation. Reverse to park mechanism with secure latching. 4,924,726, Cl. 74-600.000.
Rogers, William H., to Safariland Ltd., Inc. Handgun holster with trigger guard restraint. 4,925,075, Cl. 224-244.000.
Rohde, Ottmar; Jasne, Stanley J.; and Pfeifer, Josef, to Ciba-Geigy Corporation. Auto-photocrosslinkable copolyimides and polyimide compositions. 4,925,912, Cl. 528-226.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Rohr Industries, Inc.: *See*—
Norris, Brian; and Gojny, Francis J., 4,925,740, Cl. 428-547.000.
Rohrback, Jeffrey D.: *See*—
Lomasney, David J.; Dietze, Robert H.; and Rohrback, Jeffrey D., 4,924,630, Cl. 49-502.000.
Rojas, Dominique: *See*—
Turpin, Marc; Brevignon, Michele; and Rojas, Dominique, 4,926,040, Cl. 250-225.000.
Rojey, Alexandre; Deschamps, Andre ; Grehier, Alain; and Robert, Eric, to Institut Francais Du Petrole. Process for separation of the constituents of a mixture in the gas phase using a composite membrane. 4,925,459, Cl. 155-16.000.
Roman, Thomas J.; and Ringle, Michael A., to Aluminum Company of America. Apparatus for retaining the configuration of an aperture formed through a coil. 4,925,390, Cl. 432-247.000.
Romeo-Rim, Inc.: *See*—
Smiszek, James L., 4,925,224, Cl. 293-120.000.
Romer, Joachim C., to AVS Ing. J.C. Romer GmbH. Membrane valve for fluids. 4,925,153, Cl. 251-30.010.
Romig, Kenneth L., to General Motors Corporation. Anti-vibration mechanism for a clutch pedal. 4,924,992, Cl. 192-30.00V.
Ronco, Roland; Ciapponi, Ermanno; and Pessonneaux, Pierre, to Ciba-Geigy Corporation. Preparation of cationic azo or hydrazone dyes in which the alkylation and the separation of the cationic dye are carried out continuously. 4,925,926, Cl. 534-589.000.
Ronis S.A.: *See*—
Pinsson, Daniel; and Rouesnel, Bernard, 4,924,994, Cl. 194-253.000.
Rorden, Louis H.: *See*—
More, Henry S.; Rorden, Louis H.; and Akkerman, Neil H., 4,926,188, Cl. 343-719.000.
Rosby Corporation: *See*—
Yurgevich, Howard J., 4,925,349, Cl. 410-54.000.
Rosemount Inc.: *See*—
Goetzinger, Charles E.; and Borgeson, Dale W., 4,926,340, Cl. 364-483.000.
Rosen, Robert: *See*—
Steiner, Solomon; and Rosen, Robert, 4,925,673, Cl. 424-455.000.
Rosenbaum, Robert S., to Mission Kleensweep Products, Inc. Combined sprayer and refill container. 4,925,066, Cl. 222-192.000.
Rosenberg, Leonard S.: *See*—
Herbranson, Dale E.; Speicher, Earl R.; and Rosenberg, Leonard S., 4,925,860, Cl. 514-359.000.
Rosenberg, Martin, to United States of America, Health and Human Services. Plasmid cloning vector pAS1. 4,925,799, Cl. 435-172.300.
Rosenblatt/Ima Invention Enterprises: *See*—
Rosenblatt, Richard, 4,925,447, Cl. 604-133.000.
Rosenblatt, Richard, to Rosenblatt/Ima Invention Enterprises. Aspirator without partition wall for collection of bodily fluids including improved safety and efficiency elements. 4,925,447, Cl. 604-133.000.
Rosenthal, Lewis H.: *See*—
Comroe, Richard A ; Coe, Richare H.; Roane, Katherine B.; and Rosenthal, Lewis H., 4,926,495, Cl. 455-54.000.
Rosini, Paolo, to SGS Microelettronica S.p.A. Method of designing integrated microcomputers and integrated microcomputer with modular structure obtained by said method 4,926,376, Cl. 364-900.000.
Rosky, David S.: *See*—
Coy, Bruce H.; and Rosky, David S., 4,926,065, Cl. 307-475.000.
Ross, Edward W : *See*—
Baker, Bruce D.; Corey, Robert L.; Adams, John A.; and Ross, Edward W., 4,926,452, Cl. 378-22.000.
Ross, James A.: *See*—
O'Connor, R. Bruce; Toth, Thomas E.; and Ross, James A., 4,926,118, Cl. 324-158.00F.
Rossi, Anna Grazia: *See*—
Matarrese, Savino; Rossi, Anna Grazia; Lo Consolo, Mauro; Cigna, Giuseppe; and Borghi, Italo, 4,925,896, Cl. 525-53.000.
Rossi, Guilio A.; and Pelletier, Paul J., to Norton Company. Joining of SiC parts by polishing and hipping. 4,925,608, Cl. 264-60.000.
Rossman, Herman; and Duggan, Sharon A., to United States of America, Air Force. Spring loaded hand operated extraction/insertion line replaceable module (LRM) lever. 4,926,287, Cl. 361-392.000.
Rosthauser, James W.; and Markusch, Peter H., to Mobay Corporation. Aqueous compositions for use in the production of crosslinked polyurethanes. 4,925,885, Cl. 523-415.000.
Rouesnel, Bernard: *See*—
Pinsson, Daniel; and Rouesnel, Bernard, 4,924,994, Cl. 194-253.000.
Roussel Uclaf: *See*—
Cadiergue, Joseph; Demoute, Jean-Pierre; and Tessier, Jean, 4,925,874, Cl. 514-517.000.
Clemence, Francois; Le Martret, Odile; and Delevallee, Francoise, 4,925,859, Cl. 514-342.000.
Deacon, Robert M. J.; Gillespie, Roger J.; Gardner, Colin R.; and Tully, Wilfred R., 4,925,846, Cl. 514-258.000.
Demassey, Jacques; Demoute, Jean-Pierre; and Tessier, Jean, 4,925,862, Cl. 514-369.000.
Rouy, Noel: *See*—
Massonneau, Viviane; Mulhauser, Michel; Bonnamas, Claude; and Rouy, Noel, 4,925,949, Cl. 548-336.000.
Rowe, Bruce S.: *See*—
Roy, Bryan A.; Funk, John G.; and Rowe, Bruce S., 4,926,046, Cl. 250-506.100.
Rowens, Frank J., Sr. View finder bracket for video camera. 4,926,262, Cl. 358-229.000.
Roy, Bryan A.; Funk, John G.; and Rowe, Bruce S., to Westinghouse Electric Corp. Volumetrically efficient container apparatus. 4,926,046, Cl. 250-506.100.
Roy, Richard S., to Visic, Incorporated. Static ram with write recovery in selected portion of memory array. 4,926,384, Cl. 365-230.030.
Royal Melbourne Institute of Technology Limited: *See*—
Francis, Philip S., 4,926,348, Cl. 364-520.000.
Roze, Paul F. Cassette container. 4,925,027, Cl. 206-387.000.
Rozniecki, Edward J.: *See*—
Taube, Frank A., Sr.; and Rozniecki, Edward J., 4,924,900, Cl. 137-101.000.
Rubin, Arnold: *See*—
Anten, Lewis; and Rubin, Arnold, 4,925,025, Cl. 206-335.000.
Rubin, Mae K., to Mobil Oil Corp. Synthesis of crystalline ZSM-35 structure. 4,925,548, Cl. 208-46.000.
Ruby, James A.; Lange, Rolf-Peter; and Hoover, Randy C., to Rehau AG & Co. Prefabricated slider window system with lift-out windows. 4,924,628, Cl. 49-380.000.
Rudolf, Boris; and Blutharsch, Walter, to C. & E. Feini GmbH & Co. Portable grinder with adjustable protective hood. 4,924,635, Cl. 51-170.00R.
Rueb, Lothar; Eicken, Karl; Pander, Hans J.; Plath, Peter; Schwalge, Barbara; Wuerzer, Bruno; and Meyer, Norbert, to BASF Aktiengesellschaft. N-phenyltetrahydrophthalimides. 4,925,484, Cl. 71-96.000.
Ruppel, John S.: *See*—
Shirley, Thomas F., Jr.; Ruppel, John S.; Zuiss, Thomas J.; and Battin, Jeffrey A., 4,926,497, Cl. 455-67.000.
Rushforth, Craig K.: *See*—
Tong, Po; Berlekamp, Elwyn R.; Currie, Robert J.; and Rushforth, Craig K., 4,926,169, Cl. 340-825.570.
Rutgerswerke AG: *See*—
Gotz, Josef, Orth, Winfried; Weiss, Wolfgang; Rapp, Bernd; and Kleffner, Hans W., 4,925,942, Cl. 546-133.000.
Ryan, John W., to Dow Corning Corporation. Food composition containing a siloxane polymer and a particulate silica. 4,925,692, Cl. 426-531.000.
Rydel, Charles: *See*—
Feppon, Philippe; and Rydel, Charles, 4,925,310, Cl. 356-434.000.
Ryder International Corporation: *See*—
Rabenau, Richard; Kanner, Rowland W.; and Hunter, Donald W., 4,925,464, Cl. 55-179.000.
Ryham, Rolf, to Ahlstromforetagen Svenska AB. Method for the recovery of turpentine and heat in a refiner pulping process. 4,925,527, Cl. 162-15.000.
Ryobi Ltd.: *See*—
Hojo, Nobuyoshi; Asai, Yoshiro; Fujioka, Motoo; Kobayashi, Naotou; and Yamaguchi, Takashi, 4,925,510, Cl. 156-92.000.
Ryobi Motor Products Corp.: *See*—
Niemela, Paul; and Peot, David G., 4,926,079, Cl. 310-71.000.
S.G.B. Holdings Limited: *See*—
Cornish, John R. E., 4,925,330, Cl 403-171.000.
Saba, Manfred: *See*—
Holst, Hans; Lindemann, Klaus; Saba, Manfred; Kaess, Hans-Harald; and Petersen, Erwin, 4,925,254, Cl. 303-111.000.
Saba, Mounir G. Lighting and air freshener fixture. 4,926,293, Cl. 362-96.000.
Sacks, Richard D.; and Tanguay, Suzanne L., to University of Michigan, The Regents of the. Ion bombardment furnace for atomic spectroscopy. 4,925,306, Cl. 356-311.000.
Sacks, Robert N.: *See*—
Merritt, Sears W.; Sacks, Robert N.; and Foyt, Arthur G., 4,926,083, Cl. 310-313.00R.
Saens, Michel S.; Jacquet, Bruno; Marie, Philippe; Noirot, Frederic; and Tellier, Francois, to La Telemecanique Electrique. Protected electric switching apparatus and a device for fixing same. 4,926,149, Cl. 335-132.000.
Saez, Carlos A.; and Cooper, Robert P., to Applied Vascular Devices. Manually driven syringe. 4,925,449, Cl. 604-227.000.
Safariland Ltd., Inc.: *See*—
Rogers, William H., 4,925,075, Cl. 224-244.000.
Safetytech Corporation: *See*—
Fenton, Ronald L.; and Brandt, Robert, 4,925,053, Cl. 220-88.00A
Sahi, Ash K., to Du Pont Canada Inc. Lid for food trays. 4,925,685, Cl. 426-123.000.
Saijo, Yoshihiro: *See*—
Ueda, Kazuo; Wakabayashi, Shigeru; Saijo, Yoshihiro; and Fujikawa, Yasuji, 4,925,069, Cl. 222-500.000.
Saiki, Atsushi: *See*—
Mukai, Kiichiro; Saiki, Atsushi; and Harada, Seiki, 4,926,238, Cl. 357-72.000.
Saiki, Shuji: *See*—
Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi; Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, 4,924,962, Cl. 181-141.000.
Saint-Gobain Vitrage: *See*—
Agethen, Heinrich; Gesenhues, Paul; Radisch, Helmer; Jandeleit, Otto; and Schafer, Wolfgang, 4,925,734, Cl. 428-349.000.
Saint-Gobain Vitrage "Les Miroirs" : *See*—
Bourelier, Claude, 4,925,379, Cl. 425-94.000.
Saischek, Gerald: *See*—
Schermanz, Karl; Saischek, Gerald; Urmann, Robert; and Martetschlager, Kurt, 4,925,855, Cl. 514-341.000.

Saito, Kaoru: *See*—
Kajiyama, Koichi; Saito, Kaoru; Itakura, Yasuo; Wakabayashi, Osamu; Kowaka, Masahiko; and Yamaguchi, Tadayoshi, 4,926,428, Cl. 372-20.000.
Saito, Katsuyuki: *See*—
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, 4,926,258, Cl. 358-98.000.
Saito, Keiya: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, 4,925,755, Cl. 430-5.000.
Saito, Shiori: *See*—
Takenouchi, Shigeki; Hirano, Akira; Saito, Shiori; and Fujimaki, Yoshihide, 4,925,757, Cl. 430-31.000.
Saito, Takashi. Multiobjective switch opening and closing apparatus. 4,926,011, Cl. 200-6.00A.
Saito, Tutomu: *See*—
Sekizawa, Hidekazu; Saito, Tutomu; Yamamoto, Naofumi; Higuchi, Kazuhiko; and Kawakami, Haruko, 4,926,251, Cl. 358-75.000.
Saito, Yukihiro: *See*—
Waragai, Katsunori; Saito, Yukihiro; and Asakawa, Shiro, 4,925,612, Cl. 264-154.000.
Saitoh, Mitsuyoshi; and Sekine, Kunio, to Kabushiki Kaisha Toshiba. Magnetic head apparatus having surfaces contoured to minimize friction between a magnetic head and a magnetic disk. 4,926,274, Cl. 360-102.000.
Sakabe, Nobuyuki: *See*—
Miyabayashi, Toshio; Sakabe, Nobuyuki; and Zen, Shinichiro, 4,925,907, Cl. 526-255.000.
Sakagami, Atsushi: *See*—
Futami, Toru; Suzuki, Tadashi; and Sakagami, Atsushi, 4,926,417, Cl. 370-85.100.
Sakaguchi, Hiroaki: *See*—
Aramaki, Minoru; Okamoto, Kimitaka; Sakaguchi, Hiroaki; and Nakamura, Tamio, 4,925,975, Cl. 562-113.000.
Sakai, Akira: *See*—
Nakagawa, Katsumi; Ishihara, Shunichi; Kanai, Masahiro; Arao, Kozo; Fujioka, Yasushi; and Sakai, Akira, 4,926,229, Cl. 357-30.000.
Sakai, Kiyoshi: *See*—
Tsubuko, Kazuo; Kuramoto, Shinichi; and Sakai, Kiyoshi, 4,925,763, Cl. 430-106.000.
Sakai, Toshiaki: *See*—
Numata, Motoichi; Nozaki, Kinya; Hayashida, Hajime; and Sakai, Toshiaki, 4,924,742, Cl. 84-218.000.
Sakamoto, Hidetoshi; Uematsu, Kenjiro; Momota, Masashi; Tanabe, Susumu; Suzuki, Tatsuo; and Endo, Toshihiko, to Fuji Terumo Co., Ltd. Guide wire for catheter. 4,925,445, Cl. 604-95.000.
Sakamoto, Hiroshi: *See*—
Harada, Koosuke; and Sakamoto, Hiroshi, 4,926,302, Cl. 363-16.000.
Sakamoto, Masahiro, to Canon Kabushiki Kaisha. Driving method for a stepping motor and sheet conveying apparatus using the driving method. 4,926,270, Cl. 358-498.000.
Sakamoto, Shinichi: *See*—
Kuroda, Hiroshi; Kurihara, Nobuo; and Sakamoto, Shinichi, 4,924,699, Cl. 73-178.00R.
Sakamura, Ken; Hashimoto, Kouzi; Kawasaki, Ikuya; Hasegawa, Atsushi; and Iwasaki, Kazuhiko, to Sakamura, Ken; Hitachi, Ltd.; and Hitachi Microcomputer, Engineering, Ltd. Method of searching a queue in response to a search instruction. 4,926,321, Cl. 364-200.000.
Sakane, Kohji: *See*—
Kitamura, Takao; Sakane, Kohji; Wada, Hideo; Hata, Hajime; and Kanbara, Hajime, 4,925,641, Cl. 423-279 000.
Sakashita, Keiichi: *See*—
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; Hayashi, Seiji; and Mori, Kenji, 4,925,591, Cl. 252-299.660.
Sakashita, Takeshi: *See*—
Atsuta, Mitsuru; Sakashita, Takeshi; Miyamoto, Ryoichi; Tanimura, Yukinori; and Fuji, Saburo, 4,925,660, Cl. 424-81.000.
Sakata, Hajime, to Canon Kabushiki Kaisha. Optical analog-digital converter provided with a nonlinear optical element and an optical feedback system for the output lights of said element. 4,926,177, Cl. 341-137.000.
Sakata, Haruyasu: *See*—
Hangai, Toshimasa; Tateishi, Kiyoshi; Ishitoya, Koichi; and Sakata, Haruyasu, 4,926,405, Cl. 369-32.000.
Sakui, Koji; Ohuchi, Kazunori; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Divided bit line type dynamic random access memory with charging/discharging current suppressor. 4,926,382, Cl. 365-203.000.
Sakurai, Hideyuki, to Toyota Jidosha Kabushiki Kaisha. Assembly for mounting air bag cover. 4,925,209, Cl. 280-743.000.
Sakurai, Kazuhiro: *See*—
Yanagihara, Hiromichi; Ito, Sumio; Sakurai, Kazuhiro; and Akita, Kouichi, 4,925,091, Cl. 237-2.00A.
Salehi, Iraj A.: *See*—
Rector, James; Marion, Bruce; Widrow, Bernard; and Salehi, Iraj A., 4,926,391, Cl. 367-41.000.
Salerno, Albert; and Racz, Gabor. Laryngoscope blade. 4,924,855, Cl. 128-11.000.
Salerno, Franco: *See*—
Castello, Rinaldo; Ferro, Marco; Salerno, Franco; and Tomasini, Lucano, 4,926,138, Cl. 330-253.000.
Salkeld, David; and Schofield, John W., to British Aerospace public limited company. Missile defence system. 4,925,129, Cl. 244-3.110.
Salomon S.A.: *See*—
Graillat, Gerard, 4,925,206, Cl. 280-615.000.
Samejima, Masakuni; Fukuda, Kiyohito; and Matsumoto, Mitsuru, to Yazaki Corporation. Connector. 4,925,398, Cl. 439-357.000.
Samson AG: *See*—
Kemmler, Lothar, 4,925,498, Cl. 137-382.000.
Samsung Electronics Co., Ltd.: *See*—
Kim, Jung B., 4,924,939, Cl. 165-172.000.
Kim, Suk-Joon, 4,926,465, Cl. 379-131.000.
San-Ei Chemical Industries, Ltd.: *See*—
Odake, Yoshinobu, 4,925,690, Cl. 426-330.500.
Sandmeyer, John J. Multiple clip holding assembly. 4,925,143, Cl. 248-441.100.
Sandoz Pharmaceuticals Corp.: *See*—
Houlihan, William J., 4,925,851, Cl. 514-326.000.
Sandvik AB: *See*—
Leini, Arvo, 4,924,577, Cl. 30-387.000.
Sandvik Rock Tools, Inc.: *See*—
Chuang, Jo-Yu; and Fritsch, Edward V., 4,924,948, Cl. 173-139.000.
Sanford, David M Telephone call screening circuit. 4,926,470, Cl. 379-199.000.
Sanford, Norman A.; and Connors, James M., to Polaroid Corporation. Proton-exchanged waveguides for sum-frequency generation. 4,925,263, Cl. 350-96.120.
Sankei Giken Kogyo Kabushiki Kaisha: *See*—
Yokokoji, Osamu; and Fukuda, Masuo, 4,925,634, Cl. 422-179.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Oishi, Hiroshi, 4,925,416, Cl. 440-84.000.
Yoshimura, Tsuyoshi, 4,924,724, Cl. 74-473.00R.
Santa Barbara Research Center: *See*—
Ahlgren, William L., 4,926,038, Cl. 250-211.00J.
Sanyo Electric Co., Ltd.: *See*—
Suzuki, Hirohisa; and Tanno, Masaya, 4,926,498, Cl. 455-133.000.
Touya, Syouichi; and Kishi, Hideki, 4,924,548, Cl. 15-347.000.
Yoshida, Tetsuji; Teraoka, Yoshiaki; Ogawa, Yoji; Kozaki, Ken; Hara, Kenji; Satou, Hiroshi; and Yoshino, Akira, 4,926,487, Cl. 381-186.000.
Sapienza, Richard S.; and Slegeir, William A. Iron catalyst for preparation of polymethylene from synthesis gas and method for producing the catalyst. 4,925,824, Cl. 502-262.000.
Sapp, Samuel C.; and Payne, Peter R., to Marine Technological Exchange, Inc. High speed planing boat. 4,924,792, Cl. 114-61.000.
Sargent, Bruce J.: *See*—
Housley, John R.; Jeffery, James E.; Johnston, David N.; and Sargent, Bruce J., 4,925,879, Cl. 514-650.000.
Sarraf, Mohammad, to Western Digital Corporation. Data storage mounting assembly. 4,926,291, Cl. 361-384.000.
Sasagawa, Katsuyoshi: *See*—
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, 4,926,258, Cl. 358-98.000.
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, to Olympus Optical Co., Ltd. Electronic endoscope apparatus capable of driving solid state imaging devices having different characteristics. 4,926,258, Cl. 358-98.000.
Sasaki, Nasaomi: *See*—
Hashimoto, Mitsuru; and Sasaki, Nasaomi, 4,925,758, Cl. 430-57.000.
Sasaki, Seihiro: *See*—
Iseki, Izuru; Higashi, Akihiro; and Sasaki, Seihiro, 4,925,388, Cl. 432-77.000.
Sasaki, Yutaro: *See*—
Toda, Masaaki; Sasaki, Yutaro; and Shimoji, Katsuichi, 4,925,929, Cl. 536-4.100.
Sasaoka, Michio: *See*—
Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi; Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, 4,925,934, Cl. 540-310.000.
Sato, Goro; Higashi, Hidehiro; Shirono, Katsuhiro; and Eto, Yoshio, to Catalysts & Chemicals Industries Co., Ltd. Hydrotreating process for heavy hydrocarbon oils. 4,925,554, Cl. 208-210.000.
Sato, Goro; Komatsu, Michio; Nishida, Hiroyasu; Tanaka, Yoshichika; Koyanagi, Tsuguo; and Mihara, Kei, to Catalsts & Chemicals Industries Co., Ltd. Processes for preparing mono-dispersed particles. 4,925,704, Cl. 427-221.000.
Sato, Kazuyoshi; and Okajima, Hideaki, to Kabushiki Kaisha Sugino Machine. Burnishing device for external surfaces of workpieces having circular sectional contours. 4,924,568, Cl. 29-90.010.
Sato, Ko: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.
Sato, Kyosaku, to Polysar Limited. Linerless roll of self fusing tape 4,925,715, Cl. 428-40.000.
Sato, Michio: *See*—
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.

VOL 1114 ISS 3 MY 15 1990 UMI

Sato, Takanori; and Takanashi, Kazumitsu, to Shimizu Construction Co., Ltd. Method for restraining vibration of a floor and apparatus therefor. 4,924,639, Cl. 52-167.0DF.
Sato, Yuichi: *See*—
Hirasawa, Junichi; Sato, Yuichi; and Iida, Toru, 4,926,219, Cl. 355-309.000.
Satoh, Katsuaki: *See*—
Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi; Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, 4,924,962, Cl. 181-141.000.
Satou, Hiroshi: *See*—
Yoshida, Tetsuji; Teraoka, Yoshiaki; Ogawa, Yoji; Kozaki, Ken; Hara, Kenji; Satou, Hiroshi; and Yoshino, Akira, 4,926,487, Cl. 381-186.000.
Saturn Corporation: *See*—
Keller, John F., 4,924,582, Cl. 29-434.000.
Saturn International, Inc.: *See*—
Taek, Kim C., 4,926,097, Cl. 315-307.000.
Savall, Vincent: *See*—
Gaudin, Marie-Pierre; Meindre, Daniel; and Savall, Vincent, 4,925,556, Cl. 210-293.000.
Sawa, Tetsuya: *See*—
Fushiya, Fusao; Yoshida, Kenji; Naitoh, Akira; and Sawa, Tetsuya, 4,926,075, Cl. 310-50.000.
Sawamura, Masashi: *See*—
Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nihashi, Hiroyuki; and Tanaka, Tsuneo, 4,925,731, Cl. 428-336.000.
Sawatzki, Gunther: *See*—
Schweikhardt, Friedrich; Sawatzki, Gunther; and Braun, Rainer, 4,925,680, Cl. 426-42.000.
Sawayama, Ippei; and Jinnai, Masayuki, to Canon Kabushiki Kaisha. Vibration wave motor. 4,926,085, Cl. 310-323.000.
Sayles, David C., to United States of America, Army. Ambient cure catalyst for solid propellants. 4,925,504, Cl. 149-21.000.
Scannon, Patrick J.: *See*—
Byers, Vera S.; Baldwin, Robert W.; and Scannon, Patrick J., 4,925,922, Cl. 530-391.000.
Schadt, Martin: *See*—
Buchecker, Richard; Fromm, Hans-Jurgen; Kelly, Stephen; and Schadt, Martin, 4,925,278, Cl. 350-350.500.
Schaefer, Willi: *See*—
Bock, Hans-Christian, Kaul, Karlheinz; and Schaefer, Willi, 4,926,456, Cl. 378-177.000.
Schaeffer, George; and Lawrence, William, to OPI Products, Inc. Form for extending fingernails and method of using the same. 4,924,889, Cl. 132-73.000.
Schafer, Wolfgang: *See*—
Agethen, Heinrich; Gesenhues, Paul; Radisch, Helmer; Jandeleit, Otto; and Schafer, Wolfgang, 4,925,734, Cl. 428-349.000.
Schaffer, Mark M., to International Business Machines Corporation. Residue checking apparatus for detecting errors in add, subtract, multiply, divide and square root operations. 4,926,374, Cl. 364-739.000.
Schaffer, Michael J., to Nawsir Inc. Contact sensing system. 4,924,715, Cl. 73-865.800.
Schafft, Helmut. Method of filtering. 4,925,570, Cl. 210-741.000.
Schantz, Chris: *See*—
Childers, Winthrop D.; Schantz, Chris; and Hanson, Eric, 4,926,197, Cl. 346-140.00R.
Schaubs, Randolph J.: *See*—
Hamilton, Scott L.; Harney, Michael P.; Naddor, David J.; Farmer, James Q.; Frederick, Richard B.; and Schaubs, Randolph J., 4,926,444, Cl. 375-9.000.
Schaudt Maschinenbau GmbH: *See*—
Beyer, Rudolf; Heerdt, Lutz-Peter; and Schemel, Roland, 4,924,632, Cl. 51-105.00R.
Schawbel Corporation, The: *See*—
Zaborowski, Thaddeus, 4,924,849, Cl. 126-409.000.
Scheitza, Matthias, to Leinhaas Industrieberatung. Gripper feed device. 4,925,078, Cl. 226-108.000.
Schell, Frederick S.: *See*—
Licht, Brigitte H.; Bentley, Roger T.; and Schell, Frederick S., 4,925,988, Cl. 568-625.000.
Schemel, Roland: *See*—
Beyer, Rudolf; Heerdt, Lutz-Peter; and Schemel, Roland, 4,924,632, Cl. 51-105.00R.
Schenberg, Alan N., to ITT Corporation. High gain zero offset linear phase detector apparatus. 4,926,140, Cl. 331-1.00A.
Schenker, Gilbert; Piorr, Robert; and Luettge, Sabine, to Henkel Kommanditgesellschaft auf Aktien. Hydroxy ethers, a process for their production, and methods for their use. 4,925,587, Cl. 252-174.220.
Schering Agrochemicals Limited: *See*—
Ball, Keith V., 4,925,030, Cl. 206-487.000.
Schering Aktiengesellschaft: *See*—
Blume, Friedhelm; Dorfmeister, Gabriele; Franke, Wilfried; Rees, Richard; Johann, Gerhard; and Arndt, Friedrich, 4,925,481, Cl. 71-92.000.
Bohlmann, Rolf; Laurent, Henry; Henderson, David; and Nishino, Yukishige, 4,925,834, Cl. 514-177.000.
Gries, Heinz; Niedballa, Ulrich; and Weinmann, Hanns-Joachim, 4,925,652, Cl. 424-9.000.
Kosikowski, Thomas, 4,925,011, Cl. 198-624.000.
Schollkopf, Klaus; and Wachtel, Helmut, 4,925,854, Cl. 514-338.000.
Skuballa, Werner; and Dahl, Helmut, 4,925,956, Cl. 549-214.000.
Schermanz, Karl; Saischek, Gerald; Urmann, Robert; and Martetschlager, Kurt, to CL Pharma Aktiengesellschaft. Imidazole derivatives and antimycotics containing them. 4,925,855, Cl. 514-341.000.
Scheuneman, James H.; Mayer, Michael E.; and Purdham, David M., to Unisys Corporation. Error correction check during write cycles. 4,926,426, Cl. 371-40.100.
Schiedegger, Charles E.: *See*—
MacLeod, Richard J.; Schiedegger, Charles E.; and Chubb, Norman L., 4,924,761, Cl. 98-42.210.
Schiller, Barry. Tool holder assembly. 4,924,576, Cl. 30-358.000.
Schlaikjer, Carl R. Lithium/sulfur dioxide cell. 4,925,753, Cl. 429-196.000.
Schley-May, James T., to Telxon Corporation. Telephone communication apparatus and method having automatic selection of receiving mode. 4,926,464, Cl. 379-99.000.
Schloegl, Gunter: *See*—
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,925,728, Cl. 428-216.000.
Schlueter, Edward L., Jr.: *See*—
Heeks, George J.; Henry, Arnold W.; and Schlueter, Edward L., Jr., 4,925,895, Cl. 524-714.000.
Schlumberger Industries, Inc.: *See*—
Leydier, Robert A., 4,926,131, Cl. 328-181.000.
Schlumberger Technology Corporation: *See*—
Vachon, Guy, 4,924,596, Cl. 33-715.000.
Wraight, Peter D., 4,926,044, Cl. 250-264.000.
Schlunke, Christopher K.: *See*—
Lear, Mark; Schlunke, Christopher K.; and Seeber, Kenneth P., 4,924,820, Cl. 123-65.0PE.
Schlunke, Jurgen; Kaiser, Franz; and Fenzau, Hilmar, to Kleinwefers GmbH. Calender with individually supported rolls and constant nip alignment. 4,924,772, Cl. 100-163.00R.
Schmalenbach, Dietrich; and Henke, Bernhard, to F. W. Oventrop, KG. Three-way valve. 4,924,911, Cl. 137-625.500.
Schmatz, Duane J.: *See*—
Moskowitz, David; Hoffman, David W.; and Schmatz, Duane J., 4,925,346, Cl. 408-1.00R.
Schmid, Hans-Dieter: *See*—
Buchschmid, Emil; Frenznick, Anton; Lindner, Klaus; Schmid, Olaf; Schmid, Hans-Dieter; Schmidt, Gerhard; and Sturm, Theodor, 4,926,150, Cl. 335-196.000.
Schmid, Jean: *See*—
Asselin, Andre A.; and Schmid, Jean, 4,925,955, Cl. 548-432.000.
Schmid, Olaf: *See*—
Buchschmid, Emil; Frenznick, Anton; Lindner, Klaus; Schmid, Olaf; Schmid, Hans-Dieter; Schmidt, Gerhard; and Sturm, Theodor, 4,926,150, Cl. 335-196.000.
Schmidt, Arno P. O., to Hilti Aktiengesellschaft. Compositions containing stabiized unsaturated polyester resins. 4,925,904, Cl. 526-205.000.
Schmidt, Gerhard: *See*—
Buchschmid, Emil; Frenznick, Anton; Lindner, Klaus; Schmid, Olaf; Schmid, Hans-Dieter; Schmidt, Gerhard; and Sturm, Theodor, 4,926,150, Cl. 335-196.000.
Schmidt, Hans: *See*—
Hadwiger, Helmut; and Schmidt, Hans, 4,924,590, Cl. 29-848.000.
Schmidt, Harald: *See*—
Lentz, Norbert; and Schmidt, Harald, 4,925,006, Cl. 198-461.000.
Schmidt, Hermann, to Metallgesellschaft Aktiengesellschaft. Dust collection in sintering of metallurgical products. 4,925,487, Cl. 75-749.000.
Schmidt, Siegmar: *See*—
Maisenbacher, Bernd; and Schmidt, Siegmar, 4,925,273, Cl. 350-315.000.
Schmidt, Wolfgang, to Desitin Arzneimittel GmbH. Administration and dosage form for drug active agents, reagents or the like and process for the preparation thereof. 4,925,670, Cl. 424-443.000.
Schmierer, Roland, to Hoechst Aktiengesellschaft. Process for the preparation of N-alkoxycarbonylmethyl-N-formyl-amines and -anilines. 4,925,958, Cl. 560-43.000.
Schmitt, Franz-Ulrich: *See*—
Ostertag, Werner; Czech, Erwin; Schmitt, Franz-Ulrich; and Schulze-Hagenest, Detlef, 4,925,762, Cl. 430-106.600.
Schmuser, Dirk: *See*—
Grosseholz, Werner; Schmuser, Dirk; and Wenzel, Werner, 4,924,553, Cl. 17-50.000.
Schneider, Jakob, to Lemo M. Lehmacher & Sohm GmbH. Apparatus for stacking and possibly blocking plastic bags. 4,925,439, Cl. 493-204.000.
Schneider, John L. Detonating heads. 4,924,952, Cl. 175-4.540.
Schneider, Juergen: *See*—
Stelter, Norbert; Richter, Goetz; and Schneider, Juergen, 4,926,329, Cl. 364-424.010.
Schneider, Larry, to Alko, Ltd. Liquid dispenser. 4,925,068, Cl. 222-484.000.
Schneider, Michel; Guillot, Christian; and Lamy, Bernard, to Battelle Memorial Institute. Method of purifying bioactive substances by biospecific adsorption. 4,925,818, Cl. 502-7.000.
Schneider, Ortwin, to Erweka Apparatebau GmbH. Dissolution testing apparatus. 4,924,716, Cl. 73-866.000.
Schoenmakers, Johannes J. M., to U.S. Philips Corporation. Magnetic tape cassette apparatus having reduced azimuth error. 4,926,278, Cl. 360-130.210.
Schofield, John W.: *See*—
Salkeld, David; and Schofield, John W., 4,925,129, Cl. 244-3.110.
Scholle, Roger A.; and Scholle, Stephen R. Adjustable sailboard. 4,924,791, Cl. 114-39.200.

Scholle, Stephen R.: *See*—
Scholle, Roger A.; and Scholle, Stephen R., 4,924,791, Cl. 114-39.200.
Schollkopf, Klaus; and Wachtel, Helmut, to Schering Aktiengesellschaft. Benzimidazole derivatives. 4,925,854, Cl. 514-338.000.
Schooley, Arthur F.; Eben-Ebenau, Wolf R.; and Nelson, Lloyd J. Variable speed/variable voltage generator set. 4,926,108, Cl. 322-15.000.
Schott, Christa: *See*—
Kanmacher, Isabelle; Stambach, Jean-Francois; Jung, Louis; Schott, Christa; Stoclet, Jean-Claude; and Heitz, Christiane, 4,925,943, Cl. 546-149.000.
Schotter, Daniel K., to Hughes Aircraft Company. Fiber guide. 4,925,126, Cl. 242-157.00R.
Schramm, Willfried, to BioQuant, Inc. Diagnostic device. 4,925,629, Cl. 422-82.050.
Schreiner, Sabine: *See*—
Dickert, Franz; Kimmel, Heinz; Mages, Gert; and Schreiner, Sabine, 4,926,156, Cl. 338-36.000.
Schremmer, Gottfried: *See*—
Peitsmeier, Karl; and Schremmer, Gottfried, 4,925,210, Cl. 280-775.000.
Schroder, George A. T.: *See*—
te Hennepe, Hendrikus J. D.; Mulder, Marcellinus H. V.; Smolders, Cornelis A.; Bargeman, Derk; and Schroder, George A. T., 4,925,562, Cl. 210-500.250.
Schroder, Hans-Rudiger: *See*—
Stolarski, Erwin; and Schroder, Hans-Rudiger, 4,924,554, Cl. 19-0.600.
Schroeder, Allen G.; Schroeder, Thaddeus; Karadsheh, Sam M.; Goings, Janet S.; and Golebiewski, Ronald T., to General Motors Corporation. Noncontacting position sensor for an automotive steering system. 4,924,696, Cl. 73-118.100.
Schroeder, Otto E.: *See*—
Barry, David L.; Dreher, Mark L.; Johnson, Alan A.; and Schroeder, Otto E., 4,925,694, Cl. 426-613.000.
Schroeder, Thaddeus; and Lequesne, Bruno P. B., to General Motors Corporation. High sensitivity magnetic circuit. 4,926,122, Cl. 324-207.130.
Schroeder, Thaddeus: *See*—
Schroeder, Allen G.; Schroeder, Thaddeus; Karadsheh, Sam M.; Goings, Janet S.; and Golebiewski, Ronald T., 4,924,696, Cl. 73-118.100.
Schroers, Otto: *See*—
Huhner, Wolfgang; and Schroers, Otto, 4,925,884, Cl. 523-340.000.
Schroter, Reinhard: *See*—
Wratil, Peter; and Schroter, Reinhard, 4,926,351, Cl. 364-550.000.
Schubert, Hiltmar: *See*—
Hommel, Horst; and Schubert, Hiltmar, 4,925,600, Cl. 264-3.400.
Schultz, Gary R.; and Oltean, Jerry M., to Eaton Corporation. Central tire inflation system. 4,924,926, Cl. 152-417.000.
Schultz, Thomas J.; Shah, Jay K.; and Daiga, Valdis R., to Surface Combustion, Inc. Thermal cleaning system. 4,924,785, Cl. 110-346.000.
Schulze-Hagenest, Detlef: *See*—
Ostertag, Werner; Czech, Erwin; Schmitt, Franz-Ulrich; and Schulze-Hagenest, Detlef, 4,925,762, Cl. 430-106.600.
Schulze, Martin: *See*—
Preusser, Gerhard; Emmrich, Gerd; and Schulze, Martin, 4,925,535, Cl. 203-25.000.
Schulze, Reinhold, to SKW Trostberg Aktiengesellschaft. Process for the isolation of noble metals. 4,925,485, Cl. 423-22.000.
Schurpack, Inc.: *See*—
Sorensen, Leif B., 4,925,318, Cl. 383-63.000.
Schwab, Frederick J.: *See*—
Giles, Brian A.; and Schwab, Frederick J., 4,924,890, Cl. 134-61.000.
Schwalge, Barbara: *See*—
Rueb, Lothar; Eicken, Karl; Pander, Hans J.; Plath, Peter; Schwalge, Barbara; Wuerzer, Bruno; and Meyer, Norbert, 4,925,484, Cl. 71-96.000.
Schwanbom, Erik: *See*—
Kiske, Siegfried; Schwanbom, Erik; and Wallroth, Carl F., 4,924,861, Cl. 128-205.180.
Schwartz, Richard W.: *See*—
Rao, Suren B.; and Schwartz, Richard W., 4,924,842, Cl. 125-11.010.
Schwarz, Eric M.: *See*—
Vassiliadis, Stamatis; Schwarz, Eric M.; and Sung, Baik M., 4,926,371, Cl. 364-760.000.
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., to Air Products and Chemicals, Inc. Perfluorinated 2-ISO propyl derivative compounds. 4,925,992, Cl. 570-130.000.
Schweikhardt, Friedrich; Sawatzki, Gunther; and Braun, Rainer, to Milupa Aktiengesellschaft. Process for enzymatic production of bifidogenic infant and dietetic foods. 4,925,680, Cl. 426-42.000.
Scientific-Atlanta, Inc.: *See*—
Hamilton, Scott L.; Harney, Michael P.; Naddor, David J.; Farmer, James Q.; Frederick, Richard B.; and Schaubs, Randolph J., 4,926,444, Cl. 375-9.000.
Scientific Growth, Inc.: *See*—
Crisp, William E.; Engel, Melvyn; Kudlicki, Richard C.; and Smith, Judson L., 4,925,495, Cl. 134-18.000.
Sclavo, S.p.A.: *See*—
Rappuoli, Rino, 4,925,792, Cl. 435-69.100.
Scott Orthotic Labs, Inc.: *See*—
Harris, Godfrey; and Hydle, Leslie K., 4,925,242, Cl. 297-284.000.
Scrivener, Paul L., to Pirelli General plc. Optical fibre structure. 4,925,269, Cl. 350-96.330.
Scull, Herbert M.: *See*—
Beard, William R.; and Scull, Herbert M., 4,925,962, Cl. 556-187.000.
Scully, Michael J.: *See*—
Fogg, Michael W.; Scully, Michael J.; and Wolfe, Brian A., 4,925,401, Cl. 439-465.000.
SDS Biotech K.K.: *See*—
Kobayashi, Hiroshi; and Shimizu, Masaaki, 4,925,966, Cl. 558-419.000.
Seagate Technology, Inc.: *See*—
Gauthier, Raymond G.; Krause, James N.; and Lancisi, David M., 4,926,077, Cl. 310-68.00C.
Sealed Air Corporation: *See*—
Kannankeril, Charles P., 4,925,453, Cl. 604-378.000.
Seals, Brad A.: *See*—
Seals, William L.; and Seals, Brad A., 4,924,970, Cl. 182-91.000.
Seals, William L.; and Seals, Brad A. Ladder apparatus. 4,924,970, Cl. 182-91.000.
Sechi, Franco N.: *See*—
Bujatti, Marina; and Sechi, Franco N., 4,925,723, Cl. 428-137.000.
Secretary of State for Defence (G.B.): *See*—
Ashley, Timothy; Elliott, Charles T.; and White, Anthony M., 4,926,228, Cl. 357-30.000.
Seeber, Kenneth P.: *See*—
Lear, Mark; Schlunke, Christopher K.; and Seeber, Kenneth P., 4,924,820, Cl. 123-65.0PE.
Seelen, Josef. Seal for blast pipe or shaft. 4,924,817, Cl. 122-379.000.
Seelmann-Eggebert, Hans-Peter: *See*—
Boeckh, Dieter; Seelmann-Eggebert, Hans-Peter; Hartmann, Heinrich; Trieselt, Wolfgang; and Baur, Richard, 4,925,905, Cl. 526-208.000.
Seichter, Helmut: *See*—
Auslander, Klaus; Fabris, Hans-Jurgen; Patzwald, Wolfgang; and Seichter, Helmut, 4,926,127, Cl. 324-329.000.
Seigenji, Kiyoshi: *See*—
Oku, Shunji; Mizumo, Yoshiyuki; and Seigenji, Kiyoshi, 4,925,525, Cl. 156-652.000.
Seignemartin, Elbert E.: *See*—
Richter, Jeff T.; and Seignemartin, Elbert E., 4,926,280, Cl. 361-15.000.
Seitoh, Shinichi: *See*—
Iwamoto, Hirofumi; Kawai, Tatsundo; Ogura, Makoto; Nakagawa, Katsumi; Seitoh, Shinichi; and Kaifu, Noriyuki, 4,926,058, Cl. 250-578.100.
Seki, Kameharu; and Kubo, Isamu, to Nippon CMK Corp. Method of chamfering planar plate. 4,925,347, Cl. 409-132.000.
Seki, Yoshinobu: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; Honda, Yutaka; and Ichihara, Yasuo, 4,925,537, Cl. 204-61.000.
Sekine, Kunio: *See*—
Saitoh, Mitsuyoshi; and Sekine, Kunio, 4,926,274, Cl. 360-102.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Endo, Gen; Tateishi, Hiroyuki; Kawata, Yoshihiro; Karasudani, Isao; and Omura, Hirofumi, 4,925,725, Cl. 428-156.000.
Sekiya, Kazuo; and Kasuya, Tamotsu, to Kabushiki Kaisha Komatsu Seisakusho. Heat exchanger for lowering temperature of exhaust gas from internal combustion engine. 4,924,672, Cl. 60-310.000.
Sekiya, Masataka: *See*—
Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; Owashi, Hitoaki; Sekiya, Masataka; and Minabe, Kohji, 4,926,361, Cl. 364-574.000.
Sekizawa, Hidekazu; Saito, Tutomu; Yamamoto, Naofumi; Higuchi, Kazuhiko; and Kawakami, Haruko, to Kabushiki Kaisha Toshiba. Color image processing apparatus with image corrector. 4,926,251, Cl. 358-75.000.
Selbert, Alan J.: *See*—
Witzke, Duane W.; Selbert, Alan J.; and Lowe, Michael E., 4,925,513, Cl. 156-245.000.
Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Galati, Gaspare; and Jacovitti, Giovanni, 4,926,184, Cl. 342-149.000.
Selenia Spazio S.p.A.: *See*—
Alaria, Gian B.; Poggio, Cesare; and Ventimiglia, Giovanni, 4,926,422, Cl. 370-97.000.
Semasa, Takayoshi: *See*—
Ueno, Yutaka; Emmons, Lawrence D.; Kaneko, Koji; and Semasa, Takayoshi, 4,926,245, Cl. 358-12.000.
Senda, Tetsuya: *See*—
Matsumoto, Hiroaki; Senda, Tetsuya; and Fukuda, Tokuya, 4,926,261, Cl. 358-167.000.
Senkler, Carol A.: *See*—
Madeleine, Dennis G.; Senkler, Carol A.; and Grezzo Page, Loretta A., 4,925,764, Cl. 430-110.000.
Senma, Toshitaka: *See*—
Imamura, Tomoatsu; Shimada, Kazuyuki; and Senma, Toshitaka, 4,926,433, Cl. 372-50.000.
Sensabaugh, Andrew J., Jr.: *See*—
Raker, Mark L.; Sensabaugh, Andrew J., Jr.; and Jakob, Stephen W., 4,924,887, Cl. 131-331.000.
Seo, Naobumi: *See*—
Murakami, Teruo; and Seo, Naobumi, 4,926,408, Cl. 369-58.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Seo, Yoshimasa: *See*—
Matsumoto, Mutsumi; and Seo, Yoshimasa, 4,925,980, Cl. 562-534.000.
Serradura, Thierry: *See*—
Ayello, Jean-Claude; and Serradura, Thierry, 4,926,466, Cl. 379-143.000.
Sestanj, Kazimir; Wrobel, Jay E.; and Kelly, Joseph M., to American Home Products Corporation. N-acyl-N-naphthoylglycines as aldose reductase inhibitors. 4,925,968, Cl. 560-21.000.
Setz, Michael: *See*—
Bischof, Stefan; Lohrmann, Gerhard; and Setz, Michael, 4,925,326, Cl. 400-616.100.
Seufert, Walter: *See*—
Mackenroth, Wolfgang; Hoelderich, Wolfgang; Becker, Rainer; and Seufert, Walter, 4,925,991, Cl. 568-908.000.
Sevrin, Mireille: *See*—
George, Pascal; Sevrin, Mireille; Maloizel, Christian; Tixidre, Arlette; and Froissant, Jacques, 4,925,850, Cl. 514-307.000.
Sewcyk, Richard: *See*—
Jeffers, Cecil W.; and Sewcyk, Richard, 4,925,722, Cl. 428-131.000.
Seydel Vermogensverwaltungsgesellschaft mit beschrankter Haftung: *See*—
Gilhaus, Konrad, 4,924,556, Cl. 19-0.350.
Seymour, Shaun A., to Ford New Holland, Inc. Constant clearance conditioning rolls. 4,924,661, Cl. 56-1.000.
SGS Microelettronica S.p.A.: *See*—
Rosini, Paolo, 4,926,376, Cl. 364-900.000.
SGS-Thomson Microelectronics S.p.A.: *See*—
Castello, Rinaldo; Ferro, Marco; Salerno, Franco; and Tomasini, Lucano, 4,926,138, Cl. 330-253.000.
SGS-Thomson Microelectronics S.A.: *See*—
Bergemont, Albert, 4,926,223, Cl. 357-23.600.
Sha, Chi: *See*—
Onaga, Eimei M.; Casler, Richard J., Jr.; Penkar, Rajan C.; Lancraft, Roy E.; and Sha, Chi, 4,925,312, Cl. 364-513.000.
Shackle, Dale R.; Fauteux, Denis G.; and Lundsgaard, Jorgen S. High power solid state electrochemical laminar cell. 4,925,751, Cl. 429-191.000.
Shah, Jay K.: *See*—
Schultz, Thomas J.; Shah, Jay K.; and Daiga, Valdis R., 4,924,785, Cl. 110-346.000.
Shah, Reza H. Ultrasonic remote controlled switching device. 4,924,564, Cl. 126-512.000.
Shannon, Jeffrey C.: *See*—
DeVit, Martin B; and Shannon, Jeffrey C., 4,924,681, Cl. 62-238.600.
Shapovalov, Jury P.: *See*—
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P., 4,925,550, Cl. 210-106.000.
Sharp, Bruce R. Double walled ribbed storage tank systems. 4,925,046, Cl. 220-5.00A.
Sharp Kabushiki Kaisha: *See*—
Fujisawa, Isao; and Hashimoto, Katsuhiko, 4,926,166, Cl. 340-717.000.
Fujita, Kazuya; Maeda, Takamichi; and Hayakawa, Masao, 4,926,239, Cl. 357-72.000.
Kawanishi, Hidenori; Hayashi, Hiroshi; Morimoto, Taiji; Kaneiwa, Shinji; and Yamaguchi, Masahiro, 4,926,431, Cl. 372-45.000.
Kunita, Hisao; Morita, Akitaka; and Matsuda, Eichika, 4,926,388, Cl. 365-244.000.
Morita, Akitaka; Nishimura, Toshio; and Takada, Hiroshi, 4,926,368, Cl. 364-715.050.
Nagano, Fumikazu, 4,926,252, Cl. 358-75.000.
Nakagawa, Kiyotoshi; and Kawano, Kenzo, 4,926,243, Cl. 357-84.000.
Ogura, Mitsuru, 4,926,210, Cl. 355-28.000.
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 4,925,776, Cl. 430-321.000.
Ohta, Tomozo; Nakano, Hiroshi; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,926,182, Cl. 342-44.000.
Takano, Sakuharu; Nishibori, Toshiki; and Katsuta, Yuji, 4,926,269, Cl. 358-474.000.
Tanaka, Hideaki; and Kitamura, Yoshihiko, 4,926,492, Cl. 382-18.000.
Tsukamoto, Kimihide; and Tsuji, Masaru, 4,925,062, Cl. 271-115.000.
Yamamoto, Kunihiko; and Ishii, Yutaka, 4,926,168, Cl. 340-784.000.
Shaw, Henry, to Picanol N.V. Weft thread break monitor and movement limiting device. 4,924,917, Cl. 139-452.000.
Shaw, Stuart. Frames for vehicles license plates and the like. 4,924,611, Cl. 40-210.000.
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Bahl, Harsh V., and Sheets, Laurence L., 4,926,473, Cl. 379-416.000.
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Vorlow, Sotiris, 4,925,573, Cl. 208-100.000.
Shell Oil Company: *See*—
Chou, Charles C.; and Olson, Donald C., 4,925,569, Cl. 210-713.000.
Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., 4,925,820, Cl. 502-66.000.
Robschlager, Karl H., 4,925,995, Cl. 58.5-310.000.
Slaugh, Lynn H.; Johnson, Thomas H.; and Hoxmeier, Ronald J., 4,925,822, Cl. 502-112.000.
Southwick, Jeffrey G.; and Nelson, Richard C., 4,925,578, Cl. 252-8.554.
Udding, Anne C., 4,925,881, Cl. 521-129.000.
Wife, Richard L.; and Wong, Pui K., 4,925,917, Cl. 528-392.000.
Shelton, Alan J., to General Motors Corporation. Hold open device for compartment lid. 4,925,230, Cl. 296-76.000.
Shemwell, David M., to Spectra-Physics, Inc. Scanning laser based system and method for measurement of distance to a target. 4,926,050, Cl. 250-560.000.
Shen, Jian-Chyun, to Union Oil Company of California. Well forming process. 4,924,942, Cl. 166-291.000.
Shepard, Robert R.: *See*—
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 4,926,462, Cl. 379-67.000.
Shepherd, Lawrence H., Jr.: *See*—
Lee, John Y.; and Shepherd, Lawrence H., Jr., 4,925,984, Cl. 564-412.000.
Sherman, Earle C.: *See*—
Asbury, Charles E., Jr.; Gulati, Monmohan S.; Sherman, Earle C.; and Calvert, Dan V., 4,925,521, Cl. 156-517.000.
Sherman, James F.; and Hauser, Kenneth C., to General Motors Corporation. Multispeed power transmission. 4,924,729, Cl. 475-207.000.
Shibata, Yukio: *See*—
Kishi, Noriaki; Nosaka, Kazuto; Terao, Tadayoshi; and Shibata, Yukio, 4,925,468, Cl. 55-467.000.
Shibayama, Toyohiro: *See*—
Shogaki, Toshihiro; Shibayama, Toyohiro; and Omoto, Noriaki, 4,926,137, Cl. 330-252.000.
Shiga, Tsutomu: *See*—
Nimura, Takayasu; and Shiga, Tsutomu, 4,926,076, Cl. 310-68.00D.
Shikoku Chemicals Corporation: *See*—
Kitamura, Takao; Sakane, Kohji; Wada, Hideo; Hata, Hajime; and Kanbara, Hajime, 4,925,641, Cl. 423-279.000.
Shikoku Kakoki Co., Ltd.: *See*—
Ueda, Kazuo; Wakabayashi, Shigeru; Saijo, Yoshihiro; and Fujikawa, Yasuji, 4,925,069, Cl. 222-500.000.
Shikowitz, Mark J., to Long Island Jewish Medical Center. Topical hematoporphyrin. 4,925,736, Cl. 424-449.000.
Shimabayashi, Akihiro: *See*—
Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi; Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, 4,925,934, Cl. 540-310.000.
Shimada, Fumio: *See*—
Fukuda, Tsuyoshi; and Shimada, Fumio, 4,926,202, Cl. 354-246.000.
Shimada, Kazuyuki: *See*—
Imamura, Tomoatsu; Shimada, Kazuyuki; and Senma, Toshitaka, 4,926,433, Cl. 372-50.000.
Shimada, Yoshio: *See*—
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Shimamune, Takayuki: *See*—
Matsumoto, Yukiei; Nishiki, Yoshinori; Hirao, Kazuhiro; and Shimamune, Takayuki, 4,925,538, Cl. 204-129.400.
Shimamura, Norio; and Sudo, Taiji, to Tokyo Tatsuno Co., Ltd. Reader and/or writer for IC card. 4,926,032, Cl. 235-441.000.
Shimase, Akira: *See*—
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, 4,925,755, Cl. 430-5.000.
Shimazaki, Tatsuo: *See*—
Ogawa, Masahiro; Shimazaki, Tatsuo; Umeda, Osamu; Aoki, Toshihiro; and Nakakusu, Toru, 4,925,295, Cl. 353-57.000.
Shimazu, Tomonori: *See*—
Inamori, Masahito; Horii, Tetsuo; Shimazu, Tomonori; and Sugaya, Masaji, 4,925,864, Cl. 514-383.000.
Shimizu Construction Co., Ltd.: *See*—
Sato, Takanori; and Takanashi, Kazumitsu, 4,924,639, Cl. 52-167.0DF.
Shimizu, Haruaki: *See*—
Kubota, Naminosuke; Shimizu, Haruaki; Sonobe, Tadashi; and Nakashita, Goro, 4,925,909, Cl. 528-55.000.
Shimizu, Hiroshi, to NEC Corporation. Transmission system of a packet signal in an integrated network system using a frame format flexible for various forms of the integrated network system. 4,926,420, Cl. 370-94.100.
Shimizu, Makoto; Nakamura, Katutoshi; and Furusawa, Noriyuki, to Fuji Photo Film Co., Ltd. Method and apparatus for inspecting resistance to film draw-out. 4,925,119, Cl. 242-57.000.
Shimizu, Masaaki: *See*—
Kobayashi, Hiroshi; and Shimizu, Masaaki, 4,925,966, Cl. 558-419.000.
Shimizu, Noboru; Yoshida, Hiroshi; Daigo, Hiromiki; and Matsumoto, Shoichi, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method of isolating methacrylic acid. 4,925,981, Cl. 562-600.000.
Shimizu, Rio: *See*—
Takeda, Keiso; Nakanishi, Kiyoshi; Kawai, Taiyo; and Shimizu, Rio, 4,925,110, Cl. 239-533.120.
Shimizu, Shinji: *See*—
Kosa, Yasunobu; and Shimizu, Shinji, 4,926,222, Cl. 357-23.500.
Shimizu, Shoichi: *See*—
Yoshihara, Kunio; Terada, Toshiyuki; Takubo, Chiaki; Koide, Nobuo; and Shimizu, Shoichi, 4,926,451, Cl. 377-48.000.

Shimoji, Katsuichi: *See*—
Toda, Masaaki; Sasaki, Yutaro; and Shimoji, Katsuichi, 4,925,929, Cl. 536-4.100.
Shimosato, Masashi; and Ochiai, Kuniaki, to Tokyo Electric Company, Ltd. Dot print head having a torsion bar with elastic portions. 4,925,625, Cl. 400-124.000.
Shimozawa, Kenji: *See*—
Tsuyuguchi, Hiroshi; Shimozawa, Kenji; and Kamisaka, Takashi, 4,926,403, Cl. 369-13.000.
Tsuyuguchi, Hiroshi; Shimozawa, Kenji; and Kamisaka, Takashi, 4,926,409, Cl. 309-112.000.
Shin-Etsu Handotai Company, Limited: *See*—
Katsuoka, Nobuo; Hirano, Yoshihiro; and Kakegawa, Tomohiro, 4,926,357, Cl. 364-560.000.
Shin, Shigemitsu: *See*—
Kawamura, Kichinari; Kono, Yasuo; Okado, Hideo; Shin, Shigemitsu; and Takaya, Haruo, 4,926,006, Cl. 585-640.000.
Shinbori, Osamu: *See*—
Mimura, Yoshinori; Noda, Yukio; Norimatsu, Naoki; Tokiwa, Hideharu; and Shinbori, Osamu, 4,925,475, Cl. 65-48.000.
Shinko Electric Co., Ltd.: *See*—
Yoshida, Hiroshi; Ikeya, Hiroshi; Kobayashi, Kunihiro; and Kondo, Yasuhiko, 4,925,092, Cl. 237-12.30B.
Shinoda, Masaki: *See*—
Hayashi, Yoshio; Oguri Tomei; Shinoda, Masaki; Takahashi, Kazuo; and Hashimoto, Munehiro, 4,925,861, Cl. 514-367.000.
Shinoda, Tsutae; and Nanto, Toshiyuki, to Fujitsu Limited. Three-component gas mixture for fluorescent gas-discharge color display panel. 4,926,095, Cl. 315-169.400.
Shiokawa, Youichi; Akahane, Atsushi; Katayama, Hirohito; and Mitsunaga, Takafumi, to Fujisawa Pharmaceutical Company, Ltd. Pharmaceutically useful pyrazolopyridines. 4,925,849, Cl. 514-300.000.
Shionogi & Co., Ltd.: *See*—
Shudo, Koichi, 4,925,979, Cl. 562-462.000.
Shirai, Eiji: *See*—
Hayashi, Masaharu; Kodama, Hisashi; Okabe, Yoshio; Kobayashi, Yukimori; and Shirai, Eiji, 4,925,436, Cl. 474-101.000.
Shiraishi, Hideo; and Morita, Tsutomu, to Akebono Brake Industry Co., Ltd. Method for manufacturing a reinforcing element for asbestos free friction material. 4,924,566, Cl. 28-143.000.
Shirley, Thomas F., Jr.; Ruppel, John S.; Zuiss, Thomas J.; and Battin, Jeffrey A., to Motorola, Inc. Radio alignment/programming device. 4,926,497, Cl. 455-67.000.
Shirono, Katsuhiro: *See*—
Sato, Goro; Higashi, Hidehiro; Shirono, Katsuhiro; and Eto, Yoshio, 4,925,554, Cl. 208-210.000.
Shirota, Hiroyuki, to Dainippon Screen Mfg. Co., Ltd. Telecentric f-θ lens system. 4,925,279, Cl. 350-415.000.
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P. Batch-action apparatus for filtering fluid medium. 4,925,550, Cl. 210-106.000.
Shitanoki, Kazuaki; Kawaguchi, Masaaki; and Kobayashi, Saburo, to Honda Giken Kogyo Kabushiki Kaisha. Air bag device for protecting a vehicle occupant. 4,925,208, Cl. 280-741.000.
Shivashankar, Srinvasrao A.: *See*—
Brezoczky, Blasius; Cuomo, Jerome J.; Guarnieri, C. Richard; Ramanathan, Kumbakonam V.; Shivashankar, Srinvasrao A.; Smith, David A.; and Yee, Dennis S., 4,925,700, Cl. 427-38.000.
Shmueli, Itzhak. Net of plastic rings connected by connector means. 4,925,709, Cl. 428-33.000.
Shockney, Charles H.; Hill, Roger L.; and White, William T., to USBI Company. Mold making method. 4,925,611, Cl. 264-135.000.
Shoffner, William H.: *See*—
Villalon, S. Leonard; Olds, James D.; and Shoffner, William H., 4,925,205, Cl. 280-507.000.
Shogaki, Toshihiro; Shibayama, Toyohiro; and Omoto, Noriaki, to Matsushita Electric Industrial Co., Ltd. Transistor amplifier for outputting a voltage which is higher than a breakdown voltage of the transistor. 4,926,137, Cl. 330-252.000.
Shoji, Akira: *See*—
Omori, Hidetoshi; Shoji, Akira; and Akaza, Hiroshi, 4,925,563, Cl. 210-532.100.
Showers, Donald K.: *See*—
Colla, Jeannine O.; Thomas, Paul E.; and Showers, Donald K., 4,926,155, Cl. 338-36.000.
Shreeve, Robert W., to Hewlett-Packard Company. High capacitance cable. 4,926,008, Cl. 174-117.0FF.
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, to Centre International De Recherches dermatologiques (CIRD). Aromatic esters and thioesters and their use in human or veterinary medicine and in cosmetic compositions. 4,925,658, Cl. 424-70.000.
Shu, Joseph S.; Springer, Robert; and Yeh, Chia L., to Nynex Corporation. Reproduction of halftone original with reduced moire. 4,926,267, Cl. 358-454.000.
Shudo, Koichi, to Shionogi & Co., Ltd., a part interest. Flavone carboxylic acid derivatives. 4,925,979, Cl. 562-462.000.
Shust, Ryan E., to Ford New Holland, Inc. Drive reverser and clutch selector mechanism. 4,924,720, Cl. 74-377.000.
Sidley, Joseph D. H. Computerized gaming system. 4,926,327, Cl. 364-412.000.
Siebler, Helmut, to Daimler-Benz AG. Tiltable vehicle seat. 4,925,229, Cl. 296-65.100.
Siegrist, Urs: *See*—
Drabek, Jozef; and Siegrist, Urs, 4,925,875, Cl. 514-594.000.
Siemens Aktiengesellschaft: *See*—
Bock, Hans-Christian; Kaul, Karlheinz; and Schaefer, Willi, 4,926,456, Cl. 378-177.000.
Dickert, Franz; Kimmel, Heinz; Mages, Gert; and Schreiner, Sabine, 4,926,156, Cl. 338-36.000.
Hadwiger, Helmut; and Schmidt, Hans, 4,924,590, Cl. 29-848.000.
Haendle, Joerg; and Maass, Wolfgang, deceased, 4,926,454, Cl. 378-100.000.
Krause, Norbert; and Requardt, Hermann, 4,924,868, Cl. 128-653.0SC.
Oppelt, Ralph, 4,926,147, Cl. 334-81.000.
Quella, Ferdinand; Nuyken, Oskar; Budde, Klaus; and Suefke, Thomas, 4,925,772, Cl. 430-281.000.
Reichert, Thomas, 4,926,289, Cl. 361-141.000.
Remein, Duane, 4,926,427, Cl. 371-67.100.
Richter, Bernd; and Rittler, Ulrich, 4,924,933, Cl. 165-1.000.
Solkner, Gerald, 4,926,043, Cl. 250-231.100.
Siemens Energy & Automation, Inc.: *See*—
Buxton, Clifford A.; and Leone, David A., 4,926,018, Cl. 200-147.00R.
Leone, David A.; Buxton, Clifford A.; and Quinton, Don, 4,926,016, Cl. 200-144.00R.
Leone, David A.; Buxton, Clifford A.; Tharp, James A.; and McCord, Neil A., 4,926,019, Cl. 200-147.00R.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Berti, Martin; and Frei, Max, 4,924,657, Cl. 53-450.000.
Sigai, A. Gary: *See*—
Kasenga, Anthony F.; Sigai, A. Gary; Peters, Thomas E.; and Hunt, Roger B., 4,925,703, Cl. 427-215.000.
Silbermann, Joseph; and Burchill, Michael T., to M&T Chemicals Inc. Surface modified polymer article and process for making same. 4,925,739, Cl. 428-522.000.
Silkman, Glenn W.: *See*—
Chagnon, Kevin C.; and Silkman, Glenn W., 4,924,578, Cl. 30-500.000.
Silver, Frederick H.; Berg, Richard A.; Doillon, charles J.; Chernomorsky, Arkady; and Olson, Robert M., to University of Medicine and Dentistry of New Jersey. Biocompatible synthetic and collagen compositions having a dual-type porosity for treatment of wounds and pressure ulcers and therapeutic methods thereof. 4,925,924, Cl. 530-356.000.
Silver Security Limited: *See*—
Flanagan, Thomas; McMurry, Robert V.; O'Donoghue, Patrick; O'Donoghue, Timothy; McKeon, Michael; and Breen, John, 4,925,109, Cl. 239-429.000.
Silverman, Jeffrey: *See*—
Montgomery, Thomas; and Silverman, Jeffrey, 4,924,606, Cl. 36-31.000.
Silverman, Lawrence M.: *See*—
Phillips, James L.; Richardson, Dale W.; and Silverman, Lawrence M., 4,925,516, Cl. 156-252.000.
Silverstone, Leon M.: *See*—
O'Neill, Michael W.; Silverstone, Leon M.; and Halleck, Michael E., 4,924,880, Cl. 128-787.000.
Simenz, Rod F.: *See*—
Harper-Tervet, Jan; Simenz, Rod F.; and George, James C., 4,925,721, Cl. 428-116.000.
Simila , Jussi J.: *See*—
Lindblom, Kurt L.; Simila , Jussi J.; and Kanervo, Seppo J., 4,925,173, Cl. 270-54.000.
Simmel, Thomas L.; and Baker, Craig A., to Link Racing, Inc. Liquid delivery/filling system. 4,924,921, Cl. 141-286.000.
Simon, Frederick E., to Campbell Soup Company. Food package with a microwave releasable sealed closure. 4,925,684, Cl. 426-107.000.
Simonazzi A: & L. S.p.A.: *See*—
Limoni, Alfredo, 4,925,003, Cl. 198-452.000.
Simplimatic Engineering Company: *See*—
Keller, Daniel H., 4,925,005, Cl. 198-460.000.
Simpson, Robert C.: *See*—
Jones, Orville F.; and Simpson, Robert C., 4,924,574, Cl. 30-115.000.
Simpson Strong-Tie Company, Inc.: *See*—
Gilb, Tyrell T.; and Commins, Alfred D., 4,924,648, Cl. 52-295.000.
Sinclair, Peter; and Hayes, Angela J., to Wiggins Teape Group Limited, The. Loaded paper. 4,925,530, Cl. 162-164.100.
Singer, Barry M.; Bruning, Gert W.; and Mukherjee, Satyendranath, to North American Philips Corporation. Semiconductor switch with parallel lateral double diffused MOS transistor and lateral insulated gate transistor. 4,926,074, Cl. 307-581.000.
Sinha, Shome N.: *See*—
Blander, Milton; and Sinha, Shome N., 4,925,488, Cl. 75-562.000.
Sion Technology, Inc.: *See*—
O'Neill, Michael W.; Silverstone, Leon M.; and Halleck, Michael E., 4,924,880, Cl. 128-787.000.
Sipra Patententwicklungs-und Beteiligungsgesellschaft GmbH: *See*—
Groezinger, Gerhard, 4,926,353, Cl. 364-551.020.
Site Masters, Inc.: *See*—
Hendy, Daniel M., 4,925,342, Cl. 405-45.000.
Sittig, Kenneth W., to J. H. Smith Co., Inc. Laundry receptacle construction. 4,926,060, Cl. 273-400.000.
Skelding, William T. H.: *See*—
Willis, Anthony J.; Skelding, William T. H.; and Radvan, Bronislaw, 4,925,615, Cl. 264-257.000.
Sketo, James L. Steering stabilizer. 4,925,165, Cl. 267-221.000.

Skuballa, Werner; and Dahl, Helmut, to Schering Aktiengesellschaft. Novel process for manufacturing optically active carbacyclin intermediates. 4,925,956, Cl. 549-214.000.
SKW Trostberg Aktiengesellschaft: *See*—
Schulze, Reinhold, 4,925,485, Cl. 423-22.000.
Skyline Displays, Inc.: *See*—
Beaulieu, Bryan J.; and Sorenson, Gary R., 4,926,294, Cl. 362-125.000.
Slaugh, Lynn H.; Johnson, Thomas H.; and Hoxmeier, Ronald J., to Shell Oil Company. Disproportionation catalyst and process. 4,925,822, Cl. 502-112.000.
Slegeir, William A.: *See*—
Sapienza, Richard S.; and Slegeir, William A., 4,925,824, Cl. 502-262.000.
Slimak, Karen M. Processes for products from malanga. 4,925,696, Cl. 426-637.000.
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Sloan-Kettering Institute for Cancer Research: *See*—
Heston, Warren D. W., 4,925,835, Cl. 514-183.000.
Watanabe, Kyoichi A., 4,925,939, Cl. 544-251.000.
Slootweg, Evert R.: *See*—
Den Braber, Antonie A.; and Slootweg, Evert R., 4,925,657, Cl. 424-45.000.
Smart, J. A.: *See*—
Johnson, Ronald F.; Smart, J. A.; Goodman, E. Carl; and Bowles, Richard, 4,924,929. Cl. 160-84.100.
Smets, Bruno M. J.: *See*—
Verlijsdonk, Johannus G.; Pet, Robert J.; and Smets, Bruno M. J., 4,926,091, Cl. 313-486.000.
Smigel, Irwin; and Raziq, Said I., to Robell Research. Powder composition for forming a mouthwash. 4,925,655, Cl. 424-52.000.
Smiszek, James L., to Romeo-Rim, Inc. Energy absorbing vehicle bumper. 4,925,224, Cl. 293-120.000.
Smith, Benjamin A.; and Hoback, Conaway K., to Digital Telecommunications Systems, Inc Pay station telephone coin box apparatus. 4,926,468, Cl. 379-147.000.
Smith, Benjamin A.; and Hoback, Conaway K., to Digital Telecommunications Systems, Inc. Pay station telephone call routing apparatus. 4,926,469, Cl. 379-155.000.
Smith, Charles E.: *See*—
Matysek, James F. and Smith, Charles E., 4,926,220, Cl. 355-313.000.
Smith, Charles R.: *See*—
Orkin, Fredric I.; Liber, Theodore; Smith, Charles R.; Knowlton, Kimball J.; and Huntley, Albin, 4,925,444, Cl. 604-80.000.
Smith, Christopher D.: *See*—
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,926,193, Cl. 346-76.0PH
Smith, Colin F. C.: *See*—
Lewis, John W.; and Smith, Colin F. C., 4,925,848, Cl. 514-282.000.
Smith, David A.: *See*—
Brezoczky, Blasius; Cuomo, Jerome J.; Guarnieri, C. Richard; Ramanathan, Kumbakonam V.; Shivashankar, Srinvasrao A.; Smith, David A.; and Yee, Dennis S., 4,925,700, Cl. 427-38.000.
Smith, Douglas D.: *See*—
Kertis, Robert A.; and Smith, Douglas D., 4,926,383, Cl. 365-203.000
Smith, Earl M. Expansion joint cover and drain. 4,925,339, Cl. 404-47.000.
Smith, Ernest R., to Cox, John H., III; and Rochelle, Charles W., part interest to each. Pressurized oil filter/carbon separator. 4,925,553, Cl. 210-186.000.
Smith, Jack E.; and Pfeiffer, Mark G., to General Motors Corporation. Rolling diaphragm system for deflating weatherstrips. 4,924,629, Cl. 49-477.000.
Smith, James E., to Graves Spray Supply, Inc. Compact spray gun. 4,925,104, Cl. 239-71.000.
Smith, Judson L.: *See*—
Crisp, William E.; Engel, Melvyn; Kudlicki, Richard C.; and Smith, Judson L., 4,925,495, Cl. 134-18.000.
Smith, Robert D. Arrow guide. 4,924,841, Cl. 124-44.500.
Smith, Roger E., to Great Lakes Chemical Corporation. Method for controlling plant diseases and microoganisms in the presence of plants. 4,925,866, Cl. 514-389.000.
Smith, Stephen A.; and Markwell, Roger E., to Beecham Group PLC. Benzimidazoles as 5-lipoxygenase inhibitors. 4,925,853, Cl. 514-338.000.
Smith, Terry B., to Dow Chemical Company, The. Roll tab for a roll of plastic film and apparatus for producing same. 4,925,028, Cl. 206-389.000.
Smithers, Michael J., to Imperial Chemical Industries PLC. Therapeutic agents. 4,925,869, Cl. 514-452.000.
Smiths Industries Public Limited Company: *See*—
Kler, Chandra M.; and Hanspal, Jagdevinder S., 4,926,087, Cl. 313-131.00A.
Kler, Chandra M., 4,926,088, Cl. 313-131.00A.
Smolders, Cornelis A.: *See*—
te Hennepe, Hendrikus J. D.; Mulder, Marcellinus H. V.; Smolders, Cornelis A.; Bargeman, Derk, and Schroder, George A. T., 4,925,562, Cl. 210-500.250.
Snamprogetti S.p.A.: *See*—
Ginatta, Marco, 4,925,543, Cl. 204-288.000.
Snap-Tire, Inc.: *See*—
Lewis, Thomas F.; and Ochsenreiter, John E., 4,924,902, Cl. 137-270.000.
Snap-Tite, Inc.: *See*—
Wilcox, Wayne, 4,924,909, Cl. 137-614.050.
Snead, Edwin D.; and Snead, William B. Self-unloading train for bulk commodities. 4,925,356, Cl. 414-339.000.
Snead, William B.: *See*—
Snead, Edwin D.; and Snead, William B., 4,925,356, Cl. 414-339.000.
Snedden, Richard B.: *See*—
Bellas, George T.; Snedden, Richard B.; Lennon, Dennis R.; and Foster, Edward P., 4,924,784, Cl. 110-261.000.
Snyder, Stephen W.: *See*—
Baker, Keith H.; Snyder, Stephen W.; and Clauss, Allen D., 4,925,586, Cl. 252-90.000.
Societe Anonyme dite: Alcatel Satmam: *See*—
Krasuski, Marek; and Prugnolle, Bernard, 4,924,652, Cl. 53-55.000.
Societe de Recherches Industrielles Sori: *See*—
Gabetta, Bruno; Magistretti, Maria J.; and Dostert, Philippe, 4,925,870, Cl. 514-453.000.
Gabetta, Bruno; and Magistretti, Maria J., 4,925,871, Cl. 514-453.000.
Societe d'Etude et de Construction de Materiel Electronique: *See*—
Pellerin de Beauvais, Hugues, 4,926,012, Cl. 200-16.00R.
Societe dite Sinergy S.A.: *See*—
Ognier, Jean-Francois; and Manhes, Hubert, 4,924,851, Cl. 128-4.000.
Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "SNECMA": *See*—
Crozet, Francois E. G.; and Soupizon, Jean-Luc, 4,925,365, Cl. 415-173.600.
Sodemann, Wayne N. Apparatus for roadway snow plow attachment. 4,924,610, Cl. 37-231.000.
Soderman, Claes-Erik: *See*—
Svensson, Dick L.; and Soderman, Claes-Erik, 4,924,996, Cl. 198-341.000.
Sohn, Erich; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, to Hoechst Aktiengesellschaft. Novel quinolinoxy compounds, a process for their preparation, and their use as antidotes. 4,925,478, Cl. 71-90.000.
Solia, Franco, to Akzo S.r.l. Motor-boat hull. 4,924,797, Cl. 114-288.000.
Solkner, Gerald, to Siemens Aktiengesellschaft. Apparatus and method for optical measuring and imaging of electrical potentials. 4,926,043, Cl. 250-231.100.
Sollas Holland B.V.: *See*—
Oly, Pieter J., 4,924,653, Cl. 53-66.000.
Solomon, Donald D.: *See*—
Khan, Mohammad A.; Solomon, Donald D.; and Byron, Matthew P., 4,925,668, Cl. 424-422.000.
Solomon, Harvey D.; and Catlin, William R., to General Electric Company. Method for calculating crack lengths of conductive sensors. 4,924,708, Cl. 73-799.000.
Somar Corporation: *See*—
Kiryu, Naohiko; Kimizuka, Kazutoshi; Minezaki, Etsuko; and Maruyama, Hiroshi, 4,925,713, Cl. 428-40.000.
Sumi, Sigeo, 4,925,036, Cl. 209-552.000.
Somfai, Eva: *See*—
Bodo, Gyorgy; Knoll, Jozsef; Somfai, Eva; Virag, Sandor; and Zak, Ferenc, 4,925,878, Cl. 514-646.000.
Sonesson, Harald V. Ball with unbalance mechanism. 4,925,428, Cl. 446-437.000.
Sonobe, Tadashi: *See*—
Kubota, Naminosuke; Shimizu, Haruaki; Sonobe, Tadashi; and Nakashita, Goro, 4,925,909, Cl. 528-55.000.
Sonoco Gunther S.A.: *See*—
Briand, Jean P., 4,925,512, Cl. 156-201.000.
Sony Corporation: *See*—
Kurashima, Satoru; and Meguro, Hiroshi, 4,926,279, Cl. 360-132.000.
Matsumoto, Hiroaki; Senda, Tetsuya; and Fukuda, Tokuya, 4,926,261, Cl. 358-167.000.
Nakano, Yoshitomo, 4,926,484, Cl. 381-56.000.
Outou, Tatsuyuki; and Watanabe, Hisanori, 4,925,127, Cl. 242-201.000.
Suzuki, Akira; and Takahashi, Kenji, 4,926,410, Cl. 369-290.000.
Tsukamura, Yoshihiro; Ogawa, Masataka; and Kobayashi, Seiji, 4,925,717, Cl. 428-64.000.
Sorbello, Robert M.: *See*—
Zaghloul, Amir I.; and Sorbello, Robert M., 4,926,189, Cl. 343-700.0MS.
Sorensen, David I.: *See*—
Baror, Gigy; Case, Brian W.; Fleck, Rod G.; Freidin, Philip M.; Gupta, Smeeta; Johnson, William M.; Kong, Cheng-Gang; Moller, Ole H.; Olson, Timothy A.; and Sorensen, David I., 4,926,323, Cl. 364-200.000.
Sorensen, Jay R., to SpaceLabs, Inc. Pneumatic control system for neonatal blood pressure monitoring. 4,924,873, Cl. 128-677.000.
Sorensen, Leif B., to Schurpack, Inc. Packing, method of manufacturing same, and strip material therefor. 4,925,318, Cl. 383-63.000.
Sorenson, Gary R.: *See*—
Beaulieu, Bryan J.; and Sorenson, Gary R., 4,926,294, Cl. 362-125.000.
Sorrentino, Michael; and Kidd, John. Dual wheels for a radio controlled toy car. 4,925,250, Cl. 301-13.00R.
Sorrick, Charles H. Clog resistant high efficiency filter media. 4,925,560, Cl. 210-387.000.

Soubrier, Pierre; and Desmet, Bernard, to Baxter International Inc. Apparatus for cleaning and/or decontaminating a continuous strip of thermoplastsic film. 4,924,891, Cl. 134-64.00R.
Soupizon, Jean-Luc: *See*—
Crozet, Francois E. G.; and Soupizon, Jean-Luc, 4,925,365, Cl. 415-173.600.
Sourander, Roy T.: *See*—
Jakupovic, Edib; Sourander, Roy T.; Stenhede, Jan U.; and Svensson, Rolf P., 4,925,933, Cl. 540-63.000.
Southern Systems, Inc.: *See*—
Linton, Leon; and Campbell, Michael L., 4,924,777, Cl. 104-172.200.
Southwick, Jeffrey G.; and Nelson, Richard C., to Shell Oil Company. Polymer-thickened aqueous solutions containing a mercaptobenzothiazole. 4,925,578, Cl. 252-8.554.
Soycorp, Inc.: *See*—
Dietrich, William J., Sr., 4,924,946, Cl. 172-382.000.
SpA Tonon & C.: *See*—
Nava, Paolo, 4,925,244, Cl. 297-440.000.
SpaceLabs, Inc.: *See*—
Sorensen, Jay R., 4,924,873, Cl. 128-677.000.
Spademan, Richard G. Shoe dynamic fitting and shock absorbtion system. 4,924,605, Cl. 36-114.000.
Spalding & Evenflo Companies, Inc.: *See*—
Melvin, Terence; and Nesbitt, R. Dennis, 4,925,193, Cl. 273-232.000.
Spamer, William S.: *See*—
Cisternino, Andrew J.; and Spamer, William S., 4,925,357, Cl. 414-495.000.
Span, Francis J., to U.S. Philips Corporation. Patient support system for radiotherapy. 4,924,781, Cl. 108-22.000.
Spancrete Machinery Corporation: *See*—
Cook, Paul J., 4,925,358, Cl. 414-685.000.
Spang, Peter: *See*—
Aumueller, Alexander; Neumann, Peter; Spang, Peter; Matzke, Guenter; and Trauth, Hubert, 4,925,888, Cl. 524-91.000.
Spangler, Fredrick E.: *See*—
Cole, Robert E.; and Spangler, Fredrick E., 4,926,496, Cl. 455-77.000.
Spangler, Harold L.: *See*—
Maini, Rajnish; and Spangler, Harold L., 4,926,066, Cl. 307-303.100.
Spanswick, James: *See*—
Harris, James E.; Berger, Abe; Chopdekar, Vilas M.; Matzner, Markus; and Spanswick, James, 4,925,916, Cl. 528-353.000.
Sparrow, James A.; and McEvoy, John J., to Westinghouse Electric Corp. Rod pressurization sensing apparatus. 4,925,619, Cl. 376-258.000.
Speck, Richard: *See*—
Beggs, George; and Speck, Richard, 4,926,170, Cl. 340-904.000.
Spector, George: *See*—
Jones, Christine B.; and Spector, George, 4,925,102, Cl. 239-52.000.
Newton, Jerry; Grogan, Chester, Jr., and Spector, George, 4,925,148, Cl. 248-542.000.
Vargas, Augustin; and Spector, George, 4,925,256, Cl. 312-237.000.
Spectra-Physics, Inc.: *See*—
Shemwell, David M., 4,926,050, Cl. 250-560.000.
Speicher, Earl R.: *See*—
Herbranson, Dale E.; Speicher, Earl R.; and Rosenberg, Leonard S., 4,925,860, Cl. 514-359.000.
Speil, Walter, to Motomak Motorenbau, Maschinen-und Werkzeugfabrik, Konstruktionen GmbH. Outer guide means for a valve tappet. 4,924,825, Cl. 123-90.550.
Spender, Eugene H., Jr.: *See*—
Hazelton, Donald R.; Latka, Paul J.; Lyons, Joseph N., Jr.; and Spender, Eugene H., Jr., 4,925,214, Cl. 283-62.000.
Spielberg, Theodore E. Ultrafiltering hybrid artificial organ. 4,925,555, Cl. 210-137.000.
Spiess, Fred N.: *See*—
Boegeman, Dwight E.; Lowenstein, Carl D.; and Spiess, Fred N., 4,926,395, Cl. 367-89.000.
Spiess, Hansruedi; and Galvanetto, Francois, to Von Roll, AG. Manhole covering. 4,925,337, Cl. 404-26.000.
Spindt, Charles A., to SRI International. Microelectronic field ionizer and method of fabricating the same. 4,926,056, Cl. 250-423.00F.
Spink, Stanley T., Jr., to Brown & Sharpe Manufacturing Co. Electronic gage amplifier and display. 4,926,360, Cl. 364-571.010.
Spiotta, Mark G.; and Bjerga, Erling, to Motorola, Inc. Data encryption key failure monitor. 4,926,475, Cl. 380-2.000.
Spiro America Inc.: *See*—
Castricum, Wilhelmus P. H., 4,924,684, Cl. 72-49.000.
Sprague Electric Company: *See*—
Richardson, William E., 4,925,808, Cl. 437-62.000.
Springer, Robert: *See*—
Shu, Joseph S.; Springer, Robert; and Yeh, Chia L., 4,926,267, Cl. 358-454.000.
Spruce, Brian; Welsby, David P.; and Bell, John L., to British Nuclear Fuels Plc. Services connections for workstations. 4,924,587, Cl. 29-723.000.
Spykerman, Scott A.: *See*—
Hemmeke, Ronald L.; and Spykerman, Scott A., 4,925,232, Cl. 296-97.800.
Square, Nick J. Resiliently supported toilet seat. 4,924,531, Cl. 4-251.000.
SRI International: *See*—
Harris, Ralph N., III; Bedford, Clifford D.; Goff, Dane A.; Hilmas, Duane E.; Howd, Robert A.; Kenley, Richard A.; Koolpe, Gary A.; and Pick, Robert O., 4,925,856, Cl. 514-341.000.
Spindt, Charles A., 4,926,056, Cl. 250-423.00F.
Srinivasan, Rajagopalan S.: *See*—
Coe, Charles G.; Gaffney, Thomas R.; and Srinivasan, Rajagopalan S., 4,925,460, Cl. 55-25.000.
Srinivasan, Rangaswamy: *See*—
Braren, Bodil E.; and Srinivasan, Rangaswamy, 4,925,523, Cl. 156-643.000.
SS Pharmaceutical Co., Ltd.: *See*—
Tokizawa, Minoru; Asaoka, Takemitsu; Matsuda, Hideaki; and Katori, Tatsuhiko, 4,925,953, Cl. 548-341.000.
Stachura, Joseph F.: *See*—
College, David A.; Johnson, Keith, Jr.; Stachura, Joseph F.; and Walter, Herman D., 4,924,693, Cl. 72-453.030.
Staffe, Detlef, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Diagnostic system for control apparatus of a motor vehicle. 4,926,352, Cl. 364-550.000.
Stafford, Raymond: *See*—
James, Enoch; and Stafford, Raymond, 4,925,274, Cl. 350-320.000.
Stagni, Rino: *See*—
Bonfiglioli, Silverio; and Stagni, Rino, 4,924,834, Cl. 123-470.000.
Stahl, Daniel E.: *See*—
Blair, Bryce W.; Norton, Jeffrey M.; and Stahl, Daniel E., 4,925,400, Cl. 439-374.000.
Stahlman, Harold E. Response letter. 4,925,086, Cl. 229-92.300.
Stairs, Henry M., Jr., to American Standard Inc. Coupling means for toilet tank and bowl assembly. 4,924,533, Cl. 4-252.00R.
Stambach, Jean-Francois: *See*—
Kanmacher, Isabelle; Stambach, Jean-Francois; Jung, Louis; Schott, Christa; Stoclet, Jean-Claude; and Heitz, Christiane, 4,925,943, Cl. 546-149.000.
Stammreich, John: *See*—
Carmody, Timothy A.; Bourne, William R., Jr.; and Stammreich, John, 4,925,221, Cl. 292-200.000.
Staneluis, James M.; and Rodenbeck, Donald L., to Centrite Corp. Reinforced polymeric composites. 4,925,719, Cl. 428-71.000.
Stanley, Leon R. Pendent-type wheel balancer. 4,924,705, Cl 73-484.000.
Stasiak, Daniel L.: *See*—
Brown, Jeffrey D.; Freerksen, Donald L.; Hilker, Scott A.; and Stasiak, Daniel L., 4,926,370, Cl. 364-748.000.
Staubli International AG: *See*—
Onaga, Eimei M.; Casler, Richard J., Jr.; Penkar, Rajan C.; Lancraft, Roy E.; and Sha, Chi, 4,925,312, Cl. 364-513.000.
Stauffer, John E. Removal of nitric oxide from waste gases and recovery as nitric acid. 4,925,639, Cl. 423-235.000.
Stearns, Charles L.: *See*—
Strauss, Daniel L.; Taylor, Thomas H.; Stearns, Charles L.; and Lobaugh, Thomas E., 4,925,585, Cl. 252-89.100.
Steckel, Thomas F., to Lubrizol Corporation, The. Boronated compounds. 4,925,983, Cl. 564-8.000.
Steel Heddle Mfg. Co.: *See*—
Faasse, Gene E.; and Howard, James E., 4,924,916, Cl. 139-91.000.
Steele, David F., to United Kingdom Atomic Energy Authority. Regeneration of nitrous acid by oxidation with direct application of heated nitric acid. 4,925,643, Cl. 423-393.000.
Steele, Donald F., to Airxchange, Inc. Rotary heat wheel cassette assembly. 4,924,934, Cl. 165-8.000.
Steer, Peter L., to E. R. Squibb and Sons, Inc. Method and apparatus for attaching a catheter to a bag such as a wound drainage bag. 4,925,216, Cl. 285-3.000.
Stein, Harvey L., to Hoechst Celanese Corporation. Composition and process for making porous articles from ultra high molecular weight polyethylene. 4,925,880, Cl. 521-98.000.
Steiner, Ronald M.; Koepsel, Roger E.; Gilgenbach, Hubert S.; and Reinke, Terence C., to Brunswick Corporation. Easily removed marine propeller. 4,925,369, Cl. 416-204.00R.
Steiner, Solomon; and Rosen, Robert, to Clinical Technologies Associates, Inc. Delivery systems for pharmacological agents encapsulated with proteinoids. 4,925,673, Cl. 424-455.000.
Steinmetz, Guy R.: *See*—
Abraham, Thomas J., Jr.; Fugate, Eric J.; Steinmetz, Guy R.; and Dolfi, Martin D., 4,925,998, Cl. 585-469.000.
Stelter, Norbert; Richter, Goetz; and Schneider, Juergen, to Dr. Ing. H.c.F. Porsche AG. Arrangement for controlling the power transmission of an all-wheel drive vehicle. 4,926,329, Cl. 364-424.010.
Stemcor Corporation: *See*—
Yamada, Hisao; and Yuan, Thomas, 4,925,609, Cl. 264-61.000.
Stemke, Jeffrey E., to Chevron Research Company. Lubricating oil containing hydroperoxidized ethylene copolymers and terpolymers as dispersants and V.I. improvers. 4,925,579, Cl. 252-32.70E.
Stenhede, Jan U.: *See*—
Jakupovic, Edib; Sourander, Roy T.; Stenhede, Jan U.; and Svensson, Rolf P., 4,925,933, Cl. 540-63.000.
Stenzel, Gerhard, to GAO Gesellschaft fur Automation und Organisation mbH. Token such as credit or identification card and an apparatus for testing the token or card. 4,926,031, Cl. 235-380.000.
Stephen, John F.: *See*—
Neilan, James P.; and Stephen, John F., 4,925,938, Cl. 544-221.000.
Sterling Drug Inc.: *See*—
Bailey, Denis M.; D'Ambra, Thomas E.; and Ezrin, Alan M., 4,925,857, Cl. 514-341.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Stern, Howard K.; Yonescu, William; and Briceno, Daniel A., to Robotic Vision System, Inc. Calibration of three-dimensional space. 4,925,308, Cl. 356-375.000.
Sterzer, Fred, tr MMTC, Inc. Angioplastic method for removing plaque from a vas. 4,924,863, Cl. 606-27.000.
Stevenson, James W.; and Arato, Paul T., to James William Stevenson. Portable pitcher's mound. 4,925,186, Cl. 273-25.000.
Stewart, Dennis K. Hand-held turning tool system. 4,924,924, Cl. 142-49.000.
Stewart, Ray F.: *See—*
Lahlouh, John; Stewart, Ray F.; Wasley, Robert S.; Hauptly, Paul D.; and Welsh, Laurence M., 4,926,165, Cl. 340-603.000.
Stewart, Roger G.: *See—*
Ipri, Alfred C.; and Stewart, Roger G., 4,926,236, Cl. 357-71.000.
Stichting Istaned: *See—*
Abeln, Maarten A. M., 4,924,645, Cl. 52-177.000.
Stieff, Lorin R.: *See—*
Dempsey, John C.; and Stieff, Lorin R., 4,926,053, Cl. 250-376.000.
Stiegler GmbH Maschinenfabrik: *See—*
Wagner, Robert, 4,925,438, Cl. 493-194.000.
Stignani, Renato; and Ferrari, Francesco, to Montedipe S.p.A. Tool for the non-destructive removal of tubes from heat exchangers. 4,924,588, Cl. 29-726.000.
Stimac, Gary A.; Crosswy, William C.; Preston, Stephen B.; and Flannigan, James S., to Compaq Computer Corporation. Software emulation of bank-switched memory using a virtual DOS monitor and paged memory management. 4,926,322, Cl. 364-200.000.
Stimac, Jerry L., to University of Florida. Biological control of imported fire ants with a fungal pathogen. 4,925,663, Cl. 424-93.000.
Stires, John C., III; and Bastyr, Charles A., to Stires, John C., III. Tamperproof strip chart recorder with inaccessible cover-mounted transducer. 4,926,192, Cl. 346-33.0TP.
Stoclet, Jean-Claude: *See—*
Kanmacher, Isabelle; Stambach, Jean-Francois; Jung, Louis; Schott, Christa; Stoclet, Jean-Claude; and Heitz, Christiane, 4,925,943, Cl. 546-149.000.
Stoecklin, Gerhard: *See—*
Coenen, Heinz H.; Kling, Peer; and Stoecklin, Gerhard, 4,925,651, Cl. 424-1.100.
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, to Picker International, Inc. Spot filmer cassette transport vibration suppression. 4,926,455, Cl. 378-176.000.
Stokes, Robert B.: *See—*
Yen, Kuo-Hsiung; Kagiwada, Reynold S.; Stokes, Robert B.; and Huang, Marshall Y., 4,926,146, Cl. 333-195.000.
Stolarski, Erwin; and Schroder, Hans-Rudiger, to Hoechst Aktiengesellschaft. Process and manipulator for the guidance of running threads. 4,924,554, Cl. 19-0.600.
Stoll, Kurt; and Gla / ttli, Hans H. Control circuit arrangement for solenoid valves. 4,925,156, Cl. 251-129.010.
Stollar, Hayman; and Becker, Abram, to Bromine Compounds Limited. Process for the preparation and the isolation of aromatic nitriles. 4,925,642, Cl. 423-364.000.
Stoner, Fred L. Microbicidal cleanser/barrier kit. 4,925,033, Cl. 206-581.000.
Stork Amsterdam B.V.: *See—*
Mollenkamp, Daniel L., 4,925,001, Cl. 198-412.000.
Stouky, R. Jon; and Hayhurst, John T., to Apex Technologies, Inc. Evacuation method for motor operated valves lubricant. 4,925,496, Cl. 134-22.180.
Strand, Olaf: *See—*
Myklebust, Eirik; Omdal, Bjarne; Juel, Anders; Strand, Olaf; and Jonsgard, Erik, 4,925,317, Cl. 383-8.000.
Stratus Computer, Inc.: *See—*
Long, William L.; Wambach, Robert F.; Baty, Kurt F.; Lamb, Joseph M.; and McNamara, John E., 4,926,315, Cl. 364-200.000.
Straube, Christina: *See—*
Hausler, Nikolaus; Muller, Heidi; Pinck, Peter; and Straube, Christina, 4,924,884, Cl. 131-84.100.
Strauss, Daniel L.; Taylor, Thomas H.; Stearns, Charles L.; and Lobaugh, Thomas E., to Procter & Gamble Company, The. Detergent granules from cold dough using fine dispersion granulation. 4,925,585, Cl. 252-89.100.
Strawn, Laurie: *See—*
Counsell, Raymond E.; and Strawn, Laurie, 4,925,649, Cl. 424-1.100.
Streusand, Barry J.; Allen, Raymond H.; Coons, Darrell E.; and Hutton, Robert C., to AMAX Inc. Reactive gas sample introduction system for an inductively coupled plasma mass spectrometer. 4,926,021, Cl. 219-121.590.
Strobl, Karlheinz: *See—*
Cuykendall, Robert R.; and Strobl, Karlheinz, 4,926,366, Cl. 364-713.000.
Stroech, Klaus; Frie, Monika; Himmler, Thomas; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Fungicidal and plant growth-regulating hydroxyalkyl-azolyl derivatives. 4,925,482, Cl. 71-92.000.
Stroech, Klaus; Frie, Monika; Himmler, Thomas; and Plempel, Manfred, to Bayer Aktiengesellschaft. Antimycotic agents. 4,925,865, Cl. 514-383.000.
Stuck, Robert M., to Marshall Air Systems, Inc. Conveyorized cooking apparatus. 4,924,767, Cl. 99-423.000.
Students, Peter A., to Liquid Air Corporation. Multi-orifice manifold for balancing discharge of liquified gases. 4,925,095, Cl. 239-1.000.
Studholme, Matthew B.: *See—*
Dolden, John G.; Harris, Gaynor P.; and Studholme, Matthew B., 4,925,914, Cl. 528-336.000.
Studiengesellschaft Kohle mbH: *See—*
Lehmkuhl, Herbert; and Mehler, Klaus-Dieter, 4,925,536, Cl. 204-58.500.
Stumm, James E. Deployable membrane shell reflector. 4,926,181, Cl. 342-5.000.
Stumpf, David M.: *See—*
Martin, Robert A., Jr.; and Stumpf, David M., 4,925,695, Cl. 426-660.000.
Sturgeon, Clayton L., to Qualitron, Inc. Control circuit for a switching DC to DC Power converter including a multi-turn control transformer. 4,926,303, Cl. 363-19.000.
Sturm, Theodor: *See—*
Buchschmid, Emil; Frenznick, Anton; Lindner, Klaus; Schmid, Olaf; Schmid, Hans-Dieter; Schmidt, Gerhard; and Sturm, Theodor, 4,926,150, Cl. 335-196.000.
Suarez, Jose : *See—*
Giannini, Robert P.; Fromm, Susan M.; and Suarez, Jose , 4,925,675, Cl. 424-469.000.
Sudo, Taiji: *See—*
Shimamura, Norio; and Sudo, Taiji, 4,926,032, Cl. 235-441.000.
Suefke, Thomas: *See—*
Quella, Ferdinand; Nuyken, Oskar; Budde, Klaus; and Suefke, Thomas, 4,925,772, Cl. 430-281.000.
Suehiro, Tetsuro; Yamauchi, Aizo; Ichijo, Hisao; Nagasawa, Jun'ichi; and Aisaka, Noboru, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Fibrous roll of tubular braid for immobilization of cells and enzymes. 4,925,803, Cl. 435-288.000.
Suematsu, Chiaki: *See—*
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, 4,925,514, Cl. 156-249.000.
Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Hydraulic lock-up control system during shifting in automatic transmission. 4,924,979, Cl. 192-3.310.
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, to Research Development Corporation of Japan; and Tokin Corporation. Thin-film having large Kerr rotation angle and production process thereof. 4,925,742, Cl. 428-692.000.
Sugawara, Hideo; and Ashida, Hideo, to Fujitsu Limited. Radio-frequency identification system. 4,926,187, Cl. 342-361.000.
Sugawara, Toru, to Kabushiki Kaisha Toshiba. Gyrotron device. 4,926,093, Cl. 315-4.000.
Sugaya, Masaji: *See—*
Inamori, Masahito; Horii, Tetsuo; Shimazu, Tomonori; and Sugaya, Masaji, 4,925,864, Cl. 514-383.000.
Sugitani, Yuji; Kobayashi, Yukio; Ikeda, Yoshihisa; and Murayama, Masatoshi, to Nippon Kokan Kabushiki Kaisha. High-speed rotative arc welding device. 4,926,023, Cl. 219-125.120.
Sugiura, Kazuki: *See—*
Yamada, Teruaki; Doko, Yoshiji; and Sugiura, Kazuki, 4,925,977, Cl. 562-416.000.
Suhadolnik, Robert J.; and Pfleiderer, Wolfgang, to Temple University of the Commonwealth System of Higher Education. 2',5'-phosphorothioate oligoadenylates and plant antiviral uses thereof. 4,924,624, Cl. 47-58.000.
Suizu, Yoji; Masaki, Nobuo; Fujita, Takafumi; and Kurabayashi, Hiroshi, to Bridgestone Corporation; and Takafumi Fujita. Vibration controlling apparatus for buildings. 4,924,640, Cl. 52-167.0DF.
Sullivan, Michael J., to Brechteen Company, The. Net rucker. 4,924,552, Cl. 17-1.00R.
Sulzer Brothers Limited: *See—*
Quack, Hans, 4,924,677, Cl. 62-87.000.
Sumi, Sigeo, to Somar Corporation. Plate-like member selecting and accommodating apparatus. 4,925,036, Cl. 209-552.000.
Sumikin Chemical Co., Ltd.: *See—*
Yamada, Teruaki; Doko, Yoshiji; and Sugiura, Kazuki, 4,925,977, Cl. 562-416.000.
Sumitomo Electric Industries, Ltd.: *See—*
Fujita, Nobuhiko; Itozaki, Hideo; Tanaka, Saburo; Yazu, Shuji; and Jodai, Tetsuji, 4,925,829, Cl. 505-1.000.
Hayashi, Kyozo; Kawamura, Seiji; and Ikeda, Hirosaka, 4,925,394, Cl. 439-86.000.
Itoh, Yoshiaki; Odani, Yusuke; Akechi, Kiyoaki; and Kuroishi, Nobuhito, 4,926,242, Cl. 357-81.000.
Sumiyoshi, Shigeru: *See—*
Kiba, Hiroshi; Nagano, Kenzou; and Sumiyoshi, Shigeru, 4,924,892, Cl. 134-123.000.
Summerlin, Frederick A.; and Hendry, James C., to Avdel Systems Limited, A British Company. Breakstem fastener installation tool. 4,924,691, Cl. 72-391.000.
Summerville, David F.; Williston, John P.; Wand, Martin A.; Doty, Thomas J.; Rice, Haradon J.; and Huang, Phen-Lan, to Texas Instruments Incorporated. System for dynamically determining position of multiple automatically guided vehicles. 4,926,103, Cl. 318-587.000.
Sun, Shih W.; and Lee, Jen-Jiang, to Motorola, Inc. Device metallization, device and method. 4,926,237, Cl. 357-71.000.
Sundberg, Ingvar, to Nordisk Kartro AB. Sheet nails in strips. 4,925,352, Cl. 411-443.000.
Sundstrand-Sauer: *See—*
Heiser, Richard K.; and Reed, James R., 4,925,340, Cl. 404-75.000.
Sung, Baik M.: *See—*
Vassiliadis, Stamatis; Schwarz, Eric M.; and Sung, Baik M., 4,926,371, Cl. 364-760.000.

Sunpower, Inc.: *See—*
Redlich, Robert W., 4,926,123, Cl. 324-208.000.
Surface Combustion, Inc.: *See—*
Schultz, Thomas J.; Shah, Jay K.; and Daiga, Valdis R., 4,924,785, Cl. 110-346.000.
Susanna, Luigi, to Giomama S.r.l. Life preserver collar. 4,925,419, Cl. 441-123.000.
Sutcliffe, Frank, to Vickers Shipbuilding & Engineering Limited. Frictional joints. 4,925,415, Cl. 440-83.000.
Sutherland, Charles W.: *See—*
King, Harold B., Jr.; Muncy, Donald G.; and Sutherland, Charles W., 4,924,586, Cl. 29-723.000.
Sutherland, Robert L.: *See—*
Ganz, Robert H.; and Sutherland, Robert L., 4,925,019, Cl. 206-145.000.
Sutter, Phillip R.: *See—*
Bixler, Dickie R.; and Sutter, Phillip R., 4,924,813, Cl. 119-82.000.
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, to Olympus Optical Co., Ltd. Endoscope. 4,924,852, Cl. 128-4.000.
Suzuki, Akira; and Takahashi, Kenji, to Sony Corporation. Disk. 4,926,410, Cl. 369-290.000.
Suzuki, Akitoshi: *See—*
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; Kaneko, Motohiro; Kusumoto, Yoshiro; Takakuwa, Kazuo; and Ikuta, Tetsuya, 4,924,807, Cl. 118-725.000.
Suzuki, Daisuke: *See—*
Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi; Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, 4,925,934, Cl. 540-310.000.
Suzuki, Hirohisa; and Tanno, Masaya, to Sanyo Electric Co., Ltd. FM diversity receiver. 4,926,498, Cl. 455-133.000.
Suzuki, Hiroyuki: *See—*
Orikasa, Tsuyoshi; Ito, Fujihiro; Suzuki, Hiroyuki; Kameyama, Makoto; Niizuma, Kiyozumi; Yoshida, Kazuyo; and Yamanaka, Toshio, 4,926,276, Cl. 360-126.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Tsutsumi, Masanori, 4,924,669, Cl. 60-323.000.
Suzuki, Kiyotaka: *See—*
Tsuchitani, Masatoshi; Naito, Sakae; Morijiri, Hiroshi; and Suzuki, Kiyotaka, 4,925,547, Cl. 208-39.000.
Suzuki, Kouichi; and Konishi, Kiyoshi, to Nissan Motor Company, Limited. System and method for automatically controlling a vehicle speed to a desired cruising speed. 4,926,334, Cl. 364-426.040.
Suzuki, Masami: *See—*
Ito, Toshiaki; Numano, Kazuhiro; and Suzuki, Masami, 4,925,198, Cl. 280-89.000.
Suzuki, Seiji: *See—*
Okada, Masahiro; Ukai, Toshinao; Suzuki, Seiji; Adachi, Keiichi; Watanabe, Toshiyuki; and Ishigaki, Kunio, 4,925,782, Cl. 430-510.000.
Suzuki, Shingo: *See—*
Okada, Hiroshi; Suzuki, Shingo; Kagami, Manabu; and Suematsu, Chiaki, 4,925,514, Cl. 156-249.000.
Suzuki, Tadashi: *See—*
Futami, Toru; Suzuki, Tadashi; and Sakagami, Atsushi, 4,926,417, Cl. 370-85.100.
Suzuki, Takanori; and Takada, Kazuyoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Belt tensioner device for lawn mower. 4,925,437, Cl. 474-135.000.
Suzuki, Takashi: *See—*
Murayama, Fumio; and Suzuki, Takashi, 4,924,965, Cl. 181-156.000.
Suzuki, Tatsuo: *See—*
Sakamoto, Hidetoshi; Uematsu, Kenjiro; Momota, Masashi; Tanabe, Susumu; Suzuki, Tatsuo; and Endo, Toshihiko, 4,925,445, Cl. 604-95.000.
Suzuki, Yoshikuni: *See—*
Takahashi, Toshihiro; Hagihara, Koichiro; Nakamaru, Koichi; and Suzuki, Yoshikuni, 4,925,843, Cl. 514-248.000.
Svensson, Dick L.; and Soderman, Claes-Erik, to Atlas Copco Aktiebolag. Method for positioning a number of working implements relative to a car body. 4,924,996, Cl. 198-341.000.
Svensson, Rolf P.: *See—*
Jakupovic, Edib; Sourander, Roy T.; Stenhede, Jan U.; and Svensson, Rolf P., 4,925,933, Cl. 540-63.000.
Swanson, David T.: *See—*
Avellino, Frank J.; Case, Richard A.; and Swanson, David T., 4,925,522, Cl. 156-632.000.
Swiden, Bror Lennart A. Method and arrangement of automatically actuating a vehicle wheel brake with the aim of preventing the wheel from skidding. 4,925,253, Cl. 303-110.000.
Swinderman, R. Todd; and Mueller, David W., to Martin Engineering Co. Torsiconal tensioning device. 4,925,434, Cl. 474-101.000.
Swiss Aluminium Ltd.: *See—*
Mizrah, Tiberiu; Maurer, Albert; and Gabathuler, Jean-Pierre, 4,924,570, Cl. 29-163.800.
Sym-Tek Systems, Inc.: *See—*
O'Connor, R. Bruce; Toth, Thomas E.; and Ross, James A., 4,926,118, Cl. 324-158.00F.
Synek, Joe: *See—*
Zeck, Walter M.; and Synek, Joe, 4,925,483, Cl. 71-93.000.
Synthelabo: *See—*
Cavero, Icilio; Cazor, Jean-Louis; Hicks, Peter; and Langer, Salomon, 4,925,837, Cl. 514-211.000.
George, Pascal; Sevrin, Mireille; Maloizel, Christian; Tixidre, Arlette; and Froissant, Jacques, 4,925,850, Cl. 514-307.000.
Synthetic Products Company: *See—*
Baker, Paulette, 4,925,883, Cl. 524-287.000.
Syntonic Systems Inc.: *See—*
Tapang, Carlos C., 4,926,064, Cl. 307-201.000.
System 3R USA, Inc.: *See—*
Ramsbro, Borje K. H., 4,925,168, Cl. 269-136.000.
Systems Specialties: *See—*
Taube, Frank A., Sr.; and Rozniecki, Edward J., 4,924,900, Cl. 137-101.000.
Szczesny, Paul M.: *See—*
King, Robert D.; and Szczesny, Paul M., 4,926,104, Cl. 318-599.000.
Szymczak, Edward J.; and Chin, Arthur H. T., to Cameron Iron Works U.S.A., Inc. Tubular joint. 4,925,220, Cl. 285-382.400.
Tabata, Kazumasa; Ooishi, Hiroshi; and Takaoka, Manabu, to Koyo Seiko Co., Ltd. Hydraulic pressure control valve. 4,924,910, Cl. 137-625.230.
Tabb, David L.; and Wilson, Janet M., to Du Pont de Nemours, E. I., and Company. Fluoroelastomer compositions containing a tetraalkylammonium halide and vulcanization accelerator. 4,925,892, Cl. 524-236.000.
Tabuchi, Koichi; and Kizu, Shigeo, to Kabushiki Kaisha Toshiba. Apparatus and method for recording and reproducing information signals. 4,926,273, Cl. 360-64.000.
Tachi, Takahiro; Kato, Akira; Kawagoshi, Hiroshi; Yamashita, Hisao; and Kamo, Tomoichi, to Babcock-Hitachi Kabushiki Kaisha. Catalyst for removing nitrogen oxides. 4,925,825, Cl. 502-309.000.
Tadauchi, Masaharu: *See—*
Nakashima, Keisuke; Yasukawa, Saburo; Tadauchi, Masaharu; and Hori, Yasuro, 4,926,253, Cl. 358-75.000.
Taek, Kim C., to Saturn International, Inc. Ballast circuit for a fluorescent lamp. 4,926,097, Cl. 315-307.000.
Tagaya, Mamoru. Medical glove. 4,924,530, Cl. 2-163.000.
Tahernia, Omid: *See—*
Herold, Barry W.; and Tahernia, Omid, 4,926,141, Cl. 331-16.000.
Taiho Pharmaceutical Co., Ltd.: *See—*
Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi; Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, 4,925,934, Cl. 540-310.000.
Taisei Corporation: *See—*
Naito, Masamitsu; and Wada, Kenji, 4,926,042, Cl. 250-227.110.
Tajima, Ikuo; and Anezaki, Tomoaki, to Tokai Kogyo Mishin Kabushiki Kaisha. Device for driving a thread take-up lever in a multi-head sewing machine. 4,924,789, Cl. 112-241.000.
Takada, Hiroshi: *See—*
Morita, Akitaka; Nishimura, Toshio; and Takada, Hiroshi, 4,926,368, Cl. 364-715.050.
Takada, Kazuyoshi: *See—*
Suzuki, Takanori; and Takada, Kazuyoshi, 4,925,437, Cl. 474-135.000.
Takada, Minoru, to Nissei Jushi Kogyo Kabushiki Kaisha. Mold clamping method. 4,925,618, Cl. 264-328.100.
Takafumi Fujita: *See—*
Suizu, Yoji; Masaki, Nobuo; Fujita, Takafumi; and Kurabayashi, Hiroshi, 4,924,640, Cl. 52-167.0DF.
Takahara, Wataru: *See—*
Ikeda, Masaaki; and Takahara, Wataru, 4,925,817, Cl. 501-138.000.
Takahashi, Akira: *See—*
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 4,925,776, Cl. 430-321.000.
Takahashi, Kazuo: *See—*
Hayashi, Yoshio; Oguri Tomei; Shinoda, Masaki; Takahashi, Kazuo; and Hashimoto, Munehiro, 4,925,861, Cl. 514-367.000.
Takahashi, Kenji; and Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Radiation image recording and reproducing method and radiation image storage panel employed for the same. 4,926,047, Cl. 250-484.100.
Takahashi, Kenji: *See—*
Hosoi, Yuichi; Takahashi, Kenji; and Arakawa, Satoshi, 4,926,045, Cl. 250-327.200.
Suzuki, Akira; and Takahashi, Kenji, 4,926,410, Cl. 369-290.000.
Takahashi, Osamu: *See—*
Ikoma, Munehisa; Kawano, Hiroshi; Takahashi, Osamu; Matsumoto, Isao; and Ikeyama, Masakazu, 4,925,748, Cl. 429-59.000.
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing ethyl-alpha-amino-gamma-oxo-gamma-phenybutyrate derivatives. 4,925,969, Cl. 560-41.000.
Takahashi, Takehiko; and Kato, Hitoshi, to Combi Co., Ltd. Mechanism for adjusting height of handle bar of pushcart. 4,924,725, Cl. 74-551.300.
Takahashi, Tokuo, to Kawada Co., Ltd. Toy vehicle and track with track mountable command segments. 4,925,424, Cl. 446-175.000.
Takahashi, Toshihiro; Hagihara, Koichiro; Nakamaru, Koichi; and Suzuki, Yoshikuni, to Nisshin Flour Milling Co., Ltd. 2-pyridylmethylthio derivatives as antiulcer agents. 4,925,843, Cl. 514-248.000.
Takahashi, Toshinori; Hayashi, Chikahisa; Takahashi, Yoshinori; and Kantoh, Takanori, to Toyoda Gosei Co., Ltd. Liquid level sensor having a retained base plate. 4,926,015, Cl. 200-84.00C.
Takahashi, toshiro: *See—*
Tsuya, Noboru; Tokushima, Tadao; and Takahashi, toshiro, 4,925,738, Cl. 428-472.200.

VOL
1114
ISS
3
MY
15
1990
UMI

Takahashi, Yoshinori: *See*—
Takahashi, Toshinori; Hayashi, Chikahisa; Takahashi, Yoshinori; and Kantoh, Takanori, 4,926,015, Cl. 200-84.00C.

Takakura, Koichi: *See*—
Tanihara, Masao; Yamada, Hideaki; Nakashima, Toshihide; Omura, Yoshiaki; and Takakura, Koichi, 4,925,787, Cl. 435-7.000.

Takakuwa, Kazuo: *See*—
Nakayama, Izumi; Suzuki, Akitoshi; Nawa, Hiroyuki; Kaneko, Motohiro; Kusumoto, Yoshiro; Takakuwa, Kazuo; and Ikuta, Tetsuya, 4,924,807, Cl. 118-725.000.

Takamatsu, Hisashi; Takeuchi, Hisaharu; and Tohchi, Mamoru, to Hitachi, Ltd. Method for controlling a rotating storage unit. 4,926,272, Cl. 360-49.000.

Takanashi, Kazumitsu: *See*—
Sato, Takanori; and Takanashi, Kazumitsu, 4,924,639, Cl. 52-167.0DF.

Takano, Sakuharu; Nishibori, Toshiki; and Katsuta, Yuji, to Sharp Kabushiki Kaisha. Method of reading and displaying an image in an information filing apparatus. 4,926,269, Cl. 358-474.000.

Takanohashi, Morihiko: *See*—
Niitsuma, Hiroaki; Nakatsuka, Katsuto; Abe, Hiroyuki; Takanohashi, Morihiko; Sato, Ko; and Chiba, Fumihiko, 4,924,950, Cl. 175-50.000.

Takaoka, Manabu: *See*—
Tabata, Kazumasa; Ooishi, Hiroshi; and Takaoka, Manabu, 4,924,910, Cl. 137-625.230.

Takara, Akira: *See*—
Maruyama, Teruo; and Takara, Akira, 4,925,321, Cl. 384-114.000.

Takasaki, Yoshiyuki, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method of using G-4 amylase to produce high maltotetraose and high maltose content starch hydrolysates. 4,925,795, Cl. 435-95.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,925,948, Cl. 548-195.000.

Takata, Yasunori: *See*—
Iwasaki, Masayuki; Fujikura, Sadao; Wakata, Yuichi; and Takata, Yasunori, 4,925,768, Cl. 430-271.000.

Takatori Corporation: *See*—
Yoshimura, Yoshitaka; and Oura, Yasuhiro, 4,925,515, Cl. 156-250.000.

Takatori Hitech Co., Ltd.: *See*—
Yoshimura, Yoshitaka; and Oura, Yasuhiro, 4,925,515, Cl. 156-250.000.

Takatsuka, Hiromu: *See*—
Morii, Atsushi; Koyanagi, Toshio; Takatsuka, Hiromu; and Iida, kouzou, 4,925,640, Cl. 423-239.000.

Takaya, Haruo: *See*—
Kawamura, Kichinari; Kono, Yasuo; Okado, Hideo; Shin, Shigemitsu; and Takaya, Haruō, 4,926,006, Cl. 585-640.000.

Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, to Fujisawa Pharmaceutical Company, Ltd. 2 amino 5 chloro thiazol-4-yl cycloalkenoxy imino acetic derivatives. 4,925,948, Cl. 548-195.000.

Takebayashi, Yoichi: *See*—
Maeda, Kenichi; Tsuboi, Hiroyuki; and Takebayashi, Yoichi, 4,926,491, Cl. 382-14.000.

Takeda Chemical Industries, Ltd.: *See*—
Terao, Shinji; and Hirata, Minoru, 4,925,868, Cl. 514-425.000.
Tsujimoto, Yasuhiro; Kurita, Masayuki; and Miki, Minoru, 4,925,718, Cl. 428-68.000.

Takeda, Kazuhiro: *See*—
Miyamura, Masataka; Wada, Yuusuke; Takeda, Kazuhiro; Nakaizumi, Yuji; and Kohara, Teiji, 4,925,773, Cl. 430-285.000.

Takeda, Keiso; Nakanishi, Kiyoshi; Kawai, Taiyo; and Shimizu, Rio, to Toyota Jidosha Kabushiki Kaisha. Fuel injection valve for an internal combustion engine having a pillar opposing a fuel injection hole. 4,925,110, Cl. 239-533.120.

Takeda, Shigehumi: *See*—
Kimura, Masayuki; Hosaka, Kunio; Takeda, Shigehumi; and Mitsuhashi, Hiroshi, 4,925,872, Cl. 514-465.000.

Takehama, Koichi, to Ibaraki Precision Machinery Co., Ltd. Packaging apparatus. 4,924,658, Cl. 53-547.000.

Takenaka, Eiji; Muraoka, Naoki; and Nakadai, Yoshikazu, to Ricoh Company, Ltd. Image recording apparatus and method of carrying out initializing process in image recording apparatus. 4,926,191, Cl. 346-24.000.

Takenaka, Shunpei, to Canon Kabushiki Kaisha. Word processor for selecting a control program stored in the word processor when a control program in an externally detachable memory is not able to be read. 4,926,373, Cl. 364-900.000.

Takenouchi, Shigeki; Hirano, Akira; Saito, Shiori; and Fujimaki, Yoshihide, to Konica Corporation. Electrophotographic photoreceptor for negative electrification. 4,925,757, Cl. 430-31.000.

Takesue, Toshihiro: *See*—
Murahashi, Takashi, Fujita, Hisao; Nakazawa, Toshihiko; Takesue, Toshihiro; and Motoi, Toshihiro, 4,926,195, Cl. 346-108.000.

Taketomi, Tsuneharu: *See*—
Ikimi, Takahiro; Taketomi, Tsuneharu; and Kato, Kiminari, 4,924,637, Cl. 51-290.000.

Takeuchi, Hiroshi, to Kabushiki Kaisha Daikin Seisakusho. Damper disc. 4,924,990, Cl. 192-106.200.

Takeuchi, Hiroshi, to Kabushiki Kaisha Daikin Seisakusho. Clutch cover assembly with self-adjusting pressure plate. 4,924,991, Cl. 192-111.00A

Takeuchi, Hisaharu: *See*—
Takamatsu, Hisashi; Takeuchi, Hisaharu; and Tohchi, Mamoru, 4,926,272, Cl. 360-49.000.

Takeuchi, Masahiko: *See*—
Komatsubara, Shoji; Takeuchi, Masahiko; and Oka, Yasuyuki, 4,926,213, Cl. 355-49.000.

Takeuchi, Tomio: *See*—
Umezawa, Hamao, deceased; Takeuchi, Tomio; Tatsuta, Kuniaki; Isshika, Kunio; and Imoto, Masaya, 4,925,877, Cl. 514-630.000.

Takeuchi, Yasuhito; Higashiizumi, Takao; Ando, Motoyoshi; and Tamezumi, Yoshiro, to Yokogawa Medical Systems, Limited. Ultrasonic diagnostic system. 4,924,869, Cl. 128-660.050.

Takigawa, Akio: *See*—
Baba, Tsuyoshi; Takigawa, Akio; Hirayama, Naoto; and Yoshida, Motoaki, 4,925,737, Cl. 428-437.000.

Takubo, Chiaki: *See*—
Yoshihara, Kunio; Terada, Toshiyuki; Takubo, Chiaki; Koide, Nobuo; and Shimizu, Shoichi, 4,926,451, Cl. 377-48.000.

Talisa, Salvador H., to Westinghouse Electric Corp. Wide band large dynamic range current sensor and method of current detection using same. 4,926,116, Cl. 324-117.00R.

Tallarita, Domenic A. Electric motor driven pump with an automatic transmission. 4,925,370, Cl. 417-15.000.

Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi; Onai, Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko. Semiconductor device. 4,926,235, Cl. 357-68.000.

Tamaru, Takeshi: *See*—
Gemba, Tsuneo; Tamaru, Takeshi; and Matsuura, Tetsuhiko, 4,925,461, Cl. 55-26.000.

Tamezumi, Yoshiro: *See*—
Takeuchi, Yasuhito; Higashiizumi, Takao; Ando, Motoyoshi; and Tamezumi, Yoshiro, 4,924,869, Cl. 128-660.050.

Tamura, Keiichi: *See*—
Maeda, Yoshihiro; Hosonuma, Kunihiko; and Tamura, Keiichi, 4,925,596, Cl. 252-32.70E.

Tamuraya, Makoto, to Nissan Motor Co., Ltd. Sun visor for automotive vehicle. 4,926,295, Cl. 362-144.000.

Tanabe, Susumu: *See*—
Sakamoto, Hidetoshi; Uematsu, Kenjiro; Momota, Masashi; Tanabe, Susumu; Suzuki, Tatsuo; and Endo, Toshihiko, 4,925,445, Cl. 604-95.000.

Tanaka, Hideaki; and Kitamura, Yoshihiko, to Sharp Kabushiki Kaisha. Optical character reading apparatus and method. 4,926,492, Cl. 382-18.000.

Tanaka, Masato, to Dainippon Screen Mfg. Co. Ltd. Apparatus for applying photo-resist to substrate. 4,924,800, Cl. 118-50.100.

Tanaka, Saburo: *See*—
Fujita, Nobuhiko: Itozaki, Hideo; Tanaka, Saburo; Yazu, Shuji; and Jodai, Tetsuji, 4,925,829, Cl. 505-1 000.

Tanaka, Sumio; and Atsumi, Shigeru, to Kabushiki Kaisha Toshiba Voltage level converting circuit. 4,926,070, Cl. 307-475.000.

Tanaka, Tsuneo: *See*—
Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nihashi, Hiroyuki; and Tanaka, Tsuneo, 4,925,731, Cl. 428-336.000.

Tanaka, Yasuhiko: *See*—
Koshizuka, Kunihiro; Asano, Masao; Tezuka, Toshiaki; Machashi, Tatsuichi; and Tanaka, Yasuhiko, 4,925,735, Cl. 428-423.100.

Tanaka, Yoshichika: *See*—
Sato, Goro; Komatsu, Michio; Nishida, Hiroyasu; Tanaka, Yoshichika; Koyanagi, Tsuguo; and Mihara, Kei, 4,925,704, Cl. 427-221.000.

Tanguay, Suzanne L.: *See*—
Sacks, Richard D.; and Tanguay, Suzanne L., 4,925,306, Cl. 356-311.000.

Tani, Tatsuo; Yokoyama, Hiroshi; Hayashi, Shoji; and Murofushi, Takashi, to Ricoh Company, Ltd. System for controlling curls of a paper. 4,926,358, Cl. 364-562.000.

Tani, Toshihiko; and Wada, Shigetaka, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Silicon carbide composite ceramic. 4,925,815, Cl. 501-90.000.

Taniguchi, Masatoshi; Sasaoka, Michio; Matsumura, Kiyotoshi; Kawahara, Ichiro; Kaze, Kenji; Suzuki, Daisuke; and Shimabayashi, Akihiro, to Otsuka Kagaku Kabushiki Kaisha; and Taiho Pharmaceutical Co., Ltd. Process for preparation of beta-lactam derivatives. 4,925,934, Cl. 540-310.000.

Taniguchi, Nobuyuki: *See*—
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,926,203, Cl. 354-287.000.

Tanihara, Masao; Yamada, Hideaki; Nakashima, Toshihide; Omura, Yoshiaki; and Takakura, Koichi, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Monoclonal anti-idiotypic antibody, method for production thereof, and hybridoma producing said antibody. 4,925,787, Cl. 435-7.000.

Tanimura, Yukinori: *See*—
Atsuta, Mitsuru; Sakashita, Takeshi; Miyamoto, Ryoichi; Tanimura, Yukinori; and Fuji, Saburo, 4,925,660, Cl. 424-81.000.

Tanis, Peter G. Aircraft battery charging device. 4,926,106, Cl. 320-35.000.

Taniura, Hiroshi, to Think Laboratory Co., Ltd. Optical beam splitter. 4,925,271, Cl. 350-172.000.

Tanken Seiko Kabushiki Kaisha: *See*—
Nagai, Yataro; Matsushita, Mitsuyoshi; Ishibashi, Osamu; Terasaki, Kiyoshi; and Tokumoto, Kei, 4,925,490, Cl. 75-238.000.

Tanno, Masaya: *See*—
Suzuki, Hirohisa; and Tanno, Masaya, 4,926,498, Cl. 455-133.000.

Tapang, Carlos C., to Syntonic Systems Inc. Sleep refreshed memory for neural network. 4,926,064, Cl. 307-201.000.

Tapco Products Company, Inc.: *See*—
MacLeod, Richard J.; Schiedegger, Charles E.; and Chubb, Norman L., 4,924,761, Cl. 98-42.210.

Tapscott, Peter A.; and Courtney, Thomas P., to Xerox Corporation. Sensing amount of medium and medium roll malfunction in a printer. 4,925,121, Cl. 242-57.000.

Tarleton, George K.; Abrant, Robert J.; and Oltman, Bruce A., to AG Communication Systems Corporation. Unique phase difference measuring circuit. 4,926,115, Cl. 324-83.00D.

Tarrillo, Albert G., to Zenith Electronics Corporation. Push-pull class-E bi-directional scanning circuit. 4,926,098, Cl. 315-408.000.

Tarrson, Emanuel B.; and Maric, Dane, to John O. Butler Company. Dental floss holder. 4,925,073, Cl. 225-44.000.

Tarry, Timothy A., to Maintenance Concepts, Inc. Electrical de-icer device. 4,926,026, Cl. 219-213.000.

Tassie, Douglas P.; and Folsom, Mark F., to General Electric Company. Drive system for a Gatling type gun. 4,924,752, Cl. 89-160.000.

Tassie, Douglas P.; and Bullis, Stephen J., to General Electric Company. Self powered drive system for a Gatling type gun. 4,924,753, Cl. 89-160.000.

Tateho Chemical Industries Co., Ltd.: *See*—
Ikeda, Tamehiko; and Yano, Shusuke, 4,925,743, Cl. 428-702.000.

Tateishi, Hiroyuki: *See*—
Endo, Gen; Tateishi, Hiroyuki; Kawata, Yoshihiro; Karasudani, Isao; and Omura, Hirofumi, 4,925,725, Cl. 428-156.000.

Tateishi, Kiyoshi: *See*—
Hangai, Toshimasa; Tateishi, Kiyoshi; Ishitoya, Koichi; and Sakata, Haruyasu, 4,926,405, Cl. 369-32.000.

Tateishi, Mataji: *See*—
Asai, Koetsu; Nakagawa, Hiroshi; and Tateishi, Mataji, 4,924,822, Cl. 123-27.0GE.

Tatsuta, Kuniaki: *See*—
Umezawa, Hamao, deceased; Takeuchi, Tomio; Tatsuta, Kuniaki; Isshika, Kunio; and Imoto, Masaya, 4,925,877, Cl. 514-630.000.

Taube, Frank A., Sr.; and Rozniecki, Edward J., to Systems Specialties. Adjustable ratio mixing valve. 4,924,900, Cl. 137-101.000.

Tauster, Samuel J.: *See*—
Fung, Shun C.; Tauster, Samuel J.; and Koo, Jay Y., 4,925,819, Cl. 502-37.000.

Tawada, Yoshihisa: *See*—
Yamagishi, Hideo; Yamaguchi, Minori; Asaoka, Keizo; Hiroe, Akihiko; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,926,230, Cl. 357-30.000.

Tawara, Kiyoshi; Osada, Masakazu; and Nishihara, Eitaro, to Kabushiki Kaisha Toshiba. Local area network system for efficiently transferring messages of different sizes. 4,926,415, Cl. 370-60.000.

Taylor, John R., to Innovative Building Products, Inc. Corner assembly for a skylight frame. 4,924,649, Cl. 52-656.000.

Taylor, Thomas H.: *See*—
Larson, Brad W.; Hockersmith, Dan; Taylor, Thomas H.; Bedinger, John M.; Kottman, Rick; and Pebley, Steve, 4,925,167, Cl. 269-112.000.
Strauss, Daniel L.; Taylor, Thomas H.; Stearns, Charles L.; and Lobaugh, Thomas E., 4,925,585, Cl. 252-89.100.

Taylor, William J.: *See*—
Garofalo, Mel V.; Taylor, William J.; and Rheaume, Wayne T., 4,924,580, Cl. 33-832.000.

TDK Corporation: *See*—
Ikeda, Masaaki; and Takahara, Wataru, 4,925,817, Cl. 501-138.000.

TEAC Corporation: *See*—
Tsuyuguchi, Hiroshi; Shimozawa, Kenji; and Kamisaka, Takashi, 4,926,403, Cl. 369-13.000.
Tsuyuguchi, Hiroshi; Shimozawa, Kenji; and Kamisaka, Takashi, 4,926,409, Cl. 309-112.000.

Techniair, Inc.: *See*—
Jakobsen, Karl S., 4,924,581, Cl. 29-402.020.

Tecumseh Products Company: *See*—
Page, Rocky H., 4,924,988, Cl. 192-70.230.

Tedioli, Pier G., to Bertagnoli, Eugeio, a part interest. Electric grinder for pepper or salt. 4,925,150, Cl. 241-169.100.

Teerman, Richard F., to General Motors Corporation. Hydraulic lash adjuster and bridge assembly. 4,924,821, Cl. 123-90.220.

te Hennepe, Hendrikus J. D.; Mulder, Marcellinus H. V., Smolders, Cornelis A.; Bargeman, Derk; and Schroder, George A. T., to GFT Gesellschaft fur Trenntechnik mbH. Pervaporation process and membrane. 4,925,562, Cl. 210-500.250.

Tek-Aids, Inc.: *See*—
Kahler, William F., 4,925,376, Cl. 417-477.000.

Tekmat Corporation: *See*—
Klausner, Mitchell; Manning, Michael P.; and Baddour, Raymond F., 4,925,698, Cl. 427-2.000.

Teledyne Exploration: *See*—
Robertson, Bob K., 4,926,396, Cl. 367-159.000.
Robertson, Bob K., 4,926,397, Cl. 367-157.000.

Teledyne Industries, Inc.: *See*—
Leland, John D., 4,925,486, Cl. 75-360.000.

Tellier, Francois: *See*—
Saens, Michel S.; Jacquet, Bruno; Marie, Philippe; Noirot, Frederic; and Tellier, Francois, 4,926,149, Cl. 335-132.000.

Telxon Corporation: *See*—
Schley-May, James T., 4,926,464, Cl. 379-99.000.

Temple University of the Commonwealth System of Higher Education: *See*—
Borenstein, Michael R.; Doukas, Peter H.; and Abou-Gharbia, Magid A., 4,925,841, Cl. 514-235.500.
Suhadolnik, Robert J.; and Pfleiderer, Wolfgang, 4,924,624, Cl. 47-58.000.

Tennant, William A.: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,925,100, Cl. 239-416.400.

Terada, Toshiyuki: *See*—
Yoshihara, Kunio; Terada, Toshiyuki; Takubo, Chiaki; Koide, Nobuo; and Shimizu, Shoichi, 4,926,451, Cl. 377-48.000.

Teradata Corporation: *See*—
Neches, Philip M.; Hartke, David H.; Baran, Richard J.; Woodcock, Darryl L.; and Papachristidis, Alexandros C., 4,925,311, Cl. 364-200.000.

Terai, Kenichi; Saiki, Shuji; Murata, Kousaku; Satoh, Katsuaki; Kumura, Yoichi; Nakama, Yasutoshi; Ogawa, Michiko; and Obata, Shuichi, to Matsushita Electric Industrial Co., Ltd. Sound reproducing apparatus for use in vehicle. 4,924,962, Cl. 181-141.000.

Terakado, Akira: *See*—
Hashimoto, Yasushi; Tsuji, Yasuyuki; and Terakado, Akira, 4,926,216, Cl. 355-212.000.

Teramoto, Takero; and Watanabe, Kazuhiro, to Nippon Steel Corporation; and Nippon Steel Chemical Co., Ltd. Heat-resistant unsaturated polyester. 4,925,913, Cl. 528-272.000.

Teramoto, Togo; Oku, Syunji; Miyoshi, Yasuhiro; and Katsuragi, Mamoru, to Minolta Camera Kabushiki Kaisha. Photographic viewfinder assembly. 4,926,208, Cl. 354-485.000.

Terao, Shinji; and Hirata, Minoru, to Takeda Chemical Industries, Ltd. 4-Hydroxy-3-pyrrolin-2-ones and treatment of circulatory disorders therewith. 4,925,868, Cl. 514-425.000.

Terao, Tadayoshi: *See*—
Kishi, Noriaki; Nosaka, Kazuto; Terao, Tadayoshi; and Shibata, Yukio, 4,925,468, Cl. 55-467.000.

Terao, Toshimi; Kiyama, Kentaro; and Kitano, Kyozo, to Lion Corporation. Olefin sulfonation method. 4,925,976, Cl. 562-123.000.

Teraoka, Yoshiaki: *See*—
Yoshida, Tetsuji; Teraoka, Yoshiaki; Ogawa, Yoji; Kozaki, Ken; Hara, Kenji; Satou, Hiroshi; and Yoshino, Akira, 4,926,487, Cl. 381-186.000.

Terasaki, Kiyoshi: *See*—
Nagai, Yataro; Matsushita, Mitsuyoshi; Ishibashi, Osamu; Terasaki, Kiyoshi; and Tokumoto, Kei, 4,925,490, Cl. 75-238.000.

Ternynck, Therese M. F.: *See*—
Avrameas, Stratis; and Ternynck, Therese M. F., 4,925,921, Cl. 530-389.000.

Tessier, Jean: *See*—
Cadiergue, Joseph; Demoute, Jean-Pierre; and Tessier, Jean, 4,925,874, Cl. 514-517.000.
Demassey, Jacques; Demoute, Jean-Pierre; and Tessier, Jean, 4,925,862, Cl. 514-369.000.

Texaco Inc.: *See*—
Hagan, John J.; and Herbstman, Sheldon, 4,925,989, Cl. 568-697.000.
Najjar, Mitri S.; and Corbeels, Roger J., 4,925,644, Cl. 423-415.00A.

Texas Instruments Incorporated: *See*—
Hosack, Harold H., 4,926,225, Cl. 357-24.000.
Hutter, Louis N., 4,926,233, Cl. 357-43.000.
Larson, Brad W.; Hockersmith, Dan; Taylor, Thomas H.; Bedinger, John M.; Kottman, Rick; and Pebley, Steve, 4,925,167, Cl. 269-112.000.
Redwine, Donald J., 4,926,224, Cl. 357-23.600.
Summerville, David F.; Williston, John P.; Wand, Martin A., Doty, Thomas J.; Rice, Haradon J.; and Huang, Phen-Lan, 4,926,103, Cl. 318-587.000.

Textron, Inc.: *See*—
Ehn, Byron N., Jr.; and Mast, James W., 4,924,663, Cl. 56-202.000.

Tezuka, Akira: *See*—
Ushiku, Kenichi; and Tezuka, Akira, 4,925,378, Cl. 418-148.000.

Tezuka, Toshiaki: *See*—
Koshizuka, Kunihiro; Asano, Masao; Tezuka, Toshiaki; Machashi, Tatsuichi; and Tanaka, Yasuhiko, 4,925,735, Cl. 428-423.100.

Thacker, Milton B.; Limburg, John M.; and Memmott, Vincent J. Low profile fluid catalytic cracking apparatus. 4,925,632, Cl. 422-142.000.

Thaler, Doug. Vehicle sunroof shade. 4,925,238, Cl. 296-218.000.

Tharp, James A.: *See*—
Leone, David A.; Buxton, Clifford A.; Tharp, James A.; and McCord, Neil A., 4,926,019, Cl. 200-147.00R.

Theiss, George H., to Power Cell, Inc. Reserve battery 4,925,750, Cl 429-116.000.

TheraTech, Inc.: *See*—
Feijen, Jan, 4,925,677, Cl. 424-484.000.

Thermos Company, Inc., The: *See*—
Peacock, Dale; and Raymer, Doyle, 4,924,846, Cl. 126-41.00R.

Thierheimer, Charles L., Jr., to Petrolite Corporation. Solvent for paraffin removal from oilfield equipment. 4,925,497, Cl. 134-40.000.

Think Laboratory Co., Ltd.: *See*—
Taniura, Hiroshi, 4,925,271, Cl. 350-172.000.

Thiokol Corporation: *See*—
Levinthal, Michael L., 4,925,936, Cl. 540-475.000.

Thomas Jefferson University: *See*—
Murphy, Scott, 4,925,665, Cl. 424-532.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Thomas, Paul E.: *See—*
Colla, Jeannine O.; Thomas, Paul E.; and Showers, Donald K., 4,926,155, Cl. 338-36.000.
Thomas, Sidney S.: *See—*
Hoyt, Steven W.; and Thomas, Sidney S., 4,925,124, Cl. 242-107.40A.
Thompson, Michael P.: *See—*
Kucera, Lawrence P.; and Thompson, Michael P., 4,926,356, Cl. 364-557.000.
Thompson, Mortimer S., to Tri-Tech Systems International, Inc. Method of forming a closure cap with a seal. 4,925,617, Cl. 264-291.000.
Thomson-CSF: *See—*
Turpin, Marc; Brevignon, Michele; and Rojas, Dominique, 4,926,040, Cl. 250-225.000.
Thor, Leif R., to International Business Machines Corporation. Method for display panel processing. 4,926,349, Cl. 364-523.000.
Thrall Car Manufacturing Company: *See—*
Curtis, Richard D.; and Richmond, Shaun, 4,924,779, Cl. 105-4.100.
Throtonics Corporation: *See—*
Di Manno, Carl M., 4,925,195, Cl. 273-428.000.
Thudium, Karl: *See—*
Rieger, Walter; and Thudium, Karl, 4,924,692, Cl. 72-405.000.
Timberline Supply Ltd.: *See—*
Frederiksen, Bjarne; Allen, John M.; and Walla, Gregg W., 4,925,257, Cl. 312-221.000.
Timmermann, Donald N.: *See—*
Pokrandt, Glenn C.; Busser, William F.; Timmermann, Donald N.; and Kuliga, Thomas N., 4,925,431, Cl. 464-54.000.
Tippmann, Joseph J. Method of making a frameless refrigerated storage enclosure. 4,925,509, Cl. 156-92.000.
Tixidre, Arlette: *See—*
George, Pascal; Sevrin, Mireille; Maloizel, Christian; Tixidre, Arlette; and Froissant, Jacques, 4,925,850, Cl. 514-307.000.
Toa Nenryo Kogyo K. K.: *See—*
Kohara, Tadanao; and Ueki, Satoshi, 4,926,002, Cl. 585-512.000.
Tochizawa, Nariaki: *See—*
Ichimura, Kunihiro; Yonezawa, Teruhiko; Kikuchi, Hideo; Tochizawa, Nariaki; and Hayashi, Keiichi, 4,925,770, Cl. 430-273.000.
Toda, Masaaki; Sasaki, Yutaro; and Shimoji, Katsuichi, to Ono Pharmaceutical Co. Ltd. Glucopyranose derivatives. 4,925,929, Cl. 536-4.100.
Toddler U, Inc.: *See—*
Montgomery, Thomas; and Silverman, Jeffrey, 4,924,606, Cl. 36-31.000.
Togami Electric Mfg., Co., Ltd.: *See—*
Maki, Kazuyoshi; Harada, Sadami; and Nakashima, Takanori, 4,926,286, Cl. 361-345.000.
Tohchi, Mamoru: *See—*
Takamatsu, Hisashi; Takeuchi, Hisaharu; and Tohchi, Mamoru, 4,926,272, Cl. 360-49.000.
Tokai Kogyo Kabushiki Kaisha: *See—*
Unuma, Sadao, 4,925,076, Cl. 226-74.000.
Tokai Kogyo Mishin Kabushiki Kaisha: *See—*
Tajima, Ikuo; and Anezaki, Tomoaki, 4,924,789, Cl. 112-241.000.
Tokes, Jozsef; and Ugrosdy, Laszlo, to Tungsram Reszvenytarsasag. Exhaust head for compact fluorescent lamps. 4,925,422, Cl. 445-73.000.
Tokico Ltd.: *See—*
Inada, Yutaka; Kawasaki, Kazumasa; Nishiyama, Shigeru; and Yoshikura, Hiroshi, 4,924,710, Cl. 73-861.230.
Tokin Corporation: *See—*
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, 4,925,742, Cl. 428-692.000.
Tokiwa, Hideharu: *See—*
Mimura, Yoshinori; Noda, Yukio; Norimatsu, Naoki; Tokiwa, Hideharu; and Shinbori, Osamu, 4,925,475, Cl. 65-48.000.
Tokizawa, Minoru; Asaoka, Takemitsu; Matsuda, Hideaki; and Katori, Tatsuhiko, to SS Pharmaceutical Co., Ltd. Imidazole derivative. 4,925,953, Cl. 548-341.000.
Tokumoto, Kei: *See—*
Nagai, Yataro; Matsushita, Mitsuyoshi; Ishibashi, Osamu; Terasaki, Kiyoshi; and Tokumoto, Kei, 4,925,490, Cl. 75-238.000.
Tokushima, Tadao: *See—*
Tsuya, Noboru; Tokushima, Tadao; and Takahashi, toshiro, 4,925,738, Cl. 428-472.200.
Tokyo Electric Company, Ltd.: *See—*
Shimosato, Masashi; and Ochiai, Kuniaki, 4,925,625, Cl. 400-124.000.
Tokyo Tatsuno Co., Ltd.: *See—*
Shimamura, Norio; and Sudo, Taiji, 4,926,032, Cl. 235-441.000.
Tom, Glenn M.; and Brown, Duncan W., to Advanced Technology Materials, Inc. Process and composition for drying of gaseous hydrogen halides. 4,925,646, Cl. 423-488.000.
Tomantschger, Klaus: *See—*
Kordesch, Karl; and Tomantschger, Klaus, 4,925,747, Cl. 429-59.000.
Tomasini, Lucano: *See—*
Castello, Rinaldo; Ferro, Marco; Salerno, Franco; and Tomasini, Lucano, 4,926,138, Cl. 330-253.000.
Tomasko, Douglas G.: *See—*
Wlodarczyk, Marek T.; Coletta, Luciano; Campbell, James A.; and Tomasko, Douglas G., 4,924,870, Cl. 128-667.000.
Tominaga, Kazutoshi, to Kabushiki Kaisha Tominaga Jyushi Kogyosho. Insect keeping and observing container. 4,924,810, Cl. 119-15.000.
Tominaga, Teruyuki: *See—*
Kawabata, Misao; Ushikubo, Hisao; and Tominaga, Teruyuki, 4,924,927, Cl. 152-531.000.
Tomioka, Takeshi: *See—*
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Tomioka, Takeshi, 4,926,440, Cl. 375-1.000.
Tong, Po; Berlekamp, Elwyn R.; Currie, Robert J.; and Rushforth, Craig K., to UNISYS Corp. Coder-decoder for purged extended golay (22,7) codes. 4,926,169, Cl. 340-825.570.
Toniolo, Bruno, to I.M.S. Internazionale Medico Scientifica s.r.l. Mammography apparatus. 4,926,453, Cl. 378-37.000.
Topolcsanyi, George; and Dimasi, Salvators. Electrical connector. 4,925,406, Cl. 439-839.000.
Toray Industries Inc.: *See—*
Kataoka, Hiroshi; Kunitomo, Tetsunosuke; and Kobayashi, Takuichi, 4,925,534, Cl. 210-647.000.
Torii, Nozomu: *See—*
Komuro, Kenichi; Kawai, Taneichi; Kamei, Atsushi; Asada, Toru; Torii, Nozomu; and Fukumoto, Ryoichi, 4,926,332, Cl. 364-424.050.
Tormey, David: *See—*
Higham, Graham J.; Pruitt, Gerald R.; Morris, Ronald; Heger, Frank; Livingstone, James; and Tormey, David, 4,924,675, Cl. 62-6.000.
Toth, Bartholomew L.: *See—*
Donnelly, Donald E.; Zikes, Bradley C.; Moore, Dwain F.; Price, Jeffrey E.; and Toth, Bartholomew L., 4,925,386, Cl. 431-28.000.
Toth, Denis W., to Can-Am Engineered Products, Inc. Turbo-compressor having air-cooled bearing. 4,925,368, Cl. 415-180.000.
Toth, Thomas E.: *See—*
O'Connor, R. Bruce; Toth, Thomas E.; and Ross, James A., 4,926,118, Cl. 324-158.00F.
Toubo, Kihachirou: *See—*
Machino, Toshimichi; Oda, Saiji; Toubo, Kihachirou; and Kadosaki, Masahiro, 4,924,713, Cl. 73-862.060.
Touya, Syouichi; and Kishi, Hideki, to Sanyo Electric Co., Ltd. Portable vacuum cleaner. 4,924,548, Cl. 15-347.000.
Toyo Gosei Kogyo Co., Ltd.: *See—*
Ichimura, Kunihiro; Yonezawa, Teruhiko; Kikuchi, Hideo; Tochizawa, Nariaki; and Hayashi, Keiichi, 4,925,770, Cl. 430-273.000.
Toyo Ink Manufacturing Co., Ltd.: *See—*
Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nihashi, Hiroyuki; and Tanaka, Tsuneo, 4,925,731, Cl. 428-336.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Harada, Masashi; and Miyazaki, Hiroshi, 4,925,613, Cl. 264-232.000.
Toyoda Gosei Co., Ltd.: *See—*
Takahashi, Toshinori; Hayashi, Chikahisa; Takahashi, Yoshinori; and Kantoh, Takanori, 4,926,015, Cl. 200-84.00C.
Toyoshima, Hideo: *See—*
Ando, Yuji; and Toyoshima, Hideo, 4,926,232, Cl. 357-34.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Chujo, Yoshiki; Aoki, Keiji; Hyodo, Yoshihiko; and Katsuno, Toshiyasu, 4,924,837, Cl. 123-494.000.
Haraguchi, Tetsunori, 4,925,207, Cl. 280-690.000.
Sakurai, Hideyuki, 4,925,209, Cl. 280-743.000.
Takeda, Keiso; Nakanishi, Kiyoshi; Kawai, Taiyo; and Shimizu, Rio, 4,925,110, Cl. 239-533.120.
Yanagihara, Hiromichi; Ito, Sumio; Sakurai, Kazuhiro; and Akita, Kouichi, 4,925,091, Cl. 237-2.00A.
Tracer Technologies, Inc.: *See—*
Walsh, Fraser, 4,925,830, Cl. 505-1.000.
Tran, Duc H.: *See—*
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,926,193, Cl. 346-76.0PH.
Tran, Minh Q.: *See—*
Bondeson, Anders; Isaak, Bernhard; Perrenoud, Andre; and Tran, Minh Q., 4,926,094, Cl. 315-5.000.
Transpharm Group Inc.: *See—*
Garay, Garbiel L.; and Garay, Kathleen M. K., 4,925,446, Cl. 604-96.000.
Trauth, Hubert: *See—*
Aumueller, Alexander; Neumann, Peter; Spang, Peter; Matzke, Guenter; and Trauth, Hubert, 4,925,888, Cl. 524-91.000.
Treff, Ernest H.: *See—*
Breton, Richard; Treff, Ernest H.; and McKrell, Richard L., 4,925,179, Cl. 271-187.000.
Tri-Tech Systems International, Inc.: *See—*
Thompson, Mortimer S., 4,925,617, Cl. 264-291.000.
Trieselt, Wolfgang: *See—*
Boeckh, Dieter; Seelmann-Eggebert, Hans-Peter; Hartmann, Heinrich; Trieselt, Wolfgang; and Baur, Richard, 4,925,905, Cl. 526-208.000.
Trine, Linda M.: *See—*
Gutman, Jose; Goldberg, Steven J.; and Trine, Linda M., 4,926,460, Cl. 379-57.000.
Trinh, Toan: *See—*
Borcher, Thomas A., Sr.; Delgado, Rodolfo; and Trinh, Toan, 4,925,577, Cl. 252-8.900.
Trinity Industrial Corporation: *See—*
Omori, Hidetoshi; Shoji, Akira; and Akaza, Hiroshi, 4,925,563, Cl. 210-532.100.

Trinity Industries, Inc.: *See—*
Hart, James D., 4,924,780, Cl. 105-378.000.
Triplex: *See—*
Murphy, Kenneth J., 4,926,281, Cl. 361-55.000.
Trison Associates Incorporated: *See—*
Bateman, Robert, 4,925,227, Cl. 296-65.100.
Trombetti-Dickens, Pamela. Nursing bib. 4,924,528, Cl. 2-104.000.
Trott, Arthur F.: *See—*
Bays, F. Barry; Trott, Arthur F.; and Marchand, Sam R., 4,924,865, Cl. 606-77.000.
Troy, Leonard. Solenoid-operated control apparatus. 4,925,157, Cl. 251-129.150.
TRW, Inc.: *See—*
Fisher, Charles K., 4,925,351, Cl. 411-182.000.
Kidd, Philip W., 4,925,542, Cl. 204-192.310.
Yen, Kuo-Hsuing; Kagiwada, Reynold S.; Stokes, Robert B.; and Huang, Marshall Y., 4,926,146, Cl. 333-195.000.
TRW Repa GmbH: *See—*
Frei, Bernhard; and Honl, Wolf-Dieter, 4,925,123, Cl. 242-107.000.
TRW Vehicle Safety Systems Inc.: *See—*
Lenzen, Reiner, 4,924,774, Cl. 102-202.700.
Tsai, Chao-Hsiung. Musical dancing block set. 4,924,743, Cl. 84-476.000.
Ts'ao, Si-Ling. Device for automatically opening and closing a door. 4,924,626, Cl. 49-347.000.
Tse, Stephen H.; Hollenberg, David H.; Martin, Richard L.; and Manning, James H., to James River Corporation of Virginia. Manufacture of wetlaid nonwoven webs. 4,925,528, Cl. 162-146.000.
Tselesin, Naum N.: *See—*
deKok, Peter T.; and Tselesin, Naum N., 4,925,457, Cl. 51-293.000.
Tsubata, Noritaka: *See—*
Matsuda, Yoshio; Horikawa, Mitsuo; and Tsubata, Noritaka, 4,924,560, Cl. 24-392.000.
Tsuboi, Hiroyuki: *See—*
Maeda, Kenichi; Tsuboi, Hiroyuki; and Takebayashi, Yoichi, 4,926,491, Cl. 382-14.000.
Tsubouchi, Kazuo: *See—*
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Tomioka, Takeshi, 4,926,440, Cl. 375-1.000.
Tsubuko, Kazuo; Kuramoto, Shinichi; and Sakai, Kiyoshi, to Ricoh Company, Ltd. Developer for electrophotography containing ionomer resin. 4,925,763, Cl. 430-106.000.
Tsuchitani, Masatoshi; Naito, Sakae; Morijiri, Hiroshi; and Suzuki, Kiyotaka, to Maruzen Petrochemical Co., Ltd. Process for producing pitch for the manufacture of high-performance carbon fibers together with pitch for the manufacture of general-purpose carbon fibers. 4,925,547, Cl. 208-39.000.
Tsuchiya Mfg. Co., Ltd.: *See—*
Ishii, Yoshio; and Okaya, Shigeru, 4,925,561, Cl. 210-493.300.
Tsuda, George I.; and Tsuhako, Kernel S., to Hughes Aircraft Company. Frequency converter. 4,926,500, Cl. 455-302.000.
Tsuge, Kazunori: *See—*
Yamagishi, Hideo; Yamaguchi, Minori; Asaoka, Keizo; Hiroe, Akihiko; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,926,230, Cl. 357-30.000.
Tsuhako, Kernel S.: *See—*
Tsuda, George I.; and Tsuhako, Kernel S., 4,926,500, Cl. 455-302.000.
Tsuji, Masaru: *See—*
Tsukamoto, Kimihide; and Tsuji, Masaru, 4,925,062, Cl. 271-115.000.
Tsuji, Yasuyuki: *See—*
Hashimoto, Yasushi; Tsuji, Yasuyuki; and Terakado, Akira, 4,926,216, Cl. 355-212.000.
Tsujimoto, Yasuhiro; Kurita, Masayuki; and Miki, Minoru, to Takeda Chemical Industries, Ltd. Sheet-shaped molding material. 4,925,718, Cl. 428-68.000.
Tsukamoto, Kimihide; and Tsuji, Masaru, to Sharp Kabushiki Kaisha. Paper feeder. 4,925,062, Cl. 271-115.000.
Tsukamura, Yoshihiro; Ogawa, Masataka; and Kobayashi, Seiji, to Sony Corporation. Disk-shaped recording medium and disk apparatus. 4,925,717, Cl. 428-64.000.
Tsumura & Co.: *See—*
Kimura, Masayuki; Hosaka, Kunio; Takeda, Shigehumi; and Mitsuhashi, Hiroshi, 4,925,872, Cl. 514-465.000.
Tsuruta, Setsuo; and Miyamoto, Shoji, to Hitachi, Ltd. Transit schedule generating method and system. 4,926,343, Cl. 364-513.000.
Tsutsumi, Hideo: *See—*
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,925,838, Cl. 514-210.000.
Tsutsumi, Masanori, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Cover structure for exhaust manifold inlet ducts. 4,924,669, Cl. 60-323.000.
Tsuya, Noboru; Tokushima, Tadao; and Takahashi, toshiro. Substrate for a magnetic disk and process for its production. 4,925,738, Cl. 428-472.200.
Tsuyuguchi, Hiroshi; Shimozawa, Kenji; and Kamisaka, Takashi, to TEAC Corporation. Magneto-optic recording apparatus for recording information selectively on both sides of the recording medium. 4,926,403, Cl. 369-13.000.
Tsuyuguchi, Hiroshi; Shimozawa, Kenji; and Kamisaka, Takashi, to Teac Corporation. Optical permitting record/playback from both sides of an optical disk. 4,926,409, Cl. 309-112.000.
Tucker, Daniel A.: *See—*
Bruce, Andrew D.; and Tucker, Daniel A., 4,925,174, Cl. 270-54.000.
Tulgan, Terri R. Backpack including restraint means. 4,925,070, Cl. 224-202.000.
Tully, Wilfred R.: *See—*
Deacon, Robert M. J.; Gillespie, Roger J.; Gardner, Colin R.; and Tully, Wilfred R., 4,925,846, Cl. 514-258.000.
Tung, Thomas T.: *See—*
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,925,100, Cl. 239-416.400.
Tungsram Reszvenytarsasag: *See—*
Tokes, Jozsef; and Ugrosdy, Laszlo, 4,925,422, Cl. 445-73.000.
Turk, Roger R.; and Ramirez, Nelson, to Hughes Aircraft Company. Optical fibers formed by rolling process. 4,925,599, Cl. 264-1.500.
Turnbull, Andrew A., to U.S. Philips Corp. Thermal-image sensing devices and their manufacture. 4,926,051, Cl. 250-332.000.
Turpin, Marc; Brevignon, Michele; and Rojas, Dominique, to Thomson-CSF. Shift sensor with optic fiber. 4,926,040, Cl. 250-225.000.
Tursi, Angelo. Tape measure device. 4,924,597, Cl. 33-758.000.
Twyman, Nancy D.: *See—*
Vogt, Clifford M.; Twyman, Nancy D.; and Allen, Roe C., Jr., 4,925,601, Cl. 264-6.000.
Tyler, Warren C.: *See—*
Robichaud, Arthur R.; Wilgus, Frank R.; Tyler, Warren C.; and Holmes, Jack, 4,925,034, Cl. 206-603.000.
Tzikas, Athanassios, to Ciba-Geigy Corporation. Reactive dyes containing a vinylsulfonylaminocarbonyl group bound to bis-(triazenylamino)-benzene as bridging member of two chromophoric systems. 4,925,927, Cl. 534-618.000.
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Uchida, Akihisa: *See—*
Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi; Onai, Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko, 4,926,235, Cl 357-68.000.
Uchida, Masaaki; Uema, Hideki; Miwa, Hiromichi; and Kawamura, Yoshihisa, to Nissan Motor Company, Limited. Air/fuel ratio control system for internal combustion engine with correction coefficient learning feature. 4,924,836, Cl. 123-489.000.
Uchida, Noboru; Kaneko, Masahiko; and Matsumoto, Hisayoshi, to Citizen Watch Co., Ltd. Printer with emulation card installation reporting feature. 4,926,347, Cl. 364-519.000.
Uchikawa, Sadao: *See—*
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.
Uchikubo, Akinobu: *See—*
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, 4,926,258, Cl. 358-98.000.
Udding, Anne C., to Shell Oil Company. Heat resistant foamable thermosetting resin systems. 4,925,881, Cl. 521-129.000.
Ueda, Hiroshi: *See—*
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,926,203, Cl. 354-287.000.
Ueda, Kazuo; Wakabayashi, Shigeru; Saijo, Yoshihiro; and Fujikawa, Yasuji, to Shikoku Kakoki Co., Ltd. Apparatus for filling specified amount of liquid. 4,925,069, Cl. 222-500.000.
Ueda, Shigeta; Hombu, Mitsuyuki; Honda, Kazuo; and Morinaga, Daisaku, to Hitachi, Ltd. Electric power converter. 4,926,306, Cl. 363-58.000.
Ueda, Tetsuya: *See—*
Banjo, Toshinobu; Ueda, Tetsuya; and Onoda, Shigeo, 4,926,034, Cl. 235-492.000.
Ueda, Yasuyoshi: *See—*
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Uehara, Masao: *See—*
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, 4,926,258, Cl. 358-98.000.
Ueki, Satoshi: *See—*
Kohara, Tadanao; and Ueki, Satoshi, 4,926,002, Cl. 585-512.000.
Uema, Hideki: *See—*
Uchida, Masaaki; Uema, Hideki; Miwa, Hiromichi; and Kawamura, Yoshihisa, 4,924,836, Cl. 123-489.000.
Uematsu, Kenjiro: *See—*
Sakamoto, Hidetoshi; Uematsu, Kenjiro; Momota, Masashi; Tanabe, Susumu; Suzuki, Tatsuo; and Endo, Toshihiko, 4,925,445, Cl. 604-95.000.
Uematsu, Mioko: *See—*
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; Hayashi, Seiji; and Mori, Kenji, 4,925,591, Cl. 252-299.660.
Ueno, Yutaka; Emmons, Lawrence D.; Kaneko, Koji; and Semasa, Takayoshi, to Luma Telecom, Inc. Quadrature amplitude modulation

VOL 1114 ISS 3 MY 15 1990 UMI

preserving one channel zero crossing for video telephone. 4,926,245, Cl. 358-12.000.
Ugrosdy, Laszlo: *See—*
Tokes, Jozsef; and Ugrosdy, Laszlo, 4,925,422, Cl. 445-73.000.
Ukai, Toshinao: *See—*
Okada, Masahiro; Ukai, Toshinao; Suzuki, Seiji; Adachi, Keiichi; Watanabe, Toshiyuki; and Ishigaki, Kunio, 4,925,782, Cl. 430-510.000.
Ukegawa, Takeshi, to Ricoh Company, Ltd. Data communication apparatus having a reprogrammable voice memory. 4,926,463, Cl. 379-88.000.
Umeda, Osamu: *See—*
Ogawa, Masahiro; Shimazaki, Tatsuo; Umeda, Osamu; Aoki, Toshihiro; and Nakakusu, Toru, 4,925,295, Cl. 353-57.000.
Umezawa, Hamao, deceased (by Umezawa, Mieko, Kazuo Umezawa, Yoji Umezawa, heirs); Takeuchi, Tomio; Tatsuta, Kuniaki; Isshika, Kunio; and Imoto, Masaya, to Zaidanhojin Biseibutsu Kagaku Kenkyukai. Physiologically active erbstatin analogue compounds and compositions. 4,925,877, Cl. 514-630.000.
Umezawa, Mieko, Kazuo Umezawa, Yoji Umezawa, heirs: *See—*
Umezawa, Hamao, deceased; Takeuchi, Tomio; Tatsuta, Kuniaki; Isshika, Kunio; and Imoto, Masaya, 4,925,877, Cl. 514-630.000.
Unda Oy: *See—*
Byckling, Eero; and Kajanto, Markus, 4,925,261, Cl. 350-3.710.
Unifi, Inc.: *See—*
Whetstone, James H., 4,925,726, Cl. 428-196.000.
Unilever Patent Holdings B.V.: *See—*
Giles, Alan F.; and Moore, James M., 4,926,308, Cl. 364-147.000.
Union Carbide Chemicals and Plastics Company Inc.: *See—*
Leung, Pak S.; Goddard, Errol D.; and Ancker, Fred H., 4,925,890, Cl. 524-133.000.
Union Oil Company of California: *See—*
Shen, Jian-Chyun, 4,924,942, Cl. 166-291.000.
Uniroyal Chemical Company, Inc.: *See—*
Capolupo, Janet D.; and Chucta, Thomas M., 4,925,889, Cl. 524-169.000.
Unisys Corporation: *See—*
Byers, Larry L.; Koehler, Howard A.; and Michaelson, Wayne A., 4,926,313, Cl. 364-200.000.
Frost, Richard L.; Morley, Kenneth S.; and Pulsipher, Dennis C., 4,926,482, Cl. 381-31.000.
Scheuneman, James H.; Mayer, Michael E.; and Purdham, David M., 4,926,426, Cl. 371-40.100.
Tong, Po; Berlekamp, Elwyn R.; Currie, Robert J.; and Rushforth, Craig K., 4,926,169, Cl. 340-825.570.
United Kingdom Atomic Energy Authority: *See—*
Steele, David F., 4,925,643, Cl. 423-393.000.
United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Brown, James L., 4,925,297, Cl. 356-28.500.
Air Force: *See—*
Carns, Richard A.; Flick, Peter M.; and Byrnes, John M., 4,926,362, Cl. 364-578.000.
Robb, James R., 4,926,445, Cl. 375-106.000.
Rossman, Herman; and Duggan, Sharon A., 4,926,287, Cl. 361-392.000.
Army: *See—*
Humphrey, John M., 4,924,775, Cl. 102-352.000.
Sayles, David C., 4,925,504, Cl. 149-21.000.
Energy: *See—*
Cremers, David A.; Radziemski, Leon J.; and Loree, Thomas R., 4,925,307, Cl. 356-318.000.
Cutburth, Ronald W., 4,925,286, Cl. 350-632.000.
Emmett, John L., 4,925,259, Cl. 350-1.600.
Jubin, Robert T., 4,925,441, Cl. 494-32.000.
Updike, Earl O., 4,925,304, Cl. 356-237.000.
Health and Human Services: *See—*
Kovacs, Joseph A.; and Masur, Henry, 4,925,800, Cl. 435-240.270.
Rosenberg, Martin, 4,925,799, Cl. 435-172.300.
Interior: *See—*
Hjelmstad, Kenneth E., 4,925,247, Cl. 299-5.000.
National Aeronautics and Space Administration: *See—*
Collins, Earl R., Jr., 4,926,481, Cl. 380-25.000
U.S. Philips Corporation: *See—*
Autier, Philippe; and Auger, Jean-Marc, 4,925,813, Cl. 437-228.000.
Billard, Didier; and Poquillon, Bernard, 4,926,259, Cl. 358-105.000.
Erman, Marko; and Gamonal, Remi, 4,925,264, Cl. 350-96.130.
Frencken, Peter H.; Nillesen, Antonius H. H. J.; and Brand, Simon J., 4,926,260, Cl. 358-148.000.
Marinus, Antonius A. M., 4,926,304, Cl. 363-20.000.
Ouwerkerk, Cornelis; and Beijersbergen Van Henegouwen, Cornelis, 4,926,411, Cl. 369-291.000.
Schoenmakers, Johannes J. M., 4,926,278, Cl. 360-130.210.
Span, Francis J., 4,924,781, Cl. 108-22.000.
Turnbull, Andrew A., 4,926,051, Cl. 250-332.000.
van den Broek, Adrianus P., 4,925,421, Cl. 445-4.000.
van Ommen, Alfred H.; Mulder, Johanna M. L.; and Verhoeven, Johannes F. C. M., 4,925,805, Cl. 437-21.000.
Verlijsdonk, Johannus G.; Pet, Robert J.; and Smets, Bruno M. J., 4,926,091, Cl. 313-486.000.
Voorman, Johannes O., 4,926,135, Cl. 330-107.000.
United Technologies Corporation: *See—*
Das, Ranjan, 4,925,364, Cl. 415-150.000.
Merritt, Sears W., Sacks, Robert N.; and Foyt, Arthur G., 4,926,083, Cl. 310-313.00R.
Veronesi, William A.; Weise, Andrew P.; Reed, Robert W.; and Ringermacher, Harry I., 4,926,120, Cl. 324-204.000.
Universal Protection Corp.: *See—*
Rilling, John F., 4,924,799, Cl. 116-206.000.
University of Alberta, The Governors of the: *See—*
Harrison, H. Page, 4,924,947, Cl. 172-701.100.
University of California, The Regents of the: *See—*
Blanch, Harvey W.; Randolph, Theodore; and Wilke, Charles R., 4,925,790, Cl. 435-52.000.
Boegeman, Dwight E.; Lowenstein, Carl D.; and Spiess, Fred N., 4,926,395, Cl. 367-89.000.
Oppenheim, A. K., 4,924,828, Cl. 123-299.000.
University of Cincinnati: *See—*
Deutsch, Edward A., 4,925,925, Cl. 534-10.000.
University of Colorado Foundation, Inc.: *See—*
Barnes, Frank S., 4,926,082, Cl. 310-90.500.
University of Florida: *See—*
Stimac, Jerry L., 4,925,663, Cl. 424-93.000.
University of Iowa Research Foundation: *See—*
Cuykendall, Robert R.; and Strobl, Karlheinz, 4,926,366, Cl. 364-713.000.
University of Medicine and Dentistry of New Jersey: *See—*
Silver, Frederick H.; Berg, Richard A.; Doillon, charles J.; Chernomorsky, Arkady; and Olson, Robert M., 4,925,924, Cl. 530-356.000.
University of Michigan, The: *See—*
Counsell, Raymond E., and Strawn, Laurie, 4,925,649, Cl. 424-1.100.
Sacks, Richard D., and Tanguay, Suzanne L., 4,925,306, Cl. 356-311.000.
University of Utah: *See—*
Jackson, J. R. Hunter; and Parks, Thomas N., 4,925,664, Cl. 424-537.000.
Unuma, Sadao, to Tokai Kogyo Kabushiki Kaisha. Paper feeder 4,925,076, Cl. 226-74.000.
Updike, Earl O., to United States of America, Energy. Small bore ceramic laser tube inspection light table 4,925,304, Cl. 356-237.000.
Uphus, Arnold: *See—*
Lehmann, Hanno; Uphus, Arnold; and Kreimer, Johannes, 4,924,769, Cl. 99-455.000.
Ura, Takeshi: *See—*
Katayama, Yoshiyuki; Ura, Takeshi; and Inamori, Akio, 4,924,983, Cl. 192-52.000.
Urano, Satoshi; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Production of isocyanate compounds. 4,925,982, Cl. 562-871.000.
Uresil Corporation: *See—*
Melinyshyn, Lev; and Goldberg, Edward M., 4,925,452, Cl. 604-284.000.
Urmann, Robert: *See—*
Schermanz, Karl; Saischek, Gerald, Urmann, Robert, and Martetschlager, Kurt, 4,925,855, Cl. 514-341.000.
USBI Company: *See—*
Shockney, Charles H.; Hill, Roger L.; and White, William T., 4,925,611, Cl. 264-135.000.
Ushiku, Kenichi; and Tezuka, Akira, to Hitachi, Ltd. Rotary vane compressor with valve controlled pressure biased sealing means. 4,925,378, Cl. 418-148.000.
Ushikubo, Hisao: *See—*
Kawabata, Misao; Ushikubo, Hisao; and Tominaga, Teruyuki, 4,924,927, Cl. 152-531.000.
Usina, Juan S. Steering wheel locking mechanisms for cars and trucks. 4,924,685, Cl. 70-218.000.
Ussery, Wayne L.; and Weiss, Leonard, to Ussery, Wayne L., a part interest Touch control circuit for ornamental lamps and method therefore. 4,926,062, Cl. 307-116.000.
Uthemann, Horst, to Biotest AG. Method of determining blood groups by the solid-phase procedure with blood-group specific antibodies of the immunoglobulin M. type and support and kit for carrying out the method. 4,925,786, Cl. 435-7.000.
Utsunomiya, Mitito: *See—*
Konishi, Satoshi; Naito, Kazufumi; and Utsunomiya, Mitito, 4,926,359, Cl. 364-567.000.
Uttscheid, Georg. Switch for a floor transportation system. 4,924,776, Cl. 104-130.000.
Vachon, Guy, to Schlumberger Technology Corporation. Method for correcting slippage during wireline depth measurements. 4,924,596, Cl. 33-715.000.
Vaglica, John J.: *See—*
Wilkie, Brian F.; Goler, Vernon B.; Groves, Stanley E.; and Vaglica, John J., 4,926,319, Cl. 364-200.000.
Vaida, Robert M.; and Osthus, Harold L., to Gerber Garment Technology, Inc. Variable position carrier body. 4,925,015, Cl. 198-803.700.
Valavaara, Viljo K., to Fluid Jet International Inc. In line valve. 4,924,901, Cl. 137-102.000.
Valentine, A. H. Llynn; and Noack, William L. Multipurpose shaped pitcher and surgical kit and wrap system. 4,925,047, Cl. 220-23.830.
Valeo: *See—*
Filderman, Rene, 4,924,989, Cl. 192-103.00F.
Valmet Paper Machinery Inc.: *See—*
Koski, Erkki, 4,925,531, Cl. 162-301.000.
van den Broek, Adrianus P., to U.S. Philips Corporation. Method of manufacturing a color cathode-ray tube and a color cathode-ray tube. 4,925,421, Cl. 445-4.000.

Van Der Velde, Arthur: *See—*
Greenbank, Robin A.; and Van Der Velde, Arthur, 4,924,551, Cl. 17-1.00R.
Vandevyver, Michel: *See—*
Barraud, Andre; Richard, Joel; and Vandevyver, Michel, 4,925,774, Cl. 430-296.000.
Van Erden, Donald L.; and Boeckmann, Hugo, to Minigrip, Inc. Reclosable bag having an outer reclosable zipper type closure and inner non-reclosable closure. 4,925,316, Cl. 383-61.000.
van Hattem, Jan C.: *See—*
Weiland, Jan A. E. S.; and van Hattem, Jan C., 4,924,908, Cl. 137-565.000.
Van Leeuwen, Robert J., to Northern Telecom Limited. Apparatus for organizing equipment cables. 4,926,009, Cl. 174-135.000.
van Ommen, Alfred H.; Mulder, Johanna M. L.; and Verhoeven, Johannes F. C. M., to U.S. Philips Corporation. Method of manufacturing a semiconductor device having an SOI structure using selectable etching. 4,925,805, Cl. 437-21.000.
van Rens, Jan L. M. Supporting structure for seed beds. 4,924,623, Cl. 47-18.000.
Van Winckel, Walter. Thermal energy storage container system. 4,924,935, Cl. 165-10.000.
Vargas, Augustin; and Spector, George. Convertible sofa table. 4,925,256, Cl. 312-237.000.
Vassiliadis, Stamatis; Schwarz, Eric M.; and Sung, Baik M., to International Business Machines Corporation. Two's complement multiplication with a sign magnitude multiplier. 4,926,371, Cl. 364-760.000.
Vaughn, Thomas D., to Nordyne, Inc. High-efficiency furnace for mobile homes. 4,924,848, Cl. 126-110.0AA.
Vecchi, John C., to J. V. Manufacturing Company, Inc. Strip material feed guide. 4,925,081, Cl. 226-199.000.
Vegter, Gert: *See—*
Faber, Pals G.; Hermans, Stefanus P. E. A.; and Vegter, Gert, 4,925,355, Cl. 412-37.000.
Vella, John, Jr.: *See—*
Kudert, Frederick G.; Latreille, Maurice G.; McHenry, Robert J.; Nahill, George F.; Pfutzenreuter, Henry, III; Tennant, William A.; Tung, Thomas T.; and Vella, John, Jr., 4,925,100, Cl. 239-416.400.
Ventimiglia, Giovanni: *See—*
Alaria, Gian B.; Poggio, Cesare; and Ventimiglia, Giovanni, 4,926,422, Cl. 370-97.000.
Venture Innovations, Inc.: *See—*
Brown, Ronald W.; and House, Roy F., 4,925,616, Cl. 264-262.000.
Venuta, Salvatore: *See—*
Mertelsmann, Roland; Welte, Karl; and Venuta, Salvatore, 4,925,919, Cl. 530-351.000.
Verbrugge, Jeroen K., to Multinorm B.V. Method for cleaning a teat of a female animal, milking method and cup for use with above mentioned methods. 4,924,809, Cl. 119-14.020.
Verbruggen, Alfons M.: *See—*
Nosco, Dennis L.; and Verbruggen, Alfons M., 4,925,650, Cl. 424-1.100.
Verhoeven, Johannes F. C. M.: *See—*
van Ommen, Alfred H.; Mulder, Johanna M. L.; and Verhoeven, Johannes F. C. M., 4,925,805, Cl. 437-21.000.
Verlijsdonk, Johannus G.; Pet, Robert J.; and Smets, Bruno M. J., to U.S. Philips Corporation. Luminescent terbium-activated borate, luminescent screen provided with such a borate and low-pressure mercury vapor discharge lamp provided with such a screen. 4,926,091, Cl. 313-486.000.
Vernay Laboratories, Inc.: *See—*
Boehmer, Dennis A.; and Williams, James W., 4,924,923, Cl. 141-312.000.
Vernice, Gerard: *See—*
Policht, Stanislaw A.; and Vernice, Gerard, 4,925,779, Cl. 430-403.000.
Veronesi, William A.; Weise, Andrew P.; Reed, Robert W.; and Ringermacher, Harry I., to United Technologies Corporation. In-line metallic debris particle detection system. 4,926,120, Cl. 324-204.000.
Verschueren, Edward M.: *See—*
Ludwig, Gary L.; and Verschueren, Edward M., 4,925,258, Cl. 312-323.000.
Vickers, Incorporated: *See—*
Hansen, Lowell D., 4,925,372, Cl. 417-310.000.
Vickers Shipbuilding & Engineering Limited: *See—*
Sutcliffe, Frank, 4,925,415, Cl. 440-83.000.
Videocolor: *See—*
Fourche, Jean-Pierre; Legrand, Guy; Faivre, Michel; and Berthaut, Olivier, 4,925,420, Cl. 445-3.000.
Villalon, S. Leonard; Olds, James D.; and Shoffner, William H., to Guardian Hitch, Inc. Tamper resistant trailer hitch. 4,925,205, Cl. 280-507.000.
Vinciguerra, Costantino, to Nuovopignone-Industrie Meccaniche E Fonderia S.p.A. Modulator for controlling high-speed rotary dobbies. 4,924,915, Cl. 139-76.000.
Vinod, Yashavant V., to Du Pont de Nemours, E. I., and Company. Treatment of carpets. 4,925,707, Cl. 427-393.400.
Vinson, Paul S. Temperature responsive engine compartment. 4,924,826, Cl. 123-195.00C.
Virag, Sandor: *See—*
Bodo, Gyorgy; Knoll, Jozsef; Somfai, Eva; Virag, Sandor; and Zak, Ferenc, 4,925,878, Cl. 514-646.000.
Visic, Incorporated: *See—*
Roy, Richard S., 4,926,384, Cl. 365-230.030.
Vissers, Hermanus H.: *See—*
Wondergem, Jan; and Vissers, Hermanus H., 4,924,667, Cl. 56-341.000.
VIV Engineering Inc.: *See—*
Hishida, Tadashi, 4,925,322, Cl. 384-486.000.
VMX/OPCOM: *See—*
Ladd, David J.; Pounds, Gregory E.; Kusumi, Tim J.; Bonee, Peter A.; and Shepard, Robert R., 4,926,462, Cl. 379-67.000.
Voest-Alpine Stahl Donawitz Gesellschaft m.b.H.: *See—*
von Bogdandy, Ludwig; Mitter, Gerhard; and Koller, Otto, 4,925,489, Cl. 75-574.000.
Vogel, David S.; and Vogel, Donald E. Thread snips. 4,924,572, Cl. 30-253.000.
Vogel, Donald E.: *See—*
Vogel, David S.; and Vogel, Donald E., 4,924,572, Cl. 30-253.000.
Voges, Dieter: *See—*
Franz, Lothar; Eggersdorfer, Manfred; and Voges, Dieter, 4,925,940, Cl. 544-315.000.
Vogt, Clifford M.; Twyman, Nancy D.; and Allen, Roe C., Jr., to Kimberly-Clark Corporation. Method for making melt-blown liquid filter medium. 4,925,601, Cl. 264-6.000.
Voituriez, Daniel. Method of diffusing essential oils and oleo-resins of spices in a carrier solution. 4,925,688, Cl. 426-281.000.
Volk, Harald K.: *See—*
Wessling, Bernhard M.; and Volk, Harald K., 4,925,610, Cl. 264-101.000.
Vollenweider, Mark. Electronic drum with curved playing surface. 4,924,741, Cl. 84-730.000.
Von Roll, AG: *See—*
Spiess, Hansruedi; and Galvanetto, Francois, 4,925,337, Cl. 404-26.000.
von Benda, Claus: *See—*
Kistrup, Holger; and von Benda, Claus, 4,925,706, Cl. 427-305.000.
von Bogdandy, Ludwig; Mitter, Gerhard; and Koller, Otto, to Voest-Alpine Stahl Donawitz Gesellschaft m.b.H. Process for melting scrap iron, sponge iron and/or solid pig iron. 4,925,489, Cl. 75-574.000.
von der Saal, Wolfgang: *See—*
Mertens, Alfred; von der Saal, Wolfgang; Kling, Lothar; and Muller-Beckmann, Bernd, 4,925,845, Cl. 514-254.000.
von Dusterlho, Wolfgang, to Icis-Tirestar Vertrieb Montage Service W. von Dusterlho KG. Horizontal link member for connecting vertical links of a tire chain. 4,924,925, Cl. 152-243.000.
Von Kohorn, Henry. System for evaluation of response to broadcast transmissions. 4,926,255, Cl. 358-84.000.
Vonlanthen, Benno, to R. Berchtold AG. Contact device for transmitting electrical signals between a lock and key in a cylinder lock. 4,924,686, Cl. 70-277.000.
von Plessen, Helmold; and Rittner, Siegbert, to Hoechst Aktiengesellschaft. Dioxane adduct of 2-hydroxynaphthalene-6-carboxylic acid and process for the preparation thereof. 4,925,959, Cl. 549-377.000.
Voorman, Johannes O., to U.S. Philips Corporation. Balanced integrator-filter arrangement. 4,926,135, Cl. 330-107.000.
Vora, Rohitkumar H.: *See—*
Mueller, Werner H.; Khanna, Dinesh N.; Vora, Rohitkumar H.; and Erckel, Ruediger J., 4,925,915, Cl. 528-353.000.
Vorlow, Sotiris, to Shell Internationale Research Maatschappij, B.V. Process for separating hydroprocessed effluent streams. 4,925,573, Cl. 208-100.000.
Voxbrunner, Walter: *See—*
Feuser, Alfred; Neumann, Joachim; and Voxbrunner, Walter, 4,924,754, Cl. 91-363.00R.
Vroman Foods, Inc.: *See—*
Getman, Harlan R., 4,925,689, Cl. 426-289.000.
VSI Corp.: *See—*
Carmody, Timothy A.; Bourne, William R., Jr.; and Stammreich, John, 4,925,221, Cl. 292-200.000.
Vuilleumier, Cyril; and Muller, Jacques, to ETA SA Fabriques. Skeleton watch allowing sight of all or some of the elements forming it. 4,926,401, Cl. 368-88.000.
W. A. Lane, Inc.: *See—*
Lane, William A., Jr., 4,924,762, Cl. 98-58.000.
W. C. Bradley Company: *See—*
Hitch, Robert J., 4,924,766, Cl. 99-421.0HV.
W. H. Brady Co.: *See—*
Aufderheide, Brian E.; and Hanauer, Gerald G., 4,926,007, Cl. 174-36.000.
W. L. Gore & Associates, Inc.: *See—*
Driskill, Kathleen R.; and Henn, Robert L., 4,925,732, Cl. 428-336.000.
W. R. Grace & Co.-Conn.: *See—*
Gray, Stephen L.; and Horner, John E., 4,925,687, Cl. 426-129.000.
WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Holst, Hans; Lindemann, Klaus; Saba, Manfred; Kaess, Hans-Harald; and Petersen, Erwin, 4,925,254, Cl. 303-111.000.
Wachtel, Dany, heir: *See—*
Wachtel, Jean Louis, deceased; Wachtel, Tom, heir; Wachtel, Irene, heir; Erny, Susan, heir; and Wachtel, Dany, heir, 4,924,547, Cl. 15-185.000.
Wachtel, Helmut: *See—*
Schollkopf, Klaus; and Wachtel, Helmut, 4,925,854, Cl. 514-338.000.
Wachtel, Irene, heir: *See—*
Wachtel, Jean Louis, deceased; Wachtel, Tom, heir; Wachtel, Irene, heir; Erny, Susan, heir; and Wachtel, Dany, heir, 4,924,547, Cl. 15-185.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Wachtel, Jean Louis, deceased; by Wachtel, Tom, heir; by Wachtel, Irene, heir; by Erny, Susan, heir; and by Wachtel, Dany, heir, to Celluloid S.A. Packageable toilet utensil. 4,924,547, Cl. 15-185.000.
Wachtel, Tom, heir: *See—*
Wachtel, Jean Louis, deceased; Wachtel, Tom, heir; Wachtel, Irene, heir; Erny, Susan, heir; and Wachtel, Dany, heir, 4,924,547, Cl. 15-185.000.
Wachtler, Andreas: *See—*
Reiffenrath, Volker; Krause, Joachim; Wachtler, Andreas; Weber, Georg; and Finkenzeller, Ulrich, 4,925,590, Cl. 252-299.610.
Wada, Hideo: *See—*
Kitamura, Takao; Sakane, Kohji; Wada, Hideo; Hata, Hajime; and Kanbara, Hajime, 4,925,641, Cl. 423-279.000.
Wada, Kenji: *See—*
Naito, Masamitsu; and Wada, Kenji, 4,926,042, Cl. 250-227.110.
Wada, Shigetaka: *See—*
Tani, Toshihiko; and Wada, Shigetaka, 4,925,815, Cl. 501-90.000.
Wada, Yasunori: *See—*
Metoki, Iku; Honda, Chika; and Wada, Yasunori, 4,925,783, Cl. 430-569.000.
Wada, Yuusuke: *See—*
Miyamura, Masataka; Wada, Yuusuke; Takeda, Kazuhiro; Nakaizumi, Yuji; and Kohara, Teiji, 4,925,773, Cl. 430-285.000.
Wade, Wallace R., to Ford Motor Company. Fast response exhaust gas recirculation (EGR) system. 4,924,840, Cl. 123-571.000.
Wagner, Bruce C.: *See—*
Hink, Karl M.; Pottebaum, Joseph R.; Reichard, Jerome J.; Wagner, Bruce C.; Weber, Douglas B.; and Wiesendanger, Theodore O., 4,926,100, Cl. 318-269.000.
Wagner, Klaus; Rieber, Norbert; Pommer, Ernst-Heinrich; and Dressel, Juergen, to BASF Aktiengesellschaft. Azole hemiaminal derivatives and their use as nitrification inhibitors. 4,925,476, Cl. 71-27.000.
Wagner, Robert, to Stiegler GmbH Maschinenfabrik. Bags made of a thermoplastic synthetic resin sheeting and process for the production of said bags. 4,925,438, Cl. 493-194.000.
Wahba, Brent J., to General Motors Corporation. Fuel injection. 4,925,112, Cl. 239-585.000.
Wakabayashi, Osamu: *See—*
Kajiyama, Koichi; Saito, Kaoru; Itakura, Yasuo; Wakabayashi, Osamu; Kowaka, Masahiko; and Yamaguchi, Tadayoshi, 4,926,428, Cl. 372-20.000.
Wakabayashi, Shigeru: *See—*
Ueda, Kazuo; Wakabayashi, Shigeru; Saijo, Yoshihiro; and Fujikawa, Yasuji, 4,925,069, Cl. 222-500.000.
Wakata, Yuichi: *See—*
Iwasaki, Masayuki; Fujikura, Sadao; Wakata, Yuichi; and Takata, Yasunori, 4,925,768, Cl. 430-271.000.
Wakui, Norihiro: *See—*
Ichihara, Yoshiyuki; Ito, Kunio; Izawa, Tadashi; and Wakui, Norihiro, 4,926,249, Cl. 358-75.000.
Walchandnagar Industries Limited: *See—*
Pole, Kishor M., and Dhavlikar, Bhagawan S., 4,925,115, Cl. 241-222.000.
Walker, Jimmy P.: *See—*
Barton, James T.; and Walker, Jimmy P., 4,926,198, Cl. 346-155.000.
Walker, Louis L.: *See—*
Bertram, James L.; Walker, Louis L.; and Muskopf, John W., 4,925,901, Cl. 525-482.000.
Walker, Rick C.: *See—*
Corsetto, Craig; Hornak, Tom; Nordby, Rasmus; Walker, Rick C.; and Yen, Chu, 4,926,447, Cl. 375-120.000.
Walla, Gregg W.: *See—*
Frederiksen, Bjarne; Allen, John M.; and Walla, Gregg W., 4,925,257, Cl. 312-221.000.
Wallach, Steven J.; Chastain, David M.; and Weatherford, James R., to Convex Computer Corporation. Hierarchical memory system with logical cache, physical cache, and address translation unit for generating a sequence of physical addresses. 4,926,317, Cl. 364-200.000.
Wallroth, Carl F.: *See—*
Kiske, Siegfried; Schwanbom, Erik; and Wallroth, Carl F., 4,924,861, Cl. 128-205.180.
Walsh, Fraser, to Tracer Technologies, Inc. Laser based method for forming a superconducting oxide layer on various substrates. 4,925,830, Cl. 505-1.000.
Walter, Herman D.: *See—*
College, David A.; Johnson, Keith, Jr.; Stachura, Joseph F.; and Walter, Herman D , 4,924,693, Cl. 72-453.030.
Wambach, Robert F.: *See—*
Long, William L.; Wambach, Robert F.; Baty, Kurt F.; Lamb, Joseph M.; and McNamara, John E., 4,926,315, Cl. 364-200.000.
Wamser, Manfred; and Overlach, Knud, to Dr.-Ing. Ludwig Pietzach GmbH & Co. Measuring arrangement for form measurement. 4,924,595, Cl. 33-542.000.
Wand, Martin A.: *See—*
Summerville, David F.; Williston, John P.; Wand, Martin A.; Doty, Thomas J.; Rice, Haradon J.; and Huang, Phen-Lan, 4,926,103, Cl. 318-587.000.
Wang, Chang-Ning J.; and Klotz, Lynn C., to Biotechnica Diagnostics, Inc. Nucleic acid hybridization assays. 4,925,785, Cl. 435-6.000.
Wang, Chen-Shih: *See—*
Atkins, Richard P.; Wang, Chen-Shih; and Dearlove, Thomas J., 4,925,886, Cl. 523-443.000.
Wang Laboratories, Inc.: *See—*
Whipple, David L., 4,926,419, Cl. 370-85.600.
Wang, Paul S. Canteen. 4,925,040, Cl. 215-1.00A.
Wapdlewopth, James M.: *See—*
Bayles, Richard W.; Boyle, Francis T.; Gravestock, Michael B.; and Wapdlewopth, James M., 4,925,863, Cl. 514-383.000.
Waragai, Katsunori; Saito, Yukihiro; and Asakawa, Shiro, to Matsushita Electric Industrial Co., Ltd. Method for making a thin film of polymer. 4,925,612, Cl. 264-154.000.
Ward, Frank; and Moody, William J. Orbital support structure for micromanipulators used with compound microscopes. 4,925,284, Cl. 350-532.000.
Waren, Jerry B. Masonry saw jig. 4,924,843, Cl. 125-35.000.
Warner-Lambert Company: *See—*
Ghebre-Sellassie, Isaac; Iyer, Uma; and Fawzi, Mahdi B., 4,925,676, Cl. 424-470.000.
Warnicke, Volker: *See—*
Foertsch, Manfred; Hans, Waldemar; and Warnicke, Volker, 4,925,111, Cl. 239-533.120.
Warren, John R. Underwater viewing paddle board. 4,925,417, Cl. 441-65.000.
Washio, Katsuyoshi: *See—*
Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi; Onai, Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko, 4,926,235, Cl. 357-68.000.
Wasley, Robert S.; and Holmes, James C., to Raychem Corporation. Sensor assembly for detecting multiple events and distinguishing between them. 4,926,129, Cl. 324-555.000.
Wasley, Robert S.: *See—*
Lahlouh, John; Stewart, Ray F.; Wasley, Robert S.; Hauptly, Paul D.; and Welsh, Laurence M., 4,926,165, Cl. 340-603.000.
Wass, William E.: *See—*
DeCicco, Steven G.; Lee, Sung K.; Novak, Rudy G.; Wass, William E.; and Mak, Kai K., 4,925,389, Cl. 432-106.000.
Wasserman, Nelson M.; and Erlichman, Irving. Compliant lens blocks and method of using them. 4,925,518, Cl. 156-295.000.
Watanabe, Harumi, to International Sankoh Kabushiki Kaisha. Sealing height adjusting device for package wrapping apparatus. 4,924,659, Cl. 53-550.000.
Watanabe, Hisanori: *See—*
Outou, Tatsuyuki; and Watanabe, Hisanori, 4,925,127, Cl. 242-201.000.
Watanabe, Kazuhiro: *See—*
Teramoto, Takero; and Watanabe, Kazuhiro, 4,925,913, Cl. 528-272.000.
Watanabe, Keiichiro; Ohashi, Tsuneaki; and Matsuhisa, Tadaaki, to NGK Insulators, Ltd. Novel solid solution, heat-resistant sintered body and method of producing the same. 4,925,816, Cl. 501-104.000.
Watanabe, Kiyoshi: *See—*
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Watanabe, Kunihiko: *See—*
Tamaki, Yoichi; Kure, Tokuo; Nakamura, Tohru; Hayashida, Tetsuya; Ikeda, Kiyoji; Washio, Katsuyoshi; Onai, Takahiro; Uchida, Akihisa; and Watanabe, Kunihiko, 4,926,235, Cl. 357-68.000.
Watanabe, Kyoichi A., to Sloan-Kettering Institute for Cancer Research. 6,7-dihydropyrrol[3,4-c]pyrido[2,3-d]pyrimidine derivatives. 4,925,939, Cl. 544-251.000.
Watanabe, Seiji: *See—*
Handa, Akio; Hosoya, Eiji; Ishiwatari, Makoto; Kimura, Yoshihiro; and Watanabe, Seiji, 4,924,959, Cl. 180-297.000.
Watanabe, Tadashi; and Morita, Yasuyuki, to Bridgestone Corporation. Pneumatic tire. 4,924,928, Cl. 152-533.000.
Watanabe, Takao: *See—*
Hatazaki, Kaichiro; and Watanabe, Takao, 4,926,483, Cl. 381-43.000.
Watanabe, Tetsuya: *See—*
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 4,926,143, Cl. 331-156.000.
Watanabe, Toshiyuki: *See—*
Okada, Masahiro; Ukai, Toshinao; Suzuki, Seiji; Adachi, Keiichi; Watanabe, Toshiyuki; and Ishigaki, Kunio, 4,925,782, Cl. 430-510.000.
Watanabe, Yoshitaka: *See—*
Mizoguchi, Yoshiyuki; Watanabe, Yoshitaka; Hiraga, Hiroyuki; and Fukuyama, Shigeru, 4,926,196, Cl. 346-140.00R.
Waters, Colin M.; Noakes, Timothy J.; and Pavey, Ian, to Imperial Chemical Industries PLC. Process for producing liquid crystal devices. 4,925,708, Cl. 428-1.000.
Watertown Tableslide Company, a Div. of Consolidate Industries, Inc.: *See—*
Reiss, Thomas J., Jr., 4,925,319, Cl. 384-17.000.
Watson, William G.: *See—*
Muench, George J.; Lewis, Brian G.; Ashok, Sankaranarayanan; Watson, William G.; and Cheskis, Harvey P., 4,925,103, Cl. 239-79.000.
Watt, Darrell J.: *See—*
Ali, Athar M.; Watt, Darrell J.; and Wilson, Wendell G., 4,925,063, Cl. 222-108.000.
Weatherford, James R.: *See—*
Wallach, Steven J.; Chastain, David M.; and Weatherford, James R., 4,926,317, Cl. 364-200.000.
Weaver, Lindsay A., to Qualcomm, Inc. Synchronous up-conversion direct digital synthesizer. 4,926,130, Cl. 328-14.000.

Webb, Edward; and Duclo, Marley, to Koronis Parts, Inc. Intake and pump assembly for aquatic vehicle. 4,925,408, Cl. 440-38.000.
Weber, Douglas B.: *See—*
Hink, Karl M.; Pottebaum, Joseph R.; Reichard, Jerome J.; Wagner, Bruce C.; Weber, Douglas B.; and Wiesendanger, Theodore O., 4,926,100, Cl. 318-269.000.
Weber, Georg: *See—*
Reiffenrath, Volker; Krause, Joachim; Wachtler, Andreas; Weber, Georg; and Finkenzeller, Ulrich, 4,925,590, Cl. 252-299.610.
Weber, Kurt: *See—*
Hefti, Heinz; Reinehr, Dieter; Weber, Kurt; and Eckhardt, Claude, 4,925,595, Cl. 252-301.210.
WEBER s.r.l.: *See—*
Bonfiglioli, Silverio; and Stagni, Rino, 4,924,834, Cl. 123-470.000.
Wei, Mu K. DIN-type connector. 4,925,405, Cl. 439-608.000.
Weihe, Gary R.: *See—*
Brown, Andrew V.; Gen, Tamar G.; and Weihe, Gary R., 4,925,727, Cl. 428-199.000.
Weik, Hartmut, to Alcatel N.V. Method and facilities for hybrid packet switching. 4,926,416, Cl. 370-60.100.
Weil, Geoffrey M.: *See—*
Reinhardt, Nicholas; and Weil, Geoffrey M., 4,926,285, Cl. 361-230.000.
Weiland, Jan A. E. S.; and van Hattem, Jan C., to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V. Apparatus for withdrawing liquid from a reservoir by means of a water jet device. 4,924,908, Cl. 137-565.000.
Weinmann, Hanns-Joachim: *See—*
Gries, Heinz; Niedballa, Ulrich; and Weinmann, Hanns-Joachim, 4,925,652, Cl. 424-9.000.
Weinstein, Jerry G.: *See—*
Kelkar, Anant H.; Capodicasa, Frank A.; and Weinstein, Jerry G., 4,925,492, Cl. 106-38.350.
Weis, Anton, to Albert-Frankenthal AG. Overhead frame for a folder. 4,925,170, Cl. 270-5.000.
Weise, Andrew P.: *See—*
Veronesi, William A.; Weise, Andrew P.; Reed, Robert W.; and Ringermacher, Harry I., 4,926,120, Cl. 324-204.000.
Weiss, Leonard: *See—*
Ussery, Wayne L.; and Weiss, Leonard, 4,926,062, Cl. 307-116.000.
Weiss, Wolfgang: *See—*
Gotz, Josef; Orth, Winfried; Weiss, Wolfgang; Rapp, Bernd; and Kleffner, Hans W., 4,925,942, Cl. 546-133.000.
Weisser, Harald: *See—*
Hoffmann, Dietrich; and Weisser, Harald, 4,924,614, Cl. 42-78.000.
Weizer, Thomas C.; and Cerjak, Thomas P., to AXIA, Inc. Knockdown stackable container. 4,924,783, Cl. 108-53.300.
Welch, Ernst R.: *See—*
Hummel, Alan R.; and Welch, Ernst R., 4,924,583, Cl. 29-460.000.
Wells, James R.: *See—*
Crawford, Steven A.; and Wells, James R., 4,924,977, Cl. 192-3.280.
Wells, Phyllis D.: *See—*
Dyer, Alan; Wells, Phyllis D.; and Williams, Craig D., 4,925,669, Cl. 424-438.000.
Welsby, David P.: *See—*
Spruce, Brian; Welsby, David P.; and Bell, John L., 4,924,587, Cl. 29-723.000.
Welsh, Laurence M.: *See—*
Lahlouh, John; Stewart, Ray F.; Wasley, Robert S.; Hauptly, Paul D.; and Welsh, Laurence M., 4,926,165, Cl. 340-603.000.
Welte, Karl: *See—*
Mertelsmann, Roland; Welte, Karl; and Venuta, Salvatore, 4,925,919, Cl. 530-351.000.
Wenzel, Werner: *See—*
Grosseholz, Werner; Schmuser, Dirk; and Wenzel, Werner, 4,924,553, Cl. 17-50.000.
Wermelinger, Jorg: *See—*
Kunz, Peter; Hunger, Heinz; and Wermelinger, Jorg, 4,925,218, Cl. 285-93.000.
Wernicke, Ubbo, to Agfa-Gevaert Aktiengesellschaft. Process for the rapid development of color materials. 4,925,778, Cl. 430-383.000.
Wessling, Bernhard M.; and Volk, Harald K., to Zipperling Kessler & Co. (GmbH & Co.). Process for the production of conductive molded articles. 4,925,610, Cl. 264-101.000.
West, William G.: *See—*
Newkirk, Raymond K.; and West, William G., 4,925,519, Cl. 156-304.100.
Westbrock, Jerry B., to Konietzki, Melvin J. Portable tree seat. 4,924,972, Cl. 182-187.000.
Western Atlas International, Inc.: *See—*
Doyen, Philippe M., 4,926,394, Cl. 367-73.000.
Western Digital Corporation: *See—*
Sarraf, Mohammad, 4,926,291, Cl. 361-384.000.
Western Insulated Glass Company: *See—*
Ellis, Benny J.; and Daniels, Kurt H., 4,925,361, Cl. 414-786.000.
Westfalia Separator Aktiengesellschaft: *See—*
Lehmann, Hanno; Uphus, Arnold; and Kreimer, Johannes, 4,924,769, Cl. 99-455.000.
Westinghouse Electric Corp.: *See—*
Brotherton, Walter W., 4,926,364, Cl. 364-581.000.
Brown, James R.; and Olson, Rick A., 4,925,363, Cl. 415-129.000.
Hwang, Edward Y.; and Chow, Michael P., 4,926,342, Cl. 364-508.000.
Moore, Donald W., 4,924,706, Cl. 73-579.000.
Olver, Terence E., 4,926,134, Cl. 330-2.000.
Olver, Terence E., 4,926,136, Cl. 330-149.000.
Roy, Bryan A.; Funk, John G.; and Rowe, Bruce S., 4,926,046, Cl. 250-506.100.
Sparrow, James A.; and McEvoy, John J., 4,925,619, Cl. 376-258.000.
Talisa, Salvador H., 4,926,116, Cl. 324-117.00R.
Westmoreland, Amos E.: *See—*
Perfetti, Thomas A.; and Westmoreland, Amos E., 4,924,883, Cl. 131-336.000.
Whessoe. S.A.: *See—*
Habart, Philippe, 4,924,700, Cl. 73-290.00V.
Whetstone, James H., to Unifi, Inc. Wallcovering substrate formed of textured, continuous, multi-filament yarns having hydrophilic characteristics. 4,925,726, Cl. 428-196.000.
Whipple, David L., to Wang Laboratories, Inc. Priority apparatus. 4,926,419, Cl. 370-85.600.
Whipple, Roger B.: *See—*
Burmeister, Scott N.; Harris, Duane W.; Whipple, Roger B.; and Mondek, Martin J., 4,925,411, Cl. 440-61.000.
Whirlpool Corporation: *See—*
Janke, Donald E.; and Frohbieter, Edwin H., 4,924,680, Cl. 62-187.000.
Whitaker, Earl J.: *See—*
Mercer, Ferrell L.; Whitaker, Earl J.; and Cuthbert, Christopher P., 4,926,375, Cl. 364-900.000.
White, Anthony M.: *See—*
Ashley, Timothy; Elliott, Charles T.; and White, Anthony M., 4,926,228, Cl. 357-30.000.
White, Dennis E. Portable bookholder. 4,925,144, Cl. 248-445.000.
White, John J.; and Dean, Robert H., to Midland Manufacturing Corp. Tank-level alarm control system. 4,924,703, Cl. 73-308.000.
White, William T.: *See—*
Shockney, Charles H.; Hill, Roger L.; and White, William T., 4,925,611, Cl. 264-135.000.
Whiteley, Steve R., to Hypres, Inc. Integrated superconducting sampling oscilloscope. 4,926,067, Cl. 307-352.000.
Whitman Saddle Mfg., Inc.: *See—*
Norman, Dennis L.; and Norman, Melvin E., 4,924,660, Cl. 54-46.000.
Whittaker, Justin P.; and Whittaker, Paul H. Retractable brace for ambulance attendants. 4,925,211, Cl. 280-801.000.
Whittaker, Paul H.: *See—*
Whittaker, Justin P.; and Whittaker, Paul H., 4,925,211, Cl. 280-801.000.
Widrow, Bernard: *See—*
Rector, James; Marion, Bruce; Widrow, Bernard; and Salehi, Iraj A., 4,926,391, Cl. 367-41.000.
Wieder, Irwin: *See—*
Hale, Ron L.; and Wieder, Irwin, 4,925,804, Cl. 436-501.000.
Wiedman, Helmut: *See—*
Anger, Wilhelm; and Wiedman, Helmut, 4,925,291, Cl. 351-123.000.
Wiersma, Wouter J.: *See—*
Moore, Henry J., Jr.; and Wiersma, Wouter J., 4,925,093, Cl. 237-19.000.
Wiesendanger, Theodore O.: *See—*
Hink, Karl M.; Pottebaum, Joseph R.; Reichard, Jerome J.; Wagner, Bruce C.; Weber, Douglas B.; and Wiesendanger, Theodore O., 4,926,100, Cl. 318-269.000.
Wife, Richard L.; and Wong, Pui K., to Shell Oil Company. Polymerization of olefin/carbon monoxide with catalyst composition comprising halogen dicarboxylic acid. 4,925,917, Cl. 528-392.000.
Wigderson, Avi: *See—*
Goldwasser, Shafi; Kilian, Joseph; Wigderson, Avi; and Ben-Or, Michael, 4,926,479, Cl. 380-23.000.
Wiggins Teape Group Limited, The: *See—*
Sinclair, Peter; and Hayes, Angela J., 4,925,530, Cl. 162-164.100.
Willis, Anthony J.; Skelding, William T. H.; and Radvan, Bronislaw, 4,925,615, Cl. 264-257.000.
Wihl, Mark J.: *See—*
Danielson, Donald L.; Wihl, Mark J.; and Joseph, David A., 4,926,489, Cl. 382-8.000.
Wilcox, Wayne, to Snap-Tite, Inc. Semi-balanced staggered locking coupling. 4,924,909, Cl. 137-614.050.
Wilgus, Frank R.: *See—*
Robichaud, Arthur R.; Wilgus, Frank R.; Tyler, Warren C.; and Holmes, Jack, 4,925,034, Cl. 206-603.000.
Wilhelm, Daniel D., to Nartron Corporation. Electrically heated seat resistive heating element energization system. 4,926,025, Cl. 219-202.000.
Wilke, Charles R.: *See—*
Blanch, Harvey W.; Randolph, Theodore; and Wilke, Charles R., 4,925,790, Cl. 435-52.000.
Wilkie, Brian F.; Goler, Vernon B.; Groves, Stanley E.; and Vaglica, John J., to Motorola Inc. Integrated circuit timer with multiple channels and dedicated service processor. 4,926,319, Cl. 364-200.000.
Williams, Brian J.: *See—*
Baker, Raymond; Leeson, Paul D.; Ludduwahetty, Tamara; and Williams, Brian J., 4,925,867, Cl. 514-425.000.
Williams, Craig D.: *See—*
Dyer, Alan; Wells, Phyllis D.; and Williams, Craig D., 4,925,669, Cl. 424-438.000.
Williams, David L.; Edwards, William B., III; Cox, Richard H.; Faustini, Daryl L.; and Drew, Surnease, to Philip Morris Incorporated. Novel process for the production of 4,6-dimethyl-7-hydroxynonan-3-one. 4,925,985, Cl. 568-384.000.

VOL
1114
ISS
3
MY
15
1990
UMI

Williams, James W.. *See*—
Boehmer, Dennis A.; and Williams, James W., 4,924,923, Cl. 141-312.000.
Williams, John C. Conveyorized sortation system. 4,925,002, Cl. 198-445.000.
Willis, Anthony J.; Skelding, William T. H.; and Radvan, Bronislaw, to Wiggins Teape Group Limited, The. Method of molding fiber reinforced plastic articles. 4,925,615, Cl. 264-257.000.
Willis, M. Joseph: *See*—
Jacob, A. Kirk; Willis, M. Joseph; and Hardman, A. Pierce, 4,925,571, Cl. 210-742.000.
Williston, John P.: *See*—
Summerville, David F.; Williston, John P.; Wand, Martin A.; Doty, Thomas J.; Rice, Haradon J.; and Huang, Phen-Lan, 4,926,103, Cl. 318-587.000.
Willms, Lothar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, to Hoechst Aktiengesellschaft. Heterocyclically substituted N-sultamsulfonamides, and their use as herbicides and plant growth regulators. 4,925,480, Cl. 71-91.000.
Wilson, Alexander I., to Morgan Construction Company. Rolling mill. 4,924,689, Cl. 72-249.000.
Wilson, Eleanora G.: *See*—
Dowdell, James F.; and Wilson, Eleanora G., 4,925,285, Cl. 350-621.000.
Wilson, Howard A.: *See*—
Batruni, Roy G.; and Wilson, Howard A., 4,926,472, Cl. 379-411.000.
Wilson, Janet M.: *See*—
Tabb, David L.; and Wilson, Janet M., 4,925,892, Cl. 524-236.000.
Wilson, Wendell G.: *See*—
Ali, Athar M.; Watt, Darrell J.; and Wilson, Wendell G., 4,925,063, Cl. 222-108.000.
Wiltron Company: *See*—
Bradley, Donald A., 4,926,288, Cl. 361-101.000.
Windle, William E.; Zimmerman, Robert E.; Glotzbach, Ronald W.; and Onesti, Robert J., to Navistar International Transportation Corp Truck operation monitoring system. 4,926,331, Cl. 364-424.040.
Wirt, David F., to Minnesota Mining and Manufacturing Company. Liquid applicator with metering insert. 4,925,327, Cl. 401-205.000.
Wirth, Hermann O.: *See*—
Gunther, Peter; Wirth, Hermann O.; and Endlich, Wilhelm, 4,925,887, Cl. 524-14.000.
Wise, James H.: *See*—
Himes, John L., Jr.; and Wise, James H., 4,925,392, Cl. 439-55.000.
Wissman, Terry L.; and Bornhorst, John B., to Minster Machine Company, The. Scrap tire processing apparatus. 4,925,113, Cl. 241-101.400.
Wittenberg, Peter, to Hughes Aircraft Company. Multiple radio frequency single receiver radar operation. 4,926,185, Cl. 342-201.000.
Wittmann, Dieter: *See*—
Kress, Hans-Jurgen; Lindner, Christian; Muller, Friedemann; Peters, Horst; Wittmann, Dieter; and Buekers, Josef, 4,925,891, Cl. 524-139.000.
Witzke, Duane W.; Selbert, Alan J.; and Lowe, Michael E., to Hoover Universal, Inc. Method for manufacturing contoured seats. 4,925,513, Cl. 156-245.000.
Wlodarczyk, Marek T.; Coletta, Luciano; Campbell, James A.; and Tomasko, Douglas G., to Fiberoptic Sensor Technologies, Inc. Fiber optic sensors. 4,924,870, Cl. 128-667.000.
Woco Franz-Josef Wolf & Co: *See*—
Wolf, Franz J.; and Pletsch, Hubert, 4,925,163, Cl. 267-153.000.
Woerner, Pierre; and Hainaut, Jean-Pierre, to Messier-Hispano-Bugatti. Shock absorber with improved dynamic sealing. 4,924,975, Cl. 188-322.180.
Wohr, Rolf, to Robert Bosch GmbH. Method of and an apparatus for controlling a quantity of an explosive gas mixture in a workpiece treatment chamber. 4,925,499, Cl. 148-9.00R
Wojtasik, Joseph F.: *See*—
Harwood, Van N., Jr., and Wojtasik, Joseph F., 4,925,631, Cl. 422-122.000.
Wolf, Franz J.; and Pletsch, Hubert, to Woco Franz-Josef Wolf & Co. Spring element. 4,925,163, Cl. 267-153.000.
Wolf, Robert, to J.M. Voith GmbH. Device for removing condensate from a steam-heated drying cylinder or similar by means of a rotating syphon. 4,924,603, Cl. 34-125.000.
Wolfe, Brian A.: *See*—
Fogg, Michael W., Scully, Michael J., and Wolfe, Brian A., 4,925,401, Cl. 439-465.000.
Wolfson, Lawrence S.: *See*—
Pearl, David R.; and Wolfson, Lawrence S., 4,924,727, Cl. 74-603.000.
Won-Door Corporation *See*—
Johnson, Ronald F.; Smart, J. A.; Goodman, E. Carl; and Bowles, Richard, 4,924,929, Cl. 160-84.100.
Wondergem, Jan; and Vissers, Hermanus H., to Multinorm B.V. Baler with successively positioned reaction mechanism. 4,924,667, Cl. 56-341.000.
Wong, James, to Composite Materials Technology, Inc. Getter wire. 4,925,741, Cl. 428-661.000.
Wong, Pui K.: *See*—
Wife, Richard L.; and Wong, Pui K., 4,925,917, Cl. 528-392.000.
Wood, Jerry W., to Electric Power Research Institute, Inc. Welding tool. 4,925,074, Cl. 228-49.100.
Woodbridge Group, The: *See*—
Main, Ewan J., 4,924,540, Cl. 5-436.000.
Woodcock, Darryl L.. *See*—
Neches, Philip M.; Hartke, David H., Baran, Richard J.; Woodcock, Darryl L.; and Papachristidis, Alexandros C., 4,925,311, Cl. 364-200.000.
Wraight, Peter D., to Schlumberger Technology Corporation. Thermal decay time logging method and apparatus. 4,926,044, Cl. 250-264.000.
Wratil, Peter; and Schroter, Reinhard, to Klockner-Moeller. Digital processing device for analog input. 4,926,351, Cl. 364-550.000.
Wright, Douglas W., to Emhart Industries, Inc. Adjustable mounting for multigob apparatus for straight line shearing. 4,924,740, Cl. 83-527.000.
Wright, Michael L., to Lilliwyte Societe Anonyme. Electrochemical cell. 4,925,749, Cl. 429-104.000.
Wrobel, Jay E.: *See*—
Sestanj, Kazimir; Wrobel, Jay E.; and Kelly, Joseph M., 4,925,968, Cl. 560-21.000.
Wu, Charles L.; and Haboush, Roger K., to Ford Motor Company. Artificial intelligence for adaptive machining control of surface finish. 4,926,309, Cl. 364-149.000.
Wu, Dong Her. Tri-shaft type multi-function cleaner. 4,924,550, Cl. 15-328.000.
Wu, Hai-Ming. Convertable toy car having a two-level cam. 4,925,427, Cl. 446-409.000.
Wu, Margaret M.: *See*—
Pelrine, Bruce P.; and Wu, Margaret M., 4,926,004, Cl. 585-530.000.
Wuerzer, Bruno: *See*—
Rueb, Lothar; Eicken, Karl; Pander, Hans J.; Plath, Peter; Schwalge, Barbara; Wuerzer, Bruno; and Meyer, Norbert, 4,925,484, Cl. 71-96.000.
Wunsch, Adolf. Conveying plant. 4,924,997, Cl. 198-345.000.
Wurst, Stephen G.; Adams, William J.; and Munson, Kenton M., to Rockwell International Corporation. Hydraulic buoyancy force suit. 4,925,133, Cl. 244-118.500.
Wyckoff, Frank M.: *See*—
Keene, Howard F.; and Wyckoff, Frank M., 4,924,757, Cl. 92-128.000.
Wynes, Joseph: *See*—
Hock, Thomas H.; O'Banion, Michael L.; Koehler, Heinrich P. F.; and Wynes, Joseph, 4,924,633, Cl. 51-135.00R.
Xerox Corporation: *See*—
Acquaviva, Thomas, 4,925,176, Cl. 271-3.100.
Baranyi, Giuseppa; Hor, Ah-Mee; Loutfy, Rafik O.; and Popovic, Zoran D., 4,925,760, Cl. 430-59.000.
Bares, Jan, 4,926,217, Cl. 355-253.000.
Bhagwat, Anil G., 4,924,920, Cl. 141-98.000.
Christy, Kenneth G.; Cooper, Thomas F.; and Dastin, Richard, 4,925,172, Cl. 270-53.000.
Heeks, George J.; Henry, Arnold W.; and Schlueter, Edward L., Jr., 4,925,895, Cl. 524-714.000.
Jansen, Frank; and Machonkin, Mary A., 4,925,701, Cl. 427-38.000.
Kramer, William E.; Charland, Terrence D.; Forward, John E.; Burger, William R.; and Mandel, Barry P., 4,925,171, Cl. 270-53.000.
Matysek, James F.; and Smith, Charles E., 4,926,220, Cl. 355-313.000.
Tapscott, Peter A. and Courtney, Thomas P., 4,925,121, Cl. 242-57.000.
Xintec Corporation. *See*—
Rink, John L.; Rink, Dan L.; and Lee, Garrett, 4,925,265, Cl. 350-96.180.
Xoma Corporation: *See*—
Byers, Vera S.; Baldwin, Robert W.; and Scannon, Patrick J., 4,925,922, Cl. 530-391.000.
Yagasaki, Akio: *See*—
Miyamaru, Yukio; Yagasaki, Akio; Kimura, Shigeo; and Osanai, Yoshimi, 4,925,432, Cl. 474-8.000.
Yale, Ramon L., to GTE Products Corporation. Hydrolysis resistance of rare earth oxysulfide phosphors produced by the addition of zinc in synthesis. 4,925,594, Cl. 252-301.60S.
Yalpani, Manssur; and Magdzinski, Leon, to Domtar Inc. Lignin having chemically bound sulfur and phosphorus groups mainly as thiophosphate, using phosphorus pentasulfide. 4,925,923, Cl. 530-506.000.
Yamada, Akira: *See*—
Eguchi, Masaharu; and Yamada, Akira, 4,926,207, Cl. 354-484.000.
Yamada, Hideaki: *See*—
Tanihara, Masao; Yamada, Hideaki; Nakashima, Toshihide; Omura, Yoshiaki; and Takakura, Koichi, 4,925,787, Cl. 435-7.000.
Yamada, Hidetoshi: *See*—
Nagasaki, Tatsuo; Yamada, Hidetoshi; and Fujimori, Hiroyoshi, 4,926,247, Cl. 358-43.000.
Yamada, Hisao; and Yuan, Thomas, to Stemcor Corporation. Oxygen-sensing element. 4,925,609, Cl. 264-61.000.
Yamada, Kazuhiko: *See*—
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Yamada, Kiichi: *See*—
Hashiguchi, Masayuki; Yamada, Kiichi; Ito, Masayoshi; Kawano, Atsuhiro; Nishikawa, Susumu; Funakoshi, Takeshi; and Ikeda, Shuji, 4,926,333, Cl. 364-426.020.
Yamada, Koutaro: *See*—
Ohyama, Mineo; Katagiri, Shigenobu; Kozawa, Hiroomi; and Yamada, Koutaro, 4,926,200, Cl. 346-160.000.
Yamada, Shinji; and Aoki, Yutaka, to Nitto Denko Corporation. Liquid active substance slow releasing device. 4,925,730, Cl. 428-305.500.

Yamada, Takashi, to Aisin AW Co., Ltd.; and Kabushiki Kaisha Shinsangyokaihatsu. Route searching system of navigation apparatus. 4,926,336, Cl. 364-444.000.
Yamada, Teruaki; Doko, Yoshiji; and Sugiura, Kazuki, to Sumikin Chemical Co., Ltd. Method for the preparation of naphthalene dicarboxylic acids. 4,925,977, Cl. 562-416.000.
Yamada, Yoshihiro: *See*—
Hayakawa, Youichi; Kuwayama, Yoshinari; and Yamada, Yoshihiro, 4,924,731, Cl. 74-869.000.
Yamada, Yukio: *See*—
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Yamagishi, Fumio; Hasegawa, Shinya; and Ikeda, Hiroyuki, to Fujitsu Limited. Method and apparatus for light beam scanning using a hologram. 4,925,262, Cl. 350-3.710.
Yamagishi, Hideo; Yamaguchi, Minori; Asaoka, Keizo; Hiroe, Akihiko; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Multiple junction solar power generation cells. 4,926,230, Cl. 357-30.000.
Yamagishi, Wataru; and Iikawa, Tsutomu, to Fujitsu Limited. Iron-cobalt type soft magnetic material. 4,925,502, Cl. 148-311.000.
Yamaguchi, Akira, to Fuji Photo Film Co., Ltd. Laminating method of thermoplastic resin members. 4,925,507, Cl. 156-73.100.
Yamaguchi, Hiroshi; Saito, Keiya; Shimase, Akira; Haraichi, Satoshi; Aiuchi, Susumu; Akiyama, Nobuyuki; Kuniyoshi, Shinji; and Kimura, Takeshi, to Hitachi, Ltd. Method of correcting defect in circuit pattern. 4,925,755, Cl. 430-5.000.
Yamaguchi, Masahiro: *See*—
Kawanishi, Hidenori; Hayashi, Hiroshi; Morimoto, Taiji; Kaneiwa, Shinji; and Yamaguchi, Masahiro, 4,926,431, Cl. 372-45.000.
Yamaguchi, Minori: *See*—
Yamagishi, Hideo; Yamaguchi, Minori; Asaoka, Keizo; Hiroe, Akihiko; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,926,230, Cl. 357-30.000.
Yamaguchi, Tadayoshi: *See*—
Kajiyama, Koichi; Saito, Kaoru; Itakura, Yasuo; Wakabayashi, Osamu; Kowaka, Masahiko; and Yamaguchi, Tadayoshi, 4,926,428, Cl. 372-20.000.
Yamaguchi, Takashi: *See*—
Hojo, Nobuyoshi; Asai, Yoshiro; Fujioka, Motoo; Kobayashi, Naotou; and Yamaguchi, Takashi, 4,925,510, Cl. 156-92.000.
Yamaguchi, Tomoyoshi, to Japan Life Company, Ltd. Sleeping mattress. 4,924,542, Cl. 5-481.000.
Yamaha Corporation: *See*—
Kimpara, Mamoru; and Ichiki, Tetsuji, 4,924,745, Cl. 84-609.000.
Numata, Motoichi; Nozaki, Kinya; Hayashida, Hajime; and Sakai, Toshiaki, 4,924,742, Cl. 84-218.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Ito, Toshiaki; Numano, Kazuhiro; and Suzuki, Masami, 4,925,198, Cl. 280-89.000.
Suzuki, Takanori; and Takada, Kazuyoshi, 4,925,437, Cl. 474-135.000.
Yamamoto, Akira; Motoyama, Miho; Kitajima, Hiroyuki; Doi, Takashi; and Nishimura, Toshifumi, to Hitachi, Ltd. I/O control system and method. 4,926,324, Cl. 364-200.000.
Yamamoto, Hirohiko: *See*—
Ohta, Tomozo; Nakano, Hiroshi; Higashi, Kazutada; and Yamamoto, Hirohiko, 4,926,182, Cl. 342-44.000.
Yamamoto, Kunihiko; and Ishii, Yutaka, to Sharp Kabushiki Kaisha. Liquid crystal display device having a randomly determined polarity reversal frequency. 4,926,168, Cl. 340-784.000.
Yamamoto, Naofumi: *See*—
Sekizawa, Hidekazu; Saito, Tutomu; Yamamoto, Naofumi; Higuchi, Kazuhiko; and Kawakami, Haruko, 4,926,251, Cl. 358-75.000.
Yamamoto, Shizuo: *See*—
Kanda, Tetsuro; and Yamamoto, Shizuo, 4,924,966, Cl. 181-228.000.
Yamamoto, Takashi: *See*—
Ozawa, Yoshio; and Yamamoto, Takashi, 4,926,212, Cl. 355-43.000.
Yamamoto, Yoshio: *See*—
Kikuchi, Shuichi; Yamamoto, Yoshio; and Kawasaki, Yoshihiko, 4,924,999, Cl. 198-409.000.
Yamamura, Kimio, to Hudson Soft Co., Ltd. Apparatus for generating sound through low frequency and noise modulation. 4,924,744, Cl. 84-601.000.
Yamamura, Tetsushi: *See*—
Yoshida, Ryuichi; Ohnishi, Tokio; Yamamura, Tetsushi; and Nihei, Kanta, 4,924,958, Cl. 180-128.000.
Yamamuro, Mikio, to Kabushiki Kaisha Toshiba. Optical data processor. 4,926,407, Cl. 369-44.110.
Yamanaka, Toshio: *See*—
Orikasa, Tsuyoshi; Ito, Fujihiro; Suzuki, Hiroyuki; Kameyama, Makoto; Niizuma, Kiyozumi; Yoshida, Kazuyo; and Yamanaka, Toshio, 4,926,276, Cl. 360-126.000.
Yamane, Takehiko: *See*—
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Yamasaki, Yoshikiyo, to Kabushiki Kaisha Fuji Iryoki; and Kabushiki Kaisha Japan Health. High-speed emitting apparatus of mixed fluid for use in a bathtub. 4,924,535, Cl. 4-544.000.
Yamashita, Hisao: *See*—
Tachi, Takahiro; Kato, Akira; Kawagoshi, Hiroshi; Yamashita, Hisao; and Kamo, Tomoichi, 4,925,825, Cl. 502-309.000.
Yamashita, Junichi: *See*—
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.
Yamashita, Masayasu, to Pioneer Electronic Corporation. Output level control apparatus. 4,926,485, Cl. 381-107.000.
Yamashita, Shinji: *See*—
Sasaki, Masahiko; Uehara, Masao; Kanno, Masahide; Yamashita, Shinji; Sasagawa, Katsuyoshi; Hasegawa, Jun; Saito, Katsuyuki; and Uchikubo, Akinobu, 4,926,258, Cl. 358-98.000.
Yamatsuta, Kiichi, to Asahi Fiber Glass Company Limited. Method of restarting operations for manufacturing filaments of a thermoplastic material after an accident of the breaking. 4,925,471, Cl. 65-2.000.
Yamauchi, Aizo: *See*—
Suehiro, Tetsuro; Yamauchi, Aizo; Ichijo, Hisao; Nagasawa, Jun'ichi; and Aisaka, Noboru, 4,925,803, Cl. 435-288.000.
Yamauchi, Yutaka: *See*—
Ikeda, Hideo; Horiki, Yoshio; Yamauchi, Yutaka; Kasamatsu, Hiroshi; and Akao, Akimasa, 4,925,511, Cl. 156-106.000.
Yamaya, Koji: *See*—
Suzuki, Akira; Nagayama, Yoshikatsu; Sato, Michio; Yamaya, Koji; Kanbara, Koji; Hasegawa, Akira; Hayashi, Masaaki; Adachi, Hideo; and Nakamura, Takeaki, 4,924,852, Cl. 128-4.000.
Yamazaki, Kiyoshi; and Chuubachi, Muneki, to Kabushiki Kaisha Toshiba. Apparatus and method for preventing paper interference in a recording device. 4,926,265, Cl. 358-304.000.
Yamazaki, Toru, to NEC Corporation. Bi-MOS circuit capable of high speed operation with low power consumption. 4,926,069, Cl. 307-446.000.
Yanagihara, Hiromichi; Ito, Sumio; Sakurai, Kazuhiro; and Akita, Kouichi, to Toyota Jidosha Kabushiki Kaisha. Vehicle engine warming and passenger compartment heating device. 4,925,091, Cl. 237-2.00A.
Yanagita, Yoshifumi: *See*—
Takahashi, Satomi; Ueda, Yasuyoshi; Yamada, Kazuhiko; Yamada, Yukio; Yamane, Takehiko; Yanagita, Yoshifumi; Shimada, Yoshio; Watanabe, Kiyoshi; Nomura, Michio; Ohashi, Takehisa; and Inoue, Kenji, 4,925,969, Cl. 560-41.000.
Yang, Tai-Her. Detachable motor/air pump unit for a hydraulic jack adaptable for lifting and pumping functions. 4,925,158, Cl. 254-8.00B
Yang, Tai-Her. Polyphase a.c. motor supplied with power via d.c. power supply. 4,926,307, Cl. 363-161.000.
Yano, Shusuke: *See*—
Ikeda, Tamehiko; and Yano, Shusuke, 4,925,743, Cl. 428-702.000.
Yasuda, Tetsuo: *See*—
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.
Yasukawa, Saburo: *See*—
Nakashima, Keisuke; Yasukawa, Saburo; Tadauchi, Masaharu; and Hori, Yasuro, 4,926,253, Cl. 358-75.000.
Yazaki Corporation: *See*—
Endo, Takayoshi; Inaba, Shigemitsu; and Hashizawa, Shigemi, 4,925,309, Cl. 356-394.000.
Inaba, Shigemitsu; Ootaka, Kazuto; and Hashizawa, Shigemi, 4,925,402, Cl. 439-490.000.
Ohshima, Tsuyoshi; and Aoki, Kunimitsu, 4,925,272, Cl. 350-174.000.
Samejima, Masakuni; Fukuda, Kiyohito; and Matsumoto, Mitsuru, 4,925,398, Cl. 439-357.000.
Yoneyama, Norihiro, 4,924,561, Cl. 24-453.000.
Yazu, Shuji: *See*—
Fujita, Nobuhiko; Itozaki, Hideo; Tanaka, Saburo; Yazu, Shuji; and Jodai, Tetsuji, 4,925,829, Cl. 505-1.000.
Yeates, Stephen G.. *See*—
Padget, John C.; Yeates, Stephen G.; and Marsh, Mary R. R., 4,925,893, Cl. 524-337.000.
Yee, Dennis S.: *See*—
Brezoczky, Blasius; Cuomo, Jerome J.; Guarnieri, C. Richard; Ramanathan, Kumbakonam V.; Shivashankar, Srinvasrao A.; Smith, David A.; and Yee, Dennis S., 4,925,700, Cl. 427-38.000.
Yeh, Chia L.: *See*—
Shu, Joseph S.; Springer, Robert; and Yeh, Chia L., 4,926,267, Cl. 358-454.000.
Yeh, Mon-Cheng: *See*—
Ohta, Shunsaku; and Yeh, Mon-Cheng, 4,925,425, Cl. 446-185.000
Yen, Chu: *See*—
Corsetto, Craig; Hornak, Tom; Nordby, Rasmus; Walker, Rick C.; and Yen, Chu, 4,926,447, Cl. 375-120.000.
Yen, Kuo-Hsuing; Kagiwada, Reynold S.; Stokes, Robert B.; and Huang, Marshall Y., to TRW Inc. Parallel-to-serial signal processor using surface acoustic waves. 4,926,146, Cl. 333-195.000.
Yeung, Peter C.: *See*—
Jannson, Thomasz P.; Jannson, Joanna L.; and Yeung, Peter C., 4,926,412, Cl. 370-3.000.
Yim, Jeffrey B.: *See*—
Iyer, Lokanathan M.; Yim, Jeffrey B.; and Lyon, Kenneth S., 4,925,268, Cl. 350-96.290.

Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
Goldwasser, Shafi; Kilian, Joseph; Wigderson, Avi; and Ben-Or, Michael, 4,926,479, Cl. 380-23.000.

Yokogawa Electric Corporation: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 4,926,143, Cl. 331-156.000.

Yokogawa Medical Systems, Limited: *See*—
Takeuchi, Yasuhito; Higashiizumi, Takao; Ando, Motoyoshi; and Tamezumi, Yoshiro, 4,924,869, Cl. 128-660.050.

Yokokoji, Osamu; and Fukuda, Masuo, to Sankei Giken Kogyo Kabushiki Kaisha. Catalytic converter for use with internal combustion engine. 4,925,634, Cl. 422-179.000.

Yokomizo, Soamu: *See*—
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.

Yokota, Kenji, to Fuji Photo Film Co., Ltd. Synchronizing circuit for optical scanning apparatus. 4,926,263, Cl. 358-474.000.

Yokoyama, Hiroshi: *See*—
Tani, Tatsuo; Yokoyama, Hiroshi; Hayashi, Shoji; and Murofushi, Takashi, 4,926,358, Cl. 364-562.000.

Yokoyama, Shouji, to Aisin-Warner Kabushiki Kaisha; and Kabushiki Kaisha Shinsangyokaihatsu. Road image input system for vehicle control. 4,926,346, Cl. 364-518.000.

Yoneda, Minoru: *See*—
Enomoto, Akihiko; Koga, Takashi; Yoneda, Minoru; and Kobata, Hiroshi, 4,926,101, Cl. 318-374.000.

Yonescu, William: *See*—
Stern, Howard K.; Yonescu, William; and Briceno, Daniel A., 4,925,308, Cl. 356-375.000.

Yoneyama, Norihiro, to Yazaki Corporation. Single-fin fastener. 4,924,561, Cl. 24-453.000.

Yonezawa Chemical Industry Co., Ltd.: *See*—
Yonezawa, Taiji, 4,925,999, Cl. 585-469.000.

Yonezawa, Taiji, to Yonezawa Chemical Industry Co., Ltd. Method for non-pollution processing of halogenated organic compounds. 4,925,999, Cl. 585-469.000.

Yonezawa, Teruhiko: *See*—
Ichimura, Kunihiro; Yonezawa, Teruhiko; Kikuchi, Hideo; Tochizawa, Nariaki; and Hayashi, Keiichi, 4,925,770, Cl. 430-273.000.

Yoo, Inbae: *See*—
Ellenberger, John C.; Yoo, Inbae; and Burdick, Eugene V., 4,925,024, Cl. 206-328.000.

Yoon, InBae. Wound-closing device. 4,924,866, Cl. 128-335.000.

Yoon, Young R., to Daewoo Electronics Co., Ltd. Voltage switching device with plural fuses. 4,926,110, Cl. 323-345.000.

Yoshida, Hiroshi; Ikeya, Hiroshi; Kobayashi, Kunihiro; and Kondo, Yasuhiko, to Shinko Electric Co., Ltd. Hot water supply system utilizing exhaust gas of engine. 4,925,092, Cl. 237-12.30B.

Yoshida, Hiroshi: *See*—
Shimizu, Noboru; Yoshida, Hiroshi; Daigo, Hiromiki; and Matsumoto, Shoichi, 4,925,981, Cl. 562-600.000.

Yoshida, Kazuyo: *See*—
Orikasa, Tsuyoshi; Ito, Fujihiro; Suzuki, Hiroyuki; Kameyama, Makoto; Niizuma, Kiyozumi; Yoshida, Kazuyo; and Yamanaka, Toshio, 4,926,276, Cl. 360-126.000.

Yoshida, Kenji: *See*—
Fushiya, Fusao; Yoshida, Kenji; Naitoh, Akira; and Sawa, Tetsuya, 4,926,075, Cl. 310-50.000.

Yoshida Kogyo K. K.: *See*—
Matsuda, Yoshio; Horikawa, Mitsuo; and Tsubata, Noritaka, 4,924,560, Cl. 24-392.000.

Yoshida, Kousaku: *See*—
Ohno, Tamio; Yoshida, Kousaku; and Kitagawa, Masaki, 4,926,264, Cl. 358-349.000.

Yoshida, Masanobu, to Fujitsu Limited. Data read circuit for use in semiconductor memory device. 4,926,379, Cl. 365-189.010.

Yoshida, Masaru: *See*—
Isogai, Takao; and Yoshida, Masaru, 4,925,794, Cl. 435-91.000.

Yoshida, Motoaki: *See*—
Baba, Tsuyoshi; Takigawa, Akio; Hirayama, Naoto; and Yoshida, Motoaki, 4,925,737, Cl. 428-437.000.

Yoshida, Ryuichi; Ohnishi, Tokio; Yamamura, Tetsushi; and Nihei, Kanta, to Kawasaki Jukogyo Kabushiki Kaisha. Finger skirt for an air cushion vehicle. 4,924,958, Cl. 180-128.000.

Yoshida, Takashi: *See*—
Harada, Kinji; Ikeda, Kyoichi; Kuwayama, Hideki; Kobayashi, Takashi; Nishikawa, Tadashi; Watanabe, Tetsuya; and Yoshida, Takashi, 4,926,143, Cl. 331-156.000.

Yoshida, Tetsuji; Teraoka, Yoshiaki; Ogawa, Yoji; Kozaki, Ken; Hara, Kenji; Satou, Hiroshi; and Yoshino, Akira, to Sanyo Electric Co., Ltd. Speaker system. 4,926,487, Cl. 381-186.000.

Yoshihara, Kunio; Terada, Toshiyuki; Takubo, Chiaki; Koide, Nobuo; and Shimizu, Shoichi, to Kabushiki Kaisha Toshiba. Timing controller for high-speed digital integrated circuit. 4,926,451, Cl. 377-48.000.

Yoshiharu, Tetsujiro; and Kamise, Haruo, to Osaka Titanium Co., Ltd.; and Kyushu Electronic Metal Co., Ltd. Semiconductor wafer and epitaxial growth on the semiconductor wafer with autodoping control and manufacturing method therefor. 4,925,809, Cl. 437-95.000.

Yoshikawa, Kuniyoshi, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device. 4,925,807, Cl. 437-44.000.

Yoshikawa, Takeshi: *See*—
Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nihashi, Hiroyuki; and Tanaka, Tsuneo, 4,925,731, Cl. 428-336.000.

Yoshikumi, Chikao: *See*—
Oguchi, Yoshiharu; Niimura, Koichi; Fujii, Takayoshi; Fujii, Masahiko; Matsunaga, Kenichi; and Yoshikumi, Chikao, 4,925,662, Cl. 424-85.910.

Yoshikura, Hiroshi: *See*—
Inada, Yutaka; Kawasaki, Kazumasa; Nishiyama, Shigeru; and Yoshikura, Hiroshi, 4,924,710, Cl. 73-861.230.

Yoshimoto, Yuichiro: *See*—
Masuhara, Yasuhiro; Yokomizo, Soamu; Inoue, Kotaro; Uchikawa, Sadao; Aoyama, Motoo; Yamashita, Junichi; Yoshimoto, Yuichiro; Yasuda, Tetsuo; and Hirakawa, Hiromasa, 4,926,450, Cl. 376-444.000.

Yoshimura, Tsuyoshi, to Sanshin Kogyo Kabushiki Kaisha. Shift assisting device. 4,924,724, Cl. 74-473.00R.

Yoshimura, Yoshitaka; and Oura, Yasuhiro, to Takatori Corporation; and Takatori Hitech Co., Ltd. Method and apparatus for applying a protective tape on a wafer and cutting it out to shape. 4,925,515, Cl. 156-250.000.

Yoshino, Akira: *See*—
Yoshida, Tetsuji; Teraoka, Yoshiaki, Ogawa. Yoji; Kozaki, Ken; Hara, Kenji; Satou, Hiroshi; and Yoshino, Akira, 4,926,487, Cl. 381-186.000.

Yoshioka, Akiteru: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,925,948, Cl. 548-195.000.

Yoshioka, Yo, to Kabushiki Kaisha Toshiba. Digital to analog data demodulation circuit. 4,926,179, Cl. 341-144.000.

Yoshizawa, Tomimi; Ogi, Keiji; and Kamitakahara, Atushi, to Konica Corporation. Direct positive silver halide light-sensitive color photographic material. 4,925,780, Cl. 434-589.000.

Younes, Joseph F. Vertical power pulling device. 4,925,159, Cl. 254-30.000.

Young, Daru: *See*—
Crowl, Robert M.; and Young, Daru, 4,925,784, Cl. 435-5.000.

Yu, Zhou. Beverage can. 4,925,050, Cl. 220-90.200.

Yuan, Thomas: *See*—
Yamada, Hisao; and Yuan, Thomas, 4,925,609, Cl. 264-61.000.

Yuda, Lawrence F. Compact fluid operated apparatus and method. 4,924,758, Cl. 92-128.000.

Yurgevich, Howard J., to Rosby Corporation. Adapter casting and interlock. 4,925,349, Cl. 410-54.000.

Zaborowski, Thaddeus, to Schawbel Corporation, The. Portable heating appliance having fuel cartridge with on/off switch. 4,924,849, Cl. 126-409.000.

Zaghloul, Amir I.; and Sorbello, Robert M., to Communications Satellite Corporation. High-gain single- and dual-polarized antennas employing gridded printed-circuit elements. 4,926,189, Cl. 343-700.0MS.

Zaidanhojin Biseibutsu Kagaku Kenkyukai: *See*—
Umezawa, Hamao, deceased; Takeuchi, Tomio; Tatsuta, Kuniaki; Isshika, Kunio; and Imoto, Masaya, 4,925,877, Cl. 514-630.000.

Zak, Ferenc: *See*—
Bodo , Gyorgy; Knoll, Jozsef; Somfai, Eva; Virag, Sandor; and Zak, Ferenc, 4,925,878, Cl. 514-646.000.

Zawalski, Robert C., to Dixie Chemical Company. Process for preparing chlorofluorocarbons via an in situ generated activated aluminum trichloride catalyst and products resulting therefrom. 4,925,993, Cl. 570-151.000.

Zech, Kurt: *See*—
Bergendahl, Hans-Georg; Zech, Kurt; and Zisselmar, Raimund, 4,925,382, Cl. 425-367.000.

Zeck, Walter M.; and Synek, Joe, to Mobay Corporation. Triazinone synergistic compositions. 4,925,483, Cl. 71-93.000.

Zeigler, John R. Powered communication link. 4,926,158, Cl. 340-310.00A.

Zemlo, Bridgett; Petro, Richard J.; and Moore, David N., to Phoenix Closures, Inc. Dispenser closure. 4,925,067, Cl. 222-480.000.

Zen, Shinichiro: *See*—
Miyabayashi, Toshio; Sakabe, Nobuyuki; and Zen, Shinichiro, 4,925,907, Cl. 526-255.000.

Zenith Electronics Corporation: *See*—
Moore, Melvin L., 4,926,089, Cl. 313-403.000.
Tarrillo, Albert G., 4,926,098, Cl. 315-408.000.

Zentralna la Boratoria Po Elektrochimicheski Iztochnici Na Tok: *See*—
Pavlov, Dechko; Donchev, Todor V.; Nikolov, Ivan P.; Nikolova, Veneta I.; Papazov, Geno P.; and Petrov, Konstantin M., 4,925,746, Cl. 429-57.000.

Zider, Robert B., to Beta Group, The. Wide-body aircraft having efficient utilization of interior space and method therefor. 4,925,132, Cl. 244-118.100.

Zidon, Aharon: *See*—
Gotlieb, Itzhak; and Zidon, Aharon, 4,925,576, Cl. 210-781.000.

Ziethen, Rudiger; Benenowski, Sebastian; Kais, Alfred; and Nuding, Erich, to BWG Butzbacher Weichenbau GmbH. Arrangement for controlled guidance of a wheel axle or of a bogie of a rail vehicle passing over points. 4,925,135, Cl. 246-436.000.

Zikes, Bradley C.: *See*—
Donnelly, Donald E.; Zikes, Bradley C.; Moore, Dwain F.; Price, Jeffrey E.; and Toth, Bartholomew L., 4,925,386, Cl. 431-28.000.

Zimmerman, Robert C., to Hollowick, Inc. Candle lamp. 4,926,298, Cl. 362-163.000.

Zimmerman, Robert E.: *See*—
Windle, William E.; Zimmerman, Robert E.; Glotzbach, Ronald W.; and Onesti, Robert J., 4,926,331, Cl. 364-424.040.

Zimmermann, Harry, to PA-HA-GE Hutten und Giessereibedarf GmbH & Co. KG. Gas flushing brick for metallurgical vessels. 4,925,166, Cl. 266-270.000.

Zimmermann, Josef, to Hoechst Aktiengesellschaft. Spray head for the administration of a multi-component material by means of gas. 4,925,108, Cl. 239-419.300.

Zipperling Kessler & Co. (GmbH & Co.): *See*—
Wessling, Bernhard M.; and Volk, Harald K., 4,925,610, Cl. 264-101.000.

Zisselmar, Raimund: *See*—
Bergendahl, Hans-Georg; Zech, Kurt; and Zisselmar, Raimund, 4,925,382, Cl. 425-367.000.

Zoche, Gu / nter, to Huels Aktiengesellschaft. Process for the manufacture of ketoximosilanes. 4,925,964, Cl. 556-422.000.

Zorzy, John, to Gilbert Engineering Company, Inc. Coaxial transmission medium connector. 4,925,403, Cl. 439-578.000.

Zuerger, Manfred: *See*—
Huemmer, Wolfgang; Bronstert, Bernd; Littmann, Dieter; and Zuerger, Manfred, 4,925,769, Cl. 430-271.000.

Zuiss, Thomas J.: *See*—
Shirley, Thomas F., Jr.; Ruppel, John S.; Zuiss, Thomas J.; and Battin, Jeffrey A., 4,926,497, Cl. 455-67.000.

Zukowski, Charles, to Columbia University in the City of New York, The Trustees of. Time-division-multiplexed data transmission system. 4,926,423, Cl. 370-112.000.

Zwick Energy Research Organization, Inc.: *See*—
Brigham, William D.; and Zwick, Eugene B., 4,924,679, Cl. 62-50.700.

Zwick, Eugene B.: *See*—
Brigham, William D.; and Zwick, Eugene B., 4,924,679, Cl. 62-50.700.

VOL 1114 ISS 3 MY 15 1990 UMI

VOL
1114
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF MAY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ball Corporation: *See*—
Nguyen, Tuan A., Re. 33,217, Cl. 220-66.000.

Carlew Chemicals Limited: *See*—
Crocker, Zenas; and Gupta, Ved P., Re. 33,214, Cl. 523-303.000.

Crocker, Zenas; and Gupta, Ved P., to Carlew Chemicals Limited. Process for controlled mixing in a high intensity mixer. Re. 33,214, Cl. 523-303.000.

Gupta, Ved P.: *See*—
Crocker, Zenas; and Gupta, Ved P., Re. 33,214, Cl. 523-303.000.

Marocco, Norbert. Blind assembly. Re. 33,216, Cl. 160-168.100.

Nguyen, Tuan A., to Ball Corporation. Buckle resistance for metal container closures. Re. 33,217, Cl. 220-66.000.

Sweet, Paula J. Method of assembling textiles. Re. 33,215, Cl. 2-243.00R.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Brum, Roger D.: *See*—
Yates, John S.; and Brum, Roger D., B1 4,770,368, Cl. 244-1.0TD.

Burkinshaw, Jeffrey R.: *See*—
DeLong, Bradley W.; and Burkinshaw, Jeffrey R., B1 4,732,583, Cl. 55-16.000.

Bytzek, Klaus K.: *See*—
Thomey, Henry W.; Bytzek, Klaus K.; and Mevissen, Johannes H., B1 4,473,362, Cl. 474-135.000.

DeLong, Bradley W.; and Burkinshaw, Jeffrey R., to Phillips Petroleum Co. Gas separation. B1 4,732,583, 5-15-90, Cl. 55-16.000.

Lai, Stanley H.: *See*—
Liebermann, Leonard N.; and Lai, Stanley H., B1 1,032,552, Cl. 340-632.000.

Liebermann, Leonard N.; and Lai, Stanley H., to TIF Instruments. Gaseous impurity detector employing corona discharge phenomenon. B1 1,032,552, 5-15-90, Cl. 340-632.000.

Litens Automotive Inc.: *See*—
Thomey, Henry W.; Bytzek, Klaus K.; and Mevissen, Johannes H., B1 4,473,362, Cl. 474-135.000.

Mevissen, Johannes H.: *See*—
Thomey, Henry W.; Bytzek, Klaus K.; and Mevissen, Johannes H., B1 4,473,362, Cl. 474-135.000.

Phillips Petroleum Co.: *See*—
DeLong, Bradley W.; and Burkinshaw, Jeffrey R., B1 4,732,583, Cl. 55-16.000.

Southwest Aerospace Corporation: *See*—
Yates, John S.; and Brum, Roger D., B1 4,770,368, Cl. 244-1.0TD.

Thomey, Henry W.; Bytzek, Klaus K.; and Mevissen, Johannes H., to Litens Automotive Inc. Belt tensioner with variably proportional damping. B1 4,473,362, 5-15-90, Cl. 474-135.000.

TIF Instruments: *See*—
Liebermann, Leonard N.; and Lai, Stanley H., B1 1,032,552, Cl. 340-632.000.

Yates, John S.; and Brum, Roger D., to Southwest Aerospace Corporation. Turbine/air vent reeling machine. B1 4,770,368, 5-15-90, Cl. 244-1.0TD.

LIST OF DESIGN PATENTEES

Airway Industries, Inc.: *See*—
Kim, Hyun S., 307,827, Cl. D3-71.000.
Kim, Hyun S., 307,828, Cl. D3-71.000.

Airwick Industries, Inc.: *See*—
Fish, Darrell D., 307,938, Cl. D23-367.000.

Aizawa, Toshio: *See*—
Tominaga, Tomonori; Aizawa, Toshio; and Shinya, Satoshi, 307,910, Cl. D14-299.000.

Alber, John I. Costume mask. 307,954, 5-15-90, Cl. D29-17.000.

Almet/Lawnlite, Inc.: *See*—
Corning, Donald D.; and Hill, Andrew C., 307,835, Cl. D6-364.000.

Amko Plastics Inc.: *See*—
Makrauer, George A.; and Graham, Donald R., 307,825, Cl. D3-42.000.
Makrauer, George A., 307,826, Cl. D3-42.000.

Andersen, Teija: *See*—
Parri, Marja; and Andersen, Teija, 307,815, Cl. D1-127.000.

Aoki, Sanae; and Konoike, Tsunataka, to Tanaka Manufacturing Company Limited. Can holder. 307,850, 5-15-90, Cl. D7-624.000.

Armstrong, Thomas B.: *See*—
Rosa, Richard; Armstrong, Thomas B.; Bacigalupi, David, III; and Cunninghame-Blank, Deborah, 307,959, Cl. D32-17.000.

AST Research, Inc.: *See*—
Toedter, Peter K., 307,891, Cl. D14-100.000.

Bacigalupi, David, III: *See*—
Rosa, Richard; Armstrong, Thomas B.; Bacigalupi, David, III; and Cunninghame-Blank, Deborah, 307,959, Cl. D32-17.000.

Back, Karl J., to Stretch Machinery AB. Pallet. 307,966, 5-15-90, Cl. D34-38.000.

Baer, Kenneth. Countertop water filter. 307,933, 5-15-90, Cl. D23-209.000.

Baldwin, Blair F.; and Lamson, William C., to Bexel Corporation. Emergency umbrella. 307,818, 5-15-90, Cl. D3-5.000.

Barr, Lance N., to Nintendo of America, Inc. Joy stick controller for video game. 307,921, 5-15-90, Cl. D21-13.000.

Baus, Andre E. J.: *See*—
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,880, Cl. D12-147.000.
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,881, Cl. D12-147.000.

Beaumont, Thomas G., to Motorola, Inc. Two-way mobile radio. 307,906, 5-15-90, Cl. D14-157.000.

Bexel Corporation: *See*—
Baldwin, Blair F.; and Lamson, William C., 307,818, Cl. D3-5.000.

Bieganski, Barbara J. Paper cup dispenser. 307,842, 5-15-90, Cl. D6-516.000.

Bloom, David H.: *See*—
Hart, Richard S.; Bloom, David H.; and Bransky, Jeffery D., 307,873, Cl. D10-94.000.

Boag, Nigel, to Masco Building Products Corp. Key blank. 307,863, 5-15-90, Cl. D8-347.000.

Bouilhet, Henry, to Societe Orfevrerie Christofle. Handle for an article of flatware. 307,856, 5-15-90, Cl. D7-653.000.

Box, Thomas, to Spectrum International, Inc. Beverage case. 307,969, 5-15-90, Cl. D34-40.000.

Bransky, Jeffery D.: *See*—
Hart, Richard S.; Bloom, David H.; and Bransky, Jeffery D., 307,873, Cl. D10-94.000.

Brown, Michael: *See*—
Helstab, Edmond J.; and Brown, Michael, 307,905, Cl. D14-151.000.

Browns Holdings Limited: *See*—
Davey, Andrew P., 307,903, Cl. D14-149.000.

Bruni, James G.: *See*—
Sauter, Bruce M.; and Bruni, James G., 307,964, Cl. D32-55.000.

Buckley, Galen L.; Selesky, Kenneth G.; and Houston, Daniel M., to Pyramid Optical. Prism assembly. 307,914, 5-15-90, Cl. D16-137.000.

Busse, Rido, to SOEHNLE-Waagen GmbH & Co. Scale. 307,872, 5-15-90, Cl. D10-92.000.

Cal-Comp Electronics, Inc.: *See*—
Chen, Ray, 307,917, Cl. D18-7.000.

California Optical Leather, Inc.: *See*—
Marks, Robert J., 307,822, Cl. D3-34.000.

Carr, Jeff A. Bracket for supporting a mounting bar on a vehicle. 307,883, 5-15-90, Cl. D12-157.000.

Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 307,951, Cl. D28-77.000.
Cassai, Henry J.; and Cassai, Gino H., 307,952, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 307,951, 5-15-90, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 307,952, 5-15-90, Cl. D28-77.000.

CertainTeed Corporation: *See*—
Westphal, Dennis; and Piles, Jonathan, 307,944, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,945, Cl. D25-124.000.

CertainTeed Corportation: *See*—
Westphal, Dennis; and Piles, Jonathan, 307,943, Cl. D25-124.000.

Chen, Ray, to Cal-Comp Electronics, Inc. Calculator or similar article. 307,917, 5-15-90, Cl. D18-7.000.

Ching, Larry K. W., Jr.; and Puester, Neil, to Gates Energy Products, Inc. Battery. 307,886, 5-15-90, Cl. D13-103.000.

Ciccone, Theodore P., III, to Stanley Works, The. Ultrasonic measuring tool. 307,871, 5-15-90, Cl. D10-70.000.

CKD Kabushiki Kaisha. *See*—
Ogasawara, Yoshinari; and Miyake, Kouichi, 307,913, Cl. D15-150.000.

Clark, Bruce D. Drink cup holder for arena seats. 307,852, 5-15-90, Cl. D7-620.000.

Clark, Thomas R.: *See*—
Dobies, Mark A.; Repasky, Carol M.; Clark, Thomas R.; Kobayashi, Masaharu; and Tejima, Keisuke, 307,909, Cl. D14-258.000.

Conner, Audri J.; and Guzowski, Christopher P., to Kraft, Inc. Packaging container. 307,865, 5-15-90, Cl. D9-352.000.

Cook, Wayne W., Jr. Tape cassette carrying case. 307,823, 5-15-90, Cl. D3-35.000.

Corning, Donald D.; and Hill, Andrew C., to Almet/Lawnlite, Inc. Outdoor chair frame. 307,835, 5-15-90, Cl. D6-364.000.

Cowan, Murray L., to Textron, Inc. Expansion bracelet. 307,876, 5-15-90, Cl. D11-25.000.

Crane, Jewel A. Toilet bowl brush. 307,831, 5-15-90, Cl. D4-131.000.

Creations Dina Inc.: *See*—
Tyberg, Theodore, 307,853, Cl. D7-626.000.

Cunninghame-Blank, Deborah: *See*—
Rosa, Richard; Armstrong, Thomas B.; Bacigalupi, David, III; and Cunninghame-Blank, Deborah, 307,959, Cl. D32-17.000.

Curtis, James H.: *See*—
Siddoway, Craig F.; Curtis, James H.; and Reitz, Christopher J., 307,907, Cl. D14-225.000.

D. B. Smith and Company, Inc.: *See*—
Trefzger, Edwin W., 307,935, Cl. D23-226.000.

Dallas Corporation: *See*—
Hewitt, Lew V., 307,940, Cl. D25-48.000.

Daniel, Barry S. Roll-up pick-up cargo cover. 307,882, 5-15-90, Cl. D12-156.000.

Davey, Andrew P., to Browns Holdings Limited. Telephone set. 307,903, 5-15-90, Cl. D14-149.000.

Dicon Systems Limited: *See*—
Mallory, John, 307,874, Cl. D10-106.000.
Mallory, John, 307,875, Cl. D10-106.000.

Dobies, Mark A.; Repasky, Carol M.; Clark, Thomas R.; Kobayashi, Masaharu; and Tejima, Keisuke, to Ford Motor Company. Front panel for a compact disc player. 307,909, 5-15-90, Cl. D14-258.000.

Dooley, Patricia A.: *See*—
Ullom, Kathleen K.; and Dooley, Patricia A., 307,820, Cl. D3-28.000.

Doran, Brian A.; and Redkey, Robert H., to Redkey, Robert H. Golf putter head. 307,931, 5-15-90, Cl. D21-215.000.

Doucette, Kenneth E.; and Jennings, Chris W. Floating cooler chest. 307,854, 5-15-90, Cl. D7-605.000.

Dupont, John J., to Skytrader Corporation. Aircraft. 307,885, 5-15-90, Cl. D12-344.000.

Eastman Kodak Company: *See*—
Leonard, Bruce A., 307,916, Cl. D16-209.000.

Eberhardt, Peter. Hanger or the like. 307,832, 5-15-90, Cl. D6-317.000.

Electec, Ltd.: *See*—
Hyde, Douglas, 307,887, Cl. D13-139.000.

Eley, David L.; Plummer, Jeffrey J.; and Gill, George P., to Greenlee Textron Inc. Dual capstan electric puller. 307,965, 5-15-90, Cl. D34-33.000.

Elgin Sweeper Company: *See*—
Martinez, Mario J.; Parsons, Roger B.; and Lee, William A., 307,960, Cl. D32-28.000.

Elleance Ltd.: *See*—
McCready, Karen, 307,953, Cl. D28-85.000.

Ellis, Todd D., to International Consumer Brands, Inc. Grass trimmer 307,860, 5-15-90, Cl. D8-8.000.

Everts, Robert G., to Inertia Dynamics Corp. Suction cleaner. 307,956, 5-15-90, Cl. D32-15.000.

Fallon, Mary C. Twin baby carrier. 307,821, 5-15-90, Cl. D3-31.000.

Favaretto, Paolo. Chair. 307,836, 5-15-90, Cl. D6-372.000.

Fish, Darrell D., to Airwick Industries, Inc. Dispenser for an air freshener. 307,938, 5-15-90, Cl. D23-367.000.

Fish, Thomas E., Jr., to Little Tikes Company, The. Construction toy gable block. 307,924, 5-15-90, Cl. D21-108.000.

Flambeau Corporation: *See*—
Lanius, Charles A., 307,967, Cl. D34-40.000.

Ford Motor Company: *See*—
Dobies, Mark A.; Repasky, Carol M.; Clark, Thomas R.; Kobayashi, Masaharu; and Tejima, Keisuke, 307,909, Cl. D14-258.000.

Fortune, William S. Desoldering tool or the like. 307,958, 5-15-90, Cl. D32-17.000.

Francis, Judy. Victorian keepsake ornament. 307,948, 5-15-90, Cl. D28-5.000.

Galante, Richard L.: *See*—
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,880, Cl. D12-147.000.
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,881, Cl. D12-147.000.

Gates Energy Products, Inc.: *See*—
Ching, Larry K. W., Jr.; and Puester, Neil, 307,886, Cl. D13-103.000.

Gedan, Robert: *See*—
Irgang, Myron; and Gedan, Robert, 307,870, Cl. D10-44.000.

General Company Limited: *See*—
Goda, Hiroyuki, 307,918, Cl. D18-12.000.

Giambrone, Harry J., to Spalding & Evenflo Companies, Inc. Baby carriage. 307,879, 5-15-90, Cl. D12-129.000.

Gill, George P.: *See*—
Eley, David L.; Plummer, Jeffrey J.; and Gill, George P., 307,965, Cl. D34-33.000.

Gillette Company, The: *See*—
Poisson, Norman D.; Herbst, Walter B.; and Peterson, Kurt, 307,919, Cl. D19-55.000.

Goda, Hiroyuki, to General Company Limited. Cassette for a thermicly printing machine or the like. 307,918, 5-15-90, Cl. D18-12.000.

Gold Star Co., Ltd.: *See*—
Shim, Kue S., 307,898, Cl. D14-135.000.
Shim, Kue S., 307,902, Cl. D14-135.000.
Yang, Doo S., 307,900, Cl. D14-135.000.
Yang, Doo S., 307,901, Cl. D14-135.000.

Gompes, Simon: *See*—
Rylands, Patrick, 307,925, Cl. D21-136.000.

Goodyear Tire & Rubber Company, The: *See*—
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,880, Cl. D12-147.000.
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,881, Cl. D12-147.000.

Graco Inc.: *See*—
Murphy, Edward P., 307,830, Cl. D4-114.000

Graham, Donald R.: *See*—
Makrauer, George A.; and Graham, Donald R., 307,825, Cl. D3-42.000.

Grant, Kjell. Chair. 307,837, 5-15-90, Cl. D6-380.000.

Greenlee Textron Inc.: *See*—
Eley, David L.; Plummer, Jeffrey J.; and Gill, George P., 307,965, Cl. D34-33.000.

Grome, Donald C.; Myers, Terry L.; Ryan, Thomas J.; and Wilkinson, Kenneth E., to Proctor-Silex, Inc. Coffee maker. 307,857, 5-15-90, Cl. D7-317.000.

Guzowski, Christopher P.: *See*—
Conner, Audri J.; and Guzowski, Christopher P., 307,865, Cl. D9-352.000.

Hagen, Bill: *See*—
Wells, Gae; and Hagen, Bill, 307,947, Cl. D27-113.000.

Hanifl, Paul H.; Newton, John J., Jr.; and Mosior, Donald J., to Sage Products, Inc. Combined needle disposal container and glove dispenser. 307,841, 5-15-90, Cl. D6-515.000.

Harden, Richard W., Jr.: *See*—
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,880, Cl. D12-147.000.
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,881, Cl. D12-147.000.

Hart, Richard S.; Bloom, David H.; and Bransky, Jeffery D., to Sunbeam Corporation. Domestic scale weight display module. 307,873, 5-15-90, Cl. D10-94.000.

Hashiba, Takeo, to Sharp Corporation. Television set. 307,897, 5-15-90, Cl. D14-133.000.

Hasuike, Makio. Suit-case. 307,829, 5-15-90, Cl. D3-76.000.

VOL 1114 ISS 3 MY 15 1990 UMI

Helstab, Edmond J.; and Brown, Michael, to Northern Telecom Limited. Base for a telephone set. 307,905, 5-15-90, Cl. D14-151.000.
Herbst, Walter B.: *See—*
Poisson, Norman D.; Herbst, Walter B.; and Peterson, Kurt, 307,919, Cl. D19-55.000.
Hewitt, Lew V., to Dallas Corporation. Revolving door enclosure. 307,940, 5-15-90, Cl. D25-48.000.
Hill, Andrew C.: *See—*
Corning, Donald D.; and Hill, Andrew C., 307,835, Cl. D6-364.000.
Hirano, Yukio; Narikawa, Tadakazu; and Yamada, Junichi, to Matsushita Electric Industrial Co., Ltd. Air cleaner. 307,936, 5-15-90, Cl. D23-364.000.
Hird, Nancy C. Child's car seat slip cover. 307,847, 5-15-90, Cl. D6-611.000.
Home & Roam Leisure Inc.: *See—*
Laputka, John T., 307,939, Cl. D25-2.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Yoshida, Isao; and Maeda, Joji, 307,912, Cl. D15-12.000.
Horie, Hideyuki, to Toshiba Corporation. Word processor having function of electronic computer. 307,892, 5-15-90, Cl. D14-106.000.
Houston, Daniel M.: *See—*
Buckley, Galen L.; Selesky, Kenneth G.; and Houston, Daniel M., 307,914, Cl. D16-137.000.
Howell, Allan M. Lift tab can opener. 307,861, 5-15-90, Cl. D8-40.000.
Howell, Edward B. Hot water tank helical coil cleaner. 307,961, 5-15-90, Cl. D32-35.000.
Hybrinetics, Inc.: *See—*
Rosa, Richard; Armstrong, Thomas B.; Bacigalupi, David, III, and Cunninghame-Blank, Deborah, 307,959, Cl. D32-17.000.
Hyde, Douglas, to Electec, Ltd. Receptacle plug combination. 307,887, 5-15-90, Cl. D13-139.000.
Hystar Aerospace Development Corporation: *See—*
Ninkovich, George, 307,884, Cl. D12-325.000.
Inertia Dynamics Corp.: *See—*
Everts, Robert G., 307,956, Cl. D32-15.000.
International Consumer Brands, Inc.: *See—*
Ellis, Todd D., 307,860, Cl. D8-8.000.
Irgang, Myron; and Gedan, Robert. Novelty timing device. 307,870, 5-15-90, Cl. D10-44.000.
Ishida, Katsuhiro, to Sharp Corporation. Programming device for sequence controller. 307,888, 5-15-90, Cl. D14-100.000.
Jennings, Chris W.: *See—*
Doucette, Kenneth E.; and Jennings, Chris W., 307,854, Cl. D7-605.000.
Johnson, Roy L., Jr., to RBI Royal Builders, Inc. Shelf unit. 307,839, 5-15-90, Cl. D6-450.000.
Johnston, Jimmie L. Display console. 307,838, 5-15-90, Cl. D6-421.000.
Kabushiki Kaisha Tominaga Jyushi Kogyosho: *See—*
Tominaga, Kazutoshi, 307,955, Cl. D30-112.000.
Katayama, Takao: *See—*
Miyawaki, Manabu; Katayama, Takao; Takakura, Jinnosuke; Sadagane, Hirofumi; and Katoh, Hisato, 307,911, Cl. D15-14.000.
Kato, Arthur K.; Leonard, Vurnen J.; Sakurai, Osamu; and Koizumi, Osamu, to Minnesota Mining and Manufacturing Company. Magnetic recording disk cartridge. 307,893, 5-15-90, Cl. D14-114.000.
Katoh, Hisato: *See—*
Miyawaki, Manabu; Katayama, Takao; Takakura, Jinnosuke; Sadagane, Hirofumi; and Katoh, Hisato, 307,911, Cl. D15-14.000.
Keller, H. Thomas, to Kosalco, Inc. Etagere. 307,840, 5-15-90, Cl. D6-479.000.
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 307,827, 5-15-90, Cl. D3-71.000.
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 307,828, 5-15-90, Cl. D3-71.000.
Kim, Young, to Spectrum Concepts, Inc. Hand held data entry terminal. 307,890, 5-15-90, Cl. D14-100.000.
Kitagawa, Ryunosuke; and Shimizu Osamu, to Sharp Corporation. Television set. 307,895, 5-15-90, Cl. D14-126.000.
Kitagawa, Ryunosuke; and Shimizu, Osamu, to Sharp Corporation. Television set. 307,896, 5-15-90, Cl. D14-126.000.
Kiyokane, Jerrilyn C., to Namkung Promotions, Inc. Confection mold. 307,848, 5-15-90, Cl. D7-676.000.
Kiyokane, Jerrilyn C., to Namkung Promotions, Inc. Confection mold. 307,849, 5-15-90, Cl. D7-676.000.
Kobayashi, Masaharu: *See—*
Dobies, Mark A.; Repasky, Carol M.; Clark, Thomas R.; Kobayashi, Masaharu; and Tejima, Keisuke, 307,909, Cl. D14-258.000.
Kohler Co.: *See—*
Sauter, Bruce M.; and Bruni, James G., 307,964, Cl. D32-55.000.
Koizumi, Osamu: *See—*
Kato, Arthur K.; Leonard, Vurnen J.; Sakurai, Osamu; and Koizumi, Osamu, 307,893, Cl. D14-114.000.
Konoike, Tsunataka: *See—*
Aoki, Sanae; and Konoike, Tsunataka, 307,850, Cl. D7-624.000.
Kosalco, Inc.: *See—*
Keller, H. Thomas, 307,840, Cl. D6-479.000.
Kraft, Inc.: *See—*
Conner, Audri J.; and Guzowski, Christopher P., 307,865, Cl. D9-352.000.
Kubota, Ltd.: *See—*
Miyawaki, Manabu; Katayama, Takao; Takakura, Jinnosuke; Sadagane, Hirofumi; and Katoh, Hisato, 307,911, Cl. D15-14.000.
Kuester, William F., III, to Pelco. Camera housing. 307,915, 5-15-90, Cl. D16-203.000.
Lamson, William C.: *See—*
Baldwin, Blair F.; and Lamson, William C., 307,818, Cl. D3-5.000.
Lanius, Charles A., to Flambeau Corporation. Tool box tray. 307,967, 5-15-90, Cl. D34-40.000.
Laputka, John T., to Home & Roam Leisure Inc. Swimming pool. 307,939, 5-15-90, Cl. D25-2.000.
Lechner, Werner K., to Mercedez-Benz Do Brasil S.A. Truck cab body. 307,878, 5-15-90, Cl. D12-96.000.
Lee, William A.: *See—*
Martinez, Mario J.; Parsons, Roger B.; and Lee, William A., 307,960, Cl. D32-28.000.
Leonard, Bruce A., to Eastman Kodak Company. Still camera with built-in flash unit. 307,916, 5-15-90, Cl. D16-209.000.
Leonard, Vurnen J.: *See—*
Kato, Arthur K.; Leonard, Vurnen J.; Sakurai, Osamu; and Koizumi, Osamu, 307,893, Cl. D14-114.000.
Lewis, Kit R. Liquid spray container. 307,867, 5-15-90, Cl. D9-424.000.
Light, Walter M., Jr. Scoop. 307,855, 5-15-90, Cl. D7-691.000.
Little Tikes Company, The: *See—*
Fish, Thomas E., Jr., 307,924, Cl. D21-108.000.
Maeda, Joji: *See—*
Yoshida, Isao; and Maeda, Joji, 307,912, Cl. D15-12.000.
Maki, Isao, to Soko Co., Ltd. Clip clothes hanger. 307,833, 5-15-90, Cl. D6-326.000.
Makrauer, George A.; and Graham, Donald R., to Amko Plastics Inc. Tote bag. 307,825, 5-15-90, Cl. D3-42.000.
Makrauer, George A., to Amko Plastics Inc. Tote bag. 307,826, 5-15-90, Cl. D3-42.000.
Mallory, John, to Dicon Systems Limited. Door/window intrusion detector transmitter. 307,874, 5-15-90, Cl. D10-106.000.
Mallory, John, to Dicon Systems Limited. Perimeter intrusion detector transmitter. 307,875, 5-15-90, Cl. D10-106.000.
Marks, Robert J., to California Optical Leather, Inc. Spectacle case for attachment to a sunvisor. 307,822, 5-15-90, Cl. D3-34.000.
Martinez, Mario J.; Parsons, Roger B.; and Lee, William A., to Elgin Sweeper Company. Control panel for street sweeper. 307,960, 5-15-90, Cl. D32-28.000.
Masco Building Products Corp.: *See—*
Boag, Nigel, 307,863, Cl. D8-347.000.
Masotta, James. Multipurpose scraper. 307,862, 5-15-90, Cl. D8-45.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Hirano, Yukio; Narikawa, Tadakazu; and Yamada, Junichi, 307,936, Cl. D23-364.000.
McCready, Karen, to Elleance Ltd. Lipstick case with deco band. 307,953, 5-15-90, Cl. D28-85.000.
Meisner, Edward H., to Voit Sports Incorporated. Exercise bicycle. 307,928, 5-15-90, Cl. D21-194.000.
Mercedez-Benz Do Brasil S.A.: *See—*
Lechner, Werner K., 307,878, Cl. D12-96.000.
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., to Goodyear Tire & Rubber Company, The. Tire. 307,880, 5-15-90, Cl. D12-147.000.
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., to Goodyear Tire & Rubber Company, The. Tire. 307,881, 5-15-90, Cl. D12-147.000.
Minnesota Mining and Manufacturing Company: *See—*
Kato, Arthur K.; Leonard, Vurnen J.; Sakurai, Osamu; and Koizumi, Osamu, 307,893, Cl. D14-114.000.
Miskinis, Robert J. Laboratory flask holder. 307,869, 5-15-90, Cl. D9-455.000.
Mr. Longarm, Inc.: *See—*
Newman, Robert D., Sr.; and Newman, Robert D., Jr., 307,963, Cl. D32-41.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Tominaga, Tomonori; Aizawa, Toshio; and Shinya, Satoshi, 307,910, Cl. D14-299.000.
Miyake, Kouichi: *See—*
Ogasawara, Yoshinari; and Miyake, Kouichi, 307,913, Cl. D15-150.000.
Miyawaki, Manabu; Katayama, Takao; Takakura, Jinnosuke; Sadagane, Hirofumi; and Katoh, Hisato, to Kubota, Ltd. Walking operator type lawn mower. 307,911, 5-15-90, Cl. D15-14.000.
Mockovak, Robert A., to Remington Products, Inc. Lint remover. 307,957, 5-15-90, Cl. D28-50.000.
Morrissey, William J. Cutter. 307,859, 5-15-90, Cl. D8-98.000.
Mosior, Donald J.: *See—*
Hanifl, Paul H.; Newton, John J., Jr.; and Mosior, Donald J., 307,841, Cl. D6-515.000.
Motorola, Inc.: *See—*
Beaumont, Thomas G., 307,906, Cl. D14-157.000.
Siddoway, Craig F.; Curtis, James H.; and Reitz, Christopher J., 307,907, Cl. D14-225.000.
Murphy, Edward P., to Graco Inc. Pressure-fed paintbrush head. 307,830, 5-15-90, Cl. D4-114.000.
Myers, Terry L.: *See—*
Grome, Donald C.; Myers, Terry L.; Ryan, Thomas J.; and Wilkinson, Kenneth E., 307,857, Cl. D7-317.000.
Namkung Promotions, Inc.: *See—*
Kiyokane, Jerrilyn C., 307,848, Cl. D7-676.000.
Kiyokane, Jerrilyn C., 307,849, Cl. D7-676.000.
Narikawa, Tadakazu: *See—*
Hirano, Yukio; Narikawa, Tadakazu; and Yamada, Junichi, 307,936, Cl. D23-364.000.
Neal, William. Portable receptacle for accommodating rigid refuse bags. 307,968, 5-15-90, Cl. D34-40.000.

Newman, Robert D., Jr.: *See—*
Newman, Robert D., Sr.; and Newman, Robert D., Jr., 307,963, Cl. D32-41.000.
Newman, Robert D., Sr.; and Newman, Robert D., Jr., to Mr. Longarm, Inc. Squeegee handle. 307,963, 5-15-90, Cl. D32-41.000.
Newton, John J., Jr.: *See—*
Hanifl, Paul H.; Newton, John J., Jr.; and Mosior, Donald J., 307,841, Cl. D6-515.000.
Ninkovich, George, to Hystar Aerospace Development Corporation. Air vehicle. 307,884, 5-15-90, Cl. D12-325.000.
Nintendo of America, Inc.: *See—*
Barr, Lance N., 307,921, Cl. D21-13.000.
Nippon Seiko K.K.: *See—*
Sudoh, Kunio; and Nogami, Kohei, 307,834, Cl. D6-333.000.
Nogami, Kohei: *See—*
Sudoh, Kunio; and Nogami, Kohei, 307,834, Cl. D6-333.000.
Northern Telecom Limited: *See—*
Helstab, Edmond J.; and Brown, Michael, 307,905, Cl. D14-151.000.
Pushelberg, Floyd J., 307,908, Cl. D14-240.000.
Ogasawara, Yoshinari; and Miyake, Kouichi, to CKD Kabushiki Kaisha. Lubricator. 307,913, 5-15-90, Cl. D15-150.000.
Omdoll, Paul A., to San Jamar, Inc. Toilet tissue dispenser. 307,845, 5-15-90, Cl. D6-520.000.
Orly International Inc.: *See—*
Pink, Jeff, 307,866, Cl. D9-413.000.
OY Karl Fazer AB: *See—*
Parri, Marja; and Andersen, Teija, 307,815, Cl. D1-127.000.
Packaging Resources Incorporated: *See—*
Van Sumeren, Mark W., 307,868, Cl. D9-428.000.
Palmer, Leonard H.: *See—*
Sokol, Howard; Palmer, Leonard H.; and Salvesen, Robert H., 307,930, Cl. D21-213.000.
Paramount Pictures Corporation: *See—*
Probert, Andrew G., 307,923, Cl. D21-87.000.
Parkerson, Charles R. Golfer's aiming aid for a tee. 307,929, 5-15-90, Cl. D21-208.000.
Parri, Marja; and Andersen, Teija, to OY Karl Fazer AB. Bar of chocolate. 307,815, 5-15-90, Cl. D1-127.000.
Parshall, Belinda K. Combined cleaning fluid spray container and rolled towel support. 307,843, 5-15-90, Cl. D6-521.000.
Parsons, Roger B.: *See—*
Martinez, Mario J.; Parsons, Roger B.; and Lee, William A., 307,960, Cl. D32-28.000.
Pease Industries, Inc.: *See—*
Shaffer, B. Jeremiah, 307,942, Cl. D25-103.000.
Pelco: *See—*
Kuester, William F., III, 307,915, Cl. D16-203.000.
Peters, Gerald A. Embroidery work station. 307,819, 5-15-90, Cl. D3-25.000.
Peterson, Kurt: *See—*
Poisson, Norman D.; Herbst, Walter B.; and Peterson, Kurt, 307,919, Cl. D19-55.000.
Phelps, Pamela; and White, Roberta Wall hamper. 307,962, 5-15-90, Cl. D32-37.000.
Piles, Jonathan: *See—*
Westphal, Dennis; and Piles, Jonathan, 307,943, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,944, Cl. D25-124.000.
Westphal, Dennis; and Piles, Jonathan, 307,945, Cl. D25-124.000.
Pink, Jeff, to Orly International Inc. Bottle with cap. 307,866, 5-15-90, Cl. D9-413.000.
Plummer, Jeffrey J.: *See—*
Eley, David L.; Plummer, Jeffrey J.; and Gill, George P., 307,965, Cl. D34-33.000.
Poisson, Norman D.; Herbst, Walter B.; and Peterson, Kurt, to Gillette Company, The. Grip portion for a writing instrument. 307,919, 5-15-90, Cl. D19-55.000.
Polidoros, Nicolas. Ice bucket holder. 307,851, 5-15-90, Cl. D7-601.000.
Probert, Andrew G., to Paramount Pictures Corporation. Toy spaceship. 307,923, 5-15-90, Cl. D21-87.000.
Proctor-Silex, Inc.: *See—*
Grome, Donald C.; Myers, Terry L.; Ryan, Thomas J.; and Wilkinson, Kenneth E., 307,857, Cl. D7-317.000.
Puester, Neil: *See—*
Ching, Larry K. W., Jr.; and Puester, Neil, 307,886, Cl. D13-103.000.
Pushelberg, Floyd J., to Northern Telecom Limited. Housing for telephonic equipment. 307,908, 5-15-90, Cl. D14-240.000.
Pyramid Optical: *See—*
Buckley, Galen L.; Selesky, Kenneth G.; and Houston, Daniel M., 307,914, Cl. D16-137.000.
RBI Royal Builders, Inc.: *See—*
Johnson, Roy L., Jr., 307,839, Cl. D6-450.000.
Reckitt & Colman Products Limited: *See—*
Verebelyi, Nicholas B., 307,934, Cl. D23-208.000.
Redkey, Robert H.: *See—*
Doran, Brian A.; and Redkey, Robert H., 307,931, Cl. D21-215.000.
Reed, Gerald D. Fishing bobber. 307,932, 5-15-90, Cl. D22-146.000.
Reitz, Christopher J.: *See—*
Siddoway, Craig F.; Curtis, James H.; and Reitz, Christopher J., 307,907, Cl. D14-225.000.
Remington Products, Inc.: *See—*
Mockovak, Robert A., 307,957, Cl. D28-50.000.
Repasky, Carol M.: *See—*
Dobies, Mark A.; Repasky, Carol M.; Clark, Thomas R.; Kobayashi, Masaharu; and Tejima, Keisuke, 307,909, Cl. D14-258.000.
Romeka, Philip. Toilet paper holder. 307,844, 5-15-90, Cl. D6-523.000.
Rosa, Richard; Armstrong, Thomas B.; Bacigalupi, David, III; and Cunninghame-Blank, Deborah, to Hybrinetics, Inc. Garment steamer. 307,959, 5-15-90, Cl. D32-17.000.
Rose, Dana C. Game board. 307,922, 5-15-90, Cl. D21-27.000.
Rudinski, Robert S. Combined drapery rod and bracket. 307,941, 5-15-90, Cl. D25-55.000.
Ryan, Thomas J.: *See—*
Grome, Donald C.; Myers, Terry L.; Ryan, Thomas J.; and Wilkinson, Kenneth E., 307,857, Cl. D7-317.000.
Rylands, Patrick, to Gompes, Simon; and Schpektor, Herman. Toy car. 307,925, 5-15-90, Cl. D21-136.000.
Sadagane, Hirofumi: *See—*
Miyawaki, Manabu; Katayama, Takao; Takakura, Jinnosuke; Sadagane, Hirofumi; and Katoh, Hisato, 307,911, Cl. D15-14.000.
Saeger, Kathryn L. Tooth pillow. 307,846, 5-15-90, Cl. D6-597.000.
Sage Products, Inc.: *See—*
Hanifl, Paul H.; Newton, John J., Jr.; and Mosior, Donald J., 307,841, Cl. D6-515.000.
Sakaguchi, Hiroshi; and Takahashi, Toshiya, to Sharp Corporation. Computer. 307,889, 5-15-90, Cl. D14-100.000.
Sakurai, Osamu: *See—*
Kato, Arthur K.; Leonard, Vurnen J.; Sakurai, Osamu; and Koizumi, Osamu, 307,893, Cl. D14-114.000.
Salvesen, Robert H.: *See—*
Sokol, Howard; Palmer, Leonard H.; and Salvesen, Robert H., 307,930, Cl. D21-213.000.
San Jamar, Inc.: *See—*
Omdoll, Paul A., 307,845, Cl. D6-520.000.
Satake, Kouji; and Sato, Tokuko, to Sharp Corporation. Television set. 307,899, 5-15-90, Cl. D14-133.000.
Sato, Tokuko: *See—*
Satake, Kouji; and Sato, Tokuko, 307,899, Cl. D14-133.000.
Sauter, Bruce M.; and Bruni, James G., to Kohler Co. Sink insert. 307,964, 5-15-90, Cl. D32-55.000.
Schneider, Jules, to What's What, Inc. Shoe sole. 307,816, 5-15-90, Cl. D2-320.000.
Schneider, Jules, to What's What, Inc. Shoe sole. 307,817, 5-15-90, Cl. D2-320.000.
Schpektor, Herman: *See—*
Rylands, Patrick, 307,925, Cl. D21-136.000.
Sekiguchi, Kazuhiko, to Zebra Co., Ltd. Protective end cap for a ball point pen. 307,920, 5-15-90, Cl. D19-57.000.
Selesky, Kenneth G.: *See—*
Buckley, Galen L.; Selesky, Kenneth G.; and Houston, Daniel M., 307,914, Cl. D16-137.000.
Shaffer, B. Jeremiah, to Pease Industries, Inc. Decorative glass panel. 307,942, 5-15-90, Cl. D25-103.000.
Sharp Corporation: *See—*
Hashiba, Takeo, 307,897, Cl. D14-133.000.
Ishida, Katsuhiro, 307,888, Cl. D14-100.000.
Kitagawa, Ryunosuke; and Shimizu Osamu, 307,895, Cl. D14-126.000.
Kitagawa, Ryunosuke; and Shimizu, Osamu, 307,896, Cl. D14-126.000.
Sakaguchi, Hiroshi; and Takahashi, Toshiya, 307,889, Cl. D14-100.000.
Satake, Kouji; and Sato, Tokuko, 307,899, Cl. D14-133.000.
Shim, Kue S., to Gold Star Co., Ltd. Video cassette recorder. 307,898, 5-15-90, Cl. D14-135.000.
Shim, Kue S., to Gold Star Co., Ltd. Video cassette recorder. 307,902, 5-15-90, Cl. D14-135.000.
Shimizu Osamu: *See—*
Kitagawa, Ryunosuke; and Shimizu Osamu, 307,895, Cl. D14-126.000.
Kitagawa, Ryunosuke; and Shimizu, Osamu, 307,896, Cl. D14-126.000.
Shinohara, Muneyoshi, to Takara Co., Ltd. Reconfigurable toy scorpion. 307,926, 5-15-90, Cl. D21-150.000.
Shinya, Satoshi: *See—*
Tominaga, Tomonori; Aizawa, Toshio; and Shinya, Satoshi, 307,910, Cl. D14-299.000.
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Dupont, John J., 307,885, Cl. D12-344.000.
Snow, Steven R. Exteriorly mounted support plate for a vehicle rear brake light. 307,946, 5-15-90, Cl. D26-138.000.
Societe Orfevrerie Christofle: *See—*
Bouilhet, Henry, 307,856, Cl. D7-653.000.
SOEHNLE-Waagen GmbH & Co.: *See—*
Busse, Rido, 307,872, Cl. D10-92.000.
Soko Co., Ltd.: *See—*
Maki, Isao, 307,833, Cl. D6-326.000.
Sokol, Howard; Palmer, Leonard H.; and Salvesen, Robert H. Paddle. 307,930, 5-15-90, Cl. D21-213.000.
Sorensen, Kirk M. Food service tray. 307,864, 5-15-90, Cl. D7-554.000
Spalding & Evenflo Companies, Inc.: *See—*
Giambrone, Harry J., 307,879, Cl. D12-129.000.
Spectrum Concepts, Inc.: *See—*
Kim, Young, 307,890, Cl. D14-100.000.
Spectrum International, Inc.: *See—*
Box, Thomas, 307,969, Cl. D34-40.000.

VOL 1114 ISS 3 MY 15 1990 UMI

Stanley Works, The: *See*—
Ciccone, Theodore P., III, 307,871, Cl. D10-70.000.
Sterk, Olivier, to U.S. Philips Corporation. Dry shaver. 307,950, 5-15-90, Cl. D28-50.000.
Stretch Machinery AB: *See*—
Back, Karl J., 307,966, Cl. D34-38.000.
Sudoh, Kunio; and Nogami, Kohei, to Nippon Seiko K.K. Child car seat. 307,834, 5-15-90, Cl. D6-333.000.
Sunbeam Corporation: *See*—
Hart, Richard S.; Bloom, David H.; and Bransky, Jeffery D., 307,873, Cl. D10-94.000.
Symbol Technologies, Inc.: *See*—
Siemiatkowski, Bish, 307,894, Cl. D14-116.000.
Takahashi, Toshiya: *See*—
Sakaguchi, Hiroshi; and Takahashi, Toshiya, 307,889, Cl. D14-100.000.
Takakura, Jinnosuke: *See*—
Miyawaki, Manabu; Katayama, Takao; Takakura, Jinnosuke; Sadagane, Hirofumi; and Katoh, Hisato, 307,911, Cl. D15-14.000.
Takara Co., Ltd.: *See*—
Shinohara, Muneyoshi, 307,926, Cl. D21-150.000.
Tanaka Manufacturing Company Limited: *See*—
Aoki, Sanae; and Konoike, Tsunataka, 307,850, Cl. D7-624.000.
Tejima, Keisuke: *See*—
Dobies, Mark A.; Repasky, Carol M.; Clark, Thomas R.; Kobayashi, Masaharu; and Tejima, Keisuke, 307,909, Cl. D14-258.000.
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Textron, Inc.: *See*—
Cowan, Murray L., 307,876, Cl. D11-25.000.
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Tominaga, Tomonori; Aizawa, Toshio; and Shinya, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Controller for television camera. 307,910, 5-15-90, Cl. D14-299.000.
Toshiba Corporation: *See*—
Horie, Hideyuki, 307,892, Cl. D14-106.000.
Trefzger, Edwin W., to D B. Smith and Company, Inc. Spray gun. 307,935, 5-15-90, Cl. D23-226.000.
Tyberg, Theodore, to Creations Dina Inc. Lunch box. 307,853, 5-15-90, Cl. D7-626.000.
Ullom, Kathleen K.; and Dooley, Patricia A. Double latch needle garment marker. 307,820. 5-15-90, Cl. D3-28.000.
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Sterk, Olivier, 307,950, Cl. D28-50.000.
Van Sumeren, Mark W., to Packaging Resources Incorporated. Package container. 307,868, 5-15-90, Cl. D9-428.000.
Verebelyi, Nicholas B., to Reckitt & Colman Products Limited. Toilet bowl deodorant holder. 307,934, 5-15-90, Cl. D23-208.000.
Voit Sports Incorporated: *See*—
Meisner, Edward H., 307,928, Cl. D21-194.000.
Waibel, Terry J.: *See*—
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,880, Cl. D12-147.000.
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Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 307,945, 5-15-90, Cl. D25-124.000.
What's What, Inc.: *See*—
Schneider, Jules, 307,816, Cl. D2-320.000.
Schneider, Jules, 307,817, Cl. D2-320.000.
White, Robert E., Jr. Hanging planter. 307,877, 5-15-90, Cl. D11-148.000.
White, Roberta: *See*—
Phelps, Pamela; and White, Roberta, 307,962, Cl. D32-37.000.
Wilkinson, Kenneth E.: *See*—
Grome, Donald C.; Myers, Terry L.; Ryan, Thomas J.; and Wilkinson, Kenneth E., 307,857, Cl. D7-317.000.
Williams Trading B.V.: *See*—
Ten Wolde, Anne W., 307,937, Cl. D23-366.000.
Windham, Terrell D.: *See*—
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,880, Cl. D12-147.000.
Miller, Frederick W.; Galante, Richard L.; Harden, Richard W., Jr.; Waibel, Terry J.; Baus, Andre E. J.; and Windham, Terrell D., 307,881, Cl. D12-147.000.
Wong, Nancy L. Skin lotion applicator. 307,949, 5-15-90, Cl. D28-7.000.
Wood Communications Corp.: *See*—
Zimmerman, Thomas J., 307,904, Cl. D14-149.000.
Woodman, Donald H.; and Woodman, Lucille L. Bird figure. 307,927, 5-15-90, Cl. D21-160.000.
Woodman, Lucille L.: *See*—
Woodman, Donald H.; and Woodman, Lucille L., 307,927, Cl. D21-160.000.
Yamada, Junichi: *See*—
Hirano, Yukio; Narikawa, Tadakazu; and Yamada, Junichi, 307,936, Cl. D23-364.000.
Yang, Doo S., to Gold Star Co., Ltd. Video cassette recorder. 307,900, 5-15-90, Cl. D14-135.000.
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Yoo, Sang H. Control panel for a microwave oven. 307,858, 5-15-90, Cl. D7-406.000.
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Zebra Co., Ltd.: *See*—
Sekiguchi, Kazuhiko, 307,920, Cl. D19-57.000.
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CLASS 2
2 4,924,525
13 4,924,526
49 R 4,924,527
104 4,924,528
123 4,924,529
163 4,924,530
243 R Re.33,215

CLASS 4
233 4,924,532
251 4,924,531
252 R 4,924,533
447 4,924,534
544 4,924,535
665 4,924,536

CLASS 5
61 4,924,537
81 B 4,924,538
100 4,924,539
436 4,924,540
468 4,924,541
481 4,924,542
484 4,924,543

CLASS 7
138 4,924,544

CLASS 8
151 4,924,545

CLASS 12
7.1 4,924,546

CLASS 15
185 4,924,547
328 4,924,550
347 4,924,548

CLASS 16
82 4,924,549

CLASS 17
1 R 4,924,551
4,924,552
50 4,924,553
74 4,924,555

CLASS 19
0.35 4,924,556
0.6 4,924,554

CLASS 23
305 A 4,925,454

CLASS 24
16 PB 4,924,557
20 CW 4,924,558
303 4,924,559
392 4,924,560
453 4,924,561
647 4,924,562

CLASS 26
76 4,924,563

CLASS 27
7 4,924,565

CLASS 28
143 4,924,566
185 4,924,567

CLASS 29
90.01 4,924,568
163 8 4,924,570
402.02 4,924,581
434 4,924,582
460 4,924,583
509 4,924,584
527.5 4,924,585
723 4,924,586
4,924,587
726 4,924,588
832 4,924,589
848 4,924,590
890.14 4,924,569

CLASS 30
115 4,924,574
121 4,924,571
253 4,924,572
272.1 4,924,573
315 4,924,575
358 4,924,576
387 4,924,577
500 4,924,578

CLASS 33
1 LE 4,924,579
203.14 4,924,591
270 4,924,592
324 4,924,593
483 4,924,594
542 4,924,595
715 4,924,596
758 4,924,597
832 4,924,580
4,924,598

CLASS 34
4 4,924,599
10 4,924,600
46 4,924,601
97 4,924,602
125 4,924,603
151 4,924,604

CLASS 36
31 4,924,606
42 4,924,607
62 4,924,608
114 4,924,605

CLASS 37
191 A 4,924,609
231 4,924,610

CLASS 40
210 4,924,611
547 4,924,612
586 4,924,613

CLASS 42
78 4,924,614
85 4,924,615
94 4,924,616

CLASS 43
6 4,924,619
15 4,924,617
43.6 4,924,618
44.9 4,924,620
57.2 4,924,621
100 4,924,622

CLASS 44
77 4,925,455

CLASS 47
18 4,924,623
58 4,924,624

CLASS 48
127.9 4,925,456

CLASS 49
212 4,924,625
347 4,924,626
351 4,924,627
380 4,924,628
477 4,924,629
502 4,924,630
504 4,924,631

CLASS 51
105 R 4,924,632
135 R 4,924,633
168 4,924,634
170 MT 4,924,636
170 R 4,924,635
290 4,924,637
293 4,925,457
4,925,458
320 4,924,643

CLASS 52
86 4,924,638
105 4,924,644
167 DF 4,924,639
4,924,640
177 4,924,645
204 4,924,641
217 4,924,642
221 4,924,646
235 4,924,647
295 4,924,648
656 4,924,649
741 4,924,650
745 4,924,651

CLASS 53
55 4,924,652
66 4,924,653
128 4,924,655
399 4,924,654
436 4,924,656
450 4,924,657
547 4,924,658
550 4,924,659

CLASS 54
46 4,924,660

CLASS 55
16 B1 4,732,583
25 4,925,460
26 4,925,461
37 4,925,462
96 4,925,463
179 4,925,464
267 4,925,465
319 4,925,466
430 4,925,467
467 4,925,468
480 4,925,469

CLASS 56
1 4,924,661
12 R 4,924,662
202 4,924,663
4,924,664
295 4,924,665
330 4,924,666
341 4,924,667

CLASS 60
278 4,924,668
310 4,924,672
323 4,924,669
418 4,924,670
428 4,924,671
589 4,924,673
608 4,924,674

CLASS 62
4 4,925,470
6 4,924,675
50.7 4,924,679
59 4,924,676
87 4,924,677
138 4,924,678
187 4,924,680
238 6 4,924,681
372 4,924,682

CLASS 65
2 4,925,471
4,925,472
12 4,925,473
29 4,925,474
48 4,925,475

CLASS 70
14 4,924,683
218 4,924,685
277 4,924,686

CLASS 71
27 4,925,476
77 4,925,477
90 4,925,478
91 4,925,479
4,925,480
92 4,925,481
4,925,482
93 4,925,483
96 4,925,484

CLASS 72
49 4,924,684
102 4,924,687
199 4,924,688
249 4,924,689
343 4,924,690
391 4,924,691
405 4,924,692
453.03 4,924,693

CLASS 73
45.5 4,924,694
61.1 R 4,924,695
118.1 4,924,696
146.8 4,924,697
151 4,924,701
170 A 4,924,698
178 R 4,924,699
290 V 4,924,700
304 C 4,924,702
308 4,924,703
317 4,924,704
484 4,924,705
579 4,924,706
644 4,924,707
799 4,924,708
829 4,924,709
861.23 4,924,710
862.04 4,924,711
862.06 4,924,713
863 11 4,924,714
865 4 4,924,712
865 8 4,924,715
866 4,924,716

CLASS 74
7 B 4,924,717
25 4,924,718
99 A 4,924,719
377 4,924,720
425 4,924,721
459 4,924,722
473 R 4,924,723
4,924,724
551 3 4,924,725
600 4,924,726
603 4,924,727
640 4,924,728
869 4,924,731

CLASS 75
238 4,925,490
360 4,925,486
562 4,925,488
574 4,925,489
749 4,925,487

CLASS 81
54 4,924,732
57.12 4,924,734
63.2 4,924,737
133 4,924,735
438 4,924,733
448 4,924,736

CLASS 82
1 11 4,924,739
127 4,924,738

CLASS 83
527 4,924,740

CLASS 84
218 4,924,742
476 4,924,743
601 4,924,744
609 4,924,745
615 4,924,746
663 4,924,747
730 4,924,741

CLASS 89
8 4,924,750
24 4,924,748
41.09 4,924,749
43.01 4,924,751
160 4,924,752
4,924,753

CLASS 91
363 R 4,924,754
376 R 4,924,755

CLASS 92
45 4,924,756
128 4,924,757
4,924,758
240 4,924,759

CLASS 98
42 15 4,924,760
42.21 4,924,761
58 4,924,762

CLASS 99
339 4,924,763
348 4,924,764
4,924,765
421 HV 4,924,766
423 4,924,767
425 4,924,768
455 4,924,769
511 4,924,770
533 4,924,771

CLASS 100
163 R 4,924,772

CLASS 101
327 4,924,773

CLASS 102
202 7 4,924,774
352 4,924,775

CLASS 104
130 4,924,776
172 2 4,924,777
284 4,924,778

CLASS 105
4 1 4,924,779
378 4,924,780

CLASS 106
1.19 4,925,491
38 35 4,925,492
272 4,925,493
280 4,925,494

CLASS 108
22 4,924,781
27 4,924,782
53.3 4,924,783

CLASS 110
261 4,924,784
346 4,924,785

CLASS 111
184 4,924,786

CLASS 112
142 4,924,787
182 4,924,788
241 4,924,789
272 4,924,790

CLASS 114
39 2 4,924,791
61 4,924,792
102 4,924,793
4,924,794
107 4,924,795
219 4,924,796
288 4,924,797
363 4,924,798

CLASS 116
206 4,924,799

CLASS 118
50.1 4,924,800
58 4,924,801
410 4,924,802
630 4,924,803
658 4,924,806
669 4,924,804
680 4,924,805
725 4,924,807

CLASS 119
1 4,924,808
14.02 4,924,809
15 4,924,810
29 4,924,811
76 4,924,812
82 4,924,813
96 4,924,814
106 4,924,815

CLASS 122
17 4,924,816
379 4,924,817

CLASS 123
27 GE 4,924,822
41 14 4,924,818
64 4,924,823
65 P 4,924,824
65 PE 4,924,819
4,924,820
90.22 4,924,821
90.55 4,924,825
195 C 4,924,826
198 DB 4,924,827
259 4,924,829
299 4,924,828
414 4,924,830
417 4,924,831
419 4,924,832
449 4,924,833
470 4,924,834
478 4,924,835
489 4,924,836
494 4,924,837
541 4,924,838
559 1 4,924,839
571 4,924,840

CLASS 124
44 5 4,924,841

CLASS 125
11 01 4,924,842
35 4,924,843

CLASS 126
9 R 4,924,844
25 R 4,924,845
41 R 4,924,846
77 4,924,847
110 AA 4,924,848
409 4,924,849
500 4,924,850
512 4,924,564

CLASS 128
4 4,924,851
4,924,852
6 4,924,853
4,924,854
4,924,856
11 4,924,855
20 4,924,857
24 A 4,924,858
52 4,924,859
205.12 4,924,860
205.18 4,924,861
207.16 4,924,862
335 4,924,866
645 4,924,867
653 SC 4,924,868
660.05 4,924,869
667 4,924,870
672 4,924,871
673 4,924,872
677 4,924,873
682 4,924,874
696 4,924,875
725 4,924,876
748 4,924,877
751 4,924,878
770 4,924,879
785 4,924,881
787 4,924,880
898 4,924,882

CLASS 131
84 1 4,924,884
84 4 4,924,885
194 4,924,886
331 4,924,887
336 4,924,883
4,924,888

CLASS 132
73 4,924,889

CLASS 133
16 4,924,893

CLASS 134
18 4,925,495
22 18 4,925,496
40 4,925,497
61 4,924,890
64 R 4,924,891
123 4,924,892

CLASS 135
65 4,924,894
89 4,924,895
90 4,924,896

CLASS 137
1 4,924,897
101 4,924,900

VOL 1114 ISS 3 MY 15 1990 UMI

102 4,924,901
232 4,924,899
270 4,924,902
382 4,925,498
454.5 4,924,903
505.11 4,924,904
510 4,924,905
512.1 4,924,906
527.8 4,924,907
565 4,924,908
566 4,924,898
614.05 4,924,909
625.23 4,924,910
625.5 4,924,911
831 4,924,912

CLASS 138

155 4,924,913

CLASS 139

11 4,924,914
76 4,924,915
91 4,924,916
452 4,924,917

CLASS 140

102 4,924,918

CLASS 141

10 4,924,919
98 4,924,920
286 4,924,921
312 4,924,923
346 4,924,922

CLASS 142

49 4,924,924

CLASS 148

9 R 4,925,499
12 F 4,925,500
101 4,925,501
311 4,925,502

CLASS 149

19.4 4,925,503
21 4,925,504
89 4,925,505

CLASS 152

243 4,924,925
417 4,924,926
531 4,924,927
533 4,924,928

CLASS 155

16 4,925,459

CLASS 156

64 4,925,506
73.1 4,925,507
79 4,925,508
92 4,925,509
4,925,510
106 4,925,511
201 4,925,512
245 4,925,513
249 4,925,514
250 4,925,515
252 4,925,516
276 4,925,517
295 4,925,518
304.1 4,925,519
494 4,925,520
517 4,925,521
632 4,925,522
643 4,925,523
4,925,524
652 4,925,525

CLASS 159

13.3 4,925,526

CLASS 160

84.1 4,924,929
90 4,924,930
135 4,924,931
168.1 Re.33,216
201 4,924,932

CLASS 162

15 4,925,527
146 4,925,528
152 4,925,529
164.1 4,925,530
301 4,925,531

CLASS 165

1 4,924,933
8 4,924,934
10 4,924,935
47 4,924,936
96 4,924,937
158 4,924,938
172 4,924,939

CLASS 166

105.1 4,924,940
134 4,924,941
291 4,924,942

CLASS 172

1 4,924,943
22 4,924,944
197 4,924,945
382 4,924,946
701.1 4,924,947

CLASS 173

139 4,924,948

CLASS 174

36 4,926,007
117 FF 4,926,008
135 4,926,009

CLASS 175

4.54 4,924,952
25 4,924,949
50 4,924,950
57 4,924,951
315 4,924,954
323 4,924,953

CLASS 177

210 C 4,924,955

CLASS 178

13 4,926,010

CLASS 180

65.3 4,924,956
90 4,924,957
128 4,924,958
170 4,925,196
297 4,924,959
333 4,924,960
374 4,924,961

CLASS 181

141 4,924,962
144 4,924,963
151 4,924,964
156 4,924,965
223 4,924,966
243 4,924,967
282 4,924,968
290 4,924,969

CLASS 182

91 4,924,970
93 4,924,971
187 4,924,972

CLASS 187

1 R 4,924,973
4,924,974

CLASS 188

322.18 4,924,975
375 4,924,976

CLASS 192

3.28 4,924,977
3.3 4,924,978
3.31 4,924,979
30 V 4,924,992
45 4,924,980
4,924,981
48.8 4,924,982
52 4,924,983
58 B 4,924,984
4,924,985
4,924,986
4,924,987
70.23 4,924,988
103 F 4,924,989
106.2 4,924,990
111 A 4,924,991

CLASS 193

311 4,924,993

CLASS 194

253 4,924,994

CLASS 198

323 4,924,995
341 4,924,996
345 4,924,997
365 4,924,998
409 4,924,999
4,925,000
412 4,925,001
445 4,925,002
452 4,925,003
457 4,925,004
460 4,925,005
461 4,925,006
470.1 4,925,007
497 4,925,008
583 4,925,009
588 4,925,010
624 4,925,011
690.1 4,925,012
698 4,925,013
780 4,925,014
803.7 4,925,015
834 4,925,016

CLASS 200

6 A 4,926,011
16 R 4,926,012
19 DC 4,926,013
61.86 4,926,014
84 C 4,926,015
144 B 4,926,017
144 R 4,926,016
147 R 4,926,018
4,926,019

CLASS 202

219 4,925,532

CLASS 203

25 4,925,535
51 4,925,533

CLASS 204

58.5 4,925,536
61 4,925,537
129.4 4,925,538
146 4,925,539
157.42 4,925,540
182.5 4,925,541
182.9 4,925,545
192.31 4,925,542
288 4,925,543
421 4,925,544

CLASS 206

5.1 4,925,017
38.1 4,925,018
145 4,925,019
150 4,925,020
279 4,925,021
296 4,925,022
309 4,925,023
328 4,925,024
335 4,925,025
373 4,925,026
387 4,925,027
389 4,925,028
473 4,925,029
486 4,925,031
487 4,925,030
564 4,925,032
581 4,925,033
603 4,925,034
633 4,925,035

CLASS 208

39 4,925,547
46 4,925,548
65 4,925,549
100 4,925,573
111 4,925,546
210 4,925,554
361 4,925,558

CLASS 209

166 4,925,559
552 4,925,036

CLASS 210

106 4,925,550
137 4,925,555
140 4,925,551
150 4,925,552
186 4,925,553
293 4,925,556
321.68 4,925,557
387 4,925,560
493.3 4,925,561
500.25 4,925,562
532.1 4,925,563
608 4,925,564
634 4,925,565
635 4,925,574
647 4,925,534
651 4,925,566
656 4,925,567
701 4,925,568
706 4,925,575
713 4,925,569
741 4,925,570
742 4,925,571
767 4,925,572
781 4,925,576

CLASS 211

59.2 4,925,037
4,925,038

CLASS 212

182 4,925,039

CLASS 215

1 A 4,925,040
11.1 4,925,042
216 4,925,041
322 4,925,043

CLASS 219

10.55 M 4,926,020
121.59 4,926,021
121.63 4,926,022
125.12 4,926,023
137.31 4,926,024
202 4,926,025
213 4,926,026
222 4,926,027
230 4,926,028
421 4,926,029
541 4,926,030

CLASS 220

3 4,925,044
4 E 4,925,045
5 A 4,925,046
23.83 4,925,047
66 Re.33,217
70 4,925,048
72 4,925,049
88 A 4,925,053
90.2 4,925,050
90.4 4,925,051
4,925,052
94 R 4,925,054
335 4,925,059
371 4,925,060
403 4,925,055
404 4,925,056
426 4,925,057

CLASS 221

279 4,925,058

CLASS 222

1 4,925,061
108 4,925,063
189 4,925,065
192 4,925,066
211 4,925,128
480 4,925,067
484 4,925,068
500 4,925,069

CLASS 224

155 4,925,064
202 4,925,070
207 4,925,071
244 4,925,075
282 4,925,072

CLASS 225

44 4,925,073

CLASS 226

74 4,925,076
97 4,925,077
108 4,925,078
152 4,925,079
196 4,925,080
199 4,925,081

CLASS 227

120 4,925,082

CLASS 228

49.1 4,925,074
102 4,925,083
107 4,925,084
179 4,925,085

CLASS 229

92.3 4,925,086
120.03 4,925,087
120.12 4,925,088

CLASS 232

34 4,925,090

CLASS 235

380 4,926,031
441 4,926,032
480 4,926,033
492 4,926,034
494 4,926,035

CLASS 236

78 D 4,925,089

CLASS 237

2 A 4,925,091
12.3 B 4,925,092
19 4,925,093

CLASS 238

265 4,925,094

CLASS 239

1 4,925,095
8 4,925,101
10 4,925,096
52 4,925,102
71 4,925,104
73 4,925,097
79 4,925,103
154 4,925,105
205 4,925,098
289 4,925,099
333 4,925,106
414 4,925,107
416.4 4,925,100
419.3 4,925,108
429 4,925,109
533.12 4,925,110
4,925,111
585 4,925,112

CLASS 241

101.4 4,925,113
169.1 4,925,150
191 4,925,114
222 4,925,115
236 4,925,116
4,925,117

CLASS 242

1.1 R 4,925,118
57 4,925,119
4,925,121
59 4,925,120
85 4,925,122
107 4,925,123
107.4 A 4,925,124
117 4,925,125
157 R 4,925,126
201 4,925,127

CLASS 244

1 TD B1 4,770,368
3.11 4,925,129
3.21 4,925,130
7 C 4,925,131
118.1 4,925,132
118.5 4,925,133
158 A 4,925,134

CLASS 246

436 4,925,135

CLASS 248

62 4,925,136
148 4,925,137
165 4,925,138
179 4,925,139
188 4,925,140
217.2 4,925,141
219.4 4,925,142
441.1 4,925,143
445 4,925,144
454 4,925,145
4,925,146
463 4,925,147
542 4,925,148
687 4,925,149

CLASS 249

65 4,925,151

CLASS 250

201.1 4,926,036
205 4,926,037
211 J 4,926,038
213 VT 4,926,039
225 4,926,040
226 4,926,041
227.11 4,926,042
231.1 4,926,043
264 4,926,044
327.2 4,926,045
332 4,926,051
370.14 4,926,052
376 4,926,053
396 R 4,926,054
423 F 4,926,056
423 R 4,926,055
484.1 4,926,047
506.1 4,926,046
548 4,926,048
4,926,049
560 4,926,050
578.1 4,926,057
4,926,058

CLASS 251

5 4,925,152
30.01 4,925,153
58 4,925,154
117 4,925,155
129.01 4,925,156
129.15 4,925,157

CLASS 252

8.554 4,925,578
8.9 4,925,577
32.7 E 4,925,579
4,925,596
47 4,925,580
48.2 4,925,581
49.3 4,925,582
58 4,925,583
62 4,925,584
89.1 4,925,585
90 4,925,586
174.22 4,925,587
174.23 4,925,588
299.01 4,925,589
299.61 4,925,590
299.66 4,925,591
299.67 4,925,592
301.21 4,925,595
301.6 S 4,925,593
4,925,594
631 4,925,597

CLASS 254

8 B 4,925,158
30 4,925,159
101 4,925,160

CLASS 261

44.3 4,926,059
87 4,925,598

CLASS 264

1.5 4,925,599
3.4 4,925,600
6 4,925,601
25 4,925,602
28 4,925,603
29.2 4,925,604
46.6 4,925,605
50 4,925,606
60 4,925,607
4,925,608
61 4,925,609
69 4,925,161
101 4,925,610
135 4,925,611
154 4,925,612
185 4,925,169
232 4,925,613
4,925,614
257 4,925,615
262 4,925,616
291 4,925,617
328.1 4,925,618

CLASS 266

270 4,925,166

CLASS 267

140.1 4,925,162
153 4,925,163
167 4,925,164
221 4,925,165

CLASS 269

112 4,925,167
136 4,925,168

CLASS 270

5 4,925,170
53 4,925,171
4,925,172
54 4,925,173
4,925,174

CLASS 271

3 4,925,175
3.1 4,925,176
110 4,925,177
115 4,925,062
186 4,925,178
187 4,925,179
198 4,925,180

CLASS 272

1 B 4,925,181
31 R 4,925,182
73 4,925,183
4,925,184
126 4,925,185

CLASS 273

25 4,925,186
54 B 4,925,187
86 R 4,925,188
148 B 4,925,189
162 F 4,925,190
178 A 4,925,191
187 R 4,925,192
232 4,925,193
271 4,925,194
400 4,926,060
428 4,925,195

CLASS 280

32.6 4,925,197
89 4,925,198
216 4,925,199
233 4,925,200
238 4,925,201
261 4,925,202
278 4,925,203
295 4,925,204
507 4,925,205
615 4,925,206
690 4,925,207
741 4,925,208
743 4,925,209
775 4,925,210
801 4,925,211
807 4,925,212

CLASS 282

12 A 4,925,213

CLASS 283

62 4,925,214
82 4,925,215

CLASS 285

3 4,925,216
93 4,925,217
4,925,218
95 4,925,219
382.4 4,925,220

CLASS 290

55 4,926,061

CLASS 292

200 4,925,221
336.3 4,925,222
339 4,925,223

CLASS 293

120 4,925,224

CLASS 294

64.1 4,925,225
82.1 4,925,226

CLASS 296

65.1 4,925,227
4,925,228
4,925,229
76 4,925,230
78.1 4,925,231
97.11 4,925,233
97.8 4,925,232
136 4,925,234
180.2 4,925,235
180.5 4,925,236
216 4,925,237
218 4,925,238

CLASS 297

29 4,925,239
161 4,925,240
229 4,925,241
284 4,925,242
440 4,925,244
4,925,245
466 4,925,246

CLASS 299

5 4,925,247

CLASS 301

9 TV 4,925,248
13 R 4,925,250
111 4,925,249

CLASS 303

22.1 4,925,251
89 4,925,252
110 4,925,253
111 4,925,254

CLASS 307

116 4,926,062
144 4,926,063
201 4,926,064
303.1 4,926,066
352 4,926,067
359 4,926,068
446 4,926,069
475 4,926,065
4,926,070
4,926,071
542.1 4,926,072
544 4,926,073
581 4,926,074

CLASS 309

112 4,926,409

CLASS 310

50 4,926,075
68 C 4,926,077
68 D 4,926,076
71 4,926,078
4,926,079
80 4,926,080
89 4,926,081
90.5 4,926,082
313 R 4,926,083
316 4,926,084
323 4,926,085
361 4,926,086

CLASS 312

204 4,925,255
221 4,925,257
237 4,925,256
323 4,925,258

CLASS 313

131 A 4,926,087
4,926,088
403 4,926,089
478 4,926,090
486 4,926,091
493 4,926,092

CLASS 315

4 4,926,093
5 4,926,094
169.4 4,926,095
225 4,926,096
307 4,926,097
408 4,926,098

CLASS 318

254 4,926,099
269 4,926,100
374 4,926,101
573 4,926,102
587 4,926,103
599 4,926,104
800 4,926,105

CLASS 320

35 4,926,106

CLASS 322

4 4,926,107
15 4,926,108

CLASS 323

274 4,926,109
345 4,926,110
355 4,926,111

CLASS 324

71.4 4,926,114
83 D 4,926,115
117 R 4,926,116
158 F 4,926,117
4,926,118
158 P 4,926,119
204 4,926,120
207.13 4,926,122
208 4,926,121
4,926,123
309 4,926,124
318 4,926,125
322 4,926,126
329 4,926,127
376 4,926,128
555 4,926,129
664 4,926,112
694 4,926,113

CLASS 328

14 4,926,130
181 4,926,131

CLASS 329

318 4,926,132
336 4,926,133

CLASS 330

2 4,926,134
107 4,926,135
149 4,926,136
252 4,926,137
253 4,926,138
294 4,926,139

CLASS 331

1 A 4,926,140
16 4,926,141
99 4,926,142
156 4,926,143

CLASS 332

124 4,926,144

CLASS 333

125 4,926,145
195 4,926,146

CLASS 334

81 4,926,147

CLASS 335

13 4,926,148
132 4,926,149
172 4,926,157
196 4,926,150
296 4,926,151

CLASS 336

90 4,926,152

CLASS 337

273 4,926,153

CLASS 338

32 R 4,926,154
36 4,926,155
4,926,156

CLASS 340

310 A 4,926,158
384 E 4,926,159
426 4,926,160
534 4,926,162
572 4,926,161
576 4,926,164
581 4,926,163
603 4,926,165
632 B1 Re.32,552
717 4,926,166
764 4,926,167
784 4,926,168
825.57 4,926,169
904 4,926,170
961 4,926,171

CLASS 341

20 4,926,172
22 4,926,173
110 4,926,174
131 4,926,175
135 4,926,176
137 4,926,177
143 4,926,178
144 4,926,179
159 4,926,180

CLASS 342

5 4,926,181
44 4,926,182
67 4,926,183
149 4,926,184
201 4,926,185
360 4,926,186
361 4,926,187

CLASS 343

700 MS 4,926,189
719 4,926,188

CLASS 346

1.1 4,926,190
24 4,926,191
33 TP 4,926,192
76 PH 4,926,193
108 4,926,194
4,926,195
140 R 4,926,196
4,926,197
155 4,926,198
157 4,926,199
160 4,926,200

CLASS 350

1.6 4,925,259
3.67 4,925,260
3.71 4,925,261
4,925,262
96.12 4,925,263
96.13 4,925,264
96.18 4,925,265
96.20 4,925,266
4,925,267
96.29 4,925,268
96.33 4,925,269
131 4,925,270
172 4,925,271
174 4,925,272
315 4,925,273
320 4,925,274
333 4,925,275
342 4,925,276
350 S 4,925,277
350.5 4,925,278
415 4,925,279
423 4,925,280
4,925,281
429 4,925,282
432 4,925,283
532 4,925,284
621 4,925,285
632 4,925,286
4,925,287
636 4,925,288
637 4,925,289

CLASS 351

55 4,925,290
123 4,925,291
128 4,925,292
214 4,925,293

CLASS 352

57 4,925,294

CLASS 353

4,925,295

CLASS 354

219 4,926,201
246 4,926,202
287 4,926,203
400 4,926,204
402 4,926,205
403 4,926,206
484 4,926,207
485 4,926,208

CLASS 355

27 4,926,209
28 4,926,210
4,926,211
43 4,926,212
49 4,926,213
75 4,926,214
99 4,926,215
212 4,926,216
253 4,926,217
283 4,926,218
309 4,926,219
313 4,926,220

CLASS 356

28 4,925,296
28.5 4,925,297
30 4,925,298
40 4,925,299
71 4,925,300
124 4,925,301
128 4,925,302
152 4,925,303
237 4,925,304
300 4,925,305
311 4,925,306
318 4,925,307
375 4,925,308
394 4,925,309
434 4,925,310

CLASS 357

16 4,926,221
23.5 4,926,222
23.6 4,926,223
4,926,224
24 4,926,225
27 4,926,226
28 4,926,227
30 4,926,228
4,926,229
4,926,230
4,926,231
34 4,926,232
43 4,926,233
68 4,926,234
4,926,235
71 4,926,236
4,926,237
72 4,926,238
4,926,239
74 4,926,240
75 4,926,241
81 4,926,242
84 4,926,243

CLASS 358

12 4,926,244
4,926,245
21 R 4,926,246
43 4,926,247
75 4,926,248
4,926,249
4,926,250
4,926,251
4,926,252
4,926,253
76 4,926,254
84 4,926,255
4,926,256
98 4,926,257
4,926,258
105 4,926,259
148 4,926,260
167 4,926,261
229 4,926,262
304 4,926,265
349 4,926,264
426 4,926,266
454 4,926,267
458 4,926,268
474 4,926,263
4,926,269
498 4,926,270

CLASS 360

49 4,926,272
62 4,926,271
64 4,926,273
102 4,926,274
106 4,926,275
126 4,926,276
128 4,926,277
130.21 4,926,278
132 4,926,279

CLASS 361

15 4,926,280
55 4,926,281
101 4,926,288
102 4,926,282
103 4,926,283
117 4,926,284
141 4,926,289
230 4,926,285
345 4,926,286
380 4,926,290
384 4,926,291
392 4,926,287
402 4,926,292

CLASS 362

96 4,926,293
125 4,926,294
144 4,926,295
156 4,926,296
162 4,926,297
163 4,926,298
184 4,926,299
189 4,926,300
226 4,926,301

CLASS 363

16 4,926,302
19 4,926,303
20 4,926,304
21 4,926,305
58 4,926,306
98 4,926,354
161 4,926,307

CLASS 364

147 4,926,308
149 4,926,309
186 4,926,310
191 4,926,311
200 4,925,311
4,926,312
4,926,313
4,926,314
4,926,315
4,926,316
4,926,317
4,926,318
4,926,319
4,926,320
4,926,321
4,926,322
4,926,323
4,926,324
4,926,355
408 4,926,325
410 4,926,326
412 4,926,327
424.01 4,926,329
424.03 4,926,330
424.04 4,926,331
424.05 4,926,332
424.1 4,926,328
426.02 4,926,333
426.04 4,926,334
431.05 4,926,335
444 4,926,336
474.06 4,926,337
474.32 4,926,338
478 4,926,339
483 4,926,340
508 4,926,341
4,926,342
513 4,925,312
4,926,343
4,926,344
4,926,345
518 4,926,346
519 4,926,347
520 4,926,348
523 4,926,349
550 4,926,350
4,926,351
4,926,352
551.02 4,926,353
557 4,926,356
560 4,926,357
562 4,926,358
567 4,926,359
571.01 4,926,360
574 4,926,361
578 4,926,362
579 4,926,363
581 4,926,364
708 4,926,365
713 4,926,366
4,926,367
715.05 4,926,368
739 4,926,374
748 4,926,369
4,926,370
760 4,926,371
900 4,926,372
4,926,373
4,926,375
4,926,376

CLASS 365

29 4,926,377
179 4,926,378
189.01 4,926,379
4,926,381
203 4,926,382
4,926,383
230.03 4,926,384
4,926,385
4,926,386
233 4,926,387
244 4,926,388

CLASS 366

81 4,925,313
249 4,926,390

CLASS 367

7 4,926,380
41 4,926,391
57 4,926,393
59 4,926,392
73 4,926,394
89 4,926,395
157 4,926,397
159 4,926,396
172 4,926,398
173 4,926,399

CLASS 368

82 4,926,400
88 4,926,401

CLASS 369

13 4,926,402
4,926,403
32 4,926,404
4,926,405
36 4,926,406
44.11 4,926,407
58 4,926,408
290 4,926,410
291 4,926,411

CLASS 370

3 4,926,412
13.1 4,926,413
31 4,926,414
60 4,926,415
60.1 4,926,416
85.1 4,926,417
85.5 4,926,418
85.6 4,926,419
94.1 4,926,420
95.1 4,926,421
97 4,926,422
112 4,926,423

CLASS 371

22.3 4,926,424
22.6 4,926,425
40.1 4,926,426
67.1 4,926,427

CLASS 372

20 4,926,428
32 4,926,429
33 4,926,430
45 4,926,431
46 4,926,432
50 4,926,433
69 4,926,434
73 4,926,435
4,926,436
87 4,926,437
109 4,926,438

CLASS 373

10 4,926,439

CLASS 374

16 4,925,314
31 4,925,315

CLASS 375

1 4,926,440
9 4,926,444
60 4,926,441
76 4,926,442
102 4,926,443
106 4,926,445
109 4,926,446
120 4,926,447
121 4,926,448

CLASS 376

258 4,925,619
260 4,925,620
262 4,925,621
289 4,925,622
306 4,926,449
314 4,925,623
400 4,925,624
444 4,926,450

CLASS 377

48 4,926,451

CLASS 378

22 4,926,452
37 4,926,453
100 4,926,454
176 4,926,455
177 4,926,456
209 4,926,457

CLASS 379

27 4,926,458
52 4,926,459
57 4,926,460
67 4,926,461
4,926,462

VOL 1114 ISS 3 MY 15 1990 UMI

88 4,926,463
99 4,926,464
131 4,926,465
143 4,926,466
146 4,926,467
147 4,926,468
155 4,926,469
199 4,926,470
216 4,926,471
411 4,926,472
416 4,926,473
433 4,926,474

CLASS 380

2 4,926,475
4 4,926,476
15 4,926,477
21 4,926,478
23 4,926,479
4,926,480
25 4,926,481

CLASS 381

31 4,926,482
41 4,926,488
43 4,926,483
56 4,926,484
107 4,926,485
152 4,926,486
186 4,926,487

CLASS 382

8 4,926,489
9 4,926,490
14 4,926,491
18 4,926,492

CLASS 383

8 4,925,317
61 4,925,316
63 4,925,318

CLASS 384

17 4,925,319
42 4,925,320
114 4,925,321
486 4,925,322
490 4,926,493
607 4,925,323

CLASS 400

124 4,925,625
240.3 4,925,324
582 4,925,325
616.1 4,925,326

CLASS 401

205 4,925,327

CLASS 402

77 4,925,328

CLASS 403

93 4,925,329
171 4,925,330
267 4,925,331
373 4,925,332

CLASS 404

6 4,925,333
9 4,925,334
12 4,925,335
25 4,925,336
26 4,925,337
41 4,925,338
47 4,925,339
75 4,925,340
112 4,925,341

CLASS 405

45 4,925,342
60 4,925,343
184 4,925,344
232 4,925,345

CLASS 408

1 R 4,925,346

CLASS 409

132 4,925,347
231 4,925,348

CLASS 410

54 4,925,349

CLASS 411

82 4,925,350
182 4,925,351
443 4,925,352
453 4,925,353

CLASS 412

8 4,925,354
37 4,925,355

CLASS 414

339 4,925,356
495 4,925,357
685 4,925,358

722 4,925,359
730 4,925,360
786 4,925,361
790.7 4,925,362

CLASS 415

129 4,925,363
150 4,925,364
173.6 4,925,365
174.3 4,925,366
180 4,925,368
213.1 4,925,367

CLASS 416

204 R 4,925,369

CLASS 417

15 4,925,370
18 4,925,371
310 4,925,372
372 4,925,373
403 4,925,374
430 4,925,375
472 4,925,377
477 4,925,376

CLASS 418

148 4,925,378

CLASS 419

18 4,925,626

CLASS 422

82.05 4,925,629
99 4,925,627
100 4,925,628
104 4,925,630
122 4,925,631
142 4,925,632
171 4,925,633
179 4,925,634
202 4,925,635
248 4,925,636
313 4,925,638

CLASS 423

22 4,925,485
235 4,925,639
239 4,925,640
279 4,925,641
364 4,925,642
393 4,925,643
415 A 4,925,644
477 4,925,645
488 4,925,646
592 4,925,647

CLASS 424

1.1 4,925,648
4,925,649
4,925,650
4,925,651
9 4,925,652
45 4,925,657
47 4,925,653
52 4,925,654
4,925,655
53 4,925,656
70 4,925,658
78 4,925,659
81 4,925,660
85.91 4,925,661
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93 4,925,663
401 4,925,666
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422 4,925,668
438 4,925,669
443 4,925,670
448 4,925,671
449 4,925,736
451 4,925,672
455 4,925,673
469 4,925,674
4,925,675
470 4,925,676
484 4,925,677
493 4,925,678
532 4,925,665
537 4,925,664

CLASS 425

94 4,925,379
131.1 4,925,380
145 4,925,381
367 4,925,382
453 4,925,383
564 4,925,384

CLASS 426

2 4,925,637
18 4,925,679
42 4,925,680
52 4,925,681
87 4,925,682
103 4,925,683
107 4,925,684
123 4,925,685

129 4,925,687
131 4,925,686
281 4,925,688
289 4,925,689
330.5 4,925,690
485 4,925,691
531 4,925,692
549 4,925,693
613 4,925,694
637 4,925,696
4,925,697
660 4,925,695

CLASS 427

2 4,925,698
28 4,925,699
38 4,925,700
4,925,701
65 4,925,702
215 4,925,703
221 4,925,704
259 4,925,705
305 4,925,706
393.4 4,925,707

CLASS 428

1 4,925,708
33 4,925,709
34.5 4,925,710
35.2 4,925,711
35.7 4,925,712
40 4,925,713
4,925,714
4,925,715
41 4,925,716
64 4,925,717
68 4,925,718
71 4,925,719
77 4,925,720
116 4,925,721
131 4,925,722
137 4,925,723
4,925,724
156 4,925,725
196 4,925,726
199 4,925,727
216 4,925,728
245 4,925,729
305.5 4,925,730
336 4,925,731
4,925,732
4,925,733
349 4,925,734
423.1 4,925,735
437 4,925,737
472.2 4,925,738
522 4,925,739
547 4,925,740
661 4,925,741
692 4,925,742
702 4,925,743

CLASS 429

27 4,925,744
40 4,925,745
57 4,925,746
59 4,925,747
4,925,748
104 4,925,749
116 4,925,750
191 4,925,751
4,925,752
196 4,925,753
245 4,925,754

CLASS 430

5 4,925,755
18 4,925,756
31 4,925,757
57 4,925,758
59 4,925,759
4,925,760
97 4,925,761
106 4,925,763
106.6 4,925,762
110 4,925,764
4,925,765
115 4,925,766
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285 4,925,773
296 4,925,774
306 4,925,775
321 4,925,776
377 4,925,777
383 4,925,778
403 4,925,779
505 4,925,781
510 4,925,782
569 4,925,783

CLASS 431

2 4,925,385

28 4,925,386
187 4,925,387

CLASS 432

77 4,925,388
106 4,925,389
247 4,925,390

CLASS 433

31 4,925,391

CLASS 434

589 4,925,780

CLASS 435

5 4,925,784
6 4,925,785
7 4,925,786
4,925,787
4,925,788
38 4,925,789
52 4,925,790
69.1 4,925,791
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136 4,925,798
172.3 4,925,799
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262 4,925,802
288 4,925,803

CLASS 436

501 4,925,804

CLASS 437

21 4,925,805
34 4,925,806
44 4,925,807
62 4,925,808
95 4,925,809
105 4,925,810
129 4,925,811
142 4,925,812
228 4,925,813

CLASS 439

55 4,925,392
76 4,925,393
86 4,925,394
100 4,925,395
147 4,925,396
353 4,925,397
357 4,925,398
370 4,925,399
374 4,925,400
465 4,925,401
490 4,925,402
578 4,925,403
607 4,925,404
608 4,925,405
839 4,925,406
887 4,925,407

CLASS 440

38 4,925,408
52 4,925,409
55 4,925,410
61 4,925,411
71 4,925,412
75 4,925,413
83 4,925,414
4,925,415
84 4,925,416

CLASS 441

65 4,925,417
92 4,925,418
123 4,925,419

CLASS 445

3 4,925,420
4 4,925,421
73 4,925,422

CLASS 446

98 4,925,423
175 4,925,424
185 4,925,425
226 4,925,426
409 4,925,427
437 4,925,428
487 4,925,429

CLASS 455

41 4,926,494
54 4,926,495
67 4,926,497
77 4,926,496
133 4,926,498
302 4,926,500
306 4,926,499

CLASS 464

14 4,925,430
54 4,925,431

CLASS 474

8 4,925,432
9 4,925,433
101 4,925,434
4,925,435
4,925,436
135 4,925,437
B1 4,473,362

CLASS 475

166 4,924,730
207 4,924,729

CLASS 493

194 4,925,438
204 4,925,439
466 4,925,440

CLASS 494

4,925,441
40 4,925,442

CLASS 501

66 4,925,814
90 4,925,815
104 4,925,816
138 4,925,817

CLASS 502

7 4,925,818
37 4,925,819
66 4,925,820
107 4,925,821
112 4,925,822
211 4,925,823
262 4,925,824
309 4,925,825
407 4,925,826

CLASS 503

207 4,925,827
218 4,925,828

CLASS 505

1 4,925,829
4,925,830

CLASS 514

49 4,925,831
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183 4,925,835
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212 4,925,839
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239.5 4,925,842
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646 4,925,878
650 4,925,879

CLASS 521

98 4,925,880
129 4,925,881
132 4,925,882

CLASS 523

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340 4,925,884
415 4,925,885
443 4,925,886

CLASS 524

14 4,925,887
91 4,925,888
133 4,925,890
139 4,925,891
169 4,925,889
236 4,925,892
287 4,925,883
337 4,925,893
484 4,925,894
714 4,925,895

CLASS 525

53 4,925,896
285 4,925,897
305 4,925,898
314 4,925,899
329.3 4,925,900
482 4,925,901

CLASS 526

87 4,925,902
204 4,925,903
205 4,925,904
208 4,925,905
245 4,925,906
255 4,925,907
320 4,925,908

CLASS 528

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171 4,925,910
184 4,925,911
226 4,925,912
272 4,925,913
336 4,925,914
353 4,925,915
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392 4,925,917
4,925,918

CLASS 530

351 4,925,919
356 4,925,924
387 4,925,920
389 4,925,921
391 4,925,922
506 4,925,923

CLASS 534

10 4,925,925
589 4,925,926
618 4,925,927
4,925,928

CLASS 536

4.1 4,925,929
23 4,925,930
25 4,925,931
55.3 4,925,932

CLASS 540

63 4,925,933
310 4,925,934
350 4,925,935
475 4,925,936
477 4,925,937

CLASS 544

221 4,925,938
250 4,925,946
251 4,925,939
315 4,925,940
354 4,925,941

CLASS 546

133 4,925,942
149 4,925,943
167 4,925,944
292 4,925,945
302 4,925,947

CLASS 548

195 4,925,948
336 4,925,949
338 4,925,950
4,925,951
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341 4,925,953
417 4,925,954
432 4,925,955

CLASS 549

214 4,925,956
239 4,925,957
377 4,925,959
412 4,925,960
521 4,925,961

CLASS 556

187 4,925,962
422 4,925,964
474 4,925,963

CLASS 558

411 4,925,965
419 4,925,966
445 4,925,967

CLASS 560

21 4,925,968
41 4,925,969
43 4,925,958
125 4,925,970
137 4,925,971
204 4,925,973
206 4,925,972

336 4,925,974

CLASS 562

113 4,925,975
123 4,925,976
416 4,925,977
443 4,925,978
462 4,925,979
534 4,925,980
600 4,925,981
871 4,925,982

CLASS 564

8 4,925,983

149 4,925,832
412 4,925,984

CLASS 568

384 4,925,985
450 4,925,986
4,925,987
625 4,925,988
697 4,925,989
862 4,925,990
908 4,925,991

CLASS 570

130 4,925,992

151 4,925,993
210 4,925,994

CLASS 585

312 4,925,996
428 4,925,997
469 4,925,998
4,925,999
476 4,926,000
500 4,926,001
512 4,926,002
517 4,926,003
530 4,926,004

632 4,926,005
640 4,926,006

CLASS 600

16 4,925,443

CLASS 604

80 4,925,444
95 4,925,445
96 4,925,446
133 4,925,447
171 4,925,448
227 4,925,449

240 4,925,450
246 4,925,451
284 4,925,452
378 4,925,453

CLASS 606

27 4,924,863
77 4,924,865
142 4,924,864

CLASS 8.5

310 4,925,995

CLASSIFICATION OF DESIGNS

D1— 127 307,815
D2— 320 307,816
307,817
D3— 5 307,818
25 307,819
28 307,820
31 307,821
34 307,822
35 307,823
40 307,824
42 307,825
307,826
71 307,827
307,828
76 307,829
D4— 114 307,830
131 307,831
D6 317 307,832
326 307,833
333 307,834
364 307,835
372 307,836
380 307,837
421 307,838
450 307,839
479 307,840

515 307,841
516 307,842
520 307,845
521 307,843
523 307,844
597 307,846
611 307,847
D7— 317 307,857
406 307,858
554 307,864
601 307,851
605 307,854
620 307,852
624 307,850
626 307,853
653 307,856
676 307,848
307,849
691 307,855
D8— 8 307,860
40 307,861
45 307,862
98 307,859
347 307,863
D9— 352 307,865
413 307,866

424 307,867
428 307,868
455 307,869
D10— 44 307,870
70 307,871
92 307,872
94 307,873
106 307,874
307,875
D11— 25 307,876
148 307,877
D12— 96 307,878
129 307,879
147 307,880
307,881
156 307,882
157 307,883
325 307,884
344 307,885
D13— 103 307,886
139 307,887
D14— 100 307,888
307,889
307,890
106 307,892

114 307,893
116 307,894
126 307,895
307,896
133 307,897
307,899
135 307,898
307,900
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307,902
149 307,903
307,904
151 307,905
157 307,906
225 307,907
240 307,908
258 307,909
299 307,910
D15 12 307,912
14 307,911
150 307,913
D16— 137 307,914
203 307,915
209 307,916
D18— 7 307,917
12 307,918

D19— 55 307,919
57 307,920
D21— 13 307,921
27 307,922
87 307,923
108 307,924
136 307,925
150 307,926
160 307,927
194 307,928
208 307,929
213 307,930
215 307,931
D22— 146 307,932
D23— 208 307,934
209 307,933
226 307,935
364 307,936
366 307,937
367 307,938
D25— 2 307,939
48 307,940
55 307,941
103 307,942
124 307,943
307,944

307,945
D26— 138 307,946
D27— 113 307,947
D28— 5 307,948
7 307,949
50 307,950
307,957
77 307,951
307,952
85 307,953
D29— 17 307,954
D30— 112 307,955
D32— 15 307,956
17 307,958
307,959
28 307,960
35 307,961
37 307,962
41 307,963
55 307,964
D34— 33 307,965
38 307,966
40 307,967
307,968
307,969

CLASSIFICATION OF PLANTS

P. 31 7,228
86 7,229
7,230
7,231

VOL 1114 ISS 3 MY 15 1990 UMI

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	4,925,055		4,924,841		4,925,479		4,926,345		4,925,544		4,924,826
	4,925,464		4,924,855		4,925,542		4,926,384		4,925,639		4,925,060
	4,925,504		4,924,877		4,925,549		4,926,391		4,925,646		4,925,063
	4,925,565		4,924,889		4,925,579		4,926,395		4,925,681		4,925,165
	4,925,611		4,924,896		4,925,599		4,926,412		4,925,789		4,925,357
	4,925,645		4,924,912		4,925,607		4,926,435		4,925,889		4,925,457
	4,926,107		4,924,919		4,925,691		4,926,436		4,926,083		4,925,601
04	4,925,085		4,924,942		4,925,700		4,926,449		4,926,120		4,926,016
	4,925,117		4,924,970		4,925,721		4,926,452		4,926,193		4,926,018
	4,925,125		4,925,024		4,925,723		4,926,459		4,926,355		4,926,019
	4,925,126		4,925,025		4,925,727		4,926,462	10	4,925,707		4,926,444
	4,925,192		4,925,040		4,925,740		4,926,472		4,925,732		4,926,448
	4,925,204		4,925,045		4,925,790		4,926,477		4,925,756	15	4,925,226
	4,925,238		4,925,047		4,925,793		4,926,481		4,925,771		4,925,328
	4,925,361		4,925,048		4,925,804		4,926,489		4,925,844		4,925,433
	4,925,477		4,925,066		4,925,806		4,926,494		4,925,892	16	4,925,363
	4,925,495		4,925,089		4,925,812		4,926,500		4,925,938		4,926,117
	4,925,656		4,925,093		4,925,856		1,032,552	11	4,924,718		4,926,350
	4,926,062		4,925,121		4,925,908		4,770,368	12	4,924,532	17	4,924,525
	4,926,066		4,925,124		4,925,922	08	Re.33,217		4,924,569		4,924,537
	4,926,073		4,925,128		4,925,930		4,924,880		4,924,576		4,924,599
	4,926,115		4,925,132		4,925,965		4,924,960		4,924,613		4,924,601
	4,926,132		4,925,133		4,925,970		4,924,971		4,924,618		4,924,636
	4,926,231		4,925,144		4,926,028		4,924,976		4,924,665		4,924,655
	4,926,240		4,925,181		4,926,037		4,925,242		4,924,709		4,924,684
	4,926,476		4,925,185		4,926,038		4,925,524		4,924,792		4,924,703
05	4,925,343		4,925,190		4,926,056		4,926,021		4,924,865		4,924,737
	4,925,532		4,925,196		4,926,059		4,926,041		4,924,878		4,924,782
06	4,924,528		4,925,203		4,926,065		4,926,082		4,925,005		4,924,838
	4,924,536		4,925,219		4,926,071		4,926,170		4,925,075		4,924,846
	4,924,544		4,925,221		4,926,077		4,926,392		4,925,099		4,924,859
	4,924,562		4,925,235		4,926,118	09	4,924,539		4,925,104		4,924,946
	4,924,579		4,925,239		4,926,129		4,924,578		4,925,341		4,925,018
	4,924,589		4,925,259		4,926,130		4,924,581		4,925,364		4,925,020
	4,924,634		4,925,260		4,926,131		4,924,644		4,925,399		4,925,050
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	4,925,452		4,926,285		4,924,605		4,925,338		4,925,714		4,925,376
	4,925,488		4,926,315		4,924,705		4,925,451		4,925,719		4,925,619
	4,925,546		4,926,419		4,925,033		4,925,492		4,925,724		4,925,687
	4,925,745		4,926,479	33	4,924,606		4,925,523		4,925,744		4,926,079
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	4,926,495		4,924,798		4,925,019		4,925,835		4,926,331		4,924,617
18	4,924,572		4,924,821		4,925,029		4,925,857		4,926,362		4,924,619
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	4,925,031		4,924,870		4,925,351		4,925,919		4,924,813		4,924,871
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	4,925,349		4,924,926		4,925,453		4,925,986		4,925,374		4,924,894
	4,925,385		4,924,977		4,925,455		4,925,987		4,925,417		4,924,898
	4,925,466		4,924,988		4,925,494		4,926,010		4,925,635		4,924,940
	4,925,866		4,924,992		4,925,527		4,926,067		4,925,699		4,924,948
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	4,926,457		4,925,032		4,925,576		4,926,092		4,925,997		4,925,065
19	4,924,574		4,925,090		4,925,638		4,926,104		4,732,583		4,925,154
	4,925,114		4,925,140		4,925,648		4,926,125	41	4,924,615		4,925,167
	4,925,116		4,925,164		4,925,654		4,926,161		4,924,873		4,925,220
	4,925,637		4,925,169		4,925,676		4,926,180		4,924,924		4,925,234
	4,926,366		4,925,191		4,925,684		4,926,198		4,925,026		4,925,334
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20	4,924,575		4,925,224		4,925,764		4,926,220		4,925,200		4,925,345
	4,925,041		4,925,230		4,925,765		4,926,267		4,925,246		4,925,356
	4,925,143		4,925,232		4,925,779		4,926,298		4,925,336		4,925,423
	4,925,359		4,925,233		4,925,784		4,926,369		4,925,486		4,925,557
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	4,924,633		4,926,122		4,926,244		4,924,888		4,924,909		4,926,044
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VOL
1114
ISS
3
MY
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	4,925,985		4,924,998		4,925,802		4,924,610		4,925,327		4,925,517
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	4,924,895						4,925,319				

DESIGN PATENTS

01	307,968		307,914		307,907		307,877		307,969		307,924
04	307,823		307,915		307,933		307,919	36	307,816		307,942
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06	307,821		307,931	16	307,961		307,909		307,842		307,867
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	307,848	08	307,864		307,954		307,852		307,952		307,906
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	307,883		307,871		307,945		307,963		307,857	55	307,845
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	307,894		307,870		307,876		307,962		307,881		307,967

PLANT PATENTS

06	7,229	7,230	7,231	37	7,228		

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MY
22

1990

UMI

VOL
1114

ISS
4

MY
22

990

UMI

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UNITED STATES PATENT AND TRADEMARK OFFICE
May 22, 1990 Volume 1114 Number 4

CONTENTS

Patent and Trademark Office Notices	Page
Patent Cooperation Treaty (PCT) Information	1114 OG 58
Notice of Maintenance Fees Payable	1114 OG 58
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1114 OG 59
Notification of Acceptance of Delayed Payment of Maintenance Fee	1114 OG 61
Reissue Applications Filed	1114 OG 61
Requests for Reexaminations Filed	1114 OG 61
Patent Terms Extended Under 35 USC 156	1114 OG 62
Errata	1114 OG 62
Patent Certificates of Correction	1114 OG 63
Special Boxes for Mail	1114 OG 64
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1114 OG 65
Condition of Patent Applications	1114 OG 67
Reissue Patents Granted (33,218)	2083
Plant Patents Granted (7,232)	2085
Patents Granted	
General and Mechanical (4,926,501)	2087
Chemical (4,927,429)	2399
Electrical (4,927,982)	2559
Design Patents Granted (307,970)	2675
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 73
Classification of	
Patents (Including Reissues, and Reexaminations)	PI 77
Designs, and Plants Applications	PI 81
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 82
Designs and Plant Applications	PI 84
Change of Address Form and Subscription Order Form	Back Page

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VOL
1114
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Apr. 30, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 19, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,665,561 through 4,667,342
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 17, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,383,335 through 4,384,368
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 11, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,104	07/096,920	10/31/89
(4,570,032)	(06/719,990)	(3/11/86)
4,318,221	06/261,588	3/09/82
4,318,224	06/233,620	3/09/82
4,318,326	06/220,309	3/09/82
4,318,381	06/237,991	3/09/82
4,318,419	06/216,193	3/09/82
4,318,472	06/221,348	3/09/82
4,318,546	06/244,039	3/09/82
4,318,685	06/222,711	3/09/82
4,318,839	06/227,715	3/09/82
4,318,863	06/220,632	3/09/82
4,318,891	06/230,535	3/09/82
4,318,954	06/232,426	3/09/82
4,319,045	06/240,749	3/09/82
4,574,402	06/696,914	3/11/86
4,574,403	06/552,618	3/11/86
4,574,407	06/627,206	3/11/86
4,574,410	06/622,806	3/11/86
4,574,414	06/656,276	3/11/86
4,574,416	06/636,366	3/11/86
4,574,420	06/583,437	3/11/86
4,574,421	06/666,110	3/11/86
4,574,427	06/567,750	3/11/86
4,574,431	06/672,889	3/11/86
4,574,432	06/565,695	3/11/86
4,574,441	06/591,111	3/11/86
4,574,444	06/522,702	3/11/86
4,574,445	06/633,745	3/11/86
4,574,461	06/634,604	3/11/86
4,574,464	06/534,047	3/11/86
4,574,469	06/650,964	3/11/86
4,574,477	06/638,059	3/11/86
4,574,478	06/497,484	3/11/86
4,574,480	06/529,396	3/11/86
4,574,482	06/504,316	3/11/86
4,574,484	06/674,498	3/11/86
4,574,493	06/691,408	3/11/86
4,574,504	06/616,195	3/11/86
4,574,505	06/633,296	3/11/86
4,574,506	06/582,630	3/11/86
4,574,507	06/569,797	3/11/86
4,574,508	06/513,881	3/11/86
4,574,511	06/568,379	3/11/86
4,574,512	06/495,048	3/11/86
4,574,514	06/494,892	3/11/86
4,574,517	06/517,660	3/11/86
4,574,519	06/536,765	3/11/86
4,574,520	06/663,400	3/11/86
4,574,530	06/587,823	3/11/86
4,574,532	06/660,898	3/11/86
4,574,534	06/702,334	3/11/86
4,574,551	06/613,255	3/11/86
4,574,554	06/499,226	3/11/86
4,574,562	06/729,899	3/11/86
4,574,567	06/562,585	3/11/86
4,574,568	06/644,986	3/11/86
4,574,579	06/577,512	3/11/86
4,574,583	06/619,126	3/11/86
4,574,596	06/617,682	3/11/86
4,574,597	06/632,403	3/11/86
4,574,601	06/636,875	3/11/86
4,574,602	06/535,872	3/11/86
4,574,606	06/703,607	3/11/86
4,574,611	06/743,042	3/11/86
4,574,620	06/656,589	3/11/86
4,574,622	06/593,962	3/11/86
4,574,650	06/643,013	3/11/86
4,574,653	06/573,350	3/11/86
4,574,654	06/575,057	3/11/86
4,574,657	06/557,230	3/11/86
4,574,662	06/696,757	3/11/86
4,574,663	06/606,384	3/11/86
4,574,670	06/552,692	3/11/86
4,574,672	06/671,274	3/11/86
4,574,677	06/692,642	3/11/86
4,574,679	06/563,315	3/11/86
4,574,690	06/630,377	3/11/86
4,574,691	06/587,174	3/11/86
4,574,695	06/653,581	3/11/86
4,574,698	06/630,669	3/11/86
4,574,699	06/552,650	3/11/86
4,574,702	06/539,030	3/11/86
4,574,720	06/648,785	3/11/86
4,574,723	06/691,289	3/11/86
4.574,725	06/626,940	3/11/86
4,574,731	06/687,831	3/11/86
4,574,732	06/616,862	3/11/86

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Patent Number	Serial Number	Issue Date
4,574,741	06/569,318	3/11/86
4,574,743	06/578,515	3/11/86
4,574,749	06/601,985	3/11/86
4,574,752	06/660,703	3/11/86
4,574,763	06/514,774	3/11/86
4,574,764	06/734,190	3/11/86
4,574,767	06/595,465	3/11/86
4,574,773	06/638,588	3/11/86
4,574,777	06/635,232	3/11/86
4,574,783	06/671,186	3/11/86
4,574,784	06/947,188	3/11/86
4,574,791	06/574,470	3/11/86
4,574,795	06/564,504	3/11/86
4,574,796	06/663,042	3/11/86
4,574,798	06/560,336	3/11/86
4,574,799	06/503,503	3/11/86
4,574,805	06/542,278	3/11/86
4,574,806	06/656,798	3/11/86
4,574,810	06/657,949	3/11/86
4,574,816	06/575,167	3/11/86
4,574,822	06/615,465	3/11/86
4,574,831	06/474,713	3/11/86
4,574,839	06/601,780	3/11/86
4,574,841	06/652,616	3/11/86
4,574,842	06/544,409	3/11/86
4,574,847	06/691,898	3/11/86
4,574,851	06/631,186	3/11/86
4,574,852	06/614,729	3/11/86
4,574,855	06/599,793	3/11/86
4,574,861	06/540,434	3/11/86
4,574,864	06/650,092	3/11/86
4,574,865	06/668,119	3/11/86
4,574,867	06/644,524	3/11/86
4,574,874	06/482,860	3/11/86
4,574,875	06/558,025	3/11/86
4,574,877	06/585,982	3/11/86
4,574,880	06/573,083	3/11/86
4,574,893	06/644,263	3/11/86
4,574,902	06/566,148	3/11/86
4,574,907	06/587,773	3/11/86
4,574,909	06/525,536	3/11/86
4,574,911	06/666,158	3/11/86
4,574,912	06/671,207	3/11/86
4,574,916	06/748,162	3/11/86
4,574,919	06/682,306	3/11/86
4,574,921	06/654,310	3/11/86
4,574,926	06/508,406	3/11/86
4,574,933	06/601,674	3/11/86
4,574,934	06/696,338	3/11/86
4,574,935	06/591,580	3/11/86
4,574,938	06/564,738	3/11/86
4,574,942	06/560,319	3/11/86
4,574,944	06/635,553	3/11/86
4,574,947	06/649,438	3/11/86
4,574,951	06/682,150	3/11/86
4,574,955	06/655,571	3/11/86
4,574,969	06/677,741	3/11/86
4,574,972	06/730,004	3/11/86
4,574,983	06/613,910	3/11/86
4,574,988	06/581,355	3/11/86
4,574,990	06/575,143	3/11/86
4,575,002	06/602,909	3/11/86
4,575,022	06/592,556	3/11/86
4,575,028	06/625,749	3/11/86
4,575,040	06/751,562	3/11/86
4,575,042	06/642,062	3/11/86
4,575,049	06/600,330	3/11/86
4,575,050	06/421,266	3/11/86
4,575,051	06/661,138	3/11/86
4,575,067	06/679,865	3/11/86
4,575,071	06/629,334	3/11/86
4,575,078	06/627,926	3/11/86
4,575,079	06/707,382	3/11/86
4,575,080	06/604,166	3/11/86
4,574,083	06/627,544	3/11/86
4,575,088	06/370,566	3/11/86
4,575,090	06/649,603	3/11/86
4,575,091	06/656,684	3/11/86
4,575,092	06/637,736	3/11/86
4,575,094	06/578,192	3/11/86
4,575,095	06/544,518	3/11/86
4,575,096	06/621,853	3/11/86
4,575,108	06/536,676	3/11/86
4,575,112	06/604,175	3/11/86
4,575,126	06/495,856	3/11/86
4,575,127	06/692,702	3/11/86
4,575,142	06/650,119	3/11/86
4,575,149	06/581,890	3/11/86
4,575,150	06/599,789	3/11/86
4,575,155	06/588,211	3/11/86
4,575,169	06/698,922	3/11/86
4,575,177	06/537,068	3/11/86
4,575,180	06/523,325	3/11/86
4,575,192	06/540,949	3/11/86
4,575,196	06/634,155	3/11/86
4,575,197	06/674,376	3/11/86
4,575,200	06/513,334	3/11/86
4,575,204	06/514,307	3/11/86
4,575,220	06/561,534	3/11/86
4,575,226	06/713,269	3/11/86
4,575,229	06/606,512	3/11/86
4,575,236	06/642,753	3/11/86
4,575,243	06/502,990	3/11/86
4,575,246	06/586,142	3/11/86
4,575,253	06/554,551	3/11/86
4,575,258	06/637,917	3/11/86
4,575,262	06/554,488	3/11/86
4,575,266	06/669,109	3/11/86
4,575,270	06/669,650	3/11/86
4,575,275	06/610,988	3/11/86
4,575,293	06/630,223	3/11/86
4,575,300	06/620,483	3/11/86
4,575,301	06/545,044	3/11/86
4,575,313	06/651,978	3/11/86
4,575,315	06/500,178	3/11/86
4,575,327	06/465,104	3/11/86
4,575,328	06/586,855	3/11/86
4,575,335	06/677,592	3/11/86
4,575,338	06/673,822	3/11/86
4,575,339	06/621,852	3/11/86
4,575,341	06/527,027	3/11/86
4,575,343	06/232,954	3/11/86
4,575,345	06/715,729	3/11/86
4,575,346	06/525,549	3/11/86
4,575,348	06/594,534	3/11/86
4,575,349	06/700,505	3/11/86
4,575,351	06/574,073	3/11/86
4,575,354	06/507,706	3/11/86
4,575,367	06/638,070	3/11/86
4,575,371	06/738,509	3/11/86
4,575,375	06/667,575	3/11/86
4,575,377	06/650,304	3/11/86
4,575,391	06/573,177	3/11/86
4,575,398	06/393,750	3/11/86
4,575,405	06/448,056	3/11/86
4,575,407	06/664,145	3/11/86
4,575,408	06/598,549	3/11/86
4,575,422	06/446,963	3/11/86
4,575,433	06/688,553	3/11/86
4,575,441	06/587,530	3/11/86
4,575,444	06/370,556	3/11/86
4,575,458	06/427,721	3/11/86
4,575,501	06/405,847	3/11/86
4,575,505	06/634,847	3/11/86
4,575,517	06/580,902	3/11/86
4,575,528	06/585,461	3/11/86
4,575,548	06/654,471	3/11/86
4,575,555	06/656,128	3/11/86
4,575,563	06/575,734	3/11/86
4,575,578	06/455,662	3/11/86
4,575,582	06/664,066	3/11/86
4,575,586	06/626,875	3/11/86
4,575,587	06/653,626	3/11/86
4,575,588	06/660,639	3/11/86
4,575,595	06/705,866	3/11/86
4,575,607	06/555,601	3/11/86
4,575,717	06/558,372	3/11/86
4,575,718	06/405,418	3/11/86
4,575,724	06/640,904	3/11/86
4,575,733	06/673,564	3/11/86
4,575,735	06/601,842	3/11/86
4,575,736	06/598,517	3/11/86
4,575,757	06/487,861	3/11/86
4,575,782	06/742,801	3/11/86
4,575,784	06/684,492	3/11/86
4,575,789	06/694,504	3/11/86
4,575,820	06/518,168	3/11/86
4,575,837	06/583,705	3/11/86
4,575,840	06/595,120	3/11/86
4,575,855	06/518,342	3/11/86

Patent Number	Serial Number	Issue Date
4,575,608	06/657,909	3/11/86
4,575,624	06/556,310	3/11/86
4,575,645	06/639,302	3/11/86
4,575,660	06/526,321	3/11/86
4,575,662	06/674,688	3/11/86
4,575,677	06/614,082	3/11/86
4,575,680	06/485,879	3/11/86
4,575,684	06/704,433	3/11/86
4,575,700	06/611,295	3/11/86
4,575,709	06/620,856	3/11/86
4,575,713	06/605,552	3/11/86
4,575,714	06/588,823	3/11/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,362,243	06/281,013	12/07/82	7/06/81	4/17/90
4,491,639	06/431,192	1/01/85	9/30/82	4/16/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,737,814, Re. S. N. 07/508,642, Filed Apr. 11, 1990, Cl. 354/412, ELECTRONIC MEMORY MEANS FOR ADJUSTING CAMERA ELECTRIC CIRCUITS, Yukio Nakojima, Owner of Record: *Olympus Optical Co., Ltd., Tokyo, Japan*, Attorney or Agent: Louis Weinstein, Ex. Gp.: 211

4,738,015, Re. S. N. 07/509,939, Filed Apr. 16, 1990, Cl. 29/407, INDUSTRIAL ROBOT WITH AUTOMATIC CENTERING, Hisao Kato, Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: David J. Cushing, Ex. Gp.: 326

4,766,106, Re. S. N. 07/509,017, Filed Apr. 13, 1990, Cl. 514/12, SOLUBILIZATION OF PROTEINS FOR PHARMACEUTICAL COMPOSITIONS USING POLYMER CONJUGATION, Nadine Katre, Owner of Record: *Cetus Corp., Emeryville, Calif.*, Attorney or Agent: Philip McGarrigle, Ex. Gp.: 186

4,794,248, Re. S. N. 07/507,278, Filed Mar. 22, 1990, Cl. 250/221, DETECTION DEVICE HAVING ENERGY TRANMITTERS LOCATED AT VERTICALLY SPACED APART POINTS ALONG MOVABLE DOORS, John E. Gray, Owner of Record: *Otis Elevator Co., Farmington, Conn.*, Attorney or Agent: William W. Jones, Ex. Gp.: 255

4,808,524, Re. S. N. 07/509,648, Filed Feb. 20, 1990, Cl. 435/36, TEST KIT AND METHOD FOR THE DETERMINATION OF STREPTOCOCCUS A AINTIGEN, Brian A. Snyder, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.*, Attorney or Agent: James L. Tucker, Ex. Gp.: 182

4,826,150, Re. S. N. 07/509,539, Filed Mar. 30, 1990, Cl. 272/73, RESISTANCE APPLYING MEANS FOR EXERCISING APPARATUS, Chihiro Minoura, Owner of Record: *Minoura Carrier & Stand Works Co., Ltd., Gifu-Ken, Japan*, Attorney or Agent: Douglas A. Miro, Ex. Gp.: 332

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,062,141, Reexam. No. 90/001,987, Requested Apr. 9, 1990, Cl.: 43/3, DECOY, Jelmer Shjeflo, Owner of Record: *M.M. & G.W. Jurgens, Fergus Falls, Minn.*, Attorney or Agent: Robert E. Kleve, Ex. Gp.: 320, Requester: CBK Ltd., Union City, Tenn.

4,369,722, Reexam. No. 90/001,985, Requested Apr. 6, 1990, Cl.: 112/103, CONTROL SYSTEM FOR A PLURALITY OF EMBROIDERY SEWING MACHINES, Kaji Nishida, et al., Owner of Record: *Aisin Seiki Kabushiki Kaisha, Aichi, Japan*, Attorney or Agent: Unknown, Ex. Gp.: 240, Requester: Owner

4,424,551, Reeexam. No. 90/001,983, Requested Apr. 3, 1990, Cl.: 361/302, HIGHLY-RELIABLE FEED THROUGH-FILTER CAPACITOR AND METHOD FOR MAKING SAME, Robert A. Stevenson, Owner of Record: *AVX Corp., New York, N.Y.*, Attorney or Agent: Sutton, Basseches, Magidoff & Amaral, Ex. Gp.: 210, Requester: Sierra Aerospace Technology Inc., Carson City, Nev.

4,433,070, Reexam. No. 90/001,986, Requested Apr. 9, 1990, Cl.: 523/171, CULTURED ONYX PRODUCTS AND METHODS THEREFOR, Gilbert B. Ross, et al., Owner of Record: *Spectrum Licensing Corp., New York, N.Y.*, Attorney or Agent: Louis J. Bachand, Ex. Gp.: 150, Requester: John W. Jones, Houston, Tex.

4,544,584, Reexam. No. 90/001,988, Requested Apr. 9, 1990, Cl.: 428/15, CULTURED ONYX PRODUCTS AND METHODS THEREFOR, Gilbert B. Ross, et al., Owner of Record: *Spectrum 21 Licensing Corp., New York, N.Y.*, Attorney or Agent: Louis J. Bachand, Ex. Gp.: 150, Requester: John W. Jones, Houston, Tex.

4,619,584, Reexam. No. 90/001,984, Requested Apr. 6, 1990, Cl.: 416/129, DOUBLE PROPELLER DRIVE FOR BOATS, Lennart Brandt, Owner of Record: *AB Volvo Penta, Gathenburg, Sweden*, Attorney or Agent: Unknown, Ex. Gp.: 340, Requester: Owner

4,657,696, Reexam. No. 90/001,981, Requested Apr. 2, 1990, Cl.: 252/301.170, SCINTILLATION COUNTING MEDIUM AND COUNTING METHOD, James Thomson, Owner of

VOL
1114
ISS
4
MY
22
1990
UMI

Record: *Fisons, Plc., Ipswitch, England*, Ex. Gp.: 110, Requester: Packard Instrument Co., Inc., Downers Grove, Ill.

4,748,161, Reexam. No. 90/001,980, Requested Apr. 4, 1990, Cl.: 514/182, TRITERPENYL ESTERS OF ORGANIC ACIDS AND HYPOLIPIDEMIC AGENTS COMPOSED OF THEM, Goro Kimura, et al., Owner of Record: *Amano Pharmaceutical Co., Ltd., Nagoya, Japan*, Attorney or Agent: Wegner & Bretschneider, Ex. Gp.: 120, Requester: Owner

4,776,765, Reexam. No. 90/001,979, Requested Apr. 2, 1990, Cl.: 416/241, MEANS AND METHOD FOR REDUCING SOLID PARTICLE EROSION IN TURBINES, William J. Sumner, Owner of Record: *General Electric Co., Schenectady, N.Y.*, Attorney or Agent: J.E. Squillaro, Ex. Gp.: 340, Requester: George Vande Sande, Washington, D.C.

4,864,390, Reexam. No. 90/001,982, Requested Apr. 4, 1990, Cl.: 358/60, DISPLAY SYSTEM WITH EQUAL PATH LENGTHS, Thomas McKechnie, et al., Owner of Record: *North American Philips Corp , Tarrytown, N.Y.*, Attorney or Agent: Unknown, Ex. Gp.: 260, Requester: Owner

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Patent Terms Extended Under 35 USC 156

Certificates extending the terms of the following patents were issued on April 25, 1990.

U.S. Patent No. 4,267,320, granted May 12, 1981 to Michael Gregson et al., Owner of Record: Glaxo Operations UK Ltd., Title: CEPHALOSPORIN ANTIBIOTICS, Classification: 544/22, Product Trade Name: Ceftin, Term Extended: 2 years

U.S. Patent No. 4,409,214, granted Oct. 11, 1983 to Takao Takaya, et al., Owner of Record: Fujisawa Pharmaceutical Co., Ltd., Title: 7-ACYLAMINO-3-VINYLCEPHALOSPORANIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF, Classification: 424/246, Product Trade Name: Suprax, Term Extended: 2 years

U.S. Patent No. 4,494,531, granted Jan. 22, 1985 to Cesare Gianturco, Owner of Record: Cook, Inc., Title: EXPANDABLE BLOOD CLOT FILTER, Classification: 128/1R, Product Trade Name: Cook Bird's Nest Vena Cava Filter, Term Extended: 459 days

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Errata

"All reference to Patent No. 4,904,250 to Ingela Ternstrom of Molnlycke, Sweden for `ABSORPTION BODY INTENDED FOR DISPOSABLE ARTICLES SUCH AS DIAPERS, SANITARY NAPKINS AND THE LIKE' appearing in the Official Gazette of Feb. 27, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,917,936 to John C. Rhodes et al., of Mo. for `ABSORBENT PAD AND METHOD FOR CONSTRUCTING SAME' appearing in the Official Gazette of Apr. 17, 1990 should be deleted since no patent was granted."

PATENT NOTICES

Certificates of Correction For Week of May 22, 1990

D. 301,184	4,826,128	4,841,081	4,849,113
D. 302,074	4,826,225	4,841,148	4,849,125
4,618,622	4,826,347	4,841,310	4,849,136
4,640,319	4,826,678	4,841,699	4,849,207
4,674,108	4,826,854	4,841,905	4,849,396
4,679,560	4,827,802	4,842,875	4,849,400
4,704,548	4,827,871	4,843,056	4,849,453
4,705,831	4,827,985	4,843,197	4,850,359
4,716,856	4,828,096	4,843,211	4,850,490
4,736,125	4,828,611	4,843,404	4,850,504
4,742,279	4,829,146	4,843,566	4,850,707
4,742,806	4,831,362	4,843,790	4,850,886
4,745,355	4,832,469	4,844,427	4,850,949
4,746,234	4,832,680	4,844,939	4,851,423
4,747,130	4,833,161	4,845,056	4,851,568
4,748,158	4,833,662	4,845,146	4,851,569
4,749,576	4,833,957	4,845,279	4,851,667
4,772,983	4,834,218	4,845,411	4,851,800
4,773,206	4,834,757	4,845,522	4,851,806
4,773,936	4,835,011	4,845,658	4,851,855
4,776,064	4,835,295	4,845,726	4,852,042
4,784,465	4,835,516	4,845,943	4,852,044
4,792,411	4,835,636	4,845,976	4,852,104
4,795,925	4,835,779	4,846,168	4,852,141
4,798,793	4,835,800	4,846,185	4,852,199
4,799,151	4,836,192	4,846,549	4,852,254
4,805,376	4,836,697	4,846,669	4,852,396
4,805,901	4,836,924	4,846,696	4,852,598
4,808,625	4,836,941	4,846,905	4,853,269
4,808,658	4,837,241	4,846,924	4,853,300
4,810,783	4,837,470	4,846,931	4,853,311
4,810,896	4,837,499	4,846,957	4,853,436
4,811,278	4,837,608	4,847,254	4,853,572
4,811,362	4,837,857	4,847,449	4,854,661
4,814,598	4,838,201	4,847,702	4,854,734
4,816,474	4,838,535	4,847,712	4,855,185
4,818,062	4,838,652	4,848,146	4,855,852
4,819,050	4,838,761	4,848,199	4,861,109
4,820,001	4,838,902	4,848,201	4,861,139
4,820,201	4,839,190	4,848,320	4,861,760
4,821,463	4,839,458	4,848,327	4,861,988
4,821,570	4,839,679	4,848,434	4,863,953
4,824,065	4,839,680	4,848,664	4,868,177
4,824,160	4,839,822	4,848,735	4,837,740
4,824,582	4,840,457	4,848,742	4,877,318
4,824,720	4,840,576	4,848,920	4,879,738
4,824,964	4,840,972	4,848,978	4,894,974

VOL
1114
ISS
4
MY
22
1990
UMI

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VOL
1114
ISS
4
MY
22
1990
UMI

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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF April 7, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-7-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	10-18-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	5-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	2-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	3-23-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	3-30-88
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-24-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during April 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,723,992 to 3,729,743 inclusive
Plant Patents ..... None

VOL
1114
ISS
4
MY
22
1990
UMI

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,218

WEIGHT LIFTING BAR

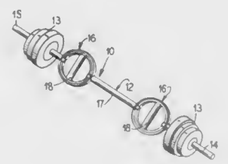
Brian Twardosz, 12941 Exchange, Chicago, Ill. 60633

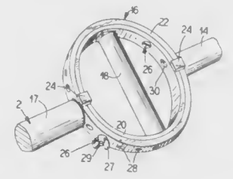
Original No. 4,618,143, dated Oct. 21, 1986, Ser. No. 679,869, Dec. 10, 1984. Application for reissue Apr. 25, 1988, Ser. No. 185,819

Int. Cl.[5] A63B *13/00*

U.S. Cl. 272—123

11 Claims





10. A device used to hold weights during human exercise comprising:

a bar with a longitudinal axis having opposed end portions receiving selectively removable weights and two spaced hand grip portions each inboard of said end portions and non-removably secured relative to each other and said end portions;

said hand grip portions each comprising:

an outer ring member secured against rotation to said bar;

a cylindrical hand grip member extending across a diameter of said ring member; and

a retaining means engageable between said hand grip member and said ring member to selectively secure said hand grip member against rotation relative to said bar member;

wherein said hand grip member can be selectively rotated relative to said bar and retain in said selected position to permit various exercises to be performed without removal of said weights from said bar.

Re. 33,219

CLAMP VALVES

Michael G. Daniell, and Gerald S. Martin, both of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Original No. 4,634,092, dated Jan. 6, 1987, Ser. No. 656,724, Oct. 1, 1984. Application for reissue Jan. 4, 1989, Ser. No. 293,198

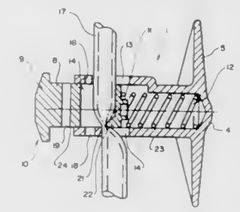
Claims priority, application New Zealand, Sep. 30, 1984, 205826

Int. Cl.[5] F16L *55/14*

U.S. Cl. 251—7

5 Claims

1. A clamp valve comprising a hollow member open at one end and having a side wall with a pair of apertures therethrough, a slide movable in said hollow member and having a transverse aperture therethrough so that a conduit having a pliable resilient wall can in use be passed through both said apertures in said wall of said hollow member and through said aperture through said slide, said aperture through said slide having an outer edge *shaped to provide a rib extending inwardly*



of said aperture and juxtaposed to an inner edge of one of the apertures in said wall for clamping said conduit between said edges, and biasing means to bias said slide relative to said hollow member to a position for clamping said conduit between said edges so that said conduit is normally closed to fluid flow.

Re. 33,220

MODULAR COMBINATION FLOOR SUPPORT AND ELECTRICAL ISOLATION SYSTEM FOR USE IN BUILDING STRUCTURES

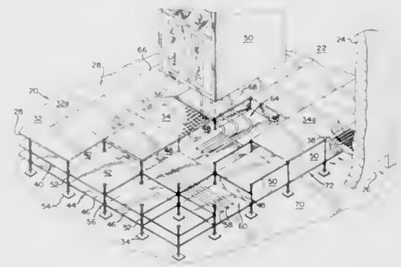
William R. Collier, Oak Brook Terrace, Ill., assignor to Interstitial Systems, Inc., Oakbrook, Ill.

Original No. 4,630,417, dated Dec. 23, 1986, Ser. No. 579,426, Feb. 13, 1984. Application for reissue Dec. 23, 1988, Ser. No. 289,615

Int. Cl.[5] E04B *2/82*

U.S. Cl. 52—263

26 Claims



1. A combination working area floor structure and conductor support and isolator assembly comprising, in combination, a plurality of vertically extending floor support column units each having upper and lower end portions and an intermediate column section, a working area floor positioned by and disposed in overlying relation to said upper ends of said column support units; means on at least one intermediate portion of said support columns for positioning and supporting at least one conductor support floor, said conductor support floor being disposed beneath and spaced apart from said working area floor, a plurality of vertically extending imperforate wall panels extending between portions of said conductor support

VOL
1114
ISS
4
MY
22
1990
UMI

floor and said working area floor so as to subdivide the region above said conductor support floor and below said working area floor into a mechanically isolated conductor plenum adapted to receive and support insulated electrical conductors, and to afford mechanical isolation therefor, said plenum also including at least one upwardly extending opening in said working area floor through which said conductors may pass for attachment to an apparatus supported on said working area floor, with said wall panels also defining a mechanically isolated, vertically extending passage extending from beneath said conductor support floor through said isolated plenum and to said working area floor, with an under portion of said working area floor lying above said vertically extending passage and said conductor support floor also including at least one opening therein to afford communication between the area above said working area floor and the area beneath said conductor support floor.

Re. 33,221

DENTAL RESTORATIVE CEMENT PASTES

Walter E. Brown, Rockville, and Laurence C. Chow, Potomac, both of Md., assignors to American Dental Association Health Foundation, Washington, D.C.

Original No. 4,518,430, dated May 21, 1985, Ser. No. 539,740, Oct. 6, 1983. Continuation-in-part of Ser. No. 373,157, Apr. 29, 1982, abandoned. Application for reissue May 18, 1987, Ser. No. 51,739

Int. Cl.[5] **C01B** *25/32;* **C09K** *3/00*

U.S. Cl. 423—308 **18 Claims**

1. A [dental restorative] paste *consisting essentially of* [comprising] an aqueous mixture of $Ca_4(PO_4)O$ and at least one other calcium phosphate selected from the group consisting of $CaHPO_4.2H_2O$ [,] *and* $CaHPO_4$, [$Ca_8H_2(PO_4)_6.5H_2O$, β-$Ca_3(PO_4)_2$, β-$Ca_3(PO_4)_2$, and modified $Ca_3(PO_4)_2$, the paste being capable of hardening] *which aqueous mixture hardens* into a cement *at an ambient temperature.*

PLANT PATENTS

GRANTED MAY 22, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,232

LILY PLANT NAMED PENNY LANE

Petrus M. M. Hoff, Hemmerbuurt, Netherlands, assignor to Hoffgaarde B.V., Netherlands

Filed May 11, 1989, Ser. No. 350,236

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of lily plant named Penny Lane, as illustrated and described.

7,233

CHRYSANTHEMUM PLANT NAMED YELLOW COMET

Camilo Herrera, Bogota, Colombia, assignor to Whitefield Corporation, Panama

Filed Apr. 13, 1989, Ser. No. 337,425

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Yellow Comet, as described and illustrated.

7,234

POINSETTIA PLANT '135'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed Oct. 27, 1988, Ser. No. 263,494

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, distinguished by its predominantly white bracts bearing scattered red splotches, stiff-stemmed, and vigorous growth habits.

7,235

POINSETTIA PLANT 'C-27'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed Oct. 27, 1988, Ser. No. 263,496

Int. Cl.[5] **A01H** *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, distinguished by its large, bright red, erect flower bracts which tend to bend upwards.

VOL
1114

ISS
4

MY
22

1990

UMI

PATENTS

GRANTED MAY 22, 1990

ERRATA

For CLASS	See PATENT NO.
047-052	4,926,597
047-061	4,926,598
049-088	4,926,599
049-491	4,926,600
051-007	4,926,601
051-135	4,926,602
051-165	4,926,603
051-165	4,926,604
055-089	4,926,620
070-374	4,926,670
072-389	4,926,676
072-430	4,926,670
072-410	4,926,685
074-527	4,926,688
074-227	4,926,711
475-227	4,926,712
475-146	4,926,713
475-337	4,926,715
119-106	4,926,784
606-088	4,926,854
606-159	4,926,858
606-144	4,926,860
128-731	4,926,969
222-520	4,927,065
224-042	4,927,066
248-539	4,927,117
248-545	4,927,118
248-555	4,927,119
248-676	4,927,120
292-201	4,927,203
292-216	4,927,204
294-094	4,927,205
455-611	4,927,226
424-004	4,927,345
600-036	4,927,410
604-088	4,927,423
209-315	4,927,534
424-449	4,927,687
549-451	4,927,968

VOL
1114
ISS
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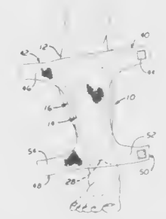
341-137 4,928,007
187-108 4,928,021
331-017 4,928,075
353-020 4,928,123
354-106 4,928,124
342-009 4,928,130
342-188 4,928,131
358-213 4,928,137
363-040 4,928,138
372-038 4,928,248
367-106 4,928,262
367-118 4,928,263
367-141 4,928,264
369-116 4,928,277
378-020 4,928,283

PATENTS

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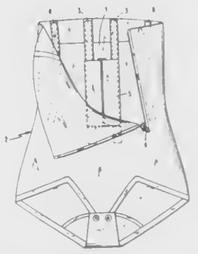
GENERAL AND MECHANICAL

4,926,501
DISPOSABLE ANTERIOR LOWER LEG GUARD
Carl C. Goosen, 2415 Shoreham Rd., Orlando, Fla. 32803
Filed Nov. 21, 1988, Ser. No. 274,350
Int. Cl.[5] A41D *13/06, 13/08*
U.S. Cl. 2—22 3 Claims



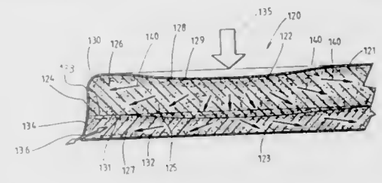
1. A disposable anterior lower leg guard to reduce injury to the anterior lower leg area of a patient comprising an inner shock absorbing protective member including an elongated outer protective panel and an elongated inner corrugated shock absorbing section, said elongated inner corrugated shock absorbing section comprising an inner shock absorbing member including a plurality of ridges and troughes disposed within an outer relatively soft enclosure including an inner and outer enclosure element cooperatively forming a pocket therebetween to receive and operatively retain said inner shock absorbing protective member therebetween to be worn over and protect the anterior lower leg area of the patient, and an upper and lower attachment means formed on the upper and lower portion of said outer relatively soft enclosure to detachably attach said disposable anterior leg guard to the anterior lower leg area of a patient, said elongated outer protective panel and said elongated inner corrugated shock absorbing section each including an arcuate concave recess formed on the lower end portion thereof to accommodate ankle and foot movement.

4,926,502
CORSET FOR ALLEVIATION OF LUMBAGO
Tetsuo Miyamura, Shiga, Japan, assignor to Wacoal Corp., Japan
Filed Jan. 9, 1989, Ser. No. 295,102
Int. Cl.[5] A41C *1/00, 1/08*
U.S. Cl. 2—44 7 Claims



1. A corset for alleviation of lumbago, comprising:
a non-stretchable section which is formed to be positioned at a portion which corresponds to the lumbar region in the center of the back of a human body;
stretchable portions comprising elastic core materials which are respectively connected to left and right side edges of said non-stretchable section; and
a gel pad disposed at said non-stretchable section so as to deformably fill any gap between the user's back and said non-stretchable section to provide improved back support to the user.

4,926,503
ATHLETIC SHOCK ABSORBING PAD
James C. Wingo Jr, Houston, Tex., assignor to Riddell, Inc., Chicago, Ill.
Division of Ser. No. 193,840, May 13, 1988. This application Jun. 30, 1989, Ser. No. 373,501
Int. Cl.[5] A41D *27/26*
U.S. Cl. 2—267 4 Claims



1. A shock absorbing pad structure for athletic equipment comprising:
a flexible enclosure having first and second faces and a periphery defining a cavity;
a flexible open-celled foam member is disposed within the cavity and comprises two layers of open-celled foam, the density of the layers of open-celled foam being different from one another, each layer of the foam member having two faces, one face of each layer being bonded to one face of the flexible enclosure, and each layer of open-celled foam having a periphery disposed adjacent the periphery of the flexible enclosure, the cells of the foam member releasably holding a volume of air selectively varied between first and second volumes differing by a volume differential in response to application and removal of a force on the shock absorbing pad structure, said volume differential being transferred between the foam member and the atmosphere outside the shock absorbing pad structure through at least one air permeable region of the periphery of the flexible enclosure.

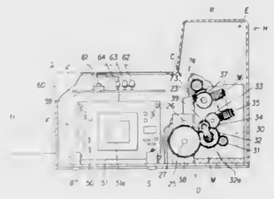
4,926,504
TOILET SEAT STRUCTURE CAPABLE OF AUTOMATICALLY FEEDING A SEAT COVERING PAPER ONTO A TOILET SEAT
Mitsuhiro Higuchi, and Hirofumi Yamamoto, both of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan
Filed May 23, 1988, Ser. No. 197,531
Claims priority, application Japan, May 28, 1987, 62-134531; Aug. 22, 1987, 62-208537; Oct. 28, 1987, 62-165962[U]; Dec. 18, 1987, 62-322571
Int. Cl.[5] A47K *13/20*
U.S. Cl. 4—247 2 Claims

1. A toilet seat structure which comprises:
(a) a toilet seat body having an upper surface;
(b) a functional casing provided at the rear of the toilet seat body;
(c) a paper roll storage box disposed in the functional casing at an upper portion thereof and rotatably stored in the

VOL
1114
ISS
4
MY
22
1990
UMI

storage box a paper roll having a length of paper sufficient for being cut into a plurality of seat covering papers, the paper having a free end beginning with which the paper is unreelable from the roll;

(d) a paper feeding mechanism for feeding paper in a forward direction toward said toilet seat body by unreeling the paper from the paper roll and extending the paper forwardly onto the upper surface of the toilet seat body, said paper feeding mechanism being disposed in the functional casing immeddiately below the storage box, said paper feeding mechanism including a feed roller and a press roller biased together to form a nip through which the paper is conducted from the paper roll, the feed roller and the press roller being so arranged that the paper before entering said nip travels on a substantial portion of the surface of the press roller in a direction opposite the direc-



tion of winding of the paper on the paper roll to offset curl imparted to the paper by the roll so that the paper is flat when extended onto said upper surface of the seat body;

(e) a paper cutting mechanism disposed in the functional casing in front of the paper feeding mechanism, said paper cutting mechanism being located to cut the paper at a position a predetermined distance rearwardly away from the free front end of the paper to provide a flat piece of seat covering paper on the toilet seat body;

(f) a control unit comprising a central processing unit for accurately controlling the operation of the paper feeding mechanism and the paper cutting mechanism to feed a specified length of the paper onto the toilet seat body and cut the paper fed onto the toilet seat body to provide a seat covering paper on said toilet seat body; and

(g) a control board for transmitting control signals to the control unit.

4,926,505

TOILET SEAT STRUCTURE CAPABLE OF AUTOMATICALLY FEEDING SEAT COVERING PAPER ON TOILET SEAT

Mitsuhiro Higuchi; Hirofumi Yamamoto, both of Kitakyushu; Osamu Yamamoto, Kasugai; Shokichi Fujii, Kasugai, and Katsumi Nonomura, Kasugai, all of Japan, assignors to Toto Ltd., Kasugai, Japan

Filed Nov. 14, 1988, Ser. No. 271,134

Claims priority, application Japan, Nov. 20, 1987, 62-294476; Aug. 3, 1988, 63-195131

Int. Cl.[5] A47K *13/18*

U.S. Cl. 4—247 **28 Claims**

1. A toilet seat structure capable of automatically feeding a seat covering paper onto a toilet seat comprising:

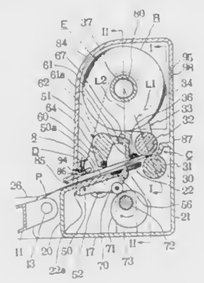
(a) a seat covering paper roll in a seat covering paper roll protection cover disposed at the rear end of a toilet seat body,

(b) a seat covering paper feeding mechanism for feeding a seat covering paper from said seat covering paper roll to the upper surface of the seat body,

(c) a seat covering paper tearing mechanism for tearing said seat covering paper after said feeding of said seat covering paper and

(d) a control unit for controlling said seat covering paper feeding mechanism and said seat covering paper tearing mechanism,

said toilet seat structure further comprising tension applying means comprising first clamping means and second clamping means disposed below said seat covering paper roll in a spaced-apart manner in a feeding direction, said tension applying means being capable of applying a tension to a



portion of said seat covering paper reeled out from said seat covering paper roll which bridges between said first and second clamping means, and said seat covering paper tearing mechanism comprising a press plate disposed between said first and second clamping means, said press plate being capable of applying pressure on said tensioned portion of said seat covering paper for tearing said seat covering paper.

4,926,506

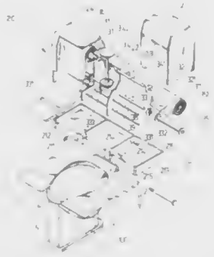
SANITARY LAVATORY SEAT SYSTEM

Grande Wang, No. 255, Dong Ming Road, Tali Shiang, Taichung, Taiwan

Filed Aug. 1, 1988, Ser. No. 226,861

Int. Cl.[5] A47K *3/18*

U.S. Cl. 4—247 **8 Claims**



1. A sanitary lavatory seat system comprising:

a lavatory seat having two generally flat portions and having a protruding portion at the rear thereof, said lavatory seat being positioned above a lavatory bowl;

a casing positioned at the rear of a lavatory bowl, said casing being solely mounted to said protruding portion and said lavatory bowl whereby said sanitary lavatory seat system is free-standing on the lavatory bowl, said lavatory seat being pivotally attached about said protruding portion to said casing whereby said lavatory seat can be raised against said casing, said casing further having a bottom holder, a middle holder and two side covers cooperating with said bottom holder to provide an encloses space on each side of said middle holder;

a wheel axle within each of said two side covers for receiving rolls of covering material;

a take-up wheel axle extending from said middle holder into said two side covers and positioned beneath said wheel axle, each of said rolls having a terminal end which is extended out of a bottom slot of the casing, over the top of one of the generally flat portions of the lavatory seat, deflected around a front edge of the generally flat portion, extended under the generally flat portion, returned into the casing and wound around the take-up wheel axle;

a pair of fixed guide rods within each of the two side covers, one of the pair of rods guiding the covering material leaving the casing through the slot and the other of the pair of rods guiding the covering material returning to the casing to be wound around said take-up wheel, said one pair of at guide rods being positioned beneath said wheel axle; and

drive means positioned within said middle holder for rotating the take-up wheel axle to synchronously slide the covering material over the lavatory seat for a fixed length to thereby cover the two generally flat portions of the lavatory seat and to present a clean and sanitary portion of the covering material upon each activation of the drive means;

each of said wheel axles, said take-up wheel axle, said pair of fixed guide rods and said drive means all being located within said enclosed space of said casing whereby said covering material can assuredly remain clean until moved out of said casing and over the top of the generally flat portions of the lavatory seat by said drive means and whereby damage to said wheel axles, take-up wheel axle, guide rods and drive means can be avoided further comprising a wheel hub positioned on said take-up wheel axle for each of said rolls and a driving wheel fixedly attached on said take-up wheel axle of each of said wheel hubs, said driving wheel being rotatable with said take-up wheel axle and having a groove therein for receiving a portion of the wheel hub to lock the hub therewith whereby said wheel hub will be rotated with said take-up wheel axle, each of said wheel hubs being longitudinally slidable along said take-up wheel axle to facilitate replacement of the covering material.

4,926,507

ADJUSTABLE DRAIN CLOSURE

Burnie M. Craig, Laguna Beach, and Roy K. Fujitaki, Altadena, both of Calif., assignors to American Brass and Aluminum Foundry Co., Inc., Los Angeles, Calif.

Filed Aug. 9, 1989, Ser. No. 390,025

Int. Cl.[5] A47K *1/14*; E03C *1/26*

U.S. Cl. 4—295 **13 Claims**

1. In a drain closure, the combination comprising:

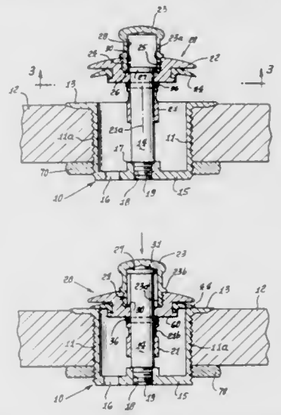
(a) a drain stopper having a downwardly projecting sleeve,

(b) an upwardly extending post loosely received in said sleeve, and means carrying the post,

(c) the sleeve having at least one opening through the side thereof,

(d) and a spring carried by the sleeve and having an arm received in said opening to frictionally engage the post,

(e) whereby the sleeve, spring and stopper are adjustably movable up and down relative to the post, against frictional force exerted by the spring arm engaging the post as the arm slides relative to the post,



4,926,508

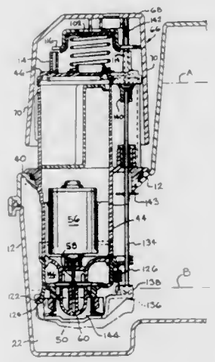
PORTABLE TOILET WITH BATTERY OPERATED FLUSH ASSEMBLY

Charles L. Sargent; John M. Antos, and Scott I. Biba, all of Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Continuation of Ser. No. 114,081, Oct. 27, 1987. This application Feb. 10, 1989, Ser. No. 309,844

Int. Cl.[5] E03D *1/24*

U.S. Cl. 4—329 **10 Claims**



1. In a portable toilet which includes a seat section having a bowl with a bottom discharge opening and a chamber containing flush water for rinsing said bowl and flushing the contents thereof through said discharge opening, pump means operable to move water from said flush water chamber into said bowl, an enclosure for said pump means having a lower flush water inlet communicating with said flush water chamber, electric motor means drivingly connected to said pump means, battery means mounted on said seat section, means for selectively electrically connecting said battery means to said motor means, said electrical connecting means including a circuit having an "on/off" switch and further including a switch actuating member movably mounted on said seat section for movement be-

VOL
1114
ISS
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MY
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1990
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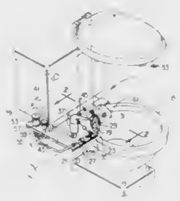
tween two positions corresponding to "on" and "off" positions of said switch, closure means for said flush water inlet movable between open and closed positions, said closure means in the closed position blocking flow of flush water from said chamber into said enclosure and then into said bowl and said closure means in the open position enabling flow of flush water from said chamber into said enclosure, and means operable in response to movement of said actuating member to said position corresponding to the "on" position of said switch for moving said closure means to said open position.

4,926,509

BIDET

Joyce H. Bass, 2405 Arbor Oaks Dr., Arlington, Tex. 76006

Filed Jul. 21, 1988, Ser. No. 222,132
Int. Cl.[5] A61H *35/00*
U.S. Cl. 4—448 21 Claims



1. A bidet apparatus adapted to be fitted to a toilet including a bowl having an upper horizontal rim surface, which comprises:

a base plate attachable to said upper horizontal rim surface;

a spray pipe pivotally mounted to said base plate about a horizontal axis, said spray pipe having an inlet and an outlet and sized and shaped to be movable between a retracted position adjacent said rim surface and an in use position extending toward the center of said bowl;

a spray nozzle connected to the outlet end of said spray pipe;

a crank arm connected to said spray pipe to pivot said spray pipe about said horizontal axis between said retracted and in use positions;

a valve mounted to said base plate adjacent to and horizontally displaced from said crank arm, said valve having an outlet and at least one inlet, said valve having a lever handle pivotable about a horizontal axis between a valve open position and a valve closed position by said lever handle,

said valve being operative to selectively control the rate of flow of water passing through the bidet apparatus, said rate of flow being selectable in response to linear movement of said lever handle;

conduit means for connecting said outlet of said valve to said spray pipe;

and a link pivotally connected between said lever handle of said valve and said crank arm, whereby movement of said lever handle to said valve open position pivots said spray pipe to said in use position; wherein

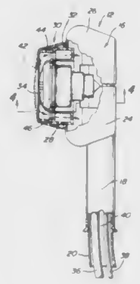
said spray pipe is curved such that movement of said lever handle to change the rate of flow does not appreciably change the direction of the spray exiting said spray nozzle while said spray nozzle is in said in use position.

4,926,510

HAND HELD DRY HYDRO-MASSAGE UNIT FOR A SPA

Jonathan Watkins, Vista, Calif., assignor to Watkins Manufacturing Corporation, Carlsbad, Calif.

Filed Oct. 24, 1988, Ser. No. 261,943
Int. Cl.[5] A61H *9/00*; E04H *3/18*
U.S. Cl. 4—542 15 Claims



1. A hand held dry hydro-massage unit for applying dry hydro-massage to specific portions of a user's body, said unit associated with a spa tub having a water and an air supply, said dry hydro-massage unit comprising:

a rigid housing having a front opening;

a hydro-massage jet assembly having a discharge nozzle mounted within said housing, said hydro-massage jet assembly supplying a massaging fluid mix of air and water through said discharge nozzle;

means fluidly connecting said hydro-massage jet assembly to the water and air supply of the tub for the supply of water and air to said hydro-massage jet assembly; and

a diaphragm sealingly covering said opening of said housing whereby said massaging fluid mix of air and water from said discharge nozzle massagingly flexes said diaphragm;

means for restricting outlet flow of discharged fluid from said housing thereby increasing the fluid pressure within said housing to expand and maintain said diaphragm in a substantially constant inflated state beyond said front opening so as to provide a pillow-like surface to contact the user, said discharge jet discharging fluid into the pressurized fluid environment and against said expanded diaphragm,

said dry hydro-massage unit manually manipulable such that said diaphragm covered discharge nozzle may be selectively positioned against specific portions of the user's body.

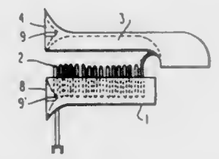
4,926,511

MOVABLE SHOWER ASSEMBLY HAVING AN AUTOMATICALLY RETRACTING HOSE AND A SHOWER HEAD CAPABLE OF TAKING UP MULTIPLE POSITIONS

Alain Coll, 10 rue des Albatros, 77200 Croissy Beaubourg, France

Division of Ser. No. 54,563, May 27, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 262,044
Claims priority, application France, Jun. 6, 1986, 86 08223
Int. Cl.[5] A47K *3/22*
U.S. Cl. 4—605 6 Claims

1. A shower assembly, comprising: a support (1) having a semi-cylindrical housing, a hose (2), and a hand manipulable shower head (3) having at least one concave surface in the form of a sector of a cylinder, wherein said hose is of round or shaped cross section and is wound helically to constitute a helical spring shape, wherein said shower head and said support together constitute a housing for at least partially enclosing said hose when retracted and wherein the shower head comprises an elongate hand grip portion followed by a water outlet nozzle, an outlet end of the hose being coupled to the



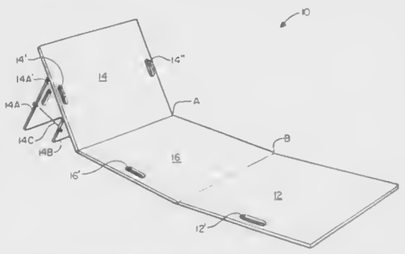
shower head proximate an interface region between the hand grip portion and the nozzle, and the length of the support being approximate that of the hand grip portion.

4,926,512

FOLDING PAPERBOARD BEACH CHAIR

Brian D. Coyle, 205 Get-a-Way La., Bahama, N.C. 27503

Filed Nov. 28, 1989, Ser. No. 442,144
Int. Cl.[5] A47C *7/16*
U.S. Cl. 5—417 6 Claims



1. A folding paperboard chair scored and cut to form a beach chair or the like, said chair comprising:

an elongated paperboard body having two spaced-apart and transversely extending score lines which define a bottom leg support panel, a middle seat support panel, and a top back support panel, said bottom and top panels being adapted to fold upwardly and over said middle panel so as to overlay same for ease of carrying said chair in a closed configuration;

a plurality of spaced-apart, foldable support panels extending transversely across the back of said top back support panel to provide support for said top panel when said chair is in an open configuration and which are adapted to fold upon and overlay said top panel when said top panel is folded to overlay said middle panel; and

an aperture defined by each of said bottom, middle and top panels and adjacent to one side thereof so as to be in registration and thereby to form a carrying handle when said chair is in a closed configuration and said top and bottom panels overlay said middle panel.

4,926,513

APPARATUS FOR CHANGING DISPOSABLE BEDDING ON A MATTRESS

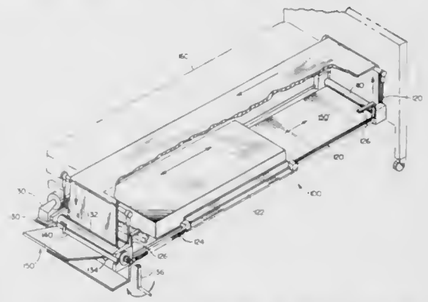
Edwin O. Oats, Dallas, Tex., assignor to Roll-in-Sheet Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 279,973, Dec. 5, 1988, abandoned. This application Jun. 28, 1989, Ser. No. 372,326
Int. Cl.[5] A47C *21/00*
U.S. Cl. 5—488 2 Claims

1. The combination, with a bed having a mattress, and disposable bedding sheets in tension contact with the top surface of a mattress, comprising:

A. a bedding storage carton for storage of folded increments of bedding sheets that are folded to some fractional width of the mattress, commeasurate with the width of the storage carton;

B. means supported by the bed to control tension relationship of the storage carton means, by tension springs and to rollably guide multiple increments of bedding sheets;



C. said bedding sheets comprising at spaced intervals, a topmost sheet and a lowermost sheet, said sheets being of substantially the same width, said sheets also having longitudinal edges folded upon themselves;

D. means mounted on the bed, opposite the means supported by the bed to control tension and to advance portions of multiple increments of said bedding into and out of registry with the mattress of said bed; and

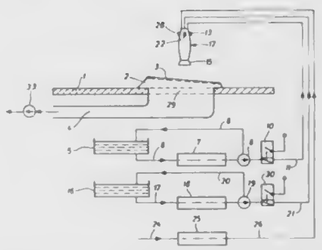
E. means to sever used portions of the disposable bedding.

4,926,514

METHOD OF AND APPARATUS FOR REMOVING STAINS FROM SOILED AREAS OF A PLANNAR TEXTILE ARTICLE

Hans Leuenberger, Bottighofen, Switzerland, assignor to Biac Holding AG, Kreuzlingen, Switzerland

Filed Jan. 18, 1989, Ser. No. 299,474
Claims priority, application Switzerland, Jan. 18, 1988, 163/88; May 20, 1988, 1926/88
Int. Cl.[5] D06B *1/02*, *5/24*
U.S. Cl. 8—150 26 Claims



1. A method of removing stains from a soiled area of a planar textile article, comprising the steps of

placing a soiled area of a planar textile article in a stretched condition over a water and air penetratable support;

mechanically working said soiled area at least once by a jet consisting essentially of relatively highly pressurized liquid by directing said jet against said soiled area such as to cause said relatively highly pressurized essentially liquid jet to penetrate therethrough, whereby dirt which caused

VOL
1114
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the staining is torn away from said stained area and is dragged along by said relatively highly pressurized essentially liquid jet; and

immediately thereafter exposing said area to a jet consisting essentially of pressurized air such as to have the pressurized essentially air jet penetrate therethrough, whereby liquid is expelled and driven away from said area by the force of the pressurized essentially air jet and an immediate drying thereof is reached.

17. An apparatus for removing stains from a soiled area of a planar textile article, comprising

a water and air penetratable support intended for supportingly receiving a soiled area of a textile article;

at least one means for producing and discharging a jet consisting essentially of relatively highly pressurized liquid directed against the soiled area of the textile article stretched over said support whereby dirt which caused the staining is torn away from said area and is dragged along by said relatively highly pressurized essentially liquid jet;

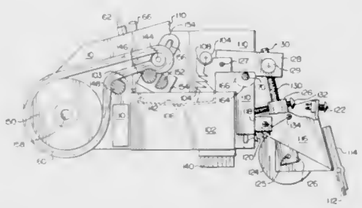
a means for producing and discharging a jet consisting essentially of pressurized air directed against said area of such textile article placed onto said support whereby liquid is expelled and driven away from said area by the force of the pressurized essentially air jet and an immediately drying thereof is reached.

4,926,515

IMPROVED MOPPING SYSTEM

William R. Lynn, P.O. Box 1074, Dover, N.H. 03820, and Roger R. Belanger, 11 1/2 Hamilton St., Dover, N.H. 03820

Filed Mar. 3, 1987, Ser. No. 21,339
Int. Cl.[5] A47L *11/14*
U.S. Cl. 15—4 6 Claims



1. An improved mopping system for use in cleaning a surface comprising in combination:

a mopping assembly comprising handle means;

means for containing a dispensable liquid;

a floor cleaner apparatus having a top surface, and, a bottom surface positioned adjacent which, for contacting the surface to be cleaned, is a rotatable means for absorbing liquid from the surface to be cleaned; said rotatable absorbent means having means for removing liquid therefrom which has been absorbed from the surface to be cleaned and reservoir means, separate from the container means, associated with said removing means, for storing liquid removed from said rotatable absorbent means;

means for attaching said container means to said mopping system;

means for dispensing fresh liquid from the container means onto the surface to be cleaned; and

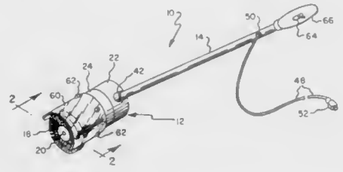
means for fastening said handle means to the top surface of the floor cleaner apparatus.

4,926,516

FLOOR CARE APPARATUS

Russell Valvo, P.O. Box 1, 144 Lake St., Angola, N.Y. 14006

Filed Oct. 14, 1988, Ser. No. 258,030
Int. Cl.[5] A47L *11/18*
U.S. Cl. 15—49 C 6 Claims



1. Floor care apparatus capable of removing chewing gum or the like; from flooring such as carpets or the like, the floor care apparatus comprising:

a housing having a generally cylindrical non-rotatable portion a segment of which is disposed upon the flooring when the housing is in an operative position, the housing being rockable to an inoperative position;

an electric motor mounted within the housing, the motor having an arbor shaft which extends beyond one side of the housing, the motor being mounted in such a manner that the arbor shaft is generally parallel to the surface of the flooring when the housing is in an operative position;

a wire brush mounted on the arbor shaft beyond one side of the housing, the periphery of the wire brush engaging the surface of the flooring when the housing is in an operative position and the periphery of the wire brush not engaging the surface of the flooring when the housing is rocked to an inoperative position;

a control handle having one end rigidly interconnected with said generally cylindrical portion of the housing and mounted so that it is generally perpendicular to the axis of the arbor shaft, the other end of the control handle being provided with a hand grip or the like, the handle being capable of the causing the housing to be rocked between its operative and inoperative positions;

power line means to power up the electric motor to cause the wire brush to be rotated, at least a portion of the power line means extending through the control handle; and

a clear shield having an edge portion mounted on the cylindrical portion of the housing, which clear shield extends beyond one side of the housing above the wire brush when the floor care apparatus is in an operative position.

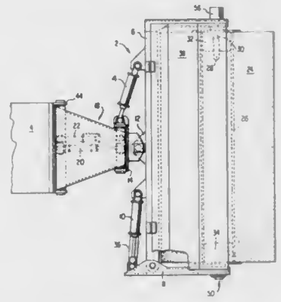
4,926,517

SWEEPER

Keith E. Smith, 1612 S. Combee Rd., Lakeland, Fla. 33801

Filed Feb. 24, 1989, Ser. No. 315,300
Int. Cl.[5] E01H *1/02*
U.S. Cl. 15—82 10 Claims

1. Sweeping apparatus comprising support means for supporting a brush for rotation about a generally horizontal axis and means for mounting said support means on a vehicle, wherein said support means comprises first and second arms, means for moving said first arm with respect to said second arm between a first position wherein said first arm is spaced from said second arm by a distance such that said brush is received between said arms and a second position wherein said first arm is spaced from said second arm such that said brush is released from between said arms, drive means mounted on said first arm by universal joint means for engaging one end of said brush and for rotating said brush about an axis extending between said first and second arms, and idler means mounted on



said second arm by universal joint means for engaging an opposite end of said brush.

4,926,518

PLASTIC DRAIN AUGER

Erwin F. Mikol, Park Ridge, Ill., assignor to Twentieth Century Companies, Inc., Wheeling, Ill.

Filed Jul. 15, 1988, Ser. No. 219,956
Int. Cl.[5] B08B *9/02*
U.S. Cl. 15—104.33 7 Claims



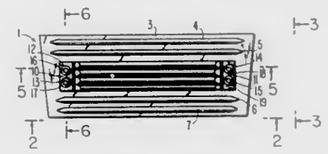
1. An elongated, generally cylindrical auger disposed about a central axis, said auger adapted to be used for cleaning pipes and tubes, said auger comprising of a plastic material, said auger having a continuous core concentrically positioned about said central axis, the outer surface of said auger being a helical coil shape, concentrically positioned about said central axis, said helical coil shape being defined by closely spaced ribs separated by notches, said ribs being sufficiently close to limit the flexing of said auger.

4,926,519

TROWEL

Daniel B. Podlesny, New Brunswick, and Ralph Lopez, Cliffwood Beach, both of N.J., assignors to Red Devil, Inc., Union, N.J.

Filed Apr. 10, 1989, Ser. No. 335,846
Int. Cl.[5] B05C *17/10*
U.S. Cl. 15—235.4 11 Claims



1. A plastic trowel comprising:

a substantially flat blade;

a smooth lower side on said blade;

an upper side on said blade;

a curved handle;

a first handle-retaining means on said upper side near a first end of said blade;

a second handle-retaining means on said upper side near a second end of said blade;

an arcuate handle;

a first end portion extending from a first end of said handle;

a second end portion extending from a second end of said handle;

first engagement means on said first end portion for engaging said first handle-retaining means;

second engagement means on said second end portion for engaging said second handle-retaining means;

said first handle-retaining means including a first member passing through said first end portion;

a first upset on said first member above said first end portion, whereby said first end portion is firmly affixed to said blade;

said second handle-retaining means including a second member passing through said second end portion; and

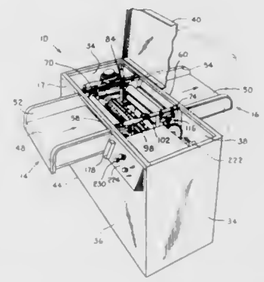
a second upset on said second member above said second end portion, whereby said second end portion is affixed to said blade.

4,926,520

METHOD AND APPARATUS FOR CLEANING CARPET TILES

Clande F. Watson, 19 Harvest La., Greenville, S.C. 29601

Filed Jul. 31, 1987, Ser. No. 80,429
Int. Cl.[5] A47L *11/00*
U.S. Cl. 15—302 6 Claims



1. A subassembly for a carpet tile cleaning machine having a scrubbing device for scrubbing carpet tiles, such subassembly comprising:

a reservoir adapted for holding a fluid, said reservoir having inlet means adapted for allowing a fluid to be introduced therein, and outlet means comprising separate wetting outlet means and rinsing outlet means integral with reservoir and adapted for allowing a fluid to be discharged therefrom, respectively;

wetting means connected to said wetting outlet means and adapted for wetting a carpet tile with at least a fluid from said reservoir prior to the carpet tile being scrubbed by a scrubbing device of a carpet tile cleaning machine;

rinsing means connected to said rinsing outlet means and adapted for rinsing a carpet tile with a fluid from said reservoir after the carpet tile is scrubbed by a scrubbing device of a carpet tile cleaning machine;

pump means adapted for pumping fluid from said wetting and rinsing outlet means to said wetting means and said rinsing means, respectively;

VOL 1114 ISS 4 MY 22 1990 UMI

drainage means associated with said wetting means and said rinsing means, said drainage means being adapted for receiving fluid emitted by said wetting means and said rinsing means;

vacuum means for vacuuming fluid from a carpet tile after the carpet tile has been subjected to rinsing fluid from said rinsing means;

a vacuumed fluid container connected to said vacuum means for receiving the fluid vacuumed from a carpet tile, said vacuumed fluid container being connected to said drainage means for allowing removal of the fluid therefrom through said drainage means; and

vacuum pump means connected to said vacuumed fluid container and said vacuum means for drawing a vacuum in said vacuumed fluid container and said vacuum means.

4,926,521

ERGONOMIC HANDLE FOR A KITCHEN ARTICLE

Didier Gagnepain, Tournus, France, assignor to Terraillon, societe anonyme, Annemasse, France

Filed Aug. 23, 1988, Ser. No. 236,021
Claims priority, application France, Sep. 8, 1987, 87 12659
Int. Cl.[5] A47J *45/06*
U.S. Cl. 16—110 A **8 Claims**



1. A handle for a kitchen article, comprising an elongate body ending in a first attachment end providing connection of the handle with the kitchen article body and in a second free end, its lower face comprising a first transverse groove, with rounded edges, disposed at a small distance from the first end of the handle, wherein:

the first transverse groove has a section adapted for engagement of a finger of the user,

the handle comprises a second transverse groove with rounded edges, spaced apart from the first transverse groove in the direction of the second end of the handle, for engaging a finger of the user,

the spacing between the first and second transverse grooves is from about 7 to about 9 cm,

said handle having a substantially constant cross-section between the free end and the second transverse groove,

said handle comprising a first handle section between the second transverse groove and the first handle end and a second handle section between the second groove and the second handle end, the first and second handle sections forming an acute angle with respect to each other.

4,926,522

UTILITY TOOLS

Wei Wang, 3757 16th Ave. S., Minneapolis, Minn. 55407

Filed Apr. 18, 1989, Ser. No. 340,135
Int. Cl.[5] B25G *1/04, 3/24*
U.S. Cl. 16—114 R **11 Claims**

11. A utility tool for use with utility workheads having screwing attachment chambers and for utility workheads that are conventional held in the hand of the user comprising:

a utility handle, said utility handle including a first tubular section and a second tubular section located in telescoping arrangement with one another to permit a user to lengthen or shorten the tubular sections with respect to one another to thereby permit the user to lengthen or shorten said utility handle;

an extender for attaching to one end of said first tubular section, said extender having a female thread on one end for engaging the first end of said tubular section and a male thread on the opposite end to permit said extender to be connected to various utility workheads, said extender including a female thread on said opposite end to connect to an adaptor; and

an adaptor, said adaptor having means for engaging said first tubular section and a housing having a chamber for receiving and holding a utility workhead that is normally held in a users hand, said means including a cylindrical chamber having a thumbscrew with one end extending partially across said cylindrical chamber to engage the utility workhead that is normally held in the users hand by tightly sandwiching the utility workhead in the chamber between the end of said thumbscrew and a portion of said cylindrical chamber so that said utility workhead is firmly held in said cylindrical chamber.

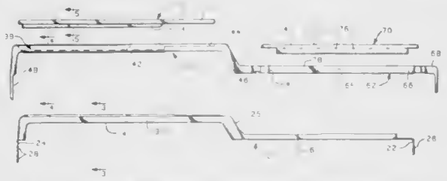


4,926,523

DOOR HANDLE OF A HOUSEHOLD REFRIGERATOR

James R. Carlson, and Joseph D. Tobbe, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 3, 1989, Ser. No. 375,571
Int. Cl.[5] E05B *1/00*; A47B *95/02*; B65D *25/28*
U.S. Cl. 16—125 **5 Claims**



1. A door handle assembly of a household refrigerator comprising:

a stiffener member having an elongated body made of rigid metal in the shape of an upwardly open channel with a base and two legs and having a first section offset from a second section to act as the gripping section and having spaced apart apertures, said stiffener member having means at each end for securement to a refrigerator door, said first section having a molded soft elastomeric covering on the outside and having apertures in alignment with the apertures in the stiffener member;

a first decorative trim member having an inner side with a contour to receive the legs of the channel of the first section of the stiffener member and side walls overlapping the upper edge of the legs and elastomeric covering, said trim member having an open upwardly facing recess area in the outer side with apertures in alignment with the apertures in the stiffener member and having a terminal end portion;

an elongated metal plate dimensioned to be nested in the recess area of the decorative trim member and having threaded fastener receiving means in alignment with the apertures in the decorative trim member and stiffener member;

a second decorative trim member with an upwardly open channel surrounding the base and both legs of the channel of the second section and having one end secured to the terminal end portion of the decorative trim covering the first section and the other end secured to a trim end cap secured to the means for securing the stiffener member to the refrigerator door;

a downwardly open channel shaped member having a base and two legs, said legs being located between the legs of the upwardly open channel decorative trim member and the legs of the second section of the stiffener member; and

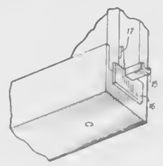
threaded fastener means through the apertures into the fastener receiving means in the elongated metal plate to rigidly assemble the components together as a subassembly for installation on a refrigerator door.

4,926,524

WINDOW PIVOT CORNER

George W. Owens, 233 Dove Av., Sebring, Fla. 33870

Filed Aug. 31, 1987, Ser. No. 91,742
Int. Cl.[5] E05D *15/22*
U.S. Cl. 16—386 **11 Claims**



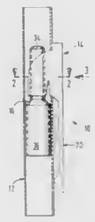
1. A corner pivot for mounting in a sash of an associated window hung between side rails of a window frame to permit tilting of the window, comprising in a molded, single-piece, unitary body (a) an attaching portion having a wall with a first bore therethrough for receiving a first screw, the attaching portion being received within the sash of the associated window; (b) a lug unitary with the single-piece, unitary body and extending in a direction perpendicular to the wall of the attaching portion, the lug having a second bore therethrough opening in a direction substantially perpendicular to that of the bore through the wall for receiving a second screw that extends substantially perpendicular with respect to the first screw; and (c) a projecting pivot pin unitary with the molded, single-piece, unitary body and extending therefrom in a direction substantially parallel with the wall of the attaching portion for engagement with the adjacent side rail of the window frame for permitting tilting as well as sliding of the window, wherein a molded, unitary, single-piece corner pivot with a projecting pivot pin is provided, which corner pivot is retained in the sash by a first screw received in the bottom wall and a second screw received through the lug.

4,926,525

ARRANGEMENT FOR FASTENING POCKET CLIPS TO TUBULAR PARTS OF WRITING INSTRUMENTS

Dieter Eylers, Idar-Oberstein, Fed. Rep. of Germany, assignor to Gottlieb Roll GmbH & Co., Idar-Oberstein, Fed. Rep. of Germany

Filed Sep. 13, 1989, Ser. No. 406,685
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 8811733
Int. Cl.[5] B43K *25/00*
U.S. Cl. 24—11 F **6 Claims**



1. In combination:

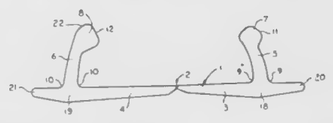
a tubular part of a writing instrument, such as a ball-point pen casing, fountain pen cap or the like, said tubular part having a substantially rectangular opening in a circumferential wall thereof, and having an open end; a pocket clip having a tongue stamped from metal band material and made relatively stiff with an upper end flexibly fastened to the tubular part and a lower end urged resiliently against the tubular part, said upper end having two tab-like material sections passed through the substantially rectangular opening into the interior of the tubular part having free end portions lying in the interior of the tubular part, the tab-like material sections being bent arcuately contrariwise with concave sides facing one another in a plane at right angles to the longitudinal central axis of the tubular part; and a locking component circular in diameter and inserted into the tubular part from the open end, said bent end portions engaging with bias the locking component and permitting a resilient rocking up of the bottom end of the tongue, in an intermediate area each tab-like material section having a slot open at a lower end and running substantially parallel to the pocket clip, for permitting a resilient springing open of the end portions of the tab-like material sections adjoining the slots, within the tubular part.

4,926,526

REUSABLE BAG CLOSURE

Christine C. Brown, 30001 Golden Lantern #204, Laguna Niguel, Calif. 92667, and Dennis G. Brown, P.O. Box 458, Lemon Grove, Calif. 92045

Continuation of Ser. No. 531,427, Sep. 12, 1983, abandoned. This application Jan. 13, 1986, Ser. No. 817,780
Int. Cl.[5] B65D *33/16, 77/10*
U.S. Cl. 24—30.5 R **21 Claims**



1. A reusable closure of the type used for holding sheets of pliable material together, comprising a one-piece elongate

member molded from a plastics material, the member being formed with a reduced thickness live hinge line extending along its length, substantially straight leg portions being defined on opposite sides of said live hinge line which are movable towards and away from each other about said live hinge line, said leg portions each having an upstanding ear extending along their lengths, the areas joining said leg portions and ears being rounded, said ears having interengageable locking portions at their free edges which are adapted to snap releasably into locking engagement when said leg portions are urged towards each other;

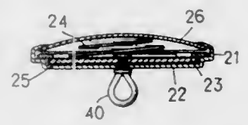
said locking portions comprising lips, one of said lips being of arcuate cross section and having a slanted flat face and the other lip being of substantially circular cross section and having a rounded face positioned so as to initially engage said flat face through sheets of pliable material disposed therebetween when said leg portions are urged towards each other and to slide over said slanted flat face into said locking position, whereby the sheets of pliable material are clamped between said interengaged locking portions to hold the sheets together, each of said ears curving arcuately towards each other at an angle of less than 90 degrees so that when in a closed position, the closure is substantially formed into an A-shape with the ears comprising the base of the A, thereby the closure to close and clamp the closure onto sheets of pliable material for clamping the sheets of pliable material together.

4,926,527

ORNAMENTAL BUTTON

Jinichi Sekiguchi, Tokyo, Japan, assignor to Meikho Industry Corp., Ltd., Tokyo, Japan

Filed Aug. 2, 1989, Ser. No. 388,466
Claims priority, application Japan, Apr. 11, 1989, 1-89610
Int. Cl.[5] A44B *1/18*
U.S. Cl. 24—90 A **3 Claims**



1. In an ornamental button adapted to be sewn on a clothing, furniture or the like by a thread which has passed through a thread attachment ring provided on the bottom of said button and having a thread guide eye, characterized by:

(1) a main body including:

a back seat plate having a circular flat bottom provided with an arcuate guide slot adjacent to the peripheral edge and a holding hole extending radially outwardly from the center of said bottom and terminating at an enlarged diameter leading end;

an operation seat plate rotatably disposed on said bottom of the back seat plate and provided with an operation projection adjacent to the periphery of said operation seat plate to fit in said guide slot and an operation hole extending radially outwardly from the center of the operation seat plate and terminating at an enlarged diameter leading end to be align with or displaced from said holding hole in the back seat plate during the rotation of said operation seat plate; and

a spring disposed on said bottom of the back seat plate for urging said operation seat plate against said bottom of the back seat plate and

(2) a thread attachment ring detachably attached to the back of said main body and including:

a stopper having such a diameter allowed to be inserted via said enlarged diameter ends of the holding and operation holes into said holding and operation holes when the two holes align with each other but not to be allowed to be inserted into the holding and operation holes via the inner ends of said holding and operation holes having a diameter smaller than that of said enlarged diameter leading ends;

a neck having such a thickness allowed to be inserted even in said smaller diameter inner ends of the holding and operation holes and attached said stopper thereto,

an attachment portion secured to one end of said neck; and

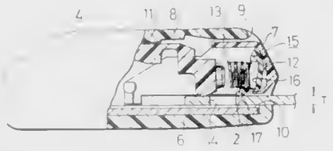
a thread guide eye connected to the other end of said neck to guide a thread therethrough.

4,926,528

BUCKLE FOR SEAT BELT SYSTEM

Masuo Matsuki, Chigasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1989, Ser. No. 407,041
Claims priority, application Japan, Sep. 21, 1988, 63-122765[U]
Int. Cl.[5] A44B *11/26*
U.S. Cl. 24—640 **5 Claims**



1. In a buckle for a seat belt system, said buckle including:

a buckle base;

a buckle button provided movably in parallel with the length of the buckle base, adapted to move a buckle latch piece upon parallel movement thereof and defining in association with the buckle base a clearance through which an associated tongue plate may be inserted into the buckle;

a cover defining an opening through which a portion of the buckle button is selectively movable back and forth and enclosing therein the buckle button and buckle base except for a surface area of the buckle button, said surface area being exposed through the opening; and

a button spring provided between the cover and the buckle button for applying a spring force against the buckle button in a direction to push out the buckle button,

the improvement wherein the buckle button is provided with a tiltable member which has a seat portion receiving an outer end portion of the button spring thereon and a suppressing portion projecting into the clearance from the seat portion.

4,926,529

TENTER FRAME APPARATUS AND METHOD

Christopher E. Hosmer, Taylors, S.C., and John F. Whaley, Warwick, R.I., assignors to Marshall and Williams Company, Providence, R.I.

Filed Sep. 15, 1988, Ser. No. 244,300
Int. Cl.[5] D06C *3/02, 3/10;* B21L *53/10*
U.S. Cl. 26—89 **16 Claims**

1. The method of fabricating a lubrication free tenter for processing sheet material including a chain having a pin and steel bushing carried thereon opposite a tender rail comprising the steps of:

press fitting a molded bushing liner constructed of low friction wear resistant polyimide resin or the like plastic material stable at high temperatures into said steel bushing; and

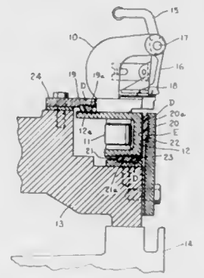
then axially boring said bushing liner while press fitted into the steel bushing increasing the size of the opening therein

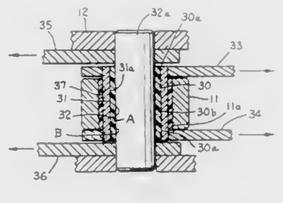
to accommodate the pin and minimize the thickness of the liner;

whereby breakage of the bushing liner during boring is avoided while minimized thickness thereof reduces stretching of the chain due to compression of the liner resulting from tensioning of the chain.

9. A lubrication free tenter for processing sheet material including a chain having a pin and steel bushing carried thereon opposite a tentar rail comprising:

a press fitting molded bushing liner constructed of low





friction wear resistant polyimide resin or the like plastic material stable at high temperatures in said steel bushing; and

an axial bore in said bushing liner machined therein while said bushing liner is press fitted into the steel bushing increasing the size of the opening in said liner to accommodate the pin and minimize the thickness of the liner;

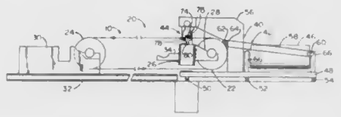
whereby breakage of the bushing liner during boring is avoided while minimized thickness thereof reduces stretching of the chain due to compression of the liner resulting from tensioning of the chain.

4,926,530

METHOD FOR MANUFACTURING NEEDLED FELTS HAVING MACHINE DIRECTION ORIENTED FIBERS

Peter P. Stanislaw, Bennington, Vt., assignor to Morrison Berkshire, Inc., North Adams, Mass.

Filed Dec. 11, 1987, Ser. No. 131,996
Int. Cl.[5] D04H *5/02*
U.S. Cl. 28—111 **7 Claims**



1. A method of manufacturing endless needled felts having at least one layer of longitudinally-extending spiral windings of a fiber web, said method comprising the steps of:

providing a first machine having first support means for supporting an endless fabric and for moving a fabric supported thereon in a longitudinal direction of said first machine, said first machine having in association therewith a web feeding device for feeding a fiber web having a width substantially less than the working width of said first machine and tacking means operatively associated with said web feeding device for tacking fiber web applied to an endless fabric supported on said first machine, and said first machine having no separate full-width needling means which is operable to perform full-width needling of an endless fabric supported on said first machine;

providing a second machine having second support means for supporting an endless fabric and for moving a fabric supported thereon in a longitudinal direction of said second machine, said second machine including full-width needling means for needling a fabric supported on said second support means, said full-width needling means being disposed to extend in a direction transverse to said longitudinal direction of said second machine and having a working width corresponding to the working width of said second machine, and said second machine having no web feeding device for feeding onto an endless fabric supported on said second machine longitudinally extending spiral windings of a fiber web which has a width substantially less than the width of endless felts to be produced;

placing an endless fabric on said first support means and operating said first machine to move said endless fabric in said longitudinal direction of said first machine;

while said endless fabric is being moved in said longitudinal direction of said first machine, reciprocating said web feeding device throughout the working width of said endless fabric so as to apply overlapping longitudinally extending spiral windings of said fiber web on said endless fabric;

operating said tacking means as said web feeding device is reciprocated so that said tacking means tacks said fiber web applied to said endless fabric substantially only throughout the width of said applied fiber web;

removing from said first machine said endless fabric having said fiber web tacked thereto;

placing said removed endless fabric having said tacked fiber web onto said second support means of said second machine and operating said second machine to move said endless fabric placed thereon in said longitudinal direction of said second machine; and

operating said full-width needling means of said second machine as said fabric is being moved in said longitudinal direction of said second machine to fully needle said tacked fiber web to said endless fabric.

4,926,531

APPARATUS FOR GIVING PROTECTION FROM DRAFT AND DUST AT A WINDING MACHINE

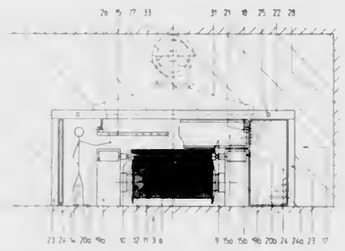
Gerhard Koslowski, Uzwil, and Manfred Bollen, Oberuzwil, both of Switzerland, assignors to Benninger AG, Uzwil, Switzerland

Filed Jan. 11, 1989, Ser. No. 299,546
Claims priority, application Switzerland, Jan. 22, 1988, 224/88
Int. Cl.[5] D02H *11/00*
U.S. Cl. 28—173 **12 Claims**

1. A winding installation comprising a bobbin creel, a winding machine including a beam for winding on an array of yarns applied from said bobbin creel and a portal-like support construction mounted outside said bobbin creel and over said winding machine with clearance, said support construction extending with respect to width and height beyond said winding machine and substantially parallel to the axis of said beam and said support construction including wall portions that

VOL 1114 ISS 4 MY 22 1990 UMI

substantially close off said clearance between said support construction and said winding machine thereby giving protec-



tion when said winding machine is in operation from draft and dust arising as a result of said operation.

4,926,532

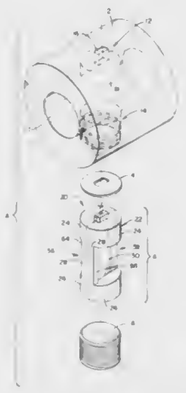
METHOD OF MANUFACTURING A FLOW METER

Jackie M. Phipps, 1337 Rutherford Dr., Mesquite, Tex. 75149, and Ronald B. Barrier, 15505 Lea Valley Circle, Dallas, Tex. 75248

Division of Ser. No. 56,836, Jun. 3, 1987, Pat. No. 4,854,177. This application May 3, 1989, Ser. No. 346,794

Int. Cl.[5] **H01L** *41/22*

U.S. Cl. 29—25.35 **7 Claims**



1. A method of manufacturing a flow meter comprising the steps of:

(a) providing first and second body members each having inner and outer surfaces;

(b) forming a first recess extending transversely from the inner surface of said first body member through only a portion thereof thereby forming a first sensing surface;

(c) associating a first sensing means with said first recess and communicating with said first sensing surface; and

(d) securing said first body member to said second body member.

4,926,533

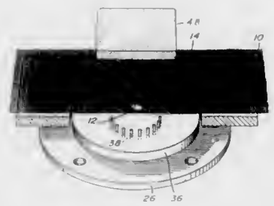
PAPER-MAKING WIRE REPAIR KIT

Jean Couture, 4025 Courcelles St., Jonquière, Quebec, Canada (G8A 1B6)

Filed Nov. 8, 1988, Ser. No. 268,540

Int. Cl.[5] **B23D** *19/00*

U.S. Cl. 29—33 F **7 Claims**



1. An apparatus for use with U-shaped staples of substantially same dimensions and consisting of a bight and of two legs, said apparatus destined to fix a patch onto a face of a paper-making pulp dewatering wire to cover a perforation of said wire and comprising:

a base plate;

a plurality of staple-ejecting plungers fixed to, and upstanding from, said base plate,

a pusher plate disposed over said base plate, having a wire-contacting face and having through-bores slidably receiving said plungers,

biasing means to move said pusher plate from a retracted to an advanced position, spaced from said base plate,

stop means to stop said pusher plate at said advanced position under the bias of said biasing means, and

guide means to guide said pusher plate during its movement between said retracted and said advanced position; and

wherein the stroke of said pusher plate from its retracted to its advanced position is at least equal to the length of a staple, such in said advanced position, a stapler inserted in a through-bore and contacting the plunger therein, does not protrude from said wire-contacting face of said pusher plate, and in its retracted position, the end of said plunger is at least flush with said wire-contacting face.

4,926,534

METHOD FOR MANUFACTURING A POPPET VALVE HEAD

Herbert Windelbandt, Aachen, Fed. Rep. of Germany, assignor to Sempell Armaturen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 155,121, Feb. 10, 1988, abandoned. This application May 9, 1989, Ser. No. 349,919

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704948; European Pat. Off., Jul. 14, 1987, 87110122.6

Int. Cl.[5] **B21K** *1/22*

U.S. Cl. 29—888.451 **4 Claims**

1. A method of manufacturing a poppet valve member having a stem portion and a poppet disk, comprising the following sequence of steps:

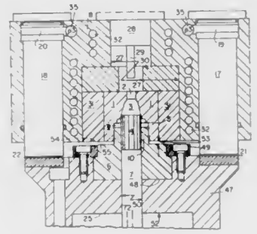
(a) using a single finish forming die means of hard metal having a first stem forming cavity, a second widened stem forming cavity, and a third poppet disk forming cavity,

(b) heating and cutting to length a work piece blank, then

(c) first extrusion pressing and simultaneously guiding said heated and cut blank in such a way that said first and second stem cavities must be filled to form said stem portion prior to any filling of said poppet disk cavity, and then immediately in the same finish forming die means,

(d) upset pressing without any further extrusion said heated and extrusion pressed blank for only now filling said third poppet disk cavity, whereby said stem portion is formed first by extrusion pressing and said poppet disk is formed

next by upset pressing and all three cavities of said finish forming die means are filled in one uninterrupted opera-



tion in a single work cycle and in the same work station to avoid repositioning of said work piece blank.

4,926,535

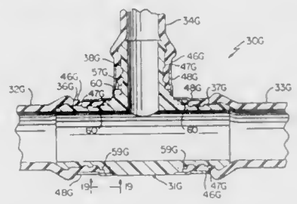
BRANCHED HOSE CONSTRUCTION, T-CONNECTOR THEREFOR AND METHODS OF MAKING THE SAME

Roger D. Meadows; James B. Rush, both of Waynesville, and James S. Bryan, Haywood County, all of N.C., assignors to Dayco Products, Inc., Dayton, Ohio

Continuation of Ser. No. 2,531, Jan. 12, 1987, abandoned, which is a division of Ser. No. 777,804, Sep. 19, 1985, Pat. No. 4,648,628. This application Dec. 12, 1988, Ser. No. 282,669

Int. Cl.[5] **B21D** *53/06*

U.S. Cl. 29—890.144 **8 Claims**



1. In a method of making a branched hose construction comprising the steps of forming a T-connector to have a body portion provided with a pair of substantially oppositely directed legs extending therefrom and an outwardly directed branch leg extending therefrom intermediate said pair of legs, telescoping three tubular hoses respectively onto said legs so as to be disposed in fluid communication with each other through said T-connector, forming each said hose to have an outer peripheral surface and an annular end surface that is substantially transverse to the longitudinal axis thereof, forming said body portion to have an external peripheral surface adjacent said legs thereof, forming said body portion to have an annular shoulder adjacent each leg thereof and disposed substantially transverse to the longitudinal axis thereof and against which said annular end surface of its respective hose abuts and which is of a size that causes said outer peripheral surface of that respective hose to substantially mate with and thereby be substantially flush with said external peripheral surface of said body portion that is adjacent that respective hose, and clamping annular clamping means respectively about said hoses so as to clamp the hoses against their respective legs of said T-connector, the improvement comprising the step of forming each said annular shoulder of said T-connector to have an outwardly and axially extending projection means thereon that extends longitudinally from the respective annular shoulder and along the respective leg thereof so that each said hose has said annular end surface thereof merely initially abutting said projection means of its respective annular shoulder so that said annular end surface is initially spaced from that annular shoulder and thereafter being axially deformed around its respective projection means by the step of clamping its respective clamping means about said hose so as to substantially longitudinally embed that respective projection means therein.

4,926,536

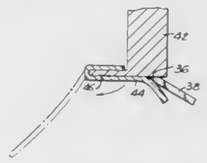
APPARATUS FOR REPLACING A DOOR PANEL

Frank R. Kohut, 107 Columbus St., Bloomfield, N.J. 07003

Continuation-in-part of Ser. No. 248,452, Sep. 23, 1988. This application May 17, 1989, Ser. No. 353,845

Int. Cl.[5] **B23P** *11/00*

U.S. Cl. 29—238 **10 Claims**



1. A tool for crimping a door panel edge of an automobile door comprising a dolly block having a guide formed therein, handle means mounted on said dolly block, a pad mounted on said dolly block, and crimping means positioned within said guide for crimping a door panel when said pad comes in contact with a door panel adjacent to an edge to be crimped.

4,926,537

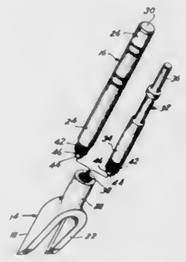
TIE ROD AND BALL JOINT SEPARATOR

James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Continuation of Ser. No. 245,708, Sep. 18, 1988, abandoned. This application Oct. 12, 1989, Ser. No. 423,487

Int. Cl.[5] **B25B** *27/14*

U.S. Cl. 29—275 **4 Claims**



1. In an automotive separating tool for tie rods, and ball joint connections, the separating tool including: a wedge-shape head that has a first end facing in one direction and a second end facing in the other, opposite direction, that has a pair of tapered spaced-apart prongs extending from the one end of the head in the one direction, with the tapered portion of the prongs creating a wedge to be forced between the parts to be separated; and an elongated handle that extends from the second end of the head in the other direction, said handle having a first end and a distal end, said distal end being adapted to be struck in the one direction during the separating of the parts; the shape of the distal end of the handle being one of either a shape where the distal end may be struck by a hammer or a

shape where the distal end may be driven by an air hammer; the improvement comprising:

a threaded recess formed in the second end of the head with the threaded recess having a tapered bottom; and

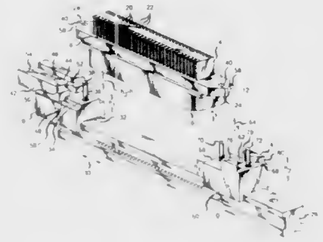
a threaded projection formed on the first end of a handle, with the pilot end of the threaded projection being tapered and with the threaded projection being removably threaded into and received within the threaded recess so that the handle and head are connected together during the use of the tool to separate parts, wherein the depth of the threaded recess is less than the length of the threaded projection so that when recess and said projection are threaded together, said recess and said projection tapered surfaces matiningly engage and firmly abut each other to act as means for reduction of the stress on the threads when the handle is driven or hammered.

4,926,538

UNIVERSAL NEST FOR A CONNECTOR ASSEMBLY TOOL

Robert H. Bond, Ewing, N.J., and Ivan Pawlenko, Holland, Pa., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 10, 1989, Ser. No. 419,301
Int. Cl.[5] B23Q *7/00*
U.S. Cl. 29—559 7 Claims



1. A universal nest for seating a separate one of a first and second connector, each having a pair of opposed ends, the ends of the first and second connectors being of a first and a second height, respectively, the nest comprising:

a base plate;

first support means of a first height slidably mounted on the base plate for movement therealong;

second support means having first and second opposed shelves of a first and a second height, respectively, the second support means being rotatably mounted to the base place to permit a separate one of the first and second shelves to be positioned opposite the first support means so an end of a separate one of the first and second connectors may be seated on a separate one of the shelves, respectively; and

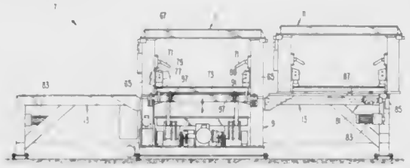
a slide of a thickness on the order of the difference between the first and second heights, the slide slidably mounted on the upper surface of the first support means for movement between a first position, at which a portion of the upper surface of the first support means is exposed to seat the other end of the first connector, and a second position, at which the slide completely overlies the upper surface of the first support means so that the slide serves to seat the other end of the second connector.

4,926,539

APPARATUS HAVING A LIFTING FRAME FOR PROCESSING WORKPIECES

Karl H. Muller, Ingolstadt; Volker Riedl, Gaimersheim, and Bernhard Arbesmeier, Altmannstein/Hagenhill, all of Fed. Rep. of Germany, assignors to Andi AG, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00773, § 371 Date Jun. 17, 1988, § 102(e) Date Jun. 17, 1988, PCT Pub. No. WO87/03834, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 21, 1986, Ser. No. 276,430
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545537
Int. Cl.[5] B23Q *3/155*
U.S. Cl. 29—568 26 Claims



1. A device for processing workpieces, wherein a lower tool which receives the workpiece can be moved upward toward an upper tool by a lifting frame comprising:

(a) a tool frame subdivided horizontally from the lifting frame and being mounted onto the lifting frame in an easily releaseable manner;

(b) the tool frame comprising a plurality of columns, a head plate connected to the columns and a base plate detachably fastened to the columns;

(c) the base plate having attached thereto the lower tool while the upper tool is attached to the tool frame but not the base plate; and

(d) the lifting frame comprising a moveable lifting table which can be connected in a raised position to the base plate of the tool frame.

4,926,540

PROCESS FOR PRODUCING AN ELECTRIC MOTOR

Iwao Kato, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 81,444, Aug. 4, 1987. This application May 31, 1989, Ser. No. 359,152
Claims priority, application Japan, Aug. 5, 1986, 61-183769
Int. Cl.[5] H02K *15/08*
U.S. Cl. 29—596 3 Claims



1. A process of producing a motor having at least two stator assemblies, each including magnetic means and a non-magnetic molded member incorporated in said magnetic means, coils wound on the outer periphery of said stator assemblies, and a rotor rotating within said stator assemblies, said process comprising the steps of:

forming said magnetic means to have magnetic pole plate bodies, a recess formed in at least one of said magnetic pole plate bodies, a bridge member incorporated in said at least one of said magnetic pole plate bodies in such a manner as to close said recess, a plurality of terminal elements respectively having base ends and free ends with the base ends being coupled to said bridge member and the free ends extending into and toward said recess;

molding said stator assemblies by filling said recess of said magnetic means, together with the free ends of said terminal elements, with said non-magnetic molded member;

projecting the base ends of said terminal elements from the surface of said non-magnetic molded member by cutting and removing said bridge member of said stator assembly; and

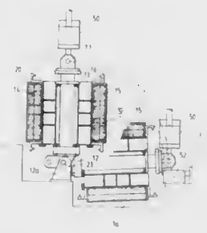
winding said coils on said stator assemblies and electrically connecting the ends thereof to the projections of said terminal elements.

4,926,541

METHOD OF ASSEMBLING WOUND ROTOR OF VERTICAL TYPE ADJUSTABLE SPEED HYDROELECTRIC ROTATING MACHINE AT ITS INSTALLATION SITE

Shinsaku Hakuta; Yasuhiro Yasaka, both of Hitachi; Osamu Nagura, Katsuta; Eiji Tsuji, Hitachi; Makoto Suzuki, Hitachi, and Hirotaka Akagawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 392,059
Claims priority, application Japan, Sep. 14, 1988, 63-228708
Int. Cl.[5] H02K *15/02*
U.S. Cl. 29—598 6 Claims



1. A method of assembling a wound rotor of a vertical type adjustable speed electric rotating machine at a power house of a hydroelectric power plant, the method comprising steps of

(a) forming a steel rotor rim around an upright spider with a rotor shaft;

(b) laminating thin steel laminations around a resultant rotor rim to form a rotor core with slots therearound;

(c) clamping the rotor core between end plates;

(d) securing respective end rings to the respective end plates;

(e) laying the resultant rotor body including the spider, the rotor rim, the rotor core, the end plates and the end rings, on its side;

(f) inserting insulated conductor bars into the respective slots of the rotor core;

(g) connecting ends of the respective insulated conductor bars to constitute field coils having a predetermined number of magnetic poles;

(h) binding end portions of the field coils supported in the respective end rings by a binding wire; and

(i) brazing the bound binding wire,

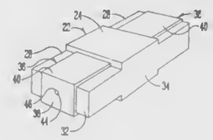
wherein said step (e) is carried out while disposing the rotor body in a pit formed in the power house having enough space to receive the rotor body in a laid-down state with a circumference of the rotor body extending from a foundation of the lower house to a height sufficient to facilitate a carrying out of said steps (f) to (i) by working personnel from the foundation of the power house.

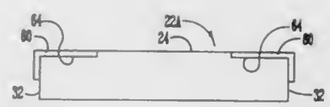
4,926,542

METHOD OF MAKING A SURFACE MOUNT WIREWOUND RESISTOR

Gary E. Bougger, Columbus, Nebr., assignor to Dale Electronic, Inc., Columbus, Nebr.

Division of Ser. No. 236,718, Aug. 26, 1988, Pat. No. 4,884,053.
This application Aug. 21, 1989, Ser. No. 396,067
Int. Cl.[5] H01C *17/28*
U.S. Cl. 29—619 3 Claims





1. The method of making a surface mount resistor, comprising,

taking an elongated resistance element comprising a core, a pair of terminal caps on the ends of said core, and a resistance wire wound on said core and electrically connected to said terminal caps, with elongated straight axial leads secured to said terminal caps and extending outwardly in alignment with the longitudinal axis of said core,

embedding said resistance element in a rectangular plastic body member having substantially flat and parallel upper and lower surfaces, and opposite ends with said axial leads extending from said opposite ends,

severing said axial leads at a point adjacent said opposite ends,

and securing electrical terminal pads to said body member in electrical contact with said severed axial leads.

3. The method of making a surface mount resistor, comprising,

taking an elongated resistance element comprising a core, a pair of terminal caps on the ends of said core, and a resistance wire wound on said core and electrically connected to said terminal caps,

taking a rectangular-shaped metal lead frame including opposite sides having electrical lead tabs extending inwardly towards the center of said frame,

connecting said terminal caps to one each of said lead tabs,

embedding said resistance element in a rectangular plastic body member having substantially flat and parallel upper and lower surfaces, and opposite ends with said lead tabs extending from said opposite ends,

severing said lead tabs from said lead frame,

and bending said lead tabs into coplanar engagement with said upper surface of said body member.

VOL 1114 ISS 4 MY 22 1990 UMI

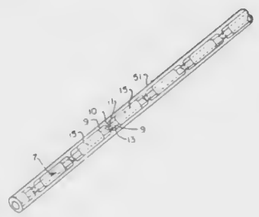
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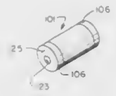
4,926,543

METHOD OF MAKING A SUB-MINIATURE FUSE

Vaughan Morrill, Jr., Creve Coeur; John H. Scandrett, University City, both of Mo., and David K. Hudson, Granite City, Ill., assignors to Morrill Glasstek, Inc., Maryland Heights, Mo.

Division of Ser. No. 198,762, May 22, 1988, Pat. No. 4,860,437, which is a division of Ser. No. 5,964, Jan. 22, 1987, Pat. No. 4,749,980. This application Aug. 21, 1989, Ser. No. 396,561
Int. Cl.[5] H01H *69/02*
U.S. Cl. 29—623 11 Claims





1. The method of forming a fuse comprising a step of metallizing an elongate substrate to form a continuous metallized conductor on the substrate running lengthwise of the substrate, the continuous metallized conductor comprising a plurality of spaced-apart fusible elements, positioning a cover over the outer surface of the substrate and thereafter a step of cutting through the cover substrate and continuous metallized conductor between spaced-apart fusible elements to form a plurality of fuses from the substrate.

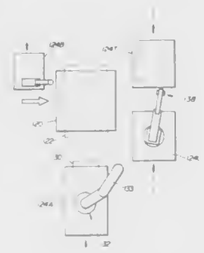
4,926,544

PRODUCTION SYSTEM USING UNMANNED AUTOMATICALLY GUIDED VEHICLES

Haruo Koyanagi, Hachioji; Hideyuki Kumasaka, Yokohama; Koji Takao, Atsugi, and Tomohiko Noda, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 26, 1988, Ser. No. 236,876
Claims priority, application Japan, Aug. 27, 1987, 62-211421; Aug. 27, 1987, 62-211420
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—703 13 Claims

1. An automated delivery and assembly system, comprising:
- a first unmanned self-propelled vehicle, said first vehicle being arranged to carry a main work piece;
- a second unmanned self-propelled vehicle, said second vehicle being arranged to carry components which are to be secured to the main work piece;
- transfer means for moving said components from said second vehicle to the main work piece on said first vehicle;
- a control system being arranged to transmit control orders by way of a wireless communication system to said first and second vehicles and said transfer means, said control orders containing data which induces said first vehicle to assume a predetermined position on a work floor, and to induce said second vehicle to move along the work floor, approach said first vehicle and induce said transfer means to place said component on a predetermined site on said



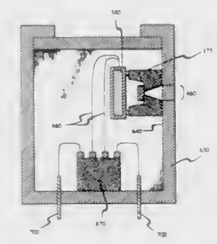
main work piece while said main work piece is on said first vehicle.

4,926,545

METHOD OF MANUFACTURING OPTICAL ASSEMBLIES

Richard J. Pimpinella, Hampton, and John M. Segelken, Morristown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 17, 1989, Ser. No. 353,264
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—832 9 Claims



1. A method of manufacturing at least two articles, comprising the steps of:
- providing a substrate having first and second surfaces;
- forming, on said second surface, at least first and second sets of electrically conductive regions, each of said sets including at least two electrical contacts and at least one electric conductor electrically connecting said two electrical contacts;
- mounting at least first and second optoelectronic devices on the second surface of said substrate, so that each optoelectronic device is in electrical contact with one of said sets of conductive regions;
- after said mounting step, dividing said substrate into at least first and second parts, each of said parts including one of said sets of conductive regions and one of said optoelectronic devices; and
- completing the manufacture of said articles,

CHARACTERIZED IN THAT

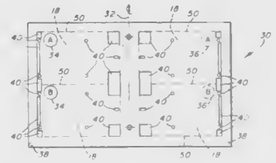
- the method further comprises, prior to said dividing step, the step of forming, in said first surface, at least first and second cavities extending from said first surface toward said second surface, and wherein said dividing step leads to each of said parts including one of said cavities.

4,926,546

PC BOARD PANEL CONFIGURATION TECHNIQUE

Mark Polczynski, Elm Grove, and Brian Krueger, Brown Deer, both of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jun. 9, 1988, Ser. No. 204,707
Int. Cl.[5] H05K *3/35*
U.S. Cl. 29—840 8 Claims



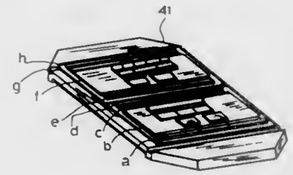
1. A method for configuring a printed circuit board panel adapted for the concurrent fabrication of a plurality of printed circuit boards, said method comprising the steps of:
- laying-out patterns for each individual layer of the printed circuit boards; and
- symmetrically arranging, for fabrication on the printed circuit board panel with respect to a center-line thereof, copies of individual ones of the patterns positioned so that identical printed circuit board patterns are in the same location if the printed circuit board panel is rotated through a 180° angle about said center-line.

4,926,547

METHOD FOR MANUFACTURING A MODULAR SEMICONDUCTOR POWER DEVICE

Antonio P. Spatrisano, Palermo; Luciano Gandolfi, Corsico; Carlo Minotti, Catania, and Natale Di Cristina, Palermo, all of Italy, assignors to SGS-Thomson Microelectronics S.p.A., Catania, Italy

Continuation of Ser. No. 160,630, Feb. 26, 1988, abandoned. This application Jun. 27, 1989, Ser. No. 373,647
Claims priority, application Italy, Mar. 9, 1987, 19630 A/87
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—841 6 Claims



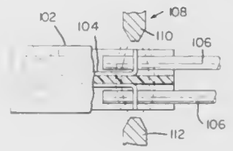
1. A method of manufacturing a modular semiconductor power device, comprising the steps of:
- (a) welding semiconductor means including at least one semiconductor chip onto conductive-sheet means including at least one sheet of an electrically conductive material;
- (b) forming a power-device body by fixing said sheet to a member provided with a heat-dissipating metal plate for dissipating heat generated by the Joule effect and parallel to and close to said heat-dissipating plate;
- (c) blanking from a single sheet of conductive material a one-piece frame formed with strips adapted to form signal and power terminals of said device and with temporary connections between outer ends of said strips;
- (d) soldering inner ends of said strips selectively to points of said conductive sheet means connected with said semiconductor means or to said semiconductor means;
- (e) encapsulating at least active parts of said body and said inner ends of said strips with an insulating resin and leaving said outer ends of said strips and an outer surface of said plate uncovered by said resin; and
- (f) shearing said temporary connections from said strips.

4,926,548

SELECT SOLDER SLOT TERMINATION METHOD

John R. Hopkins, Hummelstown; Randy M. Manning, New Cumberland, both of Pa., and Stephen A. Marusak, New Port Richey, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 661,744, Oct. 17, 1984, abandoned. This application Jun. 27, 1988, Ser. No. 212,119
Int. Cl.[5] H01R *9/08*
U.S. Cl. 29—860 1 Claim



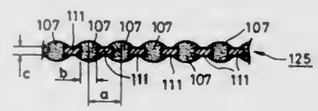
1. A method of terminating insulated electrical conductors in terminals having terminating sections including slots in an electrical connector having a plastic housing, characterized by the steps of:
- applying solder on the terminals in the terminating section along the slots;
- positioning the terminals in the plastic housing;
- positioning the electrical conductors at the entrance to the slots of said terminals in said plastic housing;
- driving the conductors into the slots of said terminals in said plastic housing, so that the conductor is in frictional engagement with the terminating section forming an electrical connector therebetween; and
- reflowing the solder which gathers at the connection formed between the conductor and the terminating section of said terminals in said plastic housing, by positioning portions of the plastic housing adjacent the terminating section of said terminals in an electromagnetic field to concentrate the electromagnetic field on the terminating section.

4,926,549

METHOD OF PRODUCING ELECTRICAL CONNECTION MEMBERS

Tetsuo Yoshizawa, Yokohama; Yoshimi Terayama, Odawara; Hiroshi Kondo, Yokohama; Takashi Sakaki, Tokyo; Shunichi Haga, Yokohama; Yasuteru Ichida, Machida, and Masaki Konishi, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,269
Claims priority, application Japan, May 31, 1988, 63-133401
Int. Cl.[5] H01R *43/20*
U.S. Cl. 29—876 34 Claims

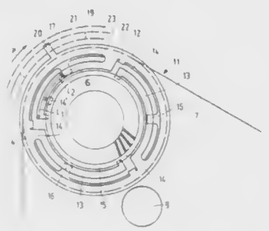


1. A method of producing an electrical connection member, comprising the steps of:

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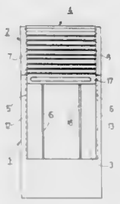
applying a carrier containing a light-sensitive resin onto a first electrically conductive member;
forming holes in predetermined portions of the carrier to form a pattern and expose the first electrically conductive member through each of the holes;
filling each hole in the carrier with a second electrically conductive member; and
removing the first electrically conductive member from the carrier.

4,926,550
SHAVING APPARATUS
Geert Geertsma; Hendrik Poel, and Andreas Weersink, all of Drachten, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.
Filed Jan. 19, 1989, Ser. No. 300,402
Claims priority, application Netherlands, Feb. 18, 1988, 8800406
Int. Cl.[5] B26B *19/14*
U.S. Cl. 30—43.1 3 Claims



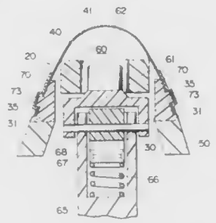
1. A shaving apparatus having a housing comprising a holder for at least one shaving unit, which shaving unit comprises an external shaving member with hair entry apertures and an internal shaving member which is rotatable relative to the external shaving member, the holder comprising a support with a resilient element which acts on the external shaving member, whereas the apparatus comprises an adjustment mechanism for adjusting the stiffness of the resilient element.

4,926,551
DRY-SHAVING APPARATUS COMPRISING AT LEAST ONE SHUTTER WHICH IS SLIDABLE ON THE APPARATUS HOUSING
Arno Wolfger, Klagenfurt, Austria, assignor to U.S. Philips Corp., New York, N.Y.
Filed Apr. 21, 1988, Ser. No. 184,309
Claims priority, application Austria, Apr. 24, 1987, A 1026/87
Int. Cl.[5] B26B *19/02*
U.S. Cl. 30—43.92 9 Claims



1. A dry-shaving apparatus comprising at least one shutter which is slidable on the apparatus housing for optionally covering or exposing a shear foil of the dry-shaving apparatus, and which is laterally guided at both sides in groove-shaped guides on the apparatus housing, wherein the shutter-wall surface which faces the apparatus housing is spaced from the apparatus housing and at least one sliding guide means situated intermediate the lateral edges of the shutter acts between the shutter and the apparatus housing to provide localized areas of contact between the shutter and the apparatus housing in the sliding direction of the shutter.

4,926,552
CUTTING HEAD FOR RECIPROCATORY-TYPE DRY SHAVERS
Kiyotaka Otsuka, and Hideji Wataya, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Japan
Filed Dec. 30, 1988, Ser. No. 292,015
Claims priority, application Japan, Jan. 26, 1988, 63-15065
Int. Cl.[5] B26B *19/02*
U.S. Cl. 30—43.92 9 Claims



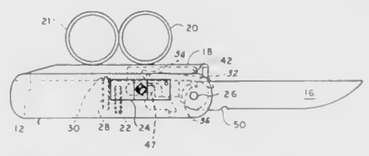
1. In a cutting head for reciprocatory-type shavers comprising:
a mount frame having a pair of opposed side bars between which a shearing foil extends in a convexly curved manner, said curved shearing foil having a plurality of hair receiving apertures and having a longitudinal axis extending along its top end in parallel with said side bars;
an inner cutter assembly having a plurality of inner blades which are in shearing contact with the undersurface of said shearing foil, said inner cutter assembly being driven within said mount frame to reciprocate along said longitudinal axis for shearing hairs between said shearing foil and said inner blades, said inner cutter assembly being mounted to be movable to a limited extent within said mount frame transversely towards said side bars;
said shearing foil having its lateral lower end portions secured to the exterior surface of said side bars, respectively, such that the lower end portions of said shearing foil are isolated from said inner cutter assembly by the side bars so as not to be in direct contactable relation with the inner cutter assembly, wherein said mount frame includes a pair of elongated clamp plates each of which is placed over the lower end portion of said shearing foil and fixed onto the exterior surface of said side bar to hold said lower end portion of said shearing foil therebetween, each of said clamp plates having its top portion extending above the top edge of the adjacent side bars along the curved surface of said shearing foil to conceal said apertures in a limited region adjacent upwardly of said side bar.

4,926,553
RAZOR
Michael Miskin, 4927 N. Lester, Chicago, Ill. 60630; William Bamford, 778 Leicester Rd., Elk Grove Village, Ill. 60007, and Micheal D. Lake, Chicago, Ill., assignors to Michael Miskin, Chicago and William Bamford, Elk Grove Village, both of, Ill.
Continuation-in-part of Ser. No. 74,775, Jul. 17, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 283,217
Int. Cl.[5] B26B *21/28*
U.S. Cl. 30—49 12 Claims



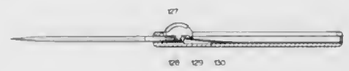
1. A razor for removing, trimming and shaping facial hair comprising:
an elongated handle having a longitudinal axis and opposed ends;
a razor head including a cutting edge extending from a surface thereof;
said cutting edge being adapted to engage and sever hair;
a neck joining said razor head to one end of said handle;
said neck having opposed ends with one said end attached to said handle and an opposed end terminating in the form of an expandable ball;
a socket located in a surface of said razor head;
said expandable ball being received in said socket for rotation therein so that an angular position of said razor head relative to said neck can be adjusted about three orthogonal axes of said neck to obtain a desired attitude of said razor head to said handle; and,
locking means operably connected to said expandable ball for locking said razor head after said razor head is adjusted to a desired attitude;
said ball being expandable within said socket by said locking means so that said razor head can be locked into a fixed position by expansion of said ball within said socket to a point where said ball can no longer freely rotate within said socket.

4,926,554
COLLAPSIBLE KNIFE
Wayne C. Martin, Inverness, Ill., assignor to Charles L. Martin, Inverness, Ill.
Filed Aug. 24, 1989, Ser. No. 398,251
Int. Cl.[5] B26B *3/06*
U.S. Cl. 30—161 6 Claims



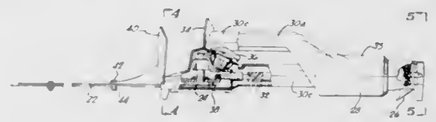
1. A clasp knife comprising in combination
an elongate body having spaced side walls defining a cavity therebetween,
a blade pivotably attached to said body for pivotable movement between a first position wherein it is disposed in said cavity and a second position wherein it extends from said one end of said body,
a latching lever pivotably attached to said body for pivotal movement between a first position adjacent said body and a second position extending from said one end of said body,
a latching dog pivotably attached to said latching lever,
said blade having a notch therein for receiving said dog when said lever is in said second position to lock said blade in said second position,
spring means biasing said dog into locking engagement with said blade, and
lock actuator means mounted to said body for movement between a first unlocking position for engagement with said latching dog when said lever is in said second position and a second locking position remote from said latching dog.

4,926,555
POCKET KNIFE
Denis J. Lemaire, Boucherville, Canada, assignor to Wenger SA, Delémont, Switzerland
Filed Aug. 16, 1989, Ser. No. 394,520
Int. Cl.[5] B26B *1/00*
U.S. Cl. 30—162 2 Claims



1. A pocket knife comprising a pair of bolster linings superposedly fixed to each other and defining a space therebetween, a cutting blade slidably mounted in said space relative to one of said linings and adjacent thereto, a leaf spring fixed to the other lining in said space, one end of said leaf spring adapted to abut against the end of said blade when the latter is projecting partly out of said linings, a knob connected to the end of said blade and extending out of a slot provided through said first lining, the said knob being pivot connected to the end of said blade and adapted to push on said leaf spring and retract the latter from abutment with the end of the blade.

4,926,556
HAND HELD TRIMMER FOR CUTTING VEGETATION SUCH AS HEDGES AND THE LIKE
Edward A. Pilatowicz, Woodland Hills; Anthony Carsello, Chino, and Richard Landy, Saugus, all of Calif., assignors to Allegretti & Company, Chatsworth, Calif.
Continuation of Ser. No. 121,617, Nov. 17, 1987, abandoned. This application May 23, 1989, Ser. No. 356,613
Int. Cl.[5] B26B *19/02*
U.S. Cl. 30—216 8 Claims



1. A hand held trimmer for cutting heavy vegetation such as hedges and the like, comprising:
a handle, said handle including a plurality of hand grips;
a cutting means, said cutting means being connected to said handle;
a motor means, said motor means being connected to said handle, said motor means and said cutting means being

disposed at substantially opposite ends of said handle and arranged with respect to said handle so as to substantially counterbalance each other; and

resilient drive means, said drive means extending between said motor means and said cutting means and being sufficiently resilient for driving said cutting means so as to substantially avoid damaging said motor means should said cutting means become jammed during operation,

wherein said handle has one lower hand grip and two upper hand grips and said hand grips are positioned substantially at the apices of an inverted triangle.

4,926,557

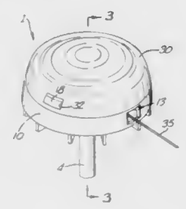
SEMI-AUTOMATIC STRING TRIMMER HEAD

Eugene J. Haupt, Woodland Hills, Calif., assignor to Allegretti & Company, Chatsworth, Calif.

Filed Jul. 21, 1988, Ser. No. 222,652

Int. Cl.[5] B26B *7/00*; A01D *50/00*

U.S. Cl. 30—276 **20 Claims**



1. A feed head for a string trimmer comprising:

(a) a body member rotatable about a center axis and connectable to a drive means for rotation in a cutting direction;

(b) a substantially cylindrical spool member within said body member coaxial with and rotatable relative to said body member, said spool member having a grooved end face adjacent said body member, said grooved end face having a cam channel of a generally circular shape about the center axis, said cam channel comprised of

a plurality of switchbacks spaced about the center axis, each switchback having a radially inward portion and a radially outward portion and

a plurality of arcuate segments, said switchbacks connecting adjacent arcuate segments, said arcuate segments extending gradually radially outward from the radially inward portion of one switchback to the

(c) a first arm member pivotally connected at a first end to said body member, a second end of said first arm member being biased in a radially inward direction toward the center axis; and

(d) a first cam pin on a second end of said first arm member, said first cam pin extending into and engaging said cam channel, said first cam pin being slidable along said cam channel.

4,926,558

AXE MAUL APPARATUS

Regie P. Brace, Lot 33, Bert's Trailer Park, 401 S. Rte. 7, Milton, Vt. 05468

Filed Mar. 7, 1989, Ser. No. 320,222

Int. Cl.[5] B26B *3/00*

U.S. Cl. 30—308.1 **4 Claims**

1. An axe maul apparatus, for splitting blocks of wood or the like, comprising:

a head comprising a one piece block with no moveable parts;

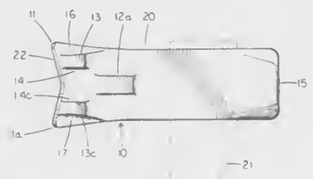
said head having first means for initiating the splitting of a block of wood located at the leading edge of said head;

said first means comprises at least one material penetration means;

said material penetration means comprising means defining tapered leading edge contact points;

said contact points having a cutting edge located behind said contact points;

said head further having second means for flaring apart the sections of said block of wood;



said second means comprises a plurality of flaring wedges;

a plurality of spaced apart ribs; and

maul means located on said head at the end opposite said first means.

4,926,559

MEASURING DEVICE FOR DETERMINING THE POSITION OF WORKPIECE FACES

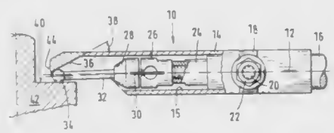
Horst Knäbel, Meerbusch, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 323,933

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808548

Int. Cl.[5] G01B *7/02*

U.S. Cl. 33—832 **8 Claims**



1. A device for determining the position of a workpiece face comprising:

a body having a longitudinal axis and a longitudinal bore concentric with said longitudinal axis;

an extendable member having a first end movable within said bore along said axis,

means disposed on said member for moving said first end of said extendable member,

a coupling member fastened to said first end of said extendable member for movement therewith,

means for releasably securing a second end of said extendable member within said bore,

a sensor head,

resilient means for attaching said sensor head to said coupling member,

an essentially spherical contact tip attached to said sensor head and aligned with said axis for travel along an axial path in conjunction with the movement of said first end of said extendable member, and

deflection means for deflecting said tip out of alignment with said axis, said deflection means being attached to said body at a known angle with respect to said longitudinal axis and positioned in said path of said tip, whereby

deflection of said tip causes at least one point on the surface of said tip to advance toward said workpiece surface along a path radial to said axis.

4,926,560

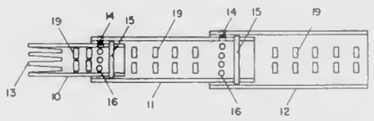
SHADE FOR TELESCOPIC SIGHT

Eldon F. Kilgore, 809 Clearwater Trail, Round Rock, Tex. 78664, and Howard J. Kilgore, Rte. 1, Box 190, Elmott, Tex. 76640

Continuation of Ser. No. 120,159, Nov. 13, 1987, abandoned. This application Jul. 24, 1989, Ser. No. 384,031

Int. Cl.[5] F41G *11/00, 1/38*

U.S. Cl. 33—244 **2 Claims**



1. An extensible shade for a telescopic sight comprising:

a plurality of concentric tubular sections arranged successively in overlapping, sliding relationship, each section having an exterior surface with a multiplicity of light admitting apertures formed therein,

means to fasten a first one of said tubular sections to an exit end of a telescopic sight, and

means to hold said plurality of tubular sections in fixed position relative to one another.

4,926,561

TRIPOD STAND FOR A SURVEYOR'S ROD

Donald P. Miller, 9239 S. 19th Ave., Phoenix, Ariz. 85041

Continuation-in-part of Ser. No. 59,568, Jun. 8, 1987, Pat. No. 4,803,784. This application Dec. 22, 1988, Ser. No. 289,329

Int. Cl.[5] G01C *15/00*

U.S. Cl. 33—293 **25 Claims**



1. A portable stand for a surveyor's rod having a longitudinal axis, said stand comprising in combination:

(a) a tripod for placement upon the surface of interest;

(b) an omnidirectionally rotatable captured element for supporting the rod;

(c) means for attaching said captured element to said tripod;

(d) means for securing the rod to said captured element; and

(e) means for positionally stabilizing said captured element to retain the rod in a predetermined alignment.

4,926,562

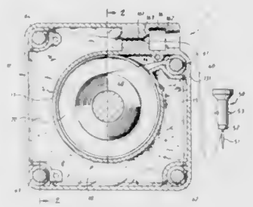
CLOSED TYPE OF LINE MARKING DEVICE

Chyn-Herng Hwu, 10 Fl, 76, Lane 131, Shin-Yi Rd., Sec. 3, Taipei, Taiwan

Filed Dec. 2, 1988, Ser. No. 278,758

Int. Cl.[5] G01B *3/02*

U.S. Cl. 33—414 **5 Claims**



1. A closed type line marking device comprising:

a body including a case defining the inner space of the body, a circular partition wall dividing the inner space into a space serving as a bobbin seat and a space for sealed ink, and a plug seat with a needle path at one end and an opening at the other end;

a thread bobbin disposed in the bobbin seat;

an ink absorbent material stuffed in the ink space;

a plug cap provided with a fixing needle and a compressible leak stoppage plug at one end for sealing the opening of the plug seat; p1 an O-ring for leak stoppage mounted between the bobbin and the bobbin seat;

a flexible ink thread of ink absorbent material wound on the bobbin and running through the ink absorbent material and needle path of the plug seat to the plug cap;

said body further comprising several pulleys located at the places where the ink thread is to make a turn, for facilitating the turning and pulling of the ink thread.

4,926,563

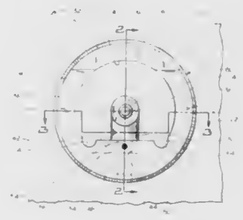
THEODOLITE TARGET ADAPTOR AND METHOD OF USE

Robert L. Smith, Mt. Juliet, Tenn., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Oct. 10, 1989, Ser. No. 419,228

Int. Cl.[5] G01C *1/02*

U.S. Cl. 33—293 **8 Claims**



7. Apparatus adapted to couple a theodolite target with an aperture of tooling comprising:

a cylindrical disk-like member having a circular exterior surface adapted to be received and supported in a circular aperture of the tooling, the exterior surface having chamfered edges to facilitate the insertion and removal of the disk-like member with respect to the aperture, the disk-like member having an interior surface formed to define a space in which a theodolite target is to be received and

VOL 1114 ISS 4 MY 22 1990 UMI

VOL 1114 ISS 4 MY 22 1990 UMI

supported, the disk-like member having a thickness at its upper and its lower portions essentially the same as the aperture in which it is to be received and with a lesser thickness at the sides between the upper and lower portions, the disk-like member having a flat surface on the lower portion of the interior surface with a hole extending therein radially with respect to the axis of the disk-like member, the hole being of a size to receive the cylindrical base of the theodolite target to be received and supported, and with a threaded aperture extending through the disk-like member into the hole;

a set screw mounted in the threaded aperture for fixedly securing the theodolite target in position in the disk-like member and with respect to the tooling; and

a pair of essentially semi-circular slots formed in the lower portion on opposite sides of the hole and parallel with the axis adapted to receive a fixture for the insertion of the disk-like member into the tooling in which it is to be received and for its removal therefrom.

4,926,564

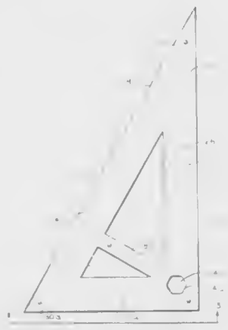
TRIANGULAR DRAFTING INSTRUMENT

C. J. Loggins, Sheboygan, Wis., assignor to Mayline Company, Inc., Sheboygan, Wis.

Filed Dec. 27, 1988, Ser. No. 290,744

Int. Cl.[5] G01B *3/00*

U.S. Cl. 33—474 **19 Claims**



1. A drafting instrument comprising:

a triangular integrally formed planar body having an upper face and a lower face, having three elongate perimeter legs being a first, base leg with first and second ends, a second, upright leg with first and second ends, and a third, hypotenuse leg with first and second ends, each of said legs being of equal width throughout its length, with the second end of said base leg interconnected to the first end of said upright leg; at a right angle, the second end of said upright leg interconnected to the first end of said hypotenuse leg, and the second end of said hypotenuse leg interconnected to the first end of said base leg, forming the triangular configuration of the drafting instrument, the width of said legs being such that an open space is defined in the interior of said body;

an elongate interior leg of equal width throughout its length, extending in the plane of said body from the interconnection of said base leg and said upright leg to said hypotenuse leg intermediate its first and second ends, and interconnected therebetween such that a right angle is formed between said interior leg and said hypotenuse leg;

a plurality of glide points extending outwardly from at least one of said upper and lower faces of said body a short distance so as to contact a planar surface upon which the drafting instrument is positioned with the planar body of the drafting instrument parallel to said planar surface, and suspend said planar body above said planar surface in stable parallel relation thereto; and

a handle assembly including an aperture penetrating said body near the interconnection between said base leg and said upright leg, a shaft to be received through said aperture in sliding relation therewith and a pair of end caps each interconnected to a different end of said ;shaft, each of said end caps having a thickness equal to or less than the distance of extension of each of said glide points from said body and having a dimension parallel to the plane of said body greater than the dimension of said aperture in the plane of said body, so as to retain said shaft within said aperture.

4,926,565

END MEASURE, PARTICULARLY STEPPED END MEASURE

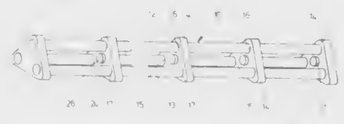
Hans-Helmut Kümmerer, Tamm, Fed. Rep. of Germany, assignor to C. Stiefelmayer KG, Esslingen, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 274,195

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806791

Int. Cl.[5] G01B *3/38*

U.S. Cl. 33—567 **25 Claims**



1. An end measure, comprising at least one linear support having a longitudinal axis; a plurality of touching surfaces extending substantially perpendicularly to said longitudinal axis of said support and spaced from one another by predetermined distances, said support being formed as at least one pipe provided with a plurality of plates which are spaced from one another in direction of said longitudinal axis; a plurality of pin parts having ends with end surfaces which form respective ones of said touching surfaces, said pin parts being transversely spaced from said pipe.

4,926,566

METHOD OF PRODUCING A METROLOGICAL SCALE AND SCALE PRODUCED BY SUCH METHOD

D. R. McMurtry, Wotton-under-Edge; W. F. N. Stephens, Badminton, and M. Kirkbride, Dursley, all of United Kingdom, assignors to Renishaw PLC, Gloucestershire, United Kingdom

Continuation of Ser. No. 165,989, Mar. 2, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 368,152

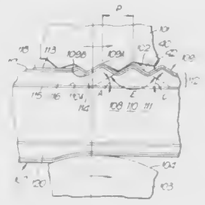
Claims priority, application United Kingdom, Jul. 3, 1986, 8616240

Int. Cl.[5] G01B *3/10*

U.S. Cl. 33—771 **16 Claims**

1. A method of producing a metrological scale wherein the scale comprises an elongate scale member having a reference plane and intended to have a periodic surface profile composed of alternate first and seocnd surfaces which are elongate in a direction transverse to the length of the member and which differ regarding their position relative to the reference plane , the method comprising passing the member between rollers one of which has a plain cylindrical surface and the other one of which has a surface which is generally cylindrical but which

has a profile being the counterpart of the surface profile of the scale, and passing the member through the nip of the rollers



while applying pressure therebetween thereby to deform one surface of the scale member in accordance with the profile of said other roller .

4,926,567

PROCESS AND APPARATUS FOR DRYING COATED WEB

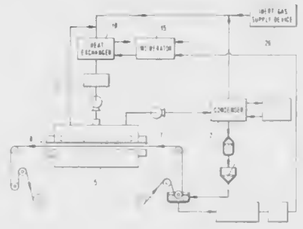
Masaharu Ogawa, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 2, 1986, Ser. No. 881,271

Claims priority, application Japan, Jul. 4, 1985, 60-145706; Jul. 4, 1985, 60-145707

Int. Cl.[5] F26B *3/04*

U.S. Cl. 34—23 **7 Claims**



1. A process for drying a web coated with a coating composition containing an inflammable organic solvent which comprises, drying said coated web by passing through a closed-type oven where a hot inert gas is filled, recovering a substantial portion of said organic solvent from the exhaust gas of said oven by condensation, heating the exhaust gas of said condenser by incinerating the organic solvent remaining therein and returning said heated exhaust gas to said oven.

4,926,568

SOLE PROTECTOR ATTACHMENT

Cynthia L. Coffman, 909 Madeira N.E., Albuquerque, N. Mex. 87108

Filed Feb. 6, 1989, Ser. No. 306,628

Int. Cl.[5] A43B *13/28, 3/24;* A61F *5/14*

U.S. Cl. 36—15 **6 Claims**

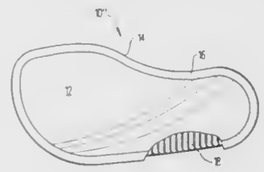
1. A sole protector attachment for securement to a woven or knitted sock or slipper, comprising:

a sole-shaped thin flat flexible pad formed from a wear resistant material;

a narrow edging extending only around a periphery of said pad;

said edging having an upper surface provided with hook portions of cooperating hook and loop type fastening strips for engagement with said woven or knitted sock or slipper;

a sole member extending in spaced parallel relation with said pad; and



a plurality of elongated transversely extending unconnected solid rods sandwiched between said pad and said sole member, said rods disposed in side by side abutting relation and extending along the entire length of said sole member.

4,926,569

SHOE WITH CRADLE ARCH SUPPORT

Richard P. Bunch, Reading, Mass., assignor to Converse Inc., North Reading, Mass.

Filed Oct. 31, 1988, Ser. No. 264,628

Int. Cl.[5] A43B *7/14, 13/40*

U.S. Cl. 36—91 **2 Claims**



1. A shoe comprising:

a sole, having a medial region and a lateral region;

an upper attached to the sole;

an arch support device including an elastic strap having first and second ends, the first end having first attachment means for removably attaching such end to the sole at a sole attachment site, the second end being removably attached to the upper; and

a cushioned insole disposed above the strap, such insole having arch support padding and second attachment means for removably attaching the insole to the strap at a strap attachment site;

so that the shoe may be readily reconfigured to be used either with an elastic strap to provide arch support via the cushioned insole or with the cushioned insole alone.

4,926,570

SHOE INNER SOLE, PARTICULARLY INSOLE OR WELT

Manfred Fohst, Dierdorf, Fed. Rep. of Germany, assignor to Lohmann GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 222,098

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724327

Int. Cl.[5] A43B *13/38*

U.S. Cl. 36—43 **10 Claims**

1. Shoe inner sole, particularly insole or welt for working or

VOL
1114
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safety shoes, with a binder and a non-woven fabric as well as antistatic additives, wherein the non-woven fabric comprises a



mixture of fibers with between approximately 1 to 10% by weight of electrically conductive staple fibers.

4,926,571

CONNECTION FOR CONNECTING COMPRESSED-AIR LINES

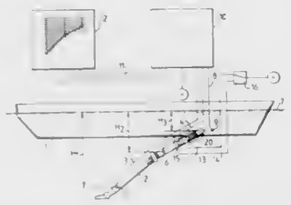
Karl Johannsen, Lübeck-Travemünde, Fed. Rep. of Germany, assignor to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,148

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714220

Int. Cl.[5] E02F *3/88*

U.S. Cl. 37—72 **8 Claims**



1. In a connection for connecting compressed-air lines arranged on the body of a floating dredge, the compressed-air lines leading to measuring devices, control devices or the like mounted on the floating dredge, with compressed-air lines mounted on a suction pipe of the floating dredge used for suction pipe position measuring units for the operation of pneumatic drives of throttle valves or the like arranged on the suction pipe, the suction pipe including a suction pipe elbow with a sliding plate, the improvement comprising the compressed-air lines mounted on the suction pipe being connected to a coupling component mounted on the sliding plate, a coupling countercomponent being fastened to the body of the dredge near the sliding plate, the compressed-air lines leading from the coupling countercomponent to the measuring devices, control devices or the like.

4,926,572

MEDICATION TIMING DEVICE

Gordon W. Holmes, Toronto, Canada, assignor to Professional Packaging Limited, Mississauga, Canada

Filed Aug. 24, 1988, Ser. No. 235,500

Claims priority, application United Kingdom, Aug. 24, 1987, 8719932

Int. Cl.[5] G09F *9/00*

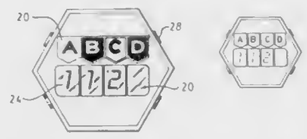
U.S. Cl. 40—448 **10 Claims**

1. A medicament regime control device, comprising:

a housing having an upper face,

display means associsted with said upper face having a plurality of individual side-by-side displays for displaying numerals therein,

electronic circuit means within said housing and operatively connected to said display means for controlling interchangeable messages conveyed by numerals displayed by said display means, including a message corresponding to the number of units of medication of selected ones of differing medicaments, and



individual distinguished indicia on said upper face one adjacent each of said displays corresponding to individual medicament to be taken by a patient.

4,926,573

COVER FOR SMOKING ACCESSORY

Homer S. Hetrick, 501 Alison Ave., Mechanicsburg, Pa. 17055

Filed Aug. 8, 1988, Ser. No. 229,421

Int. Cl.[5] G09F *3/08*

U.S. Cl. 40—663 **4 Claims**



1. In a cigarette lighter assembly having a socket adapted to removably receive lighter means, the improvement comprising a covering plug including:

an outwardly facing surface having an annular locking portion extending away from said surface in a direction opposite to the outwardly facing direction; and

said annular locking portion having flexible locking means for securing said plug in said socket.

4,926,574

RIFLE WITH SAFETY SYSTEM

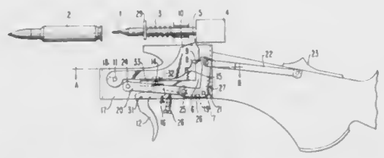
Benedikt Rieger, Altenmunster-Hegnenbach, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 24, 1988, Ser. No. 261,224

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3735773

Int. Cl.[5] F41C *17/04*

U.S. Cl. 42—70.04 **17 Claims**



1. A rifle, comprising a firing pin with a striker member and a cocking spring, a triggering system with a trigger, and safety means having a cocked position and an uncocked position operatively associated with the stock of the rifle, a guided cage movable in a direction of a barrel of the rifle, a catch lever rotationally movably attached to the cage engaging the striker member so that the firing pin can also be moved against a cocking spring with the cage, said catch lever releasing the striker member only in the cocked condition by operation of the trigger and a lever of the safety means that moves the cage being operable from a stock neck of the rifle.

4,926,575

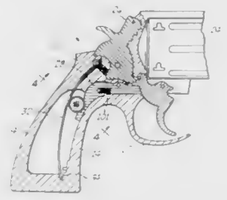
GUN GRIP EMBLEM MANUAL SAFETY

Walter Pastor, 1100 NE. 182 St., North Miami Beach, Fla. 33162

Continuation of Ser. No. 286,465, Dec. 19, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 366,537

Int. Cl.[5] F41C *17/02*

U.S. Cl. 42—70.06 **11 Claims**



1. A safety assembly for use in combination with a hand gun of the type including a rebound slide disposable between a locking position and a release position relative to movement of a trigger lever, a firing pin block, a trigger and a hammer to accomplish the firing cycle of the hand gun, said assembly comprising:

(a) a piston assembly movably mounted in a handle of the gun and extending transversely therethrough in communicating relation with each oppositely disposed handle stock portion mounted on opposite sides of the handle of the gun,

(b) said piston assembly comprising two piston segments, a longer piston segment and a shorter piston segment connected together in spaced apart relation and each movably mounted at least partially within a different one of said handle stock portions,

(c) each of said piston segments including an exposed outer end surface and said piston assembly including a longitudinal dimension sufficient to selectively dispose each of said outer end surfaces concurrently in adjacent relation to an outer surface of a respectively positioned handle stock portion,

(d) said rebound slide including an integrally formed tail portion of unitary design, said tail portion containing a concave area projecting inwardly therefrom for accommodation of said longer piston segment when said safety assembly is disposed in an interruptive position, said interruptive position defined by a blocking disposition of said longer piston segment relative to said tail portion of said rebound slide as said rebound slide moves between the locking position and the release position thereof,

(e) said piston assembly selectively positionable along a longitudinal dimension between a safety position and an operative position,

(f) said safety position defined by substantially flush disposition of each outer end surface of said piston segments with the outer surface of the correspondingly positioned handle stock portions, and disposition of said tail portion of said rebound slide in said interruptive position, and

(g) said operative position defined by respective recessed and protruding positions of said piston segments relative to correspondingly positioned handle stock portions and disposition of said tail portion of said rebound slide out of said interruptive portion.

4,926,576

MOUNTING DEVICE ADAPTABLE ON A WEAPON

Félix V. Maes, Barchon, and Michel Baikrich, Tilff, both of Belgium, assignors to ARSOC S.P.R.L., Barchon, Belgium

Filed Aug. 9, 1988, Ser. No. 330,137

Claims priority, application Belgium, Aug. 13, 1987, 08700903

Int. Cl.[5] F41G *1/38*

U.S. Cl. 42—101 **15 Claims**



1. A mounting device for fixing an instrument or accessory onto a weapon, comprising a body adapted to carry an instrument, said body having a surface festuring at least an attachment edge or surface intended to mate with the surface of one side of the weapon, a pivotal lateral leg mounted on the body in order to mate with the surface of the weapon on the side which is opposite to the one where said attachment edge or surface fits, said pivotal lateral leg having a cut allowing for a pressure shoulder, and a locking means mounted on said body in order to keep said pivotal lateral leg in a state of pressure on the weapon, said locking means consisting of a lever jointed on a pivot mounted on said pivotal lateral leg, said lever having surfaces to mate with the pressure shoulder arranged on said body when said lever is in a clamping position, said surfaces and said pressure shoulder being so shaped that, when the locking lever is in clamping position, the pressure shoulder exerts such a pressure on said surfaces that the lever is caused to pivot thereby to maintain said pivotal lateral leg in clamping engagement with the weapon, thereby when the pivotal lateral leg is in engagement with the surface of the weapon, said body is rigidly fixed onto the weapon through clamping engagement on the opposite sides of the weapon.

4,926,577

QUICK GLIDING LURE

Konstantin Radtchenko, 235 Manhattan Ave., Jersey City, N.J. 07307

Filed Jan. 24, 1989, Ser. No. 300,943

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42 **16 Claims**



1. A quick glide fish lure comprising an elongated body, said body as viewed by a longitudinal vertical cross section comprises:

(a) an upper facing surface extending the length of said body;

(b) a rear portion extending from a rearward most tip to a vertical plane, generally perpendicular with said surface, and bisecting said bodies center of gravity;

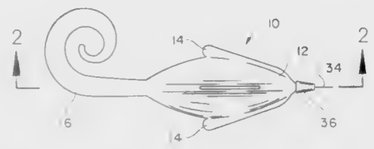
(c) a front portion extending from a frontward most tip to the center of gravity plane;

(d) a front lower surface having a downwardly convex shape beginning at said front tip and running to said center of gravity plane;

(e) a first rearward lower surface having a downwardly concave shape which connects and transitions from the

convex shape at the center of gravity plane and then arcs towards said rearward tip;
(f) a second rearward lower surface, descending from said rearward tip toward said front at an angle less than 90 degrees from said upper surface and connecting said first rearward lower surface; and
(g) at least one fish hook attached to said body.

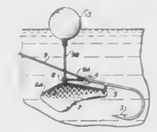
4,926,578
FISHING LURE
James D. Morse, 210 Hunt's Neck Rd., Poquoson, Va. 23662, and Daniel C. Morris, II, 1733 Old Buckingham Rd., Hampton, Va. 23669
Filed Dec. 5, 1988, Ser. No. 279,927
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.24 **7 Claims**



1. A soft plastic body fishing lure comprising:
(a) a body having a front, rear, top, bottom, first side and second side portions;
(i) said top portion being substantially flat;
(ii) said bottom portion
having said first and second side portions being flat and parallel with said top portion, and further having a V-shaped keel portion, having an apex, where the apex corresponds to said bottom portion's midpoint, and said keel connects said side portions, said keel running the length of said body;
(iii) said body, as viewed from the top, having an oval shape where said front and rear portions correspond to the ends of aid oval, and further having wings attached to said first and second side portions, said wings beginning at said front portion, extending along the sides of said oval and ending approximately midway between said front and rear portions;
(b) a tail portion substantially longer than said body, attached to said body's rear portion having a uniform thickness where the tail's top and bottom extend from said flat top portion and said flat bottom portions respectively, said tail further having a spirally wound shape; and
(c) a fish hook removably embedded in said body.

4,926,579
SNAG-PROOF SAFETY FISHING LURE
Miguel A. Jimenez, P.O. Box 1146, Douglas, Ariz. 85607
Filed May 3, 1989, Ser. No. 347,229
Int. Cl.[5] A01K *93/00*
U.S. Cl. 43—42.44 **18 Claims**

1. A snag-proof fishing lure comprising in combination:
(a) a J-shaped hook having a barb at a curved end thereof and a first eyelet at a shank end thereof;
(b) a shield having a recess in a lower surface thereof to cover the barb when the lure is not submerged;
(c) means positioned below the first eyelet for pivotally connecting the shield to a shank of the hook; and





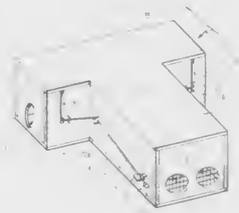
(d) floatation means associated with the shield as the hook sinks in water to effectively lift the shield to expose the barb.

4,926,580
SAFETY SINKER
Chen-Ju Lin, No. 13, Lane 194, Chung Hsiao Road, Taichung, Taiwan
Filed Oct. 3, 1989, Ser. No. 415,937
Int. Cl.[5] A01K *75/06*
U.S. Cl. 43—44.89 **1 Claim**



1. A safety sinker, including
a sinker coupler unitarily made of resilient plastic material through shape molding process and generally comprised of a retaining ring portion having a gap made thereon for insertion therethrough of a fish line into the inner space thereof, a neck portion extending downward from said retaining ring portion, a fork end portion extending from said neck portion, and two opposite semi-sphere members made on the two terminals of said fork end portion, a sinker comprising an opening, and an inner chamber communicating with said opening;
characterized in that said two semi-sphere members of said sinker coupler are spaced away from each other, after having been incorporated into a spherical configuration and inserted into said inner chamber of said sinker through said opening, to firmly connect said sinker to a fish line, and said two semi-sphere members may be squeezed to close together to form into a spherical configuration so as to disconnect from said sinker when a pull force is applied thereto.

4,926,581
ANIMAL TRAP
August Grivas, 3215 Avenue L, Brooklyn, N.Y. 11210
Filed Jul. 6, 1989, Ser. No. 375,897
Int. Cl.[5] A01M *23/08*
U.S. Cl. 43—61 **14 Claims**

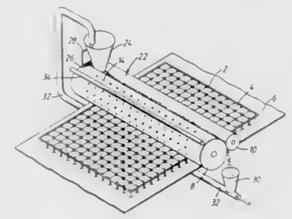


1. A T-shaped animal trap comprising:
in the head portion of the T,
entry ports at opposite ends thereof, and
a sliding door above each of said entry ports when said entry ports are open, each of said sliding doors being positioned to slide down inside of each of said entry ports;
in the leg portion of the T,
at least one open screened window,
a platform near said open screened window, said platform attached on a dowel above the bottom of said trap, said platform being tilted with said dowel when weight from an animal moves thereon; and
a trigger mechanism, wherein
said dowel traverses the width of said leg portion and passes through holes in the sides of said portion sized to permit rotation of said dowel,
a magnet on each end of said dowel, and
two flexible metal wires, each one extending from attachment to one of said sliding doors to reach one of said magnets when each of said sliding doors is above each of said entry ports whereby, when said platform and dowel tilt, said wires are thereby released from said magnets allowing said doors to slide downward simultaneously closing said entry ports.

4,926,582
LOW POUR CRUDE OIL COMPOSITIONS
Kaye L. Motz, Ponca City, Okla.; Roger A. Latham, Carouge, Switzerland, and Robert J. Statz, Kennett Square, Pa., assignors to E. I. duPont de Nemours & Company, Wilmington, Del.
Filed Jun. 2, 1988, Ser. No. 202,151
Int. Cl.[5] C10L *1/16, 1/22*
U.S. Cl. 44—62 **14 Claims**

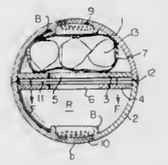
1. In the process of transporting waxy curde oils through a pipeline, the improvement which comprises incorporating into said crude oil an effective pour point depressant amount of an additive comprising a polymer selected from the group consisting of copolymers of ethylene and acrylonitrile, and terpolymers of ethylene, acrylonitrile, and a third monomer selected from the group consisting of vinyl acetate, carbon monoxide, alkyl acrylates, alkyl methacrylates, alkyl vinyl ethers, vinyl chloride, vinyl fluoride, acrylic acid, and methacrylic acid, wherein the amount of third monomer in the terpolymer ranges from about 0.1 to about 10.0 precent by weight.

4,926,583
APPARATUS FOR SELECTING AND DISCHARGING SEEDS
Thomas W. Hamilton, Stoke Poges, United Kingdom, assignor to T W Hamilton Design Limited, United Kingdom
Filed Mar. 28, 1988, Ser. No. 174,247
Claims priority, application United Kingdom, Apr. 11, 1987, 8708734
Int. Cl.[5] A01G *9/08, 7/18*
U.S. Cl. 47—1.01 **10 Claims**



1. A seeding machine comprising:
first and second movable surfaces positioned to make contact along a common line and thereafter separating to define a seed trough,
means for moving the surfaces defining the trough in a direction away from the common line to cause any seeds in the trough to tumble continuously, one of said surfaces defining a plurality of openings,
a source of pressure difference;
means coupling said openings to said source of pressure difference to enable an individual seed to be attracted to each opening and to allow the said one surface to carry the individual seeds to a location for discharge, and
end stop means comprising a wall of bristles in sliding engagement with the opposite walls of the trough, and mounted adjacent at least one end of the trough for preventing the spillage of seeds from that end of the trough.

4,926,584
APPARATUS FOR HYDROPONIC FARMING
Hiroshi Horibata, Mitaka House, No. 25-20 5-Chome, Kamiren-jaku, Mitaka-Shi, Tokyo 181, Japan
Continuation of Ser. No. 175,105, Mar. 30, 1988, abandoned. This application Aug. 2, 1989, Ser. No. 393,095
Claims priority, application Japan, Mar. 31, 1987, 62-47982[U]
Int. Cl.[5] A01G *31/00*
U.S. Cl. 47—59 **23 Claims**



1. An aquatic float for hydrophonic gardening comprising:
a floatable curved surface vessel means having a cavity formed within the vessel for enclosing a bulb to be grown therein, the vessel cavity having an exterior and an interior wall;
a floatable coaster means having a substantially planar extent and extending across the cavity for partially closing the

cavity, the coaster means having an aperture therein in alignment with seedbed means which is spaced from the coaster means;

the seedbed means being located on the interior wall of the vessel for supporting the bulb disposed in the cavity of the vessel, the seedbed means having a plurality of passage means in a defined arrangement extending through the interior and exterior walls of the vessel for receiving growing hair roots of the bulb;

wherein the aperture of the coaster means has a shape and size substantially corresponding to the defined arrangement of the passage means and is in alignment therewith.

4,926,585

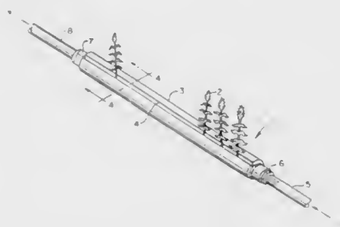
PLANT NUTRIENT DELIVERY SYSTEM HAVING A POROUS TUBULAR MEMBER

Thomas W. Dreschel, Titusville, Fla., assignor to The Bionetics Corporation, Hampton, Va.

Continuation-in-part of Ser. No. 21,448, Mar. 4, 1987, abandoned. This application Apr. 7, 1988, Ser. No. 179,036

Int. Cl.[5] A01G *31/02*

U.S. Cl. 47—64 **33 Claims**



1. In a method of hydroponic growth of a plant from seed and a nutrient solution, said method comprising the steps of supporting the seed and subsequent plant roots directly on a microporous membrane and supplying liquid nutrients to said seed and subsequent plant roots by migration through said membrane, the improvement comprising the steps of:

providing a section of rigid tubular pipe defining an opening in its walls;

supporting a seed and subsequent plant roots directly on a tubular hydrophilic microporous membrane telescopically received inside of said pipe, said tubular membrane and said tubular pipe being provided in a spaced telescopic arrangement to provide a sufficient air space without a growing medium therebetween for said seed and subsequent plant roots to be positioned directly on said membrane adjacent to said opening so that the stem of said plant can grow outwardly through said opening and the roots of said plant supported between said tubular pipe and said tubular membrane can grow unimpeded and in contact with said membrane such that the seed and subsequent plant root are held in the air space between the exterior of said membrane and interior of said tubular pipe, the pores in said membrane being sized to be sealed by surface tension of said solution provided along the length of said tubular membrane except where said roots contact said membrane whereby said solution only flows through said membrane when in contact with said roots by capillary action to said roots;

supporting said membrane in a circumferentially spaced relationship to the interior of said rigid pipe;

providing a nutrient solution at one end of said tubular membrane; and

removing nutrient solution from the other end of said tubular membrane.

8. In an apparatus for hydroponic growth of a plant from seed and a nutrient solution:

a section of rigid tubular pipe defining an opening in its wall;

a rigid tubular, hydrophilic, microporous member telescopically received inside of said pipe, said rigid tubular member and said tubular pipe being provided in a spaced telescopic arrangement to provide a sufficient air space without a growing medium therebetween for a seed to be positioned directly on said member adjacent to said opening so that the stem of said plant can grow outwardly through said opening and the roots of said plant supported between said tubular pipe and said tubular member can grow unimpeded and in contact with said member such that the roots are held in the air space between the exterior of said member and the interior of said tubular pipe, the pores in said member being sized to be sealed by surface tension of said solution provided along the length of said tubular member except where said roots contact said member whereby said solution flows through said member when in contact with said roots by capillary action to said roots;

a support means to support said member in a spaced relationship to the interior of said rigid pipe;

inlet means connected to one end of said tubular member adapted to receive said nutrient solution; and

outlet means connected to the other end of said tubular member adapted to remove said nutrient solution.

4,926,586

BOX FOR CULTIVATING PLANT

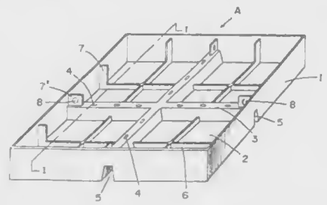
Mutuo Nagamatsu, 33-4, Kasumigaoka 4-chome, Higashi-ku, Fukuoka-shi, Japan

Continuation of Ser. No. 72,072, Jul. 10, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 319,900

Claims priority, application Japan, Oct. 23, 1986, 61-253152

Int. Cl.[5] A01G *9/02;* **E02D** *29/00*

U.S. Cl. 47—66 **3 Claims**



1. The combination of a building having a roof, a drainage pipe at the periphery of the roof and a roof-protective covering substantially entirely covering the roof and comprising a plurality of rectangular-shaped turf cultivating plant boxes which are installed on the roof contiguously laterally and longitudinally to form a grid,

each said turf cultivating plant box comprising:

(a) a rectangular bottom plate bounded by four side walls,

(b) a first hollow ridge extending longitudinally entirely across the box between a first opposed pair of said side walls and having a central portion substantially equidistantly spaced from the side walls of said first opposed pair of side walls,

(c) a second hollow ridge extending laterally entirely across the box between a second opposed pair of said side walls and having a central portion substantially equidistantly spaced from the side walls of said second opposed pair of side walls,

(d) the first and second hollow ridges being constituted of elevated portions of said bottom plate, the ridges each having an upper extremity which is of lesser elevation than the side walls,

(e) the central portion of the first hollow ridge and the central portion of the second hollow ridge integrally merging at right angles,

(f) a multiplicity of water drainage perforations formed through each of the first and second ridges at regular intervals at the upper extremity thereof,

(g) the underside of each of the first and second ridges defining water drainage grooves communicating with said multiplicity of perforations and opening at each end through a respective wall of said respective opposed pair of walls between which said respective ridge extends, the groove defined by the first ridge and the groove defined by the second ridge communicating with each other at said integrally merged central portions, said openings of said water drainage grooves being aligned and in communication with the openings of the water drainage grooves formed in a plurality of turf cultivating plant boxes which are laterally and longitudinally contiguous with said cultivating plant box to form continuous lateral and longitudinal water drainage channels,

(h) each of said boxes being filled to a level above said ridges with soil for cultivating turf, and

(i) natural turf planted on said soil.

4,926,587

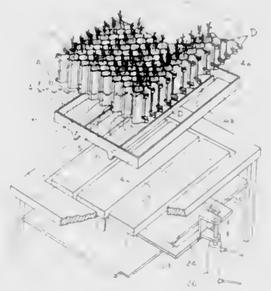
METHOD AND APPARATUS FOR PROPAGATING PLANTS

Aart van Wingerden, Hwy. 191, Rte. 1, Box 74A, Horse Shoe, N.C. 28742

Continuation of Ser. No. 933,741, Nov. 2, 1986, abandoned. This application Apr. 18, 1989, Ser. No. 341,254

Int. Cl.[5] A01G *9/02, 9/10*

U.S. Cl. 47—85 **1 Claim**



1. For use in a tray for propagating seedlings and the like utilizing a plurality of elongated strips which form a plurality of rows of growing compartments, a molded plastic frame comprising:

a bordering member encompassing a plurality of strips forming rows of growing compartments extending about and confining said strips therewith; horizontally spaced vertical support members extending across said bordering member and having connection therewith; and said support members being vertically spaced below said bordering member to permit the strips to be placed thereacross to support the strips from the bottom while the strips are confined at their ends within said bordering member; spaced vertical slots within a lower portion of each of said strips for reception of respective support members.

4,926,588

DEVICE FOR CENTERING OF OPTIC LENSES IN A MECHANICAL MOUNTING, IN PARTICULAR DURING EDGE CUTTING AND BEVELLING

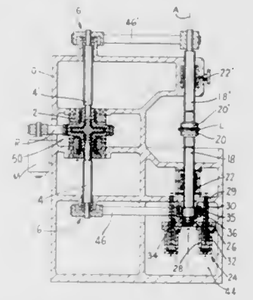
Erhard Brueck, Heuchelheim, Fed. Rep. of Germany, assignor to Wilhelm Loh Wetzlar Optikmaschinen GmbH & Co. KG, Wetzlar, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 289,922

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 374411

Int. Cl.[5] B24B *13/005, 5/02;* **B23B** *19/02, 33/00*

U.S. Cl. 51—217 T **11 Claims**



1. A device for centering optic lenses in a mechanical mounting for edge cutting and bevelling, comprising:

a housing;

a drive shaft and two coaxially aligned centering spindles rotatably supported in said housing, said centering spindles having a pair of respectively mutually adjacent ends, said mutually adjacent ends carrying clamping cups thereon for clamping a lens therebetween, one said centering spindle being axially movably supported in said housing, the other said centering spindle being axially adjustably arranged in said housing, said centering spindles being constructed as rigid, radially and axially supported shafts;

drive elements drivingly connected between said drive shaft and said centering spindles, and motor means drivingly connected to said drive shaft for rotating said drive shaft and said centering spindles; and

pressurized fluid-actuated clamping means disposed in said housing for moving said centering spindles both axially toward and away from one another, said clamping means including means defining at least one pressure cylinder adapted to receive pressurized fluid and having an axis parallel to a direction of relative axial movement of said centering spindles, said clamping means further including a membrane piston which is engageable with an end of said one centering spindle opposite said clamping cups for urging said one centering spindle for axial movement in said housing relative to said pressure cylinder.

4,926,589

PRESSURIZED HOSE HANDLE WITH SYSTEM CONTROLS

Kenneth E. Abbott; Patrick J. Lyons, and Richard M. Satariano, all of Tucson, Ariz., assignors to Stripping Technologies Inc., Tucson, Ariz.

Filed Oct. 4, 1988, Ser. No. 253,233

Int. Cl.[5] B24C *5/02*

U.S. Cl. 51—427 **1 Claim**

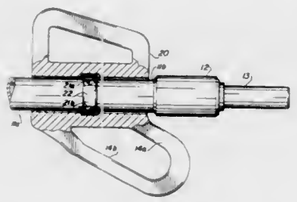
1. A handle system for a pressure hose comprising:

(a) a stop mechanism attached substantially at a first end of the hose;

(b) an operator's handle totally containing said stop mecha-

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nism, said operator's handle disposed between the stop mechanism and a second end of the hose, said handle encircling said hose such that said hose may rotate within said handle, and wherein said stop mechanism presses against said handle during pressurization of said hose; and,



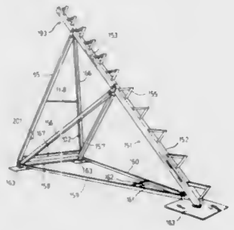
(c) an operator's control panel located on said operator's handle, said operator's control panel for control of operational functions affecting said pressure hose and external to said handle system.

4,926,590

STAGING

Benjamin J. Harris, Elm Tree House, Wendlebury, England (0X6 8PN)

Filed Mar. 24, 1989, Ser. No. 328,501
Claims priority, application United Kingdom, Mar. 26, 1988, 8807257; Jul. 16, 1988, 8817000; Jan. 31, 1989, 8902045
Int. Cl.[5] E04H *3/12*
U.S. Cl. 52—8 14 Claims



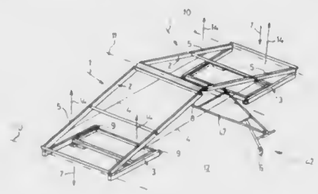
1. Staging comprising:
a pair of mutually spaced support assemblies, each support assembly comprising,
a truss member having front and rear ends,
a first pair of legs arranged in an inverted-V configuration to support said truss member with a rearward inclination, upwardly, each leg of said first pair of legs having upper and lower ends,
first connection means positively connecting said first pair of legs to said truss member to prevent movement of said legs longitudinally of said truss member,
bracing means for determining the spacing of said lower ends of said first pair of legs, and
a pair of tie bars each linking said lower end of a respective leg of said first pair of legs with said front end of said truss member; and
a plurality of decking members bridging said truss members of said support assemblies in a stepped configuration.

4,926,591

ROOFING METHOD AND APPARATUS

Johannes Buijs, Krimpen a/d IJssel, Netherlands, assignor to Adviesbureau D3BN Civiel Ingenieurs B.V., Netherlands

Filed Dec. 2, 1988, Ser. No. 278,863
Claims priority, application Netherlands, Dec. 3, 1987, 8702908
Int. Cl.[5] E04B *1/343*
U.S. Cl. 52—63 21 Claims



1. A method of forming a roofed structure from a frame and a tent cloth, comprising the steps of:
lifting the frame having two roof elements pivotally joined along a ridge line defining two frame halves and having two wall elements pivotally joined to the roof elements along roof edge lines from a flat starting position by at least two points, such that the roof elements are lifted first on a side of the ridge line until the roof elements are at a given angle relative to each other;
connecting a tie member to the roof elements, in a loaded condition, to define the given angle between the roof elements;
additionally lifting the frame and swivelling the wall elements outwardly to substantially vertical positions in which the wall elements are relatively fixed to the roof elements; and
swivelling outwardly wall spreaders, hinged to the wall elements about lines parallel to the ridge line, to positions in which the wall spreaders extend substantially in one plane.

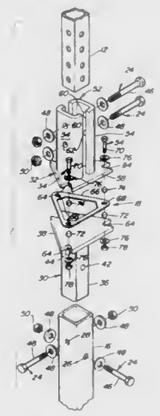
4,926,592

BREAKAWAY SIGN POST COUPLING

Charles O. Nehls, Allen Park, Mich., assignor to Unistrut International Corp., Ann Arbor, Mich.

Filed Feb. 10, 1989, Ser. No. 308,552
Int. Cl.[5] E02D *27/42*; F16D *1/00*
U.S. Cl. 52—98 15 Claims

1. A breakaway coupling for a roadside support post to be used in conjunction with a ground engaging mounting post having a portion extending above ground level comprising, in combination:
a pedestal mounting member having a longitudinally extending shank for engagement with said mounting post, and a generally triangular shaped base plate transversely located at one end of said shank;
means for firmly attaching said shank to said mounting post;
a support post mounting member having a longitudinally extending standard for engaging said support post and a generally triangular shaped slip flange congruent to said base plate transversely located at one end of said standard;
means for firmly attaching said standard to said support post;
generally V-shaped notches at the corners of said triangular shaped base plate and triangular shaped slip flange;
a friction reducing gasket located between said base plate and said slip flange;
a bolt and nut connection inserted in each notch drawing said plate and flange together with said gasket therebetween; and
a pair of cam rollers on each bolt, one located between said gasket and said base plate, and the other located between said gasket and said slip flange;



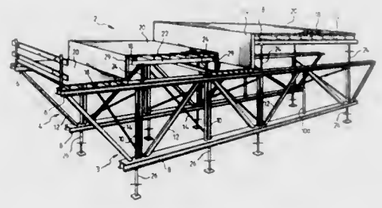
whereby when said post is subjected to a vehicular impact, said slip flange will slide relative to said base plate severing said support post mounting member and support post from the base plate of said pedestal mounting member.

4,926,593

TRUSS ARRANGEMENT

Ronald J. Johnston, Georgetown, Canada, assignor to Aluma Systems Ltd., Downsview, Canada

Continuation of Ser. No. 813,242, Dec. 24, 1985, Pat. No. 4,787,183. This application Nov. 28, 1988, Ser. No. 277,006
Claims priority, application Canada, Dec. 27, 1984, 471047
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[5] E04G *11/36*
U.S. Cl. 52—126.4 6 Claims



1. A structural member for use in a concrete forming structure comprising a pair of tubular members disposed in parallel relation with each tubular member integral with opposed webs which in combination with said tubular members define an enclosure extending the length of said tubular members, each web to a side opposite said enclosure including opposed flanges which in combination with the particular web define an open bolt slot extending in the length of said tubular members.

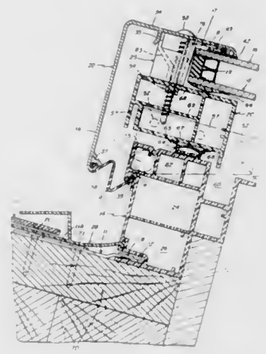
4,926,594

SKYLIGHT CONSTRUCTION

Robert Sampson, Sanford, and Sean Flanigan, Wells, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Filed Dec. 13, 1988, Ser. No. 283,797
Int. Cl.[5] E04B *7/18*
U.S. Cl. 52—200 34 Claims

1. A skylight construction for an opening in a building or the like comprising: a curb frame extending about the opening including means for securing thereof about the opening, translucent or transparent means for covering the opening and extending at edges to overlie the curb frame, means for retaining the covering means on the curb frame, said means for retaining including a retainer and associated securing fastener,



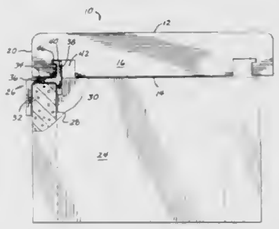
and a cushioning member disposed between said retainer and curb frame and including a resilient cushioning piece supported laterally adjacent the peripheral edge of said covering means, said cushioning member having passage means therethrough for receiving and guiding said securing fastener.

4,926,595

RETAINING WALL CAP UNIT

Robert W. Dean, Jr., Milwaukee, Wis., assignor to Stonewall Landscape Systems, Inc., Milwaukee, Wis.

Filed May 1, 1989, Ser. No. 345,884
Int. Cl.[5] E04F *19/02*
U.S. Cl. 52—300 9 Claims

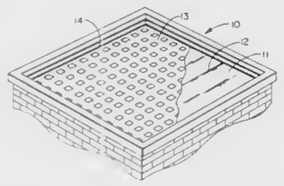


1. A cap unit for a retaining wall, said retaining wall being constructed of a plurality of retaining wall blocks in which at least the uppermost course of retaining wall blocks is provided with a plurality of connector members, each connector member having an upstanding portion extending above the upper surface of the blocks in said uppermost course, said cap unit comprising:
first and second end surfaces;
first and second side surfaces extending between said first and second end surfaces;
a top surface; and
a bottom surface;
said cap unit being adapted for placement on said uppermost course of retaining wall blocks such that either its first end surface or its second end surface faces outwardly; and
said bottom surface being provided with a pair of cavities, with one of said cavities being disposed toward said first

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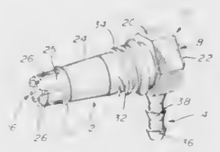
end surface and the other of said cavities being disposed toward said second end surface, said cavities being arranged such that one of said cavities receives the upstanding portion of said connector member when said cap unit is positioned such that said first end surface faces outwardly, and the other of said cavities receives the upstanding portion of said connector member when said cap unit is positioned such that said second end surface faces outwardly.

4,926,596
ROOF DECK COVERING SYSTEM
Robert C. Yeamans, 2777 Northwest Blvd., Columbus, Ohio 43221
Filed Jan. 6, 1989, Ser. No. 294,023
Int. Cl.[5] E04B *7/00*
U.S. Cl. 52—408 4 Claims



1. A system for covering a roof deck comprising,
a roof waterproofing membrane positioned on said roof deck and secured at the periphery of said roof deck,
a flat sheet apertured overlay positioned on top of said membrane immediately adjacent thereto and in contact therewith and secured at the periphery of said roof deck,
said apertured overlay being provided with a plurality of apertures therein and being made of a material having significantly less elongation than said membrane.

4,926,597
DEVICE FOR COLLECTING SAP
Bernard Landry, St-Damien, Canada, assignor to IPL Inc., St-Damien, Canada
Filed Mar. 29, 1988, Ser. No. 182,281
Int. Cl.[5] A01G *23/10*
U.S. Cl. 47—52 8 Claims



1. A device for collecting sap from trees and for directing said sap to a sap collecting system operable under vacuum conditions, comprising: a longitudinal hollow body having an open end and a closed end, said body including a frusto-conical section adapted to be forced into outer layers of a tree to be sap-collected, said frusto-conical section displaying, adjacent to the open end of said body, sap irrigating means having one end adjacent said open end to allow sap in said outer layers to be received and directed to said open end and into said hollow body; said frusto-conical section displaying thereon an annular groove which is located adjacent an opposite end of said sap irrigating means on said body; resilient sealing means having an inner portion tightly secured in said groove and an outer portion extending beyond said groove and engaging, when received in a tree, the adjacent tree layers to provide a sealing engagement between the frusto-conical section and the tree layers by radial compression to thereby prevent air infiltration in said body when said sap collecting system is operating under vacuum conditions; said closed end of said body displaying a rigid section adapted to be hit in order to force said frusto-conical section into said layers; and tube securing means extending perpendicularly from said rigid section, said securing means being hollow and contiguous with said hollow body for direction sap collected in said body to said sap collecting system.

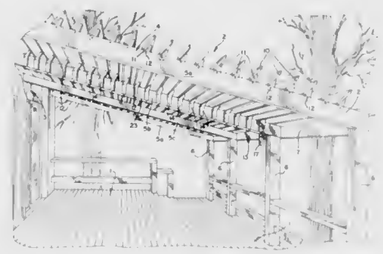
4,926,598
METHOD AND APPARATUS FOR GERMINATING SEED SPROUTS
Huy Chung, Apt. No. 417, 11950 Pierrefonds Blvd., Pierrefonds, Quebec, Canada (49A 2X5)
Filed Oct. 20, 1988, Ser. No. 260,305
Claims priority, application Canada, Nov. 2, 1987, 550819
Int. Cl.[5] A01L *1/02*
U.S. Cl. 47—61 6 Claims



1. An apparatus for accelerated germinaton of seeds comprising:
an enclosed vessel having a screen in a lower portion of the vessel to hold a layer of seeds, the vessel having a drain in the lower portion below the screen,
a shower at the top of the vessel to spray water from a water supply onto the screen,
water heating means with water temperature sensing device and means to control temperature of the water supply to the shower,
an air supply means having an air heating means to supply air through an air inlet at the top of the vessel, the air flowing downwards and exiting through the drain,
air temperature sensing device in the vessel and means to control the air temperature in the vessel,
moisture producing means in the vessel with humidity measuring device and means to control humidity in the vessel, and
sequence control means to control a soaking step and an air flow step with intermittent spraying from the shower.

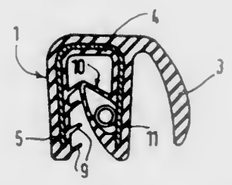
4,926,599
ADJUSTABLE LOUVERED AWNING
Edward Scholz, 5131 W. Ainslie, Chicago, Ill.
Filed Jan. 17, 1989, Ser. No. 297,578
Int. Cl.[5] E06B *7/086*
U.S. Cl. 49—88 4 Claims

1. An adjustable, louvered awning inclined downwardly and extending outwardly from a building wall or the like and supported at its outer end, comprising:
(a) a plurality of beams extending substantially parallel to each other and forming an awning frame;
(b) a plurality of louver vanes extending across the top of each of said beams in parallel relationship to each other;
(c) each of said vanes having an upper edge and a lower surface, and a fitting protruding downwardly from said lower surface adjacent said upper edge in alignment with one side of at least one of said beams;
(d) each of said fittings being pivotally connected to said one side;
(e) said vanes being pivotally moveable between a position wherein they are lifted off said beams and the awning is opened and a position wherein the lower edges of each of said vanes overlap the upper edges of the next lower vane and the awning is closed;



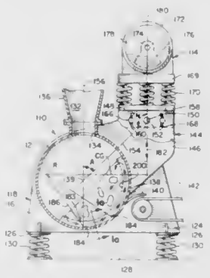
(f) each of said vanes also having an operating arm protruding downwardly from said lower surface adjacent said upper edge in alignment with one side of one other one of said beams;
(g) each of said operating arms being pivotally connected to said one side of the corresponding one beam;
(h) an operating bar pivotally connected to the lower end of each of said operating arms; and
(i) one of said operating arms including a blocking mechanism for releasably locking said vanes in any of a plurality of positions by engaging in, or disengaging from, a member on said corresponding one beam.

4,926,600
SECTION FORMING A GRIPPER FOR AUTOMOBILE GASKETS
Gerard Mesnel, Carrieres sur Seine, France, assignor to Etablissements Mesnel S.A., Carrieres-sur-Seine, France
Filed Dec. 22, 1988, Ser. No. 288,230
Claims priority, application France, Dec. 23, 1987, 87 18032; Aug. 1, 1988, 88 10376
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—491 14 Claims



1. An automobile gasket gripper for capping a projecting element of an automobile, comprising:
a capping member having substantially parallel faces adapted to receive the projecting element;
said capping member having projecting parts projecting from each face adapted to contact the projecting element;
at least one projecting part being hollow and having a wall which contacts the projecting element with its outer face, the projecting part having disposed therein a means for exerting a substantially constant counterpressure on a portion of an inner face of the wall of the tubular element opposite the outer face;
wherein the capping comprises a longitudinal metal core having a U-shaped cross-section and a sheath or plastic-like material surrounding the core; and
wherein upon receiving the projecting element, the counterpressure means bears against a portion of the longitudinal metal core.

4,926,601
VIBRATORY TUMBLING APPARATUS
Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.
Filed Mar. 9, 1989, Ser. No. 320,994
Int. Cl.[5] B24B *31/06*
U.S. Cl. 51—7 19 Claims

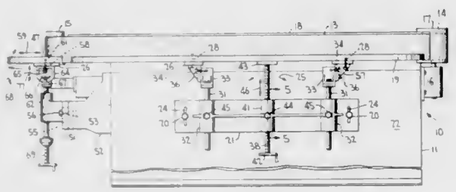


1. A vibratory apparatus, comprising:
a container having a curved material supporting surface disposed about a generally horizontal longitudinal axis, said container having a center of gravity offset from said longitudinal axis, said curved material supporting surface having a plurality of generally circumferential, parallel troughs disposed along said longitudinal axis;
said container having a material input end and a material discharge end, said material input end being axially spaced from said material discharge end of said container, said troughs each having a positive pitch in a direction toward said material discharge end to feed the material from the input end to the discharge end;
means for resiliently mounting said container relative to a mounting surface; and
vibration generating means mounted on said container for producing vibratory forces directed along a linear path, said linear path being displaced not only from said longitudinal axis but also from said center of gravity of said container.

4,926,602
EDGE SANDER HAVING ADJUSTABLE SUPPORT TABLE OR TABLES
Robert H. Crouch, 7 Lakes Box 578, West End, N.C. 27376
Filed Jul. 27, 1989, Ser. No. 385,580
Int. Cl.[5] B24B *21/10*
U.S. Cl. 51—135 R 11 Claims

1. A belt sanding apparatus having apparatus having a longitudinally extending, endless belt trained over both a drive roll and a driven roll for finishing a workpiece, said belt having an abrasive surface, the apparatus comprising an elongated support frame, means for mounting said rolls on said frame for rotation about fixed upstanding axes, a workpiece support table on said frame, means for mounting said table to said frame for four-way adjustment relative to said belt, said means comprising an elongated support bracket plate mounted on said frame for pivotal movement about a transverse tilt axis extending

perpendicular to the belt surface, guide means connected to said table and being in engagement with said bracket plate for vertical sliding movemeat and for pivotal movement together with said table about said transverse tilt axis, moving means on said bracket for vertically moving said table along an axis



parallel to said belt surface, means connecting said table to said guide means for effecting movement of said table both along a horizontal axis parallel to said transverse tilt axis and about a roll axis extending parallel to said belt, whereby said table is capable of vertical, horizontal, tilt and roll adjustments relative to said belt.

4,926,603

CENTERLESS GRINDING

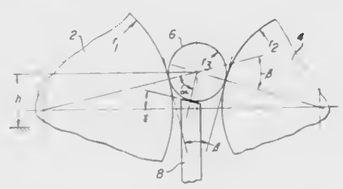
Martin Frost, Bristol; Brace J. Horton, Hertfordshire, and Jonathan L. Tidd, Devon, all of England, assignors to University of Bristol, United Kingdom

Filed Jul. 1, 1988, Ser. No. 214,668

Claims priority, application United Kingdom, Jul. 2, 1987, 8715544

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.77 **8 Claims**



1. A centerless grinding maching for grinding a component having a generally circular periphery, the machine comprising:

(a) means for supporting the component at points on its periphery during grinding:

(b) means for detecting periodic irregularities in the periphery of the component during the grinding of the component;

(c) means for analysing the periodic irregularities in the periphery of the component detected by the detecting means, the analysing means producing a signal indicative of the adjustment in the position of the component necessary to eliminate, during grinding, the detected periodic irregularities in the periphery of the component; and

(d) means for periodically adjusting the support means of the component in response to the signals from the analysing means to eliminate said periodic irregularities in the periphery of the component.

4,926,604

METHOD FOR CORRECTING ABRASION IN A ROBOT HAVING A WEARING TOOL MOUNTED THEREON

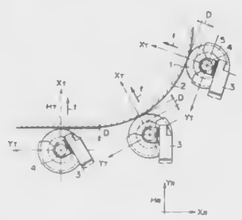
Masaaki Hara; Seigo Nishikawa; Taketoshi Tazaki, and Hiroshi Inokuchi, all of Kitakyushu, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Fukuoka, Japan

Filed Dec. 28, 1988, Ser. No. 291,300

Claims priority, application Japan, Dec. 28, 1987, 62-329719

Int. Cl.[5] B24B *49/00*

U.S. Cl. 51—165.88 **4 Claims**



1. A method for correction of abrasion in a robot having a wearing tool mounted thereto, the method comprising setting a coordinate system H_T with respect to a wearing tool mounted to a wrist of a robot separately from a rectangular coordinate system H_R of a robot, providing a sensor externally of the robot, detecting said tool prior to and after abrasion, calculating the worn amount of said tool from a difference between positions of the robot when the sensor is turned on or off, and parallel-shifting the worn amount at the coordinate system set to said tool to effect correction of abrasion.

4,926,605

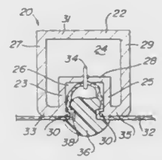
CONSTRUCTION ASSEMBLY FOR CLOSURE STRUCTURE

Les Milliken, 101 S. McCall Rd., and K. Blair Milliken, 305 Gladstone Blvd., both of, Englewood, Fla. 34223

Filed May 9, 1988, Ser. No. 191,419

Int. Cl.[5] E04H *15/18*

U.S. Cl. 52—63 **5 Claims**



1. A construction assembly for closures and the like comprising:

a plurality of substantially elongated joinable members;

said elongated members each having defined therein at least one longitudinal channel, said channel being defined by a first channel wall, a second channel wall, and a channel base disposed therebetween;

a covering material;

means for anchoring said covering material into said channel of selected ones of said elongated members, said means for anchoring comprises a plurality of staples;

a plurality of flexible elongated trim pads having at least two coplanar longitudinal slots defined therein; and

said elongated trim pads adapted to be fixed into said channels thereby substantially locking said covering material therein and forming a tight seal thereby;

each of said joinable members being hollow and having an outer periphery which is substantially squareshaped in cross section;

said square shape being defined by a first side member having a base member edge and a first adjacent wall edge, a second side member having a base member edge and a second adjacent wall edge, a base member interconnecting said base member edges of said first side member and said second side member, a first adjacent wall interconnecting said first adjacent wall edge of said first side member and said first channel wall, and a second adjacent wall interconnecting said second adjacent wall edge of said second side member and said second channel wall.

4,926,606

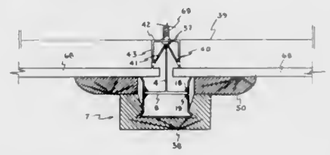
ORNAMENTAL CEILING SYSTEM

Carl E. Hanson, 666 Greenbrier, Crystal Lake, Ill. 60014

Filed Nov. 14, 1988, Ser. No. 271,229

Int. Cl.[5] E04B *5/52*

U.S. Cl. 52—484 **23 Claims**



1. An ornamental ceiling that attaches close to a preexisting structural ceiling, comprising:

(a) an inverted T-member having a generally vertical portion and a generally horizontal portion;

(b) a stile having an upper face, a lower face and a longitudinal groove generally centrally disposed along the upper face of the said stile;

(c) a clip associated with said longitudinal groove having a means for attaching said clip to the horizontal portion of said inverted T-member, wherein the horizontal portion of said inverted T-member is located above the upper face of said stile;

(d) a panel located above the lower face of said stile and laterally from the vertical portion of said inverted T-member; and

(e) a connecter attached to an upper end of the generally vertical portion of said inverted T-member and having a resilient snap-on means for readily gripping the upper end of the generally vertical portion of said inverted T-member and a means for securing the connector directly to a preexisting structural ceiling so that the distance between the lower face of stile and the preexisting structural ceiling may be less than six inches.

4,926,607

COMPRESSION LEG

William J. Platt, Collingdale, Pa., and Thomas E. Rose, Dunwoody, Ga., assignors to National Rolling Mills, Inc., Frazer, Pa.

Filed Aug. 14, 1989, Ser. No. 393,355

Int. Cl.[5] E04B *5/55*

U.S. Cl. 52—484 **4 Claims**

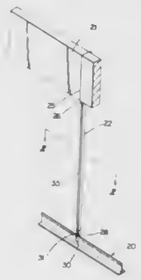
1. For use with a ceiling construction having

(a) a suspended ceiling formed of grid members and a ceiling surface secured to such grid,

(b) a structural member above the suspended ceiling for supporting the suspended ceiling, and

(c) hanger wires extending longitudinally in tension between and connected to the structural member and the grid members for hanging the suspended ceiling from the structural member, an improvement applied to a hanger wire after the wire is in place in the ceiling construction, comprising

a fixed length compression leg extending longitudinally from the structural member to the grid member and having a



tubular portion that envelopes the hanger wire, and a longitudinally extending slot in the tubular portion that permits the leg to be applied in a lateral direction to the wire, wherein the leg forms a resistance to upward movement of the ceiling.

4,926,608

ROOFING PANEL

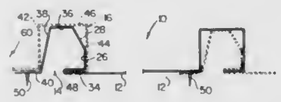
Albert Beauregard, Hull, Canada, assignor to Ideal Roofing Company Ltd. Manufactures, Ottawa, Canada

Filed May 9, 1989, Ser. No. 349,518

Claims priority, application Canada, May 30, 1988, 568153

Int. Cl.[5] E04D *1/00*

U.S. Cl. 52—522 **26 Claims**



1. A roofing panel for application with its longitudinal direction in the direction of slope of a roof, said panel comprising

an elongated thin rectangular body section having first and second longitudinal edges and respective first and second longitudinal upstanding ribs of inverted channel configuration adjacent said edges, said first and second ribs being of substantially the same height, and of substantially the same width at the bottom of the upstanding parts thereof, and a central portion extending between said ribs and configured to extend parallel to said roof;

wherein said first rib has an inner side thereof remote from said first longitudinal edge, the bottom section of said inner side is formed to a position approximately parallel to said central portion and spaced therefrom to form an inwardly facing slot adjacent said central portion, and said slot extends a substantial distance into the interior of said first rib, and wherein said second rib has a first outer side the bottom section of which includes said second edge and which bottom section is formed to a position substantially coplanar with said central portion to form an inwardly facing flange;

whereby when a first said panel is placed adjacent a second said panel, said second rib of said second panel fits over said first rib of said first panel and said flange is then housed in said slot.

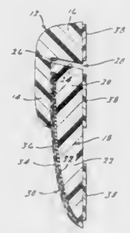
4,926,609
EXHIBIT DISPLAY
Joseph Arico, 308 Larson Rd., North Brunswick, N.J. 08902
Filed Oct. 18, 1988, Ser. No. 259,197
Int. Cl.[5] A47F *5/00*
U.S. Cl. 52—582 **43 Claims**



36. A freestanding knockdown display system comprising, a plurality of structural panels of substantially similar construction, each said structural panel having a front surface, a rear surface and a top, bottom, and side peripheral edges, flexible hinge means for releasably hinging at least a pair of said structural panels in a side-by-side relationship to form a first panel section, a second panel section of substantially similar construction as said first panel section, a recessed portion on said front surface adjacent a peripheral edge other than a side peripheral edge of each of said structural panels, said recessed portion defining a secondary front surface rearwardly spaced from said front surface, said secondary front surface of said recessed portion of each said structural panel of said first panel section having securement means associated therewith, said rear surface of each said structural panel of the second panel section having complementary securement means associated therewith, said securement means being cooperable with said complementary securement means to releasably engage said recessed portion of one structural panel to said rear surface of another structural panel to thereby vertically and releasably join said first panel section to the second panel section so that the front surfaces of the structural panels in said first panel section are substantially flush with the front surfaces of the structural panels in said second panel section with substantially no obstructions from said first panel section to said second panel section.

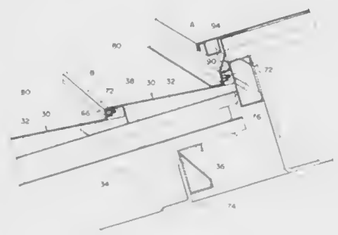
4,926,610
VARIABLE-WIDTH MOLDING AND BRIGHTWORK
Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Cleveland, Ohio
Filed Dec. 12, 1988, Ser. No. 282,708
Int. Cl.[5] B60R *27/00*
U.S. Cl. 52—716 **8 Claims**

1. A body side molding comprising:
an elongated member having an inner and outer surface;
an elongated receiver, L-shaped in cross-section, adapted for interfitting engagement with said elongated member, said receiver having a first arm and a second arm connected to said first arm, said arms defining said L-shape of said receiver;
said elongated member having a portion being received between said arms of said receiver and being overlapped by one of said arms of said receiver, wherein said width of said molding can be varied by varying the degree of overlap of said elongated member by said overlapping arm of said receiver;
brightwork covering at least a portion of said outer surface of said elongated member, said brightwork having a visible portion which can be varied by varying the degree of overlap of said elongated member by said receiver, said brightwork comprising a metallic-appearing layer; and



an end cap adapted for sealing engagement with an end of said molding.

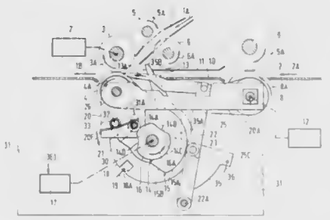
4,926,611
METHOD OF ASSEMBLING A ROOF STRUCTURE
Motokatsu Funaki, 430 Shimotsuchidana, Fujisawa-shi, Kanagawa-ken, Japan
Division of Ser. No. 910,576, Sep. 23, 1986, Pat. No. 4,803,818. This application Jul. 25, 1988, Ser. No. 223,579
Claims priority, application Japan, Sep. 26, 1985, 60-210958; Sep. 26, 1985, 60-210959; Dec. 16, 1985, 60-280999
Int. Cl.[5] E04G *21/14*
U.S. Cl. 52—748 **1 Claim**



1. A method of assembling a roof structure formed of a plurality of roof boards extending at a downward incline from a ridge to an eave by connecting said plurality of roof boards to one another in adjacent side by side relation between the ridge and the eave and mounting the roof boards on a roof support means, said roof boards each having a flat surface section, a ridge side connection portion formed at the side of the flat surface section facing the ridge and an eaves side connection portion formed at the side of the flat surface section facing the eave comprising the steps of:
mounting a rising ridge side support means on said roof support means;
fixing a holding member on said rising ridge side support means;
holding the ridge side connection portion of the roof board of the plurality of boards closest the ridge on said holding member;
arranging a backing member having an eaves side end closest the eave and a ridge side end closest the ridge under said roof board closest to the ridge;
securely abutting the eaves side end of said backing member against a fixture fixed on said roof support means at a position on the eaves side of the backing member beyond said eaves side connection of said roof board closest to the ridge to the roof board closest to the eave and;

repeating the above steps on the backing members, the fixture and the plurality of roof boards until said roof structure is complete.

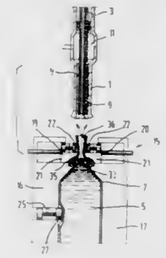
4,926,612
MACHINE FOR INSERTING MAIL INTO ENVELOPES
Marek Krasuski, Fontenay Aux Roses, and Bernard Prugnolle, Pantin, both of France, assignors to Societe Anonyme dite: ALCATEL SATMAN, Bagneux, France
Filed Jul. 17, 1989, Ser. No. 380,238
Claims priority, application France, Jul. 27, 1988, 8810121
Int. Cl.[5] B65B *43/26*
U.S. Cl. 53—69 **8 Claims**



1. A machine for inserting mail into envelopes, the machine comprising:
a first set of wheels and an associated first set of backing wheels for bringing an envelope to a defined "filling" position and presenting it facing a mail path;
mail advance means on the mail path for advancing an item of mail towards the envelope in the filling position;
means for actuating the first set of backing wheels from a presser position to a retracted position when the envelope is in said filling position; and
envelope body opening means controlled to move from a retracted position to an opening position when the envelope is in said filling position;
wherein said first set of backing wheels is coupled via a freewheel mechanism to said mail advance means in order to be driven therewith, said advance means themselves being mounted at a distance from said first set of backing wheels which is less than the length of the items of mail to be inserted in the envelopes; and
wherein the machine also includes first detector means for detecting partial insertion of an item of mail into an envelope, said detection means being coupled to said means for actuating the first set of backing wheels to return them to their presser position, thereby ensuring that the item of mail is fully inserted into the envelope.

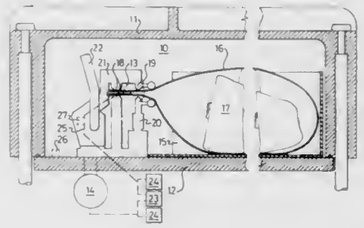
4,926,613
PROCESS FOR FILLING AND SUBSEQUENT FUSION WELDING OF RECEPTACLES
Bernd Hansen, Heerstrasse 16, 7166 Sulzbach-Laufen 2, Fed. Rep. of Germany
Filed Sep. 7, 1989, Ser. No. 403,947
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1988, 3834184
Int. Cl.[5] B65B *47/08, 31/02, 51/14*
U.S. Cl. 53—433 **5 Claims**

1. A process for filling and sealing an at least partially elastically deformable container of heat sealable material, comprising the steps of:
forming an elastically deformable container with a filler connection having a flow passage with cross-sectional dimensions smaller than a body portion of the container and an open end at a distal end of the filler connection;
filling the container through the open end thereof to a first level of contents;
raising the contents to a higher, second level inside the filler connection of the container by elastically deforming the container;
in a first heat sealing step, reforming the filler connection to reduce the transverse cross-sectional dimensions of the flow passage by pressing flat and heat sealing a border zone of the filler connection after filling, the passage remaining open at the distal end thereof;



in a second heat sealing step, closing and sealing the distal end of the passage after raising the contents to the second level; and
between starting to raise the contents to the second level and starting the second heat sealing step, removing vapors, clouds or foams from an upper surface of said contents in the filler connection by suction by applying reduced pressure in the filler connection.

4,926,614
PACKAGING METHOD AND APPARATUS
Anthony W. Costello, Howick; Graeme J. Ogg, Murrays Bay, and John C. McGregor, Mangere, all of New Zealand, assignors to RMF Steel Products Co., Grandview, Mo.
Continuation of Ser. No. 117,287, Nov. 4, 1987. This application Sep. 15, 1989, Ser. No. 408,442
Claims priority, application New Zealand, Nov. 5, 1986, 218186; Jul. 23, 1987, 221180
Int. Cl.[5] B65B *31/02, 31/06*
U.S. Cl. 53—434 **6 Claims**



1. A method for packaging a product in a flexible container, said method including the steps of:
placing the product within a flexible container having a closable opening, the flexible container being substantially impermeable to oxygen in normal use,
attaching the flexible container to a snorkel having a first gas passageway and closing the opening of the container about the snorkel by a pair of elongate clamping elements so that the first gas passageway communicates with the interior of the then closed container,

providing a pair of elongate sealing members adjacent the clamping elements but beyond the end of the snorkel,

closing a chamber about the flexible container to contain the snorkel, the clamping elements, the sealing members, and the flexible container so that the flexible container is entirely contained within the chamber but is isolated from gas within the chamber by the flexible container being closed about the snorkel,

controlling the evacuation of gas from within the chamber and substantially simultaneously evacuating the flexible container via the first gas passageway to control the evacuation of the flexible container and prevent premature collapsing of the flexible container to substantially entirely remove all of the gas from within the flexible container, and

injecting a selected gas into the flexible container, and at the same time refilling the chamber with air or other gas, sealing the flexible container and removing the flexible container from the snorkel.

4,926,615

MACHINE FOR FORMING CARTONS AND PACKAGING GOODS THEREIN

Kenneth G. Alexander, MacLeod, Australia, assignor to Alexander Packaging Equipment Pty. Ltd., Eltham and Fibre Containers Pty. Limited, Chullora, both of, Australia

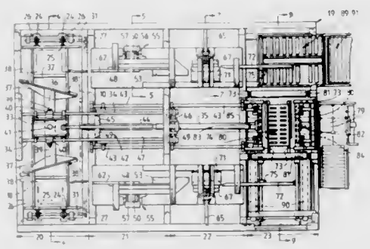
PCT No. PCT/AU87/00329, § 371 Date Jan. 13, 1989, § 102(e) Date Jun. 13, 1989, PCT Pub. No. WO88/03501, PCT Pub. Date May 19, 1988

PCT Filed Sep. 25, 1987, Ser. No. 340,179

Claims priority, application Australia, Nov. 12, 1986, PH8950

Int. Cl.[5] B31B *1/44, 1/52;* B65B *43/10, 49/00*

U.S. Cl. 53—564 12 Claims



1. A machine for forming blanks of cardboards or like material into containers around goods to be packaged therein and including a first operating stage where a stack of said blanks are stored and sequentially fed to a forming stage, and a forming stage where said goods are loaded onto a said blank which is then formed into a said container around said goods, characterized in that, said containers are crates and said machine includes an intermediate operating stage (**21, 22**) incorporating folding apparatus (**54, 57, 67**) for folding each of two opposed extended end flaps (**14c**) of said blank (**10**) back on themselves to form a reinforcing structure including a ledge (**12**) which, in a formed crate extends across each of two opposed ends (**14**) of the crate towards the upper edge of said opposed ends and directed inwardly of said crate.

4,926,616

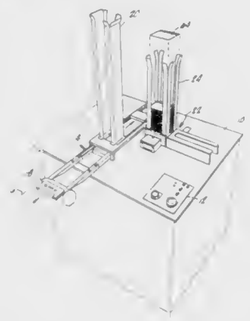
CASSETTE PACKAGING SYSTEM

Darrell W. Zielke, Valencia, and Kenneth D. Dean, Sepulveda, both of Calif., assignors to Paktec Automation, Valencia, Calif.

Filed Feb. 1, 1989, Ser. No. 305,243

Int. Cl.[5] B65B *9/10, 43/32, 5/04*

U.S. Cl. 53—585 19 Claims



1. A mechanism for packaging tape cassettes in sleeves, each sleeve having two opposed wide sides and two opposed narrow sides to closely fit the cassettes, comprising

a frame;

a guideway mounted to said frame and sized to receive cassettes therein, said guideway including a packaging station;

a loading track on said frame extending to said packaging station, said loading track having guidewalls extending along said loading track and standing upwardly from said loading track on either side thereof and flanges extending toward one another from said guidewalls, said flanges and said guidewalls forming opposed channels having first ends distant from said packaging station and second ends proximate to said packaging station, said guidewalls mutually converging toward said packaging station and being spaced one from the other at said first ends to be as wide as two adjacent sides of the sleeves lying in a plane and at said second ends to be slightly narrower than a wide side of the sleeves;

a sleeve pusher mounted to said frame to reciprocate along said track and between said guidewalls.

4,926,617

APPARATUS FOR WRAPPING ROUND BALES

Michael D. Van Mill, Shell Rock, Iowa, assignor to Unverferth Manufacturing Co., Inc., Kalida, Ohio

Filed Jan. 23, 1989, Ser. No. 300,959

Int. Cl.[5] B65B *11/04*

U.S. Cl. 53—587 16 Claims

1. An apparatus for wrapping a round hay bale with a continuous sheet of wrapping material, comprising:

a load supporting frame;

mounting bracket means attached to said frame and adapted to be coupled to a vehicle;

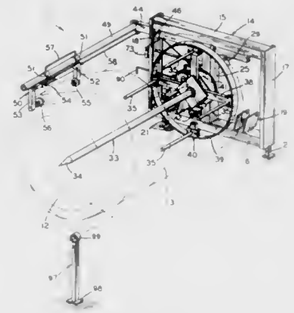
a spindle rotatably mounted on said frame and adapted to be inserted along a longitudinal axis of a round hay bale;

spinner plate means rotatably mounted on said frame and adapted to engage a round hay bale on said spindle for rotating the bale about its longitudinal axis;

a dispenser arm attached to said frame and extending generally parallel to said spindle;

a dispenser assembly slidably attached to said arm and adapted to retain a source of a continuous sheet of wrapping material;

control means coupled to said spinner plate for rotating said spinner plate and moving said dispenser assembly along said dispenser arm to wrap said sheet material around the bale; and



a cable winding means rotatably attached to said frame, a cable connected between said dispenser assembly and said winding means, and means for selectively coupling said winding means to said control means for rotating said winding means and moving said dispenser assembly.

4,926,618

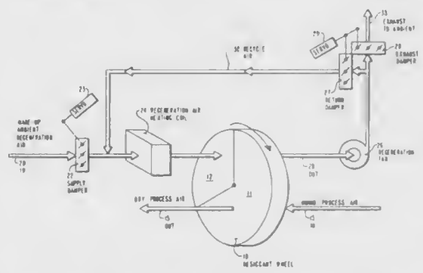
INDUSTRIAL DEHUMIDIFIER

Charles Ratliff, 49 Ridgeway Dr., Brownsburg, Ind. 46112

Filed Jan. 3, 1989, Ser. No. 292,822

Int. Cl.[5] B01D *53/06*

U.S. Cl. 55—20 14 Claims



1. A method of operating a rotating sorption bed system having a mass of thermally regenerable sorbent material divided into a process sector and a regeneration sector, said method comprising the continuous steps of:

flowing a process fluid stream through the process sector;

controllably flowing a regenerant fluid stream through the regeneration sector to regenerate the sorbent material;

controllably heating the regenerant fluid stream upstream of the regeneration sector;

controllably recirculating a variable recycle stream portion of the regenerant fluid stream downstream of the regeneration sector for at least one additional pass through the regeneration sector.

4,926,619

HAY-MAKING MACHINE

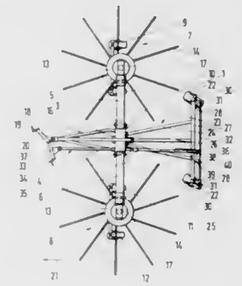
Josef Ungruh, Rheine, and Maximilian Rohlmann, Hörstel-Riesenbeck, both, Fed. Rep. of Germany, assignors to H. Niemeyer Söhne GmbH & Co. KG, Hörstel-Riesenbeck, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,144

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 8715405

Int. Cl.[5] A01B *73/02;* A01D *80/00, 78/10*

U.S. Cl. 56—15.4 10 Claims



1. A hay-making machine moveable along a straight line path and a curved path, comprising a central support, elongated transverse supports pivotably connected to said central support and extending from opposite sides of said central support in a direction generally perpendicular to said straight line path, rake means on each of said transverse supports, ground-support wheels on each of said transverse supports, drawbar means connected to said central support and extending generally forwardly of said central support, said drawbar means being connectable to a tractor vehicle, undercarriage means connected to said central support and extending generally rearwardly of said central support, running wheels rotatably mounted on said undercarriage means, pivotal means pivotably supporting said running wheels for pivotable movement about generally vertical axes, and a steering means operably connected between said pivotal means and said draw bar means for pivoting and steering said running wheels in response to alignment changes between the hay-making machine and the tractor vehicle connected to said drawbar means.

4,926,620

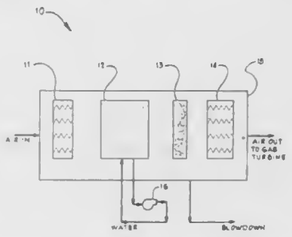
CLEANING GAS TURBINE INLET AIR

David W. Doule, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 8, 1988, Ser. No. 217,006

Int. Cl.[5] B01D *47/06*

U.S. Cl. 55—89 11 Claims



1. A process for removing particulate and volatile contami-

VOL 1114 ISS 4 MY 22 1990 UMI

nants from inlet air passing to a gas turbine comprising contacting the air with a stream of water at a rate sufficient to reduce the contaminants present in the air by passing the air through a spray pattern or a substantially flat wall of finely atomized water formed by at least a pair of opposing spray streams whereby the streams impact each other to fan out creating the wall of water.

4,926,621

MOWING TRACTOR WITH TOWED MOWER

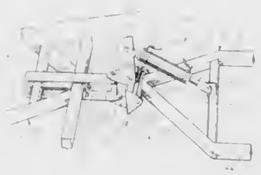
Robert M. Torras, 101 Gould St., Simons Island, Ga. 31522

Continuation-in-part of Ser. No. 197,094, May 20, 1988, abandoned, and a continuation-in-part of Ser. No. 914,712, Oct. 2, 1986, Pat. No. 4,876,846. This application Dec. 7, 1988, Ser. No. 281,061

Int. Cl.[5] **A01D** *75/30*; **A01B** *59/04*

U.S. Cl. 56—6 **24 Claims**





1. In combination a self propelled front mower and a towed near mower for cutting grass and other vegetation, said front mower comprising rear driving wheels engaging the ground surface for moving the front mower in a forward direction and front cutter means arranged for cutting a swath in the grass and like vegetation beneath the front mower, said rear mower including a support frame extending laterally on opposite sides of the swath to be cut by said front mower, wheel means supporting said support frame on the ground surface, rear cutters mounted to said support frame and spaced from each other on opposite sides of the swath cut by said front mower a distance to cut swaths in the grass and the like beneath the rear mower that partially overlap the swath cut by said front mower, connecting means for connecting said rear mower to said front mower in trailer fashion for allowing said rear mower to pivot with respect to said front mower about a substantially upright axis, the dimensions between the upright axis of said connecting means and the rear driving wheels of said front mower, and between the upright axis of said connecting means and the wheels means of the support frame of said rear mower, and the placement of the front cutter means and of the rear cutters of the support frame of said rear mower are selected to cause the rear cutters to straddle and overlap the swath cut by the front cutter means as the front mower and towed rear mower move through a turn, and power means for driving said driving wheels, said front cutter means and said rear cutters.

4,926,622

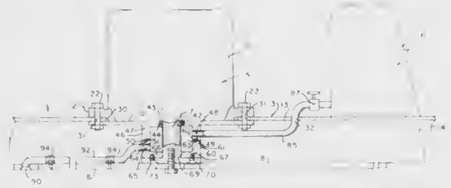
COMBINED ROTARY CUTTER AND HERBICIDE APPLICATOR AND METHOD

Robert L. McKee, Rte. 1, Box 138, Maynard, Ark. 72444

Filed Apr. 3, 1989, Ser. No. 331,823

Int. Cl.[5] **A01C** *15/00*; **A01D** *34/82*

U.S. Cl. 56—16.8 **10 Claims**



1. In a rotary vegetation cutter with a rotating shaft, a plurality of cutting blades extending substantially radially from said shaft and power means for rotating said shaft, the improvement comprising means for feeding herbicide adjacent a cutting portion of at least one of said blades while said blades are rotated, whereby said herbicide is applied to vegetation as it is cut, said herbicide feeding means including a reservoir for said herbicide, a distributor manifold concentric with said shaft, tube means from said reservoir to said manifold, and feed conduit means from said manifold to port means opening along at least one of said blades radially inboard of a radially outer end of said blade, said distributor manifold including a cup mounted on and around said shaft adjacent said blade for rotation therewith, a collar fixed against rotation axially above said cup, and seal means between said cup and said collar, said tube means communicating with the interior of said collar and said feed conduit means communicating with the interior of said cup.

4,926,623

MOWING APPARATUS

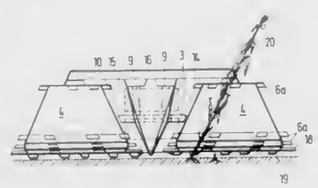
Josef Fiener, Mindelheim, Fed. Rep. of Germany, assignor to Karl Mengele & Söhne Maschinenfabrik und Eisengiesserei GmbH & Co., Guenzburg/Donau, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,472

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1987, 3712507

Int. Cl.[5] **A01D** *45/02*

U.S. Cl. 56—60 **3 Claims**



1. A mowing apparatus for moving stalk-like crops independently of rows and for conveying the mowed crop to a draw-in box of a chopper, comprising:

rotatable mowing rollers each having a conical upwardly directed outer shape and rigid entrainment fingers which have tips which define a tip path during rotation of said mowing rollers; and

rotatable wipe-off rollers each having a conical downwardly directed outer shape and wipe-off fingers which have tips which define a tip path during rotation of said wipe-off rollers, said wipe-off rollers cooperating with said mowing rollers by an overlapping of the tip paths of said entrainment fingers and said wipe-off fingers, said conically shaped mowing rollers and wipe-off rollers being arranged so as to form a sideways inclined draw-in channel in front of the draw-in box.

4,926,624

LAWN MOWER

Masatake Murakawa; Niro Bando, both of Sakai; Masatsugu Tone, Hashimoto; Mikio Yuki, Kawachinagano; Junji Miyata, Kyoto; Tetsuaki Hayashi, Osaka, and Kazuaki Kurohara, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 109,967, Oct. 19, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 333,753

Claims priority, application Japan, Oct. 21, 1986, 61-251290; Oct. 21, 1986, 61-161736[U]; Oct. 21, 1986, 61-161737[U]

Int. Cl.[5] **A01D** *34/70*

U.S. Cl. 56—202 **12 Claims**



1. A lawn mower including a pair of grass catchers and means for mounting the grass catchers, the lawn mower having a pair of right and left frame members defining main frames, the mounting means comprising:

(a) end openings provided at at least rear end regions of the respective frame members, the end openings extending along a center line longitudinally of the mower and opening rearwardly,

(b) a pair of L-shaped connecting members formed of pipes, one leg of each of the L-shaped members having a distal end insertable into a respective one of the end openings such that the other leg of the respective L-shaped member is vertically arranged,

(c) fixing means for rigidly retaining connected portions of the connecting members inserted into the end openings, and

(d) a support member for mounting the pair of grass catchers, the support member having a frame structure and including engaging elements remote from each other for being removably connected to the vertical legs of the respective connecting members, thereby defining a space between the connecting members and maintaining the support member substantially horizontal, each of the grass catchers having a top opening and a mouthpiece extending along the periphery of the top opening, the mouthpiece resting upon the frame structure and the frame structure thereby supporting the grass catchers.

4,926,625

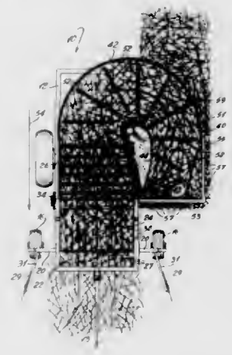
WINDROW TURNING APPARATUS

Yves Laquerre, Ste-Therese, Canada, assignor to B. & R. Choiniere Limited, Quebec, Canada

Continuation-in-part of Ser. No. 30,140, Mar. 26, 1987, Pat. No. 4,777,788. This application Aug. 23, 1988, Ser. No. 235,098

Int. Cl.[5] **A01D** *76/00, 78/00, 80/00, 84/00*

U.S. Cl. 56—376 **12 Claims**



1. An apparatus for inverting a windrow of material such as hay or the like in a delicate manner, comprising:

a carriage including (a) means for enabling a forward motion thereof parallel to the windrow of said material lying upon the surface of the ground, (b) a front portion, and (c) skid means mounted on said front portion and slidingly engaging the surface of the ground;

windrow pick-up means mounted on said carriage, said windrow pick-up means extending from a point adjacent to the ground to an elevated position for picking up the windrow and for elevating progressively said windrow from the ground;

a windrow turner including a rotatable platform mounted onto said carriage adjacent said windrow pick-up means for receiving windrowed material from said windrow pick-up means and for moving the received windrowed material along an approximately circular path, said rotatable platform having a roughened upper surface constituting mechanical anti-slipping means for reducing slippage of said material thereon; and

a discharge mouth portion on said carriage adjacent said rotatable platform through which material is deposited on the ground in inverted condition from said rotatable platform by the forward motion of said carriage, the material being supported on said windrow pickup means and on said rotatable platform on the underside to reduce agitation of the upper side thereof.

4,926,626

FLAMME FANCY YARN MANUFACTURING METHOD AND APPARATUS

Blagoy A. Andonov, Sofia, Bulgaria, assignor to N I T I "Veda", Sofia, Bulgaria

Filed Jul. 1, 1988, Ser. No. 214,236

Int. Cl.[5] **D02G** *3/34, 3/38, 5/32*

U.S. Cl. 57—18 **3 Claims**

1. A method for producing flamme fancy yarn comprising the steps of continuously feeding at least one sliver of staple fibers at a constant speed into a draft zone;

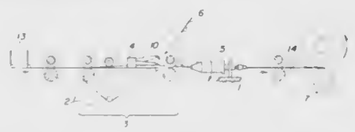
drawing the sliver in the draft zone, and simultaneously applying a force with permanent action to the sliver at an angle toward the trajectory of the sliver path;

breaking the thinning sliver being drawn under the action of

VOL
1114
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said force, and simultaneously adding the broken tuft of the sliver to a core thread;

extending, after each breaking of drawing sliver, the trajectory of the sliver path of the remaining broken sliver, fed without drawing into the draft zone;



recapturing the sliver remaining in the draft zone by front end delivery rollers, stretching the sliver in the draft zone and subjecting the sliver to a new drawing;

binding together the tuft and core thread and subsequent winding the ready-made yarn.

4,926,627

DEVICE TO FEED AND OPEN A FIBER SLIVER ON AN OPEN-END SPINNING DEVICE

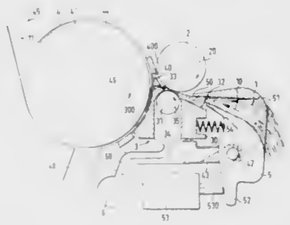
Erwin Braun, Ingolstadt; Michael Strobel, Munich, and Rupert Karl, Ingolstadt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,214

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817346

Int. Cl.[5] D01H *7/895;* D01G *15/20*

U.S. Cl. 57—412 21 Claims



1. A feeding device for feeding a fiber sliver to an open-end spinning device having an opening roll, comprising:

(a) a feed roll driven in a direction to feed said fiber sliver to said opening roll;

(b) a feed tray disposed opposite said feed roll for supporting said fiber sliver;

(c) a recess in said feed tray in communication with said feed roll;

(d) a pressure roll disposed in said recess in a position to press said fiber sliver into contact with said feed roll, and supported for rotation in a direction to assist said feed roll in feeding said fiber sliver to said opening roll; and

(e) guide walls disposed on the sides of said feed tray adjacent to each end of said pressure roll for confining and guiding said fiber sliver between said feed roll and said pressure roll.

4,926,628

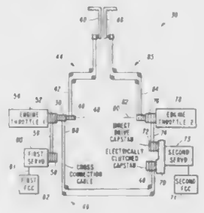
AUTOMATIC FUEL CONTROL AND ENGINE SYNCHRONIZER SYSTEM AND APPARATUS

Dan S. Veerhusen, and David C. Pattison, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 915,167, Oct. 3, 1986, Pat. No. 4,805,396. This application Dec. 9, 1988, Ser. No. 282,430

Int. Cl.[5] F02C *6/00*

U.S. Cl. 60—39.15 2 Claims



1. An automatic, independent, redundant, and computer controlled engine fuel control system for aircraft of the type having at least a first rear mounted engine, disposed in the aft portion of said aircraft and having a first engine throttle and a second rear mounted engine disposed in the aft portion of said aircraft and having a second engine throttle, comprising in operative combination:

a. first servo for controlling the first engine throttle said first servo means being disposed in the aft portion of said aircraft;

b. second servo means for controlling the second engine throttle said second servo means being disposed in the aft portion of said aircraft;

c. means for selectively connecting the first servo means with the second servo means so that during normal operations a manipulation of the first servo means does not effect the second servo means, but upon demand, the first servo means can be selectively connected, in at least two directions, with the second servo means, so that a manipulation of the second servo means, in either direction, will result in a manipulation of the first engine throttle said means for connecting being coupled with said first and second servo means and further wholly disposed in the aft portion of said aircraft.

4,926,629

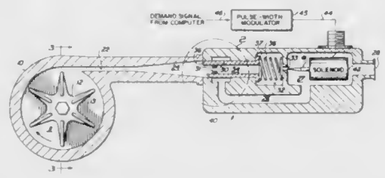
LOW COST FUEL SUPPLY SYSTEM FOR GAS TURBINE ENGINES

Christopher D. Eick, Phoenix; Kenneth P. Worcester, Tempe, and John R. Williamson, Paradise Valley, all of Ariz., assignors to Allied-Signal Inc., Phoenix, Ariz.

Filed Oct. 28, 1988, Ser. No. 264,235

Int. Cl.[5] F02C *9/26*

U.S. Cl. 60—39.281 10 Claims



1. Apparatus for supplying and metering fuel to a gas turbine engine, comprising in combination:

vortex pump means for supplying flow of said fuel through a diffuser at substantially constant pressure regardless of flow rate;

a fuel metering body having an inlet, an outlet and a first fuel flow path providing fluid communication between said inlet and said outlet, said inlet being in fluid communication with said diffuser to receive said flow of fuel from said pump and said outlet being in flow communication with said engine;

said body also having therein a variable pressure cavity, a second flow path providing fluid communication between said inlet and said pressure cavity, and an orifice providing communication between said cavity and said outlet;

a metering spool slidably disposed in said body to define a variable flow metering area between said inlet and said first flow path;

means, disposed in said pressure cavity for biasing said spool in a direction tending to decrease said flow area: and

means, responsive to electrical signals indicating fuel demand for said engine, for variably blocking said orifice;

whereby said flow area varies proportionally to a difference between fuel pressure in said variable pressure cavity and said substantially constant pressure.

4,926,630

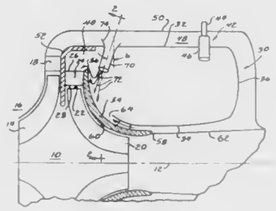
JET AIR COOLED TURBINE SHROUD FOR IMPROVED SWIRL COOLING AND MIXING

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 12, 1988, Ser. No. 283,071

Int. Cl.[5] F23R *3/16, 3/54*

U.S. Cl. 60—39.36 10 Claims



1. A radial inflow turbine comprising:

a rotor rotatable about an axis and having a compressor section having a compressed air outlet and a turbine wheel section;

an annular combustor disposed about said turbine wheel section and including spaced radially inner and outer walls connected at one end by a radial directed wall, the opposite end defining a hot gas outlet;

a rear turbine wheel shroud in adjacency to said turbine wheel at the radially inner side of said hot gas outlet and extending toward said radially outer wall for confining hot gases of combustion against said turbine wheel;

a turbine nozzle in fluid communication with said hot gas outlet and connected to said rear turbine shroud near the radially outer edge thereof for directing hot gas of combustion from said combustor against said turbine wheel to drive the same; and

a plurality of inwardly directed tubes disposed across said hot gas outlet and in fluid communication with said compressed air outlet and extending at least almost to said turbine shroud radially outer edge to direct compressed air against said rear turbine shroud to cool the same.

4,926,631

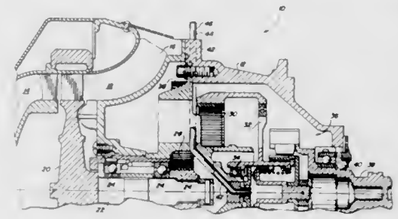
PAWL AND RATCHET CLUTCH AND AIR TURBINE STARTER HAVING SUCH A CLUTCH

Kal K. Sorenson, Tempe, Ariz., assignor to Allied-Signal, Inc., Phoenix, Ariz.

Division of Ser. No. 165,664, Mar. 8, 1988. This application Jun. 14, 1989, Ser. No. 366,084

Int. Cl.[5] F02C *7/277*

U.S. Cl. 60—39.142 7 Claims



1. A pawl and ratchet clutch mechanism between a driving element rotating in response to a flow of pressurized fluid and a rotatable driven element, comprising:

ratchet means secured for rotation with the driving element;

pawl means mounted on the driven element for movement to engage said ratchet means to transmit rotary movement of the driving element to the driven element, said pawl means being responsive to centrifugal force resulting from rotation of the driven element to tend toward disengagement from said ratchet means;

movable stop means for in a first position stopping said pawl means from engaging said ratchet means, said stop means moving to a second position allowing engagement of said ratchet means by said pawl means; and

said driving element defining a bore, a piston member sealingly and movingly received in said bore and cooperating with said driving element to define a variable-volume chamber, flow path means communicating said pressurized fluid to said variable-volume chamber to move said piston member in a first direction, and means coupling said piston member with said stop means to move the latter to said second position in response to movement of said piston member in said first direction.

4,926,632

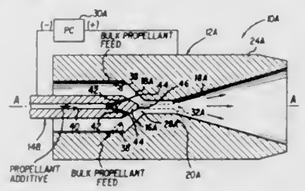
PERFORMANCE ARCJET THRUSTER

Richard D. Smith, Kirkland; Steve Knowles, Seattle; R. J. Cassady, Bellevue; William Smith, Seattle, and Mark A. Simon, Redmond, all of Wash., assignors to Olin Corporation, Stamford, Conn.

Filed Feb. 1, 1988, Ser. No. 150,591

Int. Cl.[5] F02K *11/00*

U.S. Cl. 60—203.1 21 Claims



1. In an arcjet thruster, the combination comprising:

(a) a body forming an annular-shaped constrictor and an annular-shaped nozzle being tandemly-arranged and hav-

VOL 1114 ISS 4 MY 22 1990 UMI

ing respective surfaces which together define an arc chamber, at least said nozzle being electrically conductive to constitute an anode;

(b) an elongated member having a tip disposed adjacent to and spaced upstream from said constrictor, said member being electrically conductive to constitute a cathode spaced from said anode by a gap generally coextensive with said arc chamber;

(c) means for applying an electrical potential to said anode and cathode so as to generate an electrical arc in said arc chamber from said cathode to said anode which produces thermal heating of propellant gases flowing through said chamber and exparsion thereof through said nozzle; and

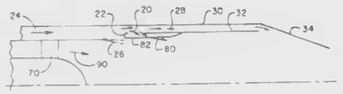
(d) means for supplying a propellant gas blend composed of a higher molecular weight propellant having a first specific impulse and a lower molecular weight propellant having a second specific impulse greater than said first specific impulse to said arc in said arc chamber.

4,926,633

COOLANT PRESSURE REGULATING APPARATUS

Dudley O. Nash, Cincinnati, and Frederick C. Herzner, Fairfield, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 27, 1989, Ser. No. 372,416
Int. Cl.[5] F02K *3/04*
U.S. Cl. 60—226.1 8 Claims



1. A coolant pressure regulating apparatus in the exhaust system of an aircraft turbine engine comprising in combination:

an engine casing enclosing a turbine and extending downstream therefrom to an exhaust nozzle, said engine casing between said turbine and said exhaust nozzle enclosing a fan duct which operatively communicates with said turbine and said exhaust nozzle, said fan duct located inside the outer periphery of said engine casing and enclosing a core air flow channel, said core air flow channel directing air from said turbine to said exhaust nozzle,

a closed cavity suppressor operatively arranged along the inner surface of said fan-duct, said closed cavity suppressor having an upper and lower wall, said closed cavity suppressor operatively communicating the coolant air flow from said fan duct into said core air flow channel, and,

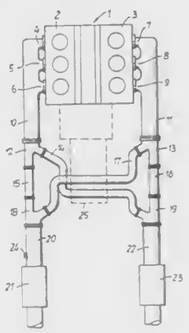
a predetermined number of valves circumferentially arranged in said upper wall of said closed cavity suppressor, each valve of said predetermined number of valves being responsive to the level of pressure of the coolant air in said fan duct, said valve being in the closed position during low coolant air pressure thereby preventing coolant air flow from said fan duct from passing into said closed cavity suppressor, during an excess coolant air pressure operating condition said valve opens to relieve the excess coolant air pressure operating condition and thereby maintaining a desired coolant air pressure in said fan duct.

4,926,634

METHOD AND APPARATUS FOR PRODUCING A HOMOGENEOUS EXHAUST GAS MIXTURE IN AN EXHAUST SYSTEM FOR AN INTERNAL COMBUSTION ENGINE HAVING TWO BANKS OF CYLINDERS

Heinrich Pütz, Much; Friedhelm Nowitzki, Engelskirchen; Gunter Damm, Cologne; Hartmut Bathelt, Weinsberg; Günter Krömer, Heilbronn; Henning Hoffmann, Neckarsulm, and Reiner Pischke, Bad Friedrichshall, all of Fed. Rep. of Germany, assignors to Audi AG, Fed. Rep. of Germany

PCT No. PCT/DE87/00576, § 371 Date May 11, 1989, § 102(e) Date May 11, 1989, PCT Pub. No. WO88/04358, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 4, 1987, Ser. No. 353,671
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641376; Nov. 27, 1987, 3740238
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—274 8 Claims



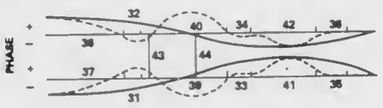
1. Method for the production of a homogeneous exhaust gas mixture in an exhaust system with two catalysts (21, 23) for an internal combustion engine (1) with two cylinder banks (2, 3) and with lambda control of the fuel-air ratio by means of a lambda probe (24) disposed in the exhaust, individual exhaust pipes (4, 5, 6) of the first cylinder bank (2) being combined into a first exhaust manifold (10) and individual exhaust pipes (7, 8, 9) of the second cylinder bank (3) being combined into a second exhaust manifold (11), dividing the exhaust stream of each cylinder bank (2, 3) into two substantially equal partial streams and combining a partial stream from each cylinder bank with a partial stream from the other cylinder bank and feeding the combined stream to a catalyst (21 and 23, respectively).

4,926,635

EXHAUST SYSTEM FOR MULTI-CYLINDER ENGINE

Yuichi Sakuma, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 3, 1988, Ser. No. 202,000
Claims priority, application Japan, Jun. 8, 1987, 62-143863
Int. Cl.[5] F01N *3/28;* F02B *27/02*
U.S. Cl. 60—299 10 Claims



1. An exhaust system for a multi-cylinder engine, comprising:

means for dividing exhaust ports of the engine into first and second groups;

first and second exhaust systems each of which includes a catalytic converter, a muffler and a first tube for fluidly connecting said catalytic converter with said muffler, said catalytic converter of said first exhaust system communicating with said first group exhaust ports, said catalytic converter of said second exhaust system communicating with said second group exhaust ports:

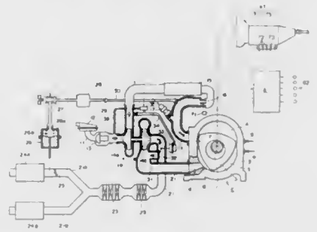
at least one communicating pipe member for communicating said first tubes of said first and second exhaust systems, said communicating pipe member having a first end connected to said first exhaust system first tube at a first predetermined position between said catalytic converter and said muffler, and a second end connected to said second exhaust system first tube at a second predetermined position corresponding to said first predetermined position.

4,926,636

ENGINE-CONTROL APPARATUS

Tomoo Tadokoro; Seiji Tashima; Haruo Okimoto; Toshimichi Akagi; Masami Nakao; Ikuo Matsuda, and Einosuke Suekuni, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 14, 1989, Ser. No. 309,847
Claims priority, application Japan, Feb. 18, 1988, 63-34037
Int. Cl.[5] F02B *27/02, 75/10*
U.S. Cl. 60—312 21 Claims



1. An engine-control apparatus comprising:

a plurality of sound deadening passages mounted on an exhaust passageway of an engine;

a shift valve mounted on the exhaust passageway and adapted to switch a flow of exhaust gases between a first state and a second state by changing the flow of exhaust gases through at least a portion of the plurality of the sound deadening passages, the first state being a state in which pressure of the exhaust gases is decreased and the second state being a state in which pressure of the exhaust gases is increased;

a switching control means for controlling the switching of the shift valve on the basis of a predetermined switching characteristic in accordance with a state of running the engine; and

a torque regulating means for regulating a change in torque to be transmitted to a driven wheel at the time of switching the shift valve by the switching control means.

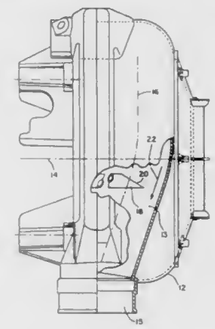
4,926,637

EXHAUST CONFIGURATION

James Gassen, Charlotte, N.C., assignor to Textron Inc., Providence, R.I.

Filed Sep. 19, 1988, Ser. No. 245,569
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—317 10 Claims

1. An exhaust configuration for a blower having a volute housing including a volute duct and a volute opening through which air exits the apparatus and a gas engine having an exhaust system through which an exhaust stream leaves the engine comprising: means for coupling and merging the exhaust stream with the air stream within the volute duct so that



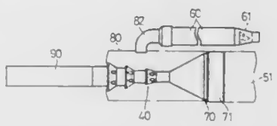
the air stream flows into the exhaust stream for increasing the back pressure of the exhaust stream.

4,926,638

NEGATIVE PRESSURE AIR STREAM ACCELERATOR OF SUCTION TYPE AIR COOLING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Yoshiaki Kakuta, 1-8-1, Hamakawado, Kasukabe-Shi, Saitama-Ken, Japan

Filed Jun. 24, 1988, Ser. No. 210,857
Claims priority, application Japan, Dec. 3, 1987, 62-306684
Int. Cl.[5] F02B *35/00*
U.S. Cl. 60—319 18 Claims



1. A negative pressure air stream generator for a suction type air cooling mechanism of an internal combustion engine for drawing atmospheric air through the cooling mechanism by negative pressure produced by the exhaust gas stream in the exhaust system comprising:

a continuous tubular acceleration means having a reducing section for decreasing the cross-sectional area and increasing velocity of the exhaust gas stream, and at least two stages, each stage comprising a volume increasing section for increasing the cross-sectional area of the exhaust gas stream downstream of said reducing section, and a substantially constant diameter axially extending section downstream of said volume increasing section;

a casing surrounding said acceleration means;

a duct having a front end connected to the air cooling mechanism and a rear end connected to said casing and communicating with the interior thereof; and

means communicating the interior of said casing with the exhaust gas stream passing through said volume increasing section of each of said stages.

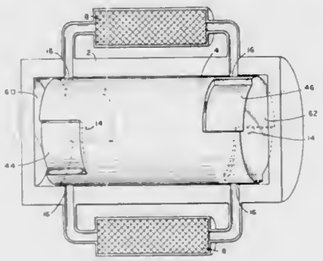
VOL
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4,926,639

SIBLING CYCLE PISTON AND VALVING METHOD

Matthew P. Mitchell, Berkeley, and Luc Bauwens, Oakland, both of Calif., assignors to Mitchell/Sterling Machines/Systems, Inc., Berkeley, Calif.

Continuation of Ser. No. 300,855, Jan. 24, 1989, abandoned. This application Oct. 10, 1989, Ser. No. 420,669
Int. Cl.[5] F02G *1/04*
U.S. Cl. 60—522 7 Claims



1. In a device of the Stirling Cycle type for converting energy between heat and work comprising:
compression and expansion chambers,
means for decreasing the volume of one of the chambers while increasing the volume of the other chamber,
gas storage means comprising first and second regenerator means, each connected to the expansion chamber and to the compression chamber,
a quantity of compressible gas confined for circulation through the chambers and gas storage means,
control means for communicating the first regenerator means only to the expansion chamber while communicating the second regenerator means only to the compression chamber and subsequently communicating the second regenerator means only to the expansion chamber while communicating the first regenerator means only to the compression chamber with intermediate steps of closing one of the regenerator means while exchanging fluid between the chambers through the other regenerator means,
means for conducting heat into the expansion chamber, and
means for conducting heat out of the compression chamber,
the improvement comprising:
a double acting piston mounted for synchronous reciprocation and rotation for increasing and decreasing the volumes of the chambers through the reciprocation and for operating said control means through the rotation.

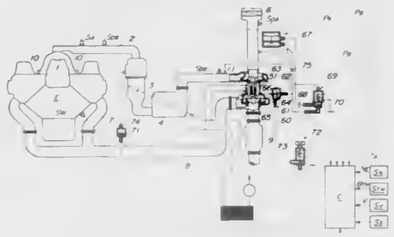
4,926,640

SUPERCHARGING PRESSURE CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Inoue Kazuo; Kishi Noriyuki; Kubodera Masao; Akiyama Eitetsu; Kashiwabara Shigeto, and Takizawa Osamu, all of Wako, Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,863
Claims priority, application Japan, Dec. 29, 1987, 62-334198; Dec. 29, 1987, 62-334199; Mar. 18, 1988, 63-65320; May 11, 1988, 63-114101; May 11, 1988, 63-114100; May 12, 1988, 63-115706; Jul. 19, 1988, 63-179452
Int. Cl.[5] F02B *37/12*
U.S. Cl. 60—602 5 Claims

1. A method of controlling supercharging pressure in an internal combustion engine having a transmission and a supercharger, wherein the supercharging pressure created by said supercharger is controlled in dependence on operating conditions of said engine,
the method comprising the steps of:
(1) detecting a rate of rise of the supercharging pressure in a transient state;
(2) detecting a gear position of said transmission; and



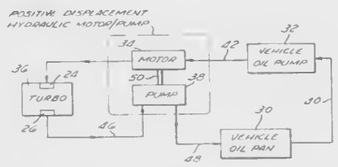
(3) when the detected gear position is a predetermined lower speed position which is a first speed position, correcting the rate of rise of said supercharging pressure in said transient state to a value lower than a value assumed when the detected gear position is a higher speed position.

4,926,641

TURBOCHARGER LUBRICATION SYSTEM

Robert A. Keller, 1604 Camberwell Pl., Westlake Village, Calif. 91361

Filed Jan. 11, 1989, Ser. No. 296,186
Int. Cl.[5] F01M *11/04*; F02B *37/00*
U.S. Cl. 60—605.3 15 Claims



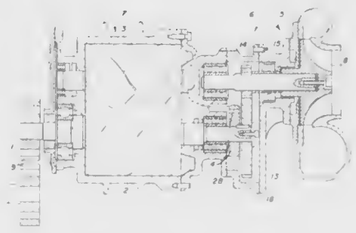
1. In an internal combustion engine having an oil pump for lubricating said engine and a turbocharger for increasing engine performance, the turbocharger having an oil inlet port and an oil outlet port, a lubrication system for supplying and removing lubricating oil to the turbocharger comprising:
motor means fluidically coupled to and driven by said oil pump of the internal combustion engine for supplying positive pressure oil flow to the oil inlet port of said turbocharger; and
pump means mechanically coupled to and driven by said motor means for providing a positive vacuum oil flow from the oil outlet port of said turbocharger.

4,926,642

INTERNAL COMBUSTION ENGINE CHARGING UNIT

Peter Buthmann, Gelsenkirchen, and Joachim Kotzur, Oberhausen, both of Fed. Rep. of Germany, assignors to MAN Gutehoffnungshütte, GmbH, Oberhausen, Fed. Rep. of Germany

Division of Ser. No. 241,024, Sep. 2, 1988. This application Oct. 4, 1989, Ser. No. 416,849
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729583; Dec. 5, 1987, 3741286
Int. Cl.[5] F02B *37/10*
U.S. Cl. 60—607 3 Claims



1. An internal combustion engine charging arrangement, comprising:
a screw charger including a main rotor rotating about a main rotor shaft and a secondary rotor rotating about a secondary rotor shaft;
a synchronizing gearing means connected to said main rotor shaft and connected to said secondary rotor shaft for synchronizing the rotation of said main rotor and said secondary rotor;
an exhaust gas turbine having an intake connected to an exhaust of the internal combustion engine, said exhaust gas turbine being mounted on an exhaust gas turbine shaft; and,
transmission gearing means connected to said synchronizing gearing unit and connected to said exhaust gas turbine, said transmission gearing means and said synchronizing gearing unit being arranged on one side of said screw charger in a common casing, said exhaust gas turbine shaft having a gear element of said transmission gearing means fixed thereto, another gear element of said transmission gearing means and a gear element of said synchronizing gearing means being fixed on a single shaft.

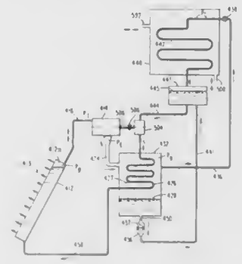
4,926,643

CLOSED LOOP SYSTEM WITH REGENERATIVE HEATING AND PUMP-DRIVEN RECIRCULATION OF A WORKING FLUID

Barry Johnston, 2423 Pickwick Rd., Baltimore, Md. 21207

Filed Jul. 19, 1989, Ser. No. 381,909
Int. Cl.[5] F01K *7/34*
U.S. Cl. 60—691 14 Claims

1. A closed loop thermodynamic system, wherein a recirculating working fluid cyclically undergoes changes between its liquid and vapor phases during which energy received from an external energy source is utilized to vaporize the working fluid at a high pressure in a vaporizing means and the high pressure vapor is utilized in an energy-utilizing means and is exhausted therefrom, various components of the system being located at different heights relative to each other, comprising:
thermal regeneration means for providing regenerative heating of a flow of working fluid in the form of a condensate that is at a pressure not less than an operating pressure of said vaporizing means, said regeneration means being formed to have a first portion and a second portion separated therefrom by a heat-conducting wall, said first portion being formed to convey said condensate therethrough to regeneratively heat the same, said second portion being connected to said energy utilizing means to receive said exhausted vapor to transfer therefrom a portion of the enthalpy thereof across said heat conducting wall to said condensate flow through said first portion, said second portion of said regenerative means also being provided with a vapor outlet and being formed in part to hold a pool of liquid working fluid formed by condensation of a first portion of said exhausted vapor that has condensed due to said energy transfer therefrom, said pool having an outlet with a one-way outflow valve;
vapor condensing means connected to said vapor outlet of said regeneration means to receive therethrough such of said exhausted vapor as did not condense in said first portion, to condense the same by a further transfer of thermal energy therefrom;



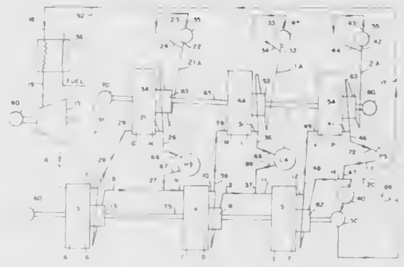
condensate-holding means for holding condensate formed in said condensing means, said condensate-holding means also being connected to said valve of said regeneration means to receive condensate therethrough from said pool and being connected to said first portion of said regeneration means to provide said flow of condensate to be heated in flowing therethrough; and
condensate pressurizing means intermediate said condensing means and said first portion of said regeneration means to raise a pressure of said first flow of condensate to a value not less than said operating pressure of said vaporizing means.

4,926,644

POWER PLANT WITH MEDIUM AND LOW POWER PLANT SYSTEMS

Demos Papastavros, 2429 NE. 184 Ter., North Miami Beach, Fla. 33160

Continuation-in-part of Ser. No. 150,636, Feb. 1, 1988, Pat. No. 4,894,984. This application Oct. 16, 1989, Ser. No. 422,250
Int. Cl.[5] F01K *19/02*, *21/00*
U.S. Cl. 60—715 13 Claims



1. In a power plant system having a medium power plant

VOL 1114 ISS 4 MY 22 1990 UMI

system and a low power plant system with individual closed loops in which each of the medium power plant systems and the low power plant system with individual closed loops containing:

a plurality of N turbine housings, where N is a whole number greater than one, each having a fluid inlet and a fluid outlet, each of said turbine housings containing a power turbine having a fluid inlet and a fluid outlet and being operatively connected to a first shaft which connects all said power turbines, each of said turbine housings also containing a compressor turbine having a fluid inlet and a fluid outlet and being operatively connected to a second shaft said second shaft is operatively connected to a gear housing system and is designed to allow said compressor turbine to rotate independently of said power turbine, therefore said power turbine and said compressor turbine are located and operate inside each of said plurality of N turbine housings, each of said plurality of N turbine housings having a first fluid conduit means operatively connecting said inlet of said turbine housing to said inlet of said power turbine, said first fluid conduit is designed to pass outside the rotor blades of said power turbine, tapering in, decreasing in size from said inlet of said turbine housing to said inlet of said power turbine,

each of said plurality of N turbine housings having a means for allowing working fluid to flow from said outlet of said power turbine to the inlet of said compressor turbine,

each of said plurality of N turbine housings having a second fluid conduit means operatively connecting said outlet of said compressor turbine to said outlet of said turbine housing, said second fluid conduit is designed to pass outside the rotor blades of said compressor turbine, tapering out, increasing in size, from said outlet of said compressor turbine to said outlet of said turbine housing, each of said plurality of N turbine housings having a said gear housing system which consists of a series of individual gears and shafts which are designed to allow said compressor turbine to rotate faster and in an opposite direction from said power turbine,

said medium power plant system comprising the combination of:

said plurality of N turbine housings of the medium power plant system, each having a fluid inlet and a fluid outlet;

a generator means operatively connected to said first shaft of the medium power plant system which connects all of the plurality of N power turbines of the medium power plant system;

a plurality of N heat exchange fluid conduits, where N is a whole number greater than one, each of which having a first fluid passageway which contains hot exhaust fluid and a second fluid passageway which contains cold condensed fluid which flows in an opposite direction than the hot exhaust fluid in said first fluid passageway, a fluid conduit means operatively connecting the following in an open loop cycle, an external source of exhaust heat fluid pressure (heat energy) to the inlet of the first of said plurality of N turbine housings of the medium power plant system, said fluid conduit then operatively connecting the outlet of each of said plurality of N turbine housings of the medium power plant system to said first passageway of one of said plurality of N heat exchange fluid conduits and then to the inlet of the next of said plurality of N turbine housings of the medium power plant system, said fluid conduit then operatively connecting the outlet of the last of said plurality of N turbines of the medium power plant system to the environment;

said low power plant system with individual closed loops consisting of a plurality of N individual closed loops, where N is a whole number greater than one, each of said plurality of N individual closedloops comprising a combination of;

said turbine housing of the low power plant system with individual closed loops, having a fluid inlet and

a fluid outlet;

a condenser having a fluid inlet, a fluid outlet and condensing means between its inlet and its outlet;

a second compressor turbine having a fluid inlet, a fluid outlet and a compressing and circulating means between its inlet and its outlet,

a heat exchange fluid conduit having a first fluid passageway which contains hot exhaust fluid from the outlet of said turbine housing and a second fluid passageway which contains cold condensed fluid from the outlet of said condenser, said cold condenser fluid flowing in an opposite direction than said hot exhaust fluid in said first passageway which is designed to give up heat energy to said second fluid passageway therefore preheating the working fluid;

a fluid conduit means operatively connecting the following in a closed loop cycle, the outlet of said turbine housing to the inlet of the first passageway of said heat exchange fluid conduit, the outlet of the first passageway of said heat exchange fluid conduit, to the inlet of said condenser, the outlet of said condenser to the inlet of the second fluid passageway of said heat exchange fluid conduit, the outlet of the second fluid passageway of said heat exchange fluid conduit to the inlet of said second compressor turbine, the outlet of said second compressor turbine to the inlet of said second fluid passageway of one of the plurality of N heat exchange fluid conduits of the medium power plant system, where the individual closed loop of the low power plant system absorbs additional heat energy from the first fluid passageway of the plurality of N heat exchange fluid conduits of the medium power plant system;

the outlet of said second fluid passageway of one of the plurality of N heat exchange fluid conduits of the medium power plant system to the inlet of said turbine housing representing a complete individual closed loop cycle of the low power plant system;

said low power plant system with individual closed loops also consisting of:

a generator means operatively connected to said first shaft of the low power plant system which connects all of the plurality of N power turbines of the low power plant system:

a starter means operatively connected to said first shaft of the low power plant system.

4,926,645

COMBUSTOR FOR GAS TURBINE

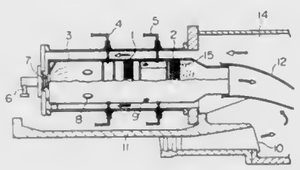
Kazumi Iwai, Mito; Hiromi Koizumi, and Katsuo Wada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 91,752, Sep. 1, 1987. This application Jul. 31, 1989, Ser. No. 387,146

Claims priority, application Japan, Sep. 1, 1986, 61-203747

Int. Cl.[5] **F23R** *3/40, 3/34*

U.S. Cl. 60—723 **2 Claims**



1. A catalytic combustor for a gas turbine comprising:

a combustor liner having at an upstream section a head portion provided with a fuel nozzle and at a downstream section a rear portion provided with a tail cylinder;

stages of catalyst layers retained in said combustor liner between said head portion and said rear portion at a predetermined spaced interval in a direction of gas flow in said combustor liner;

a fuel supply nozzle disposed upstream of each of said catalyst layers;

first control means operatively associated with the fuel supply nozzle means most proximate the tail cylinder controlling flow rate of fuel therethrough so that a temperature level at the catalyst layer most proximate the tail cylinder is kept not lower than about 1000° C. and not higher than about 1500° C. independently of a load on the gas turbine; and

second control means operatively associated with the fuel supply nozzle most proximate the head portion controlling flow rate of fuel therethrough in accordance with the load on the gas turbine.

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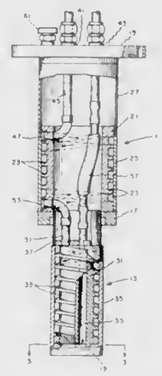
CRYOGENIC PRECOOLER FOR SUPERCONDUCTIVE MAGNETS

Bizhan Dorri, Clifton Park, and Steven J. Brzozowski, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,268

Int. Cl.[5] **F25B** *19/00*

U.S. Cl. 62—51.1 **11 Claims**



1. A precooler for initial cooldown of superconductive magnets using a two stage cryocooler and having a two stage interface, said precooler comprising:

a mounting flange for securing the precooler to the two stage interface, said flange having an inlet and outlet port;

a heat exchanger having passageways for carrying a cryogenic fluid;

thermal insulating means for mechanically coupling said heat exchanger and said flange;

a first and second stage heat stations coupled to the heat exchanger to provide heat flow between the first and second stage heat stations and the heat exchanger;

said first and second stage heat stations spaced apart from one another and said flange to contact the heat stations of the two stage interface when inserted therein;

a first thermally insulated pipe connected between one end of said heat exchanger passageway and said inlet port in flow communication; and

a second thermally insulated pipe connected between the other end of said heat exchanger passageway and said outlet port.

4,926,647

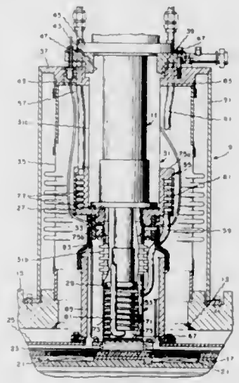
CRYOGENIC PRECOOLER AND CRYOCOOLER COLD HEAD INTERFACE RECEPTACLE

Bizhan Dorri, Clifton Park, and Evangelos T. Laskaris, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,466

Int. Cl.[5] **F25B** *19/00*

U.S. Cl. 62—51.1 **2 Claims**



1. A superconductive magnet comprising:

a two stage cryocooler having a first and second heat station;

a superconductive magnet winding;

a thermal radiation shield spaced away from and surrounding said winding;

a cryostat defining an aperture spaced away from and surrounding said thermal radiation shield;

a cryocooler cold head interface receptacle situated in said cryostat aperture said interface receptacle providing a first and second heat station for connecting in a heat flow relationship to the cryocooler first and second heat station, respectively, said first and second interface receptacle heat stations thermally insulated from one another; and

a precooler having first and second stage heat exchangers connected in a heat flow relationship with said interface receptacle first and second heat stations, respectively, said interface receptacle having inlet and outlet ports for supplying and removing cryogens, and piping means fabricated from heat insulating material for connecting said first and second heat exchangers in a series flow relationship between said inlet and outlet ports.

4,926,648

TURBOMOLECULAR PUMP AND METHOD OF OPERATING THE SAME

Katsuya Okumura; Fumio Kuriyama; Yukio Murai; Manabu Tsujimura, and Hiroshi Sobukawa, all of Kanagawa, Japan, assignors to Toshiba Corp. and Ebara Corp., both of Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,206

Claims priority, application Japan, Mar. 7, 1988, 63-51623

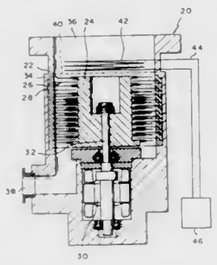
Int. Cl.[5] **B01D** *8/00*

U.S. Cl. 62—55.5 **11 Claims**

1. A turbomolecular pump having a rotor provided with a plurality of rotor blades and a spacer provided with a plurality of stator blades so that gas molecules are sucked in from a suction port, compressed and discharged from an exhaust port by the interaction between said rotor and stator blades, wherein the improvement comprises:

a heat exchanger provided inside said suction port, said heat

exchanger being connected to a refrigerator through a refrigerant pipe; and



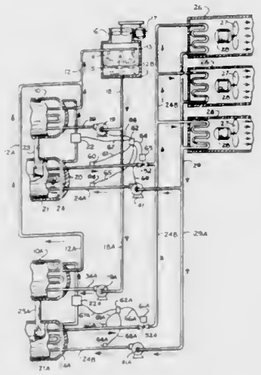
a gate valve provided on the upstream side of said suction port.

4,926,649

METHOD AND APPARATUS FOR SAVING ENERGY IN AN AIR CONDITIONING SYSTEM

George Martinez, Jr., P.O. Box 1141, Gonzales, La. 70737

Division of Ser. No. 60,535, Jun. 11, 1987, Pat. No. 4,817,395.
This application Jul. 11, 1988, Ser. No. 216,964
Int. Cl.[5] F25D *17/02*
U.S. Cl. 62—99 12 Claims



1. A method for reducing the amount of energy consumed in a building utilizing two or more chilled water air conditioning units connected in parallel when less than the entire cooling capacity of all of said units is sufficient to cool the building, each of said air conditioning units containing a supply chilled water line and a return chilled water line, each of said air conditioning units having a compressor, comprising:

a. operating the entire air conditioning system at full capacity until the difference in the temperature of the supply chilled water and the return chilled water is less than a first pre-set temperature,

b. varying the total water flow in one selected air conditioning unit in the return chilled water line and the supply chilled water line of said one selected chiller to maintain the temperature differential between other temperature of the water in the supply chilled water line and the temperature of the water in the return chilled water line at a second pre-set temperature,

c. measuring the temperature of said return chilled water in said one selected air conditioning unit,

d. comparing the temperature of the return chilled water in said one selected air conditioning unit to a third pre-set temperature, and

e. turning off the compressor of said one selected air conditioning unit and the total flow of chilled water thereto when the temperature of said return chilled water is equal to said third pre-set temperature.

4,926,650

REFRIGERANT FLUID AND METHOD OF USE

Douglas D. Dawn, Pasadena, Calif., and Reinhard Radermacher, Kensington, Md., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 18, 1988, Ser. No. 195,704
Int. Cl.[5] F25B *13/00*; C09K *5/00*
U.S. Cl. 62—114 4 Claims

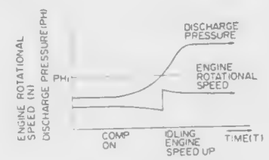
1. In a system involving a vapor compression cycle comprising evaporation, compression, condensation and expansion of a refrigerant fluid, the improvement comprising using, as the refrigerant fluid in said system, a fluid comprising a first amount of trichloromonofluoromethane; and a second amount of 1-chloro-1,1-difluoroethane, said second amount comprising between about 12 and 92 mol % based on the combination of the first and second amounts.

4,926,651

CONTROL APPARATUS FOR AUTOMOBILE AIR-CONDITIONERS

Ichiro Noguchi, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 334,881
Claims priority, application Japan, Apr. 13, 1988, 62-49495[U]
Int. Cl.[5] F25B *27/00*; F02M *3/06*
U.S. Cl. 62—133 3 Claims



1. A control apparatus for an automobile air-conditioner, comprising:

(a) a variable displacement compressor driven by an engine and operative to vary its displacement gradually from a small displacement to a large displacement immediately after it is started;

(b) a fast idling device responsive to the start of operation of said variable displacement compressor and operative to increase the idling speed of said engine by a predetermined value;

(c) a pressure sensor for detecting a discharge pressure of said variable displacement compressor; and

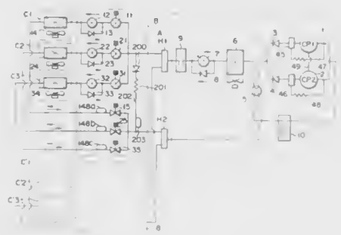
(d) idling-up control means for retarding operation of said fast idling device until detection of a predetermined discharge pressure of said variable displacement compressor by said pressure sensor.

4,926,652

AIR CONDITIONER SYSTEM WITH CONTROL FOR OPTIMUM REFRIGERANT TEMPERATURE

Manabu Kitamoto, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 6, 1989, Ser. No. 306,074
Claims priority, application Japan, Feb. 9, 1988, 63-28105; Feb. 10, 1988, 63-29266
Int. Cl.[5] F25B *7/00*
U.S. Cl. 62—175 20 Claims



1. An air conditioner comprising:

an outdoor unit having a variable-capability compressor and an outdoor heat exchanger coupled to said variable-capacity compressor;

a plurality of indoor units, each indoor unit having an indoor heat exchanger and demand-capability data output means for outputting demand-capability data according to an air-conditioning load of its indoor heat exchanger;

a distributing unit for coupling said outdoor unit and said plurality of indoor units in parallel to form respective refrigeration cycles, said distributing unit having a plurality of refrigerant flow control means corresponding to said refrigeration cycles, respectively;

first control means, for supplying to said refrigerant flow control means of said distributing unit refrigerant flow control commands associated with demand-capability data of said plurality of indoor units, and outputting sum data of said demand-capability data;

second control means, for supplying a capacity-change control command to said variable-capability compressor, in accordance with said sum data from said first control means;

refrigerant super-heat detection means for detecting the degree of refrigerant super heat in each indoor unit, said refrigerant super-heat detection means including a plurality of first temperature sensors for detecting temperatures of said refrigerant expelled from said indoor units, and a second temperature in said refrigeration cycle, and calculating differences between said expelled refrigerant temperatures and said pseudo-saturated refrigerant temperature as a pseudo refrigerant super-heat degree in said indoor units; and

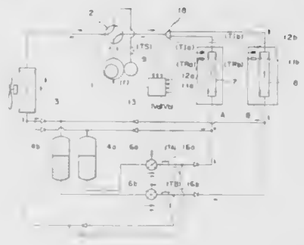
third control means, for supplying refrigerant flow compensation commands associated with a detection output of said refrigerant super-heat detection means, to said respective refrigerant flow control means of said distributing unit.

4,926,653

MULTI-ROOM TYPE AIR-CONDITIONING EQUIPMENT

Masaaki Masuda, Nara; Masanori Kotani, Yamatokooriyama; Katsuhiro Wakahara, Nara, and Shuichi Sakata, Habikino, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 16, 1989, Ser. No. 367,141
Claims priority, application Japan, Jun. 17, 1988, 63-151001; Apr. 10, 1989, 64-91064; Jun. 14, 1989, 64-152618
Int. Cl.[5] F25B *41/04*
U.S. Cl. 62—204 5 Claims



1. A two-room type air-conditioning apparatus comprising:

an outdoor apparatus; and

first and second indoor apparatuses respectively connected to said outdoor apparatus through corresponding first and second electric expansion valves respectively, in which refrigerant compressed by a compressor is condensed by respective first and second heat exchangers provided in said first and second indoor apparatuses or by an outdoor heat exchanger provided in said outdoor apparatus after said refrigerant is expanded to be decompressed by said first and second electric expansion valves respectively, said refrigerant is evaporated by said outdoor heat exchanger or said first and second indoor heat exchangers so as to perform an air-conditioning operation such as heating or cooling operations for respective areas,

wherein opening/closing degrees of said electric expansion valves are determined by a ratio of the loads for said first and second indoor apparatuses, the loads being obtained from the differences between setting temperatures set by first and second room temperature setting means provided in said first and second indoor apparatuses respectively and actual room temperatures actually detected by first and second room temperature detecting means provided in the first and second indoor apparatuses respectively.

4,926,654

CONTROL ASSEMBLY FOR ADJUSTING THERMOSTAT SETTING

Ronald M. Johnson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 21, 1989, Ser. No. 410,507
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—229 7 Claims

1. A control assembly for a household refrigerator having a mullion partition separating the freezer compartment and the fresh food compartment with a front face and a bottom panel forming the top of the fresh food compartment comprising:

a control bracket mounted on the bottom-panel of the mullion partition, said bracket having a circular aperture with two radial notches;

a thermostat mounted on the control bracket and having a rotatable stem for adjusting the thermostat setting;

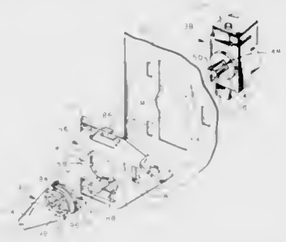
a rotatable hub member having,

a circular central portion with radial lugs slightly smaller than the circular aperture and radial notches of the control bracket with a portion of the central portion and lugs

projected through the circular aperture and radial notches and rotated to mount the hub member on the control bracket,

an aperture in the circular central portion to receive the rotatable stem of the thermostat and dimensioned to rotate the stem in unison with rotation of the hub member,

a lever arm radially outward of the central portion, and



a push-pull device located inside the mullion partition and having one end of the device secured to the lever arm of the hub member and the opposite end of the device is a manual actuator means located at the front of the mullion partition whereby movement of the actuator means rotates the hub member which rotates the thermostat stem to adjust the thermostat setting.

4,926,655

AIR CONDITIONER UNIT SUITABLE FOR MOUNTING ON THE ROOF OF A VEHICLE

Donald D. King, Chanhassen, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed May 1, 1989, Ser. No. 345,854
Int. Cl.[5] B60H *1/32*
U.S. Cl. 62—244 11 Claims



1. An air conditioner unit suitable for mounting on the roof of a vehicle, comprising:

a vehicle having a front, back, first and second sides, a passenger compartment, air delivery ducts for delivering conditioned air to the passenger compartment, conditioned air openings in the roof in communication with said air delivery ducts, and return air openings in the roof in communication with the passenger compartment,

a frame having a bottom, top, first and second ends, first and second sides, and a longitudinal axis extending between said first and second ends,

means fixing said frame to the roof of said vehicle, with the longitudinal axis of the frame oriented front to back on said vehicle,

first and second elongated evaporator coils each having first and second ends and a longitudinal axis which extends between said first and second ends,

said first and second evaporator coils being mounted in spaced relation on said frame, respectively spaced from the first and second sides of said frame, with the longitudinal axes of said first and second evaporator coils being parallel to the longitudinal axis of said frame,

first and second evaporator air delivery means on said frame, respectively between said first side and said first evaporator coil, and between said second side and said second evaporator coil,

openings in the bottom of said frame in registry with the conditioned air and the return air openings in the roof of said vehicle, such that each of the first and second evaporator air delivery means draws return air from the passenger compartment, through the associated evaporator coil, and discharges conditioned air into an air delivery duct of the vehicle,

first and second elongated condenser coils each having first and second ends and a longitudinal axis which extends between the first and second ends,

said first and second condenser coils being mounted in spaced relation on said frame, between and respectively adjacent to said first and second evaporator coils, with the longitudinal axes of said first and second condenser coils being parallel to the longitudinal axis of said frame,

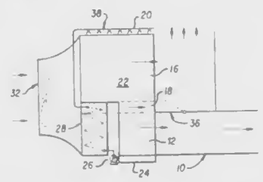
and condenser air delivery means mounted on said frame, between said first and second spaced condenser coils.

4,926,656

INTEGRATED WET BULB DEPRESSION AIR COOLER

Pieter John A. Hickey, and Cornelius J. Claassen, both of Transvaal Province, South Africa, assignors to Aztec Sensible Cooling, Inc., Albuquerque, N. Mex.

Filed Jun. 30, 1989, Ser. No. 373,489
Claims priority, application South Africa, Jan. 11, 1989, 890209
Int. Cl.[5] F28D *5/00*
U.S. Cl. 62—310 16 Claims



1. A method for cooling and supplying air to a space to be cooled comprising steps of;

A. Passing a secondary air stream in direct heat exchange relationship with a recirculating working fluid in a first humidifying and cooling chamber to evaporatively cool said secondary air stream and said working fluid and discharging said secondary air stream from said first humidifying and cooling chamber;

B. Discharging said working fluid from said first humidifying and cooling chamber and passing the working fluid through a primary humidifying and cooling chamber and thereafter collecting said working fluid;

C. Recirculating said working fluid through an indirect heat exchanger to said first humidifying and cooling chamber;

D. Passing a primary air stream in heat exchange relationship with said indirect heat exchanger to thereby indirectly cool said primary air stream and heat said working fluid and thereafter;

E. Passing said primary air stream passing through the indirect heat exchanger through said primary humidifying and cooling chamber in direct heat exchange relationship with said working fluid passing therethrough prior to the working fluid being collected to thereby evaporatively cool said primary air stream and said working fluid, and

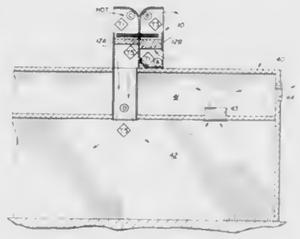
F. Discharging said primary air stream from said primary humidifying and cooling chamber to the space to be cooled.

4,926,657

HEAT PIPE ASSISTED EVAPORATIVE COOLER

Elmer B. Bomar, 3601 E. Pierson, Phoenix, Ariz. 05018

Filed Jun. 30, 1989, Ser. No. 375,203
Int. Cl.[5] F28D *5/00*
U.S. Cl. 62—311 11 Claims



1. A heat pipe assisted evaporative cooler comprising:

a heat pipe; and

an evaporative cooler pad coupled to said heat pipe for air flow heat transfer between said heat pipe and said heater pad; and,

means for controlling the direction of air flow through said cooler including:

first means for directing a first volume of air through said cooler pad, to be evaporatively cooled, then further directing said air to impinge on and flow past a first end of said pipe such that said cooled air absorbs heat from said heat pipe; and

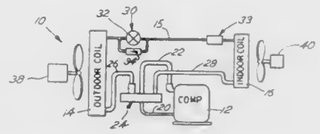
second means for directing a second volume of air to impinge on and flow past a second end of said heat pipe to transfer heat to said heat pipe and to continue to flow through said cooler pad to be evaporatively cooled thereby.

4,926,658

TWO WAY FLOW CONTROL DEVICE

Mark W. Olsen, Carrollton, and John B. Winegardner, Hurst, both of Tex., assignors to Lennox Industries, Inc., Carrollton, Tex.

Filed Apr. 14, 1989, Ser. No. 339,206
Int. Cl.[5] F25B *27/00*
U.S. Cl. 62—324.1 7 Claims



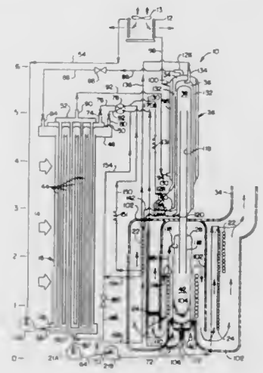
6. In a heat pump comprising a compressor, a reversing valve, an outdoor coil, metering means, and an indoor coil operatively connected to one another, the improvement wherein the metering means includes a two way flow control device comprising a generally cylindrical body means open at each end, a plurality of first axial passages in said body means, a second axial passage in said body, an orifice of predetermined size fixed in position in said second axial passage, an annular washer-like valve member disposed in said body means and movable between a first position blocking said first axial passages to fluid flow while permitting flow through said second axial passage in one direction of fluid flow, and a second position away from said first axial passage to permit fluid flow through said first axial passages to bypass said second axial passage, and orifice means of predetermined diameter fixed in said second axial passage.

4,926,659

DOUBLE EFFECT AIR CONDITIONING SYSTEM

Richard N. Christensen; Anthony C. DeVuono; William H. Wilkinson, and D. Karl Landstrom, all of Columbus, Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Mar. 30, 1989, Ser. No. 331,675
Int. Cl.[5] F25B *15/00*
U.S. Cl. 62—476 25 Claims



1. In an absorption refrigeration system for conditioning air within a building interior and having an air cooling mode of operation and an air heating mode of operation, in combination:

a. first substantially vertical tube members each having an outer air heat transfer surface and an inner liquid refrigerant/concentrated refrigerant solution heat transfer surface;

b. second substantially vertical tube members cooperating with said first tube members and each having an inner hydronic fluid heat transfer surface and an outer liquid refrigerant/concentrated refrigerant solution heat transfer surface;

c. air distribution means flowing building air substantially horizontally between and around said first tube member outer air heat transfer surfaces in both the system air cooling mode of operation and air heating mode of operation;

d. hydronic fluid loop means cooling and flowing hydronic fluid through said second tube members in heat transfer relation to said second tube member inner surface in the system air cooling mode of operation and heating and flowing hydronic fluid through said second tube members in heat transfer relation to said second tube member inner surfaces in the system air heating mode of operation; and

e. absorption refrigeration fluid distribution means separately and simultaneously flowing liquid refrigerant and concentrated refrigerant solution to said first tube member inner heat transfer surfaces and to said second tube member outer heat transfer surfaces in the system air cooling mode of operation and in the system air heating mode of operation,

said absorption refrigeration fluid distribution means flowing liquid refrigerant to said first tube member inner heat transfer surfaces and flowing concentrated refrigerant solution to said second tube member outer heat transfer surfaces for vertical gravitational flow in the system air cooling mode of operation, and flowing liquid refrigerant to said second tube member outer heat transfer surfaces and flowing concentrated refriger-

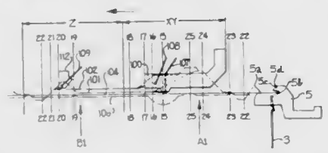
ant solution to said first tube member inner heat transfer surfaces for vertical gravitational flow in the system air heating mode of operation.

4,926,660

METHOD OF KNITTING JACQUARD KNIT FABRIC BY CIRCULAR KNITTING MACHINE

Yamaoko Takashi, Hyogo, Japan, assignor to Precision Fukuhara Works, Ltd., Hyogo, Japan

Filed Oct. 7, 1988, Ser. No. 254,849
Claims priority, application Japan, Mar. 29, 1988, 63-77443
Int. Cl.[5] D04B *9/12*
U.S. Cl. 66—9 R 1 Claim



1. A method of knitting a pile jacquard fabric on a circular knitting machine including needles and a single piece sinker positioned between each pair of said needles, and a plurality of groups of two adjacent yarn feeders, said pile jacquard fabric including successive courses of plain jersey stitch wales knit of a ground yarn, each successive course also including a first pile loop yarn knit with the ground yarn in selected groups of adjacent needle wales and forming an individual pile loop in each intervening sinker wale, a second pile loop yarn knit with the ground yarn in other groups of adjacent needle wales and forming an individual pile loop in each intervening sinker wale, multiwale floats on the first pile loop yarn extending above the individual pile loops in the sinker wales of the corresponding selected groups of adjacent needle wales, and multi-wale floats of the second pile loop yarn extending above the individual pile loops in the sinker wales of the corresponding other groups of adjacent needle wales, and wherein the upstanding individual pile loops and the multi-wale floats are adapted to be cut in a shearing operation to form a patterned velour jacquard fabric, said method including the sequential steps of

raising all of the needles to stitch loop clearing level and feeding ground yarn into the hooks at the first yarn feeder of each group while the sinkers are retracted;

lowering first groups of needles to welt level while receiving the ground yarn;

raising second selected groups of needles and feeding the first pile loop yarn in the hooks of said second groups of needles and above inwardly advanced sinkers at the first yarn feeder, while floating the first pile loop yarn inside of said first groups of needles;

raising said first groups of needles from said welt level and feeding the second pile loop yarn in the hooks thereof and above inwardly advanced sinkers at the second yarn feeder, while floating the second pile loop yarn inside of the second groups of needles; and

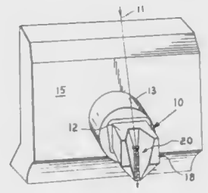
lowering all of the needles to knitting level at the second yarn feeder to form a course of plain jersey stitches of the ground yarn with individual pile loops of the first pile yarn extending upwardly from intervening sinker wales corresponding with the selected groups of adjacent needle wales and with individual pile loops of the second pile yarn extending upwardly from intervening sinker wales corresponding with the other groups of adjacent needle wales, both the individual pile loops of the first and second pile loop yarns being positioned in side-by-side relationship in adjacent groups in one continuous ground yarn course.

4,926,661

YARN FINISH APPLICATOR

Brian M. Agers, Wilmington, Del., and John S. Dickins, III, Wilmington, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 15, 1989, Ser. No. 323,818
Int. Cl.[5] D06B *1/08*
U.S. Cl. 68—200 6 Claims



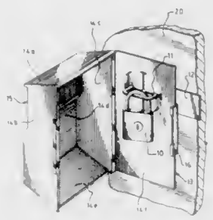
3. A stationary yarn finish applicator surface in which yarn contacts said surface, said surface being provided with a passage through which finish is metered to said surface, said surface having a plurality of depressions evenly distributed over from about 25 percent to about 50 percent of said surface, said depressions forming discontinuous interruptions in said surface in all directions.

4,926,662

PADLOCK SHIELD

Rolland M. Gaudet, Site 26, Box 26, R. R. #1, Windsor Junction, Halifax Co., Nova Scotia, Canada (B0N 2V0)

Filed Jun. 15, 1989, Ser. No. 366,395
Int. Cl.[5] E05B *67/58*
U.S. Cl. 70—56 6 Claims



1. A padlock shield for protecting a padlock when it is secured to a staple, said shield comprising:

a cover having a plurality of walls, one of which has a means for receiving a staple therethrough, said means being adapted to receive the staple therethrough at any one of a plurality of orientations.

4,926,663

COMBINATION LOCKS FOR SUITCASES, BAGS AND THE LIKE

Italo Azzalin, Varese, Italy, assignor to C.G.V. S.p.A., Italy

Filed Nov. 30, 1988, Ser. No. 278,192
Claims priority, application Italy, Dec. 10, 1987, 22939 A/87
Int. Cl.[5] E05B *65/48*
U.S. Cl. 70—74 15 Claims

1. A combination lock for an article comprising at least two relatively movable parts, particularly a suitcase and the like, comprising:

an engagement member having a striker to be fixed to one of said parts of the article;

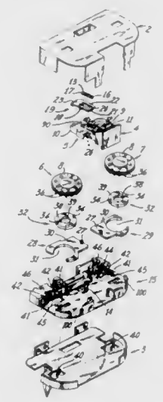
a combination mechanism fixed to the other of said parts;

coupling means associated with said combination mechanism and cooperating with said engagement member;

a pair of rotatable discs for setting the combination;

a stop body removably engaged with each respective rotatable disc in such manner as to be rotated with this latter during engagement but to enable the combination to be changed during disengagement;

a sliding grip provided with at least a pair of inclined guide tracks;



at least a pair of sliders each carrying a pin and one of said stop bodies, said pin being slidable along said respective inclined guide track, said sliding, which can occur when the correct combination is set, generating an approach movement of said bodies and causing disengagement between said bodies and the rotatable discs to enable the user to change the lock combination, said grip being formed in such a manner as to generate with its movement the disengagement between said engagement member and said coupling means.

4,926,664

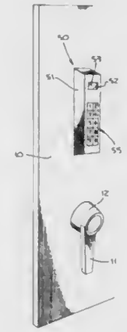
SELF LOCKING ELECTRONIC LOCK

Klaus W. Gartner, 2632 Via Anacapa, Palos Verdes Estates, Calif. 90274, and Alan K. Uyeda, 8317 Elsomore Dr., Rosemead, Calif. 91770

Filed Feb. 16, 1989, Ser. No. 311,696
Int. Cl.[5] E05B *49/00*
U.S. Cl. 70—119 12 Claims

1. A self locking electronic lock for use with a safe door having manually operated bolt works including a door handle, linkage operated by said handle and door bolts operated by said linkage, said linkage having a lock bolt receiving gate whereby said linkage is immobilized when a lock bolt is received in said gate to thereby lock said safe door, said electronic lock comprising:

a biased lock bolt and mounting means for mounting said lock bolt relative said linkage whereby said bolt is normally biased into said linkage gate when aligned thereto in a linkage locking position and biased against said linkage when not aligned to said gate, in a linkage engaging position whereby manipulation of said linkage by said handle to align said gate to said lock bolt causes said lock bolt to



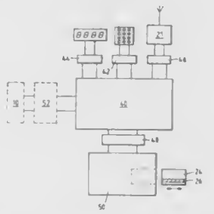
automatically enter said gate due to its bias toward such linkage locking position.

4,926,665

REMOTELY PROGRAMMABLE KEY AND PROGRAMMING MEANS THEREFOR

Gerald Stapley, Godalming; Geoffrey Tate, Haslemere, and Derek Hardisty, Brookwood, all of England, assignors to Security Services PLC, London, England

Filed Mar. 11, 1988, Ser. No. 166,983
Claims priority, application United Kingdom, Mar. 12, 1987, 8705892
Int. Cl.[5] E05B *49/00*
U.S. Cl. 70—277 21 Claims



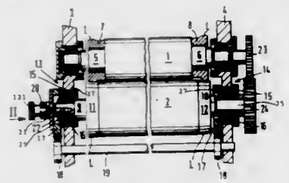
1. For use with a lock having means to detect a predetermined key code stored on a key and means for responding to said detection to operate the lock, the combination of:

(a) at least one such key for storing data comprising one of a plurality of key codes;

(b) mobile key programming means comprising means for receiving from a remote station a transmitted signal indicating said key code to be stored by the key and for causing the key to store that key code wherein said mobile key programming means is adapted to be taken to a location in the vicinity of the lock, to receive said signal and to cause the key to store the key code at said location; and wherein

(c) each key and storage of said data on each key is such as to require the key code indicated by the transmitted signal to be stored in the key be use of the mobile key programming means.

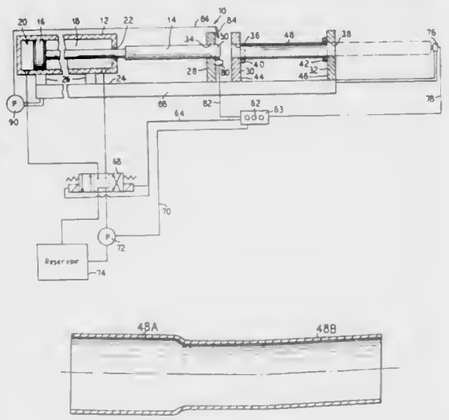
4,926,666
ASSEMBLY FOR ADJUSTING THE ROLLS OF PUNCHING AND LIKE MACHINES
Georg Götting, Lörrach, and Harro Lämmle, Schopfheim, both of Fed. Rep. of Germany, assignors to Grapha-Holding AG, Hergiswil, Switzerland
Filed Jun. 9, 1988, Ser. No. 205,081
Claims priority, application Switzerland, Jun. 19, 1987, 2326/87
Int. Cl.[5] B21B *31/18*
U.S. Cl. 72—247 13 Claims



1. In an assembly for treating a running sheet or web, particularly in a punching or a like machine, a combination comprising a first roll; a second roll defining with the first roll a nip for the running web or sheet; and means for selecting the width of the nip, including a plurality of first bearing rings coaxial with said first roll and having conical peripheral surfaces tapering toward the axis of the first roll in a first direction, a plurality of second bearing rings, one for each of said first rings, said second rings being coaxial with said second roll and having conical peripheral surfaces tapering toward the axis of the second roll in a second direction counter to said first direction, the peripheral surfaces of said first rings abutting the peripheral surfaces of the respective second rings, and means for moving at least the first rings and the first roll axially relative to the second rings.

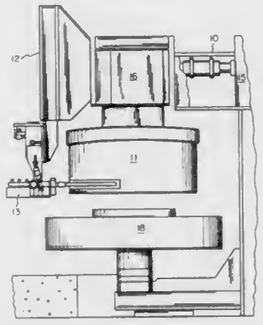
4,926,667
METHOD OF SIZING AND STRAIGHTENING EXTRUDED TUBES
James E. Markiewicz, Roselle, and Darrell G. Shroutz, Elgin, both of Ill., assignors to Precision Extruded Products, Inc., Elgin, Ill.
Filed Apr. 17, 1989, Ser. No. 339,317
Int. Cl.[5] B21C *23/00, 45/00*; B21D *3/00*
U.S. Cl. 72—256 14 Claims

1. A method of sizing and straightening an extruded tube comprising:
extruding a tube of metal having a predetermined internal diameter;
inserting a tapered mandrel having a first portion with an increasing external diameter and a second portion with a relatively large, constant diameter and a length as long as the tube into said tube at a first low insertion speed until the second portion of the mandrel having the large, constant external diameter has entered into that part of the tube pre-expanded by the first portion and then increasing the insertion speed until the mandrel has been fully inserted and the tube fully expanded; and
withdrawing the mandrel from the tube at a first low withdrawal speed until the large, constant diameter second portion of the mandrel has been completely withdrawn from the tube and then increasing the withdrawal speed



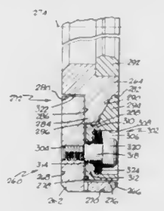
until the entire mandrel is completely withdrawn from the tube.

4,926,668
AUTOMATIC DIE BOX POSITIONING FOR DRAWBLOCK
Robert J. Rau, Pittsburgh, and Donald H. Haydo, Ellwood City, both of Pa., assignors to Italimpianti of America Incorporated, Coraopolis, Pa.
Filed Sep. 18, 1989, Ser. No. 408,671
Int. Cl.[5] B21C *1/02*
U.S. Cl. 72—289 5 Claims



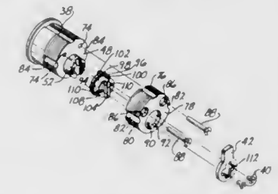
1. In a continuous drawblock apparatus for drawing tubing through a reducing die comprising a capstan upon which the tubing is wrapped after passing through the die, said capstan rotating upon an axis and having associated means for gripping and automatically releasing the end of the tubing held at an axial position relative to the capstan known as the start of draw position, said die carried by a die box, means for mounting the die box for translation in the direction of the axis of the capstan, for rotation about a first axis parallel to the axis of the capstan and for rotation about a second axis perpendicular to the first axis, the improvement comprising energizable means for clamping the die box in an infinitely adjustable position about the first axis after the drawing of the tubing has begun and the die box has naturally rotated to the correct drawing position, said clamping taking place in a manner not to jolt the die box, whereby the tubing exits from the die in a direction tangent to the capstan where the tubing first contacts the capstan.

4,926,669
CONTAINER BODY MAKER DIE
Conrad M. Grims; Bruce A. Moen, both of Golden, and Jaroslav F. Pardubicky, Westminster, all of Colo., assignors to Adolph Coors Company, Golden, Colo.
Filed Jul. 7, 1989, Ser. No. 376,762
Int. Cl.[5] B21D *22/28*
U.S. Cl. 72—349 19 Claims



1. Apparatus for use in positioning a tool member means for contacting a workpiece which is moved through the tool member means by ram means comprising:
an elongated hollow housing having a central opening extending therethrough and a longitudinal axis;
adjustable support means connected to said elongated hollow housing and having portions thereof located within said elongated hollow housing;
at least one workpiece engaging tool member means for performing operations on a workpiece and having a longitudinal axis;
at least one holding means for receiving and supporting said workpiece engaging tool member means and having a longitudinal axis;
said holding means being supported on said adjustable support means so that said holding means and said workpiece engaging tool member means are located within said elongated hollow housing;
clamping means for cooperation with said support means to prevent movement of said holding means in radial directions;
movement permitting means cooperating with said holding means and said workpiece engaging tool member means so that said workpiece engaging tool member means is capable of radial movement in any direction relative to said longitudinal axis thereof when a sufficient radially directed force is applied thereto and for permitting rotational movement of said workpiece engaging tool member means relative to said holding means when a sufficient rotational force is applied thereto;
movable ram means for supporting said workpiece and moving said workpiece through said central opening in said workpiece engaging tool member means, said movable ram means and said workpiece each having a longitudinal axis; and
stop means for limiting movement of said workpiece engaging tool member means in directions parallel to said longitudinal axis thereof.

4,926,670
EXTENSION FOR MORTISE CYLINDER
William Deforrest, Sr., Yorba Linda, Calif., assignor to Major Lock Supply Inc., Anaheim, Calif.
Filed Feb. 27, 1989, Ser. No. 316,250
Int. Cl.[5] E05B *9/04*
U.S. Cl. 70—374 22 Claims



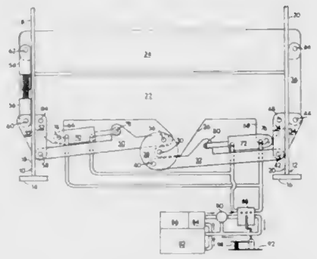
1. In combination with a mortise cylinder of the type having a cylindrical body, a control element rotatively mounted in the body and a cam member attaching means on the control element for attaching a cam member to the control element, a cylinder extension comprising:
an extension body;
means for fixedly connecting said extension body to said mortise cylinder body;
said extension body including a bore extending through said extension body;
first and second coupling elements sized and shaped to simultaneously be located in said extension body bore and to rotate within said bore;
first coupling means for coupling said first coupling element to said cam member attaching means to couple said first coupling element to said mortise cylinder control element;
a cam member, said cam member including a mounting slot;
second coupling means located on said second coupling element for coupling said cam member to said second coupling element, said second coupling means comprising an attachment tenon located on said second coupling element, said attachment tenon sized and shaped to fit into said cam member mounting slot; and
means for interconnecting said first and second coupling elements whereby when said cylinder extension is mounted on said mortise cylinder, rotation of said control element is transferred through said first coupling element to said second coupling element and to said cam member attached thereto.

4,926,671
PRESS BRAKE
James B. Hill, Rt. 2, P.O. Box 62, Galena, Mo. 65656
Filed Dec. 5, 1988, Ser. No. 279,866
Int. Cl.[5] B21J *9/18*
U.S. Cl. 72—389 15 Claims

1. A press brake comprising:
a stationary bar having a first longitudinal end and a second longitudinal end and having a lateral side edge;
a translatable bar having a first longitudinal end and a second longitudinal end and having a lateral side edge facing said stationary bar lateral edge;
means for selectively adjusting the angle of said stationary bar lateral edge relative to said translatable bar lateral edge such that said lateral edges may be selectively oriented at a selected angle, including parallel, with respect to each other and for maintaining said selected angle when said translatable bar is translated toward or away from said stationary bar; and
means for selectively translating said translatable bar toward or away from said stationary bar, said translating means including a disk rotatable about a fixed, stationary axis, a first set of linkage interconnecting one longitudinal end of said translatable bar with said disk, and a second set of

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linkage interconnecting the other longitudinal end of said translatable bar with said disk, the rotation of said disk in a first direction acting through both said sets of linkage to



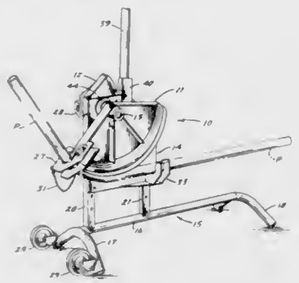
translate said translatable bar toward said stationary bar, and the rotation of said disk in a second direction acting through both said sets of linkage to translate said translatable bar away from said stationary bar.

4,926,672

PIPE BENDER

Melvin E. Swanson, Hayesville, N.C., assignor to Lidseen of North Carolina, Inc., Hayesville, N.C.

Filed May 3, 1989, Ser. No. 346,985
Int. Cl.[5] B21D *7/04*
U.S. Cl. 72—458 **9 Claims**



1. An improved pipe bender for accommodating multiple pipes of varying diameters and bending sections of them into an arcuate form, said pipe bender comprising:

a mounting base;

an axle supported by said mounting base and having opposite end portions which protrude from respective opposite sides of said mounting base;

a pair of sheave blocks, one of which is mounted on each protruding end portion of said axle on each respective opposite side of said mounting base for rotation about the axis of the axle on said opposite sides of said mounting base, each said sheave block including a plurality of arcuate pipe receiving channels adapted for receiving respective pipes therein, the pipe receiving channels on each sheave block being axially offset from one another along its length when positioned in a pipe receiving channel;

first pipe engaging means carried by each of said sheave blocks and cooperating with said pipe receiving channels for engaging and holding pipe at a first location along its length when positioned in a pipe receiving channel;

second pipe engaging means carried by said mounting base on each of said opposite sides thereof and positioned for engaging and holding pipe at a second location longitudinally spaced from said first location;

means for rotating said sheave blocks about the axis of said axle so that a pipe which is positioned in one of said pipe receiving channels is bent into an arcuate form corresponding to that of the respective pipe receiving channel;

and wherein the opposingly mounted sheave blocks cooperate with one another such that the bending moments about the axis of said axle which result from the force required to bend a pipe substantially offset one another to thereby reduce the likelihood of shearing the axle from said mounting base.

4,926,673

PROCESS AND APPARATUS USING AN ELASTOFORMING DIE/FORM BLOCK COMPRISING LOW-HARDNESS SILICONE ELASTOMER

Claude Laurent, Annecy; Paul Rostaing, Vienne, and Rene Lyobard, Saint-Priest, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Division of Ser. No. 13,362, Feb. 11, 1987, Pat. No. 4,824,891. This application Jan. 27, 1989, Ser. No. 302,362
Claims priority, application France, Feb. 11, 1986, 86 01993
Int. Cl.[5] B21D *26/00*
U.S. Cl. 72—465 **3 Claims**

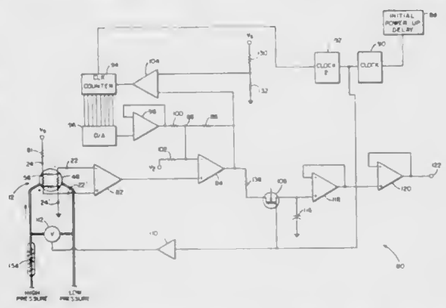
1. In an elastoforming process for the stamping of sheet material workpieces comprising the step of stamping said sheet material workpiece with an elastoforming die or form block, the improvement which comprises utilizing as said elastoforming die or form block therefor, a shaped silicone elastomer comprising a crosslinked fluid organopolysiloxane including at least one silicone-compatible organic or inorganic plasticizer within the crosslinked network thereof, said at least one plasticizer being stable and nonmigrating under elastoforming stamping conditions, and said at least one plasticizer being present in such amount that said plasticized silicone elastomer has a Shore 00 hardness of less than about 40.

4,926,674

SELF-ZEROING PRESSURE SIGNAL GENERATOR

Steven C. Fossum, Hopkins; J. Gregory Sedivy, Prior Lake, and Wayne K. Savick, Eden Prairie, all of Minn., assignors to Innovex Inc., Hopkins, Minn.

Filed Nov. 3, 1988, Ser. No. 266,819
Int. Cl.[5] G01L *27/00*
U.S. Cl. 73—4 R **11 Claims**



1. A method of generating a zeroed pressure signal comprising the steps of:

generating an electrical signal which varies as fluid pressure difference varies between two domains;

applying the electrical signal to the noninverting input of an operational amplifier;

applying a feedback signal from the output of the operational amplifier to the inverting input of the operational amplifier;

periodically eliminating the pressure difference between the two areas;

determining a compensation signal to be summed with the feedback signal at the inverting input of the operational amplifier to adjust the output signal of the operational amplifier to the value of a reference signal; and

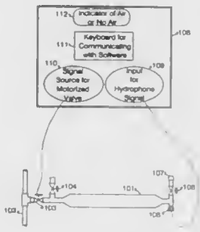
thereafter summing the determined compensation and feedback signals at the inverting terminal while pressure differences are allowed to occur between the domains.

4,926,675

AIR DETECTOR FOR LIQUID-FILLED SENSING LINES

Gerald A. Schohl, Knoxville, and Svein Vigander, Norris, both of Tenn., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Division of Ser. No. 169,917, Mar. 18, 1988, Pat. No. 4,858,460. This application Mar. 17, 1989, Ser. No. 325,277
Int. Cl.[5] G01N *33/00*
U.S. Cl. 73—19 **22 Claims**



1. An active comparative standing wave frequency system eminently suitable for measuring and comparing the characteristics of a fluid static in or flowing through containment means, said containment means including first conduit means, and said measuring of characteristics including detecting inhomogeneities comprising air pockets, gas bubbles, or both in said fluid within said first conduit means, said system comprising:

(a) void detection attachment means, said void detection attachment means comprising:

(1) second conduit means for containing a relatively small portion of fluid, said second conduit means operatively associated with said first conduit means;

(2) pressure transient inducing means operatively associated with said second conduit means;

(3) pressure response detecting means operatively associated with said second conduit means; and

(b) pressure response analyzer means coupled to receive the output from said pressure response detecting means, said pressure response analyzer means comprising:

(1) power spectrum indicative means for providing, over a predetermined frequency range, the distribution of the pressure fluctuations sensed by said pressure response detecting means, said pressure fluctuations effected in said second conduit means by virtue of same being induced therein by said pressure transient inducing means;

(2) storage means for the resulting distribution of said pressure fluctuations;

(3) retrieval means operatively associated with said storage means and with later mentioned standing wave frequency comparator means; and

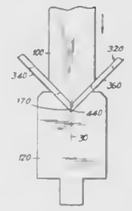
(4) standing wave frequency comparator means for effecting a comparison between the frequency distribution of said pressure fluctuations with previously stored frequency distributions, said previously stored frequency distributions subsequently retrieved from said storage means by said retrieval means, and said standing wave frequency comparator means thereby operable to detect a change in the quantitative value of inhomogeneities in said fluid within said first conduit means.

4,926,676

FORMING PROCESS FOR PRODUCING SHARP CORNERS IN SHEET METAL

Lowell Bailey, Long Beach, and Hervey Libbert, Redondo Beach, both of Calif., assignors to Lane & Roderick, Inc., Santa Fe Springs, Calif.

Continuation of Ser. No. 93,409, Sep. 4, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 332,416
Int. Cl.[5] B21D *9/08*
U.S. Cl. 72—389 **1 Claim**



1. A process for producing a sharp corner in a sheet metal workpiece along a transverse plane thereof, which comprises:

(a) placing the workpiece between a pair of forming dies,

the first, female die being in the form of a first pair of generally orthogonally directed intersecting planar surfaces,

the second, male die being in the form of a second pair of generally orthogonally directed intersecting planar surfaces having a nipple machined on the intersection of said second pair of surfaces and extending lengthwise thereof,

the intersections of said surfaces being aligned with one another and with the transverse plane in the workpiece,

and said nipple having a first dimension extending a substantial distance in the direction of the female die and a second dimension extending lengthwise of said dies defining a volume sufficient to displace the workpiece into substantially all of the region of the female die adjacent the intersection of said first pair of intersecting planar surfaces;

(b) forcing the workpiece into contact with said forming dies to bend it, in a single operation, along said transverse plane, the nipple imposing an additional forming force on the sheet metal to penetrate into at least about ½ of its thickness and displace a substantial amount of the sheet metal into said region and thereby form the sharp corner in the workpiece.

4,926,677

DIE APPARATUS

Kurt Waldner, 12260 Saraglen Dr., Saratoga, Calif. 95170

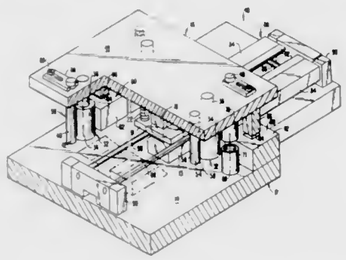
Filed Dec. 3, 1987, Ser. No. 128,291
Int. Cl.[5] B21J *15/24*
U.S. Cl. 72—430 **19 Claims**

3. Die apparatus comprising:

a pair of vertically spaced die plates, the lower plate adapted to mount a lower die and the upper plate adapted to mount an upper die aligned with the lower die, whereby the dies will perform at least one function on a work piece between the dies when the die plates move relative to and toward each other;

means coupled with the die plates for lifting the upper die plate away from the lower die plate, said lifting means permitting the upper die plate to be lowered until the upper die is in proximity to a work piece when the work piece is substantially supported on the lower die;

a pair of stop members on the die plates, one of said members having a resilient element engageable by the other stop member to deaden the sound when said power means is actuated; and



a solenoid assembly including a coil having a central opening and an armature receivable within the opening, said assembly being coupled with the die plates for applying a downward force on the upper die plate when the upper die is in proximity to the work piece so that the upper die is moved further downwardly in processing relationship to the work piece, whereby the power stroke of said power device is relatively short to thereby minimize the noise associated with the power stroke.

4,926,678

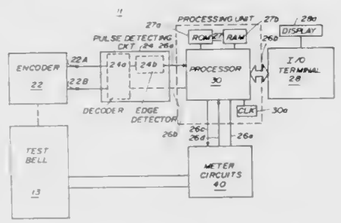
METHOD AND APPARATUS FOR PROVING ELECTRONIC GAS METERS AT LOW FLOW RATES

Arthur N. J. Pearman, St. Paul, Minn., assignor to Gas Research Institute, Chicago, Ill.

Filed Oct. 11, 1988, Ser. No. 255,644

Int. Cl.[5] G01F *25/00*

U.S. Cl. 73—3 **11 Claims**



1. A method for proof testing of an electronic fluid flow meter and the like at low flow rates, comprising:

supplying test fluid to the meter under test;

measuring the actual volume flow rate of test fluid supplied to the meter using a volume measurement standard apparatus and a timing means associated with the volume measurement standard apparatus for measuring the interval of time taken for the test fluid to pass through the meter;

enabling the meter to measure the volume flow rate of test fluid supplied to the meter during the time interval measured by said timing means and to provide data indicative of measured volume flow rate during said time interval;

and correlating the measured volume flow rate for the fluid passed through the meter with the actual volume flow rate in proving the operation of the meter.

4,926,679

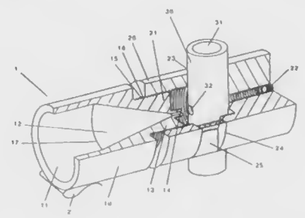
INERTIAL IMPACTION AIR SAMPLING DEVICE

Katharine H. Dewhurst, 13150 Wenonah SE. Apt. 727, Albuquerque, N. Mex. 87123

Filed Dec. 10, 1987, Ser. No. 130,926

Int. Cl.[5] G01N *31/00*

U.S. Cl. 73—28 **21 Claims**



1. A portable inertial impact sampler of solid aerosol particulates in gas, comprising:

a. cylindrical means for collimating a flow of gas, said means having an input end for receiving the gas and an output end for expelling the gas, said output end being shaped to provide a parallel flow of gas in a first direction;

b. tubular flow diverting means for diverting said parallel gas flow to a second direction normal to said first direction;

c. a sample collecting surface within said flow diverting means; and

d. mounting means, capable of being connected to said cylindrical means, for selectively

(1) adjustably spacing said surface to receive said parallel flow from said output end, said surface extending parallel to said second direction, whereby the size of particulates collected on said surface is controlled by the size of said output end, the rate of flow of said gas, and the spacing between said output end and said surface; and

(2) releasing said surface from said output end for measurement and analysis of particulates collected on said surface, said mounting means comprising

a central axis,

opposed first and second ends, said first end capable of being removably attached to said cylindrical means,

a transverse cylindrical bore located at said second end of, and extending through said mounting means perpendicular to said central axis, whereby said tubular flow diverting means is capable of being removably inserted and rigidly fixed into said bore for collection of solid aerosol particulates in a gas, and

a window aperture located in a wall of said mounting means opposite, but aligned with, said bore, whereby said tubular flow diverting means, when inserted into said bore, may be viewed for alignment with said output end of said cylindrical means.

4,926,680

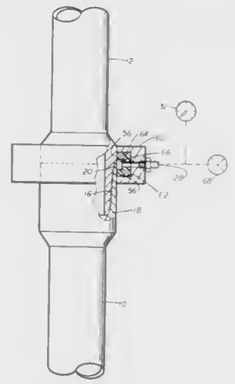
METHOD AND APPARATUS FOR EXTERNALLY AND INTERNALLY TESTING FOR LEAKS IN CONNECTIONS BETWEEN TUBULAR MEMBERS

Brian B. Hasha, 6114 Willowcrest Ct., Spring, Tex. 77389; Malvern M. Hasha, 14655 Champion Forest Dr., #1802, Houston, Tex. 77069, and Bruce B. Hasha, 19103 Owen Oak, Humble, Tex. 77346

Filed Feb. 9, 1988, Ser. No. 154,981

Int. Cl.[5] G01M *3/28*

U.S. Cl. 73—46 **13 Claims**



1. A method for externally hydrostatically testing an integral connection between two sections of pipe, each of said sections of pipe bearing threads on at least one of its ends, said pipe sections being joined together by threadedly engaging one of said pipe sections with the other of said pipe sections wherein an interference seal is provided between selected mating surfaces carried on corresponding male and female ends of said joined sections of pipe, and wherein an external radial orifice is defined between said joined sections of pipe which radial orifice is in fluid communication with a space defined between said threads borne on said male and female ends of said joined pipe sections, said method comprising:

supplying a leak testing apparatus having an annular housing including an annular seal which seal defines an annular chamber, and having a conduit formed in said annular housing and in said annular seal, to allow fluid communications between an exterior portion of said housing and said annular chamber,

placing said leak testing apparatus circumferentially about said connection with said annular housing surrounding and contacting an outer annular surface portion of said connection in a selected localized area, and with said annular chamber placed in fluid communication with said external radial orifice;

providing means for determining a possible leak in said connection and operatively connecting said means for determining to said conduits,

supplying a pressurized hydrostatic test fluid to said leak testing apparatus by moving said fluid from said exterior portion of said housing, through said conduit, through said annular chamber, and into said space between said threads;

selectively applying said pressurized hydrostatic test fluid principally in the vicinity of said external radial orifice without applying substantial test pressure radially to said outer annular surface portion of said connection in the vicinity of said interference between said mating surfaces on said corresponding male and female ends of said sections of pipe, which radially applied test pressures would tend to substantially affect said interference seal's bearing pressure; and

determining if said connection leaks through appropriate use of said means for determining.

4,926,681

CONTAINER CONTENT TESTER

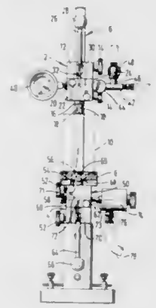
Nicholas B. Fitzpatrick, Haslemere, England, assignor to The BOC Group plc, Windlesham, England

Filed Sep. 8, 1988, Ser. No. 242,017

Claims priority, application United Kingdom, Sep. 9, 1987, 8721175

Int. Cl.[5] G01D *21/02;* **G01N** *7/00, 27/28*

U.S. Cl. 73—52 **12 Claims**



1. Apparatus for testing the contents of a sealed container holding a liquid under the pressure of gas in a head space, including a first piercer positioned and operable to penetrate a top of the container whereby to place the headspace of the container in communication with at least one gas passageway, and a second piercer positioned and operable to penetrate a bottom of the container whereby to place the liquid in communication with a liquid passageway.

4,926,682

VISCOSITY SENSOR

James W. Holm-Kennedy, and Scot P. McArthur, both of Hoooulu, Hi., assignors to The Research Corporation of the University of Hawaii, Honolulu, Hi.

Filed Jun. 3, 1988, Ser. No. 201,887

Int. Cl.[5] G01N *11/00*

U.S. Cl. 73—54 **27 Claims**



11. Viscosity sensor apparatus comprising a transducer, electrical driving means connected to the transducer, a substrate connected to the transducer, the substrate having a recess means which is at least partially closed by the transducer, thereby forming a gap, conduit means connected to the recess means for conducting fluid to and from the gap and impeding means connected to the conduit means for impeding

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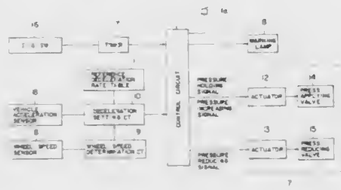
passage of the fluid in the conduit means, wherein when the transducer is energized by the driving means and volume of the gap is changed, and sensor means connected to the transducer for sensing time dependent response and for indicating viscosity of fluid in the gap.

4,926,683

METHOD OF TESTING A SET OF WHEEL SPEED SENSORS FORMING PARTS OF AN ANTI-LOCK BRAKE CONTROL SYSTEM

Seiichi Ishizeki, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 304,184, Jan. 31, 1989. This application Sep. 14, 1989, Ser. No. 407,137
Claims priority, application Japan, Feb. 3, 1988, 63-23527
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.1 **5 Claims**



1. A method of testing an anti-lock brake control system for a motor vehicle having a set of wheels, a wheel brake for each wheel, and a hydraulic unit to produce fluid pressure according to a predetermined sequence provided by the anti-lock brake control system, the anti-lock brake control system including a plurality of wheel speed sensors for detecting the rotational speed of each wheel and providing a wheel speed signal indicative thereof, a control circuit for controlling the fluid pressure, a terminal for receiving a check signal, and a warning device for indicating a malfunction of the anti-lock brake control system, the method of comprising the steps of:
- connecting the terminal and the warning device to the control circuit;
- applying a check signal received by the terminal to the control circuit;
- determining whether the check signal is applied to the control circuit within a first predetermined time period;
- maintaining the warning device in a check mode;
- successively rotating each of the wheels at a predetermined brake control speed and detecting wheel speed signals from the wheel speed sensors within a second predetermined time period;
- storing trouble data indicating that a speed sensor has failed to provide a wheel speed signal within the second predetermined time,
- retrieving any stored trouble data;
- displaying the trouble data;
- terminating the check mode of the warning device; and
- erasing the trouble data.

4,926,684

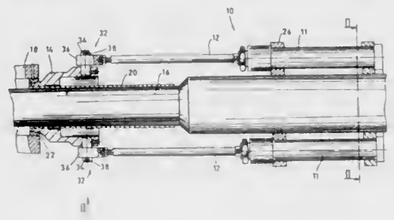
APPARATUS FOR DISSIPATING SHOCK-WAVE ENERGY EXPERIENCED BY A TEST MODEL

Moshe Zilberman, Maccabim; Mordechai Livne, Ramat Hasharon; Doron Tchetchick, Tel Aviv, and Moshe Daniel, Metar, all of Israel, assignors to Israel Aircraft Industries, Ltd., Israel

Filed May 19, 1989, Ser. No. 354,160
Claims priority, application Israel, May 23, 1988, 86471
Int. Cl.[5] G01M *9/00*
U.S. Cl. 73—147 **7 Claims**

1. Apparatus for dissipating shock-wave energy experienced by a test model having a base and being supported at a first location by a sting in a wind tunnel comprising:

tapered means movably mounted onto the sting for locking thereto at a second location the base portion of the test model and



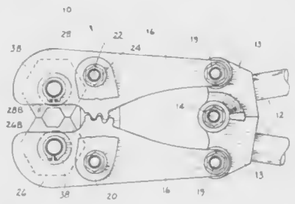
means for selectably moving said means for locking into and out of locking engagement with the test model and the sting.

4,926,685

ADJUSTABLE CRIMPING TOOL

John K. Shannon, Sr., 2000 S. Vincennes Cir., Racine, Wis. 53402

Filed Sep. 19, 1989, Ser. No. 409,100
Int. Cl.[5] B21D *7/06*
U.S. Cl. 72—410 **20 Claims**



1. In an adjustable crimping tool of the type having at least one jaw, a die wheel rotatably mounted thereon to selectively expose die portions with different profiles for accepting workpieces of different shapes and/or sizes, and means to secure the die wheel in selected position, the improvement comprising:
- the jaw and die wheel each having a non-round aperture therethrough, said apertures being in coaxial alignment;
- an axle extending through the non-round apertures with axially aligned first and second portions selectively engageable with the non-round apertures, the jaw and die wheel non-rotatable on the first portion and rotatable on the second portion, said first and second portions being axially movable with respect to both said apertures.

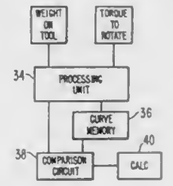
4,926,686

METHOD FOR DETERMINING THE WEAR OF THE CUTTING MEANS OF A TOOL DURING DRILLING A ROCKY FORMATION

Hubert Fay, L'Etang La Ville, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Sep. 19, 1988, Ser. No. 246,192
Claims priority, application France, Sep. 17, 1987, 8712928
Int. Cl.[5] E21B *44/00*
U.S. Cl. 73—151 **8 Claims**

7. A device for determining wear of the cutting means of a tool during drilling a formation, comprising instruments at the well bottom for measuring the weight W on the tool and the torque T required to rotate said tool, means for applying a weight on the tool during a test period, wherein device comprises means for transmitting the weight and torque measurements to a processing unit which converts said measurements into a curve representative of the torque variations according



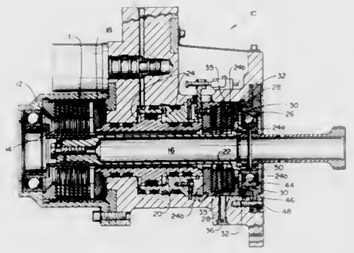
to the variations of the weight, means for memorizing said representative curve for a given test period, means for comparing different representative curves corresponding to successive test periods, and means for calculating the degree of wear on the basis of the variation of a valve corresponding to said representative curves.

4,926,687

SYSTEM AND METHOD FOR OBTAINING A GIVEN PRELOAD ON A SPRING

Eli Avny, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 3, 1988, Ser. No. 266,646
Int. Cl.[5] G01L *1/04*
U.S. Cl. 73—161 **16 Claims**



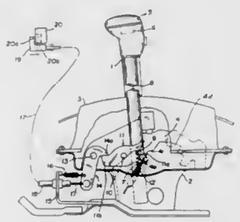
1. In a device which requires a given preload on a spring or other resilient member, a system for obtaining the given preload comprising:
- means for setting the spring under the influence of a given load;
- receptacle means for containing the spring and including at least one member positionally movable relative to a fixed member in response to said spring setting;
- first shim means for placing between the receptacle means and the spring for first adjusting the spring setting outside the device while the spring is under the influence of said given load whereby a position of the movable member is set responsive to the adjusting;
- second shim means for placing between the receptacle means and a portion of the device for readjusting the spring setting inside the device; and
- access means in the device to afford observation from outside the device of the position of the movable member inside the device to compare the readjusting with the first adjusting.

4,926,688

PARKING LOCK FOR AUTOMOTIVE VEHICLES

Isao Murasaki, Okazaki, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 301,518
Claims priority, application Japan, Feb. 26, 1988, 63-23835[U]
Int. Cl.[5] G05G *5/06*
U.S. Cl. 74—527 **3 Claims**



1. A parking lock for use in an automotive vehicle having an automatic transmission gear system with a rotatable output shaft and having a key cylinder adapted to receive an ignition key, said lock comprising:
- a selector lever adapted to be shifted into any one of a plurality of positions, including a parking position, said output shaft being locked against rotation when the lever is in parking position;
- a horizontally projecting detent pin secured to said lever and vertically movable from a first position when the lever is in any position other than the parking position to a second position when the lever is in the parking position;
- a detent plate which is engaged by the pin when the pin is in the second position and is disengaged from the plate when the pin is in the first position;
- a first cam rotatably pivoted to said detent plate and formed with a first abutting portion and an engaging portion, said engaging portion being engaged by said detent pin when the selector lever is set in said parking position;
- a second cam rotatsbly pivoted to said detent plate and formed with a second abutting portion adapted to abut said first abutting portion of said first cam;
- a connection member having first and second ends, the first end of the member connected to the key cylinder, the second end of the member being connected to an end of the second cam; and
- biasing means for biasing the first and second cams toward each other so as to bring the second abutting portion into positive abutment with said first abutting portion, whereby removal of the key from the key cylinder is permitted only when the selector lever is shifted to said parking position and the detent pin is in engagement with the detent plate.

4,926,689

PROOFMASS SUSPENSION ASSEMBLY FOR ACCELEROMETERS

Richard A. Hanson, 21220 NE. 156th Ave., Woodinville, Wash. 98072

Continuation of Ser. No. 899,975, Aug. 25, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 257,189
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—497 **20 Claims**

1. An improved pendulous type of proofmass suspension assembly for an accelerometer having a support structure, a sensitive axis, a proofmass, and sensing means including components thereof carried by said proofmass for detecting a response in said proofmass to an acceleration along said sensitive axis for indicating an acceleration of said accelerometer

along said sensitive axis, wherein said proofmass suspension assembly comprises:

a frame which is mounted to said support structure;

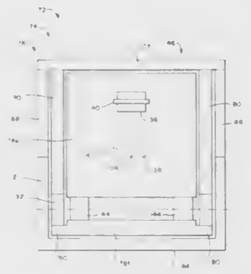
an isolation bridge;

one or more isolation bridge flexures; and

one or more proofmass flexures;

wherein said proofmass flexures and said isolation bridge flexures are thinner than both said isolation bridge and said proofmass in a direction parallel to said sensitive axis when the proofmass is at rest, whereby to support said proofmass for pivotal movement relative to said isolation bridge;

wherein said one or more proofmass flexures connect said bridge to one side of said proofmass such that the proofmass is supported in a pendulous manner for limited back and forth movement about an axis adjacent one side of the proofmass and through a resting plane which contains the proofmass when the latter is in its resting position;



wherein said isolation bridge is pendulously connected to said frame by said one or more isolation bridge flexures for pendulous movement toward and away from said resting plane;

wherein said one or more proofmass flexures are spaced from and are not directly connected in any substantial way with said one or more isolation bridge flexures; and

wherein said isolation bridge is supported by said isolation bridge flexures and said proofmass flexures in a sufficiently compliant manner to absorb random strains in order to substantially prevent random strains in said frame and said one or more isolation bridge flexures from reaching said one or more proofmass flexures and said proofmass and thereby possibly produce substantial errors in the output of said sensing means and indicate inaccurately an acceleration of said accelerometer.

4,926,690

PENDULOUS ACCELEROMETER AND/OR INCLINOMETER

Paul E. Oberg, 3231 Forest Crest Dr., Minneapolis, Minn. 55431

Filed Mar. 7, 1988, Ser. No. 164,558

Int. Cl.[5] G01P *33/401*

U.S. Cl. 73—514 **23 Claims**



1. A pendulous accelerometer indicating by deflection of an indicator element in an XZ plane a pendulous acceleration undergone by a mass accelerating in a YZ plane that is orthogonal to the XZ plane, the accelerometer comprising:

an X axis shaft, parallel to or coincident with an X coordinate axis;

a first pendulous mass, affixed to the X axis shaft, moving in an arc due to an accelerating force in the YZ plane so as to induce rotation of the X axis shaft;

a first member, affixed to the X axis shaft, defining at an extension from the X axis shaft and between two elements of the first member that are aligned approximately about radial lines from the X axis shaft a region that is capable of laterally interlocking a second member, the first member undergoing movement in the YZ plane corresponding to arcuate movement of the first pendulous mass;

a Y axis shaft, parallel to or coincident with a Y coordinate axis;

an angled helical second member in three dimensions and not in any one plane, affixed at two separated points to the Y axis shaft for an axis of rotation, and extending radially away from the Y axis shaft at these points until, a predetermined distance of separation having been reached, the second member runs along the length of the Y axis shaft at a pitch;

the X axis shaft being located in an plane that is normal to the Y axis shaft and that intersects the Y axis shaft in the region of the second member;

the second member laterally interlocked by the two elements of the first member's extended region so that movement of the first member and the two elements of its extended region responsive to X axis shaft rotation causes a corresponding rotation of the second member and of the Y axis shaft.

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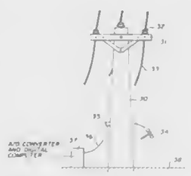
APPARATUS AND METHOD FOR TESTING WOODEN POLES

Douglas E. Franklin, Abbotsford; Maurice W. Murphy, and Richard A. Palylyk, both of Surrey, all of Canada, assignors to Powertech Labs, Inc., Surrey, Canada

Continuation-in-part of Ser. No. 838,538, Mar. 11, 1986, abandoned. This application Jan. 10, 1989, Ser. No. 295,478

Int. Cl.[5] G01N *29/04*

U.S. Cl. 73—579 **9 Claims**



1. A method of determining the stiffness and condition of a wooden pole in the ground comprising:

(a) initiating the natural vibration of the wooden pole in frequency band that covers at least two of the first five natural modes of vibration;

(b) generating an electrical response equivalent to the vibration motion of the wooden pole;

(c) converting the electrical response to a digital signal;

(d) calculating at least two of the first five natural frequencies of the wooden pole from the digital signal;

(e) formulating a mathematical model of the wooden pole in the ground, comprising a linearly tapered structural element connected to a spring, the linearly tapered structural element representing the portion of the pole above the ground, and the spring representing the portion of the pole below the ground;

(f) adjusting the magnitude of linear taper and spring constant in the mathematical model until the natural frequencies of the mathematical model are substantially the same as the natural frequencies of the wooden pole;

(g) calculating the stiffness of the mathematical model for the linear taper and spring constant thus obtained, this stiffness being equivalent to the stiffness of the wooden pole;

(h) changing the spring constant in the mathematical model to a very large value and recalculating the stiffness of the mathematical model; a and

(i) calculating the ratio between these two stiffnesses, called relative stiffness, which is a measure of the condition of the wooden pole near the ground line.

4,926,692

METHOD OF MEASUREMENT OF RESIDUAL STRESSES IN THE MATERIAL OF THE OBJECT UNDER TEST

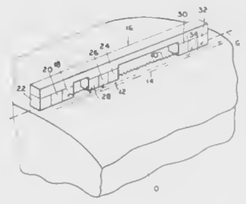
Andrzej Brokowski; Julian Deputat, and Krzysztof Mizerski, all of Warsaw, Poland, assignors to Polska Akademia Nauk Instytut Podstrowowych Problemow, Warsaw, Poland

Continuation of Ser. No. 35,064, Apr. 6, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 268,662

Claims priority, application Poland, Apr. 18, 1986, 259038

Int. Cl.[5] G01N *29/00*

U.S. Cl. 73—597 **5 Claims**



1. A method of measuring residual stresses in the material of an object, comprising:

propagating surface and longitudinal and transverse subsurface ultrasonic waves in the material of an object in the same direction along one line parallel to a surface of the object;

detecting the travel times of the waves over a path length along the line of the object and a path of the same length in a standard of the same grade of material as the object;

determining experimentally the elastoacoustic constants and constants of proportionality for the material of the object; and

calculating residual stress components parallel and perpendicular to the direction of propagation of the waves from the travel times and constants.

4,926,693

CONTACTLESS ACTUATOR PISTON PROXIMITY SENSOR

James W. Holm-Kennedy; Eric H. Kawamoto, and Thomas T. Bopp, all of Honolulu, Hi., assignors to The Research Corporation of the University of Hawaii, Honolulu, Hi.

Filed Jun. 3, 1988, Ser. No. 201,940

Int. Cl.[5] G01S *15/32*

U.S. Cl. 73—597 **6 Claims**

1. A hydraulic actuator piston proximity sensor comprising: a chamber, an acoustic transducer, acoustical coupling means for acoustically coupling the transducer to the chamber, electrical driving means for driving the transducer whereby the transducer transmits ultrasonic energy through the said acoustically coupling means into the chamber, and monitoring means for monitoring electric characteristics of the transducer for determining piston position, wherein the transducer is a piezoelectric crystal and said driving means include means for



driving the transducer by a modulated frequency over a frequency range near the piezoelectric crystal's resonant frequency and wherein the monitoring means comprises means for determining the absolute proximity of the piston by measuring change in frequency between extreme in electrical impedance of the piezoelectric crystal by the monitoring means.

4,926,694

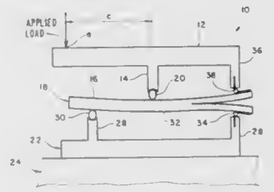
DELAMINATION TEST APPARATUS AND METHOD

John H. Crews, Jr., Grafton, and James R. Reeder, Hampton, both of Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 28, 1989, Ser. No. 386,172

Int. Cl.[5] G01N *3/00*

U.S. Cl. 73—794 **12 Claims**



1. An apparatus for testing a laminated composite specimen having upper and lower opposite surfaces and first and second ends, said second end being delaminated forming oppositely disposed lower and upper arms on said second end comprising:

a base having two opposite ends;

a first support extending upwardly from the base and movably supporting said first end of the specimen;

a second support extending upwardly from the base and being spaced from the first support and fixedly connected to the lower arm of said second end of the specimen;

a load applying beam having first and second ends and a fulcrum for abutment with the upper surface of the specimen at a point between the first and second supports;

a third support extending from said second end of said beam and being fixedly connected to the upper arm of the specimen at said second end of the specimen, the second and third supports being substantially aligned; and

means for applying a load to the beam at a point between the fulcrum and the first end of the beam thereby simultaneously generating opening and shear stresses in the specimen to increase the delamination at said second end.

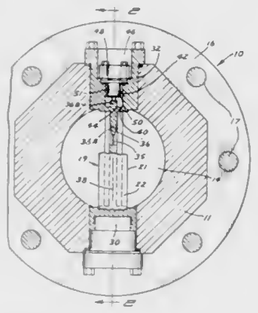
VOL
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4,926,695

ROCKING BEAM VORTEX SENSOR

Lowell A. Kleven, Eden Prairie, and Gary P. Corpron, Chanhassen, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 15, 1987, Ser. No. 96,954
Int. Cl.[5] G01F 1/32
U.S. Cl. 73—861.24 27 Claims



1. An apparatus providing an output indicative of a flow of fluid, comprising:

a housing which includes a body for inducing vortices in the fluid as a function of the flow, the housing having an isolation chamber therein;

a thin sensing diaphragm formed in the body and being supported at peripheral portions on the body and open to the fluid for deflecting laterally responsive to the vortices formed by the body;

a beam coupled to the sensing diaphragm to move laterally therewith and extending to an isolated beam surface positioned in the isolation chamber for transferring deflection of the sensing diaphragm to the isolated beam surface, the sensing diaphragm extending both upstream and downstream from the beam;

sensing means coupled to the isolated beam surface for sensing deflection thereof and for providing the output indicative of the flow; and

an isolator diaphragm formed in the housing and sealingly joined to the beam for isolating the isolation chamber from the fluid such that the sensing means are not in contact with the fluid.

4,926,696

OPTICAL MICROPRESSURE TRANSDUCER

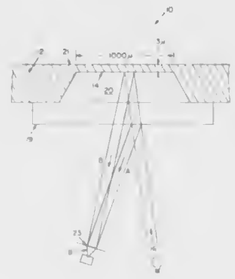
Joseph H. Haritonidis, Cambridge; Stephen D. Senturia, Boston; David J. Warkentin, Cambridge, all of Mass., and Mehran Mehregany, Merriam, Kans., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 19, 1986, Ser. No. 932,780
Int. Cl.[5] G01D 5/34; G01L 7/08, 9/00
U.S. Cl. 73—205 32 Claims

1. A diaphragm transducer involving Michelson-type interferometry comprising:

a diaphragm micromachined into a substrate, the diaphragm being responsive to pressure;

an optical surface connected to the substrate with a defined gap between the diaphragm and the optical surface, wherein one of the diaphragm and the surface is a transparent member and the other is a reflective member, where said transparent member serves as a fixed local reference plane by splitting a coherent source light beam into a locally reflected beam part and a transmitted beam part, the locally reflected beam part being immediately reflected from and the transmitted beam part being transmitted through a common surface of the transparent member such that the transmitted beam part of the split source beam is reflected off said reflective member and transmitted back through the transparent member, and the locally reflected beam part of the split source beam is reflected locally off the transparent member in a direction away from the reflective member to interfere with said transmitted beam part transmitted back through the transparent member after being reflected off the reflective member, the interference being indicative of the amount of deflection of the diaphragm due to a pressure applied across the diaphragm; and



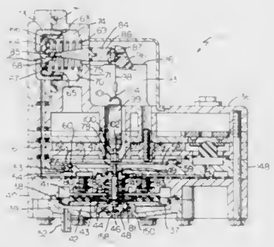
light detector means for detecting the interfering light and producing an indication of the amount of deflection.

4,926,697

DIFFERENTIAL PRESSURE TRANSMITTER, A SQUARE ROOT EXTRACTING DEVICE THEREFOR AND METHODS OF MAKING THE SAME

George T. Hardin, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 13, 1989, Ser. No. 297,665
Int. Cl.[5] G01F 1/46
U.S. Cl. 73—861.48 6 Claims



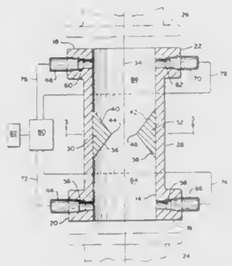
1. In a differential pressure transmitter comprising means for producing an output pneumatic signal from a pneumatic source in relation to the air velocity pressure of air flowing in a passage, means for sensing the difference between the total pressure and the static pressure of said air flowing in said passage, and means for extracting the square root of said air velocity pressure of said air from said pneumatic output signal as said pneumatic output signal is being produced so that said pneumatic output signal is substantially linear with respect to said air velocity of said air flow in said passage whereby said transmitter comprises a linear air velocity transmitter, said means for extracting the square root comprising a cam face that defines at least part of the involute of a circle, a roller having a surface that defines a substantially circular transverse cross-sectional configuration, said roller carrying said cam so that said cam rotates as said roller rolls on said surface thereof, a flat surface engaged by said surface of said roller so that said roller can roll on said flat surface, a movable wall carried by said transmitter and defining an output signal chamber therewith whereby the position of said wall is determined by the value of the pressure in said output signal chamber, rod means operatively interconnecting said wall to said roller to roll said roller on said flat surface as the value of said pressure in said output chamber changes, and a cable, said means for producing said output pneumatic signal comprising a bleed nozzle carried by said transmitter and a flapper lever pivotally carried by said transmitter for controlling said bleed nozzle, said means for sensing the difference between the total pressure and the static pressure comprising a housing having a pair of chambers separated from each other by a flexible diaphragm whereby one of said chambers is for receiving said total pressure therein and the other of said chambers is for receiving said static pressure therein, said flexible diaphragm having a post that is operatively interconnected to said flapper lever to transmit movement of said diaphragm to said flapper lever which will produce said output pneumatic signal with said nozzle, said cam face of said cam being operatively interconnected to said flapper lever by said cable, said cable having opposed ends one of which is operatively interconnected to said flapper lever and the other of which is secured to said cam face in such a manner that said cable is wound onto said cam face as said roller rolls on said flat surface in one direction and is unwound from said cam face as said roller rolls on said flat surface in the opposite direction to said one direction, the improvement wherein said rod means and said movable wall respectively have universal joint means snap-fitted together to provide for universal movement therebetween while movement of said wall causes said roller to roll on said flat surface, said transmitter having first stop means, said rod means having abutment means engaging said stop means when the value of said output signal is below a start point value thereof, said transmitter having a second stop means and an actuator spring operatively interconnected to said movable wall to move said movable wall against said second stop means when said transmitter is in a relaxed state thereof, said universal joint means having lost motion means therein to permit said wall to move against said second stop means after said abutment means of said rod means has engaged its respective stop means.

4,926,698

DUAL WEDGE FLOW ELEMENT

Raymond E. Owen, Rochester, N.Y., assignor to Process Automation Business, Inc., Columbus, Ohio

Filed Mar. 3, 1989, Ser. No. 318,696
Int. Cl.[5] G01F 1/42
U.S. Cl. 73—861.61 12 Claims



1. A liquid flow metering device comprising:

a body having a cylindrical wall defining a flow bore passing through first and second ends thereof;

means for connecting the first and second ends of the body to first and second cylindrical liquid impulse lines, respectively;

two substantially solid wedge members located in the bore symmetrically about the bore axis, each wedge member having a first surface oriented obliquely to the bore axis and generally facing the first end of the body, and a second surface oriented obliquely to the bore axis and generally facing the second end of the body, the first and second surfaces of each wedge member forming an apex edge that is spaced from and oriented substantially perpendicularly to the bore axis, each of the wedges having a peripheral surface opposite the apex edge, which conforms to and is selectively detachable from the wall;

first sensor means, for sensing the fluid pressure at a first location within the bore between one of said first surfaces and the first end of the body; second sensor means, for sensing the fluid pressure at a second location within the bore between one of said second surfaces and the second end of the body;

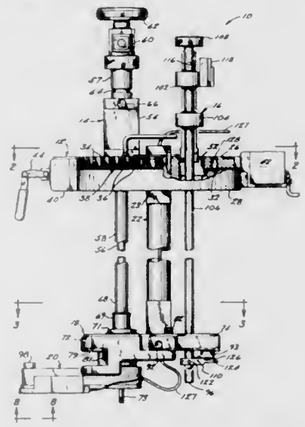
whereby the fluid flow rate through the bore can be determined from the sensed pressures at the first and second locations.

4,926,699

TORQUE TOOL

Luigi C. Salce, Sr., Quinebaug, Conn., assignor to Advance Manufacturing Co., Inc., Westfield, Mass.

Filed Apr. 3, 1989, Ser. No. 332,877
Int. Cl.[5] B25B 23/14; B23P 19/06
U.S. Cl. 73—862.21 12 Claims



1. A device for torquing and untorquing visible or hidden nuts on bolts disposed on a common circle of centers on an inner disk hub in the rotor assembly of a jet engine, said device comprising

(a) a bolt locating platform disposed outside of said rotor assembly,

(b) a trunnion assembly rotatably disposed within said rotor assembly,

(c) a connector connecting said bolt locating platform to said trunnion assembly in a predetermined relationship,

(d) a torquing assembly disposed on said platform and extending into said rotor assembly wherein it passes through said trunnion assembly to a point beyond same,

(e) a torque box disposed beneath said trunnion assembly, said torque box having one end thereof connected to said torquing assembly,

VOL 1114 ISS 4 MY 22 1990 UMI

(i) a nut socket disposed on the upper side of said torque box at the other end thereof, said nut socket being operably connected by gear means to said torquing assembly,

(f) a nut inserter assembly for transferring a nut from a point outside of said rotor assembly to a point within said rotor assembly wherein said nut is deposited in the nut socket of said torque box, and

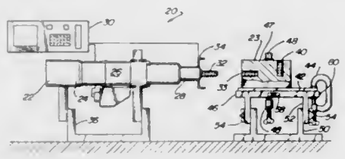
(g) means for monitoring and measuring bolt torquing and untorquing parameters.

4,926,700

BLIND HOLE THREAD GAUGE

Alphonso Peplinski, 35534 Mound Rd., Sterling Heights, Mich. 48310

Filed Mar. 27, 1989, Ser. No. 329,270
Int. Cl.[5] G01L *5/24*
U.S. Cl. 73—862.23 **10 Claims**



1. An apparatus for testing a threaded hole formed within a part, comprising:

a motor;

a driven rotary element driven by said motor;

a torque gauge and transducer monitoring the torque between said motor and said driven rotary element;

means for monitoring the torque readings from said torque gauge and transducer;

a threaded plug element mounted within said driven rotary element and dimensioned so as to approximate predetermined desired dimensions of a given threaded hole that is to be tested; and

control means that compare the monitored torque read-outs with predetermined minimum and maximum torque readings and identify whether a given threaded hole to be tested has been properly formed, a torque read-out that is less than the predetermined minimum or greater than the predetermined maximum identifying an improper threaded hole.

4,926,701

PIPETTING METHOD AND APPARATUS

David J. Tompkins, Ashford, England, assignor to Kontron Instruments Holdings, NV., Curacao, Netherlands

Continuation of Ser. No. 80,138, Jul. 31, 1987, abandoned. This application Mar. 9, 1989, Ser. No. 323,249
Claims priority, application Switzerland, Aug. 14, 1986, 3263/86
Int. Cl.[5] G01N *1/14*
U.S. Cl. 73—864.15 **5 Claims**

1. A pipetting apparatus for accurately pipetting a predetermined quantity of a liquid, comprising:

a. probe means for receiving and dispensing the predetermined quantity of a liquid;

b. a fluid line connected to the probe means;

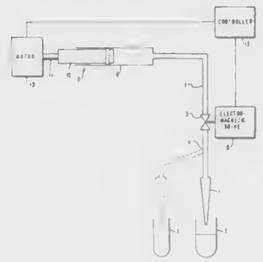
c. pump means connected to the fluid line for drawing air and the predetermined quantity of liquid into the probe means during an intake phase and expelling the air and predetermined quantity of liquid from the probe means during a delivery phase;

d. flow control means interposed in said fluid line between the probe means and pump means for permitting the air and predetermined quantity of liquid to flow therethrough when said flow control means is in an open state and hindering flow of the air and predetermined quantity of liquid therethrough when said flow control means is in a closed state; and

e. controller means connected to said pump means and flow control means for controlling the intake phase and delivery phase of said pump means and the open state and closed state of said flow control means, such that

(i) the flow control means is in the open state during the intake phase of the pump means, whereby the air and predetermined quantity of liquid may be drawn into the probe means during the intake phase;

(ii) the flow control means is in the closed state for a



portion of the delivery phase of the pump means to hinder flow of the air and predetermined quantity of liquid there through thereby compressing the air and retaining a portion of the predetermined quantity of liquid; and

(iii) the flow control means is returned to the open state during the delivery phase of the pump after compression of the air to thereby cause the pipetting apparatus to rapidly expel the compressed air through the probe means creating an air stream which entrains the retained portion of the predetermined quantity of liquid not previously expelled, thereby accurately pipetting the predetermined quantity of liquid.

4,926,702

SAMPLE PRESENCE DETECTOR FOR AUTOMATIC SAMPLE INJECTOR

Donald E. Stephens, Palo Alto, and Manfred W. Unterbusch, Sunnyvale, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 18, 1987, Ser. No. 98,573
Int. Cl.[5] G01N *1/14*
U.S. Cl. 73—864.83 **20 Claims**



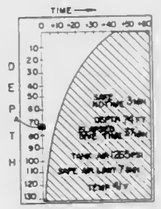
1. In a chromatographic circuit including a sample injector valve for use in injecting sequential samples into an analyzer system wherein said system includes: a sample source including a sample within a conductive fluid; a fluid source having a substantially nonconductive fluid; an analyzer column; the injector valve including a stationary housing and a moving valve member, said valve including conductive material at a first electrical potential; said stationary housing having a plurality of ports, said ports being in fluid communication respectively with said sample source, said fluid source and said analyzer column; said movable valve member mounted to said housing and defining a sample trapping passageway, said movable valve member movable from a first position wherein said sample trapping passageway is in fluid communication with said sample source to a second position wherein said sample trapping passageway is in fluid communication with said analyzer column; one of said ports of said housing constituting a registered port communicated to said sample passageway when said movable valve member is in said first position; a pump for pumping said sample through said sample trapping passageway towards said registered port; and means for stopping said pump responsive to said movement of said sample, the improvement in said means for stopping said pump comprising: a conductive member electrically isolated from said valve penetrating said registered port immediately adjacent said sample passageway, said conductive member at a second electrical potential; circuit detector means electrically communicated to said conductor member for detecting the presence of said sample upon entrance to said registered port; whereby sample upon first entrance to said registered port immediately stops said pump.

4,926,703

METHOD AND APPARATUS FOR DETERMINATION AND DISPLAY OF CRITICAL GAS SUPPLY INFORMATION

William D. Budinger, 16 Southridge Dr., Kennett Square, Pa. 19348

Division of Ser. No. 169,651, Mar. 21, 1988, Pat. No. 4,876,903, which is a continuation-in-part of Ser. No. 142,370, Jan. 11, 1988, abandoned. This application Feb. 9, 1989, Ser. No. 308,509
Int. Cl.[5] G06F *15/42*
U.S. Cl. 73—865.1 **3 Claims**



1. A portable diving apparatus with a means for displaying to a diver critical safety information relating to depths and times, the information being displayed in a two dimensional Pictorial format and in a manner that provides the diver with a visual reference for his condition at the current depth in comparison with potential conditions at other times and depths where the diver may operate safely.

4,926,704

VALVE TEST PLUG

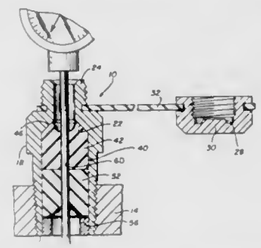
Robert J. Survil, Duncanville, and Robert T. Weber, Dallas, both of Tex., assignors to Flow Design, Inc., Dallas, Tex.

Filed Apr. 10, 1989, Ser. No. 335,891
Int. Cl.[5] G01L *7/00*
U.S. Cl. 73—866.5 **4 Claims**

1. An improved valve test plug for use with a slender, elongated test probe comprising:

a hollow valve body having a first end arranged for connection to a pressure vessel with the interior of the body exposed to the fluid pressure in the vessel and having a second end remote from said vessel, said body having an interior shoulder adjacent to said second end and a tapered interior surface on said shoulder;

a resilient valve core located in the interior of said body, a first end on said engageable with said shoulder in said body, said core having a second end and a slit sized to receive the test probe extending through first and second



ends of said core, the first end of said core being exposed to fluid pressure in said vessel to force the second end of said core into engagement with said tapered interior surface whereby said core is biased toward a smaller diameter forcing said slit closed; and

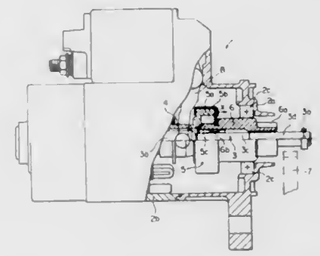
said resilient valve core also includes a first core portion including the first end of said core, and a second core portion including the second end of said core, said second core portion located in tandem relationship to said first core portion and being harder than said first core portion.

4,926,705

STARTER DEVICE FOR INTERNAL COMBUSTION ENGINES

Akira Morishita; Toshinori Tanaka, and Shuzoo Isozumi, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,643
Claims priority, application Japan, Oct. 7, 1987, 62-153526[U]; Nov. 6, 1987, 62-170612[U]
Int. Cl.[5] F02N *11/00*
U.S. Cl. 74—6 **10 Claims**



1. A starter device for an internal combustion engine, comprising:

a housing;

an output shaft rotatably supported by said housing;

drive means for driving said output shaft in one rotational direction;

a hollow shaft member disposed coaxially around said out-

VOL 1114 ISS 4 MY 22 1990 UMI

put shaft, said hollow shaft member being splined to said output shaft so as to slidable in the axial direction of said output shaft;

a hollow cylindrical member disposed coaxially around said output shaft at a front side of said hollow shaft member, said hollow cylindrical member having a portion, opposite the side near the hollow shaft member, at which the inner diameter thereof is reduced;

a pinion formed at the front end of said hollow cylindrical member at which the inner diameter thereof is reduced, said pinion being placed into driving engagement with a ring gear of said internal combustion engine when said hollow cylindrical member is slid to a front position on said output shaft;

bearing means coupled to an inner circumferential surface of said hollow cylindrical member for rotatably supporting said hollow cylindrical member around said output shaft, said bearing means allowing said hollow cylindrical member to slide in the axial direction of the output shaft;

one-way clutch means for sliding said hollow shaft member to said hollow cylindrical member for transmitting a rotational force in one rotational direction;

sliding means for sliding said hollow cylindrical member, together with said hollow shaft member, in the axial direction on said output shaft between a rear and a front axial limit position; and

a rust-preventive coating provided on an outer circumferential surface of said output shaft along an axial length which is situated axially in front of said bearing means when said hollow cylindrical member is slid to said front axial limit position, said axial length provided with said rust-preventive coating including at least a portion of said output shaft which projects out of said hollow cylindrical member when said hollow cylindrical member is at said rear axial limit position whereby sliding contact between said output shaft and said hollow cylindrical member is facilitated.

4,926,706

COAXIAL ENGINE STARTER

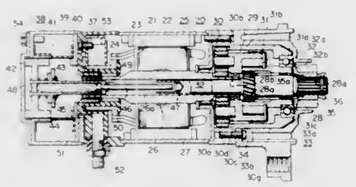
Shuzoo Isozumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,561

Claims priority, application Japan, Mar. 3, 1988, 63-51021

Int. Cl.[5] **F02N** *11/00;* **F16H** *57/02*

U.S. Cl. 74—7 A **2 Claims**



1. A coaxial engine starter comprising

an electric motor having a tubular armature rotary shaft;

an output rotary shaft disposed at a front end of said electric motor and having at a first end a pinion and axially slidably inserted into an inner bore of said armature rotary shaft at a second end;

planetary speed reduction gear including a sun gear formed around an outer periphery of a front end of said armature rotary shaft and a plurality of planetary gears meshing with said sun gear for reducing the rotational speed of said armature rotary shaft;

an over-running clutch including a clutch inner member fitted on said output rotary shaft for transmitting the rotation of said armature rotary shaft transmitted through said planetary speed reduction gear to said output rotary shaft;

a front bracket including an inner front bracket connected to said electric motor and containing therein at least said overrunning clutch and said planetary speed reduction gear and an outer front bracket connected to said inner front bracket;

a ball bearing having an inner and an outer race for rotatably supporting said output rotary shaft, said inner race of said bearing being held in its position by said clutch inner member and said pinion, and said outer race of said bearing being held in its position by said inner front bracket and said outer front bracket.

4,926,707

ACTUATOR FOR AUTOMOTIVE DOOR LOCKING DEVICE

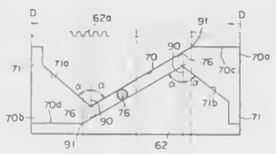
Shinjiro Yamada, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1988, Ser. No. 252,921

Claims priority, application Japan, May 1, 1986, 61-101807

Int. Cl.[5] **F16H** *25/18;* **E05C** *3/26*

U.S. Cl. 74—96 **3 Claims**



1. An actuator for an automotive door locking device comprising:

a rotating member **62** that is rotatable by a power source M;

a cam groove formed in the rotating member **62**;

a cam follower **76** that moves along the cam groove; and

a lock lever **31** which moves between a lock position and a unlock position as a result of the movement of the cam follower **76**;

the cam groove having a first groove **70** for moving the lock lever **31** between the lock position and the unlock position and a second groove **71** for moving the cam follower **76** between the ends **70***a*, **70***b* of the first groove **70** without using the first groove **70**,

the first groove **70** having on one of its side walls at least a first inclined wall **71***c*, for moving the cam follower **76** from one end **70***a* of the first groove **70** to the other end **70***b* and a second inclined wall **71***a*, which is inclined reverse to the first inclined wall **71***c*;

the first groove **70** having on the other side wall at least a third inclined wall **71***d*, for moving the cam follower **76** from the second end **70***b* to the first end **70***a* of the first groove **70** and a fourth inclined wall **71***b*, which is inclined reverse to the third inclined wall **71***d*;

whereby the first through fourth inclined walls **71***a*, **71***b*, **71***c*, **71***d* of the first groove **70** are cut in such a way that the pressure angles between the cam follower **76** and the first through fourth inclined walls **71***a*, **71***b*, **71***c*, **71***d* are almost constant.

4,926,708

APPARATUS FOR CONVERTING ROTARY MOTION INTO AXIAL MOTION

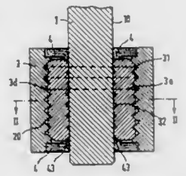
Johannes Dietrich, Gilching, and Bernd Gombert, Furstenfeldbruck, both of Fed. Rep. of Germany, assignors to Deutsch Forschungsanstalt fur Luft- und Raumfahrt e.V., Linder Hohe, Fed. Rep. of Germany

Filed Nov. 8, 1988, Ser. No. 268,892

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3739059

Int. Cl.[5] **F16H** *25/22*

U.S. Cl. 74—424.8 C **3 Claims**



1. Apparatus for converting rotary motion into axial motion, having a threaded spindle, an internally contoured nut surrounding the threaded spindle and capable of rotating relative to said spindle, and having a number of interposed contour rollers, wherein the threaded spindle (**1**) has a simplex or multiplex fine thread (**10**) on an outside surface thereof, the interior contour of the nut (**2**) that can rotate relative to the spindle comprises relatively coarse grooves (**20**), the rollers (**3***a* to **3***f*) have two differing contours (**31**; **32**) on alternating sections whereby one contour (**31**) fits the fine thread (**10**) on the spindle (**1**) and another groove contour (**32**) corresponds to the relatively coarse grooves (**20**) in the interior of the nut (**2**), wherein the one contour (**31**) produces the axial connection with the fine thread (**10**) on the spindle (**1**), and the other contour (**32**) produces the axial connection with the coarse groove contour (**20**) on the interior of the nut (**2**).

4,926,709

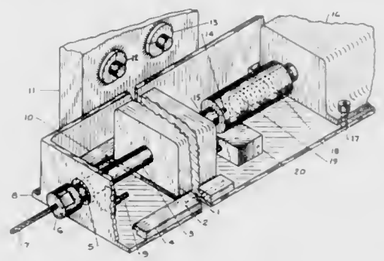
MOTION TRANSMITTING SYSTEMS FOR MACHINERY & MACHINE TOOLS

James J. Gardner, 700 East Fifth Ave., Lancaster, Ohio 43130

Filed May 16, 1988, Ser. No. 194,507

Int. Cl.[5] **F16H** *1/10*

U.S. Cl. 74—424.88 **13 Claims**



1. A motion transmitting system comprising:

an elongated spindle connected at its forward end to a tool carrier means;

said spindle being connected at its rear end to a front output means of a first rotary power means, which rotates said spindle about its longitudinal axis;

said first rotary power means having a rear output means, which is generally opposite of said front output means;

an elongated first connector is connected to said rear output means of said first rotary power means, which rotates said first connector about its longitudinal axis;

said first connector having at least one helical groove with corresponding ridges spiralling longitudinally thereof;

an elongated second connector having at least one helical groove with corresponding ridges spiralling longitudinally thereof, which are engaged with said first connector's helical grooves and ridges;

said first and second connector's helical grooves fitting slidably into one another's helical ridges such that dissimilar angular velocities between said first and second connector create longitudinal linear motion therebetween;

said second connector being connected to a second rotary power means which rotates said second connector about its longitudinal axis;

means anchoring said second rotary power means in a functionally engaging relationship with the system;

means restraining said second connector from linear movement while simultaneously permitting angular velocity thereof about its longitudinal axis;

supporting means;

said spindle, said first rotary power means, and said first connector move linearly in unison when first and second connectors rotate at said dissimilar angular velocities;

bearing means including between said first rotary power means and at least one supporting surface;

said first rotary power means being retained in alignment against a supporting means by at least one retaining means, which permits linear movement in a predetermined direction relative to the longitudinal axis of said spindle;

enclosing means;

shock-absorbing means;

stopping means controlling linear movement;

angular velocity control means;

angular velocity brake means;

said first rotary power means being prearranged to rotate a predetermined amount faster than said second rotary power means;

said first and second rotary power means rotating in the same direction;

a sequence of operations as follows: first, activation of said first rotary power means resulting in rapid advancement of said spindle to a first predetermined position; second, activation of said second rotary power means resulting in feed advancement of said spindle to a second predetermined position; third, deactivation of said first rotary power means resulting in rapid retraction of said spindle to a third predetermined position; fourth, deactivation of said second rotary power means, thus completing a cycle;

and control means for said sequence of operations.

4,926,710

METHOD OF BALANCING BLADE GAS TURBINE ENGINE ROTOR

Rudolph J. Novotny, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 94,213, Sep. 8, 1987, Pat. No. 4,848,182.

This application Feb. 13, 1989, Ser. No. 310,177

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] **F16F** *15/32;* **B21K** *3/04*

U.S. Cl. 74—573 R **4 Claims**

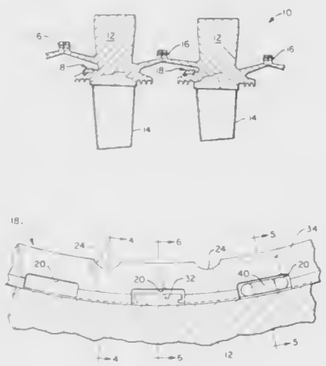
1. A method of balancing a bladed gas turbine engine rotor having a plurality of bladed disks comprising:

shrink fitting within each disk a balance ring;

spinning each disk together with the balance ring individually to determine the unbalance of the disk together with the balance ring;

correcting the unbalance of the disk together with the bal-

ance ring by removal of material only from the balance ring;
assembling a plurality of bladed disks to form a rotor;



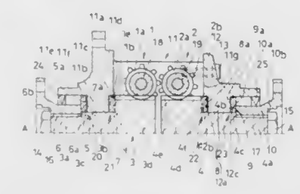
spinning the rotor to determine the unbalance of the rotor; and
correcting the unbalance of the rotor by adding weights at selected locations within the balance ring.

4,926,711

WORM GEAR TYPE DIFFERENTIAL MECHANISM

Yoshichika Arakawa, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 21, 1988, Ser. No. 273,609
Claims priority, application Japan, Nov. 21, 1987, 62-293099
Int. Cl.[5] F16H *1/44*
U.S. Cl. 475—227 5 Claims



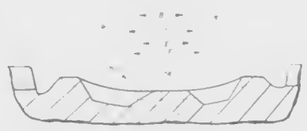
1. A worm gear type differential mechanism comprising:
a casing,
first and second shafts having axially aligned first and second ends rotationally disposed in said casing,
a first worm gear joined for common rotation with said first end of said first shaft, said first end facing said second end of said second shaft,
a second worm gear joined for common rotation with said second end of said second shaft,
a first worm wheel supported rotationally to said casing orthogonally to said first and second shafts, and engaged with said first worm gear,
a second worm wheel supported rotationally to said casing orthogonally to said first and second shafts and extending parallel to said first worm wheel, said second worm wheel engaging said second worm gear,
spur gears joined for common rotation with said first and second worm wheels, respectively, and engaged with one another, and
bias ratio equalizing means disposed between said casing and said first and second worm gears operating in response to the occurrence of relative rotation between said first and second shafts for equalizing the ratios of torque acting on said worm gears such that the ratio of the torque T_1 acting on the worm gear of the faster shaft to the torque T_2 acting on the worm gear of the slower shaft is substantially equal regardless of which of said shafts constitutes the faster shaft, said first worm gear includes first and second axially spaced transverse faces, said casing including third and fourth axially spaced transverse faces, said first and third transverse faces being axially opposed to define a first space, said second and fourth transverse faces being axially opposed to define a second space, said second worm gear including fifth and sixth axially spaced transverse faces, said casing including seventh and eighth axially spaced transverse faces, said fifth and seventh transverse faces being axially opposed to define a third space, and said sixth and eighth transverse faces being axially opposed to define a fourth space, said bias ratio equalizing means comprising friction members disposed in said first, second, third and fourth spaces.

4,926,712

WORM WHEEL AND METHOD OF HOBBING SAME

Gene A. Stritzel, Rochester, N.Y., assignor to DK-Gleason, Inc., Rochester, N.Y.

PCT No. PCT/US86/02161, § 371 Date Oct. 15, 1986, § 102(e) Date Oct. 15, 1986, PCT Pub. No. WO88/02829, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 15, 1986, Ser. No. 363,910
Int. Cl.[5] F16H *00/00*
U.S. Cl. 475—227 33 Claims



1. An hourglass worm wheel having a longitudinal axis, a generally hourglass-shaped root surface and at least one gear tooth formed thereon, said root surface increasing in diameter from opposite ends of a mid zone which is substantially cylindrical and which cylindrical mid zone extends over a predetermined axial distance.

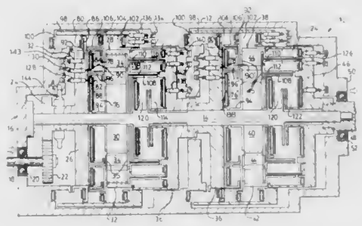
4,926,713

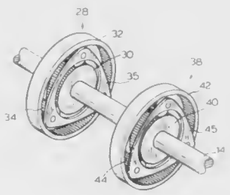
MULTIPLE GEAR-RATIO AUTOMATIC TRANSMISSION

E. Gaylord Madill, Edmonton, Canada, assignor to H.V.T. Technology Ltd., Edmonton, Canada

Filed Mar. 15, 1989, Ser. No. 323,979
Int. Cl.[5] F16H *37/00, 3/44, 57/10*
U.S. Cl. 475—146 6 Claims

3. The transmission of claim 1, wherein means for selectively transmitting power from said power input means comprises:
first power transfer plate means rotatably mounted on said stationary shaft adjacent to and operatively connected to said power input means, selectively-operable hydraulic clutch means connecting said first power transfer plate means and said sun gear, ring gear and planet carrier of said first planetary gearset, and selectively-operable hydraulic clutch means for connecting said sun gear to said stationary shaft and said ring gear and said planet carrier to a reaction sleeve.



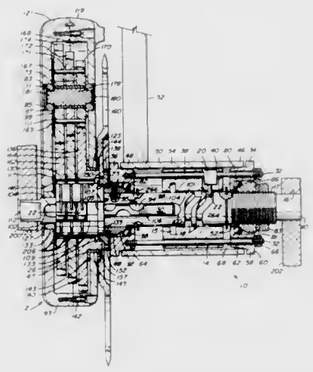


4,926,714

GEAR SELECTOR FOR BICYCLE HUB TRANSMISSION

Louis Bailey, Donniz Dr., Rte. 5, Box 60A, Slidell, La. 70460, assignor to Louis Bailey, Slidell, La.

Filed Sep. 21, 1988, Ser. No. 247,790
Int. Cl.[5] F16H *3/66*
U.S. Cl. 74—337.5 31 Claims



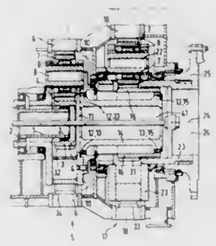
1. A reverse pedal-actuated, multi-speed bicycle transmission comprising:
a pedal shaft rotatably displaceable in a pedal shaft hub of a bicycle frame;
said pedal shaft hub having opposed open ends;
a plurality of drive gears rotatably disposed on said pedal shaft for selective rotational engagement therewith;
pawl means for selectively connecting each of said drive gears into driving engagement with said shaft;
a cam follower disposed about said pedal shaft for longitudinal displacement therealong;
cam follower support means supporting said cam follower to prevent rotation thereof;
cam follower engagement means engageable with said cam follower and said pedal shaft and responsive to an arc of reverse rotational displacement of said pedal shaft for displacing said cam follower longitudinally with respect to said pedal shaft; and
a pawl arm disposed on said pedal shaft for rotation therewith and longitudinal displacement thereon in response to cam follower displacement for effecting the selective connection of each of said drive gears into rotational engagement with said pedal shaft.

4,926,715

PLANETARY GEAR TRAIN

Manfred Hirt, and Heinrich Arndt, both of Augsbury, Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk AG, Fed. Rep. of Germany

PCT No. PCT/EP83/00034, § 371 Date Jul. 29, 1983, § 102(e) Date Jul. 29, 1983, PCT Pub. No. WO83/02810, PCT Pub. Date Aug. 18, 1983
PCT Filed Feb. 14, 1983, Ser. No. 519,763
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205208
Int. Cl.[5] F16H *57/10*
U.S. Cl. 475—337 4 Claims



1. A planetary gear train comprising at least two planetary gear sets arranged coaxially, one behind the other, and drivingly connected with one another, each planetary gear set having a sun gear, a stationary ring gear and a plurality of planet gears, said plurality of planet gears being between and engaging their respective sun and ring gears, each of said sun and ring gears having teeth lying on a pitch circle having a pitch diameter, one of sid planetary gear sets containing less planet gears than the other planetary gear set, the planet gears of both planetary gear sets and their respective bearings being identical to each other, the planet gears of said one planetary gear set being arranged in a first lateral plane transverse to the common axis of the planetary gear train and the planet gears of the said other planetary gear set arranged in another lateral plane transverse to the common axis of the planetary gear train, the said pitch diameter of the sun gear and of the ring gear of the said other planetary gear set being larger than the pitch diameter of the sun gear and ring gear, respectively, of the said one planetary gear set with less planet gears, and wherein said sun gears and said ring gears have the same strength and thus both sets are designed to approximately the same line loading of the teeth of the sun gears, planet gears and ring gears, wherein line loading is defined as the force per face width in the contact line of two teeth bearing against each other.

VOL
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4,926,716

METHOD OF CONTROLLING CONTINUOUSLY VARIABLE TRANSMISSION SYSTEM

Sadayuki Hirano; Katsuaki Murano; Yoshinori Yamashita, all of Shizuoka; Takumi Tatsumi, and Hiroaki Yamamoto, both of Hyogo, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 8, 1988, Ser. No. 229,899
Claims priority, application Japan, Aug. 10, 1987, 62-199411
Int. Cl.[5] B60K *41/16*
U.S. Cl. 74—866 6 Claims



1. A method of controlling a continuously variable vehicle transmission which has a movable input part driven by an engine, a movable output part, and ratio control means for drivingly coupling said input part to said output part with a selected drive ratio from a range of drive ratios, said engine having speed control means for facilitating control of the speed of said engine, comprising the steps of:

detecting a state of said speed control means and determining as a function thereof a first objective engine speed;

detecting an actual vehicle speed and determining as a function thereof a second objective engine speed;

detecting which of a plurality of states a motion control selector is in and then selecting a predetermined engine speed range corresponding to said detected state of said motion control selector;

determining as a function of said first and second objective engine speeds a third objective engine speed which is within said selected engine speed range; and

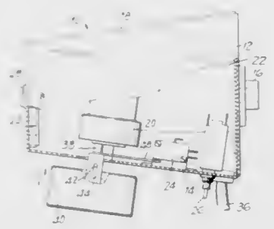
causing said ratio control means to vary said selected drive ratio as a function of said third objective engine speed.

4,926,717

BOTTLE UNCAPPING AND RECAPPING MACHINE

Francis Gomes, Jersey City, N.J., assignor to Manostat Corporation, New York, N.Y.

Filed Sep. 5, 1989, Ser. No. 403,088
Int. Cl.[5] B67B *7/18*
U.S. Cl. 81—3.2 8 Claims



1. A machine for the removal and reapplication of threaded caps from bottles having a screw threaded neck, comprising:

a frame;

a reversible electric motor supported by said frame;

an output shaft of said motor;

a chuck supported on said output shaft for rotation in unison with said output shaft and moveable between a first and a second position longitudinally of said output shaft;

electronic controller means controlling said motor and supported on said frame;

micro switch means for signaling the electronic controller; and,

an actuator of said switch means extending into the path of axial movement of said chuck for actuating said switch means upon movement of said chuck from a first position to a second position;

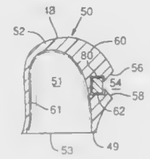
whereby, an initial axial movement of said chuck in one direction will actuate said electronic controller to cause rotation of said electric motor in one direction, and, a subsequent axial movement of said chuck in said one direction will cause further actuation of said micro switch means to produce reversal of the direction of rotation of said reversible electric motor.

4,926,718

NAIL HOLDING TOOL

Graham R. Cook, Britannia Beach, Canada, assignor to Clifford Lawrence Goodman, Britannia Beach, Canada

Filed Mar. 8, 1989, Ser. No. 321,643
Int. Cl.[5] B25C *3/00*
U.S. Cl. 81—44 4 Claims



1. A nail holding tool, comprising:

(a) an impact resistant sheath having a top end and an open lower end, a longitudinal axis extending from said top end to said open lower end, said sheath having an inner wall surface forming a hollow interior region sized to fit snugly over a user's thumb, and an outer wall surface said inner wall surface having an upper thumb tip engaging surface portion adjacent said top end; and,

(b) a nail holding fixture means supported in the outer wall surface of said sheath in a position between said thumb tip engaging surface portions and said open lower end for holding a nail below the tip of said thumb in a position extending substantially transverse to the longitudinal axis of said sheath, such that

said sheath, when fitted on said thumb, can move with movement of said thumb between a position extending away from the user's hand and a position extending across the palm region of the user's hand to grip a nail held in the palm of the user's hand.

4,926,719

SUPPLEMENTARY DEVICE FOR INSERTING SCREWS BY MEANS OF A POWER-DRIVEN SCREW DRIVER

Manfred Kross, Iserlohn, and Hans J. Plumer, Hemer, both of Fed. Rep. of Germany, assignors to ITW-ATECO, GmbH, Norderstedt, Fed. Rep. of Germany

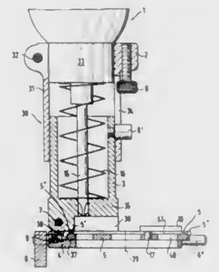
Filed Jun. 22, 1988, Ser. No. 209,893
Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717959
Int. Cl.[5] B25B *13/02*
U.S. Cl. 81—57.37 18 Claims

1. A supplementary device for driving fasteners by means of a tool having a longitudinal axis, comprising:

means coaxially disposed with respect to said tool for movably supporting said tool between a first retracted non-driving position with respect to said fasteners at which said tool is out of engagement with said fasteners, and a second extended driving position with respect to said fasteners at which said tool is disposed in engagement with one of said fasteners so as to drive said one of said fasteners into a workpiece;

a base plate mounted upon said tool supporting means so as to extend substantially perpendicular with respect to said longitudinal axis of said tool supporting means and said tool;

index disc means removably mounted and rotatably indexable upon said base plate for supporting said fasteners at a plurality of loci which define a circular arc which intersects said longitudinal axis of said tool wherein each one of said fasteners disposed along said cricular arc can be coaxially disposed with said tool along said longitudinnal axis thereof as said index disc means is indexed upon said



base plate such that said tool can engage said one of said fasteners disposed at an arcuate position corresponding to said longitudinal axis of said tool when said tool is moved from said first retracted position to said second extended driving position so as to drive said one of said fasteners into said workpiece during performance of a fastener driving operation; and

magazine disc means releasably supporting said fasteners upon said index disc means for permitting said fasteners to be released from said magazine disc means and said index disc means as a result of axial pressure applied to said one of said fasteners, disposed at said arcuate position corresponding to said longitudinal axis of said tool, by said tool as said tool engages said one of said fasteners as a result of being moved from said first retracted position to said second extended driving position during performance of said fastener driving operation.

4,926,720

RACHET SPANNER WITH OPEN MOUTH

Kurt Srzanna, Berlin, Fed. Rep. of Germany, assignor to Peter Wolter, Leonberg, Fed. Rep. of Germany

Continuation of Ser. No. 24,303, Mar. 10, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,200
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3609118; Mar. 25, 1986, 3610508
Int. Cl.[5] B25B *15/04*
U.S. Cl. 81—61 21 Claims

1. A ratchet spanner comprising:

a handle;

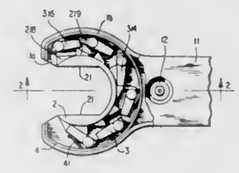
said handle including a head portion having upper and lower walls defining a space therebetween, and an opening for engaging an element to be rotated, said head portion including a side wall bordering said space;

said upper wall having a plurality of first apertures and said lower wall having a like plurality of second apertures;

a plurality of pawls pivotally mounted in said head portion adjacent said side wall;

each of said plurality of pawls having at least a pair of integral support posts, one of said support posts on each pawl being received in a respective one of said plurality of first apertures and the other of said pair of support posts being received in a respective one of said plurality of second apertures, whereby each one of said plurality of pawls is mounted on said head portion for pivotal movement with respect thereto;

a ratchet insert member in said space and rotatable with respect to said head portion, said ratchet insert member including a plurality of teeth engageable by respective ones of said plurality of pawls, said ratchet insert member having spaced gripping surfaces adapted for gripping a nut or the like, and



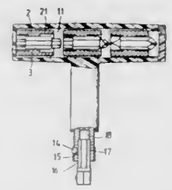
spring biasing means disposed in said space between said side wall and each of said plurality of pawls, said spring biasing means being engageable with said plurality of pawls for biasing each of said plurality of pawls into operative engagement with respective ones of said teeth, said spring biasing means including a sheet-like arcuate member adjoining said side wall having a plurality of spring members partially cut-out from said arcuate member which are biased into engagement with respective ones of said pawls to pivot each of said pawls into engagement with respective ones of said teeth.

4,926,721

MULTIPURPOSE HAND TOOL STRUCTURE

K. H. Hsiao, No. 4, Lane 11, Tzu Chiang St., Tu Cheng Shiang, Taichung Shien, Taiwan

Filed Jun. 29, 1989, Ser. No. 372,762
Int. Cl.[5] B25G *1/08*
U.S. Cl. 81—177.4 6 Claims



1. A multi-purpose hand tool structure comprising:

(a) a hollow handle portion for storing a plurality of sockets therein;

(b) a plurality of sockets for storage within the hollow handle portion;

(c) a socket connector

(d) each socket including a first hole at one end thereof for engagment• with said socket connector, a second hole at another end thereof for engaging a fastener head, and a middle through bole extending between the first and second holes, each middle through hole having an inner diameter sized to receive a cylindrical tool part therein;

(e) a cylindrical tool part disposable within the middle through hole of each socket, wherein the sockets and their corresponding tool parts may collectively be stored within the hollow handle portion; and

(f) engaging means for detachably selectively securing said

VOL 1114 ISS 4 MY 22 1990 UMI

socket connector or one of said tool parts to the tool structure.

4,926,722

QUICK-ACTION BAR CLAMP

Joseph A. Sorensen, and Dwight L. Gatzemeyer, both of Lincoln, Nebr., assignors to Petersen Manufacturing Co., Inc., DeWitt, Nebr.

Filed Aug. 19, 1988, Ser. No. 234,173
Int. Cl.[5] B25B *5/02*
U.S. Cl. 81—487 **24 Claims**



1. A quick-acting bar clamp comprising:
a fixed jaw;
a movable jaw for opposing said fixed jaw;
a slide bar, said movable jaw being mounted on one end of said slide bar, said slide bar being movable to bring said movable jaw toward and away from said fixed jaw;
support means for supporting said slide bar, said fixed jaw being connected to said support means;
one-way drive means for releasably engaging and, when engaged, for advancing said slide bar and attached movable jaw, said movable jaw being subject to advancement toward said fixed jaw when said one-way drive means is disengaged;
said one-way drive means having a driving lever, and a braking lever normally engaging said slide rod, said braking lever when engaging said slide bar preventing motion of said movable jaw away from said fixed jaw, and when disengaging said slide bar allowing advancement of said movable jaw away from said fixed jaw, said braking lever having an engaging portion extending outwardly from said support means,
a trigger handle pivotably mounted to said support means rearwardly of said braking lever and contacting said driving lever,
said engaged driving lever moving said slide rod and said movable jaw toward said fixed jaw,
said support means including a handgrip, a trigger-type relationship existing between said trigger handle and said handgrip, said bar clamp being holdable at said handgrip, said braking lever and the trigger handle being selectively operable by the same hand in such a manner that one of the index and middle fingers is positioned on the engaging portion of the braking lever to actuate the braking lever, while the other fingers encircle and contain the trigger handle and the handgrip.

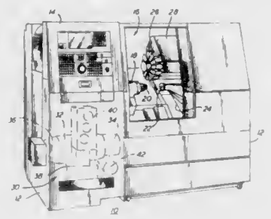
4,926,723

MACHINE TOOL AUXILIARY FUNCTION HYDRAULIC SYSTEM

Henry Lothammer, Manlius, N.Y., assignor to Ralph Earl Co., Inc., Syracuse, N.Y.

Filed Dec. 6, 1988, Ser. No. 280,571
Int. Cl.[5] B23B *23/00, 7/04*
U.S. Cl. 82—118 **5 Claims**

1. Modular hydraulic assembly for an automated machine tooler of the type that has a rotary spindle that carries a collet into which a workpiece can be secured, a tailstock which is movable forward to contact said workpiece and movable away from the workpiece to a home position, a spindle brake which is held out of engagement with said spindle to permit rotation thereof and is urged into braking engagement with said spindle to halt said rotation, and a rotary tool turret for holding a plurality of tools at respective rotary positions thereon, said turret being rotatable to bring a desired one of said tools into position to machine said workpiece, including a turret clamp which is movable between an unlock position to permit rotation of the turret and a lock position to hold the turret against rotation; said modular hydraulic assembly comprising a hydraulic circuit which includes a reservoir, a hydraulic pump, a pressure supply line carrying pressurized hydraulic fluid from said hydraulic pump, a return line carrying fluid to said reservoir, an accumulator coupled to said supply line for storing a quantity of said fluid substantially at the pressure of said pump; and a tailstock cylinder assembly which comprises a cylinder coupled to said tailstock and having first and second hydraulic connections to be coupled to said supply and return lines; a



tailstock valve coupled between said supply and return lines and the hydraulic connections of said cylinder, and having forward position, a neutral position, and a home position, in said forward position said return line and said supply line being connected respectively to said first and second hydraulic connections, and in said home position said supply line and said return line being connected respectively to said first and second hydraulic connections a tailstock pressure regulator disposed between said supply line and said valve providing a reduced hydraulic pressure through said valve to said cylinder; pressure sensing means for sensing the hydraulic pressure at said first hydraulic connection of said tailstock cylinder for detecting a pressure drop thereat to indicate contact of the tailstock with said workpiece and supplying a tailstock-in-position signal; and means actuating said tailstock valve in response to said tailstock-in-position signal to halt movement of said cylinder when said tailstock contacts said workpiece.

4,926,724

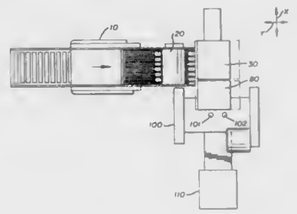
METHOD AND APPARATUS FOR MULTIDIRECTIONAL SHEET FEEDING

Joseph D. Bulso, Jr., Canton, and William R. Lewers, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Sep. 20, 1988, Ser. No. 246,772
Int. Cl.[5] B65H *5/16*
U.S. Cl. 83—35 **11 Claims**

9. A method of feeding sheets of material into a press comprising the steps of:
(a) depositing a first sheet of material on a feeder disposed adjacent the press;
(b) feeding the sheet into the press a predetermined distance in a first direction;
(c) performing a press operation on the sheet;
(d) moving the sheet in a second direction normal to the first;
(e) depositing a second sheet on a loader positioned adjacent the feeder remote from the press and in alignment with the feeder and the press along the direction of feed while said first sheet is on said feeder;
(f) repeating steps b through d until the press is ready to perform its last operation on said first sheet;

(g) moving said loader in said second direction until said first and second sheets are in alignment in said first direction; and



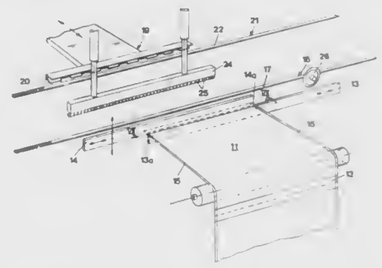
(h) simultaneously performing the last press operation on the first sheet while advancing the second sheet onto said feeder in said first direction.

4,926,725

DEVICE FOR ALIGNING AND CUTTING A WEB

Bernt Helgesson, Sandhult, Sweden, assignor to Akab of Sweden AB, Sweden

Filed Oct. 18, 1988, Ser. No. 259,051
Int. Cl.[5] D06H *7/02*; B26D *7/14*
U.S. Cl. 83—155 **7 Claims**



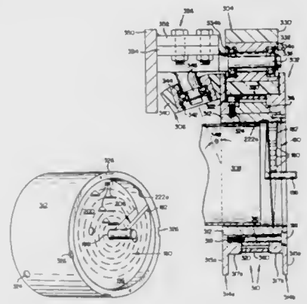
1. A system for handling a web which has longitudinal edges and alternating thick portions and thin portions, said system comprising:
first and second rulers for aligning the web with respect to a direction of travel of the web through said system, said rulers being elongated in a transverse direction which is substantially perpendicular to the direction of travel of the web through said system, said rulers being adjustably spaced apart so as to selectively (1) permit the thick portions and the thin portions of the web to pass between said rulers and (2) prevent the thick portions from passing between said rulers while permitting the thin portions to pass between said rulers, said rulers overlapping each other in the transverse direction so as to permit the longitudinal edges of the web to travel through said system without having to pass between said rulers, the extent to which said rulers overlap each other in the transverse direction being adjustable so that said system can handle webs of different widths;
means for seizing a portion of the web and for transferring the web to a conveyor; and
a pulling device for pulling the web in the direction of travel.

4,926,726

FOOD PROCESSING APPARATUS

John C. Julian, Richland, Wash., assignor to Lamb-Weston, Inc., Tri-Cities, Wash.

Continuation-in-part of Ser. No. 119,662, Nov. 12, 1987. This application Jan. 3, 1989, Ser. No. 292,926
Int. Cl.[5] B26D *3/11*
U.S. Cl. 83—165 **25 Claims**



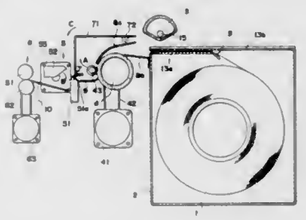
1. A rotary cutting apparatus used in food processing, comprising:
a substantially cylindrical cutter head assembly having an outer periphery, a cutting end, a discharge end and knife means mounted proximate said cutting end for slicing food items;
cutter head support means for supporting said cutter head assembly in a manner which permits said cutter head to rotate about a longitudinal axis, said support means including plural rotatable members in rolling contact with both said outer periphery and said discharge end, said cutter head assembly being supported only by said rotatable members; and
a drive belt frictionally engaging the outer periphery of said cutter head assembly and operable to apply a rotational force thereto.

4,926,727

CUTTING DEVICE FOR CUTTING STRIP OF RECORDING MEDIUM

Yutaka Maeda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 11, 1988, Ser. No. 231,212
Claims priority, application Japan, Aug. 21, 1987, 62-127897
Int. Cl.[5] B26D *5/20*
U.S. Cl. 83—203 **21 Claims**



1. A device, which is used as a feeder for cutting a strip of recording medium in the form of a roll into sheets and feeding each sheet, comprising:
delivery means for drawing out the strip of recording medium from the roll and for transporting the strip, said

VOL
1114
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delivery means being movable between a first position where the delivery means nips the strip and a second position where the delivery means is retracted from the strip;

cutting means disposed downstream from the delivery means with respect to the direction of delivery of the strip for cutting the strip into the sheet as transported by the delivery means by a specified length;

holding means provided between the delivery means and the cutting means for holding the leading end of the strip drawn out by the delivery means from the roll; and

control means for controlling operation of the delivery means and holding means, for first energizing the holding means to hold the leading end of the strip from the roll after a cutting operation of said cutting means and for thereafter retracting the delivery means to the second position, and for causing the leading end of the strip to be held by the holding means and said delivery means to be retracted from the strip to the second position until a successive drawing out operation of said delivery means.

4,926,728

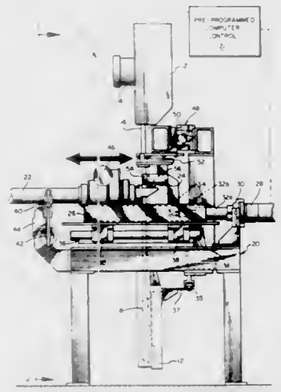
BAND SAW FOR CUTTING SHAPED PIECES OF BAR STOCK

James Kawabata, Niles, Ill., assignor to Contour Saws, Inc., Des Plaines, Ill.

Continuation of Ser. No. 904,157, Sep. 5, 1986, abandoned. This application Feb. 28, 1989, Ser. No. 316,984

Int. Cl.[5] B23D *53/08, 55/04, 55/08;* **B26D** *13/10*

U.S. Cl. 83—251 **8 Claims**



1. A band saw machine capable of making a plurality of saw cuts at any selected portion and to any selected depth along the entire length of a piece of bar stock comprising:

a band saw blade assembly having a saw blade and driving wheels mounted to a frame to permit movement of the band saw blade assembly in a direction generally perpendicular to the longitudinal axis of the bar stock;

a servo motor connected to the band saw blade assembly to provide movement to the band saw blade assembly in a direction generally perpendicular to the longitudinal axis of the bar stock;

a collet assembly comprising a rotatable collet connected to a gear assembly and a servo motor to enable the collet to rotate the piece of bar stock up to 360 degrees;

a bearing assembly comprising linear bearings and a servo motor connected to the collet assembly to provide movement to the collet assembly and bar stock in a direction generally parallel to the longitudinal axis of the bar stock;

an index vise assembly for moving the bar stock longitudinally through the collet in a direction generally parallel to the longitudinal axis of the bar stock;

a saw blade twist assembly for twisting the saw blade through an arc of generally 90 degrees; and

an automated control means connected to all servo motors for coordinating the movements of the band saw blade and the bar stock to enable the band saw blade to make selected cuts to any selected depth along any selected portion of the entire length of the piece of bar stock.

4,926,729

ENVELOPE OPENER

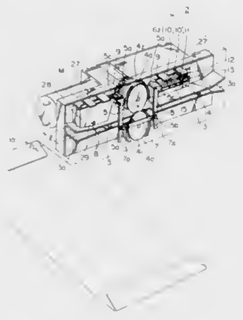
Hideo Igarashi, Tokyo, Japan, assignor to Elm Industry Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 390,854

Claims priority, application Japan, Sep. 5, 1988, 63-115895

Int. Cl.[5] B26D *5/38, 1/14*

U.S. Cl. 83—364 **1 Claim**



1. A double-entry type envelope opener provided with a pair of entries in its opposite sides through which an envelope may enter said opener from either side to have its head automatically cut as it passes through said opener, comprising:

a reversible electric motor;

a pair of rotary disc blades driven by said reversible electric motor, said rotary disc blades being vertically arranged;

a guide lane extending horizontally for guiding said envelope, said guide lane being interrupted by said pair of rotary disc blades so that said pair of rotary disc blades cross said guide lane;

a pair of bar-type swingable sensors vertically mounted in said guide lane to cross the lane, said bar-type swingable sensors being positioned in opposite sides of said pair of rotary disc blades;

a link connecting said pair of bar-type swingably sensors with each other to move them in synchronism when one of them is swung by an envelope passing through said guide lane; and

a pair of contact assemblies coupled with said pair of bar-type swingable sensors, one of said contact assemblies being operated by one of said bar-type swingable sensors to establish rotational directions of said reversible electric motor and said rotary disc blades when the head of an envelope enters said opener from either side and passes said guide lane in either direction to swing one of said bar-type swingable sensors, the other of said bar-type swingable sensors being swung through said link into a position where the other of said contact assemblies coupled with the other of said bar-type swingable sensors remains opened or turned off.

4,926,730

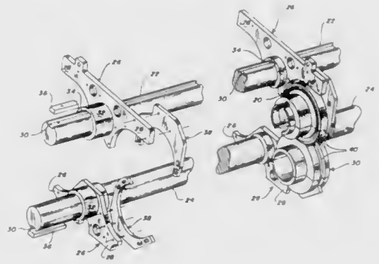
GUIDE FOR SLOTTING, SCORING, TRIMMING OR LIKE HEADS

Jimmy R. Garrett, Rte. 1, Box 569, Worden, Ill. 62097

Filed Aug. 30, 1988, Ser. No. 238,204

Int. Cl.[5] B26D *3/08, 1/24*

U.S. Cl. 83—499 **7 Claims**



1. A guide for slotting, scoring, trimming or like heads, said heads having a peripheral groove with a bottom and sidewalls and said guide including a plate with an arcuate bearing surface adapted to ride along the bottom of the peripheral groove provided therefor in the heads, said plate having opposite side faces and being thinner in crosssection than the groove is wide, said plate further having a plurality of recesses in the opposite side faces into which rollers are mounted for rotation off a side centerline of said plate, at least some portion of which rollers include means for adjustment of the roller's axis of rotation towards or away from the sidewalls of the groove.

4,926,731

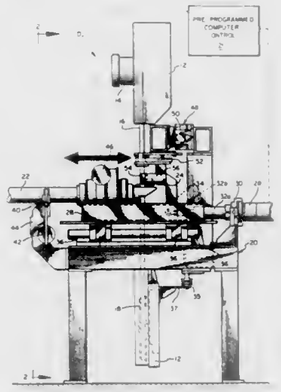
BAND SAW FOR CUTTING SHAPED PIECES OF BAR STOCK

James Kawabata, Niles, Ill., assignor to Contour Saws, Inc., Des Plaines, Ill.

Division of Ser. No. 904,157, Sep. 5, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 304,345

Int. Cl.[5] B23D *55/04;* **B27B** *13/00*

U.S. Cl. 83—789 **3 Claims**



1. An index vise assembly mounted to a band saw machine for controlling the indexing and longitudinal movement of a piece of bar stock being cut by a band saw blade comprising:

a pair of movable arms to which hardened jaws are mounted,

a threaded rod extending through the arms and providing the means for adjusting the position of the arms to accommodate varying sizes of bar stock,

a short stroke air cylinder mounted to the lower portion of one of the movable arms,

an adjusting means journaled through the lower portion of the moveable arm not supporting the air cylinder and abutting against the air cylinder, and

computer control means for engaging and disengaging the air cylinder, so that the bar stock may be indexed longitudinally forward.

4,926,732

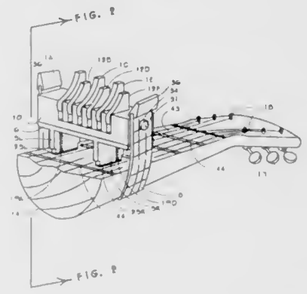
VARIABLE CHORD-FORMING CAPOTASTO

William D. Collins, Eagle's Aerie Farm, Rustic Hills Rte. 4, and Jeremiah Sundown, Rte. 4, both of Ashland City, Tenn. 37015

Filed Jun. 16, 1989, Ser. No. 367,485

Int. Cl.[5] G10D *3/04*

U.S. Cl. 84—318 **9 Claims**



1. A variable chord-forming capotasto, comprising:

a body;

means for releasably mounting said body to the neck of a stringed musical instrument; and

a plurality of string stopping means, one for each string on said instrument, said plurality of string stopping means being oriented on said body to engage the strings adjacent a selected fret, each of said string stopping means comprising a string engaging means individually actuated to depress the respective string into contact with said adjacent fret, and a cam lever pivoted on said body to selectively actuate said string engaging means and to lock said string engaging means in the actuated state.

4,926,733

SAW BLADE TENSIONING ARRANGEMENT

Kurt Janson, Mariannelund, Sweden, assignor to Aktiebolaget A.K. Eriksson, Mariannelund, Sweden

Filed May 22, 1989, Ser. No. 362,440

Claims priority, application Sweden, Nov. 27, 1986, 8605093; PCT Int'l Appl., Nov. 19, 1987, PCT/SE87/00543

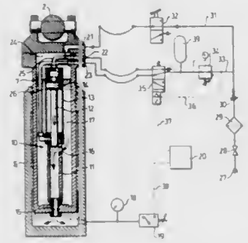
Int. Cl.[5] B23D *55/10;* **B27B** *13/08*

U.S. Cl. 83—819 **10 Claims**

1. A saw-blade tensioning arrangement for band saws and like machines, including a hydraulic cylinder (6) having movably arranged therein a piston (7) which is intended to activate saw-blade tension regulating means (2), so that the blade tension becomes dependent on the hydraulic pressure in the cylinder (6), characterized by means for pneumatically controlling the hydraulic pressure, these means including a pneumatically

VOL 1114 ISS 4 MY 22 1990 UMI

operated pressure booster (10), and means (19, 20, 35) for activating the pressure booster (10) at the end of a working



stroke of the hydraulic piston (7), so as to tension the saw blade (5) to a desired working tension.

4,926,734

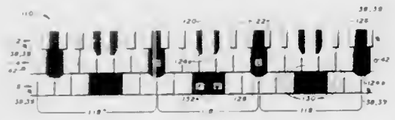
GRAPHIC/TACTILE MUSICAL KEYBOARD AND NOMOGRAPHIC MUSIC NOTATION

James C. Rickey, 16000 NE. 4th, Bellevue, Wash. 98008

Continuation-in-part of Ser. No. 59,606, Jun. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 827,515, Feb. 10, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 236,459

Int. Cl.[5] G10C *3/12*

U.S. Cl. 84—423 R 18 Claims



1. A graphic/tactile musical instruction system, comprising:

tone producing means for producing a musical note in response to the actuation of a selected key of a keyboard;

a graphic/tactile keyboard wherein actuation of any two adjacent keys within a single row causes the tone producing means to produce two musical notes separated by a whole tone, and actuation of any two adjoining keys in adjacent rows produces two musical notes separated by a half-tone, the keyboard having:

an upper row of keys positioned relatively farther away from the player, the upper row keys producing the notes C♯/D♭, D♯/E♭, F, G, A and B, wherein adjacent upper row keys are separated by a gap, and wherein selected upper row keys are graphically and tactilely differentiated from the remaining upper row keys, the upper row keys in a predetermined one or more highest octaval groupings being narrower than the upper row keys in octaval groupings below said narrower keys;

a middle row of keys positioned lower and relatively closer to the player than the upper row, the middle row keys producing the notes C, D, E, F♯/G♭, G♯/A♭ and A♯/B♭, wherein a longitudinal centerline of each middle row key is parallel to and laterally offset from the longitudinal centerline of an adjacent upper row key, and wherein the middle row keys have a uniform width approximately equal to the width of any selected one of the upper row keys plus the width of the gap separating the upper row key from an adjacent upper row key, and wherein selected middle row keys are graphically and tactilely differentiated from the remaining middle row keys; and

a lower row of keys positioned lower and relatively closer to the player than the middle row, wherein the longitudinal centerline of each of said lower row keys is aligned with the longitudinal centerline of a corresponding upper row key which produces the same note as said lower row key, wherein said lower row keys have a uniform width equal to the uniform width of the middle row keys, and wherein the frontmost ends of all said lower row keys are coplanar; and

a nomographic music notation system comprising musical notation wherein notes to be played on one row of the keyboard are graphically marked while notes to be played on another row of the keyboard are unmarked, said notation system, in addition to conventional key signature symbols, including in the key signature area nomographic symbols indicating the lines and spaces on which said graphically marked notes occur.

4,926,735

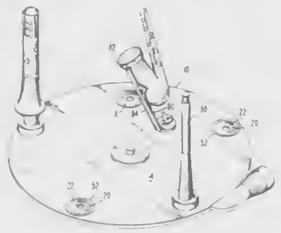
HEATED ROTATABLE MUSICAL INSTRUMENT STAND

Gary Smith, 256 W. 5th Ave., Collegeville, Pa. 19426, assignor to Mobile Music, Inc., Horsham; Gary Smith, Collegeville and Joseph Stefano, Oreland, all of, Pa.

Filed Feb. 3, 1989, Ser. No. 305,587

Int. Cl.[5] G10G *5/00*

U.S. Cl. 84—453 20 Claims



1. A heated rotatable musical instrument stand comprising:

(a) a base member defining a base inlet therein;

(b) a platform member rotatably mounted with respect to said base member to be separately rotatable with respect thereto, said platform member and said base member cooperating to define a heated air chamber therebetween in fluid flow communication with respect to said base inlet, said platform member further defining a plurality of mounting stations thereon, each mounting station including a mounting outlet means in fluid flow communication with respect to said heated air chamber to allow heated air to exit therefrom;

(c) a heating means in fluid flow communication with respect to said heated air chamber to supply heated air thereto;

(d) at least one instrument support member being detachably attached with respect to said mounting station on said platform member to facilitate retaining of a musical instrument thereon, said instrument support member being positioned adjacent said mounting outlet means to be heated by air exited therefrom, said instrument support member being rotatable with said platform member to facilitate instrument selection; and

(e) an outlet closing means positioned adjacent to each of said mounting outlet means and having a steady state closed position extending thereover to close said mounting outlet means and prevent air flow therethrough, said outlet closing means being adapted to be urged to the opened position responsive to said instrument support member being attached with respect to said mounting station to allow flow of heated air to said instrument support member.

4,926,736

ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC PERFORMANCE APPARATUS

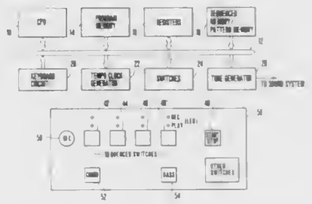
Koichi Kozuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 22, 1988, Ser. No. 210,030

Claims priority, application Japan, Jun. 25, 1987, 62-156600; Jun. 25, 1987, 62-156601

Int. Cl.[5] G10H *1/36, 7/00*

U.S. Cl. 84—609 13 Claims



12. An electronic musical instrument, comprising:

means for designating performance data for plural performance parts of a musical piece;

means for generating tones in accordance with designated performance data, including plural tone generation channels;

means for independently designating at least one tone generating channel for each performance part;

means for assigning each performance part to at least one available tone generation channel, the number of available tone generation channels for a particular performance part being equal to the number of tone generation channels designated for the particular performance part.

4,926,737

AUTOMATIC COMPOSER USING INPUT MOTIF INFORMATION

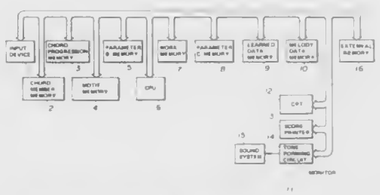
Junichi Minamitaka, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,592

Claims priority, application Japan, Apr. 8, 1987, 62-86571; May 20, 1987, 62-121037; Jun. 12, 1987, 62-145405; Jun. 15, 1987, 62-146963

Int. Cl.[5] G10H *1/38, 1/42, 7/00*

U.S. Cl. 84—611 62 Claims



1. An automatic composer comprising:

input means for providing motif information for composing a melody;

motif analyzer means for extracting motif-featuring parameters characterizing said motif information;

chord data source means for providing chord progression information; and

melody forming means for composing melody data in accordance with said motif-featuring parameters and also in accordance with said chord progression information.

4,926,738

ELECTRONIC RHYTHM PERFORMING APPARATUS GENERATING BOTH MANUAL AND AUTOMATIC RHYTHM TONES

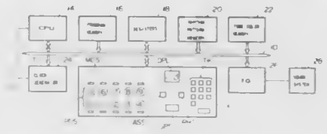
Masao Kondo, and Yasunao Abe, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 4, 1989, Ser. No. 293,219

Claims priority, application Japan, Jan. 6, 1988, 63-1082

Int. Cl.[5] G10H *1/22, 1/42, 7/00*

U.S. Cl. 84—618 14 Claims



1. An electronic rhythm performing apparatus, comprising:

(a) memory means for storing a rhythm pattern;

(b) automatic rhythm generating means for automatically generating an automatic rhythm signal representing an automatic rhythm performance in accordance with said rhythm pattern;

(c) manual rhythm generating means for generating a manual rhythm signal representing a manual rhythm performance in accordance with a manual operation thereof; and

(d) control means for restraining said automatic rhythm signal during a predetermined time interval in response to said manual rhythm performance so that said manual rhythm performance has priority over said automatic rhythm performance for the predetermined time interval.

4,926,739

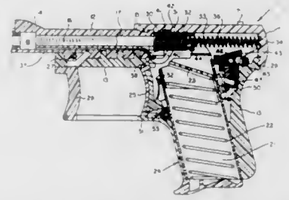
POLYMER GUN OPERATING HANDLE

David E. Byron, Casselberry, Fla., assignor to Red Eye Arms, Inc., Winter Park, Fla.

Continuation of Ser. No. 149,914, Jan. 27, 1988, abandoned, which is a continuation of Ser. No. 362, Jan. 5, 1987, abandoned, which is a division of Ser. No. 702,655, Feb. 4, 1985, Pat. No. 4,703,826. This application Mar. 10, 1989, Ser. No. 320,900

Int. Cl.[5] F41D *11/00*

U.S. Cl. 89—1.4 2 Claims



1. A weapon apparatus comprising in combination:

upper and lower polymer receivers;

a polymer bolt slidably mounted in said upper receiver and having a bolt spring;

a polymer hammer slidably mounted in said upper receiver and having a hammer spring;

a trigger;

an ammunition feed system;

a sear assembly having a sear therein;

a locking block for locking said bolt; and

an operating handle separate from said bolt and forming the forward member of a trigger guard, means slidably

VOL 1114 ISS 4 MAY 22 1990 UMI

mounting said operating handle on the lower polymer receiver, said operating handle having a top slide extending angularly upward and backward therefrom, such that when the operating handle is pushed rearward, said top slide impinges on said locking block to unlock the bolt and drives said hammer and bolt to a position where said hammer is engaged by the sear and said operating handle is released to let said bolt drive a cartridge in said ammunition feed system into the chamber.

4,926,740

LAUNCHERS FOR AIRBORNE MISSILES

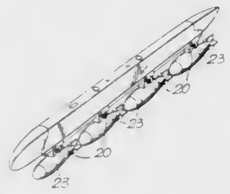
Dennis Griffin, and John R. Pearce, both of Surrey, England, assignors to Frazer-Nash Defence Systems Limited, England

Continuation of Ser. No. 139,774, Dec. 30, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,227

Claims priority, application United Kingdom, Dec. 31, 1986, 8631067

Int. Cl.[5] **F41F** *3/04, 3/052, 3/06, 7/00*

U.S. Cl. 89—1.819 **10 Claims**



1. A convertible rail launcher to carry airborne missiles or other airborne stores, comprising:

an elongated main launcher body for attachment to an aircraft to lie in a direction generally fore and aft of the aircraft,

a plurality of individual hook modules including a first cooperating attachment member at the top thereof each said hook module including a releasable suspension hook for carrying an airborne store,

hook-operating means for selectably releasing the hook to cause it to drop a store carried thereby,

interface means for supporting and securing said hook modules on said launcher body along the underside thereof said interface means including a second cooperating attachment member where said first and second attachment members cooperate to effect releasable attachment of the hook modules to the launcher body at selected positions along said interface means, and

a missile carrying sub-rail capable of substitution for the hook modules on said interface upon removal of said hook modules, said sub-rail including a first cooperating attachment member at the top thereof.

4,926,741

APPARATUS FOR DRIVING A COIL LAUNCHER

Zivan Zabar, Forest Hills, N.Y., assignor to Polytechnic University, Brooklyn, N.Y.

Filed Dec. 12, 1988, Ser. No. 283,254

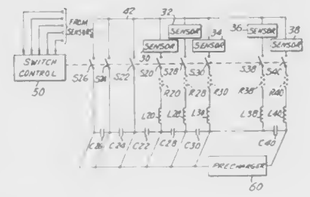
Int. Cl.[5] **F41F** *1/02*

U.S. Cl. 89—8 **15 Claims**

1. Apparatus for driving a coil launcher of the type having multiple energizable coils arranged in sections to drive a projectile therewithin and unconnected to said coils, said apparatus comprising a plurslity of pre-energized capacitance means cumulatively connected, one-at-a-time to sequential individual ones of said coil sections to add energy stored on previously connected capacitance means to the energy stored on the capacitance means next connected, whereby increasing energy at increasing AC frequency is supplied to successive ones of said coil sections, the improvement comprising

a number of switch means connected to respective ones of said capacitance means; and

means for activating said switch means one-at-a-time to cumulatively connect said capacitance means for supplying increasing energy concurrently to a predetermined plurality of said coil sections, the capacitance of the cumulatively connected capacitance means and the inductance of the predetermined plurality of coil sections determining a resonant frequency which increases as said capacitance means are cumulatively connected.



4,926,742

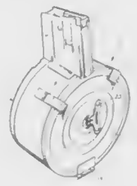
SPIRAL DRUM MAGAZINE WITH ELONGATED MAGAZINE CLIP AND SINGLE PIECE LAST ROUND FOLLOWER

Bao P. Ma, Atlanta, Ga.; Zhong Shou-Fu, Shandong, and Qin Z. Li, Gunmin, China, assignors to Poly Technologies, Inc., Beijing, China

Continuation-in-part of Ser. No. 920,046, Oct. 16, 1986, Pat. No. 4,745,842. This application May 24, 1988, Ser. No. 198,061

Int. Cl.[5] **F41D** *10/42*

U.S. Cl. 89—33.02 **13 Claims**



9. A magazine for feeding rounds of ammunition to an automatic weapon with said magazine comprising a drum, an outlet opening formed in said drum for passing rounds of ammunition from said drum, a clip magazine mounted to said drum about said outlet opening for passing rounds of ammunition radially from said drum to the weapon, a rotor for moving rounds of ammunition in a circular path toward said drum outlet opening, with said rotor comprising a pair of rotor plates maintained in spaced parallel relationship by a plurality of connector pins, said plates defining a plurality of circumferentially spaced radially outwardly facing slots for receiving rounds of ammunition, and a last round follower formed in a single piece and being positioned between said rotor plates and having a width less than the space between the rotor plates so as to be movable between said plates, said last round follower being pivotably connected at one end to inwardly opposing sides of said plates with the other end of said last round follower including a protrusion extending laterally through an opposing set of said radially outwardly facing slots.

4,926,743

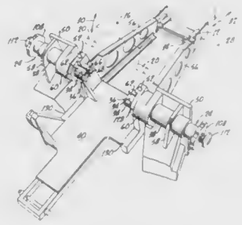
QUICK RELEASE GUN MOUNT ASSEMBLY

Richard E. Dodd, Santa Ana, Calif., assignor to North American Dynamics, Tustin, Calif.

Filed Jun. 26, 1989, Ser. No. 371,130

Int. Cl.[5] **F41A** *27/08*

U.S. Cl. 89—40.14 **10 Claims**



1. Gun mounting apparatus comprising:

coaxial gun fittings disposed on a gun;

a mating bracket disposed on said gun in a spaced apart relationship with said coaxial gun fittings;

quick release means for both engaging said coaxial gun fittings and enabling gun rotation thereabout; and

pivotable shoe means for slidably engaging the mating bracket and for supporting a substantial amount of the gun weight in order to facilitate movement of the gun and engagement of the coaxial gun fittings with the quick release means.

4,926,744

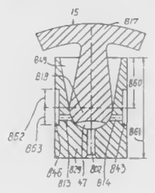
RADIAL PISTON HYDRAULIC MACHINE WITH PISTON HAVING TWELVE CIRCUMFERENTIAL FLUID BEARING POCKETS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 799,688, Nov. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 419,375, Sep. 17, 1982, abandoned, which is a division of Ser. No. 110,080, Jan. 7, 1980, Pat. No. 4,478,733, which is a division of Ser. No. 765,221, Feb. 3, 1977, Pat. No. 4,193,336, which is a continuation-in-part of Ser. No. 528,346, Nov. 29, 1974, Pat. No. 4,037,523. This application Mar. 28, 1988, Ser. No. 174,292

Int. Cl.[5] **F01B** *9/06, 13/06;* **F01M** *1/06*

U.S. Cl. 92—58 **5 Claims**



3. A piston and piston shoe arrangement for a radial piston machine wherein fluid flows through substantially radially directed cylinders, comprising, in combination,

pistons for reciprocation in said cylinders and piston shoes to be borne by said pistons and to be guided by a piston stroke guide ring while said piston shoes have outer and inner portions with said inner portions forming pivot portions with pivot faces of equal radii around pivot centers and with said outer portions forming slide faces to slide along a guide face of said piston stroke ring whereby said guide face holds said slide faces and said piston shoes parallel to a medial plane which is normal to the axis of the rotor which has said cylinders, while said pistons have in their outer ends hollow spherical pivot beds with bed faces of said radii and complementary configuration relative to said pivot faces to pivotably bear thereon said pivot portions of said piston shoes;

wherein said pistons are freely revolvable relative to said piston shoes due to the part spherical configurations of said beds and pivot portions;

wherein bores through said pistons communicate said beds with said cylinders;

wherein said pistons have outer faces to be guided on the inner faces of said cylinders and to seal said cylinders by close fits of said outer faces on said inner faces, while at least twelve peripheral angularly spaced pockets are provided through said outer faces into said pistons respective to the axes of said pistons at least partially radially of said pivot centers,

wherein passages extend from said pockets through portions of said pistons towards said bed and through said bed face, and;

wherein control recesses are provided in said pivot portions with said recesses extended parallel to said medial plane while they are narrow parallel to said axis of said rotor to communicate and discommunicate alternately during each revolution of said rotor and completion of a pivotal movement of said piston shoe on said piston said recesses with those of said passages which meet said recesses during said pivotal movement;

whereby fluid under pressure is passed from said cylinders through said bores, recesses and passages into those of said pockets which are close to said plane to exert forces onto said pistons which oppose forces which are exerted onto said pistons by said piston shoes during said pivotal movements of said shoes.

4,926,745

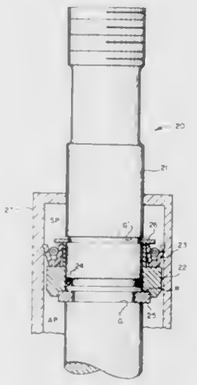
PULL ROD ASSEMBLY

Oliase C. Cioletti, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 21, 1988, Ser. No. 184,327

Int. Cl.[5] **F16J** *1/00*

U.S. Cl. 92—256 **4 Claims**



4. In a piston and rod assembly having a rod, a piston means disposed on said rod, and locking means for locking said piston means onto said rod, said locking means including first and second axially spaced grooves in said rod, a recess extending into said piston means, a first locking member disposed in said first groove and extending radially therefrom and into said

VOL
1114
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recess, a second locking member disposed in said second groove and extending radially therefrom into engagement with that portion of said piston means disposed adjacent to said second groove, the improvement comprising:

a piston means comprising a cylindrical adapter surrounding said rod and having first and second end portions respectively abutting said first and second locking members, wherein said recess is formed in said first end portion and said second end portion having an inwardly extending shoulder portion formed therein and said piston means further comprising a seal member disposed between said shoulder portion and said second locking member.

4,926,746

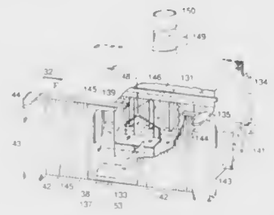
WORK CHAMBER WITH SHIFTING VENTILATION ZONE

Clyde M. Smith, 1705 Green Hills Dr., Nashville, Tenn. 37215

Continuation-in-part of Ser. No. 141,097, Jan. 5, 1988, abandoned. This application Jan. 18, 1989, Ser. No. 298,042

Int. Cl.[5] B05B *15/12*

U.S. Cl. 98—115.2 25 Claims



1. In a ventilated work chamber large enough to accommodate a worker and allow him to move about in the chamber and perform work activity in different locations in the chamber, said chamber being equipped with means for passing ventilating air through the chamber in a direction that is substantially perpendicular to a cross section of the chamber, at least a portion of said ventilating air being fresh air, and said air exiting the chamber through an exhaust face, and said chamber including means for exhausting to the atmosphere at least part of the air that exits the chamber, the improvement wherein the chamber includes (a) means for recirculating at least part of such ventilating air through the chamber, (b) a mobile, open cab operable to carry the worker from one location to another in the chamber and hold the worker as he performs his work activity in different locations in the work zone of the chamber, said cab having a rear portion and a front portion, and (c) means for delivering the fresh air to said cab from the rear, said cab and delivery means serving to substantially confine the fresh air component of the ventilating air passing through the chamber to a zone having a smaller cross section than the said cross section of the chamber, as well as to permit shifting of the location of said zone of moving fresh air about the chamber as the work activity shifts about the chamber, so as to be able to constantly maintain a flow of fresh air through the location of the work activity, even thought said location moves from place to place in the plane of the cross section of the chamber.

4,926,747

APPARATUS FOR MANUFACTURING SOY SAUCE

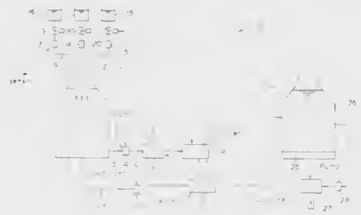
Hikotaka Hashimoto, and Kunio Kobayashi, both of Chiba, Japan, assignors to Kikkoman Corporation, Japan

Division of Ser. No. 173,373, Mar. 25, 1988, Pat. No. 4,888,190. This application Sep. 21, 1989, Ser. No. 411,392

Claims priority, application Japan, Mar. 25, 1987, 62-68942

Int. Cl.[5] B23Q *15/00*

U.S. Cl. 99—486 7 Claims



1. An apparatus for manufacturing soy sauce comprising:

at least one storage tank for storing a predetermined amount of raw soy sauce;

a sampling mechanism for sampling a portion of the predetermined amount of raw soy sauce;

an automatic multiple analyzer for receiving said portion of the predetermined amount of raw soy sauce from said sampling mechanism and simultaneously analyzing the concentration of at least two ingredients of the sampled portion of the raw soy sauce;

at least one control tank operatively communicating with said storage tank for storing at least one ingredient and supplying said at least one ingredient to the raw soy sauce in said storage tank;

control valves operatively coupled between said control tank and said storage tank for controlling the amount of the at least one ingredient to be supplied to the raw soy sauce in said storage tank;

control means operatively connected to said automatic multiple analyzer and said control valves for selectively opening and closing said control valves according to analytic results from said automatic multiple analyzer thereby to add the at least one ingredient to the raw soy sauce in said storage tank to adjust the concentrations of the at least two ingredients of the predetermined amount of raw soy sauce to target values; and

a mechanism for subsequently processing the raw soy sauce thus adjusted in said storage tank to obtain product soy sauce.

4,926,748

FRAMEWORK FOR SUPPORTING AND TYING STACKED WASTE PAPER AND NEWSPAPER

June Smith, and Steve Smith, both of 177 Viewbank Crescent, Oakville, Ontario, Canada (L6L 1R3)

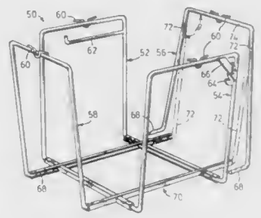
Filed May 26, 1989, Ser. No. 357,245

Claims priority, application Canada, May 27, 1988, 567980

Int. Cl.[5] B65B *13/00*

U.S. Cl. 100—34 8 Claims

1. Structure for the temporary storage of waste paper, the structure comprising two pairs of upstanding sides adapted to locate paper in a stack, and a bottom side to support the stack, the upstanding sides having respective anchor means to retain the ends of filament for securing said stack in a bundle, each pair of upstanding sides being fabricated from respective lengths of wire rod of which the ends are joined to form a closed substantially rectangular loop, each loop being bent upwardly at opposite ends to define said upstanding sides, and intervening portions of the loops being disposed one above the other at right angles to each other to define upper and lower supports comprising said bottom side, the upper support being



bent upwardly and horizontally where it meets the lower support so that the structure has an operatively lower surface which lies in a single plane.

4,926,749

ROTARY COMPACTION OF FIBROUS MATERIAL

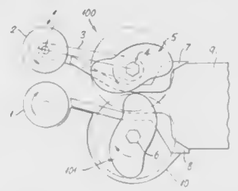
Michael A. Neale, Bedford, and Wilfred E. Klinner, Milton Keynes, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 220,202, Jul. 18, 1988, abandoned. This application Oct. 10, 1989, Ser. No. 418,963

Claims priority, application United Kingdom, Jul. 17, 1987, 8716869

Int. Cl.[5] B30B *5/00, 3/04*

U.S. Cl. 100—177 13 Claims



1. A compression device for compressing fibrous material comprising: two double-lobed rotors mounted for rotation on spaced parallel axes, one of said rotors when viewed along its axis of rotation being slightly of an S-shape and having a substantially constant width, except at the end portions thereof, that is at least of the order of one-half of the length thereof and the other of said rotors when similarly viewed along its axis of rotation being a mirror image of said one rotor, said rotors being connected to counter-rotate about said axes with a ninety degree phase difference therebetween said rotors being aligned and opposed and said axes being spaced apart a distance sufficient to enable intermeshing of said rotors while providing a continually varying passageway therebetween having an entrance end and an exit end, whereby during rotation of said rotors to apply periodic pulses of pressure to material within said passageway as the material is fed into said entrance end and passes between said rotors in a direction determined by their senses of rotation.

4,926,750

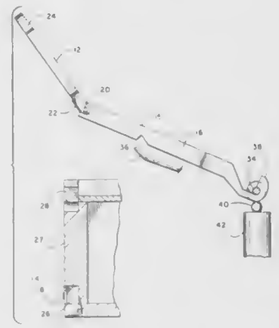
SAFETY LOCKING PULL RING

Peter H. Van Sloun, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 12, 1988, Ser. No. 256,444

Int. Cl.[5] F42C *15/22*

U.S. Cl. 102—261 12 Claims



1. Apparatus for a portable munition comprising:

(a) a flexible planar ring having an outward projection, extending in the plane of said ring and in a direction generally perpendicular thereto; the projection having pivot means attached thereto having a pivot axis in the plane of said ring and perpendicular to the projection; said ring being constructed to have a predetermined unstressed shape and a predetermined stressed shape, when compressed along a line perpendicular to the pivot axis in the plane of said ring;

(b) a planar side surface on the munition having a ring recess which can contain said ring, the ring projection, and the pivot means, when said ring is oriented with a predetermined angular orientation with respect to and with the planar surface parallel to the side surface; said recess being sized to contain said ring whether in the stressed or the unstressed shape;

(c) first ring securing means for said ring, when contained within said ring recess, arranged such as to prevent the unstressed shape but permit the stressed shape ring to be rotated out of said ring recess about the pivot axis.

4,926,751

ARRANGEMENT FOR DRAWING A BRAKING PARACHUTE OUT OF AN ARTICLE OF SUBMUNITION

Jurgen Wittman, Nuremburg; Wolfgang von Entress-Furstenecк, Leinburg, and Gunther Thurner, Schwaig, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremburg, Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,592

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1988, 3823446

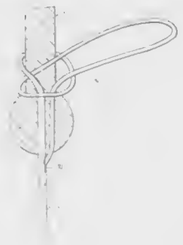
Int. Cl.[5] F72B *10/86*

U.S. Cl. 102—348 4 Claims

1. An arrangement for drawing a braking parachute out of a front article of submunition of a pair of submunition articles, including a pull line extending between the front and rear articles of submunition, said pull line having one end fastened to a stowage pack for a braking parachute of the front submunition and having the other end connected through a slip knot with the rear submunition; and a further line being fastened to the braking parachute which engages said slip knot and opens said knot after the drawing of the stowage sack from the para-

VOL 1114 ISS 4 MY 22 1990 UMI

chute, said pull line having a hose-like configuration and said further line extending as an internal line through said pull line,



said internalline being conducted outwardly of the pull line in a region proximate the slip knot.

4,926,752

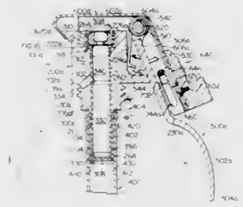
SAFETY FUZE FOR A HAND GRENADE

Vincent DiRubbio, 580 E. Ash St., Perry, Fla. 32347, and Edmund V. Galinski, P.O. Box 860, Andover, N.J. 07821

Filed Mar. 7, 1989, Ser. No. 319,694

Int. Cl.[5] F42B *27/08*

U.S. Cl. 102—486 **34 Claims**



1. A fuze for a hand grenade comprising:

(a) a fuze body having a top having a recess therein, a closed bottom, a head adjacent said fuze body top, a stem adjacent said fuze body bottom, and a central portion intermediate said fuze body head and stem, and a bore extending longitudinally through said fuze body, said recess having an opening therein, said opening in said recess defining the top of said bore and said closed of said fuze body defining the bottom of said bore, said head having a pair of opposed front and back walls, a pair of opposed side walls having back edges, and said fuze body central portion including engaging means for engaging the grenade;

(b) a primer positioned in said top of said bore and a delay charge positioned adjacent the bottom of said bore,

(c) detonator assembly means for detonating the hand grenade, said detonator assembly means including a detonator case sealingly engaging the exterior of said fuze body stem and an explosive detonator charge positioned in said detonator case;

(d) an initiator lever assembly mounted on said fuze body and rotatable between an unprimed position and a primed position, comprising:

an initiator lever having a longitudinal plane of symmetry, a distal end and a proximal end and top and bottom surfaces, said initiator lever being rotatable about said proximal end thereof between a first position corresponding to said unprimed position and a second position corresponding to said primed position, said initiator lever being elongated to prevent said initiator lever from being unknowningly released;

mounting means for mounting said proximal end of said initiator lever to said fuze body head adjacent said fuze body top for rotation about an axis perpendicular to said plane of symmetry of said initiator lever between said first position and said second position;

biasing means for biasing said initiator lever in said second position; and

a firing pin mounted on said initiator lever, said firing pin being positioned on said initiator lever to engage said primary when said initiator lever assembly is in said primed position;

(e) a cover assembly comprising a cover piece having a top portion covering said fuze body top and a bottom portion covering said back edges of said side walls, said cover assembly having pin-receiving apertures therein; and

(f) a pull ring assembly having elongated retaining pin means for retaining said initiator lever in said first position thereof when said retaining pin is inserted in said pin-receiving apertures.

27. A fuze for a hand grenade comprising:

(a) a fuze body having a head, a stem, and a central portion intermediate said head and said stem, and a bore extending longitudinally through said head, said central portion, and stem, said central portion including engaging means for engaging the grenade;

(b) a primer positioned in the top of said bore;

(c) detonator assembly means in sealing engagement with the exterior of said stem for detonating the hand grenade;

(d) an initiator lever assembly mounted on said fuze body and rotatable between an unprimed position and a primed position, comprising:

an initiator lever having a longitudinal plane of symmetry, a distal end, and a proximal end, said initiator lever being rotatable about said proximal end thereof between a first position corresponding to said unprimed position and a second position corresponding to said primed position, said initiator lever being elongated to define a handle to be restrained while holding and throwing the grenade;

mounting means for mounting said proximal end of said initiator lever to said fuze body head for rotation about an axis perpendicular to said plane of symmetry of said initiator lever between said first position and said second position;

biasing means for biasing said initiator lever in said second position; and

a firing pin mounted on said initiator lever, said firing pin being positioned on said initiator lever to engage said primer when sad initiator lever assembly is in said primed position;

(e) cover assembly means for protecting said primer and bearing against said initiator lever assembly; and

(f) retaining means for retaining said initiator lever in said first position thereof.

4,926,753

FLEXIBLE MATERIAL TRANSPORT SYSTEM

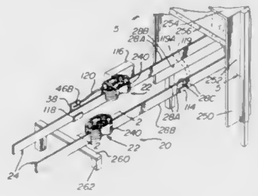
Mitchell Weiss, Haverford, Pa., assignor to Programmation, Inc., King of Prussia, Pa.

Continuation of Ser. No. 856,992, Apr. 29, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 243,141

Int. Cl.[5] B61J *3/00, 13/04;* **B60L** *11/08*

U.S. Cl. 104—88 **45 Claims**

45. A transport system for carrying material to various workstations at spaced-apart locations within a common facility, said transport system comprising a track extending past said workstations and at least one self-powered carrier for support said material thereon, said at least one carrier including a rechargeable battery means for powering it, characterized in that said carrier includes a charging means for the battery means, intelligent controller means for monitoring information indicative of the condition of the battery means and for providing instructions via signals to said charging



means for controlling charging of said batter means, said intelligent controller means being powered by said battery means.

4,926,754

CABLE WAY FOR SUSPENDED VEHICLES

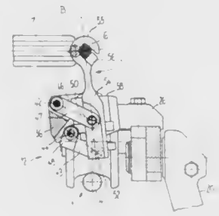
Fritz Feuz, Thun, Switzerland, assignor to Von Roll Transportsysteme AG, Thun, Switzerland

Filed Feb. 10, 1989, Ser. No. 309,348

Claims priority, application Switzerland, Feb. 10, 1988, 00472/88

Int. Cl.[5] B61B *7/02*

U.S. Cl. 104—112 **14 Claims**



1. Cable haulage apparatus comprising a pulling cable, vehicles, and means for securing said vehicles to said pulling cable, wherein the improvement comprises a guide member (1) defining a course of travel of said vehicles and having a long travel axis (L), said guide member including rigid curved sections, said pulling cable (6) runs along and is spaced from said guide member, said means for securing said vehicle to said pulling cable comprising roller mechanisms (12), each including travel rollers (18) in rolling contact with said guide member along the long travel axis, each said roller mechanism including means for rigidly connecting a grip (10) to said pulling cable in the direction of the long travel axis and for displaceably connecting said grip (10) in a plane extending transversely of the long travel axis, each said grip (10) is pivotally connected to the corresponding roller mechanism (12) by an articulated rocker (34) and includes means for allowing the grip displaceable in said articulated rocker, said grip is connected to said articulated rocker (34) by two link elements (46) for pivotal movement relative to said articulated rocker, and said link elements having spaced parallel axes for effecting pivotal movement of said grip.

4,926,755

RAIL CAR MOVING SYSTEM

Donald S. Seiford, Sr., Inver Gr. Hts, Minn., assignor to DS Industrial & Marine Co., Inc., Newport, Minn.

Filed Dec. 27, 1988, Ser. No. 290,138

Int. Cl.[5] B61B *13/12;* **B61J** *3/06, 3/08*

U.S. Cl. 104—183 **9 Claims**



1. A rail car moving system which comprises:

a guide track secured onto one end of rail track ties outside of and substantially parallel with supporting rails,

at least one truck supported by wheels and movable relative to said guide track to push a rail car for a desired distance,

said guide track having a configuration conducive to receiving said wheels of said at least one truck,

said at least one truck including two pair of pusher arms,

said pusher arms being adaptable to be recessed in a position lower than a side frame of a rail car and to be raised to an up position which engages said side frame of said rail car for pushing said rail car, and

means for moving said at least one truck for pushing said rail car.

4,926,756

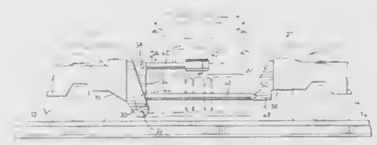
LONGITUDINAL STEERING LINKAGE FOR TRUCK WITH INTERAXLE YOKES

Roy E. Smith, Kingston, and Peter E. Timan, Sydenham, both of Canada, assignors to UTDC Inc., Kingston, Canada

Continuation of Ser. No. 327,375, Mar. 23, 1989, abandoned, which is a continuation of Ser. No. 78,742, Jul. 28, 1987, abandoned. This application Aug. 31, 1989, Ser. No. 407,677

Int. Cl.[5] B61F *3/00*

U.S. Cl. 105—167 **4 Claims**



1. A steering mechanism for use on a railway vehicle having a car body mounted on at least two trucks, at least one of said trucks having inboard and outboard wheelsets, and a truck frame, each of said wheel-sets having a steering yoke attached thereto, each said steering yoke having a generally C shaped configuration and extending laterally from adjacent one wheel of a wheelset to adjacent the opposite wheel of the wheelset, each said steering yoke further extending inwardly toward the other yoke of said truck and the two side yokes having a pivotal interconnection, said wheelsets supporting said truck and adapted for relative pivotal movement with respect to said truck about a generally vertical axis and,

a steering mechanism for guiding said wheelsets to a radial alignment when said vehicle is travelling on circular curved track, said steering mechanism being independent of any direct pivotal connections to said truck frame, said steering mechanism comprising,

a steering link connected to said car body remote from the longitudinal center line of said car body,

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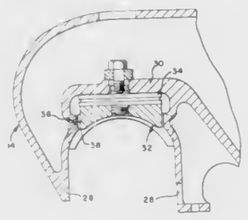
a steering lever pivotally connected to said steering link, and linkage mechanism interconnecting said steering lever and said inboard and outboard yokes whereby longitudinal movement of the connection between said steering link and said car body with respect to said truck when said truck rotates with respect to said body guides said wheelsets to a radial alignment.

4,926,757

ELECTRICALLY GROUNDED RAILWAY TRUCK

Charles P. Spencer, Staunton, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 30, 1989, Ser. No. 302,902
Int. Cl.[5] B61F 5/30
U.S. Cl. 105—224.1 1 Claim



1. An improved railway truck having wheels electrically insulated from side frames by a non-conductive elastomeric suspension pad interposed between said side frame and a wheel-axle bearing adapter, wherein the improvement comprises:

an elastic electrically conductive assembly extending between two spaced opposed surfaces of said side frame and said bearing adapter to form a conductive path between said side frame and said bearing adapter, said conductive assembly comprising; a conductive compression spring capable of expanding and contracting sufficiently to keep said spaced opposed surfaces in constant electrical contact throughout relative movement of said side frame and said bearing adapter during operation of said railway truck, said compression spring being seated in an aperture located in one of said spaced opposed surfaces and expanding into contact with the other of said spaced opposed surfaces and being in constant and continuous contact with said side frame and said bearing adapter.

4,926,758

PLAYTRAY WITH HINGED LEGS

Carol E. H. Lilly, Bellevue; Loyd C. Moore, Bellevue; Mark E. Eike, Bellevue, and Nicholas E. Barker, Seattle, all of Wash., assignors to Carol E. H. Lilly, Bellevue, Wash.

Continuation-in-part of Ser. No. 136,117, Dec. 21, 1987, Pat. No. 4,872,410. This application Apr. 25, 1988, Ser. No. 185,737
The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.
Int. Cl.[5] A47B 23/00
U.S. Cl. 108—43 13 Claims

1. A playtray for use with toys or blocks with at least one attachment surface, comprising:

a table top having first and second end portions and a table play surface with attachment means on said table play surface corresponding to the attachment surface of the toys or blocks for detachably fastening the toys or blocks thereto by their attachment surface;

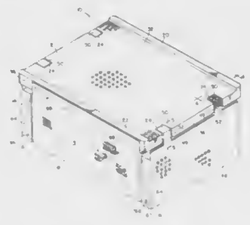
a first leg having a first leg play surface with attachment means on said first leg play surface corresponding to the attachment surface of the toys or blocks for detachably fastening the toys or blocks thereto by their attachment surface;

first hinge means for pivotally attaching said first leg to said table top first end portion;

a second leg having a second leg play surface with attachment means on said second leg play surface corresponding to the attachment surface of the toys or blocks for detachably fastening the toys or blocks thereto by their attachment surface;

second hinge means for pivotally attaching said second leg to said table top second end portion;

first latch means for latching said first leg against movement relative to said table top in at least first and second leg configurations;



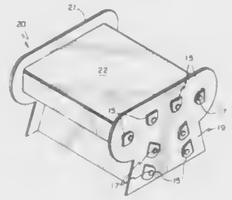
second latch means for latching said second leg against movement relative to said table top in at least said first and second leg configurations, wherein in said first leg configuration each said latch means latches the corresponding one of said legs in a position with said first and second legs extending generally transverse to said table top in a common direction to support said table top with said table play surface uppermost, and wherein in said second leg configuration each said latch means latches the corresponding one of said legs in a position with said first and second legs extending away from said table top in generally opposite directions and in a plane generally parallel with said table top to position said table play surface and said first and second leg play surfaces in generally coplanar arrangement to define an extended play surface.

4,926,759

KNOCKDOWN FURNITURE

Sally J. Vitsky, 4116 Bromley La., Richmond, Va. 23221, and Margaret P. Levine-Umans, 13 Bank St., New York, N.Y. 10014

Filed Aug. 31, 1989, Ser. No. 401,421
Int. Cl.[5] A47B 3/00
U.S. Cl. 108—111 19 Claims



1. Furniture which may be assembled and readily disassembled, comprising:

(a) at least one generally planar central member, having extended from edges thereof a plurality of tab members each having therein an aperture;

(b) at least one generally planar side member, having therethough a plurality of elongated slot-like first apertures for receiving said tab members, and a plurality of adjacent second apertures substantially matching said tab member apertures; and

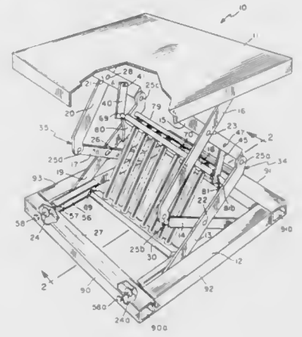
(c) expansible fastener means for securing said tab members to said side members by inserting said fastener means through said tab apertures and said second apertures.

4,926,760

SELF LEVELING TABLES

Allen J. Sack, 3 Township Rd., Waseca, Minn. 56093

Filed Jan. 27, 1989, Ser. No. 302,684
Int. Cl.[5] A47B 9/02
U.S. Cl. 108—145 11 Claims



1. A self leveling table having a top for holding stacked articles on the top of the self leveling table comprising:

a table top for holding stacks of articles;

a frame for supporting the self leveling table on a work surface; and

a pair of scissor arms for raising and lowering the table top each of said pair of scissor arms including two foldable members pivotally connected together and each of said pair of scissor arms having a first end for engaging said frame and a second end for engaging said table top, one of said pair of scissor arms including a first pivot member pivotally connected to said table top and a second pivot member pivotally connected to said frame, the other of said pair of scissor arms including a first sliding member slideably connected to said table top and a second slideable member slideably connected to said frame so that said table top can move toward or away from said frame as said pair of scissor arms connecting said table top to said frame are extended or folded;

a plurality of foldable springs having a first end, said first end including means for pivotally mounting said first end on said frame, said plurality of springs having a second end, said plurality of springs including means for pivotally connecting to one of said pair of scissor arms to provide a weight responsive lowering of said table top as more articles are placed on said table top;

means for adjusting a compressive force on said plurality of, adjusting including rotatable bolts having spur gears that are interconnected to each other by a link chain engaging said spur gears;

a cam located on one of said pair of scissor arms; and

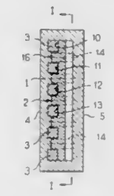
a cam follower connected to said plurality of springs, said cam follower engaging said cam to thereby provide a support surface for said plurality of springs as said table top is raised or lowered.

4,926,761

ARMOR PARTICULARLY FOR A SAFE AND A SAFE THUS PRODUCED

Francis Haesebrouck, Paris la Défense, France, assignor to Usines et Acieries de Sambre et Meuse, Feignies, France

Filed Sep. 9, 1988, Ser. No. 244,515
Claims priority, application France, Sep. 9, 1987, 87 12512
Int. Cl.[5] E06B 9/00; E04B 2/02
U.S. Cl. 109—49.5 32 Claims



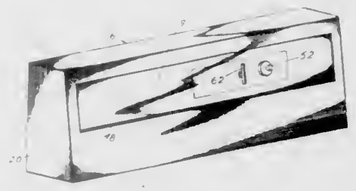
1. Armor particularly for safes, comprising a weldable refractory steel base plate (1) having two faces, said steel resisting cracking by means of a conventional torch, wherein at least one insert (2, 16, 17, 21, 25, 27a, 27b) of refractory material resisting an added metal powder torch is encased in the refractory steel (1), the structure and distribution in the interior of the steel of said at least one insert (2, 16, 16, 21, 25, 27a, 27b) being such that the plate comprises a series of zones, distributed throughout the whole of the plate, which are separated by zones in which the thickness of the steel is different, the plate enclosing moreover at least one insert (3, 18, 22, 26, 28) of drill-resisting material, said inserts being constituted by two series of bars forming a grid embedded in said refractory steel in substantially parallel relationship with the faces of the steel base-plate.

4,926,762

SECURITY SAFES FOR VEHICLES

Clarence A. Paul, P.O. Box 2186, Grass Valley, Calif. 95945

Filed Oct. 10, 1989, Ser. No. 419,500
Int. Cl.[5] E05G 1/04, 3/00
U.S. Cl. 109—51 20 Claims



1. A safe for use in a vehicle to secure valuables, comprising:

a metal box-like housing having an interior first layer of heat and fire resistant material placed against said metal; an interior second layer of a fabric carpet-like material over said heat and fire resistant material; a plurality of apertures in at least one panel of said housing adapted to allow attachment of said housing to a stationary member of said vehicle with a plurality of fasteners; said fasteners being of a type to provide nonremovability of said fasteners with said safe in a closed and locked position; an access opening in said housing; a metal reinforcing framework generally interiorly of said housing around said access opening; an openable door structured of a metal panel having a raised reinforcing frame adjacent outside edges of a backside of

VOL
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MY
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said door, said door attached by a hinge to said reinforcing framework of said housing with said hinged door adapted to close said access opening; said hinged door recessed inward of an exposed front edge of said reinforcing framework around said access opening;

a locking means adapted to secure said door over said access opening comprising a combination lock affixed to said backside of said door, said combination lock having a rotary dial accessible on a front side of said door, said combination lock adapted to extend and retract a lock bolt of said combination lock on said backside of said door by way or proper actuntion of said rotary dial; a handle rod extending through an aperture in said door generally adjacent said combination lock, a handle attached to one end of said handle rod on said front side of said door adapted to rotate said handle rod with rotation of said handle; a locking plate attached by releasable attachment means to said handle rod on said backside of said door with said locking plate adapted to allow locking said handle rod stationary against an extended said lock bolt of said combination lock; said handle attached to said handle rod by an attachment means adapted to release said handle from said handle rod at a predetermined torque when said handle rod is locked stationary; a main crank connected by attachment means to said handle rod on said backside of said door with said main crank adapted to move with rotation of said handle rod; a main rod attached to said main crank adapted to move with movement of said main crank; said main rod being further attached to at least one secondary crank; said secondary crank rotatably attached to said backside of said door; a plurality of lock pin apertures extending through said raised reinforcing frame in at least two oppositely disposed side edges of said door; a plurality of lock pin apertures in said reinforcing framework around said access opening aligned with said lock pin apertures in said raised reinforcing frame of said door with said door in said closed position; two lock pin rods, one said lock pin rod extending generally parallel along each said oppositely disposed side edge of said door adjacent said reinforcing frame having said lock pin apertures; a plurality of lock pins attached to each said lock pin rod with one said lock pin aligned with each said lock pin aperture in said raised reinforcing frame; a linkage means attached to each said lock pin rod and said secondary crank; said locking means adapted to allow said handle to be manually rotated with said lock bolt retracted whereby said rotation of said handle causes said handle rod and said attached main crank to rotate causing said main rod to move whereby said secondary crank is rotated causing movement of said linkage means; said movement of said linkage means causing both said lock pin rods to move outward extending said lock pins through said lock pin apertures in both said reinforcing frame and said reinforcing framework to lock said safe closed with said rotation of said handle in one direction, said handle rotated in an opposite direction causing retraction of both said lock pin rods and said lock pins to allow opening of said door;

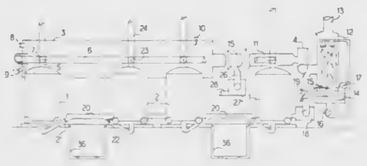
said releasable attachment means attaching said locking plate to said handle rod structured to maintain said locking plate in place and said door in said locked position with said handle and said handle rod removed from said safe.

4,926,763

METHOD AND DEVICE FOR MANUFACTURING CHARCOAL

Andre-Jean Leroux, Brebières, and Claude Mercier, Chemin des Marlieres, 59553 Lambres les Douai, both of France, assignors to Claude Mercier, Lambres les Douai, France, a part interest

Filed Jan. 17, 1989, Ser. No. 297,409
Claims priority, application France, Mar. 1, 1988, 88 02520; Apr. 14, 1988, 88 04928
Int. Cl.[5] F23J *15/00*
U.S. Cl. 110—215 13 Claims



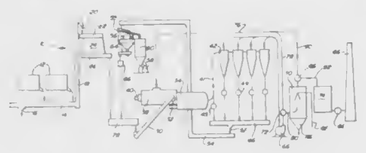
1. Charcoal manufacturing device comprising at least two bottomless furnaces of which, in operation, at least one is in a carbonization phase and at least one other is charged with wet wood to be dried, an incinerator for burning gas produced during the carbonization phase connected to said at least one furnace, a first hot gas diluter connected to said incinerator, an extractor connected to said first diluter, an optional washing device connected to said extractor, means for taking off hot gas produced by said at least one furnace during the carbonization phase upstream of said extractor, said take-off means being connected to said at least one other furnace, and a second hot gas diluter in said take-off means adapted to render the temperature of said hot gas compatible with said wet wood to be dried.

4,926,764

SEWAGE SLUDGE TREATMENT SYSTEM

Jos van den broek, Nijendal 30, 3972 KC Driebergen, Netherlands

Filed Aug. 17, 1989, Ser. No. 394,975
Int. Cl.[5] F23G *5/04*
U.S. Cl. 110—221 16 Claims



12. A sewage sludge stream treatment system wherein a concentrated stream of sewage is dried in a rotary drier by a hot gaseous effluent from a combustion chamber, the gaseous discharge from the rotary drier having entrained particulate matter and a high moisture content, the gaseous discharge is further processed sequentially by mechanically separating particulate materials, scrubbing in a wet gas scrubber and heating in an afterburner prior to being vented to the atmosphere wherein the improvement comprises:

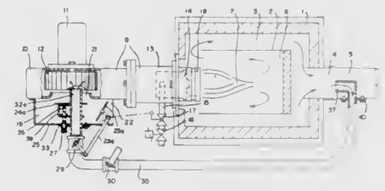
a proportional valve means downstream from the rotary drier for directing a portion of the gaseous discharge to an inlet port in the combustion chamber whereby energy requirements of the system are reduced by the use of preheated gases in the combustion chamber and by reducing the volumetric requirements of the afterburner.

4,926,765

FURNACE BLOWER WITH EXTERNAL GAS RECYCLING FOR THE REDUCTION OF NO_x

Walter Dreizler, Brachetweg 16, 7000 Stuttgart 75, and Ulrich Dreizler, Verenaweg 3, 7208 Spaichingen, both of Fed. Rep. of Germany

Continuation of Ser. No. 39,072, Apr. 16, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 334,738
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642357
Int. Cl.[5] F23B *7/00*
U.S. Cl. 110—234 4 Claims



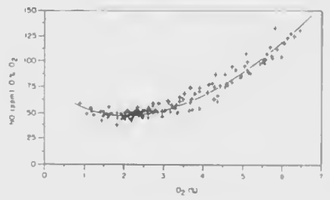
1. In a furnace construction comprising a furnace blower provided with a motor, blower wheel, ventilation housing, portend and a flame tube which is adapted for modulating burner operation with a combined fuel and air control, an air intake chamber attached at a front end of an air intake opening of the ventilation housing, a servomotor-activated air intake control butterfly valve disposed inside the air intake opening of said air intake chamber, a manually adjustable air throttling disk downstream of said air intake opening of the ventilation housing adapted to reduce NO_x by external recycling of exhaust gas through a pipe means characterized in that an exhaust gas recirculation tube is guided through an external wall of air intake chamber and terminates in close proximity to the blower wheel, means to support a flange relative to the exhaust gas recirculation tube for adjustment of an air throttling disk which is movable by means of a threaded spindle, the entrance of exhaust gas recirculation tube being positioned downstream of air throttling disk directly in the low pressure area of blower wheel.

4,926,766

CIRCULATING FLUID BED COMBUSTION WITH CIRCULATING CO COMBUSTION PROMOTER

Amos A. Avidan, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,930
Int. Cl.[5] F23B *7/00*
U.S. Cl. 110—342 16 Claims



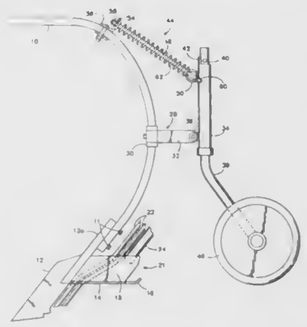
1. In a circulating fluidized bed combustion zone wherein a carbon-containing material is burned by contact with an oxygen-containing gas in a generally vertical combustor comprising a fast fluidized bed of particulates wherein at least a majority of the particulate matter in the fast fluidized bed has a particle diameter in excess of 100 microns, to generate a flue gas/particulate stream which is discharged from the top of the combustor, said flue gas comprising flue gas, fines having a particle diameter less than about 100 microns, and circulating particles having an average particle size of about 100–400 microns, which flue gas passes through a separation means to recover from the flue gas at least a majority of the 100–400 micron particles which are recycled to the circulating fluidized bed combustion zone, the improvement comprising adding to the circulating particles a circulating CO combustion promoter in an amount equal to 0.001 to 100 wt. ppm of a promoter selected from the group of Pt, Pd, Ir, Rh, Os and compounds and mixtures thereof.

4,926,767

NO-TILL DRILL PROVIDING SEED AND FERTILIZER SEPARATION

J. W. Thomas, HC 11 Box 140, Prescott, Wash. 99348

Filed Oct. 24, 1988, Ser. No. 261,352
Int. Cl.[5] A01C *5/08*
U.S. Cl. 111—187 5 Claims



1. A seed and fertilizer drill comprising:

(a) blade means for making a furrow when the drill is pulled across the field;

(b) fertilizer supply tube means positioned adjacent to said blade means for placing fertilizer in the furrow formed by said blade means, proximate the bottom thereof;

(c) seed distribution means associated with said blade means for widening the upper portion of the furrow formed by said blade means above the portion thereof which contains the fertilizer, and for placing seed in the widened furrow portion created thereby in a manner such that it is above the fertilizer and separated therefrom, said seed distribution means including:

(i) a rectangular plate which extends rearwardly from attachment to said blade means and is oriented generally horizontally when the drill is in its operative position;

(ii) said plate having an upturned lip on the end thereof which is opposite the end which is attached to said blade means;

(iii) spaced-apart upstanding side walls which are joined to said plate along the opposed side margins thereof, said side walls extending from joinder with said blade means rearwardly over less than the entire extent of said plate;

(iv) seed supply tube means for placing seed onto said plate between said side walls; and

(d) a packer wheel which is located behind said blade means and said seed distribution means and closes the furrow formed thereby.

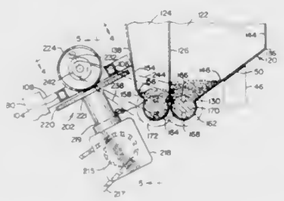
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SEED SPREADER

Robert J. Magda, Morganville, N.J., assignor to Lawn Doctor, Inc., Matawan, N.J.

Filed Dec. 11, 1987, Ser. No. 132,000
Int. Cl.[5] A01C *19/02*; F04B *17/06*
U.S. Cl. 111—11 10 Claims



1. A seed spreader, comprising:
a manually guided, power driven, frame assembly having at least one axle;
front wheels operatively connected to said frame assembly;
rear wheels operatively connected to said axle of said frame assembly;
a drive assembly having an internal combustion engine mounted on said frame assembly and operatively connected to said wheels, said drive assembly including a drive sprocket operatively connected to said rear wheels, a drive chain operatively connecting said engine and said drive sprocket, a gear reduction assembly operatively connected to said drive sprocket;
first seed hopper means providing a first compartment mounted on said frame assembly for containing one type of grass seed;
second seed hopper means providing a second compartment mounted on said frame assembly for containing another type of grass seed;
a first seed dispensing tube defining inlet and outlet openings and containing a first set of seed tumblers operatively associated with said first seed hopper means for dispensing one type of grass seed from said first seed hopper means at a first dispensing rate;
a second seed dispensing tube defining inlet and outlet openings and containing a second set of seed tumblers operatively associated with said first seed hopper means for dispensing a second type of grass seed from said second seed hopper means at a second dispensing rate different then said first dispensing rate;
a drive disc operatively connected to and driven by said drive sprocket, said drive disc being positioned at an angle of inclination ranging from about 15 degrees to about 60 degrees and facing generally upwardly and slightly rearwardly;
a first toothless friction wheel engaged and driven by said drive disc for driving said first set of tumblers; and
a second toothless friction wheel engaged and driven by said drive disc for driving said second set of tumblers.

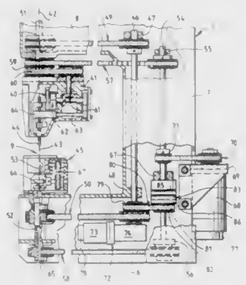
4,926,769

AUTOMATIC SEWING DEVICE WITH A SEWING HEAD INCLUDING A ROTARY HOUSING

Egon Upmeier, Lage-Kachtenhausen, Fed. Rep. of Germany, assignor to Kochs Adler Aktiengesellschaft, Fed. Rep. of Germany

Filed May 31, 1989, Ser. No. 359,874
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1988, 3819975
Int. Cl.[5] D05B *39/00, 69/28*
U.S. Cl. 112—121.12 9 Claims

1. An automatic sewing device with a sewing head (**5**) and a device for generating a two-axis-relative movement between the sewing head (**5**) and a workpiece (**36**) to be sewn, said sewing head (**5**) including:
a rotary housing (**41**) supported at said sewing head (**5**) and drivable in a swivelling manner about an axis of rotation by an adjusting shaft (**46**), said rotary housing (**41**) having:
a needle bar (**44**) with a needle (**43**) supported in said rotary housing (**41**) and reciprocatingly drivable via a crank drive (**62**) driven by a common drive, which common drive is drivable by a drive shaft (**54**) of said sewing head (**5**), the needle having a needle axis (**42**) being identical with said axis of rotation,
a needle jogging gear (**63, 64**) connected to said crank drive (**62**) for generating a needle feed movement, and



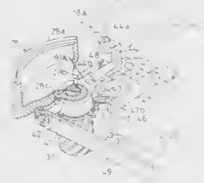
a thread take-up lever drive (**40**) coupled to said crank drive (**62**),
a hook bearing (**45**) drivable in a swivelling manner by said adjusting shaft (**46**) about said needle axis (**42**) equiangularly to said rotary housing (**41**),
a hook (**53**) arranged in said hook bearing (**45**) and drivable by said drive shaft (**54**),
a drive motor (**68**) for driving said drive shaft (**54**),
an actuating drive (**72**) for driving said adjusting shaft (**46**),
a device for a drive-like connection of the adjusting shaft (**46**) and the drive shaft (**54**), and
a device for the disengaging of the drive motor (**68**) from the drive shaft (**54**).

4,926,770

NEEDLE HOLE GUIDE MECHANISM FOR ZIGZAG SEWING MACHINE

Susumu Hanyu; Kazumasa Hara, and Yasuro Sano, all of Tokyo, Japan, assignors to Janome Sewing Machine Company Limited, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 300,336
Claims priority, application Japan, Jan. 22, 1988, 63-10741
Int. Cl.[5] D05B *3/02, 73/12*
U.S. Cl. 112—453 3 Claims



1. A zigzag sewing machine having stitch forming instru-

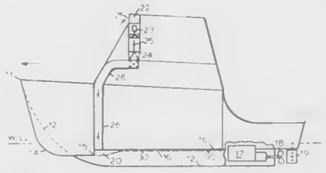
mentalities including a vertically reciprocating and laterally swingable needle having an upper thread carried thereon, and a loop taker having a lower thread loaded bobbin carried therein and rotatable in a horizontal plane in synchronism with the needle to catch the upper thread and interconnect the upper thread with the lower thread and form lock stitches, the needle being vertically reciprocated by an upper drive shaft rotatably journalled on a machine housing while the loop taker is rotated by a lower shaft operatively connected to the upper drive shaft for rotation therewith, a needle plate having a laterally elongated hole formed therein for receiving the laterally swingable needle, said sewing machine comprising:
(a) needle hole means including a member having formed therein a round needle hole of a diameter slightly larger than that of the needle, the needle hole member being in engagement with the laterally elongated hole of the needle plate and swingable along the latter;
(b) operation means including a base member mounted coaxially with said loop taker and being turnable relative to said loop taker;
(c) means for pivotally connecting said needle hole member to said base member so that said needle hole member may be vertically swingable relative to said base member;
(d) swingable means operatively connected to said needle hole member;
(e) first actuating means including a cam rotated in synchronism with the vertical reciprocation of said needle to swing said swingable means; and
(f) second actuating means including a stepping motor operatively connected to said needle to laterally reciprocate said needle, said stepping motor being also operatively connected to said base member to reciprocate the latter.

4,926,771

VARIABLE HULL RESISTANCE SYSTEM FOR MARINE VESSELS

Francis R. Hull, 567 E. 26th St., Brooklyn, N.Y. 11210

Filed Jun. 21, 1989, Ser. No. 369,340
Int. Cl.[5] B63B *1/22*
U.S. Cl. 114—61 5 Claims



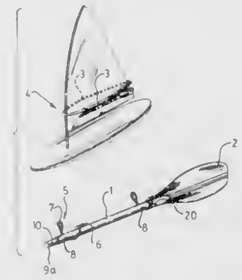
1. A variable water-side flow resistance system to enhance and control forward movement of buoyantly-supported marine vessels comprising an open-channel conduit bounded by lower portions of the vessel's hull, for the passage of fluids thereunder; said open-channel conduit boundaries comprised by a primary hydrodynamic step having bluff trailing surfaces at the after end of a contoured central bow section which is disposed adjacent the forward end of a shallower-draft aft central hull section, said central bow section and said aft central hull section disposed between adjacent elongate outboard hull sponsons whose lower portions project below said primary step of said central bow section and below said aft central hull section; said elongate outboard hull sponsons providing substantial buoyant support for said marine vessel; said aft central hull section having a shingled bottom surface forming a series plurality of secondary hydrodynamic steps with bluff trailing surfaces; means for propelling said marine vessels; and means for selectively supplying ventilation air under said aft central hull section into the water-side separation zone abaft said primary hydrodynamic step to occupy the separation zone and form an air-filled dynamic plenum during planing or semi-planing operations in ahead vessel propulsion, the ventilation air being discharged from the air-filled dynamic plenum to flow downstream adjacent the said series plurality of secondary hydrodynamic steps in the bottom surfaces of said aft central hull section as a thick layer of air bubbles which occupies the separation zones thereof; whereby total water-side pressure drag resistance of the vessel's hull may be substantially reduced when the said ventilation air supply occupies the separation zones of said primary and secondary hydrodnamic steps, and total water-side pressure drag resistance of the vessel's hull may be substantially increased to exert strong braking forces against forward vessel motion when the said ventilation air supply is shut off.

4,926,772

EMERGENCY PADDLE KIT

Vernon G. Bright, 298 Highfield Road, Toronto, Ontario, Canada (M4L 2V5)

Continuation-in-part of Ser. No. 185,725, Apr. 25, 1988, abandoned. This application Sep. 27, 1989, Ser. No. 414,153
Int. Cl.[5] B63H *16/04*
U.S. Cl. 114—39.2 9 Claims



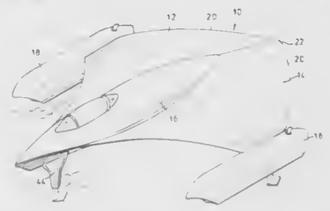
1. An emergency paddle kit for a sailboard having a boom, comprising,
a paddle having a shaft with a free end and a blade formed at the opposite end of the shaft;
means positioned on the shaft for releasably attaching the shaft to the boom of the sailboard when the boom is in an operative sailing position,
whereby that when the sail of the sailboard is not being used to propel the sailboard through the water, and the boom is in an inoperative position, said shaft may be released from the boom and the paddle may be used to propel the sailboard.

4,926,773

HIGH PERFORMANCE SEA-GOING CRAFT

Yehuda Manor, 1 Giladi Street, Jerusalem 93385, Israel

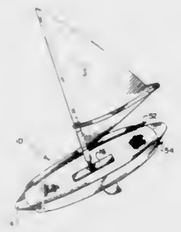
Filed Jun. 9, 1988, Ser. No. 204,300
Claims priority, application United Kingdom, Jun. 12, 1987, 87 13767
Int. Cl.[5] B63B *35/72*
U.S. Cl. 114—61 8 Claims



1. A sea-going craft comprising: a main central body,

two wings affixed to said body and extending generally horizontally away therefrom to either side,
a catamaran-type hull affixed to each wing remote from the central body, the hulls being adapted to provide flotation,
each wing having a forward edge and a rearward edge, each rearward edge extending obliquely and smoothly from the respective catamaran-type hull to a rearward location behind the central body, each rearward edge further being substantially closer to the water than the forward edge when the craft is under power, whereby the wings can exhibit the wing-in-ground-effect to produce ram lift,
a hydrofoil affixed to each hull and extending downwardly therefrom, and a third hydrofoil affixed to the central body and extending downwardly therefrom,
and means for propelling the craft.

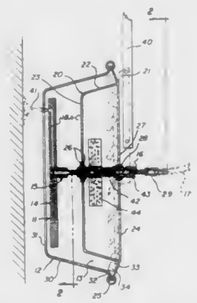
4,926,774
WIND PROPELLED APPARATUS
William K. Winner, White Salmon, Wash., assignor to Bic Corporation, Milford, Conn.
Filed Dec. 2, 1988, Ser. No. 278,906
Int. Cl.[5] B63B *43/04*
U.S. Cl. 114—123 26 Claims



1. A wind propelled apparatus comprising:
a. body means adapted to support a user;
b. wind-propulsion means adapted to receive wind for motive power; and
c. sleeve means surrounding substantially all of said body means, said surrounding means comprising a stretchable fabric which surrounds and includes an inflatable side pocket positioned on each side of said body means and formed as part of said surrounding means to stabilize the body means with respect to at least one axis, said sleeve means being configured and adapted to be fitted about said body means in relatively snug relation therewith.

4,926,775
DEVICE FOR CLEANING SURFACES, PARTICULARLY IN WATER
John P. Andorsen, Dehlgaardstien 5, 7000 Trondheim, Norway
Filed Apr. 14, 1988, Ser. No. 181,733
Int. Cl.[5] B63B *59/00*
U.S. Cl. 114—222 9 Claims

1. A cleaning apparatus for use under water, particularly for cleaning vertical surfaces which have been fouled by marine organisms, where there is a set of nozzles for spraying water under high pressure against a surface which is to be cleaned and where there is a reaction means which holds the nozzle set in position against the said surface, said nozzle set includes at least one nozzle, the apparatus is characterized by the nozzle set being located on a rotating, disk-shaped holding unit where the rotation axis is generally perpendicular to the surface which is to be cleaned, said set of nozzles also producing a tangential spray component that causes rotation and around the peripheral areas of the rotating holding unit there is a casing which forms an annular chamber with an outlet means

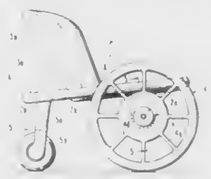


for water which is at least partly directed away from the surface to be cleaned and which forms said reaction means.

4,926,776
VERTICALLY ADJUSTABLE FLOATING DOCK
Reg D. Corbett, 23116 Roberts Run, Bay Village, Ohio 44140
Filed May 15, 1987, Ser. No. 49,830
Int. Cl.[5] B63C *1/02*
U.S. Cl. 114—263 2 Claims

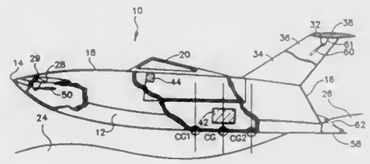
1. A vertically adjustable floating dock unit adapted to float in water and be vertically adjustable relative to the water line, the floating dock unit comprising:
an upper dock structure having an upper dock surface and a downwardly depending transverse frame member, a vertically adjustable mounting assembly, connector means for removably connecting the mounting assembly to the downwardly depending transverse frame member, and a flotation unit secured to the adjustable mounting assembly in spaced relation to transverse frame member whereby the flotation unit is adapt to float in water and support the upper dock structure above the water line;
said mounting assembly comprising an upright member adapted to be removably secured to the downwardly depending transverse frame member and a saddle structure adapted to be secured to and engage an upper surface of the flotation unit;
said vertically adjustable mounting assembly being vertically adjustable relative to the upper dock structure to provide variable height adjustment differentials of the dock surface relative to the water line;
said flotation unit comprises a pair of pontoons and each adjustable mounting assembly includes a saddle member adapted to be secured to one of said pontoons;
each said pontoon is secured to the saddle member by a strapping means and each said pontoon is substantially cylindrically;
said saddle member contains a stop means adapted to prevent the strapping means from slipping off of the saddle means.

4,926,777
AQUATIC WHEELCHAIR
Frederick B. Davis, Jr., 21 Deer Creek Rd., Ketchum, Id. 83340
Filed Nov. 1, 1988, Ser. No. 265,812
Int. Cl.[5] B63B *35/02;* B63H *16/00*
U.S. Cl. 114—270 20 Claims



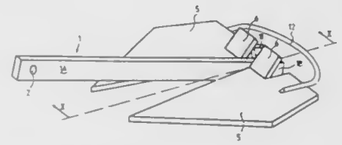
1. An aquatic wheelchair comprising, a main flotation body having a seat portion and a backrest portion, a pair of flotation paddle wheels having upper circumference portions, means connecting said pair of paddle wheels underneath said seat portion in proximity to and rearwardly of the front of the seat portion, a flotation stabilizer wheel assembly, means connecting the stabilizer wheel assembly to the backrest portion, said pair of paddle wheels each having a radius positioning the upper circumference portion thereof above said seat portion in a horizontal plane tangent to said circumference portion and intersecting said backrest portion at a medical portion of the height of said backrest portion, and said upper circumference portion positioned rearwardly of the front of said seat portion and forwardly of said backrest portion, whereby an occupant of the chair can grasp the upper circumference portion of the paddle wheels for manually propelling the wheelchair not only on soft terrain but also in the water.

4,926,778
AERODYNAMIC STABILIZATION SYSTEM FOR WATERCRAFT
Daniel D. Johnston, 335 "I" Ave., Coronado, Calif. 92118
Filed Jul. 5, 1988, Ser. No. 216,101
Int. Cl.[5] B63B *1/32, 39/04*
U.S. Cl. 114—273 17 Claims



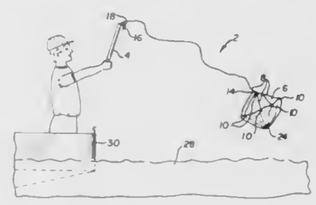
1. A pitch stabilization system for a high speed planing watercraft comprising in combination:
an elongated planing hull having a bow, a stern, a bottom defining an elongated water contacting planing surface for supporting said hull on the surface of a body of water, and a transverse pitch axis;
variable pitch airfoil means extending outwardly of said hull at the forward end and above the waterline thereof and at a distance from the pitch axis of said hull;
means for sensing a deviation of said hull from a reference pitch angle and generating a signal in response to said deviation; and
control means responsive to said signal for varying said airfoil means for maintaining the pitch of said hull substantially aligned with said reference pitch angle.

4,926,779
MARINE ANCHOR EQUIPPED WITH ANCHOR WEIGHING MEANS
Claude Piton, and Jacqueline Piton, both of 45, rue de Dinan, 22130 Plancoet, France
Filed Dec. 14, 1988, Ser. No. 284,140
Int. Cl.[5] B63B *21/44*
U.S. Cl. 114—297 6 Claims



1. A marine anchor equipped with anchor weighing means, comprising two symmetrical flukes (5″) joined by transverse shaft (4″), each of said flukes being fitted with a pair of symmetrical ledges (6″) and, a shank (1″) between said flukes (5″), said shank (1″) pivoting around said transverse shaft (4″) that joins the two flukes (5″), so as to form relative to said shaft (4″) a fore arm (1″A) and a rear arm (1″B) carrying transverse stop-pins (13″), characterized in that a truncated triangular aperture (3″) is provided in the shank, the directions of a longitudinal axis perpendicular to the base of said truncated triangle coinciding a longitudinal axis of said shank; for the passage of said shaft (4″) that joins the flukes (5″), the stop-pins coming into abutment against the ledges (6″) of the flukes when the shaft (4″) is in a rear part of the aperture (3″), the stop-pins (13″) being disengaged from said ledges when the shaft (4″) is in a rear part of the aperture (3″), the stop-pins (13″) being disengaged from said ledges when the shaft (4″) is in a fore part of the aperture (3″), a long base of said truncated triangle being located toward the fore part, and elastic or breakable lug pieces for limiting, under normal conditions, the movements of the stop-pins (13″) when the latter are disengaged from said ledges (6″).

4,926,780
SEA ANCHOR DEPLOYMENT AND STORAGE DEVICE AND ASSOCIATED METHOD
Fred A. Wiehagen, 103 D. Harper Dr., Turtle Creek, Pa. 15145
Filed Jan. 18, 1989, Ser. No. 298,575
Int. Cl.[5] B63B *21/48*
U.S. Cl. 114—311 12 Claims

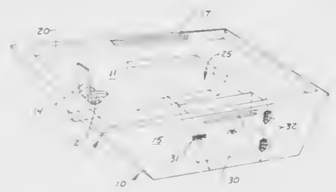


1. A sea anchor deployment and storage apparatus comprising:
anchor means;

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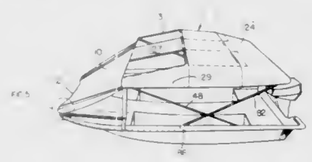
attachment means having a first end and a second end, said anchor means connected to said first end;
spool means connected to said second end of said attachment means, said spool means adapted to store, pay out and retrieve said attachment means; and
elongated tube means having a first end and a second end and defining an interior compartment for storing said anchor means, said spool means being removably attached to said first end of said elongated tube means and said anchor means being deployed from said second end of said elongated tube means.

4,926,781
PORTABLE PERSONAL FLOATATION DEVICE
Martin G. Baner, Rte. 1, Box 1, Bismarck, N. Dak. 58501
Filed Aug. 22, 1988, Ser. No. 234,898
Int. Cl.[5] B63C *9/10*
U.S. Cl. 114—351 **11 Claims**



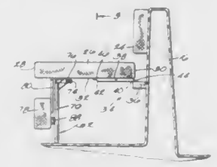
1. A portable personal flotation device comprising:
a support frame having a main horizontal panel with side panels comprising elongated, longitudinally extending buoyant pontoons attached to the main panel along the sides thereof and extending downwardly from the main panel, the pontoons having front and rear ends and being spaced apart;
an opening in the main panel of use to permit a person to extend through, said opening being defined by the side panels along the sides thereof;
a door formed in a portion of one pontoon, and the door defining one side of the opening in the main panel, the door extending between a top and bottom of the one pontoon and being positioned between the front and rear ends thereof; and
the main panel having sufficient space for the person to sit thereon with legs through the opening.

4,926,782
ADJUSTABLE WINDSHIELD AND CANOPY FOR A BOAT
Franklin R. Lacy, 12819 SE. 38th, Suite 57, Bellevue, Wash. 98006
Filed Aug. 26, 1988, Ser. No. 236,596
Int. Cl.[5] B63B *19/02*
U.S. Cl. 114—361 **13 Claims**



1. An adjustable windshield, adapted for use with a boat having a deck, a bow, a stern, and gunwales, the windshield comprising:
a windshield element, having bottom and top edges, which is sufficiently wide to extend substantially across the bow of the boat;
means movably and directly connecting the bottom edge of the windshield element to the deck of the boat in the vicinity of the bow thereof, such that the windshield element moves about the connecting means at the deck of the boat between a first stowed position adjacent the gunwales aft of the connecting means, and a second position angularly removed from the first position;
elongated support means movably connected at one end thereof to the windshield element; and
means connecting the other end of the elongated support means to the boat in such a manner that the said other end is capable of moving longitudinally of the boat a selected distance so that the windshield element may be raised and lowered about the connecting means accordingly.

4,926,783
RECREATIONAL BOAT SEAT/SUN DECK
Michael W. Lathers, Metamora, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Jul. 8, 1988, Ser. No. 216,728
Int. Cl.[5] B63B *29/04*
U.S. Cl. 114—363 **27 Claims**

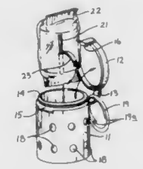


1. A marine vehicle comprising a generally vertical wall, a seat bottom member, and means supporting said seat bottom member for movement between a first position wherein said seat bottom member extends generally horizontally from said wall, and a second position wherein said wall, said supporting means including a mounting member having first and second ends, means connecting said first end of said mounting member to said wall for pivotal movement about a first generally horizontal axis, and means connecting said second end of said mounting member to said seat bottom member for pivotal movement about a second axis generally parallel to said first axis, a retractable leg for supporting said seat bottom member in said first position, and a seat back member mounted on said wall and located between said seat bottom member and said wall when said seat bottom member is in said second position.

4,926,784
PET DEODORIZER DEVICE
Deborah S. Brightful, and Charles E. Brightful, Jr., both of 46 Woodleaf, Pittsford, N.Y. 14534
Filed Jun. 5, 1989, Ser. No. 362,009
Int. Cl.[5] A01K *27/00*
U.S. Cl. 119—106 **1 Claim**

1. A pet deodorizing device comprising, in combination,
a pet collar,
and
an elongate cylindrical canister including a first diameter surface for receiving a cup-shaped lid thereto wherein said lid is hingedly mounted to said canister first diameter surface,
and
a solid chemical member replaceably positioned within said canister,
and
a securement means for securing said canister to said collar, and

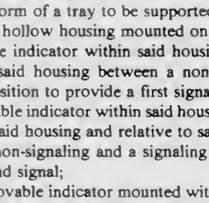
wherein said canister includes an annular rim of a second diameter less than said first diameter formed to said canister for receiving the lid, said lid is formed of a diameter equal to said first diameter and is of a cup-shaped configuration to receive said rim therewithin, said rim being of a height substantially equal to a downwardly extending skirt of said lid, and
wherein said lid includes a downwardly extending leg with an inwardly directed tab securable to an outwardly extending flange integrally formed to the canister to selectively latch said lid to said canister, and
wherein said lid is hingedly mounted to said canister including an elongate flexible hinge secured to said canister at the first diameter surface at one end and to the skirt of the lid at its other end, and wherein the leg is secured to said lid diametrically opposed to the hinge, and the flange secured to the first diameter surface diametrically opposed to the hinge, and
wherein the canister is formed with a matrix of through-extending apertures formed through the first diameter



surface to enable distribution of a vapor provided by the chemical member onto an associated animal, and
wherein the chemical member comprises a deodorizing agent, and the chemical member is secured within a hermetically sealed flexible covering, the flexible covering formed with a removable tear strip to enable the vapor to be directed through the covering and through the apertures of the canister, and
wherein securement means includes an annular spring ring slidably mounted onto said elongate flexible hinge securing the lid to the canister and defined by a further diameter less than said first diameter to capture the ring means on the hinge, and
further comprising a collar ring mounted on the collar and the ring means mounted on the collar ring to suspend the canister from the collar, and
wherein said securement means includes an elongate flexible strap orthogonally directed across a rear surface of the canister, and the strap being connected to the canister in alignment with said elongate flexible hinge securing the lid to the canister.

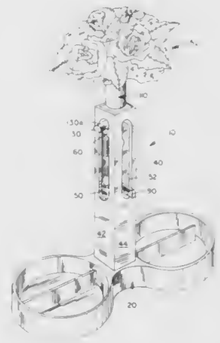
4,926,785
MARKER POST SYSTEM
Frederick W. Lamson, Birmingham, Mich., assignor to Lockwood Manufacturing Co., Livonia, Mich.
Continuation of Ser. No. 229,249, Aug. 8, 1988, abandoned. This application Sep. 19, 1989, Ser. No. 409,280
Int. Cl.[5] E04H *13/00*
U.S. Cl. 116—209 **17 Claims**

12. A boundary marking system comprising:
a hollow tubular receptacle having a longitudinal axis;
a marker stake, having a longitudinal axis coaxially aligned with the longitudinal axis of the receptacle, removably and contiguously disposed in the receptacle;
a surface plate of substantially greater diameter than the receptacle; and
a swivel means interconnecting the receptacle and surface plate for varying the relative angular relationship between



the surface plate and the respective longitudinal axes of the receptacle and marker stake.

4,926,786
RESTAURANT SIGNALING DEVICE
Thomas C. White, P.O. Box 3208, 10 Lenhardt Ave., Trenton, N.J. 08619
Filed Apr. 10, 1989, Ser. No. 335,372
Int. Cl.[5] G08B *5/02*
U.S. Cl. 116—324 **12 Claims**



1. A restaurant signaling device, comprising:
a base in the form of a tray to be supported on a surface;
an upstanding hollow housing mounted on said base;
a first movable indicator within said housing and movable relative to said housing between a non-signaling and a signaling position to provide a first signal;
a second movable indicator within said housing and movable relative to said housing and relative to said first indicator between a non-signaling and a signaling position to provide a second signal;
said second movable indicator mounted within and movable relative to said first movable indicator; and
means for maintaining said first and second indicators in their respective signaling positions.

4,926,787
ENVELOPE FLAP MOISTENING APPARATUS
Arnold Fassman, Westport, and John R. Noblle, Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed May 19, 1989, Ser. No. 354,175
Int. Cl.[5] B05C *1/02*
U.S. Cl. 118—32 **15 Claims**

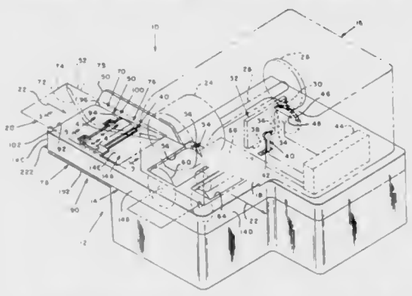
1. Envelope flap moistening apparatus for use in a machine

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for feeding an envelope having a flap in a predetermined downstream path of travel, the apparatus comprising:

a. an elongate horizontally-extending stripper blade including a trailing edge longitudinally-extending transverse to the path of travel, the stripper blade including a lower elongate hinge segment and an upper elongate hinge segment, each of the stripper blade hinge segments transversely-extending from the stripper blade trailing edge;

b. an elongate applicator retainer including a leading edge longitudinally-extending transverse to the path of travel,



the retainer including an upper elongate hinge segment and a lower elongate hinge segment, each of the retainer hinge segments transversely-extending from the retainer leading edge;

c. the upper hinge segments and lower hinge segments respectively cooperatively configured for engagement with one another and for maintaining the retainer in a predetermined position of alignment with the stripper blade; and

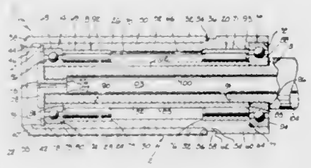
d. a moisture applicator, the applicator including a pad made of a fluid wicking material for applying moisture to an envelope flap.

4,926,788

CAN COATER/DECORATOR MANDREL SYSTEM

Robert L. Metcalf, Beaverton, Oreg., assignor to Wilbanks International, Inc., Hillsboro, Oreg.

Filed Jan. 2, 1987, Ser. No. 202
Int. Cl.[5] B05C *13/02*
U.S. Cl. 118—500 6 Claims



1. Apparatus for supporting a cylindrical can body workpiece having a cylindrical side wall portion and a bottom wall portion in parallel coaxial relationship to the central axis of a mandrel support shaft of a can decorating machine or the like comprising:

a cylindrical workpiece support sleeve means made of a separately formed one piece solid monolithic body of ceramic material and having an axially central cylindrical bore extending therein with a central longitudinal axis and an elongated cylindrical outer peripheral surface which is concentric to said central longitudinal axis for supporting the cylindrical side wall portion of the workpiece in circumjacent relationship to the support shaft and having an axially innermost end portion and an axially outermost tip portion with a radially inwardly extending interior surface and a radially inwardly extending exterior surface having a profile corresponding to the profile of the bottom wall portion of the workpiece for engaging and supporting the bottom wall portion of the workpiece and having an elongated cylindrical inner peripheral surface which is concentric to said central longitudinal axis;

a support core means made of one piece of metallic material for fixedly supporting said workpiece support sleeve means and having a central cylindrical bore extending therein with a central longitudinal axis which is coaxial with said workpiece support sleeve means for rotatably supporting said workpiece support sleeve means and said support core means in coaxial circumjacent relationship to the support shaft;

said support core means having an elongated cylindrical outer peripheral surface which is concentric to said central longitudinal axis of said support core means and has a length approximately equal to the length of said elongated cylindrical inner peripheral surface of said support sleeve means and has a diameter approximately equal to the diameter of said elongated cylindrical inner peripheral surface of said support sleeve means, and said support core means having an axially outermost end portion with a radially inwardly extending exterior surface having a profile corresponding to the interior surface profile of said tip portion of said support sleeve means for abutting supporting engagement therewith, and said support core member having an axially innermost end portion which is axially inwardly spaced from said axially innermost end portion of said support sleeve means;

at least two axially spaced precision cylindrical bearing support means associated with said support core means for receiving and supporting at least two axially spaced bearing unit means on and in coaxially and concentrically associated relationship with the support shaft; and

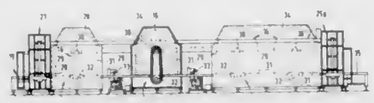
interface bonding means for providing a continuous bonded cylindrical surface interface between said cylindrical inner peripheral surface of said workpiece support sleeve means and said cylindrical outer peripheral surface of said support core means and for fixedly permanently connecting said workpiece support sleeve means to said support core means to provide a unitary mandrel assembly.

4,926,789

TRANSPORT APPARATUS FOR BOARDS

Hartmut Wenger, Pratteln; Peter Martin, Basel; Hans Rotzinger, Kaiseraugst, and Martin Denz, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,302
Claims priority, application Switzerland, Oct. 13, 1987, 3995/87
Int. Cl.[5] B05C *1/02*; B65G *37/00*
U.S. Cl. 118—668 18 Claims



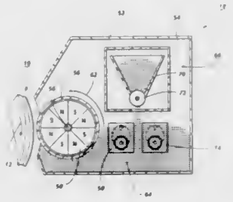
1. A transport apparatus for conveying workpieces in the form of boards comprising advancing means for advancing the workpieces holding elements for the workpieces, gripping means incorporated in each holding element and adapted to grip a workpiece and hold it relative to the holding element, and means releasably coupling a holding element to the advancing means, the advancing means serving to advance the workpiece while engaging only the holding element which holds the workpiece by means of its gripping means, whereby the workpiece can be advanced without coming into direct contact with the advancing means, two holding elements, each incorporating at last one gripper and disposed for engaging opposite longitudinal edges of said workpiece, a first of said advancing means and a second set of the advancing means, the first set following a fixed path and the second set of advancing means being movable laterally relative to the first, whereby the system can accommodate workpieces of different widths.

4,926,790

AUGER UNIT

Thomas W. Nash, Sodus, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 22, 1988, Ser. No. 247,566
Int. Cl.[5] G03G *15/09*
U.S. Cl. 118—653 6 Claims



1. An apparatus for developing an electrostatic latent image used in a printing machine, including:

a housing defining a chamber having therein a supply of developer material comprising at least carrier granules having toner particles adhering triboelectrically thereto;

means, in communication with the chamber of said housing, for advancing developer material into contact with the electrostatic latent image; and

an elongated member having an elongated aperture therein extending from one end of said member to the other end thereof, said elongated member being positioned at least partially in the supply of developer material in the chamber of said housing and having an expansion chamber connected to the aperture and extending over a portion of the aperture, and

means, disposed in the aperture of said member, for transporting the developer material from one end of the aperture to the other end thereof with at least a portion of the developer material flowing through the expansion chamber for greater mixing thereat to increase the triboelectric charge on the toner particles being transported from one end of the aperture to the other end thereof.

4,926,791

MICROWAVE PLASMA APPARATUS EMPLOYING HELMHOLTZ COILS AND IOFFE BARS

Naoki Hirose; Takashi Inujima, and Toru Takayama, all of Atsugi, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Apr. 26, 1988, Ser. No. 186,219
Claims priority, application Japan, Apr. 27, 1987, 62-104024; Apr. 27, 1987, 62-104025
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—723 5 Claims

1. A plasma deposition apparatus comprising:

a vacuum chamber in which a deposition space is defined;

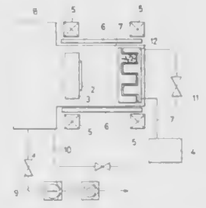
a substrate holder provided in said deposition space for supporting a substrate to be coated;

Helmholtz coils within which said deposition space is located;

Ioffe bars arranged in parallel with the axial direction of said Helmholtz coils;

a vacuum pump for evacuating said vacuum chamber;

a gas feeding means for inputting a reactive gas to said deposition space; and



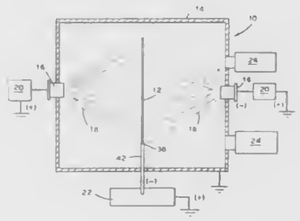
an energy supplying means for initiating the deposition reaction of said reactive gas.

4,926,792

APPARATUS AND PROCESS FOR COLORING OBJECTS BY PLASMA COATING

James A. E. Bell, and Bruce R. Conard, both of Oakville, Canada, assignors to Inco Limited, Toronto, Canada

Continuation of Ser. No. 198,189, May 23, 1988, abandoned.
This application Aug. 10, 1989, Ser. No. 393,054
Claims priority, application Canada, May 29, 1987, 538430
Int. Cl.[5] B05C *1/02*
U.S. Cl. 118—729 7 Claims



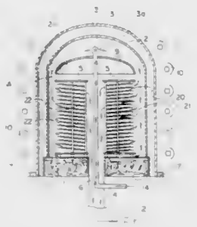
1. An apparatus for plasma coating objects, the system comprising a sealable reactor chamber, means for introducing at least one ionic plasma stream into the reactor, an object of storage means disposed within the reactor chamber situated to receive the ionic plasma stream, the improvement comprising the object storage means including four peripheral sides defining a substantially open frame, a plurality of spaced parallel longitudinal races bridging two opposed sides, the longitudinal races adapted to hold the objects and allow rotational and continuous reciprocating translational locomotion of the objects along the length of the races, the length of each longitudinal race being longer than the total length of the objects situated within the longitudinal race, the open frame pivotally mounted on a support disposed within the reactor, and the support adapted to repetitively tilt the open frame through a predetermined arc to effect object locomotion within the races.

4,926,793

METHOD OF FORMING THIN FILM AND APPARATUS THEREFOR

Noburu Arima, Kubiki; Nobuyosi Ogino, Tokyo, and Hiroi Kimura, Takefu, all of Japan, assignors to Shin-Etsu Handotai Co., Ltd. and Sin-Etsu Quartz Products Co., Ltd., both of Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,784
Claims priority, application Japan, Dec. 15, 1986, 61-296636; Dec. 15, 1986, 61-296637
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—730 9 Claims



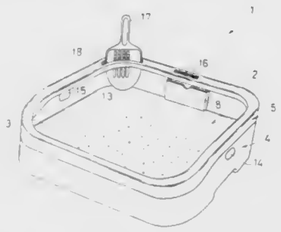
1. An apparatus for forming thin films on respective surfaces of a plurality of substrates, said apparatus comprising a vertical reactor defining a reaction space and having a vertical axis, an exhausting means provided along said reactor axis, a plurality of substrate supporters arranged in a peripheral space around said exhausting means and spaced a predetermined radial distance from said exhausting means, each of said substrate supporters carrying a set of vertically stacked substrates spaced a predetermined distance from each other, and means for passing reaction gas substantially vertically along an inner wall surface of said reactor situated radially outward of said substrate supporters, so that said reaction gas passes through reaction regions on the surfaces of individual substrates and then is discharged directly out of said reactor through said exhausting means.

4,926,794

DOMESTIC PETS' CHAMBERPOT

Yoshikazu Yamamoto, 1-1, 3-chome, Eganosho, Habikino-shi, Osaka, Japan

Filed Mar. 28, 1989, Ser. No. 329,657
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—1 2 Claims



1. An animal toilet comprising:
a base structure having a level horizontal bottom surface and four substantially vertical peripheral walls extending upwardly from said bottom surface, one of said peripheral walls having a shorter height than the other peripheral walls;
a removable guard device mounted on top of said peripheral walls opposite said bottom surface, said guard device having four outer wall portions corresponding to and fitted to said peripheral walls and inwardly directed jaw portions extending from said outer wall portions and overhanging an area above said bottom surface so as to prevent material held within said base structure from being thrown out of said animal toilet;
engaging bores extending through at least two of said peripheral walls and disposed toward the top thereof, said at least two peripheral walls located opposite each other;
engaging projections extending from at least two of said outer wall portions corresponding to said engaging bores in said at least two peripheral walls away from said jaw portions, said engaging projections having dimensions so as to engage within and extend through said engaging bores to a position outside of said area above said bottom surface presenting a substantially flush surface with said at least two peripheral walls so that said guard device is locked to said base structure when said engaging projections are engaged within said engaging bores and said guard device is unlocked from said base structure when, by the application of manual pressure directed against said engaging projections inwardly toward said area above said bottom surface, said engaging projections are moved out of said engaging bores and the guard device is thereby removed from said base structure; and
a holder means for receiving a deodorizer/aromatic agent on an inner surface of one of said peripheral walls, said guard device further having an opening in the jaw portion thereof such that when said guard device is locked to said base structure, the opening is disposed above said holder means so as to permit the deodorizer/aromatic agent to exit therethrough.

4,926,795

METHOD OF REINSTATING ACCEPTABLE FLAVOR TO OFF-FLAVOR CATFISH BY TREATMENT WITH PEROXIDE ADDITIVES

Frank S. Hamilton, Schlater; Johnny D. Ouzts, Cleveland, and Ray W. Mabry, Greenwood, all of Miss., assignors to HOM, Inc., Greenwood, Miss.

Filed Feb. 14, 1989, Ser. No. 309,869
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—3 7 Claims

7. A method of achieving commercially acceptable flavor reinstatement in non-scaly fish raised in an aquatic environment and intended to be marketed commercially, said fish having been determined to have a commercially unacceptable off-flavor comprising:
subjecting said off-flavor fish in said aquatic environment to an effective amount of an inorganic peroxide which releases hydrogen peroxide into said aquatic environment for a time sufficient to reinstate commercially acceptable flavor.

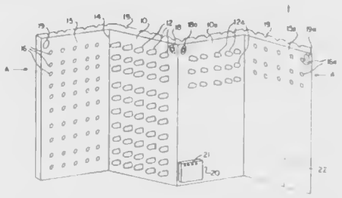
4,926,796

GROOMING DEVICE

Arthur B. Leopold, Secaucus, N.J., assignor to Tarel Seven Design, Inc., Secaucus, N.J.

Continuation of Ser. No. 172,707, Mar. 24, 1988, Pat. No. 4,807,569, which is a continuation of Ser. No. 934,201, Dec. 18, 1986, Pat. No. 4,747,371. This application Nov. 7, 1988, Ser. No. 268,005
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[5] A01K *13/00*
U.S. Cl. 119—83 6 Claims

1. An animal grooming device, comprising:
plate means made of a material selected from a group consisting essential of plastic, rubber and a combination thereof, said plate means defining an area at which said plate means can be folded, said plate means including a pair of surface portions each having a plurality of teeth extending therefrom and each surface portion spaced apart from each other by said area;
means for securing said plate to a support; and



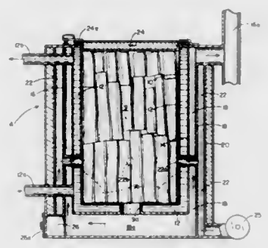
container means coupled to said plate for storing an aromatic substance for attracting the animal to said grooming device, wherein said container means has a surface with a plurality of holes therethrough for emitting the aroma of the aromatic substance when the aromatic substance is contained therein.

4,926,797

WOOD BURNING HOT WATER FURNACE

Jon E. Butler, 6447 N. 48th St., St. Paul, Minn. 55109

Filed Feb. 21, 1989, Ser. No. 312,686
Int. Cl.[5] F22B *5/00*
U.S. Cl. 122—15 3 Claims



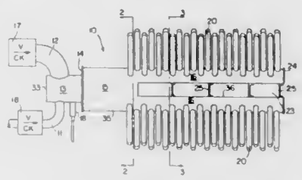
1. A forced air liquid heating furnace comprising,
a combustion chamber, having side walls, a bottom and a removable top closure,
a liquid heating chamber surrounding portions of the combustion chamber in heat exchange relation thereto,
an exhaust gas plenum below the combustion chamber,
an exhaust gas discharge passage in the bottom of the combustion chamber delivering the combustion gases downwardly into the plenum,
an annular exhaust gas passage surrounding the liquid heating chamber and receiving the exhaust gases from the plenum,
a vent stack communicating with the upper end of the annular exhaust gas passage to discharge the exhaust gases from the combustion chamber into the atmosphere, and
a blower delivering combustion air into the lower portion of the combustion chamber to produce an air flow downwardly within said chamber through the bottom exhaust gas passage in the bottom of the chamber, and wherein the liquid heating chamber underlies the bottom of the combustion chamber in heat exchange relation to both the plenum and the combustion chamber.

4,926,798

PROCESS FOR PULSE COMBUSTION

Peter Kardos, Longmeadow, Mass., assignor to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 229,130, Aug. 5, 1988, Pat. No. 4,884,963. This application Jul. 26, 1989, Ser. No. 383,671
Int. Cl.[5] F22B *31/00*
U.S. Cl. 122—24 15 Claims



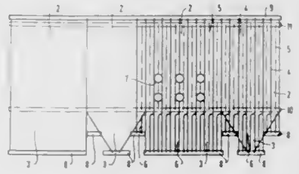
1. A process for pulse combustion in a horizontal pulse combustor having fuel inlet valve means, air inlet valve means, a combustion chamber, and a plurality of downstream combustion chamber branches in which each is in communication with a plurality of downstream exhaust tubes, the process comprising the steps of:
introducing air through the air inlet valve means and into a mixing and ignition chamber;
introducing fuel through the fuel inlet valve means and into the mixing and ignition chamber;
forming a combustible fuel/air mixture within the mixing and ignition chamber;
igniting the fuel/air mixture to begin combustion within the mixing and ignition chamber;
exhausting combustion product gases through the combustion chamber branches and further through the exhaust tubes.

4,926,799

CONTINUOUS FLOW STEAM GENERATOR

Eberhard Wittchow, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 26, 1989, Ser. No. 385,740
Claims priority, application European Pat. Off., Jul. 26, 1988, 88112051.3; Jun. 26, 1989, 89111630.3
Int. Cl.[5] F22B *15/00, 25/00, 37/10*
U.S. Cl. 122—235 A 8 Claims



1. Continuous flow steam generator, comprising a vertical gas flue having means for attaching burners for fossil fuel, a tube wall, and a lower end with a bottom, said tube wall including vertically disposed tubes with inlet and outlet ends and long sides being welded together in a gas-tight manner, said bottom including other tubes having inlet and outlet ends and being welded together in a gas-tight manner, said tubes of said tube wall including tubes of a first tube group and tubes of a second tube group, said tubes of said first tube group being hydraulically connected to said other tubes of said bottom and having an outlet header connected to said tubes of said first tube group, said tubes of said second tube group having an inlet header and an outlet header connected to said tubes of said second tube group, a conduit connected between said outlet

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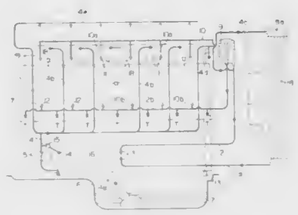
header of said first tube group and said inlet header of said second tube group for hydraulically connecting said tubes of said second tube group downstream of said tubes of said first tube group, and said inlet end of each tube of said first tube group merging with said outlet end of at least one of said other tubes of said bottom.

4,926,800

OIL-COOLED INTERNAL COMBUSTION ENGINE

Assen Valev, Perchtoldsdorf, Austria, assignor to Steyr-Daimler-Puch, Vienna, Austria

Filed Apr. 12, 1989, Ser. No. 336,749
Claims priority, application Austria, Apr. 29, 1988, 1103/88
Int. Cl.[5] F01P *3/02*
U.S. Cl. 123—41.42 16 Claims



1. An internal combustion engine, having portions subject to high temperatures and other portions to be cooled, comprising

an oil pan containing an oil sump,

a cooling oil circuit, directly connected to said oil sump, containing a cooling oil pump and extending to said other portions to be cooled,

a lubricating oil circuit, connected to said cooling oil circuit, and containing an oil cooler, a lubricating oil pump and an oil filter, and

secondary cooling oil circuit means, branching from said lubricating oil circuit downstream of said oil cooler, and extending to said portions subject to high temperatures.

4,926,801

WET/DRY CYLINDER LINER FOR HIGH OUTPUT ENGINES

Eugene Eisenberg, Hagerstown, Md.; Frederick E. Lindsay, Greencastle, Pa.; James J. Evans, Titusville, Fla., and Ronald H. Collins, Waynesboro, Pa., assignors to Mack Trucks, Inc., Allentown, Pa.

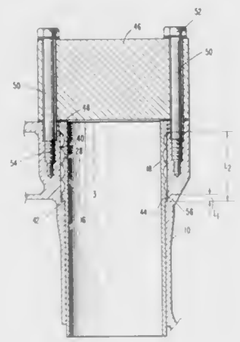
Filed Dec. 22, 1987, Ser. No. 136,400
Int. Cl.[5] F02F *1/10*
U.S. Cl. 123—41.84 5 Claims

1. In an internal combustion engine comprising a cylinder head and a plurality of cylinders each of which includes a cylinder wall and cylinder bore, a cooling arrangement for the engine comprising:

(a) a cylinder liner having a predetermined length and being received in each of said bores, a lower portion of each liner being a dry portion of said liner which is received in a corresponding bore with an interference fit along the substantial length of the lower portion under operating conditions, said lower portion constituting approximately two-third of the length of said liner and providing support for said liner;

(b) an upper portion of said liner being disposed at a combustion region of the cylinder and being formed to provide a plurality of passages for liquid coolant extending in substantially parallel arcuate paths around the cylinder liner, said arcuate paths comprise means for increasing velocity of said liquid coolant around said combustion region said passages being of substantially constant cross-section so as to provide substantially uniform high velocity circulation of liquid coolant around the cylinder liner in said combustion region, the upper portion of the liner constituting approximately one-third of the length of said liner and being a wet portion of the liner with the liquid coolant being in contact with said upper portion of the liner so as to provide the entire cooling for said cylinder liner;

(c) a shoulder formed on said liner approximately at a junction of said upper and lower portions and a shoulder formed on said cylinder wall; and



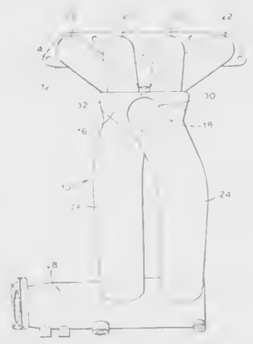
(d) means engaging said cylinder wall for pressing said shoulders in firm engagement so that the engaged shoulders at approximately the junction of said upper and lower portions provide a seal which prevents liquid coolant from contacting the dry lower portion of the cylinder liner.

4,926,802

TUNED MANIFOLD

Guy D. Morris, Rettendon Common; Trevor A. Jordon, Hullbridge; William C. Davidson, Woodham Ferrers, and Timothy J. Bowman, Bexley, all of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1988, Ser. No. 285,158
Int. Cl.[5] F02M *9/10*
U.S. Cl. 123—52 M 5 Claims



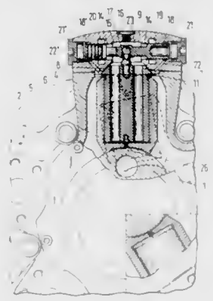
1. A manifold for a bank of multiple cylinders of an engine having a number of pairs of primary tracts, each primary tract leading to a respective cylinder and a pair of secondary tracts each connected at a respective one of two separate branching points to a respective pair of pimary tracts which lead to cylinders of which the combustion cycles are in antiphase, wherein the two branching points are arranged adjacent one another and form between a decoupling chamber within which there is disposed a valve connecting the two branching points, characterized in that the secondary tracts cross over at their ends near the primary tracts such that the branching points are contiguous and disposed one above the other, and in that all the primary tracts are of equal length.

4,926,803

RADIAL-PISTON ENGINE

Mattias Szewczyk, and Hans-Jürgen Pöting, both of Witten, Fed. Rep. of Germany, assignors to Paul Pleiger Maschinenfabrik GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,287
Int. Cl.[5] F01B *1/06*
U.S. Cl. 123—55 R 8 Claims



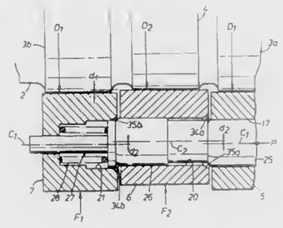
1. A radial-piston engine having radially extending cylinders and a housing with respective cylinder covers and having pot-shaped pistons which are in contact with the circumference of an eccentric shaft and into which there engages in each piston a guide body mounted radially beyond the piston to the respective cylinder cover in floating arrangement, and having fluid ports in the cylinder cover for the inflow and outflow of a pressure fluid, wherein a control element (15), connected in jointed manner to the guide body (5), is adjustably disposed in the housing for controlling the inflow and outflow ports (19, 20).

4,926,804

MECHANISM FOR SWITCHING VALVE OPERATING MODES IN AN INTERNAL COMBUSTION ENGINE

Koichi Fukuo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1989, Ser. No. 356,915
Claims priority, application Japan, May 23, 1988, 63-125437
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.16 9 Claims



1. In a mechanism for switching valve operation modes in an internal combustion engine having high- and low-speed cams with different cam profiles corresponding to rotational speed ranges of the engine, a valve disposed in an intake or exhaust port of a combustion chamber and normally urged to be closed by spring means, a directly moving transmitting member for imparting a lift of said low-speed cam to said valve, an idling transmitting member for transmitting a lift of said high-speed cam to said valve, and selective coupling means for selectively connecting both said transmitting members when mutually adjacent portions of both the transmitting members are in a predetermined positional relationship, an improvement comprising,

The diameter of a base-circle portion of said high-speed cam being smaller than the diameter of a base-circle portion of said low-speed cam.

4,926,805

PUSH ROD TUBE FOR HIGH LIFT ROCKER ARMS

Robert A. Tomlinson, 28813 Farmersville, Farmersville, Calif. 93223

Filed Apr. 12, 1989, Ser. No. 336,699
Int. Cl.[5] F01L *1/14*
U.S. Cl. 123—90.61 1 Claim



1. A push rod tube for a flat four opposed cylinder air cooled engine comprising

an elongated tube having a fluted outer end with straight sides tapering down to an intermediate location along the length of the tube, said tube having an increased internal diameter for a portion of the length thereof in the fluted portion with the largest portion of the diameter being disposed at the outer end of said tube,

a flange disposed proximate the outer end of said tube in surrounding relation, and

said elongated tube having an inner end opposite said fluted outer end with an accordion section disposed proximate said inner end.

4,926,806

TWO-FLUID FUEL INJECTED ENGINES

Steven R. Ahern, Claremont; Roy S. Brooks, and Martin J. P. Cebis, both of South Perth, all of Australia, assignors to Orbital Engine Co., Proprietary Limited, Balcatta, Australia

Filed Feb. 23, 1989, Ser. No. 313,831
Claims priority, application Australia, Feb. 25, 1988, PI6956
Int. Cl.[5] F02M *67/02*; F02D *41/06*
U.S. Cl. 123—179 L 21 Claims

1. A method of controlling the injection of fuel directly into the combustion chamber of an engine comprising injecting a metered quantity of fuel into the combustion chamber by a charge of gas at an above atmospheric pressure, and controlling the timing of said injection of the fuel in relation to the combustion chamber cycle whereby:

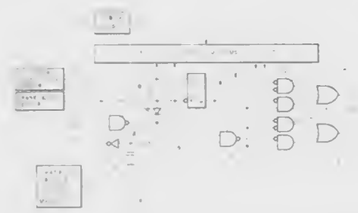
VOL
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(1) the timing of injection fuel when the engine is idling is preset,
(2) at the commencement of start up of the engine, the timing of injection is adjusted so injection occurs at a preselected timing earlier in the combustion chamber cycle than said preset timing of injection for idle,



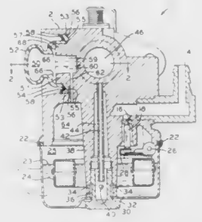
(3) in response to the engine reaching a predetermined speed of rotation during start up, the timing of injection is progressively adjusted each engine cycle towards said preset injection timing at idle during a time interval of between about 0.2 to 1.0 seconds commencing from the engine attaining said predetermined speed, and
(4) thereafter adjusts the timing of injection in accordance with the engine speed and/or load.

4,926,807
IGNITION SIGNAL DISTRIBUTING CIRCUIT FOR ENGINE
Takanori Fujimoto, and Toshirou Hara, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 24, 1989, Ser. No. 356,165
Claims priority, application Japan, Jun. 3, 1988, 63-137996
Int. Cl.[5] F02P *9/00*
U.S. Cl. 123—179 BG **4 Claims**



1. An ignition signal distributing circuit for a multicylinder engine comprising:
a power source for power supplying;
a cylinder identifying sensor which identifies that a predetermined cylinder is to be ignited and outputs a signal in response to a detected result;
a means for outputting an engine starting information when said engine is started up;
a crank angle sensor which detects a predetermined crank angle and outputs a signal in response to the detected crank signal;
a flip-flop which is inputted output signals of said both sensors;
an arithmetic circuit which distributes ignition signals to every cylinder of said engine individually on the basis of output signals of said both sensors, the output of said flip-flop and said engine starting information; ;and
a delay circuit which delays the output signal of said crank angle sensor for the duration from the starting of power supplying by said power source to a completion of the first output signal of said crank angle sensor.

4,926,808
PRIMER BULB CHECK VALVE SYSTEM FOR AN INTERNALLY VENTED BOWL PRIMER CARBURETOR
William C. Kandler, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed Jun. 8, 1989, Ser. No. 363,627
Int. Cl.[5] F02M *1/16*
U.S. Cl. 123—187.5 R **15 Claims**

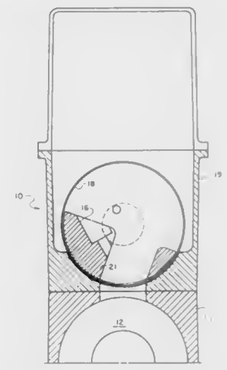


1. A carburetor for providing a fuel/air mixture to an internal combustion engine, said carburetor comprising:
a carburetor body having a throat formed therein, said throat defining a fuel/air mixture passage through said body,
a fuel supply bowl,
conduit means for conveying fuel from said fuel supply bowl to said throat,
a variable volume primer chamber,
a priming passageway from said chamber to said fuel supply bowl,
operator actuable primer means for abruptly varying the volume of said primer chamber and displacing a discrete volume of air from said chamber through said priming passageway into said fuel supply bowl,
a venting passageway extending from said throat to said chamber, and
valve means associated with said primer chamber for blocking the flow of air from the primer chamber through said venting passageway when the primer means is actuated to displace air through said priming passageway into said fuel supply bowl.

4,926,809
INTERNAL COMBUSTION ENGINE WITH ROTARY VALVE
Charles A. Allen, 55 Hidden Springs Rd., Spartanburg, S.C. 29302
Filed Aug. 10, 1989, Ser. No. 392,068
Int. Cl.[5] F01L *7/00*
U.S. Cl. 123—190 A **7 Claims**

1. In an internal combustion engine having a cylinder, a piston moving within the cylinder, an intake manifold through which air flows into the cylinder, inlet valve means for controlling the flow of air into the cylinder, and fuel control means for controlling the flow of fuel into the cylinder with the air, an improvement in said inlet valve means and comprising an elongate thin wall right circular cylindrical valve member mounted for rotation within said intake manifold about the longitudinal axis of said valve member and having an arcuate flow opening therethrough extending over an arc of at least about 100 degrees measured on the circumference of a circle

described by the intersection of said valve member with a plane perpendicular to said axis, and means for driving said



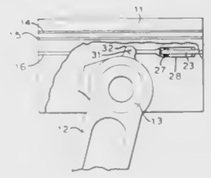
valve member in rotation in timed relation to movement of said piston within said cylinder.

4,926,810
ENGINE VIBRATION BALANCER
Roy E. Diehl, Northville, and Alvin H. Berger, Brownstone, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Oct. 5, 1988, Ser. No. 253,474
Int. Cl.[5] F02B *75/06*
U.S. Cl. 123—192 B **4 Claims**



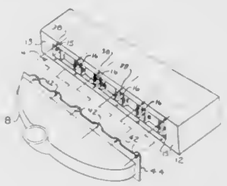
1. A crankshaft vibration balancing means for an automotive type internal combustion engine, comprising, in combination, an engine block having main bearing means, a crankshaft rotatably mounted in the bearing means, and at least one main bearing cap securing the bearing means and crankshaft to the block, and a desmodromic operating type vibration balancing mass pivotally secured to and supported upon the cap and mounted for an oscillatory movement with respect to the axis of the crankshaft to balance the second order of vibration of the crankshaft at a selected frequency of rotation thereof, and cam means on the crankshaft engagable with and oscillating the mass upon rotation of the crankshaft, the mass consisting of a pair of elements each essentially L-shaped in cross-section with a central pivot fulcrum and two leg portions extending from the pivot forming essentially a right angle with respect to each other, means securing the elements to the bearing cap on opposite axial sides thereon, the elements being arranged oppositely on the cap in a face-to-face relationship whereby the resultant center of mass of both elements lies on the vertical axis of the bearing cap and crankshaft and cam means, the cam follower means being mounted adjacent the ends of each leg portion and equidistant from the fulcrum.

4,926,811
INTERNAL COMBUSTION ENGINES
Bryan N. V. Parsons, Stoney Stanton, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom
Filed Jun. 30, 1989, Ser. No. 375,147
Claims priority, application United Kingdom, Jul. 6, 1988, 8816092
Int. Cl.[5] F02F *5/00*
U.S. Cl. 123—193 P **9 Claims**



1. An internal combustion engine comprising a cylinder, a piston mounted for reciprocating motion within the cylinder and sealed with respect thereto, the piston being connected to a crankshaft by means of a connecting rod which is pivotally attached at opposite ends to the piston and to the crankshaft, an oil ring being provided in a circumferential groove in the wall of the piston, said oil ring being split so that there will be a gap in the ring when it engages the wall of the cylinder and means being provided to reduce the width of the gap, upon upward movement of the piston.

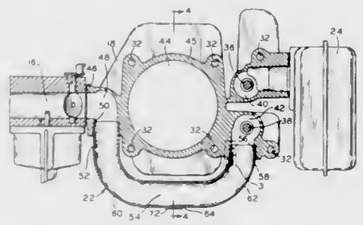
4,926,812
CYLINDER HEAD INTAKE MANIFOLD INTERFACE
Fred L. Cailey, Batavia, Ill., assignor to Navistar International Transportation Corp., Chicago, Ill.
Filed Nov. 2, 1989, Ser. No. 431,046
Int. Cl.[5] F02F *1/24*
U.S. Cl. 123—193 H **14 Claims**



1. In an internal combustion engine cylinder head, said cylinder head having an intake manifold interface surface intersected by charge air intake port inlets having port walls, the improvement comprising arcuate columnar structures disposed laterally adjacent the intake port inlets thereof and having a periphery smoothly blended into the port walls to provide arcuate port inlets and a depressed chamber disposed between said columnar structures between adjacent port inlets, said depressed chamber being recessed into said cylinder head from the outermost periphery of said columnar structures.

VOL
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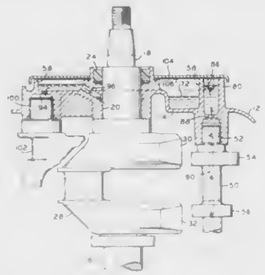
4,926,813
INVERTED PORT ENGINE WITH CROSS-UNDER INTAKE PASSAGE
Kevin G. Bonde, Kiel, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed Jul. 12, 1989, Ser. No. 378,808
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—195 HC **16 Claims**



1. In a vertical shaft internal combustion engine having a carburetor and an exhaust system, a cylinder assembly comprising:
a cylinder block comprising a cylinder including a a piston bore, an intake cavity for receipt of an intake valve, an exhaust cavity for receipt of an exhaust valve, said exhaust cavity having an exhaust port therein, said exhaust cavity located proximate and have said intake cavity on a first side of said cylinder, a downwardly facing first opening located below said intake cavity on said first side, a downwardly facing second opening located on a second side, and a carburetor port located on said second side, said first opening being in communication with and near said intake cavity, said second opening being in communication with said carburetor port;
a cross-under tube connected to said cylinder block, said cross-under tube having a first end and a second end received in said cylinder block, said cross-under tube being U-shaped with said first and second ends being relatively parallel, said first end and said second end of said cross-under tube being slidably received in said first opening and said second opening, respectively, of said cylinder; and
means for connecting and sealing said cross-under tube to said cylinder block such that said cross-uner tube and said cylinder block provide an intake passage from said carburetor port to said intake cavity;
said carburetor disposed on said second side and connected to said carburetor port, said exhaust system being disposed on said first side and connected to said exhaust port.

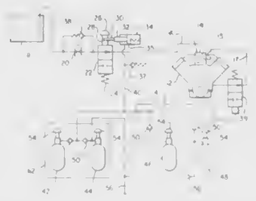
4,926,814
CRANKCASE BREATHER AND LUBRICATION OIL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE
Kevin G. Bonde, Kiel, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed Jul. 12, 1989, Ser. No. 378,867
Int. Cl.[5] F01M *1/00*
U.S. Cl. 123—196 W **16 Claims**

1. In an internal combustion engine including a crankcase having a generally horizontally oiented top wall, an oil sump, an oil pump, and a vertically oriented crankshaft rotatably journalled therein, a horizontally oriented cylinder bore communicating with and extending from the crankcase, a piston disposed for reciprocation within the cylinder bore and linked to the crankshaft, and a plurality of lubrication sites, the improvement comprising:
a first upstanding wall extending upwardly from the top wall of said crankcase, said first upstanding wall circumscribing and defining a first chamber;
breather passage means for communicating crankcase gases from said crankcase into said first chamber;
drain passage means for communicating oil separated from the crankcase gases in said first chamber into the cylinder bore below the piston, said drain passage means being positioned along the cylinder bore so as to be periodically occluded by the piston during reciprocation thereof;



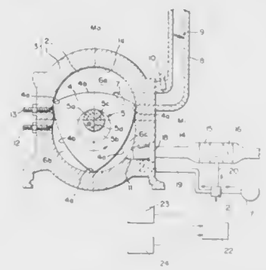
a second upstanding wall extending upwardly from the top wall of said crankcase in spaced relationship to at least a portion of said first wall, said first and second walls defining therebetween a second chamber;
first oil passage means communicating oil from said lubricant pump to said second chamber; and
second oil passage means communicating oil from said second chamber to at least one of the lubrication sites.

4,926,815
RAPID SHUT-OFF SYSTEM FOR TRUCK ENGINE
Trent E. Cowley, Wright, Wyo., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Sep. 6, 1989, Ser. No. 403,633
Int. Cl.[5] F02B *77/08*
U.S. Cl. 123—198 DB **9 Claims**



1. An engine shut-off system particularly adapted for use in conjunction with a propulsion engine for an off-highway vehicle such as a large dumper truck and the like, said system comprising:
a supply conduit for supplying fuel to said engine and in communication with a source of fluid fuel;
fuel flow shut-off valve means interposed in said conduit, said shut-off valve means being normally biased to a closed position and being actuated to an open position by valve actuating means;
actuator means operable to be engaged with said valve actuating means and a source of pressure fluid for placing said shut-off valve means in an operating condition which will rapidly close said shut-off valve means; and
a source of pressure fluid disposed for operation from at least one of an operator's cab for said vehicle and a position in proximity to the ground surface and exterior of said vehicle for operation of said actuator means to cause said shut-off valve means to shut off fuel flow to said engine.

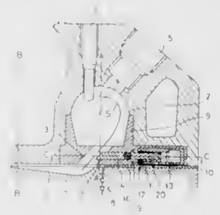
4,926,816
ROTARY PISTON ENGINE
Tatsuya Kita; Takuro Shigemura; Setsuo Nakamura, all of Hiroshima, and Hisanori Nakane, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 19, 1988, Ser. No. 285,982
Claims priority, application Japan, Dec. 21, 1987, 62-192658[U]
Int. Cl.[5] F01N *3/32;* **F02B** *53/00*
U.S. Cl. 123—203 **18 Claims**



1. A rotary piston engine comprising a casing including a rotor housing having an inner wall of a trochoidal configuration and a pair of side housings gas-tightly secured to the opposite sides of the rotor housing to form a rotor cavity therein, a substantially polygonal rotor disposed in said casing with apex portions in sliding contact with the inner wall of the rotor housing to define working chambers of which the volumes cyclically change to conduct intake, compression, expansion and exhaust strokes as the rotor rotates, an intake port provided in said casing to communicate with the working chamber in the intake stroke, an exhaust port provided in said casing to communicate with the working chamber in the exhaust stroke, air supplying means for supplying air comprising an air pump and an air supplying passage connecting said air pump and said exhaust port, an insert comprising a hollow body located in said exhaust port, an exhaust port passage provided in the hollow body with its inner end located in the trailing part of said exhaust port and an air injection passage provided in the hollow body with its inner end located in the leading part of said exhaust port, said air injection passage being connected with said air supplying passage, nozzle means being located at the inner end of said air injection passage for discharging air into the leading side of the working chamber which is in the exhaust stroke.

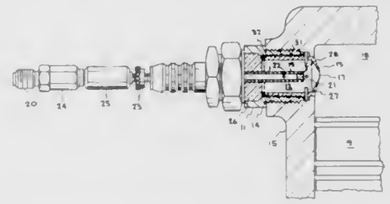
4,926,817
COMBUSTION CHAMBER OF SUBCHAMBER TYPE INTERNAL COMBUSTION ENGINE
Koji Imoto; Tadao Omura; Yoichi Kataoka, all of Nagasaki; Kunihiko Nakajima, Muko; Motoyuki Maekawa, Kyoto; Hiroki Tamura, Okazaki, and Yoshiaki Shioya, Kyoto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan
Filed Dec. 27, 1988, Ser. No. 290,191
Claims priority, application Japan, Dec. 24, 1987, 62-325219
Int. Cl.[5] F02B *19/02, 19/18*
U.S. Cl. 123—292 **12 Claims**

1. In a fuel-injected combustion engine having a cylinder head in which a subchamber is defined, fuel injection means for injecting fuel into said subchamber, and a main combustion chamber, the improvement comprising a mouthpiece having an inner peripheral surface defining a subchamber injection port open to the subchamber and to the combustion chamber, and the mouthpiece having a space defined therein open to said peripheral surface; a subchamber injection port control rod disposed in said space adjacent said subchamber injection port; and an actuator disposed in said space remote from said subchamber injection port with said subchamber injection port control rod interposed therebetween, said actuator operatively engaging said subchamber injection port control rod for positioning one end of said control rod at the location at which said space is open to said inner peripheral surface when the engine is subjected to a light load and for projecting said control rod



into said subchamber injection port passageway to reduce the cross-sectional area thereof when the engine is subjected to a heavy load that is greater than said light load, said actuator comprising a working substance such as wax or rubber or alcohol that expands and contracts to a significant degree when subjected to temperature changes, and an expansible member comprising an expansible material such as rubber sealing said working substance within said actuator and conformed to receive the other end of said control rod, said other end of said control rod extending in and engaged by said expansible member.

4,926,818
PULSED JET COMBUSTION GENERATOR FOR PREMIXED CHARGE ENGINES
A. K. Oppenheim, Berkeley; H. E. Stewart, Alameda, and K. Hom, Hercules, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.
Filed Feb. 24, 1989, Ser. No. 315,405
Int. Cl.[5] F02P *1/00;* **F02B** *23/00*
U.S. Cl. 123—297 **12 Claims**



1. Apparatus for generating pulsed jets comprising combustion initiating high temperature combustion products containing an appreciable amount of active radicals, for injection into compressed premixed fuel-air charges of internal combustion engines during an appropriate time interval close to the end of the compression stroke, for initiating and controlling combustion of said compressed premixed fuel-air mixture, which comprises:
a body defining an interior chamber, said chamber including a terminal section defining at least one orifice for forming

VOL
1114
ISS
4
MY
22
1990
UMI

said jet, said body being capable of being secured to said internal combustion engine in fluid communication with the head space of a cylinder of said engine to direct said jet into said head space;

a hollow electrically conductive tube secured to said body in electrically insulated relationship thereto, one first end of said hollow electrode projecting into said interior chamber, said first end being closed and defining a plurality of spray perforations between the interior of said tube and said chamber, said hollow, electrically conductive tube having a second end capable of being connected to a supply of pressurized fuel in an electrically non-conductive relationship with said body, and said hollow, electrically conductive tube being capable of being connected to source of electrical energy sufficient to cause an electrical discharge across said chamber for ignition.

4,926,819

SYSTEM FOR INJECTING FUEL INTO COMBUSTION CHAMBERS OF AN INTERNAL COMBUSTION ENGINE

Gerhard Auwärter, Stuttgart; Ernst Imhof, Münchingen; Iwan Komaroff, Regensburg; Helmut Reum; Günther Schmid, both of Stuttgart, and Bernhard Kaczynski, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

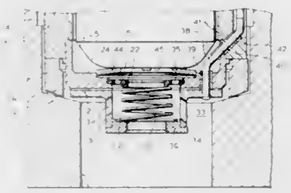
PCT No. PCT/DE87/00008, § 371 Date Sep. 14, 1988, § 102(e) Date Sep. 14, 1988, PCT Pub. No. WO87/05663, PCT Pub. Date Sep. 24, 1987

PCT Filed Jan. 10, 1987, Ser. No. 271,755

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609749

Int. Cl.[5] **F02M** *53/06;* **F02B** *9/08*

U.S. Cl. 123—297 **10 Claims**



1. A system for injecting fuel into the combustion chambers of an internal combustion engine comprising, in combination:

a nozzle body having a front side;

a glow coil having two ends;

a sleeve enclosing said glow coil at a radial distance therefrom, said sleeve having at least one aeration opening leading into the annular space between said sleeve and said glow coil allowing air to enter the boundary zones of the injection jets from said combustion chamber by means of injector action;

a contact ring body for mounting said glow coil and said sleeve downstream from said front side of said nozzle body, one end of said glow coil making contact with and being supported at said sleeve and the other end of said glow coil being in electrical connection with said contact ring body;

means for electrically insulating said sleeve from said contact ring body;

an axially springing heat protection ring interposed between said contact ring body and said front side of said nozzle body; and

a current lead extending along said nozzle body and making electrical connection with said sleeve, the arrangement being such that said sleeve and said contact ring body provide a conductive path for carrying current through said glow coil from said current lead.

4,926,820

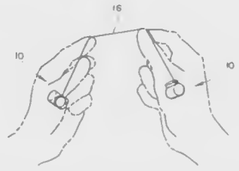
DENTAL FLOSS HOLDING ASSEMBLY

E. Stafford Wearn, P.O. Box 1746, Statesville, N.C. 28677

Filed Mar. 31, 1989, Ser. No. 331,499

Int. Cl.[5] **A61C** *15/00*

U.S. Cl. 132—323 **8 Claims**



1. A dental floss holding assembly comprising a pair of holders, one each for being held in a hand while dental floss suspended under tension therebetween is manipulated in dental interstices, each of said pair of holders comprising:

(a) a compact, hand-holdable substantially cylindrical member having a size for being held in and completely enclosed within the palm of the hand;

(b) said hand-holdable member having positioned on the cylinder wall intermediate the ends an outwardly-extending disk defining a floss-retaining groove between said hand-holdable member and said disk for securing one wrapped end of said length of floss therearound, said disk having a diameter approximately one-half the length of the hand-holdable member.

4,926,821

ELECTRONIC CONTROLLER FOR INTERNAL COMBUSTION ENGINES

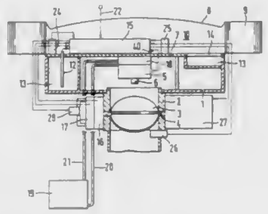
Wolfgang Porth, Frankfurt am Main; Wolfgang Weibler; Eckhart Kern, both of Hofheim a. T.; Thomas Hannewald, Griesheim, and Reiner Weingärtner, Hofheim a. T., all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 926,454, Nov. 3, 1986, Pat. No. 4,719,891. This application Dec. 21, 1987, Ser. No. 135,658

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3539012

Int. Cl.[5] **F02D** *41/00*

U.S. Cl. 123—399 **11 Claims**



1. In a system having an electronic controller for an internal combustion engine, in which the controller is functionally connected to a plurality of sensors and at least one actuator, the improvement comprising:

an assembly including the controller; and wherein

the assembly comprises a throttle-valve mechanism, an air-mass sensor and a throttle-valve position sensor;

said electronic controller comprises a controller of an electronic gas-pedal system;

said throttle-valve mechanism comprises an electromotive actuator, and said electronic controller includes an output connected to said electromotive actuator; and

the system further comprises an injection valve located within a housing, said injection valve serving as said actuator and being driven by the controller;

an air filter assembly which has a circular air filter and is located on an outer wall of the housing; and wherein

a flow channel formed in said housing connects an inner space of the filter assembly, formed by the circular air filter, to the inside of the housing, said air-mass sensor being located within said flow channel; and

the electronic controller is located on the outer wall of the housing and extends into the inside of the air-filter assembly.

4,926,822

CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

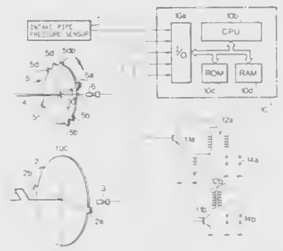
Kunihiro Abe, and Masaaki Furuyama, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,731

Claims priority, application Japan, Apr. 28, 1988, 63-108673

Int. Cl.[5] **F02D** *7/067*

U.S. Cl. 123—414 **4 Claims**



1. A system for controlling an internal combustion engine having even cylinders, comprising:

a crankshaft disk rotated in synchronism with a crankshaft of said engine;

at least two first indicator means formed on said crankshaft disk on diametrically opposite positions, corresponding to specific positions in crank angle;

a first sensor for sensing said first indicator means and for producing a crank angle signal;

a camshaft disk rotated in synchronism with a camshaft of said engine;

at least two second indicator means formed on said camshaft disk on diametrically opposite positions, corresponding to specific positions in cam angle for at least two groups in which a pair of cylinders are in opposite phase to each other;

a second sensor for sensing said second indicator means and for producing a cam angle signal;

third indicator means formed on said camshaft disk for representing a specific cylinder;

discriminator means responsive to an output signal of said second sensor when detecting said third indicator means for producing a discriminating signal;

control means responsive to said crank angle signal and to said cam angle signal for controlling operations for the cylinder in each group, and responsive to said discriminating signal, said cam angle signal and said crank angle signal for independently controlling the operation for each cylinder.

4,926,823

METHOD OF CONTROLLING AN AIR/FUEL RATIO OR AN INTERNAL COMBUSTION ENGINE

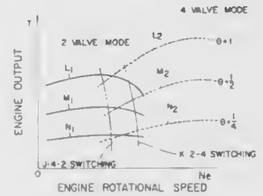
Noriyuki Kishi; Atsushi Katoh, both of Tokyo, and Tomohisa Saita, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,657

Claims priority, application Japan, Nov. 12, 1986, 61-269335

Int. Cl.[5] **F02B** *15/00*

U.S. Cl. 123—432 **17 Claims**



1. A method of controlling an air/fuel ratio for an internal combustion engine having a valve switching device for changing the characteristics of an intake valve operation as a function of at least an engine rotational speed, comprising the step of:

gradually varying the air/fuel ratio according to at least a change in said engine rotational speed in a range of rotational speeds including when said valve switching device effects valve switching operation, wherein said valve switching device operates to open only one valve at low engine speeds and to open all intake valves at high engine speeds.

4,926,824

FUEL INJECTION SYSTEM

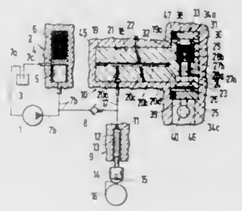
Gerd-Uwe Dahlmann, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,995

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816089

Int. Cl.[5] **F02M** *39/00*

U.S. Cl. 123—450 **6 Claims**



1. A fuel injection system comprising a device for proportioning and distributing fuel to the individual cylinders of an internal combustion engine including a pressure pump having a high-pressure chamber, a distribution rotor driven in proportion to the speed of the engine and having high-pressure channels communicating with the high-pressure chamber of the pressure pump for variable connection with injection lines leading to the cylinders of the engine, a control valve in the distribution rotor connecting the highpressure channels therein with an outlet to control the end of fuel injection and actuable by a roller tappet disposed in a transverse bore of the distribution rotor, and a plurality of camlike projections surrounding

VOL 1114 ISS 4 MY 22 1990 UMI

the distribution rotor and engageable by the roller tappet which are displaceable in the peripheral direction.

4,926,825

AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

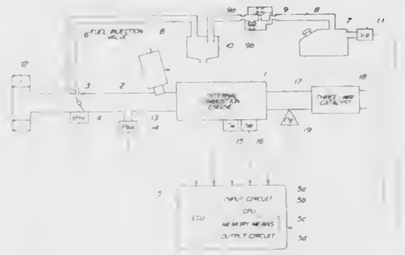
Shoichi Ohtaka, and Hisashi Igarashi, both of Wako, Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English), Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,024

Claims priority, application Japan, Dec. 7, 1987, 62-310314; Dec. 7, 1987, 62-310315

Int. Cl.[5] F02M *25/08*; F02D *41/14*

U.S. Cl. 123—489 **13 Claims**



1. In a method of controlling in a feedback manner the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine having an intake system, a fuel supply system, means for supplying vaporized fuel from said fuel supply system to said intake system during operation of said engine, an exhaust system, and sensor means arranged in said exhaust system for sensing the concentration of an exhaust gas ingredient therein, wherein during operation of said engine in an air-fuel ratio feedback control region, the air-fuel ratio is controlled by the use of a correction value which varies in response to an output from said sensor means and the maximum or minimum value of which is limited to an upper or lower limit value,

the improvement comprising the steps of sensing the pressure of said vaporized fuel in said fuel supply system, and setting at least one of said upper and lower limit values in accordance with the sensed pressure of said vaporized fuel.

4,926,826

ELECTRIC AIR-FUEL RATIO CONTROL APPARATUS FOR USE IN INTERNAL COMBUSTION ENGINE

Shimpei Nakaniwa, and Toshibumi Itoh, both of Isesaki, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Gunma, Japan

Filed Aug. 25, 1988, Ser. No. 236,223

Claims priority, application Japan, Aug. 31, 1987, 62-215191; Sep. 11, 1987, 62-226607

Int. Cl.[5] F02M *51/00*

U.S. Cl. 123—489 **23 Claims**

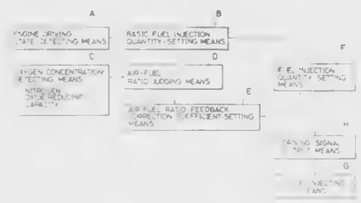
1. An electric air-fuel ratio control apparatus for use in an internal combustion engine, which comprises:

an engine driving state-detecting means for detecting the driving state of the engine;

a basic fuel injection quantity-setting means for setting a basic fuel injection quantity based on the engine driving state detected by the engine driving state-detecting means;

an oxygen concentration-detecting means for detecting an oxygen concentration in an exhaust gas, which has such an output characteristic that the output value gradually changes with the oxygen concentration in a zone in the vicinity of the theoretical air-fuel ratio of an air-fuel mixture sucked in the engine, wherein said oxygen concentration-detecting means comprises a zirconia tube having platinum electrodes formed on an inner surface and an outer surface thereof, in which an electromotive force is generated according to the oxygen concentration ratio between outer air introduced in the interior of the zirconia tube and exhaust gas from the engine outside the tube, said platinum catalyst layer acting as an oxidation catalyst with such a weakened oxidation activity that the output electromotive force of the oxygen concentration-detecting means is gradually changed with an air-fuel ratio in a zone in the vicinity of the theoretical air-fuel ratio, said oxygen concentration-detecting means having a capacity for reducing nitrogen oxides contained in an exhaust gas of the engine, detects the concentration of oxygen in the exhaust gas, inclusive of oxygen obtained by reduction of the nitrogen oxides, and has such an output characteristic that the output value gradually changes with the oxygen in a zone in the vicinity of the theoretical air-fuel ratio of an air-fuel mixture sucked in the engine;

an air-fuel ratio-judging means for comparing the output value of the oxygen concentration-detecting means with a



predetermined value corresponding to the theoretical air-fuel ratio and judging the air-fuel ratio of the air-fuel mixture sucked in the engine with reference to the theoretical air-fuel ratio;

an air-fuel ratio feedback correction coefficient-setting means for changing and setting, by integration control based on a predetermined integration constant, an air-fuel ratio feedback correction coefficient for correcting the basic fuel injection quantity based on the result of the judgment of the air-fuel ratio-judging means to bring the actual air-fuel ratio close to the theoretical air-fuel ratio;

a fuel injection quantity-setting means for setting a fuel injection quantity based on the basic fuel injection quantity set by the basic fuel injection quantity-setting means and the air-fuel ratio feedback correction coefficient set by the air-fuel ratio feedback correction coefficient-setting means;

a fuel injection means for injecting fuel into the engine; and

a driving signal output means for putting out a driving signal corresponding to the fuel injection quantity set by the fuel injection quantity-setting means to a fuel-injecting means in an on-off manner.

4,926,827

OUTPUT CORRECTION METHOD FOR EXHAUST GAS INGREDIENT-CONCENTRATION SENSORS

Akira Kato, and Toru Yano, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,987

Claims priority, application Japan, Jun. 30, 1988, 63-162856

Int. Cl.[5] F02D *41/14*

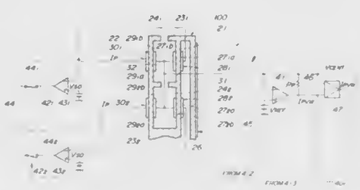
U.S. Cl. 123—489 **11 Claims**

1. In an output correction method for an exhaust gas ingredient-concentration sensor adapted for use in an internal combustion engine, said sensor having first and second sensor elements having output characteristics different from each other, said

first and second sensor elements each producing an output proportional to the concentration of an ingredient in exhaust gases emitted from said engine, wherein said sensor controls the air-fuel ratio of a mixture supplied to said engine to a desired air-fuel ratio by the use of an output from at least one of said first and second sensor elements,

the improvement comprising the steps of:

(1) determining whether or not a difference between said



desired air-fuel ratio and an actual air-fuel ratio represented by said output of at least one of said first and second sensor elements is smaller than a predetermined value, and

(2) correcting an output value of one of said first and second sensor elements based on an output value of the other of said first and second sensor elements when it is determined that said difference is smaller than said predetermined value.

4,926,828

AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

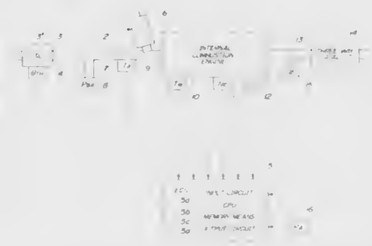
Sachito Fujimoto, and Shuichi Hosoi, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Feb. 14, 1989, Ser. No. 310,869

Claims priority, application Japan, Mar. 1, 1988, 63-49182

Int. Cl.[5] F02D *41/14*

U.S. Cl. 123—489 **3 Claims**



1. A method of effecting feedback control of the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine having an exhaust system, and a sensor arranged in said exhaust system for sensing a value of the concentration of an ingredient in exhaust gases from said engine, wherein when said engine is operating in a feedback control region, the value of the concentration of said ingredient detected by said sensor is compared with a reference value, and the air-fuel ratio of the air-fuel mixture is controlled to a desired value in a feedback manner responsive to the result of the comparison, the method comprising the steps of:

(1) detecting a value of atmospheric pressure; and

(2) setting said reference value to a value depending on the detected value of atmospheric pressure, said reference value being set to different values between when said engine is operating in an idling region within said feedback control region and when said engine is operating in a region within said feedback control region other than said idling region.

4,926,829

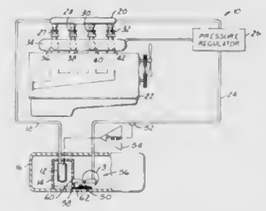
PRESSURE-RESPONSIVE FUEL DELIVERY SYSTEM

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Continuation-in-part of Ser. No. 276,801, Nov. 28, 1988. This application Mar. 17, 1989, Ser. No. 324,649

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—497 **9 Claims**



1. A fuel delivery system for an internal combustion engine that includes a fuel supply with a pump responsive to application of electrical power for delivering fuel under pressure, an engine air intake manifold, fuel delivery means coupled to said fuel supply for controlled delivery of fuel from said supply to said manifold, pressure regulator means having a first input responsive to fuel pressure at said fuel delivery means, a reference input connected to said air intake manifold and an outlet connected through a fuel return to said supply, said regulator means being responsive to a predetermined pressure differentials across said fuel delivery means for passing excess fuel through said return to said supply, and means for applying electrical power to said pump; characterized in that said power-applying means comprises:

means in said return between said regulating means and said supply for restricting flow of fuel therethrough and thereby developing a back pressure of fuel in said return between said restricting means and said regulator means, a differential pressure sensor having a first input coupled to said return between said restricting means and said regulator means, a second input connected to receive air at ambient pressure and an output for supplying an electrical sensor signal as a direct continuous function of a differential between said back pressure and ambient caused by fuel flow through said return, and means for applying electrical power to said pump as a continuous inverse function of said sensor signal.

4,926,830

MOUNTED FUEL TANK HEATER

Jerald R. McNelley, Rte. 2, Box 172, Benton, Tenn. 37307

Filed Feb. 3, 1989, Ser. No. 306,641

Int. Cl.[5] F02M *53/00, 31/16*; F02N *17/02*

U.S. Cl. 123—557 **6 Claims**

1. A system for preheating fuel for an internal combustion engine having a fuel line comprising:

a fuel tank for storing fuel to be supplied to said fuel line, said tank having an access opening provided in an upper portion thereof;

an elongated heat exchanger installed through and secured to said access opening, a substantial portion of said heat exchanger being contained within said fuel tank;

said heat exchanger defining an inlet port and an outlet port proximate a first end portion of said heat exchanger positioned externally of said fuel tank;

a heated fluid chamber defined by said heat exchanger communicating between said inlet and outlet ports, said heated

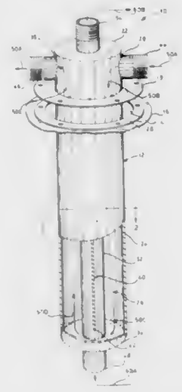
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fluid chamber including a divider plate which separates said heated fluid chamber into an inlet section communicating with said inlet port and an outlet section communicating with said outlet port, said divider plate being positioned such that a heated fluid entering said inlet port flows toward a second end portion of said heat exchanger where said heated fluid flows through said outlet section of said heated fluid chamber and exists through said outlet port;

a source of said heated fluid;

means for providing fluid communication between said source of heated fluid and said inlet and outlet ports of said heat exchanger;

said heat exchanger further comprising a fuel tube passing substantially axially through said heated fluid chamber



and forming a portion of said divider plate, said fuel tube having a fuel inlet end positioned externally of said heated fluid chamber proximate said second end portion of said heat exchanger in fluid communication with said fuel in said fuel tank, and said fuel tube having a fuel outlet end positioned externally of said heated fluid chamber proximate said first end portion of said heat exchanger in fluid communication with said fuel line of said internal combustion engine;

whereby said fuel in said fuel tank is heated by heat transferred from heated fluid contained within said heated fluid chamber through the walls of said heat exchanger; and

whereby fuel drawn from said fuel tank through said fuel tube into said fuel line is further heated by heat transferred from heated fluid contained by said heated fluid chamber which surrounds said fuel tube.

4,926,831
FUEL VAPORIZATION APPARATUS
Gregory K. Earl, 4005 Saul Rd., Kensington, Md. 20895
Filed May 12, 1989, Ser. No. 350,845
Int. Cl.[5] F02M *31/18*
U.S. Cl. 123—557 33 Claims

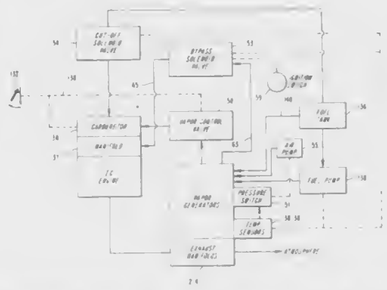
1. A vaporization apparatus for use in the fuel supply system of an internal combustion engine, comprising:

vapor generator means for generating fuel vapor;

fuel inlet means for introducing fuel into said vapor generator means in a mist form;

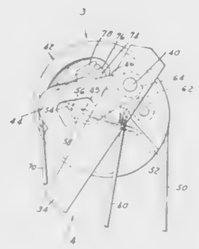
exhaust collection means, connected adjacent said vapor generator means, for collecting heated exhaust from said internal combustion engine and providing heat to said vapor generator means; and

valve means, connected to said vapor generator means, for selectively providing said fuel vapor to a carburetion device of said internal combustion engine;



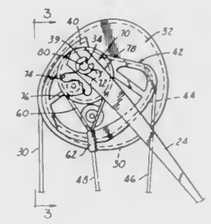
said vapor generator means comprising first and second vapor generator chambers and a vapor passage element connected between and in vapor communication with said first and second vapor generator chambers.

4,926,832
COMPOUND BOW WITH ADJUSTABLE CABLE LENGTH
Rex F. Darlington, 3540 Darton Rd., Hale, Mich. 48739
Filed Feb. 28, 1989, Ser. No. 316,773
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—25.6 2 Claims



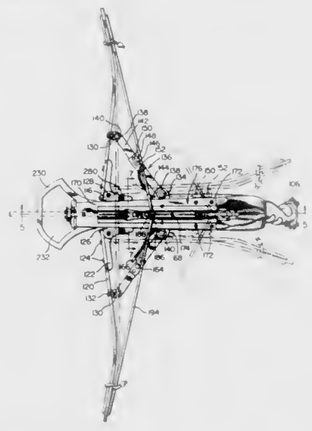
1. In a compound archery bow including a center handle section supporting upper and lower limbs having distal ends with attached grooves, eccentric, cam wheel assemblies on each mounted on a transverse axis, and bowstring and power tension cables extending between said wheel assemblies, that improvement which comprises a bowstring having a permanent loop at each end, a bowstring wheel on each said cam wheel assembly having formed thereon an integral, axially-extending chordal projection within the peripheral confines of said bowstring wheel, a knob formed on said chordal projection having one side shaped to provide a plurality of first open grooves lying in a plane perpendicular to the plane of said wheel assembly, said bowstring being wrapped around a sheave on said bowstring wheel and turned toward the center of said wheel in a direction opposite to the open side of said grooves to overlie said chordal projection, with the looped end releasably secured in one of said grooves.

4,926,833
COMPOUND BOW WITH ADJUSTABLE CABLE ANCHOR
Rex F. Darlington, 3540 Darton Rd., Hale, Mich. 48739
Filed Feb. 14, 1989, Ser. No. 310,343
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—23.1 1 Claim



1. In a compound archery bow having bowstring pulleys and tension cable pulleys mounted on a common axle at each distal end of the bow and anchor points of the respective ends of the tension cable, that improvement in the anchor points for the ends of the tension cable which comprises a perforate disc mounted on each end of the tension cable having an external groove to receive a bight portion of a closed stable loop of a tension cable end, said disc having a reference point and formed therein a plurality of notches of different lengths around said reference point, each notch being open at an inner end to the reference point and having a bight at a closed end opposite to the reference point to receive and anchor on a pulley axle in various positions of adjustment of the tension cable.

4,926,834
FOLDING CROSSBOW
Glenn A. Chauvin, P.O. Box 807, Escatawta, Miss. 39552
Filed Jan. 26, 1989, Ser. No. 301,701
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—25 9 Claims



1. A crossbow comprising:

a main stock,

a secondary stock pivotally connected to said main stock and movable relative to said main stock between collapsed and extended positions,

a pair of prod members, each having inner and outer ends, said prod members pivotally connected at the inner ends thereof to said main stock and pivotable relative to said main stock between inoperative and operative positions,

a drawstring secured at opposite ends to said prod members,

a drive block movable along said main stock between cocked and released positions, said drawstring biasing said drive block toward said released position, and

a trigger for retaining said drive block in said cocked position so that when said prod members are in said operative position, an arrow can be loaded onto said crossbow, said trigger also able to release said drive block from said cocked position so that said drawstring can move said drive block along said main stock toward said released positon to fire the arrow,

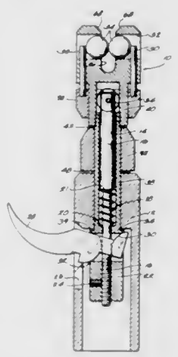
wherein said main stock and said secondary stock can be retained in said collapsed position and said prod members can be retained in said inoperative position when the crossbow is not in use so that the crossbow is compact,

an arrow guide sight mounted on said main stock, said arrow guide sight comprising an L-shaped bracket secured to said main stock, a sight base, including an elongated cylindrical extension, secured to said bracket, said extension projecting forwardly relative to said sight base and being provided with a first cut away portion in its cylindrical wall, and

an alignment member including a second cut away portion, mounted for rotation on said extension,

wherein said alignment member can be rotated so that said first and second cut away portions are aligned and an arrow may be lowered through the aligned cut away portions to load said arrow for firing.

4,926,835
BALL BEARING TYPE BOW STRING RELEASE
Paul L. Peck, Fond du Lac, Wis., assignor to Archery Designs, Inc., North Fond du Lac, Wis.
Filed Jan. 7, 1989, Ser. No. 362,882
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—35.2 9 Claims



1. A bow string release including,

a handle,

a head having a string receiving notch therein,

means freely rotatably mounting said head on said handle,

a collar slideably mounted on said head,

a cross bore in said head intersecting said notch,

a ball in said bore on each side of said notch,

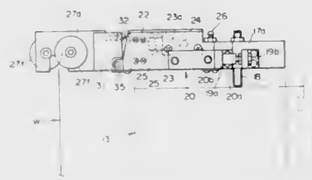
a pair of holes in said head parallel to and on opposite sides of said notch and intersecting said cross bore,

a pair of pins each slidably mounted in one of said holes and fixed to said collar for movement between a first position in which said pins act on said balls to move said balls into

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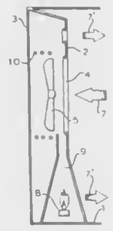
contact closing said notch and a release position in which said balls are separated and a bow string can pass between the balls,
a pull pin mounted on the axis of said head and connected to said collar and extending into said handle,
said handle being rotatable relative to said pull pin,
a trigger mounted in said handle and operative to actuate said pull pin to move said collar.

4,926,836
METHOD OF AND APPARATUS FOR DRESSING CUTTING EDGE OF CUT-OFF WHEEL
Seiichi Abe, Sodegaura, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 13, 1988, Ser. No. 181,202
Claims priority, application Japan, Jul. 31, 1987, 62-192478
Int. Cl.[5] B24B *53/00*
U.S. Cl. 125—11.01 **6 Claims**



1. A method of applying a dressing, by using a rotary grinding wheel, to a peripheral cutting edge of abrasive grain formed on either an outer periphery or an inner periphery of a disc-shaped rotary cut-off wheel, the dressing method comprising the steps of: rotating both the grinding wheel and the cut-off wheel about their respective axes; bringing the grinding wheel into contact with the peripheral cutting edge of the cut-off wheel in such a manner that the axis of the grinding wheel is inclined, at an angle larger than 0° and smaller than 90°, to the axis of the cut-off wheel, when the axes of the grinding and cut-off wheels are viewed from a plane of projection perpendicular to the direction in which the grinding wheel and the cut-off wheel are aligned, said step of bringing the grinding wheel into contact with the peripheral cutting edge of the cut-off wheel including pressing the grinding wheel against the peripheral cutting edge by means of a spring so that the pressing force with which the grinding wheel contacts the cutting edge is adjusted to a level not greater than the elastic force of the spring, before the step of bringing the grinding wheel into contact with the peripheral cutting edge of the cut-off wheel, positioning the grinding wheel and a second rotary grinding wheel respectively at opposite sides of the cutting edge of the cut-off wheel, and wherein after positioning said grinding wheels, the step of bringing the grinding wheel into contact with the peripheral cutting edge of the cut-off wheel further includes moving both grinding wheels selectively along the axis of the cut-off wheel until one of the grinding wheels contacts one of the opposite side surfaces of the cutting edge, such that either of the opposite side surfaces of the cutting edge is selectively applied with a dressing.

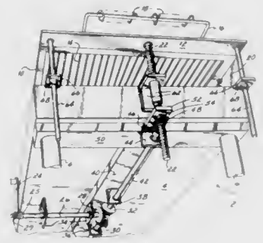
4,926,837
COOKING OVENS
Christopher Parker, Chester, and Gordon T. Andrews, Bromley, both of England, assignors to New World Domestic Appliances Limited, Warrington, United Kingdom
Filed Jun. 27, 1989, Ser. No. 371,793
Claims priority, application United Kingdom, Jun. 28, 1988, 8815381
Int. Cl.[5] F24C *15/32*
U.S. Cl. 126—21 H **11 Claims**



1. A cooking oven comprising:
(a) oven means including a back wall, a bottom wall and a top wall,
(b) a second wall spaced from said back wall and extending from the bottom wall to the top wall of said oven means and forming with said back wall a heating compartment,
(c) said heating compartment including an electric heating means and a gas heating means,
(d) a fan means in said heating compartment,
(e) an intake vent in said second wall in proximity to said fan means,
(f) output vents in said wall spaced above and below said intake vent,
(g) a baffle extending upwardly from the bottom wall of said oven means in said heating compartment and spaced between said back wall and said second wall and extending upwardly to said intake vent,
(h) said gas heating means positioned between said baffle and said second wall adjacent said oven bottom wall,
(i) said baffle including an inside facing said second wall and an outside facing said back wall,
(j) said electric heating means positioned at the outside of said baffle,
(k) said oven including microwave means, and
(l) means for automatically controlling said electric heating means, said gas heating means and said microwave heating means.

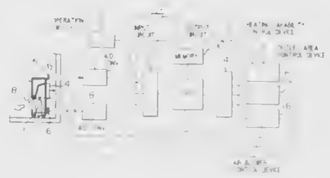
4,926,838
CHARCOAL GRILLING UNIT
Charles C. Sells, Mt. Juliet, and Robert N. Martin, Brentwood, both of Tenn., assignors to Sportsman's Market, Inc., Batavia, Ohio
Filed Apr. 28, 1989, Ser. No. 345,195
Int. Cl.[5] A47J *37/00*; F24B *3/00*
U.S. Cl. 126—25 A **15 Claims**

1. An outdoor grill for cooking relatively large quantities of food at one time on a grid surface, comprising:
a fuel bed;
a plurality of vertical support members to maintain said fuel bed a distance above the ground and approximately parallel thereto;
a grid frame having terminus plates at opposite ends thereof, said frame positioned above said fuel bed;
a bevel gear transmission attached to said fuel bed and actuable by a crank, said transmission comprising a crank-connected bevel gear which meshes with two shaft bevel gears, said shaft bevel gears rotating in opposed directions in response to rotation of said crank-connected bevel gear;
a plurality of driveshafts driveably connected to said shaft



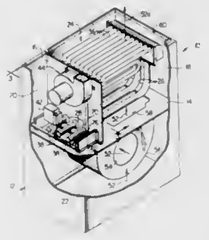
bevel gears of said bevel gear transmission and to said terminus plates for adjusting the height of said grid frame; and
a grid surface mounted on said grid frame.

4,926,839
HOT AIR TYPE HEATER
Sakuo Sogawara; Masanori Hara, and Takane Suzuki, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 26, 1989, Ser. No. 343,367
Claims priority, application Japan, Apr. 28, 1988, 63-104148; Apr. 28, 1988, 63-104150; Apr. 28, 1988, 63-104149; Apr. 28, 1988, 63-104147; May 17, 1988, 63-118208
Int. Cl.[5] F24C *5/04*
U.S. Cl. 126—96 **6 Claims**



1. A heater comprising
a heater body containing a heating source;
an air blower for forcibly blowing off heated air from the heater body into a room, the heated air being produced by heat-exchanging with the heating source;
a first temperature detection element for detecting a temperature at an upper level in the room;
a second temperature detection element for detecting a temperature at a lower level in the room;
a sensation input means for enabling a user to input his or her sensation corresponding to an actual room temperature;
means for determining heating output of the heating source based on the difference between the temperature detected by the first temperature detection element and a first set temperature;
means for changing the outlet area of the heated air based on the difference between the temperature detected by the second temperature detection element and a second set temperature lower than the first set temperature to determine the blow-off speed of the heated air; and
a control means for changing the first set temperature and the second set temperature based on the input given through the sensation input means.

4,926,840
PILOT GAS BYPASS SYSTEM FOR FUEL-FIRED FURNACES
Timothy J. Shellenberger, and William T. Harrigill, both of Port Smith, Ark., assignors to Rheem Manufacturing Company
Filed Sep. 28, 1989, Ser. No. 415,122
Int. Cl.[5] F24H *3/00*
U.S. Cl. 126—110 R **12 Claims**



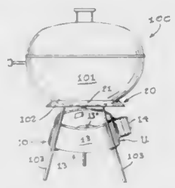
1. Induced draft, fuel-fired furnace apparatus comprising:
a housing;
heat exchanger means, disposed within said housing, through which hot combustion products may be internally flowed to transfer heat to air flowed externally across said heat exchanger means;
blower means for flowing air to be heated externally across said heat exchanger means;
burner means selectively operable to receive fuel from a source thereof and discharge the received fuel;
pilot means for continuously maintaining within said housing a standing pilot flame operative to ignite fuel discharged from said burner means to thereby create hot combustion products from the discharged fuel, said pilot flame continuously generating hot combustion products within said housing;
draft inducing fan means connected to said heat exchanger means and connectable to an exhaust stack, said draft inducing fan means being selectively operable to sequentially draw hot combustion products discharged from said burner means through said heat exchanger means and discharge combustion products exiting said heat exchanger means into and through the exhaust stack when connected thereto; and
means for venting hot combustion products from said pilot flame into the exhaust stack through said draft inducing fan means, during idle periods thereof, in a manner precluding an appreciable amount of pilot flame combustion products from interiorly traversing said heat exchanger means.

4,926,841
WEATHER PROOF ASH CONTAINMENT SYSTEM FOR BARBEQUES
Douglas M. Woolf, 105 Mount Etna Dr., Clayton, Calif. 94517
Filed Aug. 17, 1989, Ser. No. 394,913
Int. Cl.[5] F23J *1/00*
U.S. Cl. 126—243 **9 Claims**

1. An ash catching apparatus for barbeque grills including a cooking receptacle having an apertured bottom and a plurality of support legs projecting outwardly and downwardly with respect to the apertured bottom wherein the ash catching apparatus comprises:
an ash catching receptacle comprising an enlarged frusto-conical receptacle member dimensioned to be received between adjacent legs of said plurality of support legs;
a plurality of support members wherein each of the plurality of support members are operatively and movably disposed on respective ones of said plurality of support legs for

VOL
1114
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supporting the ash catching receptacle relative to the bottom of the cooking receptacle; and,



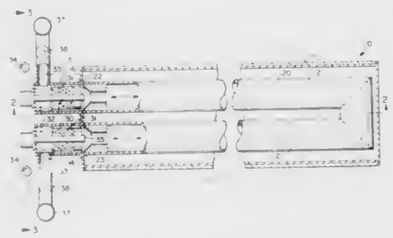
a weather ring including an outwardly and downwardly flared skirt member which is operatively attached to the bottom of the cooking receptacle.

4,926,842

IMMERSION TUBE HEATER TREATER IMPROVED IMMERSION TUBE HEATER TREATER

James E. Watson, Southgate, Mich., and Theodore E. Davies, Hudson, Ohio, assignors to North American Mfg. Co., Cleveland, Ohio

Continuation of Ser. No. 49,577, May 11, 1987, abandoned. This application May 10, 1989, Ser. No. 352,702
Int. Cl.[5] F24H *1/20*
U.S. Cl. 126—360 R 6 Claims



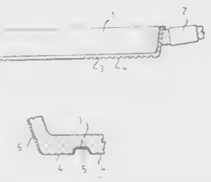
1. An improved heater for a containment vessel of an oil having a coking temperature of substantially 700 degrees F. and a desired temperature of substantially 250 degrees F., said improved heater comprising an immersion heater tube, said heater tube having two ends, said heater tube being in the containment vessel in contact with the oil, a bi-directional burner, said bi-directional burner being affixed to one end of said heater tube coaxially therewith, said bi-directional burner having an air intake/exhaust plenum, a second bi-directional burner, said second bi-directional burner being affixed to the other end of said heater tube coaxially therewith, said second bi-directional burner having an air intake/exhaust plenum, and control means to selectively operate said bi-directional burner and said second bi-directional burner by firing said burners and connecting said plenums of said burners to air intake or exhaust as appropriate to heat the entire length of the heater tube substantially uniformly to a temperature at least the desired temperature of 250 degrees F. but below the coking temperature of 700 degrees F. of the oil.

4,926,843

COOKING VESSEL

Henning L. Vocke, Helsingfors, and Pauli Saarenko, Järvenpää, both of Finland, assignors to Oy Alu AB, Jarvenpaa, Finland

Continuation of Ser. No. 296,335, Jan. 10, 1989, abandoned, which is a continuation of Ser. No. 35,727, Apr. 8, 1987, abandoned, which is a continuation of Ser. No. 782,706, Oct. 1, 1985, abandoned. This application Jun. 6, 1989, Ser. No. 362,823
Claims priority, application Finland, Nov. 2, 1984, 844308; Jan. 21, 1985, 850259
Int. Cl.[5] A47J *27/00*
U.S. Cl. 126—390 4 Claims



1. A method of forming the bottom surface of a cooking vessel, the method comprising:
providing a cooking vessel having a bottom surface;
roll forming spaced, concentric grooves having widths of 4 to 7 mm and depths of 0.5 to 2 mm into the bottom surface of the cooking vessel, the spaces between adjacent ones of the grooves thereby being protrusions from the adjacent grooves;
providing layers of a heat-absorbing material only in the respective grooves; and
maintaining the heights of the layers from the grooves the layers are respectively in to less than that of the protrusions from the respective grooves comprises: supporting an inner surface of the cooking vessel that is opposite the bottom surface;
radially contacting the bottom surface with a conical shaping body having parallel ridges thereabout; and rotating the bottom surface of the cooking vessel and the conical shaping body while in contact, whereby to retain the grooves.

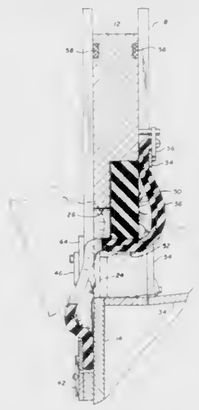
4,926,844

SEALING COLLAR FOR A RESUSCITATOR OR RESPIRATOR

John E. Lindley, 1410 20th Ave., Meridian, Miss. 39301

Filed Apr. 19, 1989, Ser. No. 340,523
Int. Cl.[5] A61H *31/02*
U.S. Cl. 128—30 12 Claims

1. A wall and collar for a pressure chamber of a resuscitator or respirator, said wall having a generally central opening for loosely enclosing the neck of a patient wherein in use a patient's head will be located on one side of the wall while the rest of a patient's body will be on the other side of the wall, comprising:
upper and lower wall sections together defining said opening;
means mounting said upper section for movement away from said lower section for reception of the neck of a supine patient in said opening, and back toward said lower section to loosely enclose the neck;
collar means of elastic sealing material for cradling and sealing against the for posterior neck, for gently wrapping and sealing against the posterior lateral neck and for pressing and sealing against the upper anterior torso adjacent the neck of a patient without pressing tightly against the jugular vein, carotid arteries trachea and other delicate structures of the anterior neck and anterior lateral neck of a patient, and
clamp means for pressing a lower portion of said collar means against the head side of said wall about said opening and an for pressing upper portion of said collar means



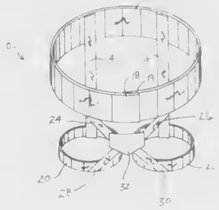
against the body side of said wall about said opening to form a seal between the head and body sides of said wall.

4,926,845

SACRUM SUPPORT DEVICE

Don W. Harris, P.O. Box 3490, Ft. Stewart, Ga. 31314

Filed Sep. 26, 1988, Ser. No. 248,981
Int. Cl.[5] A61F *5/24*
U.S. Cl. 128—78 1 Claim



1. A sacrum support device, comprising:
a generally horizontally extending waist strap having fastening means for securement around an individual's waist;
a pair of generally horizontally extending leg straps, each having fastening means for securement around an individual's leg;
a pair of generally vertical support straps connecting said leg straps to a front portion of said waist strap;
a pad formed from a soft resilient material;
said pad having a pentagonal shape with an apex pointing downwardly, away from said waist strap;
a first pair of diagonally extending pad support straps connecting said pad to a rear portion of said waist strap; and
a second pair of diagonally extending pad support straps connecting said pad to rear portions of said leg straps, whereby said pad is disposed between said vertical support straps and between said waist and leg straps in a position to protect an individual's sacrum.

4,926,846

METHOD AND DEVICE FOR LIMITING INTERMALLEOLAR EXPANSION

Lawrence G. Nassar, 33951 Glouster Cir., Farmington Hills, Mich. 48331

Filed Oct. 31, 1988, Ser. No. 264,529
Int. Cl.[5] A61F *3/00*
U.S. Cl. 128—80 H 4 Claims



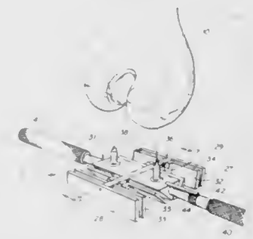
2. An exterior wrap for limiting intermalleolar expansion of a tibiofibular joint capsule without limiting said joint capsule's range of motion comprising:
a first independent elastomeric strip having two ends and a length approximately equal to the circumference of the external surface of said joint capsule plus an additional length to accommodate a first closure means, locating means disposed on said first steps;
said first closure means for said first independent elastomeric strip located at the ends of said first elastomeric strip;
a second independent elastomeric strip applied upon the exterior surface of said first independent elastomeric strip said second strip having two ends, the length of said second strip being slightly less than the length of said first strip and the width of said second strip being less than but at least half of the width of said first strip;
an orientation means disposed on said second independent elastomeric strip engageable with said locating means; and
a second closure means for said second independent elastomeric strip located at the ends of said second elastomeric strip.

4,926,847

SURGICAL CUTTING BLOCK

Thomas Luckman, Lakeville, Mass., assignor to Johnson & Johnson Orthopaedics, Inc., New Brunswick, N.J.

Filed Dec. 27, 1988, Ser. No. 290,545
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—88 10 Claims



10. A cutting guide to guide a cutting device to make cuts in a distal femur to prepare the distal femur to receive the femoral component of a total knee prosthesis comprising:
a body having as two first fixed guiding surfaces which are set at angels to the bone to be cut of from 0° to 10°, two first movable surfaces movable attached to the body which are capable of being moved toward or away from

VOL 1114 ISS 4 MY 22 1990 UMI

the two first fixed surfaces to create slots to receive and position a cutting device with respect to the bone to be cut; two second fixed guiding surfaces which are set at an angle of 40° to 50° to the bone to be cut, two second movable surfaces attached to the body which are capable of being moved toward or away from the two second fixed surfaces to create slots to receive and position a cutting device with respect to the bone to be cut.

4,926,848

ADJUSTABLE ELASTIC BANDAGE

John W. Shimkus, 118 Pulteney St., Hammondsport, N.Y. 14840, and Jane M. Brownell, R.D. 4, Box 186, Fort Hill Rd., Bath, N.Y. 14810

Filed Sep. 2, 1988, Ser. No. 239,936
Int. Cl.[5] A61F *13/06*
U.S. Cl. 128—169 **10 Claims**



1. An adjustable strip of elastic adapted to be wrapped around a portion of a patient's body to be bandaged in a plurality of overlapping convolutions so that the inner end thereof will be held in place by succeeding convolutions, comprising:

(a) a first fastener component of a flexible material of sufficient flexibility to conform to the curvature of the underlying convolutions of said strip when wrapped around said body portion and having an opening therein receving a portion of said strip intermediate the ends of said strip, wherein:

1. said first fastener component is adjustable along the length of said strip so that it may be spaced from the outer end of the strip a distance substantially corresponding to the length of the outer convolution of the stretched strip,
2. said first fastener component has an outer portion comprised of a front outer face and a rear outer face, and
3. fibrous fastener fabric appears on both of said front outer face and said rear outer face of said first fastener component;

(b) a second fastener component fixed to the outer end portion of said strip and being adapted to cooperate with said outer portion of said first fastener component to separably connect said components together so as to secure the outer end portion of said elastic strip with respect to the remainder of said strip when said elastic strip has been wrapped on a patient, said first fastener component being readily movable when said elastic strip is in an unwrapped, extended state, wherein complementary fibrous fabric material appears on both of the front face and the rear face of said second fastener component.

4,926,849

APPARATUS FOR SEPARATING VERTEBRAE

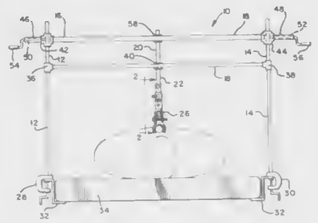
Ernest L. Downey, 10559 S. Ave. G, Chicago, Ill. 60617

Filed Dec. 19, 1986, Ser. No. 943,481
Int. Cl.[5] A61B *17/00*
U.S. Cl. 128—75 **16 Claims**

1. An apparatus useful to separate adjacent first and second vertebrae during surgery comprising:

support means; first and second grip means associated with said support means and being sized and structured to grip said first vertebra and said second vertebra, respectively;

first movement means associated with said first grip means and structured to be manually operated while said first grip means is gripping said first vertebra and said second grip means is gripping said second vertebra to move said first grip means to a desired position relative to said second grip means, to separate said first and second vertebrae and to hold said first grip mean in said desired position; and



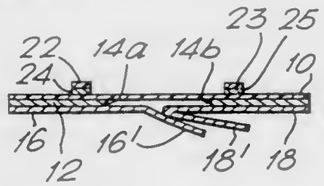
second movement means associated with said second grip means and structured to be manually operated independent of said first movement means while said first grip means is gripping said first vertebra and said second grip means is gripping said second vertebra to move said second grip means to a desired position relative to said first grip means, to separate said first and second vertebrae and to hold said second grip means in said desired position.

4,926,850

WOUND DRESSING

Gloria Y. Lott, Des Peres; Scott M. Britton, Ballwin, both of Mo., and Barry E. Constantine, Island Heights, N.J., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Nov. 30, 1988, Ser. No. 278,256
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—155 **14 Claims**



1. A dressing, comprising:

a plastic film having a wound contacting portion and lateral ends;

a uniform adhesive coating on at least a portion of one surface of said plastic film about said wound contacting portion defining an adhesive-free wound contacting window;

release liner means covering at least a portion of said adhesive coating and at least a portion of said wound contacting window of said plastic film, said release liner means being in releasable contact with said adhesive coating and including grasping means for enabling said release liner means to be peeled from said adhesive coating; and

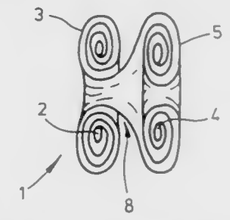
means adjacent at least one lateral side of said wound contacting window and remote from said lateral ends of said plastic film for varying abruptly the resistance offered by the release liner means to peeling from the adhesive coating thereby providing a signal to the user when the release liner means have been peeled sufficiently to uncover said wound contacting window.

4,926,851

TUBULAR BANDAGE AND A METHOD FOR ITS APPLICATION

John L. Bulley, St. Columb, United Kingdom, assignor to JLB Textiles Limited, United Kingdom

Filed Aug. 22, 1988, Ser. No. 234,633
Int. Cl.[5] A61F *15/00*
U.S. Cl. 128—157 **10 Claims**



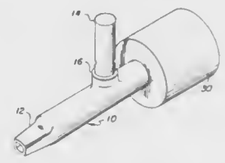
1. A tubular bandage comprising a length of tubular fabric knitted from a combination of substantially inelastic yarn and elastic yarn so as to have alternating circumferential rows of inelastic yarn and elastic yarn and having a first end portion rolled outwardly from the free end and the other end portion rolled inwardly from the opposite free end to form two rolls each constituted by nearly half the bandage.

4,926,852

MEDICATION DELIVERY SYSTEM PHASE ONE

Bart J. Zoltan, Old Tappan, N.J.; Beth L. Laube, and George K. Adams, III, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 877,331, Jun. 23, 1986, Pat. No. 4,790,305. This application Sep. 30, 1988, Ser. No. 251,454
Int. Cl.[5] A61M *11/00*
U.S. Cl. 128—200.23 **8 Claims**



6. The invention according to claim 1, wherein said main body portion of said rigid housing is defined by axially collapsible wall means.

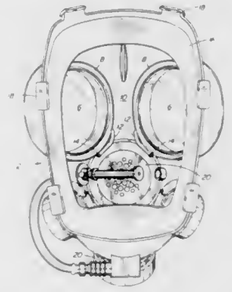
4,926,853

GAS MASK NOSE OCCLUDER

Pierre P. Meunier, Nepean, Canada, assignor to Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Jun. 29, 1988, Ser. No. 213,263
Claims priority, application Canada, Jan. 21, 1988, 557060
Int. Cl.[5] A62B *7/00*
U.S. Cl. 128—201.18 **3 Claims**

1. In a face mask having two rigid eyepieces having rims, a pliable full face covering carrying the eyepieces such that the eyepieces can be manually moved toward the face of a user, breathing means and sealing and securing means for sealing the mask securely to the head of a wearer, the improvement comprising nose occluder means including a pair of prong members each made of a material having sufficient rigidity to close the nostrils of a user, said prong members each being adjustably attached at one end thereof directly to an interior lower rim



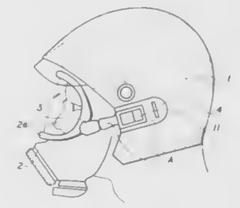
portion of a respective eyepiece at an angle with respect thereto so as to be directed inwardly toward the nose of the wearer, said pliable full face covering enabling said eyepieces to be manipulated toward the face to cause the prong members to press against the nose and close the nostrils.

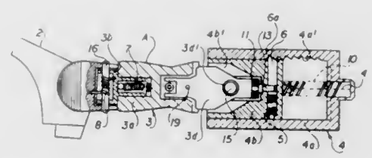
4,926,854

PROTECTIVE HELMET WITH A STRAPLESS BREATHING PROTECTION MASK

Sven Bode, Berlin, Fed. Rep. of Germany, assignor to Sven Bode, Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,655
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721662
Int. Cl.[5] A62B *17/04, 3/00;* **A42B** *300*
U.S. Cl. 128—201.23 **13 Claims**





1. A protective helmet with a strapless breathing protection mask in a detachable connection, which is formed by plug-in type and lockable connecting elements arranged on both sides of the helmet and the mask, the improvement comprising:

each connection element having a flexible plug-type part capable of limited rotation, arranged on the breathing

VOL
1114
ISS
4
MY
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UMI

protection mask, and of a plug receptacle part arranged on the protective helmet;

the plug receptacle part has an adjusting device which can be adjusted to a number of different positions, and which holds the plug-type part in the plug receptacle part with positive force; and

wherein the plug receptacle part includes a housing with U-shaped cross-section and a slide which can move in the housing in longitudinal direction against the force of a first spring disposed in the housing and which constitutes the adjusting device.

4,926,855

RESPIRATOR

Ivan Hellquist, Sollentuna, and Carl P. M. Mühlmann, Lidingo, both of Sweden, assignors to Interspiro AB, Lidingo, Sweden

Continuation-in-part of Ser. No. 774,625, Sep. 11, 1985. This application Jan. 29, 1987, Ser. No. 8,195

Claims priority, application Sweden, Sep. 21, 1984, 8404752

Int. Cl.[5] A62B *18/10*

U.S. Cl. 128—201.28 **19 Claims**



1. A rescue type breathing apparatus comprising:

a hood adapted to enclose a user's head and neck, said hood being at least substantially made of a flexible material and including an elastic neck seal means for allowing gas from the inside of said hood to escape to the outside when the pressure in said hood exceeds the ambient gas pressure and substantially preventing leakage of the ambient gas into said hood when the ambient gas pressure exceeds the pressure in said hood;

a face mask mounted inside said hood, said face mask including gas communication means for allowing passage of breathing gas between said hood and said face mask;

gas supply means connected to said face mask for supplying breathing gas to said face mask;

controlling means responsive to changes in gas pressure in said face mask during the inhalation and exhalation phase of a respiratory cycle of the user for allowing the flow of said breathing gas from said gas supply means to said mask during at least the first part of the inhalation phase in response to a first inhalation demand by the user;

said gas communication means including first and second regulating means responsive to changes in gas pressure in said face mask;

said first regulating means allowing passage of gas including said breathing gas from said face mask into said hood in response to exhalation and said second regulating means allowing passage of gas including said breathing gas from said hood into said face mask during the second part of said inhalation phase in response to subsequent inhalation demand by the user.

4,926,856

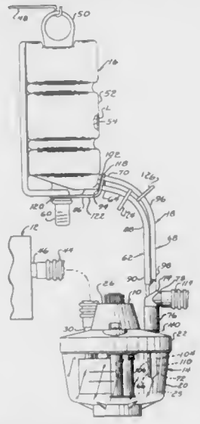
FEEDING SYSTEM

Orlando D. Cambio, Jr., Bristol, Wis., and Earl R. Refsland, Arlington Heights, Ill., assignors to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Continuation of Ser. No. 87,135, Aug. 19, 1987, abandoned, which is a continuation of Ser. No. 747,219, Jun. 21, 1985, abandoned. This application Feb. 17, 1988, Ser. No. 156,778

Int. Cl.[5] A61M *16/00*; F23D *11/00*

U.S. Cl. 128—203.26 **11 Claims**



1. A feeding system, comprising:

a humidifier;

a reservoir housing a liquid above the humidifier;

first elongated conduit means for feeding liquid from the reservoir to the humidifier and having an upper end and a lower end;

second elongated conduit means alongside the first conduit means for passing air from the humidifier to the reservoir and having an upper end and a lower end;

means for connecting the upper end of the first and second conduit means in fluid communication to the reservoir below the level of liquid in the reservoir; and

means for connecting the conduit means to the upper part of the humidifier with the lower end of the first and second conduit means located inside the humidifier with the lower end of the first conduit means being located adjacent the lower end of the second conduit means, and with the lower end of the first conduit means being located above at least a portion of the second conduit means and the lower end of the second conduit means being cut off at a single angle through the second conduit means relative to the longitudinal axis of the second conduit means.

4,926,857

DEVICE FOR TREATING LIFE FORMS WITH TWO DIFFERENT TYPES OF FOCUSED ACOUSTICAL WAVES

Gerd Wessels, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

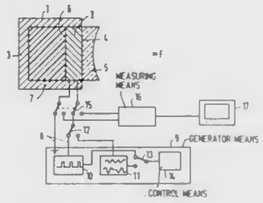
Filed Feb. 16, 1988, Ser. No. 156,240

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704836.8

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 A **16 Claims**

1. A device for generating focused, acoustical waves for treating life forms, said device comprising an electrically drivable acoustical wave means for generating acoustical waves for treating a life form, means for focusing the acoustical waves generated by the acoustical wave means, and an electrical generator means for driving the acoustical wave means, the generator means comprising two separate generator means with one of the two generator means producing an electrical signal for driving the acoustical wave means to generate shock waves for treating the life form and the other of the two generator means producing an electrical signal for driving the acoustical wave means to generate a periodic acoustical wave for treating the life form and the device further comprising switch means for connecting at least one of the two generator means to the acoustical wave means.



4,926,858

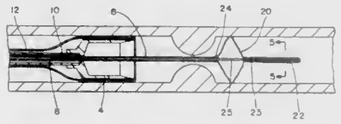
ATHERECTOMY DEVICE FOR SEVERE OCCLUSIONS

Hanson S. Gifford, III, Palo Alto; John B. Simpson, Woodside, and Peter S. Brown, Los Altos Hills, all of Calif., assignors to Devices for Vascular Intervention, Inc., Redwood City, Calif.

Continuation of Ser. No. 45,916, May 1, 1987, abandoned, which is a continuation of Ser. No. 732,691, May 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 615,298, May 30, 1984, abandoned. This application Aug. 7, 1989, Ser. No. 391,636

Int. Cl.[5] A61F *17/32*

U.S. Cl. 606—159 **51 Claims**



1. An atherectomy device for removal of material of an atheroma from a vascular vessel, said device comprising:

a flexible tubular member adapted to be inserted into the vessel and having proximal and distal extremities,

flexible drive means having proximal and distal extremities and disposed within said tubular member for rotational and axial movement therein, said drive means extending from the proximal to distal ends of the tubular member,

a cup-shaped cutter carried by the distal extremity of the flexible drive means, said cutter having a distally extending annular cutting surface and an interior collection chamber, and

means carried by the proximal extremity of the flexible tubular member and coupled to the flexible drive means for rotating the cutter independently of rotation of the tubular member and for axially extending and retracting the cutter independent of axial movement of the tubular member,

whereby said cutter is movable axially from a position fully received by the tubular member to an axially extended position wherein the cutting surface is spaced forwardly of the distal extremity of the tubular member so that the cutter is capable of engaging and severing the atheroma with the severed portions of the atheroma being received in the collection chamber.

4,926,859

A MEDICAL TREATMENT DEVICE FOR TREATING AN UNDESIRED FORMATION IN A LIVING BODY

John E. Field, 1 Babraham Road, Cambridge, Great Britain (CB2 2RB); John P. Dear, Rapley, Oakley Road, Bromley, Great Britain (BR2 8HQ), and Peter N. Davies, 2 Ditton Forest Cottages, Newmarket, Great Britain

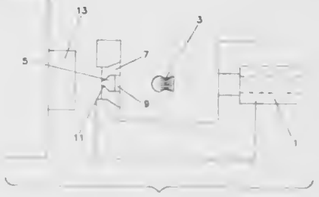
PCT No. PCT/GB86/00737, § 371 Date Jul. 5, 1988, § 102(e) Date Jul. 5, 1988, PCT Pub. No. WO87/03468, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 4, 1986, Ser. No. 203,452

Claims priority, application United Kingdom, Dec. 4, 1985, 8529824

Int. Cl.[5] A61F *5/46*

U.S. Cl. 128—24 A **10 Claims**



1. A medical treatment device for treating a target in a living body which takes the form of an undesired solid formation, the device comprising:

a chamber for accommodating a charge of material of low density;

a nozzle forming an outlet from said chamber;

a receiving aperture communicating with the chamber and arranged to receive a slug of a density higher than said low density material projected at high speed towards the aperture, thereby to transmit the impacting force of the slug to the charge in a chamber so that the charge is extruded through the nozzle as a pulsed jet;

means for projecting the slug towards the receiving aperture; and

a guide tube connected to the nozzle and arranged to direct the pulsed jet, issuing from the nozzle, substantially without loss of kinetic energy and towards the target so as to effect cleavage of the solid formation.

4,926,860

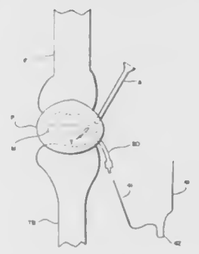
ARTHROSCOPIC INSTRUMENTATION AND METHOD

James D. Stice, Minneapolis; Chester E. Sievert, Jr., St. Paul, and Steven C. Christian, Crystal, all of Minn., assignors to Flexmedics Corporation, Minneapolis, Minn.

Filed Feb. 5, 1988, Ser. No. 152,652

Int. Cl.[5] A61B *17/06*; A61M *25/00*

U.S. Cl. 606—144 **19 Claims**



1. Arthroscopic instrumentation comprising a cannula hav-

VOL 1114 ISS 4 MY 22 1990 UMI

ing a curved lumen, an end thereof being directable to an operative location; and an elongated, flexible, normally straight shape memory alloy probe receivable in the cannula for introduction to the operative location, the cannula being configured to cause the probe to bend during its passage through the curved lumen, the shape memory character of the probe causing the probe to exit from the end of the cannula in a substantially straight orientatioo.

4,926,861

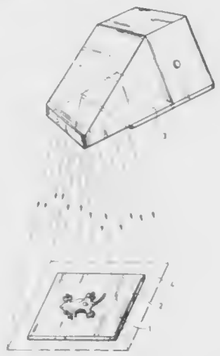
METHOD FOR IN VIVO TREATMENT OF TUMOROUS TISSUES ON BODY SURFACES

Martha Fenyo, Budapest, Hungary; Helmut Borberg, Gladbach, and Janos G. Kadar, Cologne, both of Fed. Rep. of Germany, assignors to Harrier Inc., Salt Lake City, Utah

Filed Oct. 8, 1987, Ser. No. 106,544

Int. Cl.[5] A61N *5/00*

U.S. Cl. 128—395 **6 Claims**



1. Method for in vivo treatment of tumorous tissues on body surfaces comprising the step of irradiating said tissues by polarized light of predetermined intensity, said polarized light predominantly including wavelength components exceeding 300 nm and substantially excluding ultraviolet components, wherein said intensity is between 20 and 150 mW/cm^2, and wherein said step of irradiation is carried out at least once a day for at least one period of at least 2 minutes duration.

4,926,862

DEFIBRILLATION SYSTEM

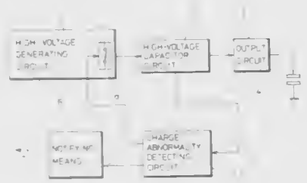
Nobukazu Miyajima, Tokorozawa; Akira Tanaka, Okegawa, and Masaru Shinoda, Tokyo, all of Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,823

Claims priority, application Japan, Jul. 11, 1987, 62-106745[U]

Int. Cl.[5] A61N *1/00*

U.S. Cl. 428—419 D **6 Claims**



1. A defibrillation system comprising:
a high voltage generating circuit;
a high voltage capacitor circuit which is adapted to be charged with a high voltage by said high voltage generating circuit and which includes a metallized plastic film capacitor;
an output circuit which includes at least a switch and is adapted to apply said high voltage to a paddle mounted on the body of a patient;
a charge abnormally detection circuit for detecting either a sharp increase in charge current or a sharp drop in charge voltage across said metallized plastic film capacitor which is caused by a dielectric breakdown thereof;
a notifying means for notifying an operator of said defibrillation system of detected charge current or charge voltage abnormality, said notifying means responding to a detection signal produced by said charge abnormality detection circuit; and
a switch circuit for inhibiting in response to said detection signal, the charging of said capacitor to a high voltage using said high voltage generating circuit.

4,926,863

RATE RESPONSIVE CARDIAC PACEMAKER

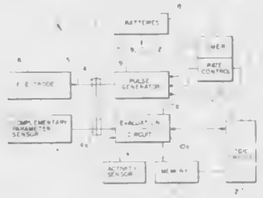
Eckhard Alt, Munich, Fed. Rep. of Germany, assignor to Intermedics, Inc., Angleton, Tex.

Filed Sep. 10, 1987, Ser. No. 94,875

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631155

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 PG **10 Claims**



1. A rate responsive cardiac pacemaker for implantation in a patient, comprising
activity sensor means for converting mechanical movements of the patient to an electrical signal representative thereof,
means responsive to said electrical signal for passing only a portion thereof in a frequency range below 4 Hz to discriminate against signal components arising from other than physical activity of the patient,
processing means responsive to the passed portion of the signal to recover therefrom a predetermined variable signal component other than frequency of amplitude crossings relative to a threshold value, for producing an output signal representative of true physical body activity, and
means responsive to said output signal for generating pulses at a rate that varies depending on said predetermined signal component to stimulate the patient's heart at a rate according to the state of true physical body activity of thee patient.

4,926,864

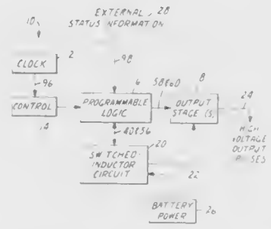
BIOLOGICAL TISSUE STIMULATOR WITH TIME-SHARED LOGIC DRIVING OUTPUT TIMING AND HIGH VOLTAGE STEP-UP CIRCUIT

Joel R. Dufresne, and Alan P. Dieken, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 42,166, Apr. 24, 1987, abandoned. This application May 30, 1989, Ser. No. 361,784

Int. Cl.[5] A61N *1/32*

U.S. Cl. 128—421 **10 Claims**



1. A biological tissue stimulator, comprising:
a low-voltage direct current power source;
step-up voltage means operatively coupled to said low-voltage direct current power source for converting said low-voltage direct current power source to a high-voltage direct current output;
said step-up voltage means having high-voltage storage means coupled to said high-voltage direct current output for storing the voltage of said high-voltage direct current output;
timing means powered by said low-voltage direct current power source for automatically alternately supplying a plurality of switching signals to said step-up voltage means and supplying a plurality of timing signals; and
output circuit means operatively coupled to said high-voltage storage means and to said timing means for providing a biological tissue stimulation pulse from said high-voltage direct current output in response to said plurality of timing signals.

4,926,865

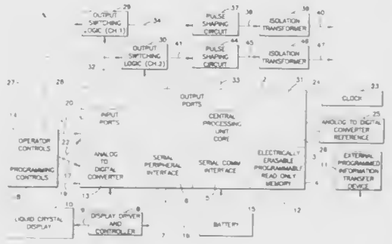
MICROCOMPUTER-BASED NERVE AND MUSCLE STIMULATOR

Paul S. Oman, 4701 Island View Dr., Mound, Minn. 55364

Continuation of Ser. No. 103,589, Oct. 1, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,782

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—421 **12 Claims**



I. An electrical stimulator for use by a human patient, comprising:
(a) means for generating a pulsed signal, said pulsed signal having parameters including an amplitude, a pulse width and a frequency, the parameters having values;
(b) means, cooperatively connected to said generating means, for controlling the parameters of said pulsed signal, said controlling means including:
(i) operator control means for adjusting the values of a first subset of the parameters of said pulsed signal, said first subset of the parameters including signal current amplitude;
(ii) first programming control means for establishing the values of a second subset of the parameters of said pulsed signal including signal modulation amplitude, on time, off time, rise time, signal modulation rate, type of signal modulation, signal pulse width, and signal pulse frequency;
(iii) second programming control means for selectively initiating and terminating access to said first programming control means, wherein upon termination of access to said first programming control means, the values of said second subset of the parameters may not be varied until access to said first programming control means is initiated; and
(c) a microprocessor, operatively connected to said first and second programming control means, wherein said first and second programming control means supplies input data to said microprocessor, said microprocessor operatively connected to a non-volatile electrically erasable programmable read only memory to store parameters.

4,926,866

SYSTEM FOR GATHERING PHYSIOLOGICAL DATA

Arnold St. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025

Continuation of Ser. No. 73,641, Jul. 15, 1987, abandoned, which is a division of Ser. No. 786,746, Oct. 11, 1985, Pat. No. 4,681,098. This application Oct. 24, 1988, Ser. No. 262,051

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—630 **1 Claim**



1. A system for accurately and reproducibly gathering physiological data taken from a subject's body, the system comprising:
steady means for stationing the subject's body in a reproducible supine position, the steady means including a rigid body mold having an impression intimately matching the entire length of the dorsal portion of the subject's body; and
sensor means mounted in a defined position in said steady means and positioned so as to have a defined position relative to the subject's body when the subject is placed in said steady means for taking physiological data from the body.

4,926,867

LIGHT-REFLECTING AND HEATING TYPE OXIMETER

Masahiko Kanda, and Yuichi Miyagawa, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 54,889, May 27, 1987, abandoned. This application May 19, 1989, Ser. No. 355,842

Claims priority, application Japan, May 27, 1986, 61-121896

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **8 Claims**

1. An oximeter sensor for non-invasively measuring oxygen

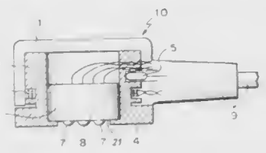
VOL
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saturation of blood contained within a part of a living body comprising:

optical sensor means for measuring oxygen blood saturation, said optical sensor means including:

a housing containing a flat surface end adaptable to face said body part,

means for emitting measuring light having at least two different wavelengths protruding from said flat surface end, said light emitting means including at least two



light emitting elements that emit different wavelengths of measuring light, and

means for receiving said measuring light protruding from said flat surface end between said at least two light emitting elements; and

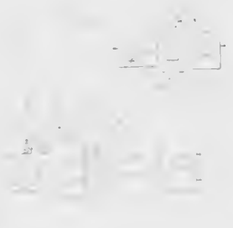
means for controllably heating said body part containing a contact surface adaptable to be placed on said body and disposed around and protruding from said flat surface and of said housing; substantially the same amount as said light emitting means and said light receiving means.

4,926,868

METHOD AND APPARATUS FOR CARDIAC HEMODYNAMIC MONITOR

Lawrence E. Larsen, 308 Hamilton Ave., Silver Spring, Md. 20901

Filed Apr. 15, 1987, Ser. No. 38,952
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—653 R 4 Claims



1. Apparatus for cardiac hemodynamic monitoring, comprising

(a) flexible transmitting antenna means adapted for mounting adjacent to the back of a patient;

(b) transmitter means connected with said transmitting antenna means for generating a signal having a frequency between 900 and 930 MHz which is transmitted by said transmitting antenna means through the mediastinum of the patient, said signal being altered as a function of cardiac hemodynamic operation;

(c) receiving antenna means adapted for mounting adjacent to the chest of the patient for receiving said altered signal, said transmitting and receiving antenna means providing close coupling to the chest wall of the patient;

(d) means connected with said receiving antenna means for processing said received signal to produce outputs representing the magnitude and phase angle, respectively, of a bistatic scattering parameter (S_{21}) as functions of time on a heartbeat by heartbeat basis; and

(e) display means for displaying said outputs representing the magnitude and phase angle of said bistatic scattering parameter to provide a visual indication of cardiac hemodynamic operation.

4,926,869

METHOD FOR THE DIAGNOSIS AND TREATMENT OF INFLAMMATION

Robert H. Rubin, Brookline, and H. William Strauss, Newton, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

PCT No. PCT/US87/00079, § 371 Date Nov. 13, 1987, § 102(e) Date Nov. 13, 1987, PCT Pub. No. WO87/04351, PCT Pub. Date Jul. 30, 1987
Continuation-in-part of Ser. No. 819,585, Jan. 16, 1986, abandoned. This PCT application Jan. 12, 1987, Ser. No. 93,500
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—654 29 Claims



1. A method of detecting an inflammation site in vivo in an individual which comprises:

(a) administering to said individual a diagnostically effective amount of an agent, wherein said agent consists essentially of a detectably labeled immunoglobulin or a fragment thereof, and said immunoglobulin substantially accumulates at said site when said site is inflamed, and

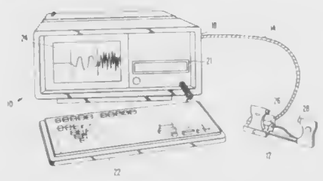
(b) detecting said detectably labeled immunoglobulin.

4,926,870

METHOD AND APPARATUS FOR ULTRASONIC ANALYSIS OF BONE STRENGTH IN VIVO

Gary H. Brandenburger, Maynard, Mass., assignor to Osteo-Technology, Inc., Cambridge, Mass.

Filed Aug. 30, 1988, Ser. No. 238,282
Int. Cl.[5] A61B 8/00
U.S. Cl. 128—660.01 32 Claims



1. A method for directing an ultrasonic signal along a desired ultrasonic path through a member, the ultrasonic signal being capable of propagating along a plurality of ultrasonic paths and the member interacting with ultrasonic signals differently along each of the plurality of paths, the method comprising the steps of:

(a) positioning an ultrasonic transmitter and an ultrasonic receiver proximate the member to establish a direct ultrasonic path between said transmitter and said receiver approximately along said desired path;

(b) launching an ultrasonic signal into the member toward the receiver;

(c) receiving the launched ultrasonic signal after it propagates through the member and producing a received electronic signal representative of the ultrasonic signal received by said receiver;

(d) signal conditioning said received electronic signal to produce a conditioned electronic waveform;

(e) comparing selected characteristics of the conditioned electronic waveform with corresponding selected characteristics of a canonical waveform, said canonical waveform being obtained due to the interaction of the member with said launched ultrasonic signal as said launched ultrasonic signal propagates at least along said desired path through the member; and

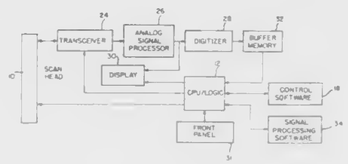
(f) repositioning said transmitter and said receiver at different orientations relative to the member to establish different ultrasonic pathways until said selected characteristics of said conditioned electronic waveform are substantially the same as said corresponding selected characteristics of said canonical waveform, thereby indicating that said ultrasonic signal launched from said transmitter has propagated along at least said desired path to said receiver.

4,926,871

APPARATUS AND METHOD FOR NON-INVASIVELY AND AUTOMATICALLY MEASURING THE VOLUME OF URINE IN A HUMAN BLADDER

Dipankar Ganguly, Redmond, and David Giuliani, Mercer Island, both of Wash., assignors to International Biomedics, Inc., Bothell, Wash.

Continuation of Ser. No. 5,152, Sep. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 732,344, May 8, 1985, abandoned. This application Jul. 28, 1988, Ser. No. 226,148
Int. Cl.[5] A61B 8/00
U.S. Cl. 128—660.07 8 Claims



1. An apparatus for automatically measuring the volume of urine in a human bladder defined by a border, comprising:

means for transmitting a plurality of ultrasound signals into the bladder in first and second planes, wherein the first and second planes are in first and second directions, respectively, which are substantially orthogonal to each other and wherein the transmitting means is movable so that ultrasound signals may be transmitted into the bladder in a plurality of planes in both the first and second directions as the transmitting means is moved;

means for receiving the returning plurality of ultrasound signals from each of said first and second planes;

means for developing initial ultrasound image information of the bladder in said first and second planes;

means for automatically processing the initial ultrasound image information to accurately determine the true border of the bladder in the first and second planes and develop enhanced ultrasound image information therefor;

means for displaying at least one of the initial ultrasound image information and the enhanced ultrasound image information;

means for selectively storing the enhanced ultrasound image information for said first and second planes;

means for automatically determining the distance between the opposing portions of the border of the bladder for each ultrasound signal in said first and second planes from the enhanced ultrasound image information;

means for automatically determining the area of the bladder in said first and second planes from the determined distance information;

means for automatically determining the volume of said bladder and hence the volume of urine in the bladder from the determined areas of the bladder in said first and second planes; and

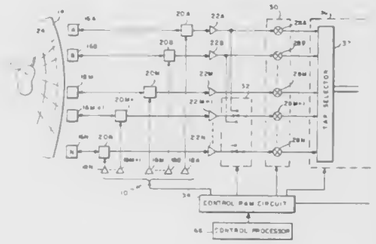
means for displaying said volume in numeral form, wherein the apparatus is characterized in that the initial ultrasound image information, the enhanced ultrasound image information, and the volume of urine in the bladder are provided in substantially real time.

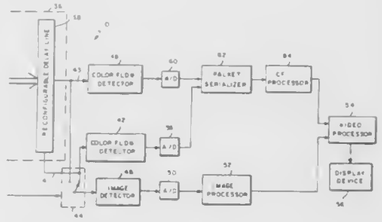
4,926,872

ULTRASONIC TRANSDUCER SYSTEM AND METHOD FOR THE OPERATION THEREOF

George A. Brock-Fisher, Andover; Paul R. Kranz, Harvard; James R. Mniece, Waltham, all of Mass.; Karl E. Thiele, Derry, N.H.; Bernard J. Savord, Ithaca, N.Y., and Richard B. Smith, Tewksbury, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 28, 1988, Ser. No. 173,763
Int. Cl.[5] A61B 8/00
U.S. Cl. 128—661.01 23 Claims





1. An ultrasonic transducer system comprising:

a plurality of ultrasonic transducer elements;

means for transmitting at least two different types of ultrasonic lines from said elements to a selected target;

means for receiving ultrasonic echo signals from said elements in response to said at least two different types of lines;

a tapped delay line adapted to sum the received echo signals in a predetermined manner;

means for utilizing an output of the delay line to display a representation of echo signals received in response to each type of transmitted line; and

means for configuring the delay line so as to cause serial processing of echo signals received in response to one

VOL
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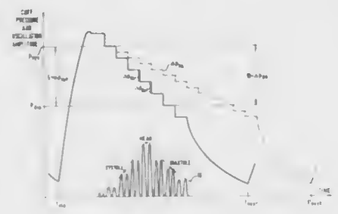
type of line and to cause parallel processing of echo signals received in response to a second type of line.

4,926,873

METHOD FOR MEASURING BLOOD PRESSURE AND APPARATUS FOR AUTOMATED BLOOD PRESSURE MEASURING

Michael Frankenreiter, Sindelfingen, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 20, 1989, Ser. No. 325,627
Claims priority, application European Pat. Off., Aug. 1, 1988, 88-112-448.1
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—681 6 Claims



1. A method for measuring blood pressure of a subject, the method comprising the steps of:

(a) applying a blood pressure cuff about a subject's limb that contains an artery;

(b) inflating the cuff to a pressure p_{max} above the systolic pressure p_{sys} of the subject, thereby occluding flow in the artery;

(c) reducing cuff pressure from p_{max} to a pressure p_{min} below the diastolic pressure p_{dia} of the subject in a sequence of cuff pressure abrupt decrements Δp_{def} of approximately equal magnitude in a sequence of time intervals, where the pressure decrement for each time interval in cycle i+1 ($i \geqq 1$) is determined by dividing the difference of two pressure values p_{2ci} and p_{1ci} by a positive constant that is independent of subject and that is no greater than six, where p_{1ci} and p_{2ci} are pressure values determined in cycle i that satisfy the relations $p_{min} \leqq p_{1ci} < p_{2ci} \leqq p_{max}$, thereby permitting sequentially increasing flow of blood through the artery;

(d) determining the artery pressure within each time interval for which cuff pressure is approximately constant and determining p_{sys}, p_{dia} and the mean arterial pressure for the cycle i+1;

(e) displaying the blood pressure values p_{sys} and p_{dia} for the subject for the cycle i+1; and

(f) repeating the preceding method steps (b), (c) and (d) at least once.

4,926,874

METHOD FOR DETERMINING BLOOD PRESSURE

Arnold St. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025

Division of Ser. No. 801,248, Nov. 25, 1985, Pat. No. 4,841,980. This application Jan. 30, 1989, Ser. No. 302,772
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—682 2 Claims

1. A method for determining the blood pressure of a test specimen, the steps of the method including:

providing a blood pressure recorder system having an inflatable cuff in flow communication with a pressurized gas source, the blood pressure recorder system including:

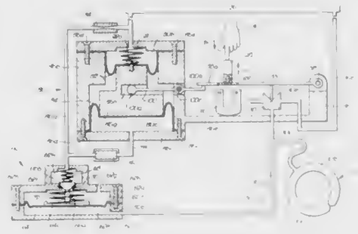
a three-way inflation valve in flow communication with the inflatable cuff and the pressurized gas source;

a pressure sensor having only two chambers with each chamber having a pressure responsive member;

means, responsive to the sensor, for operating the inflation valve;

a conduit connecting the pressurized gas directly from the pressurized gas source to one chamber of the pressure sensor; and

a flow restricted conduit connecting the pressurized gas from the pressurized gas source to the other chamber of



the pressure sensor whereby the pressure sensor facilitates deflation of the cuff when a predetermined small gas pressure remains in the cuff for a predetermined time period;

attaching the cuff to the test specimen in an operable manner; and

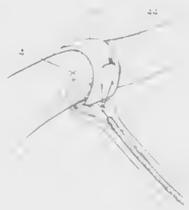
employing the blood pressure recorder system to determine the blood pressure of the test specimen.

4,926,875

IMPLANTABLE AND EXTRACTABLE BIOLOGICAL SENSOR PROBE

Raphael S. Rabinovitz, and Craig J. Hartley, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation-in-part of Ser. No. 147,368, Jan. 25, 1988, abandoned. This application May 26, 1988, Ser. No. 199,163
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—691 13 Claims



1. An implantable and extractable probe comprising:

at least one biological sensor;

lead wires extending from said sensor;

a flexible band to which said sensor is fixed;

a suture means terminating in ends;

means for retaining part of the suture means inside the flexible band with the ends of the suture means extending outside the band; and

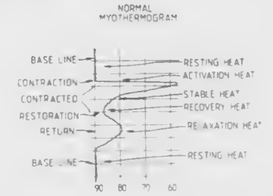
means for selectively releasing the part of the suture means head inside said flexible band.

4,926,876

DIAGNOSIS OF MUSCLE PROBLEMS

John M. H. Howard, 100 Crabtree Lane, Harpenden, Herts AL5 5RF, England

Filed Oct. 31, 1988, Ser. No. 264,624
Int. Cl.[5] A61B 5/00
U.S. Cl. 128—736 10 Claims



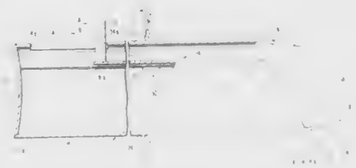
1. A process for diagnosing suspected muscle problems in a subject, which comprises measuring the difference in temperature between opposite limbs of the subject while one limb is at rest and the other is exercised determining said difference as a function of time, and diagnosing muscle problems from the determined function.

4,926,877

BIOPSY NEEDLE WITH COMPLETELY CLOSABLE CUTTING END BORE

John R. Bookwalter, 9 Belmont Ave., Brattleboro, Vt. 05301

Filed Apr. 24, 1989, Ser. No. 342,198
Int. Cl.[5] A61B 10/00
U.S. Cl. 128—754 6 Claims



1. A biopsy needle for penetrating, severing and removing tissue specimens comprising:

a hollow tubular needle body of racetrack cross-section, having a proximate hub end, and an open, distal end, said hollow tubular needle body being defined by laterally opposed, parallel straight walls integrally joined along opposite edges by respective, opposed arcuate walls, said distal end of said hollow tubular needle body terminating in an axially oblique, sharp cutting edge forming a pointed tip, at least the straight walls of said hollow tubular needle body narrowing toward each other at said body distal end to form a reduced lateral width bore, guide means provided within the hollow tubular needle body at the juncture between one arcuate wall and the opposed parallel straight walls, a thin flexible strip form metal, guillotine cutting blade of a width less than the distance between the opposed parallel straight body walls positioned between said guide means and said one arcuate wall for longitudinal sliding movement toward and away from said distal end, said flexible guillotine cutting blade having a width in excess of the distal end opening within said hollow tubular needle body such that said flexible guillotine cutting blade is prevented from projecting through said distal end opening, and is deflected toward said tip during sliding movement in a direction tending to close off said opening, said guillotine cutting blade terminating in a transverse curved leading edge conforming to the curvature of the hollow tubular needle body distal end other arcuate wall, and

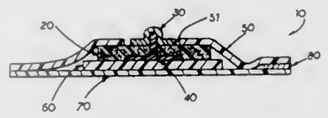
means carried by said blade to shift said blade between an axially projected position wherein said flexible guillotine cutting blade closes off said distal end opening and a retracted position where tubular needle body distal end is open to receive tissue to be severed.

4,926,878

MEDICAL ELECTRODE

Marvin L. Snedeker, Grand Rapids, Mich., assignor to Labeltape Meditect Inc., Grand Rapids, Mich.

Filed Dec. 29, 1988, Ser. No. 291,458
Int. Cl.[5] A61N 1/04
U.S. Cl. 128—798 5 Claims



1. A medical electrode comprising:

a highly conductive dispersive layer having an aperture therein and an upper surface and a lower surface;

a nonconductive eyelet having an eyelet post projecting upwardly from an eyelet base having an upper surface and a lower surface, which base radiates outwardly from said post.

a conductive stud for mating engagement with said eyelet, said stud including a stud post projecting upwardly from a stud base, said base radiating outwardly from said post;

said post of said eyelet projecting through said aperture in said conductive dispersive layer and matingly engaging the interior of said stud post whereby said stud and eyelet are secured together with said eyelet base contacting said lower surface of said conductive dispersive layer and said stud base making direct electrical contact with said upper surface of said conductive dispersive layer;

a layer of facestock having a adhesive coated undersurface being adhered to the upper surface of said conductive dispersive layer, said facestock having an aperture therein larger in dimensions than said stud base said stud base being entirely within said aperture, and said stud post projecting from said aperture in said facestock whereby the material of said facestock does not interfere with direct electrical contact between said conductive stud base and said conductive dispersive layer;

said facestock being larger in dimensions than said conductive dispersive layer;

a gel layer adhered to and completely covering the lower surface of said eyelet base and the lower surface of said conductive dispersive layer.

4,926,879

ELECTRO-TACTILE STIMULATOR

Christophe Jean-Paul Sevrain, Fitchburg, Wis.; Heather R. Schramm, Minneapolis, Minn.; Daniel G. Schmidt, Dane, Wis.; Paul S. Hooper, Stoughton, Wis., and Mary P. Thomas, Madison, Wis., assignors to Sevrain-Tech, Inc., Madison, Wis.

Continuation-in-part of Ser. No. 205,919, Jun. 13, 1988, abandoned. This application Sep. 12, 1989, Ser. No. 406,192
Int. Cl.[5] A61N 1/02, 1/36
U.S. Cl. 128—798 21 Claims

1. A cutaneous stimulator for applying electricity to the skin of a user comprising:

a flexible substrate upon one surface of which is formed a printed circuit pattern, the pattern including a plurality of electrodes and conductors connected to the electrodes;

an insulating layer contiguous with the one surface of said substrate and having a plurality of apertures each of which is aligned with one of said electrodes; and

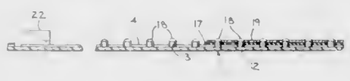
VOL
1114
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MY
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1990
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an electrically conductive layer contiguous with said insulating layer and having a plurality of apertures therethrough each one of which being aligned with a different one of said electrodes.

13. A cutaneous stimulator for applying electricity to the skin of a user comprising:

a substrate;

a plurality of first electrodes on said substrate;



a second electrode surrounding each of said first electrodes and electrically isolated therefrom;

means for applying to each of said first electrodes, a first charge pulse of one polarity followed by a second charge pulse of the opposite polarity, the absolute magnitude of the pulses of each polarity applied to a given electrode being unequal by a given amount so that the pH of the skin remains substantially unchanged by the application of the pulses to the electrodes.

4,926,880

METHOD FOR RELIEVING SINUS AND NASAL CONGESTION UTILIZING MICROCURRENTS

John P. Claude, Redwood City, and Stephen L. Young, San Mateo, both of Calif., assignors to Microcurrents, Redwood City, Calif.

Filed Nov. 8, 1988, Ser. No. 268,597
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—800 17 Claims



1. A method for relieving sinus and nasal congestion, the method comprising the steps of:

generating periodically repeating microcurrent excursions;

applying said microcurrent excursions to a patient's face adjacent the patient'nasal area; and

generating a perceptible signal when said microcurrent excursions are being applied to a low impedance region of said patient's face;

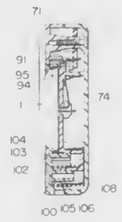
whereby, when said microcurrent excursions are applied to low impedance regions of a patient's face adjacent the nasal area, said microcurrent excursions relieve the patient's sinus and nasal congestion.

4,926,881

PORTABLE BATTERY POWERED ELECTROMAGNETIC THERAPY APPLICATOR

Tsutomu Ichinomiya; Tomohiro Kami, both of Hikone; Fumio Kitagawa, Neyagawa; Sumio Wada, Hikone; Hideaki Abe, Moriguchi; Youichi Ise, Hirakata, and Toshio Kusunoki, Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Apr. 7, 1988, Ser. No. 178,583
Claims priority, application Japan, Jun. 15, 1987, 62-148534
Int. Cl.[5] A61N *1/40*
U.S. Cl. 128—804 19 Claims



1. A portable diathermy apparatus comprising in combination a battery powered applicator for applying a high frequency electromagnetic field to a living tissue and a charger unit for recharging said applicator;

said applicator adapted in use to be attached to the skin of a patient and comprising:

an oscillator for producing the high frequency electromagnetic field;

an antenna connected to be energized by said oscillator to transmit the electromagnetic field to the tissue;

a rechargeable battery electrically connected for driving the oscillator;

a casing encapsulating therein electronic components forming said oscillator together with said antenna and said rechargeable battery, and

electrodes connected to said rechargeable battery and exposed on the exterior of said casing;

said charger unit comprising a recess and a source of electric power connected to said applicator when the applicator is received in said recess therein, said recess having charging terminals for electrical connection respectively with the electrodes of said applicator when received in said recess for recharging the battery of said applicator from said source of electric power.

4,926,882

TRANSPARENT SHIELDING DEVICE FOR USE WITH AUTOPSY SAW

Sharon K. Lawrence, 789 Bayard St., Teaneck, N.J. 07666

Filed Sep. 6, 1988, Ser. No. 240,694
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—850 9 Claims

1. A protective shield and saw assembly for use during an autopsy by a prosector operating upon a subject comprising, in combination:

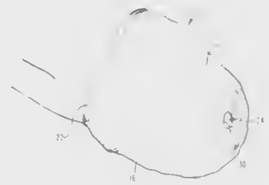
a transparent shield for attachment to and for draping about said subject, said shield having an inside and an outside face and, when said shield is draped about said subject, the inside face is adjacent said subject;

one or more attachment means for sealing said body to the subject, said attachment means for isolating the portion of said subject to be dissected and for defining a sealed dissection chamber thereabout;

at least one autopsy instrument port means for inserting an oscillating autopsy saw partly into said chamber with the handle thereof adjacent the outside face of said body; and,

an instrument seal means for sealing said port means to said saw;

an oscillating autopsy saw mounted with the blade portion in the dissection chamber and the instrument seal means sealed to the shank of the saw;



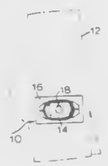
whereby the prosector, when the protective shield and saw assembly is employed, is enabled to use with an unobstructed view thereof, said oscillating autopsy saw upon said subject while restricting the effluent from the dissection of the subject to said sealed dissection chamber and thereby protecting the prosector from infection.

4,926,883

PROTECTIVE BODY APPLIANCE

Alvin E. Strock, 647 Commonwealth Ave., Newton Center, Mass. 02159

Filed Jun. 2, 1988, Ser. No. 201,170
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—888 14 Claims



1. A protective body appliance to be secured to a wearer, comprising:

a pad formed from a relatively flexible, relatively compressible material having a first section and a second section, said second section having a surface for positioning against the wearer, and including a pair of opposed end wing portions that are flexible relative to said first pad section when said second section is adhered to the wearer;

means for adhering said second pad section surface to the wearer; and

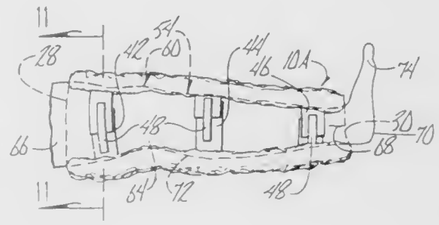
a relatively rigid shield having opposed ends secured to said first pad section so that a central portion of the shield is raised above said pad and so that said shield is permitted a limited degree of rocking movement relative to wing portions of said second pad section when said second pad section surface is adhered to the wearer, said shield being adapted to absorb and disperse forces applied thereto, transferring such forces to areas spaced away from said central portion of said shield.

4,926,884

METHOD AND MEANS FOR PREVENTING SKIN ABRASIONS FOR PATIENTS HAVING LEGS SUBSTANTIALLY LOCKED IN JUXTAPOSITION

Robert Lonardo, Treasure Island, Fla., assignor to L'Nard Associates, Inc., St. Petersburg, Fla.

Continuation-in-part of Ser. No. 107,980, Oct. 14, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 255,013
Int. Cl.[5] A61B *19/00*
U.S. Cl. 128—892 10 Claims



1. A pad for preventing skin abrasions and the like for use between the legs of patients whose legs are substantially positioned in overlapping condition, comprising, a flexible planar pad having an interior compartment and having a

top, a bottom, side edges, and opposite leg engaging surfaces, including surfaces to permit simultaneous engagement with opposed heels, ankles, or knees of said patient,

a first pair of spaced substantially vertical slots adjacent the top of one of said leg engaging surfaces,

a second pair of spaced substantially vertical slots adjacent the bottom of said one of said leg engaging surfaces,

said leg engaging surfaces comprising a soft resilient material so that the skin and flesh of the inner portion of a patient's legs will be protected from abrasive friction when said pad is placed between the legs of a patient whose legs are subtantially locked together in overlapping condition, whereby the pressure exerted by the weight of one leg on the other can be equalized, and the pressure points between heels, ankles and knees of the patient can be relieved when said heels, ankles or knees are in overlapping condition,

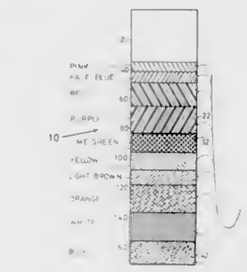
first strap means, having a center portion and opposite end portions, threaded through said first pair of vertical slots so that the center portion thereof dwells within said interior compartment and said end portions thereof extend over said side edges to be joined on the side of said patient's leg opposite to said center portion thereof, for securing said pad to a patient's leg above the knee,

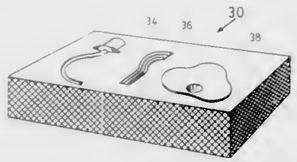
and a second strap means, having a center portion and opposite end portions, threaded through said first pair of vertical slots so that the center portion thereof dwells within said interior compartment and said end portions thereof extend over said side edges to be joined on the side of said patient's leg opposite to said center portion thereof, for securing said pad to a patient's leg above the ankle,

said first and second strap means being capable of pulling said pad into engagement with a patient's leg as the end portions thereof extend over said side edges and are joined, respectively, on the side of a patient's leg opposite to said pad so that said pad will conform to the shape of the patient's leg.

VOL
1114
ISS
4
MY
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1990
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4,926,885
METHOD OF SELECTING MEDICATION AND MEDICAL EQUIPMENT
Allen J. Hinkle, Box 451, Hardy Hill Rd., Lebanon, N.H. 03766
Filed Feb. 22, 1988, Ser. No. 158,548
Int. Cl.[5] G01B *3/02*
U.S. Cl. 128—898 **11 Claims**

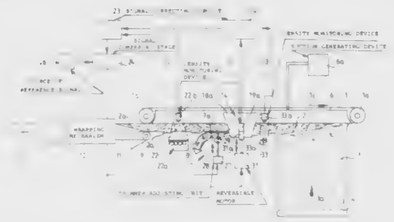




1. A method for selecting medication and medical equipment for a patient comprising the steps of:
preparing series of packages based on anatomical dimensions, each of said packages containing a group of elements which correlated to an anatomical dimension;
coding said packages to correlate with said anatomical dimension;
determining said anatomical dimension of a patient;
correlating said anatomical dimension of said patient to said code; and
selecting from said packages a package with said correlated code.

4,926,886
METHOD OF AND APPARATUS FOR MAKING A TRIMMED STREAM OF TOBACCO FIBERS OR THE LIKE
Heinz-Christen Lorenzen, Wentorf; Uwe Heitmann; Wolfgang Siems, both of Hamburg, and Peter Pinck, Gross-Hansdorf, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany
Filed Jul. 28, 1988, Ser. No. 225,694
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725365
Int. Cl.[5] A24C *5/18*
U.S. Cl. 131—84.4 **20 Claims**

1. A method of making and trimming a stream of fibers of smokable material or filter material for tobacco smoke, comprising the steps of establishing and elongated substantially horizontal path; supplying fibers into a first portion of the path to form a continuous stream which contains a surplus of fibers; advancing the stream along the path in a predetermined direction; removing the surplus from the stream in a second portion of the path downstream of the first portion to thus convert the stream into a filler; monitoring the density of portions of predetermined height of successive increments of the stream between the first and second portions of the path, including directing against the stream at least one beam of radiation whereby some of the radiation penetrates through the stream and is indicative of the density of corresponding increments of the stream, and generating density signals denoting the intensity of radiation which penetrates through the stream; regulating said surplus removing step in response to said density



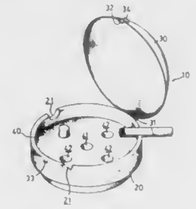
signals; monitoring the density of successive increments of the filler downstream of the second portion of said path, including generating second signals which are indicative of monitored density of the filler; and utilizing said second signals to modify the corresponding density signals so as to compensate, when necessary, for the influence of differences between said predetermined height and the height of the filler.

4,926,887
APPARATUS FOR MANIPULATING ROD-SHAPED ARTICLES
Jochim Myohl, Wentorf, and Alfred Kasparek, Hamburg, both of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany
Filed Dec. 29, 1988, Ser. No. 291,511
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1988, 3800431
Int. Cl.[5] A24C *5/28*
U.S. Cl. 131—91 **9 Claims**



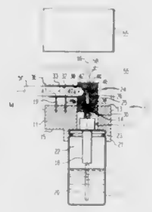
1. Apparatus for manipulating a series of rod-shaped articles which move axially, particularly for manipulating rod-shaped articles of the tobacco processing industry which are severed from a moving continuous rod, comprising a guide having a channel defining for the articles of the series an elongated path which is open at one side and which the articles tend to leave when moving at an elevated speed, said path having an article-receiving end and said open side being the upper side of said path; and means for stabilizing the articles in said path, including a stabilizing element disposed at a level above the article-receiving end of said path and arranged to at least reduce the tendency of the articles to leave said path while moving longitudinally at said elevated speed.

4,926,888
DISPOSABLE ASHTRAY
Chin-Ching Lee, No. 10, Lane Nan-E, Ch'ang-shou Rd., Feng-Yuan City, Tai-Chung Hsien, Taiwan
Filed Nov. 21, 1988, Ser. No. 274,359
Int. Cl.[5] A24F *19/00, 19/14*
U.S. Cl. 131—236 **1 Claim**



1. In a disposable ashtray having a cover hinged to an ashtray body, which is substantially closable by the cover, an improved insert therefor comprising:
a molded block disposed within the ashtray body, said block being formed of a high molecular hydrophilic polymer and having an upper surface thereof including a plurality of holes formed therein for accommodating an increase in the volume of said block when said block expands when absorbing water, said holes being constructed and arranged to prevent said upper surface from becoming domed during such expansion, said holes also being sized to accommodate a cigarette butt therein for providing an extinguishing means for the cigarette when the cigarette is inserted into one of said holes.

4,926,889
APPARATUS FOR TREATING TOBACCO PRODUCTS
George E. Brackett, 9897 Treasure Cay Ln., Bonita Springs, Fla. 33923
Continuation-in-part of Ser. No. 940,063, Dec. 10, 1986. This application May 19, 1988, Ser. No. 195,965
Int. Cl.[5] A61K *13/00, 13/08*
U.S. Cl. 131—329 **27 Claims**



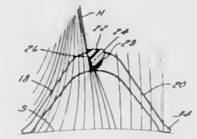
1. Apparatus for treating tobacco products, comprising:
(a) a body member;
(b) a push button member movable relative to said body member between an actuated position and a deactuated position;
(c) means for supporting a tobacco product on one of said members;
(d) means carried by one of said members for puncturing the sidewall of said tobacco product; and
(e) means responsive to movement of said push button member to its actuated position for supplying a moistening liquid to said tobacco product.

4,926,890
COMPOSITION AND METHOD FOR ENHANCING FINGERNAILS
Margaret E. Hoskins, 2230 Homestead Ct., #211, Los Altos, Calif. 94022
Filed Mar. 16, 1988, Ser. No. 168,855
Int. Cl.[5] A45D *29/00*
U.S. Cl. 132—73 **11 Claims**



1. A dry powder product suitable for application to a layer of cosmetically acceptable adhesive for strengthening or extending fingernails, which powder product comprises:
base-treated, dried, powdered bone, having a particle size between about 230 mesh and about 325 mesh.

4,926,891
HAIR CUTTING GUIDE
Frank P. Fani, 401 71st St., Kenosha, Wis. 53140, and Frank Mikic, 3329 99th St., Kenosha, Wis. 53142
Continuation of Ser. No. 165,589, Mar. 8, 1988, abandoned. This application Sep. 5, 1989, Ser. No. 403,787
Int. Cl.[5] A45D *24/36*
U.S. Cl. 132—214 **6 Claims**



1. A hair cutting guide comprising:
a plurality of parallel spaced-apart segments, each of said segments comprising a pair of legs having longitudinal axes formed along intersecting planes such that each of said segments has a generally triangular shape in cross-section; and
connecting means being of generally triangular shape in cross-section including a top surface having a longitudinal axis, for linking said segments along a top portion thereof to produce a generally unitary structure having a predetermined height, said height measured from said top surface between said segments along a line perpendicular to a plane defined by distal ends of a pair of said legs in said segments, said top surface having means for defining a cutting plane lying generally parallel to the plane defined by distal ends of said legs; and
said connecting means further having a pair of side walls associated with said top surface and each defining along the longitudinal axis a surface of a groove between pairs of legs in adjacent segments whereby hair is captured in said grooves against said side walls and is cut along the longitudinal axis of said top surface in the plane defined by said top surface.

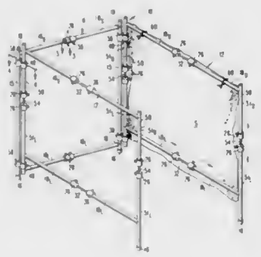
VOL 1114 ISS 4 MY 22 1990 UMI

4,926,892

TEMPORARY ENCLOSURE STRUCTURE

Daniel T. Osmonson, Fountain Hills, Ariz., and James L. McNulty, North Vernon, Ind., assignors to Krohm, Inc., Columbus, Ind.

Filed Nov. 15, 1989, Ser. No. 436,593
Int. Cl.[5] E04H *15/38*
U.S. Cl. 135—103 10 Claims



1. A temporary enclosure structure comprising:
a rear frame section, including;
a pair of spaced apart tubular vertical support members;
a first pair of extensible tubular horizontal members;
means for attaching each of said first pair of extensible horizontal members between said pair of vertical support members in spaced apart relation to define a generally planar frame;
a side frame section, including;
a pair of spaced apart extensible tubular vertical members;
a second pair of extensible tubular horizontal members;
second means for attaching each of said second pair of extensible horizontal members between said pair of extensible vertical members in spaced apart relation to define a generally planar frame; and
a pair of frame supports engaged on said rear frame section for supporting said side frame section, each of said pair of frame supports being in vertical spaced apart relation and including;
a rear pipe section concentrically disposed about one of said pair of vertical support members of said rear frame section;
a forward pipe section integral with said rear pipe section, concentrically disposed about one of said pair of extensible vertical members of said side frame section, wherein said one vertical member is slidable within to said forward pipe section; and
a removable fastener for connecting said rear pipe section to said one of said pair of vertical support members of said rear frame section.

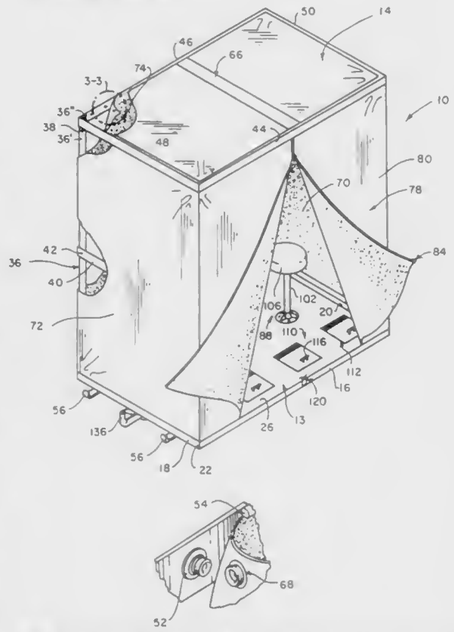
4,926,893

PORTABLE, COLLAPSIBLE ICE FISHING SHELTER

Rick Klopfenstein, and Tom Kreitzer, both of 203 E. State St., Botkins, Ohio 45306

Filed Jun. 13, 1989, Ser. No. 365,604
Int. Cl.[5] E04H *15/44*
U.S. Cl. 135—106 6 Claims

1. A portable, collapsible ice fishing shelter comprising:
(A) a frame assembly which includes
(1) a rectangular base which includes sides and ends which intersect said sides to form corners,
(2) a support block located at each of said corners and each including
(a) orthogonally arranged side faces,
(b) a groove defined in two adjacent side faces, with said grooves intersecting to form an L-shaped guide that extends for essentially the entire length of said block and to extend vertically upward from said frame assembly base when said block is affixed to said base,
(3) a plurality of vertical L-shaped supports each attached at one end to one of said blocks adjacent to said guide and extending vertically upward from said base,
(4) a plurality of cross supports, each connecting adjacent vertical supports together at a location that is vertically spaced from said base,
(5) a plurality of horizontal top elements, each attached to another end of said vertical supports and extending horizontally at a location vertically spaced from said base,
(6) frame assembly snap fastener elements on said base and on said top elements, and
(7) a plurality of ski-like runners mounted on said base to be parallel to said base sides and to each other;
(B) a unitary covering assembly including
(1) a top section,
(2) a rear section,
(3) side sections, and



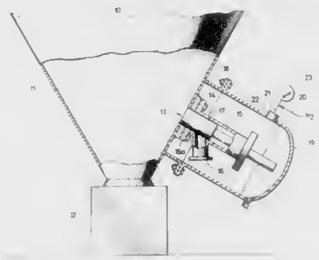
(4) a front section which has two panels and a zipper for securing said panels together, and
(5) snap fastener elements which cooperate with said frame assembly snap fastener elements and secure said unitary covering assembly to said frame assembly;
(6) a seat assembly which includes
(1) a plurality of spaced apart seat brace elements mounted on said frame assembly base,
(2) a seat member releasably coupled to each seat brace and including
(a) a support post releasably coupled to said seat brace, and
(b) a seat element attached to said post; and (D) a fishing opening assembly which includes
(1) a plurality of spaced apart openings defined through said frame assembly base,
(2) a cover hingeably connected to said frame assembly base adjacent to each opening and each including a handle.

4,926,894

APPARATUS AND METHOD FOR DRAINING A VISCOUS MATERIAL FROM A VESSEL

Gaylon L. Dighton, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1989, Ser. No. 434,395
Int. Cl.[5] F16L *55/18*
U.S. Cl. 137—15 5 Claims



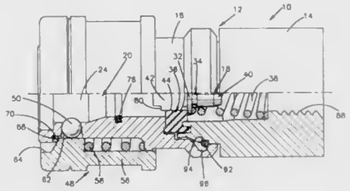
2. The method of claim 1 which includes the steps of:
removing the valve actuator means from the valve body after the piston has been moved into the closed position; and
attaching the dome section to the base section, to thereby provide the housing assembly which encloses the valve unit.

4,926,895

SOCKET ASSEMBLY

Edward D. Galley, Mentor, Ohio, assignor to Tuthill Corporation, Cleveland, Ohio

Filed Jul. 7, 1989, Ser. No. 376,761
Int. Cl.[5] F16L *37/28*
U.S. Cl. 137—15 8 Claims



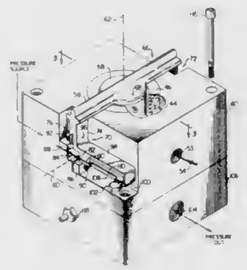
1. A method comprising the steps of providing a first socket part having an outwardly opening groove, providing a second socket part having an inwardly opening groove, providing a resilient retainer ring, telescopically positioning the retainer ring on an end portion of the first socket part at a location axially offset from the groove in the first socket part, engaging the grooves in the first and second socket parts with the retainer ring by pressing against the retainer ring with the second socket part to move the retainer ring axially toward the groove in the first socket part and resiliently expanding the retainer ring under the influence of force applied against an inner side area of the retainer ring by the first socket part as the retainer ring moves axially toward the groove in the first socket part, thereafter, inserting a plug into a socket chamber which is at least partially formed by one of the socket parts, and retaining the first and second socket parts against movement relative to each other by abutting engagement of surfaces of the grooves in the first and second socket parts with the retainer ring when the plug is in the socket chamber.

4,926,896

SENSITIVE ELECTRICAL TO MECHANICAL TRANSDUCER

Robert C. Prescott, N. Marshfield, Mass., and Robert J. Robinson, Derry, N.H., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 23, 1988, Ser. No. 289,224
Int. Cl.[5] G05D *16/00*; H01F *7/14*
U.S. Cl. 137—82 84 Claims



1. An electrical to mechanical transducer, comprising:
a coil winding adapted for carrying a current to provide a magnetic field, said winding being wound so as to define an opening having an axis coaxial with magnetic flux lines of the magnetic field;
a high energy magnetic material having an energy greater than about 30,000,000 gauss-oersted, disposed in the opening of said winding, and of the type which is moved in response to the magnetic field generated by said winding, said magnet being disposed in said coil winding opening such that the polarization thereof is orthogonal to the magnetic flux lines; and
a coupling arm connected to said magnetic material and movable in response to the movement of said magnetic material to provide a mechanical output of said transducer.

4,926,897

AUTOMATIC FLUID PRESSURE EQUALIZING VALVE

Charles H. Perrott, Portland, Oreg., assignor to C. H. Perrott, Inc., Portland, Oreg.

Filed Jun. 12, 1989, Ser. No. 364,140
Int. Cl.[5] G05D *7/01*
U.S. Cl. 137—98 3 Claims

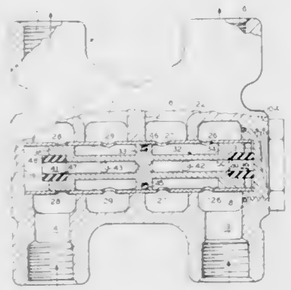
1. A valve assembly comprising:
(a) a unitary valve body **10** apertured to provide a central axial cavity open at one end,
(b) a sleeve **18** disposed within the cavity and substantially coextensive therewith,
(c) the valve body having a recess **19** in its closed end closely accommodating the adjacent end of the sleeve,
(d) the valve body further having hot and cold water inlet and outlet passages **13, 16** and **14, 17**,
(e) the sleeve having ports **26, 27**, and **28, 29** providing fluid communication between the hot water inlet and outlet passages **14, 17** and between the cold water inlet and outlet passages **13, 16** respectively,
(f) a pressure balancing piston **32** disposed for movement within the sleeve and having a central land **33** and terminal lands **34, 36**,
(g) the piston also having axially internal bores **39, 41** which terminate at their inner ends substantially at the central

VOL
1114
ISS
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land **33** and at their outer ends in segments **47, 49** of enlarged diameter,

(h) the piston having also apertures **42, 43** communicating the bores with the interior of the sleeve,

(i) the terminal lands **34, 36** being contoured and dimensioned to serve as closure means to inversely obstruct the sleeve ports between the hot water inlet and outlet passages and the sleeve ports between the cold water inlet



and outlet passages in response to a variation in the ratio of fluid pressures in the inlet passages,

(j) longitudinally perforated compressible pads **48, 50** mounted in axial bores **39, 41** of the piston, the perforations of the pads communicating with the said bores of the pistons,

(k) and a plug **11** threaded into the valve body for closing the open end of the body cavity and the adjacent end of the sleeve.

4,926,898

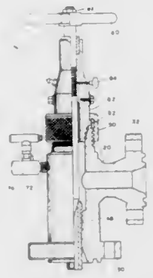
SAFETY CHOKE VALVE

Ted J. Sampey, P.O. Box 877, Belle Chasse, La. 70037

Filed Oct. 23, 1989, Ser. No. 425,485

Int. Cl.[5] F16K *43/00, 51/00*

U.S. Cl. 137—315 **30 Claims**



1. A safety choke comprising:

a valve body having an inlet fluid flow passage and an outlet fluid flow passage arranged at a right angle to said inlet flow passage, the valve body being provided with a frustoconical cavity in a valve body top portion;

a bonnet means having a frustoconical lower part matingly tapered to fit in a seated engagement within said cavity; and

means for securing position of said bonnet means on said valve body, said bonnet being partially manually disengaged from said valve body to cause breaking of the seated engagement, so as to determine, by at least partial relief of pressure build up between the valve body and the bonnet, if an excessive pressure exists in the valve body, wherein when the excessive pressure is above a predetermined level said bonnet is prevented from being manually unseated thereby alerting an operator to relieve the pressure through an alternative pressure relief means.

4,926,899

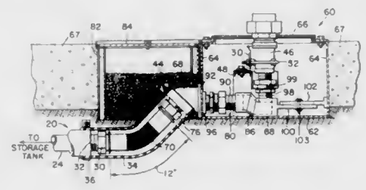
TRANSITION CONDUIT SYSTEM FOR FUEL PUMP

Toby Argandona, 21221 Running Branch Rd., Diamond Bar, Calif. 91765

Filed Sep. 19, 1989, Ser. No. 409,080

Int. Cl.[5] F16L *5/00*

U.S. Cl. 137—364 **22 Claims**



1. A transition conduit system for a fuel pumping unit, comprising:

a casing disposed in a base for a fuel pumping unit, said casing comprising a bottom wall and upstanding side walls for containing spilled fuel,

a vertically oriented flow valve in the upper section of the casing,

a first acute-angle elbow passage means on one of said casing side walls to position a first outlet leg of the elbow passage to extend horizontally through said one casing side wall, and to position a second inlet leg of the elbow passage to extend at an acute downward angle relative to the first leg,

an L-shaped passage means in the casing and extending between the horizontal leg of said elbow passage means and the vertically oriented flow valve, and

a second elbow passage means joined to the second leg of the first elbow passage means, the second elbow passage means including a first upwardly inclined outlet passage section connected to the inlet leg of the first elbow passage means and a second inlet passage section extending essentially horizontally with the second elbow joined to the first elbow.

4,926,900

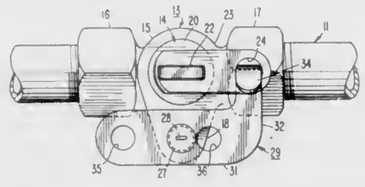
VALVE ASSEMBLY AND LOCKING MEANS THEREFOR

Eugene E. Pietras, Liverpool, N.Y., assignor to Niagara Mohawk Power Corporation, Syracuse, N.Y.

Filed May 16, 1989, Ser. No. 352,295

Int. Cl.[5] F16K *35/00*

U.S. Cl. 137—385 **36 Claims**



1. A valve assembly comprising:

a valve having a housing provided with inlet and outlet ports and a valve element disposed in said housing and movable between closed and open positions, said valve element having a wing portion provided with an opening therein movable between a first position when said valve element is in the closed position and a second position when said valve element is in the open position, said housing having a wing portion provided with an opening therein disposed in lockable relation with said valve element wing portion when said valve element is in said first position;

a rigid spacer member disposable between said housing and valve element wing portions when said valve element is in the open position and said valve element wing portion is in said second position;

a barrel lock removably mountable in registered openings of said wing portions when said valve element wing portion is in said first position and said valve element is in the closed position whereby said valve element will be locked in the closed position; and

said rigid spacer member having a hook portion cooperable with the opening in said valve element wing portion, and an opening spaced from said hook portion and registrable with the opening in said housing wing portion for removably mounting said barrel lock in said registered openings when said valve element wing portion is in the second position and said valve element is in the open position whereby said valve element will be locked in the open position.

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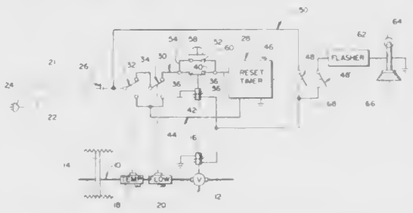
FLUID SUPPLY LINE FLOW CONTROL DEVICE

Harold D. Waltenburg, 11754 Woodbine St., N. W., Coon Rapids, Minn. 55433

Filed Jun. 28, 1989, Ser. No. 372,668

Int. Cl.[5] F16K *17/00*

U.S. Cl. 137—456 **5 Claims**



1. Apparatus for automatically terminating flow through a fluid supply line in response to continuous flow through the line for a period greater than a defined time, comprising:

(a) a normally-open control valve in the supply line;

(b) a sensor in the supply line, up-flow of said control valve, for ascertaining flow of fluid through the supply line;

(c) power means;

(d) timing means actuatable by said power means, said time means operational in reset, timing, and trip modes;

(e) a normally-closed reset circuit having a first two-position switch therein, said switch normally being in a first position thereof to provide power from said power means to maintain said timing means in said reset mode thereof, and said switch being responsive to said sensor to move to a second position thereof when flow of fluid through the supply line is ascertained;

(f) a normally-open initiation circuit, closable by said two-position switch when it has been moved to said second position, to provide power from said power means to initiate said timing means in said timing mode thereof;

(g) a normally-open control circuit having a second two-position switch therein, said second two-position switch normally being in a first, open position to maintain said control circuit open, and said second two-position switch being responsive to said timing means, when said timing means, after a predetermined period of time after entering said timing mode thereof, is automatically initiated in said trip mode thereof, to be moved by said timing means to said second two-position switch's second position to close said control circuit and provide power from said power means to said normally-open control valve, to close said valve; and

(h) means, actuatable when said control circuit is closed, for opening said reset circuit.

4,926,902

PRESSURE EQUALIZER VALVE DEVICE OF FUEL INJECTION PUMP

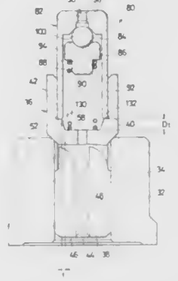
Hisashi Nakamura; Satoshi Takahashi; Takayuki Ikeda, and Masaaki Ogino, all of Saitama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Jan. 17, 1989, Ser. No. 298,104

Claims priority, application Japan, Jan. 18, 1988, 63-3821[U]; Jul. 4, 1988, 63-165049; Nov. 14, 1988, 63-14758[U]; Nov. 14, 1988, 63-285734

Int. Cl.[5] F16K *17/18*

U.S. Cl. 137—493.3 **23 Claims**



1. A pressure equalizer valve device incorporated in a fuel delivery valve assembly for use in a fuel injection pump, the fuel delivery valve assembly having a valve chamber and a delivery valve member axially movable in part within the valve chamber, the delivery valve member having an axially elongated concavity which is open at one end of the delivery valve member, the pressure equalizer valve device comprising

(a) a hollow equahzer valve casing member which has an axial end portion closely received in said axially elongated concavity and which is thereby fixedly secured to said delivery valve member, said casing member having a valve seat surface portion and a valve chamber open in said delivery valve member,

(b) an equalizer valve element movable into and out of a position seated on said valve seat surface portion, and

(c) biasing means engaging said equalizer valve element and located in part within said delivery valve member for urging said equalizer valve element against said valve seat surface portion of said equalizer valve casing member,

(d) wherein said equalizer valve element and at least a portion of said biasing means are accommodated within the valve chamber in said equalizer valve casing member.

VOL 1114 ISS 4 MY 22 1990 UMI

4,926,903

BUTTERFLY VALVE HAVING A FUNCTION FOR MEASURING A FLOW RATE AND METHOD OF MEASURING A FLOW RATE WITH A BUTTERFLY VALVE

Kouzi Kawai, Higashi-Osaka, Japan, assignor to Tomoe Technical Research Company, Japan

Filed May 5, 1989, Ser. No. 347,621
Int. Cl.[5] G01F *1/28*; F16K *37/00*
U.S. Cl. 137—554 16 Claims



10. A method of measuring a flow rate of a fluid flowing through a butterfly valve, comprising the steps of;

detecting a valve opening of said butterfly valve,

detecting a dynamic torque applied to a valve member of said butterfly valve around a valve shaft of said butterfly valve by said fluid, and

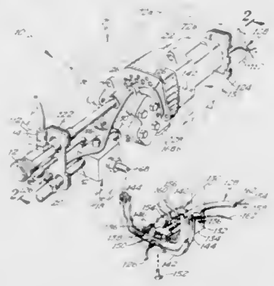
determining said flow rate as a function of said detected valve opening and said detected dynamic torque.

4,926,904

PRESSURE WASHER

Gary C. Polk, Eden Prairie; Steve A. Larson, Stacy, and Ronald E. Albrecht, Crystal, all of Minn., assignors to Power Flo Products Corp., Minneapolis, Minn.

Division of Ser. No. 229,832, Aug. 8, 1988, Pat. No. 4,851,724. This application Jun. 12, 1989, Ser. No. 364,178
Int. Cl.[5] F04B *21/00*
U.S. Cl. 137—565 13 Claims



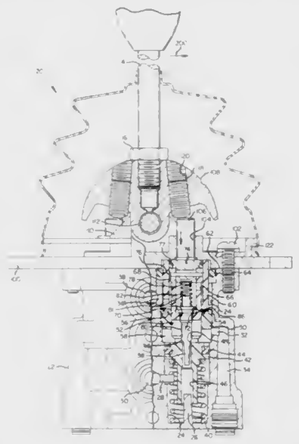
1. Housing for an internal component including a first end having a shape and a second end having a shape, with the shapes of the first and second ends of the internal component being of different sizes and shapes, comprising, in combination: a first housing half having a first end, a second end, and an inner surface defining an interior; a second housing half having a first end, a second end, and an inner surface defining an interior, with the first end of the first housing half being interconnected to the second end of the second housing half and the second end of the first housing half being interconnected to the first end of the second housing half, with the first housing half being identical to the second housing half, with the first and second housing halves each including first and second ribs extending from the inner surface and equidistant and on opposite sides of the center of the housing half between the first and second ends, with the first rib of the first housing half and the second rib of the second housing half engaging the first end of the internal component and the second rib of the first housing half and the first rib of the second housing half being in a noninterfering relation with the second end of the internal component; and third and fourth ribs extending from the inner surface and equidistant and on opposite sides of the center of the housing half between the first and second ends, with the fourth rib of the first housing half and the third rib of the second housing half engaging the second end of the internal component and the third rib of the first housing half and the fourth rib of the second housing half being in a noninterfering relation with the first end of the internal component.

4,926,905

MANUALLY OPERATED AIR VALVE AND ACTUATOR IN COMBINATION CONTROL A HYDRAULIC SPOOL VALVE FOR MANEUVERING HEAVY EQUIPMENT

Jim Helfenstein, Portland, Oreg., assignor to Williams Controls, Inc., Portland, Oreg.

Filed Sep. 29, 1989, Ser. No. 421,964
Int. Cl.[5] F15B *13/042*
U.S. Cl. 137—625.6 4 Claims



1. In combination, an air regulating controller valve having a regulating section, and an air operated actuator controlling a hydraulic valve for manual operator control of heavy equipment comprising;

said regulating section of the controller valve having a movable cartridge with an inlet orifice, a moveable first piston with an exhaust orifice, and a poppet protruding through the inlet orifice and into the exhaust orifice, said inlet orifice and exhaust orifice defining therebetween an air pressure chamber, a first spring means biasing the poppet into a closed position in the inlet orifice, a second spring means biasing the piston toward the poppet, and manual control means for selectively moving the movable cartridge toward the first piston whereby the poppet is urged to a closed position in the exhaust orifice and to an open position in the inlet orifice to thereby permit air from the cartridge to pass through the inlet orifice into the air pressure chamber until the biasing force of the second spring means is overcome by air pressure in the chamber to force retraction of the first piston and thereby allow the first spring means to move the poppet into closed position in the inlet orifice;

an actuator having a movable second piston, a conduit directing air pressure from the air pressure chamber in the regulating section to one side of the movable second piston urging a first directional movement thereof, and a third spring means resisting said first directional movement of the second piston, said moveable second piston having a defined distance of effective movement and said third spring means providing increasing resistance to said first directional movement of the second piston throughout said distance of effective movement;

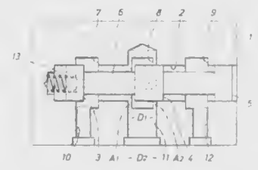
said moveable first piston having a defined distance of effective movement and said second spring means providing increasing resistance to movement of the first piston throughout said distance of effective movement, said second spring means being matched to said third spring means whereby movement of the first piston along its defined distance of effective movement establishes air pressure in the conduit that generates a proportionate movement of the second piston along its defined distance of effective movement.

4,926,906

SPOOL VALVE

Kouji Ichihashi; Junichi Tani; Katsuhiko Tsukazaki; Hiroshi Sakuyama; Nobuo Baba; Kiyoji Nakajima; Takaaki Arai, and Akira Inaba, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 303,656
Claims priority, application Japan, Mar. 30, 1988, 63-74480
Int. Cl.[5] F15B *13/04*
U.S. Cl. 137—625.3 12 Claims



1. A spool valve comprising:

a valve housing having a valve bore extending in an axial direction therein, a control port extending therein and intersecting said valve bore so as to be open thereto at an opening of the control port, and a groove extending therein circumferentially of and open to said valve bore,

said opening having a diameter as taken transversely of said axial direction that is less than the diameter of said valve bore,

said groove being defined between inner peripheral surfaces of said valve housing which are spaced apart in and extend perpendicular to said axial direction, at least one of said inner peripheral surfaces lying in a plane intersecting said opening so that a segmental portion of said opening is disposed to one side of said groove in said axial direction, said segmental portion having a predetermined width as taken in said axial direction and defining thereover a control zone in the valve; and

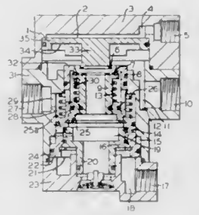
a spool mounted to said valve housing within said valve bore so as to be slidable therein in said axial direction, said spool including a land having an outer circumferential surface complementary to and slidable over an inner peripheral surface of said valve housing defining said valve bore, said land having a width as taken in said axial direction that is at least equal to the maximum diameter of said opening of said control port as taken in said axial direction, and said spool being slidable within said valve bore between a position at which said land closes said control port to said valve bore and a position at which said control port is open to said valve bore via at least the segmental portion of the opening of said control port.

4,926,907

RELAY VALVE FOR PNEUMATIC OR HYDRAULIC APPLICATION

Gerhard Fauck, Hanover; Wolfgang Pohl, Garbsen, and Helmut Ulrich, Springe, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 679,420, Dec. 7, 1984, abandoned. This application Feb. 12, 1986, Ser. No. 828,927
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1983, 3344841
Int. Cl.[5] F16K *21/00*
U.S. Cl. 137—627.5 8 Claims



1. A relay valve for a pneumatic brake installation for vehicles, comprising:

(a) an inlet valve having a first control connection which is in communication with a source of a first control pressure and having at least one supply connection which is in communication with a source of a supply pressure and which is put in communication with a source of at least one working connection;

(b) an outlet valve for connecting the working connection to the atmosphere;

(c) said inlet valve and said outlet valve being operated by a relay piston which is in communication with the first control pressure to move the inlet valve in an opening direction and to move the outlet valve in a closing direction, and being operated by the relay piston which is in communication with the working pressure supplied to a reaction chamber which is connected to the working connection to move the inlet valve in a closing direction and to move the outlet valve in an opening direction;

(d) graduated piston means located adjacent to the inlet and outlet valves for providing a graduated increase of the working pressure greater than the value corresponding to the first control pressure, up to the available supply pressure; and

(e) said graduated piston means is activated above a predetermined pressure value of a source of a second control pressure.

4,926,908

PRESSURE RELIEF AND VACUUM VENT VALVE

Otto Dschida, Stillman Valley, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 7, 1985, Ser. No. 795,879
Int. Cl.[5] F16K *24/00*
U.S. Cl. 137—846 19 Claims

1. A pressure relief and vacuum vent valve, comprising:

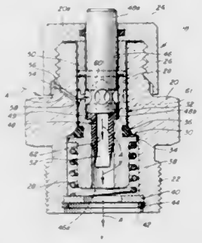
a valve body including means defining a valve seat;

a valve assembly positioned in the valve body and including a closure portion movable toward and away from the valve seat to close and open the valve;

biasing means for urging the valve assembly closure portion toward the valve seat to close the valve;

actuator means connected to the valve assembly for selectively moving the closure portion to open the valve and release pressure from within the valve body;

conduit means through the valve assembly and outwardly through the valve body; and



a flexible vent valve integral with the valve assembly and movable therewith in response to moving the actuator means, the flexible vent valve being located within the conduit means for venting fluid therethrough independently of the closure portion and biasing means only in response to vacuum within the valve body.

4,926,909

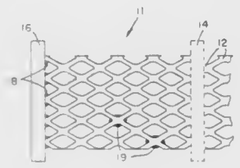
INTERSTICED NIPPLE FOR ELASTOMERIC HOSE

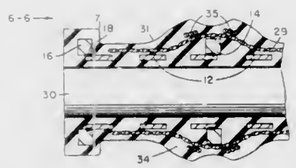
Philip Salinas, Aurora, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Continuation of Ser. No. 368,126, Jun. 16, 1989, abandoned, which is a continuation of Ser. No. 885,061, Jul. 14, 1986, abandoned. This application Jan. 2, 1990, Ser. No. 462,355

Int. Cl.[5] F16L *11/10*

U.S. Cl. 138—109 **12 Claims**





1. In a cured elastomeric hose and fitting assembly of the type with an elastomeric tube and joined together by a curing process, an elastomeric cover surrounding the tube, and the fitting with an annular nipple end bead attached near an end of a substantially cylindrically shaped nipple embedded in a terminus of the hose between a portion of the tube and cover, and wherein the improvement comprises:

the nipple of an expanded metal that defines a wall with a grid and a plurality of interstices with regularly repeating, substantially diamond shaped openings and which define a means for receiving viscoelastic flowby of a portion of the elastomeric tube and cover during said curing process and wherein the elastomer flowby is disposed in the interstices.

4,926,910

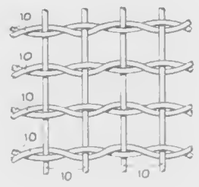
RADIO-FREQUENCY REFLECTIVE FABRIC

William D. Wade, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 123,843, Nov. 23, 1987. This application Aug. 22, 1988, Ser. No. 234,599

Int. Cl.[5] D03D *15/00*; D02G *3/12, 3/36*

U.S. Cl. 139—425 R **15 Claims**



1. A yarn for use in weaving a fabric that reflects radio-frequency electromagnetic energy, said yarn comprising a metallic filament and a non-metallic roving material, said roving material being wound around said metallic filament so as to form an electrically insulating covering for said metallic filament, said metallic filament having a diameter and said roving material having a density that are related to each other such that approximately half of any loading forces imposed upon said yarn by thermal stresses applied to the fabric woven from said yarn are accepted by said roving material, said filament and said roving material having corresponding coefficients of thermal expansion that are related to each other so that mechanical strain thermally induced in said metallic filament is substantially counteracted by mechanical strain thermally induced in said roving material as a result of thermal stresses applied to the fabric woven from said yarn at temperatures in a range extending from about −150° C. to about 100° C., said yarn thereby having an effective coefficient of thermal expansion of substantially zero over said range of temperatures.

6. A fabric that reflects radio-frequency electromagnetic energy, said fabric having an effective coefficient of thermal expansion of substantially zero at temperatures in a range extending from about −150° C. to about 100° C., said fabric being woven from a yarn comprising a metallic filament and a non-metallic roving material, said roving material being wound around said metallic filament so as to form an electrically insulating covering for said metallic filament, said metallic filament having a diameter and said roving material having a density that are related to each other such that approximately half of any loading forces imposed upon said yarn by thermal stresses applied to said fabric are accepted by said roving material, said filament and said roving material having corresponding coefficients of thermal expansion that are related to each other so that mechanical strain thermally induced in said metallic filament is substantially counteracted by mechanical strain thermally induced in said roving material as a result of thermal stresses applied to said fabric at temperatures in said temperature range.

4,926,911

DETECTION AND STANDBY WEFT SUPPLY APPARATUS BREAK

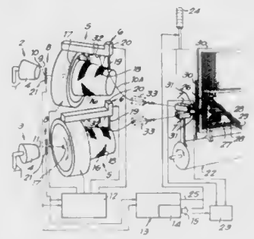
Henry Shaw, Woesten-Vleteren, Belgium, assignor to Picanol N.V., Belgium

Filed Mar. 16, 1989, Ser. No. 324,000

Claims priority, application Belgium, Mar. 16, 1988, 8800300

Int. Cl.[5] D03D *47/34, 51/34*

U.S. Cl. 139—435.1 **8 Claims**



1. A weft thread supply for an airjet weaving machine, comprising: at least two thread preparation mechanisms, each including task performing means for performing the task of supplying weft thread to the shed of the weaving machine, each said task performing means including at least one thread package, a thread accumulator device, a thread stopping device, and a main nozzle; a detector arranged to detect thread breaks, which operates on at least one of respective thread packages and thread stopping devices; a control unit connected to the detector and to the thread preparation mechanisms and including means for, upon detection of a thread break by the detector, deactivating the thread preparation mechanism in which the thread break has occurred and transferring its task to the other thread preparation mechanism; and a monitoring device connected to the detector, said device including delay circuit means for supplying a delayed output signal for further processing by the control unit after the detector has detected a thread break.

4,926,912

WEFT FEEDING DRUM WITH LAMING ARRAY BRAKE

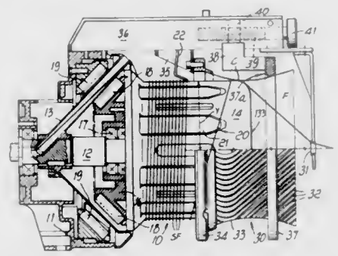
Pietro Zenoni, Leffe, Italy, assignor to L.G.L. Electronics S.p.A., Bergamo BG, Italy

Filed Feb. 21, 1989, Ser. No. 313,412

Claims priority, application Italy, Mar. 2, 1988, 67162 A/88; Jun. 14, 1988, 67559 A/88

Int. Cl.[5] D03D *47/34*

U.S. Cl. 139—452 **12 Claims**



1. A weft feeding device, for looms, of the type comprising a drum for winding the thread and means for braking the thread which unwinds from the drum including an array of metallic laminas fitted on and tangent to the drum, wherein said array of laminas is arranged according to the surface of a rotational paraboloid, said paraboloid having a minimum-circumference radius, said paraboloid elastically engaging the thread at said own minimum-circumference radius; said paraboloid having one end rigidly coupled to a fixed supporting ring which encircles the drum and its other free end subject to the action of a movable ring which, when moved axially with respect to the paraboloid, varies curvature of said paraboloid to correspondingly vary the contact pressure of the laminas on the thread.

4,926,913

METHOD AND A DEVICE FOR ASEPTIC TRANSFER OF AN AMOUNT OF LIQUID FROM ONE SPACE TO ANOTHER

Bengt Palm, Genarp, Sweden, assignor to Alfa-Laval Food & Dairy Engineering AB, Tumba, Sweden

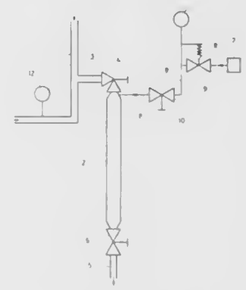
PCT No. PCT/SE87/00307, § 371 Date Dec. 29, 1988, § 102(e) Date Dec. 29, 1988, PCT Pub. No. WO88/00234, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 29, 1987, Ser. No. 295,604

Claims priority, application Sweden, Jul. 4, 1986, 8602973

Int. Cl.[5] B65B *3/04, 31/00*

U.S. Cl. 141—1 **6 Claims**



1. A method of aseptically transferring liquid at a given pressure and temperature from a first space to a second space which comprises filling the second space with a sterile gas, having a condensation temperature, which, at said given pressure, is higher than the temperature of the liquid, to substantially the given pressure in the first space, bringing the first and second spaces into communication with one another, thereby causing the gas in the second space to be condensed by contact with the liquid and inducing the liquid to flow from the first space to the second space; and interrupting the communication between the first and second spaces so that the liquid in the second space is separated from the liquid remaining in the first space.

4,926,914

VENT CONTROL VALVE ATTACHED TO FUEL FILLER TUBE

Mitsuo Morizumi, Atsugi; Kinya Omura, Zama; Eriya Arita, Kawagoe; Katsuji Furuya, Tokyo; Sakae Yasuda, Kawagoe, and Masaya Kodera, Zama, all of Japan, assignors to Nissan Motor Company, Limited and Tsuchiya Mfg. Co., Ltd., both of, Japan

Filed Aug. 8, 1988, Ser. No. 229,423

Claims priority, application Japan, Aug. 10, 1987, 62-19931

Int. Cl.[5] B65B *31/00*

U.S. Cl. 141—59 **16 Claims**

1. A vent control system comprising:

a vapor storage canister;

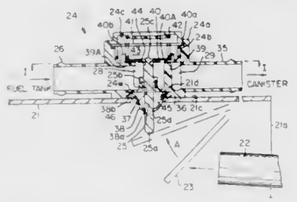
a fuel tank;

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a fuel filler tube communicating with the fuel tank and having an axis and a movable door; and

a vent control valve attached to the fuel filler tube and including

means for defining first and second chambers located side by side on a plane parallel to the fuel filler tube, said first chamber communicating with the fuel tank, said second chamber communicating with the vapor storage canister, and said chambers defining means including a partition wall extending generally perpendicular to the axis of the fuel filler tube wherein said first and second chambers are located on opposite sides of said partition wall and wherein said first and second chambers and said partition wall are generally coaxial with each other and

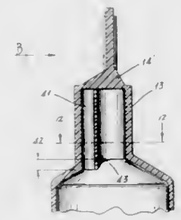


valve means adapted to cause said first and second chambers to communicate with each other so as to allow the fuel tank to communicate with the vapor storage canister, said valve means including a rod extending generally perpendicular to the axis of the fuel filler tube and having first and second end sections and a diaphragm member fixedly secured to the second end section of said rod, said rod and said diaphragm member being movable between a first position wherein said door is spaced from the first end section of said rod and said diaphragm member contacts said partition wall to block communication between said first and second chambers and a second position wherein said door is pushed against said first end section of said rod and said diaphragm member is separated from said partition wall to establish communication between said first and second chambers.

4,926,915
AMPUL

Heino Deussen, and Werner Deussen, both of Eltville, Fed. Rep. of Germany, assignors to Stella KG Werner Deussen, Eltville, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,593
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1988, 3818682
Int. Cl.[5] B65B *3/10*; A61J *1/06*
U.S. Cl. 141—290 **13 Claims**

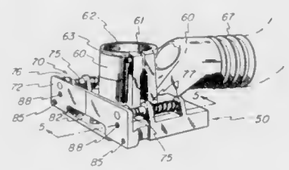


1. A one-piece ampoule adapted to accommodate a dose of a liquid medium for transfer to a hypodermic syringe, said ampoule comprising a container and a tubular neck integral with the container, said neck comprising elastically ductile material and being constituted in the form of a push-on annular retainer means for encircling and directly engaging and sealing with the conical seating cone of a hypodermic syringe, which seating cone is intended to be later received in the cup of a hypodermic needle, said neck having a discharge opening therein and an integrally formed vent opening coextensive with said discharge opening but separated therefrom by an elongate wall common to both the said discharge opening and said vent opening, and an integral break-away cover normally sealing both said discharge opening and said vent opening, said integral cover having integrally formed manually engageable handle means to enable the cover to be forcibly broken away to simultaneously permanently uncover both said discharge opening and said vent opening of the ampoule, and to thereafter permit flow of the liquid medium out through the discharge opening while air can simultaneously flow into the ampoule through the separate vent opening.

4,926,916
BISCUIT JOINER

John G. Legler, Huber Heights; Harold E. Folkerth, Dayton, and David D. Flora, Arcanum, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Filed Aug. 10, 1989, Ser. No. 392,183
Int. Cl.[5] B27C *5/00, 1/00*
U.S. Cl. 144—136 R **6 Claims**



1. Apparatus for cutting slots in wood workpieces to be joined by disk-like biscuits of predetermined dimensions inserted in such slots, comprising:

(a) a power tool including a frame and drive means mounted on said frame and having a drive spindle,

(b) a worktable mounted on said frame for relative adjustment toward and away from said drive means,

(c) a rotary saw blade drivingly connected with said spindle for rotation about a predetermined axis perpendicular to said worktable and fixed laterally with respect to said worktable,

(d) a housing mounted on said drive means in enclosing relation with said saw blade and open at the front thereof,

(e) said housing and said saw blade being so proportioned that in said mounted positions thereof on said drive means, said saw blade projects through said open front of said housing,

(f) means for effecting relative adjustment of said drive means and said worktable parallel with said axis to establish a predetermined space between said saw blade and said worktable,

(g) a guide for workpieces to be slotted having a face for engagement by each such workpiece,

(h) means mounted said guide on said housing at said open front thereof for linear movement toward and away from said saw blade,

(i) said guide having a slot therethrough aligned with and for receiving said saw blade therethrough,

(j) stop means establishing an outer limit position of said guide wherein said saw blade does not project beyond the plane of said guide face, and

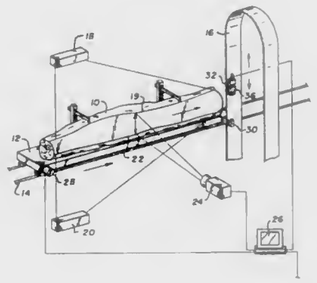
(k) stop means for establishing an inner limit position of said guide establishing the maximum depth of the slot but by said saw blade in a workpiece moved on said worktable with said guide to said inner limit position;

(l) whereby upon movement of said guide toward said housing by a workpiece listing on said worktable in engagement with said guide, said saw blade will cut a slot in said workpiece at the level determined by said means for effecting relative adjustment of said drive means and said worktable.

4,926,917
FEED SPEED AND GUIDE ARM CONTROL FOR SAWING LOGS

Eberhard Kirbach, 10260 Dennis Crescent, Richmond, British Columbia, Canada (V7A 3R8)

Filed Jul. 10, 1989, Ser. No. 377,096
Int. Cl.[5] B27B *1/00*
U.S. Cl. 144—356 **9 Claims**



1. A method of controlling feed speed of a log or cant while sawing with a saw blade, comprising the steps of,

positioning a log or cant in preparation for sawing in a saw line on the log or cant,

projecting a first light line onto the surface of the log or cant at the projected saw entry line, and a second light line onto the surface of the log or cant at the projected saw exit line,

measuring the distance between the first light line and the second light line on the log or cant to determine depth of cut, and

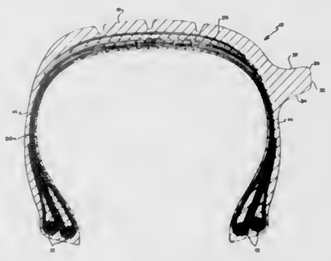
controlling the feed speed of the log or cant past the saw blade during the sawing step, to a predetermined feed speed for the measured depth of cut to avoid overfeed and underfeed.

4,926,918
PNEUMATIC TIRE

Edward J. Demor, III, Copley; Walter W. Hinkel, Massillon, and Lewis T. Lukich, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 21, 1989, Ser. No. 313,192
Int. Cl.[5] B60C *13/02*
U.S. Cl. 152—154 **4 Claims**

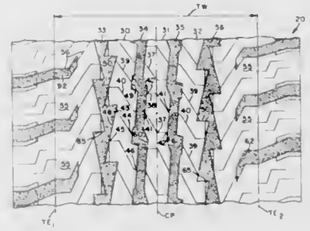
1. A pneumatic tire having sidewalls, comprising: a chine extending generally axially from a sidewall, the chine having a width and a thickness, the average thickness of the chine between a point located at 50% of the width of the chine from the sidewall and the end of the chine being at least 50% of the width of the chine and wherein the thickness measured at a point located at 50% of the width of the chine from the sidewall is at least 66% of the width of the chine.



4,926,919
VEHICLE TIRE WITH RIB TYPE TREAD PATTERN HAVING SIPES ACROSS THE RIBS

William M. Hopkins, Hudson; Robert A. Brightwell, Uniontown; Ray A. Young, East Sparta; John K. Clark, Copley; Frederick W. Miller; Richard L. Galante, both of Akron; Terry J. Walbel, Wadsworth, and Michael A. Kolowski, Mogadore, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 14, 1988, Ser. No. 270,598
Int. Cl.[5] B60C *11/12*
U.S. Cl. 152—209 R **17 Claims**



1. A tire comprising a tread having a pair of lateral edges and a st of at least three ribs extending circumferentially thereabout with each said rib having a pair of lateral edges bordered by two grooves which each extend circumferentially about the tread, the central rib of said set being disposed midway between said tread edges and having a series of grooves therein which extend completely thereacross and are disposed obliquely with respect to a plane containing the axis of rotation of the tire, the depth of each of the obliquely extending grooves in said central rib varying along its length such that its minimum depth is not more than 50% of its maximum depth, said central rib having a pair of lateral edges and each obliquely extending groove in the central rib is at its maximum depth at the junction of the oblique groove and only one lateral edge of the rib, said maximum depth of each obliquely extending groove in said central rib being at an opposite lateral edge of said central rib from the maximum depth junctions of the circumferentially next adjacent obliquely extending grooves in said central rib, at least one other rib of said set being disposed on each side of said central rib, said other ribs having each having a series of grooves therein which extend completely thereacross and are disposed obliquely with respect to a plane

VOL
1114
ISS
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MY
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1990
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containing the axis of rotation of the tire, the variation in depth along the length of each of the obliquely extending grooves in said other ribs differing from the variation in depth along the length of the circumferentially next adjacent obliquely extending grooves in the same rib, said circumferentially extending grooves having greater maximum depths than the maximum depths of any of the obliquely extending grooves in all of said ribs have widths such that the obliquely extending grooves close up in a footprint of the tire, and the circumferentially extending grooves have widths such that they do not close up in a footprint of the tire, a circumferentially extending array of shoulder blocks being disposed between each lateral edge of the tread and the nearest of said circumferentially extending grooves, the circumferentially next adjacent blocks in said arrays being separated from one another by grooves extending from the respective tread edge to the nearest circumferentially extending groove with a portion of each said separating groove being disposed obliquely with respect to a plane containing the axis of rotation of the tire in a sense that is opposite to the sense at which the grooves extending across the rib nearest to the respective tread edge are oriented.

4,926,920

PNEUMATIC TIRE-THE CARCASSE OF WHICH IS FORMED OF A REGENERATED CELLULOSE FIBER

Jacques Gouttebessis, Chanat-la-Mouteyre, France, and Philippe Villaine, Dubendorf, Switzerland, assignors to Michelin Recherche et Technique S.A., Basel, Switzerland

Filed Oct. 22, 1986, Ser. No. 922,028

Claims priority, application France, Oct. 24, 1985, 85/16078

Int. Cl.[5] B60C *9/04*; D02G *3/48*

U.S. Cl. 152—548 **6 Claims**

1. A pneumatic tire comprising at least one carcass ply, said tire being characterized by the fact that said carcass ply is formed, at least in part, of a regenerated cellulose fiber, said fiber being formed of at least one filament having a base material selected from the group consisting of cellulose and cellulose derivatives containing cellulose ester groups, at least a part of these ester groups being formate groups, said fiber having the following properties:

(a) the degree of substitution DS of the cellulose by formate groups is less than 2% and the degree of polymerization DP of the cellulose is greater than 150 and less than 1200 and the degree of substitution DS of the cellulose by ester groups other than formate in zero or less than 1.5%;

(b) the degree of polymerization DP of the cellulose, the tenacity T and the initial modulus M_i of the fiber verify the following relationships, T and M_i being expressed in cN/tex:

for $150 < DP < 200$: $T > 20$ and $M_i > 1800$;

for $200 \leqq DP < 300$: $T > 30$ and $M_i > 2000$;

for $300 \leqq DP < 400$: $T > 40$ and $M_i > 2400$;

for $400 \leqq DP < 1200$: $T > 60$ and $M_i > 2600$; and

(c) each filament has a morphology such that it is formed, at least in part, by layers which are embedded in each other, these layers surrounding the axis of the filament, and such that in each layer the optical direction and the direction of crystallization vary pseudoperiodically along the axis of the filament.

4,926,921

LOUVER

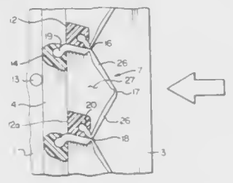
Joachim Heinemann, Weinheim; Karl-Heinz Spies, Birkenau; Frank Keller, Weinheim; Bernd Beicht, Gross-Umstadt; Wulf Leitermann, Bad Wimpfen, and Rolf Lechler, Necharsulm, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr. and Firma Audi AG, Ingolstadt, both of, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,423

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731980

Int. Cl.[5] E06B *3/48*

U.S. Cl. 160—115 **13 Claims**



1. A louver for selectively closing flow openings defined therethrough comprising:

(a) a stationary support grid including a plurality of equidistantly spaced, first rods extending in a first direction to define flow openings therebetween;

(b) a movable grid including a plurality of spaced, second rods extending parallel to said first rods and being movable relative to said first rods in a straight path in a second direction perpendicular to said first direction from a first position in which each of said second rods at least partially overlaps a respective one of said first rods to a second position spaced from said first position by a distance approximately equal to the equidistant spacing between said first rods; and

(c) a plurality of substantially impermeable, flexible, flat structures each having first and second longitudinal edges and each of which is connected along the entire length of its first edge to one of said first rods and along the entire length of its second edge to a respective second rod that at least partially overlaps said one first rod in said first position, said flat structures having a width at least as wide as the width of said equidistant spacing whereby when said second rods are moved to said second position said flat structures close said flow openings.

4,926,922

CURTAIN DRAWING DEVICE

Fumio Shimazaki, Osaka, Japan, assignor to Topia Industry Co., Ltd., Higashiosaka, Japan

Filed Nov. 30, 1988, Ser. No. 277,841

Claims priority, application Japan, Dec. 4, 1987, 62-305956; Aug. 8, 1988, 63-196037

Int. Cl.[5] A47H *5/06*

U.S. Cl. 160—331 **4 Claims**

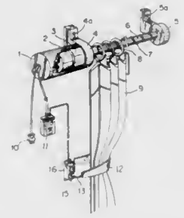
1. A curtain drawing device for a curtain providing either manual or automatic drawing of said curtain comprising:

an electric motor;

a curtain rod, which is rotatably mounted and connected to said electric motor so that said electric motor can drive said curtain rod rotatably;

an exteriorly-protruding longitudinally-extending spiral element attached to an outer circumference of said curtain rod, said spiral element encircling said curtain rod;

a plurality of rings, through which said curtain rod passes, each of said rings having a larger diameter than a diameter of said curtain rod including said spiral element, said curtain being attachable to said rings for suspension from said curtain rod, and



a tassel band and a solenoid-actuated tassel holder, which holds one end of said tassel band and which is structured to release said tassel band when said solenoid-actuated tassel holder receives an external electrical signal.

4,926,923

DEPOSITION OF METALLIC PRODUCTS USING RELATIVELY COLD SOLID PARTICLES

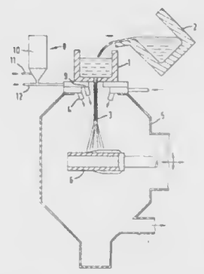
Reginald G. Brooks; Alan Leatham, and Jeffrey Coombs, all of Swansea, Wales, assignors to Osprey Metals Ltd., Wales

Filed Mar. 24, 1986, Ser. No. 842,943

Claims priority, application United Kingdom, Mar. 25, 1985, 8507647

Int. Cl.[5] B22D *23/00*

U.S. Cl. 164—5 **7 Claims**



1. A method of increasing the solidification rate of a coherent spray deposited product produced from metal or metal alloy and thereby refining its microstructure comprising the steps of

heating the metal or metal alloy above its liquidus temperature to form molten metal or metal alloy,

atmoizing a stream of the molten metal or metal alloy to form a spray of hot metal atomized droplets by subjecting the stream to relatively cold gas directed at the stream,

introducing relatively cold solid particles into the spray of the molten metal or metal alloy,

co-depositing the spray of solid particles and atomized droplets onto a collecting surface and,

maintaining the surface of the already deposited metal or metal alloy in a semi-solid/semi-liquid state into which the solid particles and atomized droplets are co-deposited, the application of relatively cold solid particles increasing the solidification rate of the semi-solid/semi-liquid surface and thereby generating a fine uniform grain size which bears no direct relationship to the size of the atomized droplets.

4,926,924

DEPOSITION METHOD INCLUDING RECYCLED SOLID PARTICLES

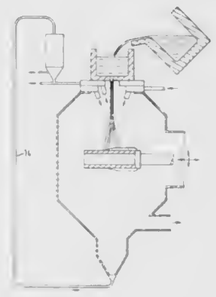
Reginald G. Brooks; Alan Leathman, both of Swansea, and Jeffrey Coombs, Neath, all of Wales, assignors to Osprey Metals Ltd., Wales, Wales

Continuation of Ser. No. 842,943, Mar. 24, 1986. This application Jun. 16, 1989, Ser. No. 367,029

Claims priority, application United Kingdom, Mar. 25, 1985, 8507647

Int. Cl.[5] B22D *23/00*

U.S. Cl. 164—5 **12 Claims**

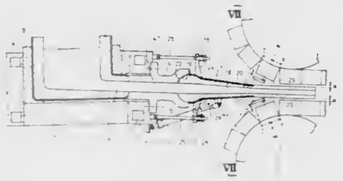


1. A method of spray depositing a coherent product from a metal or metal alloy comprising the steps of heating the metal or metal alloy above its liquidus temperature to form molten metal or metal alloy, atomizing a stream of the molten metal or metal alloy to form a spray of hot metal atomized droplets by subjecting the stream to gas which is at a temperature less than that of the molten metal or metal alloy directed at the stream, depositing the atomized droplets onto a collecting surface on which the coherent product is formed, collecting atomized droplets which are not deposited on the collecting surface as an overspray powder of solid particles, recycling said solid particles, introducing said solid particles into the stream or spray of the molten metal or metal alloy, and co-depositing the solid particles with the atomized droplets onto the collecting surface.

9. Apparatus for spray depositing a coherent spray deposit comprising a collecting surface, means for producing a stream of molten metal or metal alloy, means for atomizing the stream to produce a spray of molten metal or metal alloy particles directed at the collecting surface whereby a coherent spray deposit is formed on the collecting surface, means for introducing solid particles into the stream or spray, means for collecting non-deposited atomized droplets as an overspray powder of solid particles, and means for recycling the overspray to the introducing means whereby said overspray powder form a source of said solid particles.

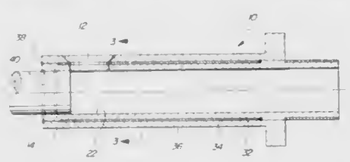
VOL
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4,926,925
POURING APPARATUS FOR MOVING-MOLD TYPE CONTINUOUS CASTING MACHINE
Shuzo Takahashi, Yokohama; Yutaka Tsuchida, Yokosuka; Shiro Osada, Yokohama; Nobuhisa Hasebe, Yokohama, and Masayuki Nakada, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of, Japan
Filed May 17, 1989, Ser. No. 352,862
Claims priority, application Japan, Jun. 8, 1988, 63-141350
Int. Cl.[5] B22D *11/06, 11/18*
U.S. Cl. 164—154 **1 Claim**



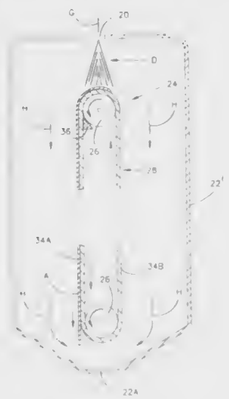
1. A pouring apparatus for a moving-mold type continuous casting machine comprising a tundish nozzle adapted to be tilted or inclined with respect to a melt output of a tundish, a hydraulic cylinder for tilting or inclining said tundish nozzle, position sensors disposed at an inlet of a mold cavity defined by upper and lower block molds each for detecting distance from a corresponding block mold passing past said inlet and a control device responsive to outputs from said position sensors for detecting deflection of a leading end of said tundish nozzle with respect to the upper and lower block molds, thereby outputting a drive signal to said hydraulic cylinder.

4,926,926
THREE LAYER SHOT SLEEVE ASSEMBLY
Kenneth P. Zecman, 46520 Strathmore, Plymouth, Mich. 48170
Filed Dec. 5, 1988, Ser. No. 279,924
Int. Cl.[5] B22D *17/10*
U.S. Cl. 164—312 **13 Claims**



1. A shot sleeve assembly for moving molten metal into a mold cavity, said assembly comprising:
an elongated shot sleeve having a bore extending axially therethrough from a first end to a second end adapted to be positioned adjacent the mold cavity;
a well opening extending through a side wall of said sleeve at a location adjacent said first end; and
an injection piston slidably mounted in said bore, wherein the shot sleeve includes:
an inner barrel extending the length thereof;
an intermediate layer of high thermal conductivity material disposed around, secured to and covering substantially the entire outer surface of the inner barrel commencing at a point medial of the first end and the well and terminating at a point proximate and spaced from the second end to form a two-layer assembly; and
a high yield strength outer shell enclosing under compression said two-layer assembly, extending beyond the terminal ends of said twolayer assembly and being secured to the inner barrel to envelop and trap said intermediate layer, said outer shell having a mass and a yield strength substantially greater than that of said inner barrel.

4,926,927
VERTICAL SUBSTRATE ORIENTATION FOR GAS-ATOMIZING SPRAY-DEPOSITION APPARATUS
Gary W. Watson, Cheshire; Cheskis Harvey P., North Haven, and Ashok Sankaranarayanan, Bethany, all of Conn., assignors to Olin Corporation, New Haven, Conn.
Filed Sep. 20, 1988, Ser. No. 246,704
Int. Cl.[5] B22D *23/00, 11/06;* **C23C** *4/12*
U.S. Cl. 164—429 **7 Claims**



1. In a molten metal gas-atomizing spray-depositing apparatus, the combination comprising:
(a) means employing a pressurized gas flow for atomizing a stream of molten metal into a spray pattern of metal particles and producing a flow of said particles in said pattern thereof along with the gas flow in a generally downward direction; and
(b) means movable continuously along an endless path and having an area thereon disposed below said atomizing means for receiving a deposit of said particles flowing in said spray pattern to form a product thereon, said endless path of said movable means being generally elongated in the downward direction and thus extending parallel to the general downward direction of gas flow such that any particle overspray past said deposit-receiving area is carried by the gas flow downward past said movable means, substantially avoiding entrainment of the particle overspray in the product being formed thereon.

4,926,928
PROTECTIVE DEVICE OF RESTRAINING ROD PRODUCED IN CONTINUOUS CASTING AND ROLLING PROCESS
James H. Leckie, Huntington, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.
Filed Jul. 29, 1985, Ser. No. 760,202
Int. Cl.[5] B22D *11/12*
U.S. Cl. 164—452 **5 Claims**

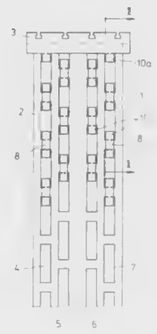
1. A method of manufacturing rod by continuously casting a molten metal on a continuous casting apparatus to form a continuous bar, the bar is rolled through a series of rolling mill stands to form rod, the rod is passed through an eddy current detector to detect flaws, and then coiled, characterized by:
sensing a break in said bar or rod, and
activating a protective device between said mill stands and said eddy current detector to prevent any projections formed on the rod by the break in said bar or rod from damaging said eddy current detector.

3. A continuous casting apparatus for producing a continuous rod having a plurality of mill stands for forming said continuous rod and an eddy current detector disposed downstream of said mill stands to detect surface flaws in said continuous rod characterized by:



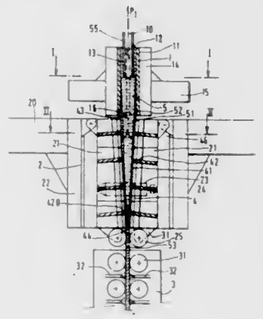
means for detecting a break in said continuous rod, and
means for protecting said eddy current detector disposed between said mill stands and said eddy current detector and activated by said detecting means upon a break in said rod to prevent any projections formed on the rod due to said break from damaging said eddy current detector.

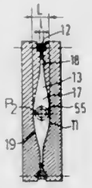
4,926,929
DUMMY BAR FOR CONTINUOUS CASTING MACHINES
Hans Streubel, Erkrath, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed Aug. 8, 1989, Ser. No. 390,724
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827582
Int. Cl.[5] B22D *11/08*
U.S. Cl. 164—445 **13 Claims**



1. A dummy bar for continuous casting machines having an at least partially arc-shaped strand guide comprising:
a dummy bar head;
a flexible sheet fastened to said dummy bar head and having rows of contact elements extending longitudinally therealong;
the contact elements being fastened along a portion of their length to said sheet, each of said contact elements in one of said rows having projections which overlap projections of contact elements disposed in others of said rows in a direction longitudinal of said sheet; and
recesses disposed along said rows of said flexible sheet, said overlapping projections of each of said contact elements extending into associated ones of said recesses.

4,926,930
PROCESS AND MACHINE FOR THE CONTINUOUS CASTING OF A THIN METAL PRODUCT
Pierre Gay, L'Etrat, and Robert Vatant, Saint-Chamond, both of France, assignors to Clecim, Courbevoie Cedex, France
Continuation of Ser. No. 31,472, Feb. 25, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 274,554
Claims priority, application France, Jun. 25, 1985, 85 09661
Int. Cl.[5] B22D *11/00*
U.S. Cl. 164—476 **13 Claims**

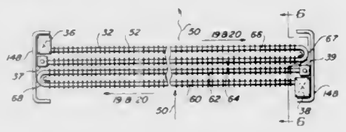




1. A process for the continuous casting of thin metal products, comprising the steps of
(a) pouring molten metal into an openended mold (1) having two wide walls (11) and two narrow walls (12) which are cooled, to form a flat product (5) which consists of a liquid core (51) surrounded by a solidified skin (52);
(b) discharging said flat product through exit orifices (16) of the mold (1) and subsequently passing said product into a secondary cooling device (2, 3) equipped with means (4) for cooling and retaining at least the large faces of the product until complete solidification;
(c) providing the wide walls (11) of the mold in a curved shape so that the cast product has a widened central part (55) narrowing in the form of a spindle to edges having a thickness equal to that of the thin product to be cast; flattening the central part (55) of the product (5) progressively to a thickness equal to that of the edges in a reducing stand (2) located immediately downstream of the exit orifice of the mold (1) and comprising two surfaces for respectively guiding and straightening the two large faces of the product, the profile of which is determined as a function of the casting speed, so as to exert a pressure uniformly distributed over the entire surface thereby causing and controlling, on each of the large faces, the symmetrical movements of two straightening zones from the edge towards the axis at a speed the respectively axial and radial components of which are substantially constant and synchronized with the casting speed, in order to carry out continuous straightening of the wide walls of the product, up to complete solidification.

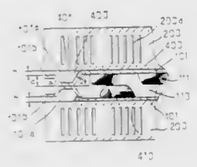
VOL
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ISS
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1990
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4,926,931
FREEZE PROTECTED, AIR-COOLED VACUUM STEAM CONDENSERS
Michael W. Larinoff, 370 Holly Hill Rd., Oldsmar, Fla. 34677
Continuation of Ser. No. 270,656, Nov. 14, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 409,952
Int. Cl.[5] F28B *1/06, 9/10*
U.S. Cl. 165—111 7 Claims



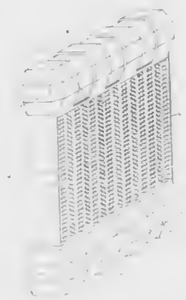
4. For use in condensing steam, input header means, output header means, a plurality of sets of tubes each in a U-shaped configuration and together forming a bundle, each tube having an input length terminating at an input end and an output length terminating at an output end and with a bight therebetween, each tube coupling a front header means with a rear header means and with the output ends of the tubes being positioned between the input lengths of each pair for the thermal protection thereof.

4,926,932
PLATE TYPE HEAT EXCHANGER
Toshio Ohara, Kariya, and Yoshiyuki Yamauchi, Chita, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Jul. 15, 1988, Ser. No. 219,266
Claims priority, application Japan, Aug. 9, 1987, 62-199490
Int. Cl.[5] F28B *1/06, 9/08*
U.S. Cl. 165—111 6 Claims



1. A plate type heat exchanger comprising:
a plurality of tube units for forming a tank portion to which fluid is introduced and a tube portion through which passes fluid introduced into said tank portion; and
a corrugated fin having bent portions and straight portions for promoting heat exchange between the fluid within said tube portion and air passing through said corrugated fin,
said bent portions being connected at an outer surface of each of said tube units at said tube portion thereof and each of said straight portions extending from one of said bent portions to an adjacent bent portion;
each of said tube units being formed by a pair of plates each having a connecting portion at which said pair of plates are connected to each other continuously around an outer periphery of said plates;
the connecting portion at least one of said pair of plates being transversely spaced a predetermined amount from its adjacent corrugated fin which extends outwardly beyond said connecting portion; and
said one plate having at an outer side of its said connecting portion an elongated portion angling outward from its said connecting portion toward said corrugated fin and forming therewith a predetermined gap which is smaller than said predetermined amount and further forming with its said connecting portion and its said corrugated fin a draining space for draining water condensed on the outer surface of the tube unit and the corrugated fin.

4,926,933
METHOD AND APPARATUS RELATING TO HEAT EXCHANGERS
James Gray, 10 Grange Park Avenue, Raumati South, New Zealand
Filed Nov. 16, 1987, Ser. No. 120,986
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—173 1 Claim

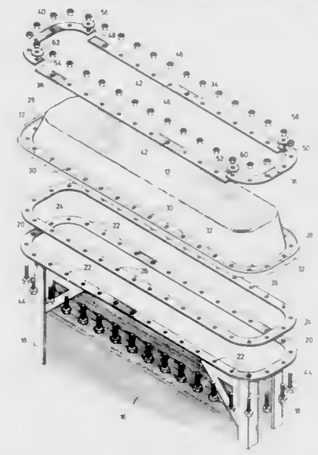


1. A heat exchange unit having a plurality of tube members for the passage of fluid therethrough, characterized in that each tube member is formed by an extrusion process from a heat resistant substantially rigid setting plastic material so as to have a wall part with an uninterrupted smooth cylindrical bore and a solid thin helical external fin formed integrally with the tube wall part and extending along at least a major part of its length, said plurality of extruded plastic tube members are disposed in spaced substantially parallel relationship and are joined at one end to a first plastic manifold member and at their opposite ends to a second plastic manifold member in providing communication between the two manifold members for the passage of fluid therebetween, and at least some of said extruded plastic tube members have their helical fins oppositely wound relative to the other of said tube members, and said tube members with the oppositely wound fins are located in staggered relationship relative to said other tube members to provide a counter baffling effect on fluid passed externally over said tube members.

4,926,934
RADIATOR TANK PLATES
Eugene S. Ivy, 2247 Carrolton Dr., Southaven, Miss. 38671
Filed May 22, 1989, Ser. No. 355,271
Int. Cl.[5] F28F *9/02;* B65D *6/36*
U.S. Cl. 165—173 3 Claims

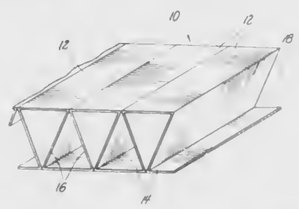
1. Apparatus for use with a radiator tank having a surface with a plurality of spaced bolt holes therein whereby said tank may be bolted to a radiator core, said apparatus comprising:
Four (4) plates, each having two ends, shaped to be superposable on said surface and having a plurality of bolt holes therein congruent with said bolt holes in said surface, whereby

said tank and said plates may be bolted to said core in superposed position such that ends of adjacent plates abut; and



Four (4) washers positioned at bolt holes nearest where the ends of said plates abut whereby said washers overlap the edges of adjacent plates to maintain said plates coplanar.

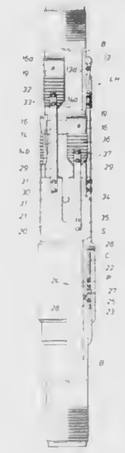
4,926,935
COMPRESSED FIN HEAT SINK
Frederick W. Haushalter, Kenton, Ohio, assignor to Robinson Fin Machines, Inc., Kenton, Ohio
Filed Mar. 6, 1989, Ser. No. 319,348
Int. Cl.[5] F28F *7/00;* H01L *23/36*
U.S. Cl. 165—185 2 Claims



2. A method for creating a heat sink from a length of fin, the method comprising:
generating a continuous corrugated piece of fin from a flat sheet of a metal, the fin including top and bottom connecting surfaces for connecting interposing lines of fin;
compressing the fin to form continuous top and bottom flat surfaces; and
bonding the compressed corrugated top and bottom connecting surfaces of the fin to generate permanent continuous top and bottom flat surfaces, whereby components may be directly mounted on the flat surface without the need for an intervening base plate.

4,926,936
MULTIPLE PURPOSE LINER HANGER CONSTRUCTION
Britt O. Braddick, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.
Filed Jul. 20, 1989, Ser. No. 382,195
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—217 29 Claims

1. In a liner hanger which may be actuated hydraulically or mechanically for supporting a liner lowered on an operating string to position in a tubular member in a well bore including:
a longitudinally extending tubular body;
upper and lower longitudinally spaced annular rings on said body;
upper and lower cone segments for removably fitting on said upper and lower rings;
said upper and lower cone segments having longitudinally extending edges;
surface means on each of said upper and lower rings to enable said upper and lower cone segments to be removably positioned thereon;



additional surface means on each of said upper and lower rings;
surface means on each said upper and lower cone segments engageable with said surface means and additional surface means on said upper and lower rings to removably retain said upper and lower cone segments on each of said upper and lower rings, respectively; and
means to removably secure said upper and lower cone segments in predetermined positions on each of said upper and lower rings, respectively.

4,926,937
COMPOUND LINKAGE-ARM ASSEMBLY FOR USE IN BORE-HOLE TOOLS
Jim P. Hademenos, Friendswood, Tex., assignor to Western Atlas International, Inc., Houston, Tex.
Filed Jun. 8, 1989, Ser. No. 363,584
Int. Cl.[5] E21B *23/00, 47/00*
U.S. Cl. 166—206 7 Claims

1. An apparatus for urging a device against a wall of a container, comprising in combination:
(a) a drive means within the device;
(b) an arm pivotably coupled at one end to the device, the arm adapted to rest adjacent the device and to swing out from the device in an arc to engage the wall of the container;
(c) first means interconnecting the arm and the drive means for extending and retracting the arm along the arc with respect to the device upon actuation of the drive means; and

VOL
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(d) second means pivotally coupled to the arm and to the first means for exerting an initial lateral force upon the





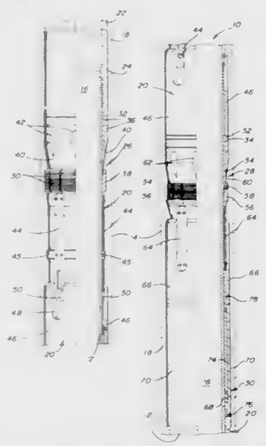
arm with actuation of the drive means, thereby extending and retracting the arm with respect to the device.

4,926,938

ROTATABLE LINER HANGER WITH MULTIPLE BEARINGS AND CONES

Hiram E. Lindsey, Jr., Midland, Tex., assignor to Lindsey Completion Systems, Inc., Midland, Tex.

Filed May 12, 1989, Ser. No. 351,734
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—208 14 Claims



1. A rotatable liner hanger and casing liner assembly for securing the casing liner within a well bore comprising:

an upper slip assembly mounted to the casing liner, said upper slip assembly including a plurality of slip elements and a slip cone;

an upper bearing assembly mounted to the casing liner adjacent said upper slip assembly for rotation of the casing liner relative to said upper slip assembly;

a lower slip assembly mounted to the casing liner, said lower slip assembly including a plurality of slip elements and a slip cone;

a lower bearing assembly axially slidably mounted to the casing liner adjacent said lower slip assembly for rotation of said lower slip assembly relative to said upper slip assembly and rotation of the casing liner relative to said lower slip assembly; and

fluid pressure responsive means mounted to the casing liner for effecting longitudinal movement of said lower slip assembly, said lower bearing assembly and said slip elements of said upper slip assembly to set said upper slip assembly and said slip elements of said lower slip assembly to secure the casing liner within the well bore.

4,926,939

HYDRAULICALLY ACTUATED LINER HANGER

J. Lindley Baugh, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 325,235, Mar. 16, 1989, abandoned.
This application Nov. 3, 1989, Ser. No. 431,302
Int. Cl.[5] E21B *23/04*
U.S. Cl. 166—208 9 Claims

1. A liner hanger for a cased subterranean well comprising:

an elongated tubular body having a small diameter fluid passage in the wall thereof extending from a bore opening below the upper end of said tubular body to an opening in the exterior of the tubular body above the bottom end of said tubular body;

a running tool detachably secured to the upper end of said tubular body;

means in said running tool for pressurizing fluid in said fluid passage;

ramp means secured to the exterior of said tubular body adjacent said lower end of said tubular body;

a sleeve piston surrounding said lower end of said tubular body and defining an annular chamber communicating with said exterior opening of said fluid passage;

said small diameter fluid passage and said annular chamber being fillable at the well surface with a clean fluid;

seal means for applying a force derived from said pressured clean fluid to said sleeve piston to move said sleeve piston axially relative to said ramp means; and

a plurality of peripherally spaced slips operably connected to said sleeve piston and movable thereby into engagement with said ramp means.

7. The method of hydraulically setting a liner hanger in a well casing, said liner hanger comprising an elongated tubular body having ramp means on its exterior, a piston sleeve surrounding its lower portion, and peripherally spaced slips axially movable by said piston sleeve into operable engagement with said ramp means to expand into biting engagement with the well casing, comprising the steps of:

providing a small diameter fluid passage in the wall of said tubular body extending from a bore opening below the upper end of said tubular body to an exterior opening in said tubular body above the bottom end of said tubular body;

providing seal means intermediate the bore of said sleeve piston and the adjacent exterior surface of said tubular body to define an annular fluid pressure chamber communicating with said bottom exterior opening of said small diameter fluid passage;

filling said small diameter fluid passage and said annular

pressure chamber at the well surface with a clean fluid; and



applying pressure to the clean fluid in upper end of said small diameter fluid passage by an isolating piston to produce axial movement of said sleeve piston to set said slips.

4,926,940

METHOD FOR MONITORING THE HYDRAULIC FRACTURING OF A SUBSURFACE FORMATION

David C. Stromswold, Addison, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,308
Int. Cl.[5] E21B *43/267, 49/00*
U.S. Cl. 166—247 12 Claims

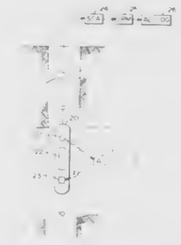
1. A method for monitoring the hydraulic fracturing of a subsurface formation of interest, comprising the steps of:

(a) logging a subsurface formation through a measurement of delayed gamma rays from the neutron activation of a characteristic element of said formation,

(b) injecting a fracturing fluid into said formation to hydraulically create a fracture within said formation,

(c) injecting a proppant into said fracture containing said element which emits delayed gamma rays in response to neutron activation,

(d) logging said proppant containing said fractured formation through a measurement of delayed gamma rays from the neutron activation of said proppant containing fractured formation, and



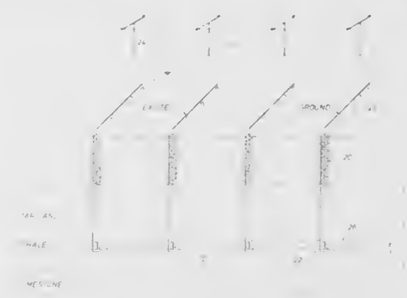
(e) identifying the extent of proppant deposition within said fractured formation from the difference in the delayed gamma ray measurements of said formation before and after said proppant injection.

4,926,941

METHOD OF PRODUCING TAR SAND DEPOSITS CONTAINING CONDUCTIVE LAYERS

Carlos A. Glandt; Harold J. Vinegar, and Michael Prats, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 10, 1989, Ser. No. 419,172
Int. Cl.[5] E21B *43/24*
U.S. Cl. 166—248 9 Claims



1. A process for recovering hydrocarbons from a hydrocarbon-bearing deposit, comprising:

selecting a hydrocarbon-bearing deposit which contains a thin conductive layer within the deposit;

installing electrodes spanning the thin conductive layer;

electrically heating the thin conductive layer to form a thin preheated zone immediately adjacent to the thin conductive layer;

providing wells for hot fluid injection into the deposit and hydrocarbon production from the deposit;

injecting a hot fluid into the deposit adjacent to the thin conductive layer and within the thin preheated zone to displace the hydrocarbons to the production wells; and

recovering hydrocarbons from the production wells.

9. A process for increasing the injectivity of a hydrocarbon-bearing deposit, comprising:

selecting a hydrocarbon-bearing deposit which contains a thin conductive layer within the deposit;

installing electrodes spanning the thin conductive layer;

electrically heating the thin conductive layer to form a thin preheated zone immediately adjacent to the thin conductive layer;

VOL
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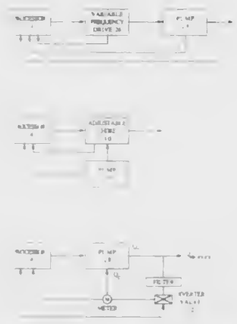
heating the thin preheated zone by thermal conduction to a temperature sufficient to allow injection of fluids into the thin preheated zone.

4,926,942

METHOD FOR REDUCING SAND PRODUCTION IN SUBMERSIBLE-PUMP WELLS

William P. Profrock, Jr., 5122 Lawn Arbor, Houston, Tex. 77066

Filed Feb. 22, 1989, Ser. No. 313,716
Int. Cl.[5] E21B *43/12*
U.S. Cl. 166—250 4 Claims



1. A method of inhibiting the production of sand and other macroscopic particles in a well system producing fluid from a formation through a submersible pump, comprising the repeated performance of the following steps:
(a) measuring the rate of fluid production over a set time interval;
(b) estimating fluid pressure in the region of the formation from the rate of fluid production and fixed physical measurements of the submersible pump and well system;
(c) regulating the rate of fluid production from the formation in response to the estimated fluid pressure in the region of the formation according to a predetermined profile of fluid production versus time, thereby maintaining the rate of change of fluid pressure in the region of the formation below a predetermined limit.

4,926,943

PHENOLIC AND NAPHTHOLIC ESTER CROSSLINKED POLYMERIC GELS FOR PERMEABILITY PROFILE CONTROL

Dennis H. Hoskin, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 10, 1989, Ser. No. 322,337
Int. Cl.[5] E21B *33/138, 43/22, 43/24*
U.S. Cl. 166—270 15 Claims

1. A process for recovering oil from a subterranean oil-bearing formation having relatively high permeability zones and relatively low permeability zones penentrated by at least one injection well and at least one production well comprising the steps of:
(a) injecting into the relatively high permeability zones of the formation an aqueous gel-forming solution comprising water, a vicosifying amount of a water-dispersible polymer; and a crosslinking agent in an amount effective to cause gelation of the aqueous solution of said water-dispersible polymer, said crosslinking agent comprising a mixture of an aldehyde and a member selected from the group consisting of phenolic esters, naphtholic esters, halogenated phenolic esters and halogenated naphtholic esters, whereby upon gelation of the solution the zones of relatively high permeabilty of the formation are selectively plugged;
(b) injecting a flooding fluid into the formation via the injection well; and
(c) recovering fluids including oil from the formation via the production well.

4,926,944

LIGNIN-BASED CEMENT FLUID LOSS CONTROL ADDITIVE

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 17, 1989, Ser. No. 297,653
Int. Cl.[5] C04B *7/02*; E21B *33/14*
U.S. Cl. 166—293 8 Claims

1. A hydraulic cement slurry composition which comprises:
(a) a hydraulic cement, and the following expressed as parts by weight per 100 parts of said hydraulic cement,
(b) water from about 25 to 105 parts, and
(c) from about 0.5 to 2.5 parts of a compound selected from the group consisting of a sulfonated lignin and a sulfomethylated lignin, wherein said lignin has been sequentially crosslinked by reacting said lignin with a member of the group consisting of formaldehyde and epichlorohydrin and alkoxylated with between about 2 to about 6 moles of a compound selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide and a combination thereof per 1000 g of said lignin.

5. A method of cementing a zone in a well penetrating a subterranean formation comprising injecting down the well and positioning in the zone to be cemented a hydraulic aqueous cement slurry composition comprising
(a) a hydraulic cement, and the following expressed as parts by weight per 100 parts of said hydraulic cement,
(b) water from about 25 to 105 parts, and
(c) a fluid loss additive comprising from about 0.5 to 2.5 parts of a compound selected from the group consisting of a sulfonated lignin and a sulfomethylated lignin, wherein said lignin has been sequentially crosslinked by reacting said lignin with a member of the group consisting of formaldehyde and epichlorohydrin and alkoxylated with between about 2 to about 6 moles of a compound selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide or a combination thereof per 1000 g of said lignin, and allowing the cement thus positioned to set to a monolithic mass.

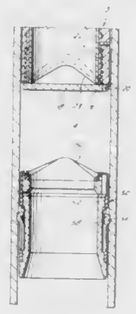
4,926,945

SUBSURFACE WELL SAFETY VALVE WITH CURVED FLAPPER AND METHOD OF MAKING

Ronald E. Pringle, Houston, and Arthur J. Morris, Magnolia, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Sep. 7, 1989, Ser. No. 404,241
Int. Cl.[5] E21B *34/06*
U.S. Cl. 166—321 7 Claims

1. A subsurface well safety valve for controlling the fluid flow through a well conduit comprising,
a housing having an axial bore therethrough,
a valve seat positioned in the housing,
a valve closure member movable between open and closed positions relative to the valve seat, said valve closure member being a sector of a cylinder having a concave surface which forms a sealing surface,
said valve seat having a seating surface contoured to coact with the sealing surface,
a flow tube telescopically movable in the housing for controlling the movement of the valve closure member, the lower end of the flow tube having a surface contoured to coact with the concave sealing surface and being substantially equal to the contour of the concave sealing surface, and



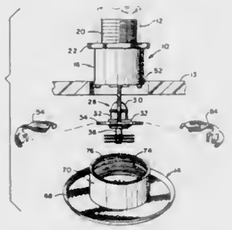
hydraulic piston and cylinder means in the housing actuating the flow tube.

4,926,946

PENDENT STYLE SPRINKLER WITH COVER

George S. Polan, Harleysville, Pa., assignor to Central Sprinkler Corporation, Landsale, Pa.

Filed Nov. 8, 1988, Ser. No. 268,911
Int. Cl.[5] A62C *37/08, 37/10, 33/00, 39/00*
U.S. Cl. 169—37 20 Claims



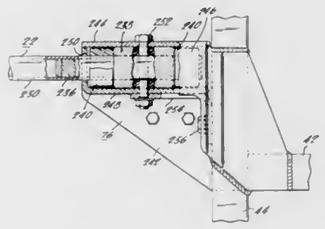
9. Pendent style sprinkler comprising:
a sprinkler body portion including an outlet side for discharging a fire quenching fluid;
a plug valve movable with respect to said sprinkler body portion for opening said sprinkler when said sprinkler is heated, a portion of said plug valve extending from said outlet side of said sprinkler body portion when said sprinkler is closed;
a clip wedged between said sprinkler body portion and said portion of said plug valve so as to separate from said sprinkler body portion and said plug valve portion when said plug valve moves to open said sprinkler; and
a cover having a central portion contacting a peripheral edge portion of said clip such that said cover is suspended from said peripheral edge portion of said clip.

4,926,947

TURF AERATING APPARATUS WITH RESILIENT HANDLE MOUNT

Mark L. Cozine, 5301 S. Coddington Ave., Lincoln, Nebr. 68523; David G. Ferguson, 3035 Cable Ave., Lincoln, Nebr. 68502; Loren F. Hansen, 1629 N. 73rd St., Lincoln, Nebr. 68505, and Mark E. Lamb, 6510 S. 41st St., Lincoln, Nebr. 68516

Division of Ser. No. 120,948, Nov. 16, 1987, Pat. No. 4,867,244.
This application Aug. 16, 1989, Ser. No. 365,525
Int. Cl.[5] A01B *45/02*
U.S. Cl. 172—22 3 Claims



1. Turf aerating apparatus comprising a frame, means supporting said frame for rolling movement across a turf area, means for driving said supporting means to move said frame across the turf, an aerator mechanism mounted on said frame comprising at least one pair of substantially vertical tine arms, each said tine arm having at least one downwardly directed turf coring tine disposed on the lower end thereof, said aerator mechanism including tine arm actuating means connected to the upper end of each said tine arm for imparting an alternating recipricatory motion to said tine arms to drive said tines into the turf, a handle extending rearwardly from said frame having at least one rearwardly extending handle element connected with said frame, vibration damping means connecting said handle to said frame, said latter means comprising a receiver on said frame for receiving one end of said handle element, a resilient sleeve surrounding said end of said handle element and engaged with the inner walls of said receiver, and pivot means extending horizontally through said receiver and said handle element end to permit pivotal movement of said handle element in a vertical plane against the resilient resistance of said sleeve.

4,926,948

METHOD AND APPARATUS FOR CONTROLLING MOTORGRADER CROSS SLOPE CUT

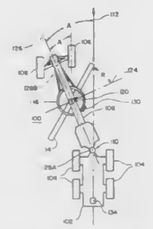
James B. Davidson, New Carlisle; Peter N. Kaz, Medway; Michael H. Kidwell, and Mark E. Zachman, both of Huber Heights, all of Ohio, assignors to Spectra Physics, Inc., San Jose, Calif.

Filed Jun. 28, 1989, Ser. No. 372,909
Int. Cl.[5] E02F *3/84*
U.S. Cl. 172—4.5 8 Claims

1. In a motorgrader having a two-part articulated frame defined by a rear drive unit including rear drive wheels and a front steering unit which can be rotated relative to the drive unit and including front steering wheels, and a blade supported upon the steering unit, the blade being rotatable about a generally vertical axis and being mounted for adjustment of the elevations of the ends of the blade to define a blade slope angle relative to horizontal, apparatus for controlling the cross slope angle of a surface being worked by the motorgrader comprising:
input means for selecting a desired cross slope angle;
first angle sensor means for sensing the angle of rotation of the blade relative to the steering unit;
second angle sensor means for sensing the angle of rotation of said steering unit relative to the drive unit;

VOL
1114
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first slope sensor means for sensing the blade slope angle of said blade relative to horizontal;
second slope sensor means for sensing the direction of travel slope angle of said motorgrader; and



cross slope control means connected to said input means, to said first and second angle sensor means, and to said first and second slope sensor means for controlling said blade slope angle to maintain said desired cross slope when said motorgrader is operated in a crabbed steering position.

4,926,949

THERMAL SHIELD FOR DRILLING MOTORS

John Forrest, Houston, Tex., assignor to Drilex Systems, Inc., Houston, Tex.

Filed Dec. 7, 1988, Ser. No. 281,153
Int. Cl.[5] E21B *4/02*
U.S. Cl. 175—17 **31 Claims**



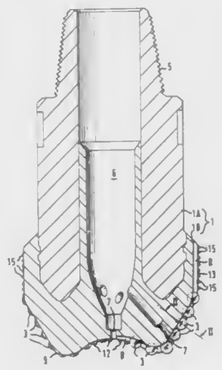
1. A drilling assembly to be run into a well hole using a drill string, drilling fluid being supplied to said drilling assembly through the drill string, said drilling assembly comprising:
a housing assembly connected to said drill string; and
a fluid operated drilling motor operatively connected to a drilling tool, said drilling motor having a motor housing disposed within said housing assembly;
said housing assembly including baffled fluid passage means surrounding said motor housing for circulating drilling fluid through said housing assembly to maintain the operating temperature of said drilling motor, said housing assembly including at least one inner fluid port to provide fluid communication between the interior of said housing assembly in fluid communication with the motor housing and one end of said fluid passage means and at least one outer fluid port to provide fluid communication between the other end of said fluid passage means and the exterior of said housing assembly, drilling fluid circulating through said at least one inner fluid port, through said circuitous fluid passage means and through said at least one outer fluid port to maintain the operating temperatures.

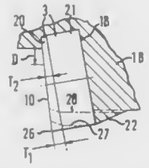
4,926,950

METHOD FOR MONITORING THE WEAR OF A ROTARY TYPE DRILL BIT

Djurre H. Zijsling, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 26,609, Mar. 17, 1987. This application Dec. 20, 1988, Ser. No. 287,640
Claims priority, application United Kingdom, Mar. 27, 1986, 8607700
Int. Cl.[5] E21B *3/00, 12/02*
U.S. Cl. 175—39 **2 Claims**





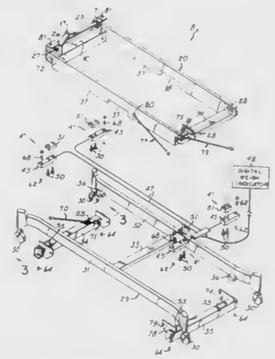
1. A method of monitoring the wear of a rotary type drill bit for deephole drilling subsurface earth formations, comprising:
providing a plurality of cutting elements protruding from a bit body coupled to the lower end of the drill string wherein at least some of the cutting elements are provided with a front layer of interbonded abrasive particles having a thickness which varies substantially with distance from the bit body; and
measuring the ratio of torque on bit to weight on bit during drilling as an indication of the thickness of the front layer of abrasive particles presented at the wearing edge of the cutting elements thereby providing an indication of the progress of bit wear.

4,926,951

WEIGH BED

Walter L. Carruth, Cordova; Warren P. Jones, Memphis, both of Tenn., and Richard B. Stacy, Charleston, S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

Filed Jun. 26, 1989, Ser. No. 371,611
Int. Cl.[5] G01G *19/52, 3/08, 21/24*
U.S. Cl. 177—144 **9 Claims**



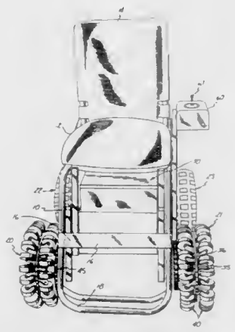
1. A scale comprising:
a base,
a weigh frame mounted above said base,
four laterally and longitudinally spaced load cell beams fixed at one end to said weigh frame,
a ball supporting each said beam for rolling movement on said base,
and means limiting movement of said weigh frame with respect to said base in three axes.

4,926,952

FOUR-WHEEL DRIVE WHEELCHAIR WITH COMPOUND WHEELS

Jeffrey Farnam, 3035 Humboldt Ave. S., Minneapolis, Minn. 55408

Continuation of Ser. No. 204,509, Jun. 9, 1988, Pat. No. 4,823,900. This application Mar. 30, 1989, Ser. No. 331,596
Int. Cl.[5] A61G *5/04;* **B62D** *11/04*
U.S. Cl. 180—6.5 **5 Claims**



1. A four-wheel drive vehicle comprising:
a frame;
a pair of non-compound rear wheels mounted near the rear end and on opposite sides of said frame for supporting the rear end thereof, each of said rear wheels mounted for rotation in a fixed plane parallel to the side of said frame;
a pair of front compound wheels mounted near the front end and on opposite sides of said frame for supporting the front end thereof, each of said wheels mounted for rotation in a fixed plane parallel to the side of said frame and providing a substantially continuous traction-providing surface with respect to wheel rotation in said plane and supporting the front end of said vehicle to roll substantially freely transverse to said plane from side to side, the tread of each of said rear wheels providing flotation for each of said rear wheels on outdoor terrain and further wherein the tread of each of said front compound wheels provides flotation which is substantially equal to the flotation of said treads on said front wheels, whereby said front and rear wheels provides substantially the same flotation for said vehicle on outdoor terrain;
differential steering means including first means for connecting the front and rear wheels on one side of said frame to turn in unison, second means for connecting the front and rear wheels on the other side of said frame to turn in unison and motorized drive means including one or more electrical motors and control circuits for applying forward or rearward drive power to each set of connected wheels so that said vehicle may be steered differentially, said motorized drive means further including rechargeable batteries for supplying drive power thereto;
whereby the front wheels play an active role in the driving, steering and braking of the vehicle, so that powered four-wheel drive and four-wheel differential steering is provided, said front compound wheels permitting the vehicle to be turned with substantially less power than that which is required to turn a skid steer four-wheel drive vehicle.

4,926,953

BATTERY HOLD-DOWN STRUCTURE

Richard B. Platt, 381 Country Club La., Detroit, Mich. 48236

Filed Dec. 24, 1984, Ser. No. 685,769
Int. Cl.[5] B60R *18/02*
U.S. Cl. 180—68.5 **19 Claims**



1. In combination with a battery for a vehicle, a battery tray in which the battery is positioned, a battery strap having openings in the ends thereof positioned over the top of the battery and battery hold-down structure on opposite sides of the battery, each battery hold-down structure including an elongated bolt having a length slightly less than the height of the battery which bolt is threaded over at least one-fourth of its length from one end toward the other end thereof and which bolt includes means at the other end thereof for securing the other

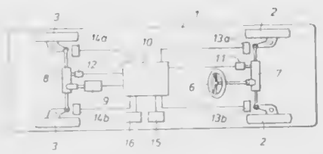
end of the bolt to the battery tray and an elongated nut having a length approximately one half as long as the elongated bolt including a smaller diameter portion extending through an opening in an associated end of the battery strap having an internally threaded axially extending recess therein for receiving the one end of the bolt and a larger diameter end providing an annular abutment between the smaller diameter and larger diameter ends for clamping the battery strap to the top of the battery with the nut extending through the opening in the associated end of the battery strap for approximately one-fourth of the height of the battery from the top toward the bottom of the battery and engaged with the one end of the bolt and with the other end of the bolt secured to the tray, and radially extending wings on the larger diameter portion of the nut having a dimension to permit grasping of the wings in the palm of the hand to facilitate threading the nut on or off of the bolt with the battery tray, battery strap and battery hold-down structure in assembly.

4,926,954

FRONT AND REAR WHEEL STEERING VEHICLE WITH A MINIMIZED MANEUVERING AREA

Hiroshi Ataka, and Yoshinui Furukawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,966
Claims priority, application Japan, Sep. 16, 1987, 62-231474; Aug. 26, 1988, 63-212260
Int. Cl.[5] B62D *5/06*
U.S. Cl. 180—140 **18 Claims**



1. A front and rear wheel steering vehicle, comprising:
manual steering means for manually steering a front wheel;
means for detecting a steering angle of said front wheel;
memory means for storing said steering angle of said front wheel detected by said detecting means; and
powered steering means for steering a rear wheel to a steering angle which coincides, in a spatially fixed absolute coordinate system, with the steering angle of said front wheel stored in the memory means when said front wheel was located at a location which is a current location of said rear wheel.

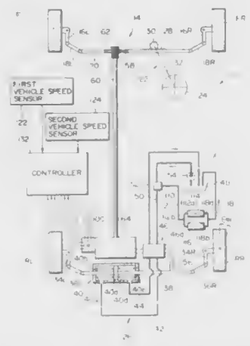
4,926,955

REAR WHEEL STEERING APPARATUS FOR AUTOMOBILE

Hiroshi Ohmura, Higashihiroshima, and Takashi Nakashima, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 18, 1988, Ser. No. 273,087
Claims priority, application Japan, Nov. 20, 1987, 62-293288
Int. Cl.[5] B62D *6/00, 7/14*
U.S. Cl. 180—140 **24 Claims**

1. A rear wheel steering apparatus for an automobile having brake means for braking to wheels, which detects a vehicle speed by vehicle speed detection means and turns rear wheels at a rear wheel turning angle ratio according to the detected vehicle speed upon turning of front wheels, comprising:
discrimination means for discriminating a travel state, including a normal travel state wherein slippage of the wheels has not substantially occurred and a lock state of the wheels wherein the detected vehicle speed is lowered from a predetermined value to substantially zero during actuation of said brake means;
first setting means for, when said discrimination means determines the normal travel state, setting the rear wheel turning angle ratio in accordance with a first characteristic according to the detected vehicle speed; and



second setting means for, when said discrimination means determines a lock state of the wheels, setting the rear wheel turning angle ratio in accordance with a second characteristic for stabilization.

4,926,956

ELECTRONICALLY CONTROLLED STEERING SYSTEM

James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 115,083, Oct. 30, 1987, Pat. No. 4,828,067. This application Dec. 30, 1988, Ser. No. 292,090
Int. Cl.[5] B62D *5/08*
U.S. Cl. 180—142 **3 Claims**

1. A power steering gear system for controlling the dirigible wheels of a vehicle comprising:
a constant flow fluid pressure pump;
a gear mechanism having a torque input member adapted to receive driver steering torque and a torque output member adapted to be connected to the dirigible wheels and a fluid motor having a pressure movable member for augmenting steering torque;
a steering valve assembly having primary and secondary valve portions with registering valve lands that define variable fluid flow areas, and primary valve lands controlling pressure distribution to opposite sides of said pressure movable member to provide a pressure steering assist;
a high pressure passage connecting the flow inlet side of said primary valve portion with the high pressure side of said pump and a low pressure passage connecting the flow

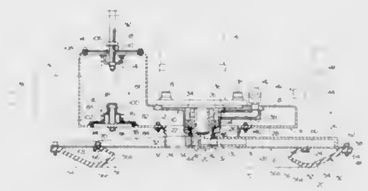
outlet side of said primary valve portion with the low pressure side of said pump;
a steering assist control solenoid valve means communicating with said high pressure passage and said low pressure passage for establishing a bypass flow between said high pressure passage and said low pressure passage;
a steering torque pressure passage extending from said high pressure passage to the inlet side of said secondary valve portion;
a steering torque sensor flow control valve means disposed in and forming a part of said steering torque pressure passage for establishing a constant flow to said secondary valve portion;
an electronic processor unit including a data input portion, an output driver portion and a memory portion, said driver portion being connected to said solenoid valve, said memory portion having stored therein desired functional relationships between steering torque and steering pressure for various vehicle speeds; and
a steering torque pressure sensor and a vehicle speed sensor connected to the data input portion of said processor unit, said pressure sensor being connected to said steering torque pressure passage.

4,926,957

DEVICE CAPABLE OF SUCTION-ADHERING TO A WALL SURFACE AND MOVING THEREALONG

Fukashi Urakami, 5-21-204 Konandai 4-chome, Konan-ku, Yokohama, Japan

Filed Mar. 25, 1988, Ser. No. 174,404
Claims priority, application Japan, Apr. 10, 1987, 62-80320
Int. Cl.[5] B60B *39/00*
U.S. Cl. 180—164 **3 Claims**



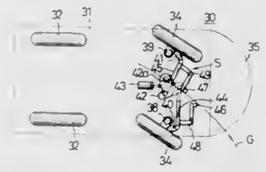
1. A device comprising a main body, moving means mounted on the main body, a partitioning member mounted on the main body and defining a pressure reduction space in cooperation with the main body of the device and a wall surface, and vacuum creating means for discharging a fluid from the pressure reduction space, said device being adapted to suction-adhere to the wall surface by the pressure of an ambient fluid acting on the main body of the device owing to the difference in fluid pressure between the inside and outside of the pressure reduction space and to move along the wall surface by the action of the moving means; wherein
the partitioning member has an outside wall portion extending from one end of said member connected to the main body of the device to a contacting portion of said member which makes contact with the wall surface, and an inside wall portion located inwardly of the outside wall portion and extending from said contacting portion to the other end of said member connected to the main body of the device,
a pressure adjusting space is defined by the outside wall portion and the inside wall portion,
a pressurized fluid supply source is provided for pressurizing the pressure adjusting space,
means is provided for feeding a pressurized fluid from the pressurized fluid supply source to the pressure adjusting space to stretch the partitioning member at the time of changing the moving direction of the main body of the device to move the moving means away from the wall surface so that the main body is supported by the partitioning member while the moving direction is changed.

4,926,958

GUIDE DEVICE FOR AUTOMATED GUIDED VEHICLE

Shoji Nishikawa, Nagoya; Akira Ohkura, and Katsuya Ichida, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 1, 1988, Ser. No. 200,975
Claims priority, application Japan, Jun. 4, 1987, 62-87128; Jun. 10, 1987, 62-89550
Int. Cl.[5] B62D *1/02*
U.S. Cl. 180—168 **9 Claims**



1. An apparatus for guiding an A.G.V. along a guide cable defining a straight and curved course, the A.G.V. having a pair of steerable wheels each mounted at opposite ends of a beam to pivot about a corresponding vertical axis, the beam extending perpendicular to the longitudinal center line of the A.G.V., the apparatus comprising:
a steering linkage for each of the pivotable wheels including,
a bell-crank mounted to the beam substantially equidistant from each wheel and pivotable on a vertical axis on the longitudinal center line;
a knuckle arm connected to each wheel having an end offset from the vertical axis of the corresponding wheel,
a tie-rod for each wheel having a first end pivotably connected to a corresponding knuckle arm and a second end pivotably connected to the bell-crank, the pivotable location of the second end of one of the tie-rods providing for revolving in an arc about the bell-crank axis in a direction toward the center line while the pivotable location of the second end of the other tie-rod provides for revolving in an arc about the bell-crank axis in a direction away from the center line at times when the wheels are turned to travel the curved course;
a detecting coil for each steerable wheel for sensing the magnetic field surrounding the guide cable;
means for connecting each detection coil to the steering linkage of a corresponding wheel effective to position the detecting coils spaced from the beam in a direction of the longitudinal center line a first predetermined equal distance on opposite sides of the longitudinal center line at times when the steering linkage positions the radial extent of the wheels parallel to the longitudinal center line for traveling the straight course;
the connecting means being effective to shift both detection coils in a direction transverse the longitudinal center line while decreasing the distance between the detection coils and an extension of a line connecting the pivotal axis of the bell crank and the pivotal location of the second end of the tie-rod revolving in an arc toward the longitudinal center line at times when the steering linkage turns the wheels obliquely to the longitudinal center line for traveling the curved course.

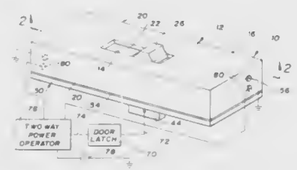
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4,926,959

OPERATOR CONTROL FOR VEHICLE COMPONENTS

Frederic R. Adams, Troy; Jeffrey M. Boyer, Rochester; Ronald N. Schultz, Troy, and Barry Taylor, Bloomfield Hills, all of Mich., assignors to Saturn Corporation, Troy, Mich.

Continuation of Ser. No. 261,541, Oct. 24, 1988, abandoned.
This application Aug. 21, 1989, Ser. No. 396,261
Int. Cl.[5] B60R *25/00*
U.S. Cl. 180—315 10 Claims



1. In combination with a plurality of vehicle components having controls movable between first and second operative positions, mechanical means for mechanically moving one of the component controls between its first and second operative positions, and power operating means for power moving all of the component controls between their first and second operative positions, an operator control for sequentially operating the mechanical means and the power operating means comprising, a support, a driven member mounted on the support for movement between first and second operative positions corresponding to the first and second operative positions of all of the component controls, means operable upon movement of the driven member between its first and second operative positions for mechanically moving the one component control between its corresponding first and second operative positions, a manually movable drive member mounted on the support for simultaneous movement with the driven member between the first and second positions of the driven member and continued movement independently of the driven member to the first and second operative positions of the drive member corresponding to the first and second operative positions of all of the component controls, means coupling the drive member to the driven member for simultaneous movement of the driven and drive members as a unit between the first and second positions of the driven member to mechanically move the one component control between its first and second operative positions, and means operable at each of the first and second positions of the driven member uncoupling the drive member from the driven member for additional movement of the drive member to the same position as the driven member to actuate the power operating means and power move all of the component controls to the same position as the one component control was moved by the driven member.

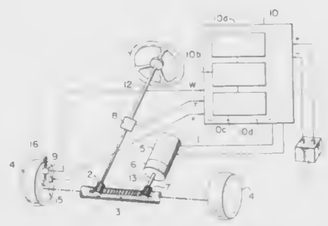
4,926,960

ELECTRIC POWER STEERING APPARATUS FOR VEHICLE

Hisatugu Ishikura, Katsuta; Kazuo Tahara, Hitachi; Toshimi Abukawa, Hitachiota; Katsuji Marumoto; Toshiyuki Koterazaka, both of Hitachi; Mitsuyuki Hombu, Katsuta; Tadashi Takahashi, Hitachi; Hirohisa Yamamura, Hitachiota; Toru Tatsuzaki, Hiratsuka; Tsutomu Ohmae, and Shuichi Takamatsu, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of, Japan

Filed Sep. 16, 1988, Ser. No. 245,349
Claims priority, application Japan, Sep. 16, 1987, 62-229904
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 4 Claims

1. An electric power steering apparatus for a vehicle comprising:
a steering shaft;
an electric motor operable to generate an auxiliary steering force having a magnitude corresponding to a value of electric current supplied thereto;
means for detecting an operational state of said steering apparatus, said detecting means including a steering torque sensor for detecting a steering torque applied to said steering shaft and a vehicle weight sensor for detecting a vehicle weight; and
means for controlling a value of electric current to be supplied to said electric motor in accordance with a value detected by said detecting means, said controlling means being constituted to increase and decrease the value of



electric current to be supplied to said electric motor in accordance with increase and decrease, respectively, of the value detected by said steering torque sensor, and to increase and decrease the value of electric current to be supplied to said electric motor in accordance with the increase and decrease, respectively, of the value detected by said vehicle weight sensor such that the increase and decrease in the value of electric current based on the value detected by the steering torque sensor is modified by the value detected by the vehicle weight sensor and the auxiliary steering force is increased with increases in vehicle weight.

4,926,961

HINGED ACOUSTICAL VOICE TUBE

Phillip Gattey, Los Gatos, and Shu-Ren Chen, Santa Cruz, both of Calif., assignors to ACS Communications, Scotts Valley, Calif.

Filed Jul. 29, 1988, Ser. No. 226,146
Int. Cl.[5] G10K *11/00*
U.S. Cl. 181—22 9 Claims



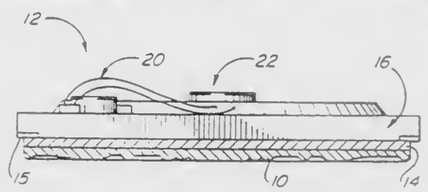
1. An acoustical voice tube for use with communications equipment, comprising:
a hollow, acoustical upper piece having an upper end for detachable coupling with the communications equipment and a lower end with at least one convex protrusion;
a hollow, acoustical lower piece having a lower end adapted for receiving sound and an upper end having at least one bore aligned for air-tight coupling with said convex protrusion of said lower end of said upper piece and thereby creating a hinged connection between said upper piece and said lower piece.

4,926,962

DECORATIVE SPEAKER COVER

Gary T. Graham, 601 Dakota Ave., St. Cloud, Fla. 32769, and Sara L. Gillen, 1011 S. Summerline Ave., Orlando, Fla. 32806

Division of Ser. No. 917,735, Oct. 10, 1986, Pat. No. 4,769,188.
This application Aug. 29, 1988, Ser. No. 237,138
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—150 8 Claims



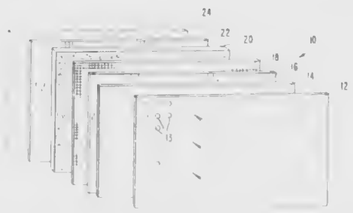
1. A speaker cover for a loudspeaker system for installation in a ceiling or wall composed of panels having a predetermined visible, external appearance, said speaker cover comprising a thin sheet of closed cell foam having a concealed rear surface facing the loudspeaker system and a front visible surface which has the same visible appearance as the panels so that when the speaker cover is installed, said cover appears to be one of the panels of the ceiling or wall.

4,926,963

SOUND ATTENUATING LAMINATE FOR JET AIRCRAFT ENGINES

Stephen J. Snyder, West Hills, Calif., assignor to UAS Support, Inc., Geneva, Switzerland

Continuation-in-part of Ser. No. 106,618, Oct. 6, 1987, Pat. No. 4,848,514. This application Apr. 5, 1989, Ser. No. 333,346
Int. Cl.[5] E04B *1/82*
U.S. Cl. 181—290 25 Claims



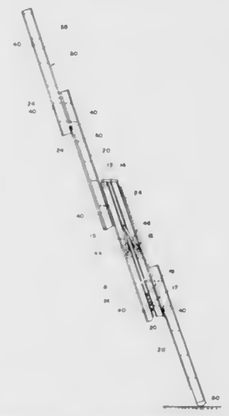
1. A multilayered laminate having improved sound energy attenuating properties comprising:
a perforated facing layer;
a moisture barrier layer adjacent to said facing layer;
a first protecting layer adjacent to said moisture barrier layer;
a screen layer adjacent to said first protecting layer;
an acoustic attenuating material layer adjacent to said screen layer;
a second protecting layer adjacent to said acoustic attenuating material layer; and
a solid backing sheet layer adjacent to said second protecting layer.

4,926,964

STEP/EXTENSION LADDER

Danny R. Herrin, 4835 Yale St., Metairie, La. 70062

Filed Sep. 5, 1989, Ser. No. 402,561
Int. Cl.[5] E06C *1/18, 1/12*
U.S. Cl. 182—22 14 Claims



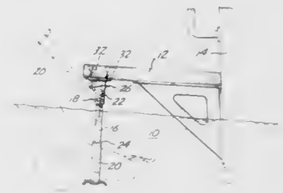
1. A convertible step/extension ladder, comprising:
a first frame portion;
a second frame portion pivotally attached to said first frame portion, each of said first and second portions comprising a pair of parallel leg members and a plurality of transverse spaced apart rungs fixedly attached to said leg members;
an elongated housing member carried by an exterior of each of the leg members, said housing member having a central opening therein;
at least one extension member having a pair of parallel leg members and a plurality of transverse spaced-apart rungs fixedly attached to the leg members;
an elongated rail member carried by an exterior of the extension leg members, said rail member being slidably engaged within the central opening of the housing member to allow telescopic movement of the extension members along exterior of the frame portion;
means for locking the first and the second frame portions in substantially parallel relationship to each other when the ladder is converted from a step ladder to an extension ladder.

4,926,965

SELF-RETRACTING STEP

Mark Fox, 532-210th SW., Lynnwood, Wash. 98036

Filed Oct. 18, 1989, Ser. No. 423,344
Int. Cl.[5] B63B *27/14, 27/00*
U.S. Cl. 182—89 20 Claims



1. A step apparatus, mountable to the exterior of a boat hull

VOL 1114 ISS 4 MY 22 1990 UMI

to assist a person in climbing into the boat, the step apparatus comprising:

a support member;

a step member, mounted on the support member for receiving a person's foot, the step member and at least a portion of the support member defining a reactive surface;

pivot means for pivotally mounting the support member to the exterior of the boat hull to pivot the apparatus between an extended position and a retracted position; and

first biasing means for biasing the step member towards the extended position in which a person may be supported by the step member, the first biasing means capable of being overcome by water drag force acting on the reactive surface during movement of the boat to move the step member towards the retracted position, in which the reactive surface presents a reduced drag profile.

4,926,966

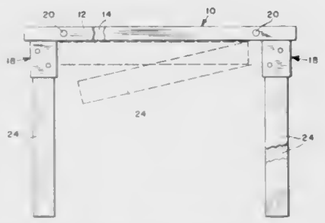
FOLDING SAW-HORSE

Alban M. Boudreau, 649 Rollstone St., Fitchberg, Mass. 01420

Filed Oct. 17, 1989, Ser. No. 422,534

Int. Cl.[5] **B27B** *21/00*; **B25H** *1/06*

U.S. Cl. 182—155 **8 Claims**



1. A folding saw-horse comprising a back and a pair of supporting legs secured to the back adjacent each end of the saw-horse,

a bracket for each pair of legs, each bracket comprising means to attach the same to the back in swinging relation, each bracket including a pair of plates for attachment to a separate leg in a diverging relation terminating in spaced free ends for the legs,

each bracket being a single one-piece integral part; the leg attaching and swinging means being fixed to the plates, and the plates being divergent inter se, to hold the legs in their fixed, divergent relation at all times,

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4,926,967

FOLDING LADDERS

Baker Mervyn R., 12 Bowen Close, Prestbury Cheltenham, Gloucestershire; Raymond J. Pearson, 4 The Orchard, Ham Road, Charlton Kings, Cheltenham, Gloucestershire, and Roger Emsley, Woodpeckers, Ash Lane, Down Hatherley, Gloucestershire, all of England

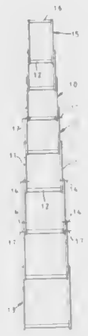
Filed Jan. 10, 1989, Ser. No. 295,383

Claims priority, application United Kingdom, Jul. 27, 1988, 8817934

Int. Cl.[5] **E06C** *1/383, 1/52*

U.S. Cl. 182—164 **10 Claims**

1. A folding ladder comprising a series of modules, each module including a pair of spaced, parallel stile sections connected together by a transverse tread section, the modules being of decreasing size and each module, except for the largest one, being pivotally mounted between the stile sections of the next adjacent larger module, so as to be foldable between an extended position and a folded position in which the smaller module is nested within the larger module, releasable locking means being provided to lock each module in the extended position, characterised in that the tread and stile sections are hollow, and in that the transverse tread section of each module is connected to each of its associated stile sections by a separately formed joint member, one end of which projects into the



hollow stile section and is secured thereto, and the other end of which projects into the hollow tread section and is secured thereto.

4,926,968

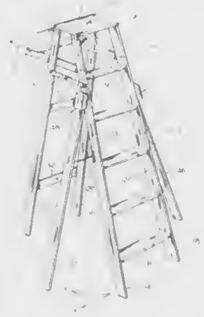
LADDER SUPPORTS

Leroy F. Schumer, Rte. 1, #1627, Perryville, Mo. 63775

Filed Sep. 19, 1989, Ser. No. 409,070

Int. Cl.[5] **E06C** *5/36*

U.S. Cl. 182—172 **8 Claims**



1. A ladder comprising at least first and second legs with a plurality of steps or rungs therebetween for bearing the weight of a person standing thereon, a brace leg pivotally attached to each of said weight bearing legs, means for providing said pivotal attachment by enabling said brace leg to swing into a spread and generally vertical position when said ladder is in a weight supporting position, said spread position being with said brace swung horizontally outward from the weight bearing leg of said ladder to provide sway bracing for said ladder, means for limiting said outward movement of said brace leg away from said weight bearing legs, and compression spring means associated with said pivotal attachment and positioned on a side of said brace leg remote from said weight bearing leg, said horizontal swinging of said leg compressing and being opposed by said spring.

4,926,969

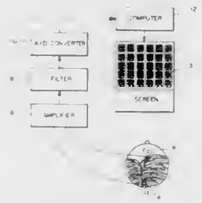
SENSORY-DRIVEN CONTROLLER

Geoffrey D. Wright, and Edmund Pirali, both of Baltimore, Md., assignors to NeuroSonics, Inc., Baltimore, Md.

Filed Nov. 18, 1988, Ser. No. 272,949

Int. Cl.[5] **A61B** *5/04*

U.S. Cl. 128—731 **16 Claims**



1. A method for detecting the point of attention of a subject who is attending to a stimulus, comprising the steps of:

establishing a calibrated response template unique to the subject representing the correspondence between a stimulus and an evoked response;

providing a stimulus for evoking an EEG response in a subject;

detecting the EEG response evoked from the subject by the stimulus;

mathematically corelating the EEG response with the template to derive the template response that corresponds to the EEG response; and

determining the point of attention of said subject from said mathematical correlation.

4,926,970

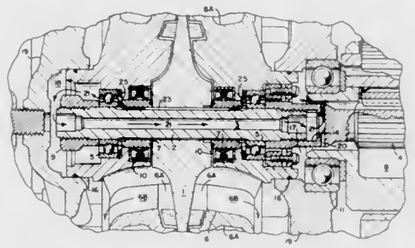
LUBE OIL SYSTEM FOR ROTATING MACHINERY

Robert R. Kimberlin, Athens, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 10, 1987, Ser. No. 335,545

Int. Cl.[5] **F01M** *1/00*

U.S. Cl. 184—6.11 **5 Claims**



1. A circulating system for cooling and lubrication for a rotating machine having a rotor mounted on shaft means and a stator surrounding the rotor, said shaft means disposed for rotation within the stator on bearing means in a bore of the stator and said shaft means further including a central bore, a pinion having a hollow pinion shaft fixed about an end portion of said shaft means and in communication with said central bore, and radial path means between the interior and the periphery of said pinion shaft for centrifugally inducing flow through said central bore in said shaft in an axial direction towards one end of said shaft and means forming a path for circulating fluid from said radial path means at one end of said shaft means through said bearing means and about the outer periphery of said shaft means to the central bore at the opposite end of said shaft means.

4,926,971

ARRANGEMENT FOR LUBRICATING THE CHAIN GUIDE IN A DRAG CHAIN CONVEYOR FOR LOOSE ARTICLES

Walter C. Egger, Zurich, Switzerland, assignor to VT-Verpackungstechnik Zurich, Zurich, Switzerland

Filed May 4, 1984, Ser. No. 607,249

Claims priority, application Switzerland, May 4, 1983, 2421/83

Int. Cl.[5] **B65G** *45/02*

U.S. Cl. 184—15.1 **5 Claims**



1. A drag chain conveyor comprising:

an endless conveyor chain having a plurality of spaced apart successive carriers thereon, each carrier having a holder portion;

guide rails having at least two planar surfaces, each planar surface being non-planar with respect to the remaining planar surfaces, the guide rails slidably supporting the carrier by the holder portion thereof, the guide rails being intermittently covered and uncovered as the spaced apart carriers slide over the guide rails, each guide rail having a channel therein and a plurality of bores extending from the channel in at least two non-parallel directions to at least two of the planar surfaces of the guide rail through which lubricant is supplied to the surfaces of the guide rail;

a lubricant supply connected to the channel by a pipe; and

a pressure-reducing metering valve operatively connected with the lubricant supply, the valve being adjusted so that the lubricant flows out of the bores substantially under zero pressure difference over the ambient pressure.

4,926,972

METHOD OF AND APPARATUS FOR INJECTING LIQUID INTO BOOT FOR JOINT UNITS

Hiroshi Yoshioka; Nobuyoshi Nagatsuma, and Shinobu Kobayashi, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1989, Ser. No. 324,529

Claims priority, application Japan, Mar. 18, 1988, 63-65537

Int. Cl.[5] **F16C** *1/24*; **B23P** *11/00*

U.S. Cl. 184—109 **3 Claims**



1. A method of injecting a liquid into a boot for a joint unit, the boot having a diametrically larger end fitted over an outer

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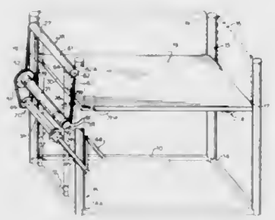
periphery of an open end of a joint unit assembled to an end portion of a shaft, and a diametrically smaller end closely fitted to the shaft, comprising: after the joint unit is assembled to the end portion of the shaft with the open end abutting on the diametrically larger end of the boot, conveying the shaft to a liquid injection station while held in vertical posture with said end portion facing upward, separating and holding the diametrically larger end of the boot from said open end, injecting the liquid into the boot, and then re-fitting the diametrically larger end over the outer periphery of said open end.

4,926,973

MOBILE WHEELCHAIR LIFT AND BRAKES THEREFORE

Dave W. Smith, 238 Scarboro Ave., S. W., Calgary, Alta., Canada (T3C 2H3)

Filed Dec. 9, 1988, Ser. No. 282,262
Int. Cl.[5] B66B *9/20*
U.S. Cl. 187—11 **20 Claims**



1. A mobile wheelchair lift comprising in combination a base frame, a vertically situated support structure extending upwardly from adjacent each end of said base frame, a substantially horizontal wheelchair platform, a winch assembly including a cable drum and a cable system operatively connected thereto, and supporting said platform between said support structure for elevating and lowering action within said support structure, said cable system including at least one upper pulley and at least one lower pulley, upper and lower pulley support means and a cable operatively extending between said cable drum and said upper and lower pulleys, and an automatic braking system cooperating between said winch assembly and said platform to prevent inadvertent descent of said platform, said braking system including at least one brake drum means operatively connected to said cable drum, brake means operatively connected to said brake drum means, and operating link means operatively extending between said upper pulley support means and said brake means to actuate said brake means, said upper pulley support means including a cam action therein for pivotally supporting same to said vertical support structure whereby the initiation of descent of said platform moves said link means to actuate said brake means.

4,926,974

ELEVATOR CAR WITH IMPROVED CAR DOOR CLUTCH

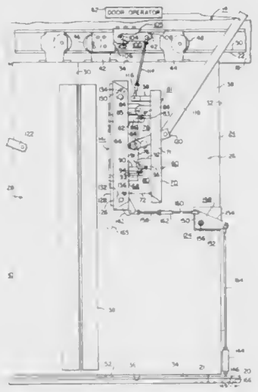
Arnold M. Morris, Chester Twp., Morris County; Daphne D'Zurko, Pompton Lakes; Richard H. Pilsbury, Demarest, all of N.J.; J. Warren Barkell, Jr., Penn Twp., Westmoreland County, Pa.; Karl B. Orndorff, Bouneauville Boro, Adams County, and Lawson Randall S., Gettysburg, both of Pa., assignors to Inventio AG, Hergiswil, Switzerland

Filed Feb. 13, 1989, Ser. No. 309,629
Int. Cl.[5] B66B *13/00*
U.S. Cl. 187—52 LC **13 Claims**

1. An elevator car having a cab which defines an opening, including a header and sill respectively disposed above and below the opening, a roller track fixed to the header, a car door having hanger rollers supported by the roller track, a door operator for imparting horizontal rectilinear motion to the car door, to open and close the opening, and a car door clutch carried by the car door having spaced "open" and "close" vanes for engaging hatch door rollers for simultaneous opening and closing of a hatch door with the car door, the improvement comprising:

first means associated with the card door clutch for selectively changing the spacing between the open and close vanes in response to a predetermined mechanical movement,

said first means including a parallelogram linkage assembly disposed to swing the close vane between first and second positions which provide first and second predetermined



spacings, respectively, between the open and close vanes, with the second predetermined spacing being less than the first predetermined spacing,

and second means directly responsive to the position of the elevator car door for providing said predetermined mechanical movement,

said second means including a cam and a cam follower arranged for relative movement in response to movement of the elevator car door, and for engagement when the elevator car door is closing the opening to the cab, with said engagement providing the predetermined mechanical movement which changes the spacing between the open and close vanes.

4,926,975

ELEVATOR CAR WITH IMPROVED DOOR LOCK

Arnold M. Morris, Chester Township, Morris County, N.J., assignor to Inventio AG, Hergiswil, Switzerland

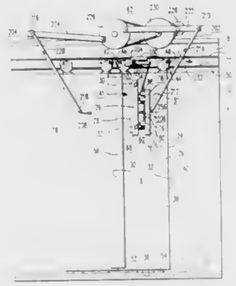
Filed Feb. 13, 1989, Ser. No. 309,630
Int. Cl.[5] B66B *13/00*
U.S. Cl. 187—57 **3 Claims**

1. An elevator car having a cab which defines an opening; a car door mounted for movement relative to the cab opening, between open and closed positions; a car door clutch carried by the car door having spaced open and close vanes for engaging hatch door drive rollers for simultaneously opening and closing a hatch door with the car door; a door operator having a door drive arm; and a door crank arm linking the door drive arm with the car door, the improvement comprising:

first means biased to a first position which prevents the door crank arm from moving beyond a predetermined dimension when the car door is closed, with the predetermined dimension being selected to limit car door opening such that passenger egress from the cab is prevented,

and second means responsive to he open vane contacting a

hatch door drive roller for moving the first means to a second position which allows the car door to be fully opened, with said open vane including a movable member responsive to engagement of the open vane with a hatch door roller,



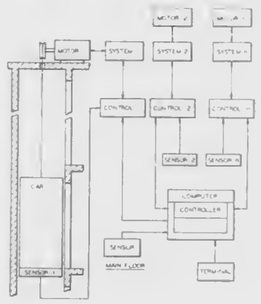
and wherein the second means includes a post member fixed to the movable member of the open vane, with said post member being positioned to move the first means to the second position when the movable member of the open vane is moved by engagement of the open vane with a hatch door roller.

4,926,976

METHOD AND APPAPARATUS FOR THE CONTROL OF ELEVATOR CARS FROM A MAIN FLOOR DURING UP PEAK TRAFFIC

Joris Schroder, Lucerne, Switzerland, assignor to Inventio AG, Switzerland

Filed Dec. 20, 1988, Ser. No. 287,009
Claims priority, application Switzerland, Dec. 22, 1987, 05000/87
Int. Cl.[5] B66B *1/20*
U.S. Cl. 187—125 **36 Claims**



1. A method for the control of the dispatch of elevator cars during up peak traffic conditions from a main floor. of an elevator group having at least one elevator. comprising the steps of:

a. detecting building filling passenger traffic arriving at a main floor by a first traffic measurement and detecting building filling passenger traffic departing at the main floor by a second traffic measurement;

b. creating data fields by storing predetermined data related to transport capacities. nominal departure loads and nominal time intervals calculated according to an algorithm;

c. establishing nominal values of a departure load variable and a time interval variable dependent on said first and second traffic measurements and dependent on said predetermined data stored in said data fields and calculated according to said algorithm; and

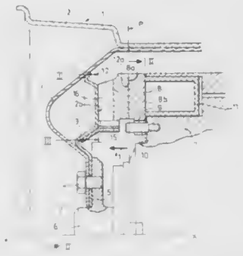
d. comparing an actual value of a departure load for each elevator car with said nominal departure load variable value established in said step c . and comparing an actual time interval with said nominal time interval variable value established in said step c. and, upon at least one of said actual values reaching said compared nominal value. dispatching an associated elevator car from the main floor.

4,926,977

DISK BRAKE ASSEMBLY FOR WHEELS OF LAND MOTOR VEHICLES

Alain L. Gassiat, Montussan, France, assignor to Carbone Industrie, Bagnolet Cedex, France

Filed May 12, 1988, Ser. No. 193,082
Claims priority, application France, May 13, 1987, 8707010
Int. Cl.[5] B60T *1/06;* **F16D** *65/78*
U.S. Cl. 188—18 A **6 Claims**



1. A disk brake assembly for a land vehicle wheel of the type including a rim and a run-out, the assembly comprising:

(a) a stationary hub carrier;

(b) a rotary hub supported within the hub carrier;

(c) a single annular rotor disk formed of carbon material, the rotor disk including a first friction face and a second face, the first friction face facing a stator disk and the second face defining a plurality of ventilation grooves;

(d) a single annular stator disk formed of carbon material slidably mounted on the hub carrier including a second fiction face having an area substantially equal to that of the first friction face;

(e) hydraulic piston means carried by the hub carrier for urging the second friction face of the stator disk against the first friction face of the rotor disk; and,

(f) a counter-thrust plate mounted on the rotary hub and laterally slidably supporting the single annular rotor disk, the counter-thrust plate having a portion adapted to bear against the second face of the rotor disk so as to counteract forces exerted on the rotor disk by the stator disk.

4,926,978

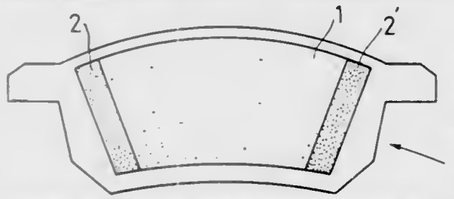
FRICTION PAD FOR USE WITH DISC BRAKE

Katsuhiro Shibata; Yuichi Azuma; Masao Inoue, and Shinichiro Okumura, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 356,929, May 25, 1989, abandoned. This application Jun. 2, 1989, Ser. No. 360,871
Int. Cl.[5] F16D *69/02*
U.S. Cl. 188—73.1 **3 Claims**

1. A friction pad for use with a disc brake having a rotary disc sandwiched between a pair of friction pads and gripped thereby for braking, said friction pad comprising a central main portion and a peripheral portion made of different matrices having different compositions and arranged in the direction of

rotation of the disc; the ratio of area of the matrix of said central main portion to that of the matrix of said peripheral portion being between 10:5 and 10:0.5; both said central main portion and said peripheral portion containing an organic or inorganic fiber such as aramid fiber and glass fiber, a binder such as phenol resin, and an organic or inorganic filler such as cashew resin, carcium carbonate and graphite, but not containing asbestos or lead or lead compound except for lead sulfide; the matrix of said central main portion containing at least one of a substance having a Knoop or Micro-Vickers hardness of not less than 600 and a Moh's hardness of not less than 6 and steel in the form of powder, granule, chip or fiber, the content of said substance or said steel in the matrix of said peripheral portion being either zero per cent by volume, or not more than



90 per cent by volume if the substance or steel in the matrix of said peripheral portion is the same as the substance or steel in the matrix of said central main portion; the sum of values for said peripheral portion calculated by use of the following formula being approximate to, or less than, the sum of values for said central main portion

the sum of Knoop or Micro-Vickers hardness of each substance or steel multiplied by content thereof per unit volume

if said substance or steel in the matrix of said peripheral portion differs in hardness from said substance or steel in the matrix of said central main portion; other components in the matrix of said peripheral portion being similar to other components in the matrix of said central main portion.

4,926,979

DISK BRAKE OF A PIN TYPE

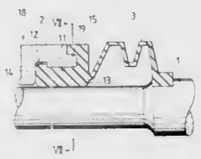
Seiya Odaka, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,689

Claims priority, application Japan, Jul. 13, 1988, 63-91840[U]

Int. Cl.[5] F16D *65/00*

U.S. Cl. 188—73.44 **3 Claims**



1. A disc brake of a pin type, comprising:

a boss member provided on one of a caliper of the disc brake and a support member fixed to a stationary portion of a vehicle;

a guide pin slidably mounted in said boss member, said guide pin being fixed to the other one of said caliper and said support member; and

means for damping and sealing said boss member, said means being disposed between said boss member and said guide pin, said means being formed of an elastic material, said damping and sealing means being provided at one end thereof with a thickened portion and a seal portion, said thickened portion having an outer diameter substantially equal to an inner diameter of one end of said boss member, said thickened portion being press-fitted in between said boss member and said guide pin, said seal portion being substantially tubular and formed integral with said damping and sealing means, said seal portion being disposed radially outwardly of said thickened portion in surrounding relation to said thickened portion, said seal portion being fitted on said outer surface of said boss member.

4,926,980

AUTOMATIC BRAKE ADJUSTING MECHANISM

James C. Cumming, Pleasant Ridge, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 681,164, Dec. 13, 1984, abandoned, which is a continuation of Ser. No. 629,013, Jul. 9, 1984, abandoned, which is a continuation of Ser. No. 556,805, Dec. 1, 1983, abandoned, which is a continuation of Ser. No. 273,537, Jun. 15, 1981, abandoned. This application Jun. 3, 1985, Ser. No. 740,157

Int. Cl.[5] F16D *65/60, 65/54*

U.S. Cl. 188—79.55 **2 Claims**



1. A brake adjusting mechanism for a vehicle brake assembly having a movable brake shoe (16) with a friction lining (17) adapted to engage a surrounding brake drum (15);

a housing (40) having a first bore (42);

a ratchet member (51) slidably and rotatably mounted in said first bore (42), said ratchet member (51) having helical teeth about a generally cylindrical outer surface thereof and a threaded connection with means (44) operative to position the brake shoe relative to the surrounding brake drum (15);

a second bore (90) in said housing (40) and communicating with said first bore (42);

an elongate element (91) mounted for rectilinear movement in said second bore (90), said elongate element (91) having a pawl (94) engaged with said helical teeth of said ratchet member (51); and

means biasing (95) said pawl into engagement with said ratchet member (51);

characterized in that one end (92) of said elongate element (91) extends out of said second bore (90); in that said second bore (90) traverses said first bore (42), an intermediate portion of said elongate element (91) traverses said ratchet member (52), said pawl is disposed on one side of said ratchet member (52) and said one end (92) of said elongate element (91) is disposed on the other side of said ratchet member (52), said pawl (94) being formed as an integral part of said elongate element (91) and said means biasing said pawl comprises a spring (95) seated at one end against an abutment internal of said second bore (90) and seated at the other end against said elongate element (91), and in that said pawl is adapted to be disengaged from said ratchet member (52) by manually pressing on said one end (92) of said elongate element (91) to move said elongate element (91) against said biasing means (95).

4,926,981

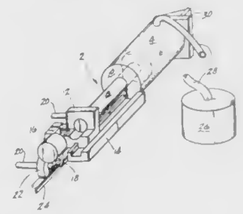
ESCALATOR STEP BUFFER

Klaus Bruehl, Hanover, and Dietmar Thaler, Seggebruch, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Jun. 19, 1989, Ser. No. 368,476

Int. Cl.[5] B60T *17/18*

U.S. Cl. 188—111 **6 Claims**



1. A buffer assembly for emergency stopping of escalator steps in the event of escalator malfunction, said buffer assembly comprising:

a) a cylinder assembly for holding a buffering fluid, said cylinder assembly comprising an outer cylinder housing and an inner sleeve contained in said housing, said sleeve being inwardly spaced from said housing to form an annular space therebetween;

b) a fluid reservoir apart from said cylinder assembly, said reservoir being connected to said annular space by first conduit means;

c) a piston slideably telescoped into said sleeve and reciprocally movable therein, said piston including a piston rod extending from said cylinder assembly;

d) a catch mounted on said piston rod and normally disposed adjacent to but out of a path of movement of a step component of the escalator;

e) means for moving said catch to a step component-engaging position responsive to escalator malfunction whereupon said piston is driven into said sleeve; and

f) said sleeve being provided with at least two different adjacent gradients of fluid jets for bleeding fluid from said sleeve into said annular space operable to provide staged braking of said piston in said sleeve whereby the escalator will stop within a predetermined distance after engagement by said catch irrespective of the load on the escalator.

4,926,982

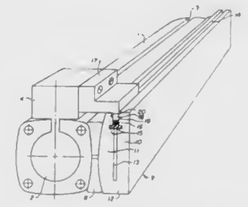
BRAKING DEVICE IN AN ARRANGEMENT FOR LINEAR MOVEMENT

Bo Granbom, Södergatan 5, S-736 00 Kungsör, Sweden

Filed Dec. 15, 1988, Ser. No. 287,850

Int. Cl.[5] F15B *15/08*

U.S. Cl. 188—271 **8 Claims**



1. A braking arrangement for a rodless piston, comprising: housing means defining a cylinder having a longitudinally elongated, enclosed chamber receiving a rodless piston which is longitudinally shorter than said chamber and capable of being moved longitudinally of the cylinder in the chamber throughout a stroke in a stroke direction;

fluid pressure means selectively communicating with said chamber for moving said piston longitudinally of the cylinder in said stroke direction;

dog means effectively connecting with said rodless piston for movement therewith along said stroke, said dog means having a portion which is physically accessible from externally of said cylinder;

at least one first braking surface provided on said housing means and having a length longitudinally of said housing means which is at least as long as the maximum length of said stroke;

at least one second braking surface provided on said portion of said dog means so as to be engageable with said at least one first braking surface throughout the length of said stroke; and

means operable for moving at least one of said first and second braking surfaces towards and away from one another, generally transversally of said cylinder, into and out of braking engagement with one another, respectively for stopping said rodless piston at an intended position along said stroke, and freeing said rodless piston to be moved along said stroke in said stroke direction.

4,926,983

HYDRAULIC SHOCK ABSORBER

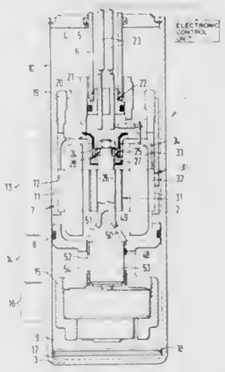
Bernd Taubitz, Schwieberdingen; Peter Zieher, Eberdingen; Claus Kramer; Kurt Engelsdorf, both of Besigheim, and Armin Schuelke, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 300,872

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3805934

Int. Cl.[5] F16F *9/46;* **F16K** *31/02*

U.S. Cl. 188—299 **23 Claims**



1. A hydraulic shock absorber having an automatically adjustable damper force, which comprises a cylinder (2), a damper piston (7) that is axially movable in said cylinder, said damper piston divides said cylinder interior into two chambers (9, 10) and has a controllable flow across section, a piston rod (6) connected to said damper piston within said cylinder and protruding to the outside through one end of said cylinder, a control slide (14) including at least two solid sections and at least two oppositely disposed sections having a plurality of radial openings, a fixed hollow cylinder slide surrounding said control slide (14) and provided with a plurality of radial openings (54) relative to said control slide (14), an electromagnetic rotary adjuster (13) within said piston for controlling said

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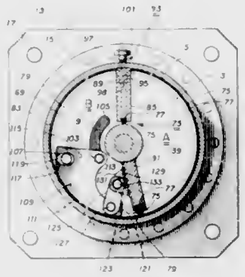
control slide for monitoring at least two flow cross sections, said electromagnetic rotary adjuster (13) is a permanently excited single-winding rotary adjuster having a maximum adjusting range of 30°, and a magnetic safety resetting.

4,926,984

HYDRAULIC SHOCK ABSORBER WITH NONLINEAR PROPERTIES

Gary M. Pollitt, 45050 Cameron Rd., Temecula, Calif. 92390

Filed Jun. 12, 1989, Ser. No. 364,967
Int. Cl.[5] F16F *9/12*
U.S. Cl. 188—310 **12 Claims**



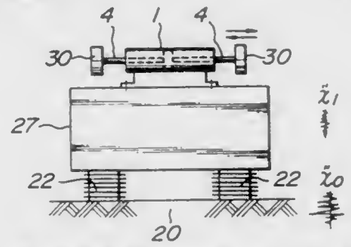
1. An hydraulic shock absorber comprising:
(a) a fluid-filled shock absorber chamber bounded by cylindrical walls and opposed, spaced-apart first and second chamber end plates including first means for anchoring said chamber to a frame;
(b) a freely rotating shock absorber center shaft axially positioned in said chamber pivotally received in said first chamber end plate;
(c) an operating shaft coaxially aligned with said center shaft in said chamber passing out through said second chamber end plate including second means for connection to a separate oscillatory member;
(d) a work disk pivotally mounted inside said chamber intermediate said first and second end plates, in fluid sealing relationship with said cylindrical walls and fastened securely to said operating shaft;
(e) a baffle fixedly mounted inside said chamber in fluid-sealing relationship therein having at least one aperture formed therethrough;
(f) a wiper vane mounted on said center shaft intermediate said disk and said first end plate extending outward into fluid-sealing relationship against said chamber walls, said vane, work disk and said first end plate effectively dividing said chamber into first and second subchambers, so that rotation of said center shaft forces fluid from said first subchamber through said aperture into said second subchamber;
(g) a first pivot pin extending from said second end plate, through a circumferential slot formed in said work disk, into said chamber;
(h) a second pivot pin, spaced-apart from said first pivot pin, extending from said work disk into said chamber;
(i) a lug pivotally received on said first pivot pin and slidingly received on said second pivot pin having an arm extending outward around the inside of said chamber walls to a distal end adjacent said chamber walls when said vane is in a first position apart from said fixed baffle and said first pivot pin is at one end of said slot; and,
(j) a moveable link pivotally attached between said distal end of said lug and said vane for urging said vane through said fluid causing said lug to pivot about said first pivot pin and rotate said work disk about said chamber walls to provide variable fluid flow from said first subchamber to said second subchamber as a nonlinear function of operating shaft rotation.

4,926,985

OSCILLATING APPARATUS FOR DAMPING VIBRATION

Keiichiro Mizuno, Tokyo; Kazuyoshi Iida, and Kazutomo Murakami, both of Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,213
Claims priority, application Japan, Nov. 2, 1987, 62-275619
Int. Cl.[5] F16F *7/10, 15/03;* F16M *1/00*
U.S. Cl. 188—378 **8 Claims**



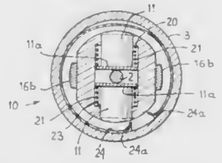
1. An oscillating apparatus comprising: a cylinder, a piston reciprocatingly movably fitted in the cylinder, shaft members connected to the piston and at least one shaft member extending out of the cylinder, said cylinder, piston and shaft members forming an oscillator, said oscillator arranged on an object to be damped which is supported through laminated elastic members on a base, and weights are fixed to ends of the shaft members extending out of the cylinder, an inlet and an outlet for an electro-rheological fluid provided at each of two cylinder chambers defined in said cylinder by the piston, and voltage applying means for applying electric voltage to the electro-rheological fluid passing through said inlets and outlets, respectively, so that applications of the voltage to the inlet of one cylinder chamber and the outlet of the other cylinder chamber are simultaneously effected and applications of the voltage to the inlets of both the cylinder chambers are alternately effected.

4,926,986

CENTRIFUGAL CLUTCH FOR AN ACTUATOR FOR RENDERING INOPERATIVE AN AUTOMOBILE VEHICLE DOOR LATCH

Jean P. Noel, Saint Die, France, assignor to Rockwell-CIM, France

Filed Dec. 9, 1988, Ser. No. 282,159
Claims priority, application France, Dec. 14, 1987, 87 17423
Int. Cl.[5] F16D *11/06*
U.S. Cl. 192—0.02 R **6 Claims**



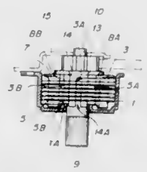
1. A centrifugal clutch for an actuator for rendering an automobile vehicle door latch inoperative, said clutch being interposed between and combined with an electric motor and a gear train drivingly connected to a screw on which is mounted a tapped sleeve for controlling an element for rendering said latch inoperative, said motor having an output shaft, said clutch comprising: a bell element, at least one weight disposed in the bell element radially of the output shaft of the motor, elastically yieldable return means associated with the weight for biasing the weight to a de-clutched position of rest, the weight being capable of being driven by centrifugal force created by rotation of the shaft of the motor to a clutching position where said weight drives said bell element, the bell element being provided with a gear wheel drivingly connected to said gear train and the weight being mounted in a support comprising a hub having substantially axially aligned branches surrounding the weight and defining a cavity for the weight, a cover closing said cavity and fixed to the hub, said cover and said hub allowing radial displacement of the weight toward the bell element under the effect of centrifugal force, said bell element having an inner wall and a stressed spring in said bell element and frictionally engaging the inner wall of the bell element, said spring having at least one clutch dog positioned for engagement with said weight in said clutching position, whereby said spring is operative to rotatably drive said bell element and said gear-wheel by friction contact with said inner wall of the bell element when the weight engages said clutch dog in said clutching position and to slip on said internal wall of the bell element when rotation of said bell element is suddenly stopped.

4,926,987

ONE-WAY TRANSMISSION DEVICE

Mikio Honma, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Oct. 24, 1988, Ser. No. 261,153
Claims priority, application Japan, Jan. 13, 1987, 63-3870; Oct. 28, 1987, 62-270295
Int. Cl.[5] F16D *51/04*
U.S. Cl. 192—8 C **9 Claims**



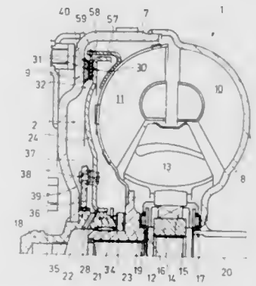
1. A one-way transmission device comprising:
a housing having a cylindrical inner wall formed therein;
a first coil spring coaxially receiving in said housing and resiliently pressed at its outer periphery against said cylindrical inner wall, said first coil spring having first and second ends which are bent radially inwardly;
a second coil spring coaxially received in said housing beside said first coil spring, said second coil spring being pressed at its outer periphery against said cylindrical inner wall, said second coil spring having first and second ends which are bent radially inwardly;
an annular core coaxially and rotatably received in the coaxially arranged first and second coil springs and having at a peripheral portion thereof a sectoral recess into which said first and second ends of said first and second coil springs are received, said sectoral recess being defined by circularly spaced first and second walls;
input and output shafts respectively connected to axially opposed sides of said annular core to rotate therewith;
an output member including a base portion having a bore through which said output shaft passes and a pawl projecting into said sectoral recess, said pawl having a slit with which said first end of said first coil spring is engaged; and
said first end of said second coil spring is arranged between said first wall of said sectoral recess and said pawl, and in which said second ends of said first and second coil springs are each arranged between said second wall of said sectoral recess and said pawl.

4,926,988

HYDRODYNAMIC CLUTCH

Wolfgang Kundermann, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 5, 1989, Ser. No. 375,815
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823210
Int. Cl.[5] F16D *33/00*
U.S. Cl. 192—3.3 **16 Claims**



1. A hydrodynamic clutch, especially hydrodynamic torque converter, comprising,
a casing (7) rotatably driven about an axis of rotation (20) and having a drive-side casing wall (9) and a drive-remote casing wall (8),
a pump wheel (10), firmly connected to the drive-remote casing wall (8),
a turbine wheel (11), rotatably mounted relative to the casing (7) about the axis of rotation (20) between the pump wheel (10) and the drive-side casing wall (9),
a bridging clutch (2; 3; 4; 5; 6) in the casing (7) between the turbine wheel (11) and the drive-side casing wall (9), said bridging clutch (2; 3; 4; 5; 6) comprising a guide hub (18) axially fixedly connected with the drive-side casing wall (9),
a piston (24, 25; 26; 27) which is axially slidably guided in its radially inner zone on the guide hub (18) concentric to the axis of rotation (20) and is guided torsionally fixed relative to the casing (7) and is sealed relative to the guide hub (18),
a stop (23) on the guide hub (18) for limiting the axial sliding movement of the piston (24; 25; 26; 27) relative to the drive-side casing wall (9) towards the turbine wheel (11),
a first friction surface (30) in the radially outer zone of the piston (24; 25; 26; 27),
a second friction surface (31) on the drive side-casing wall (9) opposite the first friction surface,
at least one friction disc (32, 33) disposed between the first and the second friction surfaces (30, 31), which friction disc is in torque-fixed connection in the region of its outer circumference with the turbine wheel (11),
and means for alternately subjecting a space between the drive-side casing wall (9) and the piston (24; 25; 26; 27) on the one hand, and a space between the drive remote casing wall (8) and the piston (24; 25; 26; 27) on the other hand to pressurized fluid for the purpose of opening and closing the bridging clutch (2; 3; 4; 5; 6).

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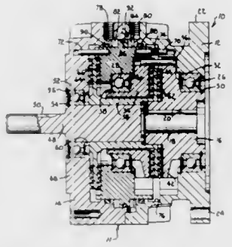
ENCLOSED DRY CLUTCH/BRAKE

Rodney D. Bruntz, Valley Center, Kans., assignor to The Carlson Company, Inc., Wichita, Kans.

Continuation-in-part of Ser. No. 185,552, Apr. 25, 1988, abandoned. This application Jul. 21, 1989, Ser. No. 383,369

Int. Cl.[5] F16D *67/02*

U.S. Cl. 192—18 A **18 Claims**



1. A clutch/brake unit comprising:

a closed stationary housing;

an input hub supported in the housing for rotation and adapted to be driven rotatively;

an output shaft supported in the housing for rotation;

a brake disk having opposing surfaces each carrying a friction brake lining thereon;

a clutch disk having opposing surfaces each carrying a friction clutch lining thereon;

a rotor carrying said brake disk and said clutch disk thereon, said rotor having a spline connection with said output shaft to mount said brake disk and clutch disk on the output shaft for rotation therewith;

a double acting piston mounted in said housing for axial movement in opposite first and second directions respectively toward the brake disk and the clutch disk;

said piston acting upon movement thereof in said first direction to effect application of frictional force to both friction brake linings in a manner to frictionally brake the output shaft and said piston acting upon movement thereof in said second direction to effect application of frictional force to both friction clutch linings in a manner to frictionally couple the input hub with the output shaft for driving of the latter;

means for applying fluid pressure to said piston in a manner to move the piston in said second direction; and

means for moving said piston in said first direction.

4,926,990

CLUTCH FOR FRANKING MACHINE

Manfred Schleuchardt, Offenbach am Main, Fed. Rep. of Germany, assignor to Francotyop-Postalia GmbH, Berlin, Fed. Rep. of Germany

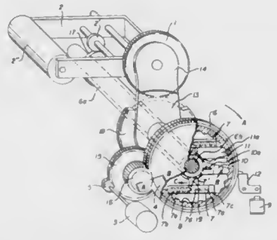
Continuation of Ser. No. 77,027, Jul. 20, 1987, abandoned, which is a continuation of Ser. No. 837,563, Mar. 3, 1986, abandoned, which is a continuation of Ser. No. 516,785, Jul. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 176,046, Aug. 7, 1980, abandoned. This application Mar. 3, 1989, Ser. No. 319,898

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2932427

Int. Cl.[5] F16D *11/02*

U.S. Cl. 192—28 **4 Claims**

1. In a franking machine having a drive, a transport mechanism, and a control cylinder, a non-slipping overrunning latch-type clutch disposed between the drive and transport mechanism and between the drive and control cylinder for triggering printing in franking machines, comprising a shaft, a locking wheel being mounted on said shaft and engaged by the drive, internal gearing having an odd number of teeth formed on said locking wheel, a bushing being disposed on said shaft and connectible to the transport mechanism and control cylinder, a locking gear disposed on said bushing adjacent said locking wheel, teeth disposed on part of the periphery of said locking gear, at least one pawl being disposed in said locking gear and extended into a hollow space formed in said locking wheel for engaging said internal gearing, a lever disposed on said bushing adjacent said locking gear, at least one finger being integral



with said lever and engageable with said at least one pawl, a torsion spring for rotating said lever and at least one finger to push said at least one pawl into said internal gearing and couple said locking wheel and locking gear, and an electromagnetically controlled latch for preventing said lever from being rotated by said spring in a first position and for allowing said at least one finger to push said at least one pawl into said internal gearing in a second position, said locking gear being sliplessly rotated by the drive engaging said locking wheel after initial rotation of said locking wheel.

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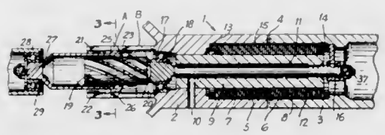
ACTUATED SPRING CLUTCH ASSEMBLY

Robert A. Stone, Sandy Hook, and Jules G. Kish, West Haven, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1988, Ser. No. 288,410

Int. Cl.[5] F16D *11/06, 13/06*

U.S. Cl. 192—41 S **9 Claims**



1. A spring clutch assembly having an input clutch member; an output clutch member, the input and output members having bores extending therethrough, each member being separably rotatable; an arbor extending through the bores in both members; a clutch spring placed on the arbor, each member having a drive surface engageable by the spring; the spring clutch assembly further comprising:

a shaft, disposed in a passage in the arbor, the shaft extending through the arbor and being rotatable therein;

spring engagement means fixed to the shaft for engaging the spring;

rotating means, engaged to the shaft, for rotating the shaft relative to the arbor in response to a control signal.

4,926,992

ELECTROMAGNETICALLY OPERABLE FRICTION-DISK CLUTCH

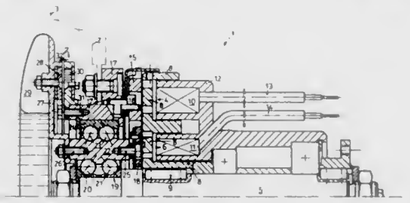
Karl-Heinz Linnig, Kapitän Wagnerstrasse 34, 7990 Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 17, 1988, Ser. No. 275,771

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739537

Int. Cl.[5] F16D *27/08*

U.S. Cl. 192—48.2 **10 Claims**



1. A torque-transmitting assembly comprising

(a) a drive shaft adapted to be rotated by external power;

(b) an output member mounted on the shaft for rotation thereon;

(c) an eddy-current coupling mounted on said shaft for rotation thereon and including

(1) a rotatable driving member;

(2) a rotatable driven member being unitary with said output member; and

(3) magnetic force-transmitting means for applying a driving torque from the driving member to the driven member upon rotation of the driving member;

(d) a ball bearing mounted on said shaft for rotation thereon and including

(1) a series of radially inner bearing balls;

(2) a series of radially outer bearing balls;

(3) an inner ring surrounded by said series of radially inner bearing balls and being seated on said shaft;

(4) an outer ring surrounding said series of radially outer bearing balls and supporting said output member; and

(5) a rotary intermediate ring extending between and being in a contacting relationship with the radially inner bearing balls and the radially outer bearing balls; the intermediate ring being affixed to said rotatable driving member of the eddy-current coupling; and

(3) a clutch mounted on said shaft and having an engaged state in which said clutch maintains a torquetransmitting connection between said shaft and said intermediate ring, whereby said shaft drives the rotatable driving member of said eddy-current coupling through said clutch and said intermediate ring; said clutch further having a disengaged state in which said torque-transmitting connection between said shaft and said intermediate ring is absent.

4,926,993

RELEASE BEARING UNIT

Hirotaka Kusumoto, and Toshihiko Shiraki, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Mar. 18, 1988, Ser. No. 170,334

Claims priority, application Japan, Mar. 18, 1987, 62-64781

Int. Cl.[5] F16D *23/14*

U.S. Cl. 192—98 **6 Claims**

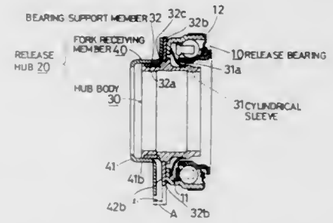
1. A release bearing unit comprising:

a release bearing; and

release hub means for receiving a release fork of a clutch, said release bearing being coupled to the circumference of said release hub means, said release hub means further comprising;

a hub body having a generally cylindrical sleeve and a bearing support member, said generally cylindrical sleeve having a longitudinal axis, said bearing support member having a cylindrical portion positioned on a side of said generally cylindrical sleeve and having a flange in contact with said release bearing, and

fork receiving means for engaging the release fork of the clutch, said fork receiving means being positionable on said cylindrical portion of said bearing support member and thereafter being retained relative thereto for preventing rotational and axial movement between said fork



receiving means and said cylindrical portion of said bearing support member, said fork receiving means additionally having at least one projection portion defining a clearance between said fork receiving means and the flange of the bearing support member when said fork receiving means is positioned on said cylindrical portion of said bearing support member.

4,926,994

AUTOMATIC CLUTCH CONTROL APPARATUS

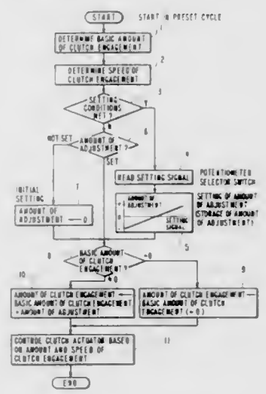
Toshifumi Koshizawa, Kawasaki; Kiyomi Ohkawa, Fujisawa, and Teruhiko Horiuchi, Yokohama, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Continuation of Ser. No. 95,649, Sep. 14, 1987, abandoned. This application Sep. 12, 1989, Ser. No. 406,809

Claims priority, application Japan, Sep. 13, 1986, 61-216426

Int. Cl.[5] F16D *25/14;* **B60K** *41/28*

U.S. Cl. 192—110 R **7 Claims**



1. An automatic clutch control apparatus for controlling a clutch actuator for engaging and disengaging a clutch on a vehicle, comprising:

means for automatically determining a basic amount of engagement of the clutch from a position to start engaging the clutch based on operating conditions of the vehicle;

means for manually setting an amount of fine adjustment of

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the automatically determined amount of engagement of the clutch; and

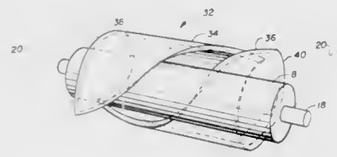
control means for controlling an amount of engagement of the clutch based on the automatically determined basic amount of engagement and the manually set amount of fine adjustment.

4,926,995

SEPARABLE ROLLER SLEEVE

Kenneth A. Kauffman, York, Pa., assignor to KRB Machinery Co., York, Pa.

Filed Sep. 26, 1988, Ser. No. 249,106
Int. Cl.[5] B65G *13/00*
U.S. Cl. 193—37 4 Claims



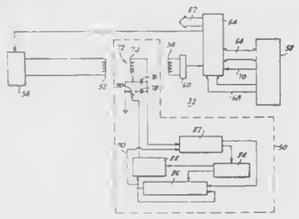
1. In combination with a typical roll conveying machine having a plurality of conveyor rollers, a separable roller sleeve adapted to be twistably opened and oriented manually for enclosable installation upon a bare conveyor roller of said typical roll conveying machine said separable roller sleeve comprising, a relatively thick walled resilient tubular member of uniform construction throughout having a length with opposite longitudinal ends and an interior cross-sectional diameter closely complementary but oversize to that of said bare conveyor roller by such an amount so as to provide a mechanically loose fitting disposition therebetween, and an unimpeded longitudinally extending compression closing spiral through-wall separation extending from one longitudinal end to the opposite longitudinal end thereof.

4,926,996

TWO WAY COMMUNICATION TOKEN INTERROGATION APPARATUS

David Eglise, Windsor, and Adrian Lewis, Lymington, both of England, assignors to Mars Incorporated, McLean, Va.

Division of Ser. No. 678,509, Dec. 5, 1984, Pat. No. 4,674,618. This application Jun. 22, 1987, Ser. No. 64,877
Claims priority, application United Kingdom, Dec. 6, 1983, 8332443; Oct. 4, 1984, 8425079
Int. Cl.[5] G07F *7/10*
U.S. Cl. 194—212 26 Claims



1. A token reading device for communicating with a data-storing token, said device comprising:

inductive coupling means for inductively coupling said reading device with said token, the inductive coupling means comprising transmitting antenna means for transmitting a signal to a token, said signal directly supplying power to said token;

signal generating means for generating and applying said signal to said antenna means, said signal generating means comprising means for modulating said signal in dependence on data to be transmitted to said token; and

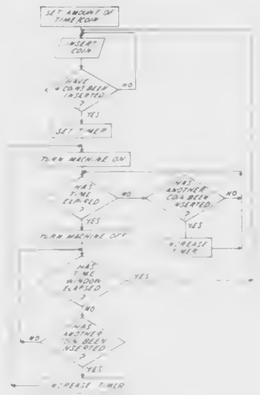
data detection means coupled to said inductive coupling means for detecting changes in the transmitted signal caused by alterations of the impedance of said token, thereby detecting data transmitted by the token.

4,926,997

APPARATUS AND METHOD FOR RESTARTING A COIN OPERATED DEVICE AFTER EXPIRATION OF TIME

Donald O. Parker, 1003 Spring St., Grand Rapids, Mich. 49503

Filed Sep. 22, 1988, Ser. No. 247,705
Int. Cl.[5] G07F *17/20, 5/16*
U.S. Cl. 194—231 18 Claims



1. In a coin operated device, an apparatus comprising, in combination,

means for accepting deposited coins;

means for activating the device in response to at least a first predetermined plurality of deposited coins for a full preset first time period responsive to said deposited coins and deactivating said device upon the end of said first time period; and

means for restarting said device for a second time period less than said first time period within a preset time window following expiration of said first time period in response to a deposit of less than said first predetermined plurality of coins.

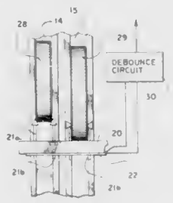
4,926,998

COIN SENSER FOR PAY TELEPHONE

Jan P. Finegan, 2871 Parkridge Rd., Chamblee, Ga. 30319

Filed Oct. 27, 1988, Ser. No. 263,410
Int. Cl.[5] G07D *5/08*
U.S. Cl. 194—315 7 Claims

1. Coin detecting apparatus, in combination with a coin sorting device, said coin sorting device including means for receiving coins, means for sorting coins by denomination, and a plurality of chutes, each chute of said plurality of chutes receiving one denomination of coin, said coin detecting apparatus including an integral insulating block extending across said plurality of chutes in a position to be struck by the coins, a plurality of pins fixed to said block and extending upwardly from said block into said chutes, and circuit means carried by said block and electrically connected to said pins, said pins having a sloped portion disposed within said chute for engagement by a coin, and an apex of said pins disposed beyond said chute so that a coin falling within said chute cannot engage said apex.

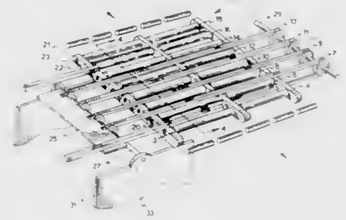


4,926,999

RIGHT ANGLE FLOW-THROUGH JUMP TRANSFER CONVEYOR SYSTEM

Frederick E. Fauth, Sr., Towson, and Paul E. Barkley, Sykesville, both of Md., assignors to American Bottlers Equipment Co., Inc., Owings Mills, Md.

Continuation of Ser. No. 129,189, Dec. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 76,183, Jul. 15, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 344,805
Int. Cl.[5] B65G *43/08*
U.S. Cl. 198—358 21 Claims



1. A right angle jump transfer for a conveyor system, said right angle jump transfer having a plurality of parallel rollers disposed in a planar array, comprising:

(A) a plurality of flexible strips interposed between said rollers each of said flexible strips being supported at its ends by a pair of end pulleys, said end pulleys being disposed outside the ends of said rollers;

(B) a first support member means supporting each of said plurality of flexible strips for tensioning, raising and lowering said strips, said first support member means being disposed between said pair of end pulleys and comprising:

(1) an elongated solid lubricant strip means to directly receive said flexible strip thereon,

(2) a shape d member directly mounted below said lubricant strip means, and

(3) a first actuator cylinder for moving the shaped members upwards or downwards, whereby said plurality of flexible strips are raised and lowered relative to and independent from said end pulleys;

(C) first driving means for driving said plurality of rollers;

(D) second driving means for driving said plurality of strips, at least one of each pair of said end pulleys being operably coupled to said second driving means; and

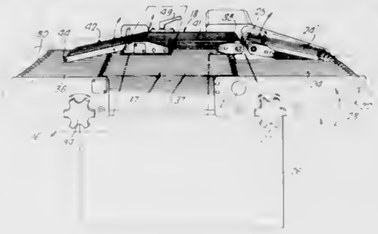
(E) first sensing means for detecting a predetermined condition in the flow of articles along said conveyor system on said right angle jump transfer.

4,927,000

CONVEYOR SYSTEM

Trevor B. Hoyland, and Richard Payne, both of Norfolk, England, assignors to Thurne Engineering Co., Ltd., Norfolk, England

Division of Ser. No. 131,977, Dec. 10, 1987, Pat. No. 4,846,336. This application Jan. 6, 1989, Ser. No. 294,026
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642123; United Kingdom, Aug. 12, 1987, 8719101
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—418.4 6 Claims



1. A conveyor system for positioning slices of meat or other foodstuffs by converting M input streams of products into N output streams of products where M is an integer greater than one and N is an integer less than M, said system comprising:

input conveyor means for conveying said M input streams;

output conveyor means for conveying said N output streams; and

at least one multi-element strip conveyor, said multi-element strip conveyor having:

an upstream input end;

a downstream output end;

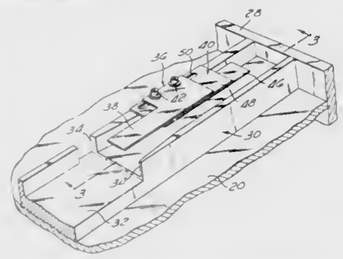
lateral movement means to move laterally said downstream output end; and

a series of parallel conveying elements, said conveying elements being arranged to conform as said downstream end of said multi-element strip conveyor moves laterally, said upstream input end of said multi-element strip conveyor being arranged to receive products from an input stream on said input conveyor means, and said downstream end being arranged to deposit products into an output stream shifted laterally with respect to said input stream,

wherein said input conveyor means separates said input streams in a vertical direction, wherein said vertically separated input streams M are moved laterally by said multi-element strip conveyor such that said streams are overlapped, and wherein said multi-element strip conveyor includes at said upstream, input end, a grooved drive roller and, at said downstream end, grooved idler roller means both receiving said conveying elements of said strip conveyor, said idler roller means being movable laterally with respect to the drive roller by said lateral movement means and said conveying elements of said multi-element conveyor being elastic to accommodate changes in length between said idler roller means and said drive roller as said idler roller means is moved laterally.

VOL
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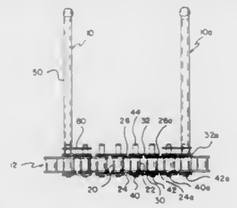
4,927,001
ADJUSTABLE COMPONENT COVER PLATE FOR VIBRATING CONVEYOR
Ross D. Hendricks, Palos Verdes Peninsula, Calif., assignor to Excellon Automation, Torrance, Calif.
Filed Feb. 19, 1988, Ser. No. 157,930
Int. Cl.[5] B65G *47/00*
U.S. Cl. 198—463.5 **15 Claims**



1. An apparatus for maintaining the orientation of a plurality of electronic components advancing toward a first predetermined location, said components adapted to be singularly lifted from said first predetermined location and moved to a second predetermined location, said apparatus comprising:
a feed tray having a trough, said trough having an upwardly facing surface adapted to provide a path for guiding said components toward said first predetermined location, said components being oriented in said trough in a plane substantially parallel to the plane of said upwardly facing surface;
a stop plate, located at one end of said feed tray, proximate to said first predetermined location, said stop plate adapted to retaining said components on said feed tray until they are subsequently lifted therefrom; and
a component cover plate extending across said trough for preventing said components from being canted within said trough, said cover plate comprising:
a flap which is positioned directly above and which at least partially overhangs a component disposed at a first predetermined location, said flap having sufficient flexibility to allow said component to be lifted from said feed tray past said flap, in a direction substantially perpendicular to the direction in which said components advance, yet being rigid enough to prevent canting of a component at said first predetermined location; and
a backing plate positioned directly above said flap so as to restrict deflection of said flap.

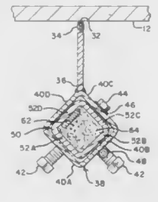
4,927,002
CONVEYOR CHAIN HAVING DETACHABLE MEMBER FOR CARRYING ARTICLES
Charles G. Springman, Beech Grove, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.
Filed May 10, 1989, Ser. No. 349,815
Int. Cl.[5] B65G *17/12*
U.S. Cl. 198—487.1 **16 Claims**

1. An improved article carrying member for detachable mounting to link pin ends protruding from a roller type chain conveyor, said member comprising:
a shaft with a socket at one end adapted to be press fitted onto a first link pin; and
a supplemental link plate secured to said shaft spaced from said one end, said supplemental link plate having an opening, said opening being of a size and spaced from said shaft sufficient to be press fitted to a second link pin adjacent to said first link pin, whereby both said socket and said supplemental link plate will be readily separable from said



first and second link pins upon excessive load or impact on said shaft.

4,927,003
HEATED CONVEYOR BELT CLEANER
Robert T. Swinderman, Kewanee, and David W. Mueller, Neponset, both of Ill., assignors to Martin Engineering Company, Neponset, Ill.
Filed Jun. 2, 1989, Ser. No. 360,444
Int. Cl.[5] B65G *45/10*
U.S. Cl. 198—497 **7 Claims**



1. A heated conveyor belt cleaner including a support shaft positioned adjacent the belt to be cleaned and generally transverse to its direction of travel, heating means including an electrical resistance heating element disposed internal to said shaft said heating element adapted to generate heat within said shaft and to thereby heat said shaft, at least one mounting sleeve slidably supported on said shaft for mounting a belt scraper element, at least one belt scraper element adapted to be positioned in contact with said belt to be cleaned and connectable to said mounting sleeve and, through said mounting sleeve, to said shaft such that heat generated by said heating element within said shaft is communicated from said shaft through said mounting sleeve to said scraper element to heat said element for effective removal of adherent materials from said conveyor belt.

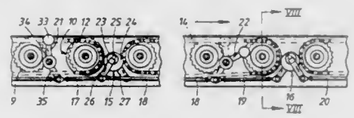
4,927,004
FEEDER
Timothy H. Leaton, Ascot, Great Britain, assignor to Etablissement Gersan, Vaduz, Liechtenstein
Filed Mar. 2, 1988, Ser. No. 163,004
Claims priority, application United Kingdom, Mar. 2, 1987, 8704830
Int. Cl.[5] B65G *17/36*
U.S. Cl. 198—704 **11 Claims**

1. A feeder for single feeding of discrete objects at a predetermined spacing and at a predetermined velocity, the feeder comprising:
a series of spaced containers, each for receiving a single said object;
means constraining the containers to circulate in a closed path comprising a feed section in which the containers descend substantially vertically through a substantial distance, at said predetermined spacing, the feed section having an upper end and a lower end;
driving means for driving the containers around said path whereby the containers descend in said feed section at said predetermined velocity; and



discharging means for discharging the object from each successive container at the lower end of said feed section without imposing any substantial lateral forces on the object during discharge; and
wherein each container includes a bottom which comprises generally planar openable parts whose lower portions are of generally triangular shape and co-act to form the bottom of the container, said discharging means being for opening said parts.

4,927,005
ACTUATOR
Lars Sirefelt, Sisjövägen 321, S-436 00 Askim, Sweden
PCT No. PCT/SE88/00057, § 371 Date Oct. 19, 1988, § 102(e) Date Oct. 19, 1988, PCT Pub. No. WO88/06134, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 15, 1988, Ser. No. 264,953
Claims priority, application Sweden, Feb. 19, 1987, 8700675
Int. Cl.[5] B65G *13/06*
U.S. Cl. 198—781 **3 Claims**



1. Actuator included in a roller conveyor having a plurality of rotatable driving rollers (2–7) which are connected as sections to a driving device via a switching device (10) for each section, the sections of driving rollers being arranged to be switched by means of said switching devices between a driven state and a disengaged state depending on the presence of goods (30,31) on the respective section and the preceding section, the presence being sensed by means of a sensing member (33,36) provided for each section, said actuator (15,16) being provided at each switching device (10) for mechanically switching the switching device between at least two functional positions and comprising a rotationally symmetrical inner rotatable member (23) which is rotatably journalled by means of an eccentrically located axle (25), and, around said inner rotatable member, an eccentrically journalled outer rotatable member (24), which is provided with surfaces which by changing position, influence said switching device, the inner rotatable member (23) and the outer rotatable member (24) being arranged to assume different rotational positions, in part by rotation of the inner rotatable member about an axle (25), thereby setting the outer rotatable member in its rotational movement, and in part by rotation of the outer rotatable member (24) relative to the inner rotatable member, thus causing the said changing of position of the said actuator members, and said switching device being provided with an element (28) for switching the switching device between an engaged position and a disengaged position upon switching by means of the actuator (15,16) between a centric and an eccentric position, said sensing member (33,36) of each section being arranged, in the presence of goods on a certain section, to swing in part a first swinging arm (26) of the actuator belonging to this section and in part a second swinging arm (27) of the actuator (15,16) belonging to the following section.

4,927,006
INTERNALLY STABILIZED SLIDE CONVEYOR
Michael S. Dolan, Denver, Colo., assignor to Serpentix Conveyor Corporation, Westminster, Colo.
Filed Sep. 29, 1988, Ser. No. 250,939
Int. Cl.[5] B65G *11/10*
U.S. Cl. 198—822 **17 Claims**



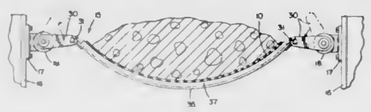
1. A conveyor, comprising:
a conveying surface capable of carrying a bulk load along a longitudinal path;
a track assembly including:
a generally horizontal, longitudinally extending guide surface located below the conveying surface;
a longitudinally extending side wall, extending upwardly from said guide surface; and
a longitudinally extending lip attached to said side wall at a position spaced above the guide surface and below the conveying surface, overhanging a portion of the guide surface and defining a slot between the guide surface and the lip;
an elongated pulling element comprising a chain formed of alternating vertical and horizontal links and operable over said guide surface;
a joining means associated with the pulling element for connecting the pulling element to the conveying surface; and
a laterally extending stabilizer comprising first and second blocks, each attached to an opposite lateral side of said chain, received in said slot between the guide surface and said lip, the stabilizer being of sufficient size with respect to the slot that when twisting forces are applied to the pulling element, the stabilizer is tilted into contact with an inner surface of the slot.

4,927,007
CONVEYOR SUPPORT
James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Sep. 27, 1989, Ser. No. 413,145
Int. Cl.[5] B65G *15/08*
U.S. Cl. 198—823 **5 Claims**

1. A troughing conveyor support assembly for supporting a

VOL
1114
ISS
4
MY
22
1990
UMI

conveyor belt for longitudinal movement thereover comprising an elongated flexible belt support, said belt support having an elongated and transversely extending flexible backing layer, said backing layer having a layer of low friction material adhered thereto for supporting the passage of said conveyor belt thereover, said backing layer having a pair of end portions, a pair of torsion springs, each torsion spring having a shell member and a shaft member, each of said torsion springs having an



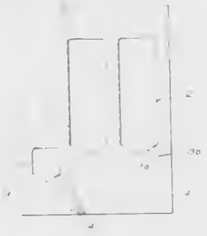
elastomeric sleeve interconnecting said shell member and said shaft member for relative rotational movement of one of said members relative to the remaining one of said members, each torsion spring having one of said members connected to one of said end portions of said backing layer, a pair of rigid supports respectively connected to the other one of said members of said torsion springs to provide a catenary support to said conveyor belt under load.

4,927,008

MULTI-CELLED PAPERBOARD CONTAINER WITH V-SHAPED WINDOWS

Ronald G. Platt, Chicago, Ill., assignor to Perfect Carton Corporation, Chicago, Ill.

Filed Jul. 31, 1989, Ser. No. 386,981
Int. Cl.[5] B65D *25/00*
U.S. Cl. 206—45.31 **10 Claims**



1. In a paperboard container for carrying a cylindrical article, the container having a wall structure including site, bottom, front, and back walls with the side or front or back walls comprising at least one cut-out window useful for viewing the cylindrical article conveyed by said container, the container characterized in that the bottom of the cut-out window is generally V-shaped so as to facilitate the loading of the cylindrical articles into the container.

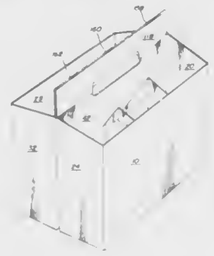
4,927,009

ARTICLE CARRIER

James T. Stout, Ellijay, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 27, 1989, Ser. No. 343,968
Int. Cl.[5] B65D *85/40*
U.S. Cl. 206—188 **3 Claims**

1. An article carrier comprising:
a bottom wall;
opposed side walls joined to said bottom wall along opposite side edges thereof;
end wall panels joined respectively to the end edges of said side walls and extending inwardly of the carrier;
a first pair of riser panels foldably joined respectively to said end wall panels at one end of the carrier, foldably joined to each other along a riser fold line, and extending medially inward of the carrier;
a second pair of riser panels foldably joined respectively to said end wall panels and extending medially inward of the carrier;
a pair of handle panels foldably joined respectively to said first pair of riser panels, and foldably joined to each other along a handle fold line;



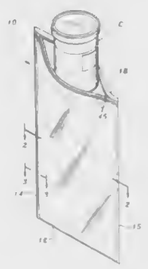
said first pair of riser panels having a plurality of elongated openings defined therethrough and lying with their axis of elongation along said riser fold line to extend into each of said first pair of riser panels, and thereby to define segments of said riser fold line separated by said openings;
at least one of said elongated openings having side edges extending inwardly from each end of said one opening to lie along said riser fold line.

4,927,010

SHIPPING BAG FOR CONTAINERS OF POTENTIALLY BIOHAZARDOUS LIQUIDS

Charles P. Kannankeril, North Caldwell, N.J., assignor to Sealed Air Corporation, Saddle Brook, N.J.

Filed Dec. 27, 1988, Ser. No. 290,695
Int. Cl.[5] B65D *81/26*
U.S. Cl. 206—204 **11 Claims**



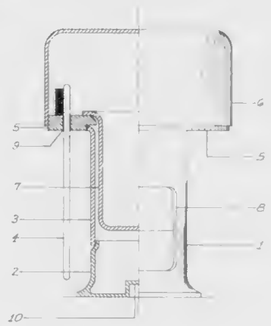
1. A shipping bag for containers of potentially biohazardous liquids characterized by the ability to absorb such liquid upon rupture of the container and to protect persons handling the bag from contact with such liquid, said bag comprising:
(a) first and second outer panels formed of liquid impervious material connected along opposed side edges and one end to define an open top liquid impervious body portion;
(b) liquid absorbing means confined within said body portion and comprising a pair of absorbent pads arranged adjacent each of said first and second outer panels;
(c) first and second inner panels formed of liquid permeable sheet material made of hydrophobic filaments, wherein said inner panels are confined within said body portion and disposed parallel to said first and second outer panels and respectively connected therewith along said opposed side edges and opposite ends to define an open inner space in communication with said open top and separating said liquid absorbing means from said inner space; and
(d) closure means at said open top to sealingly close said inner space and retain any liquids within said body portion to protect persons handling the shipping bag from contact with potentially biohazardous liquid.

4,927,011

STORAGE DEVICE FOR PERSONAL DENTAL HYGIENE AND ORAL CARE PRODUCTS

William T. Wilkinson, P.O. Box 378, Chesapeake City, Md. 21915

Filed Nov. 6, 1989, Ser. No. 432,224
Int. Cl.[5] A47B *49/00*; A45D *40/00*
U.S. Cl. 206—217 **11 Claims**



1. A storage system for personal care items for dental hygiene and oral care comprising:
a storage tube with an interior and exterior surface and two ends, one end closed and used as the base and the other end open;
a toothbrush ring with outer and inner rims mounted on the open end of storage tube, the outer rim of the toothbrush ring extends beyond the exterior surface of the storage tube and contains a plurality of apertures in which toothbrushes hang and the inner rim extends inside the interior surface of the storage tube;
a rinse cup with an exterior flange on an open end to catch the interior rim of the toothbrush ring such that the rinse cup is stored within the storage tube and rests on the inner rim of the toothbrush ring; a rinse cup lid which rests on the rim of the toothbrush ring covering the exterior flange of the rinse cup.

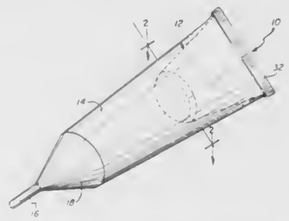
4,927,012

PACKAGING ASSEMBLY FOR SUBSTANCES TO BE POST-MIXED

John P. Rowe, 321 Green Hill Road, Madison, Conn. 06443

Filed Feb. 3, 1989, Ser. No. 305,620
Int. Cl.[5] B65D *25/08*
U.S. Cl. 206—219 **6 Claims**

1. A packaging assembly for substances that are to be post-mixed, comprising: a tube that is integrally formed as a single piece from a synthetic resinous material, having forward and rearward ends with a continuous cavity of forwardly diminishing cross section extending therethrough and containing a first flowable substance, said tube including a closed, pliant body portion at said rearward end and a close d nozzle portion at said forward end thereof; and an ampule smaller than and contained within said tube and integrally formed as a single piece from a synthetic resinous material, said ampule having forward and rearward ends with a continuous cavity of forwardly diminishing cross section extending therethrough and containing a second flowable substance therewithin, and including a closed, pliant body portion at said rearward end and a closed frangible portion at said forward end thereof, said frangible portion being adapted to be fractured under manually applied compressive force to open said ampule, and being comprised of;
(a) a generally cylindrical sidewall element with an outer end;



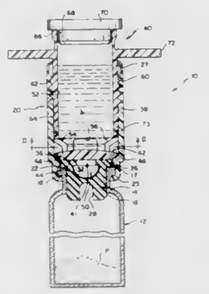
(b) a blunt end wall element extending transversely across said forward end of said ampule; and
(c) a transition element extending between said outer end of said sidewall element and said end wall element, and connecting them to one another, said transition element forming a sharp internal angle having a value of about 90° or less at one of the intersections with said sidewall element and said end wall element, over which angle said material is relatively thin; whereby compressive force applied in the region of said transition element will concentrate stress at said one intersection, thereby tending to cause fracture thereat.

4,927,013

PACKAGE FOR STORING AND REMIXING TWO MATERIALS

Nicholas Van Brunt; Jeffrey C. Robertson, both of Rochester, and Daniel Homa, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1989, Ser. No. 336,986
Int. Cl.[5] B65D *25/08, 81/32*
U.S. Cl. 206—221 **7 Claims**



1. In a bottle package containing a first material in a first portion, a second material in a second portion for mixing with said first material after storage, and a barrier between said portions for maintaining the materials temporarily separate from each other, one of said portions comprising a bottle;
the improvement wherein each said portion has an outlet capable of providing material access to said other portion,

and said barrier comprises a stopper in each of said outlets, the stopper in said first portion being susceptible to leaching in the presence of the second material and the stopper in said second portion being effective to seal off the second material from access to said outlets and said stopper in said first portion,

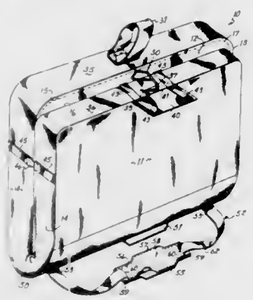
and a plunger extending from and movably mounted in said second portion, said plunger having means for permanently attaching both of said stoppers and means for sealing at least one of said stoppers to the outlet receiving said stopper of said first portion, said plunger including means for manual engagement to allow said stoppers to be pulled away from said outlets, whereby the second material can be added to the first material after storage is no longer needed.

4,927,014

GARMENT BAG WITH FLAP COVER FOR STRAP HOOK

John V. Pulichino, Jr., Providence, R.I., assignor to American Tourister, Inc., Warren, R.I.

Filed Jun. 26, 1989, Ser. No. 371,108
Int. Cl.[5] A95C *5/06, 5/12, 13/10, 13/34;* **A40C** *5/12*
U.S. Cl. 206—287.1 **1 Claim**



1. A garment bag comprising:

an elongated bag having free ends,

a carrying handle and strap at the center of said bag,

said bag being foldable upon itself to bring said free ends together to form the lower end of the bag when it is carried by said handle or strap,

a hook connected by a long, flexible strap to one free end, a retaining loop on the other free end to receive said hook to hold said free ends together,

a flap hinged to said other free end adjacent said retaining loop, hook-and-loop fastener means on said flap and free end, respectively, to secure said flap against said free end overlying said hook when said hook is in said retaining loop, thereby keeping said hook from dangling when said bag is being carried by said handle or strap.

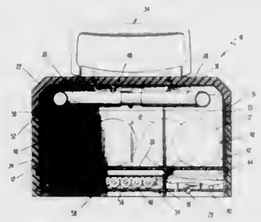
4,927,015

LUMINOUS GOLF BALLS AND CARRYING CASE THEREFOR

John S. Jones, 3729 N. Frontage Rd., Lakeland, Fla. 33804

Filed Jun. 21, 1989, Ser. No. 369,378
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—315.9 **18 Claims**

18. The carrying case of claim 17, wherein a first position of said switch means conductively couples said source of electromagnetic radiation and said battery pack and wherein a second



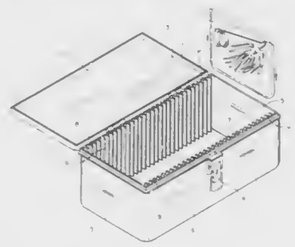
position of said switch means conductively couples said source of electromagnetic radiation and said solar panel means.

4,927,016

SPINNER BAIT BOX AND STORAGE SYSTEM

Jimmie G. Fuller, 113 W. Davies St., Anna, Ill. 62906

Filed Apr. 17, 1989, Ser. No. 338,886
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—315.11 **5 Claims**



1. A spinner bait box, comprising:

(a) an outer shell having front and rear vertical walls, end walls and an upper lid hingedly attached to said rear wall, wherein said front and rear walls have a plurality of corresponding vertical ribs therein which form individual packet spaces; and

(b) a plurality of individually removable spinner bait packets, wherein each packet comprises a stiff back portion and a pliable, expandable, clear front portion, said back and front portions being permanently attached along the sides and bottom thereof and forming a spinner bait receiving compartment, each of said packets being located within one of said packet spaces.

whereby said packets are secured in place by said ribs and said lid when closed and whereby a plurality of spinner bait lures may be stored, interchangeably categorized and conveniently viewed.

4,927,017

PROTECTIVE COVERING FOR VIDEO CAMERA OR THE LIKE

Michael D. Easter, 840 J. St., Penrose, Colo. 81240

Filed Sep. 26, 1989, Ser. No. 412,843
Int. Cl.[5] B65D *85/38*
U.S. Cl. 206—316.2 **11 Claims**

1. A cover for a video camera or the like, the camera having a main camera housing a lens tube, a microphone, a viewing tube, a hand strap with Velcro fastening devices, and a shoulder strap and comprising:

a shield means for mounting on the camera in a fixed mounting position thereon with a forward portion extending forwardly beyond the forward end of the lens tube a sufficient distance to provide a shield against moisture in the atmosphere and blocking of wind from the microphone;

fastening strap means mounted on said shield means for holding said shield means on the camera housing in the shielding position;



a flexible cloth-like bag means for providing a cavity therewithin of sufficient size and shape to receive and enclose the camera and said shield means; and

an openable and closeable audio and visual signal receiving opening means in a front end portion of said bag means and being located adjacent said forward portion of said shield means for enabling operation of the camera in an open position and for closing the bag means in a storage position.

4,927,018

DISPOSABLE COVERED NEEDLE SAFETY ASSEMBLY

Herbert Yang; Patrick Han, and Frank Yu, all of 6-1 Fl., No. 185, Yungchi Road, Taipei, Taiwan

Filed Dec. 6, 1988, Ser. No. 280,322
Int. Cl.[5] B65D *83/10;* **A61M** *5/00*
U.S. Cl. 206—365 **1 Claim**



1. A disposable covered needle assembly and cover housing for use in conjunction with conventional hypodermic syringes, wherein:

said needle assembly includes: a circular mount, an orifice, a conical end and a needle, said circular mount protruding from an outer surface of the needle assembly proximate to the orifice, catch slots being vertically oriented on an upper portion of said circular mount with slanted surfaces therebetween, said slanted surfaces all slanting in a same radial direction, said orifice being inwardly tapered to frictionally engage with a discharge nozzle of said hypodermic syringe, a needle being set on an end opposite to said orifice with a needle cover thereon;

said cylindrical cover housing slidably and frictionally encompasses said hypodermic syringe, said cover housing having inward projections on an inner surface thereof proximate to said main opening, said main opening has a lip therearound to act as a grip for said cover housing, said inward projections also having a U-shaped slot therearound so as to be outwardly flexible when said hypodermic syringe is inserted into or retracted from said cover housing, said cover housing having a circular aperture at an end opposite said inward projections for allowing a lower portion of said needle assembly to pass therethrough;

said inward projections frictionally fit into said catch slots before said disposable covered needle assembly is used, a lower portion of said needle assembly being projectable from said circular aperture by pulling said lip towards a stop on an end of said hypodermic syringe, said lower portion of said needle assembly being retractable from said circular aperture by pulling said cover housing away from said stop so that said inward projections flex to be turnable on said slanted surface and to frictionally engage with said catch slots and to totally enclose said needle assembly inside of said cover housing for waste disposal after use on a patient.

4,927,019

COMBINATION NEEDLE SHEATH AND STERILITY PACKAGE

Terry M. Haber, El Toro; William H. Smedley, Lake Elsinore; Clark B. Foster, Laguna Niguel, and John A. Lewis, Jr., Costa Mesa, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Jun. 12, 1989, Ser. No. 364,233
Int. Cl.[5] B65B *85/24*
U.S. Cl. 206—365 **20 Claims**



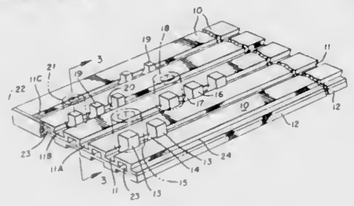
1. For a double ended needle cannula to be positioned in fluid communication with the cylinder of a hypodermic syringe and being supported by a needle hub that is adapted to be mated to said cylinder so that the cannula may communicate therewith, a combination needle sheath and sterility package comprising:

first needle cover means detachably connected to the needle hub to surround and protect the distal end of the double ended cannula; and

second needle cover means to surround and protect the proximal end of the cannula, said second needle cover means having an open end dimensioned to receive a portion of the syringe cylinder therethrough between the second needle cover means and the needle hub so that the needle hub can be mated to said cylinder with the proximal end of the cannula in fluid communication thereiwth, said second needle cover means being coaxially aligned with and slidable axially over said first needle cover means when the needle hub is mated to the cylinder of the syringe.

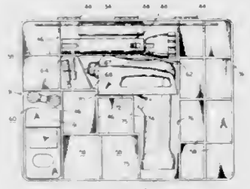
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4,927,020
HOLDER FOR SOCKET WRENCH HEADS
Frank Randy, 5 N. Greenwood Ave., New Castle, Pa. 16101
Filed Mar. 13, 1989, Ser. No. 322,359
Int. Cl.[5] B65D *85/20*
U.S. Cl. 206—378 1 Claim



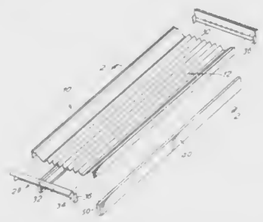
1. An improved apparatus for organizing and holding individual socket wrench heads of tools having sets of said socket wrench heads, said heads having a squared opening in one end adapted to engage a drive member and having the other end shaped to engage nuts and bolt heads, the improved apparatus comprising: a base member in the form of a flat body having upper and lower surfaces, a plurality of transversely parallel dove-tailed grooves in said upper surface thereof and a plurality of cross sectionally square posts, each having a dove-tailed downward extension adapted to fit into said dove-tailed grooves in said base member and said cross sectionally square posts fitting with frictional engagement in said squared openings in said socket wrench heads, channels formed in said lower surface of said flat body intermediate said spaced parallel dove-tailed grooves whereby the base member may be temporarily bowed transversely in a direction to increase the width of said dove-tailed grooves to permit the downturned extensions on the cross sectionally square posts to be movably placed therein.

4,927,021
INSTALLER'S BRIEFCASE
Steven C. Taylor, 1413 Kesser Dr., Plano, Tex. 75023
Filed May 26, 1987, Ser. No. 53,621
Int. Cl.[5] B65D *85/28*
U.S. Cl. 206—373 6 Claims



1. A box for retaining tools and fasteners, comprising:
a bottom section including a rigid bottom, a rigid front wall, rigid side walls and a rigid back wall, said walls extending to a first height perpendicular to said bottom;
a lid section hingedly coupled to said bottom section, having a rigid top, a rigid front wall, rigid side walls and a back wall, said walls extending to a second height perpendicular to said top;
a plurality of rigid partitions extending from said bottom perpendicular to said bottom for a height approximately equal to said first and second height combined to form a plurality of compartments such that when said lid section is closed onto said bottom section with the respective front, side and back walls of said bottom and lid sections contacting each other, said rigid top contacts a top region of said rigid partitions to prevent articles from moving from one compartment to another even though said toolbox is inverted or laid on its side; and
said compartments including at least one compartment having a first power tool and a second power tool enclosed therein simultaneously, said at least one compartment being shaped to retain said first power tool having a first size and shape and said second power tool having a different size and shape from said first power tool's size and shape, said first power tool being retained by contacting first and second partitions which form said at least one compartment and said second power tool of a different size and shape being retained by contacting a plurality of partitions, said first and second power tools being enclosed in said box in a nested relationship, said first power tool being enclosed by contacting said rigid bottom, said first and second partitions and said second power tool being enclosed by contacting said rigid top, a plurality of partitions and said first power tool.
5. Tools and a toolbox for retaining said tools, comprising:
a bottom section including a rigid bottom, a rigid front wall, rigid side walls, and a rigid back wall, said walls extending perpendicular to said bottom;
a lid section hingedly coupled to said bottom section, having a rigid top, a rigid front wall, rigid side walls, and a back wall;
a plurality of rigid partitions extending from said rigid bottom perpendicular to said bottom to form a first compartment, said first compartment having a projecting lip formed by said partitions and defining a boundary of said compartment; and
an electric drill and a staple gun enclosed in a nested relationship within said first compartment, wherein said staple gun overlies said electric drill, said electric drill being enclosed by being restrained by said rigid bottom, and a plurality of partitions of said first compartment and said staple gun, said staple gun being enclosed by being restrained by said rigid top, said projecting lip, and a plurality of partitions and said electric drill.

4,927,022
CORE TRAYS
John D. Wilson, Sandton, South Africa, assignor to Corstor (Proprietary) Limited, Johannesburg, South Africa
Filed Mar. 14, 1989, Ser. No. 322,905
Claims priority, application South Africa, Jul. 28, 1986, 86/5995; Jul. 30, 1987, 87/5619
Int. Cl.[5] B65D *1/36*
U.S. Cl. 206—443 28 Claims



1. A core tray for supporting cores, comprising:
(a) a base plate of shaped sheet planar material having longitudinally extending grooves therein, the sides of which grooves are in transverse section flat and inclined to one another, the cores being supported solely by said sides,
(b) support surfaces running parallel to the grooves whereon a second similar tray can be supported, and

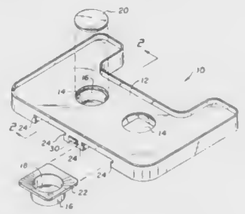
(c) re-inforcing means provided at the ends of the grooves and extending transversely to the tray.

4,927,023
SPACER MEMBER AND METHOD OF FORMING THE SAME
Paul B. Elzey, Kalamazoo, Mich., assignor to EFP Corporation, Elkhart, Ind.
Filed Mar. 24, 1986, Ser. No. 843,015
Int. Cl.[5] B65D *81/02*
U.S. Cl. 206—523 1 Claim



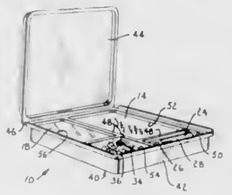
1. A foam member for use as a spacer adjacent a fragile object during storage and shipment, comprising a spacer member of selected dimensions and thickness, a tape adhered to a surface of said member by a first adhesive, a second adhesive applied to said tape at the surface thereof opposite that at which said first adhesive is applied, and a release layer adhered to said second adhesive and serving to connected adjacent spacer members, and a second spacer member of selected dimensions and thickness substantially the same as said first mentioned spacer member, said second spacer member positioned adjacent said first mentioned spacer member, a second tape spaced from said first tape and adhered to a surface of said second spacer member by said first adhesive, said second adhesive applied to said second tape at an opposite surface of said second tape, said release layer being continuous and adhered to said second tape to connect said first and second spacer members.

4,927,024
TRAY FOR A BABY'S CHAIR
Paul M. J. M. T. Lloyd, 8351 Gilbert Road, Richmond, B.C., Canada (V7C 1W4)
Filed Jan. 31, 1989, Ser. No. 305,227
Int. Cl.[5] B65D *1/34*
U.S. Cl. 206—562 6 Claims



1. A tray for a chair comprising:
a main body adapted to attach to a chair;
at least one opening in the main body;
a bowl having an open top to be received in the main body with the open top aligned with the opening in the main body, the bowl being formed with a flange;
a track formed on the underside of the main body to receive the flange, whereby the bowl may be moved along the track to align with the opening in the main body; and
a lid to close the bowl and the opening.

4,927,025
CAST DECORATION KIT
Gregory E. Thompson, 1008 S. Grant, and Paul V. Thompson, 416 E. Mitchell, both of, Marshall, Mo. 65340
Filed Sep. 11, 1989, Ser. No. 405,229
Int. Cl.[5] B65D *69/00*
U.S. Cl. 206—575 17 Claims



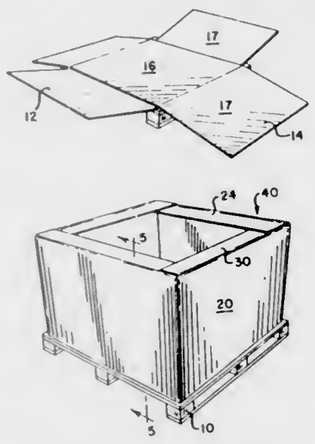
1. A kit for use with a cast said kit comprising:
a marking instrument adapted to mark on the cast;
an instrument holder for releaseably receiving said marking instrument and having means for attaching said holder detachably to the cast;
a decorative fabric sleeve having a size and shape to closely cover the cast to enhance the appearance thereof;
a plurality of decorative articles applicable to the cast to decorate same; and
a package in which said decorative articles, said fabric sleeve, said instrument holder and said marking instrument are all contained.

4,927,026
PALLET BOX
Hans K. Gossler, Munster, Ind., and Charles P. Roberts, Springfield, Ohio, assignors to Navistar International Transportation Corp., Chicago, Ill.
Filed Aug. 2, 1985, Ser. No. 761,999
Int. Cl.[5] B65D *19/00*
U.S. Cl. 206—600 13 Claims

12. A container assembly comprising:
a rigid pallet base;
a first cardboard floor board covering said pallet base and being fixably connected to said pallet, said floor board having foldable end flaps;
a second cardboard floor board covering said first floor board and being nailed to said pallet, said second floor board extending in a direction generally transverse to said first floor board, said second floor board having foldable end flaps; and
a tubular member with a rectangular cross sectional area

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surrounding said floor board end flaps folded in a vertical orientation, and said tubular member having flaps foldable

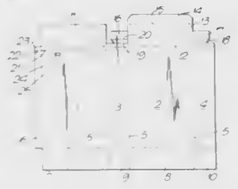


in an alternating overlapping manner to form a fixed top frame border for said container.

4,927,027
RECLOSABLE CARTON

Willem Beute, Zwijndrecht, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,174
Claims priority, application United Kingdom, Jun. 5, 1987, 8713265
Int. Cl.[5] B65D *5/54*
U.S. Cl. 206—611 9 Claims

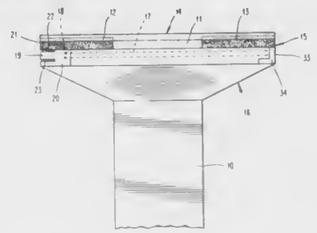


1. A reclosable carton comprising a front wall, a back wall, and two opposite side walls, minor closure flaps foldably attached to the side walls, an inner major closure flap foldably attached to the front wall overlying the minor closure flaps and an outer major closure flap foldably attached to the back wall overlying and adhered to the inner major closure flap to form therewith a reclosable lid to the carton, a tuck-flap attached to the outer major closure flap along an edge opposite the connection to the back wall and folded to overlie the front wall, and tear means extending across the front wall adjacent to the connection between the front wall and the inner major closure flap, the tuck flap being insertable within the carton along the tear means to lie behind the front wall and retain the lid in the reclosed position.

4,927,028
PACKAGE HAVING A TEAR-OPEN STRIP

Gerhard Hemm, Sottrum; Gerhard Clausing, and Heiko Pietzsch, both of Berlin, all of Fed. Rep. of Germany, assignors to Jacobs Suchard AB, Zurich, Switzerland

Filed Jun. 17, 1988, Ser. No. 208,051
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721890; Nov. 2, 1987, 3737111; Mar. 8, 1988, 3807469
Int. Cl.[5] B65D *27/38*
U.S. Cl. 206—618 15 Claims



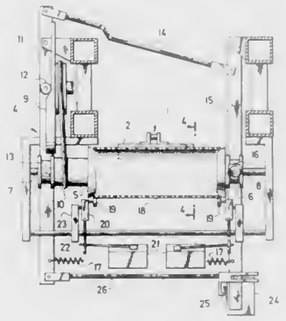
1. A vacuum pack comprising:
- a body of multilayer composite sheet material having a pourable product located therein in the form of a block, said body surrounding the block and extending from both ends thereof, one end of said body extending from said block being provided with a closure seam which extends across said body so that the portion of said body which extends from said block forms a fin fold;
- a tear-open strip on said body located between said block and said closure seam;
- a side weld located along a portion of a side edge of said fin fold, said side weld securing together wall portions of said composite sheet material; and
- a punch cut located in said side weld, said punch cut defining a grip tab which can be grasped and pulled so as to initiate tearing of the pack, said tear-open strip extending across at least a portion of said fin fold and having one end located proximate to said punch cut and another end located distally from said punch cut, the end of said tear-open strip located proximate to said punch cut defining a gripping end of the tear-open strip, said gripping end being spaced from said punch cut so as to ensure that the side weld is tightly sealed and said gripping end of said tear-open strip being positioned in said side weld.

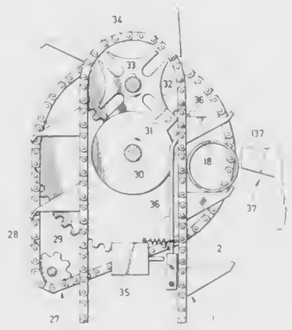
4,927,029
DEVICE FOR CHECKING CYLINDRICAL BODIES, ESPECIALLY TUBES OF OPEN-END SPINNING MACHINES

Jirí Thrlík, Ústí nad Orlicí , Czechoslovakia, assignor to Elitex koncern textilního strojirenství, Liberec, Czechoslovakia

Filed Aug. 30, 1988, Ser. No. 239,163
Claims priority, application Czechoslovakia, Aug. 31, 1987, 6330-87
Int. Cl.[5] B07C *5/00, 5/34*
U.S. Cl. 209—538 1 Claim

1. An apparatus for inspecting cylindrical tubes transported along a feed path from a tube supply container by means of a vertical chain conveyor having a plurality of uniformly spaced feed blades and driven by an intermittent cyclical drive means which advances each cylindrical tube in a stepwise manner through an operative cycle, the apparatus comprising
- said intermittent cyclical drive means comprising a maltese cross wheel whereby during one cycle in which said wheel is driven one complete revolution, said conveyor is stopped for ¾ of said cycle and moves for ¼ of said cycle;
- an auxiliary container for receiving discarded tubes mounted above the tube supply container proximate to said cyclical drive means and adjacent to said feed path, said auxiliary container having an inlet aperture facing the feed path;
- centering means mounted proximate said cyclical drive means and transversely to the feed path and arranged such that when said conveyor is stopped, said centering means is coaxial with respect to a tube on said conveyor;
- driving means operatively connected to said centering means for imparting rotary motion to said tube;
- an inspection means comprising contact means, feeler means, and switch means ; said centering means operable to center said tubes relative to said inspection means, said



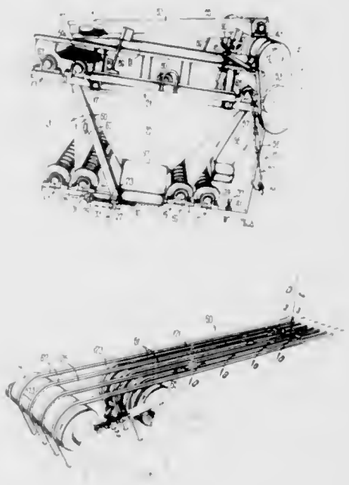


contact means contacting only opposite edges of a centered tube and operatively connected to said feeler means which is operatively connected to said switch means, whereby said opposite edges of said tube are inspected by said inspection means while said conveyor is stopped and said switch is activated if one of said edges is imperfect;
- removing means mounted along said feed path opposite said inlet aperture, said removing means being operatively connected to said switch such that said removing means shifts said tube out of the feed path and into the inlet aperture of the auxiliary container in response to said switch being activated.

4,927,030
METHOD AND APPARATUS FOR DEBRIS SCREENING AND SORTING OF PEANUTS

Jack T. Chastain, and John McWhorter, both of Rochelle, Ga., assignors to Doster Warehouse, Rochelle, Ga.

Filed Nov. 7, 1988, Ser. No. 268,156
Int. Cl.[5] B07B *1/10*
U.S. Cl. 209—620 8 Claims



1. A peanut debris cleaning and sorting apparatus comprising:
- at least two sets of sorting belts defining a substantially horizontal surface, each set longitudinally offset relative to the adjacent set, the sets interposed to position a belt from one set adjacent a belt from another set, each set comprising a plurality of endless belts spaced apart to define a gap between adjacent belts;
- at least two upper deive shafts for each set of belts;
- at least one lower drive shaft for each set of belts;
- a motor connected to one drive shaft of one set of sorting belts;
- sprocket means connected between the motor driven shaft of the one set of sorting belts and a drive shaft of each other set of sorting belts to drive each set of sorting belts at different speeds; and
- means for changing the vertical position of one upper drive shaft of one set of belts relative to the upper drive shafts of the other set of belts, whereby the gap between adjacent belts is changed.

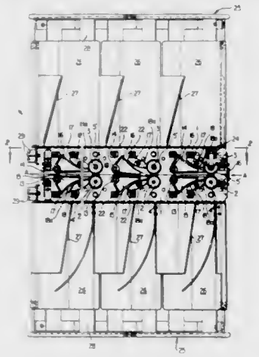
4,927,031
DOCUMENT SORTER FOR READER/PRINTER EQUIPMENT

Emilio B. Martin, Madrid, Spain, assignor to AMPER, S.A., Madrid, Spain

Filed May 10, 1989, Ser. No. 350,097
Claims priority, application Spain, May 10, 1988, 8801449
Int. Cl.[5] B07C *5/36;* B65H *29/70*
U.S. Cl. 209—657 18 Claims

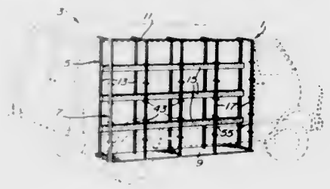
1. A document sorter for sorting different types of documents processed by a document reader/printer according to type of document comprising:

a support structure;
at least one drive wheel pair for pulling said documents through said document sorter, each said drive wheel pair comprised of a drive wheel and a guide wheel in tangential contact with each other and mounted on said support structure;
at least one document guide, each said document guide comprised of first and second concave guide parts rotatably mounted on said support structure and first and second convex guide parts, said first and second concave guide parts each having an inner side and a concavely curved outer side, said inner sides facing each other to define a document passage therebetween through which



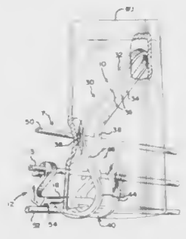
undeflected documents travel, said first and second convex guide parts each having a convexly curved side respectively facing said first and second concavely curved outer sides, said first concavely curved outer side and said first convexly curved inner side defining a first deflected document path, said second concavely curved outer side and said second convexly curved inner side defining a second deflected document path;
a pair of compartmentalized sorter bins mounted on said support structure, each said compartment of said sorter bins receiving a different type of document; and
means for selectively deflecting said documents along said first or said second deflected document path.

4,927,032
GLASS RACK
Roger Mercure, 399 Principale, Ste. Dorothée, Laval, Quebec, Canada (H7W 3S6)
Filed Mar. 17, 1989, Ser. No. 324,764
Claims priority, application Canada, Sep. 2, 1988, 576500
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—41 **7 Claims**



1. A rack for snugly holding sheets:
the rack having two opposed sides for receiving sheets therebetween;
a plurality of clamps on one of the two sides of the rack for clamping the sheets snugly against the other of the two sides;
each clamp comprising:
a clamping bar with opposed ends, one of the ends being cushioned;
fixed pivot means pivotally connecting the clamping bar at a location spaced from its cushioned end, to the one side of the rack; the clamping bar movable about the pivot means between a generally upright, inoperative position, and an upwardly sloping operative position where its cushioned end abuts sheets resting against the other side of the rack; and holding means on the one side of the rack, separate from and movable relative to the pivot means; the holding means holding the clamping bar in its operative position to have its cushioned end clamp the glass sheets against the other side of the rack.

4,927,033
REMOVABLE ARTICLE HOLDER FOR A DISHWASHER
Ginger E. Patera, Lincoln Township, Berrien County; Larry L. Janke, and William T. Lampman, both of Joseph Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 30, 1988, Ser. No. 292,262
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—41 **33 Claims**

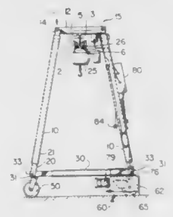


1. An article holder for securing an article in a basket having at least one horizontally extending tine and at least one member extending above said tine comprising:
means for interconnecting said article holder with said basket tine;
means extending generally vertically with respect to said interconnecting means for engaging an article; and
means interposed between said interconnecting means and said article engaging means for resiliently biasing said article engaging means towards said basket member to resiliently hold a portion of said article between said article engaging means and s id basket member.

4,927,034
STEERABLE POWER DRIVE FOR GANTRY CRANE
John A. Holden, 107 Shedoke Ave., Hamilton, Ontario, Canada (L8P 4P2)
Filed Jul. 18, 1988, Ser. No. 220,330
Int. Cl.[5] B66C *5/02*
U.S. Cl. 212—218 **2 Claims**

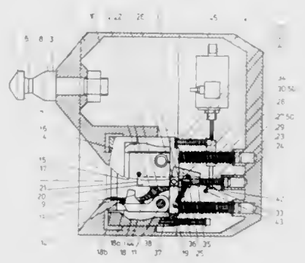
1. A self-propelled steerable gantry comprising:
a. an elevated load carry beam;
b. individually adjustable downwardly divergent pairs of legs spaced apart lengthwise of said beam proximal the ends thereof for supporting said beam;
c. tie means between the lower ends of the legs of each said pair of legs to maintain and adjust the angularity between said legs; said tie means having a length which is substantially shorter than the length of said beam; and

d. ground engaging mobile mountings for said gantry including:
i. a castering wheel disposed adjacent the lower end of one leg of each said pair of downwardly divergent legs, each said castering wheel being capable of swivelling about an upright axis perpendicular to the longitudinal axis of said tie means;
ii. a fixed orientation wheel disposed adjacent the lower end of the other leg of each said pair of legs and being aligned with the longitudinal axis of said tie means, the distance between the two fixed orientation wheels and



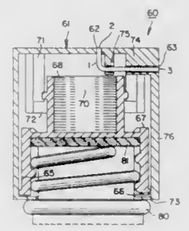
the distance between the two castering wheels being substantially greater than the distance between the caster wheel and the fixed orientation wheel of each said pair of downwardly divergent legs in all adjustement positions of said legs;
iii. a prime power mover operatively connected to each of said fixed orientation wheels and capable of independently rotating each said fixed orientation wheel in a forward or reverse direction; and
iv. control means operable to independently actuate said prime mover means for forward or reverse rotation of said fixed orientation wheels.

4,927,035
AUTOMATIC COUPLING FOR RAIL BORNE VEHICLES
Markus Geng, Stühlingen, Fed. Rep. of Germany, and Dominique Loutan, Geneva, Switzerland, assignors to Georg Fischer AG
Filed May 17, 1989, Ser. No. 353,347
Claims priority, application Switzerland, May 17, 1988, 01879/88
Int. Cl.[5] B61G *3/00*
U.S. Cl. 213—77 **16 Claims**



1. Automatic coupling for a rail vehicle having two similar coupling heads, each said coupling head comprising:
(a) a tension bolt;
(b) a tension bolt receptacle;
(c) a locking mechanism in the receptacle;
(d) a unlocking device connected to the locking mechanism;
(e) means connected to the locking mechanism and operable during the coupling process for storing energy;
(f) means operable upon actuation of said unlocking device to release the energy stored in said energy storing means for actuating said locking mechanism so that it will allow decoupling.

4,927,036
CONTAINER WITH TAMPER INDICATOR USING PIPED LIGHT
Edward P. Diehl Pojedinec, 112 S. Valley Rd., Lincoln Park, N.J. 07035
Continuation of Ser. No. 9,720, Feb. 2, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,433
Int. Cl.[5] B65D *55/02*
U.S. Cl. 215—203 **13 Claims**



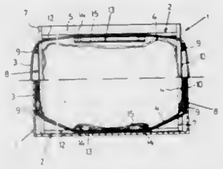
1. A packaging system for packaging a product and indicating whether the packaging system has been opened so as to provide evidence of tampering, said system comprising, in combination:
a container;
a cap, including a top and a skirt, for closing the container;
light guide means for providing said evidence of tampering and including a light collecting surface for collecting ambient light, a light emitting surface for emitting at least a portion of the light transmitted through the guide means, and an intermediate section between said light collecting and emitting surfaces and constructed so as to be in a first condition when said cap is initially secured to said container and in a second condition when said cap is initially removed from said container, and wherein said light guide means is secured within said cap so that the light collecting surface collects light at the top of said cap, and the light emitting surface emits light from the skirt of said cap when said intermediate section is in at least one of said conditions; and
means for permanently modifying said intermediate section so as to change the condition of said intermiate section from said first condition to said second condition when said cap is initially removed from said container so as to alter the light emitted from said light emitting surface.

4,927,037
CONTAINER FOR FLUIDS, SOLIDS HAVING FLOW PROPERTIES OF THE LIKE
Gerardus A. M. Boots, Boskriek 72, 5401 LP Uden, Netherlands
Filed Sep. 27, 1988, Ser. No. 249,869
Claims priority, application Netherlands, Sep. 30, 1987, 8702331
Int. Cl.[5] B65D *90/16, 90/20*
U.S. Cl. 220—1.5 **9 Claims**

1. A container for fluids, solids having for properties, or the like comprising a box of a conventional packing material, a supporting frame inside the box and of a material that is at least in part stronger and of greater dimensional stability than said conentional packing material, and an inner bag inside the frame and of a conventional flexible packing material for containing the material being packed, said supporting frame including four opposed frame sidewalls each having a pressure face

VOL
1114
ISS
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extending the full height of the respective side wall but having a width less than that of the respective sidewall, and said container further comprising a sleeve of a relatively thin material of high tensile strength and relatively low stretch extending on the outside of, and around the pressure faces, and from one side of a pressure face substantially directly to the adjacent side edge of the pressure face of the adjacent sidewall, the circumference of said sleeve being less than the outer circumference of the supporting frame.



4,927,038

CONTAINER FOR HIGH PRESSURE GASES

Maurice J. Roebuck, Dorking, Surrey, England, assignor to British Petroleum Company p.l.c., London, England

Filed Jul. 14, 1989, Ser. No. 380,056

Claims priority, application United Kingdom, Aug. 5, 1988, 8818622

Int. Cl.[5] **B65D** *90/04*

U.S. Cl. 220—3 **20 Claims**

1. A container for high pressure gases, which comprises a hollow shell of thermoplastic mataerial having an inner surface and an outer surface, nt least one of which is covered with a layer comprising a metallised film of plastics material; and an outer layer comprising fibrous windings bound together with resin.

11. A method for fabricating a container for high pressure gases, the method comprising preparing a hollow shell of thermoplastic material having an inner and an outer surface; covering at least one of said surfaces with a layer comprising a metallised film of plastics material; wrapping the resulting shell with fibrous windings, said windings being impregnated with resin before or after wrapping; and curing the resin.

4,927,039

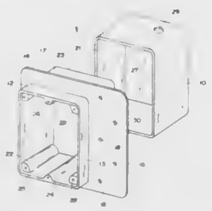
ELECTRICAL BOX

Wayne McNab, Ladner, Canada, assignor to Viscount Industries Limited, Vancouver, Canada

Filed Jnl. 12, 1989, Ser. No. 378,920

Int. Cl.[5] **H02G** *3/12*

U.S. Cl. 220—3.7 **13 Claims**



1. An electrical box for use in building electrical wiring systems, telephone wiring systems, cable television or other similar systems, comprising:

(a) a receptacle having an open front face;

(b) admitting means for permitting passage into an interior of said receptacle of a wire or cable;

(c) a receptacle attachment removably affixable to the front face of said receptacle;

(d) a flange affixed to an exterior aurface of said receptacle attachment encircling the latter and spaced apart from open first and second opposite faces thereof a pre-selected distance equal to first and second pre-selected wall covering thicknesses;

(e) means for affixing said attachment to said receptacle with either the first or second face juxtaposed to said receptacle; and

(f) means for attaching said flange to a wall frame.

4,927,040

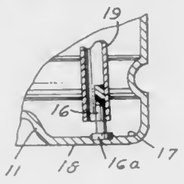
PLASTIC DRUM AND METHOD OF MAKING

Harley L. Cramer, Swanton, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Aug. 7, 1989, Ser. No. 390,004

Int. Cl.[5] **B65D** *21/00*

U.S. Cl. 220—5 R **4 Claims**



1. A plastic drum comprising

a side wall,

a bottom wall and

a top wall having an opening therein and

a plastic stem fusion bonded to the inner surface of the bottom wall in general alignment with the opening such that a dispensing tube can be inserted through the opening with the lower end of the tube engaging the stem to hold the dispensing tube in position adjacent the bottom wall.

4,927,041

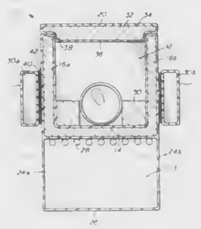
SELF-STABILIZING FLOATING COOLER

Michael J. Hepburn, 5806 Old Lodge Dr., Houston, Tex. 77066

Filed Jul. 15, 1988, Ser. No. 220,072

Int. Cl.[5] **B65D** *1/24;* **A01K** *97/00*

U.S. Cl. 220—20 **27 Claims**



1. A self-stabilizing floating cooler, comprising:

a floor and contiguous wall extending vertically therefrom made of an insulated material to define a storage cavity;

a chamber for containing water formed beneath said floor, said chamber having perforations substantially adjacent said floor for allowing the passage of water and air therethrough, wherein the chamber fills with water when the cooler is placed therein to stabilize floatation thereof wherein said chamber has a depth at least one third that of said storage cavity and wherein the chamber is drainable of water when the cooler is removed therefrom; and

floatation means mounted on said wall.

4,927,042

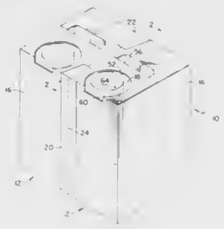
DISPENSING BOTTLE CONTAINER ASSEMBLY INCLUDING SEPARABLE COMPOSITE PACKAGES

Robert G. Ring, Memphis, Tenn., assignor to Ring Can Corporation, Oakland, Tenn.

Filed Mar. 30, 1989, Ser. No. 330,487

Int. Cl.[5] **B65D** *21/02;* **B67D** *5/00*

U.S. Cl. 220—23.83 **2 Claims**



1. A container assembly comprising at least two packages arranged side by side, each package including an outer rectangular carton and a bottle mounted within said carton, said bottle having a pouring spout at one end thereof, said carton including front, rear, and first and second side walls, a flap assembly at one end of said carton including first and second side flaps connected to said side walls and folded substantially perpendicular to said side walls, said first and second side flaps having their edges shaped so as to cooperate to form a first opening for said spout and a second opening defining a handle, front and rear flaps connected to said front and rear walls and folded over said side flaps, said front and rear flaps having edges which lie adjacent to each other, said front flap having a third opening aligning with said first opening to accommodate said spout, said rear flap having means cooperating with said second opening to form said handle, said front wall having a recess intersecting and extending downwardly from said third opening, said carton having a bottom flap assembly at its other end and including bottom front and rear flaps folded perpendicularly from said front and rear walls and having edges spaced from each other to define a bottom opening, and bottom side flaps connected to said side walls and folded over said bottom front and rear flaps, said bottom side flaps including means defining a handle overlying said bottom opening, and means separably connecting together the outer cartons of said packages, whereby said packages are shipped together as an assembly and then separated for use individually without having to remove the bottle from its carton.

4,927,043

NECKED-DOWN CAN HAVING A FALSE SEAM AND AN APPARATUS TO FORM SAME

Dirk Vanderlaan, Alameda, Calif., assignor to Ihly Industries, Inc., Englewood, Colo.

Filed Nov. 13, 1987, Ser. No. 120,338

Int. Cl.[5] **B65D** *8/20*

U.S. Cl. 220—67 **4 Claims**

1. A three-piece can which comprises:

(a) a thin wall, hollow cylindrical can body including open top and bottom ends, and;

(b) a pair of generally flat, circular cover elements;

(c) each of said cover elements being secured to one of the open ends of said cylindrical can body at a circumferential seam; each of said circumferential seams having an external diameter that is larger than the diameter of the cylindrical can body adjacent thereto;

(d) one of said cover elements having a diameter which is less than the diameter of said cylindrical can body;

(e) said cylindrical can body being formed to a tapered portion adjacent a reduced end portion upon which said one of said cover elements is secured;

(f) said cylindrical can body including a circumferential bulge portion immediately adjacent said tapered portion;

(g) said circumferential bulge portion having an external diameter which is equal to the external diameter of the circumferential seam securing the other of said cover elements to said cylindrical can body.

3. A three-piece can comprising first and second end pieces and a substantially cylindrical body therebetween, said first end piece being adjoined to a first end of said body to define a first adjoinment and said second end piece being adjoined to a second end of said body to define a second adjoinment, said body being integrally formed between said first adjoinment and said second adjoinment, said second adjoinment having a



diameter less than said first adjoinment, said body having a circumferential bulge located near said second adjoinment, and said bulge having a diameter equal to the diameter of said first adjoinment and greater than the average diameter of the cylindrical body therebetween, wherein said can may roll substantially straight when horizontally oriented.

4. A three-piece can comprising first and second end pieces and a substantially cylindrical body therebetween, said first end piece being adjoined to a first end of said body to define a first adjoinment and said second end piece being adjoined to a second end of said body to define a second adjoinment, said body having a necked-in portion near said second adjoinment and having an outwardly tapered portion adjacent thereto, said second adjoinment having a diameter less than the diameter of said first adjoinment, said body having a circumferential bulge immediately adjacent to said tapered portion, said bulge having a diameter equal to the diameter of said first adjoinment and greater than the average diameter of the cylindrical body therebetween, wherein said can may roll substantially straight when horizontally oriented.

4,927,044

HEAT INSULATING CASE AND PROCESS FOR PREPARING THE SAME

Masao Gotoh, Yokosuka; Yasuo Hira; Kenichi Waragai, both of Fujisawa; Shozo Nakamura, Yokohama, and Hitoshi Yokono, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 442,464, Nov. 17, 1982. This application Feb. 28, 1985, Ser. No. 706,248

Claims priority, application Japan, Nov. 20, 1981, 56-185366; Nov. 20, 1981, 56-185373

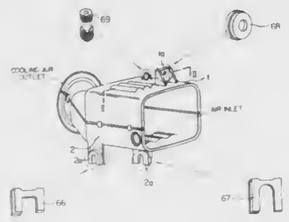
Int. Cl.[5] **B65D** *25/00*

U.S. Cl. 220—83 **16 Claims**

1. A heat-insulating structure for an automobile air conditioner, which heat-insulating structure comprises a body part with projected parts on its outer surface, the body part being a body part consisting of an upper case part and a lower case part of foamed polyurethane resin, the upper and lower case parts being case parts formed by mixing and foaming a liquid A and a liquid B, the liquid A comprising 100 parts of a mixture of polyols consisting of 20 to 60% by weight of an aliphatic amino-based polyol, 30–60% by weight of an alkylene oxide adduct of 4,4'-diaminodiphenylmethane and 10 to 40% by weight of a polyol obtained by adding an alkylene oxide to compounds having two or three active hydrogens, total

VOL 1114 ISS 4 MY 22 1990 UMI

thereof being kept to 100% by weight, 1 to 5 parts by weight of a foam-controlling agent, 5 to 45 parts by weight of water or an organic liquid compound of low boiling point as a foaming agent and 0.2 to 10 parts by weight of a catalyst, and the liquid B comprising 110 to 190 parts by weight of polyisocyanate on the basis of 100 parts by weight of the mixture of the polyols, the heat-insulating structure having an overall density of 300–700 kg/m^3; the body part having a density of 50 to 700



kg/m^3, and having skin layers of a high density sandwiching a core of lower density containing independent foam cells, the core being a core integrally molded with the skin layers; and the projected parts being of higher density than that of the body part, the projected parts having a density of 800–1200 kg/m^3, the projected parts having U-type metal inserts, metal washer inserts or screw metal inserts therein, the projected parts being integrally molded together with the body part.

4,927,045

SYSTEM OF SAFETY TANK ELEMENTS PREVENTING EXPLOSIONS

Helmut J. Lichka, Vienna, Austria, assignor to Technolizenz Establishment, Triesen, Liechtenstein

Continuation of Ser. No. 713,727, Feb. 27, 1985, abandoned.
This application Dec. 21, 1988, Ser. No. 289,481
Claims priority, application Austria, Jun. 27, 1983, 2342/83
Int. Cl.^{5} B65D *25/00*
U.S. Cl. 220—88 R 21 Claims



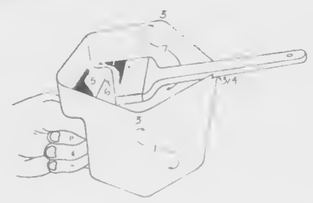
1. A filler apparatus for a container which can hold an explosible fluid and which has at least one opening, comprising filler means capable of passing through the largest opening in the container for forming therein a three-dimensional structure which is at least one of thermally and electrically conductive, said filler means including a filling element having a dimension in at least one direction which, when in the interior of the container, exceeds the greatest dimension of the largest opening in the container, said filling element including a plurality of diverging elements which are elastically deformable and project from at least one support member, said diverging elements having ends remote from said support member which are free of interconnections.

4,927,046

HOLDING VESSEL WITH SUPPORTIVE HANDLE

Robert E. Armstrong, 118 Chestnut Ave., Medford, Oreg. 97501

Continuation-in-part of Ser. No. 645, Jan. 5, 1987, abandoned.
This application May 16, 1988, Ser. No. 194,189
Int. Cl.^{5} A47G *19/22*
U.S. Cl. 220—90 1 Claim



1. A holding vessel, having a base, a body having a pentagonal cross-sectional shape in a plane parallel to said base, a supportive handle, and an upper rim comprising:

said vessel having a ledge, located between the base and the upper rim, formed by an inset in the sidewall below the ledge, said sidewall extending from the base to an inner edge of the ledge and from an outer edge of the ledge to the upper rim;

said upper rim being of pentagonal shape, the corners of said upper rim being rounded and flexible in order to form left, right, and front-end pouring spouts;

said front-end pouring spout being located opposite said ledge and having a notch to keep the handle of a paint brush from sliding back and forth, and in conjunction with the opposing ledge, forming a built-in paint brush holder;

said supportive handle, located in the middle of one of the five sides of the body of the vessel and on the same side as the ledge, beginning at the base of the vessel, extending outwardly parallel to said base, then upwardly, generally parallel to said sidewall and intersecting said ledge, said handle being an integral part of the body of the vessel;

said handle angling away from the body of the vessel in a pistol-grip fashion;

the body of the vessel above the ledge and handle and extending to the rim being thicker and more rigid than the rest of the body;

said base having three low, narrow ridges extending inwardly therefrom.

4,927,047

INSULATED JACKET FOR BEVERAGE CONTAINER

Michael G. Stuber, Shakopee, and Charles E. Effertz, Wayzata, both of Minn., assignors to Cantainer Corporation, Eden Prairie, Minn.

Filed Jul. 31, 1989, Ser. No. 388,066
Int. Cl.^{5} A47G *19/00*
U.S. Cl. 220—90.2 21 Claims

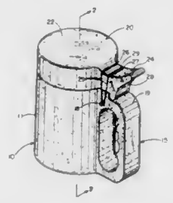
1. A reusable insulated jacket constructed and arranged for removably receiving an open cylindrical beverage container therewithin and for preventing windblown sand and other foreign materials from entering the opening of the container, said jacket comprising:

(a) an upright main body member of molded thermal-insulating material having a substantially cylindrical open interior and a closed bottom and a cylindrical opening at its upper end which will receive an open cylindrical beverage container therein in close-fitting shape-conforming thermal-insulating relation;

(b) said body member having an exterior bearing surface;

(c) a separate imperforate molded cover member of thermal-insulating material extending across said upper end of said main body member and sealing off said cylindrical opening, said cover member having an underside;

(d) said cover member having a cooperative bearing surface at said underside engaging said bearing surface of said body and pivoting thereagainst while moving between open and closed positions of said cover member relative to the interior



of said main body member, thereby providing a pivot function for said cover member during such movement; and

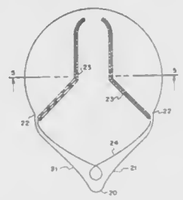
(e) resilient tension means extending between said cover member and said body member and maintaining said bearing surfaces in interengaging relation and urging said cover member toward said closed position.

4,927,048

BEVERAGE CAN HAVING A SANITARY COVER

Roy T. Howard, 2750 Plumas St, #300, Reno, Nev. 89509

Filed Apr. 14, 1986, Ser. No. 851,544
Int. Cl.^{5} B65D *51/20*
U.S. Cl. 220—90.2 2 Claims



1. A protective covering for a beverage can having a top closure panel having a pouring aperture sealed by a pull-tab and a raised perimeter rim, said covering comprising an integral aluminum foil of substantially circular periphery having a tear-resistant plastic coating and configured to cover said closure panel and rim in adhesive attachment therewith, and a tear-away access strip constituting a portion of said foil in aligned disposition above said pouring aperture, said access strip being defined by pathways wherein said tear-resistant plastic coating is not functionally present, said pathways terminating in extremities within said tear-resistant plastic coating, thereby permitting easy and controlled tearing of the foil at the boundaries of the access strip, yet preventing complete separation of the access strip from the remainder of the foil.

4,927,049

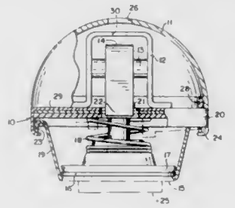
LOCKING RADIATOR CAP

John Giordano, 123 Hempstead, Lynbrook, N.Y. 11563

Filed Aug. 15, 1989, Ser. No. 393,997
Int. Cl.^{5} B65D *55/00*
U.S. Cl. 220—201 6 Claims

1. A thermally locking radiator cap for coupling to the filler neck flange of a conventional radiator wherein the filler neck flange is formed with diametrically opposite, radially-open opening notches for receiving the inwardly bent radial fingers of a radiator cap comprising;

thermally responsive stop means disposed on a surface of the radiator cap and in thermal communication with the cap, said stop means having one end secured to said cap and its opposite end disposed along the peripheral edge of the cap;



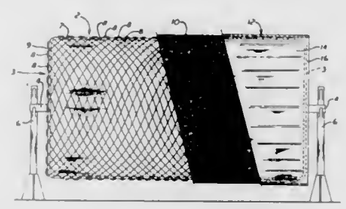
an opening formed along the outer periphery of said radiator cap for receiving said thermally responsive stop means so that when radiator heats up, said stop means will expand and pass through the opening formed in the periphery of the radiator cap and pass into a corresponding opening notch of the filler neck flange thereby preventing any rotational movement of the cap with respect to the filler neck;

4,927,050

METHOD OF MAKING DOUBLE WALL STORAGE TANK FOR LIQUIDS FROM A METAL TANK HAVING A PATTERNED SURFACE

David T. Palazzo, P.O. Box 290676, Tampa, Fla. 33687

Continuation-in-part of Ser. No. 194,387, May 16, 1988, Pat. No. 4,817,817, which is a continuation-in-part of Ser. No. 105,890, Oct. 7, 1987, Pat. No. 4,780,997, which is a continuation-in-part of Ser. No. 105,881, Oct. 7, 1987, Pat. No. 4,780,946, and a continuation-in-part of Ser. No. 43,634, Jun. 11, 1987, Pat. No. 4,744,137, which is a division of Ser. No. 884,481, Sep. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 884,389, Apr. 7, 1987, Pat. No. 4,655,367, which is a continuation-in-part of Ser. No. 818,258, Jan. 13, 1986, Pat. No. 4,644,627, which is a continuation-in-part of Ser. No. 775,140, Sep. 12, 1985, Pat. No. 4,640,439. This application Apr. 3, 1989, Ser. No. 332,806
Int. Cl.^{5} B23D *9/00*
U.S. Cl. 220—445 12 Claims



1. A method of manufacturing a double wall storage tank for storage of liquids, comprising the steps of

forming a substantially rigid inner tank from metal with at least lower portions of said inner tank being formed from patterned metal having a pattern of projections formed of said metal and extending outwardly from a base surface on at least one side thereof, such that the exterior surfaces of said portions of said inner tank include said projections extending outwardly therefrom;

VOL
1114
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MY
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1990
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stretching over said inner tank and said projections a sheet of imperforate material to separate said inner tank from subsequently applied sheathing material; and

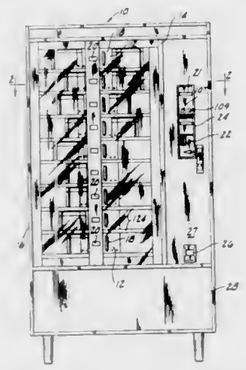
applying over said inner tank exterior and said sheet a substantially rigid outer sheath of a material that is substantially liquidtight, said sheath being spaced from said inner tank exterior surface by said sheet supported on said projections, whereby is provided a rigid, double wall tank.

4,927,051

MULTIPLE-PRODUCT MERCHANDISING MACHINE

Leonard P. Falk, Florissant, and Paul K. Griner, St. Louis County, both of Mo., assignors to UniDynamics Corporation, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,475
Int. Cl.[5] G07F *11/54*
U.S. Cl. 221—12 19 Claims



1. A multiple-product merchandising machine comprising:

a cabinet having a viewing area in which the products in several of the compartments on each shelf can be seen at one time by a potential customer;

a cylindrical merchandise carrying drum mounted within the cabinet for rotation about its central longitudinal axis and having a plurality of annular product supporting shelves at spaced intervals along the drum concentric with the axis of the drum, a plurality of walls extending between adjacent shelves and together with the shelves defining a plurality of individual compartments in which product may be placed;

a plurality of access doors in the cabinet, one each associated with a respective shelf on the merchandise carrying drum and disposed adjacent thereto for allowing access to a compartment on the respective shelf when the compartment is aligned with it, the access doors being movable between an open position and a closed position and being normally locked in the closed position;

currency actuated means for allowing a selected access door to be moved from the closed position to the open position when a predetermined amount of currency is inserted by a customer;

reversible motor means for rotating the merchandise carrying drum in either direction;

manually controllable actuating means for actuating the reversible motor means to rotate the merchandising drum to allow a customer to bring any compartment on a shelf into alignment with the associated access door; and

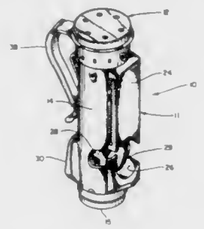
control means for activating the motor means at a predetermined time after a selection has been made and in either direction of rotation of the drum to bring the drum to a predetermined rest position at which it is stopped, the control means being operable to determine the number and location of empty compartments and to move the drum to a rest position at which it is stopped and in which the fullest section of the drum with the least number of empty compartments is disposed adjacent the viewing area of the cabinet.

4,927,052

GOLF BALL PACKAGE, HOLDER AND DISPENSER

Robert H. Marthaler, 942 Sycamore La., Bartlett, Ill. 60103, and Gregory A. Marthaler, 1969 Dorset Dr., Wheaton, Ill. 60187

Filed Nov. 7, 1988, Ser. No. 267,925
Int. Cl.[5] B65D *83/00*
U.S. Cl. 221—64 11 Claims



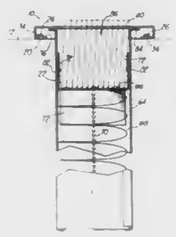
1. A golf ball package and dispenser, comprising: a one-piece plastic molded base adapted to receive a plurality of golf balls, having a generally cylindrical configuration with a closed bottom end and an open top end adapted to receive a plurality of golf balls, means for closing the open end of the base, and means for dispensing the golf balls adjacent the closed end of the base, said dispensing means including a side aperture in the base adjacent the closed end, said aperture being shaped to normally retain the golf balls in the base, said aperture being constructed to be deformable to permit removal of the golf balls through the aperture, said aperture being formed entirely in the one-piece base without additional ball retaining parts.

4,927,053

DISPENSERS

John T. Mayfield, III, Clarkston, Ga., assignor to The Meyer Company, Cleveland, Ohio

Division of Ser. No. 162,657, Mar. 1, 1988, Pat. No. 4,858,783. This application Mar. 16, 1989, Ser. No. 325,303
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—279 11 Claims



1. A dispenser which extends through an opening in a mounting surface, comprising:

I. means to position a face plate on the mounting surface, comprising:

(*a*) a mounting template having an opening corresponding to the opening in the mounting surface; and

(*b*) a plurality of mounting fasteners which fasten the mounting template to the mounting surface;

(*c*) the face plate having an opening corresponding to the opening in the mounting surface and keyed holes in order to capture the mounting fasteners so that the face plate is removably attached to the mounting template; and

II. a container assembly attached to the mounting surface comprising:

(*a*) an elongated container body from one end of which extends a plurality of mounting flanges;

(*b*) a plurality of container fasteners for fastening the container body to the mounting surface;

(*c*) a follower which slides inside the container body;

(*d*) a spring for forcing the follower and thus the items in the dispenser toward the face plate; and

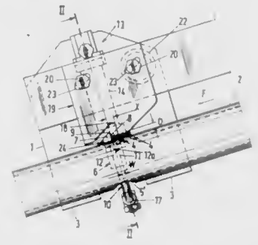
(*e*) a stabilizer member attached to the container body and the follower for stabilizing the follower.

4,927,054

APPARATUS FOR SINGULARIZING GARMENT HANGERS

Hans Heinhold, Dietzenbach, Fed. Rep. of Germany, assignor to Sussman, Jennewein Bekleidungstechnik GmbH, Mörfelden-Walldorf, Fed. Rep. of Germany

Filed Jan. 24, 1989, Ser. No. 301,511
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802805
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—289 18 Claims



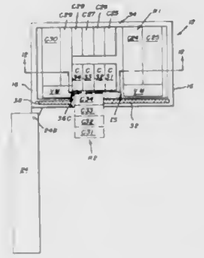
1. Apparatus for singularizing objects, particularly garment hangers, having substantially hook-shaped suspendible portions of substantially circular cross-sectional outline with a predetermined diameter, comprising a ramp including an upper portion and a lower portion, said ramp being arranged to support a series of suspendible portions and having an inclination such that the suspendible portions thereon slide by gravity in a direction from said upper to said lower portion; an intercepting member disposed intermediate said upper and lower portions and having a section located in the path of movement of oncoming suspendible portions on said ramp so that the foremost oncoming suspendible portion comes to rest in response to engagement with said intercepting member; means for lifting successive suspendible portions of the series of suspendible portions above said member, including an elevator adjacent and located aheat of said section in said direction, and means for moving said elevator between a lower position beneath the suspendible portion which abuts said intercepting member and an upper position in which the elevator lifts the suspendible portion thereabove to a level such that the thus lifted suspendible portion can ride over and beyond said intercepting member in said direction; and a guide disposed above and defining with said intercepting member a channel for suspendible portions of successive objects, said guide extending from upstream to downstream of said intercepting member and said elevator, said channel having an inlet which is adjacent said elevator in the upper position of said elevator, said inlet having a width in said direction which is between about 1 and 2 D wherein D is said predetermined diameter, said guide having a recess which forms part of the channel and said elevator extending into said recess in said upper position thereof.

4,927,055

INCREASED COLUMN/SELECTIVITY VENDER

Phillip B. Groover, Woodstock, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Continuation of Ser. No. 68,936, Jul. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 911,152, Sep. 24, 1986, Pat. No. 4,722,455. This application Jun. 21, 1989, Ser. No. 370,100
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—67 12 Claims



1. A vend rack assembly for delivering vendable cylindrical products to discharge port means in the face of a vending machine comprising:

a plurality of vertical columns disposed side-by-side in a parallel relationship behind said face of said vending machine, the bottom of each of said columns communicating with said discharge port means, said columns including means for supporting products in stacks therein and being arranged in groups to provide space for respective products commensurate with anticipated sales of such products, some of said columns being fixed within said vending machine and certain of said columns indicating means for mounting said certain columns for at least partial removal thereof from the interior of said vending machine, said columns including at least tow different product storage configurations and capacities, to provide access to all of said columns for loading the same with said products and to maximize the number of groups of said columns within a given interior space of said vending machine;

wherein said columns are collectively contained side-by-side in at least first and second rows within a substantially rectangular area as viewed from the front of said vending machine, wherein said second row is parallel to said first row and said first row is fixed within said vending machine and said second row includes mounting means for said columns in said second row to permit said second row of columns to move outward from the interior of said vending machine to facilitate loading of products therein, said mounting means includes a hinged pivot means permitting said second row to swing away from said first row;

an interior rear wall opposite said vending machine face; and

a pair of sidewalls substantially extending from said rear wall to said face;

wherein said first row comprises a combination of vertically disposed corded double-deep product columns, single double-deep product columns and single-deep product columns disposed across said interior rear wall, and wherein said second row comprises a plurality of vertically disposed single-deep product columns in said mount-

VOL 1114 ISS 4 MY 22 1990 UMI

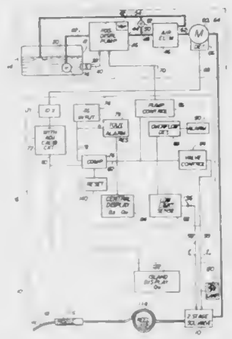
ing means adjacent the interior of said vending machine face.

4,927,056

OIL DISPENSING SYSTEM WITH CONTROLLED METERING AND METHOD

Richard S. Glover, Hollywood, Fla., assignor to RSL Industries, Inc., Cooper City, Fla.

Filed May 22, 1987, Ser. No. 53,344
Int. Cl.[5] B67D *5/16*
U.S. Cl. 222—1 **29 Claims**



1. A system for metering and dispensing at a low flow rate a high viscosity fluid from a source comprising:
- means for obtaining said fluid from said source and supplying said fluid to a system line, said means for obtaining including means for maintaining a total dynamic head in said system line;
- means for eliminating the air from said fluid flowing through said system line;
- metering means for measuring the flow of said fluid and generating a representative electrical signal of said flow, said metering means disposed downstream of said means for eliminating with respect to the flow of said fluid through said system line;
- controllable dispensing means at the end of said system line;
- an adjustable means for correcting said representative signal based upon an initial calibration of said system accounting for slippage and initial pressure variations of said means for obtaining, means for eliminating, metering means and compression of said high viscosity fluid in said system line; and
- means for determining and displaying the quantity of fluid dispensed based upon the corrected representative signal obtained from said metering means.

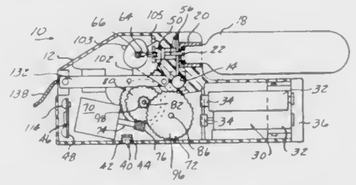
4,927,057

AUTOMATIC INFLATOR FOR INFLATABLE ARTICLES

Michael Janko, Richmond, Mich., and Matthew McAllister, Lexington, both of Mich., assignors to Inflation Technologies & Innovation, Anchorville, Mich.

Filed May 30, 1989, Ser. No. 359,875
Int. Cl.[5] B67B *7/24*
U.S. Cl. 222—5 **17 Claims**

1. An inflator for inflatable articles comprising:
- a housing;
- means, formed in the housing for discharging gas therefrom;
- a pressurized gas canister attached to the housing and disposed in fluid flow communication with the gas discharging means;
- a plunger movably mounted within the housing with respect to and facing the canister, the plunger having a canister piercing end;
- an electrical power source mounted within the housing;
- water sensor means, mounted on the housing and extending partially outward therefrom for generating an output signal when immersed in water;
- actuating means, mounted within the housing and responsive to the output signal, for mechanically moving the plunger to urge the piercing end of the plunger into the canister;



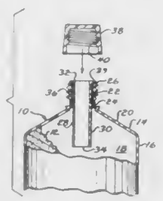
- a central processing unit, mounted within the housing and connected to the electrical power source, the actuating means and the water sensor means and executing a stored control program, the central processing unit being responsive to the output signal from the water sensor means to activate the actuating means when the water sensor means is immersed in water; and
- status indicator means, mounted within the housing and responsive to the central processing unit, for indicating the operative state of the inflator.

4,927,058

PACKAGE FOR A FLOWABLE MATERIAL SUSCEPTIBLE TO FLAVOR LOSS

Alan Nimmey, Sale, and Harry Hayes, Warrington, both of England, assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Jul. 20, 1988, Ser. No. 221,768
Int. Cl.[5] B65D *35/08, 35/14*
U.S. Cl. 222—106 **13 Claims**



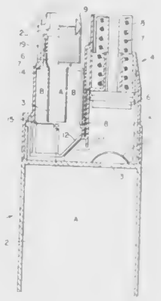
1. A package for a flowable material susceptible to flavor loss, comprising;
- an elongated collapsible tube defining a chamber to receive the material, said tube having a body portion and a tapered shoulder extending from the body portion, and a hollow neck having an inner end extending from the shoulder, and an outer end, said shoulder being in contact with the material and normally causing flavor loss of the material in the region of the chamber adjacent the shoulder with the body portion, neck and shoulder being of one-piece construction; and
- an insert separate from the tube and comprising a tubular section having an outer end connected to the outer end of the neck, and an inner end extending into the chamber a sufficient distance to prevent extrusion of the material in the region of the shoulder through the neck.

4,927,059

DEVICE FOR DISPENSING A MULTICOMPONENT FLOWABLE SUBSTANCE

Juergen Fiedler, Nettetal; Albert Stoeffler, and Michael Bergmann, both of Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 279,480
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741087
Int. Cl.[5] B67D *5/52, 5/60;* G01F *11/02*
U.S. Cl. 222—136 **4 Claims**



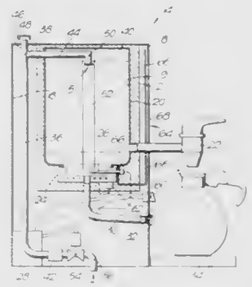
1. A device for selectively dispensing a paste-like flowable mixture of first and second components, said device comprising:
- a container forming a lower portion of said device, the uppermost portion of said container including an outlet; and
- a dosing unit mounted upon an uppermost portion of said container, said dosing unit including:
- a first valve flap covering said outlet of said container;
- a spring-biased plunger mounted and guided within a cylinder, said cylinder including an outlet opening;
- a second valve flap surrounding and closing the outside of said outlet opening of said cylinder;
- a tubular element located above and proximate to said second valve flap;
- a compartment surrounding and concentric with said tubular element, said compartment being open at its lower end facing said second valve flap;
- said tubular element having at least one opening provided through its upper portion providing a pathway from said compartment;
- said device providing for filling said container with a first component of said flowable substance, and said compartment with a second component of said flowable substance, for dispensing a striped-like combination of said first and second components; and
- mounting means for providing the combination of said compartment and said tubular element as a replaceable portion of said dosing unit.

4,927,060

APPARATUS WITH STEAM TRAP FOR HEATING AND DISPENSING HOT LIQUIDS

Malcolm R. Snowball, St. Leonards-on-Sea, and Cecil Hayes, Hastings, both of East Sussex, England, assignors to W. M. Still & Sons Limited, England

Continuation-in-part of Ser. No. 924,512, Oct. 29, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 187,289
Claims priority, application United Kingdom, Jan. 8, 1986, 8600323; Sep. 4, 1986, 8621316
Int. Cl.[5] A47G *19/24;* B67D *5/38, 1/08;* A47J *31/00*
U.S. Cl. 222—146.5 **13 Claims**



1. A hot liquid storing and dispensing unit comprising:
- a closed hot water tank having a wall;
- a housing containing the hot water tank;
- an insulating jacket within the housing and surrounding the hot water tank;
- an outlet dispensing tap;
- means passing through the insulating jacket for connecting the dispensing tap to the hot water tank;
- means outside the housing for actuating the dispensing tap;
- a dispensing valve within the jacket coupled to the actuating means adjacent to the tank wall;
- a hot liquid inlet conduit connected to a water supply and having a passage extending through the tank wall and opening vertically downwards into the hot water tank above a supply of water in the hot water tank; and
- a steam trap associated with the hot liquid inlet conduit,
- said steam trap including means for normally closing the inlet passage to prevent escape of steam from the hot water tank through the inlet passage and for opening the inlet passage in response to a predetermined head of water in the inlet passage to allow water from said supply to enter the tank,
- wherein the steam trap comprises a trap member which is U-shaped in cross-section and which is supported just below the outlet of the hot liquid inlet conduit.

4,927,061

DISPENSING VALVE WITH ELASTIC SEALING TUBE

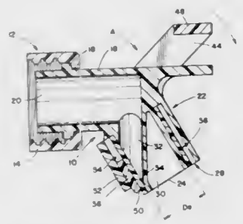
James P. Leigh, and Henry G. Roethel, both of Ravenna, Ohio, assignors to The Meyer Company, Cleveland, Ohio

Filed Sep. 22, 1988, Ser. No. 247,733
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—212 **4 Claims**

1. A manually operable dispensing valve comprising:
- a body member including connecting means for connecting the body member to a fluid supply source, said body member including an elongated relatively rigid body portion extending outwardly from the connecting means and terminating in a free end:
- a laterally opening discharge orifice in the rigid body portion adjacent the free end thereof and a fluid passageway extending through the body member for con-

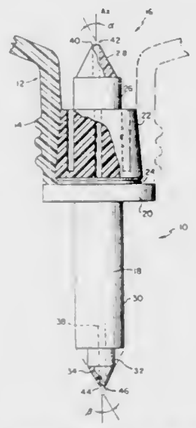
VOL 1114 ISS 4 MY 22 1990 UMI

ducting fluid from the supply source to the discharge orifice;
a resilient tubular member positioned over the rigid body portion in tensioned surrounding relationship thereto to sealingly overlie the discharge orifice;
operating means for deflecting the tubular member away



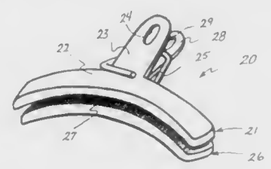
from the orifice to permit fluid flow therethrough, said operating means comprising an operating lever pivotally mounted on the body member and having an end joined to the tubular member at a location exterior of the body adjacent the discharge orifice to selectively deflect the tubular member away from the outlet orifice upon actuation of the lever.

4,927,062
PRECISION MICRO-LITER DROP DISPENSER
James W. Walsh, 3832 Beech Ave., Baltimore, Md. 21211
Filed Sep. 22, 1988, Ser. No. 247,864
Int. Cl.[5] B65D *47/18*
U.S. Cl. 222—420 18 Claims



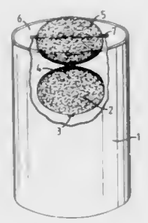
1. A dropper tip for the drop-wise dispensing of a liquid in drop volumes of less than 20 μl volumes from a container, comprising:
a dispensing stem having a cylindrical lumen therethrough formed along an axis from a liquid entry port at one end to an exit port at the other end, the lumen defined by a surface of revolution about the axis; and
a fitment intermediate the ends of said dispensing stem for engaging a neck of a container to position one portion of said dispensing stem and said entry port in the interior of the liquid container and to position the remaining portion of the dispensing stem and said exit port exteriorly of the container;
said entry port defined by a frusto-conical surface formed about the axis, the lumen extending along the axis through said frusto-conical surface to define a circular rim at the intersection of said frusto-conical surface and said surface of revolution, the circular rim having a minimum contact surface at said entry port to minimize surface area for the adhesion of bubbles at or adjacent to said entry port.

4,927,063
COMBINATION CAP HANGER AND VISOR PRESS
Gerald A. Fricano, 8 Watchet La., Fairport, N.Y. 14450
Filed Apr. 26, 1989, Ser. No. 343,895
Int. Cl.[5] A47G *25/10*
U.S. Cl. 223—84 5 Claims



1. A combination cap hanger and visor press, including:
first and second T-shaped gripping members each including a lever handle and a gripping crossbar, said gripping members pivotally connected for movement between open and closed positions and spring loaded toward said closed position;
said gripping crossbars mating with each other and defining therebetween a concave cavity curved in a plane substantially perpendicular to said lever handles, said gripping crossbars adapted to receive a cap visor between them, the curvature of said gripping crossbars and the force of said spring load combining to retain said cap visor in a desired shape; and
hanging means to hang said cap hanger and visor press.

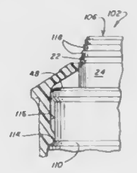
4,927,064
CURVED DISPENSIBLE PADS
Robert Burgin, Schaffhausen, Switzerland, assignor to IVF Maschinenfabrik Schaffhausen, Switzerland
Filed Jul. 20, 1988, Ser. No. 221,712
Claims priority, application United Kingdom, Jul. 21, 1987, 8717143
Int. Cl.[5] B65D *5/72*
U.S. Cl. 225—106 2 Claims



1. A dispensing system, comprising:
a stack of pads overlying one another and stacked on a common axis, each of the pads having arcuate edges and the opposed arcuate edges of adjacent pads in sequence in the stack being joined by a single frangible bridge immediately between and adjacent the pads; and

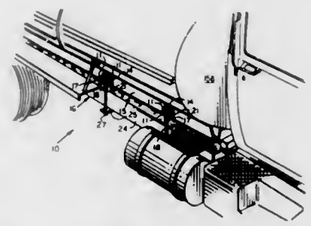
a container for the stack, the container terminating at one end and toward one end of the stack in an elongate dispensing slot so that the pads are withdrawn in sequence through the slot;
the stack and the slot cooperating in use so that withdrawal of the then uppermost pad in a direction generally transverse to the axis of the stack and the slot causes the then next pad in the stack to be folded over the edge of the slot for fracturing the frangible bridge before that next pad is withdrawn;
the pads being formed from a resilient absorbent fibrous material in which elongate fibers run from one pad to the next pad via the frangible bridge and the frangible bridge is shaped and sized so that with the quantity and nature of the fibers running through the bridge, the bridge will withstand a straight pull between 200 and 400 grams, the material which makes up the pads and the frangible bridge being homogenous throughout the stack of pads.

4,927,065
ADJUSTABLE METERING CLOSURE CAP
James M. Beck, Carol Stream, Ill., assignor to Creative Packaging Corp., Wheeling, Ill.
Continuation of Ser. No. 169,603, Mar. 17, 1988, abandoned.
This application Apr. 13, 1989, Ser. No. 338,482
Int. Cl.[5] B67D *5/06*
U.S. Cl. 222—520 13 Claims



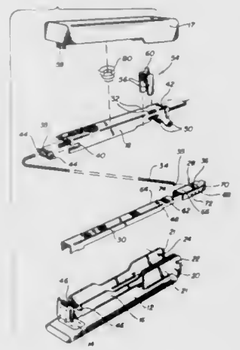
8. A closure cap for dispensing contents of a container, comprising:
a central post having a top surface and a substantially cylindrical imperforate peripheral wall, said cylindrical imperforate peripheral wall including a plurality of reduced wall peripheral portions formed in said peripheral wall and opening to said post top surface for metering the contents to be dispensed; and
a cap body reciprocally mounted on said central post and having an inner periphery which cooperates with said post peripheral wall to form a variable opening between said cap body inner periphery and said post peripheral wall and to provide a closure position below said reduced wall peripheral portion and a plurality of dispensing positions for dispensing the contents at a plurality of different rates as said cap body is moved on said post away from said closure position, said cap body being reciprocally mounted on said central post by a push-pull cooperation between a portion of said post having a lower and an upper stop position formed thereon and a projection formed on an inner wall of said cap body which abuts said lower and upper stop positions to form closed and full open dispensing positions, a portion of said reciprocal movement of said cap body being provided by threads cooperating between said post and said inner cap body wall.

4,927,066
GAS AND OIL TRUCK TANK MOUNTING STRAP REPLACEMENT KIT
Louis Hemmerich, 62-69 60th Rd., Maspth, N.Y. 11378, and Ronald Strait, 80-15 30th Ave., Apt. 1, Jackson Heights, N.Y. 11370
Filed Dec. 2, 1988, Ser. No. 278,756
Int. Cl.[5] B60P *3/22*; B65D *88/12*
U.S. Cl. 224—42.45 R 7 Claims



1. A gas and oil truck tank structure mounting strap replacement kit, comprising, a plurality of assemblies, each assembly including a pair of parallel mounting plates adapted for mounting to tank bearing channels of a tank structure when carried on a frame of a truck, a vertical plate adapted to be releasably attached to said pair of mounting plates, a rod adapted to be received by the vertical plate, and a horizontal strap plate adapted to be received on said rod and adapted for securing to the frame, for securing said tank structure to a truck vehicle.

4,927,067
STAPLING MACHINE
John Leszczak, Roselle Park, N.J., assignor to The Bates Manufacturing Company, Hackettstown, N.J.
Filed Jul. 27, 1988, Ser. No. 225,069
Int. Cl.[5] B25C *5/02*
U.S. Cl. 227—128 3 Claims



1. A stapling machine comprising:
a staple machine for receiving staples, having a staple discharge opening at one end;
a cover pivotally mounted to the magazine at the other end, pivotally movable between a closed position overlying the magazine and an open position;
a cap mounted a distance from the cover and pivotally movable therewith;
a staple supporting means within the magazine for support-

VOL
1114
ISS
4
MY
22
1990
UMI

ing staples therein comprising a rail having a top wall and two side walls;
a follower means slidably mounted on the supporting means for urging staples toward the discharge opening;
a spring means secured to the cover and to the follower means for urging the follower to slide away from and toward the staple discharge means and to urge the cover closed;
detent means within the magazine coacting with the follower to prevent the follower means from sliding toward the discharge means when the cover is open, said detent means comprising a shoulder in a side wall of the rail;
wherein the follower comprises a top wall having two side walls, at least one wall having a lip thereon which coacts with the shoulder;
an actuator means mounted to the cover coacting with the follower to release the follower from the detent means when the cover is pivoted to a substantially closed position thereby permitting the follower to slide toward the discharge opening;
wherein the actuator means coacts with the cap to release the follower when the cover is in a substantially closed position; and
wherein the actuator comprises a stirrup having two fingers and a toe thereon, the fingers slidably mounted in the cover and adapted to coact with the follower and the toe adapted to coact with the cap.

4,927,068

METHOD FOR HEATING A PATTERNED SUBSTRATE

Hiroyuki Naka, Osaka; Tomohide Hirono, Hirakata; Naoki Suzuki, Sakai, and Takashi Ichiyanagi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 23, 1988, Ser. No. 288,876
Claims priority, application Japan, Dec. 25, 1987, 62-330721
Int. Cl.[5] B23K *1/12, 1/19*
U.S. Cl. 228—103 **2 Claims**



1. A method for heating a substrate, having a plurality of electronic components at coordinates (i, j) on the substrate, using a mask having a plurality of apertures, comprising the steps of

(1) obtaining a respective heat transfer rate of an aperture associated with a respective coordinate aperture (R (i, j)) to make the temperature of the respective coordinate, as shown in the following equations (1) and (2), meet a respective desired temperature:

$$T_{ij}^{\tau+\Delta\tau} = \frac{\lambda\Delta\tau}{(C_R\gamma_R + C_S\gamma_S\delta_S/h)\,\delta_1\delta_2}\left\{\frac{\delta_2}{\delta_1}(T_{i+1,j}^{\tau} + T_{i-1,j}^{\tau} - \right. \tag{1}$$

-continued

$$\left. 2T_{i,j}^{\tau}) + \frac{\delta_1}{\delta_2}(T_{i,j+1}^{\tau} + T_{i,j-1}^{\tau} - 2T_{i,j}^{\tau}) + \frac{\delta_1\delta_2 q(\tau)}{\lambda}\right\} + T_{i,j}^{\tau}$$

$$q(\tau) = \alpha(T_{air}^{\tau} - T_{i,j}^{\tau}) - \tag{2}$$

$$R(i,j)C_\sigma \frac{\left(\frac{T_{i,j}^{\tau}+273}{100}\right)^4 - \left(\frac{T_w+273}{100}\right)^4}{\frac{1}{\epsilon_1}+\frac{1}{\epsilon_2}-1}$$

wherein
T_{ij}^{τ}: temperature of a coordinate (i, j) on said substrate,
τ: time
ΔT: a time interval
C_R: specific heat of said substrate
λ: thermal conductivity said substrate
γ_R: specific gravity said substrate
C_S: specific heat of one of said electronic components,
δ_S: representative thickness of one of said electronic components,
γ_S: specific gravity said one of electronic components,
h: thickness of the substrate,
δ_1, δ_2: long and broad length of said coordinate,
T_{air}^{τ}: temperature of (ambient) atmosphere in the heater,
α: convention heat transfer coefficient,
T_w: temperature of the heater,
C_σ: Stefan-Boltzmann's constant,
$q(\tau)$: quantity of heat flux in a unit area for a unit time interval from the heater source at every time interval $\Delta\tau$,
ϵ_1: emissivity of said substrate,
ϵ_2: emissivity of the heater,
$R_{(i,j)}$: heat transfer rate of an aperture corresponding to the coordinate area δ_1 δ_2 and

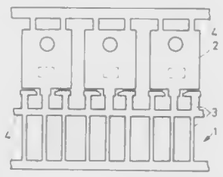
(2) repeating step (1) for each of the plurality of coordinates.

4,927,069

SOLDERING METHOD CAPABLE OF PROVIDING A JOINT OF REDUCED THERMAL RESISTANCE

Takao Ushikubo, Kawagoe; Yasuhiro Iwasa, Wako, and Yukinori Yamaji, Yamagata, all of Japan, assignors to Sanken Electric Co., Ltd., Saitama, Japan

Filed Jul. 10, 1989, Ser. No. 377,906
Claims priority, application Japan, Jul. 15, 1988, 63-176386; Mar. 17, 1989, 1-65671; Mar. 17, 1989, 1-65672
Int. Cl.[5] B23K *1/12, 31/02*
U.S. Cl. 228—123 **15 Claims**



1. A method of soldering two members together, which comprises:

(a) placing a body of solder together with a flux between the two members;

(b) heating the solder and the flux to a prescribed temperature above the melting point of the solder and above a flux activation temperature at which the flux generates a gas;

(c) maintaining the solder and the flux at the prescribed temperature for a preassigned length of time; and

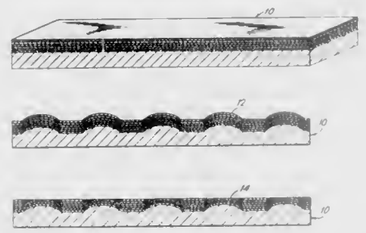
(d) exerting a compressive force on the solder through at least either of the two members in order to drive off the gas bubbles generated by the flux from the molten body of solder and hence to provide a joint of reduced thermal resistance.

4,927,070

METHOD FOR MAKING MULTI-COLORED COMPOSITE LAMINATES

Steven D. Kretchmer, 48 Francis La., Greenwich, Conn. 06831, assignor to Steven D. Kretchmer, Greenwich, Conn. and Stern Metals, Inc., Attleboro, Mass.

Filed Mar. 10, 1989, Ser. No. 321,597
Int. Cl.[5] B23K *20/04, 31/00*
U.S. Cl. 228—155 **23 Claims**



1. A method for making multi-layered composites comprising the steps of:

stacking a plurality of sheets in a predetermined color sequence;

solid-phase bonding said sheets into a composite laminate;

forming a raised pattern on an outer surface of said laminate by passing said laminate through a patterned roller;

removing said raised patterns to form a substantially flat surface and to expose portions of sheets other than said outer surface; and

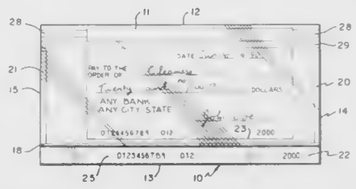
rolling said composite laminate to a finished dimension having a flat surface and color design thereupon due to said exposed sheet portions.

4,927,071

DOCUMENT CARRIER

Daniel J. Wood, 123 Calle Pena, Santa Fe, N. Mex. 87501

Filed Mar. 29, 1989, Ser. No. 329,520
Int. Cl.[5] B65D *27/00, 27/04;* **G06K** *19/06*
U.S. Cl. 229—71 **7 Claims**



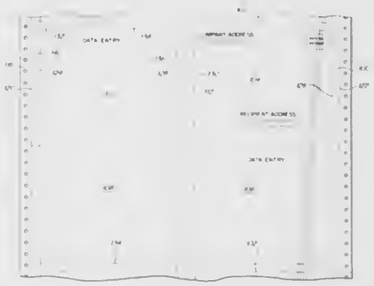
1. The document carrier which comprises a rectangular back sheet and a rectangular front sheet, the back sheet being provided with a surface of vellum to accept magnetic indicia, said front sheet being formed of translucent material through which the document can be easily read, said front and back sheets being secured by glue lines along the bottom edge and along at least one side edge, pressure sensitive adhesive bars, positioned to seal an inserted document in said document carrier, the pressure sensitive adhesive bars being of a type that permits the front sheet and the back sheet to be easily peeled apart to allow insertion of the document, said bars being located inside the pocket into which the document is to be inserted, whereby the pressure sensitive adhesive will hold the document inside the carrier permitting the document to be removed without damage.

4,927,072

MAILER

Richard A. Jenkins, Wheeling, and Wilbur P. Hutchinson, Mount Prospect, both of Ill., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation-in-part of Ser. No. 911,425, Sep. 25, 1986, abandoned. This application Aug. 11, 1988, Ser. No. 230,916
Int. Cl.[5] B65D *27/10, 27/34*
U.S. Cl. 229—92.3 **6 Claims**



1. A mailer comprising:

a generally rectilinear sheet of material having respective orthogonally related edges;

first and second foldlines extending in said sheet generally perpendicular one to the other, generally parallel to said orthogonally related edges, respectively, and defining first and second panels and third and fourth panels of said sheet, respectively, on opposite sides of said first foldline, said fourth and first panels and said second and third panels, respectively, lying on opposite sides of said second foldline;

first lines of adhesive along the edges of said sheet on one face thereof such that, when said sheet is folded about said first foldline to register the first and fourth panels one with the other and the second and third panels one with the other and to register portions of the second foldline each with the other, the corresponding edges of the folded sheet may be secured one to the other;

second lines of adhesive along edges of the face of said sheet opposite said one face such that, when the registering first and fourth panels and said second and third panels are folded about the registering second foldline portions, the corresponding edges of said fourth and third panels may be secured one to the other therealong whereby at least a four-ply mailer may be formed; and

lines of perforations extending along the margins of said sheet inset from said edges thereof and generally parallel thereto, said marginal lines of perforations registering one with the other when said sheet is folded about said first foldline, the registering marginal lines of perforations of said first and fourth panels lying in registration with the registering marginal lines of perforations of said second and third panels when said sheet is folded about said second foldline to form marginal tear strips about two sides of the mailer, additional lines of perforations on opposite sides of and adjacent to said first foldline and extending parallel thereto, said additional lines of perforations being registerable one with the other when said sheet is folded about said first foldline, the registering additional

VOL
1114
ISS
4
MY
22
1990
UMI

lines of perforations of said first and fourth panels lying in registration with the registering additional lines of perforations of the second and third panels when said sheet is folded about said second foldline to form an additional marginal tear strip along another side of said mailer whereby the marginal tear strips may be removed and the mailer opened, said second lines of adhesive extending about the edges of one of said third and fourth panels coincident with the corresponding edges of said sheet and also about a margin of one of said third and fourth panels adjacent said first foldline, the registering marginal lines of perforations of said first and fourth panels and said second and third panels being inset from said first lines of adhesive and a portion of said second lines of adhesive when said sheet is folded to form said four-ply mailer and the registering additional lines of perforations of said first and fourth panels and said second and third panels being inset from the remaining portion of said second lines of adhesive when said sheet is folded to form said four-ply mailer.

4,927,073

FOLDABLE AND STERILIZABLE COMPARTMENTALIZED ORGANIZER

Ruth Esposito, 1008 Spruce St., Philadelphia, Pa. 19107

Filed Oct. 13, 1988, Ser. No. 257,453
Int. Cl.[5] B65D *5/36;* **A61B** *19/02*
U.S. Cl. 229—117.07 **28 Claims**

1. A packaged sterilant organizer comprising
a sealed package formed of sterilizable, contamination-impermeable material, and
a folded compartmentalized tray completely enclosed in said package and packaged in a substantially collapsed condition and having a bottom, a plurality of wall members foldably attached to the bottom, an operating strap for erecting said tray into an open box having a plurality of compartments, and means for locking said tray into the erected condition,
a sterilizable, elongated semi-rigid sheet having a central area, a first side foldably attached to the central area, a second side foldably attached to the central area, a first end piece foldably attached to the central area, a second end piece foldably attached to the central area, and a tongue having a first end portion and a second end portion, the tongue first end portion being connected to the first end piece, said first and second sides being folded equidistantly over said central area, said second end piece including a strap locking means for locking the second end portion of the strap to the second end piece, said second end piece being folded inward over said first and second sides, said tongue second end portion abutting the edge of the second end piece,
a plurality of transverse wall members extending across the central area between the first and second sides, each said transverse wall member including a slot,
said strap extending through said slots in said transverse wall members to said second end piece and being attached to the transverse wall member furthermost from said second end piece,
whereby when said strap is pulled outwardly from said second end piece, said first and second sides and said first and second end pieces are drawn perpendicular to said central area to erect side and end walls and said strap is locked to said second end piece to prevent recollapse of said tray, converting said sheet into a rigid compartmentalized tray.

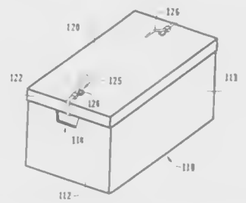
3. A collapsible, sterilizable, compartmentalized tray for holding medical instruments and supplies for use in operating rooms and at bedside of a hospital patient, comprising
a bottom wall,
a first wall connected to the bottom wall,
a second wall connected to the bottom wall,
a third wall connected to the bottom wall,
a transverse wall extending across the bottom wall,
erecting and compartment forming means for erecting the first, second, and third walls in an erected condition and for forming a plurality of compartments, and
locking means for locking the first, second, and third walls in an erected condition,
said erecting and compartment forming means including
an operating strap having a first end portion and a second end portion,
the operating strap being connected to the second wall at the operating strap first end portion and being extendable over the bottom wall to the third wall forming a tray partition,
said transverse wall having a slot through which the operating strap extends so that when the operating strap second end portion is pulled towards the third wall the transverse wall is drawn perpendicular to the bottom wall in an erected condition,
said locking means including
attachment means for attaching the second end portion of the operating strap to the third wall.

4,927,074

DOCUMENT CONTAINER

John D. LaRue, and John D. LaRue, Jr., both of 6720 Golf Dr., Dallas, Tex. 75205

Filed Jan. 25, 1989, Ser. No. 303,372
Int. Cl.[5] B65D *43/08*
U.S. Cl. 229—125.21 **31 Claims**



1. A document-handling container, comprising:
a box body, comprising end walls, side walls, and a floor,
said end walls, side walls, and floor being folded from a continuous common sheet of cardboard,
said end walls being thicker than said side walls of said box body,
said end walls also including handle holes therein;
a lid, consisting essentially of a folded continuous sheet of cardboard,
said lid having a peripheral lip thereon,
said lid also including holes therein close to said lip,
said lip including multiple plies of cardboard; and
a ratcheting closure tie, which is dimensioned to be threaded completely through said handle hole, and through a respective corresponding one of said holes in said lid, and which can lock to itself;
said holes in said lid being located, within said lid, such that, when said lid is emplaced on said box body, plural respective ones of said holes are in proximity to respective corresponding ones of said handle holes.

4,927,075

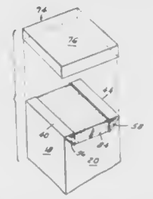
MULTI-PIECE FLAT TOP CONTAINER

Robert E. Lisiecki, Bloomfield, Mich., assignor to Pure-Pak, Inc., Walled Lake, Mich.

Filed Jul. 3, 1989, Ser. No. 374,928
Int. Cl.[5] B65D *43/14*
U.S. Cl. 229—125.34 **12 Claims**

1. A thermoplastic coated multi-piece falt top container including four respectively adjacent body panels, each connected to the adjacent body panel by a longitudinal score line,

two pairs of oppositely disposed top fold-down edge panels connected by a lateral score line to the respective body panels and to each other by extensions of said longitudinal score lines, said lateral score line forming intersections with said longitudinal score lines, a pair of diagonal score lines formed on each of one pair of said oppositely disposed top fold-down edge panels converging substantially from the intersections of the respective longitudinal and lateral score lines across each edge panel and forming a pair of corner gussets on each of the one pair of



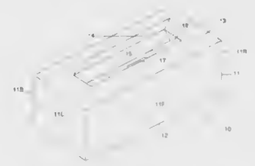
edge panels, characterized by said one pair of edge panels being folded outwardly and downwardly about said lateral score line onto the respective adjacent body panels, and said corner gussets being folded about said diagonal score line onto their respective edge panels, and the other pair of oppositely disposed top fold-down edge panels being folded inwardly about said lateral score line, and a membrane being sealed onto predetermined surfaces of each of said other pair of edge panels, said corner gussets and said first pair of edge panels.

4,927,076

MEDICAL APPLIANCE DISPOSAL CONTAINER

James L. Simpson, Indialantic, Fla., assignor to Hemox, Inc., Indian Harbor Beach, Fla.

Filed Jan. 24, 1989, Ser. No. 300,946
Int. Cl.[5] B65D *5/06*
U.S. Cl. 229—132 **20 Claims**



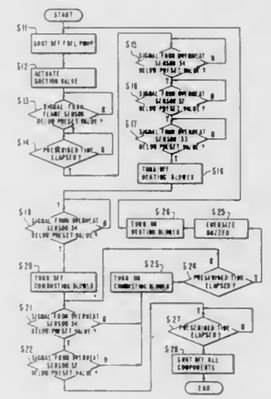
1. A discarded material container comprising a container body having a bottom and sidewalls and a container top enclosing said container, said container top having an opening therethrough for the insertion of discarded material into the container, said body being comprised of a laminate structure of compact fibrous material and a material that is effectively impervious to the passage of a fluid therethrough, and wherein said container top is formed of a first layer of said laminate structure having an opening therethrough that is shaped to define a lip extending from one side of said opening, and a second layer of said laminate structure, disposed adjacent to said first layer of said laminate structure, said second layer of said laminate structure having a cut therethrough to define a flexible tab overlying the opening in said first layer and being sized to effectively close said opening when urged downwardly onto said opening and engaged by said lip; and
wherein said second layer of said laminate structure is scored along a top surface thereof to define a pivot line about which said tab is normally caused to be urged upwardly away from said opening.

4,927,077

HEATER DEVICE FOR MOTOR VEHICLE

Masaki Okada, Yokohama, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 118,947
Claims priority, application Japan, Nov. 13, 1986, 61-270618
Int. Cl.[5] G05D *23/00*
U.S. Cl. 237—2 A **7 Claims**



1. (THREE TIMES AMENDED) A heater apparatus for a motor vehicle, comprising:
a burner for combusting fuel and producing hot combustion gas;
a heat exchanger connected to the burner and being operable to transfer heat between the combustion gas from the burner and heating air to be introduced into a passenger compartment of the motor vehicle;
means for detecting when the burner ceases operation and outputting a signal indicative of a ceased operation condition;
temperature detecting means connected to the heater apparatus for detecting the temperature of the heater apparatus and outputting a signal indicative of an over heat condition;
blower means in fluid communication with the heater apparatus; and
means operable in response to the over heat condition signal and the ceased operation condition signal for actuating the blower means to introduce air into the heater apparatus, thereby lowering the temperature of the heater apparatus.

4,927,078

DEVICE FOR ELASTICALLY AND RAPIDLY FIXING A RAILWAY RAIL

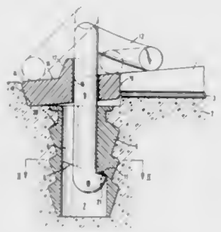
Gerard Vanotti, Mailliat, France, assignor to Etablissements S.A., Oyonnax, France

PCT No. PCT/FR87/00493, § 371 Date Jul. 29, 1988, § 102(e) Date Jul. 29, 1988, PCT Pub. No. WO88/04342, PCT Pub. Date Jun. 26, 1988
PCT Filed Dec. 11, 1987, Ser. No. 246,816
Claims priority, application France, Dec. 12, 1986, 86-17614
Int. Cl.[5] E01B *9/48, 9/60*
U.S. Cl. 238—349 **16 Claims**

1. A securing device, for securing railway rails on cross ties, comprising a rod having a first end and a second end and a longitudinal axis, said first end including a spring head, shaped as an open ring, which is adapted to rest against a rail shoe, said second end including an inclined heel, off-centered from said longitudinal axis, defining a hook which is adapted to cooperate with a hooking surface, and means for progressively ten-

VOL
1114
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1990
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sioning said spring head on the rail shoe, comprising a surface inclined upwardly in the direction of the rail shoe, for guiding



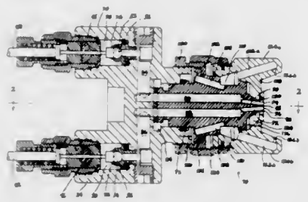
said spring head of said rod to a position over the rail shoe as said spring head of said rod is moved by a half-turn around said longitudinal axis.

4,927,079

PLURAL COMPONENT AIR SPRAY GUN AND METHOD

David H. Smith, Redwood City, Calif., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Oct. 4, 1988, Ser. No. 253,262
Int. Cl.[5] B05B *7/08, 1/28*
U.S. Cl. 239—11 22 Claims



1. A plural component external mix air spray gun, comprising a fluid nozzle having first and second hemispherically-shaped fluid outlet orifices having flat sides in facing and spaced relationship; means for delivering first and second liquid materials to said first and second fluid orifices, respectively, for emission therefrom in first and second hemispherically-shaped unatomized liquid streams that are inclined toward each other and come together along their flat sides beyond said orifices in a composite cylindrical stream of the first and second materials; and pneumatic means for mixing and breaking up the composite cylindrical liquid stream into an atomized spray downstream from said first and second fluid orifices, said pneumatic means including an air outlet orifice surrounding said first and second fluid orifices and means for delivering air to said air orifice for emission therefrom in surrounding relationship to the first and second liquid streams and the composite cylindrical stream.

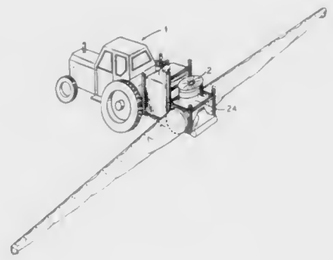
4,927,080

FIELD SPRAYING DEVICE

Erik Alsing, Nivå, Denmark, assignor to Hartvig Jensen & Co. A/S, Glostrup, Denmark

Filed Jan. 23, 1989, Ser. No. 299,415
Claims priority, application Denmark, Jan. 25, 1988, 336/88
Int. Cl.[5] E05B *1/20, 3/12*
U.S. Cl. 239—77 3 Claims

3. A spraying device comprising an elongated spray beam with a plurality of spray nozzles spaced therealong, a source of compressed air, and a partially inflatable hose being connected to said source and being mounted on said beam adjacent said nozzles, said hose being made of a flexible material and having at least one slotted discharge opening positioned adjacent said nozzles, said spraying device including means for mounting said opening for pivotal movement along an axis extending





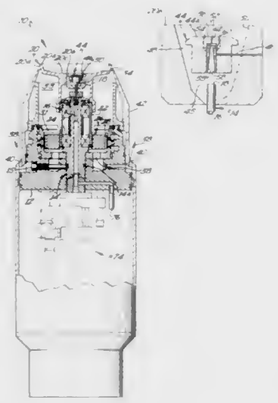
parallel to the beam with the hose yielding in shape and the nozzle being mounted separate from the slotted discharge opening so that a discharge of the nozzle intersects a discharge of the opening at a point spaced from the nozzle and opening and at an angle adjusted by the means for mounting.

4,927,081

ROTARY ATOMIZER

Kui-Chiu Kwok, Arden Hills, Minn., and Bernard J. Marchand, Le Raincy, France, assignors to Graco Inc., Minneapolis, Minn.

Filed Sep. 23, 1988, Ser. No. 249,423
Int. Cl.[5] B05B *3/10*
U.S. Cl. 239—223 3 Claims



1. A rotary atomizer for applying coating materials in combination with a turbine and a stationary center feed tube connected to a source of coating materials and having a discharge end, said rotary atomizer comprising:

a cup having a forward facing surface with a discharge edge and a central bore having a diameter;

a distributor adjacent said feed tube end and having an outside diameter substantially smaller than said central bore, said distributor further having an axial bore;

a diffuser pressed into said axial bore and comprising:

forward and rear ends;

an axial passage located coaxially with said feed tube for receiving material from said feed tube end and extending forwardly from said rear end of said diffuser, said rear end being adjacent said feed tube said axial passage tapering inwardly from said rear end to said front end; and

at least one radial passage extending radially outwardly from said axial passage and communicating with said axial bore said forward end of said diffuser being spaced rearwardly from the forward end of said distributor forming a depression in said forward end of said distributor; and

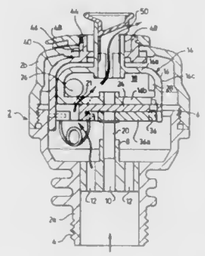
pins coaxially locating said distributor in said central bore of said cup and in annularly spaced relationship thereto, said distributor being connected to and supported by said cup only by said pins, said radial and axial passages and said depression being sized to substantially fill said depression with liquid coating materials when in operation and whereby a substantial majority of the paint exiting said center feed tube discharge end passes on to the forward facing surface of said cup through the annular space formed between said distributor and said cup, and said paint discharging from said distributor recess flowing substantially radially outwardly to said cup forward surface.

4,927,082

BALL-TYPE WATER SPRINKLER

Ilan Greenberg, Haifa, and Amir Cohen, Yuvalium, both of Israel, assignors to Lego M. Lemelshtrich Ltd., Netanya, Israel

Filed Aug. 15, 1989, Ser. No. 393,732
Claims priority, application Israel, Apr. 19, 1989, 90037
Int. Cl.[5] B05B *3/06*
U.S. Cl. 239—230 19 Claims



1. A ball-type water sprinkler, comprising a housing; a rotor mounted for rotation within the housing and including a chamber having a water inlet oriented to direct the water to flow circumferentially of the chamber; a ball freely movable within the chamber according to the direction of flow of the water therein; an impact element fixed to the rotor to be impacted by the ball and to rotate the rotor according to the direction of rotation of the ball therein; a water outlet from said chamber; and a nozzle communicating with the outlet and rotatable with the rotor; characterized in that:

said housing includes a fixed stop and a presettable stop presettable about the circumference of the housing;

said rotor includes two inlets oriented to direct the water to flow in opposite directions circumferentially around said chamber;

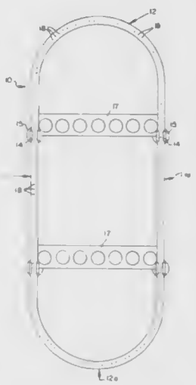
and said sprinkler further includes a shutter rotatable with the rotor and movably mounted with respect thereto to a first position covering one inlet and uncovering the other inlet to cause the water to flow in a first direction, or to a second position uncovering said one inlet and covering said other inlet to cause the water to flow in the opposite direction; an actuator member rotatable with the rotor and having a projection engageable with the fixed stop or the presettable stop during its rotation; and a coupling between the actuator member and the shutter and effective to move the shutter to its first position wherein said projection engages said fixed stop, or to its second position wherein said projection engages said presettable stop.

4,927,083

ELONGATED SHOWER HEAD

N. Charles Daunt, 6 Nautilis Rd., Hilton Head Island, S.C. 29928

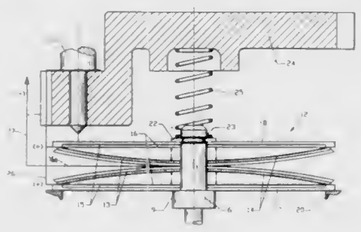
Filed May 9, 1989, Ser. No. 439,519
Int. Cl.[5] B05B *15/06*
U.S. Cl. 239—282 22 Claims



1. An elongated shower head comprising a length of hollow tubing in the shape of an elongated loop having two spaced apart side sections and a bottom section joining respective lower ends of said side sections, said hollow tubing having an outer wall concentric of a central axis extending lengthwise of said loop, and means supporting said tubing length in a shower area with said side sections disposed vertically and said bottom section extending horizontally between said side section lower ends such that semi-circumferential portions of said tubing outer wall comprise one face of said loop facing outwardly of a shower area wall, said tubing outer wall portions of said side and bottom sections of said loop one face containing orifices spaced apart lengthwise of said sections and offset a distance circumferentially of the tubing from the centerline of said tubing outer wall semi-circumferential portions comprising said loop one face in the direction of the central region of said loop, said offset distances of said orifices in a central sector portion of said bottom section tubing being greater than the offset distances of orifices in sectors of outer portions of said bottom section tubing adjacent each said side section.

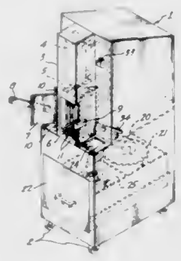
VOL
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4,927,084
FUEL INJECTION VALVE
Burkhard Brandner, Werdohl, and Klaus Wenzlik, Iserlohn, both of Fed. Rep. of Germany, assignors to Atlas Fahrzeugtechnik GmbH, Werdohl, Fed. Rep. of Germany
Filed Dec. 28, 1988, Ser. No. 291,946
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1988, 3800203
Int. Cl.[5] B05B 3/14; F16K 31/02; F02M 51/06
U.S. Cl. 239—584 17 Claims



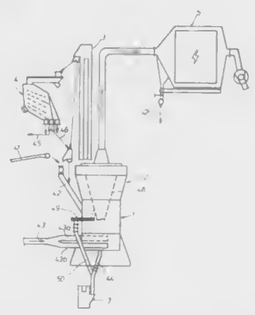
1. A valve, particularly a fuel injection valve, comprising a housing; a valving element mounted in said housing and being movable between first and second positions; and piezoceramic means for moving said valving element from said first to said second position, including at least two energizable laminated packages each of which is deformable in response to energization and each including a ceramic layer having a first surface and a second surface, a plate-like carrier at one surface of the ceramic layer, first conductor means at the other surface of the ceramic layer, and second conductor means, the carrier being disposed between the second conductor means and the ceramic layer, said second conductor means of said packages being disposed between said ceramic layers so that energization of said packages entails deformation of said packages such that the packages have convex sides confronting each other, said piezoceramic means further comprising an energy source having first and second poles, means for connecting one of said poles to the first conductor means of said packages, and means for connecting the second conductor means with the other of said poles.

4,927,085
APPARATUS FOR RECYCLING OIL FILTERS
Gordon D. Oberg, 1717 S. Lake Stickney Dr., Lynnwood, Wash. 98207
Filed Dec. 21, 1988, Ser. No. 288,321
Int. Cl.[5] B30B 1/32; B02C 19/08
U.S. Cl. 241—36 6 Claims



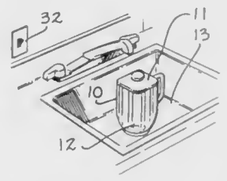
1. Apparatus for recycling an oil filter comprising a housing having an elongated compartment sized to receive the oil filter and having a first end adapted to engage such filter, a crusher plate mounted for movement lengthwise of said compartment toward and away from said first end, and means for moving said crusher plate in said compartment with sufficient force to collapse such filter, said crusher plate moving means including a fluid pressure jack connected to said crusher plate and control means for supplying fluid under pressure to said fluid pressure jack, said control means including a directional control valve actuatable to supply fluid under pressure to said jack so as to effect movement of said crusher plate toward said first end of said compartment and for moving said plate away from such first end automatically when force in excess of a predetermined force is applied against the oil filter by said crusher plate, said control means further including means for sensing the position of said crusher plate as it is moved away from said first end of said compartment and for automatically cutting off the supply of fluid under pressure to said hydraulic jack so as to stop such movement of said crusher plate when it reaches a predetermined position.

4,927,086
GRINDING PROCESS AND APPARATUS
Heinrich Henne, Ennigerloh; Karl-Heinz Dammertz, Oelde; Lutz T. Schneider, Ennigerloh, and Gotthard Blasczyk, Beckum, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany
Filed May 14, 1985, Ser. No. 733,945
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418197
Int. Cl.[5] B02C 15/00
U.S. Cl. 241—80 8 Claims



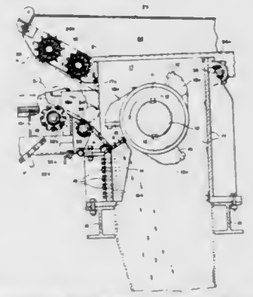
1. A ring mill wherein fresh material is delivered to and comminuted at a grinding zone and desirable finished products of differing fineness classifications are continuously produced from a single grinding process having a grinding plate rotatable about a vertical axis, grinding elements engageable with the plate for comminuting material to be ground, a nozzle ring encircling said plate, and means for establishing an upwardly directed air stream via said nozzle ring of such velocity as to entrain and carry upwardly relatively fine constituents of comminuted material, said mill comprising first and second opposing and upwardly directed walls forming part of said nozzle ring and limiting its internal cross section; means for radially adjusting the position of one of said walls relative to the other to adjust the quantity and velocity of air passing through said nozzle ring to obtain a selected pneumatic preclassification between a first relatively fine narrow range classification of constituents capable of being entrained in said air stream and exhausted from said mill to form a first finished product and a second relatively coarse broad range classification of constituents which cannot be entrained in said air stream and are discharged downwardly through said nozzle ring by gravity; mechanical separating means; conveyor means for delivering all of said relatively coarse constituents of said second classification to said separating means, said separating means being operable to extract from said coarse constituents a proportion of the relatively less coarse constituents of said second classification of substantially uniform size to form a second finished product having constituents coarser than those of said first finished product and finer than the remainder of said coarse constituents; and chute means for continuously delivering fresh material to said mill and returning the remainder of said coarse constituents downward by gravity to said mill for further grinding.

4,927,087
ICE SHAVING SYSTEM
John B. Palochak, 227 Chico Avenue, Santa Cruz, Calif. 95060
Filed Jun. 2, 1989, Ser. No. 360,858
Int. Cl.[5] B02C 18/42
U.S. Cl. 241—100.5 12 Claims



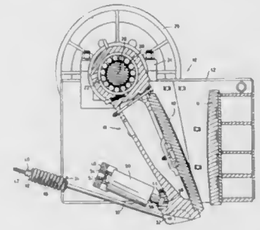
1. A system for reducing larger pieces of material to pieces of smaller size, said system comprising:
(a) a container in which said larger pieces of said material are reduced to said pieces of smaller size, said container having an apertured top portion through which said larger pieces of said material are received and through which said pieces of smaller size are removed, said container having side and bottom portions that are substantially closed except for an opening in said bottom portion;
(b) a cutting device;
(c) a shaft carrying said cutting device, said shaft extending through said opening in said bottom portion of said container so that a first end of said shaft is located within said container and a second end of said shaft is located outside said container, said first end of said shaft being attached to said cutting device so as to support said cutting device for rotary motion within said container;
(d) a fitting disposed in said opening in said bottom portion of said container, said fitting being configured to enable rotary motion of said shaft while substantially precluding said pieces of smaller size from leaving said container via said opening in said bottom portion of said container;
(e) a sink having a drain opening, said drain opening being configured to receive said second end of said shaft carrying said cutting device;
(f) an electric motor positioned underneath said sink so that a drive shaft of said motor is substantially aligned with said shaft carrying said cutting device; and
(g) an elongate extension device for longitudinally coupling said drive shaft of said motor to said second end of said shaft carrying said cutting device, said elongate extension device having a first end connectable to said drive shaft of said motor and a second end connectable to said second end of said shaft carrying said cutting device so that said elongate extension device extends generally coaxially with respect to both said drive shaft of said motor and said shaft carrying said cutting device, rotary motion of said drive shaft of said motor thereby causing concomitant rotary motion of said shaft carrying said cutting device, said cutting device thereby being made to rotate in contact with said larger pieces of said material within said container so as to reduce them to said pieces of smaller size.

4,927,088
TIRE FEEDING STRUCTURE FOR TIRE SHREDDING APPARATUS
John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Machinery Corp., Salt Lake City, Utah
Filed Feb. 27, 1989, Ser. No. 316,012
Int. Cl.[5] B02C 19/12
U.S. Cl. 241—223 20 Claims



1. Tire shredding apparatus, comprising tire shredding mechanism; tire feeding structure comprising a set of rolls including lower and upper studded rolls for receiving tires fed flatwise thereinto, said set of rolls being rotatably mounted in mutually parallel relationship forwardly of said shredding mechanism and defining a downwardly sloping path of tire travel leading thereinto; and means for rotating said rolls toward said shredding mechanism.

4,927,089
ROCK CRUSHERS
Joseph Altmayer, Kitchener, Canada, assignor to E&E Seegmiller Limited, Kitchener, Canada
Filed Oct. 28, 1988, Ser. No. 263,865
Int. Cl.[5] B02C 1/04
U.S. Cl. 241—264 2 Claims



1. In a jaw crusher for crushing rock of the type having a frame, a fixed jaw mounted on the frame and a movable jaw mounted on the frame for movement toward and away from the fixed jaw between a first set position which determines the maximum size of the gap formed between the jaws for a predetermined jaw setting and a first advanced position in which the movable jaw is located more closely adjacent the fixed jaw, and wherein the movable jaw is movable from the first set position to a retracted position in which it is more remote from the fixed jaw than it is when it is in the first set position so as to facilitate the removal of obstructing material from the bite which is formed between the jaws, the improvement of;
hydraulic control means for controlling the movement of the movable jaw between said first set position and said retracted position comprising;
(a) a double acting hydraulic ram having first and second ends mounted on the frame and movable jaw respectively, and being extensible and contractable between said ends,

VOL 1114 ISS 4 MY 22 1990 UMI

said ram comprising a cylinder, a piston slidably mounted in the cylinder and dividing the cylinder into first and second fluid chambers, a rod extending from the piston and projecting from one end of the cylinder, one of said ends of said ram being located on said cylinder and the other being located on said rod, first and second fluid ports communicating with said first and second chambers respectively, movement of said piston resulting from expansion of said first fluid chamber serving to move the movable jaw to said first set position and movement of said piston resulting from expansion of said second fluid chamber serving to move the movable jaw to said retracted position,

(b) a source of high pressure hydraulic fluid,

(c) first fluid supply conduit means communicating between said source and said first fluid chamber to supply and vent hydraulic fluid from said first fluid chamber,

(d) second fluid supply conduit means communicating between said source and said second fluid chamber to supply and vent hydraulic fluid from said second fluid chamber,

(e) flow control means in said first and second fluid supply conduit means for simultaneously locking hydraulic fluid in said first and second fluid supply conduits to hold the extensible ram in a substantially rigid fixed length condition when in said set position during normal operation of the crusher,

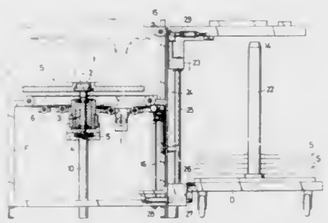
(f) non-pneumatic pressure relief means communicating with said first fluid chamber to relieve the pressure in said first fluid chamber when the pressure in said first fluid chamber exceeds a predetermined control pressure to free the movable jaw for movement toward said retracted position.

4,927,090

METHOD AND APPARATUS FOR DISCHARGING SPOOLS

Masao Matsumoto, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,049
Claims priority, application Japan, May 30, 1987, 62-137486
Int. Cl.[5] B65H *19/22, 19/30*
U.S. Cl. 242—67.1 R 8 Claims



1. An apparatus for discharging a spool from a reeling machine to a carrier car, the spool being disposed on a winding head of the reeling machine rotatable about a vertical axis, said apparatus comprising:

(a) at least one belt conveyor extending in a horizontal plane below the winding head and vertically movable to an elevated position above the winding head for lifting up the spool to remove the same from the winding head;

(b) at least one horizontal support arm extending in alignment with said conveyor for receiving therefrom the spool when said belt conveyor is disposed at said elevated position; and

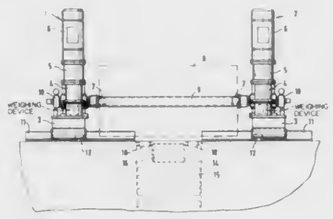
(c) means defining a parking lot disposed beneath said support arm for admitting the carrier car.

4,927,091

DEVICE FOR WINDING AND UNWINDING A WEB OF MATERIAL

Peter Weiss, and Knut Welkers, both of Neuss, Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,336
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714329
Int. Cl.[5] B65H *19/06, 16/06*
U.S. Cl. 242—68.4 8 Claims



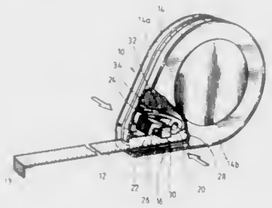
1. In a device for winding and unwinding a reel comprising a web of material on a core tube and comprising two separated uprights, in each of which is mounted a horizontal chuck which can engage the core tube, the improvement comprising a mechanism (15–17) that supports the reel (8) at the bottom during winding and unwinding, means for moving the supporting mechanism along with the reel, means for detecting the actual weight of the reel on the chucks and means for raising the supporting mechanism in accordance with the actual weight.

4,927,092

TAPE MEASURE LOCKING SYSTEM

Billy S. Ingram, II, Asheville, and David S. Chapin, Raleigh, both of N.C., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 30, 1988, Ser. No. 213,735
Int. Cl.[5] G01B *3/10;* B65H *75/30*
U.S. Cl. 242—107.2 8 Claims



1. A locking system for a coiled tape measure contained within a hollow flexible case having parallel sides separated by a wall comprising:

means for pressing said tape measure outwardly against the inside of the case wall;

means for biasing said means for pressing said tape outwardly against the inside of the case wall;

means for defeating said means for biasing, said means for defeating said means for biasing being activated by an inward force from one of the parallel sides of the coiled tape measure case;

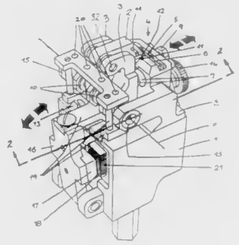
wherein said means for defeating said means for biasing comprises at least one wedge member attached to the inside of said case, said wedge member being constructed and arranged to engage and lift said means for pressing said tape against the inside wall of the case.

4,927,093

METHOD FOR BRAKING A MOVING THREAD-LIKE MATERIAL AND THREAD BRAKE FOR CARRYING OUT SAID METHOD

Erich Weidmann, Wetzikon, Switzerland, assignor to Gebrueder Loepfe AG, Wetzikon, Switzerland

Filed Jan. 9, 1989, Ser. No. 294,751
Claims priority, application Switzerland, Jan. 15, 1988, 00146/88
Int. Cl.[5] B65H *59/26*
U.S. Cl. 242—154 24 Claims



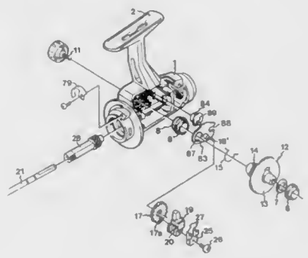
1. A thread brake comprising a brake body provided with a plurality of thread guide means for guiding a thread-like material, biasing means associated with said brake body for holding said brake body and said thread guide means in a first position so as to allow said thread-like material to be drawn through said thread guide means, a brake head having a plurality of brake elements and means for selectively biasing said plurality brake elements toward said brake body and against said thread-like material whereby said brake body is gradually moved from said first position against said biasing means by said thread-like material to a second position wherein said thread-like material is alternatively looped between said thread guide means and said brake elements for braking said thread-like material.

4,927,094

OPEN-FACE FISHING REEL OF THE FIXED-SPOOL TYPE

Bengt-Åke Henriksson, Svängsta, Sweden, assignor to ABU Garcia Produktioo AB, Svagsta, Sweden

Filed Jul. 6, 1989, Ser. No. 376,103
Int. Cl.[5] A01K *89/01*
U.S. Cl. 242—242 2 Claims



1. Open-face fishing reel of the fixed-spool type, comprising

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4,927,095

PLANETARY GEAR DRIVE FOR FISHING REEL

John N. Young, Fairfax, Calif., assignor to Charles C. Worth Corporation, Kentfield, Calif.

Filed Jan. 23, 1989, Ser. No. 298,929
Int. Cl.[5] A01K *89/015*
U.S. Cl. 242—261 5 Claims

1. A drive system for a fishing reel comprising:

a main frame;

a spool shaft rotatable on said frame and carrying a spool for a fishing line;

a driven pinion;

a handle shaft rotatable on said frame in axial alignment with said spool shaft;

a ring gear driven by said handle shaft;

a planetary gear carrier;

a plurality of planetary gears rotatable on said carrier engaging said ring gear and said driven pinion;

said planetary gears being equally spaced around said pinion;

means holding said planetary gear carrier against rotation on said main frame;

means for selectively keying said driven pinion onto one end of said spool shaft;

a coaxial recess in said handle shaft of a size to receive said driven pinion freely;

yieldable means biasing said driven pinion into driving engagement with said spool shaft; and

free spool cam means for engaging said driven pinion and shifting it axially into said recess to disengage said driven pinion from said spool shaft.

a housing;

a spool rotatably and axially displaceably mounted in said housing;

a line spool non-rotatably connected to said spindle and axially fixed to one end thereof;

a drive shaft mounted in said housing and extending at right angles to said spindle;

a handle for rotating said drive shaft;

a driving gear non-rotatably mounted on said drive shaft;

driver means axially fixed on said spindle;

an oscillating gear rotatably mounted on a bearing pin and meshing with said driving gear, said oscillating gear having eccentric means thereon for engaging said driver means in order, upon rotation of the drive shaft, to move the spindle back and forth in its longitudinal direction and, thus, oscillate said line spool about a center of oscillation; and

shifting means for supporting said bearing pin for said oscillating gear, and means for pivoting said shifting means about the axis of said drive shaft in order to shift said bearing pin and, thus, displace the center of oscillation of the line spool to a desired position in the longitudinal direction of said spindle.

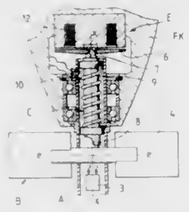
VOL
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ISS
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4,927,096

ROTOR SETTING SYSTEM IN CONJUNCTION WITH AERODYNAMIC BODY CONTROLS

Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, München, Fed. Rep. of Germany

Filed Feb. 20, 1987, Ser. No. 16,881
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606423
Int. Cl.[5] F42B *15/027*; F41G *9/02*
U.S. Cl. 244—3.22 9 Claims



1. A rotor setting system for an aerodynamic body comprising:

rotor means comprising support means rotatably mounted on the aerodynamic body;

rotary drive means for driving said rotor means in rotation;

said rotary drive means comprising setting means for controlling the flight path of the aerodynamic body rotatably mounted on the support means;

first control means for controlling the rotation of the rotor means; and

second control means coupled to said setting means for controlling the orientation of said setting means, said second control means being coupled to said first control means by said support means and cooperating with said first control means to set said setting means, said second control means being coupled to said setting means via a first shaft means, said shaft means having a cam means mounted thereon cooperating with a projection means coupled to said setting means for changing the orientation of a surface of said setting means with respect to a longitudinal axis of said aerodynamic body, and said setting means being mounted on a second shaft means disposed transversely to said rotor means and having said projection disposed thereon in abutment with said cam means, said rotor means further being coupled to said second control means via spring means coupled to said first shaft means for limiting movement between said second control means and said rotor means, whereby when said first control means determines a position of said rotor means with respect to said aerodynamic body, said second control means adjusts the orientation of said setting means thereby to determine the flight path of the aerodynamic body.

4,927,097

CAGING SYSTEM

Terry S. Allen, Phoenix, and Patrick J. Wolke, Glendale, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 29, 1988, Ser. No. 237,207
Int. Cl.[5] B64D *47/00*
U.S. Cl. 244—118.1 14 Claims

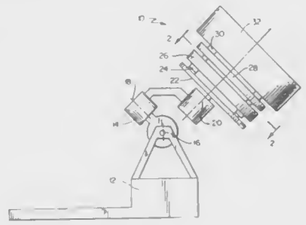
1. A caging system for a platform including at least one caging actuator comprising:

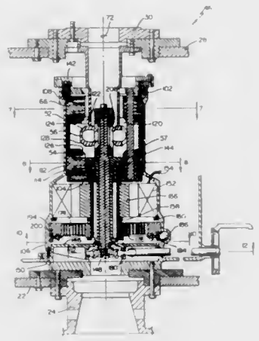
a first ring having an axis;

a second ring coaxial with the first ring;

a snubber member disposed between the first ring and the second ring; and

cam means for urging the first ring and the second ring against the snubber in a caged condition and for urging the





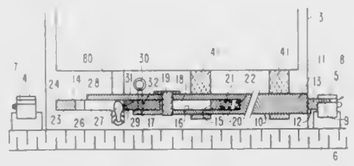
first ring and the second ring away from the snubber in an uncaged condition.

4,927,098

MECHANISM FOR FASTENING A LIFE-SAVING DEVICE OF THE SIMPLE EVACUATION SLIDE OR DINGHY TYPE FOR AIRCRAFT

Alain Depeige, Tournefeuille, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Oct. 18, 1988, Ser. No. 259,758
Int. Cl.[5] B64D *9/00*
U.S. Cl. 244—137.2 12 Claims



1. A mechanism for fastening a life-saving device for an aircraft, having at least one system of two fastening shoes fast with the floor of said aircraft, at least a first of said shoes comprising a recessed housing, said mechanism comprising:

a rod, one of the two ends of said rod comprising means for clipping and releasing with respect to the second shoe,

a counter-rod,

means for slidably mounting a first end of said counter-rod with respect to said rod, so that said counter-rod and said rod can lie in at least two positions, a first, so-called retracted position and a second, so-called extended position,

means for applying an electric force between said rod and counter-rod to tend to position them in said extended position,

means for latching-unlatching said rod and counter-rod with respect to each other in at least one of the two positions,

means for controlling slide of one of said rod and counter-rod with respect to the other in a given direction,

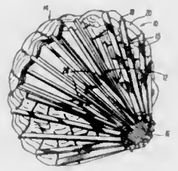
the second end of said counter-rod comprising an endpiece whose shape is substantially complementary of said recessed housing in said first shoe, so that said endpiece can be housed in said recessed housing.

4,927,099

AERODYNAMIC CONTROLLABLY VENTED PRESSURE MODULATING DROGUE

Richard C. Emerson, and John B. Sherman, both of DeLand, Fla., assignors to DeCel Incorporated, DeLand, Fla.

Filed Apr. 29, 1988, Ser. No. 188,489
Int. Cl.[5] B64D *17/18*
U.S. Cl. 244—152 7 Claims



1. An aeronautical drogue including a plurality of support members, the support members having one end attachable to a connection means and the other end connected to a canopy, the canopy being formed of elastic material and having a generally annular or circular shape, the drogue providing an essentially constant drag/force at variable speeds and altitude with means for controllably venting the entire canopy to achieve aerodynamic pressure modulation so that the effective pressure area within the canopy of the drogue is modulated by equalizing the system pressure of the drogue from within the canopy; the venting means comprising a plurality of vent holes throughout the elastic canopy, the vent holes being geometrically and symmetrically arranged to allow pressure modulation and direction.

4,927,100

AIRFOIL CONFIGURATION

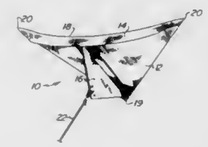
Eugene F. Provenzo, Jr., and Peter A. Zorn, both of Coral Gables, Fla., assignors to Patrician Corporation, Coral Gables, Fla.

Filed Nov. 11, 1988, Ser. No. 264,154
Int. Cl.[5] B64C *31/06, 3/58*
U.S. Cl. 244—153 R 5 Claims

1. An airfoil comprising:

(a) a sail having an essentially symmetrical planar configuration, said sail comprising an arcuate leading edge, a trailing edge and a tapered profile from the outermost lateral tips of its leading edge to the outermost lateral tips of its trailing edge; and

(b) a spoiler integral with and in articulating relationship to said sail along essentially the entire leading edge of said sail, said spoiler extending forward and downward from said leading edge and affixed at the lateral tips thereof to the underside of the sail;



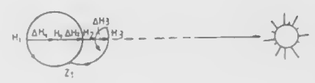
the inherent physical characteristic of the construction materials of each of said sail and said spoiler being sufficiently stiff to maintain each such airfoil component at a normal or pre-set aerodynamic configuration having a shallow dihedral angle and yet sufficiently resilient to permit controlled resistance to change in said dihedral angle of said sail in response to changing wind conditions.

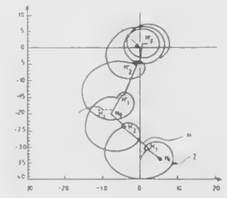
4,927,101

METHOD FOR TILTING THE MOMENT OF INERTIA OF A ROTATING FREE BODY IN SPACE INTO ANY GIVEN DIRECTION

Bernard Blancke, Le Cannet, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Apr. 25, 1989, Ser. No. 342,842
Claims priority, application France, Apr. 26, 1988, 88 05517
Int. Cl.[5] B64G *1/24, 1/38*
U.S. Cl. 244—164 4 Claims





1. Method for tilting the kinetic moment (H_i) of a free body, in space, in stable rotation about its principal axis of inertia (Z) into any given inertial direction (sun, earth, astral body . . .) so as to attain this direction, the said free body comprising on the one hand actuators adapted to exert torques ($\pm\Gamma$) of fixed intensity and adjustable duration around an axis (X) perpendicular to the principal axis (Z); on the other hand an angular deviation detector (D_F) which during the rotation of the free body generates a sinusoidal deviation measurement signal indicative of the angle (Θ) between the plane (XZ) and the plane containing the axis of the torque (X) and the given inertial direction (sun, earth, astral body . . .) towards which one

VOL
1114
ISS
4
MY
22
1990
UMI

can tilt the kinetic moment of the free body, the said procedure being characterized in that it consists in:

(a) identifying, if appropriate, the period of proper rotation of the free body, from the difference between two successive passages through zero of the sinusoidal signal of the angle (Θ) and therefore the instantaneous real speed of spin (ω), which gives the value of the initial kinetic moment ($H_i = I \cdot \omega$) of the free body in rotation;

(b) when the difference measuring signal for the angle (Θ) passes through zero with a positive (or respectively negative) speed, imparting by means of the actuator a first positive (or respectively negative) torque impulse (Γ) about the axis (X) for a predetermined period (T_1), whereby

displacing the initial kinetic moment (H_i) to (H_1) while the principal axis of inertia (Z) of the body in rotation follows a nutation movement around (H_1) to a point (Z_i);

(c) when the deviation measurement signal for the angle (Θ) again passes through zero with a positive (or respectively negative) speed and which corresponds to the instant when the principal axis of inertia (Z) reaches the point (Z_i), imparting a second positive (or respectively negative) torque impulse (Γ) around the axis (X) for a predetermined time (T_2), which has the effect of displacing the kinetic moment (H_1) to (H_2), while the principal axis of inertia (Z) of the body in rotation follows a nutation movement around (H_2) to a final point (Z_F);

(d) when the deviation measurement signal for the angle (Θ) again passes through zero with a positive (or respectively negative) speed and which corresponds to the instant when the principal axis of inertia (Z) reaches the final point (Z_F), imparting a third positive (or respectively negative) torque impulse (Γ) around the axis (X) for a predetermined time (T_1) identical to that of the first impulse, which has the effect of displacing the kinetic moment (H_2) to (H_F), which now merges itself with the final position (Z_F) of the nutation of the principal axis of inertia (Z) around (H_2), whereby nutation is nil and the tilting of the initial kinetic moment (H_i) of the body in rotation towards the given inertial direction (sun, earth, astral body . . .) has been secured by only three impulses and without residual nutation.

4,927,102

REVERSING DEVICE FOR MOVABLE PARTS WITHIN THE DEFLECTION AREA OF A RAILWAY SWITCH

Gerald Durchschlag, Zeltweg; Alfred Lang, Wiesen; Franz Rotter, Zeltweg; Dieter Fritz, Fohnsdorf, and Heinz Kopilovitsch, Hetzendorf, all of Austria, assignors to Voest-Alpine Maschinenban Gesellschaft m.b.H., Linz, Austria

Filed Nov. 7, 1988, Ser. No. 267,876

Claims priority, application Austria, Nov. 5, 1987, 2931/87; Sep. 16, 1988, 2274/88

Int. Cl.[5] E01B *7/02, 7/16*

U.S. Cl. 246—469 **12 Claims**



1. A reversing device for a railway switch, comprising:

a first pair of laterally-spaced fixed rails at one end of a deflection area;

two alternatively useful second pairs of laterally-spaced fixed rails at an opposite end of said deflection area, respective ones of said rails in said two pairs converging towards one another towards said deflection area;

said first pair of fixed rails being in longitudinal alignment with respective rails of one of said second pairs of fixed rails for providing a substantially straight longitudinal path through the railway switch and with respective rails of the other of said second pairs of fixed rails for providing a curved path through the railway switch;

two said rails at a same end of said deflection area having corresponding switchable portions which are fixed at said same end of said deflection area to provide continuations of respective ones of said rails, and which are supported for coordinated lateral deflection along the lengths thereof between one position in which said switchable portions are disposed to provide continuity through the railway switch along said substantially straight path and another position in which said switchable portions are disposed to provide continuity through the railway switch along said curved path;

said rails being supported on a fixed base;

at least one longitudinally elongated supporting rod supported on said fixed base by guide means so as to be aligned with said substantially straight path and disposed for longitudinal movement forwards and rearwards along said substantially straight path;

means for moving said at least one longitudinally elongated supporting rod substantially longitudinally forwards and rearwards along said substantially straight path;

each of said switchable portions of said rails being provided with a plurality of longitudinally-spaced, laterally-projecting first thrust supports;

said at least one supporting rod being provided with two sets of longitudinally-spaced, laterally-projecting second thrust supports;

each first thrust support having a laterally-facing thrust support surface means arranged to engage a respective laterally-facing thrust support surface means of a respective second thrust support upon longitudinal movement of said at least one elongated support rod to a selected position;

said thrust support surface means of one of said first and second thrust supports comprising a wedge-shaped ramp surface adjoining a main surface oriented substantially parallel to said substantially straight path;

said thrust support surface means being disposed and oriented such that when corresponding thrust support surface means of said first and second supports are not in engagement and said at least one longitudinally-elongated supporting rod is moved longitudinally by said moving means to cause engagement, said wedge-shaped ramp surfaces of the thrust support surface means of one of said first and second thrust supports first engages, and cams against the thrust support surface means of the other of said first and second thrust supports, thereby deflecting the respective said switchable portion of said rails from alignment in one of said paths into alignment in the other of said paths, and further movement of said at least one longitudinally-elongated supporting rod causes the main surfaces of the thrust support surface means of said one of said first and second thrust supports to engage against the thrust support means of the other of said first and second thrust supports, thereby holding the respective switchable portion of said rails in alignment with the other of said paths, and reverse movement of said at least one longitudinally-elongated supporting rod progressively eliminates holding of the respective switchable portion of said rails in alignment with said other of said paths and removes camming action therefrom by said wedge-shaped ramp surfaces, permitting the respective switchable portion to return to alignment with said one of said paths.

4,927,103

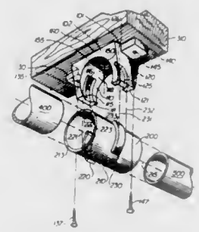
METHOD AND APPARATUS FOR PIPING SUPPORT

Richard J. Nicholson, Rte. 2, Box 137-A, Dothan, Ala. 36301

Filed Nov. 14, 1988, Ser. No. 270,072

Int. Cl.[5] F16L *3/08*

U.S. Cl. 248—62 **3 Claims**



1. An apparatus for supporting pipe such as PCV pipe or metal pipe, said apparatus comprising:

a standard pipe fitting

having an outer perimeter of its cross section and

configured with the addition of one or more mechanical protrusions wherein said protrusions are formed to have a shape of an arced segment of a slice of a cylindrical pipe somewhat larger than the fitting so that the outside diameter is the same as the inside diameter of the slice, the slice being taken perpendicular to the centerline of the larger cylindrical pipe and the inside diameter of the slice being equal to the outside diameter of the fitting and

a pipe support comprising

one or more arms,

each having an inner surface, and

each extending from a common base in a manner whereby the inner surface or surfaces of the arm or arms generally describe an area having a shape complimentary to said outer perimeter,

a gap between the end of the arm and the base or between the ends of the arms,

means for temporarily enlarging the gap in a manner whereby the gap is large enough for said pipe fitting to pass through the gap during installation,

means for reducing the enlarged gap, after installation, in a manner whereby said arm or arms fit snugly around said fitting in a manner whereby said fitting is held securely in place during use,

means for enlarging the gap, after installation, in a manner whereby the installed fitting may be removed from said support if said removal is intended, and

one or more recesses of sufficient number shape and position to snugly accommodate said protrusion or protrusions each said recess including an edge which engages an edge of its respective protrusion.

4,927,104

COLLAPSIBLE BAG-SUPPORTING FRAME

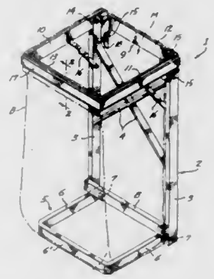
Robert W. Miller, 11731 26th NE., Seattle, Wash. 98125

Filed May 22, 1989, Ser. No. 355,599

Int. Cl.[5] A63B *55/04*

U.S. Cl. 248—97 **9 Claims**

1. A bag support comprising a frame having a side section including elongated transversely spaced upright posts and means maintaining said posts in substantially parallel relationship, said side section having a top portion and a bottom portion, the bottom portion of said side section between said posts being open and unobstructed, a base section connected to the bottom end portion of said side section and including elongated transversely spaced legs, said legs having corresponding ends pivotally connected to the bottom end portions of said posts and being swingable to a nested position in which said legs extend close alongside and substantially parallel to said posts, said legs being swingable from said nested position through an angle of approximately 270 degrees to a supporting position extending substantially perpendicular to said posts for supporting said side section in upright position, stop means limiting swinging movement of said legs for normally maintaining them in supporting position, a top section forming a closed bag ring having an unobstructed outer periphery and an open interior, said top section including spaced stubs secured along the inner periphery of said bag ring and projecting transversely of and below said bag ring, said portions of said stubs projecting from said bag ring extending close alongside and being pivotally connected to the upper end portions of said posts for swingably connecting said bag ring to the upper end portions of said posts for movement between a bag-supporting position extending substantially perpendicular to said side section with said bag ring positioned above the top ends of said posts and a collapsed



position in which said top section is positioned close alongside but connected to said posts, means for normally maintaining said top section with said bag ring in its bag-supporting position but manually releasable for swinging of said bag ring to its collapsed position, and a clamping ring having an inner periphery of approximately the same size and shape as the outer periphery of said bag ring for unobstructed insertion of said clamping ring downward over the outer periphery of said bag ring with at least a portion of the inner periphery of said clamping ring substantially contiguously engaged against a portion of said bag ring, whereby, with said clamping ring removed, the bag can be inserted through the open interior of said bag ring and have its lip folded over said bag ring to extend downward alongside the outer periphery of said bag ring and, thereafter, said clamping ring can be inserted over said bag ring for clamping the entire circumference of the lip portion of the bag to said bag ring.

4,927,105

CONVERTIBLE LEG/ROLLER STRUCTURE

Patrick R. Habermann, 750 Conn Valley Rd., St. Helena, Calif. 94574

Filed Jan. 12, 1989, Ser. No. 296,813

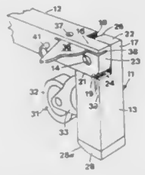
Int. Cl.[5] A47B *91/00*

U.S. Cl. 248—188.8 **11 Claims**

1. In a convertible leg/roller structure for supporting an object: a pivotally mounted leg movable about an axis between vertical and horizontal positions, a surface at one end of the leg for engagement with a supporting surface when the leg is in the vertical position, and a roller mounted on one side of the leg for engagement with the supporting surface when the leg is in the horizontal position, the surface at the end of the leg and the portion of the roller which engages the supporting surface

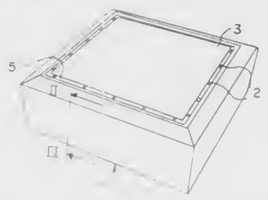
VOL
1114
ISS
4
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lying on an arc centered about the axis so that leg can be moved between the vertical and horizontal positions to engage



either the surface at the end of the leg or the roller with the supporting surface without lifting the object.

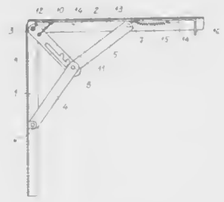
4,927,106
PRESENTATION PODIUM
Johann Tomforde, Sindelfingen, and Monika Wall, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Sep. 7, 1988, Ser. No. 241,248
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1987, 3729904
Int. Cl.[5] A47G *23/02*
U.S. Cl. 248—146 **19 Claims**



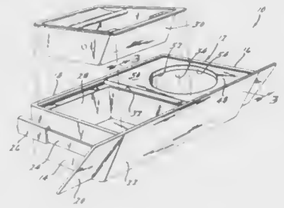
1. A convertible presentation podium comprising:
a closed, self supporting frame for receiving different insert elements each having different functional capabilities,
horizontal support bolts inwardly directed with respect to the frame and fastened in a region beneath an upper edge of the frame, and
one of the different insert elements inserted in the frame, the one of the different insert elements having means for cooperating with the horizontal support bolts to maintain an air gap between the one of the different insert elements inserted in the frame and the frame, the air gap having a uniform width and extending entirely around the one of the different insert elements inserted in the frame, wherein the means of the one of the different insert elements inserted in the frame are placed directly on the bolts which each have a given length.

4,927,107
SUPPORT FOR RECLINABLE BOARDS
Ramon Mateo Maria, Narciso Monturiol Street s/no. 08339, Vilassar De Dalt, Barcelona, Spain
Filed Mar. 1, 1989, Ser. No. 317,370
Int. Cl.[5] A47G *29/02*
U.S. Cl. 248—240.4 **3 Claims**

1. A support for a reclinable object comprising two arms each having first and second ends, the first ends of said arms being pivotally joined together for movement about a common axis between folded and extended positions, releasable support means for maintaining said arms in said extended position, said releasable support means including first and second legs each having first and second ends, said respective first ends of each said leg being pivotally attached on a said respective arm and said respective second ends of said legs being pivotally connected on a common pin member, a cross leg member having one end pivotally connected to said common axis and another end having a plurality of engagement positions each for pivotally receiving said common pin member and means for releasing said common pin member from a said respective engagement position.

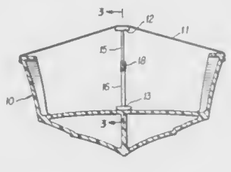


4,927,108
CUP HOLDER
Leonard J. Blazic, Washington, and Robert J. Janosko, Bloomfield Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Jul. 13, 1989, Ser. No. 379,037
Int. Cl.[5] A47K *1/08*
U.S. Cl. 248—311.2 **4 Claims**



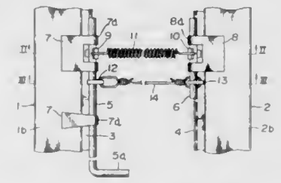
1. A convertible retainer mounted on an automotive vehicle console for movement into and out of a console housing, said convertible retainer adapted for ready conversion between a first combined ashtray and single cup holder mode and a second dual cup holder mode, comprising:
a generally rectangular-shaped retainer having a pair of lateral sides, a rear longitudinal side, and a forward longitudinal side, said retainer defining a generally rectangular first cavity adapted to receive a removable ashtray therein and a laterally adjacent raised rectangular-shaped horizontally disposed platform;
said raised platform including an upper horizontal wall and a generally annular vertical wall forming a second cylindrically shaped cavity disposed in the center of said horizontal wall adapted to receive a beverage cup therein, said second cavity having its principal axis disposed vertically;
said retainer rear and forward sides having means forming rear and forward laterally spaced longitudinally extending opposed tracks, respectively, such that each said rear and forward track being coextensive with and adjacent to the upper portion of its associated side at a predetermined elevation above said raised platform horizontal wall;
a rectangular plate member having front and rear edges, two opposing sides, and top and bottom planar surfaces, said plate member having a circular aperture extending therethrough said circular aperture having its center adjacent the center of said plate member and adapted to receive a beverage cup therein;
said plate member front and rear edges including means operatively engaging said forward and rear opposed tracks, respectively, for lateral sliding movment of said plate member between a combined ashtray and single cup holder mode overlying said platform horizontal wall and a second dual cup holder mode overlying said first cavity;
whereby with said convertible retainer moved out of the console and with plate member in said first mode overlying said platform horizontal wall, such that said second cavity principal axis is aligned with said plate member circular aperture center, wherein said plate member circular aperture and said second cavity are adapted to conjointly receive a beverage cup therein; and
whereby with said convertible retainer moved out of the console and with said retainer in said second dual cup holder mode with said ashtray removed from said first cavity and said plate member overlying said first cavity, such that said plate member circular aperture together with said first cavity is adapted to receive a first beverage cup therein and said second cavity is adapted to receive a second beverage cup therein wherein the first and second beverage cups may be supported in a side-by-side manner.

4,927,109
WATER SHEDDING DEVICE FOR BOAT COVERS
Donald G. Wilson, 9731 Wenonga Rd., Shawnee Mission, Kans. 66206
Continuation-in-part of Ser. No. 858,121, May 1, 1986, abandoned. This application Oct. 11, 1989, Ser. No. 419,795
Int. Cl.[5] E04G *25/00*
U.S. Cl. 248—354.3 **4 Claims**



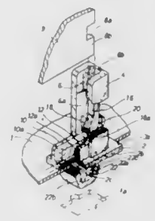
1. For use with a boat hull having a cover secured over the cockpit an apparatus adapted to be placed between the underside of the cover and the floor of the boat to form a peaked cover to shed rain and snow off the boat cover to prevent collapsing of the cover under the weight of collected rain or snow thereon, a boat cover water shedding device comprising a pair of boat cover and floor engaging members, a pair of telescopic variable length inner and outer support members, one end of the outer one of said variable length support members being externally threaded, the other ends of each variable length support members being smooth, said cover and floor engaging members being of mushroom shape having smooth bore bosses in the stem portion of the mushroom shape adapted to receive one end of said inner and outer support members, the portion of said cover and floor engaging mushroom-like members adapted for engagement with said floor and cover having checkered-like roughened gripping surfaces to form an anti-slip surface between the support rod, cover and boat floor, an externally fluted compression member having internal threads receivable over the externally threaded end of one of said variable length support members and a truncated conical cap defining a chamber at one end and being threaded at its other end complemental to the threads on the outer one of said variable length support members, and a split compression ring in said chamber receivable over the inner one of said telescopic members so that upon rotating said externally fluted compression member the split compression ring will be compressed to arrest relative movement between said telescopic variable length inner and outer support members to maintain a peaked condition of said cover to shed off rain and snow from said boat cockpit.

4,927,110
SLIDE LOCKING DEVICE FOR A CAR SEAT
Kenji Tsumura, Ikeda; Yukifumi Yamada, and Takami Terada, both of Kariya, all of Japan, assignors to Daihatsu Motor Co., Ltd., Osaka and Aishin Seiki Co., Ltd., Aichi, both of, Japan
Filed Jul. 17, 1989, Ser. No. 380,509
Claims priority, application Japan, Jul. 25, 1988, 63-98298
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—430 **4 Claims**



1. A slide locking device for locking slide motion of a car seat slidable longitudinally of a car body, provided with,
(a) a pair of lock plates fixed to said car body at both sides thereof under said car seat and each having a plurality of locking retained portions,
(b) a pair of lock shafts disposed at both sides of the lower surface of said car seat and rotatably supported thereto, comprising a driving side lock shaft and a driven side lock shaft rotatable in association with said driving side lock shaft,
(c) a driving side lock lever and a driven side lock lever each having an engaging portion engageable with one of said retained portions at each of said lock plates, supported to said lock shaft, and swingable of widthwise of said car body by rotation of said lock shaft,
(d) association means for rotating said driven side lock shaft in association with rotatable operation of said driving side lock shaft, and
(e) a tension coil spring stretched between said driving side lock shaft and said driven side lock shaft and for biasing said engaging portions at said lock levers in the direction of engaging with said retained portions at said lock plates, said one tension coil spring operating to elastically engage said engaging portion of each of said lock levers with said retained portion at each of said lock plates.

4,927,111
BOARD MOUNT
Katsumasa Takahashi, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Japan
Filed Oct. 21, 1988, Ser. No. 260,568
Claims priority, application Japan, Nov. 2, 1987, 62-168347
Int. Cl.[5] H02B *1/02*
U.S. Cl. 248—500 **9 Claims**

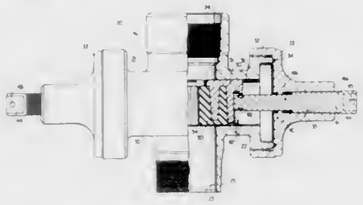


1. A board mount for mounting a board on a mounting surface comprising:

VOL
1114
ISS
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1990
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a. a base plate for resting on the mounting surface;
b. a brace rising from an upper surface of the base plate, the brace having:
i. a slot for holding a corner of the board in the brace, and
ii. a resilient strip formed on the back of the brace with:
A. a locking pin on the lower end of the strip projecting forward into the slot, and
B. a hook means on the lower end of the strip for allowing insertion of a tool therein to move the resilient strip and retract the locking pin from said slot; and
c. an anchor descending from the underside of the base plate for inserting into a mounting hole provided on the mounting surface.

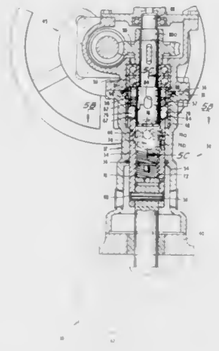
4,927,112
BLOWOUT PREVENTER
James A. Wilson, Dallas, Tex., assignor to Doulbe-E Inc., Dallas, Tex.
Division of Ser. No. 154,061, Feb. 9, 1988, Pat. No. 4,844,406.
This application Jun. 19, 1989, Ser. No. 368,271
Int. Cl.[5] E21B *33/06*
U.S. Cl. 251—1.3 7 Claims



1. A seal assembly for a blowout preventer comprising:
a ram plate adapted to slideably fit in a blowout preventer body side chamber including only a substantially rectangular top backup plate, an integral retainer sidewall dependant from said backup plate, and a dependant pin secured at a top end to said top backup plate spaced in front of said retainer sidewall; and
an elastic seal substantially rectangular in horizontal cross section coupled with said ram plate below said backup plate within said retainer sidewall, said seal overlapping a front edge of said backup plate and opposite end edges of said backup plate and said retainer sidewall, and a socket in said seal opening from a top face thereof and spaced from a back edge of said seal and sized and shaped to receive said dependant pin on said ram plate for attaching said seal on said ram plate.

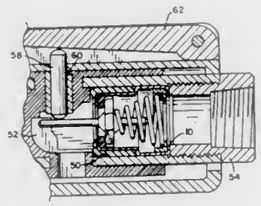
4,927,113
VALVE CONTROL MECHANISM
Irving J. Heinen, 78-086 Lago Dr., La Quinta, Calif. 92253
Continuation of Ser. No. 216,727, Jul. 8, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 407,440
Int. Cl.[5] F16K *25/00*
U.S. Cl. 251—165 5 Claims

3. A plug-type valve including
a plug adapted to rest on a seat in the valve, and
a valve operator for lifting the plug off the seat, said valve operator including
a spindle having a pair of diametrically opposed recesses therein, and
a clutch-type mechanism comprising a sleeve threadably connected to the spindle and a pair of diametrically opposed roller elements which are mounted to move linearly a predetermined distance between a position where the roller elements are aligned with the recesses



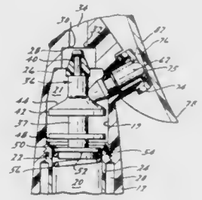
and a displaced position where the roller elements are not in alignment with the recesses.

4,927,114
TILT VALVE CARTRIDGE
David J. Baker, Waverly, N.Y.; Kenneth J. Dubuque, Sheshequin, Pa.; John M. Estep, Granville Summit, Pa., and Charles J. Hix, Jr., Ulster, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Mar. 17, 1989, Ser. No. 324,902
Int. Cl.[5] F16K *51/00*
U.S. Cl. 251—240 9 Claims



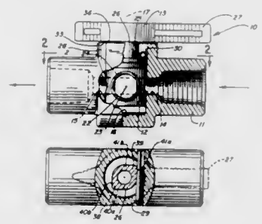
1. A tilt valve cartridge for a pneumatic mechanism comprising:
a cylindrical housing having a central passageway connecting a first open end and a second open end, said first open end having a smaller diameter than that of said second open end, said first and second ends having means for retaining interior parts within said cartridge;
valve seat in the passageway at the first open end of the housing;
valve member in tiltable contact with the valve seat;
valve stem extending from the valve member and protruding from the first open end;
means for biasing the valve member to a closed position; and
means for sealing said cartridge in said mechanism.

4,927,115
VALVE FOR A HAND HELD SPRAY NOZZLE
Gobind Bahroos, Riverview, Mich., and Patrick B. Joote, Indianapolis, Id., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed May 26, 1989, Ser. No. 358,309
Int. Cl.[5] F16K *31/44*
U.S. Cl. 251—241 13 Claims



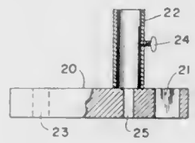
1. A valve characterized by:
a housing having an upstream end constructed to be secured to a flexible hose and a downstream end having a fluid outlet and a valve seat;
a movable valve element axially movable along an axis between an open and closed position;
a push rod canted with respect to said axis;
an annular frusto-conical camming member affixed upstream of and to said valve element for abutting said push rod;
a handle means for axially moving said push rod against said camming means for axially moving said valve element upstream to said open position; and
biasing means for biasing said valve element to said closed position.

4,927,116
PLUG VALVE
Albert J. Schwarz, Lincolnwood, and Anthony M. Pietramale, Schaumburg, both of Ill., assignors to The Pullman Company, Princeton, N.J.
Filed Oct. 31, 1988, Ser. No. 264,996
Int. Cl.[5] F16K *5/04*
U.S. Cl. 251—312 11 Claims



1. A plug valve comprising:
a body defining a cylindrical flow chamber recess defining an axis and opening axially outwardly through an opening in a first portion of the body, an inlet port opening through a second portion thereof to said recess transversely to the axis of the recess, an outlet port opening through a third portion thereof from said recess transversely to the axis of the recess;
a straight-walled cylindrical flow control plug coaxially rotatably received in said recess through said outwardly axial opening, and defining a through bore extending axially transversely to the axis of rotation of the plug in the recess providing a flow passage through the plug from said inlet port to said outlet port in an open arrangement of the valve;
a stem projecting from said plug outwardly through said first body portion opening;
a manipulating handle connected to said stem outwardly of said first body portion opening;
a single member retaining element extending through said first body portion and across said opening laterally adjacent said stem and axially between said handle and said plug for securely retaining said plug rotatably in said recess and for accurately locating the plug and body ports for assuring full flow;
means for sealing the plug to said body including a first annular seal extending coaxially about the plug to seal the plug to the body in said recess axially inwardly of said first body portion opening, and a second annular seal carried by the plug and defining an axis intersecting the axis of said through bore for sealing engagement with the body about said inlet port in a closed arrangement of the valve;
stop means rotatable with said plug for selectively engaging said retaining element for accurately and precisely limiting the rotation of the plug about the axis thereof, thereby precisely controlling the open and close positions of the valve.

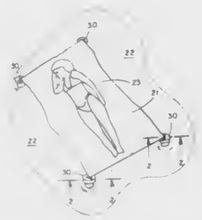
4,927,117
RIDING TRACTOR UMBRELLA
Michael D. Gainey, 100 Beth Dr., Darlington, S.C. 29532
Filed Nov. 17, 1988, Ser. No. 272,346
Int. Cl.[5] B60R *11/00*
U.S. Cl. 248—539 9 Claims



1. A riding tractor suitable for cutting grass having a means to shelter the operator from the sun attached thereto comprising a riding tractor having at least one accessory implement attaching aperture on a rear portion thereof to attach accessory implements thereto, a plate having at least one aperture therethrough to align with the accessory implement attaching aperture on the rear portion of said riding tractor, means to attach said plate to the at least one accessory implement attaching aperture on a rear portion of the riding tractor, a shelter means to shelter said operator from the sun, means to attach to said plate said means to shelter said operator, and aperture means in said plate to attach an accessory implement to said plate.

VOL
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1990
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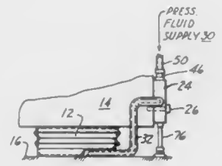
4,927,118
BEACH ACCESSORY DEVICE
Donato A. Pierorazio, 124 Riverside Rd., Baltimore, Md. 21221
Filed Aug. 8, 1988, Ser. No. 229,324
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—545 30 Claims

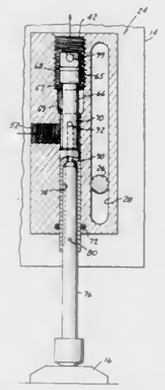


1. In combination with a towel or the like intended for use on the beach, wherein wind currents normally whip the towel around and prevent the towel from lying smoothly on the beach, the beach towel having a plurality of corners, a plurality of devices associated with the corners of the towel for retaining the towel on the beach, each of the devices comprising a hollow main body portion having an open top, so that sand is poured through the open top into the main body portion, thereby substantially increasing the weight of the device, the device further comprising a stem portion formed integrally with the main body portion such that an intersection is formed therebetween, the stem portion depending therefrom, and adapted to be pressed into the beach, such that the device is buried in the beach to a depth substantially to the intersection between the main body portion and the stem portion of the device, a lid removably engaging the open top of the main body portion of the device, and means for retaining the corner of the beach towel or the like by the device.

4,927,119
REVERSIBLE FLOW VALVE FOR AIR ISOLATED BASES
Charles Frost, La Verne, Calif., assignor to Kimball Industries, Inc., Monrovia, Calif.
Continuation of Ser. No. 832,848, Feb. 24, 1986, abandoned.
This application Oct. 31, 1988, Ser. No. 264,687
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—550 17 Claims

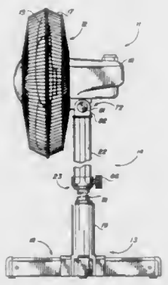
17. In combination: A self-adjusting valve and a fluid pressure system comprising a fluid inflatable means, said valve comprising an axially extended valve body movably positioned above a surface, said valve body having first and second ports at selectively different fluid pressures and a valve body passage therebetween, said second port being adapted for open communication with said fluid inflatable means, said fluid inflatable means being desirably kept at a predetermined level of inflation, an axially extended valve stem bodily shiftable within said passage, and cooperating means defined by said passage and said stem for controlling fluid flow to and from said inflatable means, said valve stem having a rigid axial extension beyond said valve body adapted to contact or not contact said surface responsive to greater or lesser inflation of said fluid inflatable





means to shift said valve stem axially to adjust fluid flow to achieve said predetermined level of inflation.

4,927,120
PORTABLE ELECTRICAL FAN
Jui-Shang Wang, Taipei, Taiwan, assignor to Duracraft Corporation, Sudbury, Mass.
Filed Aug. 9, 1989, Ser. No. 391,261
Int. Cl.[5] F16M *3/00*
U.S. Cl. 248—676 20 Claims



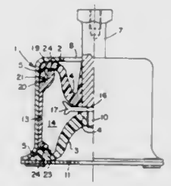
1. A portable electric appliance comprising:
standard means;
fan means supported by one end of said standard means and comprising a rotatable blade assembly, and an electrical motor operatively coupled to said blade assembly; and
pedestal means supporting an end of said standard means opposite to said one end and comprising: a hub having a tubular upright portion retaining said end of said standard means opposite to said one end; a base portion defining a pair downwardly facing, orthogonally intersecting first and second U-shaped retainer portions; a first elongated U-shaped channel member having an upper wall, a pair of side walls projecting downwardly from said upper wall, and a central portion retained in said first retainer portion and having a slot extending transversely through lower portions of said side walls; and a second elongated U-shaped channel member having an upper wall, a pair of side walls projecting downwardly from said upper wall, and a central portion retained in said second retainer portion and having a slot extending through its said upper wall and upper portions of its said side walls, and wherein said slot in said first channel member engages said slot in said second channel member.

4,927,121
SPRING LEAF WITH A DIMINISHING THICKNESS TOWARDS THE ENDS THEREOF AND HAVING SHOULDERS ON OPPOSITE SIDES
Alexandr N. Komarov, ulitsa Pisarzhevskogo, 7, kv. 78.; Vitaly T. Shevtsov, Topol 3, II, korpus 3, kv. 99.; Viktor E. Zema, bulvar Slavy, 44, korpus I. kv. 42.; Grigory L. Lebedik, ulitsa Pisarzhevskogo, 7, kv. 6., all of Dnepropetrovsk; Evgeny M. Zema, ulitsa Chekhova, Ib, kv. 1., Sinelnikovo Dnepropetrovskaya oblast; Vladimir A. Nedorezov, ulitsa Chekhova, Ib, kv. 2., Sinelnikovo, Dnepropetrovskaya oblast; Anatoly K. Obiovatsky, prospekt Mira, 33, kv. 10., Sinelnikiovo, Dnepropetrovskaya oblast; Boris Y. Drozdov, ulitsa Tsentralnaya, 2/4, kv. 18., Dnepropetrovsk; Andrei A. Zezjulinsky, ulitsa Geroev Stalingrada, 3I, kv. 62., Dnepropetrovsk; Sergei V. Kovalenko, prospekt Petrovskogo, 42a, kv. 38., Dnepropetrovsk; Alexandr N. Litvin, ulitsa Mira, 37, kv. 26., Sinelnikovo, Dnepropetrovskaya oblast; Vladislav P. Yatsenko, ulitsa Dnepropetrovskaya, 20., Sinelnikovo, Dnepropetrovskaya oblast, and Alexandr N. Katunin, ulitsa Mira, 36, kv. 75., Sinelnikovo, Dnepropetrovskaya oblast, all of U.S.S.R.
Filed Dec. 18, 1985, Ser. No. 810,390
Int. Cl.[5] F16F *1/18*
U.S. Cl. 267—47 8 Claims



1. A spring leaf comprising:
a central section having a substantially constant thickness;
a first terminal section connected at a first end of said central section and having a first free end;
said first terminal section having a thickness diminishing from said first end of said central section toward the first free end;
a second terminal section connected at a second, opposite end of said central section and having a second free end;
said second terminal section having a thickness diminishing from said second end of said central section toward the second free end; and
a plurality of upstanding shoulders on opposite sides of said spring leaf and extending at least along a portion of said opposite sides in the longitudinal direction thereof substantially to the ends of the first and second terminal sections, the height of each said shoulder diminishing from the first and second free ends towards the central section of the spring leaf.

4,927,122
VIBRATION ABSORBER
Reinhold Brumme, Wiesbaden, Fed. Rep. of Germany, and Roger Desons, Les Essarts Le Roi, France, assignors to Applied Power Inc., Milwaukee, Wis.
Filed Nov. 30, 1988, Ser. No. 277,726
Claims priority, application France, Jan. 8, 1988, 88 00158
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.1 7 Claims



1. A vibration absorptive assembly for dampening shock and vibration between first and second structural elements said assembly comprising:
a casing including: a generally cylindrical side wall, a bottom plate wall adapted to be attached to a first structural member, and a top wall, said top, said and bottom walls defining a casing chamber therein;
an aperture disposed in the top wall in axial alignment with the axis of the cylindrical side wall;
a rod member having an inner end disposed within the casing chamber and an outer end extending exteriorly of the chamber, the outer end adapted to be attached to a second structural element;
a first resiliently deformable bell-shaped membrane disposed in the casing chamber and having, inner and outer surfaces, a top bell-shaped portion axially attached to a portion of the inner end of said rod member, and an integral lower radially extending peripheral edge portion bearing against adjacent portions of the side and bottom walls;
a second resiliently deformable bell-shaped membrane disposed in the casing chamber in a position diametrically opposed to said first membrane and having inner and outer surfaces, a top bell-shaped portion axially attached to a portion of the inner end of said rod member adjacent to the outer surface of the top bell-shaped portion of said first membrane and an integral lower radially extending peripheral edge portion bearing against adjacent portions of the side and top walls;
the outer surfaces of the first and second bell-shaped membranes delimiting a hydraulic chamber;
a fluid filling said hydraulic chamber;
a sleeve member coaxially mounted within the hydraulic chamber adjacent the cylindrical side wall, said sleeve member terminating at one end with a first front face engaging the peripheral edge portion of the first membrane and a second front face engaging the peripheral edge portion of the second membrane whereby the peripheral edge portions are firmly sealed between the cylinder faces and the casing walls;
a circular washer-shaped element disposed upon the rod member between the top bell-shaped portions of the first and second membranes;
said washer-shaped member extending radially into the hydraulic chamber and terminating in a V-shaped profile;
whereby dampening between said first and second structural elements is effected by relative motion of the rod and washer-shaped element with respect to the resilient membranes and the hydraulic fluid in said hydraulic chamber.

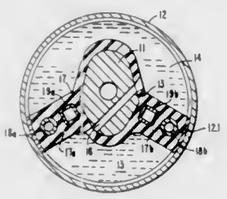
VOL
1114
ISS
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4,927,123

ELASTIC SLEEVE SPRING WITH REINFORCEMENT BODIES FOR INCREASED STIFFNESS

Hans-Werner Schwerdt, Laudenbach, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 279,663
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3741260
Int. Cl.[5] F16M *5/00;* F16F *13/00*
U.S. Cl. 267—140.1 13 Claims



1. A hydraulically damped elastic sleeve spring comprising:
(a) an inner tube;
a window tube surrounding the inner tube at a radial spacing to form a gap therebetween, said window tube including longitudinally extending cut-outs;
(c) an outer tube surrounding the window tube;
(d) a spring body adhesively connected to the inner tube and the window tube in the gap formed therebetween wherein the spring body comprises a partition forming at least two chambers disposed behind each other with respect to the direction in which force to be damped is applied;
(e) a liquid in said chambers;
(f) at least one choke opening connecting the chambers in fluid communication;
(g) said partition comprising two sections that bridge the gap on both sides of the inner tube in a direction essentially transverse to the force application direction, at least one of said two partition sections being formed with a recess disposed at a radial distance from the inner tube and the window tube; and
(h) a reinforcement body retained in said recess to stiffen said at least one of the partition sections.

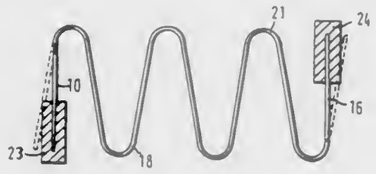
4,927,124

SPRING ASSEMBLIES

Colin E. Spedding, Wolverhampton, and Andrew Pollard, Bridgnorth, both of United Kingdom, assignors to GKN Technology Limited, West Midlands, England

PCT No. PCT/GB87/00299, § 371 Date Dec. 2, 1988, § 102(e) Date Dec. 2, 1988, PCT Pub. No. WO87/06986, PCT Pub. Date Nov. 19, 1987
PCT Filed May 7, 1987, Ser. No. 269,538
Claims priority, application United Kingdom, May 9, 1986, 8611340
Int. Cl.[5] F16F *1/36, 13/00;* B60G *3/14, 15/06*
U.S. Cl. 267—229 7 Claims

1. An assembly for preventing excessive deformation of a spring, the spring being in the form of a strip of fibre-reinforced plastics material of zig-zag configuration, having a plurality of limbs (10, 11, 12, 13, 14, 15, 16) connected by reflex portions (17, 18, 19, 20, 21, 22) with the longitudinal centre line of the strip lying substantially in a single plane, into a shape in which all the reflex portions are deformed equally and the limbs are all parallel to one another at a particular value of applied load and which deformed shape the spring would develop were the end limbs (10, 16) pin-jointed at their midpoints for pivotal movement about respective axes (26, 27);
the assembly including a spring as defined above; and
mounting means (23, 24) holding end ones (10, 16) of said limbs so that the spring acts resiliently therebetween and is stabilized against displacement transverse of the direction of a load applied to the spring, wherein the mounting means (23, 24) of at least one of said end limbs (10, 16)



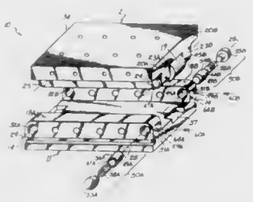
holds the respective limb at an attitude about the same as the attitude it would have at a mean value of spring load in use by having the limb pin-jointed to allow changes in attitude of the limb in use.

4,927,125

SET UP ASSEMBLY

Jerry J. Hunter, Madison, Ind., assignor to Doe Run Tooling, Inc., Madison, Ind.

Filed Apr. 4, 1989, Ser. No. 334,000
Int. Cl.[5] B23Q *1/04*
U.S. Cl. 269—74 28 Claims



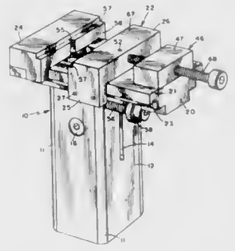
1. A set up assembly for use in holding a workpiece during a machining operation comprising:
a first member;
a second member disposed above and supported by said first member;
a roll assembly mounted to one of said members along an axis, the roll assembly having outwardly directed ends; and
engagement means mounted to the other of said members, said engagement means being selectively movable into engagement with said outwardly directed ends of said roll assembly to form a hingable connection between said first and second members, said engagement means coacting with said outwardly directed ends to form said connection in dead center position along said axis, whereby said second member may be hingedly raised above said first member about said axis, said engagement means further being selectively movable out of engagement with said roll assembly to permit removal of said second member from said first member.

4,927,126

PRECISION VISE

Frank Huffman, 1101 Connecticut St., Imperial Beach, Calif. 92032

Filed Sep. 6, 1988, Ser. No. 240,951
Int. Cl.[5] B23Q *1/04*
U.S. Cl. 269—60 17 Claims



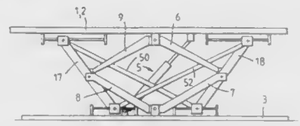
1. A portable apparatus for holding small workpieces relative to a fixed mounting device, comprising:
an elongated post having opposed flat surfaces for releasably clamping the post at one end between the jaws of a fixed mounting device;
a rail member selectively slidably mounted at one end of the post for movement transverse to the longitudinal axis of the post;
a workpiece holding assembly mounted on the upper surface of the rail member, the workpiece holding assembly having a workpiece engaging means fixedly mounted at one end of the rail member for engaging a workpiece and a selectably slidably jaw means mounted on the upper surface of the rail member for releasably holding the workpiece adjacent the workpiece holding means.

4,927,127

ADJUSTABLE SUPPORT TABLE FOR MEDICAL USE

Willem Lock, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 9, 1988, Ser. No. 230,286
Claims priority, application United Kingdom, Aug. 12, 1987, 8719133
Int. Cl.[3] A61G *13/00*
U.S. Cl. 269—322 18 Claims



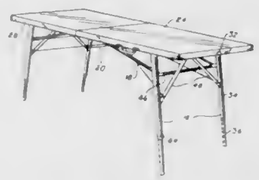
1. A table for supporting a patient comprising, a carrier member including a support table top, a base member below said carrier member, a linkage assembly means connecting the carrier member to the base member for maintaining the table top substantially horizontal while permitting a relative vertical displacement to occur between the carrier member and the base member, and adjustment means for effecting a said relative vertical displacement between the carrier member and the base member, wherein the linkage assembly means comprises a rhombus shaped assembly of four linked struts pivotally joined end to end to one another by a series of pivotal joints including an upper pivotal joint pivotally mounted on the carrier member, a lower pivotal joint pivotally mounted on the base member, and first and second intermediate pivotal joints on opposite sides of said rhombus shaped assembly, said series of pivotal joints having pivot axes parallel to each other, first and second support struts on opposite sides of said rhombus shaped assembly and each having an upper and a lower end and a mid point between said upper and lower ends, first upper and first lower horizontally displaceable bearing means respectively pivotally connecting the upper and lower ends of the first support strut to the carrier member and the base member, second upper and second lower horizontally displaceable bearing means respectively pivotally connecting the upper and lower ends of the second support strut to the carrier member and the base member, said first and second, upper and lower, horizontally displaceable bearing means having pivot axes parallel to the pivot axes of said series of pivotal joints, the mid points of the first and second support struts being respectively pivotally attached to the first and second intermediate pivotal joints, and first and second substantially inextensible supporting linkages of equal effective length, each said supporting linkage having an upper and a lower end, said first supporting linkage being pivotally attached at its upper and lower ends respectively coaxially with the pivot axes of the first upper and second lower horizontally displaceable bearing means and said second supporting linkage being pivotally attached at its upper and lower ends respectively coaxially with the pivot axes of the second upper and first lower horizontally displaceable bearing means.

4,927,128

SLIDING LEG BODYWORK TABLE

Lynwood O'Brian, 5381 Old San Jose Rd., Soquel, Calif. 95073

Filed Sep. 8, 1989, Ser. No. 404,852
Int. Cl.[5] A61G *13/00*
U.S. Cl. 269—322 10 Claims

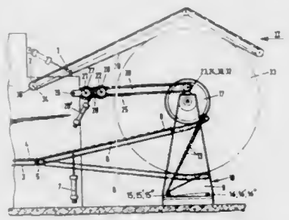


1. A folding portable table for use in massage and other therapeutic applications, comprising:
a rectangular table top comprised of a pair of abutting rectangular table top sections hingedly connected to one another,
a perimeter frame integral with each of said table top sections,
four channels, each channel being secured inside of said perimeter frame and in a corner position thereof, said channels being elongate and adapted to slidably receive and secure a table leg therein,
two sets of paired tubular legs, each set connected together by a leg set top tube and a lower connecting cross tube being essentially parallel to said table top so that each pair of legs is secured to a underside of a table top section, each leg comprising an upper and a lower portion, said lower portion being of slightly smaller dimension than said upper portion to permit a telescoping movement by the lower portion.
means for securing said lower leg portion and said upper leg portion together,
two sets of paired diagonal braces each secured at one end to the underside o a table top section substantially at a central position and at the other end each diagonal brace is rotably connected to said leg set connecting cross tube forming a triangular configuration between the support legs, the diagonal braces, and the table top, and
four wire rope cables each attached at one end to said leg set top tube near each channel and at the other end to a brace,

VOL
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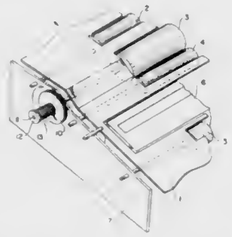
each cable being under tension when said table top sections are in an open configuration.

4,927,129
APPARATUS FOR STORING PARTIALLY OVERLAPPING PAPER SHEETS
Peter Merkli, Oftringen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland
Filed Nov. 16, 1988, Ser. No. 272,119
Claims priority, application Switzerland, Nov. 19, 1987, 04503/87
Int. Cl.[5] B65H *39/08*; B65B *63/04*
U.S. Cl. 270—60 13 Claims



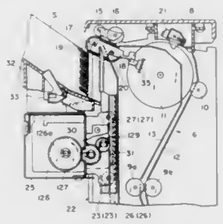
1. Apparatus for converting a succession of sheets into a roll of convoluted sheets, comprising a frame; first and second cores rotatably mounted in said frame; a plurality of elastic bands convoluted onto said second core and onto each other and having end portions connected to said first core, said bands including a shorter band and a longer band; and guide means provided in said frame for moving the bands apart intermediate said cores so that when the first core is rotated to collect said bands, the bands are convoluted onto discrete portions of said first core, said guide means including means for stretching said shorter band to a greater first extent and for stretching the longer band to a lesser second extent so that the difference in the stretching of said shorter and longer bands exceeds the difference in lengths of said shorter and longer bands.

4,927,130
AUTOMATIC SHEET FEEDER
Hironori Tanaka, Yamatokoriyama; Matahira Kotani, and Masafumi Matsumoto, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 6, 1988, Ser. No. 241,372
Claims priority, application Japan, Sep. 7, 1987, 62-224790
Int. Cl.[5] B65H *5/06*
U.S. Cl. 271—10 5 Claims



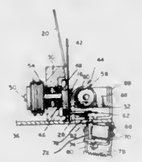
1. An automatic sheet feeder comprising:
a feed roller for feeding sheets one by one to a sheet conveying path;
a feed roller shaft for supporting the feed roller;
a conveyor roller provided downstream of said feed roller on the sheet conveying path, said conveyor roller conveys sheets fed by the feed roller to an image reading unit at a first speed;
a feed roller gear supported on said feed roller shaft for rotating said feed roller at a second speed, said first speed being greater than said second speed;
clutch means for connecting said feed roller gear to the feed roller shaft to rotate said feed roller at the second speed until a leading edge of a sheet being fed by said feed roller arrives at a nipping line of the conveyor roller whereafter said feed roller is uncoupled from the feed roller gear and is rotated at the first speed by movement of said sheet, said clutch means comprises a coupling member supported on said feed roller shaft and a spring extending between said coupling member and said feed roller gear; and
means for temporarily stopping rotation of said feed roller after the sheet has passed from the feed roller whereby spacing between successive sheets fed past said conveyor roller can be maintained, said means for temporarily stopping comprises a notched portion at an end of said feed roller shaft, said notched portion being positioned in an opening defined in said coupling member, said coupling member at the opening having a generally flat face, said notched portion having two sides, a first side of said notched portion contacting said face when said feed roller is rotated at the first speed and a second side of said notch portion contacting the face when said feed roller is rotated at the second speed, said feed roller shaft and notched portion being rotatable relative to the coupling member whereby a time period is provided when said first side of the notched portion disengages from the face and said second side of the notched portion thereafter engages the face during which time period rotation of the feed roller is stopped to thereby maintain the spacing between successive sheets.

4,927,131
SHEET STACKING APPARATUS
Hiroshi Hashimoto, Tokyo, and Hiromichi Yamanaka, Higashiyamato, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 81,134, Aug. 3, 1987, abandoned. This application Oct. 6, 1989, Ser. No. 418,764
Claims priority, application Japan, Aug. 4, 1986, 61-183022; Aug. 4, 1986, 61-183023; Aug. 4, 1986, 61-183161; Jan. 20, 1987, 62-012108
Int. Cl.[5] B65H *31/10*
U.S. Cl. 271—215 14 Claims



1. A sheet stacking apparatus, comprising:
a sheet discharge outlet;
sheet stacking means for receiving sheet materials discharged through said sheet discharge outlet;
means for supporting said sheet stacking means for substantially vertical movement;
driving means for moving said sheet stacking means in a substantially vertical direction;
control means for controlling said driving means to move said sheet stacking means down in the substantially vertical direction through a predetermined distance each time a predetermined amount of the sheet materials is stacked on the sheet stacking means; and
detecting means for detecting fullness of said sheet stacking means by detecting said sheet stacking means at a lower limit level which is changed in accordance with sizes of the sheet materials.

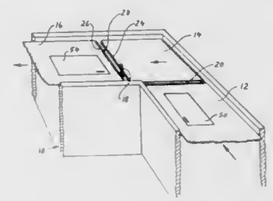
4,927,132
DOCUMENT TRANSPORT APPARATUS
Dwight G. Westover, Sierra Madre, Calif., assignor to TransTechnology Corporation, Sherman Oaks, Calif.
Filed Jul. 28, 1988, Ser. No. 225,232
Int. Cl.[5] B65H *5/06*
U.S. Cl. 271—225 37 Claims



1. Apparatus for registering and advancing a document along a track, comprising in combination:
document receiving means including said track having a registration surface for supporting said document along said document's bottom edge;
a plurality of rotatable disks having respective planar surfaces in side-by-side spaced relation along said track;
means for rotating said disks and said disk surfaces;
a plurality of first members, each actuable between an active position and an inactive position and having actuation means therefor, said first members when in their active positions urge said document received by said document receiving means against respectively associated ones of said rotating disk surfaces when said document is interposed therebetween for causing said document to advance toward and register its bottom edge against said registration surface;
a plurality of second members, each actuable between an active position and an inactive position and having actuation means therefor, said second members when in their active positions urge said received document against respectively associated ones of said rotating disk surfaces when said document is interposed therebetween for causing said document to advance along said track; and
control means for controlling actuation of said first and second members to said active and inactive positions respectively, and alternatively to said inactive and active positions respectively.

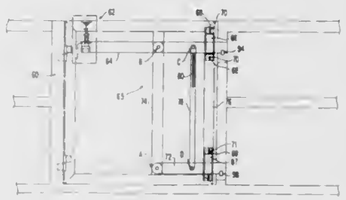
4,927,133
ANGLED CONVEYOR FOR DOCUMENT PACKAGES
David W. Evans, Alpha, N.J., assignor to Bell & Howell Company, Skokie, Ill.
Filed Sep. 23, 1988, Ser. No. 248,458
Int. Cl.[5] B65H *5/02*
U.S. Cl. 271—225 10 Claims

1. A mailing machine including an angled conveyor device for document packages comprising:
first feed means for in-feeding of said document packages in seriatim;
a transition conveyor belt including a downstream transition end;
an output conveyor belt for seriatim outfeeding of said document packages, said output conveyor belt including an upstream output end;
a frame on which said belts are drivcably mounted;
a transition gap disposed between said downstream transition end and said upstream output end;
turn post means extending substantially vertically upwardly through said transition gap and protruding above the upper surfaces of said transition and output conveyor belts, said turn post means serving to intercept and guide said document packages therearound so that said document packages become substantially aligned angularly and transversely on said output conveyor belt;



said transition conveyor belt having an angled direction of motion relative to the direction of motion of said document packages during in-feeding; and,
said output conveyor belt having a direction of motion generally in line with the direction of motion of said transition conveyor belt.

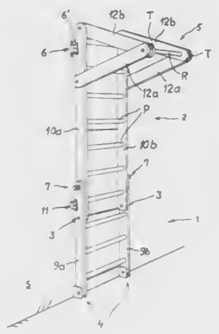
4,927,134
DASHER BOARD SYSTEM
John S. Burley, Salix, Pa., assignor to Burley's Ring Supply, Salix, Pa.
Division of Ser. No. 214,433, Jul. 1, 1988, Pat. No. 4,883,267.
This application Aug. 17, 1989, Ser. No. 395,361
Int. Cl.[5] E04H *17/16*
U.S. Cl. 272—3 5 Claims



1. A dasher board system for an ice rink comprising:
frame segments coupled to form a continuous framework around said ice rink;
facing panels attached to said framework;
a door opening formed between two adjacent frame segments to accommodate a hinged door, said door having a latch mechanism including:
a push-button lock means for releasing said latch mechanism, said lock means being flush with an upper edge of said door when in its non-actuated position and actuatable from either inside or outside of said ice rink;
a lever arm arrangement pivotally coupled to form a parallelogram configuration; and
a hook means for receiving at least one arm of said lever arm arrangement when said door is closed, so that upon actuation of said lock means, said lever arm arrangement pivots to release said at least one arm from said hook means.

VOL
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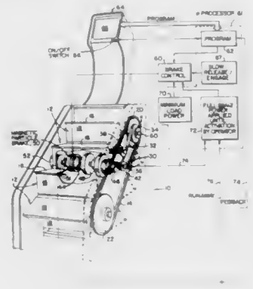
4,927,135
EXERCISE APPARATUS
Heikki Nieppola, Rusinniementie 17, SF-35800 Mänttä , Finland
PCT No. PCT/FI87/00178, § 371 Date Sep. 2, 1988, § 102(e) Date Sep. 2, 1988, PCT Pub. No. WO88/04943, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 29, 1987, Ser. No. 246,397
Claims priority, application Finland, Jan. 5, 1987, 870017
Int. Cl.[5] A63B *17/00*
U.S. Cl. 272—63 6 Claims



1. Exercise apparatus for use mounted at a wall, said apparatus comprising:
upper and lower elongated members, each of said elongated members comprising a pair of spaced-apart longitudinal stringers and means holding said stringers in a spaced-apart parallel arrangement, each of said members having upper and lower end portions;
means affixed at the lower end of said lower member for pivotally securing said lower member at the base of said wall;
pivot means connecting the lower end portion of said upper member in an overlapping relationship with the upper end portion of said lower member for pivoting movement between a position in which both elongated members are in the same plane, and a position in which said elongated members are at an angle with respect to each other;
locking means for locking said elongated members in the same plane in an upright position, and for securing said upper elongated member in a horizontal or an inclined position, said locking means comprising pins mounted at the upper ends of said stringers of said lower elongated member and corresponding holes in the lower end portion of said upper elongated member for engaging said pins; and
a support pedestal fixedly mounted on the upper end of said upper elongated member for supporting said upper end of said upper elongated member.

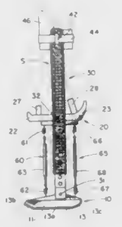
4,927,136
BRAKING SYSTEM FOR EXERCISE APPARATUS
John W. Leask, Carlisle, Mass., assignor to Engineering Dynamics Corporation, Lowell, Mass.
Filed Jan. 6, 1989, Ser. No. 294,478
Int. Cl.[5] A63B *23/06*
U.S. Cl. 272—69 13 Claims

1. In combination with escalator type exercise apparatus including an inclined and hinged set of stairs, means for guiding movement of said stair down an incline, and means coupled to said stairs for limiting the movement thereof in a downward direction when an individual is standing on one of said stairs, said limiting means including electromagnetic braking means for controlling the movement of said stairs down said incline, said electromagnetic braking means including a shaft con-



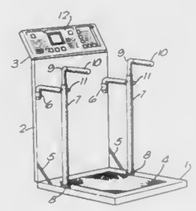
nected to said stairs, means for substantially locking said shaft and means actuatable by said individual for deactivating said locking means.

4,927,137
STILT
Charles R. Speer, 14014 Briar Pl., Houston, Tex. 77077
Filed Jul. 11, 1988, Ser. No. 217,157
Int. Cl.[5] A63B *25/00*
U.S. Cl. 272—70.1 18 Claims



1. A stilt to be used in pairs for elevating the user thereof comprising: ground or floor engaging means, elongated support means attached to said ground engaging means, said support means including means for attachment to the user's leg, and a foot support assembly attached to said support means for supporting a foot of said user at a vertically elevated position from said ground engaging in which each of said ground engaging means and said foot assembly is attached to said support means by single pivot connections, one pivot connection for each, the single pivot connection for said foot assembly supporting the load on said foot assembly and the single pivot connection for said ground engaging means supporting the load on said ground engaging means, and biasing means connecting said ground engaging means and said foot support assembly tending to bias said ground engaging means and said foot support assembly toward mutually parallel positions.

4,927,138
EXERCISE APPARATUS
Carlo V. G. Ferrari, 51 Hyde Crescent, Hendon, London N.W.9., England
Filed Jul. 1, 1988, Ser. No. 214,474
Claims priority, application United Kingdom, Jan. 26, 1988, 8801701
Int. Cl.[5] A63B *1/00, 3/00*
U.S. Cl. 272—70 4 Claims



1. A portable exercise apparatus comprising:
a base member having a force plate thereon for receiving the force of a user standing and running in place on the force plate, the base member having a rear edge and opposite side edges;
an upstanding member hingedly connected to the rear edge of the base member, the upstanding member having a top edge and opposite side edges;
a display panel member hingedly connected to the top edge of the upstanding member;
a pair of first sockets connected to the upstanding member adjacent respective opposite side edges thereof;
a pair of second sockets connected to the base member adjacent respective opposite side edges thereof;
a first angled support having a lower end engageable into one of the second sockets, the first angled support having an upper end with a portion pivotally mounted in one of the first sockets;
a second angled support having a lower end engaged into the other of the second sockets, the second angled support having an upper end with a portion pivotally mounted in the other of the first sockets;
a pair of angle members, each angle member telescopically engaged into the upper end of one of the first and second angled supports, each angle member having a hand grip to be held by the user for conducting isometric, isotonic and running in place exercises on the force plate; and
bracket means connected between the base member and the upstanding member for holding the upstanding member in an upstanding relationship to the base member, the lower ends of the angled supports being disengageable from the second sockets for pivoting the angled supports toward each other in the first sockets and against the upstanding member, and the base member and display panel member being pivotable against the upstanding member and over the folded angled supports for storage of the apparatus.

4,927,139
THERAPEUTIC BACK REST
Abraham K. Taltre, 1011 E. Ginter Rd., Tucson, Ariz. 85706
Filed Jun. 2, 1989, Ser. No. 360,859
Int. Cl.[5] A63B *23/00*
U.S. Cl. 272—144 10 Claims

1. A therapeutic back rest for placing a person's back, neck, and pelvis in a continuous curve when reclining comprising:
a pair of parallel, spaced apart semi-circular supports having first and second ends adapted to rest on the ground, said semi-circular supports having a radius sufficiently great than the arc defined by said supports is of such a length that a fully extended user may recline along said back rest with no part of the person touching the ground;
a foot cross bar connecting said semi-circular supports proximate said first end of said semi-circular supports;
a second cross bar connecting said semi-circular supports proximate said second end of said semi-circular supports;
a plurality of spaced apart slats operably attached to said semi-circular supports, said slats forming an arch adapted to receive the body of the reclining person and defining



the arc that the person's back, neck, and pelvis is to conform to; and
a third cross bar proximate said second cross bar, and a pair of spaced apart structural members, said second and third cross bars and said pair of structural members defining a rectangle, said rectangle adapted to receive and hold the person's head when the person is reclining on said back rest whereby the person's neck continues to conform to the curve of the person's back.

4,927,140
CONVERTIBLE BILLIARD TABLE
Spilios A. Pappas, 4233-24th St., San Francisco, Calif. 94114
Filed Jul. 21, 1989, Ser. No. 383,016
Int. Cl.[5] A63D *15/04*
U.S. Cl. 273—4 R 14 Claims

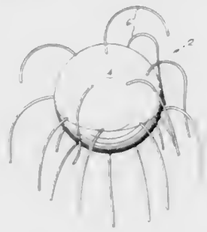


1. A game table including:
a rectilinear bed having four edges bounding an upper playing surface;
curvilinear bed notches in the four corners of the bed and in the center of two opposing edges; and
four rails moveable from a first to a second position, each position having one rail adjacent and parallel to each edge, the rails having

VOL
1114
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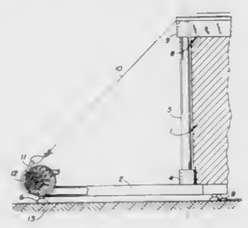
opposing and parallel first and second long sides each, and generally curvilinear rail notches at the ends of the rails on the first side and in the center of two of the rails on the first side,
wherein
pockets are formed by the bed notches and adjacent rail notches when the rails are in the first position with the first sides facing the playing surface
and wherein
no pockets are formed when the rails are in the second position with the second sides facing the playing surface.

4,927,141
NOVELTY BALL
Arlen C. Paranto, P.O. Box 304, Eatonville, Wash. 98328
Filed Jul. 24, 1989, Ser. No. 383,607
Int. Cl.[5] A63B *37/14, 43/02*
U.S. Cl. 273—58 K 10 Claims



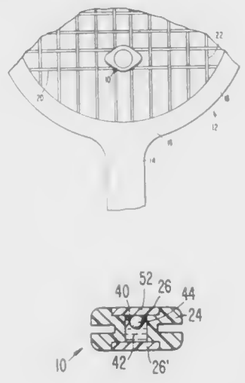
1. A novelty ball useful for the development of motor skills and for other purposes which comprises:
a long, generally spherical ball formed of a soft, compressible, resilient material; and
a multiplicity of flexible whisker means having one end anchored within and protruding from the ball generally along radii thereof, said whiskers having at least some drape when the ball is at rest but not so much drape so that they hang limply from the ball.

4,927,142
SUPPORTING DEVICE FOR NET POSTS IN TENNIS COURTS
Norbert Drusel, Im Schluh 12, 2862 Worpswede, Fed. Rep. of Germany
Filed Jan. 6, 1989, Ser. No. 295,110
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802655
Int. Cl.[5] A63B *61/02*
U.S. Cl. 273—29 BB 7 Claims



1. A supporting device for supporting a tennis net on a tennis court, comprising:
A tennis net and a pair of vertically extending tennis net support posts said net being attached between said support posts by a net support means;
A horizontally extending lever having first and second ends and top and bottom surfaces, mounting means adjacent said first end and on said top surface mounting a lower end of at least one of said support post to said lever; an elongate, cylindrical weight means attached to said second end of the top surface of said lever, said weight means extending substantially perpendicular to a longitudinal recess of said lever and eccentrically mounted roller means disposed at each end of said cylindrical weight for rotation about an axis, said axis being offset from a longitudinal axis of said weight means, a net tension line attachment means attached intermediate the ends of said weight means for attachment at least one of said support post, a net tension line extending from said tension line attachment means to the top of said at least one of said support post for holding said tennis net support means in a taunt condition, and an elastic support means on said bottom of said lever.

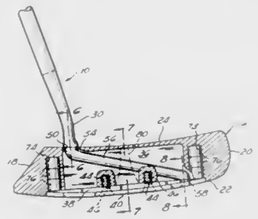
4,927,143
FLUID VIBRATION DAMPER FOR RACQUET
Bart A. Hillock, 5560 Pembroke, Santa Barbara, Calif. 93111
Continuation of Ser. No. 911,005, Sep. 24, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 222,282
Int. Cl.[5] A63B *51/10*
U.S. Cl. 273—73 D 14 Claims



7. In combination with a sports racquet having a plurality of crossing strings, a handle, a throat connected to said handle, and a bow connected to said throat and adapted for mounting said strings, a damping device, comprising:
a body having a pair of end faces each having a greatest longitudinal dimension and a greatest lateral dimension, said body further having a peripheral wall extending between said end faces and defining a thickness of said body, said greatest longitudinal dimension being greater than said greatest lateral dimension so that the body has a generally oblong shape, both said longitudinal dimension and said lateral dimension being greater than the distance between adjacent strings on said sports racquet, a peripheral groove dimensioned to receive the strings of said sports racquet, said peripheral groove being formed in said peripheral wall such that the peripheral groove has a maximum depth which is not uniform, the depth of the peripheral groove being greater in said longitudinal dimension than said lateral dimension, and further wherein said damping device is mounted in said strings such that said groove receives strings to entrap said damping device among said strings so that the body overlaps the strings to

a greater extent in the longitudinal dimension of the body than in the lateral dimension.

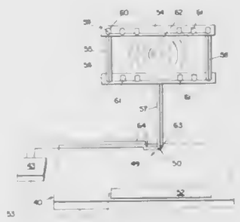
4,927,144
PUTTER
Robert D. Stormon, 2103 Divot La., Palm Springs, Calif. 92264
Filed Aug. 7, 1989, Ser. No. 390,082
Int. Cl.[5] A63B *53/02, 53/08*
U.S. Cl. 273—80 A 8 Claims



1. The improvement in a golf putter having an elongated shaft with a grip at its upper end and having a club head with a heel end, a toe end, a sole, an upper surface, and a face comprising:
(a) said club head having a downwardly open cavity elongated in a heel-to-toe direction and having a plate closing said cavity at said sole of said club head and secured to said club head,
(b) said club head having a generally vertically extending top opening to said cavity in said heel end of said club head and said plate having a generally vertically extending through opening in said toe end thereof,
(c) said shaft having an extension at its lower end below the main portion of said shaft including a first portion bent to pass downwardly through said top opening, having a second portion slanting downwardly in said cavity toward said toe end, and having a third portion extending downwardly into said through opening in said plate where it is welded to said plate,
(d) said shaft at its location passing through said top opening being smaller in cross-section than said top opening whereby when a golf ball is struck by said face said first portion of said shaft has room in said top opening to flex relative to said club head whereby said head gives upon initial impact with said golf ball and then recoils against said golf ball,
(e) said club head having a center of gravity located at the intersection of the longitudinal axis of said second portion of said shaft and of a diagonal line bisecting the angle formed by a line from said grip to said through opening and by the centerline of said main portion of said shaft, said extension including a first reduced diameter portion above and adjacent to said top opening of said club head and said third portion of said extension being equally reduced in diameter and said reduced diameter portions being substantially equally spaced from said center of gravity whereby torquing of said shaft upon impact with a golf ball is equally shared by said reduced diameter portions, and
(f) half the weight of said club head being disposed above and half the weight of said club head being disposed below an oblique plane that extends through said longitudinal axis of said second portion of said shaft extension, said oblique plane forming straight horizontal lines in vertical planes at right angles to said longitudinal axis of said second portion of said shaft extension, whereby during generally horizontal travel of said club head during a stroke, said club head does not tend to rotate about said longitudinal axis of said second portion of said shaft extension.

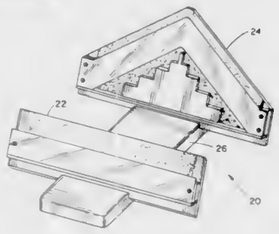
4,927,145
BOARD GAME APPARATUS
George M. Davis, 1826 Escambia Ave., Pensacola, Fla. 32503
Filed Oct. 11, 1988, Ser. No. 255,488
Int. Cl.[5] A63F *7/06*; A63B *63/00*
U.S. Cl. 273—94 10 Claims





4. A board game apparatus comprising:
a planar playing board having line graphics and alphanumeric graphics printed thereon;
a flat disc shaped object adapted to be propelled by the manual thumping method across said playing board;
said line and alphanumeric graphics comprising indicia means for determining the outcome of a play by a player propelling said disc by the manual thumping method in accordance with predetermined game rules;
the surface of said playing board having suitable surface unevenness to impede the formation of a vacuum between said disc and surface while said disc is being propelled across said surface;
a plurality of distributed conductor means associated with said laying board for generating signals relating to the position of said disc relative to said playing board, said disc having appropriate characteristics to interact cooperatively with said conductor means to generate said signals; and
auxiliary game apparatus adapted to be used in combination with said playing board and disc during play, including a removably mountable goal apparatus adapted to be mounted in a receptacle formed in said playing board, said goal apparatus comprising a central post member, a crossbar member connected to said central post member, and two upright members removably mountable on said crossbar member.

4,927,146
PLAYING CARD HOLDER
Arthur E. Bull, 48 Laurel, Mt. Dora, Fla. 32757
Filed Nov. 14, 1988, Ser. No. 270,951
Int. Cl.[5] A63F *1/10*
U.S. Cl. 273—150 19 Claims



1. A holder for playing cards, comprising:
a backing plate;
a transparent view plate fixed to said backing plate, said view plate being substantially parallel to and spaced apart from said backing plate to define a card-holding slot therebetween; and
means for urging a playing card inserted in said card-holding slot against said view plate, said urging means including a plurality of deformable carpet pile filaments fixed to said backing plate and extending across said card-holding slot into abutment with said view plate, said filaments deflecting when a playing card is inserted in said card-holding slot and holding the inserted card against said view plate.

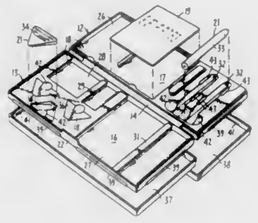
4,927,147
CHARADE AND DRAWING CARD GAME USING DICE
Robert J. Delzio, P.O. Box 20251, San Deigo, Calif. 92120
Filed Apr. 11, 1988, Ser. No. 180,146
Int. Cl.[5] A63F *1/04, 9/04*
U.S. Cl. 273—146 2 Claims





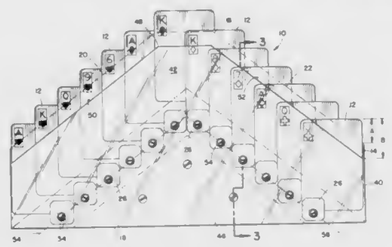
1. A charade and drawing card game consisting of a supply of cards each bearing eighteen words or phrases categorized into three letter groups, A, B, and C, of six words or phrases each, numbered 1 through 6, utilizing three distinct six-sided dice, the Letter Die (two sides "A", two sides "B", two sides "C"), the Number Die (numbered 1 through 6), and the Charade/Draw Die (three sides "Charade", three sides "Draw"), which when tossed simultaneously, these dice serve to reference specific words or phrases and denote the drawing or charading of that word or phrase.

4,927,148
LOTTERY KIT
Steven L. Weiner, 5333 Blackhawk Dr., Danville, Calif. 94526
Filed Jun. 6, 1988, Ser. No. 202,950
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—148 R 15 Claims



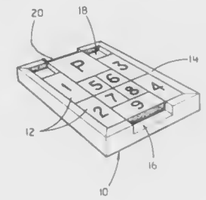
8. A kit for lottery playing paraphernalia, comprising:
first and second commensurate members each having an inner surface, an outer surface and perimeter edges, said inner and outer surfaces being contiguous to each other without space therebetween;
a protective cover member sized to fit a chosen one of said first and second members in covering relation thereto;
interengaging snap means, provided on the chosen member and on said protective cover member, for releasably holding the protective cover member in place on the chosen member;
said members being hingedly joined to each other along a perimeter edge such that in a closed position said members lie inner surface to inner surface thereby forming a clamshell folio case, and in an open position said members lie substantially coplanar;
an inner face of at least one member including at least one indentation sized to receive at least one piece of paper used in lottery playing; and
a latch located on said first member for releasably retaining the second member when the clamshell folio case is in the closed position.

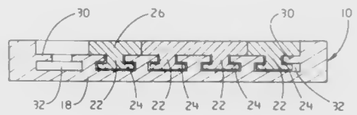
4,927,149
PLAYING CARD HOLDER
Arthur E. Bull, 48 Laurel, Mt. Dora, Fla. 32757
Filed Dec. 21, 1988, Ser. No. 287,718
Int. Cl.[5] A63F *1/10*
U.S. Cl. 273—150 19 Claims



1. A holder for playing cards, comprising:
a backing plate having a top backing plate edge; and
a plurality of pinching members mounted on said backing plate in a preselected arrangement, each of said pinching members including a pinch block having a fixed end connected to said backing plate and a free end extending from said fixed end toward said top backing plate edge, said free end of each of said pinch blocks including a card-gripping surface facing said backing plate, each of said pinching members also including a spacer disposed between said respective pinch block and said backing plate to define a clearance space between said card-gripping surface of said respective pinch block and said backing plate, each of said clearance spaces having a width less than the thickness of a playing card so that a playing card inserted in any of said clearance spaces is fictionally gripped between said backing plate and said card-gripping surface of said respective pinch block.

4,927,150
SHIFTABLE BLOCK PUZZLE
Terry Monoyios, 323 Alten, N.E., Grand Rapids, Mich. 49503
Filed May 11, 1988, Ser. No. 192,843
Int. Cl.[5] A63F *9/08*
U.S. Cl. 273—153 S 2 Claims





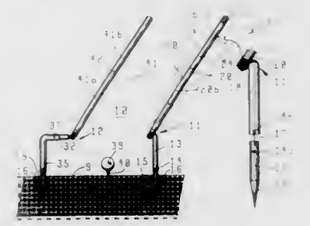
1. In a sliding block puzzle comprising a playing surface including formed channels therein surrounded by a rectangular frame, a plurality of rectangular playing pieces slidably positioned on the playing surface, said playing pieces including depending projections that fit into said channels, the projections further including extending portions below the playing surface that compatibly prevent the pieces from being vertically removed from the playing surface while allowing for slidable movement of the playing pieces through said channels in the playing surface, the size of the playing pieces being such that the pieces are positioned contiguously and fill the frame, with the exception that there is at least one vacant space inside the frame such that the playing pieces are slidable in perpendicular directions inside the frame and into the vacant spaces to change relative positions of the pieces on the playing surface, the improvement wherein an object piece is also slidably positioned on the playing surface, said object piece not having a depending projection and therefore being free to be removed from the playing surface, and further where the frame includes at least one opening therein at a predetermined location, the object piece being slidable through the opening allowing the exit of the object piece from the playing surface when the object piece is slidably manipulated to a position on the playing surface adjacent the opening.

4,927,151
GOLF CLUB INCLUDING SIGHT LEVEL INDICATOR
Albert J. Ronnick, 1928 S. Orange Ave., Sarasota, Fla. 34239
Filed Jul. 28, 1989, Ser. No. 387,000
Int. Cl.[5] A63B *69/36, 53/00*
U.S. Cl. 273—162 B 4 Claims



1. A golf club including a sight level indicator, said golf club having an elongated shaft with a head at the lower end of said shaft and a handle at the upper end of said shaft, said level indicator comprising:
a liquid-filled transparent vial having an elongated body, said liquid in sufficient quantity within said vial to form a gas bubble within said vial for viewing;
said vial structured to be connected within a mating slot or groove formed adjacent the upper end, and extending inwardly from the outer surface, of the golf club handle, said slot or groove transverse and perpendicular to the longitudinal axis of the golf club;
said vial generally fitting within the outer surface of the golf club handle and oriented so that said bubble may be viewed when said shaft is suspended in a generally upright orientation by the golfer for establishing the direction of offset of the fairway or putting green grade.

4,927,152
PORTABLE GOLF SWING TRAINING AID
Janice C. Graham, Rte. 4, Box 129, Miami, Okla. 74354
Filed Jul. 18, 1989, Ser. No. 381,379
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186 R 8 Claims

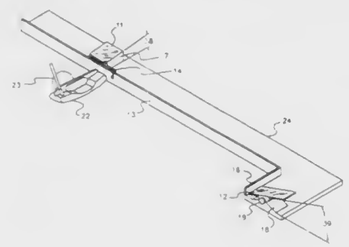


1. A collapsible golf swing aid comprising:
(a) a first pair of spaced members (13,13) each having one end for securing vertically to a rigid horizontal surface and a second end;
(b) first bar means (8) attaching said second ends to form an "U" shaped member;
(c) a first bar attachment means (18) rigidly attached to said first bar means and extending beyond each side of said "U" shaped member; said first bar attachment means (18) having securing means mounted into the portions (18*a*, 18*b*) thereof extending beyond said "U" shaped member;

VOL 1114 ISS 4 MY 22 1990 UMI

(d) arcuate tubular means having a mating securing means in one end for inserting over said portions of said first for attachment means for securing said arcuate tubular means into a selected position;
(e) a second pair of first and second spaced members (35, 36) each having one end for securing vertically to a rigid surface and having a second end formed at right angles to said second pair of spaced members;
(f) a second "U" shaped member (32, 34, 33) adapted to rotatably attach to said second ends of said second pair of spaced members (35, 36);
(g) releasable securing means interposed between said attachment of said second "U" shaped member and said right angle ends so that when said securing means is released, said second pair of spaced members can be rotated to a substantially compact configuration;
(h) a second bar attachment means (26) rigidly secured to said second "U" shaped member and having an extension on each side beyond said second "U" shaped member, each extension having securing means therein; and
(i) a second arcuately shaped tubular means having mating securing means on each end for attachment to one of said securing means on said second bar attachment means.

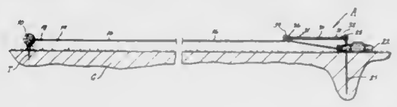
4,927,153
GOLF PUTTING PRACTICE DEVICE
John P. Schaefer, 2533 Pepperidge Dr., Garland, Tex. 75044
Filed Feb. 13, 1989, Ser. No. 309,373
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—187 R 14 Claims



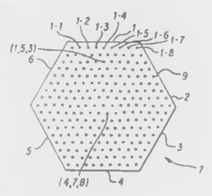
1. A device for assisting a golfer during practice putting, comprising;
(a) a base member having first and second mirrors mounted thereon;
(b) said first mirror positioned directly in front of the golfer where the stance is to be taken;
(c) said second mirror positioned on base extension to the right, or left, of golfer and directly behind the proper location of the golf ball;
(d) both mirrors having a directional slant toward the golfer's proper head position, so that the golfer will be able to see his eyes reflected in both mirrors when his head is properly aligned directly above the golf ball.

4,927,154
GOLF PRACTICE DEVICE
Ralph C. Boyer, 1507 Missouri Ave., Crystal City, Mo. 63019, and Edward C. Macauley, 1455 Reauville, St. Louis, Mo. 63122
Filed Jul. 17, 1989, Ser. No. 380,603
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—200 R 6 Claims

1. A device for the practice of golf strokes comprising a golf ball, a non-elastic elongated member of preselectable length having opposite ends, an elastic segment, reel means and anchor means; said non-elastic member comprising a tether cord and being securely attached at one end to said golf ball and at the other end to said reel means; said elastic segment being attached by one of its ends to a point along said tether cord and at its other end to said anchor means for prevention of transfer of shock to the reel means when said golf ball reaches the outermost point of its trajectory and for facilitating return of said ball; said tether cord having an integral component defined by its attachment at one end to said reel means and at its other end by the point of attachment of said elastic segment for checking the flight of the golf ball; the preselected length of said tether cord between said golf ball and said reel means defining the maximum length of the trajectory of the golf ball; said anchor means comprising a post-forming element for anchoring said device throughout use thereof.

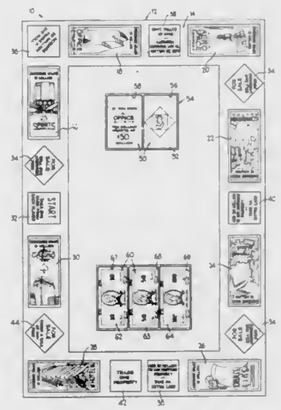


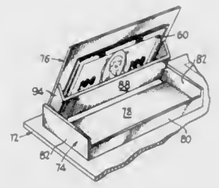
4,927,155
BOARD GAME
Jeffrey N. Bellinger, 56 Frances Dr., Clark, N.J. 07066
Filed Apr. 19, 1989, Ser. No. 340,285
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—255 5 Claims



1. A board game comprising:
(a) a board having a multiplicity of spaces formed over the entirety of a surface thereof;
(b) a plurality of game pieces placeable on said board in random fashion, said pieces including:
(i) a plurality of birds for each player, each said bird for moving about said board;
(ii) a tree for providing a place of safety for a said bird;
(iii) a home base for each player, each home base being randomly placeable on said board and being provided for storing select game pieces;
(iv) a plurality of weapons for destroying select game pieces;
(v) a plurality of tablets adapted to be collected by a said player;
(vi) a plurality of markers, each marker for placement on a space on said board;
(vii) a pair of transport gates to permit rapid movement across said board;
(viii) a plurality of crystals for freezing a said bird of an opponent;
(c) a chance device used to determine player moves;
(d) players being permitted to move their birds and any crystals responsive to operation of said chance device, the object of said game being to obtain a predetermined number of tablets, using said birds to bring said tablets back to a respective said home base.

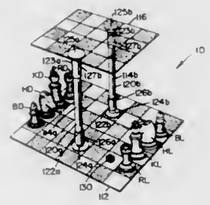
4,927,156
PROPERTY DEALING GAME
Jeffrey D. Breslow, Highland Park; John V. Zaruba, Chicago, and Donald A. Rosenwinkel, Oak Park, all of Ill., assignors to Breslow, Morrison, Terzian & Associates, Inc., Chicago, Ill.
Filed Feb. 6, 1989, Ser. No. 307,331
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—256 10 Claims





1. A game for a number of players comprising in combination:
means defining a path of spaces;
some of the spaces representing properties;
the spaces not representing properties containing directions affecting play of the game;
a supply of simulated money;
an opaque container for each of the properties;
each container being identified with and removably fitting on a space representing a particular property;
each container having a slot through which a piece of the money may be inserted;
each container being capable of holding a number of pieces of the money while obscuring the total amount of the money being held in the container; and
means for obtaining access to the interior of the container to determine the amount of the money contained in the box.

4,927,157
CHESS-LIKE BOARD GAME APPARATUS AND METHOD OF PLAYING THE SAME
Clayton Rihiluoma, 3923 Foss Rd., No. 101, Minneapolis, Minn. 55421, and Kurt R. Miller, 4902 London Rd., Duluth, Minn. 55804
Continuation of Ser. No. 697,270, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 409,260, Aug. 19, 1982, Pat. No. 4,494,868. This application Sep. 19, 1989, Ser. No. 410,002
Int. Cl.[5] A63F *3/02*
U.S. Cl. 273—260 6 Claims



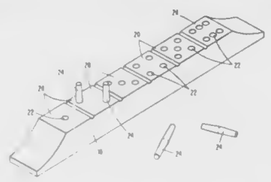
1. A board game apparatus for a chess-like game having multiple playing pieces, comprising:
(a) a first generally flat game board defining a playing surface with forty-two identifiable positions arranged in seven rank and six file rows, forty of the identifiable positions being playing positions available for occupancy and movement thereacross by the playing pieces, two of the identifiable positions being non-playing positions, which are not available for occupancy or for movement thereacross by the playing pieces, one of said non-playing positions being positioned in a second file row from a first side edge of the game board and one of said non-playing positions being positioned in a second file row from a second side edge of the game board, both of said non-playing positions being positioned in a fourth rank row from both ends of the game board;
(b) two sets of distinguishable playing pieces, each of said sets having less than sixteen playing pieces and including four playing pieces being identifiable from one another, the moves of said four identifiable playing pieces being defined according to a predetermined set of game rules, said four identifiable playing pieces having moves similar to those of the king, knight, bishop, and rook in the game of chess; and
(c) each of the two sets of playing pieces being positioned in the opposing rank rows immediately adjacent opposite ends of the game board at the start of the game, the bishop and rook playing pieces being positioned in the second file rows from the side edges of the game board so as to be in the same file rows as the non-playing positions at the start of the game, the knight and rook playing pieces of each set of playing pieces being positioned in the third file rows from the side edges of the game board.

4,927,158
GAME
W. O. Lierman, 2510 Fremont St., Boulder, Colo. 80302
Filed Dec. 23, 1985, Ser. No. 812,837
Int. Cl.[5] A63F *3/08*
U.S. Cl. 273—268 1 Claim

1. An improved game device for aiding the learning of basic skills and providing extensive entertainment comprising:
a plurality of game boards each having a scoring section;
each said score section having 21 peg receptacles for scoring;
said peg receptacles are segregated in the form of numeric indicia of a die from 1 through 6;

VOL
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a die, said die with faces having numeric indicia on said faces;



a plurality of associated pegs, said pegs being constructed for placement in said peg receptacles for scoring.

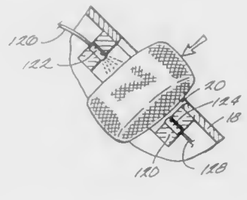
4,927,159
GAME OF HORSESHOES
Mark E. Morrissey, Box 7210 Franklin Rd., Evans City, Pa. 16033, and Thomas Schiemer, Jr., 47 Hempstead Ave., Pittsburgh, Pa. 15229
Filed Aug. 29, 1989, Ser. No. 400,083
Int. Cl.[5] A63B 67/06
U.S. Cl. 273—338 8 Claims



1. A method of playing a game of horseshoes, between at least a first and second player including the steps of:
(a) providing each said first and second player with at least one pair of horseshoes made from a resilient material each having an opening end;
(b) providing each said first and second player with a marker;
(c) positioning said first player at a predetermined distance from said second player;
(d) placing said marker of said first player underneath a foot of said first player;
(e) commencing playing the game of horseshoes by having said second player toss said horseshoes one at a time at the feet of said first player;
(f) awarding points to said second player by landing said horseshoes in a predetermined location with respect to said first player's feet;
(g) continuing play by repeating steps (d) through (f) wherein said marker of said second player is placed underneath a foot of said second player and said first player tosses said horseshoes at the feet of said second player; and
(h) ending play when said first and second players have had the same number of tosses of horseshoes and a predetermined winning number of points have been scored by either said first or second player.

4,927,160
ELECTRONIC BAG TOSS GAME WITH LIGHT-ACTIVATED DETECTION
Thomas W. Nichol, 3765 Maple Wood Ct., Hubertis, Wis. 53033; Edward T. Gisske, Verona, Wis., and Arlyn Johnson, 7350 N. 76th St., Milwaukee, Wis. 53223, assignors to Thomas W. Nichol, Hubertis and Arlyn Johnson, Milwaukee, both of, Wis.
Continuation-in-part of Ser. No. 300,134, Jan. 23, 1989. This application May 8, 1989, Ser. No. 351,952
Int. Cl.[5] A63B 63/00, 71/04
U.S. Cl. 273—371 8 Claims





1. An automated bag toss game, comprising:
a game board surface, having a plurality of holes formed therein;
at least one item to be tossed:
light-activated sensing means, disposed generally beneath said game board surface and aligned with said holes, for sensing the passage of said item into one of said holes and producing a signal corresponding to the particular hole into which the item passed.

4,927,161
CHIP SHOT GAME
Rex D. Brenneman, 2244 Osage, Wichita, Kans. 67213
Filed Apr. 20, 1989, Ser. No. 340,801
Int. Cl.[5] A63B 67/06
U.S. Cl. 273—402 3 Claims

1. A throwing game and device wherein projectiles are tossed, pitched or lobbed by players standing on a first target area at a second target area comprising:
a pair of target structures each being formed in a rectangular, shallow, box shape and each having front, back, said and inside supports sufficiently strong to support the weight of said players;

a target area having a plurality of circular openings adapted to be supported on top of each of said target structures;



a linkage adapted to connect said pair of target structures in a fixed, spaced apart relationship; and
a plurality of projectiles for pitching at said target areas.

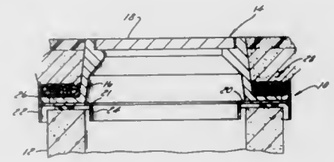
4,927,162
DARTBOARDS
Henry W. Kicks, 22 Orchard Close, and Malcolm Kicks, The Daubers, Keddington Road, both of Haverhill, Suffolk, England
Continuation of Ser. No. 63,133, May 18, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 274,921
Claims priority, application United Kingdom, Sep. 23, 1985, 8523446; Apr. 24, 1986, 8610011
Int. Cl.[5] F41J 3/00
U.S. Cl. 273—408 5 Claims



1. A dartboard of compressed sisal fibers having beds on a face of the board defined by wire, said wire having a quadrilateral cross-section, one corner of the wire being in contact with the board face, the opposite corner being exposed to the oncoming darts and the remaining two corners of the wire being spaced away from the board face, the wire being arranged to extend both radially and in a circle on the face, wherein a radially extending wire has sides that define a cross-section which is at least in part tapered, the radially extending wire being arranged on the board with the sides which define the tapered cross-section facing away from the board, and wherein a radially extending wire and a circularly extending wire cross over one another on the face, there being provided a notch in the part of either a radially extending or a circularly extending wire which is adjacent to the other at the cross-over point, or notches in the parts of each of the radially extending and the circularly extending wires which are adjacent to the other at the cross-over point.

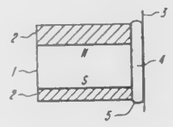
4,927,163
STORM INFILTERATION DISK WITH FILTER
Stanley Gagas, 3642 E. American Ave., Oak Creek, Wis. 53154
Filed Dec. 22, 1988, Ser. No. 288,464
Int. Cl.[5] F16J 15/10; E02D 29/14
U.S. Cl. 277—23 5 Claims

1. An infiltration system for sealing the gap between a manhole and a manhole cover assembly, said system comprising:
an infiltration disk positioned between the manhole and the manhole cover assembly,
said disk including a circular plate having a flange on the outer periphery thereof extending above and below said plate,



said flange encircling the outer perimeter of the manhold and being spaced radially outwardly from said manhole cover assembly, and
a filtration means positioned in said radial space between said flange and said cover assembly for preventing ingress of solid matter into said radial space between said manhole cover assembly and said flange.

4,927,164
FERROFLUID SEAL WITH EPOXY POLE PIECES
Kuldip Raj, Merrimack, N.H.; Joseph Moses, Tyngsboro, Mass.; Ronald Moskowitz, Hollis, and Frank Bloom, Windham, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.
Filed Aug. 8, 1988, Ser. No. 229,640
Int. Cl.[5] F16J 15/40
U.S. Cl. 277—80 15 Claims



1. In a ferrofluid seal for sealing an object, said seal having a permanent magnet positioned about said object, at least one pole piece attached to said magnet, said pole piece extending near said object to form a gap and ferrofluid in said gap, the improvement wherein said pole piece is fabricated entirely from an adhesive material, which material adhesively bonds directly to said magnet to form a hermetic seal between said pole piece and said magnet.

4,927,165
MASTER/SLAVE HYDRAULIC SYSTEM FOR ADJUSTING THE SUPPORT WHEELS OF AN ARTICULATED IMPLEMENT
David L. Murray, Lee's Summit, Mo., assignor to Deutz-Allis Corporation, Norcross, Ga.
Filed Feb. 27, 1989, Ser. No. 315,491
Int. Cl.[5] B62D 33/08
U.S. Cl. 280—43.23 2 Claims

1. A wide implement comprising:
a main frame having a pair of frame sections extending laterally in end-to-end relation to one another with their adjacent laterally inner ends pivotally connected on a longitudinal horizontal axis extending in the direction the implement travels during a field working operation,
laterally spaced inner and outer support wheels connected in vertically adjustable supporting relation to the laterally

VOL 1114 ISS 4 MY 22 1990 UMI

inner portion and laterally outer portion, respectively, of each of said frame sections, and

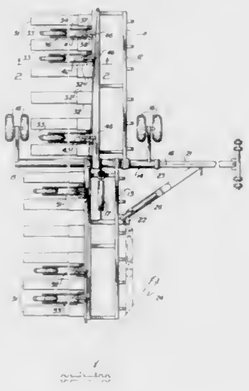
an hydraulic control system providing equalized wheel support for said implement including

a laterally outer hydraulic master jack operatively interconnected between one of said frame sections and the laterally outer support wheel adjustably connected thereto

a laterally inner hydraulic master jack operatively interconnected between said one frame section and the laterally inner support wheel adjustably connected thereto

a laterally outer hydraulic slave jack operatively interposed between the other frame section and the laterally outer support wheel adjustably connected thereto

a laterally inner hydraulic slave jack operatively interposed between said other frame section and the laterally inner support wheel adjustably connected thereto, said jacks being linearly extensible and contractible and having corresponding first and second ends



a source of pressurized hydraulic fluid including a pump and a fluid reservoir

a control valve having raise, lower and hold positions of adjustment and connected in fluid receiving relation to said pump and in fluid return relation to said reservoir, said valve presenting a pair of supply ports,

conduits connecting said first corresponding ends of said master jacks in parallel to one of said supply ports,

a conduit connecting said second end of the laterally outer master jack to said first end of said laterally inner slave jack,

a conduit connecting said second end of said laterally inner master jack to send first end of said laterally outer slave jack and

conduits connecting said secondn ends of said slave jacks in parallel to the other of said supply ports of said valve.

4,927,166

REAR WHEEL STEERING DEVICE FOR AUTOMOTIVE VEHICLES

Akira Takahashi, and Yuji Soejima, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 312,039

Claims priority, application Japan, Feb. 25, 1988, 63-24432

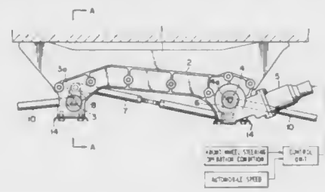
Int. Cl.[5] B62D *5/10*

U.S. Cl. 280—91 **6 Claims**

1. A rear wheel steering device for automotive vehicles, of the type in which a double-link type of a rear suspension having rear wheels, and a front and a rear pair of suspension arms against an automotive body respectively so as to rotatably support the rear wheels:

supporting pins supporting base end portions of at least one of the front and the rear pairs of suspension arms to be suspension cross member of the automobile body;

supporting shafts supporting the other pair of suspension arms to the automobile body, with one of the end portions of said supporting shafts being rotatably mounted to said suspension cross member, and with t he other end portions of said supporting shafts having eccentric shaft portions interconnected by a connecting rod;



said eccentric shaft portions being fitted with sliding bushes comprising an elastic circular ring and an inner cylinder rotatably supporting base end portions of the other pair of suspension arms; and

an actuator to rotate one of said supporting shafts, so that the other supporting shafts is rotated in the same direction by the connecting rod.

4,927,167

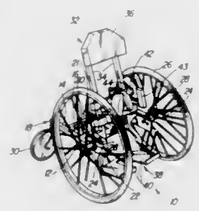
AMBULATORY WHEELSTAND

Daniel W. Davis, 1367 Merle Ave., Burton, Mich. 48509

Filed Mar. 21, 1988, Ser. No. 171,678

Int. Cl.[5] B62M *1/14*

U.S. Cl. 280—250.1 **20 Claims**



15. An ambulatory wheelstand for a user having a center of gravity, said wheelstand comprising:

a frame having a pair of elongated, spaced lateral supports and at least one cross support extending between said lateral supports at a front end of said frame;

two large diameter drive wheels rotatably attached to said lateral supports towards a rear end of said frame;

at least one castor wheel attached to said frame towards the front end, said wheels being adapted to support said frame above a ground surface;

a user support structure pivotably secured to said frame and movable between at least an upright position, in which said structure is substantially vertical, and a prone position, in which said support is substantially horizontal; and

means for pivoting said user support structure so that, regardless of its position, the center of gravity of the user supported by the support structure remains above substantially a single point with respect to said frame;

said means for pivoting comprising:

(a) a portion of each of said lateral supports defining an elongated slot therewith, each slot extending substantially parallel to said lateral supports;

(b) a pair of hinge pins secured coaxially to said user support structure, one of said hinge pins being slidably entrained in each of said slots and movable between at least a front end and a rear end of said slot; and

(c) at least one pivot arm having a first end pivotably secured to said frame in front of said slots and a second end pivotably secured to said user support structure toward the chest plate end from said hinge pin, wherein said hinge pin is disposed at the front end of said slot when the user support structure is in the upright position and at the rear end of said slot when the user support structure is in said prone position.

4,927,168

CROSS-COUNTRY SKI BINDING

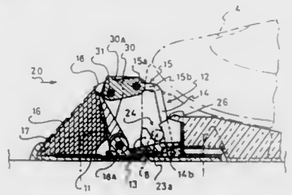
Marc Provence, Thornes-Les-Glieres, and Didier Rousset, Lescheraines, both of France, assignors to Salomon, S.A., Annecy Cedex, France

Filed May 31, 1989, Ser. No. 359,438

Claims priority, application France, Jun. 9, 1988, 88 08034

Int. Cl.[5] A63C *9/18*

U.S. Cl. 280—615 **13 Claims**



1. A cross-country ski binding for latching a shoe or boot on a cross-country ski and for allowing rotation of the shoe or boot about an axis substantially perpendicular to the longitudinal axis of the ski, the shoe or boot being provided at its front end with a journal element, said binding comprising:

journal means complementary to and for cooperation with the journal element of the shoe or boot, a bridling stirrup for engagement with the front end of the shoe or boot, said bridling stirrup being journalled on the ski for movement about an axis substantially perpendicular to the longitudinal axis of the ski, said bridling stirrup being biased by an elastic device, said elastic device also exerting a return force on the shoe or boot when it is lifted from the upper surface of the ski while retained thereon by said bridling stirrup, an element positioned in front of and at a distance from said bridling stirrup, said element comprising a transmission plate for transmission of the forces of said elastic device, the lower end of said plate being journalled relative to the ski, said binding further comprising a connecting rod, wherein said upper end of said plate is journalled on said connecting rod, said connecting rod being journalled on said bridling stirrup, wherein said elastic device exerts said return force on said bridling stirrup by said plate.

4,927,169

SUSPENSION SYSTEM WITH CONSTANT CAMBER

Onofrio Scaduto, 1623 S. 56th Ct., Cicero, Ill. 60650

Continuation-in-part of Ser. No. 212,218, Jun. 27, 1988, Pat. No. 4,854,603. This application Dec. 23, 1988, Ser. No. 288,991

Int. Cl.[5] B62D *17/00*

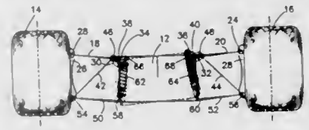
U.S. Cl. 280—661 **21 Claims**

17. A vehicle suspension system for maintaining zero degree camber comprising:

right and left suspension assemblies for mounting right and left wheel assemblies to a vehicle chassis;

said suspension assemblies each comprising an upper control arm and a lower control arm, each having an outer end for connecting to a wheel assembly and an inner end for connecting to a chassis,

a control lever pivotally connected to said chassis at a fulcrum and having a free outer end connecting on of said upper and lower control arms to said chassis for enabling said control arm to extend and retract for maintaining a wheel assembly at a constant camber in response to tilt of said chassis, said control lever having a length that is less than one-half the length of the control arm, and



a control rod having an inner end connected to said control lever on a common side of said fulcrum with said control arm and an outer end connected to one of said upper portion and said lower portion of said wheel assembly for maintaining a wheel of said wheel assembly at a substantially constant camber in of said wheel assembly response to a roll force of said chassis about the roll axis of said chassis.

4,927,170

SUSPENSION CONTROL APPARATUS FOR AN AUTOMOTIVE VEHICLE

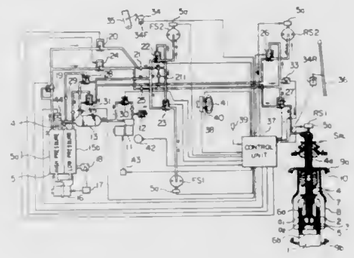
Shunichi Wada, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1989, Ser. No. 320,435

Claims priority, application Japan, Mar. 8, 1988, 63-55262

Int. Cl.[5] B60G *17/00*

U.S. Cl. 280—707 **7 Claims**



1. A suspension control apparatus for an automotive vehicle comprising:

attitude-adjusting means for adjusting the attitude of a body of a vehicle;

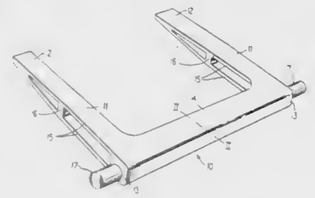
an acceleration sensor which senses the acceleration of the vehicle body and produces a corresponding output signal, said output signal having a neutral point corresponding to no acceleration;

correcting means for correcting the output of said acceleration sensor for drift of the neutral point from a predetermined value; and

control means for controlling said attitude-adjusting means in accordance with the corrected output of said acceleration sensor so as to suppress a motion of the vehicle body caused by the acceleration which is sensed by said acceleration sensor.

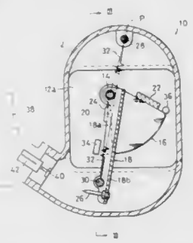
VOL 1114 ISS 4 MY 22 1990 UMI

4,927,171
VEHICLE SUSPENSION SYSTEM
Nils G. Westerlund, Knagalu, Sweden, assignor to The Secretary of State for Trade and Industry in Her Brittanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom
PCT No. PCT/GB87/00272, § 371 Date Dec. 13, 1988, § 102(e) Date Dec. 13, 1988, PCT Pub. No. WO87/06540, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 24, 1987, Ser. No. 288,084
Claims priority, application United Kingdom, Apr. 24, 1986, 8610029
Int. Cl.[5] B60G *11/02*
U.S. Cl. 280—718 25 Claims



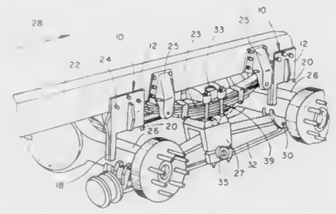
1. A vehicle suspension unit including two arms secured together by and perpendicular to a cross member, each arm comprising two cantilever springs formed from fibre reinforced plastics material which are secured together at each of a first and a second end of the arm and which between these ends are separated in a plane perpendicular to a plane of the arms and cross-member by the cross-member and by a spacing member at a position between the first ends and the cross-member.

4,927,172
MECHANICAL ACCELERATION SENSOR
Yasuki Motozawa, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Ksisha, Tokyo, Japan
Filed Apr. 26, 1989, Ser. No. 342,836
Claims priority, application Japan, Apr. 27, 1988, 63-102653
Int. Cl.[5] B60R *21/32*; F42C *1/04*
U.S. Cl. 280—734 9 Claims



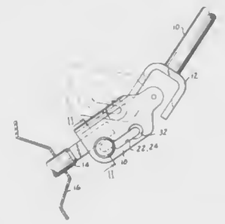
1. A mechanical acceleration sensor comprising:
a housing;
a weight rotatably supported by said housing;
an actuating arm rotatable about an axis parallel or coaxial to an axis of rotation of said weight and abutting against said weight when rotated toward said weight;
a toggle spring preloaded between said actuating arm and said housing for usually biasing said actuating arm in one direction such that said actuating arm abuts against said weight to prevent said weight from rotating and, when said weight is rotated to a predetermined position together with said actuating arm against a biasing force of said toggle spring, urging said actuating arm in a direction opposite to said one direction such that said actuating arm is released from said weight and rotated alone;
an actuating member mounted on said actuating arm; and
an output device positioned on a path along which said actuating member is movable and being operated by said actuating member when said actuating arm is rotated to a predetermined position away from said weight.

4,927,173
APPARATUS FOR PREVENTING TRUCK ROLL OVER IN THE EVENT OF FAILURE OF ITS SUSPENSION SYSTEM
Raymond E. Clifton, Jr., 9746 Rte. 99, P.O. Box 202, Ellicott City, Md. 21043
Continuation-in-part of Ser. No. 128,712, Dec. 4, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 234,605
Int. Cl.[5] B60R *21/02*; B60G *11/04*
U.S. Cl. 280—755 21 Claims



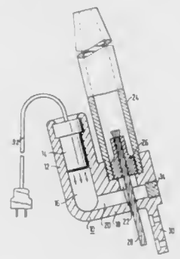
1. In a motor vehicle having a frame, a suspension supporting the frame, and tires, wheels, and axles within housings spaced from the frame by the suspension, apparatus comprising:
rigid means extending forward from the frame, rigidly connected with said frame and having a lower free terminal end, for engaging at least one vertical side of an axle housing for preventing the frame from translating away from the axles when the suspension fails during movement of the vehicle and when said vertical side of the axle housing contacts said downwardly extending rigid means.

4,927,174
STEERING COLUMN COUPLING
Bryan Jones, Chelmsford, England, assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 2, 1988, Ser. No. 278,907
Claims priority, application United Kingdom, Dec. 4, 1987, 8728414
Int. Cl.[5] B62D *1/18*
U.S. Cl. 280—777 10 Claims



1. A steering column coupling for attaching a steering driveshaft to a non-round stub shaft which is connected to a steering rack operating member and is adapted to be turned about a longitudinal axis to operate the steering rack, the coupling comprising a connection link pivoted to the lower end of the steering shaft, the link having a longitudinal recess with a cross-section complementary to that of the stub shaft, the recess being open at one side to receive the stub shaft, and the link including a bolt which can be tightened to clamp the shaft in the recess, the bolt being arranged so that it is captive on the link but can slide longitudinally along the link between a first position where it does not obstruct the side opening of the recess, and a second position in contact with the stub shaft where it can be tightened to clamp the stub shaft in the recess.

4,927,175
DRIVE DEVICE FOR RESTRAINING SYSTEMS IN MOTOR VEHICLES
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany
Filed Jun. 15, 1989, Ser. No. 366,780
Claims priority, application European Pat. Off., Sep. 29, 1988, 88116072.5
Int. Cl.[5] B60R *21/10*
U.S. Cl. 280—806 15 Claims



1. A drive device for restraining systems in motor vehicles comprising a working chamber and a pyrotechnical gas generator, which, when energized, produces gas with an operating temperature and acting on said working chamber, said working chamber comprising an outwardly leading relief and a closure element sealing said relief path and consisting of a material which at a temperature exceeding said operating temperature but not exceeding a self-igniting temperature of said gas generator softens at least to such an extent that said closure element on self-ignition of said gas generator frees said relief path but, at temperatures corresponding to said operating temperature, has a sufficient mechanical strength to ensure that said relief path remains sealed by said closure element under exposition to gas produced by said gas generator.

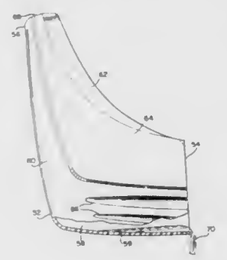
4,927,176
SKI-MOUNTABLE DEVICE FOR SCRAPING BOOTS
Allen B. King, and Thomas J. Perfetti, both of Vail, Colo., assignors to Exci-Tech Industries, Inc., Vail, Colo.
Filed Nov. 23, 1988, Ser. No. 275,403
Int. Cl.[5] A63L *11/18*
U.S. Cl. 280—813 1 Claim

1. A boot scraper for use on a snow ski, said scraper comprising:
an elongated, rectangularly shaped body;
means for removably mounting said elongated body on said snow ski so the integrity of the inner core of said snow ski is not harmed and said elongated body can be removed from said snow ski without harm to the finish of said snow ski; said mounting means comprising double-backed high tensile strength adhesive tape corresponding to said rectangular shape of said elongated body;
means formed in the upper surface of said elongated body for scraping debris from the sole of a boot; said scraping means comprising outer side surfaces formed on the opposing and longer edges of said elongated body, said formed outer edges extending upwardly and inwardly toward each other from the bottom surface of said elongated body, each of said formed outer edges terminating in narrow rectangular lip surfaces formed on the upper surface of said elongated body, said narrow rectangular lip surfaces being parallel to each other and to the bottom of said elongated body and functioning to remove said debris from said sole as said sole is scraped across both said narrow rectangular lip surfaces, each of said narrow rectangular lip surfaces being located a predetermined distance from said bottom surface of said elongated body;
means for directing said scraped debris from said sole, said directing means comprising a longitudinal channel having a circular shaped arc cross-section, the radius of said circular shaped arc being substantially less than said predetermined distance;



means to allow said elongated boy to substantially flex about the longitudinal axis of said snow ski at temperatures below zero degrees as said snow ski flexes so there is limited impairment of the performance of said snow ski, said flexing means comprising forming said body of a material having the properties of resilience and flexibility at temperatures below zero degrees; said flexing means further comprising forming said channel to extend substantially half of the thickness of said body and mounting said body so said channel extends along the central longitudinal axis of the rectangularly shaped portion of said snow ski; and
means formed on opposing ends of said elongated body for deflecting crossed ski tails; said deflecting means comprise forming said opposing ends of said elongated body in a low-profile shape with inwardly sloping corners and parallel scraping edges.

4,927,177
CUSTOM MOLDED VEHICLE SPLASH GUARD
Robert A. Price, Glencoe, Ill., assignor to G-P Manufacturing Co., Inc., Chicago, Ill.
Division of Ser. No. 259,868, Oct. 19, 1988, Pat. No. 4,877,268. This application Aug. 8, 1989, Ser. No. 391,119
Int. Cl.[5] B62D *25/16*
U.S. Cl. 280—851 7 Claims



1. A custom molded vehicle splash guard for attachment to

VOL 1114 ISS 4 MY 22 1990 UMI

a lower portion of a vehicle fender adjacent a corresponding wheel well so as to intercept debris thrown rearwardly by a corresponding vehicle tire to prevent the debris from impacting the fender portion comprising:

a display surface having an inner edge, an outer edge, an upper portion, a substantially planar portion and a lower edge;

a slightly concave mounting surface having an inner edge, an outer edge, an upper portion and a lower edge; and

a central portion extending between and connecting said mounting surface and said display surface along said outer and lower edges thereof, forming a U-shaped pocket open along said inner edges, with said display surface and said mounting surface being in generally parallel relation to each other;

wherein said display surface is configured to be trimmed to generally correspond with the outer profile of the vehicle fender portion, and said mounting surface is configured to be secured to a wall of the wheel well adjacent the fender portion, and, upon mounting, the inside edge of said display surface being in engagement with the fender portion.

4,927,178

INDEXED REFERENCE BOOK

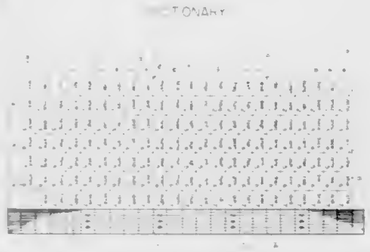
Eliezer Schechter, 21 Usisshkin St., Jerusalem, Israel

Filed Oct. 18, 1988, Ser. No. 259,058

Claims priority, application Israel, Nov. 1, 1987, 84325

Int. Cl.[5] **B42F** *21/00*; **G09B** *19/08, 3/06*

U.S. Cl. 283—38 **9 Claims**



1. An indexed reference book for rapidly locating words or material arranged in an alphabetical order in the pages of said book, said reference book comprising:

front cover means having an array of index zones arranged in rows and columns for bearing identifying indicia, each of said index zones bearing indicia corresponding to indicia appearing on different pages of said book, and the indicia in said index zones being arranged in alphabetical order from a beginning to an end of a first row and then continuing from a beginning to an end in a subsequent row while the pages bearing indicia corresponding to the indicia contained in two adjacent zones in a row are separated from each other by interposed pairs of facing pages, said pairs of pages corresponding in number to the number of rows in an index column minus one, said pages being arranged in an order dictated by the respective index zones rather than in a continuous alphabetical order, a fore-edge of the pages of said book being marked by tab means for identifying a location of indicia, said tab means being arranged along the fore-edge of the book in rows and columns, so that the tab means of a page bearing specific indicia corresponds in its horizontal positioning on the fore-edge of the book to the respective row and column of the index zone bearing said indicia and the number of tabs in each row corresponds to the number of zones in the same row.

4,927,179

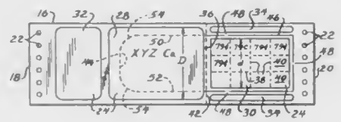
SHIPPING LABEL WITH PRICE TAG SECTION

Barbara A. Ehret, Seattle, and James H. Pearce, III, Rothell, both of Wash., assignors to Uarco Incorporated, Barrington, Ill.

Filed Dec. 27, 1988, Ser. No. 289,700

Int. Cl.[5] **B42D** *15/00*

U.S. Cl. 283—79 **10 Claims**



1. A pressure sensitive adhesive business form for use in shipping merchandise for subsequent sale comprising:

a first ply of release liner;

a second ply of label stock and having a pressure sensitive adhesive on one side thereof releasably adhered to said first ply;

said label stock ply having a shipping label section and a price tag section;

said price tag section comprising a plurality of individual and separable price tags, and having one dimension that is less than the corresponding dimension of said shipping label section and being closely adjacent said shipping label section and at least nominally centered with respect to one edge thereof that is parallel to the direction of said dimensions; and

a closed line of perforation in said release liner ply including generally parallel sections spaced apart a distance equal to or somewhat greater than said price tag section one dimension which extend in a frame-like pattern within at least two opposed sides of said shipping label section and about the periphery of three sides of said price tag section;

whereby said shipping label section and said price tag section may be printed upon simultaneously and thereafter, that part of said release liner defining said frame-like pattern removed to expose pressure sensitive adhesive on said two opposed sides of said shipping label section, said price tag section folded along said edge and under said shipping label section and said shipping label section adhered to a shipping container by said exposed pressure sensitive adhesive in superimposed relation to said price tag section.

4,927,180

MARKING OF ARTICLES WITH PHOTOCHROMIC COMPOUNDS

Clive Trundle, Silverstone, and Jack Brettle, Greens Norton, both of England, assignors to Plessey Overseas Limited, England

PCT No. PCT/GB87/00592, § 371 Date Jun. 6, 1988, § 102(e) Date Jun. 6, 1988, PCT Pub. No. WO88/01288, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 21, 1987, Ser. No. 187,690

Claims priority, application United Kingdom, Aug. 22, 1986, 8620430

Int. Cl.[5] **B42D** *15/00*

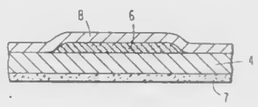
U.S. Cl. 283—70 **11 Claims**

1. A security device in the form of a label, document or card which incorporates a security mark or device which is partially or wholly invisible in light which does not contain a U.V. component, said device comprising:

(a) a flexible substrate having printed thereon a mark or device in a clear, dried, reversibly photochromic ink film, said ink in its liquid state comprising a solution of from 1 to 5% of a photochromic compound in a solvent/resin medium and said photochromic compound being selected from fulgides, fulgimides, benzopyrans and naphthopyrans and said dried ink film being from 10 to 60 microns thick, and

(b) a clear, superficial protective layer extending over said mark or device, which gives protection for the photochromic compound against degradation by atmospheric moisture and oxygen,

whereby said photochromic compound is converted to a colored form on exposure to U.V. light within about 60 seconds and reverts to a pale or substantially colourless form within about 2 minutes in the absence of U.V. light.



4,927,181

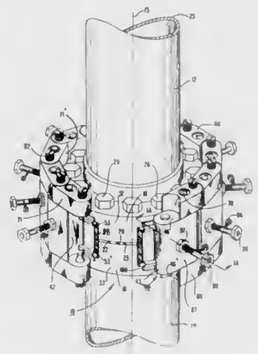
APPARATUS AND METHOD FOR SEALING LEAKS

Alfredo A. Ciotola, 1060 Revere Ave., Bronx, N.Y. 10465

Filed Jun. 22, 1989, Ser. No. 370,327

Int. Cl.[5] **F16L** *55/16*

U.S. Cl. 285—15 **33 Claims**



1. An apparatus for sealing leaks at a circumferential surface of an article, which apparatus comprises in combination:

a plurality of interlocking links constructed to form a circumferential collar on the circumferential surface surrounding the leak, the circumference of the collar can be varied by adding or removing links, each of said links having a sealing surface and constructed and arranged to exert radial pressure on the circumferential surface of the article; and

a sealing means disposed between the circumferential surface of the article and the links to seal the leak.

4,927,182

PIPELINE REPAIR CLAMP

Billy G. Moore, Montebello, Calif., assignor to Koppl Industrial Systems, Inc., Montebello, Calif.

Filed Jun. 4, 1987, Ser. No. 57,309

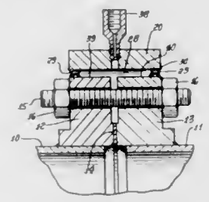
The portion of the term of this patent subsequent to Sep. 22, 2006, has been disclaimed.

Int. Cl.[5] **F16L** *55/16*

U.S. Cl. 285—15 **6 Claims**

1. In a clamp for repair of a leak at a flanged joint, said clamp comprising a plurality of arcuate clamp sections for assembly end to end to form a clamp ring positionable about the flanges of the joint, with each of said clamp sections having an inner surface with spaced edges,

the improvement comprising a seal tube of deformable metal fixed to each of said clamp sections at each of said edges, with each of said seal tubes having a folded wall with at least one ridge between troughs, with said ridge exposed adjacent the clamp section edge when in engagement with a flange, and deformable by pressure engagement between said clamp and flanges and deformable by peening on said ridge at a trough to obtain a cold-forged metallic joint between the clamp and the flange.



4,927,183

ADAPTING PIECE OF THERMOPLASTIC MATERIAL

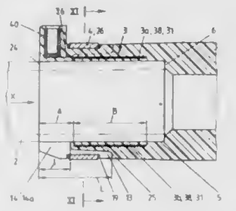
Hans-Werner Steinmetz, Schaffhausen, and Fritz Reich, Uhwiesen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 58,990, Jun. 8, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 317,075

Claims priority, application Switzerland, Jun. 25, 1986, 02562/86

Int. Cl.[5] **F16L** *21/08*

U.S. Cl. 285—21 **6 Claims**



1. An adapting piece of weldable thermoplastic material, comprising at least one welding sleeve portion with an electric heating device, the welding sleeve portion being adapted for weld-connecting the adapting piece to a tubular piece, the welding sleeve portion having an end face, a longitudinal axis and a circumference, the electric heating device comprising windings extending in longitudinal direction, the electric heating device in circumferential direction forming two winding portions which are connected in parallel, the windings having a middle in longitudinal direction, the welding sleeve portion defining a plurality of radial incisions extending in longitudinal direction, wherein, starting at the end face over a first part in longitudinal direction of the welding sleeve portion, the incisions are slots extending radially through the welding sleeve portion, each slot in the first part in longitudinal direction of the welding sleeve portion defining a gap at the radially inner end of the welding sleeve portion, the gap having surfaces which extend parallel to each other, the incisions extending longitudinally over a second part in longitudinal direction of the welding sleeve portion adjacent the first part to at least the middle of the windings, the windings of the electric heating

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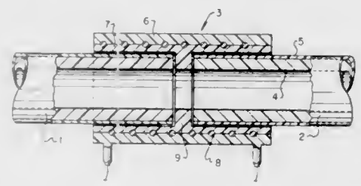
device being formed by a bare resistance wire embedded in the thermoplastic material of the adapting piece by injection molding the thermoplastic material around the windings when the adapting piece is manufactured, a clamping element mounted on the circumference of the welding sleeve portion, the clamping element being radially compressible after the tubular piece has been inserted and the welding sleeve portion has been aligned, whereby the tubular piece is clampable in an aligned position by clamping prior to welding, and whereby a substantially closed connection between the tubular piece and the welding sleeve portion is effected for building up a welding pressure required for the welded connection.

4,927,184

PIPES BASE ON POLYOLEFIN RESIN FOR MANUFACTURING PIPELINES AND COUPLINGS FOR ASSEMBLING THEM

Pierre Bourjot, Maden, and Marie-Anne Garnaud, la Garenne Colombe, both of France, assignors to Atochem, Paris la Defense, France

Filed Feb. 19, 1988, Ser. No. 157,888
Claims priority, application France, Nov. 7, 1986, 8615537
Int. Cl.[5] F16L *13/02*
U.S. Cl. 285—21 **9 Claims**



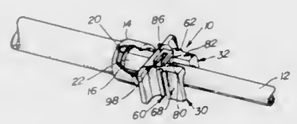
1. Pipes for manufacturing pipelines of great length by end-to-end assembly, comprising a wall having at least one layer of core material consisting essentially of a crosslinked polyolefin resin and at least one layer of surface material consisting essentially of a thermoplastic resin, said core material being crosslinked to a rate higher than 30%.

4,927,185

RELEASE TOOL FOR FLUID QUICK CONNECTORS

James McNaughton, Rochester, Mich., assignor to Huron Products Corporation, Mt. Clemens, Mich.

Filed Mar. 7, 1989, Ser. No. 319,960
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—39 **12 Claims**



1. A connector release tool for releasing a male fitting conduit from a female fitting connector coupled together by a retaining mechanism comprising:

means adapted for positioning about a peripheral surface of a male fitting conduit or the like, said positioning means comprised of a pair of integral members movable with respect to one another for positioning peripherally about the male fitting conduit or the like, said integral member having a smooth arcuate interior surface corresponding to an exterior surface of the male fitting, and a convex exterior surface such that when said pair of integral members are coupled together opposing one another they form a cylindrical annular portion and define a central axis, said integral members each also including a planar exterior surface portion substantially continuous with said convex exterior surface portion such that said planar exterior surface portions are on opposing sides of said central axis when said integral members are coupled together;

means for locking said members together when positioned peripherally about the male fitting conduit or the like, said locking means unitarily formed with said members;

said cylindrical annular portion adapted for opening retaining mechanisms retaining the male fitting conduit in a female fitting connector by inserting into the female fitting and spreading the retaining mechanisms; and

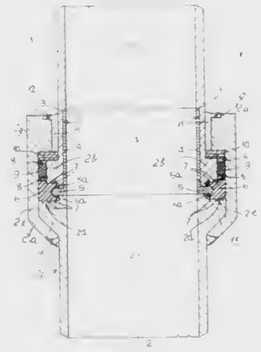
means for enabling gripping of the tool for enabling insertion of the tool into the female fitting for manual release of the male fitting conduit from the female fitting connector, said gripping means unitarily formed with said planar exterior surfaces.

4,927,186

DIELECTRIC JOINT, PARTICULARLY FOR METALLIC CONDUITS FOR LIQUIDS AND/GASES

Walter Zoboli, Via Prampolini 30, Formigine (Province of Modena), Italy

Continuation-in-part of Ser. No. 39,134, Apr. 16, 1987. This application Jun. 13, 1988, Ser. No. 205,693
Claims priority, application Italy, Apr. 18, 1986, 28969/86[U]
Int. Cl.[5] F16L *11/12*
U.S. Cl. 285—54 **8 Claims**



1. A dielectric joint, in particular for metal conduits for liquids and gases, comprising:

a first conduit length having a first outwardly protruding enlarged head, said first conduit length having a first inner surface and defining an inner annular recess extending at least at said first enlarged head, and said first enlarged head defining an outer diameter,

a second conduit length having a second outwardly protruding enlarged head facing towards said first enlarged head, said second conduit length having a further inner surface aligned to said first inner surface of said first conduit length,

a ring element surrounding said first and second enlarged heads, said ring element having an enlarged end portion surrounding said first conduit length at a portion of said first conduit length arranged near said enlarged head, said enlarged end portion of said ring element defining an annular interspace with said first conduit length and having an inner diameter which is smaller than said outer diameter of said first enlarged head of said first conduit portion, said ring element further having a second end portion countershaped to and in contact with said second enlarged head and welded to said second conduit length,

a cylindrical element of highly electrical insulating material, said cylindrical element extending in said inner annular recess of said first conduit length and having a cylindrical inner surface extending flush with said inner surfaces of said first and second conduit lengths, said cylindrical element having a radial projection outwardly protruding and partially extending between said first and said second enlarged heads,

an annular gasket extending among and in contact with said first and second enlarged heads, said radial projection and said ring element, said annular gasket having first engagement means cooperating with said first and second enlarged heads and said radial projection for position blocking,

electric insulation elements and stiffening elements interposed between said ring element and said first conduit length and filling said annular interspace, said electric insulation and stiffening elements defining further engagement means engaging with said enlarged end portion of said ring element,

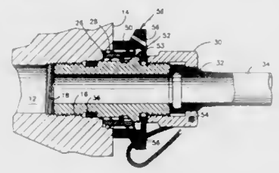
wherein said first engagement means of said annular gasket comprises tooth formations protruding from said annular gasket towards said first and second enlarged heads and engaging with corresponding recess formations defined in said first and second enlarged heads, an inner circumferential hole partially accommodating said radial projection, and annular cavities formed in said hole and accommodating corresponding collar elements formed on said annular projection.

4,927,187

FITTING WITH LOCK WIRE FEATURE

David L. Sanford, Stuart, and Gary W. Douglass, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 26, 1989, Ser. No. 427,385
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—80 **3 Claims**



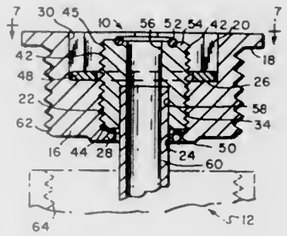
1. A safety wire retention device for a fitting to adapt a fluid connecting tube having an opening to a casing, said fitting including a ferrule attached to one end of said tube, an elongated tubular adapter having a central opening communicating with the opening in said tube, said tubular adapter being threaded at each end and one end threaded to a threaded tube nut for securing said ferrule to said tubular adapter and the other threaded end threadably attaching said adapter to said casing, said tubular adapter including an enlarged diameter portion spaced from one of said threaded ends and together with said threaded tube nut defining an annular space, a lock ring having internal splines and external splines, said tubular adapter having a splined portion on the outer diameter thereof being in splined engagement with said internal splines of said lock ring, said casing being in splined relation with said external splines, said external splines extending beyond said casing, said safety wire retention device comprising a collar surrounding said tubular adapter and having splines formed on the inner diameter of said collar engaging said external splines of said lock ring and an inner flange portion extending radially inwardly on said collar being trapped in said space provided by said enlarged diameter portion and one of said threaded ends, the end of said tube nut and an outer flange portion extending radially outwardly on said collar having a drilled hole adapted to receive the safety wire extending from a hole formed in said tube nut.

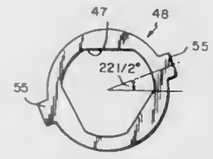
4,927,188

FITTING FOR CONNECTING A DRUM TO A PIPELINE

Philip W. Sands, Coventry, England, assignor to Shipley Company, Inc., Newton, Mass.

Filed Nov. 30, 1988, Ser. No. 278,018
Int. Cl.[5] F16L *41/08*
U.S. Cl. 285—89 **13 Claims**





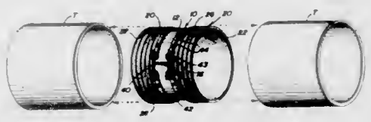
1. A coupling for connecting a drum to a pipeline, comprising a bung threaded into an end of the drum, said bung containing a through opening comprising concentric outer and inner openings, said outer opening being of a larger diameter than the inner opening, said inner opening being threaded, an externally threaded sleeve having inner and outer threaded ends containing a through passage, threaded at one end into the threaded inner opening in the bung with its inner end engaged with the inner threaded end of the inner opening of said bung and a draw tube fixed at one end to the inner end of the sleeve within the through passage of the sleeve and extending therefrom into the drum, said sleeve being contained entirely within said through opening of said bung and means for connecting the pipeline to the sleeve.

4,927,189

INTERNAL EXPANSION COUPLING DEVICE

John W. Burkit, 1506 Lincoln St., Bethlehem, Pa. 18017

Filed Apr. 10, 1989, Ser. No. 335,567
Int. Cl.[5] F16L *21/02*
U.S. Cl. 285—109 **10 Claims**



1. An internal expansion coupling device for joining a pair of tubular members comprising:

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(a) an elongated open ended tubular joint member formed from a single, relatively rigid, rectangular sheet-like member, said member being defined by a pair of opposing sheet ends and a pair of opposing sheet sides, where the sheet ends overlap such that the end portions thereof lie contiguous with each other;

(b) a continous circumferential gasket sealing sleeve formed of an elastomeric material and overlapping each said sheet side about each open end of said tubular joint member, where said gasket sealing sleeve, about the circumference thereof, is provided with at least a pair of continuous upstanding ribs, each of which is adapted to lie adjacent to and be compressed against the inside wall of a tubular member; and

(c) means accessible externally thereof for expanding said sheet-like member whereby said sheet ends move circumferentially towards one another and said extending sheet-like member uniformly urges said elastomeric gasket sealing sleeve and said ribs against the inside walls of said tubular member thereabout.

4,927,190

HOSE FITTING

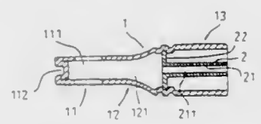
Masayuki Nishikawa, Inazawa; Takeshi Miyazaki, Nagoya; Terumitsu Shigeki, Nagoya; Satoshi Mitzutani, Kuwana, and Toru Isono, Kagamihara, all of Japan, assignors to Toyoda Gosei Co., Ltd, Nishikasugai, Japan

Filed Apr. 12, 1989, Ser. No. 336,814

Claims priority, application Japan, Mar. 30, 1987, 62-47581; Mar. 31, 1987, 62-78853; Mar. 31, 1987, 62-78854

Int. Cl.[5] F16L *55/00*

U.S. Cl. 285—175 12 Claims



1. A hose fitting comprising:

a hose fitting body including: a head portion having at least two flattened surfaces disposed parallel to each other and a fluid delivery through hole formed in the center of said flattened surfaces; a base portion continuing from said head portion and having a hollow truncated cone shape; and a cylindrical sleeve portion continuing from said base portion,

wherein said hose fitting body is integrally formed from a test tube-shaped workpiece, said flattened surfaces of said head portion being formed by pressing said test tube-shaped workpiece from opposite sides of its closed end in a manner parallel to each other while leaving space inside thereof, said base portion being formed of the intermediate portion of said test tube-shaped workpiece, and said sleeve portion being formed from the open end of said test tube-spaced workpiece, and

a nipple integrally fixed on the inner circumferential surface of said sleeve portion and having a fluid delivery hole therethrough.

4,927,191

ADJUSTABLE TUBULAR WALL STRUCTURE FOR CONNECTORS AND THE LIKE

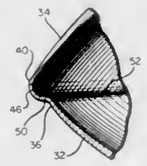
Erwin F. Mikol, Park Ridge, Ill., assignor to Twenthieth Century Companies, Inc., Wheeling, Ill.

Continuation-in-part of Ser. No. 487,865, Apr. 22, 1983, Pat. No. 4,846,510. This application Feb. 2, 1987, Ser. No. 9,671

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] F16L *27/00*

U.S. Cl. 285—226 6 Claims



1. A tapered tubular wall structure for tubular conduits and the like, said wall structure comprising:

a tapered tubular body of pleated accordion fold configuration formed from a semi-rigid resiliently flexible material of substantially uniform gauge to define an encompassing wall of tapered tubular configuration that has a longitudinal central axis extending centrally and longitudinally of same;

said wall being formed to define along said central axis alternating thrust cone wall segments and Belleville washer-like wall segments of gradually diminishing inside and outside diameter integrally connected consecutively along the length of said pleated section;

said thrust cone wall segments defining a wide end portion at one end and a narrow end portion at the other end, said wall segments being spherically contoured;

said Belleville washer-like wall segments defining a wide end portion at one end and a narrow end portion at the other end, said wall segments being spherically contoured;

with each of said pleats each comprising a thrust cone wall segment and a Belleville washer-like wall segment integrally connected at their respective narrow end portions to define annular articulations therebetween and form the roots of the pleats;

with the wide end portion of each Belleville washer-like wall segment of each pleat being integral with the wide end portion of the thrust cone wall segment of the next consecutive pleat to form the crowns of the pleats;

said crowns of said pleats each respectively lying in a plane that extends normally of said axis and defining a radially outwardly distensible annular articulation between the Belleville washer-like wall segment and the thrust cone wall segment, said wide ends integrally connected thereat in circumambient relation thereabout for resiliently resisting distension of said crown radially outwardly thereof in the plane of the crown;

said Belleville washer-like wall segment of each pleat being proportioned to be wholly snap shifted through the said plane at the articulation between same and the thrust cone wall segment of the next adjacent pleat for disposing said pleats in contracted, nested relation and extended relation axially of said body;

with the respective pleats in their extended relations each having the said thrust cone wall segment thereof disposed relative to said Belleville washer-like wall segment thereof such that said other end of said thrust cone segment is disposed substantially 90° of said other end of said Belleville washer-like wall segment thereof annularly about said root of the respective pleats;

said proportioning of said Belleville washer-like wall segment at the respective pleats accommodating snap shifting of one side only of said other end of same through said plane thereof at the said articulation thereof within and in stabilized seating relation against the thrust cone wall segment of the said next adjacent pleat, for disposing said thrust cone wall segment thereof in angled relation to such next adjacent pleat thrust cone wall segment; and

whereby said tubular body is stable in and may be preset, prior to use, in its said extended relation, contracted, nested relation and angled relation.

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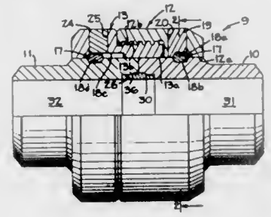
PIPE CONNECTOR LOAD ELEMENT

Tep Ungchusri, The Woodlands, and George D. Lemons, Stephenville, both of Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Jun. 29, 1989, Ser. No. 372,807

Int. Cl.[5] F16L *19/02*

U.S. Cl. 285—305 4 Claims



1. A pipe connector load element for use in a pipe connector device having first and second pipe elements for connection in an end-to-end relationship, said first pipe element having a groove extending about the outer circumference of said first pipe element, a first retention member having an internal bore for receiving said first pipe element with said first retention member having a groove adjacent to said internal bore, means for selectively connecting said first retention member to said second pipe element, said load element being mounted in said pipe element groove and in said retention member groove to secure said pipe element to said retention member, said load element comprising:

a plurality of elongated components with each of said components being segments of a hollow cylinder with an inner surface of each of said components having a radius which mates with a groove in an outer circumference of a first pipe element, each of said components having a slot extending along a length of said component, said slot forming a "T" having a stem extending perpendicular from said inner surface and having a cross-bar at a top of said "T", said cross-bar extending parallel to said inner surface of each of said components; and

a flexible ribbon extending through said cross-bar portion of said slot in each of said components to thread said components to said ribbon in an end-to-end arrangement.

4,927,193

MOUNTING CASSETTE FOR PUSH-BAR EXIT DEVICES

Theodore H. Miller, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

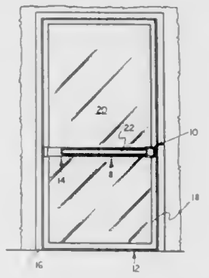
Filed May 30, 1986, Ser. No. 868,851

Int. Cl.[5] F05C *3/12*

U.S. Cl. 292—92 6 Claims

1. A mounting cassette for an exit device mounted on a first side of a narrow stile door and having a cylinder lock mounted on the other side of said door, said exit device, and said cylinder lock being selectively operable to control movement of a latch bolt of a latch bolt assemble, said exit device having a first actuator connected to said latch bolt and said cylinder lock having a second actuator connected to the latch bolt, the longitudinal axis of said second actuator extending through the narrow stile and the longitudinal axis of said first actuator being inwardly offset along the horizontal axis of the door relative to the longitudinal axis of said second actuator, said mounting cassette including

first motion transmitting means mounted for rotation in said cassette and including coupling means for receiving said



second actuator for rotation of said motion transmitting means thereby;

second motion transmitting means rotatably coupled with said first motion transmitting means for receiving said first actuator, with the longitudinal axis of said second motion transmitting means being inwardly offset along the horizontal axis of the door relative to the longitudinal axis of said first motion transmitting means.

4,927,194

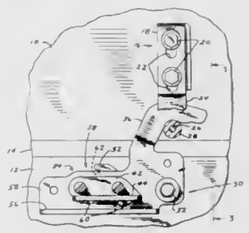
INTERLOCK LATCH ASSEMBLY FOR RELEASABLY SECURING COWL SECTIONS OF AN OUTBOARD MOTOR

James L. Wagner, Neenah, Wis., assignor to Notron Engineering AG, Zollbruck, Switzerland

Filed Jul. 14, 1988, Ser. No. 219,086

Int. Cl.[5] F05C *19/10*

U.S. Cl. 292—128 5 Claims



1. For an outboard motor or the like having a power head enclosed by first and second cowl sections, a latch assembly for releasably securing said first and second cowl sections together, comprising:

catch means connected to one of said cowl sections;

latch means movably connected to the other of said cowl sections, said latch means comprising a latch member having a hook portion and a handle portion disposed on opposite ends thereof, said latch means being movable between an engaging position in which the hook portion of said latch means engages said catch means for securing said cowl sections together, and a disengaging position in

VOL
1114
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which said latch means and said catch means are disengaged; and

interlock means mounted to the same cowl section to which said latch means is connected for preventing movement of said latch means to its disengaging position when said latch means is in its engaging position, said interlock means comprising:

a stationary interlock member mounted to and projecting outwardly from said cowl section;

a movable interlock member mounted to said latch member, said movable interlock member being movable between a locking position, in which movement of said latch member to its release position is prevented due to engagement of said movable interlock member with said stationary interlock member, and a release position for allowing movement of said latch member to its disengaging position; and

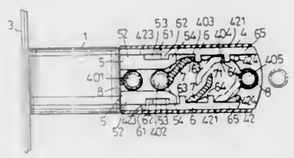
bias means for biasing said movable interlock member toward its locking position.

4,927,195

DUAL BACKSET DEADBOLT ASSEMBLY

Rong-Faa Wu, and Shoei-Jyi Wu, both of Chiayi Hsien, Taiwan, assignors to Posse Lock Manufacturing Co., Ltd., Chiayi, Taiwan

Filed Nov. 8, 1988, Ser. No. 268,435
Int. Cl.[5] E05C *1/16*
U.S. Cl. 292—169.14 **8 Claims**



1. A dual backseat deadbolt assembly to be used in association with a lock having a rotatable cylinder which has two axially extending crank members for actuating said deadbolt assembly to move in either one of two opposite directions, wherein said deadbolt assembly comprises:

a deadbolt housing;

a deadbolt mounted in said deadbolt housing for moving to a locking position or an unlocking position upon rotation of said lock;

an extension housing having two parallel side plates which have front ends connected to said deadbolt housing, each one of said side plates having a plurality of crank holes, said plurality of crank holes of one side plate being respectively aligned with said plurality of crank holes of the other side plate to form through-holes, each one of said through-holes establishing a different selectable backset distance of said deadbolt and being capable of receiving said crank members so that said crank members can be turned about a horizontal axis at one of said backset distances;

a transmission plate means slideably provided between said side plates, said transmission plate means having a front engaging member and a rear forked portion, said front engaging member extending into said deadbolt housing and engaging with said deadbolt;

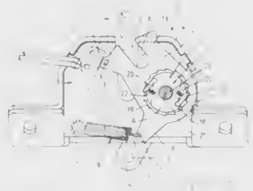
two independently movable axial strip members slideably provided between said side plates, one of said axial strip members being above said through-holes and the other said axial strip member being below said through-holes, each one of said axial strip members being connected to said rear forked portion of said transmission plate means and having a plurality of teeth extending into said through-holes, each one of said plurality of teeth being capable of engaging with one of said crank members when said lock is rotated, wherein rotation of said lock causes one of said crank members to cooperatively engage a tooth on one of said axial strip members, said axial strip members being selectable for cooperation with one of said crank members depending on which direction said lock is rotated.

4,927,196

POWER-ASSISTED ROTARY BOLT LOCK

Joël Girard, Abbeville, and Christian Wattebled, Sailly-Flibeaucourt, both of France, assignors to Vachette, Paris, France

Filed Oct. 18, 1988, Ser. No. 259,584
Claims priority, application France, Oct. 21, 1987, 87 14529; May 24, 1988, 88 06852
Int. Cl.[5] E05C *3/06*
U.S. Cl. 292—201 **19 Claims**



1. A lock device of the type used with an automobile door, lid or trunk or the like, comprising a rotary bolt means for cooperation with a keeper, motor assist means for assisting rotation of said bolt means at least during locking movement of the locking device, manual control means for operating said bolt means, said manual control means being operable in the event of failure of said motor assist means, transmission means operatively connected to said motor assist means for imparting rotation to said bolt means in a locking direction, said manual control means including an anti-locking device for preventing operation of said transmission means to thereby disengage said bolt means from said motor assist means in the event of failure of said motor assist means, said transmission means comprising a free wheel rotatably mounted adjacent said bolt means concentrically therewith and having means for rotatably driving said bolt means.

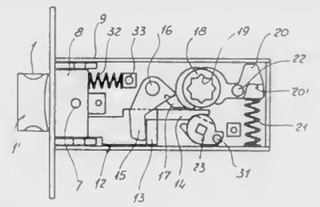
4,927,197

SPRING-LATCH DOOR LOCK PROVIDED WITH AN IMPROVED LOCKING SYSTEM AND ADAPTED TO BE USED FOR INWARDLY AND OUTWARDLY OPENED DOORS

Piero Predelli, via Imbonati, 17, 20129 Milano, Italy

Filed Sep. 19, 1988, Ser. No. 246,352
Claims priority, application Italy, Jul. 22, 1988, 21463 A/88
Int. Cl.[5] E05C *1/16*
U.S. Cl. 292—245 **6 Claims**

1. A spring-latch door lock provided with an improved locking system to be used both for inwardly and outwardly opened doors, comprising a spring-latch member rotatably coupled to a sliding block for assuming two fixed positions with respect to said sliding block, said sliding block being controlled by a rotary restraining member provided for restraining a lug extending from an inner face of said sliding block and driven by a lever arm operated by a handle, wherein said spring-latch member is mounted on a cylindrical rod rotatably coupled to said sliding block and having a radial blind hole provided with at least a circumferential slot engaged



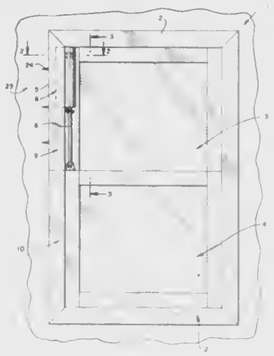
by a resilient ring member, in said radial blind hole being engaged a spring biassing a restraining pin.

4,927,198

LOCKING DEVICE FOR WINDOWS/SLIDING DOORS

Cheryl A. Fennell, 14 Barberry Ct., Largo, Md. 20772, and Kathy L. Fennell, 6504 W. Forest Rd., #201, Landover, Md. 20785

Filed Jan. 3, 1989, Ser. No. 293,061
Int. Cl.[5] E05C *17/30*
U.S. Cl. 292—306 **7 Claims**



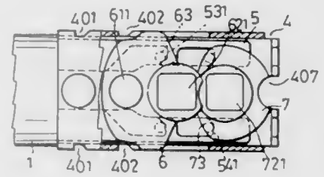
1. A locking device for windows in overlapping relationship including a vertically moveable lower window and a vertically moveable upper window that comprises an upper window frame and a lower window frame, a vertically upstanding pneumatic cylinder having an upper end and a lower end and a piston rod member at said lower end moveable with respect thereto, means pivotally securing said piston rod at its lower end to the upper end of said lower window, a first lower vertical channel frame adjacent and aligned with one side of the lower window and a second upper vertical channel frame having grooves and aligned and coextensive with said lower channel frame and adjacent said one side of the upper window, said pneumatic cylinder having laterally positioned legs forming a U-shaped member that extends longitudinally there along, the legs being adapted to be received in said grooves of said upper channel frame and secured thereto to said upper channel frame and said locking device constituting an integrated unit, a washer mounted on said rod and having a flange facing a lower end of said cylinder and means for moving said washer along said rod so as to adjustably limit movement of said piston rod with respect to said cylinder, thereby controlling movement of said lower window.

4,927,199

LATCH ASSEMBLY FOR CYLINDER LOCK

Rong-Faa Wu, and Shoei-Jyi Wu, both of No. 82, Lane 17, Ho-Mo Tsun, Chung-Pu Hsiang, Chiayi Hsien, Taiwan

Filed Sep. 23, 1988, Ser. No. 249,359
Int. Cl.[5] E05B *9/02*
U.S. Cl. 292—337 **3 Claims**



1. A dual backset latch assembly to be associated with a lock having a latch operating spindle, said latch assembly having a latch housing and an extension housing, said extension housing having two parallel side walls at least one of which has a cam guide slot means, a latch bolt provided in said latch housing for moving to a locking position or an unlocking position upon rotation of said spindle and a transmission mechanism for transmitting the movement of said latch operating spindle to said latch bolt when said lock is operated, said transmission mechanism including a first and a second cam member for rotation about two parallelly offset transverse axes which are selectable for the axis of rotation of said spindle, said first cam member having a first disc, and a substantially circular first journal boss axially projecting from said first disc, said second cam member having a second disc and a substantially circular second journal boss axially projecting from said second disc, said first and second journal bosses being inserted rotatably in said cam guide slot means and having a spindle slot for receiving said spindle, and a transmission plate to transmit the movement of said first or second cam member to said latch bolt, said latch assembly having improvements wherein both said first and second cam members are mounted on one of said parallel side walls through said cam guide slot means, the total axial length of said first cam member being greater than that of said second cam member, said first cam member being concaved radially inward to form a recess adjacent to said second cam member, said recess having an axial length smaller than said total axial length of said first cam member but greater than that of said second cam member, thereby permitting said second cam member to overlap said first cam member, said transmission plate being placed adjacent to said first and second cam members, and having a front engaging end to engage with said latch bolt, and a rear portion which has a longitudinally extending opening dividing said rear portion into two parallel strip members, said opening being aligned with said cam guide slot means, said strip members having inner sides opposite to one another, each of said strip members having a first and a second indentation adjacent to said inner sides, said first disc having two camming pins respectively extending into said first indentation of said strip members, said second disc having two camming pins extending into said second indentation of said strip members.

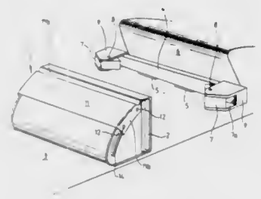
VOL 1114 ISS 4 MY 22 1990 UMI

4,927,200

STORAGE CONTAINER AND FASTENER ASSEMBLY FOR CARS

John D. Wilkins, 75 Kenley Road, Kingston upon Thames, England (KT1 3RR)

PCT No. PCT/GB87/00543, § 371 Date Jan. 30, 1989, § 102(e) Date Jan. 30, 1989, PCT Pub. No. WO88/00895, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 30, 1987, Ser. No. 305,726
Int. Cl.[5] B60R 7/04
U.S. Cl. 296—37.8 14 Claims



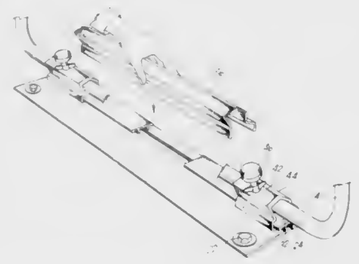
1. A storage container and a fastener assembly for detachably fixing the container to a vehicle seat, the fastener assembly being attachable to, or integral with, the vehicle seat, the container having at least a base wall, a rear wall and a pair of side walls, the base wall being adapted to engage with the floor of the vehicle in front of said seat, and the rear wall being adapted to lie adjacent to the front of said seat, wherein the fastener assembly is provided with a pair of spring-biassed clips engageable with grooves in the side walls of the container for detachably holding the container.

4,927,201

MEANS FOR RELEASABLY ANCHORING VEHICLE SEATS

Andrew Froutzis, P.O. Box 4110, Elkhart, Ind. 46514

Filed Dec. 27, 1988, Ser. No. 291,444
Int. Cl.[5] B60N 1/00
U.S. Cl. 296—63 3 Claims



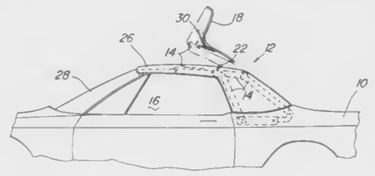
3. A device for anchoring a seat to the floor of a vehicle, said seat having a pair of spaced lower horizontal supports, said device comprising a pair of generally flat base members including a raised generally T-shaped portion each having at least one substantially vertical leg and a substantially flat upper surface overlying said leg and formed in one piece therewith and to underlie and support one of said supports, a pair of anchors removably carried by the opposite ends of each base member, each anchor including an integral channel part to accommodate each support, complementary interengaging parts carried by each base member and anchor, and a fastener threaded in each anchor to engage said seat support and to shift said anchor into interlocking engagement with said base at said interengaging parts.

4,927,202

CONVERTIBLE TOP VINYL PUSH-OUT

Joseph M. Wagner, Manitou Beach, Mich., assignor to C & C Incorporated, Brighton, Mich.

Filed Sep. 12, 1988, Ser. No. 243,941
Int. Cl.[5] B60J 7/06
U.S. Cl. 296—107 15 Claims



1. An attachment to a retractable convertible top for a vehicle, the convertible top including a retractable support structure and a covering material attached to the support structure, said attachment comprising:

a main body having first and second ends, said first end fixedly attached to the support structure of the top and said second end slidably engaging the support structure of the top for movement therealong during retraction and extension of the top, said body engaging the covering material of the top during retraction preventing the covering material from becoming caught between components of the support structure.

4,927,203

BOOT SEALING AND ATTACHMENT MEANS FOR AUTOMOTIVE DOOR LOCK ACTUATORS AND THE LIKE

Ronald F. Mayer, Northville, and Robert Thrasher, Jr., Taylor, both of Mich., assignors to United Technologies Electro Systems, Inc., Columbus, Miss.

Filed Feb. 17, 1989, Ser. No. 312,087
Int. Cl.[5] E05B 47/00
U.S. Cl. 292—201 14 Claims



1. In a vehicular electric door locking apparatus, including

a door locking mechanism movable between locked and unlocked positions,

reversible, manually operated drive means connected to the locking mechanism for moving it between the locked and unlocked positions,

non-yielding manual means connected to the locking mechanism for moving it between the locked and unlocked positions,

electrically powered operated drive means,

a flexible boot covering over at least in part the electrically powered operated drive means to protect it from the environment, and

an axially moveable actuator rod connected to the locking mechanism for actuating it when driven by the electrically powered operated drive means and connected to one end of the boot, the improvement which comprises:

two, radially spaced, annular grooves located around the exterior surface of said rod;

the distal end portion of said boot including on its interior surface two, longitudinally spaced beads spaced at a distance less than the distance separating said two annular grooves; and

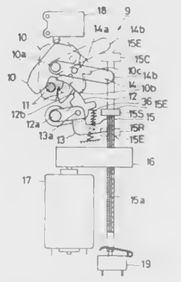
two boot retainer clips, a first one located within the interior chamber defined by said boot and a first one of said annular grooves, the second boot retainer clip being located outside of but adjacent to said boot adjacent to said second one of said beads and positioned in the second one of said annular grooves; said boot and said rod being attached together with said distal end portion of said boot being substantially affixed to said rod with respect to their relative axially positions but allowing said rod to be rotated within said distal end portion, with the beads bearing inwardly against and sliding around the exterior surface of said rod, without significantly distorting said boot.

4,927,204

DOOR OPENING/CLOSING DEVICE

Tohru Asada, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 24, 1988, Ser. No. 211,501
Claims priority, application Japan, Jun. 27, 1987, 62-160215
Int. Cl.[5] E05C 3/26
U.S. Cl. 292—216 6 Claims



1. A device for latching and unlatching a door, comprising:

a striker;

a latching member rotatably mounted to the door, the latching member being rotatable to a first latch position in engagement with the striker and rotatable to a second latch position out of engagement with the striker;

a pawl rotatably mounted to the door, the pawl being rotatable between a regulatory position for holding the latching member in the first latch position and a releasing position for permitting movement of the latching member to the second latch position;

urging means for biasing the pawl to the regulatory position;

operating means operative when driven to a first operating position to rotate the latching means to the first latch position and operative when driven to a second operating position to rotate the latching means to the second latch position;

first detecting means for detecting the closing of the door;

second detecting means for detecting circumstances preparatory to opening of the door; and

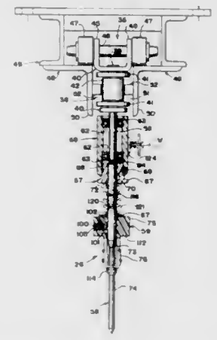
controlling means responsive to the detection of the closing of the door by the first detecting means for driving the operating means to the first operating position, and responsive to the detection of circumstances preparatory to opening the door by the second detecting means for driving the operating means to the second operating position.

4,927,205

ROTATIONAL CONTAINER HOLDING DEVICE AND METHOD

Peter T. Bowler, Amherst Township, Lorain County, and Thomas J. Zeeff, Cleveland, both of Ohio, assignors to Feco Engineered Systems, Inc., Cleveland, Ohio

Continuation of Ser. No. 069,704, Jul. 2, 1987, abandoned. This application Jul. 6, 1989, Ser. No. 376,958
Int. Cl.[5] B65G 47/90; B66C 1/54
U.S. Cl. 294—94 34 Claims



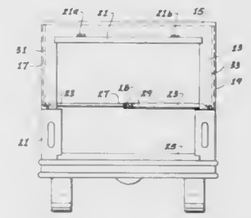
1. A device for gripping and holding different sized open-ended containers, said device being adapted to engage said different sized containers at an interior surface thereof, said device further comprising a plurality of jaws arranged around an axis of said device for radial expansion and contraction, control means movable axially with respect to said jaws for controlling radial expansion and contraction of said jaws, and resilient friction means supported by said jaws and urgeable radially outwardly by said jaws for resiliently applying gripping force and friction holding force to the interior surface of a container telescoped over said jaws, said resilient means including at least one annular resilient member circumscribing said jaws, and said member being replaceable with different size resilient means for applying said gripping and friction forces to different sized open-ended containers.

4,927,206

PICKUP TRUCK CAP

Clifford R. Murdock, 2392 Printup Rd., Sanborn, N.Y. 14132

Continuation-in-part of Ser. No. 206,433, Aug. 22, 1988, abandoned. This application Jan. 19, 1989, Ser. No. 367,610
Int. Cl.[5] B62D 25/00
U.S. Cl. 296—156 5 Claims



1. An improved shell-type pickup truck cap having a means for preventing damage to the cap when it is being installed or removed from the bed of a pickup truck, or when said cap is being transported to or from storage, said cap comprising:

a. a substantially planar top, opposite, spacedly arranged longitudinal sidewalls and a rear wall of a substantially inverted U-shaped configuration; and

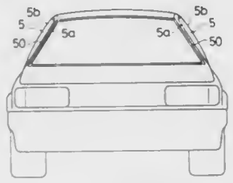
b. a rigid, elongated support bar spanning the distance between said sidewalls, said bar detachably secured to the bottom rear portions of said cap to substantially prevent lateral movement of the cap sidewalls when said bar is secured in place between said sidewalls thereby preventing damage to the upper rear portions of the cap while said cap is being installed on, removed from, or being transported to or from storage.

4,927,207

GLASS CONSTRUCTION FOR AN AUTOMOBILE

Koji Kishino, Hiroshima, Japan, assignor to Mazada Motor Corporation, Hiroshima, Japan

Filed Jan. 25, 1989, Ser. No. 303,746
Claims priority, application Japan, Jan. 25, 1988, 63-015531
Int. Cl.[5] B62D *35/00*
U.S. Cl. 296—185 25 Claims



1. In an automobile having a windowpane, the automobile defining a central vertical plane extending longitudinally and vertically through the automobile from a front center portion to a rear center portion of the automobile, and further defining a horizontal plane extending horizontally relative to the automobile along a bottom portion of the automobile, the improvement comprising:

said windowpane having an inner and an outer surface and a front edge and a rear edge, said inner and said outer surface each having a curvature corresponding to a portion of a surface of one of a cylindrical body and a conical body, and,

said windowpane being mounted in the automobile such that one of said front edge and said rear edge is positioned closer to the central vertical plane of the automobile relative to the other of said front edge and said rear edge, and such that a central axis of curvature defined by said curvature of said windowpane mounted in the automobile is slanted relative to the horizontal plane of the automobile.

4,927,208

SUN ROOF FOR VEHICLES

Rolf Farmont, Hurtienstienstrasse 17, 4000 Düsseldorf 30, Fed. Rep. of Germany

PCT No. PCT/EP88/00299, § 371 Date Feb. 22, 1989, § 102(e) Date Feb. 22, 1989, PCT Pub. No. WO88/08375, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 10, 1988, Ser. No. 299,360
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 8706217[U]
Int. Cl.[5] B60J *7/04*
U.S. Cl. 296—216 12 Claims

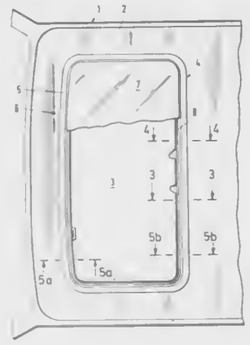
1. A sun roof to be installed in a roof opening (3) of a vehicle (1), in which a rigid lining (solid canopy 10) is located beneath the roofing (2) for receiving the sun roof (6), and comprising at least:

(a) a cover (7) which can be opened and closed and which is substantially aligned with the roofing; and

(b) a frame (4) consisting of several parts which can be clamped directly against the roofing (2) and including:

(b1) a one-piece outer frame part (5) circumscribing the roof opening (3) and which can be mounted on the roofing (2) from above, and

(b2) a one-piece inner frame part (9) circumscribing the roof opening (3), which can be rigidly joined wiht the outer frame part (5) in a zone within the roof opening (3) by means of connecting or fastening elements (16,



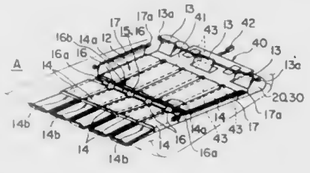
17, 17A, 17B) and which engages the roofing (2) from beneath, characterized in that the inner frame part (9) has a portion (a) extending under the roofing (2) in engagement therewith and designed as a flange (clamping flange 18) which can be pushed into the space between the roofing (2) and the solid canopy (10), and the solid canopy has, at least along one edge (cut surface 12) of the roof opening (3), an opening (3') identical to the roof opening (3).

4,927,209

TRIM COVER FOR USE WITH SEATS IN VEHICLES

Hidekazu Maruyama, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Continuation of Ser. No. 894,946, Aug. 8, 1986. This application Apr. 18, 1988, Ser. No. 185,238
Claims priority, application Japan, Aug. 9, 1985, 60-122434
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[5] A47C *7/74*
U.S. Cl. 297—180 6 Claims



1. A trim cover for covering a heat cushion of a seat in a vehicle, comprising:

a surface skin;

a base cloth connected to said surface skin;

wadding sandwiched between said surface skin and said base cloth;

an electric heater comprising a plurality of band-like portions;

a plurality of elongated sack-like portions formed between said surface skin and said base cloth, each sack-like portion being separated from adjacent sack-like portions by seams which bind said surface skin and said base cloth together, each sack-like portion receiving one of said plurality of band-like electric heater portions and having openings formed intermediate its length and extending partially across its width, said openings being aligned adjacent one another;

pulling loop means constructed by a plurality of pulling loop pieces provided at borders of each adjacent pair of sack-like portions at an intermediate portion thereof and being joined together with said surface skin and said base cloth at said borders of each adjacent pair of sack-like portions; and

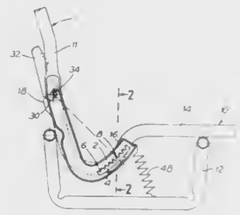
a pulling wire passed under said pulling loop pieces for securing the trim cover to the seat cushion.

4,927,210

SEAT WITH AN ADJUSTABLE FOLD-DOWN BACK

Francois Fourrey, Montbelliard, and Jean F. Mauffrey, Audelnans, both of France, assignors to ECIA - Equipements Et Composants Pour L'Industrie Anbomobile, Audincourt, France

Filed Apr. 13, 1989, Ser. No. 337,695
Claims priority, application France, Apr. 22, 1988, 88 05396
Int. Cl.[5] A47C *1/025*
U.S. Cl. 297—366 14 Claims



1. Seat with an adjustable fold-down back, characterized in that it comprises a backframe (1) and a sitting-surface frame (10) which are connected to one another by means of two mutually spaced axles which provide for relative movement between said backframe (1) and said sitting-surface frame (10), said two axles comprising a tilting first axle (34) and a folding-down second axle which are fixed to one of the frames (1, 10) and locked on the other frame (10, 1), and means (32) for releasing each of said two axles for the purpose of pivoting the back about the other of said two axles.

4,927,211

SAFETY HARNESS

Robert J. Bolcerek, 1701 Discus Dr., Las Vegas, Nev. 89108

Filed Jul. 24, 1989, Ser. No. 383,997
Int. Cl.[5] A47D *15/00*
U.S. Cl. 297—465 19 Claims

1. A restraint device, comprising:

a chest pad;

a back pad;

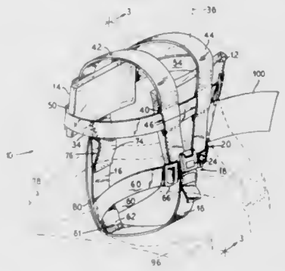
shoulder straps connectible between said pads;

a chest strap connectible between said pads;

a crotch strap connectible between said pads;

seat belt receiving means affixed to said crotch strap near a lower edge of said back pad; and

a torque strap affixed to said crotch strap at a point remote from said back pad, and buckle means attached to said back pad for cooperation with said strap to adjust the effective crotch strap length without alternating the position of attachment of a seat belt with respect to the body of a child wearer of the restraint device.

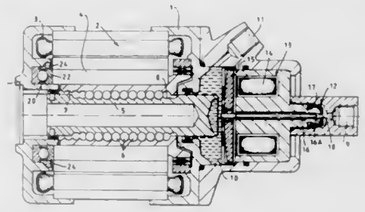


4,927,212

ROTARY ELECTRIC DRIVE DEVICE FOR ANTI-SKID BRAKING SYSTEM

Anthony W. Harrison, Birmingham, and Philip A. Taft, Solihull, both of England, assignors to Lucas Industries, Public Limited Company, Birmingham, England

Filed Nov. 18, 1988, Ser. No. 273,072
Claims priority, application United Kingdom, Nov. 20, 1987, 8727294; Nov. 20, 1987, 8727293
Int. Cl.[5] B60T *8/32*
U.S. Cl. 303—115 24 Claims



1. A rotary electric device normally rotatable in two opposed directions comprising a rotary armature support means supporting the armature for rotation relative to fixed structure, and restraint means permitting free rotation of the armature in one direction of rotation, wherein said restraint means acts to cause resistance to reverse rotation, at least during a period within which the device is de-energised,

wherein said restraint means acts to lock said armature support means against reverse rotation, said support means providing a surface frictionally engaged by a surface associated with the armature in order to provide said resistance to reverse rotation of the armature during locking of said support means.

VOL 1114 ISS 4 MY 22 1990 UMI

4,927,213

SLIP-CONTROLLED HYDRAULIC BRAKE SYSTEM

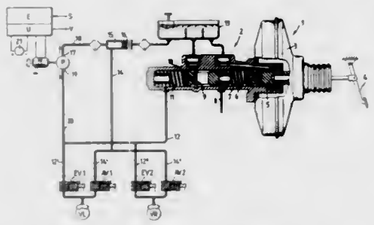
Jochen Burgdorf, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,797

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808902

Int. Cl.[5] B60T *13/70, 13/16, 8/64*

U.S. Cl. 303—116 4 Claims



1. A slip-controlled hydraulic brake system for vehicles having motor driven wheels including:

a braking pressure generator, which is pressureless in a first position and which is connected to a storage reservoir;

at least one wheel brake cylinder generating a braking torque at each of the driven wheels;

a brake line connecting the braking pressure generator with the wheel brake cylinder, and a first check valve connected into said brake line;

a relief line connected to wheel brake cylinders, and a second check valve connected into said relief line; and,

a pressure medium pump having a first and a second connection, and means for delivering a pressure medium from one of said connections to the other, said first connection being connected to the relief line and said second connection being connected to the braking pressure generator, the direction of delivery of the pump being reversible so that during a brake slip control operation the pump delivers pressure medium from the first connection to the second connection and, during a traction slip control operation, the pump delivers pressure medium from the second connection to the first connection and including means for supplying fluid from said pump to the wheel brakes during said traction slip control operation, wherein the relief line and the first connection of the pump terminate in a prechamber connected to the storage reservoir by way of a non-return valve with the non-return valve being biased to prevent said pressure medium from returning into the storage reservoir, and wherein in said traction slip control operation, said pump supplies fluid to the wheel brakes by way of said prechamber and by way of actuated outlet valves.

4,927,214

OPERATING ROOM INSTRUMENT TABLE

Howard H. Kaufman, 11 Heather Dr., Morgantown, W. Va. 26505, and German Nunez, 14713 SW. 110 Ter., Miami, Fla. 33196

Filed Jun. 17, 1988, Ser. No. 208,074

Int. Cl.[5] A47B *77/00*

U.S. Cl. 312—195 7 Claims

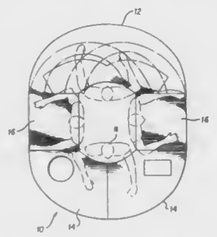
1. An operating room instrument table assembly, comprising:

(a) a plurality of modular table units;

(b) base frame for each of the table units, the base frame having vertical supports, a center connector, feet portions at the bottom of the vertical supports and wheeled castor means depending from the feet portions;

(c) a table top support frame carried by the base frame, the table top support frame having columns fitting over the base frame supports and having top portions for supporting a table top unit;

(d) a table top unit having means on the bottom surface thereof for cooperating with the table top support frame



to allow the table top unit to be fixedly supported on the support frame and to be removable therefrom;

(e) a top portion of the table top unit having indicia thereon for the placement of surgical instruments;

(f) the table top being individually removable and sterilizable as a unit with the instruments.

4,927,215

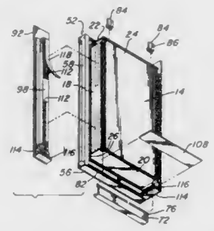
BATH CABINET MOUNTING AND FINISHING APPARATUS

Howard S. Katz, Riegelsville, Pa., assignor to Robern, Inc., Bensalem, Pa.

Filed Feb. 23, 1989, Ser. No. 314,523

Int. Cl.[5] A40B *67/00*

U.S. Cl. 312—224 2 Claims



1. In combination with a surface-mounted bath cabinet having respective side, top, bottom and rear walls, a mounting bracket adapted to be secured to the surface of a wall, said mounting bracket having means thereon engagable with the cabinet to support and position the cabinet, a first channel on said mounting bracket facing away from the wall, a second channel on said cabinet facing toward the wall when the cabinet is operatively disposed, a bottom trim panel having respective longitudinal edges thereof received within said first and second channels, and a pair of side trim members coupled to said cabinet to provide finished side panels for the side walls of the cabinet, said side trim members having brackets thereon adjacent to their lower edges, said brackets having third channels thereon extending below said side walls, lateral edges of said bottom trim panel being engagable with and receivable within said third channels when said side panels are operatively disposed, and means on said side panels for securing said side panels to the side walls of the cabinet.

4,927,216

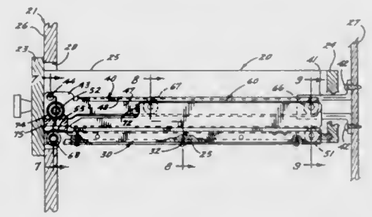
SIDE MOUNTED DRAWER SLIDE SYSTEM

John W. Boda, Roscoe, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Jun. 26, 1989, Ser. No. 371,505

Int. Cl.[5] A47B *88/00*

U.S. Cl. 312—339 10 Claims



1. A system for supporting a drawer in a cabinet for back and forth horizontal movement between a fully closed position in which the rear of the drawer is located adjacent the rear of the cabinet and a fully extended open position in which the rear of the drawer is located in very close proximity to the front of the cabinet, said system comprising an elongated rail secured to the drawer and extending along one side thereof, an elongated track secured to the cabinet and spaced above said rail, and an adaptor located between said rail and said track and adapted to coact with the rail and the track to support said drawer for movement toward and away from said closed position, a first roller rotatably supported on the rear end portion of said rail and positioned to ride along said adaptor, a second roller rotatably supported on the front end portion of said adaptor and positioned to support said rail as said first roller rides along said adaptor, a third roller rotatably supported on the rear end portion of said adaptor, a fourth roller rotatably supported on said adaptor between said front and rear end portions thereof and between said second and third rollers, said third and fourth rollers being at the same elevation and being positioned to ride along said track, and a fifth roller rotatably supported on the front end portion of said track.

4,927,217

ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP

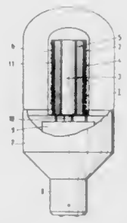
Anthony Kroes, and Pieter G. Van Engen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 8, 1988, Ser. No. 204,146

Claims priority, application Netherlands, Jun. 26, 1987, 8701496

Int. Cl.[5] H05B *41/16*

U.S. Cl. 315—248 10 Claims



1. An electrodeless low-pressure discharge lamp comprising a discharge vessel sealed in a vacuum-tight manner and having a discharge space containing an ionizable vapour and a rare gas,

the discharge vessel having a protuberance protruding into the discharge space,

a body of soft magnetic material surrounded by an electrical coil, this body and this coil being provided in said protuberance in the discharge vessel, characterized in that the body of soft magnetic material has a heat-resistant envelope of an electrical and thermal insulator, which separates the electrical coil from said body.

4,927,218

FLAT DISPLAY TUBE COMPRISING AN EMISSION SYSTEM FOR EMITTING A PLANAR ELECTRON BEAM, A DEFLECTION SYSTEM AND A MODULATION SYSTEM

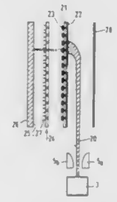
Antonius P. F. Zegers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1989, Ser. No. 320,134

Claims priority, application Netherlands, Mar. 7, 1988, 8800554

Int. Cl.[5] H01J *29/70, 29/72*

U.S. Cl. 315—366 4 Claims



1. A flat display tube comprising an evacuated envelope which is provided with a display window, a phosphorescent display screen being present on the display window in the evacuated envelope, an emission system for emitting a planar electron beam which initially extends substantially parallel to the display screen, a modulation system for modulating the planar electron beam, which modulation system extends substantially parallel to the display screen, and a deflection system for deflecting the planar electron beam towards the modulation system, characterized in that the flat display tube comprises a selection system for selecting the electron beam in a direction transverse to the planar electron beam.

4,927,219

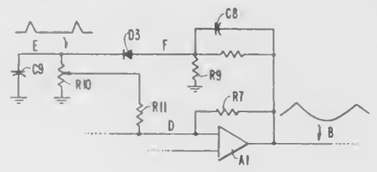
CORNER RASTER DISTORTION CORRECTION CIRCUIT

Stephen S. Golik, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Jun. 26, 1989, Ser. No. 371,868

Int. Cl.[5] H01J *29/56, 29/70*

U.S. Cl. 315—371 5 Claims



1. A corner distortion correction circuit for correcting cor-

VOL
1114
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ner distortion in a raster display in which side pincushion correction has been effected by a diode modulator driver circuit including an operational amplifier having an output for providing an output signal of said diode modulator driver circuit, said corner distortion correction circuit comprises:

means coupled to the output of said operational amplifier for removing any DC component in the output signal thereof;

threshold means coupled to said removing means for passing only that portion of said output signal exceeding a predetermined threshold level; and

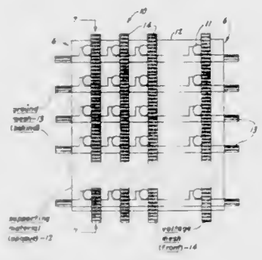
negative feedback means for negatively feeding back an output of said threshold means to an input of said operational amplifier.

4,927,220

SYSTEM AND METHOD FOR PHOTOREFRACTIVE HOLOGRAPHIC RECORDING AND SIGNAL PROCESSING

Lambertus Hesselink, Woodside, Calif., and Steve R. Redfield, Austin, Tex., assignors to Microelectronic & Computer Technology Corp., Austin, Tex.

Filed Dec. 31, 1987, Ser. No. 140,196
Int. Cl.[5] G03H *1/02*; G02F *1/05*
U.S. Cl. 350—3.64 **26 Claims**



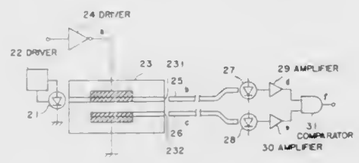
25. An optical array comprising at least two photorefractive crystallytes capable of being selectively addressed for at least one of optical signal processing or halographic recording.

4,927,221

BALANCED LIGHTWAVE TRANSMISSION SYSTEM

Mikio Kiyono, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 4, 1988, Ser. No. 267,020
Claims priority, application Japan, Nov. 7, 1987, 62-280318
Int. Cl.[5] G02B *6/10*
U.S. Cl. 350—96.14 **1 Claim**



1. A balanced lightwave transmission system comprising:

light source means for emitting a light beam;

light source driving means for driving said light source means to emit said light beam constantly;

optical directional coupling switch means having an input port optically coupled with said light source means for receiving said light beam as an input light beam and a first and a second output port for delivering a first and a second output light signal, said optical directional coupling switch means responsive to a control signal for delivering said input light beam to one of said first and second output ports as one of said first and second output light signals;

control signal generating means responsive to a digital signal to be transmitted for producing said control signal which selectively takes one of a first and a second voltage level so that said input light beam is delivered to said first output port as said first output light signal when said control signal takes said first voltage level while said input light beam is delivered to said second output port as said second output light signal when said control signal takes said second voltage level;

first and second parallel lightwave guide means having a first and a second input terminal end which are optically coupled with said first and second output ports, respectively, and having a first and a second output terminal end, respectively, for transmitting said first and second output light signals as a first and a second optical signal, respectively;

first and second photo sensing means optically coupled with said first and second output terminal ends, respectively, for converting said first and second optical signals into a first and a second electric signal, respectively; and

comparing means coupled with said first and second photo sensing means for comparing said first and second electric signals to reproduce said digital signal as an output electric signal of said comparing means.

4,927,222

DUAL OPTICAL FIBER DEVICE

Tadao Kamiya, Anaheim, and Matthew J. Leader, Long Beach, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.

Filed Jun. 16, 1986, Ser. No. 874,927
Int. Cl.[5] G02B *6/26*
U.S. Cl. 350—96.15 **11 Claims**



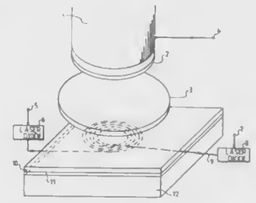
1. A device for transmitting electromagnetic radiation to a radiation sensitive component, receiving output radiation from said component and transmitting said output radiation substantially unattenuated to a radiation measuring, transducing, recording or retransmitting component, which device comprises a first cladded optical fiber having a proximal end and a distal end, said proximal end being adapted to receive source radiation and said distal end having a exposed tip which touches but is not integrally joined to an exposed intermediate portion of a second cladded optical fiber having a proximal end and a distal end, the touch contact between said tip and the exposed portion of said second optical fiber forming a highly directional radiation-transmissible junction, the proximal end of said second optical fiber being adapted to be attached to a radiation sensitive component such that the output radiation from said radiation sensitive component passes substantially unattenuated along said second optical fiber and through said junction to said radiation measuring, transducing, recording or retransmitting component, said junction being encased in a opaque, radiation reflective jacket.

4,927,223

OPTIC FIBER CORRELATOR

Jean P. Pocholle, Arpajon; Michel Papuchon, Massy; Claude Puech, Longjumeau, and Pierre Tournois, Le Rouret, all of France, assignors to Thomson-CSF, Paris, France

Filed Jul. 14, 1988, Ser. No. 218,861
Claims priority, application France, Jul. 17, 1987, 87 10120
Int. Cl.[5] G02B *6/26, 6/42*
U.S. Cl. 350—96.15 **5 Claims**



1. An optic fiber correlator comprising:

a first laser and a second laser each emitting the same frequency and having an amplitude modulated respectively by a first signal and a second signal to be correlated;

an optic fiber with its two ends respectively coupled to said two lasers and having a length which is at least equal to the product of light velocity in the fiber and the maximum duration of the signals to be correlated, said optic fiber comprising, throughout its length, a part with its diameter reduced to let through an evanescent wave associated with the guided mode;

a layer of non-centrosymmetrical structure material in contact with the part having a reduced diameter, throughout the length of the fiber; and

means to collect the light emitted by said layer at a frequency which is twice the frequency of said two lasers, and to give an electric signal which is a function of the intensity of said light, said signal being an output signal of said correlator.

4,927,224

LENSLESS MULTIFIBER OUTPUT COUPLER

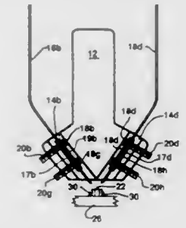
Angel L. Ortiz, Jr., and Marshall G. Jones, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1989, Ser. No. 329,137
Int. Cl.[5] G02B *6/26*
U.S. Cl. 350—96.15 **11 Claims**

1. A output coupler for directly applying laser beams from a plurality of optical fibers to a workpiece, said coupler comprising:

a body means for receiving a plurality of fiber and for directly applying said laser beams to the workpiece; and

means, disposed in said body means, for adjusting the spacing and angle between the fibers, said adjusting means comprising a first screw disposed to engage a first fiber at a first position, and a first spring having first and second ends, said first spring end disposed to engaged said first fiber opposite said first screw and said second spring end disposed to engage said body means.

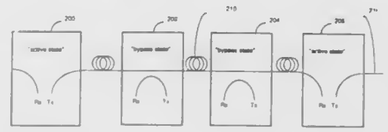


4,927,225

2×2 OPTICAL BYPASS SWITCH

Frank H. Levinson, Redwood City, Calif., assignor to Finisar Corporation, Menlo Park, Calif.

Filed May 30, 1989, Ser. No. 358,892
Int. Cl.[5] G02B *6/32*
U.S. Cl. 350—96.18 **12 Claims**



9. An optical fiber switch, comprising:

four optical signal ports,

an array of optical channels, including a set of four optical fibers coupled to said four optical signal ports, said four optical fibers having coplanar ends arranged in a square array; said array of optical channels further including loop back means adjacent to said square array and having two optical ports coplanar with said ends of said fibers; said loop back means including means for transmitting optical signals incident on one of said optical ports to the other of said optical ports;

a lens having two end faces, one end face abutting said coplanar ends of said set of four fibers, the other end face having mirror means for reflecting light incident thereon; and

actuator means for moving the lens between two predefined positions with respect to said array of optical channels;

said lens, when in said first position, coupling first an second ones of said optical signal ports to third and fourth ones of said optical signal ports, respectively, by reflecting optical signals from the optical fibers coupled to said first and second ones of said optical signal ports to the optical fibers coupled to said third and fourth ones of said optical signal ports;

said lens, when in said second position, coupling said first and third ones of said optical signal ports to said second and fourth ones of said optical signal ports, respectively, by reflecting optical signals from the optical fiber coupled to said first optical signal port to the optical fiber coupled to said second optical signal port, reflecting optical signals from the optical fiber coupled to said third optical signal port to a first port of said loop back means, and reflecting optical signals from the second port of said loop back means to the optical fiber coupled to said fourth optical signal port;

whereby two distinct optical connections are made when

VOL 1114 ISS 4 MY 22 1990 UMI

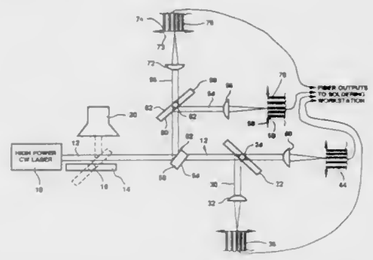
said optical fiber switch is in said first and second positions.

4,927,226

MULTIPLEXER FOR HIGH POWER CW LASERS

Angel L. Ortiz, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1989, Ser. No. 329,160
Int. Cl.[5] G02B *6/32;* B23K *9/00*
U.S. Cl. 455—611 16 Claims



1. Apparatus for multiplexing a coherent high power continuous wave laser beam having a first path, said apparatus comprising:

means for interrupting the propagation of said light beam along the first path;

deflection means, disposed in the first path after said interruption means, for changing the direction of at least a portion of said laser beam to a second path, said deflection means changing the direction of said first path only when said interruption means is interrupting the propagation of said laser beam;

first focussing means disposed in said second path and having a first focus plane; and

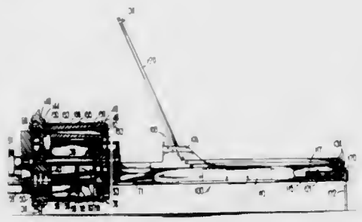
a first plurality of means for transmitting laser beams, each of said plurality of means having an input end disposed in said first focus plane.

4,927,227

OPTICAL FIBER CABLE CLOSURE

William H. Bensel, III, Lawrenceville; Robert H. Gladden, Jr., Norcross; John F. Mulluck, Marietta; Robert R. Ross, Gainsville, and Andrew H. Williamson, Jr., Doraville, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1988, Ser. No. 264,606
Int. Cl.[5] G02B *6/36, 7/26*
U.S. Cl. 350—96.20 22 Claims



1. An optical fiber cable closure, said closure comprising:

a cover having a closed end and an open end; and a cable splicing termination assembly which is adapted to become disposed within said cover, said cable splicing termination assembly including:

cable entry means through which cables to be spliced are routed into said closure;

support means which extends from said cable entry means and which has a free end adapted to be disposed adjacent to said closed end of said cover, said support means including a plurality of pairs of opposing, aligned pins which pins are staggered in a stepped manner and in a direction from said cable entry means to a free end of said support means;

at least one tray which is mounted pivotally on said support means for holding spliced portions of optical fibers, each of said trays cooperating with an associated pair of said pins forming partially a hinge and including means for holding spliced portions of fibers;

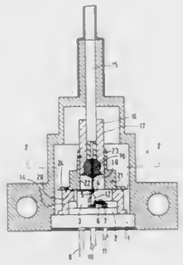
hinge lock plate means removably attached to one end of said at least one tray for completing said hinge means for each said tray and being removable to permit optical fibers from at least one entering cable to be routed into each said tray, said hinge lock plate means also cooperating with a portion of said at least one tray to prevent unintended movement of optical fibers at an entrance to said at least one tray.

4,927,228

OPTOELECTRONIC ARRANGEMENT HAVING A COUPLING BETWEEN AN OPTICAL TRANSMISSION FIBRE AND A SEMICONDUCTOR LASER DIODE

Hermanus A. Van De Pas, Nijmegen, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 31, 1989, Ser. No. 359,464
Claims priority, application Netherlands, Jun. 6, 1988, 8801443
Int. Cl.[5] G02B *6/36*
U.S. Cl. 350—96.20 4 Claims



1. An arrangement for coupling an optical transmission fiber with a laser diode comprising:

a holder for said optical fiber;

a holder for said laser diode;

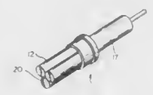
an intermediate part disposed between said holder for said optical fiber and said holder for said laser diode, one of said two holders and said intermediate part being insertable within one another and having an annular connection part of reduced thickness to permit axial adjustment of one of two said holders and said intermediate part and fixation of same by welding, the other of said holders and said intermediate part having confronting flat surfaces extending traversely to the longitudinal axis of said holder and said intermediate part, one of said confronting surfaces having a flange of reduced thickness to permit welded fixation of said other holder and said intermediate part after transverse adjustment thereof to permit axial and transverse alignment of said optical fiber and said laser diode.

4,927,229

OPTICAL CABLE COUPLING ADAPTER

Yoshiyasu Tanaka, Yokohama; Toshimi Nagaishi, and Mituyoshi Suzuki, both of Machida, all of Japan, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 6, 1989, Ser. No. 293,975
Int. Cl.[5] G02B *6/38*
U.S. Cl. 350—96.21 6 Claims



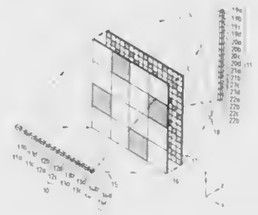
1. An optical cable coupling adapter comprising two end portions each holding a plurality of cylindrical rods with their outer circumferences kept in contact with one another, the cylindrical rods in each end portion defining a passage for an optical fiber, and a single piece nearly polygonal split sleeve adapted to make contact with the exposed outer circumferential surfaces of the cylindrical rods and effect center alignment of the fiber passages in the two end portions.

4,927,230

OPTICAL SWITCH ARRAY PROVIDED WITH A MASK HAVING OPENINGS OF A PREDETERMINED PATTERN AND SHUTTERS CORRESPONDING TO THE PATTERN

Jun Tokumitsu, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 231,004
Claims priority, application Japan, Aug. 19, 1987, 62-206038
Int. Cl.[5] G02B *6/04*
U.S. Cl. 350—96.24 14 Claims



1. An optical switch array comprising:

N light-emitting means arranged in a predetermined direction and each emitting a light independently modulated in accordance with an input signal, wherein N is an integer greater than 1;

masking means having N×M segments arranged in the form of a matrix in said predetermined direction and in a direction perpendicular thereto, some of said segments performing one of transmitting the lights emitted from said light-emitting means therethrough and reflecting the lights emitted from said light-emitting means, said masking means having repetitively formed thereon a predetermined pattern comprising at least two of said segments as a unit, wherein M is an integer greater than 1;

M light-receiving means arranged in a direction perpendicular to said predetermined direction, for receiving the lights transmitted through or reflected by said masking means and independently outputting signals; and

shutter means comprising shutters disposed in the optical path from said light-emitting means to said light-receiving means and arbitrarily openable-closable at each segment unit constituting the pattern of said masking means.

4,927,231

LIQUID FILLED FLEXIBLE DISTAL TIP LIGHT GUIDE

Jeffrey I. Levatter, San Diego, Calif., assignor to Acculase Inc., San Diego, Calif.

Continuation of Ser. No. 146,430, Jan. 21, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 282,932
Int. Cl.[5] G02B *6/20*
U.S. Cl. 350—96.32 15 Claims



1. An elongated light guide assembly for a high-power laser beam, comprising:

an optical fiber having a solid core for transmitting a high-power laser beam, the optical fiber extending over a substantial majority of the elongated light guide assembly's length; and

a liquid-filled flexible tube optically coupled to one end of the optical fiber, for transmitting the high-power laser beam transmitted to it by the optical fiber, wherein the liquid-filled flexible tube is substantially more flexible than is the optical fiber.

4,927,232

STRUCTURAL MONITORING SYSTEM USING FIBER OPTICS

Richard W. Griffiths, Pacific Palisades, Calif., assignor to G2 Systems Corporation, Pacific Palisades, Calif.

Continuation-in-part of Ser. No. 32,042, Mar. 27, 1987, Pat. No. 4,812,645, which is a continuation-in-part of Ser. No. 712,889, Mar. 18, 1985, Pat. No. 4,564,520, which is a continuation-in-part of Ser. No. 571,304, Jan. 16, 1984, abandoned, which is a continuation of Ser. No. 295,600, Aug. 24, 1981, abandoned. This application Mar. 13, 1989, Ser. No. 323,498
Int. Cl.[5] G02B *6/16*
U.S. Cl. 350—96.29 7 Claims

1. An optical fiber sensor cable, comprising:

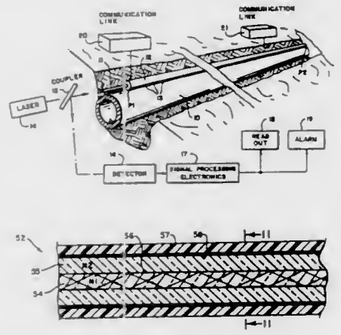
a core;

a cladding surrounding said core and having an index of refraction different from the index of refraction of said core; and

a coating surrounding said cladding, said coating including a particulate material in intimate engagement with said

VOL 1114 ISS 4 MY 22 1990 UMI

cladding, said particulate material being movable radially toward and away from said cladding to distort the homogeneity of at least a portion of said cladding to change the index of refraction thereof.



4,927,233

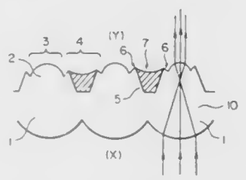
REAR PROJECTION SCREEN

Yasuaki Nakanishi, Zama, and Masao Inoue, Tokyo, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Filed Mar. 6, 1989, Ser. No. 319,629

Int. Cl.[5] G03B *21/60*

U.S. Cl. 350—128 6 Claims



1. In a rear projection screen having an incidence surface upon which projection light rays impinge, and a viewing surface on which a projected image is visible, comprising lenticular lenses formed on said incidence surface for focusing the projection light rays on said viewing surface within light focusing areas other than no-light focusing areas, lenticular lenses formed on said viewing surface in said light focusing areas; and ambient light absorbing layers formed on said viewing surface in said no-light focusing areas, the improvement wherein each of said no-light focusing areas is formed therein with an ink filling groove and has ridges on both sides of the groove, each of said ridges having top edge, ink is filled in said groove in each no-light focusing area so as to form each of said ambient light absorbing layers having both side edges reaching the top edges of said ridges, whereby the both side edges of each of said light absorbing layers define straight border lines extending therealong.

4,927,234

OPTICAL SYSTEM FOR HEAD-UP DISPLAYS

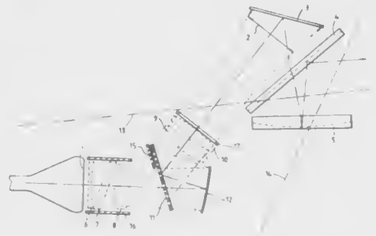
John R. Banbury, Fleet, and Derek L. Barter, Aldershot, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom

Filed Aug. 12, 1988, Ser. No. 231,448

Claims priority, application United Kingdom, Aug. 21, 1987, 8719854

Int. Cl.[5] G02B *27/10*

U.S. Cl. 350—174 7 Claims



1. An optical system for a head-up display having a collimator for producing a collimated image of one or more display objects and including an optical relay unit for producing an intermediate image of each display object in the focal plane of the collimator, the optical relay unit comprising:

a first group of relay elements for each display object;

a second group of relay elements for receiving light from each of the first groups of relay elements and focusing said light in the focal plane of the collimator;

and a plurality of optical folding elements for producing a double fold in the optical path between said first and second groups of relay elements, the folding elements comprising one or more first folding elements one for each display object for reflecting light from the display object to a second folding element;

said second folding element positioned to reflect light incident on it at a defined combination of angle of incidence and wavelength, and to transmit display light incident on it at a different combination of angle of incidence and wavelength, and being so disposed that light from at least one display object passes through the second folding element before being reflected by the first folding element to impinge on the second folding element at a different angle of incidence and is hence reflected towards the second group of relay elements.

4,927,235

MOVABLE-MEMBER SUPPORTING APPARATUS

Ichiro Narumi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 154,412, Feb. 10, 1988, abandoned.

This application Sep. 26, 1989, Ser. No. 412,615

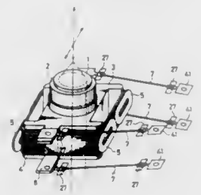
Claims priority, application Japan, Feb. 10, 1987, 62-28748

Int. Cl.[5] G02B *7/04;* G11B *7/00*

U.S. Cl. 350—252 5 Claims

1. A movable-member supporting apparatus, comprising: a first end portion fixed to a movable member; a second end portion adapted to be fixed to a fixed member; a connecting portion for connecting said first and second end portions to each other; a first flexible portion provided at a portion of said connecting portion in the vicinity of one of said first and second end portions and arranged so as to be independently flexible in the longitudinal direction of said connecting portion and

at least in one direction substantially perpendicular to said longitudinal direction; and a first vibration-suppressing member attached to said first flexible portion for suppressing vibrations of said flexible member.



4,927,236

NON-SELF SUPPORTING OPTICAL DEVICE WITH SUPPORT STRUCTURE

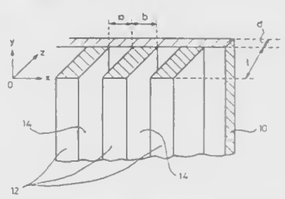
Fritz Keilmann, Stuttgart, Fed. Rep. of Germany, assignor to Max Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Mar. 10, 1988, Ser. No. 166,221

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707983

Int. Cl.[5] G02B *5/30*

U.S. Cl. 350—276 R 11 Claims



1. An optical arrangement comprising

an optically effective arrangement (10) which has predetermined planar dimensions as well as a slight thickness (d) which alone is not sufficiently stable mechanically and which is designed for the transmission of optical radiation of a predetermined wave length region, and

supporting arrangement which is substantially transparent for the radiation and which is coupled with the optically effective arrangement for the mechanical stabilization thereof,

characterized in that

the supporting arrangement comprises at least one group of spaced webs or lamellae (12) made from metal, the maximal wavelength of the predetermined wave length region and

the lamellae (12) have a width (b) and such spacing (a) with respect to each other, that the sum (a+b) of a lamellae width and of a lamellae length is smaller than the smallest effective wavelength of the wavelength region, wherein in the case of a vertical beam incidence, the effective wave length is equal to the smallest wavelength of the wavelength region and, in case of a radiation incidence under an angle α (for example in the z-y plane) the effective wavelength is equal to the minimum wave length divided by (1-sin α).

4,927,237

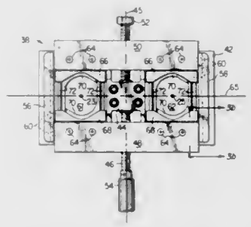
UNIVERSAL NIGHT VISION GOGGLE ADAPTER

Richard T. Hart, Garland, Tex., assignor to Varo, Inc., Garland, Tex.

Filed Jun. 7, 1988, Ser. No. 203,496

Int. Cl.[5] G02B *7/02*

U.S. Cl. 350—319 17 Claims



9. A universal night vision goggle adapter for use with a Special Purpose Test Set, comprising:

first and second parallel bars arranged symmetrically on either side of optical axes of the test set;

a first pair of generally c-shaped clamping portions fixed to said first bar in a spaced relationship to each other and correspondingly centrally facing said optical axes;

a second pair of generally c-shaped clamping portions fixed to said second bar in a spaced relationship to each other and symmetric to the first pair of clamping portions with respect to said optical axes and slidably engageable therewith

a bearing housing disposed between said first pair of clamping portions and said first and second parallel bars;

a rod with right hand threads on one end and left hand threads on another end, said rod passing through and rotatably supported by said bearing housing, and threadably attached to said first and second parallel bars; and

a platform having holes passing therethrough, said holes having axes coincident with said optical axes of the test set, said bearing housing being fixed to said platform in order to allow said rod to rotate within said housing to move said parallel bars and adjust each of said first and second pairs of clamping portions around a night vision goggle to allow testing thereof.

4,927,238

METHOD AND APPARATUS FOR DISPLAYING A THREE DIMENSIONAL VISUAL IMAGE

James A. Green, Mars, Pa., and Nicholas C. Terzis, 1507 Merrick Ave., Pittsburgh, Pa. 15226, assignors to Nicholas C. Terzis, Pittsburgh, Pa.

Continuation of Ser. No. 675,275, Nov. 27, 1984, abandoned.

This application Sep. 30, 1988, Ser. No. 253,315

Int. Cl.[5] G02B *27/22;* G03B *21/32*

U.S. Cl. 350—130 17 Claims

1. A photographic transparency display for depicting a three dimensional visual image comprising:

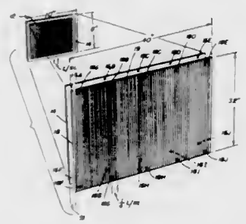
supporting frame means for displaying a photographic image which defines a height, a width, a first side and a second side;

a viewing screen extending substantially along said height and width of said first side of said supporting frame means with said viewing screen generated by exposing photographic film to light which has passed through a lenticular screen thereby generating a plurality of substantially parallel lines which are of a predetermined width and separated by clear spaces;

a transparency having a photographic image disposed thereon and extending substantially along said height and width of said second side of said supporting frame means

VOL
1114
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and spaced from said first side by a predetermined distance with said photographic image including a plurality of substantially parallel image segments generated by exposing said transparency to light which has passed through said lenticular screen, said image segments having



a predetermined width corresponding to the width of said lines on said viewing screen and being in fixed alignment and registration with said lines on said viewing screen;

wherein a three dimensional visual image of said photographic image results when viewing said photographic image through said viewing screen.

4,927,239

ANTI-REFLECTION FILM FOR AN OPTICAL ELEMENT CONSISTING OF AN ORGANIC MATERIAL

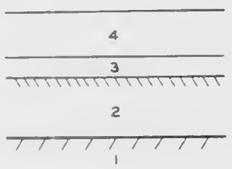
Manfred Melzig, Wessling; Horst Rösler, both of Wessling, and Medardus Schöbl, Lundsberied, all of Fed. Rep. of Germany, assignors to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 240,480, Sep. 6, 1988, abandoned, which is a continuation of Ser. No. 119,237, Sep. 25, 1987, which is a continuation of Ser. No. 740,920, Jul. 11, 1985, abandoned. This application Jan. 23, 1989, Ser. No. 300,192

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1983, 3332872

Int. Cl.[5] G02B *1/10*

U.S. Cl. 350—165 4 Claims



1. An anti-reflection film for a clearly transparent optical element (1) of organic material, the film consisting substantially of a multi-layered body wherein a first layer (2) is deposited directly on the optical element, the first layer being comprised of SiO_2 with a thickness in the range of from 0.1 μm to 5 μm, a middle or second layer (3) comprising of at least one from the group consisting of dysprosium oxide (D_2O_3), erbium oxide (Er_2O_3), europium oxide (Eu_2O_3), holmium oxide (Ho_2O_3), neodymium oxide Nd_2O_3), samarium oxide (Sm_2O_3), terbium oxide (Tb_4O_7), ytterbium oxide (Yb_2O_3) and yttrium oxide (Y_2O_3), neodymium oxide (Nd_2O_3), samarium oxide (Sm_2O_3), the middle layer (3) having a thickness less than $\lambda/10$ and an upper layer (4) comprised of SiO_2 and having a thickness of $\lambda/4$, where λ is the "center-of-gravity" wavelength of the incident light.

4,927,240

MULTIPLE LIQUID CRYSTAL DISPLAY

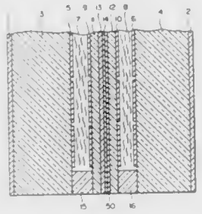
Michael Stolov, and Adi Stolov, both of 25 Hapoel Street, Nof-Yam, Israel

Continuation of Ser. No. 797,464, Nov. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 552,379, Nov. 16, 1983, Pat. No. 4,580,876. This application Aug. 25, 1988, Ser. No. 236,293

Claims priority, application Israel, Nov. 2, 1983, 70115

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—335 8 Claims



1. A multilayer liquid crystal display providing high contrast, said multilayer liquid crystal display, comprising the sequence of:

a first polarizer applied to one surface of a first glass plate, said first glass plate having on a second surface a first transparent electrode,

a first liquid crystal layer of the sort which twists the plane of polarization applied with one of its surfaces to said first transparent electrode and with the second surface to a second transparent electrode disposed on one surface of a second glass plate, said second glass plate applied with the second surface to one surface of a second polarizer, said second polarizer applied with the second surface to one surface of a third glass plate, said third glass plate having on a second surface a third transparent electrode, and

a second liquid crystal layer of the sort which twists the plane of polarization, applied with one surface to said third transparent electrode and with the second surface to one surface of a fourth transparent electrode disposed on one surface of a fourth glass plate, having on the second surface a third polarizer, wherein said first liquid crystal layer and said second liquid crystal layer can be energized simultaneously causing high contrast compared with a single cell liquid crystal display.

4,927,241

OPTICAL IMAGING SYSTEM HAVING AN ELECTRONICALLY VARIABLE FOCAL LENGTH AND OPTICAL IMAGE SENSOR PROVIDED WITH SUCH A SYSTEM

Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

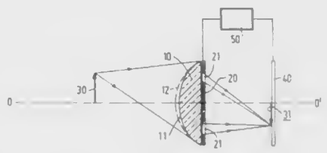
Continuation of Ser. No. 78,334, Jul. 27, 1987, abandoned. This application Sep. 25, 1989, Ser. No. 411,792

Claims priority, application Netherlands, Aug. 25, 1986, 8602149

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—336 7 Claims

1. An optical imaging system having an electronically variable focal length, comprising a system of lenses and a liquid crystal layer, characterized in that the system of lenses is divided into a plurality of sectors having different, constant focal lengths and in that the liquid crystal layer forms part of an electronically variable diaphragm including at least first and second terminals disposed on the surface of said layer for selecting sectors of the system of lenses and hence selecting a focal length.



4,927,242

DUAL FREQUENCY, OPTICALLY ACTIVE LIQUID CRYSTAL CELL

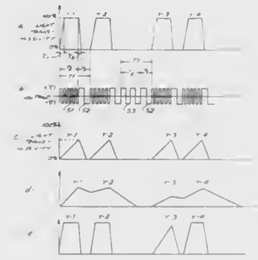
Kenji Aoki; Mitsuo Nagata; Haruo Nakamura, and Teiji Miura, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

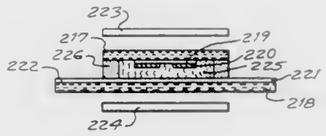
Continuation of Ser. No. 309,521, Oct. 7, 1981, abandoned. This application Jun. 10, 1985, Ser. No. 742,651

Claims priority, application Japan, Oct. 8, 1980, 55-141085; Jun. 19, 1981, 56-95091

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—346 16 Claims





1. A liquid crystal optical device comprising a liquid crystal panel including two opposed transparent base plates, each having at least one electrode disposed thereon, and a liquid crystal material sealed between the two base plates, said liquid crystal material having a dielectric anisoptropy which becomes zero at a crossing frequency ("fc") of 100 KHz or below at working temperatures, the dielectric anisotropy which being positive at frequencies lower than fc ("fl") and negative at frequencies higher than fc ("fh"), and a liquid crystal driving circuit for selectively applying signals of frequency fh and fl during successively repeating writing periods, T_1, T_1 including a first signals applying period T_2 and a second signal applying period T_3, such that $T_1=T_2+T_3$, wherein the driving circuit selectively applies in T_2 a signal fl or a signal fh for placing the panel in one of the OFF or ON states, the liquid crystal material aligned parallel with an electric field or inclined with an electric field or inclined with respect to the electric field, and applies in T_3 a signal for placing the liquid crystal material in an initial driving state aligned with the electric field.

4,927,243

METHOD AND APPARATUS FOR DRIVING OPTICAL MODULATION DEVICE

Osamu Taniguchi, Chigasaki; Yoshihiro Onitsuka, Yokohama, and Tadashi Mihara, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,244

Claims priority, application Japan, Nov. 4, 1986, 61-262460

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—350 S 15 Claims



1. A driving method for an optical modulation device comprising a plurality of scanning lines and a plurality of data lines intersecting with the scanning lines to form a matrix of pixels each formed at an intersection of the scanning lines and the data lines, each pixel assuming either a first optical state or a second optical state depending on the direction of an electric field applied thereto; said driving method comprising:

applying a scanning selection signal to a scanning line to select the scanning line in a scanning selection period including a former phase and a latter phase having a duration smaller than that of the former phase, said scanning selection signal having a voltage of one polarity at the former phase and a voltage of the other polarity at the latter phase wherein the time duration of the applied voltage of one polarity at the former phase is longer than the time duration of the applied voltage of the other polarity at the latter phase; and

applying a data signal to data lines in synchronism with the scanning selection signal, said data signal having a voltage of zero at a part of the former phase, a voltage of one or the other polarity at another part of the former phase, and a voltage of a polarity opposite to said one or the other polarity at the latter phase, with said voltages of zero, and one and the other polarities being defined with respect to the voltage level of a non-selected scanning line, so as to apply to all or a prescribed part of the pixels on the selected scanning line a voltage of one polarity providing the first optical state to all or a prescribed part of the pixels

VOL
1114
ISS
4
MY
22
1990
UMI

at the former phase, apply to a selected pixel among all or a prescribed part of the pixels a voltage of the other polarity providing the second optical state, and to the remaining pixels a voltage not changing an optical state at the latter phase, and apply to the pixels on a non-selected scanning line a voltage not changing an optical state and having an average value of zero.

4,927,244

USE OF COMPOUNDS OR MIXTURES OF COMPOUNDS WHICH HAVE A CHIRAL, ORTHOGONAL, MORE HIGHLY ORDERED SMECTIC PHASE IN THE RANGE OF SAID PHASE AS SWITCHING OR INDICATING MEDIUM

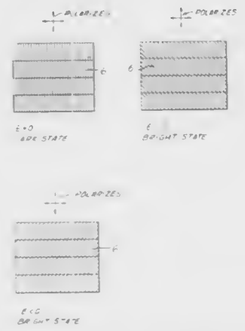
Christian Bahr; Gerd Heppke; Detlef Lötzsch, all of Berlin; Hans-Rolf Dübal, Königstein; Claus Escher, Mühltal, and Dieter Ohlendorf, Lieferbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 5, 1988, Ser. No. 177,685

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711360; May 29, 1987, 3718174

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—350 S 3 Claims



1. A switching or indicating component which is based on the electroclinic effect, comprising as switching or indicating medium a compound or a mixture of compounds which are present in a chiral, orthogonal, more highly ordered smectic phase in the operational state of the switching or indicating component.

4,927,245

FREQUENCY SHIFTER FOR MEDIUM INFRARED RANGE WAVE

Michel Papuchon, Massy; Jean-Paul Pocholle, Arpajon, and Dominique Delacourt, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 30, 1988, Ser. No. 238,123

Claims priority, application France, Sep. 1, 1987, 87 12156

Int. Cl.[5] G02B *5/18, 6/34; G02F 1/23*

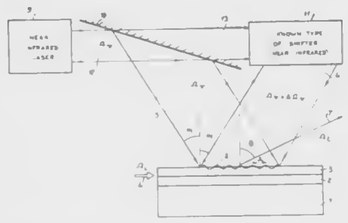
U.S. Cl. 350—354 2 Claims

1. A frequency shifter for waves in the medium infrared range, comprising:

a diffraction grating in motion to shift, by Doppler effect, the frequency of a wave applied to this grating;

an optic guide, in which is guided the wave which has to undergo the frequency shift, formed by semiconducting materials and on the surface of which the diffraction grating is created by carriers photo-induced by periodic illumination; and

means to produce two wave beams and to make them interfere on the surface of the guide, said wave beams having different frequencies, belonging to the near or visible



infrared range, to produce said periodic illumination in translational motion on the surface of the guide.

4,927,246

PLANAR ELECTROCHROMIC DIMMER

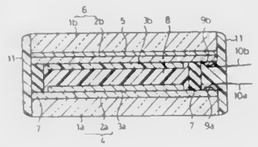
Toshiyasu Ito; Jun Minoura; Shigeyuki Takahashi; Takaaki Mori; Mamoru Kato, and Toshikazu Funahashi, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 12, 1988, Ser. No. 231,470

Claims priority, application Japan, Aug. 13, 1987, 62-124153[U]

Int. Cl.[5] G02F *1/17*

U.S. Cl. 350—357 7 Claims



1. A planar electrochromic dimmer comprising:

first and second electrode-equipped bases, each including a transparent electrode film provided thereon, the bases being arranged such that the transparent electrode films face each other,

an electrolyte provided between the electrode-equipped bases,

a color-forming layer provided on at least one of said electrode-equipped bases, and

a thin metal film with a visible ray transmittivity of 20–60% provided between said at least one color forming layer and its respective transparent electrode film, the metal film and the transparent electrode set functioning together as electrodes.

4,927,247

OBJECTIVE LENS FOR OPTICAL DISK SYSTEM AND OPTICAL HEAD USING THE SAME

Yasuhiro Tanaka, Ashiya; Masaaki Sunohara, Nishinomiya; Yasuo Nakajima, Ibaraki, and Shinichi Tanaka, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

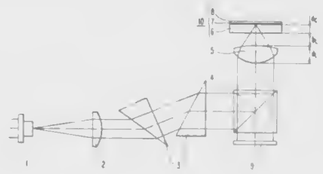
Filed Apr. 26, 1989, Ser. No. 343,256

Int. Cl.[5] G02B *13/18*

U.S. Cl. 350—432 7 Claims

1. An objective lens for an optical disk system, having opposite first and second aspherical surfaces each providing a positive refractive power for focusing a light to form a light spot

through a transparent plate, and satisfying substantially the following condition:



$$\left| \frac{f_L}{\nu_L} - \frac{n_c - 1}{{n_c}^2} \cdot \frac{d_c}{\nu_c} \right| < \frac{\lambda}{3NA^2}$$

where,

f_L: focal length of the lens,

d_c: thickness of the transparent plate,

n_c: refractive index of the transparent plate,

λ: center wavelength of the light,

NA: numerical appertures of the lens,

ν_L: local dispersion of the lens, and

ν_c: local dispersion of the transparent plate, the local dispersion being expressed by:

$$\nu = -\frac{n_\lambda - 1}{n_{\lambda+5} - n_{\lambda-5}}$$

where n_λ is a refractive index at a center wavelength λ of the light, $n_{\lambda+5}$ is a refractive index at a wavelength 5 nm longer than the center wavelength of the light, and $n_{\lambda-5}$ is a refractive index at a wavelength 5 nm shorter than the center wavelength of the light.

4,927,248

VEHICLE LAMP LENS HAVING FRESNEL LENS

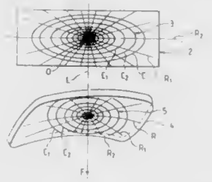
Koichi Sakakibara, and Yasuo Ozawa, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1989, Ser. No. 334,620

Claims priority, application Japan, Apr. 8, 1988, 63-46856; Apr. 11, 1988, 63-89645; Apr. 13, 1988, 63-89128; Sep. 7, 1988, 63-223968

Int. Cl.[5] G02B *3/08*

U.S. Cl. 350—452 10 Claims



1. A vehicle lamp lens, comprising: an elliptic Fresnel lens area wherein concentric elliptic pitch baselines are arranged at a suitable pitch on a surface of a lens member; said elliptic pitch baselines being circumferentially divided by a number of radial division lines passing through the center of said elliptic pitch baselines to thereby demarcate a number of elliptically-arcuate Fresnel step design sections; Fresnel steps of an angular shape and having inclined surfaces formed respectively at said Fresnel step design sections; the angle of the angular shape as well as the inclined surfaces of the Fresnel step being determined such that light transmitted from a focus on the reverse side of the lens to the respective Fresnel step design sections will pass through respective prisms so as to form substantially parallel outgoing beams, said Fresnel steps of angular shape being disposed continuously along said elliptic pitch baselines in juxtaposed relation.

4,927,249

ELECTROMECHANICAL LIGHT CHOPPER ARRANGEMENT

George R. Wisner, Deep River, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1988, Ser. No. 289,109

Int. Cl.[5] G02B *26/00*

U.S. Cl. 350—486 9 Claims



1. An arrangement for chopping a collimated beam of light traveling in an initial path, comprising

means for reflecting the light of said beam, including a flexible mirror which reflects substantially all of said light from said initial path into an auxiliary path in a first configuration thereof;

means for deforming said flexible mirror from said first configuration to a second configuration in which said flexible mirror disperses said light such that all but a minute fraction of the so dispersed light propagates outside said auxiliary path; and

means for blocking further propagation along said auxiliary path of that of said light that is reflected by said flexible mirror to the outside of said auxiliary path.

4,927,250

OPTICAL SYSTEM FOR COMPENSATING CHROMATIC ABHERRATION OF IMAGE

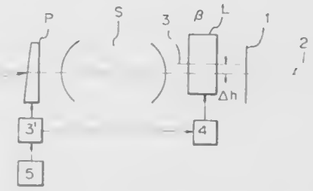
Shigeyuki Suda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 844,383, Mar. 26, 1986, abandoned. This application Aug. 16, 1988, Ser. No. 232,533

Claims priority, application Japan, Mar. 29, 1985, 60-65467

Int. Cl.[5] G02B *27/64*

U.S. Cl. 350—500 11 Claims



8. An optical system for stabilizing an image formed by an objective lens by an image deflector of a variable angle, comprising:

an optical unit being arranged at an image plane side of said objective lens and comprising a plurality of optical elements having different dispersions for suppressing an

VOL
1114
ISS
4
MY
22
1990
UMI

aberration of the image due to the refraction by said deflector,

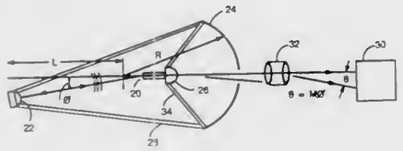
said optical unit being displaced substantially in the direction perpendicular to an optical axis of the objective lens in accordance with the refraction angle of said deflector.

4,927,251

SINGLE PASS PHASE CONJUGATE ABERRATION CORRECTING IMAGING TELESCOPE

Neil C. Schoen, 9817 Freestate Pl., Gaithersburg, Md. 20879

Filed Jun. 13, 1988, Ser. No. 205,926
Int. Cl.[5] G02B *23/06*
U.S. Cl. 350—503 **8 Claims**



1. An aberration correction imaging device, in which an object beam of electromagnetic radiation and an aberration-sampling reference beam both make a single pass through the aberrations present in said device and interact with an unaberrated reference beam in a phase conjugating medium, producing as output an unaberrated image beam, said device comprising: said phase conjugating medium; means for producing reference beams; means for receiving the incident object beam and the aberration-sampling reference beam onto optical components having aberrations; means for directing the resulting aberrated object beam, the aberration-sampling reference beam and the unaberrated reference beam onto said phase conjugating medium to thereby produce the output unaberrated image beam, and means for separating the unaberrated image beam from the aberration-sampling reference beam and the unaberrated reference beam, said means for separating utilizing differences in angular direction, polarization, or wavelength between the unaberrated output image beam from the reference beams.

4,927,252

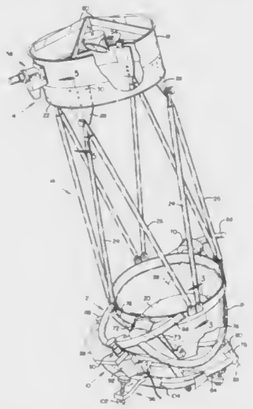
NEWTONIAN TELESCOPE ASSEMBLY WITH ROTARY FLAT MIRROR

James D. Burr, 1960 Jefferson Rd., No. 23, Evergreen, Colo. 80439

Filed Apr. 12, 1989, Ser. No. 336,870
Int. Cl.[5] G02B *23/06, 23/16, 7/18, 17/06*
U.S. Cl. 350—503 **5 Claims**

1. In a Newtonian telescope that includes a base and a primary mirror for the telescope mounted on said base, a nose spaced along the axis of the telescope and forwardly of said primary mirror, a viewing assembly mounted on said nose disposed laterally of the viewing path extending between the primary mirror and the object viewed, and a flat mirror mounted on said nose providing a viewing path extending between the viewing assembly and said primary mirror,

nose mounting means rotatably mounting said nose for rotation about the axis of the telescope thus to swing the viewing assembly in an arc extending about said axis, said nose mounting means including an annular mounting frame, and truss rods extending from and interconnecting the annular mounting frame and said base, said annular mounting frame having a guide surface and the guide surface guidably supporting said nose for rotatory movement, and



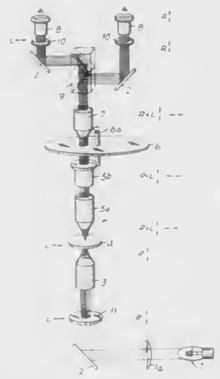
means rotatably mounting the telescope for rotation about a polar axis.

4,927,253

APPARATUS FOR THE RELATIVE INCREASE OF DEPTH SHARPNESS AND IMPROVEMENT OF RESOLVING POWER OF MAGNIFYING SYSTEMS, PARTICULARLY MICROSCOPES

Istvan Stuber, Nagyenyed u. 16, H-1123 Budapest; Geza Nagy, Jozseg Attila u. 135, H-1195 Budapest, and Peter Petrak, Istenhegyl ut 20/c, H-1126 Budapest, all of Hungary

Filed Jan. 4, 1988, Ser. No. 140,387
Int. Cl.[5] G02B *21/20, 21/16*
U.S. Cl. 350—508 **16 Claims**



1. Apparatus for increasing the depth sharpness and resolving power of magnifying systems, comprising:

a first primary magnifier;

a first secondary magnifier;

an illuminating system for producing the image of an object to be viewed, wherein said illuminating system emits electromagnetic radiation with a wavelength other than that of visible light;

an image-forming layer disposed in the optical path between the first primary magnifier and the first secondary magnifier in the image plane of the first primary magnifier and in the object plane of the first secondary magnifier, said layer being formed by independent particles dispersed in a medium having an index of refraction different from that of said particles, said image-forming layer being displaceable in said image plane;

a second primary magnifier, where said first and second primary magnifiers produce, at different angles on said image-forming layer, first and second images of the object to be viewed; and

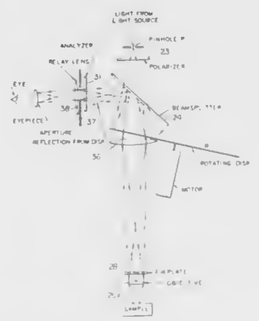
a second secondary magnifier, where said first secondary magnifier projects said first image for viewing by a first eye of a viewer, and said second secondary magnifier projects said second image for viewing by a second eye of said viewer.

4,927,254

SCANNING CONFOCAL OPTICAL MICROSCOPE INCLUDING AN ANGLED APERTURED ROTATING DISC PLACED BETWEEN A PINHOLE AND AN OBJECTIVE LENS

Gordon S. Kino, and Guoqing Xiao, both of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 31,516, Mar. 27, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 226,044
Int. Cl.[5] G02B *21/06*
U.S. Cl. 350—507 **13 Claims**



1. A scanning microscope for viewing an object comprising:

a light source;

a pinhole for receiving light from said light source;

an objective lens disposed to focus light from said pinhole onto said sample surface area;

an apertured rotating disc placed between said pinhole and said objective lens with the axis of rotation of said disc at an angle with respect to the axis of the light from said pinhole passing through apertures in aid apertured rotating disc to said objective lens and sample, said objective lens serving to focus light reflected at said sample surface onto said rotating disc whereby light reflected from said surface is transmitted through said apertures; and

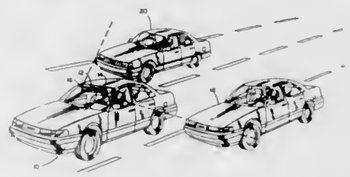
means for directing said transmitted light onto an image plane and for eliminating from said image plane light from the pinhole reflected by said rotating disc.

4,927,255

AUXILIARY REAR VIEW MIRROR ASSEMBLY

Santiago Martinez, 87 Davis Rd., Storrs, Conn. 06268

Filed Mar. 1, 1989, Ser. No. 317,602
Int. Cl.[5] G02B *27/02*
U.S. Cl. 350—616 **34 Claims**



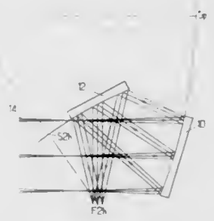
15. An auxiliary rear view mirror assembly which attaches onto an existing automotive main rear view mirror of the type which has a laterally elongated frame and means connected to said frame to support the rear view mirror on a motor vehicle, the assembly comprising left side and right side auxiliary mirrors, left side and right side support plate assemblies each including means for attaching same onto a rear surface of the frame of the main rear view mirror, a rigid support connector for connecting the left and right support plate assemblies to one another when the latter are attached onto said main rear view mirror frame; left and right auxiliary arms connecting the left and right side auxiliary mirrors respectively to the left side and right side support plate assemblies to position and hold the left side auxiliary mirror leftward of the main rear view mirror and to position and hold the right side auxiliary mirror rightward of the main rear view mirror; and respective left and right side auxiliary mirror position adjusting means for independently adjusting the positions of the left side auxiliary rear view mirror and the right side auxiliary rear view mirror in three dimensions, namely right-left, up-down, and fore-aft with respect to the main rear view mirror after the auxiliary rear view mirror assembly has been installed thereon.

4,927,256

MULTISPECTRAL OPTICAL DEVICE COMPRISING MIRRORS

Jean Lacuve, Athis Mons, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique Sagem, Paris, France

Filed Jul. 26, 1989, Ser. No. 385,129
Claims priority, application France, Jul. 26, 1988, 88 10060
Int. Cl.[5] G02B *5/10*
U.S. Cl. 350—619 **9 Claims**



1. Mirror device for providing an image of a remote object, comprising:

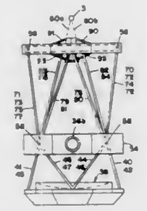
a primary concave mirror whose surface is an off-axis portion of a paraboloid having a rotational symmetry about an axis, and

a secondary concave mirror whose surface is an off-axis

VOL
1114
ISS
4
MY
22
1990
UMI

portion of a hyperboloid one focus of which coincides with the focus of the paraboloid, wherein
the mirrors have sizes of the same order of magnitude,
the primary mirror is so located with respect to the secondary mirror that a light beam received by the whole of the primary mirror and having a mean ray parallel to the axis of the paraboloid is unobscured by the secondary mirror, and
the radii of curvatures of the two mirrors along their respective axes do not differ by more than 10%.

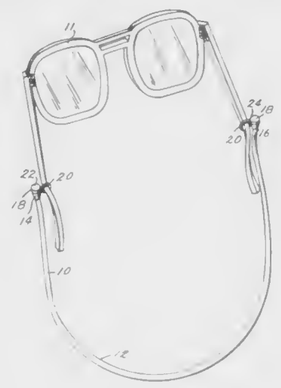
4,927,257
KINEMATIC TRUSS
David L. Enterline, San Jose, and Hugh L. Smith, Palo Alto, both of Calif., assignors to Ford Aerospace Corporation, Newport Beach, Calif.
Filed Aug. 31, 1988, Ser. No. 239,083
Int. Cl.[5] G02B *7/182*
U.S. Cl. 350—631 18 Claims



1. Apparatus for receiving a focused image comprising:
(a) a primary structure for holding a reflective device; and
(b) means for obtaining a reflection from the reflective device, said means for obtaining a reflection and said primary structure linked at a mounting means for the apparatus for receiving a focused image by a truss system, said primary structure further comprising a first primary four-bar linkage defining linkage action planes, the linkage action planes of the first primary four-bar linkage intersecting substantially at a focal point of the reflective device.

4,927,258
EYEGLASS HOLDER
Peter L. McKenna, 322 Falls Ct., Woodstock, Ga. 30188, and James M. Walters, III, 173 Autumn Ridge Trail, Roswell, Ga. 30076
Filed Nov. 9, 1988, Ser. No. 268,793
Int. Cl.[5] G02C *3/00*
U.S. Cl. 351—156 10 Claims

1. An eyeglass holder comprising:
an elongated, flexible, hollow tube defining first and second ends;
means attached to at least one of said ends for removably covering said end to close said hollow tube interior;
means in operative relationship with said tube and with said covering means for receiving and holding earpieces of said eyeglasses, whereby said eyeglasses can be suspended from the wearer's neck;
said covering means including a first cap of predetermined size and shape to removably fit within and close said first end of said hollow tube;
said hollow tube interior defining a first opening at said first end, said opening defining a wall having a boss within the opening, and wherein said cap defines an enlarged flexible end portion for releasably engaging and snap-fitting over

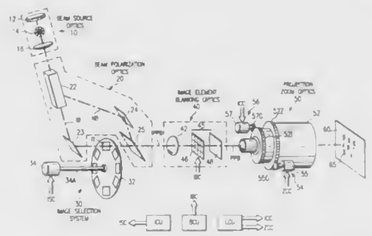


said boss to releasably hold said cap in position to close said opening.

4,927,259
APPARATUS AND METHOD FOR TESTING VISUAL FIELD
Joerg Weber, Auf dem Muehlenacker 40, 5030 Huerth-Hermuelheim, Fed. Rep. of Germany
Filed Dec. 19, 1988, Ser. No. 286,074
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3742945
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—224 3 Claims

1. A method for testing the visual field of a person comprising the steps of:
illuminating points of light distributed over the visual field of the person being tested at predetermined intensities;
accepting responsive inputs from said person under test indicative of whether said person under test can see each of said points of light at said predetermined intensity;
monitoring the intensity of each point of light;
collecting data measurements by correlating the intensity of each point of light with a corresponding responsive input;
increasing the intensity of a point of light when said corresponding responsive input indicates that person under test cannot see said point of light;
decreasing the intensity of a point of light when said corresponding responsive input indicates that said person under test can see said point of light;
changing into a next phase of reversed intensity changes when a change in said corresponding responsive input to the previous input is detected whereby the step between the logarithm of successive intensities of said point of light is increased within a phase if the phase corresponds to an increasing intensity phase and decreased within a phase if the phase corresponds to a decreasing intensity phase;
cycling each of said points of light through a complete measurement cycle having at least one phase; and
using the data measurements obtained during said measurement cycle to measure the field of vision of said person under test.

4,927,260
APPARATUS AND METHOD FOR THE PRECISION EVALUATION OF VISUAL FUNCTION IN THE FOVEA CENTRALIS (MACULA) AREA OF THE RETINA
Orville Gordon, 12915 Hunters Arrow, San Antonio, Tex. 78230
Filed Oct. 11, 1988, Ser. No. 255,875
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—243 11 Claims



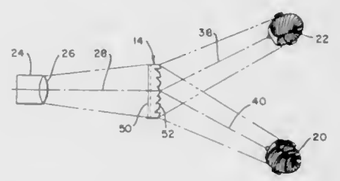
1. A foveal vision evaluation instrument for evaluating visual :unction in the foveal (macular) area of the retina, comprising:
(a) Foveal test image means for projecting an image that is substantially within the foveal field of vision;
(b) image magnification means for controlling the magnification of the image within the foveal field and
(c) foveal vision measurement means for controlling said image magnification means to incrementally change image magnification within the foveal field based on patient responses indicative of the patient's foveal vision function;
thereby measuring foveal vision including any degeneration in foveal vision function such as is manifested by foveal segmentation and abnormalities or changes in foveal vision.

4,927,261
METHOD AND APPARATUS FOR PHOTOGRAPHING A MOVEMENT
Ahti Rahikainen, Kääpäkuja 12, 00760 Helsinki, Finland
Filed Sep. 30, 1988, Ser. No. 251,898
Claims priority, application Finland, Oct. 6, 1987, 874374
Int. Cl.[5] G03B *19/18, 21/32*
U.S. Cl. 352—39 16 Claims



1. An apparatus for photographing a moving subject in order to study the motion of said subject wherein said subject is externally illuminated by a background lighting source and said subject has means for generating at least one light beam of essentially one selected wavelength from at least one moving point of said subject, said apparatus comprising:
a camera;
means for mounting said camera in front of said subject;
a disc having at least one transparent aperture allowing transmission of the light of said background lighting source reflected from said subject, a plurality of filter apertures circumferentially spaced from one another and from said at least one transparent aperture, a plurality of opaque regions of said disc separating said filter apertures from one another and said at least one transparent aperture from said filter apertures, and means, connected to said disc and associated with filter apertures, for filtering light such that only the light of said essentially one selected wavelength is transmitted through said filter apertures; and
means, connected to said mounting means, for rotating said disc in front of said camera such that said at least one light beam and said reflected light enter said camera through, respectively, said filter and transparent apertures, whereby a photograph produced by said camera comprises a series of light-streaks produced by said at least one light beam entering said camera through said filter apertures, a series of interruptions between said light-streaks produced by said opaque regions between said filter apertures and a series of stroboscopic images of said subject produced by said reflected light entering said camera through said at leat one transparent aperture.

4,927,262
MULTIPLE PUPIL PROJECTION DISPLAY
Alfred Schwartz, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Apr. 26, 1989, Ser. No. 343,326
Int. Cl.[5] G03B *21/60*
U.S. Cl. 353—13 20 Claims



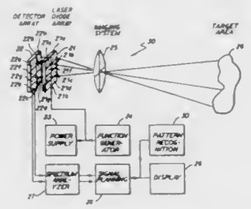
9. A multiple pupil projection lens comprising:
a field lens element having a first face and a second face, said second face of said field lens element comprising at least first and second sets of Fresnel lens segments, said first set of Fresnel lens segments having the equivalent curvature of a first lens and said second set of Fresnel lens segments having the equivalent curvature of a second lens, said first and second Fresnel lens segments being shaped to form first and second exit pupils.

4,927,263
POSITION AND VELOCITY IMAGING SYSTEM USING 2-D LASER DIODE ARRAY
Peter J. de Groot; Steven H. Macomber, both of Bethel, and Gregg M. Gallatin, Monroe, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Aug. 15, 1988, Ser. No. 232,074
Int. Cl.[5] G01C *3/08;* G01N *21/00;* G06K *9/46*
U.S. Cl. 356—5 8 Claims

1. An optical radar system for determining range and velocity information of a target comprising
a plurality of laser diodes for emitting a plurality of laser beams to a target;
a plurality of photodetectors, each responsive to one of said laser diodes for sensing variations therein caused by light

VOL 1114 ISS 4 MY 22 1990 UMI

which is from the one of said laser diodes and which is backscattered from the target;



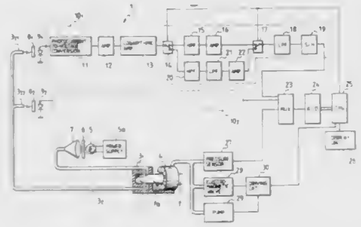
processing means connected to each photodetector for calculating range and velocity information of the target.

4,927,264

NON-INVASIVE MEASURING METHOD AND APPARATUS OF BLOOD CONSTITUENTS

Toshikazu Shiga, Kyoto, and Takuji Suzaki, Uji, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 1, 1988, Ser. No. 278,494
Claims priority, application Japan, Dec. 2, 1987, 62-304975; Dec. 2, 1987, 62-304976; Dec. 3, 1987, 62-306481
Int. Cl.[5] A61B *5/00*; G01N *21/17*
U.S. Cl. 356—41 8 Claims



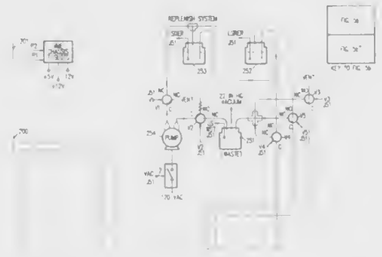
1. An apparatus for measuring a blood constituent in a living body, comprising:
light source means for illuminating a measuring part of said living body by at least two kinds of light beams with different wavelength components;
photodetecting means for detecting light beams transmitted from said measuring part;
logarithm-converting means for logarithm-converting photodetected signals outputted from said photodetecting means;
signal separation means for separating time-variant venous signal components corresponding to respective wavelength components from logarithm-converted signals;
pressure application means for applying pressure to a proximal portion from said measuring part; and
computing means for controlling said pressure application means so that said pressure may change with a peak value being about the minimum blood pressure and calculating a venous blood constituent characteristic on the basis of said venous signal components separated by said signal processing means.

4,927,265

DETECTOR FOR FLUORESCENCE AND ABSORPTION SPECTROSCOPY

Robert G. Brownlee, Los Altos Hills, Calif., assignor to 501 Microphoretic Systems, Inc., Sunnyvale, Calif.

Filed Apr. 29, 1988, Ser. No. 187,789
Int. Cl.[5] G01N *21/31, 21/64*
U.S. Cl. 356—73 21 Claims



1. A fluorescence and absorption detector comprising:
light source means for simultaneously providing a first light beam and a second light beam wherein said first and second light beams are simultaneously incident upon and interact with a sample and emerging light from such a sample is characteristic of said sample;
means, receiving said emerging light, for separating light into a number of different wavelengths wherein said emerging light is separated into different wavelengths; and
means, receiving each of said different wavelengths from said means for separating light, for providing an output signal corresponding to each of said different wavelengths;
wherein said first light beam includes a wavelength of light causing such a sample to fluoresce and said second light beam includes a wavelength absorbed by such a sample;
said emerging light comprises unabsorbed light from said second light beam and fluorescent radiation; and
a first subset of said output signals represent said flourescent radiation from such a sample and a second subset of said output signals represent said unabsorbed light from such a sample.

4,927,266

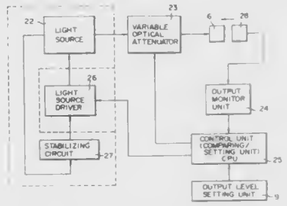
OPTICAL SIGNAL GENERATING APPARATUS AND OPTICAL POWER METER CALIBRATING SYSTEM USING THE SAME

Itsuo Sugiura; Yutaka Nishida; Kaoru Ito, and Toshiyuki Ozaki, all of Tokyo, Japan, assignors to Anritsu Corporation, Tokyo, Japan

PCT No. PCT/JP88/00316, § 371 Date Nov. 29, 1988, § 102(e) Date Nov. 29, 1988, PCT Pub. No. WO88/07700, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 30, 1988, Ser. No. 283,474
Claims priority, application Japan, Mar. 30, 1987, 62-76768; Jul. 31, 1987, 62-193069
Int. Cl.[5] G01J *1/08, 1/10*
U.S. Cl. 356—243 12 Claims

1. An optical signal generating apparatus comprising:
a light source;
light source driving means for driving said light source;
optical level adjusting means for receiving output light from said light source and adjusting the level of the output light;
optical output means for externally outputting the output light from said optical level adjusting means;

optical level setting means for setting the output light externally output from said optical output means to be a desired level;
output light monitoring means, detachably connected to said optical output means, for monitoring the output light; and
control means for comparing an optical output level set signal from said optical output level setting means with an output signal from said output light monitoring means to supply a control signal for adjusting the level of the output



light externally output from said optical output means to said optical level adjusting means in accordance with a comparison error, and when the comparison error becomes zero, for maintaining a value of the corresponding control signal to control such that said optical output means outputs output light of the desired level set by said optical output level setting means even after said optical output means is disconnected from said output light monitoring means.

4,927,267

METHOD AND APPARATUS FOR OPTICALLY MEASURING, WITHOUT CONTACT, THE GRANULOMETRY OF A CLOUD OF PARTICLES OR THE ROUGHNESS OF A SURFACE

Philippe Herré, Paris, France, assignor to Universite Paris X - Nanterre, Nanterre, France

Filed Mar. 21, 1989, Ser. No. 326,367
Int. Cl.[5] G01N *21/47*
U.S. Cl. 356—336 10 Claims



1. Method for the contactless measurement in real time of the granulometry of a cloud of particles or of the roughness of a surface characterized in that:
a diffraction pattern is formed of the cloud of particles or of the surface of the body, by means of a convergent lens,
this diffraction pattern is multiplied, in intensity, by a function f(r) such that

$$A(r^{1.5}+Br_o^4)<f(r)<A(r^4+Br_o^4)$$

with
A=constant determined by calibration
B=constant: $o<B<0.1$
r=distance measured in the focal plane of the lens with respect to the optical axis thereof,
r_o=maximum useful radius of the spatial filter,
and a reverse Fourier transform is carried out on the result of this multiplication, whose result forms the desired spectrum of the granulometry of the cloud of particles or the desired spectrum of the roughness of the surface.

4,927,268

OPTICAL ANALYSIS

Robert Carr; David J. Clarke, and Tony Atkinson, all of Salisbury, United Kingdom, assignors to Public Health Laboratory Service Board, Salisbury, United Kingdom

PCT No. PCT/GB87/00627, § 371 Date Jul. 5, 1988, § 102(e) Date Jul. 5, 1988, PCT Pub. No. WO88/01736, PCT Pub. Date Mar. 10, 1988
PCT Filed Sep. 7, 1987, Ser. No. 215,070
Claims priority, application United Kingdom, Sep. 5, 1986, 8621426
Int. Cl.[5] G01N *15/02*
U.S. Cl. 356—336 14 Claims



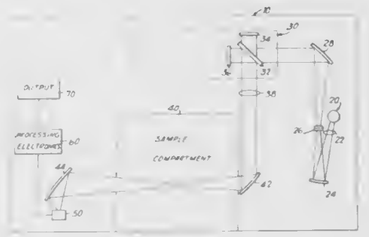
1. Apparatus for optical analysis comprising a detection zone; a common optical fibre for carrying first and second laser beams which are mutually coincident and of different wavelengths; a common focusing lens arranged to focus the two beams at respective focal points spaced longitudinally of an axis extending through the detection zone, such that in the detection zone the transverse extents of the two beams are different and in a predetermined ratio, and a pair of light detectors focused at the detection zone and responsive respectively to light scattered from the first and second laser beams.

4,927,269

CORRECTION OF NON-LINEARITIES IN DETECTORS IN FOURIER TRANSFORM SPECTROSCOPY

Axel Keens, and Arno Simon, both of Karlsruhe, Fed. Rep. of Germany, assignors to Bruke Analytische Messtechnik GmbH, Rheinstetten, Fed. Rep. of Germany

Filed Jan. 31, 1989, Ser. No. 304,697
Int. Cl.[5] G01B *9/02*; G01J *3/45*
U.S. Cl. 356—346 11 Claims



1. In a Fourier transform spectrometer comprising means for forming an interferogram, a detector for detecting the interferogram and signal processing means connected to said detector for Fourier transforming a signal representative of the interferogram detected by said detector, a method of compensating for non-linearities in said detector and/or said signal processing means comprising the steps of:

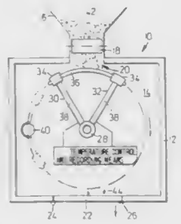
VOL
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forming an interferogram by interfering two beams of radiation,
detecting said interferogram by producing a signal representative of said interferogram,
said signal having first spectral components below a cutoff frequency of said detector and second spectral components above said cutoff frequency,
determining from said first and second spectral components first and second correction factors of the interferogram,
calculating a corrected interferogram using said first and second correction factors, and
Fourier transforming said corrected interferogram to form a corrected Fourier transform.

4,927,270
METHOD OF AND APPARATUS FOR DETERMINING MELTING POINTS

John A. Bonnard, P.O. Box 781393, Sandton, Transvaal, South Africa

Filed Nov. 9, 1988, Ser. No. 269,014
Claims priority, application South Africa, Nov. 18, 1987, 87/8616
Int. Cl.[5] G01N 25/04
U.S. Cl. 374—16 9 Claims



1. A method of determining the melting point of a powdered or particulate material which includes the steps of producing a heated surface, gradually increasing the temperature of the heated surface, causing a succession of samples of the material to contact the heated surface and moving the heated surface in between the loading of the succession of samples to discharge from the heated surface unmelted powdered or particulate material remaining from a preceding sample, and observing each sample of the material on the heated surface to detect whether the respective sample of the material melts on the heated surface.

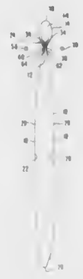
7. Apparatus for determining the melting point of a powdered or particulate material which includes a container for the material, a surface, means for heating the surface to a desired temperature in a controlled manner, means for effecting relative movement between the surface and the container, means for releasing a plurality of samples of the material from the container to move successively under gravity action onto the heated surface, means for displacing unmelted material from the heated surface before a subsequent sample of the material moves onto the heated surface, and means for recording the temperature of the heated surface at which the material melts.

4,927,271
RECLOSEABLE TAMPER EVIDENT BAG WITH HOODED CLOSURE

Mark E. Branson, Shelbyville, Ind., assignor to KCL Corporation, Shelbyville, Ind.

Filed Dec. 12, 1988, Ser. No. 282,615
Int. Cl.[5] B65D 33/34
U.S. Cl. 383—5 16 Claims

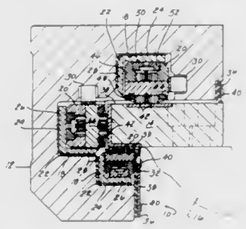
1. A tamper evident reclosable bag comprising two opposing plastic wall panels having a tamper evident hooded closure and reclosable separable fastener assembly attached to said wall panels proximate to the top, said assembly comprising:
oppositely disposed first and second cooperating fastener profile elements attached to the inside surfaces of said wall panels arranged in a position facing each other; and
said first and second cooperating fastener profile elements being selectively interlockable when pressed together and selectively releasable when pulled apart;
a hooded closure attached at a pair of lower portions thereof to the outside surfaces of said wall panels and having an integral upper portion thereof enveloping said top of said wall panels and preventing said cooperating fastener profile elements from being openable and reclosable prior to removal of said hooded closure;
said hooded closure having a line of perforations extending lengthwise across said hooded closure and situated below the top of said wall panels to effect removal of said hooded closure and allow access to said cooperating fastener profile elements thereby visually indicating the opened condition of said bag;
said upper portion of said hooded closure being adapted for easy removal from said wall panels by pulling said upper portion of said hooded closure above said top of said wall panels in an upward motion, thereby tearing said hooded closure along said line of perforations.



4,927,272
LINEAR BEARING WITH IMPROVED LUBRICATION SYSTEM AND METHOD

Robert E. Ward, Jr., Charlotte, N.C., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed May 22, 1989, Ser. No. 355,262
Int. Cl.[5] F16C 29/06
U.S. Cl. 384—13 6 Claims

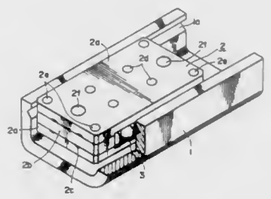


1. In combination, a linear bearing (20) installed in a recess (18) in a structure (12) so as to support said structure (12) on a way surface (38), an adjustment mechanism (58) drivingly interconnecting said structure (12) and said linear bearing (20) to enable lengthwise shifting of the position thereof in said recess (18), a lubrication system for directing lubricant into said linear bearing (20), said lubrication system characterized by a lubricant injector assembly (60) mounnted in said structure (12) and having an injector tube (96) extending in a lengthwise direction into said recess (18), said linear bearing (20) having a receptor (98), with said injector tube (96) telescoped into said receptor (98) to accommodate said adjustment of said linear bearing (20) in said recess (18).

4,927,273
LINEAR MOTION ROLLING CONTACT BEARING ASSEMBLY HAVING A FEED-IN PORT

Tatsuo Mottate, Mitaka, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,605
Int. Cl.[5] F16C 29/06
U.S. Cl. 384—45 3 Claims

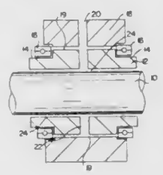


1. A linear motion rolling contact bearing assembly comprising:
a rail extending over a predetermined distance and including at least one guide groove which defines a predetermined travel path;
a slider operatively coupled to said rail to travel along said predetermined travel path in either direction, said slider including a main body provided with at least one endless circulation path and at least one feed-in port for feeding roller members into said endless circulation path, said at least one feed-in port being in communication with said endless circulation path, means for plugging said at least one feed-in port to prevent egress of roller members therefrom, said endless circulation path including a load path section defined along one side of said main body opposite to said guide groove, and said endless circulation path being provided with a plurality of said rolling members which may roll along said endless circulation path whereby said rolling members provide a rolling contact between said slider and said rail by engaging with said guide groove when located at said load path section;
wherein said main body includes a pair of upper and lower bearing plates which are formed with grooves and which when brought together in a face-to-face contact define said endless circulation path and said at least one feed-in port;
wherein said upper and lower bearing plates are generally rectangular in shape and identical in structure and said at least one feed-in port is defined at one end portion of said main body; and
wherein said main body also includes a pair of front and rear end plates fitted into front and rear clearances defined at front and rear ends of said main body when said pair of upper and lower bearing plates are brought together, whereby one of said pair of front and rear end plates serves as said means for plugging.

4,927,274
SLIP RING AIR BEARING

Robert S. Smith, 1263 Emory St., San Jose, Calif. 95126

Filed Jun. 23, 1989, Ser. No. 370,607
Int. Cl.[5] F16C 21/00
U.S. Cl. 384—101 7 Claims

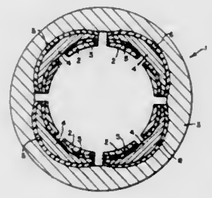


1. A journal air bearing to support a rotor having an axially symmetric surface, said bearing comprising:
a sleeve having two ends and an inner and outer surface concentric with said rotor;
said inner surface defining an air bearing space with said rotor surface;
a stator having a stator wall which defines a chamber having a surface enclosing said sleeve;
a ball bearing on each said sleeve end having an outer surface in supporting contact with said chamber surface and an inner surface in supporting contact with said said outer sleeve surface defining a closed space between said chamber surface and said outer sleeve surface;
said airbearing space supplied by pressurized air from a supply of air through a passage leading from said pressurized air supply, through said stator wall and said sleeve, to said airbearing space.

4,927,275
EQUALIZING HYDRODYNAMIC BEARING

James L. Lawson, Simsbury, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Sep. 23, 1988, Ser. No. 248,062
Int. Cl.[5] F16C 17/03
U.S. Cl. 384—117 17 Claims



1. A hydrodynamic bearing assembly for supporting an opposing moving member, said bearing assembly comprising: a plurality of bearing pads adjacent to said moving member; a support structure; a plurality of equalizing pads disposed between said bearing pads and said support structure; and an elastomeric layer disposed between said bearing pads and said equalizing pads, wherein at least two bearing pads are attached to each equalizing pad.

VOL
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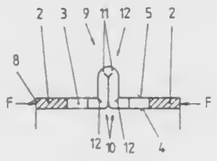
Robert Stolz, Schweinfurt; Knut Mirring, Gochsheim; Rudolf Hein, Hambach; Dieter Simon, Kolbingen; Lothar Raab, and Peter Glatz, both of Mühlheim, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 130,000, Dec. 8, 1987, abandoned. This application Aug. 16, 1989, Ser. No. 395,142

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642114

Int. Cl.[5] F16C *33/54*

U.S. Cl. 384—572 5 Claims



1. In a pocket cage, formed from a deformable sheet, having first and second side rings and a plurality of webs extending therebetween, each web having a projection in its middle area when formed comprising a folding formed by bending at a plurality of bending points, including a bending point at the middle of each web, the improvement wherein at least the material in the middle of each web of said deformable sheet has reduced resistance to bending relative to the segments of material of the respective web adjoining the bending points and on either side of said bending points; and whereby bending produces a radial projection in the middle of each web, comprising a felded laminate, each lamina tapering steadily radially outwardly from the radius of the side rings to the region of a central bend.

4,927,277

PRINTER HAVING A DEVICE FOR ADJUSTING THE PRINTING CONDITION, DEPENDING UPON PAPER THICKNESS

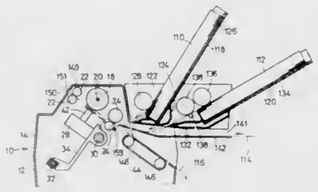
Takeshi Niikawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Apr. 3, 1989, Ser. No. 332,057

Claims priority, application Japan, Apr. 6, 1988, 63-84423

Int. Cl.[5] B41J *11/50*

U.S. Cl. 400—56 18 Claims



1. A printing apparatus for printing on a recording medium, comprising:

a platen mounted on a frame, for supporting the recording medium;

a print head for effecting a printing operation on the recording medium supported by the platen, while the print head is moved along the platen;

changeover means for changing a printing condition of the print head;

a plurality of medium delivery devices for delivering different types of the recording medium, at least one of said medium delivery devices including at least one of a sheet stacker for supporting a stack of cut sheets as one of said different types of recording medium and pressing a top sheet of said stack against a feed roll, and a paper casing supported by said frame for accommodating a corresponding one of said different types of recording medium;

a medium feeding device for feeding the recording medium from one of said medium delivery devices a along a feed path leading to a printing position between said platen and said print head;

at least one of five elements which consist of (a) a first detector generating a first signal when said sheet stacker is moved to a fully retracted position thereof remote from said feed roll, (b) a second detector generating a second signal when said paper casing is removed from said frame, (c) selector means for generating a third signal for selecting one of said medium delivery devices from which the recording medium is delivered for printing by said print head, (d) a third detector generating a fourth signal indicative of an absence of the recording medium from said selected medium delivery device, in said feed path, and thereby detecting depletion of said recording medium in said selected medium delivery device, and (e) an operator-controlled print start switch for generating a fifth signal for initiating said printing operation;

medium thickness detecting means for detecting the thickness of the recording medium; and

control means responsive to a trigger signal which consists of one of said first, second, third, fourth and fifth signals and which is indicative of a possibility of a change in the thickness of the recording medium, for activating said medium thickness detecting means to detect the thickness of the recording medium, and activating said changeover means to change the printing condition of said print head, depending upon the thickness of the recording medium detected by said medium thickness detecting means.

4,927,278

TAPE CASSETTE AND TAPE PRINTER FOR USE THEREWITH

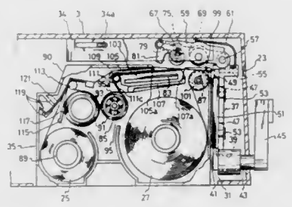
Susumu Kuzuya, Gifu; Yoshiaki Nagao, Mizuho; Hideo Asakura, Nagoya, and Shigenori Hattori, Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 28, 1988, Ser. No. 291,143

Claims priority, application Japan, Dec. 29, 1987, 62-199662[U]; Oct. 17, 1988, 63-135230[U]; Oct. 17, 1988, 63-135277[U]

Int. Cl.[5] B41J *35/28*

U.S. Cl. 400—208 10 Claims



1. A tape cassette for being detachably loaded in a tape printer having a frame, a printing head, a platen and tape driving means, said printing head and platen being provided in a printing area in said-frame, said printing head and said platen being relatively movable between an inoperative position, at which they are spaced apart, and an operative position, in which they are in contact with each other to perform a printing operation, comprising:

a housing with a tape outlet;

first to third accommodating sections provided in said housing;

an image source tape accommodated in said first accommodating section and driven by said tape driving means between said printing head and platen;

a substantially transparent image receiving tape accommodated in said second accommodating section, driven by said tape driving means in an overlapped state over said image source tape between said printing head and platen, said image receiving tape having a printing surface facing said image source tape, an image being transferred to said printing surface through said image source tape by said printing head in a printing operation; and

an adhesive tape accommodated in said third accommodating section, driven by said tape driving means, and applied to said printing surface of said image receiving tape after the printing operation.

4,927,279

KEYBOARDS FOR HOMES

Ruth B. Morgan, 737 N. Nelson St., #28, Arlington, Va. 22203

Continuation of Ser. No. 589,412, Mar. 14, 1984, abandoned. This application Sep. 11, 1989, Ser. No. 405,592

Int. Cl.[5] B41J *5/10*

U.S. Cl. 400—486 3 Claims



1. A keyboard display for use on typewriters and other typographical equipment having keys or key designations wherein three rows are provided with a top row of 10 keys, a center row of 11 keys, and a bottom row of 11 keys comprising:

Five vowels, A, E, I, O, U, displayed in alphabetical order on the center five keys of the center row and said center row further displaying on the outer three keys at each end all of the punctuation marks, provided on said keyboard, said punctuation marks including the quotation mark, colon, semicolon, comma, question mark, and period and said top and bottom rows displaying only the remaining letters of the alphabet in horizontal ascending alphabetical sequence starting at the left end of the top row.

4,927,280

PLATEN ROLLER

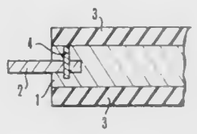
Jun Murata, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 159,540, Feb. 22, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 415,461

Claims priority, application Japan, Feb. 23, 1987, 62-37734

Int. Cl.[5] B41J *11/02;* B41B *31/08*

U.S. Cl. 400—661 11 Claims



1. A platen roller comprising a solid cylindrical base body defining a longitudinal axis and having a first end, a second end and defining an outer surface having a predetermined diameter, said base body providing at least one rotating shaft such that a rotating shaft end protrudes from said first end and a rotating shaft end protrudes from said second end, said rotating shaft ends being aligned generally concentrically with said longitudinal axis;

said platen roller further comprising a hard elastic layer covering said outer surface of the base body having a predetermined diameter, wherein said base body is constructed from a metal selected from the group consisting of lead, iron, zinc and alloys of at least one of such metals, the ratio of the diameter of the base body to the diameter of the elastic layer being from 0.45–0.75:1,

said rotating shaft being secured to said base body by means of a pin positioned in said rotating shaft with at least one end at the peripheral surface of said base body, said pin positioned so as not to protrude into the hard elastic layer.

4,927,281

BRUSH FOR APPLYING MASCARA AND CONTAINER

Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Feb. 10, 1989, Ser. No. 308,726

Claims priority, application France, Feb. 12, 1988, 88 01690

Int. Cl.[5] A46B *9/06, 11/00*

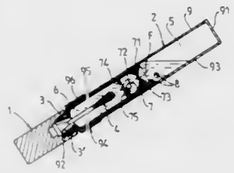
U.S. Cl. 401—129 13 Claims



1. A brush for applying a makeup product, in particular for applying mascara to the eyelashes or a dye to the hair, including a plurality of bristles held between the spirals of at least two branches of a helically twisted metal wire that forms the core defining the longitudinal axis of the brush, wherein over at least a portion of a brush, some of said bristles are provided at the surface thereof with at least one groove extending substantially from the base to the tip of said respective bristles, and some of said plurality of bristles having cross sections which have different shapes from that of other of said bristles, so that said plurality of bristles comprise at least two types, and that the bristles, having different cross-sectional shapes, are spaced apart along said axis of the core, and that a space exists between the bristles to permit the penetration of the eyelashes or hair, the bristles of different cross-sectional shapes resulting in filling of different amounts of the product along the brush, some of said bristles having a cross section area larger than other of said bristles and the bristles having a cross section of larger area being made of a material capable of softening when it is dipped into the product intended to be spread by the brush.

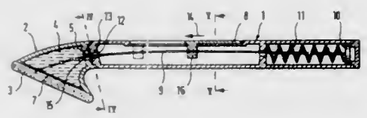
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4,927,282
CONTAINER FOR NAIL POLISH
Bruno Morane, Neuilly, and Gërard Joulia, Paris, both of France, assignors to L'Oreal, Paris, France
Filed Mar. 13, 1989, Ser. No. 322,571
Claims priority, application France, Mar. 11, 1988, 88 03192
Int. Cl.[5] A45D *34/00*; A46B *11/00*
U.S. Cl. 401—129 9 Claims



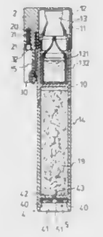
1. A container for nail polish including a bottle for containing the nail polish and a stopper provided with a brush affixed with a rod whereby said brush is dipped into the bottle when the container is closed, the bottle being elongated in shape, and being divided along its length into a first and a second compartment separated by a valve means, the brush being contained entirely within the first compartment, which is the closest to the stopper, said valve means having a valve member which moves to a closed position when said container is substantially vertically upright with said first compartment disposed above said second compartment and to an open position at least when said second compartment is disposed at least partially above said first compartment.

4,927,283
APPLICATOR DEVICE WITH PUNCTURING MEANS
Holger Fitjer, Ansbach, Fed. Rep. of Germany, assignor to Georg Karl geka-brush GmbH, Bechhofen-Waizendorf, Fed. Rep. of Germany
Filed Apr. 27, 1989, Ser. No. 344,330
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1988, 3814305
Int. Cl.[5] A47L *17/00*; A61M *35/00*
U.S. Cl. 401—132 20 Claims



1. An applicator device for the application of a liquid or pasty substance, comprising a handle means having an interior chamber, an applicator means having a sealed compartment in which said liquid or pasty substance is sealed, detachable connecting means on said handle means and on said applicator means detachably connecting said applicator means to said handle means, said applicator means having at least a part thereof made of a penetrable material, a release means movably mounted in said interior chamber of said handle means between an extended and a retracted position, said handle means having an opening opening up into said interior chamber, said release means having an operable part extending into said opening and disposed to be engageable by the user of the applicator to move said release means between said extended and retracted positions, said release means being movable from its retracted to its extended position to penetrate said penetrable material and thereby effect release of said liquid or pasty substance from said sealed compartment, said release means in its retracted position being spaced from said applicator means to enable connection of said applicator means to said handle means by said detachable connecting means while said liquid or pasty substance remains sealed in said sealed compartment.

4,927,284
PEN-LIKE EYEGLASS CLEANER
Allan Tsai, 2nd Fl., No. 1, Lane 222, Tun-Hua N. Rd., Taipei, Taiwan
Filed Jun. 20, 1989, Ser. No. 368,810
Int. Cl.[5] G02C *13/00*
U.S. Cl. 401—195 6 Claims



1. A pen-like eyeglass cleaner including a hollow pen body having a first end and a second end, a wiping tip of absorbent material disposed on said first end of said pen body, a detergent container mounted detachably in said pen body, an amount of detergent which is held in said container, a roll of cleaning cloth mounted detachably in said pen body, and a cap which is sized to firmly cover said first end of said pen body and has a clip secured thereto, characterized by a magnifying glass mounted detachably on said pen body, and a screwdriver mounted detachably on said clip.

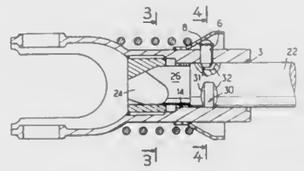
4,927,285
BALL JOINT DESIGN
Steven P. Kotz, Norwalk, and John H. Lane, Hudson, both of Ohio, assignors to The Pullman Company, Princeton, N.J.
Continuation of Ser. No. 151,729, Feb. 19, 1988, abandoned.
This application May 15, 1989, Ser. No. 353,170
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—133 5 Claims



1. In a bonded ball joint having a ball-stud member with a ball portion at one end and a shank portion at the other end; an open-ended socket member surrounding said ball portion in spaced relationship thereto, said open end of the socket member forming a window in the socket member through which said shank portion projects, the window and ball-stud member defining clearance therebetween the ball-stud member and the socket member without allowing the ball portion to pass through the window, and an elastomer coating layer, bonded to said ball stud member and resiliently interconnecting the ball stud member and the socket member, the improvement comprising:

said socket member having an inner wall portion, said inner wall portion being outwardly tapered away from the open end of the socket member in a smooth continuous manner for essentially its entire length for controlling and minimizing adverse stress concentration in the bonded ball joint.

4,927,286
RAPID CONNECTION BETWEEN TWO SHAFTS OR THE LIKE
Andio Hobluigie; Jean-Pierre Barnabë, both of Valentigney, and Frederic Mouhot, Voujeancourt, all of France, assignors to ECIA - Equipements et Composants Pour L'Industrie Automobile, Audincourt, France
Filed Jul. 20, 1988, Ser. No. 221,583
Claims priority, application France, Jul. 20, 1987, 87 10238; Feb. 11, 1988, 88 01651
Int. Cl.[5] F16B *7/00*
U.S. Cl. 403—322 5 Claims

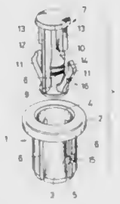


1. A rapid connection between two rotary members, such as shafts, having axes of rotation, said connection comprising, on an end of one of said rotary members, a cylindrical hollow socket having a wall defining said hollow of the socket, a cylindrical elongated stem on an end of the other rotary member, a fixed inner drive block having inclined inner faces and being in a fixed position in the socket, a pyramidal end head on the stem and having inclined faces corresponding to and cooperative with said inclined faces of the block, locking pins extending substantially radially through said wall of the socket and movable between an outer position in which the pins are retracted within said wall of the socket and out of said hollow of the socket, and an inner locking position in which the pins extend radially inwardly beyond said wall into said hollow of the socket, means associated with the pins for elastically biasing the pins to said inner locking position, means for retaining the pins in said outer position so long as the socket has not received the pyramidal end head, means on the stem cooperative with the pins for moving the pins to said outer position, and notches in the stem for receiving the pins in said inner locking position for axially locking together the two rotary members and ensuring a connection without any angular or axial play between said rotary members; wherein

said means for biasing the pins comprise a frustoconical ring slidably mounted on the socket and a spring for biasing the ring in a direction to cause the ring to bear against outer ends of the pins; and

the frustoconical ring is freely rotatable relative to the socket and defines, for each locking pin, a helical ramp, and the pins have a head on which the respective ramp is capable of fitting so that the ramp radially displaces the respective pin relative to the notches of the stem upon rotation of the frustoconical ring relative to the socket.

4,927,287
FASTENER FOR FASTENING PLATES TOGETHER
Toshiya Ohkawa, Nagayo; Hiromichi Nakayama, and Tatsuya Iguchi, both of Toyota, all of Japan, assignors to NIFCO, Inc., Yokohama, Japan
Filed Jun. 20, 1989, Ser. No. 368,759
Claims priority, application Japan, Jun. 28, 1988, 63-158201
Int. Cl.[5] F16B *13/06*
U.S. Cl. 403—408.1 13 Claims



1. A fastener, comprising:

a female body to be inserted through aligned first and second holes formed within overlapped first and second plates to be fastened together; and

a male body for causing flaring of said female body,

said female body having a head portion for engaging a plate surface portion surrounding said first one of said holes defined within said first plate, a plurality of circumferentially spaced-apart leg portions depending from said head portion and each having an inner projection projecting from a lower free end portion and an axially central male body insertion hole penetrating said head portion and extending axially centrally between said leg portions,

said male body having a pin-like portion having sufficient length so as to penetrate the entire length of said insertion hole, said pin-like portion having an axially intermediate large-diameter portion having a diameter not greater than the diameter of said insertion hole of said female body and first and second small-diameter portions separated by means of said large-diameter portion, said male body further having a plurality of elastic engagement pieces extending obliquely upwardly and outwardly from a lower end portion of said pin-like portion,

said fastener being capable of changing its state between a first state in which said male body is temporarily coupled to said female body by inserting said male body into said insertion hole of said female body such that said inner projections of said leg portions of said female body abut said first small-diameter portion of said male body and said elastic engagement pieces project outwardly through gaps defined between adjacent leg portions of said female body, a second state in which said leg portions of said female body are flared outwardly as a result of abutment of said inner projections of said leg portions of said female body with said large-diameter portion of said male body, and a third state in which said leg portions of said female body are brought closer to one another as a result of said inner projections of said leg portions of said female body being brought into abutment with said second small-diameter portion of said male body,

said female and male bodies being provided with respective stopper means which engage each other in said first state so as to prevent any change of said fastener from said first state to said second state,

one of said female and male bodies being further provided with releasing means for releasing said engagement between said stopper means when said leg portions of said female body are inserted through said second one of said holes defined within said second plate to be fastened to said first plate.

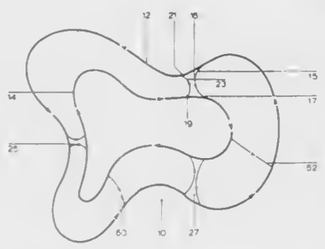
VOL
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4,927,288

ROAD TRAFFIC NETWORK

Subhash Raswant, 84-49 168th St., Apt. 1U, Jamaica, N.Y. 11432

Filed Nov. 25, 1988, Ser. No. 276,038
Int. Cl.[5] E01C *1/00*
U.S. Cl. 404—1 20 Claims



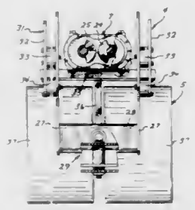
1. A road traffic system comprising:
(a) a first endless loop of roadway, directing traffic flow in a first one-way direction;
(b) a second endless loop of roadway, directing traffic flow in a second one-way direction opposite the said first one-way direction, said second endless loop of roadway being surrounded by said first endless loop of roadway and having no points of loop roadway intersection; and
(c) at least one traffic loop interconnecting roadway means having two roadway portions in one-way opposite directions extending between said first endless loop of roadway and said second endless loop of roadway, said interconnecting roadway means allowing traffic to transfer between said first and second endless loops without crossing over or intersecting traffic traveling on said road traffic system.

4,927,289

VIBRATORY MECHANISM FOR A COMPACTION ROLLER

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to M-B-W Inc., Slinger, Wis.

Continuation-in-part of Ser. No. 210,911, Jun. 24, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,539
Int. Cl.[5] E01C *19/26*
U.S. Cl. 404—117 11 Claims



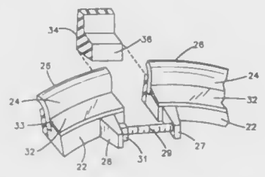
1. A compaction apparatus, comprising a first frame, a second frame, first resilient means interconnecting said first and second frames, second resilient means interconnecting said first and second frames and spaced from said first resilient means, a means mounted on said second frame and including a pair of eccentric weights constructed and arranged to add vertical vibrational forces generated by said weights and to cancel fore-and-aft vibratory forces, said first resilient means and said second resilient means being offset horizontally from a vertical plane passing through the axis of said drum, said first resilient means being offset a greater distance from said plane than said second resilient means, whereby the downward vertical vibratory forces acting through said offset distances will tend to rotate the drum and subject the soil to a shear type of action.

4,927,290

MANHOLE COVER SUPPORT RESISTANT TO WATER INFILTRATION

Harold M. Bowman, 18867 N. Valley Dr., Fairview Park, Ohio 44126

Continuation-in-part of Ser. No. 207,325, Jun. 15, 1988, abandoned, and a continuation-in-part of Ser. No. 201,573, Jun. 1, 1988, Pat. No. 4,867,600, and a continuation-in-part of Ser. No. 207,266, Jun. 15, 1988, Pat. No. 4,867,601, and a continuation-in-part of Ser. No. 207,185, Jun. 15, 1988, Pat. No. 4,872,780, and a continuation-in-part of Ser. No. 362,216, Jun. 6, 1989, and a continuation-in-part of Ser. No. 362,257, Jun. 6, 1989, each is a continuation-in-part of Ser. No. 76,668, Jul. 23, 1987, Pat. No. 4,834,574. This application Jul. 11, 1989, Ser. No. 378,412
Int. Cl.[5] E02D *29/14*
U.S. Cl. 404—26 22 Claims



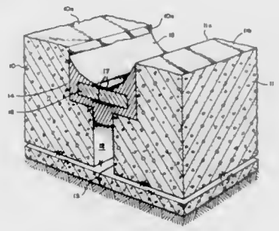
1. A manhole cover support adapted for accommodating a layer of paving around its outer perimeter and a manhole cover therewithin while raising the effective grade of an existing manhole cover receiving structure, the existing receiving structure having a manhole cover sill and an inside shoulder surface ascending therefrom, the manhole cover support comprising:
a body that has at least one adjustable joint equipped with spreader means for rendering the cover support adjustable in its outer perimeter dimension,
the spreader means being capable of creating a gap in the base upon expansion of the body;
a plurality of deformable seal elements comprising synthetic or natural resin-containing material; and
compressible plug means for each said adjustable joint,
the plug means comprising synthetic and/or natural resin-containing material,
the body including a base having a ledge for supporting the manhole cover,
the ledge having a lateral cover keeper arising therefrom,
the base having an outer wall, at least part of which is adapted to react around its periphery against said shoulder surface upon expansion of the body with the spreader means,
one of the seal elements being disposed on the ledge and at least one other of the seal elements being disposed substantially around the outer perimeter of the body including at least the outer wall of the base thereof,
the seal element around the outer wall of said base being sufficiently thick for obtaining continuity of contact between said outer wall and said shoulder surface,
the continuity being interrupted only by the gaps in the base,
the minimum thickness of the seal element around the outer wall of the base being between 8 and 9 mils, the maximum about 600 mils,
the coefficient of static friction of the seal element around said outer wall with respect to said shoulder surface substantially exceeding the coefficient of static friction obtainable directly between said outer wall and said shoulder surface,
the plug means being adapted to interact with the seal elements at the gaps to block substantial infiltration of surface water into the manhole.

4,927,291

JOINT SEAL FOR CONCRETE HIGHWAYS

Michael C. Belangie, 27 Q St., Salt Lake City, Utah 84103

Continuation-in-part of Ser. No. 1,699, Jan. 9, 1987, Pat. No. 4,824,283. This application May 3, 1988, Ser. No. 189,631
The portion of the term of this patent subsequent to Apr. 25, 2009, has been disclaimed.
Int. Cl.[5] E01C *11/10*
U.S. Cl. 404—64 12 Claims



1. A sealed joint between adjoining slabs of concrete in a highway or other area subject to vehicular traffic, the slabs being separated by a shrinkage-control cut or by a construction joint, said sealed joint comprising a joint installation channel above and extending along and across said cut or construction joint, said channel having a width sufficiently narrow that traffic loads are carried by the concrete bordering said channel rather than by said sealed joint; a preformed and relaxed length of a ductile and elastic material within said channel bridging and extending along said shrinkage control cut or construction joint; a ductile and elastic type of adhesive bonding said preformed and relaxed length to at least part of the concrete faces of said installation channel, the concrete of the slabs being an ordinary type of concrete having voids at faces of the joint installation channel; and an antibonding material applied to width surfaces of the preformed and relaxed length that bridge and extend along the shrinkage control cut or construction joint and that are covered by the adhesive, said voids being filled by the adhesive.

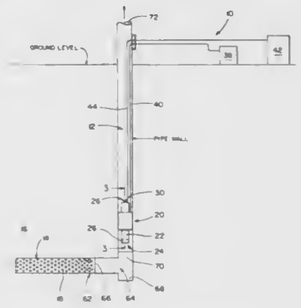
12. A method of making a sealed joint between adjoining slabs of concrete in a highway or the like that are separated by a shrinkage-control cut or by a construction joint, comprising the steps of forming a sealed joint installation channel above and extending along and across said cut or construction joint, said channel above and extending along and across said cut or construction joint, said channel having a width sufficiently narrow that traffic loads are carried by the concrete bordering said channel; placing a preformed and relaxed length of a ductile and elastic material within said channel bridging and extending along said shrinkage control cut or construction joint; and bonding said preformed and relaxed length to at least part of the concrete faces of said installation channel by means of a ductile and elastic type of adhesive, the preformed and relaxed length being a strip of silicone material wound on itself as a roll and placed in the adhesive as it is being unrolled.

4,927,292

HORIZONTAL DEWATERING SYSTEM

Donald R. Justice, P.O. Box 458, Matiacha, Fla. 33909

Filed Mar. 17, 1989, Ser. No. 324,700
Int. Cl.[5] E02B *11/00*
U.S. Cl. 405—43 6 Claims



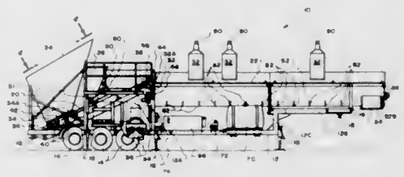
5. A method for removing water from underground, said method comprising the steps of:
digging a horizontally elongated trench,
locating a length of perforated pipe at the bottom of said trench,
covering said length of perforated pipe,
connecting a length of imperforate pipe to said perforated pipe, said imperforate pipe extending from above ground to said imperforate pipe located below ground,
inserting a submersible pump into and within said imperforate pipe, said submersible pump having a proximal discharge port and a distal suction port,
positioning said submersible pump in said imperforate pipe with said suction port being proximate said perforated pipe,
energizing said submersible pump,
creating a vacuum below said pump to draw water into said suction port of said pump from said perforated pipe and expelling water out of said discharge port of said submersible pump into said imperforate pipe, and
expelling water out of said imperforate pipe above ground level.

4,927,293

METHOD AND APPARATUS FOR REMEDIATING CONTAMINATED SOIL

Randy P. Campbell, 712 E. Locust, Lompoc, Calif. 93436

Filed Feb. 21, 1989, Ser. No. 312,934
Int. Cl.[5] B09B *3/00*
U.S. Cl. 405—128 31 Claims



1. An apparatus for remediating contaminated material, comprising:
(a) means for conveying a contaminated material from a receiving location to a transfer location;
(b) means for dispensing an absorbent material on the con-

VOL 1114 ISS 4 MY 22 1990 UMI

taminated material between said receiving and transfer locations;

(c) means for receiving the contaminated and absorbent materials at said transfer location and for concurrently mixing the materials together and transporting them from said transfer location to a deposit location;

(d) means for applying an oxidizing material on the contaminated and absorbent materials between said transfer and deposit locations to produce mixing of the oxidizing material therewith between said transfer and deposit locations; and

(e) means for injecting oxygen containing gas the contaminated, absorbent and oxidizing materials between said transfer and deposit locations concurrently as the oxidizing material is being applied and the contaminated, absorbent and oxidizing materials are being mixed to produce a reaction therebetween which forms reaction by-products more environmentally acceptable than the contaminated material for discharge at said deposit location.

23. A method for remediating contaminated material, comprising the steps of:

(a) conveying a contaminated material from a receiving location to a transfer location;

(b) dispensing an absorbent material on the contaminated material between the receiving and transfer locations;

(c) receiving the contaminated and absorbent materials at the transfer location and concurrently mixing the materials together and transporting them from the transfer location to a deposit location;

(d) applying an oxidizing material on the contaminated and absorbent materials between the transfer and deposit locations to produce mixing of the oxidizing material therewith between the transfer and deposit locations; and

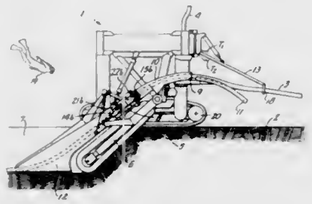
(e) aerating the contaminated, absorbent and oxidizing materials between the transfer and deposit locations concurrently as the oxidizing material is being applied and the contaminated, absorbent and oxidizing materials are being mixed to produce a reaction therebetween and form reaction by-products which are more environmentally acceptable than the contaminated material for discharge at the deposit location.

4,927,294

METHOD AND EQUIPMENT FOR LAYING AN ELONGATED ELEMENT UNDERGROUND

Francesco Magnani, Pavia, and Paolo Minardi, Martellago, both of Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Apr. 18, 1989, Ser. No. 339,407
Claims priority, application Italy, Apr. 22, 1988, 20292A
Int. Cl.[5] F16L *1/00*
U.S. Cl. 405—177 20 Claims



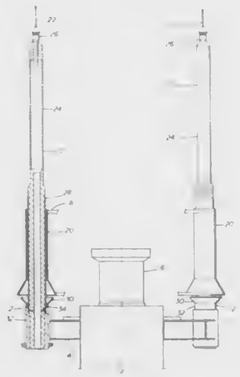
1. In the laying of an elongated element in a trench in the ground, which element has previously been laid on the ground, with apparatus which advances in a predetermined direction and which forms said trench, lifts said element from the ground at the upstream side of the apparatus and then deposits said element in said trench at the downstream side of the apparatus, said apparatus having ways for receiving and slidably engaging said element in its passage from the upstream side of said apparatus to the downstream side thereof, whereby a first portion of said element at and downstream of said apparatus is subjected to a first tension force in the direction of advance of said apparatus due to the friction between said ways and said element and to the resistance to movement of the portion of said element deposited in said trench and a second portion of said element upstream of said apparatus is subjected to second tension force in the opposite direction at the upstream side of said ways due to the weight of the lifted portion of said element upstream of said apparatus and to the resistance to movement of the portion of said element upstream of said apparatus, the method of at least partially offsetting any difference between said first tension forced applied to said elongated element in the first-mentioned said direction and said second tension applied to said element in said opposite direction which comprises engaging said element intermediate said upstream side and said downstream side of said apparatus and applying a third tension force to said element in the direction opposite to the direction of advance of said apparatus at least equal to said first tension force.

4,927,295

RETRIEVABLE GUIDE POST SYSTEM

David G. Knowles, Cleckheaton, England, assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Jan. 9, 1989, Ser. No. 294,784
Claims priority, application European Pat. Off., Sep. 9, 1988, 88308354.5
Int. Cl.[5] E02D *5/74;* E21B *43/01*
U.S. Cl. 405—195 16 Claims



1. A retrievable guide post comprising

a tubular body having external means for engagement of said tubular body near its upper end,

a sleeve surrounding and axially movable along the lower portion of the tubular body and having an upper end and a lower end,

said lower end having a reduced wedging rim and external means for engagement of said sleeve close to the upper end,

a split latching ring supported on said body and coacting with said sleeve wedging rim,

a support ring positioned around said tubular body below said split latching ring,

means releasably securing said support ring to said tubular body, and

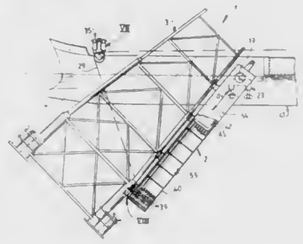
means connecting said support ring to said tubular body allowing a limited axial movement between said support ring and said tubular body whereby lifting forces on said tubular body can be transmitted to said split latching ring.

4,927,296

METHOD AND INSTALLATION FOR DISPLACING A JACKET OF AN ARTIFICIAL ISLAND IN RELATION TO AN UNDERWATER BASE

Willem P. Kaldenbach, The Hague, Netherlands, assignor to Allseas Engineering B.V., Netherlands

Filed Jan. 25, 1989, Ser. No. 301,058
Claims priority, application Netherlands, Oct. 4, 1988, 8802431
Int. Cl.[5] E02D *25/00*
U.S. Cl. 405—206 16 Claims



1. The method of placing an artificial island structure in a vertical standing position on an underwater base site, which comprises the steps of:

(a) loading the artificial island structure, while horizontal, from land onto a buoyant carrier disposed in water,

(b) affixing the horizontal artificial island to the carrier,

(c) transporting the carrier through the water to a large displacement buoyant vessel,

(d) journalling one end of the carrier upon the vessel,

(e) transporting the vessel to a position over the underwater base site,

(f) ballasting the carrier until the carrier swings vertically downwardly about said one end of the carrier to an upright position of the carrier and artificial island affixed thereto,

(g) suspending the upright artificial island from the vessel,

(h) disconnecting the carrier from the artificial island structure, and

(i) lowering the artificial island structure relative to the vessel until it is supported in vertical position on the underwater base site.

4,927,297

LEAK PREVENTION STRUCTURE, METHOD AND APPARATUS

William Simpson, Arlington Heights, Ill., assignor to Clem Environmental Corporation, Chicago, Ill.

Filed Oct. 4, 1988, Ser. No. 253,238
Int. Cl.[5] E02D *3/12;* C09K *17/00*
U.S. Cl. 405—270 12 Claims

1. A method of forming an in-situ sub-surface barrier to contaminated groundwater or other undesired groundwater flow in a soil structure comprising the steps of:

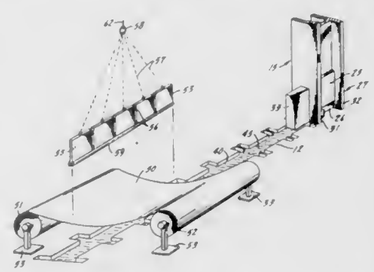
forming a trench in said soil structure, said trench having a depth substantially greater than its width, inserting into said trench a plurality of clay based sheets by,

positioning at least one flexible sheet of clay based material by said trench with a portion of said material extending over said trench, wherein each sheet having a low coefficient of permeability upon hydration thereof,

placing a weight on said portion,

and pushing said flexible sheet of clay based material into said trench,

lining at least one side of said trench with said sheets, and overlapping edges of adjacent sheets so that clay of one of said sheets contacts an adjacent sheet to form an impermeable joint, whereby a continuous internally extending



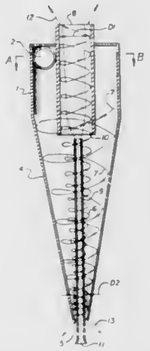
impermeable barrier is formed with a plurality of adjacent sheets.

4,927,298

CYCLONE SEPARATING METHOD AND APPARATUS

Wlodzimier J. Tuszko, 6083 Fremont Cir., Camarillo, Calif. 93010, and Wojciech J. Tuszko, 427 S. Manhattan Pl., Apt. 104A, Los Angeles, Calif. 90020

Continuation-in-part of Ser. No. 158,916, Feb. 22, 1988, abandoned. This application Jun. 23, 1988, Ser. No. 210,371
Int. Cl.[5] B65G *53/60, 53/62*
U.S. Cl. 406—173 6 Claims



1. In a method for separating a feed comprising particulate suspensions of liquid mixtures delivered in fluid flow to a cyclone separator of the type having an axially elongated cylindrical-conical separating chamber, a conical bottom portion, a cylindrical upper portion in said chamber, an exhaust pipe having bottom region in said cylindrical portion, and an inlet duct in said cylindrical portion for introducing said feed into said cylindrical portion in a tangential direction in a helical swirling flow pattern so as to establish within the separating chamber counterflowing inner and outer vortexes, causing a lighter portion of said feed to move to the inner vortex and exit through said exhaust pipe in the top or ceiling wall of the cylindrical portion as overflow and a coarser or heavier product to move to the outer vortex and exit through the bottom outlet in said conical portion as underflow; the improvement of the method comprising:

introducing a steady supply of air into the bottom region of said exhaust pipe to maintain a steady air core in said exhaust pipe.

VOL 1114 ISS 4 MY 22 1990 UMI

4,927,299

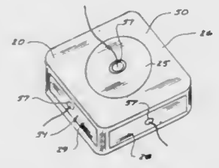
INTEGRAL ACOUSTIC EMISSION SENSOR FOR MANUFACTURING PROCESSES AND MECHANICAL COMPONENTS

Subbiah Ramalingam, Roseville, and Darrell A. Frohrib, St. Paul, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 52,788, May 21, 1987, abandoned. This application Apr. 24, 1989, Ser. No. 342,723

Int. Cl.[5] B23B *27/00*

U.S. Cl. 407—120 13 Claims



1. An acoustic emission sensor for sensing acoustic emissions from a machine element having a first edge which engages another part comprising a thin film piezoelectric material sensor deposited in a layer which is in integral atomic level bonding coupling with a surface of the machyine element after depositing without substantial mass to supporting the thin film piezoelectric layer, the thin film layer being selected to sense emission in the acoustic range and defined by a periphery which is adjacent but spaced from the edge of the machine element; and conductor means coupled to said piezoelectric sensor and to the machine element for sensing outputs in the acoustic emission range generated in said piezoelectric material sensor.

4,927,300

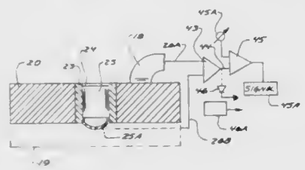
INTELLIGENT INSERT WITH INTEGRAL SENSOR

Subbiah Ramalingam, Roseville, and Darrell A. Frohrib, St. Paul, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 35,038, Apr. 6, 1987, abandoned. This application Sep. 21, 1988, Ser. No. 248,298

Int. Cl.[5] B23B *27/00*

U.S. Cl. 407—120 10 Claims



1. A cutting insert for machining materials having a cutting edge, said cutting insert comprising a solid body, and a sensor integrally coupled directly to and carried by the insert to sense parameters at the cutting edge which are functions of the cutting phenomena acting on the insert, the sensor having means for providing output signals from the sensor generated by mechanical forces acting on the cutting insert, the sensor comprising a deposited thin film of piezo-electric material coupled to a cutting insert surface and spaced from an edge of such insert which contacts a workpiece, the piezo-electric layer having atomic level bonding with respect to the surface of the insert.

4,927,301

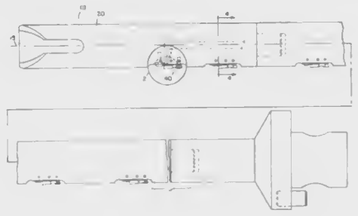
ADJUSTABLE BORING BAR CARTRIDGE

Lee Reiterman, Royal Oak, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Dec. 27, 1988, Ser. No. 290,600

Int. Cl.[5] B31B *29/02, 29/14, 29/22*

U.S. Cl. 408—180 14 Claims



1. A boring bar assembly comprising a generally cylindrical body rotatable about a centrally disposed axis,

said body comprising a peripheral surface area and at least one recess,

an adjustable cartridge for receipt into said recess,

said recess having an axial length dimension and spaced walls substantially parallel with respect to each other and said axis,

said recess further including an arcuate seating surface which intersects said walls and opens radially to the periphery,

said cartridge comprising an anvil having a generally planar top face and a radiused bottom face cooperating with said arcuate seating surface to define a rotational adjustment path,

said top face further comprising axially spaced forward and rear portions,

said radiused face extending from said rear portion,

a pocket for receipt of a polygonal form lay down indexable insert,

means for adjusting said cartridge in said boring bar along said adjustment path,

means for preloading said anvil in said slot towards said adjustment means,

said rear portion having a first recessed area for receipt of said cartridge adjustment means,

said forward portion having a second recessed area for receipt of said preloading means,

said anvil having a center point about which said anvil rotates,

said insert having a cutting edge seated in said anvil with said edge spaced axially from said center point so to impart rotational force about said center point and loading on said bar adjustment means during operation, and

means for forcing said anvil toward at least one of said recess walls.

4,927,302

THREADING DEVICE

Robert A. Beaty, Rte. #1 Box 43-6, Jamestown, Tenn. 38556

Filed Sep. 14, 1988, Ser. No. 244,107

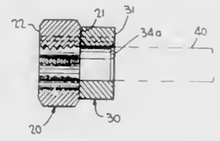
Int. Cl.[5] B23G *1/26, 5/00*

U.S. Cl. 408—221 10 Claims

1. A threading device for cutting threads in the outer surface of a round bar or tube which comprises

a die nut which defines an axis A and includes a plurality of radially-inwardly extending axial projections, each of said projections providing a set of axially spaced cutting threads thereon, said die nut also including two separated axial holes therein, and

a guide ring which defines an axis B and a flat front face, a flat rear face, a cylindrical outer side surface which extends from said flat front face to said flat rear face, a cylindrical inner side surface which extends from said flat rear face towards said flat face, and an annular knurled surface which extends from said flat front face to said cylindrical inner surface said guide ring including two roll pins which extend away from said flat rear face in parallel with said axis B and which are extendable into said axial



holes in said die nut without play so as to easily detachably connect said guide ring with said die nut and cause said axis B to be coaxial with said axis A, said guide ring assuring proper alignment of a round bar or tube relative to the cutting threads of said die nut and said annular knurled surface thereof helping to guide an entry end of such round bar or tube into and through the guide ring and thereafter into said die nut.

4,927,303

BALL END MILL

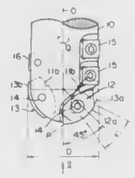
Osamu Tsujimura; Masaaki Nakayama, and Masayuki Okawa, all of Tokyo, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,495

Claims priority, application Japan, Sep. 27, 1988, 63-126013[U]

Int. Cl.[5] B23B *51/00;* B23C *5/02*

U.S. Cl. 408—223 3 Claims



1. A ball end mill comprising:

a tool body rotatable around an axis and having a plurality of tip pockets formed in a forward end of said tool body, each of said tip pockets having a wall surface facing toward a rotational direction of said tool body;

a plurality of throw-away tips each having at least one arcuate cutting edge, the arcuate cutting edges of the respective throw-away tips describing a rotational locus when said tool body rotates around said axis;

a plurality of clamp bolts each of which is removably fastened to the wall surface of a corresponding tip pocket through a corresponding throw-away tip such that an end of the throw-away tip and an adjacent end of the adjacent throw-away tip in said rotational locus of said throw-away tips overlap with each other to form substantially a ½ arc of said rotational locus;

the cutting edge of one of said throw-away tips and the cutting edge of the adjacent throw-away tip overlapping with each other, the center of the overlapping being located at a position that is substantially 45° from a forward end of the cutting edge along a ½ arc of said rotational locus therefrom, and the overlapping length being ¼ to ½ of a diameter of said rotational locus in an arcuate length thereof;

a planar section formed at a side surface of at least one of said plurality of throw-away tips, which is located at the forward end of said tool body, said side surface being located adjacent the forward end of the cutting edge of the throw-away tip; and

a planar surface formed at at least one of said tip pockets at a position facing toward said planar section, said planar surface being subject to a radial cutting force acting from the throw-away tip having said planar section, said planar section being abutted against said planar surface.

4,927,304

HOLDER FOR ROTARY MATERIAL REMOVING TOOLS

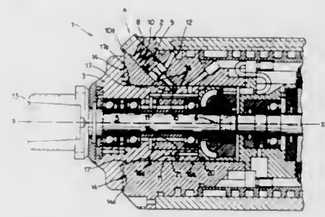
Hermann Hauser, Otto-Lilienthal-Strasse 4, D-7835 Teningen 3, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 317,727

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807102

Int. Cl.[5] B23C *1/00*

U.S. Cl. 409—231 31 Claims



1. A holder for rotary material removing tools and the like, comprising a housing including coaxial first and second sections; a tool supporting spindle having a torque-transmitting portion mounted in said first section; and means for releasably coupling said sections to each other end-to-end, including a plurality of male coupling elements mounted in one of said sections for movement between operative and inoperative positions, a female coupling device provided in the other of said sections to receive portions of said male coupling elements in operative positions of said male coupling elements, and motor means for moving said male coupling elements to at least one of said positions, said portions of said male coupling elements urging said first section axially toward said second section in the operative positions of said male coupling elements.

4,927,305

TIGHTENING DEVICE FOR THREADED CONNECTORS

Charles D. Peterson, Jr., P.O. Box 217, Richardson, Tex. 75080

Filed Sep. 2, 1988, Ser. No. 240,151

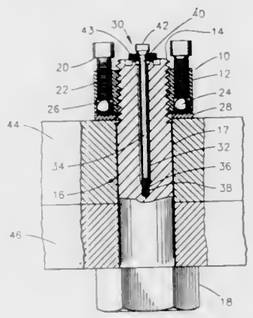
Int. Cl.[5] F16B *31/12*

U.S. Cl. 411—14 10 Claims

1. In a tightening device having an elongated shank and an abutment head adapted to be tightened against a fixed support provided with an opening receiving said shank, and a plurality of jack bolts threadly engageable with a plurality of threaded holes positioned circumferentially about said abutment head and adapted to exert pressure against said support member, the improvement comprising a plurality of separate and discrete ball members closely receivable within said holes and posi-

VOL 1114 ISS 4 MY 22 1990 UMI

tioned between bottom ends of said jack bolts and a wear plate supported by said support member, said ball members being



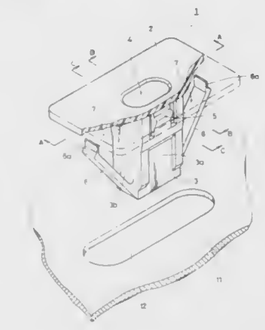
composed of a metal having a hardness greater than the bottom ends of said jack bolts.

4,927,306

SCREW GROMMET

Seiichi Sato, Yokohama, Japan, assignor to Kato Hatsujo Kaisha, Ltd., Yokohama, Japan

Filed May 18, 1988, Ser. No. 195,905
Int. Cl.[5] F16B *19/00, 37/04*
U.S. Cl. 411—182 10 Claims



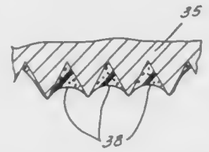
1. A screw grommet for insertion in an oblong fitting hole of a mounting panel, comprising:
an enlarged head adapted to abut against the mounting panel;
a shank extending from said head, said shank including a first pair of opposed walls and a second pair of opposed walls;
a pair of engaging shoulders adapted to engage first edges of the fitting hole, each one of said engaging shoulders extending from an associated one of said first pair of walls near the end of said walls closest to said head;
a pair of elastic arms, each one of said elastic arms having an end connected to an associated one of said second pair of walls near the end of said walls farthest from said head, each of said arms extending toward said head at a prescribed angle oblique to the plane of said associated one of said second pair of walls, a free end of each of said arms adapted to engage second edges of the fitting hole;
at least two ribs extending from said head in the direction of said shank, each of said ribs having a free end adapted to abut the mounting panel, said free ends and a surface of said head adjacent said shank defining a space;
packing material disposed within said space; and
a screw socket open at said head and extending into said shank, whereby said grommet will be retained within the fitting hole by said head, said engaging shoulders and said arms, and a screw can be inserted within said socket.

4,927,307

PATCH-TYPE SELF-LOCKING SCREW FASTENERS

Walter P. Fitzgerald; Beatrix Y. Sanders, both of San Diego, and Mansour A. H. Bagheri, Downey, all of Calif., assignors to Long-Lok Fasteners Corporation, Lancaster, Tex.

Continuation of Ser. No. 460,864, Jan. 25, 1983, abandoned, which is a continuation of Ser. No. 142,645, Apr. 22, 1980, abandoned, which is a continuation of Ser. No. 419,630, Nov. 27, 1973, abandoned, which is a division of Ser. No. 226,147, Feb. 14, 1972, Pat. No. 3,784,435, which is a continuation-in-part of Ser. No. 126,882, Apr. 19, 1971, abandoned, which is a division of Ser. No. 36,960, May 13, 1970, abandoned. This application Nov. 8, 1988, Ser. No. 268,578
Int. Cl.[5] F16B *39/00, 39/34*
U.S. Cl. 411—302 6 Claims



1. A self-locking metal screw-threaded fastener comprising:
a metallic fastener including a leading thread end and an element having a threaded portion including crests and valleys, said valleys including cooperating thread flanks located on each side of said crests;
a patch of crystallizable thermoplastic polymer having a lower crystallization rate than polyethylene directly bonded to said threaded portion and spaced from said leading thread end and extending around only a portion of the periphery of said threaded portion and operative upon assembly to a mating threaded member to tend to displace said threaded fastener laterally and in a direction opposite to said patch to effect locking by frictional engagement of the threads opposite said patch with the opposed threaded portion of the mating threaded member;
said patch including individual segments of said polymer in said valleys and adhered directly to the flanks on each side of said crests;
said segments being separated by said crests whereby the major diameter of said fasteners remains essentially unchanged and the leading thread end is essentially free of patch material;
said polymer having a maximum crystallization shrinkage of about 3% or higher by volume,
said polymer being a poly (alkene phthalate), and
said polymer in said patch having a reduced degree of crystallization shrinkage of about 25% or less of its maximum crystallization shrinkage.

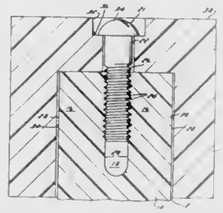
4,927,308

FASTENING MEANS

Bernard DiMarco, Lilburn, and Steven A. Kaufman, Decatur, both of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Dec. 1, 1988, Ser. No. 278,628
Int. Cl.[5] F16B *37/00*
U.S. Cl. 411—437 7 Claims

1. An assembly for connecting two members comprising:
a one piece engagement receptacle including a first end opening and a second end opening substantially smaller than the first end opening;
an engagement member including a slot defining at least two substantially parallel surfaces and an open end, wherein the engagement member is adapted to rest in the engagement receptacle such that the engagement member passes



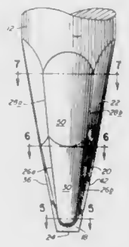
through the first end opening and the open end abuts the engagement receptacle such that it is restricted from entering the second end opening; and
means for fixing the engagement member in the engagement receptacle, wherein the means engages the surfaces and the second end opening is adapted to accept the means.

4,927,309

WIRE NAIL

Henry A. Sygnator, 22 S. Ridge Ave., Arlington Hts., Ill. 60005

Filed May 8, 1989, Ser. No. 348,732
Int. Cl.[5] F16B *15/00*
U.S. Cl. 411—439 13 Claims



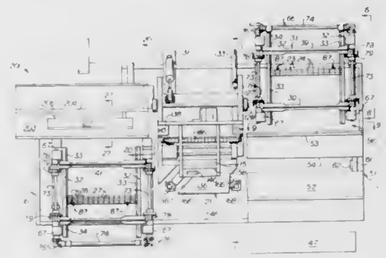
1. A wire nail having a shank with opposite ends, a head formed on one of the ends, and a point formed on the other end, the shank defining an axis;
the point having a penetrating portion, which is blunt, a wedging portion, which merges with and tapers toward the penetrating portion, and a transitional portion, which merges with and tapers toward the wedging portion and merges with the last-mentioned end of the shank;
the wedging portion defining plural straight edges, each of which is inclined at a given angle relative to the axis defined by the shank;
the wedging portion having a plurality of convex surfaces, each of which conforms generally to a section of a circular cylinder, and two of which meet at each of said edges defined by the wedging portion;
the transitional portion defining plural straight edges, each of which meets a different one of said edges defined by the wedging portion, and each of which is inclined at a lesser angle relative to the axis defined by the shank; and
the transitional portion having a plurality of convex surfaces, each of which conforms generally to a section of a circular cylinder, and two of which meet at each of said edges defined by the transitional portion.

4,927,310

METHOD FOR AUTOMATICALLY JUSTIFYING, ASSEMBLING, AND BINDING BOOKS

William H. Abildgaard, Redwood City, Calif.; Charles Chadwick, Old Saybrook, Conn.; Peter Hotkowski, Deep River, Conn., and Frank A. Todaro, Clinton, Conn., assignors to VeloBind, Inc., Fremont, Calif.

Division of Ser. No. 116,045, Nov. 2, 1987, Pat. No. 4,848,616.
This application Feb. 27, 1989, Ser. No. 315,490
Int. Cl.[5] B42B *5/08*
U.S. Cl. 412—7 12 Claims



1. A method for preparing books for binding which comprises the steps of:
providing a stack of sheets each formed with first holes spaced from but adjacent an edge of said sheets and spaced apart in intervals,
providing a male strip having projecting studs spaced the same intervals as said first holes,
providing a female strip having a plurality of second holes spaced the same intervals as said first holes,
assembling said sheets, male strip and female strip with said female strip on a first side of said stack and said male strip in an initial position on a second side of said stack opposite said first side with said studs pointed toward but spaced from said stack, said step of assembling said stack of sheets comprising supporting said stack of sheets horizontal and moving said stack of sheets horizontally onto a support surface, said support surface being initially horizontal and pivoting said support surface to vertical position while loosely supporting said sheets,
jogging said sheets to align said first holes with themselves and with said second holes and studs,
pushing said studs through said first holes and then through said second holes,
and in which said step of assembling further comprises feeding said female strip into position on said first side in a longitudinal direction relative to said edge and feeding said male strip into position in a longitudinal direction relative to said edge on said second side.

4,927,311

SHIP UNLOADER WITH SCREW CONVEYOR SWINGABLE IN VARIOUS PLANES

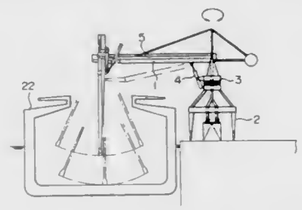
Yoshio Kada, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,662
Claims priority, application Japan, Aug. 18, 1987, 62-203448
Int. Cl.[5] B65G *67/60*
U.S. Cl. 414—140.7 1 Claim

1. An unloader comprising: a boom having a head end; a boom conveyer disposed above said boom in such a manner as to extend in the longitudinal direction of said boom; a screw supporting frame mounted above the head end of said boom in such a manner as to be able to pivot about a longitudinal axis of said boom conveyor; a vertical screw conveyer supported by

VOL 1114 ISS 4 MY 22 1990 UMI

said screw supporting frame in such a manner as to be swingable within a plane which is substantially parallel with a plane including the axis of rotation of said screw supporting frame; a portal-shaped frame supported on the head end of said boom in such a manner as to extend across and over said boom conveyer, said portal-shaped frame having upper opposite ends



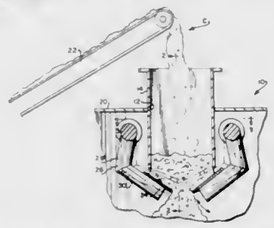
and being provided with rollers at said upper opposite ends; and an electric motor supported above said boom and having a shaft one end of which a pinion is fitted into; said screw supporting frame having circular-arc rails disposed in engagement with said rollers, and a circular-arc rack disposed in parallel with said rails and in meshing engagement with said pinion.

4,927,312

CHIP GATES WITH AIR LOCK

Michael D. Meredith; Joseph R. Phillips; Richard O. Laakso, and C. Bertil Stromberg, all of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed May 19, 1988, Ser. No. 195,890
Int. Cl.[5] B65G *69/00*
U.S. Cl. 414—221 **12 Claims**



1. Apparatus for feeding cellulosic chips, comprising:

a vessel, having top, bottom and side walls, for receiving the chips;

means carried by said vessel defining an inlet in the top wall of said vessel for continuously supplying chips thereto while simultaneously substantially precluding escape of gas from said vessel through said inlet including an inlet opening and a gate mounted in a single plane to support the chips and movable in said opening for varying the size of said opening, said gate having a surface and being movable into a position to support the chips in said opening in positions overlying said surface and overlying and occluding said opening to substantially preclude escape of gas through said inlet opening by the downward mass/flow of the chips while the chips are simultaneously supplied to the vessel through said inlet opening when the gate surface is in a downwardly directed supplying position; and

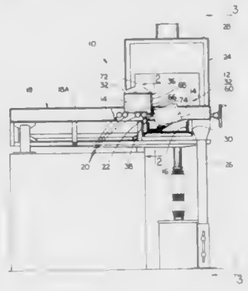
means responsive to the weight of the chips on said gate for varying the size of said opening while the chips are supplied through the opening while simultaneously maintaining a downward mass/flow of chips sufficient to preclude the escape of gas from the vessel through said inlet opening.

4,927,313

NUCLEAR FUEL PELLET SINTERING BOAT UNLOADING APPARATUS AND METHOD

Thomas B. Huggins, Columbia; Wade H. Widener, Cayce, and Kenneth K. Klapper, West Columbia, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 21, 1989, Ser. No. 313,128
Int. Cl.[5] B65B *21/22;* **B65G** *65/23*
U.S. Cl. 414—414 **20 Claims**



14. A method for unloading nuclear fuel pellets from a sintering boat having an open top, said method comprising the steps of:

(a) pivoting a transfer housing loaded with the boat filled with nuclear fuel pellets about a generally horizontal axis from an upright position remote from a pellet deposit surface to an inverted position adjacent to the deposit surface to move the boat from an upright to inverted orientation with the pellets retained within the boat by a latched lid in a closed condition on the housing;

(b) unlatching the lid of the housing as the housing reaches its inverted position but engaging the unlatched lid with the deposit surface to retain it in its closed condition; and

(c) reverse pivoting the housing from its inverted position back toward its upright position to permit the unlatched lid to pivot from the closed condition to an opened condition thereby allowing pellets to slide out of the open top of the inverted boat and down the opened lid of the housing to the deposit site.

4,927,314

ENGINE VALVE FEED APPARATUS

Hideharu Sakimori, Hiroshima; Susumu Ihara, Higashihiroshima, and Hiroyuki Hayashi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 17, 1989, Ser. No. 297,442
Claims priority, application Japan, Jan. 14, 1988, 63-3389[U]
Int. Cl.[5] B65G *1/06;* **B23P** *19/04*
U.S. Cl. 414—416 **6 Claims**

1. An apparatus for feeding engine valves to a valve handling apparatus at a valve pick-up station where said valve handling apparatus picks up and fits said engine valves to an engine cylinder head one after another, said apparatus comprising:

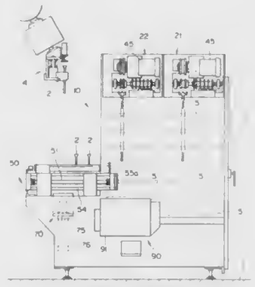
a valve hanger plate formed with a number of valve holes for tightly receiving a number of engine valves to hang said engine valves upside down;

hanger plate transfer means for transferring a number of said valve hanger plates to said valve pick-up station one after another; and

thrust-up means disposed at said valve pick up station for thrusting up said valves from said valve hanger plate transferred to said valve pick-up station so as to allow said valve handling apparatus to hold a stem of each said engine valves, said thrust-up means comprising;

holding means movable up and down and formed with a number of positioning holes for receiving therein the stem ends of said engine valves hung from said valve hanger plate to thereby hold said valves upright when moved up;

lift means for moving up and down said holding means; and



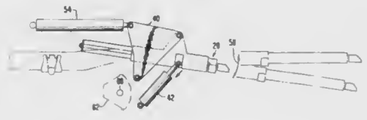
a stopper for preventing said valve hanger plate from being forced up when said holding means is moved up and receives said stem ends of said engine valves hung from said valve hanger plate.

4,927,315

VEHICLE LIFTING AND TOWING APPARATUS

Ronald B. Nespor, Mercer, Pa., assignor to Chevron, Inc., Mercer, Pa.

Filed Mar. 6, 1989, Ser. No. 331,340
Int. Cl.[5] B60P *3/12*
U.S. Cl. 414—563 **12 Claims**



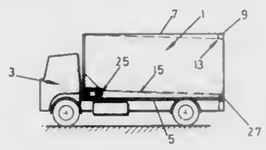
8. A vehicle lifting and towing apparatus as recited in claim 7, wherein said means for tilting said boom comprises third and fourth hydraulic cylinders pivotally mounted to said vehicle within the understructure thereof and said boom.

4,927,316

CARGO SPACE UTILIZATION

Wojciech J. Kordel, Great Budworth, United Kingdom, assignor to Joloda Plc., Liverpool, United Kingdom

Filed Jul. 15, 1988, Ser. No. 219,587
Claims priority, application United Kingdom, Jul. 18, 1987, 8716996
Int. Cl.[5] B60P *1/38*
U.S. Cl. 414—510 **9 Claims**



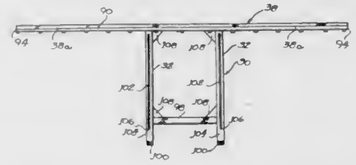
1. A box-like cargo holding body having a length, a roof line, a lintel which projects below the roof line, an underside of the lintel, a movable cargo loading surface, a loading aperture defined between the underside of the lintel and the movable cargo loading surface, a maximum permissible cargo load height dictated by a distance between the underside of the lintel and the movable cargo loading surface, which distance is fixed, and a moving floor to the body providing said movable cargo loading surface which moving floor has a constant slope over its length and is maintained at that slope such that it is at progressively reduced spacing from the roof line in a direction along its length from the loading aperture into the body and over the length of the body and wherein a minimum spacing is at least equal to the maximum permissible cargo load height.

4,927,317

APPARATUS FOR TEMPORARILY COVERING A LARGE LAND AREA

Wilfred J. Acosta, Violet, La., assignor to Waste Management, Inc., Oak Brook, Ill.

Filed Sep. 1, 1988, Ser. No. 239,294
Int. Cl.[5] E02F *5/00*
U.S. Cl. 414—724 **12 Claims**



1. Apparatus for suspending a flexible cover a spaced distance from a front loader bucket of an earth-moving vehicle, comprising:

a cross member having opposed free ends and an intermediate portion;

a pair of spaced apart rearwardly extending extension arms joined at one end to the intermediate portion of the cross member and having second, opposed free ends;

means at the second ends of the extension arms for mounting the extension arms to the front loader bucket;

a lateral member extending between the extension arms adjacent the free ends thereof;

upstanding reinforcing spines upwardly extending from the extension arms and having free ends spaced from the free ends of the extension arms; and

means for releasably supporting the flexible cover at a series of spaced locations along said cross member.

4,927,318

METHOD FOR FORMING, GRASPING AND HANDLING CUBES OF STACKED PRINTED PRODUCTS

William Hayden, Easton; Mark W. Hayden, Monroe, and Richard S. White, Old Saybrook, all of Conn., assignors to Galpin Research, Limited Partnership, Stratford, Conn.

Filed Feb. 9, 1988, Ser. No. 153,992
Int. Cl.[5] B65B *35/56*
U.S. Cl. 414—786 **21 Claims**

9. The method of assembling and handling printed products, wherein each printed product previously has been folded to form a spine and has a rectangular shape with the spine extending along a longer edge of the rectangular shape with the other longer edge of the rectangular shape being the "lap" edge, said method of assembling and handling such printed products comprising the steps of:

stacking such printed products into four stacks of similar height with each of said stacks having four sides;

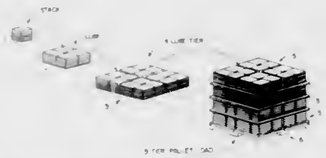
during the formation of each stack positioning the spines of a multiplicity of successive printed products in each stack

VOL
1114
ISS
4
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22
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along one longer side of the stack while positioning the lap edges of said multiplicity along the other longer side of the stack, thereby providing two longer sides on each of said four stacks and two shorter sides on each of said four stacks;

providing a cube builder station;

placing said four stacks in said cube builder station with a longer side of each stack oriented at 90° to a longer side of both of its adjoining stacks and with a shorter side of each



stack facing a longer side of an adjoining stack to form a "cube" and with a longer side of each stack on an exterior side surface of said cube being aligned with a shorter side of an adjoining stack on the exterior side surface of said cube for providing a square exterior shape of said cube as seen from above said cube with a square central opening in said cube as seen from above said cube; and

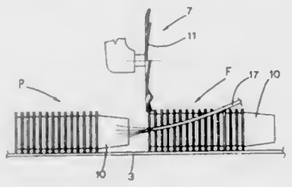
grasping, lifting and removing said cube as a unit from said cube builder station.

4,927,319

DEVICE FOR DETERMINING A PRESET NUMBER OF CONTAINERS, PARTIALLY INSERTED WITHIN ONE ANOTHER FORMING A PACKAGE OF THE SAME CONTAINERS

Gian Luigi Montali, Vignola, Italy, assignor to S.T.S. SRL, Anzola Emilia, Italy

Filed Jnl. 20, 1988, Ser. No. 221,863
Claims priority, application Italy, Aug. 3, 1987, 4934/87[U]
Int. Cl.[5] B65G *59/10*
U.S. Cl. 414—788.4 **3 Claims**



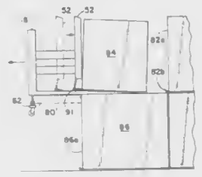
1. A device for determining a preset number of containers that are partially inserted within one another to form a package of the same containers, said device comprising first means for moving a row of said containers; second means for guiding said row; third means for effecting a forward movement of said containers one at a time in relation to said row in order to form a package of said containers; fourth means for pushing said package in a forward direction; with the said third means comprising a circular disc that is located above the said row so that said row strikes with its front against a lower part of the peripheral rim of said disc, said peripheral rim of said disc being divided into a series of sectors, each sector being turned through a predetermined angle with respect to a plane which contains said disc's center, said disc being able to rotate around a central axis parallel to said row, in a predetermined direction, causing said sectors to be one by one inserted between contiguous edges of a pair of said containers at said front of said row, in order to separate said containers from one another by imposing a forward movement on said first container, and retaining said second container in the row.

4,927,320

AUTOMATIC LOAD PUSH-PULL SLIPSHEET HANDLER

John E. Olson, Portland, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Continuation of Ser. No. 154,646, Feb. 9, 1988, Pat. No. 4,861,223. This application Jul. 14, 1989, Ser. No. 379,821
Int. Cl.[5] B66F *9/20*
U.S. Cl. 414—786 **7 Claims**



1. A method of handling a load by using a vehicle-supported push-pull slipsheet handler having a load-carrying member for supporting a load and a push-pull assembly comprising a frame, a push plate, a selectively-actuated power apparatus mounted on said frame for extending and retracting said push plate relative to said frame along a direction of extension, and a selectively openable and closable jaw on said push plate for gripping a slipsheet, said method comprising:

(a) supporting a first load on said load-carrying member;

(b) determining whether or not said first load is to be deposited atop a second load;

(c) sensing, by means of a sensor assembly mounted on said push-pull slipsheet handler, the presence of a vertically-oriented surface located beyond said push-pull slipsheet handler in said direction of extension and the distance, along said direction of extension, between said surface and a predetermined portion of said push-pull assembly;

(d) selectively controlling said vehicle in response to steps (b) and (c) as follows:

(1) if said first load is to be deposited atop said second load, controlling said vehicle in response to said sensor assembly so as to move said portion of said push-pull assembly to a first position where said portion is separated by a first predetermined distance from said vertically-oriented surface, and stopping said vehicle when said first position is reached or, alternatively,

(2) if said first load is not to be deposited atop said second load, controlling said vehicle in response to said sensor assembly so as to move said portion of said push-pull assembly to a second position where said portion is separated by a second predetermined distance, greater than said first predetermined distance, from said vertically-oriented surface, and stopping said vehicle when said second position is reached; and

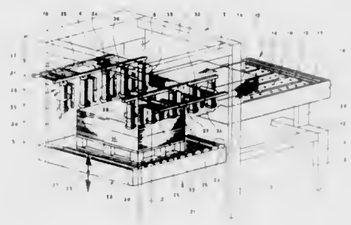
(e) thereafter, depositing said first load by actuating said power apparatus to extend said push plate while moving said vehicle in a direction opposite to said direction of extension.

4,927,321

DEVICE FOR STACKING BATCHES OF FLAT OBJECTS IN A VERTICAL FILE

Raymond Lucas, Villandraut, France, assignor to Bobst SA, Switzerland

Filed Aug. 3, 1988, Ser. No. 227,637
Claims priority, application France, Aug. 5, 1987, 87 11187
Int. Cl.[5] B65H *29/40, 31/20, 31/30*
U.S. Cl. 414—788.9 **6 Claims**



1. In a piling device for flat objects arranged batchwise, especially folded boxes of corrugated board or non-folded blanks of boxes arranged in successive layers on any sort of loading plane, said device including a frame containing infeed means for conveying the batches into the device on a conveying axis, means for carrying a layer of batches from the infeed means to a point above a vertically movable loading plane, means for retaining and then laying down the layer on top of said loading plane, means for laterally guiding of the layer as the layer is being laid down onto the loading plane, stop means for positioning a front edge of each layer in said means for carrying and means for vertically shifting said loading plane, the improvements comprising said infeed means for the batches being made up of a table having motor-driven rollers with axles, said rollers cooperating with a lateral baffle arranged at right angles to the axles of said motor-driven rollers, said means for carrying a layer of batches to a point above the vertical moving loading plane consisting of two rows of spaced apart motor-driven, vertically arranged rollers for engaging opposite sides of the layer to be carried forward, mounting means for adjustably positioning said two rows in said frame laterally to said conveying axis, said mounting means including two supporting bars being movable in the frame by a setting appliance, a longitudinal beam for mounting each row of rollers, each beam being connected by air cylinders to one of said supporting bars to move therewith, said means for retaining and then putting down said layer including a retaining appliance operating jointly with each vertically arranged roller and a support operating jointly with said two rows, said means for laterally guiding said layer consisting of vertical batch guides being mounted on said supporting bars to extend within spaces existing between the vertically arranged rollers of said rows, said stop means comprising a front stop plate having an adjustable size as required by the size of said batch, and said lateral baffle being secured to an extension of one of said rows situated on the side of the conveying axis.

4,927,322

STACK STRIPPER FOR A STACKING MACHINE

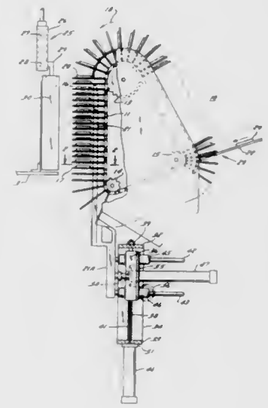
Werner Schweizer, Boynton Beach; Daniel J. McGuire, Ft. Lauderdale, and Edward D. Archer, Lantana, all of Fla., assignors to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed May 8, 1989, Ser. No. 349,119
Int. Cl.[5] B65G *25/00*
U.S. Cl. 414—794.7 **7 Claims**

1. A stripper device for stripping articles from the conveyor of an article stacking machine, the conveyor comprising: closed loop flexible means driven lengthwise continuously, a series of paddle members disposed along the length of said flexible means, said paddle members having corresponding inside ends connected to said flexible means and extending outwardly therefrom for articles to be deposited on said paddle members at one location and for a series of articles to be accumulated on said paddle members, respectively, where a series of generally vertically moving paddle members are above and below each other at another location to facilitate stripping said articles from said paddle members to form a stack of articles, said stripper device comprising:

a vertically extending stripper bar for stripping simultaneously said articles from a predetermined number of continuously downwardly moving paddle members by way of said bar moving transversely to the path of said moving paddle members from the uppermost position of said bar inwardly of said paddle members to a position outwardly of said paddle members,

a carriage and a first fluid pressure responsive actuator connected to said carriage and operative in one mode to raise said carriage to an uppermost position,



means for mounting said stripper bar on said carriage for being moved substantially horizontally and a second fluid pressure responsive actuator operatively connected to said stripper bar for moving said bar cyclically outwardly away from said paddle members and inwardly of said paddle members,

a vertically extending gear rack mounted to said carriage,

a gear meshed with said gear rack and a rotatable shaft supporting said gear for rotation,

a clutch having power input and output means and means for driving said input means at a speed which is proportional to the speed at which said paddle members are moving downwardly,

means coupling said power output means of the clutch to said gear such that when said clutch is activated said gear is rotated to drive said carriage and the stripper bar mounted thereto downwardly at the same speed at which said paddle members are moving downwardly, and

control means for controlling operating of said clutch and said fluid responsive actuators.

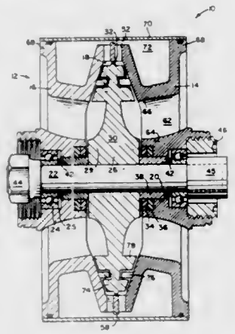
VOL 1114 ISS 4 MY 22 1990 UMI

4,927,323

RADIAL FLOW FLUID PRESSURE MODULE

Robert R. Kimberlin, Athens, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 21, 1988, Ser. No. 291,184
Int. Cl.[5] F01D 3/02
U.S. Cl. 415—98 12 Claims



1. A radial flow fluid pressure module comprising:
a symmetric housing assembly formed by two mateable housing members and having a hollow rotor chamber formed between the mated housing members;
radial openings in the radial periphery of said rotor chamber through each housing member;
opposed annular passages axially extending from the inner portion of said rotor chamber through each housing member;
a shaft supported for rotation in said housing assembly;
a rotor having opposed faces and mounted on said shaft for rotation with said shaft in said rotor chamber;
at least one circular row of axially cantilevered blades mounted on each face of said rotor;
a least one set of integrally formed nozzles axially extending from each housing member and arranged radially concentric and adjacent to a respective row of rotor blades such that each set of nozzles is in fluid communication with said respective row of rotor blades;
a plurality of radially directed flow paths defined by said rotor and said housing members; and
an annular plenum chamber circumferentially surrounding said housing assembly, in fluid communication with said radial openings, and further comprising:
a pair of annular flanges, one flange extending radially outward from each housing member; and
a cylindrical member in circumferential sealing contact with both flanges.

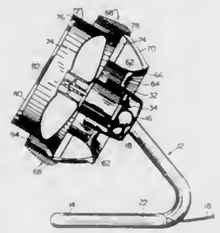
4,927,324

DUCTED FAN

Michael C. Coup; Gary P. Israel, both of Wichita; Glen W. Ediger, Newton, and Donald J. Moore, Wichita, all of Kans., assignors to Vornado Air Circulation Systems, Inc., Wichita, Kans.

Filed Jan. 9, 1989, Ser. No. 294,780
Int. Cl.[5] F04D 29/70
U.S. Cl. 415—121.2 15 Claims

1. A ducted fan comprising:
a base member with a motor and bladed impeller attached to the base;
a funnel-shaped duct with its large end facing upstream concentrically positioned upstream of the blades and around the motor and connected thereto;
an outer cowling concentrically positioned, connected to the funnel-shaped duct through a series of radial ribs;
a inner cowling positioned inside the outer cowling and attached thereto, the inner cowling being circular in lateral cross section and tapered longitudinally in shape from its larger diameter intake end to its lesser diameter discharge end;
a circular grill having an outer radius attached to the discharge end of the inner cowling, the grill including a center hub and a series of arcuate shaped ribs extending outwardly from the hub to said outer radius, each rib having a constant curvature radius and each rib being equally spaced from each other around the hub, the maximum lateral spacing between the ribs is inboard from said outer radius; and
a support means pivotally attached to said motor and base member.

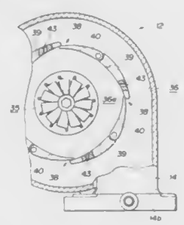


4,927,325

VARIABLE-DISPLACEMENT TURBINE

Shunji Yano, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 338,984
Claims priority, application Japan, Apr. 15, 1988, 63-94073
Int. Cl.[5] F01D 17/14
U.S. Cl. 415—161 9 Claims



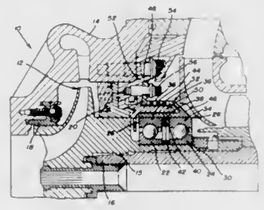
1. A variable-displacement turbine comprising:
a housing;
a turbine wheel disposed in said housing;
a scroll passage defined in said housing around said turbine wheel;
at least one fixed vane and at least one movable vane disposed between said scroll passage and said turbine wheel and arranged alternately as an annular array in the direction of rotation of said turbine wheel;
a variable nozzle jointly defined by said vanes and having an opening adjustable in response to angular movement of said movable vane; and
at least one of said fixed vane and said movable vane having a bypass passage defined therein in bypassing relation to said variable nozzle.

4,927,326

TURBOMACHINERY ROTOR SUPPORT WITH DAMPING

George L. von Pragenau, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 26, 1989, Ser. No. 364,743
Int. Cl.[5] F01D 11/08
U.S. Cl. 415—170.1 24 Claims



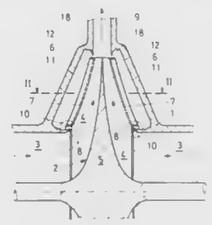
1. In high speed turbomachinery having a housing containing a pressurized working fluid, an axially elongated rotatable member supported by ball bearing means within said housing, said ball bearing means including an inner race fastened to said rotatable member for rotation therewith and an outer race, bearing supporting and damping means comprising: an annular sleeve disposed about said outer race including a radially inner portion having a tightly abutting fit with said outer race, and a radially outer portion spaced from said inner portion, means for securing said sleeve to said housing, a support member fixed to said housing having an annular rim disposed intermediate said inner portion and said outer portion and providing a gap with said inner portion, said gap being substantial relative to said fit with said outer race, said fluid having a pressure differential across said support member and said sleeve so that fluid may flow into and fill said gap, and a plurality of radial slits spaced axially and circumferentially about said outer portion of said sleeve for providing said sleeve axially and radially flexible.

4,927,327

CONTACTLESS CENTRIFUGAL SEAL DEVICE FOR A ROTATING MACHINE PART

Jakob Keller, Dottikon, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Continuation of Ser. No. 84,022, Aug. 11, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 283,281
Claims priority, application Fed. Rep. of Germany, Ang. 16, 1986, 3627778
Int. Cl.[5] F01D 5/14; F04D 29/08; F16J 15/40
U.S. Cl. 415—171.1 7 Claims



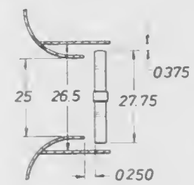
1. A contactless centrifugal seal device for a rotating machine part in a gaseous compressor, which part has an interior space for guiding a gas to be compressed, said part being supported so that it can rotate within a casing such that a low pressure vortex space exists between the casing and the rotating part, said rotating part further including an external rotation surface for separating the interior space from the low pressure vortex space, narrow annular gaps exist between the rotating machine part and the casing at opposite ends of the vortex space, the vortex space between the ends having a width that is a measure of the shortest distance between said external rotation surface along any point thereon between said ends and a surface of said casing opposing the respective point on said external rotation surface, said annular gaps interconnecting the low pressure vortex space and the interior space of the rotating machine part, one of said annular gaps having a first diameter and a second of said annular gaps having a second diameter larger than the diameter of the one annular gap, the seal device comprising:
fin means provided on the external rotation surface from the one annular gap to the second annular gap and extending into the low pressure vortex space for creating a vortex in the low pressure vortex space that is sufficient to create a pressure rise in the low pressure vortex space that is substantially equal to a pressure rise in the interior space during operation of the compressor, said fin means extending into the low pressure vortex space for a distance that is less than half of the width of the low pressure vortex space.

4,927,328

SHROUD ASSEMBLY FOR AXIAL FLOW FANS

William D. Scoates, and Samuel W. Scoates, both of Rte. 1, Box 930, Bryan, Tex. 77803

Continuation-in-part of Ser. No. 317,903, Mar. 2, 1989. This application Nov. 1, 1989, Ser. No. 430,185
Int. Cl.[5] F04D 29/68
U.S. Cl. 415—220 3 Claims



1. An axial fan comprising a hub, means supporting the hub for rotation around the longitudinal axis of the fan, a plurality of impeller blades attached to the hub and extending radially from the axis of rotation, a shroud assembly including a band encircling the blades and spaced from the tips of the blades a sufficient distance to provide ample clearance to avoid contact between the blades and the band during shipment and operation of the fan, said shroud further including an orifice positioned upstream of the blades, said band having a diameter that is about 106% of the diameter of the orifice means for preventing air from flowing between the orifice and the band, said orifice having a downstream end located adjacent to but spaced from the impeller blades, said impeller blades having a diameter that is about 103% of the diameter of the orifice so that the impeller blades extend outwardly from the hub beyond the orifice to reduce the flow of air over the tips of the impeller blades substantially while providing ample clearance between the tips of the impeller blades and the band.

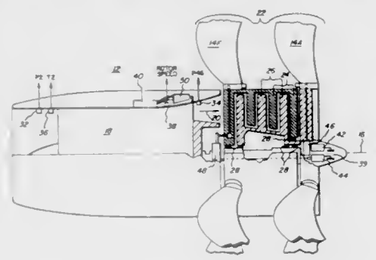
VOL
1114
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4,927,329

AIRCRAFT ENGINE UNDUCTED FAN BLADE PITCH CONTROL SYSTEM

Gerald B. Kliman, Schenectady, and Donald W. Jones, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 21, 1988, Ser. No. 260,645
Int. Cl.[5] B64C *11/44*
U.S. Cl. 416—127 19 Claims



1. Aircraft propulsion apparatus, comprising:
(a) a gas generator for generating a gas stream and containing therein compressor means for driving a rotatable shaft;
(b) first and second coaxially situated rotatable members;
(c) a plurality of first and second rotor blades affixed to said first and second rotatable members, respectively, said first and second rotor blades being positioned such that a gas stream, when produced by said gas generator, impinges thereon and causes said first and said second rotatable members to counterrotate;
(d) a plurality of forward and aft variable pitch propulsor blades coupled to, and extending radially outwardly of, said first and second rotatable members, respectively;
(e) gear means coupled to said propulsor blades;
(f) electric motor means, including rotor means, mounted in stationary fashion relative to said rotatable members;
(g) means coupling said rotor means to said gear means such that rotation of said rotor means effects a pitch change of said propulsor blades;
(h) electrical generator means coupled to said rotatable shaft for generating electrical power; and
(i) circuit means coupling said electrical generator means to said motor means, said circuit means including control means responsive to a desired propulsor blade pitch command for controlling said motor means to force each of said blades to a respective desired blade pitch.

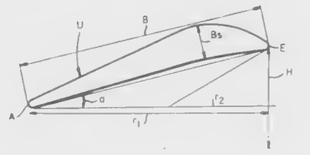
4,927,330

AIR PROPELLER

Oscar Asboth, Schlösselgasse 2, A-1080 Vienna, Austria

Continuation-in-part of Ser. No. 916,813, Oct. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 641,451, Aug. 16, 1984, abandoned. This application Jun. 24, 1988, Ser. No. 212,049
Claims priority, application Austria, Aug. 17, 1983, 2949/83
Int. Cl.[5] B64C *11/18*
U.S. Cl. 416—223 R 4 Claims

1. In a drive system for propelling a land or water vehicle at a reduced speed by rotation of a propeller in the air with a high slip of approximately at least 60% and having a quality coefficient of at least 70% for 100% slip, the improvement wherein
the propeller is of substantially constant pitch;
the propeller is rotated about an axis and the aerodynamic center of pressure is located at a distance from the propeller axis equal to approximately three-fourths of the radius of the propeller;
the angle of the blade inclination decreases continuously as the diameter of the propeller increases;
the thickness of the blade is greatest in the leading third of the width of the blade;
the propeller has a leading edge and a trailing edge and the leading edge has a radius of curvature that is greater seen in cross section than the radius of curvature of the trailing edge, the radius of curvature of the trailing edge being smallest in the area of approximately the outermost third of the propeller;



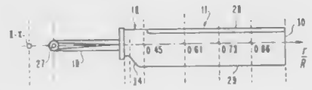
the propeller has a suction surface that has a shape when seen in cross section that is an essentially straight line in the area between the region of greatest blade thickness and the trailing edge;
the ratio of the diameter of the propeller to its pitch is approximately 1.18 to 2.9 times the value of the quality coefficient; and
the blade width of the propeller is 0.09 to 0.19 times the pitch of the propeller, the pitch being the axial propeller displacement with no slip.

4,927,331

BLADE FOR HIGH-PERFORMANCE SHROUDED PROPELLER, MULTI-BLADE SHROUDED PROPELLER PROVIDED WITH SUCH BLADES AND TAIL ROTOR ARRANGEMENT WITH SHROUDED PROPELLER FOR ROTARY WING AIRCRAFT

Alain E. Vuillet, Bouc Bel Air, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Feb. 28, 1989, Ser. No. 317,286
Claims priority, application France, Mar. 7, 1988, 88 02873
Int. Cl.[5] B63H *1/26*
U.S. Cl. 416—238 12 Claims



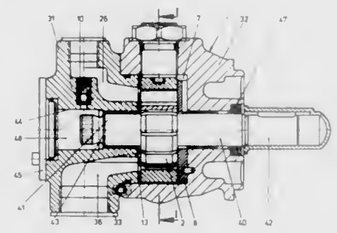
1. A blade for shrouded propeller comprising a tunnel and a rotor with multiple blades coaxial to said tunnel, said rotor comprising a rotating hub of which the radius is of the order of 40% that of said tunnel and on which said blades are mounted via blade shanks, wherein:
in plan, the aerodynamically active part of said blade presents, beyond the blade shank, a rectangular shape with the result that the successive profiles constituting said aerodynamically active part all have the same chord 1 and that the end section of said aerodynamically active part is straight; and,
along the span of the blade counted from the axis of the tunnel, between a first section of which the relative span is close to 45% and the end section of said blade:
the maximum relative camber of the successive profiles constituting said aerodynamically active part of the blade is positive and increases from a value close to 0 to a value close to 0.04;
the twist of said aerodynamically active part of the blade decreases from a first value close to 12° at said first section to a second value close to 4° at a second section of which the relative span is close to 0.86, then increases from this second section to a third value close to 4.5° at said end section of blade; and
the maximum relative thickness of said successive profiles decreases from a value close to 13.5% to a value close to 9.5%.

4,927,332

VANE PUMP

Horst Fischer, Lohr, and Karl Staub, Frammersbach, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Apr. 16, 1986, Ser. No. 852,714
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513923
Int. Cl.[5] F04B *49/08*
U.S. Cl. 417—299 5 Claims



1. A vane-type pump comprising:
a housing,
a rotor,
a plurality of vanes supported by said rotor,
a rotor shaft onto which said rotor is mounted,
a leakage oil space defined in said housing,
said rotor shaft having a first end and a second end, said first end ending within said housing and defining a border of said leakage oil space, said second end extending out of said housing and forming a shaft pin for driving said shaft,
said housing defining a suction space and a pressure space, said suction space and said pressure space being operatively coupled to vane chambers formed by said vanes,
a pressure port bore defined in said housing and coupled to said pressure space, said pressure port bore having a longitudinal axis, and
a venting valve disposed within said housing immediately adjacent said pressure port bore and having an inlet directly coupled to said pressure port bore and an outlet coupled to said leakage oil space,
a longitudinal axis of said venting valve being parallel to said axis of said pressure port bore such that a direct connection can be provided between the pressure port bore and leakage oil space.

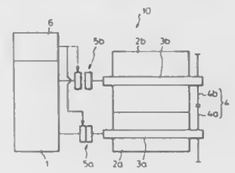
4,927,333

FLUID PUMP

Kichiro Kato, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 17, 1989, Ser. No. 297,969
Claims priority, application Japan, Jan. 22, 1988, 63-10881; Jun. 20, 1988, 63-150014
Int. Cl.[5] F04B *35/00*
U.S. Cl. 417—316 8 Claims

1. A fluid pump comprising:
a housing having an inlet and an outlet;
a pair of rotors rotatably arranged in the housing and engaged with each other;
a pair of rotor shafts supporting the rotors, respectively, and rotatably arranged in the housing;
identical mating gears provided on the rotor shafts, respectively, and in mesh with each other;
a rotary drive for driving either of the rotor shafts to rotate the rotors;
a first clutch means provided between the rotary drive and one of the rotor shafts to transmit the rotation of the rotary drive to the rotor shaft;



a second clutch means provided between the rotary drive and the other rotor shaft to transmit the rotation of the rotary drive to the other rotor shaft, when activated;
a clutch operating means which selectively operates one of the first clutch means and the second clutch means to change the drive-driven relationship between one of the rotor shafts and the other of the rotor shafts.

4,927,334

LIQUID PUMP DRIVEN BY ELEMENTS OF A GIANT MAGNETOSTRICTIVE MATERIAL

Göran Engdahl, Täby, and Gunnar Molund, Västeras, both of Sweden, assignors to ABB Atom AB, Västeras, Sweden

Filed Dec. 9, 1988, Ser. No. 282,271
Claims priority, application Sweden, Dec. 10, 1987, 8704931
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—322 5 Claims

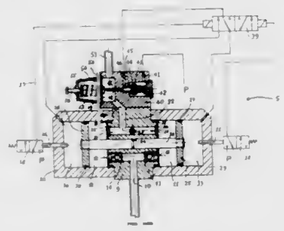


1. A pump for liquids driven by magnetostrictive rods, comprising:
a housing including a piston space therein;
a piston mounted for reciprocating movement along an axis extending within said piston space;
at least one pair of magnetostrictive rods including first and second rods made of a magnetostrictive material and mounted to engage with, said piston along said axis; and
coils surrounding each of said first and second rods adapted to generate magnetic fields such that motion is imparted to said piston in one direction along said axis with said first rod being deformed and simultaneously therewith said second rod dynamically prestressing said first rod, and such that motion in the opposite direction to said one direction is imparted to said piston with said second piston being deformed and simultaneously therewith said first

VOL
1114
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rod dynamically prestressing said second rod, whereby said piston moves with a reciprocating movement.

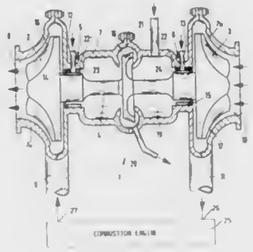
4,927,335
PUMP FOR TRANSFERRING LIQUIDS, IN PARTICULAR BEER OR CARBONATED BEVERAGES
Carlo M. Pensa, Esino Lario, Italy, assignor to O.D.L. S.r.l., Como, Italy
Filed Oct. 28, 1988, Ser. No. 264,264
Claims priority, application Italy, Nov. 4, 1987, 22509 A/87
Int. Cl.[5] F04B *43/06*
U.S. Cl. 417—393 6 Claims



1. A pump for transferring pressurized liquids, in particular for beer or carbonated beverages comprising:

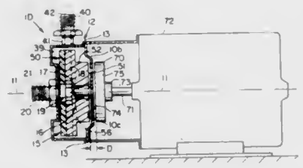
a central body having a rod reciprocable through said central body; first and second mutually opposite pistons on said rod, which pistons reciprocate integrally; said pistons sliding inside first and second cylinders, respectively, on opposite sides of said central body, whereby said pistons define, with their reciprocating motion, four variable-volume chambers, with a first and a second such chamber being located in said first cylinder on opposite sides of said first piston and with a third and a fourth such chamber being located in said second cylinder on opposite sides of said second piston; each of said first and third chambers having a liquid inlet and a liquid outlet; liquid being intaken alternately into said first and third chambers through said inlet through first valve means, said liquid being delivered alternately from said third and first chambers through said outlet under control of said first valve means; said delivered liquid being delivered alternately from said first and third chambers by a gas alternatively flowing into said second and fourth chambers respectively; a gas pressure regulator which modulates gas pressure in said second and fourth chambers and wherein pressure of the delivered liquid counteracts a calibration force in said gas pressure regulator, said gas alternatively acting, by control means inside of said second and fourth chambers to maintain a substantially constant and predetermined delivery pressure of said liquid and whereby said delivery pressure of said delivered liquid from one of said first or third chambers is obtained as the sum of a thrust exerted by liquid intaken in the other of said first or third chambers, plus the modulated gas pressure acting as a thrust on a face of the piston in said second or fourth chamber.

4,927,336
DRIVE SYSTEM INCLUDING AN ENGINE AND A TURBO-CHARGER
Axel Rossmann, and Werner Huether, both of Karlsfeld, Fed. Rep. of Germany, assignors to MTU Motoren-Und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany
Filed Dec. 7, 1987, Ser. No. 129,703
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642121
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—407 12 Claims



1. A drive system comprising a combustion engine, a cooling water circulating circuit for said combustion engine, a turbo-charger for said combustion engine, said turbo-charger including a compressor section, a turbine section, and housing means for said turbine section and for said compressor section, a shaft in said housing means for interconnecting said compressor section and said turbine section, sleeve bearing means for supporting said shaft in said housing means, water supply means interconnecting said housing means and said cooling water circulating circuit of said combustion engine for supplying cooling water as a lubricant to said sleeve bearing means, cooling water discharge means connecting said housing means back to said cooling water circulating circuit of said combustion engine for removing water from said housing means, a water pump wheel mounted on said shaft in said housing means between said compressor section and said turbine section for simultaneously circulating cooling water through said cooling water supply means, through said housing means, through said sleeve bearing means, through said cooling water discharge means and through said cooling water circulating circuit of said combustion engine, thereby avoiding a separate cooling pump for said combustion engine.

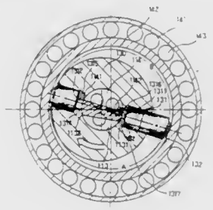
4,927,337
MAGNETICALLY DRIVEN PUMP
Ferdinand Lustwerk, Page Rd., Lincoln, Mass. 01773
Continuation of Ser. No. 904,409, Sep. 8, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 202,270
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—420 11 Claims



1. A magnetically driven centrifugal pump comprising,

(a) a magnetically driven rotor having a front face and a back face,
(b) a sealed housing enclosing said rotor and having a front wall, a back wall and a peripheral wall,
(c) said rotor being carried on an axle inside said housing, said axle being attached at one end thereof only to said housing back inside wall so that said rotor rotates freely on said axle, which defines an axis of rotation of said rotor, and extends cantilevered from said housing back inside wall, the rotor back face being adjacent said housing back inside wall and said rotor front face being adjacent said housing front inside wall,
(d) fluid impellers attached to said rotor that extend generally radially from said axis of rotation in the space between said rotor front face and said housing front inside wall,
(e) a fluid input passage through said housing front wall for fluid flow into said housing,
(f) a fluid output passage for fluid flow out of said housing through said peripheral wall,
(g) one or more straight permanent rotor magnets carried on said rotor and oriented thereon each with its north (N) and its south (S) magnetic poles on the same radial line from said axis of rotation,
(h) means external of said housing that magnetically couples with said rotor magnet through at least one wall of said housing including one or more external drive magnets oriented therein each with its north (N) and its south (S) magnetic poles on the same radial line from said axis of rotation and said external drive magnets and said rotor magnets polarities are oriented so that each drive magnet exerts a magnetic force of attraction on a rotor magnet and said force of attraction is generally parallel to said axis of rotation and
(i) means for driving said coupling means in rotation,
(j) whereby said driving means drives said rotor impellers which compels fluid flow from said input passage to said output passage.

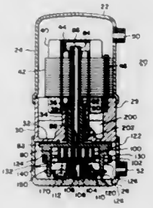
4,927,338
RADIAL PISTON PUMP
Yoshiaki Ito, Kariya; Kougi Nagai, Anjo; Akihiko Sawada, Toyohashi, and Hideyuki Koike, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Feb. 29, 1988, Ser. No. 162,205
Claims priority, application Japan, Mar. 2, 1987, 62-47194; Dec. 25, 1987, 62-331338
Int. Cl.[5] F04B *1/04*
U.S. Cl. 417—462 17 Claims



1. Radial piston pump comprising:

a housing having a cylindrical suction chamber therein;
a shaft rotatably provided within said housing, a longitudinal axis of said shaft being off-set from a center axis of said suction chamber by predetermined amount;
a pump column provided within said suction chamber of said housing, a longitudinal axis of said pump column is coaxial with the longitudinal axis of said shaft, said pump column having a suction groove on an outer surface thereof, a suction path connecting said suction groove to said suction chamber, a discharge groove formed on the outer surface thereof and the discharge path connecting said discharge groove to an outside of said pump column;
a rotor rotatably provided on said pump column, said rotor having a first and a second cylinders therein, each of said first and second cylinders aparting from each other by 180 degree;
a first and a second pistons each of which is slidably provided within each of said first and second cylinders;
a bearing provided within said suction chamber of said housing between said housing and said rotor, said bearing having an outer race fixing to said housing and an inner race to which a top end of said piston abuts; and
coupling transmitting the rotation of said shaft to said rotor wherein;
wherein the relation within a starting point and a finishing point of said suction groove, a starting point and a finishing point of said discharge groove and opening ports of said first and second cylinders is designed in such a manner that;
a rear end point of said opening port of said first cylinder functionally fits to said finishing point of said discharge groove and there exists a first predetermined angle θ_1 between a front end point of said opening port of said first cylinder and said starting point of said suction groove at a first position when said first piston locats a bottom dead point;
said front end point of said opening port of said first cylinder fits to said starting point of said discharge groove and there exists a second predetermined angle θ_2 between a rear end point of said opening port of said second cylinder and said finishing point of said suction groove at a second position when said rotor rotates by said first predetermined angle θ_1 from said first position;
said rear end point of said opening port of said second cylinder fits to said finishing point of said suction groove and there exists a third predetermined angle θ_3 between a front end point of said opening port of said second cylinder and said starting point of said discharge groove at a third position when said rotor rotates by said second predetermined angle from said second position; and
said front end point of said opening port of said second cylinder fits to said starting point of said discharge groove at a position when said rotor rotates by said third predetermined angle θ_3 from said third position.

4,927,339
ROTATING SCROLL APPARATUS WITH AXIALLY BIASED SCROLL MEMBERS
Delmar R. Riffe; Peter A. Kotlarek, both of La Crosse, and Robert E. Utter, Onalaska, all of Wis., assignors to American Standard Inc., New York, N.Y.
Filed Oct. 14, 1988, Ser. No. 260,153
Int. Cl.[5] F01C *1/04, 17/00, 19/00, 21/04*
U.S. Cl. 418—55 170 Claims



1. A fluid apparatus comprised of:

a first scroll member having an end plate, an upstanding involute portion disposed on said end plate, and a drive shaft on said end plate, said first scroll member further including two extension members at radially opposite ends

VOL 1114 ISS 4 MY 22 1990 UMI

of said end plate extending generally parallel to said upstanding involute portion, said extension members having a drive key portion and a retainer portion;
a compression plate secured to said retainer portion of said extension members;
a second scroll member between said first scroll end plate and said compression plate, said second scroll member having an end plate, an upstanding involute portion disposed on said end plate for interleaving engagement with said upstanding involute portion of said first scroll member, two oppositely disposed idler drive keys, and an idler shaft on said end plate;
means for biasing said first scroll member end plate from said compression plate; and
means for driveably rotating said first scroll member shaft.
9. A fluid apparatus comprised of:
a hermetic shell including a high pressure portion;
a first scroll member disposed in said hermetic shell, said first scroll member having an end plate, an upstanding involute portion disposed in said end plate, and a shaft of diameter D on said end plate, said shaft having a plan view area defined by said diameter D, said plan view area exposed to high pressure in said high pressure portion of said hermetic shell for biasing said first scroll member;
a second scroll member disposed in said hermetic shell, said second scroll member having an end plate, an upstanding involute portion disposed on said end plate for interleaving engagement with said upstanding involute portion of said first scroll member, and a shaft of diameter I on said end plate, said shaft having a plan view area defined by said diameter I;
means for biasing said second scroll member end plate toward said first scroll member end plate;
means for driveably rotating said first scroll member shaft; and
means for rotatably supporting said second scroll member shaft.

4,927,340

SYNCHRONIZING AND UNLOADING SYSTEM FOR SCROLL FLUID DEVICE

John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Aug. 19, 1988, Ser. No. 234,098
Int. Cl.[4] F01C *1/04*; F16D *3/04*
U.S. Cl. 418—55 **4 Claims**



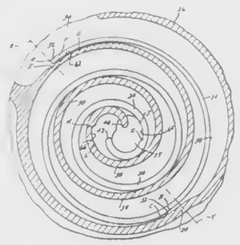
1. A scroll fluid device comprising, in combination:
at least one pair of meshed axially extending involute spiral wraps having involute centers and defining at least one chamber between them that moves radially between an inlet zone and an outlet zone when one wrap is orbited by translation along a curvilinear path about an orbit center relative to the other wrap;
wrap support means secured to and supporting each wrap;
means for mounting said wrap support means for enabling relative orbital motion of the wraps relative to each other about an orbit radius;
synchronizer means arranged to prevent relative rotation of one wrap relative to the other notwithstanding the orbital motion of one wrap relative to the other, said synchronizer being arranged to permit motion of one wrap relative to the other in a direction extending generally along a line connecting the involute centers of the wraps;
said wrap support means arranged so that one wrap support means is movable relative to the other wrap support means in a direction generally along a line connecting the involute centers of the wraps, said one wrap support means being located normally such that the distance between involute centers corresponds with a selected orbit radius of the scroll fluid device;
said synchronizer means comprising axially extending teeth integral with and projecting from one wrap support means and axially extending grooves provided in the other wrap support means, said teeth and grooves being interdigited;
said teeth comprising radially and circumferentially extending elements having flat circumferentially spaced teeth side wall surfaces, said grooves defined by generally radially extending flat groove side wall surfaces;
each of said teeth side wall surfaces being separated by a tooth width and each of said groove side wall surfaces being separated by a groove width, and wherein said groove width corresponds to the maximum orbital excursion of the teeth side wall surfaces, said teeth and groove side wall surfaces cooperating to prevent relative rotation between the scroll support means while accommodating their relative orbital motion.

4,927,341

SCROLL MACHINE WITH RELIEVED FLANK SURFACE

James W. Bush, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 123,866, Nov. 23, 1987, abandoned.
This application Apr. 12, 1989, Ser. No. 338,377
Int. Cl.[5] F01C *1/04*
U.S. Cl. 418—55 **30 Claims**



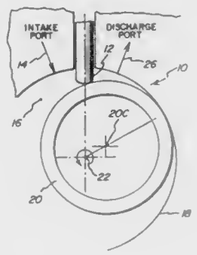
1. A scroll type machine including
first and second scroll members, each of said scroll members including an end plate having an outwardly projecting spiral wrap thereon, each of said wraps having active flank surfaces and radially inner tip end portions, and center and outer ports for receiving and discharging fluid, said wraps being interleaved with each other such that said active flank surfaces of said wraps interengage each other at a plurality of spaced locations so as to define a plurality of chambers therebetween such that when one of said scroll members is caused to orbit with respect to the other said scroll member said chambers will be caused to travel between said ports, whereby fluid received in one of said chambers through one of said ports if discharged through the other of said ports, the improvement comprising means defining a first relieved surface in the outer flank surface of one of said wraps, said relieved surface extending circumferentially inwardly along said flank surface from a point which is just circumferentially outwardly of the outer end of said flank surface on the other of said wraps which except for said relieved surface would be an active flank surface and a ramp surface extending radially outwardly between the circumferentially inner end of said relieved surface and the adjacent active flank surface on said one wrap, said ramp surface extending circumferentially a distance substantially greater than the circumferential distance said relieved surface extends.

4,927,342

COMPRESSOR NOISE ATTENUATION USING BRANCH TYPE RESONATOR

Jeung T. Kim, and Imdad Imam, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 12, 1988, Ser. No. 282,784
Int. Cl.[5] F04C *18/356, 29/06*
U.S. Cl. 418—63 **20 Claims**



1 A rotary compressor comprising:
a compression chamber having a cylindrical housing:
a roller mounted for eccentric rotation within said cylindrical housing;
a discharge port communicating with said compression chamber; and
a resonator of the branch type, said resonator communicating with said compression chamber and being Helmholtz resonator having a bandwidth centered at within 20% of 4 kHz, and;
wherein said Helmholtz resonator has a cavity of volume V, and a passage having length l and cross-sectional area S_b and a passage extending to the cavity, and wherein the square root of V in $mm^{3/2}$ multiplied by $0.125/mm^3$ is within k percent of the square root of S_b/l mm^1, where k is not greater than 10%.

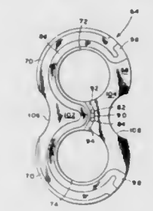
4,927,343

LUBRICATION OF GEAR PUMP TRUNNIONS

Kenneth F. Lonsberry, Hudson, Ohio, assignor to Permco, Inc., Streetsboro, Ohio

Continuation-in-part of Ser. No. 254,209, Oct. 6, 1988, abandoned. This application Aug. 3, 1989, Ser. No. 389,625
Int. Cl.[5] F03C *2/08*; F04C *2/18, 15/00*
U.S. Cl. 418—102 **12 Claims**

1. A thrust plate for a gear pump or the like comprising a plate member having two circular portions each with an aperture therethrough defining a figure-eight configuration, said plate member having a gear tooth confronting surface and a housing sealing surface each including a first pressure region and a second pressure region, said first pressure region being at a pressure different than the pressure at said second pressure region, said plate member also including a fluid transmitting path in each of said circular portions between said first pressure region on said gear tooth confronting surface and said second pressure region on said housing sealing surface, said fluid transmitting path comprising a slot from each of said apertures in said circular portions of said plate member and a bore which passes through said slot and interconnects said housing sealing surface and said gear tooth confronting surface.

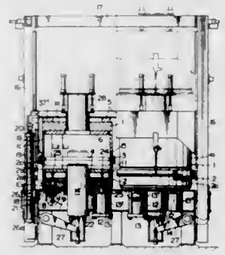


4,927,344

STEAM DOME TYPE VERTICAL TIRE PRESS

Itaru Amano, Kobe; Yasuhiko Fujieda; Katumi Ichikawa, both of Akashi, and Seisuke Fukumura, Miki, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 24, 1989, Ser. No. 315,266
Claims priority, application Japan, Feb. 29, 1988, 63-48142
Int. Cl.[5] B29C *35/04*
U.S. Cl. 425—28.1 **5 Claims**



1. A steam dome type vertical tire press comprising:
an upper dome having an upper mold mounting member for holding an upper mold;
a lower dome having a lower mold mounting member for holding a lower mold, said upper dome and said lower dome abutting at respective connection edges;
a dome lock ring engagable with said abutting connection edges of said upper and lower domes for locking said abutting connection edges;
a central mechanism vertically movably mounted at a central position of said lower mold mounting member;
a mold clamping cylinder having a pressure rod connected to said lower mold mounting member;
a cylinder support extending downwardly from said lower dome and connecting to said mold clamping cylinder for supporting said mold clamping cylinder;
a mold height adjusting device provided outside a dome space defined by said upper and lower domes and comprising means for adjusting a height between said upper and lower molds; and

VOL 1114 ISS 4 MY 22 1990 UMI

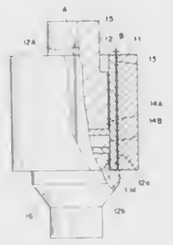
a heat/pressure medium sealing means interposed at least between an outer circumferential surface of said lower mold mounting member and an inner circumferential surface of said lower dome and between said connection edges of said upper and lower domes for sealing said abutting connection edges and for sealing a space between said lower mold mounting member and said lower dome, whereby said dome space is sealed.

4,927,345

PRESS CYLINDER FOR HIGH-TEMPERATURE, HIGH-PRESSURE PRESSING MACHINE

Makoto Takei, Nishinomiya, and Mamoru Tamura, Hirakata, both of Japan, assignors to Ohwada Carbon Industrial Co., Ltd., Osaka, Japan

Filed Feb. 27, 1989, Ser. No. 316,416
Claims priority, application Japan, Mar. 3, 1988, 63-50937
Int. Cl.[5] G01N *1/06*; A01N *1/00*
U.S. Cl. 424—4 **7 Claims**



1. A press cylinder for a high-temperature, high-pressure pressing machine, comprising:
an outer casing made of a carbon fiber reinforced carbon composite,
an inner casing made of a heat resistant material and formed with a longitudinally extending slit of a width (A) expressed by equation (I) which is fitted in the outer casing with a fitting gap (B) therebetween expressed by equation (II),
two press plates made of a heat resistant material and fitted in the inner casing, and
a press bar made of a heat resistant material and fitted in the inner casing, wherein
equation (I) is

$$A=\alpha\cdot T\cdot D\cdot\pi\cdot(C_2-C_1)$$

and equation (II) is

$$B=\beta\cdot T\cdot D\cdot(C_2-C_1)$$

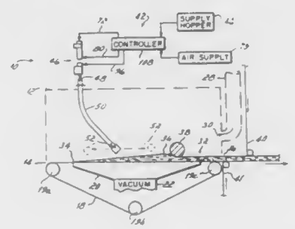
where A: slit width in mm, B: fitting gap in mm, α: 0.05 ~ 2.0, β: 0.1 ~ 2.0, T: temperature °C., D: outer diameter of the inner casing in mm, C_1: coefficient of linear expansion of the carbon fiber reinforced carbon composite of which the outer casing is made, and C_2: coefficient of linear expansion of the heat resistant material of the inner casing.

4,927,346

APPARATUS FOR DEPOSITING PARTICULATE MATERIAL INTO A PAD OF FIBROUS MATERIAL IN A FORMING CHAMBER

Thomas A. Kaiser, Vermilion; Douglas C. Mulder, Wellington, both of Ohio; David E. O'Ryan, Jackson, Mich.; Douglas A. Schneider, Lorain, and Rodney L. Ward, Wellington, both of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 939,093, Dec. 8, 1986, abandoned. This application May 2, 1989, Ser. No. 348,149
Int. Cl.[5] A29D *7/00*
U.S. Cl. 425—81.1 **26 Claims**



1. Apparatus for forming a non-woven pad of fibrous material with particulate material interspersed throughout a selected portion of the thickness of said non-woven pad, comprising:
a chamber having an inlet and an outlet;
a conveyor movable between said inlet and said outlet of said chamber;
means for introducing fibrous material into said chamber;
vacuum means located beneath said conveyor for applying a vacuum in said chamber to draw said fibrous material onto said conveyor, said fibrous material forming a non-woven pad on said conveyor which increases in thickness in a direction from said inlet of said chamber toward said outlet thereof, said non-woven pad having a bottom surface resting atop said conveyor and a top surface which slopes upwardly relative to said conveyor from said inlet of said chamber toward said outlet thereof;
dispenser means disposed within said chamber above said conveyor at a predetermined location along said upwardly sloping top surface of said non-woven pad for intermixing particulate material with a portion of said fibrous material being drawn onto said conveyor at said predetermined location to form a layer of intermixed fibrous material and particulate material within a predetermined portion of said thickness of said non-woven pad while maintaining another portion of said thickness of said non-woven pad substantially free of said particulate material.

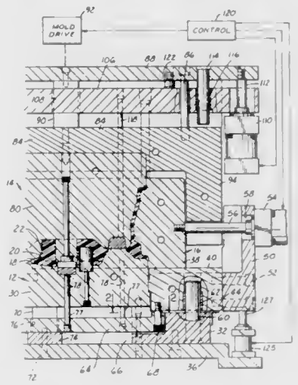
4,927,347

COMPRESSION MOLD FOR FIBER-REINFORCED COMPOSITE WHEELS

John H. Golata, and James A. Woelfel, both of Lansing, Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 11, 1988, Ser. No. 255,445
Int. Cl.[5] B22C *9/28*; B29C *43/04*
U.S. Cl. 425—150 **3 Claims**

1. A compression mold for forming a fiber-reinforced composite wheel including integral rim and disc portions with a bead retaining flange on at least one axial end of said rim portion, said mold comprising: first radially reciprocable mold sections having mold surfaces defining radially outward rim-forming surfaces of a mold cavity, second and third axially opposed mold sections having mold surfaces defining disc-forming portions of said mold cavity and cooperable with opposing surfaces of said first mold sections for forming portions of said rim including said flange, first means supporting said first mold sections for radial reciprocation relative to a central axis of said mold, second means mounting said second mold section in fixed position, third means mounting said third mold section for axial reciprocation between a first position adjacently opposed to said second mold section to form said mold cavity and a second position axially spaced from said second mold section, fourth means mounting said first means for axial reciprocation between a first position adjacently opposed to said second mold section to form said mold cavity and a second position axially spaced from said second mold



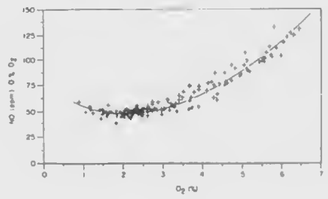
section in the direction of said third mold section, said fourth means including means resiliently urging said first means to said second position, and means for reciprocating said first and third mold sections between said first and second positions relative to said second mold section, said reciprocating means including fifth means for radially reciprocating said first mold sections on said first means, and sixth means for axially reciprocating said third mold section toward said second mold section, said third means including means for axial abutting engagement said first means and axially reciprocating said first mold sections toward said second mold section conjointly with said third mold section against said resiliently-urging means.

4,927,348

CIRCULATING FLUID BED COMBUSTION WITH CO COMBUSTION PROMOTER AND REDUCED COMBUSTION AIR

Amos A. Avidan, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,929
Int. Cl.[5] F23D *3/40*
U.S. Cl. 431—7 **15 Claims**



1. In a circulating fluidized bed combustion zone wherein a carbon-containing fuel is burned at an elevated temperature by contact with oxygen-containing gas added in an amount equal to at least 110% of the amount needed for complete combustion of the fuel, said combustion occurring in a generally vertical combustor comprising a fast fluidized bed of patriculated including limestone or dolomite wherein at least a majority of the particulate matter in the fast fluidized bed has a particle diameter in excess of 100 microns, to generate a flue gas/particulate stream which is discharged from the top of the combustor, said flue gas comprising excess oxygen, fines having a particle diameter less than about 100 microns, and circulating particles having average particle size of about 100–400 microns, which flue gas passes through a separation means to recover from the flue gas at least a majority of the 100–400 micron particles which are recycled to the circulating fluidized bed combustion zone, the improvement comprising burning said fuel in the presence of about 0.001 to 100 wt. ppm CO combustion promoter selected from the group of Pt, Pd, Rh, Ir, OS, and mixtures and compounds thereof in the combustion zone and reducing the amount of oxygen containing gas added per amount of fuel burned so that a total of 100 to 110% of the oxygen required for complete combustion of said fuel is added.

4,927,349

METHOD FOR BURNING NITROGEN-CONTAINING FUELS

Robert M. Schirmer; Ellsworth H. Fromm, and Henry E. Alquist, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 272,442, Jun. 10, 1981, Pat. No. 4,721,454, which is a continuation-in-part of Ser. No. 932,820, Aug. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,361, May 25, 1977, abandoned. This application Nov. 9, 1987, Ser. No. 118,827
Int. Cl.[5] F23M *3/04*
U.S. Cl. 431—10 **13 Claims**



1. A plurality of combustion processes, each in an individual combustion zone having a primary combustion region and a secondary combustion region, comprising:
initiating a fuel-rich combustion stage, in said primary combustion region of each of said plurality of combustion zones, by burning a fuel-rich combustion mixture, comprising a fuel and a first volume of a preimary air source and having a fuel-air ratio greater than the stochiometric ratio, for a period of time sufficient to produce a moving primary combustion stage effluent comprising a flame front, unburned fuel and partially burned fuel;
abruptly terminating said fuel-rich combustion stage and initiating a fuel-lean combustion stage, in said secondary combustion region of each of said plurality of combustion zones, by reducing the peripheral dimension of said moving primary combustion region effluent and introducing into said moving primary combustion region effluent a second volume of a secondary air source to produce a fuel-lean combustion mixture having a fuel-air ratio less than the stochiometric ratio, said second volume of said secondary air being introduced at a longitudinally narrow zone immediately before said reduction of the peripheral dimension of said primary combustion region effluent; and
burning said fuel-lean combustion mixture, in said secondary combustion region of each of said plurality of combustion zones, to produce a moving secondary combustion stage effluent.

VOL 1114 ISS 4 MY 22 1990 UMI

4,927,350

COMBUSTION CONTROL

Martin E. Zabielski, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 27, 1987, Ser. No. 43,571
Int. Cl.[5] F23N *1/00*
U.S. Cl. 431—12 8 Claims



1. In a combustion process which is regulated by maintaining a preselected feed forward relationship of fuel input and air input, the improved method of operating comprising:

establishing a fuel/air input peak relationship for the approximately stoichiometric condition which produces the maximum infrared radiation;

selecting a desired operating fuel/air ratio based on a result of the fuel/air input other than infrared radiation;

determining the desired fuel/air input relationship for said desired operating fuel/air ratio;

determining a fuel/air relationship offset between the fuel-/air input peak relationship and the fuel/air input desired relationship;

operating the combustion process based on a feed forward signal representing the desired fuel/air input relationship;

recalibrating the process by later establishing a new fuel/air input relationship for the approximately stoichiometric condition which produces the maximum infrared radiation;

establishing a new desired fuel/air relationship by applying said fuel/air relationship offset to the new fuel/air input peak relationship;

operating the combustion process at the new desired fuel/air relationship.

4,927,351

METHOD AND SYSTEM FOR CONTROLLING THE SUPPLY OF FUEL AND AIR TO A FURNACE

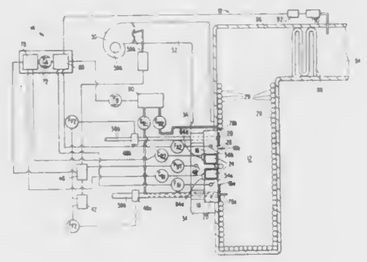
Donald K. Hagar, Emmaus, Pa., and Robert W. McIntyre, 2845 E. Overlook, Cleveland Heights, Ohio 44118, assignors to Eagleair, Inc., Bethlehem, Pa. and Robert W. McIntyre, Cleveland Heights, Ohio

Continuation of Ser. No. 917,900, Oct. 10, 1986, Pat. No. 4,887,958. This application Aug. 4, 1989, Ser. No. 393,150
Int. Cl.[5] F23N *5/00*
U.S. Cl. 431—12 4 Claims

1. A method for providing fuel and air to a furnace through a plurality of burner assemblies, each burner assembly including a combustion air register, each combustion air register including a combustion air passageway that produces a discrete air flow path of combustion air, an air valve for controlling the flow of combustion air through the burner assembly, and an air flow meter located exclusively in that combustion air register for measuring the air flow through the discrete air flow path downstream of the air valve, the method comprising the steps of:

(a) sensing a combustion characteristic produced by each separate burner assembly;

(b) sensing the air flow through each separate burner assembly by taking a separate measurement exclusively of the air flow through the discrete air flow path of each combustion air register downstream of the air valve, each such separate measurement being taken with the air flow meter for the combustion air register in which the measurement is being taken; and



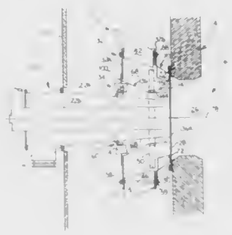
(c) separately controlling each individual air valve in response to the combustion characteristic sensed in step (a) and the air flows sensed in step (b) to thereby individually control the performance of each burner assembly.

4,927,352

BOILER FURNACE AIR REGISTER

Landy Chung, 5144 Cliff Dr., Ashtabula, Ohio 44004

Filed Jul. 19, 1988, Ser. No. 221,134
Int. Cl.[5] F23M *9/00*
U.S. Cl. 431—184 21 Claims



1. An air register for providing combustion air to a burner, comprising:

(a) an air register mounting frame comprising a pair of spaced apart support plates interconnected by circumferentially spaced, fixed housing members, said mounting frame defining an inlet opening for admitting combustion air between said fixed housing members;

(b) at least one, oblique non-planar, parallelogram-shaped, curved damper door pivotally mounted in said inlet opening for controlling the admission of combustion air into a region defined within said register,

(c) each of said damper doors including a pair of parallel edges which define an oblique angle with respect to an axis of said register; and

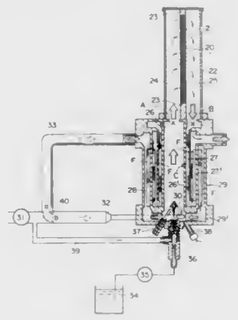
(d) pivot structure for pivotally mounting each of said damper doors, defining an axis of rotation for each door which extends substantially along a diagonal of said door.

4,927,353

CATALYTIC COMBUSTION DEVICE

Yoshihiro Nomura, and Yoichiro Ohkubo, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jun. 6, 1989, Ser. No. 362,094
Claims priority, application Japan, Jun. 6, 1988, 63-138878; Jun. 6, 1988, 63-138879
Int. Cl.[5] F23D *11/44*
U.S. Cl. 431—215 11 Claims



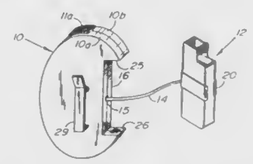
1. A catalytic combustion device having a fuel supply means communicated with a fuel supply source, an air supply passage communicated with an air supply source, a premixing chamber for mixing together fuel supplied from said fuel supply means and combustion air supplied from said air supply passage to form a fuel-air mixture, a catalyst installed in a combustion chamber to cause oxidation reaction of said fuel-air mixture supplied thereto, thereby effecting catalytic combustion said premixing chamber communicating with said combustion chamber, and an exhaust passage for discharging combustion gas from the catalyst in said combustion chamber, wherein the improvement comprises a part of said exhaust passage being defined outside said premixing chamber with a common wall being provided therebetween, said exhaust passage being communicated with said combustion chamber, and a part of said air supply passage defined being outside said exhaust passage with a common wall being provided therebetween, said air supply passage being communicated with said premixing chamber, thereby heating said premixing chamber by means of the combustion gas in said exhaust passage to vaporize the fuel and also heating said air supply passage to preheat the combustion air.

4,927,354

RETRACTABLE CIGARETTE LIGHTER HOLDER

Kirk Sanford, 18441 Vine St., Hesperia, Calif. 92345

Filed Jul. 5, 1988, Ser. No. 215,777
Int. Cl.[5] F23Q *2/32*
U.S. Cl. 431—253 13 Claims



1. A cigarette lighter holder assembly comprising:

a housing formed of two cup shaped portions in facing relation to define a hollow interior;

compartment means formed in the periphery of said housing, said compartment means including a back and opposing first and second edges generally transverse thereto, the dimensions of said edges and said back generally corresponding to the length and width of a lighter to be retained therein;

means, including spring means, in proximate relation to said compartment means for enabling releasable retention of a cigarette lighter within said compartment means in proximate relation to said back and between said edges; a retractable spring loaded reel mechanism mounted within said housing;

cord means having a first end thereof within said housing attached to said reel mechanism and a second end extending externally to said housing;

said second end of said cord means being attached to said spring means; and

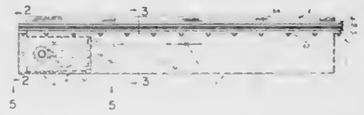
said retractable reel mechanism includes cord retraining and release means for selectively retaining the amount of extension of said cord at selected points, the release of which allows said reel mechanism to retract the lighter.

4,927,355

BURNER ASSEMBLY

Allen Haire, Garfield Heights, Ohio; Alan C. Abele, Zelienople, Pa., and Stanley W. Kuczek, Aurora, Ohio, assignors to Enerco Technical Products, Inc., Cleveland, Ohio

Filed Nov. 1, 1988, Ser. No. 265,559
Int. Cl.[5] F23D *14/14*
U.S. Cl. 431—329 14 Claims



1. A burner assembly comprising:

a housing having first and second surfaces spaced by a sidewall;

an air inlet defined on said first surface and adapted to communicate with a supply of gas;

means for mixing air and gas in said housing;

a plenum chamber defined in said housing operatively associated with said mixing means;

a radiant surface defined by a multi-ply screen assembly communicating with said plenum chamber and defining a combustion surface, said radiant surface being disposed on said housing at said second surface opposite said air inlet for eliminating backflashing;

means for compressing the multi-ply screen assembly wherein the compressing means has a coefficient of thermal expansion greater than said multi-ply screen assembly; and

a reverberator extending adjacent said radiant surface for reflecting heat from said radiant surface.

4,927,356

GAS BURNER

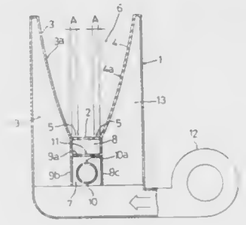
Tetsuji Otsuka, Neyagawa; Kenichi Shinozaki, Kashiwara; Kenji Toyoyama, Fujiidera, and Shinobu Ishihara, Kawachinagano, all of Japan, assignors to Osaka Gas Co., Ltd., Osaka, Japan

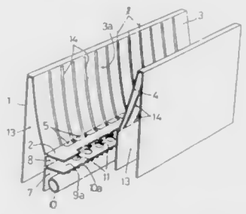
Filed Aug. 21, 1987, Ser. No. 88,124
Claims priority, application Japan, Aug. 22, 1986, 61-197848; Dec. 27, 1986, 61-199926[U]; Dec. 27, 1986, 61-199927[U]; Apr. 2, 1987, 62-81967; Apr. 2, 1987, 62-81968; Apr. 3, 1987, 62-83578
Int. Cl.[5] F23D *15/00*
U.S. Cl. 431—351 11 Claims

1. A gas burner, havng a base 2 containing a plurality of spaced flame openings 5 for discharging from an elongate mixing chamber 8 a mixture of gaseous fuel and primary com-

VOL 1114 ISS 4 MY 22 1990 UMI

bustion air, said primary combustion air being supplied from an electric fan **12** directly to said mixing chamber **8**, said gaseous fuel being supplied to said mixing chamber from a gaseous fuel supply means **10** having a plurality of evenly spaced openings for supplying gaseous fuel uniformly over the length of the mixing chamber **8**, and a secondary air supply passage **13** for supplying secondary combustion air from said electric fan **12** into a combustion space 6 adjacent said flame openings **5**, comprising:





a pair of wall members **3**, **4**, extending from said base **2** on opposite sides of said flame openings **5**, defining therebetween said combustion space **6** extending in the discharge direction of said mixture; and

a plurality of secondary combustion air outlet openings **14** defined in said wall members **3**, **4** between adjacent flame openings **5** extending along the discharge direction of said mixture.

4,927,357

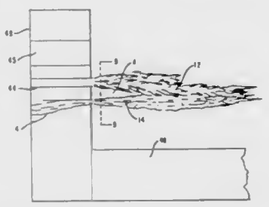
METHOD FOR GAS LANCING

Loo T. Yap, Princeton, N.J., assignor to The BOC Group, Inc., Murray Hill, New Providence, N.J.

Division of Ser. No. 310,161, Feb. 16, 1989, which is a continuation-in-part of Ser. No. 176,488, Apr. 1, 1988, abandoned. This application Oct. 12, 1989, Ser. No. 420,441

Int. Cl.[5] **F27B** *3/22*

U.S. Cl. 432—22 **5 Claims**



1. In a method of heating a surface comprising providing a burner system which produces a flame extending over said surface and providing one or more reaction-rate enhancing gas lances between the burner system and the surface, said lances producing a jet of said gas between the flame and the surface, the improvement comprising emitting said reaction rate enhancing gas such that the point of exit of the gas taken perpendicular to the longitudinal axis of the flow of the gas is essentially non-circular, thereby enhancing the uniformity of heating by producing a jet which creates an aerodynamically reduced pressure field thereby deforming the flame and displacing the flame toward the surface.

4,927,358

APPARATUS FOR PRODUCING HONEYCOMB PANELS

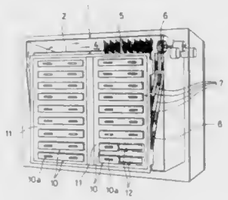
Mitsunobu Tamura, Chigasaki; Toshifumi Tsuchihashi, Tokyo, and Toshihisa Kenmochi, Wako, all of Japan, assignors to The Yokohama Rubber Co., Ltd. and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 27, 1989, Ser. No. 343,642

Claims priority, application Japan, May 6, 1988, 63-108949

Int. Cl.[5] **F26B** *3/04*; **B32B** *31/20*; **C09J** *5/06*

U.S. Cl. 432—204 **7 Claims**



1. Apparatus for producing honeycomb panels comprising:

a heating chamber isolated from external air by a wall; and

a plurality of drawout trays capable of being individually inserted into and withdrawn from the heating chamber through a plurality of openings formed in the wall; whereby each of the drawout trays has a work accommodating chamber connected to a vacuum source, a top opening of the work accommodating chamber being hermetically closed by a flexible sheet that can be opened and closed, and block plates at the front and rear ends for closing the opening in the wall at every terminal positions when inserted and withdrawn.

4,927,359

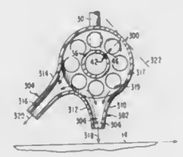
FLUID DISTRIBUTION APPARATUS

Thomas T. Hitch, Lawrenceville, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1989, Ser. No. 331,717

Int. Cl.[5] **F27B** *5/16*, *5/10*, *5/04*

U.S. Cl. 432—206 **13 Claims**



1. A fluid distribution apparatus for an atmosphere exhibiting temperature excursions, said apparatus comprising:

a first plenum adapted to receive pressurized fluid and having a plurality of spaced first orifices for distributing the received fluid in said plenum to a region exterior said plenum, the fluid in said plenum being at a first pressure and tending to flow through said orifices in jets;

a second plenum having a plurality of spaced second orifices, said second plenum being secured in fluid communication with said first plenum via said first orifices, the first and second orifices being dimensioned so that the fluid in the second plenum is at a second pressure lower than said first pressure, said plenums tending to expand and contract differently in response to said temperature excursions;

means for directing the jets against a surface in said second plenum to disperse the flow of said jets, said orifices and means for directing being so aligned and the pressure differential in the first and second plenums being sufficiently different so as to provide a substantially negligible pressure gradient of said fluid in said second plenum in a region along and adjacent to said second orifices;

securing means for securing said first plenum to said second plenum and for allowing said secured first and second plenums to move relative to one another in response to said different expansions and contractions of said plenums; and

wherein said means for directing includes means for directing jets in a direction approximately towards said second orifices, said apparatus further including baffle means in the second plenum between said first and second orifices for dispersing the fluid in said jets.

4,927,360

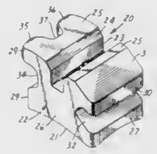
TRIWING ORTHODONTIC BRACKET

Jirina V. Pospisil, Monrovia, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Apr. 29, 1988, Ser. No. 187,747

Int. Cl.[5] **A61C** *3/00*

U.S. Cl. 433—8 **4 Claims**



1. A labial triwing orthodontic bracket comprising a base, a body extending integrally from the base, said body having an outer labial face and having a mesiodistally extending arch-wire slot extending from the labial face toward the base, a pair of spaced-apart ligature tie wings extending gingivally away from the arch-wire slot, and a single tie wing extending occlusally from the arch-wire slot, the single occlusal tie wing having a mesiodistal width at least as large as the combined mesiodistal widths of the spaced-apart gingival tie wings, wherein the width of the occlusal tie wing substantially corresponds to the mesiodistal width of the bracket body and base.

4,927,361

ORTHODONTIC ATTACHMENTS

Dennis C. Smith, 183 St. Clair Ave. E, Toronto, Ontario, and Rolf Maijer, 435 Trunk Road, Suite 207, Duncan, British Columbia, both of Canada

Continuation of Ser. No. 402,307, Jul. 27, 1982, Pat. No. 4,460,336. This application Mar. 30, 1984, Ser. No. 595,321

Int. Cl.[5] **A61C** *7/00*

U.S. Cl. 433—9 **6 Claims**

1. In a dental attachment for affixing by adhesive bonding to a tooth surface and having a tooth engaging surface suitable for effecting said adhesive bonding of said attachment to a tooth surface, the improvement which comprises particulate material on said tooth engaging surface.

4,927,362

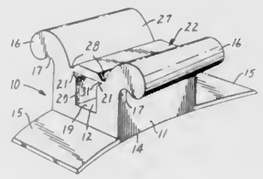
CONVERTIBLE BUCCAL TUBE

Wilford A. Snead, San Dimas, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Jul. 12, 1988, Ser. No. 218,095

Int. Cl.[5] **A61C** *3/00*

U.S. Cl. 433—17 **12 Claims**



1. An integral, convertible buccal tube made of sintered metal for mounting on a molar tooth in an orthodontic treatment program, comprising:

a base configured for fitting on a tooth;

a body extending integrally from the base, and defining an elongated arch-wire slot; and

a cover plate extending across and closing a buccal side of the arch-wire slot, the plate being integrally joined to the body adjacent opposite sides of the slot by elongated, frangible webs extending along the length of the slot, the webs being of small cross section as compared to the cover plate buccal-lingual thickness, whereby the plate can be sheared from the body along both of the webs to open the slot.

4,927,363

DENTAL PROSTHESIS IMPLANT

Rudolf Schneider, Heidenreichstein, Austria, assignor to Netalln. Kunststoffwaren Erzeugengagesellschaft M.B.H., Vienna, Austria

Filed Jan. 4, 1989, Ser. No. 293,239

Claims priority, application Austria, Jan. 4, 1988, 4/88

Int. Cl.[5] **A61C** *8/00*

U.S. Cl. 433—173 **10 Claims**

1. An implant for affixing a dental prosthesis, comprising:

a primary member anchorable in a jawbone of a subject to be fitted with a dental prosthesis, said primary member having a recess opening at an end of said primary member and formed with an annular wall;

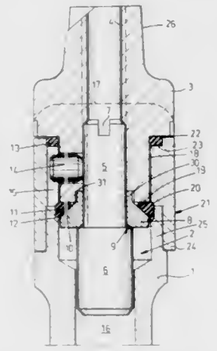
a secondary member detachably connectable to said primary member and formed with a throughgoing axial bore;

a screw in alignment with said bore and provided with a tool-engaging formation enabling rotation of said screw by a tool inserted into said bore;

a compression ring engaged by said screw and displaceable upon rotation of said screw axially toward a surface of said secondary member; and

VOL
1114
ISS
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an O-ring clamped between said compression ring and said surface, positioned in said recess and radially compressed against said wall between said surface and said compression ring upon rotation of said screw in one sense to resiliently retain said secondary member on said primary member, said O-ring releasing from said primary member upon rotation of said screw in a sense opposite said one sense to permit removal of said secondary member from said primary member, said compression ring being formed with a



frustoconical surface diverging in a direction opposite a direction of displacement of said compression ring by rotation of said screw in said one sense whereby said O-ring is pressed outwardly and said parts are drawn axially together upon rotation of said screw in said one sense, said secondary member being formed with a stop surface engaged by said compression ring upon rotation of said screw in said one sense to define a maximum compression of said O-ring.

4,927,364

STEERING WHEEL

Shuji Inui; Tetsushi Hirumitsu; Toshinori Takahaski; Makoto Tamaki; Mitsuhiro Kikuta, and Junichi Mizutani, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 29, 1988, Ser. No. 213,294

Claims priority, application Japan, Jun. 30, 1987, 62-101568; Jul. 28, 1987, 62-189669

Int. Cl.[5] H01R *39/02, 39/08*

U.S. Cl. 439—15 24 Claims



2. A steering wheel comprising:

a pair of sun gears arranged facing each other, each sun gear comprising a wheel portion having an inner surface and a rim portion protruding along an outer circumference of said wheel portion,

at least two segmented slip rings mounted on said inner surface of said each wheel portion, said segmented slip ring being a plating formed on said inner surface of said wheel portion; and

contact pins, in sliding contact with said segmented slip rings on said each wheel portion, provided between said pair of sun gears.

4,927,365

APPARATUS FOR PROVIDING AN ELECTRICAL CONDUCTION PATH BETWEEN TWO CONTACT LOCATIONS WHICH ARE ROTATABLE WITH RESPECT TO EACH OTHER

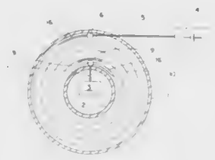
Friedrich Schauer, Heroldsberg, and Manfred Wolff, Schwarzenbruch, both of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 2, 1989, Ser. No. 430,321

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1988, 3838114

Int. Cl.[5] H01R *39/00*

U.S. Cl. 439—15 9 Claims



1. In an apparatus for providing an electrical conduction path between a first contact location and a second contact location rotatable one with respect to the other, said electrical conduction path comprising a flat ribbon cable having at least two electrical conductors and being wound in the manner of a coiled spring, said flat ribbon cable being firmly attached at a first end thereof to said first contact location, and firmly attached at a second end thereof to said second contact location, the improvement comprising an end portion of said flat ribbon cable at said first end being folded across an immediately adjacent portion of said flat ribbon cable to form a change in the longitudinal direction of said flat ribbon cable, said folded portion of said flat ribbon cable having a stabilizer connection assembly positioned thereabout, said assembly including:

an angular attachment of molded insulating material, said attachment having a clamping segment and a ribbon-shaped, sheath segment extending at an angle one to the other, said clamping segment including a pair of clamping arms between which said folded end portion of said flat ribbon cable is positioned, and said sheath segment being positioned closely about a portion of the said flat ribbon cable immediately adjacent to said folded end portion;

a protective sheath of flexible insulating material positioned closely about a portion of said folded end portion of said flat ribbon cable, between said clamping arms; and

means for locking said clamping arms in a compressed condition.

4,927,366

FUSED ELECTRICAL CONNECTOR WITH SEWING WINGS

David P. Tommerson, and Kevin L. Brekkestran, both of Fargo, N. Dak., assignors to Environwear, Inc., Fargo, N. Dak.

Filed Sep. 8, 1989, Ser. No. 404,887

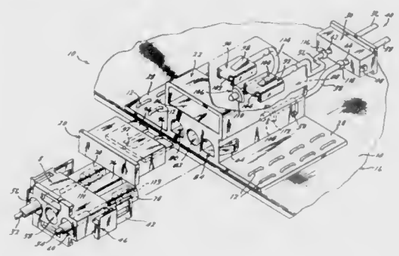
Int. Cl.[5] H01R *13/68, 13/58*

U.S. Cl. 439—37 16 Claims

12. An electrical connector assembly, adapted to be securely attached to fabric, for allowing electrical current to be supplied from a first wire conductor through the connector assembly to a second wire conductor, the connector assembly comprising:

removable first connector means for securely receiving a portion of the first wire conductor;

second connector means for securely receiving a portion of the second wire conductor and removably connecting with the first connector means in a mating fashion, whereby mating connection of the first and second connector means operates to electrically connect the first and second wire conductors, thereby allowing current to flow through to the second wire conductor;



wing means of tbin and substantially planar configuration securely attached to the second connector means and protruding outwardly therefrom for facilitating secure attachment of the second connector means to the fabric,

a readily removable and replaceable fuse adapted to reside in series with and between the first and second wire conductors; and

means, located in and forming part of one of the connector means, for removably receiving the fuse, whereby the fuse operates to interrupt the current flowing through the first and second wire conductors when more than a predetermined amount of current flows in the wire conductors.

4,927,367

SELECTIVE GROUNDING DEVICE FOR ELECTRONIC EQUIPMENT

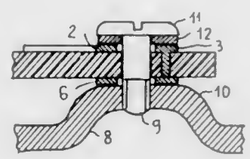
Elvio Salvagno, Caluso, Italy, assignor to Bull HN Information Systems Italia S.p.A., Caluso, Italy

Filed Mar. 7, 1989, Ser. No. 320,258

Claims priority, application Italy, Mar. 15, 1988, 19772 A/88

Int. Cl.[5] H01R *4/66*

U.S. Cl. 439—92 2 Claims



1. Selective grounding device for electronic equipment comprising at least a printed circuit board clamped to a ground frame by means of at least a screw inserted through an opening of the board and screwed into the ground frame, comprising a first conductive pad surrounding said opening and located on the board side contacting the frame, a second and third conductive pads, each insulated from the other, surrounding said opening on the other board side, the second of said pads being electrically connected to said first one, the third of said pads being electrically connected to the board's DC ground, and a washer, selectively insulating or conductive, overlaying said second and third pads and clamped against said second and third pads by said clamping screw.

4,927,368

CONNECTOR

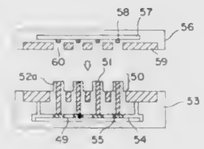
Katsuhide Shino, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 9, 1987, Ser. No. 107,765

Claims priority, application Japan, Oct. 13, 1986, 61-156200; Nov. 10, 1986, 61-172440; Nov. 19, 1986, 61-178675

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—66 7 Claims



1. A rubber connector having conducting portions and insulation portions disposed alternately with each other, said rubber connector comprising:

projecting portions formed on one side of said connector,

each of said projecting portions being formed of a conducting portion extending to a front end face thereof and an insulating portion covering the peripheral face of said conducting portion, the conducting portion being exposed to the outside on the front end face of said projecting portion.

4,927,369

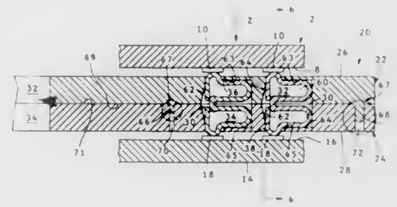
ELECTRICAL CONNECTOR FOR HIGH DENSITY USAGE

Dimitry G. Grabbe, Middletown, and William J. Schnoor, Upper Strasburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 22, 1989, Ser. No. 314,346

Int. Cl.[5] H01R *23/72*

U.S. Cl. 439—66 9 Claims



1. An electrical connector for interposition between first and second opposing surfaces each having thereon a multiplicity of contact pads arranged in a predetermined grid array, electrically to connect each pad on said first surface with a respective pad on said second surface, the connector comprising;

a pair of insulating plates arranged in parallel, superposed relationship, said plates presenting third and fourth opposed outer surfaces and each plate being formed with a multiplicity of recesses arranged in said predetermined grid array, each recess of one plate being aligned with a respective recess of the other plate to define a contact element receiving cavity;

connecting means formed integral with said plates and connecting said plates together in said superposed relationship

comprising first interengaging pins and sockets connecting outer margins of said plates, and second interengaging pins and sockets connecting said plates at positions between said cavities, the first pins and sockets being of substantially greater cross sectional area than the second pins and sockets; and

a multiplicity of contact elements each retained by said plates in a respective one of said cavities and each having a pair of opposed contact noses one of which protrudes through an opening in said third outer surface, for resilient engagement with a respective contact pad on said first opposing surface and the other of which protrudes through an opening in said fourth outer surface for resilient engagement with a respective contact pad on said second opposing surface.

4,927,370

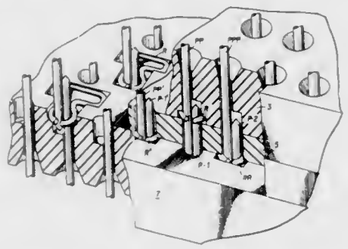
HIGH DENSITY CONNECTOR

Patrick J. Murphy, Mounds View, and John W. Svenkeson, Scandia, both of Minn., assignors to Unisys Corporation (Formerly Burroughs Corp), Detroit, Mich.

Continuation of Ser. No. 149,235, Jan. 27, 1988, abandoned. This application Jul. 28, 1989, Ser. No. 385,963

Int. Cl.[5] H01R *9/09, 13/20*

U.S. Cl. 439—74 **13 Claims**



1. Engager means for resiliently urging both of a pair of ohmic contact pins against one another, the engager means comprising a substantially C-shaped resilient conductive ring means including a spaced pair of ends and spring means therebetween, the ends opposing one another and spaced closer than the combined thickness of the pins;

said conductive ring means comprising a pair of resilient C-shaped segments adapted to surround a given pair of pins. plus a connective intermediate section formed as a substantially elliptical open loop and adapted to join said C-shaped segments and thrust said segments resiliently toward one another;

the pin pairs being arranged to be juxtaposed, or disposed relatively close together, with the open loop of the connector ring engaging said pin pairs, and also adapted to extend around one or more other adjacent pin pairs without touching said adjacent pin pairs.

4,927,371

SOCKET FOR SEMICONDUCTOR DEVICE

Hiroshi Nakatsu, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 12, 1988, Ser. No. 242,980

Claims priority, application Japan, Sep. 14, 1987, 62-140657

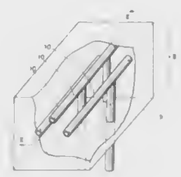
Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—79 **15 Claims**

1. A socket for a semiconductor device used for mounting a semiconductor device having a plurality of lead pins on a circuit board, comprising:

a socket body having a shape in the form of a generally solid rectangular block;

a plurality of receiving holes in said socket body, said receiving holes extending in mutually parallel relationship and having inner surfaces of conductive material for receiving each of said plurality of lead pins; and



a plurality of conductive coupling portions extending at right angles to and contacting said inner surfaces of said receiving holes for coupling said receiving holes to conductive portions of said circuit board.

4,927,372

ELECTRICAL CONNECTOR

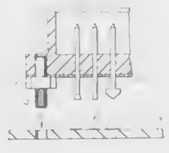
John C. Collier, Southport, United Kingdom, assignor to ITT Industries Limited, Basingstoke, United Kingdom

Filed Feb. 21, 1989, Ser. No. 312,831

Claims priority, application United Kingdom, Feb. 19, 1988, 8802893

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—83 **8 Claims**



1. A connector for a printed circuit board comprising a housing having a plurality of holes accommodating respective elongated contacts one end of which is adapted to make electrical contact with a conductive trace, pad or other conductive surface on the printed circuit board when the connector is brought into contact with the board, characterised in that the contacts (5,6,7) are capable of limited axial movement relative to the housing (1) in order to take up irregularities in the board and that frictional material (8) is provided to cause the contacts to be retained in the positions which they have taken up when the connector is fully engaged with the board (9).

4,927,373

ELECTRICAL SAFETY RECEPTACLE ASSEMBLY

Robert G. Dickie, Newmarket, Canada, assignor to Paige Manufacturing Company, Inc., Newmarket, Canada

Filed Oct. 26, 1989, Ser. No. 427,073

Int. Cl.[5] H01R *29/00*

U.S. Cl. 439—188 **9 Claims**

1. An electrical receptacle comprising

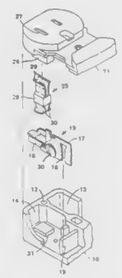
a receptacle housing,

at least one pair of normally-open contacts disposed within said housing, and

means, responsive to the insertion of an electrical pin into said housing, for closing said normally-open contacts only after said pin is inserted a substantial distance into said housing,

said means for closing said normally-open contacts comprising

fixed contacts,



bifurcated movable elements having contacts at the ends thereof,

said bifurcated movable elements being responsive to the insertion of said electrical pin therebetween to move said contacts into electrical connection with said fixed contacts.

4,927,374

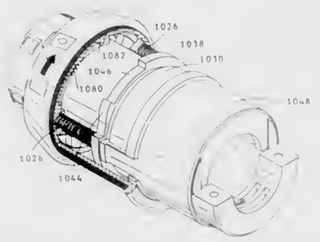
MODULAR ELECTRICAL CONNECTOR ASSEMBLY

Robert W. Pitts, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 940,835, Dec. 12, 1986, Pat. No. 4,820,204. This application Apr. 10, 1989, Ser. No. 335,603

Int. Cl.[5] H01R *13/62*

U.S. Cl. 439—310 **18 Claims**



1. An electrical connector assembly for interconnecting a plurality of conductors, the assembly comprising matable first and second connectors, each connector having a plurality of terminals located in insulative housing means, and latching means on the first and second connectors comprising a plurality of resilient collet fingers on the first connector and an outer shiftable sleeve surrounding an inner core on the second connector, the resilient collet fingers being deflectable over a surface on the inner core of the second connector when the outer shiftable sleeve is retracted, the sleeve being shiftable over the collet fingers to prevent disengagement of the collet fingers from the surface, the shiftable sleeve being spring biased relative to the inner core by at least one spring extending between first and second spring stops on the shiftable sleeve and the inner core respectively, the shiftable sleeve being initial rotatable relative to the inner core to confine at the least one spring between the spring stops, first anti-rotation means on the shiftable sleeve engaging second anti-rotation means on the inner core when the at least one spring is confined between the first and second spring stops.

4,927,375

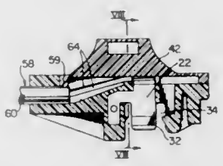
ELECTRICAL CONNECTOR FOR ELECTRICAL CONNECTION TO INSULATION DISPLACEMENT TERMINALS

George Debortoli, Ottawa, and Alex G. Cristescu, Montreal, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 23, 1989, Ser. No. 314,028

Int. Cl.[5] H01R *13/58, 13/627*

U.S. Cl. 439—357 **13 Claims**



1. An electrical connector for electrical connection to an insulation displacement terminal of a terminal assembly, the connector comprising:

a dielectric housing body having an integral latch means extending outwardly from one side of the body for releasably latching the connector in a mounting position on the terminal assembly, the housing body defining a chamber with an entrance to the chamber for an insulated conductor, a conductor terminal position within the body, an opening at another side of the body for access to the chamber and the terminal position, an electrical contact blade carried by and extending from said one side of the body, the contact blade also extending to the terminal position, and a conductor insulation strain relief means; and

a cover for positioning over and closing the opening, the cover locatable to close the opening in a snap-on manner.

4,927,376

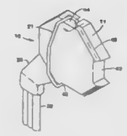
ELECTRICAL PLUG ASSEMBLY AND SYSTEM

Robert G. Dickie, Newmarket, Canada, assignor to Paige Manufacturing Company Incorporated, New Market, Canada

Filed May 17, 1989, Ser. No. 353,092

Int. Cl.[5] H01R *19/04*

U.S. Cl. 439—484 **7 Claims**



1. An alternating current low profile electrical plug assembly comprising

a flat, low profile insulative plug body having a vertical axis,

a plurality of conductive pins having a connector portion extending perpendicularly to said plug body for engagement with mating sockets in an electrical outlet,

each of said pins including at least one stabilizing land area at right angles to said connector portion and embedded in said body,

each of said pins including a wire connecting area also at

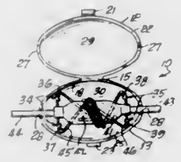
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right angles to said connector portion and embedded in said body,
electrical wires connected to said pins and exiting said body at an acute angle to said vertical axis and
a cone-shaped sleeve attached to said body and enclosing said electrical wires, said sleeve including a bend which realigns said electrical wires with said vertical axis.

4,927,377
PROTECTOR FOR JOINED EXTENSION CORDS

William D Bach. 5715 Ventura Canyon Ave., Van Nuys, Calif. 91401, and Donald R. Murphy, 3861 Poppyseed La., Apt. #1, Calabasas, Calif. 91302

Filed Dec. 12, 1988, Ser. No. 282,624
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—367 11 Claims



1 In a protector for joined plugs on the ends of cords, said protector comprising a pair of shells each of which having a wall and interior surface thereon and closable upon one another to form a cavity while providing distal ports which produce apertures in its closed mode, the joined plugs adapted to be disposed within such cavity in the protector's open mode, the improvement comprising

means for attaching to the protector stretchable bands adapted to be twisted and entwined about such plugs to keep them joined together, said attaching means being mounted to the interior surface of the wall of one of the shells.

4,927,378
LEAD WIRE CONNECTING DEVICE FOR COAXIAL CABLE CONNECTOR

Jae C. Song, 295-9, Jangan-1 Dong, Dongdaemoon-Ku, Seoul, Rep. of Korea

Filed Dec. 27, 1988, Ser. No. 290,460
Claims priority, application Rep. of Korea, Dec. 23, 1987, 22863/1987
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—394 11 Claims



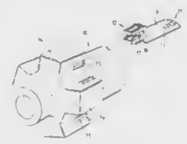
1. A connector for electrically connecting a coaxial cable to an appliance, said connector comprising:

a conductive pin for electrically connecting an exposed end of a core wire of the coaxial cable to the appliance, said pin having an inner end for contacting the exposed end of the core wire;
a conductive sleeve for electrically connecting a shield wire of the coaxial cable to the appliance, said sleeve surrounding said pin, said sleeve having a conductive spike for piercing through an outer layer of insulation to contact the shield wire of the coaxial cable; and
a pinching piece for cooperating with said inner end of said pin to bend the exposed end of the core wire between said pinching piece and said inner end of said pin.

4,927,379
ELECTRICAL CONNECTOR

Patrick S. Wang; Georg Strobl, and Raymond W. H. Chu, all of Hong Kong, Hong Kong, assignors to Johnson Electric Industrial Manufactory, Limited, Chaiwan, Hong Kong

Filed Aug. 19, 1988, Ser. No. 233,756
Claims priority, application United Kingdom, Aug. 20, 1987, 8719715; Oct. 1, 1987, 8723021
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—398 11 Claims

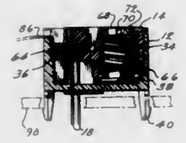


1. An electrical connector formed from sheet material folded to provide two overlying parts, each part having a slot open at one end, the open ends of the slots being adjacent and the two slots being arranged so as to be only partly in register with one another so that the resultant slot in the connector is narrower than each of the slots in the two overlying parts and is open at one end for receiving and gripping a wire, non-aligned regions (as considered in a direction perpendicular to the plane of each overlying part) bordering the slots of the two overlying parts, the non-aligned regions defining the resultant slot being offset by a part-shearing out of the plane of the respective part towards the other part so that the non-aligned regions are substantially co-planar.

4,927,380
PRINTED CIRCUIT BOARD CONNECTOR

Howard Reynolds, Waterbury, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Dec. 23, 1988, Ser. No. 289,546
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—411 19 Claims



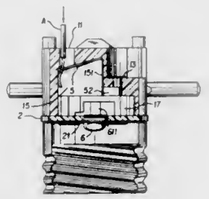
1. An electrical connector comprising:

insulative housing means, said housing means having an opening leading to a housing means cavity, said cavity having a predetermined shape;
insulative insert cover means having a predetermined shape which corresponds to said predetermined shape of said cavity, said insert cover means being received in said cavity of said housing means;
threaded screw means threadably received in said insert cover means, said screw means being captured and retained by screw means retaining means in said housing means; and
at least one conductive terminal supported in said housing means and extending into said insert cover means wherein said insert cover means is raised or lowered in said housing means by actuation of said threaded screw means and wherein a wire lead will be simultaneously terminated on said conductive terminal when said insert cover means is lowered.

4,927,381
ELECTRICAL PUSH-PULL CONNECTOR

Jean Y. Shang, 1, Lane 118, San Ho Rd., Fong Ywan City, Taichong County, Taiwan

Filed Jul. 26, 1989, Ser. No. 385,089
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—438 6 Claims



1. An electrical push-pull connector, comprising:

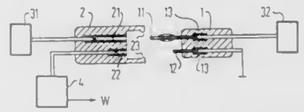
a housing, having a pair of slots formed through a top surface thereof for insertion of a pair of electrical leads;
an insulation disc secured to said housing;
a screwshell member secured to said housing, said screwshell and said insulation disc being rivetted to said housing, said screwshell being substantially tubular in contour having internal threads for threaded coupling to a lamp base;
displaceable actuation means for electrically actuating said connector, said displaceable actuation means including a longitudinally extending and displaceable push-pull stem member extending through said housing, said push-pull stem member having coupled thereto an electrically conductive sliding brass member displaceable within a central slot formed in said housing, and a coil spring contacting said stem member for biasing said stem member in a predetermined direction;
a pair of bent spring members locationally positioned on opposing sides of said central slot for displaceable contact with said sliding brass member;
an insulation member mounted on said insulation disc; and,
a C-contoured spring positioned within a recess of said housing for contacting one of said bent spring members.

4,927,382
ELECTRICAL FUNCTION GROUP FOR A VEHICLE

Anton Huber, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1988, Ser. No. 249,763
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 3737289
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—490 4 Claims

1. An electrical function group for a vehicle comprising a useful circuit that contains at least two electrical module units that are connected via a plurality of electrical plug-type connectors each comprising a plug part and a socket part whereby said plug part has at least one useful contact comprising a longer contact pin and at least one signal contact comprising a shorter contact pin, and said socket part has at least two contact sleeves for frictional acceptance of said contact pins, and further comprising a signal circuit being conducted serially through said plurality of electrical plug-type connectors

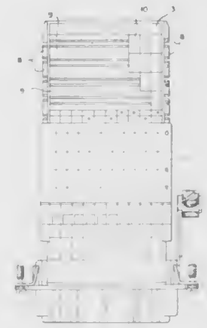


that contains a monitoring means being conducted via the signal contact, said monitoring means generating an alarm given an interruption of said signal circuit due to a parting of the signal contact in any one of said plug-type connectors.

4,927,383
ELECTRICAL PLUG CONNECTOR

Willi Dürkop, Reinheim, and Wolfgang Scheffner, Roedermark-deutsche Staatsbürger, both of Fed. Rep. of Germany, assignors to C. A. Weidmüller GmbH & Co., Fed. Rep. of Germany

Filed Jul. 18, 1989, Ser. No. 381,381
Claims priority, application European Pat. Off., Aug. 4, 1988, 88112662.7
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—491 6 Claims



1. An electrical plug connector, comprising

(a) a housing; and
(b) a plate slidably connected with said housing for movement between a retracted position wherein said plate is arranged within said housing and an extended position wherein said plate is arranged beyond said housing, said plate including a label for designating the poles of the connector, said label being visible when said plate is in the extended position and said label and said plate being obscured from view by said housing when said plate is in the retracted position.

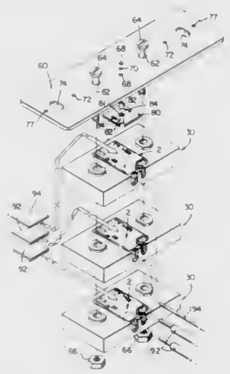
4,927,384
FLAT WIRE TO ROUND WIRE ELECTRICAL INTERCONNECT

Reginald A. Bates, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 898,969, Aug. 21, 1986, abandoned. This application Apr. 17, 1989, Ser. No. 339,900
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—494 26 Claims

1. A transition block for interconnecting flat undercarpet power cable having a plurality of flat conductors arranged side-by-side in the same plane to round conductor power cable,

the transition block comprising means for arranging at least some of the flat conductors into an array of planes separate from one another to decrease the width of the cable at the arranging means, at least one of said planes in said array being distinct from the plane of said flat cable, each arranging means including means for electrically interconnecting a flat power cable conductor to a round conductor, the arranging means comprising individual block members which carry individual electrical interconnection means, the block members being stackable one above the other and for trapping between them



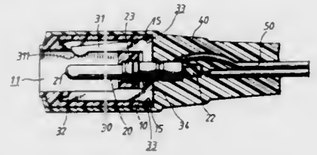
a flat power cable conductor, the transition block further comprising means to urge the block members together, effecting the electrical connection between the conductors and the individual electrical interconnection means, means to secure the block within an electrical utility box comprising a mounting yoke which is connectable to the transition block, the mounting yoke having mounting holes in alignment with threaded holes on the utility box, and the transition block further comprising means to common conduit carrying the round cable into the utility box to flat shielding which overlies the flat power cable and to a ground conductor.

4,927,385

CONNECTOR JACK

Yu F. Cheng, No. 7, Fu Hsing St., Tu Cheng Ind. Dist., Taipei Hsien, Taiwan

Filed Jul. 17, 1989, Ser. No. 380,314
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 **3 Claims**



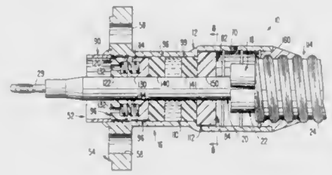
1. A connector jack comprising:
a molded retainer (**10**) having a cylindrical body including a central recess (**11**) at a front end thereof for receiving an annular prong of a plug, two slots (**12**) at a rear end thereof, a central stepped recess (**13**) at the rear end thereof, and a perforation (**14**) formed on a base of said stepped recess (**13**);
a conducting pin (**20**) centrally located within said molded retainer (**10**), said conducting pin (**20**) including a pin body (**21**), two conducting arms (**22**) formed in parallel with said pin body (**21**), and a pin-neck (**23**) which connects the two conducting arms (**22**) to said pin body (**21**), said pin-neck (**23**) having a stepped profile, said conducting pin (**20**) being insertable into said central stepped recess (**13**) with said pin body (**21**) passing through said perforation (**14**) and being retained in said central recess (**11**), said pin-neck (**23**) being retained in said stepped recess (**33**); and
a resilient clamping element (**30**) including a conducting leg (**31**) and a fixing leg (**32**) and a T-shaped stem (**34**) which connects said conducting leg (**31**) and said fixing leg (**32**), said conducting leg (**31**) and said fixing leg (**32**) being respectively insertable into said slots (**12**) of said molded retainer (**10**), said conducting leg (**31**) further including a semicircular-shaped conducting end (**311**) at an inner side thereof, said semicircular-shaped conducting end (**311**) projecting over said slot (**12**) into said central recess (**11**).

4,927,386

ELECTRICAL CABLE CONNECTOR FOR USE IN OIL WELLS

David H. Neuroth, Hamden, Conn., assignor to Hubbell Incorporated, Orange, Conn.

Filed Aug. 22, 1988, Ser. No. 234,574
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—589 **14 Claims**



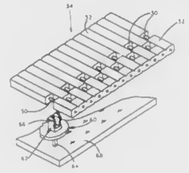
1. An electrical cable connector, the combination comprising:
at least one continuous insulated electrical conductor having a connecting end;
a hollow housing receiving a portion of said electrical conductor therein and having first and second open ends with said electrical conductor being rigidly coupled to said housing adjacent said first open end and said connecting end of said electrical conductor extending outwardly from said second open end of said housing;
means, located in said housing, for sealing the space between said housing and said conductor,
said means comprising
a first sealing assembly coupled to said housing in a relatively stationary position and having a portion of said conductor extending therethrough,
a second sealing assembly slidably coupled to said housing and axially spaced from said first sealing assembly and having a portion of said conductor extending therethrough,
a dielectric, incompressible, flowable sealing material located in said housing between said first and second sealing assemblies, and
biasing means, coupled to said housing, for biasing said second sealing assembly towards said first sealing assembly for pressuring said sealing material to fill any otherwise empty spaces between said housing and said first and second sealing
assemblies and between said conductor and said first and second sealing assemblies under the influence of said biasing means.

4,927,387

METHOD AND DEVICE FOR CONNECTION TO WIRES IN A FLEXIBLE CABLE

Donald F. Eckler, Newark Valley; John R. Mankus, Endicott; Francis J. Ripp, Vestal, and George J. Saxenmeyer Jr., Apalachin, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1988, Ser. No. 284,577
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—499 **15 Claims**



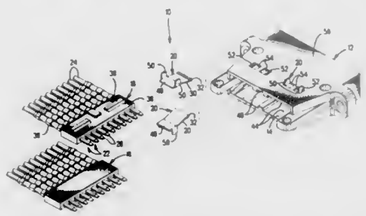
1. A method of connecting the wires in a flexible cable wherein the wires are laterally spaced within an insulating coating to a connector device having a plurality of connectors each having a bifurcated end portion adapted to transversely engage the wires for electrical contact comprising the steps of:
arranging said connectors in said device in a preselected pattern disposed to receive the wires therein;
stripping the insulation completely from selected portions of each of said wires in said cable in a pattern which corresponds to the pattern of arrangement of said connectors while maintaining the stripped portions of the wires essentially co-planer and axially parallel; and
thereafter forcing said stripped wire portions transversely into engagement with said connectors with the wires remaining essentially co-planer and parallel;
whereby connection of pre-exposed bare wires is made to connections in a preselected pattern in a sliding manner.

4,927,388

ELECTRICAL CONNECTOR SHELL ASSEMBLY AND MODULE RETENTION CLIP

David H. Gutter, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 29, 1989, Ser. No. 414,814
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—660 **3 Claims**



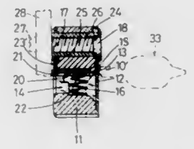
1. A retention clip for being affixed along an inside surface of a connector shell for retention of a terminal module therein, the clip being of the type having a mounting section and a module-engaging spring arm extending forwardly therefrom to a free end adapted to latch behind a transverse rib of the terminal module to prevent rearward axial movement of the module after insertion into the shell, the improvement comprising:
said mounting section comprising a body section having a pair of initially outwardly extending tabs along lateral edges of the body section, said tabs adapted to be inserted outwardly through associated longitudinal slits in the cavity-defining wall of the shell and then be bent over along the outwardly facing surface of the shell, securing the clip to the shell with the body section against the inwardly facing surface of the shell and the spring arm extending forwardly therefrom and inwardly into the shell cavity.

4,927,389

FIXTURE FOR MULTIPLE-CONTACT PIN HALOGEN LAMPS

Helmut Willnat, and Manfred Meichsner, both of Kierspe, Fed. Rep. of Germany, assignors to Bender & Wirth GmbH & Co., Kierspe, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,594
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 8800561[U]
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—682 **23 Claims**



1. A fixture for current consuming devices, particularly for halogen lamps with plural contact pins, comprising a socket having recesses for contact pins; an electrical connector for each of said recesses, at least one of said connectors comprising a contact element provided in one of said recesses and engageable by a contact pin, a conductive fastener element provided in said socket, and an intermediate member integral with at least one of said elements and providing an electrical connection between said elements; support means including electrical conductors for said connectors; and means for connecting said fastener element to said support means so that the fastener element electrically connects said contact element with the respective conductor in response to connection of said fastener element to said support means.

4,927,390

GAS EXHAUSTION DEVICE FOR INBOARD/OUTBOARD ENGINE

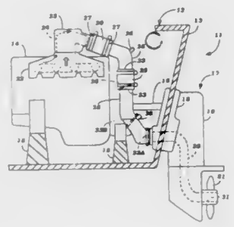
Noboru Kudoh; Itsushi Hirukawa; Satoshi Aoki; Tsuyoshi Yoshimura, and Shigeki Shiozawa, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamantsu, Japan

Filed Dec. 22, 1988, Ser. No. 289,982
Claims priority, application Japan, Dec. 25, 1987, 62-327310
Int. Cl.[5] B63H *21/32, 21/38*
U.S. Cl. 440—88 **13 Claims**

1. In a fluid connection between a rigid conduit, a flexible conduit adapted to be telescopically received with said rigid conduit and releasable clamping means for retaining said con-

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duits together, the improvement comprising a projection on said rigid conduit position and provided for the sole purpose of



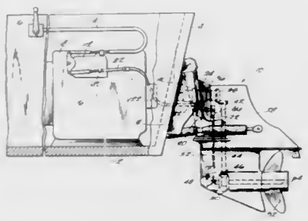
engaging said clamping means when said clamping means is released for retaining said clamping means.

4,927,391

SHIFT MEANS FOR MARINE PROPULSION DEVICE

Gerald F. Bland, Glenview, and Donald K. Sullivan, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 3, 1984, Ser. No. 677,569
Int. Cl.[5] B63H *5/13*
U.S. Cl. 440—84 28 Claims



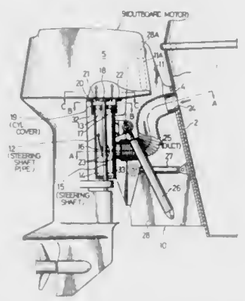
1. A marine propulsion device comprising a pivot housing adapted to be mounted on a boat transom for pivotal movement relative to the boat transom about a generally vertical steering axis, and for pivotal movement relative to the boat transom about a generally horizontal tilt axis, a propulsion unit including a reversible transmission and being removably connected to said pivot housing for pivotal movement with said pivot housing, and means extending between said pivot housing and said propulsion unit for actuating said transmission from forwardly of said pivot housing and including a vertically shiftable member located in said propulsion unit and operably connected to said transmission for actuation thereof, a push-pull cable extending forwardly from said housing for actuation at a remote point, and means for automatically coupling said push-pull cable to said vertically shiftable member incident to connection of said propulsion unit to said pivot housing and for automatically uncoupling said push-pull cable and said vertically shiftable member incident to disconnection of said propulsion unit from said pivot housing.

4,927,392

AIR SUPPLY APPARATUS FOR OUTBOARD MOTOR

Nobuo Makihara, and Hideo Tahara, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Mar. 13, 1989, Ser. No. 322,199
Claims priority, application Japan, Mar. 15, 1988, 63-33817[U]
Int. Cl.[5] B63H *21/36*
U.S. Cl. 440—88 9 Claims



1. An air supply apparatus for an outboard motor provided with an engine compartment and a steering shaft and movably support near a transom of a boat hull, which comprises:

(a) a hollow steering shaft pipe positioned below said engine compartment and supported near the transom, formed with an inner hollow portion communicatable with the engine compartment; and

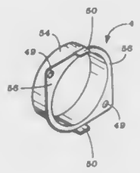
(b) a flexible duct, connected between said hollow steering shaft pipe and the transom, for introducing air from inside the hull to the engine compartment through said flexible duct and said hollow steering shaft pipe.

4,927,393

FIXING STRUCTURE FOR BELLOWS OF MARINE PROPULSION DEVICE

Kenichi Hayasaka, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 25, 1988, Ser. No. 276,063
Claims priority, application Japan, Nov. 26, 1987, 62-298808
Int. Cl.[5] F16J *3/04*
U.S. Cl. 440—112 5 Claims



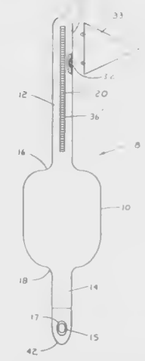
1. A marine propulsion device comprising an engine output shaft leading through a transom mount, a universal joint coupling said engine output shaft with an input shaft of a drive unit for directing engine output to a propulsion means of said drive unit, a swivel casing having a cylindrical opening to accommodate a portion of said universal joint, said swivel casing affording tilting movement of said drive unit relative to said transom mount, and a flexible bellows extending over said universal joint, wherein said bellows includes a cylindrical end disposed within said cylindrical opening in swivel casing and a retaining sleeve having a sleeve portion engaging the inner surface of said bellows cylindrical end to form a seal between said retaining sleeve and said cylindrical opening in swivel casing, said retaining sleeve further comprising a flange portion for directly affixing said retaining sleeve to said swivel casing.

4,927,394

UNITARY BUOY

Thomas Galgana, 22 Gannett Rd., Quincy, Mass. 02169

Filed Oct. 24, 1988, Ser. No. 261,689
Int. Cl.[5] B63B *21/00*
U.S. Cl. 441—1 1 Claim



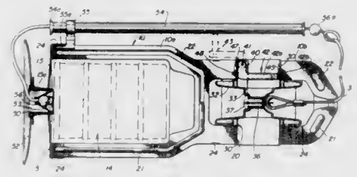
1. A unitary buoy, comprising a body portion and a handle portion, the body portion including a first end, the handle portion extending from the first end and including a terminal end and a shaft and having a series of longitudinal teeth set in a channel, the shaft being hollow.

4,927,395

COMBINED BUOY AND ANCHOR DEVICE

Kenneth D. Saulnier, P.O. Box 815, Yarmouth, Nova Scotia, Canada (B5A 4K4), and Hubert J. Van Leeuwen, Amherst, Canada, assignors to Kenneth D. Saulnier, Yarmouth, Canada

Filed Jun. 9, 1989, Ser. No. 363,938
Int. Cl.[5] B63B *22/24*
U.S. Cl. 441—26 7 Claims



1. A combined buoy and anchor device for fishermen, comprising:

(a) a buoy body with a hollow interior, and having a closure member for closing its upper end,

(b) a reel rotatably mounted in the buoy body and to which is secured the inner end of a cable,

(c) an anchor connected to an outer end of said cable,

said anchor including a shank and a plate detachable from said shank, and wherein said plate and said closure member have interengaging means whereby said plate can be retained in place on said closure member.

4,927,396

SONOBUOY

Gordon H. Wood, London, Canada, assignor to Her Majesty the Queen in Right of Canada as represented by the Minister of National Defence, Canada

Filed Jan. 19, 1989, Ser. No. 299,059
Claims priority, application Canada, May 26, 1988, 567752
Int. Cl.[5] F41F *5/02*
U.S. Cl. 441—33 6 Claims



1. A sonobuoy comprising:

a container adapted to rest side-by-side and end-to-end with plural containers of the same configuration;

an inflatable parafloat collapsed into an upper chamber of the container;

compressed gas means in the container for inflating the parafloat;

a hydrophone;

a hydrophone suspending cable assembly; and

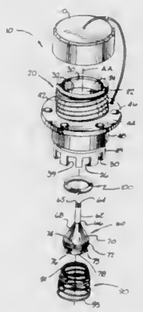
release means for normally securing the hydrophone and the suspending cable assembly to the container and operable to release the hydrophone and suspending cable in response to deposition of the container in a body of water.

4,927,397

RAFT INFLATION VALVE

Gregory H. Yeager, 309 Jackson, Denver, Colo. 80206

Filed Feb. 23, 1989, Ser. No. 314,823
Int. Cl.[5] B63B *35/58*
U.S. Cl. 441—41 6 Claims



1. A raft inflation valve assembly comprising:

(a) a tubular body member adapted to be mounted in fixed relationship with a raft bladder and having a central bore defined by an interior surface having an upper opening exterior of said raft bladder and a lower opening interior of said raft bladder; said tubular body member comprising a first annular lip surface defining a portion of said central bore and a second annular lip surface defining a portion of said central bore;

(b) a plunger member for coacting with said valve body member, for alternately placing said inflation valve assem-

VOL 1114 ISS 4 MY 22 1990 UMI

bly in an open state and a closed state; said plunger member being received in said tubular body member bore and having a shaft portion having a first end which is adapted to engage said first lip portion for maintaining said inflation valve assembly in said open state and having a base portion which is adapted to engage said second lip portion for placing said inflation valve assembly in said closed state; and

(c) biasing means for biasing said plunger member upwardly within said valve body bore.

4,927,398

INCANDESCENT LAMPS INCLUDING A COMBINED GETTER

John W. Shaffer, Montoursville, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 287,769, Dec. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 287,574, Dec. 16, 1988, which is a continuation of Ser. No. 153,863, Feb. 9, 1988, abandoned. This application Sep. 19, 1989, Ser. No. 409,979

Int. Cl.[5] H01J 9/38

U.S. Cl. 445—9 23 Claims

9. A method of gettering an incandescent lamp comprising the steps of:

introducing a phosphorus source into an unsealed envelope;

treating the phosphorus source contained in the unsealed envelope to produce elemental phosphorus within the unsealed envelope;

introducing a fill gas and silane into the unsealed lamp envelope;

sealing the lamp envelope; and

activating the elemental phosphorus and silane contained in the sealed envelope.

4,927,399

DIAPHRAGM GAME CALL WITH TONE MODIFYING SLITS

Mark Mueller, Pacific, Mo., assignor to Penn's Woods Products, Inc., Delmont, Pa.

Filed Jan. 24, 1989, Ser. No. 300,856

Int. Cl.[5] A63H 5/00

U.S. Cl. 446—207 20 Claims



1. A game caller of a size and shape suitable for insertion into a user's mouth for support against the roof of the mouth comprising:

a support;

first and second generally flat diaphragms fixidly retained by the support in a generally spaced-apart relationship with respect to one another with one of the diaphragms generally overlying the other, each diaphragm presenting an edge free of the support to vibrate by exhausted pulmonary air, the first diaphragm having at least two slits to provide a flap on the first diaphragm and the second diaphragm having at least one slit to permit exhausted pulmonary air to flow therethrough, the exhausted pulmonary air causing said flap to flutter during use.

4,927,400

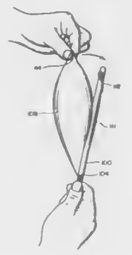
BALLOON SCULPTURING METHODS, APPARATUS AND PRODUCTS

Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240

Division of Ser. No. 183,720, Apr. 19, 1988, Pat. No. 4,850,926. This application Jun. 21, 1989, Ser. No. 370,636

Int. Cl.[5] A63H 3/06; A45B 19/00

U.S. Cl. 446—220 20 Claims



1. The method of forming a sculpture from one (1) or more balloons comprising the steps of:

(a) establishing a balloon forming device consisting of rigid rod-like balloon former defining means; and,

(b) securing at least one (1) balloon to the rigid rod-like balloon former defining means in juxtaposition therewith; whereby, when each balloon is inflated the rigid rod-like balloon former defining means establish at least one (1) lineal barrier precluding distension of each balloon along that lineal barrier while permitting distension of each balloon as lobes formed on either side of the barrier so as to cause the inflated balloon to assume a nonspherical configuration which: (i) substantially conceals the rigid rod-like balloon former defining means; and (ii), conforms in shape to the shape of at least a portion of the desired sculpture.

4,927,401

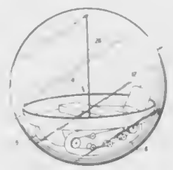
RADIO CONTROLLABLE SPHERICAL TOY

Harald V. Sonesson, Stenåldersvägen 131, S-222 54 Lund, Sweden

Filed Aug. 8, 1989, Ser. No. 390,773

Int. Cl.[5] A63H 30/04, 17/00, 17/14; A63G 25/00

U.S. Cl. 446—456 4 Claims



1. A radio-controllable substantially spherical toy comprising a hollow, substantially spherical toy body having an inner surface substantially concentric with an outer surface thereof and a predetermined diameter of the inner surface of said body containing a radio controlled vehicle having means frictionally engaging said inner surface for causing relative movements between said vehicle and said body, characterized in that said means consist of two endless bands each said band engaging the inner surface for traction and being wrapped around a system of a plurality of support wheels and at least one driving wheel defining an arced length, said endless bands having such dimensions that a maximum distance between end points of said arcedlength, of engagement between said bands with the inner surface of said body is less than 80% of the diameter of the inner surface of said body.

4,927,402

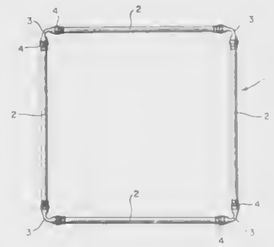
RECONFIGURABLE LOOP APPARATUS

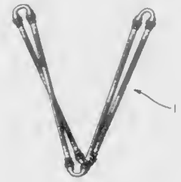
Wylci Fables, and Jore Park, both of 4040 Galt Ocean Dr., Apartment 918, Fort Lauderdale, Fla. 33308

Continuation of Ser. No. 144,947, Jan. 19, 1988, abandoned. This application Jul. 19, 1989, Ser. No. 383,244

Int. Cl.[5] A63H 33/00

U.S. Cl. 446—487 12 Claims





1. Apparatus comprising:

first, second, third and fourth elongated members, each member having first and second ends;

first, second, third and fourth couplings, said first coupling joining the first end of said first member to the first end of said second member, said second coupling joining the second end of said second member to the first end of said third member, said third coupling joining the second end of said third member to the first end of said fourth member, said fourth coupling joining the second end of said fourth member to the second end of said first member, whereby said couplings join the ends of the members together to form a closed loop, each coupling being twistable and bendable such that by bending of the coupling each member joined by the coupling can be moved through an angle of substantially 360° in substantially all directions relative to the other member joined by the coupling;

whereby the closed loop of joined elongated members can be reconfigured into a variety of shapes.

4,927,403

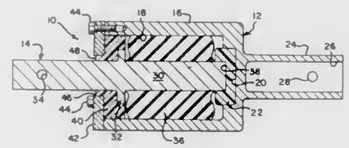
HIGH VOLTAGE INSULATIVE SHAFT COUPLER

Kenneth D. Pate, Sr., 801 Greenwood Ave. East, Waukegan, Ill. 60087

Continuation-in-part of Ser. No. 17,446, Feb. 24, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,420

Int. Cl.[5] F16D 3/76, 7/02

U.S. Cl. 464—30 8 Claims



1. A high voltage electrically insulative shaft coupler, comprising

a. A first coupler element having a hollow housing, said housing including a cylindrical interior cavity having an inner diameter of a first dimension,

b. a second coupler element including an elongated shaft, said shaft being formed to fit within said cavity, and

c. a cylindrical, flexible elastomeric retention member secured to said shaft, and said retention member having an outer diameter of a second dimension, said second dimension being greater than said first dimension, said retention member being formed of a dielectric material capable of withstanding high voltage of on the order of 50 kilovolts without breakdown,

d. said shaft retention member being installed axially within said housing cavity; such that said retention member is compressed so that the outer diameter of said retention member is equal to said first dimension, whereby said retention member and said shaft will be axially rotated when said first coupler element housing is rotated,

e. a dielectric first guide means located centrally adjacent the bottom of said cavity in axial registration with the interior of said cavity and with the end of said shaft within said cavity, said first guide means being capable of withstanding high voltage and being formed to receive said shaft end and being sufficiently hard and unyielding to retain said shaft end in position in axial registration with the interior of said cavity and prevent substantial lateral movement thereof,

f. a dielectric guide collar adjacent the top of said cavity in close fitting relationship with the cavity defining portions of said hollow housing and in close fitting surrounding relationship with respect to said shaft, said guide collar being capable of withstanding high voltage and being sufficiently hard and unyielding to prevent substantial lateral movement of the portions of said shaft adjacent the top of said cavity, and

g. retaining means for retaining said guide collar in place adjacent the top of said cavity,

h. whereby said second coupler element shaft will be held in place and prevented from substantial lateral movement by said first guide means adjacent the bottom of said cavity and by said guide collar adjacent the top of said cavity and will be electrically insulated from said first coupler element by said first guide means, said guide collar and said intermediate elastomeric retention member.

VOL
1114
ISS
4
MY
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1990
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4,927,404

LINK CHAIN FOR AN INFINITELY VARIABLE CONE DRIVE DISK TRANSMISSION

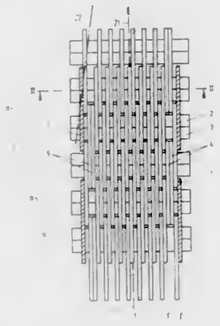
Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to Reimers Getriebe AG, Zug, Switzerland

Filed Jul. 11, 1989, Ser. No. 378,362

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 3826809

Int. Cl.[5] F16G 1/24

U.S. Cl. 474—242 16 Claims



1. Link chain for an infinitely variable cone drive disk transmission having

a plurality of plate-like links, formed with openings therein;

connecting joint elements (2, 3) fitted into said openings,

said connecting joint elements, in operation of the chain and upon placement between the drive disks (30), transferring by frictional force torque between the drive disks and the link chain by engagement of the end surfaces of the connecting joint elements with the faces of the drive disks,

wherein the links are located next to each other such that the overall cross section of the links transferring said forces and engaged by the connecting joint elements is essentially constant;

the links are located longitudinally staggered along the length of the chain in groups (a,b,c;d,e) and so positioned that a theoretical line (22, 522) connecting the centers of gravity of laterally adjacent links extends at an inclination with respect to the longitudinal direction of the chain; and

wherein those groups (b,c;e) of the groups of the links(a,b,c;d,e) which have an overall cross section smaller than that group (a;d)of the links which have the largest cross section includes links (4, 5, 6, 6',10) positioned at outer sides of the chain which are structurally stronger than the links (1, 8) positioned inwardly of the outer links.

4,927,405

PROTECTIVE LABORATORY SPECIMEN BAG

Kenneth W. Martin, 4857 Coach Hill Dr., Greenville, S.C. 29615, and Jonathan T. McClure, P.O. Box 26838, Greenville, S.C. 29616

Filed Jul. 1, 1988, Ser. No. 214,520

Int. Cl.[5] B31B 27/64, 27/14

U.S. Cl. 493—194 11 Claims

6. A method for producing a unitary specimen bag for packaging a laboratory specimen container and associated paper work comprising:

supplying plastic folded tubing having first and second side walls with a resealable lock having opposed linear mating portions carried by said first and second side walls;

supplying plastic folded sheeting having a third side wall and fourth side wall which includes a reverse flip;

feeding said folded tubing and sheeting in a superposed manner to heat seal means;

forming a first heat seal across said second, third, and fourth side walls of said superposed sheeting and tubing;

forming a plurality of spaced second heat seals on said superposed sheeting and tubing transverse to said first heat seal to form a first compartment between said first and second



side walls and a second compartment between said third and fourth side walls; and

forming said first heat seal in such a manner to form a closed top composite bag with said reverse flip forming a side mouth opening for said second compartment.

4,927,406

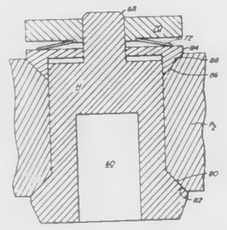
SPRING BIASED DRIVE SOCKET INSERT FOR CENTRIFUGE ROTORS

Stefan J. Glen, Palo Alto, and William E. Ellison, San Mateo, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 15, 1988, Ser. No. 284,974

Int. Cl.[5] B04B 9/00

U.S. Cl. 494—84 7 Claims



1. In a centrifuge rotor having a rotor body and a drive hub socket, the rotor construction comprising;

a rotor body, said rotor body fabricated of a composite material and symmetrically formed with respect to a spin axis of said rotor and defining at least one aperture for receiving materials to be separated;

at least one substantially conical aperture concentric to the spin axis of said rotor defined in said rotor body for receiving a rotor drive hub socket to said rotor body;

a rotor drive hub socket, said rotor drive hub socket defining an aperture for mating to the centrifuge drive hub for rotating said rotor body through said spindle, said aperture concentric to the spin axis of said rotor as defined through said drive hub socket;

said rotor drive hub socket further defining a substantially conical mating surface to the substantially conical aperture of said rotor body; said mating surface defined on the exterior of said rotor drive hub socket for forming contact with the substantially conical aperture of said rotor body,

said mating surface concentric to the spin axis of said rotor; and

spring means operatively connecting said drive hub socket and said rotor body for urging said substantially conical surfaces into contact during the spinning of said rotor, said substantially conical surface given a respective slope to prevent self-locking upon relative movement between said rotor body and drive hub socket and to permit dynamic self-centering sliding contact at said substantially conical surfaces during dynamic differential expansion of said apertures one with respect to another.

4,927,407

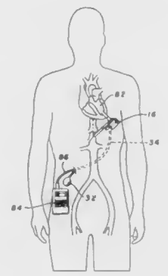
CARDIAC ASSIST PUMP WITH STEADY RATE SUPPLY OF FLUID LUBRICANT

Frank Dorman, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 19, 1989, Ser. No. 367,960

Int. Cl.[5] A61F 2/22

U.S. Cl. 600—16 21 Claims



1. A system for conveying bodily fluid including:

a pump having a housing defining a first chamber, a second chamber, a first inlet passageway in fluid communication with said first chamber for admitting a bodily fluid into said first chamber, a first outlet passageway in fluid communication with said first chamber for expelling said bodily fluid out of the first chamber, and a second inlet passageway in fluid communication with said second chamber for admitting a fluid lubricant into the second chamber, said lubricant being biocompatible and soluble in said bodily fluid;

an impeller mounted rotatably in said first chamber, a rotor mounted to rotate in said second chamber, and a connecting means for coupling said impeller to rotate responsive to rotation of said rotor;

an elastically deformable sealing means fixed to said housing, disposed between said first chamber and said second chamber, and forming an interface with said connecting means, said sealing means normally in a surface engagement with said connecting means along said interface;

a supply means for supplying said lubricant at a first predetermined constant fluid flow rate through the second inlet passageway into said second chamber, to cause a perfusion of said lubricant along said interface and into said first chamber at a second constant fluid flow rate, thus to elastically deform said sealing means and maintain said sealing means in close, spaced apart relation to said connecting means against a restoring force in said sealing means tending to restore said surface engagement, so long as said perfusion continues; and

a drive means for rotating said rotor to convey said bodily fluid through said first chamber and said first inlet and outlet passageways.

4,927,408

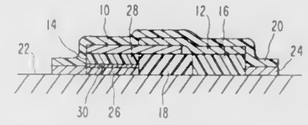
ELECTROTRANSPORT TRANSDERMAL SYSTEM

Ronald P. Haak, Cupertino; Felix Theeuwes, and J. Richard Gyory, both of Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Oct. 3, 1988, Ser. No. 252,463

Int. Cl.[5] A61N 1/30

U.S. Cl. 604—20 21 Claims



1. An electrotransport system for placement on a body surface and delivering an agent through said surface, the system comprising:

a non-conductive backing member;

a source of electrical power comprising first and second current conducting members, said current conducting members being positioned adjacent to said backing member;

a first electrode pad comprising a first reservoir containing an electrolyte and a second reservoir containing the agent, said electrolyte-containing reservoir, positioned adjacent to said first current conducting member and said agent-containing reservoir adapted to be positioned in current conducting relationship to said body surface;

a selectively permeable membrane separating the first and second reservoirs from one another, the membrane comprising a microporous polymer which is impermeable to the agent and to chemical species having a molecular weight greater than a predetermined molecular weight and permeable to chemical species having a molecular weight less than the predetermined molecular weight;

a second electrode pad positioned adjacent to said second current conducting member and adapted to be positioned in current conducting relationship to said body surface;

an insulating means electrically insulating said first and said second electrode pads from each other; and

a means for maintaining said system in current conducting and agent transmitting relationship to said body surface.

4,927,409

Patent Not Issued For This Number

VOL
1114
ISS
4
MY
22
1990
UMI

4,927,410
METHOD FOR FABRICATING PROSTHESIS MATERIAL

Stephen G. Kovacs, Oldsmar, Fla., assignor to University of South Florida, Tampa, Fla.

Filed Nov. 18, 1988, Ser. No. 273,298
Int. Cl.[5] A61F 2/06, 2/04
U.S. Cl. 600—36 23 Claims

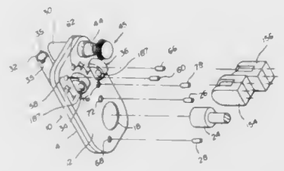
1. Method of fabricating prosthesis material for use with a living body which comprises:
(a) preparing a polymerizable thermosetting material by mixing components thereof at about ambient temperature and about atmospheric pressure;
(b) introducing the thermosetting material to the surface of tubular forming means having notability about a substantially horizontal axis thereby forming a relatively thin film of thermosetting material thereon;
(c) subjecting the thin film to sub-atmospheric pressure at about ambient temperature thereby imparting isotropic characteristics to the film;
(d) contacting the thin film with wiper means in order to remove excess material from the film thereby achieving desired film thickness; and
(e) curing the thin film to a stable physical structure of prosthesis material.

4,927,411
DRIVE MECHANISM FOR DISPOSABLE FLUID INFUSION PUMPING CASSETTE

John Pastrone, Los Gatos, and Edward Laenen, Palo Alto, both of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed May 1, 1987, Ser. No. 45,924
Int. Cl.[5] A61M 31/00
U.S. Cl. 604—65 13 Claims

1. A mechanism for actuating a plunger-type slideable valve on a valving device, comprising
a moveable support associated with said mechanism for holding said valving device;

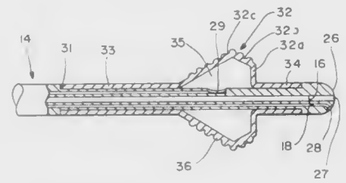


a moveable gripping means on said mechanism for gripping said valve; and
a linking means between said moveable support and said gripping means to transmit the movement of said support to said gripping means whereby a valving device can be placed in said moveable support, said gripping means can engage said valve and slide said valve as said moveable support is moved, said linking means transmitting the movement of said moveable support to said gripping means to slide said valve.

4,927,412
CORONARY SINUS CATHETER

Philippe Menasche, Paris, France, assignor to Retroperfusion Systems, Inc., Costa Mesa, Calif.

Filed Dec. 8, 1988, Ser. No. 282,004
Int. Cl.[5] A61M 25/00
U.S. Cl. 604—96 8 Claims



1. In a coronary sinus catheter, a flexible elongate member having proximal and distal extremities, the flexible elongate member having at least two lumens extending longitudinally thereof, a balloon mounted on the distal extremity of the flexible elongate member and having its interior in communication with one of the lumens, the balloon having at least one truncated conical surface having outwardly facing spaced apart parallel concentric lands formed thereon for frictionally engaging the coronary sinus to provide a high retentive force for the catheter.

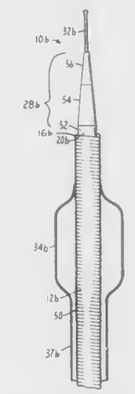
4,927,413
CATHETER FOR BALLOON ANGIOPLASTY

Robert Hess, Portola Valley, Calif., assignor to Progressive Angioplasty Systems, Inc., Menlo Park, Calif.

PCT No. PCT/US88/02826, § 371 Date Nov. 21, 1988, § 102(e) Date Nov. 21, 1988
Continuation-in-part of Ser. No. 88,264, Aug. 24, 1987, Pat. No. 4,808,164. This PCT application Aug. 24, 1988, Ser. No. 299,149
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] A61M 25/00
U.S. Cl. 604—95 10 Claims

1. A catheter for balloon angioplasty comprising:
a flexible shaft having a sealed hollow passage defined therein and having a first proximal end and a second distal

end, both said ends being open, said flexible shaft being a coated wire wound member, said coating being fluid impervious and extending along substantially the entire length of the wire wound member, the wire wound member being substantially round in cross-section and resistant to flattening in cross-section when said flexible shaft is bent along the length thereof in the tortuous path of a coronary artery, allowing close tolerances for a member that may be inserted therein, the coated wire wound member inherently having high column strength providing pushability while maintaining a high degree of flexibility and being resistant to a preset in overall shape when the catheter is coiled for storage;
a core means movably, removably and substantially contained within said flexible shaft, said core means having a first proximate end and a second distal end and having a first flexible portion extending from said first proximate end and a second flexible portion terminating in said sec-



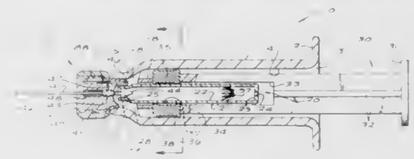
ond distal end of said core means, said second flexible portion being of greater flexibility than said first flexible portion, said second flexible portion having a variable core strength along the length thereof from greater to lesser strength extending toward the second distal end of said core means, said second flexible portion being tapered along the length thereof such that essentially all of said second flexible portion can generally be extended within a coronary artery to maximize the variable stiffness of said catheter, the combination of the core means and the coated wire wound member providing variable trackability, pushability and flexibility of said catheter;
a flexible guide wire fixed to and further axially extending from the second distal end of said core means; and
an inflatable member having a non-inflatable sheath covering an external surface of said flexible shaft near the second distal end of said flexible shaft and further including means for inflating said inflatable member.

4,927,414
SYRINGE WITH SAFETY RETRACTING NEEDLE

John C. Kulli, 1920 Spruce St., South Pasadena, Calif. 91030

Continuation-in-part of Ser. No. 43,691, Apr. 29, 1987, Pat. No. 4,747,831. This application May 27, 1988, Ser. No. 199,694
Int. Cl.[5] A61M 5/24
U.S. Cl. 604—110 26 Claims

1. A safety device for use in injecting liquid into or withdrawing liquid from a patient and for thereafter protecting people from contact with portions of the device that have been within the patient; said device comprising:
a hollow needle for piercing such patient and for guiding and carrying such liquid into or out of the patient, said needle having a hollow shaft with at least one sharp end;
a syringe that includes:
a syringe barrel for containing a quantity of such liquid, and
a syringe plunger disposed at least partially within the syringe barrel and adapted to be moved forward within the syringe barrel to drive such liquid out of the syringe barrel and through the hollow shaft into such patient;
means for securing the needle shaft to the syringe barrel, with the sharp end projecting from the syringe barrel; and

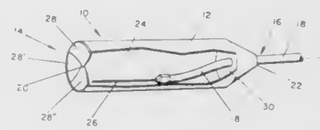


manually actuable means for releasing the securing means and for substantially permanently retracting the sharp end of the needle into the syringe and beyond reach of such people's fingers;
wherein the plunger is relieved to permit retraction of the sharp end of the needle by the releasing and retracting means into a space within the syringe, while the plunger is disposed forward within the syringe barrel; and
wherein the releasing and retracting means are manually actuable by a simple unitary motion, of amplitude that is substantially shorter than the shaft of the needle.

4,927,415
APPARATUS FOR SAFE USE AND DISPOSAL OF NEEDLES

Stuart A. Brodsky, 2556-H Navarra Dr., Carlsbad, Calif. 92009

Filed Aug. 12, 1988, Ser. No. 231,782
Int. Cl.[5] A61M 5/18
U.S. Cl. 604—164 21 Claims



17. An apparatus for the use of safely administering or withdrawing fluids through an intravenous needle and the safe disposal of said intravenous needle comprising:
an intravenous needle;
needle-safe containment means comprising a longitudinal body having first and second ends, entry and closure means disposed at said first end for allowing said needle to enter said longitudinal body and for denying exit of said needle therethrough, and aperture means at said second end of said longitudinal body;
discrete needle pulling means attached to said needle and passed through said entry and closure means and said aperture means for drawing said needle into said longitudinal body for safe positioning and disposal of said needle within said needle-safe containment means after use of said needle;
fluid movement means attached to said needle pulling means exiting said second end of said longitudinal body for causing fluid to flow into or from a patient.

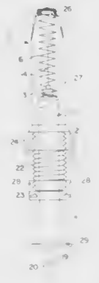
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4,927,416

USER-PROTECTIVE HYPODERMIC SYRINGE HOLDER

Stanley Tomkiel, South Hempstead, N.Y., assignor to National Medical Device Corporation, Valley Stream, N.Y.

Continuation-in-part of Ser. No. 127,689, Dec. 2, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 230,796
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 21 Claims



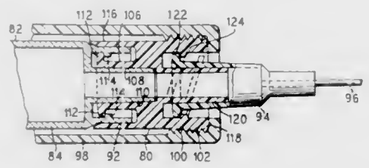
1. A user-protective holder for use with a hypodermic syringe having a barrel, finger flanges projecting out from the barrel adjacent one end thereof and a coupling for receiving a needle at the other end of the barrel, and a plunger received in the barrel, comprising a unitary tubular holder member adapted to be received over the syringe barrel with a proximate portion closely adjacent the gripping flanges and a distal end closely adjacent the distal end of the barrel, leaving the needle substantially fully exposed for use, coupling means including a coupling element engageable with the finger flanges of the barrel for securing the holder member to the syringe barrel, a tubular protective sheath received over the barrel in a retracted position in which the needle is exposed for use and movable along the barrel to an extended position in which the needle is received entirely within the sheath such that the sheath protects the user against needle pricks, releasable latch means for coupling the sheath to the holder member in the retracted position, the latch means and coupling means being adapted to enable the holder member and sheath to be preassembled to each other before the syringe is inserted into and coupled to the holder member, and means for holding the sheath in the extended position upon release of the latch means and movement of the sheath to the extended position.

4,927,417

SAFETY SLEEVE ADAPTER

Elizabeth Moncada, and Michael B. Schneider, both of Chicago, Ill., assignors to Schneider Medical Technologies, Inc., Chicago, Ill.

Filed Jul. 7, 1988, Ser. No. 216,001
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—198 9 Claims



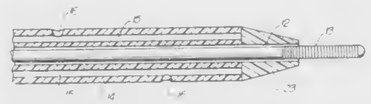
1. An adapter for selective engagement with a sleeve for protective shielding of a needle, comprising:
an adapter body;
a connector portion on said adapter body;
means for removably mounting a needle on said adapter body, said means for removably mounting a needle including a female portion of a Luer lock connector for receiving a cooperating male portion of a Luer lock connector having said needle integral therewith; and
means on said adapter body for selective engagement with said sleeve when said sleeve is in a forward position shielding said needle.

4,927,418

CATHETER FOR UNIFORM DISTRIBUTION OF THERAPEUTIC FLUIDS

Michael D. Dake, Miami, Fla., and Mark A. Maguire, San Jose, Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed Jan. 9, 1989, Ser. No. 295,088
Int. Cl.[5] A61M *5/325*
U.S. Cl. 604—264 14 Claims



1. A multilumen vascular catheter for the uniform delivery of fluid containing drugs, therapeutic agents and the like comprising an elongated tubular body having a first lumen for receiving a guidewire to facilitate the advancement of the catheter through a patient's vasculature and a plurality of second lumens, each of said second lumens having in fluid communication therewith a single flow passageway extending through the wall of the tubular body to the exterior thereof with the flow passageways being longitudinally spaced from each other so that a uniform flow of fluid is discharged over a length of the catheter.

4,927,419

SUSTAINED RELEASE MEDICATING DEVICE FOR LIVESTOCK

Marlan O. Scully, Estancia, N. Mex., assignor to Agri Research and Development, Tucson, Ariz.

Filed Apr. 24, 1987, Ser. No. 42,314
Int. Cl.[5] A61K *9/22*; A01N *17/00*
U.S. Cl. 604—892.1 3 Claims



1. In an osmotic dispensing device for the dispensing of a substance into the body, the improvement comprising a second osmotic dispensing device linked to said osmotic dispensing device through a bioerodible connecting strand, said connecting strand comprising a material which will be degraded by said body to cause the separation of said osmotic dispensing device from said second osmotic dispensing device after said substance has been dispensed into said body.

4,927,420

ULTRA-SHARP TUNGSTEN NEEDLE FOR ELECTROSURGICAL KNIFE

John B. Newkirk, Evergreen, Colo., and Kim H. Manwaring, Scottsdale, Ariz., assignors to Colorado Biomedical, Inc., Evergreen, Colo.

Filed Nov. 14, 1988, Ser. No. 271,235
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—45 13 Claims



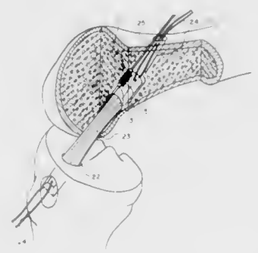
1. An electrosurgical electrode composed of a refractory alloy comprising a solid needle with a blunt end and a tip end, the tip radius of said tip end being less than 50 microns.

4,927,421

PROCESS OF ENDOSTEAL FIXATION OF A LIGAMENT

E. Marlowe Gohle, 850 E. 1200 North; W. Karl Somers, 651 N. 150 West, both of, Logan, Utah 84321, and David McGuire, 3418 Lakeside Dr., Acborage, Ak. 99515

Filed May 15, 1989, Ser. No. 352,153
Int. Cl.[5] A61F *2/08*
U.S. Cl. 606—73 4 Claims



1. A process of endosteal fixation of a ligament within the interior of a bone mass comprising, forming a ligament tunnel through adjacent bone masses; fitting a ligament under tension in said ligament tunnel, extending between said adjacent bone masses; and turning a threaded device into one end of said ligament tunnel, guiding it alongside the ligament, such that the threads of said threaded device turn into said tunnel wall and a bone block end portion of said ligament.

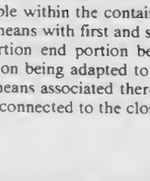
4,927,422

ELBOW ARTHROPLASTY INSTRUMENTATION AND SURGICAL PROCEDURE

John A. Engelhardt, Warsaw, Ind., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Aug. 31, 1989, Ser. No. 401,634
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—79 3 Claims

1. A surgical procedure of modifying injured or diseased geometry existing at the distal end of a humerus in preparation for fixation thereto of a replacement for an elbow joint comprising the steps of:
(a) forming a through hole in the superior aspect of the olecranon fossa of the humerus aligned with the longitudinal axis thereof and in communication with the humeral canal;
(b) inserting into the humeral canal via the through hole formed in step (a) the stem of a distal cut guide tool including a platform having a planar guide surface until the planar guide surface is generally coplanar with the junction of the medial epicondyle and the trochlea such that, in an anterior view, the planar guide surface generally assumes the normal valgus angle of a healthy humerus and such that, in a lateral view, the planar guide surface generally assumes the anterior angle of inclination of a healthy humerus;
(c) forming a first resected surface by sawing into the distal end of the humerus along a plane coextensive with the planar guide surface and generally parallel to the anatomical center of rotation of the elbow joint and removing the excess bone;



(d) withdrawing the distal cut guide tool from the humerus;
(e) inserting into the humeral canal via the through hole formed in step (a) the stem of a broach and chamfer cut guide tool including a slotted chamfer guide block integral with the head of the stem until the chamfer guide block is contiguously positioned on the first resected surface formed in step (c);
(f) forming a plurality of second resected surfaces by sawing into the distal end of the humerus as guided by the slotted chamfer guide block;
(g) withdrawing the broach and chamfer cut guide tool from the humerus;
(h) removing the excess bone resulting from step (f); and
(i) removing an excess amount of anterior and posterior bone adjacent the second resected surfaces for reception of the trial prosthesis on the modified distal end of the humerus.

4,927,423

CONNECTOR AND A DISPOSABLE ASSEMBLY UTILIZING SAID CONNECTOR

Bengt Malmborg, Helsingborg, Sweden, assignor to Aktiebolaget Leo, Helsingborg, Sweden

Filed May 11, 1988, Ser. No. 193,282
Claims priority, application Sweden, Sep. 18, 1986, 8603928; Dec. 9, 1986, 8605259
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—88 11 Claims

1. A connecting mechanism adapted to provide fluid communication between first and second containers closed by means of pierceable closure associated with outwardly-directed flange portions, with one of the containers having a plunger means movable within the container, comprising:
(a) a first holding means with first and second end portions, the first end portion end portion being closed and the second end portion being adapted to receive a container with a plunger means associated therewith;
(b) piercing means connected to the closed first end portion

VOL 1114 ISS 4 MY 22 1990 UMI

of the first holding means, including a first piercing member projecting toward the first holding means and a second piercing member projecting away from the first holding means, the first and second piercing members being in fluid communication with each other,

(c) second holding means connected to the first holding means for holding the other container relative to the second piercing member;

(d) the first and second holding means including positioning



means for selectively holding the containers in a retracted position relative to their respective piercing members where the piercing members do not pierce the pierceable closures, and an inserted position where the piercing members pierce the pierceable closures and are in fluid communication with the interior of the containers;

(e) said second piercing member comprising cannula holding means for receiving and holding a cannula in fluid communication with the second piercing member after said other container is removed.

4,927,424

REAMER GUIDE FOR INTRAMEDULLARY NAIL PLACEMENT

Bernard E. McConnell, Rte. 2, Box 87, and John C. McConnell, 614 Mink Dr., both of Greenville, Tex. 75401

Filed Jul. 26, 1988, Ser. No. 224,451
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—96 **4 Claims**



1. Orthopedic surgery apparatus for guiding extension and retraction of a reaming tool through an opening defining an entrance to the intramedullary canal of a fractured bone, said apparatus comprising, in combination:

an elongated guide chute having an open shell defining a trough which is concave in cross section, and having a nose portion adapted for placement adjacent to said entrance opening against the surface of a fractured bone; and,

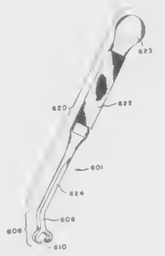
an elongated pin attached to said shell, said elongated pin having a piercing end portion projecting in alignment with the longitudinal axis of said elongated guide chute, said piercing end portion being adapted for insertion into the bone in the proximate vicinity of said entrance opening for securing said chute in longitudinal alignment with said intramedullary canal.

4,927,425

SURGICAL ROD PUSHER INSTRUMENT

Antony J. Lozier, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Filed Dec. 21, 1988, Ser. No. 287,243
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—99 **7 Claims**



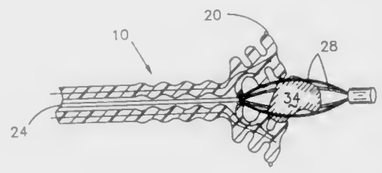
1. A surgical rod pusher instrument for application of force against a rod, the instrument comprising a distal tip and an elongated handle extending therefrom, the tip including a rod receiving opening leading into an enlarged cavity, the cavity including a plurality of discrete rod locator recesses wherein each discrete recess is substantially semi-cylindrical and each discrete recess has a different directional orientation.

4,927,426

CATHETER DEVICE

Stephen P. Dretler, 7 Deer Run, Wayland, Mass. 01778

Filed Jan. 3, 1989, Ser. No. 292,910
Int. Cl.[5] A61B *17/22*
U.S. Cl. 606—128 **9 Claims**



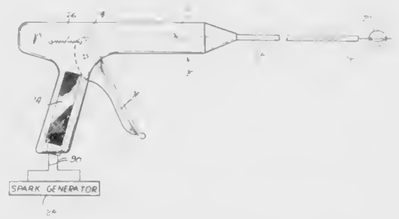
1. A catheter device for capturing and holding kidney stones and the like within a body passage said device comprising in combination an elongated tube for insertion into a body passage said tube having distal and proximal ends wherein the length of said tube is such that said distal end is disposed within said body passage and said proximal end is disposed outside of said body passage; an axially inwardly collapsable cuff portion disposed adjacent the distal end of said tube, said cuff portion being an expanded portion of said tube wall and terminating in a free end; and snare means disposed within said tube and movable axially therein, said snare means comprising a second hollow elongated tube having a capturing head disposed at its distal end, said capturing head being disposed about the opening of said second hollow elongated tube wherein said capturing head with a kidney stone or the like held therein when moved outwardly of said body passage towards said expanded portion causes the free end of said cuff portion of said elongated tube to collapse axially inwardly into said expanded portion so as to envelope said capturing head and kidney stone or the like.

4,927,427

LITHOTRIPTOR DEVICE FOR TRAPPING AND DESTROYING CONCRETIONS

G. Vincent Kriaucinnas, Westchester, and Karen Vance, Palatine, both of Ill., assignors to Northgate Research, Inc., Arlington Heights, Ill.

Filed Sep. 29, 1989, Ser. No. 414,396
Int. Cl.[5] A61B *17/22*
U.S. Cl. 606—128 **11 Claims**



1. An electrohydraulic lithotriptor device to be used with an endoscope for trapping and destroying concretions such as kidney stones comprising:

a base part, having a manually operable trigger,

a flexible, insulating tubing, having one end connected to and extending from said base part and having the other end adapted to be positioned adjacent a concretion by insertion through said endoscope,

an electrically conductive wire, extending and axially movable through and beyond said tubing and having an exposed end,

a stone trapping device secured to said wire adjacent said exposed end and adapted to trap said concretion,

an electrode carried by said tubing, adjacent said exposed end, said wire being retractable to pull said concretion trapped by said stone trapping device into close proximity to said other end of said tubing and to said electrode,

means on said base part, and controlled by said trigger, for extending and retracting said wire,

a spark generator,

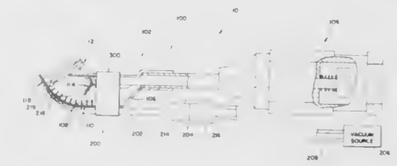
and means extending through said base part and said tubing for electrically connecting said wire and said electrode to said spark generator for causing a succession of sparks to jump between said wire and said electrode adjacent said other end of said tubing to generate a shock wave adjacent said concretion to effect destruction thereof.

4,927,428

SURGICAL SUTURING SYSTEM AND PROBE ASSEMBLY

William D. Richards, Medway, Mass., assignor to Ophthalmic Ventures Limited Partnership, Norwood, Mass.

Filed Oct. 7, 1988, Ser. No. 255,541
Int. Cl.[5] A61B *17/00, 17/04*
U.S. Cl. 606—148 **9 Claims**



1. A probe assembly for positioning and holding human and animal tissue for suturing, the probe assembly comprising an elongated body having a hollow interior, a narrowed working end, and a rear end, said working end including (a) a suction head having a long, narrow slot coupling said interior of said body with the region outside said body, said slot being positioned so that an axis extending along the long dimension of the slot extends perpendicular to the elongate axis of said body, and (b) a flat supporting member positioned forward of said slot, said rear end comprising an opening and being adapted for attachment to a vacuum source so as to couple said hollow interior with said vacuum source.

VOL
1114
ISS
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4,927,429

PROCESS OF DYEING SYNTHETIC FABRICS USING HIGH-BOILING ESTER SOLVENTS

George L. Brodmann, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed May 4, 1987, Ser. No. 45,557
Int. Cl.[5] D06P *1/46*
U.S. Cl. 8—583 6 Claims

1. A process of dyeing polyester or nylon comprising exposing polyester or nylon fibers at elevated temperatures to a waterless coloring composition composed of a high-boiling ester solvent and a dye at elevated temperatures, in which the dye:

(1) is a nonionic dye or a premetallized solvent dye that is soluble in the solvent tris(2-ethylhexyl) trimellitate at 350° F. to the extent of at least 2.0 by weight, based on the weight of the solvent;

(2) provides a depth of coloration, calculated as the quotient of the integrated depth value of a sample in the solvent divided by the integrated depth value of the same weight of a proven disperse dye of the same or substantially the same color, expressed as % yield, of at least 25%;

(3) dyes the polyester or nylon fibers to a lightfastness value, according to AATCC Test Method 16A-1982 for 40 hours of exposure, of at least 3; and

(4) provides a washfastness value of at least 3 according to AATCC Test Method 61-1985-IA.

4,927,430

METHOD FOR PRODUCING AND TREATING COAL GASES

Albert Calderon, P.O. Box 126, Bowling Green, Ohio 43402

Filed May 26, 1988, Ser. No. 198,862
Int. Cl.[5] C10J *3/62*
U.S. Cl. 48—197 R 14 Claims



1. A method of generating a de-sulphurized volatile matter and a relatively low Btu gas comprising the steps of:

(a) pyrolyzing coal to produce volatile matter and a char;

(b) feeding the volatile matter to a first de-sulphurizing means containing a de-sulphurizing agent to remove sulphur from the volatile matter;

(c) gasifying the char to produce a relatively low Btu gas;

(d) feeding the relatively low Btu gas to a second de-sulphurizing means also containing the de-sulphurizing agent to remove sulphur from the relatively low Btu gas;

(e) providing a regenerating means for removing sulphur from the de-sulphurizing agent; and

(f) moving at least portions of the de-sulphurizing agent from the second de-sulphurizing means to the first de-sulphurizing means, from the first de-sulphurizing means to the regenerating means, and from the regenerating means to the second de-sulphurizing means.

12. A method of generating a de-sulphurized volatile matter and a relatively low Btu gas comprising the steps of:

(a) pyrolyzing coal to produce volatile matter and a char;

(b) feeding the volatile matter to a first de-sulphurizing means containing a de-sulphurizing agent to remove sulphur from the volatile matter;

(c) gasifying the char to produce a relatively low Btu gas;

(d) feeding a portion of the relatively low Btu gas about the first de-sulphurizing means to indirectly increase the temperature thereof;

(e) combining the portion of the relatively low Btu gas fed about the first de-sulphurizing means with the remaining portion of the relatively low Btu gas from step (c);

(f) feeding the combined portions of the relatively low Btu gas to a second de-sulphurizing means also containing the de-sulphurizing agent to remove sulphur from the relatively low Btu gas;

(g) providing a regenerating means for removing sulphur from the de-sulphurizing agent; and

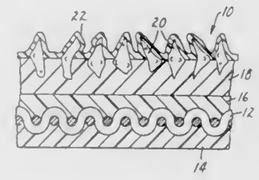
(h) moving at least portions of the de-sulphurizing agent among the first de-sulphurizing means, the second de-sulphurizing means, and the regenerating means such that the regenerating means regenerates the de-sulphurizing agent.

4,927,431

BINDER FOR COATED ABRASIVES

Scott Buchanan; Eric G. Larson; Jon R. Pieper, and Thomas E. Boettcher, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 8, 1988, Ser. No. 241,946
Int. Cl.[5] C09K *3/14*
U.S. Cl. 51—298 24 Claims



1. An abrasive article comprising a backing and abrasive grains, wherein said abrasive grains are secured to at least one side of said backing by at least one binder prepared from a blend comprising

(1) at least one radiation curable monomer selected from the group consisting of:

(a) isocyanurate derivatives having at least one terminal or pendant acrylate group,

(b) isocyanate derivatives having at least one terminal or pendant acrylate group, and

(c) multifunctional acrylates having on average at least three pendant acrylate groups, and

(2) a thermally curable resin selected from the group consisting of phenolic resins, epoxy resins having an oxirane ring, urea-formaldehyde resins, melamine-formaldehyde resins, and polyimide resins.

4,927,432

PAD MATERIAL FOR GRINDING, LAPPING AND POLISHING

William D. Budinger, Kennett Square, Pa., and Elmer W. Jenson, Wilmington, Del., assignors to Rodel, Inc., Newark, Del.

Filed Mar. 25, 1986, Ser. No. 843,881
Int. Cl.[5] C09B *3/14*
U.S. Cl. 51—298 19 Claims

1. A poromeric pad material comprising a porous thermoplastic resin matrix reinforced with a fiber network, said resin matrix being coalesced among the fibers to increase the poros-

VOL
1114
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MY
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ity and hardness of the material, wherein said resin matrix comprises a blend of at least two resins, one of said resins



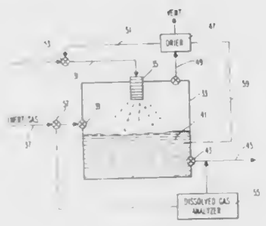
having a melting point higher than the other, whereby said higher melting point resin is not substantially coalesced.

4,927,433

APPARATUS FOR REMOVING GAS FROM A LIQUID

Rolf H. Wieland, Norristown, and Martin A. Krongold, Aston, both of Pa., assignors to MG Industries, Valley Forge, Pa.

Filed May 22, 1989, Ser. No. 355,192
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—18 **4 Claims**



1. A process for removing za gas from a liquid, the gas being initially dissolved in the liquid, the method comprising the steps of:

(a) directing the liquid to an opening in a container, the opening having an atomizer mounted therein, such that the liquid entering the container is substantially atomized,

(b) introducing an inert gas into the container, the inert gas being introduced in sufficient quantity to cause the dissolved gas to separate from the liquid,

(c) venting gas from the container,

(d) permitting the degassed atomized liquid to accumulate at the bottom of the container,

(e) withdrawing at least some of the liquid from the container,

(f) measuring the amount of dissolved gas remaining in the liquid being withdrawn from the container, and

(g) adjusting the flow rate of inert gas into the container, until the amount of dissolved gas in the liquid being withdrawn from the container has reached a desired level.

4,927,434

GAS COMPONENT EXTRACTION

Harry D. Cordes, Largo; Michael B. Duich, Palm Harbor, and Gardner S. Bailey, Pinellas Park, all of Fla., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,162
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—20 **23 Claims**

1. A method of optimizing the production of a product gas mixture in a pressure swing apparatus including two regenerable sorbent beds from an inlet gas mixture from which the sorbent beds extract a component to produce the product gas mixture comprising:

extracting a component from a pressurized inlet gas mixture by passing it through a first sorbent bed during an adsorption interval thereby producing a product gas mixture;

regenerating a second sorbent bed during the adsorption interval of the first sorbent bed including passing a quantity of the product gas from the first sorbent bed through the second sorbent bed in a reverse direction during a purging interval while the second sorbent bed is vented to the ambient;

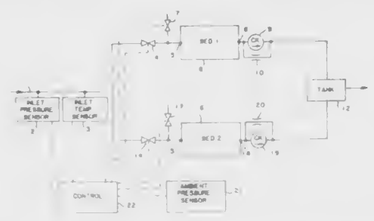
alternating the first and second beds between adsorption and regeneration operations;

sensing the ambient pressure and the temperature and pressure of the pressurized inlet gas mixture;

determining from the sensed ambient pressure and the temperature and pressure of the pressurized inlet gas mixture and from the sorption characteristics of the sorbent beds the length of adsorbing and purging intervals that optimize the production of product gas; and

adjusting the adsorption and purging intervals of the first and second sorption beds to the respective determined intervals that optimize the production of product gas.

5. An apparatus for extracting a component from a gaseous mixture comprising:



first and second sorption beds, each bed having an inlet for admitting gas and an outlet for discharging gas, said beds for, in an operating condition, adsorbing a component from an inlet gas mixture and supplying as a product gas the mixture from which the component has adsorbed, and for, in a regenerating condition, desorbing the adsorbed component;

an inlet conduit for supplying the inlet gas mixture to said inlets of said first and second beds;

first and second inlet valves connected between said inlet conduit and said inlets of said first and second beds, respectively, for selectively admitting the inlet gas mixture to said first and second beds;

first and second vent valves in fluid communication with said first and second beds, respectively, for venting said first and second beds to the ambient;

means for admitting product gas from one bed in an operating condition to the other bed in a regenerating condition to purge said other bed;

first and second sensors in fluid communication with said inlet conduit for sensing the pressure and temperature, respectively, of the inlet gas mixture supplied to said first and second inlet valves;

a third sensor for sensing ambient pressure proximate said first and second beds; and

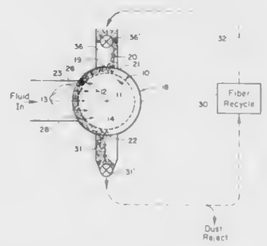
control means, storing the sorption characteristics of said first and second beds as a function of ambient pressure and temperature and pressure of the inlet gas mixture, for determining, in response to said first, second, and third sensors and the sorption characteristics of said first and second beds, intervals for adsorption by and purging of said first and second beds and for actuating said first and second inlet and vent valves for cycling said first and second beds between operating and regenerating conditions in accordance with the determined adsorption and purging intervals to optimize the production of product gas for the sensed inlet gas mixture and ambient conditions.

4,927,435

ROTATING DRUM FILTER

Donald Anson, Worthington, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Mar. 31, 1989, Ser. No. 332,647
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—96 **9 Claims**



1. A method for removing a pollutant such as dust from a fluid stream comprising

providing a substantially cylindrical rotatable drum, positioned with its axis substantially horizontal, having openings for entering fluid in its cylindrical surface, and at least one opening for exiting fluid in an end surface,

providing a substantially cylindrical housing around the drum and coaxial therewith, having a supply opening for filter material in the upper part of its cylindrical surface, a removal opening for filter material in the lower part thereof, an inlet opening for fluid at least partly higher than the axis and generally between the filter material supply and removal openings, and at least one outlet opening for fluid in an end surface,

providing a continuous and substantially uniform array of loosely nested fibers through the filter material supply opening of the housing onto the cylindrical surface of the drum to form a filtering mat over a region thereof at least wide enough to meet all of the fluid that may pass through the fluid inlet in the housing,

rotating the drum about its axis to carry the nested fibers downward past the fluid inlet and thence to and out through the filter material removal opening of the housing, and

directing a stream of fluid into the fluid inlet of the housing, in through the adjacent mat of nested fibers and openings in the cylindrical surface of the drum, out through at least one opening in an end surface of the drum and through at least one outlet opening for fluid in an end surface of the housing, and away therefrom to means for utilizing the filtered fluid.

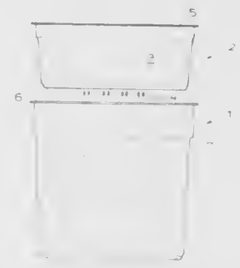
4,927,436

ROOM DEHUMIDIFIER

Peter O. Glienke, Baden-Baden, Fed. Rep. of Germany, assignor to Wenko-Wenselaar GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 302,779
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1988, 8809377[U]
Int. Cl.[5] B01D *53/20*
U.S. Cl. 55—281 **19 Claims**

1. Room dehumidifier comprising a water collector having an open top end, an absorbent receptacle removably supported within the open top end of the water collector, and a water absorbent filler formed of a hygroscopic material disposed in said absorbent receptacle; wherein said receptacle has a water drainage opening in a bottom wall thereof and an open top end; wherein the water collector and absorbent receptacle are formed by containers that are circumferentially configured with respect to each other for enabling stackable nesting of the absorbent receptacle within the water collector but which have heights which differ in a manner so as to create a water collection space within the water collector below the absorbent receptacle when the absorbent receptacle is nested within



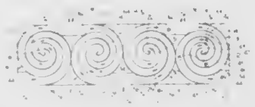
the water collector, wherein the water collector has a recessed abutment flange and the absorbent receptacle has a support flange near a bottom end thereof, said support flange being seated on said recessed abutment flange, and wherein the absorbent receptacle has a rim flange at its open top end and the distance between said rim flange and said support flange is greater than the distance between the open top end of the water collector and said recessed abutment flange, whereby said rim flange may be used for liftingly removing the absorbent receptacle from the water collector.

4,927,437

CYCLONIC SEPARATOR FOR REMOVING AND RECOVERING AIRBORNE PARTICLES

Ben M. Richerson, P.O. Box 2253, Sulphur Springs, Tex. 75482

Filed Feb. 21, 1989, Ser. No. 313,078
Int. Cl.[5] B01D *45/12*
U.S. Cl. 55—349 **24 Claims**



1. A cyclonic separator for removing particles from an air stream entering said separator, said separator comprising;

first and second spiral baffles adapted for mating engagement each one within the other for imparting a cyclonic flow to said air stream;

said first and second baffles are each constructed of a spiral shape comprising at least approximately 630° of curvature; and

said first baffle being disposed in an opposite direction of inwardly extending curvature relative to said second baffle to define a flow path with a concentric and spiral inlet passageway having a substantially uniform width to provide said cyclonic flow of said air stream therebetween whereby said air stream flowing with cyclonic motion in a first direction is reversed to flow with cyclonic motion in a second, opposite direction.

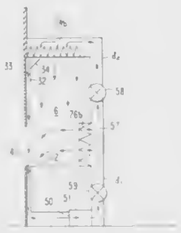
VOL
1114
ISS
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MY
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1990
UMI

4,927,438

HORIZONTAL LAMINAR AIR FLOW WORK STATION

Eric L. Mears, Rockport, and Robert E. Jennings, Andover, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 126,656, Dec. 1, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 290,889
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—385.2 9 Claims



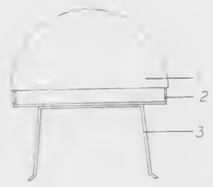
1. A load station for semiconductor wafers comprising:
a chamber having an opening;
means for supporting at least one cassette for holding semiconductor wafers oriented horizontally in said chamber,
channel means comprising;
first channel means for directing a horizontal flow of air into said chamber toward a cassette supported by said means for supporting and toward said opening and
second channel means for directing a first stream of air to flow vertically
downward into said chamber; and
means for generating a second stream of air forming an air curtain having a velocity greater than the velocity of said first stream of air, said means for generating being capable of producing a downward velocity in said curtain of air sufficient to prevent said horizontal flow from penetrating said curtain of air so that the interior of said chamber is isolated from the environment external to said chamber opening;
said channel means including air return slot means in said chamber for receiving air from said horizontal flow, said first stream and said second stream.

4,927,439

COOLING TOWER OVERFLOW DRAIN CAP

Paul J. DeCanio, 49 Greis Ave., LK Ronkonkoma, N.Y. 11779

Filed Jul. 26, 1989, Ser. No. 385,198
Int. Cl.[5] B01F *3/04*
U.S. Cl. 55—385.1 2 Claims



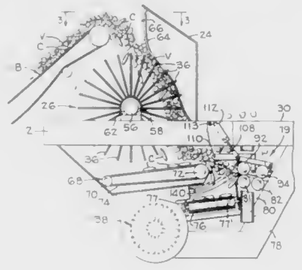
1. Cooling tower overflow drain cap which comprises:
(A) a cap which prevents condenser carryover and makeup spray loss down the overflow drain, and
(B) a stop member which holds the cap at a proper distance from the overflow drain permitting overflowing condenser water down the overflow drain, and
(C) retention leg members which when removably installed in the overflow drain holds the device in place for desired results, and
(D) a cap which has a larger diameter than the drain pipe, shaped as a half hollow sphere, which can fit various size drain pipes, and
(E) a stop member which is connected to the cap, which the bottom surface of the stop member makes contact with the top edge of the drain pipe, means for support of the cap bottom edge above the upper edge of the drain pipe, and means for stopping the movement of the cap in a downward direction, which can fit various size drain pipes, and
(F) retention leg members which are connected to the bottom surface of the stop member, which each leg member angle outwardly from the bottom surface of the stop member, which at the bottom of the retention leg members have an angle protruding out, which edge conforms to the inner surface of the drain pipe, means for keeping the cap centric to the drain pipe, and means for holding the cap in the inverted position with the stop member bottom surface flush against the top edge of the drain pipe, which does not permit movement, which can fit various size drain pipes.

4,927,440

THRASHING SYSTEM FOR VEGETABLE HARVESTERS

Lee D. Butler, Kingsburg; Franklin P. Orlando, Morgan Hill, and Don H. Lenker, Salinas, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Dec. 23, 1988, Ser. No. 288,838
Int. Cl.[5] A01D *45/00*
U.S. Cl. 56—12.8 20 Claims



1. An apparatus for harvesting fruit attached to vines growing in the ground, comprising:
means for moving a mobile harvester through the vines;
means for elevating the vines and attached fruit from the ground;
means defining an oscillating shaker head including a tubular shaft having a plurality of tines thereon, a pair of eccentric weights connected to said tubular shaft, first drive means for oscillating said eccentric weighs, and second drive means connected to said tubular shaft for allowing the tubular shaft to oscillate while positively driving the shaker head in a desired direction;
means for releasing the vines and attached fruit onto tines of said oscillating shaker head for shaking a major portion of the fruit free from the vines while the shaker head is driven in a predetermined direction;
means for directing a blast of high pressure air against the vines and separate fruit for lifting and separating the vines for releasing the fruit therefrom;
means for collecting the fruit; and
means for discharging the vines from the harvester.

15. A method of harvesting fruit attached to vines growing in the ground, comprising the steps of:
moving a mobile harvester through the vines;

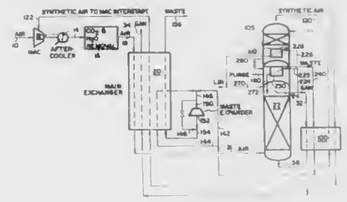
elevating the vines and attached fruit;
releasing the vines and attached fruit on tines of an associated shaker head for shaking a majority of the fruit free from the vines while rotating in a predetermined direction;
continuously oscillating the tines while harvesting the fruit;
driving the portions of the tines in contact with the vines and fruit in a direction rearwardly of the direction of movement of the mobile harvester;
directing the vines and fruit into at least one pair of pinch rolls for separating the fruit from the vines and for gripping and pulling the vines out of the harvester for discharge on the ground;
directing a blast of high pressure air against the vines and separate fruit for lifting and separating the vines for releasing the fruit therefrom; and
separately connecting the fruit and discharging the vines from the harvester.

4,927,441

HIGH PRESSURE NITROGEN PRODUCTION CRYOGENIC PROCESS

Rakesh Agrawal, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 27, 1989, Ser. No. 428,377
Int. Cl.[5] F25J *3/02*
U.S. Cl. 62—28 6 Claims



1. In a process for the separation of air by cryogenic distillation wherein a feed air stream is compressed by a multi-staged main air compressor, cooled to near the dew point of the feed air stream and separated into a nitrogen overhead stream and an oxygen-enriched bottoms liquid in a rectifier; at least a portion of the nitrogen overhead is condensed to provide reflux for the rectifier; at least another portion of the nitrogen overhead is removed from the process as gaseous nitrogen product; the oxygen-enriched bottoms liquid is stripped in a distillation zone comprising one or more distillation stages into a synthetic air stream and a second oxygen-enriched liquid; and the synthetic air stream is warmed to recover refrigeration and subsequently recycled to the process; the improvement for producing medium to high pressure gaseous nitrogen product in a more energy efficient manner comprises:
dividing the portion of the nitrogen overhead to be condensed to provide reflux for the rectifier into two substreams, a first nitrogen overhead substream and a second nitrogen overhead substream;
(b) condensing the first nitrogen overhead substream by indirect heat exchange with the second oxygen-enriched liquid thereby producing a first liquid nitrogen stream;
(c) reducing in pressure at least a portion of the second oxygen-enriched liquid to produce a reduced pressure oxygen-enriched liquid stream;
(d) condensing the second nitrogen overhead substream by indirect heat exchange with the reduced pressure oxygen-enriched liquid stream thereby producing a second light nitrogen stream and a gaseous, oxygen-enriched waste stream;
(e) feeding the first and second liquid nitrogen streams to the top of the rectifier to provide reflux; and
(f) expanding and subsequently warming at least a portion of the gaseous, oxygen-enriched waste stream to recover refrigeration for the process.

4,927,442

METHOD OF PRODUCING OPEN-PORE SINTERED GLASS FILTERS AND PRODUCT

Norbert Greulich; Werner Kiefer, and Veronika Rehm, all of Mainz, Fed. Rep. of Germany, assignors to Schott Glaswerke, Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 323,088
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637690
Int. Cl.[5] C03B *19/08;* B32B *3/26*
U.S. Cl. 65—18.1 32 Claims



1. Method for the production of open-pored sintered bodies composed of glass, having a large open-pore volume, high flexural tensile strength, predetermined pore sizes and high flow velocities for fluids and gases, by means of sintering a glass-salt mixture followed by washing out the salt, including the steps of:
producing a parent granular material composed of fine grained glass powder, coarse grained salt powder, the salt having a melting point higher than the glass sintering temperature to prevent the salt from combining with the glass material, said salt being soluble in liquids that do not dissolve the glass, and a bonding material, and to the resulting granulated material admixing 5 to 20 weight percent, with respect to said granulated material, of fine grained glass powder, subjecting the resulting mass to a molding procedure to produce a molded body and sintering the body by heating to the sintering temperature of the glass, and afterwards washing out the salt from the sintered glass.

4,927,443

APPARATUS FOR MANUFACTURING CURVED GLASS SHEETS

Seiichiro Honjo; Kazuo Yamada; Yasuhiro Fuchigami, and Tetsuya Mizusugi, all of Osaka, Japan, assignors to Nippon Sheet Glass Company, Ltd., Osaka, Japan

Filed Apr. 8, 1988, Ser. No. 179,569
Claims priority, application Japan, Apr. 8, 1987, 62-86573
Int. Cl.[5] C03B *23/023, 35/20*
U.S. Cl. 65—273 5 Claims

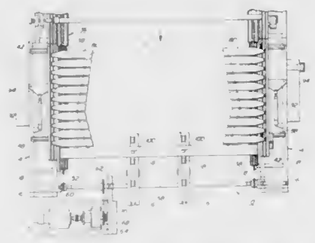
1. A system for conveying a heated glass sheet and transferring the heated glass sheet to a mold means, comprising:
a frame;
guide means supported on said frame, said guide means including a pair of fixed inner rails extending parallel to one another in a first direction in which the glass sheet is conveyed between a first position and a second position and a pair of outer movable rails, said movable rails extending in said first direction parallel to said pair of fixed rails;
moving means for moving each of said movable rails in a second direction substantially perpendicular to said first direction of conveyance of the glass sheet between an

VOL
1114
ISS
4
MY
22
1990
UMI

inner glass sheet supporting position and an outer glass sheet transfer position;

carrier means movably engaged with each rail of said pair of fixed rails and movable along said fixed rails between said first and second positions; and

glass sheet support/transfer means for supporting said glass sheet thereon and transferring the glass sheet to the mold



means, said glass sheet support/transfer means comprising a plurality of pairs of plates respectively supported on said carrier means for movement therewith and respectively engaged with said pair of movable rails for movement therewith in said second direction substantially perpendicular to the first direction, whereby the glass sheet can be conveyed from the first position to the second position and transferred to the mold means.

4,927,444

PUSHER MECHANISM FOR GLASS FORMING MACHINE

Gary R. Voisine, Windsor, Conn., assignor to Emhart Industries, Inc., Towson, Md.

Filed Sep. 5, 1989, Ser. No. 402,956
Int. Cl.[5] C03B *35/10*
U.S. Cl. 65—323 **5 Claims**



1. A pusher mechanism for transferring a selected number of containers from a dead plate of a glass forming machine to a conveyor comprising

a container handling arm including a corresponding number of receptacles each having a container engaging corner,

means for displacing said container handling arm from a retracted position to an advanced container receiving position and for displacing said advanced container handling arm from said receiving position through an arc to a deposit position on the conveyor,

a corresponding number of conduit means displaceable with said container handling arm and selectively aimed to direct air discharged therefrom toward the corner of a respective one of said receptacles, and

means for supplying air under pressure to said conduit means when said container handling arm is fully extended for locating each container in its associated corner.

4,927,445

APPARATUS FOR PRODUCING COATED SINGLE TWIST GLASS YARNS

Barbara Soszka, Chambery; Robert Federowsky, Aix-Les-Bains, and Jacques Mahler, Chambery, all of France, assignors to Vetrotex Saint-Gobain, Chambery, France

Division of Ser. No. 127,732, Dec. 2, 1987, Pat. No. 4,853,021. This application Apr. 5, 1989, Ser. No. 334,042
Claims priority, application France, Dec. 4, 1986, 86-16971
Int. Cl.[5] C03C *25/02*; D10H *1/24*; C03B *37/02*
U.S. Cl. 65—11.1 **18 Claims**



1. An apparatus for producing single twist coated glass yarns, said apparatus comprising:

receptacle means for providing a substantially constant stream of molten glass;

means for drawing a plurality of elongated glass fibers from said receptacle means;

first means for applying a curable sizing coating to at least a portion of an outer surface of said fibers, said coating being applied directly after said fibers exit said receptacle means;

means for gathering said coated fibers into a yarn;

means for imparting a continuous, rotative twisting movement to said coated yarn; and

means for curing said sizing coating upon the surface of said yarn.

4,927,446

GLASS MELTING FURNACE

Seiichiro Manabe, and Yukihito Nagashima, both of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

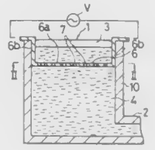
Filed Dec. 16, 1988, Ser. No. 285,893
Claims priority, application Japan, Dec. 24, 1987, 62-327892
Int. Cl.[5] C03B *5/033*
U.S. Cl. 65—347 **5 Claims**

1. A glass melting furnace comprising,

a furnace body having an upper portion and a bottom portion, a material entrance provided at the upper portion of the furnace body,

a molten glass exit provided at the bottom portion of the furnace body, and

a resistance heating element situated in the furnace body between the material entrance and molten glass exit, said resistance heating element extending substantially throughout at least one horizontal level of the furnace body and having openings therein and extending through said heating element with 5–60% of ration T/S×100(%) wherein T is total area of the openings and S is total area of the resistance heating element so that when the furnace



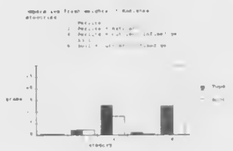
is used to melt glass, the resistance heating element is immersed in the glass to melt glass around the resistance heating element and allow molten glass to pass through the openings.

4,927,447

SOIL AMENDMENT MATERIAL AND PROCESS FOR PREPARATION THEREOF

Nabil N. Youssef, 2168 N. 1450 East, North Logan, and Gene W. Miller, 935 S. 400 East, Providence, both of Utah 84321

Continuation of Ser. No. 936,519, Dec. 1, 1986, Pat. No. 4,762,545. This application May 13, 1988, Ser. No. 194,043
The portion of the term of this patent subsequent to Aug. 9, 2006, has been disclaimed.
Int. Cl.[5] C05G *3/04*
U.S. Cl. 71—27 **13 Claims**



1. A method of preparing a plant nutritive soil amendment material, comprising the steps:

providing a quantity of water insoluble hydrophilic polymer in granular form, said polymer being non-toxic to plants to be grown and capable of cross linking in the presence of water to become essentially insoluble and capable of undergoing repeated reversible hydration and dehydration cycles;

providing a quantity of water solution containing at least one plant nutrition containing salt, said solution being of sufficiently dilute concentration that said polymer is capable of said cross linking in its presence to become essentially insoluble and to maintain its capability to undergo repeated reversible hydration and dehydration;

soaking said quantity of polymer in a quantity of said solution, so that said polymer swells to incorporate at least a portion of said solution within its molecular structure;

decanting any remaining unbound solution from the swollen polymer;

heating said polymer to expel the absorbed water therefrom; and

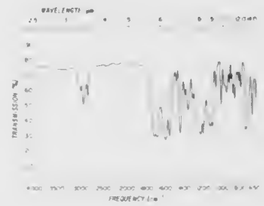
repeating the soaking, decanting and drying steps, until the nutritive content of the polymer reaches a desired level.

4,927,448

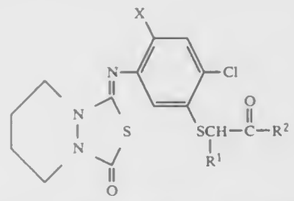
THIADIAZABICYCLONONANE DERIVATIVES AND HERBICIDAL COMPOSITIONS

Mikio Yamaguchi; Chiharu Suzuki, both of Shizuoka; Kenji Matsunari, Fujieda; Takeshige Miyazawa, Shizuoka, and Yasuo Nakamura, Tokyo, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,805
Claims priority, application Japan, Oct. 16, 1987, 62-260866
The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.
Int. Cl.[5] C07D *513/04*; A01N *43/82*
U.S. Cl. 71—90 **12 Claims**

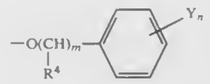


1. A thiadiazabicyclononane derivative having the formula:

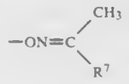


(I)

wherein X is hydrogen or halogen, R^1 is hydrogen or lower alkyl, R^2 is lower alkenyloxy, lower alkynyloxy, lower alkythio, halogen-substituted alkoxy lower alkosy, lower alkoxycarbonyl (lower) alkoxy α, α-dimethylbenzylamino, $—OC_2H_4S(O)_lR^3$ (wherein R^3 is alkyl or phenyl, and l is an integer of 0 or 2),

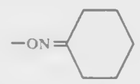


(wherein Y is halogen, lower alkyl, lower alkoxy or nitro, R^4 is hydrogen or lower alkyl, and each of m and n is an integer of 0, 1 or 2), $—OC_2H_4OR^5$ (wherein R^5 is phenyl, benzyl or methoxyalkyl), $—OCH_2R^6$ (wherein R^6 is styryl, cyanoalkyl, tetrahydrofuran-2-yl, thienyl or pyridin-2-yl),



(wherein R^7 is lower alkyl or phenyl) or

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4,927,449

TRICYCLIC 1H-IMIDAZOLE-5-CARBOXYLIC ACID DERIVATIVES AS HERBICIDES

William R. Lutz, Riehen, Switzerland; Wim G. Verschueren, Antwerpen, Belgium; Hanspeter Fischer, Bottmingen, Switzerland, and Guy R. E. Van Lommen, Berlaar, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

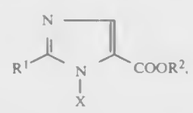
Division of Ser. No. 134,440, Dec. 17, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 289,947

Claims priority, application United Kingdom, Dec. 23, 1986, 8630759

Int. Cl.[5] A01N *43/02, 43/48;* C07D *403/00*

U.S. Cl. 71—90 17 Claims

1. A compound of the formula:



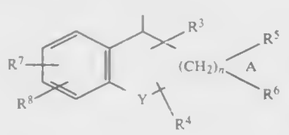
(I)

a stereochemically isomeric form thereof, or a salt thereof, wherein:

R^1 represents hydrogen or mercapto;

R^2 represents hydrogen, C_{1-7}alkyl, C_{3-7}alkenyl, C_{3-7}-alkynl, Cphd 3-7cycloalkyl, C_{1-7}alkyloxy-C_{1-7}alkyl, or arylC_{1-5}alkyl; and

X represents a group of the formula:



wherein:

Y represents O or S(O) wherein m represents zero, one, or two;

n represents 1, 2, or 3;

A represents C_{1-5}alkanediyl or C_{5-7}cycloalkanediyl;

R^3, R^4, R^5, and R^6each independently represent hydrogen, C_{1-5}alkyl, mono- and di(aryl)C_{1-5}alkyl, C_{1-5}alkloxy, halo, C_{3-7}alkenyl, C_{1-5}alkyl substituted with one to three halo atoms, C_{1-5}alkyloxy substituted with one to three halo atoms, or aryl;

wherein the groups R^3, R^4, and the bivalent group A as defined above may be substituted on any carbon atom making up the Y-containing part of the tricyclic ring system, including any of the CH_2 moieties of the $-(CH_2)_n-$ and Y fragments; provided that the bivalent group A is not connected to the same carbon atom thus forming a spirocyclic ring system; and

R^7 and R^8 each independently represent hydrogen, C_{1-5}alkyl, C_{1-5}alkyloxy, halo, C_{1-5}alkyl substituted with one to three halo atoms, C_{1-5}alkyloxy substituted with one to three halo atoms, cyano, nitro, amino, mono- and di(C_{1-5}alkyl)amino, or C_{1-5}alkyl-carbonylamino; and

wherein aryl represents phenyl optionally substituted with up to three substituents each independently selected from C_{1-5}alkyl, C_{1-5}alkyloxy, and halo.

9. A method for controlling weeds. which method comprises applying to said weeds or to the locus thereof of a herbiacidally effective amount of a chemical compound having the formula (I) as claimed in claim 1.

4,927,450

N-HETEROCYCLOSULFONYL-N'-PYRIMIDINYLUREAS

Werner Föry, and Willy Meyer, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 13, 1987, Ser. No. 120,043

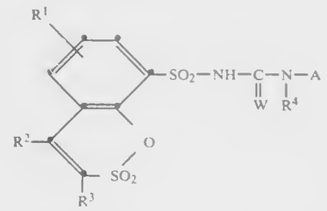
Claims priority, application Switzerland, Nov. 28, 1986, 4770/86

The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.

Int. Cl.[5] A01N *43/54, 43/32;* C07D *411/12, 403/12*

U.S. Cl. 71—91 11 Claims

1. An N-(2,2-dioxo-1,2-benzoxathiin-8-ylsulfonyl)N'-primidinylurea of formula I



(I)

wherein

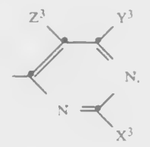
R^1 is hydrogen, halogen, nitro, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_1-C_4alkoxycarbonyl, C_1-C_4alkylthio, C_1-C_4alkylsulfinyl, C_1-C_4alkylsulfonyl or C_2-C_5alkoxyalkoxy,

R^2 and R^3 are each independently of the other hydrogen or C_1-C_4alkyl,

R^4 is hydrogen, methyl or ethyl,

W is oxygen or sulfur, and

A is



A3

wherein

X^3 is halogen, C_1-C_4haloalkoxy, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4alkyl, dimethylamino, methylamino, ethylamino, amino or C_2-C_4alkoxyalkyl,

Y^3 is methyl, methoxy, ethyl, ethoxy, C_1-C_2haloalkyl, C_1-C_2haloalkoxy, dimethylamino or methylamino,

Z^3 is hydrogen, methyl, ethyl, methoxy, ethoxy, methoxycarbonyl, ethoxycarbonyl, halogen, cyano, nitro, methylthio, methylsulfinyl or methylsulfonyl, or

Z^3 and Y^3 together are a C_2-C_4alkylene bridge or a C_2-C_4alkylene bridge which is interrupted by oxygen,

or a salt thereof.

9. A method of controlling undesired plant growth, which method comprises applying to the plants or to the locus thereof an effective amount of a compound of formula I according to claim 1, or of a composition containing such a compound.

4,927,451

3-ARYLDIHYDROURACILS

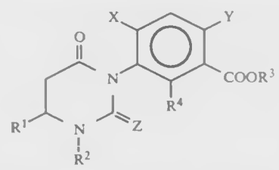
Walter G. Brouwer, Guelph, Ontario; Ethel Ellen Felauer, Puslinch, Ontario, both of Canada, and Allyn Roy Bell, Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Chemical Ltd/Ltee, Don Mills, Canada

Filed Dec. 30, 1988, Ser. No. 292,088

Int. Cl.[5] A01N *43/54;* C07D *239/22*

U.S. Cl. 71—92 9 Claims

1. A compound having the structural formula



where R^1 is hydrogen, C_1-C_4 alkyl, C_3-C_6 cycloalkyl, C_3-C_4 alkenyl or trifluoromethyl; R^2 is C_1-C_4 alkyl, C_3-C_6 cycloalkyl, C_3-C_4 alkenyl, C_7-C_{10} aralkyl or C_7-C_{10} haloaralkyl; R^3 is hydrogen or C_1-C_4 alkyl; R^4 is hydrogen or C_1-C_2 alkyl; X is halogen; Y is hydrogen; C_1-C_4 alkyl or halogen; and Z is oxygen or sulfur.

7. A method for controlling weeds comprising applying a herbicidally effective amount of the compound of claim 1 to the locus to be protected.

4,927,452

1-CARBONYL-2-PYRAZOLINE DERIVATIVES HAVING HERBICIDAL ACTIVITY

Kobus Wellinga, and Jacobus H. H. Eussen, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

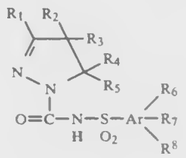
Continuation of Ser. No. 113,659, Oct. 28, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,529

Claims priority, application Netherlands, Oct. 31, 1986, 8602746

Int. Cl.[5] A01N *43/56;* C07D *231/06, 231/08*

U.S. Cl. 71—92 10 Claims

1. A composition having herbicidal and/or plant growth regulating activity, comprising a herbicidal and/or plant growth regulating amount of an active substance in addition to a solid or liquid inert carrier material, characterized in that the active substance is a compound of the general formula:



(I)

wherein

R_1, R_2, R_3 and R_4 are equal or different and represent hydrogen atoms, alkyl groups having 1–6 carbon atoms, cycloalkyl groups having 3–6 carbon atoms or alkoxycarbonyl groups having 2–5 atoms;

R_5 is a hydrogen atom, an alkyl group or haloalkyl group having 1–8 carbon atoms, an unsubstituted phenyl group or a phenyl group substituted with halogen, nitro, C_1-C_4 haloalkyl, C_1-C_4 alkoxy or C_1-C_4 haloalkoxy, a heterocyclic group selected from the group consisting of furyl and thienyl, which heterocyclic group is unsubstituted or substituted with halogen, nitro, C_1-C_4 haloalkyl, C_1-C_4 alkoxy or C_1-C_4 haloalkoxy, or an aikenyl, alkynyl or alkoxycarbonyl group having 2–5 carbon atoms;

or wherein R_1 together with R_2 or R_3 together with R_4 may form a straight or branched alkylene group having 3–5 carbon atoms;

Ar is a phenyl group, a phenyl (C_1-C_4) alkyl group, a thienyl group or a pyrazolyl group;

R_6 is a hydrogen atom or a substituent on Ar, which substituent, in case Ar is a phenyl or phenylalkyl group, is attached to the phenyl group in the ortho position with respect to the sulphonyl or sulphonylalkyl group, and which substituent is selected from the following atoms and groups: a halogen atom; a nitro group; an alkoxycarbonyl group that has 2–8 carbon atoms and is unsubstituted or substituted with one or more hydroxy or C_1-C_4 alkoxy groups; and an alkyl, hydroxyalkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, alkylsulphonyl and haloalkylsulphonyl group having 1–6 carbon atoms;

R_7 is a hydrogen atom, a halogen atom or a C_1-C_4 alkyl group; and

R_8 is a hydrogen atom, a halogen atom or a C_1-C_4 alkyl group; or a salt of this compound with an inorganic o organic base.

4,927,453

HERBICIDAL SULFONAMIDES

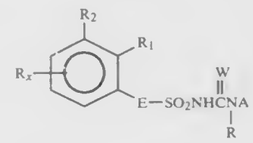
Stephen K. Gee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 85,852, Aug. 17, 1987, abandoned, which is a continuation of Ser. No. 920,051, Oct. 17, 1986, abandoned. This application Aug. 30, 1988, Ser. No. 238,108

Int. Cl.[5] A01N *43/54;* C07D *239/69*

U.S. Cl. 71—92 24 Claims

1. A compound selected from



I

wherein

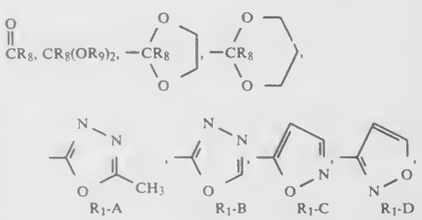
E is CH_2 or a single bond;

W is O or S;

R is H or CH_3;

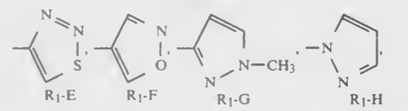
R_X is H, F, Cl, CH_3, OCH_3, $N(CH_3)_2$ or $OCHF_2$;

R_1 is F, Cl, Br, NO_2, C_1-C_4 alkyl, C_2-C_4 alkenyl, C_2-C_4 haloalkenyl, C_2-C_4 alkynyl, C_1-C_4 haloalkyl, C_1-C_4 akloxy, $OCH_2CH_2OCH_3$, C_1-C_4 haloalkoxy, C_3-C_4 alkenyloxy, C_2-C_4 haloalkenyloxy, C_3-C_4 alkynyloxy, CO_2R_3, $CONR_4R_5$, $SO_2NR_4'R_5'$, $S(O)_nR_6$, OSO_2R_7, C_1-C_2 alkyl substituted with C_1-C_2 alkoxy, OH or C_1-C_2 alkylthio, CH_2CN, C_6H_5,

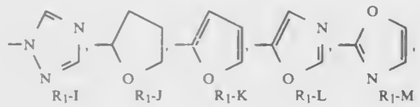


R_1-A R_1-B R_1-C R_1-D

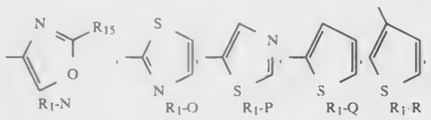
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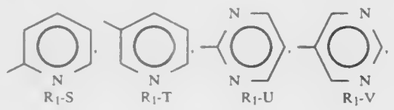
R_1-E R_1-F R_1-G R_1-H



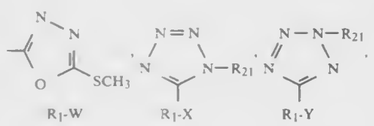
R_1-I R_1-J R_1-K R_1-L R_1-M



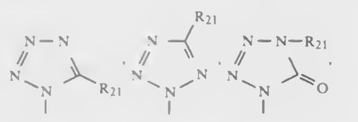
R_1-N R_1-O R_1-P R_1-Q R_1-R



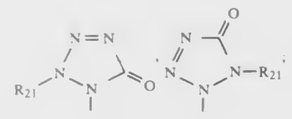
R_1-S R_1-T R_1-U R_1-V



R_1-W R_1-X R_1-Y

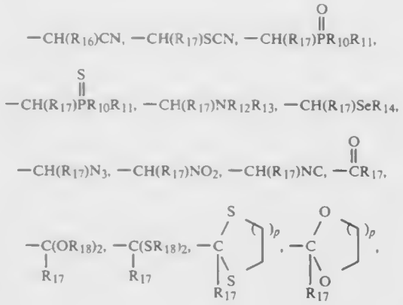


R_1-Z R_1-AA R_1-AB



R_1-AC R_1-AD

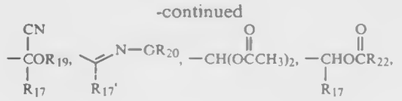
R_2 is



$-CH(R_{16})CN$, $-CH(R_{17})SCN$, $-CH(R_{17})\overset{O}{\overset{\|}{P}}R_{10}R_{11}$, $-CH(R_{17})\overset{S}{\overset{\|}{P}}R_{10}R_{11}$, $-CH(R_{17})NR_{12}R_{13}$, $-CH(R_{17})SeR_{14}$, $-CH(R_{17})N_3$, $-CH(R_{17})NO_2$, $-CH(R_{17})NC$, $-C\overset{O}{\overset{\|}{R}}_{17}$,

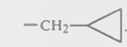
$-C(OR_{18})_2$, $-C(SR_{18})_2$, $-C(R_{17})\overset{S}{\overset{\|}{}}$, $-C(R_{17})\overset{O}{\overset{\|}{}}$

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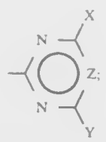


$-C(R_{17})Cl$, $-C(R_{17})Br$ or $-CHOSO_2CH_3$;

R_3 is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 or alkynyl,

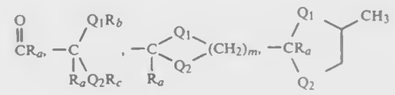


CH_2CH_2Cl, CH_2CH_2F, C_1–C_2 alkyl substituted with OCH_3, SCH_3 or CN;
R_4 is C_1–C_3 alkyl or C_1–C_2 alkoxy;
R_4' is C_1–C_3 alkyl or C_1–C_2 alkoxy;
R_5 is H or C_1–C_3 alkyl;
R_5' is H or C_1–C_3 alkyl;
R_4 and R_5 may be taken together to form $-(CH_2)_3-$ or $-(CH_2)_4-$;
R_4' and R_5' may be taken together to form $-(CH_2)_3-$ or $-(CH_2)_4-$;
R_6 is C_1–C_3 alkyl, $-CH_2CH=CH_2$ or $CH_2C\equiv CH$;
R_7 is C_1–C_3 alkyl or $N(CH_3)_2$;
R_8 is H, C_1–C_4 alkyl, C_3–C_4 alkenyi, C_3–C_4 alkynyl, CH_2CH_2Cl, CH_2CH_2F, C_1–C_2 alkyl substituted with OCH_3 or SCH_3 or C_3–C_6 cycloalkyl;
R_9 is C_1–C_2 alkyl;
R_{10} and R_{11} are independently C_1–C_2 alkyl, C_1–C_2 alkoxy, C_1–C_2 alkylthio, $NHCH_3$ or $N(CH_3)_2$;
R_{12} and R_{13} are independently H or C_1–C_2 alkyl;
R_{14} is C_1–C_3 alkyl;
R_{15} is H or CH_3;
R_{16} is H, C_1–C_2 alkyl or F;
R_{17} is H or C_1–C_2 alkyl;
R_{17}' is H, C_1–C_2 alkyl, CN, Cl, OCH_3, SCH_3 or $N(CH_3)_2$;
R_{18} is C_1–C_2 alkyl;
R_{19} is H, $Si(CH_3)_3$ or C_1–C_2 alkyl;
R_{20} is H or C_1–C_2 alkyl;
R_{21} is H, C_1–C_3 alkyl or allyl;
R_{22} is C_1–C_2 alkyl or C_1–C_2 haloalkyl;
R_{23} is H, CH_3, Cl or Br;
R_{24} is H or CH_3;
p is 1 or 2;
n is 0, 1 or 2;
A is



A-1

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl, C_1–C_4 haloalkyl, C_2–C_4 alkynyl, C_3–C_5 cycloalkyl, azido, cyano,



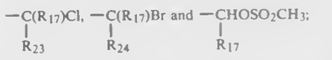
or

$N(OCH_3)CH_3$;

m is 2 or 3:
Q_1 and Q_2 are independently O or S;
R_a is H or C_1–C_3 alkyl;
R_b and R_c are independently C_1–C_3 alkyl; and
Z is CH, CCH_3, CC_2H_5, CCl or CBr;
and their agriculturally suitable salts; provided that
(1) when X is halogen, then Z is CH and Y is OCH_3, OC_2H_5, NH_2, $NHCH_3$, $N(CH_3)_2$, OCF_2H, OCF_2Br or $N(OCH_3)CH_3$;
(2) when X or Y is C_1 haloalkoxy, then Z is CH;
(3) when W is S, then R is H, Z is CH and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH=CH_2$, $OCH_2C\equiv CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or



(4) when the total number of carbon atoms of X and Y is greater than four, then the combined number of carbons of R_1 and R_2 is less than or equal to six;
(5) when R_2 is $-C(O)R_{17}$, $-C(R_{23})(R_{17})Cl$ or $-C(R_{24})(R_{17})Br$ then Y is other than cyclopropyl;
(6) when Y is C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl or C_2–C_5 alkylsulfonylalkyl, then R_2 is other than $-CH(R_{17})NO_2$,



$-C(R_{17})Cl$, $-C(R_{17})Br$ and $-CHOSO_2CH_3$;

(7) when R_4' is C_1–C_2 alkoxy and R_5' is H, then R_2 is other than $CH(R_{17})CN$, $C(R_{23})(R_{17})Cl$ and $C(R_{24})(R_{17})Br$;
(8) when R_2 is $C(O)R_{17}$, $C(R_{23})(R_{17})Cl$ or $C(R_{24})(R_{17})Br$, then R_1 is other than C_1–C_4 haloalkyl or C_2 alkyl substituted with C_1–C_2 alkoxy, OH or C_1–C_2 alkylthio;
(9) when R_2 is $C(R_{23})(R_{17})Cl$ or $C(R_{24})(R_{17})Br$, then X and Y are other than C_1–C_4 haloalkoxy or C_1–C_4 haloalkylthio;
(10) when R_2 is $C(R_{23})(R_{17})Cl$ or $C(R_{24})(R_{17})Br$, then R_1 is other than C_1–C_4 haloalkoxy, C_3–C_4 alkenyloxy, C_2–C_4 haloalkenyloxy, C_2–C_4 alkynyl, C_3–C_4 alkynyloxy, C_2–C_4 haloalkenyl and R_1—A through R_1—W;
(11) when R_1 is R_1—X, R_1—Y, R_1—Z, R_1—AA, R_1—AB, R_1—AC or R_1—AD, then R_2 is other than $CH(R_{16})CN$, $C(R_{23})$—$(R_{17})Cl$ and $C(R_{24})(R_{17})Br$;
(12) when R_2 is $C(O)R_{17}$, then R_1 is other than $SO_2NR_4'R_5'$; and
(13) when R_2 is CO_2R_3, then both R_{12} and R_{13} are other than H.

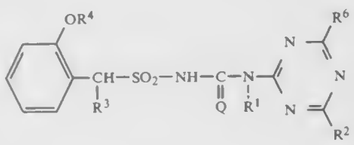
4,927,454

SUBSTITUTED 1-BENZYLSULPHONYL-3-HETEROARYL-(THIO)UREA HERBICIDES

Christa Fest, Wuppertal; Klaus-Helmut Müller, Duesseldorf; Theodor Pfister, Monheim; Hans-Jochem Riebel, Wuppertal; Ernst Kysela, Bergisch-Gladbach; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Robert H. Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 130,772, Dec. 9, 1987, Pat. No. 4,806,147. This application Nov. 8, 1988, Ser. No. 268,419
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642824
Int. Cl.[5] **A01N** *43/66;* **C07D** *251/42, 251/48, 251/70*
U.S. Cl. 71—93 **4 Claims**

1. A substituted 1-benzylsulphonyl-3-triazinyl(thio)urea of the formula



in which
Q represents oxygen or sulphur,
R^1 represents hydrogen, or represents C_1–C_6-alkyl (which is optionally substituted by fluorine, cyano, C_1–C_4-alkoxy or C_1–C_4-alkylthio), or represents C_3–C_6-alkenyl or C_3–C_6-alkynyl (which are optionally substituted by fluorine or chlorine), or represents phenyl-C_1–C_2-alkyl (which is optionally substituted in the phenyl part by fluorine, chlorine, nitro, cyano, methyl, methoxy or C_1–C_2-alkoxycarbonyl),
R^2 represents hydrogen, fluorine, chlorine, bromine, methyl, ethyl, trifluoromethyl, methoxy, ethoxy, difluoromethoxy, methylthio, ethylthio, amino, methylamino, ethylamino, dimethylamino or diethylamino,
R^3 represents hydrogen or C_1–C_4-alkyl,
R^4 represents halogeno-C_1–C_4-alkyl wherein halogen represents fluorine and/or chlorine, and
R^6 represents hydrogen, fluorine, chlorine, bromine, methyl, ethyl, trifluoromomethyl, methoxy, ethoxy, propoxy, isopropoxy, difluoromethoxy, methylthio, ethylthio, methylamino, ethylamino, dimethylamino or diethylamino,
or a salt thereof with a metal or basic organic nitrogen compound.

3. A herbicidal composition comprising a herbicidally effective amount of a compound or salt thereof according to claim 1 and a diluent.

4,927,455

PLANT GROWTH MEDIUM

Saburo Hotta; Yoshiaki Kikuchi, both of Yokohama; Masanori Takaya, Tokyo, and Takashi Inoue, Yokohama, all of Japan, assignors to Kyodo Shiryo Co., Ltd., Kanagawa, Japan

Filed Sep. 1, 1987, Ser. No. 91,864
Claims priority, application Japan, Sep. 12, 1986, 61-215087; Jan. 14, 1987, 62-5035; Jun. 9, 1987, 62-142233
Int. Cl.[5] **C05G** *3/04;* **C09K** *17/00*
U.S. Cl. 71—64.13 **6 Claims**

1. Plant growth medium obtained by a process comprising a gel-formable material and water-holding material with a conventional powdery plant culture medium, forming the resultant mixture, and then drying and solidifying the thus-formed mixture by vacuum freeze drying, the water-holding material being selected from the group consisting of vermiculite, perlite, zeolite, cellulose materials, water-holding fibrous materi-

VOL
1114
ISS
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als, ceramic raw materials and rock wool, and the gel-formable material being selected from the group consisting of agar, carrageenan, gelatin, pullulan of bacterial origin and montmorillonite.

4,927,456

HYDROMETALLURGICAL PROCESS FOR PRODUCING FINELY DIVIDED IRON BASED POWDERS

Nelson E. Kopatz, Sayre; Walter A. Johnson, and Joseph E. Ritsko, both of Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 27, 1987, Ser. No. 54,479

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[5] B22F *1/00, 9/24*

U.S. Cl. 75—346 13 Claims

1. A process consisting essentially of:

(a) forming an aqueous solution containing at least one iron group metal value,

(b) forming a reducible solid metallic material selected from the group consisting of iron group metal salts, oxides, hydroxides and mixtures thereof from said solution,

(c) reducing said material to form iron group based metallic powder particles,

(d) entraining at least a portion of said powder particle in a carrier gas to form entrained iron group metal powder particles,

(e) feeding said entrained particles and said carrier gas into a high temperature zone and maintaining said particles in said zone for a sufficient time to melt at least about 50% by weight of said particles, and to form droplets therefrom and

(f) cooling said droplets to form iron group metal based particles having essentially a spherical shape and a majority of said particles having a size less than 20 micrometers.

4,927,457

METHOD OF MANUFACTURING LOW CARBON FERRO-CHROMIUM

Kazumi Ohta; Sotoaki Kawaguchi; Hisao Doyama, and Yutaka Yano, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00085, § 371 Date Sep. 28, 1988, § 102(e) Date Sep. 28, 1988, PCT Pub. No. WO88/05829, PCT Pub. Date Aug. 11, 1988

PCT Filed Feb. 1, 1988, Ser. No. 272,806

Claims priority, application Japan, Feb. 2, 1987, 62-22156; Feb. 6, 1987, 62-24785

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—10.63 12 Claims



1. A method of manufacturing low carbon ferro-chromium having a low nitrogen level, comprising the steps of:

melting ores including oxides of Cr and Fe in a furnace to form a melt comprising molten slag;

pouring the molten slag into a ladle;

adding a reducing agent to the molten slag in the ladle to reduce oxides of Cr and Fe to form metallic low-carbon ferro-chromium; and

introducing an oxidizing gas or an inert gas other than nitrogen or a nitrogen-containing gas into the melt in the ladle, thereby bubbling the melt and accelerating reduction of said oxides, said gas being introduced into the melt in the ladle at a rate of more than 7.0 l/min. but not exceeding 29.0 l/min., for each ton of the melt in the ladle.

4,927,458

METHOD FOR IMPROVING THE TOUGHNESS OF BRITTLE MATERIALS FABRICATED BY POWDER METALLURGY TECHNIQUES

Martin J. Blackburn, Kensington, and Michael P. Smith, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 1, 1988, Ser. No. 239,720

Int. Cl.[5] B22F *1/00*

U.S. Cl. 75—246 4 Claims

1. A method for increasing the toughness of a powder metallurgy brittle material which comprises:

incorporating from about 5% to about 30% by vol. of tough compatible particles having an average diameter of from about 50 to about 300 microns into the matrix,

whereby the toughness of the resultant article exceeds that which would be predicted by a rule of mixture calculation.

4,927,459

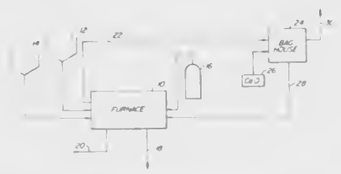
TREATMENT OF ALUMINUM REDUCTION CELL LININGS COMBINED WITH USE IN ALUMINUM SCRAP RECLAMATION

Owen M. Gardner, Oakland, Calif., and Ralph L. Cheek, Tulsa, Okla., assignors to Imco Recycling Inc., Dallas, Tex.

Filed Mar. 17, 1989, Ser. No. 324,843

Int. Cl.[5] C22B *7/04*

U.S. Cl. 75—685 32 Claims



1. A process for disposing of spent aluminum reduction cell lining material in a manner free of leachable species of such material, said process comprising:

(a) combining said lining material with salt flux materials to form a flux mixture;

(b) contacting aluminum-bearing waste material with said flux mixture in molten form to cause aluminum from said aluminum-bearing waste material to separate into a molten aluminum phase substantially free of species other than metallic aluminum, and to convert substantially all leachable species from said lining material to vapor form, leaving a salt phase containing nonvaporized components of said flux mixture and said species from said aluminum-bearing waste material other than metallic aluminum; and

(c) disposing of said lining material free of said leachable species.

4,927,460

INDUCTION MELTING AND STIRRING

John H. Simcock, Droitwich, United Kingdom, assignor to Inductotherm Europe Limited, Hereford & Worcester, United Kingdom

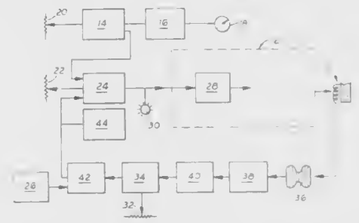
Division of Ser. No. 144,367, Jan. 15, 1988, Pat. No. 4,850,573.

This application Apr. 4, 1989, Ser. No. 333,356

Claims priority, application United Kingdom, Feb. 14, 1987, 8703488

Int. Cl.[5] C21C *7/00*

U.S. Cl. 75—10.14 11 Claims



1. A method of inductively stirring molten metal, which comprises the steps of:

(a) inductively heating molten metal in a vessel to a preselected temperature by applying power thereto from a single power supply at a first frequency through an induction coil; and

(b) modulating the amplitude of the power to the induction coil with a modulation signal at a second frequency so that the melt is agitated to a predetermined extent independent of a selected overall power input.

4,927,461

MACHINABLE-GRADE, FERROUS POWDER BLEND CONTAINING BORON NITRIDE AND METHOD THEREOF

Cavit Cilogln, Tracy; Martin Gagne, St-Pierre de Sorel; Edy Laraque, Tracy; Joel Poirier, Sorel; Sylvain Tremblay, Joquiere, and Yves Trudel, Tracy, all of Canada, assignors to Quebec Metal Powders, Ltd., Tracy, Canada

Filed Nov. 2, 1988, Ser. No. 266,419

Int. Cl.[5] B22F *1/00*

U.S. Cl. 75—254 24 Claims

1. A powder metallurgy blend comprising:

from about 85 to about 99.99 weight percent of a ferrous powder having a maximum particle size of less than about 300 microns; and

from about 0.01 to about 0 5 weight percent boron nitride powder comprising irregularly-shaped submicron particles of about 1 micron or less.

4,927,462

OXIDATION OF CARBON FIBER SURFACES FOR USE AS REINFORCEMENT IN HIGH-TEMPERATURE CEMENTITIOUS MATERIAL SYSTEMS

Toshifumi Sugama, Mastic Beach, N.Y., assignor to Associated Universities, Inc., Washington, D.C.

Filed Dec. 23, 1988, Ser. No. 288,962

Int. Cl.[5] C04B *7/02*

U.S. Cl. 106—99 4 Claims

1. In a Portland cementitious material system suitable for use in geothermal wells which contains a carbon fiber-reinforced cement, an improvement which comprises pre-treating said carbon fiber with a sodium hydroxide solution as an oxidizing agent so that said fiber has an oxidized fiber surface.

4,927,463

AQUEOUS DISPERSION OF GYPSUM AND ITS USE AS A FILLER AND COATING PIGMENT IN THE PRODUCTION OF PAPER AND CARDBOARD

Erhard Kloetzer, Putzbrunn; Johannes Kioustelidis, Ladenburg, and Guenter Schmidt, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to Blochemie Ladenburg GmbH, Ladenburg, Fed. Rep. of Germany

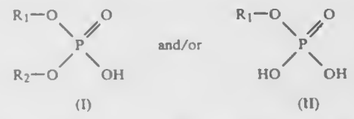
Filed Mar. 30, 1989, Ser. No. 330,815

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811763

Int. Cl.[5] C04B *11/00, 24/00;* C01F *11/46*

U.S. Cl. 106—109 24 Claims

1. An aqueous dispersion comprising gypsum and a surface-active, anionic compound, wherein said surface-active compound is a phosphoric acid ester selected from the group consisting of (1) an acidic phosphoric acid ester of the formula:



(I) (II)

wherein R1 and R2 are the same or different and are alkyl poly(oxyethylene), alkyl poly(oxypropylene), alkylphenoxyalkyl or alkylphenyl polyoxyalkyl radicals, (2) a monophosphoric acid ester of a monoor dihydroxyalkylurea or of an alkoxylated mono- or dihydroxyalkylurea, and (3) a phosphoric acid ester of a poly-alkoxylated amine, in which one or more hydroxyl groups are are be esterified with phosphoric acid.

4,927,464

PARTICULATE MATERIAL

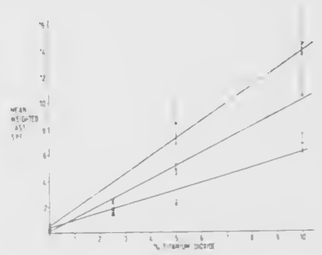
Alan G. Cowie, Stockton on Tees, England, assignor to Tioxide Group PLC, London, United Kingdom

Filed May 23, 1988, Ser. No. 197,169

Claims priority, application United Kingdom, May 30, 1987, 8712752

Int. Cl.[5] C09C *1/36*

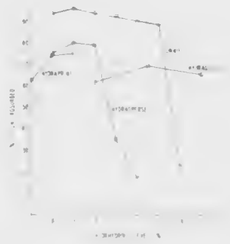
U.S. Cl. 106—436 17 Claims



1. Particulate material comprising non-calcined titanium dioxide the particles of which are acicular in shape and which have a ratio of the longest dimension to the shortest dimension within the range of 8:1 to 2:1 and wherein the largest dimension is within the range 0.01 to 0.15 micron and said particles having a coating comprising an oxide or hydrous oxide of aluminum and an oxide or hydrous oxide of silicon in a weight ratio of Al_2O_3:SiO_2 of at least 1.5 and not greater than 4.5 and said material being substantially transparent to visible light and substantially absorbant to UV light.

VOL 1114 ISS 4 MY 22 1990 UMI

4,927,465
KAOLIN CLAYS FOR PITCH CONTROL
Walter J. Hyder, Lizella; Albert C. Knnkle, and Robert M. Weaver, both of Macon, all of Ga., assignors to J. M. Huber Corporation, Rumson
Filed Oct. 19, 1987, Ser. No. 109,881
Int. Cl.[5] C09C *1/42*
U.S. Cl. 106—486 6 Claims

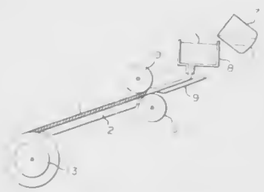


1. Kaolin clay chemically modified to have improved pitch adsorption by reaction with a double bond hydroxide of magnesium and aluminum, said kaolin clay having been beneficiated prior to said chemical modification.

4,927,466
TRANSPARENT, HIGH STRENGTH ORGANIC PIGMENTS AND PROCESS FOR MAKING SAME
Byron G. Hays, Verona, N.J., assignor to BASF Corp., Parsippany, N.J.
Filed Jul. 7, 1989, Ser. No. 376,618
Int. Cl.[5] C08K *5/00*
U.S. Cl. 106—494 22 Claims

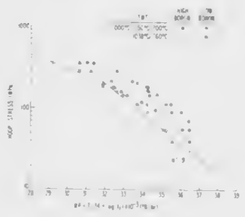
1. A high strength, substantially transparent pigment product, the product comprising at least one pigment selected from the group consisting of disazo pigments and monoazo pigments wherein the pigment particles have a mean ultimate diameter of between about 0.010 micron and about 0.040 micron.

4,927,467
METHOD FOR PRODUCING THIN PLATE OF PHOSPHOR BRONZE
Takaji Kusakawa, 19-9, Saginomiya 1-chome, Nakano-ku, Tokyo; Katsuyoshi Wakamoto, Sagamihara, and Mitsuyuki Imaizumi, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Takaji Kusakawa, both of Tokyo, Japan
Filed Feb. 10, 1988, Ser. No. 154,330
Claims priority, application Japan, Feb. 10, 1987, 62-29225
Int. Cl.[5] C22F *1/08*
U.S. Cl. 148—3 6 Claims



1. A method for continuous manufacture of thin plate ingot of phosphor bronze composed of 0.1 to 9.0% by weight of Sn, 0.03 to 0.35% by weight of P, and the balance being Cu and unavoidable impurities, by quenching molten metal of bronze, which comprises the steps of: quenching said molten metal at a cooling rate in a range of from 10^2 °C./sec. to 10^5°C./sec. to thereby solidify the molten metal; and continuously cooling said solidified metal to a normal temperature to thereby obtain a microstructure having a crystal grain size of 50 μm or below and in which appearance of the dendritic structure and the segregation layer is suppressed.

4,927,468
PROCESS FOR MAKING A MARTENSITIC STEEL ALLOY FUEL CLADDING PRODUCT
Gerald D. Johnson; Ralph J. Lobsinger, both of Kennewick; Margaret L. Hamilton, Richland, and David S. Gelles, West Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Nov. 30, 1988, Ser. No. 278,068
Int. Cl.[5] C21D *9/00*
U.S. Cl. 148—3 1 Claim



1. A process for making a martensitic steel alloy fuel cladding product for liquid metal cooled reactors, said process comprising the steps of:
preparing and alloy consisting essentially of 9.6–11.6 wt.% chromium, 1.4–1.6 wt.% molybdenum, 0.75–0.95 wt.% manganese, 0.15–0.25 wt.% niobium, 0.3–0.45 wt.% silicon, 0.15–0.25 wt.% carbon, 0.15–0.25 wt.% vanadium, 0.05 maximum wt.% nickel, 0.01–0.02 wt.% nitrogen, 0.01–0.02 wt.% sulfur, 0.03–0.07 wt.% copper, 0.004–0.010 wt.% boron, 0.005–0.010 wt.% phosphorous, and the with remainder being essentially iron;
homogenizing said alloy at about 1000° C. for 16 hours;
annealing said homogenized alloy at 1150° C. for 15 minutes; and
tempering said annealed alloy at 700° C. for 2 hours.

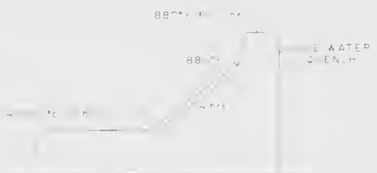
4,927,469
ALLOY TOUGHENING METHOD
Roberto J. Rioja, and Diana K. Denzer, both of Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Continuation of Ser. No. 860,546, May 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 735,567, May 17, 1985, abandoned. This application Apr. 11, 1988, Ser. No. 180,623
Int. Cl.[5] C22F *1/04*
U.S. Cl. 148—11.5 A 50 Claims

1. A method of treating a metallurgical object containing metastable, crystalline, featureless regions adversely affecting toughness, comprising heating the object for transforming the regions at least sufficiently out of their metastable state to stabilize them and make them deformable, and deforming the



object following the heating to improve toughness as compared to that achieved without the heating.

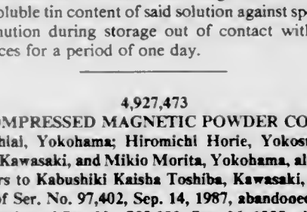
4,927,470
THIN GAUGE ALUMINUM PLATE PRODUCT BY ISOTHERMAL TREATMENT AND RAMP ANNEAL
Alex Cho, Richmond, Va., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Oct. 12, 1988, Ser. No. 256,840
Int. Cl.[5] C22F *1/04*
U.S. Cl. 148—12.7 A 60 Claims



1. A method of producing an unrecrystallized aluminum base, wrought alloy product having improved levels of strength and fracture toughness, the method comprising the steps of:
(a) providing a body of an aluminum base heat treatable alloy;
(b) working the body to a wrought product;
(c) subjecting said product to a soak;
(d) then subjecting said product to a ramp anneal wherein the annealing temperature is increased during time of anneal; and
(e) solution heat treating, quenching and aging said product to provide a substantially unrecrystallized wrought product having improved levels of strength and fracture toughness.

4,927,471
SEMICONDUCTOR SUBSTRATE COMPRISING WAFER SUBSTRATE AND COMPOUND SEMICONDUCTOR LAYER
Hiroshi Okuda, Atsugi, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Filed Feb. 28, 1989, Ser. No. 316,633
Claims priority, application Japan, Mar. 1, 1988, 63-45820
Int. Cl.[5] H01L *21/20*
U.S. Cl. 148—33.5 9 Claims

1. A semiconductor substrate including a top epitaxial semiconductor layer comprising:
a single-crystalline semiconductor wafer substrate;
a strained layer superlattice structure layer having a lattice constant varying from that of said wafer substrate to that of said top semiconductor layer and formed on said wafer substrate;
a compound semiconductor buffer layer having the same lattice constant as that of said top semiconductor layer and formed on said strained layer superlattice structure layer;
another strained layer superlattice structure layer for filtering dislocations having a fixed lattice constant equal to



that of said top semiconductor layer and formed on said buffer layer; and
the top semiconductor layer formed on said another strained layer superlattice structure layer.

4,927,472
CONVERSION COATING SOLUTION FOR TREATING METAL SURFACES
Yasunobu Matsushima; Shigeo Tanaka; Tomoyuki Aoki, all of Kanagawa, and Yohji Ono, Tokyo, all of Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan
Filed Oct. 13, 1988, Ser. No. 256,935
Claims priority, application Japan, Oct. 13, 1987, 62-257678
Int. Cl.[5] C23C *22/14, 22/23*
U.S. Cl. 148—261 12 Claims

1. An aqueous solution for depositing a coating consisting predominantly of tin phosphate on an active metal surface in contact with said solution, comprising:
(a) from about 1 to about 50 grams per liter of orthophosphate ions;
(b) from about 0.2 to about 20 grams per liter of chlorate and bromate ions combined;
(c) a pH of about 2 to about 6;
(d) a total concentration of simple and chelated tin cations, measured stoichiometrically as tin only, of from about 0.01 to about 5.0 grams per liter; and
(e) a concentration of condensed total phosphoric acid and ions derived therefrom, emasured stoichiometrically as maximally neutralized ions, of from about 0.01 to about 5 grams per liter, said condensed phosphoric acid having the general formula $H_{(n+2)}P_nO_{(3n+1)}$, wherein n=2, 3, or 4, said concentration of condensed total phosphoric acid and anions derived therefrom being effective to stabilize the soluble tin content of said solution against spontaneous diminution during storage out of contact with reactive surfaces for a period of one day.

4,927,473
COMPRESSED MAGNETIC POWDER CORE
Kumi Ochiai, Yokohama; Hiromichi Horie, Yokosuka; Itsuo Arima, Kawasaki, and Mikio Morita, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 97,402, Sep. 14, 1987, abandoned, which is a continuation of Ser. No. 780,303, Sep. 26, 1985, abandoned. This application Oct. 20, 1988, Ser. No. 260,314
Claims priority, application Japan, Sep. 29, 1984, 59-204870; Dec. 27, 1984, 59-274096
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—306 7 Claims

1. A compressed magnetic powder core comprising a compressed body of an iron-based metallic magnetic powder each particle surface of which has been covered with an insulating layer comprising an insulating material selected from the

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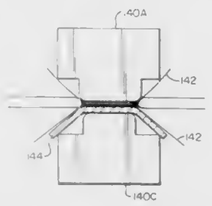
group consisting of a first inorganic compound powder having an electronegativity of not less than 12.5 selected from the group consisting of thallium oxide, bismuth oxide, manganese dioxide, boron trioxide, arsenic oxide, germanium oxide, tin oxide, tantalum oxide, niobium oxide, vanadium oxide, titanium dioxide, zirconium dioxide, molybdenum, oxide, silicon nitride, titanium nitride, boron nitride, silicon carbide, titanium carbide and a mixture thereof, and a second inorganic compound powder having an electronegativity of less than 8.5 selected from the group consisting of magnesium oxide, yttrium oxide, europium oxide, neodymium oxide, thulium oxide, dysprosium oxide, lanthanum oxide, cobalt oxide, nickel oxide and a mixture thereof, each particle of said first and second inorganic compound powder having a size not exceeding 5 μm, and wherein the magnetic powder has an average particle size of not less than 10 μm and not more than 300 μm.



4,927,474
PROCESS AND APPARATUS FOR SEALING THERMOPLASTIC PLIES IN LAMINATED SHEETS HAVING THICKENED SECTIONS

James C. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 11, 1988, Ser. No. 230,940
Int. Cl.[5] B32B *31/20*
U.S. Cl. 156—66 10 Claims

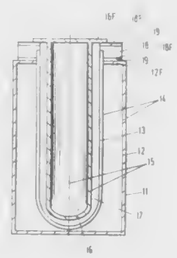


1. A process for sealing plies of thermoplastic material included in laminated sheets having thickened sections resulting from the presence of zipper closures, said process comprising the steps of:
(a) performing a first blocking operation on said laminated sheets by the application of heat and pressure through a pair of seal bars configured to maintain said laminated sheets substantially planar during said first blocking operation, said bars engaging areas of said sheets to be sealed including zipper closure portions thereof to preliminarily seal said zipper closure portions and preblock the remainder of said areas;
(b) performing a second blocking operation over the previously blocked areas of said laminated sheets by the application of heat and a soft pressure through a pair of seal bars configured to maintain said laminated sheets substantially planar during said second blocking operation to seal the remainder of said areas and secondarily seal said zipper closure portions; and
(c) performing a final cooling blocking operation over the previously blocked areas of said laminated sheets by the pressure application of a pair of cooling bars configured to maintain said laminated sheets substantially planar during said cooling blocking operation.

4,927,475
PROCESS FOR JOINING METALLIC AND CERAMIC MATERIALS

Günther Steinleitner, Schriesheim, and Philipp Roze, Wiesloch-Baiertal, both of Fed. Rep. of Germany, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 265,147
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736843
Int. Cl.[5] B32B *18/00*
U.S. Cl. 156—89 2 Claims



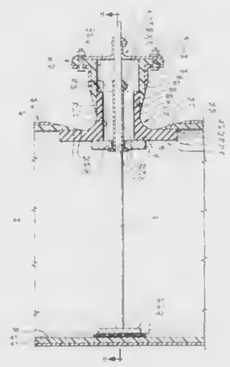
1. A process for joining ceramic to metallic materials which comprises the steps of coating a portion of the ceramic material at the area of the joining surface with a glass coating, juxtaposing the coating portion with the joining area portion of the metallic material to be joined, then consolidating the juxtaposed areas into a joint by the application of a combined pressure and heat treatment:
wherein said glass coating for said ceramic material is selected from the group of glasses having coefficients of thermal expansion with the range of ±10% of the thermal expansion coefficients of said ceramic substrate material and said glass having a transformation point below the heat treatment temperature, said glass for said coating being selected from the group consisting of glasses containing 5 to 20 wt. % of sodium oxide, 30–60 wt. % of boron oxide and 20 to 60 wt. % of silica; said coating being applied to said ceramic substrate at the joining area to a thickness of from 1 to 10 μm; and said temperature and pressure heat-treatment conditions for said ceramic to said metal consolidation are temperatures of at least $0.8 \cdot T_m$ and a pressure of at least 10 Mpa, wherein T_m is the melting point in ° K. of the glass juxtaposed between said ceramic and metallic materials; said heat treatment time being sufficient for consolidation at said joining surfaces of said ceramic and metallic materials by said interposed glass.

4,927,476
METHOD FOR MAKING A REINFORCED THERMOSETTING RESIN STRUCTURE WITH INTEGRAL FLANGED NOZZLE

Richard L. T. Watkins, 1117 E. Beachview Pl., Bellingham, Wash. 98226

Filed Jun. 27, 1988, Ser. No. 212,349
Int. Cl.[5] B32B *31/02*
U.S. Cl. 156—173 80 Claims

1. A method for producing an article of manufacture, comprising the steps of:
(a) providing a primary structure comprising a primary structure wall with an interior surface and an exterior surface, and having a through branch opening defined by a wall edge portion,
(b) providing a branch pipe section having an end edge portion,
(c) providing a mold member comprising
(i) a branch locating portion adapted to be positioned inside said branch pipe section so as to position said branch pipe section,
(ii) a flange portion having a locating surface adapted to engage an interior edge surface portion of the interior surface of said primary structure adjacent to said opening;
(iii) a transition portion interconnecting said branch locating portion and said flange portion, said transition portion having an outer forming surface portion,
(d) locating said mold member in an operating position where
(i) said branch locating portion extends outwardly from said through opening, and
(ii) said flange portion fits against said interior edge surface portion,



(e) positioning said branch pipe section around said branch locating portion so as to position said branch pipe section relative to said primary structure,
(f) said transition portion being configured so that with the mold member in said operating position, said outer forming surface is tangentially aligned with an inner edge surface portion of the branch pipe section adjacent to the end edge portion thereof and also tangentially aligned with the interior edge surface portion of said primary structure,
(g) applying a quantity of resin material to said outer forming surface of said mold to form an interconnecting pipe section joining said primary structure and said branch section and providing a transition surface portion blending into the interior edge surface portion of said primary structure and the inner edge surface portion of the branch pipe section, so as to form a finished article,
(h) disengaging said mold member from said interior edge surface portion of said primary structure, and removing said mold member from the finished article.

4,927,477
METHOD FOR MAKING A FLUSH SURFACE LAMINATE FOR A MULTILAYER CIRCUIT BOARD

Theron L. Ellis, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 769,524, Aug. 26, 1985, abandoned.
This application Apr. 15, 1988, Ser. No. 183,462
Int. Cl.[5] B32B *31/26, 31/00*; C09J *5/10*
U.S. Cl. 156—182 5 Claims

1. A method for making a multilayer circuit board having flush surface laminates with completely flush surfaces, comprising the steps of:
sandwiching a sheet of dielectric material between two sheets of conductive material, each sheet of conductive material having at least one opening extending therethrough between a first surface of the conductive sheet in contact with the dielectric material and a second surface of the conductive sheet forming an outside surface of the sandwich; said dielectric material consisting essentially of an epoxy resin where the thickness of said dielectric material is selected such that a desired spacing is provided between the two sheets of conductive material to produce a characteristic impedance of about 50 ohms;
placing release sheets on the outside surfaces of the sandwich of dielectric and conductive materials;
positioning the sandwich of dielectric and conductive materials with the release sheets on the outside surface between a top plate and a bottom plate which may be used to press the sandwich together while maintaining the sheets of dielectric and conductive material in registration with each other by the use of said openings; and
pressing the sandwich together between the top and the bottom plates at a temperature and pressure sufficient for the dielectric material to flow into the openings in the sheets of conductive material and form a first completely flush surface laminate with the sheets of conductive material;
forming a second completely flush surface laminate in the same manner as the first flush surface laminate;
placing only a layer of dielectric material between the first and the second flush surface laminates; and,
pressing the first and second flush surface laminates together at a temperature and pressure sufficient to form a multilayer laminate;
said multilayer laminate having a characteristic impedance of about 50 ohms between said first and second flush surface laminates.

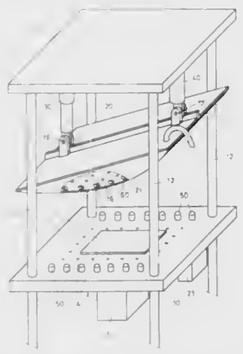
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4,927,478
METHOD AND APPARATUS FOR FLETCHING ARROWS
Duane Ericksoo, 3170 S. 10th East, Salt Lake City, Utah 84106
Filed May 15, 1989, Ser. No. 352,027
Int. Cl.[5] B65H *81/00*; B32B *31/00*
U.S. Cl. 156—185 8 Claims



1. A method of fletching arrows comprising the steps of applying elongate fletching guides to be equally spaced around one end of an arrow shaft; and making a fletching extend from each elongate fletching guide.

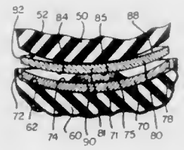
4,927,479
PROCESS AND PLANT FOR PRESSING FLEXIBLE SHEETS
Josef Böck, Steigrüebli, CH-9400 Rorschacherberg, Switzerland
Continuation of Ser. No. 758,629, Jul. 2, 1985, abandoned. This application Feb. 28, 1989, Ser. No. 318,413
Claims priority, application Switzerland, Nov. 2, 1983, 5926/83
Int. Cl.[5] B29D *9/00*; H01H *11/00*; B32B *31/04*
U.S. Cl. 156—228 10 Claims



1. A process for pressure-bonding flexible foils to form a multi-layer composite, comprising:
detachably fastening a first foil layer to a first surface along one side thereof using vacuum pressure;
transferring the first foil layer from the first surface to a second opposed cooperating curved surface including vacuum pressure means using a rolling motion of the second surface over the first surface by reducing the vacuum pressure fastening the first foil layer to the first surface and increasing the vacuum pressure of the second surface simultaneously so that the first foil is detached from the first surface and becomes detachably fastened to the second surface, the first and second surfaces including guide means for cooperating with each other;
detachably fastening a second foil layer to the first surface along one side thereof using vacuum pressure in the same position as the first foil;
rolling the second surface and first foil attached thereto across the first surface while applying uniform contact pressure between the first and second foil layers and engaging the guide means so that a multi-layer composite of the first and second foil layers is formed and simultaneously releasing the second foil layer from the first surface to attach the composite of the first and second foil layers to the second surface; and
removing the composite from the second surface.

5. A device for pressure-bonding flexible foil layers to form flexible composite sheets, comprising:
a frame;
a first vacuum plate having a substantially planar surface for releaseably holding a flexible foil layer on the planar surface mounted on the frame;
a second opposed cooperating vacuum plate having a lower convex surface opposed to the first vacuum plate for releasably holding a flexible foil on the convex surface and being movably mounted on the frame opposite the first plate so that the lower convex surface is rollable across the planar surface of the first plate and applies uniform pressure to the foil layers therebetween;
the first vacuum plate and second vacuum plate cooperating so that the vacuum pressure can be reduced at the same time the vacuum pressure is increased in the second surface when contact pressure between the plates is applied: and
motion control means for imparting a rolling motion of the second plate across the first plate and maintaining uniform contact pressure between the plates and against the foil layers therebetween whereby encapsulation of aid between the foil layers is prevented.

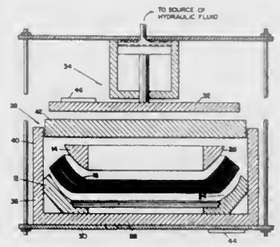
4,927,480
METHOD AND CLAMPING DEVICE FOR BONDING THIN LENS WAFERS
Thomas L. Vaughan, La Jolla, Calif., assignor to Signet Armorlite, Inc., San Marcos, Calif.
Filed Feb. 27, 1989, Ser. No. 315,548
Int. Cl.[5] B29C *65/48*; B32B *1/00*
U.S. Cl. 156—228 17 Claims



1. A clamping device for squeezing a quantity of bonding material between a first bonding surface of a first lens wafer and a second bonding surface of a second lens wafer, said first lens wafer comprising a convex outer surface and said second lens wafer comprising a concave outer surface, said clamping device comprising:
a deformable, resilient mold;
said mold comprising a concave surface that is slightly more planar than said convex outer surface of said first lens wafer;
a deformable, resilient stamp disposed opposite said mold;
said stamp comprising a convex surface that is slightly more curved than said concave outer surface of said second lens wafer; and
piston means for simultaneously exerting pressure on said convex and concave outer surfaces of said lens wafers through said concave surface of said mold and said convex surface of said stamp, respectively, thereby squeezing said quantity of bonding material between said bonding surfaces of said lens wafers.

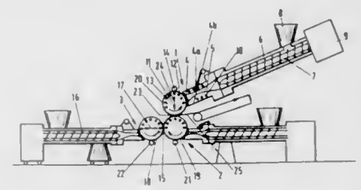
11. A method for bonding a first lens wafer comprising both a first bonding surface and a convex outer surface to a second lens wafer comprising both a second bonding surface and a concave outer surface, said method comprising the steps of:
applying a quantity of bonding material to a center portion of one of said bonding surfaces;
placing the other of said bonding surfaces in contact with said quantity of bonding material;
providing a deformable, resilient mold comprising a concave surface that is slightly more planar than said convex outer surface of said first lens wafer;
providing a deformable, resilient stamp disposed opposite said mold and comprising a convex surface that is slightly more curved than said concave outer surface of said second lens wafer; and
simultaneously exerting pressure on said convex and concave outer surfaces of said lens wafers through said concave surface of said mold and said convex surface of said stamp, respectively, thereby squeezing said quantity of bonding material between said bonding surfaces of said lens wafers.

4,927,481
METHOD OF MAKING CONTINUOUS REINFORCEMENT FOR FLEXIBLE BEARING LAMINATE
James D. McGregor, Logan, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.
Division of Ser. No. 183,568, Apr. 14, 1988. This application Feb. 3, 1989, Ser. No. 306,966
Int. Cl.[5] B29C *43/20*
U.S. Cl. 156—245 15 Claims



1. The method of making a flexible bearing that is fabricated of first and second rigid end rings having opposing laminate engaging surfaces with a flexible laminate therebetween consisting of alternate layers of elastomeric material and reinforcement fabric material, impregnated with a resin comprising the steps of:
(a) preparing said reinforcement material in the form of a continuous helical arrangement;
(b) placing said first end ring in the bottom of a mold with the laminate engaging surface thereof facing upwards;
(c) placing said continuous helical arrangement of reinforcement material on the laminate engaging surface of the first end ring, coaxially therewith, with layers of elastomeric material alternating with layers of reinforcement material, to form the laminate;
(d) placing said second end ring in the mold with the laminate engaging surface thereof in engagement with the laminate, coaxially therewith, and with said first ring; and
(e) debulking and curing the assembly.

4,927,482
METHOD AND APPARATUS FOR PRODUCING TREAD STRIPS FOR AUTOMOTIVE VEHICLE TIRES
Gerd Capelle, Langenhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany
Filed Nov. 4, 1988, Ser. No. 267,346
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737676
Int. Cl.[5] B29C *47/06*
U.S. Cl. 156—243 9 Claims



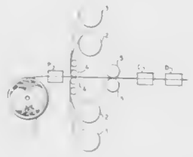
1. A method of producing profile strips for tread strips, lateral strips, and inner liners, of automotive vehicle tires from a plurality of different rubber components, comprising the steps of:
(a) extruding each of at least two components individually in at least two separate extrusion devices;
(b) passing each said extruded component through a separate extrusion head each associated with one of said at least two extrusion devices to produce a strip of said extruded component;
(c) discharging each said strip through separate nozzle means at the outlet of each of said extrusion heads, each said nozzle means comprising a stationary lip and a movable lip comprising a single rotatable roller around which strip passes;
(d) edge-trimming both lateral edges of each of said strips while said strip is disposed on said associated roller;
(e) disposing said rollers in a roller assembly such that said roller associated with each of said at least two extrusion devices lies closely adjacent the roller associated with another of said at least two extrusion devices to define at least one roller nip therebetween; and
(f) laminating together said individual edge-trimmed strips by passing said strips through said at least one roller nip.

4,927,483
METHOD OF MANUFACTURING A NAIL FILE
David Bray, 2198 Corsair Road, Mississauga, Ontario, Canada (L5A 2L8)
Division of Ser. No. 918,511, Oct. 14, 1986, Pat. No. 4,785,835. This application Nov. 17, 1988, Ser. No. 272,713
Claims priority, application Canada, Nov. 8, 1985, 494963
Int. Cl.[5] B32B *31/14*
U.S. Cl. 156—306.6 9 Claims

1. A method of manufacturing a nail polisher and file comprising the steps of:
(a) providing a stiff sheet or strip of a base material;
(b) providing at least one source of abrasive substrate, adjacent said base material (a);
(c) providing at least one source of heat activated adhesive film adjacent said substrate and said base material,

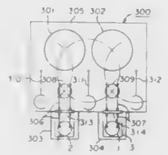
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whereby said heat activated adhesive film can be drawn with said substrate into contact with said base material, between said base and said substrate;
(d) drawing said substrate and said film into contact with



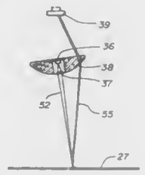
said base as aforesaid, and applying heat, between 300° F. and 500° F., and pressure, to said base, film and substrate, to laminate said substrate to said base, and thereby form a laminate; and
(e) cutting said laminate into nail files.

4,927,484
REACTIVE ION ETCHING APPARTUS
Yoshimichi Mitomi, Wadasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 84,193, Aug. 12, 1987, abandoned. This application Oct. 18, 1988, Ser. No. 259,395
Claims priority, application Japan, Sep. 3, 1986, 61-205854
Int. Cl.[5] H01L *21/02*
U.S. Cl. 156—345 5 Claims



1. A reaction ion etching apparatus comprising a buffer room which contains:
a first reactive chamber,
a second reactive chamber placed adjoining said first reactive chamber in a first direction,
a first stage member disposed adjoining said first reactive chamber in a second direction perpendicular to said first direction,
a second stage member disposed adjoining said second reactive chamber in said second direction,
the centers of said first and second reactive chambers and said first and second stage members are respectively at corners of a square;
a first transfer arm positioned and arranged for transferring a wafer from said first stage member to said first reactive chamber,
a second transfer arm positioned and arranged for transferring said wafer among said first and second reactive chambers and said first and second stage members, said second transfer arm having a pivot point at the center of said square so as to be turnable through 360°, and
a third transfer arm positioned and arranged for transferring said wafer from said second reactive chamber to said second stage member;
said first, second and third transfer arm each positioned and arranged for transferring wafers along a path defined by the length of their respective arms wherein all three arms may be moved simultaneously by moving said first transfer arm and said third transfer arm in one of two directions, clockwise or counterclockwise, while moving said second transfer arm in the other of said two directions.

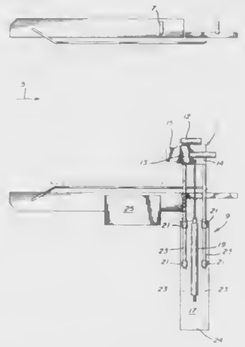
4,927,485
LASER INTERFEROMETER SYSTEM FOR MONITORING AND CONTROLLING IC PROCESSING
David Cheng, San Jose; Robert P. Hartlage, Santa Clara, and Wesley W. Zhang, Burlingame, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.
Filed Jul. 28, 1988, Ser. No. 225,158
Int. Cl.[5] G01B *11/06;* H01L *21/306*
U.S. Cl. 156—345 4 Claims



1. A laser interferometer system for monitoring the etching of a workpiece, compriising: a laser for providing laser light; and for positioning a workpiece such that laser light from said laser is reflected off of said workpiece; detecting means for detecting laser light reflected from a surface of the workpiece; means for analyzing the detected light to monitor at least one of etch rate, etch depth and etch-through of a selected layer of the workpiece; and, a collector lens mounting the laser within said collector lens; means for mounting said collected lens in said interferometer system, such that said collector lens is pivotally movable relative to said workpiece surface to focus selected diffraction orders of light reflected from said workpiece surface into said detecting means.

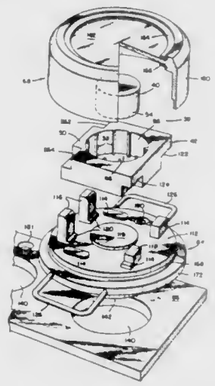
4,927,486
SYSTEM FOR APPLYING LABELS TO PALLETS MOVABLE ALONG A CONVEYOR LINE
R. George Fattal, Pierrefonds, and Gordon Ringrose, Pointe-Claire, both of Canada, assignors to Twinpak Inc., Dorval, Canada
Filed May 24, 1989, Ser. No. 356,938
Int. Cl.[5] B32B *31/00;* G05G *15/00;* B65C *9/40*
U.S. Cl. 156—351 9 Claims

1. A system for applying labels to pallets movable along a conveyor line, said conveyor line including a label applying station;
said system comprising:
sensor means for sensing the presence of a pallet at said label applying station;
label printing/dispensing means;
robot arm means mounting thereon label receiving/applying means and label reading means, and including moving means for moving said robot arm means between a first position adjacent said label printing/dispensing means for receiving a label from said label printing/dispensing means, a second position adjacent said label applying station for applying a label to said pallet, and a third position for reading said applied label; and
processor means, said processor means receiving inputs from said sensor means, said label printing/dispensing means, and said label reading means, and providing controlling signals to said robot arm means, said label printing/dispensing means and said label reading means;
whereby, when said processor receives a signal from said sensor means indicating the presence of a pallet to be labelled at said label applying station, said processor controls:
(a) said printing/dispensing means to print a label in accordance with predetermined information;
(b) said robot arm to move to said first position to receive said printed label from said printing/dispensing means;



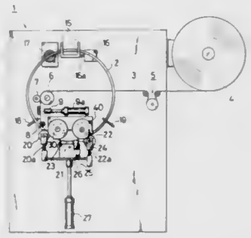
(c) said printing/dispensing means to dispense said printed label to said robot arm;
(d) said robot arm to move to said second position to apply said printed label to said pallet to be labelled; and
(e) said robot arm to move to said third position to read said applied printed label.

4,927,487
APPARATUS FOR PRODUCING AN ATMOSPHERE OTHER THAN AMBIENT
William A. Gelinas, Hadley, Mass.; Edwin R. Holtz, Enfield; Dennis J. Argazzi, Deep River, both of Conn.; Robert L. Smigel, Higganum, and Dan W. Wiley, Bristol, both of Conn., assignors to Loctite Corporation, Newington, Conn.
Division of Ser. No. 21,445, Mar. 4, 1987, Pat. No. 4,804,435, which is a division of Ser. No. 745,656, Jun. 17, 1985, Pat. No. 4,661,190. This application Nov. 30, 1988, Ser. No. 278,252
Int. Cl.[5] B32B *31/28*
U.S. Cl. 156—351 21 Claims



1. Apparatus for producing an atmosphere other than an ambient atmosphere comprising:
container means including:
a base member having inner and outer surfaces, an opening extending between said inner and outer surfaces, and a slitted diaphragm in said opening normally sealing against flow of gases between said inner and outer surfaces; and
a dome member removably sealingly supported on said base member, said base member and said dome member together defining an isolated region;
a source of a gaseous stream to be introduced into said container means taken from at least one of
(a) individual gases
(b) mixture of gases
(c) compounds of gases; and
a needle injector connected to said source movable between a retracted position distant from said diaphragm and an advanced position extending through said diaphragm to deliver the gaseous stream to the isolated region and to force out the ambient air through said diaphragm.

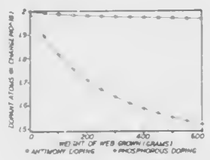
4,927,488
APPARATUS FOR COVERING A TIRE BEAD WITH A TAPE
Norio Abe, and Osamu Fukaura, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jun. 20, 1988, Ser. No. 208,538
Claims priority, application Japan, Jun. 18, 1987, 62-150158
Int. Cl.[5] B29D *29/06, 30/48, 30/32*
U.S. Cl. 156—460 9 Claims



1. An apparatus for covering a tire bead with a tape comprising:
drive rollers held in contact with an inner circumferential surface of a rotably supported annular tire bead to rotate the tire bead;
tape feed means for sticking a tape onto the inner circumferential surface of said rotating bead while feeding the tape;
flange members fitted around said drive rollers so as to be slidable in their axial direction for cooperating with flange portions provided on said drive rollers so that they may pinch said bead jointly with said fed tape from the opposite sides to stick the tape onto the side surfaces of the bead;
biasing means for biasing said flange members so as to reduce the intervals between said flange portions and flange members;
a movable plate having circular notches somewhat larger in diameter than said rollers, disposed as directed in a transverse direction straddling said drive rollers from the above, and movable in the axial direction to expand the intervals between said flange portions and said flange members against said biasing means; and
tape fold-back means for folding back edge portions of the tape onto the outer circumferential surface of said bead.

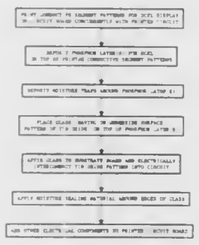
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4,927,489
METHOD FOR DOPING A MELT
Robert B. Campbell, Ben Avon Borough; Edgar L. Kochka, Greentree, and Paul A. Piotrowski, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 2, 1988, Ser. No. 201,228
Int. Cl.[5] H01L *21/208*
U.S. Cl. 156—620.1 2 Claims



1. A method for growing a silicon dewndritic web crystal exhibiting an n-type resistivity, said crystal exhibiting a uniform resistivity over the length of said crystal, said method comprising:
a. placing a silicon charge in a crucible;
b. melting said silicon;
c. placing a quantity of antimony dopant in said charge, allowing said antimony to melt and diffuse into said silicon, thereby producing an antimony-doped silicon melt;
d. growing a silicon dendritic web crystal from said antimony-doped silicon melt;
f. replenishing said silicon melt with sufficient silicon to maintain a substantially constant silicon melt level as said crystal is pulled from said melt, said silicon replenishing being done without adding additional dopant to said melt;
g. continuing to grow said crystal up to a crystal weight of at least 600 grams.

4,927,490
METHOD OF MANUFACTURING AN ELECTROLUMINESCENT DISPLAY
Eugene P. Mierzwinski, Fort Wayne, Ind., assignor to Hamilton Standard Controls, Inc., Farmington, Conn.
Division of Ser. No. 197,194, May 23, 1988, Pat. No. 4,839,558. This application Mar. 24, 1989, Ser. No. 328,382
Int. Cl.[5] B44C *1/22;* C23F *1/02;* C03C *15/00, 25/06*
U.S. Cl. 156—634 4 Claims



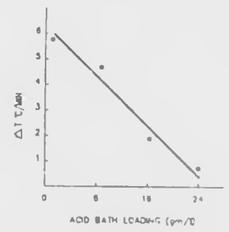
1. A method of manufacturing an electroluminescent display (DCEL), having phosphor layers and conductive segment patterns, to be used in conjunction with an electronic assembly substrate carrying various other electrical circuit components electrically connected together by means of a printed circuit made from a conductive layer, with which the DCEL is to be electrically used, comprising the following steps:
(a) defining and making the segment patterns for the DCEL display on the conductive layer concurrently with at least some of the conductive layer pattern that is used for interconnecting the other electrical components;
(b) deposing the phosphor layer(s) for the DCEL on top of the conductive segment patterns;
(c) placing a glass element, which has on its inner surface a pattern of tin oxide, over the phosphor depositions; and
(d) affixing the glass element with respect to said substrate and electrically interconnecting the pattern of tin oxide into the circuit; the DCEL becoming an integral part of the electronic assembly substrate, with the substrate becoming an integral part of the DCEL.

4,927,491
METHOD OF BONDING IC UNIT
Hisashi Masaki, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed May 4, 1989, Ser. No. 347,391
Claims priority, application Japan, May 16, 1988, 63-117004
Int. Cl.[5] B44C *1/22;* C23F *1/02;* C03C *15/00, 25/06*
U.S. Cl. 156—630 5 Claims



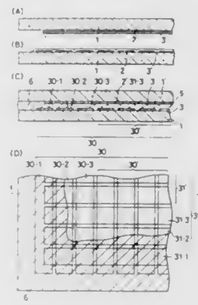
1. A method of bonding an IC unit, comprising:
a device hole forming step of forming a number of IC device holes in a carrier tape;
an adding step of adding a first metal foil on at least one surface of said carrier tape;
a lead forming step of etching said first metal foil to form a plurality of finger leads each having an end projecting into a corresponding IC device hole, and connection leads for connecting some finger leads to some finger leads each projecting at one end thereof into an adjacent IC device hole;
an inner lead bonding step of arranging an IC device in each IC device hole, and bonding the ends of said finger leads to electrodes of said IC devices;
a cutting step of cutting said carrier tape for forming an IC unit having a single support tape and a plurality of the IC devices which are mounted on said single support tape through said finger leads; and
an outer lead bonding step of arranging said IC units on a substrate having connection terminals, and bonding said finger leads to said connection terminals formed on said substrate.

4,927,492
ETCHING PROCESS FOR ZIRCONIUM METALLIC OBJECTS
Armand J. Panson, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 91,225, Aug. 31, 1987, abandoned. This application May 10, 1989, Ser. No. 352,673
Int. Cl.[5] C23F *1/00*
U.S. Cl. 156—642 8 Claims



1. In a process for etching of zirconium metallic articles formed from zirconium or a zirconium alloy, wherein said zirconium metallic articles are contacted with a bath of aqueous hydrofluoric acid-nitric acid etching solution in a tank and zirconium dissolves into the bath, and the etching rate of the bath decreases as the zirconium content of the bath increases, and wherein, depending upon the zirconium content of the bath, the bath may then be (I) replenished with acid and further utilized to etch additional zirconium metallic articles, (2) further utilized to etch additional zirconium metallic articles without being replenished with acid, or (3) discarded from the tank, the improvement comprising the steps of:
(a) providing a predetermined volume of a bath of an aqueous hydrofluoric acid-nitric acid etching solution having a known dissolved zirconium content;
(b) immersing an object having a known quantity of a zirconium metal and having a known surface area into said predetermined bath volume;
(c) determining the rate of the rise in temperature of said predetermined volume of said bath over a known period of time upon immersion of said zirconium metal object which rate of rise depends upon the dissolved zirconium content of said bath;
(d) repeating steps (a), (b) and (c) with at least one other known dissolved zirconium content to develop a correlation between the rate of temperature rise in a known time period and the dissolved zirconium content of the bath;
(e) etching zirconium metal articles in the bath of said tank;
(f) providing a portion of said bath of step (e) after etching said zirconium metal articles, said portion having a predetermined volume;
(g) immersing an object having a known quantity of a zirconium metal, and having a known surface area into said portion of said bath having a predetermined volume;
(h) measuring the rate of rise in temperature of said bath portion due to dissolution of said zirconium metal object therein over a predetermined period of time; and
(i) determining the dissolved zirconium metal content of said bath of step (e) by comparing said measured rate of rise of temperature of said bath portion of step (f) with said previously developed correlation.

4,927,493
METHOD FOR MANUFACTURING LIQUID CRYSTAL DEVICE HAVING ELECTRODE STRIPS OF NO USE
Shunpei Yamazaki, Tokyo; Akira Mase, Atsugi, and Hiroyuki Sakayori, Machida, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan
Continuation of Ser. No. 82,544, Aug. 7, 1987, Pat. No. 4,854,675. This application Jul. 21, 1988, Ser. No. 222,635
Claims priority, application Japan, Aug. 7, 1987, 61-186201
Int. Cl.[5] B44C *1/22;* B23K *26/00*
U.S. Cl. 156—643 6 Claims



1. A method of manufacturing a liquid crystal device comprising the steps of:
coating a first substrate with a conductive film;
scribing said conductive film with an eximer laser to form on the surface of said first substrate a plurality of first electrode strips elongated along an X direction;
coating a second substrate with a conductive film;
scribing the conductive film on the second substrate with an eximer laser to form a plurality of second electrode strips elongated along a Y direction; and
joining said first and second substrates with the first and second electrode strips facing each other with a liquid crystal layer in between where the perimeter of the substrates is sealed.

4,927,494
APPARATUS FOR PREPARING HIGH-CONCENTRATION ALKALI
Robert Winkler, Wallisellen, Switzerland; Siro Sala, Como, Italy; Takayuki Kobayashi, and Shinjiro Yokota, both of Ube, Japan, assignors to Sulzer-Escher Wyss AG, Zürich, Switzerland
Division of Ser. No. 879,105, May 27, 1986, Pat. No. 4,830,707. This application Jun. 2, 1988, Ser. No. 209,335
Claims priority, application European Pat. Off., Apr. 18, 1985, PCT/EP85/00175
Int. Cl.[5] B01D *1/00, 3/00*
U.S. Cl. 159—2.1 2 Claims

1. An apparatus for producing high-concentration caustic alkali by concentrating a caustic alkali solution by evaporation at an elevated temperature, comprising:
a high pressure evaporation vessel operated at elevated temperature and under a predeterminate pressure above atmospheric pressure;
a low pressure expansion vessel operating under a predeterminate pressure lower than said operating pressure of said high pressure evaporation vessel;
pressure difference absorbing means having a predeterminate length and connecting said high pressure evaporation vessel and said low pressure expansion vessel to each other for gradually absorbing over said predeterminate length a pressure difference between the predeterminate pressure above atmospheric pressure in said high pressure

VOL 1114 ISS 4 MY 22 1990 UMI

evaporation vessel and the predeterminate pressure prevailing in said low pressure expansion vessel;

said pressure difference absorbing means is a liquid column having a predeterminate vertical extension defining said predeterminate length of said pressure difference absorbing means and generating a hydrostatic pressure substantially corresponding to said pressure difference between said predeterminate pressure above atmospheric pressure in said high pressure evaporation vessel and said predeterminate pressure prevailing in said low pressure expansion vessel;



said liquid column being part of a substantially U-shaped siphon tube connected between said high pressure evaporation vessel and said low pressure expansion vessel;

an intermediate vessel disposed in a lower region of said liquid column;

a rise-pipe connecting an upper end of said intermediate vessel to a lower end of said low pressure expansion vessel; and

a recirculation pipe connecting a lower end of said intermediate vessel to said lower end of said low pressure expansion vessel.

4,927,495

SUPPORT FOR PHOTOGRAPHIC PRINTING PAPER

Shigehisa Tamagawa, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 29, 1988, Ser. No. 237,369

Claims priority, application Japan, Aug. 29, 1987, 62-21601

Int. Cl.[5] D23E *3/04*; B41C *1/10*

U.S. Cl. 162—135 **8 Claims**

1. A process for producing a support for a photographic printing paper, comprising; contacting a wet paper having a front and a back surface and having a water content of between 50 and 80 wt% against the mirror surface of a mirror surface type drier which mirror surface is maintained in the range of 100° C. to 200° C., to obtain a base paper having a Beck smoothness of at least 300 seconds at the front surface of the base paper, further subjecting the paper to treatment as necessary to impart a Beck smoothness of at least 100 seconds to the back surface of the base paper, and coating both the front and back surface of the base paper with a 15 to 50 μm polyolefin layer

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4,927,496

SIZING PULP

Stephen A. Walkden, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 25, 1988, Ser. No. 198,522

Claims priority, application United Kingdom, May 26, 1987, 8712349

Int. Cl.[5] D21H *3/02*

U.S. Cl. 162—136 **18 Claims**

1. The process of using an aqueous emulsion of from about 0.01 to about 0.6 percent, based on the dry weight of the pulp, of ketene dimer size, from about 0.4 to about 4 percent, based on the dry weight of the pulp, of cationic rosin size and insolubilizing agent, for increasing the resistance of the cut edges of liquid packaging board to penetration by hot hydrogen peroxide, said process comprising adding both sizes and the insolubilizing agent either separately or in preblended form to the aqueous pulp slurry at a pH of at least about 7.0.

4,927,497

METHOD OF PREVENTING CELLULOSIC WEB DEGRADATION USING AN AMINE VAPOR

Hillary M. Sharpe, 46 Selvage Lane, Mill Hill, London, NW7 3SP, United Kingdom

Filed Aug. 3, 1988, Ser. No. 227,919

Claims priority, application United Kingdom, Aug. 4, 1987, 8718422

Int. Cl.[5] D21D *3/00*; D21H *5/22*

U.S. Cl. 162—160 **12 Claims**

1. A method of preventing cellulosic fibre web degradation which method comprises permeating a stack of cellulosic fibre webs with an amine vapour so as to pass amine vapour through said stack, and disposing an amine-immobilizing agent to contact amine vapour which has passed through at least part of said stack, the immobilizing agent being in an amount sufficient to take up or condense excess amine vapour.

4,927,498

RETENTION AND DRAINAGE AID FOR PAPERMAKING

John D. Rushmere, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 143,350, Jan. 13, 1988, abandoned. This application Jun. 30, 1988, Ser. No. 213,484

Int. Cl.[5] D21H *3/78*

U.S. Cl. 162—168.3 **7 Claims**

1. In a papermaking process in which an aqueous paper furnish containing cellulosic pulp, and optionally also mineral fillers is formed and dried, the improvement comprising adding to said pulp from about 0.01 to about 1.0 wt. percent, based on the dry weight of the paper furnish, of a water soluble alkali metal polyaluminosilicate microgel formed from the reaction of polysilicic acid and an alkali metal aluminate and comprising aggregates of particles in which each particle has a surface area of at least about 1000 meters^2/gram, the polyaluminosilicate microgel having an alumina/silicate mole ratio greater than about 1/100, and from about 0.01 to about 2.0 wt. percent, based on the dry weight of the paper furnish of a water soluble cationic polymer capable of flocculating fiber and filler fines.

4,927,499

APPARATUS FOR STABILIZING THE JET FLOW EXITING A HEADBOX OF A PAPER MACHINE

Kai Wikman, Virkkala, Finland, assignor to Valmet-Ahlstrom, Inc., Karhula, Finland

Filed Dec. 19, 1988, Ser. No. 286,517

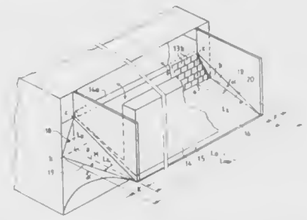
Claims priority, application Finland, Dec. 23, 1987, 875693

Int. Cl.[5] D21F *1/02*

U.S. Cl. 162—336 **10 Claims**

1. A headbox for the delivery of a stock jet having a direction of flow to a moving forming wire comprising:

a slice channel having a machine direction vertical plane, a center, and an elongated slice opening; said slice channel being defined by a bottom wall and a top wall each extending in the direction of said elongation and by two opposed side walls extending between said bottom and top walls, said opposed side walls converging in a cross-flow direction toward said slicing opening;



and being substantially planar and inclined relative to said machine direction vertical plane toward the center of the slice channel.

4,927,500

WASTE OIL PURIFYING APPARATUS

Charles K. Martin, Boonton, N.J., assignor to Infern-O-Therm, Keyport, N.J.

Continuation of Ser. No. 537,278, Sep. 29, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,962

Int. Cl.[5] B01D *1/02*; C10G *1/02*

U.S. Cl. 196—46 **12 Claims**

1. Apparatus for recovering a finished oil product from crude or waste oil contaminated with water and the like, comprising:

a tank for receiving and containing a certain amount of waste oil, and including exhausting means for exhausting waste gasses from said tank;

burner means including a chamber inside said tank, for heating the waste oil contained in said tank to produce (i) waste gases including light ends from the waste oil in said tank, and (ii) a desired finished oil product from the waste oil in said tank, wherein said burner means is arranged to provide a heating flame to produce fire in said chamber, the waste oil being inside said tank and outside said chamber of said burner means so as to be isolated from direct contact with the flame of said burner means;

said waste gases being kept separate from combustion gas products produced by said burner means;

means for feeding back said waste gases from said exhausting means to said chamber;

afterburner means associated with said burner means and arranged inside of said tank and at least partly within said chamber, for combusting, inside said chamber, the fed back waste gases produced from the waste oil in said tank with the flame of said burner means to obtain additional heat from the combustion of the fed back waste gases for heating the waste oil contained in said tank;

means for exhausting said combustion gas products from said burner means;

outlet means coupled to said tank for discharging the finished oil product recovered from the waste oil in said tank.

4,927,501

OVEN DOOR

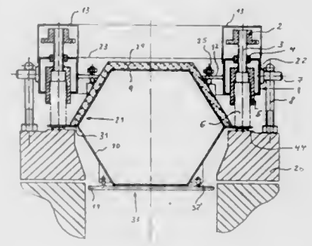
Wolfgang Becker, Bochum, Fed. Rep. of Germany, assignor to Ruhrkohle AG, Essen, Fed. Rep. of Germany

Filed Jul. 28, 1988, Ser. No. 225,686

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 3725537; Dec. 19, 1987, 3743156

Int. Cl.[5] C10B *25/06*

U.S. Cl. 202—248 **17 Claims**



1. An oven door assembly comprising a peripheral door frame, a peripheral sealing means secured to said door frame for sealing an oven door opening and a metal heat shield, said metal heat shield comprising:

a multiplicity of elongated metal members having elongated axes;

means for retaining said elongated metal members in at least one array in which said elongated axes are disposed generally parallel to each other within a plane, said retaining means extending across said elongated metal members at spaced points along the axes of said members and maintaining a space between adjacent members of said elongated metal members in the array; and

means for supporting said array of elongated metal members on said sealing means so as to extend parallel to the door frame and sealing means and thereby shield the same from heat generated in an oven.

4,927,502

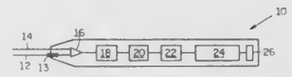
METHODS AND APPARATUS USING GALVANIC IMMUNOELECTRODES

Christopher L. Reading, Kingwood, Tex.; Malcolm R. Smyth, and Richard O'Kennedy, both of Dublin, Ireland, assignors to Board of Regents, The University of Texas, Austin, Tex.

Filed Jan. 31, 1989, Ser. No. 304,739

Int. Cl.[5] G01N *27/50*

U.S. Cl. 204—153.1 **22 Claims**



1. A method for measuring the level of a complementary immunochemical reactant in a conductive aqueous solution, comprising the steps of:

providing a first electrode and a second electrode, the electrodes having surfaces and generating a galvanic current when electrically interconnected and immersed in a conductive aqueous solution;

binding a selected immunochemical reactant to the surface of the first electrode;

VOL 1114 ISS 4 MY 22 1990 UMI

electrically interconnecting the first and second electrodes;
immersing the electrodes in a conductive aqueous solution containing the complementary immunochemical reactant to the bound immunochemical reactant:
measuring the galvanic current generated by the immersed electrodes as a function of time;
calculating the level of the complementary immunochemical reactant in the solution by comparing the measured current with a standard current;
wherein the standard current substantially represents the galvanic current as a function of time generated by the electrodes when immersed in a standard solution, the standard solution being a solution having similar conductivity to the conductive aqueous solution and containing no complementary immunochemical reactant.

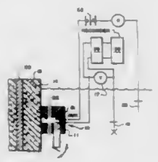
11. A device for measuring the level of a complementary immunochemical reactant in a conductive aqueous solution, comprising:
a first electrode having a surface and having a selected immunochemical reactant bound to its surface and a second electrode, the electrodes generating a galvanic current when electrically interconnected and immersed in a conductive aqueous solution;
an electrical interconnection between the first and second electrodes;
means for measuring the galvanic current generated by the first and second electrodes as a function of time when immersed in a conductive aqueous solution;
means for comparing the measured galvanic current with a standard current and calculating the level of the complementary immunochemical reactant;
wherein the standard current substantially represents the galvanic current as a function of time generated by the electrodes when immersed in a standard solution, the standard solution being a solution having similar conductivity to the conductive aqueous solution and containing no complementary immunochemical reactant.

4,927,503

METHOD FOR ASSESSMENT OF CORROSION ACTIVITY IN REINFORCED CONCRETE

Daniel R. Polly, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 196,136, May 16, 1988, abandoned. This application Feb. 10, 1989, Ser. No. 308,596
Int. Cl.[5] G01N *17/02*
U.S. Cl. 204—153.11 **1 Claim**



1. A method for nondestructive detecting, locating and measuring of the corrosion activity of a metal reinforcement in a concrete marine structure by direct detection of electrochemical current flow, comprising the steps of:
a. first, establishing a baseline potential by measuring the freely corroding electrical potential of a probe electrode relative to a remote underwater reference electrode;
b. secondly, positioning said probe electrode in sealing engagement against the underwater surface of said concrete structure such that the measurement path is effectively restricted to the path from said probe electrode through said concrete structure and surrounding water to said remote electrode, and then measuring the electrical potential between said probe electrode and said remote reference electrode; the potential difference between the first and second potential measurements being the IR drop caused by corrosion currents flowing through said concrete structure, and attributable to the electrochemical corrosion of said metal reinforcement.

4,927,504

SCULPTURE PROCESS

Christopher R. Scala, 1666 Summer Way, Winter Park, Fla. 32789

Filed Sep. 14, 1989, Ser. No. 407,144
Int. Cl.[5] C25D *9/08*
U.S. Cl. 204—23 **10 Claims**



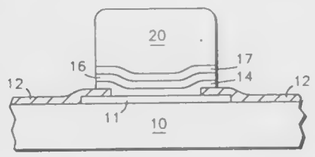
1. A process of making a sculpture comprising the steps of:
making a shaped sculpture model;
shaping a metal wire cloth over said said sculpture model;
forming a support frame for a sculpture;
attaching said shaped metal wire cloth to said support frame;
connecting a conductor to said shaped wire cloth on said frame to act as one electrode of an electrolytic cell;
placing said shaped metal wire cloth attached to said frame in an electrolyte;
positioning an electrode adjacent said metal wire cloth and frame in said electrolyte; and
applying a voltage between said electrodes for a predetermined time to thereby electrolytically coat said metal wire cloth to form an acreted sculpture over said shaped metal wire cloth.

4,927,505

METALLIZATION SCHEME PROVIDING ADHESION AND BARRIER PROPERTIES

Ravinder K. Sharma, Mesa; Harry J. Geyer, Phoenix, and Douglas G. Mitchell, Tempe, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 215,108, Jul. 5, 1988, Pat. No. 4,880,708. This application Jul. 28, 1989, Ser. No. 386,058
Int. Cl.[5] H01L *21/48, 21/28, 21/308;* C25D *7/12*
U.S. Cl. 204—34.5 **17 Claims**



1. A method of fabricating a structure for providing adhesion and barrier properties to a semiconductor substrate having a surface, comprising the steps of:
providing a first conductor layer made of a conductive metal on at least a portion of the surface of the substrate;
forming a passivation layer on the surface of the substrate and the first conductor layer, and having at least one opening to the first conductor layer;
forming a second conductor layer made of titanium-tungsten-nitride on the first conductor layer and the passivation layer;
forming a third conductor layer made of titanium-tungsten on the second conductor layer, and;
forming a fourth conductor layer made of a conductive metal on the third conductor layer.

4,927,506

HIGH-PERFORMANCE ELECTRODEPOSITED CHROMIUM LAYERS FORMED AT HIGH CURRENT EFFICIENCIES

Nicholas M. Martyak, Hazlet, N.J., assignor to Atochem North America, Inc., Somerville, N.J.

Filed Sep. 14, 1989, Ser. No. 407,174
Int. Cl.[5] C25D *3/04*
U.S. Cl. 204—51 **16 Claims**

1. A functional chromium plating bath consisting essentially of chromic acid, from about 40 to about 150 g/l. of sulfoacetic acid, said bath being substantially free of other carboxylic acids, and substantially free of fluoride ion, chloride ion and phosphate ion, and further having selenate or tellurate ions in the bath, present in the amount of from about 0.1 to about 1.0 g/l. each.

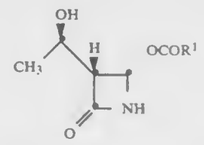
4,927,507

NOVEL PROCESS FOR THE MANUFACTURE OF 4-ACYLOXY-3-HYDROXYETHYL-AZETIDINONES

Peter Schneider, Bottmingen; Gerardo Ramos, Arlesheim, and Jacques Bersier, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

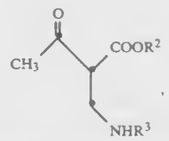
Filed Apr. 27, 1988, Ser. No. 186,547
Claims priority, application Switzerland, May 4, 1987, 1683/87
Int. Cl.[5] C25B *3/02*
U.S. Cl. 204—78 **6 Claims**

1. A process for the manufacture of compounds of formula



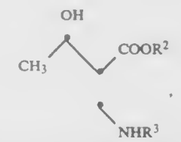
(I)

in which R^1 represents lower alkyl or aryl, characterised in that a compound of formula



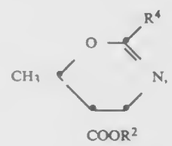
(II)

in which R^2 represents hydrogen or an esterifying radical and R^3 represents hydrogen or the acyl radical of a carboxylic acid or of a carbonic acid semiester, or a salt thereof, is reduced with an enantioselective reducing agent, a resulting compound of formula



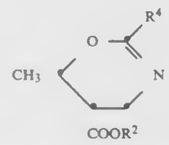
(IIIa)

in the case when R^2 and/or R^3 represent(s) hydrogen, is in any sequence esterified or acylated with a reagent that introduces the acyl radical of a carboxylic acid or of a carbonic acid semiester, and the resulting compound, or the compound of formula IIIa in which R^2 already represents an esterifying radical and R^3 already represents the acyl radical of a carboxylic acid or of a carbonic acid semiester, or a salt thereof, is cyclised with an agent that activates the hydroxy group, a resulting compound of formula



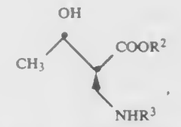
(IV)

in which R^2 represents an esterifying radical and R^4 represents the radical of a carboxylic acid or of a carbonic acid semiester R^4COOH, is isomerised with a base, and a resulting diastereoisomer of formula



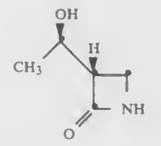
(IVa)

is hydrolysed, the resulting compound of formula



(IIIb)

in which R^2 and R^3 represent hydrogen, or a salt thereof, is cyclised with an agent removing the elements of water, and the resulting compound of formula



(V)

is oxidatively acylated electrochemically with an agent that introduces the radical $R^1COO—$.

VOL 1114 ISS 4 MY 22 1990 UMI

4,927,508

ALKYL 2-FLUORO-1-METHOXYETHYLCARBAMATES

James M. Renga, Walnut Creek; Charles K. Pon, Concord; Aylin H. Gulbenkian, and Michael G. Smith, both of Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 154,762, Feb. 11, 1988, Pat. No. 4,845,267.
This application Feb. 7, 1989, Ser. No. 307,397
Int. Cl.[5] C25B 3/02
U.S. Cl. 204—79 11 Claims

1. A process for the preparation of a compound of the formula

$$F-CH_2CHNHCO_2R$$
$$\quad\quad\quad|$$
$$\quad\quad OCH_3$$

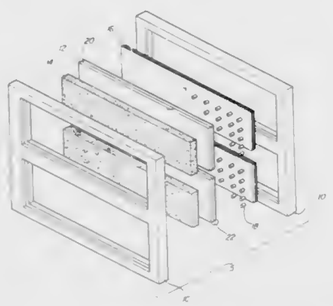
wherein R represents C_1–C_4 alkyl
which comprises passing an electrical current through a mixture containing a C_1–C_4 alkyl 2-fluoroethylcarbamate, an electrolyte and methanol under conditions conducive to electrochemical oxidation.

4,927,509

BIPOLAR ELECTROLYZER

Indresh Mathur, Sarnia; Allan James, Wallaceburg, and David Bissett, Bright's Grove, all of Canada, assignors to H-D Tech Inc., Woodbridge, Canada

Filed Jun. 4, 1986, Ser. No. 870,474
Int. Cl.[5] C25B 1/30
U.S. Cl. 204—83 22 Claims



1. An electrode assembly exhibiting improve electrolyte flow through a diaphragm thereof when used in an electrochemical cell, said assembly comprising:
(A) a liquid permeable, multiple layered diaphragm;
(B) a porous, self-draining electrode, and
(C) a current distributor; said current distributor and said diaphragm each being in contact with an opposite face of said electrode wherein said assembly exhibits substantially no voltage penalty as compared to use of an electrode assembly having said diaphragm and said current distributor located on the electrolyte side of said electrode.

14. A process for the manufacture of an alkaline peroxide aqueous solution by the electrolysis of an aqueous electrolyte in a bipolar, filter press type, electrolytic cell; said cell comprising a bipolar anode/current distributor; a liquid permeable diaphragm; a porous, self-draining cathode and an electrically nonconductive spacing means; wherein said cathode is in contact with a current distributor on one face of said cathode and is in contact with said liquid permeable diaphragm on an opposite face of said cathode; wherein said liquid permeable diaphragm comprises multiple layers of (A) a microporous polyolefin film or (B) a composite comprising said microporous polyolefin film and a support fabric resistant to deterioration upon exposure to electrolyte and electrolysis products thereof; wherein said anode/current distributor comprises stainless steel or a composite of a coated electrically conductive substrate, said substrate selected from the group consisting of nickel and a nickel coated substrate, wherein said nickel or nickel coated substrate is coated with an electrocatalytically effective amount of cobalt and tungsten compounds; and wherein said nonconductive spacing means separates said liquid permeable diaphragm and said anode, said process comprising:
(A) flowing a gas into a portion of said self-draining cathode;
(B) controllably flowing a liquid electrolyte through said liquid permeable diaphragm into a portion of said self-draining cathode at a rate about equal to the drainage rate of the cathode;
(C) electrolytically reacting said liquid electrolyte with said gas to form at least one non-volatile product; and
(D) removing the products of electrolysis from said self-draining cathode.

4,927,510

HYDROMETALLURGICAL PROCESS FOR RECOVERING IN PURE METAL FORM ALL THE LEAD CONTAINED IN THE ACTIVE MASS OF EXHAUSTED BATTERIES

Marco Olper, Monza, and Pierluigi Fracchia, Milan, both of Italy, assignors to Engitec Impianti S.p.A., Italy

Filed Oct. 17, 1988, Ser. No. 258,596
Claims priority, application Italy, Oct. 20, 1987, 22348 A/87
Int. Cl.[5] C25C 1/18
U.S. Cl. 204—114 5 Claims



1. A process for recovering in pure metal form substantially all lead from battery sludge containing lead compounds including lead dioxide and lead sulfate and containing organic substances of the form $C_n(H_2O)_m$ comprising the steps of:
(a) desulfurizing battery sludge to form a desulfurized paste;
(b) leaching said desulfurized paste with an aqueous solution of an acid selected from the acids suitable for electrowinning to form a liquid/solid mixture;
(c) separating said liquid/solid mixture by press-filtering and washing to form a filtrate containing Pb^{++} ions and an insoluble residue consisting essentially of lead dioxide organic substances and moisture;
(d) treating said filtrate by electrowinning to produce lead in pure metal form and an exhausted electrolyte;
(e) treating said insoluble residue formed in step (c) with concentrated sulfuric acid sufficient to cause the simultaneous occurring of the following reactions:

$$C_n(H_2O)_m + H_2SO_4 \rightarrow nC + H_2SO_4.mH_2O \quad (1)$$

$$C + 2PbO_2 + 2H_2SO_4 \rightarrow 2PbSO_4 + CO_2 + 2H_2O \quad (2)$$

up to the quantitative reduction of substantially all of the lead dioxide PbO_2 and elimination of substantially all the organic substances $C_n(H_2O)_m$ contained in said insoluble residue; and

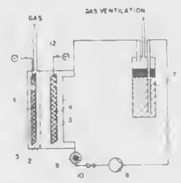
(f) feeding the so-treated insoluble residue to the desulfurizing of step (a).

4,927,511

METHOD AND DEVICE FOR BREAKING A DISPERSE SYSTEM IN AN ELECTROCHEMICAL CELL

Volker Friehmelt, Wollstadt; Bernhard Maier, Amberg; Alfons Kohling, Eschborn, and Rolf-Eberhard Schmitt, Nackenheim, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 271,649
Claims priority, applicatioo Fed. Rep. of Germany, Nov. 23, 1987, 3739580
Int. Cl.[5] C02F 1/46
U.S Cl. 204—151 11 Claims



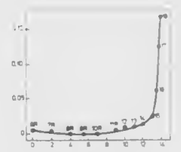
1. Method of breaking a disperse system in form of oil-in-water emulsions, comprising: neutralizing the electrical charges in a medium containing a non-ionically or ionically stabilized oil-in-water emulsion flowing through a working electrode compartment within an electrode compartment subdivided by an ion exchanger membrane into a working electrode compartment and a counterelectrode compartment such that the ultrafine constituents of the emulsion combine to form larger agglomerates using a working electrode consisting of a corrosion-resistant material; and separating the agglomerated constituents from the residual medium outside of said electrode compartment in a separator attached thereto in a circuit.

4,927,512

PROCESS FOR PRODUCTION OF HYDROGEN PEROXIDE BY A CHEMICAL PHOTOREDUCTION OF OXYGEN, AND HYDROGEN PEROXIDE OBTAINED BY THIS PROCESS

Francisco F. de la Rosa; Jose A. Navarro; Mercedes Roncel, and Miguel A. de la Rosa, all of Sevilla, Spain, assignors to Interox (Société Anonyme), Brussels, Belgium

Filed May 5, 1988, Ser. No. 190,552
Claims priority, application Spain, May 5, 1987, 8701334
Int. Cl.[5] B01J 19/08
U.S. Cl. 204—157.5 8 Claims



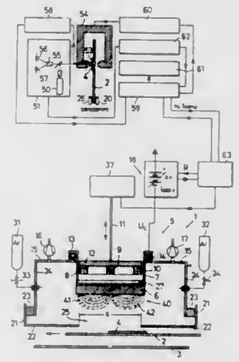
1. A process for the manufacture of hydrogen peroxide, comprising:
photoreduction of molecular oxygen in an aqueous medium at a pH above 9 in the presence of visible light, semicarbazide and a photosensitizer selected from among Bengal Rose and ruthernium II trichelate complex with the ligand (2,2'-dipyridyl) referred to by the abbreviation Ru $(bpy)_3^{2+}$.

4,927,513

METHOD AND ARRANGEMENT FOR FABRICATING MAGNETO-OPTICAL, STORABLE, AND/OR DELETABLE DATA CARRIERS

Eberhard Schultheiss, Herborn, and Peter Wirz, Waldernbach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 294,734
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1988, 3800449
Int. Cl.[5] C23C 14/54
U.S. Cl. 204—192.13 27 Claims



1. A method for fabricating a magneto-optical, storable, and/or deletable data carrier, including the steps of:
operating a magnetron sputtering system (1) to apply a layer comprising different magnetic materials, with different specific weights, on a substrate (4), wherein the magnetron system (1) produces a magnetic field; and
controlling the chemical composition of the layer by controlling the magnetic field of the magnetron system (1).

4,927,514

PLATINUM BLACK AIR CATHODE, METHOD OF OPERATING SAME, AND LAYERED GAS DIFFUSION ELECTRODE OF IMPROVED INTER-LAYER BONDING

Frank Solomon, Great Neck, and Yury Genodman, Brooklyn, both of N.Y., assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed Sep. 1, 1988, Ser. No. 239,582
Int. Cl.[5] C25B 11/00
U.S. Cl. 204—290 R 19 Claims

1. An electrode in multi-layer form and having enhanced inter-layer bonding, said electrode comprising a gas porous, polymer-containing support layer, a catalyst-containing and polymer-containing active layer and a gas porous intermediate bonding layer consisting of thermoplastic hydrophobic polymer.

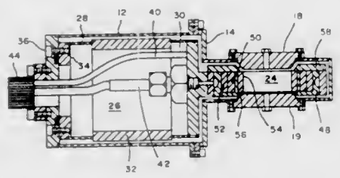
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4,927,515

CIRCULAR MAGNETRON SPUTTERING DEVICE

Douglas L. Keith, Santa Clara, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jan. 9, 1989, Ser. No. 295,237
Int. Cl.[5] C23C *14/34, 14/56*
U.S. Cl. 204—298.21 5 Claims



1. A circular magnetron sputtering device comprising
a cathode structure including an annular magnet and an annular body of target material positioned coaxially with and inside of said annular magnet,
adapter means including a central insulating body portion of cylindrical configuration and an electrically conductive end portion attached to said central insulating portion and to said cathode structure generally perpendicular to the axis of said annular magnet for supporting said cathode structure,
an anode structure spaced from and in juxtaposition with openings of said annular magnet, said anode structure including a housing for receiving said adapter means,
electrical power interconnect means connected to said electrically conductive end portion of said adapter means for energizing said cathode structure, and
means for providing a coolant flow through said cathode structure.

4,927,516

ENZYME SENSOR

Shuichiro Yamaguchi, Fuji; Naoto Uchida; Takeshi Shimomura, both of Fujinomiya, and Noboru Oyama, Fuchu, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1987, Ser. No. 65,908
Claims priority, application Japan, Jun. 27, 1986, 61-149753
Int. Cl.[5] G01N *27/30*
U.S. Cl. 204—403 36 Claims



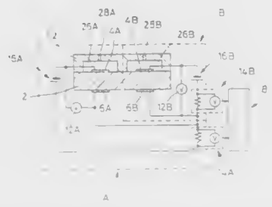
1. An enzyme sensor for measuring a substrate concentration using an enzyme, comprising:
an electrically conductive carbon having a graphite structure for generating an electric potential responsive to a hydrogen ion concentration;
an enzyme layer comprising an enzyme imparted with a cross-linked structure by a cross-linking agent coating a surface of said electrically conductive carbon having a graphite structure, said enzyme layer being capable of generating a change in said hydrogen ion concentration by promoting the chemical reaction of a substrate on which said enzyme is active; and
measuring means for measuring the electric potential of said electrically conductive carbon having a graphite structure.

4,927,517

NOX SENSOR HAVING CATALYST FOR DECOMPOSING NOX

Yoshihiko Mizutani, Nagoya, and Hitoshi Nishizawa, Iwakura, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 27, 1989, Ser. No. 343,682
Claims priority, application Japan, Apr. 30, 1988, 63-108049
Int. Cl.[5] G01N *27/58*
U.S. Cl. 204—406 14 Claims



1. An NOx sensor for determining the concentration of NOx contained in a measurement gas, comprising:
an electrochemical cell having a solid electrolyte body, and at least two electrodes, formed on said solid electrolyte body, which includes a first electrode exposed to said measurement gas and a second electrode;
diffusion-resistance means for restricted communication of said first electrode with an external space in which said measurement gas exists, said diffusion-resistance means having a predetermined resistance to diffusion of said measurement gas therethrough from said external space toward said first electrode;
a catalyst disposed adjacent said first electrode, for decomposing NOx contained in an atmosphere adjacent said catalyst;
current applying means for applying an electric current between said first and second electrodes of said electrochemical cell;
current measuring means for detecting an electric current flowing between said first and second electrodes;
oxygen partial pressure measuring means for detecting an oxygen partial pressure of the atmosphere adjacent said catalyst; and
control means for calculating the concentration of NOx contained in said measurement gas, based on a first current value and a second current value, said first current value being detected by said current measuring means when said oxygen partial pressure detected by said oxygen partial pressure measuring means is higher than a predetermined level above which the decomposition of NOx by said catalyst will not occur and below which said decomposition of NOx will occur, and said second current value being detected by said curent measuring means when said oxygen partial pressure detected by said oxygen partial pressure measuring means is lower than said predetermined level.

4,927,518

REFERENCE ELECTRODE HAVING IMMOBILIZED ELECTROLYTE

Gunter Tauber, Kriftel, and Andrea Dornauf, Kelkheim, both of Fed. Rep. of Germany, assignors to Schott Glaswerke, Fed. Rep. of Germany

Filed Jun. 1, 1989, Ser. No. 359,972
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818846
Int. Cl.[5] G01N *27/30*
U.S. Cl. 204—421 9 Claims



5. A reference electrode comprising:
a solidified body of hydraulically setting cementitious material including an electrolyte which is mixed in the material before it is set and wherein said cementitious material is based on materials selected from the group consisting of calcium silicates, calcium aluminates, gypsum, high alumina cement, controlled setting cement, Roman cement and sulphate blast furnace cement, plaster and trass cement, said body further including a filler selected from the group consisting of pozzolan, glass and quartz powder,
an electrode element embedded in said body and an electrical conductor connected to said element and extending through said body to the outside thereof.

4,927,519

METHOD FOR CONTROLLING FOULING DEPOSIT FORMATION IN A LIQUID HYDROCARBONACEOUS MEDIUM USING MULTIFUNCTIONAL ANTIFOULANT COMPOSITIONS

David R. Forester, Spring, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 177,252, Apr. 4, 1988, Pat. No. 4,828,674. This application Jun. 17, 1988, Ser. No. 208,203
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[5] C10G *9/12*
U.S. Cl. 208—48 AA 83 Claims

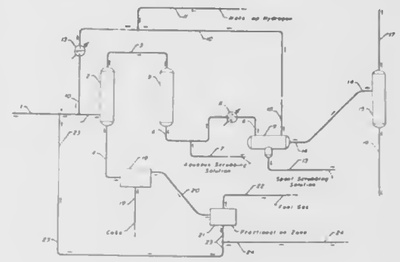
1. A method of inhibiting fouling deposit formation in a liquid hydrocarbonaceous medium, undergoing processing wherein in the absence of such fouling inhibition, fouling deposits would normally be formed within said medium, said method comprising adding to said medium an effective amount of an antifoulant composition comprising:
Component (1) an alkyl phosphonate phenate sulfide antifoulant compound formed from the reaction of an alkyl (C_1–C_{24}) phenol sulfide and phosphoric acid; and at least one additional compound selected from the group consisting of:
Component (2) an effective antioxidant compound or compounds to inhibit oxygen based polymerization of said hydrocarbon medium selected from the group consisting of: phenylenediamine compounds, substituted phenolic compounds, quinone and its derivatives; or phenothiazine and its derivatives;
Component (3) a corrosion inhibiting compound or compounds to reduce corrosion of metal surfaces in contact with said hydrocarbon medium during processing thereof, selected from the group consisting of: tetrahydropyrimidines; imidazolines; reaction products of alkylene polyamines and aliphatic carboxylic acids and optionally further reacted with paraformaldehyde to give heterocyclic compounds; magnesium, calcium or amine sulfonates; reaction products of ethylene or propylene oxide with alkyl phenol to yield aromatic ethers or reaction products of a tallowpolyamine and an alkylacrylate; and
Component (4) a metal deactivator compound or compounds adapted to complex with metallic impurities in said hydrocarbon medium selected from the group consisting of: N,N'-disalicylidene-1,2-cyclohexanediamine; 2,5-dimercapto-1,3,4-thiadiazole and its derivatives; or reaction products of alkyl phenol, aldehyde and polyamines to yield Mannich products; and mixtures thereof.

4,927,520

PROCESS FOR TREATING A HYDROCARBONACEOUS STREAM CONTAINING A NON-DISTILLABLE COMPONENT TO PRODUCE A HYDROGENATED DISTILLABLE HYDROCARBONACEOUS PRODUCT

Tom N. Kalnes, La Grange; Robert B. James, Jr., Northbrook, and Darrell W. Staggs, Crystal Lake, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 2, 1988, Ser. No. 265,969
Int. Cl.[5] C10G *69/06, 69/10*
U.S. Cl. 208—50 14 Claims



1. A process for treating a hydrocarbonaceous stream containing a non-distillable component to produce a hydrogenated distillable hydrocarbonaceous product while minimizing thermal degradation of said hydrocarbonaceous stream which process comprises the steps of:
(a) contacting said hydrocarbonaceous stream with a hot first hydrogen-rich gaseous stream having a temperature greater than said hydrocarbonaceous stream in a flash zone at flash conditions thereby increasing the temperature of said hydrocarbonaceous stream without indirect heat exchange and vaporizing at least a portion thereof to provide a hydrocarbonaceous vapor stream comprising hydrogen and a heavy stream comprising said non-distillable component;
(b) contacting said hydrocarbonaceous vapor stream comprising hydrogen with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation conditions to increase the hydrogen content of the hydrocarbonaceous compounds contained in said hydrocarbonaceous vapor stream;
(c) condensing at least a portion of the resulting effluent from said hydrogenation reaction zone to provide a second hydrogen-rich gaseous stream and a liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds;
(d) recovering a hydrogenated distillable hydrocarbonaceous product from said liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds; and
(e) reacting at least a portion of said heavy stream comprising said non-distillable component recovered from step (a) in a thermal coking zone at thermal coking conditions to provide a thermal coking zone effluent.

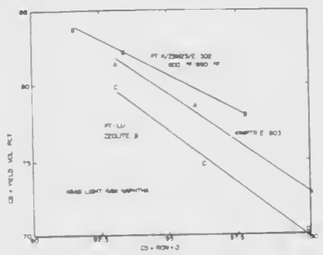
VOL 1114 ISS 4 MY 22 1990 UMI

4,927,521

METHOD OF PRETREATING A NAPHTHA

Yung F. Chu, Plainsboro, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 30, 1988, Ser. No. 238,678
Int. Cl.[5] C07C 35/06
U.S. Cl. 208—65 27 Claims



1. A method of pretreating a raw naphtha feedstream comprising contacting said naphtha feedstream with a noble metal-/alkali metal-containing zeolite naphtha reforming catalyst, said catalyst containing from about 0.1–1.0 wt. % of said noble metal and an amount of said alkali metal which exceeds the cationic exchange capacity of said zeolite, at a pressure of about 0 to about 1000 psig, a temperature of about 550° F. to about 850° F., a hydrogen to hydrocarbon molar ratio of about 0.1 to 1 to about 15 to 1 and a weight hourly space velocity of about 0.5 to about 20, thereby increasing the yield of C_4^+ and C_5^+ gasoline and thereafter catalytically reforming said treated naphtha.

4,927,522

MULTIPLE FEED POINT CATALYTIC CRACKING PROCESS USING ELUTRIABLE CATALYST MIXTURE

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,206
Int. Cl.[5] C10G 11/05, 11/18
U.S. Cl. 208—120 12 Claims

1. A fluidized catalytic cracking (FCC) process wherein a source of hot, regenerated cracking catalyst having a settling velocity contacts a heavy hydrocarbon feed in a vertical riser reactor adapted to maintain said catalyst and said heavy feed as a dilute phase, said reactor having a cross-sectional area and a base, to produce a mixture of cracked products and spent catalyst, wherein spent catalyst is stripped and charged to a catalyst regeneration zone to produce the hot, regenerated catalyst characterized by use of an elutriable mixture of conventionally sized FCC catalyst and a separate additive catalyst having a higher settling velocity than the conventionally sized FCC catalyst and comprising a shape selective zeolite having a Constraint Index of about 1–12 in a riser having a lower and an upper elutriating section of increased cross-sectional area relative to the riser, and further characterized by

(a) charging to said lower elutriating section at least a portion of said elutriable catalyst mixture and a hydrocarbon feed comprising 1–50 wt % of a light, hydrogen-rich fraction comprising C_5^- hydrocarbons and 50–99 wt % straight run naphtha hydrocarbons having a boiling range between C_5–460° F. to generate in said lower elutriating section reactive fragments and an upgraded straight run naphtha fraction which are discharged up from said lower elutriating section into the dilute phase riser which is contiguous with and above said lower elutriating section;

(b) adding a resid feed to the base of the dilute phase riser and reacting in said dilute phase riser resid with reactive fragments generated in said lower elutriating section;

(c) adding to an upper portion of said dilute phase riser additional hot regenerated elutriable catalyst mixture and adding gas oil boiling range hydrocarbons and discharging the dilute phase transport riser up into the base of the upper elutriating section which is contiguous with and above said riser;

(d) adding to said upper elutriating section a recycled hydrocarbon fraction comprising hydrocarbons boiling within the range of 200°–500° F.;

(e) discharging from the top of the riser cracked products and catalyst.

4,927,523

ADDITION OF SHAPE SELECTIVE ZEOLITES TO CATALYTIC CRACKING UNITS

Susan P. Donnelly, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 12, 1988, Ser. No. 282,785
Int. Cl.[5] C10G 11/05, 11/18
U.S. Cl. 208—120 15 Claims

1. A method of adding an additive zeolite having a constraint index of 1–12 to a catalytic cracking unit wherein a heavy feed is added at a given feed rate to a catalytic cracking unit and contacts a source of hot, regenerated equilibrium catalytic cracking catalyst to produce cracked products including gasoline having an octane number, C_3/C_4 hyrdrocarbons and heavy products boiling above the gasoline boiling range, and wherein the severity of the catalytic cracking operation is controlled to achieve a specified conversion of feed to products characterized by

(a) adding at least 0.5 wt. % additive, based on zeolite content of the additive and the total weight of the equilibrium catalyst inventory in the catalytic cracking unit, to the catalytic cracking unit within a 24 hour period to produce an unacceptable increase in C_3/C_4 production;

(b) adjusting the feed rate or the severity of the catalytic cracking operation or both to reduce the production of C_3/C_4 to an acceptable level;

(c) aging in the catalytic cracking unit the zeolite additive, said aging reducing the cracking activity of the additive zeolite and thereby reducing the production of C_3/C_4; and

(d) increasing the feed rate or the severity of the catalytic cracking operation or both to achieve the specified conversion of feed without producing unacceptable amounts of C_3/C_4, and recovering a gasoline boiling range product having an increased octane number.

4,927,524

PROCESS FOR REMOVING VANADIUM AND SULPHUR DURING THE COKING OF A HYDROCARBON FEED

Domingo Rodriguez, Edo Miranda, and Cebers Gomez, San Antonio de los Altos, both of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed May 10, 1989, Ser. No. 350,122
Int. Cl.[5] C10G 9/14
U.S. Cl. 208—131 6 Claims

1. A process for producing metallurgical grade coke from a hydrocarbon feedstock characterized by high vanadium and sulphur contents comprising:

(a) feeding said hydrocarbon feedstock to a coking drum;

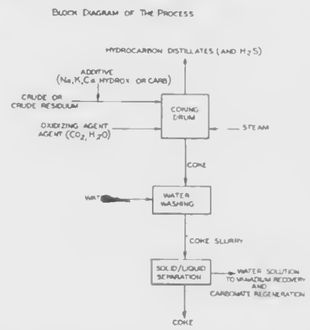
(b) feeding an additive selected from the group consisting of carbonates and hydroxides of Na, K, Ca and mixtures thereof to said coking drum;

(c) feeding an oxidizing agent to said coking drum;

(d) heating said feedstock, said additive and said oxidizing agent in said coking drum such that said vanadium is oxidized to its pentavalent state so that said vanadium reacts with said additive so as to form a water soluble salt while at the same time said sulphur reacts with said additive so as to form a water soluble salt and said feedstock decomposes leaving a mass of coke;

(e) injecting superheated steam into said coking drum so as to hydrolyze said sulphur to form H_2S;

(f) washing said coke with water wherein said water soluble salts are forced into solution; and



(g) separating out said coke substantially free of vanadium and sulphur from said solution.

4,927,525

CATALYTIC REFORMING WITH IMPROVED ZEOLITE CATALYSTS

Yung F. Chu, Plainsboro, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 30, 1988, Ser. No. 238,677
The portion of the term of this patent subsequent to May 22, 1990, has been disclaimed.
Int. Cl.[5] C10G 35/06
U.S. Cl. 208—138 18 Claims



1. A method for reforming a naphtha which comprises contacting said naphtha with a noble metal/alkali metal-containing zeolite naphtha reforming catalyst said catalyst containing from about 0.1–1.0 wt % of said noble metal and an amount of said alkali metal which exceeds the cationic exchange capacity of said zeolite, a pressure of from about 0 to about 2000 psig, a temperature of about 750° F. to about 1200° F., a hydrogen to hydrocarbon molar ratio of about 0.1 to 1 to about 15 to 1 and a weight hourly spaced velocity of about 0.5 to about 20, whereby naphtha reforming activity of said catalyst is enhanced by said zeolite resulting in significantly improved C_4^+ gasoline yields.

4,927,526

OCTANE IMPROVEMENT OF GASOLINE IN CATALYTIC CRACKING WITHOUT DECREASING TOTAL LIQUID YIELD

Conroy D. Anderson, Wenonah; Tai-Sheng Chou, Sewell, both of N.J.; William E. Cormier, Jr., Ellicott City, Md.; Francis G. Dwyer, West Chester, Pa.; Frederick J. Krambeck, Cherry Hill, N.J.; Gary M. Pasquale, Lansdale, Pa.; Paul H. Schipper, Wilmington, Del., and William A. Stover, Hampstead, N.C., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 801,103, Nov. 22, 1985, abandoned, and a continuation-in-part of Ser. No. 627,991, Jul. 7, 1984, abandoned, and a continuation-in-part of Ser. No. 628,062, Jul. 8, 1984, abandoned, and a continuation-in-part of Ser. No. 675,375, Nov. 27, 1984, abandoned, and a continuation-in-part of Ser. No. 629,922, Jul. 11, 1984, abandoned. This application Jun. 28, 1988, Ser. No. 187,099
Int. Cl.[5] C10G 11/18
U.S. Cl. 208—152 24 Claims

1. A method of adding ZSM-5 zeolite catalyst to a circulating catalyst inventory of equilibrium catalyst comprising a conventional large pore catalytic cracking catalyst in a catalytic cracking unit in a catalytic cracking operation, in which hydrocarbon feedstock is catalytically cracked to gasoline, which operation includes regeneration of catalyst which has become spent during catalytic cracking wherein said method comprises,

altering said catalyst inventory by adding ZSM-5 incrementally to said catalyst inventory;

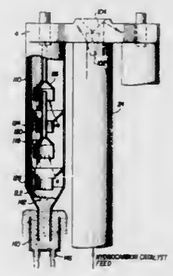
ceasing said altering when the equilibrium catalyst contains 1 to 20 wt % of ZSM-5, and continuing said catalytic cracking operation.

4,927,527

METHOD FOR REDUCING OVERCRACKING DURING FCC CATALYST SEPARATION

James H. Haddad, Princeton Junction, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 70,663, Jul. 2, 1987, abandoned, which is a continuation of Ser. No. 837,863, Mar. 5, 1986, abandoned, which is a continuation of Ser. No. 632,086, Jul. 18, 1984, abandoned. This application Jan. 3, 1989, Ser. No. 293,543
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[5] C10G 35/00
U.S. Cl. 208—161 7 Claims



1. In a method of fluid catalytic cracking of a hydrocarbon feed wherein said feed contacts a source of hot regenerated catalyst in the base of a riser reactor, said feed is cracked in said riser reactor to lighter cracked products and said catalyst is deactivated in said riser, and a mixture of cracked products and deactivated catalyst containing entrained and absorbed hydrocarbons is discharged from said riser reactor, separated into a

VOL
1114
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gaseous effluent and a separated catalyst stream, said separated catalyst is stripped with a stripping fluid in a catalyst stripper and regenerated in a catalyst regenerator to produce regenerated catalyst, and said regenerated catalyst is recycled to the base of said riser reactor to crack said hydrocarbon feed, the improvement comprising;

separating in a separator connective with said riser reactor a cracked hydrocarbon feed into a gaseous effluent and a separated catalyst;

immediately stripping upon leaving said catalyst separator within a stripper vessel connective with said riser reactor, entrained and absorbed hydrocarbons from catalyst particles in said separated catalyst as said catalyst particles exit said separator;

passing said stripper hydrocarbons to a stripped hydrocarbon exit; and

discharging said stripped catalyst from said stripper vessel through a dipleg extension of said stripper vessel into a catalyst seal pot, said seal pot thereby sealing said dipleg extension, passing between 10 and 90% of said stripped catalyst flowing through said stripper through at least one drain of said seal pot and overflowing a remainder of said stripped catalyst from said seal pot, said seal pot being suspended in an atmosphere of said reactor vessel above a catalyst bed in said reactor vessel.

4,927,528

SIEVE DEVICE FOR SIEVING OUT COMPOST FROM ROTTEN ORGANIC MATERIAL

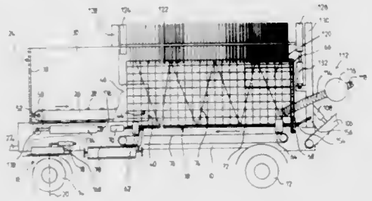
Werner Doppstadt, Vossnacker Strasse 67, 5620 Velbert-Langenberg, Fed. Rep. of Germany

Continuation of Ser. No. 135,663, Dec. 21, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,139

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644146

Int. Cl.[5] C05F *9/02*

U.S. Cl. 209—240 **36 Claims**



30. Sieve Device for sieving out compost of rotten organic material out of stacks of organic waste comprising:

(a) a filling funnel for feeding organic waste, said filling funnel consisting of a housing having a rectangular filling opening at the top and two opposite sidewalls, one sidewall being vertical and the other sidewall extends obliquely downwards, said two opposite sidewalls being cooperative to prevent said organic waste from forming bridges in said filling funnel, a first conveyer belt running on the bottom of said housing for conveying organic waste dropping thereon from said housing and for turning elongated objects in organic waste to extend substantially longitudinally of said conveyer belt, and servomotor means for slidingly guiding the filling funnel in a direction parallel to the axis of the sieve drum, including means for guiding the funnel so that the conveyer belt is completely retracted from the sieve drum,

(b) a sieve drum open at both ends, the axis of said sieve drum extending parallel to the conveying direction of said first conveyer belt, the first conveyer belt, in operation, projecting on one side thereof, into said sieve drum, said sieve drum being rotatably mounted on freely rotatable rollers to permit unobstructed passage of bulky components of organic waste,

(c) (i) sieve drum driving means comprising toothing arranged to impart to the sieve drum rotary movement about its axis, (ii) said toothing being engaged by a motor-driven toothed wheel arranged to impart to the sieve drum rotary movement about its axis even when heavy parts from organic waste are supplied to said sieve drum,

(d) means for transporting organic waste along the sieve drum from one side to the opposite other side during said rotary movement,

(e) a second conveyer belt running below the sieve drum for carrying out earth falling through the sieve drum, and

(f) means for carrying out elements of organic waste retained by the sieve drum.

4,927,529

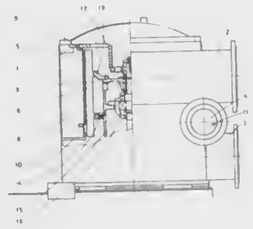
METHOD AND APPARATUS FOR SEPARATING KNOTS

Kaj O. Henricson, Kotka; Erkki T. Repo, Lappeenranta, and Hannu U. Rönkönharju, Kyminlinna, all of Finland, assignors to A. Ahlstrom Corporation

Filed Jan. 19, 1988, Ser. No. 145,557

Int. Cl.[5] B07B *1/22*

U.S. Cl. 209—270 **10 Claims**



1. A method of separating knots and other solids from a pulp fibre suspension in an apparatus having an upwardly extending outer housing, an upwardly extending screen cylinder having an interior and mounted for rotation within and spaced inwardly from said outer housing and forming an annular space therebetween, said screen cylinder having a contoured outer surface facing the annular space with openings therethrough between the annular space and the interior of the screen cylinder, and at least one blade arranged within the interior of and adjacent said screen cylinder for subjecting said screen cylinder to pressure pulses, comprising the steps of

rotating said screen cylinder at a rotational speed;

flowing the fibre suspension to be treated into the apparatus directly into the annular space tangentially to the outer surface of said screen cylinder in the direction of rotation of said screen cylinder at a feed speed less than the rotational speed of the screen cylinder for utilizing the feed speed in carrying out the method;

increasing the feed speed of the fibre suspension by the rotational speed of the screen cylinder and thereby effecting a slight fluidization at the contoured outer surface of the screen cylinder and facilitating the centrifugal separation of knots;

positioning the at least one blade in the range of ±10° to 45° relative to one of an input connection and a reject connection;

flowing an accept of the suspension directly through the screen cylinder into the interior of the screen cylinder flowing in the direction of rotation of the screen cylinder and discharging the accept tangentially from the interior of the screen cylinder in the direction of the rotation of the screen cylinder;

discharging a reject of said suspension from the annular space tangentially of the outer surface of said screen cylinder and in the rotational direction of the screen cylinder and facilitating the discharge of the reject by the rotational speed of the screen cylinder; and

subjecting pressure pulses to the screen cylinder from within the screen cylinder for loosening and displacing fibre stuck in the openings of said screen cylinder.

4,927,530

APPARATUS FOR PROCESSING SLUDGE

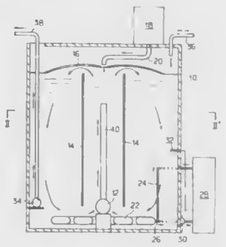
Iwao Ueda, 416, Nanba-cho, Matsubara-sagaru, Nishikiyama-chi-dori, Shimogyo-ku, Kyoto, Japan, assignor to Iwao Ueda; Chie Ueda and Etsuko Ueda, all of, Japan

Filed Apr. 28, 1988, Ser. No. 187,634

Claims priority, application Japan, Apr. 30, 1987, 62-107534

Int. Cl.[5] C02F *11/04*

U.S. Cl. 210—149 **9 Claims**



1. A sludge processing apparatus, comprising: a processing tank, in which a quantity of sludge flowing in through a sludge inflow pipe is deposited and processed;

submersible pump means, located centrally at the bottom in the processing tank, for taking in the sludge from the bottom of the processing tank and spouting it upward to the upper surface of the quantity of deposited sludge;

a circulation guide plate, which circulates the sludge spouted upward by the submersible pump throughout the whole processing tank;

chemical providing means, which feeds to the processing tank a quantity of a chemical for promoting activity of anaerobic bacteria carrying out anaerobic digestion of the sludge;

heating medium means, providing a heating medium and circulating the same through a heating pipe disposed inside said processing tank to heat the sludge;

temperature control means for controlling the temperature of the sludge in the processing tank to be within a predetermined temperature range; and

drain pump means for pumping supernatant water that is left after processing of the sludge out of the processing tank through a drain pipe.

4,927,531

AXIALLY ADJUSTABLE-TYPE COLUMN DEVICE

Kiyoaki Sakamoto, Hofu; Kenichi Matsubara, Shinnanyo; Yasuhiro Nakahara, Yamaguchi, and Masaki Nomura, Tokuyama, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Feb. 27, 1989, Ser. No. 315,857

Claims priority, application Japan, Feb. 25, 1988, 63-43003

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **2 Claims**

2. An axially adjustable-type column device for liquid chromatography, comprising:

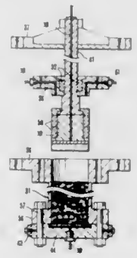
a cylindrical column to be packed with a gel;

a lower partition member in said column;

an upper partition member connected to a plug movably fittable in said column above said lower partition member to form a fluid tight gel bed section therebetween;

liquid supply means for supplying a pressurized liquid to said gel bed section through one of said lower and upper partition members and for permitting a discharge of the liquid from said gel bed section through the other of said lower and upper partition members;

means for forming a pressure balance chamber above said plug;



means including a constant flow pump for applying the pressure of the pressurized liquid to said pressure balance chamber, whereby the pressure in said pressure balance chamber varies as a function of the liquid flowing through said gel bed section so that said upper partition may move downwardly in response to a downward movement of an upper surface of a gel bed in said gel bed section during a column packing operation, and

means for locking the position of said plug, whereby said upper partition member may be locked in place during a separation operation.

4,927,532

DEVICE FOR THE COMPENSATION OF THE BASELINE DRIFT OF A CHROMATOGRAPHIC SEPARATING COLUMN

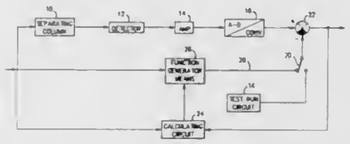
Peter Pospisil, Überlingen, and Bruno Kolb, Owingen, both of Fed. Rep. of Germany, assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 623,884, Jun. 25, 1984, abandoned. This application Jan. 31, 1989, Ser. No. 304,865

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323744

Int. Cl.[5] B01D *15/08*

U.S. Cl. 210—198.2 **2 Claims**



1. Device for the compensation of the baseline drift of a chromatographic separating column during a temperature and/or flow program, comprising,

(a) a separating column,

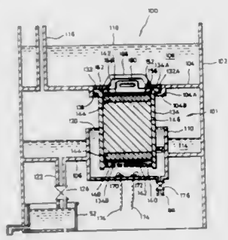
(b) programmer means, which are arranged to subject the separating column to predeterminable temperature and/or flowing programs,

(c) test run means for providing a first temperature and/or flow program without sample feeding for determination

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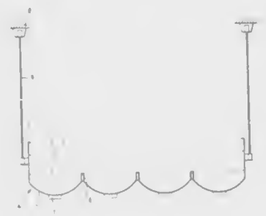
of a baseline depending on the temperature and on the flow and characteristic for the separating column,
(d) a memory arranged to memorize data of the baseline thus determined, and
(e) difference forming means, to which, during the subsequent execution of a second temperature and/or flow program with sample feeding and with the same separating column,
a measuring signal corresponding to the output of the separating column and
a baseline signal obtained from the memorized data for correction of the measuring signal are adapted to be applied, comprising,
(i) computer means,
to which the program parameters of the first temperature and/or flow program are applied by the test run means, and
to which the uncorrected baseline signal obtained with this temperature and/or flow program without sample feeding is applied, and
which are arranged to calculate parameters, a, b, τ, Io, specific for the separating column of the analytic function of known form which represents the course of the baseline signal, and
(ii) function generator means,
to which the parameters a, b, τ, Io specific for the separating column and calculated by the computer means are adapted to be applied, and which are arranged to illustrate the baseline signal as said analytic function of time t of the program parameters θ_1, θ_2, θ_3, t_1, t_2, t_3, R_1, R_2, of the temperature and/or flow program determined by the program supply means and of the parameters a, b, τ, Io, specific for the separating column, and
(f) means for correcting said measuring signal with said computed baseline signal
wherein:
a, b are columns specific constants;
τ is a time constant;
θ, θ_2, and θ_3 are column temperatures;
t_1, t_2, and t_3 are times; and
R_1 and R_2 are increase rates.

4,927,533
WATER DEIONIZING APPARATUS
Haruo Takase; Kazushige Uenaka, both of Tokyo; Akira Abe, and Yoshihiro Fujita, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Division of Ser. No. 155,454, Feb. 12, 1988, Pat. No. 4,857,950. This application May 26, 1989, Ser. No. 358,289
Claims priority, application Japan, Feb. 13, 1987, 62-30782; Feb. 14, 1987, 62-32184
Int. Cl.[5] C02F *1/42*
U.S. Cl. 210—257.1 **5 Claims**



1. A water deionizing apparatus for deionizing and purifying water comprising:
a first chamber for storing water therein having an opening in a bottom portion thereof;
a second chamber for storing deionized water therein;
a water deionizing unit removably disposed in said opening between said first and second chamber through which said water is deionized and purified. said deionizing unit having its water entrance sunk in said water in said first chamber and its deionized water exit sunk in said deionized water in said second chamber; and
a removable holding cover for holding down said deionizing unit in said opening, said holding cover having a through opening therein to allow water to enter said water entrance of said deionizing unit.

4,927,534
SCREEN SYSTEM
Antti Riihimäki, Noormarkku, Finland, assignor to Rauma-Repola Oy, Finland
Filed Mar. 10, 1989, Ser. No. 321,311
Claims priority, application Finland, Mar. 30, 1988, 881494
Int. Cl.[5] B07B *1/46*
U.S. Cl. 209—315 **3 Claims**

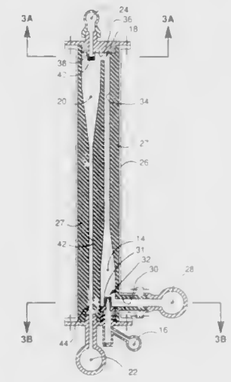


1. A screen system for the screening of wood chips, comprising:
a plurality of screening faces placed one above the other;
a bottom face having sides and a middle portion placed underneath said screening faces;
support means for supporting said bottom face;
vibrating means operatively connected to said screening faces for producing a screening movement;
the bottom face being made of a flexible material and is displaceable during the screening relative to its support means; and
said support means being operatively connected to the vibrating means so that the support means are moved and the bottom face is deformed by the vibrating means during the screening movement whereby the adherence of materials on the bottom face is prevented.

4,927,535
MICROPOROUS MEMBRANES FROM ISOTACTIC POLYSTYRENE AND SYNDIOTACTIC POLYSTYRENE
Henry N. Beck, Walnut Creek, and Robert D. Mahoney, Danville, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jul. 14, 1989, Ser. No. 380,845
Int. Cl.[5] B01D *13/01*
U.S. Cl. 210—500.23 **8 Claims**

1. A semi-permeable membrane comprising a thin isotropic or anisotropic microporous membrane consisting essentially of a mixture of isotactic polystyrene and syndiotactic polystyrene, wherein the ratio of isotactic polystyrene to syndiotactic polystyrene is such as to provide said membrane with properties sufficient for maintaining structural integrity under conditions of ultrafiltration and/or microfiltration.

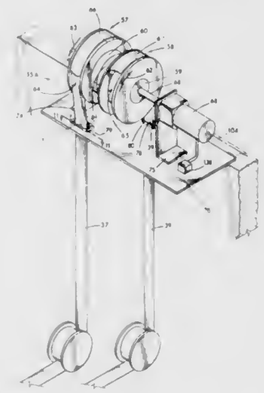
4,927,536
HYDROCYCLONE SEPARATION SYSTEM
J. Robert Worrell, Tulsa; William D. Wakley, Broken Arrow, and Grant A. Young, Tulsa, all of Okla., assignors to Amoco Corporation, Chicago, Ill.
Filed Mar. 21, 1989, Ser. No. 326,351
Int. Cl.[5] B01D *17/038;* **B04C** *5/28*
U.S. Cl. 210—512.2 **3 Claims**



1 A hydrocyclone separation system for separating a fluid mixture into at least two components having differing densities, comprising:
a first hydrocyclone separator and a second hydrocyclone separator contained within an elongated protective conduit and each being substantially parallel to a longitudinal axis of the conduit, each hydrocyclone separator having a tangential fluid inlet, an overflow fluid outlet and an underflow fluid outlet;
the first hydrocyclone separator and the second hydrocyclone separator being oppositely disposed with respect to each other with the underflow fluid outlet of the first hydrocyclone separator being spaced immediately adjacent to the tangential fluid inlet of the second hydrocyclone separator and the overflow fluid outlet of the first hydrocyclone separator being spaced immediately adjacent the underflow fluid outlet of the second hydrocyclone separator; and
a curved flow direction conduit extending tangentially from the underflow fluid outlet of the first hydrocyclone separator to the tangential fluid inlet of the second hydrocyclone separator to preclude remixing of differing density components.

4,927,537
TAPE DRIVE WITH SELF-EXPANDING COILS FOR SLUDGE COLLECTOR
Charles L. Meurer, Golden, Colo., assignor to Envirotech Corporation, Salt Lake City, Utah
Filed Mar. 9, 1989, Ser. No. 321,440
Int. Cl.[5] B01D *21/20;* **F16H** *29/02;* **B66D** *1/26*
U.S. Cl. 210—527 **4 Claims**

1. An apparatus for taking up and paying out opposite first and second ends of loop of a metal tape, said tape having an intermediate section, comprising:
first reel means connected to said first end for carrying a first coil of said tape, said first coil extending from said first reel means and being self-expanding so as to unwind itself from said first reel means;
second reel means connected to said second end for carrying a second coil of said tape, said second coil extending from said second reel means and being self-expanding so as to unwind itself from said second reel means;
common means connected to both said first and second reel means for supporting both said first and second reel means for rotation in the same direction;
means for guiding said intermediate section of said tape from said first reel means to said second reel means; and
means for rotating said supporting means in a first rotary direction so that said first coil tends to unwind from said



first reel means and said second coil is wound up on said second reel means to move said intermediate section of said tape toward said second reel means and to draw said tape from said first coil, said rotating means being effective to rotate said supporting means in a second rotary direction so that said second coil tends to unwind from said second reel means and said first coil is wound up on said first reel means to move said intermediate section of said tape toward said first reel means and to draw said tape from said second coil.

4,927,538
PURIFICATION OF C.I. SOLVENT BLACK 3
Hisashi Senshu, Machida, and Masahiro Otsuka, Osaka, both of Japan, assignors to Orient Chemical Industries, Ltd., Osaka, Japan
Filed Apr. 28, 1989, Ser. No. 344,372
Claims priority, application Japan, May 6, 1988, 63-110978
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—634 **8 Claims**

1. A process for purifying C.I. Solvent Black 3 comprising dissolving C.I. Solvent Black 3 in an organic solvent selected from the group consisting of aromatic hydrocarbons having 6 to 12 carbon atoms, petroleum hydrocarbons having 6 to 10 carbon atoms and mixtures thereof to form a solution, filtering said solution, and removing said solvent from the filtrate resulting from the filtering.

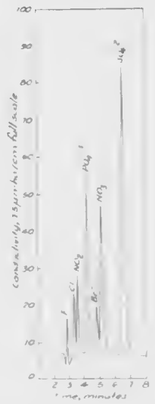
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4,927,539

HIGH PERFORMANCE ANION-EXCHANGE CHROMATOGRAPHIC PACKING COMPOSITION CONSISTING OF LOW POROSITY SYNTHETIC RESIN GEL PARTICLE SUBSTRATE COATED WITH LIQUID WATER-SOLUBLE AMINATED RESIN

Timothy S. Stevens; Martin A. Langhorst, and Osro W. Randall, III, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 490,268, May 2, 1983, abandoned. This apolication Oct. 24, 1988, Ser. No. 262,074
Int. Cl.[5] B01D *15/08*; C08D *5/20*
U.S. Cl. 210—635 6 Claims



1. A chromatographic analytical column, the column containing a packed bed of an anion-exchange chromatographic packing which comprises:

a substrate which consists essentially of insoluble synthetic resin particles of the low porosity gel type, having cation-exchanging sites at least on their available surfaces, the particles being of a diameter of between 1 to about 75 microns; and

a chromatographically active anion-exchange liquid coating irreversibly attached to the available surfaces of the substrate particles, the liquid coating consisting essentially of hydrophilic, water soluble, film forming aminated resin having anion-exchanging sites which attract available cation-exchanging sites of the substrate, wherein the liquid coating is retained by electrostatic bonds on the available surfaces of the substrate particles.

4,927,540

IONIC COMPLEX FOR ENHANCING PERFORMANCE OF WATER TREATMENT MEMBRANES

Ritchie A. Wessling, Midland; Sharon S. Whipple, Sanford, and Richard F. Fibiger, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 903,640, Sep. 4, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 185,323
Int. Cl.[5] B01D *13/00, 13/01*
U.S. Cl. 210—638 17 Claims

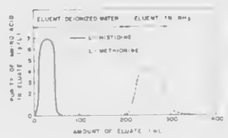
1. An improved reverse osmosis membrane comprising a semipermeable reverse osmosis membrane having a first discriminating layer as a supporting surface and affixed to the supporting surface is a second thin film layer comprising an ionic complex of a first compound bearing at least one quaternary ammonium, imidazolinium or pyridinium group and a second compound bearing at least one carboxylate, phosphonate or sulfonate group, with the proviso that at least one of the first and second compounds is a polymer or prepolymer and also bears an average of more than one ionic group per molecule.

4,927,541

PROCESS FOR REFINING AMINO ACIDS

Masaaki Matsuda, and Yuji Yoshida, both of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 3, 1989, Ser. No. 332,172
Claims priority, application Japan, Apr. 8, 1988, 63-87551
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—656 6 Claims



1. A process for separating and refining a first amino acid away from at least one other amino acid, which process comprises:

(i) contacting a chelate resin having aminocarboxylic acid groups or aminophosphonic acid groups coordinated with metal ions, with an aqueous solution containing said first amino acid and said at least one other amino acid under conditions such that said first amino acid and said at least one other amino acid are adsorbed on said chelate resin, and

(ii) successively eluting said first amino acid and said at least one other amino acid from said chelate resin with an eluent.

4,927,542

ELIMINATION OF HYDROXYLAMMONIUM SALTS FROM WASTEWATERS CONTAINING SUCH SALTS

Hugo Fuchs, Lugwigshafen, and David Agar, Rimbach, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 19, 1989, Ser. No. 410,044
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1988, 3834050
Int. Cl.[5] C02F *1/58*
U.S. Cl. 210—711 4 Claims

1. A process for eliminating hydroxylammonium salts from wastewaters containing such salts, which comprises treating a wastewater containing hydroxylammonium salts with not less than 0.5 mole of manganese(IV) oxides per mole of hydroxylamine in the form of hydroxylammonium salts at a pH of from 1 to 4 and at from 10 to 100° C.

4,927,543

METHOD AND INSTALLATION FOR TREATING LIQUID BY SEDIMENTATION USING FINE SAND

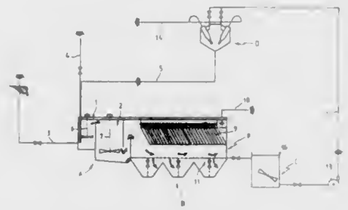
Guy P. Bablon, Felicherolles, and Gilbert Desbos, Maisons Laffitte, both of France, assignors to Omnium de Traitements et de Valorisation (OTV), Cedex, France

Filed Feb. 14, 1989, Ser. No. 310,204
Claims priority, application France, Feb. 25, 1988, 88 02288
Int. Cl.[5] B01D *21/08*
U.S. Cl. 210—711 20 Claims

1. A method for liquid treatment by sedimentation comprising the steps of:

injecting reagents into a flow of untreated liquid and creating in said flow a colloid mixing and destabilization area where said flow is made turbulent and where insoluble granular material denser than said liquid is injected into said liquid in predetermined proportions;

passing said liquid flow with said insoluble granular material into an intermediate colloid aggregation area where turbulence is induced to maintain said insoluble granular material in suspension,



passing said turbulent liquid flow together with substantially all of said granular material into a sedimentation area equipped with separator plates and removing clarified liquid from said separator plates; and

removing from the sedimentation area sludge formed therein including said insoluble granular material, recovering said insoluble granular material from said sludge, and cleaning and recycling said granular material.

4,927,544

PROCESS FOR THE CONTINUOUS REMOVAL OF A GUM PHASE FROM TRIGLYCERIDE OIL

Martin van Opstal, Izegem; Frans Dewulf, Lauwe; Bernard Cleenewerck, Wachtebeke, all of Belgium, and Ernst Weber, Oelde, Fed. Rep. of Germany, assignors to N.V. Vandemoortele International, Kortrijk, Belgium

Filed Mar. 14, 1989, Ser. No. 322,860
Claims priority, application European Pat. Off., Jul. 6, 1988, 88110751.0
Int. Cl.[5] B01D *21/26*
U.S. Cl. 210—712 8 Claims

1. A process for the continuous removal of a gum phase from triglyceride oil comprising the following stages:

(a) in a first stage the oil containing a separate gum phase is subjected to centrifugal separation in a first centrifugal separator to yield gums with low oil content and an oil that still contains a fraction of the gums originally present in the feed;

(b) in a second stage the oil obtained from stage (a) is subjected to centrifugal separation in a second centrifugal separator to yield oil with a further reduced residual gum content and a gum phase with a higher oil content than the gums obtained in stage (a);

(c) in a third stage the gum phase obtained in stage (b) is recycled into the oil stream fed to the first centrifugal separator; and

(d) optionally in a fourth stage the oil obtained in stage (b) is washed one or more times with water.

4,927,545

METHOD AND APPARATUS FOR AUTOMATIC PROCESSING AND ANALYZING OF BLOOD SERUM

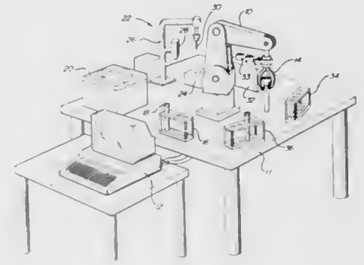
Edward T. Roginski, Hamtramck, Mich., assignor to Medical Automation Specialties, Inc., Detroit, Mich.

Filed Oct. 6, 1988, Ser. No. 254,420
Int. Cl.[5] B01D *21/26*
U.S. Cl. 210—745 17 Claims

1. The method of inspecting centrifuged test tubes containing whole blood and separator wax, that have been centrifuged to produce separation of the blood into red cells and serum, comprising:

moving the test tube into an optical sensing unit having at least one light beam extending generally normally to the longitudinal axis of the tube;

positioning at least one photosensor in said optical sensing unit to receive the light beam transmitted through the tube; and



analyzing electrical signals generated by the photosensor to: (a) evaluate the success of the separation; and (b) determine the position of the boundary surface between the separator wax and the blood serum.

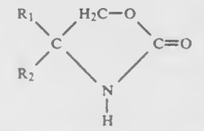
4,927,546

METHOD FOR INHIBITING GROWTH OF ALGAE IN RECREATIONAL WATER

Charles R. Wiedrich, Wadsworth, Ohio, and Edward J. Sare, Berkeley Heights, N.J., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 28, 1988, Ser. No. 276,728
Int. Cl.[5] C02F *1/76*
U.S. Cl. 210—755 11 Claims

1. A method for inhibiting the growth of algae in a stored body of water in the absence of algicidal amounts of free available halogen, which comprises providing in said body of water from about 0.05 to 4.5 ppm of a 2-oxazolidinone and a sufficient amount of a source of halogen to provide from about 0.03 to about 2.8 ppm respectively of combined available halogen based on the corresponding halogen-containing, 2-oxazolidinone, said halogen being selected from the group consisting of chlorine and bromine, said 2-oxazolidinone being represented by the graphic formula:



wherein R_1 is a C_1–C_4 alkyl; R_2 is selected from the group consisting of C_1–C_4 alkyl, hydroxy, hydroxymethyl, C_1–C_4 alkoxy and —Ph—R, wherein Ph is phenylene and R is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy and hydroxy.

4,927,547

METHOD OF FILTERING THE EFFLUENT FROM A WIRE EDM PROCESS

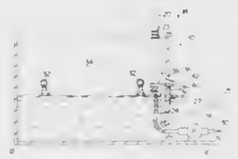
Sune Backman, Götavägen 10B, Djursholm S-182 61, Sweden

Filed Oct. 26, 1988, Ser. No. 262,775
Int. Cl.[5] B01D *23/24*
U.S. Cl. 210—771 16 Claims

1. A method for removing impurities from a liquid-solid effluent generated in an electric discharge machining process, said method comprising the steps of:

VOL 1114 ISS 4 MY 22 1990 UMI

(a) providing at least one filter apparatus, comprising at least one filtering means for separating at least a portion of said impurities from said effluent, said filter apparatus being oriented in an operating position wherein said filtering means is at least partially immersed in said effluent, and said filter apparatus being mounted for movement between said operating position and a cleaning position in which said filtering means is not immersed in said effluent;
(b) providing said effluent from said electric discharge machining process to said filter apparatus;



(c) filtering at least a portion of said impurities from said effluent by drawing at least a portion of said effluent, in a filtering direction, through said filtering means, thereby forming a liquid filtrate;
(d) moving said filter apparatus to said cleaning position; and
(e) backflushing a medium, comprising said liquid filtrate, through said filtering means in a cleaning direction which is opposite to said filtering direction, said backflushing being conducted at an elevated pressure greater than atmospheric pressure, thereby removing at least a portion of the impurities from said filtering means.

4,927,548

PROCESS FOR THE PRODUCTION OF BASIC SOAPS OF DIVALENT METALS IN POWDER FORM

Albrecht Hirsch, Bremerhaven, and Erwin Fleischer, Schiffdorf, both of Fed. Rep. of Germany, assignors to Neynaber Chemie GmbH, Loxstedt, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 315,963
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806192
Int. Cl.[5] C10M *129/26*
U.S. Cl. 252—17 7 Claims

1. A process for the production of powdered basic metal soaps having a composition corresponding to the formula $(MO)_n{\cdot}M(RCOO)_2$, wherein MO represents a metal oxide selected from the group consisting of CaO, ZnO, MgO, BaO, and PbO, or a mixed oxide selected from the group consisting of PbO/CaO, CaO/ZnO, BaO/CdO, and BaO/ZnO; M represents a divalent metal cation or mixture of metal cations corresponding to the metal content of MO; the group RCOO represents the anions of a fatty acid containing 8 to 34 carbon atoms or of a mixture of such fatty acids; and n has a value of 0.2 to 2; said process comprising mechanically mixing in a reactor:
(a) powdered solid fatty acids having the formula RCOOH, in which RCOO is as defined above;
(b) powdered metal oxides or metal oxide mixtures having the formula MO, or the corresponding powdered metal hydroxides or metal hydroxide mixtures; and
(c) a component selected from the group consisting of:
(i) about 0.1 to about 5% by weight of water, ethanol, or a mixture of water and ethanol;
(ii) about 0.1 to about 1% by weight of a secondary acid having a first ionization product constant of at least 10^{-5}; and
(iii) both (i) and (ii),
said % by weight being referred to the combined total weight of components (a), (b), and (c) of the mixture;
the relative amounts of components (a) and (b) being such as to provide after reaction the proper stoichiometric amounts corresponding to said formula $(MO)_n{\cdot}M(RCOO)_2$; said mixing being performed at a temperature between ambient temperature and about 100° C. and under a pressure not greater than the ambient pressure; the reaction mixture being present in the form of discrete, free-flowing particles throughout the entire process.

4,927,549

LUBRICANT OF LUBRICATING OIL BASIS FOR LUBRICATING ROTATING AND/OR SLIDING SURFACES AND PROCESS FOR PREPARING SAME

József Harsányi, Budapest; László Kohányi, Százhalombatta; Károly Domsa, Budapest; Lajos Szakács, Budapest; Géza Szentgyörgyi, Budapest, and Aladár Imre, Budapest, all of Hungary, assignors to Egis Gyogyszergyar, Budapest, Hungary

Filed Jun. 9, 1988, Ser. No. 204,254
Int. Cl.[5] C10M *125/10*
U.S. Cl. 252—25 6 Claims

1. Lubricant of lubricating oil basis for lubricating rotating and/or sliding surfaces, which comprises, beside the usual additives of lubricating oils, 0.01 to 0.3 g/l of aluminium oxide powder consisting of particles of 0.1 to 4 μm in size.

4,927,550

CORROSION PREVENTIVE COMPOSITION

John A. Cutcher, Westmont, and Gary M. Andrews, Chicago Ridge, both of Ill., assignors to Castrol Industrial Inc., Chicago, Ill.

Filed Jan. 27, 1989, Ser. No. 302,478
Int. Cl.[5] C10M *137/02, 129/40*
U.S. Cl. 252—32.5 58 Claims

1. An aqueous alkaline metalworking fluid composition in the form of a concentrate comprising:
a salt of orthophosphoric acid;
a dibasicdioic acid in an amount of up to about 5.0% by weight of the concentrate;
a chelating agent; and,
a neutralizing base,
said composition being essentially free of phosphates.

4,927,551

LUBRICATING OIL COMPOSITIONS CONTAINING A COMBINATION OF A MODIFIED SUCCINIMIDE AND A GROUP II METAL OVERBASED SULFURIZED ALKYLPHENOL

Timothy R. Erdman; Michael A. Shippey, and Robert H. Wollenberg, all of San Rafael, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 139,513, Dec. 30, 1987, abandoned, which is a continuation of Ser. No. 921,719, Oct. 21, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 339,465
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[5] C10M *141/06, 133/44*
U.S. Cl. 252—42.7 10 Claims

1. A lubricating oil composition comprising an oil of lubricating viscosity and (a) from about 0.2 to about 10 percent by weight of a polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with a hydroxyhydrocarbyl oxycarbonyl group wherein the hydroxyhydrocarbyl oxycarbonyl group contains from 2 to 20 carbon atoms and 1 to 6 hydroxy groups with the proviso that there is no hydroxy substitution on the hydrocarbyl carbon atom attaching the hydroxyhydrocarbyl group to the oxy atom of the oxycarbonyl group and with the further proviso that when more than one hydroxy group is contained in the hydroxyhydrocarbyl group, no more than one hydroxy is attached to the same carbon atom and the number of carbon atoms in the hydroxyhydrocarbyl group is minimally one

greater than the number of hydroxy groups; and (b) from about 0.5 to about 40 percent by weight of a Group II metal overbased sulfurized alkylphenol.

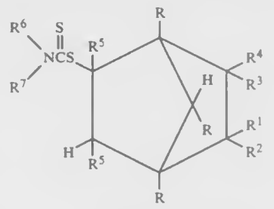
4,927,552

LUBRICATING OIL COMPOSITION

William Y. Lam, Ballwin, Mo., assignor to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Division of Ser. No. 189,101, May 2, 1988, Pat. No. 4,876,375. This application Jul. 17, 1989, Ser. No. 380,464
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[5] C10M *135/18*
U.S. Cl. 252—47 9 Claims

1. A lubricating composition containing a major amount of lubricating oil and a minor antiwear-antioxidant amount of an additive compound having the general formula:



(A)

wherein:
a. each of R, R^2 and R^4 when taken singly is a hydrogen atom, an alikyl group containing from 1 to about 15 carbon atoms, an aryl group containing from 6 to about 15 carbon atoms or a cycloalkyl group containing from 4 to about 10 carbon atoms;
b. each of R^1 and R^3 when taken singly is a hydrogen atom, an alkyl group containing from 1 to about 15 carbon atoms; an aryl group containing from 6 to about 15 carbon atoms; a cycloalkyl group containing from 4 to about 10 carbon atoms or an alkenyl group containing from 2 to about 10 carbon atoms or R^1 and R^3 taken together form the group —CHYCY=CY— in which Y is a hydrogen atom or a methyl group or R^1 together with R^2 form an alkylidene group containing from 1 to about 6 carbon atoms;
c. R^5 is a hydrogen atom or an alkyl group containing from 1 to about 15 carbon atoms;
d. R^6 is an organic radical selected from an alkyl group, an alkenyl group, an aryl group or an aralkyl group in which the aikyl or alkenyl groups contain up to 32 carbon atoms and the aryl or aralkyl groups contain up to 15 carbon atoms each; and
e. R^7 is hydrogen or an organic radical selected from an alkyl group or alkenyl group, an aryl or aralkyl group in which the alkyl or alkenyl groups contain up to 32 carbon atoms and the aryl or aralkyl groups contain up to 15 carbon atoms each.

4,927,553

HAZE-FREE BORONATED ANTIOXIDANT

William E. Wright, Farmington Hills; Bryan T. Davis, West Bloomfield, both of Mich.; Donald S. Matteson, Moscow, Id., and Gordon G. Knapp, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed May 6, 1983, Ser. No. 492,354
Int. Cl.[5] C10M *141/02*
U.S. Cl. 252—49.6 3 Claims

1. A hydrolytically stable additive composition comprising about 75–99.5 parts by weight of a boronated phenolic antioxidant which is a mixture of about 0–50 weight percent 4,4'-methylenebis(2,6-di-tert-butylphenol); about 10–75 weight percent 4,4'-methylenebis(2,6-di-tert-butylphenol)-di-(di-sec-butyl orthoborate); and about 25–75 weight percent 4,4'-methylenebis(2,6-di-tert-butylphenol)-mono-(di-sec-butyl orthoborate), said boronated phenolic antioxidant being subject to hydrolysis in the presence of moisture and, to prevent or correct haze or film formation in said boronate phenolic antioxidant due to said hydrolysis, about 0.5–25 parts by weight of pinane diol or pinacol.

4,927,554

LIQUID COMPOSITIONS CONTAINING ORGANIC SULFONES AND SULFOXIDES

Scott T. Jolley, Mentor, and Mary F. Salomon, Cleveland Hts., both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Nov. 10, 1988, Ser. No. 269,622
Int. Cl.[5] C09K *5/00*; C10M *105/72, 135/08*
U.S. Cl. 252—68 14 Claims

1. A liquid composition comprising
(A) a major amount of a fluorine containing hydrocarbon containing one or two carbon atoms, and
(B) a minor amount of a soluble organic lubricant free of acetylenic and aromatic unsaturation and comprising at least one sulfone or sulfoxide characterized by the formulae

$$R^1(R^2)SO_2 \quad (I)$$

$$R^1(R^2)SO \quad (II)$$

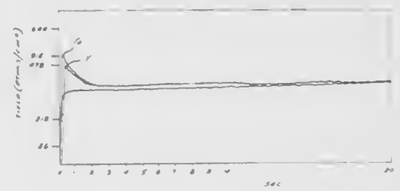
wherein R^1 and R^2 are each independently hydrocarbyl groups, $—R^3O(O)CR^4$, $—NR^4R^5$ or $—R^3NR^4R^5$ groups wherein R^3 is a hydrocarbylene group, and R^4 and R^5 are each independently hydrocarbyl groups, or R^1 and R^2 are hydrocarbylene groups joined together to form a cyclic moiety including the sulfur atom, or R^1 is a hydrocarbyl group and R^2 is OR^6 wherein R^6 is a hydrocarbyl group.

4,927,555

PROCESS FOR MAKING THIXOTROPIC DETERGENT COMPOSITIONS

Remo J. Colarusso, Jr., Wayne, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 928,736, Nov. 10, 1986, abandoned, which is a continuation of Ser. No. 640,484, Aug. 13, 1984, abandoned. This application Jul. 26, 1988, Ser. No. 225,617
Int. Cl.[5] C11D *1/24*
U.S. Cl. 252—99 18 Claims



1. A process for making an aqueous thixotropic dishwasher detergent composition comprising by weight:
(a) 8 to 35% alkali metal tripolyphosphate,
(b) 2.5 to 20% alkali metal silicate,
(c) 0 to 9% alkali metal carbonate,
(d) 0.1 to 5% chlorine bleach stable, water dispersible organic detergent active material,
(e) 0 to 5% chlorine bleach stable foam depressant,
(f) chlorine bleach compound in an amount to provide about 0.2 to 4% of available chlorine,
(g) thixotropic clay thickener in an amount sufficient to

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provide the composition with a thixotropy index of about 2.5 to 10.0, and

(h) 40 to 50% water; said process comprising the steps of:

1. mixing water containing dissolved alkali metal carbonate with a sufficient amount of alkali metal tripolyphosphate detergent builder salt to obtain a viscous mixture having a viscosity of 20,000 to 60,000 centipoises,
2. subjecting said viscous mixture to high speed dispersing to effect wet grinding of said builder salt to a particle size of less than about 40 microns,
3. adding a sufficient amount of water to reduce the viscosity of the wet ground mixture to less than 10,000 centipoises,
4. high speed dispersing said wet ground mixture while adding powdered clay thickener to obtain a homogeneous and smooth viscous mixture, and
5. adding to the smooth viscous mixture the remaining ingredients so as to produce the thixotropic detergent composition.

4,927,556

AQUEOUS BASED COMPOSITION CONTAINING DIBASIC ESTER AND THICKENING AGENT FOR REMOVING COATINGS

Richard J. Pokorny, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 164,231, Mar. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 58,162, Jun. 4, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 260,172

Claims priority, application Australia, Apr. 28, 1988, 15253/88; European Pat. Off., May 11, 1988, 88304241.8; Japan, Jun. 3, 1988, 63-137163; Rep. of Korea, Jun. 3, 1988, 88-6758

Int. Cl.[5] **C11D** *7/26*

U.S. Cl. 252—173 **18 Claims**

16. A thixotropic emulsion composition consisting essentially of:

(1) at least one dibasic ester in an amount sufficient to render organic polymeric coatings removable from surfaces;

(2) water in an amount exceeding 55 percent by weight of the composition; and

(3) at least one thickening agent selected from the group consisting of water soluble and water swellable thickening agents in an amount sufficient to form a stable thixotropic emulsion having the ability to cling to vertical surfaces.

4,927,557

PROCESS FOR FORMING FLAKES

Jack W. Revis; John A. Sagel, both of Cincinnati, and Daniel I. Ostendorf, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 182,265, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 46,596, May 5, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,692

Int. Cl.[5] **C11D** *17/06;* **B29B** *9/04;* **B02C** *11/02*

U.S. Cl. 252—174.15 **19 Claims**

1. A process for forming solid flakes comprising cooling a thin film of a molten, water-soluble or water dispersible, non-hygroscopic plastic organic material on a belt cooler, the surface of said belt cooler having been wetted by spraying, dripping, or wiping on a thin film of a hydrophilic solvent, so as to improve the rate of cooling and solidification of said organic material.

4,927,558

PROTEOLYTIC DETERGENT ADDITIVE AND COMPOSITIONS CONTAINING THE SAME

Dorrit A. Aaslyng, Roskilde; Georg W. Jensen, Bagsvaerd; Ib Schneider, Hellerup, and Palle Schneider, Ballerup, all of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

PCT No. PCT/DK87/00145, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO88/03946, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 25, 1987, Ser. No. 223,787

Claims priority, application Denmark, Nov. 25, 1986, 5640/86

Int. Cl.[5] **C11D** *3/386, 7/42;* **C12N** *9/50, 9/58*

U.S. Cl. 252—174.12 **14 Claims**

1. A proteolytic detergent additive comprising a combination of at least two alkaline proteases, of which one is a protease obtainable from *Bacillus sp.* and one is a fungal or actinomycete protease the Bacillus protease providing from 50 to 95% of the total proteolytic activity CPU in the detergent additive, the detergent additive comprising a non-dusting granulate or a stabilized liquid having a total protease activity from 0.1 to 10 CPU/g.

4,927,559

LOW PERBORATE TO PRECURSOR RATIO BLEACH SYSTEMS

Joshua Schwarz, Brooklyn, N.Y., and Christine Accardi, Lodi, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 14, 1988, Ser. No. 181,288

Int. Cl.[5] **D06L** *3/02;* **C11D** *3/39*

U.S. Cl. 252—186.39 **6 Claims**

1. A bleaching composition to be added to an aqueous medium comprising:

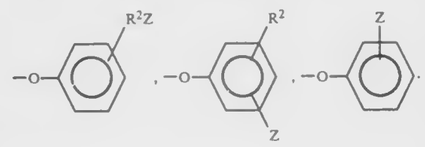
(i) a peroxygen bleaching compound capable of yielding hydrogen peroxide in said aqueous media; and

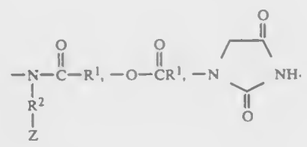
(ii) one or more bleach precursors having the general formula:

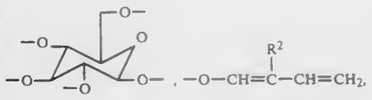


(I)

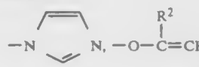
wherein R is an aromatic or substituted aromatic radical with a total of 6 to about 18 carbon atoms, L is a leaving group, wherein a conjugate acid of an anion formed on L has a pK_a in the range of from about 4 to about 13; and L is selected from the group consisting of:







-continued



and mixtures thereof: wherein R^1 is an alkyl group containing from 5 to about 17 carbon atoms and wherein R^2 is an alkyl chain containing from about 1 to about 8 carbon atoms, R^3 is H or R^2, and Z is H or a solubilizing group; and

wherein the peroxygen bleaching compound relative to the precursor is present in a molar ratio that ranges from 0.1 to 1, and the pH of the aqueous media ranges from 8.5 to 9.4.

4,927,560

METHOD FOR PRODUCTION OF INORGANIC MINUTE GLOBULAR PARTICLES

Shigemi Osaka; Kazuo Hata, and Tsukasa Takahashi, all of Himeji, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 24, 1988, Ser. No. 159,889

Claims priority, application Japan, Feb. 25, 1987, 62-40085; Feb. 27, 1987, 62-42750; Jul. 10, 1987, 62-170868

Int. Cl.[5] **C04B** *33/00*

U.S. Cl. 252—315.1 **21 Claims**

1. A method of producing inorganic minute globular particles comprising, forming a W/O sol emulsion by mixing (1) at least one metal oxide-containing sol selected from the group consisting of (a) metal oxide sols and (b) mixed sols containing said metal oxide sols and an inorganic compound, an alkoxide, or a sol of at least one other element, with (2) an organic solvent, insoluble or sparingly soluble in water, in the presence of a surfactant; mixing said emulsion with a basic substance or an electrolyte to convert said sol forming the water layer in said emulsion into gel to provide globular gel particles; and subsequently heating said globular gel particles to expel water in said globular gel particles in the form of a mixture thereof with said organic solvent.

4,927,561

MULTIFUNCTIONAL ANTIFOULANT COMPOSITIONS

David R. Forester, The Woodlands, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 944,159, Dec. 18, 1986, Pat. No. 4,775,458.

This application Jun. 17, 1988, Ser. No. 208,204

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[5] **C23F** *11/10*

U.S. Cl. 252—389.22 **22 Claims**

1. Composition for controlling the formation of fouling deposits in a hydrocarbon medium during processing thereof at elevated temperatures comprising:

an ester of a polyalkenylthiophosphonic acid processed via steam hydrolysis and methanol extraction and at least one additional antifouling component selected from the group consisting of:

(1) an effective antioxidant compound or compounds adapted to inhibit oxygen based polymerization of said hydrocarbon medium, selected from the group consisting of: phenylenediamine compounds, substituted phenolic compounds, quinone or derivatives thereof and phenothiazine or derivatives thereof,

(2) a corrosion inhibiting compound or compounds to reduce corrosion of metallic surfaces in contact with said hydrocarbon medium during processing thereof, selected from the group consisting of: tetrahydropyrimidenes, imidazolines, reaction products of alkylene polyamines, aliphatic carboxylic acids and paraformaldehyde, magnesium, calcium or amine sulfonates and reaction products of ethylene oxide or propylene oxide and alkylphenol, and

(3) a metal deactivator compound or compounds adapted to complex with metallic impurities in said hydrocarbon medium selected from the group consisting of: N,N'-disalicylidene-1,2-cyclohexanediamine, 2,5-dimercapto-1,3,4-thiadiazole or derivatives thereof, and Mannich reaction products of alkylphenol, aldehyde and a polyamine.

4,927,562

ELASTOMER-COMPATIBLE OXALIC ACID ACYLATED ALKENYLSUCCINIMIDES

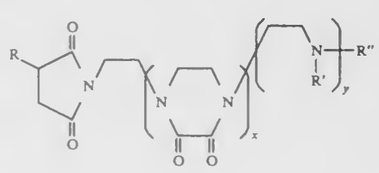
Thomas J. Karol, and Theodore E. Nalesnik, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 495,295, May 16, 1983, abandoned. This application Oct. 24, 1988, Ser. No. 246,043

Int. Cl.[5] **C10M** *133/44;* **C07D** *207/40*

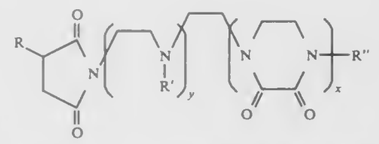
U.S. Cl. 252—51.5 A **14 Claims**

1. A compound of the formula:



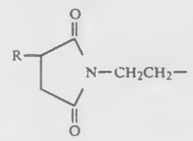
(I)

or



(II)

in which R is a hydrocarbyl radical having from 8 to 400 carbon atoms, "X is a number ranging from 1 to 6, Y is a number ranging from 0 to 6," whose additive total is from 1 to 6, R' is hydrogen or a mono-, or bi-acyl radical of oxalic acid, and R" is a hydrogen or hydrocarbyl substituted succinic-N-ethylene radical of the formula



4,927,563

ANTIDANDRUFF SHAMPOO COMPOSITIONS CONTAINING A MAGNESIUM ALUMINUM SILICATE-XANTHAN GUM SUSPENSION SYSTEM

Patrick C. McCall, Cincinnati, Ohio, assignor to Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 26, 1988, Ser. No. 148,728

Int. Cl.[5] **A61K** *7/075*

U.S. Cl. 252—551 **7 Claims**

1. A lotion shampoo composition comprising:

(a) from about 10% to about 30% of a synthetic surfactant selected from the group consisting of anionic surfactant, zwitherionic surfactants, amphoteric surfactants and mixtures thereof;

(b) from about 0.1% to about 5.0% of selenium sulfide having an average particle size of less than about 25 μm;

(c) from about 0.02% to about 0.40% of a xanthan gum;

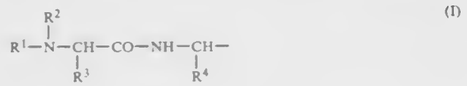
(d) from about 0.5% to about 2.0% of a magnesium aluminum silicate; and
(e) the remainder water.

4,927,564
METHOD FOR CONDITIONING RADIOACTIVE OR TOXIC WASTES IN THERMOSETTING RESINS
André Barlou, La Tour D'Algues; Alexandre Beltritti, Manosque; Patrick Grandondi, Saint Cannat, and Hugues Vidal, Pertuis, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Nov. 17, 1988, Ser. No. 272,716
Claims priority, application France, Nov. 23, 1987, 87 16199
Int. Cl.[5] G21F 9/16; C08F 8/32
U.S. Cl. 252—628 10 Claims

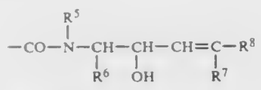
1. A method for conditioning in a thermosetting resin a quantity of radioactive or toxic waste stored in water, said resin being curable by the liquid hardening agent which is immiscible with water and has a density greater than that of water, comprising the sequential steps of:
(a) addition and mixing of the liquid hardening agent with the waste stored in the water,
(b) decantation of the waste with the liquid hardening agent,
(c) extraction of the water present above the liquid hardener agent in which the waste is transferred, and
(d) mixing of the waste transferred into the liquid hardening agent with the thermosetting resin.

4,927,565
5-SUBSTITUTED AMINO-4-HYDROXY-PENTENOIC ACID DERIVATIVES AND THEIR USE
Seiichi Tanaka, Tokyo; Yutaka Koike, Koshigaya; Masato Nakano, Tokyo; Shugo Atsumi, Tokyo; Hajime Morishima, Tokyo, and Kenji Matsuyama, Kashiwa, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan
Filed Dec. 16, 1987, Ser. No. 133,642
Claims priority, application Japan, Dec. 19, 1986, 61-301596
Int. Cl.[5] C09F 5/00, 5/06
U.S. Cl. 260—404.5 11 Claims

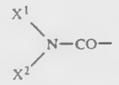
1. A compound or its salt represented by the formula:



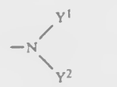
(I)



wherein each of R^1 and R^2 which may be the same or different is a hydrogen atom, a lower alkyl group, an aralkyl group, a lower alkoxycarbonyl group, an aryloxycarbonyl group, an aralkyloxycarbonyl group or a lower alkanoyl group which may be substituted by from one to three substituents selected from the group consisting of an amino group, a hydroxyl group, a carboxyl group, an aryloxy group, an aralkyloxycarbonylamino group, a lower alkoxycarbonylamino group and a



group (wherein each of X^1 and X^2 which may be the same or different is a hydrogen atom, a lower alkyl group, an aryl group or an aralkyl group, or X^1 and X^2 form together with the adjacent nitrogen atom a 5- or 6-membered heterocyclic group which may further contain a hetero atom selected from the group consisting of a nitrogen atom, an oxygen atom and a sulfur atom) and which may further contain a double bond in its carbon chain, each of R^3, R^4 and R^6 which may be the same or different is a hydrogen atom, a lower alkyl group, a cycloalkyl group, a cycloalkylalkyl group, an aryl group, an aralkyl group or a residue of an acidic, neutral or basic amino acid, R^5 is a hydrogen atom or a lower alkyl group, R^7 is a hydrogen atom, a lower alkyl, cycloalkyl, cycloalkylalkyl or aralkyl group which may be substituted by one or two hydroxyl groups or a residue of an acidic, neutral or basic amino acid, and R^8 is a hydroxymethyl group or a —CO—R^9 group (wherein R^9 is a hydroxyl group, a —OY group (wherein Y is a lower alkyl group, an aryl group, an aralkyl group, a lower alkoxyalkyl group, a lower alkanoyloxyalkyl group, a lower akloxycarbonyloxyalkyl group, or a 1-phthalidyl group) or a



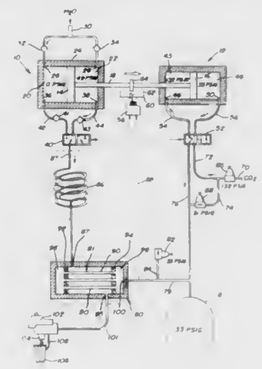
group (wherein each of Y^1 and Y^2 which may be the same or different is a hydrogen atom, a lower alkyl group, an aryl group, an aralkyl group or a cycloalkyl group, or Y^1 and Y^2 form together with the adjacent nitrogen atom a 5- or 6-membered heterocyclic group which may further contain a hetero atom selected from the group consisting of a nitrogen atom, an oxygen atom and a sulfur atom)).

4,927,556
OIL AND FAT RELEASE METHOD
Rathindra N. Roychoudhury, Marysville, Ohio, assignor to Nestec S.A., Vevey, Switzerland
Filed Jan. 12, 1988, Ser. No. 143,351
Int. Cl.[5] C09F 5/00; C11B 1/00
U.S. Cl. 260—412 10 Claims

1. A process for obtaining glycerol fatty acid esters from glycerol fatty acid ester-containing materials comprising:
adding water to glycerol fatty acid ester-containing materials for dissociating and releasing glycerol fatty acid esters from the materials into water for forming a liquid comprising water and the glycerol fatty acid esters;
absorbing the liquid with an inert absorbing substance;
drying the inert absorbing substance containing the liquid for removing the water from the inert absorbing substance;
extracting the esters from the dried inert absorbing substance with a solvent for obtaining the esters in the solvent; and
removing the solvent from the extracted esters.

4,927,567
MOTORLESS CONTINUOUS CARBONATOR
Arthur G. Rudick, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Jun. 23, 1989, Ser. No. 370,886
Int. Cl.[5] B01F 3/04
U.S. Cl. 261—35 16 Claims

1. A motorless carbonator for carbonated drink dispenser means, comprising:
a double acting water pump including a pair of pump chambers separated by a reciprocatory pumping member,
means for feeding still water alternately in and out of said pump chambers;
a double acting gas activated pump actuator including a pair of gas chambers separated by a reciprocatory actuator member powered by a differential gas pressure in said pair of gas chambers;
means for feeding carbonating gas alternately into said gas chambers at a relatively high pressure and out of said gas chambers at a relatively low pressure;
means for mechanically connecting said reciprocatory pumping member of said pump to said reciprocatory actuator member of said pump actuator;
a carbonator assembly including a plurality of hollow semi-permeable membrane fibers coupled to said relatively low pressure carbonation gas out of said gas chambers and being located in a housing having a still water input port and a carbonated water output port, and wherein said



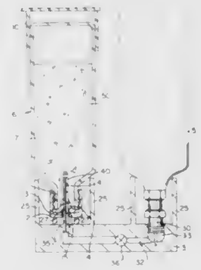
carbonating gas passes through said semi-permeable membrane fibers and dissolves into still water fed from said pump to said input port to form carbonated water which is fed to said output port; and
means connected to said output port of said carbonator assembly for feeding carbonated water to said drink dispensing means.

4,927,568
APPARATUS FOR AERATING WATER IN A CONTAINER
Daniel N. Campau, Grand Rapids, Mich., assignor to Flow-Rite Controls, Ltd., Grand Rapids, Mich.
Continuation-in-part of Ser. No. 196,025, May 19, 1988, Pat. No. 4,865,776. This application Aug. 31, 1989, Ser. No. 403,563
Int. Cl.[5] B01F 3/04
U.S. Cl. 261—36.1 4 Claims



1. An apparatus for aerating water in a livewell mounted within a fishing boat, said apparatus comprising:
a livewell receptacle having sidewalls and a bottom for holding water, said receptacle including a drair port adjacent its bottom, an overflow port in one of said sidewalls, and an inlet;
conduit means and pump means in communication with an external water supply for providing water to said inlet;
an aerator apparatus mounted in said conduit means externally of said receptacle, said aerator apparatus including a main flow passageway in communication with an air intake conduit having a free end located internally of said receptacle and in communication with the ambient atmosphere at a level above said overflow port;
means within said aerator apparatus for aspirating air through said air intake conduit and into the water flowing through said main flow passageway;
an inlet conduit connected to said aerator apparatus for receiving said water and aspirated air, said inlet conduit being mounted externally of said receptacle; and
a tangential discharge tube connected to said inlet conduit, said tangential discharge tube mounted in one of the sidewalls of said receptacle and adapted to direct said water and aspirated air into said receptacle; said tangential discharge tube having a free end positioned below the level of the overflow port.

4,927,569
CARBONATION APPARATUS WITH CO_2 INJECTION INTO SERVING VESSEL
Bruce R. Robinson, 458 Batts Neck Rd., Stevensville, Md. 21401
Filed Mar. 1, 1989, Ser. No. 317,628
Int. Cl.[5] B01F 3/04
U.S. Cl. 261—79.2 8 Claims



1. In a carbonation apparatus of the type comprising means for injecting CO_2 into liquid in an interior of an inverted serving vessel, said means including a nozzle for insertion into and through a self-sealing cap closing a lower end of said vessel, means mounting said nozzle in a vertical position in communication with a source of CO_2, said nozzle comprising a passage having a substantially vertically disposed axis and wherein the CO_2 flows through said passage in an axial direction in traveling from the source to the interior of the vessel and within the nozzle and entering the liquid substantially adjacent said cap, the improvement comprising means blocking vertical communication of said passage with the interior and wherein said nozzle further comprises at least first and second opposed CO_2 path means for communicating the passage to the interior of the vessel and each having an axis different from the axis of said passage, said path means being formed for imparting a force for directing injected CO_2 bubbles toward a helical path of travel.

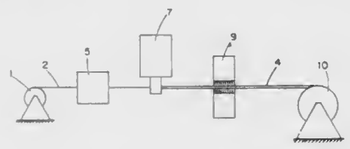
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4,927,570

METHOD FOR MANUFACTURING OPTICAL CABLES

Otto Breitenbach, Nuremberg; Helmar Hetz, Sulzbach-Rosenber; Friedemann Rous, and Josef Ottenreuther, both of Nuremberg, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 20, 1988, Ser. No. 260,297
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739879
Int. Cl.[5] G02B *6/22*
U.S. Cl. 264—1.4 5 Claims



1. Method for manufacturing an optical cable comprising the steps of:

continuously drawing a cable core in a longitudinal direction through a sheathing station for forming a sheath about said cable core, said cable core including at least one optical fiber for the provision of a continuous light transmission path, said forming of said sheath comprising the successive steps of winding at least one layer of a metallic band in an overlapping manner about said cable core and then forming a wire mesh of metallic wires about said metallic band, said metallic band and said wire mesh in combination comprising said sheath of said cable core;

continuously drawing the sheathed cable core in a longitudinal direction through a jacketing station for forming an outer jacket of halogen free, cross-linkable plastic material about said sheath; and

continuously drawing the sheathed and jacketed cable core in a longitudinal direction through an energy radiation source having a radiation penetration selected so as to extend into the outer jacket but not beyond the thickness thereof, for causing a cross-linking of said plastic material of said outer jacket.

4,927,571

PREPARATION OF INJECTABLE DOXORUBICIN/LIPOSOME SUSPENSION

Anthony H. Huang, Sunnyvale, and Satya Krishnan, Mountain View, both of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Filed May 18, 1987, Ser. No. 51,418
Int. Cl.[5] A61K *37/22, 45/05;* B01J *13/02*
U.S. Cl. 264—4.3 6 Claims

1. A method of preparing an injectable doxorubicin/-liposome suspension containing at least about 85% liposome-entrapped doxorubicin, comprising

reconstituting a dehydrated liposome composition characterized, in a pre-dehydration liposome dispersion, by:

a. liposome sizes predominantly in a selected size range between about 0.1 to 0.5 microns,

b. liposome-entrapped doxorubicin, in an amount which is at least about 90% of the total doxorubicin, and

c. between about 1% to 10% cryoprotectant, with an aqueous medium to a final liposome concentration of greater than about 100 mM lipid,

by said reconstituting, forming a liposome concentrate which shows substantially no increase in free doxorubicin when stored at 4° C for up to several months, and

diluting the reconstituted concentrate with an aqueous medium to a final liposome concentration suitable for intravenous injection.

4,927,572

METHOD OF MAKING A DECORATIVE PANEL WITH IMPROVED SURFACE CHARACTERISTICS

Johannes C. W. van der Hoeven, Horn, Netherlands, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 47,320, May 8, 1987, Pat. No. 4,801,495, which is a continuation of Ser. No. 734,148, May 15, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 244,005
Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418282
Int. Cl.[5] B29C *43/20*
U.S. Cl. 264—22 6 Claims

1. A method for producing a decorative panel, comprising the steps of:

providing an underlay;

applying to said underlay a decorative layer;

applying to said decorative layer a liquid coating consisting essentially of a radiation-polymerizable mixture;

applying radiation to form a radiation-polymerized layer on said decorative layer; and

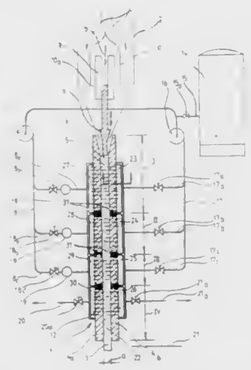
thermopressing said underlay, said decorative layer and said radiation-polymerized layer together under conditions of elevated temperature and pressure such that a scratch resistance of at least about 1.5 Newtons, as measured by DIN 53 799, part 10, is imparted to said radiation-polymerized layer.

4,927,573

PROCESS FOR THE PRODUCTION OF BUILDING UNITS FROM AFTERHARDING MATERIALS

Tibor Alpár; János Györvári, and Ernö Schmidt, all of Szombathely, Hungary, assignors to Fakombinat, Szombathely, Hungary

Filed Sep. 14, 1989, Ser. No. 407,430
Claims priority, application Hungary, Mar. 5, 1987, 2004/87
Int. Cl.[5] B28B *3/20;* B29C *47/00;* C04B *40/00*
U.S. Cl. 264—40.1 8 Claims



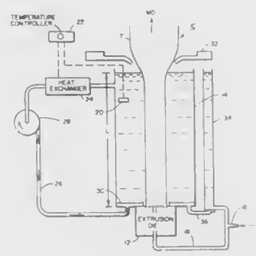
1. Process for the production of building units from an afterhardening mixture containing cement, additives and water as binding material, the process including the steps of admitting the afterhardening mixture into a die which has an inlet port for insertion of the afterhardening mixture and an outlet port for removal of the afterhardening mixture in compacted form, injecting CO_2 gas into the afterhardening mixture and bringing about a carbonation reaction with the afterhardening mixture, pressing the afterhardening mixture continuously in the die while injecting the CO_2 gas into the afterhardening mixture under pressure, controlling the injecting of the CO_2 gas so as to provide a greater amount of the gas flowing through the afterhardening mixture near the inlet port of the die as compared to the amount of the gas flowing through the afterhardening mixture near the outlet port, mechanically compacting the afterhardening mixture at the inlet port and faces of the die, and thereby forming a generally gastight seal between the afterhardening material and the die, controlling the injecting of the CO_2 gas into the die so that full completion or essentially full completion of the carbonation reaction occurs, and removing the afterhardening mixture in compacted form from the die and separating the afterhardening mixture in compacted form into the building units.

4,927,574

WATER BATH FILM COOLING APPARATUS AND METHOD

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corp., New York, N.Y.

Filed Dec. 21, 1988, Ser. No. 287,218
Int. Cl.[5] B29C *47/92*
U.S. Cl. 264—40.6 15 Claims



1. An apparatus for the production of a tubular thermoplastic film; comprising means for continuously extruding a seamless tube of molten film material in a generally upward direction; rapid quenching means for applying a liquid cooling medium to the external surface of said molten tubular film downstream of said extruding means; means for maintaining a pressure interiorly of said film tube during passage thereof through said liquid cooling medium; means for controlling the temperature of said liquid cooling medium; and means for maintaining a predetermined optimized pressure differential between the exterior of the film tube over the height of the liquid cooling medium and the interior of the film tube so as to thereby enhance the speed of cooling and increase the strength of the film material by minimizing the crystallinity thereof upon extrusion from said apparatus and passage through said quenching means.

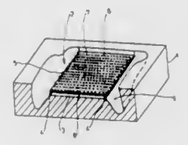
9. A method for the production of a tubular thermoplastic film; comprising continuously extruding a seamless tube of molten film material in a generally upwardly directed orientation;; applying a liquid cooling medium to the external surface of said molten tubular film downstream of said extruding means for rapidly quenching said molten material; maintaining a pressure interiorly of said film tube during passage thereof through said liquid cooling medium; controlling the temperature of said liquid cooling medium; and maintaining a predetermined optimized pressure differential between the exterior of the film tube over the height of the liquid cooling medium and the interior of the film tube so as to thereby enhance the speed of cooling and increase the strength of the film material by minimizing the crystallinity thereof subsequent to extrusion and during said rapid quenching.

4,927,575

PROCESS FOR PRODUCING FOAM CUSHIONS

Martin Brock, Cologne, and Pohlig Ralf, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 17, 1989, Ser. No. 339,452
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813587
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.4 6 Claims



1. In a process for producing a foam cushion having sections of different hardnesses using foam molding, comprising introducing a first reaction mixture into a mold cavity, introducing a second reaction mixture into the mold cavity, said second mixture already being in a creamed state, allowing the reaction mixtures to foam, and removing the resultant product from the mold cavity, the improvement wherein

(i) prior to the introduction of said first reaction mixture, a web with holes in it is clamped over a deepened section of the mold cavity to provide a space below said web and a remaining space above and to the sides of said web;

(ii) said first reaction mixture is fed onto said web, said first mixture being in a sufficiently liquid state such that it flows through said holes and into said space below said web; and

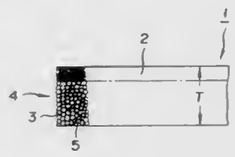
(iii) said second reaction mixture is fed into said space remaining above and to the sides of said web, said second mixture being sufficiently creamed up so that it does not flow through said holes in said second web.

4,927,576

METHOD FOR THE MANUFACTURE OF FLAT PERMEABLE MEMBRANE

Yukio Seita, Fuji, and Makoto Emi, Fujinomiya, both of Japan, assignors to Terumo Kabushiki Kaisha (Terumo Corporation), Tokyo, Japan

Division of Ser. No. 796,433, Nov. 8, 1985, Pat. No. 4,743,375. This application Jan. 21, 1988, Ser. No. 146,726
Claims priority, application Japan, Nov. 9, 1984, 59-236180; Aug. 29, 1985, 60-188480
Int. Cl.[5] B29C *67/20*
U.S. Cl. 264—49 16 Claims



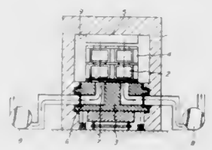
1. A method for the manufacture of flat permeable membrane, comprising the steps of:

mixing a polyolefin, an organic filler uniformly dispersible in said polyolefin in the molten state thereof, and crystal seed forming agent for said polyolefin;

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discharging the resultant mixture in the molten state thereof through a die;
bringing one surface of the discharged molten membrane into contact with a cooling roll thereby cooling and solidifying said membrane;
placing the cooled and solidified flat membrane into contact with an extractant capable of dissolving and extracting said organic filler and incapable of dissolving said polyolefin thereby extracting and removing said organic filler from said membrane; and
subjecting the cooled and solidified flat membrane in a fixed state in longitudinal and lateral directions to a heat treatment at a temperature 20° to 50° C. lower than the melting point of said polyolefin.

4,927,577
PROCESS FOR FIRING CERAMIC HONEYCOMB STRUCTURAL BODIES
Masashi Ohtaka, Mie, and Kazuhiro Miyahara, Nagoya City, both of Japan, assignors to NGK Insulators, Ltd., Japan
Filed Feb. 22, 1988, Ser. No. 158,670
Claims priority, application Japan, Feb. 27, 1987, 62-43178
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—63 1 Claim



1. A process for firing ceramic honeycomb structural bodies containing a shaping aid and having a plurality of partition walls defining a plurality of through holes, comprising forcing passage of a firing atmosphere gas having a temperature equal to that of the firing atmosphere surrounding an exterior of the ceramic honeycomb structural bodies through the through holes of the ceramic honeycomb structural bodies at a speed of about 1.0–5 m/s, in order to heat said ceramic honeycomb structural bodies and thus uniformly burn and remove said shaping aid contained therein at inner and outer portions thereof.

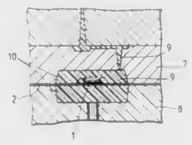
4,927,578
METHOD FOR PRODUCING UNCROSSLINKED POLYACETYLENE FILM
Herbert Naarmann, Wattenheim, and Nicolas Theophilou, Philadelphia, both of Pa., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed May 18, 1988, Ser. No. 195,663
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717067
Int. Cl.[5] B29C *41/08;* B05D *3/04*
U.S. Cl. 264—81 30 Claims

6. A process for preparing a polyacetylene film, which comprises the steps of:
(a) preparing a catalyst solution containing an organic aluminum compound, a titanate and an inert solvent;
(b) applying the catalyst solution to a substrate;
(c) polymerizing acetylene over the catalyst solution and substrate at from −10° to 100° C. to form a polyacetylene film;
(d) treating the polyacetylene film with a reducing agent, wherein the reducing agent is inert to the organoaluminum compound and is added at from 0.01 to 10% by weight based on the amount of catalyst system components;
(e) stretching the polyacetylene film;
(f) washing the polyacetylene film after the polyacetylene film has been stretched;
(g) drying the polyacetylene film under an inert gas; and
(h) doping the polyacetylene film with electron donors or electron acceptors.

4,927,579
METHOD FOR MAKING FIBER-REINFORCED PLASTICS
Eugene R. Moore, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Apr. 8, 1988, Ser. No. 179,346
Int. Cl.[5] B29C *47/00*
U.S. Cl. 264—101 16 Claims

1. A method for reducing fiber breakage in preparing fiber reinforced plastic extrudate comprising:
blending a low viscosity polymer solution having a total resin solids content in the range from 20 to 90 percent and a viscosity not greater than 50,000 centipoises and chopped fibers under low to moderate shear mixing conditions at a mixing speed in the range from 5 to 300 revolutions per minute and a temperature below the boiling point of the solvent of said polymer solution to form a dispersion of chopped fibers in said polymer solution, the dispersion having not more than 60 volume percent of reinforcing fiber;
blending said dispersion into a molten polymer to be reinforced; and
extruding the resultant blend while simultaneously removing the solvent therefrom to form a reinforced fiber plastic extrudate.

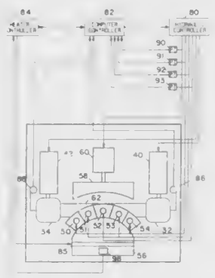
4,927,580
METHOD FOR MANUFACTURING ELECTRONIC DEVICE INCLUDING A VIBRATION GENERATING ELEMENT
Kazuhiko Nasu; Kazuel Kenmochi; Tomohiko Niikawa, and Atsushi Matsui, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 14, 1988, Ser. No. 284,427
Claims priority, application Japan, Dec. 15, 1987, 62-316613
Int. Cl.[5] B29C *45/14*
U.S. Cl. 264—102 9 Claims



1. A method for manufacturing an electronic device having therein a lead frame and a vibration-generating element integrally provided on said lead frame, comprising the steps of;
(a) inserting said lead frame and said element into a metallic mold assembly comprising an upper mold portion and a lower mold portion, said upper and lower mold portions respectively having recess portions so as to form a cavity when said upper and lower mold portions are assembled with each other;
(b) injecting into said cavity a first sealing material having a shrinkage property and a low adhesion property so that said element is covered by the injected first sealing material, the shrinkage property and low adhesion property of said first material causing formation of a space on said element in response to solidification so as to prevent the vibration of said element from being impeded;

(c) after the solidification of the injected first sealing material, removing said lead frame and said sealing-material-covered element from said mold assembly immersing it in a second sealing material at a vacuum state so that said second sealing material is impregnated between said first sealing material portion and said lead frame to seal the space therebetween; and
(d) after release from the immersion state, curing said second sealing material impregnated therebetween.

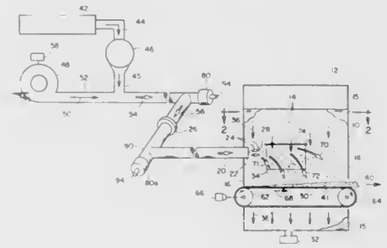
4,927,581
METHOD FOR SHAPING FIBER REINFORCED RESIN MATRIX MATERIALS
Steven J. Medwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 259,837, Oct. 19, 1988, abandoned. This application May 4, 1989, Ser. No. 347,054
Int. Cl.[5] B29C *55/00*
U.S. Cl. 264—108 11 Claims

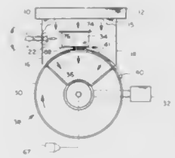


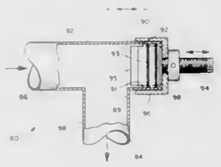
1. A method of shaping a composite structure of a resin matrix reinforced with fibers into a predefined path, said composite structure having a longitudinal axis, said method comprising:
(a) defining said path as a plurality of adjoining component lengths;
(b) stretching said structure from each of its ends by applying a force to each end along its longitudinal axis away from said ends to shape the structure into at least one formed component length defined by said path;
(c) heating said structure intermediate its ends while stretching the structure according to step (b);
(d) holding said one formed component length of the structure in place while stretching said structure as in step (b) to shape the structure into formed component lengths adjoining said one formed length; repeating step (d) to complete the formation of said structure into a predefined path; and
(e) cooling the structure.

4,927,582
METHOD AND APPARATUS FOR CREATING A GRADUATED DISTRIBUTION OF GRANULE MATERIALS IN A FIBER MAT
Robert E. Bryson, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Continuation of Ser. No. 899,179, Aug. 22, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 170,587
Int. Cl.[5] D04H *1/04;* F15D *1/02;* B65G *53/52*
U.S. Cl. 264—113 25 Claims

1. An apparatus for forming an absorbent body, comprising:
a. a forming chamber;
b. fiber delivering means for providing a flow of fibrous material within said forming chamber;
c. a forming layer, which is located in said forming chamber and is movable therein, for receiving a deposit of said fibrous material thereon to form said absorbent body;
d. conduit means for supplying a flow of dispersed bodies of high-absorbency material, which enters said forming chamber and intermixes with said flow of fibrous material therein; and
e. regulating means for controlling a velocity of said flow of high-absorbency material into said flow of fibrous material to provide high-absorbency material having various shorter, longer and intermediate trajectories, wherein said various trajectories deposit the high-absorbency material at different locations in said forming chamber to thereby selectively distribute said high-absorbency material







through a thickness dimension of said absorbent body to produce a concentration gradient of high-absorbency material along said thickness dimension.

19. A conduit section for changing a flow direction of a gas particle dispersion, comprising:
a. a first, substantially linear conduit section;
b. a second, substantially linear conduit section which intersects in fluid communication with said first conduit section to form a T-bend enters said conduit section, an exit arm from which said dispersion departs from said intersection with a changed flow direction, and a blinded arm; and
c. adjustment means for selectively controlling an effective conduit length of said blinded arm, said adjustment means located in said blinded on and constructed to position a

face surface of said adjustment means at a location which can be recessed into and protruded from said blinded arm by a selected distance to thereby provide a substantially uniform distribution of particles in said dispersion departing from said exit arm.

4,927,583

PROCESS FOR THE MANUFACTURE OF POLYAMIDE COMPOSITE MATERIAL REINFORCED WITH LONG FIBERS

Michel Lottiau, Bernay; Michel Glemet, Serquigny; Gilles Cognet, and Alain Causier, both of Bernay, all of France, assignors to Atochem, France

Filed Sep. 9, 1987, Ser. No. 95,047
Claims priority, application France, Sep. 17, 1986, 86 12997
Int. Cl.[5] B32B *31/16, 31/26*
U.S. Cl. 264—136 9 Claims

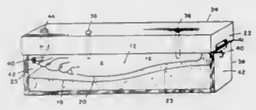
1. A process for the manufacture of a polyamide composite material reinforced with long fibers, the improvement comprising impregnating the fibers with a polyamide oligomer or prepolymer, heat-treating the impregnated fiber to polymerize said oligomer or prepolymer, and then shaping the impregnated fiber by pultrusion.

4,927,584

METHOD OF CUSTOM MANUFACTURING SHOES AT A SPECIFIED HEEL HEIGHT

Donald R. Pfrimmer, 1550 Old Hickory Blvd., Brentwood, Tenn. 37027

Filed Jul. 22, 1986, Ser. No. 888,479
Int. Cl.[5] B29C *45/16*
U.S. Cl. 264—154 6 Claims



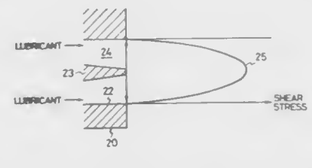
1. A method of custom manufacturing shoes at a specified heel height with a predetermined sole thickness, comprising:
forming a negative impression mold of a foot for which a shoe is to be made with the foot oriented at the specified heel height;
filling the negative impression mold with a settable material adapted to set into a hard mass to form a positive impression mold of the foot;
removing the positive impression mold from the negative impression mold after the positive impression mold hardens;
dividing the positive impression mold into an upper and lower part;
providing a sole impression box having a bottom, sides, an open top, and a removable cover for being placed on the open top, said cover having an underside;
providing a sole impression form having an upper surface shaped to correspond to the lower surface of a sole of a shoe with the specified heel height;
placing the sole impression form in the box on the bottom thereof so that the upper surface of the form faces the open top of the box;
atttaching the lower part of the positive impression mold to the underside of the cover of the sole impression box so that when the cover of the box is placed on the open top of the box, the lower surface of the lower part of the positive impression mold is separated from the upper surface of the sole impression form by a space such that the distance of separation between the positive impression mold and the sole impression form is approximately equal to the desired sole thickness;
placing the cover on the open top of the box;
introducing a settable material adapted to harden to form a suitable sole into the space through an opening in the box;
permitting air displaced when the settable material is introduced into the space to escape through a second opening in the box so that the settable material substantially fills the space between the positive impression mold and the sole impression form;
permitting the settable material that was introduced between the positive impression mold and the sole impression form to harden to form a sole;
separating the sole from the positive impression mold and the sole impression form;
attaching upper materials to the sole; and
attaching a heel of the specified heel height to the sole.

4,927,585

PROCESS FOR PRODUCING HIGHLY ORIENTED RESIN-MADE REINFORCING MEMBER

Fumio Suzuki; Nobuhiro Akasaka, and Makoto Honjo, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 826,698, Feb. 6, 1986, Pat. No. 4,721,637.
This application Sep. 28, 1987, Ser. No. 101,696
Claims priority, application Japan, Feb. 6, 1985, 60-15781; Feb. 6, 1985, 60-15782
Int. Cl.[5] B29C *47/02, 47/94*
U.S. Cl. 264—171 6 Claims



1. A process for producing a reinforcing member in a form a of a solid wire or rod that contains a highly oriented resin as principal component and in which a degree of orientation decreases from center to periphery of said solid wire or rod, said process using a die having a molding port comprising at least one concentric molten resin extruding nozzle having a side wall with an inner and outer surface and a projecting rod member disposed along a central axis of said nozzle, and said process comprising extruding a molten highly oriented resin through said nozzle as a lubricant is applied to the inner surface of the side wall of said nozzle opposite to the projecting rod member such that shear stress applied to the resin is continuously increased from periphery to center.

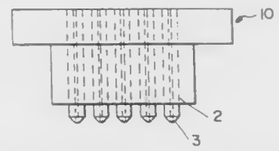
4,927,586

PROCESS FOR PREPARING POLYVINYL ALCOHOL YARN

Jan Smook, Dieren; Gerardus J. H. Vos, Westervoort; Johannes A. Juijn, Velp, and Theodorus J. Van Hees, Dieren, all of Netherlands, assignors to AKZO N.V., Arnhem, Netherlands

Filed Aug. 31, 1988, Ser. No. 238,602
Claims priority, application Netherlands, Aug. 31, 1987, 8702038; Fed. Rep. of Germany, Aug. 5, 1988, 3826621
Int. Cl.[5] D01F *6/14*
U.S. Cl. 264—185 14 Claims

1. A process for preparing a yarn having a tenacity of at least 90 cN/tex, comprising:
extruding a solution of a polyvinyl alcohol which has a viscosity average molecular weight $\overline{M}_v$ in the range of 10^5 to 4×10^5 in an organic solvent from a spinneret having capillaries into a coagulation bath through an air gap or inert gas gap; and
drawing the extruded polyvinyl alcohol solution;



wherein a length of the capillaries of the spinneret in the direction of flow is at least 5 times a diameter of said capillaries, and a concentration of the polyvinyl solution is at least $30-(\overline{M}_v/20{,}000)$ in percent by weight of the polyvinyl alcohol solution.

4,927,587

METHOD FOR MANUFACTURING EXTRUSION MOLDED SILICONE INSULATING ARTICLES

Masaharu Takahashi, and Takeo Yoshida, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 316,959
Claims priority, application Japan, Feb. 29, 1988, 63-46049
Int. Cl.[5] B29C *47/00, 47/06;* B32B *1/08;* C08K *3/38*
U.S. Cl. 264—211 6 Claims

1. A method for manufacturing an extrusion molded silicone insulating article having improved electrical insulation, comprising the steps of:
extrusion molding a silicone rubber composition comprising
(A) 100 parts by weight of an organopolysiloxane having an average unit formula:

$$R_aSiO_{(4-a)/2} \quad (1)$$

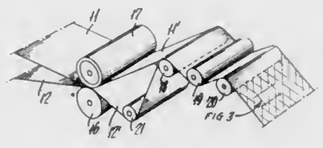
wherein R is at least one radical selected from the group consisting of unsubstituted monovalent hydrocarbon radicals and substituted monovalent radicals each having 1 to 10 carbon atoms, and a is a number having a value of from 1.95 to 2.05,
(B) 5 to 500 parts by weight of a finely divided silica filler having a specific surface area of from 1 to 500 m^2/g,
(C) 2 to 20 parts by weight of powder boron nitride having a mean particle size of from 0.4 μm to 10 μm, and
(D) 0.01 to 5 parts by weight of a curing catalyst, and
curing the molded composition.

4,927,588

METHOD MULTI-PLY EMBOSSED FIBROUS SHEET

Galyn A. Schulz, Appleton, Wis., assignor to James River Corporation of Virginia, Norwalk, Conn.

Filed May 24, 1988, Ser. No. 198,146
Int. Cl.[5] B29C *59/04;* B32B *31/20*
U.S. Cl. 264—258 4 Claims



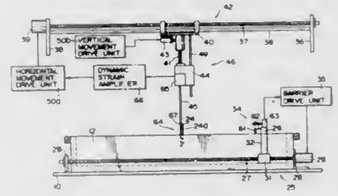
1. A process for the production of a soft, absorbent multi-ply embossed towel or fibrous tissue product which comprises forming a multi-ply sheet of unembossed fibrous webs, simultaneously embossing said fibrous webs by passing said multi-ply sheet through the nip of an embossing roll and a back-up roll, separating the embossed multi-ply sheet into separate embossed webs, longitudinally displacing one of said webs of said sheet from another, and recombining said webs into a single multi-ply sheet with the embossments of one web out of register with the embossments of the other by an amount sufficient to prevent nesting of the embossments.

4,927,589

METHOD FOR MANUFACTURING ORGANIC THIN FILM

Syun Egusa, Yokohama; Akira Miura, Toride, and Nobuhiro Gemma, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 21, 1988, Ser. No. 287,281
Claims priority, application Japan, Mar. 16, 1988, 63-62263; Sep. 20, 1988, 63-235301
Int. Cl.[5] B29C *39/04, 39/12;* B05D *1/20*
U.S. Cl. 264—259 9 Claims



1. A method of manufacturing a multi-layered organic thin film comprising the steps of:
preparing a liquid surface for forming a developing region in which a monomolecular film of organic molecules can be developed;
developing a monomolecular film of organic molecules in the developing region;
compressing the developed monomolecular film to a predetermined surface pressure;
supporting a workpiece so that a build-up surface of the workpiece is located perpendicular to the developed monomolecular film; and
moving the workpiece through the developed monomolecular film in a direction inclined to the developed monomolecular film that includes a directional component which is perpendicular to the build-up surface and directed ahead thereof, to thereby build up the monomolecular film on the build-up surface.

4,927,590

METHOD FOR ENCAPSULATING INTEGRATED CIRCUITS

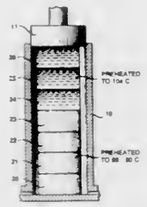
Gerhard W. Poelzing, New Providence, N.J., assignor to At&T Bell Laboratories, Murray Hill, N.J.

Filed May 26, 1989, Ser. No. 358,313
Int. Cl.[5] B29C *45/02, 45/14*
U.S. Cl. 264—272.17 8 Claims

2. A process for molding a plastic package around an integrated circuit device by placing the device in a mold cavity and injecting uncured molding material into the cavity under pressure the steps of: preheating a plurality of resin preforms, said preforms having a tablet shape, stacking the plurality of preheated preforms into a cylindrical stack, placing the stacked preheated preforms into a cylindrical pressure chamber, said chamber having a diameter larger than the diameter of the stack, and having at least one passageway extending from the chamber to the mold cavity, and applying pressure to the stack

VOL 1114 ISS 4 MY 22 1990 UMI

of preforms to force the molding material through the passageway to the mold cavity the process characterized in that at



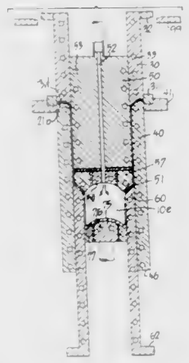
least one preform is preheated to a temperature more than 10 degrees C. higher than the temperature of another.

4,927,591

CONTAINER, METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Torsten Nilsson, Löddeköpinge, Sweden, assignor to Petainer S.A., Neuchatel, Switzerland

Filed Aug. 14, 1986, Ser. No. 902,456
Claims priority, application Sweden, Dec. 14, 1984, 8406373
Int. Cl.[5] B29C *17/03, 17/07*
U.S. Cl. 264—532 26 Claims



1. A method of shaping a substantially tubular preform of deformable plastic material into a hollow body, said method comprising:

providing a tubular preform of deformable plastic material having a closed bottom, an open mouth and a tubular wall between the bottom and the mouth,

positioning a mandrel at the open mouth of the tubular preform in spaced relation from the closed bottom of the preform so that the interior of the preform is hollow and unoccupied, the mandrel having an outer diameter which is greater than the inner diameter of the tubular preform,

forming an outwardly flared edge portion on said preform at said open mouth,

clamping said flared edge portion of the preform between mechanical clamping devices around and outside said mandrel, and

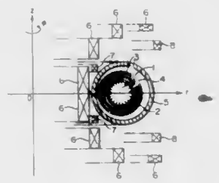
relatively displacing said mandrel and said mechanical clamping devices to cause said mandrel to move into the hollow interior of said tubular preform causing the wall of the preform to progressively expand circumferentially while said open mouth remains clamped by said mechanical clamping devices.

4,927,592

REVERSED FIELD PINCH APPARATUS

Sataro Yamaguchi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 13, 1988, Ser. No. 218,162
Claims priority, application Japan, Jul. 16, 1987, 62-175814
Int. Cl.[5] G21B *1/00*
U.S. Cl. 376—123 10 Claims



1. In a reversed field pinch apparatus including a toroidal vacuum vessel in which a plasma is confined, a coil arrangement comprising:

a first ohmic heating coil means supplying an alternating current for F-Θ pumping, said first coil means including a first coil which is coaxial with respect to said vacuum vessel and is inductively coupled with said plasma and

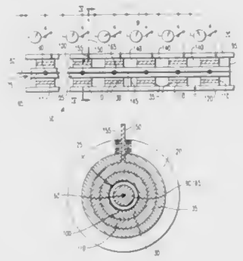
a second ohmic heating coil means supplying a direct current which is greater than the alternating current for generating a plasma current in said plasma, said second coil means including a second coil which is inductively coupled with said plasma.

4,927,593

BETA RAY FLUX MEASURING DEVICE

Albert J. Impink, Jr., and Norman P. Goldstein, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 25, 1988, Ser. No. 275,983
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—254 15 Claims



8. A beta ray flux measuring device connectable to a reactor vessel containing a reactor coolant at a pressure, for detecting a beta ray flux emitted from respective portions of an activated member irradiated at corresponding sensing positions within the vessel, said detector comprising:

a pressure boundary defining an inner space with a central axis and being connectable to the reactor vessel so that the inner space contains some of the reactor coolant at substantially the pressure;

an outer insulator positioned around the central axis within the inner space;

a collector ring having a response characteristic and being positioned within the inner space and around the central axis; and

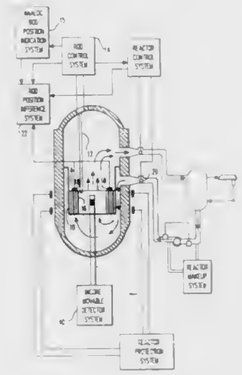
an inner conductor positioned around the central axis and within said collector ring so as to be electrically isolated from said collector ring.

4,927,594

THERMOCOUPLE BASED CONTROL ROD POSITION INDICATION SYSTEM

Michael D. Heibel, Plum Borough; Albert J. Impink, Jr., Murrysville Borough, and Louis R. Grobmyer, North Huntiogdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1988, Ser. No. 230,393
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—258 7 Claims



7. A rod position determination method comprising the steps of:

(a) measuring core coolant inlet temperature;

(b) measuring core coolant assembly exit temperature associated with a control rod;

(c) determining enthalpy rise from the inlet and exit temperature and a reference for an assembly containing the rod;

(d) determining rod position change ΔRj from

$$Bi = \Delta h / \Delta hR$$

$$\Delta Rj = Ki\ (\Delta hmi - Bi \cdot \Delta hmiR)$$

$$Ki = \partial R / \partial \Delta hmi = (mi / \Delta h100) \cdot \partial R / \partial fi$$

where Δh is a resistance temperature detector measured enthalpy rise, ΔhR is a reference resistance temperature detector measured enthalpy, FΔhmi is measured enthalpy rise, Δh100 is one hundred percent of full reactor power core enthalpy rise, ∂R/∂fi is the slope of the relation between the change in rod control cluster assembly j position and the change in the nuclear design prediction of the relative assembly power in the core location of thermocouple i, ΔhmiR is an incore measured reference enthalpy rise, mi is the thermocouple flow mixing factor, j is the rod control cluster identifier and i is the thermocouple identifier; and

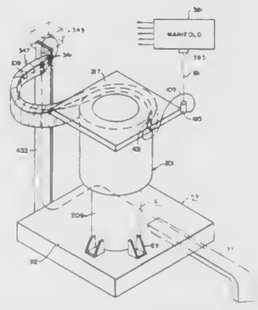
(e) determining rod position from the rod position change and a reference rod position.

4,927,595

REFUELING OF NUCLEAR REACTOR

John W. Kaufmann, Murrysville; Kenneth J. Swidwa, Harmar Township, Allegheny County, and Leonard P. Hornak, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 382,269, May 26, 1982, Pat. No. 4,832,902.
This application Aug. 19, 1988, Ser. No. 234,112
Int. Cl.[5] G21C *19/00*
U.S. Cl. 376—268 16 Claims



14. Apparatus for refueling a nuclear reactor, said reactor being disposed in a pit in a containment under water and having component assemblies, of at least one type, a trolley, said trolley having facilities for controlling said apparatus, a supporting mast, means for engaging and raising and lowering said component assemblies of at least one type suspended in said pit from said supporting mast, hoist means supported on said supporting mast, said hoist means having cables connected to said engaging-raising-and-lowering means for raising or lowering said engaging-raising-and-lowering means on operation of said hoist means, electric and fluid-pressure operable means connected to said engaging-raising-and-lowering means for operating said engaging-raising-and-lowering means, electric-and-fluid-conductor handling facilities supported on said supporting mast, electrical conductors connecting said controlling facilities on said trolley and said electrical-conductor-handling facilities on said supporting mast, electrical and fluid conductors extending from said handling facilities and connected to said electric-and-fluid-pressure operable means for supplying electricity and fluid-pressure to operate said operable means, and bearing means on said trolley supporting said supporting mast rotatably, said engaging-raising-and-lowering means, said electric and fluid conductors and said hoist means and its cables and said facilities rotating together and with said supporting mast on rotation of said supporting mast, whereby the restriction of the rotation of said supporting mast and the twisting of the electric and fluid conductors and the fouling of the hoist cables by the electric and fluid conductors which would result from rotation of said supporting mast and the engaging-raising-and-lowering means suspended from said supporting mast relative to said hoist means and said electric-and-fluid-conductor handling facilities are precluded, a flexible cable tray connected to said supporting mast at one end, extending from said one end peripherally at least partly around said mast and thence departing from said mast and terminating at the opposite end a predetermined distance from said mast so that when said mast is rotated in one direction said tray is wound peripherally on said mast and when said mast is rotated in the opposite direction said tray is unwound peripherally from said mast, said electrical conductors, passing between said controlling facilities on said trolley and said electrical-conductor-handling facilities on said supporting mast, through said cable tray, entering said cable tray near said one end and leaving said cable tray near said opposite end, the said electrical conductors following the winding and unwinding of said tray,

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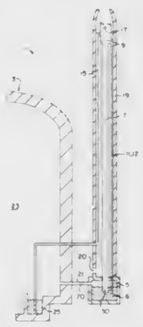
said tray remaining fixed at said opposite end as said tray is wound on said mast or unwound from said mast, whereby said electrical conductors remain fixed at said opposite end as said mast is rotated, whereby the portion of said electrical conductors between said opposite end and said controlling facilities on said trolley remain fixed.

4,927,596

SELF-ACTUATING PRESSURE RELIEF DEVICE AND METHOD FOR NUCLEAR CONTAINMENT

Lawrence E. Minnick, Los Altos, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 231,847, Aug. 12, 1988, abandoned. This application Aug. 4, 1989, Ser. No. 390,456
Int. Cl.[5] G21C *9/00*
U.S. Cl. 376—283 21 Claims



19. A passive self-actuating pressure relief device for nuclear reactor containments having a sealing water chamber for holding water for cooling the reactor core in the event of an accident, the pressure relief device comprising:

a sealed chamber for holding a liquid material, the liquid within the sealed chamber having a normal operating liquid level;

piping means for coupling said sealed chamber to the reactor containment;

an extended standpipe in fluid communication with the interior of said sealed chamber, the standpipe having a first opening within the sealed chamber at a position below the normal operating liquid level and a second opening outside of and substantially above the sealed chamber;

a mixing chamber in fluid communication with the second standpipe opening and carried by the standpipe substantially above the sealed chamber;

a multiplicity of recirculating drain pipes for transporting liquid between said mixing chamber and said sealed chamber and cooling the transported liquid;

a moisture separator in communication with the mixing chamber for trapping water droplets that escape from the mixing chamber; and

an overflow drain in fluid communication between said mixing chamber and the reactor containment sealing water chamber;

whereby the normal operating liquid level within the sealed chamber is chosen to insure that when the pressure within the reactor containment surpasses a designated threshold pressure, sufficient liquid will be forced from the sealed chamber into the standpipe to cause the liquid level within the sealed chamber to fall below the first standpipe opening thereby allowing containment gases to escape from the sealed chamber into the standpipe.

4,927,597

DEVICE FOR COOLING THE MAIN VESSEL OF A FAST NEUTRON NUCLEAR REACTOR COOLED BY A LIQUID METAL

Alain Cros, Lyons, France, assignor to NOVATOME, Courbevoie, France

Continuation of Ser. No. 106,294, Oct. 9, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 313,341
Claims priority, application France, Oct. 9, 1986, 86 14052
Int. Cl.[5] G21C *11/00, 15/00*
U.S. Cl. 376—290 5 Claims



1. In a fast neutron nuclear reactor having a main vessel (3) containing liquid metal coolant therein, said main vessel having a substantially cylindrical wall in its upper part and a dished bottom in its lower part and being arranged with its axis vertical and an inner vessel located inside the main vessel, having a diameter less than that of the main vessel and containing hot liquid metal coolant, a reactor core positioned in said inner vessel, said rector core being supported by a means including a flooring, said flooring being supported by said dished bottom of said main vessel, the improvement consisting of a cooling device (**14**) for cooling the main vessel, said cooling device consisting of

(a) a first annular collector between the upper part of the wall of the main vessel (3) and an overflow sleeve (**18**) coaxial with the main vessel (3) and of a diameter less than that of the main vessel but greater than that of the inner vessel;

(b) a second annular collector (**16**) between the overflow sleeve (**18**) and an inner sleeve (**21**) coaxial with the main vessel (**3**) and with the overflow sleeve (**18**) and of a diameter less than that of the overflow sleeve (**18**) but greater than that of the inner vessel; and

(c) a conduit means (**17**) connected to a lower end of the first collector and to a lower part of the flooring for conveying cooled liquid metal into said first collector (**15**), and contacting and cooling an inner wall of said main vessel (**3**), up to an upper part of the overflow sleeve, said overflow sleeve having a top at its upper part for conveying said cooled liquid metal into said second collector, said second collector having a bottom pierced by orifices debouching into an annular space between the inner vessel and the overflow sleeve, said annular space being in communication at its lower end with a part inside the main vessel containing cooled liquid metal, said annular space containing cooled liquid metal up to a level above the bottom of said second collector and less than the level of hot liquid metal in the inner vessel, the orifices in said bottom of said second collector being such that the level of cooled liquid metal in said second collector is controlled and maintained above the level of cooled liquid metal in the annular space, said overflow sleeve and said inner sleeve each being a right circular cylinder having a substantially constant diameter throughout its length;

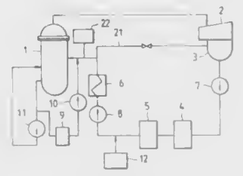
(d) wherein the inner sleeve (**21**) of said second collector (**16**) has a length substantially less than the length of the overflow sleeve (**18**), the upper ends of these sleeves (**18, 21**) being substantially at the same level, and the lower part of the inner sleeve (**21**) of said second collector (**16**) being connected to the overflow sleeve **18** in a region substantially equidistant from each end of said overflow sleeve (**18**) by said bottom of said second collector.

4,927,598

RADIOACTIVITY REDUCTION METHOD OF A NUCLEAR POWER PLANT AND A NUCLEAR POWER PLANT REDUCED IN RADIOACTIVITY

Yoshitaka Nishino; Toshio Sawa; Katsumi Ohsumi, and Hisao Itow, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,601
Claims priority, application Japan, Sep. 9, 1987, 62-223949
Int. Cl.[5] G21D *3/08*
U.S. Cl. 376—306 7 Claims



6. A method of reducing radioactivity in a nuclear power plant, comprising the steps of injecting iron ion and one of beryllium and beryllium ion into a primary cooling water in a primary cooling water recirculation line of the power plant, heating and recirculating the primary cooling water, and forming a film including 95% or more of nickel ferrite and/or cobalt ferrite on each surface of piping of the primary cooling water recirculation line and structural members disposed in said primary cooling water recirculation line in contact with the primary cooling water.

4,927,599

THERMIONIC CONVERTER EMITTER SUPPORT ARRANGEMENT

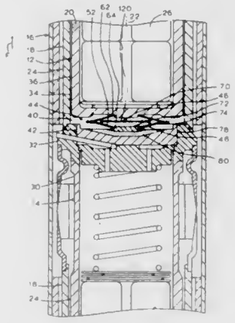
Daniel T. Allen, La Jolla, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jni. 6, 1989, Ser. No. 376,071
Int. Cl.[5] G21C *7/00*
U.S. Cl. 376—321 3 Claims

1. In a thermionic fuel element which includes a housing with a hollow collector having an axis, an emitter lying primarily within and coaxial with the collector and wherein the emitter has a front end supported on the housing and a rear free end spaced from the housing and the collector thereof, a quantity of nuclear reactor fuel within the emitter, a spring structure having front and rear ends with the front end engaging the emitter free end to keep it coaxial with the collector while allowing the emitter free end to axially expand and contract as it is heated and cooled, the improvement of a support structure for supporting the rear end of the spring structure, comprising:

a metal spring-engaging element having a portion which engages the rear end of the spring structure, and having a rear surface;

a metal main support having a forward surface facing said spring-engaging element and a periphery attached to said housing;



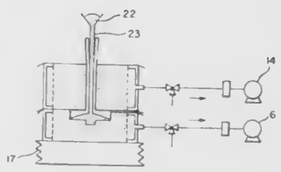
a ceramic layer lying between said main support and said spring-engaging element, said ceramic layer being hot-press bonded to said rear surface of said spring-engaging element and to said front surface of said main support.

4,927,600

METHOD FOR MOLDING OF POWDERS

Tsuneo Miyashita, Yokohama; Hiroaki Nishio, Yokohama; Kazuya Yabuta, Chiba, and Yoshio Takagi, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 866,359, May 23, 1986, abandoned. This application Oct. 8, 1987, Ser. No. 105,985
Claims priority, application Japan, May 28, 1985, 60-113301
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—49 4 Claims



1. A method of molding powders of metals or ceramics comprising the steps of:

forming a cavity within an air-permeable mold carrier of a powdered filler material, a wall of said cavity being coated with a water-soluble film, and maintaining the shape of said powdered filler material by use of a vacuum;

introducing into said cavity of said mold carrier a pouch-like member of thin-walled rubber-like resilient material, said pouch-like member carrying moisture on the outer surface thereof;

dissolving said water-soluble film by contacting said water-soluble film with said pouch-like member, during the use of said vacuum in such a degree that said pouch-like member is inflated and tightly contacted to said wall of said cavity in said mold carrier, thereby forming a mold;

charging starting powders into said mold;

discharging air from the inside of the mold to a desired degree of vacuum through an opening of said pouch-like member;

sealing said evacuated mold while the pouch-like member is within the cavity of said mold carrier;

re-establishing an atmospheric pressure to said powdered

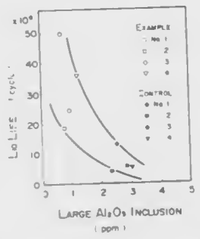
filler material thereby disintegrating the air-permeable mold carrier so as to remove a preformed molding in a form contained in said sealed pouch-like member; and pressing the preformed molding while the molding is sealed within the pouch-like member by a cold or hot isostatic press to densify the same.

4,927,601

HEAT RESISTING BEARING STEEL

Tomohito Iikubo, Nagoya, and Yutaka Kurebayashi, Tokai, both of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 6, 1988, Ser. No. 240,658
Int. Cl.[5] C22C *38/22, 38/24*
U.S. Cl. 420—111 2 Claims



1. A heat resisting bearing steel consisting essentially of 0.6–0.9 % C, up to 0.5 % Si, up to 0.5% Mn, 3.0–5.5 % Cr, 3.0 to 5.0% Mo and 0.5–1.5% V, and the balance being Fe and inevitable impurities; and the content of large Al_2O_3 inclusions having a length of 10 microns or larger being restricted to 1.5 ppm or less.

4,927,602

HEAT AND CORROSION RESISTANT ALLOYS

John H. Culling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Sep. 27, 1989, Ser. No. 413,288
Int. Cl.[5] C22C *30/02*
U.S. Cl. 420—586 7 Claims

1. An air meltable, weldable alloy having good hot gas corrosion resistance above about 1800° F. and exceptional hot strength above about 1600° F. and which can be cast or forged in air, consisting essentially of:

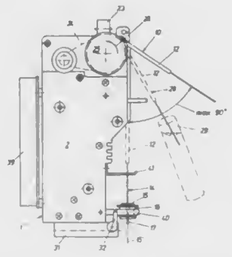
Nickel	35–46% by weight
Chromium	25–29%
Cobalt	10–13%
Tungsten	5.5–8%
Columbium	0.2–1.5%
Zirconium	0.2–1.5%
Titanium	0.05–0.5%
Carbon	0.3–0.9%
Manganese	up to 1.5%
Silicon	up to 2%
Nitrogen	up to 0.3%
Iron	essentially the balance

4,927,603

FEEDING DEVICE FOR INTRODUCING LIQUID OR GASEOUS SAMPLES

Fritz Fischer; Erich Kleinhappl, and Hermann Marsoner, all of Graz, Austria, assignors to AVL AG, Switzerland

Filed Jun. 29, 1988, Ser. No. 213,155
Claims priority, application Austria, Jul. 2, 1987, 1672/87
Int. Cl.[5] G01N *35/00*
U.S. Cl. 422—67 7 Claims



1. A feeding device for introducing liquid or gaseous samples into an analysis path of an analyzing apparatus which comprises

a link chain mounted on a guide pulley,

a stepping motor for driving said link chain,

a control means for controlling the operation of said stepping motor,

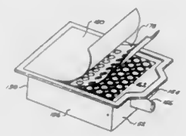
a feeder element comprising a needle holder and a hollow needle, said feeder element being connected to said link chain by chain pins, said control means controlling the operation of said stepping motor and thus the movement of said link chain such that, starting from an initial position where said needle holder is remote from said guide pulley and said hollow needle is located in a feed opening of an element wherein it can be contacted with calibrating or cleansing media, movement of said link chain in a first direction will cause said needle holder to move along an axis defined by the feed opening and, as said needle holder moves around said guide pulley, to tilt said hollow needle relative to said axis into a first sample intake position.

4,927,604

MULTIWELL FILTER PLATE VACUUM MANIFOLD ASSEMBLY

Gregory Mathus, Concord, and George Lyman, Cape Porpoise, both of Mass., assignors to Costar Corporation, Cambridge, Mass.

Filed Dec. 5, 1988, Ser. No. 280,170
Int. Cl.[5] G01N *1/14*
U.S. Cl. 422—101 23 Claims



1. A filtration system for handling 96 well filter plates or filter strips wherein the plates or strips have an array of wells each including a generally cylindrical side wall closed at the bottom by a filter membrane and open at the top comprising

a manifold having continuous side and end walls and a bottom wall connected to the side and end walls upwardly of the bottom edges thereof so as to be disposed above a supporting surface when the manifold is placed with lower edges of the side and end walls on the surface,

a shoulder in the side and end walls for supporting a plate or strip placed in the manifold,

a plurality of supports extending upwardly from the bottom wall for engaging the filter membranes disposed at the bottom of the cylindrical wall of each well when the plate or strip is supported on the shoulder,

a first sealing surface in the side and end walls coplanar with the open tops of the cylindrical walls of the wells when the plate or strip is disposed in the manifold and the bottoms of the cylindrical walls are engaged by the supports,

a sheet of sealing material disposed on the first sealing surface and engaging the tops of the wells and having means defining openings therein registering with the open tops of the cylindrical walls, said sheet preventing entry of material between said wells,

a vacuum hose fitting in one of the side or end walls for connecting a low pressure source to the manifold above the bottom wall, the low pressure source causing the sheet of sealing material to seal about the tops of the cylindrical walls and draw filtrate material in the wells through the filter membrane,

an imperforate removable film disposed over the top of the manifold for maintaining a sterile atmosphere in the manifold prior to use,

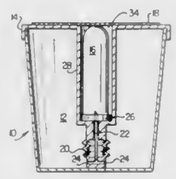
and a second sealing surface in the side and end walls and disposed above the first surface for supporting the imperforate removable film.

4,927,605

SPECIMEN COLLECTION AND SAMPLING CONTAINER

Gordon L. Dorn, Dallas, and Michael A. Johnson, Fort Worth, both of Tex., assignors to Wadley Technologies. Inc., Dallas, Tex.

Filed Apr. 22, 1987, Ser. No. 41,153
Int. Cl.[5] G01N *1/18*
U.S. Cl. 422—102 57 Claims



1. A specimen collection container comprising:

a cup positioned and arranged to receive and hold a specimen, the cup having an open top end and a closed bottom end;

a lid positioned and arranged to engage securely with the open top end of the cup,

a main compartment contained within the cup,

at least one sample chamber attached to said container, the at least one sample chamber positioned and arranged to receive an aliquot of specimen from said main compartment;

segregation means for segregating the aliquot into the at least one sample chamber as the lid is closed onto the cup, the segregation means preventing fluid flow between the main compartment and the at least one sample chamber when said aliquot of specimen is being removed from the at least one sample chamber;

a support chamber projecting from the lid, inside the cup and towards the bottom end of the cup when the lid is placed on the cup, an evacuated tube being held within said support chamber; and

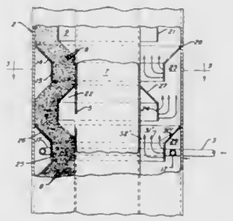
an accordion-shaped shaft connected to the support chamber and holding a needle, the shaft contacting the bottom of the cup when the lid is closed on the cup.

4,927,606

FCC STRIPPING APPARATUS

Ismail B. Cetinkaya, Palatine, and Robert P. Culler, Clarendon Hills, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 867,972, May 29, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 101,225
Int. Cl.[5] B01J *8/24, 8/44*
U.S. Cl. 422—144 4 Claims



3. A stripping apparatus for an FCC unit that removes hydrocarbons from particulate catalyst by contact with a stripping gas, said apparatus comprising:

(a) a vessel having an elongated shape, a principally vertical orientation, a transverse cross-section open to downward catalyst flow, an uppermost end in communication with a source of catalyst particles and a lowermost end in communication with a means for withdrawing catalyst particles;

(b) at least two grids located in and extending downwardly and inwardly from opposite vertical sides of the vessel, each grid extending inwardly over at least about half of said transverse cross-section such that together said grids substantially cover said transverse cross-section, and said grids being offset vertically to provide a flow path for a stream of catalyst to flow downwardly through said vessel;

(c) means for adding stripping gas to said vessel below the lowermost of said grids;

(d) a vertical skirt attached to the bottom of each grid, said grid, skirt, and vessel forming a gas collection space underneath each grid for receiving stripping gas; and

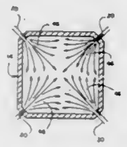
(e) at least two sets of apertures defined in each grid skirt, each set of apertures having apertures of a uniform size, a uniform spacing between apertures, and a common vertical elevation for all apertures associated therewith, each aperture in each set having a horizontal centerline projection and a diameter of restricted size to produce a gas jet that extends into said flow path with the apertures in the lowermost aperture set on each skirt having the largest diameter so that the apertures of the lowermost aperture set will produce the longest jet length.

4,927,607

NON-CYLINDRICAL REACTOR FOR CARBON BLACK PRODUCTION

Alan C. Berg, and William R. Jones, Jr., both of Monroe, La., assignors to Columbian Chemicals Company, Atlanta, Ga.

Filed Jan. 11, 1988, Ser. No. 142,478
Int. Cl.[5] B01J *10/00*; C09C *1/48*
U.S. Cl. 422—150 10 Claims



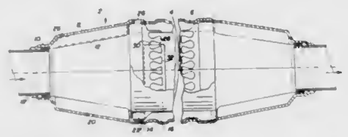
1. Apparatus for the production of carbon black, comprising:
means for producing a flow of hot gas;
a reaction chamber having an inlet opening receiving the flow of hot gas and having an outlet opening so that the hot gas can flow through the reaction chamber,
means positioned between the inlet opening and the outlet to opening of the reaction chamber for introducing a plurality of feedstock hydrocarbon sprays into the reaction chamber substantially transversely to the hot gas flow to form a non-circular feedstock hydrocarbon spray pattern at a cross-section of the reaction chamber; and,
said reaction chamber being shaped and said spray means being positioned within the reaction chamber such that the feedstock hydrocarbon spray pattern formed extends substantially across the entire cross-sectional flow area of the reaction chamber and is not circular in cross-section, so as to maximize coverage of the cross-sectional area of the hot gas flow by the feedstock hydrocarbon spray.

4,927,608

DEVICE FOR CATALYTIC CLEANING OF MOTOR VEHICLE EXHAUST GASES

Siegfried Wörner, Esslingen; Peter Zacke, Albertshausen, and Georg Wirth, Kirchheim, all of Fed. Rep. of Germany, assignors to J. Eberspächer, Esslingen, Fed. Rep. of Germany

Filed Dec. 31, 1987, Ser. No. 139,904
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1987, 3700070
Int. Cl.[5] F01N *3/15*
U.S. Cl. 422—179 10 Claims



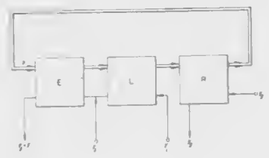
1. A device for cleaning gases exiting from a vehicle motor exhaust pipe, comprising an outer tubular housing having a first connection portion at one end and a second connection portion at the other end, each connection portion positioned and arranged to overlie and be connected to a part of the exhaust pipe; first and second transition portions of gradually increasing diameter extending radially outwardly of said first and second connection portions, respectively; a monolith portion connected at each end to each of said first and second transition portions at ends which are each remote from said first and second connection portions, respectively; a monolith in said monolith portion having a catalytically active coating and an end face; an inner shell of a temperature resistant plate metal in said housing spaced radially inwardly of the interior of said housing in each of said first and second transition portions, a spacer matting positioned between the interior of said housing and said monolith and comprising a material permitting variable thermal expansion of said housing and said monolith, said spacer matting having a side face protected by a protective layer, said inner shell having at least one end portion extending into said monolith portion with a base portion connected to said tubular housing and an end face portion overlapping portions of the monolith end face to maintain the monolith in position, securing means securing said inner shell base portion to said tubular housing at said monolith portion, said inner shell having another end portion adjacent said first and second connection portions which are free for thermal expansion.

4,927,609

RECOVERY OF GALLIUM/RARE EARTH VALUES FROM OXIDE MIXTURES THEREOF

Alain Leveque, Paris, and Michel Triollier, Gouvieux, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 670,061, Nov. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 360,559, Mar. 22, 1982, abandoned, which is a continuation of Ser. No. 162,492, Jun. 24, 1980, abandoned. This application Sep. 5, 1985, Ser. No. 772,672
Claims priority, application France, Jul. 3, 1979, 79 17212
Int. Cl.[5] C01F *17/00*
U.S. Cl. 423—21.5 81 Claims



1. A process for the recovery of gallium and rare earth values from mixtures of the oxides thereof, comprising:
(i) acidulating and dissolving such admixtures in a chloride acidic medium;
(ii) liquid/liquid extracting the solution which results with a water-insoluble organic extraction agent into an aqueous phase and an organic phase, whereby said gallium values are preferentially transferred from said aqueous phase into said organic phase; and
(iii) recovering said gallium and said rare earth values from the respective phases comprising same.

4,927,610

METHOD FOR EXTRACTING COPPER, SILVER AND RELATED METALS

Bruce A. Moyer, Oak Ridge, and W. J. McDowell, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 111,490, Oct. 23, 1987, abandoned. This application Jul. 1, 1988, Ser. No. 214,814
Int. Cl.[5] B01D *11/00*
U.S. Cl. 423—24 3 Claims

1. A process for selectively extracting copper and silver from aqueous solution comprising:
contacting said aqueous solution containing copper and silver with an organic solvent mixture of a first organic reagent and a second organic reagent, said first reagent being a tetrathiamacrocycle and said second organic reagent being an organic acid that will exchange a proton for metal cations corresponding to metals of said aqueous solution, said organic acid having a sufficient molecular weight of about 300 or more so that neither its salts nor its adducts will crystallize, resulting in a metal complex with said organic reagents that is soluble in a resulting organic phase but not in a resulting aqueous phase;
separating said organic phase from said aqueous phase; and
dissociating said copper and silver from said organic phase.

4,927,611

LIGHTWEIGHT MAGNESIA CLINKER AND PROCESS FOR THE PREPARATION OF THE SAME

Kosei Yamamoto; Akira Kaneyasu, and Toshiichi Iwamoto, all of Ube, Japan, assignors to UBE Chemical Industries, LTD., Yamaguchi, Japan

Filed Jun. 15, 1988, Ser. No. 207,142
Claims priority, application Japan, Jun. 15, 1987, 62-149741
Int. Cl.[5] C01F *5/06, 5/08, 5/12*
U.S. Cl. 423—155 9 Claims

1. A process for the preparation of a lightweight magnesia clinker which comprises the steps of granulating a mixture of a magnesium oxide-forming component having a particle size distribution such that the 100-mesh sieve residue is less than 5 wt.%, a powder combustible pore-forming material in an amount of 10 to 40 parts by weight based on 100 parts by weight of the magnesium oxide-forming component and a magnesium salt in an amount of 1 to 15 wt.% of the total weight of the magnesium oxide-forming component and the powder combustible pore-forming material to form particles having an average diameter of smaller than 3 mm, and firing the particulate mixture at a temperature of 1,300° to 1,600° C.

4,927,612

REDUCTION OF NITROGEN- AND CARBON-BASED POLLUTANTS

Wayne E. Bowers, Clearwater, Fla., assignor to Fuel Tech, Inc., Stamford, Conn.

Division of Ser. No. 906,671, Sep. 10, 1986, Pat. No. 4,751,065, which is a continuation of Ser. No. 811,532, Dec. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 784,827, Oct. 4, 1985, abandoned. This application Jun. 2, 1988, Ser. No. 201,546
The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
Int. Cl.[5] C01B *21/00*
U.S. Cl. 423—235 8 Claims

1. A process for reducing the concentration of nitrogen oxides in an oxygen-rich effluent from the combustion of a carbonaceous fuel, which process comprises injecting a solution comprising at least one additive compound selected from the group consisting of guanidine, guanidine carbonate, biguanide, guanylurea sulfate, melamine, dicyandiamide, biuret, 1,1'-azobisformamide, methylol urea, methylol urea-urea condensation product, dimethylol urea, methyl urea, and dimethyl urea, at a concentration and a temperature effective to achieve reduction in nitrogen oxide levels in the effluent.

4,927,613

PROCESS FOR REMOVING A CONSTITUENT FROM A HOT GAS STREAM BY EXOTHERMIC IONIC REACTION OF THE CONSTITUENT WITH A REACTANT PROVIDED IN FINE PARTICULATE FORM

Sirpa Hämäläi, Tampere; Matti Heikkilä, Helsinki; Jouko Laine, Tampere; Kari Kokkonen, Tampere, and Timo Kenakkala, Tampere, all of Finland, assignors to Oy Tampella AB, Tampere, Finland

Continuation of Ser. No. 191,973, May 9, 1988, abandoned. This application Oct. 4, 1989, Ser. No. 418,818
Claims priority, application Finland, May 11, 1987, 872072
Int. Cl.[5] B01J *8/00*
U.S. Cl. 423—244 16 Claims

1. A process for removing a constituent from a hot gas stream by exothermic ionic reaction of the constituent with a reactant provided in fine particulate form, comprising the steps of:
(a) providing a flowing hot gas stream containing, in fine particulate form, a reactant capable of reacting with a constituent of the hot gas stream in an exothermic ionic reaction;
(b) while directing the flowing hot gas stream upwardly, introducing droplets of water thereinto so that the water droplets, while being borne upwardly in the hot gas stream, evaporate in major proportion, thereby coating said particulate reactant and humidifying the flowing hot gas stream, and thereby providing a flowing cooled and humidified gas stream;
(c) subjecting the cooled and humidified gas stream to a plurality of episodes of turbulence, each successive two of said episodes of turbulence being separated by a respective interval of substantially laminar, vertical flow and thereafter vertical downward laminar flow thereby causing said



reactant in fine particulate form and water droplets remaining after partial evaporation as a result of step (b), to impinge upon one another thereby producing in said cooled and humidified gas stream, aqueous film-covered particles of said reactant, in which film an exothermic ionic reaction proceeds between said constituent and said reactant, at least one of said episodes of turbulence being caused by abruptly reversing flow direction of said flowing gas stream;
(d) directing the resulting gas stream to flow in continued contact with said aqueous film-covered particles, whereby heat of reaction from said exothermic ionic reaction evaporates said aqueous film into said gas stream, whereby chemically reacted particles in which said constituent have been consumed may be removed from the gas stream for purifying the gas stream of said constituent; and
(e) recovering said chemically reacted particles from the gas stream.

4,927,614

PROCESS FOR GROWING BERLINITE CRYSTALS

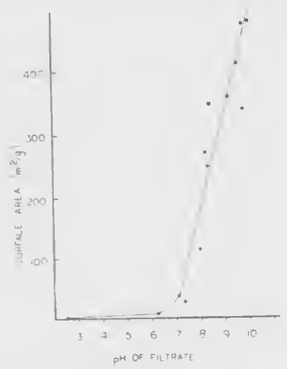
Horst G. Langer, Wayland, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1988, Ser. No. 157,840
Int. Cl.[5] C01B *25/36*
U.S. Cl. 423—305 3 Claims

1. A process for growing crystals of berlinite, comprising the steps of:
(a) preparing in an organic solvent an organoaluminum phosphate organogel, characterized by an OH:Al ratio less than or equal to 2;
(b) heating the thus-prepared organoaluminum phosphate

VOL 1114 ISS 4 MY 22 1990 UMI

organogel in an organic solvent at a temperature sufficient to slowly and continuously remove water from the organoaluminum phosphate organogel and to cause precipitation and growth of berlinite crystals and



(c) recovering the thus-produced berlinite crystals, carried out in the presence of a dopant comprising a Group IVB metal compound.

4,927,615

CRYSTALLINE SODIUM/ALUMINUM ACID PHOSPHATES

Paul Michel, Lyons, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 21, 1988, Ser. No. 260,719
Claims priority, application France, Oct. 21, 1987, 87 14520
Int. Cl.[5] C01B *15/16, 25/26*
U.S. Cl. 423—305 **15 Claims**

1. A process for the preparation of a crystalline aluminum and sodium acid phosphate having the following general formula:

$$Na_aAl_bH_c(PO_4)_d \cdot n\ H_2O$$

wherein a ranges from 0.6 to 3.3, b ranges from 1.8 to 3.3, c ranges from 12 to 16, d ranges from 7 to 9, and n ranges from 0 to 5, with the proviso that $a+3b+c=3d$, comprising coating and drying an atomized precursor solution of such acid phosphate on inert solid particles which comprise a fluidized bed thereof.

4,927,616

PREPARATION OF SILANE AND AMINE ALANES

Everett M. Mariett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 2, 1989, Ser. No. 416,042
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[5] C01B *33/04, 9/08;* C07F *5/06*
U.S. Cl. 423—347 **43 Claims**

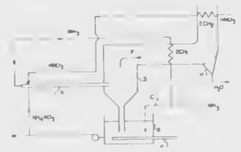
1. A process which comprises reacting
a. tertiary ammonium trichlorosilyl,
b. a complexing tertiary amine, and
c. an alkali metal aluminum tetrahydride, in molar proportion a:b:c of about 1:2:3, said process being conducted in a liquid reaction medium, such that silane and tertiary amine alane are produced.

4,927,617

PROCESS OF PRODUCING CONCENTRATED SOLUTIONS OF AMMONIUM NITRATE

Alexandre Villard, and Yves Cotonea, both of Rouen, France, assignors to Societe Chimique des Charbonnages S.A., Paris, France

Filed Mar. 2, 1987, Ser. No. 20,770
Int. Cl.[5] C06B *1/04*
U.S. Cl. 423—396 **4 Claims**



1. Process for producing concentrated solutions of ammonium nitrate which comprises neutralizing nitric acid with ammonia in a substantially horizontal pipe reactor containing no packing wherein the global flow of reactants is less than 150 kg/h/cm^2 and a recycled flow of ammonium nitrate solution is present having a recycling ratio ranging between 1:1 and 5:1.

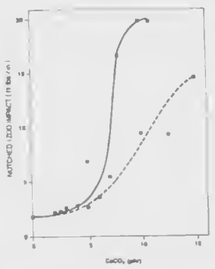
3. Process for producing concentrated solutions of ammonium nitrate which comprises neutralizing nitric acid with ammonia in a substantially horizontal pipe reactor containing no packing wherein the global flow of reactants is greater than 150 kg/h/cm^2 and no recycling of ammonium nitrate solution is carried out.

4,927,618

PROCESS FOR THE PREPARATION OF LARGE SURFACE AREA, FINELY DIVIDED PRECIPITATED CALCIUM CARBONATE AND FILLED POLYMERIC COMPOSITIONS OF MATTER CONTAINING SAID CALCIUM CARBONATE

Krishna K. Mathur; Robert F. Resnik, both of Easton, Pa., and Randall G. Simmons, San Jose, Calif., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 123,037, Nov. 19, 1987, abandoned. This application Jun. 7, 1988, Ser. No. 204,057
Int. Cl.[5] C01F *5/24, 11/18*
U.S. Cl. 423—432 **12 Claims**



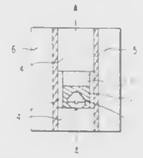
1. A process for the preparation of precipitated calcium carbonate which comprises introducing carbon dioxide into an aqueous slurry of calcium hydroxide containing anionic organopolyphosphonate polyelectrolyte present in the amount of from about 0.02 to about 1.0 weight percent based on the calcium carbonate equivalent of said hydroxide, the concentration of said hydroxide in said slurry being greater than about 5 weight percent, starting said introduction at a temperature above about 7° C. and below about 18° C., continuing said introduction until calcium carbonate precipitation is substantially complete and adding a polybasic acid selected from the group consisting of maleic, malic, tartaric, citric, malonic, phthalic, boric, sulfuric, aspartic, sulfurous, oxalic, glutaric and phosphoric acids in an amount from about 0.75 to about 4.0 weight percent based on the precipitated calcium carbonate.

4,927,619

DIAMOND SINGLE CRYSTAL

Kazuo Tsuji, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 733,541, Jun. 12, 1985, abandoned, which is a division of Ser. No. 506,935, Jun. 22, 1983, Pat. No. 4,544,540. This application Oct. 11, 1988, Ser. No. 255,249
Claims priority, application Japan, Jun. 25, 1982, 57-110398; Aug. 13, 1982, 57-141505
Int. Cl.[5] C01B *31/06*
U.S. Cl. 423—446 **15 Claims**



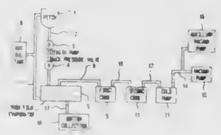
1. An artificial diamond single crystal, at least a part of a surface of the crystal having a rough surface which diffusibly reflects light which is formed by suppressing crystal growth at that surface, and wherein said diamond single crystal is obtained by a process consisting essentially of:
providing a diamond synthesis reaction system comprised of a reaction chamber housing having positioned therein a carbon source and a solvent metal arranged in contact with the said carbon source, said reaction system being arranged in a pressure medium;
providing a seed crystal in the reaction chamber;
providing temperatures of from about 1300° to 1600° C. and pressure of from about 50 to 60 Kb in the reaction chamber which permit diamond to be maintained thermodynamically stable in the reaction chamber housing;
heating the reaction chamber to provide a temperature gradient in such a way that a portion of the solvent metal in contact with the carbon source is higher in temperature than a portion of the solvent metal in contact with the seed crystal so as to migrate the carbon from the higher temperature portion to the lower temperature portion using the solvent metal as a medium; and
allowing the carbon to precipitate and grow as a diamond on the seed crystal due to the difference in solubility caused by the temperature gradient in the reaction chamber housing;
the crystal growth being maintained for about 10 to 100 hours until the crystal growth in the reaction chamber housing in at least one direction perpendicular to the direction of the temperature gradient reaches the contact surface of the solvent metal with the pressure medium having an irregular rough surface and thereby the crystal growth is suppressed at the surface of the pressure medium to thereby form an irregular rough surface on the crystal.

4,927,620

PROCESS FOR THE MANUFACTURE OF CARBON FIBERS AND FEEDSTOCK THEREFOR

Clifford Ward, Louisa; Eugene Chao, Ashland, both of Ky.; Roy E. Booth, Duncanville, Tex.; Frank H. Turrill, Huntington, W. Va.; Robert H. Wombles, Worthington, Ky.; John W. Newman, Ashland, Ky., and William P. Hettinger, Jr., Russell, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 549,115, Nov. 7, 1983, abandoned, which is a continuation of Ser. No. 446,535, Dec. 3, 1982, Pat. No. 4,497,789, which is a continuation-in-part of Ser. No. 331,443, Dec. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 963,080, Nov. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 963,232, Nov. 22, 1978, abandoned, which is a continuation of Ser. No. 838,900, Oct. 3, 1977, abandoned. This application Oct. 21, 1985, Ser. No. 789,590
Int. Cl.[5] D01F *9/12*
U.S. Cl. 423—447.2 **15 Claims**



1. A process for preparing carbon fibers from a catalytic pitch which consists essentially of:
(a) solvent extracting said catalytic pitch to selectively remove therefrom low molecular weight compounds, said solvent extraction being characterized in that it is performed under sufficiently mild time-temperature conditions such that;
(i) the mesophase content of said pitch is not significantly increased and is maintained below 5%, and
(ii) alkyl groups attached to aromatic compounds are not preferentially removed from said pitch,
(b) recovering from step (a) a fiber precursor pitch having the following properties:

Property	Value
Wt % of aromatic compounds	At least about 95
Wt % of aromatic carbon atoms	At least about 85
Total aliphatic hydrogen atoms, mol % of total hydrogen atoms	25–65
Aliphatic alpha hydrogen atoms, mol % of total hydrogen atoms	20–40
Aliphatic beta hydrogen atoms, mol % of total hydrogen atoms	2–15
Aliphatic gamma hydrogen atoms, mol % of total hydrogen atoms	1–10
Carbon/hydrogen atomic ratio	At least about 1.5
Wt % xylene insolubles	15–40
Wt % quinoline insolubles	Less than about 5
Wt % coking value	65–90
Softening point, °C.	At least about 240
% Mesophase	Less than about 5
Glass transition temp., °C.	150–220
Wt % ash	Less than about 0.1

(c) converting the fiber precursor pitch of step (b) into fibers;
(d) stabilizing the fibers of step (c) by heating them in an atmosphere containing an oxidizing gas at a temperature close to, but at least 5° C. below, the glass transition temperature of the fibers;
(e) transferring the stabilized fibers of step (d) into a zone substantially free of an oxidizing gas, and heating said fibers to a temperature of at least about 1000° C. for a

VOL 1114 ISS 4 MY 22 1990 UMI

period of time sufficient to increase the fixed carbon content of said fibers to at least about 90 weight %; and

(f) recovering the carbon fibers from step (e); the catalytic pitch employed in step (a) having the following properties:

Property	Value
Softening point, °C.	About 40–130° C.
Wt % xylene insolubles	Less than about 8
Wt % quinoline insolubles	Nil
Wt % coking value	Less than about 48
Carbon/hydrogen atomic ratio	Greater than about 1.2
% Mesophase	Less than about 5
Glass transition temp., °C.	Greater than about 35
Wt % ash	Less than about 0.1

4,927,621

PURIFICATION OF ANHYDROUS HYDROGEN CHLORIDE

Joseph F. Repman, Angleton; Thomas E. Morris, and Thomas F. Hill, Jr., both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 27, 1989, Ser. No. 303,513

Int. Cl.[5] C01B *7/07*; B01D *3/00*

U.S. Cl. 423—488 **46 Claims**

1. A method to purify impure gaseous hydrogen chloride containing an unsaturated chlorinated hydrocarbon in an amount less than that necessary to inhibit purification, comprising exposing the impure hydrogen chloride to an ultraviolet light source in the presence of gaseous chlorine for a sufficient time for the gaseous chlorine to react with organic impurities in the hydrogen chloride to form organic compounds heavier than the impurities and thereafter separating the heavier compounds from the hydrogen chloride.

4,927,622

PROCESS FOR PRODUCING ZIRCONIUM BASED GRANULES

Sivananda S. Jade, Englewood, Colo., assignor to Manville Corporation, Denver, Colo.

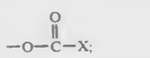
Continuation-in-part of Ser. No. 65,809, Jun. 19, 1987, abandoned. Dec. 11, 1987. Ser. No. 131,594

Int. Cl.[5] C01G *25/02*

U.S. Cl. 423—608 **4 Claims**

1. A process for the production of amorphous zirconium based granules, said process consisting essentially of the steps of:

(a) adding about 2–15 wt % of a suitable phase stabilizer to an aqueous solution, based upon the total weight of ZrO_2 in solution, comprising a compound of the formula $Zr(R)_4$, wherein each R is individually selected from the group consisting of



—OX; —NO_3, halogen; —OH, or OY and X represents a C_1–C_{10} hydrocarbyl group and Y represents a halogen, to produce an aqueous solution having a pH in the range of about 4 to 7 comprising a zirconium based complex and phase stabilizer and thereafter;

(b) drying said aqueous solution comprising said zirconium based complex and said phase stabilizer at a temperature below about 180° C. for a time a sufficient to evaporate said aqueous solution thereby forming amorphous zirconium based granules containing said phase stabilizer.

4,927,623

DISSOLUTION OF GAS IN A FLUOROCARBON LIQUID

David M. Long, Jr., San Diego, Calif., assignor to Alliance Pharmaceutical Corp., San Diego, Calif.

Continuation-in-part of Ser. No. 818,690, Jan. 14, 1986, Pat. No. 4,865,836, which is a continuation-in-part of Ser. No. 82,846, Aug. 5, 1987. This application Jan. 4, 1988, Ser. No. 140,543

Int. Cl.[5] A61K *49/04, 47/00*

U.S. Cl. 424—5 **11 Claims**

1. A method of dissolving a gas in a fluorocarbon emulsion comprising:

a. providing a first flexible container that is permeable to gas, but not to liquids or solids, in contact with the interior of a second container, said first and said second containers having means for introducing and removing fluid;

b. providing a fluorocarbon emulsion in one of said containers;

c. inserting said gas to be dissolved into the other of said containers and allowing the gas to permeate said one container to provide an oxygenated fluorocarbon emulsion in said one container.

4,927,624

CLAY MAGNETIC RESONANCE CONTRAST AGENTS FOR GASTROINTESTINAL COMSUMPTION OR INTRODUCTION

Robert G. Bryant, Pittsford, and Jay J. Listinsky, Rochester, both of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Nov. 19, 1987, Ser. No. 123,007

Int. Cl.[5] A61K *49/00*; G01N *24/00*

U.S. Cl. 424—9 **7 Claims**

1. In the method of nuclear magnetic resonance imaging of the gastrointestinal tract involving administering a contrast agent, the improvement comprising the oral or rectal administration of a contrast agent consisting essentially of a suspension of clay mineral in water.

4,927,625

TOOTHPASTES

Ralph M. Duckworth, Kelsall, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 18, 1988, Ser. No. 233,693

Claims priority, application United Kingdom, Aug. 21, 1987, 8719775

Int. Cl.[5] A61K *7/16, 7/18*

U.S. Cl. 424—52 **10 Claims**

1. A toothpaste comprising about 5 to about 75% by weight of an abrasive cleaning agent, an oral therapeutic agent which is a source of fluoride ions present in an effective amount to inhibit caries, 0.01 to 0.05% by weight of a flavouring agent, 0.002 to 0.01% by weight of a sweetening agent and 0.075 to 1.5% by weight of an anionic surfactant, the amount of said flavouring and sweetening agent being sufficiently low to reduce their normal stimulatory effect upon salivary flow.

4,927,626

METHOD FOR ENHANCEMENT OF UNGUIS GROWTH

Richard L. DeVillez, 930 Forrest Dr., Kalamazoo, Mich. 49002, and Richard K. Scher, 913 Gardiner Dr., P.O. Box P107, Bay Shore, N.Y. 11706

Filed Oct. 28, 1988, Ser. No. 264,470

Int. Cl.[5] A61K *7/04, 9/12*

U.S. Cl. 424—61 **5 Claims**

1. A method for enhancing the growth of unguis in animals including humans comprising:

topically applying to a region of the unguis where it emerges from the skin an effective amount of minoxidil.

4,927,627

EMULSION-FORM HYDROGEN PEROXIDE PREPARATIONS FOR THE BLEACHING AND OXIDATIVE DYEING OF HAIR

Dieter Schrader, Duesseldorf, and Winifried Neuhaus, Mettmann, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,875

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732147

Int. Cl.[5] A61K *7/135, 7/13*

U.S. Cl. 424—62 **25 Claims**

1. An oil-in-water emulsion suitable for use as a component in hair dyeing and hair bleaching preparations comprising a mixture of:

(a) an oily component selected from the group consisting of oils, fatty alcohols, and mixtures thereof;

(b) one or more emulsifiers selected from the group consisting of anionic, zwitterionic and nonionic surfactants, and mixtures thereof;

(c) hydrogen peroxide;

(d) a thickening agent selected from the group consisting of polymers and copolymers containing carboxyl groups and soluble in aqueous alkali; and

(e) water;

said emulsion having a viscosity within the range of about 0.5 to about 2 Pa.s as measured at 20° C. and at a shear rate of about 3 to about 6 cm^{-1}.

4,927,628

VACCINE AGAINST ROTAVIRUS DISEASES AND METHOD OF PREPARING SAME

Robert M. Chanock, Bethesda; Albert Kapikian, Rockville, both of Md.; Karen Midthun, Washington, D.C.; Jorge Flores, Bethesda, Md.; Mario Gorziglia, Silver Spring, Md.; Yasutaka Hoshino, Bethesda, Md., and Irene Peres-Schael, San Jose, Venezuela, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 21, 1987, Ser. No. 98,977

Int. Cl.[5] A61K *39/12*; C12N *15/00, 7/00*

U.S. Cl. 424—89 **2 Claims**

1. A method for producing a vaccine against rotavirus disease, consisting essentially of:

(a) isolating a rotavirus from humans having undergone asymptomatic rotaviral infection;

(b) analyzing the isolated virus obtained from step (a) by confirming the presence of the desired fourth rotaviral gene associated with rotaviral attenuation;

(c) growing a purified inoculum of the isolated rotavirus, carrying the fourth gene, in cells acceptable for use in vaccine for human administration; and

(d) employing an immunogenic amount of the rotavirus infected cells of step (c) as a vaccine in a pharmaceutically acceptable carrier.

4,927,629

RELAXATION OF SMOOTH VASCULAR MUSCLE

Richard J. Bing, La Canada, Calif., assignor to Huntington Medical Research Institutes, Pasadena, Calif.

Filed Dec. 17, 1987, Ser. No. 134,034

Int. Cl.[5] A61K *37/48*

U.S. Cl. 424—94.6 **4 Claims**

1. A method for relaxing smooth vascular muscle comprising administering to a living body having a vascular system with an endothelial lining and suffering from vascular contraction in said smooth vascular muscle an effective amount of a pharmacologically-acceptable amount of prospholipase A_2.

4,927,630

TISSUE PLASMINOGEN ACTIVATOR FROM NORMAL HUMAN COLON CELLS

Joseph Feder, University City; Susan C. Howard, Fenton; Arthur J. Wittwer, Ellisville, all of Mo.; Thomas W. Rademacher, Oxford, United Kingdom; Raj B. Parekh, Oxford, United Kingdom, and Raymond A. Dwek, Oxford, United Kingdom, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 929,950, Nov. 11, 1986, Pat. No. 4,751,084, which is a continuation-in-part of Ser. No. 834,080, Feb. 26, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 167,946

The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.

Int. Cl.[5] C12N *9/48, 9/50*; A61K *37/547*

U.S. Cl. 424—94.64 **3 Claims**

1. Human color fibroblast tissue plasminogen activator glycoprotein in which the protein moiety is glycosylated with Type I or Type II glycoforms or mixtures thereof upon separation by affinity chromatography on lysine-Sepharose such that the percent molar ratio of the individual oligosaccharides is about as follows:

Oligosaccharide	Percentage
C-A	1–3
C-B	8–11
C-C-1	9–13
C-C-2	2–4
C-C-3	0–3
C-C-4	0–3
C-D-1	2–6
C-D-2	8–18
C-E	8–14
C-F	4–7
C-G-1	2–7
C-G-2	2–4
C-G-3	3–6
C-H	8–19
C-I	7–15
C-J	2–4.

4,927,631

DECONGESTANT PREPARATION

Harry L. Bates, 311 West Ave., Elmira, N.Y. 14904

Continuation-in-part of Ser. No. 935,937, Nov. 28, 1986, abandoned. This application Feb. 16, 1989, Ser. No. 311,983

Int. Cl.[5] A61K *35/78*

U.S. Cl. 424—195.1 **6 Claims**

1. A decongestant preparation comprising a set of active components and a petrolatum base wherein said active components consist essentially of menthol, camphor, eucalyptus oil, and spirits of turpentine, wherein the total concentration of said active components is no greater than about 1.0% by weight of said decongestant preparation, and wherein said set of active components consists essentially of in percent by weight from about 15 to about 25 menthol, from about 30 to about 40 camphor, from about 5 to about 10 eucalyptus oil, and from abut 30 to about 40 spirits of turpentine, said decongestant being suitable for direct application to the nasal cavity.

4,927,632

SELECTIVE PULSED DRUG DELIVERY SYSTEM

Patrick S.-L. Wong, Hayward, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 878,947, Jun. 26, 1986, Pat. No. 4,786,500. This application Jun. 29, 1988, Ser. No. 213,215

The portion of the term of this patent subsequent to Nov. 22, 2006, has been disclaimed.

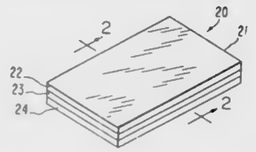
Int. Cl.[5] A61M *31/00*

U.S. Cl. 424—422 **2 Claims**

1. A delivery system for delivering a beneficial drug at a

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controlled rate to a biological environment, wherein the delivery system comprises: (a) a reservoir dimensioned for use and retention in the biological environment, the reservoir comprising a polymeric formulation that permits the passage of drug; (b) a beneficial drug in the reservoir; (c) a first membrane in contacting relation with a surface of the reservoir, the membrane comprising a material substantially impermeable to the passage of an osmagent; (d) an osmagent in the first membrane



in contacting relation with a surface of the reservoir; (e) a second membrane in contact with a different surface of the reservoir, the second membrane comprising a material substantially impermeable to the passage of an osmagent; and (f) an osmagent in the second membrane in contacting relation with a different surface of the reservoir, and wherein, when the delivery system is in operation in the biological environment, beneficial drug is released by the formation of osmotically-bursting apertures in (c) and (e).

4,927,633

DISPENSER FOR DELIVERING DRUG TO LIVESTOCK

James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 902,916, Sep. 2, 1986, Pat. No. 4,729,793, which is a continuation-in-part of Ser. No. 764,143, Aug. 9, 1985, Pat. No. 4,624,945, which is a continuation-in-part of Ser. No. 590,778, Mar. 19, 1984, Pat. No. 4,595,583. This application Jun. 24, 1987, Ser. No. 66,674

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.[5] A61K *9/22*; A61M *31/00*

U.S. Cl. 424—438 37 Claims

1. A dispensing device for delivering a beneficial agent formulation to an environment of use, the dispensing device comprising

(a) a wall that defines an internal space, said wall comprising in at least a part a composition that permits the passage of fluid;

(b) a beneficial agent formulation in the space, said formulation comprising selenium;

(c) an expandable composition in the space for urging the beneficial agent formulation from the device;

(d) a layer of a composition comprising means for maintaining the identity of the beneficial agent formulation and the expandable composition in the space between the beneficial agent formulation and the expandable composition;

(e) a density member in the space comprising a density for maintaining the device in the environment of use; and

(f) exit means in the wall for dispensing the beneficial selenium to the environment of use over time.

4,927,634

PHARMACEUTICAL COMPOSITIONS CONTAINING DYCLONINE HCl AND PHENOL

James V. Sorrentino, Wilton; William J. Kelleher, Storrs, and Jeanne O. Moye, Fairfield, all of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Continuation of Ser. No. 133,834, Dec. 16, 1987, Pat. No. 4,808,410. This application Jan. 13, 1989, Ser. No. 297,450

Int. Cl.[5] A61N *25/00*

U.S. Cl. 424—405 1 Claim

1. A pharmaceutical composition of matter having enhanced antimicrobial action comprising from about 0.02 to about 3.0 w/w percent of dyclonine HCl and from about 0.3 to about 5.0 w/w percent of phenol in admixture with a pharmaceutically acceptable aqueous carrier.

4,927,635

DEVICE FOR CONTROLLING STORED FOOD INSECTS

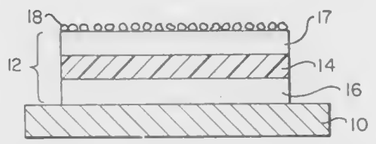
Samuel R. Loschiavo, Winnipeg, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Jul. 21, 1988, Ser. No. 222,571

Claims priority, application Canada, Jul. 24, 1987, 543006

Int. Cl.[5] A01N *25/08*

U.S. Cl. 424—409 8 Claims



1. A device for controlling stored-food insects, comprising a substrate selected from the group consisting of paper, burlap, cardboard and porous plastic, a layer of non-drying adhesive attached to said substrate and a deposit of silica aerogel particles atop the adhesive layer, the silica aerogel particles being releasable upon the insect contact thereof.

4,927,636

ASSOCIATION COMPLEX COMPRISING PULLULAN AND POLYETHYLENE GLYCOL, AND PREPARATION AND USES OF THE SAME

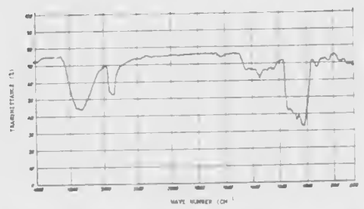
Hiromi Hijiya, and Toshio Miyake, both of Okayama, Japan, assignors to 501 Kabushiki Kaisha Hayashibara Kagaku Kenkyujo, Okayama, Japan

Filed Nov. 3, 1987, Ser. No. 116,329

Claims priority, application Japan, Nov. 11, 1986, 61-268305

Int. Cl.[5] A01N *25/34*; A61K *9/26, 47/00*; C05G *5/06*

U.S. Cl. 424—409 13 Claims



1. A complex, comprising pullulan and polyethylene glycol associated on a molecular level via hydrogen bonds and having a decreased water solubility with respect to the water solubility of said pullulan and said polyethylene glycol, said polyethylene glycol having a molecular weight in the range of about 200–10,000, and wherein the amount of polyethylene glycol is

in the range of 0.01–100 parts by weight with respect to one part by weight of pullulan, based on the dry solid.

13. The product of claim 12 in the form of a gradually disintegrable- or sustained release-shaped product.

4,927,637

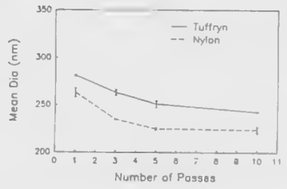
LIPOSOME EXTRUSION METHOD

Jacqueline K. Morano, Mountain View; Francis J. Martin, San Francisco, and Martin Woodle, Menlo Park, all of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Filed Jan. 17, 1989, Ser. No. 297,946

Int. Cl.[5] A61K *37/22*

U.S. Cl. 424—450 7 Claims



1. A method of producing a suspension of liposomes which have uniform sizes and a selected average size in the size range between about 0.1 and 0.4 microns, said method comprising

providing a suspension of heterogeneous-size liposomes containing a substantial portion with sizes greater than 1.0 micron, and

passing the suspension through a polymer membrane filter characterized by:

(a) a web-like construction providing a network of interconnected, tortuous-path capillary pores;

(b) a membrane thickness of at least about 100 microns; and

(c) a membrane pore size rating which is approximately the same as the selected average size of the liposomes.

4,927,638

ETOPOSIDE SOLUTIONS

Gururaj Bykadi, Phoenix, Ariz.; Murray A. Kaplan, Syracuse, N.Y.; Richard G. Corrao, Syracuse, N.Y.; Edward J. Bara, Syracuse, N.Y.; Ismat Ullah, Liverpool, N.Y., and Shreeram N. Agharkar, Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 916,599, Oct. 8, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 243,392

Int. Cl.[5] A61K *9/66, 9/08*; C07H *15/20*

U.S. Cl. 424—455 35 Claims

1. An etoposide solution comprising etoposide in dimethylisosorbide.

4,927,639

MODIFIED RELEASE GEMFIBROZIL COMPOSITION

Isaac Ghebre-Sellassie, Stanhope; Robert H. Gordon, Dover, and Sadath U. Khan, Mine Hill, all of N.J., assignors to Warner-Lambert Company, Ann Arbor, Mich.

Filed Feb. 2, 1989, Ser. No. 305,082

Int. Cl.[5] A61K *9/16*

U.S. Cl. 424—497 11 Claims

1. A disintegratable formulation of gemfibrozil providing both immediate and sustained release and comprising a tablet compressed from a mixture of (i) a first granulation, (ii) a second granulation, and (iii) a disintegration excipient operable to effect partial or complete disintegration in the stomach, said first and second granulations being present in a ratio of each to the other of from about 10:1 to about 1:10, respectively, said first granulation comprising finely divided particles of pure gemfibrozil granulated with at least one cellulose derivative and said second granulation comprising finely divided particles of pure gemfibrozil granulated with a pharmaceutically acceptable water soluble or insoluble polymer, said second granulation being uniformly coated with a water insoluble material prior to admixture with said first granulation.

4,927,640

CONTROLLED RELEASE BEADS HAVING GLASS OR SILICON DIOXIDE CORE

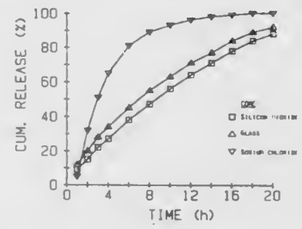
Lars-Erik D. Dahlinder, Mölndal; Mats O. Johansson, Göteborg; John A. Sandberg, Mölndal, and Sjö, Mönlycke, all of, Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

Filed Sep. 12, 1986, Ser. No. 907,599

Claims priority, application Sweden, Oct. 11, 1985, 8504720

Int. Cl.[5] A61K *9/16*

U.S. Cl. 424—497 10 Claims



1. Controlled release beads, each comprising a compact inert core selected from the group consisting of glass and silicon dioxide which is insoluble in water, physiological fluids and liquids commonly used for intraveneous infusion; a layer applied to the surface of the insoluble core consisting essentially of one or more pharmaceutically active compounds selected from among those compounds for which a non-instant drug release is wanted; and a release controllling polymeric membrane covering the active layer.

4,927,641

VETERINARY LINIMENT AND METHOD

Gerald L. Knight, 13106 McBurnett, Corpus Christi, Tex. 78410

Filed May 23, 1989, Ser. No. 355,352

Int. Cl.[5] A61K *33/14*

U.S. Cl. 424—665 9 Claims

1. A penetrating veterinary liniment comprising from about 1 to 10% by volume of an alkali metal hypochlorite; and from about 5 to 90% by volume DMSO, balance diluent.

4,927,642

APPARATUS FOR WELDING TUBULAR COMPONENTS OF THERMOPLASTIC MATERIAL

Peter Kunz, Schaffhausen, Switzerland, assignor to Georg Fischer AG, Schaffhausen, Switzerland

Filed Aug. 29, 1988, Ser. No. 237,903

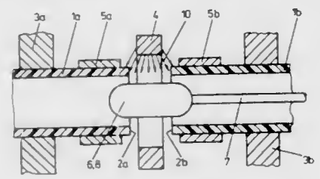
Claims priority, application Switzerland, Sep. 23, 1987, 03680/87

Int. Cl.[5] B29C *65/14*; B28B *21/96*

U.S. Cl. 425—508 3 Claims

1. Apparatus for welding tubular components of thermoplastic material, the tubular components having an axis, ends to be joined facing each other and an inner and an outer circumference, the apparatus comprising bracing devices for holding and moving the tubular components coaxially and toward each other, an annular heating device positioned between the bracing devices for generating radiation heat for heating the spaced-apart ends of the tubular components by radiation heat without contact at the outer circumference thereof at least until the melting point of the thermoplastic material is reached, preheatable support rings slidable toward each other in axial direction on the outer circumference of the tubular components prior to joining the ends of the tubular components, said

support rings positioned intermediate the bracing devices and within the annular heating device, and an expandable support means positioned within the support rings and annular heating



device, said expandable support means capable of being pressed against the inner circumference of the tubular components after the ends of the tubular components have been joined.

4,927,643

SOLUBLE FISH-ATTRACTANT COATING, COATED LURE, AND COATING COMPOSITION AND METHOD

Vincent T. D'Orazio, 5802 Tahoe Dr., Racine, Wis. 53406, and Robert B. O'Brien, 3515 Indiana St., Racine, Wis. 53405

Filed Nov. 23, 1988, Ser. No. 275,418

Int. Cl.[5] A01K *85/00*

U.S. Cl. 426—1 **14 Claims**

1. A liquid composition for application onto pre-existing fishing lure structures comprising:

a volatile solvent;

a polymer dissolved in the solvent and capable of forming a water-soluble coating upon volatilization of the solvent, the polymer selected from the group consisting of acidic polymers and alkaline polymers;

a neutralizer for the polymer present in an amount sufficient for partial neutralization to render the coating polymer water soluble to an extent; and

an odoriferous fish-attractant material dispersed in the solution, said fish-attractant material being selected from the group consisting of anise oil, fish oil, amino acids, earthworm extract, fish egg extract, fish meal homogenate, and mixtures thereof,

whereby the composition, when applied in liquid form onto a fishing lure structure, solidifies to a substantially continuous film coating thereon which will dissipate in water over time for steady extended release of the fish-attractant material without erosion or breakup of the pre-existing fishing lure structure.

4,927,644

PREFERENTIAL ENTRAINMENT OF ENZYMES IN CHEESE CURDS

Michael V. Arbige, Mostara, and Scott C. Sliver, Belmont, both of Calif., assignors to Genencor, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 689,867, Jan. 9, 1985, abandoned. This application Jun. 25, 1987, Ser. No. 67,664

Int. Cl.[5] A23C *19/032, 19/05*

U.S. Cl. 426—35 **4 Claims**

1. A process for improving the amount of protease or lipase which is entrained into cheese curds from milk comprising:

(a) selecting insoluble particles having a size of at least about 0.20 microns; said particles consisting essentially of a protease or lipase enzyme from a microbial source;

(b) adding to milk an amount of the selected protease or lipase particles sufficient to achieve the desired entrainment of the particles in the cheese curds; and

(c) forming curds and whey from the milk of step (b).

4,927,645

PROCESS FOR MAKING CANDY COATED SNACK FOODS SUCH AS POPCORN

Yanien Lee Manlius, N.Y., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 909,485, Sep. 19, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 313,048

Int. Cl.[5] A23G *3/00*

U.S. Cl. 426—93 **17 Claims**

1. A candy bar which displays uniform melting characteristics in a microwave oven and forms a pourable composition that is useful as a coating comprising

a solidified emulsion of shortening, water, an edible emulsifying agent, and a sweetener selected from the group consisting of sugar, corn syrup, corn syrup solids, molasses, and mixtures thereof, said solidified emulsion having a substantially uniform thickness,

the amount of moisture present in the bar being in the range from about 2% to about 10% of said bar by weight,

the amount of emulsifying agent present being from about 1% to about 2% of said bar by weight and sufficient to inhibit the separation of said shortening as the fluid emulsion is cooled and hardened to form said bar, and

the amount of shortening being from about 1% to about 30% of said bar by weight and sufficient to promote uniform melting of said candy bar.

4,927,646

SUCRALOSE SWEETENING COMPOSITION

Michael R. Jenner, Goring-on-Thames, and Graham Jackson, Reading, both of Great Britain, assignors to Tate & Lyle PLC, Great Britain

Filed Nov. 13, 1987, Ser. No. 120,077

Claims priority, application United Kingdom, Nov. 13, 1986, 8627139

Int. Cl.[5] A23L *1/236*

U.S. Cl. 426—96 **12 Claims**

1. A heat stable sweetener concentrate comprising particles of substantially non-crystalline sucralose dispersed evenly throughout, and closely adhering to, a water-soluble glucose oligosaccharide or mixture of said oligosaccharides, the concentrate containing between about 20% and 80% sucralose on a dry weight basis.

4,927,647

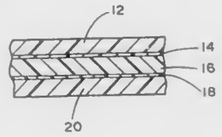
ANTI-STICK PACKAGE FOR HYGROSCOPIC FOODS

Jennifer A. Bailey, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 73,797, Jul. 13, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 277,464

Int. Cl.[5] A23L *3/00*

U.S. Cl. 426—126 **10 Claims**



1. A packaged dried fruit candy hygroscopic food stuff comprising a hygroscopic foodstuff contained in a flexible laminated package, said flexible laminated package comprising an inner layer formed of a polystyrene foam film having anti-stick characteristics whereby when placed in said package, said hygroscopic foodstuffs will not adhere to said polystyrene inner layer.

4,927,648

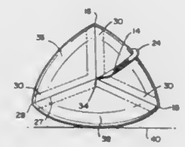
METHOD OF PREPARING POPCORN

Jon A. Ylvisaker, Marietta, N.Y., assignor to Borden, Inc., Columbus, Ohio

Filed Oct. 27, 1989, Ser. No. 427,698

Int. Cl.[5] B65B *29/68;* **A23L** *1/18*

U.S. Cl. 426—234 **3 Claims**



1. A method of preparing popcorn comprising the steps of: placing a pleated package containing a charge of unpopped popcorn kernels in a microwave oven, said package form from a length of microwave energy transparent sheet material, said sheet material forming said package having longitudinally extending opposed marginal edges, said package comprising two substantially planar opposed faces of said sheet material defining a product-containing chamber and said charge of unpopped popcorn contained therein; two opposed longitudinally extending fold lines in said sheet material joining the longitudinal periphery of said opposed faces; a longitudinally-extending seam intermediate said fold lines, integral with and projecting away from said one of said faces, outside the plane of said one face, said seam comprising a seal between said opposed marginal edges such that said edges are sealed to each other in face to face congruent fashion; and a longitudinally-extending pleat intermediate said fold lines, integral with and projecting away from said face opposite said one of said faces, outside the plane of said opposite face, said pleat comprising an additional fold line in said sheet material and additional opposed faces and foldable to lie against said opposite face,

said package further comprising two opposed transverse seals extending substantially along only the transverse edges of said package to seal the popcorn kernels contained therein, said transverse seals sealing said opposed faces to each other along said transverse edge and sealing said additional opposed faces to each other that constitute said pleat, said sheet material being otherwise unsealed between said opposed faces, said package being placed in said microwave oven such that the pleat is folded against the package and in contact with the oven floor; and then

applying sufficient microwave energy to the charge of unpopped kernels to pop said kernels and cause the release of steam and vapor from the kernels, said additional opposed faces and the orientation and configuration of said pleat and said transverse seals being such that said steam and vapor expands said pleat creating a three-surface, generally tubular structure with sealed transverse edges, each surface having one common edge with each of the other surfaces and each surface convexly curved between the sealed transverse edges and between its common edges such that only one of said surfaces of the package contacts said oven floor and makes minimal contact between the package and the microwave oven floor thereby reducing heat transfer from said package to said floor.

4,927,649

METHOD OF MAKING A HEMICELLULOSE COATED DIETARY FIBER

Robert N. Antenucci, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sep. 16, 1988, Ser. No. 245,890

Int. Cl.[5] A23P *1/08*

U.S. Cl. 426—273 **12 Claims**

1. A method of preparing a soluble/insoluble dietary fiber supplement from corn bran comprising:

(a) removing from a first portion of corn bran at least a portion of a digestible component thereof to concentrate the dietary fiber content thereof and yield an insoluble fiber;

(b) extracting hemicellulose from a second portion of corn bran,

(c) coating the insoluble fiber with the hemicellulose using an aqueous medium, and

(d) removing said aqueous medium from said coating to deposit said hemicellulose upon said insoluble fiber.

4,927,650

FOOD PREPARATION

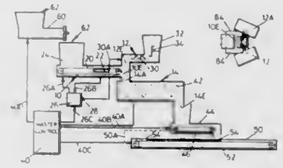
William W. Roberts, Port Dinorwic, Great Britain, assignor to Quick Cuisine Limited, Wales

Continuation of Ser. No. 819,816, Jan. 16, 1986, abandoned. This apolication Feb. 22, 1989, Ser. No. 314,290

Claims priority, application United Kingdom, Jan. 16, 1985, 8501105

Int. Cl.[5] A23B *7/04, 7/16*

U.S. Cl. 426—295 **4 Claims**



1. A method of producing a food product for a food dish requiring a main ingredient and further ingredients at least for flavoring purposes, said method comprising the steps of:

preparing a main ingredient and further ingredients separately to states wherein the further ingredients are in a dry particulate condition and wherein the main ingredient and the further ingredients are admixable to form said food product which can be quickly and readily brought to a state ready for consumption;

chilling the prepared main ingredient to between −5° C. and +10° C. and dividing the chilled main ingredient; and

after said chilling has been completed, continuously and simultaneously:

supplying the chilled and divided main ingredient and the unchilled dry particulate further ingredients into a mixing chamber separately and at independently controllable rates;

admixing the chilled and divided main ingredient and the dry particulate further ingredients in the mixing chamber to form a combined product where the main ingredient is coated by the dry particulate further ingredients; and

removing the combined product from the mixing chamber.

VOL
1114
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4,927,651

METHOD OF PRESERVING FOOD

Hiroo Kumani, and Akio Okamoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Nasa, Kanagawa, Japan

Filed Mar. 3, 1989, Ser. No. 318,532
Claims priority, application Japan, Oct. 7, 1988, 63-253412
Int. Cl.[5] A23L *3/26*
U.S. Cl. 426—324 27 Claims

1. A method of preserving food, comprising the steps of: adding to the food an aqueous solution containing a plant extract of 0.1 to 1% by volume containing flavonoids; preparing a wrapping material from a thermoplastic to which a far infrared radiating ceramic is added;; wrapping the food with the wrapping material, which is capable of radiating far infrared rays and absorbing ethylene gas; and maintaining the wrapped food at a low temperature.

4,927,652

PROCESS FOR THE EXTRACTION OF LACTONES FROM LIPID MATERIAL

Petrus G. M. Haring, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 13, 1988, Ser. No. 283,701
Claims priority, application European Pat. Off., Dec. 16, 1987, 87202559
Int. Cl.[5] A23D *5/00*
U.S. Cl. 426—330.6 10 Claims

1. Process for the extraction of lactones from a lactone-containing lipid material, by contacting a medium, having a temperature near the critical temperature of said medium, and having a pressure near the critical pressure of said medium, with the lipid material, and subsequently removing the medium, wherein the medium, upon contacting, has a temperature T (in °C.), and pressure P (in bar), such that:

$$-25 \leq T^* \leq 18.5$$

$$-40 \leq P^* \leq 300$$

$$T^* \times P^* \leq 1900$$

where $T^* = T - T_c$, $P^* = P - P_c$, T_c is the critical temperature (in °C.), and P_c is the critical pressure (in bar) of said medium.

4,927,653

STERILIZED FOODSTUFF PREPARATION

Clive Manvell, East Haaney, England, assignor to CMB Packaging (UK) Limited, Worcester, United Kingdom

Continuation of Ser. No. 38,467, Apr. 14, 1987, abandoned, which is a continuation of Ser. No. 663,237, Oct. 22, 1984, abandoned. This application Jun. 13, 1989, Ser. No. 366,294
Claims priority, application United Kingdom, Oct. 27, 1983, 8328725
Int. Cl.[5] A23L *1/01, 3/00*
U.S. Cl. 426—399 9 Claims

1. A process for sterilizing a solid food product having water as a constituent thereof, said process comprising the steps of:
introducing the solid food product into a reaction vessel;
introducing a pressurized gaseous medium into the reaction vessel so as to subject the solid food product to an applied pressure which is sufficient to elevate the boiling point of water to at least 110° C.;
heating a cooking oil or fat to a temperature which is at least equal to said elevated boiling point of water;
continuously supplying the heated oil or fat to the reaction vessel for a predetermined period of time so as to immerse the solid food product in the heated oil or fat with the solid food product subjected to said applied pressure;
said predetermined period of time being sufficient to partly vaporize water in the solid food product and heat the interior of the solid food product to no more than the elevated boiling temperature of water, and long enough to sterilize the solid food product, but not long enough to allow drying out of the solid food product;
at the end of said predetermined period of time, halting the supply of heated oil or fat and releasing the solid food product from said applied pressure;
removing the solid food product from the reaction vessel and separating the solid food product from the heated oil or fat under aseptic conditions; and
hermetically sealing the solid food product in a container while still under aseptic conditions.

4,927,654

WATER SOLUBLE BULKING AGENTS

Ronald E. Barnett, Brewster, N.Y.; Roxane Dikeman, Arlington Heights, Ill.; Shyh-Yuan Liao, Schaumburg, Ill.; John Gill, Mount Prospect, Ill., and David P. Pantaleone, Buffalo Grove, Ill., assignors to The Nutrasweet Company, Deerfield, Ill.

Continuation-in-part of Ser. No. 76,632, Jul. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 19,816, Feb. 27, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 218,532
Int. Cl.[5] A23L *1/308*
U.S. Cl. 426—548 17 Claims

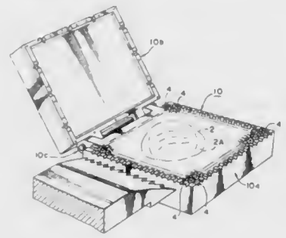
1. A sweetener composition comprising:
(a) a high potency sweetener and
(b) a water soluble bulking agent selected from the group consisting of:
(i) a hemicellulose A
(ii) a hemicellulose B
(iii) a modified hemicellulose A
(iv) a modified hemicellulose B and
(v) mixtures of (i), (ii), (iii), and (iv).

4,927,655

HEAT PROCESSED FOOD BASE

Sadaharu Ito, 30-5, Saginomiya 1-chome, Nakano-ku, Tokyo 165, Japan

Filed Apr. 29, 1988, Ser. No. 188,548
Claims priority, application Japan, May 1, 1987, 62-108578
The portion of the term of this patent subsequent to May 22, 2006, has been disclaimed.
Int. Cl.[5] A21D *13/08*
U.S. Cl. 426—549 3 Claims



1. A supply of intermediate products which can be individually toasted to provide crisp edible vessels, comprising:
a plurality of disk-like sheets of material partially baked from a batter mixture of the following ingredients:

Ingredient	Parts by Weight
wheat flour	80–120
sugar	30–60
oil or fat	10–30
egg	10–30

-continued

Ingredient	Parts by Weight
glycerin mono-fatty acid ester	0.5–2
powdered milk	3–5
salt	0.5
coloring and flavoring agents	small amount
water	80–120,

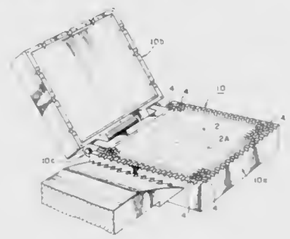
said sheets being at most slightly browned, having platen imprints on both opposite faces thereof, and having a moisture content of more than 7 percent to 20 percent by weight;
said sheets being stacked a plurality of sheets high, in a package containing at least ten such sheets.

4,927,656

METHOD OF PRODUCING EDIBLE VESSEL

Sadaharu Ito, 30-5, Saginomiya 1-chome, Nakano-ku, Tokyo 165, Japan

Filed Apr. 29, 1988, Ser. No. 188,550
Claims priority, application Japan, May 1, 1987, 62-108579
Int. Cl.[5] A21D *13/08*
U.S. Cl. 426—549 7 Claims



1. A method for providing a supply of intermediate products which subsequently can be toasted on-site to provide crisp edible vessels, comprising:
(a) providing a batter mixed from the following ingredients:

Ingredient	Parts by Weight
wheat flour	80–120
sugar	30–60
oil or fat	10–30
egg	10–30
glycerin mono-fatty acid ester	0.5–2
powdered milk	3–5
salt	0.5
coloring and flavoring agents	small amount
water	80–120

(b) inserting quanta of the batter between upper and lower platens heated to 120°–180° C. so that each quantum is contacted on opposite faces by respective upper and lower platens;
(c) while maintaining the batter at 110°–150° C. by heat transfer thereto from the platens partially baking the quanta of batter to produce disk-like intermediate products having a moisture content in the range of more than 7 percent to 20 percent by weight; and
(d) cooling, stacking and packaging into packages of at least ten, said intermediate products.

4,927,657

REDUCED TARTNESS SALAD DRESSING

James M. Antaki, San Leandro, and Daniel T. Layne, III, Clayton, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Apr. 13, 1989, Ser. No. 338,367
Int. Cl.[5] A23L *1/24*
U.S. Cl. 426—589 38 Claims

1. An improved, reduced tartness salad dressing product which is resistant to bacteriological spoilage, including an edible oil in an amount of between about 0% and 90% by weight; moisture in an amount of between about 5% and 90% by weight; the balance being edible ingredients; and a preservation system comprising at least two edible acids in an amount sufficient to provide a titratable glacial acetic acid equivalent in said salad dressing product of between about 1.1% and about 6.5% by weight of the aqueous phase, and buffering salt sufficient to buffer said dressing product to a pH of from about 3.0 to about 4.5; wherein said edible acids are selected from phosphoric, acetic, fumaric, lactic, citric, adipic, malic, tartaric and hydrochloric, and
wherein the combination of said at least two acids and said pH contributes to low tartness in said salad dressing product.

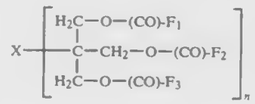
4,927,658

TRIS-HYDROXYMETHYL ALKANE ESTERS AS LOW CALORIE FAT MIMETICS

Lawrence P. Klemann, Somerville; John W. Finley, Whippany, and Anthony Scimone, Cedar Grove, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Feb. 16, 1989, Ser. No. 311,709
Int. Cl.[5] A23D *5/00;* C11C *3/00*
U.S. Cl. 426—611 43 Claims

1. A food composition comprising an edible fat compound of the formula



where
n=2,
X is an ester bridge having 1 to 8 carbons and
F_1, F_2, and F_3 are dicarboxylate-extended fatty acid residues.

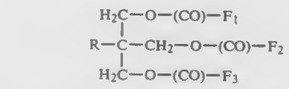
4,927,659

TRIS-HYDROXYMETHYL LOWER ALKANE ESTERS AS FAT MIMETICS

Lawrence P. Klemann, Somerville; John W. Finley, Whippany, and Anthony Scimone, Cedar Grove, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Feb. 16, 1989, Ser. No. 312,076
Int. Cl.[5] A23D *5/00;* C11C *3/00*
U.S. Cl. 426—611 48 Claims

1. A food composition comprising a partially digestible edible fat of the formula



wherein R is a methyl or ethyl group, and F_1, F_2, and F_3 are the same or different fatty acid residues comprising from 10 to 22 carbon atoms.

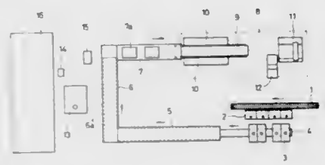
VOL
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ISS
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4,927,660

MANUFACTURING PROCESS OF PACKED FAST-COOKING RICE

Joji Sano, No. 6-31, Rokkakubashi 6-chome, Kanagawa-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Nov. 10, 1988, Ser. No. 271,209
Claims priority, application Japan, Nov. 11, 1987, 62-283167
Int. Cl.[5] A23L *1/182*
U.S. Cl. 426—618 17 Claims



1. A process for preparing packaged fast-cooking rice, comprising washing raw material rice in water, soaking said washed rice in water, draining water from the rice, heating the rice to gelatinized grains of cooked rice having a water absorptive property, impregnating said gelatinized and water-absorptive grains of rice with an additive liquid to swell the grains of rice causing the grains of rice to separate from each other, and packaging the swelled and separated rice grains in an air evacuated package.

4,927,661

HEAT PRODUCT

Noel J. Bradshaw, Sharnbrook, and David Hughes, Rushden, both of United Kingdom, assignors to Unilever Patent Holdings, B.V., Rotterdam, Netherlands

Filed Aug. 19, 1985, Ser. No. 767,028
Claims priority, application United Kingdom, Aug. 17, 1984, 8420946
Int. Cl.[5] A23L *1/314, 1/315, 1/317*
U.S. Cl. 426—641 15 Claims

1. A two-phase meat product, comprising (a) from 20 to 90 percent by weight of a texture imparting phase, consisting of aligned, flat meat slices having a thickness of from 0.5 mm to 6 mm, and (b) from 80 to 10 percent by weight of a finely dispersed succulence imparting phase, comprising fat, water and a binding agent, said two-phase meat product exhibiting a parallel arrangement of its constituent phases.

7. A process of preparing a two-phase beef, pork or poultry meat product, according to claim 1, comprising the steps of:

(a) slicing beef, pork or poultry into slices having a thickness of from 0.5 mm to 6 mm, forming a texture imparting phase;

(b) forming a finely dispersed succulence imparting phase, comprising fat, water and a binding agent;

(c) gently combining the texture imparting phase and the succulence imparting phase;

(d) subjecting the mixture obtained to an alignment treatment, and

(e) bringing the aligned mixture into the required form and shape for consumption.

4,927,662

TREATMENT OF POWDERED CELLULOSE

Jau Y. Hsu, Brookfield, and Gary J. Larson, New Milford, both of Conn., assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 857,109, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 528,562, Sep. 1, 1983, abandoned, which is a continuation of Ser. No. 313,906, Oct. 22, 1981, abandoned, which is a continuation of Ser. No. 170,089, Jul. 18, 1980, abandoned. This application Jun. 28, 1988, Ser. No. 214,910
Int. Cl.[5] A23L *1/10, 1/015*
U.S. Cl. 426—658 13 Claims

1. A process for treating powdered cellulose which comprises combining powdered cellulose, a flavoring agent and water, wherein, by weight, the wate is in an amount of from 25 to 75 parts per 100 parts of powdered cellulose, and mixing the cellulose, flavoring agent and water to provide a mixture in which substantially all of the cellulose is wetted and then heating the mixture to remove most of the water.

4,927,663

METHOD FOR MINIMIZING CURLING IN SCREEN PRINTING

Richard F. Small, Gillingham; Dakshesh S. Patel, Harrow, both of United Kingdom; Lascelle A. Barrow, London, and Barry M. Dix, Middlesex, both of England, assignors to Small Products Limited, London, England

PCT No. PCT/GB87/00541, § 371 Date Sep. 30, 1988, § 102(e) Date Sep. 30, 1988, PCT Pub. No. WO88/00889, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 30, 1987, Ser. No. 254,800
Claims priority, application United Kingdom, Jul. 30, 1986, 8618595; Aug. 6, 1986, 8619245
Int. Cl.[5] B05D *3/06, 1/32, 3/02, 5/00*
U.S. Cl. 427—40 29 Claims

1. A method for minimizing substrate edge-curl in a process when a substrate is screen printed with a water-based screen printing ink comprising the steps of:

(a) carrying out a first screen printing using an ink which produces a minimal curl in the substrate edge; and then

(b) carrying out at least one subsequent screen printing on the printed substrate from step (a) using a water-based ink —,whereby any resulting curl is less than that which would be obtained if the first screen printing were with said water-based ink—.

4,927,664

PROCESS FOR APPLYING ELECTRICALLY INSULATIVE LAYERS

Chong S. Tsai; Shou H. Chen; Bean T. Li, and King L. Jean, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Mar. 15, 1989, Ser. No. 324,212
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—57 3 Claims

1. A process for applying an electrically insulative layer on a metal surface which comprises suspending an electrically insulative powder in a highly volatile solvent by ultrasonic vibration to give a homogeneous suspension, applying said suspension on the surface of said metal surface, and then evaporating said solvent, leaving an electrically insulative layer consisting essentially of said insulative powder.

4,927,665

SIMULTANEOUS MULTI-LAYER COATING METHOD FOR MANUFACTURING MAGNETIC RECORDING MEDIUM

Naoyoshi Chino; Tsunehiko Sato; Shinji Saito, and Hiroshi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 12, 1989, Ser. No. 420,410
Claims priority, application Japan, Oct. 13, 1988, 62-255967
Int. Cl.[5] H01F *10/02*
U.S. Cl. 427—131 7 Claims

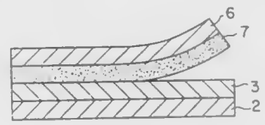
1. In a coating method in which a plurality of organic-solvent-based layers are simultaneously formed on a nonmagnetic support which is continuously run to manufacture a magnetic recording medium, the improvement wherein a surface tension of a solvent composition comprising at least two types of solvents and which is used to form an uppermost one of said plurality of layers is lower than a surface tension of a solvent composition comprising at least two types of solvents and which is used to form the remaining layers, said surface tension of said solvent composition forming said uppermost of said plurality of layers being in a range of 0.1 to 10 dyne/cm.

4,927,666

IMAGE-RECEIVING SHEET

Sadanobu Kawasaki, Tokorozawa; Mineo Yamanchi, Ichikawa, and Masanori Akada, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 871,918, Jun. 9, 1986, Pat. No. 4,820,687, which is a continuation of Ser. No. 633,252, Jul. 23, 1984, Pat. No. 4,626,256. This application Dec. 13, 1988, Ser. No. 283,973
Claims priority, application Japan, Jul. 25, 1983, 58-135627
Int. Cl.[5] B41M *3/12, 5/035, 5/26*
U.S. Cl. 427—146 19 Claims



1. A process for producing an image-receiving sheet for use in an image-forming system wherein said sheet is brought into contact with a heat transfer sheet, said heat transfer sheet comprising a support and a heat transfer layer provided on the support comprising a heat transferable dye contained in a synthetic resin binder, wherein an image is formed on the image-receiving sheet by contacting the heat transfer layer with the image-receiving sheet and selectively heating at least a portion of the heat transfer sheet with heating means to transfer the dye selectively from the heat transfer layer to the image-receiving sheet, the process comprising:

preparing a substrate;

applying a composition for forming an image-receiving layer onto the substrate, the composition comprising:

(a) a synthetic resin for receiving the dye transferred from the heat transfer layer of the heat transfer sheet;

(b) a dye-permeable releasing agent for preventing heat adhesion of the synthetic resin binder of the heat transfer sheet to said image-receiving layer upon heating thereof by the heating means; and

(c) a solvent;

pre-drying the composition thus applied in a dryer, such that the solvent is thoroughly removed from the applied composition; and

drying the composition such that at least a portion of said releasing agent is exuded to form a releasing agent layer on at least a portion of a surface of the image-receiving layer.

4,927,667

AQUEOUS PROCESS FOR PREPARING WATER-RESISTANT COATINGS OF HYDROPHOBIC COPOLYMERS MADE FROM HYDROPHILIC MONOMERS

Jenn S. Shih, Paramus; Terry E. Smith, Morristown, and Robert B. Login, Oakland, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Jun. 22, 1989, Ser. No. 370,208
Int. Cl.[5] B65B *33/04*
U.S. Cl. 427—154 6 Claims

1. An aqueous process for preparing water-resistant coatings of hydrophobic copolymers made from hydrophilic monomers which comprises:

(a) providing a hydrophobic copolymer including (i) about 15–85% by wt. of a hydrophilic vinyl lactam and (ii) about 85–15% by wt. of a hydrophilic polymerizable carboxylic acid which copolymer is water-resistant within said ranges,

(b) forming an aqueous solution of said hydrophobic copolymer in a volatile neutralizing agent,

(c) applying said solution to a substrate to form a coating of said copolymer thereon, and

(d) removing said volatile neutralizing agent from said coating to convert it into a water-resistant coating.

6. A process according to claim 1 wherein step (d) is carried out with heating.

4,927,668

TREATMENT FOR AUTOMOBILE WINDSHIELDS

Patrick D. Senckowski, 114 Southbridge St., Worcester, Mass. 01608, assignor to Joseph M. Senckowski and Patrick D. Senckowski, both of Worcester, Mass.

Filed Aug. 1, 1988, Ser. No. 226,617
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—168 4 Claims

1. The process of applying onto at least one surface of an optically clear substrate a compound which forms a transparent anti-fogging and anti-wetting layer from a valve actuated, pressurized container comprising the following steps:

(a) actuating the valve,

(b) directing the compound onto the surface of an optically clear substrate, and wherein said compound comprises:

(1) 10 to 20% by weight of an isoparaffinic hydrocarbon solvent,

(2) 10 to 20% by weight of an alkane selected from the group consisting of isobutane, N butane, and propane,

(3) 5 to 15% by weight of a hydrocarbon wax, and

(4) 60 to 70% by weight of water, and

(c) buffing the substrate with a terry-type cloth to remove dirt and oils from the substrate and to provide a uniform and transparent layer of the compound on said surface.

4,927,669

OIL FIELD CORROSION INHIBITION

David E. Knox, Goose Creek, and Eugene R. Fischer, James Island, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,184
Int. Cl.[5] B05D *7/22*
U.S. Cl. 427—239 9 Claims

1. A method for inhibiting corrosion in downwell oil field equipment and piping which is in contact with an oil/water medium taken from a producing well by coating said equipment and piping with a formulation including a reaction product of C_{18} unsaturated fatty acids and a compound selected from the group consisting of maleic anhydride and fumaric acid, wherein said product is selected from the group consisting of a fatty acid Diels-Alder adduct and a fatty acid-ene reaction product, wherein the formulation is added to said oil/water medium.

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4,927,670

CHEMICAL VAPOR DEPOSITION OF MIXED METAL OXIDE COATINGS

Ahmet Erbil, Atlanta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jun. 22, 1988, Ser. No. 210,023
Int. Cl.[5] C23C *16/00*; B05D *5/12*
U.S. Cl. 427—255.3 11 Claims

1. A chemical vapor deposition process for preparing a composite article comprising a thin mixed metal oxide film coating on a substrate, which comprises: contacting a heated substrate with (1) an oxidizing gas stream and (2) heat decomposable organometallic compounds yielding on decomposition two or more metals of different groups of the Periodic Table and each selected from the group consisting of metals of Group IIA and transition metals of the Periodic Table, said heat decomposable organometallic compounds being contained in one or more nonoxidizing carrier gas streams, said heat decomposable organometallic compounds including at least one compound of the following formula (I)



(I)

wherein:

M_1 is a metal of Group IIA, IIIB, IVB, VB, VIB, VIIB or VIII of the Periodic Table,

R_1 is a lower alkyl or lower alkenyl radical of 2 to about 6 carbon atoms,

R_2 is hydrogen, fluoring, a lower alkyl radical of 1 to 6 carbon atoms, or a lower alkenyl radical of 2 to 6 carbon atoms,

n is the valence of M_1 and is an integer from 2 to 4, and

p is an integer from 0 to (n−1);

or a compound of the following formula (II)



(II)

wherein;

M_2 is a metal of Group IIB of the Periodic Table;

R_3 is a lower alkyl radical of 1 to about 6 carbon atoms, or a lower alkenyl radical of 2 to about 6 carbon atoms; and

R_4 is a lower alkyl radical of 1 to 6 carbon atoms;

the temperature of said substrate being from 150° to 1000° C. and above the decomposition temperatures of said organometallic compounds.

4,927,671

METHOD OF PRODUCING COLORED DECORATIONS ON CERAMIC PRODUCTS

Klaus Nawothnig, Brachttal, Fed. Rep. of Germany, assignor to Wachtersbacher Keramik Otto Friedrich Furst zu Ysenburg und Budingen GmbH & Co. KG, Brachttal, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 157,378
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705572
Int. Cl.[5] B05D *3/02, 5/00*
U.S. Cl. 427—274 7 Claims

1. Process for the production of colored decorations on ceramic bodies comprising

forming an aqueous suspension of a pigment, said aqueous suspension containing at least one surface active agent,

causing said aqueous suspension to foam,

contacting said ceramic body with said foam and thereby depositing said pigment on said ceramic body, and

heating said ceramic body to a temperature of about 600° to 1500° C.

4,927,672

PROCESS FOR RAPIDLY FIXING WOOD PRESERVATIVES TO PREVENT AND REDUCE ENVIRONMENTAL CONTAMINATION

William F. Drinkard, Jr., Charlotte, N.C., assignor to Drinkard Developments, Charlotte, N.C.

Filed May 11, 1989, Ser. No. 350,604
Int. Cl.[5] B05D *1/18*
U.S. Cl. 427—336 33 Claims

1. A process for accelerated fixing of heat-fixable wood preservatives in wood, comprising:

contacting preservative-impregnated wood with an aqueous heated liquid heating medium preheated to at least 100 degrees F.;

raising the temperature of the wood from ambient to from 100 F. to 240 degrees F.; and

maintaining both liquid contact and raised temperature of the wood for a period of time from 20 minutes up to 2 hours;

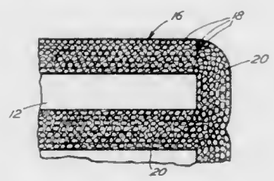
whereby complete fixation occurs in less than 48 hours.

4,927,673

RAPID TECHNIQUE FOR MAKING IMPROVED LAMINAR CERAMIC SHELL MOLDS USING A PHOSPHATE MODIFIED ALUMINUM SALT BINDER

Kermit A. Buntrock, Chicago, Ill.; Daniel R. English, Felton, Calif., and Wescomb R. Jones, Wilmington, Del., assignors to Buntrock Industries, Inc., Lively, Va.

Filed Jan. 27, 1988, Ser. No. 148,940
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—376.2 39 Claims



1. An investment casting process for forming a laminar ceramic mold, comprising in combination the steps of:

(a) preparing a first bath comprising either an alkali stabilized solution of negatively charged ionic silicate or an alkali stabilized sol of negatively charged colloidal silica;

(b) preparing a second bath comprising an acid stabilized solution of phosphate modified positively charged aluminum salt;

(c) dipping a support structure initially into one of the baths to define a first coating on the support structure; and

(d) dipping the support structure thereafter into the other of the baths to define a second coating on the support structure;

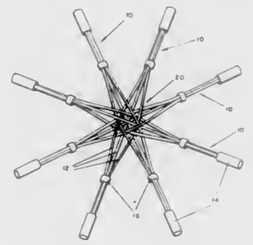
whereby the first and second coatings on the support structure react to form a gel set shell which can thereafter be fired to create a ceramic.

4,927,674

WOVEN WIRE APPARATUS

Bradford L. Smith, Santa Fe, N. Mex., assignor to Wovenwire Corporation, Santa Fe, N. Mex.

Filed Mar. 2, 1989, Ser. No. 319,653
Int. Cl.[5] A45B *19/00, 27/00*
U.S. Cl. 428—11 39 Claims



1. A woven wire apparatus comprising at least one bundle, said bundle comprising:

a plurality of multi-wire elements, each said multi-wire element having first and second ends, and each said multi-wire element comprising a plurality of stiff but slightly flexible wires;

means for positioning said multi-wire elements in a mutually intersecting relationship to one another;

means for joining said first end and means for joining said second end of said multi-wire elements whereby said elements are thereby retained in said intersecting relationship to one another; and

movably engageable wire retaining means additional to said positioning means and said joining means for fixing said elements in position and allowing movement of said elements.

4,927,675

FILLED CORE MATERIALS HAVING UNFILLED OUTER ATTACHED LAYERS

Ronald L. Adams, Mt. Vernon; Kirk L. Kimbel, Evansville, and Clayton B. Quinn, Mt. Vernon, all of Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 814,960, Dec. 31, 1985, abandoned.
This application Apr. 21, 1989, Ser. No. 342,606
Int. Cl.[5] B32B *27/08, 27/36*; B27N *5/00*
U.S. Cl. 428—35.9 12 Claims

1. A coextruded multilayer material comprising an aromatic polycarbonate core layer having a substantial amount of at least one colorant dispersed therein, said colorant being present at a level of from one percent by weight to 40 percent by weight of the total weight of said multilayer material;

a transparent first coextruded aromatic polycarbonate outer layer attached to a first surface of the core layer and substantially free of dispersed colorants; and

a transparent second coextruded aromatic polycarbonate outer layer attached to a second surface of the core layer opposite the first surface and substantially free of dispersed colorants, said first and second outer layers each having a thickness sufficient to prevent the migration of the colorant dispersed in said core layer to the surface portions of said first and second outer layers opposite the core layer, said first and second outer layers each having a thickness of from 0.5 mil to about 30 mils.

4,927,676

METHOD FOR RAPID ADHERENCE OF ENDOTHELIAL CELLS ONTO A SURFACE AND SURFACES PREPARED THEREBY

Joel L. Williams; David B. Montgomery, both of Cary, and Lillian P. Baldwin, Durham, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 214,240, Jul. 1, 1988, abandoned. This application Apr. 19, 1989, Ser. No. 340,190
Int. Cl.[5] A01N *1/02*
U.S. Cl. 428—36 21 Claims

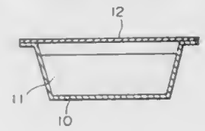
1. A method for endothelialization of a polymeric surface comprising contacting a polymeric surface with a plasma generated from a gaseous material comprising nitrogen whereby said polymeric surface is modified to contain surface amino groups, and applying to said modified surface sufficient endothelial cells to form a confluent layer of cells on said amino group-containing surface without a requirement for cell proliferation.

4,927,677

COMPOSITE MATERIALS AND TOP MATERIALS FOR RETORT CONTAINER

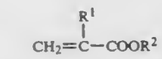
Ryusuke Kasai, Kiyose, Japan, assignor to Nikka Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1988, Ser. No. 187,297
Claims priority, application Japan, Apr. 28, 1987, 62-105521; Apr. 28, 1987, 62-105522
Int. Cl.[5] B32B *27/00*; B65D *5/00*
U.S. Cl. 428—36.6 20 Claims



1. A composite material for a retort container which comprises:

a biaxially stretched film consisting essentially of a copolymer of vinylidene chloride and an acrylic ester shown by the following formula (1):



(1)

wherein R^1 represents hydrogen or a methyl group and R^2 represents a substituted or unsubstituted monovalent hydrocarbon group having 1 to 20 carbon atoms, and

a first polypropylene film superposed on one or both sides of the biaxially stretched film.

4,927,678

PROTECTIVE BELLOWS PARTICULARLY FOR A MOTOR VEHICLE FRONT WHEEL DRIVE

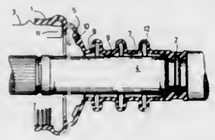
Serge Lallement, La Chapelle S/erdre, France, assignor to Compagnie Des Products Industriels de l'Ouest (C.P.I.O.), Carquefou, France

Filed Dec. 1, 1988, Ser. No. 278,470
Claims priority, application France, Dec. 1, 1987, 87 16631
Int. Cl.[5] F16D *3/84*
U.S. Cl. 428—36.9 6 Claims

1. A protective bellows made of polymer material for a motor vehicle front wheel drive having a transmission with a bowl and a drive shaft, which comprises:

a conical part to be fastened to said bowl of said transmission; and

a cylindrical part having a substantially uniform diameter connected with said conical part wherein said cylindrical



part includes a plurality of folds positioned along the length of said cylinder.

4,927,679

PREFORM FOR A MONOBASE CONTAINER

Martin H. Beck, Merrimack, N.H., assignor to Devtech, Inc., Amherst, N.H.

Continuation-in-part of Ser. No. 129,642, Dec. 7, 1987, Pat. No. 4,889,752, which is a continuation-in-part of Ser. No. 55,647, May 29, 1987, Pat. No. 4,780,257. This application Oct. 21, 1988, Ser. No. 261,551
Int. Cl.[5] B65D *23/00*
U.S. Cl. 428—36.92 21 Claims



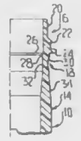
1. An improved preform for use in a blow molding process for producing a one-piece plastic container by expanding a hollow preform containing material for a neck, sidewall and base of the container in a mold; the preform having an open neck to form the neck, a sidewall-forming portion of constant thickness and a baseforming portion including an annular thickened portion positioned such that following blowing of the preform the material of the base-form portion is deposited so that an inward sloping base portion is formed which is of a thickness sufficient to resist self-deformation and create a moment arm thereof around a chime tending to unroll and radially stretch the chime, the chime having an integral reinforcing hoop formed therein to prevent unrolling and radial stretching of the chime which would allow inversion of the inward sloping base portion, the preform defining interior and exterior walls which are ever decreasing in diameter from the neck to the base so that the preform may be easily removed from a mating core and injection mold cavity used to mold the preform thereby avoiding the need for a split mold to form the preform, and the base forming portion having an exterior annular concavity adjacent the thickened portion remote from the sidewall-forming portion.

4,927,680

PREFORM AND METHOD OF FORMING CONTAINER THEREFROM

Wayne N. Collette, Merrimack; Suppayan M. Krishnakumar, Nashua, and David P. Piccioli, Auburn, all of N.H., assignors to Continental PET Technologies, Inc., Norwalk, Conn.

Division of Ser. No. 137,565, Dec. 24, 1987, Pat. No. 4,863,046. This application Apr. 11, 1989, Ser. No. 336,417
Int. Cl.[5] B65D *25/00*; B29C *49/08*
U.S. Cl. 428—36.92 14 Claims



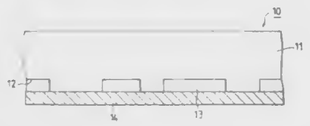
1. A preform for forming a blow molded hot fill container, said preform beii g formed of a polyester resin and including a base portion, a body portion, a neck finish portion and a neck to body transition, said neck finish portion including a lower flange immediately adjacent said neck to body transition, said neck to body transition has a portion of minimum cross section in its entirety spaced from said flange, said minimum cross section portion being of a lesser thickness than said body portion, and said neck to body transition flaring in thickness to said body portion.

4,927,681

OPTICAL INFORMATION RECORDING MEDIUM PROVIDING REFLECTED LIGHT AT TWO DIFFERENT WAVELENGTHS

Kiyofumi Chikuma, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 327,884
Claims priority, application Japan, Aug. 12, 1988, 63-202542
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 13 Claims



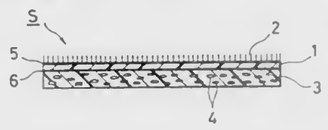
1. An optical information recording medium comprising:
transparent substrate means;
reflective layer means provided on a first principal surface of said substrate means; and
island means of light-emitting material formed between said substrate means and said reflective layer means, said island means being sensitive to illuminating light incident thereupon, and in response thereto, for producing emitting light having a different wavelength than said illuminating light,
said recording medium being adapted such that a recording information surface corresponds to an array of said island means of light-emitting material.

4,927,682

HEAT-RESISTANT FLOCK SHEET

Satoru Nagura, Tokyo; Tsutomu Ebihara, and Toshihide Matsumoto, both of Tsuchiura, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 364,353
Claims priority, application Japan, Jun. 14, 1988, 63-77799[U]
Int. Cl.[5] B32B *33/00*
U.S. Cl. 428—88 14 Claims



1. A heat-resistant flock sheet comprising a heat-resistant film layer consisting of an unfusible organic polymer, a flock layer formed by flocking a plurality of short fibers on a surface of said heat-resistant film and a first adhesive layer positioned between the heat-resistant film and the flock layer; a drawn film layer containing a plurality of voids laminated on a surface of said heat-resistant film layer opposite to said flock layer and a second adhesive layer positioned between the heat-resistant film layer and the drawn film layer; said drawn film layer comprising a synthetic polymer having particulate fillers, and being drawn to form voids around the particulate fillers.

4,927,683

COLOR-BEARING TEXTILE PRODUCT

Masatoshi Tsutsui, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Nov. 19, 1987, Ser. No. 122,437
Claims priority, application Japan, Dec. 13, 1986, 61-297240
Int. Cl.[5] B32B *7/00, 15/00*
U.S. Cl. 428—90 7 Claims



1. A color-bearing textile product which comprises fibers, silver-gray metal layer formed on the surface of said fibers, said silver-gray metal layer covering the surface of said fibers, and a thin chromatic color layer having such a thickness as permits light to pass therethrough, said color-bearing textile product having a metallic color inherent in said thin chromatic color layer.

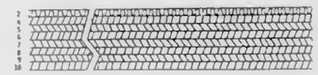
4,927,684

ASSEMBLY OF SEVERAL LAYERS HAVING ONE OR MORE REINFORCING LAYERS AND FIBER REINFORCED PLASTIC ARTICLE PRODUCED THEREFROM

Javier Asensio, Tägerwilen, and Richard Hayman, Frauenfeld, both of Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 26, 1988, Ser. No. 186,324
Claims priority, application Switzerland, Apr. 28, 1987, 611/87
Int. Cl.[5] B32B *33/00*
U.S. Cl. 428—91 15 Claims

1. An assembly of several resin-impregnated layers having
(a) one or more reinforcing layers produced of unidirectional, bidirectional, multidirectional or random fibers or combinations thereof produced of glass, boron or carbon fibers, aromatic polyamide fibers, silicon carbide fibers or mixtures thereof, and
(b) one or two knitted or woven textile fabrics (2, 12) having at least one tufted, fibrous, velvety, napped, brushed or pile surface,



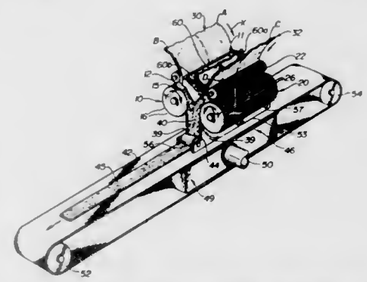
the textile fabric(s) (2, 12) being the external layer(s) of the assembly and the tufted, fibrous, velvety, napped, brushed or pile surface of the textile fabric(s) forming the surface(s) of the assembly.

4,927,685

TRANSVERSE WEBBER AND STRATIFIED WEBS FORMED THEREWITH

Gerald M. Marshall, Somerville; Raymond Hull, Jr., Hampton, and Allan P. Farrington, Englishtown, all of N.J., assignors to Chicopee, New Brunswick, N.J.

Filed Sep. 22, 1987, Ser. No. 99,875
Int. Cl.[5] B32B *5/08, 5/12, 5/26*; D04H *1/70*
U.S. Cl. 428—74 10 Claims



1. A nonwoven fiber structure having at least one layer with a preponderance of a first fiber material toward one lateral edge, a predponderance of a second fiber material different from said first fiber material toward the other lateral edge, a first transition zone of fibers in between, further including a second layer over said one layer having a preponderance of a third fiber material toward said one lateral edge, a fourth fiber material different from said third fiber material toward the other lateral edge, a second transition zone of fibers in between said preponderance of third and fourth fibers and a third transition zone between said first and second layers.

4,927,686

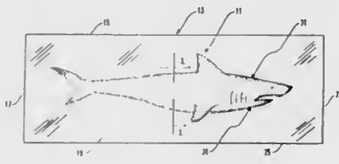
COLBAR ART

Ovidiu Colea, Glen Cover, N.Y., assignor to Colbar Art, Inc., Long Island City, N.Y.

Continuation-in-part of Ser. No. 152,161, Feb. 4, 1988, abandoned. This application Dec. 20, 1988, Ser. No. 288,033
Int. Cl.[5] B44C *3/06*
U.S. Cl. 428—13 17 Claims

1. An ornamental article comprising an inner shaped body embedded within an outer shaped body, said inner and outer body being formed of a base material moldable into a unitary, integrally formed transparent mass with amorphous interfaces, at least the base material of said inner body having homogeneously suspended in said material, a minute amount of finely

ground nonsoluble matter sufficient only to render said base material at least in part translucent and to provide the article



with three-dimensional regions visible when viewed through the outer body.

4,927,687

SUSTAINED RELEASE TRANSDERMAL DRUG DELIVERY COMPOSITION

Elie S. Nuwayser, Wellesley, Mass., assignor to Biotek, Inc., Woburn, Mass.

Division of Ser. No. 653,362, Oct. 1, 1984, Pat. No. 4,624,665. This application Sep. 22, 1986, Ser. No. 909,959

Int. Cl.[5] **A61L** *15/03*

U.S. Cl. 424—449 **17 Claims**

1. A composition for the accelerated sustained release, transdermal delivery of a drug to a user, which composition comprises:

(a) a viscous, film-forming base material selected to match generally the degree of hydrophobicity of the drug and, when placed in contact with the skin of the user, to occlude the skin of the user and to force hydration of the stratum corneum layer by diffusion of water from the lower layers of the epidermis of the user in use and to increase the porosity of the stratum corneum layer and thereby to accelerate the transdermal drug delivery across said layer; and

(b) a plurality of drug rate controlling solid microparticles generally uniformly dispersed and suspended in the base material, the microparticles having a particle size of less than about 1000 microns and containing an effective therapeutic amount of a drug for transdermal delivery, the active drug of transdermal delivery and the base material selected to permit the transport of the drug from the rate controlling microparticles and through the base material and into the skin of the user; whereby, on application to the skin of the user of the transdermal drug composition, the drug is released at a sustained release rate from the suspended microparticles into the base material and into the skin of the user.

4,927,688

CAST-IRON ELEMENT

Rudi Hass, Monchen-Gladbach; Georg Jansen, Eschweiler, and Wilhelm Kallen, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Eisengiesserei Monforts GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Division of Ser. No. 132,981, Dec. 15, 1987, Pat. No. 4,832,107. This application Jan. 27, 1989, Ser. No. 303,532

Int. Cl.[5] **B32B** *1/08, 17/06, 15/04*

U.S. Cl. 428—34.6 **3 Claims**



1. A cast-iron element having an entirely enclosed interior area occupied by a core of glass conforming to said interior area.

4,927,689

GAS BARRIER STRUCTURES

Stan J. Markiewicz, Whitby, Canada, assignor to Du pont Canada Inc., Mississauga, Canada

Filed Jul. 7, 1987, Ser. No. 70,829

Claims priority, application United Kingdom, Jul. 17, 1986, 8617535

Int. Cl.[5] **A22C** *13/00*

U.S. Cl. 428—34.8 **11 Claims**

1. A composite structure comprising a base synthetic thermoplastic polymeric layer having two coatings on one side of the base layer, the first coating being adjacent the base layer and being a solvent-based urethane primer, which when dry allows an aqueous dispersion or solution of polyvinyl alcohol to "wet out" the primer, in an amount in the range of from 0.3 to 3.0 g/m^2 of the base layer, and the second coating being placed on the exposed surface of the first coating and comprising a polyvinyl alcohol gas barrier material in an amount in the range up to about 2.0 g/m^2 of said base layer, said second coating having been formed from a dispersion or solution.

4,927,690

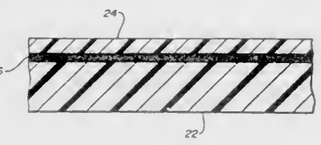
THERMOFORMABLE LAMINATED PACKAGING MATERIAL

Gary C. Welsh, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 818,439, Jan. 13, 1986, abandoned. This application Nov. 28, 1988, Ser. No. 277,079

Int. Cl.[5] **B65D** *25/00;* **B32B** *27/28*

U.S. Cl. 428—35.7 **4 Claims**



1. A rigid, thermoformable packaging material for medical, dental, and food packages comprising of an outer layer consisting essentially of a nonfoamed biaxially oriented polystyrene having a thickness of between about 1 to about 30 mils, and an inner layer laminated to said outer layer of a polymer resin selected from the group consisting of low density polyethylene, high density polyethylene, polypropylene and nylon, said inner layer having a thickness of between about 0.5 to about 10 mils, and wherein said oriented polystyrene comprises from about 78% to about 96.5% by weight of said packaging material.

4,927,691

IMPLOSION RESISTANT FILMS

Solomon Bekele, Taylors, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Oct. 16, 1987, Ser. No. 109,543

Int. Cl.[5] **B32B** *27/08*

U.S. Cl. 428—35.2 **8 Claims**

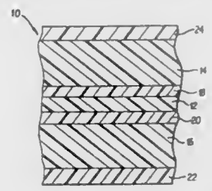
1. An implosion resistant film comprising:

(a) a core layer of ethylene vinyl acetate copolymer;

(b) two intermediate layers each comprising ethylene vinyl acetate copolymer;

(c) two polymeric layers of low density polyethylene which each bond an intermediate layer to a respective surface of the core layer;

(d) a first outer layer bonded to one of the intermediate layers, comprising a heat sealable polymeric material; and



(e) a second outer layer, bonded to one of the intermediate layers, comprising a high density polyethylene.

4,927,692

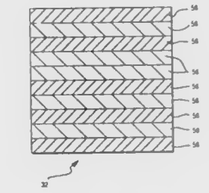
ANTISTATIC MASK FOR USE WITH ELECTRONIC TEST APPARATUS

Padmanabhan Dhanakoti, Austin; Gerry W. Moore, Valley Mills, and Harold F. Smith, Cedar Park, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,890

Int. Cl.[5] **B32B** *3/00*

U.S. Cl. 428—137 **20 Claims**



1. An antistatic mask for use with a bed-of-nails type electronic card tester having a plurality of pin probes and electronic switches associated therewith comprising

a plurality of first layers of a hygroscopic material;

a plurality of second layers of insulative support material, each of said second layers being disposed between a different pair of said first layers; and

a plurality of aperture means defined by and extending through said first and second layers and substantially normal to a plane defined by said first and second layers for receiving said pin probes.

4,927,693

THERMAL TRANSFER RECORDING MEDIUM AND ITS MANUFACTURING METHOD

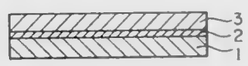
Kunihiro Koshizuka; Toshiaki Tezuka; Takao Abe, and Harue Ebisawa, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 300,614

Claims priority, application Japan, Jan. 26, 1988, 63-16357; Jan. 26, 1988, 63-16359; Feb. 24, 1988, 63-42474

Int. Cl.[5] **B41M** *5/26;* **B41J** *31/06*

U.S. Cl. 428—141 **10 Claims**



1. A thermal transfer recording medium comprising a support, and

coated on said support, an anchor layer which is operable to remain substantially on said support and not be transferred when the thermal transfer recording medium is used, and

coated on said anchor layer, a thermally fusible colorant layer,

wherein said anchor layer contains a resin component and not less than 25% by weight of carbon black, and said colorant layer contains carbon black.

4,927,694

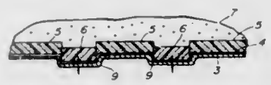
METHOD OF PRODUCING SKIN-COVERED PAD FOR SEAT

Ichiro Matsuura, and Toyoharu Chiyoshi, both of Ayase, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed May 26, 1988, Ser. No. 200,633

Int. Cl.[5] **B32B** *1/04, 3/02, 3/26*

U.S. Cl. 428—159 **5 Claims**



1. A skin-covered pad for a seat, comprising:

a base structure of foamed plastic; and

an outer skin member which covers said base structure, wherein said outer skin member includes:

an innermost foamed layer having an inner surface intimately contacting said base structure, and having first wettable and second nonwettable parts, said first and second parts being wettable and non-wettable with respect to a liquid material used to produce said base structure;

an outermost layer covering said innermost foamed layer, and

a non-wettable backing sheet interposed between said outermost and innermost layers,

wherein said second part of said innermost foamed layer is expanded outward thereby to provide the outer surface of said outer skin member with a raised portion.

2. A skin-covered pad as claimed in claim 1, in which said outer skin member has an outward projection at the position where said second part is located.

4,927,695

MICROPOROUS MARKING STRUCTURES

Willem Ooms; Frank R. Moss, both of Cookeville, and Jonnie L. Key, Algood, all of Tenn., assignors to Porelon, Inc., Cookeville, Tenn.

Continuation of Ser. No. 34,124, Apr. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 775,456, Sep. 11, 1985, abandoned. This application Jun. 6, 1989, Ser. No. 363,347

Int. Cl.[5] **B41K** *1/38*

U.S. Cl. 428—159 **29 Claims**



7. A marking structure, comprising:

a microporous layer having front and rear faces and formed from interconnected particles of a thermoplastic resin impregnated with an ink, said microporous layer having a relief pattern on a front fact thereof for transferring an ink image of said relief pattern to a surface to be marked, said particles forming an open-celled network of pores allow-

VOL 1114 ISS 4 MY 22 1990 UMI

ing repetitive transfer of an ink image of said relief pattern to the marking surface; and

an absorbent backing layer having front and rear faces, said front face of said backing layer being superposed on said rear face of said ink impregnated layer, said backing layer containing excess ink absorbed from said ink impregnated layer in an amount in the range of about 0.3 to 0.7 grams of ink per per square inch of said backing layer, and said backing layer is bonded to said microporous layer at an interface zone wherein said resin permeates said backing layer.

4,927,696

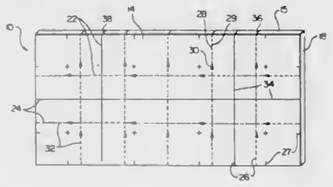
MATERIAL FOR USE IN FABRICATION

Louis K. Berg, Box 51, Sedalia, Alberta, Canada (T0J 3C0)

Filed Jul. 28, 1988, Ser. No. 225,542

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—195 **4 Claims**



1. In combination:

a. a roll of material for use in fabrication; and

b. reference markings on the roll of material spaced uniformly such that the markings can be used for measurement, the roll of material having reference numbers at regular interval adjacent the reference markings, such that the reference numbers designate the positioning of the adjacent reference marking relative to a primary reference point at the centre of the roll of material.

4,927,697

SURFACE MOUNTING LEADLESS COMPONENTS ON CONDUCTOR PATTERN SUPPORTING SUBSTRATES

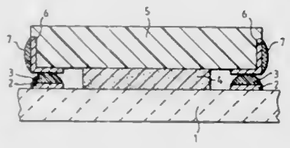
Peter F. IHill, Hatfield, England, assignor to British Aerospace Public Limited Company, London, England

Filed Nov. 28, 1988, Ser. No. 276,841

Claims priority, application United Kingdom, Nov. 28, 1988, 8727926

Int. Cl.[5] G32B *3/02*

U.S. Cl. 428—198 **5 Claims**



1. An assembly of a conductor pattern supporting substrate and a leadless component comprising:

a pad of adhesive material fixing the component to the substrate;

solder pillars between connection pads of the component and the conductor pattern on the substrate further fixing the component to said substrate such that a stand-off distance formed between the component and the substrate.

4,927,698

PUCKER AND SHRINK RESISTANT FLAME RETARDANT FABRIC FORMED OF CORESPUN YARNS

Pamela J. Jaco, Rock Hill, and Thomas W. Tolbert, Fort Mill, both of S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Mar. 15, 1989, Ser. No. 324,266

Int. Cl.[5] B32B *27/14*

U.S. Cl. 428—198 **14 Claims**



1. A fabric formed of corespun yarns having a core formed of fire-resistant filaments and a sheath formed of staple fibers and a cured, crosslinked coating on said fabric and imparting pucker and shrink resistance to the fabric, said coating comprising a first crosslinkable resin having an affinity for said core filaments and a second crosslinkable resin having an affinity for said sheath fibers and for said first crosslinkable resin.

4,927,699

PROCESS FOR PRODUCING A DECORATIVE FOIL OR SHEET CONTAINING A POLYMER PLASTIC, AND A FOIL OR PLASTIC PRODUCED BY THIS PROCESS

Gerhard Melcher, Vienna, Austria, assignor to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

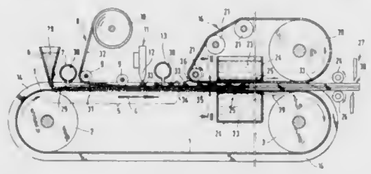
PCT No. PCT/AT87/00026, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/06183, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 14, 1987, Ser. No. 141,610

Claims priority, application Austria, Apr. 14, 1986, 957/86

Int. Cl.[5] B32B *27/10*

U.S. Cl. 428—203 **16 Claims**



1. Process for the continuous production of a decorative foil (**38**) containing a polymer plastic, in which at least one flat, porous and fibrous carrier is used, and which comprises a transparent protective layer of a polymer plastic on a decorative surface of the foil protecting a decorative layer at least at one of its surfaces, characterized by that a highly viscous polymer plastic on the basis of prepolymerizate of monomethyl methacrylate with a viscosity higher than 10,000 mPa.s is applied to a flat moving support to form a first separating layer, by that to this layer of highly viscous polymer plastic a low-viscosity liquid (**30**) consisting of at least one of the members of the group consisting of polymerizable monomer and prepolymer each on the basis of monomethyl methacrylate with a viscosity of less than 100 mPa.s is applied, which will fill any still free regions in said first separating layer and form over it a liquid layer (**31**), by the porous carrier material (**32**) which has a decorative surface is then applied onto this liquid layer (**31**), whereby it is dipped into said liquid layer, by that eventually thereupon a highly-viscous plastic on the basis of prepolymerizate of monomethyl methacrylate with a viscosity higher than 10,000 mPa.s is applied to form a second separating layer, and by that the thusly produced compound material (**35**) is transformed into the decorative foil under polymerization of the plastics contained in the said compound material, wherein one of the separating layers forms the transparent protective layer.

4,927,700

COPPER ETCHING PROCESS AND PRODUCT WITH CONTROLLED NITROUS ACID REACTION

Norvell J. Nelson, Palo Alto, and Phillip A. Martens, Fremont, both of Calif., assignors to PSI Star, Fremont, Calif.

Division of Ser. No. 159,727, Feb. 24, 1988, Pat. No. 4,846,918. This application Feb. 6, 1989, Ser. No. 293,877

Int. Cl.[5] R32B *9/00*

U.S. Cl. 428—209 **8 Claims**

1. In copper foil for use in a printed circuit board prepared by etching in a nitric acid solution: a material distributed within the copper foil for promoting the formation of nitrous acid from nitric acid in a controlled manner when the board is exposed to the nitric acid solution.

4,927,701

SHEET MOULDING COMPOUND AND A TOP FOR IT

René L. E. van Gasse, Opglabbeek, Belgium, assignor to DSM Resins B.V., AW Zwolle, Netherlands

Continuation of Ser. No. 16,204, Feb. 18, 1987, abandoned. This application Aug. 25, 1988, Ser. No. 236,289

Claims priority, application Netherlands, Feb. 27, 1986, 8600487

Int. Cl.[5] B32B *7/02, 27/08, 27/36*

U.S. Cl. 428—212 **4 Claims**



1. Sheet moulding compound (SMC) comprising:

a basic layer consisting of thermosetting material, fillers, fibers and customary additives, having at least one side of said basic layer provided with two layers, an intermediate layer and a top layer, the intermediate layer of which lies against the basic layer, the intermediate layer comprising at least fibre reinforcement and thermosetting material in a partly cured state said intermediate layer being capable of resisting the shear forces with the top layer that occur during moulding, and the top layer comprising the same or a different thermosetting material having no fiber reinforcement, which is in a cured state to a smaller extent than the intermediate layer.

4,927,702

THERMAL INSULATING MATERIAL

August Mühlratzer, Krailling; Karin Handrick, Dachau; Siegfried Lassmann, Gröbenzell, and Alfred Hirt, Munich, all of Fed. Rep. of Germany, assignors to Man Technologie AG, Munich, Fed. Rep. of Germany

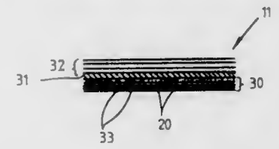
Filed Feb. 9, 1988, Ser. No. 154,141

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705440

Int. Cl.[5] B32B *7/02*

U.S. Cl. 428—215 **7 Claims**

1. A thermal insulating composite structure for high temperature use for protection against the effect of heat of short duration, said composite insulating structure comprising a plurality of superposed reflective layers comprising a substrate of relatively thin impregnated and fired ceramic fibers having



a thickness of 20–200 microns and a metal refracting coating of a thickness of about 0.2 microns on said substrate.

4,927,703

PROCESS FOR THE ANIONIC POLYMERIZATION OF ACRYLIC MONOMERS AND OPTIONALLY OF VINYL COMONOMERS

Philippe Teyssie, Neuville-En-Condroz; Sunil K. Varshney, Liege; Robert Jerome, Tilff, and Roger Fayt, Neupre, all of Belgium, assignors to Norsolor, Paris, France

Division of Ser. No. 134,373, Dec. 18, 1987, Pat. No. 4,826,941. This application Apr. 26, 1989, Ser. No. 343,349

Claims priority, application France, Dec. 19, 1986, 86 17790

Int. Cl.[5] B32B *7/02*

U.S. Cl. 428—220 **6 Claims**

1. A polymer comprising a homopolymer of 2,2,2-trifluorethyl methacrylate or a copolymer comprising at least one poly(2,2,2-tri-fluoroethyl methacrylate) block, said homopolymer or copolymer having a polydispersity between 1.1 and 4 and a number average molecular weight of between 10,000 and 300,000.

4,927,704

ABRASION-RESISTANT PLASTIC ARTICLES AND METHOD FOR MAKING THEM

Clive W. Reed, Scotia; Stefan J. Rzad, Rexford, and John C. Devins, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1989, Ser. No. 336,277

Int. Cl.[5] B05D *3/06*

U.S. Cl. 428—221 **23 Claims**

1. A method for preparing an abrasion-resistant plastic article, comprising plasma-enhanced chemical vapor deposition of an abrasion-resistant gradational layer onto a plastic substrate, wherein the composition of the gradational layer changes gradually in a direction perpendicular to the substrate surface from a composition consisting essentially of an interfacial material selected from the group consisting of organosilicon, organometallic, acrylic, and polyolefin materials, to a composition consisting essentially of an abrasion-resistant material selected from the group consisting of silicon dioxide, silicon nitride, silicon oxynitride, silicon carbide, silicon carbonitride, boron oxide, boron nitride, aluminum oxide, aluminum nitride, titanium dioxide, tantalum oxide, iron oxide, germanium oxide, germanium carbide, and mixtures thereof.

4,927,705

INSULATING LAMINATE

Robert W. Syme, 132 Curtis Crescent RR#4, King, Ontario, Canada (LOG 1KO), and Michael E. McKenna, 5191 Idlewood Crescent, Burlington, Ontario, Canada (L7L 3Y5)

Filed Aug. 8, 1988, Ser. No. 229,609

Int. Cl.[5] D04H *1/16*

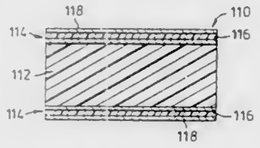
U.S. Cl. 428—282 **9 Claims**

1. A flexible, insulating laminate comprising:

heat insulating, flameproof ply of a soft, resilient, compressible polyester blanket having an inner face and an outer face, and

a vapour barrier ply comprising a moisture impermeable

polymer film having an inner side and an outer side, said inner side being bonded directly to said inner face of said



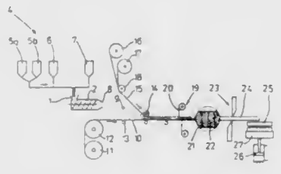
blanket by a bonding layer and said outer side supporting a coating of metal.

4,927,706

POST FORMING SEMI-FINISHED PRODUCT FOR THE MANUFACTURE OF MOULDED PARTS RESISTANT TO BENDING

Eberhard Born, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 155,981
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706227
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—304.4 7 Claims



1. A post forming semi-finished product having sheet like dimensions for producing rigid molded parts by applying heat and compression of 1:2 to 1:6, the semi-finished product having flexible covering layers with a resin containing core between the layers, the covering layers comprising dry reinforcing mats having open spaces therein which extend in the direction of the core, the core including fixed debris material of individual three dimensional elements changeable in volume or form embedded in an uncured and storage stable resin, and the open spaces in the dry reinforcing mats being constructed and arranged to fill with the uncured and storage stable resin when the semi-finished product is post formed by application of heat and compression of 1:2 to 1:6.

4,927,707

COMBINATION OF SLIDE MEMBERS

Toshihiko Matsubara, and Taku Kitayama, both of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabashiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,424
Claims priority, application Japan, Sep. 8, 1987, 224598
Int. Cl.[5] B32B *5/16*; C22C *29/02*
U.S. Cl. 428—323 4 Claims

1. A combination of a first slide member and a second slide member to be held in sliding contact with each other, said combination comprising a first slide member made of a ferrous material in which at least a slide surface layer thereof has a metallurgical structure having granular carbides dispersed in a matrix phase, and a second slide member formed of cast steel having a chemical composition comprising:

C 0.8–2.0%,
Si 0.4–2.0%,
Mn 0.3–1.5%,
Cr 6.0–20.0%,
Mo 0.3–5.0%

by weight, the remainder being Fe and impurities and in which at least a slide surface layer thereof has a metallurgical structure comprising network-like carbides dispersed in a martensite matrix phase obtained by high frequency quench hardening after casting.

4,927,708

FLEXIBLE STRETCH/SHRINK FILM

Vincent W. Herran, Greenville, and George D. Wofford, Duncan, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 36,750, Apr. 10, 1987, abandoned. This application Jul. 26, 1988, Ser. No. 225,588
Int. Cl.[5] B32B *27/32, 27/06*
U.S. Cl. 428—332 4 Claims



1. In a multilayer thermoplastic packaging film having at least five layers, including a layer of linear low density polyethylene, the improvement wherein:

(a) a core layer comprises a very low density polyethylene;
(b) intermediate layers adjacent each side of the core layer comprise a linear low density polyethylene; and
(c) two outer layers each bonded to a respective intermediate layer comprise a very low density polyethylene;

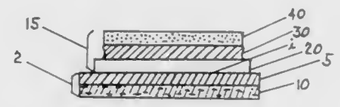
wherein the film has a modulus at 73° F. of less than about 17,000 p.s.i. in the longitudinal and transverse directions.

4,927,709

HEAT TRANSFERABLE LAMINATE

Tim Parker, Shrewsbury; Robert M. Edwards, Milford; Frank A. Magnotta, Framingham, all of Mass.; Jean-Paul Laprade, Woonsocket, R.I.; Donald R. Smith, Hingham, Mass.; Eleanor H. Sodagar, Worcester, Mass.; John M. Anemaet, Millis, Mass.; Dennis R. Benoit, Woonsocket, R.I.; Earl K. Thornton, Jr., Andover, Mass., and Richard J. Galante, Milford, Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 181,090, Apr. 13, 1988. This application Sep. 16, 1988, Ser. No. 245,760
Int. Cl.[5] C09J *7/02*
U.S. Cl. 428—352 18 Claims



1. A heat transferable laminate comprising a transfer substrate affixed to a carrier sheet for transfer from the carrier sheet to an article upon application of heat to the carrier sheet while said article contacts the transfer substrate, the carrier

sheet comprising a support sheet and a nonwax release layer consisting essentially of polyethylene coated over said support sheet, the nonwax release layer being in contact with said transfer substrate, said transfer substrate comprising a transfer coating and an ink design layer over the transfer coating, and a heat activatable adhesive layer over the ink design layer, the transfer coating being in contact with said nonwax release layer, said heat transfer laminate having the property that when a heat source is applied to the carrier for sufficient duration so that the nonwax release layer at least begins to soften while said transfer substrate contacts the article said transfer substrate separates cleanly from said nonwax release layer and transfers to said article, the heat transferable laminate having the additional property that no discernible portion of said nonwax release layer is transferred to the article along with said transfer substrate.

4,927,710

MATTING AGENT

Koji Tanaka; Minoru Ueda, and Taizo Masuda, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Apr. 5, 1989, Ser. No. 333,582
Claims priority, application Japan, Apr. 21, 1988, 63-99675; Nov. 10, 1988, 63-284897; Jan. 23, 1989, 64-14543
Int. Cl.[5] B32B *27/02*
U.S. Cl. 428—394 5 Claims

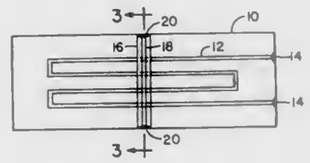
1. A matting agent produced from fibers of a polymer containing acrylonitrile in a quantity more than 50 weight %, said fibers having a fiber diameter less than 100μ, a fiber length less than 0.3 mm, an aspect ratio less than 20, and a non-circular cross-sectional shape.

4,927,711

HYBRID CIRCUITS AND THICK FILM DIELECTRICS USED THEREIN

Gaylord L. Francis, and Francis W. Martin, both of Painted Post, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 23, 1988, Ser. No. 289,260
Int. Cl.[5] B32B *17/06, 15/20, 18/00*
U.S. Cl. 428—432 7 Claims



1. A hybrid circuit comprising a substrate composed of a material having a coefficient of thermal expansion not over about 45×10^{-7}/°C. and selected from aluminum nitride, mullite and a cordierite glass-ceramic, and a thick film dielectric coated on the surface of said substrate, wherein the thick film dielectric has a composition essentially free of Na_2O, Li_2O and K_2O and consists essentially of, in percent by weight as calculated on an oxide basis, 15–45% ZnO, 3–15% MgO, 10–30% Al_2O_3, and 30–55% SiO_2 said film composed of a glass-ceramic having a primary crystal phase of willemite and a secondary phase of cordierite.

4,927,712

FUSIBLE CORE ALLOY COMPOSITES FOR PLASTICS MOLDING

Yoon O. Lhymn, and Chang Lhymn, both of Erie, Pa., assignors to Yoon Technology, Erie, Pa.

Continuation-in-part of Ser. No. 187,734, Apr. 27, 1988, which is a continuation-in-part of Ser. No. 166,060, Mar. 9, 1988. This application May 23, 1988, Ser. No. 197,170
Int. Cl.[5] B22C *12/00, 13/00, 13/02*
U.S. Cl. 428—614 18 Claims



1. A tin-based or tin-bismuth eutectic alloy matrix composite usable as a fusible core material in the lost core technology consisting essentially of:

(a) a tin-bismuth alloy matrix or a tin-lead antimony alloy matrix; and
(b) a reinforcing agent comprising metal shots.

4,927,713

HIGH EROSION/WEAR RESISTANT MULTI-LAYERED COATING SYSTEM

Diwakar Garg, Macungie; Ernest L. Wrecsics, Bethlehem; Leslie E. Schaffer, Macungie; Carl F. Mueller, Easton; Paul N. Dyer, Allentown, and Keith R. Fabregas, Easton, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 153,738, Feb. 8, 1989, Pat. No. 4,855,188. This application Aug. 2, 1989, Ser. No. 389,206
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—627 16 Claims



1. A highly erosion and abrasion wear resistant composite coating system on a substrate, said system comprising a plurality of composite layers,

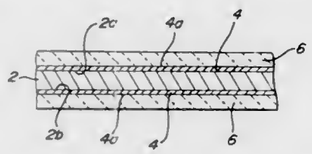
each of said composite layers comprising a first layer toward said substrate of tungsten of sufficient thickness to confer substantial erosion and abrasion wear resistance characteristics on said coating system and a second layer away from said substrate of a mixture of tungsten and tungsten carbide wherein said tungsten carbide comprises W_2C, W_3C, or a mixture of both.

4,927,714

REFRACTORY METAL COMPOSITE COATED ARTICLE

Seymour Priceman, Seaford, N.Y., assignor to Barson Corporation, Troy, Mich.

Continuation of Ser. No. 86,023, Aug. 17, 1987. This application Mar. 13, 1989, Ser. No. 322,693
Int. Cl.[5] B32B *15/04*
U.S. Cl. 428—628 8 Claims



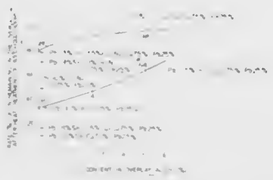
5. A coated article comprising a substrate of a refractory metal, an oxidation resistant intermetallic silicide layer fused in situ to the substrate and including by a reaction therewith an oxidation resistant silicide compound of the refractory metal, and a ceramic layer adhered to the intermetallic silicide layer and stable in high temperature oxidizing environments and at the interface with the silicide layer, said intermetallic silicide layer having a surface roughness of at least about 160 microinches RMS to promote adherence of the ceramic layer thereon.

4,927,715

OVERLAY ALLOY USED FOR A SURFACE LAYER OF SLIDING MATERIAL

Sanae Mori, Nagoya, Japan, assignor to 501 Daido Metal Company Ltd., Nagoya, Japan

Continuation of Ser. No. 61,030, Jun. 11, 1987, abandoned, which is a continuation of Ser. No. 813,971, Dec. 27, 1985, abandoned. This application Mar. 31, 1989, Ser. No. 332,407
Claims priority, application Japan, May 22, 1985, 60-109627; Sep. 26, 1985, 60-213460
Int. Cl.[5] F16C *33/12*
U.S. Cl. 428—645 2 Claims



1. A composite sliding material comprising a backing metal, a layer of bearing alloy bonded to said backing metal, a bonding layer above said layer of bearing alloy, and a surface layer bonded to said bearing layer through said bonding layer,

said bearing alloy being selected from the group consisting of Al-Zn alloy and Al-Si alloy,

said bonding layer being selected from the group consisting of Cu and Cu-Zn, and

said surface layer being an alloy consisting essentially of, by weight, 0.1–6% Cu, 1–10% In, and the balance Pb and incidental impurities.

4,927,716

SURFACE TREATMENT FOR RECORDING MEDIA

Terence Goulding, Garswood, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Aug. 13, 1987, Ser. No. 84,855
Claims priority, application United Kingdom, Aug. 21, 1986, 8620338; Oct. 7, 1986, 8624021
Int. Cl.[5] G11B *5/64*
U.S. Cl. 428—695 8 Claims

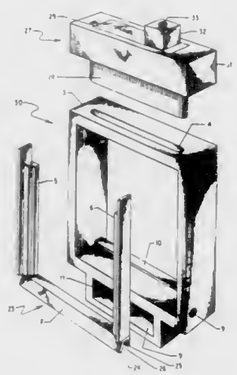
1. A method for treating the surface of an electroless plated ferromagnetic recording layer to enhance its abrasion resistance, which comprises applying to the surface a dilute solution comprising 0.1 to 1% by weight of organic peroxide having carbon chains containing 8–20 carbon atoms in the absence of any organic material polymerisable by the peroxide solution.

4,927,717

BIPOLAR METAL/AIR BATTERY

Homer L. Turley, Painesville; Marilyn J. Niksa, Concord; Gerald R. Pohto, Mentor, and Andrew J. Niksa, Concord, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Division of Ser. No. 56,567, Jun. 1, 1987, Pat. No. 4,828,939. This application Apr. 3, 1989, Ser. No. 332,086
Int. Cl.[5] H01M *4/00, 2/14*
U.S. Cl. 429—27 11 Claims



1. A metal-air battery cell having an anode support comprising:

an elongated lower frame member of a generally inverted U-shape in cross-section upon which an anode rests when inserted into said anode support, said lower frame member having apertures extending from the chamber defined by said general inverted U-shape upwardly toward said anode along said frame member; and

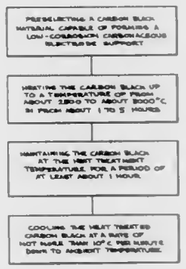
a pair of upright, elongated side rails spaced apart, one from the other whereby each extend from an end of said lower frame member, with each side rail providing lateral support for an anode.

4,927,718

NOVEL AIR ELECTRODE FOR METAL-AIR BATTERY WITH NEW CARBON MATERIAL AND METHOD OF MAKING SAME

Philip N. Ross, Jr., Kensington, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 21, 1988, Ser. No. 209,397
Int. Cl.[5] H01M *4/86;* C09C *1/56*
U.S. Cl. 429—44 25 Claims



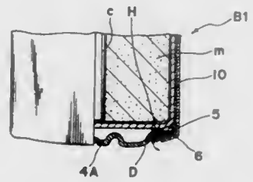
1. A corrosion-resistant carbonaceous electrode support material characterized by a corrosion rate of 0.03 wt.%/hour or less when measured at 550 millivolts vs. a Hg/HgO electrode in a 30 wt.% KOH electrolyte at 30° C., comprising a furnace-process carbon black material which has been heat-treated by heating the material to a temperature of from about 2500° to about 3000° C. over a period of from about 1 to about 5 hours in an inert atmosphere and maintained at this temperature for a period of at least about 1 hour in said inert atmosphere.

4,927,719

DRY CELL

Ryobei Ashihara, Neyagawa; Kikumitsu Suehiro, Kadoma; Kazuo Sugino, and Jun Miyoshi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 29, 1988, Ser. No. 291,788
Claims priority, application Japan, Dec. 29, 1987, 62-334456
Int. Cl.[5] H01M *2/12*
U.S. Cl. 429—54 5 Claims



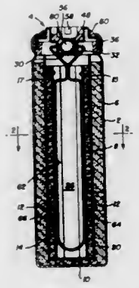
1. In a dry cell which comprises a raw cell having an opening proximate to the upper portion of said raw cell, said opening sealed by a sealing material, a bottom plate provided at the lower portion of said raw cell, a cap provided at the upper portion of said raw cell, a metal jacket conveying the outer periphery of said raw cell and subjected to laser-welding at its opposite butted ends, and a seal packing interposed between the lower edge of said metal jacket and a peripheral edge of said bottom plate, the improvement comprising a gas discharge mechanism provided at said peripheral edge of said bottom plate, and arranged to be normally closed by said seal packing and to be opened upon deformation by an increase of an internal pressure of the dry cell for discharging gas within the dry cell therethrough.

4,927,720

ELECTROCHEMICAL CELL HAVING A SAFETY VENT CLOSURE

Earl J. Chaney, Jr., Medina; Manuel R. Malay, Brunswick; Thomas J. O'Hara, Bay Village, and Alan D. Ayers, Westlake, all of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Oct. 13, 1989, Ser. No. 421,440
Int. Cl.[5] H01M *2/12*
U.S. Cl. 429—54 20 Claims



1. An electrochemical cell comprising active components of the cell assembled within a housing, said housing comprising a container having an open end closed by a cover and having at least one vent orifice defined by a wall in said housing; a bushing defining an axial opening and comprising an upper portion terminating with a thinner walled lower portion, said bushing disposed within and against the wall defining the vent orifice in said housing; a seal member having an external circumference smaller than the internal circumference of the opening defined in the upper portion of the bushing and larger than the internal circumference of the opening defined in the lower portion of the bushing; said seal member force-fitted within the lower portion of the bushing to seal the cell; and wherein at least one of said bushing and said seal member is resiliently deformable such that said seal member will be at least partially expelled from the vent opening upon a predetermined internal gas pressure buildup within the cell to provide a vent for the cell.

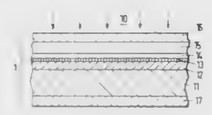
VOL
1114
ISS
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4,927,721

PHOTO-ELECTROCHEMICAL CELL

Michael Gratzel, chemin du Marquisat 7a - CH-1050, Sts. Sulpica, and Paul Liska, chemin des Bossons 47 - CH1018, Lausanne, both of Switzerland

Filed Oct. 7, 1988, Ser. No. 255,052
Claims priority, application Switzerland, Feb. 12, 1988, 00505/88
Int. Cl.[5] H01M 6/36
U.S. Cl. 429—111 15 Claims





1. A regenerative photo-electrochemical cell comprising
a polycrystalline metal oxide semi-conductor having a surface with a roughness factor of more than 20; and
a monomolecular chromophore layer on said surface of said semi-conductor.

4,927,722

SEPARATOR FOR STARTER BATTERIES

Werner Böhnstedt, Henstedt-Ulzburg, and Werner Lindenstruth, Quickborn, both of Fed. Rep. of Germany, assignors to Grace G.m.b.H., Norderstedt, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 386,394
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830728; Feb. 10, 1989, 3903977
Int. Cl.[5] H01M 2/18
U.S. Cl. 429—147 28 Claims



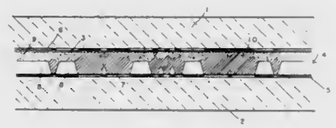
1. A battery separator comprising a sheet of elastic synthetic material, the sheet having a first side and a second side, the first side having a plurality of ribs arranged in pairs, the second side having a plurality ribs arranged as single, spaced apart ribs, the ribs on the second side being positioned between the pair of ribs on the first side so as to form a group of three associated ribs, the distance between each member of the pair of ribs on the first side being smaller than the distance between the adjacent groups of ribs.

4,927,723

RELIEF PRINTING PLATE MANUFACTURE

George B. Cusdin, St. Albans, England, assignor to W. R. Grace Limited, London, England

Filed Jun. 7, 1988, Ser. No. 203,782
Claims priority, application United Kingdom, Jun. 17, 1987, 8714177
Int. Cl.[5] G03F 7/02; G03L 3/00
U.S. Cl. 430—15 16 Claims



1. A process for preparing a relief printing plate comprising image-wise exposing a surface of a layer (4;22) of uncured photocurable polymer to a negative pattern of the desired image to be printed, in order to form, on the exposed surface, cured relief printing areas (10) which correspond with the transparent regions (7b) of the negative (7) and uncured areas (8) which will correspond with recessed floor portions (9) at voids formed in register with the opaque portions (7a) of the negative; and exposing the uncured polymer (4;22) through its surface opposite the first-mentioned surface to harden the floor areas (9) and the support for the said cured relief areas (10); wherein the exposing through said other surface of the polymer includes image-wise exposing the opposite surface of the layer (4;22) to a positive (6) of the image to be printed, which positive is in substantial registration with said negative such that the opaque areas of said negative correspond in extent and position to the transparent areas of said positive, thereby exposing and curing the floor areas (9) of said layer which are substantially in register with said uncured areas (8) resulting from the negative exposure operation.

11. A process for preparing a flexographic relief printing plate comprising the steps of image-wise exposing a printing surface of a layer of uncured photocurable polymer to a negative pattern of the desired image to be printed, thereby forming a corresponding negative pattern of cured and uncured areas in said printing surface; image-wise exposing the surface of said layer opposite said printing surface to a positive pattern of said image which is in substantial registration with said negative pattern such that the opaque areas of said negative pattern substantially correspond in extent and position to the transparent areas of said positive pattern, thereby selectively exposing and curing the floor areas of said layer which are substantially in register with the uncured areas in said printing surface; and removing uncured polymer from said layer to form a relief image.

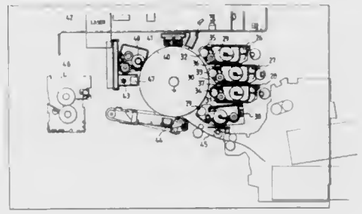
4,927,724

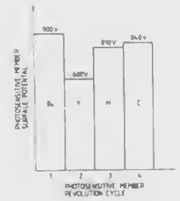
METHOD AND APPARATUS FOR COLOR ELECTROPHOTOGRAPHY

Hajime Yamamoto, Osaka; Yuji Takashima, Nishinomiya; Kazunori Kitagaki, Utsunomiya, and Masahiko Nakamura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 8, 1988, Ser. No. 269,751
Claims priority, application Japan, Nov. 18, 1987, 62-291055
Int. Cl.[5] G03G 13/01
U.S. Cl. 430—45 14 Claims

1. A method of color electrophotography comprising the steps of:
(a) performing a charging process, an exposure process, and a development process to form a toner image on a photosensitive member for each of a plurality of different colors, with the resulting toner images for the respective colors forming a composite color image, wherein yellow toner image forming processes are effected subsequent to black toner image forming processes, wherein the black charging process charges the photosensitive member to a first potential, the yellow charging process charges the photosensitive member to a second potential and the second potential is equal to or lower than the first potential, and wherein the charge on the photosensitive member resulting from the yellow toner image forming process is not removed by light exposure after the yellow toner image is formed; and
(b) transferring the composite color image to a sheet.





4,927,725

ELECTROPHOTOGRAPHIC METHOD

Hiroo Nishide, and Shintaro Kaneko, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1988, Ser. No. 281,375
Claims priority, application Japan, Dec. 14, 1987, 62-316853
Int. Cl.[5] G03G 13/01, 13/22
U.S. Cl. 430—54 3 Claims



1. A method of making an electrophotographic reproduction copy of an original document comprising the steps of:
forming a first image with latent image forming parameters made suitable for higher print density portion reproduction;
transferring said first image onto paper;
forming a second image with latent image forming parameters made suitable for lower print density portion reproduction; and
transferring said second image onto said paper so that said second image is superimposed over said first image.

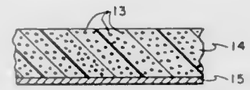
2. A method of making a color electrophotographic reproduction copy of an original color document comprising the steps of:
forming a first image with latent image forming parameters made suitable for higher print density portion reproduction of a first color component of said original color document and transferring said first image onto paper;
forming a second image with latent image forming parameters made suitable for lower print density portion reproduction of said first color component and transferring said second image onto said paper so that said second image is superimposed over said first image;
forming a third image with latent image forming parameters made suitable for higher print density portion reproduction of a second color component of said original color document and transferring said third image onto said paper so that said third image is superimposed over said second image;
forming a fourth image with latent image forming parameters made suitable for lower print density portion reproduction of said second color component and transferring said fourth image onto said paper so that said fourth image is superimposed over said third image;
forming a fifth image with latent image forming parameters made suitable for higher print density portion reproduction of a third and last color component of said original color document and transferring said fifth image onto said paper so that said fifth image is superimposed over said fourth image;
forming a sixth and last image with latent image forming parameters made suitable for lower print density portion reproduction of said third and last color component and transferring said sixth and last image onto said paper so that said sixth image is superimposed over said fifth image.

4,927,726

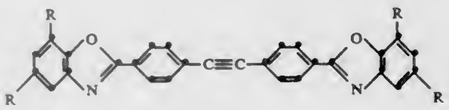
PHOTORECEPTOR WITH POLYNUCLEAR BISOXAZOLE OR BISTHIZOLE

Michael Scozzafava; Ching W. Tang, and Ralph H. Young, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 17, 1988, Ser. No. 232,974
Int. Cl.[5] G03G 5/06, 5/14
U.S. Cl. 430—78 3 Claims



1. A photoreceptor comprising at least one non-charge-injecting contact in a charge-collecting relationship with a solid phase consisting essentially of a compound having the formula



wherein R is $-C(CH_3)_2C_2H_5$.

VOL
1114
ISS
4
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THERMALLY ASSISTED TRANSFER OF SMALL ELECTROSTATOGRAPHIC TONER PARTICLES

Donald S. Rimai, Webster, and Chandra Sreekumar, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1988, Ser. No. 230,394
Int. Cl.[5] G03G *13/14, 13/16*
U.S. Cl. 430—99 19 Claims

1. In method of making a hard copy wherein a latent electrostatic image on an image-bearing substrate is developed by applying to said image dry thermoplastic charged toner particles comprising a toner binder, and said developed image is transferred to the surface of a receiver by contacting said developed image on said substrate with said surface, then removing said surface from said substrate, the improvement which comprises

(A) developing said latent electrostatic image with a toner having a particle size of less than 8 micrometers;

(B) heating said surface before it contacts said developed image, to a temperature such that said surface heats said toner particles when it contacts said developed image to a temperature between 10° C. above the T_g of said toner binder and 20° C. below the T_g of said toner binder, where said temperature is sufficient to fuse discrete toner particles that form said image to each other at points of contact between said particles, but insufficient to cause said contacting particles to flow into a single mass;

(C) non-electrostatically transferring said developed image to said surface, where said surface has a roughness average less than the radius of said toner particles; and

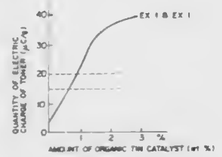
(D) heating said developed image after it has been removed from said substrate to a temperature sufficient to fuse it to said surface.

4,927,728

CARRIER PARTICLES FOR USE IN A TWO-COMPONENT DRY-TYPE DEVELOPER

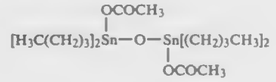
Tetsuo Isoda; Yoichiro Watanabe; Nobuhiro Nakayama, and Mitsuo Aoki, all of Shizuoka, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 656,115, Sep. 28, 1984, abandoned. This application Nov. 23, 1988, Ser. No. 276,279
Claims priority, application Japan, Oct. 4, 1983, 58-185517
Int. Cl.[5] G03G *9/10*
U.S. Cl. 430—108 6 Claims



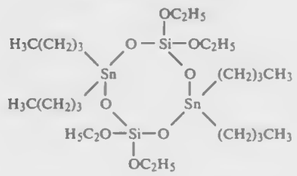
1. Carrier particles for use in two-component dry-type developers for electrophotography, comprising: core particles coated with a hardened silicone resin having a three-dimensional network structure comprised of Si-O-Si bonds, said core particles being made of a material selected from the group consisting of a magnetic metal, a non-magnetic metal and a non-metallic material, with the particle size thereof being in the range of 30 μm to 1,000 μm, said carrier particles having been prepared by dissolving an organosiloxane capable of forming said silicone resin and an organic tin catalyst capable of catalyzing hardening of said silicone resin in an organic solvent to form a silicone varnish, then coating said core particles with said varnish and drying said varnish to form coatings on said core particles, then heating said coated core particles at a temperature in the range of about 100° C. to about 250° C. to harden the silicone resin, said organic tin catalyst being selected from the group consisting of:

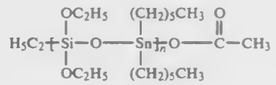
(No. 1) $R_2Sn(OCOR')_2$ wherein R and R' each represent an alkyl group of $C_1 \sim C_{12}$.


(No. 2)


(No. 3)


(No. 4)


(No. 5)


(No. 6)


(No. 7)

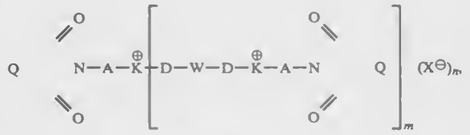
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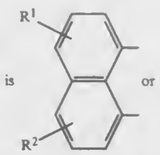
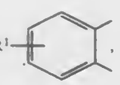
COLORLESS SALTS OF HETEROPOLYACIDS AS CHARGE CONTROL SUBSTANCES IN TONERS

Horst Harnisch, Much, and Roderich Raue, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,554
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738948
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[5] G03G *9/08;* C07F *5/06, 7/02, 11/00*
U.S. Cl. 430—110 7 Claims

1. Heteropolyacid salts of the formula



in which Q is  or  ,

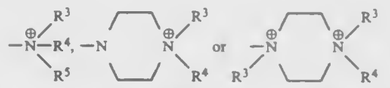
R^1 and R^2 independently of one another are hydrogen, chlorine, bromine, hydroxyl, C_1- to C_4-alkoxy, nitro or carboxyl,

A is C_1- to C_5-alkylene or $-C_6H_4-CH_2-$ (m- or p-),

m is 0 or 1,

n is 1 or 2,

K^+ is



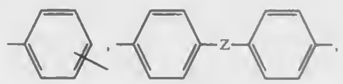
R^3 is C_1- to C_{24}-alkyl, carbamoyl-C_1- to C_2-alkyl, C_1- to C_4-alkoxycarbonyl-C_1- to C_2-alkyl, benzyl, cyclohexyl or allyl,

R^4 is C_1- to C_4-alkyl or a single bond linked to D,

R^5 is C_1- to C_4-alkyl,

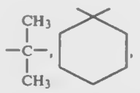
D is $-CH_2-$, $-CH_2-CO-$, $-CH_2-CO-NH-$ or $-CH_2-CO-NH-CH_2-$,

W is



CO or a single bond,

Z is $-CH_2-$,



$-O-$, $-S-$, $-SO_2-$ or a single bond and

$X^{\ominus}$ is an anion of a heteropolyacid based on tungsten and/or molybdenum containing phosphorus, silicon, vanadium, cobalt, nickel, manganese, chromium and/or aluminium.

5. Electrographic toners containing as the cationic charge-reinforcing additive a salt according to claim 1.

4,927,730

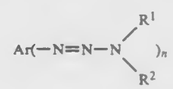
LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND

Kazo Sato, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1987, Ser. No. 43,121
Claims priority, application Japan, Apr. 25, 1986, 61-96339
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[5] G03C *1/68, 1/72*
U.S. Cl. 430—138 14 Claims

1. An image-forming method which comprises:

imagewise exposing a light-sensitive material comprising a light-sensitive layer provided on a support wherein the light-sensitive layer contains silver halide, a reducing agent, a polymerizable compound and a triazene compound having the following formula:



in which Ar is an aryl group or a heterocyclic group, each of which may have one or more substituent groups; each of R^1 and R^2 independently is a group selected from the group consisting of hydrogen, an alkyl group, a cycloalkyl group, an aralkyl group, an alkenyl group, an aryl group and a heterocyclic group, each of which may have one or more substituent groups, or R^1 and R^2 form, together with the neighboring nitrogen, a heterocyclic group which may have one or more substituent groups; and n is 1, 2 or 3, to form a latent image of the silver halide;

simultaneously or thereafter developing the light-sensitive material to polymerize the polymerizable compound within the area where the latent image of the silver halide has been formed, and thereby fixing the triazene compound on the support within the area;

pressing the light-sensitive material on an image-receiving material comprising an image-receiving layer containing an acid color developer and a coupler provided on a support to transfer the unfixed triazene compound to the image-receiving material; and

heating the image-receiving material to accelerate the reaction of the triazene compound with the acid color developer and the coupler.

4,927,731

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT POLYMERIZABLE COMPOUND, AND POLAR COMPOUND

Ryuichi Takahashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1988, Ser. No. 175,456
Claims priority, application Japan, Mar. 30, 1987, 62-77320; Apr. 10, 1987, 62-87998
Int. Cl.[5] G03C *1/68, 1/72*
U.S. Cl. 430—138 8 Claims

1. A light-sensitive material comprising a support and a light-sensitive layer containing silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound and a base or base precursor, said silver halide, reducing agent and polymerizable compound being contained in microcapsules which are dispersed in the light-sensitive layer, and said base or base precursor being arranged outside of the microcapsules,

wherein the light-sensitive layer contains a polar compound having a melting point in the range of 30° to 250° C., said polar compound being arranged inside and outside of the microcapsules, and said polar compound arranged outside of the microcapsules is present in an amount of from 3 to 30 weight percent and

wherein the reducing agent, the polar compound contained in the microcapsules, the polar compound arranged outside of the microcapsules and the base or a base formed from the base precursor have pKa values satisfying the conditions of the formulas (V) and (VI):

$$D \leqq E \leqq G \quad (V)$$

$$D \leqq F \leqq G \quad (VI)$$

in which D represents the pKa value of the reducing agent; E represents the pKa value of the polar compound contained in the microcapsules; F represents the pKa value of the polar compound arranged outside of the microcapsules; and G represents the pKa value of the base or a base formed from the base precursor and wherein said microcapsules contain said polar compound in an amount of from 0.1 to 1.0 mole based on one mole of the reducing agent.

4,927,732

POSITIVE-WORKING PHOTOSENSITIVE COMPOSITION CONTAINING A DYE AND POSITIVE-WORKING PHOTOSENSITIVE RECORDING MATERIAL PREPARED THEREFROM

Hans-Joachim Merrem, Steheim-Jugenheim; Gerhard Buhr, Koenigstein, and Ruediger Lenz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 20, 1988, Ser. No. 260,307

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735852

Int. Cl.[5] G03C *1/60, 1/495*

U.S. Cl. 430—191 **21 Claims**

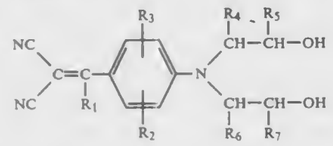
1. Positive-working photosensitive composition comprising, in admixture:

a positive-working photosensitive compound in an amount sufficient to render exposed areas soluble in a developer, said compound being selected from the group consisting of (1) an o-quinone diazide and (2) a combination of photolytic acid donor with an acid-cleavable compound,

a binder that is isoluble in water and soluble or swellable in an aqueous-alkaline solution, present in an amount such that said composition forms a uniform film when applied to a substrate, and

a dye comprising a non-bleachable compound that absorbs light in the region of actinic radiation to which the photosensitive compound responds and corresponds to the general formula I

(I)



wherein

R_1 denotes hydrogen, alkyl, aryl, alkoxy or nitrilo,

R_2 and R_3 are identical or different and denote hydrogen, hydroxy, alkyl, aryl, alkoxy, aryloxy, nitrilo, amino, alkylamino or halogen, and

R_4, R_5, R_6 and R_7 are identical or different and denote hydrogen, hydroxy, alkyl, aryl, alkoxy, aryloxy, amino, alkylamino or halogen

wherein said dye is present in an amount sufficient to significantly reduce the effects of reflection when said composition is coated on a substrate and exposed.

4,927,733

CONFORMATION OF VACUUM - LAMINATED SOLDER MASK COATED PRINTED CIRCUIT BOARDS BY FLUID PRESSURIZING

Gary K. Stout, Gloucester, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1988, Ser. No. 288,915

Int. Cl.[5] G03C *1/74*

U.S. Cl. 430—256 **18 Claims**

1. A method of obtaining a substantially void free interface between a light sensitive dry film on a substrate having a raised relief comprising the steps of:

(a) vacuum laminating the light sensitive dry film onto the substrate;

(b) releasing the vacuum to obtain at ambient pressure a laminate of the photosensitive film on the substrate whereby voids are present at an interface between the substrate and the laminated film;

(c) applying uniform elevated pressure of at least 0.3 atmospheres above ambient to the entire substrate with the dry film laminate by a pressurized fluid whereby voids entrapped in the substrate surface-dry film interface are eliminated; and

(d) releasing the uniform elevated pressure.

4,927,734

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND A PROCESS FOR FORMING A HIGH CONTRAST PHOTOGRAPHIC IMAGE

Shuji Rokutanda, Tokyo; Yasuo Higemitsu, Ohmiya; Akiyoshi Tsuchida, Kitamoto, and Yukihiro Yamakoshi, Urawa, all of Japan, assignors to Dainippon Ink. and Chemicals, Inc., Tokyo, Japan

Filed Nov. 21, 1988, Ser. No. 274,223

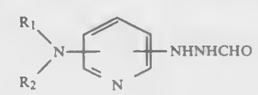
Claims priority, application Japan, Dec. 25, 1987, 62-326855

Int. Cl.[5] G03C *1/33*

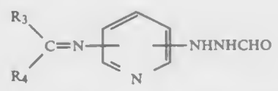
U.S. Cl. 430—264 **61 Claims**

1. A silver halide photographic light-sensitive material containing at least one negative-working silver halide photographic emulsion layer comprising substantially surface latent image type monodispersed silver halide grains, said material containing a compound represented by formula I or II:

[I]



[II]



wherein each of R_1, R_2, R_3 and R_4 represents a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group provided that if one of R_3 and R_4 is a hydrogen atom, the other cannot be a hydrogen atom.

4,927,735

NOVEL NAPHTHALOCYANINE DYE, METHOD FOR PREPARING THE SAME, AND OPTICAL INFORMATION RECORDING MEDIUM EMPLOYING THE SAME

Susumu Era; Setsuo Kobayashi, and Akio Mukoh, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,248

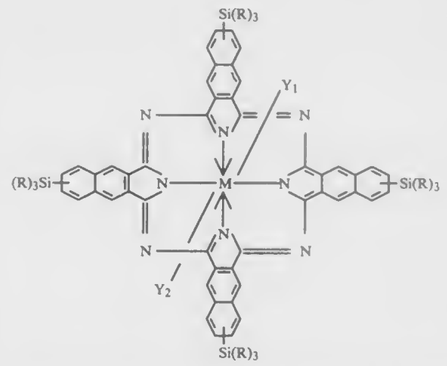
Claims priority, application Japan, Jan. 7, 1987, 62-452

Int. Cl.[5] G11B *7/24;* B41M *5/26;* G03C *1/72;* C07D *487/22*

U.S. Cl. 430—270 **12 Claims**

1. A novel naphthalocyanine dye represented by the following general formula (I):

(I)



wherein R is an alkyl group having 1 to 22 carbon atoms or an aryl group and three Rs may be the same or different; M is selected from the group consisting of Si, Al, Ti, Ge and Sn;

Y_1 and Y_2 are selected from the group consisting of OR', OAr, $OSi(R')_3$, OSi $(Ar)_3$ and $OC(Ar)_3$ and may be the same or different, with the proviso that when M is Al, Y_1 alone should be bound to M and Y_2 is absent, in which R' is an alkyl group having 1 to 22 carbon atoms, and

Ar is an aryl group or an aralkyl group.

4,927,736

HYDROXY POLYIMIDES AND HIGH TEMPERATURE POSITIVE PHOTORESISTS THEREFROM

Werner H. Mueller, East Greenwich, and Dinesh N. Khanna, West Warwick, both of R.I., assignors to Hoechst Celanese Corporation, Summit, N.J.

Filed Jul. 21, 1987, Ser. No. 76,098

Int. Cl.[5] G03C *1/495, 5/16*

U.S. Cl. 430—275 **36 Claims**

20. A positive working photoresist composition comprising a radiation sensitizer and a polyimide condensation product of at least one aromatic dianhydride and at least one hydroxy substituted aromatic diamine.

24. A photosensitive article comprising a support substrate having coated thereon a positive working photoresist composition according to claim 20.

4,927,737

RADIATION POLYMERIZABLE COMPOSITION AND ELEMENT CONTAINING A PHOTOPOLYMERIZABLE ACRYLIC MONOMER

John E. Walls, Hampton; Carlos Tellechea, Shrewsbury, and Major S. Dhillon, Belle Mead, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 762,010, Aug. 2, 1985, Pat. No. 4,780,392. This application May 26, 1988, Ser. No. 199,012

Int. Cl.[5] G03C *1/94, 1/76, 5/16, 1/78*

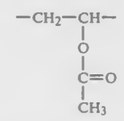
U.S. Cl. 430—278 **22 Claims**

1. A photographic element comprising a substrate, having coated thereon a radiation-polymerizable composition comprising in admixture

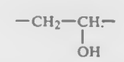
(a) a binder resin having the general formula

—A—B—C—

wherein a plurality of each of components A, B and C occur in ordered or random sequence in the resin and wherein A is present in said resin at about 5% to about 20% by weight and comprises groups of the formula

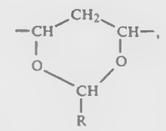


B is present in said resin at about 4% to about 30% by weight and comprises groups of the formula

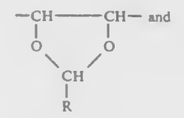


and C is present in said resin at about 50% to about 91% by weight and comprises acetal groups consisting of groups of the formulae

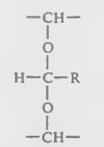
(I)



(II)



(III)



where R is lower alkyl or hydrogen, and wherein said group I is present in component C from about 75% to about 85%, group II is present in component C from about 3% to about 5%; and group III is present in component C from about 10% to about 22%;

(b) a photoinitiator; and

(c) an acrylic monomer having one or more unsaturated groups.

2. The photographic element of claim 1, further comprising and a transparent, continuous, oxygen barrier film on said composition.

3. The photographic element of claim 2 wherein said substrate is selected from the group consisting of aluminum and its alloys, polyester and silicon.

4,927,738

CONJUGATED DIENE COPOLYMER, PROCESS FOR PRODUCING THE SAME, AND PHOTOSENSITIVE RESIN COMPOSITION COMPRISING THE SAME

Shin-ichiro Iwanaga; Tatsuaki Matsunaga; Itao Nishiwaki, all of Yokkaichi, and Hiroji Enyo, Suzuka, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 124,870

Claims priority, application Japan, Dec. 26, 1986, 61-308133

Int. Cl.[5] C08F *2/50, 265/06, 267/06;* G03C *1/68*

U.S. Cl. 430—286 **10 Claims**

1. A photosensitive resin composition comprising (I) a conjugated diene copolymer comprising (A) 40 to 90 mole % of a conjugated diene component, (B) 0.5 to 10 mole % of an alpha, beta-ethylenically unsaturated carboxylic acid component, (C)

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0.1 to 5 mole % of a polyfunctional alkenyl compound component not in component (A) and selected from the group consisting of esters of polyhydric alcohols with acrylic and methacrylic acids, divinylbenzeae and trivinylbenzene and (D) 5 to 58 mole % of a monoolefinically unsaturated compound component other than one from component (B), in which copolymer the intrinsic viscosity as measured at 30° C. in demethylformamide is 0.01 to 3.0 dl/g, the width (αTg) of the endothermic transition temperature section determined by a differential scanning calorimetry is 45° to 120° C. and the limit temperature (T_1) on the lower temperature side of the endothermic transition temperature section is −40° C. or less (II) a photopolymerizzable unsaturated compound monomer and (III) a photosensitizer, wherein said copolymer is prepared by polymerizing a monomer mixture of (a) 30–90% by weight of said conjugated diene monomer, (b) 0.5–10% by weight of said alpha, beta-ethylenically unsaturated carboxylic acid monomer, (c) 0.1–10% by weight of said polyfunctional alkenyl compound monomer and (d) 5–65% by weight of said monoolefinically unsaturated compound monomer, wherein (a)+(b)+(c)+(d)=100% by weight, in the presence of a radical polymerization initiator, wherein all of component (a) is initially added, and 20–100% by weight of the above amount of component (b), 20–80% by weight of the above amount of component (c) and 1–50% by weight of the above amount of component (d) are post-added at one time or continuously when the polymerization conversion of the initially added monomers has reached 20-85%.

4,927,739

PHOTOSENSITIVE COMPOSITION CONTAINING A GELLING AGENT

Masaharu Taniguchi, Shiga; Chikara Ichijo, Kashiwa, and Junichi Fujikawa, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,561

Int. Cl.[5] G03C *1/68, 1/70, 1/71*

U.S. Cl. 430—286 **15 Claims**

1. A photosensitive composition containing a photoreactive monomer or oligomer; and a photoreaction initiator; and containing at least one compound selected from the group consisting of N-acyl amino acid derivatives and condensates of an aliphatic or aromatic aldehyde with a polyhydric alcohol having 2 to 40 carbon atoms.

2. A photosensitive composition containing a polyolefin or polyene having a number-average molecular weight of 30,000 to 500,000; a photoreactive monomer or oligomer; and a photoreaction initiator; and containing at least one compound selected from the group consisting of N-acyl amino acid derivatives, condensates of an aliphatic or aromatic aldehyde with a polyhydric alcohol having 2 to 40 carbon atoms, 12-hydroxystearic acid and condensates of polysaccharides with a fatty acid having 8 to 20 carbon atoms.

5. A photosensitive composition containing an alcohol-soluble polyamide or polyesteramide; a photoreactive monomer or oligomer; and a photoreaction initiator; and containing at least one compound selected from the group consisting of N-acyl amino acid derivatives, condensates of an aliphatic or aromatic aldehyde with a polyhydric alcohol having 2 to 40 carbon atoms, 12-hydroxystearic acid and its derivatives, acylated polysaccharides and a metallic soap.

12. A photosensitive composition containing an alcohol-soluble polyamide or polyester amide; a photoreactive monomer or oligomer; and a photoreaction initiator; and containing at least one compound selected from the group consisting of N-acyl amino acid amide, condensates of a benzaldehyde with a D-sorbitol and 12-hydroxystearic acid.

13. A photosensitive composition containing an alcohol-soluble polyamide or polyesteramide; a photoreactive monomer or oligomer at least partly comprising a polyene having a number-average molecular weight of 500 to 20,000; and a photoreaction initiator; and containing at least one compound selected from the group consisting of N-acyl amino acid derivatives, condensates of an aliphatic or aromatic aldehyde with a polyhydric alcohol, hydroxycarboxylic acids having 8 to 20 carbon atoms and their derivatives, acylated polysaccharides and metallic soap.

4,927,740

CLOSING AND/OR SEALING ORIFICES, CAVITIES OR SPACES IN PRINTING PLATES MOUNTED ON PLATE CYLINDERS

Guenter Wallbillich, Neustadt; Gerhard Bleckmann, Lampertheim, and Dankmar Scholz, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 262,629

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736180

Int. Cl.[5] G03F *7/02;* G03C *1/68*

U.S. Cl. 430—309 **9 Claims**

1. A process for closing and sealing orifices, cavities or spaces, which are formed when printing plates are mounted on a plate cylinder, which comprises: applying to the orifices, cavities or spaces a sealing or closing compound which is a pasty, photocurable compound which is viscoplastic at room temperature and essentially consists of a photopolymerizable mixture of

(a) from 10 to 50% by weight of one or more photopolymerizable, ethylenically unsaturated low molecular weight compounds,

(b) from 25 to 50% by weight of a mixture of the components 1) a styrene/maleic half-ester copolymer or a linear soluble copolyamide, and 2) at least one unsaturated polyester, which components are compatible with the photopolymerizable low molecular weight compounds of component (a),

(c) from 0.01 to 10% by weight of one or more photopolymerization initiators and

(d) from 3 to 40% by weight of one or more finely divided oxidic fillers which, when mixed with components (a) to (c) give mixtures which are transparent to long-wavelength UV light, with the proviso that the sum of the percentages stated under (a) to (d) is 100,

and thereafter exposing the photopolymerizable mixture in the orifices, cavities or spaces to be closed or sealed, to actinic light.

4,927,741

PROCESSING OF EXPOSED LITHOGRAPHIC PRINTING PLATES BY CONDUCTING SECOND EXPOSURE UNDER WATER

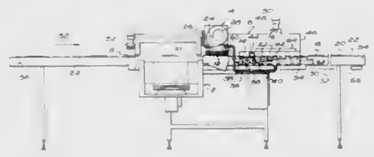
Peter Garth; Stuart M. Simpson, both of Leeds, United Kingdom; John E. Parkinson, Lincoln, Nebr., and Alan H. Rogers, Stockport, England, assignors to Horsell Graphic Industries Limited, Leeds, England

Continuation of Ser. No. 25,414, Mar. 13, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 274,730

Claims priority, application United Kingdom, Mar. 13, 1986, 8606258

Int. Cl.[5] G03C *5/24;* G03F *7/08, 7/26*

U.S. Cl. 430—309 **5 Claims**



1. A method for the reversal of photosoluble lithographic printing plates having a light sensitive coating at one surface, comprising the successive steps of:

(i) imagewise exposing a portion of the coated surface to render said portion soluble in developer;

(ii) heating the plate to render the imagewise exposed portion relatively insoluble in the developer;

(iii) overall irradiating the coated surface to solubilize the remaining portion of the coated surface not previously exposed, after said heating step; and

(iv) promoting easier solubilization of the remaining portion of the coated surface during said step of overall irradiating by:

(A) applying water over the coated surface; and

(B) applying the overall irradiation of step (iii) through the applied water.

4,927,742

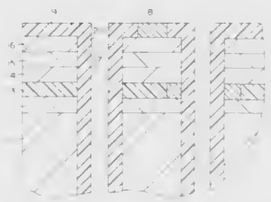
MULTILAYER PRINTED WIRING BOARDS

Thomas S. Kohm, Huntington, N.Y., assignor to Kollmorgen Corporation, Simsburg, Conn.

Division of Ser. No. 280, Jan. 14, 1987, Pat. No. 4,804,575. This application Nov. 23, 1988, Ser. No. 275,358

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—311 **8 Claims**



1. A process for manufacturing a multilayer printed wiring board comprising:

establishing at least one inner layer conductive pattern on an organic insulating base material;

coating at least a portion of the inner layer conductive pattern and the insulating base material with a primer coating composition which when cured firmly bonds to the conductive pattern and the base material, said primer coating composition comprising:

the product of reacting between 20 to 60% by weight of a poly(vinyl-acetal) resin with 80–40% by weight phenolic resin in the presence of an acidic catalyst;

a coupling agent having at least two amino substituted aromatic groups covalently bonded to a titanium or zirconium central atom via an oxygen containing linkage, said coupling agent being capable of coupling to a metal surface and capable of reacting with the phenolic resin, said coupling agent being present in the composition in an amount sufficient to couple the poly(vinyl acetal)-phenolic resin reaction product to the metal surface; and

sufficient organic solvent to dissolve the resins and coupling agent and establish a viscosity for the coating composition suitable for applying the coating composition to a substrate;

curing said primer coating composition thereon;

applying an organic dielectric insulating layer on the primer coating;

curing said insulating layer thereon and firmly bonding it thereto;

applying a bonding composition for adherently plating metal thereon over said organic dielectric insulating layer, said bonding composition comprising:

a phenolic resin, said resin being substantially free of methyl ether groups, having an average of between four and ten phenolic rings per molecule and at least two methylol functional groups;

at least one heat resistant polymer having an aromatic or cyclic backbone and functional groups capable of crosslinking with phenolic methylol groups without evolving water, said heat resistant polymers being present in an amount sufficient to react with substantially all the methylol groups of the phenolic resin, said polymer with aromatic or cyclic backbone being capable of improving the electrical or heat resistant properties of said bonding composition;

an elastomer selected from the group consisting of neoprene, nitrile rubber and chlorosulfonated polyethylene, and vinyl and acrylic elastomers, said elastomer being 30 to 60% of the combined weight of the phenolic and heat resistant resins and elastomer;

the bonding composition capable of being applied onto a printed wiring base material and cured to a solid thermoset composition and when cured capable of being adhesion promoted for adherent metal deposition, and capable of maintaining the bond of a deposited metal for at least 10 seconds at a temperature of 430° C.;

curing said bonding composition thereon;

plating a metallic conductive pattern securely adhered to said bonding composition creating a multilayer printed wiring board, said multilayer board having adhesion between said 5 layers capable of withstanding exposure to at least 5 soldering cycles of at least 255° C. for 2 seconds without blistering or delamination between the layers when the conductive patterns are unperforated metal planes, the planes having areas up to 75 mm×75 mm.

4,927,743

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS HAVING SPECIFIED COUPLER, DIR COUPLER AND SILVER COVERAGE

Koji Tamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

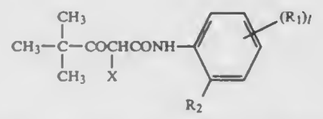
Filed Feb. 26, 1988, Ser. No. 160,971

Claims priority, application Japan, Feb. 27, 1987, 62-44789

Int. Cl.[5] **G03C** *1/46, 1/06, 7/32*

U.S. Cl. 430—496 **10 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having provided thereon one or more blue-sensitive layers each containing a yellow coupler, one or more green-sensitive layers each containing a magenta coupler, one or more red-sensitive layers each containing a cyan coupler and one or more protective layers provided on the side of the support and further from the support than the color-sensitive layer which is furthest away from the support, the thickness of the total photographic layers provided on the support from the color-sensitive layer located closest to the support to the protective layers, inclusive, being 18 μm or less, wherein at least one of said yellow coupler is a compound represented by formula (I)



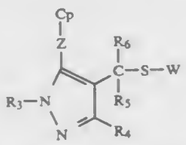
(I)

wherein R_1 represents a halogen atom, an aliphatic group, an aromatic group, an aliphatic oxy group, an aromatic oxy group, a carboxylamido group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, an acyloxy group, a substituted amino group, an aliphatic thio group, a ureido group, a sulfamoylamino group, a cyan group, an aliphatic oxycarbonyl group, an aliphatic oxycarbonylamino group, an imido group, an aliphatic sulfonyl group, an aromatic sulfonyl group or a heterocyclic group; R_2 represents a hydrogen atom, a halogen atom or an aliphatic oxy group; X represents a hydrogen atom or a group which is eliminated by a coupling reaction with the oxidized form of a primary aromatic amine based developing

VOL
1114
ISS
4
MY
22
1990
UMI

agent; l represents 0 or an integer of from 1 to 4; and wherein said light-sensitive photographic material further contains a compound represented by formula (II)

(II)



wherein Cp represents a coupling component which is able to react with the oxidized form of a primary aromatic amine based developing agent; R_3 represents a hydrogen atom, an alkyl group, an aryl group, an acyl group, a sulfonyl group, an alkoxycarbonyl group or a heterocyclic group; R_4 represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an amino group, a carboxylamido group, a sulfonamido group, a carboxyl group, an alkoxycarbonyl group, a carbamoyl group or a cyano group; R_5 and R_6 each represents individually hydrogen atoms, alkyl groups or aryl groups; W represents a group which forms, together with the sulfur atom when the thioether bond is eliminated, a compound which has a development inhibiting action; and Z is bonded to the coupling position of Cp and represents an —O— group, an —S— group or an



group, wherein R_7 represents a hydrogen atom, an alkyl group, an acyl group or a sulfonyl group, wherein the amount of silver contained in the light-sensitive material is 5.5 g/m^2 or less and wherein the amount of silver iodide in the silver halide contained in the light-sensitive material is 2 to 40 mol %, and wherein at least one of said yellow, magenta and cyan couplers is incorporated by using a dispersion method in which a high boiling point solvent as the coupler dispersion medium is dispersed in an amount such that the weight ratio with respect to the coupler is not more than 0.2.

4,927,744

PHOTOGRAPHIC ELEMENT HAVING SOLID PARTICLE DISPERSION OXIDIZED DEVELOPER SCAVENGER

Richard P. Henzel, Webster, and Paul L. Zengerle, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,372
Int. Cl.[5] G03C *1/42*
U.S. Cl. 430—566 11 Claims

1. A photographic element comprising a support having thereon at least one silver halide emulsion layer, and a layer, which is the same or different from the silver halide layer, comprising solid particles dispersed in a vehicle, said particles consisting essentially of a hydroquinone derivative.

4,927,745

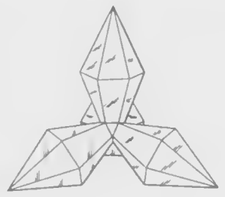
SILVER HALIDE GRAINS AND PROCESS FOR THEIR PREPARATION

Mark E. Irving, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 22, 1989, Ser. No. 369,789
Int. Cl.[5] G03C *1/02*
U.S. Cl. 430—567 12 Claims

1. A process for the preparation of radiation sensitive silver halide grains which have the morphological configuration of four hexagonal bipyramids, the four bases of which are joined to form a common tetrahedron which process comprises the steps of:

(a) forming in a colloid dispersing medium silver halide grains containing at least 90 mol % iodide by homogeneous nucleation of silver iodide grains at a pAg of from about 11.0 to about 5.0 at a temperature between about 30° and 90° C.;



(b) maintaining these conditions until the silver iodide grains are from about 0.005 to about 0.5 μm in diameter;

(c) altering the growth environment of the silver iodide grains to a pAg of from about 13.5 to about 9.8 at a temperature from about 30° to about 90° C., and optionally;

(d) removing water soluble salts formed during the precipitation.

4,927,746

PHOTOGRAPHIC STABILIZING BATH CONTAINING POLYARCYLIC ACID

Paul A. Schwartz, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,728
Int. Cl.[5] G03C *7/40*
U.S. Cl. 430—372 20 Claims

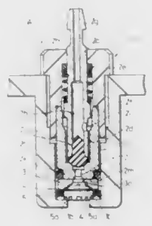
1. An aqueous photographic stabilizing bath for use in the color processing of photographic elements, said bath containing a dye stabilizing agent, an alkanolamine in an amount sufficient to inhibit sulfurization of said stabilizing bath resulting from carry-in of a thiosulfate fixing agent, and polyacrylic acid or a water-soluble salt thereof in an amount sufficient to prevent the precipitation of calcium salts.

4,927,747

NONCONTROLLING TYPE VALVE

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corp., Yokohama, Japan

Filed Apr. 24, 1989, Ser. No. 342,201
Claims priority, application Japan, Apr. 27, 1988, 63-55865[U]
Int. Cl.[5] F23D *14/28*; F23Q *2/16*
U.S. Cl. 431—344 1 Claim



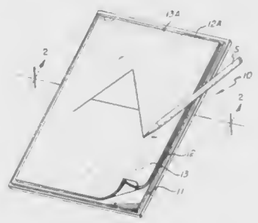
1. A noncontrolling type valve for a gas container having a top plate, a recess formed in said top plate, said recess having a through aperture in its bottom communicating with the inside of said gas container comprising; a valve body having a valve opening at one end push-fitted in said recess with said valve opening facing said through opening in said bottom of said recess; and a filter positioned in said recess under said valve body for permitting a given constant flow of gas to pass to said valve body when said valve opens, characterized in that said filter is a porous object having a center aperture and a downward-diverging space, said porous object being in said recess between a bottom end of said valve body and said bottom of said recess with said center aperture in alignment with said valve opening of said valve body, said valve further comprises; a slotted ring push-fitted in said recess in advance of said valve body and said porous object and across said through aperture in said bottom of said recess; an impermeable, resilient membrane on said slotted ring, said porous object engaging said membrane; and an O-ring fitted around said one end of said valve body and pushing against an inside edge of an uppersurface of said porous object and against an inner wall of said recess for preventing gas from leaking sideways past said O-ring.

4,927,748

LUMINESCENT WRITING OR DISPLAY DEVICE

Benjamin Kinberg, 200 Fifth Ave., New York, N.Y. 10010

Filed Feb. 27, 1989, Ser. No. 315,611
Int. Cl.[5] B43L *1/12*
U.S. Cl. 434—410 5 Claims



1. An improved writing and display device for producing a luminescent image upon the application of a pressure thereon comprising

a transparent plastic sheet having means comprising a primary low volatile plasticizer, and containing a luminescent tinting material integrally dispersed throughout said plastic sheet,

an opaque white sheet disposed contiguous to said transparent sheet to be in direct interfacing relationship therewith,

said transparent sheet and tinting materials therein being in overlying relationship and in direct contacting relationship to said opaque sheet,

and said sheets each having an exposed smooth surface for direct contact at the inteface thereof,

said means being capable of prohibiting the migration of said tinting material from said transparent sheet and onto said underlying opaque sheet in direct contact therewith,

and at least one of said sheets being pliable so that upon the application of pressure thereon, the respective smooth surfaces of said sheets are urged into intimate contact at the points of the applied pressure to form a luminescent image along the points of applied pressure that will be retained so long as said sheets are adhered to one another along the points of applied pressure,

whereby any protective insert between said transparent and opaque sheet during non-use of said display device is rendered unnecessary.

4,927,749

REAGENT FOR CELL SEPARATION

Allan R. Dorn, Bethany, Okla., assignor to Jeanette Simpson, Tulsa, Okla.

Filed Apr. 9, 1986, Ser. No. 849,819
Int. Cl.[5] A01N *1/02*; C12N *1/02*
U.S. Cl. 435—2 11 Claims

1. A cell separation composition comprising a stable aqueous colloidal suspension of reagent-modified colloidal silica particles, which suspension is comprised of a plurality of colloidal silica particles, each particle covalently linked to an organosilane having a non-ionic, hydrophilic group.

2. The composition of claim 1 wherein said organosilane is of the general formula:

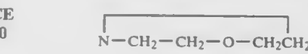
$$(X)_3—Si—(CH_2)_3—Y$$

and wherein "Y" is selected from the group consisting of

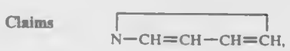


OCH_2CHCH_2O, O_2CCH_3, $N(CH_2CH_2OH)_2$, CO_2CH_3,

$NH(CH_2)_2NH(CH_2)_2CO_2CH_3$, $NHCOCH_2NHC(CH_3)O$,



and



and wherein "X" is selected from the group consisting of H_3CO, Cl, H_5C_2O, H_3CCO_2, and H_3C.

4,927,750

CELL SEPARATION PROCESS

Allan R. Dorn, Bethany, Okla., assignor to Jeanette Simpson, Tulsa, Okla.

PCT No. PCT/US87/00628, § 371 Date Mar. 25, 1987, § 102(e) Date Mar. 25, 1987, PCT Pub. No. WO87/06233, PCT Pub. Date Oct. 22, 1987
Continuation-in-part of Ser. No. 849,819, Apr. 9, 1986. This PCT application Mar. 25, 1987, Ser. No. 49,863
Int. Cl.[5] A01N *1/02*; C12N *1/02*
U.S. Cl. 435—2 11 Claims

1. A process for separating a component of interest from a cell mixture, comprising the steps of:

(a) adding a cell mixture to a cell separation composition to form a composite, said cell separation composition comprising a plurality of colloidal silica particles covalently linked to an organosilane reagent having a non-ionic hydrophilic group, said cell separation composition diluted with an appropriate aqueous solution to a buoyant density near the range of the buoyant density of a component of interest in said cell mixture; and

(b) centrifuging said component at a sufficient speed for a sufficient duration to generate a density gradient in situ so that said component of interest separates from other components in said cell mixture, with the proviso that said sufficient speed and sufficient duration are low enough to preserve the viability of the component of interest.

VOL
1114
ISS
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1990
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4,927,751

PROCESSES FOR OBTAINING EXOENZYMES BY CULTURE

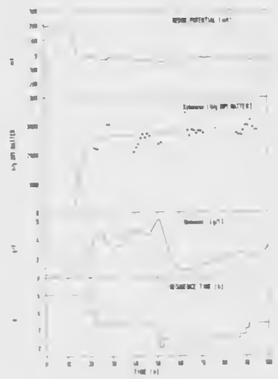
Klaus Memmert, and Christian Wandrey, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Juelich Gesellschaft mit beschrsenkter Hagtung, Juelich, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,349

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524273; Apr. 19, 1986, 3613311

Int. Cl.[5] **C12Q** *3/00;* **C12N** *9/00, 9/28, 9/56*

U.S. Cl. 435—3 **41 Claims**



1. A process for obtaining exoenzymes by continuous-flow fermentation, comprising the steps of

(A) providing a culture of an exoenzyme-producing microorganism in one fermenter which provides an output solution;

(B) imposing on said culture in said fermenter a continuous modification of growth conditions under non chemastatic conditions, wherein said continuous modification is predetermined to effect a restricted multiplication of said microorganism, such that a maximum exoenzyme production by said culture is repeatedly obtained;

(C) continuing said modification of growth conditions to maximize exoenzyme production; and then

(D) recovering exoenzyme from said output solution from said fermenter.

24. A process for obtaining exoenzymes by continuous-flow fermentation performed in only one fermenter, comprising the steps of

(A) providing a culture of an exoenzyme-producing microorganism in one fermenter which provides an output solution;

(B) imposing on said culture a transient modification of growth conditions in said fermenter, wherein said modification effects a restricted multiplication of said microorganism, such that a maximum exoenzyme production by said culture is repeatedly obtained, and wherein (1) said modification of growth conditions is imposed each time the exoenzyme concentration in said culture decreases to less than 50% of a preceding maximum value and (2) said restricted multiplication results in a biomass decrease, in said culture, of more than 30%;

(C) repeating said modification of growth conditions to achieve said maximum exoenzyme production; and then

(D) recovering exoenzyme from said output solution from said fermenter.

4,927,752

SUPPORT USED IN BIOLUMINESCENT DOSING OF ENZYMES, SUBSTRATES OR ENZYMATIC INHIBITORS

José Remacle, Chemin des Pierres 14, B-5730 Malonne, Belgium

PCT No. PCT/BE86/00020, § 371 Date Feb. 20, 1987, § 102(e) Date Feb. 20, 1987, PCT Pub. No. WO87/00198, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 19, 1986, Ser. No. 31,470

Claims priority, application Belgium, Jun. 26, 1985, 902745

Int. Cl.[5] **C12N** *11/08;* **C12Q** *1/66;* **G01N** *33/53*

U.S. Cl. 435—8 **34 Claims**

17. A method for determining a test enzyme in a test solution, comprising:

contacting an immobilized enzyme device with a test solution,

said immobilized enzyme device comprises:

a transparent hydrophobic plastic support;

a layer of an amino acid polymer coating the support, said amino acid polymer having hydrophobic portions and hydrophilic portions and said amino acid polymer being oriented so that the hydrophobic portions of the polymer are bound to the support and the hydrophilic portions of the polymer extend outwardly from the support; and

an enzyme composition adsorbed to the hydrophilic portions of the polymer, said composition comprising a luciferase; and

said test solution comprising:

the test enzyme and chemical species that enzymatically react with the test enzyme and the luciferase to emit photons;

detecting photoemission from the contacted test solution; and

quantifying the photoemission to determine the test enzyme in the test solution.

4,927,753

QUANTITATIVE DETERMINATION OF L-FUCOSE

Takeshi Sakai; Susumu Matsui, both of Shiga; Sumiko Akiyoshi, Kyoto, and Akira Obayashi, Uji, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed Jan. 14, 1987, Ser. No. 3,283

Claims priority, application Japan, Jan. 29, 1986, 61-17435

Int. Cl.[5] **C12Q** *1/32, 1/34;* **C12N** *9/04;* **C12R** *1/15*

U.S. Cl. 435—26 **5 Claims**

1. A method for the quantitative determination of L-fucose in a sample solution, which comprises allowing an L-fucose dehydrogenase derived from Corynebacterium sp. FS-0077 (FERM BP 1234) and having its optimum pH around neutrality to act upon said sample solution in the presence or absence of an α-L-fucosidase, measuring the amount of reduced nicotinamide adenine dinucleotide thus formed and relating the amount of reduced nicotinamide adenine dinucleotide measured to the amount of L-fucose in the sample.

4,927,754

METHOD FOR SELECTIVELY INCREASING THE RATIO OF SINGLE MAJOR COMPONENTS OF TEICOPLANIN A2 COMPLEX

Francesco Assi, Cernusco Sul Naviglio; Giancarlo Lancini, Pavia, and Anacleto Gianantonio, Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed May 19, 1986, Ser. No. 864,675

Claims priority, application United Kingdom, May 21, 1985, 8512795

Int. Cl.[5] **C12P** *19/56, 21/04;* **C12N** *1/38*

U.S. Cl. 435—71 **49 Claims**

1. A process for preparing teicoplanin A_2 (T-A2) selectively enriched in one of its major components, wherein said component is T-A2-1, which comprises adding to the culture medium of *Actinoplanes teichomyceticus* nov. sp. ATCC 31121, or one of its mutant which produces T-A2-1 through the same metabolic pathway, an effective amount of an appropriate precursor of the acyl group of the glucosamine moiety of T-A-2-1, wherein said appropriate precursor is selected from the group consisting of:

linoleic acid, its salts with bases which are non-toxic to the microorganism and its esters with mono- and polyhydroxy lower alkanols.

4,927,755

PROCESS FOR PREPARING POLYNUCLEOTIDES

Chabrier De Lassauniere, Paris, and Acaye S. Colote, Les Ulis, both of France, assignors to Societe de Conseils de Recherches et d'Applicatios Scientifiques (S.C.R.A.S.), France

Filed Nov. 1, 1988, Ser. No. 265,561

Claims priority, application United Kingdom, Nov. 2, 1987, 8725606

Int. Cl.[5] **C12P** *19/34;* **C07K** *3/12, 3/18, 3/20*

U.S. Cl. 435—91 **2 Claims**

1. A process for preparing polymers of nucleotides comprising the following sequence of steps:

inducing the lysis of a bacteria strain culture and passing the resulting medium successively through three columns:

the first one containing an ion exchange resin,

the second one containing a hydrophobic resin and

the third one containing a molecular sieve, which treatment leads to a polynucleotidephosphorylase solution substantially pure with regard to substances that might affect a further polymerisation process,

treating a selected nucleotide by the phosphorylase thus obtained, comprising reacting from about 200 to about 750 phosphorylase units in a solution containing the usual buffers and a concentration of 0.06 to 0.2 mmoles/ml of the selected mononucleotide in the presence of $MgCL_2$, stepwise added for controlling the polymerisation level, for a duration of about 3 to about 6 while keeping the pH values between 7.4 and 8.6,

separating and washing the polymer thus obtained, whereby a substantially non-pyrogenic and/or substantially non-toxic polymer is obtained.

4,927,756

WATER SOLUBLE IRON DEXTRAN AND A PROCESS FOR ITS MANUFACTURE

Dieter Schwengers, Dormagen, Fed. Rep. of Germany, assignor to Pfeifer & Langen, Cologne, Fed. Rep. of Germany

Division of Ser. No. 741,395, Jun. 5, 1985, Pat. No. 4,749,695. This application Feb. 25, 1988, Ser. No. 159,146

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422249

Int. Cl.[5] **C12P** *19/08, 19/18;* **C08B** *37/02;* **C07G** *17/001*

U.S. Cl. 435—103 **17 Claims**

1. A process for the manufacture of water soluble iron dextran having an iron content of from 27 to 33 percent by weight and an average molar mass of the dextran component of from 2000 to 4000, characterized by adding to an aqueous solution containing more than 200 mmol D-glucose per 1000 Uα(1→6)-D-glucosyl transferase, at from 265 to 310 K. and a pH value of from 4.5 to 8, an aqueous sucrose solution in such an amount that the mole ratio of sucrose to glucose is from 2.0 to 5.0; separating, after the consumption of the sucrose, liberated fructose and undesirable oligosaccharides; reacting the so-purified dextran with freshly precipitated iron(III) hydroxide and optionaly further purifying the same.

4,927,757

PRODUCTION OF SUBSTANTIALLY PURE FRUCTOSE

Herbert J. Hatcher, Idaho Falls; John J. Gallian, Twin Falls, and Stephen A. Leeper, Idaho Falls, all of Id., assignors to Idaho Research Foundation, Inc., Moscow, Id.

Filed Jul. 29, 1988, Ser. No. 225,914

Int. Cl.[5] **C12P** *19/02, 19/24, 19/18;* **C12N** *11/18*

U.S. Cl. 435—105 **15 Claims**

1. A process for the production of a substantially pure product containing greater than 60% fructose, comprising:

combining a sucrose-containing substrate with effective amounts of a levansucrase enzyme preparation to form levan and glucose;

purifying said levan by at least one of the following purification methods: ultrafiltration, diafiltration, hyperfiltration, reverse osmosis, liquid-liquid partition, solvent extraction, chromatography, and precipitation;

hydrolyzing said levan to form fructose substantially free of glucose and sucrose; and,

recovering said fructose by at least one of the following recovery methods: hyperfiltration, reverse osmosis, evaporation, drying, crystallization, and chromatography.

4,927,758

PROCESS FOR PRODUCING HISTIDINE

Toru Mizukami; Ryoichi Katsumata, both of Machida, and Tetsuo Oka, Yokohama, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 580,814, Feb. 16, 1984. This application Aug. 25, 1987, Ser. No. 89,922

Claims priority, application Japan, Feb. 17, 1983, 58-25397

Int. Cl.[5] **C12R** *13/24;* **C12N** *1/20;* **C12P** *1/13, 1/15*

U.S. Cl. 435—107 **9 Claims**

1. A process for producing histidine, which comprises:

transforming a host microorganism belonging to the genus Corynebacterium or Brevibacterium with a vector containing a DNA fragment containing a gene isolated from *Corynebacterium glutamicum* or *Escherichia coli* coding for ATP phosphoribosyl transferase; culturing the transformant in a nutrient medium; accumulating histidine in the culture medium; and recovering histidine therefrom.

4,927,759

NEW STRAINS OF *PSEUDOMONAS PUTIDA* AND THEIR USE

John A. Schofield; Peter R. Betteridge; George Ryback, all of Sittingbourne, and Philip J. Geary, Ashford, all of England, assignors to Shell Oil Company, Houston, Tex.

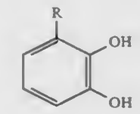
Division of Ser. No. 68,493, Jul. 1, 1987, Pat. No. 4,876,200. This application Jun. 8, 1989, Ser. No. 363,575

Claims priority, application United Kingdom, Jul. 8, 1986, 8616612; Jul. 8, 1986, 8616613

Int. Cl.[5] **C12F** *7/02;* **C12P** *7/22;* **C12R** *1/40*

U.S. Cl. 435—156 **4 Claims**

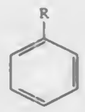
1. A biochemical process for the preparation of a compound of formula (III)



(III)

from a compound of formula (I)

VOL 1114 ISS 4 MY 22 1990 UMI



(I)

wherein R is hydrogen or fluorine, comprising providing a culture of a strain of *Pseudomonas putida* NCIB 12190 or mutant thereof, which is constitutive for and which accumulates catechol or 3-fluorocatechol, supplying a compound of formula (I) to the culture in a suitable medium in the absence of an inducing agent for said strain and subsequently recovering a compound of formula (III) therefrom.

4,927,760

PRODUCTION OF CRYSTALLINE PIGMENTS FROM MONASCUS DURING FERMENTATION

Edward J. St. Martin, Libertyville, Ill., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 261,811, Oct. 24, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 366,726

Int. Cl.[5] C12P *1/02, 7/48;* **C12N** *9/02, 9/06*

U.S. Cl. 435—171 **6 Claims**

1. A process of inducing crystalline precursor pigment formation from Monascus species producing the precursor pigment in a pigment producing culture medium at a level of at least 30 milligrams per liter comprising growing said Monascus species in a pigment producing culture medium containing a crystalline pigment inducer in an amount effective to induce crystalline pigment formation.

4,927,761

IMMOBILIZATION OF CELLS WITH ALGINATE AND AGAROSE

Anthony H. Reading, Wantage, and Brynley J. Miles, Cirencester, both of United Kingdom, assignors to The Secretary of State for United Kingdom Atomic Energy Authority in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 1, 1988, Ser. No. 162,579

Claims priority, application United Kingdom, Mar. 9, 1987, 8705464

Int. Cl.[5] C12N *11/10, 11/02, 5/02*

U.S. Cl. 435—178 **5 Claims**

1. A method for preparing a composite material containing immobilized viable biological cells, said method comprising forming a mixture consisting essentially of viable biological cells, alginate and agarose; forming droplets of said mixture; contacting said droplets with a reagent to gel the alginate to thereby provide a stable matrix within which the agarose is held until set, said matrix containing said viable biological cells; and subsequently removing at least a portion of said alignate to form a composite material comprising beads of porous agarose gel in which said viable biological cells are immobilized.

4,927,762

CELL CULTURE MEDIUM WITH ANTIOXIDANT

Frederick J. Darfler, Derwood, Md., assignor to Cell Enterprises, Inc., Harrisonburg, Va.

Continuation of Ser. No. 846,716, Apr. 1, 1986, abandoned. This application Nov. 30, 1988, Ser. No. 281,974

Int. Cl.[5] C12N *5/00, 5/02, 1/38*

U.S. Cl. 435—240.31 **26 Claims**

1. A chemically defined, serum free, albumin-free medium for maintenance or growth of immortal or immortalized cells which comprises a cell-growth promoting amount of a compound having one free thiol group, and which is capable of supporting the growth of immortal or immortalized cells at seed densities less than 10^5 cells/ml.

4,927,763

STABILIZATION OF DRIED BACTERIA EXTENDED IN PARTICULATE CARRIERS

A. Louis Sudoma, and Dean G. Dalebroux, both of Milwaukee, Wis., assignors to Chr. Hansen's Laboratory, Inc., Milwaukee, Wis.

Continuation of Ser. No. 591,944, Mar. 21, 1984, abandoned. This application Jun. 28, 1988, Ser. No. 212,515

Int. Cl.[5] C12N *91/04, 1/20;* **C12R** *1/01*

U.S. Cl. 435—260 **9 Claims**

1. The method of forming stabilized admixtures of dried viable harmless lactic acid producing bacteria, comprising:

(a) preparing a blend by intermixing a non-toxic particulate carrier with a hydrophilic molecular sieve absorbent, said blend containing at least about 95% by weight of said carrier which carrier has a water absorbing capacity of less than one percent of its moisture free weight when equilibrated in air of 70% relative humidity, said molecular sieve absorbent having a water absorbing capacity of at least 15% of its moisture free weight when equilibrated in air at 10% relative humidity and being blended in 0.1 to 2 parts by weight per each 98 to 99.9 parts of said carrier; and

(b) dispersing in said blend either during the intermixing of step (*a*) or subsequent thereto said lactic acid product bacteria to form a highly diluted admixture thereof which is storable without refrigeration.

4,927,764

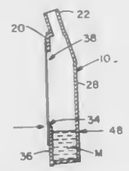
TISSUE CULTURE FLASK

George Lyman, Cape Porpoise, and Gregory Mathus, Concord, both of Mass., assignors to Costar Corporation, Cambridge, Mass.

Filed Nov. 17, 1987, Ser. No. 122,052

Int. Cl.[5] B01L *3/08;* **C12M** *1/24*

U.S. Cl. 435—296 **15 Claims**



14. A tissue culture flask comprising rigid plastic top and bottom walls connected together by sides, an open neck adapted to receive a removable cover connected to one of the sides said bottom wall having an inner surface for growing tissue cultures,

an opening in the top wall opposite the inner surface of the bottom wall for access to said surface,

and a cover secured to the top wall for closing the opening, said cover overlapping said top wall at a portion of said top wall.

4,927,765

AUTOMATIC REAGENT DISPENSER

Ronald L. Saxon, Port Murray; Leroy Zeger, Passaic, and Kenneth Horbatt, Pompton Plains, all of N.J., assignors to Pharmacia ENI Diagnostics, Inc., Fairfield, N.J.

Filed Feb. 29, 1988, Ser. No. 162,172

Int. Cl.[5] G01N *35/00*

U.S. Cl. 436—43 **6 Claims**

1. A method for automatically dispensing one or more reagents into one or more cuvettes which avoids contamination of said reagents comprising the steps of:

(1) moving an aspirating arm to a selected reagent bottle,

(2) engaging a pipette tip which is supported by the cap of the reagent bottle,

(3) aspirating a preselected volume of reagent,

(4) elevating the aspirating arm so that the tip is clear of the bottle and its cap,

(5) moving the aspirating arm to a selected cuvette so that the tip does not pass over another reagent bottle or a non-selected cuvette,

(6) expelling the aspirated reagent into the cuvette,

(7) moving the aspirating arm so that the tip is repositioned over the original bottle,

(8) releasing the tip into the cap of the bottle and

(9) moving the aspirating arm to the next reagent bottle.

4,927,767

METHOD FOR THE DETECTION OF DISEASES ASSOCIATED WITH THE METABOLIC ABNORMALITY OF L-FUCOSE

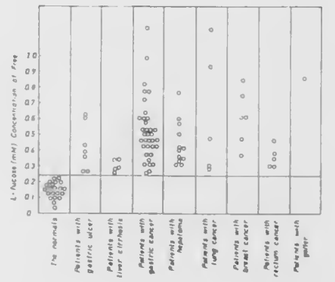
Takeshi Sakai, Kusatsu; Hiroko Yokota, Otsu; Kazuki Yamamoto, Moriyama; Sadaji Yokoyama; Susumu Matsui, both of Otsu; Ikunoshin Kato, and Akira Obayashi, both of Uji, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed Oct. 20, 1988, Ser. No. 260,518

Claims priority, application Japan, Nov. 19, 1987, 62-290735; May 10, 1988, 63-111576

Int. Cl.[5] G01N *33/493, 33/50*

U.S. Cl. 436—64 **2 Claims**



1. A method for the detection of a disease associated with the metabolic abnormality of L-fucose in a subject, which comprises determining the concentration of free L-fucose in a urine specimen from the subject, and comparing the determined concentration with a normal concentration of free L-fucose.

4,927,766

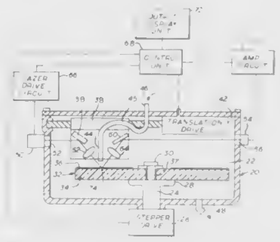
GAS CONSTITUENT MEASUREMENT AND RECORDING

Abraham Auerbach, Monsey, N.Y., and Sonia Friedman, Lawtenceville, N.J., assignors to The BOC Group, Inc., Murray Hill, New Providence, N.J.

Filed May 27, 1986, Ser. No. 866,810

Int. Cl.[5] G01N *31/22, 35/00*

U.S. Cl. 436—44 **55 Claims**



1. A method of measuring the molecular concentration of a constituent in a gas comprising the steps of:

(a) contacting the gas with a surface of a solid body;

(b) momentarily heating said surface so that said constituent reacts at said surface to alter a property of said surface permanently; and

(c) determining the degree or rate of alteration in said property produced by reaction of said constituent during said momentary heating step, said heating step including the step of momentarily applying heating radiant energy to said surface in a plurality of heating pulses to a plurality of different localized regions of said surface in temporal sequence, said determining step being performed separately for each of said localized regions to thereby provide a plurality of measurements of said molecular concentration, whereby each of said measurements is indicative of said molecular concentration at the time of one of said pulses.

4,927,768

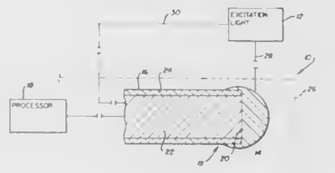
GROWN CRYSTALLINE SENSOR AND METHOD FOR SENSING

Peter K. Coughlin, Yorktown Heights, N.Y.; William C. Mercer, Brookfield, Conn., and Edith M. Flanigen, White Plains, N.Y., assignors to UOP, Des Plaines, Ill.

Filed Jun. 29, 1988, Ser. No. 213,302

Int. Cl.[5] G01N *21/00*

U.S. Cl. 436—172 **64 Claims**



1. A sensor for determining the concentration of a gaseous component of interest comprising a sensing element comprising an inorganic oxide composition and an inorganic crystalline composition including at least one metal component in an amount effective to provide a light signal at least one property of which varies as the concentration of the gaseous component of interest varies, said inorganic crystalline composition having been grown, or derived from a material grown, by crystal growth upon at least a portion of the surface of said inorganic oxide composition to form a composite with at least two substantially contiguous phases which exhibit at least one of a

VOL
1114
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distinct compositional heterogeneity and a distinct structural heterogeneity of one phase to the other; and processing means to process said signal and provide a basis for determining the concentration of said gaseous component of interest.

4,927,769

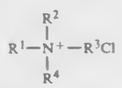
METHOD FOR ENHANCEMENT OF CHEMILUMINESCENCE

Steve C. S. Chang, Franklin, and Thomas E. Miller, Norwood, both of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Jul. 8, 1987, Ser. No. 71,660
Int. Cl.[5] G01N *33/543, 21/00, 33/531, 33/532*
U.S. Cl. 436—518 **13 Claims**

1. A method for enhancing the chemiluminescent signal of an acridinium ester in a chemiluminescent reaction which comprises oxidizing the acridinium ester in the presence of an effective amount of an enhancer to effect enhanced chemiluminescent signal said enhancer selected from the group consisting of:

(a) a quarternary amine cationic surfactant of formula:



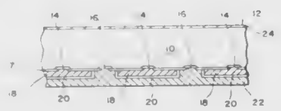
wherein R^1 is C_8–C_{20} alkyl or alkenyl; and
R^2, R^3 and R^4 are C_1–C_4 alkyl or alkenyl.
(b) a nonionic surfactant; and
(c) a sulfated primary alcohol selected from the group consisting of sodium dodecylsulfate, magnesium dodecylsulfate and tridecylsulfate.

4,927,770

METHOD OF FABRICATING BACK SURFACE POINT CONTACT SOLAR CELLS

Richard M. Swanson, Los Altos, Calif., assignor to Electric Power Research Inst. Corp. of District of Columbia, Palo Alto and Board of Trustees of the Leland Stanford California Corporation, Stanford, both of, Calif.

Filed Nov. 14, 1988, Ser. No. 272,130
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—2 **14 Claims**



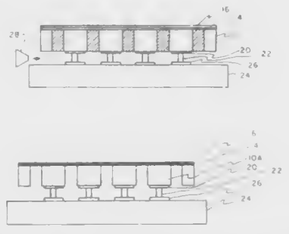
1. A method of fabricating a back surface point contact solar cell, comprising the steps of
(a) providing a substrate of silicon having two major opposing surfaces,
(b) forming a silicon oxide layer on at least a first of said major surfaces,
(c) forming a silicon nitride layer on said silicon oxide layer,
(d) removing first portions of said layers thereby exposing first surface areas on said first major surface,
(e) forming a first doped layer with a first conductivity type dopant therein on said surface areas,
(f) removing second portions of said layers, thereby exposing second surface areas on said first major surface,
(g) forming a second doped layer with a second conductivity type dopant therein over on said second surface areas,
(h) heating said substrate and thereby diffusing dopant from said first layer into said first surface areas and diffusing dopant from said second doped layer into said second surface areas,
(i) subjecting said substrate and said layers to an elevated temperature of at least 900° C. in a hydrogen atmosphere, thereby hydrogenating the interface between said major surface and said silicon oxide layer,
(j) removing said first and second doped layers by a preferential etchant which does not remove said silicon nitride, and
(k) forming a two-level metal interconnect structure for separately contacting said first surface areas and said second surface areas.

4,927,771

METHOD OF THERMAL ISOLATION OF DETECTOR ELEMENTS IN AN UNCOOLED STARING FOCAL PLANE ARRAY

Donald A. Ferrett, Prince William Co., Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1989, Ser. No. 319,788
Int. Cl.[5] H01L *27/144*
U.S. Cl. 437—3 **7 Claims**



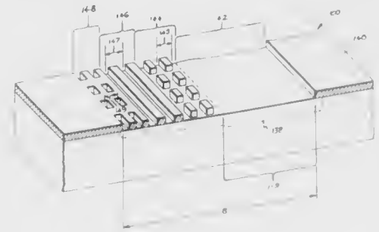
1. A method of thermally isolating detector elements in an uncooled staring focal plane array, said method comprising the steps of:
providing an unthinned wafer of detector material;
reticulating said wafer to form reticulated grooves and isolated detector elements;
backfilling said reticulated grooves by evaporating arsenic trisulfide as removable backfill material therein until said reticulated grooves are filled to overflow to strengthen the reticulated wafer;
cleaning excess backfill material down to the top of said detector elements;
evaporating a top electrode layer over the surface formed by said backfill material and said top of said detector elements;
evaporating an absorber layer over said top electrode layer;
inverting said unthinned wafer of detector material and mounting on a layer of support material;
thinning said unthinned wafer to a final thickness wherein said backfill material is exposed forming isolated detector elements;
depositing a metal pad and solder bump sequentially on each of said isolated detector elements wherein the temperature of deposition never exceeds 170 degrees Celsius to prevent thermal sublimation of said arsenic trisulfide removable backfill material;
bump bonding a readout device to each of said solder bumps;
inverting said readout device and the thinned wafer and removing said layer of support material from said absorber layer; and
jetting an oxygen rich gas between the detector array and said readout device in the open space formed around the bump bonds to remove said arsenic trisulfide removable backfill material from said reticulated grooves wherein said bonded detector array and readout device are fixed on a rotating stage in an enclosure and a nozzle jetting said oxygen rich gas is stationary so that said gas is jetted through the open space from all directions as the array and device are rotated wherein said oxygen rich gas sublimates and carries away the arsenic trisulfide out of said reticulated grooves to leave thermal isolation air gaps between said detector elements.

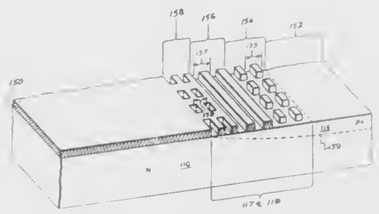
4,927,772

METHOD OF MAKING HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

Stephen D. Arthur, Scotia, and Victor A. K. Temple, Jonesville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 30, 1989, Ser. No. 358,057
Int. Cl.[5] H01L *21/26*
U.S. Cl. 437—6 **13 Claims**





1. A process of fabricating a semiconductor device including, when complete, at least one P-N junction, a first region of semiconductor material of one conductivity type having an upper surface and forming one side of said junction, a second region of semiconductor material having a lower surface and forming the other side of said junction, said second region being formed within said first region with conductivity type opposite that of the first region; and wherein said P-N junction includes a terminated portion at said upper surface of said first region, said second region includes a graded region adjacent to termination of said P-N junction, and said first region at a location beneath said P-N junction contains a depletion region width W_D when said junction is reverse-biased to its ideal breakdown voltage, the improvement comprising, in combination with the foregoing:
(a) forming a first mask of not so uniform thickness on said semiconductor device adjacent to said terminated portion to be used in forming a junction termination extension region, said step of forming a first mask comprising configuring said mask to expose a percentage x of a first portion of said first region adjacent said terminated portion and to expose a percentage y of a second portion of said first region adjacent said first portion remote from said terminated portion of said P-N junction, and wherein x is greater than y and adjacent openings in said first mask have a center-to center spacing of less than $0.25W_D$,
(b) simultaneously doping said first and second portions of said first region through said first mask with the same concentration of dopant to form in said first region, a first zone contiguous with said terminated portion and a second zone adjacent said first zone, said first and second zones being of approximately the same depth and establishing a junction termination extension;
(c) forming a second mask of not so uniform thickness on said semiconductor device adjacent said terminated portion and remote from the balance of said junction termination extension region, to be used in forming said second region including said graded region, said step of forming a second mask comprising configuring said mask to expose a percentage m of a first portion of said first region adjacent said terminated portion and to expose a percentage n of a second portion of said first region adjacent said first portion remote from said terminated portion of said P-N junction and wherein n is greater than m;
(d) simultaneously doping said first and second portions of said first region through said second mask with the same concentration of dopant to form in said first region said second region such that said second region has a first zone contiguous with said terminated portion and a second zone adjacent said first zone; and
(e) simultaneously diffusing said junction termination extension implant and said second region dopant implant, whereby the junction termination extension region is diffused with no additional diffusion time other than that required for diffusion of the P-N junction.

4,927,773

METHOD OF MINIMIZING IMPLANT-RELATED DAMAGE TO A GROUP II-VI SEMICONDUCTOR MATERIAL

Michael D. Jack, Goleta; George R. Chapman, Santa Barbara, and Michael Ray, Goleta, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 5, 1989, Ser. No. 361,452
Int. Cl.[5] H01L *21/385, 21/425*
U.S. Cl. 437—22 **29 Claims**



1. In a semiconductor material comprised of Group II–VI material, a method of forming a region therein that differs from the semiconductor material surrounding the region, comprising the steps of:
providing a body comprised of Group II–VI semiconductor material;
forming a cap layer having a lower surface that overlies a surface of the body;
implanting a selected chemical species through an upper surface of the cap layer, the species being implanted to a depth such that an implant peak is located within the cap layer such that no significant implant damage or effects thereof are sustained by the underlying body; and
diffusing the implanted species from the cap layer down into the underlying body to form a region therein that differs from the material of the body surrounding the region.

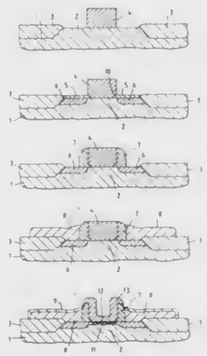
VOL 1114 ISS 4 MY 22 1990 UMI

4,927,774

SELF ALIGNED BIPOLAR FABRICATION PROCESS

Anthony Welbourn, Ipswich, and Christopher Heslop, Woodbridge, both of England, assignors to British Telecommunications plc, London, England

Continuation of Ser. No. 204,823, Jun. 10, 1988, abandoned.
This application Oct. 18, 1989, Ser. No. 423,691
Int. Cl.[5] H01L *21/34*
U.S. Cl. 437—31 12 Claims



1. A method of fabricating a walled-emitter transistor, the method comprising the steps of:

(a) forming an isolated device island (2) on the surface of a semiconductor wafer (1);

(b) forming a first layer (3) of dielectric material on the surface of the semiconductor wafer (1), the first layer (3) of dielectric material having an opening exposing at least part of the device island (2);

(c) forming a body (4) of dielectric material within said opening to leave exposed an annulus of the device island (2);

(d) oxidising the surface of said exposed annulus to produce a layer (5) of oxide which extends beneath the periphery of the body (4) of dielectric material;

(e) forming non-lithographically, within said opening, an annular body (7) of dielectric material against and about the body (4) of dielectric material;

(f) forming a base contact conductor (8) about the annular body (7) of dielectric material and in contact with the semiconductor of the device island (2);

(g) forming a second layer (9) of dielectric material on the base contact conductor (8);

(h) removing the body (4) of dielectric material to expose the substrate within the inner periphery of the annular body (7) of dielectric material, and forming a base region (11) within the semiconductor so exposed; and

(i) forming an emitter (12) in the semiconductor exposed within the inner periphery of the annular body (7) of dielectric material.

4,927,775

METHOD OF FABRICATING A HIGH PERFORMANCE BIPOLAR AND MOS DEVICE

Antonio R. Alvarez, Sunnyvale, Calif., and James A. Kirchgessner, Mesa, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 6, 1989, Ser. No. 319,387
Int. Cl.[5] H01L *21/28, 21/22*
U.S. Cl. 437—31 3 Claims

1. A method of fabricating a bipolar device integrated with an MOS device, comprising the steps of:

providing a semiconductor substrate having at least a first and a second isolated region;

forming a gate dielectric layer over the first isolated region;

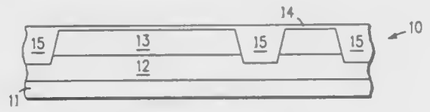
forming an intrinsic base region in the second isolated region;

depositing a polysilicon layer on the surface of the substrate;

doping a predetermined region of the polysilicon layer which defines a polysilicon emitter region and a polysilicon gate region;

removing portions of the polysilicon layer adjacent to the polysilicon emitter region and adjacent to the polysilicon gate region;

forming a source and a drain region in the substrate adjacent to the polysilicon gate region;



growing a silicon dioxide layer on the surface of the polysilicon layer and the semiconductor substrate surfacer, wherein a thicker amount of silicon dioxide grows over the polysilicon emitter region and the polysilicon gate region;

etching the silicon dioxide layer so that only a portion of the silicon dioxide which is adjacent to the polysilicon gate region and the polysilicon emitter region remains, thereby creating silicon dioxide sidewall spacers; and

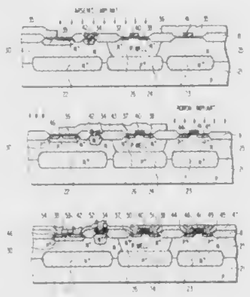
forming a silicide layer on the polysilicon layer, the polysilicon emitter region, and the semiconductor substrate surface, wherein the silicide forms self-aligned contacts to the intrinsic base regions, the polysilicon emitter region, the source and drain regions, and the polysilicon gate region.

4,927,776

METHOD OF PRODUCING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING BIPOLAR TRANSISTOR AND INSULATED GATE FIELD EFFECT TRANSISTOR

Katsumoto Soejima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 920,009, Oct. 17, 1986, abandoned.
This application Nov. 8, 1988, Ser. No. 270,434
Claims priority, application Japan, Oct. 17, 1985, 60-232671
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—33 6 Claims



1. A method for producing semiconductor device of a type in which a bipolar transistor and an insulated gate field effect transistor are formed on one chip, said method comprising the steps of:

forming a collector region of said bipolar transistor of one conductivity type and a substrate region of said insulated gate field effect transistor of the opposite conductivity type in said chip,

forming an insulating layer on said collector region and said substrate region,

forming a base region in said collector region,

forming a collector contact hole in said insulating layer to selectively expose said collector region,

depositing a polycrystalline silicon layer over said insulating layer so as to fill said collector contact hole,

diffusing first impurities into said polycrystalline silicon layer, to lower the resistance thereof, and, simultaneously, into said collector region through said collector contact hole to form a collector contact region in said collector region,

selectively removing said polycrystalline layer to form a gate electrode of said insulated gate field effect transistor and a collector electrode of said bipolar transistor, said collector electrode contacting said collector contact region through said collector contact hole, and

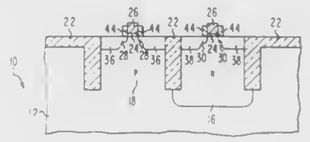
selectively doping second impurities into the polycrystalline silicon collector electrode, said base region and said substrate region to form an emitter region of said bipolar transistor and source and drain regions of said insulated gate field effect transistor, said first impurities in said collector contact region being further diffused into said collector region during the formation of said emitter, source and drain regions, such that the depth of said collector region becomes larger than said emitter, source and drain regions.

4,927,777

METHOD OF MAKING A MOS TRANSISTOR

Sheng T. Hsu, Lawrenceville, and Doris W. Flatley, Belle Mead, both of N.J., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 301,074, Jan. 24, 1989, abandoned. This application Oct. 6, 1989, Ser. No. 418,762
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—44 5 Claims



1. A method of making a MOS transistor having source and drain extensions comprising the steps of:

forming on the surface of a substrate of single crystalline silicon a gate line of a conductive material with a layer of insulating material between the gate line and the substrate surface;

implanting a light dose of ions of a desired conductivity type into the surface of the substrate at each side of the gate line up to the side walls of the gate line;

providing a layer of polycrystalline silicon over the substrate surface on each side of the gate line and over the gate line;

heating the polycrystalline silicon layer in an oxidizing atmosphere to convert substantially the entire polycrystalline silicon layer to thermally grown silicon oxide;

removing the portions of the thermally grown silicon oxide on the substrate surface at each side of the gate line leaving spacers on the side walls of the gate line; and

implanting a heavier dose of the ions into the substrate surface at each side of the gate line up to the spacers to form the source and drains of the transistors.

4,927,778

METHOD OF IMPROVING YIELD OF LED ARRAYS

Daniel C. Abbas, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 228,654
Int. Cl.[5] H01L *21/20, 21/66, 21/302*
U.S. Cl. 437—51 5 Claims



1. A method of fabricating integrated light emitting semiconductor diode arrays each comprised of a series of diodes arranged along a major axis comprising:

creating a plurality of diode arrays in a common semiconductor wafer containing parallel linear crystal irregularities that can result in the production of dark line defects in the completed diodes;

subdividing the wafer to produce a plurality of chips each containing at least one of the diode arrays; and

selecting diode arrays for use based on the diode to diode uniformity of light emission of the diodes in each array;

characterized by the steps comprising:

examining each semiconductor wafer in advance of formation of the diode arrays thereon to determine the nature and alignment of the parallel linear crystal irregularities; and

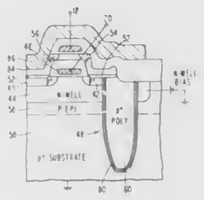
forming the diode arrays on the semiconductor wafer with their major axes parallel to the parallel linear crystal irregularities.

4,927,779

COMPLEMENTARY METAL-OXIDE-SEMICONDUCTOR TRANSISTOR AND ONE-CAPACITOR DYNAMIC-RANDOM-ACCESS MEMORY CELL AND FABRICATION PROCESS THEREFOR

Sang H. Dhong, Mahopac; Nicky C. Lu, Yorktown Heights, and Walter H. Henkels, Putnam Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 230,410, Aug. 10, 1988. This application Oct. 27, 1989, Ser. No. 428,159
Int. Cl.[5] H01L *21/265, 27/10*
U.S. Cl. 428—52 5 Claims



1. A method for fabricating a memory cell for a semiconductor memory array comprising the steps of:

Step (1) disposed an epitaxial layer on a semiconductor

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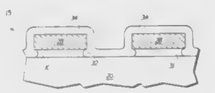
substrate and reactive ion etch a trench into the said epitaxial layer and substrate,
Step (2) form a composite oxide/nitride/oxide storage insulator layer on the walls inside said trench,
Step (3) fill said trench with polysilicon and planarize,
Step (4) form a retrograde n-well in said epitaxial layer by a surface impurity implant and a deep impurity implant,
Step (5) grow gate oxide and deposit polysilicon gate material for a PMOS type device and deposit an oxide film insulator layer over the PMOS gate and lithographically pattern said oxide film layer,
Step (6) implant dopants into said n-well to provide graded source/drain junctions for PMOS and NMOS transistor devices, respectively,
Step (7) open the surfaces of said source/drain regions for silicide formation wherein said gate element is protected from said silicide by said oxide film insulator layer formed in step (5),
Step (8) form a lightly doped silicon film over said silicide, gate oxide and isolation regions wherein said lightly doped silicon film is deposited in polycrystalline structure and recrystallized by beam annealing,
Step (9) define the NMOS type transistor device active area and grow thin NMOS gate oxide,
Step (10) adjust channel threshold voltages by an impurity implant,
Step (11) deposit polysilicon NMOS type transistor device gate material and pattern,
Step (12) form oxide spacer regions on said NMOS gate electrode edges,
Step (13) implant dopants to obtain source/drain junctions for a transfer device and grow oxide to cover the device.

4,927,780

ENCAPSULATION METHOD FOR LOCALIZED OXIDATION OF SILICON

Scott S. Roth; Bich-Yen Nguyen; Philip J. Tobin; Wayne Ray, all of Austin; E. Petyr Wachholz, Cedar Park, and Glenn Wissen, Elgin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1989, Ser. No. 415,685
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—69 **16 Claims**





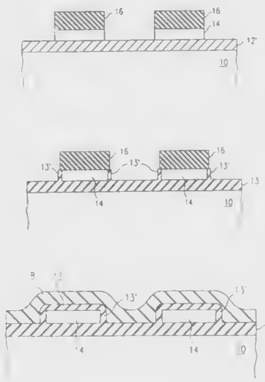
1. A method for forming an integrated circuit device on a semiconductor substrate comprising the steps of:
forming a buffer layer to overlie said substrate;
depositing a layer of oxidation resistant material onto said buffer layer to form a composite layer comprising said buffer layer and said layer of oxidation resistant material over said buffer layer;
etching selected portions of said composite layer to expose portions of said substrate and to leave masking portions of said composite layer overlying said substrate;
etching said buffer layer to form a recess under an edge portion of said oxidation resistant layer of said masking portions;
depositing a conformal layer of oxidizable material to overlie said masking portions of said composite layer substantially filling said recess with said conformal layer; and
oxidizing said conformal layer and said exposed portions of said substrate to form electrical isolation regions in said exposed portions of said substrate.

4,927,781

METHOD OF MAKING A SILICON INTEGRATED CIRCUIT WAVEGUIDE

Robert O. Miller, 5523 Vaden St., Box 99701, The Colony, Tex. 75056

Filed Mar. 20, 1989, Ser. No. 326,104
Int. Cl.[5] H01L *21/76, 21/203*
U.S. Cl. 437—71 **11 Claims**



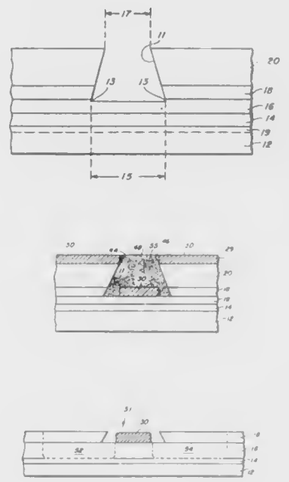
1. A method for fabricating a semiconductor waveguide, comprising:
providing a semiconductor substrate having a low or intrinsic level of dopant impurities;
forming a first layer of semiconductor material over one surface of the semiconductor substrate to a predetermined thickness;
forming a second layer of semiconductor material over the surface of the first layer of semiconductor material;
masking the upper surface of the second layer of semiconductor material with a masking layer;
patterning the second layer and masking to define at least one ridge;
selectively etching the second layer of semiconductor material and the masking layer in accordance with the pattern to etch the second layer down from the upper surface thereof and substantially to the upper surface of the first layer of semiconductor material to form at least one ridge having an upper surface and two substantially vertical surfaces and a lower surface adjacent the upper surface of the first layer of semiconductor material;
converting the first layer of semiconductor material to an insulating material adjacent the lower surface of the at least one ridge;
forming a layer of insulating material on the substantially vertical surfaces of the at least one ridge;
removing the masking layer from the upper surface of the at least one ridge; and
forming an insulating layer on the upper surface of the at least one ridge.

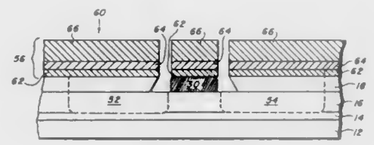
4,927,782

METHOD OF MAKING SELF-ALIGNED GAAS/ALGAAS FET'S

John E. Davey, Alexandria, and Aristos Christou, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1989, Ser. No. 371,778
Int. Cl.[5] H01L *21/338*
U.S. Cl. 437—184 **12 Claims**





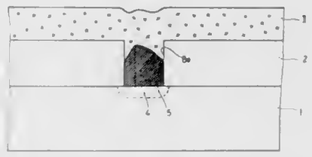
1. A method of making a field effect transistor having a gate aligned with a source and drain, comprising the steps of:
obtaining a selectively doped heterostructure substrate having a heavily doped top layer capable of being etched by an orientation-dependent etchant, having a heavily doped etchant-resistant layer under the top layer that is resistant to etching by the orientation-dependent etchant, and having an underlying layer, the layers having a predetermined crystalline orientation,
depositing an uppermost layer on the top layer that is capable of being etched by the orientation-dependent etchant,
etching an angular recess through the uppermost layer and through the top layer of the heterostructure substrate with an orientation-dependent etchant down to the etchant resistant layer, said recess having a top length and a base length, wherein the length of the angular recess is wider at the base of the recess than at the top of the recess because of the predetermined crystalline orientation and the orientation-dependent etchant,
depositing a refractory metal in the recess to form the gate wherein the length of the refractory metal gate is substantially the same as the length of the top of the recess and depositing refractory metal on the top surface of the uppermost layer;
covering the refractory metal gate with an etch-resistant and organic-solvent-soluble material;
removing the refractory metal from the uppermost layer without removing the etch-resistant and organic-solvent-soluble material;
implanting source and drain regions with implantable ions into the etchant-resistant layer which is not substantially etched by the orientation-dependent etchant;
removing the uppermost layer and the etch-resistant and organic-solvent-soluble material, whereby the top surface of the refractory metal gate is uncovered; and
depositing metal contacts on the refractory metal gate and over the source and drain regions to complete fabrication of the self-aligned field effect transistor structure.

4,927,783

METHOD FOR FABRICATING SEMICONDUCTOR DEVICE

Hajime Arai, and Hrioshi Harada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 924,566, Oct. 28, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 180,162
Claims priority, application Japan, Oct. 29, 1985, 60-244551
Int. Cl.[5] H01L *21/24, 21/28*
U.S. Cl. 437—196 **9 Claims**



1. A method for fabricating a semiconductor device, comprising the steps of:
forming an insulator layer on a silicon substrate;
opening a contact hole through said insulator layer;
forming an alloy film containing silicon, said alloy film being in contact with said silicon substrate at the bottom of said contact hole;
growing a filler of doped silicon at least on said silicon substrate in said contact hole by solid phase precipitation from said alloy film by heat treatment;
etching said alloy film away to leave at least said filler on said substrate in said contact hole; and
forming a conductor layer on said insulator layer, said conductor layer being in electric contact with said filler.

4,927,784

SIMULTANEOUS FORMATION OF VIA HOLE AND TUBE STRUCTURES FOR GAAS MONOLITHIC MICROWAVE INTEGRATED CIRCUITS

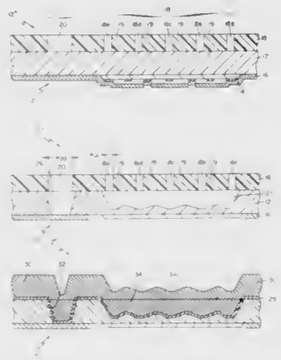
Thomas E. Kazior, Sudbury, and Mark S. Durschlag, Natick, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 44,684, May 1, 1987, Pat. No. 4,807,022. This application Sep. 28, 1988, Ser. No. 250,207
Int. Cl.[5] H01L *21/306*
U.S. Cl. 437—203 **33 Claims**

1. A method of forming first and second recessed portions in a selected surface of a substrate, each recess having a different depth into said substrate, comprises the steps of:
providing a masking layer over the selected surface of the substrate:
patterning said masking layer to provide first and second regions in said masking layer, the first region disposed over the region of said first recess being patterned to provide at least one first aperture exposing an underlying

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portion of said selected surface of said substrate, and the second region disposed over the region of said second recess being patterned to provide a plurality of separate spaced second apertures, exposing underlying portions of said selected surface of said substrate with said second apertures having a cross-sectional dimension which is smaller by a predetermined amount than the corresponding dimension of said one first apertures; and



etching said selected surface of said substrate through said first and second regions at least until the pattern etched through the plurality of separate spaced apertures, overlaps in the etched portion of the substrate, to provide the second recess, and said first region is etched to provide said first recess, with said first and second recesses having different depths.

4,927,785

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Jean-Bernard Theeten, Ozoir-La-Ferriere; Philippe Autier, Paris, and Jean Marc Anger, Joinville-Le-Pont, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1988, Ser. No. 201,514

Claims priority, application France, Jun. 4, 1987, 87 07796

Int. Cl.[5] H01L *21/66*

U.S. Cl. 437—225 8 Claims



1. In a method of manufacturing semiconductor devices using reactive ion plasma etching which method comprises the steps of

(a) forming an optical grating having a rectangular profile of grooves and mask strips on a sample material, each of said grooves having a width L_s and each of said mask strips having a width L_m, where L_s is substantially equal to L_m, said optical grating being formed of a material selected from one of a photoresist, a dielectric compound, a metal, or a metallic compound, and said sample material being formed of a material selected from one of a dielectric compound, a semiconductor compound, or alternate layers of different semiconductor material;

(b) illuminating said optical grating substantially perpendicularly to a surface of said optical grating with a laser beam, said laser beam having a wavelength λ, said widths L_s and L_m being larger in dimension than a dimension lc of the coherence zone of said laser beam;

(c) detecting specular reflection of said laser beam being reflected from said optical grating; and

(d) reactive ion etching said sample material through said optical grating.



4,927,786

PROCESS FOR THE FORMATION OF A SILICON-CONTAINING SEMICONDUCTOR THIN FILM BY CHEMICALLY REACTING ACTIVE HYDROGEN ATOMS WITH LIQUEFIED FILM-FORMING RAW MATERIAL GAS ON THE SURFACE OF A SUBSTRATE

Shoji Nishida, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 355,642, May 23, 1989, abandoned. This application Oct. 20, 1989, Ser. No. 425,350

Claims priority, application Japan, May 25, 1988, 63-123793

Int. Cl.[5] H01L *21/00, 21/02, 21/223, 21/383*

U.S. Cl. 437—233 10 Claims

1. A process for forming a silicon-containing semi-conductor thin film, said process which comprises the steps of making a film-forming raw material gas containing silicon atoms as the constituent atoms in the molecule to be adsorbed in liquid form on the cooled surface of a substrate and subsequently causing the liquefied film-forming raw material to chemically react with active hydrogen atoms to thereby solidify the silicon-containing material and form a silicon-containing semiconductor thin film on the surface of the substrate.

4,927,787

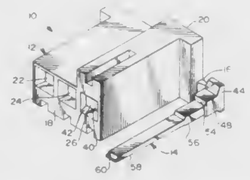
UNITARILY MOLDED ELECTRICAL CONNECTOR HOUSING WITH SEPARABLE KEY

Arvind Patel, Naperville, Ill., assignor to Molex Incorporated, Del.

Filed Feb. 9, 1989, Ser. No. 308,299

Int. Cl.[5] H01R *29/00*

U.S. Cl. 439—189 4 Claims



1. A molded switch connector housing and key structure comprising:

an electrical connector housing having at least one switch terminal cavity for receiving a pair of electrically conductive switch terminals therein, said electrical connector housing comprising at least one key aperture extending therethrough and into the switch terminal cavity; and

a key integrally molded with said electrical connector housing and selectively separable therefrom, said key comprising a blade dimensioned to pass through the key aperture of the housing for selective insertion into and removal from the switch terminal cavity thereof, the blade of said key being dimension ed to move at least one of the switch terminals relative to the other upon insertion of said key into the switch terminal cavity, whereby the separation of said key from said housing enables the key to selectively separate or permit contact between the switch terminals in said housing.

4,927,788

MONOLITHIC FEMALE CONNECTOR

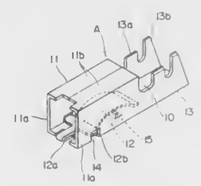
Kazutaka Nakashima, and Kazuya Saito, both of Hachioji, Japan, assignors to Dowa Mining Co., Ltd. and Yazaki Corporation, both of Tokyo, Japan

Continuation-in-part of Ser. No. 177,997, Apr. 5, 1988, abandoned. This application Nov. 29, 1988, Ser. No. 277,496

Claims priority, application Japan, Apr. 8, 1987, 62-84653

Int. Cl.[5] C22C *9/06*

U.S. Cl. 439—887 9 Claims



1. A female connector of a monolithic structure comprising a spring element, a socket portion and a wire-connecting portion, said spring element, socket portion and wire-connecting portion being integrally formed as one piece by press-working and punching from a single thin plate made of a copper-base alloy consisting essentially of 7–15 wt % Ni, 1.0–2.0 wt % Al, not more than 0.0050 wt % 0_2 and the balance of Cu and incidental impurities, said thin plate having a uniform thickness.

4,927,789

RADIO PROGRAMMING DEVICE WITH ACCESS TO A REMOTE DATABASE

Thomas F. Shirley, Jr., Fort Worth, and Eric S. Goldsmith, Watauga, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1988, Ser. No. 175,002

Int. Cl.[5] H04B *17/00*

U.S. Cl. 455—67 3 Claims

1. A method for using a programming station to program a radio that operates in a communication system, which radio includes memory means for storing:

first radio feature parameters that may be changed by said programming station without approval from a remote central unit; and

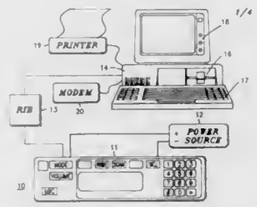
second radio feature parameters that should only be changed with approval from said remote central

said method including the steps of:

(A) coupling said programming station to said radio;

(B) accessing said remote central unit to: (i) provide information to said remote central unit regarding changes to at least some of said second radio feature parameters; (ii) receiving approved changed second radio feature parameters from said remote central unit;

(C) combining at least some of said approved changed second radio feature parameters with at least some of



said first radio feature parameters to provide combined parameters;

(D) storing said combined parameters in said memory means.

4,927,790

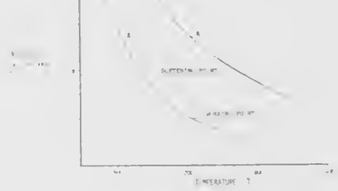
GLASS/FIBER COMPOSITE AND A METHOD OF ITS MANUFACTURE

John Bluege, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 86,343, Aug. 18, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,566

Int. Cl.[5] C03C *14/00*

U.S. Cl. 501—32 15 Claims



1. A method of manufacturing a composite structure that includes fibers embedded in a glass matrix, comprising the steps of:

forming a precursor of the composite structure, including embedding the fibers in a matrix of silica-based glass material which contains a glass-forming additive that lowers the working temperature range of such material below that of pure silica; and

chemically leaching the additive out of the precursor to obtain a porous matrix consisting substantially of silica and containing the fibers.

4,927,791

CHROMIUM CARBIDE SINTERED BODY

Kei Isozaki; Yutaka Hirashima, and Yasuo Imamura, all of Omuta, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 253,674

Claims priority, application Japan, Oct. 6, 1987, 62-250729

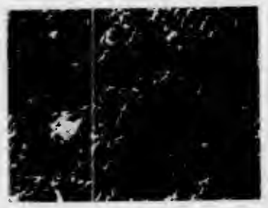
Int. Cl.[5] C04B *35/56, 35/58*

U.S. Cl. 501—87 8 Claims

1. A chromium carbide sintered body having high toughness comprising 99.5 to 50% by weight of Cr_3C_2 and 0.5 to 50% b y weight of AlN, said sintered body being obtained by sinter-

VOL
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ing Cr_3C_2 powders at a temperature of 1600° C. to 1750° C., and said sintered body containing not less than 20% by area of



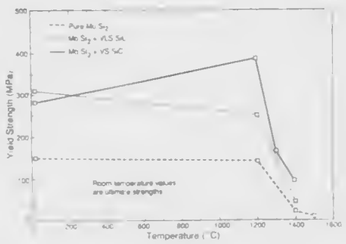
acicular crystals of Cr_3C_2 as observed from an SEM photograph.

4,927,792

MOLYBDENUM DISILICIDE MATRIX COMPOSITE

John J. Petrovic; David H. Carter, and Frank D. Gac, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 5, 1989, Ser. No. 362,112
Int. Cl.[5] C04B *35/56, 35/58*
U.S. Cl. 501—92 **2 Claims**



1. A composition of matter consisting of molybdenum disilicide reinforced with silicon carbide whiskers dispersed throughout it, where each whisker is a single crystal having an aspect ratio of from about 5:1 to about 15:1 and where the dimensions of each whisker are from about 1 to about 5 microns long and from about 0.1 to about 0.5 micron in diameter.

4,927,793

PROTON CONDUCTIVE MATERIAL AND METHOD OF MANUFACTURING THEREOF

Saburo Hori, Tokyo, and Nobuhiro Watanabe, Matsudo, both of Japan, assignors to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 235,735
Claims priority, application Japan, Aug. 20, 1987, 62-207138
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—134 **6 Claims**

1. Proton conductive material comprising a compound of a monoclinic crystal structure which is in a reversibly reduced state from a compound of a similar monoclinic crystal structure represented by the general formula:

$$Na_xAl_yTi^{3+}{}_{x-y}Ti^{4+}{}_{8-x}O_{16},$$

in which $1.5 \leqq x \leqq 2$, $1.5 \leqq y \leqq 2$, $x \geqq y$, the lattice parameter b_o of the compound of a monoclinic crystal structure in a reduced state being greater by more than 0.001 nm than the lattice parameter b_o of the compound of a similar monoclinic crystal structure represented by the general formula:

$$Na_xAl_yTi^{3+}{}_{x-y}Ti^{4+}{}_{8-x}O_{16}.$$

wherein the compound of a monoclinic crystal structure in a reduced state is formed by applying a reducing treatment to the compound of a similar monoclinic crystal structure represented by the general formula: $Na_xAl_yTi^{3+}{}_{x-y}Ti^{4+}{}_{8-x}O_{16}$ in a hydrogen atmosphere and at a temperature of from 600° C. to 1000° C.

4,927,794

LEACHING COBALT, MOLYBDENUM, NICKEL, AND VANADIUM FROM SPENT HYDROPROCESSING CATALYSTS

Paul J. Marcantonio, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 26, 1985, Ser. No. 749,614
Int. Cl.[5] B01J *38/66*
U.S. Cl. 502—26 **1 Claim**

1. A process to extract cobalt, molybdenum, nickel, and vanadium values from spent hydroprocessing catalyst particles containing carbon residue comprising:

(a) roasting said spent catalyst in an oxygen-containing gas at a temperature of from 400° C. to 450° C.;

(b) contacting said roasted catalyst particles with an aqueous solution of ammonia, ammonium salt, and hydrogen peroxide at a temperature of from 50° C. to 95° C.; wherein said aqueous solution has an initial pH of at least 10.4, an initial hydrogen peroxide concentration of from 0.02 to 0.2M, an initial ammonia concentration of at least 2M, and an initial ammonium salt concentration of at least 0.5M; and wherein said aqueous solution is maintained at a pH of greater than 9.5; and

(c) repeating steps (a) and (b) to increase metals extraction.

4,927,795

PASSIVATION OF METAL CONTAMINATED CRACKING CATALYSTS

Donald C. Tabler, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 907,767, Sep. 15, 1986. This application Oct. 28, 1988, Ser. No. 264,293
Int. Cl.[5] B01J *21/20, 38/52, 38/50;* **C10G** *11/04*
U.S. Cl. 502—33 **11 Claims**



1. A method of restoring the activity of a hydrocarbon cracking catalyst in which the cracking activity of said catalyst is at least partially decreased by contaminating metals deposited thereon, comprising contacting said cracking catalyst with a metals passivating agent consisting essentially of

(a) water,

(b) particulate antimony oxide; and

(c) at least one suspending agent selected from the group consisting of dialkyl esters of phosphoric acid and the ammonium salt of carboxymethyl cellulose, said water being present in said passivating agent in an amount in the range of from about 10 to about 97 weight percent, said particulate antimony oxide being present in the range of from about 1 to about 30 weight percent, and said at least one suspending agent being present in the range of from about 0.5 to about 5 weight percent, said weight percentages being based on the total weight of the metals passivating agent.

4,927,796

COMPOSITION FOR PURIFYING LIQUIDS

Philip J. D'Angelo, Glen Mills; Richard Hetherington, Glenside, and Joseph J. Rogan, Levittown, all of Pa., assignors to Epicor Incorporated, Linden, N.J.

Division of Ser. No. 63,177, Jun. 17, 1987, Pat. No. 4,853,130, which is a continuation-in-part of Ser. No. 811,525, Dec. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 640,528, Aug. 14, 1984, abandoned. This application Feb. 13, 1989, Ser. No. 310,221
Int. Cl.[5] B01J *20/18*
U.S. Cl. 502—62 **20 Claims**

1. A composition useful as a pre-coat medium for purifying a liquid containing radioactive and/or other deleterious material, said composition being capable of flocculation in water and comprising: (A) a finely-divided zeolitic material and (B) a finely-divided ion-exchange resin material selected from the group consisting of: (a) an admixture of a strongly acidic cation exchange resin and a strongly basic anion exchange resin, (b) an admixture of a strongly acidic cation exchange resin and a weakly basic anion exchange resin, (c) an admixture of a weakly acidic cation exchange resin and a strongly basic anion exchange resin, and (d) a strongly basic anion exchange resin.

13. A composition according to claim 1, wherein said composition also includes a filter aid.

15. A composition according to claim 1, wherein said composition also contains a flocing agent.

4,927,797

CATALYST SYSTEM FOR THE POLYMERIZATION OF OLEFINS

John A. Ewen, Houston, Tex., assignor to Fina Technology, Inc., Dallas, Tex.

Continuation of Ser. No. 36,080, Apr. 9, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 282,985
Int. Cl.[5] C08F *4/64*
U.S. Cl. 502—127 **19 Claims**

1. In a system for the polymerization and copolymerization of olefins, the combination comprising:

(a) a solid catalyst component prepared by: (i) suspending a dialkoxy magnesium in an aromatic hydrocarbon that is liquid at normal temperatures, (ii) contacting the dialkoxy magnesium with a titanium halide and further contacting the resulting composition a second time with the titanium halide, and (iii) contacting the dialkoxy magnesium with a diester of an aromatic dicarboxylic acid at some point during the treatment with the titanium halide in (ii); and

(b) an electron donor described by the formula:



wherein R_1 is a bulky alkyl or cycloalkyl group containing at least one secondary or tertiary carbon atom; R_2 and R_3 are each independently an alkyl or aryl group; and R_4 is an alkyl group with an primary carbon atom attached to the silicon atom.

4,927,798

DIFFUSION-COATED METALS

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 862,712, May 13, 1986, and a continuation-in-part of Ser. No. 830,767, Feb. 19, 1986, Pat. No. 4,799,979, and a continuation-in-part of Ser. No. 757,606, Jul. 22, 1985, and a continuation-in-part of Ser. No. 479,211, Mar. 28, 1983, and a continuation-in-part of Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913. This application Mar. 23, 1987, Ser. No. 28,741
Int. Cl.[5] B01J *25/00, 25/02*
U.S. Cl. 502—301 **3 Claims**

1. The method of treating a pyrophorically-activated aluminum-containing iron, nickel or cobalt surface, which method is characterized by contacting the activated metal surface with an acid solution having a pH between 1 and 4 to attack the surface, and terminating the contact about ½ minute after the start of gassing caused by the attack, to increase the pyrophoric heat-generating characteristics of the treated metal.

4,927,799

CATALYST FOR THE PURIFICATION OF EXHAUST GAS

Shinichi Matsumoto, Aichi; Naoto Miyoshi; Mareo Kimura, both of Nagoya; Masakuni Ozawa, Kasugai, and Akio Isogai, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan

Continuation of Ser. No. 111,661, Oct. 23, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 290,421
Claims priority, application Japan, Apr. 11, 1986, 61-262521; Apr. 11, 1986, 61-262522
Int. Cl.[5] B01J *21/06, 23/10, 23/40, 23/74*
U.S. Cl. 502—303 **20 Claims**

1. A catalyst for the purification of exhaust gases, comprising a support substrate, a catalyst carrier layer carried on said support substrate and catalyst ingredients carried thereon,

wherein said catalyst carrier layer comprises oxides of cerium and zirconium and a member selected from the group consisting of active alumina, zirconia and titanium oxide,

at least a part of each said oxide of cerium and zirconium is present in the form of a composite oxide and/or solid solution, and

said composite oxide and/or solid solution is formed by adding a cerium salt and a zirconium salt in the form of an aqueous solution on said member and burning at a temperature not less than 600° C.

4,927,800

ELECTRODE CATALYST AND METHOD FOR PRODUCTION THEREOF

Yoshinori Nishiki; Shuji Nakamatsu, both of Kanagawa, and Takayuki Shimamune, Tokyo, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed Nov. 28, 1988, Ser. No. 276,703
Claims priority, application Japan, Nov. 27, 1987, 62-297673
Int. Cl.[5] B01J *23/00*
U.S. Cl. 502—349 **16 Claims**

1. An electrode catalyst comprising a lead dioxide electrically deposited layer, said layer having particles containing β-lead dioxide powder dispersed therein.

4,927,801

DOUBLE CROSSLINKED BARRIER COATING

Meftah U. Mahmud, Nashua, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Jul. 12, 1988, Ser. No. 218,097
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—200 6 Claims



1. A heat sensitive recording material, comprising:

A. a substrate;

B. a thermal imagewise imprintable color producing layer fixed to a first surface of said substrate comprising a leuco dye developable upon exposure to an acidic developer, a binder material for said dye and developer, an acidic developer material and a basic, particulate neutralizing agent; and

C. a protective layer overlying said color producing layer, wherein said protective layer comprises an organic, water soluble resin ionically and covalently cross-linked throughout its thickness during its formation in situ atop said color producing layer and containing dispersed spacer particles.

4,927,802

PRESSURE-SENSITIVE MULTI-PART RECORD UNIT

Dennis D. Leatherman, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 9, 1988, Ser. No. 282,429
Int. Cl.[5] B41M *5/22*
U.S. Cl. 503—214 16 Claims

1. In a pressure-sensitive multi-part record unit comprising:

(a) at least one transfer sheet having a front side and a back side, said back side comprising:

(1) a pressure-rupturable coating having entrapped therein a profuse number of minute liquid droplets comprising at least one leuco dye dissolved in solvent,

(2) pressure-rupturable microcapsules containing at least one leuco dye dissolved in solvent, or

(3) a combination thereof, wherein the leuco dye is reactive with finely divided, substantially water-insoluble siliceous particles upon contact therewith to form a color, and

(b) at least one receptor sheet having a front side and a back side, said front side of said receptor sheet comprising said siliceous particles,

the improvement wherein said front side of said receptor sheet comprises microporous material comprising:

(c) a matrix consisting essentially of substantially water-insoluble thermoplastic organic polymer,

(d) finely divided substantially water-insoluble filler particles, of which at least about 50 percent by weight are siliceous particles with which said leuco dye is reactive upon contact to form a color, said filler particles being distributed throughout said matrix and constituting from about 50 percent to about 90 percent by weight of said microporous material, and

(e) a network of interconnecting pores communicating substantially throughout said microporous material, said pores on a coating-free and impregnant-free basis constituting at least about 35 percent by volume of said microporous material.

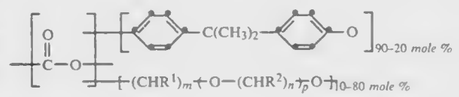
4,927,803

THERMAL DYE TRANSFER RECEIVING LAYER OF POLYCARBONATE WITH NONAROMATIC DIOL

David B. Bailey, Webster; Daniel J. Harrison, and Paul D. Yacobucci, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1989, Ser. No. 345,049
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 18 Claims

7. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer and transferring a dye image to a dye image-receiving layer of a receiving element to form said dye transfer image, the improvement wherein said dye image-receiving layer comprises a polycarbonate having a T_g from about 40° C. to about 100° C. and has the following formula:



wherein

R^1 and R^2 each independently represents hydrogen, methyl or ethyl;

m and n each independently represents an integer from 2 to 10; and

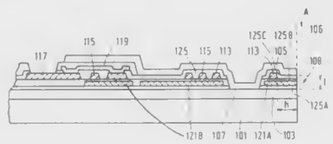
p is an integer from 0 to 6.

4,927,804

THIN-FILM TRANSFORMER AND MAGNETIC HEAD PROVIDED WITH SUCH A TRANSFORMER

Victor Zieren, and Jacobus J. M. Ruigrok, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jul. 12, 1988, Ser. No. 218,013
Claims priority, application Netherlands, Jul. 15, 1987, 8701667
Int. Cl.[5] G11B *5/14, 5/251*
U.S. Cl. 505—1 2 Claims



1. A thin-film magnetic head comprising a first electrically conducting layer which constitutes an inductive transducing element, a face for magnetic flux coupling of the transducing element with a magnetic recording medium, a first magnetically permeable layer and a second magnetically permeable layer which together constitute a magnetic yoke having a transducing gap present on the face, the magnetically permeable layers extending on either side of the transducing element, characterized in that the magnetic head also has a second electrically conducting layer which together with the first electrically conducting layer and the magnetic yoke constitutes a transformer, said transformer further comprising a layer of superconducting material between the electrically conducting layers and one of the magnetically permeable layers which constitute the magnetic yoke.

4,927,805

HYDROLYSIS OF CURCUMIN

Joseph E. Dolfini; Jerome Glinka, both of Cincinnati, and Andrew C. Bosch, Mason, all of Ohio, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 123,137, Nov. 20, 1987, Pat. No. 4,810,824, which is a continuation-in-part of Ser. No. 10,902, Feb. 4, 1987, Pat. No. 4,709,098. This application Jan. 25, 1989, Ser. No. 301,873
Int. Cl.[5] A61K *7/46;* C07C *47/575, 47/58*
U.S. Cl. 512—27 18 Claims

1. A method of reacting curcumin with water to produce a flavor compound comprising at least one reaction product of curcumin and water, comprising:

hydrolyzing with heating curcumin in the presence of water at a temperature and pressure sufficient to effect the reaction and thereby produce said compound.

4,927,806

SATURATED SALT/CONCENTRATED DEXTRAN FORMULATION TO TREAT HEMORRHAGE

George C. Kramer, Davis, and Paul R. Perron, Citrus Heights, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 23, 1987, Ser. No. 41,605
The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.
Int. Cl.[5] A61K *37/02, 31/715*
U.S. Cl. 514—2 15 Claims

1. A physiologically acceptable solution for treating hypodynamic circulatory shock in a mammal, said solution containing a crystalloid having a molecular weight less than about 1,000 in a concentration of at least about 5,000 mOsms and a colloid having a molecular weight in excess of 30,000 in a concentration of at least about 200 mm Hg.

7. A method of preventing or treating hypodynamic circulatory shock in a mammal, comprising the step of administering to said mammal in a condition of existing or impending shock, a therapeutically effective dose of a physiologically acceptable solution containing a crystalloid in a concentration of at least about 5,000 mOsms and a colloid in a concentration of at least 200 mm Hg.

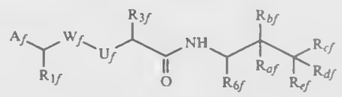
4,927,807

GLAUCOMA TREATMENT

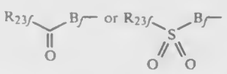
Herman H. Stein, Highland Park; Jacob J. Pattner, Libertyville, and Steven R. Crowley, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 105,636, Oct. 6, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 240,567
Int. Cl.[5] A61K *31/00, 31/415, 31/24, 31/18*
U.S. Cl. 514—18 4 Claims

1. A method for treating glaucoma or reducing and/or controlling intraocular pressure comprising administering to a patient in need of therapeutically effective amount of a renin inhibiting compound of the formula:



wherein A_f is hydrogen, loweralkyl, arylalkyl, —OR_{10f} or —SR_{10f} wherein R_{10f} is hydrogen, loweralkyl or aminoalkyl, —$NR_{11f}R_{12f}$ wherein R_{11f} and R_{12f} are independently selected from hydrogen, loweralkyl, aminoalkyl, cyanoalkyl, hydroxyalkyl, carboxyalkyl, alkoxycarbonaylalkyl, (amino)carboxyalkyl, ((N-protected)amino)carboxyalkyl, (alkylamino)carboxyalkyl, ((N-protected)alkylamino)carboxyalkyl, (dialkylamino)carboxyalkyl, (aminio)alkyoxycarbonylalkyl, ((N-protected)amino)alkoxycarbonylalkyl, (alkyamino)alkoxycarbonylalkyl, ((N-protected)alkylamino)alkoxycarbonylalkyl and (dialkylamino)alkoxycarbonylalkyl; or A_f is



wherein B_f is NH, alkylamino, S, O, CH_2 or CHOH and R_{23f} is loweralkyl, cycloalkyl, aryl, arylalkyl, alkoxy, alkenyloxy, hydroxyalkoxy, dihydrooxyalkoxy, arylalkoxy, arylalkoxyalkyl, amino, alkylamino, dialkylamino, (hydroxyalkyl)(alkyl)amino, (dihydroxyalkyl)(alkyl)amino, aminoalkyl, N-protected-aminoalkyl, alkylaminoalkyl, (N-protected)(alkyl)aminoalkyl, dialkylaminoalkyl, carboxyalkoxyalkyl, (alkoxycarbonyl)alkoxyalkyl, carboxyalkyl, carboxyalkylamino, alkoxycarbonylalkyl, alkoxycarbonylalkylamino, (amino)carboxyalkyl, (amino)carboxyalkylamino, ((N-protected)amino)carboxyalkyl, ((N-protected)amino)-carboxyalkyamino, (alkylamino)-carboxyalkyl, (alkylamino)carboxyalkylamino, ((N-protected)alkylamino-carboxyalkyl, ((N-protected)alkylamino)carboxyalkylamino, (dialkylamino)carboxyalkyl, (dialkylamino)carboxyalkylamino, (amino)alkoxycarbonylalkyl, (amino)alkoxycarbonylalkylamino, ((N-protected)amino)alkoxycarbonylalkyl, ((N-protected)amino)-alkoxycarbonylalkylamino, ((N-protected)alkylamino)alkoxycarbonylalkyl, ((N-protected)alkylamino)alkoxycarbonylalkylamino, (dialkylamino)alkoxycarbonylalkyl, (dialkylamino)alkoxycarbonylalkylamino, aminocycloalkyl, aminoalkylamino, dialkylaminoalkyl(alkyl)amino, arylalkylamino, arylalky(alkyl)amino, alkoxyalkyl(alkyl)amino, (polyalkoxy)-alkyl(alkyl)amino, di-(alkoxyalkyl)amino, di-(hydroxyalkyl)amino, di-(polyalkoxy)alkyl)amino, polyalkoxy, (polyalkoxy)alkyl, (heterocyclic)alkyl or a substituted or unsubstituted heterocyclic wherein saturated heterocyclics may be unsubstituted, monosubstituted or disubstituted with hydroxy, oxo, amino, alkylamino, dialkylamino, alkoxy, polyalkoxy or loweralkyl; unsaturated heterocyclics may be unsubstituted or monsubstituted with hydroxy, amino, alkylamino, dialkylaminio, alkoxy, polyalkoxy or loweralkyl;

W_f C=O or CHOH;

U_f is CH_2 or NR_{2f}, provided that when W_f is CHOH then U_f is CH_2;

R_{1f} is loweralkyl, cycloalkylmethyl, benzyl, 4-methoxybenzyl, halobenzyl, (1-naphthyl)methyl, (2-naphthyl)methyl, (4-imidazolyl)methyl, (alpha,alpha)-dimethylbenzyl, 1-benzyloxyethyl, phenethyl, phenoxy, thiophenoxy or anilino; provided that when R_{1f} is phenoxy, thiophenoxy or anilino, then B_f is CH_2 or CHOH or A_f is hydrogen;

R_{2f} is hydrogen or loweralkyl;

R_{3f} is loweralkyl, loweralkenyl, ((alkoxy)alkoxy)loweralkyl, (thioalkoxy)alkyl, benzyl or heterocyclic ring substituted methyl;

R_{6f} is loweralkyl, cycloalkylmethyl or benzyl;

R_{af} is vinyl, formyl, hydroxymethyl or hydrogen;

R_{df} is hydrogen or loweralkyl;

R_{bf} and R_{ef} are independently selected from OH and NH_2; and

R_{cf} is hydrogen, loweralkyl, vinyl or arylalkyl; or a pharmaceutically acceptable salt or ester thereof.

VOL 1114 ISS 4 MY 22 1990 UMI

4,927,808

γ-L-GLUTAMYL-L-CYSTEINE ETHYL ESTER AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME AS AN EFFECTIVE INGREDIENT

Shigehisa Kitahara, Hino; Akira Ohtsu, Ohme, and Katsuhiko Fujii, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP87/00475, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO88/00182, PCT Pub. Date Jan. 14, 1988

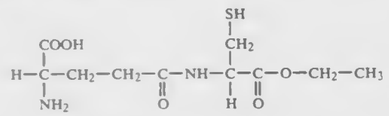
PCT Filed Jul. 7, 1987, Ser. No. 180,868

Claims priority, application Japan, Jul. 7, 1986, 61-157798; Mar. 11, 1987, 62-54229

Int. Cl.[5] A61K *37/02;* C07K *5/06, 5/10*

U.S. Cl. 514—19 5 Claims

1. γ-L-glutamyl-L-cysteine ethyl ester expressed by the following formula or its dimeric oxidized form:



wherein said dimeric oxidized form is formed by dehydrogenation between two molecules of said γ-L-glutamyl-L-cysteine ethyl ester.

4,927,809

OLIGOPEPTIDYL NITRILE DERIVATIVES, AGENTS CONTAINING THEM AND THEIR USE

Werner Stüber, Lahntal, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Filed Feb. 26, 1987, Ser. No. 19,122

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606480

Int. Cl.[5] A61K *31/19, 31/40;* C07C *119/00;* C07D *207/00*

U.S. Cl. 514—20 5 Claims

1. A compound of the formula I

A—R—NH—CHR[1]—$(CH_2)_a$—NHC(=NH)NH_2 I

in which

R^1 is the cyanide group,

R is Pro or D-Phe-Pro,

A is a hydrogen atom or a protective group customary in peptide chemistry, and

a is an integer from 2 to 5, preferably 3 or 4,

and its physiologically tolerated salts.

4. A pharmaceutical composition for the treatment of diseases related to disorders of the coagulating system were there is an increased tendency of the blood to coagulate which comprises an effective amount for said treatment of a compound of the formula I as claimed in claim 1, together with a pharmaceutically acceptable vehicle.

4,927,810

EFOMYCIN G AND IT'S USE AS YIELD PROMOTER IN ANIMALS

Klaus Frobel, Wuppertal; Hartwig Müller, Velbert; Erwin Bischoff, Wuppertal; Olga Salcher, Wuppertal; Anno de Jong, Wuppertal; Friedrich Berschauer, Wuppertal, and Martin Scheer, Wuppertal-Elberfeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,915

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608175

Int. Cl.[5] A61K *31/71;* C07H *7/06*

U.S. Cl. 514—23 4 Claims

4. A method of promoting the growth of animals which comprises supplying to such animals an animal growth promoting effective amount of efomycin G.

4,927,811

METHOD AND COMPOSITION FOR IMPROVED ANIMAL HUSBANDRY

Carey L. Quarles, Fort Collins, Colo., assignor to Coors Biotech, Inc., Westminster, Colo.

Filed Nov. 15, 1988, Ser. No. 271,931

Int. Cl.[5] A61K *33/00, 31/70*

U.S. Cl. 514—23 18 Claims

1. A method for raising poultry, comprising feeding said poultry a composition including an effective amount of fructooligosaccharides to enhance the breast weight to body weight ratio of said poultry.

4,927,812

MORPHOLINYL SILANES AND USE FOR CONTROL OF PLANT DISEASES CAUSED BY FUNGI

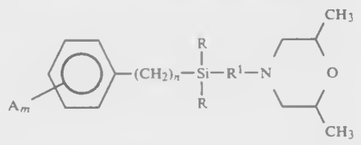
Chrislyn M. Carson, Midland, Mich.; Leonard G. Copping, Saffron Walden, England; Robert J. Ehr, Vallejo, Calif.; Melvin H. Gitlitz, Edison; Maynard W. McNeil, Washington, both of N.J.; Peter F. S. Street, Marlborough, and John W. Liebeschuetz, Wantage, both of England, assignors to Atochem North America, Inc., Somerville, N.J. and The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 111,374, Oct. 21, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 322,140

Int. Cl.[5] A01N *55/00;* C07F *7/10*

U.S. Cl. 514—63 57 Claims

1. A compound corresponding to the formula



wherein:

each A independently represents halogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, phenyl, phenoxy or halomethyl;

each R independently represents C_1-C_4 alkyl;

n represents the integer 0, 1 or 2;

m represents the integer 0 to 5; and

R^1 represents an alkylene group of the formula



where each R^2 independently represents hydrogen or C_1-C_3 straight chain alkyl and p represents an integer of from 1 to 4, with the proviso that the total number of carbon atoms in R^1 is from 3–6.

4,927,813

METHOD AND COMPOSITION FOR TREATING PEDICULOSIS CAPITIS

Joel E. Bernstein, 615 Brierhill Rd., Deerfield, Ill. 60015

Filed Mar. 8, 1988, Ser. No. 165,473

Int. Cl.[5] A61K *7/06, 37/48;* A01N *63/02*

U.S. Cl. 514—65 19 Claims

1. A method of treating a human patient having *Pediculosis capitis* by removing the nits from the patient's hair and scalp, said method comprising;

applying a composition containing a nit cement-dissolving amount of formic acid to the hair and scalp of said patient;

maintaining said formic acid on said hair and scalp for a time period sufficient to dissolve the cement attaching said nits to said hair and scalp to provide detached nits; and

washing or rinsing said hair and scalp to remove said detached nits.

4,927,814

DIPHOSPHONATE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

Rudi Gall, Hirschberg, and Elmar Bosies, Weinheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

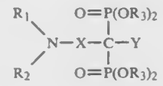
Filed Jul. 9, 1987, Ser. No. 71,471

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623397

Int. Cl.[5] C07F *9/38;* A61K *31/66*

U.S. Cl. 514—108 12 Claims

1. A diphosphonate compound of the formula



(I)

6. A method for the treatment or prophylaxis of calcium metabolism disturbance or disease comprising administering a pharmaceutically effective amount of the compound of claim 1.

4,927,815

COMPOUNDS EFFECTIVE IN INDUCING CELL DIFFERENTIATION AND PROCESS FOR PREPARING SAME

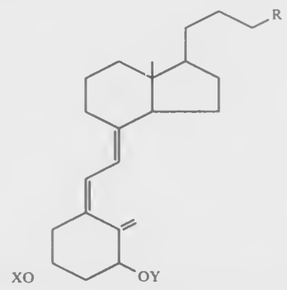
Hector F. DeLuca, Deerfield; Heinrich K. Schnoes; Kato L. Perlman, both of Madison, all of Wis., and Andrzej Kutner, Warsaw, Poland, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 29, 1988, Ser. No. 187,680

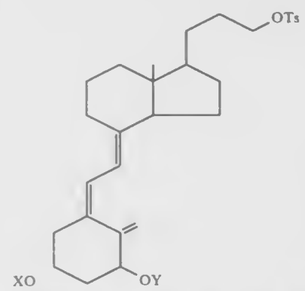
Int. Cl.[5] A61K *31/59;* C07J *9/00*

U.S. Cl. 514—167 26 Claims

1. A process for the preparation of vitamin D compounds having the general structure:



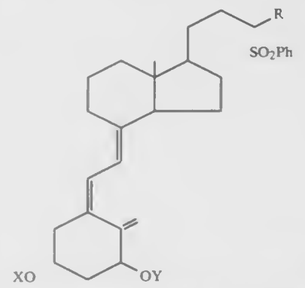
where X and Y, which may be the same or different, are selected from the group consisting of hydrogen and a hydroxy-protecting group, and where R is selected from the group consisting of alkyl, fluoro-substituted alkyl, hydroxy-substituted alkyl, hydroxy and fluoro-substituted alkyl, hydroxy-protected hydroxy-substituted alkyl and hydroxy-protected hydroxy- and fluoro-substituted alkyl, which comprises treating a vitamin D-22-tosylate derivative, of the general structure:



where X and Y are selected from the group consisting of hydrogen and hydroxy-protecting groups, with an alkylphenylsulfone derivative of the general structure:

Ph—SO_2—CH_2—R

wherein R is selected from the group consisting of alkyl, fluoro-substituted alkyl, hydroxy-substituted alkyl, and hydroxy- and fluoro-substituted alkyl, any hydroxy group present being preferably derivatized by hydroxy-protecting groups, thereby obtaining a side chain sulfone adduct, having the following general structure:



wherein X, Y and R represent the groupings defined above, and reductively desulfonating said side chain sulfone adduct so as to obtain the corresponding vitamin D compound, and, optionally removing the hydroxy-protecting groups present.

4,927,816

FORMULAE AND METHODS FOR SUBLINGUAL INGESTION OF NATURAL PROGESTERONE

George C. Ester, 9457 118th La., N. Seminole, Fla. 33542

Filed Aug. 20, 1987, Ser. No. 87,320

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—177 12 Claims

1. A pharmaceutical formula for the administration of Progesterone USP said formula comprising;

Progesterone USP milled such that at least seventy-five percent of the total amount is composed of particle sizes of less than five microns diameter;

said Progesterone USP being blended with a salivic stimulator in an amount adapted to stimulate sufficient saliva to dissolve said milled Progesterone USP but not enough to result in significant oral ingestion of Progesterone USP;

said mixture of Progesterone USP and salivic stimulator encapsulated within a soluble capsule.

VOL 1114 ISS 4 MY 22 1990 UMI

4,927,817

PREVENTIVE AND THERAPEUTIC AGENT AGAINST LIVER DISORDER

Tetsuya Inagaki; Eijiro Tagashira, both of Saitama; Masahiro Takaya, Shiga, and Yasuhiro Nishimura, Osaka, all of Japan, assignors to Zeria Pharmaceutical Co., Ltd., Tokyo and Hamari Chemicals, Ltd., Osaka, both of, Japan

PCT No. PCT/JP87/00400, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO88/00048, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 2, 1987, Ser. No. 295,204

Claims priority, application Japan, Jul. 3, 1986, 61-155088

Int. Cl.[5] A61K *31/555*

U.S. Cl. 514—184 4 Claims

1. The method of treating against liver disorder comprising administering orally to an individual, subject to liver disorder, an agent containing carnosine zinc salt as an effective component and in an effective amount to treat said disorder.

4,927,818

CEPHEM COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takao Takaya; Kazuo Sakane; Kenzi Miyai, all of Kawanishi, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 28, 1987, Ser. No. 90,345

Claims priority, application United Kingdom, Sep. 22, 1986, 8622766; Nov. 24, 1986, 8628061; Mar. 4, 1987, 8705072; May 18, 1987, 8711653; Jul. 13, 1987, 8716437

Int. Cl.[5] A61K *31/545;* C07D *501/46*

U.S. Cl. 514—202 9 Claims

7. A compound of claim 1,

wherein R^2 is 1-carboxy-1-methylethyl or carboxymethyl.

4,927,819

CYCLO-OCTANE NEUROPROTECTIVE AGENTS

Raymond Baker, Much Hadham; William R. Carling, Bishops Stortford; Kim James, Welwyn Garden City, and Paul D. Leeson, Cambridge, all of England, assignors to Merck Sharp & Dohme Limited, Holdesdon, England

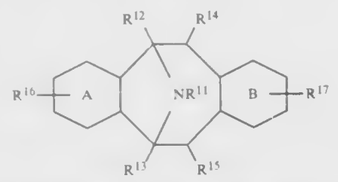
Filed Nov. 22, 1988, Ser. No. 274,436

Claims priority, application United Kingdom, Nov. 30, 1987, 8727989

Int. Cl.[5] A61K *31/435;* C07D *225/08*

U.S. Cl. 514—213 9 Claims

1. A compound of the formula II:



(II)

or a salt thereof, wherein rings A and B independently represent cyclohexane or benzene rings; R^{11} is selected from the group consisting of hydrogen and alkyl; and R^{12} to R^{17} independently represent hydrogen, hydroxy, C_{1-6} alkyl, C_{1-6} alkoxy or halogen.

4,927,820

FUSED HETEROCYCLIC DERIVATIVES OF 1,2,3,4-TETRAHYDROACRIDINE

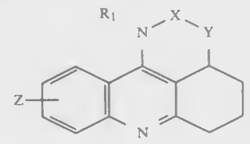
Gregory M. Shutske, Somerset, and Kevin J. Kapples, Little York, both of N.J., assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Nov. 25, 1988, Ser. No. 276,259

Int. Cl.[5] C07D *498/00*

U.S. Cl. 514—229.5 13 Claims

1. A compound of the formula



where

R_1 is hydrogen, loweralkyl or arylloweralkyl;

Z is hydrogen, loweralkyl, loweralkoxy, hydroxy, nitro or trifluoromethyl;

Y is O or NR_2, R_2 being hydrogen, loweralkyl or aryllower-alkyl; and

X is CR_3, CHR_3, C=O, C=S or $CHN(CH_3)_2$, R_3 being hydrogen, loweralkyl or aryl;

or a stereo isomer thereof or a pharmaceutically acceptable acid addition salt thereof.

4,927,821

ENOL ETHERS OF 6-CHLORO-4-HYDROXY-2-METHYL-N-(2-PYRIDYL)-2H-THIENO(2,3-E)-1,2-THIAZINE-3-CARBOXAMIDE 1,1-DIOXIDE, AND THEIR USE

Dieter Binder, Vienna; Franz Rovenszky, Bruck a.d. Leitha, and Hubert P. Ferber, Ansfelden, all of Austria, assignors to CL Pharma Aktiengesellschaft, Linz, Austria

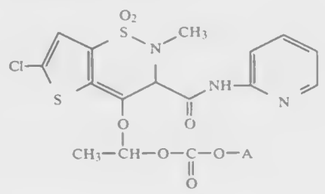
Filed Oct. 18, 1988, Ser. No. 262,499

Claims priority, application Austria, Oct. 29, 1987, 2855/87

Int. Cl.[5] A61K *31/54;* C07D *513/04*

U.S. Cl. 514—226.5 4 Claims

1. A compound of the formula



I

in which R denotes (C_1-C_6)-alkyl, (C_5-C_7)-cycloalkyl or benzyl.

4. A method for the treatment of inflammatory diseases, which comprises administering to a patient an effective amount of a compound of formula I as claimed in claim 1 in combination with pharmaceutically acceptable excipients, carrier or diluents.

4,927,822

1,3,4-THIADIAZOLES

Roger C. Brown, Loughborough; John Dixon, Melton Mowbray, and David H. Robinson, Shepshed, all of England, assignors to Fisons plc, Iswich, England

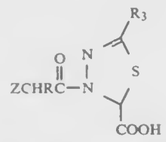
Filed Aug. 27, 1986, Ser. No. 901,048

Claims priority, application United Kingdom, Aug. 31, 1985, 8521697; Oct. 9, 1985, 8524932; Dec. 6, 1985, 8530143; Apr. 22, 1986, 8609793; May 17, 1986, 8612060

Int. Cl.[5] A61K *31/41;* C07D *285/12*

U.S. Cl. 514—236.2 19 Claims

1. A compound of formula I



(I)

in which R_3 is hydrogen, alkyl, C_{1-10}, cycloalkyl C_{3-10}, CF_3, SR_{10}, or a heterocyclic group selected from pyridyl, furyl and morpholinyl, said heterocyclic group being optionally substituted by alkyl C_{1-6}, halogen, alkoxy C_{1-6}, nitro, nitrile, CF_3, SR_6, NR_7R_{11} or hydroxy,

R_3 may also be adamantyl, methylamino, benzyl, naphthyl and phenyl optionally substituted by methylthio, methoxy, methyl, ethyl, chloro or CF_3.

R_6, R_7 and R_{11}, which may be the same or different, are each hydrogen or alkyl C_{1-10},

R_{10} is alkyl C_{1-10},

R is hydrogen, alkyl C_{1-10} or alkyl C_{1-6} substituted by NH_2,

Z is $R_2CH(COOH)NH$- or $R_1SCH_2R_1$ is hydrogen or R_8CO-,

R_8 is alkyl C_{1-10} or phenyl, and

R_2 is alkyl C_{1-10} or phenylalkyl C_{7-12} and pharmaceutically acceptable salts, esters and amides thereof.

17. A method of treatment of a hypertensive condition which comprises administration of an effective amount of a compound according to claim 1 to a patient suffering from such a condition.

4,927,823

FUNGICIDES

Ulrich Gisi, Wenslingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Nov. 30, 1988, Ser. No. 278,054

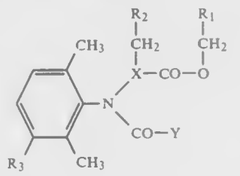
Claims priority, application United Kingdom, Dec. 2, 1987, 8728236

Int. Cl.[5] A01N *37/12, 43/08, 43/76, 43/84*

U.S. Cl. 514—237.5 8 Claims

1. A method of combatting phytophogenic fungi which comprises applying to the plants

(a) a compound of formula I



I

wherein

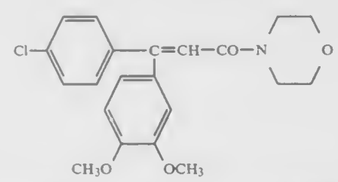
R_1 and R_2 together form a covalent bond,

R_3 is H,

X is N and

Y is CH_2OCH_3 in association with

(b) the compound of formula II



II

in a synergistic fungicidally effective aggregate amount wherein the weight ratio of the compound of formula I:the compound of formula II is in the range of from 1:1 to 1:6.5.

4,927,824

FUNGICIDAL TRISUBSTITUTED 1,3,5-TRIAZINE-2,4,6-TRIONES

Alfons Adler, Cologne; Arno Widdig, Odenthal; Engelbert Kühle, Bergisch-Gladbach; Wolfgang Führer, Cologne; Hermann Hagemann, and Gerd Hänssler, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

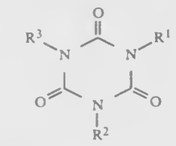
Filed Mar. 17, 1989, Ser. No. 324,948

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810080

Int. Cl.[5] A61K *31/53;* C07D *251/04*

U.S. Cl. 514—241 12 Claims

1. A trisubstituted 1,3,5-triazine-2,4,6-trione of the formula

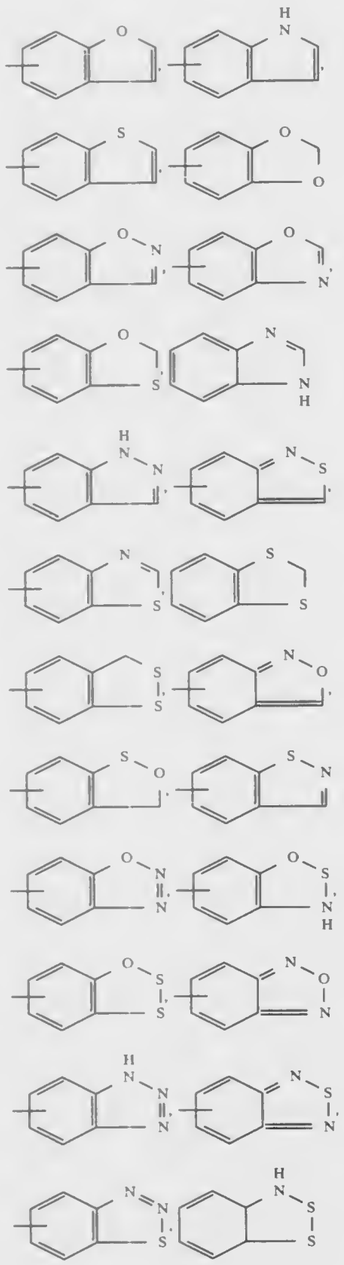


in which

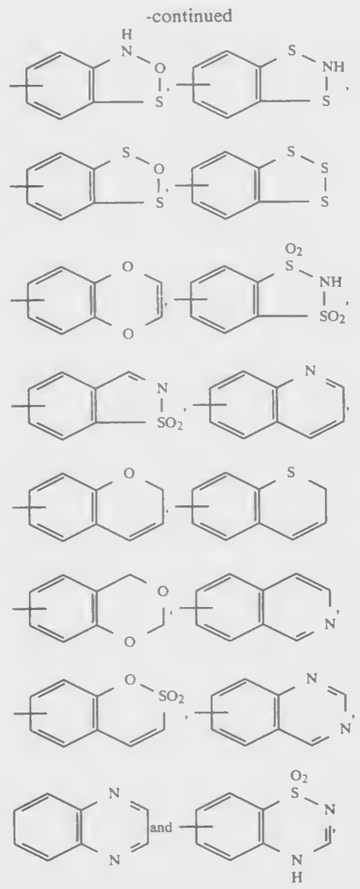
R^1 stands for straight-chain or branched alkyl which has 1 to 12 carbon atoms and which is unsubstituted or substituted once or more than once by identical or different substituents selected from the group consisting of halogen, alkoxy having 1 to 3 carbon atoms, halogenoalkoxy having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio having 1 to 3 carbon atoms, and halogenoalkylthio having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms; stands for phenyl which is unsubstituted or substituted once to five times by identical or different substituents selected from the group consisting of halogen, alkyl having 1 to 12 carbon atoms and alkoxy having 1 to 8 carbon atoms; or stands for cycloalkyl which has 3 to 8 carbon atoms and which is unsubstituted or substituted once to six times by identical or different substituents selected from the group consisting of halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 3 carbon atoms, halogenoalkoxy having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio having 1 to 3 carbon atoms and halogenoalkylthio having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms,

R^2 stands for alkyl which has 1 to 4 carbon atoms, alkenyl which has 3 to 5 carbon atoms, alkinyl which has 3 to 5 carbon atoms, alkoxyalkyl which has 1 to 3 carbon atoms in both the alkoxy moiety and the alkyl moiety, alkylthioalkyl which has 1 to 3 carbon atoms in both the alkylthio moiety and the alkyl moiety, alkoxycarbonylalkyl which has 1 to 3 carbon atoms in the alkoxy moiety and 2 or 3 carbon atoms in the alkyl moiety, or for cyanoalkyl which has 1 to 5 carbon atoms in the alkyl moiety, and

R^3 stands for a heterocyclic radical selected from the group consisting of



-continued



which is completely unsaturated or completely or partially hydrogenated and which is unsubstituted in the isocyclic ring or substituted in the isocyclic ring by identical or different substituents selected from the group consisting of fluorine, chlorine, lower alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, trifluoromethyl, acyl having 2 to 4 carbon atoms, phenyl, chlorophenyl, and tolyl, and which is unsubstituted in the heterocyclic ring or substituted in the heterocyclic ring by identical or different substituents selected from the group consisting of fluorine, chlorine, lower alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, trifluoromethyl, acyl having 2 to 4 carbon atoms, phenyl, chlorophenyl, tolyl, and oxo.

10. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim **1** and a diluent.

4,927,825

2-METHOXYCARBONYL SUBSTITUTED N,N'-DI-(TRIMETHOXYBENZOYL) PIPERAZINES, PROCESS FOR PREPARING THE SAME AND THERAPEUTICAL COMPOUNDS CONTAINING THEM

Eduardo Pirotzky, Paris, France; Georges Dive, Tilff, Belgium; Jean-Jacques Godfroid, and Francoise Heymans, both of Paris, France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), France

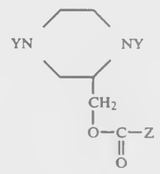
Filed Oct. 6, 1989, Ser. No. 418,113

Claims priority, application United Kingdom, Oct. 11, 1988, 8823776

Int. Cl.[5] **A61K** *31/495;* **C07D** *295/08, 295/10*

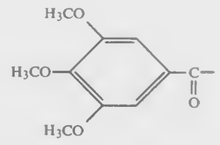
U.S. Cl. 514—255 **2 Claims**

1. Piperazine derivatives having the formula I:

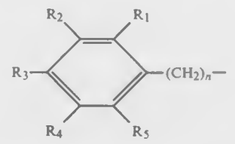


I

wherein Y stands for



and Z represents either a substituent A wherein A represents a straight or branched alkyl chain having from 1 to 17 carbon atoms; a cycloalkyl group having from 5 to 10 carbon atoms or a group of the formula:



wherein n is zero or an integer of from 1 to 5 and either each of R_1, R_2, R_3, R_4, and R_5, independently, represents a hydrogen, a chlorine or a bromine atom, a trifluoromethyl, a trifluoromethylthio or a trifluoromethoxy, a methyl or a methoxy group or a substituent NH-A wherein A is as above defined.

2. An anti-ischemic and anti-inflammatory therapeutic composition of matter comprising an effective amount of at least one compound according to claim **1**, that is to say, per unit doses, 50 to 100 mg for oral administration or 5 to 100 mg for intravenous administration, associated with the usual excipients for the selected administration route.

4,927,826

CYCLOPROYLPROPENAMIDES USEFUL AS PLATELET ACTIVING FACTOR (PAF) ANTAGONISTS

Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, and Jefferson W. Tilley, both of North Caldwell, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

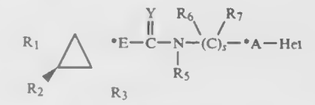
Division of Ser. No. 72,390, Jul. 10, 1987, Pat. No. 4,786,646.

This application Aug. 30, 1988, Ser. No. 238,224

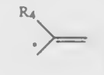
Int. Cl.[5] **C07D** *239/42, 403/12;* **A61K** *31/505*

U.S. Cl. 514—256 **18 Claims**

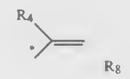
1. A compound of the formula



Y is O or S, *A is paraphenylene or *—$(CH_2)_n$—(X-)$_m$—$(CH_2)_r$—, X is O, S or —CH=CH—, n or r, independently, are integers from 0 to 3, s is an integer from 0 to 1, m is an integer from 0 to 1, provided that when m is 1, n+s must be at least 2, R_1 and R_2, independently, are hydrogen, lower alkyl, cycloalkyl, lower alkenyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro, *E is

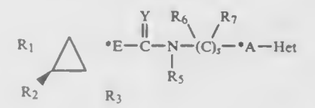


or —$(CH_2)_k$— wherein k is an integer from 0 to 4, R_3, R_4 and R_8 are independently hydrogen or lower alkyl, R_5 and R_6, independently are hydrogen or lower alkyl, R_7 is hydrogen, lower alkyl, cycloalkyl, pyrimidinyl lower alkyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro Het is pyrimidinyl which may be substituted by lower alkyl, halogen or phenyl, and the asterisk denotes the point of attachment, or an enantiomer, diastereomers or racemic mixture thereof, as well as when *E is



a geometric isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

13. A method of treating a disease state characterized by an excess of platelet activating factor which comprises administration of a compound of the formula



Y is O or S, *A is paraphenylene or *—$(CH_2)_n$—(X-)$_m$—$(CH_2)_r$—, X is O, S or —CH=CH—, n or r, independently, are integers from 0 to 3, s is an integer from 0 to 1, m is an integer from 0 to 1, provided that when m is 1, n+s must be at least 2, R_1 and R_2, independently, are hydrogen, lower alkyl, cycloalkyl, lower alkenyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro, *E is

VOL 1114 ISS 4 MY 22 1990 UMI



or —$(CH_2)_k$— wherein k is an integer from 0 to 4, R_3, R_4 and R_8 are independently hydrogen or lower alkyl, R_5 and R_6, independently are hydrogen or lower alkyl, R_7 is hydrogen, lower alkyl, cycloalkyl, pyrimidinyl lower alkyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro Het is pyrimidinyl which may be substituted by lower alkyl, halogen or phenyl, and the asterisk denotes the point of attachment, or an enantiomer, diastereomers or racemic mixture thereof, as well as when •E is



a geometric isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

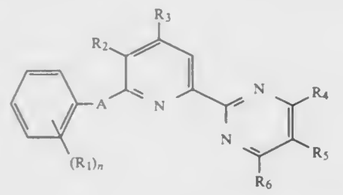
4,927,827

PYRIDINYLPYRIMIDINE DERIVATIVES, METHOD FOR PRODUCTION THEREOF AND A FUNGICIDE CONTAINING THEM AS THE ACTIVE INGREDIENT

Tsuguhiro Katoh, Osaka; Kiyoto Maeda; Masao Shiroshita, both of Hyogo; Noribisa Yamashita, Osaka; Yuzuru Sanemitsu; Satoru Inoue, both of Hyogo; Masayo Sugano, Osaka, and Hirotaka Tanako, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 19, 1988, Ser. No. 195,977
Claims priority, application Japan, May 19, 1987, 62-123188
Int. Cl.[5] C07D *239/34, 239/26;* A01N *43/54*
U.S. Cl. 514—256 6 Claims

6. A method for controlling plant pathogenic fungi which comprises applying a fungicidally effective amount of the pyridinylpyrimidine derivative of the formula:



wherein R_1, R_2, R_3, R_4, R_5, R_6, A and n are as defined in claim I, to plant phathogenic fungi.

4,927,828

DIASTEREOISOMERIC TETRAHYDROPYRIDO-(2,3,D) PYRIMIDINE DERIVATIVES

Edward C. Taylor, Princeton, N.J.; George P. Beardsley, Essex, Conn.; Chuan Shih, Indianapolis, Ind., and Stephen R. Fletcher, Buckinghamshire, England, assignors to The Trustees of Princeton University, Princeton, N.J.

Continuation-in-part of Ser. No. 871,539, Jun. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 835,457, Mar. 3, 1986, Pat. No. 4,684,653, which is a continuation-in-part of Ser. No. 709,622, Mar. 8, 1985, abandoned. This application Jun. 28, 1988, Ser. No. 220,944
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.
Int. Cl.[5] C07D *487/04;* A61K *31/505*
U.S. Cl. 514—258 13 Claims

I. A compound selected from the group consisting of:
(i) the diastereoisomer of N-(4-[2-(2-amino-4-hydroxy-5,6,7,8-tetrahydropyrido[2,3-d]-pyrimidin-6-yl)ethyl]-benzoyl)-L-glutamic acid having a $[\alpha]_{589\ nm}^{25}$ of −21.06° and being substantially free of the isomer of N-(4-[2-(2-amino-4-hydroxy-5,6,7,8-tetrahydropyrido[2,3-d]pyrimidin-6-yl)ethyl]-benzoyl)-L-glutamic acid which has a $[\alpha]_{589\ nm}^{25}$ of +31.09°;
(ii) the 4(3H)-ox form thereof; and
(iii) a pharmaceutically acceptable alkali metal, alkaline earth, non-toxic metal, ammonium, or substituted ammonium salt thereof which is substantially free of the corresponding salt of that diastereoisomer which has a $[\alpha]_{589\ nm}^{25}$ of +31.09°.

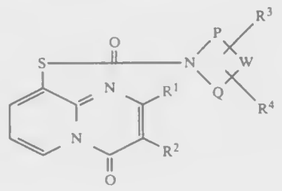
4,927,829

HETEROCYCLIC COMPOUNDS AND ANTIULCER AGENTS

Shigeru Matsutani, and Yukio Mizushima, both of Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Feb. 6, 1989, Ser. No. 306,752
Claims priority, application Japan, Feb. 18, 1988, 63-36130
Int. Cl.[5] C07D *487/02;* A61K *31/495*
U.S. Cl. 514—258 25 Claims

1. A compound of the formula:



wherein
R^1 and R^2 each is hydrogen, methyl, ethyl, methoxycarbonyl, or ethoxycarbonyl; R^3 and R^4, which may be bound to any of P, Q, and W, each is hydrogen, methyl, ethyl, methoxycarbonyl, ethoxycarbonyl, piperonyl, phenyl, methoxyphenyl, or α-phenyl-4-chlorobenzyl, or R^3 and R^4 taken together may form a condensed benzene ring; P and Q each is methylene or ethylene; W is single bond or —O—, —S—, or imino,
or a pharmaceutically acceptable acid addition salt thereof.

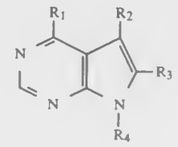
4,927,830

ACYCLIC PYRROLO[2,3-D]PYRIMIDINE ANALOGS AS ANTIVIRAL AGENTS

Leroy B. Townsend, and John C. Drach, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Apr. 8, 1988, Ser. No. 179,081
Int. Cl.[5] C07D *401/04;* A61K *31/40*
U.S. Cl. 514—258 26 Claims

1. A compound selected from the group consisting of compounds of the following formula and pharmaceutically acceptable salts thereof:



where
R_1 is NH_2 or NHOH;
R_2 is $CSNH_2$, Cl, Br, I, F, 2-buten-1-yl, 5-(1-hydroxyethyl) or 5-(1-methoxyethyl);
R_3 is H, NH_2 or Br; and
R_4 is (1,3-dihydroxy2-propoxy)methyl, (2-hydroxyethoxy)-methyl, (2-ethoxy)methyl, (2-acetoxyethoxy)methyl, 2-hydroxyl-(1,3-dihydroxy2-propoxy)ethyl, (2-phosphonyl-methoxy)ethyl or 3-hydroxy-2-phosphonylmethoxypropyl.

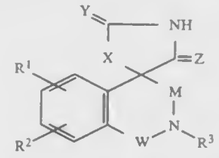
4,927,831

SPIRO-ISOQUINOLINE-PYRROLIDINE TETRONES AND ANALOGS THEREOF USEFUL AS ALDOSE REDUCTASE INHIBITORS

Michael S. Malamas, Jamison, Pa., assignor to American Home Products, New York, N.Y.

Continuation-in-part of Ser. No. 260,434, Oct. 20, 1988, abandoned. This application May 26, 1989, Ser. No. 357,563
Int. Cl.[5] A61K *31/47;* C07D *471/10*
U.S. Cl. 514—278 30 Claims

1. The compound of structural formula (I)



(I)

wherein R^1 and R^2 are independently hydrogen, alkyl containing 1 to 6 carbon atoms, halogen, lower alkoxy containing 1 to 6 carbon atoms, trifluoromethyl, lower alkylthio wherein lower alkyl contains 1 to 6 carbon atoms, dialkylamino wherein alkyl contains 1 to 6 carbon atoms, nitro, aryl or aryl (lower alkyl) oxy wherein aryl contains 6 to 10 carbon atoms and lower alkyl contains 1 to 6 carbon atoms; R^3 is hydrogen, lower alkyl containing 1 to 6 carbon atoms, aryl (lower alkyl) or halogen substituted aryl (lower alkyl) wherein aryl contains 6 to 10 carbon atoms and lower alkyl contains 1 to 6 carbon atoms, acyl or heterocyclic (lower alkyl) of structural formula



wherein R^4 is lower alkylene containing 1 to 3 carbon atoms; X is methylene, oxygen, sulfur or nitrogen; Y and Z are oxygen or sulfur; M and W are carbonyl, thiocarbonyl, sulfonyl, sulfoxo or, methylene, with the proviso that M and W are not both methylene when X is nitrogen, and the pharmaceutically acceptable salts thereof.

30. A method of preventing or relieving neuropathy, nephropathy, retinopathy, or cataracts in a diabetic mammal, which comprises administering to said mammal an alleviating or prophylactic amount of a compound of claim 1.

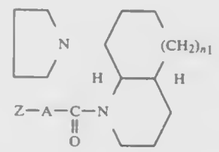
4,927,832

NOVEL TETRAHYDROPYRIDINES HAVING ANALGESIC ACTIVITY

Francois Clémence; Daniel Frechet, and Michel Fortin, all of Paris, France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 1, 1988, Ser. No. 214,673
Claims priority, application France, Jul. 3, 1987, 87 09449
Int. Cl.[5] C07D *401/04, 413/14, 417/14;* A61K *31/435*
U.S. Cl. 514—299 18 Claims

1. A compound selected from the group consisting of all enantiomeric and diasteroisomeric forms of tetrahydropyridines of the formula



I

wherein n_1 is 0 or 2, A is selected from the group consisting of —$(CH_2)_{n2}$— and alkylene substituted with alkyl having a total of 2 to 8 carbon atoms and n_2 is 0 to 5, Z is selected from the group consisting of phenyl, naphthyl, indenyl, thiazolyl, pyridinyl, oxazolyl, isoxazolyl, imidazolyl, thienyl, furyl, pyrimidinyl, indolyl, quinolyl, benzofuranyl, benzo thienyl, benzimidazolyl, benzoxazolyl and benzothiazolyl, each unsubstituted or substituted with at least one substituent from the group consisting of alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms, halogen, hydroxyl, trifluoromethyl, nitro, amino and monoalkyl- or dialkylamino with alkyls of 1 to 5 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts and quarternary ammonium salts.

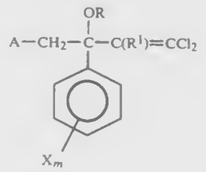
4,927,833

SUBSTITUTED AZOLES AND THEIR USE AS FUNGICIDES

Neil V. Kirby, Wantage; Peter F. S. Street, Burbage, both of Great Britain, and Lowell D. Markley, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 23, 1989, Ser. No. 299,911
Int. Cl.[5] C07D *233/60;* A01N *43/50*
U.S. Cl. 514—399 21 Claims

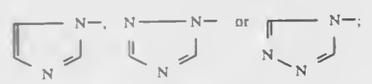
1. A substituted azole compound corresponding to the formulae



(Formula I)

wherein
A represents

VOL 1114 ISS 4 MY 22 1990 UMI



R represents —H, C_1–C_4 alkyl, C_1–C_4 alkenyl, C_1–C_4 haloalkyl or —C(O)R^2;
R^1 represents —H, halo or C_1–C_4 straight chain alkyl;
R^2 represents C_1–C_4 alkyl, C_1–C_2 haloalkyl, phenyl, or phenyl substituted by lower alkyl or halo; each X independently represents —H, halo, —CN, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, C_1–C_4 alkoxy, C_1–C_4 alkoxysulfonyloxy, nitro or phenyl;
m represents 1 to 5; and
the acid addition salts and metal complexes thereof.

4,927,834

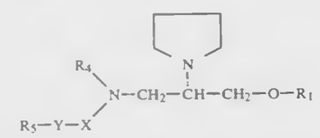
NEW 1,2-DIAMINO COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Herbert Leinert, Heppenheim; Christos Tsaklakidis, Weinheim, and Gisbert Sponer, Landenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 230,946
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726633
Int. Cl.[5] A61K *31/40;* **C07D** *295/08*
U.S. Cl. 514—422 **11 Claims**

1. Compound of the general formula:

(I)



wherein R_1 is a straight-chained or branched C_2–C_6-alkenyl radical; R_4 is a phenyl radical which is unsubstituted or substituted at least once by C_1–C_6-alkyl, C_2–C_6-alkenyl, C_1–C_3-alkoxy, C_2–C_6-alkenyloxy, hydroxy-C_1–C_6-alkyl, C_2–C_6-alkylenedioxy, hydroxy-C_1–C_3-alkoxy, C_1–C_3 alkoxyethoxy, C_1–C_6-alkylamino, di(C_1–C_6-dialkyl)amino, C_1–C_3-alkoxycarbonylethyloxy, C_1–C_6-alkylthio, C_1–C_6-alkylsulphinyl, C_1–C_6-alkylsulphonyl, C_1–C_6-alkylsulphonyloxy, carboxy, C_1–C_3 alkoxycarbonyl, aminocarbonyl, mono- or di(C_1–C_6-alkyl)aminocarbonyl, halo-C_1–C_6-alkyl, cyano, or halogen; X is a straight-chained or branched, saturated or unsaturated aliphatic hyrocarbon radical containing up to 6 carbon atoms; Y is a valency bond or —O—; and R_5 is a phenyl radical which is unsubstituted or substituted at least once by C_1–C_6-alkyl, C_1–C_3-alkoxy, C_2–C_6-alkenyloxy, phenyl-C_1–C_3-alkoxy, hydroxy, hydroxy-C_1–C_3-alkoxy, C_1–C_3-alkoxy-C_1–C_3-alkoxy, C_1–C_3-alkoxycarbonyl-C_1–C_3-alkoxy, C_1–C_2-alkylenedioxy, di(C_1–C_6-alkyl)amino, C_1–C_6-alkylthio, C_1–C_6-alkylsulphinyl, C_1–C_6-alkylsulphonyl, C_1–C_6-alkylsulphonyloxy, hydroxy-C_1–C_6-alkyl, carboxy, C_1–C_3-alkoxycarbonyl, aminocarbonyl, mono- or di(C_1–C_6-alkyl)aminocarbonyl, cyano, or halogen; or a pharmacologically acceptable salt thereof.

10. A method of producing a blood vessel relaxing effect in a patient in need of such effect, comprising administering to said patient a blood vessel relaxing amount of a compound of claim 1.

4,927,835

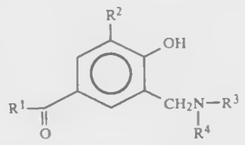
ACYLPHENOL DERIVATIVES, USEFUL AS ANTI-INFLAMMATORY AGENTS AND PAIN SUPPRESSANTS

Masahiro Kise, Kyoto; Yoshihiko Yoshimoto, Kusatsu; Hiroshi Fujisawa, Otsu; Yasuo Sasaki, Kameoka, and Shoji Yasufuku, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

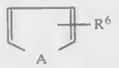
Filed Mar. 1, 1989, Ser. No. 317,601
Claims priority, application Japan, Mar. 4, 1988, 63-51977
Int. Cl.[5] A61K *31/38, 31/34, 31/40;* **C07D** *333/22*
U.S. Cl. 514—448 **24 Claims**

1. A compound of the formula

(I)



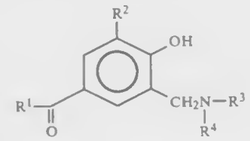
or a pharmaceutically acceptable salt thereof, wherein:
R^1 is



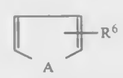
wherein A is sulfur, and R^6 is hydrogen, straight or branched chain alkyl of 1 to 4 carbon atoms or halo;
R^2 is straight or branched chain alkyl of 1 to 4 carbon atoms or cycloalkyl of 5 to 7 carbon atoms; and
R^3 and R^4 are the same or different and each is hydrogen; straight or branched chain alkyl of 1 to 8 carbon atoms unsubstituted or substituted by hydroxy, acyloxy of 2 to 5 carbon atoms, carboxyl or carbamoyl; straight or branched chain alkenyl of 2 to 6 carbon atoms; straight or branched chain alkynyl of 2 to 6 carbon atoms; or cycloalkyl of 5 to 7 carbon atoms.

17. A method of treating pain, inflammation and fever in humans and animals, which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula

(I)



or a pharmaceutically acceptable salt thereof, wherein:
R^1 is



wherein A is sulfur, and R^6 is hydrogen, straight or branched chain alkyl of 1 to 4 carbon atoms or halo;
R^2 is straight or branched chain alkyl of 1 to 4 carbon atoms or cycloalkyl of 5 to 7 carbon atoms; and R^3 and R^4 are the same or different and each is hydrogen; straight or branched chain alkyl of 1 to 8 carbon atoms unsubstituted or substituted by hydroxy, acyloxy of 2 to 5 carbon atoms, carboxyl or carbamoyl; straight or branched chain alkenyl of 2 to 6 carbon atoms; straight or branched chain alkynyl of 2 to 6 carbon atoms; or cycloalkyl of 5 to 7 carbon atoms, in combination with a pharmaceutically acceptable carrier.

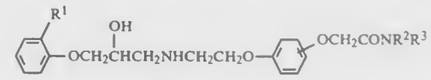
4,927,836

AMIDE DERIVATIVES

Brian R. Holloway, Congleton; Ralph Howe, MacClesfield; Balbir S. Rao, Holmes Chapel, and Donald Stribling, Prestbury, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 75,983, Jul. 21, 1987, abandoned. This application Jun. 29, 1988, Ser. No. 213,259
Claims priority, application United Kingdom, Jul. 23, 1986, 8617986; Jan. 28, 1987, 8701832
Int. Cl.[5] A61K *31/16, 31/165;* **C07C** *103/20*
U.S. Cl. 514—620 **14 Claims**

1. An amide derivative of the formula I set out below:



wherein R^1 is hydrogen or fluoro; R^2 is phenyl optionally bearing a substituent selected from the group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy, trifluoromethyl, and nitro, (3–6C)cycloalkyl, (1–4C)alkyl in which the carbon atom linked to the nitrogen of NR^2R^3 bears one or two hydrogens, or is (3–4C)alkenyl, either of which latter groups may optionally bear a substituent selected from the group consisting of hydroxy, (1–4C)alkoxy, phenyl and chlorophenyl; and R^3 is hydrogen, methyl or ethyl; or a pharmaceutically acceptable acid-addition salt thereof.

14. A method for producing a thermogenic effect in a warm-blooded animal requiring such treatment which comprises administering to said animal a thermogenically effective amount of a compound of the formula I, or of a pharmaceutically acceptable acid-addition salt thereof, as defined in claim 1.

4,927,837

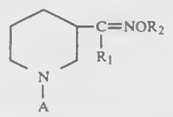
DERIVATIVES OF 3-PIPERIDINE CARBALDEHYDE OXIME AND THEIR USE AS MEDICAMENTS

Giulio Galliani; Fernando Barzaghi, both of Monza; Carla Bonetti, Fontanella, and Emilio Toja, Milan, all of Italy, assignors to Roussel Uclaf, Paris, France

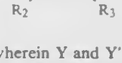
Filed Dec. 30, 1988, Ser. No. 292,257
Claims priority, application Italy, Dec. 30, 1987, 23280 A/87
Int. Cl.[5] A61K *31/445;* **C07D** *211/28*
U.S. Cl. 514—331 **15 Claims**

1. A compound of formula (I):

(I)



in which R_1 represents hydrogen, a linear, branched or cyclic alkyl, alkenyl or alkynyl radical, each containing up to 8 carbon atoms, R_2 represents hydrogen, a linear, branched or cyclic alkyl, alkenyl or alkynyl radical, each containing up to 8 carbon atoms, a $COalk_1$ radical or $(CH_2)_2$ $N(alk_2)_2$ radical, alk_1 and alk_2 representing an alkyl radical containing up to 8 carbon atoms, and A represents hydrogen, hydroxy, acetoxy or benzoyloxy, a linear, branched or cyclic alkyl, alkenyl or alkynyl radical, each containing up to 8 carbon atoms, optionally substituted by a carboxy radical or an alkoxy carbonyl group in which the alkoxy radical contains up to 8 carbon atoms, A represents benzyl, or A represents



in which R_3 represents a linear, branched or cyclic alkyl, alkenyl or alkynyl radical, each containing up to 8 carbon atoms, phenyl, benzyl, or an alkylsulphonylalkyl radical containing up to 18 carbon atoms, as well as its pharmaceutically acceptable addition salts with acids.

15. A method of treating a patient suffering from Alzheimer's disease, senile dementia, or memory loss in the aged, comprising administering to the patient a cholinomimetically effective amount of a compound as defined in any one of claims 1 to 5 and 8 to 13.

4,927,838

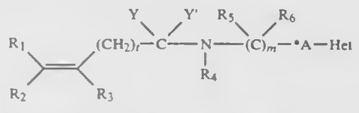
PYRIDINE COMPOUNDS WHICH ARE USEFUL IN TREATING A DISEASE STATE CHARACTERIZED BY AN EXCESS OF PLATELET ACTIVATING FACTORS

Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, North Caldwell; John G. Mullin, Hawthorne, and Jefferson W. Tilley, North Caldwell, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

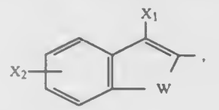
Continuation-in-part of Ser. No. 179,616, Apr. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 72,199, Jul. 10, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 215,464
Int. Cl.[5] A61K *31/44;* **C07D** *409/12*
U.S. Cl. 514—337 **40 Claims**

29. A method of treating a disease state characterized by an excess of platelet activating factor which comprises administering a compound of the formula

I



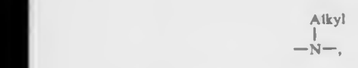
wherein Y and Y' are hydrogen or taken together are O or S, *A is paraphenylene or *—$(CH_2)_n$—$(X)_s$—$(CH_2)_r$—, X is O, S or —CH=CH—, n or r, independently, are integers from 0 to 3, m is an integer from 0 to 1, s is an integer from 0 to 1, provided that when s is 1, n+m must be at least 2, t is an integer from 0 to 10, R_1 and R_2, independently, are lower alkyl, lower alkenyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di-or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or phenyl unsubstituted or mono-, di-or trisubstituted by lower alkoxy, lower alkyl or halogen, or one of R_1 or R_2 is hydrogen and the other is



wherein W is



—CH_2—CH_2—, —CH_2—, O, S or



and

X_1 is lower alkyl, phenyl unsubstituted or mono-, di- or trisubstituted by lower alkoxy, lower alkyl or halogen, and X_2, X_3 and X_4, independently, are hydrogen, lower alkyl, lower alkoxy or halogen, R_3 is hydrogen, lower alkyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or phenyl unsubstituted or mono-, di- or trisubstituted by lower alkoxy, lower alkyl or halogen, R_4 is hydrogen, lower alkyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or phenyl unsubstituted or mono-, di- or trisubstituted by lower alkoxy, lower alkyl or halogen, naphthalenyl-lower alkyl, phenyl-lower alkyl, or phenyl-lower alkyl or naphthalenyl-lower alkyl wherein phenyl or naphthalenyl are mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or phenyl unsubstituted or mono-, di- or trisubstituted by lower alkoxy, lower alkyl or halogen, or alkanoyl of 1 to 7 carbon atoms, naphthalenyl-alkanoyl of 1 to 7 carbon atoms, phenyl-alkanoyl of 1 to 7 carbon atoms or phenyl-alkanoyl of 1 to 7 carbon atoms or naphthalenyl-alkanoyl of 1 to 7 carbon atoms wherein phenyl or naphthalenyl are mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or phenyl unsubstituted or mono-, di- or trisubstituted by lower alkoxy, lower alkyl or halogen, R_5 is hydrogen or lower alkyl, R_6 is hydrogen, lower alkyl, cycloalkyl, pyridinyl-lower alkyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or phenyl unsubstituted or mono-, di- or trisubstituted by lower alkoxy, lower alkyl or halogen, Het is pyridinyl unsubstituted or substituted by lower alkyl, halogen or phenyl, which radical may be substituted by lower alkyl, halogen, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di-or trisubstituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro or phenyl unsubstituted or mono-, di-or trisubstituted by lower alkoxy, lower alkyl or halogen, and the asterisk denotes the point of attachment,

or, when R_5 and R_6 are different, an enantiomer or racemic mixture thereof, when R_1 and R_2 are different, a geometric isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

4,927,839

METHOD OF PREVENTING FUNGAL ATTACK ON WOOD, HIDES, LEATHER OR PAINT FILMS USING A TRIAZOLE

Keith P. Parry; Paul A. Worthington, both of Maidenhead, and William G. Rathmell, Wokingham, all of England, assignors to Imperial Chemical Industries PLC, London, England

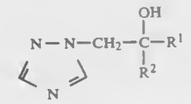
Continuation of Ser. No. 579,012, Feb. 10, 1984, Pat. No. 4,595,406, which is a division of Ser. No. 183,410, Sep. 3, 1980, Pat. No. 4,551,469, which is a continuation-in-part of Ser. No. 124,253, Feb. 25, 1980, Pat. No. 4,654,332. This application Apr. 23, 1986, Ser. No. 854,819

Claims priority, application United Kingdom, Mar. 7, 1979, 7908003; Sep. 21, 1979, 7932819; Feb. 15, 1980, 8005141; Aug. 18, 1980, 8026884

Int. Cl.[5] **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **1 Claim**

1. A method of preventing fungal attack on wood, hides, leather and paint films which comprises applying thereto an effective amount of a compound of formula (I)



wherein R^1 is C_{1-5} alkyl, or halophenyl, and R^2 is halophenyl or halobenzyl.

4,927,840

FUNGICIDAL IMIDAZOLE DIOXOLANE AND 1,3-DIOXANE DERIVATIVES

John R. H. Wilson, and Roger B. Pettman, both of Kent, England, assignors to Shell Internationale Research Maatschappij B.V., The Hague

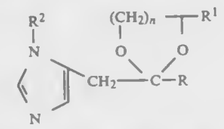
Filed Nov. 4, 1988, Ser. No. 267,166

Claims priority, application United Kingdom, Nov. 13, 1987, 8726662

Int. Cl.[5] **A01N** *43/50;* **C07D** *405/06*

U.S. Cl. 514—397 **11 Claims**

1. A compound of the formula



(I)

or an acid-addition salt or metal salt complex thereof, in which R represents an optionally substituted phenyl group; R^1 represents a hydrogen atom or an optionally substituted alkyl or alkenyl group; R^2 represents an optionally substituted alkyl group; and n is 1 or 2.

8. A fungicidal composition which comprises a carrier and, as active ingredient, a fungicidally effective amount of a compound of formula I, or an acid-addition salt or metal salt complex thereof, as defined in claim 1.

4,927,841

FUNGICIDAL IMIDAZOLE OXIME DERIVATIVES

John R. H. Wilson, Rainham; Roger B. Pettman, and Derek J. Reid, both of Sittingbourne, all of England, assignors to Shell Internationale Research Maatschappij, B.V., The Hague, Netherlands

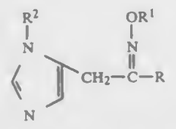
Filed Nov. 4, 1988, Ser. No. 267,154

Claims priority, application United Kingdom, Nov. 6, 1987, 8726109

Int. Cl.[5] **A01N** *43/50*

U.S. Cl. 514—400 **12 Claims**

1. A fungicidal composition comprising a carrier and, as active ingredient, a fungicidally-effective amount of a compound of the formula:



(I)

or an acid-addition salt or metal salt complex thereof,

wherein R represents an optionally substituted phenyl group;

R^1 represents an optionally substituted alkyl, alkenyl, alkynyl or aralkyl group; and

R^2 represents an optionally substituted alkyl group.

4,927,842

2,3,4,9-TETRAHYDRO-1H-CARBAZOLE ACETIC ACID DERIVATIVES, COMPOSITION AND USE AS ANTI-INFLAMMATORIES

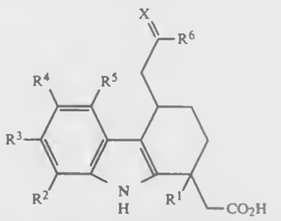
Dominick Mobilio, Franklin Park, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 29, 1989, Ser. No. 415,159

Int. Cl.[5] **A61K** *31/40;* **C07D** *209/82, 209/94*

U.S. Cl. 514—411 **14 Claims**

1. A compound of the formula (I)



(I)

wherein R^1 is lower alkyl containing one to six carbon atoms; R^2 to R^5 are independently selected from the group consisting of H, lower alkyl containing one to six carbon atoms, halogen and haloalkyl containing one to six carbon atoms; R^6 is H, lower alkyl containing one to six carbon atoms; X is O, NOH, or NO-alkyl containing one to six carbon atoms; or a pharmaceutically acceptable salt thereof.

13. A method for treating inflammatory conditions in a mammal which comprises the administration to said mammal of an effective amount of a compound selected from those of formula (I), or a pharmaceutically acceptable salt thereof, as defined in claim 1.

4,927,843

ANTIVIRAL COMPOSITIONS

Yael Teitz, Ramat-Gan, Israel, assignor to Ramot Univ. Authority for Applied Res. & Devp. Ltd., Tel-Aviv, Israel

Continuation-in-part of Ser. No. 948,415, Dec. 31, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 167,507

Claims priority, application Israel, Jan. 1, 1986, 77496

Int. Cl.[5] **A61K** *31/40*

U.S. Cl. 514—418 **7 Claims**

1. A method for inhibiting the production of human viruses of the Retroviridae family, comprising treating a human infected with said virus with a production inhibiting amount of a compound selected from the group consisting of:

1-methylisatin-beta-4';4'-diethylthiosemicarbazone;

1-allylisatin-beta-4';4'-dimethylthiosemicarbazone; and

1-allylisatin-beta-4';4'-diethylthiosemicarbazone.

4,927,844

N-SUBSTITUTED DICHLOROMALEIMIDES, AND ANTI-BACTERIAL AND FUNGICIDAL USE THEREOF

Detlef Wollweber, Wuppertal; Wolfgang Krämer, Burscheid; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hanssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

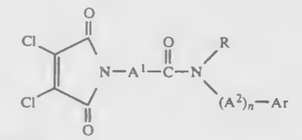
Filed Nov. 10, 1988, Ser. No. 269,938

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738591

Int. Cl.[5] **C07D** *207/452;* **A01N** *37/30*

U.S. Cl. 514—425 **10 Claims**

1. An N-substituted dichloromaleimide of the formula



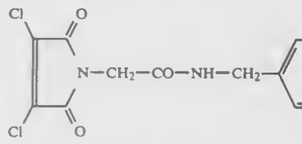
in which

R stands for hydrogen or for alkyl having 1 to 6 carbon atoms,

Ar stands for unsubstituted phenyl or phenyl which is mono-, di- or tri-substituted by non-sterically hindering identical or different substituents selected from the group consisting of halogen; cyano; nitro; alkyl; alkoxy or alkylthio, each having 1 to 4 carbon atoms; halogenoalkyl, halogenoalkoxy, dioxyhalogenoalkylene or halogenoalkylthio, each having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms; alkenyl, alkinyl, alkenyloxy or alkinyloxy, each having 3 to 6 carbon atoms; cycloalkyl having 3 to 7 carbon atoms; alkoxycarbonylalkyl or alkoxyalkyl, each having 1 to 4 carbon atoms in the individual alkyl moieties; phenyl, benzyl, phenoxy, benzyloxy, each being unsubstituted or mono-substituted by substituents selected from the group consisting of halogen and alkyl having 1 to 4 carbon atoms,

A^1 and A^2 independently of one another each stand for unsubstituted or phenyl-substituted, alkylene having 1 to 8 carbon atoms, where the phenyl substituent is unsubstituted or mono-substituted by substituents selected from the group consisting of halogen; alkyl, alkoxy, halogenoalkyl or halogenoalkoxy, each having 1 to 4 carbon atoms, and, in the case of halogenoalkyl or halogenoalkoxy, having 1 to 9 identical or different halogen atoms, and n stands for a number 0 or 1, and pure isomers or isomer mixtures thereof, with the exception of the compound 2-(dichloromaleimido)-acetanilide.

5. A compound according to claim 1 wherein such compound is 2-(dichloromaleimide)-N-(4-methylbenzyl)-acetamide of the formula



4,927,845

COMPOUNDS OF THE ANTHRAQUINONE SERIES

John M. Bruce, Wilmslow, United Kingdom, assignor to The Victoria University of Manchester, Manchester, England

PCT No. PCT/GB88/00912, § 371 Date Aug. 15, 1989, § 102(e) Date Aug. 15, 1989, PCT Pub. No. WO89/03822, PCT Pub. Date May 5, 1989

PCT Filed Oct. 21, 1988, Ser. No. 377,835

Claims priority, application United Kingdom, Oct. 22, 1987, 8724799; Oct. 22, 1987, 8724800

Int. Cl.[5] **C07C** *149/36;* **A61K** *31/10*

U.S. Cl. 514—440 **5 Claims**

1. Organic compounds useful for the treatment of psoriasis which are analogue of anthralin compound is a "spiro" derivative in which the 10-carbon atom of the anthralin ring is part of a heterocyclic ring formed by utilising both valencies of the 10-carbon atom which are not taken up in the anthralin ring system and an sulphur atom attached to the 10-carbon atom of the anthralin ring.

5. Procedure for treatment of psoriasis in which a thio-substituted anthralin as claimed in claim 1 is the treatment agent.

VOL 1114 ISS 4 MY 22 1990 UMI

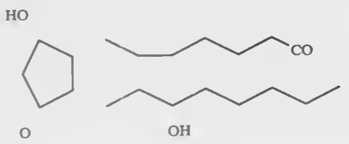
4,927,846

INTRAOCULAR PRESSURE REDUCING 1,11-LACTONE PROSTAGLANDINS

Charles Gluchowski, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Nov. 23, 1988, Ser. No. 275,465
Int. Cl.[5] A61K *31/335*
U.S. Cl. 514—450 4 Claims

1. A method of treating ocular hypertension which comprises topically administering to the eye an intraocular pressure treating amount of a 1,11-lactone of $PGF_{2\alpha}$, the compound having the following formula:



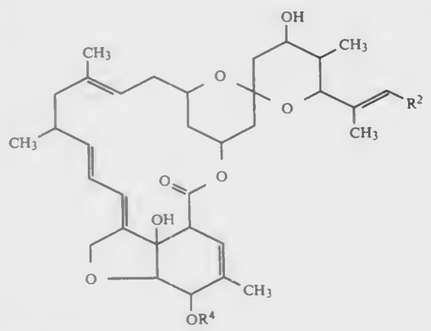
4,927,847

NOVEL C.25 (SUBSTITUTED (2-PROPENYL))-MILBEMYCINS

Christopher J. Dutton, and David A. Perry, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 227,921, Aug. 3, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 382,016
Claims priority, application United Kingdom, Sep. 15, 1987, 8721647
Int. Cl.[5] A61K *31/365*; C07D *315/00*
U.S. Cl. 514—450 6 Claims

1. A compound having the formula:



wherein

R^2 is a C_3–C_8 straight or branched-chain alkyl, alkenyl or alkynyl group which may optionally contain an oxygen or sulphur atom as part of the chain, or a C_3–C_8 cycloalkyl or cycloalkenyl group;

R^4 is hydrogen or methyl; with the proviso that when R^2 is branched chain alkyl it is not isopropyl or 2-butyl.

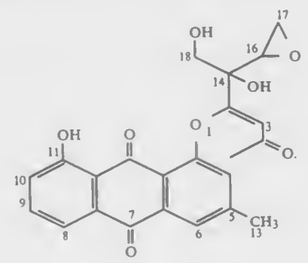
4,927,848

BU-3839T ANTIBIOTIC

Masataka Konishi, Kawasaki; Keiko Shimizu, Tokyo; Masaru Ohbayashi, Tokyo; Koji Tomita, Tokyo; Takeo Miyaki, and Toshikazu Oki, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Sep. 19, 1988, Ser. No. 246,393
Int. Cl.[5] A61K *31/35*; C07D *311/78*
U.S. Cl. 514—453 2 Claims

1. The compound BU-3839T having the formula



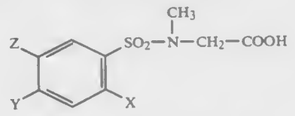
4,927,849

SULFONAMIDO DERIVATIVES INHIBITING THE ALDOSE REDUCTASE ENZYME SYSTEM AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

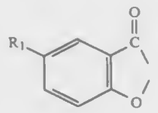
Giulio Caccia, Viareggio, and Massimo Baldacci, Pisa, both of Italy, assignors to Laboratori Baldacci SpA, Pisa, Italy

Filed Sep. 16, 1988, Ser. No. 245,165
Claims priority, application Italy, Sep. 16, 1987, 21930 A/87
Int. Cl.[5] A61K *31/35*; C07D *311/86*
U.S. Cl. 514—455 7 Claims

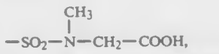
1. A sulfonamido derivative having the general formula:



wherein X represents hydrogen, alkyl, alkoxy or halogen and Y and Z taken together form the group:



wherein R_1 is a halogen,



—COOH, —CO—CH_2—R_2 (where R_2 is an alkyl radical) or CF_3.

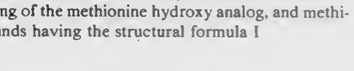
4,927,850

ANTIOXIDANT COMPOSITIONS AND METHODS FOR AMELIORATING INFLAMMATORY SYMPTOMS OF RESPIRATORY DISEASE

Robert K. Bayless, 6509 Pevensey Dr., Austin, Tex. 78745, and Gerald P. Hirsch, 8414 Hanbridge La., Austin, Tex. 78736

Filed Apr. 8, 1988, Ser. No. 179,230
Int. Cl.[5] A61K *31/20, 31/34, 31/195, 31/355*
U.S. Cl. 514—458 10 Claims

1. A method for ameliorating inflammatory symptoms of respiratory disease including but not limited to edema, adult respiratory distress syndrome, asbestosis, and asthma in a subject in need of such treatment, comprising administering to the subject an antioxidant in unit dosage form comprising active components consisting essentially of an antiinflammatory amount of at least one methionine compound selected from the group consisting of the methionine hydroxy analog, and methionine compounds having the structural formula I



dl- or d- form

and pharmaceutically acceptable N- (mono- and di- carboxylic acid) acyl derivatives and alkyl esters thereof, where n is an integer from 1 to 3, and an amount of a dietary antioxidant selected from the group consisting of vitamins A, C, and E, beta carotene, selenium, zinc and glutathionine and combinations thereof where such combination becomes therapeutically effective.

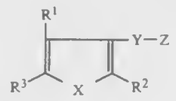
4,927,851

ANALOGS OF MEVALONOLACTONE AND DERIVATIVES THEREOF

Robert E. Damoo, II, Wharton, and James R. Wareing, Randolph, both of N.J., assignors to Sandoz Pharm. Corp., E. Hanover, N.J.

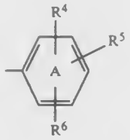
Continuation of Ser. No. 945,428, Dec. 22, 1986, Pat. No. 4,829,081, which is a continuation-in-part of Ser. No. 816,664, Jan. 7, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 242,667
Int. Cl.[5] A61K *31/34, 31/38*
U.S. Cl. 514—460 18 Claims

1. A compound of the formula:



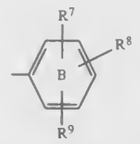
wherein

R^1 is C_{1-6}alkyl not containing an asymmetric carbon atom, C_{3-7}cycloalkyl or ring A



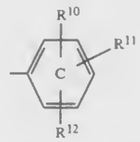
wherein R^4, R^5 and R^6 are as defined below,

R^2 is C_{1-6}alkyl not containing an asymmetric carbon atom, C_{3-7}cycloalkyl or ring B:



wherein R^7, R^8 and R^9 are as defined below,

R_3 is hydrogen, C_{1-6}alkyl not containing an asymmetric carbon atom, C_{3-7}cycloalkyl or ring C:



wherein R^{10}, R^{11} and R^{12} are as defined below;

Y is

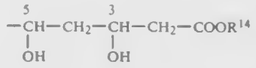


or

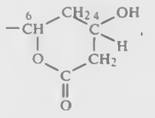
—CH_2—CH_2—, (b)

X is —O— or —S—;

Z is



or



wherein R^{14} is hydrogen, R^{15} or M,

wherein

R^{15} is a physiologically acceptable ester group, and

M is a pharmaceutically acceptable cation,

wherein

each of R^4, R^7 and R^{10} is independently hydrogen, C_{1-3}alkyl, n-butyl, i-butyl, t-butyl, C_{1-3}alkoxy, n-butoxy, i-butoxy, trifluoromethyl, fluoro, chloro, phenyl, phenoxy or benzyloxy,

each of R^5, R^8 and R^{11} is independently hydrogen, C_{1-3}alkyl, C_{1-3}alkoxy, trifluoromethyl, fluoro, chloro, phenoxy or benzyloxy, and

each of R^6, R^9 and R^{12} is independently hydrogen, C_{1-2}alkyl, C_{1-2}alkoxy, fluoro or chloro, with the provisos that not more than one substituent on each of Rings A, B and C; independently is trifluoromethyl, not more than one substituent on each of Rings A, B and C, independently is phenyoxy, and not more than one substituent on each of Rings A, B and C independently is benzyloxy with the proviso that when X is —S—, then Z is (b).

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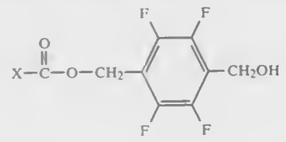
4,927,852

INSECTICIDAL COMPOUNDS CHARACTERIZED BY ENHANCED KNOCKDOWN EFFECT

Michael J. Robson, Bracknell; Peter J. V. Cleare, Ascot, and Mark A. Spinney, Wokingham, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

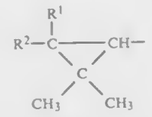
Filed Aug. 8, 1988, Ser. No. 229,532
Claims priority, application United Kingdom, Aug. 6, 1987, 8718620
Int. Cl.[5] C07C *69/743, 69/747, 69/74;* A01N *53/00*
U.S. Cl. 514—531 6 Claims

1. An insecticidal composition, comprising an insecticidally effective amount of a compound of formula (I):

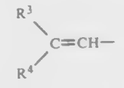


(I)

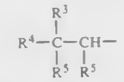
wherein X represents a group of formula:



where either (i) R^1 and R^2 are each selected from hydrogen, halo and alkyl of up to four carbon atoms, or (ii) R^1 is hydrogen and R^2 represents either a group of formula:



or a group of formula:



where R^3 and R^4 are each selected from hydrogen, methyl, halo and haloalkyl of one or two carbon atoms containing at least two fluorine atoms, and R^5 is selected from chloro and bromo, or a stereoisomer thereof, in combination with an insecticidally inert carrier or diluent.

4,927,853

COMPOSITION FOR INCREASING BLOOD PRESSURE

Richard J. Wurtman, Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 665,579, Oct. 29, 1984, Pat. No. 4,745,130, which is a continuation of Ser. No. 366,887, Apr. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 88,226, Oct. 25, 1979, abandoned, which is a continuation of Ser. No. 898,740, Apr. 27, 1978, abandoned. This application Feb. 16, 1988, Ser. No. 156,109
Int. Cl.[5] A61K *31/05*
U.S. Cl. 514—567 3 Claims

1. A composition for increasing blood pressure comprising a mixture of (a) a composition selected from the group consisting of (1) phenylalanine and (2) a mixture of phenylalanine and tyrosine and (b) a blood pressure increasing agent selected form the group consisting of neosynephrine, calcium chloride, ephedrine, dopamine and norepinephrine in an amount effective to increase blood pressure wherein the dosage of said composition (a) is between about 5 and 200 mg/kg body weight.

4,927,854

SUSTAINED/ENHANCED ANALGESIA

Abraham Sunshine, New York, and Eugene M. Laska, Larchmont, both of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Continuation of Ser. No. 137,866, Dec. 24, 1987, abandoned. This application Jul. 21, 1989, Ser. No. 384,101
Int. Cl.[5] A61K *31/19*
U.S. Cl. 514—570 41 Claims

1. The method of eliciting a sustained, enhanced analgesic response in a human mammal suffering from pain and in need of such treatment, comprising administering to such organism a unit dosage sustainedly enhancing, analgesically effective amount of the S(+) flurbiprofen enantiomer, and said enentiomer being substantially free of its R(−) flurbiprofen antipode.

4,927,855

LEVOROTATORY ISOMER OF BENZHYDRYLSULFINYL DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

Filed Jan. 28, 1987, Ser. No. 7,720
Claims priority, application France, Jan. 31, 1986, 86 01337
Int. Cl.[5] A61K *31/165;* C07C *147/14, 103.22*
U.S. Cl. 514—618 6 Claims

1. (−)-Benzhydrylsulfinylacetamide.

2. A method for the treatment of hypersomnia, which comprises administering, to a patient in need of such a treatment, an effective amount of a pharmaceutical composition consisting essentially of (−)-benzhydrylsulfinylacetamide as an arousing agent.

3. A method for the treatment of Alzheimer's disease, which comprises administering, to a patient in need of such a treatment, an effective amount of a pharmaceutical composition consisting essentially of (−)-benzhydrylsulfinylacetamide as a central nervous system stimulant.

4,927,856

PRODUCTION OF HYDROCARBONS FROM GEOTHERMAL RESOURCES

Glenn R. Elion, Chatham, Mass., assignor to International Communication & Energy, division of International Optical Telecommunications, Inc., Hyannis, Mass.

Filed Mar. 23, 1989, Ser. No. 327,643
Int. Cl.[5] C07C *27/06*
U.S. Cl. 518—702 13 Claims

1. A method for producing methanol from a gas mixture containing carbon dioxide emerging from a geopressurized resource, said method comprising:

(a) passing said gas mixture through a turbine to generate electricity;

(b) hydrolyzing water with electricity so generated to form hydrogen gas and oxygen gas; and

(c) reacting said hydrogen gas with said carbon dioxide in said gas mixture emerging from said turbine to form methanol.

4,927,857

METHOD OF METHANOL PRODUCTION

William T. McShea, III, Martinsville, and Robert M. Yarrington, Westfield, both of N.J., assignors to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 430,452, Sep. 30, 1982, abandoned. This application Jan. 18, 1989, Ser. No. 298,875
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] C07C *27/06;* C01B *3/36*
U.S. Cl. 518—703 25 Claims

1. A process for the production of methanol from a hydrocarbonaceous feed, comprising the steps of:

(a) preheating an inlet stream comprising a hydrocarbonaceous feed, H_2O, and oxygen to a preheat temperature sufficiently high to initiate catalytic oxidation of said feed as defined below;

(b) introducing the preheated inlet stream into a first catalyst zone comprising a monolithic body having a plurality of gas flow passages extending therethrough and having a catalytically effective amount of palladium and platinum catalytic components dispersed therein, the amounts of feed, H_2O, and oxygen introduced into said first catalyst zone being controlled to maintain is said inlet stream an H_2O to C ratio of from about 0.5 to 3 and an O_2 to c ratio of from about 0.35 to 0.65;

(c) contacting the preheated inlet stream within said first catalyst zone with said palladium and platinum catalytic components to initiate and sustain therein catalytic oxidation of said feed to produce hydrogen and carbon oxides therefrom the temperature of at least about 250° F. (139° C.) greater than the ignition temperature of said inlet stream, and oxidizing in said first catalyst zone a quantity, less than all, of said feed, which quantity is sufficient to heat such first zone effluent to an elevated temperature high enough to catalytically steam reform, within a second catalyst zone defined below, hydrocarbon remaining is such first zone effluent without supplying external heat thereto;

(d) passing the first zone effluent, while still at an elevated temperature, from said first catalyst zone to a second catalyst zone containing a platinum group metal steam reforming catalyst therein, and contacting the first zone effluent is said second catalyst zone with said reforming catalyst to react hydrocarbons therein with H_2O to produce hydrogen and carbon oxides therefrom;

(e) withdrawing the effluent of said second catalyst zone as said hydrogen-rich synthesis gas and cooling said synthesis gas;

(f) passing said synthesis gas from step (e) to a methanol synthesis loop to react the hydrogen with carbon oxides thereof over a methanol synthesis catalyst at methanol synthesis conditions; and

(g) withdrawing methanol as product from said methanol synthesis loop.

4,927,858

POLYPHENYLENE ETHER-ALKENYL AROMATIC POLYMER BLENDS HAVING ORGANOBROMINE ADDITIVES

James M. Joyce, Chesapeake, and Donald J. Kelley, Suffolk, both of Va., assignors to Huntsman Chemical Corporation, Salt Lake City, Utah

Filed Jul. 10, 1989, Ser. No. 377,260
Int. Cl.[5] C08J *7/18*
U.S. Cl. 521—59 6 Claims

1. A method for the production of an expandable PPE/PS composition comprising: treating a PPE/PS blend with an organobromine; wherein said PPE/PS blend comprises (i) polyphenylene ether and (ii) alkenyl aromatic polymer; wherein the amount of polyphenylene ether is within the range of about 2 weight percent to about 98 weight percent; wherein said weight percentages are based upon the total weight of polyphenylene ether and alkenyl aromatic polymer; wherein said organobromine is selected from the group consisting of: (i) tetrabromocyclooctane, (ii) hexabromocyclododecane, (iii) tetrabromovinylcyclohexene, (iv) bis(allyl ether) of tetrabromobisphenol A, and (v) any combination thereof; and wherein the amount of said organobromine is an amount sufficient to reduce said PPE/PS composition's mold cool time.

4,927,859

EXPANDABLE POLYMERS IN PARTICLE FORM

Heinz Weber, Gruenstadt; Eckhard Nintz, Ludwigshafen; Manfred Walter, Speyer; Dieter Ballweber, Frankenthal, and Bertram Ostermayer, Roedersheim-Gronau, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,230
Claims priority, application Fed. Rep. of Germany, May 25, 1988, 3817631
Int. Cl.[5] C08J *9/18*
U.S. Cl. 521—59 4 Claims

1. An expandable polymer in particle form, containing

(a) from 20 to 94.9% by weight of a styrene polymer,

(b) from 0.1 to 75% by weight of a polyphenylene ether,

(c) from 5 to 20% by weight of a blowing agent mixture consisting of

(c1) aliphatic or cycloaliphatic saturated hydrocarbons of 3 to 7 carbon atoms and

(c2) an aromatic saturated hydrocarbon of 7 or 8 carbon atoms,
an alcohol of 2 to 4 carbon atoms,
a ketone of 3 to 5 carbon atoms,
a cyclic ether of 4 to 6 carbon atoms,
an aliphatic ether of 4 to 6 carbon atoms,
an ester of 4 to 6 carbon atoms and/or a chlorohydrocarbon of 1 or 2 carbon atoms and 2 or 3 chlorine atoms in a weight ratio of c1:c2 of from 50:1 to 1:1, with or without

(d) conventional additives in effective amounts.

4,927,860

POLYAMIDE POWDER FORMED BY PARTICLES HAVING A GYPSUM ROSE STRUCTURE AND PROCESS FOR PREPARING SUCH POWDER

Jean C. Hilaire, and Roland Guerin, both of Pau, France, assignors to Atochem, Paris, France

Division of Ser. No. 217,557, Jul. 11, 1988, Pat. No. 4,831,066. This application Dec. 27, 1988, Ser. No. 289,519
Claims priority, application France, Aug. 11, 1987, 8711422
Int. Cl.[5] C08J *9/28*
U.S. Cl. 521—60 10 Claims

1. A polyamide powder consisting essentially of elementary porous particles having a "gypsum rose" structure wherein the particles have a lamellar structure whose lamellae, which are connected to each other, form cavities varying in geometric shape between a conical shape and a pyramidal shape, the apices of these geometric shapes being directed toward the centers of the particles.

VOL 1114 ISS 4 MY 22 1990 UMI

4,927,861

RIGID POLYURETHANE PREPARATION PROCESS

Sadario O. Souto, Sao Caetano do Sal, and Wilson G. De Moura, Sao Paulo, both of Brazil, assignors to Brastemp S/A, Sao Bernardo Do Campo, Brazil

Continuation of Ser. No. 164,927, Mar. 7, 1988, abandoned. This application Feb. 10, 1989, Ser. No. 309,916
Claims priority, application Brazil, Mar. 11, 1987, 8701098
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—99 9 Claims

1. Process for the preparation of rigid, cellular, high density polyurethane, comprising:

reacting a resin including at least one polyether polyol and at least one polyester polyol in an amount of 5 to 100 parts by weight of resin, said polyether polyol derived from sucrose and propylene oxide, each of said polyols having a molecular weight of between 100 and 5,000, a hydroxyl number of between 30 and 500 and a viscosity of between 100 and 10,000 centipoise, with 90 to 150 parts by weight of resin of an aromatic polyisocyanate selected from the group consisting of toluene diisocyanate and diphenylmethane diisocyanate, said aromatic polyisocyanate having a viscosity of between 8 and 1000 centipoise and having an NCO percentage of 30 to 40, said rigid polyurethane having an elongation of between 2 and 50%, a density of between 0.20 to I.30 g/cm3 and an NCO/OH ratio of between 0.60 and 2.20.

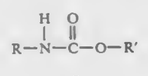
4,927,862

PROCESS FOR THE PREPARATION OF A POLYURETHANE FROM A STORAGE STABLE POLYOL COMPOSITIONS

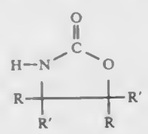
Timothy A. Tufts, Columbus, Ohio, assignor to Ashland Oil, Inc., Russell, Ky.

Division of Ser. No. 71,236, Jul. 7, 1987, abandoned. This application May 1, 1989, Ser. No. 330,585
Int. Cl.[5] C08G *18/30*
U.S. Cl. 521—118 5 Claims

1. In a process for the preparation of a polyurethane by reaction of an organic polyisocyanate and a blend comprising a long chain polyol and a short chain diol, said blend phase separating under storage, the improvement which comprises incorporating into said blend a compatibilizing amount of a urethane corresponding to Formula I or II



I



II

wherein R and R′ independently represent an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an alkyaryl group having from 7 to 20 carbon atoms, hydroxyl, hydroxyalkyl or hydroxyaryl and using said compatibilized blend for forming said polyurethane.

4,927,863

PROCESS FOR PRODUCING CLOSED-CELL POLYURETHANE FOAM COMPOSITIONS EXPANDED WITH MIXTURES OF BLOWING AGENTS

Philip L. Bartlett, and Joseph A. Creazzo, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 158,442, Feb. 2, 1988, abandoned. This application Sep. 18, 1989, Ser. No. 408,393
Int. Cl.[5] C08J *9/00*
U.S. Cl. 521—131 9 Claims

1. A process comprising

mixing at least 1 wt. percent to 59 wt. percent of a shrinkage-minimizing halocarbon selected from the group consisting of CFC-11, CFC-12, HCFC-22, HFC-32, CFC-113, CFC-114, HCFC-124, HCFC-133*a*, HFC-134*a*, HCFC-142*b* and HFC-152*a*, and 99 to 41 wt. percent of a two-carbon hydrogen-containing halocarbon selected from the group consisting of HCFC-123, HCFC-123*a* and HCFC-141*b*, to form a mixture, and, thereafter,

using the mixture to produce a minimal shrinkage closed-cell polyurethane foam.

4,927,864

USE OF A POLYAMINE AS CELL OPENER IN POLYURETHANE FOAM

Kurt C. Frisch, Jr., Fridley, Minn., and Robert F. Harris, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 31, 1989, Ser. No. 304,750
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—163 22 Claims

1. An open-celled polyisocyanate-based polymer the preparation of which comprises reacting in the presence of a blowing agent,

(a) an organic polyisocyanate,

(b) at least one polyfunctional isocyanate-reactive component, and

(c) from about 0.1 to about 15 percent by weight, relative to the amount of (b), of a cell opener which comprises a polyamine containing at least two terminal amine moieties, at least three polyalkyleneoxy moieties and at least two aminocarbonyl or aminothiocarbonyl moieties selected from the group consisting of urea, amide, biuret, thiourea, thioamide and dithiobiuret, or mixtures thereof provided that each aminocarbonyl or aminothiocarbonyl moiety is separated from each terminal amine moiety by at least one polyalkyleneoxy moiety.

4,927,865

ANTHRAQUINOYLCARBOXYLIC ACID HYDRAZIDES, CURABLE COMPOSITIONS AND USE THEREOF

Rudolf Duthaler, Bettingen, Switzerland; Jürgen Finter, Freiburg, Fed. Rep. of Germany; Walter Fischer, Reinach, and Visvanathan Ramanathan, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

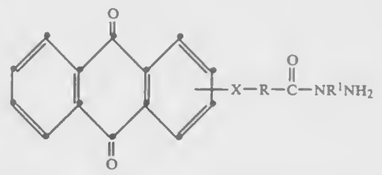
Division of Ser. No. 208,522, Jun. 20, 1988, Pat. No. 4,855,094. This application May 12, 1989, Ser. No. 350,863
Claims priority, application Switzerland, Jul. 1, 1987, 2484/87
Int. Cl.[5] C08G *2/00*; G03C *1/68*; C07C *50/18*
U.S. Cl. 522—48 9 Claims

1. A curable composition comprising

(a) at least one epoxy resin with an average of more than one epoxy group in the molecule,

(b) an epoxy resin hardener if necessary,

(c) at least one anthraquinone of formula I



(I)

wherein X is the group —CR^2R^3—, where R^2 is H, —CN or C_1–C_5-alkyl and R^3 is H or —CN, R^1 is H or C_1–C_5-alkyl and R is a direct bond or linear or branched C_1–C_{18}-alkylene which, alone or together with the —CR^2R^3— group, can be interrupted by one or more —O— when R^2 and/or R^3 are not —CN, it being possible for the group -X-R- additionally to be a direct bond, and

(d) at least one primary or secondary aliphatic amine containing at least one hydroxyl group in the aliphatic radical.

4,927,866

SHAPABLE MATERIAL AND SHAPED ARTICLES OBTAINABLE THEREFROM

Robert Purrmann, Starnberg; Rainer Guggenberger, Hechendorf, and Gunter Pieper, Seefeld, all of Fed. Rep. of Germany, assignors to ESPE Stiftung & Co. Produktions- und Vertriebs KG, Seefeld, Fed. Rep. of Germany

Filed Feb. 28, 1989, Ser. No. 316,946
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 3806448
Int. Cl.[5] A61K *6/08*
U.S. Cl. 523—115 22 Claims

1. A shapable material comprising:

(a) an aluminum fluorosilicate glass;

(b) at least one polycarboxylic acid having an average molecular weight greater than 500;

(c) a carbonate and/or hydrogen carbonate in an amount of at least 0.1% by weight, based on (a);

(d) optionally a chelating agent; and

(e) optionally water.

4,927,867

PROCESS FOR THE MANUFACTURE OF AN IMPACT-RESISTANT THERMOPLASTIC RESIN

Philippe Heim, and Gerard Riess, both of Mulhouse, France, assignors to Norsolor, Cedex, France

Filed Aug. 19, 1988, Ser. No. 234,052
Claims priority, application France, Aug. 20, 1987, 87 11758
Int. Cl.[5] C08J *3/00*
U.S. Cl. 523—339 14 Claims

1. A process for the manufacture of an impact resistant thermoplastic resin modified with an elastomeric latex, comprising the steps of:

(a) preparing the elastomeric latex in an aqueous emulsion from at least one ethylenically unsaturated monomer in the presence of an ionic surfactant;

(b) adding at least one vinyl monomer to the elastomeric latex from step (a), said vinyl monomer being insoluble or substantially insoluble in water, and adding a transfer agent having a charge opposite to that of the surfactant employed in step (a) to transfer the particles of the elastomeric latex into the vinyl monomer; and

(c) polymerizing the vinyl monomer from step (b).

4,927,868

HIGH SOLIDS COATING COMPOSITIONS CONTAINING A POLYEPOXIDE AND A COPOLYMER OF AN ALPHA-OLEFIN AND AN OLEFINICALLY UNSATURATED MONOANHYDRIDE

Karl F. Schimmel, Verona, and William P. Blackburn, Evans City, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 19, 1987, Ser. No. 87,012
Int. Cl.[5] C08L *63/02, 33/08*; C08K *5/07*
U.S. Cl. 523—439 13 Claims

1. A curable, liquid coating composition containing organic solvent and a resinous binder, said resinous binder comprising:

(a) a polyepoxide,

(b) a copolymer of an alpha-olefin or a cycloolefin and an olefinically unsaturated monoanhydride including a partial ester thereof; and

(c) a carboxy-terminated polyester polyacid curing agent containing at least two carboxyl groups per molecule;

said coating composition having a resin solids content of at least 40 percent by weight.

4,927,869

CHEMICALLY TREATED GLASS FIBERS FOR REINFORCING POLYMERS

David E. Dana, Pittsburgh, and Steven J. Morris, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 15, 1988, Ser. No. 245,099
Int. Cl.[5] C08K *3/20*
U.S. Cl. 523—502 28 Claims

1. An aqueous chemical treating composition for fibrous inorganic oxide surfaces, comprising:

a. two film forming polymers selected from water soluble, emulsifiable, or dispersible unsaturated, essentially linear polyester and from water soluble, emulsifiable, or dispersible vinyl acetate copolymer having low solubility in acetone selected from the group consisting of vinyl acetate-organo silane copolymer, and vinyl acetate-methylolacrylamide copolymer, where the two polymers are present as the only film forming polymers and present in a combined amount in the range of around 1 to 30 weight percent of the aqueous composition as an effective film forming polymeric amount, wherein the vinyl acetate copolymer is present in a predominant amount of the two film forming polymers,

b. acryloxy alkyltrialkoxy silane coupling agent selected from the group consisting of unhdyrolyzed silane, partially hydrolyzed and fully hydrolyzed derivatives thereof and mixtures thereof present in an effective coupling agent amount, and

c. polyester polymer curing agent selected from internal and external thermal oxidative curing agents in an effective amount to cure the polyester to less than its full extent,

d. fiber lubricant selected from the group consisting of nonionic, water soluble polyethylene-containing polymer and cationic lubricants selected from the group consisting of polyalkylene polyamine, polyamino amide and partially amidated polyalkyleneimines and mixtures thereof in an effective lubricating amount,

e. silylated polyazamide present in an amount ranging from 0 when the polyethylene-containing polymer is the fiber lubricant to an effective fuzz reducing amount when the cationic lubricant is the fiber lubricant, and

f. water present in an effective amount to give a total solids content for the aqueous chemical treating composition ranging from around 1 to around 30 weight percent.

VOL
1114
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4,927,870

IGNITION RESISTANT MODIFIED THERMOPLASTIC COMPOSITION

Samuel A. Ogoe, Angleton, and Thoi H. Ho, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1988, Ser. No. 236,706
Int. Cl.[5] C08K 5/52, 3/24
U.S. Cl. 524—140 11 Claims

1. An ignition resistant non-haloaromatic thermoplastic composition consisting essentially of
(A) a member of the group consisting of
(i) a non-carbonate thermoplastic polymer,
(ii) a carbonate polymer, and
(iii) a blend of A and B,
(B) 0.001 to 20% by weight of a high elastic memory polytetrafluoroethylene having a heat shrinkage equal to or greater than 15%,
(C) 0.1 to 30% by weight of an organic phosphate, and
(D) 0.001 to 10% by weight of a metal salt of an inorganic acid.

4,927,871

PROCESS FOR PRODUCING MODIFIED ULTRAHIGH-MOLECULAR-WEIGHT POLYOLEFINS

Yoshiji Ohori, and Hirofumi Harazoe, both of Waki, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,574
Claims priority, application Japan, Jul. 17, 1987, 62-177227
Int. Cl.[5] C08K 5/37, 5/20, 5/11, 5/07
U.S. Cl. 524—230 18 Claims

1. A process for producing a modified ultrahigh-molecular-weight polyolefin composition, which comprises mixing a powder of an ultrahigh-molecular-weight polyolefin (A) having an intrinsic viscosity [η] of at least 5 dl/g, a flowability improver (B) having a melting point lower than tho melting point of the ultrahigh-molecular-weight polyolefin (A), a monomer (C) having an olefinically unsaturated bond and a radical initiator (D) with stirring at the melting point of the flowability improver (B) or a higher temperature but below the melting point of the ultrahigh-molecular-weight polyolefin (A), and then melt-kneading them at the melting point of the ultrahigh-molecular-weight polyolefin (A) or a higher temperature to react the monomer (C) with the ultrahigh-molecular-weight polyolefin (A).

4,927,872

POLYPROPYLENE FILM

Masahiro Kakugo, Narashino, and Seiichiro Ima, Ichihara, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 45,433, May 4, 1987, Pat. No. 4,839,234. This application Apr. 3, 1989, Ser. No. 331,759
Claims priority, application Japan, May 13, 1986, 61-110231; Jun. 11, 1986, 61-135593
Int. Cl.[5] C08J 5/20
U.S. Cl. 524—232 5 Claims

1. A polypropylene film obtained by the melt extrusion from a composition comprising 100 parts by weight of a crystalline polypropylene and, incorporated therein, a slipping agent [A] having a melting point of 100° to 125° C. and a slipping agent [B] having a melting point of 70° to 90° C., the weight ratio of the slipping agent [A] to the slipping agent [B] being in the range of 0.2 to 20, in a total mount of 0.05 to 1.0 part by weight, the initial coefficient of friction of said film being 0.7 or below and the coefficient of friction after heating at 60° C. being 1.0 or below.

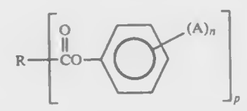
4,927,873

HALOPHENYL ESTER FLAME RETARDANTS FOR POLYPHENYLENE ETHER RESINS

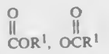
Joseph M. Bohen, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 25, 1988, Ser. No. 173,516
Int. Cl.[5] C08K 5/10, 5/11, 5/12
U.S. Cl. 524—288 14 Claims

1. A flame retardant composition comprising a polyphenylene ether resin and an amount of an ester effective to increase the flame retardancy of said resin, said ester having the formula:



wherein:
(a) R is a substituted or unsubstituted hydrocarbon radical of 1–30 carbons, in which said substituents are selected from aryl or substituted aryl, Cl, Br, OH,



in which R^1 is a 1–22 carbon alkyl or aryl which may optionally be substituted by Cl or Br;
(b) A is Br or Cl;
(c) n is an integer of 3 to 5; and
(d) p is an integer of 1 to 4.

4,927,874

BENEFICIATED TALCS

Kenneth E. Weber, Pacific Palisades, Calif., assignor to Cyprus Mines Corporation, Englewood, Colo.

Division of Ser. No. 70,940, Jul. 8, 1987, Pat. No. 4,814,019, Continuation-in-part of Ser. No. 3,242, Jan. 14, 1987, Pat. No. 4,820,347. This application Sep. 23, 1988, Ser. No. 247,928
Int. Cl.[5] C08K 5/06
U.S. Cl. 524—375 17 Claims

1. A moldable thermoplastic resinous composition comprising:
(A) A beneficiated talc hitherto regarded as suitable for use as a filler for thermoplastic resinous compositions comprising a talc which, when ground to an approximately 2.5–5.0 μm median particle size, exhibits a wet powder brightness of at least about 30%, admixed with an effective amount of:
(a) one or a mixture of octyl- or nonylphenol/poly(ethylene oxide) condensates, and
(b) one or a mixture of poly(ethylene glycols) or alkoxypoly(ethylene glycols); and
(B) a moldable thermoplastic resin.

4,927,875

METHOD FOR PREPARING ACRYLIC/POLYESTER RESIN

Rudolf Maska, Pittsburgh, and William A. Essary, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 102,209, Sep. 29, 1987. This application Nov. 29, 1989, Ser. No. 442,748
Int. Cl.[5] C08L 67/06
U.S. Cl. 524—457 9 Claims

1. A method for preparing a water-borne resin composition comprising:
(A) addition polymerizing in solution in the presence of a free-radical polymerization initiator, a first monomer composition essentially free of ethylenically unsaturated monomers having functional groups substantially reactive with epoxy groups, said first monomer composition containing from 1 to 15 percent by weight of an epoxy-functional vinyl monomer and from 99 to 85 percent by weight of at least one other copolymerizable vinyl monomer in the presence of a polyester polymer having an acid value on solids of from 10 to 95 and a weight average molecular weight of from 500 to 2,000 until the epoxy functionality of said epoxy-functional vinyl monomer has been essentially completely reacted, to form a first product (1) wherein the vinyl portion of said first product (1) is hydrophobic, and thereafter
(B) addition polymerizing in solution in said first product (1) in the presence of a free-radical polymerization initiator, a second monomer composition containing from 3 to 50 percent by weight, based on the total weight of vinyl monomers from parts (A) and (B), of an ethylenically unsaturated carboxylic acid and at least one other copolymerizable vinyl monomer different from said epoxy-functional vinyl monomer, to form a second product (2), wherein the addition polymerizations of steps (A) and (B) above are conducted in the presence of at most a limited amount of an organic solvent, and thereafter
(C) dispersing said product (2) in water utilizing a neutralizing agent selected from the group consisting of ammonia, an organic base or a mixture thereof.

4,927,876

AQUEOUS DISPERSIONS

Richard G. Coogan, North Reading, and Razmik Vartan-Boghosslan, Belmont, both of Mass., assignors to ICI Americas Inc., Wilmington, Del.

Filed Sep. 14, 1988, Ser. No. 244,385
Claims priority, application United Kingdom, Sep. 14, 1987, 8721536
Int. Cl.[5] C08L 75/04, 33/06
U.S. Cl. 524—457 16 Claims

1. An aqueous polymer dispersion containing a water-dispersible polyurethane and a vinyl polymer, the polyurethane being the product of reacting an active hydrogen containing chain extender with a water-dispersible isocyanate-terminated polyurethane derived from a polyisocyanate component comprising a mixture of the 2,4'- and 4,4'-isomers of diphenylmethane diisocyanate containing from 5 to 70% by weight of the 2,4'-isomer.

4,927,877

AIR-DRYING NON-WATER-DISPERSIBLE RESIN COMPOSITION

Terukazu Shibata, Yokohama; Nobushige Numa, Ebina, and Masafumi Kawamura, Hiratsuka, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Apr. 7, 1989, Ser. No. 334,550
Claims priority, application Japan, Apr. 12, 1988, 63-89352
Int. Cl.[5] C08L 67/08
U.S. Cl. 525—7 15 Claims

1. An air-drying non-water-dispersible resin composition obtained by dispersion-polymerization of at least one vinyllic unsaturated monomer (C) in the presence of a vinyllic graft alkyd resin (I) as a dispersion stabilizer in an organic solvent in which at least a part of the vinyllic graft alkyd resin (I) is soluble, the vinyllic unsaturated monomer (C) is substantially soluble but the resulting polymer gells are substantially insoluble, wherein the vinyllic graft alkyd resin (I) is obtained by graft copolymerizing 10 to 70% by weight of a modified alkyd resin (A) having an oil length in the range of 30 to 80% obtained by modification with at least one material selected from drying oils, semi-drying oils, drying oil fatty acids and semi-drying oil fatty acids with 90 to 30% by weight of at least one vinyllic monomer (B) at least 30% of the vinyl monomer (B) being composed of a vinyllic unsaturated monomer (B-1) having an SP value of not greater than 8.25 and a glass transition temperature of at least 20 l ° C.

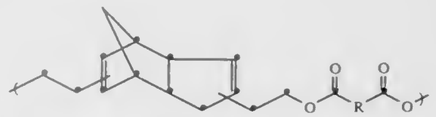
4,927,878

HEAT-CURABLE COMPOSITIONS COMPRISING A MIXTURE OF BIS(2-HYDROXYETHYL) DICYCLOPENTADIENE-CONTAINING POLYESTERS AND UNSATURATED POLYESTERS

Jerome L. Stavinoha, and Anthony W. McCollum, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 101,473, Sep. 28, 1987, Pat. No. 4,801,629. This application Oct. 25, 1988, Ser. No. 262,373
Int. Cl.[5] C08L 67/06
U.S. Cl. 525—44 1 Claim

1. An article coated by a process which comprises:
(a) providing a solution containing:
(i) a film or fiber forming polyester comprising recurring units of the formula:



wherein R is an aliphatic or aromatic group; and
(ii) an unsaturated polyester;
(b) applying a coat of the solution onto an article;
(c) removing the solvent; and
(d) heating to cure the coating.

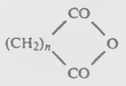
4,927,879

METHOD FOR SOLID PHASE MEMBRANE MIMETICS

Charles Pidgeon, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 160,196, Feb. 25, 1988. This application Oct. 24, 1988, Ser. No. 261,502
Int. Cl.[5] A61K 37/02; C08G 283/00; C08L 89/00
U.S. Cl. 525—54.1 1 Claim

1. A method for forming a membrane mimetic structure on a surface having covalently bound nucleophilic functional groups, said structure having a hydrophilic outer portion and a hydrophobic inner portion and consisting essentially of a monomolecular layer of adjacent amphiphilic molecules independently covalently bound to said surface through at least a portion of the nucleophilic functional groups, said method comprising the step of contacting said surface with a cyclic dicarboxylic anhydride of the formula



wherein n is an integer from 8 to 14,
said step being conducted under conditions conducive to the reaction of the nucleophilic group and said cyclic anhydride, said reaction being conducted until the covalently bound amphiphilic molecules sterically hinder further reaction with the nucleophilic groups on the surface.

VOL 1114 ISS 4 MAY 22 1990 UMI

4,927,880

LOW GLOSS MOLDED ARTICLES USING POLYORGANOSILOXANE/POLYVINYL-BASED GRAFT POLYMERS

James L. DeRudder, Mt. Vernon, Ind.; Herman Savenije, Bergen op Zoom, Netherlands, and I-Chung W. Wang, Williamstown, Mass., assignors to General Electric Company, Parkersburg, W. Va.

Filed Nov. 14, 1988, Ser. No. 271,222
Int. Cl.[5] C08L 51/08
U.S. Cl. 525—63 40 Claims

1. An extruded, molded or heat formed article having a flatted surface comprising:

(A) a thermoplastic polymer resin selected from an aromatic polycarbonate; a polyester carbonate; an aromatic dihydric phenyl sulfone carbonate polymer; a polyester resin prepared by reacting units of an aliphatic diol, a cycloaliphatic diol or a mixture of such diols, and an aromatic diacid; a poly(etherimide ester) elastomer; a vinyl aromatic polymer; a polyphenylene ether; or a mixture of any of the foregoing; and

an effective, flatting amount of a flatting agent comprising a multi-stage polyorganosiloxane/polyvinyl-based graft polymer composition (B) comprising:

(a) as a first stage, a substrate selected from

(i) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer and at least one vinyl-based polymer;

(ii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which are derived from a cross linking agent or agents;

(iii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which serve as a graft-linking agent or agents;

(iv) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, units which are derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; or

(v) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and a mixture of any of units which are derived from a crosslinking agent or agents, units which serve as a graft-linking agent or agents, or units derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; and

(b) at least one subsequent stage or stages graft polymerized in the presence of any previous stages and which is comprised of a vinyl-based polymer or a cross-linked vinyl-based polymer, the outermost stage being comprised of a vinyl aromatic-based polymer or a cross-linked vinyl aromatic-based polymer.

4,927,881

SOLVENT-RESISTANT, COMPATIBLE POLYPHENYLENE ETHER-THERMOPLASTIC POLYESTER BLENDS CONTAINING LARGE PROPORTIONS OF POLYCARBONATE

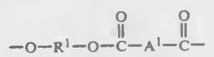
Sterling B. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 18, 1988, Ser. No. 182,691
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.
Int. Cl.[5] C08L 53/02, 71/12
U.S. Cl. 525—92 15 Claims

1. A composition comprising the following resinous components and any reaction products thereof, all percentage proportions being by weight of total resinous components:

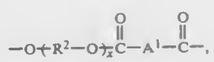
(A) about 15–40% of at least one polyphenylene ether containing at most 800 ppm. of unneutralized amino nitrogen;

(B) about 15–35% of at least one polyester selected from the group consisting of (B-1) those consisting essentially of structural units of the formulas



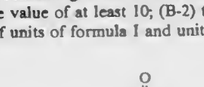
(I)

and



(II)

wherein R^1 is a saturated C_{2-10} divalent aliphatic or alicyclic hydrocarbon radical, R^2 is a saturated C_{2-4} divalent aliphatic hydrocarbon radical, A^1 is a divalent aromatic radical containing about 6–20 carbon atoms and x has an average value of at least 10; (B-2) those consisting essentially of units of formula I and units of the formula



(III)

wherein R^3 is a C_{3-6} saturated divalent aliphatic hydrocarbon radical; and blends of at least one of components B-1 and B-2 with (B-3) polyesters consisting essentially of units of formula I;

(C) about 5–20% of at least one polyphenylene ether-compatible impact modifier; and

(D) about 20–40% of at least one polymer containing a substantial proportion of aromatic polycarbonate units and having a weight average molecular weight of at least about 40,000 as determined by gel permeation chromatography relative to polystyrene.

4,927,882

SBR THERMOPLASTIC ELASTOMER

Ghawamedin Bayan, West Chester, Pa., assignor to The West Company, Incorporated, Phoenixville, Pa.

Filed Oct. 11, 1988, Ser. No. 255,498
Int. Cl.[5] C08L 23/26, 9/06, 53/02, 23/12
U.S. Cl. 525—99 9 Claims

1. A thermoplastic elastomer comprising a composition having a compression set less than about 30% and produced by dynamic vulcanization of SBR to form a dispersed phase of cross-linked SBR in a co-continuous matrix of SEBS and polypropylene.

4,927,883

PROCESS FOR THE PREPARATION OF CROSSLINKED POLY β-ALANINE IN THE FORM OF MICROSPHERES

Claudine Lapoiriere, Le Perreux; Claude Mahieu, Paris, and Christos Papantoniou, Montmorency, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Dec. 13, 1988, Ser. No. 283,960
Claims priority, application France, Dec. 16, 1987, 87 17573
Int. Cl.[5] C08L 61/00
U.S. Cl. 525—154 4 Claims

1. A process for preparing crosslinked poly β- alanine in the form of microspheres having a low size dispersity comprising

(a) polymerizing acrylamide in a tert. butanol/toluene solvent mixture, wherein the ratio of tert. butanol to toluene ranges from 1.24 to 10:1, in the presence of a polymerization initiator and an octadecene-maleic anhydride copolymer as a suspension agent;

(b) submitting the resulting suspension of poly β- alanine microspheres to a crosslinking reaction using a dialdehyde as the crosslinking agent; and

(c) isolating the resulting crosslinked poly β- alanine microspheres.

4,927,884

CURABLE COMPOSITION

Naozumi Iwasawa, Hiratsuka; Osamu Isozaki, Yokohama, and Noboru Nakai, Hiratsuka, all of Japan, assignors to Kansai Paint Co., Limited, Amagasaki, Japan

Filed Nov. 9, 1988, Ser. No. 269,084
Claims priority, application Japan, Nov. 12, 1987, 62-285859; Nov. 12, 1987, 62-287106
Int. Cl.[5] C08F 8/00
U.S. Cl. 525—195 13 Claims

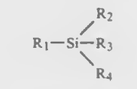
1. A curable composition characterized in that the composition consists essentially of:

(i) 100 parts by weight of a polymer mixture consisting essentially of

(a) about 5 to about 95% by weight of a polymer (X) containing a polysiloxane macromonomer as an essential monomer or a polymer (Y) containing an alkoxysilane-containing vinyl monomer as an essential monomer, and

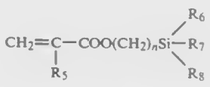
(b) about 95 to about 5% by weight of a polymer (Z) containing an epoxy-containing vinyl monomer as an essential monomer,

the polysiloxane macromonomer being prepared by reacting about 70 to about 99.999 mole % of a compound (A) represented by the formula



(I)

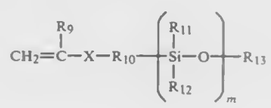
wherein R_1 is an aliphatic hydrocarbon group having 1 to 8 carbon atoms or phenyl, and R_2, R_3 and R_4 are each alkoxyl having 1 to 4 carbon atoms or hydroxyl with about 30 to about 0.001 mole % of a compound (B) represented by the formula



(II)

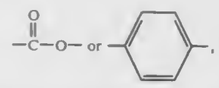
wherein R_5 is a hydrogen atom or methyl, R_6, R_7 and R_8 are each hydroxyl, alkoxyl having 1 to 4 carbon atoms or an aliphatic hydrocarbon group having 1 to 8 carbon atoms, at least one of R_6, R_7 and R_8 being hydroxyl or alkoxyl, and n is an integer of 1 to 6, the polysiloxane macromonomer having per molecule at least two functional groups selected from hydroxyl and alkoxyl and being about 400 to about 100000 in number average molecular weight,

the alkoxysilane-containing vinyl monomer being represented by the formula



(III)

wherein X is



R_9 is a hydrogen atom or methyl, R_{10} is a bivalent saturated aliphatic hydrocarbon group having 1 to 6 carbon atoms, R_{11} and R_{12} are the same or different and are each phenyl, alkyl having 1 to 6 carbon atoms or alkoxyl having 1 to 6 carbon atoms, R_{13} is alkyl having 1 to 6 carbon atoms, and m is an integer of from 1 to 10; and

(ii) about 0.01 to about 30 parts by weight of at least one chelate compound selected from the group consisting of aluminum chelate compound, titanium chelate compound and zirconium chelate compound.

4,927,885

POLYPROPYLENE RESIN COMPOSITIONS

Saetou Hayashida, Noda; Kyoichiro Kimura, Ichihara, and Eiji Takahashi, Chiba, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,847
Claims priority, application Japan, Oct. 14, 1987, 62-257382
Int. Cl.[5] C08L 23/12, 45/00, 25/08
U.S. Cl. 525—211 18 Claims

1. A polypropylene resin composition for manufacture of polypropylene film having excellent transparency comprising:

(A) 70 to 99 parts by weight of stereospecific polypropylene and

(B) 1 to 30 parts by weight of a hydrogenated resin, said hydrogenated resin being obtained by hydrogenation of a thermally copolymerized resin prepared from 1 mole of cyclopentadienes and 0.06 to 0.6 mole of one or more kinds of aromatic hydrocarbons selected from the group consisting of monovinyl aromatic hydrocarbons and indenes, wherein (a) said thermally copolymerized resin contained norbornene units (ND) and cyclopentene units (CD), both derived from cyclopentadiene units contained in said thermally copolymerized resin, in a ratio (ND/CD) of not higher than 0.55, and (b) the degree of hydrogenation of said hydrogenated resin is not less than 98.0%.

4,927,886

LOW INHERENT VISCOSITY-HIGH GLASS TRANSITION TEMPERATURE ENHANCING AGENTS PRODUCED BY MASS REACTION POLYMERIZATION AS AN OVERPOLYMER ON POLYVINYL CHLORIDE RESINS

Richard H. Backderf, Richfield, and Frank J. Donat, Mantua, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 14, 1987, Ser. No. 85,668
Int. Cl.[5] C08F 8/34, 14/06
U.S. Cl. 525—261 8 Claims

1. A low inherent viscosity-high glass transition temperature treated polyvinyl chloride resin comprising:

a polyvinyl chloride resin and a polyvinyl chloride high glass transition temperature-inherent viscosity enhancing agent, said glass transition temperature-inherent viscosity enhancing agent applied to said polyvinyl chloride resin by mass overpolymerization on and within said polyvinyl chloride resin being one or more high glass transition temperature agent forming monomers and an effective amount of one or more chain transfer agents so that the inherent viscosity of said treated polyvinyl chloride resin is reduced, said chain transfer agent being a mercaptan alcohol having from 2 to 22 carbon atoms, or H_2S gas, the amount of said polyvinyl chloride resin being from about 50 parts to about 2,000 parts by weight for every 100 parts

VOL 1114 ISS 4 MY 22 1990 UMI

by weight of said one or more glass transition temperature agent forming monomers.

4,927,887

MODIFIED RUBBER COMPOSITIONS CONTAINING AROMATIC SIX-MEMBERED HETEROCYCLIC NITROGEN-CONTAINING GROUPS

David P. Tate, Akron, and Daniel F. Graves, Clinton, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation of Ser. No. 653,657, Sep. 21, 1984, abandoned. This application Aug. 19, 1988, Ser. No. 234,105

Int. Cl.[5] C08F 8/20

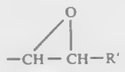
U.S. Cl. 525—279 16 Claims

1. An uncured rubber composition prepared by reacting

(a) at least one polymer rubber containing carbon-carbon unsaturation and an alkali metal chemically bonded to the polymer rubber, with

(b-2) at least one aromatic six-membered heterocyclic nitrogen-containing compound substituted with a group containing no active hydrogen which can react with the alkali metal of said rubber but said group is reacted with the alkali metal of the polymer rubber, said nitrogen-containing compound being a substituted quinoline, pyridine, pyridazine, pyraziune or pyrimidine compound, the substituent on said nitrogen-containing compound being one of the following groups

$-CH{=}CH_2$
$-NO$
$-CN$



$-C(O)-R''$

where R' is H or an alkyl or aryl group, and R'' is hydrogen, alkyl, aryl, or a pyridyl group, and thereafter reacting the rubber obtained from the reaction of (a) and (b-2) with at least one organic halide to form a quaternary ammonium salt of the nitrogen-containing heterocyclic compound in the rubber, said organic halide being represented by the formula

$$(Ar)_aC(H)_b{-}X_c \qquad (II)$$

wherein
Ar is an aromatic group,
X is a halogen,
a is a number from 1 to 3,
b is equal to 3-c,
c is a number from 1 to 3, and
a+b+c equals 4.

4,927,888

MALEIC ANHYDRIDE GRAFT COPOLYMERS HAVING LOW YELLOWNESS INDEX AND FILMS CONTAINING THE SAME

Chad A. Strait; Ricky L. Tabor, both of Lake Jackson, and Gerald M. Lancaster, Freeport, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 905,099, Sep. 5, 1986, Pat. No. 4,762,890. This application Aug. 5, 1988, Ser. No. 229,078

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[5] C08F 255/02, 283/00

U.S. Cl. 525—285 22 Claims

1. A graft copolymer comprising the reaction product of maleic anhydride and a backbone polymer which has a yellowness index as measured according to ASTM D-1925 of less than 10.0 and wherein between 0.50 and 2.0 weight percent of said graft copolymer comprises maleic anhydride and further wherein said backbone polymer is selected from the group consisting of polyolefins, linear copolymers of ethylene and carbon monoxide and copolymers of ethylene and ethylenically unsaturated carboxylic acids or derivatives thereof.

4,927,889

MODIFIED BLOCK COPOLYMER AND A PROCESS FOR PRODUCING THE SAME

Toshinori Shiraki, Yamato; Fusakazu Hayano, Chigasaki, and Hideo Morita, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 847,257, Apr. 2, 1986, Pat. No. 4,820,768. This application Oct. 27, 1987, Ser. No. 113,238

Claims priority, application Japan, Aug. 13, 1981, 56-125882; Aug. 24, 1981, 56-131650

Int. Cl.[5] C08F 257/02, 279/02, 297/04

U.S. Cl. 525—285 32 Claims

1. A modified block copolymer comprising a linear base block copolymer of at least two monovinyl substituted aromatic hydrocarbon polymer blocks and at least one olefin compound polymer block having an ethylenic unsaturation degree not exceeding 20%, said linear base block copolymer having at least one maleic anhydride unit radically grafted thereonto, said linear base block copolymer having a monovinyl substituted aromatic hydrocarbon content of 5 to 95% by weight.

4,927,890

SYNTHESIS OF BIGRAFT COPOLYMERS BASED ON GRAFTED TYPE PERACID POLYMER

Ging-Ho Hsiue, and Wen-Kuei Huang, both of Hsinchu, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Sep. 23, 1988, Ser. No. 248,034

Int. Cl.[5] C08F 255/02, 265/02

U.S. Cl. 525—301 15 Claims

1. A process of preparing a bigraft copolymer substrate having a form of a membrane, particulate or tube comprising

(a) graft polymerizing a first ethylenically unsaturated monomer containing a carboxyl acid group onto a polymer substrate having a form of a membrane, particulate or tube;

(b) oxidizing the carboxyl acid groups of the resulting graft polymer into percarboxyl acid groups; and

(c) graft polymerizing a second ethylenically unsaturated monomer onto the grafted chain of the graft polymer through the decomposition of the percarboxyl acid.

4,927,891

POLYMER BOUND LIGHT STABILIZER COATING RESINS

Vasanth R. Kamath, Amherst, and James D. Sargent, Cheektowaga, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 23, 1988, Ser. No. 275,452

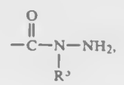
Int. Cl.[5] C08F 8/30

U.S. Cl. 525—327.3 9 Claims

1. A light stabilized acrylic resin comprising the reaction product of

an acrylic prepolymer having at least first and second types of reactive functional groups, the first type of reactive functional group being a hydroxyalkyl ester group, the second type of reactive functional group being a carboxyl group, an anhydride group, an epoxy group or an isocyanate group, and

at least one light stabilizer having a reactive hydrazido group, the light stabilizer being 2,2,6,6-tetraalkylpiperidine hydrazide, 2-(2-hydroxyphenyl)-2H-benzotriazole hydrazide, 2-hydroxybenzophenone hydrazide, aryl salicylate hydrazide or oxanilide hydrazide, the reactive hydrazido group having a formula



in which R^3 is hydrogen, primary alkyl of 1 to 8 carbons, secondary alkyl of 3 to 8 carbons, aralkyl of 7 to 12 carbons or cycloalkyl of 5 to 12 carbons.

4,927,892

PROCESS FOR THE PREPARATION OF FUNCTIONALIZED POLYMERS

Eit Drent, and Antonius A. Broekhuis, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

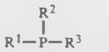
Filed Oct. 11, 1988, Ser. No. 255,232

Claims priority, application United Kingdom, Oct. 14, 1987, 8724108

Int. Cl.[5] C08F 8/00

U.S. Cl. 525—340 9 Claims

1. A process for the preparation of a functionalized polymer comprising reacting a polymer of a conjugated diene hydrocarbon or copolymer of a conjugated diene hydrocarbon and a vinyl aromatic compound, at least part of said polymer or copolymer being formed by 1,2-polymerization of the conjugated diene hydrocarbon, with (a) carbon monoxide and (b) water and/or an alcohol, in the presence of a catalytic system prepared by combining (i) a salt of divalent palladium, (ii) a phosphine ligand which has the general formula A



(A)

in which R^1, R^2 and R^3 each represent an optionally substituted aryl group and (iii) an acid, except hydrohalogenic acids wherein the acid has a non-co-ordinating anoin and a pk_a below 2, measured at 18° C. in aqueous solution, and is not a carboxylic acid.

4,927,893

PROCESS FOR PRODUCING METHACRYLIMIDE GROUP-CONTAINING POLYMER

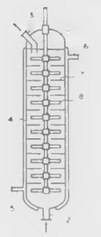
Hisao Anzai; Hideaki Makino, both of Ohtake; Masami Ootani, Kuga; Isao Sasaki, Ohno, and Kozi Nishida, Toyama, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1989, Ser. No. 406,436

Claims priority, application Japan, Oct. 31, 1988, 63-275292

Int. Cl.[5] C08F 8/32

U.S. Cl. 525—378 3 Claims



1. In a process for producing continuously a methacrylimide group-containing polymer by adding a compound represented by the following formula:

$R{-}NH_2$

wherein R represents H, an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 7 to 11 carbon atoms, or an aryl group having 6 to 10 carbon atoms, to a methacrylic polymer in the presence of a solvent, and carrying out the imidization reaction, the improvement which comprises feeding raw materials for said reaction from one end part of a reactor and removing liquid mixture that finished the reaction from other part of the reactor positioned above the one end part.

4,927,894

METHOD FOR PREPARATION OF ARYLOXYTRIAZINE-CAPPED POLYPHENYLENE ETHERS

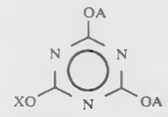
Sterling B. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 21, 1989, Ser. No. 369,153

Int. Cl.[5] C08G 30/08, 65/48

U.S. Cl. 525—390 11 Claims

1. A method for preparing an aryloxytriazine-capped polyphenylene ether composition which comprises contacting under reactive conditions, in the presence of a basic reagent, at least one polyphenylene ether with an aryl cyanurate of the formula



(I)

wherein A is an unsubstituted or substituted aromatic radical and X is an alkyl or cycloalkyl or an unsubstituted or substituted aromatic radical.

4,927,895

SILICON-CONTAINING COPOLYESTER AND METHOD OF PRODUCING THE SAME

Toshio Nakane; Kenji Hijikata; Yukihiko Kageyama, and Katsuhiko Takahashi, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 121,263, Nov. 16, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 263,698

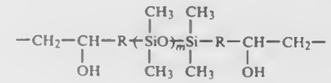
Claims priority, application Japan, May 28, 1988, 61-273518

Int. Cl.[5] C08F 20/00

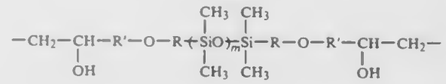
U.S. Cl. 525—438 14 Claims

1. A silicon-containing copolyester in the form of a block copolymer which consists essentially of:

(i) between about 1 to 99% by weight of a siloxane segment which is at least one selected from the group consisting of siloxane segments expressed by the following general formulas:

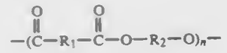


and

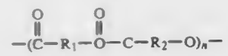


where R and R', which may be the same or different, are each hydrocarbon moieties having 1 to 10 carbon atoms, and m is an integer between 1 to 2000; and

(ii) between about 99 to about 1% by weight of a polyester segment which is at least one selected from polyester segments of the following general formulas:



and



where R_1 is at least one radical selected from the group consisting of aromatic bivalent radicals having 6 to 12 carbon atoms and aliphatic bivalent radicals having 4 to 20 carbon atoms, R_2 is at least one radical selected from the group consisting of aromatic bivalent radicals having 6 to 20 carbon atoms, and aliphatic bivalent radicals having 2 to 20 carbon atoms, and n is an integer between 1 and 1000.

4,927,896

PROCESS FOR POLYMERIZING MONOALLYLAMINE

Wesley C. Blocker; David N. Roark, and Edwin D. Hornbaker, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 148,907, Jan. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 855,940, Apr. 25, 1986, abandoned. This application Jul. 3, 1989, Ser. No. 375,034

Int. Cl.[5] C08F *2/16, 26/02*

U.S. Cl. 526—93 **18 Claims**

1. A process which comprises polymerizing a monomer charge consisting essentially of 80–100% by weight of a water-soluble salt of monoallylamine and 0–20% by weight of one or more copolymerizable allyl amine comonomers in an aqueous reaction medium at a temperature of about 30–80° C. in the presence of a polymerization initiator comprising about 5–10% by weight of hydrogen peroxide and about 1–700 ppm of a multivalent metal ion, based on the weight of the monomer charge.

4,927,897

METAL-CONTAINING ORGANIC POLYMER AND USE THEREOF

Ken Kawata; Kozo Sato, and Masayoshi Tsuboi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1988, Ser. No. 214,062

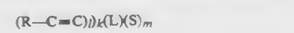
Claims priority, application Japan, Jul. 2, 1987, 62-166116

Int. Cl.[5] C08F *38/00*

U.S. Cl. 526—240 **24 Claims**

1. A catalyst film for nonelectrode plating comprising a polymer produced by the step of polymerizing

(1) a compound represented by formula (I):



(I)

wherein

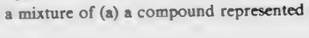
S represents a polyoxyether group, a polyaminoether group, or a polythioether group;

L represents a chemical bond or a group having a valency of (k+m);

l, k and m each represents an integer of 1 or more, and

R represents a Group IB metal atom or a Group VIII atom; or

(2) a mixture of (a) a compound represented by formula (I):



(I)

wherein

S, L, l, k and m have the same meaning as defined above; and

R represents a carboxyl group of a hydrogen atom; and

(b) a salt or a Group IB metal atom or a Group VIII metal

4,927,898

POLYSILOXANES WITH STERICALLY HINDERED HETEROCYCLIC MOIETY

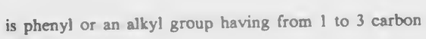
Roswell King, III, Pleasantville, N.Y.; George N. Foster, Bloomsbury, N.J., and Herbert E. Petty, Bethel, Conn., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Sep. 6, 1988, Ser. No. 240,505

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—27 **31 Claims**

1. A polysiloxane of the formula:



(I)

wherein:

M* represents a member of the group M, M′ or M″ in which

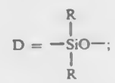
M = R^u_3SiO —;

M′ = R^u_3Si—;

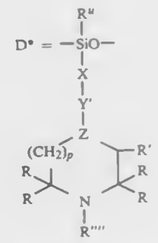
M″ = $R''O_{\frac{1}{2}}$—;

R^u is an alkyl group having from 1 to about 8 carbon atoms, phenyl or phenethyl;

R″ is an alkyl group having from 2 to about 40 carbon atoms or a phenyl group;

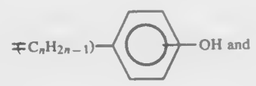


R is phenyl or an alkyl group having from 1 to 3 carbon atoms;



R′ is hydrogen, an alkyl group having from 1 to 3 carbon atoms or a keto oxygen;

X is a valence bond or a divalent linkage selected from the group consisting of $—C_nH_{2n}—$, $—C_nH_{2n}OC_mH_{2m}—$,



$—C_nH_{2n}O(C_mH_{2m-1}\mp OH$;

R″″ is hydrogen or an alkyl group having from 1 to about 12 carbon atoms;

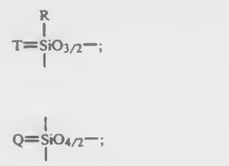
Y′ is —O—, —COO—, $—C_nH_{2n}O—$ or —NH—;

Z is carbon or nitrogen, with the proviso that when z is nitrogen Y′ is $—C_nH_{2n}O—$

n has a value of from zero to about 10;

m has a value of from zero to about 10;

p has a value of zero or one;



v has a value of 1;

x has a value of from zero to about 200;

y has a value of from 1 to about 100;

z has a value of from zero to about 5;

w has a value of from zero to about 5.

4,927,899

ALKENYLOXYLATED AROMATIC POLYAMIDOIMIDES

Philippe Michaud, Villeurbanne, and Yves Camberlin, Caluire, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

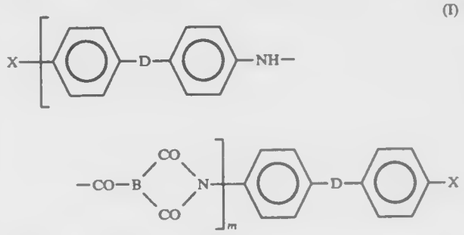
Filed Mar. 24, 1989, Ser. No. 328,240

Claims priority, application France, Mar. 24, 1988, 88 04136

Int. Cl.[5] C08G *18/34*

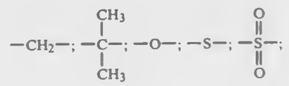
U.S. Cl. 528—49 **11 Claims**

1. A linear aromatic polyamidoimide having alkenyloxy end groups and having the following general formula:

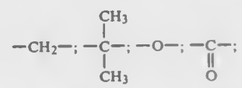


(I)

in which each of the symbols D, which are identical, is a single valence bond or one of the groups:



the symbol B is a trivalent radical comprising an aromatic radical containing at least 6 carbon atoms, substituted or unsubstituted, or of two such radicals linked together by a single valence bond or one of the groups:



the symbol m is the average number of recurring structural units and is at least equal to 1; and each of the symbols X, which are identical, is a radical of the formula:

(II)

in which R is a hydrogen atom or a methyl radical; the (meth-)allyloxy radical is in an ortho, meta or para position relative to the carbon atom of the benzene ring which is linked to the CONH group; R′ is a methyl radical; and n is an integer equal to 0, 1, 2 or 3.

4,927,900

AROMATIC POLYAMIDOIMIDES HAVING MALEIMIDO END GROUPS

Philippe Michaud, Villeurbanne, and Yves Camberlin, Caluire, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

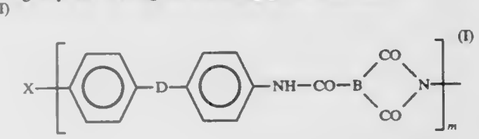
Filed Mar. 24, 1989, Ser. No. 328,506

Claims priority, application France, Mar. 24, 1988, 88 04137

Int. Cl.[5] C08G *18/34*

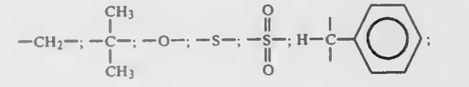
U.S. Cl. 528—49 **11 Claims**

1. A linear aromatic polyamidoimide having maleimido end groups and having the following general formula:

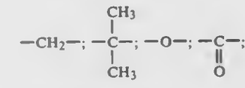


(I)

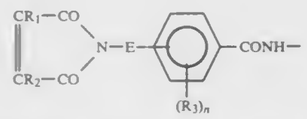
in which each of the symbols D, which are identical, is a single valence bond or one of the groups:



the symbol B is a trivalent radical comprising an aromatic radical containing at least 6 carbon atoms, substituted or unsubstituted, or of two such radicals linked together by a single valence bond or one of the groups:



the symbol m is the average number of recurring structural units and is at least equal to 1; and each of the symbols X, which are identical, is a radical of the formula:



(II)

in which each of the symbols R_1, R_2, which may be identical or different, is a hydrogen atom or a methyl radical; the symbol R_3 is a methyl radical; n is an integer equal to 0, 1, 2 or 3; and the symbol E is a single valence bond or a $—CH_2—$ group and is in an ortho, meta or para position relative to the carbon atom of the benzene ring which is linked to the CONH group.

4,927,901

CURABLE POLYURETHANE CASTING SYSTEMS AND AMINE HARDENERS THEREFOR

Teruko Miyazaki, Okemos, Mich., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 21, 1988, Ser. No. 274,081
Int. Cl.[5] C08B *18/32*
U.S. Cl. 528—64 10 Claims

1. A curable polyurethane casting system comprising
(a) an amine hardener comprising diethyltoluenediamine or t-butyl-metatoluenediamine and 4,4'-methylene-bis-ortho-ethylaniliine in a mole ratio of from about 99:1 to about 1:99;
(b) isocyanate terminated polymers of polyisocyanates and (c)polyols.

4,927,902

POLYTHIOLS AND USE AS EPOXY RESIN CURING AGENTS

Grannis S. Johnson, Maplewood; Reuben H. Grinstein, Denville; Stuart J. Hartman, Livingston, and Raymond P. Dallago, Highland Park, all of N.J., assignors to Henkel Corporation, Ambler, Pa.

Division of Ser. No. 156,692, Feb. 17, 1988, Pat. No. 4,879,414. This application Aug. 29, 1989, Ser. No. 400,057
Int. Cl.[5] C08G *59/66*
U.S. Cl. 528—99 23 Claims

1. A curable epoxy resin comprising:
(a) at least one polyepoxide and
(b) at least one polythiol having the structure:

$$(XSCH_2CHOHCH_2)_b\text{-}A\text{-}R\text{-}N$$
$$(CH_2COHOHCH_2SX)_2$$

wherein:
R is aromatic, substituted aromatic, methylene bis-diphenyl, xylylene, cycloaliphatic, substituted cycloaliphatic, methylene bisdicyclohexyl, dimethylene cyclohexyl, methylene cyclohexyl or aliphatic,
A is N or 0
X is -H or -R'SH,
R' is alkylene, cycloalkylene or alkylene substituted aromatic, and
when A is 0, b is 1 and when A is N, b is 2.

4,927,903

DIPHENOL MONOESTERS OF CARBOXYLIC ACIDS, A PROCESS FOR THEIR PREPARATION, THEIR USE FOR THE PREPARATION OF POLYESTER-CARBONATES, THE POLYESTER-CARBONATES OBTAINABLE ACCORDING TO THE INVENTION AND FLAME-REPELLENT MOULDING COMPOSITIONS

Manfred Schreckenberg; Rolf Dhein; Hans Rudolph, and Nouvertné Werner, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 616,341, Jun. 1, 1984, abandoned. This application May 9, 1986, Ser. No. 861,768
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1983, 3320260
Int. Cl.[5] C08J *5/49*
U.S. Cl. 528—176 5 Claims

1. A process for the production of a diphenol monoester of carboxylic acid comprising reacting one or more carboxylic acid with one or more high-molecular weight polycarbonate using 0.001 to 10% relative to the weight of said acid and said polycarbonate of a catalyst selected from the group consisting of 5-membered heterocyclic compounds, amidines, salts of tertiary organic amines, trialkyl ammonium hydroxide, tetraalkyl ammonium hydroxide, and oxides, hydroxides, alcoholates, carbonates, sulphonates, and phosphonates, of alkali metals at a temperature between 150° C. and 350° C., CO_2 being split off, in which one diphenol polycarbonate equivalent is employed per carboxylic acid group of the carboxylic acid employed.

4,927,904

METHOD FOR PREPARING CYCLIC POLYARYLATE OLIGOMERS

Thomas L. Guggenheim, Scotia; Sharon J. McCormick, Clifton Park, and Alice M. Colley, Latham, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 12, 1989, Ser. No. 364,294
Int. Cl.[5] C08G *63/30, 63/27*
U.S. Cl. 528—182 11 Claims

1. A method for preparing a cyclic polyarylate oligomer composition which comprises simultaneously introducing the following into a solution in a substantially water-immiscible organic liquid of (C) a catalytic amount of at least one quaternary ammonium salt having a single alkyl group containing about 8-20 carbon atoms and having not more than 5 additional carbon atoms:
a freshly prepared solution in a substantially water-immiscible organic liquid of (A) at least one halide of an aromatic dicarboxylic acid in which the carboxy groups are not attached to adjacent carbon atoms, and
a freshly prepared aqueous solution of (B) at least one water-soluble salt of a dihydroxyaromatic compound,
the amount of reagent B being at least about 3% in excess of stoichiometric.

4,927,905

PROCESS FOR THE PRODUCTION OF AROMATIC HYDROXYL-CONTAINING COMPOUND-HYDROCARBON RESINS

Gary W. Bogan, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 14, 1988, Ser. No. 270,564
Int. Cl.[5] C08G *83/00*
U.S. Cl. 528—205 12 Claims

1. In a process for the preparation of hydrocarbon-aromatic hydroxyl-containing compound resins wherein an unsaturated hydrocarbon or mixture of unsaturated hydrocarbons are reacted with an aromatic hydroxyl-containing compound or mixture of such compounds in the presence of a Lewis acid and subsequently removing the unreacted aromatic hydroxyl-containing compound therefrom: the improvement which comprises neutralizing the Lewis acid with an inorganic base prior to recovery of unreacted aromatic hydroxyl-containing compound without removing the salts formed as a result of the catalyst neutralization.

4,927,906

NOVEL POLYAMIDEIMIDE POLYMERS

Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 15, 1988, Ser. No. 284,872
Int. Cl.[5] C08G *12/00, 69/26, 63/08*
U.S. Cl. 528—228 36 Claims

1. The process of producing a polyamideimide polymer by contacting under polymerization conditions
(a) a spirodilactam precursor of up to 30 carbon atoms inclusive selected from (1) 4-oxoheptanedioic acid compounds or (2) 1,6-dioxa-[4.4]spirodilactone,
(b) a primary diamine of up to 30 carton atoms wherein the amino groups are not located on adjacent carbon atoms, and
(c) an aromatic tricarboxylic acid compound of up to 30 carbon atoms and up to 3 aromatic rings, inclusive, having two of the acid groups located on adjacent carbon atoms of the same aromatic ring as free carboxyl groups or together as an anhydride moiety.

4,927,907

BISBENZOCYCLOBUTENE/BISIMIDE/FREE RADICAL POLYMERIZATION INHIBITOR COMPOSITION

Larry S. Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 30, 1989, Ser. No. 358,742
Int. Cl.[5] C08G *73/12*
U.S. Cl. 528—322 38 Claims

1. A composition comprising
(a) a difunctional bisimide of an unsaturated dicarboxylic acid;
(b) from about 0.6 to about 2.5 moles, per mole of the difunctional bisimide, of a bisbenzocyclobutene; and
(c) a free radical polymerization inhibitor for the bisimide.

4,927,908

CURABLE RESIN COMPOSITION COMPRISING CYANATO ARYL SPIRODILACTAM

Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 23, 1989, Ser. No. 314,519
Int. Cl.[5] C08G *69/14*
U.S. Cl. 528—323 22 Claims

1. A curable thermosetting resin composition comprising (a) a cyanatoaryl-substituted 1,6-diaza[4.4]spirodilactam having a cyanatoaryl-containing substituent on each spiro ring mitrogen atom and (b) at least one additional polymerizable monomer of up to 30 carbon atoms inclusive having at least two functional substituents in the molecule with multiple bonds between adjacent atoms.

4,927,909

FABRICATION OF HIGH PERFORMANCE POLYBENZIMIDAZOLE FILMS

Lachhman Wadhwa, North Plainfield; Michel Bitritto, Summit, both of N.J., and Edward J. Powers, Charlotte, N.C., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Sep. 18, 1987, Ser. No. 98,440
Int. Cl.[5] C08G *73/18;* B29C *39/14, 67/22*
U.S. Cl. 528—331 27 Claims

1. A continuous process for the preparation of a continuous polybenzimidazole film comprising:
(a) preparing a polybenzimidazole solution;
(b) continuously depositing the polybenzimidazole solution upon a support to form a wet film; held at a temperature in the range of about 40° C. to about a 125° C.
(c) passing the wet film and the support into an oven to remove a sufficient amount of solvent to form a self-supporting film;
(d) removing the film from the support; and



(e) continuously collecting the continuous film.
27. The film produced in accordance with the process of claim 1 or 2.

4,927,910

PREPARATION OF LINEAR POLYCARBONATES FROM CYCLIC OLIGOMER COMPOSITIONS USING ARYL TETRAHYDROPYRANYL ETHER CATALYST

Kevin R. Stewart, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1989, Ser. No. 313,564
Int. Cl.[5] C08G *63/62*
U.S. Cl. 528—371 16 Claims

1. A method for preparing a resinous composition which comprises contacting, at a temperature in the range of about 200°-350° C., at least one cyclic polycarbonate oligomer with a catalytic amount of at least one aryl tetrahydropyranyl ether.

4,927,911

PREPARATION OF LINEAR POLYCARBONATES FROM CYCLIC OLIGOMER COMPOSITIONS USING ZWITTERIONIC CATALYST

Kevin R. Stewart, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1989, Ser. No. 313,563
Int. Cl.[5] C08G *63/62*
U.S. Cl. 528—371 16 Claims

1. A method for preparing a resinous composition which comprises contacting, at a temperature in the range of about 200°-350° C., at least one cyclic polycarbonate oligomer with a catalytic amount of at least one zwitterionic compound containing positively charged nitrogen and negatively charged oxygen.

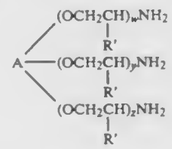
4,927,912

SECONDARY ISOPROPYL AMINES DERIVED FROM OXYALKYLENE TRIAMINES

George P. Speranza, Austin; Jiang-Jen Lin, Houston, and James H. Templeton, Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

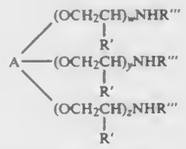
Continuation-in-part of Ser. No. 135,798, Dec. 21, 1987, Pat. No. 4,843,688. This application Mar. 13, 1989, Ser. No. 322,020
Int. Cl.[5] C08G *65/32*
U.S. Cl. 528—405 4 Claims

1. An N-isopropyl secondary triamino derivative of an oxyalkylene triamine having the formula:



said isopropyl N-secondary triamino derivative having the formula:

VOL 1114 ISS 4 MAY 22 1990 UMI



(VI)

wherein A represents the nucleus of a 3 to 6 carbon atom oxyalkylation susceptible trihydric alcohol, w, y and z are integers with an average value sufficient to impart an average molecular weight of about 100 to 400 to the triamine starting material, R' represents hydrogen or a methyl group, at least one of R''' represents an isopropyl group and the remainder of R''' represent hydrogen or isopropyl groups.

4,927,913

CURED PRODUCT FROM THERMOSETTABLE PREPOLYMER PREPARED FROM HETEROCYCLIC MATERIALS HAVING ALKYL SUBSTITUENTS, MONO- OR DIANHYDRIDES, ETHYLENICALLY UNSATURATED MATERIALS AND A HYDROXIDE, CARBONATE OR BICARBONATE OF A METAL OF GROUPS I-A OR II-A

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 142,934, Jan. 12, 1988, Pat. No. 4,847,355, which is a continuation-in-part of Ser. No. 754,696, Jul. 15, 1985, abandoned. This application Mar. 3, 1989, Ser. No. 318,777

Int. Cl.[5] **C08G** *83/00*

U.S. Cl. 528—480 **9 Claims**

1. A cured product resulting from subjecting to conditions suitable for curing a thermosettable prepolymer prepared by reacting

(A) the reaction product of

(1) a heterocyclic material having one or more rings therein, at least one nitrogen atom in a ring and at least two substituent groups which have at least one reactive hydrogen atom attached to a carbon atom which is attached to a heterocyclic ring;

(2) a cycloaliphatic or aromatic carboxylic acid mono- or dianhydride; and

(3) a compound containing both a polymerizable ethylenically unsaturated group and at least one group selected from

(a) a heterocyclic material having one or more rings, at least one nitrogen atom in a ring and at least one substituent group which has at least one reactive hydrogen atom attached to a carbon atom which is attached to a heterocyclic ring or

(b) a cycloaliphatic or aromatic carboxylic acid mono- or dianhydride group; with

(B) an aqueous or alcoholic solution of a hydroxide, carbonate or bicarbonate of a metal of groups I-A or II-A; and wherein the components of (A) are employed in a molar ratio of (1):(2):(3) of from about 1:0.25:0.25 to about 1:4:4, respectively and components A and B are present in quantities which are sufficient to react at least a portion of either the anhydride, lactone, or combination of both anhydride and lactone groups present in component (A) with component (B)

4,927,914

POLYCARBONATE CROSS-LINKER RESIN AND FIRE RESISTANT COMPOSITIONS MADE THEREFROM

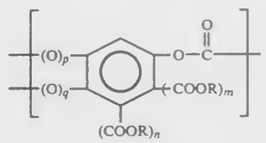
Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 7, 1988, Ser. No. 280,847

Int. Cl.[5] **C08G** *63/62*

U.S. Cl. 528—480 **3 Claims**

1. A cross-linked polycarbonate resin composition prepared by a process which comprises the thermolytic degradation of the polycarbonate resin containing at least one chain moiety of the formula:



(II)

wherein m, n, p and q are each whole number integers of from 0 to 1 and the sum of m plus n is one and the sum of p plus q is one; and R is selected from the group consisting of hydrocarbyl and halogen-substituted hydrocarbyl amenable to beta-elimination upon thermal degradation;

4,927,915

PROCESS FOR PRODUCING ANTISTATIC POLYMERIC MATERIAL

Saburo Hiraoka; Shinji Hama, both of Kasugai, and Mitsuo Senga, Nagoya, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 254,196

Claims priority, application Japan, Oct. 6, 1987, 62-252236; Nov. 4, 1987, 62-277394; Nov. 16, 1987, 62-288965; Nov. 24, 1987, 62-295479

Int. Cl.[5] **C08F** *6/00;* **C08J** *3/00*

U.S. Cl. 528—490 **4 Claims**

1. A process for producing an antistatic polymeric material which comprises heat-treating a polymeric material at a temperature of 60° C. to 140° C. moistened with an aqueous solution containing 0.5 to 5% by weight stannic chloride and 5 to 20% by weight of an inorganic acid salt selected from the group consisting of chlorides other than stannic chloride and nitrates.

4,927,916

METHOD OF PRODUCING FIBRIN-SPECIFIC MONOCLONAL ANTIBODIES LACKING FIBRINOGEN-CROSS-REACTIVITY USING FIBRIN-SPECIFIC PEPTIDES

Gary R. Matsueda, Winchester; Edgar Haber, Weston, and Kwan Hui, Brighton, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 603,155, Apr. 23, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 824,228

Int. Cl.[5] **C07K** *15/14;* **A61K** *39/395;* **107K** *15/04;* **C12N** *35/00*

U.S. Cl. 530—387 **3 Claims**

1. A process for producing monoclonal anti-fibrin specific antibodies, devoid of cross reactivity with fibrinogen comprising:

a. obtaining lymphocytes from a animal immunized against the peptide fragment comprising

A-B-C-D-E-F-G

attached to a suitable immunogenic carrier, wherein

A is glycine;

B is histidine or proline;

C is arginine;

D is proline or valine;

E is aspartic acid or glutamic acid;

G is lysine or arginine;

b. fusing said lymphocytes with a meyloma cell line to produce hydridomas which secrete anti-fibrin specific antibodies substantially devoid of fibrinogen cross-reactivity;

c. cultivating said hybridomas; and

d. isolating said secreted antibodies.

4,927,917

QUASI-LIQUID CRYSTALS

Valeri A. Krongauz, and Felix P. Shvartsman, Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

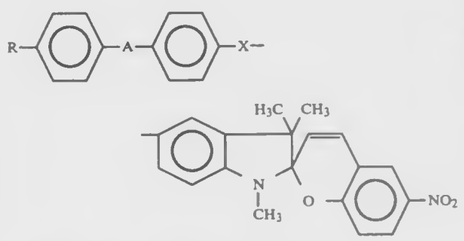
Continuation of Ser. No. 659,819, Oct. 10, 1984, abandoned. This application Dec. 19, 1988, Ser. No. 287,501

Claims priority, application Israel, Oct. 10, 1983, 69939

Int. Cl.[5] **G02B** *5/23;* **C09K** *19/34, 19/54;* **C07D** *491/107*

U.S. Cl. 534—567 **5 Claims**

1. A quasi-liquid crystal-forming compound of the formula:



wherein,

X and A independently represent: —HC═N—; —ON═N—; —N═N—; —COO—; —HC═CH—; or —C═C—;

R represents —OR'; —R'; —CN; —Cl; —F; —NO_2; —NR''$_2$; —R''; or —OR''; and

R' represents a straight chain alkyl radical and R'' is a branched alkyl or alkenyl radical.

4,927,918

ANTIPARASITIC AGENTS

Bernard J. Banks, Margate, and Michael J. Witty, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

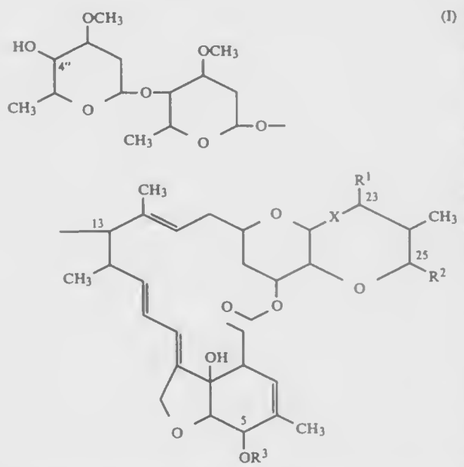
Filed Apr. 11, 1989, Ser. No. 336,400

Claims priority, application United Kingdom, Apr. 19, 1988, 8809232

Int. Cl.[5] **C07H** *17/08*

U.S. Cl. 536—7.1 **17 Claims**

1. A compound of formula (I):



(I)

wherein X represents a single or a double bond; R^1 is H or OH; provided that when X is a single bond, R^1 is H or OH, and when X is a double bond, R^1 is absent;

R^2 is a C_1–C_6 alkyl group substituted by one oxo or one or more hydroxy groups or by a single oxygen atom on two adjacent carbon atoms to form an oxirane ring, or R^2 is a C_1–C_5 alkyl group substituted by a (C_1–C_6 alkoxy) carbonyl group, said substituents on R_2 being attached to either or both a terminal carbon atom and a carbon atom adjacent to a terminal carbon atom of R^2; and R^3 is H or CH_3; or, when R^2 is substituted by oxo, a (C_1–C_4 alkyl) acetal or ketal derivative thereof.

4,927,919

CHARTREUSIN DERIVATIVES AND SALTS THEREOF

Nobutoshi Yamada; Hideo Sugi, and Kenji Koa, all of Moriyama, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

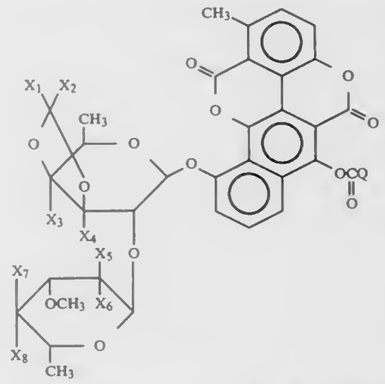
Filed Oct. 23, 1986, Ser. No. 922,433

Claims priority, application Japan, Oct. 23, 1985, 60-236833

Int. Cl.[5] **C07H** *17/04*

U.S. Cl. 536—17.4 **28 Claims**

1. A chartreusin derivative of the formula, or a salt thereof:



wherein X_1 is a hydrogen atom or a C_{1-3} alkyl group which may be substituted by a substituent selected from the group consisting of a halogen atom, a C_{1-2} alkoxy group, and a C_{1-2} alkylthio group;

X_2 is a C_{1-3} alkyl group which may be substituted by a substituent selected from the group consisting of a halogen atom, a C_{1-2} alkoxy group and a C_{1-2} alkylthio group,

a C_{1-2} alkylcarbonyl-C_{1-2} alkyl group which may be substituted by a halogen atom,

a phenyl group,

a phenyl-C_{1-2} alkyl group,

a furyl group, or

a thienyl group

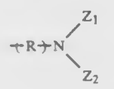
wherein each of the phenyl group, the phenyl-C_{1-2} alkyl group, the furyl group and the thienyl group may be substituted by a substituent selected from the group consisting of a halogen atom, a cyano group, a nitro group, a C_{1-3} alkyl group, a C_{1-3} alkoxy group, a C_{1-3} alkylthio group, a C_{1-3} alkycarbonyl group, a C_{1-2} alkoxycarbonyl group and a di-C_{1-3} alkylamino group

wherein each of the C_{1-3} alkyl group, the C_{1-3} alkoxy group, the C_{1-3} alkylthio group, the C_{1-3} alkylcarbonyl group, the C_{1-3} alkoxycarbonyl group and the di-C_{1-3} alkylamino group may be substituted by a halogen atom;

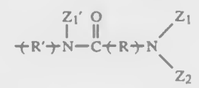
in the case where both X_1 and X_2 are said alkyl groups, the total number of carbon atoms of these alkyl groups is 4 or less;

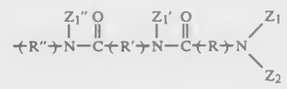
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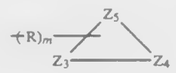
X_1 is a hydrogen atom in the case where X_2 is said phenyl group, said phenyl-C_{1-2} alkyl group, said furyl group, or said thienyl group;
X_1 and X_2, when taken together with the adjacent carbon atom, may form a C_{3-7} cycloalkylidene which may be substituted by a substituent selected from the group consisting of a halogen atom, a C_{1-2} alkoxy group and a C_{1-2} alkylthio group;
each of X_3 and X_4 is a hydrogen atom or a methyl group, X_4 being a hydrogen atom in the case where X_3 is a methyl group;
X_5 is selected from the group consisting of a hydrogen atom, a hydroxyl group and an amino group;
X_6 is a hydrogen atom or a hydroxyl group, X_5 and X_6 may be bonded to the same oxygen atom at the same time, X_6 is a hydrogen atom in the case where X_5 is a hydroxyl group or an amino group; X_7 is a hydrogen atom or an amino group;
X_8 is a hydrogen atom or a hydroxyl group, X_8 being a hydrogen atom in the case where X_7 is an amino group; and Q is selected from the group consisting of a C_{1-11} alkyl group,
a C_{2-11} alkenyl group,
a C_{3-11} alkynyl group,
a C_{3-10} cycloalkyl group,
a C_{5-10} cycloalkenyl group,
a C_{1-10} alkylcarbonyl group, and
a C_{1-10} alkoxycarbonyl group
wherein each of the C_{1-11} alkyl group, the C_{2-11} alkenyl group, the C_{3-11} alkynyl group, the C_{3-10} cycloalkyl group, the C_{5-10} cycloalkenyl group, the C_{1-10} alkylcarbonyl group and the C_{1-10} alkoxycarbonyl group may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a cyano group, a nitro group, a C_{1-6} alkoxy group, a C_{1-6} alkylthio group, a C_{1-6} alkylsulfinyl group, a C_{1-6} alkylsulfonyl group, a C_{1-6} alkylcarbonyl group, a C_{1-6} alkoxycarbonyl group, a phenoxycarbonyl group, a C_{1-6} alkylcarbonyloxy group, a C_{3-7} cycloalkyl group, a phenyl group, a phenoxy group, a phenylthio group, a phenylsulfinyl group, a phenylsulfonyl group, a benzoyl group, a benzoyloxy group and a benzyloxy group
wherein each of the C_{1-6} alkoxy group, the C_{1-6} alkylthio group, the C_{1-6} alkylsulfinyl group, the C_{1-6} alkylsulfonyl group, the C_{1-6} alkylcarbonyl group, the C_{1-6} alkoxycarbonyl group, the phenoxycarbonyl group, the C_{1-6} alkylcarbonyloxy group, the C_{3-7} cycloalkyl group, the phenyl group, the phenoxy group, the phenylthio group, the phenylsulfinyl group, the phenylsulfonyl group, the benzoyl group, the benzyloxy group, and the benzoyloxy group may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-3} alkoxy group, and a C_{1-3} alkylthio group,
Q is a phenyl group which may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a cyano group, a nitro group, a C_{1-6} alkylsulfinyl group, a C_{1-6} alkylsulfonyl group, a C_{1-6} alkyl group, a C_{1-6} alkoxy group, a C_{1-6} alkylthio group, a C_{1-6} alkylcarbonyl group, a C_{1-6} alkoxycarbonyl group, and a C_{1-6} alkylcarbonyloxy group,
wherein each of the C_{1-6} alkyl group, the C_{1-6} alkoxy group, the C_{1-6} alkylthio group, the C_{1-6} alkylcarbonyl group, the C_{1-6} alkoxycarbonyl group, and the C_{1-6} alkylcarbonyloxy group may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-3} alkoxy group and a C_{1-3} alkylthio group,
or Q is a substituent represented by any of the formulas selected from the group consisting of (a) to (i):

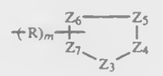

(a)

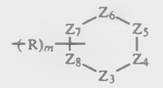
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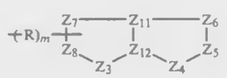

(b)

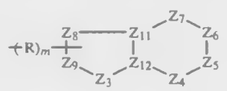

(c)

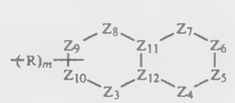

(d)


(e)


(f)


(g)


(h)


(i)

wherein each of the R, R′ and R″: is selected from the group consisting of
a C_{1-11} alkanediyl group,
a C_{2-11} alkenediyl group,
a C_{2-11} alkynediyl group,
a C_{3-10} cycloalkanediyl group, and
a C_{5-10} cycloalkenediyl group
wherein each of the C_{1-11} alkanediyl group, the C_{2-11} alkenediyl group, the C_{2-11} alkynediyl group, the C_{3-10} cycloalkanediyl group and the C_{5-10} cycloalkenediyl group may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-6} alkoxy group, a C_{1-6} alkylthio group, a C_{1-6} alkylsulfinyl group, a C_{1-6} alkylsulfonyl group, an aminocarbonyl group, a hydroxycarbonyl group, a C_{1-5} alkoxycarbonyl group, a phenyl group which may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-3} alkoxy group and a C_{1-3} alkylthio group, and a 3-indolyl group which may be substituted by a halogen atom,
or each of R, R′ and R″ is a phenylene group which may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-6} alkoxy group, a C_{1-6} alkylthio group, a C_{1-6} alkylsulfinyl group, a C_{1-6} alkylsulfonyl group, an aminocarbonyl group, a hydroxycarbonyl group, and a C_{1-5} alkoxycarbonyl group;
each of Z_1, Z'_1 and Z''_1 is a hydrogen atom, or a C_{1-6} alkyl group which may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-3} alkoxy group and a C_{1-3} alkylthio group;

Z_2 is selected from the group consisting of a hydrogen atom,
a formyl group,
a C_{1-6} alkyl group,
a C_{1-6} alkylcarbonyl group, and
a benzoyl group
wherein each of the C_{1-6} alkyl group, the C_{1-6} alkylcarbonyl group and the benzoyl group may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-3} alkoxy group and a C_{1-3} alkylthio group,
or Z_2 is a benzyloxycarbonyl group which may be substituted by a halogen atom;
Z_1 and Z_2 when taken together with the nitrogen atom, may form a nitrogen-containing C_{2-10} heterocyclic group which may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-3} alkyl group, a C_{1-3} alkoxy group, and a C_{1-3} alkylthio group;
m is zero or 1;
each of Z_3 through Z_{10} is selected from the group consisting of a $-CH_2-$ group, a


group, a

group, a


group, a $=CH-$ group, a


group, a


group, a $-NH-$ group, a


group, a


group, a


group, a $=N-$ group, an oxygen atom and a sulfur atom; each of Z_{11} and Z_{12} is selected from the group consisting of a

group, a


group, a


group and a


group; any one of Z_3 through Z_{10} is a


group, a


group or a


group, each of the others being a substituent other than these three substituents, and any one of Z_3 through Z_{10} is selected from the group consisting of a $-NH-$ group, a


group, a


group,


group, a $=N-$ group, an oxygen atom and a sulfur atom, m being zero in the case where any one of Z_3 through Z_{10} is a


group, in the above formulas of groups for Z_3 through Z_{12}, Y_1 is selected from the group consisting of a halogen atom,

VOL 1114 ISS 4 MY 22 1990 UMI

a hydroxyl group,
a mercapto group,
a nitro group,
a cyano group,
an amino group which may be substituted by a substituent selected from the group consisting of a C_{1-6} alkyl group (which may be substituted by a substituent selected from the group consisting of a halogen atom, or hydroxyl group, a mercapto group, a C_{1-3} alkoxy group and a C_{1-3} alkylthio group), a C_{1-3} alkylcarbonyl group (which may be substituted by a halogen atom), and a substituted carbonyl group having as the substituent any of the substituents represented by formulas (a) to (c),
a C_{1-3} alkyl group,
a C_{1-3} alkoxy group,
a C_{1-3} alkylthio group,
a C_{1-3} alkylcarbonyloxy group,
a C_{1-3} alkylcarbonylthio group,
a phenyl group,
wherein each of the C_{1-3} alkyl group, or the C_{1-3} alkoxy group, the C_{1-3} alkylthio group, the C_{1-3} alkylcarbonyloxy group, the C_{1-3} alkylcarbonylthio group and the phenyl group may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a cyano group, a C_{1-3} alkylcarbonyl group (which may be substituted by a halogen atom) and an amino group (which may be substituted by a substituted carbonyl group having as the substituent any of the substituents represented by formulas (a) to (c)),

and a nitrogen-containing C_{2-5} heterocyclic group may be substituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a mercapto group, a C_{1-3} alkyl group, a C_{1-3} alkoxy group, and a C_{1-3}-alkylthio group;

Y_2 is a C_{1-3} alkyl group which may be substituted by the same substituent as substituent for said C_{1-3}-alkyl group as Y_1;

Y_3 is a C_{1-3} alkyl group, a benzyloxy group,

wherein each of the C_{1-3} alkyl group and the benzyloxy group may be substituted by a halogen atom, or a substituent represented by any of formulas (a) to (c); and

Y_4 is a C_{1-3} alkyl group which may be substituted by a halogen atom; the total number of atoms of Q other than the hydrogen atoms being 30 or less, and Q being a substituent represented by any of the above formulas (d) to (i) with the proviso that this formula does not include the case where each of X_3, X_4, X_6 and X_7 is a hydrogen atom and each of X_5 and X_8 is a hydroxyl group.

4,927,920
SUGAR ESTER SYNTHESIS

Frederick W. Wagner, Walton; Rebecca S. de la Motte, and Maria A. Dean, both of Lincoln, all of Nebr., assignors to Nebraska Department of Economic Development, State of Nebraska, U.S.A., Lincoln, Nebr.

Filed Nov. 15, 1988, Ser. No. 271,661
Int. Cl.[5] C07H *13/02, 11/00, 1/00, 1/06*
U.S. Cl. 536—119 11 Claims

1. A process of making a sugar ester having a DS up to 2, comprising the steps of:

(a) reacting only a sugar and an ester of said sugar having a DS greater than about 2 in an organic solvent in the presence of a transesterification catalyst to form a sugar ester having a DS up to 2; and

(b) recovering said sugar ester having a DS up to 2 at a temperature below the boiling point of said organic solvent.

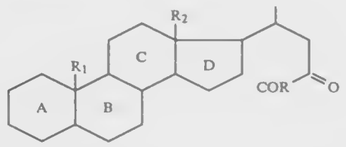
4,927,921
NOVEL 23-KETO-STEROIDS

Michel Vivat, Lagny-sur-Marne, and Jean Buendia, Le Perreux-sur-Marne, both of France, assignors to Roussel Uclaf, Paris, France

Filed Dec. 4, 1987, Ser. No. 128,997
Claims priority, application France, Dec. 5, 1986, 86 17051
Int. Cl.[5] C07J *9/00*
U.S. Cl. 540—110 7 Claims

1. A compound of the formula

I



wherein R_1 is hydrogen or methyl, R_2 is methyl or ethyl, the A, B, C and D rings saturated or containing at least one double bond and substituted with at least one member of the group consisting of 12-OH, protected 12-OH, 11 or 12=O, 11- or 12-protected keto, R is selected from the group consisting of halogen, —OH, alkylthio and alkoxy of 1 to 6 carbon atoms, aralkoxy, arylthio and aralkylthio of 7 to 15 carbon atoms and



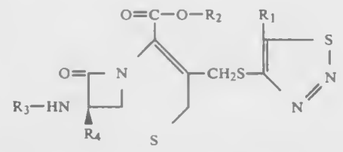
R_3 and R_4 are individually hydrogen or alkyl of 1 to 6 carbon atoms or aralkyl of 7 to 15 carbon atoms or taken together with the nitrogen form a heterocycle, which may contain another nitrogen or oxygen atom excepting the product in which R is methoxy, R_1 and R_2 each represent methyl, A ring carries a 3β-acetoxy function and B ring contains a double bond in 5(6).

4,927,922
7β-(SUBSTITUTED)AMINO-3-SUBSTITUTED CEPHALOSPORANIC ACIDS AND ESTERS

Ving J. Lee, Monsey, and William V. Curran, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

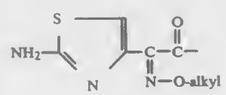
Continuation-in-part of Ser. No. 882,996, Jul. 8, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 222,463
Int. Cl.[5] C07D *501/16;* A61K *31/545*
U.S. Cl. 540—227 21 Claims

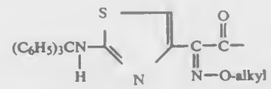
1. A compound having the formula:



wherein R_1 is selected from the group consisting of hydrogen, alkyl(C_1–C_6), phenyl and substituted phenyl wherein the substituents are alkyl(C_1;14 C;hd 6); R_2 is selected from the group consisting of hydrogen, diphenylmethyl, α-acyloxyalkyl, t-butyl, benzyl, 4-nitrobenzyl and 4-methoxybenzyl and pharmaceutically acceptable salts selected from the group consisting of sodium and potassium; and R_3 is selected from the group consisting of

-continued





and 2-thienylacetyl; and R_4 is selected from the group consisting of hydrogen, —O—alkyl, —S—alkyl and formamido.

4,927,923
MACROPOLYCYCLIC RARE EARTH COMPLEXES AND APPLICATION AS FLUORESCENT TRACERS

Gérard Mathis, Bagnols S/Ceze, and Jean-Marie Lehn, Strasbourg, both of France, assignors to Compagnie Oris Industries, Gif-Sur-Yvette, France

Filed Sep. 20, 1985, Ser. No. 778,215
Claims priority, application France, Sep. 26, 1984, 84 14799
Int. Cl.[5] G01N *00/00*
U.S. Cl. 540—456 10 Claims

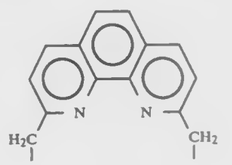
1. A macropolycyclic compound corresponding to the formula:

I

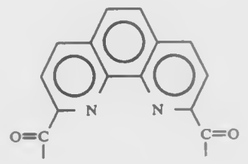


in which Z is a trivalent or tetravalent atom; R is nothing or represents hydrogen, the hydroxyl group, an amino group or a hydrocarbon radical; and the divalent radicals A, B and C independently of one another are selected from the group consisting of hydrocarbon chains, which hydrocarbon chains with one or more heteroatoms and interrupted by heteromacrocycle, wherein at least one of the radicals A, B and C includes or consists essentially of a radical selected from the group consisting of

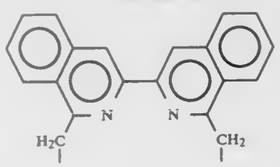
(1)



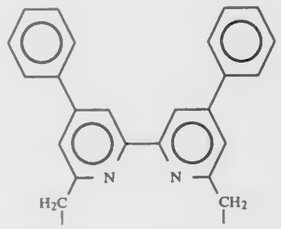
(2)



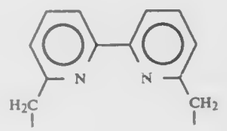
(3)



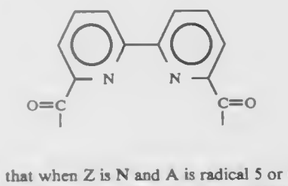
(4)



(5)



(6)



provided that when Z is N and A is radical 5 or 6, then B and C may not simultaneously be —$(CH_2)_2$—O—$(CH_2)_2$—O—$(CH_2)_2$—.

4,927,924
SYNTHESIS OF CAPROLACTAM

Weldon K. Bell, Pennington, and Werner O. Haag, Lawrenceville, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Apr. 14, 1989, Ser. No. 338,015
Int. Cl.[5] C07D *201/04*
U.S. Cl. 540—536 16 Claims

1. In a process for manufacturing epsilon-caprolactam by contacting cyclohexanone under conversion conditions with bonded particles of a crystalline zeolite catalyst, said zeolite having a silica to alumina ratio of at least 12, a Constraint Index of 1 to 12, and an Alpha Value higher than 50, the improvement comprising:

steaming said zeolite prior to said contacting step to reduce its Alpha Value to about 0.1 to 50, thereby increasing the selectivity and decreasing the aging rate of said catalyst.

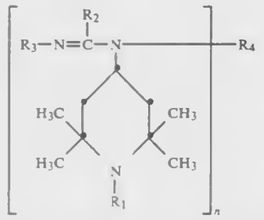
4,927,925

PIPERIDINE COMPOUNDS AND THEIR USE AS THERMAL STABILIZERS

Giuseppe Cantatore, Bari, and Valerio Borzatta, Bologna, both of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

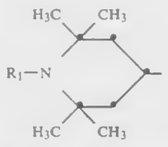
Division of Ser. No. 8,220, Jan. 29, 1987, Pat. No. 4,803,234.
This application Oct. 13, 1988, Ser. No. 257,365
Claims priority, application Italy, Jan. 30, 1986, 19230A86
Int. Cl.[5] C08J *5/34;* **C09K** *15/16;* **C07D** *251/40*
U.S. Cl. 540—598 **10 Claims**

1. A compound of formula I



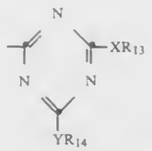
(I)

in which R_1 is hydrogen, O·, CN, NO, cyanomethyl, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or C_3–C_{12}-alkynyl subject to the proviso that the carbon atom attached to the nitrogen atom is a primary carbon atom, C_7–C_{12}-aralkyl, C_1–C_{12}-alkanoyl, C_3–C_{12}-alkenoyl, C_3–C_{12}-alkynoyl, benzoyl or benzoyl substituted by one or more of C_1–C_4-alkyl or by —OH, 2,3-epoxypropyl, OH-monosubstituted C_2–C_6-alkyl or 2,3-dihydroxypropyl, R_2 is hydrogen, C_1–C_{18}-alkyl, C_5–C_{18}-cycloalkyl, C_6–C_{18}-aryl or C_7–C_{18}-aralkyl, R_3 is C_6–C_{18}-aryl or a group of the formula (II)



(II)

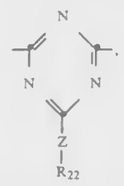
in which R_1 is as defined above, n is an integer of 1 or 2, and R_4 is a triazinyl radical of a valency equal to n, with the proviso that when n is 1, R_4 is



where R_{13} and R_{14} are hydrogen, C_1–C_{18}-alkyl, C_2–C_6-alkyl substituted by OH, by C_1–C_{18}-alkoxy or by C_2–C_{18}-dialkylamino; C_5–C_{18}-cycloalkyl, C_3–C_{18}-alkenyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a group of formula II, and

X and Y are independently a direct bond, —O— or >N-R_{16} where R_{16} is hydrogen, C_1–C_{18}-alkyl, C_5–C_{18}-cycloalkyl, C_3–C_{18}-alkenyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a group of formula II, or R_{16} is OH-monosubstituted C_2–C_6-alkyl, and at least one of groups $R_{13}X$ and $R_{14}Y$ are independently 4-morpholinyl or 1-hexahydroazepinyl; and

when n is 2, R_4 is



where $-ZR_{22}$ is 4-morpholinyl or 1-hexahydroazepinyl.

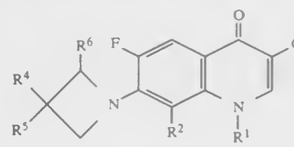
4,927,926

DERIVATIVES OF 7-(1-AZETIDINYL)-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACIDS, THEIR PREPARATION AND APPLICATION AS MEDICINES

Juan P. Corominas; Jordi F. Constansa, and Augusto C. Pinol, all of Barcelona, Spain, assignors to Laboratorios del Dr. Esteve S.A., Spain

Filed Dec. 27, 1988, Ser. No. 290,315
Claims priority, application France, Dec. 29, 1987, 87 18289; Jul. 20, 1988, 88 09816
Int. Cl.[5] C07D *265/34, 215/20, 471/00, 519/02*
U.S. Cl. 544—101 **8 Claims**

1. New heterocyclic compounds characterised in that they correspond to formula I



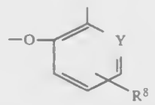
(I)

where

R^1 represents a lower alkenyl or alkyl radical, a haloalkyl radical, a cycloalkyl radical, an aminoalkyl radical, an aryl radical or a substituted aryl radical, particularly one having one or more fluorine atom substituents, R^2 represents a hydrogen atom, a halogen atom, or R^1 and R^2 may together form an X group;

R^3 represents a hydrogen atom or a lower alkyl radical; R^4 and R^5 and R^6 independently represent a hydrogen atom, a lower alkyl radical, a hydroxyl radical, an amino radical, an aminoalkyl radical, an alkylamino radical, a dialkylamino radical, an alkylaminoalkyl radical, an alkoxy radical, a mesyloxy radical, a hydroxyalkyl radical, a cyano radical, an acylaminoalkyl radical, a carboxylic radical, a carboxamido radical, a carboxyalkyl radical, a halogen atom, an alkylcarboxy radical for example acetoxy, an acetamido radical or an acetamidoalkyl radical, in these last two radicals the terminal free alkyl group may be fluorinated and the nitrogen atom in the acetamidoalkyl radical may carry an alkyl substituent;

X represents $—CH_2—CH_2—CHR^7—$, $—O—CH_2—CHR^7—$ or



where

R^7 represents a hydrogen atom or a lower alkyl radical,

R^8 represents a hydrogen atom or a halogen atom, and Y represents CH or N, with the exception however of compounds of formula (I) in which:

R^1 and R^2 together form a link represented by the group $—O—CH_2—CH(CH_3)—$ and

R^3, R^4 and R^6 represent a hydrogen atom, and R^5 represents a hydroxyl radical (OH) or a hydroxymethyl radical (CH_2OH), and of the compound of formula (I) in which:

R^1 represents an ethyl radical

R^2 represents a fluorine atom

R^3, R^4 and R^6 represent hydrogen atoms, and

R^5 represents an ethylaminomethyl radical ($CH_3CH_2NHCH_2$).

8. The use of a compound according to claims 1 or 2 as an antibacterial agent.

4,927,927

FLUORESCENT DYES AND BIOLOGICAL AND ANALYTICAL USES THEREOF

Ramanuj Goswami, Rochester, and Chin H. Chen, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 824,765, Jan. 31, 1986, Pat. No. 4,812,395.
This application Dec. 2, 1988, Ser. No. 278,993
Int. Cl.[5] C07C *97/18, 50/22, 50/38*
U.S. Cl. 544—106 **12 Claims**

1. A substituted or unsubstituted 4-oxo-4H-benz-[d,e]anthracene.

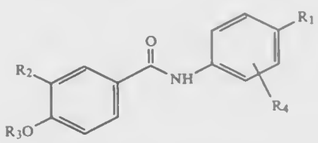
4,927,928

AROMATIC BENZAMIDO COMPOUNDS, THEIR PREPARATION AND THEIR USE IN HUMAN OR VETERINARY MEDICINE OR IN COSMETIC PREPARATIONS

Braham Shroot, Antibes; Jacques Eustache, Grasse, and Jean-Michel Bernardon, Nice, all of France, assignors to Centre International de Recherches Dermatologiques C.I.R.D., Valbonne, France

Filed Jan. 21, 1987, Ser. No. 5,727
Claims priority, application Luxembourg, Jan. 21, 1986, 86.258
Int. Cl.[5] C07C *101/72*
U.S. Cl. 544—154 **3 Claims**

1. An aromatic benzamido compound having the formula



(I)

wherein

R_1 represents $—COR_5$ wherein R_5 represents $—OR_6$ wherein R_6 represents hydrogen, lower alkyl or mono- or polyhydroxyalkyl,

R_2 represents 1-adamantyl,

R_3 represents alkyl having 1–10 carbon atoms,

R_4 represents hydrogen, lower alkyl or hydroxy, and the pharmaceutically or cosmetically acceptable salts of said aromatic benzamido compound of Formula I when R_6 represents hydrogen.

3. A compound selected from the group consisting of:
4-[3-(1-adamantyl)-4-methoxy benzamido]benzoic acid,
4-[3-(1-adamantyl)-4-methoxy benzamido]methyl benzoate,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]ethylamine,
4-[3-(1-adamantyl)-4-hydroxy benzamido]benzoic acid,
4-[3-(1-adamantyl)-4-hydroxy benzamido]methyl benzoate,
4-[3-(1-methylcyclohexyl)-4-methoxy benzamido]benzoic acid,
4-[3-(1-methylcyclohexyl)-4-methoxy benzamido]ethyl benzoate,
4-[3-(1-adamantyl)-4-decyloxy benzamido]benzoic acid,
4-[3-(1-adamantyl)-4decyloxy benzamido]methyl benzoate,
4-[3-(1-adamantyl)-4-hexyloxy benzamido]benzoic acid,
4-[3-(1-adamantyl)-4-hexyloxy benzamido]methyl benzoate,
4-[3-(1,1-dimethyl decyl)-4-methoxy benzamido]benzoic acid,
4-[3-(1,1-dimethyl decyl)-4-methoxy benzamido]methyl benzoate,
4-(3-tert. butyl-4-methoxy benzamido) benzoic acid,
4-(3-tert. butyl-4-methoxy benzamido) methyl benzoate,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]pyrrolidine,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]-piperidine,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]morpholine,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]tert. butylamine,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]ethylamine,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]aniline,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]benzylamine,
4-[3-(1-adamantyl)-4-methoxy benzamido]2-hydroxyethyl benzoate,
N-(4-acetylphenyl)-3-(1-adamantyl)-4-methoxy benzamide,
N-[4-(1-hydroxyethyl) phenyl]-3-(1-adamantyl)-4-methoxy benzamide,
N-[4-[3-(1-adamantyl)-4-methoxy benzamido]benzoyl]2-hydroxyethylamine and
2-hydroxy-4-[3-(1-adamantyl)-4-methoxy benzamido]methyl benzoate.

4,927,929

MELAMINE SALTS OF ALKYL ACID PHOSPHATES

Richard F. Grossman, Shelton, and Francis W. McKane, Jr., Bridgeport, both of Conn., assignors to Synthetic Products Company, Cleveland, Ohio

Filed Aug. 1, 1988, Ser. No. 226,866
Int. Cl.[5] C07D *251/70;* **C07F** *9/6521*
U.S. Cl. 544—195 **2 Claims**

1. A melamine salt of an alkyl acid phosphate where the alkyl group is about C_1 to about C_{20}.

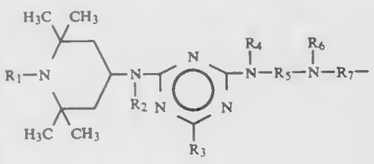
4,927,930

POLYAMINES PARTIALLY SUBSTITUTED BY PIPERIDINE-TRIAZINES

Giuseppe Cantatore, Bitonto; Valerio Borzatta, Bologna, and Franca Masina, Anzola Emilia, all of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 24, 1989, Ser. No. 356,814
Claims priority, application Italy, May 31, 1988, 20809 A/88
Int. Cl.[5] C07D *251/40;* **C08J** *5/34;* **C09K** *15/16*
U.S. Cl. 544—198 **10 Claims**

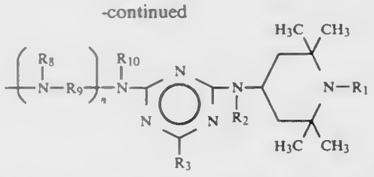
1. A compound of the formula (I)



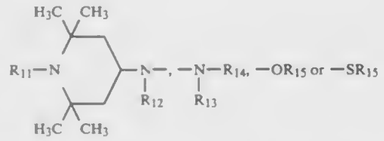
(I)

VOL 1114 ISS 4 MY 22 1990 UMI

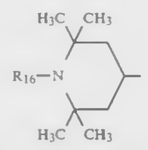
-continued



which R_1 is hydrogen, C_1–C_4alkyl, $O^\bullet$, OH, NO, CH_2CN, C_1–C_{18}alkoxy, C_5–C_{12}cycloalkoxy, C_3–C_6alkenyl, C_7–C_9phenylalkyl which is unsubstituted or mono- di- or tri-substituted on the phenyl by C_1–C_4alkyl, C_1–C_8acyl or C_2–C_4alkyl substituted by one OH in the 2-, 3- or 4-position, R_2 is hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_7–C_9phenylalkyl which is unsubstituted or mono-, di-or tri-substituted on the phenyl by C_1–C_4alkyl, or C_2–C_4alkyl substituted by OH, C_1–C_8alkoxy or di-(C_1–C_4alkyl)-amino in the 2-, 3- or 4-position, R_3 is C_1–C_{18}alkyl, phenyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, or one of the groups

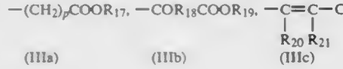


in which R_{11} is as defined above for R_1, R_{12} is as defined above for R_2, R_{13} and R_{14} which can be identical or different are as defined above for R_2 or are C_3–C_6alkenyl or, together with the nitrogen atom to which they are linked, form part of a 5-membered to 7-membered heterocyclic ring and R_{15} is C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_3–C_6alkenyl, phenyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_7–C_9phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by C_1–C_4alkyl, of a group of the formula (II)



(II)

with R_{16} being as defined above for R_1, R_4 and R_{10} which can be identical or different are hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl or a group of the formula (II), R_5, R_7 and R_9 which can be identical or different are C_2–C_{12}alkylene, n is zero or 1, R_6 and R_8 are C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_3–C_6alkenyl, C_7–C_9phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by C_1–C_4alkyl, C_2–C_4alkyl substituted by OH in the 2-, 3-or 4-position, or a group of the formula (II) or R_6 and R_8 are one of the groups of the formula (IIIa)–(IIId)



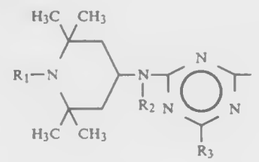
(IIIa) (IIIb) (IIIc)

-continued

$-SO_2R_{23}$

(IIId)

in which p is zero or an integer from 1 to 5, R_{17}, R_{19} and R_{22} which can be identical or different are C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, C_3–C_{18}alkenyl or a group of the formula (II), R_{18} is a direct bond or C_1–C_{12}alkylene, cyclohexylene or phenylene, R_{20} is hydrogen, C_1–C_4alkyl or phenyl, R_{21} is —CN or a group —$COOR_{22}$ with R_{22} being as defined above, and R_{23} is C_1–C_{18}alkyl or phenyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_4alkyl, or R_8 is a group of the formula (IV)

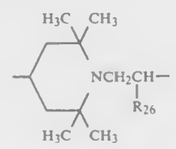


(IV)

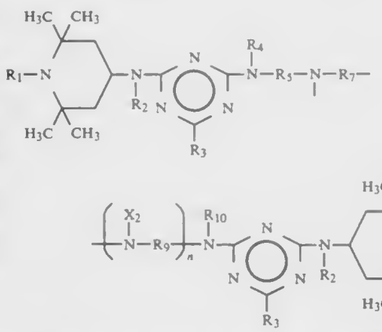
with R_1, R_2 and R_3 being as defined above, and, if n is zero or if R_8 is a group of the formula (IV), R_6 can also be one of the groups of the formulae (Va) or (Vb)

$-R_{24}X_1$, (Va) $-COOR_{25}OOCX_1$ (Vb)

where R_{24} is C_2–C_{12}alkylene, 2-hydroxytrimethylene or xylylene and R_{25} is C_2–C_{12}alkylene, C_4–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms, cyclohexylenedimethylene, methylenedicyclohexylene, isopropylidenedicyclohexylene, phenylene, xylylene or a group



with R_{26} being hydrogen, C_1–C_4alkyl or phenyl, and X_1 is a group of the formula (VI)



(VI)

where R_1, R_2, R_3, R_4, R_5, R_7, R_9, R_{10} and n are as defined above, and X_2 is a group of the formula (IV).

4,927,931

PREPARATION OF ALKYL-EXTENDED, ALCOHOL-EXTENDED OR AMINE-EXTENDED PIPERAZINES

David C. Molzahn; George E. Hartwell, and Robert G. Bowman, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 1, 1988, Ser. No. 265,610
Int. Cl.[5] D01J *23/20;* **C07D** *241/02*
U.S. Cl. 544—357 **29 Claims**

1. A process for preparing alkyl-extended, alcohol-extended or amine-extended piperazines or mixtures thereof comprising contacting an aliphatic alcohol with a reactant amine, wherein at least one of the aliphatic alcohol or reactant amine contains a piperazine moiety, the contacting occurring in the presence of a catalyst under conditions such that an alkyl-extended, alcohol-extended or amine-extended piperazine or mixture thereof is formed, said catalyst being a composition containing a Group VB metal.

4,927,932

REACTION PRODUCTS OF PYRIMIDINE, PYRIDAZINE AND 4-ISOPROPENYL-1-CYCLOHEXENE-1-CARBOXALDEHYDE

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 168,297, May 15, 1988, Pat. No. 4,831,137, which is a division of Ser. No. 840,190, Mar. 17, 1986, Pat. No. 4,755,600, which is a division of Ser. No. 726,555, Apr. 23, 1985, Pat. No. 4,629,770. This application Jan. 23, 1989, Ser. No. 300,462
Int. Cl.[5] C07D *403/06, 241/12*
U.S. Cl. 544—357 **1 Claim**

1. A composition which results from reacting (A) nitrogen containing aromatic heterocyclic compound having at least one hydrogen atom attached to a carbon atom which is attached to the ring selected from the group consisting of pyridazines, pyrimidines or a combination of the two compounds with (B) 4-isopropenyl-1-cyclohexene-1-carboxaldehyde.

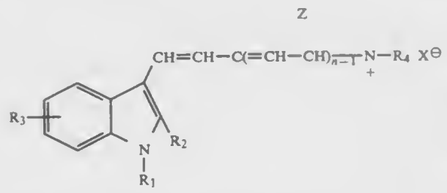
4,927,933

DIRECT POSITIVE DIMETHINE CYANINE DYES CONTAINING 1-ARYL-2-HETEROARYL INDOLE NUCLEUS

Thomas D. Weaver, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 65,552, Jun. 26, 1987, Pat. No. 4,839,271. This application Jan. 31, 1989, Ser. No. 304,574
Int. Cl.[5] C07D *471/04*
U.S. Cl. 546—113 **3 Claims**

1. A cyanine dye of the following formula:



wherein
R_1 is an aryl group of 6 to 10 carbon atoms;
R_2 is a heterocyclic azaaryl group selected from the group consisting of pyridyl, methyl substituted pyridyl and quinolyl;
R_3 is a member selected from the group consisting of a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, an aryloxy group of 6 to 10 carbon atoms, a halogen atom and nitro;
R_4 is a member selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkyl group of 1 to 4 carbon atoms substituted with a member selected from the group consisting of halogen, nitrile, sulfonate, sulfate, hydroxyl, alkoxy and carboxy; an alkenyl group of 1 to 4 carbon atoms and an aryl group of 6 to 10 carbon atoms;
n is a positive integer of from 1 to 2;
x is an acid anion; and
z is the non-metallic atoms necessary to complete a desensitizing nucleus containing from 5 to 6 atoms in a heterocyclic ring.

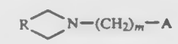
4,927,934

POLYCYCLICAMINE WITH PSYCHOTROPIC ACTIVITY

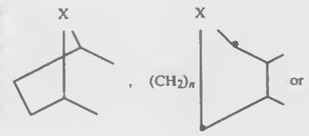
Magid A. Abou-Gharbia, Wilmington, Del., and Usha R. Patel, Audubon, Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 119,530, Nov. 12, 1987, Pat. No. 4,855,430. This application May 5, 1989, Ser. No. 348,332
Int. Cl.[5] C07D *215/06, 401/06, 487/08*
U.S. Cl. 546—152 **4 Claims**

1. A compound having the formula



wherein R represents



where
X is lower alkylene, vinylene or O;
Y is lower alkylene or vinylene;
the dotted line represents an optional double bond;
m is 1–3;
n is 2–4;
A is quinolinyl or quinolinyl substituted with lower alkyl, lower alkoxy, halo, cyano, nitro or trifluoromethyl;
and the pharmacologically acceptable salts thereof.

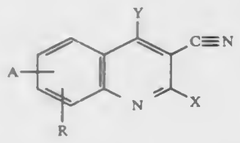
4,927,935

3-CYANOQUINOLINE DERIVATIVES

Alfred Hackenberger, Paulo, and Manfred Patsch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 60,165, Jun. 10, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 268,264
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1986, 3620856
Int. Cl.[5] C07D *215/54*
U.S. Cl. 546—157 **3 Claims**

1. A compound of the formula I



(I)

where

A is nitro, amino, halocarbonyl or halosulfonyl,

R is hydrogen, halogen, nitro, cyano, C_1–C_4-alkanoylamino, hydroxyl, C_1–C_4-alkoxy, phenoxy which is unsubstituted or substituted by methyl or chloro, mercapto, C_1–C_4-alkylthio, phenylthio which is unsubstituted or substituted by ethyl, fluoro, or methoxy, carboxyl, C_1–C_4-alkoxycarbonyl, phenoxycarbonyl which is unsubstituted or substituted by isopropyl, bromo, or methoxy, carbamoyl, hydroxysulfonyl, C_1–C_4-alkylsulfonyl, phenylsulfonyl which is unsubstituted or substituted by ethyl, chloro, or isopropoxy, sulfamoyl or trifluoromethyl or is C_1–C_4-alkyl which is unsubstituted or substituted by hydroxyl, C_1–C_4-alkoxy or halogen, and

X and Y are each, independently of one another, halogen, hydroxysulfonyl, C_1–C_4-alkoxy or phenoxy which is unsubstituted or substituted by methyl or chloro, or phenoxy, subject to the proviso that at least one of X and Y is halogen.

4,927,936

QUINOLINE DERIVATIVES

Roger Crossley, Reading, and Kenneth Heatherington, Burnham, both of United Kingdom, assignors to John Wyeth and Brother Ltd., Maidenhead, England

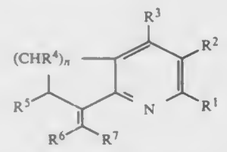
Continuation-in-part of Ser. No. 571,972, Jan. 18, 1984, Pat. No. 4,837,329. This application Dec. 16, 1988, Ser. No. 285,907

Claims priority, application United Kingdom, Jan. 19, 1983, 8301377

Int. Cl.[5] C07D *215/04*

U.S. Cl. 546—181 5 Claims

1. A compound of formula II



II

or a pharmaceutically acceptable salt thereof, wherein

R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are, independently, hydrogen, or alkyl of 1 to 6 carbon atoms, cycloalkyl of 4 to 6 carbon atoms or aralkyl of 7 to 12 carbon atoms, any of which radicals may be monosubstituted by alkyl or 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, or —CF_3 or phenyl radicals which may be monosubstituted by alkyl of 1 to 6 carbon atoms or —CF_3;

or R^2 and R^3, taken together, form a 5, 6 or 7 membered saturated carbocyclic ring;

R^4 and R^5 may also be alkoxy of 1 to 6 carbon atoms or cycloalkoxy of 4 to 6 carbon atoms;

n is one of the integers 1, 2 or 3;

and, if more than one R^4 group is present, the R^4 groups may be the same or different;

with the provisos that (1) when R^1, R^2, R^3, R^4, and R^5 are all hydrogen, R^6 and R^7 are not both hydrogen, (2) when R^1 and R^3 are both phenyl and when R^1 is methyl and R^4 is methyl, R^6 and R^7 are not both methyl, and (3) when R^1 is hydrogen or methyl, R^3 is hydrogen or methyl and R^2, R^4, R^5, and R^6 are all hydrogen, then R^7 is other than unsubstituted phenyl.

4,927,937

PHARMACOLOGICALLY ACTIVE ε-VALEROLACTAMS

Ming-he Yang; Yan-rong Chen; Geng-tao Liu, and Liang Huang, all of Beijing, China, assignors to Chinese Academy of Medical Science, Beijing, China and Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

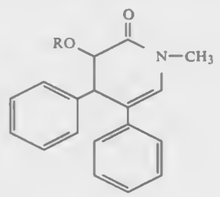
Continuation-in-part of Ser. No. 181,846, Apr. 15, 1988, abandoned, which is a continuation of Ser. No. 4,984, Jan. 20, 1987, abandoned. This application Apr. 19, 1989, Ser. No. 340,614

Claims priority, application United Kingdom, Jan. 20, 1986, 8601257

Int. Cl.[5] C07D *211/76*

U.S. Cl. 546—296 4 Claims

1. A substantially pure compound of the formula



wherein

R represents hydrogen or an acyl group having 1 to 18 carbon atoms.

4. A method for the isolation of the substantially pure compound according to claim 3 from the leaves of *Clausenia lausium* which comprises the steps of:

(a) heating leaves of *Clausenia lausium* with the boiling water,

(b) adding dilute acid to the concentrated aqueous extract,

(c) passing the supernatant through a column of cation ion exchange resin,

(d) treating the resin with a base,

(e) extracting the resin with an organic solvent,

(f) chromatographing the concentrated extract on silica or aluminum oxide column with chloroform, methylene chloride, ether or chloroform/methanol mixture as the eluting agent and

(g) collecting and concentrating the eluate with an R_f-value of 0.53 on TLC (silica gel plate, $CHCl_3$:meOH=97:3 as electing agent).

4,927,938

HALOGEN SUBSTITUTED PYRIDYLALKYL KETONES

Hans Lindel, Leverkusen, and Werner Hallenbach, Langenfeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

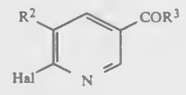
Filed Jul. 6, 1988, Ser. No. 215,683

Claims priority, applicatioo Fed. Rep. of Germany, Jul. 11, 1987, 3723070

Int. Cl.[5] C07D *213/50*

U.S. Cl. 546—315 1 Claim

1. A compound of the formula



(II)

in which

Hal and R^2 each independently is halogen and R^3 is alkyl.

4,927,939

CARDIOTONIC AROYLTHIAZOLONES

J. Martin Grisar, Wissembourg, France; Richard C. Dage, and Richard A. Schnettler, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals, Cincinnati, Ohio

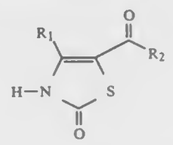
Continuation of Ser. No. 787,226, Oct. 15, 1985, abandoned. This application Mar. 17, 1987, Ser. No. 27,066

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[5] C07D *277/34*

U.S. Cl. 548—188 9 Claims

1. A compound of the formula



wherein

R_1 is a hydrogen or (C_1–C_4) alkyl group, and

R_2 is an unsubstituted benzyl or a phenyl or benzyl substituted with one or two members of the group consisting of (C_1–C_4) alkyl, (C_1–C_4) alkoxy, carboxy, carb(C_{11}–C_4)alkoxy, imidazolyl, (C_1–C_4) alkylthio, (C_1–C_4) alkylsulfinyl, (C_1–C_4) alkylsulfonyl, trifluoromethyl, cyano, amino, mono- and di- (C_1C_4) alkylamino, pyrrolidino, piperidino, morpholino, piperazino N-(C_1–C_4) alkyl-piperazino or halogen group or a methylenedioxy group.

4,927,940

PROCESS FOR LOW CHLORIDE 1,2,4-TRIAZOL-5-ONE

Max M. Boudakian, Pittsford, and Delmer A. Fidler, Rochester, both of N.Y., assignors to Olin Corporation, Cheshire, Conn.

Filed May 1, 1989, Ser. No. 345,376

Int. Cl.[5] C07D *249/12*

U.S. Cl. 548—263.2 15 Claims

1. A process for producing 1,2,4-triazol-5-one which comprises reacting an aqueous hydrazine solution with urea to form a reaction mixture of semicarbazide and ammonia, concentrating the reaction mixture, adding an aqueous solution of a mineral acid to form a slurry of a salt of semicarbazide, admixing a formic acid compound with the slurry, and heating the slurry to produce 1,2,4-triazol-5-one.

4,927,941

FLUORINE-CONTAINING NITROAZOLE DERIVATIVES AND RADIOSENSITIZER COMPRISING THE SAME

Tsutomu Kagiya; Mitsuyuki Abe, both of Kyoto; Seiichi Nishimoto, Nara; Yuta Shibamoto, Kyoto; Kazuhiro Shimokawa, Settsu; Yorisato Hisanaga, Ibaraki; Tatsuo Nakada, and Toru Yoshizawa, both of Osaka, all of Japan, assignors to Yasunori Nishijima & Daikin Industries Ltd., Kyoto, Japan

Filed Jun. 9, 1988, Ser. No. 204,367

Claims priority, application Japan, Jun. 10, 1987, 62-147459; Jun. 24, 1987, 62-156787; Sep. 26, 1987, 62-241574; Dec. 10, 1987, 62-314686; Jan. 29, 1988, 63-20456; Mar. 31, 1988, 63-79230

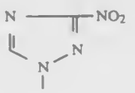
Int. Cl.[5] C07D *249/10*

U.S. Cl. 548—264.8 1 Claim

1. A nitroazole derivative of the formula:

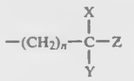
$NA\text{-}R_f$ (I)

wherein NA represents 3-nitro-1,2,4-triazol-1-yl of the formula:



(II)

and R_f is a fluorine-containing organic group



(IV)

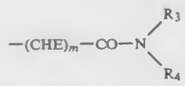
wherein X is a hydrogen atom or a fluorine atom; Y is a fluorine atom, a chlorine atom, a trifluoromethyl group, a methyl group or a hydroxy group, or X and Y together represent =O; Z is a hydrogen atom, a fluorine atom, a C_1–C_5 alkyl or a C_1–C_5 fluoroalkyl group which may be substituted with hydroxy, a group of the formula:

$$-(CHE)_m-CO-OR_1 \quad (V)$$

wherein R_1 is a hydrogen atom or a C_1–C_5 alkyl or a C_1–C_5 fluoroalkyl group, E is a hydrogen atom or a fluorine atom and m is 0 or 1,

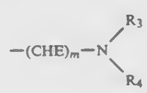
$$-CO-R_2 \quad (VI)$$

wherein R_2 is a C_1–C_5 alkyl or a C_1–C_5 fluoroalkyl group,



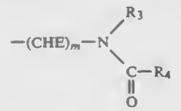
(VII)

wherein R_3 and R_4 are the same or different and a hydrogen atom, a hydroxy group or a C_1–C_5 alkyl or a C_1–C_5 fluoralkyl group which may be substituted with a hydroxy group, a C_1–C_5 alkoxy group or an amide group, or R_3 and R_4 forms a 3 to 6 membered ring together with the nitrogen atom to which they bond, and E and m are the same as defined above,



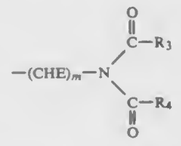
(VIII)-(1)

wherein R_3, R_4, E and m are the same as defined above,



(VIII)-(2)

wherein R_3, R_4, E and m are the same as defined above,

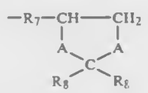


(VIII)-(3)

wherein R_3, R_4, E and m are the same as defined above,

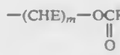
$$-(CHE)_m-A-R_5 \quad (IX)$$

wherein A is an oxygen atom or a sulfur atom, R_5 is a hydrogen atom, a C_1–C_5 alkyl or a C_1–C_5 fluoroalkyl group which may be substituted with a hydroxy group, a C_1–C_5 alkoxy group or a C_1–C_5 oxyacyl group, a group of the formula: —CO—R_6 in which R_6 is a C_1–C_5 alkyl group,



(X)

wherein R_7 is a C_1–C_7 alkylene group, R_8 is a C_1–C_3 alkyl group and A is the same as defined above, or



(XI)

wherein R_5 is a C_1–C_5 alkyl or a C_1–C_5 fluoroalkyl group and E and m are the same as defined above, Y and Z may together form =CF—CF_3 or =CHOR_6 in which R_6 is the same as defined above, and n is 0 or 1.

4,927,942

METHOD FOR THE PREPARATION OF IMIDAZOLES

George P. Speranza, and Wei-Yang Su, both of Austin, Tex., assignors to Texaco Chemical Co., White Plains, N.Y.

Filed Dec. 15, 1988, Ser. No. 284,884

Int. Cl.[5] C07D *233/58*

U.S. Cl. 548—335 **13 Claims**

1. In a method for preparation of imidazoles by dehydrogenation of imidazolines over a nickel catalyst, the improvement comprising reacting the imidazoline over a catalyst selected from the group consisting of nickel-copper, nickel-chromium and nickel-copper-chromium at a temperature of 160° C. to 300° C. and a pressure of atmospheric to 500 psig.

4,927,943

SUBSTITUTED 7-OXOMITOSANES

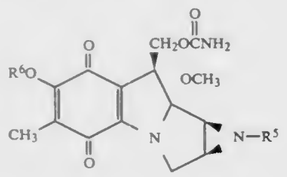
Dolatrai M. Vyas; Terrence W. Doyle, both of Fayetteville, and Richard A. Partyka, Liverpool, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 160,474, Feb. 25, 1988, Pat. No. 4,814,445, which is a continuation of Ser. No. 744,570, Jun. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,888, Sep. 4, 1984, abandoned. This application Nov. 7, 1988, Ser. No. 267,601

Int. Cl.[5] C07D *487/14*; A61K *31/40*

U.S. Cl. 548—422 **1 Claim**

1. A compound having formula IX



IX

wherein R^6 is 2-benzylthio)ethyl and R^5 is hydrogen.

4,927,944

ANTIHYPERCHOLESTEROLEMIC NITRILE COMPOUNDS

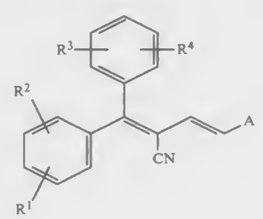
Sing-Yuen Sit, Meriden, and John J. Wright, Guilford, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Filed Aug. 25, 1988, Ser. No. 236,563

Int. Cl.[5] C07D *309/30*

U.S. Cl. 549—292 **4 Claims**

1. A compound of the formula

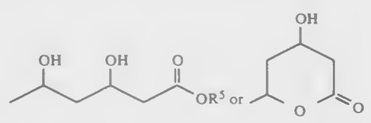


I

wherein

R^1, R^2, R^3 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy or trifluoromethyl;

A is



and

R^5 is hydrogen, a hydrolyzable ester group or a cation to form a non-toxic pharmaceutically acceptable salt.

4,927,945

PROCESS FOR PREPARING DIPHENYL ETHERS

Stuart P. Briggs, Faversham, and Derek A. Wood, Sittingbourne, both of England, assignors to Shell Internationale Research Maatschappij, B.V., The Hague, Netherlands

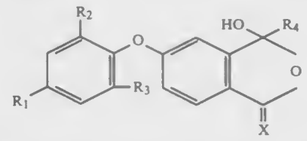
Filed Aug. 9, 1988, Ser. No. 230,104

Claims priority, application United Kingdom, Sep. 1, 1987, 8720511

Int. Cl.[5] C07D *307/00*

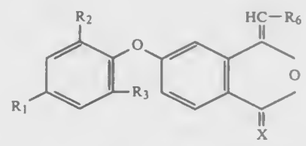
U.S. Cl. 549—305 **14 Claims**

1. A process for the preparation of a diphenyl ether derivative of formula II



(II)

wherein R_1 represents a hydrogen or halogen atom or an alkyl or haloalkyl group, R_2 and R_3, which may be the same or different, each independently represents a hydrogen or halogen atom, or an alkyl, haloalkyl, nitro or cyano group, R_4 represents and alkyl group and X represents an oxygen or sulphur atom, comprising hydrolysing a compound of formula III



(III)

where R_1, R_2, R_3 and X are as defined above and R_6 is a hydrogen atom or an alkyl group, with an alkali metal hydroxide under hydrolysing conditions, said hydrolysis step being undertaken in aqueous solution at a temperature ranging from ambient to the refluxing temperature of said solution.

4,927,946

PROCESS FOR THE PREPARATION OF 5-BROMO-5-NITRO-1,3-DIOXANE

Willi Wuest, Ratingen; Rainer Eskuchen, Duesseldorf; Herbert Esser, Troisdorf, and Hasso Leischner, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 1, 1989, Ser. No. 345,918

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1988, 3814774

Int. Cl.[5] C07D *319/06*

U.S. Cl. 549—371 **16 Claims**

1. A process for the preparation of 5-bromo-5-nitro-1,3-dioxane comprising the steps of

A. brominating an alkali metal salt and/or a water-soluble alkaline-earth metal salt of 2-nitro-1,3-propanediol by adding said salt to a mixture of bromine and aqueous hydrobromic acid while controlling the temperature of the reaction mixture so that it does not exceed about 30° C. by both cooling the reaction mixture and controlling the rate of addition of said salt to form a reaction mixture containing 2-bromo-2-nitro-1,3-propanediol;

B. adding to the reaction mixture containing 2-bromo-2 nitro-1,3-propanediol from step A. paraformaldehyde and sulfuric acid and carrying out the reaction at a temperature in the range of from about 70° C. to about 110° C. to form a reaction mixture containing 5-bromo-5-nitro-1,3-dioxane;

C. allowing the reaction mixture from step B. to separate into an aqueous phase and an organic phase which contains 5-bromo-nitro-1,3-dioxane; and

D. separating the organic phase from the aqueous phase.

4,927,947

ETHYNYLHETEROAROMATIC-ACIDS HAVING RETINOIC ACID-LIKE ACTIVITY

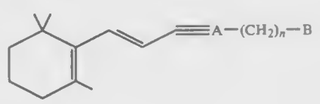
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 180,649, Apr. 1, 1988, abandoned, which is a continuation of Ser. No. 946,729, Dec. 24, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 303,864

Int. Cl.[5] C07D *307/02, 237/02, 241/02*

U.S. Cl. 549—484 **3 Claims**

1. A compound of the formula



I

where

A is furyl;

n is 0–5; and

B is H, —COOH or its esters, amides and pharmaceutically acceptable salts, —CHO and its acetal derivatives, —CH_2OH and its ether and acyl ester derivatives, or —COR_1 and its ketal derivatives where R_1 is —$(CH_2)_nCH_3$ where n is defined above; or a pharmaceutically acceptable salt.

4,927,948

PROCESS FOR STABILIZING ORGANOSILANES CONTAINING METHACRYLOXY OR ACRYLOXY GROUPS

Günther Bernhardt, Sankt Augustin; Jürgen Amort; Heinz Kragl, both of Troisdorf, and Margret Haas, Cologne, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

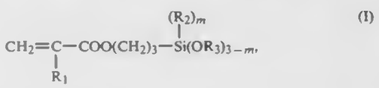
Filed Sep. 19, 1989, Ser. No. 409,604

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1988, 3832621

Int. Cl.[5] C07F *7/08, 7/18*

U.S. Cl. 556—401 **3 Claims**

1. The method of stabilizing organosilanes containing methacryloxy groups or acryloxy groups of the formula



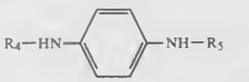
(I)

wherein R1 is hydrogen or methyl,

R_2 and R_3, which may be identical to or different from each other, are each individually alkyl of 1 to 4 carbon atoms, and

m is 0, 1 or 2, which comprises using as a stabilizer a mixture comprising

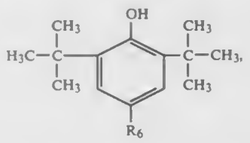
(a) at least one N,N'-di-substituted-p-phenylenediamine of the formula



(II)

wherein T_4 and R_5, which may be identical to or different from each other, are each individually phenyl, naphthyl, straight or branched alkyl of 3 to 8 carbon atoms or cyclohexyl, and

(b) at least one substituted phenol of the formula



(III)

wherein R_6 is alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms.

4,927,949

METHOD OF PREPARING AN AMINOALKYLALKOXYSILANE

Keiji Kabeta, and Michio Zenbayashi, both of Gunma, Japan, assignors to Toshiba Shilicone Co., Ltd., Tokyo, Japan

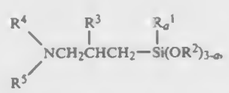
Filed Sep. 13, 1989, Ser. No. 406,728

Claims priority, application Japan, Sep. 30, 1988, 63-246097

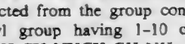
Int. Cl.[5] C07F *7/10*

U.S. Cl. 556—413 **4 Claims**

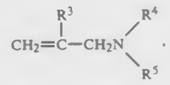
1. A method of preparing an aminoalkylalkoxysilane of the formula:



in which R^1 and R^2 independently are alkyl groups having 1–8 carbon atoms, R^3 is a hydrogen atom or an alkyl group having 1–6 carbon atoms, R^4 and R^5 independently are a member selected from the group consisting of a hydrogen atom, an alkyl group having 1–10 carbon atoms, $—CH_2CH_2NH_2$, $—CH_2CH_2NHCH_2CH_2NH_2$, an allyl group, a substituted phenyl group and a nonsubstituted phenyl group and a is an integer from 0–2, comprising the step of reacting an alkoxysilane of the formula:



where R^1, R^2 and a are described above, with an allylamine of the formula:



where R^3, R^4 and R^5 are as described above, in the presence of a catalyst composition selected from the group consisting of (1) a rhodium complex catalyst and a heterocyclic compound containing nitrogen and/or sulfur atoms and (2) a rhodium complex catalyst having a heterocyclic compound containing nitrogen and/or sulfur atoms as a ligand.

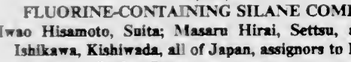
4,927,950

FLUORINE-CONTAINING SILANE COMPOUNDS

Iwao Hisamoto, Suita; Masaru Hirai, Settsu, and Sueyoshi Ishikawa, Kishiwada, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Mar. 8, 1985, Ser. No. 709,681
Claims priority, application Japan, Mar. 9, 1984, 59-46069
Int. Cl.[5] C07F *7/08, 7/10, 7/18*
U.S. Cl. 556—419 **4 Claims**

1. A fluorine-containing silane compound of the formula:



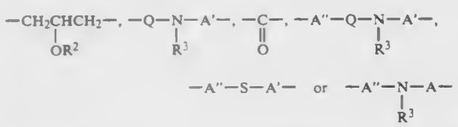
(I)

wherein

R_f is a fluorine-containing C_4–C_{18} aliphatic group,

R^1 is hydrogen or a C_1–C_4 alkyl group,

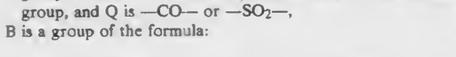
A is a straight or branched C_1–C_{12} alkylene group or a group of the formula:



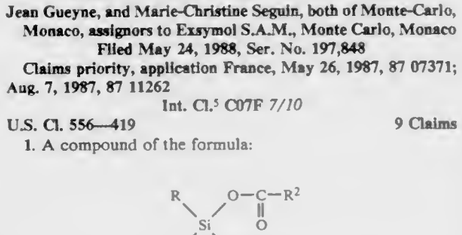
in which

R^2 is hydrogen or a C_1–C_3 acyl group, R^3 is a C_1–C_6 acyl group, A′ is a C_2–C_8 alkylene group, A″ is a C_1–C_4 alkylene group, and Q is —CO— or $—SO_2—$,

B is a group of the formula:



-continued



in which

R^4 and R^5 are each a straight or branched C_2 or C_3 alkylene group, and p is 2 or 3,

X is chlorine or a C_1–C_3 alkoxy group,

X′ is chlorine or a C_1–C_3 alkyl or alkoxy group, a phenyl group or a glycidyl group,

m is 0 or 1, and

n is an integer of 5 to 40.

4,927,951

ORGANOSILICON COMPOUND

Keiji Kabeta, and Kiyoaki Syuto, both of Gunma, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1989, Ser. No. 424,394
Claims priority, application Japan, Nov. 30, 1988, 63-303070
Int. Cl.[5] C07F *7/10*
U.S. Cl. 556—419 **6 Claims**

1. An organosilicon compound of the general formula:



where R^1 is a methyl group or hydrogen atom, R^2 is a substituted or unsubstituted monovalent hydrocargon group, Q is a divalent hydrocarbon group having 1–8 carbon atoms, A is a hydrogen atom, substituted or unsubstituted hydrocarbon group or $—QSiR_n^2[OSi(CH_3)_3]_{3-n}$, and n is an integer from 0–2.

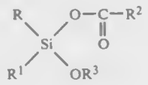
4,927,952

SILANOL CONDENSATION PRODUCTS

Jean Gueyne, and Marie-Christine Seguin, both of Monte-Carlo, Monaco, assignors to Exsymol S.A.M., Monte Carlo, Monaco

Filed May 24, 1988, Ser. No. 197,848
Claims priority, application France, May 26, 1987, 87 07371; Aug. 7, 1987, 87 11262
Int. Cl.[5] C07F *7/10*
U.S. Cl. 556—419 **9 Claims**

1. A compound of the formula:



wherein: R and R^1 are alkyl groups, alkenyl groups, alkoxy groups, cycloalkyl groups, hydrocarbon aryl groups, unsubstituted or substituted with halogen, hydroxyl, acyl or alkoxy groups, or amide groups of up to 18 carbon atoms or hydroxy; R^2 and R^3 independently are alkyl groups, alkenyl groups, alkoxy groups, cycloalkyl groups, cycloalkenyl groups, hydrocarbon aryl groups or aryloxy groups of up to 18 carbon atoms or are linked to form a ring; and wherein at least one of the R^2 and R^3 groups contain an NH_2 or NH moiety.

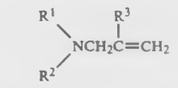
4,927,953

PROCESS FOR PREPARING AMINOPROPYL SILANES

Kazutoshi Takatsuna; Kouji Shiozawa, and Yoshiharu Okumura, all of Iruma, Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Sep. 11, 1989, Ser. No. 404,964
Claims priority, application Japan, May 31, 1989, 1-138181
Int. Cl.[5] C07F *7/10*
U.S. Cl. 556—413 **4 Claims**

1. A process for preparing aminopropyl silanes which comprises reacting an allylamine of the formula [I]



[I]

wherein R^1 and R^2, each represents hydrogen, alkyl having from 1 to 10 carbon atoms, alkenyl having from 2 to 10 carbon atoms, phenyl, substituted phenyl, $—CH_2CH_2NHCH_2CH_2NH_2$ *or* $—CH_2CH_2NH_2$, and R^3 is hydrogen or alkyl having from 1 to 6 carbon atoms with a hydrosilane in the presence of a ruthenium compound having at least one tertiary phosphine ligand as a catalyst.

4,927,954

CONTINUOUS PROCESS FOR PRODUCING SECONDARY ALCOHOLS AND CARBOXYLIC ACID ESTERS

Robert J. Knopf, St. Albans; Louis F. Theiling Jr., Charleston, both of W. Va., and Leroy P. Berti, Houston, Tex., assignors to Union Carbide Chemicals and Plastics Company, Inc., Danbury, Conn.

Continuation of Ser. No. 198,245, May 25, 1988, abandoned, which is a continuation of Ser. No. 508,561, Jun. 28, 1983, abandoned. This application Apr. 19, 1989, Ser. No. 341,270
Int. Cl.[5] C07C *67/04, 67/02, 27/00*
U.S. Cl. 558—441 **15 Claims**

1. A continuous process for co-producing secondary alcohols of long-chain olefins and lower carboxylic acid esters, comprising the steps of:

(A) passing a mixture of a long-chain α-olefin, and optionally the internal olefin isomers thereof, together with a lower carboxylic acid through a reaction zone in the presence of an amount sufficient to catalyze the conversion of said olefins and carboxylic acids to secondary alcohol carboxylates of an acidic heterogeneous catalyst under conditions at which the corresponding oxylation reaction will occur, thereby producing mixtures of isomeric secondary alcohol carboxylates;

(B) recovering the mixture of isomeric carboxylates produced in step (A);

(C) mixing the recovered carboxylates with a lower aliphatic alcohol in a pre-reaction zone in the presence of an amount sufficient to catalyze the pre-reaction of said carboxylates and lower aliphatic alcohol to said secondary alcohols of long-chain olefins and lower carboxylic acid esters of an ester exchange catalyst under conditions at which pre-reaction will occur;

(D) after the pre-reaction, passing the recovered carboxylates and a lower aliphatic alcohol, wherein the molar concentration of lower aliphatic alcohol is greater than the molar concentration of said carboxylates, through a reactive distillation still in the presence of an amount sufficient to catalyze the conversion of said carboxylates and lower aliphatic alcohol to said secondary alcohols of long-chain olefins and lower carboxylic acid esters of an ester exchange catalyst under conditions at which the ester exchange will occur, thereby producing, as coproducts, secondary alcohols of said long-chain olefins and carboxylates of said lower aliphatic alcohols; and

(E) removing said carboxylates overhead and said secondary alcohols in the tails.

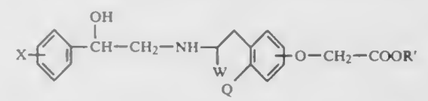
4,927,955

PROCESS FOR THE O-ALKYLATION OF N-(HYDROXY)ARALKYLPHENYLETHANOLAMINES

Robert Bolgegrain, Castelnau Le Lez, France; Roberto Cecchi, Lodi-Milan, and Sergio Boveri, Tortona, both of Italy, assignors to Sanofi, Paris, France

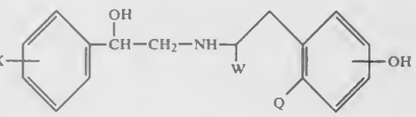
Filed Aug. 11, 1988, Ser. No. 230,860
Claims priority, application France, Aug. 12, 1987, 87 11498; Jun. 14, 1988, 88 07948
Int. Cl.[5] C07C *101/42*
U.S. Cl. 560—45 **6 Claims**

1. A process for the preparation of compounds of formula



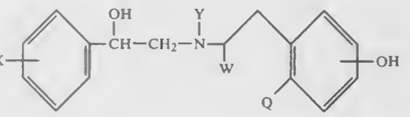
wherein X is hydrogen, halogen, a trifluoromethyl group or a lower alkyl group; W represents methyl, Q represents hydrogen or W and Q, together, form an ethylene group and R′ represents a lower alkyl group and of their pharmaceutically acceptable salts, which comprises

(a) protecting the amino group of a compound of formula



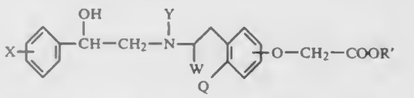
wherein X, W and Q are as defined hereinabove;

(b) submitting the compound thus obtained of formula



wherein X, W and Q are as defined hereinabove and Y is a N-protecting group, to an alkylation with a compound of formula Hal—CH_2—COOR′, wherein R′ is as defined hereinabove and Hal is chlorine, bromine or iodine;

(c) deprotecting the amino group of the compound thus obtained of formula



wherein X, Y, W, Q and R′ are as defined hereinabove; and optionally transforming the product thus obtained into one of its pharmaceutically acceptable salts.

4,927,956

3,5-DISUBSTITUTED-4-ACETOXYSTYRENE AND PROCESS FOR ITS PRODUCTION

Richard Vicari, Chatham Township, Morris County, N.J.; Mohammad Aslam, Corpus Christi; Wilson B. Ray, Beeville, both of Tex.; Kenneth G. Davenport, Hofheim, Fed. Rep. of Germany; Ralph Dammel, Mainz-Bretzenheim, Fed. Rep. of Germany; Juergen Lingnau, Mainz-Laubenheim, Fed. Rep. of Germany, and Karl-Friedrich Doessel, Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Celanese Corporation, Somerville, N.J.

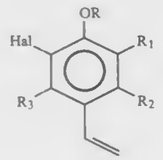
Division of Ser. No. 226,260, Aug. 2, 1988, which is a continuation-in-part of Ser. No. 97,809, Sep. 16, 1987, abandoned. This application Jun. 2, 1989, Ser. No. 360,803

Int. Cl.[5] C07C *69/14*

U.S. Cl. 560—130 **5 Claims**

1. 3,5-disubstituted-4-acetoxystyrene wherein said substitution is independently C_1 to C_{10} alkyl or alkoxy, or amino.

3. 4-hydroxy- and 4-acetoxystyrene compounds having the formula:



wherein:

R is hydrogen or acetyl; and

Hal is chlorine or bromine; and

R1, R2 and R3 are independently hydrogen, alkyl, alkoxy, or halogen; and

wherein R1 and R2 may optionally be combined to form a cycloaliphatic ring, consisting of 6 to 12 members; and

wherein, when R is acetyl at least one of R_1, R_2 and R_3 and are not hydrogen, and when R is hydrogen, at least two of R_1, R_2 and . R_3 and are not hydrogen.

4,927,957

CATALYTIC DIMERIZATION OF ALKYL ACRYLATES

Robert Perron, Charly, and Sylvain Mutez, Irigny, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Aug. 19, 1988, Ser. No. 234,154

Claims priority, application France, Aug. 19, 1987, 87 11831

Int. Cl.[5] C07C *67/465*

U.S. Cl. 560—202 **10 Claims**

1. A process for the preparation of an alkyl diester, comprising catalytically dimerizing at least one lower alkyl acrylate in the presence of a catalytically effective amount of palladium, tetrafluoroboric acid and a hydrogenophosphonium tetrafluoroborate, and wherein the palladium concentration ranges from 0.1 to 3 mmol per mole of said at least one alkyl acrylate, the reaction temperature ranges from 70° to 150° C. and the hydrogenophosphonium tetrafluoroborate concentration is at least 6 mmol per mole of said at least one alkyl acrylate.

4,927,958

STYRYL KETONES

Albert Fischli, Riehen, Switzerland; Eva-Maria Gutknecht, Buggingen-Seefelden, Fed. Rep. of Germany, and Daniel Obrecht, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

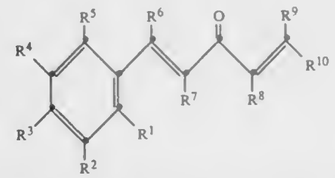
Filed Mar. 17, 1988, Ser. No. 169,570

Claims priority, application Switzerland, Mar. 20, 1987, 1071/87

Int. Cl.[5] C07C *69/76*

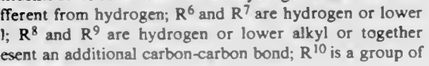
U.S. Cl. 560—53 **26 Claims**

1. A compound of the formula



I

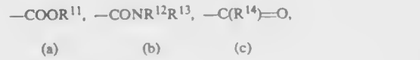
wherein R^1, R^2, R^3, R^4 and R^5 are independently hydrogen, halogen, lower alkyl, lower alkoxy-lower alkyl, hydroxy, lower alkoxy, lower alkenyloxy, lower alkynyloxy, lower alkoxy-lower alkoxy, acyloxy, aryl-lower alkoxy, lower alkylthio, lower alkoxy-lower alkythio, lower alkenylthio, lower alkynylthio, aryl-lower alkylthio, optionally substituted amino or trifluoromethyl or two of these substituents which are adjacent jointly and together with the carbon atoms to which they are attached form a 5- to 7-membered ring, provided that of the substituents R^1 to R^5 at least two are hydrogen and at least one is different from hydrogen; R^6 and R^7 are hydrogen or lower alkyl; R^8 and R^9 are hydrogen or lower alkyl or together represent an additional carbon-carbon bond; R^{10} is a group of the formula



(a) (b) (c)



(d) (e)



(f)

R^{11} is hydrogen, lower alkyl, lower alkenyl, lower alkoxy-lower alkyl, lower alkoxy-lower-alkoxy-lower alkyl, aryl or aryl-lower alkyl; R^{12} and R^{13} are hydrogen or lower alkyl or jointly and together with the nitrogen atom represent a 5- to 7-membered saturated heterocyclic group; R^{14} is lower alkyl, or aryl-lower alkyl; R^{15} is hydrogen, lower alkyl, aryl or aryl-lower alkyl; R^{16} is lower alkyl or lower alkoxy-lower alkyl; R^{17} is lower alkyl; R^{18} and R^{19} are hydrogen, lower alkyl, aryl or aryl-lower alkyl; and R^{20} is hydrogen, lower alkyl, lower alkoxy-lower alkyl, lower alkenyl, lower alkynyl, acyl or aryl-lower alkyl;

wherein the double bond(s) present in the molecule has (have) the E- and/or Z-configuration; or a pharmaceutically acceptable salt of an acidic compound of formula I with a base or of a basic compound of formula I with an acid.

4,927,959

ALPRENOLOL DERIVATIVES

Shinichi Shimada, Utsunomiya; Noboru Kawaguchi; Tadayoshi Koyama, both of Ishibashi; Akinori Wakaiki, Ishibashi; Keiji Hayashi, Ishibashi; Yasuyoshi Takeshita; Masamichi Nakakoshi, both of Utsunomiya, and Gosei Kawanishi, Ichikawa, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

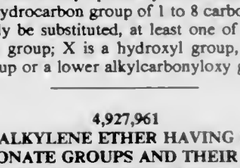
Filed Sep. 2, 1988, Ser. No. 239,663

Claims priority, application Japan, Sep. 4, 1987, 62-220268

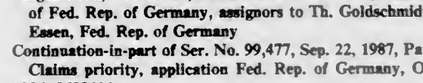
Int. Cl.[5] C07C *69/353, 69/593*

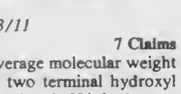
U.S. Cl. 560—193 **5 Claims**

1. An alprenolol derivative of the formula:



wherein R is





and a hydrochloride thereof.

4,927,960

PHOSPHONIUM SALTS AND PROCESSES FOR PRODUCTION OF AND USES FOR THE SAME

Toshihiko Maeda; Yasuo Tokitoh, and Noriaki Yoshimura, all of Kurashiki, Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

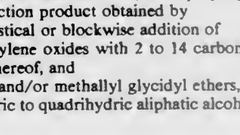
Filed Jun. 24, 1988, Ser. No. 211,034

Claims priority, application Japan, Jun. 24, 1987, 62-158290

Int. Cl.[5] C07C *53/00*

U.S. Cl. 562—512 **9 Claims**

1. A phosphonium salt of the general formula



(I)

wherein R^1 and R^2 each is a hydrogen atom or a hydrocarbon group of 1 to 12 carbon atoms which may optionally be substituted, R^3 is a hydrogen atom or a hydrocarbon group of 1 to 5 carbon atoms which may optionally be substituted; R^4, R^5 and R^6 each is a hydrocarbon group of 1 to 8 carbon atoms which may optionally be substituted, at least one of R^4, R^5 and R^6 being an aryl group; X is a hydroxyl group, a hydroxycarbonyloxy group or a lower alkylcarbonyloxy group.

4,927,961

POLYOXYALKYLENE ETHER HAVING HYDROXYL AND SULFONATE GROUPS AND THEIR USE IN THE PREPARATION OF DISPERSABLE POLYURETHANES

Jürgen Fock, Dusseldorf, and Dietmar Schedlitzki, Essen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 99,477, Sep. 22, 1987, Pat. No.

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633421

Int. Cl.[5] C07C *143/11*

U.S. Cl. 562—103 **7 Claims**

1. Polyoxyalkylene ether with an average molecular weight of 400 to 10,000 and having at least two terminal hydroxyl groups and at least one —SO_3X group wherein X is hydrogen, alkali metal or ammonium ion, said polyoxyalkylene ether being the reaction product obtained by

(i) the statistical or blockwise addition of

(a) α-alkylene oxides with 2 to 14 carbon atoms or mixtures hereof, and

(b) allyl and/or methallyl glycidyl ethers,

to dihydric to quadrihydric aliphatic alcohols with up to 8 carbon atoms, the ratio of component (a) to component (b) being selected so that at least one allyl ether group is linked to the average molecule, and

(ii) reacting the polymer thus obtained with, based on the allyl ether groups, at least equimolar amounts of a compound of the formula HSO_3Y, wherein Y is alkali metal or ammonium ion.

4,927,962

PROCESS OF PREPARING FLUOROCARBON CARBOXYLIC OR SULFONIC ACID FROM ITS FLUORIDE

Minoru Aramaki; Hiroaki Sakaguchi, and Tamio Nakamura, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Aug. 29, 1988, Ser. No. 237,072

Claims priority, application Japan, Aug. 31, 1987, 62-215195; Aug. 31, 1987, 62-215197; Sep. 29, 1987, 62-242602

Int. Cl.[5] C07C *143/02, 51/42*

U.S. Cl. 562—113 **12 Claims**

1. A process of preparing a fluorocarbon carboxylic acid represented by the formula $Rf(COOH)_m$, wherein Rf is a saturated or unsaturated perfluoroalkyl group having 1 to 10 carbon atoms, and m is 1 or 2, the process comprising the steps of:

(a) hydrolyzing a fluorocarbon carbonyl fluoride represented by the formula $Rf(COF)_m$ with water to thereby obtain an aqueous solution of said fluorocarbon carboxylic acid;

(b) mixing said aqueous solution with an aqueous solution of KOH to thereby obtain an aqueous solution in which a potassium salt of said fluorocarbon carboxylic acid is dissolved together with KF;

(c) partly evaporating water of the aqueous solution obtained at step (b) and thereafter cooling the solution to thereby precipitate said potassium salt from the solution and separating said potassium salt from the solution;

(d) adding a hydroxide of a metal selected from the group consisting of alkali metals except potassium and alkaline earth metals to the aqueous solution from which said potassium salt was separated to cause formation of KOH and precipitation of fluoride of said metal by reaction of said KF with said hydroxide and separating the precipitated fluoride from the solution;

(e) adding KOH to the aqueous solution from which the metal fluoride was separated and recycling the resultant aqueous solution of KOH to step (b); and

(f) subjecting the separated potassium salt obtained in step (c) to acid decomposition to thereby convert the potassium salt into said fluorocarbon carboxylic acid.

4,927,963

NOVEL PROCESSES FOR THE SYNTHESIS OF CERTAIN BICYCLO(4.2.0)OCTANE DERIVATIVES WITH VALUABLE THERAPEUTIC PROPERTIES

Keith A. M. Walker, Los Altos Hills, and Denis J. Kertesz, Mountain View, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

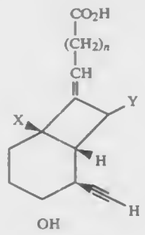
Filed Apr. 28, 1989, Ser. No. 346,425

Int. Cl.[5] C07C *62/32*

U.S. Cl. 562—501 **11 Claims**

1. A compound, as a single stereoisomer or a mixture of stereoisomers, represented by the formula (10):

VOL 1114 ISS 4 MY 22 1990 UMI



(10)

wherein:
X is hydrogen or lower alkoxy;
Y is hydrogen, exo-(lower alkyl) or endo-(lower alkyl); and
n is an integer of 2–4.

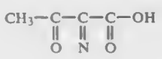
4,927,964

METHOD FOR PRODUCTION OF 2-OXYIMINO-3-OXOBUTYRIC ACIDS

Kenzo Naito, Kyoto; Yukio Ishibashi, Osaka, and Haruo Shinbo, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

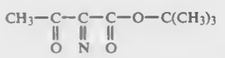
Filed Jan. 11, 1989, Ser. No. 295,510
Claims priority, application Japan, Jan. 18, 1988, 63-9271
Int. Cl.[5] C07C *131/00*
U.S. Cl. 562—560 **8 Claims**

1. A method of producing a 2-substituted oxyimino-3-oxobutyric acid of the formula:



OR

wherein R is a hydrogen atom or a straight or branched alkyl group having 1 to 4 carbon atoms which may be substituted with one or two members of the group selected from a carboxyl group, C_{1-4} alkoxy-carbonyl group, a cycloalkyl group of 3 to 6 carbon atoms and a five-membered heterocyclic group, which comprises reacting a tert-butyl 2-substituted oxyimino-3-oxobutyrate of the formula:



OR

wherein R is as defined above, with a hydrogen halide in an anhydrous organic solvent.

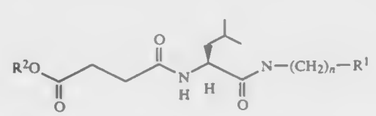
4,927,965

N-(N-SUCCINYL-L-LEUCYL)AGMATINE, RELATED COMPOUNDS AND USE IN PHARMACOLOGY

Gabriel F. Ellon, Wyndmoor, and Wayne J. Thompson, Green Lane, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 3, 1988, Ser. No. 266,609
Int. Cl.[5] C07C *129/12, 125/065*
U.S. Cl. 562—560 **5 Claims**

1. Compounds having the formula:



(1)

wherein R^1 is $-NH(C=O)OR^5$, $-NH(C=NH)NH_2$ or $-NH(C=N-NO_2)HN_2$; R^2 is hydrogen. C_{1-8}alkyl or C_{6-8}aryl; n is 2 to 6; and R^5 is hydrogen, C_{1-8}alkyl, C_{6-8}aryl, or C_{7-8}alkaryl.

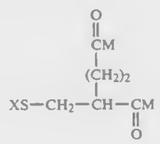
4,927,966

2-MERCAPTOMETHYLGLUTARIC ACID DERIVATIVES

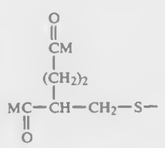
Thomas I. Kalman, East Amherst, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Jun. 4, 1987, Ser. No. 58,035
Int. Cl.[5] C07C *55/12, 149/20*; C07F *1/12, 15/04*
U.S. Cl. 562—594 **16 Claims**

1. A compound of the formula:



wherein X is selected from hydrogen, R'C—and R"—; R' is selected from alkyl, alkenyl, alkynyl, substituted and unsubstituted aryl; R" is selected from



and R'S; M is selected from OR and secondary amine; and R is selected from hydrogen, alkyl, acyloxymethyl, substituted and unsubstituted aryl, amino cation and metal cation.

4,927,967

PRODUCTION OF CARBOXYLIC ACIDS FROM ORGANIC FORMATE ESTERS USING RHODIUM COMPLEX CATALYSTS

Richard W. Wegman, South Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

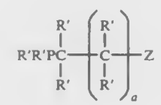
Continuation of Ser. No. 632,837, Jul. 20, 1984, abandoned. This application Nov. 6, 1985, Ser. No. 794,603
Int. Cl.[5] C07C *51/353, 53/08*
U.S. Cl. 562—607 **19 Claims**

1. A process for the production of organic carboxylic acids of the formula RCOOH which comprises the catalytic reaction of organic formate esters of the formula HCOOR in contact with carbon monoxide and a homogeneous catalyst system consisting essentially of a rhodium metal atom component, a phosphorus containing ligand in which there is present at least one oxo oxygen atom attached to a phosphorus atom or a carbon atom to form a Z group and



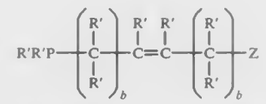
in said Z group is located at least one carbon atom removed from the phosphorus atom of the molecules represented by the formulas:

(V)

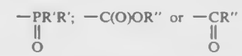


or

(VI)



and a halogen source; wherein R is an alkyl group having from 1 to 30 carbon atoms, or aryl or aralkyl groups having 6 to 10 ring carbon atoms with from 1 to 10 carbon atoms in the alk-moiety thereof, or alkenyl having from 2 to 30 carbon atoms; R' is H, aryl or aralkyl having from 6 to 10 ring carbon atoms and the alkyl moiety of said aralkyl group having 1 to 10 carbon atoms, or an alkyl group having from 1 to 10 carbon atoms; and wherein 1 or more of said R' groups can be substituted with a Z group but not more than 3 of said R' groups in the molecule are so substituted; a is an integer form 0–4; b is an integer from 0–3; and Z is a member selected from the group consisting of:



wherein R" is R' or H and said reaction is carried out at a reaction temperature up to about 170° C. and a reaction pressure up to about 450 psig.

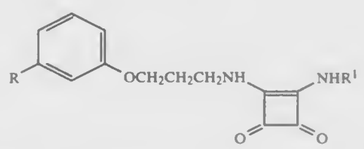
4,927,968

CHEMICAL INTERMEDIATES AND PROCESS

Aldo A. Algieri, Killingworth, Conn., and Robert F. Farney, Evansville, Ind., assignors to Bristol-Myers Company, New York, N.Y.

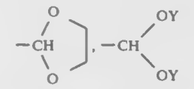
Continuation-in-part of Ser. No. 50,459, May 14, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 174,444
Int. Cl.[5] C07C *93/06*
U.S. Cl. 549—451 **5 Claims**

1. A compound of the formula



I

wherein R^1 is hydrogen or lower alkyl and R is —CHO,



—CH_2OH or —CH_2X in which X is a conventional leaving group and Y is lower alkyl.

4,927,969

PREPARATION OF ALKYL PRIMARY AMINES

Charles F. Kahle, II, Allison Park; Gregory J. McCollum, Gibsonia, and Craig A. Wilson, Bakerstown, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 2, 1988, Ser. No. 187,786
Int. Cl.[5] C09C *85/20*
U.S. Cl. 564—377 **14 Claims**

1. A process of preparing an alkyl primary amine comprising:
(a) reacting an alkyl isocyanate with an alkanolamine characterized as containing either primary or secondary amine functionality to form a urea reaction product;
(b) heating the urea reaction product for time and at temperatures sufficient to decompose the urea reaction product and form a mixture including an alkyl primary amine; and
(c) continuously separating the alkyl primary amine from the reaction mixture formed in step (b).

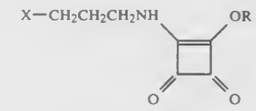
4,927,970

SUBSTITUTED 3-CYCLOBUTENE-1,2-DIONE INTERMEDIATES

James L. Douglas, Montreal West, Canada; Guy Fabre, Saint Jean de Vadas, and Claude Demosthene, Aramon, both of France, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 50,670, May 14, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 174,443
Int. Cl.[5] C07C *87/36, 87/452*
U.S. Cl. 564—462 **10 Claims**

1. A compound of the formula



wherein R is lower alkyl or cyclohexyl, X is hydroxy, halogen or $-SO_3R^4$ and R^4 is lower alkyl, trifluoromethyl, phenyl or substituted phenyl in which said substituent may be methyl, chloro, bromo, methoxy or nitro.

4,927,971

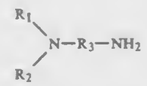
DESENSITIZER COMPOSITION

Mitsuru Fuchigami; Shingo Tachizawa, both of Takasago, and Mamoru Ishiguro, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills Ltd., Tokyo, Japan

Filed May 8, 1989, Ser. No. 348,687
Claims priority, application Japan, May 11, 1988, 63-115724; May 11, 1988, 63-115725; May 11, 1988, 63-115726; Jun. 7, 1988, 63-141264; Jul. 22, 1988, 63-183100; Dec. 28, 1988, 63-335233
Int. Cl.[5] C07C *93/04*
U.S. Cl. 564—505 **8 Claims**

1. A desensitizing ink comprising an adduct produced by the addition of 4 to 70 mols of an alkylene oxide to 1 mol of an amine represented by the general formula (I) where 40 mol % or more of said alkylene oxide are butylene oxide:

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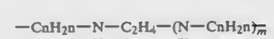


(I)

where R_1 and R_2 represent hydrogen atoms or an alkyl group having 1 to 20 carbon atoms;

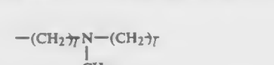
when both R_1 and R_2 are hydrogen atoms, R_3 represents a branched alkylene having 3 to 9 carbon atoms,

or a substituted alkylene represented by the general formula (II) or (III):



(II)

where m is 0 or 1, n is an integer of 3 to 6,



(III)

where l is an integer of 1 to 4,

when at least either R_1 or R_2 is an alkyl group having 1 to 20 carbon atoms, R_3 represents an alkylene group represented by the general formula (IV):

(IV)

where q is an integer of 1 to 12.

4,927,972

CATALYTIC PROCESS FOR THE PRODUCTION OF MERCAPTANS FROM THIOETHERS

Emmanuel F. E. Arretz, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

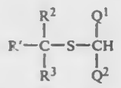
Continuation of Ser. No. 93,640, Sep. 8, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 284,767

Claims priority, application France, Sep. 11, 1986, 8612690

Int. Cl.[5] C07C *148/00*

U.S. Cl. 568—70 **11 Claims**

1. A process for the production of mercaptans by reacting a thioether with hydrogen sulfide in the presence of an acid catalyst, wherein said thioether is an unsymmetrical thioether of the formula:



where the symbols R^1, R^2 and R^3, alike or different, are C_1–C_{18} alkyl groups, Q^1 is an unsubstituted or COOH-substituted C_1–C_{18} alkyl group, and Q^2 is a hydrogen atom or a C_1–C_{18} alkyl group, said acid catalyst is selected from the aluminosilicates and the cation-exchange resins, the reaction being effected under a pressure of about 5 to 30 bars at a temperature between 80° and 200° C.

4,927,973

PROCESS FOR CONTINUOUS PURIFICATION OF BISPHENOLS

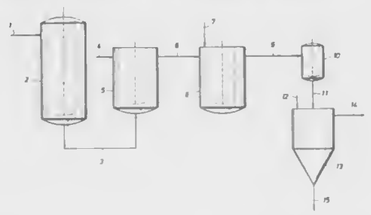
Walter Dong, Gold River, Calif.; Paul V. Shaw, and James L. Buechele, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 16, 1988, Ser. No. 285,254

Int. Cl.[5] C07C *37/84, 37/68*

U.S. Cl. 568—724 **5 Claims**

1. A process for the continuous purification of crude bisphenol which comprises (1) forming a single liquid phase comprising a hot mixture of crude bisphenol and water in a ratio substantially of from about 75% to about 85% weight of crude bisphenol to about 15% to about 25% weight water; (2) continuously feeding this mixture together with a stream of warm water to a first crystallization zone at a temperature of the combined streams sufficient to maintain a bisphenol-rich liquid



phase, a water-rich phase and a crystalline phase comprising about 70% to about 95% of the total bisphenol in the mixture; (3) passing the three-phase mixture of bisphenol and water to a second crystallization zone operated at about 85° C. to about 97° C. until about 90% to about 99% of the total bisphenol is crystallized; and (4) recovering the purified bisphenol crystals.

4,927,974

PROCESS FOR THE PREPARATION OF CYCLOHEXANOL AND/OR CYCLOHEXANONE

Paul C. van Geem, Beek, and Franciscus T. B. van den Brink, Geldrop, both of Netherlands, assignors to Stamicarbon B.V., AC Geleen, Netherlands

Filed Apr. 6, 1989, Ser. No. 334,142

Claims priority, application Netherlands, Apr. 21, 1988, 8801036

Int. Cl.[5] C07C *45/32*

U.S. Cl. 568—357 **5 Claims**

1. Process for the preparation of cyclohexanol and/or cyclohexanone, in which cyclohexene in a feed stream containing cyclohexene, cyclohexane and benzene is hydrated into cyclohexanol and/or oxidized into cyclohexanone, the cyclohexanol and/or cyclohexanone obtained is separated from the reaction mixture thus obtained and the remaining cyclohexane and benzene are recycled to a preconnected cyclohexene preparation section, wherein part of the stream that is recycled to the cyclohexene preparation section is subjected to a dehydrogenation reaction and the remaining part to a hydrogenation reaction and the reaction streams thus obtained are combined to form the feed stream to the hydration and/or oxidation step.

4,927,975

PROCESS FOR PREPARING CERTAIN DECAHYDRO-7H-3-OL-7-ONES

Marie-Madeleine Bouton; Jean Jacques, both of Paris, and André Pierdet, Noisy-Le-Sec, all of France, assignors to Roussel Uclaf, Paris, France

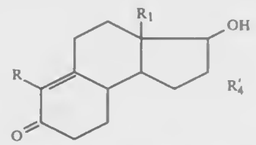
Division of Ser. No. 855,905, Apr. 24, 1986, Pat. No. 4,849,454, which is a division of Ser. No. 543,315, Oct. 19, 1983, Pat. No. 4,607,054, which is a continuation-in-part of Ser. No. 350,151, Feb. 19, 1982, Pat. No. 4,466,971. This application Jul. 25, 1988, Ser. No. 223,636

Claims priority, application France, Feb. 23, 1981, 81 04630

Int. Cl.[5] C07C *49/403, 49/497, 49/603*

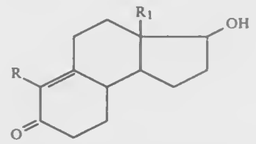
U.S. Cl. 568—373 **5 Claims**

1. A process for the preparation of a compound which has the formula



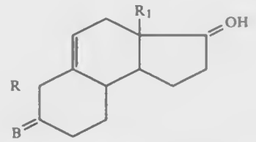
$I_{B'}$

wherein R is alkyl of 1 to 4 carbon atoms and R_1 is methyl or ethyl and R_4 is alkyl of 1 to 4 carbon atoms comprising reacting a compound of the formula



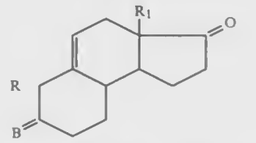
II_B

wherein R and R_1 have the above definition with a ketone protecting reactant to obtain a compound of the formula



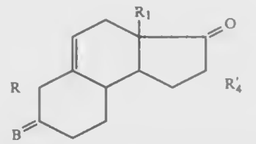
III_B

wherein R is a ketal, enamine or enol ether and the dotted line is a double bond when B is an enamine or enol ether, reacting the latter with an oxidation agent selected from the group consisting of pyridinium dichromate, sulfochromic acid solution, pyridinium chlorochormate, chromium trioxide in pyridinium, aluminum isopropoxide and aluminum tertiary butoxide to obtain a compound of the formula



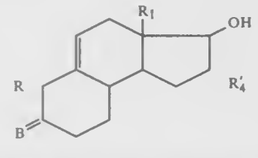
V_B

treating the latter with an iodide of the formula R_4 I in the presence of a strong base to form a compound of the formula



V_B

reacting the latter with a reducing agent selected from the group consisting of lithium aluminum hydride, sodium borohydride, potassium borohydride, and lithium borohydride to obtain a compound of the formula



V'_B

and treating the latter to remove the ketone protecting group to obtain the compound of formula I_B.

4,927,976

PROCESS FOR PREPARING 2,3-BIS(HYDROXYETHOXYMETHYL) BICYCLO [2,2,1] HEPTANE AND POLYESTER THEREWITH

Kou-Chang Liu, Wayne, N.J., assignor to GAF Chemicals Corporation, Wayne, N.J.

Filed Sep. 5, 1989, Ser. No. 402,370

Int. Cl.[5] C07C *43/02*

U.S. Cl. 568—665 **1 Claim**

1. The compound 2,3-bis(hydroxyethoxymethyl) bicyclo [22,1] heptane.

4,927,977

PROCESS AND APPARATUS FOR THE UNIFORM DISTRIBUTION OF A TWO-PHASE FEED IN A CHEMICAL REACTION ZONE

Jonathan E. Child, Sewell; Byung C. Choi, and Francis P. Ragonese, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 12, 1989, Ser. No. 296,093

Int. Cl.[5] C07C *41/05, 24/04*

U.S. Cl. 568—695 **13 Claims**

1. In a process for chemically converting a two-phase feed containing at least one liquid component and at least one gaseous component in the reaction zone of a tube of a tubular reactor to provide one or more reaction products, the improvement which comprises:

(a) adjusting the temperature of a two-phase feed as required to convert said feed into a single liquid or gaseous phase reaction mixture;

(b) substantially uniformly distributing each component of the reaction mixture therein;

(c) readjusting the temperature of the substantially uniform single phase reaction mixture to substantially correspond to the temperature within the reaction zone of a tube; and,

(d) introducing the temperature-adjusted reaction mixture into the reaction zone of said tube.

4,927,978

METHOD OF PURIFYING BISPHENOLS

James L. Buechele; Edward L. Nielsen, both of Houston, Tex.; Walter Dong, Gold River, Calif., and Paul V. Shaw, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 16, 1988, Ser. No. 285,253

Int. Cl.[5] C07C *37/84, 37/68*

U.S. Cl. 568—724 **29 Claims**

1. A process for the preparation of crystals of an adduct of a bisphenol with a phenol which comprises:

(a) adding 8–25% weight of an inert volatile liquid aliphatic hydrocarbon diluent and 0 to about 1.5% w water to a crude mixture of the bisphenol and the phenol at a temperature above the boiling temperature of the added volatile liquid diluent; and

(b) allowing the volatile liquid diluent to boil in the process thereby cooling the resulting mixture to a temperature at which crystals of the adduct form.

VOL
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4,927,979
PROCESS FOR THE PREPARATION OF P-ETHYLPHENOL

Takanori Yamagishi, Ichihara; Tsutomu Idai, Noda, and Eiji Takahashi, Chiba, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1988, Ser. No. 280,692
Claims priority, application Japan, Dec. 18, 1987, 62-321002; Jun. 24, 1988, 63-154628
Int. Cl.[5] C07C *37/14, 37/11*
U.S. Cl. 568—791 **20 Claims**

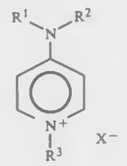
1. In a process for the preparation of a mixture of ethylphenol isomers which comprises reacting phenol with an ethylating agent selected from the group consisting of ethylene and ethanol in the vapor phase in the presence of a catalyst at a temperature of 200°–600° C. under a pressure of not higher than 10 Kg/cm².G, the improvement which comprises that said mixture of ethylphenol isomers has a p-ethylphenol content of higher than about 80 wt. % and said catalyst comprises a crystalline aluminosilicate catalyst obtained by incorporating one or more alkoxysilanes represented by the formula $R'_nSi(OR)_{4-n}$ wherein OR represents an alkoxy group having 1–6 carbon atoms, R' represents an alkyl group having 1–6 carbon atoms or a phenyl group and n represents an integer of 0–3, on a crystalline aluminosilicate having a constraint index of 1–15 and a silica/alumina molar ratio of 20–400, the amount of said incorporated alkoxysilanes being not less than 1.4 wt. % calculated as elemental silicon based on the amount of said crystalline aluminosilicate.

4,927,980
CATALYTIC METHOD FOR PRODUCING FLUOROAROMATIC COMPOUNDS USING BRANCHED ALKYL PYRIDINIUM SALTS

Gary L. Cantrell, Belleville, Ill., assignor to Mallinckrodt Inc., St. Louis, Mo.

PCT No. PCT/US87/02829, § 371 Date Feb. 9, 1987, § 102(e) Date Feb. 9, 1987, PCT Pub. No. WO87/04148, PCT Pub. Date Jul. 16, 1987
Continuation-in-part of Ser. No. 816,479, Jan. 6, 1986, abandoned. This PCT application Dec. 30, 1986, Ser. No. 146,259
Int. Cl.[5] C07C *79/12*
U.S. Cl. 568—937 **11 Claims**

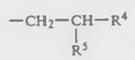
1. In a process for preparing a fluoroaromatic compound by reaction of a corresponding chloroaromatic compound with potassium fluoride under halide-exchange conditions in the presence of a catalyzing amount of a phase transfer catalyst, the improvement which comprises using as said catalyst an N-(2-branched-alkyl)-diorganoaminopyridinium salt represented by the formula



where:

R^1 and R^2 are monovalent or divalent organo radicals independently selected from substituted and unsubstituted hydrocarbon radicals having from 1 to 13 carbon atoms and divalent alkylene radicals which together can be part of a cyclic structure forming a ring having from 4 to 8 carbon atoms;

R^3 is a monovalent organo radical having from 4 to 18 carbon atoms and the formula



where R^4 and R^5 are independently selected alkyl radicals each having from 1 to 8 carbon atoms; and X- is an anion selected from the group consisting of fluoride, bromide and chloride, and

adding the phase transfer catalyst to the chloro-aromatic compound in one step.

4,927,981
MANUFACTURE OF CHLOROFORM

Kung H. Lee, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 119,397, Nov. 10, 1987, abandoned. This application Oct. 13, 1988, Ser. No. 257,355
Int. Cl.[5] C07C *17/22*
U.S. Cl. 570—255 **9 Claims**

1. A process for the manufacture of chloroform by the partial clorination of methyl chloride and methylene chloride mixtures, which process comprises

providing an initial feed mixture consisting essentially of chlorine, methyl chloride and methylene chloride in amounts such that the mol ratio of chlorine to said chlorinated methanes is in the range of from about 0.15:1 to about 0.21:1 and the mol ratio of methyl chloride to methylene chloride is about 1.5:1;

feeding said mixture at a pressure of about 13 to 130 atmospheres to a reactor that minimizes backmixing of the mixture components and heating said mixture to a temperature in the range of from about 220° to about 500° C. at which reaction of the chlorine with the chloromethanes in the feed mixture is initiated;

maintaining said reaction under said conditions until substantially all the chlorine has reacted;

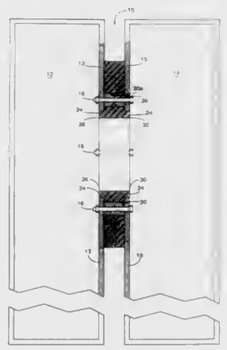
recovering a chlorinated product mixture containing chloroform, methyl chloride, methylene chloride and little or no carbon tetrachloride, the amount of methylene chloride produced being no more than 0.1 mol per mol of chloroform produced and the amount of carbon tetrachloride corresponding to less than 0.1 mol of carbon tetrachloride per mol of chloroform in the product; and

separating chloroform from the product mixture.

4,927,982
WIRE CHANNEL BUSHING AND ELECTRICAL ENCLOSURES COUPLED THEREWITH

Donald C. Wight, Marysville, and Keith T. Krueger, Bellefontaine, both of Ohio, assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Apr. 7, 1989, Ser. No. 334,965
Int. Cl.[5] H02G *3/08*
U.S. Cl. 174—50 **5 Claims**



1. An apparatus for providing a channel between electrical enclosures, the apparatus comprising:

an insulating bushing member having first and second ends, a side wall spanning therebetween, a generally circular channel passing from the first end to the second end through the bushing member, a first shoulder bordering the channel at the first end, a second shoulder bordering the channel at the second end, and at least one mounting hole in the bushing member for mounting the bushing member between the enclosures; and

at least two conductive sleeves being generally cylindrical and including an opening adapted to accept a fastener, the sleeves being carried by the bushing member exteriorly of the channel and in spaced relation to the mounting hole for providing grounding paths between the electrical enclosures, the sleeves extending from the first end through the bushing member to the second end;

wherein the electrical enclosures each include a wall having an opening, and each shoulder is adapted to extend into one opening.

4. An electrical enclosure assembly comprising:

a pull box including a first wall having a first opening;

a termination box including a second wall having a second opening;

an insulating bushing fixed between the first wall and the second wall such that a channel is provided between the first opening and the second opening, the insulating bushing including a first shoulder bordering the channel and extending into the first opening, and a second shoulder bordering the channel and extending into the second opening;

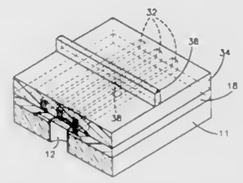
a plurality of fasteners fixing the insulating bushing between the first wall and the second wall; and

at least two conductive sleeves being generally cylindrical and including an opening adapted to accept a fastener, the sleeves being carried by the insulating bushing exteriorly of the channel and in spaced relation to the fasteners, the sleeves extending from the first wall to the second wall for providing grounding between the pull box and the termination box.

4,927,983
CIRCUIT BOARD

Alan L. Jones, Endwell; Keith A. Snyder, and Paul E. Winkler, both of Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1988, Ser. No. 286,593
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—258 **7 Claims**



1. An improved printed circuit board which board comprises an insulating core having plated through holes;

electrical circuitry on at least one side thereof which circuitry includes lands connected to said plated through holes;

a permanent dielectric material on said at least one side of said board covering the circuitry and the plated through holes,

vias extending through said permanent dielectric material to communicate with circuitry connected to said plated through holes;

electrical circuit lines on said permanent dielectric material at least a portion of which circuit lines overlies said plated through holes and is insulated therefrom;

said vias connecting said electrical circuit lines to said circuitry on said core.

4,927,984
PROTECTIVE HOUSING FOR CABLE JOINTS

Karl-Heinz Meislitzer, Löhne/Gohfeld, and Heinz Sandmann, Uchte, both of Fed. Rep. of Germany, assignors to Rose Elektrotechnik GmbH & Co. KG, Porta Westfalica, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 256,303
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 37351710
Int. Cl.[5] H02G *15/113*
U.S. Cl. 174—92 **8 Claims**



1. A housing assembly for a cable splicing joint in a cable system comprising upper and lower housing sections having upper and lower separation faces thereon, said upper and lower housing sections being joined along said upper and lower separation faces, said upper and lower separation faces including upper and lower front separation face portions hav-

VOL
1114
ISS
4
MY
22
1990
UMI

ing upper and lower recesses therein, respectively, which cooperate to define a cable accepting inlet aperture, a cable socket removably received in said cable accepting inlet aperture, said cable socket having an internal inlet opening therein, internal seal means in said internal inlet opening for sealing between said socket and a cable received in said internal inlet opening, said socket having an outer circumferential sealing face thereon, and non-adhesive sealing strip means for sealing between said upper and lower separation faces and between said upper and lower recesses and said sealing face, said sealing strip means including upper and lower seamless, unbroken non-adhesive sealing strips which extend along the entire extents of said upper and lower front separation face portions, respectively, and the upper and lower recesses therein, respectively, for sealing between said upper and lower front separation face portions and between said recesses and said sealing face.

4,927,985

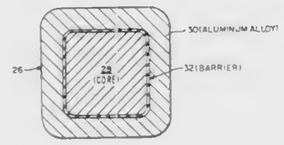
CRYOGENIC CONDUCTOR

Natraj C. Iyer, Monroeville; Walter J. Carr, Jr., Wilkins Twp., Allegheny County, and Alan T. Male, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 12, 1988, Ser. No. 231,040

Int. Cl.[5] H01B *12/00*

U.S. Cl. 174—125.1 **23 Claims**



1. A lightweight composite hyperconductor which resists power and efficiency losses due to transverse eddy currents while conducting alternating current and comprises:

cryogenic conducting means in the form of a hard and ductile hyperconductor;

matrix means surrounding said conducting means and consisting essentially of a metal or alloy of higher strength than said conducting means; and

barrier means disposed between said conducting means and said matrix means and consisting of a layer of barrier material of high electrical resistivity for electrically insulating said conducting means from said matrix means, preventing diffusing contamination of said conducting means from said matrix means and conducting heat between said matrix means and said conducting means to enable uniform cooling of said composite hyperconductor to cryogenic temperatures, said barrier material retaining these properties both during and after high temperature processing of said composite hyperconductor.

4,927,986

CONDUCTIVE STYLUS STORAGE FOR A PORTABLE COMPUTER

John J. Daly, San Carlos, Calif., assignor to GRID Systems Corporation, Fremont, Calif.

Filed Jun. 12, 1989, Ser. No. 364,951

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—18 **18 Claims**

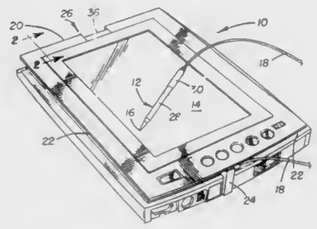
1. A system for retention of a stylus on a housing comprising:

a stylus;

a housing having channel in one edge of the computer, providing a recess within which the stylus can be laterally inserted for storage, at a storage position;

a tethering cord connected to the housing and to the stylus; the length of the tethering cord being just sufficient to allow the stylus to be inserted into said storage position with the tethering cord wrapped around the housing, from its point of connection to the housing to the stylus; and

the stylus having a smaller diameter portion and a larger diameter portion, and the housing's channel being sized to



receive the smaller diameter portion of the stylus, and having an enlarged slot area slightly longer than the enlarged diameter portion of the stylus and configured to receive the larger diameter portion to thereby positively locate the position of the stylus when it is inserted into the storage position in the housing's channel.

4,927,987

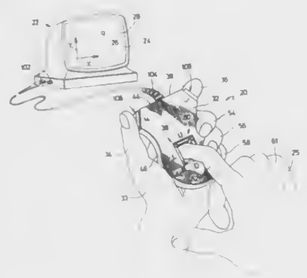
DIRECTIONAL CONTROL DEVICE

Steven J. Kirchgessner, 7845 Greenbriar Rd., Talbot, Tenn. 37877

Filed Feb. 24, 1989, Ser. No. 315,522

Int. Cl.[5] H01H *9/00*

U.S. Cl. 200—5 R **16 Claims**



1. A directional control device comprising:

a body having a recess for loosely receiving the finger of a user inserted endwise therein, said recess including sides which collectively provide an opening through which the user's finger can be operatively inserted and which opening accommodates the insertion of substantially the entire length of the user's finger; and

switch means associated with said sides including at least one directional switch which can be actuated by a depressing action, said directional switch being supported adjacent a side of said opening and adjacent the entrance to said opening for actuation with the user's finger so that by inserting his finger through the opening, the user is permitted to actuate the switch with substantially any part of his finger remote of the fingertip, and

the smallest distance as measured across the opening is at least about one inch so that when the user's finger is centered within the opening, the finger is spaced from the sides of the recess.

4,927,988

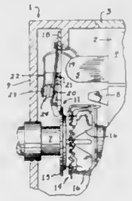
ENCLOSED SWITCH CONTACT ASSEMBLY

Duane R. Nolte, Wausau, Wis., assignor to Marathon Electric Mfg. Corp., Wausau, Wis.

Filed Jan. 23, 1989, Ser. No. 300,324

Int. Cl.[5] H01H *35/10*

U.S. Cl. 200—80 R **12 Claims**



1. In a dynamoelectric machine having a winding adapted to be selectively connected and disconnected from circuit in response to the speed of the machine, a switch assembly comprising a first contact, a second contact, means connecting said contacts in circuit with said winding, a relatively fixed mounting plate, said first contact being secured to said mounting plate and said plate having a flat planar surface surrounding said contact, a movable contact arm mounted in opposed aligned relation with said first contact, means securing said second contact to said movable arm in opposed aligned relation to said first contact, each of said contacts having an outer cylindrical periphery, a single piece tubular boot having opposite cylindrical tubular end portions and an intermediate convoluted portion defining at least one generally C-shaped deflection portion, said boot having a first end portion telescoped over said second contact and secured to the periphery of said second contact for movement therewith, said boot projecting from said second contact and having said second end portion telescoped over said first contact into compressive abutting engagement with said planar surface of said mounting plate.

4,927,989

CONTACT MATERIAL FOR VACUUM CIRCUIT BREAKER

Eizo Naya; Mitsuhiro Okumura, both of Amagasaki, and Seiichi Miyamoto, Marugame, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 2,239, Jan. 12, 1987, abandoned. This application Apr. 11, 1989, Ser. No. 336,517

Claims priority, application Japan, Jan. 10, 1986, 61-3763; May 9, 1986, 61-107208

Int. Cl.[5] H01H *1/02*

U.S. Cl. 200—265 **12 Claims**

1. A contact material for a vacuum circuit breaker, characterized in that it consists essentially of copper, molybdenum, niobium, and one or more kinds of low melting point materials selected from the group consisting of bismuth, tellurium, antimony, lead and thallium.

4,927,990

SPRING-BIASED PUSH-BUTTON SWITCH HAVING A SPRING-LOADED TACTILE FEEDBACK FEATURE

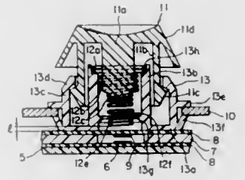
Kazuo Aoki; Toshimi Chiba; Sadao Tachibana, and Yasushi Nagatomo, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 3, 198x, Ser. No. 319,140

Claims priority, application Japan, Mar. 31, 1988, 63-41829[U]

Int. Cl.[5] H01H *13/28*

U.S. Cl. 200—517 **15 Claims**



1. In a push-button switch including:

a substrate;

a fixed electrode provided on the substrate;

a movable electrode disposed opposite to the fixed electrode;

a key housing having a base and a tubular spring retainer projecting from a central portion of the base, said tubular spring retainer having an inner shoulder formed in an end thereof opposite said base, and an annular guide wall surrounding the tubular spring retainer and having a stopping flange extending substantially radially inwardly from an end thereof opposite said base;

a coil spring received in the tubular spring retainer of the key housing with a portion thereof opposite said base seated on a surface defined by the shoulder and facing away from said base; and

a key for operating the movable electrode, having a key head, a central stem extending from a central portion of a lower surface of the key head so as to be inserted in the coil spring, and legs formed around the stem so as to extend from the lower surface of the key head, each said leg being provided at a free end thereof with a tapered claw, said key being axially slidably fitted in the key housing with the stem axially received in the coil spring in the tubular spring retainer and with the tapered claws of the legs disposed radially between said tubular spring retainer and said annular guide wall, and engaging the stopping flange of the annular guide wall;

the improvement wherein the coil spring comprises a large coil section seated on said shoulder, a middle extension coil section, and a small compression coil section, which are formed integrally in that order from said shoulder to said base, a radially inwardly directed protrusion is formed on a radially inner surface of the tubular spring retainer, and said small compression coil section includes a radially outwardly projecting part which engages a surface of the protrusion facing away from said base while the key is not depressed, the projecting part of the coil spring snapping across the protrusion toward said base when the key is depressed extending the middle extension coil section and compressing the small compression coil section, and the projecting part being caused to snap back across the protrusion by the contractive force of the middle extension coil section and the recoiling force of the small compression coil section when the key is released.

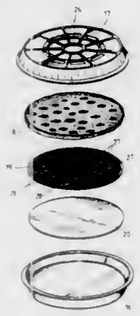
VOL
1114
ISS
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1990
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4,927,991

SUSCEPTOR IN COMBINATION WITH GRID FOR MICROWAVE OVEN PACKAGE

Dan J. Wendt, Lino Lakes; Jonathon D. Kemske, New Brighton, and Peter S. Pesheck, Brooklyn Center, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Nov. 10, 1987, Ser. No. 119,381
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E 33 Claims



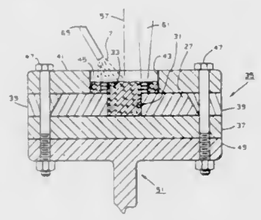
1. A food package for a microwave oven, comprising:
a first sheet of material defining susceptor means for heating in response to microwave radiation;
a second sheet of material defining a grid, the grid having a conductive surface surrounding transmissive apertures, the grid modifying the performance characteristics of the susceptor means, the grid being in close proximity to the susceptor means;
a food item, the food item being located in heating relationship with the susceptor means; and,
the grid and the susceptor being located on the same side of the food item.

4,927,992

ENERGY BEAM CASTING OF METAL ARTICLES

Graham A. Whitlow, Murrysville; Gerald J. Bruck, Library, and James E. Smith, Delmont Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 4, 1987, Ser. No. 21,856
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.65 14 Claims



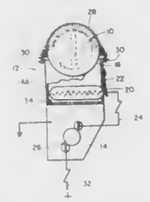
1. A method of producing articles from powder metal comprising the steps of:
generating a focused energy beam having an energy density sufficient to melt the powder metal;
generating relative movement between the energy beam and a substrate such that the energy beam repetitively traces over the substrate the shape of said article and melts the surface of the substrate at the interface of the energy beam and the substrate; and
feeding powder metal onto said substrate to maintain a depth of powder metal which laterally supports and forms a mold for a layer of powder metal at the energy beam interface which is melted by the energy beam, the thickness of the layer of powder metal being such that the energy beam penetrates the layer of powder metal and melts the surface of the substrate but only to the extent to wet the substrate sufficiently to bond to the substrate the melted powder metal, which in turn, cools rapidly upon leaving the energy beam interface to form a thick layer of the article which becomes the substrate for the next layer.

4,927,993

LOCKING CYLINDER HEATING

Ray A. Simmons, P.O. Box 1193, Muskogee, Okla. 74402-1193

Filed Nov. 30, 1988, Ser. No. 277,977
Int. Cl.[5] E05B *17/00;* H05B *3/00*
U.S. Cl. 219—201 4 Claims



1. A device for preventing freezing or locking cylinders and adapted to be removably connected thereto, comprising:
an electrically and thermally conductive body member adapted to be electrically grounded, the body member comprising an upper box-like portion adapted to be received against the locking cylinder and a lower portion, the box-like portion including an internal recess with an top opening to permit passage of radiant and convected heat therefrom;
an incandescent bulb removably mounted within the internal recess with a first contact electrically isolated and a second contact electrically connected to the body member;
a temperature activated means mounted to the lower portion of the body member and electrically connected between a power source and the first contact of the bulb to illuminate the bulb at a predetermined temperature; and
a removable heat conductive spring thermally connectable at each end thereof to opposed upper ends of the body member and adapted to extend around the locking cylinder to hold the body member thereagainst and conduct heat to the locking cylinder.

4,927,994

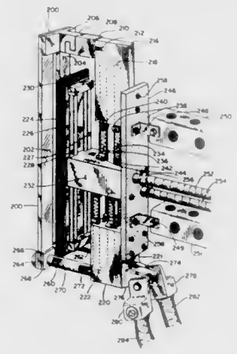
MODULAR RESISTANCE HEATER ASSEMBLY

Kenneth B. Leger, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 28, 1989, Ser. No. 318,030
Int. Cl.[5] H05B *3/08, 3/14*
U.S. Cl. 219—343 20 Claims

1. Modular electrical resistance heating apparatus comprising the combination of:
an elongated U-shaped uniplanar electrically conductive heater element having first and second parallel disposed, uniformly cross-sectioned U leg heating members which are joined together by an integral coplanar crossover portion located at one U leg member's end, said heater element including first and second cantilever support and

electrode attachment regions located at the crossover distal end of each said U leg heating member;
an expansion accommodating support member disposed at the crossover portion adjacent end of said heater element, said support member including means enabling thermally-induced movement of said heater element crossover portion along a first axis longitudinal of said U leg heating members together with captive retention of said crossover portion along the second and third axes orthogonal of said first axis;
first and second fixedly mounted, electrically segregated electrical header elements disposed adjacent said heater element support and electrode attachment regions;



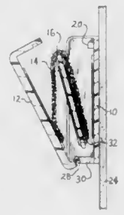
first and second electrically conductive electrode elements disposed in threaded physical and electrical connection between respective ones of said electrical header elements and said heater element electrode attachment regions;
electrically conductive means connected respectively between each said first and second header elements and oppositely polarized terminals of a heater energizing controllable source of electrical energy;
cooling means for controlling the operating temperature of said heater apparatus in the presence of thermal energy attending energized operation of said heater members.

4,927,995

ENCLOSED TOWEL WARMER

Robert R. Lovett, and Donna M. Lovett, both of 8407 Lindley #3, Northridge, Calif. 91325

Filed Feb. 24, 1989, Ser. No. 314,936
Int. Cl.[5] H05B *3/20*
U.S. Cl. 219—385 13 Claims



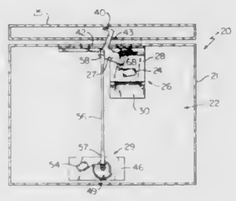
1. A towel warming device comprising:
a main body having a substantially rectangular back panel adapted to mount vertically against a wall, a pair of vertical side panels integral with said back panel, and a horizontal bottom panel;
a cover having a substantially rectangular main portion and an integral perpendicular flange portion, said cover being adapted to cooperate with said main body to form a substantially orthogonal enclosure when said cover is disposed in a closed position relative to said main body such that said main portion of said cover is disposed vertically in engagement with said side panels so as to form a front panel of said enclosure, and said flange portion is disposed horizontally so as to form a top panel of said enclosure;
a flat rectangular towel holder member disposed between said side panels and pivotedly attached thereto in a lower region thereof, on a horizontal pivot axis, such that when said cover is disposed in said closed position, said towel holder is caused to become constrained in a substantially vertical position disposed such that a towel may be contained within said enclosure, supported upon said towel holder;
hinge means, disposed along a horizontal hinging axis, hingedly attaching said cover at a lower edge thereof to said bottom panel of said main body, whereby said cover is provided with freedom to move rotationally from said closed position outward from said wall to a tilted open position constrained by stopping means to a predetermined angle less than 45 degrees from vertical, tilting of said pivotally attached towel holder being constrained to about half said predetermined angle, thereby providing access to a towel supported upon said towel holder; and
heating means adapted to warm a thusly supported towel.

4,927,996

COOKING APPARATUS, DOOR LATCHING CONSTRUCTION THEREFOR AND METHODS OF MAKING THE SAME

Francis S. Genbauffe, Irwin, and Steven A. Kimmel, Greensburg, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed May 23, 1988, Ser. No. 197,288
Int. Cl.[5] F24C *7/08;* H05B *1/02*
U.S. Cl. 219—413 26 Claims



1. In a cooking apparatus comprising a frame means, a cooking chamber means carried by said frame means, heating means carried by said frame means and being adapted to be actuated to heat clean said chamber means, switch means for permitting said heating means to heat clean said chamber means only when said switch means is actuated, a movable door means carried by said frame means for opening and closing said cooking chamber means, a movable latch member carried by said frame means and being movable between a non-latching position thereof that permits said door means to be opened and closed and a latching position thereof that locks said door means in its closed position if said door means is in its closed position at the time said latch member is moved to said latching position thereof, and drive means carried by said frame means and having moving means operatively interconnected to said latch member to move said latch member between said positions thereof only when said moving means of said drive means moves from a first position thereof to a second position thereof,

VOL 1114 ISS 4 MY 22 1990 UMI

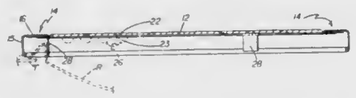
the improvement wherein said latch member is movable from said non-latching position to a third position thereof by said drive means when said drive means tends to move said latch member from said non-latching position thereof to said latching position thereof when said door means is not in a closed condition thereof and said moving means of said drive means moves from said first position thereof to said second position thereof, said latch member being adapted to actuate said switch means only when said latch member is in said latching position thereof.

4,927,997

HEAT TRANSFER PAD

Samuel Bailey, Fairfield, Ohio, assignor to Beta Development Group, Inc., Lexington, Ky.

Filed Nov. 2, 1988, Ser. No. 266,137
Int. Cl.[5] H05B *3/72*
U.S. Cl. 219—459 **10 Claims**



1. A heat transfer pad for optimizing heat transfer between an electric stove burner element and a cooking vessel, comprising:

a thermally conducting, relatively flexible disc for collecting and transferring heat, said flexible disc providing a heating surface for direct contact with a cooking vessel, said disc being provided with upper and lower surfaces, said upper and lower surfaces both being flexible; and

ring means for retaining said pad on a burner element, said ring means including thermal expansion accommodating means for said pad.

4,927,998

APPARATUS FOR COOKING BY ELECTRIC HEATING INCLUDING MEANS FOR PROVIDING INTERMITTENT TEMPERATURE CONTROL THEREOF

Haruhisa Tamura; Takahiko Yamasaki, both of Nara, and Mitsuhiro Hasegawa, Sakurai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 146,646, Jan. 21, 1988, abandoned. This application Apr. 26, 1989, Ser. No. 342,679
Claims priority, application Japan, Jan. 22, 1987, 62-12897; Jan. 22, 1987, 62-12898
Int. Cl.[5] H05B *6/68*
U.S. Cl. 219—494 **21 Claims**

1. A heating cooking apparatus for maintaining the temperature of a heating chamber included therein at a temperature which does not appreciably exceed a given temperature, said heating chamber being adapted to receive an object to be heated, comprising:

a heat source for heating said heating chamber and said object;

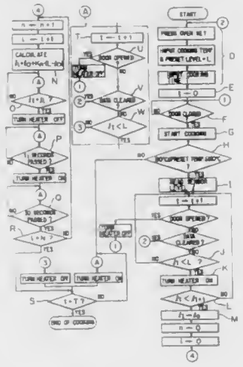
input means for setting the parameters of a heating operation to be performed on said object, said parameters being determined by the characteristics of the object to be heated as represented by a coefficient K_n, said given temperature and the amount of time during which said object is to be heated;

a temperature sensor for detecting the temperature of said heating chamber and producing an output corresponding thereto; and

control means coupled to said input means, said temperature sensor and said heat source for controlling the temperature of said heating chamber in accordance with the parameters of said heating operation, said control means including

means for energizing said heat source to heat said heating chamber;

means for performing the calculation $l_n = l_0 + K_n(L - l_0)$, where l_0 corresponds to the output of said temperature sensor at the approximate start of heating of said heating chamber by said heat source, L is the output of said temperature sensor corresponding to said given temperature, and n is an integer;



means for stopping the heating of said heating chamber when the temperature sensed by said temperature sensor corresponds to the calculated value l_n; and

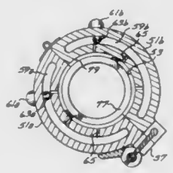
means for restarting the heating of said temperature chamber a predetermined interval after the heating of said heating chamber has stopped.

4,927,999

APPARATUS FOR FUSION JOINING PLASTIC PIPE

Reinhard Hanselka, Danville, Calif., assignor to Georg Fischer AG, Switzerland

Division of Ser. No. 245,929, Sep. 14, 1988, Pat. No. 4,876,041, which is a continuation of Ser. No. 919,238, Oct. 14, 1986, abandoned. This application Jul. 21, 1989, Ser. No. 384,284
Int. Cl.[5] H05B *3/02;* **B29C** *51/10*
U.S. Cl. 219—535 **16 Claims**



1. An apparatus for fusion joining first and second axially abutted piping system component connection ends that are in axial and circumferential alignment, comprising:

enablement means for enabling the heating of a melt region in the proximity of the interface of the first and second piping system component connection ends at least to the material softening point of the thermo-plastic material of the melt region; and

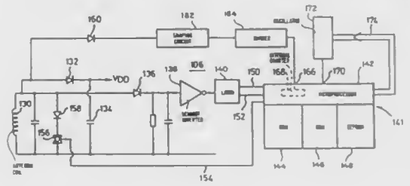
vacuummetric means for vacuummetrically inducing outward translation of the melted material of the melt region.

4,928,000

METHOD AND APPARATUS FOR COMMUNICATION FOR A DATA-STORING TOKEN

David Eglise, 53 Alma Road, Windsor, Berkshire, SL4 3HH, and Alan J. Ruddell, 49 Barkham Ride, Wokingham, Berkshire, RG11 4HA, both of United Kingdom

PCT No. PCT/GB87/00737, § 371 Date Aug. 19, 1988, § 102(e) Date Aug. 19, 1988, PCT Pub. No. WO88/02897, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 19, 1987, Ser. No. 211,858
Claims priority, application United Kingdom, Oct. 20, 1986, 8625074
Int. Cl.[5] G06F *15/20*
U.S. Cl. 235—380 **11 Claims**



1. A data-storing token which can perform a communication operation involving at least one of transmitting and receiving data in a contactless manner ussing an externally generated signal, said token comprising:

a clock generator for generating clock pulses, the clock generator including frequency adjustment means for adjusting the frequency of the clock pulses in response to a frequency adjustment signal; and

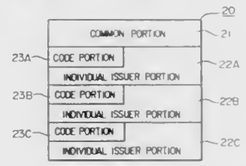
a processor arranged for receiving the clock pulses so as to operate at a rate dependent on the frequency of the clock pulses, said processor being arranged to execute a synchronization operation prior to the communication operation, the processor being responsive during the synchronization operation to the externally generated signal for producing the frequency adjustment signal, the frequency adjustment signal being such as to cause the clock frequency to approach a substantially predetermined relationship with the frequency of the externally generated signal, thereby to allow a subsequent synchronized communication operation to occur.

4,928,001

SECRET INFORMATION PRESERVING SYSTEM FOR A MULTIPLE ISSUER IC CARD

Shigeo Masada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Toyko, Japan

Filed Mar. 17, 1988, Ser. No. 169,473
Claims priority, application Japan, Mar. 20, 1987, 62-66256
Int. Cl.[5] G06K *5/00*
U.S. Cl. 235—380 **6 Claims**



1. A system comprising a multiple issuer IC card and a terminal for reading information from and writing information to the multiple issuer IC card;

the multiple issuer IC card comprising memory blocks for assignment to respective issuers and means in each memory block for storing an issuer code of a particular one of a plurality of potential issuers; and

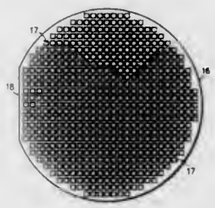
the terminal comprising means for reading the issuer codes from the IC card, means for inputting an input code and an identification code, means for comparing the issuer codes and the input code and means for writing, when a match is detected by said comparing means, said identification code into the memory block means storing the matched issuer code, thereby to activate the associated memory block with respect to that particular issuer.

4,928,002

METHOD OF RECORDING TEST RESULTS OF DIE ON A WAFER

Dean Corley, Tempe, and Hugh Littlebury, Chandler, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 5, 1988, Ser. No. 278,882
Int. Cl.[5] G06K *13/04*
U.S. Cl. 235—479 **7 Claims**



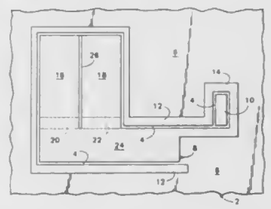
1. A method of recording test results and location of die on a wafer, comprising: testing each die on the wafer; encoding the test results in a coded format on a piece of paper using a printer to record on the paper; transferring the wafer along with the piece of paper to a die pick and place machine; and scanning the piece of paper with an optical reader to determine which die to select.

4,928,003

CHARGE-COUPLED DEVICE FOR DETECTING SPATIAL VARIATION IN THE INTENSITY OF ELECTROMAGNETIC RADIATION

Denis L. Heidtmann, Portland, and Morley M. Blouke, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 15, 1988, Ser. No. 219,954
Int. Cl.[5] H01L *27/14*
U.S. Cl. 250—211 J **24 Claims**



1. A charge-coupled device for detecting spatial variation in the intensity of electromagnetic radiation in a given spectral region, comprising:

a body of semiconductor material that responds to electromagnetic radiation in said given spectral region by generating charge carriers, the body of semiconductor material

VOL
1114
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having first and second sense volumes that are isolated from each other with respect to diffusion of charge carriers, first and second transfer regions in communication with the first and second sense volumes respectively, and a readout region having first and second zones in communication with the first and second transfer regions respectively and being connected to an output node,

a sense electrode structure that overlies the sense volumes and comprises at least first, second and third electrode parts each extending over both the first and second sense volumes with the second electrode part between the first and third electrode parts, so that the second electrode part can establish a potential barrier in each of the sense volumes between the region that lies under the first electrode part and the region that lies under the third electrode part, and

a transfer electrode structure that overlies the transfer regions,

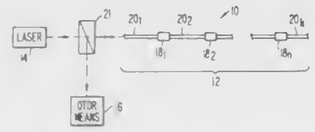
whereby charge can be accumulated in the sense volumes over an integration period and the resulting charge samples can be shifted separately through the transfer regions and applied to the output node.

4,928,004

METHOD AND APPARATUS FOR SENSING STRAIN

Bernd D. Zimmermann, Hickory, N.C.; Richard O. Claus, Christiansburg, and Kent A. Murphy, Roanoke, both of Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Jun. 20, 1988, Ser. No. 210,890
Int. Cl.[5] H01J *5/16*; G01D *5/34*
U.S. Cl. 250—227.14 **22 Claims**



1. A strain sensor comprising:

(a) at least two optical waveguides separated by an air gap in a colinear relationship;

(b) a splice for fixing said waveguides in said relationship with said gap;

(c) means for generating optical pulses into the optical waveguides; and

(d) a structure in which localized strains are to be sensed;

(e) said optical waveguides and said splice being imbedded in said structure;

(f) means for sensing localized strain in said structure by determining shifts in arrival times of the optical pulses reflected at said splice by the sensing means that correspond to the localized strain.

4,928,005

MULTIPLE-POINT TEMPERATURE SENSOR USING OPTIC FIBERS

Hervé Lefèvre, Paris; Jean-Pierre Bettini, Perthes; Serge Botti, Viroflay, and Marc Turpin, Bure sur Yvette, all of France, assignors to Thomson-CSF, Paris, France

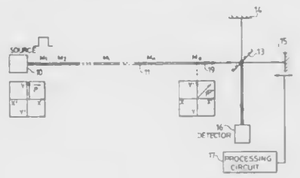
Filed Jan. 24, 1989, Ser. No. 300,926
Claims priority, application France, Jan. 25, 1988, 88 00780
Int. Cl.[5] H01J *5/16, 40/14*
U.S. Cl. 250—227.23 **6 Claims**

1. A multiple-point temperature sensor using optic fibers, comprising:

a wide band optical source, of the pulse-modulated, plane polarized, super-luminescent diode type;

A birefringent, monomode, sensing optic fiber on which there have been created localized, weak coupling points, spaced out along the fiber, the input face of which is coupled to the source, the polarization axis of the source being aligned with a neutral axis of the fiber;

polarization means coupled to the output face of the fiber, to align the polarizations of the waves transmitted by the fiber (and make their interference possible);



a device for spectroscopic analysis, coupled to the output of the polarization means, to analyse the radiation transmitted and to form the transmission function of the sensor;

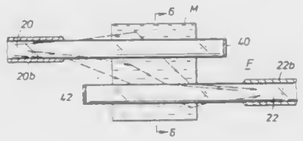
and processing means which, using the transmission function, extract the measurements of the temperatures of the segments of fibers between coupling points.

4,928,006

FLUID COUPLED FIBER OPTIC SENSOR

Charles H. Kershaw, 10454 Norton Dr., Houston, Tex. 77043

Division of Ser. No. 25,711, Mar. 13, 1987, Pat. No. 4,839,515.
This application Apr. 13, 1989, Ser. No. 337,965
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—201.1 **10 Claims**



1. A method of using a transducer to determine a sensed condition, including the steps of:

transmitting a light signal through a first fiber optic conductor;

emitting at least a portion of the light signal from a side window means in a first fiber optic conductor to contact a light reflective surface means;

coupling optically the first and second fiber optic conductors with a preselected fluid medium;

capturing at least a portion of the emitted light signal from the first fiber optic conductor contacting said light reflective surface with a second fiber optic conductor;

transmitting the light signal captured by the second fiber optic conductor through the second fiber optic conductor;

sensing a value for the light signal conducted through the second fiber optic light conductor; and

determining the condition sensed by comparing the sensed value for the light signal conducted through the second fiber optic conductor with a reference value;

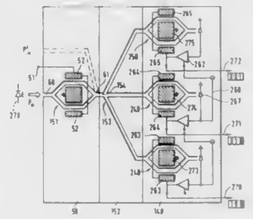
changing the relative position of an external the light reflective surface means in response to the sensed condition to proportionally control the captured portion of the emitted light signal.

4,928,007

OPTO-ELECTRIC A/D CONVERTER

Norbert Fürstenau, Braunschweig, Fed. Rep. of Germany, and Christopher Watts, Madison, Wis., assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Jun. 5, 1989, Ser. No. 361,378
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818865
Int. Cl.[5] H01J *5/16*
U.S. Cl. 341—137 **10 Claims**



1. An opto-electronic A/D converter with a plurality of parallel connected optical waveguide interferometers acted upon by a single input light source, said interferometer having electrodes arranged parallel thereto the optical path lengths of said interferometers being defined by electrical fields between said electrodes, a respective photodiode being connected after each of said interferometers, said photodiodes transforming the output signal of said interferometers in each case into an electrical voltage, said electrical voltages being amplified and displayed, wherein a common input interferometer is connected in front of a common input of a plurality of parallel multistable interferometers, said input interferometer being acted upon by said input light source and having electrodes for application of an electrical input voltage, each of said parallel interferometers having a respective amplifier connected to receive the output voltage of a respective said photodiode, the amplified output voltages of said photodiodes being connected to said respective electrodes and the output voltage of a said respective photodiode of a higher value interferometer is in each case further connected up as the offset voltage to a said amplifier of the interferometer which has a lower value, and the output voltages of said individual amplifiers are tapped in each case as digital signals and from these a coded output signal of the A/D converter is formed, and means are provided for producing a periodically clocked resetting signal.

4,928,008

VARIABLE LIGHT TRANSMISSION FILTER AND OPTICAL ANALOG POSITION SENSOR

Raymond W. Huggins, Mercer Island, Wash.; Bruce Van Deventer, St. Louis, Mo., and Glen E. Miller, Redondo, Wash., assignors to The Boeing Company, Seattle, Wash.

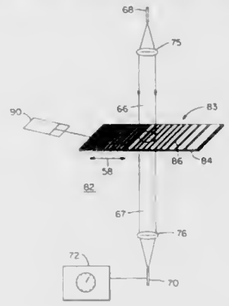
Filed Dec. 11, 1987, Ser. No. 131,664
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.1 **26 Claims**

1. A light transmission filter comprising:

a substrate having a selected configuration and having a first light transmission characteristic;

a pattern of spaced figures disposed on said substrate, said figures having a second light transmission characteristic;

said figures having selected dimensions, configurations and spacing relatively to at least one dimension of said substrate for providing an overall light transmission characteristic that varies in accordance with a selected mathematical function in a selected direction relative to at least one dimension of said substrate.

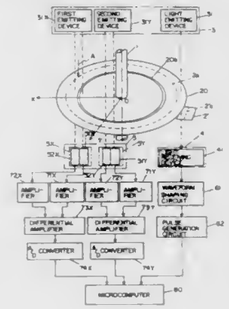


4,928,009

DEFLECTION-INSENSITIVE OPTICAL ROTARY ENCODER

Yo Ikebe, and Hideaki Oku, both of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP88/00825, § 371 Date Apr. 13, 1989, § 102(e) Date Apr. 13, 1989, PCT Pub. No. WO89/01608, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 19, 1988, Ser. No. 369,559
Claims priority, application Japan, Aug. 20, 1987, 62-205147
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.13 **9 Claims**



1. A deflection-insensitive optical rotary encoder comprising a rotary disk (2) which is coupled to a rotary shaft (1), a light reception angle detecting part (4) which receives only a ray of light having penetrated an angle detection pattern (2*a*) which is formed on said rotary disk (2) among the light emitted from a light source (3), and an angle detection part (6) which detects a rotation angle of said rotary shaft (1) according to an output signal from said light reception angle detecting part (4), characterized in that the encoder further comprises:

a circular pattern (20*b*) which is formed as a concentric circle with a regard to the center of said rotary shaft (1) on said rotary disk (2) and which varies the intensity of penetrating light from said light source (3) depending on deflection of said rotary shaft (1),

a light reception part for detecting deflection (5) whose output signal is varied depending on variation of said intensity of penetrating light,

a deflection detection part (7) which detects the deflection of said rotary shaft (1) according to the variation of the output signal of said light reception part for detecting deflection (5), and

a calculation part (8) which corrects the rotation angle which is detected by said angle detection part (6) to a rotation angle around the axis of said rotary shaft (1) depending on the deflection detected by said deflection detecting part (7).

4,928,010

OBSERVING A SURFACE USING A CHARGED PARTICLE BEAM

Kenichi Saito, Isehara; Kou Wada, Kunitachi, and Masahiro Yoshizawa, Zama, all of Japan, assignors to Nippon Telegraph and Telephone Corp.

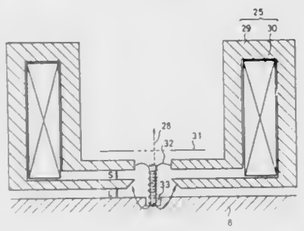
PCT No. PCT/JP87/00880, § 371 Date Jul. 25, 1988, § 102(e) Date Jul. 25, 1988, PCT Pub. No. WO88/04104, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 13, 1987, Ser. No. 233,612

Claims priority, application Japan, Nov. 28, 1986, 61-283868; Oct. 21, 1987, 62-263963

Int. Cl.[5] H01J *37/26*

U.S. Cl. 250—310 **23 Claims**



1. An apparatus for observing a surface using a charged particle beam comprising:

a charged particle gun for emitting primary charged particles;

a charged particle beam irradiation trajectory control unit for irradiating a specimen with said charged particle beam and scanning the same;

a secondary electron detector for detecting secondary electrons emitted from said specimen in response to the irradiation of said specimen by said charged particle beam;

a focusing lens for controlling a position at which said primary charged particles are converged; and

an exciting device, provided between said specimen and said focusing lens, for producing a strong magnetic field over the surface of said specimen such that said secondary electrons are emitted in a spiral motion from recesses in the surface.

4,928,011

RADIATION IMAGE READ-OUT APPARATUS

Kazuo Shimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 325,322

Claims priority, application Japan, Mar. 18, 1988, 63-64926; Aug. 23, 1988, 63-209192

Int. Cl.[5] G03B *42/00*

U.S. Cl. 250—327.2 **10 Claims**

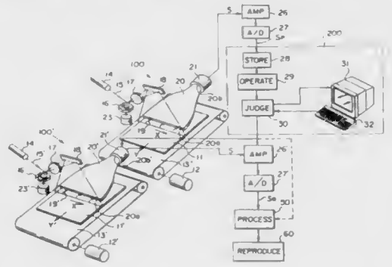
1. A radiation image read-out apparatus comprising:

(i) a preliminary read-out means for scanning a stimulable phosphor sheet, on which a radiation image has been stored, with a light beam in order to release part of the energy stored during exposure to radiation as light emitted from said stimulable phosphor sheet, detecting the light emitted by said stimulable phosphor sheet, and obtaining a preliminary read-out image signal which approximately represents said radiation image,

(ii) a final read-out means for scanning said stimulable phosphor sheet with a light beam having an energy intensity higher than that of said light beam used in said preliminary read-out means, detecting light emitted by said stimulable phosphor sheet when it is thus scanned, and obtaining a final read-out image signal which represents said radiation image,

(iii) an image processing means for receiving said final read-out image signal and carrying out image processing of said final read-out image signal, and

(iv) a condition adjusting means for receiving said preliminary read-out image signal, adjusting a read-out condition for use in obtaining said final read-out image signal and/or an image processing condition for use in carrying out image processing, said adjustment being effected on the basis of information carried by said preliminary read-out image signal, and feeding said read-out condition into said



final read-out means and/or feeding said image processing condition into said image processing means,

wherein said condition adjusting means is constituted of:

(a) a storage section for storing said preliminary read-out image signal,

(b) an operating section for reading said preliminary read-out image signal from said storage section, carrying out an operating process based on said preliminary read-out image signal in order to calculate a read-out condition to be used in obtaining a final read-out image signal and/or an image processing condition to be used in carrying out image processing of a final read-out image signal,

(c) a judging section for judging the reliability of said read-out condition and/or said image processing condition which were calculated by said operating section, and

d) a displaying section for indicating low reliability in cases where the judging section judges that reliability of said read-out condition and/or said image processing condition is low.

4,928,012

SYSTEM FOR MEASURING ELECTROMAGNETIC RADIATION ORIGINATING FROM THE HEMISPHERE

Dieter Lorenz, Hohenpeissenberg, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 747,724, Jun. 21, 1985, abandoned. This application Oct. 19, 1989, Ser. No. 425,512

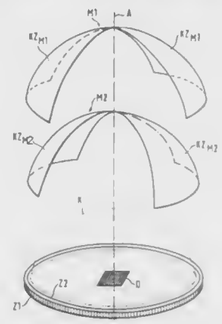
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423494

Int. Cl.[5] G01J *1/04*

U.S. Cl. 250—338.1 **14 Claims**

1. A system for measuring electromagnetic radiation originating from the hemisphere corresponding to a solid angle of 2π, comprising at least one low-inertia detector disposed below of a transmissive dome and two modulators in the shape

of dome segments having a common vertical axis which are fitted to each other and means for rotating both of said modulators about the common vertical axis at different relative speed



to each other so that the low-inertia detector is exposed to the average electromagnetic radiation from the entire hemisphere which is measured over time.

4,928,013

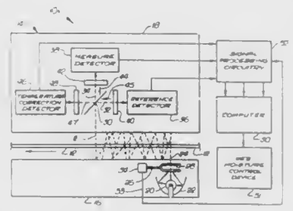
TEMPERATURE INSENSITIVE MOISTURE SENSOR

John Howarth, Monte Sereno, and Leonard M. Anderson, San Jose, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Feb. 17, 1987, Ser. No. 14,870

Int. Cl.[5] G01N *21/35*

U.S. Cl. 250—339 **4 Claims**



1. A paper web moisture sensor insensitive to web temperature, comprising:

an infrared radiation source for directing a beam of infrared radiation through a sheet of paper; and

detecting means for detecting the amount of infrared radiation from the beam which transmits through the sheet in first and second separate wavelength regions of the infrared spectrum, wherein said first region is positioned around the infrared absorption peak for water so that the intensity of the infrared radiation transmitted through the sheet in the first region is substantially insensitive to the temperature of the sheet and the second region is selected to detect infrared radiation which is primarily sensitive to the amount of paper fiber in the path of the infrared beam.

4,928,014

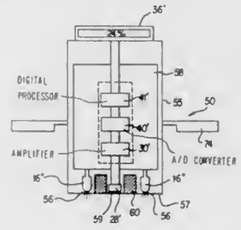
NEAR-INFRARED APPARATUS AND METHOD FOR DETERMINING PERCENT FAT IN A BODY

Robert D. Rosenthal, Gaithersburg, Md., assignor to Futrex, Inc., Gaithersburg, Md.

Filed Oct. 3, 1988, Ser. No. 252,548

Int. Cl.[5] G01N *21/55*

U.S. Cl. 250—341 **20 Claims**



1. A method for determining percent fat in a body, comprising:

(a) providing a near-infrared quantitative instrument comprising

(i) at least one point source of near-infrared radiation;

(ii) a near-infrared radiation detector capable of providing an electrical signal upon detection of near-infrared radiation;

(iii) means for preventing near-infrared radiation from said at least one point source from impinging directly on said detector;

(iv) locating means for placing said at least one point source against a body to be tested so as to introduce near-infrared radiation into said body, wherein said locating means positions said detector for receiving near-infrared radiation from said at least one point source that interacts with said body and for providing an electrical signal corresponding to the fat content of said body; and

(v) means for converting the electrical signal corresponding to the fat content of the body into a readout indicative of the percent fat of the body;

(b) placing the at least one point source against a body to be tested with the detector or positioned for receiving near-infrared radiation that interacts with said body;

(c) transmitting near-infrared radiation into said body;

(d) detecting near-infrared radiation which interacted with said body; and

(e) providing a readout of percent body fat corresponding to an electrical signal indicative of near-infrared absorption provided by said detector.

4,928,015

MEASURING MULTICOMPONENT CONSTITUENCY OF GAS EMISSION FLOW

James W. Butler, Dearborn Heights; Thomas J. Korniski, Livonia, and Alex D. Colvin, Oak Park, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 87,171, Aug. 19, 1987, Pat. No. 4,801,805. This application Oct. 3, 1988, Ser. No. 252,960

Int. Cl.[5] G01N *21/37*

U.S. Cl. 250—343 **15 Claims**

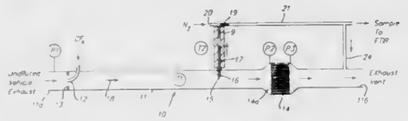
7. An on-line gas measurement apparatus, comprising:

(a) dilution tube means for sequestering a sample flow from a gas emission flow, said sample flow being diluted to lower its dew point to below room temperature and changed in either temperature and/or pressure to be substantially the same in temperature and pressure as that of gases used to create reference transmission frequency spectral data;

VOL
1114
ISS
4
MY
22
1990
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(b) FTIR apparatus effective to Produce electromagnetic signals with discernible amplitude variations resulting from irradiating said sample flow;

(c) computer means for (i) detecting and collecting said signals at a sufficiently high rate to substantially completely distinguish between adjacent spectral amplitudes



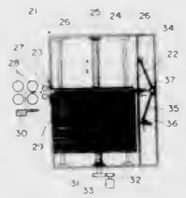
without mutual spectral interference, and (ii) analyzing said signals in accordance with Beer's Law to create reformed background-corrected data and applying reference transmission frequency spectral data to said reformed data for each suspected gas component to give a linear quantitative measure of the presence of each and every suspected gas component in said gas emission flow.

4,928,016

MAGAZINE FOR ACCOMMODATING RECORDING MEDIUM FOR ELECTRON MICROSCOPE

Nobufumi Mori; Katsuaki Muraishi; Terumi Matsuda; Masahiro Ohnishi, all of Kaisei; Hiromi Nunome, Akishima; Tadao Koyama, Akishima, and Tetsuo Oikawa, Akishima, all of Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Dec. 8, 1988, Ser. No. 281,414
Claims priority, application Japan, Dec. 16, 1987, 62-317732
Int. Cl.[5] H01J *37/26;* **G06K** *13/00;* **G03G** *13/00*
U.S. Cl. 250—440.1 **10 Claims**



1. A magazine for both supplying recording media to and receiving recording media from an electron microscope comprising:

a vertically movable rack for said recording media composed of a plurality of shelves;

thrusting means provided at a predetermined height position for pushing out said recording media at said position to supply said recording media to said electron microscope;

means for reintroducing said recording media to said rack after exposure to be received in said rack; and

accommodating means for accommodating the recording media within the rack.

4,928,017

METHOD FOR RECORDING AND REPRODUCING RADIOGRAPHIC IMAGES

Sibylle Kemmler-Sack, Tübingen, Fed. Rep. of Germany; Romano Morlotti, Ferrania, Italy, and Jürgen Reichardt, Schwab Muenchen, Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 14, 1988, Ser. No. 284,298
Claims priority, application Italy, Dec. 22, 1987, 23154 A/87
Int. Cl.[5] C09K *11/79*
U.S. Cl. 250—483.1 **1 Claim**

1. A method of direct radiography for getting a radiograph from an X-ray image of an object, comprising the steps of:

(a) causing an X-ray radiation to pass through the object,

(b) collecting the passed radiation image onto a phosphor screen containing a phosphor capable of converting the radiation image into a light image,

(c) collecting the light image onto a photographic film capable of being impressed by the light image,

said method being further characterized in that said phosphor is a terbium and cerium activated ternary lutetium-gadolinium-yttrium orthosilicate phosphor according to the formula:

$$(Lu_xGd_yY_z)_2SiO_5: aTb, bCe$$

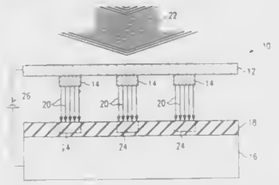
wherein $x+y+z=1$, $0.15 \leqq x \leqq 0.4.5$, $0.15 \leqq y \leqq 0.45$, $0.15 \leqq z \leqq 0.45$, $0.01 \leqq a \leqq 0.2$, $0.0008 \leqq b \leqq 0.0012$.

4,928,018

THERMO-ENHANCED ELECTRON IMAGE PROJECTOR

George R. Misinm, Richardson, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Jun. 29, 1989, Ser. No. 373,360
Int. Cl.[5] H01J *37/317*
U.S. Cl. 250—492.2 **23 Claims**



1. An electron image projecting apparatus for emitting electrons from a mask to a substrate, which comprises:

an electron-emitting pattern formed adjacent the mask; and

a heat source applied to said pattern to provide a sufficient heat level for inducing the emission of electrons from said pattern to said substrate.

4,928,019

SYSTEM FOR COMPENSATIVELY CORRECTING FOR DISPLACEMENTS DUE TO HEAT IN MACHINE TOOLS

Kazuto Tomikawa, Mishima, and Hideo Fujie, Nagaizumi, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

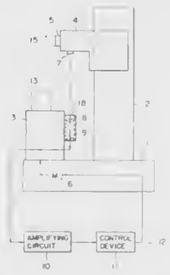
Filed Mar. 9, 1987, Ser. No. 23,252
Claims priority, application Japan, Mar. 12, 1986, 61-53982
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 **9 Claims**

1. A correction system for compensatively correcting for thermal displacement in a machine tool of the type having a column, a main spindle head ascendably and descendably supported on the column, a main spindle rotatably supported on the main spindle head and having means for holding a

machining tool, and a table for holding a workpiece to be machined by the tool, said correction system comprising:

at least one light source mounted on the main spindle head in the vicinity of the main spindle and operating to emit diffused light;

at least one lens mounted on the table in a state apart from and facing said at least one light source and functioning to receive said diffused light and to form an image of said at least one light source;



at least one light point displacement detector for detecting a variation of a position of the light source image of said at least one light source and generating a corresponding detection signal;

an amplifying circuit for amplifying said detection signal; and

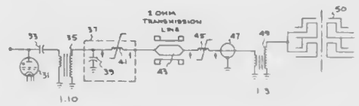
a control means operating to determine, from the signal thus amplified, any relative displacement of the table and the light source and, on the basis of said relative displacement, to correct the relative position of the table and the main spindle.

4,928,020

SATURABLE INDUCTOR AND TRANSFORMER STRUCTURES FOR MAGNETIC PULSE COMPRESSION

Daniel L. Birx, Londonderry, N.H., and Louis L. Reginato, Orinda, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 5, 1988, Ser. No. 178,041
Int. Cl.[5] H05H *5/08*
U.S. Cl. 307—106 **19 Claims**



1. Electrical transformation apparatus for a magnetic pulse compression circuit, the apparatus comprising:

two or more core assemblies substantially coaxially aligned around a common axis, each core assembly comprising:

a mandrel of mechanically rigid and conducting material with a hole along the axis; and

an annular body of ferromagnetic or ferrimagnetic material surrounding and contiguous with the mandrel with side surfaces substantially perpendicular to the axis;

one or more insulating plates, with an insulating plate placed between the side surfaces of two core assemblies;

a first electrical conductor, having at least two ends and forming a plurality of parallel circuits with each circuit arranged to make one or more substantially complete turns around the core assemblies, with the first electrical conductor, comprising:

a first upper conducting plate substantially parallel to the side surfaces of the cores and electrically connected to a mandrel;

a first lower conducting plate substantially parallel to the side surfaces of the cores and electrically connected to a mandrel and wherein the first lower conducting plate and the first upper conducting plate are on opposite sides of the core assemblies; and

a first plurality of outer conducting rods distributed around and outside of the core and substantially parallel to the axis, electrically connected to the lower conducting plate;

signal input means, electrically connected to one end of the first electrical conductor, to introduce a voltage pulse or a current pulse into the electrical conductor at that end thereof; and

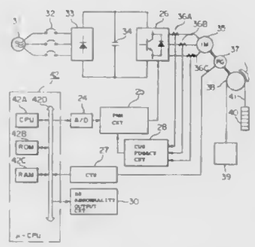
signal output means, electrically connected to a second end of the first electrical conductor, to receive a voltage pulse or a current pulse from the first electrical conductor.

4,928,021

ELEVATOR CONTROL APPARATUS

Masashi Yonemoto, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 26, 1989, Ser. No. 301,716
Claims priority, application Japan, Jan. 28, 1988, 63-18069
Int. Cl.[5] B66B *5/02*
U.S. Cl. 187—108 **3 Claims**



1. An elevator control apparatus comprising torque control means for calculating a torque command for a motor for hoisting an elevator cage, a brake which operates in response to a braking command so as to restrain said motor, brake abnormality detection means adapted to operate when a difference between a maximum value and a minimum value of the torque command is less than a predetermined value, and a brake abnormality output circuit which delivers a predetermined signal in response to the operation of said brake abnormality detection means.

4,928,022

REDUNDANCY INTERCONNECTION CIRCUITRY

John R. Marum, Stanford, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jul. 17, 1987, Ser. No. 74,608
Int. Cl.[5] H03K *17/693*
U.S. Cl. 307—241 **12 Claims**

1. Circuitry for coupling a first set of n terminals to a corresponding set of terminals selected from a larger set of m terminals, not all of which may be available, the circuitry comprising:

means for registering which of the m terminals are available; and

switching means, coupled to the means for registering, for connecting each of the n terminals to any available one of the m terminals, wherein the switching means automati-

VOL 1114 ISS 4 MY 22 1990 UMI

cally connects a first of the n terminals to a first available one of the m terminals, selected in a predictable manner, and each next one of the n terminals to a next available one of the m terminals, also selected in a predictable manner,



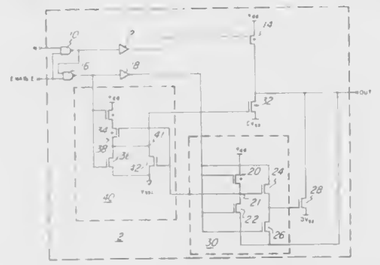
and wherein the switching means includes means for ensuring that each of the n terminals is connected to only a selected one of the m terminals, and means for ensuring that each of the m terminals is connected to no more than one of the n terminals.

4,928,023

IMPROVED OUTPUT BUFFER HAVING REDUCED NOISE CHARACTERISTICS

Steven P. Marshall, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 27, 1987, Ser. No. 90,076
Int. Cl.[5] H03K *17/16, 19/003, 5/12*
U.S. Cl. 307—443 **17 Claims**



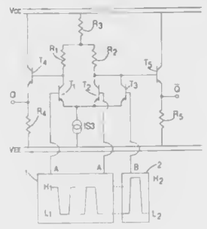
1. An output buffer circuit for presenting an output signal at an output node responsive to an input signal at an input node, comprising;
- pull-up means, connected between a power supply node and said output node;
- a first pull-down transistor, having a source-to-drain path connected between said output node and a first reference node, and having a gate;
- switching means, coupled to said input node, to said output node, and to said gate of said first pull-down transistor, for turning on said first pull-down transistor responsive to said input signal being at a first logic state, and for turning off said first pull-down transistor responsive to the voltage of said output node being substantially at the voltage of said first reference node, and having a drive control node;
- a second pull-down transistor, having a source-to-drain path connected between said output node and a second reference node, and having a gate; and
- drive means, having a first input coupled to said input node, a second input coupled to said drive control node of said switching means, and an output coupled to said gate of said second pull-down transistor, for turning on said second pull-down transistor responsive to said first input with said input node being at said first logic state and said second input with the voltage of said output node being substantially at the voltage of said first reference node.

4,928,024

REFERENCELESS ECL LOGIC CIRCUIT

Isao Shimotsuhama, Kawasaki; Shinji Emori, Urawa; Yoshio Watanabe, Kawasaki, and Masaya Tamamura, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 28, 1989, Ser. No. 344,405
Claims priority, application Japan, May 13, 1988, 63-117627
Int. Cl.[5] H03K *19/013, 19/086*
U.S. Cl. 307—455 **28 Claims**



1. A logic circuit comprising:
- a first NPN transistor and a second NPN transistor connected as a differential amplifier;
- a third NPN transistor connected in parallel with said second transistor;
- first driving means for driving said first and second NPN transistors with complementary signals having high and low levels; and
- second driving means for driving said third NPN transistor with an output signal having a high level that is higher than the high levels of said complementary signals, and having a low level that is lower than the high levels of said complementary signals.

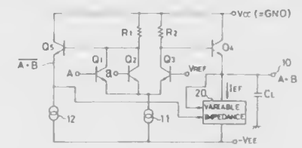
4,928,025

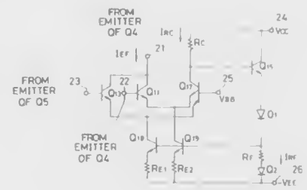
EMITTER COUPLED LOGIC CIRCUIT

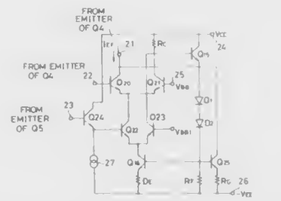
Masayuki Kokado, Machida, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 1, 1988, Ser. No. 214,356
Claims priority, application Japan, Jul. 21, 1987, 62-181965
Int. Cl.[5] H03K *19/086, 19/003, 17/04, 19/013*
U.S. Cl. 307—455 **11 Claims**

1. An emitter coupled logic circuit, comprising:
- a plurality of transistors constituting current switches for receiving input signals and outputting mutually opposite first and second outputs, emitters of the plurality of transistors being mutually connected;
- first emitter follower means for drawing the first output from said current switches, the first output being outputted through a first output terminal;
- second emitter follower means for drawing the second output from said current switches, the second output being outputted through a second output terminal; and
- variable impedance means being connected to both the first and second output terminals for providing a variable impedance to be coupled with said one output terminal, wherein said variable impedance means is for providing a first impedance when levels of the drawn first and second outputs are both at a high-level, and a second impedance when at least one of the first and second outputs is at a







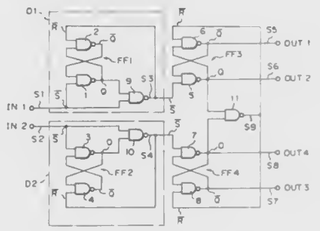
low-level, and wherein said first impedance is less than said second impedance.

4,928,026

DIGITAL PHASE COMPARING CIRCUIT

Hidetaka Ebesyu, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 22, 1988, Ser. No. 288,378
Claims priority, application Japan, Dec. 24, 1987, 62-325322
Int. Cl.[5] H03K *19/00, 5/00*
U.S. Cl. 307—479 **5 Claims**



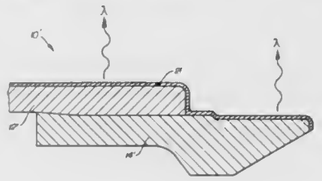
1. A digital phase comparing circuit, comprising:
- first and second input terminals receiving first and second input signals, respectively;
- a first rise detecting circuit for detecting a rise of said first input signal and outputting a first detection signal;
- a second rise detecting circuit for detecting a rise of said second input signal and outputting a second detection signal;
- a first flip-flop, operatively connected to said first rise detecting circuit, being set in response to said first detection signal and being reset in response to a reset signal;
- a second flip-flop, operatively connected to said second rise detecting circuit, being set in response to said second detection signal and being reset in response to said reset signal; and
- a logical state circuit responsive to an output of said first flip-flop and an output of said second flip-flop and, when the outputs of said first and second flip-flops coincide with each other, outputting said reset signal, wherein each output of said first and second flip-flops has a pulse width corresponding to a phase difference between said first and second input signals.

4,928,027

HIGH TEMPERATURE REFRACTORY MEMBER WITH RADIATION EMISSIVE OVERCOAT

William D. Deininger, Pasadena, and David Q. King, Sunland, both of Calif., assignors to The United States of America as represented by the administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 20, 1987, Ser. No. 87,376
Int. Cl.[4] H02K *44/10*
U.S. Cl. 310—11 **7 Claims**



1. A heat radiator for radiating heat generated by high temperature plasma in a plasma accelerator/decelerator having an interior portion in contact with the plasma and an exterior portion not in contact with the plasma comprising:
- a first layer made of a refractory material having a first spectral emissivity coefficient, the refractory material being disposed in the interior of the plasma accelerator/decelerator so as to contact the plasma and be heated by the plasma and wherein said refractory material is capable of withstanding temperatures of 1000° C. or higher without melting; and
- a second radiative layer forming a portion of the exterior of the plasma accelerator/decelerator and mechanically and thermally coupled to the first layer to radiate heat from the first layer away from the interior of the plasma accelerator/decelerator, the second layer being made of a radiation emissive material including zirconium diboride and having a second spectral emissivity coefficient that is substantially greater than the first spectral emissivity coefficient for radiatively cooling the first layer and a coefficient of thermal expansion substantially equal to that of said refractory material.

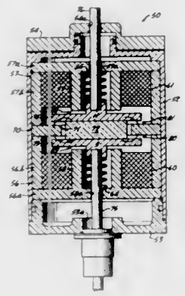
VOL 1114 ISS 4 MY 22 1990 UMI

4,928,028

PROPORTIONAL PERMANENT MAGNET FORCE ACTUATOR

Gregory Leibovich, Fullerton, Calif., assignor to Hydraulic Units, Inc., Duarte, Calif.

Filed Feb. 23, 1989, Ser. No. 314,753
Int. Cl.[5] H02K *33/12*; H01F *7/08*
U.S. Cl. 310—23 42 Claims



1. An actuator comprising:

stator means including first and second electromagnetic means, each of said electromagnetic means having main pole means in axial alignment in a first direction with the main pole means of the other and each having common pole means intermediate said main pole means and orthogonal to the direction of said main pole means;

armature means including permanent magnet means with first and second armature pole means having surfaces thereof disposed in spaced relation in said first direction to both said stator main pole means and said common pole means;

means for activating said electromagnet means for simultaneously providing a first attractive force between a first armature pole means and said common pole means, a first repulsive force between the first armature pole means and a first main pole means, a second attractive force between the second armature pole means and the second main pole means, and a second repulsive force between the second armature pole means and said common pole means, and

output means for enabling transfer of the relative displacement between said stator means and said armature means to a driven mechanism.

4,928,029

IN-SPINDLE MOTOR ASSEMBLY FOR DISK DRIVE AND METHOD FOR FABRICATING

Harold T. Wright, San Carlos, Calif., assignor to Maxtor Corporation, San Jose, Calif.

Division of Ser. No. 20,130, Feb. 27, 1984, Pat. No. 4,814,652. This application Sep. 22, 1988, Ser. No. 247,773
Int. Cl.[5] H02K *5/00*; G11B *5/012*
U.S. Cl. 310—89 6 Claims

1. A motor assembly for use in Winchester hard disk drives comprising:

a motor shaft;

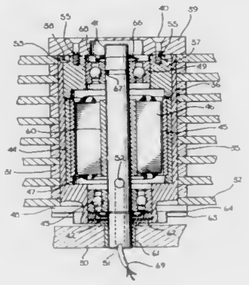
a stator affixed to said motor shaft, sad stator having electrical coil windings and being disposed about a longitudinal axis of said motor shaft;

a first hollow cylinder disposed about, and substantially aligned with, said motor shaft, said first hollow cylinder having a bore at a first end and inner and outer walls;

a second hollow cylinder disposed within said first hollow cylinder and being substantially aligned with said motor shaft, said second hollow cylinder having inner and outer walls;

a magnet means attached to said inner wall of said second hollow cylinder, said magnet means being disposed adjacent said stator;

said first hollow cylinder comprising a nonferromagnetic material and said second cylinder comprising a ferromagnetic material such that said second cylinder acts as a flux path for said magnet means;



an end cap means engageable with said second end of said first hollow cylinder, said end cap means having a bore disposed about said longitudinal axis of said stator shaft;

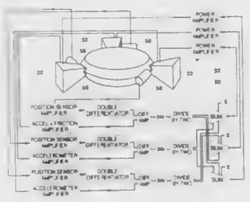
said first hollow cylinder and said end cap means having substantially the same coefficient of thermal expansion.

4,928,030

PIEZOELECTRIC ACTUATOR

Gordon W. Culp, Van Nuys, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 30, 1988, Ser. No. 252,197
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 23 Claims



1. A piezoelectric device configured to apply a force to an object, said device comprising:

(1) a crown having a friction surface which surface is proximate an object;

(2) a bottom having a surface supported by a support structure;

(3) at least one piezoelectric shear body integrally located intermediate said crown and said bottom;

(4) sensing means for determining the relative position of the crown in relation to the position of said supported surface;

(5) means for adjusting the proximate position, of the crown and the object;

(6) means for detecting and measuring a physical contact force between the crown and said object; and

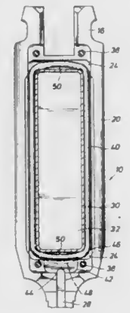
(7) means for effecting an electric potential within said piezoelectric device to activate same and apply velocity and acceleration forces to said object.

4,928,031

PRESSURE/TEMPERATURE COMPENSATED TRANSDUCER PAD ASSEMBLY

Eugene J. Linyaev, Houston, and Roy E. Swanson, Jr., Sugarland, both of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Nov. 25, 1986, Ser. No. 934,672
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—346 15 Claims



1. A transducer pad assembly, comprising:

a housing having a recess for receiving a transducer insert therein, said recess having a substantially flat bottom;

a transducer insert for disposition in said recess, said insert having a transmission surface of substantially the same shape as said bottom for mating placement and cooperation therewith;

a continuous strip of elastomeric material disposed between said housing and said insert about the periphery of said recess;

means for securing said insert in said recess in a fixed position relative to said housing for producing a closed cavity defined at least in part by said bottom of said recess, said transmission surface of said insert and said continuous strip of elastomeric material; and

an oil filling said cavity,

said continuous strip of elastomeric material being deformable to accommodate changes in the volume of said oil filling said cavity.

4,928,032

MEANS FOR CONVERTING A LAMP WITH A SCREW-TYPE BASE INTO A LAMP WITH A BI-PIN BASE

Michael J. Skoch, Mentor, and Frederick Hetzel, Brook Park, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1989, Ser. No. 331,554
Int. Cl.[5] H01J *5/50*; H01R *33/02, 13/58, 17/00*
U.S. Cl. 313—318 14 Claims

12. In combination,

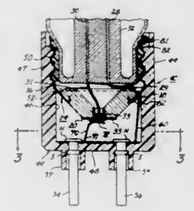
(a) a high pressure sodium arc lamp comprising: (i) a glass envelope within which a sodium vapor arc is developed during lamp operation and (ii) a screw-type base joined to said envelope, said screw-type base comprising a conductive shell having external threads and a coniform outer end, a conductive eyelet at one end of the screw-type base disposed centrally of the coniform outer end of the shell, and electrical insulation between said coniform outer end and said eyelet,

(b) a cup-shaped adapter comprising: (i) a tubular body containing a bore that extends between opposite ends of said tubular body and (ii) an end wall extending across said bore at one end of said tubular body, said bore surrounding said shell and containing internal threads for threadedly receiving the external threads on said shell, said end wall and said tubular body being of electrical insulating material,

(c) two conductive pins extending through said end wall in laterally spaced-apart relationship and supported on said end wall,

(d) first conductive means within said adapter for electrically connecting the shell of said screw-type base to one of said pins when said shell is threaded into said internal threads, said first conductive means comprising conductive structure that is electrically connected to said one pin and has a free end that is engageable by said coniform outer end of said shell when said shell is threaded into said internal threads, thereby establishing electrical contact between said free end and said coniform outer end, and

(e) second conductive means within said adapter and electrically insulated from first conductive means for electrically connecting the eyelet of said screw-type base to the other of said pins when the shell of said screw-type base is threaded into said internal threads.

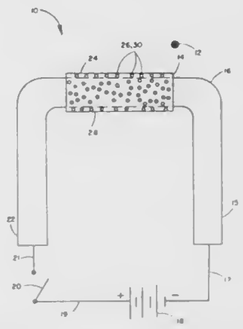


4,928,033

THERMIONIC IONIZATION SOURCE

Glenn E. Spangler, Lutherville; John P. Carrico, Jr., Laurel, and Donald N. Campbell, Timonium, all of Md., assignors to Environmental Technologies Group, Inc., Baltimore, Md.

Filed Nov. 15, 1988, Ser. No. 272,231
Int. Cl.[5] H01J *1/02, 27/26, 37/08*
U.S. Cl. 313—345 8 Claims



1. A thermionic emitter for providing positive ions comprising:

a mixture of beta alumina and inert material,

said beta alumina and inert material having portions thereof exposed on the surface of said mixture,

said exposed inert material portions providing surface sites characterized by a high work function for the emission of positive ions, and

VOL 1114 ISS 4 MY 22 1990 UMI

means for heating said mixture to a predetermined temperature.

4,928,034

IMPREGNATED CATHODE

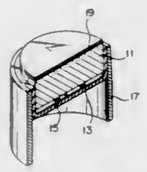
Sakae Kimura, Tokyo; Masaru Nikaido; Katumi Yanagibashi, both of Yokohama; Katsuhisa Homma, Kawasaki, and Yoshiaki Ouchi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 58,362, Jun. 4, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,157

Claims priority, application Japan, Jun. 6, 1986, 61-130223; Jun. 6, 1986, 61-130224

Int. Cl.[5] H01J *1/14*

U.S. Cl. 313—346 R **3 Claims**



1 An impregnated cathode, having stable electron emission characteristics at an early stage of operation and prolonged service life comprising:

(a) a porous pellet substrate consisting of a tungsten matrix impregnated with at least one alkaline earth oxide; and

(b) a continuous surface layer consisting of an alloy of iridium and tungsten having a thickness of 100 to 20,000 Å formed on an upper surface of said pellet substrate, wherein a crystal structure of said alloy has an ϵ_{II} phase, comprising an hexagonal close-packed structure, with lattice constants of $2.76 \leqq a \leqq 2.78$ and $4.44 \leqq c \leqq 4.46$,

wherein said stable electron emission characteristics are related to said lattice constants of said ϵ_{II} phase.

4,928,035

GLASS VIEWING SCREEN FOR A COLOR-PICTURE-REPRODUCING DEVICE AND A METHOD OF MAKING THE SAME

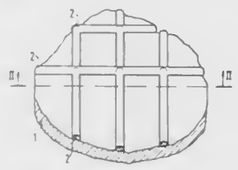
Michael Schlipf, Schorndorf, Fed. Rep. of Germany, assignor to Nokia Graetz, Pforzheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 922,738, Oct. 24, 1986, abandoned. This application Feb. 14, 1989, Ser. No. 311,089

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538167

Int. Cl.[5] H01J *29/10*

U.S. Cl. 313—466 **7 Claims**



1. A glass viewing screen for a color-picture-reproducing device, comprising:

a glass viewing screen;

phosphor areas deposited on the inside surface of said screen; and

a matrix of glass elements formed on said screen and surrounding said phosphor areas, said glass elements comprising a crystallizing sealing glass, applied to said screen as a paste by screen printing, said sealing glass paste having particles, 80 percent or more of which are smaller than 15 um, whereby the sealing glass has a characteristic such that it shrinks upon thermal crystallization.

4,928,036

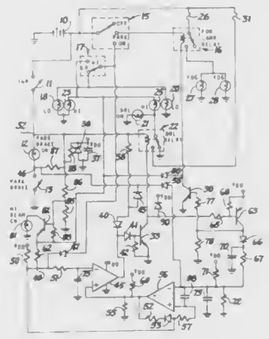
VEHICLE HEADLAMP SYSTEM WITH SERIES HIGH BEAM DAYLIGHT RUNNING LAMP OPERATION

Pierre Y. Abboud, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 123,711, Nov. 23, 1987, abandoned. This application Jul. 24, 1989, Ser. No. 384,890

Int. Cl.[5] B60Q *1/02*

U.S. Cl. 315—82 **13 Claims**



1. A headlamp system for a vehicle with an engine and an ignition switch effective to enable engine operation, the headlamp system comprising, in combination:

a source of electric power at a predetermined supply voltage;

a pair of headlamps on the front of the vehicle, one on each side thereof;

a headlamp switch having closed and open conditions;

a DRL enabling means;

first circuit means connecting one of the headlamps in series with the headlamp switch and electric power source;

a DRL activating switch effective in a first condition to connect the other of the headlamps in parallel with the one of the headlamps and in a second condition to connect the other of the headlamps in series with the one of the headlamps and the electric power source; and

second circuit means responsive to the ignition switch, headlamp switch and DRL enabling means to put the DRL activating switch in its second condition when the ignition switch is activated, the DRL enabling means is enabled and the headlamp switch is in an open condition, whereby the headlamps are both energized at approximately half the predetermined supply voltage for improved visibility of the vehicle to other vehicle operators, and otherwise to put the DRL activating switch in its first condition, whereby the headlamps may both be energized with the full predetermined supply voltage for illumination of the road for vehicle operation with the headlamp switch in its closed condition.

4,928,037

PROTECTED DISCHARGE LAMP LIGHTING SYSTEM

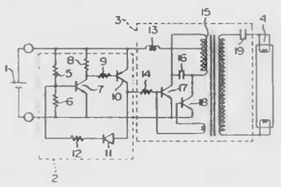
Kenji Kawabata, Ome; Soichiro Ogawa, Tokyo, and Ryoichi Masaki, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,702

Claims priority, application Japan, Dec. 25, 1987, 62-327149

Int. Cl.[5] H05B *37/02, 41/16*

U.S. Cl. 315—127 **1 Claim**



1. A discharge lamp lighting system comprising:

a d.c. power supply;

a lighting circuit to which an output from said d.c. power supply is supplied and from which a high frequency voltage is generated;

a discharge lamp connected at the output side of said lighting circuit; and

a lighting control circuit connected between said d.c. power supply and said lighting circuit, said lighting control circuit being constructed such that if a detected output voltage of said d.c. power supply is lower than a voltage value A at which a lamp discharge start voltage can be obtained, the operation of said lighting circuit is not allowed to start operating, when said detected output voltage reaches the voltage value A or over, said lighting circuit is caused to start operating and apply the start voltage to said discharge lamp to turn on said lamp, and after turning-on of said discharge lamp, when the output voltage of said d.c. power supply lowers smaller than a voltage value B at which said discharge lamp can still maintain its normal discharge said lighting circuit operation is stopped.

4,928,038

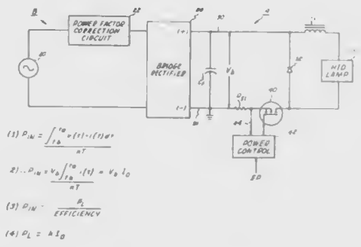
POWER CONTROL CIRCUIT FOR DISCHARGE LAMP AND METHOD OF OPERATING SAME

Louis R. Nerone, Brecksville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 26, 1988, Ser. No. 248,882

Int. Cl.[5] H05B *39/04*

U.S. Cl. 315—209 R **38 Claims**



1. A power control circuit for controlling the power to a discharge lamp from a power supply including a d-c input stage and a power switch selectively switched between a conductive state to pass current through said lamp and a non-conductive state, whereby current passing through said lamp increases when said switch is in said conductive state and decreases when said switch is in said non-conductive state, said power control circuit comprising:

current control means for creating a series of operating cycles (T) including a first driving portion (W) wherein said switch is rendered alternately conductive and non-conductive in succession and a quiescent portion (T-W) wherein said switch is non-conductive;

means for sensing the instantaneous current through said power switch and independent of said current passing through said lamp;

means for creating a first signal proportional to average of said sensed current;

means for creating a second signal proportional to a set point power;

means for creating an error signal indicative of the difference between said first and second signals; and

means for adjusting the time of said first driving portion (W) of said operating cycle (T) in accordance with said error signal whereby the output power of said power supply is continuously adjusted toward said set point power.

4,928,039

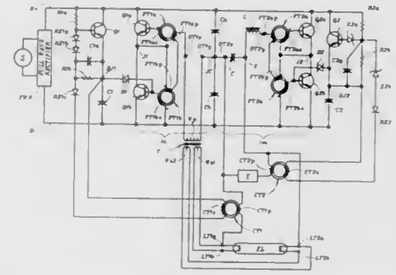
ELECTRONIC BALLAST WITH LAMP PRE-CONDITIONING

Ole K. Nilssen, Caesar Dr. Rte. 5, Barrington, Ill. 60010

Continuation of Ser. No. 678,021, Dec. 4, 1984, abandoned. This application Jul. 10, 1989, Ser. No. 377,767

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—209 R **22 Claims**



14. An arrangement to power a fluorescent lamp, comprising:

source adapted in response to trigger pulses to provide, for each trigger pulse, power to the lamp for a brief period; and

means operative controllably and periodically to provide said trigger pulses, thereby controllably to provide periodic brief periods of lamp operating power.

4,928,040

ULTRA VIOLET RAY GENERATOR BY MEANS OF MICROWAVE EXCITATION

Osamu Uesaki, 11-8, Kasukabe Higashi 5-chome, Kasukabe-shi, Saitama Prefecture, Japan

Filed Aug. 4, 1988, Ser. No. 228,043

Claims priority, application Japan, Aug. 7, 1987, 62-121264[U]

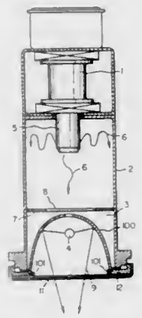
Int. Cl.[5] H05B *41/24*

U.S. Cl. 315—248 **4 Claims**

1. An ultra violet ray generator using excitation of a UV lamp by microwaves comprising a microwave generator for generating microwaves, a microwave cavity connected with said microwave generator, and an ultra violet ray lamp disposed in said microwave cavity, said microwaves generated from said microwave generator being introduced into said

VOL 1114 ISS 4 MY 22 1990 UMI

microwave cavity through a slot in an upper wall of said microwave cavity, and said ultra violet ray lamp in said microwave cavity being irradiated and exited with said microwaves to generate ultra violet rays, wherein an ultra violet ray reflector is detachably secured near said ultra violet ray lamp in said microwave cavity, said reflector consisting of a light-transmit-



ting base and an interference film thereon, and interference film having a thickness of 2 to 2.2 microns, said interference film being formed by vacuum-evaporating a first layer of zirconium oxide on the base and subsequently a second layer of silicon oxide on the first layer, and repeating said vacuum evaporations.

4,928,041

FLAT DISPLAY DEVICE

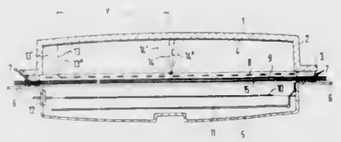
Uwe Mayer, Kirchheim-Teck, and Kurt-Manfred Tischer, Wendlingen, both of Fed. Rep. of Germany, assignors to Nokia Graetz, Pforzheim, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 306,985

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3805858

Int. Cl.[5] H01J *29/70, 29/56*

U.S. Cl. 315—366 9 Claims



1. A process for operating a flat display device of the type that displays information by generating a plurality of lines, said display device having a phosphor-coated glass faceplate and a trough-shaped back metal envelope defining an evacuated interior space, within which there is arranged an area cathode with an extract anode in front of it and, between the latter and the faceplae, a control structure and a deflection device to which there are applied deflection voltages used to deflect a plurality of electron beams used to generate each line, characterized in that the deflection voltages are modulated in such a way as to be inversely proportional to the particular distances between the deflection devices (8) and the phosphor coating (4).

4,928,042

CIRCUIT ARRANGEMENT FOR OPERATING A MULTI-PHASE SYNCHRONOUS MOTOR ON A DIRECT-VOLTAGE SYSTEM

Klaus Harms, Vaihingen/Enz; Hans-Dieter Schray, Markgröningen; Bernd Taubitz, Schwieberdingen, and Rainer Wirtz, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

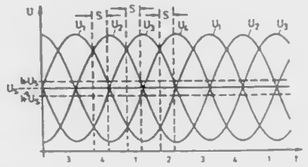
PCT No. PCT/DE87/00109, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO87/05756, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 12, 1986, Ser. No. 272,881

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609826

Int. Cl.[5] H02K *29/00*

U.S. Cl. 318—254 18 Claims



1. Circuit arrangement for operating a multi-phase synchronous motor on a direct current voltage mains, comprising a number of current valves which corresponds to the number of phases of the armature winding of the synchronous motor, each of said current valves being connected in series with an assigned phase of the armature winding to the direct current voltage source; a ring counter, having a counting input and a plurality of parallel counting outputs, each counting output being connected to a control input of an assigned control valve and when the count at the respective counting outputs in the ring counter cyclically assumes high value, the corresponding current valve is switched over into conduction; a ring counter switching device including a comparison device for comparing voltage drops across two blocked current valves, the first voltage drop being in opposite electrical phase relative to the alternating voltage induced in the phase of the armature winding which is connected to the currently conducting current valve, and the second voltage drop being in opposite electrical phase relative to the alternating voltage induced in the phase of the armature winding which is connected to the subsequent current valve when viewed in the direction of rotation of the motor; said comparison device generating a counting pulse when said second voltage drop exceeds said first voltage drop; means for deriving a set voltage value ($k \cdot U_S$) from the direct voltage of said source; and said ring counter switching device further including means for delivering said counting pulse to said counting input of the ring counter for as long as said first voltage drop exceeds said set voltage value ($k \cdot U_S$).

4,928,043

BACK EMF SAMPLING CIRCUIT FOR PHASE LOCKED LOOP MOTOR CONTROL

Allan B. Plunkett, Portland, Oreg., assignor to Synektron Corporation, Portland, Oreg.

Filed Nov. 14, 1988, Ser. No. 270,611

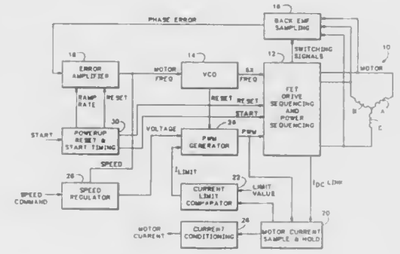
Int. Cl.[5] H02R *6/02*

U.S. Cl. 318—254 11 Claims

1. A brushless electrical rotary machine having a rotor and a stator and including a plurality of windings driven by a multiphase inverter for selectively energizing said windings in sequence, comprising:

(a) a phase detector having sampling means, including switching means responsive to said multiphase inverter, for sampling the back emf across at least one of said windings only during a period of time when said winding is normally not energized, said sampling means producing a phase error signal;

(b) integrator means responsive to said phase error signal for producing a drive signal; and



(c) oscillator means responsive to said drive signal for controlling the frequency at which said multiphase inverter selectively energizes said windings.

4,928,044

SPINDLE MOTOR STOP CONTROL DEVICE

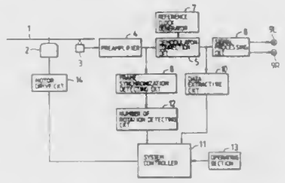
Takahumi Shiba, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 19, 1988, Ser. No. 285,973

Claims priority, application Japan, Dec. 19, 1987, 62-322507

Int. Cl.[5] H02K *5/00*

U.S. Cl. 318—364 4 Claims



1. A spindle motor stop control device for applying a reverse torque braking force to a spindle motor for rotating a data record disc comprising:

number of rotation detecting means for detecting and outputting a detection signal when the number of rotation of said spindle motor has decreased to a fraction (1/n) of a predetermined value in response to the reverse torque braking force;

measuring means for measuring the time interval, T between the time instant that said reverse torque braking force is applied to said spindle motor and the time that said detection signal is outputted;

arithmetic means for calculating a period of time t which is a function of said time interval T, and

means for continuing the application of said reverse torque braking force for the period of time t from the time of production of said detection signal.

4,928,045

CIRCUIT ARRANGEMENT FOR GENERATING A MEASUREMENT SIGNAL ASSOCIATED WITH THE FREQUENCY OF AN ALTERNATING CURRENT SIGNAL

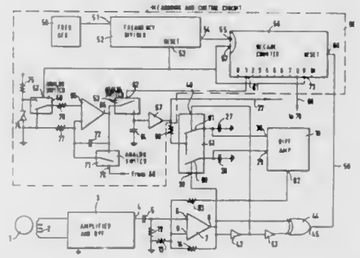
Benno Doemen, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 85,566, Jul. 6, 1987, Pat. No. 4,823,060. This application Apr. 7, 1989, Ser. No. 334,539

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539556

Int. Cl.[5] G01R *23/09*

U.S. Cl. 318—464 11 Claims



1. A circuit arrangement for generating measurement signals associated with the frequency of an alternating current signal, for measuring and regulating the synchronization of an electric motor, comprising:

a measuring and control circuit; and

a comparator circuit which converts the two opposite polarity halfwaves of the alternating current signal into pulses whose edges trigger the measuring and control circuit to generate the measurement signals in the form of digital signals or direct voltage signals, wherein the measurement signals correspond to the half-period durations of each of the two opposite polarity halfwaves of the alternating current signal measured from the respective zero passages; the measurement signals of each of the two opposite polarity halfwaves are averaged and stored separately and continuously over a plurality of periods in accordance with the positive and the negative halfwaves of the alternating current signal, and the difference of the stored values between the two opposite polarity halfwaves is fed as a correction signal to a comparison voltage input of the comparator circuit.

4,928,046

MULTIPLE ROTATIONAL POSITION SENSOR

Yutaka Karasawa, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,856

Claims priority, application Japan, Dec. 29, 1988, 63-330926

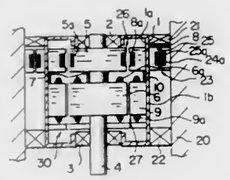
Int. Cl.[5] H02K *39/00*

U.S. Cl. 318—654 3 Claims

1. A multiple rotational position sensor comprising a stator winding provided to a stator mounted to a casing, and a rotor having a rotor winding provided to a rotor shaft mounted for rotation to said casing, in which the rotational position is sensed by the relative rotation between the rotor and the stator, wherein the improvement resides in that the multiple rotational position sensor comprises further a speed reducing unit adapted for coupling the rotor shaft and the casing to-

VOL 1114 ISS 4 MY 22 1990 UMI

gether, and outer bearings for rotatably carrying said casing, said casing being revolved by rotation of said rotor shaft and



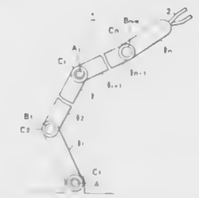
said casing being revolved by an angle less than the angle of rotation of said rotor shaft.

4,928,047

MANIPULATOR AND CONTROL METHOD

Hirohiko Arai, and Susumu Tachi, both of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,926
Claims priority, application Japan, Mar. 31, 1988, 63-80079
Int. Cl.[5] B25J *1/02*
U.S. Cl. 318—568.16 **2 Claims**



1. A multiple-degree-of-freedom manipulator comprising:
a plurality of links;
at least one passive joint for joining adjacent links and which is provided with a first sensor for detecting relative angles or relative displacements of said links and a brake which is brought to an operating state wherein said passive joint is completely fixed immovably and a release state wherein said passive joint is freely movable;
at least one active joint for adjacent links and provided with an actuator for actuating said active joint and a second sensor for detecting relative angles or relative displacements of said links; and
control means for driving said actuator and switching said brake between said operating state and said release state on the basis of relative angles or relative displacements of said links detected by said first and second sensors.

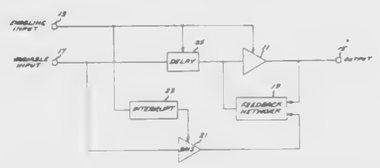
4,928,048

FAST RESPONSE CONTROL CIRCUIT

James H. Doyle, Orange, Calif., assignor to Unit Instruments, Inc., Orange, Calif.

Filed Mar. 28, 1988, Ser. No. 174,515
Int. Cl.[5] G05B *7/00*
U.S. Cl. 318—644 **18 Claims**

1. A fast response control circuit comprising:
amplifier means, responsive to an enabling input signal to provide an output signal having a magnitude determined by a variable input signal;
a feedback network in feedback relationship with the amplifier means and defining therewith a control loop comprising a capacitor and resistor in series characterized by a response time; and



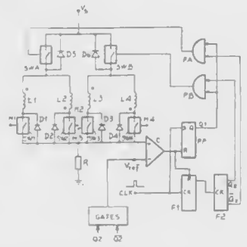
bias means connected intermediate said capacitor and said resistor, operative to apply a bias signal to the control loop and thereby to reduce the response time.

4,928,049

CIRCUIT FOR CONTROLLING CURRENT SWITCHING IN MULTIPLE INDUCTIVE LOADS, WITH SINGLE CURRENT DETECTOR, PARTICULARLY FOR WINDINGS OF STEP MOTORS

Giovanni Pietrobon, Treviso; Domenico Rossi, Cilavegna, and Salvatore Pappalardo, Padova, all of Italy, assignors to SGS-Thomson Microelectronics SRL, Italy

Filed Sep. 16, 1988, Ser. No. 245,657
Claims priority, application Italy, Oct. 5, 1987, 22141 A/87
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—685 **3 Claims**



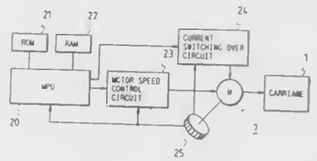
1. A circuit for controlling current switching in multiple inductive loads fed by means of respective switching switches and by means of respective current adjustment switches comprising a single sensor resistor connected in series to said switching switches, and a single comparator circuit adapted to generate a logical signal when the voltage across the sensor resistor exceeds a reference voltage (V_{ref}), said single comparator circuit driving through said logical signal respective first inputs of a plurality of AND gates, said plurality of AND gates controlling said current adjustment switches, and respective second inputs of said plurality of AND gates being driven by respective square-wave signals from a circuit means in opposite phase with a period equal to twice the switching period of a clock signal inputted to said circuit means.

4,928,050

RECORDER

Akira Torisawa, Machida; Masaaki Kakizaki, Kawasaki; Noriaki Ito, and Shigeru Yoshimura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,196
Claims priority, application Japan, Jan. 29, 1988, 63-16855; Mar. 20, 1988, 63-122034
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 **9 Claims**



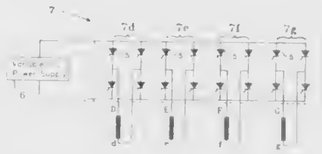
1. A recording apparatus in which a recording head is moved to effect scan for recording, comprising:
a carriage carrying the recording head;
a stepping motor for moving the carriage;
detection means for detecting a rotation angle position of a rotor of the stepping motor, the detection means generating a pulse signal for every predetermined angle of rotation of said rotor;
control means for counting the pulse signals from said detection means, detecting a position of said carriage in accordance with a counted value and outputting start and stop control signals of said carriage in accordance with counted values; and
current switching means for controlling switch-over of excitation current supplied to a coil of the stepping motor in accordance with pulse signals from said detection means, the current switching means starting switch-over control of the excitation current by the start control signal from said control means and stopping the switch-over control of the excitation current by the stop control signal.

4,928,051

ELECTRIC MOTOR

Jozsef Demeter, 2a Avenida Los Palos Grandes, Ed. Jacaranda, Apto. 3-A, Caracas, Venezuela; Tibor Zoltai, 476 Summit Ave., Saint Paul, Minn. 55102, and Hector D. Navarro, Apdo. 47411, Caracas 1041-A, Venezuela

Continuation of Ser. No. 46,849, May 5, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,762
Int. Cl.[5] H02P *5/40*
U.S. Cl. 318—731 **5 Claims**



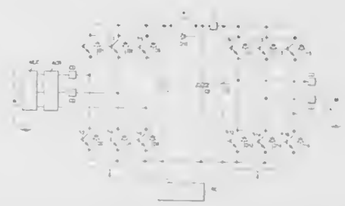
1. A method of operating an electric motor having a rotor and a stator, comprising the steps of supplying said rotor with a first current from a first current source having means defining a first maximum number of phases, said rotor being provided with said first maximum number of phase windings, and said first phase windings constituting the sole phase windings on said rotor and each being connectible to and disconnectible from a respective phase of said first source; and supplying said stator with a second current from a second current source having means defining a second maximum number of phases, said second maximum number being different from said first maximum number, and said stator being provided with said second maximum number of second phase windings, said second phase windings constituting the sole phase windings on said stator and each being connectible to and disconnectible from a respective phase of said second source, the supplying steps being performed so that said first source has a first number of excited phases and said second source has a second number of excited, phases different from the first number of excited phases, and the supplying steps inducing rotation of said rotor, the supplying steps including connecting all of said first phase windings to said first source so as to produce a first magnetic field and simultaneously connecting all but one of said second phase windings to said second source so as to produce a second magnetic field which, if out of alignment with said first magnetic field, becomes aligned therewith due to rotation of said rotor, the supplying steps further including disconnecting one of said first phase windings from said first source so that said first magnetic field rotates through a first angle and simultaneously connecting said one second phase winding to said second source so that said second magnetic field rotates through a second angle which differs from said first angle due to the difference between said first maximum number and said second maximum number, said one first phase winding and the polarity of the current in said one second phase winding being selected in such a manner as to cause said magnetic fields to rotate in the same sense and to minimize the angles of rotation of said magnetic fields.

4,928,052

POWER SUPPLY REGENERATING CIRCUIT

Yoshiki Fujioka, Yamanashi, and Mitsuhiko Hirota, Tokyo, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00417, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/08639, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 27, 1988, Ser. No. 274,148
Claims priority, application Japan, Apr. 30, 1987, 62-107255; Apr. 30, 1987, 62-107258; Apr. 30, 1987, 62-107259
Int. Cl.[5] H02P *3/18*
U.S. Cl. 318—762 **5 Claims**



1. A power supply regenerating circuit for driving an induction motor upon controlling AC frequency and voltage by an inverter after three-phase power is rectified and smoothed by a rectifying circuit, and for rectifying and smoothing induced electromotive force during deceleration of the induction motor and effecting a conversion into AC power by a semiconductor bridge circuit for performing power supply regeneration, said power supply regenerating circuit comprising:
a parallel circuit including a reverse connected diode and a resistor connected between the rectifying circuit and the bridge circuit, the regenerative power blocked by said diode being supplied to the bridge circuit as a current limited by said resistor, and the regenerative power being supplied only during a predetermined interval of a three-phase period; and
a power supply frequency discriminating circuit including:

VOL 1114 ISS 4 MY 22 1990 UMI

synchronizing signal generating means for generating signals upon successively detecting points at which an instantaneous value of voltage in one phase of a three-phase supply and an instantaneous value of voltage in a next phase of the three-phase power supply become equal;

clock generating means for generating clock pulses;

counting means, coupled to said synchronizing signal generating means, for counting clock pulses between signals from said synchronizing signal generating means;

discriminating means, coupled to said counting means, for discriminating one of 50 Hz and 60 Hz in dependence upon a counted value in said counting means; and

control means, coupled to said discriminating means and the bridge circuit, for controlling the bridge circuit by a signal from said discriminating means.

4,928,053

CONTROL CIRCUIT FOR AN INDUCTIVE LOAD

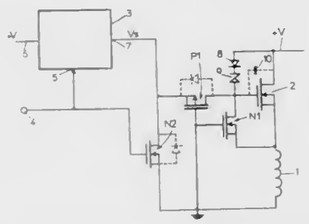
Thierry M. A. Sicard, Fenouillet, and Michel J. Saquet, Villeneuve-Tolosane, both of France, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 4, 1989, Ser. No. 333,367

Claims priority, application France, Apr. 14, 1988, 88 04938

Int. Cl.[5] G05F *1/56*

U.S. Cl. 323—284 **9 Claims**



1. A control circuit for an inductive load, comprising an N-channel MOS power transistor, the drain of which is connected to the positive terminal of a direct current electrical supply source supplying a voltage +Vbat while the inductive load is connected between the source of this transistor and ground, the drain-source circuit of an N-channel MOS interconnecting transistor (N1) being connected between the gate and the source of the power transistor, said interconnecting transistor having a conduction threshold below that of the power transistor, said control circuit comprising a P-channel MOS isolating transistor (P1), the drain and the gate of which are connected respectively to the gate of the power transistor and to the ground of the circuit, the source of the isolating transistor (P1) being selectively brought to a voltage less than or greater than +Vbat, to block or to unblock the conduction of the power transistor, respectively.

4,928,054

SWITCH MODE ELECTRICAL POWER CONTROLLER

Fernando Martin-Lopez, Santa Clara County, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation-in-part of Ser. No. 179,165, Apr. 8, 1988, abandoned. This application Sep. 20, 1988, Ser. No. 246,764

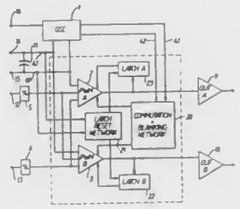
Int. Cl.[5] G05F *1/56*

U.S. Cl. 323—288 **7 Claims**

1. A switch mode power supply controller of the type that provides a repetitive output signal having a first state and a second state wherein the ratio of the first state of the output signal to the second state of the output signal varies in response to an error voltage signal representative of the difference between the actual output voltage of a power supply to which said controller belongs and a desired output voltage, said switch mode power supply controller comprising:

means for generating an oscillator signal and a control signal derived from said oscillator signal, wherein said oscillator signal has a ramp portion and a second portion, said control signal having a first state corresponding to the ramp portion of said oscillator signal and a second state corresponding to said second portion of said oscillator signal,

a pulse width modulating network comprising a comparator having a first and second input ports, wherein said first



input port is connected to said oscillator signal and said second input port is connected to said error voltage signal, the output signal of said switch mode power supply changing states when the magnitude of the ramp portion of the oscillator signal is less than the magnitude of the error voltage signal,

feedback means for latching said comparator at substantially the same time as a change in the output signal,

means for blanking the comparator such that the output signal does not change states during the second portion of the oscillator signal.

4,928,055

CONTROL CIRCUIT FOR HEAT FIXING DEVICE FOR USE IN AN IMAGE FORMING APPARATUS

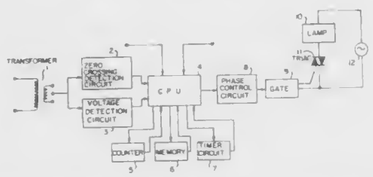
Shozo Kaieda, Hachioji; Ikuo Kurashima, Tama; Hideo Okazima, Tama, and Jun Mai, Tama, all of Japan, assignors to Kentek Information Systems, Inc., Allendale, N.J.

Filed Feb. 28, 1989, Ser. No. 316,512

Claims priority, application Japan, Nov. 25, 1988, 63-296247

Int. Cl.[5] G05F *5/00*

U.S. Cl. 323—300 **7 Claims**



1. A control circuit for a heat fixing device for use in an image forming apparatus comprising means for detecting a power source voltage, means for detecting zerocrossing points of the power source voltage, means for determining a frequency of the source voltage from the detected zero-crossing points, means for determining a power supplying time interval based on the detected power source voltage and the determined power source frequency, means for controlling the power supplied to a load in accordance with the determined power supplying time interval, whereby a given power is automatically applied to the load when the power source voltage or frequency changes, wherein a time from zerocrossing to power supply starting is stored in a memory as data for different values of power source voltage and frequency and the

power supplying time interval is determined in accordance with said stored data and the detecting power source voltage as well as the determined power source frequency.

4,928,056

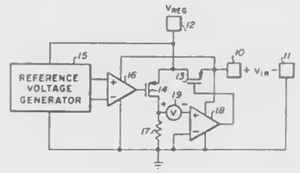
STABILIZED LOW DROPOUT VOLTAGE REGULATOR CIRCUIT

Robert A. Pease, San Francisco, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 6, 1988, Ser. No. 255,673

Int. Cl.[5] G05F *3/24*

U.S. Cl. 323—314 **5 Claims**



1. A voltage regulator circuit having an unregulated input supply terminal, a regulated output supply terminal and a supply return terminal, said circuit being composed of transistors each one having controlled current flow electrodes of high and low impedance and a current flow control electrode, said circuit comprising:

a series pass transistor having its low impedance electrode connected to said unregulated input supply terminal, its high impedance electrode connected to said regulated output supply terminal and a control electrode;

means driven from said regulated output supply terminal and connected to said control electrode of said series pass transistor thereby creating an overall negative feedback loop that operates to develop a control potential that holds said regulated output supply terminal at a constant potential level that is substantially independent of temperature, input supply voltage and output supply terminal current;

a shunt transistor having its low impedance electrode connected to said regulated supply output terminal, means for returning its high impedance electrode to said supply return terminal and a control electrode; and

means, responsive to the current flowing in said shunt transistor, connected to said control electrode of said series pass transistor to form an internal negative feedback loop, within said overall negative feedback loop, said internal negative feedback loop being operative to hold the current flow in said shunt transistor constant and said regulator circuit is thereby stabilized.

4,928,057

HIGH SPEED D.C. NON-CONTACTING ELECTROSTATIC VOLTAGE FOLLOWER

Bruce T. Williams, 454 South St., Lockport, N.Y. 14094

Division of Ser. No. 924,054, Oct. 28, 1986. This application Sep. 6, 1989, Ser. No. 403,695

Int. Cl.[5] G01R *1/04, 1/067*

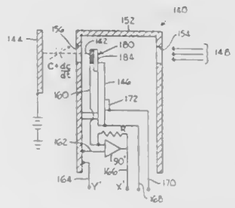
U.S. Cl. 324—72 **5 Claims**

1. In a probe for an electrostatic voltmeter including a detector electrode adapted to be disposed toward a test surface bearing an electrostatic quantity to be measure, modulator means operatively associated with said detector electrode for modulating the capacitive coupling between said electrode and said surface, and means defining a path for radiation onto said surface for irradiating a region of said surface in registry with said electrode, the improvement comprising;

(a) a carrier element of material transparent to said radiation having a first surface adapted to be disposed toward said test surface;

(b) a first film of conductive material transparent to said radiation on said first surface of said carrier element, said first film occupying less than the total area of said first surface of said carrier element and defining said detector electrode;

(c) a second film of conductive material transparent to said radiation on the remainder of said first surface of said carrier element and spaced from said first film;



(d) said carrier element being operatively associated with said modulator means for modulating the capacitive coupling between said detector electrode and said surface; and

(e) said carrier element being disposed in said path for radiation such that radiation passes through said element onto said test surface and such that compensation is made for capacitive fringing effects by allowing for radiation of the fringing areas of the test surface coupled to said detector electrode by fringing capacitance.

4,928,058

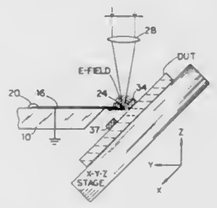
ELECTRO-OPTIC SIGNAL MEASUREMENT

Steven Williamson, Ann Arbor, Mich., assignor to The University of Rochester, Rochester, N.Y.

Filed May 23, 1989, Ser. No. 355,514

Int. Cl.[5] G01R *29/14*

U.S. Cl. 324—96 **23 Claims**



1. In a system for electro-optically measuring an electrical signal which produces a field with an electro-optic element through which said field passes and through which an optical signal also passes and is modulated by said field, said measurement being in accordance with the modulation of said optical signal, an improved probe which comprises a support having a surface with an edge, a strip of flexural material mounted on said surface and extending beyond said edge as a cantilever, said cantilever having a free end, said electro-optical element being mounted on said element between said edge and said free end and extending beyond said free end to a region where said optical signal intersects said element whereby said element is flexurally supported.

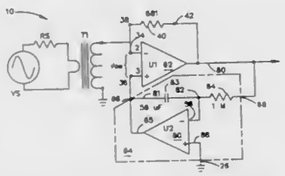
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4,928,059

SINUSOIDAL CURRENT SENSE AND SCALING CIRCUIT

Hugh L. Franklin, La Mirada; Leslie H. Whatley, Corona, and George N. Klees, Anaheim, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 1, 1989, Ser. No. 345,939
Int. Cl.[5] G01R *19/00, 19/02*
U.S. Cl. 324—123 R 4 Claims



1. A current measuring circuit for measuring a sinusoidal current from a sinusoidal current source referenced to a first reference potential for providing a scaled sinusoidal voltage proportional to said sinusoidal current, said scaled sinusoidal voltage being referenced to a second reference potential, said current measuring circuit comprising:

a transformer having a primary winding responsive to said sinusoidal current from said sinusoidal current source referenced to said first reference potential, and a secondary winding having a first terminal coupled to said second reference potential and a second terminal for providing a scaled sinusoidal current having an amplitude essentially equal to the amplitude of said sinusoidal current passing through said primary winding times the ratio of N1/N2, where N2 represents the number of turns on the secondary winding and N1 represents the number of turns on said primary winding;

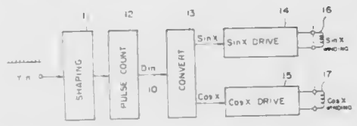
scaling means for receiving said scaled sinusoidal current, for maintaining the voltage at said transformer secondary second terminal at essentially the same potential as said second reference potential and for providing an output voltage at an output terminal equal to said secondary current times a predetermined constant.

4,928,060

DRIVING CIRCUIT OF A CROSSED-COIL TYPE INSTRUMENT USING DIGITAL DATA PULSE PRODUCTION

Akio Ito, Konosu, Japan, assignor to Jeco Company, Ltd., Japan

Filed Feb. 1, 1989, Ser. No. 305,414
Claims priority, application Japan, Feb. 5, 1988, 63-25180
Int. Cl.[5] G01R *11/36;* G01P *3/48*
U.S. Cl. 324—143 11 Claims



1. A driving circuit for driving a crossed-coil type instrument used for reading a physical quantity in which a pair of windings surrounding a movable magnet carrying a pointer needle thereon are disposed to cross each other with a predetermined mechanical angle, comprising:

digital data conversion means supplied with an electrical signal representing said physical quantity to be measured for producing a digital data representing the electrical signal;

pulse data producing means supplied with said digital data for producing a number of pulses in correspondence with said digital data such that each of the pulses represents a stepwise increment of a step function which approximates either one of a sine function and a cosine function defined as a function of the digital data; and

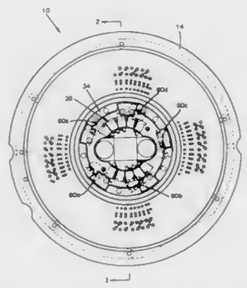
drive signal generating means supplied with said pulses for synthesizing first and second analogue drive signals respectively representing a sine wave signal and a cosine wave signal which change sinusoidally with the input electrical signal therefrom, said driving signals being respectively supplied to said first and second windings for moving the magnet disposed in the first and second windings.

4,928,061

MULTI-LAYER PRINTED CIRCUIT BOARD

Michael S. Dampier, Burlington; Ronald J. Prilik, South Burlington, and Norman R. Rapoport, Williston, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1989, Ser. No. 330,293
Int. Cl.[5] G01R *31/02;* H05K *1/11*
U.S. Cl. 324—158 F 7 Claims



3. A multi-layer printed circuit board useful in a space transform device for testing semiconductor chips, wherein external signals are supplied to the chip for testing purposes,

said printed circuit board comprising,

a stack of dielectric members generally annular in shape and having a inner peripheral edge and an outer peripheral edge,

each of said dielectric members having a conducting member on one side thereof generally spaced from both peripheral edges,

each of said conducting members having a first portion extending to the outer peripheral edge at a given location and a second portion extending to an inner peripheral edge at a given location;

the positions of the electrical conductor at both the inner and outer peripheral edges of at least two of said dielectric members being spaced from each other along both of the peripheral edges,

a first plurality of conducting lands one for each location wherein there is a first portion of a conductor disposed along the outer peripheral edge,

and a second plurality of conducting lands, one for each location where there is a second portion of a conductor disposed along the inner peripheral edge of the stack,

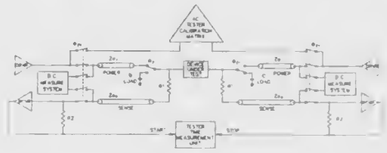
whereby a signal applied to any land is conducted to the associated peripheral edge of only those conductor portions at those associated peripheral edges.

4,928,062

LOADING AND ACCURATE MEASUREMENT OF INTEGRATED DYNAMIC PARAMETERS AT POINT OF CONTACT IN AUTOMATIC DEVICE HANDLERS

Philip D. Miles, Lavendon, England; John R. Moody, Jr., Sherman, and Sheila O'Keefe, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 146,058, Jan. 20, 1988, abandoned. This application Jun. 14, 1989, Ser. No. 368,157
Int. Cl.[5] G01R *1/02, 1/067*
U.S. Cl. 324—158 R 18 Claims



1. In a test system for making accurate measurements of semiconductor devices under test, a connect device comprising:

(a) a controlled impedance multilayer printed circuit defining transmission lines and ground planes,

(b) electrical components mounted on said multilayer printed circuit,

(c) spatially fixed contact fingers secured to said electrical components for contacting said semiconductor devices under test,

(d) two lines from the test system to a device under test, one line being a power line from a driver circuit and the other line being a sense line to a receiver circuit, and

(e) said electrical components including means for selectively and reversibly switching in and connecting the semiconductor devices to load devices.

4,928,063

AUTOMATIC EDDY CURRENT CORRECTION

David A. Lampman, Lakewood; Michael A Morich, Richmond Hts., and Wayne R. Dannels, Willoughby, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 118,865, Nov. 9, 1987, abandoned. This application May 10, 1989, Ser. No. 349,868
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—307 23 Claims

15. A magnetic resonance apparatus comprising: means for creating a magnetic field through an examination region;

a gradient field means for generating current pulses with a preselected profile;

a compensation means for selectively altering each current pulse with selectable frequency and gain correction factors;

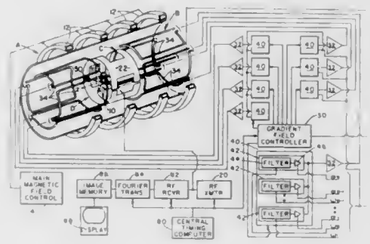
a gradient field coil means operatively connected with the compensation means for receiving the altered current pulse therefrom for generating a corresponding gradient across the main magnetic field;

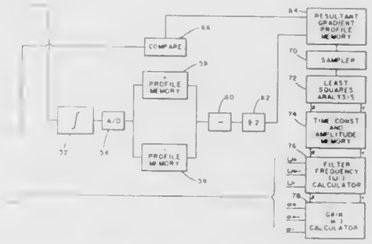
monitoring means disposed in the examination region for monitoring an induced magnetic field gradient;

analyzing means for analyzing the monitored gradient to determine a time constant and amplitude corresponding to a degrading eddy current;

a frequency correction factor deriving means for deriving the frequency correction factors from the determined time constant and amplitude from the analyzing means, the frequency correction factor deriving means being operatively connected with the analyzing means and the current pulse compensation means; and,

a gain correction factor deriving means for deriving the gain correction factors from the determined time constants, the frequency correction factors, and the amplitudes, the gain correction factor deriving means being operatively connected with analyzing means and the correction pulse compensation means.



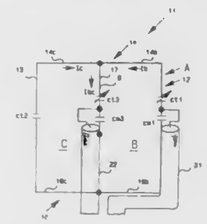


4,928,064

HYBRID SURFACE COILS

Hanan Keren, Kfar Saba, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Mar. 10, 1989, Ser. No. 321,299
Claims priority, application Israel, Mar. 18, 1988, 85786
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 9 Claims



1. A surface coil for use in a magnetic resonance (MR) system, said coil comprising:

a first loop, said first loop comprising:

first and second longitudinal substantially parallel conductors,

a pair of transverse conductors coupled to the first and second longitudinal conductors at spaced apart points thereon to form said first loop,

first means in the first loop for tuning and matching the loop to a first desired resonant frequency and to the system impedence,

VOL 1114 ISS 4 MY 22 1990 UMI

a second and a third loop comprising a third longitudinal conductor connected between substantially equal voltage points on said pair of transverse conductors, and

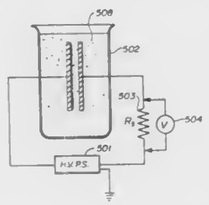
second means for tuning and matching said second and third loops including said third longitudinal conductor to a second desired resonant frequency and to the system impedence.

4,928,065

VOLTAMMETRY IN LOW-PERMITIVITY SUSPENSIONS

Gregg A. Lane, Kennett Square, Pa., and Kathryn Pearlstine, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1989, Ser. No. 331,990
Int. Cl.[5] G01N *27/42, 27/04*
U.S. Cl. 324—464 **21 Claims**



1. A method for determining the mobility of charged particles of a non-aqueous liquid test suspension of said charged particles, said suspension having a relative dielectric constant of less than 15, said method comprising the steps of:

(a) placing said suspension between two electrodes, said electrodes comprising capacitive elements;

(b) subjecting said suspension to a regularly varying electric field via said electrodes, wherein said electric field varies at a frequency greater than one Hertz and has a peak magnitude greater than one thousand volts per centimeter;

(c) measuring the resulting electric current through said suspension; and

(d) comparing said electric current to predetermined currents representative of the mobility of substantially similar suspensions.

4,928,066

CONTINUITY COUPLING IN A HARNESS MAKING MACHINE

Daniel T. Adlon, Harrisburg; Richard V. Spong, Etters; Stephen M. Cerquone, and David E. Bickford, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 7, 1989, Ser. No. 335,019
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—539 **9 Claims**

1. In a machine for automatically identifying and terminating wires of a multi-wire cable to corresponding terminals of a connector, said machine including: (1) a length of multi-wire cable wound about a reel, arranged for rotation with respect to said machine, said cable having a first end proximate the rotational axis of said reel and a second end extending from the periphery of said reel; (2) a frame having an axle for receiving any one of a plurality of different cable reels for rotation thereon; (3) apparatus for accepting said second end and applying a signal to a selected wire of said cable; (4) control means for monitoring a plurality of electrodes, which are non-rotationally coupled to said machine, identifying a specific one of said electrodes having said signal impressed thereon, and determining a desired terminal of said connector that corresponds to said selected wire; the improvement comprising:

means for releasably connecting the wires of said first end of said cable with corresponding ones of said plurality of electrodes while permitting rotation of said reel comprising:

(a) a first connector having terminals which are terminated to the wires of said first end of said cable; and



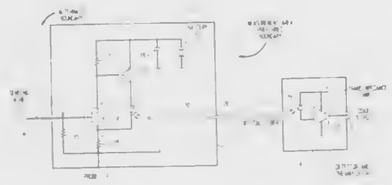
(b) rotational coupling means attached to said frame for electrically coupling said terminals of said first connector with corresponding electrodes of said plurality of electrodes.

4,928,067

NON-INTRUSIVE FIBER OPTIC ELECTROMAGNETIC FIELD PROBE APPARATUS AND ASSOCIATED METHODS

Paul U. Lind, Phoenix, Ariz., assignor to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed Dec. 19, 1988, Ser. No. 286,545
Int. Cl.[5] G01R *33/12*
U.S. Cl. 324—96 **14 Claims**



1. A field probe apparatus for measuring relatively weak RF electromagnetic fields generated within shielded enclosures and operative to minimumly disturb said fields, comprising:

a sensing conductor means adapted to be inserted into said enclosure to provide a signal indicative of electromagnetic field strength;

amplifier means having an input coupled to said conductor means and operative to provide a voltage to current conversion gain at an output;

a light emitting device coupled to said amplifier output to provide a light signal according to the signal produced on said sensing conductor means; and

an optical fiber cable having a first end positioned to receive said light signal from said emitting device to transport said light signal to a second end of said fiber,

wherein said amplifier means includes a source of operating potential, transistor means having main electrodes coupled to said source of operating potential and a control electrode coupled to said sensing conductor means, and further circuit elements coupled to said transistor means and having output terminals for providing a current output to said light emitting device,

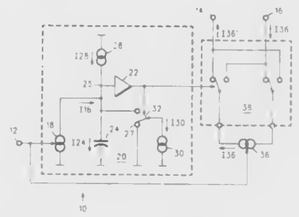
said light emitting device being a light emitting diode (LED) having its anode and cathode coupled to said output terminals of said amplifier means, and said transistor means and other coupled circuit elements thereof having a very high input impedance at said control electrode and providing a very high voltage-to-current gain at said output terminals, such that relatively weak RF electromagnetic fields sensed by said sensing conductor means result in a current output sufficient to drive said LED, wherein said light emitted by said LED varies according to the signal provided by said sensing conductor means for applying said light signal to said first end of said optical fiber cable.

4,928,068

FM DEMODULATOR

William E. Main, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 1, 1989, Ser. No. 345,816
Int. Cl.[5] H03D *3/00*
U.S. Cl. 329—324 **20 Claims**



1. An FM demodulator circuit naving first and second outputs and which receives an FM signal, comprising:

oscillator means which is responsive to the FM signal for providing a switch control signal synchronized to the FM signal, said oscillator means operating at a free-running frequency when the FM signal is disabled;

circuit means response to the FM signal for providing alternating currents synchronized to the FM signal at first and second outputs; and

commutating means coupled between first and second outputs of the FM demodulator circuit and said first and second outputs of said circuit means, said commutating means being responsive to said switch control signal for alternately switching said first and second outputs of said circuit means between said first and second outputs of the FM demodulator circuit, wherein the average value of said alternating current flowing in the first and second outputs of the FM demodulator circuit over each half cycle of said switch control signal is proportional to the deviation of the frequency of the FM signal from said free-running frequency of said oscillator means.

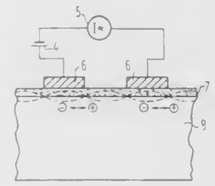
4,928,069

AMPLIFYING SURFACE WAVE RECEIVER

Helmut Schink, and Ralf D. Schnell, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,379
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732857
Int. Cl.[5] H03F *3/04*
U.S. Cl. 330—5.5 **6 Claims**

1. An amplifying surface wave receiver for a surface wave element composed of a material which has the piezo effect and which can be rendered electrically conductive by local doping, characterized in that a region is formed in the upper portion of an insulating substrate body (8) which forms the surface wave element and which is formed of piezo effect material, said region forms a conductive channel (7) between at least two contact electrodes (6 and 6') which have a defined distance between them, said conductive channel formed such that oc-



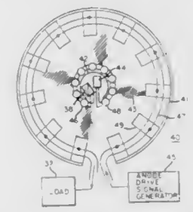
curring piezo charges are in positions so as to modulate the conductivity of said channel (7); and a voltage source (4) with one terminal connected to one of said contact electrodes (6) and the other terminal connected to the other of said contact electrodes (6') through an alternating current detector (5).

4,928,070

LOW-NOISE CROSSED-FIELD AMPLIFIER

George H. MacMaster, Lexington, and Lawrence J. Nichols, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 241,798, Sep. 6, 1988, abandoned, which is a continuation of Ser. No. 143,206, Jan. 11, 1988, abandoned, which is a continuation of Ser. No. 71,534, Jul. 8, 1987, abandoned, which is a continuation of Ser. No. 946,260, Dec. 24, 1986, abandoned. This application Feb. 28, 1989, Ser. No. 317,098
Int. Cl.[5] H03F *3/58;* H01J *25/34*
U.S. Cl. 330—43 **56 Claims**



1. A low-noise crossed-field amplifier tube circuit for use with a frequency source providing an input signal to said tube circuit comprising:

a tube comprising an anode comprising a first slow-wave circuit having a first input and a first output;

a cathode;

an interaction space between said anode and cathode;

said cathode comprising a second slow-wave circuit having a second input and a second output, said cathode providing electrons to the interaction space between said cathode and said anode;

means providing a first portion of an input signal to the input of said first slow-wave circuit and providing a portion of said input signal to the input of said second slow-wave circuit;

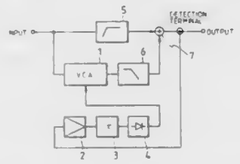
means controlling the relative phase of said first portion with respect to said second portion of said input signal;

the output of said first slow-wave circuit being adapted to be connected to an output load; and

the output of said second slow-wave circuit being adapted to be connected to a termination.

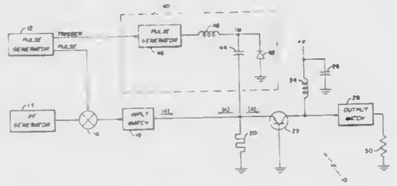
VOL 1114 ISS 4 MY 22 1990 UMI

4,928,071
LIMITER CIRCUIT
Hideo Yamamoto; Takeshi Sato; Toshikazu Yoshimi; Shuichi Mori, and Akio Tokuzo, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 29, 1988, Ser. No. 213,051
Claims priority, application Japan, Aug. 31, 1987, 62-131367[U]
Int. Cl.[5] H03G *3/20*
U.S. Cl. 330—129 **7 Claims**



1. A limiter circuit for subjecting an output of a low frequency amplifier to amplitude limitation according to an output level thereof, which comprises:
control voltage generating means connected to directly receive an output of said low frequency amplifier, to generate a control voltage according to the level thereof; and
voltage gain controlled means for amplitude-limiting only a low frequency component of said output of said low frequency amplifier, in accordance with said control voltage.

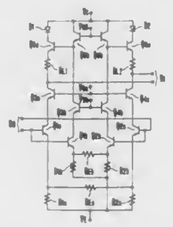
4,928,072
AMPLIFIER HAVING SUPPRESSED SPURIOUS FREQUENCY COMPONENTS
John C. Scott, Jamaica Plain, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Jul. 5, 1989, Ser. No. 376,475
Int. Cl.[5] H03F *1/26*
U.S. Cl. 330—149 **28 Claims**



1. In combination:
an amplifier having input and output terminals;
means coupled to said amplifier input terminal for generating pulses of RF energy; and
means for increasingly reflecting said RF energy from said amplifier input terminal during each of said pulses.

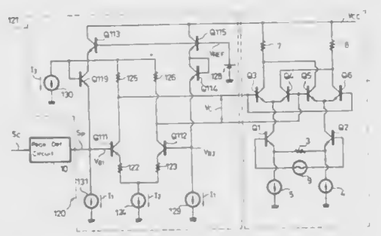
4,928,073
DC AMPLIFIER
Minoru Arai, and Yukihiro Katoh, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Apr. 14, 1989, Ser. No. 338,878
Claims priority, application Japan, May 7, 1988, 63-110795
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—252 **2 Claims**

1. A DC amplifier comprising a first differential amplification circuit including first and second transistors forming a first differential amplification transistor pair, an emitter resistor connected between emitters of said first and second transistors, and load resistors connected to collectors of said first and second transistors respectively, and a second differential amplification circuit including third and fourth transistors equivalent to said first and second transistors and forming a second differential amplification transistor pair, bases of said third and fourth transistors being commonly connected to bases of said first and second transistors, respectively, and an emitter resistor connected between emitters of said third and fourth transistors, wherein a resistance of each of said load resistors is set to



be equal to that of each of said emitter resistors, emitters of fifth and sixth transistors equivalent to said first and second transistors are respectively connected to the collectors of said first and second transistors through said respective load resistors, emitters of seventh and eighth transistors equivalent to said third and fourth transistors are respectively connected to collectors of said third and fourth transistors, bases of said fifth and sixth transistors are respectively connected to the emitters of seventh and eighth transistors, and biases of said first to eighth transistors are set to be close to each other.

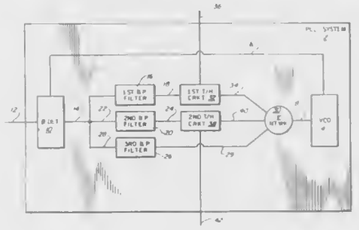
4,928,074
AUTOMATIC GAIN CONTROL CIRCUIT
Mitsuru Sato; Tetsuya Iizuka; Kiyoshi Furuya; Norio Shoji, and Masato Sekine, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jun. 13, 1989, Ser. No. 365,672
Claims priority, application Japan, Jun. 17, 1988, 63-149436
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—254 **7 Claims**



1. An automatic gain control circuit comprising:
a variable gain amplifier circuit;
a signal level detecting circuit connected to an output of said variable gain amplifier circuit for generating a detect signal having a level that changes in response to a signal level of said output; and
a gain control circuit for controlling a gain of said variable gain amplifier circuit in accordance with the signal level of said detect signal and comprising a differential amplifier circuit having first and second input terminals, said first input terminal being connected to said signal level detecting circuit for receiving said detect signal;

first reference voltage source means also connected to said first terminal of said differential amplifier for selectively providing a first predetermined voltage to said first terminal of said differential amplifier in response to said signal level of said detect signal; and
a second reference voltage source connected to said second input terminal of said differential amplifier for providing a second predetermined voltage, whereby output signals from said differential amplifier are fed to said variable gain amplifier circuit.

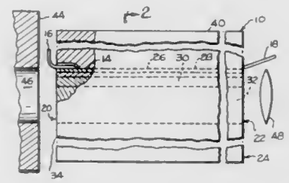
4,928,075
MULTIPLE BANDWIDTH FILTER SYSTEM FOR PHASE LOCKED LOOP
Michael D. Leis, Framingham, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Jun. 26, 1989, Ser. No. 371,494
Int. Cl.[5] H03H *21/00;* **H03L** *7/10*
U.S. Cl. 331—17 **24 Claims**



1. A method of sequentially filtering an input signal having a frequency range through a plurality of filters, each filter having a passband ranging from a widest passband with a widest selected frequency range to a narrowest passband with a narrowest selected frequency range, comprising the steps of:
coupling said input signal to the input of each said filter;
combining the outputs of said filters to form a filtered output signal having a frequency range corresponding to said widest passband filter; and
sequentially holding the output level of each of said filters in declining order of their passband frequency range, beginning from said widest passband filter to said narrowest passband filter until all of the output levels of said filters are held constant except for said narrowest passband filter, for sequentially changing the frequency range of said filtered output signal from the frequency range of said widest passband filter to the frequency range of said narrowest passband filter.

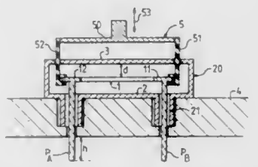
4,928,076
ULTRAFAST OPTICAL MODULATOR
Gerard A. Mourou; John A. Nees, both of Rochester, and Steven L. Williamson, Henrietta, all of N.Y., assignors to The University of Rochester, Rochester, N.Y.
Continuation of Ser. No. 242,247, Sep. 9, 1988, abandoned. This application Oct. 23, 1989, Ser. No. 425,457
Int. Cl.[5] G02B *6/10*
U.S. Cl. 330—4.3 **12 Claims**

1. An optical modulator operative over a broad band of frequencies so that pulses in the picosecond range are useful as a modulating signal which comprises a substrate of solid state electro-optic material longer in length than in width and having opposite sides, at least one electrode on one of the opposite sides and extending along the length thereof, said substrate defining an optical wave guide for the optical signal to be modulated in said substrate parallel to said electrode, a superstrate of solid state dielectric material parallel to and in contact with said electrode and disposed along said one side, said superstrate, substrate and said electrode defining an electrical transmission line along which said pulses propagate, said line having an effective bulk dielectric constant, the square root of which is substantially equal to the index of refraction of said



substrate, said line paralleling said optical wave guide along which said optical and electrical signals can travel, and said optical signal being modulated by said electrical signal.

4,928,077
TUNABLE MICROWAVE COUPLER WITH MECHANICALLY ADJUSTABLE CONDUCTORS
Francois Devaux, Paris; Norbert Herail, Jouy le Moutier; Denis Lefevre, Paris, and Jean-Pierre Lehnede, Aubergenville, all of France, assignors to Thomson-CSF, Paris, France
Filed Aug. 23, 1988, Ser. No. 235,322
Claims priority, application France, Aug. 28, 1987, 87 12040
Int. Cl.[5] H01P *5/18*
U.S. Cl. 333—111 **3 Claims**



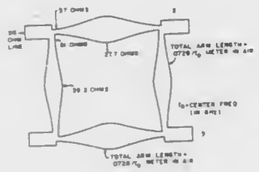
1. A microwave coupler of the three-plate type comprising a ladder-shaped central conductor (**1**) placed between two conducting plates (**2,3**) forming ground plates, said central conductor having two substantially parallel conductors (**11,12**) connected by conductors (**13,14,15**) which are substantially perpendicular to said parallel conductors, said parallel conductors (**11,12**) having opposite ends which form the terminals of said coupler, two conducting plungers (P_A, P_B) respectively fixed to two predetermined parts (A,B) of said parallel conductors (**11,12**) and designed to penetrate a microwave waveguide (**4**), said plungers being aligned along a direction of propagation of waves within said waveguide, externally controllable means for varying (**51–59**) the distance between said predetermined parts (A,B) and said ground plates through a flexure of said central conductor (**1**), thus varying the length by which said plungers (P_A, P_B) penetrate into said waveguide (**4**), said means for varying comprising at least one rod (**51**) rigidly mechanically coupled to and electrically insulated from said predetermined parts (A,B) with mechanical translation of said rod providing for variation of said distance.

4,928,078
BRANCH LINE COUPLER
Chandra Khandavalli, Fremont, Calif., assignor to Avantek, Inc., Santa Clara, Calif.
Filed Dec. 22, 1988, Ser. No. 288,686
Int. Cl.[5] H01P *5/18*
U.S. Cl. 333—109 **8 Claims**

1. A branch line coupler for transmission line signal condi-

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tioning of the type having a plurality of branch line coupler arms connected at a junction point, each said branch line coupler arm having a substantially linear shape including a middle



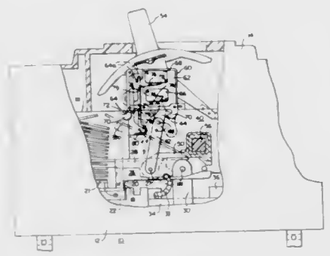
and two ends, wherein the improvement comprises each said branch line coupler arm thinning in a curvilinear manner from the middle toward each end.

4,928,079

CIRCUIT BREAKER AUXILIARY SWITCH ASSEMBLY

Andrew J. Male, Export, and Melvin A. Carrodus, Brighton Twp., Beaver County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 25, 1988, Ser. No. 223,841
Int. Cl.[5] H02B *1/08*
U.S. Cl. 335—13 4 Claims



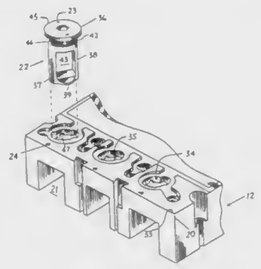
1. A circuit braker, comprising:
an electrically insulating housing;
a circuit breaker means within the housing and comprising first and second contacts operable between open and closed positions;
a releasable mechanism in an initial position and movable when released to a tripped position to effect automatic opening of the contacts;
the first contact carrying arm movable between open and closed positions of the contacts; and
auxiliary switch means including a plunger in the path of movement of the arm for opening or closing an auxiliary circuit when the arm is actuated, said plunger having a flexible portion capturing said arm which accommodates overtravel of said arm when said arm is actuated.

4,928,080

MOLDED CASE CIRCUIT BREAKER LINE TERMINAL PLUG

Linda Y. Jacobs, Barkhamsted; Joseph M. Palmieri, Southington, and James I. Smith, Avon, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jun. 23, 1989, Ser. No. 370,947
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—202 17 Claims



1. A molded case circuit breaker comprising:
a circuit breaker case and cover;
a pair of separable contacts arranged within said case under control of an operating mechanism to interrupt circuit current upon occurrence of an overcurrent condition through said contacts;
a plurality of line terminal connectors arranged within a corresponding plurality of line terminal compartments at one end of said circuit breaker case;
a corresponding plurality of line terminal access openings formed within said circuit breaker cover in registry with said line terminal connectors;
a corresponding plurality of arc gas egress slots formed within said circuit breaker case perpendicular to said access openings; and
line plugs removably arranged within said access openings thereby preventing access to said line terminal connectors while allowing egress of said arc gases, said plugs comprising a cylindrical top having tool-receiving recess means formed in a top surface thereof, said plugs further comprising a planar body member having a plurality of longitudinal slots formed therein.

4,928,081

METHOD OF MASS PRODUCING SUPERCONDUCTING PERSISTENT CURRENT RINGS

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 13, 1989, Ser. No. 322,381
Int. Cl.[5] H01F *7/22*
U.S. Cl. 335—216 6 Claims



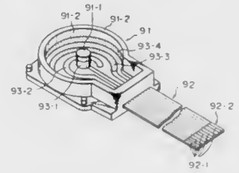
1. Method of mass producing superconducting rings with a persistent current flowing around the periphery of each ring and with accompanying magnetic flux trapped within the interior cavity of each ring from superconducting rings with no persistent current flowing around each ring and with no magnetic flux trapped within the interior cavity of each ring, said method comprising passing the superconducting rings with no persistent current flowing around each ring through the maximum magnetic field of a tapered magnetic field wherein the tapered magnetic field is tapered in strength so that each ring passing through the maximum magnetic field which is above the critical magnetic field becomes normal thereby passing through all of the magnetic flux to which its cross section is exposed and then passing each ring to a region of the tapered magnetic field lower in strength than the critical magnetic field whereby each ring becomes superconducting again and traps the magnetic flux to which its cross section is exposed.

4,928,082

MOLDED RESIN CASING OF ELECTRONIC PART WITH FLEXIBLE FLAT CABLE

Nobuyuki Yagi, Tokyo; Jiro Inagaki, Tokyo; Kozo Morita, Tokyo; Yasutoshi Kaku, Kanagawa; Nobuyuki Kikuchi, Kanagawa, and Shinji Mizuno, Kanagawa, all of Japan, assignors to Teikoku Tsushin Kogyo Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1988, Ser. No. 234,946
Claims priority, application Japan, Sep. 7, 1987, 62-224239; Sep. 22, 1987, 62-238449; Dec. 22, 1987, 62-325679
Int. Cl.[5] H01C *10/34*
U.S. Cl. 338—174 6 Claims



1. A device comprising:
a molded resin casing, and said resin casing having means for receiving a flexible board therein;
a flexible board integrally attached to and received in said receiving means of said molded resin casing, said flexible board including a synthetic resin film having a first plurality of electrical conductor patterns defined thereon, and means on said flexible board for slidably receiving an electronic part for electrically contacting an electronic part with said first plurality of electrical conductor patterns, said flexible board being integrally attached to said molded resin casing when said resin casing is molded by injecting a molten synthetic resin, and said flexible board being oriented during the molding of said resin casing for causing said first plurality of electrical conductor patterns to be exposed within said synthetic resin for contacting an electronic part received therein; and
a flexible flat cable integrally attached to said flexible board, said flexible flat cable including a synthetic resin film having a second plurality of electrical conductor patterns defined thereon, said second plurality of electrical conductor patterns being directly elec rically connected with said first plurality of electrical conductor patterns, and said flexible flat cable extending outwardly away from said synthetic resin casing.

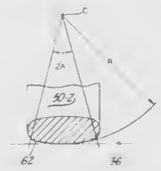
4,928,083

WIPER FOR VARIABLE ELECTRICAL RESISTOR

Dewey M. Sims, Jr., Wayne, and Ray E. Mick, Troy, both of Mich., assignors to Colt Industries Inc., New York, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,797
Int. Cl.[5] H01C *1/12*
U.S. Cl. 338—202 6 Claims

1. For use in an operating system wherein a movable control member is adjustably movable over a selected range of controlled movement and is also subjected to uncontrolled movement such as might be induced by extraneous vibration, shock loading or the like; a variable electrical resistor adapted to be connected in an electrical circuit to electrically signal the position of said control member within its selected range of movement, said resistor including a fixedly located, flat, elongate electrical resistor member, electrically conductive wiper means mechanically coupled to said control member for movement therewith relative to said resistor member and including an elongate finger-like strip having a curved knuckle portion



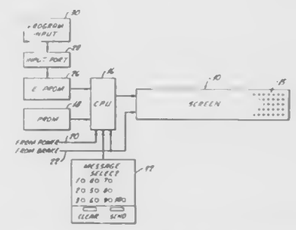
slidably engaged with said resistor member for movement along said member in response to said controlled movement of said control member, said knuckle portion of said strip having a transverse cross-sectional configuration elongated transversely of the finger and having rounded opposite side edge surfaces and a contact surface extending between said side surfaces in facing opposed relationship to said resistor member, the radius of curvature of said contact surface being substantially greater than that of said side surfaces.

4,928,084

COMBINED MESSAGE DISPLAY AND BRAKE LIGHT

Steven M. Reiser, 1900 Almont Ave., #107, Anaheim, Calif. 92805

Filed Jan. 23, 1989, Ser. No. 300,790
Int. Cl.[5] B60Q *1/44*
U.S. Cl. 340—479 14 Claims



8. A method of providing a rearwardly directed message from a vehicle comprising the steps of:
mounting upon a rear portion of the vehicle a display screen having an array of light emitting elements,
providing a plurality of sets of data, each set representing a message to be displayed,
employing a selected one of said sets to energize a group of said elements to display a message represented by the selected set, and
energizing a major part of said array when brakes of the vehicle are applied,
said step of energizing a major part of said array comprising concomitantly interrupting display of said message represented by the selected set.

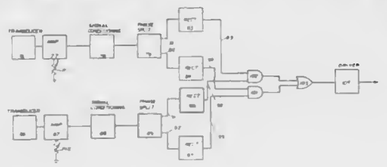
VOL
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4,928,085

PRESSURE CHANGE INTRUSION DETECTOR

Elden E. DuRand, III, Crestwood, and William K. Logadon, Louisville, both of Ky., assignors to Bluegrass Electronics, Inc., LaGrange, Ky.

Continuation of Ser. No. 469,089, Feb. 23, 1983, abandoned. This application May 30, 1989, Ser. No. 359,045
Int. Cl.[5] G08B *13/16*
U.S. Cl. 340—544 3 Claims



1. A signalling device to detect coincidence of first and second selected conditions in a selected area where

the first selected condition is infrasonic air pressure waves having frequencies below 20 cycles per second and the second selected condition is selected sonic frequency waves, said device comprising;

a pressure sensitive transducer means responsive to said infrasonic air pressure waves to provide an alternating electrical signal;

an amplifier means to selectively amplify said alternating electrical signal to provide an amplified alternating output signal;

a rectifier means to rectify said amplified alternating output signal to provide a first signal;

a sonic frequency transducer means responsive to selected frequencies to provide a second alternating electrical signal;

a second amplifier means to selectively amplify said second alternating electrical signal to provide a second amplified alternating output signal;

a second rectifier means to rectify said second amplified alternating output signal to provide a second rectified signal;

a switch means, including a coincidence detector responsive to the first and second rectified signals, which activates an alarm in response to coincident receipt of the first and second rectified signals.

4,928,086

PAGER RECEIVER HAVING A COMMON TIMER CIRCUIT FOR BOTH SEQUENTIAL LOCK-OUT AND OUT-OF-RANGE

George Drapac, Boca Raton, and Walter J. Grandfield, Lake Worth, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 30, 1989, Ser. No. 302,876
Int. Cl.[5] H04Q *7/02;* H04B *7/00*
U.S. Cl. 340—825.440 8 Claims

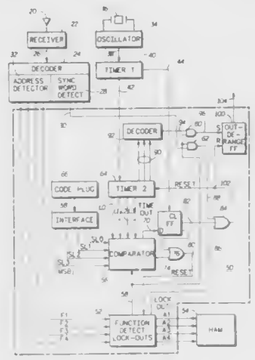
1. A pager receiver including a receiver for receiving transmitted RF signals and converting such signals to received signals for use within the paper receiver, decoder means for decoding the received signals in accordance with a coded paging system format which includes sync words and address function data to generate sync pulse timing signals in response to decoded sync words and to generate a function detect signal in response to a corresponding decoded address function of the pager receiver, means governed by said function detect signal to cause an alert annunciation corresponding to the decoded address function, and a source of timing signals, said pager receiver comprising:

means for inhibiting an alert annunciation in response to a repeat decoding of a corresponding address function within a first selected time interval of an initial decoding thereof;

means for detecting a lack of decoded sync words over a second selected time interval and for causing an out-of-range annunciation in response to said detection; and

single timer means coupled to both of the inhibiting means and the detecting means and responsive to said timing signals for generating an initiated one of either the first or second selected time intervals;

said inhibiting means including lock-out means corresponding to each address function of the pager receiver, said lock-out means activated by the function detect signal generated in response to the initial decoding of the corresponding address function to initiate the generation of the first selected time interval by the single timer means and to



inhibit an alert annunciation in response to subsequently generated corresponding function detect signals for the duration of the first selected time interval generated by the single timer means;

said detecting means including first means responsive to the sync pulse timing signals to initiate at each sync pulse timing signal the generation by the single timer means of the second selected time interval which is substantially longer in time than the time interval between any two successive sync pulse timing signals; second means for generating a set signal at the term of the second selected time interval generated by the single timer means, whereby no set signal is generated as long as sync pulse timing signals are generated; and third means responsive to said set signal for causing the out-of-range annunciation.

4,928,087

PHASE-STABILIZED, PHASE-COUPLED RESONANT CIRCUIT

Hans-Diedrich Kreft, Dassendorf; Holger MacKenthun, and Wolfgang Hass, both of Hamburg, all of Fed. Rep. of Germany, assignors to Angewandte Digital Electronik GmbH, Fed. Rep. of Germany

Filed Mar. 27, 1989, Ser. No. 329,309
Int. Cl.[5] H03B *19/00;* G06K *19/06;* H04Q *7/00*
U.S. Cl. 340—825.71 1 Claim

1. An apparatus for non-contacting signal and energy transmission between a substantially immobile part as a microstation and a mobile part as a microunit, the microstation having an oscillator operable to produce to an oscillation and having means for dividing the oscillation into two separate oscillations, means for forcing a phase shift on a first of the two separnte oscillations relative to a second of said two separate oscillations depending upon a data stream, the phase shifted oscillation being supplied to the mobile part via a first coil pair and the other oscillation being supplied to the mobile part via a second coil pair and the power transmission ensuing via the same coil pairs with the assistance of the two oscillations, the mobile part having a phase comparator to which the transmitted oscillations are Supplied, the phase comparator acquiring the data from the data stream with reference to the phase shift and the data transmission from the mobile part to the immc bile part ensuing on the basis of simultaneous load modification at both coils of the mobile part so that it is assured that documentation of the load variation is possible at one of the two coils of the microstation even given an interchanged allocation of the coil pairs, the improvement comprising: a first resonant circuit including a first inductance, a first capacitance, and a first capacitive diode, said first resonant circuit being resonant stabilized in a phase shifted fashion and having a voltage tap, a first transistor through which said first resonant circuit is driven by two coherent oscillations of fixed phase shift, said first transistor being connected in series with said first resonant circuit so that said resonant circuit acts as a real ohmic resistance resulting in a phase shift of exactly 180 degrees between an oscillation generating signal applied at a base of said first transistor and a signal at said voltage tap of said first resonant circuit when said first resonant circuit is in resonance and deviating from said 180 degree phase shift when said first



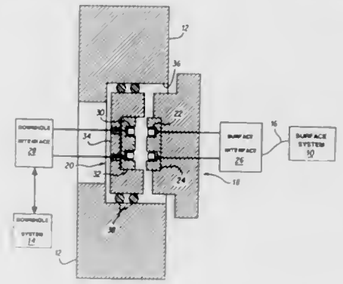
resonant circuit is not in resonance; a second resonant circuit having a second inductance, a second capacitance, and a second capacitive diode, said second resonant circuit being resonant stabilized in phase-shifted fashion; a second transistor connected in series with said second resonant circuit; logic elements connected to convert deviations from said 180 degrees phase shift intc a series of pulses having a pulse-duty factor dependent on phase shift; an R-C combination connected at an output of said logic elements to integrate said pulse-duty factor and produce a voltage value; an operational amplifier connected to compare said voltage value to a standard value, an output of said operational amplifier connected to drive said first capacitive diodes to stabilize said first resonant circuit to a supply frequency; a coherent phase-shifted part available as an oscillation generating signal being supplied to said second inductance of said second circuit; said second resonant circuit being stabilized to the same frequency as said first resonant circuit so that both frequency stabilized oscillations have a defined phase shift relative to one another, the frequency stabilized oscillations being available frequency stabilized and phase shifted via said first and second inductances of the immobile part to allow recognition and evaluation of the phase shift and guaranteeing a time defined standardized BAUD rate of the data stream on the basis of the frequency stability.

4,928,088

APPARATUS FOR EXTRACTING RECORDED INFORMATION FROM A LOGGING TOOL

Bruno Jorion; Christian Galiano, both of Houston, and Peter Wraight, Missouri City, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Mar. 10, 1989, Ser. No. 321,708
Int. Cl.[5] G01V *1/00*
U.S. Cl. 340—854 11 Claims



1. A communications system for providing communication between equipment carried within a well logging apparatus having a longitudinal axis and a side wall with an aperture formed in said side wall, and equipment external to said logging apparatus, said system comprising: a. A means for transferring information through said aperture without passing current through an electrical contact through said aperture, said means comprising:

a first portion in electrical communication with the logging apparatus equipment and mounted in said aperture; and

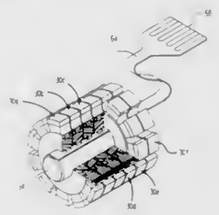
a second portion in electrical communication with the external equipment and configured to be movably placed within said aperture in juxtaposition with said first portion.

4,928,089

HALL EFFECT PRINTWHEEL ENCODER

Donatas V. Gasiunas, Carmel, N.Y., and Anthony Storace, Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 21, 1987, Ser. No. 136,085
Int. Cl.[5] G08C *19/06*
U.S. Cl. 340—870.31 9 Claims



1. Apparatus for encoding the position of a wheel comprising:

(a) a linear Hall-effect sensor fixed to a shaft at a point near the periphery thereof, said Hall-effect sensor providing an output signal whose magnitude is in correspondence to the magnetic flux thereat;

(b) a magnetic means mounted in said shaft adjacent said Hall-effect sensor for providing magnetic flux therethrough;

VOL
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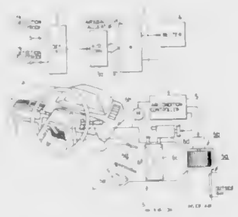
(c) a wheel rotatably mounted on said shaft at said Hall-effect sensor for rotation about the sensor;
(d) a flux-conducting ring disposed within said wheel and encircling said shaft, said ring having an inner portion including slots alternating with flux-conducting teeth extending inwardly toward the shaft at varying depth to provide thereby a varying gap between said Hall-effect sensor and said flux-conducting teeth in dependence on the angular position of the wheel, the slots providing a minimum signal between the signal associated with each tooth, creating thereby upon rotation of the wheel an alternating signal whose magnitude depends upon the dimension of the gaps between the sensor and the teeth as well as minimum signal between adjacent teeth;
(e) means for receiving and measuring the magnitude of the output signal from the Hall-effect sensor; and
(f) wherein a predetermined magnitude of the signal for each tooth positioned in juxtaposition to the sensor corresponds to a predetermined angular position of said wheel relative to said shaft whereby the wheel position is determinable both by counting alternations to reach a selected position and a measured magnitude of the signal at each tooth position.

4,928,090

AROUSAL LEVEL JUDGING APPARATUS AND METHOD

Tomohisa Yoshimi, Gamagori; Satoru Kodama, Oobu; Takeshi Yoshinori, Chiryu, and Masahiko Ito, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 8, 1988, Ser. No. 281,074
Claims priority, application Japan, Dec. 9, 1987, 62-312972; Jul. 18, 1988, 63-178793
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—575 12 Claims



1. An arousal level judging apparatus comprising:
(a) skin potential level detection means for detecting a skin potential level of a human body;
(b) level change detection means for detecting a degree of change in a level of an output signal of said skin potential level detection means over a predetermined interval;
(c) a comparing means for comparing said degree from said level change detection means with a first predetermined value to detect a pulse-like change in said skin potential level;
(d) convergence detection means responsive to an output signal from said comparing means for detecting a non-pulse like portion in said skin potential level by analyzing successive changes of gradient determined by said degree from said level change detection means;
(e) storing means for storing said skin potential level as a reference value when said non-pulse like portion is detected by said convergence detection means; and
(f) arousal level detecting means responsive to said skin potential level from said skin potential level detection means and to said reference value from said storing means for determining arousal state and non-arousal state of said human body using the relationship between said skin potential level and said reference value.

4,928,091

APPARATUS FOR DETECTING POSITION OF MOVING OBJECT

Yukikazu Masuzawa, Nishinasuno, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 837,070, Mar. 5, 1986, abandoned. This application Jul. 12, 1988, Ser. No. 217,792
Claims priority, application Japan, Mar. 6, 1985, 60-42841
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—686 10 Claims



1. An apparatus for detecting a position of a moving object, said moving object moving along a first track having a target position located within a predetermined range, said position detecting apparatus comprising:
a movable member movable along a second track;
detecting means for detecting whether said movable member has reached a predetermined point on the second track; and
transmitting means for transmitting a movement of said moving object to said movable member, said transmitting means transmitting the movement of said moving object to said movable member at a first transmission ratio of (moving distance of the movable member/moving distance of the moving object) when said moving object passes within a predetermined range on the first track and at a second transmission ratio smaller than the first transmission ratio when said moving object passes outside the predetermined range on the first track,
whereby, when said moving object reaches the target position on the first track, said movable member reaches the predetermined point on the second track, thus detecting that said moving object has reached the target position.

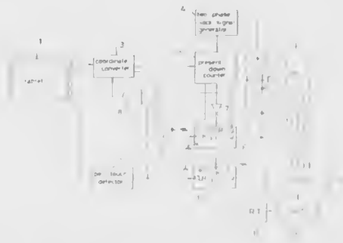
4,928,092

PATTERN INPUT UNIT

Yoshio Iizuka, Tokyo, Japan, assignor to Kokoku Rubber Industry Company Limited, Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 114,216
Claims priority, application Japan, Oct. 30, 1986, 61-257018
Int. Cl.[5] G09G *1/16*
U.S. Cl. 340—707 1 Claim

1. A pattern input device comprising
a tablet and a pen,
means for detecting contact between said pen and said tablet and for generating a pen touch output signal representative thereof,
means electrically connected to said tablet for generating a coordinate signal representative of the position of contact between said pen and said tablet, said coordinate signal generating means comprising a down counter which, upon contact between said pen and said tablet, counts down from a value representative of the position of contact between said pen and said tablet to zero, said down counter generating a first down count signal when the count equals one and a second down count signal when the count equals zero,
a central processing unit,
a clock having an output clock signal,
means for electrically connecting the clock signal to said down counter so that said down counter counts down in unison with the clock signal,
means for electrically connecting the clock signal as an input signal to said central processing unit during down counting of said down counter and means responsive to said second down count signal for disconnecting said clock signal from said central processing unit,



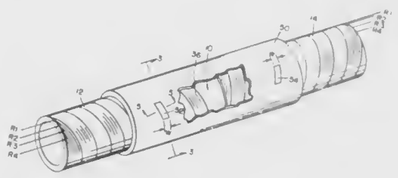
a cathode ray tube display electrically connected to said central processing unit for displaying contact and movement of said pen on said tablet, and
means for providing an input signal to said central processing unit representative of continuous movement of said pen on said tablet, said last mentioned means comprising a flip flop having an output connected to said central processing unit, said flip flop having a clear input connected to receive said pen touch output signal and a clock input connected to receive said first down count signal so that, when said pen is moved out of contact from said tablet, said first down count signal sets the output from said flip flop to a first state while said first down count signal sets the output from said flip flop to a second state when the pen contacts said tablet.

4,928,093

CURSOR CONTROL MECHANISM

Abdul W. b. A. Rahman, Singapore, Singapore, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 10, 1989, Ser. No. 309,833
Int. Cl.[5] G09G *1/00*
U.S. Cl. 340—709 14 Claims



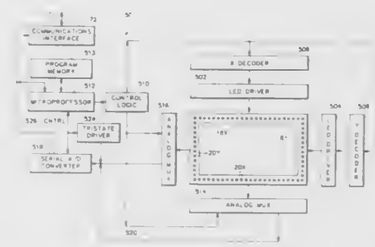
1. A hand-controlled mechanism for producing signals to move the position of a cursor in a computer display, the mechanism comprising:
shaft means having an elongated axis;
a plurality of conductor means wrapped about said shaft means;
drive means for applying an energizing signal to a sequence of said conductor means;
cylindrical means mounted on said shaft means and moveable about and along said shaft means in both rotational and translational directions, said cylindrical means provided with conductive plate means which overlap a plurality of said conductor means, said conductive plate means acting to couple an energizing signal applied to a conductor means to other conductor means overlapped by said conductive plate means; and
decoder means for sensing said coupled energizing signals and providing an output indicative of the position of said cylindrical means to accordingly control said cursor position.

4,928,094

BATTERY-OPERATED DATA COLLECTION APPARATUS HAVING AN INFRARED TOUCH SCREEN DATA ENTRY DEVICE

Mark L. Smith, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 25, 1988, Ser. No. 148,421
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—712 23 Claims



1. Photoelectric apparatus comprising:
an emitter element for intermittently emitting a beam of electromagnetic radiation,
a detector element for receiving radiation emitted by the emitter element, the detector element having a semiconductor junction and having an output terminal at which a voltage representative of intensity of electromagnetic radiation falling on the junction is developed, and
switch means for intermittently grounding the output terminal of the detector element when the emitter element is not emitting the beam of electromagnetic radiation.

4,928,095

ACTIVE MATRIX-ADDRESSED PICTURE DISPLAY DEVICE

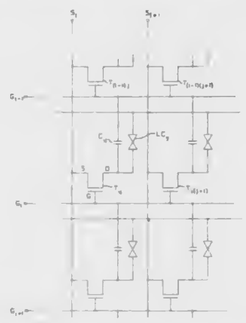
Yukito Kawahara, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Dec. 16, 1983, Ser. No. 562,079
Claims priority, application Japan, Dec. 23, 1982, 57-228184
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 4 Claims

1. An active matrix-addressed picture display device comprising: m row address electrodes which are scanned in one direction during use of the device; n column signal supply electrodes; and a plurality of picture elements arranged in m rows and n columns, each picture element comprising a liquid

VOL
1114
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cyrstal cell, a switching transistor having a gate electrode connected to one row address electrode, a source electrode connected to one column signal supply electrode and a drain electrode connected to the liquid crystal cell, and a single



capacitor one side of which is connected to the drain electrode of said switching transistor and the other side of which is connected to a preceding row address electrode preceding the picture element of which the capacitor forms a part in the scanning direction.

4,928,096

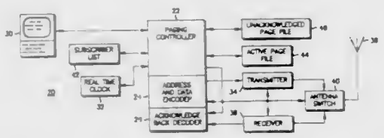
PAGING TERMINAL APPARATUS WITH MESSAGE STORAGE AND RETRANSMISSION CAPABILITY AND METHOD THEREFOR

Victoria A. Leonardo, and Leonard E. Nelson, both of Boynton Beach, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 121,362, Nov. 16, 1987, abandoned. This application Apr. 17, 1989, Ser. No. 338,453

Int. Cl.[5] H04Q *9/00*

U.S. Cl. 340—825.440 **12 Claims**



1. Paging terminal apparatus, for use with pagers having the capability to acknowledge back receipt of an address identifying the pager, wherein paging messages intended for particular pagers initially failing to acknowledge back address reception may be automatically stored for subsequent transmission later, said terminal apparatus comprising:

means for storing including establishing an active page file into which the addresses of the pagers are temporarily stored, along with the messages intended for the pagers;

means for transmitting, coupled to said means for storing, for initially sending the paper addresses stored in the active page file to the pages; and

means for receiving the acknowledge back responses generated by the pagers acknowledging back address reception,

said means for transmitting, being responsive to the received acknowledge back responses, for subsequently sending the messages stored in the active page file which are intended for the pagers acknowledging back reception of the initial address transmission,

said means for storing further including an unacknowledged page file into which the messages intended for the particular pagers failing to acknowledge back reception of the initial address transmission within a predetermined time period are stored along with the particular pager addresses for subsequent transmission later, and

said means for transmitting, periodically retransmitting the addresses of the particular pagers initially failing to acknowledge back, and further transmitting the stored messages intended for each of the particular pagers when such pagers subsequently acknowledge back reception of its retransmitted address.

4,928,097

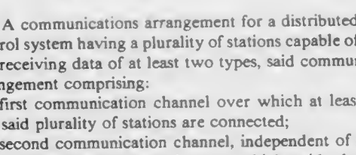
REAL TIME PROCESS CONTROL USING MULTIPLE COMMUNICATION NETWORKS

Carl J. Staab; Kirk D. Houser; Donald J. Jones; Robert T. Ihrman, all of Pittsburgh; Donald A. Poepsel, Cheswick, and Warren A. Edblad, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1988, Ser. No. 206,080

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—825.500 **6 Claims**



1. A communications arrangement for a distributed process control system having a plurality of stations capable of sending and receiving data of at least two types, said communications arrangement comprising:

a first communication channel over which at least two of said plurality of stations are connected;

a second communication channel, independent of said first communication channel, over which said plurality of stations are connected;

said first communication channel having a faster response time than said second communication channel;

processing means disposed at each of said plurality of stations for determining which of said first and second communication channels such data is to be communicated over, said processing means making such determination as a function of the type of data to be communicated; and,

wherein all data transmitted over said first communication channel is shared entirely by all stations connected to said first communication channel and data of a second type which is transmitted over said second communication channel, is distributed to stations disposed on said second communication channel on a preselected need to know basis and further wherein said second type of data to be transmitted over said second communication channel is control data which is utilized in a substantially immediate manner by said distributed process control system, said control data being distinguishable from data communicated over said first communication channel which is characterized as historical data.

4,928,098

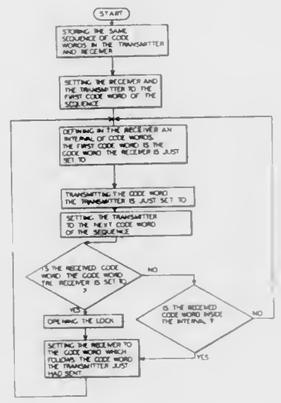
METHOD FOR CODE PROTECTION USING AN ELECTRONIC KEY

Friedrich Dannhaeuser, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 925,696, Oct. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 595,399, Mar. 30, 1984, abandoned. This application Oct. 27, 1988, Ser. No. 263,403

Int. Cl.[5] H04Q *3/02, 7/00*

U.S. Cl. 340—825.56 **1 Claim**



1. In a method of code protection of an electronic key system for operating a lock, of the type in which a code is transmitted from a transmitter to a receiver via an infrared signal, and in which the receiver responds to the receiver code to produce an unlocking signal for the lock, the improvement comprising the steps of:

determining an identical sequence of codes in the transmitter and in the receiver;

transmitting a code of the sequence from the transmitter to the receiver for an unlocking event;

setting the transmitter to the next code of the sequence following the transmitted code;

comparing, at the receiver, the received code with a code in which the receiver is set;

opening the lock of the received code matches the code to which the receiver is set;

stepping said receiver through an interval of codes following the code to which the receiver is set if the received code is other than the code to which the receiver is set by sequentially comparing said received code with the remaining codes following the code to which the receiver is set;

limiting the number of times said receiver is stepped through said interval in response to the reception of a code other than the one to which the receiver is set to a number of times less than the total number of codes in the sequence; and

setting the receiver to a code in the sequence following the code the transmitter just transmitted only if the received code is one of the codes in the interval.

4,928,099

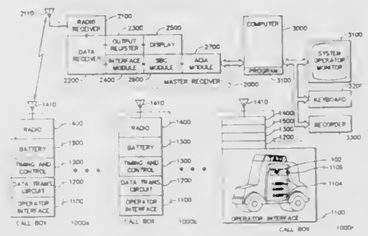
TELEMETRY SYSTEM FOR AUTOMATED REMOTE CALLING AND CENTRAL DISPATCH OF SERVICES, PARTICULARLY TAXICABS

Donald L. Drake, 1500 Prater Way, Sparks, Nev. 89431

Filed Mar. 1, 1988, Ser. No. 162,697

Int. Cl.[5] G08B *1/08;* **H04M** *11/04*

U.S. Cl. 340—825.280 **17 Claims**



1. A telemetry system for remote registration of requests for services to a central dispatch of such services, the system comprising:

a plurality of call boxes each transmitting an individually unique digital code upon such times as services are requested, each call box including

a time delay means for timing a first predetermined time period after transmitting of the digital code during which first time period the transmitting of digital code is inhibited; and

a central station receiving the digital codes upon the times services are requested from the plurality of all boxes, and for digitally processing the codes to produce a display intelligible to a human to permit dispatching by said human of a requested service to a requesting call box location.

4,928,100

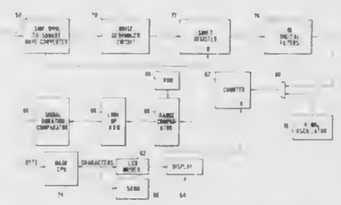
PAGING RECEIVER FOR RECEIVING PAGES FROM ANALOG OR DIGITAL PAGING TRANSMITTERS

Andrew A. Andros, Spring, Tex., and Thomas J. Campana, Chicago, Ill., assignors to Telefind Corporation, Coral Gables, Fla.

Filed Oct. 20, 1987, Ser. No. 110,512

Int. Cl.[5] H04Q *7/00;* **G08B** *5/22*

U.S. Cl. 340—825.440 **34 Claims**



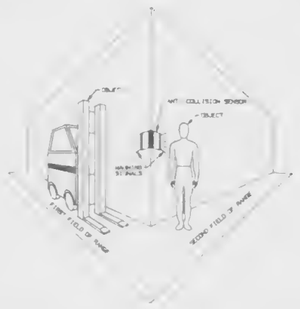
1. A RF paging receiver for receiving pages transmitted from either a frequency modulation digital paging transmitter or from a frequency modulation analog paging transmitter in which characters of the page are transmitted by frequency modulation of a carrier with a plurality of frequencies being used to encode the characters with the carrier being frequency modulated by the plurality of frequencies comprising:

(a) means for receiving and discriminating the modulated

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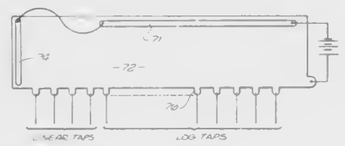
carrier into a signal having discrete frequencies with each frequency being one of the plurality of frequencies;
(b) amplifying means coupled to the means for receiving and discriminating for amplifying the signal to create a square wave having a period equal to a period of the sinusoidal signal;
(c) digital filtering means coupled to the amplifying means, having a plurality of distinct pass bands each centered around a different one of the plurality of frequencies, the digital filtering means outputting a square wave when the square wave period falls within one of the pass bands of the digital filtering means and blocking passage of all square waves falling outside the pas band of the digital filtering means;
(d) counting means, coupled to the digital filtering means, for converting each output of the digital filtering means into a number proportional to the period of the square wave passed by the digital filtering means; and
(e) character processing means, coupled to the counting means, for outputting characters each having an identity determined by the value of one or more numbers produced by the counting means.

4,928,101
ANTI-COLLISION SENSOR
Alexander L. Favors, 70 Creek Rd., Chalfont, Pa. 18914
Filed Aug. 15, 1989, Ser. No. 394,393
Int. Cl.[5] G08G *1/04*
U.S. Cl. 340—943 **11 Claims**



1. An ultrasonic anti-collision detection and warning system adapted to be attached to a corner for warning objects converging on an intersection from different directions comprising:
first ultrasonic detection means having a first ultrasonic emitter means which periodically emits an ultrasonic pulse at a first frequency within a first field of range, and a first ultrasonic sensor means which detects an echo of said ultrasonic pulse emitted at said first frequency;
second ultrasonic detection means having a second ultrasonic emitter means which periodically emits an ultrasonic pulse at a second frequency within a second field of range, and a second ultrasonic sensor means which detects an echo of said ultrasonic pulse emitted at said second frequency;
flexible connecting means for connecting said first and second ultrasonic detection means around said corner;
processor means for determining when an object enters said first field of range based upon the time an ultrasonic echo is received by said first sensor means off of said object, said processor means further determining when an object enters said second field of range based upon the time of an ultrasonic echo received by said second sensor means off of said object, said processor means outputting a signal when objects simultaneously enter said first and second fields of range; and
alarm means responsive to said signal for outputting a warning signal in said first and second fields of range when objects are simultaneously within said first and second fields of range.

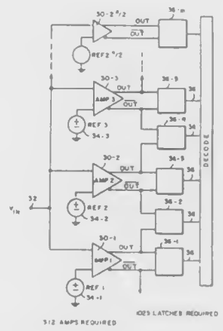
4,928,102
FLASH ANALOG-TO-DIGITAL CONVERTER WITH LOGARITHMIC/LINEAR THRESHOLD VOLTAGES
Henry S. Katzenstein, Pacific Palisades, Calif., assignor to Brooktree Corporation, San Diego, Calif.
Filed Aug. 11, 1988, Ser. No. 231,100
Int. Cl.[5] H03M *1/36, 1/78;* H01C *10/04*
U.S. Cl. 341—154 **35 Claims**



1. In combination, a member provided with an electrically resistive material on one surface of the member, the member being defined by first and second side edges and top and bottom edges,
means for providing a reference voltage on the resistive material along the first side edge of the member,
means for providing an energizing voltage on the resistive material at the juncture between the top edge and the second side edge of the resistive material, and
means for obtaining an output voltage at progressive positions along the second side edge of the resistive material the progressive positions at the second side edges of the resistive material being substantially equally spaced to provide a logarithmic relationship in the voltage at the progressive position with respect to the positions of such successive terminals.

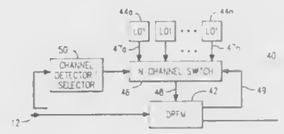
4,928,103
PARALLEL ANALOG-TO-DIGITAL CONVERTER USING $2^{(n-1)}$ COMPARATORS
Charles D. Lane, Greensboro, N.C., assignor to Analog Devices, Inc., Norwood, Mass.
Filed Sep. 18, 1989, Ser. No. 408,278
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—159 **6 Claims**

1. An analog-to digital flash converter for converting an analog signal to an n-bit digital signal, said converter comprising:
$2^n/2$ consecutive input comparators, each having a first input coupled to receive said analog signal,
means for producing $2^n/2$ reference voltages spaced apart by two LSBs of said converter and for providing one each of said $2^n/2$ reference voltages to a second input of each input comparator, each of said input comparators having first and second outputs, said first output generally being at a first voltage level when said analog signal is greater than the associated reference signal and at a second voltage level when said analog signal is less than the associated reference signal and said first output gradually transitioning from said first output voltage level to said second output voltage level where said analog signal and said associated reference signal are approximately equal, and said second output being the inverse of said first output, and
$2^n/2$ latch means, each associated with one of said input comparators and having first and second inputs for accepting said first and second outputs of said associated input comparator,
$(2^n/2)-1$ additional latch means, each additional latch means having a first input coupled to receive said first output of one of said input comparators and a second input coupled to receive said second output of an input comparator adjacent said one of said input comparators,



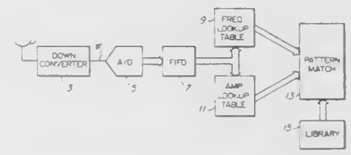
said latch means and additional latch means each having an output which is of a first latch output voltage when said first input thereto is less than said second input thereto and of a second latch output voltage when said first input thereto is greater than said second input thereto.

4,928,104
WIDEBAND MULTI-CHANNEL DIGITAL RADIO FREQUENCY MEMORY
Timothy J. Schaffer, Eldersburg, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 23, 1988, Ser. No. 288,850
Int. Cl.[5] G01S *7/38*
U.S. Cl. 342—15 **9 Claims**



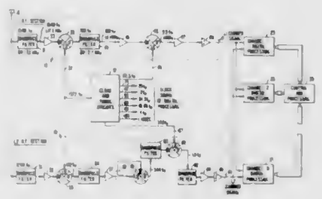
1. A digital radio frequency memory suitable for use as a coherent radio frequency memory in a military electronic countermeasure system, said memory comprising:
a plurality of RF local oscillators for producing local oscillator signals of different frequencies;
a first mixer for selectively converting an RF input signal and one of said local oscillator signals into an intermediate frequency signal within a selected instantaneous bandwidth;
an analog-to-digital (A/D) converter for converting the IF signal into digital values;
a digital memory for storing said digital values for later retrieval;
a digital-to-analog (D/A) converter for converting the retrieved digital values into an analog signal:
a second mixer for converting the analog signal and said selected local oscillator signal into an RF output signal which replicates the RF input signal;
a channel detector responsive to the frequency of the RF input signal for producing gate outputs for selected frequency ranges;
and a channel selector switch connected to the local oscillators and the channel detector for selecting a local oscillator in accordance with the gated output of the frequency detector, said channel detector causing the channel selector switch to select a different oscillator in accordance with a gated output when the instantaneous bandwidth of the DRFM would otherwise be exceeded.

4,928,105
INTRAPULSE RADAR RECEIVER
Paul Langner, Kanata, Canada, assignor to Telemus Electronic Systems, Inc., Ontario, Canada
Filed May 24, 1989, Ser. No. 356,200
Claims priority, application Canada, May 25, 1988, 567643
Int. Cl.[5] G01S *7/44;* G01R *23/02*
U.S. Cl. 342—192 **19 Claims**



1. An intrapulse microwave radar receiver, comprised of:
(a) first means for receiving and down-converting an incoming microwave signal and in response generating an intermediate analog signal,
(b) second means for receiving and digitizing said intermediate analog signal and in response generating a plurality of digital signal samples, and
(c) third means for receiving said digital signal samples in groups of three, performing a three point best-fit sinusoidal approximation of said digital signal samples and in response generating further digital signals representative of the intrapulse frequency and amplitude of said incoming microwave signal with respect to time.

4,928,106
GLOBAL POSITIONING SYSTEM RECEIVER WITH IMPROVED RADIO FREQUENCY AND DIGITAL PROCESSING
Javad Ashjaee, San Jose; Roger J. Helkey, Goleta; Robert G. Lorenz, Palo Alto, and Robert A. Sutherland, Newark, all of Calif., assignors to Ashtech Telesis, Inc., Sunnyvale, Calif.
Filed Jul. 14, 1988, Ser. No. 219,353
Int. Cl.[5] H04B *7/185*
U.S. Cl. 342—352 **15 Claims**



1. In a global positioning system receiver having a radio frequency section adapted for receiving from an antenna a L1 radio frequency signal having a nominal carrier frequency of $1540f_0$, where $f_0=1.023$ MHz., and for delivering an intermediate frequency signal to a digital section that processes the

VOL
1114
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intermediate frequency signal in a manner to extract desired phase information therefrom, an improved receiver section, comprising:

a first radio frequency stage connectable to said antenna and having an output,

a first mixer receiving said first radio frequency stage output and responsive to a first local oscillator signal for reducing a signal output of the first radio frequency stage to a first intermediate frequency signal,

a second radio frequency stage receiving the first intermediate frequency signal and having an output,

a second mixer receiving the second radio frequency stage output and responsive to a second local oscillator signal for reducing the first intermediate frequency signal to a second intermediate frequency signal,

a third radio frequency stage connecting said second intermediate frequency signal to an input of said digital section, and

means responsive to a common precise reference oscillator for generating said first and second local oscillator signals and clock signals for said digital section that are all mutually coherent with each other, said reference oscillator having a frequency of substantially $20f_0$, said first local oscillator signal being substantially $1372f_0$, wherein said first intermediate frequency signal is substantially $168f_0$, and said second local oscillator signal being substantially $171.5f_0$, wherein said second intermediate frequency signal is substantially $3.5f_0$, whereby said digital processing section can be easily process said second intermediate frequency signal.

4,928,107

SIGNAL RECEIVING METHOD FOR A USER'S DEVICE IN A GLOBAL POSITIONING SYSTEM

Hiroshi Kuroda, and Atsushi Watanabe, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Jun. 19, 1989, Ser. No. 367,665

Claims priority, application Japan, Jun. 22, 1988, 63-152215

Int. Cl.[5] G01S *5/02*; H04B *7/185*; G01C *21/00*

U.S. Cl. 342—357 **14 Claims**



1. A signal receiving method in a user's device of a global positioning system (GPS), which has a receiver with plural channels capable of simultaneously receiving signals from plural satellites to be used for the positioning and a microprocessor for executing a predetermined processing for the positioning on the basis of the received satellite signals to thereby determine a precise position of a user, comprising:

step of detecting satellites available to the user from among GPS satellites on the basis of the relationship of positions of the GPS satellites and a roughly estimated position of the user;

step of calculating values of geometric dilution of precision (GDOP) with respect to every combination of satellites; each combination of satellites including plural satellites selected from among the available satellites detected, a number of which depends on the required dimension of the positioning; and

step of determining satellites included in one of the combinations of satellites, which has a GDOP value smaller than a desired value, as the satellites to be used for the positioning,

characterized by

step of setting a present time with a predetermined operation period to periodically initiate said detecting step; and

step of repeatedly executing the processing for the positioning on the basis of the signals from the satellites determined in said determining step through one operation period.

4,928,108

ELECTRICAL SIGNAL SEPARATING DEVICE HAVING ISOLATING AND MATCHING CIRCUITRY FOR SPLIT PASSBAND MATCHING

Jerzy J. Kropielnicki, Knutsford; Brian Easter, Llangerni, and James D. Last, Llanfairfechan, all of United Kingdom, assignors to BSH Electronics, Ltd., Manchester, United Kingdom

Continuation of Ser. No. 27,520, Mar. 18, 1987, abandoned, which is a division of Ser. No. 563,513, Dec. 20, 1983, Pat. No. 4,654,669. This application Mar. 7, 1989, Ser. No. 319,738

Int. Cl.[5] H01Q *1/02, 1/32*

U.S. Cl. 343—704 **8 Claims**



1. An isolating and matching device to enable the heating element of a motor vehicle electrically heatable window, not designed specifically to be an antenna or aerial and essentially aperiodic and non-resonant at VHF frequencies, to be used as a VHF transmitting and/or receiving aerial, said device being interconnected between terminal leads of said heating element and an aerial feeder circuit of a VHF two-way communications transmit/receive unit, and having an input lead for connection to a motor vehicle D.C. power supply and an aerial terminal for connection to said aerial feeder circuit, comprising in combination: isolating circuit means coupled in parallel with said terminal leads of said heating element and with said motor vehicle D.C. power supply to permit passage of heating current from said power supply to the said heating element while isolating or blocking passage of RF signals from said heating element to the said power supply, said isolating circuit means including inductor means to bring the said heating element to parallel resonance near the center of the VHF band, and matching circuitry means connected between the said terminal leads of said heating element and said aerial feeder circuit, for effectively matching the impedance of said heating element to an aerial input impedance of the said aerial feeder circuit, said matching circuitry means including circuit means for providing two VHF passbands, one centered on a predetermined VHF transmit frequency and the other centered on a predetermined VHF receive frequency; whereby, via said isolating and matching device, said motor vehicle electrically heatable window becomes usable as an efficient VHF transmitting and/or receiving aerial.

4,928,109

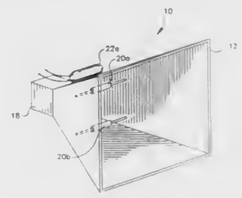
MODULATED SCANNING ANTENNA

Mark E. Bonebright, La Mesa; Paul R. Eberhardt, Encinitas, and John C. Alley, San Diego, all of Calif., assignors to Cubic Defense Systems, Inc., San Diego, Calif.

Filed Oct. 14, 1988, Ser. No. 257,691

Int. Cl.[5] H01G *13/02*

U.S. Cl. 343—786 **10 Claims**



1. A scanning antenna, comprising:

a receiver element for detecting signals in the form of interacting with electromagentic radiation at predetermined frequencies;

an antenna horn for capturing and coupling said electromagnetic radiation to said receiver element, said horn comprising non-magnetic electrical conductive material and having a centerline of focus;

magnetically switchable electrical conductor means extending between interior sides of said horn spaced apart from and substantially perpendicular to said centerline, said conductor means being magnetically switchable between discrete electrically conductive on and non-conductive off states; and

magnetic field emission means positioned adjacent a sidewall of said horn for generating a magnetic field having a strength at said conductor means sufficient to switch said conductor means between said two discrete states.

4,928,110

THERMAL RECORDING CONTROL METHOD AND SYSTEM

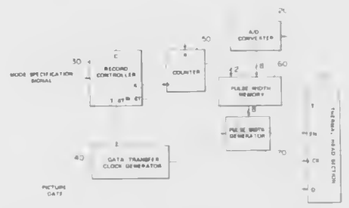
Nobuhiro Inoue, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 31, 1988, Ser. No. 238,444

Claims priority, application Japan, Sep. 1, 1987, 62-218467

Int. Cl.[5] G01D *9/00*

U.S. Cl. 346—1.1 **4 Claims**



1. A thermal recording control system comprising:

a thermal head having a plurality of heaters arranged in a line across a feed direction of a recording paper, said plurality of heaters corresponding to a line of picture data;

register means for storing a plurality of data corresponding to said line of picture data, each of the plurality of data corresponding to a respective one of the plurality of heaters, and outputting the plurality of data to the thermal head in a parallel manner;

counter means;

first control means for incrementing the value of the counter means from an initial value each time said stored plurality of data are recorded on a recording paper;

means for setting a time period for activating a respective heater of the thermal head to record the stored corresponding data on the recording paper in response to the value of said counter means, the length of said activation time period being decreased as the counter value is increased;

means for activating the respective heater in response to said register means during the set activation time period; and

second control means for setting the counter means to the initial value when the stored plurality of data are repetitively recorded on the recording paper a predetermined number of times so that a subsequent line of picture data can be recorded on the recording paper.

4,928,111

METHOD FOR OPERATING A VALVE

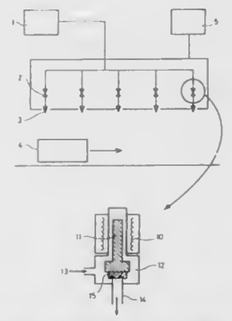
Robert L. Walton, Rushden, England, assignor to Willett International Limited, Bucks, England

Filed Apr. 3, 1989, Ser. No. 331,840

Claims priority, application United Kingdom, Dec. 1, 1988, 8828046

Int. Cl.[5] G01D *9/00*

U.S. Cl. 346—1.1 **8 Claims**



1. A method for operating an electromagnetic valve means comprising a valve plunger journalled within a valve body for movement under the influence of an electric current on a drive stroke from a valve closed position to a valve open position, which valve means controls the flow of fluid to a nozzle orifice in a non-contact fluid droplet applicator apparatus, which method comprises intermittently applying a transient drive current to the valve means which is insufficient to move the plunger sufficiently on its drive stroke towards the valve open position to permit the flow of fluid through the valve.

4,928,112

INK CURING APPARATUS

Allan G. Hock, Londonderry; John R. Larson, Hamstead, and John G. Sousa, Nashua, all of N.H., assignors to Howtek, Inc., Hudson, N.H.

Filed Mar. 23, 1987, Ser. No. 28,924

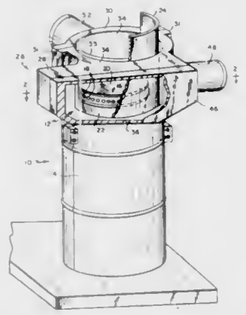
Int. Cl.[5] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—25 **13 Claims**

1. An ink curing apparatus for an ink jet printer having at least one ink jetter through which ink is discharged onto an adjacent paper sheet having top, bottom and side edges, said apparatus comprising:

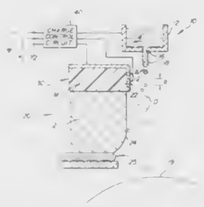
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(A) a shell over the portion of the printer where said ink jetter is located, said shell having a shell wall spaced from said ink jetter and said sheet so as to form a cavity between said sheet and the shell wall that extends between the side edges of the sheet;
(B) a plurality of openings extending from the exterior of



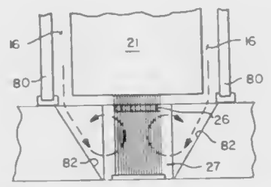
said shell into said cavity, at least two of said openings being located adjacent to the side edges of said sheet; and
(C) air moving means coupled to at least one of said plurality of openings into said cavity for moving air through said at least one opening so as to produce a flow of air between the side edges of the sheet that flows over and generally parallel to a surface of said sheet.

4,928,113
CONSTRUCTIONS AND FABRICATION METHODS FOR DROP CHARGE/DEFLECTION IN CONTINUOUS INK JET PRINTER
Margene C. Howell, Dayton; James A. Katerberg, Kettering; David N. Pipkorn, Centerville, and Wendell L. Wood, Dayton, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 31, 1988, Ser. No. 264,737
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—75 **12 Claims**



1. In continuous ink jet printing apparatus, an improved print head construction comprising:
(a) means for directing a plurality of ink streams through a drop charge region toward a print zone;
(b) charging means including charge electrodes located adjacent said drop charge region and means for selectively applying an information voltage to said charge electrodes;
(c) deflection means including a deflection electrode(s) spaced downstream from said charge electrodes by about one nominal drop spacing or less and means for applying a deflection voltage to said deflection electrode; and
(d) dielectric matrix means for integrally embedding said charge and deflection electrodes in said closely spaced relation.

4,928,114
AIR SKIVING SYSTEM FOR INK JET PRINTER START-UP
Randy L. Fagerquist; Wendell L. Wood, and Frank W. Atkins, all of Dayton, Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 31, 1988, Ser. No. 265,101
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—75 **2 Claims**

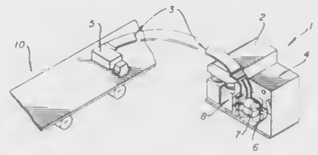


1. In continuous ink jet printer apparatus of the kind having drop generator means for directing droplet streams toward a print zone, drop charging means for inducing electrical charge selectively on droplets of such streams, catcher means for intercepting selected droplets and returning them to an ink supply and print head housing means for enclosing the drop charging and catcher means within a print head chamber having a printing egress, an improved system for air skiving said drop charging and catcher means comprising:
(a) means for defining an air inlet opening in said housing proximate said drop charging means;
(b) air filter means located in said air inlet opening to filter air passing through said opening into said housing;
(c) housing closure means for selectively opening and closing said printing egress;
(d) actuatable vacuum means for creating a negative pressure region within said chamber at a location proximate said catcher means; and
(e) control means for effecting an air skive sequence by effecting closing of said housing closure means and subsequent actuation of said vacuum means;
whereby high velocity airflow is induced to flow through said air filter means and skive over surfaces of said charging and catcher means during passage to said negative pressure region.

4,928,115
CONTINUOUS INK JET PRINTER HAVING REMOTELY OPERABLE PRINT HEAD ASSEMBLY
Randy L. Fagerquist; Wendall L. Wood; Frank W. Atkins, Dayton, and Surinder K. Bahl, Beavercreek, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 31, 1988, Ser. No. 265,102
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—75 **2 Claims**

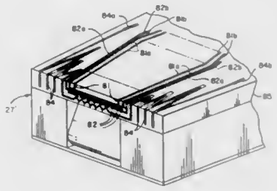
1. A continuous ink jet printer system having a remote printing capability, said system comprising:
(a) a mainframe subsystem including an ink supply reservoir, ink recirculating means, a power supply and data handling and machine control means, including phase adjustment means;
(b) a remotely operable, continuous ink jet print head assembly including:
(i) upper print head means for generating a plurality of continuous droplet streams;
(ii) drop charge means, including a plurality of drop

charge electrodes, for selectively charging droplets of said streams; and
(iii) droplet catcher means including an electrically conductive catcher pan, a catcher ink egress and a dielectric drop impact surface separating said catcher pan and said drop charge means;
(iv) housing means for supporting and defining an enclosure chamber around said upper head means and drop charge means and said catcher means, said housing including movable lower wall means for selectively opening and closing a printing egress for selectively



opening and closing a printing egress for said drop streams; and
(c) fluid and electrical umbilical means for coupling said mainframe subsystem and said remote print head assembly, including:
(i) conduit means coupling said upper print head to said ink supply reservoir and said catcher ink egress to said recirculation means; and
(ii) electrical lines coupling said drop charge means to said power supply and said catcher pan to said machine control means for phase adjustment operations.

4,928,116
INK JET PRINTER HAVING IMPROVED PRINT HEAD HEATER CONSTRUCTION
Wendell L. Wood, Dayton, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 31, 1988, Ser. No. 264,739
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—75 **7 Claims**



1. In continuous ink jet printing apparatus of the kind having means for directing a plurality of ink streams through a drop charge region toward a print zone an improved lower print head construction comprising:
(a) a support block having a lead support surface and an orthogonal electrode support surface located adjacent said drop charge region;
(b) charging means, including charge electrode portions on said electrode support surface and lead portions on said lead support surface, for discretely imparting information charge to said drop streams; and
(c) resistive heater means including resistive element portions located on said block surfaces in closely spaced relation to said charge electrodes and lead portions;
said support block comprising a dielectric matrix integrally embedding said charging and heating means in said closely spaced relation.

4,928,117
THERMAL PRINTOUT DENSITY CONTROL
Toshiyuki Takeuchi, Chigasaki, Japan, assignor to Graphtec Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 14, 1988, Ser. No. 257,983
Claims priority, application Japan, Oct. 17, 1987, 62-262345
Int. Cl.[5] G01D *15/10*
U.S. Cl. 346—76 PH **5 Claims**



5. In apparatus for recording data with a thermal recording head including a plurality of clocked heating elements,
the improvement comprising in combination:
memory areas for distinctly storing recording data, including three memory areas for each heating element;
means for sequentially applying to each of said three memory areas a present moment recording datum, a one-clock-interval-old recording datum, and a two-clock-interval-old recording datum, respectively, for the particular heating element;
a first inverter having an input connected to the memory area storing said one-clock-interval-old recording datum;
a second inverter having an input connected to the memory area storing said two-clock-interval-old recording datum;
a first AND element having a first input connected to the memory area storing said present moment recording datum and its second input connected to an output of said first inverter;
a second AND element having a first input also connected to the memory area storing said present moment recording datum and its second input connected to an output of said second inverter; and
means connected to the memory area storing said present moment recording datum and to outputs of said first and second AND elements for sequentially energizing the particular heating element pursuant to said present moment recording datum, and with an output of said first AND element and an output of said second AND element.

4,928,118
ENHANCED RESOLUTION ELECTROPHOTOGRAPHIC-TYPE IMAGING STATION
David Leksell, Oakmont; Zoltan K. Kun, Churchill Boro, and Alan F. Mandel, Mt. Lebanon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 7, 1988, Ser. No. 281,111
Int. Cl.[5] G01D *15/14*
U.S. Cl. 346—107 R **15 Claims**

1. An electrophotographic-type imaging station for producing an informational array pattern of enhanced resolution on the surface of a photosensitive medium, comprising:
a photosensitive medium having a mutually orthogonal first and second axes;
light radiation means spaced from said photosensitive medium, said light radiation means being capable of projecting a preselected number of beams of light energy along

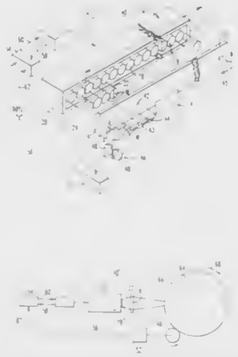
VOL
1114
ISS
4
MY
22
1990
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generally linear paths defining a row substantially parallel with said medium first axis, each projected beam having a preselected cross-sectional configuration with mutually orthogonal first and second cross-sectional axes;

said light radiation means being capable of projecting each said beam of light energy in a direction towards an individually addressable location on said medium so that each said beam first and second cross-sectional axes are substantially parallel with said medium first and second axes, respectively;

focusing means interposed between said photosensitive medium and said light radiation means, said focusing means focusing each said preselected cross-section beam projected along said row and towards an individually addressable location on said photosensitive medium to a generally rectangular beam of light energy;

each said rectangular beam having a first cross-sectional axis substantially identical in length to the length of said first cross-sectional axis of said projected beam and a second cross-sectional axis reduced as a selected percentage of the length of said projected beam second cross-sectional axis, said rectangular beam first cross-sectional axis being greater in length than said rectangular beam second cross-sectional axis;



means for moving said photosensitive medium relative to said light radiation means in a direction substantially parallel with said medium second axis;

means for coordinating the activation of said light radiation means and said means for moving said photosensitive medium so that an informational array pattern formed from a plurality of rows of generally rectangular beams is focused in row-at-a-time, abutting fashion onto said photosensitive medium;

said informational array pattern forming an N×M matrix wherein the value N corresponds to the total number of said individually addressable locations in a preselected length of a given row onto which said rectangular beams of light energy may be projected, and the value M corresponds to the total number of rows of rectangular beams of light energy capable of being projected over the same preselected length measured in a direction parallel with said medium second axis;

the value N defining the resolution of said informational array pattern in a direction parallel with said medium first axis and the value M defining the resolution of said informational array pattern in a direction parallel with said medium second axis; and

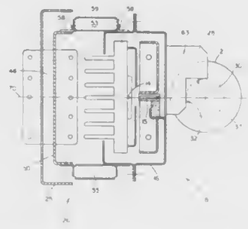
said resolution in said direction parallel with said medium second axis being greater than said resolution in said direction parallel with said medium first axis.

4,928,119

MOUNT FOR LINEAR ASSEMBLY

Jimmy P. Welker, Rochester, and James T. Bartoo, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,886
Int. Cl.[5] G01D *15/14*
U.S. Cl. 346—108 **31 Claims**



1. A mount for maintaining a printhead assembly in operative relation to a rotary component having a primary axis, despite angular displacement of the primary axis of the rotary component about x and y axes generally orthogonal to the primary axis and each other, the printhead assembly being of the type projecting a predominantly linear image on a surface moving past the printhead assembly while the surface is supported by the rotary component, said mount comprising:

means fixed to the printhead assembly for separably contacting the rotary component and restricting movement of the printhead assembly about the x and y axes relative to the rotary component, but permitting such movement of the printhead assembly with the rotary component, and

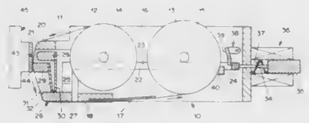
means supporting the printhead assembly, for resiliently urging the contacting means into contact with the rotary component, and for preventing angular movement of the printhead assembly about the primary axis while permitting angular movement of the printhead assembly about the x and y axes with the rotary component.

4,928,120

ORIFICE PLATE CLEANER FOR HOT MELT INK JET

Charles W. Spehrley, Jr., Hartford; Steveo H. Barss, Norwich; David G. Tomaszewski, Sharon, and Paul A. Hoisington, Thetford Center, all of Vt., assignors to Spectra, Inc., Hanover, N.H.

Filed Nov. 21, 1988, Ser. No. 275,096
Int. Cl.[5] B41J *2/165*
U.S. Cl. 346—140 R **20 Claims**



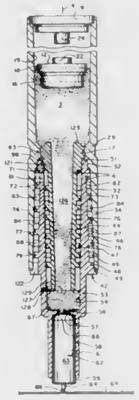
1. Apparatus for cleaning an orifice plate in a hot melt ink jet head comprising web means supported for motion toward an orifice plate of a hot melt ink jet head, movably supported pressure bar means for engaging the web means and urging the web means against the orifice plate, and means for moving the pressure bar means toward the orifice plate to urge the bar means against the web means with a selected force.

4,928,121

UNIVERSAL PLOTTER PEN HAVING IMPROVED MARKING FLUID FLOW CHARACTERISTICS

Jerald C. Raahauge, San Jose, Calif., assignor to Summer & Taylor, Inc., San Jose, Calif.

Filed Nov. 16, 1988, Ser. No. 271,910
Int. Cl.[5] G01D *15/16;* **B43K** *23/02, 5/14*
U.S. Cl. 346—140 R **40 Claims**



16. A universal plotter pen having improved marking fluid flow characteristics, comprising:

(a) a cartridge having tubular walls closed at one end and open at the other end and having a seal ring therewithin intermediate the closed and open ends and a cavity therewithin constituting a reservoir for marking fluid and defined between the seal ring and said closed end;

(b) a delivery system for marking fluid mounted in the open end of said cartridge in sealing engagement with said seal ring and including an elongated unobstructed passageway extending axially therethrough and communicating with said cavity constituting said marking fluid reservoir, whereby marking fluid may flow unobstructed from said reservoir through said passageway;

(c) an auxiliary reservoir cavity for marking fluid within said delivery system and communicating with said axially extending unobstructed passageway to receive marking fluid therefrom;

(d) a plotting point mounted on said marking fluid delivery system in communication with said auxiliary reservoir cavity, whereby marking fluid deposited by said plotting point is drawn from said auxiliary reservoir; and

(e) said tubular cartridge is provided with a thickened annular wall portion intermediate said open and closed ends.

4,928,122

EXPOSURE HEAD

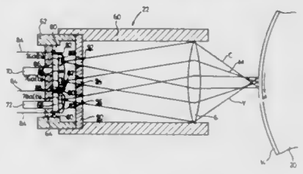
Atsuhiro Doi, and Tomonori Nishio, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 23, 1989, Ser. No. 299,578
Claims priority, application Japan, Jan. 21, 1988, 63-12361; Apr. 19, 1988, 63-96138; Apr. 19, 1988, 63-96139; Apr. 19, 1988, 63-96140
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—160 **10 Claims**

1. An exposure head for scanning a photosensitive medium with light beams modulated by image information in a main scanning direction while the photosensitive medium and the light beams are being relatively moved in an auxiliary direction transverse to the main scanning direction, to record a two-dimensional image on the photosensitive medium, comprising:

a light source for emitting the light beams; and

an aperture member disposed between said light source and the photosensitive medium and having a plurality of aper-



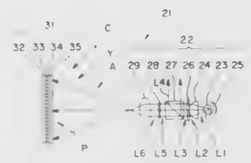
tures defined therein for passing the light beams respectively therethrough, each of said apertures being shorter in said main scanning direction and longer in said auxiliary scanning direction.

4,928,123

PROJECTION TYPE LIQUID CRYSTAL DISPLAY DEVICE

Yutaka Takafuji, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 15, 1988, Ser. No. 206,759
Claims priority, application Japan, Jun. 16, 1987, 62-150391
Int. Cl.[5] G03B *21/14*
U.S. Cl. 353—20 **7 Claims**



1. A liquid crystal display device comprising:

a display screen; and

a projector for projecting an image on said display screen;

said projector including,

a light source developing a light beam,

a polarizing beam splitter polarizing said light beam in a first polarizing direction,

a liquid crystal display modulating said light beam polarized by said polarizing beam splitter to form the image to be projected;

said display screen including,

polarizing means for polarizing said image projected by said projector, said polarizing means being arranged orthogonally to the first polarizing direction of said light beam polarized by said polarizing beam splitter, and

a lenticulated sheet lenticulated orthogonally to said polarizing means for preventing scattering of light in a vertical direction of the display screen.

VOL
1114
ISS
4
MY
22
1990
UMI

4,928,124

PHOTOGRAPHIC CAMERA

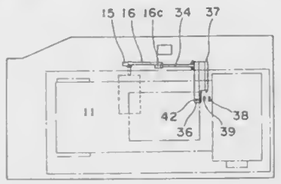
Nobuyuki Taniguchi, Nishinomiya; Takeo Hoda, Kawachinagano; Yoshiaki Hata, Nishinomiya; Manabu Inoue, Kobe; Yoshinobu Kudo, Sakai, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 348,075, May 5, 1989, Continuation of Ser. No. 939,706, Dec. 9, 1986, abandoned. This application Aug. 17, 1989, Ser. No. 395,089

Claims priority, application Japan, Dec. 9, 1985, 60-277584; Dec. 10, 1985, 60-278586; Dec. 20, 1985, 60-288366

Int. Cl.[5] G03B *3/00, 17/24*

U.S. Cl. 354—106 10 Claims



1. A photographic camera having a real focal length photographing mode in which a normal range in a frame of a film will be printed on the photographing paper and a pseudo focal length photographing mode in which a range smaller than the normal range in a frame of the film will be printed on a photographic paper, said photographic camera comprising:

a mode selecting means for selecting one of said real focal length photographing mode and said pseudo focal length photographing mode,

means for winding the film by an identical length for every shot regardless of the selection of the photographing mode by said selecting means; and

a light shielding means for shielding at least a portion of the normal range in a frame of the film in the case where said pseudo focal length photographing mode was selected, said portion being limited to a portion of said film which is not to be utilized upon printing.

4,928,125

LIQUID DROP EJECTION APPARATUS USING A MAGNETIC FLUID

Iino Shuji, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1988, Ser. No. 248,391

Claims priority, application Japan, Sep. 24, 1987, 62-240467; Sep. 24, 1987, 62-240468; Sep. 24, 1987, 62-240469; Sep. 24, 1987, 62-240470

Int. Cl.[5] G01D *15/16;* B41J *3/04*

U.S. Cl. 346—140 R 8 Claims



1. A liquid-drop ejection apparatus for supplying ink from a storage device to a nozzle and ejecting said ink in the form of drops, comprising:

a flow passage in said nozzle;

a magnetic fluid contained, adjacent to said ink, in said flow passage, and

means for ejecting said ink from a discharge opening, said ejecting means including:

means for deforming the magnetic fluid by applying a magnetic force from outside the flow passage, and

means for moving the deformed magnetic fluid along the flow passage in order to eject said ink from the discharge opening.

4,928,126

INK CONTAINER WITH DUAL-MEMBER SEALING CLOSURE

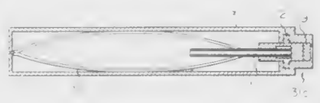
Naohito Asai, 30-2, 3-chome, Shimomaruko, Obta-ku, Tokyo, Japan

Continuation of Ser. No. 57,740, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 693,172, Jan. 22, 1985, abandoned. This application Apr. 3, 1989, Ser. No. 332,386

Claims priority, application Japan, Feb. 9, 1984, 59-20849

Int. Cl.[5] G01D *15/16;* B41J *3/04*

U.S. Cl. 346—140 R 8 Claims



1. An ink cartridge for an ink jet recording apparatus comprising:

a flexible ink bladder for storing ink therein;

a case containing said ink bladder;

an outlet pipe having an outlet port for directing the ink in said ink bladder outwardly thereof; and

a sealing closure member fitted into said case and sealing said outlet port, said closure member comprising:

a first elastic member of low gas permeability selected from the group of materials consisting essentially of butyl rubber, polychloroprene rubber, nitrile rubber, isobutylene rubber and polysulfide rubber, and

a second elastic member, with a compression permanent set lower than said first elastic member, selected from the group of materials consisting essentially of silicon rubber, urethane rubber, polyethylene chloride, eipchlorohydrin rubber, nitrile rubber (N13R), isoprene rubber, butadiene rubber, chloroprene rubber and fluororubber,

wherein said first elastic member and said second elastic member are disposed in that order from said outlet port.

4,928,127

SHEET CIRCULATION IN A DUPLEX PRINTER

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1989, Ser. No. 357,926

Int. Cl.[5] G03G *15/00*

U.S. Cl. 346—160 8 Claims

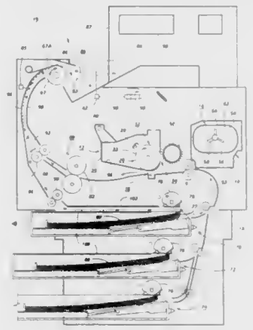
1. In a duplex printer or copier with a copy sheet output path, and a connecting duplexing path for returning copy sheets to be imaged on their opposite sides to make duplex copies, said duplexing path including a copy sheet inverting system with reversible copy sheet output path rollers to alternatively advance copy sheets, or with reversal, to transport copy sheets into said duplex path, the improvement comprising;

output path roller nip means for feeding copy sheets therefrom downstream through said copy sheet output path to said reversible copy sheet output path rollers.

copy sheet guide path means extending between, and providing a copy sheet guide path between, said output path roller nip means and said reversible copy sheet output path rollers,

said copy sheet guide path comprising a portion of said copy sheet output path and an initial portion of said duplexing path, and having a copy sheet guide path length between said output path roller nip means and said reversible copy sheet output path rollers which is a substantial portion of the dimension of the copy sheet being fed but substantially less than said copy sheet dimension so that a substantial portion of the copy sheet is extendable through and downstream of said reversible copy sheet output path rollers before the copy sheet is released by said output path roller nipmeans,

so that a subsequent copy sheet may be fed downstream in said copy sheet guide path by said output path roller nip means towards said reversible copy sheet output path



rollers simultaneously with, for a substantial time period with, the reverse feeding of the preceding copy sheet by said reversible copy sheet output path rollers into said duplex path,

and duplexing path transport means in said duplexing path for acquiring and feeding in said duplexing path copy sheets being reversibly driven by said reversible copy sheet output path rollers,

said duplexing path transport means being mounted in said duplexing path to have a copy sheet guide path length between said duplexing path transport means and said reversible copy sheet output path rollers which is substantially greater than said copy sheet guide path length between said output path roller nip means and said reversible copy sheet output path rollers.

4,928,128

SHEET CIRCULATION IN A DUPLEX PRINTER

Denis J. Stemmie, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1989, Ser. No. 359,064

Int. Cl.[5] G03G *15/00*

U.S. Cl. 346—160 6 Claims

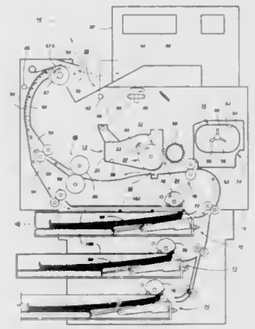
1. In a duplex printer or copier with a copy sheet output path, and a connecting duplexing path for returning copy sheets therein to be imaged on their opposite sides to make duplex copies, the improvement wherein:

said duplex printer or copier has at least one removable cassette copy sheet tray insertable into an opening in said duplex printer or copier, said cassette copy sheet tray normally providing for loading copy sheets into the printer,

said cassette copy sheet tray having a top cover member adapted to provide a lower guide member for a substantial portion of said duplexing path for guiding copy sheets in said duplexing path over the top of said cassette copy sheet tray without restacking therein,

and wherein said duplex printer or copier has a fixed baffle arrangement therein positioned to overly said top cover member of said cassette copy sheet tray when said cassette copy sheet tray is inserted into said duplex printer or copier to provide a mating upper guide member for a substantial portion of said duplexing path,

so that when said cassette copy sheet tray is inserted into said duplex printer or copier a copy sheet being duplexed is



guided between said fixed baffle arrangement and said top cover member of said cassette copy sheet tray to continue on past said cassette copy sheet tray in said duplexing path, but when said cassette copy sheet tray is removed, said substantial portion of said duplexing path is opened and exposed for recovering copy sheets therefrom.

4,928,129

PRINTING APPARATUS

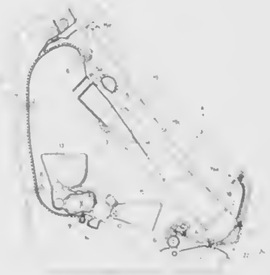
Iwakazu Honda, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1989, Ser. No. 343,197

Claims priority, application Japan, Apr. 30, 1988, 63-59128[U]; May 13, 1988, 63-117470; May 13, 1988, 63-63883[U]; May 13, 1988, 63-63884[U]; May 31, 1988, 63-73064[U]; May 31, 1988, 63-73065[U]; Jun. 15, 1988, 63-79102[U]

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—160 12 Claims



1. A printing apparatus comprising: a housing in which an electrostatic image forming means is disposed, said image forming means including a light-emitting section for irradiating a photosensitive means to form a latent image and a developing process section for developing the latent image into a real image with toner,

a paper receiving member disposed within the housing for receiving printed copy sheets,

VOL
1114
ISS
4
MY
22
1990
UMI

a paper cassette for holding copy sheets to be printed, disposed on the back of the paper receiving member so that the copy sheets are covered with the paper receiving member, and

a paper conveyer disposed below the paper cassette for transporting copy sheets from the paper cassette to the paper receiving member, said image forming means being placed between the paper cassette and the paper conveyer so that the toner image is transferred onto a copy sheet passing through the paper conveyer.

4,928,130

STAGGERED ARRANGEMENT FOR IMPROVING RADAR REFLECTION

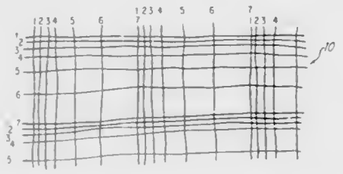
Peter Pfabe, and Hubert Nöhren, both of Hamburg, Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Continuation of Ser. No. 781,114, Sep. 27, 1985, abandoned. This application Jun. 14, 1989, Ser. No. 368,895

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1984, 3436063

Int. Cl.[5] F41J *9/10*

U.S. Cl. 342—9 20 Claims



1. In a staggered arrangement including towed aerial targets and multi-dimensional bodies where radar reflection is to be improved and on which staggered individual elements can be disposed that are made of conductive material and are spaced from one another; said elements being staggered for better radar reflection in a range between a lower cutoff frequency of a selected frequency band and an upper cutoff frequency of said selected frequency band having a predetermined wavelength of lower and upper cutoff frequencies respectively and being disposed on an object which is to be detected by a search frequency band of a radar unit;

the improvement in combination therewith comprising selecting said selected frequency band based upon a mathematically regulated variable spacing between said staggered individual elements ranging from a maximum spacing to a minimum spacing rather than constant spacing, said mathematically regulated variable spacing being based on a predetermined geometric progression involving said spacing between said staggered individual elements and said wavelength of said upper and lower cutoff frequencies of said selected frequency band wherein the distance between individual ones of said staggered individual elements at said maximum spacing starts at one half of the wavelength of the lower cutoff frequency and decreases in accordance with said predetermined geometric progression to one half of the wavelength of said upper cutoff frequency so that automatic gain of reflection results in said search frequency band of the radar unit which as a whole leads to an overall additive amplification of radar reflection according to mathematical regulation.

4,928,131

SEA CLUTTER SUPPRESSION RADAR

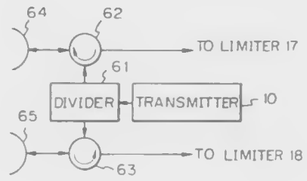
Kazuo Onozawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,236

Claims priority, application Japan, Sep. 17, 1987, 62-232965

Int. Cl.[5] G01S *13/50*

U.S. Cl. 342—188 4 Claims



1. Sea clutter suppression radar comprising:

(a) at least one antenna for simultaneously sending horizontally and vertically polarized RF waves;

(b) first and second detectors for respectively detecting IF signals of horizontally and vertically polarized components of reflected RF waves and for providing outputs corresponding thereto;

(c) third and fourth detectors for respectively detecting IF signals of the vector sum and vector difference between said horizontally and vertically polarized components and for providing outputs corresponding thereto;

(d) a first subtracter for subtracting an absolute value of a difference between said outputs from said first and second detectors, from a sum of said outputs from said first and second detectors;

(e) a second subtracter for subtracting said output from said fourth detector, from said output from said third detector;

(f) a polarity signal generator for generating an output which is a binary signal according to a selected logic combination of results of a plurality of comparisons between: (1) each of a plurality of voltages proportional to a fraction of said output of said first subtracter and a plurality of voltages proportional to a fraction of an inverted output of said first subtracter and: (2) said output from said second subtracter;

(g) a first means for providing an output equal to an absolute value of a difference between said outputs of said first and second detectors;

(h) a third subtracter for providing an output equal to a difference between said output of said first means and said output of said third detector;

(i) a fourth subtracter for providing an output equal to a difference between said output of said first means and said output of said fourth detector;

(j) an adder for adding said outputs of said third and fourth subtracters; and

(k) a polarity conversion circuit for selectively converting a polarity of an output from said adder in accordance with said output from said polarity signal generator.

4,928,132

OPTICAL DATA STORAGE MEDIUM

Robert M. Pettigrew, Foxton; Victor C. Humberstone, Stapleford; Keith Gardner, Trumpington; Robert J. Longman, Coton, and Peter R. Helfet, London, all of Great Britain, assignors to Plasmon Data Systems, San Jose, Calif.

Continuation of Ser. No. 915,619, Oct. 6, 1986, Pat. No. 4,724,444, which is a continuation-in-part of Ser. No. 535,866, Sep. 26, 1983, Pat. No. 4,616,237. This application Feb. 8, 1988, Ser. No. 153,059

Claims priority, application United Kingdom, Sep. 27, 1982, 8227500

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[5] G01D *15/34;* B05D *3/00;* B32B *15/04;* G03C *1/00*

U.S. Cl. 346—135.1 19 Claims



1. An optical data storage medium which comprises an optically sensitive layer at or adjacent to one surface of the medium, said one surface of the medium comprising a heat sensitive material having a plurality of topographical features or structures disposed in a regularly repeating textured pattern, said pattern and overcoated with a thin film of a metallic material which conforms to the topograph of said surface, being free from undercutting so that the medium can be produced and/or replicated by molding, casting, embossing or similar process against a tool.

4,928,133

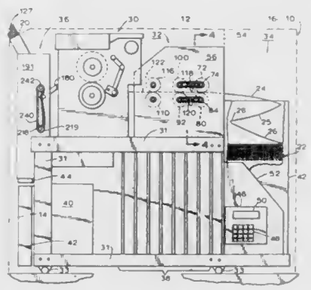
PRINTER AND METHOD

Alfred L. Fulton, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Filed Feb. 3, 1989, Ser. No. 306,804

Int. Cl.[5] G01J *15/00*

U.S. Cl. 346—150 40 Claims



1. A printer for printing information on individual sheets in a strip in which said sheets are fastened sequentially to other sheets at separation lines where said sheets are weakened for ease of separation, said printer comprising, in combination, a print engine, sheet separator means, feed means for feeding said strip into said separator means, detecting means for detecting each of said separation lines, holding means for holding said sheets against longitudinal motion due to lateral distortion of said sheets in the vicinity of said separation lines during separation, and means for passing a separation member through said sheet in the vicinity of said separation lines so as to separate said sheets from one another along said lines.

40. Apparatus as in claim **39** in which said sheet is a relatively stiff ticket blank, said ticket blank driving said belt and said idler roller, under the motive force of said drive roller, to ensure that the surface of said idler roller moves at the same speed as said blank, said guide means being positioned to guide said blank into the nip between said drive roller and said belt, and said idler roller and said belt.

4,928,134

PLATEN FOR THERMAL TRANSFER PRINTER

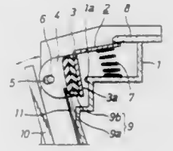
Tai Hasegawa; Jun Monnai, and Masatoshi Matsuzaki, all of Kobe, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 76,481, Jul. 22, 1987, Pat. No. 4,816,842. This application Mar. 8, 1989, Ser. No. 320,515

Claims priority, application Japan, Jul. 29, 1986, 61-178169; Jul. 29, 1986, 61-116477

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—76 PH 17 Claims



1. A platen for a thermal transfer printer, including a support and a platen body mounted on said support and made of an elastic material, characterized in that said platen body comprises a first layer having a high hardness located on the side of a thermal printer head and a second layer having a lower hardness than that of said first layer, said second layer being located on the side of said support.

4,928,135

MECHANICAL HOLDING DEVICE FOR A FREE-STRUCTURE OPTICAL-FIBER CABLE

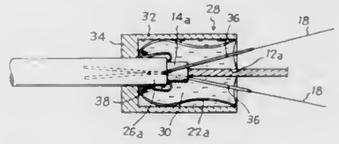
Pierre Kayoun, Boulogne-Billancourt, and Philippe Pouyez, Colombes, both of France, assignors to Amphenol Socapex, France

Filed Feb. 22, 1989, Ser. No. 313,441

Claims priority, application France, Feb. 23, 1988, 88 02167

Int. Cl.[5] G02B *6/36, 6/44*

U.S. Cl. 350—96.20 10 Claims



1. A mechanical holding device for a free-structure optical fiber cable, said cable comprising a substantially cylindrical core and an outer protective jacket, with the core being provided with peripheral grooves in which optical fibers are freely received, said device comprising a retention block which is molded directly about the core and the protective

VOL 1114 ISS 4 MY 22 1990 UMI

jacket over a bared portion of each of the core and the protective jacket, wherein the device further includes a fiber-passing tube for each optical fiber, one end of each tube extending beneath the protective jacket, and each tube accommodating a respective optical fiber passing freely therealong, each tube being molded in said retention block and passing therethrough, the retention block including shaped portions, suitable for enabling the retention block to be mounted in a fixed structure.

4,928,136

IMAGE FORMING APPARATUS

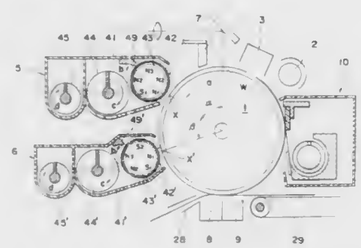
Keiji Kusumoto, and Naoyoshi Kinoshita, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Sep. 30, 1988, Ser. No. 251,666

Claims priority, application Japan, Oct. 1, 1987, 62-248789; Oct. 1, 1987, 62-248790; Oct. 2, 1987, 62-250405; Oct. 2, 1987, 62-250406; Oct. 2, 1987, 62-250407

Int. Cl.[5] **G03G** *21/00, 15/00*

U.S. Cl. 355—315 **11 Claims**



8. An electrophotographic copying machine capable of sequentially performing an electrophotographic copying process of imparting an electrostatic charge to the photoreceptor medium at a charging station; forming at an exposure station an electrostatic latent image on the photoreceptor medium in a pattern complemental to an image to be copied; applying toner material at a developing station to the photoreceptor medium to develop the electrostatic latent image into a visible powder image; transferring at a transfer station the powder image onto a copying sheet supplied thereto; separating the copying sheet, with the powder image having been transferred thereto, from the photoreceptor medium; and fixing the powder image on the copying sheet at a fixing station, which machine comprises:

said photoreceptor medium being supported for rotation in one direction sequentially past the charging, exposure, developing, transfer and separating stations;

a plurality of developing units disposed at the developing station for applying the toner material to the photoreceptor medium, said developing units accommodating respective toner material of different colors;

means for selectively driving the developing units one at a time for applying the toner material to form the powder image on the photoreceptor medium;

means for providing information descriptive of the respective colors of toner material in the developing units;

means for transporting the copying sheet sequentially past the transfer and separating stations and towards the fixing station;

means disposed at the transfer station for causing the powder image on the photoreceptor medium to be transferred onto the copying sheet; and

a control means operable, in reference to the information descriptive of the colors of toner material in the respective developing units and in the event that the control means determines that one of the developing units contains the toner material of a particular color substantially identical with that of the copying sheet, to cause one of the developing units to apply the toner material of such particular color to be applied to a portion of the photoreceptor medium, which corresponds in position to the leading edge of the copying sheet with respect to the direction of transport of the copying sheet, for forming a toner deposit on the leading edge of the copying sheet that is necessitated to facilitate a smooth separation of the copying sheet from the photoreceptor medium at the separating station.

4,928,137

IMAGE SENSING APPARATUS HAVING A LOW-RESOLUTION MONITOR MEANS FOR REDUCING THE AMOUNT OF INFORMATION IN AN IMAGE SIGNAL, AND SWITCHING MEANS FOR REDUCING POWER CONSUMPTION IN VARIOUS OPERATING MODES

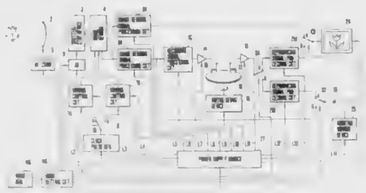
Takao Kinoshita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 134,179, Dec. 17, 1987, abandoned, which is a division of Ser. No. 682,936, Dec. 18, 1984, Pat. No. 4,740,828. This application Aug. 3, 1989, Ser. No. 390,431

Claims priority, application Japan, Dec. 24, 1983, 58-245847; Dec. 24, 1983, 58-245848; Dec. 28, 1983, 58-251736; Dec. 28, 1983, 58-251737

Int. Cl.[5] **H04N** *5/335, 3/15*

U.S. Cl. 358—213.26 **27 Claims**



1. An image sensing apparatus, comprising:

(a) an image sensor having a plurality of picture elements each for forming an electrical signal;

(b) monitor means having a fewer number of picture elements than said image sensor;

(c) recording means for recording an output signal of said image sensor;

(d) switching means for selectively guiding the output signal of said image sensor to one of said monitor means and said recording means; and

(e) control means for controlling said image sensor according to a switching operation of said switching means so as to read out the respective electrical signals of said picture elements from said image sensor as the output signal of said image sensor in case said switching means guides the output signal of said image sensor to said recording means, and so as to read out the electrical signals of groups of said picture elements added together from said image sensor as the output signal of said image sensor in case said switching means guides the output signal of said image sensor to said monitor means.

5. An image sensing apparatus, comprising:

(a) an image sensor having a plurality of picture elements each for forming an electrical signal;

(b) monitor means having a fewer number of picture elements than said image sensor;

(c) output means for conducting an output signal of said image sensor to the outside of the image sensing apparatus;

(d) switching means for selectively guiding the output signal of said image sensor to one of said monitor means and said output means; and

(e) control means for controlling said image sensor according to a switching operation of said switching means so as to read out the respective electrical signals of said picture

elements from said image sensor as the output signal of said image sensor in case said switching means guides the output signal of said image sensor to said output means, and so as to read out the electrical signals of groups of said picture elements added together from said image sensor as the output signal of said image sensor in case said switching means guides the output signal of said image sensor to said monitor means.

9. An image sensing apparatus, comprising:

(a) an image sensor having a plurality of picture elements each for forming an electrical signal;

(b) switching means for selecting a first mode in which the respective electrical signals of said picture elements are read out from said image sensor as an output signal of said image sensor and a second mode in which the electrical signals of said picture elements are partially added together and read out from said image sensor as an output signal of said image sensor;

(c) exposure control means for controlling a light amount incident on said image sensor; and

(d) means for controlling said exposure control means to change the light amount incident on said image sensor according to a selecting operation of said switching means so as not to cause a difference in the level of the output signal read out from said image sensor between said first mode and said second mode.

15. An image sensing apparatus, comprising:

(a) image sensing means for sensing optical images and converting the optical images into electrical signals;

(b) switching means for selecting one of a first mode in which the electric signals are readout after partially adding them together and a second mode in which the electric signals are readout without adding them together; and

(c) control means for varying an amount of incident light to the image sensing means in response to switching operation of said switching means.

22. An image apparatus, comprising:

(a) image sensing means for sensing optical images and converting the optical images into electric signals;

(b) drive means selectively effecting reading in one of a first reading mode in which the electric signals at the image sensing means are read out in a predetermined process and a second reading mode in which said electric signals are read out while mixing them in a process where a resolution of the read out electric signals is reduced as compared with said first predetermined process; and

(c) control means for controlling an amount of incident light to the image sensing means in response to selection of the reading mode of said drive means.

4,928,138

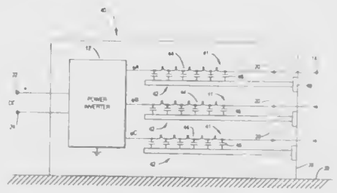
POWER SUPPLY WITH INTEGRAL FILTER AND COOLING DEVICE

Derek N. Walton, Roscoe, and Richard J. Hoppe, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 30, 1989, Ser. No. 374,136

Int. Cl.[5] **H02M** *1/12*

U.S. Cl. 363—40 **25 Claims**



1. A power supply comprising:

a chassis;

a voltage source providing an output voltage varying at a fundamental frequency and having a noise component varying as a function of time at a frequency above the fundamental frequency;

a filter including an inductance in series with the voltage source for attenuating the noise component and outputting the fundamental frequency; and

a cooling apparatus thermally and capacitively coupled to the inductor for conducting heat from the inductor and coupling the noise component to the chassis.

4,928,139

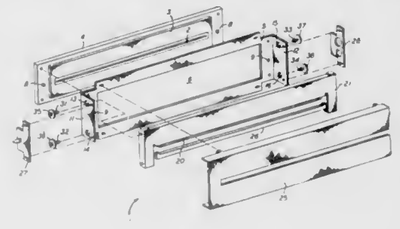
ASSEMBLY CONTAINING A LINEAR FOCUSING MEANS AND METHOD OF MAKING SAME

James T. Barton, Fairport, and Jimmy P. Walker, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1988, Ser. No. 273,770

Int. Cl.[5] **G03B** *27/00*

U.S. Cl. 355—1 **16 Claims**



1. A linear lens array assembly comprising:

a support for receiving a linear source of radiation;

a linear lens array;

a support for said linear lens array;

one of said supports including means defining a plurality of apertures,

a pin located in each aperture and seated in the support other than the support having the aperture defining means, each pin having a cross section small compared to its aperture, and

a washer carried by each pin and having an opening approximating the cross section of its pin to restrict lateral movement of said pin, each washer being fixed by adhesive to said aperture defining means.

4,928,140

HIGH SPEED APERTURE CARD PRINTER AND METHOD

David S. Wise, Solon, Ohio, assignor to Tameran, Inc., Chagrin Falls, Ohio

Filed Mar. 7, 1989, Ser. No. 319,964

Int. Cl.[5] **G03B** *27/48*

U.S. Cl. 355—48 **23 Claims**

1. A high speed aperture card printer comprising:

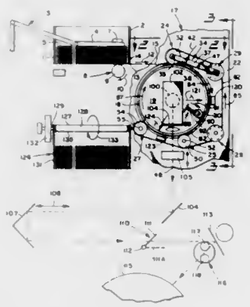
a supply means containing one or more aperture cards, each of which carries a microfilm piece in an aperture spaced predetermined distances from the leading, trailing and side edges of the card;

means to feed aperture cards one after another from the supply means to a rotating, radiant energy transmissive cylinder so that each aperture card is directly followed by another aperture card during printing;

means to hold each aperture card fed tightly against the outer diameter surface of said cylinder for transport by the rotating cylinder without covering any part of the radially outer surface of the microfilm piece;

VOL
1114
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an optics system passing a beam of radiant energy through the rotating cylinder and microfilm piece passing thereby optically to scan any image on said microfilm piece, said optics system being operative to print the image appearing



on the microfilm piece scanned onto a plain paper copy and

means to remove each aperture card from the cylinder after the microfilm piece has finally passed the optics system.

4,928,141

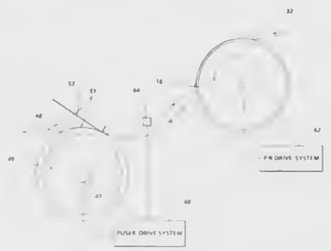
BUCKLE CONTROL FOR REDUCING INTERACTIONS BETWEEN MEDIA DRIVE SYSTEMS

Raymond E. Poehlein, Fairport; Franklin S. Reese, Victor, and John A. Adamek, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1989, Ser. No. 313,552

Int. Cl.[5] G03G *21/00, 15/20*

U.S. Cl. 355—208 **5 Claims**



1. A system for controlling the movement of a copy media a portion of which is in frictional contact between a first and a second rotational surface and forms a buckle therebetween, the system including first drive means for controlling the rotational speed of said first surface, second drive means for controlling the rotational speed of said second surface, said first and second drive means resulting in a speed mismatch which creates a change in said buckle and a sensing means for sensing a predetermined buckle size in the portion of the copy media moving between the two rotational surfaces said sensing means adapted to generate an output signal for a predetermined length of time, said output signal applied to one of said drive means so as to cause a change in the speed of said drive means whereby the said buckle configuration is restored to its original configuration.

4,928,142

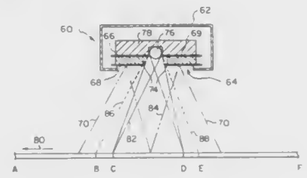
COMBINATION ERASE DEVICE

David Kloosterman, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,321

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—218 **7 Claims**



1. A combination in an electrostatographic copier or printer having a moving photoconductor that includes image frame areas, interframe areas, and a halftoning dot screen layer, the combination comprising:

(a) an electroluminescent panel supported adjacent to, and crosswise behind the photoconductor, producing light that can be absorbed by the dot screen layer and thereby selectively discharging areas on the photoconductor;

(b) a slot in said electroluminescent panel extending the full width of the photoconductor;

(c) semi-transparent members, formed by a semi-transparent material sealing the electroluminescent (EL) panel, said members projecting partially into said slot; and

(d) a source of light, for exposing a selected area of the photoconductor, suitably producing light that can pass substantially unabsorbed by the dot screen layer, said source of light being mounted on and behind said electroluminescent panel such that its light is restricted to passage through the semi-transparent members and the unobstructed portion of said slot.

4,928,143

IMAGE FORMING APPARATUS WITH IMAGE ERASING LAMP

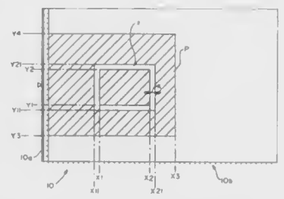
Yuji Okamoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 6, 1987, Ser. No. 106,416

Claims priority, application Japan, Oct. 9, 1986, 61-240755

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—218 **2 Claims**



1. An image forming apparatus comprising

an image erasing lamp secured between a charger for uniformly charging the surface of a photosensitive drum and a developing device and elongated in the direction of the axis of said drum, said image erasing lamp including a plurality of point light sources which can be individually switched on and off,

rectangular region setting means for specifying two X coordinates and two Y coordinates and thereby setting on an original document sheet a rectangular region with sides lying along X and Y directions,

frame-shaped region determining means for adding and subtracting a value representing a specified width to or from said X and Y coordinates to thereby determine a frame-shaped region having said specified width and positioned around a region set by said rectangular region setting means, and

lamp control means for controlling the timing of switching said point light sources on and off during an image forming process such that only the region on said photosensitive drum corresponding to said frame-shaped region is exposed by said light sources and that electrostatic charges are thereby cancelled in said corresponding region on said photosensitive drum.

4,928,144

DEVELOPING DEVICE FOR A COLOR IMAGE FORMING APPARATUS

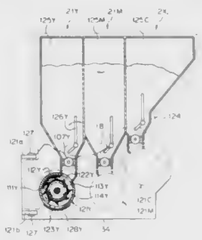
Nobuo Kasahara, 80-46, Nakazawa-cho, Asahi-ku, Yokohama-shi, Kanagawa-ken, and Susumu Wagi, Kikuchi Dai-1 Mansion, 4-12-13, Tokumaru, Itabashi-ku, Tokyo, both of Japan

Filed Apr. 22, 1988, Ser. No. 185,693

Claims priority, application Japan, May 31, 1987, 62-136035; May 31, 1987, 62-136036

Int. Cl.[5] G03G *15/06, 15/01*

U.S. Cl. 355—245 **15 Claims**



1. An image forming apparatus comprising:

(a) an image carrier;

(b) first developing means comprising a plurality of developing sections which are arranged around said image carrier, at least two of said developing sections being constructed into a single unit;

(c) second developing means comprising a single developing section disposed around said image carrier;

(d) third means for moving said first developing means back and forth between an operative position in which said at least two of said developing sections are both in operative association with said image carrier and an inoperative position in which neither of said at least two of said developing sections is in operative association with said image carrier; and

(e) fourth means for moving said second developing means back and forth between an operative position in which said single developing section is in operative association with said image carrier and an inoperative position in which said single developing section is not in operative association with said image carrier,

wherein said unit of said first developing means and said unit of said second developing means are constructed and arranged independently of each other.

4,928,145

DEVELOPING APPARATUS HAVING A BUCKET ROLLER WITH MOVABLE BUCKETS

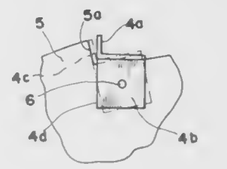
Hiroshi Okamoto; Oka Tateki; Mineyuki Sako; Tetsuo Kyogoku, and Toshikazu Suzuki, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha

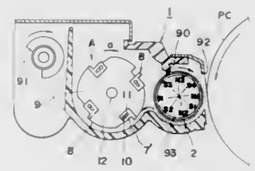
Filed Apr. 6, 1988, Ser. No. 178,344

Claims priority, application Japan, Apr. 9, 1987, 62-53836[U]

Int. Cl.[5] G03G *15/00, 15/09, 9/08*

U.S. Cl. 355—245 **6 Claims**





1. A developing apparatus comprising:

developing means for developing an electrostatic latent image formed on a photosensitive member; and

supplying means for supplying developer to said developing means including a bucket roller rotatably mounted and provided with a plurality of buckets on its periphery, said plurality of buckets being provided respectively to said bucket roller so as to move freely in accordance with the rotation of said bucket roller, and said bucket roller being given an impact due to the movement of each of said buckets.

4,928,146

DEVELOPING DEVICE

Takanobu Yamada, Osaka, Japan, assignor to Minolta Camera Co., Ltd., Osaka, Japan

Filed Mar. 29, 1989, Ser. No. 330,196

Claims priority, application Japan, Apr. 1, 1988, 63-81974; Apr. 4, 1988, 63-83501

Int. Cl.[5] G03G *15/09, 15/01*

U.S. Cl. 355—253 **18 Claims**

1. A developing device for developing an electrostatic latent image on an image support member, comprising:

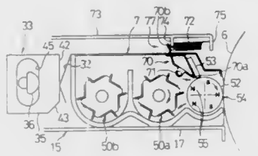
a plurality of developing units having developing rolls which are rotatively driven for supplying different colored developers to the image support member;

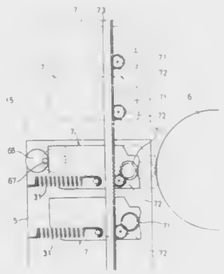
a position changeover means for switching over positions of each developing unit between a developer supply location adjacent to the image support member and a developer non-supply position away from the image support member;

a developer condition regulating means for regulating the condition of developer on the developing roll to lower the height of the developer at least at the portion where the developing roll faces the outside of the developing unit; and

VOL
1114
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an interlocking means for actuating or stopping the action of the developer regulating means correlatively with the





movement of each developing unit between the developer supply location and the developer non-supply position.

4,928,147

PRINTERS WITH SIMPLEX AND DUPLEX CUT SHEET FUSING

Gerald W. Baumann; Albert N. Garthwaite, both of Boulder, and Carl D. Hutchings, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1989, Ser. No. 316,261

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—288 **10 Claims**

1. Apparatus for handling transfer of fusible material corresponding to images from an image generator to discrete sheets of media in either simplex or duplex form comprising

a source for producing media sheets seriatim,

a transfer station means including means for motivating the fusible material from the image generator to the media sheets,

means for introducing media sheets from said source to said transfer station means,

first and second flash fusing means for fusing the fusible material to the media sheets,

first and second output paths from said transfer station means each including a respective one of said flash fusing means,

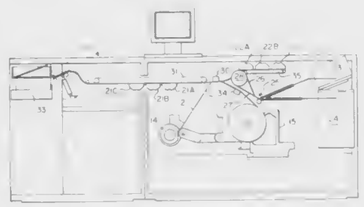
one of said output paths including means for returning received media sheets to said transfer station means for receiving image defining fusible material on the side thereof opposite the side which received the first image from said transfer station means,

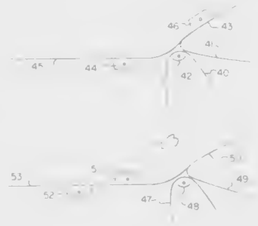
means producing a signal indicative that duplex image transferring is to occur,

means responsive to said signal producing means for selectively switching the output from said transfer station means to said one of said output paths and for otherwise directing the output of said transfer station means to the other of said output paths,

an electrical power source means, and

control means selectively coupling said electrical power source means for actuating one of said flash fusing means which has a media sheet in proximity thereto for causing





said actuated flash fusing means to fuse the fusible material on that media sheet.

4,928,148

FIXING DEVICE SELECTIVELY OPERABLE IN COLOR OR BLACK/WHITE COPING MODE

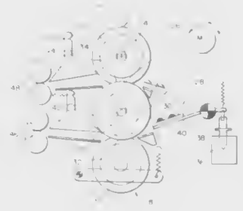
Yuichirou Higashi, Kagoshima, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 416,971

Claims priority, application Japan, Oct. 6, 1988, 63-250887; Dec. 8, 1988, 63-308785

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—290 **5 Claims**



1. A fixing device for a dry process copier selectively operable in a black-and-white copy mode which uses a black toner, and a full-color copy mode which transfers color-separated images one upon another to a paper sheet, comprising:

a first fixing roller comprising a rigid roller and having a heat source in said first fixing roller;

a second fixing roller coated with an elastic layer and having a heat source in said second fixing roller, said second fixing roller being pressed against said first fixing roller to rotate, in a pressing portion, in a same direction and at a same linear speed as said first pressing roller;

a pressing roller coated with an elastic layer and pressed against said first fixing roller to rotate, in a pressing portion, in a same direction and at a same linear speed as said first fixing roller;

guide means movable between a first position for guiding a paper sheet fed from an image transfer station to a first nipping section which is defined between said first fixing roller and said pressing roller such that an image surface of said paper sheet contacts said first fixing roller, and a second position for guiding said paper sheet to a second nipping section defined between said first fixing roller and said second fixing roller such that said image surface contacts said second fixing roller;

drive means for selectively rotating said first fixing roller in opposite directions; and

control means for controlling said first fixing roller and said drive means such that in the full-color copy mode said guide means assumes the second position and said first fixing roller is rotated in a direction for transporting the paper sheet in a predetermined direction in said second nipping section while, in a black-and-white copy mode, said guide means assumes the first position and said first fixing roller is rotated in a direction for transporting said paper sheet in said predetermined direction in said first nipping section.

4,928,149

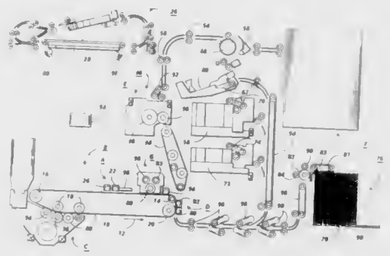
CONTAMINANT CLEANER

James E. Harmon, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1989, Ser. No. 318,388

Int. Cl.[5] G03G *15/08, 15/09*

U.S. Cl. 355—305 **15 Claims**



1. A device for preventing particles being transported on a moving image receiving member from contaminating processing stations located thereafter, including:

a support member positioned before the processing station in the direction of movement of the image receiving member; and

operator removable means, mounted on said support member, for attracting magnetic particles advancing with the image receiving member to prevent the magnetic particles from contaminating the processing station located thereafter.

4,928,150

COPY APPARATUS HAVING PLURAL COPY SHEET DISCHARGE TRAYS FOR DIFFERENT SIZED COPY SHEETS

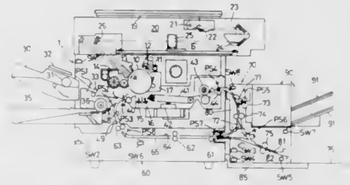
Yoshihiko Hatta, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1988, Ser. No. 184,502

Claims priority, application Japan, Apr. 23, 1987, 62-100273; Aug. 7, 1987, 62-198478; Aug. 7, 1987, 62-198479

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—311 **6 Claims**



1. An image forming apparatus comprising:

sheet feed means;

size evaluating means for evaluating a size of a sheet transported by said sheet feed means;

image forming means for forming an image on the sheet transported by said sheet feed means;

a first sheet discharge section for discharging the sheet;

a second sheet discharge section provided separately from said first sheet discharge section;

sheet re-feed means for transporting the sheet having one side thereof formed with the image by said image forming means to said image forming means again, said sheet re-feeding means including a switchback transport roller pair rotatable in a first direction for feeding the sheet toward said image forming means and in a second direction opposite to said first direction for feeding the sheet toward the second discharge section;

control means for providing at least a sheet re-feeding mode for transporting the sheet having one side thereof formed with the image by said image forming means to said image forming means again and then transporting the sheet to said first sheet discharge section, said control means being operable in said re-feeding mode to deliver the sheet to said second sheet discharge section without delivering the sheet to said first sheet discharge section when said size evaluating means judges the sheet to be unfit for re-feed.

4,928,151

APPARATUS FOR AUTOMATICALLY AND CIRCULATIVELY FEEDING ORIGINALS

Shiro Saeki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,333

Claims priority, application Japan, Jul. 30, 1987, 62-191114

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—320 **11 Claims**



1. An apparatus for automatically and circulatively feeding originals comprising:

an original feed-out section for sequentially feeding out the originals stacked therein from an original placed at a

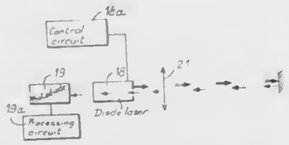
lowermost position, each image to be copied of the stacked original being kept facing downwardly;
an original exposure section disposed along the direction of movement of the fed-out original for exposing the fed-out original;
an original reversing section disposed on the opposite side to the original feed-out section with respect to the original exposure section, and having a reversing roller capable of rotating in both clockwise and counterclockwise directions for reversing the direction of movement of the original exposed at the original exposure section;
a first reversing path extending from a top of the reversing roller in the direction of the original feed-out section for guiding the original in the direction opposite to the direction of movement of the exposed original by means of clockwise rotation of the reversing roller when both-side copy is performed;
a second reversing path extending from a bottom of the reversing roller in the direction of the original feed-out section for guiding the original in the direction opposite to the direction of movement of the exposed original by means of counterclockwise rotation of the reversing roller when single-side copy is performed;
a conveyance path connected at one end thereof with the first and second reversing paths and extending from the connected portion of the first and second reversing paths in the direction of the original feed-out section;
an original discharge section connected to the other end of the conveyance path and disposed above the original feed-out section for discharging the original conveyed along the conveyance path thereinto;
wherein the original discharge section comprises:
a discharge sensor for checking the presence of the original fed out of the conveyance path;
a discharge roller for discharging toward one end of an original table the original fed out of the conveyance path; and
a pull-back roller connected to the discharge roller through a lever for guiding the original discharged by the discharge roller to the vicinity of the separation roller.

4,928,152

PROCESS AND DEVICE FOR OPTICALLY MEASURING THE DISTANCE AND THE VELOCITY OF A TARGET

Jean-Pierre Gerardin, Nanterre, France, assignor to Electricite De France, Paris, France

Filed Feb. 24, 1987, Ser. No. 17,646
Claims priority, application France, Feb. 24, 1986, 86 02515
Int. Cl.[5] G01C *3/08*; G01P *3/36*
U.S. Cl. 356—5 **10 Claims**



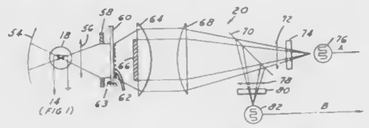
1. Process for optically measuring the distance between a target and a given location, comprising sending toward the target a radiation having a periodically varying wavelength from a monomode coherent light source placed at said location by supplying said source with a signal of variable power, receiving the radiation retroradiated by said target, re-injecting said retroradiated radiation into the cavity of said light source, and receiving on a photodetector placed at the rear of said cavity the beat between said retroradiated radiation and the radiation from said source, the frequency of the beat which is proportional to the delay of the retroradiated wave being representative of the distance between said source and said target, wherein the monomode coherent light source is a laser diode whose property of wavelength variation is a function of the supply power, said signal of variable power being supplied to said diode directly.

4,928,153

OPTICAL MEASUREMENT OF PARTICLE CONCENTRATION

Alexander J. Glass, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Apr. 6, 1987, Ser. No. 34,995
Int. Cl.[5] G01N *21/27, 15/06*
U.S. Cl. 356—343 **17 Claims**



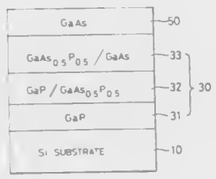
1. A method of measuring concentration of particles of size not greater than one micrometer, said method comprising the step of:
(a) directing light energy through a test medium containing said particles,
(b) measuring intensity of light energy transmitted through said medium simultaneously at two wavelengths having differing extinction coefficients as a function of particle size and wavelength, and
(c) indicating particle concentration as a function of a difference between said intensities measured in said step (b).

4,928,154

EPITAXIAL GALLIUM ARSENIDE SEMICONDUCTOR ON SILICON SUBSTRATE WITH GALLIUM PHOSPHIDE AND SUPERLATTICE INTERMEDIATE LAYERS

Masayoshi Umeno; Shiro Sakai, both of Nagoya, and Shinichiro Yahagi, Ohbu, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha and Nagoya Institute of Technology, both of Nagoya, Japan

Continuation of Ser. No. 903,195, Sep. 3, 1986, abandoned. This application Mar. 20, 1989, Ser. No. 325,115
Claims priority, application Japan, Sep. 3, 1985, 60-195628; Sep. 3, 1985, 60-195629; Sep. 3, 1985, 60-195630; Sep. 4, 1985, 60-195435
Int. Cl.[5] H01L *29/205, 29/04*
U.S. Cl. 357—16 **7 Claims**



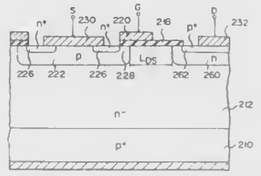
1. A semiconductor wafer having an epitaxial GaAs layer, comprising:
a monocrystalline Si substrate; and
at least one intermediate layer epitaxially grown on a major surface of said monocrystalline Si substrate, as a buffer layer for accommodating a lattice mismatch between said Si substrate and said epitaxial GaAs layer;
said at least one intermediate layer consisting of: a GaP layer formed on said Si substrate; a GaP/GaAsP superlattice formed on said GaP layer; and a GaAsP/GaAs superlattice formed on said GaP/GaAsP superlattice, said epitaxial GaAs layer being formed on said GaAsP/GaAs superlattice, wherein said GaP layer has a greater thickness than the total thickness of said superlattices; and
said GaP/GaAsP superlattice and said GaAsP/GaAs superlattice having an average lattice constant between the lattice constant of said Si substrate and the lattice constant of said GaAs layer.

4,928,155

LATERAL CONDUCTIVITY MODULATED MOSFET

Akio Nakagawa, Hiratsuka; Hiromichi Ohashi, Yokohama; Yoshihiro Yamaguchi, Urawa; Kiminori Watanabe, Kawasaki, and Thuneo Thukakoshi, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 19,337, Feb. 26, 1987, Pat. No. 4,782,372, which is a continuation of Ser. No. 738,188, May 28, 1985, Pat. No. 4,672,407. This application Jun. 10, 1988, Ser. No. 205,365
Claims priority, application Japan, May 30, 1984, 59-110244; Sep. 29, 1984, 59-204427; Nov. 20, 1984, 59-244811
The portion of the term of this patent subsequent to Nov. 1, 2006, has been disclaimed.
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.4 **6 Claims**



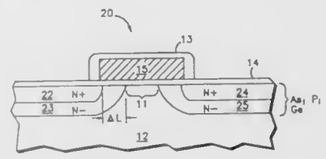
1. A lateral conductivity modulated metal oxide semiconductor field effect transistor, comprising:
a semiconductor substrate;
a high resistance semiconductor layer formed over said semiconductor substrate and having a high resistance;
a semiconductor region of a first conductivity type formed in a surface of said high resistance semiconductor layer and having an impurity concentration higher than that of said high resistance semiconductor layer;
a drain region of a second conductivity type formed and located in said semiconductor region;
a base region of the second conductivity type formed in said surface of said high resistance semiconductor layer, said base region surrounding a window of said high resistance semiconductor layer which is in said surface;
a source region of the first conductivity type formed and located in said base region;
a gate insulating film formed on a channel region which is formed in a surface of said base region between said semiconductor region and said source region;
a gate electrode formed on said gate insulating film and extending over said high resistance semiconductor layer;
a source electrode ohmicly contacting said source region and said base region; and
a drain electrode ohmicly contacting said drain region, whereby said lateral conductivity modulated metal oxide semiconductor field effect transistor can be operated under such conditions wherein a latch up current is larger than a saturation current.

4,928,156

N-CHANNEL MOS TRANSISTORS HAVING SOURCE/DRAIN REGIONS WITH GERMANIUM

John R. Alvis; James R. Pfiester, both of Austin, Tex., and Orin W. Holland, Oak Ridge, Tenn., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 72,932, Jul. 13, 1987, Pat. No. 4,837,173. This application Mar. 6, 1989, Ser. No. 319,000
Int. Cl.[5] H01L *29/78, 27/02, 29/167*
U.S. Cl. 357—23.4 **5 Claims**



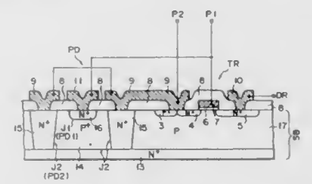
1. An n-channel MOSFET having at least one source or drain region improved with germanium, comprising:
a semiconductor substrate having a surface;
a thin dielectric layer on the surface of the semiconductor substrate;
a patterned gate of conductive material on the thin dielectric layer, where the gate has opposite sides; and
source and drain regions in the semiconductor substrate on the opposite sides of and beneath the gate, defining a channel in the semiconductor substrate between the source and drain regions, where at least one of the source and drain regions has germanium atoms in a first region, and phosphorus atoms in a second region of the semiconductor substrate, where said first region and said second region are in a relationship but not coextensive with each other.

4,928,157

PROTECTION DIODE STRUCTURE

Taira Matsunaga, and Takashi Kimura, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 5, 1989, Ser. No. 333,370
Claims priority, application Japan, Apr. 8, 1988, 63-86622
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.13 **6 Claims**



1. A protection diode structure for an insulated gate type semiconductor device which includes a semiconductor substrate layer of a first conductivity type and a gate electrode formed above and insulated from said semiconductor substrate layer and in which a driving voltage is applied between said gate electrode and said semiconductor substrate layer to create an inversion layer of a second conductivity type in the surface area of said semiconductor substrate layer in an operating mode, comprising:
a first semiconductor layer of the first conductivity type;
a second semiconductor layer of the second conductivity type formed in the surface area of said first semiconductor layer and connected to said gate electrode; and

VOL 1114 ISS 4 MY 22 1990 UMI

a third semiconductor layer of the second conductivity type formed to surround said first semiconductor layer, substantially uniformly separated from said second semiconductor layer, and connected to said semiconductor substrate layer;

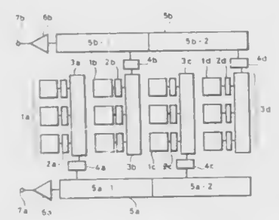
wherein said first and second semiconductor layers constitute a first PN junction diode having a breakdown voltage higher than the driving voltage and lower than the gate withstand voltage of said insulated gate type semiconductor device, and said first and third semiconductor layers constitute a second PN junction diode having a breakdown voltage lower than the gate withstand voltage of said insulated gate type semiconductor device and having a PN junction area larger than said first PN junction diode.

4,928,158

SOLID-STATE IMAGE SENSOR HAVING A PLURALITY OF HORIZONTAL TRANSFER PORTIONS

Masafumi Kimata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 260,135
Claims priority, application Japan, Oct. 20, 1987, 62-264977
Int. Cl.[5] H01L *29/78, 27/14;* **H04N** *3/14;* **G11C** *19/28*
U.S. Cl. 357—24 **17 Claims**



1. A solid-state image sensor having a semiconductor substrate, said sensor comprising:

a plurality of photoelectric conversion means arranged in column groups including at least a first column group and a second column group, for converting a light signal received to packets of electrical charge,

first charge transfer means for reading out a first electric signal corresponding to a plurality of said packets of electrical charge converted by said photoelectric conversion means arranged in said first column group and transferring said first electric signal,

second charge transfer means for reading out and transferring said first electric signal transferred by said first charge transfer means,

first output means for outputting said first electric signal transferred by said second charge transfer means,

third charge transfer means for reading out and transferring a second electric signal corresponding to a plurality of said packets of electrical charge converted by said photoelectric conversion means arranged in said second column group,

fourth charge transfer means for reading out and transferring said second electric signal transferred by said third charge transfer means, and

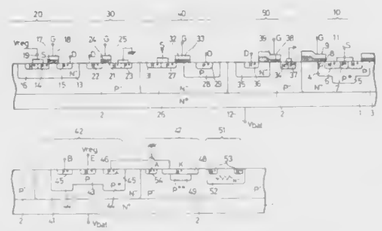
second output means for outputting said second electric signal transferred by said fourth charge transfer means, and wherein a direction of transfer of said first electric signal by said first vertical transfer means and a direction of transfer of said second electric signal by said second vertical transfer means are opposite to each other.

4,928,159

SEMICONDUCTOR DEVICE

Teruyoshi Mihara, Yokosuka, and Tsutomu Matsushita, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 5, 1988, Ser. No. 279,888
Claims priority, application Japan, Dec. 4, 1987, 62-305953
Int. Cl.[5] H01L *27/02*
U.S. Cl. 357—42 **5 Claims**



1. A semiconductor device, comprising:

a semiconductor substrate having a first conductivity type, to which a power voltage is applied;

an isolation layer having a second conductivity type, grown on the semiconductor substrate, a ground voltage being applied to the isolation layer;

a vertical MOSFET having a substantial drain region of a first well region having the first conductivity type, formed in the isolation layer to reach the semiconductor substrate therethrough and being used as output means for a load;

a P-channel MOSFET formed in a second well region having the first conductivity type, which is formed in the isolation layer, a constant voltage lower than the power voltage being applied to the second well region; and

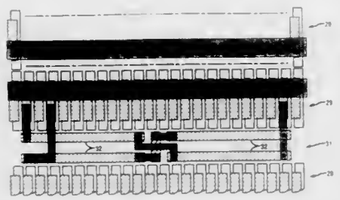
an N-channel MOSFET formed in the isolation layer, the P-channel and N-channel MOSFETs constituting a CMOS circuit constructing a peripheral circuit for the vertical MOSFET.

4,928,160

GATE ISOLATED BASE CELL STRUCTURE WITH OFF-GRID GATE POLYSILICON PATTERN

Harold S. Crafts, Fort Collins, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 17, 1989, Ser. No. 297,355
Int. Cl.[5] H01L *29/34, 27/02, 27/10*
U.S. Cl. 357—54 **8 Claims**



1. A two metal layer integrated circuit gate array configured from a chain of polysilicon gate isolated field effect transistors, comprising:

a grid reference to the source/drain regions of the field effect transistors;

a first metal layer pattern referenced to the grid;

a second metal layer pattern referenced to the grid;

a source/drain contact referenced to the grid;

an intermetal via referenced to the grid; and

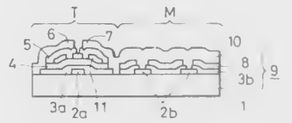
a gate polysilicon pattern referenced to the half grid.

4,928,161

THIN-FILM TRANSISTOR AND WIRING MATRIX DEVICE AND ITS FORMING METHOD

Kenichi Kobayashi, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1987, Ser. No. 71,951
Claims priority, application Japan, Jul. 11, 1986, 61-164320
Int. Cl.[5] H01L *23/48, 29/46, 29/54*
U.S. Cl. 357—71 **8 Claims**



1. A thin-film transistor device, comprising:

a substrate;

a thin-film transistor formed on said substrate including a first conducting layer deposited on said substrate, a gate insulating layer deposited on said first conducting layer, a semiconductor layer deposited on said gate insulating layer, and source and drain electrodes deposited on said semiconductor layer; and

a multi-level wiring section including a first conducting wiring layer deposited on said substrate, a wiring insulating layer deposited on said first conducting wiring layer, and a second conducting wiring layer deposited on said wiring insulating layer, contacting said first conducting wiring layer and electrically connected to a portion of said thin-film transistor;

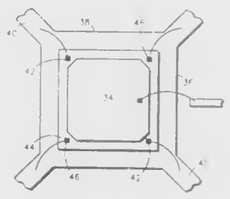
said gate insulating layer and said wiring insulating layer being made of a same inorganic material and being of the same thickness.

4,928,162

DIE CORNER DESIGN HAVING TOPOLOGICAL CONFIGURATIONS

Israel A. Lesk, Phoenix; Ronald E. Thomas, Tempe; George W. Hawkins, Mesa, and James M. Rugg, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 22, 1988, Ser. No. 158,486
Int. Cl.[5] H01L *23/28*
U.S. Cl. 357—72 **16 Claims**



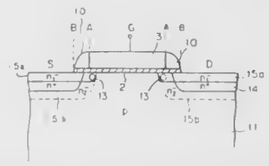
1. A semiconductor die having a plurality of circuit area corners which are void of circuitry, said circuit area corners having topological configurations thereon wherein said topological configurations include at least one dummy bond pad in each circuit area corner and a wire bond bonded to each dummy bond pad.

4,928,163

SEMICONDUCTOR DEVICE

Toshihiko Yoshida, and Toru Inaba, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 839,525, Mar. 14, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 315,196
Claims priority, application Japan, Mar. 20, 1985, 60-57416
Int. Cl.[5] H01L *11/14*
U.S. Cl. 357—23.3 **17 Claims**



1. A semiconductor device including a semiconductor substrate with a first conductivity type and source and drain regions and a gate electrode having an edge, said source and drain regions comprising:

a first impurity region having a second conductivity type opposite said first conductivity type and having a first impurity concentration, said first impurity region formed adjacent to a surface of said substrate, and having an end approximately adjacent to the edge of said gate electrode;

a second impurity region having the second conductivity type, said second impurity region being located beneath said first impurity region and having an end that is approximately coincident with said end of said first impurity region, said second type of impurity having a diffusion coefficient larger than that of said first type of impurity;

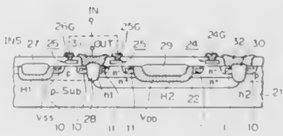
a third impurity region located adjacent said first and second impurity regions and having the second conductivity type and being spaced from the edge of said gate electrode, said third impurity region having a third impurity concentration that is higher than said first and second impurity concentrations.

4,928,164

INTEGRATED CIRCUIT DEVICE HAVING A CHIP

Tetsu Tanizawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 310,024, Feb. 10, 1989, abandoned, which is a continuation of Ser. No. 932,288, Nov. 19, 1986, abandoned. This application Aug. 10, 1989, Ser. No. 393,037
Claims priority, application Japan, Nov. 19, 1985, 60-259396
Int. Cl.[5] H01L *27/10, 27/02, 29/04*
U.S. Cl. 357—45 **11 Claims**



7. A semiconductor chip comprising:

a semiconductor substrate;

an array of pairs of n-channel formation regions and p-channel formation regions, each of the pairs having an n-channel formation region and a p-channel formation region, positioned adjacent to one another on said semiconductor substrate to form adjacent pairs;

first grooves provided in said semiconductor substrate between the n-channel formation region and the p-channel formation region of each of the pairs, having insulating

VOL 1114 ISS 4 MY 22 1990 UMI

material therein, for isolating the n-channel formation region and the p-channel formation region of each of the pairs from each other;

second grooves provided in said semiconductor substrate between the n-channel formation regions of the adjacent pairs in said array, having a first power source line situated therein for connecting portions of the n-channel formation regions of the adjacent pairs, and insulating material covering the first power source line; and

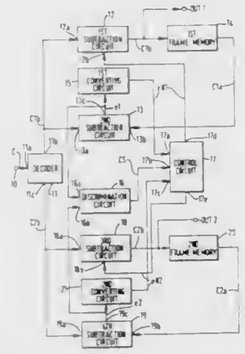
third grooves provided in said substrate between the p-channel formation regions of the adjacent pairs in said array, having a second power source line situated therein for connecting portions of the p-channel formation regions of the adjacent pairs, and insulating material covering the second power source line.

4,928,165

NOISE REDUCTION CIRCUIT FOR A CHROMINANCE SIGNAL OF A USING FRAME CORRELATION

Masaaki Kisou, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 21, 1988, Ser. No. 222,609
Claims priority, application Japan, Jul. 23, 1987, 62-182204
Int. Cl.[5] H04N *9/64, 5/213*
U.S. Cl. 358—36 **4 Claims**



1. A circuit for reducing noises in a chrominance signal in a television receiver, comprising:

decoding means for decoding first and second color difference signals from a received chrominance signal, the first and second color difference signals each including a noise component;

means for generating a first frame difference signal in response to two successive first color difference signals and a second frame difference signal in response to two successive second color difference signals;

means for generating a first compensation signal from the first frame difference signal and second compensation signal from the second frame difference signal;

means for reducing noise from the color difference signals in response to the compensation signals;

discrimination means for discriminating whether both the first and second frame difference signals are smaller than a prescribed level and for generating a control signal in response thereto; and

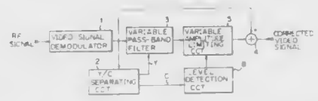
means for transferring the compensation signals from the extracting means to the reducing means in response to the control signal only when both the frame difference signals are smaller than the prescribed level.

4,928,166

APPARATUS FOR SUPPRESSING NOISES IN A VIDEO SIGNAL

Toru Akiyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,329
Claims priority, application Japan, Oct. 30, 1987, 62-275437
Int. Cl.[5] H04N *9/87*
U.S. Cl. 358—36 **6 Claims**



1. An apparatus for suppressing noises in a reproduced color video signal having a beat component corresponding to a frequency difference between a main carrier signal and a color subcarrier signal, comprising:

signal extracting means for extracting a frequency band component of said color video signal said frequency band component including said beat component;

amplitude limiting means connected to said signal extracting means, for limiting an amplitude of an output signal of said signal extracting means; and

subtracting means connected to said amplitude limiting means and receiving said color video signal, for subtracting an output signal of said amplitude limiting means from said color video signal, wherein

said color video signal is a wide band color video signal having a bandwidth including the frequency of said beat component.

4,928,167

METHOD OF AND APPARATUS FOR EXECUTING TONE CORRECTION ON AN IMAGE ACCORDING TO A CORRECTION LEVEL

Setsuji Tatsumi; Kazuo Shiota; Hitoshi Urabe, and Osamu Shimazaki, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 3, 1987, Ser. No. 80,762
Claims priority, application Japan, Sep. 2, 1986, 61-205177
Int. Cl.[5] G03F *3/08;* **H04N** *1/46*
U.S. Cl. 358—80 **14 Claims**

1. An image processing method for processing input chroma signals based on look-up table data and for outputting said processed chroma signals, comprising the steps of:

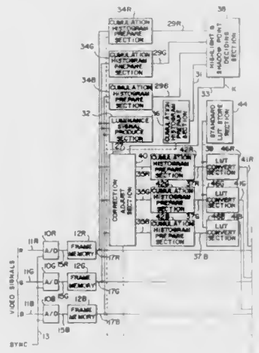
producing chroma signals, each corresponding to a selected frequency value in a respective cumulation histogram which is prepared from a respective one of the input chroma signals, and producing a luminance signal corresponding to a selected frequency value in a cumulation histogram which is prepared from a luminance signal produced from said input chroma signals;

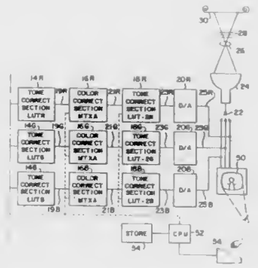
comparing said chroma signals corresponding to the selected frequency values with said luminance signal corresponding to the selected frequency value in accordance with an arithmetic relationship to determine a degree of color correction for the input chroma signals;

producing adjusted chroma signals by adjusting the levels of the input chroma signals in accordance with the determined degree of color correction;

setting a highlight point and a shadow point for each of the input chroma signals based on the adjusted chroma signals;

preparing look-up table data for each of the input chroma signals on the basis of said set highlight and shadow points; and





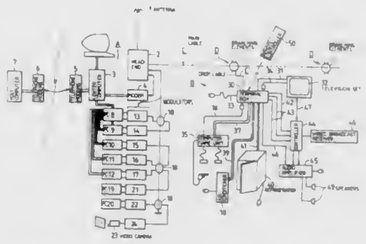
processing said input chroma signals by using said look-up table data.

4,928,168

BILLING DATA DISPLAY SYSTEM AND TERMINAL USED THEREIN FOR A CLOSED CIRCUIT TELEVISION SYSTEM

Kazuhiro Iwashita, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 312,166
Claims priority, application Japan, Aug. 8, 1988, 63-196127
Int. Cl.[5] H04N *7/10, 9/00*
U.S. Cl. 358—84 **10 Claims**



1. A billing data display system for a closed circuit TV system in which a central facility transmits video signals to a plurality of connected terminals, each of which is operated by a respective customer, said system comprising:

a computer at said central facility for storing data corresponding to charges owed by said customers;

means for requesting billing data from said central facility;

a plurality of first character generators at said central facility which are responsive to a billing data request from said terminals for converting charge data provided by said computer into video data which is transmitted to said terminals; and

means at each terminal for displaying said billing data,

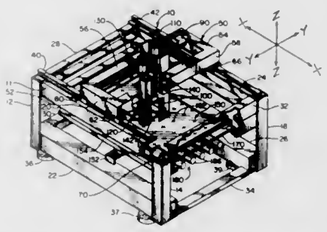
wherein said central facility further comprises means for transmitting predetermined messages to said terminals when the number of billing data requests is larger than the number of said first character generators.

4,928,169

MENSURATION FRAME GRABBING APPARATUS

Franz W. Leberl, Boulder; Milan Karspeck, Loveland; Bryan Johns, and Scott Lee, both of Boulder, all of Colo., assignors to Vexcel Corp., Boulder, Colo.

Filed Aug. 3, 1987, Ser. No. 81,118
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—93 **9 Claims**



1. Mensuration frame grabbing apparatus for digitizing an image on an object, comprising:

a table;

a reseau assembly mounted in said table, including an object mounting plate for mounting the object with the image thereon in stationary position in relation to the table, a transparent reseau plate having a plurality of grid marks thereon positioned in precisely calibrated spatial relation to each other, said reseau plate being adapted for positioning on the object mounted on said object mounting plate for holding the object stationary on the mounting plate and for providing grid mark images in precisely calibrated spatial relation to each other for use in correlation with the object image;

a solid state camera positioned over the reseau plate and having a two-dimensional array of light sensor elements, each element being capable of sensing light intensity levels incident thereon independently of the other light sensor elements and outputting a signal indicative of light intensity senses on a real time basis, said camera being oriented to receive light from the object image and the reseau grid mark image;

lens means positioned between the camera and the reseau plate for magnifying the object image and grid mark image as desired and for focusing light rays comprising said images onto said array of light sensor elements in said solid state camera; and

translation camera mounting means on said table for mounting said camera and lens means over said reseau assembly and for moving said camera parallel to the reseau plate and object as well as orthogonal to said reseau plate and object;

a table coordinate system, an image coordinate system, and a frame coordinate system, each of which coordinate

VOL 1114 ISS 4 MY 22 1990 UMI

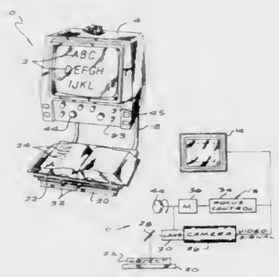
systems exists in a plane parallel to the planes of the others and which have independent spatial calibrations that can be correlated together to indicate precise mensuration data for any portion and all of an object image digitized by the camera, said table coordinate system being indicative of the position of the camera in relation to the table and the reseau grid marks, said image coordinate system being indicative of the positions of the grid marks in relation to the object image, and said frame coordinate system being indicative of the light sensor elements in the camera array of such elements in relation to the object image and grid marks.

4,928,170

AUTOMATIC FOCUS CONTROL FOR AN IMAGE MAGNIFICATION SYSTEM

Yakov G. Soloveychik, Encino, and Larry Israel, Santa Monica, both of Calif., assignors to Visualtek, Inc., Santa Monica, Calif.

Filed Jun. 21, 1988, Ser. No. 209,704
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—94 **13 Claims**



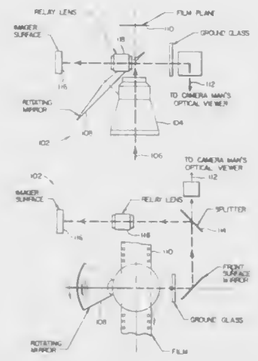
1. A closed circuit television system, comprising:
a support frame including a platen for supporting an object to be viewed;
a video camera on said support frame, said camera having an adjustable focusing lens and including means for generating a video signal representative of an image of the object supported on said platen;
a video monitor connected to said camera for receiving said video signal and for displaying the image represented by said video signal; and
automatic focus control means responsive to selected characteristics of said video signal for adjusting said focusing lens to achieve substantially optimum resolution for the image displayed by said monitor, said focus control means including a motor coupled to said focusing lens for adjusting the focus setting of said lens, and a focus control circuit including controller means responsive to said selected characteristics of the video signal for operating said motor to adjust the focus setting of the lens;
said focus control circuit including means responsive to said video signal for generating a focus signal having a magnitude representative of image focus quality, means for activating said control circuit in a scan mode for operating said motor to adjust said focusing lens rapidly, means for analyzing said focus signal in said scan mode to detect said focus signal in excess of a predetermined threshold, means responsive to the detection of said focus signal in excess of said predetermined threshold to operate said control circuit in a fine adjustment mode for operating said motor to adjust said focusing lens in incremental steps, means for detecting the magnitude of said focus signal for each of said incremental steps and for determining the difference between said detected magnitudes for adjacent incremental steps and for summing and storing the accumulated differences for a predetermined number of incremental steps throughout said fine adjustment mode, said controller means further including means for reversing the position of said lens through one-half of said predetermined number of steps when the accumulated sum substantially equals zero to place said focusing lens in a substantially optimum focus setting position.

4,928,171

VIDEO ASSIST SYSTEM FOR MOTION-PICTURE CAMERA

Donald Kline, Canoga Park, Calif., assignor to Panavision, Inc., Tarzana, Calif.

Filed Oct. 30, 1987, Ser. No. 115,145
Int. Cl.[5] H04N *3/36, 7/18*
U.S. Cl. 358—97 **37 Claims**



8. A video assist system for use in conjunction with a motion-picture camera having a predetermined capture rate for a motion-picture image, said system comprising
memory means for recording infalling light in synchrony with said motion-picture camera as a plurality of periodic image frames at said predetermined capture rate; and
means for retrieving a plurality of said periodic image frames from memory means with a line retrieval rate which is independent of said capture rate and with a frame retrieval rate which is an integer multiple of said capture rate.

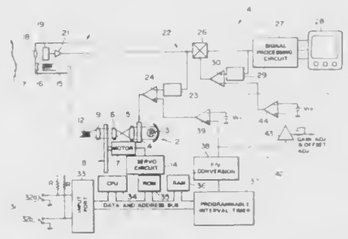
4,928,172

ENDOSCOPE OUTPUT SIGNAL CONTROL DEVICE AND ENDOSCOPE APPARATUS MAKING USE OF THE SAME

Masao Uehara; Akinobu Uchikubo; Katsuyuki Saito; Masahide Kanno; Jun Hasegawa; Masahiko Sasaki; Katsuyoshi Sasagawa, and Shinji Yamashita, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,777
Claims priority, application Japan, Jan. 7, 1988, 63-001845
Int. Cl.[5] H04N *7/18, 5/52;* **A61B** *1/06*
U.S. Cl. 358—98 **22 Claims**

1. An endoscope output signal control device comprising:
light quantity varying means for varying a quantity of light incident to an imaging means for forming an endoscopic image;
light quantity setting means for variably setting the quantity of incident light by driving said light quantity varying means;
automatic gain control means for conducting control to maintain a signal from said imaging means substantially at a constant level; and



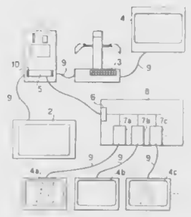
automatic gain control eliminating means for eliminating, at least when a level of the signal from said imaging means is within range controllable by said light quantity varying means, any influence of said automatic gain control means on a change in the level of said signal caused by a change in a level of light quantity set by said light quantity setting means.

4,928,173

PICTURE DISPLAY DEVICE

Takahiko Yamamuro, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1989, Ser. No. 369,831
Claims priority, application Japan, Nov. 17, 1988, 63-292978
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—102 **1 Claim**



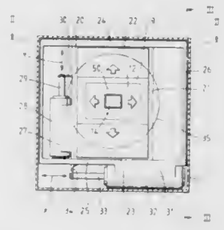
1. A picture display device comprising:
an image file controller for storing inputted pictures in arbitrarily taken state and for controlling the whole device;
a flat visual terminal being an operation terminal of said image file controller;
a picture input/output device connected to said image file controller for taking the pictures and outputting the picture indication signals;
displays connected as indication parts to said picture input-/output device for monitoring the inputted pictures of said picture input/output device and for indicating the stored pictures of said image file controller;
a buffer board connected to said image file controller; and
an increased unit having a plurality of frame memory boards for inputting and storing the picture signals stored in said image file controller through a buffer circuit connected conductively to said buffer board in response to operation of said flat visual terminal and for indicating the pictures onto respective displays connected individually.

4,928,174

APPARATUS FOR REGISTERING A SCENE, ESPECIALLY FOR ITS REPRODUCTION ON THE SCREEN OF A VIDEO MONITOR

Terence M. Smith, Grebenstein, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Oct. 4, 1988, Ser. No. 253,249
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1987, 3733593; European Pat. Off., Aug. 13, 1988, 88113200.5
Int. Cl.[5] H04N *7/18, 5/30*
U.S. Cl. 358—108 **8 Claims**



1. Apparatus for viewing a scene, especially for its reproduction on a view-screen of a video monitor, comprising: a housing, a lens mounted on the housing for projecting an image of the scene on a focal plane, a video pickup disposed in the housing, situated in the focal plane and being of a bidimensional configuration for converting the brightness and, if desired, the hue of individual points of a portion of the image into electrical signals, the video pickup being smaller than the image and being mounted for rotation around an axis and for displacement over the entire image for viewing, studying and in some cases following of a selected subject within the scene, and a driving mechanism for shifting the video pickup in the focal plane, said driving mechanism containing drives acting in different directions and an additional drive for rotating the video pickup around said axis.

4,928,175

METHOD FOR THE THREE-DIMENSIONAL SURVEILLANCE OF THE OBJECT SPACE

Henrik Haggrén, Vilniementie 12 D 30, SF-02940 Espoo, Finland

PCT No. PCT/FI87/00048, § 371 Date Oct. 7, 1988, § 102(e) Date Oct. 7, 1988, PCT Pub. No. WO87/06353, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 10, 1987, Ser. No. 259,270
Claims priority, application Finland, Apr. 11, 1986, 861550
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—108 **7 Claims**

1. A method for the three-dimensional surveillance of an object space, comprising the steps of
(a) arranging at least two image acquisition devices such as video cameras to register the said object space;
(b) positioning said image acquisition devices at an angle with respect to each other to observe said object space;
(c) digitizing the images received by the image acquisition devices;
(d) locating object points on the image planes of the image acquisition devices;
(e) calculating the space coordinates of the object points in the three-dimensional object space on the basis of the image coordinates of these object points and present constants;
(f) arranging control points in this object space;

VOL 1114 ISS 4 MY 22 1990 UMI

(g) measuring the object coordinates (Xk, Yk, Zk; k = 1, 2, 3. . .) of said control points;
(h) locating said control points on the image planes of the image acquisition devices;
(i) determining the projection wise image coordinates (Xki, Yki; Xkj, Ykj) of said control points on said images from the corresponding image acquisition devices whereafter said control points can be removed;
(j) calculating new orientation parameters (a_{11} . . . a_{33}) of projective resection on the basis of the image coordinate and space coordinate values of the control points;



(k) observing object points on the image planes of the image acquisition devices;
(l) registering the projectionwise image coordinates (X_1, Y_1, X_2 of said observed object points from the corresponding image acquisition device;
(m) solving the unknown object coordinates (X, Y, Z) of said observed object points in a real-time process by aid of said registered image coordinates (x, y) by making use of projective intersection and by employing the following transformation matrix:

$$\begin{vmatrix} X \\ Y \\ Z \end{vmatrix}_{ij} = \begin{vmatrix} X_o \\ Y_o \\ Z_o \end{vmatrix}_{ij} + \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}_{ij} \cdot \begin{vmatrix} x \\ y \\ o \end{vmatrix}_{ij}$$

where
X_i, Y_i, Z_i = the object space coordinates, i.e. X_j, Y_j, Z_j = the coordinates of the object points in the XYZ coordinates of the object space;
X_{oi}, Y_{oi}, Z_{oi} = the constants representing the projection point o_i, o_j of each image acquisition device i, j;
a_{11} . . . a_{33} = the projective orientation parameters of the images;
x_1, y_1 = x_1, y_1 = the constants of the image points on the image planes of each image acquisition device i, j;
i, j. = the image acquisition devices i and j.

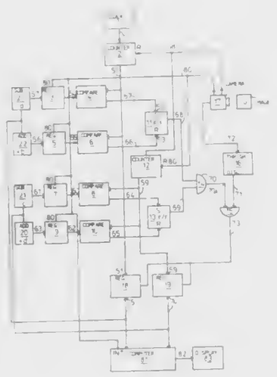
4,928,176

ELECTRONIC CAMERA-PROCESSING CIRCUIT FOR AUTOMATICALLY TRACKING PARTICLES WHICH MOVE ACROSS AN OPTICAL IMAGE

Karl-Heinz Schmidt, Aying, and Wilhelm Waidelich, Munich, both of Fed. Rep. of Germany, assignors to Gesellschaft fur Strahlen, Fed. Rep. of Germany

Filed Apr. 7, 1988, Ser. No. 178,645
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711918
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—126 **4 Claims**

1. The method of automatically tracking a single selected particle moving across an image field as a signal dot, and determining the velocity of said selected particle, comprising the steps of:
(a) scanning said image field in horizontal and vertical directions to generate an electrical output signal defining said particle, said output signal being synchronized with the scanning of each dot in said image field;
(b) generating horizontal and vertical counts corresponding respectively to the horizontal and vertical coordinates of said particle;
(c) generating start and end horizontal electronic mask aperture coordinate counts by adding and subtracting respectively first predetermined quantities to said horizontal counts, and storing said horizontal coordinate counts;
(d) generating start and end vertical electronic mask aperture coordinate counts by adding and subtracting respectively second predetermined quantities to said vertical counts, and storing said vertical coordinate counts;
(e) comparing said horizontal coordinate counts with said horizontal counts, and generating a horizontal aperture signal when said horizontal count coincides with said start



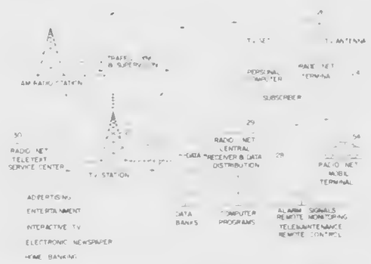
or end horizontal electronic mask aperture coordinate count;
(f) comparing said vertical coordinate counts with said vertical counts, and generating a vertical aperture signal when said vertical count coincides with said start or end vertical electronic mask aperture coordinate count;
(g) generating an electronic mask aperture signal from said horizontal and vertical aperture signals when said scanning step (a) occurs within an electronic mask defined by said horizontal and vertical electronic mask aperture coordinate counts;
(h) storing said horizontal and vertical counts when the single selected particle in said electrical output signal is within said electronic mask;
(i) repeating said steps (c) to (h) to redefine after each vertical scan said electronic mask aperture for the next scanned image field, the mask aperture for each vertical scan being determined by the position of said particle during the previous scan; and
(j) determining the velocity of said particle from the change in position thereof in successive scans.

4,928,177

TWO-WAY DATA BROADCAST NETWORKS

Louis Martinez, Cerritos, Calif., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 11, 1988, Ser. No. 179,657
Int. Cl.[5] H04N *7/08*
U.S. Cl. 358—142 **9 Claims**



1. A two-way data broadcast network comprising;
an AM radio station for transmitting a carrier signal;
a television station;
digital data means coupled to said television station for providing digital data thereto, said television station including means for producing a television signal corresponding to at least one television channel, at least part of said television signal containing said digital data;
first communication means for communicating said television signal to a plurality of remote locations;
a plurality of remote terminals for receiving said television signal and for recovery of said digital data,
said digital data means and each of said plurality of remote terminals including means for receiving said carrier signal and developing a timing reference signal therefrom to synchronize the digital data in said television signal of said television station and the recovery of said digital data by said remote terminals;
each of said plurality of remote terminals having means for generating at least one of a predetermined plurality of non-overlapping narrow band communication channels referenced to said carrier signal;
each of said plurality of remote terminals further having means for modulating said at least one narrow band communication channel with a data signal;
second communication means for simultaneous communication of a plurality of said narrow band modulated signals, each in one of said narrow band communication channels, to a central location; and
recovery means coupled to said central location for receipt and detection of each of said data signals.

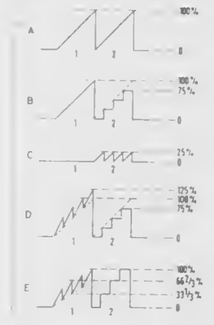
4,928,178

CONTROL OF VISUAL DISPLAY UNITS

William E. H. Hipwell, Elstree, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,135
Claims priority, application United Kingdom, Apr. 7, 1988, 8808082
Int. Cl.[5] H04N *5/14*
U.S. Cl. 358—160 **5 Claims**

1. Apparatus for controlling operation of a visual visual display unit from a video signal which is present only during a first period of time, such that an image corresponding to that signal can be displayed for one or more further such periods, said apparatus comprising storage means for storing digital signals representative of picture information to be displayed for one or more periods after that first period, and means for generating during the first period a correction signal which is arranged to compensate for any imprecision in the stored



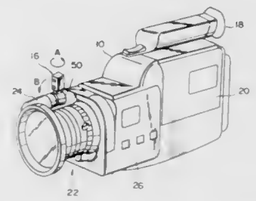
signal and which is combined with the video signal so that the display is driven by the combined signal in the first period.

4,928,179

VIDEO CAMERA CAPABLE OF EFFECTING REMOTE CONTROL OPERATION

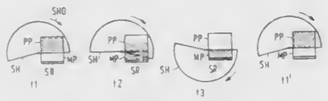
Kimihide Takahashi; Hidemi Sasaki, and Yoshiaki Nakayama, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 12, 1989, Ser. No. 351,050
Claims priority, application Japan, May 19, 1988, 63-120658
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—210 **8 Claims**



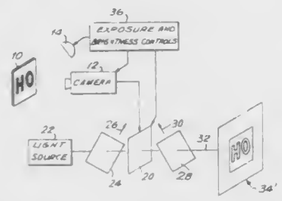
1. A video camera capable of effecting a remote control operation comprising:
light receiving means for a remote control;
display means for displaying in a remote control operation a state of an operation of said camera to an operator;
means for rotating said light receiving means and said display means at least in a horizontal direction with respect to a body of said camera; said
direction, respectively, of said light receiving means and said display means being capable of being varied depending on a direction in which an operator effects operation.

4,928,180
CAMERA WITH WELL DEFINED SHUTTER AND SUITABLE FOR RECORDING TELEVISION AND CINEMATOGRAPHIC IMAGES
Engel J. Knibbe, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Filed Aug. 2, 1988, Ser. No. 227,219
Claims priority, application Netherlands, Aug. 13, 1987, 8701900
Int. Cl.[5] H04N *5/232*
U.S. Cl. 358—213.13 4 Claims



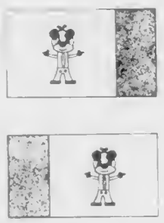
1. A camera suitable for recording at least television and cinematographic images, which camera includes a solid-state sensor of the charge transfer type, said sensor comprising a picture pick-up member for converting in its pick-up elements radiation incident via a radiation path into local charge packets as information, a storage member comprising storage elements for storing the picture information, the pick-up and storage elements being present in rows and columns and the number of rows of storage elements being smaller than the number of rows of pick-up elements, and a parallel-in, series-out shift register member which is coupled to a sensor signal output for the supply of a picture signal as picture information generated in line and field periods with line and field scanning periods and line and field blanking periods, said camera also including a shutter device arranged in the radiation path towards the picture pick-up member of the sensor and a control signal generator for controlling the picture information transfer in the sensor and for controlling the shutter device for passing or not passing radiation, characterized in that the shutter device shuts off the radiation path towards the pick-up member of the sensor for a shutter time (SHT) substantially defined by the relationship $SHT=TVB+((A-B)/A)TVS$, where TVB is the field blanking period, TVS is the field scanning period, A is the number of rows of pick-up elements, and B is the number of rows of storage elements.

4,928,181
METHODS AND APPARATUS FOR OPTICALLY ENHANCING SELECTED FEATURES IN AN INPUT IMAGE
Charles N. Harward, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Nov. 21, 1988, Ser. No. 274,029
Int. Cl.[5] H04N *5/66*
U.S. Cl. 358—230 14 Claims



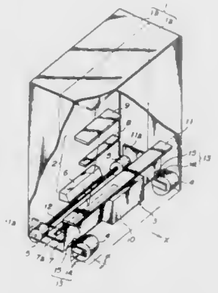
1. The method of producing an optical output image in which selected portions of an input image are optically enhanced in said output image relative to other portions of said input image, said selected portions having a predetermined brightness in said input image which is substantially different from the brightness of the portions of said input image which are not to be enhanced, said method comprising the steps of:
forming a representation of said input image on a liquid crystal display which is normally illuminated by polarized light having a first predetermined polarization axis perpendicular to the optical axis of said display, and which normally has an associated transmitted light polarizer having a second predetermined polarization axis perpendicular to said optical axis for polarizing the light transmitted by said display;
illuminating said display with polarized light having a third predetermined polarization axis which is rotated by a first predetermined angle about said optical axis from said first predetermined polarization axis;
passing the light transmitted by said display through a polarizer having a fourth predetermined polarization axis which is rotated by a second predetermined angle about said optical axis from said second polarization axis to produce said output image; and
adjusting said representation so that said selected portions of said input image are optically enhanced in said output image relative to other portions of said input image;
wherein said first predetermined angle is in the range from about 30° to about 55°, and wherein said second predetermined angle is in the range from about 45° to about 65°, and has a direction of rotation which is opposite the direction of rotation of said first predetermined angle for negative enhancement.

4,928,182
DUAL ASPECT RATIO DISPLAY WITH CYCLICLY MOVING RASTER AREA TO PREVENT UNEVEN PHOSPHOR AGING
William F. Guerinot, Knoxville; Ralph H. Bradley, Kingsport, and Stephen T. Troemel, Jefferson City, all of Tenn., assignors to North American Philips Corporation, New York, N.Y.
Filed Jan. 31, 1989, Ser. No. 304,736
Int. Cl.[5] H04N *3/223*
U.S. Cl. 358—245 17 Claims



1. A method for displaying picture information on a picture display device having a display screen which is wider than pictures formed by said picture information, said method comprising the steps:
generating a dither waveform; and
causing said pictures formed by said picture information to cyclically traverse the width of the display screen of said picture display device in response to said dither waveform.

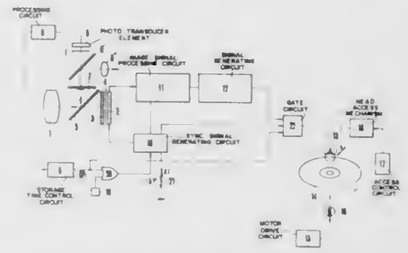
4,928,183
MANUALLY SCANNING APPARATUS WITH STRAIGHTENING ROLLERS
Hiroshi Yajima, Hanenishi, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Sep. 25, 1989, Ser. No. 411,720
Claims priority, application Japan, Oct. 4, 1988, 63-129546[U]
Int. Cl.[5] H04N *1/04, 1/23;* G06K *9/22*
U.S. Cl. 358—296 7 Claims



1. A manually operable scanning apparatus comprising:
housing means for being subjected to a manual movement on a recording medium and having an opening at the bottom thereof;
printing means disposed in said housing means for printing on said recording medium in accordance with the movement of said housing means through said opening;
roller means disposed in said housing means, a part of said roller means extending downward and out of said housing means; and
movement straightening means for rotatably coupling said roller means with said housing means and for straightening the movement of said housing means against an external thrust force urged to said housing means.

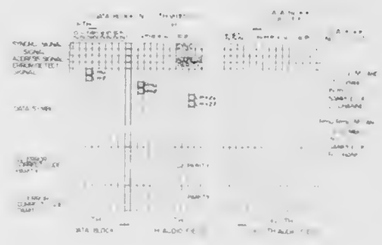
4,928,184
IMAGE RECORDING SYSTEM
Tokuichi Tsunekawa; Nobuaki Date; Hiroshi Aizawa, all of Kanagawa; Kazuya Hosoe, Machida, and Kazunori Urushibara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 4,148, Jan. 16, 1987, Pat. No. 4,823,200, which is a continuation of Ser. No. 347,966, Feb. 11, 1982, Pat. No. 4,658,304, which is a continuation of Ser. No. 31,168, Apr. 18, 1979, Pat. No. 4,366,501. This application Feb. 10, 1989, Ser. No. 309,349
Claims priority, application Japan, Apr. 23, 1978, 53-48010; Apr. 23, 1978, 53-48011
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 27 Claims

1. An image pickup device having a body, comprising, integrally contained therein:
an image pickup element for transducing an object image formation into an electrical picture image signal;
recording means for recording an output signal of said image pickup element, said recording means being capable of reproducing the recorded signal; and



display means for selectively reproducing a reproduced signal from said recording means or the output signal of said image pickup element as a visible image.

4,928,185
ROTARY HEAD TYPE RECORDING/REPRODUCING METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A DIGITAL AUDIO SIGNAL
Masaharu Kobayashi, Yokohama, and Yukio Nishimura, Kamakura, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video Engineering, Ltd., Kanagawa, both of, Japan
Filed Jan. 27, 1988, Ser. No. 149,171
Claims priority, application Japan, Jan. 30, 1987, 62-18400
Int. Cl.[5] G11B *20/12*
U.S. Cl. 360—19.1 10 Claims



1. In a rotary-head type video recorder apparatus for recording a video signal and a digital audio signal on a recording medium by means of a rotary head controlled on the basis of said video signal,
a method of recording input data indicative of an audio signal sampled to be a digital audio signal at a sampling frequency asynchronous with a cylinder rotation number of said rotary head, said method comprising:
a step of detecting a difference between a rate at which the digital audio signal is recorded on the recording medium and which is determined by the video signal and a rate of the input data determined by a sampling frequency of the audio signal for a number N of samples of the digital audio signal to be included within one field period synchronized with the video signal, where N is a non-integer positive number;
a step of setting the number of samples for the input data by preparing on the basis of the result of detection of said difference in rate at least two types of fields including a first field containing a number of samples greater than said number N within said one field period and a second field containing a number of samples smaller than said number N within said one field period;

VOL 1114 ISS 4 MY 22 1990 UMI

a block forming step of forming blocks for recording said digital audio signal on said recording medium, wherein said digital audio signal is added with a first error detection/correction code every n symbols, where n is a positive integer, for thereby forming a first code arrangement, while each of the symbols of said arrangement is imparted with amounts of delay differing from one another defined as diagonal incomplete interleave for thereby forming a second code arrangement by adding a second error detection/correction code, said second code arrangement being added with a block synchronizing signal;

a step of setting the number of blocks to be recorded within said one field period synchronized with said video signal to a constant number of blocks capable of recording a greater number of data than said sample number N independent of said set number of samples; and

a step of recording the block-formed data of the digital audio signal on the recording medium with the rotary head.

4,928,186

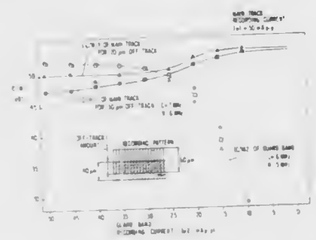
MAGNETIC RECORDING METHOD AND MAGNETIC HEAD

Takashi Matsumoto; Masamichi Sato, both of Tokyo; Satoshi Yoshida, and Yoshiaki Kato, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 31, 1987, Ser. No. 91,131

Int. Cl.[5] G11B *5/02*

U.S. Cl. 360—21 **9 Claims**



1. A magnetic recording method comprising the steps of:

recording first information on a main track of a magnetic disk using a first magnetic head with an adequate recording current; and

recording second information on a guard band adjacent to said recording main track using a second magnetic head having a predetermined non-zero azimuth angle relative to said first magnetic head with a magnetomotive force set within a range of 40% to 80% of a magnetomotive force of said magnetic head for said main track.

4,928,187

METHOD AND APPARATUS FOR ENCODING AND DECODING BINARY DATA

Theodore D. Rees, Mountain View, Calif., assignor to Laserdrive Limited, Santa Clara, Calif.

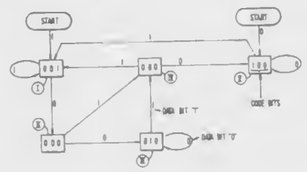
Filed Feb. 20, 1987, Ser. No. 16,949

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—40 **28 Claims**

1. Apparatus for encoding binary data in the form of serially occurring binary data bits into a series of signal transitions in order to effect high density data transmission comprising:

means for converting each said data bit in series into a predetermined one of a plurality of code words according to five states of said means for converting, each code word including three code bits, wherein a "1" code bit signifies a signal transition and a "0" code bit signifies no signal transition, such that 2, 4, 6, or 8 "0" code bits are generated between each "1" code bit; and



means for transmitting each said code word from said conversion means.

4,928,188

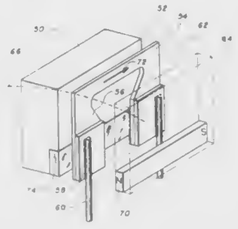
MAGNETORESISTIVE ELEMENT SANDWICHED BETWEEN A SAL FERRITE SUBSTRATEAND A COVER CONTAINING AN EASY AXIS BIASING MAGNET

George W. Brock, La Jolla, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 5, 1988, Ser. No. 214,994

Int. Cl.[5] G11B *5/30, 5/223*

U.S. Cl. 360—113 **8 Claims**



1. A magnetoresistive head comprising:

a. a substantially rigid substrate support having a substantially planar surface for deposition of said magnetoresistive head thereon, said substrate further comprising a magnetic material adapted for operation as an unsaturated soft adjacent layer,

b. a first insulating layer deposited on said planar surface of said substrate,

c. a magnetoresistive film deposited on said first insulating layer, said magnetoresistive film having an easy axis therein, said film further adapted for the flow of current therethrough along the direction of said easy axis, whereby said flow of current induces a first magnetic field in said unsaturated soft adjacent layer for hard axis biasing of said magnetoresistive film,

d. a second insulating layer deposited on said magnetoresistive film,

e. a non-magnetic coverplate adheredly covering said second insulating layer, said coverplate having a substantially planar coverplate surface,

f. a magnet located in said coverplate surface, whereby said magnet generates a second magnetic field,

g. said magnetoresistive film further comprising magnetic coupling means for coupling to said second magnetic field, whereby easy axis biasing of said magnetoresistive film is provided, and

h. said substrate further having a recessed region opposite said magnet, said recessed region being filled with a non magnetic material whereby the field of said magnet is undistorted by said substrate.

4,928,189

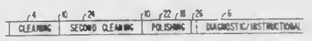
MULTIFUNCTIONAL MAGNETIC HEAD CLEANING MEDIA

Mohammed Siddiq, San Jose, Calif., assignor to Tandy Corporation, Fort Worth, Tex.

Division of Ser. No. 182,825, Apr. 18, 1988, Pat. No. 4,893,209. This application Sep. 28, 1989, Ser. No. 413,894

Int. Cl.[5] G11B *5/41*

U.S. Cl. 360—128 **6 Claims**



1. A multifunctional cleaning tape for use in a video cassette for use with a VCR, the VCR having a magnetic head, the tape comprising:

a first, nonmagnetic cleaning segment adapted to clean the magnetic head;

a nonmagnetic polishing segment, adapted to polish the magnetic head, positioned in an upstream direction relative to the first cleaning segment; and

a magnetic diagnostic/instructional segment, positioned in the upstream direction relative to the polishing segment, having diagnostic/instructional information recorded thereon to provide the user with diagnostic/instructional information regarding the status of chosen components of the VCR.

4,928,190

MAGNETIC RECORDING/REPRODUCTION APPARATUS

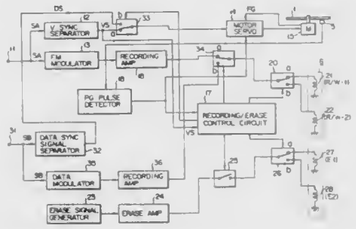
Yutaka Yunoki, Kunitachi, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 166,875, Mar. 11, 1988, abandoned, which is a division of Ser. No. 796,573, Oct. 28, 1985, Pat. No. 4,742,404. This application Apr. 4, 1989, Ser. No. 334,287

Claims priority, application Japan, Mar. 13, 1984, 59-47865; Mar. 13, 1984, 59-47866; Mar. 13, 1984, 59-47867; Mar. 13, 1984, 59-47868; Mar. 13, 1984, 59-47869; Mar. 13, 1984, 59-47870

Int. Cl.[5] G11B *5/03, 15/12*

U.S. Cl. 360—66 **10 Claims**



1. A magnetic recording apparatus using a rotatable magnetic disc as a recording medium, comprising:

a composite magnetic head having integrated erase and read/write gaps separated from each other in a longitudinal direction of a recording track on said magnetic disc to erase and record/reproduce data with respect to said magnetic disc, said composite magnetic head being arranged carrying out 2-field image recording with respect to a pair of adjacent tracks on said magnetic disc;

double record instructing means for generating a double record instructing signal in response to an operation of a user; and

control means for controlling a head driving sequence in response to a double record instructing signal from said double record instructing means for carrying out a double recording operation, by erasing one of an image data of a pair of image data of adjacent tracks and then recording another image data on the erased track.

4,928,191

TAPE LOADING MECHANISM FOR A ROTATING DRUM AND CASSETTE TYPE MAGNETIC RECORDING AND/OR REPRODUCTION APPARATUS

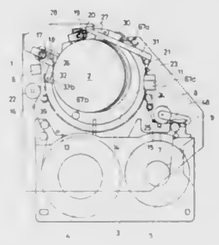
Nobuyuki Kaku, Yokohama; Tatsuya Shigemura; Masaki Uesugi, both of Katsuta; Kiyoshi Kano, and Kenji Ogiro, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,436

Claims priority, application Japan, Jun. 25, 1987, 62-156578; Aug. 20, 1987, 62-205004

Int. Cl.[5] G11B *15/665*

U.S. Cl. 360—85 **9 Claims**



1. A tape loading mechanism of a magnetic recording and/or reproduction apparatus comprising:

a tape guide drum means having a rotary magnetic head mounted thereon;

groups of tape guide means for withdrawing a magnetic tape from a cassette, winding the magnetic tape on said tape guide drum means and forming a travelling path for the magnetic tape;

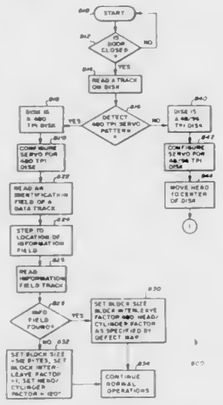
tape guide carrier means disposed substantially concentrically with said tape guide drum means for causing said groups of tape guide means to be displaced to and from an unloading position and a loading position;

a tape guide locating means for locating and holding said groups of tape guide means as they move between the loading and loading position to define the travelling path of said magnetic tape;

said groups of tape guide means include a first group of tape guide means located and held by said tape guide locating means for substantially horizontally withdrawing said magnetic tape from said cassette, and a second group of tape guide means is located and held by said tape guide positioning means for substantially horizontally withdrawing said magnetic tape from said cassette to a predetermined position and then for obliquely pulling said magnetic tape, said tape guide carrier means are formed in an arcuate shape and are mounted so as to be rotatable around said tape guide drum means and to drive said groups of tape guide means, said tape guide carrier means are connected at one end thereof to said groups of tape guide means and are displaced at a position of height which is an intermediate height of a height of said first and second groups of tape guide means so that a plane of said tape guide carrier means rotating around said tape guide drum means is positioned between said first and second groups of tape guide means.

VOL 1114 ISS 4 MY 22 1990 UMI

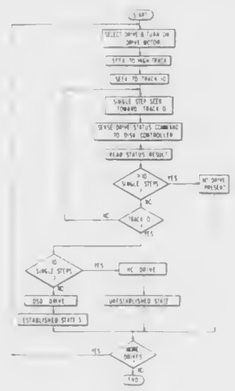
4,928,192
PROCESS FOR IDENTIFYING DISKS AND AUTOMATICALLY CONFIGURING A DISK DRIVE SYSTEM
Kenneth G. Bartlett, and Per-Erik Wallberg, both of San Jose, Calif., assignors to Konica Corporation, Tokyo, Japan
Filed Dec. 23, 1987, Ser. No. 137,804
Int. Cl.[5] G11B *5/596, 5/09*
U.S. Cl. 360—77.08 **18 Claims**



10. A process for automatically configuring a disk drive system for a variety of data disks comprising the steps of:
a. reading a track of a disk;
b. configuring a disk drive system for an embedded servo disk if a servo pattern is detected; and
c. configuring a disk drive system for a nonembedded servo disk if a servo pattern is not detected, said configuring comprising setting a data separator at a data rate for a high data rate type of nonembedded servo disk, and attempting to read an identification field, and if an identification field is read, then setting values for block size, blocks per track and blocks per surface as specified in said identification field.

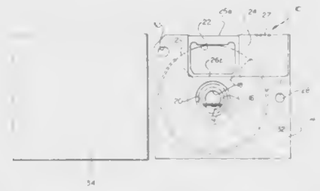
4,928,193
DISKETTE DRIVE TYPE DETERMINATION
Robert J. Agoglia; Richard A. Dayan, both of Boca Raton, and Bruce A. Smith, Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 630,610, Jul. 13, 1984, abandoned. This application Feb. 18, 1986, Ser. No. 830,488
Int. Cl.[5] G11B *5/55, 21/08;* **G06F** *3/06*
U.S. Cl. 360—78.04 **14 Claims**

6. In a computer system having a device attachment port to which any one of a plurality of different types of disk drives may be attached, a method for recognizing the type of drive currently attached to said port, said method comprising the steps of:
issuing a head positioning command to said port for directing a head on a disk drive attached to said port to move to a predetermined track address;
determining the track address to which said head has been moved; and



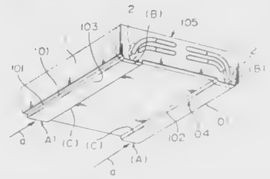
determining the type of disk drive attached to said port in accordance with the determined track address.

4,928,194
ANTI-STATIC SUPPORT FOR A CARTRIDGE IN A DISK DRIVE
James E. Elly, Rochester, and Gerald J. Kosarko, Pavilion, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 30, 1988, Ser. No. 252,233
Int. Cl.[5] G11B *5/016*
U.S. Cl. 360—97.04 **4 Claims**



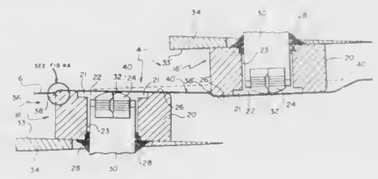
1. In disk drive apparatus of the type that uses a cartridge assembly including a flexible magnetic disk and a dual-sided plastic jacket enclosing the disk, the drive apparatus including (a) a transducer disposed to extend through a window in the jacket on a windowed side thereof and magnetically interface with the disk by means of aerodynamic forces generated as the disk rotates nearby the transducer and (b) a carriage for bringing the cartridge assembly into transducing relationship with the transducer, the improvement wherein the drive apparatus comprises:
a conductive, flat-surfaced plate substantially corresponding in size to the cartridge assembly; and
means attached to the carriage for resiliently loading said plate against the cartridge assembly opposite to said windowed side thereof so that the flat-surfaced area of said plate is substantially coextensive with the jacket.

4,928,195
IMPROVED FLOATING MAGNETIC HEAD FOR HIGH DENSITY RECORDING
Joichiro Ezaki; Yoshiaki Ito, and Mikio Matsuzaki, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Jul. 6, 1988, Ser. No. 215,524
Claims priority, application Japan, Jul. 15, 1987, 62-176631
Int. Cl.[5] G11B *5/60, 15/64, 17/32*
U.S. Cl. 360—103 **3 Claims**



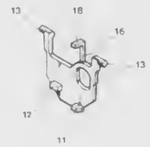
1. A magnetic head with a reading/writing element attached to an air discharge end of a slider having a flying plane on its one surface opposed to a magnetic recording medium, characterized in that the outer dimensions of said slider are so selected as to include a thickness of 0.65 mm or less from said flying plane to the opposite surface on the reverse side, a length of 1 to 3 mm in the direction of air discharge, and a width of 1 to 2.5 mm in the direction orthogonal to the air discharge.

4,928,196
MAGNETIC RECORDING DEVICE USING CIRCUMFERENTIALLY OFFSET HEADS WITH DOUBLE SIDED MEDIA
William K. Hickok; John M. Riley, both of Rochester, and Gerald J. Kosarko, Pavilion, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 4, 1988, Ser. No. 176,964
Int. Cl.[5] G11B *5/50, 21/16, 17/32*
U.S. Cl. 360—105 **16 Claims**



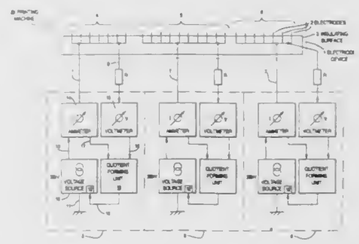
1. Apparatus for accessing both sides of a flexible storage medium rotating about an axis, said apparatus comprising:
first and second carriage members;
means commonly supporting said carriage members for radial movement relative to said axis;
a pair of transducers each supported by a respective carriage member, said transducers being disposed on opposite sides of the medium in relation to separate radii thereof such that a circumferential offset is maintained between said transducers;
stabilizing means surrounding said respective transducers for interacting with the disk and for generating respective pull down forces on successive portions of the rotated medium as each portion is rotated adjacent said stabilizing means; and
means acting upon at least one of said carriage members for relatively urging said transducers toward each other to cause each transducer to separately interact with the medium.

4,928,197
LOCK FOR VIDEO TAPE CASSETTE
Won B. Park, and Ju Y. Oh, both of Cheon-An, Rep. of Korea, assignors to SKC Limited, Kyoogki, Rep. of Korea
Filed Jan. 4, 1988, Ser. No. 140,544
Claims priority, application Rep. of Korea, Sep. 29, 1987, 87-16528[U]
Int. Cl.[5] G11B *23/087*
U.S. Cl. 360—132 **6 Claims**



1. A unitary lock arrangement for a video tape cassette the cassette having an upper half member and a lower half member, the lock arrangement comprising a base plate with two concentric supporting shafts extending outwardly from and rotatably mountable into slots formed in a side wall of the lower half member of the cassette, said base plate including means for releasably locking together said base plate and a cassette cap, said releasably locking together means including a locking protrusion and a release button for releasing said locking protrusion from locking engagement with the cassette cap, a spring pole extending from an upper side of said base plate between said two shafts so as to align with an axis of the two concentric supporting shafts, said spring pole having a tip from which extends an abutment portion, said abutment portion having an upper face and an end face being arranged to be contacted respectively with a ceiling and a side wall of the upper half member of the cassette, whereby stresses due to forces acting on said spring pole are evenly distributed to said concentric supporting shafts.

4,928,198
HIGH VOLTAGE ELECTRODE DEVICE
Klaus Domschat, Lorrach, Fed. Rep. of Germany, assignor to Eltex-Elektrostatik-Gesellschaft mbH, Weil am Rhein, Fed. Rep. of Germany
Filed Jul. 29, 1988, Ser. No. 225,812
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725142
Int. Cl.[5] G01R *27/02;* **H02H** *3/40*
U.S. Cl. 361—1 **9 Claims**



1. A high voltage electrode device comprising a plurality of individual electrodes having end portions projecting beyond an insulating surface and arranged to form at least one group of electrically connected electrodes, means for energizing and deenergizing the at least one group of electrodes, the energiz-

VOL
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ing and deenergizing means including high voltage source means having control means for turning off the high voltage source means, the high voltage source means providing an output to the at least one group of electrodes via current measuring means, the current measuring means providing an output indicative of the current measured, voltage measuring means connected to the at least one group of electrodes and providing an output indicative of the voltage measured, and quotient forming means responsive to the outputs of the current measuring means and the voltage measuring means for forming a quotient thereof and providing an output when the quotient formed has a predetermined relation to a reference value, the control means being responsive to the output of the quotient forming means for turning off the high voltage source means.

4,928,199

CIRCUIT PROTECTION DEVICE

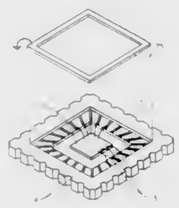
Stephen H. Diaz, Los Altos Hills; Gabe Cherian, Fremont; Stephen Morris, Los Altos, all of Calif.; John R. Vinson, Cricklade, nr. Swindon, England; David Crofts, and Anthony J. Moore, both of Cirencester, England, assignors to Raychem Limited, United Kingdom

Continuation of Ser. No. 159,473, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 71,537, Jul. 9, 1987, abandoned, which is a continuation of Ser. No. 842,108, Mar. 20, 1986, abandoned. This application Sep. 11, 1989, Ser. No. 405,409

Claims priority, application United Kingdom, Mar. 29, 1985, 8508304

Int. Cl.[5] H02H *9/04*

U.S. Cl. 361—56 **4 Claims**



1. An integrated circuit chip package which comprises
(1) a lead frame;
(2) an integrated circuit chip protected by a cavity cover comprising an electrode; and
(3) a threshold switching device for protecting the integrated circuit from a voltage transient, the switching device including a switching element formed from an amorphous composition comprising:
(a) 15 to 75 atomic % selenium;
(b) 10 to 65 atomic % arsenic; and
(c) 5 to 42 atomic % germanium, or if the composition contains less that 35 atomic % selenium, 5 to 35 atomic % germanium;
in which the proportions of (a), (b) and (c) (based on the total of (a), (b) and (c)) add up to 100%;
the composition having not more than 10 atomic % tellurium; and
the electrode being connectable to earth and an internal surface of the electrode being connectable to the composition and the chip being connected to the lead frame by wire bonds, the wire bonds being such that they contact said composition.

4,928,200

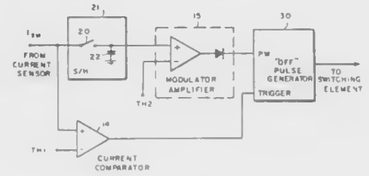
OVERCURRENT PROTECTION FOR SWITCHING MODE POWER CONVERTER

Richard Redl, Concord, and Nathan O. Sokal, Lexington, both of Mass., assignors to Cherry Semiconductor Corporation, East Greenwich, R.I.

Continuation-in-part of Ser. No. 34,098, Apr. 2, 1987, Pat. No. 4819122. This application Oct. 6, 1987, Ser. No. 106,698

Int. Cl.[5] H02H *7/12*

U.S. Cl. 361—93 **4 Claims**



1. An overload protection circuit comprising:
means for receiving an output signal from a current sensor;
means for comparing the output signal with a first threshold and for generating a signal to turn off a switching element having a minimum duty ratio in a power converter when the output signal reaches the threshold;
means for holding a peak output signal from said current sensor;
means for comparing the held peak output signal with a second threshold, said second threshold being greater than said first threshold, and for generating an "off" signal when said held peak output signal exceeds the second threshold; and
means responsive to said "off" signal for decreasing the minimum duty ratio of the switching element.

4,928,201

CURRENT COLLECTOR

Murray J. Wright, P.O. Box 19-574, and Gordon V. Ritchie, 21 Mavin Road, both of Christchurch, New Zealand

Filed Nov. 21, 1988, Ser. No. 274,455

Int. Cl.[5] H01G *47/00*

U.S. Cl. 361—215 **4 Claims**



1. A current collector for a pump, filter, or heater housing, the collector comprising a length of conductive wire wound spirally into a cone-like sleeve, a large end of the spiral being mounted in a plastic ring, the spiral being dimensional for sliding engagement in an inlet or outlet port of a pump, filter or heater housing with one end of said wire being connected by a connector to a grounded connection to prevent build-up of a static charge in said port.

4,928,202

COUPLER WITH COMBINATION LOCKING AND BONDING RING

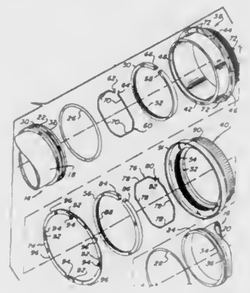
Edwin J. Gale, Aurora; Albert B. Olsen, Littleton, and John C. Dinsmoor, Denver, all of Colo., assignors to Stanley Aviation Corporation, Aurora, Colo.

Filed Dec. 12, 1988, Ser. No. 283,161

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] H01R *4/64*

U.S. Cl. 361—215 **7 Claims**



1. A threaded coupling assembly for interconnecting confronting ends of first and second fluid-carrying conduit members in locking and electrical bonding relationship, said assembly comprising:
first and second coupling means threadably interconnected and circumferentially engaging the confronting ends of said conduit members to hold them in fluid communication;
a complementary peripheral facing surface on each of said coupling means which are drawn axially toward each other as said coupling means are rotatably threaded together;
a bonding jumper in the form of a ring mounted on one of said facing surfaces having at least one resilient spring finger for bearing against said other facing surface to establish an electrical bond between said first and second coupling means when said facing surfaces are axially drawn toward each other;
a plurality of recesses in said other surface for coacting with said spring fingers to yieldably resist opposed relative rotation in the unthreading direction;
at least one of said coupling means incudes an internal peripheral groove;
a split ring releasably mounted in said groove; and
a bonding wire fixedly positioned within said split ring for contacting one of said conduit members.

4,928,203

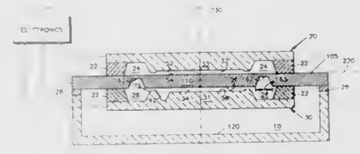
CAPACITIVE ACCELEROMETER WITH HINGES ON TOP AND BOTTOM SURFACE

James L. Swindal, East Hampton, and Walter J. Wiegand, Glastonbury, both of Conn., assignors to United Technologies, Hartford, Conn.

Filed Feb. 28, 1989, Ser. No. 317,239

Int. Cl.[5] H01G *7/00*; **G01P** *15/08*

U.S. Cl. 361—280 **7 Claims**



1. A solid-state accelerometer comprising:
a three-plate capacitor including fixed top and bottom plates and a movable sensing plate having a top surface separated from said top plate by a top gap and a bottom surface separated from said bottom plate by a bottom gap, defining a reference plane symmetrically disposed between said top and bottom surfaces, and being connected to support members by flexible connections extending across a support gap between said reference plate and said support members to move between said top and bottom plates in response to acceleration along an acceleration axis perpendicular to said reference plane, whereby acceleration along said acceleration axis displaces said sensing plate from said reference plane and alters the capacitance between said sensing plate and said top and bottom plates, in which;
said top and bottom plates and said support members are bonded together to form a rigid structure;
said sensing plate is connected to said support members by at least two flexures extending a predetermined hinge length along opposite sides of said sensing plate and having a predetermined hinge thickness less than the length of said sensing plate, so that a communication path is established between a top chamber between said top plate and said sensing plate and a bottom chamber between said bottom plate and said sensing plate; and
at least one chamber has motion stops disposed therein and grooves to facilitate squeeze-film damping in one of said sensing plate and said fixed plate, characterized in that:
said sensing plate is connected to said support members by flexures lying substantially in said top and bottom surfaces and being disposed about said support gap in a predetermined pattern;
a first side set of hinges are positioned along a first pair of sides of said sensing plate, have a predetermined total stiffness along each of said first pair of sides and are symmetric in both said top and bottom surfaces about a first plane defined by said acceleration axis and a first axis passing through said first pair of sides perpendicular to said first pair of sides and to said acceleration axis, at least one of said first side set of hinges being in each of said top and bottom surfaces, said first side set of hinges also being symmetric in said top and bottom surfaces about a second plane defined by said acceleration axis and a second axis passing through said acceleration axis perpendicular to said first axis;
a second side set of hinges are positioned along a second pair of sides, have said predetermined total stiffness along each of said second pair of sides, and are symmetric about said second and first planes in the same manner as said first side set of hinges are symmetric about said first and second planes, respectively; and
said first and second side sets of hinges are symmetrically disposed about a pair of diagonal planes perpendicular to said reference plane and having an angle of 45 degrees with respect to said first and second planes and are also symmetrically disposed about said reference plane in that for each member of said first side set disposed in said top surface, a corresponding member of said second side set is disposed in said bottom surface and vice versa.

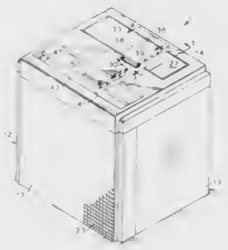
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4,928,204

PORTABLE ELECTRICAL APPLIANCE

Jui-Shang Wang, Taipei, Taiwan, assignor to Duracraft Corporation, Sudbury, Mass.

Filed Feb. 28, 1989, Ser. No. 316,826
Int. Cl.[5] H02B *5/00*
U.S. Cl. 361—331 **17 Claims**



1. An electrical appliance comprising:
an electrically powered device;
electrical control means coupled to said electrically powered device;
housing means comprising top and side surface portions, said housing means mechanically coupled to said electrically powered device and said electrical control means and defining a handle chamber having an entry opening formed in one of said surface portions, said handle chamber including a recessed portion covered by a section of said one said surface portion, and said section being partially bordered by one edge portion of said entry opening; and said housing means further defining a compartment retaining said electrical control means and having an access opening formed in one of said surface portions;
a lid retained by said housing means and covering said access opening, said lid mounted for movement out of said access opening thereby permitting manual access to said electrical control means;
a handle cover retained by said housing means and covering said entry opening, said handle cover mounted for movement into said handle chamber so as to provide manual access to an inner surface of said section; and
bias means biasing said handle cover into a position covering said entry opening.

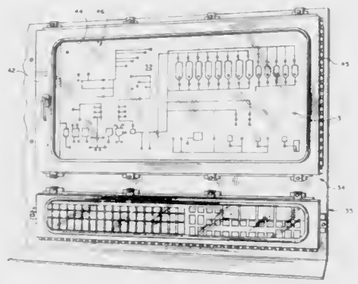
4,928,205

PANEL ASSEMBLY

David W. Duback, Glenview, and James R. Vogenthaler, Mount Prospect, both of Ill., assignors to Accurate Metering Systems, Inc., Schaumburg, Ill.

Filed Feb. 16, 1988, Ser. No. 155,856
Int. Cl.[5] H02B *1/02*
U.S. Cl. 361—346 **3 Claims**

1. A panel assembly for illustrating a layout of a system, said layout forming part of said panel assembly, the status of certain elements in said layout of the system being changeable, and the panel assembly being of the type in which the certain elements can be illuminated to indicate a certain status of an element, said panel assembly comprising:
(a) a control unit housing;
(b) an inner panel having an back side and an outer face and being hingedly mounted at one side edge to said control unit housing, said inner panel having a plurality of openings formed therethrough;
(c) light emitting means mounted in said openings for projecting light outwardly from the outer face of said inner panel;
(d) wire conductor means connected on the back side of said inner panel to the light emitting means and adapted to be connected to a source of electric power;
(e) an outer panel having an outer face and an inner face and being hingedly connected along one side thereof to said control unit housing, said outer panel having openings therethrough arranged to be in alignment with said light emitting means mounted in said openings of said inner panel; and



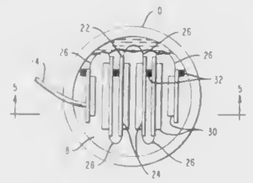
(f) said layout of said system being mounted on the outer face of said outer panel and having designated areas over at least some of said openings in said outer panel identifying certain elements of the system illustrated in the layout that have different operating modes, which designated areas are to be illuminated to indicate particular operating nodes of the elements in the layout of the system shown on said outer face of said outer panel.

4,928,206

FOLDABLE PRINTED CIRCUIT BOARD

Warren W. Porter, Escondido, and Donald K. Lauffer, Poway, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 23, 1988, Ser. No. 274,571
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—385 **11 Claims**



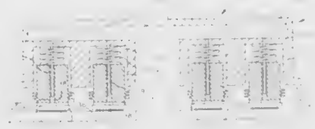
1. A printed circuit apparatus including a container, comprising:
a plurality of rigid printed circuit boards;
a width of each of said plurality of rigid printed circuit boards is less than the maximum transverse extend of said container;
at least two flexible printed circuit panels, each said flexible printed circuit panel is electrically connected to a respective pair of said plurality of rigid printed circuit boards;
said flexible printed circuit panels are folded into alternately opening U-shapes such that said plurality of rigid printed circuit boards are joined in a fan-fold configuration within said container; and
a cryogenic liquid filling a portion of said container and cryogenically cooling a portion of said plurality of rigid circuit boards and each said flexible circuit panel to provide cryogenic cooling to said portion.

4,928,207

CIRCUIT MODULE WITH DIRECT LIQUID COOLING BY A COOLANT FLOWING BETWEEN A HEAT PRODUCING COMPONENT AND THE FACE OF A PISTON

Gregory Chrysler; Richard C. Chu, and Robert E. Simons, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,945
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—385 **11 Claims**



1. A circuit module, comprising:
a substrate having a chip carrying surface;
an array of chips located at chip sites on the chip carrying surface of the substrate;
a hat cooperating with the substrate to form an enclosed space for the chips, the hat comprising supply means for supplying a liquid coolant;
pistons located in the hat above the chip sites, each of the pistons having a bore, therethrough, connected to carry a liquid coolant from the supply means to one of the chips, and each of the pistons further having a lower face, the lower face having a radially symmetrical shape; and
spacer means located on the lower face, for contacting an upper surface of the one of the chips and for forming a gap between the lower face and the upper surface.

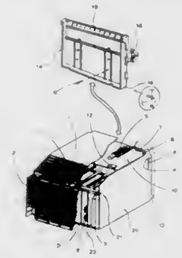
4,928,208

HOUSING AND CONNECTION DEVICE FOR ELECTRONIC MODULES

Fulvio Volpe, Arcofelice Pozzuoli, and Michele Perchiazzi, Napoli, both of Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

PCT No. PCT/IT85/00021, § 371 Date Jun. 23, 1986, § 102(e) Date Jun. 23, 1986, PCT Pub. No. WO86/04207, PCT Pub. Date Jul. 17, 1986
Continuation of Ser. No. 211,105, Jun. 17, 1988, abandoned, which is a continuation of Ser. No. 876,882, May 7, 1986, abandoned. This PCT application Jul. 24, 1985, Ser. No. 317,033
Claims priority, application Italy, Jan. 3, 1985, 35502/85[U]
Int. Cl.[5] H05K *1/14*
U.S. Cl. 361—395 **6 Claims**

1. A housing and connection device for electronic modules comprising:
a fixed panel member having an electrical interface area on one side thereof, and
a movable housing member detachably mounted on the fixed panel member and having openings for heat dissipation,
the movable housing member having a plurality of grooves extending from the interior front to the interior rear thereof for holding a plurality of electronic modules,
the movable housing member also having a first motherboard at the rear disposed perpendicularly to said electronic modules for forming electrical connection therewith, and
the movable housing member also having a second motherboard located above and substantially perpendicular to the first motherboard and electrically connected there-



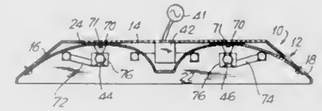
with so as to provide a housing and connection device for a plurality of electronic modules.

4,928,209

LIGHTING APPARATUS

Bruce W. Rodin, New York, N.Y., assignor to Mirrorlite, Inc., New York, N.Y.

Filed Aug. 31, 1988, Ser. No. 239,173
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—217 **21 Claims**



1. A device for modifying a lighting apparatus of the type comprising a housing for at least two spaced apart original elongated tubular bulbs disposable in first and second spaced apart elongated spaces within said housing, a pair of spaced apart original sockets, one for each of said bulbs for conducting electricity from an electric source to said bulbs, said original bulbs being supportable in said housing at least in part by their respective original sockets, said modifying device comprising:
a reflector secured to said housing, said reflector defining a third elongated space for a substitute elongated tubular bulb in lieu of said two spaced apart original bulbs,
means for supporting said substitute bulb in said third space, said supporting means being connected to and supported by said reflector;
a substitute socket for said substitute bulb; and
means for electrically connecting said substitute socket to one of said original sockets to energize said substitute bulb by said electric source.

4,928,210

LINEAR LAMP UNIT WITH CONTACTS AT BOTH ENDS

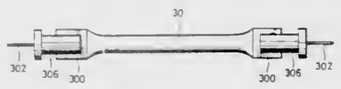
Futomi Hayakawa, and Kazuo Onoda, both of Tokyo, Japan, assignors to Kabushiki Kaisha Hybec, Tokyo, Japan

Continuation of Ser. No. 140,560, Dec. 30, 1987, abandoned. This application Aug. 18, 1989, Ser. No. 396,629
Claims priority, application Japan, May 29, 1987, 62-134037
Int. Cl.[5] H01J *5/50*
U.S. Cl. 362—217 **6 Claims**

1. In an elongated lamp unit in which electrically conductive connecting terminals provided at both ends of the lamp are electrically connected by force fitting into metal contact clamps arranged opposite each other; the improvement in which said electrically conductive connecting terminals are

VOL 1114 ISS 4 MY 22 1990 UMI

flat metal plated embedded in and extending endwise beyond ceramic cylinders secured to flat portions formed on each end of an elongated lamp bulb, said ceramic cylinders having a diameter less than the width of said flat portions, said terminals



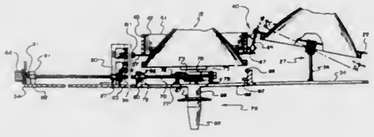
being electrically connected with a filament disposed in the bulb, said terminals having surface-to-surface contact with said metal contact clamps on opposite sides of each of said terminals endwise beyond said flat portions.

4,928,211

LIGHTHEAD ASSEMBLY

Leonard L. Hallings; Donald W. Bramer; Bruce A. Sanborn, all of Rochester, and James E. Schryver, Wayland, all of N.Y., assignors to MDT Corporation, Torrance, Calif.

Filed Mar. 6, 1989, Ser. No. 319,046
Int. Cl.[5] F21V *13/00*
U.S. Cl. 362—33 **23 Claims**



1. A lighthead assembly, comprising a lighthead with:

a central pod, including a lamp, said central pod being mounted within said lighthead and constructed and arranged such that when said lighthead is energized, said pod produces an axial light beam with respect to said lighthead;

a multiplicity of peripheral pods, each including a lamp, said peripheral pods being mounted within said lighthead symmetrically around said central pod on pivot mounts, said peripheral pods being constructed and arranged so that when said lighthead is energized, said peripheral pods produce peripheral light beams originating symmetrically with respect to said axial light beam, said pivot mounts permitting displacement of said peripheral pods within a range of pivotal movement, whereby the peripheral light beams originating from said peripheral pods may be caused to intersect said axial light beam at selected locations corresponding to selected amounts of displacement within said range of movement;

coordination means operably associated with said peripheral pods, constructed and arranged to coordinate the pivotal movement of said peripheral pods so that all of said horizontal light beams simultaneously intersect said axial light beam at any said selected location throughout said range of movement;

said coordination means including a cylindrical surface rotatably mounted within said lighthead about an axis of rotation approximately parallel said axial light beam, said cylindrical surface element carrying camming surface means; and

reaction means, operably associated with each of said peripheral pods and said camming surface means to effect synchronized pivoting of said peripheral pods in a first direction as said cylindrical surface element is rotated clockwise and in a second direction, opposite said first direction, as said cylindrical surface element is rotated counterclockwise;

drive means, mechanically coupled to, and constituting means for rotating, said cylindrical surface element; and

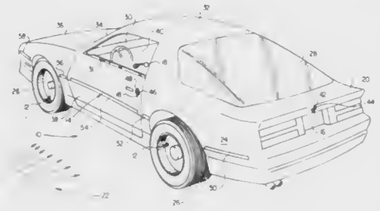
handle structure external said lighthead, mechanically coupled to said drive means and constituting means for actuating said drive means.

4,928,212

PHOSPHORESCENT VEHICLE PART IDENTIFICATION SYSTEM

Butch Benavides, 828 E. Parkerville Rd., DeSoto, Tex. 75115

Filed Nov. 3, 1988, Ser. No. 266,887
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 **6 Claims**



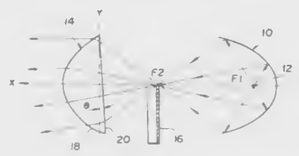
1. A phosphorescent vehicle part identification accessory comprising an article of molded plastic having formed therewith a phosphorescent compound adapted for glowing for a period of time following exposure to light energy; and means for securing said phosphorescent article to said vehicle in a location thereon for receiving illumination from other vehicles and external light sources in providing a decaying glow therefrom, said phosphorescent article comprising a vehicle wheel valve stem cap.

4,928,213

PROJECTOR-TYPE HEAD LAMP FOR VEHICLES

Yutaka Nakata, Isehara, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 298,912
Claims priority, application Japan, Jan. 20, 1988, 63-8545
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 **3 Claims**



1. A projector-type head lamp for use on vehicles, comprising a reflector having an optical axis, a first focus located near said reflector and a second focus located far from said reflector, a light source disposed near said first focus of said reflector, a convergent lens disposed opposite to said reflector with said second focus of the latter located at the intermediate position between them, of which the optical axis is nearly coincident with that of said reflector and which has a focus near said second focus of said reflector, and a shade disposed near said focus of said convergent lens and of which the cut line is located near the optical axis of said convergent lens, said convergent lens comprising an aspherical frontal surface and a substantially flat, continuous back surface which is gradually

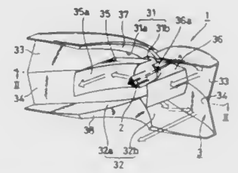
nearer to the focus of said frontal surface as it goes from the upper portion toward the lower portion of said convergent lens, whereby all the color fringes caused by the aberration of said convergent lens appear within the main illuminated zone below the light-dark limit of the light distribution pattern.

4,928,214

VEHICLE FRONT LAMP

Hiroo Oyama, Sagamihara, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 414,125
Claims priority, applicatioo Japan, May 6, 1988, 63-110129
Int. Cl.[5] B60Q *1/04*
U.S. Cl. 362—61 **11 Claims**



1. A vehicle front lamp, comprising:

a light source;

an upper first curved surface made of composite curved surfaces for reflecting a light beam from said light source in the left direction of the vehicle and in the right direction of the vehicle, respectively, said upper first curved surface being mounted at a higher position than said light source;

a lower first curved surface made of composite curved surfaces for reflecting a light beam from said light source in the left direction of the vehicle and in the right direction of the vehicle, respectively, said lower first curved surface being mounted at a lower position than said light source;

an upper second curved surface for reflecting a light beam reflected from said upper first curved surface for making said light beam reflected thereby substantially parallel in the forward direction of the vehicle, said upper second curved surface being formed at the right and left of said light source;

a lower second curved surface for reflecting a light beam reflected from said lower first curved surface for making said light beam reflected thereby substantially parallel in the forward direction of the vehicle, said lower second curved surface being formed at the right and left of said light source;

said composite curved surfaces of said upper first curved surface being slanted by an angle of 10 to 35 degrees so as to direct said light beam reflected thereby downward;

said composite curved surfaces of said lower first curved surface being slanted by an angle of 10 to 35 degrees so as to direct said light beam reflected thereby upward;

said upper second curved surface and said lower second curved surface being in contact relation with each other substantially along a line; and

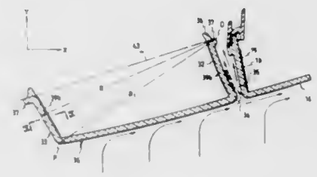
light shielding units mounted at the right and left of said light source along said line defining said contact between said upper and lower second curved surfaces.

4,928,215

VEHICLE LAMP DEVICE

Yuuji Fujino, and Yasuhiro Nakamura, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1989, Ser. No. 324,864
Claims priority, application Japan, Mar. 17, 1988, 63-36131[U]; Jul. 15, 1988, 63-176514; Oct. 8, 1988, 63-252918
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 362—61 **5 Claims**



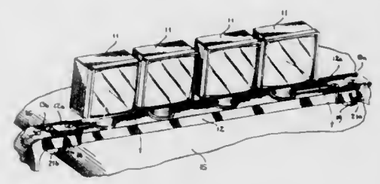
1. A vehicle lamp device comprising: a unit movable rectangular headlamp, and a rectangular vehicle lamp arranged adjacent said unit movable rectangular headlamp with a gap therebetween, each of said lamps having a front lens, at least one of said front lenses having a sidewall which confronts a sidewall of the other of said lamps and which has at least one front edge protruding outwardly toward the other of said front lenses so that the gap between the front lenses of said lamps is narrowed at said at least one front edge.

4,928,216

LIGHT MOUNT ASSEMBLY HAVING RAISED AND LOWERED POSITIONS

Jeff A. Carr, Downey, Calif., assignor to Carr Pattern Co., Inc., South Gate, Calif.

Filed Oct. 30, 1989, Ser. No. 428,859
Int. Cl.[5] B60Q *1/06*; F21V *3/18*
U.S. Cl. 362—66 **8 Claims**



1. An assembly for mounting one or more lights on a vehicle comprising:

a pair of mounting brackets attached to opposite sides of said vehicle, each of said brackets having a stop member extending therefrom;

a bar, said lights being mounted on said bar; and

means for attaching the opposite ends of said bar to said brackets for pivotal adjustment relative thereto between predetermined raised and lowered positions of said lights, said bar having projections on both ends thereof which matingly engage the stop members of the brackets when the bar is in said lowered position.

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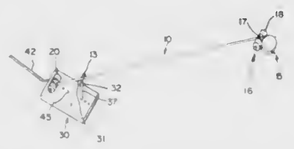
ADJUSTABLE LAMP

Lawrence L. Laske, 153 Mercer St. - 5th Floor, New York, N.Y. 10013

Continuation-in-part of Ser. No. 212,175, Jun. 27, 1988, Pat. No. 4,847,740, which is a continuation-in-part of Ser. No. 139,617, Dec. 30, 1987, Pat. No. 4,827,390. This application Feb. 10, 1989, Ser. No. 308,634

Int. Cl.[5] F21S *1//12*

U.S. Cl. 362—427 **6 Claims**



1. An adjustable lamp comprising: a base, a top wall of said base having at least one adjustment hole;

at least one lamp bar, each said lamp bar having a lamp end, an opposite pivot end and a support point therebetween, pivot means secured to said base, said opposite pivot end secured to said pivot means;

lighting means secured to said lamp end;

an adjustment bar arm having an adjustment hole end matingly engageable with said at least one adjustment hole, an adjustment bar attached to an adjustment bar end which is opposite said adjustment hole end of said adjustment bar arm, said adjustment bar having a support portion in point contact with said at least one lamp bar at said support point to provide a desired lamp vertical position; and

said pivot means comprising at least one central pivot portion pivotally supported between at least two end fixed portions, each said end fixed portion secured to said base, said opposite pivot end of said at least one lamp bar secured to said central pivot portion, said central pivot portion rotatable with respect to said at least two end fixed portions, an adjustment/assembly screw supported between said at least two end fixed portions, and said central pivot portion lockable with respect to said end fixed portion by tightening said adjustment/assembly screw.

4,928,218

SWITCH MODE POWER SUPPLY START-UP CIRCUIT

James S. Kluttz, Winter Springs, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 6, 1989, Ser. No. 319,601

Int. Cl.[5] H02M *5/458, 7/5375*

U.S. Cl. 363—37 **5 Claims**

1. A switch mode power supply comprising:

means for converting an AC input voltage to a DC voltage, including an AC input line and a first positive temperature coefficient thermistor series connected in said line;

a transformer having a primary winding, primary winding output, and secondary winding;

means for generating a series of pulses;

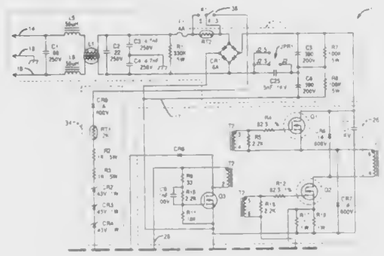
means responsive to said pulses for switching said DC voltage across the primary winding of said transformer;

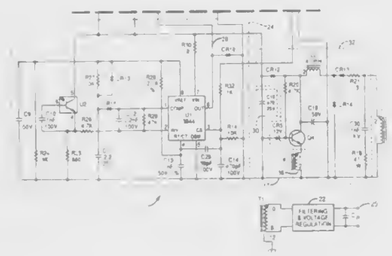
a charge storage device connected to a power input of said pulse generating means, said charge storage device comprising a storage capacitor connected between said start-up circuit and a primary DC return line;

an auxiliary voltage generator connecting the primary winding output of said transformer to said power input of said pulse generating means, said auxiliary voltage generator comprising a transistor and filter, said filter including an inductor connected between said primary winding output and transistor, said transistor and relay coil being series connected between said filter and primary DC voltage return line and said transistor having a control electrode connected through a first resistor to the junction of said filter and transistor;

a start-up circuit connecting said AC input voltage to said charge storage device; and

switch means responsive to the current in said primary





winding output for disconnecting said start-up circuit from said charge storage device, said switch means including a relay having a coil and armature, said armature having a first and second position, wherein said first position series connects said first thermistor with said start-up circuit, wherein said second position short circuits said first thermistor, and wherein said armature assumes said second position in response to a current in said coil.

4,928,219

ADAPTABLE CURRENT REGULATING SYSTEM

Charles J. Roslund, Monroeville, and Bruce M. Cook, Plum Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jnn. 29, 1989, Ser. No. 373,077

Int. Cl.[5] H02M *1/18*

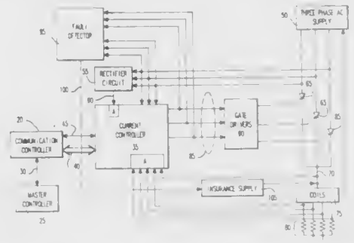
U.S. Cl. 363—54 **4 Claims**

1. An adaptable current regulating system having a status, said system being connectable to receive a supply voltage, and providing a controlled current to a drive control element in accordance with information from a master controller, said system comprising:

communication means for receiving the information, for receiving a first portion of status data and for transmitting the first portion of the status data to the master controller;

control means for monitoring the status and providing the first portion of the status data, for monitoring the received supply voltage, and for generating at least one drive signal varying in accordance with at least some of the information and the monitored supply voltage; and

fault means for monitoring said at least one drive signal and the received supply voltage and for providing a second



portion of the status data in response to monitoring the at least one drive signal and the received supply voltage.

4,928,220

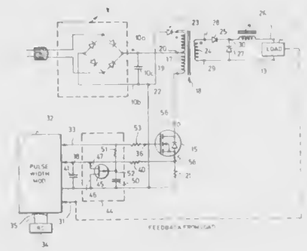
SWITCHING MODE DC-TO-DC POWER SUPPLY WITH IMPROVED CURRENT SENSING

Alan V. White, Montgomery County, Tex., assignor to Compaq Compnter Inc., Houston, Tex.

Filed Oct. 14, 1988, Ser. No. 258,220

Int. Cl.[5] H02H *7/122;* H02M *3/335*

U.S. Cl. 363—56 **18 Claims**



1. A control circuit, comprising:

a controlled device having a current path and a control terminal;

a pulse generator for applying variable pulses to said control terminal;

sensing means coupled to said current path of the controlled device and producing an electrical indication of operation of said controlled device; said indication being applied to an input of said pulse generartor to vary said pulses;

a spike-inhibiting circuit having an input coupled to receive said pulses being applied to said control terminal and having an output coupled to said input of the pulse generator to inhibit said electrical indication from being applied to said input of the pulse generator at the beginning of each of said pulses, said output of said spike-inhibiting circuit including a control transistor having a current path shunting said input of said pulse generator.

4,928,221

PART PROGRAM GENERATING SYSTEM

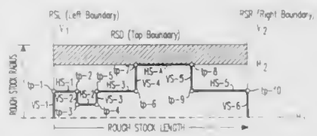
Bruno M. Belkhiter, Lewisville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1988, Ser. No. 179,685

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—191 **12 Claims**





1. A process for generating a numerical control program from a part drawing, comprising the steps of:

(a) producing a shape signature from the drawing; and

(b) generating the program from the shape signature, comprising the steps of:

(b1) producing a process tree from the shape signature;

(b2) determining boundaries for each node of the process tree;

(b3) determining a machining operation from the boundaries;

(b4) selecting processes based on the shapes defined by the boundaries; and

(b5) producing machining program steps based on the processes selected.

4,928,222

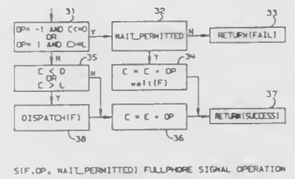
ENHANCED SEMAPHORE ARCHITECTURE

John J. Vriezen, Zumbrota, Minn., and Robin N. Niemeyer, Eau Claire, Wis., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,088

Int. Cl.[5] G06F *9/46*

U.S. Cl. 364—200 **4 Claims**



1. A fullphore for efficiently enforcing mutual exclusion between consumer tasks and producer tasks in a computer system, comprising:

a count for incrementing and decrementing responsive to an operation flag;

a limit imposed on said count; and

a queue for waiting consumer tasks and producer tasks.

VOL 1114 ISS 4 MY 22 1990 UMI

4,928,223

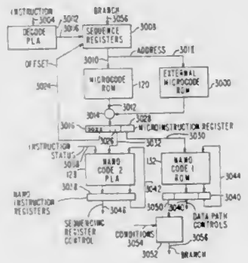
FLOATING POINT MICROPROCESSOR WITH DIRECTABLE TWO LEVEL MICROINSTRUCTIONS

Tich T. Dao, and Gary R. Burke, both of Cupertino, Calif., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 433,059, Oct. 6, 1982, abandoned. This application Aug. 28, 1986, Ser. No. 901,446

Int. Cl.[5] **G06F** *9/00, 9/22, 9/26, 13/00*

U.S. Cl. 364—200 **7 Claims**



1. A microprocessor comprising:

(a) an instruction sequence register having an instruction address and connected to provide said instruction address to means for storing a first level of instruction;

(b) a first level instruction register connected to receive a first level instruction from said first level instruction storage means;

(c) means for storing a second level of instructions connected to receive an address from said first level instruction register, said second level instruction storage means comprising:

(i) first means for storing a first portion of said second level instruction; and

(ii) separate second means for storing a second portion of said second level instructions,

(d) a first, second level instruction register connected to receive said first portion of said second level instruction; and,

(e) a second, second level instruction register connected to receive said second portion of said second level instructions, wherein said first and second, second level instruction registers are connected to supply instruction portions to said first means for storing a first portion of said second level instructions and said separate second means for storing a second portion of said second level instructions respectively and at least a portion of instructions output from said first, second level instruction register is coupled to an input of said instruction sequence register through branch control means.

4,928,224

MULTIPROCESSOR SYSTEM FEATURING GLOBAL DATA MULTIPLATION

Ferruccio Zulian, Comaredo, Italy, assignor to Bull HN Information Systems Italia S.p.A., Caluso, Italy

Filed May 19, 1988, Ser. No. 196,651

Claims priority, application Italy, Nov. 17, 1987, 22666 A/87

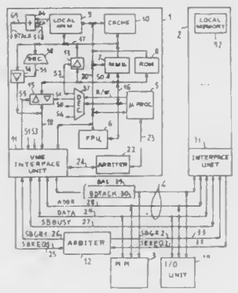
Int. Cl.[5] **G06F** *15/16*

U.S. Cl. 364—200 **9 Claims**

1. A multiprocessor computing system comprising:

a plurality of processors connected in common to a system bus, each processor comprising a processing unit, a local memory and an interface unit connected in common to an internal bus, and said interface unit connecting said internal bus to said system bus, said local memory of each processor including a plurality of addressable storage locations for storing information, a number of said storage locations used to store global data currently in use by said plurality of processors, said processing unit of each processor being connected to have access to said local memory of each of the other processors through said system bus and corresponding interface units for reading or writing information referenced by an address code, said address code comprising a destination code for identifying said local memory into which said information is to be read or written, said each processor further including:

first means including said processing unit for generating a destination code in said address code having a binary configuration for identifying said information as global data in response to each write command generated by said



processing unit for storing said information in said local memory associated therewith; and

second means including said interface unit responsive to said global data binary configuration in said destination code and to said write command from said first means to concurrently perform a write operation of said information identified as a global data into a specified one of said number of storage locations in said local memory associated therewith and broadcast said address code including said global data binary configuration and said write command on said system bus causing all of said other processors to write said information into one of said number of locations of their local memories so that all of said processors are able to have immediate access to said global data.

4,928,225

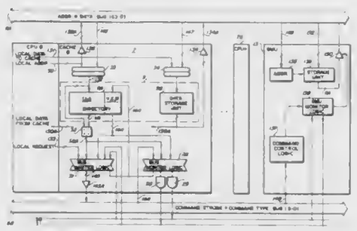
COHERENT CACHE STRUCTURES AND METHODS

Daniel M. McCarthy; Joseph C. Circello; Gabriel R. Mungula, all of Phoenix, and Nicholas J. Richardson, Scottsdale, all of Ariz., assignors to Edgcore Technology, Inc., Scottsdale, Ariz.

Continuation-in-part of Ser. No. 236,449, Aug. 25, 1988. This application Sep. 2, 1988, Ser. No. 240,747

Int. Cl.[5] **G06F** *12/08, 15/16*

U.S. Cl. 364—200 **32 Claims**



1. A method for maintaining cache coherency in a computer system including a plurality of processors each having an associated cache memory, a global memory that has an access time greater than that of the cache memories, a bus intercoupling the processors and the global memory, and status conductors connected to each of the processors and to the global memory, the method comprising the steps of:

(a) storing a plurality of blocks of data in the global memory;

(b) storing selected blocks of data, each having a respective address, in various cache memories;

(c) storing with each block of data in the cache memories a plurality of cache coherency status bits associated with that block of data;

(d) sending an address of a requested block of data from a first processor to an associated cache memory;

(e) generating a cache miss signal if that associated cache memory does not include the requested block of data;

(f) sending the address of the requested blocks of data to the bus in response to the cache miss signal;

(g) operating each of the processors, except the first processor, to monitor the address of the requested block of data on the bus;

(h) sending a state which corresponds to the status bits of the requested block of data from a second processor over the status conductors to the first processor;

(i) operating the first processor to read the state of the requested block of data from the status conductors, whereby accessing of the global memory to determine if the global memory is to supply the requested block of data is avoided.

4,928,226

DATA PROCESSOR FOR PARALLELLY EXECUTING CONFLICTING INSTRUCTIONS

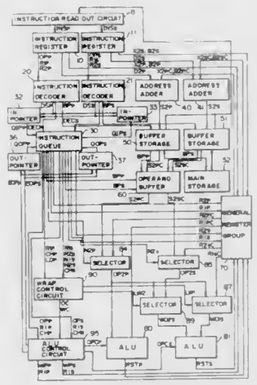
Eiki Kamada; Yooichi Shintani, both of Hadano; Kazunori Kuriyama, Saitama; Tohru Shonai, Hadano, and Kiyoshi Inoue, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 124,839

Claims priority, application Japan, Nov. 28, 1986, 61-281720

Int. Cl.[5] **G06F** *9/38, 9/00, 7/38*

U.S. Cl. 364—200 **7 Claims**



1. A data processor for parallelly executing a plurality of instructions in successive operation stage, comprising:

(a) a storage for storing operands;

(b) a group of registers each for storing an operand;

(c) operand storing means for storing operands of a plurality of instructions, said operands being read from said storage thereto;

(d) means for decoding instructions to be executed and providing decode information of at least two instructions, at least one of which is to be subjected to an arithmetic or logical operation;

(e) instruction detection means for detecting, based on said instruction decode information of said at least two instructions supplied from said decode means, that a preceding instruction among said at least two instructions requests reading of an operand from said storage or from said register group and writing of said operand into a register of said register group without performing an arithmetic or logical operation on said operand, and that a succeeding instruction among said at least two instructions requests reading of said operand in said register and performing an arithmetic or logical operation thereon; and

(f) execution means responsive to the detection by said instruction detection means for concurrently performing arithmetic or logical operation stages in the execution of said preceding instruction and said succeeding instruction.

4,928,227

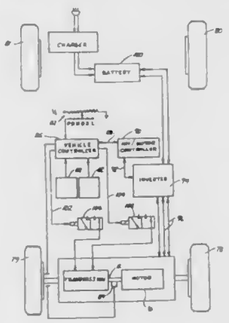
METHOD FOR CONTROLLING A MOTOR VEHICLE POWERTRAIN

Joseph C. Burba; Ronald G. Landman, both of Ypsilanti; Prabhakar B. Patil, Detroit, and Graydon A. Reitz, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1987, Ser. No. 115,799

Int. Cl.[5] **G05D** *17/02;* **B60K** *41/18;* **B60L** *7/20*

U.S. Cl. 364—424.01 **14 Claims**



1. A method for controlling the operation of a automotive vehicle powertrain system, which includes a power source, a multiple speed ratio transmission, selectively engageable and disengageable friction elements, comprising:

producing signals representing the position of a gear selector located at park P, neutral N, forward drive D and low speed forward drive L positions, the torque TQC commanded, and the speed MS of the power source;

producing an upshift command US and a downshift command DS in accordance with the current operating speed ratio, the speed of the power source and the torque represented by the torque command signal;

changing the state of the system to a first forward speed ratio state from a neutral state by moving the gear selector to a forward drive position;

changing the state of the system from the first speed ratio to the second speed ratio by operating the friction elements to upshift the transmission, provided the upshift command is present and gear selector is in the D position;

changing the state of the system from the second speed ratio state to a second speed regenerative state, provided the torque represented by the torque command signal is negative;

changing the state of the system from the second speed

VOL
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regenerative state to a first speed regenerative state provided the downshift signal is present or the gear selector is not at the D position; and

changing the state of the system from the first speed regenerative state to the first gear state, provided the gear selector is in the D or L position and the power source speed signal represents substantially zero speed.

4,928,228

APPARATUS FOR DETECTING MISFIRE AND FOR CONTROLLING FUEL INJECTION

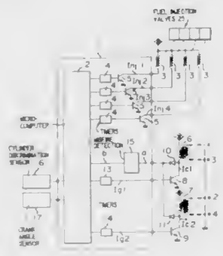
Takanori Fujimoto, and Toshiro Hara, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,427

Claims priority, application Japan, May 26, 1987, 62-130220; May 26, 1987, 62-130219; May 26, 1987, 62-130218; May 26, 1987, 62-130217; May 26, 1987, 62-130216

Int. Cl.[5] F02M *51/00*; F02P *17/00, 11/06*

U.S. Cl. 364—431.09 9 Claims



1. An engine control apparatus which comprises, in combination:

a cylinder discrimination sensor for generating cylinder discriminating signal;

a crank angle sensor for generating crank angle signal;

a fuel injection valve provided in each cylinder of the engine;

a plurality of ignition coils with each and every cylinder being connected to one of said coils;

misfire detection means for detecting a state of misfire due to a lack of an ignition signal from any of said coils in accordance with signals received from said ignition coils, said misfire detection means producing a misfire detection signal which alternately changes between two levels in response to ignition signals during normal operation and which fails to change if a misfire is detected;

an engine control section for controlling said fuel injection valves and said ignition coils in correspondence to the detected misfire upon receipt of the cylinder discrimination signal and the crank angle signal, and for not actuating the fuel injection valve of the misfired cylinder in response to the cylinder discrimination signal upon receipt of the misfire detection signal; and

an OR circuit connected to said ignition coils to detect a misfire state due to a lack of an ignition signal, said OR circuit having an output connected to an input of said misfire detection means.

4,928,229

LABEL PRINTER

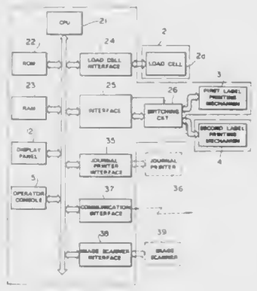
Kazuharu Teraoka; Mitsuo Satake; Toshio Denda; Takashi Katayama, and Shiro Seyasu, all of Tokyo, Japan, assignors to Teraoka Seiko Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,521

Claims priority, application Japan, Jan. 30, 1987, 62-20008; May 25, 1987, 62-127339; Sep. 30, 1987, 62-247709

Int. Cl.[5] G01G *23/22*

U.S. Cl. 364—464.01 32 Claims



1. A label printer comprising:

(a) a plurality of label printing mechanisms, each capable of printing data on a label in the form of desired dot patterns; and

(b) a printer control means to which said plurality of label printing mechanisms are connected in parallel, said printer control means selectively controlling the printing operations of said label printing mechanisms.

4,928,230

AUTOMATIC TRANSACTING APPARATUS

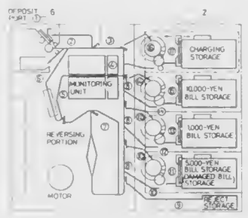
Shigemi Kawamura, and Masahide Yamauchi, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Mar. 23, 1988, Ser. No. 172,163

Claims priority, application Japan, Mar. 23, 1987, 62-68675; Mar. 23, 1987, 62-68676; Apr. 20, 1987, 62-98419; Apr. 20, 1987, 62-98417

Int. Cl.[5] G06F *15/30*

U.S. Cl. 364—479 11 Claims



1. An automatic transacting apparatus, comprising:

a plurality of storage compartments;

transporting means for storing and extracting paper documents into/from said storage compartments;

means for detecting a delivery malfunction of the transporting means when documents have not been transported correctly;

means for indicating the position of the document in the transporting means when a malfunction has occured;

switch means for generating a reset control signal for controlling the operation of said transporting means; and

means for controlling said transporting means such that said transporting means is driven at a low speed after detection of a malfunction of said transporting means when a signal from said switching means is received at said controlling means.

4,928,231

APPARATUS FOR FORMING FLOW-MAP IMAGES USING TWO-DIMENSIONAL SPATIAL FILTERS

Barry F. Hunt, Nashua, N.H.; Alwyn P. D'Sa, Cambridge, and Paul A. Magnin, Andover, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 826,800, Mar. 6, 1986, abandoned. This application May 15, 1989, Ser. No. 352,602

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—518 4 Claims



1. Apparatus for producing images of blood flow comprising:

a scanner having transducers for transmitting pulses of pressure waves into a body under examination along radial lines of a sector and means for sampling reflections from reflectors impinging on said transducers so as to derive signals from which the velocities of said reflectors at positions along said radial lines can be determined,

a velocity detector for deriving from said signals data values representing the velocities of reflectors at said positions,

a two dimensional spatial median filter coupled to said velocity detector for selecting from data values at each position and data values surrounding said position a selected data value that is to be used as the data value at said position,

a color cathode ray tube, and

means coupled between said two dimensional median filter and said cathode ray tube for controlling the colors it displays.

4,928,232

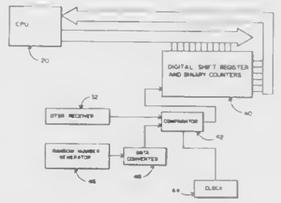
SIGNAL AVERAGING FOR OPTICAL TIME DOMAIN RELECTOMETERS

John R. Gentile, Frankfort, N.Y., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,026

Int. Cl.[5] G01M *11/00*

U.S. Cl. 364—525 9 Claims



9. In an optical time domain reflectometer which includes (a) a laser for firing signals into a fiber strand, (b) means for receiving and measuring continuously varying returning signals representing reflection values during a waveform sweep along the fiber strand, and (c) a computer controller, a method for extracting useful waveform-determining values from the noise in which they are embedded, comprising:

directing to the first input of a comparator an analog voltage signal representing the values returning from the fiber strand during a given waveform sweep;

directing to the second input of the comparator an analog voltage signal selected from a large number of signal values which are substantially evenly distributed in the range of possible values;

maintaining the same signal at the second input of the comparator during one complete waveform sweep;

outputting from the comparator at clocked intervals a digital signal indicating which of its input signals is instantaneously higher;

storing each digital signal from the comparator in a different storage register stage;

clocking the comparator output signals and the storage register stage inputs at a frequency which provides the desired waveform resolution;

transferring the signal stored in each register stage to a separate counter at the end of a waveform sweep;

changing the signal at the second input of the comparator;

repeating during the next waveform sweep the steps taken during the previous waveform sweep;

adding the values from successive sweeps into the respective counters; and

repeating the foregoing process the number of times needed to obtain a desired signal-to-noise ratio in the recorded waveform.

4,928,233

SYSTEM FOR PROVIDING THREE DIMENSIONAL OBJECT DESCRIPTIONS

David B. Millis, Friendsville, Pa., assignor to International Business Machines, Armonk, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,925

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—522 16 Claims



1. A system for producing human readable physical data in text form from geometric data in mathematical form that partially describes a three dimensional object comprising:

(a) a first database comprising said geometric data in mathematical form representative of the shape of the three dimensional object;

(b) a second database comprising said physical data in text form;

(c) means for extracting at least a portion of said data from said first database, calculating physical data in mathematical form therefrom and converting said calculated data into human readable physical data in text form; and

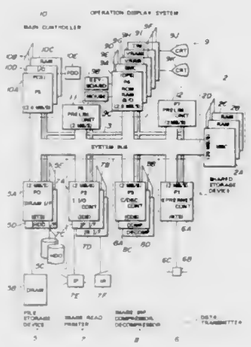
(d) means for combining said calculated human readable physical data with said data from said second database to produce a comprehensive physical and geometric description in text form of said object.

4,928,234

DATA PROCESSOR SYSTEM AND METHOD

Yoshio Kitamura, Kanagawa; Hiroshi Takizuka, Tokyo, and Tadao Ishihara, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 807,544, Dec. 11, 1985, abandoned. This application Nov. 1, 1988, Ser. No. 266,256
Claims priority, application Japan, Dec. 24, 1984, 59-280817
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—200 19 Claims



1. A data processing system of the type having a system bus, including a bus clock, one or more data input means for inputting data, display means for displaying inputted data and processed data, storage means for storing the input data and the processed data, and shared storage means connected to each of the above means through the system bus, the system processing data as designated by the data input means, wherein the system comprises

(a) a plurailty of memory bank means, each of which is connected to the system bus and which together constitute the shared storage means;

(b) a plurality of separate processor means provided for each of the data input means, the display means and the data storage means, respectively, for separately processing data for each of them, each of the separate processor means being connected to the system bus and being capable of generating a memory request command signal on the system bus for the purpose of transferring data between itself and any one of the memory bank means;

(c) arbitration means within the shared storage means which is responsive to a memory request command signal generated by one of the processor means for generating separate enable signals to acknowledge occupation of one of the memory bank means by the one processor means which generated the memory request; and

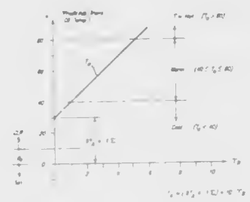
(d) data dividing means for dividing data transferred between the one processor means and the one memory bank means into predetermined groupings of divisional data and for processing each divisional data in synchronization with the bus clock of the system bus and in simultaneous parallel fashion when a plurality of memory requests are out-putted simultaneously from a plurality of the processor means.

4,928,235

METHOD OF DETERMINING THE FLUID TEMPERATURE OF AN ELECTRONIC AUTOMATIC TRANSMISSION SYSTEM

Hemang S. Mehta, Sterling Heights; Gerald L. Holbrook, Rochester Hills, and Maurice B. Leising, Clawson, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 187,771
Int. Cl.[5] G06F *15/20;* B60K *41/08*
U.S. Cl. 364—424.1 4 Claims



1. In a vehicle transmission system including an input member, an output member, a torque converter assembly for transmitting torque between an engine and the input member, a gear assembly for changing the ratio of torque between the input member and output member, a plurality of frictional units for shifting the gear assembly, a fluid actuating device being moveable axially for applying at least one frictional unit, at least one solenoid-actuated valve being moveable in response to the presence or absence of electrical power to the valve for directing fluid flow between a fluid source and the fluid actuating device, sensors providing signals indicative of measurement data for predetermined conditions, a controller for processing the signals and providing signals to control the solenoid-actuated valves, a method of determining the fluid temperature of the transmission, said method comprising the steps of:

reading a sensor by the controller for the ambient temperature of the engine;

multiplying the engine temperature by a first predetermined value;

reading the temperature of the ambient air surroundings;

multiplying the ambient temperature by a second predetermined value;

adding the multiplied engine temperature and multiplied ambient temperature together;

measuring a time period once the transmission is not in a predetermined gear and the speed of the engine is greater than a predetermined speed;

multiplying the measured time period by a third predetermined value;

summing the multiplied measured time period and the added value of temperature to obtain a value of transmission fluid temperature;

determining the transmission fluid temperature based on the value of transmission fluid temperature; and

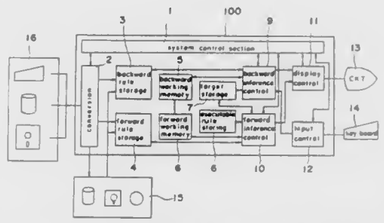
controlling the operation of the transmission based on the determined transmission fluid temperature.

4,928,236

DISPLAY METHOD IN AN INFERENCE TRACE OF AN EXPERT SYSTEM

Toshiyuki Tanaka, Yamatokoriyama; Shigeki Kuga, Nara; Nobuo Nakamura, Yamatokoriyama; Taro Morishita, and Masahiro Wada, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 19, 1988, Ser. No. 221,348
Claims priority, application Japan, Jul. 22, 1987, 62-184122
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 11 Claims



1. A method for displaying a trace of a rule for forward inference control in an expert system comprising the steps of:

(a) displaying information indicating an addition of a fact to the working memory;

(b) determining the condition of a match between the rule and the added fact;

(c) determining if condition of negation is satisfied if the condition in step (b) is affirmative;

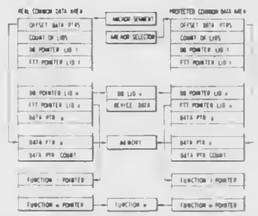
(d) displaying information indicating that the rule is executable if the condition of negation is satisfied.

4,928,237

COMPUTER SYSTEM HAVING MODE INDEPENDENT ADDRESSING

Richard Bealkowski, Delray Beach; Richard A. Dayan, Boca Raton; David J. Doria, Boca Raton; Scott G. Kinnear, Boca Raton; Jeffrey I. Krantz, Boca Raton, all of Fla.; Robert B. Liverman, Raleigh, N.C.; Guy G. Sotomayor, West Palm Beach, Fla.; Donald D. Williams, and Gary A. Vaiskanckas, both of Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 27, 1987, Ser. No. 30,789
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—200 14 Claims



7. A personal computer system comprising:

a central processing unit comprised of a microprocessor operating in either one of a first or a second mutually incompatible addressing mode;

a memory coupled to the central processing unit for storing information, said memory being addressable by said processing unit in either one of said first and second addressing modes;

means for addressing said memory, said addressing means cooperating with said central processing unit for controlling the presentation of addressing information to said central processing unit in said first and second addressing modes,

said addressing means further comprising first and second tables for the first and second modes respectively, each table including pointers to predetermined respective regions of said memory, wherein at least some of said pointers in said first table having corresponding pointers in said second table

a first anchor pointer directing said central processing unit to said first tables whenever said central processing unit is in the first addressing mode; and

a second anchor pointer directing said central processing unit to the second tables whenever said central processing unit is in the second addressing mode;

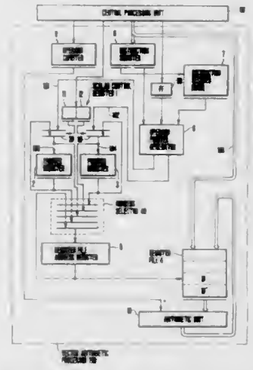
whereby said central processing unit may be directed to address the same location in said memory in either addressing mode without said central processing unit switching address modes.

4,928,238

SCALAR DATA ARITHMETIC CONTROL SYSTEM FOR VECTOR ARITHMETIC PROCESSOR

Sunao Sekiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,102
Claims priority, application Japan, Jul. 4, 1986, 61-158221
Int. Cl.[5] G06I *15/347, 15/16, 12/00*
U.S. Cl. 364—200 4 Claims



1. A scalar data arithmetic control system for a vector arithmetic processor for performing vector arithmetic operations independently of a central processing unit under the control of said central processing unit, said vector arithmetic processor comprising:

a register file for storing an operand supplied from said central processing unit when a vector operation instruction is to be executed;

pointer register means for storing and outputting to said register file address data for said operand stored in said register file;

an operand counter for counting operands supplied from said central processing unit to said register file, a count of said operand counter being incremented when said operand is loaded in said register file and decremented when said vector operation instruction is executed; and

a scalar control register for storing a value representing whether said operand is a scalar or vector operand, said value being determined by said central processing unit on the basis of said vector operation instruction and supplied therefrom to said scalar control register; said pointer

VOL
1114
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register means being coupled to said scalar control register; wherein

when said value stored in said scalar control register is representative of an operand being scalar, second and subsequent cycles of the arithmetic operations are performed using same address data outputted from said pointer register means for said operand as that used in a first cycle of the arithmetic operations so as to perform scalar arithmetic operations, and said central processing unit sets only said operand counter in place of loading of said operand in said register file.

4,928,239

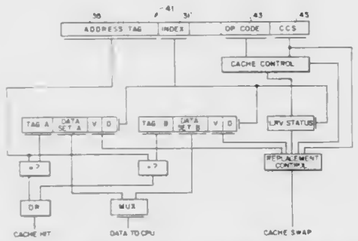
CACHE MEMORY WITH VARIABLE FETCH AND REPLACEMENT SCHEMES

Allen Baum, Palo Alto; William R. Bryg, Saratoga; Michael J. Mahon, San Jose; Ruby B. Lee, Cupertino, and Steven S. Muchnick, San Francisco, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 879,649, Jun. 27, 1986, abandoned. This application May 26, 1989, Ser. No. 358,460

Int. Cl.[5] G06F *9/32*

U.S. Cl. 364—200 **8 Claims**



1. A method for selecting for replacement data blocks in a cache memory of a computer system at a time when a new data block is retrieved from a main memory of the computing system wherein the computer system comprises a processor for fetching and executing data, the main memory, and the cache memory, the method comprising:

presenting an instruction from the processor to the cache memory, said instruction including a cache control specifier indicative of a type of data structure included in the cache memory;

selecting one of a plurality of replacement schemes for swapping a data block from cache memory, said selected replacement scheme being selected based on a value of said cache control specifier; and

swapping a data block from cache memory in accordance with said selected replacement scheme when a new data block is retrieved from the main memory of the computing system.

4,928,240

ACTIVE CLEARANCE CONTROL

Samuel H. Davison, Loveland; Kevin H. Kast, Cincinnati, and Aidan W. Clark, Blue Ash, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 24, 1988, Ser. No. 160,052

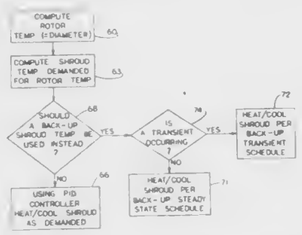
Int. Cl.[5] F01D *11/00*

U.S. Cl. 364—431.02 **47 Claims**

2. A method of controlling tip clearance in a turbine in a gas turbine engine, comprising the following steps:

(a) ascertaining turbine rotor temperature;

(b) computing a demanded shroud temperature in response to the rotor temperature; and



(c) adjusting actual shroud temperature in response to the demanded shroud temperature.

4,928,241

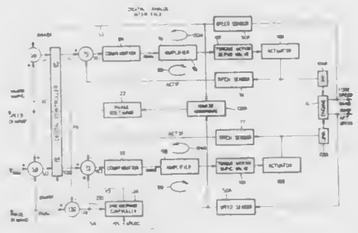
AIRCRAFT PROPELLER CONTROL

Stanley G. Day, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 737,972, May 28, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 96,283

Int. Cl.[5] B64C *11/50*

U.S. Cl. 364—424.01 **6 Claims**



6. A control for aft and fore aircraft propellers which rotate in opposite directions about a common axis, comprising:

(a) a fore speed sensor for producing a fore speed signal indicative of the speed of the fore propeller;

(b) an aft speed sensor for producing an aft speed signal indicative of the speed of the aft propeller;

(c) a fore pitch sensor for producing a fore pitch signal indicative of the pitch of the fore propeller;

(d) an aft pitch sensor for producing an aft pitch signal indicative of the pitch of the aft propeller;

(e) a phase sensor for producing a phase signal indicative of the phase angle between the two propellers;

(f) a fore pitch actuator for changing the pitch of the fore propeller;

(g) an aft pitch actuator for changing the pitch of the aft propeller;

(h) means for comparing the fore and aft speed signals with a demanded speed signal and for producing fore and aft speed error signals;

(i) means for processing the fore and aft speed error signals and for providing processed fore and aft speed error signals indicative of a fore and aft pitch angle correction required to adjust the speed of the respective fore and aft propellers;

(j) means for comparing the fore and aft speed error signals with the respective fore and aft pitch signals and producing fore and aft pitch error signals;

(k) means for changing the respective pitches of the fore and aft propellers in response to the respective pitch error signals of (j);

(l) means for comparing the phase signal with a demanded phase signal and for producing a phase error signal; and

(m) means for modifying the aft processed speed error signal of (i) in response to the phase error signal.

4,928,242

VEHICLE SPEED SENSOR ABNORMALITY DETECTION DEVICE

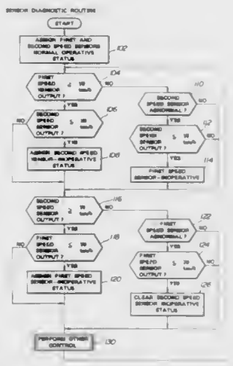
Yutaka Suzuki, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 26, 1988, Ser. No. 200,126

Claims priority, application Japan, May 28, 1987, 62-79952[U]

Int. Cl.[5] G01M *19/00*

U.S. Cl. 364—424.03 **10 Claims**



1. In a system

a first sensor for sensing the magnitude of a first operational parameter;

a second sensor for sensing said magnitude of said first operational parameter;

a control circuit which receives the outputs of said first and second sensors and which produces a control signal, said control circuit including means for diagnosing the normality of said first and second sensors, said diagnosing means including circuitry for:

comparing the output of said first sensor with a predetermined value;

comparing the output of said second sensor with said predetermined value;

indicating that said second sensor is malfunctioning in the event that the output of said first sensor is above said predetermined value and the output of said second sensor is below said predetermined value; and

indicating that said first sensor is malfunctioning in the event that the output of said first sensor is below said predetermined value and the output of said second sensor is above said predetermined value.

4,928,243

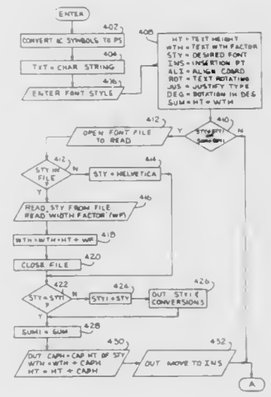
METHOD AND SYSTEM FOR PRINTING GRAPHICS AND TEXT FROM VECTOR-BASED COMPUTER AIDED SOURCE INFORMATION

William L. Hodges, Prairie Village, and Patrick J. Cheek, Shawnee Mission, both of Kans., assignors to Preco Industries, Inc., Lenexa, Kans.

Filed Oct. 6, 1987, Ser. No. 106,543

Int. Cl.[5] G05F *3/12*

U.S. Cl. 364—519 **11 Claims**



1. In a system for converting entity descriptions in vector notation of drawing components making up a plot wherein said entity description includes plotting data and the identity of entity type such as arc, text, or the like into a format for use by an image creation device such as an electrostatic printer, laser printer, or the like for creating an image of the plot, a method of operating the system for converting the entity descriptions in vector notation into entity descriptions in device notations, such as page description language, said method comprising the steps of:

selecting an entity description for conversion;

identifying the type of the entity described in the selected entity description;

converting the plotting data in vector notation of the selected entity description into corresponding plotting data in device notation according to the type of entity described in the selected entity description; and

producing signals for output representative of said entity description in device notation including signals representative of said entity type and said corresponding plotting data for use by said image creation device in creating an image of the drawing entity corresponding to said selected entity description according to said corresponding plotting data;

the image creation device further including means for producing an image of said selected entity at a selected gray scale level according to said corresponding plotting data, said method further including the steps of entering signals representative of a selected gray scale level of said selected entity, and

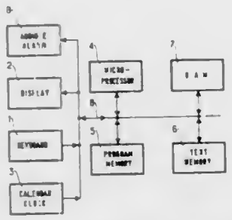
including said gray scale level in said corresponding plotting data.

4,928,244

ELECTRONIC FRANKING MACHINE INCLUDING FRANKING LIMIT VALUES

Bernard Vermeuse, L'Hay-les-Roses, France, assignor to Societe Anonyme dite : SMH Alcatel, Paris, France

Filed Feb. 29, 1988, Ser. No. 161,949
Claims priority, application France, Feb. 27, 1987, 87 02669
Int. Cl.[5] G07B *17/00*
U.S. Cl. 364—464.02 **9 Claims**



1. A franking machine comprising a keyboard, a display, a calendar clock, a microprocessor, a program memory, a text memory, and a working memory connected to a bus, a first set of messages for normal franking operations and a second set of messages for special operations being stored in the text memory, the program memory containing programs relating to each message in the first and second sets of messages, the second set of messages being accessible from a Menu key on the keyboard, depressing said Menu key causing a beginning-of-menu first message to appear, said first message comprising options each identified by a different digit corresponding to a different digit key on the keyboard, wherein:

said beginning-of-menu first message includes an option for fixing a franking limit value in order to prevent any franking operation at a higher value, said operation being identified by a digit;

the second set of messages includes a change of limit value message which appears after selecting the option for fixing the limit value, in order to receive a limit value from the keyboard; and

the first set of messages includes a "franking limit exceeded" message which appears whenever a franking value is confirmed which is greater than the limit value contained in the working memory, said franking limit exceeded message prohibiting franking.

4,928,245

AUTOMATED CARTRIDGE SYSTEM

Michael E. Moy, Lafayette; Kelly J. Beavers, Boulder; Stuart W. Bray, Louisville; Frank A. Goodknight, Boulder; Paul Kummli, Boulder; Eugene Kutasy, Boulder; Raymond L. Lucchesi; Frederick G. Munro, both of Broomfield; Richard G. Sellke, Denver, and Thomas J. Studebaker, Boulder, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Division of Ser. No. 7,047, Jan. 27, 1987, Pat. No. 4,864,511.
This application Aug. 24, 1989, Ser. No. 398,280
Int. Cl.[5] G11B *15/00, 23/00*
U.S. Cl. 364—513 **15 Claims**

1. In a data storage and retrieval subsystem of a data processing system, the subsystem including a library storage module for storing a plurality of magnetic tape cartridges in a pair of substantially cylindrical arrays disposed concentrically about a vertical axis, a robot for transferring the cartridges comprising:

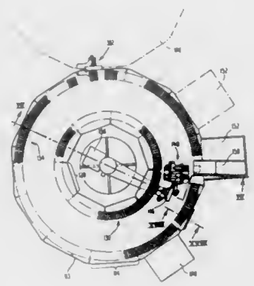
an arm mounted for rotation about the vertical axis;

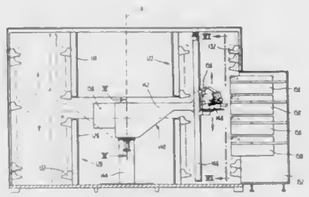
means, attached to the end of said arm, for raising and lowering the cartridges parallel to the vertical axis;

a turntable mounted for rotation upon said raising and lowering means;

a pair of hands mounted for extension and retraction in an opposed relationship upon said turntable, said hands being adapted for rotation about their axes of extension and restraction; means for rotating said turntable; and

means for rotating said hands;





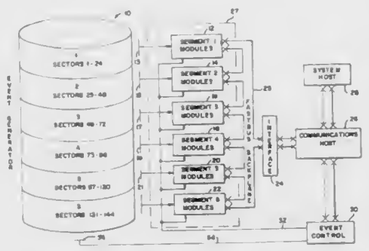
wherein each of said arms, said means for raising and lowering the cartridges, said turntable, said hands, and said rotating means act independently one from the other thereby minimizing diagnostic control.

4,928,246

MULTIPLE CHANNEL DATA ACQUISITION SYSTEM

H. Bert Crawley; Eli I. Rosenberg; W. Thomas Meyer; Mark S. Gorbics, all of Ames; William D. Thomas, Boone; Roy L. McKay, and John F. Homer, Jr., both of Ames, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 21, 1988, Ser. No. 261,031
Int. Cl.[5] G06K *15/00*; H04J *3/00*
U.S. Cl. 364—514 **30 Claims**



1. A multiple channel data acquisition system for converting analog signals from a multiplicity of data channels into digital

data samples and for transferring the data samples to a host processor, said data acquisition system comprising:

a plurality of data acquistion modules, each including a local processor means, module memory means, channel conversion means, front end buffer (FEB) means, and communications coupling means;

a high speed communication pathway which couples each communications coupling means of a respective module to the host processor;

each of said data acquisition modules further including a module bus for coupling said FEB means, said module memory means, said local processor means, and said communication coupling means, said module bus adapted for bidirectional communications between said FEB means and said module memory means, said FEB means and said communications coupling means, or said module memory means and said communications coupling means;

said channel conversion means including means for periodically converting the analog signals from at least one of said data channels into the data samples, cache memory means, means for storing the data samples in said cache memory means, and means for periodically transferring the data samples stored in said cache memory means to said FEB means;

wherein said host processor controls communications between said communications coupling means and said module memory means or said FEB means; and

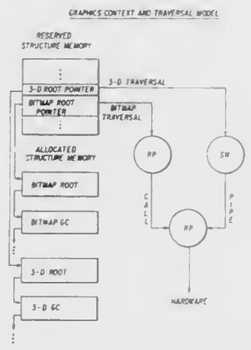
wherein said local processor controls communications between said module memory means and said FEB means or said communications coupling means.

4,928,247

METHOD AND APPARATUS FOR THE CONTINUOUS AND ASYNCHRONOUS TRAVERSAL AND PROCESSING OF GRAPHICS DATA STRUCTURES

Peter L. Doyle, Northboro; John P. Ellenberger, Groton; Ellis O. Jones, Andover; David C. Carver, Medway; Steven D. DiPirro, Holliston; Branko J. Gerovac, Marlboro, all of Mass.; William P. Armstrong; Ellen S. Gibson, both of Salt Lake City, Utah; Raymond E. Shapiro, Marlboro, Mass.; Kevin C. Rushforth, West Valley City, and William C. Roach, Salt Lake City, both of Utah, assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 85,081, Aug. 13, 1987. This application Apr. 20, 1988, Ser. No. 184,108
Int. Cl.[5] G06F *3/14*
U.S. Cl. 364—518 **12 Claims**



1. A method of operating a computer graphics system comprising the steps of:

(a) providing a plurality of application processes in a host central processing unit;

(b) operating said host central processing unit to execute said application processes to thereby generate individual graphics data structures relating to said application processes, each of said individual graphics data structures containing graphics data and commands representative of an object to be displayed by said computer graphics system;

(c) further operating said host central processing unit to store said individual graphics data structures in a memory device;

(d) operating a graphics device to continuously and asynchronously traverse said memory device through at least a portion of each of said individual graphics data structures to identify a sequence of certain ones of said individual graphics data structures and to asynchronously read and transmit said graphics data and commands of said certain ones of said individual graphics data structures, in accordance with said sequence, to a graphics subsystem for processing, manipulation and display; and

(e) identifying, ordering and setting said sequence of said certain ones of said individual graphics data structures by cooperatively operating said graphics device and said host central processing unit through further execution of said application processes to:

(i) selectively generate and control separate traversal requests, each of said separate traversal requests containing information on the mode and type of traversal of a preselected one of said certain ones of said individual graphics data structures;

(ii) attach each of said generated traversal requests to the respective preselected one of said certain ones of said individual graphics data structures; and

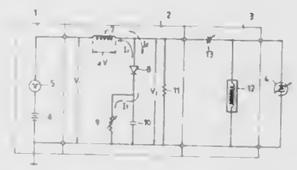
(iii) read and execute each of said traversal requests during the continuous and asynchronous traversal of said memory device to provide graphics processing of a multiple of application processes.

4,928,248

LIGHT SOURCE DRIVING DEVICE

Akira Takahashi, and Musubu Koishi, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 3, 1989, Ser. No. 347,375
Claims priority, application Japan, May 7, 1988, 63-110750
Int. Cl.[5] H01S *3/097*
U.S. Cl. 372—38 **6 Claims**



1. A light source driving device, for driving a light source comprising:

an input voltage generating section for superposing a pulse voltage on a predetermined DC voltage to provide an input voltage;

a voltage converting section having inductor means and a step recovery diode; and

a driving section having delay means,

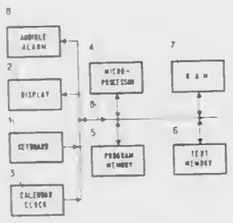
said voltage converting section applying said input voltage through said inductor means to said step recovery diode, to provide a very short pulse voltage,

said driving section for applying said very short pulse voltage to the light source, and said delay means for delaying said very short pulse voltage, inverting the polarity

VOL 1114 ISS 4 MY 22 1990 UMI

thereof, and applying said inverted very short pulse voltage to the light source.

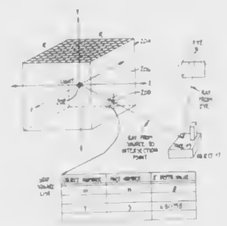
4,928,249
OPERATING SYSTEM FOR AN ELECTRONIC FRANKING MACHINE
Bernard Vermesse, l'Hay-les-Roses, France, assignor to Societe Anonyme dite : SMH Alcatel, Paris, France
Filed Feb. 29, 1988, Ser. No. 161,948
Claims priority, application France, Feb. 27, 1987, 87 02667
Int. Cl.[5] G07B *17/00*
U.S. Cl. 364—518 **12 Claims**



1. A franking machine comprising a keyboard including ten digit keys, a display, a calendar clock, a microprocessor, a program memory, a text memory, and a working memory interconnected by a bus, wherein:
the display is suitable for displaying a text of L lines of N alphanumeric characters;
the keyboard further includes an Enter key, a Cancel key, a Star key, and a Menu key;
a first set of messages for normal franking operations and a second set of messages for special operations are stored in the text memory;
the second set of messages is accessible by means of the Menu key;
each message in the first and second sets of messages is split into screens each comprising a number L of lines and N of alphanumeric characters equal to the number L of lines and N of characters that can be displayed by the display, with the screens of a message being displayed in succession;
each screen is fully displayed on the display after being transferred from the text memory into the working memory; and
the program memory contains as many programs as there are messages, with each program relating to one of the messages. with a message being displayed by running the corresponding program, with the first set of messages guiding an operator by indicating the next operation to be performed until a franking operation is achieved, and with the second set of messages guiding the operator in performing any special operation by means of messages each of which consists in a sequence of options which, on being selected, lead to corresponding other messages, and so on until the special operation is achieved.

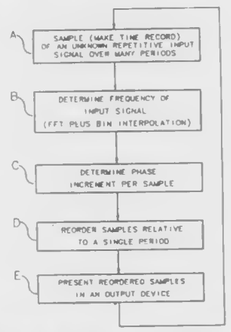
4,928,250
SYSTEM FOR DERIVING RADIATION IMAGES
Donald P. Greenberg, Michael F. Cohen, and Eric A. Haines, all of Ithaca, N.Y., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jul. 2, 1986, Ser. No. 881,067
Int. Cl.[5] G06F *15/66*
U.S. Cl. 364—518 **53 Claims**

20. A method for defining the radiation data between a surface and a radiation source in an environment, said method comprising:
defining a polyhedron enclosing said radiation source and defining grid cells on one or more planes of the polyhedron; and



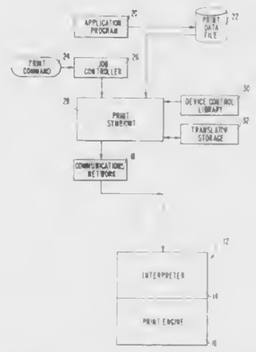
projecting an image of said surfaces onto the polyhedron in the direction of the radiation source and determining which grid cells are enclosed by or in contact with the image.

4,928,251
METHOD AND APPARATUS FOR WAVEFORM RECONSTRUCTION FOR SAMPLED DATA SYSTEM
Michael S. Marzalek, Petaluma; Stephen R. Peterson, Santa Rosa, both of Calif., and John A. Weedler, Urbana, Ill., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 27, 1987, Ser. No. 43,070
Int. Cl.[5] G01R *23/02*
U.S. Cl. 364—484 **12 Claims**



1. A signal analysis method for a repetitive input signal comprising the steps of:
generating a clock signal;
sampling said repetitive input signal in accordance with said clock signal without reference to triggering indicia of said repetitive input signal in order to obtain signal representations;
determining the fundamental frequency of said repetitive input signal from said signal representations;
determining phase information for each of said signal representations relative to a reference phase of said repetitive input signal;
sorting said signal representations according to phase relative to said reference phase of said repetitive input signal to obtain sorted signal representations; and
presenting said sorted signal representations to an output device relative to said reference phase thereby to reconstruct an image of said signal waveform.

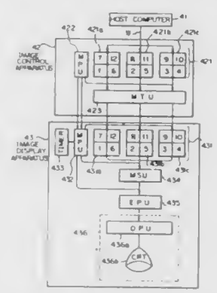
4,928,252
PRINTING APPARATUS AND METHOD FOR PRINTING A PLURALITY OF PAGES ONTO A SINGLE SHEET
David Gabbe, Hudson, and Ned Batchelder, Brookline, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Feb. 24, 1988, Ser. No. 159,947
Int. Cl.[5] G06F *3/12*
U.S. Cl. 364—519 **12 Claims**



12. An apparatus for printing a plurality of pages on a single sheet comprising:
means for generating pages in a page description format;
means for transmitting a print request;
means, coupled to said transmitting means, for scheduling said transmitted print request;
means, responsive to said print request and data representing said pages in a page description format, for printing said pages on a sheet;
means, coupled to said generating means, for storing said pages in response to said generating means,
means, coupled to said printing means, said scheduling means, and said storing means, for determining at least one grid configuration, each of said grid configurations defining a plurality of grid areas for printing pages therein, for calculating scale factors to establish the size of a page to be printed from one of said page descriptions to fit in one of said grid areas in each of said grid configurations, and for determining one of said grid configurations having a percent coverage of surface area of said sheet greater than a predetermined percentage;
means, coupled to said means for determining at least one grid configuration, for generating instructions for printing the plurality of pages in corresponding grid areas of said grid configuration having a percent coverage of surface area of said sheet greater than a predetermined percentage; and
said printing means including means for interpreting said instructions and for printing a plurality of pages on the single sheet in response to said interpreting means.

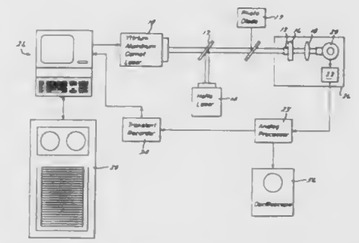
4,928,253
CONSECUTIVE IMAGE PROCESSING SYSTEM
Junichi Yamauchi; Kimiko Maejima; Kaoru Eguchi, and Noriko Kabuyama, all of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 21, 1987, Ser. No. 5,776
Claims priority, application Japan, Jan. 25, 1986, 61-14444; Jan. 25, 1986, 61-14443; Jan. 25, 1986, 61-14442
Int. Cl.[5] G09G *1/28*
U.S. Cl. 364—521 **10 Claims**

1. A consecutive image processing system for smoothly and consecutively processing image data when transferring and displaying said image data stored in image memories and display memories, said system comprising:
a host computer;
an image control means for controlling a display of images, having a plurality of image memories divided into a plurality of memory areas for storing image frames having a display order, said display order being applied to allow performance of a display based on either a memory switch or an address switch so that the memory switch and address switch are not performed simultaneously, and a first microprocessor unit for commanding an enlargement rate,



a memory transfer, and a display start based on a command from said host computer; and
an image display means for displaying images, having a plurality of display memories each divided into a plurality of memory areas corresponding to said image memories for storing image frames to be displayed, each image frame having a display order corresponding to said image memories, and a second microprocessor unit for commanding a memory switch and a start address of an enlarged image under said enlargement rate based on a command from said first microprocessor unit.

4,928,254
LASER FLASH THERMAL CONDUCTIVITY APPARATUS AND METHOD
Arne K. Knudsen, 4007 Oak Ct.; Scott H. Delzer, 5316 Russell St., and Charles A. Langhoff, 1601 Clover La., all of Midland, Mich. 48640
Filed Apr. 28, 1988, Ser. No. 187,372
Int. Cl.[5] G06F *15/20; G01N 25/20*
U.S. Cl. 364—556 **8 Claims**



1. A method of ascertaining the thermal diffusivity of a sample comprising:
applying a plurality of discrete temporally-spaced radiant energy pulses to a first portion of said sample, each of said radiant energy pulses having a peak power below the level

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at which damage to said sample occurs, each of said radiant energy pulses causing a discrete temperature rise pulse to propagate through said sample to a second portion of said sample;

sensing said temperature rise pulses at said second portion and electrically recording said sensed temperature rise pulses as data in a two-state memory device wherein each discrete temperature rise pulse corresponds to a discrete datum;

statistically processing said data to derive a set of favored values indicative of the temperature of said second portion as a function of time; and

further processing said set of favored values to determined the thermal diffusivity of said sample.

4,928,255

METHOD AND APPARATUS FOR EXPLOSION PROTECTION OF PLANTS, PIPELINES AND THE LIKE BY PRESSURE MONITORING

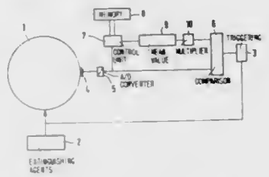
Hermann Breuaecke, Darmstadt; Horst Liere, Eppertshausen, and Reinhold Koch, Hsd Konig, all of Fed. Rep. of Germany, assignors to IRS Industrie Rationalisierungs Systeme GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 20,000, Feb. 27, 1987, abandoned. This application May 9, 1989, Ser. No. 352,667

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1986, 3607141

Int. Cl.[5] **G08B** *17/00*; **G06F** *11/30*

U.S. Cl. 364—558 **27 Claims**



17. An automatic system for automatically copying with an emergency situation in plant facilities, pipelines and the like wherein a system reference variable is continuously updated to a value which is higher than a prevailing means system parameter value by a safety margin, said system comprising:

sensor means for monitoring successive system parameter values of said system in selected areas, said sensor means being connected to an analog/digital converter arranged to supply signals representing said monitored system parameter values to a control unit and to a comparison means, said control unit supplying at least some of said system parameter values to a memory means for retention in memory and further supplying the monitored system parameter values fed to said memory means to a mean value forming means for calculating a mean value from values fed thereto over a time interval, said means value forming means being connected to a means value incrementing means arranged to increase each said means value supplied to it by said safety margin to create a reference variable, said mean value incrementing means being arranged to supply said reference variable to said comparison means for comparison with said monitored successive system parameter values, said comparison means sending a trigger signal to a triggering means to activate said triggering means upon a monitored system parameter value exceeding said reference variable, and said triggering means automatically producing a signal which is directed to said means for initiating protective provisions for coping with said emergency situation.

4,928,256

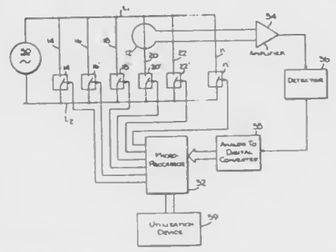
DIGITIZER FOR POSITION SENSING

James A. Parnell, and Dan R. Poole, both of Austin, Tex., assignors to Ametek, Inc., New York, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,984

Int. Cl.[5] **G08C** *21/00*; **G01B** *7/14, 7/30*

U.S. Cl. 364—561 **40 Claims**



31. An apparatus comprising:

(a) a planar pad having spaced conductors arranged along orthogonal axes thereof;

(b) a pointer capable of being moved along said planar pad;

(c) energizing means to produce responses which form a response curve dependent upon the distance between said pointer and said spaced conductors; and

(d) a control system including a microprocessor having means for controlling said energizing means and means for determining the distance of said pointer from a conductor previously determined to be nearest said pointer by performing, for each axis, the steps of:

(i) selecting a group of said spaced conductors including said conductor nearest said pointer;

(ii) measuring the responses for each conductor of said group;

(iii) mathematically fitting the measured responses to a function of the form

$$Y_i = C_1 f(x_i + C_2) + C_4 g(x_i + C_2) + C_3$$

which represents the response Y_i *for a conductar at coordinate* x_i, where f(x) is an amplitude term for said pointer having a gain coefficient C_1, g(x) is a tilt term having a tilt coefficient C_4, C_2 is the distance from said pointer to said nearest of said spaced conductors and C_3 represents an offset term, said fitting being performed by a least-squares technique to determine values of C_1, C_2, C_3 and C_4 which fit said measured responses for said group, said value of C_2 determined thereby corresponding to the distance of said pointer from said nearest conductor.

40. An apparatus comprising:

(a) a planar pad having spaced conductors arranged along orthogonal axes thereof;

(b) a pointer movable relative to said planar pad;

(c) energizing means to produce responses which form a response curve dependent upon the tilt angle and distance between said pointer and said spaced conductors; and

(d) a control system including a microprocessor having means for controlling said energizing means, and means for determining said positional coordinate and tilt angle of said pointer, for each axis as it is moved along said planar pad, by the steps of:

(i) storing information functionally related to the characteristic shape of said response curve;

(ii) measuring responses produced when said pointer is at an unknown positional coordinate and tilt angle relative to said planar pad;

(iii) mathematically fitting said measured responses to a functional expression which includes parameters representing said positional coordinate and tilt angle to determine therefrom values for said parameters.

4,928,257

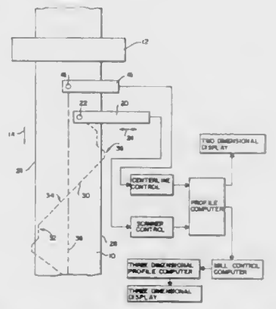
METHOD AND APPARATUS FOR MONITORING THE THICKNESS PROFILE OF A STRIP

James E. Yerkes, and Theodore H. Lethen, both of Valparaiso, Ind., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 25, 1988, Ser. No. 147,895

Int. Cl.[5] **G01B** *15/02, 15/04*

U.S. Cl. 364—563 **20 Claims**



1. The method of monitoring the thickness of longitudinally moving strip material to permit quick detection of continuous defects, comprising the steps of:

(a) scanning a strip a predetermined number of times at a plurality of sites across the strip and thereby generating a plurality of data sets with each set indicative of the thickness of the strip across the width thereof:

(b) smoothing the scans by combining the data sets and thereby generating a profile;

(c) displaying the generated profile in a two dimensional format; and,

(d) repeating steps a through c thereby continuously displaying a plurality of profiles in sequential relation so that the displayed profiles assume a three dimensional format and a continuous defect, upon the occurrence thereof, will be displayed from one profile to at least an immediately subsequent profile.

4,928,258

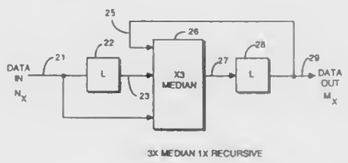
RECURSIVE MEDIAN FILTERING

Roger A. May, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 8, 1989, Ser. No. 349,558

Int. Cl.[5] **G06F** *15/31*

U.S. Cl. 364—724.17 **9 Claims**



1. A recursive median filter comprising:

a source of data in the form of samples, with each sample having a value representing a signal level;

a selection unit having a given number of input ports and one output port, with each input port adapted to receive one sample of data, the input ports being divided into a first set comprising at least two input ports and a second set comprising at least one input port, logic means in the selection unit for comparing the values of the samples at the input ports and for selecting a median sample value and supplying said median sample value to the output port;

input means coupling said source to said input ports of the first set to supply neighboring samples to said input ports, recursive means coupling the output port to said input port(s) of the second set to provide recursive sample(s).

4,928,259

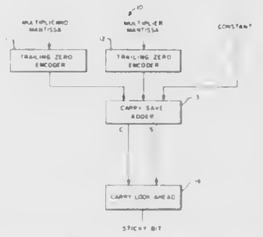
STICKY BIT PREDICTOR FOR FLOATING-POINT MULTIPLICATION

David Galbi, Mountain View, and Les Kohn, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 23, 1988, Ser. No. 248,740

Int. Cl.[5] **G06F** *7/38, 7/52*

U.S. Cl. 364—745 **10 Claims**



1. A circuit for predicting a sticky bit value when multiplying two numbers comprising:

a first trailing zero encoder for determining a number of trailing zeros in a first operand mantissa;

a second trailing zero encoder for determining a number of trailing zeros in a second operand mantissa;

an adder coupled to receive outputs of said first and second trailing zero encoders and providing a sum of said outputs to determine total number of trailing zeros in both said operand mantissas;

a comparing means coupled to said adder for determining if said sum is greater than a predetermined number, wherein determining said sticky bit value.

4,928,260

CONTENT ADDRESSABLE MEMORY ARRAY WITH PRIORITY ENCODER

Patrick T. Chuang; Robert L. Yau, both of Cupertino; Hiroshi Yoshida, Santa Clara, and Moon-Yee Wang, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 11, 1988, Ser. No. 193,315

Int. Cl.[5] **G11C** *15/00*

U.S. Cl. 365—49 **6 Claims**

1. A content addressable memory system comprising:

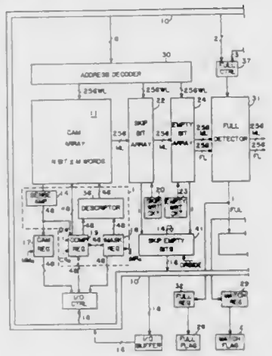
a plurality of memory cells arranged in rows and columns in an array of N bit words by M word cells;

a plurality of word lines extending through said array for addressing different words in said memory cells each of said words comprising a plurality of adjacent ones of said cells extending in a first direction in said array;

a plurality of match lines extending through said array in parallel with said word lines in said first direction;

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a plurality of bit lines extending through said array in a second direction perpendicular to said first direction, each of said bit lines communicating with said cells in one column of said cells extending through said array in said second direction;
means for storing bits in selected ones of said memory cells in said array;
an input/output (I/O) bus;
means for supplying on said I/O bus a match word to be compared with one or more of said M words in said array;
comparing means for simultaneously comparing the bits of said match word with the bits of two or more of said M words in said array;



match detecting means associated with each bit of said M words in said array for detecting a match condition between said bits in said match word and said bits in two or more of said M words in said array;
means for masking selectable ones of said match conditions to produce one or more unmasked match word conditions;
full detecting means associated with said memory system for detecting an empty word condition or a full condition in said array; and
priority encoder means responsive to said match detecting means and said full detecting means for providing array address indications for said one or more unmasked match word conditions in said array and for providing array address indications for empty word locations in said array.

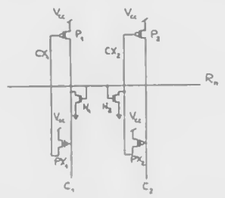
4,928,261

CMOS READ-ONLY MEMORY WITH STATIC OPERATION

Chinh Nguyen, Vimercate, Italy, assignor to SGS-Thomson Microelectronics SRL, Italy

Filed Sep. 16, 1988, Ser. No. 245,655
Claims priority, application Italy, Oct. 20, 1987, 22339 A/87
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—104 **4 Claims**

1. A CMOS read-only memory comprising in combination,
at least one individually activatable row and a plurality of main columns crossing said row and defining a plurality of cross-points, each said column of said plurality of main columns being connected to a supply voltage through a respective first pull-up transistor;
a first pull-down cell placed at a first cross-point of said plurality of cross-points and controlled by said at least one row;
a second pull-down cell placed at a second cross-point of said plurality of cross-points and controlled by said at least one row; and
a plurality of auxiliary columns, each auxiliary column associated with a respective main column and connected to the supply voltage through a respective second pull-up transistor, the respective gate of each said second pull-up transistor, the respective gate of each said second pull-up



transistor being connected to a respective main column and the respective gate of each said first pull-up transistor being connected to a respective auxiliary column.

4,928,262

MARINE SEISMIC STREAMER RETRIEVAL SYSTEM

Walter P. Neeley, Irving, and Sammie F. Ritter, Roanoke, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 9, 1988, Ser. No. 269,049
Int. Cl.[5] G01V *1/38*
U.S. Cl. 367—106 **24 Claims**



1. A marine seismic streamer system comprising:
a marine seismic streamer;
a vessel for towing said streamer through a body of water;
at least one streamer recovery unit connected into said streamer, said unit comprising:
a housing;
a source of compressed gas positioned in said housing and having an outlet;
a valve for closing and opening said outlet;
an inflatable, flotation device stored in said housing;
means for connecting said valve to said flotation device;
means aboard said vessel for generating a trigger depth signal which is representative of the depth at which said flotation device is to be inflated;
means in said housing for continuously receiving and storing said trigger depth signal through said streamer;
means for continuously measuring the operating depth of said streamer; and
means for opening said valve when said operating depth equals or exceeds the depth represented by said last received and stored trigger depth signal.

4,928,263

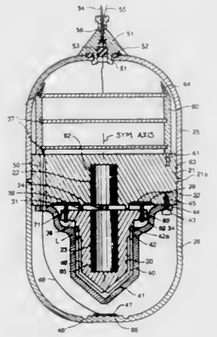
HYDROPHONES AND SIMILAR DEVICES

Bruce A. Armstrong, and Robert G. Dunn, both of Dartmouth, Nova Scotia, Canada, assignors to Hermes Electronics Limited, Dartmouth, Nova Scotia, Canada

Filed Feb. 10, 1989, Ser. No. 308,512
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—118 **23 Claims**

1. A direction finding, motion-sensitive transducer, comprising:

(a) an inertial mass;
(b) means defining a mounting base;
(c) resilient means interconnecting said inertial mass with said mounting base, said inertial mass extending along a symmetry axis when at rest in a non-accelerated condition, and said resilient means being adapted to permit the inertial mass to wobble relative to the mounting base in radial directions relative to said symmetry axis in response to and in accordance with the direction of components of acceleration of the mounting base which are transverse to the symmetry axis;



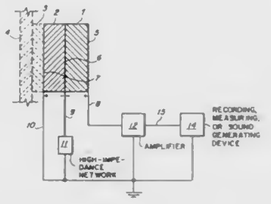
(d) a plurality of sensing elements arranged to respond to the wobbling motion of the inertial mass relative to the mounting base, with said sensing elements being located so as to define multiple directional channels which are adapted to produce outputs dependent on the directions of said acceleration components, and wherein
(e) said inertial mass, said resilient means and said sensing elements together define resonant systems, and damping means common to said inertial mass, said resilient means, said sensing elements and the multiple directional channels defined by the latter for controlling the resonance of said systems.

4,928,264

NOISE-SUPPRESSING HYDROPHONES

Manfred Kahn, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1989, Ser. No. 373,979
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—141 **12 Claims**



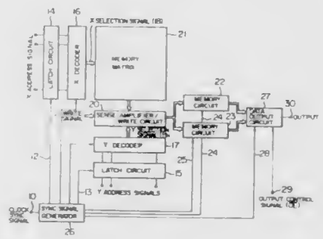
1. A hydrophone system having a hydrophone mounted under water on the outside of the hull of a ship, and associated apparatus on board ship, for detecting acoustic sound signals transmitted under water, said hydrophone system comprising:
a flat solid transducer having one of its flat surfaces affixed on a mounting structure fastened to the hull, and having piezoelectric sensitivity to noise generated by the ship and transmitted to the transducer through said mounting structure, said flat solid transducer generating a first voltage signal proportional to the piezoelectric sensitivity of said flat solid transducer to said mount-transmitted ship noise;
a flat void-containing transducer having one of its flat surfaces in contact with the other surface of the solid transducer, said void-containing transducer having piezoelectric sensitivity to both mount-transmitted ship noise and to hydrostatic acoustic signals, said flat void-containing transducer generating a second voltage signal proportional to the piezoelectric sensitivity of said flat void-containing transducer to both said mount-transmitted ship noise and said hydrostatic acoustic signals;
a first electrode disposed on an outer surface of the void-containing transducer, a second electrode interposed between the void-containing transducer and the solid transducer, and a third electrode disposed on the surface of the solid transducer facing toward the hull of the ship, said first voltage signal appearing between said second and third electrodes and said second voltage signal appearing between said first and second electrodes; and
detecting means on board ship electrically connected to said electrodes and being responsive to said voltage signals generated in response to mount-transmitted ship noise and to acoustic signals for generating electrical representations of sound signals relatively free of mount-transmitted ship noise.

4,928,265

SEMICONDUCTOR INTEGRATED CIRCUIT

Hisayuki Higuchi, Kokubunji; Noriyuki Homma, Kodaira; Makoto Suzuki, Niiza, and Suguru Tachibana, Hachioji, all of Japan, assignors to Hitachi, Ltd., Kyo, Japan

Filed Nov. 2, 1988, Ser. No. 266,148
Claims priority, application Japan, Nov. 2, 1987, 62-275812; Jan. 22, 1988, 63-10624; Mar. 11, 1988, 63-56145; Mar. 11, 1988, 63-56147
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—189.01 **9 Claims**



1. A semiconductor integrated circuit comprising:
(1) a memory matrix including a plurality of memory cells;
(2) address means for selecting at least one of said plurality of memory cells of said memory matrix in response to an address signal;
(3) a sense amplifier for amplifying a signal from said at least one selected memory cell;
(4) a first memory circuit having an input connected to the output of said sense amplifier;
(5) a second memory circuit having an input connected to the output of said sense amplifier; and
(6) a signal generator for generating a first control signal and a second control signal in response to changes in said address signal,
wherein the timing of said first control signal is set to be different from the timing of said second control signal,

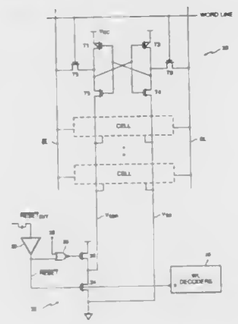
wherein said first memory circuit fetches the output of said sense amplifier in response to said first control signal, and wherein said second memory circuit fetches the output of said sense amplifier in response to said second control signal.

4,928,266

STATIC RAM WITH HIGH SPEED, LOW POWER RESET

Robert A. Abbott, Lake Oswego, Oreg.; Bruce Barbara, Dublin, and Richard S. Roy, Pleasanton, both of Calif., assignors to Visic, Inc., San Jose, Calif.

Filed May 26, 1988, Ser. No. 199,010
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—189.01 **6 Claims**



1. In a static memory device comprising an array of static memory cells, each memory cell having first and second cross-coupled inverters, the improvement comprising: power voltage connections to said memory cells including distinct power voltage connections to said first and second inverters of each said memory cell; and

reset means, coupled to said power voltage connections and responsive to a reset signal, for generating a voltage imbalance on said power voltage connections in response to said reset signal so that distinct voltage levels are applied to said first and second cross-coupled inverters of each memory cell, said voltage imbalance causing all of said memory cells in said array to be set into a predetermined state;

said static memory device including a multiplicity of bit lines for conveying data values stored in said memory cells, and a multiplicity of word lines for enabling the conveyance of data values for corresponding memory cells to corresponding ones of said bit lines; said reset means including means for disabling said multiplicity of word lines in response to said reset signal so that said memory cells are isolated from said bit lines while said memory cells are set to said predetermined state.

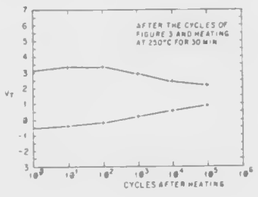
4,928,267

METHOD OF RECONDITIONING AN ELECTRONICALLY PROGRAMMABLE MEMORY DEVICE

David A. Baglee, and Ronald N. Parker, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1985, Ser. No. 776,715
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—218 **6 Claims**

1. A method of reconditioning an electrically programmable semiconductor read only memory cell after it has been subjected to a plurality of write and erase cycles resulting in narrowing of its Write/Erase window, comprising:



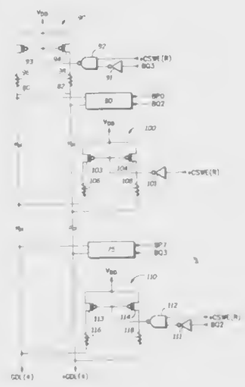
heating the cell to a temperature sufficiently high and for a sufficient length of time to re-open said Write/Erase window.

4,928,268

MEMORY USING DISTRIBUTED DATA LINE LOADING

Scott G. Nogle; Perry H. Pelley, III; Stephen T. Flannagan, and Bruce E. Engles, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 21, 1989, Ser. No. 342,160
Int. Cl.[5] G11C *8/00*
U.S. Cl. 365—230.03 **14 Claims**



1. A memory having a top and a bottom, comprising:

a pair of global data lines running from the top of the memory to the bottom;

an array set consisting of a plurality of arrays, including a first array and a last array, distributed along the length of the global data lines of said memory, said arrays having a top and a bottom, said arrays providing a pair of complementary signals to the global data lines when selected;

array selection means, coupled to the plurality of arrays, for selecting an array from the set of arrays;

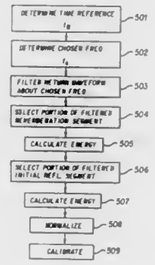
at least three loads, coupled to the pair of global data lines, distributed substantially evenly along said pair of global data lines.

4,928,269

DETERMINING IMPEDANCE OF MATERIAL BEHIND A CASING IN A BOREHOLE

Christopher V. Kimball, West Redding; Fred E. Stanke, Ridgefield, both of Conn.; Curtis J. Randall, Missouri City, Tex., and Andrew J. Hayman, Voisins-le-Bretonneux, France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 264,468, Oct. 28, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 368,065
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—35 **67 Claims**



1. A method of calculating an impedance signal related to an acoustic impedance of material behind a section of casing in a borehole, said borehole traversing subsurface earth formations, said method analyzing a return waveform obtained from an acoustic investigation of the section of casing with an acoustic excitation pulse directed thereto, the bandwidth of said pulse selected to stimulate a thickness resonance of the casing, said return waveform including a reverberation segment and an initial reflection segment, said method comprising the steps of:

determining the frequency of said thickness resonance from said return waveform,

determining a time reference indicative of the time of arrival of said return waveform,

filtering said reverberation segment in a predetermined band about said determined thickness resonance frequency, the bandwidth of said predetermined band based on said determined frequency and substantially excluding other thickness resonances;

time windowing a portion of said filtered reverberation segment based on said time reference and said determined frequency; and

calculating an integrated, amplitude-related measure of said windowed reverberation segment to produce an impedance signal.

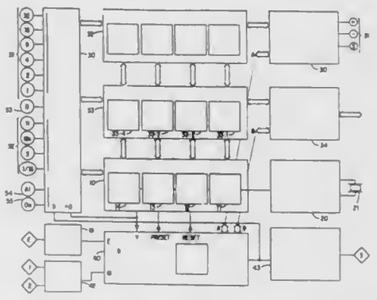
4,928,270

DIGITAL TIMER WITH CONSTANT RESOLUTION

André Chovin, Crest, and Jacques Taillebois, Bourg Les Valence, both of France, assignors to Crouzet, Montrouge, France

Filed Jun. 20, 1989, Ser. No. 368,814
Claims priority, application France, Jun. 27, 1988, 88 08718
Int. Cl.[5] G04F *8/00*; G04C *19/00*
U.S. Cl. 368—82 **5 Claims**

1. A digital timer with constant resolution, comprising a clock and a chain of binary down-counters each of which corresponds to a time range which is a multiple of that of the preceding down-counter, wherein the binary outputs of said binary down-counters are fed in parallel to display points of a first set of display points, enabling means being provided so that only the output of the most significant down-counter not at zero actuates the display points, and a display point of a second set of display points is associated with each down-counter so that only the display point corresponding to the most significant down-counter not at zero is actuated.

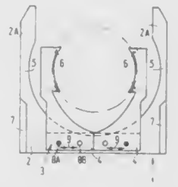


4,928,271

HOLDER FOR DISCS OF DIFFERENT DIAMETERS

Johannes P. C. M. Verhagen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 27, 1988, Ser. No. 199,985
Claims priority, application Netherlands, Jun. 10, 1987, 8701345
Int. Cl.[5] G11B *23/02*
U.S. Cl. 369—292 **11 Claims**



1. A holder intended for holding a disc, comprising at least two opposed holding elements (5) comprising holding means (6) constructed to engage a disc at its edge inside the holder (1), at least one of said holding elements (5) being arranged on an actuating element (4) to allow said holding element to be moved out of a holding position, by actuation of the actuating element, to receive or release the disc, characterized in that the movable holding element (5) is adjustable to at least two holding positions relative to a facing holding element (5) in order to hold discs of substantially different diameters.

4,928,272

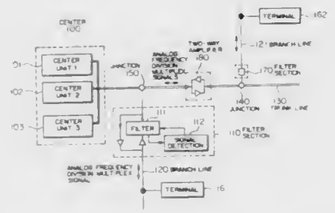
TWO-WAY CATV SYSTEM USING FREQUENCY DIVISION MULTIPLEXING

Hiroshi Ohue, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 18, 1989, Ser. No. 353,559
Claims priority, application Japan, May 23, 1988, 63-125248; Jul. 18, 1988, 63-178605
Int. Cl.[5] H04J *4/00*
U.S. Cl. 370—50 **9 Claims**

1. A two-way CATV system having a plurality of communication channels set simultaneously by using frequency division multiplexing in an upstream communication line from a plurality of terminals to a center, wherein said communication line includes a trunk line connected to the center and branch lines

branching from the trunk line, said CATV system further comprises filter means including a first digital transmultiplexer for converting a frequency division multiplex signal from the terminals into a time division multiplex signal and means for



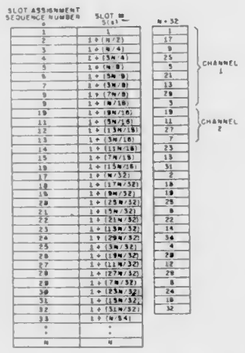
sending into the trunk line only a time slot corresponding to a frequency slot containing a signal, after converting the frequency division multiplex signal from the terminals into the time division multiplex signal through said first digital transmultiplexer.

4,928,273

TIME DIVISION MULTIPLEXER/DEMULTIPLEXER WITH DETERMINISTIC TIME SLOT ASSIGNMENT

Dimitrios Protopapas, Huntington, Conn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 21, 1989, Ser. No. 313,005
Int. Cl.[5] H04J *3/16*
U.S. Cl. 370—85.7 22 Claims



1. Slot assignment apparatus for generating a slot assignment sequence in successive iterations I, where I is initially equal to 1, for a TDM frame having N slots with respective slot numbers #1, #2, #3, . . . ,#N in increasing time order and wherein said slots assigned in said sequence are allocatable to channels carried on said frame, said channels requiring predetermined numbers, respectively, of said assigned slots, comprising:

initial assignment means for assigning slot #1 as the first slot in said sequence,

further assignment means operative during each said iteration for adding $N/2^I$ to said slot numbers of all previously assigned slots to generate further slot assignments in said sequence,

iteration incrementing means for increasing I by 1 during each said iteration,

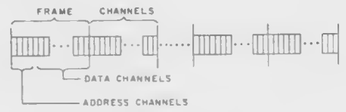
iteration control means for performing said successive iterations so as to generate said slot assignment sequence, and channel allocating means for allocating said predetermined numbers of assigned slots to said channels, respectively.

4,928,274

MULTIPLEXED ADDRESS CONTROL IN A TDM COMMUNICATION SYSTEM

Klein S. Gilhousen, San Diego, and Franklin P. Antonio, Del Mar, both of Calif., assignors to Qualcomm, Inc., San Diego, Calif.

Filed Jan. 19, 1988, Ser. No. 144,905
Int. Cl.[5] H04J *3/24*
U.S. Cl. 370—92 21 Claims



1. A communication system for sending messages from central communication stations to one or more of a plurality of mobile receivers through Earth orbital relay stations using Time Division Multiplexed communication signals, comprising:

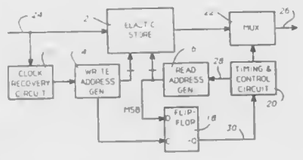
at least one central communication station having transmission means for transmitting a TDM communication signal which comprises a series of N channels, with D data channels, for $D<N$, used exclusively for transmission of message data and A address channels, where $A=N-D$, used for transmission of address information in the form of receiver addresses for receivers designated to receive messages from said station and corresponding ones of said D channels on which said receiver message is transmitted.

4,928,275

SYNCHRONIZATION OF ASYNCHRONOUS DATA SIGNALS

Thomas E. Moore, Edmonton; James A. McEachern, Kanata, and Mark S. Wight, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 26, 1989, Ser. No. 357,244
Int. Cl.[5] H04J *3/07*
U.S. Cl. 370—102 8 Claims



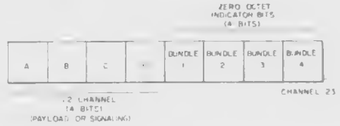
1. A method of synchronizing an asynchronous signal to produce a synchronized signal by stuffing the asynchronous signal in dependence upon a stuff request signal produced from a comparison with a threshold level of a phase difference between read and write phases with which the synchronized and asynchronous signals are respectively read from and written into a store, wherein a read address for the store is determined in synchronism with a time division multiplex frame of the synchronized signal, and the phase difference is determined at a time synchronized to a write clock for the store.

4,928,276

T1 LINE FORMAT FOR ROBBED SIGNALING FOR USE WITH CCITT 32K BIT PER SECOND ADPCM CLEAR CHANNEL TRANSMISSION AND 64KBPS CLEAR CHANNEL TRANSMISSION

Ernest E. Blondeau, Jr., Phoenix, Ariz., and Stephen J. Czarnecki, Carlsbad, Calif., assignors to AG Communication Systems Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 902,823, Sep. 2, 1986, abandoned. This application Oct. 20, 1988, Ser. No. 260,100
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—110.1 14 Claims



1. In a data transmission system having first and a second digital switching systems connected via T1 line transmission facilities, a means for generating a T1 line format for transmitting robbed signaling data from said first digital switching system via said T1 line transmission facilities, said means for generating a T1 line format comprising:

a T1 data frame, said T1 data frame including a predetermined number of data channels for transmitting data between said first and second digital switching systems;

each T1 data frame further including:

a predetermined number of clear data channels;

at least one channel for transmitting signaling data and non-clear channel data between said first and second digital switching systems said non-clear channel data providing information indicating whether a corresponding data channel contains an absence of data;

said channel being operated to transmit said signaling data and said non-clear channel data for a plurality of said clear data channels; and,

said means for generating a T1 line format further comprising:

a plurality of said T1 data frames, each including said plurality of signaling data and said non-clear channel data, and said plurality of said T1 data frames being operated to provide said signaling data and said non-clear channel data to said second digital switching system by providing a uniform portion of said signaling data and said non-clear channel data during each of said T1 data frames.

4,928,277

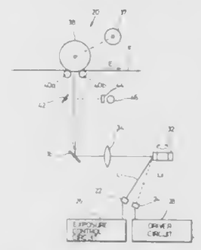
METHOD AND APPARATUS FOR DRIVING LASER BEAM SOURCE TO AVOID DROOP EFFECTS

Hisayoshi Monma, and Atsushi Suganuma, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1988, Ser. No. 206,398
Claims priority, application Japan, Jun. 18, 1987, 62-151759
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—116 8 Claims

1. A method of driving a laser beam source to emit a laser beam for use in scanning an image recording medium in order to record image formation on said image recording medium in a plurality of exposure areas, said exposure areas being spaced at intervals in a scanning direction in which said image recording medium is scanned by said laser beam, said method comprising the step of:

supplying a bias current to a laser beam source when a scanning position of said laser beam source is a predetermined distance ahead of an exposure starting position for at least one area to be exposed.

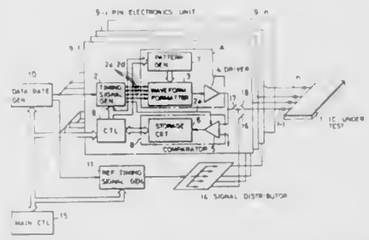


4,928,278

IC TEST SYSTEM

Taiichi Otsuji, Ebina, and Naoaki Narumi, Isehara, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 229,780
Claims priority, application Japan, Aug. 10, 1987, 62-198247; Sep. 22, 1987, 62-237981
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—1 26 Claims



21. An IC test system for testing an IC device by supplying a test signal pattern to said IC device through the input/output pins of said IC device and by receiving output signals from said IC device through said input/output pins, comprising:

(a) clock means for generating clocks;

(B) a main controller for controlling said IC test system;

(C) common timing signal generating means for generating a common timing signal in response to the clock from said clock means;

(D) a plurality of timing adjusting means; each assigned to each of said input/output pins, and for adjusting timing of said common timing signal to generate first timing signals for providing timings for supplying said test signal pattern to said IC device and a second timing signal for providing a timing for judging test result of said IC device;

(E) a plurality of pattern generating means, each assigned to each of said input/output pins, and for generating said test signal pattern in accordance with the timings defined by said first timing signals;

(F) a plurality of test result judging means, each assigned to each of said input/output pins, and each responsive to said test signal pattern and to responses of said IC device to said test signal pattern for judging the result of said responses at the timing of said second timing signal;

(G) a plurality of controllers, each for cooperating with said main controller, said timing signal adjusting means, said

VOL
1114
ISS
4
MY
22
1990
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pattern generating means and said test result judging means to measure errors of said first and second timing signals and an error of the length of a line between said IC test system and each of said input/output pins for performing arithmetic operations of and controls of said calibration of said errors;

(H) reference timing signal generating means receiving the clocks from said clock means and for generating a reference timing signal which defines a time reference when measuring said errors; and

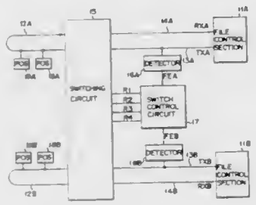
(I) distributing means for simultaneously distributing, in the case of said calibration of said errors, said reference timing signal to said plurality of test result judging means or to said plurality of test result judging means and all of said input/output pins; said main controller controlling said clock means, said common timing signal generating means, said plurality of controllers and said reference timing signal generating means to execute said calibration of said errors parallel among said plurality of controllers.

4,928,279

AUTOMATIC POS LOOP SWITCHING APPARATUS

Hidenori Muroi, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 26,289
Claims priority, application Japan, Mar. 27, 1986, 61-69241
Int. Cl.[5] G06F *11/20*
U.S. Cl. 371—11.2 **15 Claims**



1. A POS loop switching apparatus comprising:

switching circuit means for selectively connecting first and second transmission lines, to which at least one Point of Sales (POS) terminal is connected, to first and second file control means which periodically supply a control signal, to constitute at least one closed loop; and

switch control means coupled to said switching circuit means, said switch control means including;

means responsive to control signals received from both of said first and second file control means for supplying a first switching signal to said switching circuit means for causing said switching circuit means to connect said first and second file control means respectively to said first and second transmission lines, to thereby constitute first and second closed loops;

means responsive to one of said first and second file control means not generating a control signal over a predetermined period of time, for supplying a second switching signal to said switching circuit means for causing said switching circuit means to connect one of first and second transmission lines which were connected to said one of said file control means which does not generate the control signal, to the other file control means, to thereby constitute a new closed loop which includes said transmission line, said other file control means, and the other transmission line connected to said other file control means; and

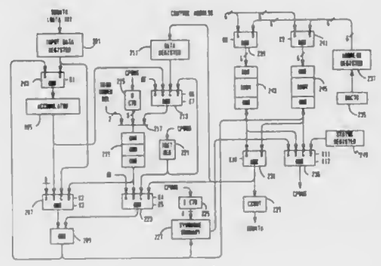
logic circuit means for supplying, when both output signals from said first and second malfunction detecting means are at said first predetermined level, the same logic signals as logic signals generated when both output signals are at said second predetermined level, to said switching circuit means.

4,928,280

FAST PROCESSOR FOR MULTI-BIT ERROR CORRECTION CODES

Martin C. Nielson, Boulder, and Kenneth R. Woodruff, Louisville, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,718
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—39.1 **9 Claims**



1. Apparatus for generating check symbols for error correctable encoding of blocks of messages composed of serial, multi-bit characters comprising:

means for receiving each successive character of a message;

means for processing successive input characters with partial check symbols generated from preceding received characters to form new partial check symbols;

means for accumulating partial check symbols until all message characters have been processed;

means for outputting accumulated check symbols to be concatenated with the block of said message characters while a next block of message characters is processed by the receiving, processing, and accumulating means;

means for selectively initializing said partial check symbols;

means for selecting the number of check symbols to be generated for each block of messages;

means for interleaving said message characters into sets; and

means for partitioning said check symbols whereby each said partition is associated with a different set of interleaved characters.

4,928,281

SEMICONDUCTOR MEMORY

Hinoko Kurosawa, Hino; Kazuya Itoh, Kodaira; Hisashi Nakamura, Ohme, and Masamichi Ishihara, Hinode, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1987, Ser. No. 60,331
Claims priority, application Japan, Jun. 13, 1986, 61-135915
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—51.1 **13 Claims**

1. A semiconductor memory comprising:

a memory array which outputs storage data, at least one data unit at a time, each data unit having a plurality of bits including a parity bit;

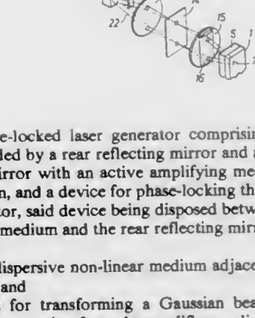
a first parity check circuit for performing parity check on storage data, at least one data unit at a time, output from said memory array;

an external terminal means for outputting the result of said parity check; and

a second parity check circuit for performing parity check on input data, at least one data unit at a time, written into said memory array, each of said input data units having a plurality of bits including a parity bit, wherein said first parity check circuit is also used as said second parity check circuit;

means for inhibiting an operation of writing said input data with respect to said memory array when a parity error is generated;

wherein said semiconductor memory is a static type RAM formed on one chip, and wherein said parity bit is added from a device which is provided outside said semiconductor memory; and



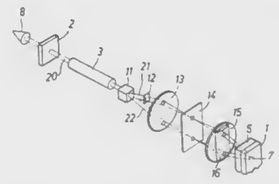
wherein said external terminal means for outputting the result of said parity check includes means for inputting-/outputting said parity bit, and the level of said external terminal means is changed to either a low or high level in accordance with the level of said parity bit when the result of said parity check is found to be normal, whereas, when a parity error is detected, the level of said external terminal is brought into a high-impedance state.

4,928,282

LASER GENERATOR WITH PHASE MODE-LOCKING

Alain Barthelemy; Serge Maneuf, and Claude Froehly, all of Limoges, France, assignors to Centre National De La Recherche Scientifique, France

PCT No. OCT/FR88/00100, § 371 Date Oct. 20, 1988, § 102(e) Date Oct. 20, 1988, PCT Pub. No. WO88/06811, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 23, 1988, Ser. No. 276,448
Claims priority, application France, Feb. 24, 1987, 87 02411
Int. Cl.[5] H01S *3/098*
U.S. Cl. 372—18 **12 Claims**



1. A mode-locked laser generator comprising: a resonant cavity bounded by a rear reflecting mirror and an outlet semi-reflecting mirror with an active amplifying medium disposed therebetween, and a device for phase-locking the modes of the laser generator, said device being disposed between the amplifying active medium and the rear reflecting mirror said device having:

(i) a non-dispersive non-linear medium adjacent to said rear mirror, and

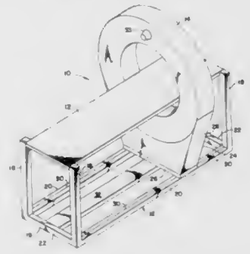
(ii) means for transforming a Gaussian beam of circular symmetry coming from the amplifier medium into a beam which travels by soliton propogation in said non-linear medium, said transforming means comprising a laser beam amplitude division interference device for forming two secondary waves, a space filter, and an afocal lens system disposed on the paths of the two secondary waves to form a reduced image of the interference pattern generated in the amplitude division interference device, said image being formed on an inlet of said to the non-linear medium opposite to the rear mirror, thereby providing a mode-locked laser in which solution propagation occurs inside said resonant cavity of said laser generator.

4,928,283

X-RAY TOMOGRAPHY APPARATUS

Bernard M. Gordon, Magnolia, Mass., assignor to Analogic Corporation, Peabody, Mass.

Filed Feb. 26, 1988, Ser. No. 160,657
Int. Cl.[5] H05G *1/02*
U.S. Cl. 378—20 **11 Claims**



1. An x-ray tomography apparatus, comprising:

an elongated patient table means having opposite ends;

a rotary fan beam x-ray tomography means encircling the patient table means; and

means for supporting the table means at opposite ends thereof and for supporting the tomography means from underneath and including means for moving the tomography means along a substantial portion of the table means,

wherein the tomography means includes means for causing at least a portion of the tomography means to continuously rotate around the table means.

4,928,284

LASER POWER CONTROL SYSTEM

Douglas H. Burns, Santa Clara, Calif., assignor to Lasa Industries, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 251,585, Sep. 28, 1988, abandoned. This application Jun. 20, 1989, Ser. No. 368,609
Int. Cl.[5] H01S *3/13*
U.S. Cl. 372—31 **14 Claims**

1. A method of precisely controlling the power of a laser beam comprising the steps of:

impinging a portion of a laser beam exiting an x-y deflector onto a photodetector, the photodetector generating an electrical feedback signal related to the power of said impinging laser beam exiting said x-y deflector;

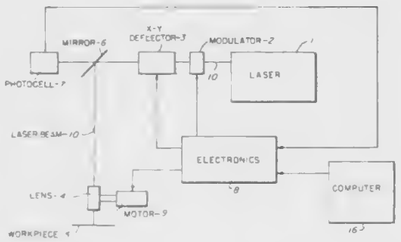
combining said electrical feedback signal with a video information signal in a servo feedback loop including said x-y deflector and a single acousto-optical modulator to produce an acousto-optical modulator control error signal; and

supplying the modulator control error signal to said single acousto-optical modulator;

said control signal controlling said single acousto-optical

VOL
1114
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modulator to reduce the error signal produced in the servo feedback loop to substantially zero thereby adjust-



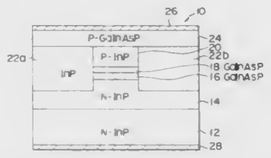
ing the power level of the laser beam to a predetermined level.

4,928,285

IMPURITY-DOPED SEMICONDUCTOR LASER DEVICE FOR SINGLE WAVELENGTH OSCILLATION

Mitsuhiro Kushibe, Tokyo; Kazuhiro Eguchi, Yokohama; Masahisa Funamizu, Tokyo, and Yasuo Ohba, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1989, Ser. No. 314,176
Claims priority, application Japan, Feb. 23, 1988, 63-40118; Feb. 23, 1988, 63-40119
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 21 Claims



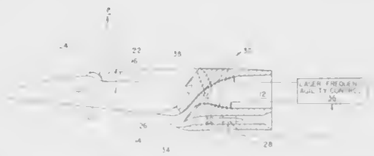
1. In a semiconductor laser device comprising:
a semiconductive substrate; and
a stacked semiconductor layer section formed on said substrate and including clad layers, an active layer and a waveguide layer;
the improvement comprising: said active layer being doped with impurities of a rare earth element with a specific doping concentration so that a single wavelength oscillation spectrum is obtained by utilizing dispersion of wavelengths in the active layer based on changes in at least one of refractive index and reflectance, said specific doping concentration being high enough to confine only light components falling within a specific range of wavelength, of all the light components produced in said layer when said laser device is operative, within said layer so as to provide single wavelength laser oscillation and that is low enough to inhibit the degradation of emission efficiency of said active layer.

4,928,286

HYPERSONIC GASDYNAMIC LASER SYSTEM

Kenneth M. Foreman, North Bellmore, and Algirdas Maciulaitis, Islip, both of N.Y., assignors to Grumman Corporation, Bethpage, N.Y.

Filed Jul. 21, 1988, Ser. No. 222,143
Int. Cl.[5] H01S *3/09*
U.S. Cl. 372—90 16 Claims



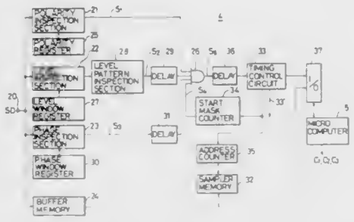
1. A visible, or near to mid infra-red, hypersonic gasdynamic laser system, comprising:
a. a hypersonic vehicle for carrying the hypersonic gas dynamic laser system, and also providing high energy ram air for thermodynamic excitation and supply of the laser gas;
b. a laser cavity defined within said hypersonic vehicle and having a laser cavity inlet for the laser cavity formed by an opening in the hypersonic vehicle, such that ram air directed through said laser cavity opening supports gasdynamic lasing operations at wavelengths less than 10.6μ meters in the laser cavity; and
c. an optical train for collecting the laser radiation from said laser cavity and directing it as a substantially colimated laser beam to an output aperture defined by an opening in the hypersonic vehicle to allow the laser beam to be directed against a target.

4,928,287

AUTOMATIC EQUALIZER

Masato Tanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 2, 1989, Ser. No. 318,001
Claims priority, application Japan, Mar. 10, 1988, 63-57004
Int. Cl.[5] H04B *3/10*
U.S. Cl. 375—13 12 Claims



1. An adaptive digital equalizer system in which equalizer characteristics are automatically controlled, the system comprising:
a digital equalizer circuit having characteristics that are controllable by a plurality of equalization coefficients and producing an equalizer output signal;
inspection means responsive to a predetermined pattern of the equalizer output signal for producing an inspection output signal;
extraction means responsive to the inspection output signal for extracting a specific waveform therefrom; and
control means responsive to the extracted specific waveform for making an analysis of the extracted specific waveform

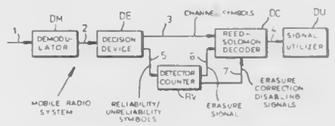
in accordance with predetermined parameters thereof and modifying said equalization coefficients in accordance with said analysis, said equalization coefficients as modified being supplied to said digital equalizer circuit for controlling the characteristics of said digital equalizer circuit.

4,928,288

DECODING METHOD AND DEVICE WITH ERASURE DETECTION FOR MULTILEVEL TRANSMISSION SYSTEMS

Giovanna D'Aria, Matera, and Giorgio Taricco, Turin, both of Italy, assignors to Societa' Italiana per L'Esercizio Delle Telecomunicazioni P.A., Turin, Italy

Filed Dec. 21, 1988, Ser. No. 288,401
Claims priority, application Italy, Dec. 22, 1987, 68104 A/87
Int. Cl.[5] H04L *1/20*
U.S. Cl. 375—17 13 Claims



1. A method of decoding multilevel signals and transmitting words each consisting of a plurality of code symbols which, in turn, comprise channel symbols, said method comprising the steps of:
(a) assigning respective decision thresholds to a levels of a multilevel signal corresponding to respective channel symbols;
(b) sampling an incoming multilevel signal to form a multiplicity of samples and comparing said samples with said decision thresholds to obtain a succession of said channel symbols from said incoming multilevel signal;
(c) supplying said succession of channel signals to an error correcting decoder outputting a utilizable decoded signal as a respective decoded word for each incoming multilevel signal;
(d) assigning to each of said decision thresholds a pair of supplementary thresholds defining a respective value region within which the respective decision threshold lies;
(e) generating an unreliability signal whenever said samples fall within a respective one of said value regions and indicating an unreliable channel symbol for the respective code symbol; and
(f) counting said unreliability signals for each of said code symbols and transmitting to said decoder a signal representing the existence of an erasure when the number of said unreliability signals for a respective code symbol exceeds a first predetermined number.

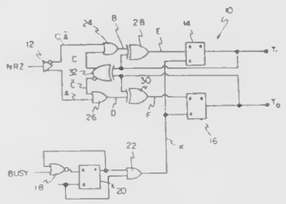
4,928,289

APPARATUS AND METHOD FOR BINARY DATA TRANSMISSION

Drake D. Dingeman, Springfield, Ohio, assignor to Systran Corporation, Dayton, Ohio

Filed Dec. 19, 1988, Ser. No. 286,186
Int. Cl.[5] H04L *25/49*
U.S. Cl. 375—20 15 Claims

1. Encoding apparatus for encoding a data signal comprising a stream of bits each of which is characterized by a first or a second binary state, said apparatus comprising:
means for accepting said data signal,
first encoding means responsive to the accepted data signal for generating a first binary code signal which undergoes a change of state for each consecutive bit in said data signal except those bits which have said second state and immediately follow a bit having said first state, and
second encoding means responsive to the accepted data



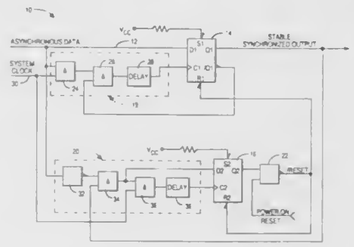
signal for generating a second binary code signal which undergoes a change of state for each consecutive bit in said data signal except those bits which have said first state and immediately follow a bit having said second state.

4,928,290

CIRCUIT FOR STABLE SYNCHRONIZATION OF ASYNCHRONOUS DATA

Tri T. Vo, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 7, 1988, Ser. No. 268,147
Int. Cl.[5] H04L *7/02*
U.S. Cl. 375—118 36 Claims



30. A synchronizer circuit comprising:
a first latch having inputs for receiving an asynchronous data signal, a first delayed system clock signal and a reset signal, and an output for providing a system clock synchronized version of said asynchronous input signal; and
first delaying means for receiving as inputs a system clock signal and said asynchronous data signal and an output for providing said first delayed system clock signal.

4,928,291

CONTROL CLUSTER PROVIDED WITH REMOVABLE CONTROL ELEMENTS FOR A NUCLEAR FUEL REACTOR

Bruno Mouesca, Lotissement "Le Coteau", Saint-Maurice de Gourdans 01800 Meximieux, and Bruno Ladouceur, 1 Bis C, rue Vignet Trouvé, 69270 Fontains S/Saone, both of France

Filed Jun. 10, 1987, Ser. No. 60,291
Claims priority, application France, Jun. 10, 1986, 86 08381
Int. Cl.[5] G21C *7/10*
U.S. Cl. 376—327 8 Claims

1. Control cluster for controlling a nuclear reactor comprising
(a) a spider having a plurality of arms angularly distributed about a vertical axis and directed substantially radially each of said arms comprising at least one vertical sleeve

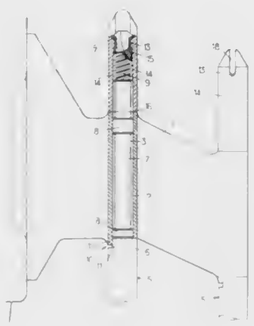
VOL
1114
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22
1990
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formed with a vertical bore of predetermined length opening into a lower end surface and an upper end surface of the sleeve;

(b) a plurality of vertical control elements each for connection to a respective one of the vertical sleeves of said spider; and

(c) a plurality of internally threaded fastening pieces, each for securing a respective one of said control elements to one of said sleeves;

(d) wherein each of said control elements has an upper plug formed with a longitudinally upwardly extending shank projecting into a respective one of the vertical bores, formed with shoulder means for abutment against the lower ends surface of the respective vertical sleeve, comprising spaced radially enlarged portions having a sliding fit in and located entirely within the respective vertical bore, having an overall length from said shoulder means larger than the said predetermined length, whereby the shank has a distal portion which projects upwardly out of



the respective vertical bore when said shoulder means are in abutment with said lower end surface, said distal portion of the shank which projects upwardly out of the respective vertical bore having a threaded portion entirely located above and at a distance from the upper end surface of the respective vertical bore and a part of reduced diameter between said threaded part and an uppermost of said enlarged portions,

(e) wherein each of said internally threaded fastening pieces is tightly screwed on the threaded part of a respective one of the control elements and is in abutting contact with the upper surface of the respective sleeve, wherein the fastening piece exerts a clamping force on the shank for locking and supporting the respective control element on the associated sleeve, and

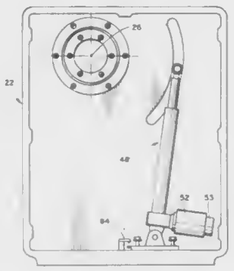
(f) wherein each upper end surface is at a distance from the threaded portion sufficient to allow room for cutting of said fastening piece and of the part of reduced diameter of the respective shank, between said upper end surface and said thread portion of the shank.

4,928,292

GANTRY TILT AND SUPPORT ASSEMBLY FOR CT SCANNER

Antoo Z. Zupancic, Kirtland, and Joseph S. Deucher, Lyndhurst, both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Nov. 25, 1988, Ser. No. 276,243
Int. Cl.[5] H05G *1/60*
U.S. Cl. 378—17 10 Claims



1. Computerized tomographic scanner apparatus comprising:

a base frame means including a pair of laterally and vertically extending support members;

a gantry assembly including a source of penetrating radiation and a detector for detecting radiation coming from said source; said gantry assembly carried by said support members by bearing means arranged to permit said gantry assembly to be tilted about a first generally horizontal axis extending between said vertically extending support members;

drive means for selectively tilting said gantry assembly about said first axis, said drive means including first and second longitudinally extensible and retractable power units each including a separate respective motor associated therewith and having a first end connected to said base frame and a second end connected to said gantry assembly at a point spaced radially outward of said first axis;

control means for controlling the operation of said power units including means for producing synchronous movement of said power units; and,

said control means further including means responsive to failure of operation of either of said power units for stopping the motor associated with the other power unit.

4,928,293

APPARATUS FOR STABILIZATION OF X-RAY FLUORESCENCE LAYER THICKNESS MEASURING INSTRUMENTS FOR STABILIZATION SNF PROCESS THEREOF

Hans H. Behncke, Gartenstr. 36, D-7400 Tubingen, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 100,164
Int. Cl.[5] G01N *23/223*
U.S. Cl. 378—50 19 Claims

1. Apparatus for stabilization of a proportional counting tube for a layer thickness measuring instrument according to the X-ray fluorescence principle, said instrument having an X-ray generator and a counting tube,

said apparatus comprising:

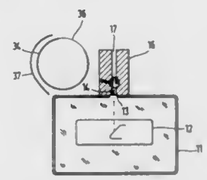
a first closing device for X-rays laying downstream in terms of radiation and alongside said counting tube,

an operating device for bringing said first closing device at least into a closed position and an open position,

and the improvement wherein:

means define a bypass passage leading from said counting tube to at least said X-rays, which is arranged to be open in said closed position of said first closing device,

a second closing device is arranged in said bypass passage, said second closing device being arranged to allow X-rays to enter said bypass passage only when said first closing device is closed completely, and



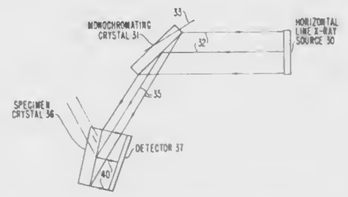
means are provided for establishing a damping transmittance characteristic through said bypass passage such that the counting rate of radiation arriving at said counting tube through said bypass passage is in the range of counting rates reflected by an object to be measured.

4,928,294

METHOD AND APPARATUS FOR LINE-MODIFIED ASYMMETRIC CRYSTAL TOPOGRAPHY

Warren T. Beard, Jr., Upper Marlboro, and Ronald W. Armstrong, Edgewater, both of Md., assignors to U.S. Government as represented by the Director, National Security Agency, Fort George G. Meade, Md.

Filed Mar. 24, 1989, Ser. No. 330,348
Int. Cl.[5] G01N *23/20*
U.S. Cl. 378—74 13 Claims



13. A method for high resolution x-ray imaging of a crystal comprising:

projecting an x-ray beam from a horizontal line source onto a monochromating crystal;

diffracting said beam at an angle relative to the surface of the crystal such that the quantity of energy diffracted at the surface of the crystal is maximized while the horizontal and vertical divergence of the diffracted beam are minimized;

projecting the diffracted beam onto a specimen crystal; and

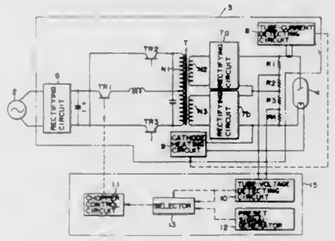
diffracting the diffracted beam at an angle relative to the surface of the specimen crystal such that the angle of the diffracted beam relative to the normal of the specimen crystal is minimized.

4,928,295

HIGH-VOLTAGE GENERATING DEVICE FOR USE WITH AN X-RAY TUBE

Shigeru Tanaka, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1988, Ser. No. 247,455
Claims priority, application Japan, Sep. 30, 1987, 62-243924
Int. Cl.[5] H05G *1/34*
U.S. Cl. 378—104 6 Claims



1. A high-voltage generating device for use with an X-ray tube, comprising:

first rectifying means, having first and second output terminals, for rectifying an A.C. voltage from an A.C. power supply;

a converter for converting an output of said first rectifying means to an A.C. voltage and boosting the converted A.C. voltage, the converter including a boosting transformer having a primary winding having a neutral point and first and second ends, the neutral point of said primary winding being connected to said first output terminal of said first rectifying means through a chopper transistor, and each of said first and second ends of said primary winding being connected to said second output terminal of said first rectifying means through a first inverter transistor and a second inverter transistor, said first and second inverter transistors being alternately operated, said converter further including a second winding for providing an A.C. high voltage, each of said chopper transistor and said first and second inverter transistors having a predetermined voltage rating;

second rectifying means for converting an output of said converter to a D.C. voltage for application to said X-ray tube;

detecting means for detecting an output voltage of said second rectifying means to produce a signal corresponding to the detected voltage;

preset signal generating means for generating a signal having a constant voltage lower than the voltage ratings of said chopper transistor and said first and second inverter transistors; and

feedback control means for controlling a switching operation of said converter on the basis of an output of said preset signal generating means at the start of operation and on the basis of an output of said detecting means thereafter.

4,928,296

APPARATUS FOR COOLING AN X-RAY DEVICE

Vedanth Kadambi, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1988, Ser. No. 177,234
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—141 5 Claims

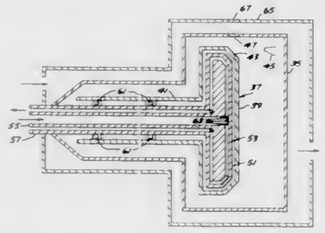
1. An X-ray generating tube comprising:

a hollow rotatable anode including a hollow disc-shaped portion having a ring-shaped target track, said disc-shaped portion affixed to a first tube extending coaxially from the

VOL
1114
ISS
4
MY
22
1990
UMI

disc-shaped portion, the interior of the hollow disc-shaped portion and the interior of the first tube being in flow communication with one another;

a stationary insert having a stationary disc-shaped portion situated inside the hollow disc-shaped portion of said anode and spaced away therefrom, said stationary insert further having a second and third tube, each being affixed to said stationary disc portion and extending coaxially therefrom, said second tube being spaced away from and surrounded by said first tube, said third tube being spaced away from and surrounded by said second tube, said stationary disc portion defining a passageway in flow



communication with the interior of the third tube at one end, extending below the surface of the stationary disc portion and in flow communication at the other end with the annular space formed between the second and third tubes;

bearing means for rotatably mounting said first tube on said second tube;

cathode means directed at said ring shaped target for generating an electron beam; and

vacuum enclosure means enclosing said hollow rotatable anode and said cathode means, said interior of said hollow rotatable anode in flow communication with the interior of said vacuum enclosure means.

4,928,297

RADIOGRAPHIC DIAGNOSTIC APPARATUS

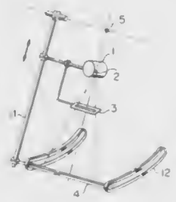
Hiroshi Tsutsui, Yawata; Sueki Baba, Suita; Koichi Ohmori, Toyonaka; Osamu Yamamoto, Moriguchi, and Hiroshi Watanabe, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 184,829

Claims priority, application Japan, Apr. 22, 1987, 62-98956

Int. Cl.[5] G21K *5/10*

U.S. Cl. 378—146 **4 Claims**



1. A radiographic diagnostic apparatus comprising:

an X-ray tube for generating X-ray radiation, said X-ray tube having a focal spot,

a line slit for shaping said X-ray radiation into a fan beam, said line slit extending in a direction of alignment,

a linear X-ray sensor array for detecting said X-ray radiation, and

movable means for rotating said X-ray tube, said line slit, and said linear X-ray sensor array about a specified fixed point so as to maintain alignment of said X-ray tube, said line slit, and said linear X-ray sensor array relative to said specified fixed point such that said focal spot of said X-ray tube and said line slit are disposed on a straight line which passes through said specified fixed point and a predetermined portion of said linear sensor array, such that said X-ray tube, said line slit and said linear X-ray sensor array move together in a direction perpendicular to the direction of alignment of said linear X-ray sensor array to scan an object, said focal spot of said X-ray tube being spaced from said specified fixed point, and such that a radiographic image of the object can be produced from an output of said linear X-ray sensor array; and

said X-ray tube and said line slit are movable along said straight line connecting said fixed point and said predetermined portion of said linear X-ray sensor array.

4,928,298

INFORMATION-BEARING SHEET FOR X-RAY FILM

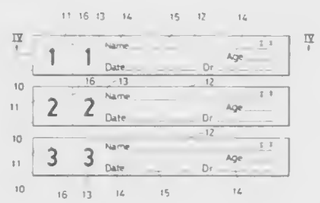
Hiroyuki Tanaka, Kanagawa, Japan, assignor to NIX Company, Ltd., Tokyo, Japan

Filed Jul. 30, 1985, Ser. No. 760,554

Claims priority, application Japan, Aug. 7, 1984, 59-120630

Int. Cl.[5] H05G *1/28*

U.S. Cl. 378—162 **13 Claims**



1. An information-bearing sheet suitable for use with an X-ray film in order to avoid confusion between X-ray pictures of different objects, comprising:

a mark-bearing portion which is opaque to X-rays to be applied to the X-ray film and exposed to X-rays upon taking an X-ray picture of an object on the X-ray film; and

a data-filling portion bearing, in a form-printed thereon, the same mark as the mark-bearing portion, containing at least one blank space for filling out identification data of the object therein and provided in combination with the mark-bearing portion;

wherein the mark-bearing portion and data-filling portion have adhesive layers on the back sides thereof and the information-bearing sheet further comprises a releasable base sheet on which the mark-bearing portion and data filling are releasably affixed; and

the mark-bearing portion and data-filling portion are formed of a single piece of paper with a tear line, thereby permitting separation of the single piece of paper along the tear line into the mark-bearing portion and data-filling portion upon application of the information-bearing sheet.

4,928,299

COIN OPERATED TELEPHONE OPERATION MONITORING SWITCH MOUNTING ARRANGEMENT

John L. Tansky, Sewell, N.J.; Edward F. Lagan, Jr., Downingtown, and Patrick J. McGarry, West Chester, both of Pa., assignors to Mars Incorporated, McLean, Va.

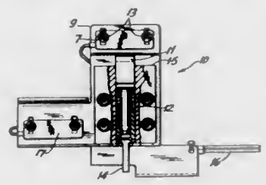
Filed May 26, 1989, Ser. No. 357,762

Int. Cl.[5] H04M *17/00*

U.S. Cl. 379—37 **17 Claims**

1. A payphone event monitoring system which may be readily installed in a standard payphone housing using preexisting paybone cutouts and which generates signals indicative of the removal of a coin box, a vault door or a front cover, comprising:

(a) a first sensor bracket assembly to which is attached a front cover sensor and a vault door sensor;



(b) a second sensor bracket assembly, containing a coin box sensor, and

(c) a means for monitoring the sensors and sending a signal indicative of removal of the coin box, vault door or front cover.

4,928,300

VIDEOPHONE WITH DETACHABLE TV CAMERA

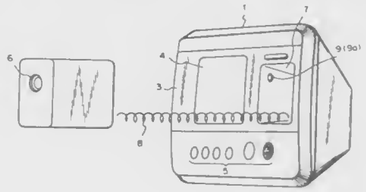
Kohji Ogawa, and Mikio Onoki, both of Gunma, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1989, Ser. No. 339,805

Claims priority, application Japan, Jun. 27, 1988, 63-158688; Jul. 29, 1988, 63-189908

Int. Cl.[5] H04M *11/00;* **H04N** *7/14*

U.S. Cl. 379—53 **9 Claims**





1. A videophone comprising:

a TV camera detachably accommodated in the unit of said videophone, said TV camera being connected to the videophone unit through a cable;

means for displaying image data picked-up by said TV camera or image data transmitted through a telephone line; and

means for detecting whether or not said TV camera is fixed in the videophone unit;

the image displayed on said displaying means being automatically switched between a reflected image and a true image in response to the output from said detecting means.

4,928,301

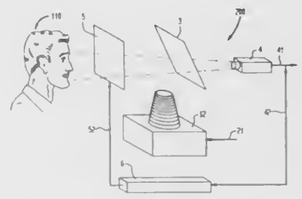
TELECONFERENCING TERMINAL WITH CAMERA BEHIND DISPLAY SCREEN

Lanny S. Smoot, Morris Township, Morris County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 292,030, Dec. 30, 1988, abandoned. This application Oct. 31, 1989, Ser. No. 429,387

Int. Cl.[5] H04M *11/00;* **H04N** *7/14*

U.S. Cl. 379—53 **11 Claims**



2. A teleconferencing terminal which enables communicants to have eye contact during a teleconference, said terminal comprising

a screen which can be switched between a transparent state and an image display state,

a video camera including image capture circuitry positioned behind said screen,

means for receiving a composite video signal comprising successive video fields, and

a control unit in communication with said screen for applying control signals to said screen so that said screen is alternately in said transparent state during which said image capture circuitry of said video camera is activated and in said image display state during which one of said video fields is displayed, wherein said successive video fields are separated by vertical retrace intervals, and wherein said screen is in said transparent state during said vertical retrace intervals.

5. A method for operating a teleconferencing terminal comprising a screen, a video camera located directly behind the screen, and means for receiving a video signal, said method comprising the steps of

applying control signals to said screen to alternate said terminal between an image capture mode wherein said screen is switched to a first, transparent state and said video camera is activated to capture an image through said screen and an image display mode wherein said screen is switched to a second state for display of an image field of a video signal received by said receiving means, wherein in said second state said screen is translucent.

VOL
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VOICE ACTUATED DIALING APPARATUS

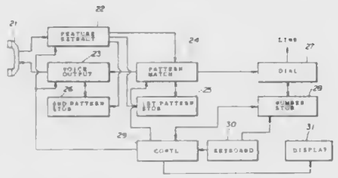
Kunihiro Kaneuchi, Yokohama; Seigou Yasuda, Yokosuka; Takashi Ariyoshi, Yokohama; Tomofumi Nakatani, Yokohama, and Hiroshi Aizawa, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Nov. 1, 1988, Ser. No. 265,766

Claims priority, application Japan, Nov. 6, 1987, 62-281833; Nov. 6, 1987, 62-281832; Nov. 6, 1987, 62-281831; Nov. 6, 1987, 62-281830; Dec. 9, 1987, 62-311397; Dec. 15, 1987, 62-316942; Jan. 22, 1988, 63-7355[U]; Jan. 22, 1988, 63-7356[U]; Jul. 13, 1988, 63-174099; Sep. 8, 1988, 63-224951; Sep. 8, 1988, 63-224950; Sep. 19, 1988, 63-233995

Int. Cl.[5] H04M *1/27*

U.S. Cl. 379—88 11 Claims



1. A voice actuated dialing apparatus comprising:

input/output means for inputting and outputting data;

feature extraction means for extracting a feature of input data received through said input/output means;

storage means for storing standard patterns and corresponding telephone numbers of destination subscribers as registered data;

pattern matching means for comparing a standard pattern of the feature extracted by said feature extraction means with the standard patterns stored in said storage means so as to recognize a predetermined one of the stored standard patterns which matches the standard pattern of the extracted feature;

speech synthesis means for outputting through said input/output means a speech corresponding to said predetermined stored standard pattern read-out from said storage means so as to confirm a result of the recognition made in said pattern matching means;

dialing means for dialing of a predetermined one of the telephone numbers stored in said storage means and corresponding to said predetermined standard pattern in a voice-dialing mode; and

control means for controlling operation sequences of said feature extraction means, said storage means, said pattern matching means, said speech synthesis means and said dialing means;

said control means successively outputting to said input/output means at least a part of the registered data stored in said storage means in response to a search instruction received from said input/output means designating the part to be successively outputted;

said pattern matching means having a preliminary selection part and a main selection part, said preliminary selection part in response to the search instruction comparing a certain portion of the standard pattern of the feature extracted by said feature extraction means with corresponding portions of the standard patterns stored in said storage means when the search instruction accompanies a subject of search so as to select specific standard patterns having a certain similarity to said certain portion, said main selection part comparing the standard pattern of the feature extracted by said feature extraction means with only said specific standard patterns so as to recognize the predetermined one of the specific standard patterns which mates the standard pattern of the extracted feature.

4,928,303

CABLING SYSTEM FOR LOW VOLTAGE AND VERY LOW VOLTAGE NETWORKS IN A BUILDING

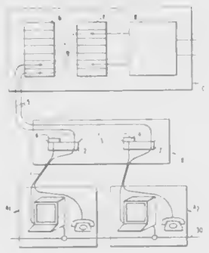
Jean-Claude Allin, 102, rue Claude Benard, 95610 Eragny, and Jacques Nozick, 28, rue Broca, 75005 Paris, both of France

Filed Dec. 29, 1988, Ser. No. 291,897

Claims priority, application France, Dec. 29, 1987, 87 18267

Int. Cl.[5] H04M *11/00*; H01R *11/00*

U.S. Cl. 379—93 10 Claims



1. A telephone and computer precabling element comprising:

a cable including at least one pair of wires for establishing a telephone link and at least one pair of wires for establishing a computer link;

at least one socket for connection to telephone equipment and at least one socket for connection to computer equipment, said sockets being connected to one end of the corresponding pairs of wires in the cable; and

a connection module including at least as many pairs of contacts as the cable has pairs of wires, with said pairs of computer wires and said pairs of telephone wires being connected to contacts in the same module.

4,928,304

ELECTRONIC SWITCHING SYSTEM CONNECTED TO AN EXTERNAL COMPUTER

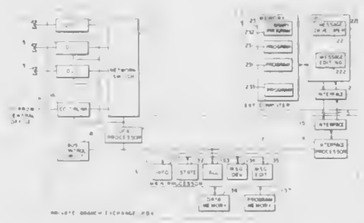
Hiroshi Sakai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,640

Claims priority, application Japan, Sep. 4, 1987, 62-222429

Int. Cl.[5] H04M *3/42, 11/08*

U.S. Cl. 379—94 2 Claims



1. An electronic switching system comprising:

a plurality of telephone terminals having display means and key input means;

an electronic exchange apparatus having a network switch for accommodating said telephone terminals, control means for achieving exchange service functions between said telephone terminals; and

an external computer connected to said control means through a computer interface including an application program for providing non-telecommunication service functions unrelated to said exchange service functions;

said control means including first facility means for initiating said application program in response to a key input operation at any of said telephone terminals and for setting a data transmission path to said external computer, second facility means for transmitting operated key data from any of said telephone terminals to said application program via said path when service by said application program is in use. third facility means for controlling said display means of any communicating one of said telephone terminals in response to an instruction from said application program when said service by said application program is in use; and

whereby said application program initiated by said first facility means controls said telephone terminals as input-/output terminals for said nontelecommunication service functions using said second and third facility means.

4,928,305

INTELLIGENT MODEM WITH MANUAL ESCAPE SWITCH

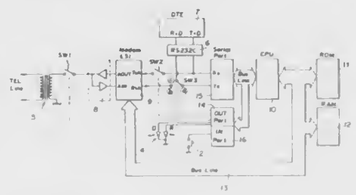
Eiichi Yui, Yokohama, Japan, assignor to Omron Tateisi Electronics Company, Kyoto, Japan

Filed Nov. 21, 1988, Ser. No. 273,829

Claims priority, application Japan, Nov. 25, 1987, 62-297101

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—98 4 Claims



1. An intelligent modem system comprising:

a modem circuit;

an interface circuit for connection to an information processing terminal;

a switching means for interconnecting said modem circuit with a public communication line and with said interface circuit;

a controller for controlling operation of said modem means and said switching circuit such that said system selectively operates in a transparent mode in which said switching means places said modem circuit in a data communication relationship with an information processing terminal connected to said interface circuit while said modem circuit is also placed in communication relationship with said public communication line, or in an escape mode in which said switching means takes said modem circuit out of a data communication relationship with said information processing terminal to permit altering the status of said modem circuit by said controller while said modem circuit remains connected with said public communication line; and,

an operator operable switch means coupled to said controller for causing said controller to operate said switching means to change from one of said transparent and escape modes to the other of said transparent and escape modes.

4,928,306

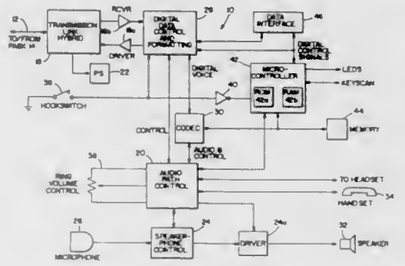
DYNAMICALLY CONFIGURABLE TELEPHONE

Gautam Biswas; David C. Black; Michael G. Duncan, all of Austin; Gary R. Key, Round Rock; Gordon D. Leak, Austin, and Robert D. Whittington, Pflugerville, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1989, Ser. No. 317,256

Int. Cl.[5] H04M *3/42*

U.S. Cl. 379—201 31 Claims



1. Telephone apparatus comprising:

means for communicating telephone related information in a bidirectional manner with a telephone exchange; and

means, coupled to the communicating means, for receiving telephone related information therefrom, the telephone related information therefrom, the telephone related information including information for specifying at least one operational configuration of the telephone, the at least one operational configuration including information for specifying at least one telephone signal power parameter, the receiving means comprising means for configuring the telephone apparatus in accordance with the received information.

4,928,307

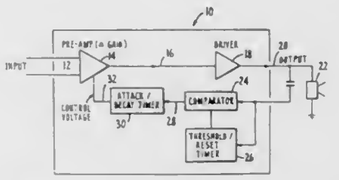
TIME DEPENDENT, VARIABLE AMPLITUDE THRESHOLD OUTPUT CIRCUIT FOR FREQUENCY VARIANT AND FREQUENCY INVARIANT SIGNAL DISCRIMINATION

Dwight D. Lynn, Santa Cruz, Calif., assignor to ACS Communications, Scotts Valley, Calif.

Filed Mar. 2, 1989, Ser. No. 318,073

Int. Cl.[5] H04M *1/60*

U.S. Cl. 379—395 6 Claims



1. A signal compression system comprising:

(a) amplifier means for amplifying an input signal to provide a power-boosted output signal, the gain of the amplifier means corresponding to a variable control voltage applied to the amplifier means;

(b) means for comparing the power-boosted output signal and an initial threshold signal to provide a comparator output corresponding to the difference between the power-boosted output signal and the initial threshold signal;

VOL
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(c) means responsive to the comparator output for providing a variable control voltage corresponding to the comparator output; and

(d) means responsive to the power-boosted output signal for switching the initial threshold signal to a second threshold signal if the power-boosted output signal exceeds the initial threshold signal for a pre-selected period of time.

4,928,308

ECHO CANCELLER CIRCUIT

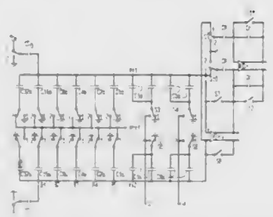
Bernward Roessler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 906,363, Sep. 12, 1986, abandoned. This application Dec. 16, 1988, Ser. No. 287,569

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3533902

Int. Cl.[5] **H04B** *3/23*

U.S. Cl. 379—411 **3 Claims**



1. A circuit for cancellation of echoes including a network of capacitors which takes part in digital to analog conversion of digital compensation signals supplied by an adpative transversal filter, in a compensation process comprising the subtraction of such compensation signals converted to analog signals from the echo-laden wanted signals supplied to said circuit, and in the analog to digital conversion of the resultant signal resulting from the compensation process which may be laden with a residual echo signal, said resultant signal to be supplied to the transversal filter as a digital correction signal. an upper set of capacitor plates of the network being connected together, and said network including capacitors corresponding with more significant bits of said digital compensation signals which are binary-weighted in their capacitance and switched by their other plates forming separate terminals of the network selectively either to ground potential or to a reference potential, and capacitors corresponding to less significant bits than said more significant bits of said digital compensation signals which are switchable by their lower plates selectively to ground potential or to fractions of the reference voltage potential, said fractions corresponding to the bit combinations of the less significant bits, characterized in that the capacitor network comprises two symmetrical halves, said halves being equal with respect to their construction and with respect to capacitance and correspondence with bits of said digital compensation signals (C0o', C1o' . . . C32o, CSo; C0u', C1u' . . . C32u', CSu), and said halves respectively comprising an additional capacitor (C32o, C32u), which additional capacitor is also switchable to ground potential or to a reference potential by one plate thereof while its other plate in connected together with the upper set of plates of said network of capacitors, as well as a scanning capacitor (CSo, CSu) of the same capacitance as that of the additional capacitor, the echo-laden wanted signals being supplied by way of said additional capacitor and by way of said scanning capacitor to the network, in the case of said additional capacitor said signals being supplied in the form as supplied to said circuit and in the case of said scanning capacitor in phase opposition thereto, and in which each of said other plates of said capacitors in said similarly arranged and valued network halves and corresponding to the more significant bits in one network half are applied to a different one of (a) ground potential and (b) reference potential than the corresponding capacitor of the other network half, and that a respective end of each network half associated with said plates connected together is connected to respective inputs of a comparator (V) comprising an operational amplifier having outputs respectively connectable to a respective one of said comparator inputs by means of a semiconductor switch.

4,928,309

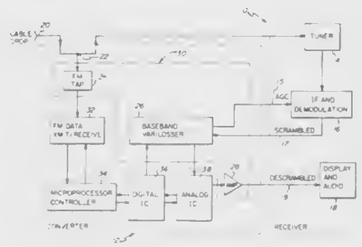
METHOD AND APPARATUS FOR DESCRAMBLING A TELEVISION SIGNAL

Charles M. White, Perkasie, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Mar. 31, 1989, Ser. No. 332,555

Int. Cl.[5] **H04N** *7/167*

U.S. Cl. 380—15 **20 Claims**



1. A baseband converter for descrambling sync suppressed video television signals comprising:

a signal level processor having an input and an output;

means for coupling the input of said signal level processor to receive a baseband television signal having a video portion with suppressed sync pulses;

control means coupled to said signal level processor for causing the processor to shift the level of predetermined portions of said signal to restore said sync pulses to a normal unsuppressed level with respect to the rest of the baseband television signal;

means for deriving a reference voltage equal to the zero carrier level of the video portion of said baseband television signal;

means for applying the reference voltage to said signal level processor for use in maintaining the level of the restored sync pulse at a proper value; and

means for coupling the level shifted signal from the output of said processor to a video appliance.

4,928,310

PSEUDORANDOM PULSE CODE GENERATORS USING ELECTRO-OPTICAL XOR GATES

Anastosios P. Goutzoulis, Pittsburgh, and David K. Davies, Churchill Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 17, 1989, Ser. No. 380,959

Int. Cl.[5] **H04L** *9/02*

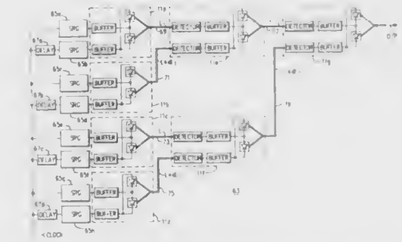
U.S. Cl. 380—46 **23 Claims**

1. A code generator generating pseudorandom digital codes comprising:

a source of optical pulses;

a plurality of optical XOR gates each having at least two optical inputs and one optical output; and

optical fiber means interconnecting the optical outputs of selected of said XOR gates to selected inputs of other of said XOR gates in a pattern which generates a single optical output representing said pseudorandom digital code, said optic fiber means having lengths selected to effect selected delays in the transmission of light pulses between selected ones of said optical XOR gates.



4,928,311

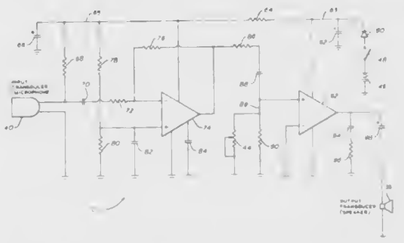
NOISE LIMITING CIRCUIT FOR EARMUFFS

Lyle D. Trompler, 13906 Wickersham, Houston, Tex. 77077

Continuation of Ser. No. 815,883, Jan. 3, 1986, abandoned. This application Jul. 1, 1987, Ser. No. 70,104

Int. Cl.[5] **A61F** *11/02*

U.S. Cl. 381—72 **8 Claims**



1. A noise limiting circuit for earmuffs, comprising:

a voltage source;

a microphone for receiving sound waves and producing a microphone output signal in response thereto;

amplifier means adapted to receive and amplify said microphone output signal and connected to said voltage source;

said amplifier means including an input terminal, an amplifier circuit, and an output terminal;

said amplifier means further including gain control means for providing said amplifier means with substantially constant circuit gain as the magnitude of the microphone output signal varies from zero to a level which saturates said amplifier circuit;

said gain control means comprising means for providing substantially constant feedback resistance between said amplifier means output and input terminals, wherein said feedback resistance is selected so as to provide saturation of said amplifier circuit when the input signal level from said microphone exceeds normal conversational levels;

said microphone output signal being coupled to said amplifier means input terminal by a direct path;

speaker means for producing sound waves in response to an electrical signal; and

volume control means connected between said amplifier means output terminal and said speaker means for dividing said amplifier means output signal so that when said amplifier circuit is saturated said signal provided to said speaker means is at a level which causes said speaker means to produce a safe level of sound waves.

4,928,312

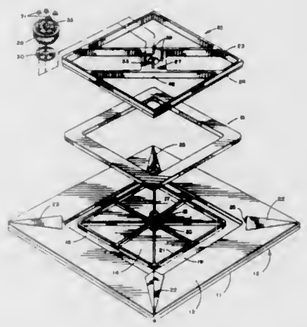
ACOUSTIC TRANSDUCER

Amel Hill, 2837 Summer Brooke Way, Carrelbury, Fla. 32707

Filed Oct. 17, 1988, Ser. No. 262,946

Int. Cl.[5] **H04R** *7/06*; **G10K** *13/00*

U.S. Cl. 381—192 **15 Claims**



1. An acoustic transducer comprising:

a one piece sheet of foamed polymer material having different densities in different portions thereof, said different portions comprising a periphery portion of a first density, a diaphragm portion of a second density formed in the center of said one piece sheet of foamed polymer material, and a resilient diaphragm suspension portion separating said periphery portion and said diaphragm portion and said resilient diaphragm suspension portion having a third density lower than said periphery portion density; wherein said diaphragm portion has a plurality of reinforcing ribs formed thereon and has a foamed polymer surround ridge immediately adjacent said diaphragm suspension portion and intersecting said reinforcing ribs; a groove immediately adjacent said ridge and formed by said periphery portion, said resilient diaphragm suspension portion and said ridge;

a resilient insert attached in said groove in said one piece sheet of foamed polymer material;

a voice coil former fixedly attached to said diaphragm portion;

at least one frame support portion formed on said periphery portion; and

a frame attached to said frame support portion and extending over a portion of said diaphragm portion, said frame having a magnet attached thereto in a position to be aligned with said voice coil former whereby a panel speaker is formed.

4,928,313

METHOD AND SYSTEM FOR AUTOMATICALLY VISUALLY INSPECTING AN ARTICLE

Patrick F. Leonard; Donald J. Svetkoff; Robert W. Kelley; Donald K. Rohrer, all of Ann Arbor, and E. North Coleman, Jr., Dearborn Heights, all of Mich., assignors to Synthetic Vision Systems, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 140,667, Jan. 4, 1988, abandoned, which is a continuation of Ser. No. 791,470, Oct. 25, 1985, abandoned. This application May 19, 1989, Ser. No. 355,816

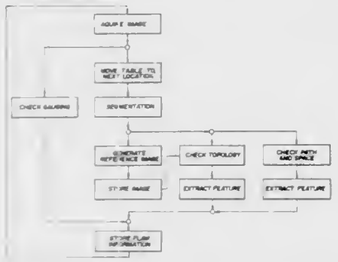
Int. Cl.[5] **G06K** *9/00*

U.S. Cl. 382—8 **14 Claims**

1. A method for automatically and visually inspecting an article, the method comprising the steps of:

acquiring a first set of digital image data representing a known good article, the image data representing a two dimensional reference image, processing the first set of

image data to separate the reference image into at least two identifiable areas having a boundary therebetween;
compressing the reference image in each of the two dimensions of the reference image, the step of compressing including the steps of reducing at least one of the areas of the reference image to an edge represented by a number of data points and reducing the number of data points representing the edge;
storing the compressed reference image;
acquiring a second set of digital image data representing a two-dimensional image of an article under inspection;
processing the second set of digital image data to separate



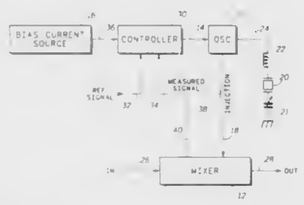
the image of the article under inspection into at least two identifiable areas having a boundary therebetween;
retrieving the compressed reference image;
regenerating the retrieved reference image, said step of regenerating including the step of regenerating the edge from the reduced number of data points, regenerating the at least one of the areas from the regenerated edge, and constructing border regions around at least one of the areas of the reference image to obtain a regenerated reference image; and
matching the regenerated reference image and the image of the article under inspection to identify areas where mismatches occur.

4,928,314

HETERODYNE STAGE HAVING PRECISE CLOSED-LOOP CONTROL OF THE AMPLITUDE OF THE INJECTION SIGNAL THEREOF

Walter J. Grandfield, Lake worth; James G. Mittel, Boynton Beach, and Walter L. Davis, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 27, 1989, Ser. No. 302,701
Int. Cl.[5] H04B *1/26*
U.S. Cl. 455—236 **10 Claims**



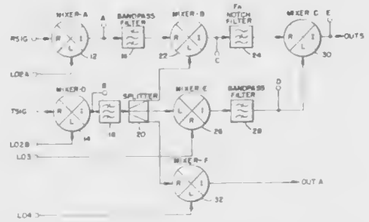
1. A heterodyne stage of a receiver comprising:
source of bias current;
local oscillator circuit responsive to bias current supplied from said source for generating an injection signal at a predetermined frequency and an amplitude based on the amount of bias current supplied;
mixer circuit governed by said injection signal to convert a receiver signal from one frequency to another frequency by a heterodyning process;
means for measuring the amplitude of said injection signal; and
differential amplifier circuit having one transistor stage input coupled to said measuring means to effect a signal representative of the amplitude of said injection signal and another transistor stage input biased at a reference level, and including a circuit stage governed by said amplitude representative signal and said reference level to adjust the amount of bias current supplied to said oscillator circuit by said source within a non-zero bias current range.

4,928,315

CHIRPED BACKSCATTER FILTER

Preben B. Jensen, Rancho Palos Verdes, and Edward L. Aran, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 21, 1987, Ser. No. 136,063
Int. Cl.[5] H04B *1/10, 1/12*
U.S. Cl. 455—307 **19 Claims**



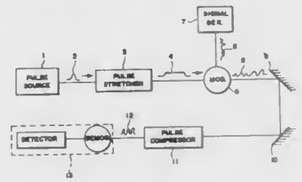
1. A frequency filter for removing an undesired frequency component from a received signal having a desired frequency component, comprising:
means for adding a first offset frequency to a received signal for generating a received signal intermediate frequency, said received signal having at least one desired frequency component and an undesired frequency component of known frequency;
means for adding a second offset frequency to a reference signal for generating a reference signal intermediate frequency, said reference signal having a frequency component substantially equal to said undesired frequency component, said first offset frequency differing from said second offset frequency by a predetermined frequency such that a frequency component of said received signal intermediate signal that is associated with said undesired frequency component differs from said frequency component of said reference signal intermediate signal by an amount substantially equal to said predetermined frequency;
means for subtracting said received signal intermediate frequency from said reference signal intermediate frequency to generate a first difference frequency signal having a frequency component substantially equal to said predetermined frequency,; and
means for removing from said first difference frequency signal said frequency component having said predetermined frequency to generate a filtered received signal wherein the undesired frequency component is substantially eliminated.

4,928,316

OPTICAL SYSTEMS AND METHODS BASED UPON TEMPORAL STRETCHING, MODULATION AND RECOMPRESSION OF ULTRASHORT PULSES

Jonathan P. Heritage, Red Bank Borough, and Andrew M. Weiner, Eatontown Borough, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Feb. 4, 1988, Ser. No. 152,237
Int. Cl.[5] H04B *9/00*
U.S. Cl. 455—600 **23 Claims**



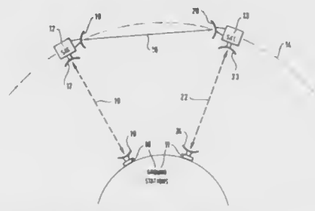
1. A communication system comprising an ultra-short optical pulse source, pulse stretching means responsive to an ultra-short optical pulse from said source for producing a chirped temporally stretched pulse, modulator means for serially modulating the chirped temporally stretched optical pulse in accordance with predetermined information, and pulse compression means for temporally recompressing the modulated stretched pulse so as to result in a shaped ultra-short optical pulse containing retrievable information in accordance with said modulation.

4,928,317

RADIO-OPTICAL TRANSMISSION SYSTEM, IN PARTICULAR FOR SPACE TELECOMMUNICATIONS

Elisabeth Franchini, Ramonville Saint Agne, France, assignor to Societe Anonyme dite: Alcatel Espace, Courbevoie, France

Filed Oct. 14, 1988, Ser. No. 257,620
Claims priority, application France, Oct. 29, 1987, 87 14994
Int. Cl.[5] H04B *9/00*
U.S. Cl. 455—601 **4 Claims**



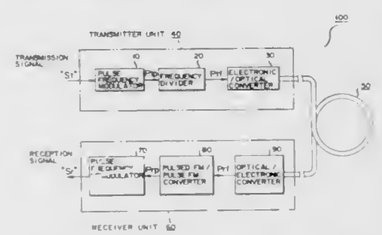
1. A radio-optical transmission system for transmitting information, in particular for space telecommunications, said system comprising:
a first, radio-optical interface device for converting a first modulated radio wave to a light wave, said first radio-optical interface device being a microwaveoptical interface device comprising:
a microwave receiver circuit; and
an optical transmitter circuit connected to an output of said microwave receiver circuit and comprising, in succession:
a mixer receiving an oscillator signal;
a filter connected to an output of said mixer and providing a filtered output accordingly;
an amplifier receiving said filtered output to provide an amplified filtered output;
a current controlling circuit receiving said amplified filtered output and providing a current controlled output accordingly;
a laser having its injection current modulated in accordance with said current controlled output; and
a temperature control circuit connected to said laser, such that said optical transmitter circuit transmits said information without intermediate demodulation thereof;
said radio-optical transmission system further comprising a second, optical-radio interface device for converting said light wave to a second modulated radio wave, said second, optical-radio interface device being an optical-microwave interface device comprising:
an optical receiver circuit comprising, in succession:
an optical matching circuit followed by a detector diode;
a filter connected to an output of said detector diode and providing a filtered output accordingly;
at least one amplifier receiving said filtered output;
a frequency acquisition and tracking loop coupled to an output of said amplifier;
a laser;
a current controlling circuit, coupled to an output of said frequency acquisition and tracking loop, for controlling the laser;
a temperature control circuit for controlling the laser;
said laser being connected to an input of the optical matching circuit, wherein said optical receiver receives said information without intermediate demodulation thereof; and
a microwave transmitter circuit connected to an output of said optical receiver circuit.

4,928,318

OPTICAL SIGNAL TRANSMISSION SYSTEM INCLUDING PULSED FM MODULATOR/DEMODULATOR

Hiroyuki Ibe, 1-3-1-807, Namiki, Kanazawa-ku, Yokohama-shi; Taro Shibagaki, 1-29-5, Minamimagome, Oota-ku, Tokyo, and Fumihiko Shimizu, 1F-3, Hikari-So, 2-30-2, Konan-ku, Yokohama-shi, all of Japan

Continuation-in-part of Ser. No. 831,864, Feb. 24, 1986, abandoned. This application Dec. 22, 1987, Ser. No. 136,534
Claims priority, application Japan, Feb. 28, 1985, 60-39298
Int. Cl.[5] H04B *9/00*
U.S. Cl. 455—608 **9 Claims**



1. An optical signal transmission system comprising:
means for frequency-modulating an input signal to produce a pulse frequency-modulated (FM) transmission signal;
means for frequency-dividing the pulse frequency-modulated transmission signal to produce a pulsed frequency-modulated (PFM) transmission signal;
first converting means, connected to said frequency-dividing means and including a laser means for emitting a laser light, for converting the pulsed frequency-modulated transmission (PFM) signal into a corresponding laser light signal;
second converting means for converting the laser light signal output from said first converting means, into a pulsed frequency-modulated (PFM) reception signal;

VOL
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transmission means, connected between said first and second converting means and including a multi-mode fiber means, for transmitting the laser light signal from said first converting means to said second converting means;

third converting means, connected to said second converting means and including delay detection means, for converting the pulsed frequency-modulated (PFM) reception signal into a pulse frequency-modulated (FM) reception signal, thereby decreasing a modal noise; and

means for demodulating the pulse frequency-modulated (FM) reception signal to produce a reception signal corresponding to the input signal; including

a mono-multivibrator for receiving said pulse frequency-modulated reception signal from said third converting means to output a pulse FM signal with a constant pulse width; a limiting pulse amplifier connected to said mono-multivibrator for amplifying the pulse FM signal with amplitude thereof being limited; and a low pass filter series connected to said limiting pulse amplifier for filtering baseband components contained in said pulse FM signal so as to derive said reception signal.

4,928,319

METHOD AND ARRANGEMENT FOR TRANSMITTING POWER IN OPTICAL FORM OVER OPTICAL FIBRES

Gilles D. Pitt, Saffron Walden; Roger E. Jones, Cambridge; George R. Antell, Saffron Walden, all of England; Lyndon R. Spicer, Newport, United Kingdom; John A. Barnett, Orpington, United Kingdom, and Robert Hill, Newcastle Upon Tyne, United Kingdom, assignors to Standard Telephones Cables Public Limited Company, London, United Kingdom

Continuation of Ser. No. 258,054, Oct. 17, 1988, abandoned, which is a continuation of Ser. No. 788,586, Oct. 17, 1985, abandoned. This application Mar. 24, 1989, Ser. No. 328,761

Claims priority, application United Kingdom, Oct. 17, 1984, 8426291

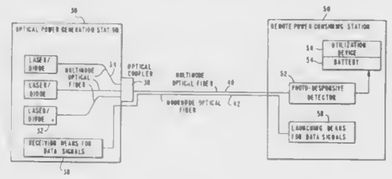
Int. Cl.[5] **H04B** *9/00*

U.S. Cl. 455—612 **10 Claims**

1. A power transmission arrangement in which operating power for a remote device is conveyed as light, the arrangement comprising a power generation station for generating optical power, a remote power consuming station separated from said power generation station, and optical fibre means coupling the power generation station to the power consuming station for conveying said optical power thereto, said optical fibre means comprising a long wavelength multimode first optical fibre having a relatively thick core size in the range 50 to 400 μm, the power generation station including a plurality of high-power gas or solid-state laser or superluminescent diodes, each having an optical output with a wavelength of the order of 0.70 to 1.7 μm and each feeding light energy into a respective second length of multimode optical fibre, and means for inputting the optical power output of the power generation station into one end of the said optical fibre means, said inputting means comprising an optical coupler coupled to the respective second lengths of multimode optical fibre from said plurality of lasers or diodes and to one end of the first optical fibre, wherein the remote power consuming station includes a photo-responsive detector upon which the optical power conveyed thereto and output from another end of the optical fibre means falls, and a utilization device coupled to the detector for utilizing said power, and wherein the detector includes a layered structure of the following layers;

(i) a first relatively thick layer of the order of 200 μm of indium phosphide doped to have n^- semi-insulating characteristic for receiving optical energy being directed to this layer,

(ii) a front contact which has a thickness in the range of 2 to μm of LPE indium phosphide of n^+ type and a doping of the order of 10^{18}–10^{19-3} disposed on the first layer,



(iii) a metalization on said front contact layer on an opposite face from the first layer for providing one contact for the extraction of electrical energy, which metallization covers a relatively small part of the opposite face,

(iv) a buffer layer also on the said opposite face of the front contact layer, which buffer layer has a thickness of the order of 1 μm, and is of LPE indium phosphide, n^- type doping of the order of 10^{16} cm^{-3},

(v) a layer of LPE indium gallium arsenide, n^- type doping of the order of 10^{16} cm^{-3}, which layer has a thickness of the order of 3 μm,

(vi) another layer of LPE indium gallium arsenide having a thickness of the order to 5 μm and being p^+ type doping of the order of 10^{18} cm^{-3}, and

(vii) a titanium gold alloy metallization on the outer face of the layer of p^+ type indium gallium arsenide, which metallization provides another contact for the extraction of electrical energy.

DESIGN PATENTS

GRANTED MAY 22, 1990

ERRATA

For CLASS	See PATENT NO.
D25-001	308,097

VOL
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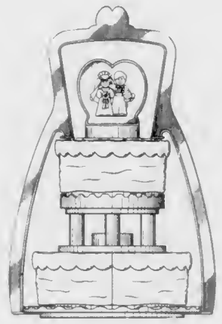
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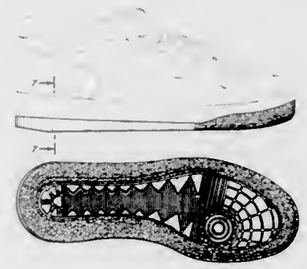
1990

UMI

307,970
WEDDING CAKE
William J. Maloney, II, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 8, 1987, Ser. No. 70,889
Term of patent 14 years
U.S. Cl. D1—129

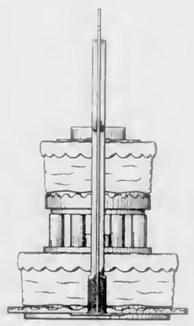


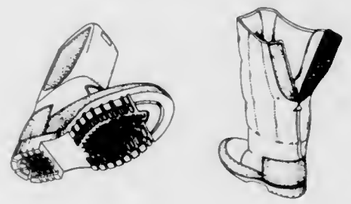
307,971
SHOE SOLE
Angelo Maccano, Simi Valley, and Dreanna Nakao, Los Angeles, both of Calif., assignors to L.A. Gear, Inc., Los Angeles, Calif.
Filed May 2, 1988, Ser. No. 189,229
Term of patent 14 years
U.S. Cl. D2—320



307,972
SANDAL
Laddie Sebestik, 164 Philippe, Rosemère, Québec, Canada (J7A 2X6)
Filed Dec. 21, 1987, Ser. No. 135,309
Term of patent 14 years
U.S. Cl. D2—270

307,973
RIDING-BOOT
Ann-Charlotte Wannius, Skanör, Sweden, assignor to Larstrade Intl. AB, Vastra Frolunda, Sweden
Filed Aug. 6, 1987, Ser. No. 82,422
Claims priority, application Sweden, Feb. 18, 1987, 87-0357
Term of patent 14 years
U.S. Cl. D2—274



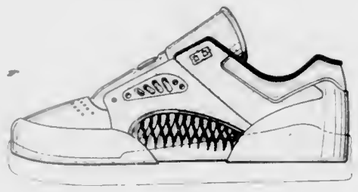


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VOL
1114
ISS
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MY
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1990
UMI

307,974
SHOE UPPER
Kimberly A. McKinstry, Redondo Beach, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Apr. 11, 1989, Ser. No. 336,313
Term of patent 14 years
U.S. Cl. D2—314





307,975
SHOE OUTSOLE
Christopher Kittle, Cohasset; James R. Holt, Medfield, and James H. Schumacher, Canton, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Feb. 9, 1989, Ser. No. 308,153
Term of patent 14 years
U.S. Cl. D2—320



307,976
THREAD ORGANIZER
Ellen D. McCarn, 3049 Cambridge Rd., Birmingham, Ala. 35223
Filed Nov. 17, 1986, Ser. No. 931,360
Term of patent 14 years
U.S. Cl. D3—21



307,977
DISC STORAGE CONTAINER
Robert A. Egly, 31 Belcourt S., Newport Beach, Calif. 92660, and Patrick Sullivan, 1752 Brookshire Ave., Tustin, Calif. 92680
Filed Jan. 16, 1987, Ser. No. 4,534
Term of patent 14 years
U.S. Cl. D3—35



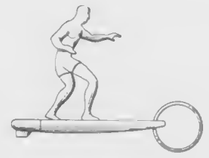
307,978
AUTOMOBILE STORAGE BAG
Donald A. Dallape, 770 Paularino Ave., Costa Mesa, Calif. 92626
Filed Jan. 5, 1987, Ser. No. 986
Term of patent 14 years
U.S. Cl. D3—40



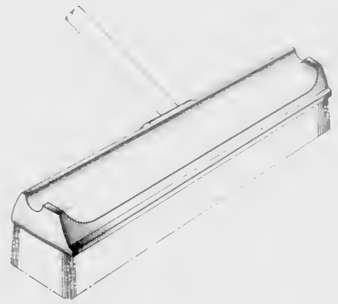
307,979
COMBINED KEY RING AND CHANGE PURSE
Janet L. Purvis, P.O. Box 2983, Canoga Park, Calif. 91306
Filed Jul. 17, 1987, Ser. No. 74,516
Term of patent 14 years
U.S. Cl. D3—62



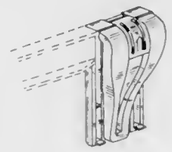
307,980
SURFER PEN KEY RING
Kyrk Walters, 305 Robin Hill Dr., Altamonte Springs, Fla. 32701
Filed Oct. 13, 1987, Ser. No. 107,534
Term of patent 14 years
U.S. Cl. D3—62



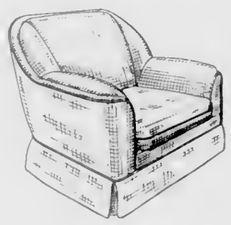
307,981
COMBINED PUSH BROOM HEAD AND SCRAPER
Jolyon Saunders, Green Bay, New Zealand, assignor to Libman Broom Company, Arcola, Ill.
Filed Mar. 30, 1987, Ser. No. 31,446
Term of patent 14 years
U.S. Cl. D4—118



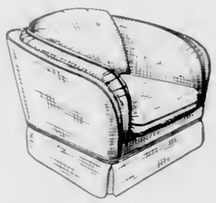
307,982
HANGER CLAMP
Everett L. Duester, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.
Continuation-in-part of Ser. No. 941,283, Dec. 12, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 121,592
Term of patent 14 years
U.S. Cl. D6—328



307,983
SEAT
Hoi Choi, Whitby, Canada, assignor to Sklar-Peppler Inc., Whitby, Canada
Filed Feb. 17, 1987, Ser. No. 15,603
Term of patent 14 years
U.S. Cl. D6—334

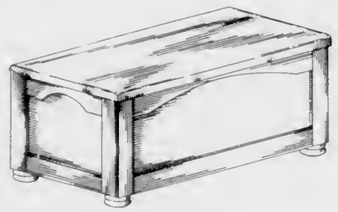


307,984
SEAT
Randy Culler, High Point, N.C., assignor to Sklar-Peppler Inc., Whitby, Canada
Filed Mar. 2, 1987, Ser. No. 20,651
Term of patent 14 years
U.S. Cl. D6—334



VOL
1114
ISS
4
MY
22
1990
UMI

307,985
STORAGE CHEST OR SIMILAR ARTICLE
Phyllis J. Hoff, P.O. Box 1445, Sutter Creek, Calif. 95685
Filed Mar. 9, 1987, Ser. No. 23,523
Term of patent 14 years
U.S. Cl. D6—440



307,986
DISPLAY CABINET
Martin L. Falk, P.O. Box 210, Wildwood, N.J. 08260
Filed Jul. 22, 1987, Ser. No. 76,196
Term of patent 14 years
U.S. Cl. D6—440



307,987
BEVERAGE DISPLAY STAND
Rafael T. Bustos, Alpharetta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed Nov. 24, 1986, Ser. No. 934,319
Term of patent 14 years
U.S. Cl. D6—450



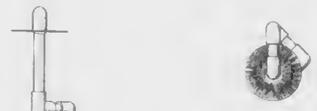


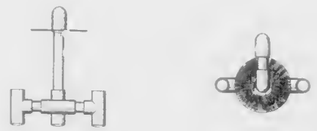
307,988
DISPLAY STAND
Gail F. Newfield, Mandeville, La., assignor to Sazerac Co., Inc., New Orleans, La.
Filed Nov. 9, 1987, Ser. No. 118,515
Term of patent 14 years
U.S. Cl. D6—450



307,989
EARRING DISPLAY STAND
Janet L. Stewart, 1825 Tecalote Dr., Fallbrook, Calif. 92028
Division of Ser. No. 869,923, Jun. 2, 1986. This application Mar. 29, 1989, Ser. No. 333,598
Term of patent 14 years
U.S. Cl. D6—467

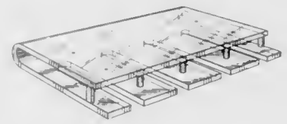




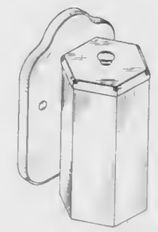




307,990
STEMWARE RACK
Robert R. Funk, 232 No. Rios Ave., Solana Beach, Calif. 92075
Filed Nov. 9, 1987, Ser. No. 118,421
Term of patent 14 years
U.S. Cl. D6—513



307,991
CUP DISPENSER
Larry M. Lofquist, 3803 Patriot La., Circle Pines, Minn. 55014
Filed Apr. 15, 1988, Ser. No. 182,327
Term of patent 14 years
U.S. Cl. D6—516



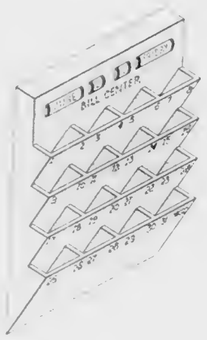
307,992
END CAP FOR A TOILET TISSUE HOLDER
Stanley T. Gresens, Chicago, and A. Denton Green, Evanston, both of Ill., assignors to Amerock Corporation, Rockford, Ill.
Division of Ser. No. 898,644, Aug. 21, 1986, Pat. No. Des. 300,998. This application Mar. 23, 1989, Ser. No. 327,568
Term of patent 14 years
U.S. Cl. D6—523



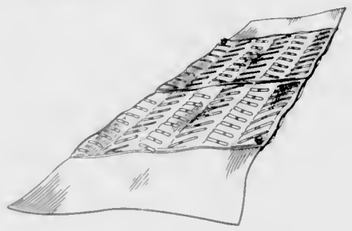


VOL
1114
ISS
4
MY
22
1990
UMI

307,993
BILL CENTER
Glenn Cignarella, 53 Mason Ave., Newton, N.J. 07860
Continuation-in-part of Ser. No. 910,166, Sep. 19, 1986, abandoned. This application May 18, 1987, Ser. No. 53,518
Term of patent 14 years
U.S. Cl. D6—553



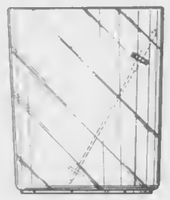
307,994
INFLATABLE MATTRESS
Joan Stuckey, 166 Burns Road, Turramurra, N.S.W. 2074, Australia
Filed Aug. 1, 1986, Ser. No. 892,396
Claims priority, application Australia, Feb. 4, 1986, 4061/86
Term of patent 14 years
U.S. Cl. D6—604

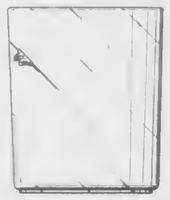


307,995
CHAIR COVER
Mitchell T. Kelldorf, 17820 Alexander Run, Jupiter, Fla. 33458
Filed Apr. 26, 1988, Ser. No. 186,213
Term of patent 14 years
U.S. Cl. D6—610



307,996
TUMBLER WITH A SWIZZLE STICK HOLDER
Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304
Filed May 12, 1986, Ser. No. 862,595
Term of patent 14 years
U.S. Cl. D7—507



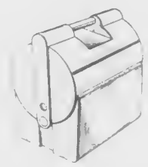


307,997
ICE DISTRIBUTION TRAY
David T. Bernstein, 303 Lake Ferry La., Atlanta, Ga. 30339
Filed Mar. 1, 1988, Ser. No. 162,464
Term of patent 14 years
U.S. Cl. D7—616

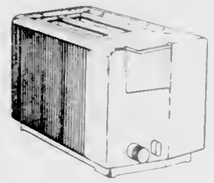




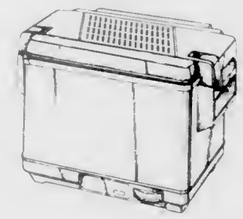
307,998
PORTABLE INSULATED CHEST
James J. J. Costello, Houston, Tex., and William A. Prindle, Santa Barbara, Calif., assignors to Igloo Products Corporation, Houston, Tex.
Filed Feb. 29, 1988, Ser. No. 162,152
Term of patent 14 years
U.S. Cl. D7—605



307,999
TOASTER
Hartwig Kahlcke, Kronberg, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Aug. 19, 1987, Ser. No. 87,271
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 73 MR 9565
Term of patent 14 years
U.S. Cl. D7—330



308,000
DEEP FRYER
Hans E. Slany, and Reinhard Renner, both of Esslingen, Fed. Rep. of Germany, assignors to I.T.T. Industries Belgium S.A., Brussels, Belgium
Filed Jul. 29, 1986, Ser. No. 891,973
Claims priority, application World Int. Prop. O., Jan. 30, 1986, DM/006411
Term of patent 14 years
U.S. Cl. D7—360





308,001
FOOD MIXER
Andre Ricard, Barcelona, Spain, assignor to Moulinex (Societe Anonyme), Bagnolet, France
Filed Feb. 11, 1988, Ser. No. 154,596
Claims priority, application France, Aug. 11, 1987, 87 4760
Term of patent 14 years
U.S. Cl. D7—376



VOL
1114
ISS
4
MY
22
1990
UMI

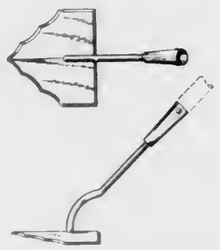
308,002
PAN OR THE LIKE FOR POURING LIQUIDS INTO A DRUM
Edward Dohrmann, 540 Kipp St., Teaneck, N.J. 07666
Filed Apr. 8, 1988, Ser. No. 179,905
Term of patent 14 years
U.S. Cl. D7—700



308,003
ELECTRIC TRIMMER MOTOR HOUSING WITH AN EXTENDABLE HANDLE
Roy Kraynyk, 229 E. Irvin Ave., State College, Pa. 16801
Filed May 18, 1988, Ser. No. 195,542
Term of patent 14 years
U.S. Cl. D8—8



308,004
COMBINED WEEDING AND FURROWING HOE HEAD
Paul S. Dawley, and Sally Dawley, both of 6010 Morgan Pl., Loomis, Calif. 95650
Filed Nov. 4, 1988, Ser. No. 267,516
Term of patent 14 years
U.S. Cl. D8—11



308,005
COMBINED TRACTOR TRAILER PIN PULLER AND FLASHLIGHT
Ernest G. Nickert, 8227 W. Lafayette, Detroit, Mich. 48209
Filed Aug. 6, 1987, Ser. No. 82,366
Term of patent 14 years
U.S. Cl. D8—14



308,006
HANDLE FOR MANUAL RELEASE OF A PAPER ROLL SPINDLE
Daniel T. Robbins, 368 E. Lombardy La., Banning, Calif. 92220
Filed Apr. 11, 1988, Ser. No. 180,268
Term of patent 14 years
U.S. Cl. D8—14



308,007
NAIL HOLDING HAMMER
Dennis A. Ferguson, and Tracey B. Lettiere, both of 1205 Orchard, Ridgecrest, Calif. 93555
Filed Mar. 3, 1988, Ser. No. 163,414
Term of patent 14 years
U.S. Cl. D8—75



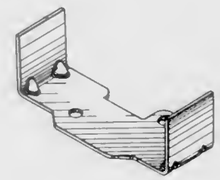
308,008
HOSE CLAMP
Sheldon Bissell, 6551 Mountain Ranch Rd., Mountain Ranch, Calif. 95246
Filed Mar. 16, 1988, Ser. No. 168,747
Term of patent 14 years
U.S. Cl. D8—72

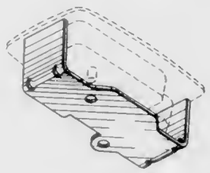


308,009
FOLDING KNIFE
Torbjörn Evrell, Eskilstuna, Sweden, assignor to Eskilstuna Knivfabriks AB, Eskilstuna, Sweden
Filed Dec. 11, 1987, Ser. No. 131,536
Claims priority, application Sweden, Nov. 23, 1987, 87-2734
Term of patent 14 years
U.S. Cl. D8—99

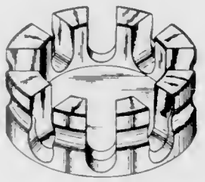


308,010
MOUNTING BRACKET FOR LATCHES AND LOCKS
Richard H. Russell, Farmington, and Thomas V. McLinden, Oxford, both of Conn., assignors to The Eastern Company, Cleveland, Ohio
Division of Ser. No. 72,278, Jul. 10, 1987. This application Jun. 28, 1989, Ser. No. 372,945
Term of patent 14 years
U.S. Cl. D8—343





308,011
ANCHOR FOR ROPE OR THE LIKE
Jerry D. Norris, Rte. 1, P.O. Box 391, Hooks, Tex. 75561
Filed Jan. 5, 1987, Ser. No. 954
Term of patent 14 years
U.S. Cl. D8—356





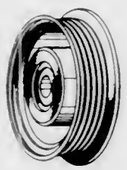
308,012
POLY-V PULLEY WITH BEARING HUB
Masahiro Kanemitsu, Kobe, Japan, assignor to Kabushiki Kaisha Kanemitsu, Japan
Filed Jul. 1, 1986, Ser. No. 880,913
The portion of the term of this patent subsequent to Mar. 15, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—360



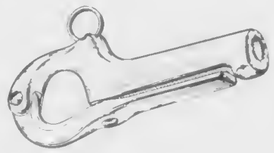


308,013
POLY-V PULLEY WITH AXIALLY DISPLACED HUB
Masahiro Kanemitsu, Kobe, Japan, assignor to Kabushiki Kaisha Kanemitsu, Japan
Filed Jul. 1, 1986, Ser. No. 880,914
The portion of the term of this patent subsequent to Sep. 20, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—360



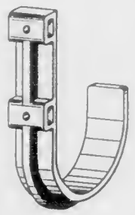


308,014
SAFETY CLIP
Gerard Issard, Thiers, France, assignor to Wichard, Thiers, France
Filed May 4, 1987, Ser. No. 45,579
Claims priority, application Hague, Dec. 31, 1986, DM/008018
Term of patent 14 years
U.S. Cl. D8—367





308,015
MARINE UTILITY HOOK
Joseph W. Volpe, 3024 Barton Dr., Sterling Heights, Mich. 48310, and William T. Chynoweth, 3770 Darleen Ct., Troy, Mich. 48084
Filed Aug. 31, 1987, Ser. No. 91,013
Term of patent 14 years
U.S. Cl. D8—367

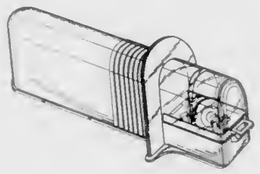


308,016
SEAL
Gary E. Tritton, and Victor R. Tritton, both of Pointe Claire, Canada, assignors to Les Entreprises Tritton Ltee, Chomedey, Canada
Filed Jan. 15, 1987, Ser. No. 3,695
Claims priority, application Canada, Jul. 17, 1986, 17-07-86-3
Term of patent 14 years
U.S. Cl. D8—394



308,017
CLAMP FOR CLAMPING WIRES
Akio Fujioka, Ichikawa, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan
Filed Dec. 30, 1987, Ser. No. 139,711
Claims priority, application Japan, Oct. 13, 1987, 62-41770
Term of patent 14 years
U.S. Cl. D8—396

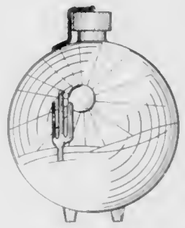
308,018
KNIFE SHARPENER
Erkki O. Lindén, Billnäs, and Timo Sunila, Karjaa, both of Finland, assignors to Fiskars OY AB, Helsinki, Finland
Filed Feb. 12, 1988, Ser. No. 155,641
Claims priority, application Finland, Aug. 14, 1987, 634/87
Term of patent 14 years
U.S. Cl. D8—93



308,019
COMBINED PACKAGE AND DISPENSER FOR EXTRUSIBLE COMESTIBLES
George Mileos, Riverdale, N.Y., assignor to Kraft General Foods, Inc., Glenview, Ill.
Filed Sep. 2, 1986, Ser. No. 903,054
Term of patent 14 years
U.S. Cl. D9—306

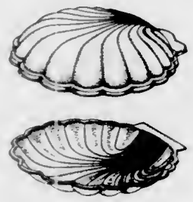


308,020
CANTEEN-SHAPED BEVERAGE CONTAINER OR SIMILAR ARTICLE
Edgar R. Laverde, P.O. Box 7024, New York, N.Y. 10116
Filed Mar. 3, 1989, Ser. No. 318,376
Term of patent 14 years
U.S. Cl. D9—307



VOL
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ISS
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MY
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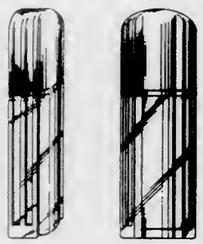
308,021
PACKAGING CONTAINER
Eiji Natori, Konosu, Japan, assignor to Chuo Kagaku Kabushiki Kaisha, Saitama, Japan
Filed Dec. 16, 1986, Ser. No. 942,578
Claims priority, application Japan, Oct. 7, 1986, 61-39778
Term of patent 14 years
U.S. Cl. D9—310



308,022
BOTTLE
Steven J. Mintz, Edgewater; Ward J. Haidle, Bordentown, and John S. Frazer, Long Beach Township, Ocean County, all of N.J., assignors to Kraft General Foods, Inc., Glenview, Ill.
Filed Oct. 20, 1988, Ser. No. 260,327
Term of patent 14 years
U.S. Cl. D9—375



308,023
PERFUME BOTTLE
Ateliers Dinand, Levallois-Perret, France, assignor to Worth Parfums, Paris, France
Filed Sep. 30, 1987, Ser. No. 103,256
Claims priority, application France, Apr. 14, 1987, 87 2189
Term of patent 14 years
U.S. Cl. D9—377



308,024
BOTTLE AND CAP
Edward J. Kunesh, Kenosha County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Aug. 12, 1988, Ser. No. 231,544
Term of patent 14 years
U.S. Cl. D9—403



308,025
GREASE CARTRIDGE PACKAGE
Billy J. Gregory, Kansas City, Mo., assignor to Witco Corporation, New York, N.Y.
Filed May 13, 1988, Ser. No. 193,646
Term of patent 14 years
U.S. Cl. D9—415





308,026
LAPEL COMMUNICATOR
Donald G. Victory, W15880 Peaceful Ave., Sheldon, Wis. 54766
Filed Sep. 30, 1987, Ser. No. 102,899
Term of patent 14 years
U.S. Cl. D11—46



308,027
EARRING
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Dec. 14, 1987, Ser. No. 132,106
Claims priority, application Italy, Jun. 22, 1987, 35871/87[U]
Term of patent 14 years
U.S. Cl. D11—43

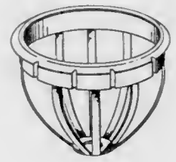




308,028
CHRISTMAS TREE STAND
Wilson P. Moriarty, P.O. Box 377, Atchison, Kans. 66002
Filed Jul. 11, 1988, Ser. No. 216,995
Term of patent 14 years
U.S. Cl. D11—130.1



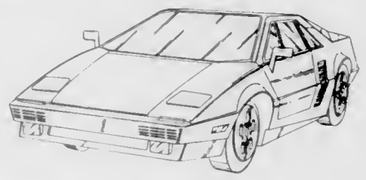
308,029
FLORAL FOAM HOLDER FOR A VASE
Juan Kladt, Mooresville, N.C., assignor to Vase D-Lite, Mooresville, N.C.
Filed Sep. 14, 1987, Ser. No. 95,939
Term of patent 14 years
U.S. Cl. D11—164



308,030
TIE CLASP
Hassan Restum, 7629 Theisen, Dearborn, Mich. 48126
Filed Apr. 3, 1987, Ser. No. 33,596
Term of patent 14 years
U.S. Cl. D11—204



308,031
AUTOMOBILE
Avelino Falero, P.O. Box 618, Juncos, P.R. 00666
Filed May 27, 1987, Ser. No. 54,679
Term of patent 14 years
U.S. Cl. D12—91

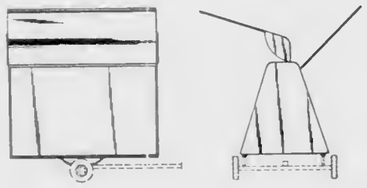


VOL 1114 ISS 4 MY 22 1990 UMI

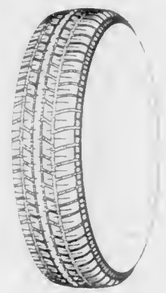
308,032
TRUCK CAB
Jeffery E. Kerney, Hayward; Charles E. Koske, Fremont, and Daniel E. Oen, San Francisco, all of Calif., assignors to Pacar Inc., Bellevue, Wash.
Filed Aug. 31, 1987, Ser. No. 91,258
The portion of the term of this patent subsequent to May 8, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—96



308,033
EXTERIOR SHELL OF A CAMPER KITCHEN TRAILER BODY
Wallace Cornell, Rte. 1, Box 1566, Hemphill, Tex. 75948
Filed Dec. 17, 1987, Ser. No. 134,055
Term of patent 14 years
U.S. Cl. D12—102



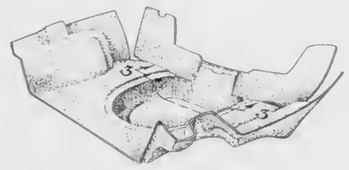
308,034
TIRE TREAD AND BUTTRESS
Maurice Graas, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 27, 1985, Ser. No. 706,361
Claims priority, application Benelux, Aug. 28, 1984, 30449-01/02
Term of patent 14 years
U.S. Cl. D12—147



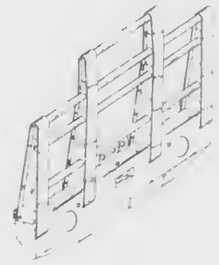
308,035
TRACTION DEVICE FOR PREVENTION OF SLIDING OF A VEHICLE TIRE
Makoto Goto, 11-12, Takasago 1-chome, Katsushika-ku, Tokyo, Japan
Filed Nov. 23, 1987, Ser. No. 123,991
Term of patent 14 years
U.S. Cl. D12—154



308,036
AUTOMOBILE TRUNK LINER
Robert A. Queen, Marion, N.C., and Michael D. Faloon, Canton Township, Wayne County, Mich., assignors to Collins & Aikman, Charlotte, N.C.
Filed Oct. 23, 1987, Ser. No. 112,757
Term of patent 14 years
U.S. Cl. D12—155



308,037
COMBINED VEHICLE BUMPER AND GUARD
Keith R. Aiken, P.O. Box 276, Campbelltown, New South Wales, Australia
Filed Jul. 7, 1987, Ser. No. 70,519
Claims priority, application Australia, Feb. 3, 1987, 0322/87
Term of patent 14 years
U.S. Cl. D12—169



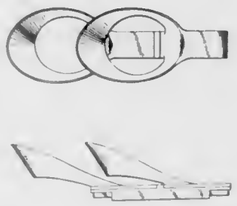
308,038
TIRE
Warren L. Guidry, Rayne, La., assignor to Interco Tire Corporation, Rayne, La.
Filed Aug. 13, 1987, Ser. No. 84,747
Term of patent 14 years
U.S. Cl. D12—146



308,039
TRACTION MAT FOR ATTACHMENT TO A VEHICLE TIRE
Reginald C. L. Ellis, Rose Cottage, School Hill, Upper Lydbrook, Gloucestershire, England
Filed Dec. 29, 1987, Ser. No. 139,272
Claims priority, application United Kingdom, Jul. 3, 1987, 1043232
Term of patent 14 years
U.S. Cl. D12—154

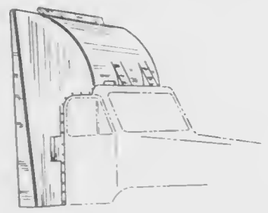


308,040
AUTOMOBILE WINDSHIELD WIPER AID
Victor Colani, Norderstedt, Fed. Rep. of Germany, assignor to Bonatrade International, Inc., Santa Ana, Calif.
Filed Sep. 9, 1987, Ser. No. 94,920
Term of patent 14 years
U.S. Cl. D12—155

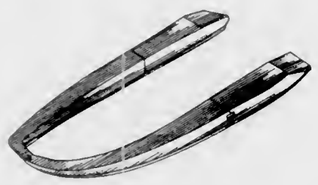


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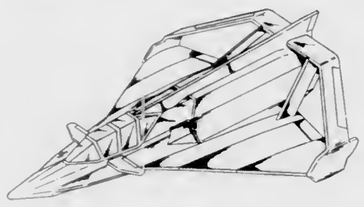
308,041
AIR SPOILER FOR TRUCKS
James R. Lund, Champlin, Minn., assignor to Lund Industries, Inc., Minneapolis, Minn.
Filed May 12, 1986, Ser. No. 862,558
Term of patent 14 years
U.S. Cl. D12—181



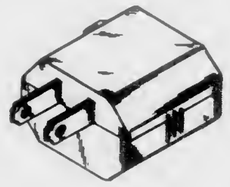
308,042
WATERCRAFT STABILIZING FLOTATION STRUCTURE
William M. Kitner, 4425 Palos Verdes Dr. North, Rolling Hills Estates, Calif. 90274; Thomas J. Calamia, 4507 Whitney, El Monte, Calif. 91731, and James R. Keahey, 7834 La Mirada Cir., Buena Park, Calif. 90620
Filed Feb. 17, 1987, Ser. No. 15,722
Term of patent 14 years
U.S. Cl. D12—317



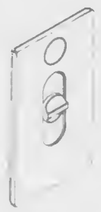
308,043
AIRCRAFT
Gerald L. Butler, P.O. Box 150163, Arlington, Tex. 76015
Filed Sep. 8, 1987, Ser. No. 93,902
Term of patent 14 years
U.S. Cl. D12—342



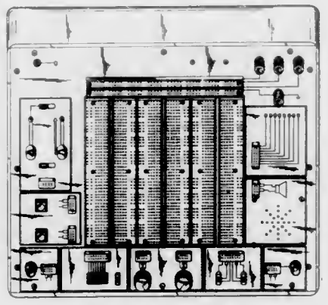
308,044
TRANSFORMER HOUSING
Bill B. Chandler, 965 Broadview Pl., Colorado Springs, Colo. 80904
Filed Oct. 14, 1988, Ser. No. 257,774
Term of patent 14 years
U.S. Cl. D13—110



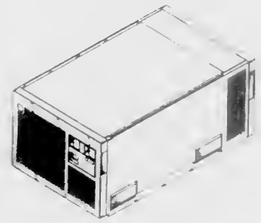
308,045
COMBINED FACE PLATE AND CONTROL OPERATORS FOR AN ELECTRICAL SWITCH OR SIMILAR ARTICLES
Richard C. Counts, Dallas, and David Fiegenschue, Irving, both of Tex., assignors to Prescolite Inc., San Leandro, Calif.
Filed May 6, 1987, Ser. No. 47,701
Term of patent 14 years
U.S. Cl. D13—170



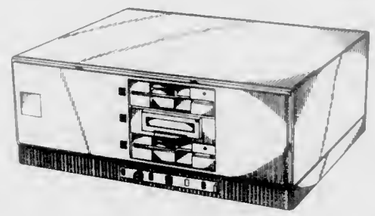
308,046
ELECTRONIC CIRCUIT SETUP STATION
Robert A. Melone, North Haven, Conn., assignor to Interplex Electronics, Inc., New Haven, Conn.
Filed Nov. 12, 1986, Ser. No. 929,766
The portion of the term of this patent subsequent to Dec. 5, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—164



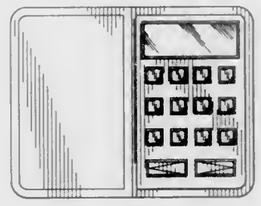
308,047
DATA PROCESSOR
Wayne L. Aderman, Rochester, Minn.; Vincent S. Garmon, West Palm Beach, Fla.; Timothy J. Rodd, Lyndhurst, England, and Robert P. Tennant, Endicott, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Oct. 6, 1987, Ser. No. 105,163
Term of patent 14 years
U.S. Cl. D14—100



308,048
PERSONAL COMPUTER
Ettore Sottsass, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Dec. 14, 1987, Ser. No. 132,145
Claims priority, application Italy, Jun. 22, 1987, 53455/87[U]
Term of patent 14 years
U.S. Cl. D14—100



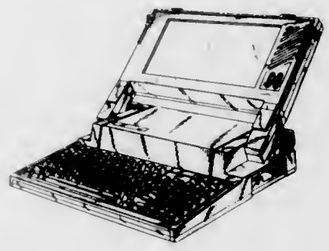
308,049
HANDHELD REFERENCE COMPUTER
Carol J. Dennett, 430 Akron, Augusta, Kans. 67010
Filed Mar. 7, 1988, Ser. No. 164,711
Term of patent 14 years
U.S. Cl. D14—100



308,050
ELECTRONIC COMPUTER
Yoshihiko Sugano, Tokyo, and Takaharu Andou, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Dec. 8, 1987, Ser. No. 130,157
Claims priority, application Japan, Aug. 3, 1987, 62-31261
Term of patent 14 years
U.S. Cl. D14—106

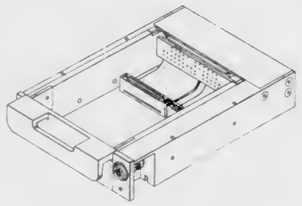


308,051
PORTABLE COMPUTER
Hiroaki Sakai, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Dec. 18, 1987, Ser. No. 135,100
Claims priority, application Japan, Jun. 29, 1987, 62-26389
Term of patent 14 years
U.S. Cl. D14—106

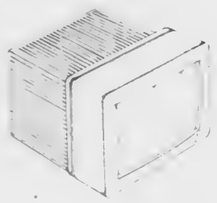


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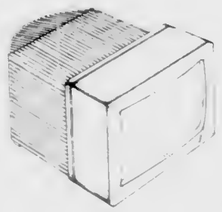
308,052
LOCKABLE AND REMOVABLE SLIDEIN ASSEMBLY FOR A HARD DISK DRIVE
Julius C. Darden, 1733 Calle Artigas, Thousand Oaks, Calif. 91360; Miguel M. L. Praca, 615 Ocean Front Walk, Apt. 203, Venice, Calif. 90291, and Philip J. Tomasi, 205 Pepper St., Newbury Park, Calif. 91301
Filed Oct. 1, 1987, Ser. No. 103,572
Term of patent 14 years
U.S. Cl. D14—109



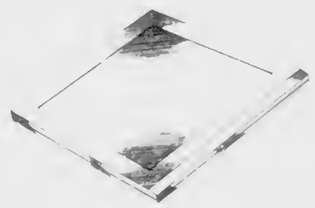
308,053
VIDEO DISPLAY FOR COMPUTER
Stephen Peart, Los Gatos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Mar. 17, 1987, Ser. No. 26,559
Term of patent 14 years
U.S. Cl. D14—113



308,054
VIDEO DISPLAY FOR COMPUTER
Stephen Peart, Los Gatos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Mar. 17, 1987, Ser. No. 26,560
Term of patent 14 years
U.S. Cl. D14—113



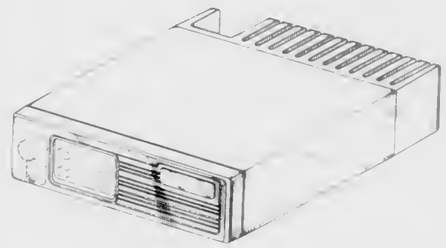
308,055
DIGITIZING TABLET FOR COMPUTER INPUT
Thomas A. Tedham, Salem, and Kenichi Akagi, Littleton, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Oct. 20, 1988, Ser. No. 260,547
Term of patent 14 years
U.S. Cl. D14—114



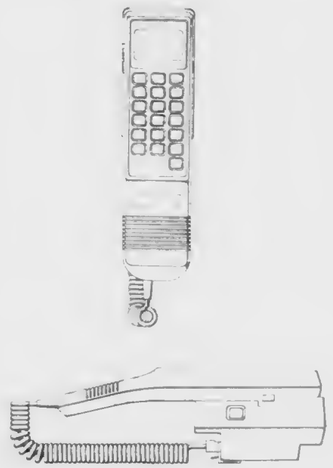
308,056
HUB FOR A TAPE REEL
Yuka Takeda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 18, 1987, Ser. No. 134,903
Claims priority, application Japan, Jun. 5, 1987, 62-23139
Term of patent 14 years
U.S. Cl. D14—121



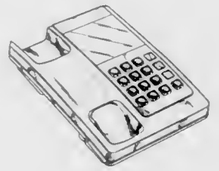
308,057
HOUSING FOR A TWO-WAY MOBILE RADIO OR SIMILAR ARTICLE
Masaru Tokiyama, Arlington, Tex., assignor to Motorola Inc., Schaumburg, Ill.
Filed Dec. 28, 1987, Ser. No. 138,529
Term of patent 14 years
U.S. Cl. D14—137

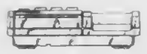


308,058
MOBILE TELEPHONE SET
Minoru Hotsumi, and Toshiaki Mizushima, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Dec. 27, 1988, Ser. No. 290,731
Claims priority, application Japan, Jun. 24, 1988, 63-25306
Term of patent 14 years
U.S. Cl. D14—138

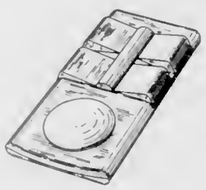


308,059
TELEPHONE BASE UNIT
Gus E. Desbarats, Putney, England, assignor to British Telecommunications public limited company, London, United Kingdom
Filed Sep. 26, 1988, Ser. No. 249,636
Claims priority, application United Kingdom, May 20, 1988, 1050886
The portion of the term of this patent subsequent to Apr. 24, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—151



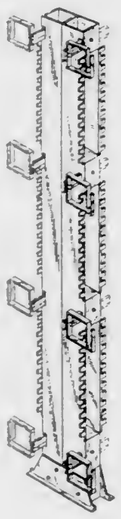


308,060
REMOTE CONTROL FOR A CAR RADIO RECEIVER
Grant M. N. Davidson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 7, 1988, Ser. No. 216,742
Claims priority, application United Kingdom, Jan. 20, 1988, 1.047.819
Term of patent 14 years
U.S. Cl. D14—218



VOL
1114
ISS
4
MY
22
1990
UMI

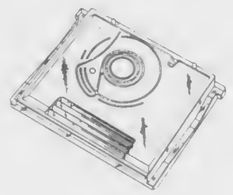
308,061
TELEPHONE MAIN FRAME MODULE OR SIMILAR ARTICLE
Paul V. De Luca, Plandome Manor, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.
Filed Jun. 3, 1987, Ser. No. 57,051
Term of patent 14 years
U.S. Cl. D14—240



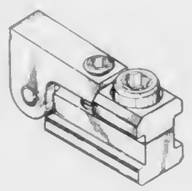
308,062
SHOULDER REST HOLDER FOR A PORTABLE TELEPHONE HANDSET
Kathleen C. Leoni; Michael D. Barron, both of P.O. Box 3116, Flint, Mich. 48502, and Robby D. Johnson, 351 Elm St., Mt. Morris, Mich. 48458
Filed Jun. 24, 1988, Ser. No. 211,039
Term of patent 14 years
U.S. Cl. D14—253



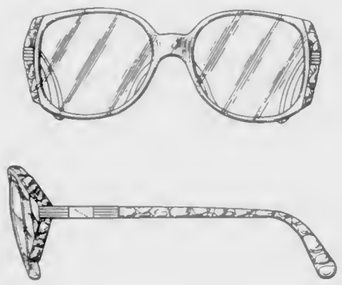
308,063
SLIDE PLATE OF A SEWING MACHINE
Masatomo Amemiya, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Feb. 17, 1987, Ser. No. 15,272
Claims priority, application Japan, Aug. 22, 1986, 32471
Term of patent 14 years
U.S. Cl. D15—72



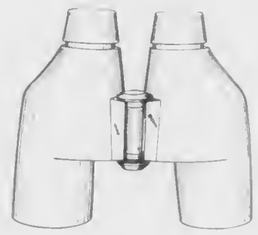
308,064
WORKPIECE CLAMP FOR FLAT BED JIG
Jimmy Hiseh, 65, Sec. 3 Chung Ching N. Road, Taipei 10316, Taiwan
Filed Apr. 13, 1987, Ser. No. 37,401
Term of patent 14 years
U.S. Cl. D15—138



308,065
EYEGLASS FRAME
Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corp., Norwood, N.J.
Filed Jan. 25, 1988, Ser. No. 147,917
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 17,322
Term of patent 14 years
U.S. Cl. D16—102



308,066
PAIR OF BINOCULARS
Claus O. Huckenbeck, Star Rte. 3, P.O. Box 4625-11, Tehachapi, Calif. 93561
Filed Oct. 28, 1988, Ser. No. 265,433
Term of patent 14 years
U.S. Cl. D16—133



308,067
ROTARY MOUNT FOR A TELESCOPE OR THE LIKE
Howard Mednick, 16518 Dearborn St., Sepulveda, Calif. 91343
Filed Feb. 9, 1987, Ser. No. 12,302
Term of patent 14 years
U.S. Cl. D16—145



308,068
PIANO
Steffen Seiler, Kitzingen-Hohenfeld, Fed. Rep. of Germany, assignor to Ed. Seiler Pianofortefabrik GmbH & Co KG, Kitzingen, Fed. Rep. of Germany
Filed Jul. 7, 1987, Ser. No. 70,485
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, MR II/759
Term of patent 14 years
U.S. Cl. D17—8



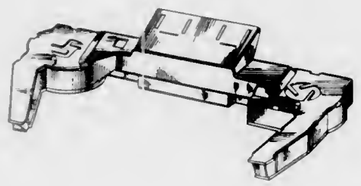


308,069
WOODWIND MOUTHPIECE
William P. Disera, 555 Westminster St., Joliet, Ill. 60435
Filed Apr. 14, 1987, Ser. No. 38,343
Term of patent 14 years
U.S. Cl. D17—13

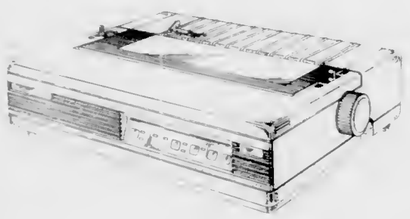


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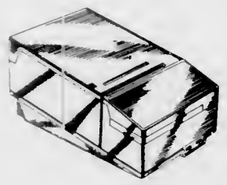
308,070
RIBBON CASSETTE
Hans W. Mueller, and Kenneth D. Vought, both of Cortland, N.Y., assignors to Smith Corona Corporation, N.Y.
Filed Nov. 30, 1987, Ser. No. 127,002
Term of patent 14 years
U.S. Cl. D18—12



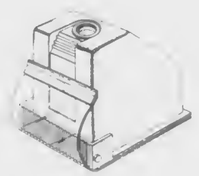
308,071
PRINTER
David S. Urbanus, North Easton, Mass., and Walter E. Lufkin, Londonderry, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Mar. 6, 1987, Ser. No. 23,065
Term of patent 14 years
U.S. Cl. D18—13



308,072
PRINTER
Duane L. Salmonson, Riverton, Wyo., assignor to Micro Peripherals, Inc., San Diego, Calif.
Filed Apr. 6, 1987, Ser. No. 34,187
Term of patent 14 years
U.S. Cl. D18—13

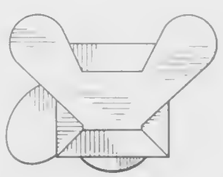


308,073
TONER TANK
Yoko Nakamura, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Oct. 21, 1988, Ser. No. 260,663
Claims priority, application Japan, Apr. 21, 1988, 63-16139
Term of patent 14 years
U.S. Cl. D18—43

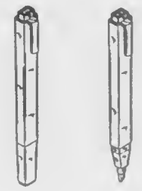


308,074
GREETING CARD
William P. Warkentin, 14 Turner Crescent, St. Catharines, Ontario, Canada (L2P 2H6)
Filed Oct. 26, 1987, Ser. No. 114,255
Claims priority, application Canada, Apr. 27, 1987, 27-04-87-6
Term of patent 14 years
U.S. Cl. D19—1

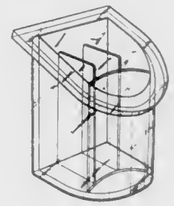




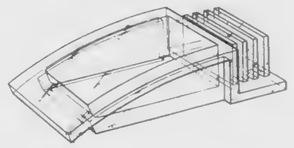
308,075
MARKING PEN
Katsuhiko Yazaki, Urawa, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan
Filed May 11, 1987, Ser. No. 49,442
Term of patent 14 years
U.S. Cl. D19—43



308,076
HOLDER FOR WRITING INSTRUMENTS
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jul. 15, 1987, Ser. No. 73,421
Claims priority, application Italy, Jan. 20, 1987, 20544/87[U]
Term of patent 14 years
U.S. Cl. D19—85



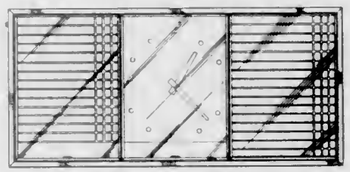
308,077
PAPER HOLDER
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jul. 15, 1987, Ser. No. 73,422
Claims priority, application Italy, Jan. 20, 1987, 20543/87[U]
Term of patent 14 years
U.S. Cl. D19—90



308,078
ADVERTISING SIGN ADAPTED FOR INSTALLATION AT A CHECK-OUT COUNTER
Fred H. Dallal, Hartsdale, and Milton Glaser, New York, both of N.Y., assignors to Media Holdings, Inc., New York, N.Y.
Filed Dec. 9, 1987, Ser. No. 130,726
Term of patent 14 years
U.S. Cl. D20—10



308,079
ILLUMINATED MENU DISPLAY UNIT
John M. Brown, 2600 Lockheed Way, Carson City, Nev. 89701
Filed Mar. 28, 1988, Ser. No. 174,617
Term of patent 14 years
U.S. Cl. D20—20



308,080
IDENTIFICATION TAG
Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada (H7W 1L3)
Continuation-in-part of Ser. No. 820,965, Jan. 22, 1986. This application Aug. 26, 1988, Ser. No. 236,778
Term of patent 14 years
U.S. Cl. D20—22



VOL
1114
ISS
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MY
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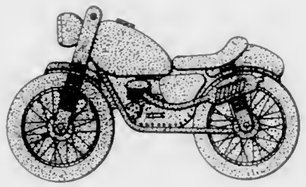
308,081
GAMEBOARD
Fred B. Wrixon, 214 N. 7th St., Martins Ferry, Ohio 43935
Filed Jul. 23, 1987, Ser. No. 76,656
Term of patent 14 years
U.S. Cl. D21—25

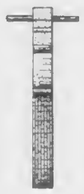


308,082
RATTLE
Rita Raiffe, Far Hills, N.J., assignor to Gund, Inc., Edison, N.J.
Filed Jan. 28, 1988, Ser. No. 150,317
Term of patent 14 years
U.S. Cl. D21—65

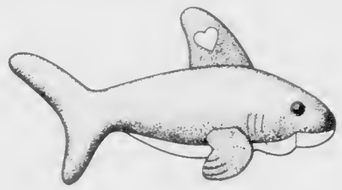


308,083
FLEXIBLE VEHICLE-LIKE CHILD'S TOY
Danny G. Freeman, Rte. 3, Box 364, Dawson Springs, Ky. 42408
Filed Sep. 5, 1986, Ser. No. 904,229
Term of patent 14 years
U.S. Cl. D21—124

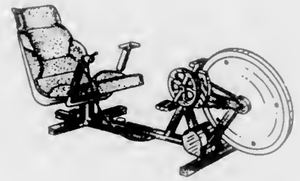


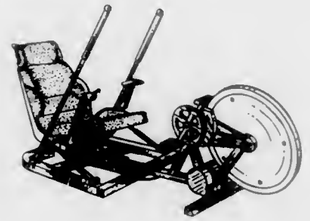


308,084
STUFFED TOY SHARK
Melanie M. Smith, and William M. Smith, both of 1630 Whitewood Ct., #A, Corona, Calif. 91720
Filed Mar. 9, 1987, Ser. No. 23,281
Term of patent 14 years
U.S. Cl. D21—157



308,085
BICYCLE EXERCISER
Terry D. Alberta, Sunset Beach, Calif., assignor to Pro-Tec Sports International, Inc., Compton, Calif.
Filed Apr. 11, 1988, Ser. No. 180,252
Term of patent 14 years
U.S. Cl. D21—194

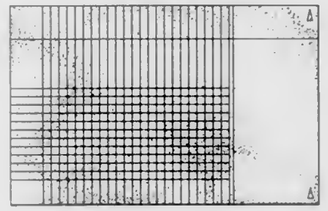




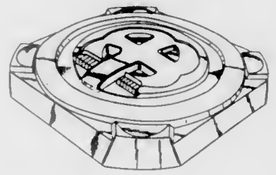
308,086
GOLF TEE
Robert Mc. Gamble, 450 N. Barfield Dr., Marco, Fla. 33937
Filed Jun. 8, 1987, Ser. No. 59,871
Term of patent 14 years
U.S. Cl. D21—208



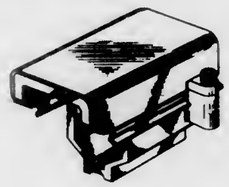
308,087
GOLF PRACTICE MAT
Peter D. Buffey, 26 Lafayette La., Norfolk, Mass. 02056
Filed May 18, 1987, Ser. No. 51,150
Term of patent 14 years
U.S. Cl. D21—234



308,088
SANDBOX
James F. Mariol, Cincinnati, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Apr. 17, 1987, Ser. No. 39,527
Term of patent 14 years
U.S. Cl. D21—252

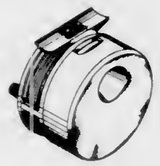


308,089
SIGHT AIMING INSTRUMENT FOR WEAPONRY
Ronald J. Sanders, P.O. Box 658, Floodwood, Minn. 55736
Filed Dec. 4, 1987, Ser. No. 128,570
Term of patent 14 years
U.S. Cl. D22—109



VOL 1114 ISS 4 MY 22 1990 UMI

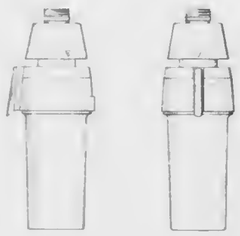
308,090
COMBINED FISHING REEL AND BAIT CASE
Shih-Yuan Yeh, No. 2-4, Chen-Hsing Road, Tai-Ping Hsiang, Taichung Hsien, Taiwan
Filed Jun. 2, 1987, Ser. No. 57,245
Term of patent 14 years
U.S. Cl. D22—139



308,091
FISH HOOK REMOVER
James D. Sprague, 505 High St., Edwardsville, Kans. 66111
Filed Feb. 18, 1987, Ser. No. 15,877
Term of patent 14 years
U.S. Cl. D22—149



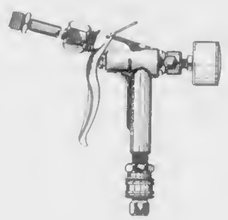
308,092
FAUCET FILTER
Francois Geneve; Luc Heiligenstein, and Stephen Melamed, all of Chicago, Ill., assignors to Associated Mills Inc., Chicago, Ill.
Filed Dec. 30, 1988, Ser. No. 292,560
Term of patent 14 years
U.S. Cl. D23—209



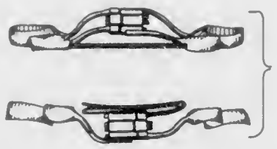
308,093
HAND HELD SPRAY
Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Feb. 10, 1988, Ser. No. 154,674
Term of patent 14 years
U.S. Cl. D23—226



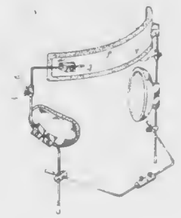
308,094
COMBINED HANDLE-OPERATED FLOW CONTROL VALVE AND PRESSURE GAUGE
Robert W. Hengesbach, 7886 Munson Rd., Mentor, Ohio 44060
Continuation of Ser. No. 68,052, Jun. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 15,604, Feb. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 674,272, Nov. 23, 1984, Pat. No. Des. 293,127, which is a continuation-in-part of Ser. No. 461,874, Jan. 28, 1983, Pat. No. Des. 282,392, which is a division of Ser. No. 756,186, Jul. 18, 1985, Pat. No. Des. 284,301. This application Jul. 26, 1988, Ser. No. 224,250
Term of patent 14 years
U.S. Cl. D23—226



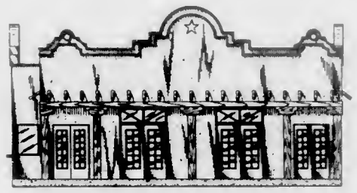
308,095
ORTHODONTIC APPLIANCE
John A. Collins, Jr., 1116 Mishawaka Ave., South Bend, Ind. 46615
Filed Jan. 4, 1988, Ser. No. 140,322
Term of patent 14 years
U.S. Cl. D24—10



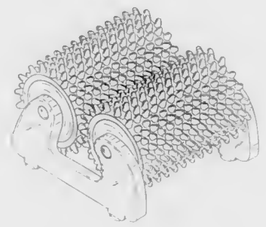
308,096
ORTHODONTIC FACE MASK
John A. Collins, Jr., 1116 Mishawaka Ave., South Bend, Ind. 46615
Filed Jan. 4, 1988, Ser. No. 140,437
Term of patent 14 years
U.S. Cl. D24—10



308,097
FAST SERVICE RESTAURANT BUILDING
Robert W. McMahon, San Antonio, Tex., assignor to Third R.W.M., Inc., San Antonio, Tex.
Filed Aug. 1, 1988, Ser. No. 226,972
Term of patent 14 years
U.S. Cl. D25—1



308,098
MASSAGE ROLLER
Arvo E. Lievonen, and Kari J. Lievonen, both of 1301 Lake Geneva Dr., Lake Worth, Fla. 33461
Filed Apr. 30, 1987, Ser. No. 45,661
Term of patent 14 years
U.S. Cl. D24—36



308,099
CATHETER BAG SUPPORT HOOK OR SIMILAR ARTICLE
Louis M. Jimenez, P.O. Box 1916, Oroville, Calif. 95965-1916
Filed Nov. 9, 1989, Ser. No. 433,734
Term of patent 14 years
U.S. Cl. D24—54



308,100
NASAL SPRAY PUMP
Keith A. Bishop, River Vale, and William S. Blake, Linwood, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.
Filed Aug. 28, 1987, Ser. No. 90,734
Term of patent 14 years
U.S. Cl. D24—62

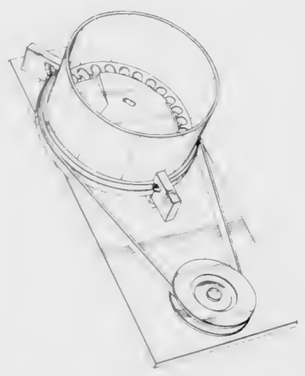


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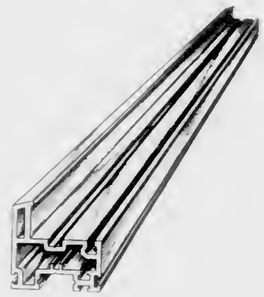
308,101
ORAL MEDICAMENT DISPENSER FOR LIQUID OR CREAM
Edward Tugwood, Iver Heath, United Kingdom, assignor to Plough, Inc., Del.
Filed Mar. 25, 1987, Ser. No. 30,782
Claims priority, application United Kingdom, Sep. 26, 1986, 1037195
Term of patent 14 years
U.S. Cl. D24—63



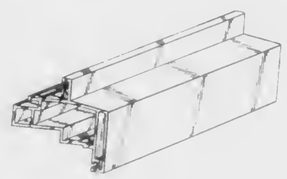
308,102
BULLET COLLATOR FOR SHELL RELOADING OPERATIONS
Ralph D. Pickens, 49162 McCoy Ave., East Liverpool, Ohio 43920
Filed May 15, 1987, Ser. No. 49,780
Term of patent 14 years
U.S. Cl. D25—116



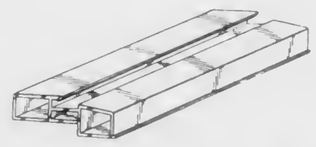
308,103
WINDOW COMPONENT EXTRUSION
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Sep. 19, 1988, Ser. No. 246,187
Term of patent 14 years
U.S. Cl. D25—124



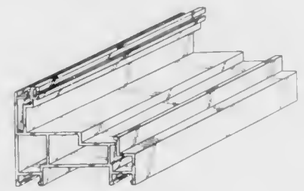
308,104
WINDOW COMPONENT
Terence Hardy, Derby, England, assignor to L. B. Plastics Limited, England
Filed Aug. 10, 1989, Ser. No. 392,252
Term of patent 14 years
U.S. Cl. D25—124



308,105
WINDOW COMPONENT
Terence Hardy, Nether Heage, England, assignor to L. B. Plastics Limited, England
Filed Aug. 10, 1989, Ser. No. 392,253
Term of patent 14 years
U.S. Cl. D25—124



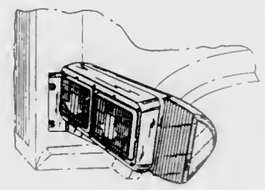
308,106
WINDOW COMPONENT
Terence Hardy, Derby, England, assignor to L. B. Plastics Limited, England
Filed Aug. 10, 1989, Ser. No. 392,254
Term of patent 14 years
U.S. Cl. D25—124



308,107
SQUARED STAIRCASE BALUSTER
Louis Manzo, 8 Putnam Ct., Holmdel, N.J. 07733
Filed Nov. 6, 1987, Ser. No. 117,732
Term of patent 14 years
U.S. Cl. D25—126



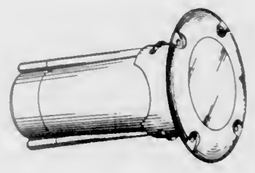
308,108
HEADLIGHT FOR A TRUCK
Ross Sasamura, Fremont, Calif., assignor to Paccar Inc., Bellevue, Wash.
Filed Sep. 11, 1987, Ser. No. 96,142
Term of patent 14 years
U.S. Cl. D26—35



308,109
FLASHLIGHT
Anthony Maglica, Ontario; Robert J. DeLong, Temple City, and Armis L. Lewis, Cucamonga, all of Calif., assignors to Mag Instrument, Inc., Ontario, Calif.
Filed Apr. 27, 1987, Ser. No. 43,596
Term of patent 14 years
U.S. Cl. D26—49



308,110
LUFF LIGHT FOR A BOAT
Theodore Zisylek, Jr., 140 Riverview Dr., Yardley, Pa. 19067
Filed Mar. 27, 1987, Ser. No. 30,784
The portion of the term of this patent subsequent to Mar. 20, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—36



VOL
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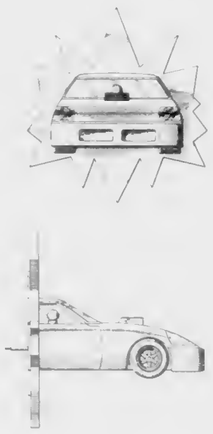
308,111
OUTDOOR LIGHT FIXTURE
Eugene D. Banathy, Skokie; Augustus B. Davis, Mundelein, and David A. Carlson, Lindenhurst, all of Ill., assignors to Intermatic Electronics, Incorporated, Spring Grove, Ill.
Filed Jun. 18, 1987, Ser. No. 64,775
Term of patent 14 years
U.S. Cl. D26—68



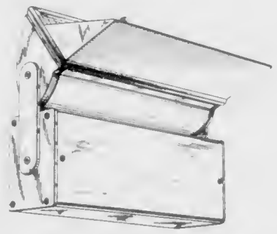
308,112
INDIRECT LIGHT FIXTURE
Giampaolo Targetti, Florence, Italy, assignor to Targetti Sankey, S.p.A., Florence, Italy
Filed Mar. 19, 1987, Ser. No. 27,676
Term of patent 14 years
U.S. Cl. D26—72



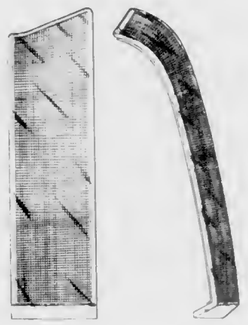
308,113
DECORATIVE WALL LAMP
Leonard O. Lewis, Jr., 32 Willow St., Port Monmouth, N.J. 07758
Filed Sep. 3, 1987, Ser. No. 92,714
Term of patent 14 years
U.S. Cl. D26—73



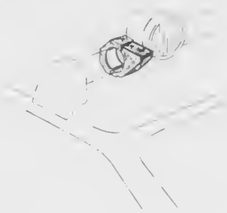
308,114
WALL MOUNTED INDIRECT LIGHTING FIXTURE
Sylvan R. Shemitz, Woodbridge, Conn., assignor to Sylvan R. Shemitz Associates, Inc., West Haven, Conn.
Filed Apr. 9, 1987, Ser. No. 36,845
Term of patent 14 years
U.S. Cl. D26—85



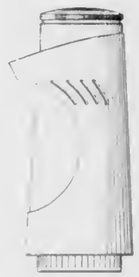
308,115
PAIR OF VEHICLE REAR SIGNAL LIGHTS
Carmelo Vitale, Mozzate, and Ezio Villa, Arese, both of Italy, assignors to Alfa Lancia Industriale S.p.A., Arese, Italy
Filed Feb. 26, 1988, Ser. No. 160,927
Term of patent 14 years
U.S. Cl. D26—122



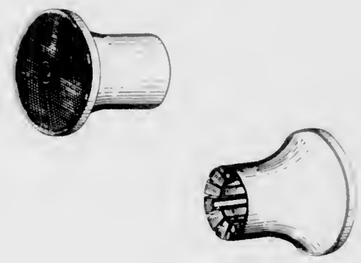
308,116
VEHICLE LIGHT MOUNTING BRACKET
Robert R. Vandergriff, 4200 Via Dolce (334), Marina Del Rey, Calif. 90291
Filed Jan. 26, 1988, Ser. No. 149,059
Term of patent 14 years
U.S. Cl. D26—149



308,117
HOT LATHER MACHINE
James L. Badgett, Atlanta, Ga., assignor to Conair Corporation, Stamford, Conn.
Filed Sep. 6, 1988, Ser. No. 240,573
Term of patent 14 years
U.S. Cl. D28—9

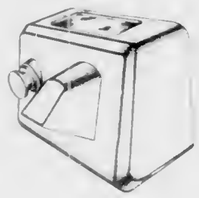


308,118
DIFFUSER ATTACHMENT FOR HAIR DRYER
Richard H. Brill, Philadelphia, Pa., assignor to Conair Corporation, Stamford, Conn.
Filed Jul. 5, 1988, Ser. No. 215,902
Term of patent 14 years
U.S. Cl. D28—18

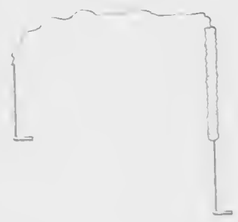


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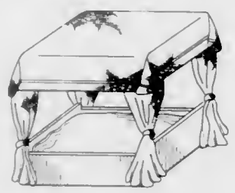
308,119
DRYER
Lorin R. Wigman, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Nov. 2, 1988, Ser. No. 266,032
Term of patent 14 years
U.S. Cl. D28—54.1



308,120
COMBINED DENTAL FLOSS AND HANDLES THEREFOR
Jan Monheim, 6087 Wadsworth Rd., Orrville, Ohio 44667
Filed Mar. 14, 1988, Ser. No. 167,421
Term of patent 14 years
U.S. Cl. D28—64



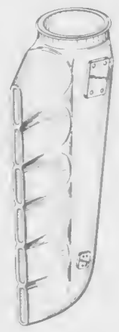
308,121
WATERBED FOR PETS OR THE LIKE
Geraldine M. Overturf, 653 24th South West, Loveland, Colo. 80537
Filed May 22, 1987, Ser. No. 52,954
Term of patent 14 years
U.S. Cl. D30—118



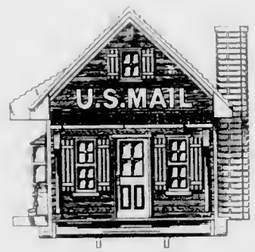
308,122
PET TOY
Joseph P. Markham, and Peter Emily, both of Lakewood, Colo., assignors to Bounce, Inc., Lakewood, Colo.
Continuation-in-part of Ser. No. 73,432, Jul. 15, 1987. This application Feb. 1, 1988, Ser. No. 151,247
Term of patent 14 years
U.S. Cl. D30—160



308,123
VEHICLE AIR DRYING NOZZLE
Graham J. Astley, Novi, and Barry S. Turner, Livonia, both of Mich., assignors to Belanger, Inc., Northville, Mich.
Filed Apr. 1, 1987, Ser. No. 32,652
Term of patent 14 years
U.S. Cl. D32—4



308,124
MAILBOX
Thomas F. Janzer, Bensalem, Pa., assignor to The Janzer Corp., Bensalem, Pa.
Filed Sep. 17, 1986, Ser. No. 908,173
Term of patent 14 years
U.S. Cl. D99—30



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MAY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Henricson, Kaj O.; Repo, Erkki T.; and Ronkonharju, Hannu U., 4,927,529, Cl. 209-270.000.
A. E. Staley Manufacturing Company: *See*—
Antenucci, Robert N., 4,927,649, Cl. 426-273.000.
A. O. Smith Corporation: *See*—
Polczynski, Mark; and Krueger, Brian, 4,926,546, Cl. 29-840.000.
Aaslyng, Dorrit A.; Jensen, Georg W.; Schneider, Ib; and Schneider, Palle, to Novo Industri A/S. Proteolytic detergent additive and compositions containing the same. 4,927,558, Cl. 252-174.120.
ABB Atom AB: *See*—
Engdahl, Goran; and Molund, Gunnar, 4,927,334, Cl. 417-322.000.
Abbas, Daniel C., to Eastman Kodak Company. Method of improving yield of LED arrays. 4,927,778, Cl. 437-51.000.
Abbott, Kenneth E.; Lyons, Patrick J.; and Satariano, Richard M., to Stripping Technologies Inc. Pressurized hose handle with system controls. 4,926,589, Cl. 51-427.000.
Abbott Laboratories: *See*—
Pastrone, John; and Laenen, Edward, 4,927,411, Cl. 604-65.000.
Stein, Herman H.; Pattner, Jacob J.; and Crowley, Steven R., 4,927,807, Cl. 514-18.000.
Abbott, Robert A.; Barbara, Bruce; and Roy, Richard S., to Visic, Inc. Static ram with high speed, low power reset. 4,928,266, Cl. 365-189.010.
Abboud, Pierre Y., to General Motors Corporation. Vehicle headlamp system with series high beam daylight running lamp operation. 4,928,036, Cl. 315-82.000.
Abe, Akira: *See*—
Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, 4,927,533, Cl. 210-257.100.
Abe, Hideaki: *See*—
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,926,881, Cl. 128-804.000.
Abe, Kunihiro; and Furuyama, Masaaki, to Fuji Jukogyo Kabushiki Kaisha. Control system for an automotive engine. 4,926,822, Cl. 123-414.000.
Abe, Mitsuyuki: *See*—
Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi; Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, 4,927,941, Cl. 548-264.800.
Abe, Norio; and Fukaura, Osamu, to Bridgestone Corporation. Apparatus for covering a tire bead with a tape. 4,927,488, Cl. 156-460.000.
Abe, Seiichi, to Mitsubishi Kinzoku Kabushiki Kaisha. Method of and apparatus for dressing cutting edge of cut-off wheel. 4,926,836, Cl. 125-11.010.
Abe, Takao: *See*—
Koshizuka, Kunihiro; Tezuka, Toshiaki; Abe, Takao; and Ebisawa, Harue, 4,927,693, Cl. 428-141.000.
Abe, Yasunao: *See*—
Kondo, Masao; and Abe, Yasunao, 4,926,738, Cl. 84-618.000.
Abele, Alan C.: *See*—
Haire, Allen; Abele, Alan C.; and Kuczek, Stanley W., 4,927,355, Cl. 431-329.000.
Abildgaard, William H.; Chadwick, Charles; Hotkowski, Peter; and Todaro, Frank A., to VeloBind, Inc. Method for automatically justifying, assembling, and binding books. 4,927,310, Cl. 412-7.000.
Abou-Gharbia, Magid A.; and Patel, Usha R., to American Home Products Corporation. Polycyclicamine with psychotropic activity. 4,927,934, Cl. 546-152.000.
ABU Garcia Produktion AB: *See*—
Henriksson, Bengt-Ake, 4,927,094, Cl. 242-242.000.
Abukawa, Toshimi: *See*—
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.
Accardi, Christine: *See*—
Schwarz, Joshua; and Accardi, Christine, 4,927,559, Cl. 252-186.390.
Acculase Inc.: *See*—
Levatter, Jeffrey I., 4,927,231, Cl. 350-96.320.
Accurate Metering Systems, Inc.: *See*—
Duback, David W.; and Vogenthaler, James R., 4,928,205, Cl. 361-346.000.
Acosta, Wilfred J., to Waste Management, Inc. Apparatus for temporarily covering a large land area. 4,927,317, Cl. 414-724.000.
ACS Communications: *See*—
Gattey, Phillip; and Chen, Shu-Ren, 4,926,961, Cl. 181-22.000.
Lynn, Dwight D., 4,928,307, Cl. 379-395.000.
Adamek, John A.: *See*—
Poehlein, Raymond E.; Reese, Franklin S.; and Adamek, John A., 4,928,141, Cl. 355-208.000.
Adams, Frederic R.; Boyer, Jeffrey M.; Schultz, Ronald N.; and Taylor, Barry, to Saturn Corporation. Operator control for vehicle components. 4,926,959, Cl. 180-315.000.
Adams, George K., III: *See*—
Zoltan, Bart J.; Laube, Beth L.; and Adams, George K., III, 4,926,852, Cl. 128-200.230.
Adams, Ronald L.; Kimbel, Kirk L.; and Quinn, Clayton B., to General Electric Company. Filled core materials having unfilled outer attached layers. 4,927,675, Cl. 428-35.900.
Adler, Alfons; Widdig, Arno; Kuhle, Engelbert; Fuhrer, Wolfgang; Hagemann, Hermann; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Fungicidal trisubstituted 1,3,5-triazine-2,4,6-triones. 4,927,824, Cl. 514-241.000.
Adlon, Daniel T.; Spong, Richard V.; Cerquone, Stephen M.; and Bickford, David E., to AMP Incorporated. Continuity coupling in a harness making machine. 4,928,066, Cl. 324-539.000.
Adolph Coors Company: *See*—
Grims, Conrad M.; Moen, Bruce A.; and Pardubicky, Jaroslav F., 4,926,669, Cl. 72-349.000.
Advance Manufacturing Co., Inc.: *See*—
Salce, Luigi C., Sr., 4,926,699, Cl. 73-862.210.
Advanced Cardiovascular Systems, Inc.: *See*—
Dake, Michael D.; and Maguire, Mark A., 4,927,418, Cl 604-264.000.
Advanced Micro Devices, Inc.: *See*—
Chuang, Patrick T.; Yau, Robert L.; Yoshida, Hiroshi; and Wang, Moon-Yee, 4,928,260, Cl. 365-49.000.
Adviesbureau D3BN Civiel Ingenieurs B.V.: *See*—
Buijs, Johannes, 4,926,591, Cl. 52-63.000.
Aerospatiale Societe Nationale Industrielle: *See*—
Blancke, Bernard, 4,927,101, Cl. 244-164.000.
Depeige, Alain, 4,927,098, Cl. 244-137.200.
Vuillet, Alain E., 4,927,331, Cl. 416-238.000.
AG Communication Systems Corporation: *See*—
Blondeau, Ernest E., Jr.; and Czarnecki, Stephen J., 4,928,276, Cl 370-110.100.
Agar, David: *See*—
Fuchs, Hugo; and Agar, David, 4,927,542, Cl. 210-711.000.
Agency of Industrial Science & Technology, Ministry of International Trade: *See*—
Arai, Hirohiko; and Tachi, Susumu, 4,928,047, Cl. 318-568.160.
Agers, Brian M.; and Dickins, John S., III, to Du Pont de Nemours, E. I., and Company. Yarn finish applicator. 4,926,661, Cl. 68-200.000.
Agharkar, Shreeram N.: *See*—
Bykadi, Gururaj; Kaplan, Murray A.; Corrao, Richard G.; Bara, Edward J.; Ullah, Ismat; and Agharkar, Shreeram N., 4,927,638, Cl. 424-455.000.
Agoglia, Robert J.; Dayan, Richard A.; and Smith, Bruce A., to International Business Machines Corporation. Diskette drive type determination. 4,928,193, Cl. 360-78.040.
Agrawal, Rakesh, to Air Products and Chemicals, Inc. High pressure nitrogen production cryogenic process. 4,927,441, Cl. 62-28.000.
Agri Research and Development: *See*—
Scully, Marlan O., 4,927,419, Cl. 604-892.100.
Ahern, Steven R.; Brooks, Roy S.; and Cebis, Martin J. P., to Orbital Engine Co., Proprietary Limited. Two-fluid fuel injected engines. 4,926,806, Cl. 123-179.00L.
Air Products and Chemicals, Inc.: *See*—
Agrawal, Rakesh, 4,927,441, Cl. 62-28.000.
Garg, Diwakar; Wreesics, Ernest L.; Schaffer, Leslie E.; Mueller, Carl F.; Dyer, Paul N.; and Fabregas, Keith R., 4,927,713, Cl. 428-627.000.
Aishin Seiki Co., Ltd.: *See*—
Tsumura, Kenji; Yamada, Yukifumi; and Terada, Takami, 4,927,110, Cl. 248-430.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Arakawa, Yoshichika, 4,926,711, Cl. 475-227.000.
Asada, Tohru, 4,927,204, Cl. 292-216.000.
Aizawa, Hiroshi: *See*—
Kaneuchi, Kunihiro; Yasuda, Seigou; Ariyoshi, Takashi; Nakatani, Tomofumi; and Aizawa, Hiroshi, 4,928,302, Cl. 379-88.000.
Tsunekawa, Tokuichi; Date, Nobuaki; Aizawa, Hiroshi; Hosoe, Kazuya; and Urushibara, Kazunori, 4,928,184, Cl. 358-335.000.
Akab of Sweden AB: *See*—
Helgesson, Bernt, 4,926,725, Cl. 83-155.000.
Akada, Masanori: *See*—
Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,927,666, Cl. 427-146.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Akagawa, Hirotaka: *See*—
Hakuta, Shinsaku; Yasaka, Yasuhiro; Nagura, Osamu; Tsuji, Eiji; Suzuki, Makoto; and Akagawa, Hirotaka, 4,926,541, Cl. 29-598.000.

Akagi, Toshimichi: *See*—
Tadokoro, Tomoo; Tashima, Seiji; Okimoto, Haruo; Akagi, Toshimichi; Nakao, Masami; Matsuda, Ikuo; and Suekuni, Einosuke, 4,926,636, Cl. 60-312.000.

Akasaka, Nobuhiro: *See*—
Suzuki, Fumio; Akasaka, Nobuhiro; and Honjo, Makoto, 4,927,585, Cl. 264-171.000.

Akebono Brake Industry Co., Ltd.: *See*—
Odaka, Seiya, 4,926,979, Cl. 188-73.440.

Akiyama, Toru, to Pioneer Electronic Corporation. Apparatus for suppressing noises in a video signal. 4,928,166, Cl. 358-36.000.

Akiyoshi, Sumiko: *See*—
Sakai, Takeshi; Matsui, Susumu; Akiyoshi, Sumiko; and Obayashi, Akira, 4,927,753, Cl. 435-26.000.

Aktiebolaget A.K. Eriksson: *See*—
Janson, Kurt, 4,926,733, Cl. 83-819.000.

Aktiebolaget Hassle: *See*—
Dahlinder, Lars-Erik D.; Johansson, Mats O.; Sandberg, John A.; and Sjo, 4,927,640, Cl. 424-497.000.

Aktiebolaget Leo: *See*—
Malmborg, Bengt, 4,927,423, Cl. 604-88.000.

AKZO N.V.: *See*—
Smook, Jan; Vos, Gerardus J. H.; Juijn, Johannes A.; and Van Hees, Theodorus J., 4,927,586, Cl. 264-185.000.

Albrecht, Ronald E.: *See*—
Polk, Gary C.; Larson, Steve A.; and Albrecht, Ronald E., 4,926,904, Cl. 137-565.000.

Alexander, Kenneth G., to Alexander Packaging Equipment Pty. Ltd.; and Fibre Containers Pty. Limited. Machine for forming cartons and packaging goods therein. 4,926,615, Cl. 53-564.000.

Alexander Packaging Equipment Pty. Ltd.: *See*—
Alexander, Kenneth G., 4,926,615, Cl. 53-564.000.

Alfa-Laval Food & Dairy Engineering AB: *See*—
Palm, Bengt, 4,926,913, Cl. 141-1.000.

Alfred Teves GmbH: *See*—
Burgdore, Jochen, 4,927,213, Cl. 303-116.000.

Algieri, Aldo A.; and Farney, Robert F., to Bristol-Myers Company. Chemical intermediates and process. 4,927,968, Cl. 549-451.000.

Allegretti & Company: *See*—
Haupt, Eugene J., 4,926,557, Cl. 30-276.000.
Pilatowicz, Edward A.; Carsello, Anthony; and Landy, Richard, 4,926,556, Cl. 30-216.000.

Allen, Charles A. Internal combustion engine with rotary valve. 4,926,809, Cl. 123-190.00A.

Allen, Daniel T., to United States of America, Energy. Thermionic converter emitter support arrangement. 4,927,599, Cl. 376-321.000.

Allen, Terry S.; and Wolke, Patrick J., to Honeywell Inc. Caging system. 4,927,097, Cl. 244-118.100.

Allergan, Inc.: *See*—
Chandraratna, Roshantha A. S., 4,927,947, Cl. 549-484.000.
Gluchowski, Charles, 4,927,846, Cl. 514-450.000.

Alley, John C.: *See*—
Bonebright, Mark E.; Eberhardt, Paul R.; and Alley, John C., 4,928,109, Cl. 343-786.000.

Alliance Pharmaceutical Corp.: *See*—
Long, David M., Jr , 4,927,623, Cl. 424-5.000.

Allied-Signal Inc.: *See*—
Eick, Christopher D.; Worcester, Kenneth P.; and Williamson, John R., 4,926,629, Cl. 60-39.281.
Sorenson, Kal K., 4,926,631, Cl. 60-39.142.

Allin, Jean-Claude; and Nozick, Jacques. Cabling system for low voltage and very low voltage networks in a building. 4,928,303, Cl. 379-93.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,927,798, Cl. 502-301.000.

Allseas Engineering B.V.: *See*—
Kaldenbach, Willem P., 4,927,296, Cl. 405-206.000.

Alpar, Tibor; Gyorvari, Janos; and Schmidt, Erno , to Fakombinat. Process for the production of building units from afterharding materials. 4,927,573, Cl. 264-40.100.

Alquist, Henry E.: *See*—
Schirmer, Robert M.; Fromm, Ellsworth H.; and Alquist, Henry E., 4,927,349, Cl. 431-10.000.

Alsing, Erik, to Hartvig Jensen & Co. A/S. Field spraying device. 4,927,080, Cl. 239-77.000.

Alt, Eckhard, to Intermedics, Inc. Rate responsive cardiac pacemaker. 4,926,863, Cl. 128-419.0PG.

Altmayer, Joseph, to E&E Seegmiller Limited. Rock crushers. 4,927,089, Cl. 241-261.000.

Aluma Systems Ltd.: *See*—
Johnston, Ronald J., 4,926,593, Cl. 52-126.400.

Aluminum Company of America: *See*—
Cho, Alex, 4,927,470, Cl. 148-12.70A.
Rioja, Roberto J.; and Denzer, Diana K., 4,927,469, Cl. 148-11.50A.

Alvarez, Antonio R.; and Kirchgessner, James A., to Motorola Inc. Method of fabricating a high performance bipolar and MOS device. 4,927,775, Cl. 437-31.000.

Alvis, John R.; Pfiester, James R.; and Holland, Orin W., to Motorola, Inc. N-channel MOS transistors having source/drain regions with germanium. 4,928,156, Cl. 357-23.400.

Alza Corporation: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,927,633, Cl. 424-438.000.
Haak, Ronald P.; Theeuwes, Felix; and Gyory, J. Richard, 4,927,408, Cl. 604-20.000.
Wong, Patrick S.-L., 4,927,632, Cl. 424-422.000.

Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katumi; and Fukumura, Seisuke, to Kabushiki Kaisha Kobe Seiko Sho. Steam dome type vertical tire press. 4,927,344, Cl. 425-28.100.

American Bottlers Equipment Co., Inc.: *See*—
Fauth, Frederick E., Sr.; and Barkley, Paul E., 4,926,999, Cl. 198-358.000.

American Brass and Aluminum Foundry Co., Inc.: *See*—
Craig, Burnie M.; and Fujitaki, Roy K., 4,926,507, Cl. 4-295.000.

American Cyanamid Company: *See*—
Lee, Ving J.; and Curran, William V., 4,927,922, Cl. 540-227.000.

American Home Products: *See*—
Malamas, Michael S., 4,927,831, Cl. 514-278.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A.; and Patel, Usha R., 4,927,934, Cl. 546-152.000.
Mobilio, Dominick, 4,927,842, Cl. 514-411.000.

American Standard Inc.: *See*—
Riffe, Delmar R.; Kotlarek, Peter A.; and Utter, Robert E., 4,927,339, Cl. 418-55.000.

American Telephone and Telegraph Company: *See*—
Bond, Robert H.; and Pawlenko, Ivan, 4,926,538, Cl. 29-559.000.

American Tourister, Inc.: *See*—
Pulichino, John V., Jr., 4,927,014, Cl. 206-287.100.

Amerock Corporation: *See*—
Boda, John W., 4,927,216, Cl. 312-339.000.

Ametek, Inc.: *See*—
Parnell, James A.; and Poole, Dan R., 4,928,256, Cl. 364-561.000.

Amoco Corporation: *See*—
Worrell, J. Robert; Wakley, William D.; and Young, Grant A., 4,927,536, Cl. 210-512.200.

Amort, Jurgen: *See*—
Bernhardt, Gunther; Amort, Jurgen; Kragl, Heinz; and Haas, Margret, 4,927,948, Cl. 556-401.000.

AMP Incorporated: *See*—
Adlon, Daniel T.; Spong, Richard V.; Cerquone, Stephen M.; and Bickford, David E., 4,928,066, Cl. 324-539.000.
Bates, Reginald A., 4,927,384, Cl. 439-494.000.
Grabbe, Dimitry G.; and Schnoor, William J., 4,927,369, Cl. 439-66.000.
Gutter, David H., 4,927,388, Cl. 439-660.000.
Hopkins, John R.; Manning, Randy M.; and Marusak, Stephen A., 4,926,548, Cl. 29-860.000.
Pitts, Robert W., 4,927,374, Cl. 439-310.000.

AMPER, S.A.: *See*—
Martin, Emilio B., 4,927,031, Cl. 209-657.000.

Amphenol Socapex: *See*—
Kayoun, Pierre; and Pouyez, Philippe, 4,928,135, Cl. 350-96.200.

Amsted Industries Incorporated: *See*—
Spencer, Charles P., 4,926,757, Cl. 105-224.100.
Springman, Charles G., 4,927,002, Cl. 198-487.100.

Analgesic Associates: *See*—
Sunshine, Abraham; and Laska, Eugene M., 4,927,854, Cl. 514-570.000.

Analog Devices, Inc.: *See*—
Lane, Charles D., 4,928,103, Cl. 341-159.000.

Analogic Corporation: *See*—
Gordon, Bernard M., 4,928,283, Cl. 378-20.000.

Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., to Mobil Oil Corporation. Octane improvement of gasoline in catalytic cracking without decreasing total liquid yield. 4,927,526, Cl. 208-152.000.

Anderson, Leonard M.: *See*—
Howarth, John; and Anderson, Leonard M., 4,928,013, Cl. 250-339.000.

Andonov, Blagoy A., to N I T I "Veda". Flamme fancy yarn manufacturing method and apparatus. 4,926,626, Cl. 57-18.000.

Andorsen, John P. Device for cleaning surfaces, particularly in water. 4,926,775, Cl. 114-222.000.

Andrews, Gary M.: *See*—
Cutcher, John A.; and Andrews, Gary M., 4,927,550, Cl. 252-32.500.

Andrews, Gordon T.: *See*—
Parker, Christopher; and Andrews, Gordon T., 4,926,837, Cl. 126-21.00H.

Andros, Andrew A.; and Campana, Thomas J., to Telefind Corporation. Paging receiver for receiving pages from analog or digital paging transmitters. 4,928,100, Cl. 340-825.440.

Anemaet, John M.: *See*—
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.

Angewandte Digital Electronik GmbH: *See*—
Kreft, Hans-Diedrich; MacKenthun, Holger; and Hass, Wolfgang, 4,928,087, Cl. 340-825.710.

Anritsu Corporation: *See*—
Sugiura, Itsuo; Nishida, Yutaka; Ito, Kaoru; and Ozaki, Toshiyuki, 4,927,266, Cl. 356-243.000.

Anson, Donald, to Battelle Memorial Institute. Rotating drum filter. 4,927,435, Cl. 55-96.000.

Antaki, James M.; and Layne, Daniel T., III, to Clorox Company, The. Reduced tartness salad dressing. 4,927,657, Cl. 426-589.000.

Antell, George R.: *See*—
Pitt, Gilles D.; Jones, Roger E.; Antell, George R.; Spicer, Lyndon R.; Barnett, John A.; and Hill, Robert, 4,928,319, Cl. 455-612.000.

Antenucci, Robert N., to A. E. Staley Manufacturing Company. Method of making a hemicellulose coated dietary fiber. 4,927,649, Cl. 426-273.000.

Antonio, Franklin P.: *See*—
Gilhousen, Klein S.; and Antonio, Franklin P., 4,928,274, Cl. 370-92.000.

Antos, John M.: *See*—
Sargent, Charles L.; Antos, John M.; and Biba, Scott I., 4,926,508, Cl. 4-329.000.

Anzai, Hisao; Makino, Hideaki; Ootani, Masami; Sasaki, Isao; and Nishida, Kozi, to Mitsubishi Rayon Co., Ltd. Process for producing methacrylimide group-containing polymer. 4,927,893, Cl. 525-378.000.

Aoki, Kazuo; Chiba, Toshimi; Tachibana, Sadao; and Nagatomo, Yasushi, to Oki Electric Industry Co., Ltd. Spring-biased push-button switch having a spring-loaded tactile feedback feature. 4,927,990, Cl. 200-517.000.

Aoki, Kenji; Nagata, Mitsuo; Nakamura, Haruo; and Miura, Teiji, to Seiko Epson Corporation. Dual frequency, optically active liquid crystal cell. 4,927,242, Cl. 350-346.000.

Aoki, Mitsuo: *See*—
Isoda, Tetsuo; Watanabe, Yoichiro; Nakayama, Nobuhiro; and Aoki, Mitsuo, 4,927,728, Cl. 430-108.000.

Aoki, Satoshi: *See*—
Kudoh, Noboru; Hirukawa, Itsushi; Aoki, Satoshi; Yoshimura, Tsuyoshi; and Shiozawa, Shigeki, 4,927,390, Cl. 440-88.000.

Aoki, Tomoyuki: *See*—
Matsushima, Yasunobu; Tanaka, Shigeo; Aoki, Tomoyuki; and Ono, Yohji, 4,927,472, Cl. 148-261.000.

Applied Materials, Inc.: *See*—
Cheng, David; Hartlage, Robert P.; and Zhang, Wesley W., 4,927,485, Cl. 156-345.000.

Applied Power Inc.: *See*—
Brumme, Reinhold; and Desons, Roger, 4,927,122, Cl. 267-140.100.

Arai, Hajime; and Harada, Hrioshi, to Mitsubishi Denki Kabushiki Kaisha. Method for fabricating semiconductor device. 4,927,783, Cl. 437-196.000.

Arai, Hirohiko; and Tachi, Susumu, to Agency of Industrial Science & Technology, Ministry of International Trade. Manipulator and control method. 4,928,047, Cl. 318-568.160.

Arai, Minoru; and Katoh, Yukihiro, to Iwatsu Electric Co., Ltd. DC amplifier. 4,928,073, Cl. 330-252.000.

Arai, Takaaki: *See*—
Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba, Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, 4,926,906, Cl. 137-625.300.

Arakawa, Yoshichika, to Aisin Seiki Kabushiki Kaisha. Worm gear type differential mechanism. 4,926,711, Cl. 475-227.000.

Aramaki, Minoru; Sakaguchi, Hiroaki; and Nakamura, Tamio, to Central Glass Company, Limited. Process of preparing fluorocarbon carboxylic or sulfonic acid from its fluoride. 4,927,962, Cl. 562-113.000.

Arbesmeier, Bernhard: *See*—
Muller, Karl H.; Riedl, Volker; and Arbesmeier, Bernhard, 4,926,539, Cl. 29-568.000.

Arbige, Michael V.; and Silver, Scott C., to Genencor, Inc. Preferential entrainment of enzymes in cheese curds. 4,927,644, Cl. 426-35.000.

Archer, Edward D.: *See*—
Schweizer, Werner; McGuire, Daniel J.; and Archer, Edward D., 4,927,322, Cl. 414-794.700.

Archery Designs, Inc.: *See*—
Peck, Paul L., 4,926,835, Cl. 124-35.200.

Argandona, Toby. Transition conduit system for fuel pump. 4,926,899, Cl. 137-364.000.

Argazzi, Dennis J.: *See*—
Gelinas, William A.; Holtz, Edwin R.; Argazzi, Dennis J.; Smigel, Robert L.; and Wiley, Dan W., 4,927,487, Cl. 156-351.000.

Arico, Joseph. Exhibit display. 4,926,609, Cl. 52-582.000.

Arima, Itsuo: *See*—
Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; and Morita, Mikio, 4,927,473, Cl. 148-306.000.

Arima, Noburu; Ogino, Nobuyosi; and Kimura, Hirosi, to Shin-Etsu Handotai Co., Ltd.; and Sin-Etsu Quartz Products Co., Ltd. Method of forming thin film and apparatus therefor. 4,926,793, Cl. 118-730.000.

Arita, Eriya: *See*—
Morizumi, Mitsuo; Omura, Kinya; Arita, Eriya; Furuya, Katsuji; Yasuda, Sakae; and Kodera, Masaya, 4,926,914, Cl. 141-59.000.

Ariyoshi, Takashi: *See*—
Kaneuchi, Kunihiro; Yasuda, Seigou; Ariyoshi, Takashi; Nakatani, Tomofumi; and Aizawa, Hiroshi, 4,928,302, Cl. 379-88.000.

Armstrong, Bruce A.; and Dunn, Robert G., to Hermes Electronics Limited. Hydrophones and similar devices. 4,928,263, Cl. 367-118.000.

Armstrong, Robert E. Holding vessel with supportive handle. 4,927,046, Cl. 220-90.000.

Armstrong, Ronald W.: *See*—
Beard, Warren T., Jr.; and Armstrong, Ronald W., 4,928,294, Cl. 378-74.000.

Armstrong, William P.: *See*—
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.

Arndt, Heinrich: *See*—
Hirt, Manfred; and Arndt, Heinrich, 4,926,715, Cl. 475-337.000.

Arnn, Edward L.: *See*—
Jensen, Preben B.; and Arnn, Edward L., 4,928,315, Cl. 455-307.000.

Arretz, Emmanuel F. E., to Societe Nationale Elf Aquitaine (Production). Catalytic process for the production of mercaptans from thioethers. 4,927,972, Cl. 568-70.000.

ARSOC S.P.R.L.: *See*—
Maes, Felix V.; and Baikrich, Michel, 4,926,576, Cl. 42-101.000.

Arthur D. Little, Inc.: *See*—
McCullough, John E., 4,927,340, Cl. 418-55.000.

Arthur, Stephen D.; and Temple, Victor A. K., to General Electric Company. Method of making high breakdown voltage semiconductor device. 4,927,772, Cl. 437-6.000.

Artzberger, Thomas G., to M-B-W Inc. Vibratory mechanism for a compaction roller. 4,927,289, Cl. 404-117.000.

Asada, Tohru, to Aisin Seiki Kabushiki Kaisha. Door opening/closing device. 4,927,204, Cl. 292-216.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, 4,927,889, Cl. 525-285.000.

Asai, Naohito. Ink container with dual-member sealing closure. 4,928,126, Cl. 346-140.00R.

Asakura, Hideo: *See*—
Kuzuya, Susumu; Nagao, Yoshiaki; Asakura, Hideo; and Hattori, Shigenori, 4,927,278, Cl. 400-208.000.

Asboth, Oscar. Air propeller. 4,927,330, Cl. 416-223.00R.

Asea Brown Boveri Aktiengesellschaft: *See*—
Steinleitner, Gunther; and Roze, Philipp, 4,927,475, Cl. 156-89.000.

Asensio, Javier; and Hayman, Richard, to Dow Chemical Company, The. Assembly of several layers having one or more reinforcing layers and fiber reinforced plastic article produced therefrom. 4,927,684, Cl. 428-91.000.

Ashihara, Ryohei; Suehiro, Kikumitsu; Sugino, Kazuo; and Miyoshi, Jun, to Matsushita Electric Industrial Co., Ltd. Dry cell. 4,927,719, Cl. 429-54.000.

Ashjaee, Javad; Helkey, Roger J.; Lorenz, Robert G.; and Sutherland, Robert A., to Ashtech Telesis, Inc. Global positioning system receiver with improved radio frequency and digital processing. 4,928,106, Cl. 342-352.000.

Ashland Oil, Inc.: *See*—
Tufts, Timothy A., 4,927,862, Cl. 521-118.000.
Ward, Clifford; Chao, Eugene; Booth, Roy E.; Turrill, Frank H.; Wombles, Robert H.; Newman, John W.; and Hettinger, William P., Jr., 4,927,620, Cl. 423-447.200.

Ashtech Telesis, Inc.: *See*—
Ashjaee, Javad; Helkey, Roger J.; Lorenz, Robert G.; and Sutherland, Robert A., 4,928,106, Cl. 342-352.000.

Aslam, Mohammad: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,927,956, Cl. 560-130.000.

Assi, Francesco; Lancini, Giancarlo; and Gianantonio, Anacleto, to Gruppo Lepetit S.p.A. Method for selectively increasing the ratio of single major components of teicoplanin A2 complex. 4,927,754, Cl. 435-71.000.

Associated Universities, Inc.: *See*—
Sugama, Toshifumi, 4,927,462, Cl. 106-99.000.

AT&T Bell Laboratories: *See*—
Bensel, William H., III; Gladden, Robert H., Jr.; Malluck, John F.; Ross, Robert R.; and Williamson, Andrew H., Jr., 4,927,227, Cl. 350-96.200.
Pimpinella, Richard J.; and Segelken, John M., 4,926,545, Cl. 29-832.000.
Poelzing, Gerhard W., 4,927,590, Cl. 264-272.170.

Ataka, Hiroshi; and Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Front and rear wheel steering vehicle with a minimized maneuvering area. 4,926,954, Cl. 180-140.000.

Atkins, Frank W.: *See*—
Fagerquist, Randy L.; Wood, Wendell L.; and Atkins, Frank W., 4,928,114, Cl. 346-75.000.
Fagerquist, Randy L.; Wood, Wendall L.; Atkins, Frank W.; and Babl, Surinder K., 4,928,115, Cl. 346-75.000.

Atkinson, Tony: *See*—
Carr, Robert; Clarke, David J.; and Atkinson, Tony, 4,927,268, Cl. 356-336.000.

Atlantic Richfield Company: *See*—
Cowley, Trent E., 4,926,815, Cl. 123-198.0DB.

Atlas Fahrzeugtechnik GmbH: *See*—
Brandner, Burkhard; and Wenzlik, Klaus, 4,927,084, Cl. 239-584.000.

Atochem: *See*—
Bourjot, Pierre; and Garnaud, Marie-Anne, 4,927,184, Cl. 285-21.000.
Hilaire, Jean C.; and Guerin, Roland, 4,927,860, Cl. 521-60.000.
Lottiau, Michel; Glemet, Michel; Cognet, Gilles; and Causier, Alain, 4,927,583, Cl. 264-136.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Atochem North America, Inc.: *See—*
Carson, Chrislyn M.; Copping, Leonard G.; Ehr, Robert J.; Gitlitz, Melvin H.; McNeil, Maynard W.; Street, Peter F. S.; and Liebeschuetz, John W., 4,927,812, Cl. 514-63.000.
Martyak, Nicholas M., 4,927,506, Cl. 204-51.000.

Atsuumi, Shugo: *See—*
Tanaka, Seiichi; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Morishima, Hajime; and Matsuyama, Kenji, 4,927,565, Cl. 260-404.500.

Audi AG, Firma: *See—*
Heinemann, Joachim; Spies, Karl-Heinz; Keller, Frank; Beicht, Bernd; Leitermann, Wulf; and Lechler, Rolf, 4,926,921, Cl. 160-115.000.
Muller, Karl H.; Riedl, Volker; and Arbesmeier, Bernhard, 4,926,539, Cl. 29-568.000.
Putz, Heinrich; Nowitzki, Friedhelm; Damm, Gunter; Bathelt, Hartmut; Kromer, Gunter; Hoffmann, Henning; and Pischke, Reiner, 4,926,634, Cl. 60-274.000.

Auerbach, Abraham; and Friedman, Sonia, to BOC Group, Inc., The. Gas constituent measurement and recording. 4,927,766, Cl. 436-44.000.

Auger, Jean Marc: *See—*
Theeten, Jean-Bernard; Autier, Philippe; and Auger, Jean Marc, 4,927,785, Cl. 437-225.000.

Autier, Philippe: *See—*
Theeten, Jean-Bernard; Autier, Philippe; and Auger, Jean Marc, 4,927,785, Cl. 437-225.000.

Autoflug GmbH: *See—*
Pfabe, Peter; and Nohren, Hubert, 4,928,130, Cl. 342-9.000.

Auwarter, Gerhard; Imhof, Ernst; Komaroff, Iwan; Reum, Helmut; Schmid, Gunther; and Kaczynski, Bernhard, to Robert Bosch GmbH. System for injecting fuel into combustion chambers of an internal combustion engine. 4,926,819, Cl. 123-297.000.

Avantek, Inc.: *See—*
Khandavalli, Chandra, 4,928,078, Cl. 333-109.000.

Avidan, Amos A., to Mobil Oil Corporation. Circulating fluid bed combustion with circulating co combustion promoter. 4,926,766, Cl. 110-342.000.

Avidan, Amos A., to Mobil Oil Corporation. Circulating fluid bed combustion with CO combustion promoter and reduced combustion air. 4,927,348, Cl. 431-7.000.

AVL AG: *See—*
Fischer, Fritz; Kleinhappl, Erich; and Marsoner, Hermann, 4,927,603, Cl. 422-67.000.

Avny, Eli, to Sundstrand Corporation. System and method for obtaining a given preload on a spring. 4,926,687, Cl. 73-161.000.

Ayers, Alan D.: *See—*
Chaney, Earl J., Jr.; Malay, Manuel R.; O'Hara, Thomas J.; and Ayers, Alan D., 4,927,720, Cl. 429-54.000.

Aztec Sensible Cooling, Inc.: *See—*
Hickey, Pieter John A.; and Claassen, Cornelius J., 4,926,656, Cl. 62-310.000.

Azuma, Yuichi: *See—*
Shibata, Katsuhiro; Azuma, Yuichi; Inoue, Masao; and Okumura, Shinichiro, 4,926,978, Cl. 188-73.100.

Azzalin, Italo, to C.G.V. S.p.A. Combination locks for suitcases, bags and the like. 4,926,663, Cl. 70-74.000.

B. F. Goodrich Company, The: *See—*
Backderf, Richard H.; and Donat, Frank J., 4,927,886, Cl. 525-261.000.
Kramer, James H., 4,927,007, Cl. 198-823.000.

B. & R. Choiniere Limited: *See—*
Laquerre, Yves, 4,926,625, Cl. 56-376.000.

Baba, Nobuo: *See—*
Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba, Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, 4,926,906, Cl. 137-625.300.

Baba, Sueki: *See—*
Tsutsui, Hiroshi; Baba, Sueki; Ohmori, Koichi; Yamamoto, Osamu; and Watanabe, Hiroshi, 4,928,297, Cl. 378-146.000.

Bablon, Guy P.; and Desbos, Gilbert, to Omnium de Traitements et de Valorisation (OTV). Method and installation for treating liquid by sedimentation using fine sand. 4,927,543, Cl. 210-711.000.

Bach, William D.; and Murphy, Donald R. Protector for joined extension cords. 4,927,377, Cl. 439-367.000.

Backderf, Richard H.; and Donat, Frank J., to B. F. Goodrich Company, The. Low inherent viscosity-high glass transition temperature enhancing agents produced by mass reaction polymerization as an overpolymer on polyvinyl chloride resins. 4,927,886, Cl. 525-261.000.

Backman, Sune. Method of filtering the effluent from a wire EDM process. 4,927,547, Cl. 210-771.000.

Bagheri, Mansour A. H.: *See—*
Fitzgerald, Walter P.; Sanders, Beatrix Y.; and Bagheri, Mansour A. H., 4,927,307, Cl. 411-302.000.

Baglee, David A.; and Parker, Ronald N., to Texas Instruments Incorporated. Method of reconditioning an electronically programmable memory device. 4,928,267, Cl. 365-218.000.

Bahl, Surinder K.: *See—*
Fagerquist, Randy L.; Wood, Wendall L.; Atkins, Frank W.; and Bahl, Surinder K., 4,928,115, Cl. 346-75.000.

Bahr, Christian; Heppke, Gerd; Lotzsch, Detlef; Dubal, Hans-Rolf; Escher, Claus; and Ohlendorf, Dieter, to Hoechst Aktiengesellschaft. Use of compounds or mixtures of compounds which have a chiral, orthogonal, more highly ordered smectic phase in the range of said phase as switching or indicating medium. 4,927,244, Cl. 350-350.00S.

Bahroos, Gobind; and Jonte, Patrick B., to Masco Corporation of Indiana. Valve for a hand held spray nozzle. 4,927,115. Cl. 251-241.000.

Baikrich, Michel: *See—*
Maes, Felix V.; and Baikrich, Michel, 4,926,576, Cl. 42-101.000.

Bailey, David B.; Harrison, Daniel J.; and Yacobucci, Paul D., to Eastman Kodak Company. Thermal dye transfer receiving layer of polycarbonate with nonaromatic diol. 4,927,803, Cl. 503-227.000.

Bailey, Gardner S.: *See—*
Cordes, Harry D.; Duich, Michael B.; and Bailey, Gardner S., 4,927,434, Cl. 55-20.000.

Bailey, Jennifer A., to R. J. Reynolds Tobacco Company. Anti-stick package for hygroscopic foods. 4,927,647, Cl. 426-126.000.

Bailey, Louis, to Bailey, Louis. Gear selector for bicycle hub transmission. 4,926,714, Cl. 74-337.500.

Bailey, Lowell; and Libbert, Hervey, to Lane & Roderick, Inc. Forming process for producing sharp corners in sheet metal. 4,926,676, Cl. 72-389.000.

Bailey, Samuel, to Beta Development Group, Inc. Heat transfer pad. 4,927,997, Cl. 219-459.000.

Baker, David J.; Dubuque, Kenneth J.; Estep, John M.; and Hix, Charles J., Jr., to Ingersoll-Rand Company. Tilt valve cartridge. 4,927,114, Cl. 251-240.000.

Baker Hughes Incorporated: *See—*
Baugh, J. Lindley, 4,926,939, Cl. 166-208.000.

Baker Mervyn R.; Pearson, Raymond J.; and Emsley, Roger. Folding ladders. 4,926,967, Cl. 182-164.000.

Baker, Raymond; Carling, William R.; James, Kim; and Leeson, Paul D., to Merck Sharp & Dohme Limited. Cyclo-octane neuroprotective agents. 4,927,819, Cl. 514-213.000.

Baldacci, Massimo: *See—*
Caccia, Giulio; and Baldacci, Massimo, 4,927,849, Cl. 514-455.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Diffusion-coated metals. 4,927,798, Cl. 502-301.000.

Baldwin, Lillian P.: *See—*
Williams, Joel L.; Montgomery, David B.; and Baldwin, Lillian P., 4,927,676, Cl. 428-36.000.

Ballweber, Dieter: *See—*
Weber, Heinz; Nintz, Eckhard; Walter, Manfred; Ballweber, Dieter; and Ostermayer, Bertram, 4,927,859, Cl. 521-59.000.

Bamford, William: *See—*
Miskin, Michael; Bamford, William; and Lake, Micheal D., 4,926,553, Cl. 30-49.000.

Banbury, John R.; and Barter, Derek L., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Optical system for head-up displays. 4,927,234, Cl. 350-174.000.

Bando, Niro: *See—*
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,926,624, Cl. 56-202.000.

Banks, Bernard J.; and Witty, Michael J., to Pfizer Inc. Antiparasitic agents. 4,927,918, Cl. 536-7.100.

Banyu Pharmaceutical Co., Ltd.: *See—*
Tanaka, Seiichi; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Morishima, Hajime; and Matsuyama, Kenji, 4,927,565, Cl. 260-404.500.

Bara, Edward J.: *See—*
Bykadi, Gururaj; Kaplan, Murray A.; Corrao, Richard G.; Bara, Edward J.; Ullah, Ismat; and Agharkar, Shreeram N., 4,927,638, Cl. 424-455.000.

Barbara, Bruce: *See—*
Abbott, Robert A.; Barbara, Bruce; and Roy, Richard S., 4,928,266, Cl. 365-189.010.

Barkell, J. Warren, Jr.: *See—*
Morris, Arnold M.; D'Zurko, Daphne; Pilsbury, Richard H.; Barkell, J. Warren, Jr.; Orndorff, Karl B.; and Lawson Randall S., 4,926,974, Cl. 187-52.0LC.

Barker, Nicholas E.: *See—*
Lilly, Carol E. H.; Moore, Loyd C.; Eike, Mark E.; and Barker, Nicholas E., 4,926,758, Cl. 108-43.000.

Barkley, Paul E.: *See—*
Fauth, Frederick E., Sr.; and Barkley, Paul E., 4,926,999, Cl. 198-358.000.

Barlou, Andre ; Beltritti, Alexandre; Gramondi, Patrick; and Vidal, Hugues, to Commissariat a l'Energie Atomique. Method for conditioning radioactive or toxic wastes in thermosetting resins. 4,927,564, Cl. 252-628.000.

Barnabe, Jean-Pierre: *See—*
Hobluigie, Audio; Barnabe, Jean-Pierre; and Mouhot, Frederic, 4,927,286, Cl. 403-322.000.

Barnett, John A.: *See—*
Pitt, Gilles D.; Jones, Roger E.; Antell, George R.; Spicer, Lyndon R.; Barnett, John A.; and Hill, Robert, 4,928,319, Cl. 455-612.000.

Barnett, Ronald E.; Dikeman, Roxane; Liao, Shyh-Yuan; Gill, John; and Pantaleone, David P., to Nutrasweet Company, The. Water soluble bulking agents. 4,927,654, Cl. 426-548.000.

Barrier, Ronald B.: *See—*
Phipps, Jackie M.; and Barrier, Ronald B., 4,926,532, Cl. 29-25.350.

Barrow, Lascelle A.: *See—*
Small, Richard F.; Patel, Dakshesh S.; Barrow, Lascelle A.; and Dix, Barry M., 4,927,663, Cl. 427-40.000.

Barson Corporation: *See—*
Priceman, Seymour, 4,927,714, Cl. 428-628.000.

Barss, Steven H.: *See—*
Spehrley, Charles W., Jr.; Barss, Steven H.; Tomaszewski, David G.; and Hoisington, Paul A., 4,928,120, Cl. 346-140.00R.

Barter, Derek L.: *See—*
Banbury, John R.; and Barter, Derek L., 4,927,234, Cl. 350-174.000.

Barthelemy, Alain; Maneuf, Serge; and Frochly, Claude, to Centre National De La Recherche Scientifique. Laser generator with phase mode-locking. 4,928,282, Cl. 372-18.000.

Bartlett, Kenneth G.; and Walberg, Per-Erik, to Konica Corporation. Process for identifying disks and automatically configuring a disk drive system. 4,928,192, Cl. 360-77.080.

Bartlett, Philip L.; and Creazzo, Joseph A., to Du Pont de Nemours, E. I., and Company. Process for producing closed-cell polyurethane foam compositions expanded with mixtures of blowing agents. 4,927,863, Cl. 521-131.000.

Barton, James T.; and Walker, Jimmy P., to Eastman Kodak Company. Assembly containing a linear focusing means and method of making same. 4,928,139, Cl. 355-1.000.

Barton, James T.: *See—*
Walker, Jimmy P.; and Barton, James T., 4,928,119, Cl. 346-108.000.

Barzaghi, Fernando: *See—*
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 4,927,837, Cl. 514-331.000.

BASF Aktiengesellschaft: *See—*
Fuchs, Hugo; and Agar, David, 4,927,542, Cl. 210-711.000.
Hackenberger, Alfred; and Patsch, Manfred, 4,927,935, Cl. 546-157.000.
Naarmann, Herbert; and Theophilou, Nicolas, 4,927,578, Cl. 264-81.000.
Wallbillich, Guenter; Bleckmann, Gerhard; and Scholz, Dankmar, 4,927,740, Cl. 430-309.000.
Weber, Heinz; Nintz, Eckhard; Walter, Manfred; Ballweber, Dieter; and Ostermayer, Bertram, 4,927,859, Cl. 521-59.000.

BASF Corp.: *See—*
Hays, Byron G., 4,927,466, Cl. 106-494.000.

Bass, Joyce H. Bidet. 4,926,509, Cl. 4-448.000.

Batchelder, Ned: *See—*
Gabbe, David; and Batchelder, Ned, 4,928,252, Cl. 364-519.000.

Bates, Harry L. Decongestant preparation. 4,927,631, Cl. 424-195.100.

Bates Manufacturing Company, The: *See—*
Leszczak, John, 4,927,067, Cl. 227-128.000.

Bates, Reginald A., to AMP Incorporated. Flat wire to round wire electrical interconnect. 4,927,384, Cl. 439-494.000.

Bathelt, Hartmut: *See—*
Putz, Heinrich; Nowitzki, Friedhelm; Damm, Gunter; Bathelt, Hartmut; Kromer, Gunter; Hoffmann, Henning; and Pischke, Reiner, 4,926,634, Cl. 60-274.000.

Battelle-Institut e.V.: *See—*
Friehmelt, Volker; Maier, Bernhard; Kohling, Alfons; and Schmitt, Rolf-Eberhard, 4,927,511, Cl. 204-151.000.

Battelle Memorial Institute: *See—*
Anson, Donald, 4,927,435, Cl. 55-96.000.

Batzdorf, Ulrich. Implant device with radiation activated protection system. 4,927,409, Cl. 604-20.000.

Bauer, Martin G. Portable personal floatation device. 4,926,781, Cl. 114-351.000.

Baugh, J. Lindley, to Baker Hughes Incorporated. Hydraulically actuated liner hanger. 4,926,939, Cl. 166-208.000.

Baum, Allen; Bryg, William R.; Mahon, Michael J.; Lee, Ruby B.; and Muchnick, Steven S., to Hewlett-Packard Company. Cache memory with variable fetch and replacement schemes. 4,928,239, Cl. 364-200.000.

Baumann, Gerald W.; Garthwaite, Albert N.; and Hutchings, Carl D., to International Business Machines Corporation. Printers with simplex and duplex cut sheet fusing. 4,928,147, Cl. 355-288.000.

Bauwens, Luc: *See—*
Mitchell, Matthew P.; and Bauwens, Luc, 4,926,639, Cl. 60-522.000.

Bayan, Ghawamedin, to West Company, Incorporated, The. SBR thermoplastic elastomer. 4,927,882, Cl. 525-99.000.

Bayer Aktiengesellschaft: *See—*
Adler, Alfons; Widdig, Arno; Kuhle, Engelbert; Fuhrer, Wolfgang; Hagemann, Hermann; and Hanssler, Gerd, 4,927,824, Cl. 514-241.000.
Born, Eberhard, 4,927,706, Cl. 428-304.400.
Brock, Martin; and Pohlig Ralf, 4,927,575, Cl. 264-46.400.
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,927,454, Cl. 71-93.000.
Frobel, Klaus; Muller, Hartwig; Bischoff, Erwin; Salcher, Olga; de Jong, Anno; Berschauer, Friedrich; and Scheer, Martin, 4,927,810, Cl. 514-23.000.
Harnisch, Horst; and Raue, Roderich, 4,927,729, Cl. 430-110.000.
Lindel, Hans; and Hallenbach, Werner, 4,927,938, Cl. 546-315.000.
Schreckenberg, Manfred; Dhein, Rolf; Rudolph, Hans; and Nouvertne Werner, 4,927,903, Cl. 528-176.000.
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,927,844, Cl. 514-425.000.
Yang, Ming-he; Chen, Yan-rong; Liu, Geng-tao; and Huang, Liang, 4,927,937, Cl. 546-296.000.

Bayless, Robert K.; and Hirsch, Gerald P. Antioxidant compositions and methods for ameliorating inflammatory symptoms of respiratory disease. 4,927,850, Cl. 514-458.000.

Baylor College of Medicine: *See—*
Rabinovitz, Raphael S.; and Hartley, Craig J., 4,926,875, Cl. 128-691.000.

BBC Brown Boveri AG: *See—*
Keller, Jakob, 4,927,327, Cl. 415-171.100.

Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., to International Business Machines Corp. Computer system having mode independent addressing. 4,928,237, Cl. 364-200.000.

Beard, Warren T., Jr.; and Armstrong, Ronald W., to United States of America, Director, National Security Agency. Method and apparatus for line-modified asymmetric crystal topography. 4,928,294, Cl. 378-74.000.

Beardsley, George P.: *See—*
Taylor, Edward C.; Beardsley, George P.; Shih, Chuan; and Fletcher, Stephen R., 4,927,828, Cl. 514-258.000.

Beaty, Robert A. Threading device. 4,927,302, Cl. 408-221.000.

Beauregard, Albert, to Ideal Roofing Company Ltd. Manufactures. Roofing panel. 4,926,608, Cl. 52-522.000.

Beavers, Kelly J.: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.

Beck, Henry N.; and Mahoney, Robert D., to Dow Chemical Company, The. Microporous membranes from isotactic polystyrene and syndiotactic polystyrene. 4,927,535, Cl. 210-500.230.

Beck, James M., to Creative Packaging Corp. Adjustable metering closure cap. 4,927,065, Cl. 222-520.000.

Beck, Martin H., to Devtech, Inc. Preform for a monobase container. 4,927,679, Cl. 428-36.920.

Becker, Wolfgang, to Ruhrkohle AG. Oven door. 4,927,501, Cl. 202-248.000.

Beckman Instruments, Inc.: *See—*
Glen, Stefan J.; and Ellison, William E., 4,927,406, Cl. 494-84.000.
Stephens, Donald E.; and Unterbusch, Manfred W., 4,926,702, Cl. 73-864.830.

Becton, Dickinson and Company: *See—*
Williams, Joel L.; Montgomery, David B.; and Baldwin, Lillian P., 4,927,676, Cl. 428-36.000.

Behncke, Hans H. Apparatus for stabilization of X-ray fluorescence layer thickness measuring instruments for stabilization SNF process thereof. 4,928,293, Cl. 378-50.000.

Behringwerke Aktiengesellschaft: *See—*
Stuber, Werner, 4,927,809, Cl. 514-20.000.

Beicht, Bernd: *See—*
Heinemann, Joachim; Spies, Karl-Heinz; Keller, Frank; Beicht, Bernd; Leitermann, Wulf; and Lechler, Rolf, 4,926,921, Cl. 160-115.000.

Bekele, Solomon, to W. R. Grace & Co.-Conn. Implosion resistant films. 4,927,691, Cl. 428-35.200.

Belanger, Roger R.: *See—*
Lynn, William R.; and Belanger, Roger R., 4,926,515, Cl. 15-4.000.

Belangie, Michael C. Joint seal for concrete highways. 4,927,291, Cl. 404-64.000.

Belkhiter, Bruno M., to Westinghouse Electric Corp. Part program generating system. 4,928,221, Cl. 364-191.000.

Bell, Allyn Roy: *See—*
Brouwer, Walter G.; Felauer, Ethel Ellen; and Bell, Allyn Roy, 4,927,451, Cl. 71-92.000.

Bell Communications Research, Inc.: *See—*
Heritage, Jonathan P.; and Weiner, Andrew M., 4,928,316, Cl. 455-600.000.
Smoot, Lanny S., 4,928,301, Cl. 379-53.000.

Bell & Howell Company: *See—*
Evans, David W., 4,927,133, Cl. 271-225.000.

Bell, James A. E.; and Conard, Bruce R., to Inco Limited. Apparatus and process for coloring objects by plasma coating. 4,926,792, Cl. 118-729.000.

Bell, Weldon K.; and Haag, Werner O., to Mobil Oil Corp. Synthesis of caprolactam. 4,927,924, Cl. 540-536.000.

Bellinger, Jeffrey N. Board game. 4,927,155, Cl. 273-255.000.

Beltritti, Alexandre: *See—*
Barlou, Andre ; Beltritti, Alexandre; Gramondi, Patrick; and Vidal, Hugues, 4,927,564, Cl. 252-628.000.

Benavides, Butch. Phosphorescent vehicle part identification system. 4,928,212, Cl. 362-61.000.

Bender & Wirth GmbH & Co.: *See—*
Willnat, Helmut; and Meichsner, Manfred, 4,927,389, Cl. 439-682.000.

Benninger AG: *See—*
Koslowski, Gerhard; and Bollen, Manfred, 4,926,531, Cl 28-173.000.

Benoit, Dennis R.: *See—*
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.

Bensel, William H., III; Gladden, Robert H., Jr.; Malluck, John F.; Ross, Robert R.; and Williamson, Andrew H., Jr., to AT&T Bell Laboratories. Optical fiber cable closure. 4,927,227, Cl. 350-96.200.

Berg, Alan C.; and Jones, William R., Jr., to Columbian Chemicals Company. Non-cylindrical reactor for carbon black production. 4,927,607, Cl. 422-150.000.

Berg, Louis K. Material for use in fabrication 4,927,696, Cl. 428-195.000.

Berger, Alvin H.: *See—*
Diehl, Roy E.; and Berger, Alvin H., 4,926,810, Cl 123-192.00B

VOL
1114
ISS
4
MY
22
1990
UMI

Bergmann, Michael: *See—*
Fiedler, Juergen; Stoeffler, Albert; and Bergmann, Michael, 4,927,059, Cl. 222-136.000.

Bernardon, Jean-Michel: *See—*
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 4,927,928, Cl. 544-154.000.

Bernhardt, Gunther; Amort, Jurgen; Kragl, Heinz; and Haas, Margret, to Huels Aktiengesellschaft. Process for stabilizing organosilanes containing methacryloxy or acryloxy groups. 4,927,948, Cl. 556-401.000.

Bernstein, Joel E. Method and composition for treating pediculosis capitis. 4,927,813, Cl. 514-65.000.

Berschauer, Friedrich: *See—*
Frobel, Klaus; Muller, Hartwig; Bischoff, Erwin; Salcher, Olga; de Jong, Anno; Berschauer, Friedrich; and Scheer, Martin, 4,927,810, Cl. 514-23.000.

Bersier, Jacques: *See—*
Schneider, Peter; Ramos, Gerardo; and Bersier, Jacques, 4,927,507, Cl. 204-78.000.

Berti, Leroy P.: *See—*
Knopf, Robert J.; Theiling Jr., Louis F.; and Berti, Leroy P., 4,927,954, Cl. 558-441.000.

Beta Development Group, Inc.: *See—*
Bailey, Samuel, 4,927,997, Cl. 219-459.000.

Bethlehem Steel Corporation: *See—*
Yerkes, James E.; and Lethen, Theodore H., 4,928,257, Cl. 364-563.000.

Betteridge, Peter R.: *See—*
Schofield, John A.; Betteridge, Peter R., Ryback, George; and Geary, Philip J., 4,927,759, Cl. 435-156.000.

Bettini, Jean-Pierre: *See—*
Lefevre, Herve ; Bettini, Jean-Pierre; Botti, Serge; and Turpin, Marc, 4,928,005, Cl. 250-227.230.

Betz Laboratories, Inc.: *See—*
Forester, David R., 4,927,519, Cl. 208-48.0AA.
Forester, David R., 4,927,561, Cl. 252-389.220.

Beute, Willem, to Lever Brothers Company. Reclosable carton. 4,927,027, Cl. 206-611.000.

Biac Holding AG: *See—*
Leuenberger, Hans, 4,926,514, Cl. 8-150.000.

Biba, Scott I.: *See—*
Sargent, Charles L.; Antos, John M.; and Biba, Scott I., 4,926,508, Cl. 4-329.000.

Bic Corporation: *See—*
Winner, William K., 4,926,774, Cl. 114-123.000.

Bickford, David E.: *See—*
Adlon, Daniel T.; Speng, Richard V.; Cerquone, Stephen M.; and Bickford, David E., 4,928,066, Cl. 324-539.000.

Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., to CL Pharma Aktiengesellschaft. Enol ethers of 6-chloro-4-hydroxy-2-methyl-N-(2-pyridyl)-2H-thieno(2,3-e)-1,2-thiazine-3-carboxamide 1,1-dioxide, and their use. 4,927,821, Cl. 514-226.500.

Bing, Richard J., to Huntington Medical Research Institutes. Relaxation of smooth vascular muscle. 4,927,629, Cl. 424-94.600.

Binks Manufacturing Company: *See—*
Smith, David H., 4,927,079, Cl. 239-11.000.

Biochemie Ladenburg GmbH: *See—*
Kloetzer, Erhard; Kioustelidis, Johannes; and Schmidt, Guenter, 4,927,463, Cl. 106-139.000.

Bionetics Corporation, The: *See—*
Dreschel, Thomas W., 4,926,585, Cl. 47-64.000.

Biotek, Inc.: *See—*
Nuwayser, Elie S., 4,927,687, Cl. 424-449.000.

Birx, Daniel L.; and Reginato, Louis L., to United States of America, Energy. Saturable inductor and transformer structures for magnetic pulse compression. 4,923,020, Cl. 307-106.000.

Bischoff, Erwin: *See—*
Frobel, Klaus; Muller Hartwig; Bischoff, Erwin; Salcher, Olga; de Jong, Anno; Berschauer, Friedrich; and Scheer, Martin, 4,927,810, Cl. 514-23.000.

Bissett, David: *See—*
Mathur, Indresh; James, Allan; and Bissett, David, 4,927,509, Cl. 204-83.000.

Biswas, Gautam; Black, David C.; Duncan, Michael G.; Key, Gary R.; Leak, Gordon D.; and Whittington, Robert D., to International Business Machines Corporation. Dynamically configurable telephone. 4,928,306, Cl. 379-201.000.

Bitritto, Michel: *See—*
Wadhwa, Lachhman. Bitritto, Michel; and Powers, Edward J., 4,927,909, Cl. 528-331.000.

Black, David C.: *See—*
Biswas, Gautam; Black, David C.; Duncan, Michael G.; Key, Gary R., Leak, Gordon D.; and Whittington, Robert D., 4,928,306, Cl. 379-201.000.

Blackburn, Martin J.; and Smith, Michael P., to United Technologies Corporation. Method for improving the toughness of brittle materials fabricated by powder metallurgy techniques. 4,927,458, Cl. 75-246.000.

Blackburn, William P.: *See—*
Schimmel, Karl F.; and Blackburn, William P., 4,927,868, Cl. 523-439.000.

Blancke, Bernard, to Aerospatiale Societe Nationale Industrielle. Method for tilting the moment of inertia of a rotating free body in space into any given direction. 4,927,101, Cl. 244-164.000.

Bland, Gerald F.; and Sullivan, Donald K., to Outboard Marine Corporation. Shift means for marine propulsion device. 4,927,391, Cl. 440-84.000.

Blasczyk, Gotthard: *See—*
Henne, Heinrich; Dammertz, Karl-Heinz; Schneider, Lutz T.; and Blasczyk, Gotthard, 4,927,086, Cl. 241-80.000.

Blazic, Leonard J.; and Janosko, Robert J., to Chrysler Corporation. Cup holder. 4,927,108, Cl. 248-311.200.

Bleckmann, Gerhard: *See—*
Wallbillich, Guenter; Bleckmann, Gerhard; and Scholz, Dankmar, 4,927,740, Cl. 430-309.000.

Blocker, Wesley C.; Roark, David N.; and Hornbaker, Edwin D., to Ethyl Corporation. Process for polymerizing monoallylamine. 4,927,896, Cl. 526-93.000.

Blondeau, Ernest E., Jr.; and Czarnecki, Stephen J., to AG Communication Systems Corporation. T1 line format for robbed signaling for use with CCITT 32K bit per second ADPCM clear channel transmission and 64KBPS clear channel transmission. 4,928,276, Cl. 370-110.100.

Bloom, Frank: *See—*
Raj, Kuldip; Moses, Joseph; Moskowitz, Ronald; and Bloom, Frank, 4,927,164, Cl. 277-80.000.

Blouke, Morley M.: *See—*
Heidtmann, Denis L.; and Blouke, Morley M., 4,928,003, Cl. 250-211.00J.

Bluege, John, to United Technologies Corporation. Glass/fiber composite and a method of its manufacture. 4,927,790, Cl. 501-32.000.

Bluegrass Electronics, Inc.: *See—*
DuRand, Elden E., III; and Logsdon, William K., 4,928,085, Cl. 340-544.000.

Board of Regents, The University of Texas: *See—*
Reading, Christopher L.; Smyth, Malcolm R.; and O'Kennedy, Richard, 4,927,502, Cl. 204-153.100.

Bobst SA: *See—*
Lucas, Raymond, 4,927,321, Cl. 414-788.900.

BOC Group, Inc., The: *See—*
Auerbach, Abraham; and Friedman, Sonia, 4,927,766, Cl. 436-44.000.
Yap, Loo T., 4,927,357, Cl. 432-22.000.

BOC Group plc, The: *See—*
Fitzpatrick, Nicholas B., 4,926,681, Cl. 73-52.000.

Bock, Josef. Process and plant for pressing flexible sheets. 4,927,479, Cl. 156-228.000.

Boda, John W., to Amerock Corporation. Side mounted drawer slide system. 4,927,216, Cl. 312-339.000.

Bode, Sven, to Sven Bode, Auergesellschaft GmbH. Protective helmet with a strapless breathing protection mask. 4,926,854, Cl. 128-201.230.

Boehringer Mannheim Corporation: *See—*
Engelhardt, John A., 4,927,422, Cl. 606-79.000

Boehringer Mannheim GmbH. *See—*
Gall, Rudi; and Bosies, Elmar, 4,927,814, Cl. 514-108.000.

Boehringer Mannheim GmbH: *See—*
Leinert, Herbert; Tsaklakidis, Christos; and Sponer, Gisbert, 4,927,834, Cl. 514-422.000.

Boeing Company, The: *See—*
Huggins, Raymond W.; Van Deventer, Bruce; and Miller, Glen E., 4,928,008, Cl. 250-231.100.
Smith, Mark L., 4,928,094, Cl. 340-712.000.

Boettcher, Thomas E.: *See—*
Buchanan, Scott; Larson, Eric G.; Pieper, Jon R.; and Boettcher, Thomas E., 4,927,431, Cl. 51-298.000.

Bogan, Gary W., to Dow Chemical Company, The. Process for the production of aromatic hydroxyl-containing compound-hydrocarbon resins. 4,927,905, Cl. 528-205.000.

Bohen, Joseph M., to Pennwalt Corporation. Halophenyl ester flame retardants for polyphenylene ether resins. 4,927,873, Cl. 524-288.000.

Bohnstedt, Werner; and Lindenstruth, Werner, to Grace G.m.b.H. Separator for starter batteries. 4,927,722, Cl. 429-147.000.

Boigegrain, Robert; Cecchi, Roberto; and Boveri, Sergio, to Sanofi. Process for the O-alkylation of N-(hydroxy)aralkylphenylethanolamines. 4,927,955, Cl. 560-45.000.

Bolcerek, Robert J. Safety harness. 4,927,211, Cl. 297-465.000.

Bollen, Manfred: *See—*
Koslowski, Gerhard; and Bollen, Manfred, 4,926,531, Cl. 28-173.000.

Bomar, Elmer B. Heat pipe assisted evaporative cooler. 4,926,657, Cl. 62-311.000.

Bond, Robert H.; and Pawlenko, Ivan, to American Telephone and Telegraph Company. Universal nest for a connector assembly tool. 4,926,538, Cl. 29-559.000.

Bonde, Kevin G., to Tecumseh Products Company. Inverted port engine with cross-under intake passage. 4,926,813, Cl. 123-195.0HC.

Bonde, Kevin G., to Tecumseh Products Company. Crankcase breather and lubrication oil system for an internal combustion engine. 4,926,814, Cl. 123-196.00W.

Bonebright, Mark E.; Eberhardt, Paul R.; and Alley, John C., to Cubic Defense Systems, Inc. Modulated scanning antenna. 4,928,109, Cl. 343-786.000.

Bonetti, Carla: *See—*
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 4,927,837, Cl. 514-331.000.

Bonnard, John A. Method of and apparatus for determining melting points. 4,927,270, Cl. 374-16.000.

Bookwalter, John R. Biopsy needle with completely closable cutting end bore. 4,926,877, Cl. 128-754.000.

Booth, Roy E.: *See—*
Ward, Clifford; Chao, Eugene; Booth, Roy E.; Turrill, Frank H.; Wombles, Robert H.; Newman, John W.; and Hettinger, William P., Jr., 4,927,620, Cl. 423-447.200.

Boots, Gerardus A. M. Container for fluids, solids having flow properties of the like. 4,927,037, Cl. 220-1.500.

Bopp, Thomas T.: *See—*
Holm-Kennedy, James W.; Kawamoto, Eric H.; and Bopp, Thomas T., 4,926,693, Cl. 73-597.000.

Borberg, Helmut: *See—*
Fenyo, Martha; Borberg, Helmut; and Kadar, Janos G., 4,926,861, Cl. 128-395.000.

Borden, Inc.: *See—*
Lee, Yanien, 4,927,645, Cl. 426-93.000.
Ylvisaker, Jon A., 4,927,648, Cl. 426-234.000.

Born, Eberhard, to Bayer Aktiengesellschaft. Post forming semi-finished product for the manufacture of moulded parts resistant to bending. 4,927,706, Cl. 428-304.400.

Borzatta, Valerio: *See—*
Cantatore, Giuseppe; and Borzatta, Valerio, 4,927,925, Cl. 540-598.000.
Cantatore, Giuseppe; Borzatta, Valerio; and Masina, Franca, 4,927,930, Cl. 544-198.000.

Bosch, Andrew C.: *See—*
Dolfini, Joseph E.; Glinka, Jerome; and Bosch, Andrew C., 4,927,805, Cl. 512-27.000.

Bosies, Elmar: *See—*
Gall, Rudi; and Bosies, Elmar, 4,927,814, Cl. 514-108.000.

Botti, Serge: *See—*
Lefevre, Herve ; Bettini, Jean-Pierre; Botti, Serge; and Turpin, Marc, 4,928,005, Cl. 250-227.230.

Boudakian, Max M.; and Fidler, Delmer A., to Olin Corporation. Process for low chloride 1,2,4-triazol-5-one. 4,927,940, Cl. 548-263.200.

Boudreau, Alban M. Folding saw-horse. 4,926,966, Cl. 182-155.000.

Bougger, Gary E., to Dale Electronic, Inc. Method of making a surface mount wirewound resistor. 4,926,542, Cl. 29-619.000.

Bourjot, Brightful; and Garnaud, Marie-Anne, to Atochem. Pipes base on polyolefin resin for manufacturing pipelines and couplings for assembling them. 4,927,184, Cl. 285-21.000.

Bouton, Marie-Madeleine; Jacques, Jean; and Pierdet, Andre , to Roussel Uclaf. Process for preparing certain decahydro-7H-3-ol-7-ones. 4,927,975, Cl. 568-373.000.

Boveri, Sergio: *See—*
Boigegrain, Robert; Cecchi, Roberto; and Boveri, Sergio, 4,927,955, Cl. 560-45.000.

Bowers, Wayne E., to Fuel Tech, Inc. Reduction of nitrogen- and carbon-based pollutants. 4,927,612, Cl. 423-235.000.

Bowler, Peter T.; and Zeeff, Thomas J., to Feco Engineered Systems, Inc. Rotational container holding device and method. 4,927,205, Cl. 294-94.000.

Bowman, Harold M. Manhole cover support resistant to water infiltration. 4,927,290, Cl. 404-26.000.

Bowman, Robert G.: *See—*
Molzahn, David C.; Hartwell, George E.; and Bowman, Robert G., 4,927,931, Cl. 544-357.000.

Bowman, Timothy J.: *See—*
Morris, Guy D.; Jordon, Trevor A.; Davidson, William C.; and Bowman, Timothy J., 4,926,802, Cl. 123-52.00M.

Boyer, Jeffrey M.: *See—*
Adams, Frederic R.; Boyer, Jeffrey M.; Schultz, Ronald N.; and Taylor, Barry, 4,926,959, Cl. 180-315.000.

Boyer, Ralph C.; and Macauley, Edward C. Golf practice device. 4,927,154, Cl. 273-200.00R.

Brace, Regie P. Axe maul apparatus. 4,926,558, Cl. 30-308.100.

Brackett, George E. Apparatus for treating tobacco products. 4,926,889, Cl. 131-329.000.

Braddick, Britt O., to Texas Iron Works, Inc. Multiple purpose liner hanger construction. 4,926,936, Cl. 166-217.000.

Bradley, Ralph H.: *See—*
Guerinot, William F.; Bradley, Ralph H.; and Troemel, Stephen T., 4,928,182, Cl. 358-245.000.

Bradshaw, Noel J.; and Hughes, David, to Unilever Patent Holdings, B.V. Heat product. 4,927,661, Cl. 426-641.000.

Bramer, Donald W.: *See—*
Hallings, Leonard L.; Bramer, Donald W., Sanborn, Bruce A.; and Schryver, James E., 4,928,211, Cl. 362-33.000.

Brandenburger, Gary H., to Osteo-Technology, Inc. Method and apparatus for ultrasonic analysis of bone strength in vivo. 4,926,870, Cl. 128-660.010.

Brandes, Wilhelm: *See—*
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,927,844, Cl. 514-425.000.

Brandner, Burkhard; and Wenzlik, Klaus, to Atlas Fahrzeugtechnik GmbH. Fuel injection valve. 4,927,084, Cl. 239-584.000.

Branson, Mark E., to KCL Corporation. Recloseable tamper evident bag with hooded closure. 4,927,271, Cl. 383-5.000.

Brastemp S/A: *See—*
Souto, Sadario O.; and De Moura, Wilson G., 4,927,861, Cl. 521-99.000.

Braun, Erwin; Strobel, Michael; and Karl, Rupert, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Device to feed and open a fiber sliver on an open-end spinning device. 4,926,627, Cl. 57-412.000.

Bray, David. Method of manufacturing a nail file. 4,927,483, Cl. 156-306.600.

Bray, Stuart W.: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.

Breitenbach, Otto; Hetz, Helmar; Rous, Friedemann; and Ottenreuther, Josef, to Kabelmetal Electro GmbH. Method for manufacturing optical cables. 4,927,570, Cl. 264-1.400.

Brekkestran, Kevin L.: *See—*
Tommerson, David P.; and Brekkestran, Kevin L., 4,927,366, Cl. 439-37.000.

Brennecke, Hermann; Liere, Horst; and Koch, Reinhold, to IRS Industrie Rationalisierungs Systeme GmbH. Method and apparatus for explosion protection of plants, pipelines and the like by pressure monitoring. 4,928,255, Cl. 364-558.000.

Brenneman, Rex D. Chip shot game. 4,927,161, Cl. 273-402.000.

Breslow, Jeffrey D.; Zaruba, John V.; and Rosenwinkel, Donald A., to Breslow, Morrison, Terzian & Associates, Inc. Property dealing game. 4,927,156, Cl. 273-256.000.

Breslow, Morrison, Terzian & Associates, Inc.: *See—*
Breslow, Jeffrey D.; Zaruba, John V.; and Rosenwinkel, Donald A., 4,927,156, Cl. 273-256.000.

Brettle, Jack: *See—*
Trundle, Clive; and Brettle, Jack, 4,927,180, Cl. 283-70.000.

Brewer, John C., to Garbalizer Machinery Corp. Tire feeding structure for tire shredding apparatus. 4,927,088, Cl. 241-223.000.

Bridgestone Corporation: *See—*
Abe, Norio; and Fukaura, Osamu, 4,927,488, Cl. 156-460.000.
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, 4,926,985, Cl. 188-378.000.

Bridgestone/Firestone, Inc.: *See—*
Tate, David P.; and Graves, Daniel F., 4,927,887, Cl. 525-279.000.

Briggs, Stuart P.; and Wood, Derek A., to Shell Internationale Research Maatschappij, B.V. Process for preparing diphenyl ethers. 4,927,945, Cl. 549-305.000.

Bright, Vernon G. Emergency paddle kit. 4,926,772, Cl. 114-39.200.

Brightful, Charles E., Jr.: *See—*
Brightful, Deborah S.; and Brightful, Charles E., Jr., 4,926,784, Cl. 119-106.000.

Brightful, Deborah S.; and Brightful, Charles E., Jr. Pet deodorizer device. 4,926,784, Cl. 119-106.000.

Brightwell, Robert A.: *See—*
Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., 4,926,919, Cl. 152-209.00R.

Bristol-Myers Company: *See—*
Algieri, Aldo A.; and Farney, Robert F., 4,927,968, Cl. 549-451.000.
Bykadi, Gururaj; Kaplan, Murray A.; Corrao, Richard G.; Bara, Edward J.; Ullah, Ismat; and Agharkar, Shreeram N., 4,927,638, Cl. 424-455.000.
Douglas, James L.; Fabre, Guy; and Demosthene, Claude, 4,927,970, Cl. 564-462.000.
Konishi, Masataka; Shimizu, Keiko; Ohbayashi, Masaru; Tomita, Koji; Miyaki, Takeo; and Oki, Toshikazu, 4,927,848, Cl. 514-453.000.
Sit, Sing-Yuen; and Wright, John J., 4,927,944, Cl. 549-292.000.
Vyas, Dolatrai M.; Doyle, Terrence W.; and Partyka, Richard A., 4,927,943, Cl. 548-422.000.

British Aerospace Public Limited Company: *See—*
Hill, Peter F., 4,927,697, Cl. 428-198.000.

British Petroleum Company p.l.c.: *See—*
Roebuck, Maurice J., 4,927,038, Cl. 220-3.000.

British Telecommunications plc: *See—*
Welbourn, Anthony; and Heslop, Christopher, 4,927,774, Cl. 437-31.000.

Britton, Scott M.: *See—*
Lott, Gloria Y.; Britton, Scott M.; and Constantine, Barry E., 4,926,850, Cl. 128-155.000.

Brock-Fisher, George A.; Kranz, Paul R.; Mniece, James R.; Thiele, Karl E.; Savord, Bernard J.; and Smith, Richard B., to Hewlett-Packard Company. Ultrasonic transducer system and method for the operation thereof. 4,926,872, Cl. 128-661.010.

Brock, George W., to Eastman Kodak Company. Magnetoresistive element sandwiched between a sal ferrite substrateand a cover containing an easy axis biasing magnet. 4,928,188, Cl. 360-113.000.

Brock, Martin; and Pohlig Ralf, to Bayer Aktiengesellschaft. Process for producing foam cushions. 4,927,575, Cl. 264-46.400.

Brodmann, George L., to Burlington Industries, Inc. Process of dyeing synthetic fabrics using high-boiling ester solvents. 4,927,429, Cl. 8-583.000.

Brodsky, Stuart A. Apparatus for safe use and disposal of needles. 4,927,415, Cl. 604-164.000.

Broekhuis, Antonius A.: *See—*
Drent, Eit; and Broekhuis, Antonius A., 4,927,892, Cl. 525-340.000.

Brokowski, Andrzej; Deputat, Julian; and Mizerski, Krzysztof, to Polska Akademia Nauk Instytut Podstrowowych Problemow. Method of measurement of residual stresses in the material of the object under test. 4,926,692, Cl. 73-597.000.

Brooks, Reginald G.; Leatham, Alan; and Coombs, Jeffrey, to Osprey Metals Ltd. Deposition of metallic products using relatively cold solid particles. 4,926,923, Cl. 164-5.000.

Brooks, Reginald G.; Leathman, Alan; and Coombs, Jeffrey, to Osprey Metals Ltd. Deposition method including recycled solid particles. 4,926,924, Cl. 164-5.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Brooks, Roy S.: *See—*
Ahern, Steven R.; Brooks, Roy S.; and Cebis, Martin J. P., 4,926,806, Cl. 123-179.00L.
Brooktree Corporation: *See—*
Katzenstein, Henry S., 4,928,102, Cl. 341-154.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Kato, Iwao, 4,926,540, Cl. 29-596.000.
Kuzuya, Susumu; Nagao, Yoshiaki; Asakura, Hideo; and Hattori, Shigenori, 4,927,278, Cl. 400-208.000.
Niikawa, Takeshi, 4,927,277, Cl. 400-56.000.
Brouwer, Walter G.; Felauer, Ethel Ellen; and Bell, Allyn Roy, to Uniroyal Chemical Company, Inc.; and Uniroyal Chemical Ltd/Ltee. 3-aryldihydrouracils. 4,927,451, Cl. 71-92.000.
Brown, Christine C.; and Brown, Dennis G. Reusable bag closure. 4,926,526, Cl. 24-30.50R.
Brown, Dennis G.: *See—*
Brown, Christine C.; and Brown, Dennis G., 4,926,526, Cl. 24-30.50R.
Brown, Peter S.: *See—*
Gifford, Hanson S., III; Simpson, John B.; and Brown, Peter S., 4,926,858, Cl. 606-159.000.
Brown, Roger C.; Dixon, John; and Robinson, David H., to Fisons plc. 1,3,4-thiadiazoles. 4,927,822, Cl. 514-236.200.
Brown, Sterling B., to General Electric Company Solvent-resistant, compatible polyphenylene ether-thermoplastic polyester blends containing large proportions of polycarbonate. 4,927,881, Cl. 525-92.000.
Brown, Sterling B., to General Electric Company. Method for preparation of aryloxytriazine-capped polyphenylene ethers. 4,927,894, Cl. 525-390.000.
Brownell, Jane M.: *See—*
Shimkus, John W.; and Brownell, Jane M., 4,926,848, Cl. 128-169.000.
Brownlee, Robert G., to 501 Microphoretic Systems, Inc. Detector for fluorescence and absorption spectroscopy. 4,927,265, Cl. 356-73.000.
Bruce, John M., to Victoria University of Manchester, The. Compounds of the anthraquinone series. 4,927,845, Cl. 514-440.000.
Bruck, Gerald J.: *See—*
Whitlow, Graham A.; Bruck, Gerald J.; and Smith, James E., 4,927,992, Cl. 219-121.650.
Brueck, Erhard, to Wilhelm Loh Wetzlar Optikmaschinen GmbH & Co. KG. Device for centering of optic lenses in a mechanical mounting, in particular during edge cutting and bevelling. 4,926,588, Cl. 51-217.00T.
Bruehl, Klaus; and Thaler, Dietmar, to Otis Elevator Company. Escalator step buffer. 4,926,941, Cl. 188-111.000.
Bruke Analytische Messtechnik GmbH: *See—*
Keens, Axel; and Simon, Arno, 4,927,269, Cl. 356-346.000.
Brumme, Reinhold; and Desons, Roger, to Applied Power Inc. Vibration absorber. 4,927,122, Cl. 267-140.100.
Bruntz, Rodney D., to Carlson Company, Inc., The. Enclosed dry clutch/brake. 4,926,989, Cl. 192-18.00A.
Bryan, James S.: *See—*
Meadows, Roger D.; Rush, James B.; and Bryan, James S., 4,926,535, Cl. 29-890.144.
Bryant, Robert G.; and Listinsky, Jay J., to University of Rochester, The. Clay magnetic resonance contrast agents for gastrointestinal consumption or introduction. 4,927,624, Cl. 424-9.000.
Bryg, William R.: *See—*
Baum, Allen; Bryg, William R.; Mahon, Michael J.; Lee, Ruby B.; and Muchnick, Steven S., 4,928,239, Cl. 364-200.000.
Bryson, Robert E., to Kimberly-Clark Corporation. Method and apparatus for creating a graduated distribution of granule materials in a fiber mat. 4,927,582, Cl. 264-113.000.
Brzozowski, Steven J.: *See—*
Dorri, Bizhan; and Brzozowski, Steven J., 4,926,646, Cl. 62-51.100.
BSH Electronics, Ltd.: *See—*
Kropielnicki, Jerzy J.; Easter, Brian; and Last, James D., 4,928,108, Cl. 343-704.000.
Buchanan, Scott; Larson, Eric G.; Pieper, Jon R.; and Boettcher, Thomas E., to Minnesota Mining and Manufacturing Company. Binder for coated abrasives. 4,927,431, Cl. 51-298.000.
Budinger, William D. Method and apparatus for determination and display of critical gas supply information. 4,926,703, Cl. 73-865.100.
Budinger, William D.; and Jensen, Elmer W., to Rodel, Inc. Pad material for grinding, lapping and polishing. 4,927,432, Cl. 51-298.000.
Buechele, James L.; Nielsen, Edward L.; Dong, Walter; and Shaw, Paul V., to Shell Oil Company. Method of purifying bisphenols. 4,927,978, Cl. 568-724.000.
Buechele, James L.: *See—*
Dong, Walter; Shaw, Paul V.; and Buechele, James L., 4,927,973, Cl. 568-724.000.
Buendia, Jean: *See—*
Vivat, Michel; and Buendia, Jean, 4,927,921, Cl. 540-110.000.
Buhr, Gerhard: *See—*
Merrem, Hans-Joachim; Buhr, Gerhard; and Lenz, Ruediger, 4,927,732, Cl. 430-191.000.
Buijs, Johannes, to Adviesbureau D3BN Civiel Ingenieurs B.V. Roofing method and apparatus. 4,926,591, Cl. 52-63.000.
Bull, Arthur E. Playing card holder. 4,927,146, Cl. 273-150.000.
Bull, Arthur E. Playing card holder. 4,927,149, Cl. 273-150.000.
Bull HN Information Systems Italia S.p.A.: *See—*
Salvagno, Elvio, 4,927,367, Cl. 439-92.000.
Zulian, Ferruccio, 4,928,224, Cl. 364-200.000.
Bulley, John L., to JLB Textiles Limited. Tubular bandage and a method for its application. 4,926,851, Cl. 128-157.000.
Bulso, Joseph D., Jr.; and Lewers, William R., to Redicon Corporation. Method and apparatus for multidirectional sheet feeding. 4,926,724, Cl. 83-35.000.
Bunch, Richard P., to Converse Inc. Shoe with cradle arch support. 4,926,569, Cl. 36-91.000.
Buntrock Industries, Inc.: *See—*
Buntrock, Kermit A.; English, Daniel R.; and Jones, Wescomb R., 4,927,673, Cl. 427-376.200.
Buntrock, Kermit A.; English, Daniel R.; and Jones, Wescomb R., to Buntrock Industries, Inc. Rapid technique for making improved laminar ceramic shell molds using a phosphate modified aluminum salt binder. 4,927,673, Cl. 427-376.200.
Burba, Joseph C.; Landman, Ronald G.; Patil, Prabhakar B.; and Reitz, Graydon A., to Ford Motor Company. Method for controlling a motor vehicle powertrain. 4,928,227, Cl. 364-424.010.
Burgdore, Jochen, to Alfred Teves GmbH. Slip-controlled hydraulic brake system. 4,927,213, Cl. 303-116.000.
Burgin, Robert, to IVF Maschinenfabrik Schaffhausen. Curved dispensible pads. 4,927,064, Cl. 225-106.000.
Burke, Gary R.: *See—*
Dao, Tich T.; and Burke, Gary R., 4,928,223, Cl. 364-200.000.
Burkit, John W. Internal expansion coupling device. 4,927,189, Cl. 285-109.000.
Burley, John S., to Burley's Ring Supply. Dasher board system. 4,927,134, Cl. 272-3.000.
Burley's Ring Supply: *See—*
Burley, John S., 4,927,134, Cl. 272-3.000.
Burlington Industries, Inc.: *See—*
Brodmann, George L., 4,927,429, Cl. 8-583.000.
Burns, Douglas H., to Lasa Industries, Inc. Laser power control system. 4,928,284, Cl. 372-31.000.
Burr, James D. Newtonian telescope assembly with rotary flat mirror. 4,927,252, Cl. 350-503.000.
Bush, James W., to Copeland Corporation. Scroll machine with relieved flank surface. 4,927,341, Cl. 418-55.000.
Buthmann, Peter; and Kotzur, Joachim, to MAN Gutehoffnungshutte, GmbH. Internal combustion engine charging unit. 4,926,642, Cl. 60-607.000.
Butler, James W.; Korniski, Thomas J.; and Colvin, Alex D., to Ford Motor Company. Measuring multicomponent constituency of gas emission flow. 4,928,015, Cl. 250-343.000.
Butler, Jon E. Wood burning hot water furnace. 4,926,797, Cl. 122-15.000.
Butler, Lee D.; Orlando, Franklin P.; and Lenker, Don H., to FMC Corporation. Thrashing system for vegetable harvesters. 4,927,440, Cl. 56-12.800.
Bykadi, Gururaj; Kaplan, Murray A.; Corrao, Richard G.; Bara, Edward J.; Ullah, Ismat; and Agharkar, Shreeram N., to Bristol-Myers Company. Etoposide solutions. 4,927,638, Cl. 424-455.000.
Byron, David E., to Red Eye Arms, Inc. Polymer gun operating handle. 4,926,739, Cl. 89-1.400.
C. A. Weidmuller GmbH & Co.: *See—*
Durkop, Willi; and Scheffner, Wolfgang, 4,927,383, Cl. 439-491.000.
C & C Incorporated: *See—*
Wagner, Joseph M., 4,927,202, Cl. 296-107.000.
C.G.V. S.p.A.: *See—*
Azzalin, Italo, 4,926,663, Cl. 70-74.000.
C. H. Perrott, Inc.: *See—*
Perrott, Charles H., 4,926,897, Cl. 137-98.000.
C. Stiefelmayer KG: *See—*
Kummerer, Hans-Helmut, 4,926,565, Cl. 33-567.000.
Caccia, Giulio; and Baldacci, Massimo, to Laboratori Baldacci SpA. Sulfonamido derivatives inhibiting the aldose reductase enzyme system and pharmaceutical compositions containing them. 4,927,849, Cl. 514-455.000.
Cailey, Fred L., to Navistar International Transportation Corp. Cylinder head intake manifold interface. 4,926,812, Cl. 123-193.00H.
Calderon, Albert. Method for producing and treating coal gases. 4,927,430, Cl. 48-197.00R.
Camberlin, Yves: *See—*
Michaud, Philippe; and Camberlin, Yves, 4,927,899, Cl. 528-49.000.
Michaud, Philippe; and Camberlin, Yves, 4,927,900, Cl. 528-49.000.
Cambio, Orlando D., Jr.; and Refsland, Earl R., to Hudson Oxygen Therapy Sales Company. Feeding system. 4,926,856, Cl. 128-203.260.
Cameo, Incorporated: *See—*
Pringle, Ronald E.; and Morris, Arthur J., 4,926,945, Cl. 166-321.000.
Cameron Iron Works USA, Inc.: *See—*
Knowles, David G., 4,927,295, Cl. 405-195.000.
Campana, Thomas J.: *See—*
Andros, Andrew A.; and Campana, Thomas J., 4,928,100, Cl. 340-825.440.
Campau, Daniel N., to Flow-Rite Coutrols, Ltd. Apparatus for aerating water in a container. 4,927,568, Cl. 261-36.100.
Campbell, Donald N.: *See—*
Spangler, Glenn E.; Carrico, John P., Jr.; and Campbell, Donald N., 4,928,033, Cl. 313-345.000.
Campbell, Randy P. Method and apparatus for remediating contaminated soil. 4,927,293, Cl. 405-128.000.
Campbell, Robert B.; Kochka, Edgar L.; and Piotrowski, Paul A., to Westinghouse Electric Corp. Method for doping a melt. 4,927,489, Cl. 156-620.100.
Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence: *See—*
Wood, Gordon H., 4,927,396, Cl. 441-33.000.

Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See—*
Meunier, Pierre P., 4,926,853, Cl. 128-201.180.
Canadian Patents & Development Ltd.: *See—*
Loschiavo, Samuel R., 4,927,635, Cl. 424-409.000.
Canon Kabushiki Kaisha: *See—*
Hashimoto, Hiroshi; and Yamanaka, Hiromichi, 4,927,131, Cl. 271-215.000.
Kinoshita, Takao, 4,928,137, Cl. 358-213.260.
Murata, Jun, 4,927,280, Cl. 400-661.090.
Nishida, Shoji, 4,927,786, Cl. 437-233.000.
Suda, Shigeyuki, 4,927,250, Cl. 350-500.000.
Taniguchi, Osamu; Onitsuka, Yoshihiro; and Mihara, Tadashi, 4,927,243, Cl. 350-350.00S.
Tokumitsu, Jun, 4,927,230, Cl. 350-96.240.
Torisawa, Akira; Kakizaki, Masaaki; Ito, Noriaki; and Yoshimura, Shigeru, 4,928,050, Cl. 318-696.000.
Tsunekawa, Tokuichi; Date, Nobuaki; Aizawa, Hiroshi; Hosoe, Kazuya; and Urushibara, Kazunori, 4,928,184, Cl. 358-335.000.
Yoshizawa, Tetsuo; Terayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shunichi; Ichida, Yasuteru; and Konishi, Masaki, 4,926,549, Cl. 29-876.000.
Cantainer Corporation: *See—*
Stuber, Michael G.; and Effertz, Charles E., 4,927,047, Cl. 220-90.200.
Cantatore, Giuseppe; and Borzatta, Valerio, to Ciba-Geigy Corporation. Piperidine compounds and their use as thermal stabilizers. 4,927,925, Cl. 540-598.000.
Cantatore, Giuseppe; Borzatta, Valerio; and Masina, Franca, to Ciba-Geigy Corporation. Polyamines partially substituted by piperidinetriazines. 4,927,930, Cl. 544-198.000.
Cantrell, Gary L., to Mallinckrodt Inc. Catalytic method for producing fluoroaromatic compounds using branched alkyl pyridinium salts. 4,927,980, Cl. 568-937.000.
Capelle, Gerd, to Hermann Berstorff Maschinenbau GmbH. Method and apparatus for producing tread strips for automotive vehicle tires. 4,927,482, Cl. 156-243.000.
Carbone Industrie: *See—*
Gassiat, Alain L., 4,926,977, Cl. 188-18.00A.
Carl Freudenberg, Firma: *See—*
Heinemann, Joachim; Spies, Karl-Heinz; Keller, Frank; Beicht, Bernd; Leitermann, Wulf; and Lechler, Rolf, 4,926,921, Cl. 160-115.000.
Schwerdt, Hans-Werner, 4,927,123, Cl. 267-140.100.
Carling, William R.: *See—*
Baker, Raymond; Carling, William R.; James, Kim; and Leeson, Paul D., 4,927,819, Cl. 514-213.000.
Carlson Company, Inc., The: *See—*
Bruntz, Rodney D., 4,926,989, Cl. 192-18.00A.
Carlson, James R.; and Tobbe, Joseph D., to General Electric Company. Door handle of a household refrigerator. 4,926,523, Cl. 16-125.000.
Carondelet Foundry Company: *See—*
Culling, John H., 4,927,602, Cl. 420-586.000.
Carr, Jeff A., to Carr Pattern Co., Inc. Light mount assembly having raised and lowered positions. 4,928,216, Cl. 362-66.000.
Carr Pattern Co., Inc.: *See—*
Carr, Jeff A., 4,928,216, Cl. 362-66.000.
Carr, Robert; Clarke, David J.; and Atkinson, Tony, to Public Health Laboratory Service Board. Optical analysis. 4,927,268, Cl. 356-336.000.
Carr, Walter J., Jr.: *See—*
Iyer, Natraj C.; Carr, Walter J., Jr.; and Male, Alan T., 4,927,985, Cl. 174-125.100.
Carrico, John P., Jr.: *See—*
Spangler, Glenn E.; Carrico, John P., Jr.; and Campbell, Donald N., 4,928,033, Cl. 313-345.000.
Carrodus, Melvin A.: *See—*
Male, Andrew J.; and Carrodus, Melvin A., 4,928,079, Cl. 335-13.000.
Carruth, Walter L.; Jones, Warren P.; and Stacy, Richard B., to SSI Medical Services, Inc. Weigh bed. 4,926,951, Cl. 177-144.000.
Carsello, Anthony: *See—*
Pilatowicz, Edward A.; Carsello, Anthony; and Landy, Richard, 4,926,556, Cl. 30-216.000.
Carson, Chrislyn M.; Copping, Leonard G.; Ehr, Robert J.; Gitlitz, Melvin H.; McNeil, Maynard W.; Street, Peter F. S.; and Liebeschuetz, John W., to Atochem North America, Inc.; and Dow Chemical Company, The. Morpholinyl silanes and use for control of plant diseases caused by fungi. 4,927,812, Cl. 514-63.000.
Carter, David H.: *See—*
Petrovic, John J.; Carter, David H.; and Gac, Frank D., 4,927,792, Cl. 501-92.000.
Carver, David C.: *See—*
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.
Cascade Corporation: *See—*
Olson, John E., 4,927,320, Cl. 414-786.000.
Casio Computer Co., Ltd.: *See—*
Masaki, Hisashi, 4,927,491, Cl. 156-630.000.
Minamitaka, Junichi, 4,926,737, Cl. 84-611.000.
Yajima, Hiroshi, 4,928,183, Cl. 358-296.000.
Cassady, R. J.: *See—*
Smith, Richard D.; Knowles, Steve; Cassady, R. J.; Smith, William; and Simon, Mark A., 4,926,632, Cl. 60-203.100.
Castrol Industrial Inc.: *See—*
Cutcher, John A.; and Andrews, Gary M., 4,927,550, Cl. 252-32.500.
Causier, Alain: *See—*
Lottiau, Michel; Glemet, Michel; Cognet, Gilles; and Causier, Alain, 4,927,583, Cl. 264-136.000.
Cebis, Martin J. P.: *See—*
Ahern, Steven R.; Brooks, Roy S.; and Cebis, Martin J. P., 4,926,806, Cl. 123-179.00L.
Cecchi, Roberto: *See—*
Boigegrain, Robert; Cecchi, Roberto; and Boveri, Sergio, 4,927,955, Cl. 560-45.000.
Cell Enterprises, Inc.: *See—*
Darfler, Frederick J., 4,927,762, Cl. 435-240.310.
Center for Innovative Technology: *See—*
Zimmermann, Bernd D.; Claus, Richard O.; and Murphy, Kent A., 4,928,004, Cl. 250-227.140.
Central Glass Company, Limited: *See—*
Aramaki, Minoru; Sakaguchi, Hiroaki; and Nakamura, Tamio, 4,927,962, Cl. 562-113.000.
Central Sprinkler Corporation: *See—*
Polan, George S., 4,926,946, Cl. 169-37.000.
Centre International de Recherches Dermatologiques C.I.R.D.: *See—*
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 4,927,928, Cl. 544-154.000.
Centre National De La Recherche Scientifique: *See—*
Barthelemy, Alain; Maneuf, Serge; and Froehly, Claude, 4,928,282, Cl. 372-18.000.
Cerquone, Stephen M.: *See—*
Adlon, Daniel T.; Spong, Richard V.; Cerquone, Stephen M.; and Bickford, David E., 4,928,066, Cl. 324-539.000.
Cetinkaya, Ismail B.; and Culler, Robert P., to UOP. FCC Stripping apparatus. 4,927,606, Cl. 422-144.000.
Chadwick, Charles: *See—*
Abildgaard, William H.; Chadwick, Charles; Hotkowski, Peter; and Todaro, Frank A., 4,927,310, Cl. 412-7.000.
Chandraratna, Roshantha A. S., to Allergan, Inc. Ethynylheteroaromatic-acids having retinoic acid-like activity. 4,927,947, Cl. 549-484.000.
Chaney, Earl J., Jr.; Malay, Manuel R.; O'Hara, Thomas J.; and Ayers, Alan D., to Eveready Battery Company, Inc. Electrochemical cell having a safety vent closure. 4,927,720, Cl. 429-54.000.
Chang, Steve C. S.; and Miller, Thomas E., to Ciba Corning Diagnostics Corp. Method for enhancement of chemiluminescence. 4,927,769, Cl. 436-518.000.
Chanock, Robert M.; Kapikian, Albert; Midthun, Karen; Flores, Jorge; Gorziglia, Mario; Hoshino, Yasutaka; and Peres-Schael, Irene, to United States of America, Health and Human Services. Vaccine against rotavirus diseases and method of preparing same. 4,927,628, Cl. 424-89.000.
Chao, Eugene: *See—*
Ward, Clifford; Chao, Eugene; Booth, Roy E.; Turrill, Frank H.; Wombles, Robert H.; Newman, John W.; and Hettinger, William P., Jr., 4,927,620, Cl. 423-447.200.
Chapin, David S.: *See—*
Ingram, Billy S., II; and Chapin, David S., 4,927,092, Cl. 242-107.200.
Chapman, George R.: *See—*
Jack, Michael D.; Chapman, George R.; and Ray, Michael, 4,927,773, Cl. 437-22.000.
Charles C. Worth Corporation: *See—*
Young, John N., 4,927,095, Cl. 242-261.000.
Chastain, Jack T.; and McWhorter, John, to Doster Warehouse. Method and apparatus for debris screening and sorting of peanuts. 4,927,030, Cl. 209-620.000.
Chauvin, Glenn A. Folding crossbow. 4,926,834, Cl. 124-25.000.
Cheek, Patrick J.: *See—*
Hodges, William L.; and Cheek, Patrick J., 4,928,243, Cl. 364-519.000.
Cheek, Ralph L.: *See—*
Gardner, Owen M.; and Cheek, Ralph L., 4,927,459, Cl. 75-685.000.
Chen, Chin H.: *See—*
Goswami, Ramanuj; and Chen, Chin H., 4,927,927, Cl. 544-106.000.
Chen, Shou H.: *See—*
Tsai, Chong S.; Chen, Shou H.; Li, Bean T.; and Jean, King L., 4,927,664, Cl. 427-57.000.
Chen, Shu-Ren: *See—*
Gattey, Phillip; and Chen, Shu-Ren, 4,926,961, Cl. 181-22.000.
Chen, Yan-rong: *See—*
Yang, Ming-he; Chen, Yan-rong; Liu, Geng-tao; and Huang, Liang, 4,927,937, Cl. 546-296.000.
Cheng, David; Hartlage, Robert P.; and Zhang, Wesley W., to Applied Materials, Inc. Laser interferometer system for monitoring and controlling IC processing. 4,927,485, Cl. 156-345.000.
Cheng, Yu F. Connector jack. 4,927,385, Cl. 439-578.000.
Cherian, Gabe: *See—*
Diaz, Stephen H.; Cherian, Gabe; Morris, Stephen; Vinson, John R.; Crofts, David; and Moore, Anthony J., 4,928,199, Cl. 361-56.000.
Cherry Semiconductor Corporation: *See—*
Redl, Richard; and Sokal, Nathan O., 4,928,200, Cl. 361-93.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Cheskis Harvey P.: *See—*
Watson, Gary W.; Cheskis Harvey P.; and Sankaranarayanan, Ashok, 4,926,927, Cl. 164-429.000.

Chevron, Inc.: *See—*
Nespor, Ronald B., 4,927,315, Cl. 414-563.000.

Chevron Research Company: *See—*
Erdman, Timothy R.; Shippey, Michael A.; and Wollenberg, Robert H., 4,927,551, Cl. 252-42.700.
Marcantonio, Paul J., 4,927,794, Cl. 502-26.000.

Chiba, Toshimi: *See—*
Aoki, Kazuo; Chiba, Toshimi; Tachibana, Sadao; and Nagatomo, Yasushi, 4,927,990, Cl. 200-517.000.

Chicopee: *See—*
Marshall, Gerald M.; Hull, Raymond, Jr.; and Farrington, Allan P., 4,927,685, Cl. 428-74.000.

Chikuma, Kiyofumi, to Pioneer Electronic Corporation. Optical information recording medium providing reflected light at two different wavelengths. 4,927,681, Cl. 428-64.000.

Child, Jonathan E.; Choi, Byung C.; and Ragonese, Francis P., to Mobil Oil Corporation. Process and apparatus for the uniform distribution of a two-phase feed in a chemical reaction zone. 4,927,977, Cl. 568-695.000.

Chinese Academy of Medical Science: *See—*
Yang, Ming-he; Chen, Yan-rong; Liu, Geng-tao; and Huang, Liang, 4,927,937, Cl. 546-296.000.

Chino, Naoyoshi; Sato, Tsunehiko; Saito, Shinji; and Ogawa, Hiroshi, to Fuji Photo Film Co., Ltd. Simultaneous multi-layer coating method for manufacturing magnetic recording medium. 4,927,665, Cl. 427-131.000.

Chiyoshi, Toyoharu: *See—*
Matsuura, Ichiro; and Chiyoshi, Toyoharu, 4,927,694, Cl. 428-159.000.

Cho, Alex, to Aluminum Company of America. Thin gauge aluminum plate product by isothermal treatment and ramp anneal. 4,927,470, Cl. 148-12.70A.

Choi, Byung C.: *See—*
Child, Jonathan E.; Choi, Byung C.; and Ragonese, Francis P., 4,927,977, Cl. 568-695.000.

Chou, Tai-Sheng: *See—*
Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., 4,927,526, Cl. 208-152.000.

Chovin, Andre ; and Taillebois, Jacques, to Crouzet. Digital timer with constant resolution. 4,928,270, Cl. 368-82.000.

Chr. Hansen's Laboratory, Inc.: *See—*
Sudoma, A. Louis; and Dalebroux, Dean G., 4,927,763, Cl. 435-260.000.

Christensen, Richard N.; DeVuono, Anthony C.; Wilkinson, William H.; and Landstrom, D. Karl, to Gas Research Institute. Double effect air conditioning system. 4,926,659, Cl. 62-476.000.

Christian, Steven C.: *See—*
Stice, James D.; Sievert, Chester E., Jr.; and Christian, Steven C., 4,926,860, Cl. 606-144.000.

Christou, Aristos: *See—*
Davey, John E.; and Christou, Aristos, 4,927,782, Cl. 437-184.000.

Chrysler Corporation: *See—*
Blazic, Leonard J.; and Janosko, Robert J., 4,927,108, Cl. 248-311.200.
Mehta, Hemang S.; Holbrook, Gerald L.; and Leising, Maurice B., 4,928,235, Cl. 364-424.100.

Chrysler, Gregory; Chu, Richard C.; and Simons, Robert E., to International Business Machines Corporation. Circuit module with direct liquid cooling by a coolant flowing between a heat producing component and the face of a piston. 4,928,207, Cl. 361-385.000.

Chu, Raymond W. H. *See—*
Wang, Patrick S.; Strobl, Georg; and Chu, Raymond W. H., 4,927,379, Cl. 439-398.000.

Chu, Richard C.: *See—*
Chrysler, Gregory; Chu, Richard C.; and Simons, Robert E., 4,928,207, Cl. 361-385.000.

Chu, Yung F., to Mobil Oil Corporation. Method of pretreating a naphtha. 4,927,521, Cl. 208-65.000.

Chu, Yung F., to Mobil Oil Corporation. Catalytic reforming with improved zeolite catalysts. 4,927,525, Cl. 208-138.000.

Chuang, Patrick T.; Yau, Robert L.; Yoshida, Hiroshi; and Wang, Moon-Yee, to Advanced Micro Devices, Inc. Content addressable memory array with priority encoder. 4,928,260, Cl. 365-49.000.

Chung, Huy. Method and apparatus for germinating seed sprouts. 4,926,598, Cl. 47-61.000.

Chung, Landy. Boiler furnace air register. 4,927,352, Cl. 431-184.000.

Ciba Corning Diagnostics Corp.: *See—*
Chang, Steve C. S.; and Miller, Thomas E., 4,927,769, Cl. 436-518.000.

Ciba-Geigy Corporation: *See—*
Cantatore, Giuseppe; and Borzatta, Valerio, 4,927,925, Cl. 540-598.000.
Cantatore, Giuseppe; Borzatta, Valerio; and Masina, Franca, 4,927,930, Cl. 544-198.000.
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, 4,927,865, Cl. 522-48.000.
Fory, Werner; and Meyer, Willy, 4,927,450, Cl. 71-91.000.
Miyazaki, Teruko, 4,927,901, Cl. 528-64.000.
Schneider, Peter; Ramos, Gerardo; and Bersier, Jacques, 4,927,507, Cl. 204-78.000.
Wenger, Hartmut; Martin, Peter; Rotzinger, Hans; and Denz, Martin, 4,926,789, Cl. 118-668.000.

Ciloglu, Cavit; Gagne, Martin; Laraque, Edy; Poirier, Joel; Tremblay, Sylvain; and Trudel, Yves, to Quebec Metal Powders, Ltd. Machinable-grade, ferrous powder blend containing boron nitride and method thereof. 4,927,461, Cl. 75-254.000.

Cioletti, Olisse C., to United States of America, Energy. Pull rod assembly. 4,926,745, Cl. 92-256.000.

Ciotola, Alfredo A. Apparatus and method for sealing leaks. 4,927,181, Cl. 285-15.000.

Circello, Joseph C.: *See—*
McCarthy, Daniel M.; Circello, Joseph C.; Munguia, Gabriel R.; and Richardson, Nicholas J., 4,928,225, Cl. 364-200.000.

CL Pharma Aktiengesellschaft: *See—*
Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., 4,927,821, Cl. 514-226.500.

Claassen, Cornelius J.: *See—*
Hickey, Pieter John A.; and Claassen, Cornelius J., 4,926,656, Cl. 62-310.000.

Clark, Aidan W.: *See—*
Davison, Samuel H.; Kast, Kevin H.; and Clark, Aidan W., 4,928,240, Cl. 364-431.020.

Clark, John K.: *See—*
Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., 4,926,919, Cl. 152-209.00R.

Clarke, David J.: *See—*
Carr, Robert; Clarke, David J.; and Atkinson, Tony, 4,927,268, Cl. 356-336.000.

Claude, John P.; and Young, Stephen L., to Microcurrents. Method for relieving sinus and nasal congestion utilizing microcurrents. 4,926,880, Cl. 128-800.000.

Claus, Richard O.: *See—*
Zimmermann, Bernd D.; Claus, Richard O.; and Murphy, Kent A., 4,928,004, Cl. 250-227.140.

Clausing, Gerhard: *See—*
Hemm, Gerhard; Clausing, Gerhard; and Pietzsch, Heiko, 4,927,028, Cl. 206-618.000.

Cleare, Peter J. V.: *See—*
Robson, Michael J.; Cleare, Peter J. V.; and Spinney, Mark A., 4,927,852, Cl. 514-531.000.

Clecim: *See—*
Gay, Pierre; and Vatant, Robert, 4,926,930, Cl. 164-476.000.

Cleenewerck, Bernard: *See—*
van Opstal, Martin; Dewulf, Frans; Cleenewerck, Bernard; and Weber, Ernst, 4,927,544, Cl. 210-712.000.

Clem Environmental Corporation: *See—*
Simpson, William, 4,927,297, Cl. 405-270.000.

Clemence, Francois; Frechet, Daniel; and Fortin, Michel, to Roussel Uclaf. Novel tetrahydropyridines having analgesic activity. 4,927,832, Cl. 514-299.000.

Clifton, Raymond E., Jr. Apparatus for preventing truck roll over in the event of failure of its suspension system. 4,927,173, Cl. 280-755.000.

Clorox Company, The: *See—*
Antaki, James M.; and Layne, Daniel T., III, 4,927,657, Cl. 426-589.000.

CMB Packaging (UK) Limited: *See—*
Manvell, Clive, 4,927,653, Cl. 426-399.000.

Coca-Cola Company, The. *See—*
Groover, Phillip B., 4,927,055, Cl. 221-67.000.
Rudick, Arthur G., 4,927,567, Cl. 261-35.000.

Coffman, Cynthia L. Sole protector attachment. 4,926,568, Cl. 36-15.000.

Cognet, Gilles: *See—*
Lottiau, Michel; Glemet, Michel; Cognet, Gilles; and Causier, Alain, 4,927,583, Cl. 264-136.000.

Cohen, Amir: *See—*
Greenberg, Ilan; and Cohen, Amir, 4,927,082, Cl. 239-230.000.

Cohen, Michael F.: *See—*
Greenberg, Donald P.; Cohen, Michael F.; and Haines, Eric A., 4,928,250, Cl. 364-518.000.

Colarusso, Remo J., Jr., to Colgate-Palmolive Company. Process for making thixotropic detergent compositions. 4,927,555, Cl. 252-99.000.

Colbar Art, Inc.: *See—*
Colea, Ovidiu, 4,927,686, Cl. 428-13.000.

Colea, Ovidiu, to Colbar Art, Inc. Colbar art. 4,927,686, Cl. 428-13.000.

Coleman, E. North, Jr.: *See—*
Leonard, Patrick F.; Svetkoff, Donald J.; Kelley, Robert W.; Rohrer, Donald K., and Coleman, E. North, Jr., 4,928,313, Cl. 382-8.000.

Colgate-Palmolive Company: *See—*
Colarusso, Remo J., Jr., 4,927,555, Cl. 252-99.000.
Nimmey, Alan; and Hayes, Harry, 4,927,058, Cl. 222-106.000.

Coll, Alain. Movable shower assembly having an automatically retracting hose and a shower head capable of taking up multiple positions. 4,926,511, Cl. 4-605.000.

Collette, Wayne N.; Krishnakumar, Suppayan M.; and Piccioli, David P., to Continental PET Technologies, Inc. Preform and method of forming container therefrom. 4,927,680, Cl. 428-36.920.

Colley, Alice M.: *See—*
Guggenheim, Thomas L.; McCormick, Sharon J.; and Colley, Alice M., 4,927,904, Cl. 528-182.000.

Collier, John C., to ITT Industries Limited. Electrical connector. 4,927,372, Cl. 439-83.000.

Collins, Ronald H.: *See—*
Eisenberg, Eugene; Lindsay, Frederick E.; Evans, James J.; and Collins, Ronald H., 4,926,801, Cl. 123-41.840.

Collins, William D.; and Sundown, Jeremiah. Variable chord-forming capotasto. 4,926,732, Cl. 84-318.000.

Colorado Biomedical, Inc.: *See—*
Newkirk, John B.; and Manwaring, Kim H., 4,927,420, Cl. 606-45.000.

Colote, Acaye S.: *See—*
De Lassauniere, Chabrier; and Colote, Acaye S., 4,927,755, Cl. 435-91.000.

Colt Industries Inc.: *See—*
Sims, Dewey M., Jr.; and Mick, Ray E., 4,928,083, Cl. 338-202.000.

Columbian Chemicals Company: *See—*
Berg, Alan C.; and Jones, William R., Jr., 4,927,607, Cl. 422-150.000.

Colvin, Alex D.: *See—*
Butler, James W.; Korniski, Thomas J.; and Colvin, Alex D., 4,928,015, Cl. 250-343.000.

Commissariat a l'Energie Atomique: *See—*
Barlou, Andre ; Beltritti, Alexandre; Gramondi, Patrick; and Vidal, Hugues, 4,927,564, Cl. 252-628.000.

Compagnie Des Products Industriels de l'Ouest (C.P.I.O.): *See—*
Lallement, Serge, 4,927,678, Cl. 428-36.900.

Compagnie Oris Industries: *See—*
Mathis, Gerard; and Lehn, Jean-Marie, 4,927,923, Cl. 540-456.000.

Compaq Computer Inc.: *See—*
White, Alan V., 4,928,220, Cl. 363-56.000.

Conard, Bruce R.: *See—*
Bell, James A. E.; and Conard, Bruce R., 4,926,792, Cl. 118-729.000.

Constansa, Jordi F.: *See—*
Corominas, Juan P.; Constansa, Jordi F.; and Pinol, Augusto C., 4,927,926, Cl. 544-101.000.

Constantine, Barry E.: *See—*
Lott, Gloria Y.; Britton, Scott M.; and Constantine, Barry E., 4,926,850, Cl. 128-155.000.

Continental PET Technologies, Inc.: *See—*
Collette, Wayne N.; Krishnakumar, Suppayan M.; and Piccioli, David P., 4,927,680, Cl. 428-36.920.

Contour Saws, Inc.: *See—*
Kawabata, James, 4,926,728, Cl. 83-251.000.
Kawabata, James, 4,926,731, Cl. 83-789.000.

Converse Inc.: *See—*
Bunch, Richard P., 4,926,569, Cl. 36-91.000.

Coogan, Richard G.; and Vartan-Boghossian, Razmik, to ICI Americas Inc. Aqueous dispersions. 4,927,876, Cl. 524-457.000.

Cook, Bruce M.: *See—*
Roslund, Charles J.; and Cook, Bruce M., 4,928,219, Cl. 363-54.000.

Cook, Graham R., to Goodman, Clifford Lawrence. Nail holding tool. 4,926,718, Cl. 81-44.000.

Coombs, Jeffrey: *See—*
Brooks, Reginald G.; Leatham, Alan; and Coombs, Jeffrey, 4,926,923, Cl. 164-5.000.
Brooks, Reginald G.; Leathman, Alan; and Coombs, Jeffrey, 4,926,924, Cl. 164-5.000.

Cooper Industries, Inc.: *See—*
Ingram, Billy S., II; and Chapin, David S., 4,927,092, Cl. 242-107.200.
Martinez, Louis, 4,928,177, Cl. 358-142.000.

Coors Biotech, Inc.: *See—*
Quarles, Carey L., 4,927,811, Cl. 514-23.000.

Copeland Corporation: *See—*
Bush, James W., 4,927,341, Cl. 418-55.000.

Copping, Leonard G.: *See—*
Carson, Chrislyn M.; Copping, Leonard G.; Ehr, Robert J.; Gitlitz, Melvin H.; McNeil, Maynard W.; Street, Peter F. S.; and Liebeschuetz, John W., 4,927,812, Cl. 514-63.000.

Corbett, Reg D. Vertically adjustable floating dock. 4,926,776, Cl. 114-263.000.

Cordes, Harry D.; Duich, Michael B.; and Bailey, Gardner S., to Pall Corporation. Gas component extraction. 4,927,434, Cl. 55-20.000.

Corley, Dean; and Littlebury, Hugh, to Motorola Inc. Method of recording test results of die on a wafer. 4,928,002, Cl. 235-479.000.

Corley, Larry S., to Shell Oil Company. Bisbenzocyclobutene/-bisimide/free radical polymerization inhibitor composition. 4,927,907, Cl. 528-322.000.

Cormier, William E., Jr.: *See—*
Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., 4,927,526, Cl. 208-152.000.

Corning Incorporated: *See—*
Francis, Gaylord L.; and Martin, Francis W., 4,927,711, Cl. 428-432.000.

Corominas, Juan P.; Constansa, Jordi F.; and Pinol, Augusto C., to Laboratorios del Dr. Esteve S.A. Derivatives of 7-(1-azetidinyl)-1,4-dihydro-4-oxo-3-quinolinecarboxylic acids, their preparation and application as medicines. 4,927,926, Cl. 544-101.000.

Corpron, Gary P.: *See—*
Kleven, Lowell A.; and Corpron, Gary P., 4,926,695, Cl. 73-861.240.

Corrao, Richard G.: *See—*
Bykadi, Gururaj; Kaplan, Murray A.; Corrao, Richard G.; Bara, Edward J.; Ullah, Ismat; and Agharkar, Shreeram N., 4,927,638, Cl. 424-455.000.

Corstor (Proprietary) Limited: *See—*
Wilson, John D., 4,927,022, Cl. 206-443.000.

Cortese, Richard: *See—*
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,927,633, Cl. 424-438.000.

Costar Corporation: *See—*
Lyman, George; and Mathus, Gregory, 4,927,764, Cl. 435-296.000.
Mathus, Gregory; and Lyman, George, 4,927,604, Cl. 422-101.000.

Costello, Anthony W.; Ogg, Graeme J.; and McGregor, John C., to RMF Steel Products Co. Packaging method and apparatus. 4,926,614, Cl. 53-434.000.

Cotonea, Yves: *See—*
Villard, Alexandre; and Cotonea, Yves, 4,927,617, Cl. 423-396.000.

Coughlin, Peter K.; Mercer, William C.; and Flanigen, Edith M., to UOP. Grown crystalline sensor and method for sensing. 4,927,768, Cl. 436-172.000.

Coup, Michael C.; Israel, Gary P.; Ediger, Glen W.; and Moore, Donald J., to Vornado Air Circulation Systems, Inc. Ducted fan. 4,927,324, Cl. 415-121.200.

Couture, Jean. Paper-making wire repair kit. 4,926,533, Cl. 29-33.00F.

Cowie, Alan G., to Tioxide Group PLC. Particulate material. 4,927,464, Cl. 106-436.000.

Cowley, Trent E., to Atlantic Richfield Company. Rapid shut-off system for truck engine. 4,926,815, Cl. 123-198.0DB.

Coyle, Brian D. Folding paperboard beach chair. 4,926,512, Cl. 5-417.000.

Cozine, Mark L.; Ferguson, David G.; Hansen, Loren F.; and Lamb, Mark E. Turf aerating apparatus with resilient handle mount. 4,926,947, Cl. 172-22.000.

Crafts, Harold S., to NCR Corporation. Gate isolated base cell structure with off-grid gate polysilicon pattern. 4,928,160, Cl. 357-54.000.

Craig, Burnie M.; and Fujitaki, Roy K., to American Brass and Aluminum Foundry Co., Inc. Adjustable drain closure. 4,926,507, Cl. 4-295.000.

Cramer, Harley L., to Owens-Illinois Plastic Products Inc. Plastic drum and method of making. 4,927,040, Cl. 220-5.00R.

Crawley, H. Bert; Rosenberg, Eli I.; Meyer, W. Thomas; Gorbics, Mark S.; Thomas, William D.; McKay, Roy L.; and Homer, John F., Jr., to Iowa State University Research Foundation, Inc. Multiple channel data acquisition system. 4,928,246, Cl. 364-514.000.

Creative Packaging Corp.: *See—*
Beck, James M., 4,927,065, Cl. 222-520.000.

Creazzo, Joseph A.: *See—*
Bartlett, Philip L.; and Creazzo, Joseph A., 4,927,863, Cl. 521-131.000.

Crews, John H., Jr.; and Reeder, James R., to United States of America, National Aeronautics and Space Administration. Delamination test apparatus and method. 4,926,694, Cl. 73-794.000.

Cristescu, Alex G.: *See—*
Debortoli, George; and Cristescu, Alex G., 4,927,375, Cl. 439-357.000.

Crofts, David: *See—*
Diaz, Stephen H.; Cherian, Gabe; Morris, Stephen; Vinson, John R.; Crofts, David; and Moore, Anthony J., 4,928,199, Cl. 361-56.000.

Cros, Alain, to NOVATOME. Device for cooling the main vessel of a fast neutron nuclear reactor cooled by a liquid metal. 4,927,597, Cl. 376-290.000.

Crossley, Roger; and Heatherington, Kenneth, to John Wyeth and Brother Ltd. Quinoline derivatives. 4,927,936, Cl. 546-181.000.

Crouch, Robert H. Edge sander having adjustable support table or tables. 4,926,602, Cl. 51-135.00R.

Crouzet: *See—*
Chovin, Andre ; and Taillebois, Jacques, 4,928,270, Cl. 368-82.000.

Crowley, Steven R.: *See—*
Stein, Herman H.; Pattner, Jacob J.; and Crowley, Steven R., 4,927,807, Cl. 514-18.000.

Cubic Defense Systems, Inc.: *See—*
Bonebright, Mark E.; Eberhardt, Paul R.; and Alley, John C., 4,928,109, Cl. 343-786.000

Culler, Robert P.: *See—*
Cetinkaya, Ismail B.; and Culler, Robert P., 4,927,606, Cl. 422-144.000.

Culling, John H., to Carondelet Foundry Company. Heat and corrosion resistant alloys. 4,927,602, Cl. 420-586.000.

Culp, Gordon W., to Rockwell International Corporation. Piezoelectric actuator. 4,928,030, Cl. 310-328.000.

Cumming, James C., to Rockwell International Corporation. Automatic brake adjusting mechanism. 4,926,980, Cl. 188-79.550.

Curran, William V.: *See—*
Lee, Ving J.; and Curran, William V., 4,927,922, Cl. 540-227.000.

Curt G. Joa, Inc.: *See—*
Schweizer, Werner; McGuire, Daniel J.; and Archer, Edward D., 4,927,322, Cl. 414-794.700.

Cusdin, George B., to W. R. Grace Limited. Relief printing plate manufacture. 4,927,723, Cl. 430-15.000.

Cutcher, John A.; and Andrews, Gary M., to Castrol Industrial Inc. Corrosion preventive composition. 4,927,550, Cl. 252-32.500.

Cyprus Mines Corporation: *See—*
Weber, Kenneth E., 4,927,874, Cl. 524-375.000.

Czarnecki, Stephen J.: *See—*
Blondeau, Ernest E., Jr.; and Czarnecki, Stephen J., 4,928,276, Cl. 370-110.100.

Dage, Richard C.: *See—*
Grisar, J. Martin; Dage, Richard C.; and Schnettler, Richard A., 4,927,939, Cl. 548-188.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Dahlinoer, Lars-Erik D., Johansson, Mats O.; Sandberg, John A.; and Sjo, to Aktiebolaget Hassle. Controlled release beads having glass or silicon dioxide core. 4,927,640, Cl. 424-497.000.
Dahlmann, Gerd-Uwe, to Volkswagen AG. Fuel injection system. 4,926,824, Cl. 123-450.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,927,666, Cl. 427-146.000.
Daido Tokushuko Kabushiki Kaisha: *See*—
Iikubo, Tomohito; and Kurebayashi, Yutaka, 4,927,601, Cl. 420-111.000.
Umeno, Masayoshi; Sakai, Shiro; and Yahagi, Shinichiro, 4,928,154, Cl. 357-16.000.
Daihatsu Motor Co., Ltd.: *See*—
Tsumura, Kenji, Yamada, Yukifumi; and Terada, Takami, 4,927,110, Cl. 248-430.000.
Daikin Industries, Ltd.: *See*—
Hisamoto, Iwao; Hirai, Masaru; and Ishikawa, Sueyoshi, 4,927,950, Cl. 556-419.000.
Daimler-Benz Aktiengesellschaft: *See*—
Tomforde, Johann; and Wall, Monika, 4,927,106, Cl. 248-146.000.
Dainippon Ink. and Chemicals, Inc.: *See*—
Rokutanda, Shuji; Higemitsu, Yasuo; Tsuchida, Akiyoshi; and Yamakoshi, Yukihiro, 4,927,734, Cl. 430-264.000.
Dake, Michael D.; and Maguire, Mark A., to Advanced Cardiovascular Systems, Inc. Catheter for uniform distribution of therapeutic fluids. 4,927,418, Cl. 604-264.000.
Dale Electronic, Inc.: *See*—
Bougger, Gary E., 4,926,542, Cl. 29-619.000.
Dalebroux, Dean G.: *See*—
Sudoma, A. Louis; and Dalebroux, Dean G., 4,927,763, Cl. 435-260.000.
Dallago, Raymond P.: *See*—
Johnson, Grannis S.; Grinstein, Reuben H.; Hartman, Stuart J.; and Dallago, Raymond P., 4,927,902, Cl. 528-99.000.
Daly, John J., to GRID Systems Corporation. Conductive stylus storage for a portable computer. 4,927,986, Cl. 178-18.000.
Damm, Gunter: *See*—
Putz, Heinrich; Nowitzki, Friedhelm; Damm, Gunter; Bathelt, Hartmut; Kromer, Gunter, Hoffmann, Henning; and Pischke, Reiner, 4,926,634, Cl. 60-274.000.
Dammel, Ralph: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,927,956, Cl. 560-130.000.
Dammertz, Karl-Heinz: *See*—
Henne, Heinrich; Dammertz, Karl-Heinz; Schneider, Lutz T., and Blaszczyk, Gotthard, 4,927,086, Cl. 241-80.000.
Damon, Robert E., II; and Wareing, James R., to Sandoz Pharm. Corp. Analogs of mevalonolactone and derivatives thereof. 4,927,851, Cl. 514-460.000.
Dampier, Michael S., Prilik, Ronald J.; and Rapoport, Norman R., to International Business Machines Corporation. Multi-layer printed circuit board. 4,928,061, Cl. 324-158.00F.
Dana, David E., and Morris, Steven J., to PPG Industries, Inc. Chemically treated glass fibers for reinforcing polymers. 4,927,869, Cl. 523-502.000.
D'Angelo, Philip J.; Hetherington, Richard, and Rogan, Joseph J., to Epicor Incorporated. Composition for purifying liquids. 4,927,796, Cl. 502-62.000.
Daniel, Moshe: *See*—
Zilberman, Moshe; Livne, Mordechai; Tchetchick, Doron; and Daniel, Moshe, 4,926,684, Cl. 73-147.000.
Dannels, Wayne R.: *See*—
Lampman, David A., Morich, Michael A; and Dannels, Wayne R., 4,928,063, Cl. 324-307.000.
Dannhaeuser, Friedrich, to Siemens Aktiengesellschaft. Method for code protection using an electronic key. 4,928,098, Cl. 340-825.560.
Dao, Tich T.; and Burke, Gary R., to Fairchild Semiconductor Corporation. Floating point microprocessor with directable two level microinstructions. 4,928,223, Cl. 364-200.000.
Darfler, Frederick J., to Cell Enterprises, Inc. Cell culture medium with antioxidant. 4,927,762, Cl. 435-240.310.
D'Aria, Giovanna; and Taricco, Giorgio, to Societa' Italiana per L'Esercizio Delle Telecomunicazioni P.A. Decoding method and device with erasure detection for multilevel transmission systems. 4,928,288, Cl. 375-17.000.
Darlington, Rex F. Compound bow with adjustable cable length. 4,926,832, Cl. 124-25.600.
Darlington, Rex F. Compound bow with adjustable cable anchor. 4,926,833, Cl. 124-23.100.
Date, Nobuaki: *See*—
Tsunekawa, Tokuichi; Date, Nobuaki; Aizawa, Hiroshi; Hosoe, Kazuya; and Urushibara, Kazunori, 4,928,184, Cl. 358-335.000.
Daunt, N. Charles. Elongated shower head. 4,927,083, Cl. 239-282.000.
Davenport, Kenneth G.: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,927,956, Cl. 560-130.000.
Davey, John E.; and Christou, Aristos, to United States of America, Navy. Method of making self-aligned GaAs/AlGaAs FET's. 4,927,782, Cl. 437-184.000.
Davidson, James B.; Kaz, Peter N.; Kidwell, Michael H.; and Zachman, Mark E., to Spectra Physics, Inc. Method and apparatus for controlling motorgrader cross slope cut. 4,926,948, Cl. 172-4.500.
Davidson, William C.: *See*—
Morris, Guy D.; Jordon, Trevor A., Davidson, William C.; and Bowman, Timothy J., 4,926,802, Cl. 123-52.00M
Davies, David K.: *See*—
Goutzoulis, Anastosios P.; and Davies, David K., 4,928,310, Cl. 380-46.000.
Davies, Peter N.: *See*—
Field, John E.; Dear, John P., and Davies, Peter N., 4,926,859, Cl. 128-24.00A
Davies, Theodore E.: *See*—
Watson, James E.; and Davies, Theodore E., 4,926,842, Cl. 126-360.00R.
Davis, Bryan T.: *See*—
Wright, William E.; Davis, Bryan T.; Matteson, Donald S.; and Knapp, Gordon G., 4,927,553, Cl. 252-49.600.
Davis, Daniel W. Ambulatory wheelstand. 4,927,167, Cl. 280-250.100.
Davis, Frederick B., Jr. Aquatic wheelchair. 4,926,777, Cl. 114-270.000.
Davis, George M. Board game apparatus. 4,927,145, Cl. 273-94.000.
Davis, Walter L.: *See*—
Grandfield, Walter J.; Mittel, James G.; and Davis, Walter L., 4,928,314, Cl. 455-236.000.
Davison, Samuel H.; Kast, Kevin H.; and Clark, Aidan W., to General Electric Company. Active clearance control. 4,928,240, Cl. 364-431.020.
Dawn, Douglas D.; and Radermacher, Reinhard, to Pennwalt Corporation. Refrigerant fluid and method of use. 4,926,650, Cl. 62-114.000.
Day, Stanley G., to General Electric Company. Aircraft propeller control. 4,928,241, Cl. 364-424.010.
Dayan, Richard A.: *See*—
Agoglia, Robert J.; Dayan, Richard A.; and Smith, Bruce A., 4,928,193, Cl. 360-78.040.
Bealkowski, Richard. Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Willhams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.
Dayco Products, Inc.: *See*—
Meadows, Roger D.; Rush, James B., and Bryan, James S., 4,926,535, Cl. 29-890.144.
de la Motte, Rebecca S.: *See*—
Wagner, Frederick W.; de la Motte, Rebecca S.; and Dean, Maria A., 4,927,920, Cl. 536-119.000.
de la Rosa, Francisco F.; Navarro, Jose A.; Roncel, Mercedes; and de la Rosa, Miguel A., to Interox (Societe Anonyme). Process for production of hydrogen peroxide by a chemical photoreduction of oxygen, and hydrogen peroxide obtained by this process. 4,927,512, Cl. 204-157.500.
de la Rosa, Miguel A.: *See*—
de la Rosa, Francisco F.; Navarro, Jose A.; Roncel, Mercedes; and de la Rosa, Miguel A., 4,927,512, Cl. 204-157.500.
Dean, Kenneth D.: *See*—
Zielke, Darrell W., and Dean, Kenneth D., 4,926,616, Cl. 53-585.000.
Dean, Maria A.: *See*—
Wagner, Frederick W., de la Motte, Rebecca S.; and Dean, Maria A., 4,927,920, Cl. 536-119.000.
Dean, Robert W., Jr., to Stonewall Landscape Systems, Inc. Retaining wall cap unit. 4,926,595, Cl. 52-300.000.
Dear, John P.: *See*—
Field, John E.; Dear, John P., and Davies, Peter N., 4,926,859, Cl. 128-24.00A.
Debortoli, George; and Cristescu, Alex G., to Northern Telecom Limited. Electrical connector for electrical connection to insulation displacement terminals. 4,927,375, Cl. 439-357.000.
DeCanio, Paul J. Cooling tower overflow drain cap. 4,927,439, Cl. 55-385.100.
DeCel Incorporated: *See*—
Emerson, Richard C.; and Sherman, John B., 4,927,099, Cl. 244-152.000.
Deforrest, William, Sr., to Major Lock Supply Inc. Extension for mortise cylinder. 4,926,670, Cl. 70-374.000.
de Groot, Peter J.; Macomber, Steven H., and Gallatin, Gregg M., to Perkin-Elmer Corporation, The. Position and velocity imaging system using 2-D laser diode array. 4,927,263, Cl. 356-5.000.
Deininger, William D.; and King, David Q., to United States of America, National Aeronautics and Space Administration. High temperature refractory member with radiation emissive overcoat. 4,928,027, Cl. 310-11.000.
de Jong, Anno: *See*—
Frobel, Klaus; Muller, Hartwig; Bischoff, Erwin; Salcher, Olga; de Jong, Anno; Berschauer, Friedrich; and Scheer, Martin, 4,927,810, Cl. 514-23.000.
Delacourt, Dominique: *See*—
Papuchon, Michel; Pocholle, Jean-Paul; and Delacourt, Dominique, 4,927,245, Cl. 350-354.000.
De Lassauniere, Chabrier; and Colote, Acaye S., to Societe de Conseils de Recherches et d'Applicatios Scientifiques (S.C.R.A.S.). Process for preparing polynucleotides. 4,927,755, Cl. 435-91.000.
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Kutner, Andrzej, to Wisconsin Alumni Research Foundation. Compounds effective in inducing cell differentiation and process for preparing same. 4,927,815, Cl. 514-167.000.
Delzer, Scott H.: *See*—
Knudsen, Arne K.; Delzer, Scott H.; and Langhoff, Charles A., 4,928,254, Cl. 364-556.000.
Delzio, Robert J. Charade and drawing card game using dice. 4,927,147, Cl. 273-146.000.

Demeter, Jozsef; Zoltai, Tibor; and Navarro, Hector D. Electric motor. 4,928,051, Cl. 318-731.000.
Demor, Edward J., III; Hinkel, Walter W.; and Lukich, Lewis T., to Goodyear Tire & Rubber Company, The. Pneumatic tire. 4,926,918, Cl. 152-154.000.
Demosthene, Claude: *See*—
Douglas, James L.; Fabre, Guy; and Demosthene, Claude, 4,927,970, Cl. 564-462.000.
De Moura, Wilson G.: *See*—
Souto, Sadario O.; and De Moura, Wilson G., 4,927,861, Cl. 521-99.000.
Denda, Toshio: *See*—
Teraoka, Kazuharu; Satake, Mitsuo; Denda, Toshio; Katayama, Takashi; and Seyasu, Shiro, 4,928,229, Cl. 364-464.010.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Isozaki, Kei; Hirashima, Yutaka; and Imamura, Yasuo, 4,927,791, Cl. 501-87.000.
Dennison Manufacturing Company: *See*—
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R., Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.
Denz, Martin: *See*—
Wenger, Hartmut; Martin, Peter; Rotzinger, Hans; and Denz, Martin, 4,926,789, Cl. 118-668.000.
Denzer, Diana K.: *See*—
Rioja, Roberto J.; and Denzer, Diana K., 4,927,469, Cl. 148-11.50A
Depeige, Alain, to Aerospatiale Societe Nationale Industrielle. Mechanism for fastening a life-saving device of the simple evacuation slide or dinghy type for aircraft. 4,927,098, Cl. 244-137.200.
Deputat, Julian: *See*—
Brokowski, Andrzej; Deputat, Julian; and Mizerski, Krzysztof, 4,926,692, Cl. 73-597.000
DeRudder, James L.; Savenije, Herman; and Wang, I-Chung W., to General Electric Company. Low gloss molded articles using polyorganosiloxane/polyvinyl-based graft polymers. 4,927,880, Cl. 525-63.000.
Desbos, Gilbert: *See*—
Bablon, Guy P.; and Desbos, Gilbert, 4,927,543, Cl. 210-711.000
Desons, Roger: *See*—
Brumme, Reinhold; and Desons, Roger, 4,927,122, Cl. 267-140.100.
Deucher, Joseph S.: *See*—
Zupancic, Anton Z.; and Deucher, Joseph S., 4,928,292, Cl. 378-17.000.
Deussen, Heino; and Deussen, Werner, to Stella KG Werner Deussen. Ampul. 4,926,915, Cl. 141-290.000.
Deussen, Werner: *See*—
Deussen, Heino; and Deussen, Werner, 4,926,915, Cl. 141-290.000.
Deutsch Forschungsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Dietrich, Johannes; and Gombert, Bernd, 4,926,708, Cl. 74-424.80C.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Furstenau, Norbert; and Watts, Christopher, 4,928,007, Cl. 341-137.000.
Lorenz, Dieter, 4,928,012, Cl. 250-338.100.
Deutz-Allis Corporation: *See*—
Murray, David L., 4,927,165, Cl. 280-43.230.
Devaux, Francois; Herail, Norbert; Lefevre, Denis; and Lehuede, Jean-Pierre, to Thomson-CSF. Tunable microwave coupler with mechanically adjustable conductors. 4,928,077, Cl. 333-111.000.
Devices for Vascular Intervention, Inc.: *See*—
Gifford, Hanson S., III; Simpson, John B.; and Brown, Peter S., 4,926,858, Cl. 606-159.000.
DeVillez, Richard L.; and Scher, Richard K. Method for enhancement of unguis growth. 4,927,626, Cl. 424-61.000.
Devins, John C.: *See*—
Reed, Clive W.; Rzad, Stefan J.; and Devins, John C., 4,927,704, Cl. 428-221.000.
Devtech, Inc.: *See*—
Beck, Martin H., 4,927,679, Cl. 428-36.920.
DeVuono, Anthony C.: *See*—
Christensen, Richard N.; DeVuono, Anthony C.; Wilkinson, William H.; and Landstrom, D. Karl, 4,926,659, Cl. 62-476.000.
Dewhurst, Katharine H. Inertial impaction air sampling device. 4,926,679, Cl. 73-28.000.
Dewulf, Frans: *See*—
van Opstal, Martin; Dewulf, Frans; Cleenewerck, Bernard; and Weber, Ernst, 4,927,544, Cl. 210-712.000.
Dhanakoti, Padmanabhan; Moore, Gerry W.; and Smith, Harold F., to International Business Machines Corporation. Antistatic mask for use with electronic test apparatus. 4,927,692, Cl. 428-137.000.
Dhein, Rolf: *See*—
Schreckenberg, Manfred; Dhein, Rolf; Rudolph, Hans; and Nouvertne Werner, 4,927,903, Cl. 528-176.000
Dhillon, Major S.: *See*—
Walls, John E.; Tellechea, Carlos; and Dhillon, Major S., 4,927,737, Cl. 430-278.000.
Dhong, Sang H.; Lu, Nicky C.; and Henkels, Walter H., to International Business Machines Corporation. Complementary metal-oxide-semiconductor transistor and one-capacitor dynamic-random-access memory cell and fabrication process therefor. 4,927,779, Cl. 428-52.000.
Diaz, Stephen H.; Cherian, Gabe; Morris, Stephen; Vinson, John R.; Crofts, David; and Moore, Anthony J., to Raychem Limited. Circuit protection device. 4,928,199, Cl. 361-56.000.
Dickie, Robert G., to Paige Manufacturing Company, Inc. Electrical safety receptacle assembly. 4,927,373, Cl. 439-188.000.
Dickie, Robert G., to Paige Manufacturing Company Incorporated. Electrical plug assembly and system. 4,927,376, Cl. 439-484.000.
Dickins, John S., III: *See*—
Agers, Brian M.; and Dickins, John S., III, 4,926,661, Cl. 68-200.000.
Di Cristina, Natale: *See*—
Spatrisano, Antonio P.; Gandolfi, Luciano; Minotti, Carlo; and Di Cristina, Natale, 4,926,547, Cl. 29-841.000.
Diehl GmbH & Co.: *See*—
Wittman, Jurgen; von Entress-Fursteneck, Wolfgang; and Thurner, Gunther, 4,926,751, Cl. 102-348.000.
Diehl Pojedinec, Edward P. Container with tamper indicator using piped light. 4,927,036, Cl. 215-203.000.
Diehl, Roy E.; and Berger, Alvin H., to Ford Motor Company. Engine vibration balancer. 4,926,810, Cl. 123-192.00B.
Dieken, Alan P.: *See*—
Dufresne, Joel R.; and Dieken, Alan P., 4,926,864, Cl. 128-421.000.
Diesel Kiki Co., Ltd.: *See*—
Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba, Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, 4,926,906, Cl. 137-625.300.
Nakamura, Hisashi; Takahashi, Satoshi; Ikeda, Takayuki; and Ogino, Masaaki, 4,926,902, Cl. 137-493.300.
Noguchi, Ichiro, 4,926,651, Cl. 62-133.000.
Dietrich, Johannes; and Gombert, Bernd, to Deutsch Forschungsanstalt fur Luft- und Raumfahrt e.V. Apparatus for converting rotary motion into axial motion. 4,926,708, Cl. 74-424.80C.
Dighton, Gaylon L., to Dow Chemical Company, The. Apparatus and method for draining a viscous material from a vessel. 4,926,894, Cl. 137-15.000.
Digital Equipment Corporation: *See*—
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.
Gabbe, David; and Batchelder, Ned, 4,928,252, Cl. 364-519.000
Leis, Michael D., 4,928,075, Cl. 331-17.000.
Dikeman, Roxane: *See*—
Barnett, Ronald E.; Dikeman, Roxane; Liao, Shyh-Yuan; Gill, John; and Pantaleone, David P., 4,927,654, Cl. 426-548.000.
DiMarco, Bernard; and Kaufman, Steven A., to Siemens Energy & Automation, Inc. Fastening means. 4,927,308, Cl. 411-437.000.
Dingeman, Drake D., to Systran Corporation. Apparatus and method for binary data transmission. 4,928,289, Cl. 375-20.000.
Dinsmoor, John C.: *See*—
Gale, Edwin J.; Olsen, Albert B.; and Dinsmoor, John C., 4,928,202, Cl. 361-215.000.
DiPirro, Steven D.: *See*—
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000
DiRubbio, Vincent; and Galinski, Edmund V. Safety fuze for a hand grenade. 4,926,752, Cl. 102-486.000.
Dive, Georges: *See*—
Pirotzky, Eduardo; Dive, Georges; Godfroid, Jean-Jacques; and Heymans, Francoise, 4,927,825, Cl. 514-255.000.
Dix, Barry M.: *See*—
Small, Richard F.; Patel, Dakshesh S.; Barrow, Lascelle A.; and Dix, Barry M., 4,927,663, Cl. 427-40.000.
Dixon, John: *See*—
Brown, Roger C.; Dixon, John; and Robinson, David H., 4,927,822, Cl. 514-236.200.
DK-Gleason, Inc.: *See*—
Stritzel, Gene A., 4,926,712, Cl. 475-227.000.
Dodd, Richard E., to North American Dynamics. Quick release gun mount assembly. 4,926,743, Cl. 89-40.140.
Doe Run Tooling, Inc.: *See*—
Hunter, Jerry J., 4,927,125, Cl. 269-74.000.
Doemen, Benno, to Papst-Motoren GmbH & Co. KG. Circuit arrangement for generating a measurement signal associated with the frequency of an alternating current signal. 4,928,045, Cl. 318-464.000.
Doessel, Karl-Friedrich: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,927,956, Cl. 560-130.000.
Doi, Atsuhiro; and Nishio, Tomonori, to Fuji Photo Film Co., Ltd. Exposure head. 4,928,122, Cl. 346-160.000.
Dolan, Michael S., to Serpentix Conveyor Corporation. Internally stabilized slide conveyor. 4,927,006, Cl. 198-822.000.
Dolfini, Joseph E.; Glinka, Jerome; and Bosch, Andrew C., to Mallinckrodt, Inc. Hydrolysis of curcumin. 4,927,805, Cl. 512-27.000.
Domsa, Karoly: *See*—
Harsanyi, Jozsef; Kohanyi, Laszlo; Domsa, Karoly; Szakacs, Lajos; Szentgyorgyi, Geza; and Imre, Aladar, 4,927,549, Cl. 252-25.000.
Domschat, Klaus, to Eltex-Elektrostatik-Gesellschaft mbH. High voltage electrode device. 4,928,198, Cl. 361-1.000.
Donat, Frank J.: *See*—
Backderf, Richard H.; and Donat, Frank J., 4,927,886, Cl. 525-261.000.
Dong, Walter; Shaw, Paul V.; and Buechele, James L., to Shell Oil Company. Process for continuous purification of bisphenols. 4,927,973, Cl. 568-724.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Dong, Walter: *See—*
Buechele, James L.; Nielsen, Edward L.; Dong, Walter; and Shaw, Paul V., 4,927,978, Cl. 568-724.000.
Donle, David W., to Dow Chemical Company, The. Cleaning gas turbine inlet air. 4,926,620, Cl. 55-89.000.
Donnelly, Susan P., to Mobil Oil Corporation. Addition of shape selective zeolites to catalytic cracking units. 4,927,523, Cl. 208-120.000.
Doppstadt, Werner. Sieve device for sieving out compost from rotten organic material. 4,927,528, Cl. 209-240.000.
D'Orazio, Vincent T.; and O'Brien, Robert B. Soluble fish-attractant coating, coated lure, and coating composition and method. 4,927,643, Cl. 426-1.000.
Doria, David J.: *See—*
Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.
Dorman, Frank, to University of Minnesota, Regents of the. Cardiac assist pump with steady rate supply of fluid lubricant. 4,927,407, Cl. 600-16.000.
Dorn, Allan R., to Simpson, Jeanette. Reagent for cell separation. 4,927,749, Cl. 435-2.000.
Dorn, Allan R., to Simpson, Jeanette. Cell separation process. 4,927,750, Cl. 435-2.000.
Dorn, Gordon L.; and Johnson, Michael A., to Wadley Technologies, Inc. Specimen collection and sampling container. 4,927,605, Cl. 422-102.000.
Dornauf, Andrea: *See—*
Tauber, Gunter; and Dornauf, Andrea, 4,927,518, Cl. 204-421.000.
Dorri, Bizhan; and Brzozowski, Steven J., to General Electric Company. Cryogenic precooler for superconductive magnets. 4,926,646, Cl. 62-51.100.
Dorri, Bizhan; and Laskaris, Evangelos T., to General Electric Company. Cryogenic precooler and cryocooler cold head interface receptacle. 4,926,647, Cl. 62-51.100.
Doster Warehouse: *See—*
Chastain, Jack T.; and McWhorter, John, 4,927,030, Cl. 209-620.000.
Douglas, James L.; Fabre, Guy; and Demosthene, Claude, to Bristol-Myers Company. Substituted 3-cyclobutene-1,2-dione intermediates. 4,927,970, Cl. 564-462.000.
Douglass, Gary W.: *See—*
Sanford, David L., and Douglass, Gary W., 4,927,187, Cl. 285-80.000.
Doulbe-E Inc.: *See—*
Wilson, James A., 4,927,112, Cl. 251-1.300.
Dow Chemical Company, The: *See—*
Asensio, Javier; and Hayman, Richard, 4,927,684, Cl. 428-91.000.
Beck, Henry N.; and Mahoney, Robert D., 4,927,535, Cl. 210-500.230.
Bogan, Gary W., 4,927,905, Cl. 528-205.000.
Carson, Chrislyn M.; Copping, Leonard G.; Ehr, Robert J.; Gitlitz, Melvin H.; McNeil, Maynard W.; Street, Peter F. S.; and Liebeschuetz, John W., 4,927,812, Cl. 514-63.000.
Dighton, Gaylon L., 4,926,394, Cl. 137-15.000.
Donle, David W., 4,926,620, Cl. 55-89.000.
Frisch, Kurt C., Jr.; and Harris, Robert F., 4,927,864, Cl. 521-163.000.
Kirby, Neil V.; Street, Peter F. S.; and Markley, Lowell D., 4,927,833, Cl. 514-399.000.
Langer, Horst G., 4,927,614, Cl. 423-305.000.
Molzahn, David C.; Hartwell, George E.; and Bowman, Robert G., 4,927,931, Cl. 544-357.000.
Moore, Eugene R., 4,927,579, Cl. 264-101.000.
Ogoe, Samuel A.; and Ho, Thoi H., 4,927,870, Cl. 524-140.000.
Pawloski, James C., 4,927,474, Cl. 156-66.000.
Renga, James M.; Pon, Charles K.; Gulbenkian, Aylin H.; and Smith, Michael G., 4,927,508, Cl. 204-79.000.
Repman, Joseph F.; Morris, Thomas E.; and Hill, Thomas F., Jr., 4,927,621, Cl. 423-488.000.
Stevens, Timothy S.; Langhorst, Martin A.; and Randall, Osro W., III, 4,927,539, Cl. 210-635.000.
Strait, Chad A.; Tabor, Ricky L.; and Lancaster, Gerald M., 4,927,888, Cl. 525-285.000.
Treybig, Duane S., 4,927,913, Cl. 528-480.000.
Treybig, Duane S., 4,927,932, Cl. 544-357.000.
Welsh, Gary C., 4,927,690, Cl. 428-35.700.
Wessling, Ritchie A.; Whipple, Sharon S.; and Fibiger, Richard F., 4,927,540, Cl. 210-638.000.
Dowa Mining Co., Ltd.: *See—*
Nakashima, Kazutaka; and Saito, Kazuya, 4,927,788, Cl. 439-887.000.
Downey, Ernest L. Apparatus for separating vertebrae. 4,926,849, Cl. 128-75.000.
Doyama, Hisao: *See—*
Ohta, Kazumi; Kawaguchi, Sotoaki; Doyama, Hisao; and Yano, Yutaka, 4,927,457, Cl. 75-10.630.
Doyle, James H., to Unit Instruments, Inc. Fast response control circuit. 4,928,048, Cl. 318-644.000.
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C., DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., to Digital Equipment Corporation. Method and apparatus for the continuous and asynchronous traversal and processing of graphics data structures. 4,928,247, Cl. 364-518.000.
Doyle, Terrence W.: *See—*
Vyas, Dolatrai M.; Doyle, Terrence W.; and Partyka, Richard A., 4,927,943, Cl. 548-422.000.
Drach, John C.: *See—*
Townsend, Leroy B.; and Drach, John C., 4,927,830, Cl. 514-258.000.
Drake, Donald L. Telemetry system for automated remote calling and central dispatch of services, particularly taxicabs. 4,928,099, Cl. 340-825.280.
Drapac, George; and Grandfield, Walter J., to Motorola, Inc. Pager receiver having a common timer circuit for both sequential lock-out and out-of-range. 4,928,086, Cl. 340-825.440.
Dreizler, Ulrich: *See—*
Dreizler, Walter; and Dreizler, Ulrich, 4,926,765, Cl. 110-234.000.
Dreizler, Walter; and Dreizler, Ulrich. Furnace blower with external gas recycling for the reduction of NO_x. 4,926,765, Cl. 110-234.000.
Drent, Eit; and Broekhuis, Antonius A., to Shell Oil Company. Process for the preparation of functionalized polymers. 4,927,892, Cl. 525-340.000.
Dreschel, Thomas W., to Bionetics Corporation, The. Plant nutrient delivery system having a porous tubular member. 4,926,585, Cl. 47-64.000.
Dresser Industries, Inc.: *See—*
Prescott, Robert C.; and Robinson, Robert J., 4,926,896, Cl. 137-82.000.
Dretler, Stephen P. Catheter device. 4,927,426, Cl. 606-128.000.
Drilex Systems, Inc.: *See—*
Forrest, John, 4,926,949, Cl. 175-17.000.
Drinkard Developments: *See—*
Drinkard, William F., Jr., 4,927,672, Cl. 427-336.000.
Drinkard, William F., Jr., to Drinkard Developments. Process for rapidly fixing wood preservatives to prevent and reduce environmental contamination. 4,927,672, Cl. 427-336.000.
Drozdov, Boris Y.: *See—*
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.
Drusel, Norbert. Supporting device for net posts in tennis courts. 4,927,142, Cl. 273-29.0BB.
DS Industrial & Marine Co., Inc.: *See—*
Seiford, Donald S., Sr., 4,926,755, Cl. 104-183.000.
D'Sa, Alwyn P.: *See—*
Hunt, Barry F.; D'Sa, Alwyn P.; and Magnin, Paul A., 4,928,231, Cl. 364-518.000.
Dschida, Otto, to Sundstrand Corporation. Pressure relief and vacuum vent valve. 4,926,908, Cl. 137-846.000.
DSM Resins B.V.: *See—*
van Gasse, Rene L. E., 4,927,701, Cl. 428-212.000.
Du pont Canada Inc.: *See—*
Markiewicz, Stan J., 4,927,689, Cl. 428-34.800.
Duback, David W.; and Vogenthaler, James R., to Accurate Metering Systems, Inc. Panel assembly. 4,928,205, Cl. 361-346.000.
Dubal, Hans-Rolf: *See—*
Bahr, Christian; Heppke, Gerd; Lotzsch, Detlef; Dubal, Hans-Rolf; Escher, Claus; and Ohlendorf, Dieter, 4,927,244, Cl. 350-350.00S.
Dubuque, Kenneth J.: *See—*
Baker, David J.; Dubuque, Kenneth J.; Estep, John M.; and Hix, Charles J., Jr., 4,927,114, Cl. 251-240.000.
Duckworth, Ralph M., to Lever Brothers Company. Toothpastes. 4,927,625, Cl. 424-52.000.
Duffy, James J., to Ford Motor Company. Electronically controlled steering system. 4,926,956, Cl. 180-142.000.
Dufresne, Joel R.; and Dieken, Alan P., to Minnesota Mining and Manufacturing Company. Biological tissue stimulator with time-shared logic driving output timing and high voltage step-up circuit. 4,926,864, Cl. 128-421.000.
Duich, Michael B.: *See—*
Cordes, Harry D.; Duich, Michael B.; and Bailey, Gardner S., 4,927,434, Cl. 55-20.000.
Duncan, Michael G.: *See—*
Biswas, Gautam; Black, David C.; Duncan, Michael G.; Key, Gary R.; Leak, Gordon D.; and Whittington, Robert D., 4,928,306, Cl. 379-201.000.
Dunn, Robert G.: *See—*
Armstrong, Bruce A.; and Dunn, Robert G., 4,928,263, Cl. 367-118.000.
Duphar International Research B.V: *See—*
Wellinga, Kobus; and Eussen, Jacobus H. H., 4,927,452, Cl. 71-92.000.
Du Pont de Nemours, E. I., and Company: *See—*
Agers, Brian M.; and Dickins, John S., III, 4,926,661, Cl. 68-200.000.
Bartlett, Philip L., and Creazzo, Joseph A., 4,927,863, Cl. 521-131.000.
Gee, Stephen K., 4,927,453, Cl. 71-92.000.
Lane, Gregg A.; and Pearlstine, Kathryn, 4,928,065, Cl. 324-464.000.
Lee, Kung H., 4,927,981, Cl. 570-255.000.
Medwin, Steven J., 4,927,581, Cl. 264-108.000.
Motz, Kaye L.; Latham, Roger A.; and Statz, Robert J., 4,926,582, Cl. 44-62.000.
Rushmere, John D., 4,927,498, Cl. 162-168.300.
Stout, Gary K., 4,927,733, Cl. 430-256.000.

Tanaka, Yoshiyasu; Nagaishi, Toshimi; and Suzuki, Mituyoshi, 4,927,229, Cl. 350-96.210.
Weaver, Thomas D., 4,927,933, Cl. 546-113.000.
Duracraft Corporation: *See—*
Wang, Jui-Shang, 4,927,120, Cl. 248-676.000.
Wang, Jui-Shang, 4,928,204, Cl. 361-331.000.
DuRand, Elden E., III; and Logsdon, William K., to Bluegrass Electronics, Inc. Pressure change intrusion detector. 4,928,085, Cl. 340-544.000.
Durchschlag, Gerald; Lang, Alfred; Rotter, Franz; Fritz, Dieter; and Kopilovitsch, Heinz, to Voest-Alpine Maschinenbau Gesellschaft m.b.H. Reversing device for movable parts within the deflection area of a railway switch. 4,927,102, Cl. 246-469.000.
Durkop, Willi; and Scheffner, Wolfgang, to C. A. Weidmuller GmbH & Co. Electrical plug connector. 4,927,383, Cl. 439-491.000.
Durschlag, Mark S.: *See—*
Kazior, Thomas E.; and Durschlag, Mark S., 4,927,784, Cl. 437-203.000.
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, to Ciba-Geigy Corporation. Anthraquinoylcarboxylic acid hydrazides, curable compositions and use thereof. 4,927,865, Cl. 522-48.000.
Dutton, Christopher J.; and Perry, David A., to Pfizer Inc. Novel C.25 (substituted (2-propenyl))-milbemycins. 4,927,847, Cl. 514-450.000.
Dutzmann, Stefan: *See—*
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,927,844, Cl. 514-425.000.
Dwek, Raymond A.: *See—*
Feder, Joseph; Howard, Susan C.; Wittwer, Arthur J.; Rademacher, Thomas W.; Parekh, Raj B.; and Dwek, Raymond A., 4,927,630, Cl. 424-94.640.
Dwyer, Francis G.: *See—*
Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., 4,927,526, Cl. 208-152.000.
Dyer, Paul N.: *See—*
Garg, Diwakar; Wrecsics, Ernest L.; Schaffer, Leslie E.; Mueller, Carl F.; Dyer, Paul N.; and Fabregas, Keith R., 4,927,713, Cl. 428-627.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Rieger, Benedikt, 4,926,574, Cl. 42-70.040.
D'Zurko, Daphne: *See—*
Morris, Arnold M.; D'Zurko, Daphne; Pilsbury, Richard H.; Barkell, J. Warren, Jr.; Orndorff, Karl B.; and Lawson Randall S., 4,926,974, Cl. 187-52.0LC.
E&E Seegmiller Limited: *See—*
Altmayer, Joseph, 4,927,089, Cl. 241-264.000.
Eagleair, Inc.: *See—*
Hagar, Donald K.; and McIntyre, Robert W., 4,927,351, Cl. 431-12.000.
Earl, Gregory K. Fuel vaporization apparatus. 4,926,831, Cl. 123-557.000.
Easter, Brian: *See—*
Kropielnicki, Jerzy J.; Easter, Brian; and Last, James D., 4,928,108, Cl. 343-704.000.
Easter, Michael D. Protective covering for video camera or the like. 4,927,017, Cl. 206-316.200.
Eastman Kodak Company: *See—*
Abbas, Daniel C., 4,927,778, Cl. 437-51.000.
Bailey, David B.; Harrison, Daniel J.; and Yacobucci, Paul D., 4,927,803, Cl. 503-227.000.
Barton, James T.; and Walker, Jimmy P., 4,928,139, Cl. 355-1.000.
Brock, George W., 4,928,188, Cl. 360-113.000.
Elly, James E.; and Kosarko, Gerald J., 4,928,194, Cl. 360-97.040.
Fagerquist, Randy L.; Wood, Wendell L.; and Atkins, Frank W., 4,928,114, Cl. 346-75.000.
Fagerquist, Randy L.; Wood, Wendall L.; Atkins, Frank W.; and Bahl, Surinder K., 4,928,115, Cl. 346-75.000.
Goswami, Ramanuj; and Chen, Chin H., 4,927,927, Cl. 544-106.000.
Henzel, Richard P.; and Zengerle, Paul L., 4,927,744, Cl. 430-566.000.
Hickok, William K.; Riley, John M.; and Kosarko, Gerald J., 4,928,196, Cl. 360-105.000.
Hipwell, William E. H., 4,928,178, Cl. 358-160.000.
Howell, Margene C.; Katerberg, James A.; Pipkorn, David N.; and Wood, Wendell L., 4,928,113, Cl. 346-75.000.
Irving, Mark E., 4,927,745, Cl. 430-567.000.
Kloosterman, David, 4,928,142, Cl. 355-218.000.
Rimai, Donald S.; and Sreekumar, Chandra, 4,927,727, Cl. 430-99.000.
Schwartz, Paul A., 4,927,746, Cl. 430-372.000.
Scozzafava, Michael; Tang, Ching W.; and Young, Ralph H., 4,927,726, Cl. 430-78.000.
Stavinoha, Jerome L.; and McCollum, Anthony W., 4,927,878, Cl. 525-44.000.
Van Brunt, Nicholas; Robertson, Jeffrey C.; and Homa, Daniel, 4,927,013, Cl. 206-221.000.
Walker, Jimmy P.; and Barton, James T., 4,928,119, Cl. 346-108.000.
Wood, Wendell L., 4,928,116, Cl. 346-75.000.
Ebara Corp.: *See—*
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 4,926,648, Cl. 62-55.500.
Eberhardt, Paul R.: *See—*
Bonebright, Mark E.; Eberhardt, Paul R.; and Alley, John C., 4,928,109, Cl. 343-786.000.
Ebesyu, Hidetaka, to Fujitsu Limited. Digital phase comparing circuit. 4,928,026, Cl. 307-479.000.
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Nagura, Satoru; Ebihara, Tsutomu; and Matsumoto, Toshihide, 4,927,682, Cl. 428-88.000.
Ebisawa, Haruc: *See—*
Koshizuka, Kunihiro; Tezuka, Toshiaki; Abe, Takao; and Ebisawa, Haruc, 4,927,693, Cl. 428-141.000.
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Fourrey, Francois; and Mauffrey, Jean F., 4,927,210, Cl. 297-366.000.
ECIA - Equipements et Composants Pour L'Industrie Automobile: *See—*
Hobluigie, Audio; Barnabe, Jean-Pierre; and Mouhot, Frederic, 4,927,286, Cl. 403-322.000.
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Staab, Carl J.; Houser, Kirk D.; Jones, Donald J.; Ihrman, Robert T.; Poepsel, Donald A.; and Edblad, Warren A., 4,928,097, Cl. 340-825.500.
Edgcore Technology, Inc.: *See—*
McCarthy, Daniel M.; Circello, Joseph C.; Munguia, Gabriel R.; and Richardson, Nicholas J., 4,928,225, Cl. 364-200.000.
Ediger, Glen W.: *See—*
Coup, Michael C.; Israel, Gary P.; Ediger, Glen W.; and Moore, Donald J., 4,927,324, Cl. 415-121.200.
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Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.
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Stuber, Michael G.; and Effertz, Charles E., 4,927,047, Cl. 220-90.200.
EFP Corporation: *See—*
Elzey, Paul B., 4,927,023, Cl. 206-523.000.
Egger, Walter C., to VT-Verpackungstechnik Zurich. Arrangement for lubricating the chain guide in a drag chain conveyor for loose articles. 4,926,971, Cl. 184-15.100.
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Harsanyi, Jozsef; Kohanyi, Laszlo; Domsa, Karoly; Szakacs, Lajos; Szentgyorgyi, Geza; and Imre, Aladar, 4,927,549, Cl. 252-25.000.
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Yamauchi, Junichi; Maejima, Kimiko; Eguchi, Kaoru; and Kabuyama, Noriko, 4,928,253, Cl. 364-521.000.
Eguchi, Kazuhiro: *See—*
Kushibe, Mitsuhiro; Eguchi, Kazuhiro; Funamizu, Masahisa; and Ohba, Yasuo, 4,928,285, Cl. 372-45.000.
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Eickmann, Karl. Radial piston hydraulic machine with piston having twelve circumferential fluid bearing pockets. 4,926,744, Cl. 92-58.000.
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Lilly, Carol E. H.; Moore, Loyd C.; Eike, Mark E.; and Barker, Nicholas E., 4,926,758, Cl. 108-43.000.
Eilon, Gabriel F.; and Thompson, Wayne J., to Merck & Co., Inc. N-(N-succinyl-L-leucyl)agmatine, related compounds and use in pharmacology. 4,927,965, Cl. 562-560.000.
Eisenberg, Eugene; Lindsay, Frederick E.; Evans, James J.; and Collins, Ronald H., to Mack Trucks, Inc. Wet/dry cylinder liner for high output engines. 4,926,801, Cl. 123-41.840.
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Hass, Rudi; Jansen, Georg; and Kallen, Wilhelm, 4,927,688, Cl. 428-34.600.
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Kazuo, Inoue; Noriyuki, Kishi; Masao, Kubodera; Eitetsu, Akiyama; Shigeto, Kashiwabara; and Osamu, Takizawa, 4,926,640, Cl. 60-602.000.
Electric Power Research Inst. Corp. of District of Columbia: *See—*
Swanson, Richard M., 4,927,770, Cl. 437-2.000.

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Minnick, Lawrence E., 4,927,596, Cl. 376-283.000.
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Thrlik, Jiri , 4,927,029, Cl. 209-538.000.
Ellenberger, John P.: *See—*
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.
Ellis, Theron L., to International Business Machines Corporation. Method for making a flush surface laminate for a multilayer circuit board. 4,927,477, Cl. 156-182.000.
Ellison, William E.: *See—*
Glen, Stefan J.; and Ellison, William E., 4,927,406, Cl. 494-84.000.
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Igarashi, Hideo, 4,926,729, Cl. 83-364.000.
Elscint Ltd.: *See—*
Keren, Hanan, 4,928,064, Cl. 324-322.000.
Eltech Systems Corporation: *See—*
Solomon, Frank; and Genodman, Yury, 4,927,514, Cl. 204-290.00R.
Turley, Homer L.; Niksa, Marilyn J.; Pohto, Gerald R.; and Niksa, Andrew J., 4,927,717, Cl. 429-27.000.
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Domschat, Klaus, 4,928,198, Cl. 361-1.000.
Elzey, Paul B., to EFP Corporation. Spacer member and method of forming the same. 4,927,023, Cl. 206-523.000.
Emerson, Richard C.; and Sherman, John B., to DeCel Incorporated. Aerodynamic controllably vented pressure modulating drogue. 4,927,099, Cl. 244-152.000.
Emhart Industries, Inc.: *See—*
Miller, Theodore H., 4,927,193, Cl. 292-92.000.
Voisine, Gary R., 4,927,444, Cl. 65-323.000.
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Seita, Yukio; and Emi, Makoto, 4,927,576, Cl. 264-49.000.
Emori, Shinji: *See--*
Shimotsuhama, Isao; Emori, Shinji; Watanabe, Yoshio; and Tamamura, Masaya, 4,928,024, Cl. 307-455.000.
Emsley, Roger: *See—*
Baker Mervyn R.; Pearson, Raymond J.; and Emsley, Roger, 4,926,967, Cl. 182-164.000.
Enerco Technical Products, Inc.: *See—*
Haire, Allen, Abele, Alan C., and Kuczek, Stanley W., 4,927,355, Cl. 431-329.000.
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McShea, William T., III; and Yarrington, Robert M., 4,927,857, Cl. 518-703.000.
Engelhardt, John A., to Boehringer Mannheim Corporation. Elbow arthroplasty instrumentation and surgical procedure. 4,927,422, Cl. 606-79.000.
Engelsdorf, Kurt: *See—*
Taubitz, Bernd; Zieher, Peter; Kramer, Claus; Engelsdorf, Kurt; and Schuelke, Armin, 4,926,983, Cl. 188-299.000.
Engineering Dynamics Corporation: *See—*
Leask, John W., 4,927,136, Cl. 272-69.000.
Engitec Impianti S.p.A.: *See—*
Olper, Marco; and Fracchia, Pierluigi, 4,927,510, Cl. 204-114.000.
Engles, Bruce E.: *See—*
Nogle, Scott G.; Pelley, Perry H., III; Flannagan, Stephen T.; and Engles, Bruce E., 4,928,268, Cl. 365-230.030.
English, Daniel R.: *See—*
Buntrock, Kermit A.; English, Daniel R.; and Jones, Wescomb R., 4,927,673, Cl. 427-376.200.
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Environmental Technologies Group, Inc.: *See—*
Spangler, Glenn E.; Carrico. John P., Jr.; and Campbell, Donald N., 4,928,033, Cl. 313-345.000.
Environwear, Inc.: *See—*
Tommerson, David P.; and Brekkestran, Kevin L., 4,927,366, Cl. 439-37.000.
Envirotech Corporation: *See—*
Meurer, Charles L., 4,927,537, Cl. 210-527.000.
Enyo, Hiroji: *See—*
Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, 4,927,738, Cl. 430-286.000.
Epicor Incorporated: *See—*
D'Angelo, Philip J.; Hetherington, Richard; and Rogan, Joseph J., 4,927,796, Cl. 502-62.000.
Era, Susumu; Kobayashi, Setsuo; and Mukoh, Akio, to Hitachi Chemical Company, Ltd. Novel naphthalocyanine dye, method for preparing the same, and optical information recording medium employing the same. 4,927,735, Cl. 430-270.000.
Erbil, Ahmet, to Georgia Tech Research Corporation. Chemical vapor deposition of mixed metal oxide coatings. 4,927,670, Cl. 427-255.300.
Erdman, Timothy R.; Shippey, Michael A.; and Wollenberg, Robert H., to Chevron Research Company. Lubricating oil compositions containing a combination of a modified succinimide and a Group II metal overbased sulfurized alkylphenol. 4,927,551, Cl. 252-42.700.
Erickson, Duane. Method and apparatus for fletching arrows. 4,927,478, Cl. 156-185.000.
Escher, Claus: *See—*
Bahr, Christian; Heppke, Gerd; Lotzsch, Detlef; Dubal, Hans-Rolf; Escher, Claus; and Ohlendorf, Dieter, 4,927,244, Cl. 350-350.00S.
Eskuchen, Rainer: *See—*
Wuest, Willi; Eskuchen, Rainer; Esser, Herbert; and Leischner, Hasso, 4,927,946, Cl. 549-371.000.
ESPE Stiftung & Co. Produktions- und Vertriebs KG: *See—*
Purrmann, Robert; Guggenberger, Rainer; and Pieper, Gunter, 4,927,866, Cl. 523-115.000.
Esposito, Ruth. Foldable and sterilizable compartmentalized organizer. 4,927,073, Cl. 229-117.070.
Essary, William A.: *See—*
Maska, Rudolf; and Essary, William A., 4,927,875, Cl. 524-457.000.
Esser, Herbert: *See—*
Wuest, Willi; Eskuchen, Rainer; Esser, Herbert; and Leischner, Hasso, 4,927,946, Cl. 549-371.000.
Essex Group, Inc.: *See—*
Leckie, James H., 4,926,928, Cl. 164-452.000.
Estep, John M.: *See—*
Baker, David J.; Dubuque, Kenneth J.; Estep, John M.; and Hix, Charles J., Jr., 4,927,114, Cl. 251-240.000.
Ester, George C. Formulae and methods for sublingual ingestion of natural progesterone. 4,927,816, Cl. 514-177.000.
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Leaton, Timothy H., 4,927,004, Cl. 198-704.000.
Etablissements Mesnel S.A.: *See—*
Mesnel, Gerard, 4,926,600, Cl. 49-491.000.
Etablissements S.A.: *See—*
Vanotti, Gerard, 4,927,078, Cl. 238-349.000.
Ethyl Corporation: *See—*
Blocker, Wesley C.; Roark, David N.; and Hornbaker, Edwin D., 4,927,896, Cl. 526-93.000.
Marlett, Everett M., 4,927,616, Cl. 423-347.000.
Wright, William E.; Davis, Bryan T.; Matteson, Donald S.; and Knapp, Gordon G., 4,927,553, Cl. 252-49.600.
Ethyl Petroleum Additives, Inc.: *See—*
Lam, William Y., 4,927,552, Cl. 252-47.000.
Eussen, Jacobus H. H.: *See—*
Wellinga, Kobus; and Eussen, Jacobus H. H., 4,927,452, Cl. 71-92.000.
Eustache, Jacques: *See—*
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 4,927,928, Cl. 544-154.000.
Evans, David W., to Bell & Howell Company. Angled conveyor for document packages. 4,927,133, Cl. 271-225.000.
Evans, James J.: *See—*
Eisenberg, Eugene; Lindsay, Frederick E.; Evans, James J.; and Collins, Ronald H., 4,926,801, Cl. 123-41.840.
Eveready Battery Company, Inc.: *See—*
Chaney, Earl J., Jr.; Malay, Manuel R.; O'Hara, Thomas J.; and Ayers, Alan D., 4,927,720, Cl. 429-54.000.
Ewen, John A., to Fina Technology, Inc. Catalyst system for the polymerization of olefins. 4,927,797, Cl. 502-127.000.
Excellon Automation: *See—*
Hendricks, Ross D., 4,927,001, Cl. 198-463.500.
Exci-Tech Industries, Inc.: *See—*
King, Allen B.; and Perfetti, Thomas J., 4,927,176, Cl. 280-813.000.
Exsymol S.A.M.: *See—*
Gueyne, Jean; and Seguin, Marie-Christine, 4,927,952, Cl. 556-419.000.
Eylers, Dieter, to Gottlieb Roll GmbH & Co. Arrangement for fastening pocket clips to tubular parts of writing instruments. 4,926,525, Cl. 24-11.00F.
Ezaki, Joichiro; Ito, Yoshiaki; and Matsuzaki, Mikio, to TDK Corporation. Improved floating magnetic head for high density recording. 4,928,195, Cl. 360-103.000.
Fables, Wylci; and Park, Jore. Reconfigurable loop apparatus. 4,927,402, Cl. 446-487.000.
Fabre, Guy: *See—*
Douglas, James L.; Fabre, Guy; and Demosthene, Claude, 4,927,970, Cl. 564-462.000.
Fabregas, Keith R.: *See—*
Garg, Diwakar; Wrecsics, Ernest L.; Schaffer, Leslie E.; Mueller, Carl F.; Dyer, Paul N.; and Fabregas, Keith R., 4,927,713, Cl. 428-627.000.
Fagerquist, Randy L.; Wood, Wendell L.; and Atkins, Frank W., to Eastman Kodak Company. Air skiving system for ink jet printer start-up. 4,928,114, Cl. 346-75.000.
Fagerquist, Randy L.; Wood, Wendall L.; Atkins, Frank W.; and Bahl, Surinder K., to Eastman Kodak Company. Continuous ink jet printer having remotely operable print head assembly. 4,928,115, Cl. 346-75.000.
Fairchild Semiconductor Corporation: *See—*
Dao, Tich T.; and Burke, Gary R., 4,928,223, Cl. 364-200.000.
Fakombinat: *See—*
Alpar, Tibor; Gyorvari, Janos; and Schmidt, Erno , 4,927,573, Cl. 264-40.100.
Falk, Leonard P.; and Griner, Paul K., to UniDynamics Corporation. Multiple-product merchandising machine. 4,927,051, Cl. 221-12.000.
Fani, Frank P.; and Mikic, Frank. Hair cutting guide. 4,926,891, Cl. 132-214.000.

Fanuc Ltd.: *See—*
Fujioka, Yoshiki; and Hirota, Mitsuhiko, 4,928,052, Cl. 318-762.000.
Ikebe, Yo; and Oku, Hideaki, 4,928,009, Cl. 250-231.130.
Farmont, Rolf. Sun roof for vehicles. 4,927,208, Cl. 296-216.000.
Farnam, Jeffrey. Four-wheel drive wheelchair with compound wheels. 4,926,952, Cl. 180-6.500.
Farney, Robert F.: *See—*
Algieri, Aldo A.; and Farney, Robert F., 4,927,968, Cl. 549-451.000.
Farrington, Allan P.: *See—*
Marshall, Gerald M.; Hull, Raymond, Jr.; and Farrington, Allan P., 4,927,685, Cl. 428-74.000.
Fassman, Arnold; and Nobile, John R., to Pitney Bowes Inc. Envelope flap moistening apparatus. 4,926,787, Cl. 118-32.000.
Fattal, R. George; and Ringrose, Gordon, to Twinpak Inc. System for applying labels to pallets movable along a conveyor line. 4,927,486, Cl. 156-351.000.
Fauck, Gerhard; Pohl, Wolfgang; and Ulrich, Helmut, to WABCO Westinghouse Fahrzeugbremsen GmbH. Relay valve for pneumatic or hydraulic application. 4,926,907, Cl. 137-627.500.
Fauth, Frederick E., Sr.; and Barkley, Paul E., to American Bottlers Equipment Co., Inc. Right angle flow-through jump transfer conveyor system. 4,926,999, Cl. 198-358.000.
Favors, Alexander L. Anti-collision sensor. 4,928,101, Cl. 340-943.000.
Fay, Hubert, to Institut Francais du Petrole. Method for determining the wear of the cutting means of a tool during drilling a rocky formation. 4,926,686, Cl. 73-151.000.
Fayt, Roger: *See—*
Teyssie, Philippe; Varshney, Sunil K.; Jerome, Robert; and Fayt, Roger, 4,927,703, Cl. 428-220.000.
Feco Engineered Systems, Inc.: *See—*
Bowler, Peter T.; and Zeeff, Thomas J., 4,927,205, Cl. 294-94.000.
Feder, Joseph; Howard, Susan C.; Wittwer, Arthur J.; Rademacher, Thomas W.; Parekh, Raj B.; and Dwek, Raymond A., to Monsanto Company. Tissue plasminogen activator from normal human colon cells. 4,927,630, Cl. 424-94.640.
Federowsky, Robert: *See—*
Soszka, Barbara; Federowsky, Robert; and Mahler, Jacques, 4,927,445, Cl. 65-11.100.
Felauer, Ethel Ellen: *See—*
Brouwer, Walter G.; Felauer, Ethel Ellen; and Bell, Allyn Roy, 4,927,451, Cl. 71-92.000.
Fennell, Cheryl A.; and Fennell, Kathy L. Locking device for windows/sliding doors. 4,927,198, Cl. 292-306.000.
Fennell, Kathy L.: *See—*
Fennell, Cheryl A.; and Fennell, Kathy L., 4,927,198, Cl. 292-306.000.
Fenyo, Martha; Borberg, Helmut; and Kadar, Janos G., to Harrier Inc. Method for in vivo treatment of tumorous tissues on body surfaces. 4,926,861, Cl. 128-395.000.
Ferber, Hubert P.: *See—*
Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., 4,927,821, Cl. 514-226.500.
Ferguson, David G.: *See—*
Cozine, Mark L.; Ferguson, David G.; Hansen, Loren F.; and Lamb, Mark E., 4,926,947, Cl. 172-22.000.
Ferrari, Carlo V. G. Exercise apparatus. 4,927,138, Cl. 272-70.000.
Ferrett, Donald A., to United States of America, Army. Method of thermal isolation of detector elements in an uncooled staring focal plane array. 4,927,771, Cl. 437-3.000.
Ferrofluidics Corporation: *See—*
Raj, Kuldip; Moses, Joseph; Moskowitz, Ronald; and Bloom, Frank, 4,927,164, Cl. 277-80.000.
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., to Bayer Aktiengesellschaft. Substituted 1-benzylsulphonyl-3-heteroaryl-(thio)urea herbicides. 4,927,454, Cl. 71-93.000.
Feuz, Fritz, to Von Roll Transportsysteme AG. Cable way for suspended vehicles. 4,926,754, Cl. 104-112.000.
Fibiger, Richard F.: *See—*
Wessling, Ritchie A.; Whipple, Sharon S.; and Fibiger, Richard F., 4,927,540, Cl. 210-638.000.
Fibre Containers Pty. Limited: *See—*
Alexander, Kenneth G., 4,926,615, Cl. 53-564.000.
Fichtel & Sachs AG: *See—*
Kundermann, Wolfgang, 4,926,988, Cl. 192-3.300.
Fidler, Delmer A.: *See—*
Boudakian, Max M.; and Fidler, Delmer A., 4,927,940, Cl. 548-263.200.
Fiedler, Juergen; Stoeffler, Albert; and Bergmann, Michael, to Henkel Kommanditgesellschaft auf Aktien. Device for dispensing a multicomponent flowable substance. 4,927,059, Cl. 222-136.000.
Field, John E.; Dear, John P.; and Davies, Peter N. A medical treatment device for treating an undesired formation in a living body. 4,926,859, Cl. 128-24.00A.
Fiener, Josef, to Karl Mengele & Sohne Maschinenfabrik und Eisengiesserei GmbH & Co. Mowing apparatus. 4,926,623, Cl. 56-60.000.
Fina Technology, Inc.: *See—*
Ewen, John A., 4,927,797, Cl. 502-127.000.
Finegan, Jan P. Coin senser for pay telephone. 4,926,998, Cl. 194-315.000.
Finisar Corporation: *See—*
Levinson, Frank H., 4,927,225, Cl. 350-96.180.
Finley, John W.: *See—*
Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, 4,927,658, Cl. 426-611.000.
Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, 4,927,659, Cl. 426-611.000.
Finter, Jurgen: *See—*
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, 4,927,865, Cl. 522-48.000.
Fischer, Eugene R.: *See—*
Knox, David E.; and Fischer, Eugene R., 4,927,669, Cl. 427-239.000.
Fischer, Fritz; Kleinhappl, Erich; and Marsoner, Hermann, to AVL AG. Feeding device for introducing liquid or gaseous samples. 4,927,603, Cl. 422-67.000.
Fischer, Hanspeter: *See—*
Lutz, William R.; Verschueren, Wim G.; Fischer, Hanspeter; and Van Lommen, Guy R. E., 4,927,449, Cl. 71-90.000.
Fischer, Horst; and Staub, Karl, to Mannesmann Rexroth GmbH. Vane pump. 4,927,332, Cl. 417-299.000.
Fischer, Walter: *See—*
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, 4,927,865, Cl. 522-48.000.
Fischli, Albert; Gutknecht, Eva-Maria; and Obrecht, Daniel, to Hoffmann-La Roche Inc. Styryl ketones. 4,927,958, Cl. 560-53.000.
Fisons plc: *See—*
Brown, Roger C.; Dixon, John; and Robinson, David H., 4,927,822, Cl. 514-236.200.
Fitjer, Holger, to Georg Karl geka-brush GmbH. Applicator device with puncturing means. 4,927,283, Cl. 401-132.000.
Fitzgerald, Walter P.; Sanders, Beatrix Y.; and Bagheri, Mansour A. H., to Long-Lok Fasteners Corporation. Patch-type self-locking screw fasteners. 4,927,307, Cl. 411-302.000.
Fitzpatrick, Nicholas B., to BOC Group plc, The. Container content tester. 4,926,681, Cl. 73-52.000.
Flanigan, Sean: *See—*
Sampson, Robert; and Flanigan, Sean, 4,926,594, Cl. 52-200.000.
Flanigen, Edith M.: *See—*
Coughlin, Peter K.; Mercer, William C.; and Flanigen, Edith M., 4,927,768, Cl. 436-172.000.
Flannagan, Stephen T.: *See—*
Nogle, Scott G.; Pelley, Perry H., III; Flannagan, Stephen T.; and Engles, Bruce E., 4,928,268, Cl. 365-230.030.
Flatley, Doris W.: *See—*
Hsu, Sheng T.; and Flatley, Doris W., 4,927,777, Cl. 437-44.000.
Fleischer, Erwin: *See—*
Hirsch, Albrecht; and Fleischer, Erwin, 4,927,548, Cl. 252-17.000.
Fletcher, Stephen R.: *See—*
Taylor, Edward C.; Beardsley, George P.; Shih, Chuan; and Fletcher, Stephen R., 4,927,828, Cl. 514-258.000.
Flexmedics Corporation: *See—*
Stice, James D.; Sievert, Chester E., Jr.; and Christian, Steven C., 4,926,860, Cl. 606-144.000.
Flora, David D.: *See—*
Legler, John G.; Folkerth, Harold E.; and Flora, David D., 4,926,916, Cl. 144-136.00R.
Flores, Jorge: *See—*
Chanock, Robert M.; Kapikian, Albert; Midthun, Karen; Flores, Jorge; Gorziglia, Mario; Hoshino, Yasutaka; and Peres-Schael, Irene, 4,927,628, Cl. 424-89.000.
Flow Design, Inc.: *See—*
Survil, Robert J.; and Weber, Robert T., 4,926,704, Cl. 73-866.500.
Flow-Rite Controls, Ltd.: *See—*
Campau, Daniel N., 4,927,568, Cl. 261-36.100.
FMC Corporation: *See—*
Butler, Lee D.; Orlando, Franklin P.; and Lenker, Don H., 4,927,440, Cl. 56-12.800.
Ungchusri, Tep; and Lemons, George D., 4,927,192, Cl. 285-305.000.
Fock, Jurgen; and Schedlitzki, Dietmar, to Th. Goldschmidt AG. Polyoxyalkylene ether having hydroxyl and sulfonate groups and their use in the preparation of dispersable polyurethanes. 4,927,961, Cl. 562-103.000.
Fohl, Artur, to TRW Repa GmbH. Drive device for restraining systems in motor vehicles. 4,927,175, Cl. 280-806.000.
Fohst, Manfred, to Lohmann GmbH & Co. KG. Shoe inner sole, particularly insole or welt. 4,926,570, Cl. 36-43.000.
Folkerth, Harold E.: *See—*
Legler, John G.; Folkerth, Harold E.; and Flora, David D., 4,926,916, Cl. 144-136.00R.
Ford Aerospace Corporation: *See—*
Enterline, David L.; and Smith, Hugh L., 4,927,257, Cl. 350-631.000.
Ford Motor Company: *See—*
Burba, Joseph C.; Landman, Ronald G.; Patil, Prabhakar B.; and Reitz, Graydon A., 4,928,227, Cl. 364-424.010.
Butler, James W.; Korniski, Thomas J.; and Colvin, Alex D., 4,928,015, Cl. 250-343.000.
Diehl, Roy E.; and Berger, Alvin H., 4,926,810, Cl. 123-192.00B.
Duffy, James J., 4,926,956, Cl. 180-142.000.
Jones, Bryan, 4,927,174, Cl. 280-777.000.
Morris, Guy D.; Jordon, Trevor A.; Davidson, William C.; and Bowman, Timothy J., 4,926,802, Cl. 123-52.00M.
Foreman, Kenneth M.; and Maciulaitis, Algirdas, to Grumman Corporation. Hypersonic gasdynamic laser system. 4,928,286, Cl. 372-90.000.
Forester, David R., to Betz Laboratories, Inc. Method for controlling fouling deposit formation in a liquid hydrocarbonaceous medium using multifunctional antifoulant compositions. 4,927,519, Cl. 208-48.0AA.

VOL
1114
ISS
4
MY
22
1990
UMI

Forester, David R., to Betz Laboratories, Inc. Multifunctional antifoulant compositions. 4,927,561, Cl. 252-389.220.
Forrest, John, to Drilex Systems, Inc. Thermal shield for drilling motors. 4,926,949, Cl. 175-17.000.
Fortin, Michel: *See*—
Clemence, Francois; Frechet, Daniel; and Fortin, Michel, 4,927,832, Cl. 514-299.000.
Fory, Werner; and Meyer, Willy, to Ciba-Geigy Corporation. N-heterocyclosulfonyl-n'-pyrimidinylureas. 4,927,450, Cl. 71-91.000.
Fossum, Steven C.; Sedivy, J. Gregory; and Savick, Wayne K., to Innovex Inc. Self-zeroing pressure signal generator. 4,926,674, Cl. 73-4.00R.
Foster, Clark B.: *See*—
Haber, Terry M.; Smedley, William H.; Foster, Clark B.; and Lewis, John A., Jr., 4,927,019, Cl. 206-365.000.
Foster, George N.: *See*—
King, Roswell; E., III; Foster, George N.; and Petty, Herbert E., 4,927,898, Cl. 528-27.000.
Fourrey, Francois; and Mauffrey, Jean F., to ECIA - Equipements Et Composants Pour L'Industrie Aubomobile. Seat with an adjustable fold-down back. 4,927,210, Cl. 297-366.000.
Fox, Mark. Self-retracting step. 4,926,965, Cl. 182-89.000.
Fracchia, Pierluigi: *See*—
Olper, Marco; and Fracchia, Pierluigi, 4,927,510, Cl. 204-114.000.
Franchini, Elisabeth, to Societe Anonyme dite: Alcatel Espace. Radio-optical transmission system, in particular for space telecommunications. 4,928,317, Cl. 455-601.000.
Francis, Gaylord L.; and Martin, Francis W., to Corning Incorporated Hybrid circuits and thick film dielectrics used therein. 4,927,711, Cl. 428-432.000.
Francotyop-Postalia GmbH: *See*—
Schleuchardt, Manfred, 4,926,990, Cl. 192-28.000.
Frankenreiter, Michael, to Hewlett-Packard Company. Method for measuring blood pressure and apparatus for automated blood pressure measuring. 4,926,873, Cl. 128-681.000.
Franklin, Douglas E.; Murphy, Maurice W.; and Palylyk, Richard A., to Powertech Labs, Inc. Apparatus and method for testing wooden poles. 4,926,691, Cl. 73-579.000.
Franklin, Hugh L.; Whatley, Leslie H.; and Klees, George N., to Rockwell International Corporation. Sinusoidal current sense and scaling circuit. 4,928,059, Cl. 324-123.00R.
Frazer-Nash Defence Systems Limited: *See*—
Griffin, Dennis; and Pearce, John R., 4,926,740, Cl. 89-1.819.
Frechet, Daniel: *See*—
Clemence, Francois; Frechet, Daniel; and Fortin, Michel, 4,927,832, Cl. 514-299.000.
Fricano, Gerald A. Combination cap hanger and visor press. 4,927,063, Cl. 223-84.000.
Friedman, Sonia: *See*—
Auerbach, Abraham; and Friedman, Sonia, 4,927,766, Cl. 436-44.000.
Friehmelt, Volker; Maier, Bernhard; Kohling, Alfons; and Schmitt, Rolf-Eberhard, to Battelle-Institut e.V. Method and device for breaking a disperse system in an electrochemical cell. 4,927,511, Cl. 204-151.000.
Frisch, Kurt C., Jr.; and Harris, Robert F., to Dow Chemical Company, The. Use of a polyamine as cell opener in polyurethane foam. 4,927,864, Cl. 521-163.000.
Fritz, Dieter: *See*—
Durchschlag, Gerald; Lang, Alfred; Rotter, Franz; Fritz, Dieter; and Kopilovitsch, Heinz, 4,927,102, Cl. 246-469.000.
Frobel, Klaus; Muller, Hartwig; Bischoff, Erwin; Salcher, Olga; de Jong, Anno; Berschauer, Friedrich; and Scheer, Martin, to Bayer Aktiengesellschaft. Efomycin G and it's use as yield promoter in animals. 4,927,810, Cl. 514-23.000.
Froehly, Claude: *See*—
Barthelemy, Alain; Maneuf, Serge; and Froehly, Claude, 4,928,282, Cl. 372-18.000.
Frohrib, Darrell A.: *See*—
Ramalingam, Subbiah; and Frohrib, Darrell A., 4,927,299, Cl. 407-120.000.
Ramalingam, Subbiah; and Frohrib, Darrell A., 4,927,300, Cl. 407-120.000.
Fromm, Ellsworth H.: *See*—
Schirmer, Robert M.; Fromm, Ellsworth H.; and Alquist, Henry E., 4,927,349, Cl. 431-10.000.
Frost, Charles, to Kimball Industries, Inc. Reversible flow valve for air isolated bases. 4,927,119, Cl. 248-550.000.
Frost, Martin; Horton, Bruce J.; and Tidd, Jonathan L., to University of Bristol. Centerless grinding. 4,926,603, Cl. 51-165.770.
Froutzis, Andrew. Means for releasably anchoring vehicle seats. 4,927,201, Cl. 296-63.000.
Fuchigami, Mitsuru; Tachizawa, Shingo; and Ishiguro, Mamoru, to Mitsubishi Paper Mills Ltd. Desensitizer composition. 4,927,971, Cl. 564-505.000.
Fuchigami, Yasuhiro: *See*—
Honjo, Seiichiro; Yamada, Kazuo; Fuchigami, Yasuhiro; and Mizusugi, Tetsuya, 4,927,443, Cl. 65-273.000.
Fuchs, Hugo; and Agar, David, to BASF Aktiengesellschaft. Elimination of hydroxylammonium salts from wastewaters containing such salts. 4,927,542, Cl. 210-711.000.
Fuel Tech, Inc.: *See*—
Bowers, Wayne E., 4,927,612, Cl. 423-235.000.
Fuhrer, Wolfgang: *See*—
Adler, Alfons; Widdig, Arno; Kuhle, Engelbert; Fuhrer, Wolfgang; Hagemann, Hermann; and Hanssler, Gerd, 4,927,824, Cl. 514-241.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Abe, Kunihiro; and Furuyama, Masaaki, 4,926,822, Cl. 123-414.000.
Ishizeki, Seiichi, 4,926,683, Cl. 73-118.100.
Takahashi, Akira; and Soejima, Yuji, 4,927,166, Cl. 280-91.000.
Fuji Photo Film Co., Ltd.: *See*—
Chino, Naoyoshi; Sato, Tsunehiko; Saito, Shinji; and Ogawa, Hiroshi, 4,927,665, Cl. 427-131.000.
Doi, Atsuhiro; and Nishio, Tomonori, 4,928,122, Cl. 346-160.000.
Kawata, Ken; Sato, Kozo; and Tsuboi, Masayoshi, 4,927,897, Cl. 526-240.000.
Matsumoto, Takashi; Sato, Masamichi; Yoshida, Satoshi; and Kato, Yoshiaki, 4,928,186, Cl. 360-21.000.
Monma, Hisayoshi; and Suganuma, Atsushi, 4,928,277, Cl. 369-116.000.
Mori, Nobufumi; Muraishi, Katsuaki; Matsuda, Terumi; Ohnishi, Masahiro; Nunome, Hiromi; Koyama, Tadao; and Oikawa, Tetsuo, 4,928,016, Cl. 250-440.100.
Ogawa, Masaharu, 4,926,567, Cl. 34-23.000.
Sato, Kazo, 4,927,730, Cl. 430-138.000.
Shimura, Kazuo, 4,928,011, Cl. 250-327.200.
Takahashi, Kimihide; Sasaki, Hidemi; and Nakayama, Yoshiaki, 4,928,179, Cl. 358-210.000.
Takahashi, Ryuichi, 4,927,731, Cl. 430-138.000.
Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, 4,927,533, Cl. 210-257.100.
Tamagawa, Shigehisa, 4,927,495, Cl. 162-135.000.
Tamoto, Koji, 4,927,743, Cl. 430-496.000.
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, 4,928,167, Cl. 358-80.000.
Fuji Xerox Co., Ltd.: *See*—
Kobayashi, Kenichi, 4,928,161, Cl. 357-71.000.
Nishide, Hiroo; and Kaneko, Shintaro, 4,927,725, Cl. 430-54.000.
Fujie, Hideo: *See*—
Tomikawa, Kazuto; and Fujie, Hideo, 4,928,019, Cl. 250-561.000.
Fujieda, Yasuhiko: *See*—
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katumi; and Fukumura, Seisuke, 4,927,344, Cl. 425-28.100.
Fujii, Katsuhiko: *See*—
Kitahara, Shigehisa; Ohtsu, Akira; and Fujii, Katsuhiko, 4,927,808, Cl. 514-19.000.
Fujii, Shokichi: *See*—
Higuchi, Mitsuhiro; Yamamoto, Hirofumi; Yamamoto, Osamu; Fujii, Shokichi; and Nonomura, Katsumi, 4,926,505, Cl. 4-247.000.
Fujikawa, Junichi: *See*—
Taniguchi, Masaharu; Ichijo, Chikara; and Fujikawa, Junichi, 4,927,739, Cl. 430-286.000.
Fujimoto, Sachito; and Hosoi, Shuichi, to Honda Giken Kogyo K.K. Air-fuel ratio feedback control method for internal combustion engines. 4,926,828, Cl. 123-489.000.
Fujimoto, Takanori; and Hara, Toshirou, to Mitsubishi Denki Kabushiki Kaisha. Ignition signal distributing circuit for engine. 4,926,807, Cl. 123-179.0BG.
Fujimoto, Takanori; and Hara, Toshiro, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting misfire and for controlling fuel injection. 4,928,228, Cl. 364-431.090.
Fujino, Yuuji; and Nakamura, Yasuhiro, to Koito Manufacturing Co., Ltd. Vehicle lamp device. 4,928,215, Cl. 362-61.000.
Fujioka, Yoshiki; and Hirota, Mitsuhiko, to Fanuc Ltd. Power supply regenerating circuit. 4,928,052, Cl. 318-762.000.
Fujisawa, Hiroshi: *See*—
Kise, Masahiro; Yoshimoto, Yoshihiko; Fujisawa, Hiroshi; Sasaki, Yasuo; and Yasufuku, Shoji, 4,927,835, Cl. 514-448.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, 4,927,818, Cl. 514-202.000.
Fujita, Yoshihiro: *See*—
Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, 4,927,533, Cl. 210-257.100.
Fujitaki, Roy K.: *See*—
Craig, Burnie M.; and Fujitaki, Roy K., 4,926,507, Cl. 4-295.000.
Fujitsu Limited: *See*—
Ebesyu, Hidetaka, 4,928,026, Cl. 307-479.000.
Kokado, Masayuki, 4,928,025, Cl. 307-455.000.
Okuda, Hiroshi, 4,927,471, Cl. 148-33.500.
Shimotsuhama, Isao; Emori, Shinji; Watanabe, Yoshio; and Tamamura, Masaya, 4,928,024, Cl. 307-455.000.
Tanizawa, Tetsu, 4,928,164, Cl. 357-45.000.
Yamauchi, Junichi; Maejima, Kimiko; Eguchi, Kaoru; and Kabuyama, Noriko, 4,928,253, Cl. 364-521.000.
Yoshida, Toshihiko; and Inaba, Toru, 4,928,163, Cl. 357-23.300.
Fukaura, Osamu: *See*—
Abe, Norio; and Fukaura, Osamu, 4,927,488, Cl. 156-460.000.
Fukumura, Seisuke: *See*—
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katumi; and Fukumura, Seisuke, 4,927,344, Cl. 425-28.100.
Fukuo, Koichi, to Honda Giken Kogyo Kabushiki Kaisha. Mechanism for switching valve operating modes in an internal combustion engine. 4,926,804, Cl. 123-90.160.
Fuller, Jimmie G. Spinner bait box and storage system. 4,927,016, Cl. 206-315.110.

Fulton, Alfred L., to SCI Systems, Inc. Printer and method. 4,928,133, Cl. 346-150.000.
Funahashi, Toshikazu: *See*—
Ito, Toshiyasu; Minoura, Jun; Takahashi, Shigeyuki; Mori, Takaaki; Kato, Mamoru; and Funahashi, Toshikazu, 4,927,246, Cl. 350-357.000.
Funaki, Motokatsu. Method of assembling a roof structure. 4,926,611, Cl. 52-748.000.
Funamizu, Masahisa: *See*—
Kushibe, Mitsuhiro; Eguchi, Kazuhiro; Funamizu, Masahisa; and Ohba, Yasuo, 4,928,285, Cl. 372-45.000.
Furstenau, Norbert; and Watts, Christopher, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Opto-electric A/D converter. 4,928,007, Cl. 341-137.000.
Furukawa, Yoshimi: *See*—
Ataka, Hiroshi; and Furukawa, Yoshimi, 4,926,954, Cl. 180-140.000.
Furuya, Katsuji: *See*—
Morizumi, Mitsuo; Omura, Kinya; Arita, Eriya; Furuya, Katsuji; Yasuda, Sakae; and Kodera, Masaya, 4,926,914, Cl. 141-59.000.
Furuya, Kiyoshi: *See*—
Sato, Mitsuru; Iizuka, Tetsuya; Furuya, Kiyoshi; Shoji, Norio; and Sekine, Masato, 4,928,074, Cl. 330-254.000.
Furuyama, Masaaki: *See*—
Abe, Kunihiro; and Furuyama, Masaaki, 4,926,822, Cl. 123-414.000.
Futrex, Inc.: *See*—
Rosenthal, Robert D., 4,928,014, Cl. 250-341.000.
G-P Manufacturing Co., Inc.: *See*—
Price, Robert A., 4,927,177, Cl. 280-851.000.
Gabbe, David; and Batchelder, Ned, to Digital Equipment Corporation. Printing apparatus and method for printing a plurality of pages onto a single sheet. 4,928,252, Cl. 364-519.000.
Gac, Frank D.: *See*—
Petrovic, John J.; Carter, David H.; and Gac, Frank D., 4,927,792, Cl. 501-92.000.
GAF Chemicals Corporation: *See*—
Liu, Kou-Chang, 4,927,976, Cl. 568-665.000.
Shih, Jenn S.; Smith, Terry E.; and Login, Robert B., 4,927,667, Cl. 427-154.000.
Gagas, Stanley. Storm infilteration disk with filter. 4,927,163, Cl. 277-23.000.
Gagne, Martin: *See*—
Ciloglu, Cavit; Gagne, Martin; Laraque, Edy; Poirier, Joel; Tremblay, Sylvain; and Trudel, Yves, 4,927,461, Cl. 75-254.000.
Gagnepain, Didier, to Terraillon, societe anonyme. Ergonomic handle for a kitchen article. 4,926,521, Cl. 16-110.00A.
Gailey, Edward D., to Tuthill Corporation. Socket assembly. 4,926,895, Cl. 137-15.000.
Gainey, Michael D. Riding tractor umbrella. 4,927,117, Cl. 248-539.000.
Galante, Richard J.: *See*—
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.
Galante, Richard L.: *See*—
Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., 4,926,919, Cl. 152-209.00R.
Galbi, David; and Kohn, Les, to Intel Corporation. Sticky bit predictor for floating-point multiplication. 4,928,259, Cl. 364-745.000.
Gale, Edwin J.; Olsen, Albert B.; and Dinsmoor, John C., to Stanley Aviation Corporation. Coupler with combination locking and bonding ring. 4,928,202, Cl. 361-215.000.
Galgana, Thomas. Unitary buoy. 4,927,394, Cl. 441-1.000.
Galiano, Christian: *See*—
Jorion, Bruno; Galiano, Christian; and Wraight, Peter, 4,928,088, Cl. 340-854.000.
Galinski, Edmund V.: *See*—
DiRubbio, Vincent; and Galinski, Edmund V., 4,926,752, Cl. 102-486.000.
Gall, Rudi; and Bosies, Elmar, to Boehringer Mannheim GmbH. Diphosphonate derivatives, pharmaceutical compositions and methods of use. 4,927,814, Cl. 514-108.000.
Gallatin, Gregg M.: *See*—
de Groot, Peter J.; Macomber, Steven H.; and Gallatin, Gregg M., 4,927,263, Cl. 356-5.000.
Gallian, John J.: *See*—
Hatcher, Herbert J.; Gallian, John J.; and Leeper, Stephen A., 4,927,757, Cl. 435-105.000.
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, to Roussel Uclaf. Derivatives of 3-piperidine carbaldehyde oxime and their use as medicaments. 4,927,837, Cl. 514-331.000.
Galpin Research, Limited Partnership: *See*—
Hayden, William; Hayden, Mark W.; and White, Richard S., 4,927,318, Cl. 414-786.000.
Gandolfi, Luciano: *See*—
Spatrisano, Antonio P.; Gandolfi, Luciano; Minotti, Carlo; and Di Cristina, Natale, 4,926,547, Cl. 29-841.000.
Ganguly, Dipankar; and Giuliani, David, to International Biomedics, Inc. Apparatus and method for non-invasively and automatically measuring the volume of urine in a human bladder. 4,926,871, Cl. 128-660.070.
Garbalizer Machinery Corp.: *See*—
Brewer, John C., 4,927,088, Cl. 241-223.000.
Gardner, James J. Motion transmitting systems for machinery & machine tools. 4,926,709, Cl. 74-424.880.
Gardner, Keith: *See*—
Pettigrew, Robert M.; Humberstone, Victor C.; Gardner, Keith; Longman, Robert J.; and Helfet, Peter R., 4,928,132, Cl. 346-135.100.
Gardner, Owen M.; and Cheek, Ralph L., to Imco Recycling Inc. Treatment of aluminum reduction cell linings combined with use in aluminum scrap reclamation. 4,927,459, Cl. 75-685.000.
Garg, Diwakar; Wrecsics, Ernest L.; Schaffer, Leslie E.; Mueller, Carl F.; Dyer, Paul N.; and Fabregas, Keith R., to Air Products and Chemicals, Inc. High erosion/wear resistant multi-layered coating system. 4,927,713, Cl. 428-627.000.
Garnaud, Marie-Anne: *See*—
Bourjot, Pierre; and Garnaud, Marie-Anne, 4,927,184, Cl. 285-21.000.
Garrett, Jimmy R. Guide for slotting, scoring, trimming or like heads. 4,926,730, Cl. 83-499.000.
Garth, Peter; Simpson, Stuart M.; Parkinson, John E.; and Rogers, Alan H., to Horsell Graphic Industries Limited. Processing of exposed lithographic printing plates by conducting second exposure under water. 4,927,741, Cl. 430-309.000.
Garthwaite, Albert N.: *See*—
Baumann, Gerald W.; Garthwaite, Albert N.; and Hutchings, Carl D., 4,928,147, Cl. 355-288.000.
Gartner, Klaus W.; and Uyeda, Alan K. Self locking electronic lock. 4,926,664, Cl. 70-119.000.
Gas Research Institute: *See*—
Christensen, Richard N.; DeVuono, Anthony C.; Wilkinson, William H.; and Landstrom, D. Karl, 4,926,659, Cl. 62-476.000.
Kardos, Peter, 4,926,798, Cl. 122-24.000.
Pearman, Arthur N. J., 4,926,678, Cl. 73-3.000.
Gasiunas, Donatas V.; and Storace, Anthony, to Pitney Bowes Inc. Hall effect printwheel encoder. 4,928,089, Cl. 340-870.310.
Gassen, James, to Textron Inc. Exhaust configuration. 4,926,637, Cl. 60-317.000.
Gassiat, Alain L., to Carbone Industrie. Disk brake assembly for wheels of land motor vehicles. 4,926,977, Cl. 188-18.00A.
Gates Rubber Company, The: *See*—
Salinas, Philip, 4,926,909, Cl. 138-109.000.
Gattey, Phillip; and Chen, Shu-Ren, to ACS Communications Hinged acoustical voice tube. 4,926,961, Cl. 181-22.000.
Gatzemeyer, Dwight L.: *See*—
Sorensen, Joseph A.; and Gatzemeyer, Dwight L., 4,926,722, Cl. 81-487.000.
Gaudet, Rolland M. Padlock shield. 4,926,662, Cl. 70-56.000.
Gay, Pierre; and Vatant, Robert, to Clecim. Process and machine for the continuous casting of a thin metal product. 4,926,930, Cl. 164-476.000.
Geary, Philip J.: *See*—
Schofield, John A.; Betteridge, Peter R.; Ryback, George; and Geary, Philip J., 4,927,759, Cl. 435-156.000.
Gebrueder Loepfe AG: *See*—
Weidmann, Erich, 4,927,093, Cl. 242-154.000.
Gee, Stephen K., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,927,453, Cl. 71-92.000.
Geertsma, Geert; Poel, Hendrik; and Weersink, Andreas, to U.S. Philips Corp. Shaving apparatus. 4,926,550, Cl. 30-43.100.
Gelinas, William A.; Holtz, Edwin R.; Argazzi, Dennis J.; Smigel, Robert L.; and Wiley, Dan W., to Loctite Corporation. Apparatus for producing an atmosphere other than ambient. 4,927,487, Cl. 156-351.000.
Gelles, David S.: *See*—
Johnson, Gerald D.; Lobsinger, Ralph J.; Hamilton, Margaret L.; and Gelles, David S., 4,927,468, Cl. 148-3.000.
Gemma, Nobuhiro: *See*—
Egusa, Syun; Miura, Akira; and Gemma, Nobuhiro, 4,927,589, Cl. 264-259.000.
Genbauffe, Francis S.; and Kimmel, Steven A., to Robertshaw Controls Company. Cooking apparatus, door latching construction therefor and methods of making the same. 4,927,996, Cl. 219-413.000.
Genencor, Inc.: *See*—
Arbige, Michael V.; and Silver, Scott C., 4,927,644, Cl. 426-35.000.
General Electric Company: *See*—
Adams, Ronald L.; Kimbel, Kirk L.; and Quinn, Clayton B., 4,927,675, Cl. 428-35.900.
Arthur, Stephen D.; and Temple, Victor A. K., 4,927,772, Cl. 437-6.000.
Brown, Sterling B., 4,927,881, Cl. 525-92.000.
Brown, Sterling B., 4,927,894, Cl. 525-390.000.
Carlson, James R.; and Tobbe, Joseph D., 4,926,523, Cl. 16-125.000.
Davison, Samuel H.; Kast, Kevin H.; and Clark, Aidan W., 4,928,240, Cl. 364-431.020.
Day, Stanley G., 4,928,241, Cl. 364-424.010.
DeRudder, James L.; Savenije, Herman; and Wang, I-Chung W., 4,927,880, Cl. 525-63.000.
Dorri, Bizhan; and Brzozowski, Steven J., 4,926,646, Cl. 62-51.100.
Dorri, Bizhan; and Laskaris, Evangelos T., 4,926,647, Cl. 62-51.100.
Guggenheim, Thomas L.; McCormick, Sharon J.; and Colley, Alice M., 4,927,904, Cl. 528-182.000.
Hitch, Thomas T., 4,927,359, Cl. 432-206.000.
Jacobs, Linda Y.; Palmieri, Joseph M.; and Smith, James I., 4,928,080, Cl. 335-202.000.
Johnson, Ronald M., 4,926,654, Cl. 62-229.000.
Kadambi, Vedanth, 4,928,296, Cl. 378-141.000.
Kim, Jeung T.; and Imam, Imdad, 4,927,342, Cl. 418-63.000.
Kliman, Gerald B.; and Jones, Donald W., 4,927,329, Cl. 416-127.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Nerone, Louis R., 4,928,033, Cl. 315-209.00R.
Ortiz, Angel L., Jr.; and Jones, Marshall G., 4,927,224, Cl. 350-96.150.
Ortiz, Angel L., Jr., 4,927,226, Cl. 455-611.000.
Reed, Clive W.; Rzad, Stefan J.; and Devins, John C., 4,927,704, Cl. 428-221.000.
Rosenquist, Niles R., 4,927,914, Cl. 528-480.000.
Skoch, Michael J.; and Hetzel, Frederick, 4,928,032, Cl. 313-318.000.
Stewart, Kevin R., 4,927,910, Cl. 528-371.000.
Stewart, Kevin R., 4,927,911, Cl. 528-371.000.

General Hospital Corporation, The: *See—*
Matsueda, Gary R.; Haber, Edgar; and Hui, Kwan, 4,927,916, Cl. 530-387.000.
Rubin, Robert H.; and Strauss, H. William, 4,926,869, Cl. 128-654.000.

General Instrument Corporation: *See—*
White, Charles M., 4,928,309, Cl. 380-15.000.

General Kinematics Corporation: *See—*
Musschoot, Albert, 4,926,601, Cl. 51-7.000.

General Motors Corporation: *See—*
Abboud, Pierre Y., 4,928,036, Cl. 315-82.000.

Geng, Markus; and Loutan, Dominique, to Georg Fischer AG. Automatic coupling for rail borne vehicles. 4,927,035, Cl. 213-77.000.

Genodman, Yury: *See—*
Solomon, Frank; and Genolman, Yury, 4,927,514, Cl. 204-290.00R.

Gentile, John R., to Laser Precision Corporation. Signal averaging for optical time domain relectometers. 4,928,232, Cl. 364-525.000.

Georg Fischer AG: *See—*
Geng, Markus; and Loutan, Dominique, 4,927,035, Cl. 213-77.000.
Hanselka, Reinhard, 4,927,999, Cl. 219-535.000.
Kunz, Peter, 4,927,642, Cl. 425-508.000.

Georg Fischer Aktiengesellschaft: *See—*
Steinmetz, Hans-Werner; and Reich, Fritz, 4,927,183, Cl. 285-21.000.

Georg Karl geka-brush GmbH: *See—*
Fitjer, Holger, 4,927,283, Cl. 401-132.000.

Georgia Tech Research Corporation: *See—*
Erbil, Ahmet, 4,927,670, Cl. 427-255.300.

Gerardin, Jean-Pierre, to Electricite De France. Process and device for optically measuring the distance and the velocity of a target. 4,928,152, Cl. 356-5.000.

Gerovac, Branko J.: *See—*
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.

Gesellschaft fur Strahlen: *See—*
Schmidt, Karl-Heinz; and Waidelich, Wilhelm, 4,928,176, Cl. 358-126.000.

Geyer, Harry J.: *See—*
Sharma, Ravinder K.; Geyer, Harry J.; and Mitchell, Douglas G., 4,927,505, Cl. 204-34.500.

Ghebre-Sellassie, Isaac; Gordon, Robert H.; and Khan, Sadath U., to Warner-Lambert Company. Modified release gemfibrozil composition. 4,927,639, Cl. 424-497.000.

Gianantonio, Anacleto: *See—*
Assi, Francesco; Lancini, Giancarlo; and Gianantonio, Anacleto, 4,927,754, Cl. 435-71.000

Gibson, Ellen S.: *See—*
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.

Gifford, Hanson S., III; Simpson, John B.; and Brown, Peter S., to Devices for Vascular Intervention, Inc. Atherectomy device for severe occlusions. 4,926,858, Cl. 606-159.000.

Gilhousen, Klein S.; and Antonio, Franklin P., to Qualcomm, Inc. Multiplexed address control in a TDM communication system. 4,928,274, Cl. 370-92.000.

Gill, John: *See—*
Barnett, Ronald E.; Dikeman, Roxane; Liao, Shyh-Yuan; Gill, John; and Pantaleone, David P., 4,927,654, Cl. 426-548.000.

Gillen, Sara L.: *See—*
Graham, Gary T.; and Gillen, Sara L., 4,926,962, Cl. 181-150.000.

Giordano, John. Locking radiator cap. 4,927,049, Cl. 220-201.000.

Girard, Joel; and Wattebled, Christian, to Vachette. Power-assisted rotary bolt lock. 4,927,196, Cl. 292-201.000.

Gisi, Ulrich, to Sandoz Ltd. Fungicides. 4,927,823, Cl. 514-237.500.

Gisske, Edward T.: *See—*
Nichol, Thomas W.; Gisske, Edward T.; and Johnson, Arlyn, 4,927,160, Cl. 273-371.000.

Gitlitz, Melvin H.: *See—*
Carson, Chrislyn M.; Copping, Leonard G.; Ehr, Robert J.; Gitlitz, Melvin H.; McNeil, Maynard W.; Street, Peter F. S.; and Liebeschuetz, John W., 4,927,812, Cl. 514-63.000.

Giuliani, David: *See—*
Ganguly, Dipankar; and Giuliani, David, 4,926,871, Cl. 128-660.070.

GKN Technology Limited: *See—*
Spedding, Colin E.; and Pollard, Andrew, 4,927,124, Cl. 267-229.000.

Gladden, Robert H., Jr.: *See—*
Bensel, William H., III; Gladden, Robert H., Jr., Malluck, John F.; Ross, Robert R.; and Williamson, Andrew H., Jr., 4,927,227, Cl. 350-96.200.

Glandt, Carlos A.; Vinegar, Harold J.; and Prats, Michael, to Shell Oil Company. Method of producing tar sand deposits containing conductive layers. 4,926,941, Cl. 166-248.000.

Glass, Alexander J., to KMS Fusion, Inc. Optical measurement of particle concentration. 4,928,153, Cl. 356-343.000.

Glatz, Peter: *See—*
Stolz, Robert; Mirring, Knut; Hein, Rudolf; Simon, Dieter; Raab, Lothar; and Glatz, Peter, 4,927,276, Cl. 384-572.000.

Glemet, Michel: *See—*
Lottiau, Michel; Glemet, Michel; Cognet, Gilles; and Causier, Alain, 4,927,583, Cl. 264-136.000.

Glen, Stefan J.; and Ellison, William E., to Beckman Instruments, Inc. Spring biased drive socket insert for centrifuge rotors. 4,927,406, Cl. 494-84.000.

Glienke, Peter O., to Wenko-Wenselaar GmbH & Co. KG. Room dehumidifier. 4,927,436, Cl. 55-281.000.

Glinka, Jerome: *See—*
Dolfini, Joseph E.; Glinka, Jerome; and Bosch, Andrew C., 4,927,805, Cl. 512-27.000.

Glover, Richard S., to RSL Industries, Inc. Oil dispensing system with controlled metering and method. 4,927,056, Cl. 222-1.000.

Gluchowski, Charles, to Allergan, Inc. Intraocular pressure reducing 1,11-lactone prostaglandins. 4,927,846, Cl. 514-450.000.

Goble, E. Marlowe; Somers, W. Karl; and McGuire, David. Process of endosteal fixation of a ligament. 4,927,421, Cl. 606-73.000.

Godfroid, Jean-Jacques: *See—*
Pirotzky, Eduardo; Dive, Georges; Godfroid, Jean-Jacques; and Heymans, Francoise, 4,927,825, Cl. 514-255.000.

Golata, John H.; and Woelfel, James A., to Motor Wheel Corporation. Compression mold for fiber-reinforced composite wheels. 4,927,347, Cl. 425-150.000.

Goldsmith, Eric S.: *See—*
Shirley, Thomas F., Jr.; and Goldsmith, Eric S., 4,927,789, Cl. 455-67.000.

Goldstein, Norman P.: *See—*
Impink, Albert J., Jr.; and Goldstein, Norman P., 4,927,593, Cl. 376-254.000.

Golik, Stephen S., to North American Philips Corporation. Corner raster distortion correction circuit. 4,927,219, Cl. 315-371.000.

Gombert, Bernd: *See—*
Dietrich, Johannes; and Gombert, Bernd, 4,926,708, Cl. 74-424.80C.

Gomes, Francis, to Manostat Corporation. Bottle uncapping and recapping machine. 4,926,717, Cl. 81-3.200.

Gomez, Cebers: *See—*
Rodriguez, Domingo; and Gomez, Cebers, 4,927,524, Cl. 208-131.000.

Goodknight, Frank A.: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.

Goodman, Clifford Lawrence: *See—*
Cook, Graham R., 4,926,718, Cl. 81-44.000.

Goodyear Tire & Rubber Company, The: *See—*
Demor, Edward J., III; Hinkel, Walter W.; and Lukich, Lewis T., 4,926,918, Cl. 152-154.000.
Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., 4,926,919, Cl. 152-209.00R.

Goosen, Carl C. Disposable anterior lower leg guard. 4,926,501, Cl. 2-22.000.

Gorbics, Mark S.: *See—*
Crawley, H. Bert; Rosenberg, Eli I.; Meyer, W. Thomas; Gorbics, Mark S.; Thomas, William D.; McKay, Roy L.; and Homer, John F., Jr., 4,928,246, Cl. 364-514.000.

Gordon, Bernard M., to Analogic Corporation. X-ray tomography apparatus. 4,928,283, Cl. 378-20.000.

Gordon, Orville. Apparatus and method for the precision evaluation of visual function in the fovea centralis (macula) area of the retina. 4,927,260, Cl. 351-243.000.

Gordon, Robert H.: *See—*
Ghebre-Sellassie, Isaac; Gordon, Robert H.; and Khan, Sadath U., 4,927,639, Cl. 424-497.000.

Gorziglia, Mario: *See—*
Chanock, Robert M.; Kapikian, Albert; Midthun, Karen; Flores, Jorge; Gorziglia, Mario; Hoshino, Yasutaka; and Peres-Schael, Irene, 4,927,628, Cl. 424-89.000.

Gossler, Hans K.; and Roberts, Charles P., to Navistar International Transportation Corp. Pallet box. 4,927,026, Cl. 206-600.000.

Goswami, Ramanuj; and Chen, Chin H., to Eastman Kodak Company. Fluorescent dyes and biological and analytical uses thereof. 4,927,927, Cl. 544-106.000.

Gotoh, Masao; Hira, Yasuo; Waragai, Kenichi; Nakamura, Shozo; and Yokono, Hitoshi, to Hitachi, Ltd. Heat insulating case and process for preparing the same. 4,927,044, Cl. 220-83.000.

Gotting, Georg; and Lammle, Harro, to Grapha-Holding AG. Assembly for adjusting the rolls of punching and like machines. 4,926,666, Cl. 72-247.000.

Gottlieb Roll GmbH & Co.: *See—*
Eylers, Dieter, 4,926,525, Cl. 24-11.00F

Goulding, Terence, to Imperial Chemical Industries PLC. Surface treatment for recording media. 4,927,716, Cl. 428-695.000.

Gouttebessis, Jacques; and Villaine, Philippe, to Michelin Recherche et Technique S.A. Pneumatic tire-the carcasse of which is formed of a regenerated cellulose fiber. 4,926,920, Cl. 152-548.000.

Goutzoulis, Anastosios P.; and Davies, David K., to Westinghouse Electric Corp. Pseudorandom pulse code generators using electro-optical XOR gates. 4,928,310, Cl. 380-46.000.

Grabbe, Dimitry G.; and Schnoor, William J., to AMP Incorporated. Electrical connector for high density usage. 4,927,369, Cl. 439-66.000.

Grace G.m.b.H.: *See—*
Bohnstedt, Werner; and Lindenstruth, Werner, 4,927,722, Cl. 429-147.000.

Graco Inc.: *See—*
Kwok, Kui-Chiu; and Marchand, Bernard J., 4,927,081, Cl. 239-223.000.

Graham, Gary T.; and Gillen, Sara L. Decorative speaker cover. 4,926,962, Cl. 181-150.000.

Graham, Janice C. Portable golf swing training aid. 4,927,152, Cl. 273-186.00R.

Gramondi, Patrick: *See—*
Barlou, Andre; Beltritti, Alexandre; Gramondi, Patrick; and Vidal, Hugues, 4,927,564, Cl. 252-628.000.

Granbom, Bo. Braking device in an arrangement for linear movement. 4,926,982, Cl. 188-271.000.

Grandfield, Walter J.; Mittel, James G.; and Davis, Walter L., to Motorola, Inc. Heterodyne stage having precise closed-loop control of the amplitude of the injection signal thereof. 4,928,314, Cl. 455-236.000.

Grandfield, Walter J.: *See—*
Drapac, George; and Grandfield, Walter J., 4,928,086, Cl. 340-825.440.

Grapha-Holding AG: *See—*
Gotting, Georg; and Lammle, Harro, 4,926.666, Cl. 72-247.000.
Merkli, Peter, 4,927,129, Cl. 270-60.000.

Graphtec Kabushiki Kaisha: *See—*
Takeuchi, Toshiyuki, 4,928,117, Cl. 346-76.0PH.

Gratzel, Michael; and Liska, Paul. Photo-electrochemical cell. 4,927,721, Cl. 429-111.000.

Graves, Daniel F.: *See—*
Tate, David P.; and Graves, Daniel F., 4,927,887, Cl. 525-279.000.

Gray, James. Method and apparatus relating to heat exchangers. 4,926,933, Cl. 165-173.000.

Green, James A.; and Terzis, Nicholas C., to Terzis, Nicholas C. Method and apparatus for displaying a three dimensional visual image. 4,927,238, Cl. 350-130.000.

Greenberg, Donald P.; Cohen, Michael F.; and Haines, Eric A., to Hewlett-Packard Company. System for deriving radiation images. 4,928,250, Cl. 364-518.000.

Greenberg, Ilan; and Cohen, Amir, to Lego M. Lemelshtrich Ltd. Ball-type water sprinkler. 4,927,082, Cl. 239-230.000.

Greulich, Norbert; Kiefer, Werner; and Rehm, Veronika, to Schott Glaswerke. Method of producing open-pore sintered glass filters and product. 4,927,442, Cl. 65-18.100.

GRID Systems Corporation: *See—*
Daly, John J., 4,927,986, Cl. 178-18.000.

Griffin, Dennis; and Pearce, John R., to Frazer-Nash Defence Systems Limited. Launchers for airborne missiles. 4,926,740, Cl. 89-1.819.

Griffiths, Richard W., to G2 Systems Corporation. Structural monitoring system using fiber optics. 4,927,232, Cl. 350-96.290.

Grims, Conrad M.; Moen, Bruce A.; and Pardubicky, Jaroslav F., to Adolph Coors Company. Container body maker die. 4,926,669, Cl. 72-349.000.

Griner, Paul K.: *See—*
Falk, Leonard P.; and Griner, Paul K., 4,927,051, Cl. 221-12.000.

Grinstein, Reuben H.: *See—*
Johnson, Grannis S.; Grinstein, Reuben H.; Hartman, Stuart J.; and Dallago, Raymond P., 4,927,902, Cl. 528-99.000.

Grisar, J. Martin; Dage, Richard C.; and Schnettler, Richard A., to Merrell Dow Pharmaceuticals. Cardiotonic aroylthiazolones. 4,927,939, Cl. 548-188.000.

Grivas, August. Animal trap. 4,926,581, Cl. 43-61.000.

Grobmyer, Louis R.: *See—*
Heibel, Michael D.; Impink, Albert J., Jr.; and Grobmyer, Louis R., 4,927,594, Cl. 376-258.000.

Groover, Phillip B., to Coca-Cola Company, The. Increased column-/selectivity vender. 4,927,055, Cl. 221-67.000.

Grossman, Richard F.; and McKane, Francis W., Jr., to Synthetic Products Company. Melamine salts of alkyl acid phosphates. 4,927,929, Cl. 544-195.000.

Grumman Corporation: *See—*
Foreman, Kenneth M.; and Maciulaitis, Algirdas, 4,928,286, Cl. 372-90.000.

Gruppo Lepetit S.p.A.: *See—*
Assi, Francesco; Lancini, Giancarlo; and Gianantonio, Anacleto, 4,927,754, Cl. 435-71.000.

GTE Products Corporation: *See—*
Kopatz, Nelson E.; Johnson, Walter A.; and Ritsko, Joseph E., 4,927,456, Cl. 75-346.000.
Shaffer, John W., 4,927,398, Cl. 445-9.000.

GTE Valenite Corporation: *See—*
Reiterman, Lee, 4,927,301, Cl. 408-180.000.

Gueret, Jean-Louis, to L'Oreal. Brush for applying mascara and container. 4,927,281, Cl. 401-129.000.

Guerin, Roland: *See—*
Hilaire, Jean C.; and Guerin, Roland, 4,927,860, Cl. 521-60.000.

Guerinot, William F.; Bradley, Ralph H.; and Troemel, Stephen T., to North American Philips Corporation. Dual aspect ratio display with cyclicly moving raster area to prevent uneven phosphor aging. 4,928,182, Cl. 358-245.000.

Gueyne, Jean; and Seguin, Marie-Christine, to Exsymol S.A.M. Silanol condensation products. 4,927,952, Cl 556-419.000.

Guggenberger, Rainer: *See—*
Purrmann, Robert; Guggenberger, Rainer; and Pieper, Gunter, 4,927,866, Cl. 523-115.000.

Guggenheim, Thomas L.; McCormick, Sharon J.; and Colley, Alice M., to General Electric Company. Method for preparing cyclic polyarylate oligomers. 4,927,904, Cl. 528-182.000.

Gulbenkian, Aylin H.: *See—*
Renga, James M.; Pon, Charles K.; Gulbenkian, Aylin H.; and Smith, Michael G., 4,927,508, Cl. 204-79.000.

Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., to Hoffman-La Roche Inc. Cycloproylpropenamides useful as platelet activing factor (PAF) antagonists. 4,927,826, Cl. 514-256.000.

Guthrie, Robert W.; Kierstead, Richard W.; Mullin, John G.; and Tilley, Jefferson W., to Hoffman-La Roche Inc. Pyridine compounds which are useful in treating a disease state characterized by an excess of platelet activating factors. 4,927,838, Cl. 514-337.000.

Gutknecht, Eva-Maria: *See—*
Fischli, Albert; Gutknecht, Eva-Maria; and Obrecht, Daniel, 4,927,958, Cl. 560-53.000.

Gutter, David H., to AMP Incorporated. Electrical connector shell assembly and module retention clip. 4,927,388, Cl. 439-660.000.

Gyorvari, Janos: *See—*
Alpar, Tibor; Gyorvari, Janos; and Schmidt, Erno, 4,927,573, Cl. 264-40.100.

Gyory, J. Richard: *See—*
Haak, Ronald P.; Theeuwes, Felix; and Gyory, J. Richard, 4,927,408, Cl. 604-20.000.

G2 Systems Corporation: *See—*
Griffiths, Richard W., 4,927,232, Cl. 350-96.290.

H-D Tech Inc.: *See—*
Mathur, Indresh; James, Allan; and Bissett, David, 4,927,509, Cl. 204-83.000.

H. Niemeyer Sohne GmbH & Co. KG: *See—*
Ungruh, Josef; and Rohlmann, Maximilian, 4,926,619, Cl. 56-15.400.

H.V.T. Technology Ltd.: *See—*
Madill, E. Gaylord, 4,926,713, Cl. 475-146.000.

Haag, Werner O.: *See—*
Bell, Weldon K.; and Haag, Werner O., 4,927,924, Cl. 540-536.000.

Haak, Ronald P.; Theeuwes, Felix; and Gyory, J. Richard, to Alza Corporation. Electrotransport transdermal system. 4,927,408, Cl. 604-20.000.

Haas, Margret: *See—*
Bernhardt, Gunther; Amort, Jurgen; Kragl, Heinz; and Haas, Margret, 4,927,948, Cl. 556-401.000.

Haber, Edgar: *See—*
Matsueda, Gary R.; Haber, Edgar; and Hui, Kwan, 4,927,916, Cl. 530-387.000.

Haber, Terry M.; Smedley, William H.; Foster, Clark B.; and Lewis, John A., Jr., to Habley Medical Technology Corporation. Combination needle sheath and sterility package. 4,927,019, Cl. 206-365.000.

Habermann, Patrick R. Convertible leg/roller structure. 4,927,105, Cl. 248-188.800.

Habley Medical Technology Corporation: *See—*
Haber, Terry M.; Smedley, William H.; Foster, Clark B.; and Lewis, John A., Jr., 4,927,019, Cl. 206-365.000.

Hackenberger, Alfred; and Patsch, Manfred, to BASF Aktiengesellschaft. 3-cyanoquinoline derivatives. 4,927,935, Cl. 546-157.000.

Haddad, James H.; and Owen, Hartley, to Mobil Oil Corporation. Method for reducing overcracking during FCC catalyst separation. 4,927,527, Cl. 208-161.000.

Hademenos, Jim P., to Western Atlas International, Inc. Compound linkage-arm assembly for use in bore-hole tools. 4,926,937, Cl. 166-206.000.

Haesebrouck, Francis, to Usines et Acieries de Sambre et Meuse. Armor particularly for a safe and a safe thus produced. 4,926,761, Cl. 109-49.500.

Haga, Shunichi: *See—*
Yoshizawa, Tetsuo; Terayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shunichi; Ichida, Yasuteru; and Konishi, Masaki, 4,926,549, Cl. 29-876.000.

Hagar, Donald K.; and McIntyre, Robert W., to Eagleair, Inc.; and McIntyre, Robert W. Method and system for controlling the supply of fuel and air to a furnace. 4,927,351, Cl. 431-12.000.

Hagemann, Hermann: *See—*
Adler, Alfons; Widdig, Arno; Kuhle, Engelbert; Fuhrer, Wolfgang; Hagemann, Hermann; and Hanssler, Gerd, 4,927,824, Cl. 514-241.000.

Haggren, Henrik. Method for the three-dimensional surveillance of the object space. 4,928,175, Cl. 358-108.000.

Haines, Eric A.: *See—*
Greenberg, Donald P.; Cohen, Michael F.; and Haines, Eric A., 4,928,250, Cl. 364-518.000.

Haire, Allen; Abele, Alan C.; and Kuczek, Stanley W., to Enerco Technical Products, Inc. Burner assembly. 4,927,355, Cl. 431-329.000.

Hakuta, Shinsaku; Yasaka, Yasuhiro; Nagura, Osamu; Tsuji, Eiji; Suzuki, Makoto; and Akagawa, Hirotaka, to Hitachi, Ltd. Method of assembling wound rotor of vertical type adjustable speed hydroelectric rotating machine at its installation site. 4,926,541, Cl. 29-598.000.

Hallenbach, Werner: *See—*
Lindel, Hans; and Hallenbach, Werner, 4,927,938, Cl. 546-315.000

VOL
1114
ISS
4
MY
22
1990
UMI

Hallings, Leonard L.; Bramer, Donald W.; Sanborn, Bruce A.; and Schryver, James E., to MDT Corporation. Lighthead assembly. 4,928,211, Cl. 362-33.000.

Hama, Shinji: *See—*
Hiraoka, Saburo; Hama, Shinji; and Senga, Mitsuo, 4,927,915, Cl. 528-490.000.

Hamala, Sirpa; Heikkila, Matti; Laine, Jouko; Kokkonen, Kari; and Kenakkala, Timo, to Oy Tampella AB. Process for removing a constituent from a hot gas stream by exothermic ionic reaction of the constituent with a reactant provided in fine particulate form. 4,927,613, Cl. 423-244.000.

Hamamatsu Photonics Kabushiki Kaisha: *See—*
Takahashi, Akira; and Koishi, Musubu, 4,928,248, Cl. 372-38.000.

Hamari Chemicals, Ltd.: *See—*
Inagaki, Tetsuya; Tagashira, Eijiro; Takaya, Masahiro; and Nishimura, Yasuhiro, 4,927,317, Cl. 514-184.000.

Hamilton, Frank S.; Ouzts, Johnny D.; and Mabry, Ray W., to HOM, Inc. Method of reinstating acceptable flavor to off-flavor catfish by treatment with peroxide additives. 4,926,795, Cl. 119-3.000.

Hamilton, Margaret L.: *See—*
Johnson, Gerald D.; Lobsinger, Ralph J.; Hamilton, Margaret L.; and Gelles, David S., 4,927,468, Cl. 148-3.000.

Hamilton Standard Controls, Inc.: *See—*
Mierzwinski, Eugene P., 4,927,490, Cl. 156-634.000.

Hamilton, Thomas W., to T W Hamilton Design Limited. Apparatus for selecting and discharging seeds. 4,926,583, Cl. 47-1.010.

Han, Patrick: *See—*
Yang, Herbert; Han, Patrick; and Yu, Frank, 4,927,018, Cl. 206-365.000.

Handrick, Karin: *See—*
Muhlratzer, August; Handrick, Karin; Lassmann, Siegfried; and Hirt, Alfred, 4,927,702, Cl. 428-215.000.

Hannewald, Thomas: *See—*
Porth, Wolfgang; Weibler, Wolfgang; Kern, Eckhart; Hannewald, Thomas; and Weingartner, Reiner, 4,926,821, Cl. 123-399.000.

Hanselka, Reinhard, to Georg Fischer AG. Apparatus for fusion joining plastic pipe. 4,927,999, Cl. 219-535.000.

Hansen, Bernd. Process for filling and subsequent fusion welding of receptacles. 4,926,613, Cl. 53-433.000.

Hansen, Loren F.: *See—*
Cozine, Mark L.; Ferguson, David G.; Hansen, Loren F.; and Lamb, Mark E., 4,926,947, Cl. 172-22.000.

Hanson, Carl E. Ornamental ceiling system. 4,926,606, Cl. 52-484.000.

Hanson, Richard A. Proofmass suspension assembly for accelerometers. 4,926,689, Cl. 73-497.000.

Hanssler, Gerd: *See—*
Adler, Alfons; Widdig, Arno; Kuhle, Engelbert; Fuhrer, Wolfgang; Hagemann, Hermann; and Hanssler, Gerd, 4,927,824, Cl. 514-241.000.
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,927,844, Cl. 514-425.000.

Hanyu, Susumu; Hara, Kazumasa; and Sano, Yasuro, to Janome Sewing Machine Company Limited. Needle hole guide mechanism for zigzag sewing machine. 4,926,770, Cl. 112-453.000.

Hara, Kazumasa: *See—*
Hanyu, Susumu; Hara, Kazumasa; and Sano, Yasuro, 4,926,770, Cl. 112-453.000.

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Hara, Masanori: *See—*
Sugawara, Sakuo; Hara, Masanori; and Suzuki, Takane, 4,926,839, Cl. 126-96.000.

Hara, Toshiro: *See—*
Fujimoto, Takanori; and Hara, Toshiro, 4,928,228, Cl. 364-431.090.

Hara, Toshirou: *See—*
Fujimoto, Takanori; and Hara, Toshirou, 4,926,807, Cl. 123-179.0BG.

Harada, Hrioshi: *See—*
Arai, Hajime; and Harada, Hrioshi, 4,927,783, Cl. 437-196.000.

Harazoe, Hirofumi: *See—*
Ohori, Yoshiji; and Harazoe, Hirofumi, 4,927,871, Cl. 524-230.000.

Hardin, George T., to Robertshaw Controls Company. Differential pressure transmitter, a square root extracting device therefor and methods of making the same. 4,926,697, Cl. 73-861.480.

Hardisty, Derek: *See—*
Stapley, Gerald; Tate, Geoffrey; and Hardisty, Derek, 4,926,665, Cl. 70-277.000.

Haring, Petrus G. M., to Lever Brothers Company. Process for the extraction of lactones from lipid material. 4,927,652, Cl. 426-330.600.

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Harmon, James E., to Xerox Corporation. Contaminant cleaner. 4,928,149, Cl. 355-305.000.

Harms, Klaus; Schray, Hans-Dieter; Taubitz, Bernd; and Wirtz, Rainer, to Robert Bosch GmbH. Circuit arrangement for operating a multiphase synchronous motor on a direct-voltage system. 4,928,042, Cl. 318-254.000.

Harnisch, Horst; and Raue, Roderich, to Bayer Aktiengesellschaft. Colorless salts of heteropolyacids as charge control substances in toners. 4,927,729, Cl. 430-110.000.

Harrier Inc.: *See—*
Fenyo, Martha; Borberg, Helmut; and Kadar, Janos G., 4,926,861, Cl. 128-395.000.

Harrigill, William T.: *See—*
Shellenberger, Timothy J.; and Harrigill, William T., 4,926,840, Cl. 126-110.00R.

Harris, Benjamin J. Staging. 4,926,590, Cl. 52-8.000.

Harris Corporation: *See—*
Hsu, Sheng T.; and Flatley, Doris W., 4,927,777, Cl. 437-44.000.

Harris, Don W. Sacrum support device. 4,926,845, Cl. 128-78.000.

Harris, Robert F.: *See—*
Frisch, Kurt C., Jr.; and Harris, Robert F., 4,927,864, Cl. 521-163.000.

Harrison, Anthony W.; and Taft, Philip A., to Lucas Industries, Public Limited Company. Rotary electric drive device for anti-skid braking system. 4,927,212, Cl. 303-115.000.

Harrison, Daniel J.: *See—*
Bailey, David B.; Harrison, Daniel J.; and Yacobucci, Paul D., 4,927,803, Cl. 503-227.000.

Harsanyi, Jozsef; Kohanyi, Laszlo ; Domsa, Karoly; Szakacs, Lajos; Szentgyorgyi, Geza; and Imre, Aladar, to Egis Gyogyszergyar. Lubricant of lubricating oil basis for lubricating rotating and/or sliding surfaces and process for preparing same. 4,927,549, Cl. 252-25.000.

Hart, Richard T., to Varo, Inc. Universal night vision goggle adapter. 4,927,237, Cl. 350-319.000.

Hartlage, Robert P.: *See—*
Cheng, David; Hartlage, Robert P.; and Zhang, Wesley W., 4,927,485, Cl. 156-345.000.

Hartley, Craig J.: *See—*
Rabinovitz, Raphael S.; and Hartley, Craig J., 4,926,875, Cl. 128-691.000.

Hartman, Stuart J.: *See—*
Johnson, Grannis S.; Grinstein, Reuben H.; Hartman, Stuart J.; and Dallago, Raymond P., 4,927,902, Cl. 528-99.000.

Hartvig Jensen & Co. A/S: *See—*
Alsing, Erik, 4,927,080, Cl. 239-77.000.

Hartwell, George E.: *See—*
Molzahn, David C.; Hartwell, George E.; and Bowman, Robert G., 4,927,931, Cl. 544-357.000.

Harward, Charles N., to Philip Morris Incorporated. Methods and apparatus for optically enhancing selected features in an input image. 4,928,181, Cl. 358-230.000.

Hasebe, Nobuhisa: *See—*
Takahashi, Shuzo; Tsuchida, Yutaka; Osada, Shiro; Hasebe, Nobuhisa; and Nakada, Masayuki, 4,926,925, Cl. 164-154.000.

Hasegawa, Jun: *See—*
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,928,172, Cl. 358-98.000.

Hasegawa, Mitsuhiro: *See—*
Tamura, Haruhisa; Yamasaki, Takahiko; and Hasegawa, Mitsuhiro, 4,927,998, Cl. 219-494.000.

Hasegawa, Tai; Monnai, Jun; and Matsuzaki, Masatoshi, to Konishiroku Photo Industry Co., Ltd. Platen for thermal transfer printer. 4,928,134, Cl. 346-76.0PH.

Hasha, Brian B.; Hasha, Malvern M.; and Hasha, Bruce B. Method and apparatus for externally and internally testing for leaks in connections between tubular members. 4,926,680, Cl. 73-46.000.

Hasha, Bruce B.: *See—*
Hasha, Brian B.; Hasha, Malvern M.; and Hasha, Bruce B., 4,926,680, Cl. 73-46.000.

Hasha, Malvern M.: *See—*
Hasha, Brian B.; Hasha, Malvern M.; and Hasha, Bruce B., 4,926,680, Cl. 73-46.000.

Hashimoto, Hikotaka; and Kobayashi, Kunio, to Kikkoman Corporation. Apparatus for manufacturing soy sauce. 4,926,747, Cl. 99-486.000.

Hashimoto, Hiroshi; and Yamanaka, Hiromichi, to Canon Kabushiki Kaisha. Sheet stacking apparatus. 4,927,131, Cl. 271-215.000.

Hass, Rudi; Jansen, Georg; and Kallen, Wilhelm, to Eisengiesserei Monforts GmbH & Co. Cast-iron element. 4,927,688, Cl. 428-34.600.

Hass, Wolfgang: *See—*
Krefl, Hans-Diedrich; MacKenthun, Holger; and Hass, Wolfgang, 4,928,087, Cl. 340-825.710.

Hata, Kazuo: *See—*
Osaka, Shigemi; Hata, Kazuo; and Takahashi, Tsukasa, 4,927,560, Cl. 252-315.100.

Hata, Yoshiaki: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,928,124, Cl. 354-106.000.

Hatcher, Herbert J.; Gallian, John J.; and Leeper, Stephen A., to Idaho Research Foundation, Inc. Production of substantially pure fructose. 4,927,757, Cl. 435-105.000.

Hatta, Yoshihiko, to Minolta Camera Kabushiki Kaisha. Copy apparatus having plural copy sheet discharge trays for different sized copy sheets. 4,928,150, Cl. 355-311.000.

Hattori, Shigenori: *See—*
Kuzuya, Susumu; Nagao, Yoshiaki; Asakura, Hideo; and Hattori, Shigenori, 4,927,278, Cl. 400-208.000.

Haupt, Eugene J., to Allegretti & Company. Semi-automatic string trimmer head. 4,926,557, Cl. 30-276.000.

Hauser, Hermann. Holder for rotary material removing tools. 4,927,304, Cl. 409-231.000.

Haushalter, Frederick W., to Robinson Fin Machines, Inc. Compressed fin heat sink. 4,926,935, Cl. 165-185.000.

Hawkins, George W.: *See—*
Lesk, Israel A.; Thomas, Ronald E.; Hawkins, George W.; and Rugg, James M., 4,928,162, Cl. 357-72.000.

Hayakawa, Futomi; and Onoda, Kazuo, to Kabushiki Kaisha Hybec. Linear lamp unit with contacts at both ends. 4,928,210, Cl. 362-217.000.

Hayano, Fusakazu: *See—*
Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, 4,927,889, Cl. 525-285.000.

Hayasaka, Kenichi, to Sanshin Kogyo Kabushiki Kaisha. Fixing structure for bellows of marine propulsion device. 4,927,393, Cl. 440-112.000.

Hayashi, Hiroyuki: *See—*
Sakimori, Hideharu; Ihara, Susumu; and Hayashi, Hiroyuki, 4,927,314, Cl. 414-416.000.

Hayashi, Keiji: *See—*
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, 4,927,959, Cl. 560-193.000.

Hayashi, Tetsuaki: *See—*
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,926,624, Cl. 56-202.000.

Hayashida, Suetou; Kimura, Kyoichiro; and Takahashi, Eiji, to Maruzen Petrochemical Co., Ltd. Polypropylene resin compositions. 4,927,885, Cl. 525-211.000.

Hayden, Mark W.: *See—*
Hayden, William; Hayden, Mark W.; and White, Richard S., 4,927,318, Cl. 414-786.000.

Hayden, William; Hayden, Mark W.; and White, Richard S., to Galpin Research, Limited Partnership. Method for forming, grasping and handling cubes of stacked printed products. 4,927,318, Cl. 414-786.000.

Haydo, Donald H.: *See—*
Rau, Robert J.; and Haydo, Donald H., 4,926,668, Cl. 72-289.000.

Hayes, Cecil: *See—*
Snowball, Malcolm R.; and Hayes, Cecil, 4,927,060, Cl. 222-146.500.

Hayes, Harry: *See—*
Nimmey, Alan; and Hayes, Harry, 4,927,058, Cl. 222-106.000.

Hayman, Andrew J.: *See—*
Kimball, Christopher V.; Stanke, Fred E.; Randall, Curtis J.; and Hayman, Andrew J., 4,928,269, Cl. 367-35.000.

Hayman, Richard: *See—*
Asensio, Javier; and Hayman, Richard, 4,927,684, Cl. 428-91.000.

Hays, Byron G., to BASF Corp. Transparent, high strength organic pigments and process for making same. 4,927,466, Cl. 106-494.000.

Heatherington, Kenneth: *See—*
Crossley, Roger; and Heatherington, Kenneth, 4,927,936, Cl. 546-181.000.

Heibel, Michael D.; Impink, Albert J., Jr.; and Grobmyer, Louis R., to Westinghouse Electric Corp. Thermocouple based control rod position indication system. 4,927,594, Cl. 376-258.000.

Heidtmann, Denis L.; and Blouke, Morley M., to Tektronix, Inc. Charge-coupled device for detecting spatial variation in the intensity of electromagnetic radiation. 4,928,003, Cl. 250-211.00J.

Heikkila, Matti: *See—*
Hamala, Sirpa; Heikkila, Matti; Laine, Jouko; Kokkonen, Kari; and Kenakkala, Timo, 4,927,613, Cl. 423-244.000.

Heim, Philippe; and Riess, Gerard, to Norsolor. Process for the manufacture of an impact-resistant thermoplastic resin. 4,927,867, Cl. 523-339.000.

Hein, Rudolf: *See—*
Stolz, Robert; Mirring, Knut; Hein, Rudolf; Simon, Dieter; Raab, Lothar; and Glatz, Peter, 4,927,276, Cl. 384-572.000.

Heinemann, Joachim; Spies, Karl-Heinz; Keller, Frank; Beicht, Bernd; Leitermann, Wulf; and Lechler, Rolf, to Carl Freudenberg, Firma; and Audi AG, Firma. Louver. 4,926,921, Cl. 160-115.000.

Heinen, Irving J. Valve control mechanism. 4,927,113, Cl. 251-165.000.

Heinhold, Hans, to Sussman, Jennewein Bekleidungstechnik GmbH. Apparatus for singularizing garment hangers. 4,927,054, Cl. 221-289.000.

Heitmann, Uwe: *See—*
Lorenzen, Heinz-Christen; Heitmann, Uwe; Siems, Wolfgang; and Pinck, Peter, 4,926,886, Cl. 131-84.400.

Helfenstein, Jim, to Williams Controls, Inc. Manually operated air valve and actuator in combination control a hydraulic spool valve for maneuvering heavy equipment. 4,926,905, Cl. 137-625.600.

Helfet, Peter R.: *See—*
Pettigrew, Robert M.; Humberstone, Victor C.; Gardner, Keith; Longman, Robert J.; and Helfet, Peter R., 4,928,132, Cl. 346-135.100.

Helgesson, Bernt, to Akab of Sweden AB. Device for aligning and cutting a web. 4,926,725, Cl. 83-155.000.

Helkey, Roger J.: *See—*
Ashjaee, Javad; Helkey, Roger J.; Lorenz, Robert G.; and Sutherland, Robert A., 4,928,106, Cl. 342-352.000.

Hellquist, Ivan; and Muhlmann, Carl P. M., to Interspiro AB. Respirator. 4,926,855, Cl. 128-201.280.

Hemm, Gerhard; Clausing, Gerhard; and Pietzsch, Heiko, to Jacobs Suchard AB. Package having a tear-open strip. 4,927,028, Cl. 206-618.000.

Hemmerich, Louis; and Strait, Ronald. Gas and oil truck tank mounting strap replacement kit. 4,927,066, Cl. 224-42.45R.

Hemox, Inc.: *See—*
Simpson, James L., 4,927,076, Cl. 229-132.000.

Hendricks, Ross D., to Excellon Automation. Adjustable component cover plate for vibrating conveyor. 4,927,001, Cl. 198-463.500.

Henkel Corporation: *See—*
Johnson, Grannis S.; Grinstein, Reuben H.; Hartman, Stuart J.; and Dallago, Raymond P., 4,927,902, Cl. 528-99.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Fiedler, Juergen; Stoeffler, Albert; and Bergmann, Michael, 4,927,059, Cl. 222-136.000.
Schrader, Dieter; and Neuhaus, Winifried, 4,927,627, Cl. 424-62.000.
Wuest, Willi; Eskuchen, Rainer; Esser, Herbert; and Leischner, Hasso, 4,927,946, Cl. 549-371.000.

Henkels, Walter H.: *See—*
Dhong, Sang H.; Lu, Nicky C.; and Henkels, Walter H., 4,927,779, Cl. 428-52.000.

Henne, Heinrich; Dammertz, Karl-Heinz; Schneider, Lutz T.; and Blaszyk, Gotthard, to Krupp Polysius AG. Grinding process and apparatus. 4,927,086, Cl. 241-80.000.

Henricson, Kaj O.; Repo, Erkki T.; and Ronkonharju, Hannu U., to A. Ahlstrom Corporation. Method and apparatus for separating knots. 4,927,529, Cl. 209-270.000.

Henriksson, Bengt-Ake, to ABU Garcia Produktion AB. Open-face fishing reel of the fixed-spool type. 4,927,094, Cl. 242-242.000.

Henzel, Richard P.; and Zengerle, Paul L., to Eastman Kodak Company. Photographic element having solid particle dispersion oxidized developer scavenger. 4,927,744, Cl. 430-566.000.

Hepburn, Michael J. Self-stabilizing floating cooler. 4,927,041, Cl. 220-20.000.

Heppke, Gerd: *See—*
Bahr, Christian; Heppke, Gerd; Lotzsch, Detlef; Dubal, Hans-Rolf; Escher, Claus; and Ohlendorf, Dieter, 4,927,244, Cl. 350-350.00S.

Herail, Norbert: *See—*
Devaux, Francois; Herail, Norbert; Lefevre, Denis; and Lehuede, Jean-Pierre, 4,928,077, Cl. 333-111.000.

Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Multiple feed point catalytic cracking process using elutriable catalyst mixture. 4,927,522, Cl. 208-120.000.

Hercules Incorporated: *See—*
Walkden, Stephen A., 4,927,496, Cl. 162-136.000.

Heritage, Jonathan P.; and Weiner, Andrew M., to Bell Communications Research, Inc. Optical systems and methods based upon temporal stretching, modulation and recompression of ultrashort pulses. 4,928,316, Cl. 455-600.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Capelle, Gerd, 4,927,482, Cl. 156-243.000.

Hermes Electronics Limited: *See—*
Armstrong, Bruce A.; and Dunn, Robert G., 4,928,263, Cl. 367-118.000.

Herran, Vincent W.; and Wofford, George D., to W. R. Grace & Co.-Conn. Flexible stretch/shrink film. 4,927,708, Cl. 428-332.000.

Herrin, Danny R. Step/extension ladder. 4,926,964, Cl. 182-22.000.

Herrington, Fox J., to Mobil Oil Corp. Water bath film cooling apparatus and method. 4,927,574, Cl. 264-40.600.

Herve, Philippe, to Universite Paris X - Nanterre. Method and apparatus for optically measuring, without contact, the granulometry of a cloud of particles or the roughness of a surface. 4,927,267, Cl. 356-336.000.

Herzner, Frederick C.: *See—*
Nash, Dudley O.; and Herzner, Frederick C., 4,926,633, Cl. 60-226.100.

Heslop, Christopher: *See—*
Welbourn, Anthony; and Heslop, Christopher, 4,927,774, Cl. 437-31.000.

Hess, Robert, to Progressive Angioplasty Systems, Inc. Catheter for balloon angioplasty. 4,927,413, Cl. 604-95.000.

Hesselink, Lambertus; and Redfield, Steve R., to Microelectronic & Computer Technology Corp. System and method for photorefractive holographic recording and signal processing. 4,927,220, Cl. 350-3.640.

Hetherington, Richard: *See—*
D'Angelo, Philip J.; Hetherington, Richard; and Rogan, Joseph J., 4,927,796, Cl. 502-62.000.

Hetrick, Homer S. Cover for smoking accessory. 4,926,573, Cl. 40-663.000.

Hettinger, William P., Jr.: *See—*
Ward, Clifford; Chao, Eugene; Booth, Roy E.; Turrill, Frank H.; Wombles, Robert H.; Newman, John W.; and Hettinger, William P., Jr., 4,927,620, Cl. 423-447.200.

Hetz, Helmar: *See—*
Breitenbach, Otto; Hetz, Helmar; Rous, Friedemann; and Ottenreuther, Josef, 4,927,570, Cl. 264-1.400.

Hetzel, Frederick: *See—*
Skoch, Michael J.; and Hetzel, Frederick, 4,928,032, Cl. 313-318.000.

Hewlett-Packard Company: *See—*
Baum, Allen; Bryg, William R.; Mahon, Michael J.; Lee, Ruby B.; and Muchnick, Steven S., 4,928,239, Cl. 364-200.000.
Brock-Fisher, George A.; Kranz, Paul R.; Mniece, James R.; Thiele, Karl E.; Savord, Bernard J.; and Smith, Richard B., 4,926,872, Cl. 128-661.010.
Frankenreiter, Michael, 4,926,873, Cl. 128-681.000.
Greenberg, Donald P.; Cohen, Michael F.; and Haines, Eric A., 4,928,250, Cl. 364-518.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Hunt, Barry F.; D'Sa, Alwyn P.; and Magnin, Paul A., 4,928,231, Cl. 364-518.000.
Marzalek, Michael S.; Peterson, Stephen R.; and Wendler, John A., 4,928,251, Cl. 364-484.000.
Rahman, Abdul W. B. A., 4,928,093, Cl. 340-709.000.

Heymans, Francoise: *See—*
Pirotzky, Eduardo; Dive, Georges; Godfroid, Jean-Jacques; and Heymans, Francoise, 4,927,825, Cl. 514-255.000.

Hickey, Pieter John A.; and Claassen, Cornelius J., to Aztec Sensible Cooling, Inc. Integrated wet bulb depression air cooler. 4,926,656, Cl. 62-310.000.

Hickok, William K.; Riley, John M.; and Kosarko, Gerald J., to Eastman Kodak Company. Magnetic recording device using circumferentially offset heads with double sided media. 4,928,196, Cl. 360-105.000.

Higashi, Yuichirou, to Ricoh Company, Ltd. Fixing device selectively operable in color or black/white coping mode. 4,928,148, Cl. 355-290.000.

Higemitsu, Yasuo: *See—*
Rokutanda, Shuji; Higemitsu, Yasuo; Tsuchida, Akiyoshi; and Yamakoshi, Yukihiro, 4,927,734, Cl. 430-264.000.

Higuchi, Hisayuki; Homma, Noriyuki; Suzuki, Makoto; and Tachibana, Suguru, to Hitachi, Ltd. Semiconductor integrated circuit. 4,928,265, Cl. 365-189.010.

Higuchi, Mitsuhiro; and Yamamoto, Hirofumi, to Toto Ltd. Toilet seat structure capable of automatically feeding a seat covering paper onto a toilet seat. 4,926,504, Cl. 4-247.000.

Higuchi, Mitsuhiro; Yamamoto, Hirofumi; Yamamoto, Osamu; Fujii, Shokichi; and Nonomura, Katsumi, to Toto Ltd. Toilet seat structure capable of automatically feeding seat covering paper on toilet seat. 4,926,505, Cl. 4-247.000.

Hijikata, Kenji: *See—*
Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Takahashi, Katsuhiko, 4,927,895, Cl. 525-438.000.

Hijiya, Hiromi; and Miyake, Toshio, to 501 Kabushiki Kaisha Hayashibara Kagaku Kenkyujo. Association complex comprising pullulan and polyethylene glycol, and preparation and uses of the same. 4,927,636, Cl. 424-409.000.

Hilaire, Jean C.; and Guerin, Roland, to Atochem. Polyamide powder formed by particles having a gypsum rose structure and process for preparing such powder. 4,927,860, Cl. 521-60.000.

Hill, Amel. Acoustic transducer. 4,928,312, Cl. 381-192.000.

Hill, James B. Press brake. 4,926,671, Cl. 72-389.000.

Hill, Peter F., to British Aerospace Public Limited Company. Surface mounting leadless components on conductor pattern supporting substrates. 4,927,697, Cl. 428-198.000.

Hill, Robert: *See—*
Pitt, Gilles D.; Jones, Roger E.; Antell, George R.; Spicer, Lyndon R.; Barnett, John A.; and Hill, Robert, 4,928,319, Cl. 455-612.000.

Hill, Thomas F., Jr.: *See—*
Repman, Joseph F.; Morris, Thomas E.; and Hill, Thomas F., Jr., 4,927,621, Cl. 423-488.000.

Hillock, Bart A. Fluid vibration damper for racquet. 4,927,143, Cl. 273-73.00D.

Hinkel, Walter W.: *See—*
Demor, Edward J., III; Hinkel, Walter W.; and Lukich, Lewis T., 4,926,918, Cl. 152-154.000.

Hinkle, Allen J. Method of selecting medication and medical equipment. 4,926,885, Cl. 128-898.000.

Hipwell, William E. H., to Eastman Kodak Company. Control of visual display units. 4,928,178, Cl. 358-160.000.

Hira, Yasuo: *See—*
Gotoh, Masao; Hira, Yasuo; Waragai, Kenichi; Nakamura, Shozo; and Yokono, Hitoshi, 4,927,044, Cl. 220-83.000.

Hirai, Masaru: *See—*
Hisamoto, Iwao; Hirai, Masaru; and Ishikawa, Sueyoshi, 4,927,950, Cl. 556-419.000.

Hiramitsu, Tetsushi: *See—*
Inui, Shuji; Hiramitsu, Tetsushi; Takahaski, Toshinori; Tamaki, Makoto; Kikuta, Mitsuhiro; and Mizutani, Junichi, 4,927,364, Cl. 439-15.000.

Hirano, Sadayuki; Murano, Katsuaki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, to Suzuki Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Method of controlling continuously variable transmission system. 4,926,716, Cl. 74-866.000.

Hiraoka, Saburo; Hama, Shinji; and Senga, Mitsuo, to Mitsubishi Rayon Company, Ltd. Process for producing antistatic polymeric material. 4,927,915, Cl. 528-490.000.

Hirashima, Yutaka: *See—*
Isozaki, Kei; Hirashima, Yutaka; and Imamura, Yasuo, 4,927,791, Cl. 501-87.000.

Hirono, Tomohide: *See—*
Naka, Hiroyuki; Hirono, Tomohide; Suzuki, Naoki; and Ichiyanagi, Takashi, 4,927,068, Cl. 228-103.000.

Hirose, Naoki; Inujima, Takashi; and Takayama, Toru, to Semiconductor Energy Laboratory Co., Ltd. Microwave plasma apparatus employing helmholtz coils and ioffe bars. 4,926,791, Cl. 118-723.000.

Hirota, Mitsuhiko: *See—*
Fujioka, Yoshiki; and Hirota, Mitsuhiko, 4,928,052, Cl. 318-762.000.

Hirsch, Albrecht; and Fleischer, Erwin, to Neynaber Chemie GmbH. Process for the production of basic soaps of divalent metals in powder form. 4,927,548, Cl. 252-17.000.

Hirsch, Gerald P.: *See—*
Bayless, Robert K.; and Hirsch, Gerald P., 4,927,850, Cl. 514-458.000.

Hirt, Alfred: *See—*
Muhlratzer, August; Handrick, Karin; Lassmann, Siegfried; and Hirt, Alfred, 4,927,702, Cl. 428-215.000.

Hirt, Manfred; and Arndt, Heinrich, to Zahnraderfabrik Renk AG. Planetary gear train. 4,926,715, Cl. 475-337.000.

Hirukawa, Itsushi: *See—*
Kudoh, Noboru; Hirukawa, Itsushi; Aoki, Satoshi; Yoshimura, Tsuyoshi; and Shiozawa, Shigeki, 4,927,390, Cl. 440-88.000.

Hisamoto, Iwao; Hirai, Masaru; and Ishikawa, Sueyoshi, to Daikin Industries, Ltd. Fluorine-containing silane compounds. 4,927,950, Cl. 556-419.000.

Hisanaga, Yorisato: *See—*
Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi; Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, 4,927,941, Cl. 548-264.800.

Hitachi Automotive Engineering Co., Ltd.: *See—*
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Hitachi Chemical Company, Ltd.: *See—*
Era, Susumu; Kobayashi, Setsuo; and Mukoh, Akio, 4,927,735, Cl. 430-270.000.

Hitachi Engineering Co., Ltd.: *See—*
Kuroda, Hiroshi; and Watanabe, Atsushi, 4,928,107, Cl. 342-357.000.

Hitachi, Ltd.: *See—*
Gotoh, Masao; Hira, Yasuo; Waragai, Kenichi; Nakamura, Shozo; and Yokono, Hitoshi, 4,927,044, Cl. 220-83.000.
Hakuta, Shinsaku; Yasaka, Yasuhiro; Nagura, Osamu; Tsuji, Eiji; Suzuki, Makoto; and Akagawa, Hirotaka, 4,926,541, Cl. 29-598.000.
Higuchi, Hisayuki; Homma, Noriyuki; Suzuki, Makoto; and Tachibana, Suguru, 4,928,265, Cl. 365-189.010.
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.
Iwai, Kazumi; Koizumi, Hiromi; and Wada, Katsuo, 4,926,645, Cl. 60-723.000.
Kaku, Nobuyuki; Shigemura, Tatsuya; Uesugi, Masaki; Kano, Kiyoshi; and Ogiro, Kenji, 4,928,191, Cl. 360-85.000.
Kamada, Eiki; Shintani, Yooichi; Kuriyama, Kazunori; Shonai, Tohru; and Inoue, Kiyoshi, 4,928,226, Cl. 364-200.000.
Kawabata, Kenji; Ogawa, Soichiro; and Masaki, Ryoichi, 4,928,037, Cl. 315-127.000.
Kobayashi, Masaharu; and Nishimura, Yukio, 4,928,185, Cl. 360-19.100.
Kuroda, Hiroshi; and Watanabe, Atsushi, 4,928,107, Cl. 342-357.000.
Kurosawa, Hinoko; Itoh, Kazuya; Nakamura, Hisashi; and Ishihara, Masamichi, 4,928,281, Cl. 371-51.100.
Nishino, Yoshitaka; Sawa, Toshio; Ohsumi, Katsumi; and Itow, Hisao, 4,927,598, Cl. 376-306.000.

Hitachi Video Engineering, Ltd.: *See—*
Kobayashi, Masaharu; and Nishimura, Yukio, 4,928,185, Cl. 360-19.100.

Hitch, Thomas T., to General Electric Company. Fluid distribution apparatus. 4,927,359, Cl. 432-206.000.

Hix, Charles J., Jr.: *See—*
Baker, David J.; Dubuque, Kenneth J.; Estep, John M.; and Hix, Charles J., Jr., 4,927,114, Cl. 251-240.000.

Ho, Thoi H.: *See—*
Ogoe, Samuel A.; and Ho, Thoi H., 4,927,870, Cl. 524-140.000.

Hobluigie, Audio; Barnabe, Jean-Pierre; and Mouhot, Frederic, to ECIA - Equipements et Composants Pour L'Industrie Automobile. Rapid connection between two shafts or the like. 4,927,286, Cl. 403-322.000.

Hock, Allan G.; Larson, John R.; and Sousa, John G., to Howtek, Inc. Ink curing apparatus. 4,928,112, Cl. 346-25.000.

Hoda, Takeo: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,928,124, Cl. 354-106.000.

Hodges, William L.; and Cheek, Patrick J., to Preco Industries, Inc. Method and system for printing graphics and text from vector-based computer aided source information. 4,928,243, Cl. 364-519.000.

Hoechst Aktiengesellschaft: *See—*
Bahr, Christian; Heppke, Gerd; Lotzsch, Detlef; Dubal, Hans-Rolf; Escher, Claus; and Ohlendorf, Dieter, 4,927,244, Cl. 350-350.00S.
Merrem, Hans-Joachim; Buhr, Gerhard; and Lenz, Ruediger, 4,927,732, Cl. 430-191.000.
van der Hoeven, Johannes C. W., 4,927,572, Cl. 264-22.000.

Hoechst Celanese Corporation: *See—*
Mueller, Werner H.; and Khanna, Dinesh N., 4,927,736, Cl. 430-275.000.
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,927,956, Cl. 560-130.000.
Wadhwa, Lachhman; Bitritto, Michel; and Powers, Edward J., 4,927,909, Cl. 528-331.000.
Walls, John E.; Tellechea, Carlos; and Dhillon, Major S., 4,927,737, Cl. 430-278.000.

Hoechst Roussel Pharmaceuticals Inc.: *See—*
Shutske, Gregory M.; and Kapples, Kevin J., 4,927,820, Cl. 514-229.500.

Hoffman, Frank. Precision vise. 4,927,126, Cl. 269-60.000.

Hoffman-La Roche Inc.: *See—*
Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,927,826, Cl. 514-256.000.
Guthrie, Robert W.; Kierstead, Richard W.; Mullin, John G.; and Tilley, Jefferson W., 4,927,838, Cl. 514-337.000.

Hoffmann, Henning: *See—*
Putz, Heinrich; Nowitzki, Friedhelm; Damm, Gunter; Bathelt, Hartmut; Kromer, Gunter; Hoffmann, Henning; and Pischke, Reiner, 4,926,634, Cl. 60-274.000.

Hoffmann-La Roche Inc.: *See—*
Fischli, Albert; Gutknecht, Eva-Maria; and Obrecht, Daniel, 4,927,958, Cl. 560-53.000.

Hoisington, Paul A.: *See—*
Spehrley, Charles W., Jr.; Barss, Steven H.; Tomaszewski, David G.; and Hoisington, Paul A., 4,928,120, Cl. 346-140.00R.

Holbrook, Gerald L.: *See—*
Mehta, Hemang S.; Holbrook, Gerald L.; and Leising, Maurice B., 4,928,235, Cl. 364-424.100.

Holden, John A. Steerable power drive for gantry crane. 4,927,034, Cl. 212-218.000.

Holland, Orin W.: *See—*
Alvis, John R.; Pfiester, James R.; and Holland, Orin W., 4,928,156, Cl. 357-23.400.

Holloway, Brian R.; Howe, Ralph; Rao, Balbir S.; and Stribling, Donald, to Imperial Chemical Industries PLC. Amide derivatives. 4,927,836, Cl. 514-620.000.

Holm-Kennedy, James W.; and McArthur, Scot P., to Research Corporation of the University of Hawaii, The. Viscosity sensor. 4,926,682, Cl. 73-54.000.

Holm-Kennedy, James W.; Kawamoto, Eric H.; and Bopp, Thomas T., to Research Corporation of the University of Hawaii, The. Contactless actuator piston proximity sensor. 4,926,693, Cl. 73-597.000.

Holmes, Gordon W., to Professional Packaging Limited. Medication timing device. 4,926,572, Cl. 40-448.000.

Holtz, Edwin R.: *See—*
Gelinas, William A.; Holtz, Edwin R.; Argazzi, Dennis J.; Smigel, Robert L.; and Wiley, Dan W., 4,927,487, Cl. 156-351.000.

HOM, Inc.: *See—*
Hamilton, Frank S.; Ouzts, Johnny D.; and Mabry, Ray W., 4,926,795, Cl. 119-3.000.

Hom, K.: *See—*
Oppenheim, A. K.; Stewart, H. E.; and Hom, K., 4,926,818, Cl. 123-297.000.

Homa, Daniel: *See—*
Van Brunt, Nicholas; Robertson, Jeffrey C.; and Homa, Daniel, 4,927,013, Cl. 206-221.000.

Hombu, Mitsuyuki: *See—*
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Homer, John F., Jr.: *See—*
Crawley, H. Bert; Rosenberg, Eli I.; Meyer, W. Thomas; Gorbics, Mark S.; Thomas, William D.; McKay, Roy L.; and Homer, John F., Jr., 4,928,246, Cl. 364-514.000.

Homma, Katsuhisa: *See—*
Kimura, Sakae; Nikaido, Masaru; Yanagibashi, Katumi; Homma, Katsuhisa; and Ouchi, Yoshiaki, 4,928,034, Cl. 313-346.00R.

Homma, Noriyuki: *See—*
Higuchi, Hisayuki; Homma, Noriyuki; Suzuki, Makoto; and Tachibana, Suguru, 4,928,265, Cl. 365-189.010.

Honda Giken Kogyo Kabashiki Kaisha: *See—*
Matsubara, Toshihiko; and Kitayama, Taku, 4,927,707, Cl. 428-323.000.

Honda Giken Kogyo K.K.: *See—*
Fujimoto, Sachito; and Hosoi, Shuichi, 4,926,828, Cl. 123-489.000.
Kato, Akira; and Yano, Toru, 4,926,827, Cl. 123-489.000.

Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English): *See—*
Ohtaka, Shoichi; and Igarashi, Hisashi, 4,926,825, Cl. 123-489.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ataka, Hiroshi; and Furukawa, Yoshimi, 4,926,954, Cl. 180-140.000.
Fukuo, Koichi, 4,926,804, Cl. 123-90.160.
Kishi, Noriyuki; Katoh, Atsushi; and Saita, Tomohisa, 4,926,823, Cl. 123-432.000.
Motozawa, Yasuki, 4,927,172, Cl. 280-734.000.
Shibata, Katsuhiro; Azuma, Yuichi; Inoue, Masao; and Okumura, Shinichiro, 4,926,978, Cl. 188-73.100.
Tamura, Mitsunobu; Tsuchihashi, Toshifumi; and Kenmochi, Toshihisa, 4,927,358, Cl. 432-204.000.
Yano, Shunji, 4,927,325, Cl. 415-161.000.
Yoshioka, Hiroshi; Nagatsuma, Nobuyoshi; and Kobayashi, Shinobu, 4,926,972, Cl. 184-109.000.

Honda, Iwakazu, to Sharp Kabushiki Kaisha. Printing apparatus. 4,928,129, Cl. 346-160.000.

Honda Motor Co., Ltd.: *See—*
Kazuo, Inoue; Noriyuki, Kishi; Masao, Kubodera; Eitetsu, Akiyama; Shigeto, Kashiwabara; and Osamu, Takizawa, 4,926,640, Cl. 60-602.000.

Honeywell Inc.: *See—*
Allen, Terry S.; and Wolke, Patrick J., 4,927,097, Cl. 244-118.100.
Van Sloun, Peter H., 4,926,750, Cl. 102-261.000.

Honjo, Makoto: *See—*
Suzuki, Fumio; Akasaka, Nobuhiro; and Honjo, Makoto, 4,927,585, Cl. 264-171.000.

Honjo, Seiichiro; Yamada, Kazuo; Fuchigami, Yasuhiro; and Mizusugi, Tetsuya, to Nippon Sheet Glass Company, Ltd. Apparatus for manufacturing curved glass sheets. 4,927,443, Cl. 65-273.000.

Honma, Mikio, to Ohi Seisakusho Co., Ltd. One-way transmission device. 4,926,987, Cl. 192-8.00C.

Hooper, Paul S.: *See—*
Sevrain, Christophe Jean-Paul; Schramm, Heather R.; Schmidt, Daniel G.; Hooper, Paul S.; and Thomas, Mary P., 4,926,879, Cl. 128-798.000.

Hopkins, John R.; Manning, Randy M.; and Marusak, Stephen A., to AMP Incorporated. Select solder slot termination method. 4,926,548, Cl. 29-860.000.

Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., to Goodyear Tire & Rubber Company, The. Vehicle tire with rib type tread pattern having sipes across the ribs. 4,926,919, Cl. 152-209.00R.

Hoppe, Richard J.: *See—*
Walton, Derek N.; and Hoppe, Richard J., 4,928,138, Cl. 363-40.000.

Horbatt, Kenneth: *See—*
Saxon, Ronald L.; Zeger, Leroy; and Horbatt, Kenneth, 4,927,765, Cl. 436-43.000.

Hori, Saburo; and Watanabe, Nobuhiro, to Kureha Chemical Industry Co., Ltd. Proton conductive material and method of manufacturing thereof. 4,927,793, Cl. 501-134.000.

Horibata, Hiroshi. Apparatus for hydroponic farming. 4,926,584, Cl. 47-59.000.

Horie, Hiromichi: *See—*
Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; and Morita, Mikio, 4,927,473, Cl. 148-306.000.

Horiuchi, Teruhiko: *See—*
Koshizawa, Toshifumi; Ohkawa, Kiyomi; and Horiuchi, Teruhiko, 4,926,994, Cl. 192-110.00R.

Hornak, Leonard P.: *See—*
Kaufmann, John W.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,927,595, Cl. 376-268.000.

Hornbaker, Edwin D.: *See—*
Blocker, Wesley C.; Roark, David N.; and Hornbaker, Edwin D., 4,927,896, Cl. 526-93.000.

Horsell Graphic Industries Limited: *See—*
Garth, Peter; Simpson, Stuart M.; Parkinson, John E.; and Rogers, Alan H., 4,927,741, Cl. 430-309.000.

Horton, Bruce J.: *See—*
Frost, Martin; Horton, Bruce J.; and Tidd, Jonathan L., 4,926,603, Cl. 51-165.770.

Hoshino, Yasutaka: *See—*
Chanock, Robert M.; Kapikian, Albert; Midthun, Karen; Flores, Jorge; Gorziglia, Mario; Hoshino, Yasutaka; and Peres-Schael, Irene, 4,927,628, Cl. 424-89.000.

Hoskin, Dennis H., to Mobil Oil Corporation. Phenolic and naphtholic ester crosslinked polymeric gels for permeability profile control. 4,926,943, Cl. 166-270.000.

Hoskins, Margaret E. Composition and method for enhancing fingernails. 4,926,890, Cl. 132-73.000.

Hosmer, Christopher E.; and Whaley, John F., to Marshall and Williams Company. Tenter frame apparatus and method. 4,926,529, Cl. 26-89.000.

Hosoe, Kazuya: *See—*
Tsunekawa, Tokuichi; Date, Nobuaki; Aizawa, Hiroshi; Hosoe, Kazuya; and Urushibara, Kazunori, 4,928,184, Cl. 358-335.000.

Hosoi, Shuichi: *See—*
Fujimoto, Sachito; and Hosoi, Shuichi, 4,926,828, Cl. 123-489.000.

Hotkowski, Peter: *See—*
Abildgaard, William H.; Chadwick, Charles; Hotkowski, Peter; and Todaro, Frank A., 4,927,310, Cl. 412-7.000.

Hotta, Saburo; Kikuchi, Yoshiaki; Takaya, Masanori; and Inoue, Takashi, to Kyodo Shiryo Co., Ltd. Plant growth medium. 4,927,455, Cl. 71-64.130.

Houser, Kirk D.: *See—*
Staab, Carl J.; Houser, Kirk D.; Jones, Donald J.; Ihrman, Robert T.; Poepsel, Donald A.; and Edblad, Warren A., 4,928,097, Cl. 340-825.500.

Howard, John M. H. Diagnosis of muscle problems. 4,926,876, Cl. 128-736.000.

Howard, Roy T. Beverage can having a sanitary cover. 4,927,048, Cl. 220-90.200.

Howard, Susan C.: *See—*
Feder, Joseph; Howard, Susan C.; Wittwer, Arthur J.; Rademacher, Thomas W.; Parekh, Raj B.; and Dwek, Raymond A., 4,927,630, Cl. 424-94.640.

Howarth, John; and Anderson, Leonard M., to Measurex Corporation. Temperature insensitive moisture sensor. 4,928,013, Cl. 250-339.000.

Howe, Ralph: *See—*
Holloway, Brian R.; Howe, Ralph; Rao, Balbir S.; and Stribling, Donald, 4,927,836, Cl. 514-620.000.

Howell, Margene C.; Katerberg, James A.; Pipkorn, David N.; and Wood, Wendell L., to Eastman Kodak Company. Constructions and fabrication methods for drop charge/deflection in continuous ink jet printer. 4,928,113, Cl. 346-75.000.

Howtek, Inc.: *See—*
Hock, Allan G.; Larson, John R.; and Sousa, John G., 4,928,112, Cl. 346-25.000.

Hoyland, Trevor B.; and Payne, Richard, to Thurne Engineering Co., Ltd. Conveyor system. 4,927,000, Cl. 198-418.400.

VOL 1114 ISS 4 MY 22 1990 UMI

Hsiao, K. H. Multipurpose hand tool structure. 4,926,721, Cl. 81-177.400.

Hsiue, Ging-Ho; and Huang, Wen-Kuei, to National Science Council. Synthesis of bigraft copolymers based on grafted type peracid polymer. 4,927,890, Cl. 525-301.000.

Hsu, Jau Y.; and Larson, Gary J., to Nestec S.A. Treatment of powdered cellulose. 4,927,662, Cl. 426-658.000.

Hsu, Sheng T.; and Flatley, Doris W., to Harris Corporation. Method of making a MOS transistor. 4,927,777, Cl. 437-44.000.

Huang, Anthony H.; and Krishnan, Satya, to Liposome Technology, Inc. Preparation of injectable doxorubicin/liposome suspension. 4,927,571, Cl. 264-4.300.

Huang, Liang: *See—*
Yang, Ming-he; Chen, Yan-rong; Liu, Geng-tao; and Huang, Liang, 4,927,937, Cl. 546-296.000.

Huang, Wen-Kuei: *See—*
Hsiue, Ging-Ho; and Huang, Wen-Kuei, 4,927,890, Cl. 525-301.000.

Hubbell Incorporated: *See—*
Neuroth, David H., 4,927,386, Cl. 439-589.000.

Huber, Anton, to Siemens Aktiengesellschaft. Electrical function group for a vehicle. 4,927,382, Cl. 439-490.000.

Hudson, David K.: *See—*
Morrill, Vaughan, Jr.; Scandrett, John H.; and Hudson, David K., 4,926,543, Cl. 29-623.000.

Hudson Oxygen Therapy Sales Company: *See—*
Cambio, Orlando D., Jr.; and Refsland, Earl R., 4,926,856, Cl. 128-203.260.

Huels Aktiengesellschaft: *See—*
Bernhardt, Gunther; Amort, Jurgen; Kragl, Heinz; and Haas, Margret, 4,927,948, Cl. 556-401.000.

Huether, Werner: *See—*
Rossmann, Axel; and Huether, Werner, 4,927,336, Cl. 417-407.000.

Huggins, Raymond W.; Van Deventer, Bruce; and Miller, Glen E., to Boeing Company, The. Variable light transmission filter and optical analog position sensor. 4,928,008, Cl. 250-231.100.

Huggins, Thomas B.; Widener, Wade H.; and Klapper, Kenneth K., to Westinghouse Electric Corp. Nuclear fuel pellet sintering boat unloading apparatus and method. 4,927,313, Cl. 414-414.000.

Hughes Aircraft Company: *See—*
Jensen, Preben B.; and Arnn, Edward L., 4,928,315, Cl. 455-307.000.
Schwartz, Alfred, 4,927,262, Cl. 353-13.000.

Hughes, David: *See—*
Bradshaw, Noel J.; and Hughes, David, 4,927,661, Cl. 426-641.000.

Hui, Kwan: *See—*
Matsueda, Gary R.; Haber, Edgar; and Hui, Kwan, 4,927,916, Cl. 530-387.000.

Hull, Francis R. Variable hull resistance system for marine vessels. 4,926,771, Cl. 114-61.000.

Hull, Raymond, Jr.: *See—*
Marshall, Gerald M.; Hull, Raymond, Jr.; and Farrington, Allan P., 4,927,685, Cl. 428-74.000.

Humberstone, Victor C.: *See—*
Pettigrew, Robert M.; Humberstone, Victor C.; Gardner, Keith; Longman, Robert J.; and Helfet, Peter R., 4,928,132, Cl. 346-135.100.

Hunt, Barry F.; D'Sa, Alwyn P.; and Magnin, Paul A., to Hewlett-Packard Company. Apparatus for forming flow-map images using two-dimensional spatial filters. 4,928,231, Cl. 364-518.000.

Hunter, Jerry J., to Doe Run Tooling, Inc. Set up assembly. 4,927,125, Cl. 269-74.000.

Huntington Medical Research Institutes: *See—*
Bing, Richard J., 4,927,629, Cl. 424-94.600.

Huntsman Chemical Corporation: *See—*
Joyce, James M.; and Kelley, Donald J., 4,927,858, Cl. 521-59.000.

Huron Products Corporation: *See—*
McNaughton, James, 4,927,185, Cl. 285-39.000.

Hutchings, Carl D.: *See—*
Baumann, Gerald W.; Garthwaite, Albert N.; and Hutchings, Carl D., 4,928,147, Cl. 355-288.000.

Hutchinson, Wilbur P.: *See—*
Jenkins, Richard A.; and Hutchinson, Wilbur P., 4,927,072, Cl. 229-92.300.

Hwu, Chyn-Herng. Closed type of line marking device. 4,926,562, Cl. 33-414.000.

Hyder, Walter J.; Kunkle, Albert C.; and Weaver, Robert M., to J. M. Huber Corporation. Kaolin clays for pitch control. 4,927,465, Cl. 106-486.000.

Hydraulic Units, Inc.: *See—*
Leibovich, Gregory, 4,928,028, Cl. 310-23.000.

Ibe, Hiroyuki; Shibagaki, Taro; and Shimizu, Fumihiko. Optical signal transmission system including pulsed FM modulator/demodulator. 4,928,318, Cl. 455-608.000.

Ichida, Katsuya: *See—*
Nishikawa, Shoji; Ohkura, Akira; and Ichida, Katsuya, 4,926,958, Cl. 180-168.000.

Ichida, Yasuteru: *See—*
Yoshizawa, Tetsuo; Terayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shinichi; Ichida, Yasuteru; and Konishi, Masaki, 4,926,549, Cl. 29-876.000.

Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba, Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, to Diesel Kiki Co., Ltd. Spool valve. 4,926,906, Cl. 137-625.300.

Ichijo, Chikara: *See—*
Taniguchi, Masaharu; Ichijo, Chikara; and Fujikawa, Junichi, 4,927,739, Cl. 430-286.000.

Ichikawa, Katumi: *See—*
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katumi; and Fukumura, Seisuke, 4,927,344, Cl. 425-28.100.

Ichikoh Industries, Ltd.: *See—*
Nakata, Yutaka, 4,928,213, Cl. 362-61.000.

Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, to Matsushita Electric Works, Ltd. Portable battery powered electromagnetic therapy applicator. 4,926,881, Cl. 128-804.000.

Ichiyanagi, Takashi: *See—*
Naka, Hiroyuki; Hirono, Tomohide; Suzuki, Naoki; and Ichiyanagi, Takashi, 4,927,068, Cl. 228-103.000.

ICI Americas Inc.: *See—*
Coogan, Richard G.; and Vartan-Boghossian, Razmik, 4,927,876, Cl. 524-457.000.

Idaho Research Foundation, Inc.: *See—*
Hatcher, Herbert J.; Gallian, John J.; and Leeper, Stephen A., 4,927,757, Cl. 435-105.000.

Idai, Tsutomu: *See—*
Yamagishi, Takanori; Idai, Tsutomu; and Takahashi, Eiji, 4,927,979, Cl. 568-791.000.

Ideal Roofing Company Ltd. Manufactures: *See—*
Beauregard, Albert, 4,926,608, Cl. 52-522.000.

Igarashi, Hideo, to Elm Industry Co., Ltd. Envelope opener. 4,926,729, Cl. 83-364.000.

Igarashi, Hisashi: *See—*
Ohtaka, Shoichi; and Igarashi, Hisashi, 4,926,825, Cl. 123-489.000.

Iguchi, Tatsuya: *See—*
Ohkawa, Toshiya; Nakayama, Hiromichi; and Iguchi, Tatsuya, 4,927,287, Cl. 403-408.100.

Ihara Chemical Industry Co., Ltd.: *See—*
Yamaguchi, Mikio; Suzuki, Chiharu; Matsunari, Kenji; Miyazawa, Takeshige; and Nakamura, Yasuo, 4,927,448, Cl. 71-90.000.

Ihara, Susumu: *See—*
Sakimori, Hideharu; Ihara, Susumu; and Hayashi, Hiroyuki, 4,927,314, Cl. 414-416.000.

Ihly Industries, Inc.: *See—*
Vanderlaan, Dirk, 4,927,043, Cl. 220-67.000.

Ihrman, Robert T.: *See—*
Staab, Carl J.; Houser, Kirk D.; Jones, Donald J.; Ihrman, Robert T.; Poepsel, Donald A.; and Edblad, Warren A., 4,928,097, Cl. 340-825.500.

Iida, Kazuyoshi: *See—*
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, 4,926,985, Cl. 188-378.000.

Iikubo, Tomohito; and Kurebayashi, Yutaka, to Daido Tokushuko Kabushiki Kaisha. Heat resisting bearing steel. 4,927,601, Cl. 420-111.000.

Iino Shuji, to Minolta Camera Kabushiki Kaisha. Liquid drop ejection apparatus using a magnetic fluid. 4,928,125, Cl. 346-140.00R.

Iizuka, Tetsuya: *See—*
Sato, Mitsuru; Iizuka, Tetsuya; Furuya, Kiyoshi; Shoji, Norio; and Sekine, Masato, 4,928,074, Cl. 330-254.000.

Iizuka, Yoshio, to Kokoku Rubber Industry Company Limited. Pattern input unit. 4,928,092, Cl. 340-707.000.

Ikebe, Yo; and Oku, Hideaki, to Fanuc Ltd. Deflection-insensitive optical rotary encoder. 4,928,009, Cl. 250-231.130.

Ikeda Bussan Co., Ltd.: *See—*
Maruyama, Hidekazu, 4,927,209, Cl. 297-180.000.
Matsuura, Ichiro; and Chiyoshi, Toyoharu, 4,927,694, Cl. 428-159.000.

Ikeda, Takayuki: *See—*
Nakamura, Hisashi; Takahashi, Satoshi; Ikeda, Takayuki; and Ogino, Masaaki, 4,926,902, Cl. 137-493.300.

Ima, Seiichiro: *See—*
Kakugo, Masahiro; and Ima, Seiichiro, 4,927,872, Cl. 524-232.000.

Imaizumi, Mitsuyuki: *See—*
Kusakawa, Takaji; Wakamoto, Katsuyoshi; and Imaizumi, Mitsuyuki, 4,927,467, Cl. 148-3.000.

Imam, Imdad: *See—*
Kim, Jeung T.; and Imam, Imdad, 4,927,342, Cl. 418-63.000.

Imamura, Yasuo: *See—*
Isozaki, Kei; Hirashima, Yutaka; and Imamura, Yasuo, 4,927,791, Cl. 501-87.000.

Imco Recycling Inc.: *See—*
Gardner, Owen M.; and Cheek, Ralph L., 4,927,459, Cl. 75-685.000.

Imhof, Ernst: *See—*
Auwarter, Gerhard; Imhof, Ernst; Komaroff, Iwan; Reum, Helmut; Schmid, Gunther; and Kaczynski, Bernhard, 4,926,819, Cl. 123-297.000.

Imoto, Koji; Omura, Tadao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki; and Shioya, Yoshiaki, to Mitsubishi Jukogyo Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of subchamber type internal combustion engine. 4,926,817, Cl. 123-292.000.

Imperial Chemical Industries PLC: *See—*
Goulding, Terence, 4,927,716, Cl. 428-695.000.
Holloway, Brian R.; Howe, Ralph; Rao, Balbir S.; and Stribling, Donald, 4,927,836, Cl. 514-620.000.
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,927,839, Cl. 514-383.000.
Robson, Michael J.; Cleare, Peter J. V.; and Spinney, Mark A., 4,927,852, Cl. 514-531.000.

Impink, Albert J., Jr.; and Goldstein, Norman P., to Westinghouse Electric Corp. Beta ray flux measuring device. 4,927,593, Cl. 376-254.000.

Impink, Albert J., Jr.: *See—*
Heibel, Michael D.; Impink, Albert J., Jr.; and Grobmyer, Louis R., 4,927,594, Cl. 376-258.000.

Imre, Aladar: *See—*
Harsanyi, Jozsef; Kohanyi, Laszlo; Domsa, Karoly; Szakacs, Lajos; Szentgyorgyi, Geza; and Imre, Aladar, 4,927,549, Cl. 252-25.000.

Inaba, Akira: *See—*
Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba, Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, 4,926,906, Cl. 137-625.300.

Inaba, Toru: *See—*
Yoshida, Toshihiko; and Inaba, Toru, 4,928,163, Cl. 357-23.300.

Inagaki, Jiro: *See—*
Yagi, Nobuyuki; Inagaki, Jiro; Morita, Kozo; Kaku, Yasutoshi; Kikuchi, Nobuyuki; and Mizuno, Shinji, 4,928,082, Cl. 338-174.000.

Inagaki, Tetsuya; Tagashira, Eijiro; Takaya, Masahiro; and Nishimura, Yasuhiro, to Zeria Pharmaceutical Co., Ltd.; and Hamari Chemicals, Ltd. Preventive and therapeutic agent against liver disorder. 4,927,817, Cl. 514-184.000.

Inco Limited: *See—*
Bell, James A. E.; and Conard, Bruce R., 4,926,792, Cl. 118-729.000.

Inductotherm Europe Limited: *See—*
Simcock, John H., 4,927,460, Cl. 75-10.140.

Industrial Technology Research Institute: *See—*
Tsai, Chong S.; Chen, Shou H.; Li, Bean T.; and Jean, King L., 4,927,664, Cl. 427-57.000.

Infern-O-Therm: *See—*
Martin, Charles K., 4,927,500, Cl. 196-46.000.

Inflation Technologies & Innovation: *See—*
Janko, Michael; and McAllister, Matthew, 4,927,057, Cl. 222-5.000.

Ingersoll-Rand Company: *See—*
Baker, David J.; Dubuque, Kenneth J.; Estep, John M.; and Hix, Charles J., Jr., 4,927,114, Cl. 251-240.000.
Kimberlin, Robert R., 4,926,970, Cl. 184-6.110.
Kimberlin, Robert R., 4,927,323, Cl. 415-98.000.

Ingram, Billy S., II; and Chapin, David S., to Cooper Industries, Inc. Tape measure locking system. 4,927,092, Cl. 242-107.200.

Innovex Inc.: *See—*
Fossum, Steven C.; Sedivy, J. Gregory; and Savick, Wayne K., 4,926,674, Cl. 73-4.00R.

Inokuchi, Hiroshi: *See—*
Hara, Masaaki; Nishikawa, Seigo; Tazaki, Taketoshi; and Inokuchi, Hiroshi, 4,926,604, Cl. 51-165.880.

Inoue, Kiyoshi: *See—*
Kamada, Eiki; Shintani, Yooichi; Kuriyama, Kazunori; Shonai, Tohru; and Inoue, Kiyoshi, 4,928,226, Cl. 364-200.000.

Inoue, Manabu: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,928,124, Cl. 354-106.000.

Inoue, Masao: *See—*
Nakanishi, Yasuaki; and Inoue, Masao, 4,927,233, Cl. 350-128.000.
Shibata, Katsuhiro; Azuma, Yuichi; Inoue, Masao; and Okumura, Shinichiro, 4,926,978, Cl. 188-73.100.

Inoue, Nobuhiro, to Kabushiki Kaisha Toshiba. Thermal recording control method and system. 4,928,110, Cl. 346-1.100.

Inoue, Satoru: *See—*
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, 4,927,827, Cl. 514-256.000.

Inoue, Takashi: *See—*
Hotta, Saburo; Kikuchi, Yoshiaki; Takaya, Masanori; and Inoue, Takashi, 4,927,455, Cl. 71-64.130.

Institut Francais du Petrole: *See—*
Fay, Hubert, 4,926,686, Cl. 73-151.000.

Intel Corporation: *See—*
Galbi, David; and Kohn, Les, 4,928,259, Cl. 364-745.000.

Intermedics, Inc.: *See—*
Alt, Eckhard, 4,926,863, Cl. 128-419.0PG.

International Biomedics, Inc.: *See—*
Ganguly, Dipankar; and Giuliani, David, 4,926,871, Cl. 128-660.070.

International Business Machines: *See—*
Millis, David B., 4,928,233, Cl. 364-522.000.

International Business Machines Corporation: *See—*
Agoglia, Robert J.; Dayan, Richard A.; and Smith, Bruce A., 4,928,193, Cl. 360-78.040.
Baumann, Gerald W.; Garthwaite, Albert N.; and Hutchings, Carl D., 4,928,147, Cl. 355-288.000.
Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.
Biswas, Gautam; Black, David C.; Duncan, Michael G.; Key, Gary R.; Leak, Gordon D.; and Whittington, Robert D., 4,928,306, Cl. 379-201.000.
Chrysler, Gregory; Chu, Richard C.; and Simons, Robert E., 4,928,207, Cl. 361-385.000.
Dampier, Michael S.; Prilik, Ronald J.; and Rapoport, Norman R., 4,928,061, Cl. 324-158.00F.
Dhanakoti, Padmanabhan; Moore, Gerry W.; and Smith, Harold F., 4,927,692, Cl. 428-137.000.
Dhong, Sang H.; Lu, Nicky C.; and Henkels, Walter H., 4,927,779, Cl. 428-52.000.
Eckler, Donald F.; Mankus, John R.; Ripp, Francis J.; and Saxenmeyer Jr., George J., 4,927,387, Cl. 439-499.000.
Ellis, Theron L., 4,927,477, Cl. 156-182.000.
Jones, Alan L.; Snyder, Keith A.; and Winkler, Paul E., 4,927,983, Cl. 174-258.000.
Nielson, Marlin C.; and Woodruff, Kenneth R., 4,928,280, Cl. 371-39.100.
Vriezen, John J.; and Niemeyer, Robin N., 4,928,222, Cl. 364-200.000.

International Communication & Energy, division of International Optical Telecommunications, Inc.: *See—*
Elion, Glenn R., 4,927,856, Cl. 518-702.000.

Interox (Societe Anonyme): *See—*
de la Rosa, Francisco F.; Navarro, Jose A.; Roncel, Mercedes; and de la Rosa, Miguel A., 4,927,512, Cl. 204-157.500.

Interspiro AB: *See—*
Hellquist, Ivan; and Muhlmann, Carl P. M., 4,926,855, Cl. 128-201.280.

Intevep, S.A.: *See—*
Rodriguez, Domingo; and Gomez, Cebers, 4,927,524, Cl. 208-131.000.

Inui, Shuji; Hiramitsu, Tetsushi; Takahaski, Toshinori; Tamaki, Makoto; Kikuta, Mitsuhiro; and Mizutani, Junichi, to Toyoda Gosei Co., Ltd. Steering wheel. 4,927,364, Cl. 439-15.000.

Inujima, Takashi: *See—*
Hirose, Naoki; Inujima, Takashi; and Takayama, Toru, 4,926,791, Cl. 118-723.000.

Inventio AG: *See—*
Morris, Arnold M.; D'Zurko, Daphne; Pilsbury, Richard H.; Barkell, J. Warren, Jr.; Orndorff, Karl B.; and Lawson Randall S., 4,926,974, Cl. 187-52.0LC.
Morris, Arnold M., 4,926,975, Cl. 187-57.000.
Schroder, Joris, 4,926,976, Cl. 187-125.000.

Iowa State University Research Foundation, Inc.: *See—*
Crawley, H. Bert; Rosenberg, Eli I.; Meyer, W. Thomas; Gorbics, Mark S.; Thomas, William D.; McKay, Roy L.; and Homer, John F., Jr., 4,928,246, Cl. 364-514.000.

IPL Inc.: *See—*
Landry, Bernard, 4,926,597, Cl. 47-52.000.

IRS Industrie Rationalisierungs Systeme GmbH: *See—*
Brennecke, Hermann; Liere, Horst; and Koch, Reinhold, 4,928,255, Cl. 364-558.000.

Irving, Mark E., to Eastman Kodak Company. Silver halide grains and process for their preparation. 4,927,745, Cl. 430-567.000.

Ise, Youichi: *See—*
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,926,881, Cl. 128-804.000.

Ishibashi, Yukio: *See—*
Naito, Kenzo; Ishibashi, Yukio; and Shinbo, Haruo, 4,927,964, Cl. 562-560.000.

Ishiguro, Mamoru: *See—*
Fuchigami, Mitsuru; Tachizawa, Shingo; and Ishiguro, Mamoru, 4,927,971, Cl. 564-505.000.

Ishihara, Masamichi: *See—*
Kurosawa, Hinoko; Itoh, Kazuya; Nakamura, Hisashi; and Ishihara, Masamichi, 4,928,281, Cl. 371-51.100.

Ishihara Sangyo Kaisha, Ltd.: *See—*
Yamada, Nobutoshi; Sugi, Hideo; and Kon, Kenji, 4,927,919, Cl. 536-17.400.

Ishihara, Shinobu: *See—*
Otsuka, Tetsuji; Shinozaki, Kenichi; Toyoyama, Kenji; and Ishihara, Shinobu, 4,927,356, Cl. 431-351.000.

Ishihara, Tadao: *See—*
Kitamura, Yoshio; Takizuka, Hiroshi; and Ishihara, Tadao, 4,928,234, Cl. 364-200.000.

Ishikawa, Sueyoshi: *See—*
Hisamoto, Iwao; Hirai, Masaru; and Ishikawa, Sueyoshi, 4,927,950, Cl. 556-419.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Takahashi, Shuzo; Tsuchida, Yutaka; Osada, Shiro; Hasebe, Nobuhisa; and Nakada, Masayuki, 4,926,925, Cl. 164-154.000.

Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Electric power steering apparatus for vehicle. 4,926,960, Cl. 180-79.100.

Ishizeki, Seiichi, to Fuji Jukogyo Kabushiki Kaisha. Method of testing a set of wheel speed sensors forming parts of an anti-lock brake control system. 4,926,683, Cl. 73-118.100.

Isoda, Tetsuo; Watanabe, Yoichiro; Nakayama, Nobuhiro; and Aoki, Mitsuo, to Ricoh Company, Ltd. Carrier particles for use in a two-component dry-type developer. 4,927,728, Cl. 430-108.000.

Isogai, Akio: *See—*
Matsumoto, Shinichi; Miyoshi, Naoto; Kimura, Mareo; Ozawa, Masakuni; and Isogai, Akio, 4,927,799, Cl. 502-303.000.

Isono, Toru: *See—*
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mitzutani, Satoshi; and Isono, Toru, 4,927,190, Cl. 285-175.000.

Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: *See—*
Melcher, Gerhard, 4,927,699, Cl. 428-203.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Isozaki, Kei; Hirashima, Yutaka; and Imamura, Yasuo, to Denki Kagaku Kogyo Kabushiki Kaisha. Chromium carbide sintered body. 4,927,791, Cl. 501-87.000.

Isozaki, Osamu: *See—*
Iwasawa, Naozumi; Isozaki, Osamu; and Nakai, Noboru, 4,927,884, Cl. 525-195.000.

Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Coaxial engine starter. 4,926,706, Cl. 74-7.00A.

Isozumi, Shuzoo: *See—*
Morishita, Akira; Tanaka, Toshinori; and Isozumi, Shuzoo, 4,926,705, Cl. 74-6.000.

Israel Aircraft Industries, Ltd.: *See—*
Zilberman, Moshe; Livne, Mordechai; Tchetchick, Doron; and Daniel, Moshe, 4,926,684, Cl. 73-147.000.

Israel, Gary P.: *See—*
Coup, Michael C.; Israel, Gary P.; Ediger, Glen W.; and Moore, Donald J., 4,927,324, Cl. 415-121.200.

Israel, Larry: *See—*
Soloveychik, Yakov G.; and Israel, Larry, 4,928,170, Cl. 358-94.000.

Isuzu Motors Limited: *See—*
Koshizawa, Toshifumi; Ohkawa, Kiyomi; and Horiuchi, Teruhiko, 4,926,994, Cl. 192-110.00R.
Okada, Masaki, 4,927,077, Cl. 237-2.00A.

Italimpianti of America Incorporated: *See—*
Rau, Robert J.; and Haydo, Donald H., 4,926,668, Cl. 72-289.000.

Ito, Akio, to Jeco Company, Ltd. Driving circuit of a crossed-coil type instrument using digital data pulse production. 4,928,060, Cl. 324-143.000.

Ito, Kaoru: *See—*
Sugiura, Itsuo; Nishida, Yutaka; Ito, Kaoru; and Ozaki, Toshiyuki, 4,927,266, Cl. 356-243.000.

Ito, Masahiko: *See—*
Yoshimi, Tomohisa; Kodama, Satoru; Yoshinori, Takeshi; and Ito, Masahiko, 4,928,090, Cl. 340-575.000.

Ito, Noriaki: *See—*
Torisawa, Akira; Kakizaki, Masaaki; Ito, Noriaki; and Yoshimura, Shigeru, 4,928,050, Cl. 318-696.000.

Ito, Sadaharu. Heat processed food base. 4,927,655, Cl. 426-549.000.

Ito, Sadaharu. Method of producing edible vessel. 4,927,656, Cl. 426-549.000.

Ito, Toshiyasu; Minoura, Jun; Takahashi, Shigeyuki; Mori, Takaaki; Kato, Mamoru; and Funahashi, Toshikazu, to Toyoda Gosei Co., Ltd. Planar electrochromic dimmer. 4,927,246, Cl. 350-357.000.

Ito, Yoshiaki; Nagai, Kougi; Sawada, Akihiko; and Koike, Hideyuki, to Nippondenso Co., Ltd. Radial piston pump. 4,927,338, Cl. 417-462.000.

Ito, Yoshiaki: *See—*
Ezaki, Joichiro; Ito, Yoshiaki; and Matsuzaki, Mikio, 4,928,195, Cl. 360-103.000.

Itoh, Kazuya: *See—*
Kurosawa, Hinoko; Itoh, Kazuya; Nakamura, Hisashi; and Ishihara, Masamichi, 4,928,281, Cl. 371-51.100.

Itoh, Toshibumi: *See—*
Nakaniwa, Shimpei; and Itoh, Toshibumi, 4,926,826, Cl. 123-489.000.

Itow, Hisao: *See—*
Nishino, Yoshitaka; Sawa, Toshio; Ohsumi, Katsumi; and Itow, Hisao, 4,927,598, Cl. 376-306.000.

ITT Industries Limited: *See—*
Collier, John C., 4,927,372, Cl. 439-83.000.

ITW-ATECO, GmbH: *See—*
Kross, Manfred; and Plumer, Hans J., 4,926,719, Cl. 81-57.370.

IVF Maschinenfabrik Schaffhausen: *See—*
Burgin, Robert, 4,927,064, Cl. 225-106.000.

Ivy, Eugene S. Radiator tank plates. 4,926,934, Cl. 165-173.000.

Iwai, Kazumi; Koizumi, Hiromi; and Wada, Katsuo, to Hitachi, Ltd. Combustor for gas turbine. 4,926,645, Cl. 60-723.000.

Iwamoto, Toshiichi: *See—*
Yamamoto, Kosei; Kaneyasu, Akira; and Iwamoto, Toshiichi, 4,927,611, Cl. 423-155.000.

Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, to Japan Synthetic Rubber Co., Ltd. Conjugated diene copolymer, process for producing the same, and photosensitive resin composition comprising the same. 4,927,738, Cl. 430-286.000.

Iwasa, Yasuhiro: *See—*
Ushikubo, Takao; Iwasa, Yasuhiro; and Yamaji, Yukinori, 4,927,069, Cl. 228-123.000.

Iwasawa, Naozumi; Isozaki, Osamu; and Nakai, Noboru, to Kansai Paint Co., Limited. Curable composition. 4,927,884, Cl. 525-195.000.

Iwashita, Kazuhiro, to Pioneer Electronic Corporation. Billing data display system and terminal used therein for a closed circuit television system. 4,928,168, Cl. 358-84.000.

Iwatsu Electric Co., Ltd.: *See—*
Arai, Minoru; and Katoh, Yukihiro, 4,928,073, Cl. 330-252.000.

Iyer, Natraj C.; Carr, Walter J., Jr.; and Male, Alan T., to Westinghouse Electric Corp. Cryogenic conductor 4,927,985, Cl. 174-125.100.

J. Eberspacher: *See—*
Worner, Siegfried; Zacke, Peter; and Wirth, Georg, 4,927,608, Cl. 422-179.000.

J. M. Huber Corporation. *See—*
Hyder, Walter J.; Kunkle, Albert C.; and Weaver, Robert M., 4,927,465, Cl. 106-486.000.

Jack, Michael D.; Chapman, George R.; and Ray, Michael, to Santa Barbara Research Center. Method of minimizing implant-related damage to a group II-VI semiconductor material. 4,927,773, Cl. 437-22.000.

Jackson, Graham: *See—*
Jenner, Michael R.; and Jackson, Graham, 4,927,646, Cl. 426-96.000.

Jackson, Norman C., to Standard Products Company, The. Variable-width molding and brightwork. 4,926,610, Cl. 52-716.000.

Jaco, Pamela J.; and Tolbert, Thomas W., to Springs Industries, Inc. Pucker and shrink resistant flame retardant fabric formed of corespun yarns. 4,927,698, Cl. 428-198.000.

Jacobs, Linda Y.; Palmieri, Joseph M.; and Smith, James I., to General Electric Company. Molded case circuit breaker line terminal plug. 4,928,080, Cl. 335-202.000.

Jacobs Suchard AB: *See—*
Hemm, Gerhard; Clausing, Gerhard; and Pietzsch, Heiko, 4,927,028, Cl. 206-618.000.

Jacques, Jean: *See—*
Bouton, Marie-Madeleine; Jacques, Jean; and Pierdet, Andre 4,927,975, Cl. 568-373.000.

Jade, Sivananda S., to Manville Corporation. Process for producing zirconium based granules. 4,927,622, Cl. 423-608.000.

Jagenberg Aktiengesellschaft: *See—*
Weiss, Peter; and Welkers, Knut, 4,927,091, Cl. 242-68.400.

Jaguar Cars Limited: *See—*
Parsons, Bryan N. V., 4,926,811, Cl. 123-193.00P.

James, Allan: *See—*
Mathur, Indresh; James, Allan; and Bissett, David, 4,927,509, Cl. 204-83.000.

James, Kim: *See—*
Baker, Raymond; Carling, William R.; James, Kim; and Leeson, Paul D., 4,927,819, Cl. 514-213.000.

James River Corporation of Virginia: *See—*
Schulz, Galyn A., 4,927,588, Cl. 264-258.000.

James, Robert B., Jr.: *See—*
Kalnes, Tom N.; James, Robert B., Jr.; and Staggs, Darrell W., 4,927,520, Cl. 208-50.000.

Janke, Larry L.: *See—*
Patera, Ginger E.; Janke, Larry L.; and Lampman, William T., 4,927,033, Cl. 211-41.000.

Janko, Michael; and McAllister, Matthew, to Inflation Technologies & Innovation. Automatic inflator for inflatable articles. 4,927,057, Cl. 222-5.000.

Janome Sewing Machine Company Limited: *See—*
Hanyu, Susumu; Hara, Kazumasa; and Sano, Yasuro, 4,926,770, Cl. 112-453.000.

Janosko, Robert J.: *See—*
Blazic, Leonard J.; and Janosko, Robert J., 4,927,108, Cl. 248-311.200.

Jansen, Georg: *See—*
Hass, Rudi; Jansen, Georg; and Kallen, Wilhelm, 4,927,688, Cl. 428-34.600.

Janson, Kurt, to Aktiebolaget A.K. Eriksson. Saw blade tensioning arrangement. 4,926,733, Cl. 83-819.000.

Janssen Pharmaceutica N.V.: *See—*
Lutz, William R.; Verschueren, Wim G.; Fischer, Hanspeter; and Van Lommen, Guy R. E., 4,927,449, Cl. 71-90.000.

Japan Electronic Control Systems Co., Ltd.: *See—*
Nakaniwa, Shimpei; and Itoh, Toshibumi, 4,926,826, Cl. 123-489.000.

Japan Exlan Company Limited: *See—*
Tanaka, Koji; Ueda, Minoru; and Masuda, Taizo, 4,927,710, Cl. 428-394.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, 4,927,738, Cl. 430-286.000.

Jean, King L.: *See—*
Tsai, Chong S.; Chen, Shou H.; Li, Bean T.; and Jean, King L., 4,927,664, Cl. 427-57.000.

Jeco Company, Ltd.: *See—*
Ito, Akio, 4,928,060, Cl. 324-143.000.

Jenkins, Richard A.; and Hutchinson, Wilbur P., to Moore Business Forms, Inc. Mailer. 4,927,072, Cl. 229-92.300.

Jenner, Michael R.; and Jackson, Graham, to Tate & Lyle PLC. Sucralose sweetening composition. 4,927,646, Cl. 426-96.000.

Jennings, Robert E.: *See—*
Mears, Eric L.; and Jennings, Robert E., 4,927,438, Cl. 55-385.200.

Jensen, Elmer W.: *See—*
Budinger, William D.; and Jensen, Elmer W., 4,927,432, Cl. 51-298.000.

Jensen, Georg W.: *See—*
Aaslyng, Dorrit A.; Jensen, Georg W.; Schneider, Ib; and Schneider, Palle, 4,927,558, Cl. 252-174.120.

Jensen, Preben B.; and Arnn, Edward L., to Hughes Aircraft Company. Chirped backscatter filter. 4,928,315, Cl. 455-307.000.

Jerome, Robert: *See—*
Teyssie, Philippe; Varshney, Sunil K.; Jerome, Robert; and Fayt, Roger, 4,927,703, Cl. 428-220.000.

Jimenez, Miguel A. Snag-proof safety fishing lure. 4,926,579, Cl. 43-42.440.

JLB Textiles Limited: *See—*
Bulley, John L., 4,926,851, Cl. 128-157.000.

Johannsen, Karl, to O&K Orenstein & Koppel Aktiengesellschaft. Connection for connecting compressed-air lines. 4,926,571, Cl. 37-72.000.

Johansson, Mats O.: *See—*
Dahlinder, Lars-Erik D.; Johansson, Mats O.; Sandberg, John A.; and Sjo, 4,927,640, Cl. 424-497.000.

John Wyeth and Brother Ltd.: *See—*
Crossley, Roger; and Heatherington, Kenneth, 4,927,936, Cl 546-181.000.

Johns, Bryan: *See—*
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; and Lee, Scott, 4,928,169, Cl. 358-93.000.

Johns Hopkins University, The: *See—*
Zoltan, Bart J.; Laube, Beth L.; and Adams, George K., III, 4,926,852, Cl. 128-200.230.

Johnson, Arlyn: *See—*
Nichol, Thomas W.; Gisske, Edward T.; and Johnson, Arlyn, 4,927,160, Cl. 273-371.000.

Johnson Electric Industrial Manufactory, Limited: *See—*
Wang, Patrick S.; Strobl, Georg; and Chu, Raymond W. H., 4,927,379, Cl. 439-398.000.

Johnson, Gerald D.; Lobsinger, Ralph J.; Hamilton, Margaret L.; and Gelles, David S., to United States of America, Energy. Process for making a martensitic steel alloy fuel cladding product. 4,927,468, Cl. 148-3.000.

Johnson, Grannis S.; Grinstein, Reuben H.; Hartman, Stuart J.; and Dallago, Raymond P., to Henkel Corporation. Polythiols and use as epoxy resin curing agents. 4,927,902, Cl. 528-99.000.

Johnson & Johnson Orthopaedics, Inc.: *See—*
Luckman, Thomas, 4,926,847, Cl. 606-88.000.

Johnson, Marvin M.: *See—*
Tabler, Donald C.; and Johnson, Marvin M., 4,927,795, Cl. 502-33.000.

Johnson, Michael A.: *See—*
Dorn, Gordon L.; and Johnson, Michael A., 4,927,605, Cl. 422-102.000.

Johnson, Ronald M., to General Electric Company. Control assembly for adjusting thermostat setting. 4,926,654, Cl. 62-229.000.

Johnson, Walter A.: *See—*
Kopatz, Nelson E.; Johnson, Walter A.; and Ritsko, Joseph E., 4,927,456, Cl. 75-346.000.

Johnston, Barry. Closed loop system with regenerative heating and pump-driven recirculation of a working fluid. 4,926,643, Cl. 60-691.000.

Johnston, Daniel D. Aerodynamic stabilization system for watercraft. 4,926,778, Cl. 114-273.000.

Johnston, Ronald J., to Aluma Systems Ltd. Truss arrangement. 4,926,593, Cl. 52-126.400.

Jolley, Scott T.; and Salomon, Mary F., to Lubrizol Corporation, The. Liquid compositions containing organic sulfones and sulfoxides. 4,927,554, Cl. 252-68.000.

Joloda Plc.: *See—*
Kordel, Wojciech J., 4,927,316, Cl. 414-510.000.

Jones, Alan L.; Snyder, Keith A.; and Winkler, Paul E., to International Business Machines Corporation. Circuit board 4,927,983, Cl. 174-258.000.

Jones, Bryan, to Ford Motor Company. Steering column coupling. 4,927,174, Cl. 280-777.000.

Jones, Donald J.: *See—*
Staab, Carl J.; Houser, Kirk D.; Jones, Donald J.; Ihrman, Robert T.; Poepsel, Donald A.; and Edblad, Warren A., 4,928,097, Cl. 340-825.500.

Jones, Donald W.: *See—*
Kliman, Gerald B.; and Jones, Donald W., 4,927,329, Cl 416-127.000.

Jones, Ellis O.: *See—*
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.

Jones, John S. Luminous golf balls and carrying case therefor. 4,927,015, Cl 206-315.900.

Jones, Marshall G.: *See—*
Ortiz, Angel L., Jr.; and Jones, Marshall G., 4,927,224, Cl. 350-96.150.

Jones, Roger E.: *See—*
Pitt, Gilles D.; Jones, Roger E.; Antell, George R.; Spicer, Lyndon R.; Barnett, John A.; and Hill, Robert, 4,928,319, Cl. 455-612.000.

Jones, Warren P.: *See—*
Carruth, Walter L.; Jones, Warren P.; and Stacy, Richard B., 4,926,951, Cl. 177-144.000.

Jones, Wescomb R.: *See—*
Buntrock, Kermit A.; English, Daniel R.; and Jones, Wescomb R., 4,927,673, Cl. 427-376.200.

Jones, William R., Jr.: *See—*
Berg, Alan C.; and Jones, William R., Jr., 4,927,607, Cl. 422-150.000.

Jonte, Patrick B.: *See—*
Bahroos, Gobind; and Jonte, Patrick B., 4,927,115, Cl. 251-241.000.

Jordon, Trevor A.: *See—*
Morris, Guy D.; Jordon, Trevor A.; Davidson, William C.; and Bowman, Timothy J., 4,926,802, Cl. 123-52.00M

Jorion, Bruno; Galiano, Christian; and Wraight, Peter, to Schlumberger Technology Corporation. Apparatus for extracting recorded information from a logging tool. 4,928,088, Cl. 340-854.000.

Joulia, Gerard: *See—*
Morane, Bruno; and Joulia, Gerard, 4,927,282, Cl. 401-129.000.

Joyce, James M.; and Kelley, Donald J., to Huntsman Chemical Corporation. Polyphenylene ether-alkenyl aromatic polymer blends having organobromine additives. 4,927,858, Cl. 521-59.000.

Juijn, Johannes A.: *See—*
Smook, Jan; Vos, Gerardus J. H.; Juijn, Johannes A.; and Van Hees, Theodorus J., 4,927,586, Cl. 264-185.000.

Julian, John C., to Lamb-Weston, Inc. Food processing apparatus. 4,926,726, Cl. 83-165.000.

Justice, Donald R. Horizontal dewatering system. 4,927,292, Cl 405-43.000.

Kabelmetal Electro GmbH: *See—*
Breitenbach, Otto; Hetz, Helmar; Rous, Friedemann; and Ottenreuther, Josef, 4,927,570, Cl. 264-1.400.
Schauer, Friedrich; and Wolff, Manfred, 4,927,365, Cl. 439-15.000.

Kabeta, Keiji; and Zenbayashi, Michio, to Toshiba Shilicone Co., Ltd. Method of preparing an aminoalkylalkoxysilane. 4,927,949, Cl. 556-413.000.

Kabeta, Keiji; and Syuto, Kiyoaki, to Toshiba Silicone Co., Ltd. Organosilicon compound. 4,927,951, Cl. 556-419.000.

Kabushiki Kaisha Hybec: *See—*
Hayakawa, Futomi; and Onoda, Kazuo, 4,928,210, Cl. 362-217.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katumi; and Fukumura, Seisuke, 4,927,344, Cl. 425-28.100.

Kabushiki Kaisha Nasa: *See—*
Kumani, Hiroo; and Okamoto, Akio, 4,927,651, Cl. 426-324.000.

Kabushiki Kaisha Toshiba: *See—*
Egusa, Syun; Miura, Akira; and Gemma, Nobuhiro, 4,927,589, Cl. 264-259.000.
Inoue, Nobuhiro, 4,928,110, Cl. 346-1.100.
Kawamura, Shigemi; and Yamauchi, Masahide, 4,928,230, Cl 364-479.000.
Kimura, Sakae; Nikaido, Masaru; Yanagibashi, Katumi; Homma, Katsuhisa; and Ouchi, Yoshiaki, 4,928,034, Cl. 313-346.00R
Kisou, Masaaki, 4,928,165, Cl. 358-36.000.
Kitamoto, Manabu, 4,926,652, Cl. 62-175.000.
Kushibe, Mitsuhiro; Eguchi, Kazuhiro; Funamizu, Masahisa; and Ohba, Yasuo, 4,928,285, Cl. 372-45.000.
Masuzawa, Yukikazu, 4,928,091, Cl. 340-686.000.
Matsunaga, Taira; and Kimura, Takashi, 4,928,157, Cl. 357-23.130.
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 4,928,155, Cl. 357-23.400.
Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; and Morita, Mikio, 4,927,473, Cl. 148-306.000.
Tanaka, Shigeru, 4,928,295, Cl. 378-104.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Matsumoto, Shinichi; Miyoshi, Naoto; Kimura, Mareo; Ozawa, Masakuni; and Isogai, Akio, 4,927,799, Cl. 502-303.000.
Nomura, Yoshihiro; and Ohkubo, Yoichiro, 4,927,353, Cl. 431-215.000.

Kabushiki Kaisha Yaskawa Denki Seisakusho: *See—*
Hara, Masaaki; Nishikawa, Seigo; Tazaki, Taketoshi; and Inokuchi, Hiroshi, 4,926,604, Cl. 51-165.880.

Kabuyama, Noriko: *See—*
Yamauchi, Junichi; Maejima, Kimiko; Eguchi, Kaoru; and Kabuyama, Noriko, 4,928,253, Cl. 364-521.000.

Kaczynski, Bernhard: *See—*
Auwarter, Gerhard; Imhof, Ernst; Komaroff, Iwan; Reum, Helmut, Schmid, Gunther; and Kaczynski, Bernhard, 4,926,819, Cl 123-297.000.

Kada, Yoshio, to Sumitomo Heavy Industries, Ltd. Ship unloader with screw conveyor swingable in various planes. 4,927,311, Cl. 414-140.700.

Kadambi, Vedanth, to General Electric Company. Apparatus for cooling an X-ray device. 4,928,296, Cl. 378-141.000.

Kadar, Janos G.: *See—*
Fenyo, Martha; Borberg, Helmut; and Kadar, Janos G. 4,926,861, Cl. 128-395.000

Kageyama, Yukihiko: *See—*
Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Takahashi, Katsuhiko, 4,927,895, Cl. 525-438.000.

Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi; Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, to Yasunori Nishijima & Daikin Industries Ltd. Fluorine-containing nitroazole derivatives and radiosensitizer comprising the same. 4,927,941, Cl. 548-264.800.

Kahle, Charles F., II; McCollum, Gregory J.; and Wilson, Craig A., to PPG Industries, Inc. Preparation of alkyl primary amines. 4,927,969, Cl. 564-377.000.

Kahn, Manfred, to United States of America, Navy. Noise-suppressing hydrophones. 4,928,264, Cl. 367-141.000.

Kaieda, Shozo; Kurashima, Ikuo; Okazima, Hideo; and Mai, Jun, to Kentek Information Systems, Inc. Control circuit for heat fixing device for use in an image forming apparatus. 4,928,055, Cl. 323-300.000.

Kaiser, Thomas A.; Mulder, Douglas C.; O'Ryan, David E.; Schneider, Douglas A.; and Ward, Rodney L., to Nordson Corporation. Apparatus for depositing particulate material into a pad of fibrous material in a forming chamber. 4,927,346, Cl. 425-81.100.

Kakizaki, Masaaki: *See—*
Torisawa, Akira; Kakizaki, Masaaki; Ito, Noriaki; and Yoshimura, Shigeru, 4,928,050, Cl. 318-696.000.

Kaku, Nobuyuki; Shigemura, Tatsuya; Uesugi, Masaki; Kano, Kiyoshi; and Ogiro, Kenji, to Hitachi, Ltd. Tape loading mechanism for a

VOL
1114
ISS
4
MY
22
1990
UMI

rotating drum and cassette type magnetic recording and/or reproduction apparatus. 4,928,191, Cl. 360-85.000.

Kaku, Yasutoshi: *See—*
Yagi, Nobuyuki; Inagaki, Jiro; Morita, Kozo; Kaku, Yasutoshi; Kikuchi, Nobuyuki; and Mizuno, Shinji, 4,928,082, Cl. 338-174.000.

Kakugo, Masahiro; and Ima, Seiichiro, to Sumitomo Chemical Company, Limited. Polypropylene film. 4,927,872, Cl. 524-232.000.

Kakuta, Yoshiaki. Negative pressure air stream accelerator of suction type air cooling mechanism for internal combustion engine. 4,926,638, Cl. 60-319.000.

Kaldenbach, Willem P., to Allseas Engineering B.V. Method and installation for displacing a jacket of an artificial island in relation to an underwater base. 4,927,296, Cl. 405-206.000.

Kallen, Wilhelm: *See—*
Hass, Rudi; Jansen, Georg; and Kallen, Wilhelm, 4,927,688, Cl. 428-34.600.

Kalman, Thomas I., to Research Foundation of State University of New York, The. 2-mercaptomethylglutaric acid derivatives. 4,927,966, Cl. 562-594.000.

Kalnes, Tom N.; James, Robert B., Jr.; and Staggs, Darrell W., to UOP. Process for treating a hydrocarbonaceous stream containing a non-distillable component to produce a hydrogenated distillable hydrocarbonaceous product. 4,927,520, Cl. 208-50.000.

Kamada, Eiki; Shintani, Yoichi; Kuriyama, Kazunori; Shonai, Tohru; and Inoue, Kiyoshi, to Hitachi, Ltd. Data processor for parallelly executing conflicting instructions. 4,928,226, Cl. 364-200.000.

Kamath, Vasanth R.; and Sargent, James D., to Pennwalt Corporation. Polymer bound light stabilizer coating resins. 4,927,891, Cl. 525-327.300.

Kami, Tomohiro: *See—*
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,926,881, Cl. 128-804.000.

Kamiya, Tadao; and Leader, Matthew J., to Shiley Incorporated. Dual optical fiber device. 4,927,222, Cl. 350-96.150.

Kamyr, Inc.: *See—*
Meredith, Michael D.; Phillips, Joseph R.; Laakso, Richard O., and Stromberg, C. Bertil, 4,927,312, Cl. 414-221.000.

Kanda, Masahiko; and Miyagawa, Yuichi, to Sumitomo Electric Industries, Ltd. Light-reflecting and heating type oximeter. 4,926,867, Cl. 128-633.000.

Kandler, William C., to Tecumseh Products Company. Primer bulb check valve system for an internally vented bowl primer carburetor. 4,926,808, Cl. 123-187.50R.

Kaneko, Shintaro: *See—*
Nishide, Hiroo; and Kaneko, Shintaro, 4,927,725, Cl. 430-54.000.

Kaneuchi, Kunihiro; Yasuda, Seigou; Ariyoshi, Takashi; Nakatani, Tomofumi; and Aizawa, Hiroshi, to Ricoh Company, Ltd Voice actuated dialing apparatus. 4,928,302, Cl. 379-88.000.

Kaneyasu, Akira: *See—*
Yamamoto, Kosei; Kaneyasu, Akira; and Iwamoto, Toshiichi, 4,927,611, Cl. 423-155.000.

Kannankeril, Charles P., to Sealed Air Corporation. Shipping bag for containers of potentially biohazardous liquids 4,927,010, Cl. 206-204.000.

Kanno, Masahide: *See—*
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,928,172, Cl. 358-98.000.

Kano, Kiyoshi: *See—*
Kaku, Nobuyuki; Shigemura, Tatsuya; Uesugi, Masaki; Kano, Kiyoshi; and Ogiro, Kenji, 4,928,191, Cl. 360-85.000.

Kansai Paint Co., Limited: *See—*
Iwasawa, Naozumi; Isozaki, Osamu; and Nakai, Noboru, 4,927,884, Cl. 525-195.000.
Shibata, Terukazu; Numa, Nobushige; and Kawamura, Masafumi, 4,927,877, Cl. 525-7.000.

Kapikian, Albert: *See—*
Chanock, Robert M.; Kapikian, Albert; Midthun, Karen; Flores, Jorge; Gorziglia, Mario; Hoshino, Yasutaka; and Peres-Schael, Irene, 4,927,628, Cl. 424-89.000.

Kaplan, Murray A.: *See—*
Bykadi, Gururaj; Kaplan, Murray A.; Corrao, Richard G.; Bara, Edward J.; Ullah, Ismat; and Agharkar, Shreeram N., 4,927,638, Cl. 424-455.000.

Kapples, Kevin J.: *See—*
Shutske, Gregory M.; and Kapples, Kevin J., 4,927,820, Cl. 514-229.500.

Karasawa, Yutaka, to Tamagawa Seiki Kabushiki Kaisha. Multiple rotational position sensor. 4,928,046, Cl. 318-654.000.

Kardos, Peter, to Gas Research Institute. Process for pulse combustion. 4,926,798, Cl. 122-24.000.

Karl Mengele & Sohne Maschinenfabrik und Eisengiesserei GmbH & Co.: *See—*
Fiener, Josef, 4,926,623, Cl. 56-60.000.

Karl, Rupert: *See—*
Brann, Erwin; Strobel, Michael; and Karl, Rupert, 4,926,627, Cl. 57-412.000.

Karol, Thomas J.; and Nalesnik, Theodore E., to Texaco Inc. Elastomer-compatible oxalic acid acylated alkenylsuccinimides. 4,927,562, Cl. 252-51.50A.

Karspeck, Milan: *See—*
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; and Lee, Scott, 4,928,169, Cl. 358-93.000.

Kasahara, Nobuo; and Wagi, Susumu. Developing device for a color image forming apparatus. 4,928,144, Cl. 355-245.000.

Kasai, Ryusuke, to Nikka Co., Ltd. Composite materials and top materials for retort container. 4,927,677, Cl. 428-36.600.

Kasparek, Alfred: *See—*
Myohl, Jochim; and Kasparek, Alfred, 4,926,887, Cl. 131-91.000.

Kast, Kevin H.: *See—*
Davison, Samuel H.; Kast, Kevin H.; and Clark, Aidan W., 4,928,240, Cl. 364-431.020.

Kataoka, Yoichi: *See—*
Imoto, Koji; Omura, Tadao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki; and Shioya, Yoshiaki, 4,926,817, Cl. 123-292.000.

Katayama, Takashi: *See—*
Teraoka, Kazuharu; Satake, Mitsuo; Denda, Toshio; Katayama, Takashi; and Seyasu, Shiro, 4,928,229, Cl. 364-464.010.

Katerberg, James A.: *See—*
Howell, Margene C.; Katerberg, James A.; Pipkorn, David N.; and Wood, Wendell L., 4,928,113, Cl. 346-75.000.

Kato, Akira; and Yano, Toru, to Honda Giken Kogyo K.K. Output correction method for exhaust gas ingredient-concentration sensors. 4,926,827, Cl. 123-489.000.

Kato Hatsujo Kaisha, Ltd.: *See—*
Sato, Seiichi, 4,927,306, Cl. 411-182.000.

Kato, Ikunoshin: *See—*
Sakai, Takeshi; Yokota, Hiroko; Yamamoto, Kazuki; Yokoyama, Sadaji; Matsui, Susumu; Kato, Ikunoshin; and Obayashi, Akira, 4,927,767, Cl. 436-64.000.

Kato, Iwao, to Brother Kogyo Kabushiki Kaisha. Process for producing an electric motor. 4,926,540, Cl. 29-596.000.

Kato, Kichiro, to Toyota Jidosha Kabushiki Kaisha. Fluid pump. 4,927,333, Cl. 417-316.000.

Kato, Mamoru: *See—*
Ito, Toshiyasu; Minoura, Jun; Takahashi, Shigeyuki; Mori, Takaaki; Kato, Mamoru; and Funahashi, Toshikazu, 4,927,246, Cl. 350-357.000.

Kato, Yoshiaki: *See—*
Matsumoto, Takashi; Sato, Masamichi; Yoshida, Satoshi; and Kato, Yoshiaki, 4,928,186, Cl. 360-21.000.

Katoh, Atsushi: *See—*
Kishi, Noriyuki; Katoh, Atsushi; and Saita, Tomohisa, 4,926,823, Cl. 123-432.000.

Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, to Sumitomo Chemical Company, Limited. Pyridinylpyrimidine derivatives, method for production thereof and a fungicide containing them as the active ingredient. 4,927,827, Cl. 514-256.000.

Katoh, Yukihiro: *See—*
Arai, Minoru; and Katoh, Yukihiro, 4,928,073, Cl. 330-252.000.

Katsumata, Ryoichi: *See—*
Mizukami, Toru; Katsumata, Ryoichi; and Oka, Tetsuo, 4,927,758, Cl. 435-107.000.

Katunin, Alexandr N.: *See—*
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.

Katz, Howard S., to Robern, Inc. Bath cabinet mounting and finishing apparatus. 4,927,215, Cl. 312-224.000.

Katzenstein, Henry S., to Brooktree Corporation. Flash analog-to-digital converter with logarithmic/linear threshold voltages. 4,928,102, Cl. 341-154.000.

Kauffman, Kenneth A., to KRB Machinery Co. Separable roller sleeve. 4,926,995, Cl. 193-37.000.

Kaufman, Howard H.; and Nunez, German. Operating room instrument table. 4,927,214, Cl. 312-195.000.

Kaufman, Steven A.: *See—*
DiMarco, Bernard; and Kaufman, Steven A., 4,927,308, Cl. 411-437.000.

Kaufmann, John W.; Swidwa, Kenneth J.; and Hornak, Leonard P., to Westinghouse Electric Corp. Refueling of nuclear reactor. 4,927,595, Cl. 376-268.000.

Kawabata, James, to Contour Saws, Inc. Band saw for cutting shaped pieces of bar stock. 4,926,728, Cl. 83-251.000.

Kawabata, James, to Contour Saws, Inc. Band saw for cutting shaped pieces of bar stock. 4,926,731, Cl. 83-789.000.

Kawabata, Kenji; Ogawa, Soichiro; and Masaki, Ryoichi, to Hitachi, Ltd. Protected discharge lamp lighting system. 4,928,037, Cl. 315-127.000.

Kawabata, Kohji: *See—*
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, 4,927,818, Cl. 514-202.000.

Kawaguchi, Noboru: *See—*
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, 4,927,959, Cl. 560-193.000.

Kawaguchi, Sotoaki: *See—*
Ohta, Kazumi; Kawaguchi, Sotoaki; Doyama, Hisao; and Yano, Yutaka, 4,927,457, Cl. 75-10.630.

Kawahara, Yukito, to Seiko Instruments Inc. Active matrix-addressed picture display device. 4,928,095, Cl. 340-784.000.

Kawai, Kouzi, to Tomoe Technical Research Company. Butterfly valve having a function for measuring a flow rate and method of measuring a flow rate with a butterfly valve. 4,926,903, Cl. 137-554.000.

Kawamoto, Eric H.: *See—*
Holm-Kennedy, James W.; Kawamoto, Eric H.; and Bopp, Thomas T., 4,926,693, Cl. 73-597.000.

Kawamura, Masafumi: *See—*
Shibata, Terukazu; Numa, Nobushige; and Kawamura, Masafumi, 4,927,877, Cl. 525-7.000.

Kawamura, Shigemi; and Yamauchi, Masahide, to Kabushiki Kaisha Toshiba. Automatic transacting apparatus. 4,928,230, Cl. 364-479.000.

Kawanishi, Gosei: *See—*
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, 4,927,959, Cl. 560-193.000.

Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, to Dai Nippon Insatsu Kabushiki Kaisha. Image-receiving sheet. 4,927,666, Cl. 427-146.000.

Kawata, Ken; Sato, Kozo; and Tsuboi, Masayoshi, to Fuji Photo Film Co., Ltd. Metal-containing organic polymer and use thereof. 4,927,897, Cl. 526-240.000.

Kayoun, Pierre; and Pouyez, Philippe, to Amphenol Socapex. Mechanical holding device for a free-structure optical-fiber cable. 4,928,135, Cl. 350-96.200.

Kaz, Peter N.: *See—*
Davidson, James B.; Kaz, Peter N.; Kidwell, Michael H.; and Zachman, Mark E., 4,926,948, Cl. 172-4.500.

Kazior, Thomas E.; and Durschlag, Mark S., to Raytheon Company. Simultaneous formation of via hole and tube structures for GaAs monolithic microwave integrated circuits. 4,927,784, Cl. 437-203.000.

Kazuo, Inoue; Noriyuki, Kishi; Masao, Kubodera; Eitetsu, Akiyama; Shigeto, Kashiwabara; and Osamu, Takizawa, to Honda Motor Co., Ltd. Supercharging pressure control method for internal combustion engines. 4,926,640, Cl. 60-602.000.

KCL Corporation: *See—*
Branson, Mark E., 4,927,271, Cl. 383-5.000.

Keens, Axel; and Simon, Arno, to Bruke Analytische Messtechnik GmbH. Correction of non-linearities in detectors in fourier transform spectroscopy. 4,927,269, Cl. 356-346.000.

Keilmann, Fritz, to Max Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Non-self supporting optical device with support structure. 4,927,236, Cl. 350-276.00R.

Keith, Douglas L., to Leland Stanford Junior University, The Board of Trustees of the. Circular magnetron sputtering device. 4,927,515, Cl. 204-298.210.

Kelleher, William J.: *See—*
Sorrentino, James V.; Kelleher, William J.; and Moye, Jeanne O., 4,927,634, Cl. 424-405.000.

Keller, Frank: *See—*
Heinemann, Joachim; Spies, Karl-Heinz; Keller, Frank; Beicht, Bernd; Leitermann, Wulf; and Lechler, Rolf, 4,926,921, Cl. 160-115.000.

Keller, Jakob, to BBC Brown Boveri AG. Contactless centrifugal seal device for a rotating machine part. 4,927,327, Cl. 415-171.100.

Keller, Robert A. Turbocharger lubrication system. 4,926,641, Cl. 60-605.300.

Kelley, Donald J.: *See—*
Joyce, James M.; and Kelley, Donald J., 4,927,858, Cl. 521-59.000.

Kelley, Robert W.: *See—*
Leonard, Patrick F.; Svetkoff, Donald J.; Kelley, Robert W.; Rohrer, Donald K.; and Coleman, E. North, Jr., 4,928,313, Cl. 382-8.000.

Kemmler-Sack, Sibylle; Morlotti, Romano; and Reichardt, Jurgen, to Minnesota Mining and Manufacturing Company. Method for recording and reproducing radiographic images. 4,928,017, Cl. 250-483.100.

Kemske, Jonathon D.: *See—*
Wendt, Dan J.; Kemske, Jonathon D.; and Pesheck, Peter S., 4,927,991, Cl. 219-10.55E.

Kenakkala, Timo: *See—*
Hamala, Sirpa; Heikkila, Matti; Laine, Jouko; Kokkonen, Kari; and Kenakkala, Timo, 4,927,613, Cl. 423-244.000.

Kenmochi, Kazuei: *See—*
Nasu, Kazuhiko; Kenmochi, Kazuei; Niikawa, Tomohiko; and Matsui, Atsushi, 4,927,580, Cl. 264-102.000.

Kenmochi, Toshihisa: *See—*
Tamura, Mitsunobu; Tsuchihashi, Toshifumi; and Kenmochi, Toshihisa, 4,927,358, Cl. 432-204.000.

Kentek Information Systems, Inc.: *See—*
Kaieda, Shozo; Kurashima, Ikuo; Okazima, Hideo; and Mai, Jun, 4,928,055, Cl. 323-300.000.

Keren, Hanan, to Elscint Ltd. Hybrid surface coils. 4,928,064, Cl. 324-322.000.

Kern, Eckhart: *See—*
Porth, Wolfgang; Weibler, Wolfgang; Kern, Eckhart; Hannewald, Thomas; and Weingartner, Reiner, 4,926,821, Cl. 123-399.000.

Kernforschungsanlage Juelich Gesellschaft mit beschraenkter Hagtung: *See—*
Memmert, Klaus; and Wandrey, Christian, 4,927,751, Cl. 435-3.000.

Kershaw, Charles H. Fluid coupled fiber optic sensor. 4,928,006, Cl. 250-201.100.

Kertesz, Denis J.: *See—*
Walker, Keith A. M.; and Kertesz, Denis J., 4,927,963, Cl. 562-501.000.

Key, Gary R.: *See—*
Biswas, Gautam; Black, David C.; Duncan, Michael G.; Key, Gary R.; Leak, Gordon D.; and Whittington, Robert D., 4,928,306, Cl. 379-201.000.

Key, Jonnie L.: *See—*
Ooms, Willem; Moss, Frank R.; and Key, Jonnie L., 4,927,695, Cl. 428-159.000.

Khan, Sadath U.: *See—*
Ghebre-Sellassie, Isaac; Gordon, Robert H.; and Khan, Sadath U., 4,927,639, Cl. 424-497.000.

Khandavalli, Chandra, to Avantek, Inc. Branch line coupler. 4,928,078, Cl. 333-109.000.

Khanna, Dinesh N.: *See—*
Mueller, Werner H.; and Khanna, Dinesh N., 4,927,736, Cl. 430-275.000.

Kicks, Henry W.; and Kicks, Malcolm. Dartboards. 4,927,162, Cl. 273-408.000.

Kicks, Malcolm: *See—*
Kicks, Henry W.; and Kicks, Malcolm, 4,927,162, Cl. 273-408.000.

Kidwell, Michael H.: *See—*
Davidson, James B.; Kaz, Peter N.; Kidwell, Michael H.; and Zachman, Mark E., 4,926,948, Cl. 172-4.500.

Kiefer, Werner: *See—*
Greulich, Norbert; Kiefer, Werner; and Rehm, Veronika, 4,927,442, Cl. 65-18.100.

Kierstead, Richard W.: *See—*
Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,927,826, Cl. 514-256.000.
Guthrie, Robert W.; Kierstead, Richard W.; Mullin, John G.; and Tilley, Jefferson W., 4,927,838, Cl. 514-337.000.

Kikkoman Corporation: *See—*
Hashimoto, Hikotaka; and Kobayashi, Kunio, 4,926,747, Cl. 99-486.000.

Kikuchi, Nobuyuki: *See—*
Yagi, Nobuyuki; Inagaki, Jiro; Morita, Kozo; Kaku, Yasutoshi; Kikuchi, Nobuyuki; and Mizuno, Shinji, 4,928,082, Cl. 338-174.000.

Kikuchi, Yoshiaki: *See—*
Hotta, Saburo; Kikuchi, Yoshiaki; Takaya, Masanori; and Inoue, Takashi, 4,927,455, Cl. 71-64.130.

Kikuta, Mitsuhiro: *See—*
Inui, Shuji; Hiramitsu, Tetsushi; Takahaski, Toshinori; Tamaki, Makoto; Kikuta, Mitsuhiro; and Mizutani, Junichi, 4,927,364, Cl 439-15.000.

Kilgore, Eldon F.; and Kilgore, Howard J. Shade for telescopic sight. 4,926,550, Cl. 33-244.000.

Kilgore, Howard J.: *See—*
Kilgore, Eldon F.; and Kilgore, Howard J., 4,926,560, Cl. 33-244.000.

Kim, Jeung T.; and Imam, Imdad, to General Electric Company. Compressor noise attenuation using branch type resonator. 4,927,342, Cl. 418-63.000.

Kimata, Masafumi, to Mitsubishi Denki Kabushiki Kaisha. Solid-state image sensor having a plurality of horizontal transfer portions. 4,928,158, Cl. 357-24.000.

Kimball, Christopher V.; Stanke, Fred E.; Randall, Curtis J.; and Hayman, Andrew J., to Schlumberger Technology Corporation. Determining impedance of material behind a casing in a borehole. 4,928,269, Cl. 367-35.000.

Kimball Industries, Inc.: *See—*
Frost, Charles, 4,927,119, Cl. 248-550.000.

Kimbel, Kirk L.: *See—*
Adams, Ronald L.; Kimbel, Kirk L.; and Quinn, Clayton B., 4,927,675, Cl. 428-35.900.

Kimberlin, Robert R., to Ingersoll-Rand Company. Lube oil system for rotating machinery. 4,926,970, Cl. 184-6.110.

Kimberlin, Robert R., to Ingersoll-Rand Company. Radial flow fluid pressure module. 4,927,323, Cl. 415-98.000.

Kimberly-Clark Corporation: *See—*
Bryson, Robert E., 4,927,582, Cl. 264-113.000.

Kimmel, Steven A.: *See—*
Genbauffe, Francis S.; and Kimmel, Steven A., 4,927,996, Cl. 219-413.000.

Kimura, Hitosi: *See—*
Arima, Noburu; Ogino, Nobuyosi; and Kimura, Hirosi, 4,926,793, Cl. 118-730.000.

Kimura, Kyoichiro: *See—*
Hayashida, Suetou; Kimura, Kyoichiro; and Takahashi, Eiji, 4,927,885, Cl. 525-211.000.

Kimura, Mareo: *See—*
Matsumoto, Shinichi; Miyoshi, Naoto; Kimura, Mareo; Ozawa, Masakuni; and Isogai, Akio, 4,927,799, Cl. 502-303.000.

Kimura, Sakae; Nikaido, Masaru; Yanagibashi, Katumi; Homma, Katsuhisa; and Ouchi, Yoshiaki, to Kabushiki Kaisha Toshiba. Impregnated cathode. 4,928,034, Cl. 313-346.00R.

Kimura, Takashi: *See—*
Matsunaga, Taira; and Kimura, Takashi, 4,928,157, Cl. 357-23.130.

Kinberg, Benjamin. Luminescent writing or display device. 4,927,748, Cl. 434-410.000.

King, Allen B.; and Perfetti, Thomas J., to Exci-Tech Industries, Inc. Ski-mountable device for scraping boots. 4,927,176, Cl. 280-813.000.

King, David Q.: *See—*
Deininger, William D.; and King, David Q., 4,928,027, Cl 310-11.000.

VOL 1114 ISS 4 MY 22 1990 UMI

King, Donald D., to Thermo King Corporation. Air conditioner unit suitable for mounting on the roof of a vehicle. 4,926,655, Cl. 62-244.000.

King, Roswell; E., III; Foster, George N.; and Petty, Herbert E., to Union Carbide Chemicals and Plastics Company Inc. Polysiloxanes with sterically hindered heterocyclic moiety. 4,927,898, Cl. 528-27.000.

Kinnear, Scott G.: *See*—
Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.

Kino, Gordon S.; and Xiao, Guoqing, to Leland Stanford Junior University, The Board of Trustees of the. Scanning confocal optical microscope including an angled apertured rotating disc placed between a pinhole and an objective lens. 4,927,254, Cl. 350-507.000.

Kinoshita, Naoyoshi: *See*—
Kusumoto, Keiji; and Kinoshita, Naoyoshi, 4,928,136, Cl. 355-315.000.

Kinoshita, Takao, to Canon Kabushiki Kaisha. Image sensing apparatus having a low-resolution monitor means for reducing the amount of information in an image signal, and switching means for reducing power consumption in various operating modes. 4,928,137, Cl. 358-213.260.

Kioustelidis, Johannes: *See*—
Kloetzer, Erhard; Kioustelidis, Johannes; and Schmidt, Guenter, 4,927,463, Cl. 106-109.000.

Kirbach, Eberhard. Feed speed and guide arm control for sawing logs. 4,926,917, Cl. 144-356.000.

Kirby, Neil V.; Street, Peter F. S.; and Markley, Lowell D., to Dow Chemical Company, The. Substituted azoles and their use as fungicides. 4,927,833, Cl. 514-399.000.

Kirchgessner, James A.: *See*—
Alvarez, Antonio R.; and Kirchgessner, James A., 4,927,775, Cl. 437-31.000.

Kirchgessner, Steven J. Directional control device. 4,927,987, Cl. 200-5.00R.

Kirkbride, M.: *See*—
McMurtry, D. R.; Stephens, W. F. N.; and Kirkbride, M., 4,926,566, Cl. 33-771.000.

Kise, Masahiro; Yoshimoto, Yoshihiko; Fujisawa, Hiroshi; Sasaki, Yasuo; and Yasufuku, Shoji, to Nippon Shinyaku Co., Ltd. Acylphenol derivatives, useful as anti-inflammatory agents and pain suppressants. 4,927,835, Cl. 514-448.000.

Kish, Jules G.: *See*—
Stone, Robert A.; and Kish, Jules G., 4,926,991, Cl. 192-41.00S.

Kishi, Noriyuki; Katoh, Atsushi; and Saita, Tomohisa, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling an air/fuel ratio or an internal combustion engine. 4,926,823, Cl. 123-432.000.

Kishino, Koji, to Mazada Motor Corporation. Glass construction for an automobile. 4,927,207, Cl. 296-185.000.

Kisou, Masaaki, to Kabushiki Kaisha Toshiba. Noise reduction circuit for a chrominance signal of a using frame correlation. 4,928,165, Cl. 358-36.000.

Kita, Tatsuya; Shigemura, Takuro; Nakamura, Setsuo; and Nakane, Hisanori, to Mazda Motor Corporation. Rotary piston engine. 4,926,816, Cl. 123-203.000.

Kitagaki, Kazunori: *See*—
Yamamoto, Hajime; Takashima, Yuji; Kitagaki, Kazunori; and Nakamura, Masahiko, 4,927,724, Cl. 430-45.000.

Kitagawa, Fumio: *See*—
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,926,881, Cl. 128-804.000.

Kitagawa Industries Co., Ltd.: *See*—
Takahashi, Katsumasa, 4,927,111, Cl. 248-500.000.

Kitahara, Shigehisa; Ohtsu, Akira; and Fujii, Katsuhiko, to Teijin Limited. γ-L-glutamyl-L-cysteine ethyl ester and pharmaceutical compositions containing the same as an effective ingredient. 4,927,808, Cl. 514-19.000.

Kitamoto, Manabu, to Kabushiki Kaisha Toshiba. Air conditioner system with control for optimum refrigerant temperature. 4,926,652, Cl. 62-175.000.

Kitamura, Yoshio; Takizuka, Hiroshi; and Ishihara, Tadao, to Sony Corporation. Data processor system and method. 4,928,234, Cl. 364-200.000.

Kitayama, Taku: *See*—
Matsubara, Toshihiko; and Kitayama, Taku, 4,927,707, Cl. 428-323.000.

Kiyono, Mikio, to NEC Corporation. Balanced lightwave transmission system. 4,927,221, Cl. 350-96.140.

Klapper, Kenneth K.: *See*—
Huggins, Thomas B.; Widener, Wade H.; and Klapper, Kenneth K., 4,927,313, Cl. 414-414.000.

Klees, George N.: *See*—
Franklin, Hugh L.; Whatley, Leslie H.; and Klees, George N., 4,928,059, Cl. 324-123.00R.

Kleinhappl, Erich: *See*—
Fischer, Fritz; Kleinhappl, Erich; and Marsoner, Hermann, 4,927,603, Cl. 422-67.000.

Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, to Nabisco Brands, Inc. Tris-hydroxymethyl alkane esters as low calorie fat mimetics. 4,927,658, Cl. 426-611.000.

Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, to Nabisco Brands, Inc. Tris-hydroxymethyl lower alkane esters as fat mimetics. 4,927,659, Cl. 426-611.000.

Kleven, Lowell A.; and Corpron, Gary P., to Rosemount Inc. Rocking beam vortex sensor. 4,926,695, Cl. 73-861.240.

Kliman, Gerald B.; and Jones, Donald W., to General Electric Company. Aircraft engine unducted fan blade pitch control system. 4,927,329, Cl. 416-127.000.

Kline, Donald, to Panavision, Inc. Video assist system for motion-picture camera. 4,928,171, Cl. 358-97.000.

Klinner, Wilfred E.: *See*—
Neale, Michael A.; and Klinner, Wilfred E., 4,926,749, Cl. 100-177.000.

Kloetzer, Erhard; Kioustelidis, Johannes; and Schmidt, Guenter, to Biochemie Ladenburg GmbH. Aqueous dispersion of gypsum and its use as a filler and coating pigment in the production of paper and cardboard. 4,927,463, Cl. 106-109.000.

Kloosterman, David, to Eastman Kodak Company. Combination erase device. 4,928,142, Cl. 355-218.000.

Klopfenstein, Rick; and Kreitzer, Tom. Portable, collapsible ice fishing shelter. 4,926,893, Cl. 135-106.000.

Kluttz, James S., to NCR Corporation. Switch mode power supply start-up circuit. 4,928,218, Cl. 363-37.000.

KMS Fusion, Inc.: *See*—
Glass, Alexander J., 4,928,153, Cl. 356-343.000.

Knabel, Horst, to Rheinmetall GmbH. Measuring device for determining the position of workpiece faces. 4,926,559, Cl. 33-832.000.

Knapp, Gordon G.: *See*—
Wright, William E.; Davis, Bryan T.; Matteson, Donald S.; and Knapp, Gordon G., 4,927,553, Cl. 252-49.600.

Knibbe, Engel J., to U.S. Philips Corp. Camera with well defined shutter and suitable for recording television and cinematographic images. 4,928,180, Cl. 358-213.130.

Knight, Gerald L. Veterinary liniment and method. 4,927,641, Cl. 424-665.000.

Knopf, Robert J.; Theiling Jr., Louis F.; and Berti, Leroy P., to Union Carbide Chemicals and Plastics Company, Inc. Continuous process for producing secondary alcohols and carboxylic acid esters. 4,927,954, Cl. 558-441.000.

Knowles, David G., to Cameron Iron Works USA, Inc. Retrievable guide post system. 4,927,295, Cl. 405-195.000.

Knowles, Steve: *See*—
Smith, Richard D.; Knowles, Steve; Cassady, R. J.; Smith, William; and Simon, Mark A., 4,926,632, Cl. 60-203.100.

Knox, David E.; and Fischer, Eugene R., to Westvaco Corporation. Oil field corrosion inhibition. 4,927,669, Cl. 427-239.000.

Knudsen, Arne K.; Delzer, Scott H.; and Langhoff, Charles A. Laser flash thermal conductivity apparatus and method. 4,928,254, Cl. 364-556.000.

Kobayashi, Kenichi, to Fuji Xerox Co., Ltd. Thin-film transistor and wiring matrix device and its forming method. 4,928,161, Cl. 357-71.000.

Kobayashi, Kunio: *See*—
Hashimoto, Hikotaka; and Kobayashi, Kunio, 4,926,747, Cl. 99-486.000.

Kobayashi, Masaharu; and Nishimura, Yukio, to Hitachi, Ltd.; and Hitachi Video Engineering, Ltd. Rotary head type recording/reproducing method and apparatus for recording and reproducing a digital audio signal. 4,928,185, Cl. 360-19.100.

Kobayashi, Setsuo: *See*—
Era, Susumu; Kobayashi, Setsuo; and Mukoh, Akio, 4,927,735, Cl. 430-270.000.

Kobayashi, Shinobu: *See*—
Yoshioka, Hiroshi; Nagatsuma, Nobuyoshi; and Kobayashi, Shinobu, 4,926,972, Cl. 184-109.000.

Kobayashi, Takayuki: *See*—
Winkler, Robert; Sala, Siro; Kobayashi, Takayuki; and Yokota, Shinjiro, 4,927,494, Cl. 159-2.100.

Koch, Reinhold: *See*—
Brennecke, Hermann; Liere, Horst; and Koch, Reinhold, 4,928,255, Cl. 364-558.000.

Kochka, Edgar L.: *See*—
Campbell, Robert B.; Kochka, Edgar L.; and Piotrowski, Paul A., 4,927,489, Cl. 156-620.100.

Kochs Adler Aktiengesellschaft: *See*—
Upmeier, Egon, 4,926,769, Cl. 112-121.120.

Kodama, Satoru: *See*—
Yoshimi, Tomohisa; Kodama, Satoru; Yoshinori, Takeshi; and Ito, Masahiko, 4,928,090, Cl. 340-575.000.

Kodera, Masaya: *See*—
Morizumi, Mitsuo; Omura, Kinya; Arita, Eriya; Furuya, Katsuji; Yasuda, Sakae; and Kodera, Masaya, 4,926,914, Cl. 141-59.000.

Kohanyi, Laszlo : *See*—
Harsanyi, Jozsef; Kohanyi, Laszlo ; Domsa, Karoly; Szakacs, Lajos; Szentgyorgyi, Geza; and Imre, Aladar, 4,927,549, Cl. 252-25.000.

Kohling, Alfons: *See*—
Friehmelt, Volker; Maier, Bernhard; Kohling, Alfons; and Schmitt, Rolf-Eberhard, 4,927,511, Cl. 204-151.000.

Kohm, Thomas S., to Kollmorgen Corporation. Multilayer printed wiring boards. 4,927,742, Cl. 430-311.000.

Kohn, Les: *See*—
Galbi, David; and Kohn, Les, 4,928,259, Cl. 364-745.000.

Kohut, Frank R. Apparatus for replacing a door panel. 4,926,536, Cl. 29-238.000.

Koike, Hideyuki: *See*—
Ito, Yoshiaki; Nagai, Kougi; Sawada, Akihiko; and Koike, Hideyuki, 4,927,338, Cl. 417-462.000.

Koike, Yutaka: *See*—
Tanaka, Seiichi; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Morishima, Hajime; and Matsuyama, Kenji, 4,927,565, Cl. 260-404.500.

Koishi, Musubu: *See*—
Takahashi, Akira; and Koishi, Musubu, 4,928,248, Cl. 372-38.000.

Koito Manufacturing Co., Ltd.: *See*—
Fujino, Yuuji; and Nakamura, Yasuhiro, 4,928,215, Cl. 362-61.000.
Sakakibara, Koichi; and Ozawa, Yasuo, 4,927,248, Cl. 350-452.000.

Koizumi, Hiromi: *See*—
Iwai, Kazumi; Koizumi, Hiromi; and Wada, Katsuo, 4,926,645, Cl. 60-723.000.

Kokado, Masayuki, to Fujitsu Limited. Emitter coupled logic circuit. 4,928,025, Cl. 307-455.000.

Kokkonen, Kari: *See*—
Hamala, Sirpa; Heikkila, Matti; Laine, Jouko; Kokkonen, Kari; and Kenakkala, Timo, 4,927,613, Cl. 423-244.000.

Kokoku Rubber Industry Company Limited: *See*—
Iizuka, Yoshio, 4,928,092, Cl. 340-707.000.

Kolb, Bruno: *See*—
Pospisil, Peter; and Kolb, Bruno, 4,927,532, Cl. 210-198.200.

Kollmorgen Corporation: *See*—
Kohm, Thomas S., 4,927,742, Cl. 430-311.000.

Kolowski, Michael A.: *See*—
Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., 4,926,919, Cl. 152-209.00R.

Komaroff, Iwan: *See*—
Auwarter, Gerhard; Imhof, Ernst; Komaroff, Iwan; Reum, Helmut; Schmid, Gunther; and Kaczynski, Bernhard, 4,926,819, Cl. 123-297.000.

Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N. Spring leaf with a diminishing thickness towards the ends thereof and having shoulders on opposite sides. 4,927,121, Cl. 267-47.000.

Kon, Kenji: *See*—
Yamada, Nobutoshi; Sugi, Hideo; and Kon, Kenji, 4,927,919, Cl. 536-17.400.

Kondo, Hiroshi: *See*—
Yoshizawa, Tetsuo; Terayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shunichi; Ichida, Yasuteru; and Konishi, Masaki, 4,926,549, Cl. 29-876.000.

Kondo, Masao; and Abe, Yasunao, to Yamaha Corporation. Electronic rhythm performing apparatus generating both manual and automatic rhythm tones. 4,926,738, Cl. 84-618.000.

Konica Corporation: *See*—
Bartlett, Kenneth G.; and Walberg, Per-Erik, 4,928,192, Cl. 360-77.080.
Koshizuka, Kunihiro; Tezuka, Toshiaki; Abe, Takao; and Ebisawa, Harue, 4,927,693, Cl. 428-141.000.

Konishi, Masaki: *See*—
Yoshizawa, Tetsuo; Terayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shunichi; Ichida, Yasuteru; and Konishi, Masaki, 4,926,549, Cl. 29-876.000.

Konishi, Masataka; Shimizu, Keiko; Ohbayashi, Masaru; Tomita, Koji; Miyaki, Takeo; and Oki, Toshikazu, to Bristol-Myers Company. BU-3839T antibiotic. 4,927,848, Cl. 514-453.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Hasegawa, Tai; Monnai, Jun; and Matsuzaki, Masatoshi, 4,928,134, Cl. 346-76.0PH.

Kontron Instruments Holdings, NV.: *See*—
Tompkins, David J., 4,926,701, Cl. 73-864.150.

Kopatz, Nelson E.; Johnson, Walter A.; and Ritsko, Joseph E., to GTE Products Corporation. Hydrometallurgical process for producing finely divided iron based powders. 4,927,456, Cl. 75-346.000.

Kopilovitsch, Heinz: *See*—
Durchschlag, Gerald; Lang, Alfred; Rotter, Franz; Fritz, Dieter; and Kopilovitsch, Heinz, 4,927,102, Cl. 246-469.000.

Koppl Industrial Systems, Inc.: *See*—
Moore, Billy G., 4,927,182, Cl. 285-15.000.

Korber AG: *See*—
Lorenzen, Heinz-Christen; Heitmann, Uwe; Siems, Wolfgang; and Pinck, Peter, 4,926,886, Cl. 131-84.400.
Myohl, Jochim; and Kasparek, Alfred, 4,926,887, Cl. 131-91.000.

Kordel, Wojciech J., to Joloda Plc. Cargo space utilization. 4,927,316, Cl. 414-510.000.

Korniski, Thomas J.: *See*—
Butler, James W.; Korniski, Thomas J.; and Colvin, Alex D., 4,928,015, Cl. 250-343.000.

Kosarko, Gerald J.: *See*—
Elly, James E.; and Kosarko, Gerald J., 4,928,194, Cl. 360-97.040.
Hickok, William K.; Riley, John M.; and Kosarko, Gerald J., 4,928,196, Cl. 360-105.000.

Koshizawa, Toshifumi; Ohkawa, Kiyomi; and Horiuchi, Teruhiko, to Isuzu Motors Limited. Automatic clutch control apparatus. 4,926,994, Cl. 192-110.00R.

Koshizuka, Kunihiro; Tezuka, Toshiaki; Abe, Takao; and Ebisawa, Harue, to Konica Corporation. Thermal transfer recording medium and its manufacturing method. 4,927,693, Cl. 428-141.000.

Koslowski, Gerhard; and Bollen, Manfred, to Benninger AG. Apparatus for giving protection from draft and dust at a winding machine. 4,926,531, Cl. 28-173.000.

Kotani, Masanori: *See*—
Masuda, Masaaki; Kotani, Masanori; Wakahara, Katsuhiro; and Sakata, Shuichi, 4,926,653, Cl. 62-204.000.

Kotani, Matahira: *See*—
Tanaka, Hironori; Kotani, Matahira; and Matsumoto, Masafumi, 4,927,130, Cl. 271-10.000.

Koterazaka, Toshiyuki: *See*—
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Kotlarek, Peter A.: *See*—
Riffe, Delmar R.; Kotlarek, Peter A.; and Utter, Robert E., 4,927,339, Cl. 418-55.000.

Kotz, Steven P.; and Lane, John H., to Pullman Company, The. Ball joint design. 4,927,285, Cl. 403-133.000.

Kotzur, Joachim: *See*—
Buthmann, Peter; and Kotzur, Joachim, 4,926,642, Cl. 60-607.000.

Kovacs, Stephen G., to University of South Florida. Method for fabricating prosthesis material. 4,927,410, Cl. 600-36.000.

Kovalenko, Sergei V.: *See*—
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.

Koyama, Tadao: *See*—
Mori, Nobufumi; Muraishi, Katsuaki; Matsuda, Terumi; Ohnishi, Masahiro; Nunome, Hiromi; Koyama, Tadao; and Oikawa, Tetsuo, 4,928,016, Cl. 250-440.100.

Koyama, Tadayoshi: *See*—
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, 4,927,959, Cl. 560-193.000.

Koyanagi, Haruo; Kumasaka, Hideyuki; Takao, Koji; and Noda, Tomohiko, to Nissan Motor Co., Ltd. Production system using unmanned automatically guided vehicles. 4,926,544, Cl. 29-703.000.

Koyo Seiko Co., Ltd.: *See*—
Kusumoto, Hirotaka; and Shiraki, Toshihiko, 4,926,993, Cl. 192-98.000.

Kozuki, Koichi, to Yamaha Corporation. Electronic musical instrument with automatic performance apparatus. 4,926,736, Cl. 84-609.000.

Kragl, Heinz: *See*—
Bernhardt, Gunther; Amort, Jurgen; Kragl, Heinz; and Haas, Margret, 4,927,948, Cl. 556-401.000.

Krambeck, Frederick J.: *See*—
Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., 4,927,526, Cl. 208-152.000.

Kramer, Claus: *See*—
Tanbitz, Bernd; Zieher, Peter; Kramer, Claus; Engelsdorf, Kurt; and Schuelke, Armin, 4,926,983, Cl. 188-299.000.

Kramer, George C.; and Perron, Paul R., to University of California, The Regents of the. Saturated salt/concentrated dextran formulation to treat hemorrhage. 4,927,806, Cl. 514-2.000.

Kramer, James H., to B. F. Goodrich Company, The. Conveyor support. 4,927,007, Cl. 198-823.000.

Kramer, Wolfgang: *See*—
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, 4,927,844, Cl. 514-425.000.

Krantz, Jeffrey I.: *See*—
Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.

Kranz, Paul R.: *See*—
Brock-Fisher, George A.; Kranz, Paul R.; Mniece, James R.; Thiele, Karl E.; Savord, Bernard J.; and Smith, Richard B., 4,926,872, Cl. 128-661.010.

Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Rotor setting system in conjunction with aerodynamic body controls. 4,927,096, Cl. 244-3.220.

Krasuski, Marek; and Prugnolle, Bernard, to Societe Anonyme dite: ALCATEL SATMAN. Machine for inserting mail into envelopes. 4,926,612, Cl. 53-69.000.

KRB Machinery Co.: *See*—
Kauffman, Kenneth A., 4,926,995, Cl. 193-37.000.

Kreft, Hans-Diedrich; MacKenthun, Holger; and Hass, Wolfgang, to Angewandte Digital Electronik GmbH. Phase-stabilized, phase-coupled resonant circuit. 4,928,087, Cl. 340-825.710.

Kreitzer, Tom: *See*—
Klopfenstein, Rick; and Kreitzer, Tom, 4,926,893, Cl. 135-106.000.

Kretchmer, Steven D., to Kretchmer, Steven D.; and Stern Metals, Inc. Method for making multi-colored composite laminates. 4,927,070, Cl. 228-155.000.

Kriauciunas, G. Vincent; and Vance, Karen, to Northgate Research, Inc. Lithotriptor device for trapping and destroying concretions. 4,927,427, Cl. 606-128.000.

Krishnakumar, Suppayan M.: *See*—
Collette, Wayne N.; Krishnakumar, Suppayan M.; and Piccioli, David P., 4,927,680, Cl. 428-36.920.

Krishnan, Satya: *See*—
Huang, Anthony H.; and Krishnan, Satya, 4,927,571, Cl. 264-4.300.

VOL
1114
ISS
4
MY
22
1990
UMI

Kroes, Anthony; and Van Engen, Pieter G., to U.S. Philips Corp. Electrodeless low-pressure discharge lamp. 4,927,217, Cl. 315-248.000.

Krohm, Inc.: *See—*
Osmonson, Daniel T.; and McNulty, James L., 4,926,892, Cl. 135-103.000.

Kromer, Gunter: *See—*
Putz, Heinrich; Nowitzki, Friedhelm; Damm, Gunter; Bathelt, Hartmut; Kromer, Gunter; Hoffmann, Henning; and Pischke, Reiner, 4,926,634, Cl. 60-274.000.

Krongauz, Valeri A.; and Shvartsman, Felix P., to Yeda Research and Development Co., Ltd. Quasi-liquid crystals. 4,927,917, Cl. 534-567.000.

Krongold, Martin A.: *See—*
Wieland, Rolf H.; and Krongold, Martin A., 4,927,433, Cl. 55-18.000.

Kropielnicki, Jerzy J.; Easter, Brian; and Last, James D., to BSH Electronics, Ltd. Electrical signal separating device having isolating and matching circuitry for split passband matching. 4,928,108, Cl. 343-704.000.

Kross, Manfred; and Plumer, Hans J., to ITW-ATECO, GmbH. Supplementary device for inserting screws by means of a power-driven screw driver. 4,926,719, Cl. 81-57.370.

Krueger, Brian: *See—*
Polczynski, Mark; and Krueger, Brian, 4,926,546, Cl. 29-840.000.

Krueger, Keith T.: *See—*
Wight, Donald C.; and Krueger, Keith T., 4,927,982, Cl. 174-50.000.

Krupp Polysius AG: *See—*
Henne, Heinrich; Dammertz, Karl-Heinz; Schneider, Lutz T.; and Blaszczyk, Gotthard, 4,927,086, Cl. 241-80.000.

Kubota, Ltd.: *See—*
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,926,624, Cl. 56-202.000.

Kuczek, Stanley W.: *See—*
Haire, Allen; Abele, Alan C.; and Kuczek, Stanley W., 4,927,355, Cl. 431-329.000.

Kudo, Yoshinobu: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,928,124, Cl. 354-106.000.

Kudoh, Noboru; Hirukawa, Itsushi; Aoki, Satoshi; Yoshimura, Tsuyoshi; and Shiozawa, Shigeki, to Sanshin Kogyo Kabushiki Kaisha. Gas exhaustion device for inboard/outboard engine. 4,927,390, Cl. 440-88.000.

Kuga, Shigeki: *See—*
Tanaka, Toshiyuki; Kuga, Shigeki; Nakamura, Nobuo; Morishita, Taro; and Wada, Masahiro, 4,928,236, Cl. 364-513.000.

Kuhle, Engelbert: *See—*
Adler, Alfons; Widdig, Arno; Kuhle, Engelbert; Fuhrer, Wolfgang; Hagemann, Hermann; and Hanssler, Gerd, 4,927,824, Cl. 514-241.000.

Kuijk, Karel E., to U.S. Philips Corp. Optical imaging system having an electronically variable focal length and optical image sensor provided with such a system. 4,927,241, Cl. 350-336.000.

Kulli, John C. Syringe with safety retracting needle. 4,927,414, Cl. 604-110.000.

Kumani, Hiroo; and Okamoto, Akio, to Kabushiki Kaisha Nasa. Method of preserving food. 4,927,651, Cl. 426-324.000.

Kumasaka, Hideyuki: *See—*
Koyanagi, Haruo; Kumasaka, Hideyuki; Takao, Koji; and Noda, Tomohiko, 4,926,544, Cl. 29-703.000.

Kumiai Chemical Industry Co., Ltd.: *See—*
Yamaguchi, Mikio; Suzuki, Chiharu; Matsunari, Kenji; Miyazawa, Takeshige; and Nakamura, Yasuo, 4,927,448, Cl. 71-90.000.

Kummerer, Hans-Helmut, to C. Stiefelmayer KG. End measure, particularly stepped end measure. 4,926,565, Cl. 33-567.000.

Kummli, Paul: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.

Kun, Zoltan K.: *See—*
Leksell, David; Kun, Zoltan K.; and Mandel, Alan F., 4,928,118, Cl. 346-107.00R.

Kundermann, Wolfgang, to Fichtel & Sachs AG. Hydrodynamic clutch. 4,926,988, Cl. 192-3.300.

Kunkle, Albert C.: *See—*
Hyder, Walter J.; Kunkle, Albert C.; and Weaver, Robert M., 4,927,465, Cl. 106-486.000.

Kunz, Peter, to Georg Fischer AG. Apparatus for welding tubular components of thermoplastic material. 4,927,642, Cl. 425-508.000.

Kuraray Company, Ltd.: *See—*
Maeda, Toshihiko; Tokitoh, Yasuo; and Yoshimura, Noriaki, 4,927,960, Cl. 562-512.000.

Kurashima, Ikuo: *See—*
Kaieda, Shozo; Kurashima, Ikuo; Okazima, Hideo; and Mai, Jun, 4,928,055, Cl. 323-300.000.

Kurebayashi, Yutaka: *See—*
Iikubo, Tomohito; and Kurebayashi, Yutaka, 4,927,601, Cl. 420-111.000.

Kureha Chemical Industry Co., Ltd.: *See—*
Hori, Saburo; and Watanabe, Nobuhiro, 4,927,793, Cl. 501-134.000.

Kuriyama, Fumio: *See—*
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 4,926,648, Cl. 62-55.500.

Kuriyama, Kazunori: *See—*
Kamada, Eiki; Shintani, Yooichi; Kuriyama, Kazunori; Shonai, Tohru; and Inoue, Kiyoshi, 4,928,226, Cl. 364-200.000.

Kuroda, Hiroshi; and Watanabe, Atsushi, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Signal receiving method for a user's device in a global positioning system. 4,928,107, Cl. 342-357.000.

Kurohara, Kazuaki: *See—*
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,926,624, Cl. 56-202.000.

Kurosawa, Hinoko; Itoh, Kazuya; Nakamura, Hisashi; and Ishihara, Masamichi, to Hitachi, Ltd. Semiconductor memory. 4,928,281, Cl. 371-51.100.

Kusakawa, Takaji; Wakamoto, Katsuyoshi; and Imaizumi, Mitsuyuki, to Mitsubishi Denki Kabushiki Kaisha; and Kusakawa, Takaji. Method for producing thin plate of phosphor bronze. 4,927,467, Cl. 148-3.000.

Kushibe, Mitsuhiro; Eguchi, Kazuhiro; Funamizu, Masahisa; and Ohba, Yasuo, to Kabushiki Kaisha Toshiba. Impurity-doped semiconductor laser device for single wavelength oscillation. 4,928,285, Cl. 372-45.000.

Kusumoto, Hirotaka; and Shiraki, Toshihiko, to Koyo Seiko Co., Ltd. Release bearing unit. 4,926,993, Cl. 192-98.000.

Kusumoto, Keiji; and Kinoshita, Naoyoshi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 4,928,136, Cl. 355-315.000.

Kusunoki, Toshio: *See—*
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,926,881, Cl. 128-804.000.

Kutasy, Eugene: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.

Kutner, Andrzej: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Kutner, Andrzej, 4,927,815, Cl. 514-167.000.

Kuzuya, Susumu; Nagao, Yoshiaki; Asakura, Hideo; and Hattori, Shigenori, to Brother Kogyo Kabushiki Kaisha. Tape cassette and tape printer for use therewith. 4,927,278, Cl. 400-208.000.

Kwok, Kui-Chiu; and Marchand, Bernard J., to Graco Inc. Rotary atomizer. 4,927,081, Cl. 239-223.000.

Kyodo Shiryo Co., Ltd.: *See—*
Hotta, Saburo; Kikuchi, Yoshiaki; Takaya, Masanori; and Inoue, Takashi, 4,927,455, Cl. 71-64.130.

Kyogoku, Tetsuo: *See—*
Okamoto, Hiroshi; Oka Tateki; Sako, Mineyuki; Kyogoku, Tetsuo; and Suzuki, Toshikazu, 4,928,145, Cl. 355-245.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Mizukami, Toru; Katsumata, Ryoichi; and Oka, Tetsuo, 4,927,758, Cl. 435-107.000.

Kysela, Ernst: *See—*
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,927,454, Cl. 71-93.000.

L.G.L. Electronics S.p.A.: *See—*
Zenoni, Pietro, 4,926,912, Cl. 139-452.000.

Laakso, Richard O.: *See—*
Meredith, Michael D.; Phillips, Joseph R.; Laakso, Richard O.; and Stromberg, C. Bertil, 4,927,312, Cl. 414-221.000.

Labeltape Meditect Inc.: *See—*
Snedeker, Marvin L., 4,926,878, Cl. 128-798.000.

Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,927,855, Cl. 514-618.000.

Laboratori Baldacci SpA: *See—*
Caccia, Giulio; and Baldacci, Massimo, 4,927,849, Cl. 514-455.000.

Laboratorios del Dr. Esteve S.A.: *See—*
Corominas, Juan P.; Constansa, Jordi F.; and Pinol, Augusto C., 4,927,926, Cl. 544-101.000.

Lacuve, Jean, to Societe d'Applications Generales d'Electricite et de Mecanique Sagem. Multispectral optical device comprising mirrors. 4,927,256, Cl. 350-619.000.

Lacy, Franklin R. Adjustable windshield and canopy for a boat. 4,926,782, Cl. 114-361.000.

Ladouceur, Bruno: *See—*
Mouesca, Bruno; and Ladouceur, Bruno, 4,928,291, Cl. 376-327.000.

Laenen, Edward: *See—*
Pastrone, John; and Laenen, Edward, 4,927,411, Cl. 604-65.000.

Lafon, Louis, to Laboratoire L. Lafon. Levorotatory isomer of benzhydrylsulfinyl derivatives. 4,927,855, Cl. 514-618.000.

Lagan, Edward F., Jr.: *See—*
Tansky, John L.; Lagan, Edward F., Jr.; and McGarry, Patrick J., 4,928,299, Cl. 379-37.000.

Laine, Jouko: *See—*
Hamala, Sirpa; Heikkila, Matti; Laine, Jouko; Kokkonen, Kari; and Kenakkala, Timo, 4,927,613, Cl. 423-244.000.

Lake, Micheal D.: *See—*
Miskin, Michael; Bamford, William; and Lake, Micheal D., 4,926,553, Cl. 30-49.000.

Lallement, Serge, to Compagnie Des Products Industriels de l'Ouest (C.P.I.O.). Protective bellows particularly for a motor vehicle front wheel drive. 4,927,678, Cl. 428-36.900.

Lam, William Y., to Ethyl Petroleum Additives, Inc. Lubricating oil composition. 4,927,552, Cl. 252-47.000.

Lamb, Mark E.: *See—*
Cozine, Mark L.; Ferguson, David G.; Hansen, Loren F.; and Lamb, Mark E., 4,926,947, Cl. 172-22.000.

Lamb-Weston, Inc.: *See—*
Julian, John C., 4,926,726, Cl. 83-165.000.

Lammle, Harro: *See—*
Gotting, Georg; and Lammle, Harro, 4,926,666, Cl. 72-247.000.

Lampman, David A.; Morich, Michael A; and Dannels, Wayne R., to Picker International, Inc. Automatic eddy current correction. 4,928,063, Cl. 324-307.000.

Lampman, William T.: *See—*
Patera, Ginger E.; Janke, Larry L.; and Lampman, William T., 4,927,033, Cl. 211-41.000.

Lamson, Frederick W., to Lockwood Manufacturing Co. Marker post system. 4,926,785, Cl. 116-209.000.

Lancaster, Gerald M.: *See—*
Strait, Chad A.; Tabor, Ricky L.; and Lancaster, Gerald M., 4,927,888, Cl. 525-285.000.

Lancini, Giancarlo: *See—*
Assi, Francesco; Lancini, Giancarlo; and Gianantonio, Anacleto, 4,927,754, Cl. 435-71.000.

Landman, Ronald G.: *See—*
Burba, Joseph C.; Landman, Ronald G.; Patil, Prabhakar B.; and Reitz, Graydon A., 4,928,227, Cl. 364-424.010.

Landrau, Felix A.: *See—*
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,927,633, Cl. 424-438.000.

Landry, Bernard, to IPL Inc. Device for collecting sap. 4,926,597, Cl. 47-52.000.

Landstrom, D. Karl: *See—*
Christensen, Richard N.; DeVuono, Anthony C.; Wilkinson, William H.; and Landstrom, D. Karl, 4,926,659, Cl. 62-476.000.

Landy, Richard: *See—*
Pilatowicz, Edward A.; Carsello, Anthony; and Landy, Richard, 4,926,556, Cl. 30-216.000.

Lane, Charles D., to Analog Devices, Inc. Parallel analog-to-digital converter using $2^{(n-1)}$ comparators. 4,928,103, Cl. 341-159.000.

Lane, Gregg A.; and Pearlstine, Kathryn, to Du Pont de Nemours, E. I., and Company. Voltammetry in low-permitivity suspensions. 4,928,065, Cl. 324-464.000.

Lane, John H.: *See—*
Kotz, Steven P.; and Lane, John H., 4,927,285, Cl. 403-133.000.

Lane & Roderick, Inc.: *See—*
Bailey, Lowell; and Libbert, Hervey, 4,926,676, Cl. 72-389.000.

Lang, Alfred: *See—*
Durchschlag, Gerald; Lang, Alfred; Rotter, Franz; Fritz, Dieter; and Kopilovitsch, Heinz, 4,927,102, Cl. 246-469.000.

Langer, Horst G., to Dow Chemical Company, The. Process for growing berlinite crystals. 4,927,614, Cl. 423-305.000.

Langhoff, Charles A.: *See—*
Knudsen, Arne K.; Delzer, Scott H.; and Langhoff, Charles A., 4,928,254, Cl. 364-556.000.

Langhorst, Martin A.: *See—*
Stevens, Timothy S.; Langhorst, Martin A.; and Randall, Osro W., III, 4,927,539, Cl. 210-635.000.

Langner, Paul, to Telemus Electronic Systems, Inc. Intrapulse radar receiver. 4,928,105, Cl. 342-192.000.

Lapoiriere, Claudine; Mahieu, Claude; and Papantoniou, Christos, to Societe Anonyme dite: L'Oreal. Process for the preparation of cross-linked poly β-alanine in the form of microspheres. 4,927,883, Cl. 525-154.000.

Laprade, Jean-Paul: *See—*
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.

Laquerre, Yves, to B. & R. Choiniere Limited. Windrow turning apparatus. 4,926,625, Cl. 56-376.000.

Laraque, Edy: *See—*
Ciloglu, Cavit; Gagne, Martin; Laraque, Edy; Poirier, Joel; Tremblay, Sylvain; and Trudel, Yves, 4,927,461, Cl. 75-254.000.

Larinoff, Michael W. Freeze protected, air-cooled vacuum steam condensers. 4,926,931, Cl. 165-111.000.

Larsen, Lawrence E. Method and apparatus for cardiac hemodynamic monitor. 4,926,868, Cl. 128-653.00R.

Larson, Eric G.: *See—*
Buchanan, Scott; Larson, Eric G.; Pieper, Jon R.; and Boettcher, Thomas E., 4,927,431, Cl. 51-298.000.

Larson, Gary J.: *See—*
Hsu, Jau Y.; and Larson, Gary J., 4,927,662, Cl. 426-658.000.

Larson, John R.: *See—*
Hock, Allan G.; Larson, John R.; and Sousa, John G., 4,928,112, Cl. 346-25.000.

Larson, Steve A.: *See—*
Polk, Gary C.; Larson, Steve A.; and Albrecht, Ronald E., 4,926,904, Cl. 137-565.000.

LaRue, John D.; and LaRue, John D., Jr. Document container. 4,927,074, Cl. 229-125.210.

LaRue, John D., Jr.: *See—*
LaRue, John D.; and LaRue, John D., Jr., 4,927,074, Cl. 229-125.210.

Lasa Industries, Inc.: *See—*
Burns, Douglas H., 4,928,284, Cl. 372-31.000.

Laser Precision Corporation: *See—*
Gentile, John R., 4,928,232, Cl. 364-525.000.

Laserdrive Limited: *See—*
Rees, Theodore D., 4,928,187, Cl. 360-40.000.

Laska, Eugene M.: *See—*
Sunshine, Abraham; and Laska, Eugene M., 4,927,854, Cl. 514-570.000.

Laskaris, Evangelos T.: *See—*
Dorri, Bizhan; and Laskaris, Evangelos T., 4,926,647, Cl. 62-51.100.

Laske, Lawrence L. Adjustable lamp. 4,928,217, Cl. 362-427.000.

Lassmann, Siegfried: *See—*
Muhlratzer, August; Handrick, Karin; Lassmann, Siegfried; and Hirt, Alfred, 4,927,702, Cl. 428-215.000.

Last, James D.: *See—*
Kropielnicki, Jerzy J.; Easter, Brian; and Last, James D., 4,928,108, Cl. 343-704.000.

Latham, Roger A.: *See—*
Motz, Kaye L.; Latham, Roger A.; and Statz, Robert J., 4,926,582, Cl. 44-62.000.

Lathers, Michael W., to Outboard Marine Corporation. Recreational boat seat/sun deck. 4,926,783, Cl. 114-363.000.

Laube, Beth L.: *See—*
Zoltan, Bart J.; Laube, Beth L.; and Adams, George K., III, 4,926,852, Cl. 128-200.230.

Lauffer, Donald K.: *See—*
Porter, Warren W.; and Lauffer, Donald K., 4,928,206, Cl. 361-385.000.

Laurent, Claude; Rostaing, Paul; and Lyobard, Rene, to Rhone-Poulenc Chimie. Process and apparatus using an elastoforming die/-form block comprising low-hardness silicone elastomer. 4,926,673, Cl. 72-465.000.

Lawn Doctor, Inc.: *See—*
Magda, Robert J., 4,926,768, Cl. 111-11.000.

Lawrence, Sharon K. Transparent shielding device for use with autopsy saw. 4,926,882, Cl. 128-850.000.

Lawson, James L., to Torrington Company, The. Equalizing hydrodynamic bearing. 4,927,275, Cl. 384-117.000.

Lawson Randall S.: *See—*
Morris, Arnold M.; D'Zurko, Daphne; Pilsbury, Richard H.; Barkell, J. Warren, Jr.; Orndorff, Karl B.; and Lawson Randall S., 4,926,974, Cl. 187-52.0LC.

Layne, Daniel T., III: *See—*
Antaki, James M.; and Layne, Daniel T., III, 4,927,657, Cl. 426-589.000.

Leader, Matthew J.: *See—*
Kamiya, Tadao; and Leader, Matthew J., 4,927,222, Cl. 350-96.150.

Leak, Gordon D.: *See—*
Biswas, Gautam; Black, David C.; Duncan, Michael G.; Key, Gary R.; Leak, Gordon D.; and Whittington, Robert D., 4,928,306, Cl 379-201.000.

Leask, John W., to Engineering Dynamics Corporation. Braking system for exercise apparatus. 4,927,136, Cl. 272-69.000.

Leatham, Alan: *See—*
Brooks, Reginald G.; Leatham, Alan; and Coombs, Jeffrey, 4,926,923, Cl. 164-5.000.

Leatherman, Dennis D., to PPG Industries, Inc. Pressure-sensitive multi-part record unit. 4,927,802, Cl. 503-214.000.

Leathman, Alan: *See—*
Brooks, Reginald G.; Leathman, Alan; and Coombs, Jeffrey, 4,926,924, Cl. 164-5.000.

Leaton, Timothy H., to Etablissement Gersan. Feeder. 4,927,004, Cl. 198-704.000.

Lebedik, Grigory L.: *See—*
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.

Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; and Lee, Scott, to Vexcel Corp. Mensuration frame grabbing apparatus. 4,928,169, Cl. 358-93.000.

Lechler, Rolf: *See—*
Heinemann, Joachim; Spies, Karl-Heinz; Keller, Frank; Beicht, Bernd; Leitermann, Wulf; and Lechler, Rolf, 4,926,921, Cl. 160-115.000.

Leckie, James H., to Essex Group, Inc. Protective device of restraining rod produced in continuous casting and rolling process. 4,926,928, Cl. 164-452.000.

Lee, Arnold St. J. System for gathering physiological data. 4,926,866, Cl. 128-630.000.

Lee, Arnold St. J. Method for determining blood pressure. 4,926,874, Cl. 128-682.000.

Lee, Chin-Ching. Disposable ashtray. 4,926,888, Cl. 131-236.000.

Lee, Kung H., to Du Pont de Nemours, E. I., and Company. Manufacture of chloroform. 4,927,981, Cl. 570-255.000.

Lee, Ruby B.: *See—*
Baum, Allen; Bryg, William R.; Mahon, Michael J.; Lee, Ruby B.; and Muchnick, Steven S., 4,928,239, Cl. 364-200.000.

Lee, Scott: *See—*
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; and Lee, Scott, 4,928,169, Cl. 358-93.000.

Lee, Ving J.; and Curran, William V., to American Cyanamid Company. 7β-(substituted)amino-3-substituted cephalosporanic acids and esters. 4,927,922, Cl. 540-227.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Lee, Yanien, to Borden, Inc. Process for making candy coated snack foods such as popcorn. 4,927,645, Cl. 426-93.000.
Leeper, Stephen A.: *See—*
Hatcher, Herbert J.; Gallian, John J.; and Leeper, Stephen A., 4,927,757, Cl. 435-105.000.
Leeson, Paul D.: *See—*
Baker, Raymond; Carling, William R.; James, Kim; and Leeson, Paul D., 4,927,819, Cl. 514-213.000.
Lefevre, Denis: *See—*
Devaux, Francois; Herail, Norbert; Lefevre, Denis; and Lehuede, Jean-Pierre, 4,928,077, Cl. 333-111.000.
Lefevre, Herve; Bettini, Jean-Pierre; Botti, Serge; and Turpin, Marc, to Thomson-CSF. Multiple-point temperature sensor using optic fibers. 4,928,005, Cl. 250-227.230.
Leger, Kenneth B., to United States of America, Air Force. Modular resistance heater assembly. 4,927,994, Cl. 219-343.000.
Legler, John G.; Folkerth, Harold E.; and Flora, David D., to Shopsmith, Inc. Biscuit joiner. 4,926,916, Cl. 144-136.00R.
Lego M. Lemelshtrich Ltd.: *See—*
Greenberg, Ilan; and Cohen, Amir, 4,927,082, Cl. 239-230.000.
Lehn, Jean-Marie: *See—*
Mathis, Gerard; and Lehn, Jean-Marie, 4,927,923, Cl. 540-456.000.
Lehuede, Jean-Pierre: *See—*
Devaux, Francois; Herail, Norbert; Lefevre, Denis; and Lehuede, Jean-Pierre, 4,928,077, Cl. 333-111.000.
Leibovich, Gregory, to Hydraulic Units, Inc. Proportional permanent magnet force actuator. 4,928,028, Cl. 310-23.000.
Leigh, James P.; and Roethel, Henry G., to Meyer Company, The. Dispensing valve with elastic sealing tube. 4,927,061, Cl. 222-212.000.
Leinert, Herbert; Tsaklakidis, Christos; and Sponer, Gisbert, to Boehringer Mannheim GmbH. 1,2-diamino compounds, processes for their preparation and pharmaceutical compositions containing them. 4,927,834, Cl. 514-422.000.
Leis, Michael D., to Digital Equipment Corporation. Multiple bandwidth filter system for phase locked loop. 4,928,075, Cl. 331-17.000.
Leischner, Hasso: *See—*
Wuest, Willi; Eskuchen, Rainer; Esser, Herbert; and Leischner, Hasso, 4,927,946, Cl. 549-371.000.
Leising, Maurice B.: *See—*
Mehta, Hemang S.; Holbrook, Gerald L.; and Leising, Maurice B., 4,928,235, Cl. 364-424.100.
Leitermann, Wulf: *See—*
Heinemann, Joachim; Spies, Karl-Heinz; Keller, Frank; Beicht, Bernd; Leitermann, Wulf; and Lechler, Rolf, 4,926,921, Cl. 160-115.000.
Leksell, David; Kun, Zoltan K.; and Mandel, Alan F., to Westinghouse Electric Corp. Enhanced resolution electrophotographic-type imaging station. 4,928,118, Cl. 346-107.00R.
Leland Stanford California Corporation, Board of Trustees of the: *See—*
Swanson, Richard M., 4,927,770, Cl. 437-2.000.
Leland Stanford Junior University, The Board of Trustees of the: *See—*
Keith, Douglas L., 4,927,515, Cl. 204-298.210.
Kino, Gordon S.; and Xiao, Guoqing, 4,927,254, Cl. 350-507.000.
Lemaire, Denis J., to Wenger SA. Pocket knife. 4,926,555, Cl. 30-162.000.
Lemons, George D.: *See—*
Ungchusri, Tep; and Lemons, George D., 4,927,192, Cl. 285-305.000.
Lenker, Don H.: *See—*
Butler, Lee D.; Orlando, Franklin P.; and Lenker, Don H., 4,927,440, Cl. 56-12.800.
Lennox Industries, Inc.: *See—*
Olsen, Mark W.; and Winegardner, John B., 4,926,658, Cl. 62-324.100.
Lenz, Ruediger: *See—*
Merrem, Hans-Joachim; Buhr, Gerhard; and Lenz, Ruediger, 4,927,732, Cl. 430-191.000.
Leonard, Patrick F.; Svetkoff, Donald J.; Kelley, Robert W.; Rohrer, Donald K.; and Coleman, E. North, Jr., to Synthetic Vision Systems, Inc. Method and system for automatically visually inspecting an article. 4,928,313, Cl. 382-8.000.
Leonardo, Victoria A.; and Nelson, Leonard E., to Motorola, Inc. Paging terminal apparatus with message storage and retransmission capability and method therefor. 4,928,096, Cl. 340-825.440.
Leopold, Arthur B., to Tarel Seven Design, Inc. Grooming device. 4,926,796, Cl. 119-83.000.
Leroux, Andre-Jean; and Mercier, Claude, to Mercier, Claude, a part interest. Method and device for manufacturing charcoal. 4,926,763, Cl. 110-215.000.
Lesk, Israel A.; Thomas, Ronald E.; Hawkins, George W.; and Rugg, James M., to Motorola, Inc. Die corner design having topological configurations. 4,928,162, Cl. 357-72.000.
Leszczak, John, to Bates Manufacturing Company, The. Stapling machine. 4,927,067, Cl. 227-128.000.
Lethen, Theodore H.: *See—*
Yerkes, James E.; and Lethen, Theodore H., 4,928,257, Cl. 364-563.000.
Leuenberger, Hans, to Biac Holding AG. Method of and apparatus for removing stains from soiled areas of a plannar textile article. 4,926,514, Cl. 8-150.000
Leupold, Herbert A., to United States of America, Army. Method of mass producing superconducting persistent current rings. 4,928,081, Cl. 335-216.000.
Levatter, Jeffrey I., to Acculase Inc. Liquid filled flexible distal tip light guide. 4,927,231, Cl. 350-96.320.
Leveque, Alain; and Triollier, Michel, to Rhone-Poulenc Industries. Recovery of gallium/rare earth values from oxide mixtures thereof. 4,927,609, Cl. 423-21.500.
Lever Brothers Company: *See—*
Beute, Willem, 4,927,027, Cl. 206-611.000.
Duckworth, Ralph M., 4,927,625, Cl. 424-52.000.
Haring, Petrus G. M., 4,927,652, Cl. 426-330.600.
Schwarz, Joshua; and Accardi, Christine, 4,927,559, Cl. 252-186.390.
Levine-Umans, Margaret P.: *See—*
Vitsky, Sally J.; and Levine-Umans, Margaret P., 4,926,759, Cl. 108-111.000.
Levinson, Frank H., to Finisar Corporation. 2×2 Optical bypass switch. 4,927,225, Cl. 350-96.180.
Lewers, William R.: *See—*
Bulso, Joseph D., Jr.; and Lewers, William R., 4,926,724, Cl. 83-35.000.
Lewis, Adrian: *See—*
Eglise, David; and Lewis, Adrian, 4,926,996, Cl. 194-212.000.
Lewis, John A., Jr.: *See—*
Haber, Terry M.; Smedley, William H.; Foster, Clark B.; and Lewis, John A., Jr., 4,927,019, Cl. 206-365.000.
Leybold Aktiengesellschaft: *See—*
Schultheiss, Eberhard; and Wirz, Peter, 4,927,513, Cl. 204-192.130.
Lhymn, Chang: *See—*
Lhymn, Yoon O.; and Lhymn, Chang, 4,927,712, Cl. 428-614.000.
Lhymn, Yoon O.; and Lhymn, Chang, to Yoon Technology. Fusible core alloy composites for plastics molding. 4,927,712, Cl. 428-614.000.
Li, Bean T.: *See—*
Tsai, Chong S.; Chen, Shou H.; Li, Bean T.; and Jean, King L., 4,927,664, Cl. 427-57.000.
Li, Qin Z.: *See—*
Ma, Bao P.; Shou-Fu, Zhong; and Li, Qin Z., 4,926,742, Cl. 89-33.020.
Liao, Shyh-Yuan: *See—*
Barnett, Ronald E.; Dikeman, Roxane; Liao, Shyh-Yuan; Gill, John; and Pantaleone, David P., 4,927,654, Cl. 426-548.000.
Libbert, Hervey: *See—*
Bailey, Lowell; and Libbert, Hervey, 4,926,676, Cl. 72-389.000.
Lichka, Helmut J., to Technolizenz Establishment. System of safety tank elements preventing explosions. 4,927,045, Cl. 220-88.00R.
Lidseen of North Carolina, Inc.: *See—*
Swanson, Melvin E., 4,926,672, Cl. 72-458.000.
Liebeschuetz, John W.: *See—*
Carson, Chrislyn M.; Copping, Leonard G.; Ehr, Robert J.; Gitlitz, Melvin H.; McNeil, Maynard W.; Street, Peter F. S.; and Liebeschuetz, John W., 4,927,812, Cl. 514-63.000.
Liere, Horst: *See—*
Brennecke, Hermann; Liere, Horst; and Koch, Reinhold, 4,928,255, Cl. 364-558.000.
Lierman, W. O. Game. 4,927,158, Cl. 273-268.000.
Lilly, Carol E. H.; Moore, Loyd C.; Eike, Mark E.; and Barker, Nicholas E., to Lilly, Carol E. H. Playtray with hinged legs. 4,926,758, Cl. 108-43.000.
Lin, Chen-Ju. Safety sinker. 4,926,580, Cl. 43-44.890.
Lin, Jiang-Jen: *See—*
Speranza, George P.; Lin, Jiang-Jen; and Templeton, James H., 4,927,912, Cl. 528-405.000.
Lind, Paul U., to Siemens Transmission Systems, Inc. Non-intrusive fiber optic electromagnetic field probe apparatus and associated methods. 4,928,067, Cl. 324-96.000.
Lindel, Hans; and Hallenbach, Werner, to Bayer Aktiengesellschaft. Halogen substituted pyridylalkyl ketones. 4,927,938, Cl. 546-315.000.
Lindenstruth, Werner: *See—*
Bohnstedt, Werner; and Lindenstruth, Werner, 4,927,722, Cl. 429-147.000.
Lindley, John E. Sealing collar for a resuscitator or respirator. 4,926,844, Cl. 128-30.000.
Lindsay, Frederick E.: *See—*
Eisenberg, Eugene; Lindsay, Frederick E.; Evans, James J.; and Collins, Ronald H., 4,926,801, Cl. 123-41.840.
Lindsey Completion Systems, Inc.: *See—*
Lindsey, Hiram E., Jr., 4,926,938, Cl. 166-208.000.
Lindsey, Hiram E., Jr., to Lindsey Completion Systems, Inc. Rotatable liner hanger with multiple bearings and cones. 4,926,938, Cl. 166-208.000.
Lingnau, Juergen: *See—*
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,927,956, Cl. 560-130.000.
Linnig, Karl-Heinz. Electromagnetically operable friction-disk clutch. 4,926,992, Cl. 192-48.200.
Linyaev, Eugene J.; and Swanson, Roy E., Jr., to Western Atlas International, Inc. Pressure/temperature compensated transducer pad assembly. 4,928,031, Cl. 310-346.000.
Liposome Technology, Inc.: *See—*
Huang, Anthony H.; and Krishnan, Satya, 4,927,571, Cl. 264-4.300.
Morano, Jacqueline K.; Martin, Francis J.; and Woodle, Martin, 4,927,637, Cl. 424-450.000.
Lisiecki, Robert E., to Pure-Pak, Inc. Multi-piece flat top container. 4,927,075, Cl. 229-125.340.
Liska, Paul: *See—*
Gratzel, Michael; and Liska, Paul, 4,927,721, Cl. 429-111.000.
Lisle Corporation: *See—*
Pool, James L., 4,926,537, Cl. 29-275.000.

Listinsky, Jay J.: *See—*
Bryant, Robert G.; and Listinsky, Jay J., 4,927,624, Cl. 424-9.000.
Littlebury, Hugh: *See—*
Corley, Dean; and Littlebury, Hugh, 4,928,002, Cl. 235-479.000.
Litvin, Alexandr N.: *See—*
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.
Liu, Geng-tao: *See—*
Yang, Ming-he; Chen, Yan-rong; Liu, Geng-tao; and Huang, Liang, 4,927,937, Cl. 546-296.000.
Liu, Kou-Chang, to GAF Chemicals Corporation. Process for preparing 2,3-bis(hydroxyethoxymethyl) bicyclo [2,2,1] heptane and polyester therewith. 4,927,976, Cl. 568-665.000.
Liverman, Robert B.: *See—*
Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.
Livne, Mordechai: *See—*
Zilberman, Moshe; Livne, Mordechai; Tchetchick, Doron; and Daniel, Moshe, 4,926,684, Cl. 73-147.000.
Lloyd, Paul M. J. M. T. Tray for a baby's chair. 4,927,024, Cl. 206-562.000.
L'Nard Associates, Inc.: *See—*
Lonardo, Robert, 4,926,884, Cl. 128-892.000.
Lobsinger, Ralph J.: *See—*
Johnson, Gerald D.; Lobsinger, Ralph J.; Hamilton, Margaret L.; and Gelles, David S., 4,927,468, Cl. 148-3.000.
Lock, Willem, to U.S. Philips Corporation. Adjustable support table for medical use. 4,927,127, Cl. 269-322.000.
Lockheed Missiles & Space Company, Inc.: *See—*
Wade, William D., 4,926,910, Cl. 139-425.00R.
Lockwood Manufacturing Co.: *See—*
Lamson, Frederick W., 4,926,785, Cl. 116-209.000.
Loctite Corporation: *See—*
Gelinas, William A.; Holtz, Edwin R.; Argazzi, Dennis J.; Smigel, Robert L.; and Wiley, Dan W., 4,927,487, Cl. 156-351.000.
Loggins, C. J., to Mayline Company, Inc. Triangular drafting instrument. 4,926,564, Cl. 33-474.000.
Login, Robert B.: *See—*
Shih, Jenn S.; Smith, Terry E.; and Login, Robert B., 4,927,667, Cl. 427-154.000.
Logsdon, William K.: *See—*
DuRand, Elden E., III; and Logsdon, William K., 4,928,085, Cl. 340-544.000.
Lohmann GmbH & Co. KG: *See—*
Fohst, Manfred, 4,926,570, Cl. 36-43.000.
Lonardo, Robert, to L'Nard Associates, Inc. Method and means for preventing skin abrasions for patients having legs substantially locked in juxtaposition. 4,926,884, Cl. 128-892.000.
Long, David M., Jr., to Alliance Pharmaceutical Corp. Dissolution of gas in a fluorocarbon liquid. 4,927,623, Cl. 424-5.000.
Long-Lok Fasteners Corporation: *See—*
Fitzgerald, Walter P.; Sanders, Beatrix Y.; and Baghen, Mansour A. H., 4,927,307, Cl. 411-302.000.
Longman, Robert J.: *See—*
Pettigrew, Robert M.; Humberstone, Victor C.; Gardner, Keith; Longman, Robert J.; and Helfet, Peter R., 4,928,132, Cl. 346-135.100.
Lonsberry, Kenneth F., to Permco, Inc. Lubrication of gear pump trunnions. 4,927,343, Cl. 418-102.000.
Lopez, Ralph: *See—*
Podlesny, Daniel B.; and Lopez, Ralph, 4,926,519, Cl. 15-235.400.
L'Oreal: *See—*
Gueret, Jean-Louis, 4,927,281, Cl. 401-129.000.
Morane, Bruno; and Joulia, Gerard, 4,927,282, Cl. 401-129.000.
Lorenz, Dieter, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. System for measuring electromagnetic radiation originating from the hemisphere. 4,928,012, Cl. 250-338.100.
Lorenz, Robert G.: *See—*
Ashjaee, Javad; Helkey, Roger J.; Lorenz, Robert G.; and Sutherland, Robert A., 4,928,106, Cl. 342-352.000.
Lorenzen, Heinz-Christen; Heitmann, Uwe; Siems, Wolfgang; and Pinck, Peter, to Korber AG. Method of and apparatus for making a trimmed stream of tobacco fibers or the like. 4,926,886, Cl. 131-84.400.
Loschiavo, Samuel R., to Canadian Patents & Development Ltd. Device for controlling stored food insects. 4,927,635, Cl. 424-409.000.
Lothammer, Henry, to Ralph Earl Co., Inc. Machine tool auxiliary function hydraulic system. 4,926,723, Cl. 82-118.000.
Lott, Gloria Y.; Britton, Scott M.; and Constantine, Barry E., to Sherwood Medical Company. Wound dressing. 4,926,850, Cl. 128-155.000.
Lottiau, Michel; Glemet, Michel; Cognet, Gilles; and Causier, Alain, to Atochem. Process for the manufacture of polyamide composite material reinforced with long fibers. 4,927,583, Cl. 264-136.000.
Lotzsch, Detlef: *See—*
Bahr, Christian; Heppke, Gerd; Lotzsch, Detlef; Dubal, Hans-Rolf; Escher, Claus; and Ohlendorf, Dieter, 4,927,244, Cl. 350-350.00S.
Loutan, Dominique: *See—*
Geng, Markus; and Loutan, Dominique, 4,927,035, Cl. 213-77.000.
Lovett, Donna M.: *See—*
Lovett, Robert R.; and Lovett, Donna M., 4,927,995, Cl. 219-385.000.
Lovett, Robert R.; and Lovett, Donna M. Enclosed towel warmer. 4,927,995, Cl. 219-385.000.
Lovik, Craig J. Balloon sculpturing methods, apparatus and products. 4,927,400, Cl. 446-220.000.
Lozier, Antony J., to Zimmer, Inc. Surgical rod pusher instrument. 4,927,425, Cl. 606-99.000.
Lu, Nicky C.: *See—*
Dhong, Sang H.; Lu, Nicky C.; and Henkels, Walter H., 4,927,779, Cl. 428-52.000.
Lubrizol Corporation, The: *See—*
Jolley, Scott T.; and Salomon, Mary F., 4,927,554, Cl. 252-68.000.
Lucas Industries, Public Limited Company: *See—*
Harrison, Anthony W.; and Taft, Philip A., 4,927,212, Cl. 303-115.000.
Lucas, Raymond, to Bobst SA. Device for stacking batches of flat objects in a vertical file. 4,927,321, Cl. 414-788.900.
Lucchesi, Raymond L.: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.
Luckman, Thomas, to Johnson & Johnson Orthopaedics, Inc. Surgical cutting block. 4,926,847, Cl. 606-88.000.
Lukich, Lewis T.: *See—*
Demor, Edward J., III; Hinkel, Walter W.; and Lukich, Lewis T., 4,926,918, Cl. 152-154.000.
Lustwerk, Ferdinand. Magnetically driven pump. 4,927,337, Cl. 417-420.000.
Lutz, William R.; Verschueren, Wim G.; Fischer, Hanspeter; and Van Lommen, Guy R. E., to Janssen Pharmaceutica N.V. Tricyclic 1H-imidazole-5-carboxylic acid derivatives as herbicides. 4,927,449, Cl. 71-90.000.
Lyman, George; and Mathus, Gregory, to Costar Corporation. Tissue culture flask. 4,927,764, Cl. 435-296.000.
Lyman, George: *See—*
Mathus, Gregory; and Lyman, George, 4,927,604, Cl. 422-101.000.
Lynn, Dwight D., to ACS Communications. Time dependent, variable amplitude threshold output circuit for frequency variant and frequency invariant signal discrimination. 4,928,307, Cl. 379-395.000.
Lynn, William R.; and Belanger, Roger R. Improved mopping system. 4,926,515, Cl. 15-4.000.
Lyobard, Rene: *See—*
Laurent, Claude; Rostaing, Paul; and Lyobard, Rene, 4,926,673, Cl. 72-465.000.
Lyons, Patrick J.: *See—*
Abbott, Kenneth E.; Lyons, Patrick J.; and Satariano, Richard M., 4,926,589, Cl. 51-427.000
M-B-W Inc.: *See—*
Artzberger, Thomas G., 4,927,289, Cl. 404-117.000.
Ma, Bao P.; Shou-Fu, Zhong; and Li, Qin Z., to Poly Technologies, Inc. Spiral drum magazine with elongated magazine clip and single piece last round follower. 4,926,742, Cl. 89-33.020.
Mabry, Ray W.: *See—*
Hamilton, Frank S.; Ouzts, Johnny D.; and Mabry, Ray W., 4,926,795, Cl. 119-3.000.
Macauley, Edward C.: *See—*
Boyer, Ralph C.; and Macauley, Edward C., 4,927,154, Cl. 273-200.00R.
Maciulaitis, Algirdas: *See—*
Foreman, Kenneth M.; and Maciulaitis, Algirdas, 4,928,286, Cl. 372-90.000.
Mack Trucks, Inc.: *See—*
Eisenberg, Eugene; Lindsay, Frederick E.; Evans, James J.; and Collins, Ronald H., 4,926,801, Cl. 123-41.840.
MacKenthun, Holger: *See—*
Kreft, Hans-Diedrich; MacKenthun, Holger; and Hass, Wolfgang, 4,928,087, Cl. 340-825.710.
MacMaster, George H.; and Nichols, Lawrence J., to Raytheon Company. Low-noise crossed-field amplifier. 4,928,070, Cl. 330-43.000.
Macomber, Steven H.: *See—*
de Groot, Peter J.; Macomber, Steven H.; and Gallatin, Gregg M., 4,927,263, Cl. 356-5.000.
Madill, E. Gaylord, to H.V.T. Technology Ltd. Multiple gear-ratio automatic transmission. 4,926,713, Cl. 475-146.000.
Maeda, Kiyoto: *See—*
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, 4,927,827, Cl. 514-256.000.
Maeda, Toshihiko; Tokitoh, Yasuo; and Yoshimura, Noriaki, to Kuraray Company, Ltd. Phosphonium salts and processes for production of and uses for the same. 4,927,960, Cl. 562-512.000.
Maeda, Yutaka, to Minolta Camera Kabushiki Kaisha. Cutting device for cutting strip of recording medium. 4,926,727, Cl. 83-203.000.
Maejima, Kimiko: *See—*
Yamauchi, Junichi; Maejima, Kimiko; Eguchi, Kaoru; and Kabuyama, Noriko, 4,928,253, Cl. 364-521.000.
Maekawa, Motoyuki: *See—*
Imoto, Koji; Omura, Tadao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki, and Shioya, Yoshiaki, 4,926,817, Cl. 123-292.000.
Maes, Felix V.; and Baikrich, Michel, to ARSOC S.P.R.L. Mounting device adaptable on a weapon. 4,926,576, Cl. 42-101.000

VOL 1114 ISS 4 MY 22 1990 UMI

Magda, Robert J., to Lawn Doctor, Inc. Seed spreader. 4,926,768, Cl. 111-11.000.

Magnani, Francesco; and Minardi, Paolo, to Societa' Cavi Pirelli S p.A. Method and equipment for laying an elongated element underground. 4,927,294, Cl. 405-177.000.

Magnin, Paul A.: *See*—
Hunt, Barry F.; D'Sa, Alwyn P.; and Magnin, Paul A., 4,928,231, Cl. 364-518.000.

Magnotta, Frank A.: *See*—
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.

Maguire, Mark A.: *See*—
Dake, Michael D.; and Maguire, Mark A., 4,927,418, Cl. 604-264.000.

Mahieu, Claude: *See*—
Lapoiriere, Claudine, Mahieu, Claude; and Papantoniou, Christos, 4,927,883, Cl. 525-154.000.

Mahler, Jacques: *See*—
Soszka, Barbara; Federowsky, Robert; and Mahler, Jacques, 4,927,445, Cl. 65-11.100.

Mahmud, Meftah U., to Nashua Corporation. Double crosslinked barrier coating. 4,927,801, Cl. 503-200.000.

Mahon, Michael J.: *See*—
Baum, Allen; Bryg, William R.; Mahon, Michael J.; Lee, Ruby B.; and Muchnick, Steven S., 4,928,239, Cl. 364-200.000.

Mahoney, Robert D.: *See*—
Beck, Henry N.; and Mahoney, Robert D., 4,927,535, Cl. 210-500.230.

Mai, Jun: *See*—
Kaieda, Shozo; Kurashima, Ikuo; Okazima, Hideo; and Mai, Jun, 4,928,055, Cl. 323-300.000.

Maier, Bernhard: *See*—
Friehmelt, Volker; Maier, Bernhard; Kohling, Alfons; and Schmitt, Rolf-Eberhard, 4,927,511, Cl. 204-151.000.

Maijer, Rolf: *See*—
Smith, Dennis C.; and Maijer, Rolf, 4,927,361, Cl 433-9.000.

Main, William E., to Motorola Inc. FM demodulator. 4,928,068, Cl. 329-324.000.

Major Lock Supply Inc.: *See*—
Deforrest, William, Sr., 4,926,670, Cl. 70-374.000.

Makihara, Nobuo; and Tahara, Hideo, to Nissan Motor Co., Ltd. Air supply apparatus for outboard motor. 4,927,392, Cl. 440-88.000.

Makino, Hideaki: *See*—
Anzai, Hisao; Makino, Hideaki; Ootani, Masami; Sasaki, Isao; and Nishida, Kozi, 4,927,393, Cl. 525-378.000.

Malamas, Michael S., to American Home Products. Spiro-isoquinoline-pyrrolidine tetrones and analogs thereof useful as aldose reductase inhibitors. 4,927,831, Cl. 514-278.000.

Malay, Manuel R.: *See*—
Chaney, Earl J., Jr., Malay, Manuel R.; O'Hara, Thomas J.; and Ayers, Alan D., 4,927,720, Cl. 429-54.000.

Male, Alan T.: *See*—
Iyer, Natraj C.; Carr, Walter J., Jr.; and Male, Alan T., 4,927,985, Cl. 174-125.100.

Male, Andrew J.; and Carrodus, Melvin A., to Westinghouse Electric Corp. Circuit breaker auxiliary switch assembly. 4,928,079, Cl. 335-13.000.

Mallinckrodt Inc.: *See*—
Cantrell, Gary L., 4,927,980, Cl. 568-937.000.
Dolfini, Joseph E.; Glinka, Jerome; and Bosch, Andrew C., 4,927,805, Cl. 512-27.000.

Malluck, John F.: *See*—
Bensel, William H., III; Gladden, Robert H., Jr.; Malluck, John F.; Ross, Robert R.; and Williamson, Andrew H., Jr., 4,927,227, Cl. 350-96.200.

Malmborg, Bengt, to Aktiebolaget Leo. Connector and a disposable assembly utilizing said connector. 4,927,423, Cl. 604-88.000.

MAN Gutehoffnungshutte GmbH: *See*—
Buthmann, Peter; and Kotzur, Joachim, 4,926,642, Cl. 60-607.000.

Man Technologie AG: *See*—
Muhlratzer, August; Handrick, Karin; Lassmann, Siegfried; and Hirt, Alfred, 4,927,702, Cl. 428-215.000.

Manabe, Seiichiro; and Nagashima, Yukihito, to Nippon Sheet Glass Co., Ltd. Glass melting furnace. 4,927,446, Cl. 65-347.000.

Mandel, Alan F.: *See*—
Leksell, David; Kun, Zoltan K.; and Mandel, Alan F., 4,928,118, Cl. 346-107.00R.

Maneuf, Serge: *See*—
Barthelemy, Alain; Maneuf, Serge; and Froehly, Claude, 4,928,282, Cl. 372-18.000.

Mankus, John R.: *See*—
Eckler, Donald F.; Mankus, John R.; Ripp, Francis J.; and Saxenmeyer Jr., George J., 4,927,387, Cl. 439-499.000.

Mannesmann Rexroth GmbH: *See*—
Fischer, Horst; and Staub, Karl, 4,927,332, Cl. 417-299.000.

Manning, Randy M.: *See*—
Hopkins, John R.; Manning, Randy M.; and Marusak, Stephen A., 4,926,548, Cl. 29-860.000.

Manor, Yehuda. High performance sea-going craft. 4,926,773, Cl. 114-61.000.

Manostat Corporation: *See*—
Gomes, Francis, 4,926,717, Cl. 81-3.200.

Manvell, Clive, to CMB Packaging (UK) Limited. Sterilized foodstuff preparation. 4,927,653, Cl. 426-399.000.

Manville Corporation: *See*—
Jade, Sivananda S., 4,927,622, Cl. 423-608.000.

Manwaring, Kim H.: *See*—
Newkirk, John B.; and Manwaring, Kim H., 4,927,420, Cl. 606-45.000.

Marathon Electric Mfg. Corp.: *See*—
Nolte, Duane R., 4,927,988, Cl. 200-80.00R.

Marcantonio, Paul J., to Chevron Research Company. Leaching cobalt, molybdenum, nickel, and vanadium from spent hydroprocessing catalysts. 4,927,794, Cl. 502-26.000.

Marchand, Bernard J.: *See*—
Kwok, Kui-Chiu; and Marchand, Bernard J., 4,927,081, Cl. 239-223.000.

Markiewicz, James E.; and Shrontz, Darrell G., to Precision Extruded Products, Inc. Method of sizing and straightening extruded tubes. 4,926,667, Cl. 72-256.000.

Markiewicz, Stan J., to Du pont Canada Inc. Gas barrier structures. 4,927,689, Cl. 428-34.800.

Markley, Lowell D.: *See*—
Kirby, Neil V.; Street, Peter F. S.; and Markley, Lowell D., 4,927,833, Cl. 514-399.000.

Marlett, Everett M., to Ethyl Corporation. Preparation of silane and amine alanes. 4,927,616, Cl. 423-347.000.

Mars Incorporated: *See*—
Eglise, David; and Lewis, Adrian, 4,926,996, Cl. 194-212.000.
Tansky, John L.; Lagan, Edward F., Jr.; and McGarry, Patrick J., 4,928,299, Cl. 379-37.000.

Marshall, Gerald M.; Hull, Raymond, Jr.; and Farrington, Allan P., to Chicopee. Transverse webber and stratified webs formed therewith. 4,927,685, Cl. 428-74.000.

Marshall, Steven P., to Texas Instruments Incorporated. Improved output buffer having reduced noise characteristics. 4,928,023, Cl. 307-443.000.

Marshall and Williams Company: *See*—
Hosmer, Christopher E.; and Whaley, John F., 4,926,529, Cl. 26-89.000.

Marsoner, Hermann: *See*—
Fischer, Fritz, Kleinhappl, Erich; and Marsoner, Hermann, 4,927,603, Cl. 422-67.000.

Martens, Phillip A.: *See*—
Nelson, Norvell J.; and Martens, Phillip A., 4,927,700, Cl. 428-209.000.

Marthaler, Gregory A.: *See*—
Marthaler, Robert H.; and Marthaler, Gregory A., 4,927,052, Cl. 221-64.000.

Marthaler, Robert H.; and Marthaler, Gregory A. Golf ball package, holder and dispenser. 4,927,052, Cl. 221-64.000.

Martin, Charles K., to Infern-O-Therm. Waste oil purifying apparatus. 4,927,500, Cl. 196-46.000.

Martin, Charles L.: *See*—
Martin, Wayne C., 4,926,554, Cl. 30-161.000.

Martin, Emilio B., to AMPER, S.A. Document sorter for reader/-printer equipment. 4,927,031, Cl. 209-657.000.

Martin Engineering Company: *See*—
Swinderman, Robert T.; and Mueller, David W., 4,927,003, Cl. 198-497.000.

Martin, Francis J.: *See*—
Morano, Jacqueline K.; Martin, Francis J.; and Woodle, Martin, 4,927,637, Cl. 424-450.000.

Martin, Francis W.: *See*—
Francis, Gaylord L.; and Martin, Francis W., 4,927,711, Cl. 428-432.000.

Martin, Kenneth W.; and McClure, Jonathan T. Protective laboratory specimen bag. 4,927,405, Cl. 493-194.000.

Martin-Lopez, Fernando, to Seagate Technology, Inc. Switch mode electrical power controller. 4,928,054, Cl. 323-288.000.

Martin, Peter: *See*—
Wenger, Hartmut; Martin, Peter; Rotzinger, Hans; and Denz, Martin, 4,926,789, Cl. 118-668.000.

Martin, Robert N.: *See*—
Sells, Charles C.; and Martin, Robert N., 4,926,838, Cl. 126-25.00A.

Martin, Wayne C., to Martin, Charles L. Collapsible knife. 4,926,554, Cl. 30-161.000.

Martinez, George, Jr. Method and apparatus for saving energy in an air conditioning system. 4,926,649, Cl. 62-99.000.

Martinez, Louis, to Cooper Industries, Inc. Two-way data broadcast networks. 4,928,177, Cl. 358-142.000.

Martinez, Santiago. Auxiliary rear view mirror assembly. 4,927,255, Cl. 350-616.000.

Martyak, Nicholas M., to Atochem North America, Inc. High-performance electrodeposited chromium layers formed at high current efficiencies. 4,927,506, Cl. 204-51.000.

Marum, John R., to TRW Inc. Redundancy interconnection circuitry. 4,928,022, Cl. 307-241.000.

Marumoto, Katsuji: *See*—
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Marusak, Stephen A.: *See*—
Hopkins, John R.; Manning, Randy M.; and Marusak, Stephen A., 4,926,548, Cl. 29-860.000.

Maruyama, Hidekazu, to Ikeda Bussan Co., Ltd. Trim cover for use with seats in vehicles. 4,927,209, Cl. 297-180.000.

Maruzen Petrochemical Co., Ltd.: *See*—
Hayashida, Suetou; Kimura, Kyoichiro; and Takahashi, Eiji, 4,927,885, Cl. 525-211.000.
Yamagishi, Takanori; Idai, Tsutomu; and Takahashi, Eiji, 4,927,979, Cl. 568-791.000.

Marzalek, Michael S.; Peterson, Stephen R.; and Wendler, John A., to Hewlett-Packard Company. Method and apparatus for waveform reconstruction for sampled data system. 4,928,251, Cl. 364-484.000.

Masada, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Secret information preserving system for a multiple issuer IC card. 4,928,001, Cl. 235-380.000.

Masaki, Hisashi, to Casio Computer Co., Ltd. Method of bonding IC unit. 4,927,491, Cl. 156-630.000.

Masaki, Ryoichi: *See*—
Kawabata, Kenji; Ogawa, Soichiro; and Masaki, Ryoichi, 4,928,037, Cl. 315-127.000.

Masao, Kubodera: *See*—
Kazuo, Inoue; Noriyuki, Kishi; Masao, Kubodera; Eitetsu, Akiyama; Shigeto, Kashiwabara; and Osamu, Takizawa, 4,926,640, Cl. 60-602.000.

Masco Corporation of Indiana: *See*—
Bahroos, Gobind; and Jonte, Patrick B., 4,927,115, Cl. 251-241.000.

Mase, Akira: *See*—
Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, 4,927,493, Cl. 156-643.000.

Masina, Franca: *See*—
Cantatore, Giuseppe; Borzatta, Valerio; and Masina, Franca. 4,927,930, Cl. 544-198.000.

Maska, Rüdolf; and Essary, William A., to PPG Industries, Inc. Method for preparing acrylic/polyester resin. 4,927,875, Cl. 524-457.000.

Massachusetts Institute of Technology: *See*—
Haritonidis, Joseph H.; Senturia, Stephen D.; Warkentin, David J.; and Mehregany, Mehran, 4,926,696, Cl. 73-205.000.
Wurtman, Richard J., 4,927,853, Cl. 514-567.000.

Masuda, Masaaki; Kotani, Masanori; Wakahara, Katsuhiro; and Sakata, Shuichi, to Sharp Kabushiki Kaisha. Multi-room type air-conditioning equipment. 4,926,653, Cl. 62-204.000.

Masuda, Taizo: *See*—
Tanaka, Koji; Ueda, Minoru; and Masuda, Taizo, 4,927,710, Cl. 428-394.000.

Masuzawa, Yukikazu, to Kabushiki Kaisha Toshiba. Apparatus for detecting position of moving object. 4,928,091, Cl. 340-686.000.

Mateo Maria, Ramon. Support for reclinable boards. 4,927,107, Cl. 248-240.400.

Mathis, Gerard; and Lehn, Jean-Marie, to Compagnie Oris Industries. Macropolycyclic rare earth complexes and application as fluorescent tracers. 4,927,923, Cl. 540-456.000.

Mathur, Indresh; James, Allan; and Bissett, David, to H-D Tech Inc. Bipolar electrolyzer. 4,927,509, Cl. 204-83.000.

Mathur, Krishna K.; Resnik, Robert K.; and Simmons, Randall G., to Pfizer Inc. Process for the preparation of large surface area, finely divided precipitated calcium carbonate and filled polymeric compositions of matter containing said calcium carbonate. 4,927,618, Cl. 423-432.000.

Mathus, Gregory; and Lyman, George, to Costar Corporation. Multiwell filter plate vacuum manifold assembly. 4,927,604, Cl. 422-101.000.

Mathus, Gregory: *See*—
Lyman, George; and Mathus, Gregory, 4,927,764, Cl. 435-296.000.

Matsubara, Kenichi: *See*—
Sakamoto, Kiyoaki; Matsubara, Kenichi; Nakahara, Yasuhiro; and Nomura, Masaki, 4,927,531, Cl. 210-198.200.

Matsubara, Toshihiko; and Kitayama, Taku, to Honda Giken Kogyo Kabashiki Kaisha. Combination of slide members. 4,927,707, Cl. 428-323.000.

Matsuda, Ikuo: *See*—
Tadokoro, Tomoo; Tashima, Seiji; Okimoto, Haruo; Akagi, Toshimichi; Nakao, Masami; Matsuda, Ikuo; and Suekuni, Einosuke, 4,926,636, Cl. 60-312.000.

Matsuda, Masaaki; and Yoshida, Yuji, to Sumitomo Chemical Company, Limited. Process for refining amino acids. 4,927,541, Cl. 210-656.000.

Matsuda, Terumi: *See*—
Mori, Nobufumi; Muraishi, Katsuaki; Matsuda, Terumi; Ohnishi, Masahiro; Nunome, Hiromi; Koyama, Tadao; and Oikawa, Tetsuo, 4,928,016, Cl. 250-440.100.

Matsueda, Gary R.; Haber, Edgar; and Hui, Kwan, to General Hospital Corporation, The. Method of producing fibrin-specific monoclonal antibodies lacking fibrinogen-cross-reactivity using fibrin-specific peptides. 4,927,916, Cl. 530-387.000.

Matsui, Atsushi: *See*—
Nasu, Kazuhiko; Kenmochi, Kazuei; Niikawa, Tomohiko; and Matsui, Atsushi, 4,927,580, Cl. 264-102.000.

Matsui, Susumu: *See*—
Sakai, Takeshi; Matsui, Susumu; Akiyoshi, Sumiko; and Obayashi, Akira, 4,927,753, Cl. 435-26.000.
Sakai, Takeshi; Yokota, Hiroko; Yamamoto, Kazuki; Yokoyama, Sadaji; Matsui, Susumu; Kato, Ikunoshin; and Obayashi, Akira, 4,927,767, Cl. 436-64.000.

Matsuki, Masuo, to Nippon Seiko Kabushiki Kaisha. Buckle for seat belt system. 4,926,528, Cl. 24-640.000.

Matsumoto, Masafumi: *See*—
Tanaka, Hironori; Kotani, Matahira; and Matsumoto, Masafumi, 4,927,130, Cl. 271-10.000.

Matsumoto, Masao, to Yoshida Kogyo K.K. Method and apparatus for discharging spools. 4,927,090, Cl. 242-67.10R.

Matsumoto, Shinichi; Miyoshi, Naoto; Kimura, Mareo; Ozawa, Masakuni; and Isogai, Akio, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Catalyst for the purification of exhaust gas. 4,927,799, Cl. 502-303.000.

Matsumoto, Takashi; Sato, Masamichi; Yoshida, Satoshi; and Kato, Yoshiaki, to Fuji Photo Film Co., Ltd. Magnetic recording method and magnetic head. 4,928,186, Cl. 360-21.000.

Matsumoto, Toshihide: *See*—
Nagura, Satoru; Ebihara, Tsutomu; and Matsumoto, Toshihide, 4,927,682, Cl. 428-88.000.

Matsunaga, Taira; and Kimura, Takashi, to Kabushiki Kaisha Toshiba. Protection diode structure. 4,928,157, Cl. 357-23.130.

Matsunaga, Tatsuaki: *See*—
Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, 4,927,738, Cl. 430-286.000.

Matsunari, Kenji: *See*—
Yamaguchi, Mikio; Suzuki, Chiharu; Matsunari, Kenji; Miyazawa, Takeshige; and Nakamura, Yasuo, 4,927,448, Cl. 71-90.000.

Matsushima, Yasunobu; Tanaka, Shigeo; Aoki, Tomoyuki; and Ono, Yohji, to Nihon Parkerizing Co., Ltd. Conversion coating solution for treating metal surfaces. 4,927,472, Cl. 148-261.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ashihara, Ryohei; Suehiro, Kikumitsu; Sugino, Kazuo; and Miyoshi, Jun, 4,927,719, Cl. 429-54.000.
Naka, Hiroyuki; Hirono, Tomohide; Suzuki, Naoki; and Ichiyanagi, Takashi, 4,927,068, Cl. 228-103.000.
Nasu, Kazuhiko; Kenmochi, Kazuei; Niikawa, Tomohiko; and Matsui, Atsushi, 4,927,580, Cl. 264-102.000.
Ohue, Hiroshi, 4,928,272, Cl. 370-50.000.
Tamura, Haruhisa; Yamasaki, Takahiko; and Hasegawa, Mitsuhiro, 4,927,998, Cl. 219-494.000.
Tanaka, Yasuhiro; Sunohara, Masaaki; Nakajima, Yasuo; and Tanaka, Shinichi, 4,927,247, Cl. 350-432.000.
Tsutsui, Hiroshi; Baba, Sueki; Ohmori, Koichi; Yamamoto, Osamu; and Watanabe, Hiroshi, 4,928,297, Cl. 378-146.000.
Yamamoto, Hajime; Takashima, Yuji; Kitagaki, Kazunori; and Nakamura, Masahiko, 4,927,724, Cl. 430-45.000.

Matsushita Electric Works, Ltd.: *See*—
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,926,881, Cl. 128-804.000.
Otsuka, Kiyotaka; and Wataya, Hideji, 4,926,552, Cl. 30-43.920.

Matsushita, Tsutomu: *See*—
Mihara, Teruyoshi; and Matsushita, Tsutomu, 4,928,159, Cl. 357-42.000.

Matsutani, Shigeru; and Mizushima, Yukio, to Shionogi & Co., Ltd. Heterocyclic compounds and antiulcer agents. 4,927,829, Cl. 514-258.000.

Matsuura, Ichiro; and Chiyoshi, Toyoharu, to Ikeda Bussan Co., Ltd. Method of producing skin-covered pad for seat. 4,927,694, Cl. 428-159.000.

Matsuyama, Kenji: *See*—
Tanaka, Seiichi; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Morishima, Hajime; and Matsuyama, Kenji, 4,927,565, Cl. 260-404.500.

Matsuzaki, Masatoshi: *See*—
Hasegawa, Tai; Monnai, Jun; and Matsuzaki, Masatoshi, 4,928,134, Cl. 346-76.0PH.

Matsuzaki, Mikio: *See*—
Ezaki, Joichiro; Ito, Yoshiaki; and Matsuzaki, Mikio, 4,928,195, Cl. 360-103.000.

Matteson, Donald S.: *See*—
Wright, William E.; Davis, Bryan T.; Matteson, Donald S.; and Knapp, Gordon G., 4,927,553, Cl. 252-49.600.

Mauffrey, Jean F.: *See*—
Fourrey, Francois; and Mauffrey, Jean F., 4,927,210, Cl. 297-366.000.

Max Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Keilmann, Fritz, 4,927,236, Cl. 350-276.00R.

Maxtor Corporation: *See*—
Wright, Harold T., 4,928,029, Cl. 310-89.000.

May, Roger A., to United States of America, Air Force. Recursive median filtering. 4,928,258, Cl. 364-724.170.

Mayer, Ronald F.; and Thrasher, Robert, Jr., to United Technologies Electro Systems, Inc. Boot sealing and attachment means for automotive door lock actuators and the like. 4,927,203, Cl. 292-201.000.

Mayer, Uwe; and Tischer, Kurt-Manfred, to Nokia Graetz. Flat display device. 4,928,041, Cl. 315-366.000.

Mayfield, John T., III, to Meyer Company, The. Dispensers. 4,927,053, Cl. 221-279.000.

Mayline Company, Inc.: *See*—
Loggins, C. J., 4,926,564, Cl. 33-474.000.

Mazada Motor Corporation: *See*—
Kishino, Koji, 4,927,207, Cl. 296-185.000.

Mazda Motor Corporation: *See*—
Kita, Tatsuya; Shigemura, Takuro; Nakamura, Setsuo; and Nakane, Hisanori, 4,926,816, Cl. 123-203.000.
Ohmura, Hiroshi; and Nakashima, Takashi, 4,926,955, Cl. 180-140.000.
Sakimori, Hideharu; Ihara, Susumu; and Hayashi, Hiroyuki, 4,927,314, Cl. 414-416.000.
Tadokoro, Tomoo; Tashima, Seiji; Okimoto, Haruo; Akagi, Toshimichi; Nakao, Masami; Matsuda, Ikuo; and Suekuni, Einosuke, 4,926,636, Cl. 60-312.000.

VOL
1114
ISS
4
MY
22
1990
UMI

McAllister, Matthew: *See—*
Janko, Michael; and McAllister, Matthew, 4,927,057, Cl. 222-5.000.
McArthur, Scot P.: *See—*
Holm-Kennedy, James W.; and McArthur, Scot P., 4,926,682, Cl. 73-54.000.
McCall, Patrick C., to Procter & Gamble Company. Antidandruff shampoo compositions containing a magnesium aluminum silicate-xanthan gum suspension system. 4,927,563, Cl. 252-551.000.
McCarthy, Daniel M.; Circello, Joseph C.; Munguia, Gabriel R.; and Richardson, Nicholas J., to Edgcore Technology, Inc. Coherent cache structures and methods. 4,928,225, Cl. 364-200.000.
McClure, Jonathan T.: *See—*
Martin, Kenneth W.; and McClure, Jonathan T., 4,927,405, Cl. 493-194.000.
McCollum, Anthony W.: *See—*
Stavinoha, Jerome L.; and McCollum, Anthony W., 4,927,878, Cl. 525-44.000.
McCollum, Gregory J.: *See—*
Kahle, Charles F., II; McCollum, Gregory J.; and Wilson, Craig A., 4,927,969, Cl. 564-377.000.
McConnell, Bernard E.; and McConnell, John C. Reamer guide for intramedullary nail placement. 4,927,424, Cl. 606-96.000.
McConnell, John C.: *See—*
McConnell, Bernard E.; and McConnell, John C., 4,927,424, Cl. 606-96.000.
McCormick, Sharon J.: *See—*
Guggenheim, Thomas L.; McCormick, Sharon J.; and Colley, Alice M., 4,927,904, Cl. 528-182.000.
McCullough, John E., to Arthur D. Little, Inc. Synchronizing and unloading system for scroll fluid device. 4,927,340, Cl. 418-55.000.
McDowell, W. J.: *See—*
Moyer, Bruce A.; and McDowell, W. J., 4,927,610, Cl. 423-24.000.
McEachern, James A.: *See—*
Moore, Thomas E.; McEachern, James A.; and Wight, Mark S., 4,928,275, Cl. 370-102.000.
McGarry, Patrick J.: *See—*
Tansky, John L.; Lagan, Edward F., Jr.; and McGarry, Patrick J., 4,928,299, Cl. 379-37.000.
McGregor, James D., to Morton Thiokol, Inc. Method of making continuous reinforcement for flexible bearing laminate. 4,927,481, Cl. 156-245.000.
McGregor, John C.: *See—*
Costello, Anthony W.; Ogg, Graeme J.; and McGregor, John C., 4,926,614, Cl. 53-434.000.
McGuire, Daniel J.: *See—*
Schweizer, Werner; McGuire, Daniel J.; and Archer, Edward D., 4,927,322, Cl. 414-794.700.
McGuire, David: *See—*
Goble, E. Marlowe; Somers, W. Karl; and McGuire, David, 4,927,421, Cl. 606-73.000.
McIntyre, Robert W.: *See—*
Hagar, Donald K.; and McIntyre, Robert W., 4,927,351, Cl. 431-12.000.
McKane, Francis W., Jr.: *See—*
Grossman, Richard F. and McKane, Francis W., Jr., 4,927,929, Cl. 544-195.000.
McKay, Roy L.: *See—*
Crawley, H. Bert; Rosenberg, Eli I.; Meyer, W. Thomas; Gorbics, Mark S.; Thomas, William D.; McKay, Roy L.; and Homer, John F., Jr., 4,928,246, Cl. 364-514.000.
McKee, Robert L. Combined rotary cutter and herbicide applicator and method. 4,926,622, Cl. 56-16.800.
McKenna, Michael E.: *See—*
Syme, Robert W.; and McKenna, Michael E., 4,927,705, Cl. 428-282.000.
McKenna, Peter L.; and Walters, James M., III. Eyeglass holder. 4,927,258, Cl. 351-156.000.
McMurtry, D. R.; Stephens, W. F. N.; and Kirkbride, M., to Renishaw PLC. Method of producing a metrological scale and scale produced by such method. 4,926,566, Cl. 33-771.000.
McNab, Wayne, to Viscount Industries Limited. Electrical box. 4,927,039, Cl. 220-3.700.
McNaughton, James, to Huron Products Corporation. Release tool for fluid quick connectors. 4,927,185, Cl. 285-39.000.
McNeil, Maynard W.: *See—*
Carson, Chrislyn M.; Copping, Leonard G.; Ehr, Robert J.; Gitlitz, Melvin H.; McNeil, Maynard W.; Street, Peter F. S.; and Liebeschuetz, John W., 4,927,812, Cl. 514-63.000.
McNelley, Jerald R. Mounted fuel tank heater. 4,926,830, Cl. 123-557.000.
McNulty, James L.: *See—*
Osmonson, Daniel T.; and McNulty, James L., 4,926,892, Cl. 135-103.000.
McShea, William T., III; and Yarrington, Robert M., to Engelhard Corporation. Method of methanol production. 4,927,857, Cl. 518-703.000.
McWhorter, John: *See—*
Chastain, Jack T.; and McWhorter, John, 4,927,030, Cl. 209-620.000.
MDT Corporation: *See—*
Hallings, Leonard L.; Bramer, Donald W.; Sanborn, Bruce A.; and Schryver, James E., 4,928,211, Cl. 362-33.000.
Mead Corporation, The: *See—*
Stout, James T., 4,927,009, Cl. 206-188.000.
Meadows, Roger D.; Rush, James B.; and Bryan, James S., to Dayco Products, Inc. Branched hose construction, T-connector therefor and methods of making the same. 4,926,535, Cl. 29-890.144.
Mears, Eric L.; and Jennings, Robert E., to Varian Associates, Inc. Horizontal laminar air flow work station. 4,927,438, Cl. 55-385.200.
Measurex Corporation: *See—*
Howarth, John; and Anderson, Leonard M., 4,928,013, Cl. 250-339.000.
Medical Automation Specialties, Inc.: *See—*
Roginski, Edward T., 4,927,545, Cl. 210-745.000.
Medwin, Steven J., to Du Pont de Nemours, E. I., and Company. Method for shaping fiber reinforced resin matrix materials. 4,927,581, Cl. 264-108.000.
Mehregany, Mehran: *See—*
Haritonidis, Joseph H.; Senturia, Stephen D.; Warkentin, David J.; and Mehregany, Mehran, 4,926,696, Cl. 73-205.000.
Mehta, Hemang S.; Holbrook, Gerald L.; and Leising, Maurice B., to Chrysler Corporation. Method of determining the fluid temperature of an electronic automatic transmission system. 4,928,235, Cl. 364-424.100.
Meichsner, Manfred: *See—*
Willnat, Helmut; and Meichsner, Manfred, 4,927,389, Cl. 439-682.000.
Meikho Industry Corp., Ltd.: *See—*
Sekiguchi, Jinichi, 4,926,527, Cl. 24-90.00A.
Meislitzer, Karl-Heinz; and Sandmann, Heinz, to Rose Elektrotechnik GmbH & Co. KG. Protective housing for cable joints. 4,927,984, Cl. 174-92.000.
Melcher, Gerhard, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Process for producing a decorative foil or sheet containing a polymer plastic, and a foil or plastic produced by this process. 4,927,699, Cl. 428-203.000.
Melzig, Manfred; Rosler, Horst; and Schobl, Medardus, to Optische Werke G. Rodenstock. Anti-reflection film for an optical element consisting of an organic material. 4,927,239, Cl. 350-165.000.
Memmert, Klaus; and Wandrey, Christian, to Kernforschungsanlage Juelich Gesellschaft mit beschraenkter Hagtung. Processes for obtaining exoenzymes by culture. 4,927,751, Cl. 435-3.000.
Menasche, Philippe, to Retroperfusion Systems, Inc. Coronary sinus catheter. 4,927,412, Cl. 604-96.000.
Mercer, William C.: *See—*
Coughlin, Peter K.; Mercer, William C.; and Flanigen, Edith M., 4,927,768, Cl. 436-172.000.
Mercier, Claude: *See—*
Leroux, Andre-Jean; and Mercier, Claude, 4,926,763, Cl. 110-215.000.
Merck & Co., Inc.: *See—*
Eilon, Gabriel F.; and Thompson, Wayne J., 4,927,965, Cl. 562-560.000.
Merck Sharp & Dohme Limited: *See—*
Baker, Raymond; Carling, William R.; James, Kim; and Leeson, Paul D., 4,927,819, Cl. 514-213.000.
Mercure, Roger. Glass rack. 4,927,032, Cl. 211-41.000.
Meredith, Michael D.; Phillips, Joseph R.; Laakso, Richard O.; and Stromberg, C. Bertil, to Kamyr, Inc. Chip gates with air lock. 4,927,312, Cl. 414-221.000.
Merkli, Peter, to Grapha-Holding AG. Apparatus for storing partially overlapping paper sheets. 4,927,129, Cl. 270-60.000.
Merrell Dow Pharmaceuticals: *See—*
Grisar, J. Martin; Dage, Richard C.; and Schnettler, Richard A., 4,927,939, Cl. 548-188.000.
Merrem, Hans-Joachim; Buhr, Gerhard; and Lenz, Ruediger, to Hoechst Aktiengesellschaft. Positive-working photosensitive composition containing a dye and positive-working photosensitive recording material prepared therefrom. 4,927,732, Cl. 430-191.000.
Mesnel, Gerard, to Etablissements Mesnel S.A. Section forming a gripper for automobile gaskets. 4,926,600, Cl. 49-491.000.
Messerschmitt-Bolkow-Blohm GmbH: *See—*
Kranz, Walter, 4,927,096, Cl. 244-3.220.
Metcalf, Robert L., to Wilbanks International, Inc. Can coater/decorator mandrel system. 4,926,788, Cl. 118-500.000.
Meunier, Pierre P., to Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Gas mask nose occluder. 4,926,853, Cl. 128-201.180.
Meurer, Charles L., to Envirotech Corporation. Tape drive with self-expanding coils for sludge collector. 4,927,537, Cl. 210-527.000.
Meyer Company, The: *See—*
Leigh, James P.; and Roethel, Henry G., 4,927,061, Cl. 222-212.000.
Mayfield, John T., III, 4,927,053, Cl. 221-279.000.
Meyer, W. Thomas: *See—*
Crawley, H. Bert; Rosenberg, Eli I.; Meyer, W. Thomas; Gorbics, Mark S.; Thomas, William D.; McKay, Roy L.; and Homer, John F., Jr., 4,928,246, Cl. 364-514.000.
Meyer, Willy: *See—*
Fory, Werner; and Meyer, Willy, 4,927,450, Cl. 71-91.000.
MG Industries: *See—*
Wieland, Rolf H.; and Krongold, Martin A., 4,927,433, Cl. 55-18.000.
Michaud, Philippe; and Camberlin, Yves, to Rhone-Poulenc Chimie. Alkenyloxylated aromatic polyamidoimides. 4,927,899, Cl. 528-49.000.
Michaud, Philippe; and Camberlin, Yves, to Rhone-Poulenc Chimie. Aromatic polyamidoimides having maleimido end groups. 4,927,900, Cl. 528-49.000.

Michel, Paul, to Rhone-Poulenc Chimie. Crystalline sodium/aluminum acid phosphates. 4,927,615, Cl. 423-305.000.
Michelin Recherche et Technique S.A.: *See—*
Gouttebessis, Jacques; and Villaine, Philippe, 4,926,920, Cl. 152-548.000.
Mick, Ray E.: *See—*
Sims, Dewey M., Jr.; and Mick, Ray E., 4,928,083, Cl. 338-202.000.
Microcurrents: *See—*
Claude, John P.; and Young, Stephen L., 4,926,880, Cl. 128-800.000.
Microelectronic & Computer Technology Corp.: *See—*
Hesselink, Lambertus; and Redfield, Steve R., 4,927,220, Cl. 350-3.640.
Midthun, Karen: *See—*
Chanock, Robert M.; Kapikian, Albert; Midtbun, Karen; Flores, Jorge; Gorziglia, Mario; Hoshino, Yasutaka; and Peres-Schael, Irene, 4,927,628, Cl. 424-89.000.
Mierzwinski, Eugene P., to Hamilton Standard Controls, Inc. Method of manufacturing an electroluminescent display. 4,927,490, Cl. 156-634.000.
Mihara, Tadashi: *See—*
Taniguchi, Osamu; Onitsuka, Yoshihiro; and Mihara, Tadashi, 4,927,243, Cl. 350-350.00S.
Mihara, Teruyoshi; and Matsushita, Tsutomu, to Nissan Motor Co., Ltd. Semiconductor device. 4,928,159, Cl. 357-42.000.
Mikic, Frank: *See—*
Fani, Frank P.; and Mikic, Frank, 4,926,891, Cl. 132-214.000.
Mikol, Erwin F., to Twentieth Century Companies, Inc. Plastic drain auger. 4,926,518, Cl. 15-104.330.
Mikol, Erwin F., to Twenthieth Century Companies, Inc. Adjustable tubular wall structure for connectors and the like. 4,927,191, Cl. 285-226.000.
Miles, Brynley J.: *See—*
Reading, Anthony H.; and Miles, Brynley J., 4,927,761, Cl. 435-178.000.
Miles, Philip D.; Moody, John R., Jr.; and O'Keefe, Sheila, to Texas Instruments Incorporated. Loading and accurate measurement of integrated dynamic parameters at point of contact in automatic device handlers. 4,928,062, Cl. 324-158.00R.
Miller, Donald P. Tripod stand for a surveyor's rod. 4,926,561, Cl. 33-293.000.
Miller, Frederick W.: *See—*
Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., 4,926,919, Cl. 152-209.00R.
Miller, Gene W.: *See—*
Youssef, Nabil N.; and Miller, Gene W., 4,927,447, Cl. 71-27.000.
Miller, Glen E.: *See—*
Huggins, Raymond W.; Van Deventer, Bruce; and Miller, Glen E., 4,928,008, Cl. 250-231.100.
Miller, Kurt R.: *See—*
Riihiluoma, Clayton; and Miller, Kurt R., 4,927,157, Cl. 273-260.000.
Miller, Robert O. Method of making a silicon integrated circuit waveguide. 4,927,781, Cl. 437-71.000.
Miller, Robert W. Collapsible bag-supporting frame. 4,927,104, Cl. 248-97.000.
Miller, Theodore H., to Emhart Industries, Inc. Mounting cassette for push-bar exit devices. 4,927,193, Cl. 292-92.000.
Miller, Thomas E.: *See—*
Chang, Steve C. S.; and Miller, Thomas E., 4,927,769, Cl. 436-518.000.
Milliken, K. Blair: *See—*
Milliken, Les; and Milliken, K. Blair, 4,926,605, Cl. 52-63.000.
Milliken, Les; and Milliken, K. Blair. Construction assembly for closure structure. 4,926,605, Cl. 52-63.000.
Millis, David B., to International Business Machines. System for providing three dimensional object descriptions. 4,928,233, Cl. 364-522.000.
Minamitaka, Junichi, to Casio Computer Co., Ltd. Automatic composer using input motif information. 4,926,737, Cl. 84-611.000.
Minardi, Paolo: *See—*
Magnani, Francesco; and Minardi, Paolo, 4,927,294, Cl. 405-177.000.
Minnesota Mining and Manufacturing Company: *See—*
Buchanan, Scott; Larson, Eric G.; Pieper, Jon R.; and Boettcher, Thomas E., 4,927,431, Cl. 51-298.000.
Dufresne, Joel R.; and Dieken, Alan P., 4,926,864, Cl. 128-421.000.
Kemmler-Sack, Sibylle; Morlotti, Romano; and Reichardt, Jurgen, 4,928,017, Cl. 250-483.100.
Pokorny, Richard J., 4,927,556, Cl. 252-173.000.
Minnick, Lawrence E., to Electric Power Research Institute, Inc. Self-actuating pressure relief device and method for nuclear containment. 4,927,596, Cl. 376-283.000.
Minolta Camera Co., Ltd.: *See—*
Yamada, Takanobu, 4,928,146, Cl. 355-253.000.
Minolta Camera Kabushiki Kaisha: *See—*
Hatta, Yoshihiko, 4,928,150, Cl. 355-311.000.
Iino Shuji, 4,928,125, Cl. 346-140.00R.
Kusumoto, Keiji; and Kinoshita, Naoyoshi, 4,928,136, Cl. 355-315.000.
Maeda, Yutaka, 4,926,727, Cl. 83-203.000.
Okamoto, Hiroshi; Oka Tateki; Sako, Mineyuki; Kyogoku, Tetsuo; and Suzuki, Toshikazu, 4,928,145, Cl. 355-245.000.
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,928,124, Cl. 354-106.000.
Minotti, Carlo: *See—*
Spatrisano, Antonio P.; Gandolfi, Luciano; Minotti, Carlo; and Di Cristina, Natale, 4,926,547, Cl. 29-841.000.
Minoura, Jun: *See—*
Ito, Toshiyasu; Minoura, Jun; Takahashi, Shigeyuki; Mori, Takaaki; Kato, Mamoru; and Funahashi, Toshikazu, 4,927,246, Cl. 350-357.000.
Mirring, Knut: *See—*
Stolz, Robert; Mirring, Knut; Hein, Rudolf; Simon, Dieter; Raab, Lothar; and Glatz, Peter, 4,927,276, Cl. 384-572.000.
Mirrorlite, Inc.: *See—*
Rodin, Bruce W., 4,928,209, Cl. 362-217.000.
Misium, George R., to Texas Instruments, Incorporated. Thermo-enhanced electron image projector. 4,928,018, Cl. 250-492.200.
Miskin, Michael; Bamford, William; and Lake, Micheal D., to Miskin, Michael; and Bamford, William. Razor. 4,926,553, Cl. 30-49.000.
Mitchell, Douglas G.: *See—*
Sharma, Ravinder K.; Geyer, Harry J.; and Mitchell, Douglas G., 4,927,505, Cl. 204-34.500.
Mitchell, Matthew P.; and Bauwens, Luc, to Mitchell/Sterling Machines/Systems, Inc. Sibling cycle piston and valving method. 4,926,639, Cl. 60-522.000.
Mitchell/Sterling Machines/Systems, Inc.: *See—*
Mitchell, Matthew P.; and Bauwens, Luc, 4,926,639, Cl. 60-522.000.
Mitomi, Yoshimichi, to Mitsubishi Denki Kabushiki Kaisha. Reactive ion etching appartus. 4,927,484, Cl. 156-345.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Arai, Hajime; and Harada, Hrioshi, 4,927,783, Cl. 437-196.000.
Fujimoto, Takanori; and Hara, Toshirou, 4,926,807, Cl. 123-179.0BG.
Fujimoto, Takanori; and Hara, Toshiro, 4,928,228, Cl. 364-431.090.
Hirano, Sadayuki; Murano, Katsuaki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,926,716, Cl. 74-866.000.
Isozumi, Shuzoo, 4,926,706, Cl. 74-7.00A.
Kimata, Masafumi, 4,928,158, Cl. 357-24.000.
Kusakawa, Takaji; Wakamoto, Katsuyoshi; and Imaizumi, Mitsuyuki, 4,927,467, Cl. 148-3.000.
Masada, Shigeo, 4,928,001, Cl. 235-380.000.
Mitomi, Yoshimichi, 4,927,484, Cl. 156-345.000.
Morishita, Akira; Tanaka, Toshinori; and Isozumi, Shuzoo, 4,926,705, Cl. 74-6.000.
Naya, Eizo; Okumura, Mitsuhiro; and Miyamoto, Seiichi, 4,927,989, Cl. 200-265.000.
Ogawa, Kohji; and Onoki, Mikio, 4,928,300, Cl. 379-53.000.
Sugawara, Sakuo; Hara, Masanori; and Suzuki, Takane, 4,926,839, Cl. 126-96.000.
Wada, Shunichi, 4,927,170, Cl. 280-707.000.
Yamaguchi, Sataro, 4,927,592, Cl. 376-123.000.
Yamamuro, Takahiko, 4,928,173, Cl. 358-102.000.
Yonemoto, Masashi, 4,928,021, Cl. 187-108.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Imoto, Koji; Omura, Tadao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki; and Shioya, Yoshiaki, 4,926,817, Cl. 123-292.000.
Murasaki, Isao, 4,926,688, Cl. 74-527.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Imoto, Koji; Omura, Tadao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki; and Shioya, Yoshiaki, 4,926,817, Cl. 123-292.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Abe, Seiichi, 4,926,836, Cl. 125-11.010.
Mitsubishi Metal Corporation: *See—*
Tsujimura, Osamu, Nakayama, Masaaki; and Okawa, Masayuki, 4,927,303, Cl. 408-223.000.
Mitsubishi Paper Mills Ltd.: *See—*
Fuchigami, Mitsuru; Tachizawa, Shingo; and Ishiguro, Mamoru, 4,927,971, Cl. 564-505.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Anzai, Hisao; Makino, Hideaki; Ootani, Masami; Sasaki, Isao; and Nishida, Kozi, 4,927,893, Cl. 525-378.000.
Hirsoka, Saburo; Hama, Shinji; and Senga, Mitsuo, 4,927,915, Cl. 528-490.000.
Nakanishi, Yasuaki; and Inoue, Masao, 4,927,233, Cl. 350-128.000.
Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See—*
Yamada, Shinjiro, 4,926,707, Cl. 74-96.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Ohori, Yoshiji; and Harazoe, Hirofumi, 4,927,871, Cl. 524-230.000.
Mittel, James G.: *See—*
Grandfield, Walter J.; Mittel, James G.; and Davis, Walter L., 4,928,314, Cl. 455-236.000.
Mitzutani, Satoshi: *See—*
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mitzutani, Satoshi; and Isono, Toru, 4,927,190, Cl. 285-175.000.
Miura, Akira: *See—*
Egusa, Syun; Miura, Akira; and Gemma, Nobuhiro, 4,927,589, Cl. 264-259.000.
Miura, Teiji: *See—*
Aoki, Kenji; Nagata, Mitsuo; Nakamura, Haruo; and Miura, Teiji, 4,927,242, Cl. 350-346.000.
Miyagawa, Yuichi: *See—*
Kanda, Masahiko; and Miyagawa, Yuichi, 4,926,867, Cl. 128-633.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Miyahara, Kazuhiro: *See*—
Ohtaka, Masashi; and Miyahara, Kazuhiro, 4,927,577, Cl. 264-63.000.

Miyai, Kenzi: *See*—
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, 4,927,818, Cl. 514-202.000.

Miyajima, Nobukazu; Tanaka, Akira; and Shinoda, Masaru, to Nihon Kohden Corporation. Defibrillation system. 4,926,862, Cl. 428-419.00D.

Miyake, Toshio: *See*—
Hijiya, Hiromi; and Miyake, Toshio, 4,927,636, Cl. 424-409.000.

Miyaki, Takeo: *See*—
Konishi, Masataka; Shimizu, Keiko; Ohbayashi, Masaru; Tomita, Koji; Miyaki, Takeo; and Oki, Toshikazu, 4,927,848, Cl. 514-453.000.

Miyamoto, Seiichi: *See*—
Naya, Eizo; Okumura, Mitsuhiro, and Miyamoto, Seiichi, 4,927,989, Cl. 200-265.000.

Miyamura, Tetsuo, to Wacoal Corp. Corset for alleviation of lumbago. 4,926,502, Cl. 2-44.000.

Miyashita, Tsuneo; Nishio, Hiroaki; Yabuta, Kazuya; and Takagi, Yoshio, to Nippon Kokan Kabushiki Kaisha. Method for molding of powders. 4,927,600, Cl. 419-49.000.

Miyata, Junji: *See*—
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,926,624, Cl. 56-202.000.

Miyazaki, Takeshi: *See*—
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mitzutani, Satoshi; and Isono, Toru, 4,927,190, Cl. 285-175.000.

Miyazaki, Teruko, to Ciba-Geigy Corporation. Curable polyurethane casting systems and amine hardeners therefor. 4,927,901, Cl. 528-64.000.

Miyazawa, Takeshige: *See*—
Yamaguchi, Mikio; Suzuki, Chiharu; Matsunari, Kenji; Miyazawa, Takeshige; and Nakamura, Yasuo, 4,927,448, Cl. 71-90.000.

Miyoshi, Jun: *See*—
Ashihara, Ryohei; Suehiro, Kikumitsu; Sugino, Kazuo; and Miyoshi, Jun, 4,927,719, Cl. 429-54.000.

Miyoshi, Naoto: *See*—
Matsumoto, Shinichi; Miyoshi, Naoto; Kimura, Mareo; Ozawa, Masakuni; and Isogai, Akio, 4,927,799, Cl. 502-303.000.

Mizerski, Krzysztof: *See*—
Brokowski, Andrzej; Deputat, Julian; and Mizerski, Krzysztof, 4,926,692, Cl. 73-597.000.

Mizukami, Toru; Katsumata, Ryoichi; and Oka, Tetsuo, to Kyowa Hakko Kogyo Co., Ltd. Process for producing histidine. 4,927,758, Cl. 435-107.000.

Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, to Bridgestone Corporation. Oscillating apparatus for damping vibration. 4,926,985, Cl. 188-378.000.

Mizuno, Shinji: *See*—
Yagi, Nobuyuki; Inagaki, Jiro; Morita, Kozo; Kaku, Yasutoshi; Kikuchi, Nobuyuki; and Mizuno, Shinji, 4,928,082, Cl. 338-174.000.

Mizushima, Yukio: *See*—
Matsutani, Shigeru; and Mizushima, Yukio, 4,927,829, Cl. 514-258.000.

Mizusugi, Tetsuya: *See*—
Honjo, Seiichiro; Yamada, Kazuo; Fuchigami, Yasuhiro; and Mizusugi, Tetsuya, 4,927,443, Cl. 65-273.000.

Mizutani, Junichi: *See*—
Inui, Shuji; Hiramitsu, Tetsushi; Takahaski, Toshinori; Tamaki, Makoto; Kikuta, Mitsuhiro; and Mizutani, Junichi, 4,927,364, Cl. 439-15.000.

Mizutani, Yoshihiko; and Nishizawa, Hitoshi, to NGK Insulators, Ltd. NOx sensor having catalyst for decomposing NOx. 4,927,517, Cl. 204-406.000.

Mniece, James R.: *See*—
Brock-Fisher, George A.; Kranz, Paul R.; Mniece, James R.; Thiele, Karl E.; Savord, Bernard J.; and Smith, Richard B., 4,926,872, Cl. 128-661.010.

Mobil Oil Corporation: *See*—
Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., 4,927,526, Cl. 208-152.000.
Avidan, Amos A., 4,926,756, Cl. 110-342.000.
Avidan, Amos A., 4,927,348, Cl. 431-7.000.
Bell, Weldon K.; and Haag, Werner O., 4,927,924, Cl. 540-536.000.
Child, Jonathan E.; Choi, Byung C.; and Ragonese, Francis P., 4,927,977, Cl. 568-695.000.
Chu, Yung F., 4,927,521, Cl. 208-65.000.
Chu, Yung F., 4,927,525, Cl. 208-138.000.
Donnelly, Susan P., 4,927,523, Cl. 208-120.000.
Haddad, James H.; and Owen, Hartley, 4,927,527, Cl. 208-161.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,927,522, Cl. 208-120.000.
Herrington, Fox J., 4,927,574, Cl. 264-40.600.
Hoskin, Dennis H., 4,926,943, Cl. 166-270.000.
Neeley, Walter P.; and Ritter, Sammie F., 4,928,262, Cl. 367-106.000.
Stromswold, David C., 4,926,940, Cl. 166-247.000.

Mobile Music, Inc.: *See*—
Smith, Gary, 4,926,735, Cl. 84-453.000.

Mobilio, Dominick, to American Home Products Corporation. 2,3,4,9-tetrahydro-1H-carbazole acetic acid derivatives, composition and use as anti-inflammatories. 4,927,842, Cl. 514-411.000.

Moen, Bruce A.: *See*—
Grims, Conrad M.; Moen, Bruce A.; and Pardubicky, Jaroslav F., 4,926,669, Cl. 72-349.000.

Molex Incorporated: *See*—
Patel, Arvind, 4,927,787, Cl. 439-189.000.

Molund, Gunnar: *See*—
Engdahl, Goran; and Molund, Gunnar, 4,927,334, Cl. 417-322.000.

Molzahn, David C.; Hartwell, George E.; and Bowman, Robert G., to Dow Chemical Company, The. Preparation of alkyl-extended, alcohol-extended or amine-extended piperazines. 4,927,931, Cl. 544-357.000.

Moncada, Elizabeth; and Schneider, Michael B., to Schneider Medical Technologies, Inc. Safety sleeve adapter. 4,927,417, Cl. 604-198.000.

Monma, Hisayoshi; and Suganuma, Atsushi, to Fuji Photo Film Co., Ltd. Method and apparatus for driving laser beam source to avoid droop effects. 4,928,277, Cl. 369-116.000.

Monnai, Jun: *See*—
Hasegawa, Tai; Monnai, Jun; and Matsuzaki, Masatoshi, 4,928,134, Cl. 346-76.0PH.

Monoyios, Terry. Shiftable block puzzle. 4,927,150, Cl. 273-153.00S.

Monsanto Company: *See*—
Feder, Joseph; Howard, Susan C.; Wittwer, Arthur J.; Rademacher, Thomas W.; Parekh, Raj B.; and Dwek, Raymond A., 4,927,630, Cl. 424-94.640.

Montali, Gian Luigi, to S.T.S. SRL. Device for determining a preset number of containers, partially inserted within one another forming a package of the same containers. 4,927,319, Cl. 414-788.400.

Montgomery, David B.: *See*—
Williams, Joel L.; Montgomery, David B.; and Baldwin, Lillian P., 4,927,676, Cl. 428-36.000.

Moody, John R., Jr.: *See*—
Miles, Philip D.; Moody, John R., Jr.; and O'Keefe, Sheila, 4,928,062, Cl. 324-158.00R.

Moore, Anthony J.: *See*—
Diaz, Stephen H.; Cherian, Gabe; Morris, Stephen; Vinson, John R.; Crofts, David; and Moore, Anthony J., 4,928,199, Cl. 361-56.000.

Moore, Billy G., to Koppl Industrial Systems, Inc. Pipeline repair clamp. 4,927,182, Cl. 285-15.000.

Moore Business Forms, Inc.: *See*—
Jenkins, Richard A.; and Hutchinson, Wilbur P., 4,927,072, Cl. 229-92.300.

Moore, Donald J.: *See*—
Coup, Michael C.; Israel, Gary P.; Ediger, Glen W.; and Moore, Donald J., 4,927,324, Cl. 415-121.200.

Moore, Eugene R., to Dow Chemical Company, The. Method for making fiber-reinforced plastics. 4,927,579, Cl. 264-101.000.

Moore, Gerry W.: *See*—
Dhanakoti, Padmanabhan; Moore, Gerry W.; and Smith, Harold F., 4,927,692, Cl. 428-137.000.

Moore, Loyd C.: *See*—
Lilly, Carol E. H.; Moore, Loyd C.; Eike, Mark E.; and Barker, Nicholas E., 4,926,758, Cl. 108-43.000.

Moore, Thomas E.; McEachern, James A.; and Wight, Mark S., to Northern Telecom Limited. Synchronization of asynchronous data signals. 4,928,275, Cl. 370-102.000.

Morane, Bruno; and Joulia, Gerard, to L'Oreal. Container for nail polish. 4,927,282, Cl. 401-129.000.

Morano, Jacqueline K.; Martin, Francis J.; and Woodle, Martin, to Liposome Technology, Inc. Liposome extrusion method. 4,927,637, Cl. 424-450.000.

Morgan, Ruth B. Keyboards for homes. 4,927,279, Cl. 400-486.000.

Mori, Nobufumi; Muraishi, Katsuaki; Matsuda, Terumi; Ohnishi, Masahiro; Nunome, Hiromi; Koyama, Tadao; and Oikawa, Tetsuo, to Fuji Photo Film Co. Ltd. Magazine for accommodating recording medium for electron microscope. 4,928,016, Cl. 250-440.100.

Mori, Sanae, to 501 Daido Metal Company Ltd. Overlay alloy used for a surface layer of sliding material. 4,927,715, Cl. 428-645.000.

Mori, Shuichi: *See*—
Yamamoto, Hideo; Sato, Takeshi; Yoshimi, Toshikazu; Mori, Shuichi; and Tokumo, Akio, 4,928,071, Cl. 330-129.000.

Mori, Takaaki: *See*—
Ito, Toshiyasu; Minoura, Jun; Takahashi, Shigeyuki; Mori, Takaaki; Kato, Mamoru; and Funahashi, Toshikazu, 4,927,246, Cl. 350-357.000.

Morich, Michael A: *See*—
Lampman, David A.; Morich, Michael A; and Dannels, Wayne R., 4,928,063, Cl. 324-307.000.

Morishima, Hajime: *See*—
Tanaka, Seiichi; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Morishima, Hajime; and Matsuyama, Kenji, 4,927,565, Cl. 260-404.500.

Morishita, Akira; Tanaka, Toshinori; and Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Starter device for internal combustion engines. 4,926,705, Cl. 74-6.000.

Morishita, Taro: *See*—
Tanaka, Toshiyuki; Kuga, Shigeki; Nakamura, Nobuo; Morishita, Taro; and Wada, Masahiro, 4,928,236, Cl. 364-513.000.

Morita, Hideo: *See*—
Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, 4,927,889, Cl. 525-285.000.

Morita, Kozo: *See*—
Yagi, Nobuyuki; Inagaki, Jiro; Morita, Kozo; Kaku, Yasutoshi; Kikuchi, Nobuyuki; and Mizuno, Shinji, 4,928,082, Cl. 338-174.000.

Morita, Mikio: *See*—
Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; and Morita, Mikio, 4,927,473, Cl. 148-306.000.

Morizumi, Mitsuo; Omura, Kinya; Arita, Eriya; Furuya, Katsuji; Yasuda, Sakae; and Kodera, Masaya, to Nissan Motor Company, Limited; and Tsuchiya Mfg. Co., Ltd. Vent control valve attached to fuel filler tube. 4,926,914, Cl. 141-59.000.

Morlotti, Romano: *See*—
Kemmler-Sack, Sibylle; Morlotti, Romano; and Reichardt, Jurgen, 4,928,017, Cl. 250-483.100.

Morrill Glasstek, Inc.: *See*—
Morrill, Vaughan, Jr.; Scandrett, John H.; and Hudson, David K., 4,926,543, Cl. 29-623.000.

Morrill, Vaughan, Jr.; Scandrett, John H.; and Hudson, David K., to Morrill Glasstek, Inc. Method of making a sub-miniature fuse. 4,926,543, Cl. 29-623.000.

Morris, Arnold M.; D'Zurko, Daphne; Pilsbury, Richard H.; Barkell, J. Warren, Jr.; Orndorff, Karl B.; and Lawson Randall S., to Inventio AG. Elevator car with improved car door clutch. 4,926,974, Cl. 187-52.0LC.

Morris, Arnold M., to Inventio AG. Elevator car with improved door lock. 4,926,975, Cl. 187-57.000.

Morris, Arthur J.: *See*—
Pringle, Ronald E.; and Morris, Arthur J., 4,926,945, Cl. 166-321.000.

Morris, Daniel C., II: *See*—
Morse, James D.; and Morris, Daniel C., 11, 4,926,578, Cl. 43-42.240.

Morris, Guy D.; Jordon, Trevor A.; Davidson, William C.; and Bowman, Timothy J., to Ford Motor Company. Tuned manifold. 4,926,802, Cl. 123-52.00M.

Morris, Stephen: *See*—
Diaz, Stephen H.; Cherian, Gabe; Morris, Stephen; Vinson, John R.; Crofts, David; and Moore, Anthony J., 4,928,199, Cl. 361-56.000.

Morris, Steven J.: *See*—
Dana, David E.; and Morris, Steven J., 4,927,869, Cl. 523-502.000.

Morris, Thomas E.: *See*—
Repman, Joseph F.; Morris, Thomas E.; and Hill, Thomas F., Jr., 4,927,621, Cl. 423-488.000.

Morrison Berkshire, Inc.: *See*—
Stanislaw, Peter P., 4,926,530, Cl. 28-111.000.

Morrissey, Mark E.; and Schiemer, Thomas, Jr. Game of horseshoes. 4,927,159, Cl. 273-338.000.

Morse, James D.; and Morris, Daniel C., 11. Fishing lure. 4,926,578, Cl. 43-42.240.

Morton Thiokol, Inc.: *See*—
McGregor, James D., 4,927,481, Cl. 156-245.000.

Moses, Joseph: *See*—
Raj, Kuldip; Moses, Joseph; Moskowitz, Ronald; and Bloom, Frank, 4,927,164, Cl. 277-80.000.

Moskowitz, Ronald: *See*—
Raj, Kuldip; Moses, Joseph; Moskowitz, Ronald; and Bloom, Frank, 4,927,164, Cl. 277-80.000.

Moss, Frank R.: *See*—
Ooms, Willem; Moss, Frank R.; and Key, Jonnie L., 4,927,695, Cl. 428-159.000.

Motor Wheel Corporation: *See*—
Golata, John H.; and Woelfel, James A., 4,927,347, Cl. 425-150.000.

Motorola Inc.: *See*—
Alvarez, Antonio R.; and Kirchgessner, James A., 4,927,775, Cl. 437-31.000.
Alvis, John R.; Pfiester, James R.; and Holland, Orin W., 4,928,156, Cl. 357-23.400.
Corley, Dean; and Littlebury, Hugh, 4,928,002, Cl. 235-479.000.
Drapac, George; and Grandfield, Walter J., 4,928,086, Cl. 340-825.440.
Grandfield, Walter J.; Mittel, James G.; and Davis, Walter L., 4,928,314, Cl. 455-236.000.
Leonardo, Victoria A.; and Nelson, Leonard E., 4,928,096, Cl. 340-825.440.
Lesk, Israel A.; Thomas, Ronald E.; Hawkins, George W.; and Rugg, James M., 4,928,162, Cl. 357-72.000.
Main, William E., 4,928,068, Cl. 329-324.000.
Nogle, Scott G.; Pelley, Perry H., III; Flannagan, Stephen T.; and Engles, Bruce E., 4,928,268, Cl. 365-230.030.
Roth, Scott S.; Nguyen, Bich-Yen; Tobin, Philip J.; Ray, Wayne; Wachholz, E. Petyr; and Wissen, Glenn, 4,927,780, Cl. 437-69.000.
Sharma, Ravinder K.; Geyer, Harry J.; and Mitchell, Douglas G., 4,927,505, Cl. 204-34.500.
Shirley, Thomas F., Jr.; and Goldsmith, Eric S., 4,927,789, Cl. 455-67.000.

Motozawa, Yasuki, to Honda Giken Kogyo Kabushiki Kaisha. Mechanical acceleration sensor. 4,927,172, Cl. 280-734.000.

Mottate, Tatsuo, to Nippon Thompson Co., Ltd. Linear motion rolling contact bearing assembly having a feed-in port. 4,927,273, Cl. 384-45.000.

Motz, Kaye L.; Latham, Roger A.; and Statz, Robert J., to Du Pont de Nemours, E. I., and Company. Low pour crude oil compositions. 4,926,582, Cl. 44-62.000.

Mouesca, Bruno; and Ladonceur, Bruno. Control cluster provided with removable control elements for a nuclear fuel reactor. 4,928,291, Cl. 376-327.000.

Mouhot, Frederic: *See*—
Hobluigie, Audio; Barnabe, Jean-Pierre; and Mouhot, Frederic, 4,927,286, Cl. 403-322.000.

Mourou, Gerard A.; Nees, John A.; and Williamson, Steven L., to University of Rochester, The. Ultrafast optical modulator. 4,928,076, Cl. 330-4.300.

Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., to Storage Technology Corporation. Automated cartridge system. 4,928,245, Cl. 364-513.000.

Moye, Jeanne O.: *See*—
Sorrentino, James V.; Kelleher, William J.; and Moye, Jeanne O., 4,927,634, Cl. 424-405.000.

Moyer, Bruce A.; and McDowell, W. J., to United States of America, Energy. Method for extracting copper, silver and related metals. 4,927,610, Cl. 423-24.000.

MTU Motoren-Und Turbinen-Union Muenchen GmbH: *See*—
Rossmann, Axel; and Huether, Werner, 4,927,336, Cl. 417-407.000.

Muchnick, Steven S.: *See*—
Baum, Allen; Bryg, William R.; Mahon, Michael J.; Lee, Ruby B.; and Muchnick, Steven S., 4,928,239, Cl. 364-200.000.

Mueller, Carl F.: *See*—
Garg, Diwakar; Wreesics, Ernest L.; Schaffer, Leslie E.; Mueller, Carl F.; Dyer, Paul N.; and Fabregas, Keith R., 4,927,713, Cl. 428-627.000.

Mueller, David W.: *See*—
Swinderman, Robert T.; and Mueller, David W., 4,927,003, Cl. 198-497.000.

Mueller, Mark, to Penn's Woods Products, Inc. Diaphragm game call with tone modifying slits. 4,927,399, Cl. 446-207.000.

Mueller, Werner H.; and Khanna, Dinesh N., to Hoechst Celanese Corporation. Hydroxy polyimides and high temperature positive photoresists therefrom. 4,927,736, Cl. 430-275.000.

Muhlmann, Carl P. M.: *See*—
Hellquist, Ivan; and Muhlmann, Carl P. M., 4,926,855, Cl. 128-201.280.

Muhlratzer, August; Handrick, Karin; Lassmann, Siegfried; and Hirt, Alfred, to Man Technologie AG. Thermal insulating material. 4,927,702, Cl. 428-215.000.

Mukoh, Akio: *See*—
Era, Susumu; Kobayashi, Setsuo; and Mukoh, Akio, 4,927,735, Cl. 430-270.000.

Mulder, Douglas C.: *See*—
Kaiser, Thomas A.; Mulder, Douglas C.; O'Ryan, David E.; Schneider, Douglas A.; and Ward, Rodney L., 4,927,346, Cl. 425-81.100.

Muller, Hartwig: *See*—
Frobel, Klaus; Muller, Hartwig; Bischoff, Erwin; Salcher, Olga; de Jong, Anno; Berschauer, Friedrich; and Scheer, Martin, 4,927,810, Cl. 514-23.000.

Muller, Karl H.; Riedl, Volker; and Arbesmeier, Bernhard, to Audi AG. Apparatus having a lifting frame for processing workpieces. 4,926,539, Cl. 29-568.000.

Muller, Klaus-Helmut: *See*—
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,927,454, Cl. 71-93.000.

Mullin, John G.: *See*—
Guthrie, Robert W.; Kierstead, Richard W.; Mullin, John G.; and Tilley, Jefferson W., 4,927,838, Cl. 514-337.000.

Munguia, Gabriel R.: *See*—
McCarthy, Daniel M.; Circello, Joseph C.; Munguia, Gabriel R.; and Richardson, Nicholas J., 4,928,225, Cl. 364-200.000.

Munro, Frederick G.: *See*—
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.

Murai, Yukio: *See*—
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 4,926,648, Cl. 62-55.500.

Muraishi, Katsuaki: *See*—
Mori, Nobufumi; Muraishi, Katsuaki; Matsuda, Terumi; Ohnishi, Masahiro; Nunome, Hiromi; Koyama, Tadao; and Oikawa, Tetsuo, 4,928,016, Cl. 250-440.100.

Murakami, Kazutomo: *See*—
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, 4,926,985, Cl. 188-378.000.

Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, to Kubota, Ltd. Lawn mower. 4,926,624, Cl. 56-202.000.

Murano, Katsuaki: *See*—
Hirano, Sadayuki; Murano, Katsuaki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,926,716, Cl. 74-866.000.

Murasaki, Isao, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Parking lock for automotive vehicles. 4,926,688, Cl. 74-527.000.

Murata, Jun, to Canon Kabushiki Kaisha. Platen roller. 4,927,280, Cl. 400-661.000.

Murdock, Clifford R. Pickup truck cap. 4,927,206, Cl. 296-156.000.

Muroi, Hidenori, to Tokyo Electric Co., Ltd. Automatic POS loop switching apparatus. 4,928,279, Cl. 371-11.200.

VOL
1114
ISS
4
MY
22
1990
UMI

Murphy, Donald R.: *See—*
Bach, William D.; and Murphy, Donald R., 4,927,377, Cl. 439-367.000.
Murphy, Kent A.: *See—*
Zimmermann, Bernd D.; Claus, Richard O.; and Murphy, Kent A., 4,928,004, Cl. 250-227.140.
Murphy, Maurice W.: *See—*
Franklin, Douglas E.; Murphy, Maurice W.; and Palylyk, Richard A., 4,926,691, Cl. 73-579.000.
Murphy, Patrick J.; and Svenkeson, John W., to Unisys Corporation (Formerly Burroughs Corp). High density connector. 4,927,370, Cl. 439-74.000.
Murray, David L., to Deutz-Allis Corporation. Master/slave hydraulic system for adjusting the support wheels of an articulated implement. 4,927,165, Cl. 280-43.230.
Musschoot, Albert, to General Kinematics Corporation. Vibratory rumbling apparatus. 4,926,601, Cl. 51-7.000.
Mutez, Sylvain: *See—*
Perron, Robert; and Mutez, Sylvain, 4,927,957, Cl. 560-202.000.
Myohl, Jochim; and Kasparek, Alfred, to Korber AG. Apparatus for manipulating rod-shaped articles. 4,926,887, Cl. 131-91.000.
N I T I "Veda": *See—*
Andonov, Blagoy A., 4,926,626, Cl. 57-18.000.
Naarmann, Herbert; and Theophilou, Nicolas, to BASF Aktiengesellschaft. Method for producing uncrosslinked polyacetylene film. 4,927,578, Cl. 264-81.000.
Nabisco Brands, Inc.: *See—*
Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, 4,927,658, Cl. 426-611.000.
Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, 4,927,659, Cl. 426-611.000.
Nagai, Kougi: *See—*
Ito, Yoshiaki; Nagai, Kougi; Sawada, Akihiko; and Koike, Hideyuki, 4,927,338, Cl. 417-462.000.
Nagaishi, Toshimi: *See—*
Tanaka, Yoshiyasu; Nagaishi, Toshimi; and Suzuki, Mituyoshi, 4,927,229, Cl. 350-96.210
Nagamatsu, Mutuo. Box for cultivating plant. 4,926,586, Cl. 47-66.000.
Nagao, Yoshiaki: *See—*
Kuzuya, Susumu; Nagao, Yoshiaki; Asakura, Hideo; and Hattori, Shigenori, 4,927,278, Cl. 400-208.000.
Nagashima, Yukihito: *See—*
Manabe, Seiichiro; and Nagashima, Yukihito, 4,927,446, Cl. 65-347.000.
Nagata, Mitsuo: *See—*
Aoki, Kenji; Nagata, Mitsuo; Nakamura, Haruo; and Miura, Teiji, 4,927,242, Cl. 350-346.000.
Nagatomo, Yasushi: *See—*
Aoki, Kazuo; Chiba, Toshimi; Tachibana, Sadao; and Nagatomo, Yasushi, 4,927,990, Cl. 200-517.000.
Nagatsuma, Nobuyoshi: *See—*
Yoshioka, Hiroshi; Nagatsuma, Nobuyoshi; and Kobayashi, Shinobu, 4,926,972, Cl. 184-109.000.
Nagoya Institute of Technology: *See—*
Umeno, Masayoshi; Sakai, Shiro; and Yahagi, Shinichiro, 4,928,154, Cl. 357-16.000.
Nagura, Osamu: *See—*
Hakuta, Shinsaku; Yasaka, Yasuhiro; Nagura, Osamu; Tsuji, Eiji; Suzuki, Makoto; and Akagawa, Hirotaka, 4,926,541, Cl. 29-598.000.
Nagura, Satoru; Ebihara, Tsutomu; and Matsumoto, Toshihide, to Toray Industries, Inc. Heat-resistant flock sheet. 4,927,682, Cl. 428-88.000.
Nagy, Geza: *See—*
Stuber, Istvan; Nagy, Geza; and Petrak, Peter, 4,927,253, Cl. 350-508.000.
Naito, Kenzo; Ishibashi, Yukio; and Shinbo, Haruo, to Takeda Chemical Industries, Ltd. Method for production of 2-oxyimino-3-oxobutyric acids. 4,927,964, Cl. 562-560.000.
Naka, Hiroyuki; Hirono, Tomohide; Suzuki, Naoki; and Ichiyanagi, Takashi, to Matsushita Electric Industrial Co., Ltd. Method for heating a patterned substrate. 4,927,068, Cl. 228-103.000.
Nakada, Masayuki: *See—*
Takahashi, Shuzo; Tsuchida, Yutaka; Osada, Shiro; Hasebe, Nobuhisa; and Nakada, Masayuki, 4,926,925, Cl. 164-154.000.
Nakada, Tatsuo: *See—*
Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi; Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, 4,927,941, Cl. 548-264.800.
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, to Kabushiki Kaisha Toshiba. Lateral conductivity modulated MOSFET. 4,928,155, Cl. 357-23.400.
Nakahara, Yasuhiro: *See—*
Sakamoto, Kiyoaki; Matsubara, Kenichi; Nakahara, Yasuhiro; and Nomura, Masaki, 4,927,531, Cl. 210-198.200.
Nakai, Noboru: *See—*
Iwasawa, Naozumi; Isozaki, Osamu; and Nakai, Noboru, 4,927,884, Cl. 525-195.000.
Nakajima, Kiyoji: *See—*
Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba, Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, 4,926,906, Cl. 137-625.300.
Nakajima, Kunihiko: *See—*
Imoto, Koji; Omura, Tadao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki; and Shioya, Yoshiaki, 4,926,817, Cl. 123-292.000.
Nakajima, Yasuo: *See—*
Tanaka, Yasuhiro; Sunohara, Masaaki; Nakajima, Yasuo; and Tanaka, Shinichi, 4,927,247, Cl. 350-432.000.
Nakakoshi, Masamichi: *See—*
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, 4,927,959, Cl. 560-193.000.
Nakamatsu, Shuji: *See—*
Nishiki, Yoshinori; Nakamatsu, Shuji; and Shimamune, Takayuki, 4,927,800, Cl. 502-349.000.
Nakamura, Haruo: *See—*
Aoki, Kenji; Nagata, Mitsuo; Nakamura, Haruo; and Miura, Teiji, 4,927,242, Cl. 350-346.000.
Nakamura, Hisashi; Takahashi, Satoshi; Ikeda, Takayuki; and Ogino, Masaaki, to Diesel Kiki Co., Ltd. Pressure equalizer valve device of fuel injection pump. 4,926,902, Cl. 137-493.300.
Nakamura, Hisashi: *See—*
Kurosawa, Hinoko; Itoh, Kazuya; Nakamura, Hisashi; and Ishihara, Masamichi, 4,928,281, Cl. 371-51.100.
Nakamura, Masahiko: *See—*
Yamamoto, Hajime; Takashima, Yuji; Kitagaki, Kazunori; and Nakamura, Masahiko, 4,927,724, Cl. 430-45.000.
Nakamura, Nobuo: *See—*
Tanaka, Toshiyuki; Kuga, Shigeki; Nakamura, Nobuo; Morishita, Taro; and Wada, Masahiro, 4,928,236, Cl. 364-513.000.
Nakamura, Setsuo: *See—*
Kita, Tatsuya; Shigemura, Takuro; Nakamura, Setsuo; and Nakane, Hisanori, 4,926,816, Cl. 123-203.000.
Nakamura, Shozo: *See—*
Gotoh, Masao; Hira, Yasuo; Waragai, Kenichi; Nakamura, Shozo; and Yokono, Hitoshi, 4,927,044, Cl. 220-83.000.
Nakamura, Tamio: *See—*
Aramaki, Minoru; Sakaguchi, Hiroaki; and Nakamura, Tamio, 4,927.962, Cl. 562-113.000.
Nakamura, Yasuhiro: *See—*
Fujino, Yuuji; and Nakamura, Yasuhiro, 4,928,215, Cl. 362-61.000.
Nakamura, Yasuo: *See—*
Yamaguchi, Mikio; Suzuki, Chiharu; Matsunari, Kenji; Miyazawa, Takeshige; and Nakamura, Yasuo, 4,927,448, Cl. 71-90.000.
Nakane, Hisanori: *See—*
Kita, Tatsuya; Shigemura, Takuro; Nakamura, Setsuo; and Nakane, Hisanori, 4,926,816, Cl. 123-203.000.
Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Takahashi, Katsuhiko, to Polyplastics Co., Ltd. Silicon-containing copolyester and method of producing the same. 4,927,895, Cl. 525-438.000.
Nakanishi, Yasuaki; and Inoue, Masao, to Mitsubishi Rayon Co., Ltd. Rear projection screen. 4,927,233, Cl. 350-128.000.
Nakaniwa, Shimpei; and Itoh, Toshibumi, to Japan Electronic Control Systems Co., Ltd. Electric air-fuel ratio control apparatus for use in internal combustion engine. 4,926,826, Cl. 123-489.000.
Nakano, Masato: *See—*
Tanaka, Seiichi; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Morishima, Hajime; and Matsuyama, Kenji, 4,927,565, Cl. 260-404.500.
Nakao, Masami: *See—*
Tadokoro, Tomoo; Tashima, Seiji; Okimoto, Haruo; Akagi, Toshimichi; Nakao, Masami; Matsuda, Ikuo; and Suekuni, Einosuke, 4,926,636, Cl. 60-312.000.
Nakashima, Kazutaka; and Saito, Kazuya, to Dowa Mining Co., Ltd.; and Yazaki Corporation. Monolithic female connector. 4,927,788, Cl. 439-887.000.
Nakashima, Takashi: *See—*
Ohmura, Hiroshi; and Nakashima, Takashi, 4,926,955, Cl. 180-140.000.
Nakata, Yutaka, to Ichikoh Industries, Ltd. Projector-type head lamp for vehicles. 4,928,213, Cl. 362-61.000.
Nakatani, Tomofumi: *See—*
Kaneuchi, Kunihiro; Yasuda, Seigou; Ariyoshi, Takashi; Nakatani, Tomofumi; and Aizawa, Hiroshi, 4,928,302, Cl. 379-88.000.
Nakatsu, Hiroshi, to Sharp Kabushiki Kaisha. Socket for semiconductor device. 4,927,371, Cl. 439-79.000.
Nakayama, Hiromichi: *See—*
Ohkawa, Toshiya; Nakayama, Hiromichi; and Iguchi, Tatsuya, 4,927,287, Cl. 403-408.100.
Nakayama, Masaaki: *See—*
Tsujimura, Osamu; Nakayama, Masaaki; and Okawa, Masayuki, 4,927,303, Cl. 408-223.000.
Nakayama, Nobuhiro: *See—*
Isoda, Tetsuo; Watanabe, Yoichiro; Nakayama, Nobuhiro; and Aoki, Mitsuo, 4,927,728, Cl. 430-108.000.
Nakayama, Yoshiaki: *See—*
Takahashi, Kimihide; Sasaki, Hidemi; and Nakayama, Yoshiaki, 4,928,179, Cl. 358-210.000.
Nalesnik, Theodore E.: *See—*
Karol, Thomas J.; and Nalesnik, Theodore E., 4,927,562, Cl. 252-51.50A.
Narumi, Ichiro, to Pioneer Electronic Corporation. Movable-member supporting apparatus. 4,927,235, Cl. 350-252.000.
Narumi, Naoaki: *See—*
Otsuji, Taiichi; and Narumi, Naoaki, 4,928,278, Cl. 371-1.000.

Nash, Dudley O.; and Herzner, Frederick C., to United States of America, Air Force. Coolant pressure regulating apparatus. 4,926,633, Cl. 60-226.100.
Nash, Thomas W., to Xerox Corporation. Auger unit. 4,926,790, Cl. 118-653.000.
Nashua Corporation: *See—*
Mahmud, Meftah U., 4,927,801, Cl. 503-200.000.
Nassar, Lawrence G. Method and device for limiting intermalleolar expansion. 4,926,846, Cl. 128-80.00H.
Nasu, Kazuhiko; Kenmochi, Kazuei; Niikawa, Tomohiko; and Matsui, Atsushi, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing electronic device including a vibration generating element. 4,927,580, Cl. 264-102.000.
National Medical Device Corporation: *See—*
Tomkiel, Stanley, 4,927,416, Cl. 604-198.000.
National Research Development Corporation: *See—*
Neale, Michael A.; and Klinner, Wilfred E., 4,926,749, Cl. 100-177.000.
National Rolling Mills, Inc.: *See—*
Platt, William J.; and Rose, Thomas E., 4,926,607, Cl. 52-484.000.
National Science Council: *See—*
Hsiue, Ging-Ho; and Huang, Wen-Kuei, 4,927,890, Cl. 525-301.000.
National Semiconductor Corporation: *See—*
Pease, Robert A., 4,928,056, Cl. 323-314.000.
Navarro, Hector D.: *See—*
Demeter, Jozsef; Zoltai, Tibor; and Navarro, Hector D., 4,928,051, Cl. 318-731.000.
Navarro, Jose A.: *See—*
de la Rosa, Francisco F.; Navarro, Jose A.; Roncel, Mercedes; and de la Rosa, Miguel A., 4,927,512, Cl. 204-157.500.
Navistar International Transportation Corp.: *See—*
Cailey, Fred L., 4,926,812, Cl. 123-193.00H.
Gossler, Hans K.; and Roberts, Charles P., 4,927,026, Cl. 206-600.000.
Nawothnig, Klaus, to Wachtersbacher Keramik Otto Friedrich Furst zu Ysenburg und Budingen GmbH & Co. KG. Method of producing colored decorations on ceramic products. 4,927,671, Cl. 427-274.000.
Naya, Eizo; Okumura, Mitsuhiro; and Miyamoto, Seiichi, to Mitsubishi Denki Kabushiki Kaisha. Contact material for vacuum circuit breaker. 4,927,989, Cl. 200-265.000.
NCR Corporation: *See—*
Crafts, Harold S., 4,928,160, Cl. 357-54.000.
Kluttz, James S., 4,928,218, Cl. 363-37.000.
Porter, Warren W.; and Lauffer, Donald K., 4,928,206, Cl. 361-385.000.
Vo, Tri T., 4,928,290, Cl. 375-118.000.
Neale, Michael A.; and Klinner, Wilfred E., to National Research Development Corporation. Rotary compaction of fibrous material. 4,926,749, Cl. 100-177.000.
Nebraska Department of Economic Development, State of Nebraska, U.S.A.: *See—*
Wagner, Frederick W.; de la Motte, Rebecca S.; and Dean, Maria A., 4,927,920, Cl. 536-119.000.
NEC Corporation: *See—*
Kiyono, Mikio, 4,927,221, Cl. 350-96.140.
Sakai, Hiroshi, 4,928,304, Cl. 379-94.000.
Sekiguchi, Sunao, 4,928,238, Cl. 364-200.000.
Soejima, Katsumoto, 4,927,776, Cl. 437-33.000.
Nedorezov, Vladimir A.: *See—*
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.
Neeley, Walter P.; and Ritter, Sammie F., to Mobil Oil Corporation. Marine seismic streamer retrieval system. 4,928,262, Cl. 367-106.000.
Nees, John A.: *See—*
Mourou, Gerard A.; Nees, John A.; and Williamson, Steven L., 4,928,076, Cl. 330-4.300.
Nehls, Charles O., to Unistrut International Corp. Breakaway sign post coupling. 4,926,592, Cl. 52-98.000.
Nelson, Leonard E.: *See—*
Leonardo, Victoria A.; and Nelson, Leonard E., 4,928,096, Cl. 340-825.440.
Nelson, Norvell J.; and Martens, Phillip A., to PSI Star. Copper etching process and product with controlled nitrous acid reaction. 4,927,700, Cl. 428-209.000.
Nerone, Louis R., to General Electric Company. Power control circuit for discharge lamp and method of operating same. 4,928,038, Cl. 315-209.00R.
Nespor, Ronald B., to Chevron, Inc. Vehicle lifting and towing apparatus. 4,927,315, Cl. 414-563.000.
Nestec S.A.: *See—*
Hsu, Jau Y.; and Larson, Gary J., 4,927,662, Cl. 426-658.000.
Roychoudhury, Rathindra N., 4,927,566, Cl. 260-412.000.
Netall- u. Kunststoffwaren Erzeugengsgesellschaft M.B.H.: *See—*
Schneider, Rudolf, 4,927,363, Cl. 433-173.000.
Neuhaus, Winifried: *See—*
Schrader, Dieter; and Neuhaus, Winifried, 4,927,627, Cl. 424-62.000.
NeuroSonics, Inc.: *See—*
Wright, Geoffrey D.; and Pirali, Edmund, 4,926,969, Cl. 128-731.000.
Neuroth, David H., to Hubbell Incorporated. Electrical cable connector for use in oil wells. 4,927,386, Cl. 439-589.000.
New World Domestic Appliances Limited: *See—*
Parker, Christopher; and Andrews, Gordon T., 4,926,837, Cl. 126-21.00H.
Newkirk, John B.; and Manwaring, Kim H., to Colorado Biomedical, Inc. Ultra-sharp tungsten needle for electrosurgical knife. 4,927,420, Cl. 606-45.000.
Newman, John W.: *See—*
Ward, Clifford; Chao, Eugene; Booth, Roy E.; Turrill, Frank H.; Wombles, Robert H.; Newman, John W.; and Hettinger, William P., Jr., 4,927,620, Cl. 423-447.200.
Neynaber Chemie GmbH: *See—*
Hirsch, Albrecht; and Fleischer, Erwin, 4,927,548, Cl. 252-17.000.
NGK Insulators, Ltd.: *See—*
Mizutani, Yoshihiko; and Nishizawa, Hitoshi, 4,927,517, Cl. 204-406.000.
Ohtaka, Masashi; and Miyahara, Kazuhiro, 4,927,577, Cl. 264-63.000.
Nguyen, Bich-Yen: *See—*
Roth, Scott S.; Nguyen, Bich-Yen; Tobin, Philip J.; Ray, Wayne; Wachholz, E. Petyr; and Wissen, Glenn, 4,927,780, Cl. 437-69.000.
Nguyen, Chinh, to SGS-Thomson Microelectronics SRL. CMOS read-only memory with static operation. 4,928,261, Cl. 365-104.000.
Niagara Mohawk Power Corporation: *See—*
Pietras, Eugene E., 4,926,900, Cl. 137-385.000.
Nichol, Thomas W.; Gisske, Edward T.; and Johnson, Arlyn, to Nichol, Thomas W.; and Johnson, Arlyn. Electronic bag toss game with light-activated detection. 4,927,160, Cl. 273-371.000.
Nichols, Lawrence J.: *See—*
MacMaster, George H.; and Nichols, Lawrence J., 4,928,070, Cl. 330-43.000.
Nicholson, Richard J. Method and apparatus for piping support. 4,927,103, Cl. 248-62.000.
Nielsen, Edward L.: *See—*
Buechele, James L.; Nielsen, Edward L.; Dong, Walter; and Shaw, Paul V., 4,927,978, Cl. 568-724.000.
Nielson, Marlin C.; and Woodruff, Kenneth R., to International Business Machines Corporation. Fast processor for multi-bit error correction codes. 4,928,280, Cl. 371-39.100.
Niemeyer, Robin N.: *See—*
Vriezen, John J.; and Niemeyer, Robin N., 4,928,222, Cl. 364-200.000.
Nieppola, Heikki. Exercise apparatus. 4,927,135, Cl. 272-63.000.
NIFCO, Inc.: *See—*
Ohkawa, Toshiya; Nakayama, Hiromichi; and Iguchi, Tatsuya, 4,927,287, Cl. 403-408.100.
Nihon Kohden Corporation: *See—*
Miyajima, Nobukazu; Tanaka, Akira; and Shinoda, Masaru, 4,926,862, Cl. 428-419.00D.
Nihon Parkerizing Co., Ltd.: *See—*
Matsushima, Yasunobu; Tanaka, Shigeo; Aoki, Tomoyuki; and Ono, Yohji, 4,927,472, Cl. 148-261.000.
Niikawa, Takeshi, to Brother Kogyo Kabushiki Kaisha. Printer having a device for adjusting the printing condition, depending upon paper thickness. 4,927,277, Cl. 400-56.000.
Niikawa, Tomohiko: *See—*
Nasu, Kazuhiko; Kenmochi, Kazuei; Niikawa, Tomohiko; and Matsui, Atsushi, 4,927,580, Cl. 264-102.000.
Nikaido, Masaru: *See—*
Kimura, Sakae; Nikaido, Masaru; Yanagibashi, Katumi; Homma, Katsuhisa; and Ouchi, Yoshiaki, 4,928,034, Cl. 313-346.00R.
Nikka Co., Ltd.: *See—*
Kasai, Ryusuke, 4,927,677, Cl. 428-36.600.
Niksa, Andrew J.: *See—*
Turley, Homer L.; Niksa, Marilyn J.; Pohto, Gerald R.; and Niksa, Andrew J., 4,927,717, Cl. 429-27.000.
Niksa, Marilyn J.: *See—*
Turley, Homer L.; Niksa, Marilyn J.; Pobto, Gerald R.; and Niksa, Andrew J., 4,927,717, Cl. 429-27.000.
Nilssen, Ole K. Electronic ballast with lamp pre-conditioning. 4,928,039, Cl. 315-209.00R.
Nilsson, Torsten, to Petainer S.A. Container, method and apparatus for manufacturing the same. 4,927,591, Cl. 264-532.000.
Nimmey, Alan; and Hayes, Harry, to Colgate-Palmolive Company. Package for a flowable material susceptible to flavor loss. 4,927,058, Cl. 222-106.000.
Nintz, Eckhard: *See—*
Weber, Heinz; Nintz, Eckhard; Walter, Manfred; Ballweber, Dieter; and Ostermayer, Bertram, 4,927,859, Cl. 521-59.000.
Nippon Kokan Kabushiki Kaisha: *See—*
Miyashita, Tsuneo; Nishio, Hiroaki; Yabuta, Kazuya; and Takagi, Yoshio, 4,927,600, Cl. 419-49.000.
Ohta, Kazumi; Kawaguchi, Sotoaki; Doyama, Hisao; and Yano, Yutaka, 4,927,457, Cl. 75-10.630.
Takahashi, Shuzo; Tsuchida, Yutaka; Osada, Shiro; Hasebe, Nobuhisa; and Nakada, Masayuki, 4,926,925, Cl. 164-154.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Matsuki, Masuo, 4,926,528, Cl. 24-640.000.
Nippon Sheet Glass Company, Ltd.: *See—*
Honjo, Seiichiro; Yamada, Kazuo; Fuchigami, Yasuhiro; and Mizusugi, Tetsuya, 4,927,443, Cl. 65-273.000.
Manabe, Seiichiro; and Nagashima, Yukihito, 4,927,446, Cl 65-347.000.
Nippon Shinyaku Co., Ltd.: *See—*
Kise, Masahiro; Yoshimoto, Yoshihiko; Fujisawa, Hiroshi; Sasaki, Yasuo; and Yasufuku, Shoji, 4,927,835, Cl. 514-448.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Osaka, Shigemi; Hata, Kazuo; and Takahashi, Tsukasa, 4,927,560, Cl. 252-315.100.

Nippon Telegraph and Telephone Corporation: *See—*
Otsuji, Taiichi; and Narumi, Naoaki, 4,928,278, Cl. 371-1.000.
Saito, Kenichi; Wada, Kou; and Yoshizawa, Masahiro, 4,928,010, Cl. 250-310.000.

Nippon Thompson Co., Ltd.: *See—*
Mottate, Tatsuo, 4,927,273, Cl. 384-45.000.

Nippondenso Co., Ltd.: *See—*
Ito, Yoshiaki; Nagai, Kougi; Sawada, Akihiko; and Koike, Hideyuki, 4,927,338, Cl. 417-462.000.
Ohara, Toshio; and Yamauchi, Yoshiyuki, 4,926,932, Cl. 165-111.000.
Yoshimi, Tomohisa; Kodama, Satoru; Yoshinori, Takeshi; and Ito, Masahiko, 4,928,090, Cl. 340-575.000.

Nishida, Kozi: *See—*
Anzai, Hisao; Makino, Hideaki; Ootani, Masami; Sasaki, Isao; and Nishida, Kozi, 4,927,893, Cl. 525-378.000.

Nishida, Shoji, to Canon Kabushiki Kaisha. Process for the formation of a silicon-containing semiconductor thin film by chemically reacting active hydrogen atoms with liquefied film-forming raw material gas on the surface of a substrate. 4,927,786, Cl. 437-233.000.

Nishida, Yutaka: *See—*
Sugiura, Itsuo; Nishida, Yutaka; Ito, Kaoru; and Ozaki, Toshiyuki, 4,927,266, Cl. 356-243.000.

Nishide, Hiroo; and Kaneko, Shintaro, to Fuji Xerox Co., Ltd. Electrophotographic method. 4,927,725, Cl. 430-54.000.

Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mitzutani, Satoshi; and Isono, Toru, to Toyoda Gosei Co., Ltd. Hose fitting. 4,927,190, Cl. 285-175.000.

Nishikawa, Seigo: *See—*
Hara, Masaaki; Nishikawa, Seigo; Tazaki, Taketoshi; and Inokuchi, Hiroshi, 4,926,604, Cl. 51-165.880.

Nishikawa, Shoji; Ohkura, Akira; and Ichida, Katsuya, to Toyota Jidosha Kabushiki Kaisha. Guide device for automated guided vehicle. 4,926,958, Cl. 180-168.000.

Nishiki, Yoshinori; Nakamatsu, Shuji; and Shimamune, Takayuki, to Permelec Electrode Ltd. Electrode catalyst and method for production thereof. 4,927,800, Cl. 502-349.000.

Nishimoto, Seiichi: *See—*
Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi; Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, 4,927,941, Cl. 548-264.800.

Nishimura, Yasuhiro: *See—*
Inagaki, Tetsuya; Tagashira, Eijiro; Takaya, Masahiro; and Nishimura, Yasuhiro, 4,927,817, Cl. 514-184.000.

Nishimura, Yukio: *See—*
Kobayashi, Masaharu; and Nishimura, Yukio, 4,928,185, Cl. 360-19.100.

Nishino, Yoshitaka; Sawa, Toshio; Ohsumi, Katsumi; and Itow, Hisao, to Hitachi, Ltd. Radioactivity reduction method of a nuclear power plant and a nuclear power plant reduced in radioactivity. 4,927,598, Cl. 376-306.000.

Nishio, Hiroaki: *See—*
Miyashita, Tsuneo; Nishio, Hiroaki; Yabuta, Kazuya; and Takagi, Yoshio, 4,927,600, Cl. 419-49.000.

Nishio, Tomonori: *See—*
Doi, Atsuhiro; and Nishio, Tomonori, 4,928,122, Cl. 346-160.000.

Nishiwaki, Ituo: *See—*
Iwanaga, Shin-ichiro; Matsunaga, Tatsuaki; Nishiwaki, Ituo; and Enyo, Hiroji, 4,927,733, Cl. 430-286.000.

Nishizawa, Hitoshi: *See—*
Mizutani, Yoshihiko; and Nishizawa, Hitoshi, 4,927,517, Cl. 204-406.000.

Nissan Motor Co., Ltd.: *See—*
Koyanagi, Haruo; Kumasaka, Hideyuki; Takao, Koji; and Noda, Tomohiko, 4,926,544, Cl. 29-703.000.
Makihara, Nobuo; and Tahara, Hideo, 4,927,392, Cl. 440-88.000.
Mihara, Teruyoshi; and Matsushita, Tsutomu, 4,928,159, Cl. 357-42.000.
Morizumi, Mitsuo; Omura, Kinya; Arita, Eriya; Furuya, Katsuji; Yasuda, Sakae; and Kodera, Masaya, 4,926,914, Cl. 141-59.000.
Sakuma, Yuichi, 4,926,635, Cl. 60-299.000.
Suzuki, Yutaka, 4,928,242, Cl. 364-424.030.

Nitta, Tomio, to Tokai Corp. Noncontrolling type valve. 4,927,747, Cl. 431-344.000.

NIX Company, Ltd.: *See—*
Tanaka, Hiroyuki, 4,928,298, Cl. 378-162.000.

Nobile, John R.: *See—*
Fassman, Arnold; and Nobile, John R., 4,926,787, Cl. 118-32.000.

Noda, Tomohiko: *See—*
Koyanagi, Haruo; Kumasaka, Hideyuki; Takao, Koji; and Noda, Tomohiko, 4,926,544, Cl. 29-703.000.

Noel, Jean P., to Rockwell-CIM. Centrifugal clutch for an actuator for rendering inoperative an automobile vehicle door latch. 4,926,986, Cl. 192-0.02R.

Nogle, Scott G.; Pelley, Perry H., III; Flannagan, Stephen T.; and Engles, Bruce E., to Motorola, Inc. Memory using distributed data line loading. 4,928,268, Cl. 365-230.030.

Noguchi, Ichiro, to Diesel Kiki Co., Ltd. Control apparatus for automobile air-conditioners. 4,926,651, Cl. 62-133.000.

Nohren, Hubert: *See—*
Pfabe, Peter; and Nohren, Hubert, 4,928,130, Cl. 342-9.000.

Nokia Graetz: *See—*
Mayer, Uwe; and Tischer, Kurt-Manfred, 4,928,041, Cl. 315-366.000.
Schlipf, Michael, 4,928,035, Cl. 313-466.000.

Nolte, Duane R., to Marathon Electric Mfg. Corp. Enclosed switch contact assembly. 4,927,988, Cl. 200-80.00R.

Nomura, Masaki: *See—*
Sakamoto, Kiyoaki; Matsubara, Kenichi; Nakahara, Yasuhiro; and Nomura, Masaki, 4,927,531, Cl. 210-198.200.

Nomura, Yoshihiro; and Ohkubo, Yoichiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Catalytic combustion device. 4,927,353, Cl. 431-215.000.

Nonomura, Katsumi: *See—*
Higuchi, Mitsuhiro; Yamamoto, Hirofumi; Yamamoto, Osamu; Fujii, Shokichi; and Nonomura, Katsumi, 4,926,505, Cl. 4-247.000.

Nordson Corporation: *See—*
Kaiser, Thomas A.; Mulder, Douglas C.; O'Ryan, David E.; Schneider, Douglas A.; and Ward, Rodney L., 4,927,346, Cl. 425-81.100.

Noriyuki, Kishi: *See—*
Kazuo, Inoue; Noriyuki, Kishi; Masao, Kubodera; Eitetsu, Akiyama; Shigeto, Kashiwabara; and Osamu, Takizawa, 4,926,640, Cl. 60-602.000.

Norsolor: *See—*
Heim, Philippe; and Riess, Gerard, 4,927,867, Cl. 523-339.000.
Teyssie, Philippe; Varshney, Sunil K.; Jerome, Robert; and Fayt, Roger, 4,927,703, Cl. 428-220.000.

North American Dynamics: *See—*
Dodd, Richard E., 4,926,743, Cl. 89-40.140.

North American Mfg. Co.: *See—*
Watson, James E.; and Davies, Theodore E., 4,926,842, Cl. 126-360.00R.

North American Philips Corporation: *See—*
Golik, Stephen S., 4,927,219, Cl. 315-371.000.
Guerinot, William F.; Bradley, Ralph H.; and Troemel, Stephen T., 4,928,182, Cl. 358-245.000.

Northern Telecom Limited: *See—*
Debortoli, George; and Cristescu, Alex G., 4,927,375, Cl. 439-357.000.
Moore, Thomas E.; McEachern, James A.; and Wight, Mark S., 4,928,275, Cl. 370-102.000.

Northgate Research, Inc.: *See—*
Kriauciunas, G. Vincent; and Vance, Karen, 4,927,427, Cl. 606-128.000.

Northrop Corporation: *See—*
Smith, Robert L., 4,926,563, Cl. 33-293.000.

Notron Engineering AG: *See—*
Wagner, James L., 4,927,194, Cl. 292-128.000.

Nouvertne Werner: *See—*
Schreckenberg, Manfred; Dhein, Rolf; Rudolph, Hans; and Nouvertne Werner, 4,927,903, Cl. 528-176.000.

NOVATOME: *See—*
Cros, Alain, 4,927,597, Cl. 376-290.000.

Novo Industri A/S: *See—*
Aaslyng, Dorrit A.; Jensen, Georg W.; Schneider, Ib; and Schneider, Palle, 4,927,558, Cl. 252-174.120.

Novotny, Rudolph J., to United Technologies Corporation. Method of balancing blade gas turbine engine rotor. 4,926,710, Cl. 74-573.00R.

Nowitzki, Friedhelm: *See—*
Putz, Heinrich; Nowitzki, Friedhelm; Damm, Gunter; Bathelt, Hartmut; Kromer, Gunter; Hoffmann, Henning; and Pischke, Reiner, 4,926,634, Cl. 60-274.000.

Nozick, Jacques: *See—*
Allin, Jean-Claude; and Nozick, Jacques, 4,928,303, Cl. 379-93.000.

Numa, Nobushige: *See—*
Shibata, Terukazu; Numa, Nobushige; and Kawamura, Masafumi, 4,927,877, Cl. 525-7.000.

Nunez, German: *See—*
Kaufman, Howard H.; and Nunez, German, 4,927,214, Cl. 312-195.000.

Nunome, Hiromi: *See—*
Mori, Nobufumi; Muraishi, Katsuaki; Matsuda, Terumi; Ohnishi, Masahiro; Nunome, Hiromi; Koyama, Tadao; and Oikawa, Tetsuo, 4,928,016, Cl. 250-440.100.

Nutrasweet Company, The: *See—*
Barnett, Ronald E.; Dikeman, Roxane; Liao, Shyh-Yuan; Gill, John; and Pantaleone, David P., 4,927,654, Cl. 426-548.000.

Nuwayser, Elie S., to Biotek, Inc. Sustained release transdermal drug delivery composition. 4,927,687, Cl. 424-449.000.

N.V. Vandemoortele International: *See—*
van Opstal, Martin; Dewulf, Frans; Cleenewerck, Bernard; and Weber, Ernst, 4,927,544, Cl. 210-712.000.

O.D.L. S.r.l.: *See—*
Pensa, Carlo M., 4,927,335, Cl. 417-393.000.

O&K Orenstein & Koppel Aktiengesellschaft: *See—*
Johannsen, Karl, 4,926,571, Cl. 37-72.000.

Oats, Edwin O., to Roll-in-Sheet Inc. Apparatus for changing disposable bedding on a mattress. 4,926,513, Cl. 5-488.000.

Obayashi, Akira: *See—*
Sakai, Takeshi; Matsui, Susumu; Akiyoshi, Sumiko; and Obayashi, Akira, 4,927,753, Cl. 435-26.000.
Sakai, Takeshi; Yokota, Hiroko; Yamamoto, Kazuki; Yokoyama, Sadaji; Matsui, Susumu; Kato, Ikunoshin; and Obayashi, Akira, 4,927,767, Cl. 436-64.000.

Oberg, Gordon D. Apparatus for recycling oil filters. 4,927,085, Cl. 241-36.000.

Oberg, Paul E. Pendulous accelerometer and/or inclinometer. 4,926,690, Cl. 73-514.000.

Oblovatsky, Anatoly K.: *See—*
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.

Obrecht, Daniel: *See—*
Fischli, Albert; Gutknecht, Eva-Maria; and Obrecht, Daniel, 4,927,958, Cl. 560-53.000.

O'Brian, Lynwood. Sliding leg bodywork table. 4,927,128, Cl. 269-322.000.

O'Brien, Robert B.: *See—*
D'Orazio, Vincent T.; and O'Brien, Robert B., 4,927,643, Cl. 426-1.000.

Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; and Morita, Mikio, to Kabushiki Kaisha Toshiba. Compressed magnetic powder core. 4,927,473, Cl. 148-306.000.

Odaka, Seiya, to Akebono Brake Industry Co., Ltd. Disk brake of a pin type. 4,926,979, Cl. 188-73.440.

Ogawa, Hiroshi: *See—*
Chino, Naoyoshi; Sato, Tsunehiko; Saito, Shinji; and Ogawa, Hiroshi, 4,927,665, Cl. 427-131.000.

Ogawa, Kohji; and Onoki, Mikio, to Mitsubishi Denki Kabushiki Kaisha. Videophone with detachable TV camera. 4,928,300, Cl. 379-53.000.

Ogawa, Masaharu, to Fuji Photo Film Co., Ltd. Process and apparatus for drying coated web. 4,926,567, Cl. 34-23.000.

Ogawa, Soichiro: *See—*
Kawabata, Kenji; Ogawa, Soichiro; and Masaki, Ryoichi, 4,928,037, Cl. 315-127.000.

Ogg, Graeme J.: *See—*
Costello, Anthony W.; Ogg, Graeme J.; and McGregor, John C., 4,926,614, Cl. 53-434.000.

Ogino, Masaaki: *See—*
Nakamura, Hisashi; Takahashi, Satoshi; Ikeda, Takayuki; and Ogino, Masaaki, 4,926,902, Cl. 137-493.300.

Ogino, Nobuyosi: *See—*
Arima, Noburu; Ogino, Nobuyosi; and Kimura, Hirosi, 4,926,793, Cl. 118-730.000.

Ogiro, Kenji: *See—*
Kaku, Nobuyuki; Shigemura, Tatsuya; Uesugi, Masaki; Kano, Kiyoshi; and Ogiro, Kenji, 4,928,191, Cl. 360-85.000.

Ogoe, Samuel A.; and Ho, Thoi H., to Dow Chemical Company, The. Ignition resistant modified thermoplastic composition. 4,927,870, Cl. 524-140.000.

Oh, Ju Y.: *See—*
Park, Won B.; and Oh, Ju Y., 4,928,197, Cl. 360-132.000.

O'Hara, Thomas J.: *See—*
Chaney, Earl J., Jr.; Malay, Manuel R.; O'Hara, Thomas J.; and Ayers, Alan D., 4,927,720, Cl. 429-54.000.

Ohara, Toshio; and Yamauchi, Yoshiyuki, to Nippondenso Co., Ltd. Plate type heat exchanger. 4,926,932, Cl. 165-111.000.

Ohashi, Hiromichi: *See—*
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 4,928,155, Cl. 357-23.400.

Ohba, Yasuo: *See—*
Kushibe, Mitsuhiro; Eguchi, Kazuhiro; Funamizu, Masahisa; and Ohba, Yasuo, 4,928,285, Cl. 372-45.000.

Ohbayashi, Masaru: *See—*
Konishi, Masataka; Shimizu, Keiko; Ohbayashi, Masaru; Tomita, Koji; Miyaki, Takeo; and Oki, Toshikazu, 4,927,848, Cl. 514-453.000.

Ohi Seisakusho Co., Ltd.: *See—*
Honma, Mikio, 4,926,987, Cl. 192-8.00C.

Ohkawa, Kiyomi: *See—*
Koshizawa, Toshifumi; Ohkawa, Kiyomi; and Horiuchi, Teruhiko, 4,926,994, Cl. 192-110.00R.

Ohkawa, Toshiya; Nakayama, Hiromichi; and Iguchi, Tatsuya, to NIFCO, Inc. Fastener for fastening plates together. 4,927,287, Cl. 403-408.100.

Ohkubo, Yoichiro: *See—*
Nomura, Yoshihiro; and Ohkubo, Yoichiro, 4,927,353, Cl. 431-215.000.

Ohkura, Akira: *See—*
Nishikawa, Shoji; Ohkura, Akira; and Ichida, Katsuya, 4,926,958, Cl. 180-168.000.

Ohlendorf, Dieter: *See—*
Bahr, Christian; Heppke, Gerd; Lotzsch, Detlef; Dubal, Hans-Rolf; Escher, Claus; and Ohlendorf, Dieter, 4,927,244, Cl. 350-350.00S.

Ohmae, Tsutomu: *See—*
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Ohmori, Koichi: *See—*
Tsutsui, Hiroshi; Baba, Sueki; Ohmori, Koichi; Yamamoto, Osamu; and Watanabe, Hiroshi, 4,928,297, Cl. 378-146.000.

Ohmura, Hiroshi; and Nakashima, Takashi, to Mazda Motor Corporation. Rear wheel steering apparatus for automobile. 4,926,955, Cl. 180-140.000.

Ohnishi, Masahiro: *See—*
Mori, Nobufumi; Muraishi, Katsuaki; Matsuda, Terumi; Ohnishi, Masahiro; Nunome, Hiromi; Koyama, Tadao; and Oikawa, Tetsuo, 4,928,016, Cl. 250-440.100.

Ohori, Yoshiji; and Harazoe, Hirofumi, to Mitsui Petrochemical Industries, Ltd. Process for producing modified ultrahigh-molecular-weight polyolefins. 4,927,871, Cl. 524-230.000.

Ohsumi, Katsumi: *See—*
Nishino, Yoshitaka; Sawa, Toshio; Ohsumi, Katsumi; and Itow, Hisao, 4,927,598, Cl. 376-306.000.

Ohta, Kazumi; Kawaguchi, Sotoaki; Doyama, Hisao; and Yano, Yutaka, to Nippon Kokan Kabushiki Kaisha. Method of manufacturing low carbon ferro-chromium. 4,927,457, Cl. 75-10.630.

Ohtaka, Masashi; and Miyahara, Kazuhiro, to NGK Insulators, Ltd. Process for firing ceramic honeycomb structural bodies. 4,927,577, Cl. 264-63.000.

Ohtaka, Shoichi; and Igarashi, Hisashi, to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd. in English). Air-fuel ratio feedback control method for internal combustion engines. 4,926,825, Cl. 123-489.000.

Ohtsu, Akira: *See—*
Kitahara, Shigehisa; Ohtsu, Akira; and Fujii, Katsuhiko, 4,927,808, Cl. 514-19.000.

Ohue, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Two-way CATV system using frequency division multiplexing. 4,928,272, Cl. 370-50.000.

Ohwada Carbon Industrial Co., Ltd.: *See—*
Takei, Makoto; and Tamura, Mamoru, 4,927,345, Cl. 424-4.000.

Oikawa, Tetsuo: *See—*
Mori, Nobufumi; Muraishi, Katsuaki; Matsuda, Terumi; Ohnishi, Masahiro; Nunome, Hiromi; Koyama, Tadao; and Oikawa, Tetsuo, 4,928,016, Cl. 250-440.100.

Oka Tateki: *See—*
Okamoto, Hiroshi; Oka Tateki; Sako, Mineyuki; Kyogoku, Tetsuo; and Suzuki, Toshikazu, 4,928,145, Cl. 355-245.000.

Oka, Tetsuo: *See—*
Mizukami, Toru; Katsumata, Ryoichi; and Oka, Tetsuo, 4,927,758, Cl. 435-107.000.

Okada, Masaki, to Isuzu Motors Limited. Heater device for motor vehicle. 4,927,077, Cl. 237-2.00A.

Okamoto, Akio: *See—*
Kumani, Hiroo; and Okamoto, Akio, 4,927,651, Cl. 426-324.000.

Okamoto, Hiroshi; Oka Tateki; Sako, Mineyuki; Kyogoku, Tetsuo; and Suzuki, Toshikazu, to Minolta Camera Kabushiki Kaisha. Developing apparatus having a bucket roller with movable buckets. 4,928,145, Cl. 355-245.000.

Okamoto, Yuji, to Sharp Kabushiki Kaisha. Image forming apparatus with image erasing lamp. 4,928,143, Cl. 355-218.000.

Okawa, Masayuki: *See—*
Tsujimura, Osamu; Nakayama, Masaaki; and Okawa, Masayuki, 4,927,303, Cl. 408-223.000.

Okazima, Hideo: *See—*
Kaieda, Shozo; Kurashima, Ikuo; Okazima, Hideo; and Mai, Jun, 4,928,055, Cl. 323-300.000.

O'Keefe, Sheila: *See—*
Miles, Philip D.; Moody, John R., Jr.; and O'Keefe, Sheila, 4,928,062, Cl. 324-158.00R.

O'Kennedy, Richard: *See—*
Reading, Christopher L.; Smyth, Malcolm R.; and O'Kennedy, Richard, 4,927,502, Cl. 204-153.100.

Oki Electric Industry Co.: *See—*
Onozawa, Kazuo, 4,928,131, Cl. 342-188.000.

Oki Electric Industry Co., Ltd.: *See—*
Aoki, Kazuo; Chiba, Toshimi; Tachibana, Sadao; and Nagatomo, Yasushi, 4,927,990, Cl. 200-517.000.

Oki, Toshikazu: *See—*
Konishi, Masataka; Shimizu, Keiko; Ohbayashi, Masaru; Tomita, Koji; Miyaki, Takeo; and Oki, Toshikazu, 4,927,848, Cl. 514-453.000.

Okimoto, Haruo: *See—*
Tadokoro, Tomoo; Tashima, Seiji; Okimoto, Haruo; Akagi, Toshimichi; Nakao, Masami; Matsuda, Ikuo; and Suekuni, Einosuke, 4,926,636, Cl. 60-312.000.

Oku, Hideaki: *See—*
Ikebe, Yo; and Oku, Hideaki, 4,928,009, Cl. 250-231.130.

Okuda, Hiroshi, to Fujitsu Limited. Semiconductor substrate comprising wafer substrate and compound semiconductor layer. 4,927,471, Cl. 148-33.500.

Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, to Toshiba Corp.; and Ebara Corp. Turbomolecular pump and method of operating the same. 4,926,648, Cl. 62-55.500.

Okumura, Mitsuhiro: *See—*
Naya, Eizo; Okumura, Mitsuhiro; and Miyamoto, Seiichi, 4,927,989, Cl. 200-265.000.

Okumura, Shinichiro: *See—*
Shibata, Katsuhiro; Azuma, Yuichi; Inoue, Masao; and Okumura, Shinichiro, 4,926,978, Cl. 188-73.100.

Okumura, Yoshiharu: *See—*
Takatsuna, Kazutoshi; Shiozawa, Kouji; and Okumura, Yoshiharu, 4,927,953, Cl. 556-413.000.

Olin Corporation: *See—*
Boudakian, Max M.; and Fidler, Delmer A., 4,927,940, Cl. 548-263.200.
Smith, Richard D.; Knowles, Steve; Cassady, R. J.; Smith, William; and Simon, Mark A., 4,926,632, Cl. 60-203.100.

VOL
1114
ISS
4
MY
22
1990
UMI

Watson, Gary W.; Cheskis Harvey P.; and Sankaranarayanan, Ashok, 4,926,927, Cl. 164-429.000.
Olper, Marco; and Fracchia, Pierluigi, to Engitec Impianti S.p.A. Hydrometallurgical process for recovering in pure metal form all the lead contained in the active mass of exhausted batteries. 4,927,510, Cl. 204-114.000.
Olsen, Albert B.: *See—*
Gale, Edwin J.; Olsen, Albert B.; and Dinsmoor, John C., 4,928,202, Cl. 361-215.000.
Olsen, Mark W.; and Winegardner, John B., to Lennox Industries, Inc. Two way flow control device. 4,926,658, Cl. 62-324.100.
Olson, John E., to Cascade Corporation. Automatic load push-pull slipsheet handler. 4,927,320, Cl. 414-786.000.
Olympus Optical Co., Ltd.: *See—*
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,928,172, Cl. 358-98.000.
Yunoki, Yutaka, 4,928,190, Cl. 360-66.000.
Oman, Paul S. Microcomputer-based nerve and muscle stimulator. 4,926,865, Cl. 128-421.000.
Omnium de Traitements et de Valorisation (OTV): *See—*
Bablon, Guy P.; and Desbos, Gilbert, 4,927,543, Cl. 210-711.000.
Omron Tateisi Electronics Co.: *See—*
Shiga, Toshikazu; and Suzaki, Takuji, 4,927,264, Cl. 356-41.000.
Yui, Eiichi, 4,928,305, Cl. 379-98.000.
Omura, Kinya: *See—*
Morizumi, Mitsuo; Omura, Kinya; Arita, Eriya; Furuya, Katsuji; Yasuda, Sakae; and Kodera, Masaya, 4,926,914, Cl. 141-59.000.
Omura, Tadao: *See—*
Imoto, Koji; Omura, Tadao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki; and Shioya, Yoshiaki, 4,926,817, Cl. 123-292.000.
Onitsuka, Yoshihiro: *See—*
Taniguchi, Osamu; Onitsuka, Yoshihiro; and Mihara, Tadashi, 4,927,243, Cl. 350-350.00S.
Ono, Yohji: *See—*
Matsushima, Yasunobu; Tanaka, Shigeo; Aoki, Tomoyuki; and Ono, Yohji, 4,927,472, Cl. 148-261.000.
Onoda, Kazno: *See—*
Hayakawa, Futomi; and Onoda, Kazuo, 4,928,210, Cl. 362-217.000.
Onoki, Mikio: *See—*
Ogawa, Kohji; and Onoki, Mikio, 4,928,300, Cl. 379-53.000.
Onozawa, Kazuo, to Oki Electric Industry Co. Sea clutter suppression radar. 4,928,131, Cl. 342-188.000.
Ooms, Willem; Moss, Frank R.; and Key, Jonnie L., to Porelon, Inc. Microporous marking structures. 4,927,695, Cl. 428-159.000.
Ootani, Masami: *See—*
Anzai, Hisao; Makino, Hideaki; Ootani, Masami; Sasaki, Isao; and Nishida, Kozi, 4,927,893, Cl. 525-378.000.
Ophthalmic Ventures Limited Partnership: *See—*
Richards, William D., 4,927,428, Cl. 606-148.000.
Oppenheim, A. K.; Stewart, H. E.; and Hom, K., to University of California, The Regents of the. Pulsed jet combustion generator for premixed charge engines. 4,926,818, Cl. 123-297.000.
Optische Werke G. Rodenstock: *See—*
Melzig, Manfred; Rosler, Horst; and Schobl, Medardus, 4,927,239, Cl. 350-165.000.
Orbital Engine Co., Proprietary Limited: *See—*
Ahern, Steven R.; Brooks, Roy S.; and Cebis, Martin J. P., 4,926,806, Cl. 123-179.00L.
Orient Chemical Industries, Ltd.: *See—*
Senshu, Hisashi; and Otsuka, Masahiro, 4,927,538, Cl. 210-634.000.
Orlando, Franklin P.: *See—*
Butler, Lee D.; Orlando, Franklin P.; and Lenker, Don H., 4,927,440, Cl. 56-12.800.
Orndorff, Karl B.: *See—*
Morris, Arnold M.; D'Zurko, Daphne; Pilsbury, Richard H.; Barkell, J. Warren, Jr.; Orndorff, Karl B.; and Lawson Randall S., 4,926,974, Cl. 187-52.0LC.
Ortiz, Angel L., Jr.; and Jones, Marshall G., to General Electric Company. Lensless multifiber output coupler. 4,927,224, Cl. 350-96.150.
Ortiz, Angel L., Jr., to General Electric Company. Multiplexer for high power CW lasers. 4,927,226, Cl. 455-611.000.
O'Ryan, David E.: *See—*
Kaiser, Thomas A.; Mulder, Douglas C.; O'Ryan, David E.; Schneider, Douglas A.; and Ward, Rodney L., 4,927,346, Cl. 425-81.100.
Osada, Shiro: *See—*
Takahashi, Shuzo; Tsuchida, Yutaka; Osada, Shiro; Hasebe, Nobuhisa; and Nakada, Masayuki, 4,926,925, Cl. 164-154.000.
Osaka Gas Co., Ltd.: *See—*
Otsuka, Tetsuji; Shinozaki, Kenichi; Toyoyama, Kenji; and Ishihara, Shinobu, 4,927,356, Cl. 431-351.000.
Osaka, Shigemi; Hata, Kazuo; and Takahashi, Tsukasa, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for production of inorganic minute globular particles. 4,927,560, Cl. 252-315.100.
Osamu, Takizawa: *See—*
Kazuo, Inoue; Noriyuki, Kishi; Masao, Kubodera; Eitetsu, Akiyama; Shigeto, Kashiwabara; and Osamu, Takizawa, 4,926,640, Cl. 60-602.000.
Osmonson, Daniel T.; and McNulty, James L., to Krohm, Inc. Temporary enclosure structure. 4,926,892, Cl. 135-103.000.
Osprey Metals Ltd.: *See—*
Brooks, Reginald G.; Leatham, Alan; and Coombs, Jeffrey, 4,926,923, Cl. 164-5.000.
Brooks, Reginald G.; Leathman, Alan; and Coombs, Jeffrey, 4,926,924, Cl. 164-5.000.
Ostendorf, Daniel I.: *See—*
Revis, Jack W.; Sagel, John A.; and Ostendorf, Daniel I., 4,927,557, Cl. 252-174.150.
Osteo-Technology, Inc.: *See—*
Brandenburger, Gary H., 4,926,870, Cl. 128-660.010.
Ostermayer, Bertram: *See—*
Weber, Heinz; Nintz, Eckhard; Walter, Manfred; Ballweber, Dieter; and Ostermayer, Bertram, 4,927,859, Cl. 521-59.000.
Otis Elevator Company: *See—*
Bruehl, Klaus; and Thaler, Dietmar, 4,926,981, Cl. 188-111.000.
Otsuji, Taiichi; and Narumi, Naoaki, to Nippon Telegraph and Telephone Corporation. IC test system. 4,928,278, Cl. 371-1.000.
Otsuka, Kiyotaka; and Wataya, Hideji, to Matsushita Electric Works, Ltd. Cutting head for reciprocatory-type dry shavers. 4,926,552, Cl. 30-43.920.
Otsuka, Masahiro: *See—*
Senshu, Hisashi; and Otsuka, Masahiro, 4,927,538, Cl. 210-634.000.
Otsuka, Tetsuji; Shinozaki, Kenichi; Toyoyama, Kenji; and Ishihara, Shinobu, to Osaka Gas Co., Ltd. Gas burner 4,927,356, Cl. 431-351.000.
Ottenreuther, Josef: *See—*
Breitenbach, Otto; Hetz, Helmar; Rous, Friedemann; and Ottenreuther, Josef, 4,927,570, Cl. 264-1.400.
Ouchi, Yoshiaki: *See—*
Kimura, Sakae; Nikaido, Masaru; Yanagibashi, Katumi; Homma, Katsuhisa; and Ouchi, Yoshiaki, 4,928,034, Cl. 313-346.00R.
Outboard Marine Corporation: *See—*
Bland, Gerald F.; and Sullivan, Donald K., 4,927,391, Cl. 440-84.000.
Lathers, Michael W., 4,926,783, Cl. 114-363.000.
Ouzts, Johnny D.: *See—*
Hamilton, Frank S.; Ouzts, Johnny D.; and Mabry, Ray W., 4,926,795, Cl. 119-3.000.
Owen, Hartley: *See—*
Haddad, James H.; and Owen, Hartley, 4,927,527, Cl. 208-161.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,927,522, Cl. 208-120.000.
Owen, Raymond E., to Process Automation Business, Inc. Dual wedge flow element. 4,926,698, Cl. 73-861.610.
Owens, George W. Window pivot corner. 4,926,524, Cl. 16-386.000.
Owens-Illinois Plastic Products Inc.: *See—*
Cramer, Harley L., 4,927,040, Cl. 220-5.00R.
Oy Alu AB: *See—*
Vocke, Henning L.; and Saarenko, Pauli, 4,926,843, Cl. 126-390.000.
Oy Tampella AB: *See—*
Hamala, Sirpa; Heikkila, Matti; Laine, Jouko; Kokkonen, Kari; and Kenakkala, Timo, 4,927,613, Cl. 423-244.000.
Oyama, Hiroo, to Stanley Electric Co., Ltd. Vehicle front lamp. 4,928,214, Cl. 362-61.000.
Oyama, Noboru: *See—*
Yamaguchi, Shuichiro; Uchida, Naoto; Shimomura, Takeshi; and Oyama, Noboru, 4,927,516, Cl. 204-403.000.
Ozaki, Toshiyuki: *See—*
Sugiura, Itsuo; Nishida, Yutaka; Ito, Kaoru; and Ozaki, Toshiyuki, 4,927,266, Cl. 356-243.000.
Ozawa, Masakuni: *See—*
Matsumoto, Shinichi; Miyoshi, Naoto; Kimura, Mareo; Ozawa, Masakuni; and Isogai, Akio, 4,927,799, Cl. 502-303.000.
Ozawa, Yasuo: *See—*
Sakakibara, Koichi; and Ozawa, Yasuo, 4,927,248, Cl. 350-452.000.
Paige Manufacturing Company, Inc.: *See—*
Dickie, Robert G., 4,927,373, Cl. 439-188.000.
Dickie, Robert G., 4,927,376, Cl. 439-484.000.
Paktec Automation: *See—*
Zielke, Darrell W.; and Dean, Kenneth D., 4,926,616, Cl. 53-585.000.
Palazzo, David T. Method of making double wall storage tank for liquids from a metal tank having a patterned surface. 4,927,050, Cl. 220-445.000.
Pall Corporation: *See—*
Cordes, Harry D.; Duich, Michael B.; and Bailey, Gardner S., 4,927,434, Cl. 55-20.000.
Palm, Bengt, to Alfa-Laval Food & Dairy Engineering AB. Method and a device for aseptic transfer of an amount of liquid from one space to another. 4,926,913, Cl. 141-1.000.
Palmieri, Joseph M.: *See—*
Jacobs, Linda Y.; Palmieri, Joseph M.; and Smith, James I., 4,928,080, Cl. 335-202.000.
Palochak, John B. Ice shaving system. 4,927,087, Cl. 241-100.500.
Palylyk, Richard A.: *See—*
Franklin, Douglas E.; Murphy, Maurice W.; and Palylyk, Richard A., 4,926,691, Cl. 73-579.000.
Panavision, Inc.: *See—*
Kline, Donald, 4,928,171, Cl. 358-97.000.
Panson, Armand J., to Westinghouse Electric Corp. Etching process for zirconium metallic objects. 4,927,492, Cl. 156-642.000.
Pantaleone, David P.: *See—*
Barnett, Ronald E.; Dikeman, Roxane; Liao, Shyh-Yuan; Gill, John; and Pantaleone, David P., 4,927,654, Cl. 426-548.000.
Papantoniou, Christos: *See—*
Lapointiere, Claudine; Mahieu, Claude; and Papantoniou, Christos, 4,927,883, Cl. 525-154.000.

Papastavros, Demos. Power plant with medium and low power plant systems. 4,926,644, Cl. 60-715.000.
Pappalardo, Salvatore: *See—*
Pietrobon, Giovanni; Rossi, Domenico; and Pappalardo, Salvatore, 4,928,049, Cl. 318-685.000.
Pappas, Spilios A. Convertible billiard table. 4,927,140, Cl. 273-4.00R.
Papst-Motoren GmbH & Co. KG: *See—*
Doemen, Benno, 4,928,045, Cl. 318-464.000.
Papuchon, Michel; Pocholle, Jean-Paul; and Delacourt, Dominique, to Thomson-CSF. Frequency shifter for medium infrared range wave. 4,927,245, Cl. 350-354.000.
Papuchon, Michel: *See—*
Pocholle, Jean P.; Papuchon, Michel; Puech, Claude; and Tournois, Pierre, 4,927,223, Cl. 350-96.150.
Paranto, Arlen C. Novelty ball. 4,927,141, Cl. 273-58.00K.
Pardubicky, Jaroslav F.: *See—*
Grims, Conrad M.; Moen, Bruce A.; and Pardubicky, Jaroslav F., 4,926,669, Cl. 72-349.000.
Parekh, Raj B.: *See—*
Feder, Joseph; Howard, Susan C.; Wittwer, Arthur J.; Rademacher, Thomas W.; Parekh, Raj B.; and Dwek, Raymond A., 4,927,630, Cl. 424-94.640.
Park, Jore: *See—*
Fables, Wylci; and Park, Jore, 4,927,402, Cl. 446-487.000.
Park, Won B.; and Oh, Ju Y., to SKC Limited. Lock for video tape cassette. 4,928,197, Cl. 360-132.000.
Parker, Christopher; and Andrews, Gordon T., to New World Domestic Appliances Limited. Cooking ovens. 4,926,837, Cl. 126-21.00H.
Parker, Donald O. Apparatus and method for restarting a coin operated device after expiration of time. 4,926,997, Cl. 194-231.000.
Parker, Ronald N.: *See—*
Baglee, David A.; and Parker, Ronald N., 4,928,267, Cl. 365-218.000.
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., to Dennison Manufacturing Company. Heat transferable laminate. 4,927,709, Cl. 428-352.000.
Parkinson, John E.: *See—*
Garth, Peter; Simpson, Stuart M.; Parkinson, John E.; and Rogers, Alan H., 4,927,741, Cl. 430-309.000.
Parnell, James A.; and Poole, Dan R., to Ametek, Inc. Digitizer for position sensing. 4,928,256, Cl. 364-561.000.
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., to Imperial Chemical Industries PLC. Method of preventing fungal attack on wood, hides, leather or paint films using a triazole. 4,927,839, Cl. 514-383.000.
Parsons, Bryan N. V., to Jaguar Cars Limited. Internal combustion engines. 4,926,811, Cl. 123-193.00P.
Partyka, Richard A.: *See—*
Vyas, Dolatrai M.; Doyle, Terrence W.; and Partyka, Richard A., 4,927,943, Cl. 548-422.000.
Pasquale, Gary M.: *See—*
Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., 4,927,526, Cl. 208-152.000.
Pastor, Walter. Gun grip emblem manual safety. 4,926,575, Cl. 42-70.060.
Pastrone, John; and Laenen, Edward, to Abbott Laboratories. Drive mechanism for disposable fluid infusion pumping cassette. 4,927,411, Cl. 604-65.000.
Pate, Kenneth D., Sr. High voltage insulative shaft coupler. 4,927,403, Cl. 464-30.000.
Patel, Arvind, to Molex Incorporated. Unitarily molded electrical connector housing with separable key. 4,927,787, Cl. 439-189.000.
Patel, Dakshesh S.: *See—*
Small, Richard F.; Patel, Dakshesh S.; Barrow, Lascelle A., and Dix, Barry M., 4,927,663, Cl. 427-40.000.
Patel, Usha R.: *See—*
Abou-Gharbia, Magid A.; and Patel, Usha R., 4,927,934, Cl. 546-152.000.
Patera, Ginger E.; Janke, Larry L.; and Lampman, William T., to Whirlpool Corporation. Removable article holder for a dishwasher. 4,927,033, Cl. 211-41.000.
Patil, Prabhakar B.: *See—*
Burba, Joseph C.; Landman, Ronald G.; Patil, Prabhakar B.; and Reitz, Graydon A., 4,928,227, Cl. 364-424.010.
Patrician Corporation: *See—*
Provenzo, Eugene F., Jr.; and Zorn, Peter A., 4,927,100, Cl. 244-153.00R.
Patsch, Manfred: *See—*
Hackenberger, Alfred; and Patsch, Manfred, 4,927,935, Cl. 546-157.000.
Pattison, David C.: *See—*
Veerhusen, Dan S.; and Pattison, David C., 4,926,628, Cl. 60-39.150.
Pattner, Jacob J.: *See—*
Stein, Herman H.; Pattner, Jacob J.; and Crowley, Steven R., 4,927,807, Cl. 514-18.000.
Paul, Clarence A. Security safes for vehicles. 4,926,762, Cl. 109-51.000.
Paul Pleiger Maschinenfabrik GmbH & Co. KG: *See—*
Szewczyk, Mattias; and Poting, Hans-Jurgen, 4,926,803, Cl. 123-55.00R.
Pawlenko, Ivan: *See—*
Bond, Robert H.; and Pawlenko, Ivan, 4,926,538, Cl. 29-559.000.
Pawloski, James C., to Dow Chemical Company, The. Process and apparatus for sealing thermoplastic plies in laminated sheets having thickened sections. 4,927,474, Cl. 156-66.000.
Payne, Richard: *See—*
Hoyland, Trevor B.; and Payne, Richard, 4,927,000, Cl. 198-418.400.
Pearce, James H., III: *See—*
Ehret, Barbara A.; and Pearce, James H., III, 4,927,179, Cl. 283-79.000.
Pearce, John R.: *See—*
Griffin, Dennis; and Pearce, John R., 4,926,740, Cl. 89-1.819.
Pearlstine, Kathryn: *See—*
Lane, Gregg A.; and Pearlstine, Kathryn, 4,928,065, Cl. 324-464.000.
Pearman, Arthur N. J., to Gas Research Institute. Method and apparatus for proving electronic gas meters at low flow rates. 4,926,678, Cl. 73-3.000.
Pearson, Raymond J.: *See—*
Baker Mervyn R.; Pearson, Raymond J.; and Emsley, Roger, 4,926,967, Cl. 182-164.000.
Pease, Robert A., to National Semiconductor Corporation. Stabilized low dropout voltage regulator circuit. 4,928,056, Cl. 323-314.000.
Peck, Paul L., to Archery Designs, Inc. Ball bearing type bow string release. 4,926,835, Cl. 124-35.200.
Pelley, Perry H., III: *See—*
Nogle, Scott G.; Pelley, Perry H., III; Flannagan, Stephen T.; and Engles, Bruce E., 4,928,268, Cl. 365-230.030.
Penn's Woods Products, Inc.: *See—*
Mueller, Mark, 4,927,399, Cl. 446-207.000.
Pennwalt Corporation: *See—*
Bohen, Joseph M., 4,927,873, Cl. 524-288.000.
Dawn, Douglas D.; and Radermacher, Reinhard, 4,926,650, Cl. 62-114.000.
Kamath, Vasanth R.; and Sargent, James D., 4,927,891, Cl. 525-327.300.
Pensa, Carlo M., to O.D.L. S.r.l. Pump for transferring liquids, in particular beer or carbonated beverages. 4,927,335, Cl. 417-393.000.
Peplinski, Alphonso. Blind hole thread gauge. 4,926,700, Cl. 73-862.230.
Perchiazzi, Michele: *See—*
Volpe, Fulvio; and Perchiazzi, Michele, 4,928,208, Cl. 361-395.000.
Peres-Schael, Irene: *See—*
Chanock, Robert M.; Kapikian, Albert; Midthun, Karen; Flores, Jorge; Gorziglia, Mario; Hoshino, Yasutaka; and Peres-Schael, Irene, 4,927,628, Cl. 424-89.000.
Perfect Carton Corporation: *See—*
Platt, Ronald G., 4,927,008, Cl. 206-45.310.
Perfetti, Thomas J.: *See—*
King, Allen B.; and Perfetti, Thomas J., 4,927,176, Cl. 280-813.000.
Perkin-Elmer Corporation, The: *See—*
de Groot, Peter J.; Macomber, Steven H.; and Gallatin, Gregg M., 4,927,263, Cl. 356-5.000.
Pospisil, Peter; and Kolb, Bruno, 4,927,532, Cl. 210-198.200.
Perlman, Kato L.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Kutner, Andrzej, 4,927,815, Cl. 514-167.000.
Permco, Inc.: *See—*
Lonsberry, Kenneth F., 4,927,343, Cl. 418-102.000.
Permelec Electrode Ltd.: *See—*
Nishiki, Yoshinori; Nakamatsu, Shuji; and Shimamune, Takayuki, 4,927,800, Cl. 502-349.000.
Perron, Paul R.: *See—*
Kramer, George C.; and Perron, Paul R., 4,927,806, Cl. 514-2.000.
Perron, Robert; and Mutez, Sylvain, to Rhone-Poulenc Chimie. Catalytic dimerization of alkyl acrylates. 4,927,957, Cl. 560-202.000.
Perrott, Charles H., to C. H. Perrott, Inc. Automatic fluid pressure equalizing valve. 4,926,897, Cl. 137-98.000.
Perry, David A.: *See—*
Dutton, Christopher J.; and Perry, David A., 4,927,847, Cl. 514-450.000.
Pesheck, Peter S.: *See—*
Wendt, Dan J.; Kemske, Jonathon D.; and Pesheck, Peter S., 4,927,991, Cl. 219-10.55E.
Petainer S.A.: *See—*
Nilsson, Torsten, 4,927,591, Cl. 264-532.000.
Petersen Manufacturing Co., Inc.: *See—*
Sorensen, Joseph A.; and Gatzemeyer, Dwight L., 4,926,722, Cl. 81-487.000.
Peterson, Charles D., Jr. Tightening device for threaded connectors. 4,927,305, Cl. 411-14.000.
Peterson, Stephen R.: *See—*
Marzalek, Michael S.; Peterson, Stephen R.; and Wendler, John A., 4,928,251, Cl. 364-484.000.
Petrak, Peter: *See—*
Stuber, Istvan; Nagy, Geza; and Petrak, Peter, 4,927,253, Cl. 350-508.000.
Petrovic, John J.; Carter, David H.; and Gac, Frank D., to United States of America, Energy. Molybdenum disilicide matrix composite. 4,927,792, Cl. 501-92.000.
Pettigrew, Robert M.; Humberstone, Victor C.; Gardner, Keith; Longman, Robert J.; and Helfet, Peter R., to Plasmon Data Systems. Optical data storage medium. 4,928,132, Cl. 346-135.100.
Pettman, Roger B.: *See—*
Wilson, John R. H.; and Pettman, Roger B., 4,927,840, Cl. 514-397.000.
Wilson, John R. H.; Pettman, Roger B.; and Reid, Derek J., 4,927,841, Cl. 514-400.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Petty, Herbert E.: *See—*
King, Roswell; E., III; Foster, George N.; and Petty, Herbert E., 4,927,898, Cl. 528-27.000.
Pfabe, Peter; and Nohren, Hubert, to Autoflug GmbH. Staggered arrangement for improving radar reflection. 4,928,130, Cl. 342-9.000.
Pfeifer & Langen: *See—*
Schwengers, Dieter, 4,927,756, Cl. 435-103.000.
Pfiester, James R.: *See—*
Alvis, John R.; Pfiester, James R.; and Holland, Orin W., 4,928,156, Cl. 357-23.400.
Pfister, Theodor: *See—*
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,927,454, Cl. 71-93.000.
Pfizer Inc.: *See—*
Banks, Bernard J.; and Witty, Michael J., 4,927,918, Cl. 536-7.100.
Dutton, Christopher J.; and Perry, David A., 4,927,847, Cl. 514-450.000.
Mathur, Krishna K.; Resnik, Robert K.; and Simmons, Randall G., 4,927,618, Cl. 423-432.000.
Pfrimmer, Donald R. Method of custom manufacturing shoes at a specified heel height. 4,927,584, Cl. 264-154.000.
Pharmacia ENI Diagnostics, Inc.: *See—*
Saxon, Ronald L.; Zeger, Leroy; and Horbatt, Kenneth, 4,927,765, Cl. 436-43.000.
Philip Morris Incorporated: *See—*
Harward, Charles N., 4,928,181, Cl. 358-230.000.
Phillips, Joseph R.: *See—*
Meredith, Michael D.; Phillips, Joseph R.; Laakso, Richard O.; and Stromberg, C. Bertil, 4,927,312, Cl. 414-221.000.
Phillips Petroleum Company: *See—*
Schirmer, Robert M.; Fromm, Ellsworth H., and Alquist, Henry E., 4,927,349, Cl. 431-10.000.
Tabler, Donald C.; and Johnson, Marvin M., 4,927,795, Cl. 502-33.000.
Phipps, Jackie M.; and Barner, Ronald B Method of manufacturing a flow meter. 4,926,532, Cl. 29-25.350.
Picanol N.V.: *See—*
Shaw, Henry, 4,926,911, Cl. 139-435.100.
Piccioli, David P : *See—*
Collette, Wayne N.; Krishnakumar, Suppayan M ; and Piccioli, David P., 4,927,680, Cl. 428-36.920.
Picker International, Inc.: *See—*
Lampman, David A.; Morich, Michael A, and Dannels, Wayne R., 4,928,063, Cl. 324-307.000.
Zupancic, Anton Z.; and Deucher, Joseph S., 4,928,292, Cl. 378-17.000.
Pidgeon, Charles, to Purdue Research Foundation. Method for solid phase membrane mimetics. 4,927,879, Cl. 525-54.100.
Pieper, Gunter: *See—*
Purrmann, Robert; Guggenberger, Rainer; and Pieper, Gunter, 4,927,866, Cl. 523-115.000.
Pieper, Jon R.: *See—*
Buchanan, Scott; Larson, Eric G.; Pieper, Jon R.; and Boettcher, Thomas E., 4,927,431, Cl. 51-298.000.
Pierdet, Andre : *See—*
Bouton, Marie-Madeleine; Jacques, Jean; and Pierdet, Andre , 4,927,975, Cl. 568-373.000.
Pierorazio, Donato A Beach accessory device. 4,927,118, Cl. 248-545.000.
Pietramale, Anthony M.: *See—*
Schwarz, Albert J., and Pietramale, Anthony M , 4,927,116, Cl. 251-312.000.
Pietras, Eugene E., to Niagara Mohawk Power Corporation. Valve assembly and locking means therefor. 4,926,900, Cl. 137-385.000.
Pietrobon, Giovanni; Rossi, Domenico; and Pappalardo, Salvatore, to SGS-Thomson Microelectronics SRL. Circuit for controlling current switching in multiple inductive loads, with single current detector, particularly for windings of step motors. 4,928,049, Cl. 318-685.000.
Pietzsch, Heiko: *See—*
Hemm, Gerhard; Clausing, Gerhard; and Pietzsch, Heiko, 4,927,028, Cl. 206-618.000.
Pilatowicz, Edward A.; Carsello Anthony; and Landy, Richard, to Allegretti & Company. Hand held trimmer for cutting vegetation such as hedges and the like. 4,926,556, Cl. 30-216.000.
Pillsbury Company, The: *See—*
Wendt, Dan J.; Kemske, Jonathon D.; and Pesheck, Peter S., 4,927,991, Cl. 219-10.55E.
Pilsbury, Richard H.: *See—*
Morris, Arnold M.; D'Zurko, Daphne; Pilsbury, Richard H.; Barkell, J. Warren, Jr.; Orndorff, Karl B.; and Lawson Randall S., 4,926,974, Cl. 187-52.0LC.
Pimpinella, Richard J.; and Segelken, John M., to AT&T Bell Laboratories. Method of manufacturing optical assemblies. 4,926,545, Cl. 29-832.000.
Pinck, Peter: *See—*
Lorenzen, Heinz-Christen; Heitmann, Uwe; Siems, Wolfgang; and Pinck, Peter, 4,926,886, Cl. 131-84.400.
Pinol, Augusto C.: *See—*
Corominas, Juan P.; Constansa, Jordi F.; and Pinol, Augusto C., 4,927,926, Cl. 544-101.000.
Pioneer Electronic Corporation: *See—*
Akiyama, Toru, 4,928,166, Cl. 358-36.000.
Chikuma, Kiyofumi, 4,927,681, Cl. 428-64.000.
Iwashita, Kazuhiro, 4,928,168, Cl. 358-84.000.
Narumi, Ichiro, 4,927,235, Cl. 350-252.000.
Shiba, Takahumi, 4,928,044, Cl. 318-364.000.
Yamamoto, Hideo; Sato, Takeshi; Yoshimi, Toshikazu; Mori, Shuichi; and Tokumo, Akio, 4,928,071, Cl. 330-129.000.
Piotrowski, Paul A.: *See—*
Campbell, Robert B.; Kochka, Edgar L.; and Piotrowski, Paul A., 4,927,489, Cl. 156-620.100.
Pipkorn, David N.: *See—*
Howell, Margene C.; Katerberg, James A.; Pipkorn, David N.; and Wood, Wendell L., 4,928,113, Cl. 346-75.000.
Pirali, Edmund: *See—*
Wright, Geoffrey D.; and Pirali, Edmund, 4,926,969, Cl. 128-731.000.
Pirotzky, Eduardo; Dive, Georges; Godfroid, Jean-Jacques; and Heymans, Francoise, to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.). 2-methoxycarbonyl substituted N,N'-di-(trimethoxybenzoyl) piperazines, process for preparing the same and therapeutical compounds containing them. 4,927,825, Cl. 514-255.000.
Pischke, Reiner: *See—*
Putz, Heinrich; Nowitzki, Friedhelm; Damm, Gunter; Bathelt, Hartmut; Kromer, Gunter; Hoffmann, Henning; and Pischke, Reiner, 4,926,634, Cl. 60-274.000.
Pitney Bowes Inc.: *See—*
Fassman, Arnold; and Nobile, John R., 4,926,787, Cl. 118-32.000.
Gasiunas, Donatas V.; and Storace, Anthony, 4,928,089, Cl. 340-870.310.
Piton, Claude; and Piton, Jacqueline. Marine anchor equipped with anchor weighing means. 4,926,779, Cl. 114-297.000.
Piton, Jacqueline: *See—*
Piton, Claude; and Piton, Jacqueline, 4,926,779, Cl. 114-297.000.
Pitt, Gilles D.; Jones, Roger E.; Antell, George R.; Spicer, Lyndon R.; Barnett, John A.; and Hill, Robert, to Standard Telephones Cables Public Limited Company. Method and arrangement for transmitting power in optical form over optical fibres. 4,928,319, Cl. 455-612.000.
Pitts, Robert W., to AMP Incorporated. Modular electrical connector assembly. 4,927,374, Cl. 439-310.000.
Plasmon Data Systems: *See—*
Pettigrew, Robert M.; Humberstone, Victor C.; Gardner, Keith; Longman, Robert J.; and Helfet, Peter R., 4,928,132, Cl. 346-135.100.
Platt, Richard B Battery hold-down structure. 4,926,953, Cl. 180-68.500.
Platt, Ronald G., to Perfect Carton Corporation. Multi-celled paperboard container with v-shaped windows. 4,927,008, Cl. 206-45.310.
Platt, William J.; and Rose, Thomas E., to National Rolling Mills, Inc. Compression leg. 4,926,607, Cl. 52-484.000.
Plessey Overseas Limited: *See—*
Trundle, Clive; and Brettle, Jack, 4,927,180, Cl. 283-70.000.
Plumer, Hans J.: *See—*
Kross, Manfred; and Plumer, Hans J., 4,926,719, Cl. 81-57.370.
Plunkett, Allan B., to Synektron Corporation. Back EMF sampling circuit for phase locked loop motor control. 4,928,043, Cl. 318-254.000.
Pocholle, Jean P.; Papuchon, Michel; Puech, Claude; and Tournois, Pierre, to Thomson-CSF. Optic fiber correlator. 4,927,223, Cl. 350-96.150.
Pocholle, Jean-Paul: *See—*
Papuchon, Michel; Pocholle, Jean-Paul; and Delacourt, Dominique, 4,927,245, Cl. 350-354.000.
Podlesny, Daniel B.; and Lopez, Ralph, to Red Devil, Inc. Trowel. 4,926,519, Cl. 15-235.400.
Poehlein, Raymond E.; Reese, Franklin S.; and Adamek, John A., to Xerox Corporation. Buckle control for reducing interactions between media drive systems. 4,928,141, Cl. 355-208.000.
Poel, Hendrik: *See—*
Geertsma, Geert; Poel, Hendrik; and Weersink, Andreas, 4,926,550, Cl. 30-43.100.
Poelzing, Gerhard W., to AT&T Bell Laboratories. Method for encapsulating integrated circuits. 4,927,590, Cl 264-272.170.
Poepsel, Donald A.: *See—*
Staab, Carl J.; Houser, Kirk D.; Jones, Donald J.; Ihrman, Robert T.; Poepsel, Donald A., and Edblad, Warren A., 4,928,097, Cl. 340-825.500.
Pohl, Wolfgang: *See—*
Fauck, Gerhard; Pohl, Wolfgang; and Ulrich, Helmut, 4,926,907, Cl. 137-627.500.
Pohlig Ralf: *See—*
Brock, Martin; and Pohlig Ralf, 4,927,575, Cl. 264-46.400
Pohto, Gerald R.: *See—*
Turley, Homer L.; Niksa, Marilyn J.; Pohto, Gerald R.; and Niksa, Andrew J., 4,927,717, Cl. 429-27.000.
Poirier, Joel: *See—*
Ciloglu, Cavit; Gagne, Martin; Laraque, Edy; Poirier, Joel; Tremblay, Sylvain; and Trudel, Yves, 4,927,461, Cl. 75-254.000.
Pokorny, Richard J., to Minnesota Mining and Manufacturing Company. Aqueous based composition containing dibasic ester and thickening agent for removing coatings. 4,927,556, Cl 252-173.000.
Polan, George S., to Central Sprinkler Corporation. Pendent style sprinkler with cover. 4,926,946, Cl. 169-37.000.
Polczynski, Mark; and Krueger, Brian, to A. O. Smith Corporation. PC board panel configuration technique. 4,926,546, Cl. 29-840.000.
Polk, Gary C.; Larson, Steve A.; and Albrecht, Ronald E., to Power Flo Products Corp. Pressure washer. 4,926,904, Cl. 137-565.000.
Pollard, Andrew: *See—*
Spedding, Colin E.; and Pollard, Andrew, 4,927,124, Cl. 267-229.000.

Pollitt, Gary M. Hydraulic shock absorber with nonlinear properties. 4,926,984, Cl. 188-310.000.
Polly, Daniel R., to United States of America, Navy. Method for assessment of corrosion activity in reinforced concrete. 4,927,503, Cl. 204-153.110.
Polska Akademia Nauk Instytut Podstrowowych Problemow: *See—*
Brokowski, Andrzej; Deputat, Julian; and Mizerski, Krzysztof, 4,926,692, Cl. 73-597.000.
Poly Technologies, Inc.: *See—*
Ma, Bao P.; Shou-Fu, Zhong; and Li, Qin Z., 4,926,742, Cl. 89-33.020.
Polyplastics Co., Ltd.: *See—*
Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Takahashi, Katsuhiko, 4,927,895, Cl. 525-438.000.
Polytechnic University: *See—*
Zabar, Zivan, 4,926,741, Cl. 89-8.000.
Pon, Charles K.: *See—*
Renga, James M.; Pon, Charles K.; Gulbenkian, Aylin H.; and Smith, Michael G., 4,927,508, Cl. 204-79.000.
Pool, James L., to Lisle Corporation. Tie rod and ball joint separator. 4,926,537, Cl. 29-275.000.
Poole, Dan R.: *See—*
Parnell, James A.; and Poole, Dan R., 4,928,256, Cl. 364-561.000.
Porelon, Inc.: *See—*
Ooms, Willem; Moss, Frank R.; and Key, Jonnie L., 4,927,695, Cl. 428-159.000.
Porter, Warren W.; and Lauffer, Donald K., to NCR Corporation. Foldable printed circuit board. 4,928,206, Cl. 361-385.000.
Porth, Wolfgang; Weibler, Wolfgang; Kern, Eckhart; Hannewald, Thomas; and Weingartner, Reiner, to VDO Adolf Schindling AG. Electronic controller for internal combustion engines. 4,926,821, Cl. 123-399.000.
Pospisil, Jirina V., to Unitek Corporation. Triwing orthodontic bracket. 4,927,360, Cl. 433-8.000.
Pospisil, Peter; and Kolb, Bruno, to Perkin-Elmer Corporation, The. Device for the compensation of the baseline drift of a chromatographic separating column. 4,927,532, Cl. 210-198.200.
Posse Lock Manufacturing Co., Ltd.: *See—*
Wu, Rong-Faa; and Wu, Shoei-Jyi, 4,927,195, Cl. 292-169.140.
Poting, Hans-Jurgen: *See—*
Szewczyk, Mattias; and Poting, Hans-Jurgen, 4,926,803, Cl. 123-55.00R.
Pouyez, Philippe: *See—*
Kayoun, Pierre; and Pouyez, Philippe, 4,928,135, Cl. 350-96.200.
Power Flo Products Corp.: *See—*
Polk, Gary C.; Larson, Steve A.; and Albrecht, Ronald E., 4,926,904, Cl. 137-565.000.
Powers, Edward J.: *See—*
Wadhwa, Lachhman; Bitritto, Michel; and Powers, Edward J., 4,927,909, Cl. 528-331.000.
Powertech Labs, Inc.: *See—*
Franklin, Douglas E.; Murphy, Maurice W.; and Palylyk, Richard A., 4,926,691, Cl. 73-579.000.
PPG Industries, Inc.: *See—*
Dana, David E.; and Morris, Steven J., 4,927,869, Cl. 523-502.000.
Kahle, Charles F., II; McCollum, Gregory J.; and Wilson, Craig A., 4,927,969, Cl. 564-377.000.
Leatherman, Dennis D., 4,927,802, Cl. 503-214.000.
Maska, Rudolf; and Essary, William A., 4,927,875, Cl. 524-457.000.
Schiminel, Karl F.; and Blackburn, William P., 4,927,868, Cl. 523-439.000.
Wiedrich, Charles R.; and Sare, Edward J., 4,927,546, Cl. 210-755.000.
Prats, Michael: *See—*
Glandt, Carlos A.; Vinegar, Harold J.; and Prats, Michael, 4,926,941, Cl. 166-248.000.
Precision Extruded Products, Inc.: *See—*
Markiewicz, James E.; and Shrontz, Darrell G., 4,926,667, Cl. 72-256.000.
Precision Fukuhara Works, Ltd.: *See—*
Takashi, Yamaoko, 4,926,660, Cl. 66-9.00R.
Preco Industries, Inc.: *See—*
Hodges, William L.; and Cheek, Patrick J., 4,928,243, Cl. 364-519.000.
Predelli, Piero. Spring-latch door lock provided with an improved locking system and adapted to be used for inwardly and outwardly opened doors. 4,927,197, Cl. 292-245.000.
Prescott, Robert C.; and Robinson, Robert J., to Dresser Industries, Inc. Sensitive electrical to mechanical transducer. 4,926,896, Cl. 137-82.000.
Price, Robert A., to G-P Manufacturing Co., Inc. Custom molded vehicle splash guard. 4,927,177, Cl. 280-851.000.
Priceman, Seymour, to Barson Corporation. Refractory metal composite coated article. 4,927,714, Cl. 428-628.000.
Prilik, Ronald J.: *See—*
Dampier, Michael S.; Prilik, Ronald J.; and Rapoport, Norman R., 4,928,061, Cl. 324-158.00F.
Princeton University, The Trustees of: *See—*
Taylor, Edward C.; Beardsley, George P.; Shih, Chuan; and Fletcher, Stephen R., 4,927,828, Cl. 514-258.000.
Pringle, Ronald E.; and Morris, Arthur J., to Camco, Incorporated. Subsurface well safety valve with curved flapper and method of making. 4,926,945, Cl. 166-321.000.
Process Automation Business, Inc.: *See—*
Owen, Raymond E., 4,926,698, Cl. 73-861.610.
Procter & Gamble Company: *See—*
McCall, Patrick C., 4,927,563, Cl. 252-551.000.
Proctor & Gamble Company, The: *See—*
Revis, Jack W.; Sagel, John A.; and Ostendorf, Daniel I., 4,927,557, Cl. 252-174.150.
Professional Packaging Limited: *See—*
Holmes, Gordon W., 4,926,572, Cl. 40-448.000.
Profrock, William P., Jr. Method for reducing sand production in submersible-pump wells. 4,926,942, Cl. 166-250.000.
Programmation, Inc.: *See—*
Weiss, Mitchell, 4,926,753, Cl. 104-88.000.
Progressive Angioplasty Systems, Inc.: *See—*
Hess, Robert, 4,927,413, Cl. 604-95.000.
Protopapas, Dimitrios, to Unisys Corporation. Time division multiplexer/demultiplexer with deterministic time slot assignment. 4,928,273, Cl. 370-85.700.
Provence, Marc; and Rousset, Didier, to Salomon, S.A. Cross-country ski binding. 4,927,168, Cl. 280-615.000.
Provenzo, Eugene F., Jr.; and Zorn, Peter A., to Patrician Corporation. Airfoil configuration. 4,927,100, Cl. 244-153.00R
Prugnolle, Bernard: *See—*
Krasuski, Marek; and Prugnolle, Bernard, 4,926,612, Cl. 53-69.000.
PSI Star: *See—*
Nelson, Norvell J.; and Martens, Phillip A., 4,927,700, Cl. 428-209.000.
Public Health Laboratory Service Board *See—*
Carr, Robert; Clarke, David J.; and Atkinson, Tony, 4,927,268, Cl. 356-336.000.
Puech, Claude: *See—*
Pocholle, Jean P.; Papuchon, Michel; Puech, Claude; and Tournois, Pierre, 4,927,223, Cl. 350-96.150.
Pulichino, John V., Jr., to American Tourister, Inc. Garment bag with flap cover for strap hook. 4,927,014, Cl. 206-287.100.
Pullman Company, The: *See—*
Kotz, Steven P.; and Lane, John H., 4,927,285, Cl. 403-133.000.
Schwarz, Albert J.; and Pietramale, Anthony M., 4,927,116, Cl. 251-312.000.
Purdue Research Foundation: *See—*
Pidgeon, Charles, 4,927,879, Cl. 525-54.100.
Pure-Pak, Inc.: *See—*
Lisiecki, Robert E., 4,927,075, Cl. 229-125.340.
Purrmann, Robert; Guggenberger, Rainer; and Pieper, Gunter, to ESPE Stiftung & Co. Produktions- und Vertriebs KG. Shapable material and shaped articles obtainable therefrom. 4,927,866, Cl. 523-115.000.
Putz, Heinrich; Nowitzki, Friedhelm; Damm, Gunter; Bathelt, Hartmut; Kromer, Gunter; Hoffmann, Henning; and Pischke, Reiner, to Audi AG. Method and apparatus for producing a homogeneous exhaust gas mixture in an exhaust system for an internal combustion engine having two banks of cylinders. 4,926,634, Cl. 60-274.000.
Qualcomm, Inc.: *See—*
Gilhousen, Klein S.; and Antonio, Franklin P., 4,928,274, Cl. 370-92.000.
Quarles, Carey L., to Coors Biotech, Inc. Method and composition for improved animal husbandry. 4,927,811, Cl. 514-23.000.
Quebec Metal Powders, Ltd.: *See—*
Ciloglu, Cavit; Gagne, Martin; Laraque, Edy; Poirier, Joel; Tremblay, Sylvain; and Trudel, Yves, 4,927,461, Cl. 75-254.000.
Quick Cuisine Limited: *See—*
Roberts, William W., 4,927,650, Cl. 426-295.000.
Quinn, Clayton B.: *See—*
Adams, Ronald L.; Kimbel, Kirk L.; and Quinn, Clayton B., 4,927,675, Cl. 428-35.900.
R. J. Reynolds Tobacco Company: *See—*
Bailey, Jennifer A., 4,927,647, Cl. 426-126.000.
Raab, Lothar: *See—*
Stolz, Robert; Mirring, Knut; Hein, Rudolf; Simon, Dieter; Raab, Lothar; and Glatz, Peter, 4,927,276, Cl. 384-572.000.
Raahauge, Jerald C., to Summer & Taylor, Inc. Universal plotter pen having improved marking fluid flow characteristics. 4,928,121, Cl. 346-140.00R.
Rabinovitz, Raphael S.; and Hartley, Craig J., to Baylor College of Medicine. Implantable and extractable biological sensor probe. 4,926,875, Cl. 128-691.000.
Rademacher, Thomas W.: *See—*
Feder, Joseph; Howard, Susan C.; Wittwer, Arthur J.; Rademacher, Thomas W.; Parekh, Raj B.; and Dwek, Raymond A., 4,927,630, Cl. 424-94.640.
Radermacher, Reinhard: *See—*
Dawn, Douglas D.; and Radermacher, Reinhard, 4,926,650, Cl. 62-114.000.
Radtchenko, Konstantin. Quick gliding lure. 4,926,577, Cl. 43-42.000.
Ragonese, Francis P.: *See—*
Child, Jonathan E.; Choi, Byung C.; and Ragonese, Francis P., 4,927,977, Cl. 568-695.000.
Rahikainen, Ahti. Method and apparatus for photographing a movement. 4,927,261, Cl. 352-39.000.
Rahman, Abdul W. B. A., to Hewlett-Packard Company. Cursor control mechanism. 4,928,093, Cl. 340-709.000.
Raj, Kuldip; Moses, Joseph; Moskowitz, Ronald; and Bloom, Frank, to Ferrofluidics Corporation. Ferrofluid seal with epoxy pole pieces. 4,927,164, Cl. 277-80.000.
Ralph Earl Co., Inc.: *See—*
Lothammer, Henry, 4,926,723, Cl. 82-118.000.
Ramalingam, Subbiah; and Frohrib, Darrell A., to University of Minnesota, Regents of the. Integral acoustic emission sensor for manufac-

VOL 1114 ISS 4 MY 22 1990 UMI

turing processes and mechanical components. 4,927,299, Cl. 407-120.000.

Ramalingam, Subbiah; and Frohrib, Darrell A., to University of Minnesota, Regents of the. Intelligent insert with integral sensor. 4,927,300, Cl. 407-120.000.

Ramanathan, Visvanathan: *See*—
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, 4,927,865, Cl. 522-48.000.

Ramos, Gerardo: *See*—
Schneider, Peter; Ramos, Gerardo; and Bersier, Jacques, 4,927,507, Cl. 204-78.000.

Ramot Univ. Authority for Applied Res. & Devp. Ltd.: *See*—
Teitz, Yael, 4,927,843, Cl 514-418.000.

Randall, Curtis J.: *See*—
Kimball, Christopher V.; Stanke, Fred E.; Randall, Curtis J.; and Hayman, Andrew J., 4 928,269, Cl 367-35.000.

Randall, Osro W., III: *See*—
Stevens, Timothy S.; Langhorst, Martin A.; and Randall, Osro W., III, 4,927,539, Cl. 210-635.000.

Randy, Frank. Holder for socket wrench heads. 4,927,020, Cl. 206-378.000.

Rao, Balbir S.: *See*—
Holloway, Brian R.; Howe, Ralph; Rao, Balbir S.; and Stribling, Donald, 4,927,836, Cl. 514-620.000.

Rapoport, Norman R.: *See*—
Dampier, Michael S.; Prilik, Ronald J.; and Rapoport, Norman R., 4,928,061, Cl. 324-158.00F.

Raswant, Subhash. Road traffic network. 4,927,288, Cl. 404-1.000.

Rathmell, William G.: *See*—
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,927,839, Cl. 514-383.000.

Ratliff, Charles. Industrial dehumidifier. 4,926,618, Cl. 55-20.000.

Rattunde, Manfred, to Reimers Getriebe AG. Link chain for an infinitely variable cone drive disk transmission. 4,927,404, Cl. 474-242.000.

Rau, Robert J.; and Haydo, Donald H., to Italimpianti of America Incorporated. Automatic die box positioning for drawblock. 4,926,668, Cl. 72-289.000.

Raue, Roderich: *See*—
Harnisch, Horst; and Raue, Roderich, 4,927,729, Cl. 430-110.000.

Rauma-Repola Oy: *See*—
Riihimaki, Antti, 4,927,534, Cl. 209-315.000.

Ray, Michael: *See*—
Jack, Michael D.; Chapman, George R.; and Ray, Michael, 4,927,773, Cl. 437-22.000.

Ray, Wayne: *See*—
Roth, Scott S., Nguyen, Bich-Yen; Tobin, Philip J.; Ray, Wayne; Wachholz, E. Petyr, and Wissen, Glenn, 4,927,780, Cl. 437-69 000.

Ray, Wilson B.: *See*—
Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, 4,927,956, Cl. 560-130.000.

Raychem Limited: *See*—
Diaz, Stephen H., Cherian, Gabe; Morris, Stephen; Vinson, John R.; Crofts, David; and Moore, Anthony J., 4,928,199, Cl. 361-56.000.

Raytheon Company: *See*—
Kazior, Thomas E.; and Durschlag, Mark S., 4,927,784, Cl 437-203.000.
MacMaster, George H., and Nichols, Lawrence J., 4,928,070, Cl. 330-43.000.
Scott, John C., 4,928,072, Cl. 330-149.000.

Reading, Anthony H., and Miles, Brynley J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for United Kingdom Atomic Energy Authority in Her Britannic Majesty's Government of the. Immobilization of cells with alginate and agarose. 4,927,761, Cl. 435-178.000.

Reading, Christopher L.; Smyth, Malcolm R., and O'Kennedy, Richard, to Board of Regents, The University of Texas Methods and apparatus using galvanic immunoelectrodes 4,927,502, Cl. 204-153.100.

Red Devil, Inc.: *See*—
Podlesny, Daniel B., and Lopez, Ralph, 4,926,519, Cl. 15-235.400.

Red Eye Arms, Inc.: *See*—
Byron, David E., 4,926,739, Cl. 89-1.400.

Redfield, Steve R.: *See*—
Hesselink, Lambertus; and Redfield, Steve R., 4,927,220, Cl 350-3.640.

Redicon Corporation: *See*—
Bulso, Joseph D., Jr.; and Lewers, William R., 4,926,724, Cl 83-35.000.

Redl, Richard; and Sokal, Nathan O., to Cherry Semiconductor Corporation. Overcurrent protection for switching mode power converter. 4,928,200, Cl. 361-93.000.

Reed, Clive W.; Rzad, Stefan J. and Devins, John C., to General Electric Company. Abrasion-resistant plastic articles and method for making them. 4,927,704, Cl 428-221.000.

Reeder, James R.: *See*—
Crews, John H., Jr.; and Reeder, James R., 4,926,694, Cl. 73-794.000.

Rees, Theodore D., to Laserdrive Limited. Method and apparatus for encoding and decoding binary data 4,928,187, Cl. 360-40.000.

Reese, Franklin S.: *See*—
Poehlein, Raymond E., Reese, Franklin S.; and Adamek, John A., 4,928,141, Cl. 355-208.000.

Refsland, Earl R.: *See*—
Cambio, Orlando D., Jr.; and Refsland, Earl R., 4,926,856, Cl 128-203.260.

Reginato, Louis L.: *See*—
Birx, Daniel L.; and Reginato, Louis L., 4,928,020, Cl. 307-106.000.

Rehm, Veronika: *See*—
Greulich, Norbert; Kiefer, Werner; and Rehm, Veronika, 4,927,442, Cl. 65-18.100.

Reich, Fritz: *See*—
Steinmetz, Hans-Werner; and Reich, Fritz, 4,927,183, Cl. 285-21.000.

Reichardt, Jurgen: *See*—
Kemmler-Sack, Sibylle; Morlotti, Romano; and Reichardt, Jurgen, 4,928,017, Cl. 250-483.100.

Reid, Derek J.: *See*—
Wilson, John R. H.; Pettman, Roger B.; and Reid, Derek J., 4,927,841, Cl. 514-400.000.

Reimers Getriebe AG: *See*—
Rattunde, Manfred, 4,927,404, Cl. 474-242.000.

Reiser, Steven M. Combined message display and brake light. 4,928,084, Cl. 340-479.000.

Reiterman, Lee, to GTE Valenite Corporation. Adjustable boring bar cartridge. 4,927,301, Cl. 408-180.000.

Reitz, Graydon A.: *See*—
Burba, Joseph C.; Landman, Ronald G.; Patil, Prabhakar B.; and Reitz, Graydon A., 4,928,227, Cl. 364-424.010.

Remacle, Jose. Support used in bioluminescent dosing of enzymes, substrates or enzymatic inhibitors. 4,927,752, Cl 435-8.000.

Renga, James M.; Pon, Charles K.; Gulbenkian, Aylin H.; and Smith, Michael G., to Dow Chemical Company, The. Alkyl 2-fluoro-1-methoxyethylcarbamates. 4,927,508, Cl. 204-79.000.

Renishaw PLC: *See*—
McMurtry, D. R.; Stephens, W. F. N.; and Kirkbride, M., 4,926,566, Cl. 33-771.000.

Repman, Joseph F.; Morris, Thomas E.; and Hill, Thomas F., Jr., to Dow Chemical Company, The. Purification of anhydrous hydrogen chloride. 4,927,621, Cl. 423-488.000.

Repo, Erkki T.: *See*—
Henricson, Kaj O.; Repo, Erkki T., and Ronkonharju, Hannu U., 4,927,529, Cl. 209-270.000.

Research Corporation of the University of Hawaii, The: *See*—
Holm-Kennedy, James W.; and McArthur, Scot P., 4,926,682, Cl. 73-54.000.
Holm-Kennedy, James W.; Kawamoto, Eric H., and Bopp, Thomas T., 4,926,693, Cl. 73-597.000.

Research Foundation of State University of New York, The: *See*—
Kalman, Thomas I., 4,927,966, Cl. 562-594.000.

Resnik, Robert K.: *See*—
Mathur, Krishna K.; Resnik, Robert K.; and Simmons, Randall G., 4,927,618, Cl. 423-432.000.

Retroperfusion Systems, Inc.: *See*—
Menasche, Philippe, 4,927,412, Cl. 604-96.000.

Reum, Helmut: *See*—
Auwarter, Gerhard; Imhof, Ernst, Komaroff, Iwan; Reum, Helmut; Schmid, Gunther; and Kaczynski, Bernhard, 4,926,819, Cl. 123-297.000.

Revis, Jack W.; Sagel, John A.; and Ostendorf, Daniel I., to Proctor & Gamble Company, The. Process for forming flakes. 4,927,557, Cl. 252-174.150.

Reynolds, Howard, to Siemon Company, The. Printed circuit board connector. 4,927,380, Cl. 439-411.000.

Rheem Manufacturing Company: *See*—
Shellenberger, Timothy J.; and Harrigill, William T., 4,926,840, Cl 126-110.00R

Rheinmetall GmbH: *See*—
Knabel, Horst, 4,926,559, Cl. 33-832.000.

Rhone-Poulenc Chimie: *See*—
Laurent, Claude; Rostaing, Paul; and Lyobard, Rene, 4,926,673, Cl. 72-465.000.
Michaud, Philippe; and Camberlin, Yves, 4,927,899, Cl. 528-49.000.
Michaud, Philippe; and Camberlin, Yves, 4,927,900, Cl. 528-49.000.
Michel, Paul, 4,927,615, Cl. 423-305.000.
Perron, Robert; and Mutez, Sylvain, 4,927,957, Cl. 560-202.000.

Rhone-Poulenc Industries: *See*—
Leveque, Alain; and Triollier, Michel, 4,927,609, Cl. 423-21.500.

Richards, William D., to Ophthalmic Ventures Limited Partnership. Surgical suturing system and probe assembly 4,927,428, Cl. 606-148.000.

Richardson, Nicholas J.: *See*—
McCarthy, Daniel M.; Circello, Joseph C.; Munguia, Gabriel R., and Richardson, Nicholas J., 4,928,225, Cl. 364-200.000.

Richardson-Vicks Inc.: *See*—
Sorrentino, James V.; Kelleher, William J., and Moye, Jeanne O., 4,927,634, Cl. 424-405.000.

Richerson, Ben M. Cyclonic separator for removing and recovering airborne particles. 4,927,437, Cl. 55-349.000.

Rickey, James C. Graphic/tactile musical keyboard and nomographic music notation. 4,926,734, Cl. 84-423.00R.

Ricoh Company, Ltd.: *See*—
Higashi, Yuichirou, 4,928,148, Cl. 355-290.000.
Isoda, Tetsuo; Watanabe, Yoichiro; Nakayama, Nobuhiro; and Aoki, Mitsuo, 4,927,728, Cl. 430-108.000.
Kaneuchi, Kunihiro; Yasuda, Seigou; Aoyoshi, Takashi; Nakatani, Tomofumi; and Aizawa, Hiroshi, 4,928,302, Cl. 379-88.000.
Saeki, Shiro, 4,928,151, Cl. 355-320.000.

Riddell, Inc.: *See*—
Wingo Jr, James C., 4,926,503, Cl. 2-267.000.

Riebel, Hans-Jochem: *See*—
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,927,454, Cl. 71-93.000.

Riedl, Volker: *See*—
Muller, Karl H.; Riedl, Volker; and Arbesmeier, Bernhard, 4,926,539, Cl. 29-568.000.

Rieger, Benedikt, to Dynamit Nobel Aktiengesellschaft. Rifle with safety system. 4,926,574, Cl. 42-70.040.

Riess, Gerard: *See*—
Heim, Philippe; and Riess, Gerard, 4,927,867, Cl. 523-339.000.

Riffe, Delmar R.; Kotlarek, Peter A.; and Utter, Robert E., to American Standard Inc. Rotating scroll apparatus with axially biased scroll members. 4,927,339, Cl. 418-55.000.

Riihiluoma, Clayton; and Miller, Kurt R. Chess-like board game apparatus and method of playing the same. 4,927,157, Cl. 273-260.000.

Riihimaki, Antti, to Rauma-Repola Oy. Screen system. 4,927,534, Cl. 209-315.000.

Riley, John M.: *See*—
Hickok, William K.; Riley, John M.; and Kosarko, Gerald J., 4,928,196, Cl. 360-105.000.

Rimai, Donald S.; and Sreekumar, Chandra, to Eastman Kodak Company. Thermally assisted transfer of small electrostatographic toner particles. 4,927,727, Cl. 430-99.000.

Ring Can Corporation: *See*—
Ring, Robert G., 4,927,042, Cl. 220-23.830.

Ring, Robert G., to Ring Can Corporation. Dispensing bottle container assembly including separable composite packages. 4,927,042, Cl. 220-23.830.

Ringrose, Gordon: *See*—
Fattal, R. George; and Ringrose, Gordon, 4,927,486, Cl. 156-351.000.

Rioja, Roberto J.; and Denzer, Diana K., to Aluminum Company of America. Alloy toughening method. 4,927,469, Cl. 148-11.50A.

Ripp, Francis J.: *See*—
Eckler, Donald F.; Mankus, John R.; Ripp, Francis J.; and Saxenmeyer Jr., George J., 4,927,387, Cl. 439-499.000.

Ritchie, Gordon V.: *See*—
Wright, Murray J.; and Ritchie, Gordon V., 4,928,201, Cl. 361-215.000.

Ritsko, Joseph E.: *See*—
Kopatz, Nelson E.; Johnson, Walter A.; and Ritsko, Joseph E., 4,927,456, Cl. 75-346.000.

Ritter, Sammie F.: *See*—
Neeley, Walter P.; and Ritter, Sammie F., 4,928,262, Cl. 367-106.000.

RMF Steel Products Co.: *See*—
Costello, Anthony W.; Ogg, Graeme J.; and McGregor, John C., 4,926,614, Cl. 53-434.000.

Roach, William C.: *See*—
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.

Roark, David N.: *See*—
Blocker, Wesley C.; Roark, David N.; and Hornbaker, Edwin D., 4,927,896, Cl. 526-93.000.

Robern, Inc.: *See*—
Katz, Howard S., 4,927,215, Cl. 312-224.000.

Robert Bosch GmbH: *See*—
Auwarter, Gerhard; Imhof, Ernst; Komaroff, Iwan; Reum, Helmut; Schmid, Gunther; and Kaczynski, Bernhard, 4,926,819, Cl 123-297.000.
Harms, Klaus; Schray, Hans-Dieter; Taubitz, Bernd; and Wirtz, Rainer, 4,928,042, Cl. 318-254.000.
Taubitz, Bernd; Zieher, Peter; Kramer, Claus; Engelsdorf, Kurt; and Schuelke, Armin, 4,926,983, Cl. 188-299.000.

Roberts, Charles P.: *See*—
Gossler, Hans K.; and Roberts, Charles P., 4,927,026, Cl. 206-600.000.

Roberts, William W., to Quick Cuisine Limited. Food preparation. 4,927,650, Cl. 426-295.000.

Robertshaw Controls Company: *See*—
Genbauffe, Francis S.; and Kimmel, Steven A., 4,927,996, Cl. 219-413.000.
Hardin, George T., 4,926,697, Cl. 73-861.480.

Robertson, Jeffrey C.: *See*—
Van Brunt, Nicholas; Robertson, Jeffrey C.; and Homa, Daniel, 4,927,013, Cl. 206-221.000.

Robinson, Bruce R. Carbonation apparatus with CO_2 injection into serving vessel. 4,927,569, Cl. 261-79.200.

Robinson, David H.: *See*—
Brown, Roger C.; Dixon, John; and Robinson, David H., 4,927,822, Cl. 514-396.200.

Robinson Fin Machines, Inc.: *See*—
Haushalter, Frederick W., 4,926,935, Cl. 165-185.000.

Robinson, Robert J.: *See*—
Prescott, Robert C.; and Robinson, Robert J., 4,926,896, Cl 137-82.000.

Robson, Michael J.; Cleare, Peter J. V.; and Spinney, Mark A., to Imperial Chemical Industries PLC. Insecticidal compounds characterized by enhanced knockdown effect. 4,927,852, Cl. 514-531.000.

Rockwell-CIM: *See*—
Noel, Jean P., 4,926,986, Cl. 192-0.02R.

Rockwell International Corporation: *See*—
Culp, Gordon W., 4,928,030, Cl. 310-328.000.
Cumming, James C., 4,926,980, Cl. 188-79.550.
Franklin, Hugh L.; Whatley, Leslie H.; and Klees, George N., 4,928,059, Cl. 324-123.00R.
Veerhusen, Dan S.; and Pattison, David C., 4,926,628, Cl. 60-39.150.

Rodel, Inc.: *See*—
Budinger, William D.; and Jensen, Elmer W., 4,927,432, Cl. 51-298.000.

Rodin, Bruce W., to Mirrorlite, Inc. Lighting apparatus. 4,928,209, Cl. 362-217.000.

Rodriguez, Domingo; and Gomez, Cebers, to Intevep, S.A. Process for removing vanadium and sulphur during the coking of a hydrocarbon feed. 4,927,524, Cl. 208-131.000.

Roebuck, Maurice J., to British Petroleum Company p.l.c. Container for high pressure gases. 4,927,038, Cl. 220-3.000.

Roessler, Bernward, to Siemens Aktiengesellschaft. Echo canceller circuit. 4,928,308, Cl. 379-411.000.

Roethel, Henry G.: *See*—
Leigh, James P.; and Roethel, Henry G., 4,927,061, Cl. 222-212.000.

Rogan, Joseph J.: *See*—
D'Angelo, Philip J.; Hetherington, Richard; and Rogan, Joseph J., 4,927,796, Cl. 502-62.000.

Rogers, Alan H.: *See*—
Garth, Peter; Simpson, Stuart M.; Parkinson, John E.; and Rogers, Alan H., 4,927,741, Cl. 430-309.000.

Roginski, Edward T., to Medical Automation Specialties, Inc. Method and apparatus for automatic processing and analyzing of blood serum. 4,927,545, Cl. 210-745.000.

Rohlmann, Maximilian: *See*—
Ungruh, Josef; and Rohlmann, Maximilian, 4,926,619, Cl. 56-15.400.

Rohrer, Donald K.: *See*—
Leonard, Patrick F.; Svetkoff, Donald J.; Kelley, Robert W.; Rohrer, Donald K.; and Coleman, E. North, Jr., 4,928,313, Cl. 382-8.000.

Rokutanda, Shuji; Higemitsu, Yasuo; Tsuchida, Akiyoshi; and Yamakoshi, Yukihiro, to Dainippon Ink. and Chemicals, Inc. Silver halide photographic light-sensitive material and a process for forming a high contrast photographic image. 4,927,734, Cl. 430-264.000.

Roll-in-Sheet Inc.: *See*—
Oats, Edwin O., 4,926,513, Cl. 5-488.000.

Roncel, Mercedes: *See*—
de la Rosa, Francisco F.; Navarro, Jose A.; Roncel, Mercedes; and de la Rosa, Miguel A., 4,927,512, Cl. 204-157.500.

Ronkonharju, Hannu U.: *See*—
Henricson, Kaj O.; Repo, Erkki T.; and Ronkonharju, Hannu U., 4,927,529, Cl. 209-270.000.

Ronnick, Albert J. Golf club including sight level indicator. 4,927,151, Cl. 273-162.00B.

Rose Elektrotechnik GmbH & Co. KG: *See*—
Meislitzer, Karl-Heinz; and Sandmann, Heinz, 4,927,984, Cl. 174-92.000.

Rose, Thomas E.: *See*—
Platt, William J.; and Rose, Thomas E., 4,926,607, Cl. 52-484.000.

Rosemount Inc.: *See*—
Kleven, Lowell A.; and Corpron, Gary P., 4,926,695, Cl. 73-861.240.

Rosenberg, Eli I.: *See*—
Crawley, H. Bert; Rosenberg, Eli I.; Meyer, W. Thomas; Gorbics, Mark S.; Thomas, William D.; McKay, Roy L.; and Homer, John F., Jr., 4,928,246, Cl. 364-514.000.

Rosenquist, Niles R., to General Electric Company. Polycarbonate cross-linker resin and fire resistant compositions made therefrom. 4,927,914, Cl. 528-480.000.

Rosenthal, Robert D., to Futrex, Inc. Near-infrared apparatus and method for determining percent fat in a body. 4,928,014, Cl. 250-341.000.

Rosenwinkel, Donald A.: *See*—
Breslow, Jeffrey D.; Zaruba, John V.; and Rosenwinkel, Donald A., 4,927,156, Cl. 273-256.000.

Rosler, Horst: *See*—
Melzig, Manfred; Rosler, Horst; and Schobl, Medardus, 4,927,239, Cl. 350-165.000.

Roslund, Charles J.; and Cook, Bruce M., to Westinghouse Electric Corp. Adaptable current regulating system. 4,928,219, Cl. 363-54.000.

Ross, Philip N., Jr., to United States of America, Energy. Novel air electrode for metal-air battery with new carbon material and method of making same. 4,927,718, Cl. 429-44.000.

Ross, Robert R.: *See*—
Bensel, William H., III; Gladden, Robert H., Jr.; Malluck, John F.; Ross, Robert R.; and Williamson, Andrew H., Jr., 4,927,227, Cl. 350-96.200.

Rossi, Domenico: *See*—
Pietrobon, Giovanni; Rossi, Domenico; and Pappalardo, Salvatore, 4,928,049, Cl. 318-685.000.

Rossmann, Axel; and Huether, Werner, to MTU Motoren-Und Turbinen-Union Muenchen GmbH. Drive system including an engine and a turbo-charger. 4,927,336, Cl. 417-407.000.

Rostaing, Paul: *See*—
Laurent, Claude; Rostaing, Paul; and Lyobard, Rene, 4,926,673, Cl. 72-465.000.

Roth, Scott S.; Nguyen, Bich-Yen; Tobin, Philip J.; Ray, Wayne; Wachholz, E. Petyr; and Wissen, Glenn, to Motorola, Inc. Encapsu-

VOL
1114
ISS
4
MY
22
1990
UMI

lation method for localized oxidation of silicon. 4,927,780, Cl. 437-69.000.

Rotter, Franz: *See—*
Durchschlag, Gerald; Lang, Alfred; Rotter, Franz; Fritz, Dieter; and Kopilovitsch, Heinz, 4,927,102, Cl. 246-469.000.

Rotzinger, Hans: *See—*
Wenger, Hartmut; Martin, Peter; Rotzinger, Hans; and Denz, Martin, 4,926,789, Cl. 118-668.000.

Rous, Friedemann: *See—*
Breitenbach, Otto; Hetz, Helmar; Rous, Friedemann; and Ottenreuther, Josef, 4,927,570, Cl. 264-1.400.

Roussel Uclaf: *See—*
Bouton, Marie-Madeleine; Jacques, Jean; and Pierdet, Andre , 4,927,975, Cl. 568-373.000.
Clemence, Francois; Frechet, Daniel; and Fortin, Michel, 4,927,832, Cl. 514-299.000.
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 4,927,837, Cl. 514-331.000.
Vivat, Michel; and Buendia, Jean, 4,927,921, Cl. 540-110.000.

Rousset, Didier: *See—*
Provence, Marc; and Rousset, Didier, 4,927,168, Cl. 280-615.000.

Rovenszky, Franz: *See—*
Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., 4,927,821, Cl. 514-226.500.

Rowe, John P. Packaging assembly for substances to be post-mixed. 4,927,012, Cl. 206-219.000.

Roy, Richard S.: *See—*
Abbott, Robert A.; Barbara, Bruce; and Roy, Richard S., 4,928,266, Cl. 365-189.010.

Roychoudhury, Rathindra N., to Nestec S.A. Oil and fat release method. 4,927,566, Cl. 260-412.000.

Roze, Philipp: *See—*
Steinleitner, Gunther; and Roze, Philipp, 4,927,475, Cl. 156-89.000.

RSL Industries, Inc.: *See—*
Glover, Richard S., 4,927,056, Cl. 222-1.000.

Rubin, Robert H.; and Strauss, H. William, to General Hospital Corporation, The. Method for the diagnosis and treatment of inflammation. 4,926,869, Cl. 128-654.000.

Ruddell, Alan J.: *See—*
Eglise, David; and Ruddell, Alan J., 4,928,000, Cl. 235-380.000.

Rudick, Arthur G., to Coca-Cola Company, The. Motorless continuous carbonator. 4,927,567, Cl. 261-35.000.

Rudolph, Hans: *See—*
Schreckenberg, Manfred; Dhein, Rolf; Rudolph, Hans; and Nouvertne Werner, 4,927,903, Cl. 528-176.000.

Rugg, James M.: *See—*
Lesk, Israel A.; Thomas, Ronald E.; Hawkins, George W.; and Rugg, James M., 4,928,162, Cl. 357-72.000.

Ruhrkohle AG: *See—*
Becker, Wolfgang, 4,927,501, Cl. 202-248.000.

Ruigrok, Jacobus J. M.: *See—*
Zieren, Victor; and Ruigrok, Jacobus J. M., 4,927,804, Cl. 505-1.000.

Rush, James B.: *See—*
Meadows, Roger D.; Rush, James B.; and Bryan, James S., 4,926,535, Cl. 29-890.144

Rushforth, Kevin C.: *See—*
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.

Rushmere, John D., to Du Pont de Nemours, E. I., and Company. Retention and drainage aid for papermaking. 4,927,498, Cl. 162-168.300.

Ryback, George: *See—*
Schofield, John A.; Betteridge, Peter R.; Ryback, George; and Geary, Philip J., 4,927,759, Cl. 435-156.000.

Rzad, Stefan J.: *See—*
Reed, Clive W.; Rzad, Stefan J.; and Devins, John C., 4,927,704, Cl. 428-221.000.

S.T.S. SRL: *See—*
Montali, Gian Luigi, 4,927,319, Cl. 414-786.400.

Saarenko, Pauli: *See—*
Vocke, Henning L.; and Saarenko, Pauli, 4,926,843, Cl. 126-390.000.

Sack, Allen J. Self leveling tables. 4,926,760, Cl. 108-145.000.

Saeki, Shiro, to Ricoh Company, Ltd. Apparatus for automatically and circulatively feeding originals. 4,928,151, Cl. 355-320.000.

Sagel, John A.: *See—*
Revis, Jack W.; Sagel, John A.; and Ostendorf, Daniel I., 4,927,557, Cl. 252-174.150.

St. Martin, Edward J., to UOP. Production of crystalline pigments from monascus during fermentation. 4,927,760, Cl. 435-171.000.

Saita, Tomohisa: *See—*
Kishi, Noriyuki; Katoh, Atsushi; and Saita, Tomohisa, 4,926,823, Cl. 123-432.000.

Saito, Katsuyuki: *See—*
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,928,172, Cl. 358-98.000.

Saito, Kazuya: *See—*
Nakashima, Kazutaka; and Saito, Kazuya, 4,927,788, Cl. 439-887.000.

Saito, Kenichi; Wada, Kou; and Yoshizawa, Masahiro, to Nippon Telegraph and Telephone Corp. Observing a surface using a charged particle beam. 4,928,010, Cl. 250-310.000.

Saito, Shinji: *See—*
Chino, Naoyoshi; Sato, Tsunehiko; Saito, Shinji; and Ogawa, Hiroshi, 4,927,665, Cl. 427-131.000.

Sakaguchi, Hiroaki: *See—*
Aramaki, Minoru; Sakaguchi, Hiroaki; and Nakamura, Tamio, 4,927,962, Cl. 562-113.000.

Sakai, Hiroshi, to NEC Corporation. Electronic switching system connected to an external computer. 4,928,304, Cl. 379-94.000.

Sakai, Shiro: *See—*
Umeno, Masayoshi; Sakai, Shiro; and Yahagi, Shinichiro, 4,928,154, Cl. 357-16.000.

Sakai, Takeshi; Matsui, Susumu; Akiyoshi. Sumiko; and Obayashi, Akira, to Takara Shuzo Co., Ltd. Quantitative determination of L-fucose. 4,927,753, Cl. 435-26.000.

Sakai, Takeshi; Yokota, Hiroko; Yamamoto, Kazuki; Yokoyama, Sadaji; Matsui, Susumu; Kato, Ikunoshin; and Obayashi, Akira, to Takara Shuzo Co., Ltd. Method for the detection of diseases associated with the metabolic abnormality of L-fucose. 4,927,767, Cl. 436-64.000.

Sakaki, Takashi: *See—*
Yoshizawa, Tetsuo; Terayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shunichi; Ichida, Yasuteru; and Konishi, Masaki, 4,926,549, Cl. 29-876.000.

Sakakibara, Koichi; and Ozawa, Yasuo, to Koito Manufacturing Co., Ltd. Vehicle lamp lens having Fresnel lens. 4,927,248, Cl. 350-452.000.

Sakamoto, Kiyoaki; Matsubara, Kenichi; Nakahara, Yasuhiro; and Nomura, Masaki, to Tosoh Corporation. Axially adjustable-type column device. 4,927,531, Cl. 210-198.200.

Sakane, Kazuo: *See—*
Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, 4,927,818, Cl. 514-202.000.

Sakata, Shuichi: *See—*
Masuda, Masaaki; Kotani, Masanori; Wakahara, Katsuhiro; and Sakata, Shuichi, 4,926,653, Cl. 62-204.000.

Sakayori, Hiroyuki: *See—*
Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, 4,927,493, Cl. 156-643.000.

Sakimori, Hideharu; Ihara, Susumu; and Hayashi, Hiroyuki, to Mazda Motor Corporation. Engine valve feed apparatus. 4,927,314, Cl. 414-416.000.

Sako, Mineyuki: *See—*
Okamoto, Hiroshi; Oka Tateki; Sako, Mineyuki; Kyogoku, Tetsuo; and Suzuki, Toshikazu, 4,928,145, Cl. 355-245.000.

Sakuma, Yuichi, to Nissan Motor Co., Ltd. Exhaust system for multi-cylinder engine. 4,926,635, Cl. 60-299.000.

Sakuyama, Hiroshi: *See—*
Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba, Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, 4,926,906, Cl. 137-625.300.

Sala, Siro: *See—*
Winkler, Robert; Sala, Siro; Kobayashi, Takayuki; and Yokota, Shinjiro, 4,927,494, Cl. 159-2.100.

Salce, Luigi C., Sr., to Advance Manufacturing Co., Inc. Torque tool. 4,926,699, Cl. 73-862.210.

Salcher, Olga: *See—*
Frobel, Klaus; Muller, Hartwig; Bischoff, Erwin; Salcher, Olga; de Jong, Anno; Berschauer, Friedrich; and Scheer, Martin, 4,927,810, Cl. 514-23.000.

Salinas, Philip, to Gates Rubber Company, The. Intersticed nipple for elastomeric hose. 4,926,909, Cl. 138-109.000.

Salomon, Mary F.: *See—*
Jolley, Scott T.; and Salomon, Mary F., 4,927,554, Cl. 252-68.000.

Salomon, S.A.: *See—*
Provence, Marc; and Rousset, Didier, 4,927,168, Cl. 280-615.000.

Salvagno, Elvio, to Bull HN Information Systems Italia S.p.A. Selective grounding device for electronic equipment. 4,927,367, Cl. 439-92.000.

Sampey, Ted J. Safety choke valve. 4,926,898, Cl. 137-315.000.

Sampson, Robert; and Flanigan, Sean, to Wasco Products, Inc. Skylight construction. 4,926,594, Cl. 52-200.000.

Sanborn, Bruce A.: *See—*
Hallings, Leonard L.; Bramer, Donald W.; Sanborn, Bruce A.; and Schryver, James E., 4,928,211, Cl. 362-33.000.

Sandberg, John A.: *See—*
Dahlinder, Lars-Erik D.; Johansson, Mats O.; Sandberg, John A.; and Sjo, 4,927,640, Cl. 424-497.000.

Sanders, Beatrix Y.: *See—*
Fitzgerald, Walter P.; Sanders, Beatrix Y.; and Bagheri, Mansour A. H., 4,927,307, Cl. 411-302.000.

Sandmann, Heinz: *See—*
Meislitzer, Karl-Heinz; and Sandmann, Heinz, 4,927,984, Cl. 174-92.000.

Sandoz Ltd.: *See—*
Gisi, Ulrich, 4,927,823, Cl. 514-237.500.

Sandoz Pharm. Corp.: *See—*
Damon, Robert E., II; and Wareing, James R., 4,927,851, Cl. 514-460.000.

Sands, Philip W., to Shipley Company, Inc. Fitting for connecting a drum to a pipeline. 4,927,188, Cl. 285-89.000.

Sanemitsu, Yuzuru: *See—*
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, 4,927,827, Cl. 514-256.000.

Sanford, David L.; and Douglass, Gary W., to United Technologies Corporation. Fitting with lock wire feature. 4,927,187, Cl. 285-80.000.

Sanford, Kirk. Retractable cigarette lighter holder. 4,927,354, Cl. 431-253.000.

Sankaranarayanan, Ashok: *See—*
Watson, Gary W.; Cheskis Harvey P.; and Sankaranarayanan, Ashok, 4,926,927, Cl. 164-429.000.

Sanken Electric Co., Ltd.: *See—*
Ushikubo, Takao; Iwasa, Yasuhiro; and Yamaji, Yukinori, 4,927,069, Cl. 228-123.000.

Sano, Joji. Manufacturing process of packed fast-cooking rice. 4,927,660, Cl. 426-618.000.

Sano, Yasuro: *See—*
Hanyu, Susumu; Hara, Kazumasa; and Sano, Yasuro, 4,926,770, Cl. 112-453.000.

Sanofi: *See—*
Boigegrain, Robert; Cecchi, Roberto; and Boveri, Sergio, 4,927,955, Cl. 560-45.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Hayasaka, Kenichi, 4,927,393, Cl. 440-112.000.
Kudoh, Noboru; Hirukawa, Itsushi; Aoki, Satoshi; Yoshimura, Tsuyoshi; and Shiozawa, Shigeki, 4,927,390, Cl. 440-88.000.

Santa Barbara Research Center: *See—*
Jack, Michael D.; Chapman, George R.; and Ray, Michael, 4,927,773, Cl. 437-22.000.

Santel, Hans-Joachim: *See—*
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,927,454, Cl. 71-93.000.

Sare, Edward J.: *See—*
Wiedrich, Charles R.; and Sare, Edward J., 4,927,546, Cl. 210-755.000.

Sargent, Charles L.; Antos, John M.; and Biba, Scott I., to Thetford Corporation. Portable toilet with battery operated flush assembly. 4,926,508, Cl. 4-329.000.

Sargent, James D.: *See—*
Kamath, Vasanth R.; and Sargent, James D., 4,927,891, Cl. 525-327.300.

Sasagawa, Katsuyoshi: *See—*
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,928,172, Cl. 358-98.000.

Sasaki, Hidemi: *See—*
Takahashi, Kimihide; Sasaki, Hidemi; and Nakayama, Yoshiaki, 4,928,179, Cl. 358-210.000.

Sasaki, Isao: *See—*
Anzai, Hisao; Makino, Hideaki; Ootani, Masami; Sasaki, Isao; and Nishida, Kozi, 4,927,893, Cl. 525-378.000.

Sasaki, Masahiko: *See—*
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,928,172, Cl. 358-98.000.

Sasaki, Yasuo: *See—*
Kise, Masahiro; Yoshimoto, Yoshihiko; Fujisawa, Hiroshi; Sasaki, Yasuo; and Yasufuku, Shoji, 4,927,835, Cl. 514-448.000.

Satake, Mitsuo: *See—*
Teraoka, Kazuharu; Satake, Mitsuo; Denda, Toshio; Katayama, Takashi; and Seyasu, Shiro, 4,928,229, Cl. 364-464.010.

Satariano, Richard M.: *See—*
Abbott, Kenneth E.; Lyons, Patrick J.; and Satariano, Richard M., 4,926,589, Cl. 51-427.000.

Sato, Kazo, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent and polymerizable compound. 4,927,730, Cl. 430-138.000.

Sato, Kozo: *See—*
Kawata, Ken; Sato, Kozo; and Tsuboi, Masayoshi, 4,927,897, Cl. 526-240.000.

Sato, Masamichi: *See—*
Matsumoto, Takashi; Sato, Masamichi; Yoshida, Satoshi; and Kato, Yoshiaki, 4,928,186, Cl. 360-21.000.

Sato, Mitsuru; Iizuka, Tetsuya; Furuya, Kiyoshi; Shoji, Norio; and Sekine, Masato, to Sony Corporation. Automatic gain control circuit. 4,928,074, Cl. 330-254.000.

Sato, Seiichi, to Kato Hatsujo Kaisha, Ltd. Screw grommet. 4,927,306, Cl. 411-182.000.

Sato, Takeshi: *See—*
Yamamoto, Hideo; Sato, Takeshi; Yoshimi, Toshikazu; Mori, Shuichi; and Tokumo, Akio, 4,928,071, Cl. 330-129.000.

Sato, Tsunehiko: *See—*
Chino, Naoyoshi; Sato, Tsunehiko; Saito, Shinji; and Ogawa, Hiroshi, 4,927,665, Cl. 427-131.000.

Saturn Corporation: *See—*
Adams, Frederic R.; Boyer, Jeffrey M.; Schultz, Ronald N.; and Taylor, Barry, 4,926,959, Cl. 180-315.000.

Saulnier, Kenneth D.; and Van Leeuwen, Hubert J., to Saulnier, Kenneth D. Combined buoy and anchor device. 4,927,395, Cl. 441-26.000.

Savenije, Herman: *See—*
DeRudder, James L.; Savenije, Herman; and Wang, I-Chung W., 4,927,880, Cl. 525-63.000.

Savick, Wayne K.: *See—*
Fossum, Steven C.; Sedivy, J. Gregory; and Savick, Wayne K., 4,926,674, Cl. 73-4.00R.

Savord, Bernard J.: *See—*
Brock-Fisher, George A.; Kranz, Paul R.; Mniece, James R.; Thiele, Karl E.; Savord, Bernard J.; and Smith, Richard B., 4,926,872, Cl. 128-661.010.

Sawa, Toshio: *See—*
Nishino, Yoshitaka; Sawa, Toshio; Ohsumi, Katsumi; and Itow, Hisao, 4,927,598, Cl. 376-306.000.

Sawada, Akihiko: *See—*
Ito, Yoshiaki; Nagai, Kougi; Sawada, Akihiko; and Koike, Hideyuki, 4,927,338, Cl. 417-462.000.

Saxenmeyer Jr., George J.: *See—*
Eckler, Donald F.; Mankus, John R.; Ripp, Francis J.; and Saxenmeyer Jr., George J., 4,927,387, Cl. 439-499.000.

Saxon, Ronald L.; Zeger, Leroy; and Horbatt, Kenneth, to Pharmacia ENI Diagnostics, Inc. Automatic reagent dispenser. 4,927,765, Cl. 436-43.000.

Scaduto, Onofrio. Suspension system with constant camber. 4,927,169, Cl. 280-661.000.

Scala, Christopher R. Sculpture process. 4,927,504, Cl. 204-23.000.

Scandrett, John H.: *See—*
Morrill, Vaughan, Jr.; Scandrett, John H.; and Hudson, David K., 4,926,543, Cl. 29-623.000.

Schaefer, John P. Golf putting practice device. 4,927,153, Cl. 273-187.00R.

Schaffer, Leslie E.: *See—*
Garg, Diwakar; Wrecsics, Ernest L.; Schaffer, Leslie E.; Mueller, Carl F.; Dyer, Paul N.; and Fabregas, Keith R., 4,927,713, Cl. 428-627.000.

Schaffer, Timothy J., to Westinghouse Electric Corp. Wideband multichannel digital radio frequency memory. 4,928,104, Cl. 342-15.000.

Schauer, Friedrich; and Wolff, Manfred, to Kabelmetal Electro GmbH. Apparatus for providing an electrical conduction path between two contact locations which are rotatable with respect to each other. 4,927,365, Cl. 439-15.000.

Schechter, Elieser. Indexed reference book. 4,927,178, Cl. 283-38.000.

Schedlitzki, Dietmar: *See—*
Fock, Jurgen; and Schedlitzki, Dietmar, 4,927,961, Cl. 562-103.000.

Scheer, Martin: *See—*
Frobel, Klaus; Muller, Hartwig; Bischoff, Erwin; Salcher, Olga; de Jong, Anno; Berschauer, Friedrich; and Scheer, Martin, 4,927,810, Cl. 514-23.000.

Scheffner, Wolfgang: *See—*
Durkop, Willi; and Scheffner, Wolfgang, 4,927,383, Cl. 439-491.000.

Scher, Richard K.: *See—*
DeVillez, Richard L.; and Scher, Richard K., 4,927,626, Cl. 424-61.000.

Schiemer, Thomas, Jr.: *See—*
Morrissey, Mark E.; and Schiemer, Thomas, Jr., 4,927,159, Cl. 273-338.000.

Schilling, Peter, to Westvaco Corporation. Lignin-based cement fluid loss control additive. 4,926,944, Cl. 166-293.000.

Schimmel, Karl F.; and Blackburn, William P., to PPG Industries, Inc. High solids coating compositions containing a polyepoxide and a copolymer of an alpha-olefin and an olefinically unsaturated monoanhydride. 4,927,868, Cl. 523-439.000.

Schink, Helmut; and Schnell, Ralf D., to Siemens Aktiengesellschaft. Amplifying surface wave receiver. 4,928,069, Cl. 330-5.500.

Schipper, Paul H.: *See—*
Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., 4,927,526, Cl. 208-152.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,927,522, Cl. 208-120.000.

Schirmer, Robert M.; Fromm, Ellsworth H.; and Alquist, Henry E., to Phillips Petroleum Company. Method for burning nitrogen-containing fuels. 4,927,349, Cl. 431-10.000.

Schleuchardt, Manfred, to Francotyop-Postalia GmbH. Clutch for franking machine. 4,926,990, Cl. 192-28.000.

Schlipf, Michael, to Nokia Graetz. Glass viewing screen for a color-picture-reproducing device and a method of making the same. 4,928,035, Cl. 313-466.000.

Schlumberger Technology Corporation: *See—*
Jorion, Bruno; Galiano, Christian; and Wraight, Peter, 4,928,088, Cl. 340-854.000.
Kimball, Christopher V.; Stanke, Fred E.; Randall, Curtis J.; and Hayman, Andrew J., 4,928,269, Cl. 367-35.000.

Schmid, Gunther: *See—*
Auwarter, Gerhard; Imhof, Ernst; Komaroff, Iwan; Reum, Helmut; Schmid, Gunther; and Kaczynski, Bernhard, 4,926,819, Cl. 123-297.000.

Schmidt, Daniel G.: *See—*
Sevrain, Christophe Jean-Paul; Schramm, Heather R.; Schmidt, Daniel G.; Hooper, Paul S.; and Thomas, Mary P., 4,926,879, Cl. 128-798.000.

Schmidt, Erno : *See—*
Alpar, Tibor; Gyorvari, Janos; and Schmidt, Erno , 4,927,573, Cl. 264-40.100.

Schmidt, Guenter: *See—*
Kloetzer, Erhard; Kioustelidis, Johannes; and Schmidt, Guenter, 4,927,463, Cl. 106-109.000.

Schmidt, Karl-Heinz; and Waidelich, Wilhelm, to Gesellschaft fur Strahlen. Electronic camera-processing circuit for automatically tracking particles which move across an optical image. 4,928,176, Cl. 358-126.000.

Schmidt, Robert R.: *See—*
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,927,454, Cl. 71-93.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Schmitt, Rolf-Eberhard: *See—*
Friehmelt, Volker; Maier, Bernhard; Kohling, Alfons; and Schmitt, Rolf-Eberhard, 4,927,511, Cl. 204-151.000.
Schneider, Douglas A.: *See—*
Kaiser, Thomas A.; Mulder, Douglas C.; O'Ryan, David E.; Schneider, Douglas A.; and Ward, Rodney L., 4,927,346, Cl. 425-81.100.
Schneider, Ib: *See—*
Aaslyng, Dorrit A.; Jensen, Georg W.; Schneider, Ib; and Schneider, Palle, 4,927,558, Cl. 252-174.120.
Schneider, Lutz T.: *See—*
Henne, Heinrich; Dammertz, Karl-Heinz; Schneider, Lutz T.; and Blaszczyk, Gotthard, 4,927,086, Cl. 241-80.000.
Schneider Medical Technologies, Inc.: *See—*
Moncada, Elizabeth; and Schneider, Michael B., 4,927,417, Cl. 604-198.000.
Schneider, Michael B.: *See—*
Moncada, Elizabeth; and Schneider, Michael B., 4,927,417, Cl. 604-198.000.
Schneider, Palle: *See—*
Aaslyng, Dorrit A.; Jensen, Georg W.; Schneider, Ib; and Schneider, Palle, 4,927,558, Cl. 252-174.120.
Schneider, Peter; Ramos, Gerardo; and Bersier, Jacques, to Ciba-Geigy Corporation. Novel process for the manufacture of 4-acyloxy-3-hydroxyethyl-azetidinones. 4,927,507, Cl. 204-78.000.
Schneider, Rudolf, to Netall- u. Kunststoffwaren Erzeugengsgesellschaft M.B.H. Dental prosthesis implant 4,927,363, Cl. 433-173.000.
Schnell, Ralf D.: *See—*
Schink, Helmut; and Schnell, Ralf D., 4,928,069, Cl. 330-5.500.
Schnettler, Richard A.: *See—*
Grisar, J. Martin; Dage, Richard C.; and Schnettler, Richard A., 4,927,939, Cl. 548-188.000.
Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Kutner, Andrzej, 4,927,815, Cl. 514-167.000.
Schnoor, William J.: *See—*
Grabbe, Dimitry G.; and Schnoor, William J., 4,927,369, Cl. 439-66.000.
Schobl, Medardus: *See—*
Melzig, Manfred; Rosler, Horst; and Schobl, Medardus, 4,927,239, Cl. 350-165.000.
Schoen, Neil C. Single pass phase conjugate aberration correcting imaging telescope. 4,927,251, Cl. 350-503.000.
Schofield, John A.; Betteridge, Peter R.; Ryback, George; and Geary, Philip J., to Shell Oil Company. New strains of *Pseudomonas putida* and their use. 4,927,759, Cl. 435-156.000.
Schohl, Gerald A.; and Vigander, Svein, to Tennessee Valley Authority. Air detector for liquid-filled sensing lines. 4,926,675, Cl. 73-19.000.
Scholz, Dankmar: *See—*
Wallbillich, Guenter; Bleckmann, Gerhard; and Scholz, Dankmar, 4,927,740, Cl. 430-309.000.
Scholz, Edward. Adjustable louvered awning. 4,926,599, Cl. 49-88.000.
Schott Glaswerke: *See—*
Greulich, Norbert; Kiefer, Werner; and Rehm, Veronika, 4,927,442, Cl. 65-18.100.
Tauber, Gunter; and Dornauf, Andrea, 4,927,518, Cl. 204-421.000.
Schrader, Dieter; and Neuhaus, Winifred, to Henkel Kommanditgesellschaft auf Aktien. Emulsion-form hydrogen peroxide preparations for the bleaching and oxidative dyeing of hair. 4,927,627, Cl. 424-62.000.
Schramm, Heather R.: *See—*
Sevrain, Christophe Jean-Paul; Schramm, Heather R.; Schmidt, Daniel G.; Hooper, Paul S.; and Thomas, Mary P., 4,926,879, Cl. 128-798.000.
Schray, Hans-Dieter: *See—*
Harms, Klaus; Schray, Hans-Dieter; Taubitz, Bernd; and Wirtz, Rainer, 4,928,042, Cl. 318-254.000.
Schreckenberg, Manfred; Dhein, Rolf; Rudolph, Hans; and Nouvertne Werner, to Bayer Aktiengesellschaft. Diphenol monoesters of carboxylic acids and process for their preparation. 4,927,903, Cl. 528-176.000.
Schroder, Joris, to Inventio AG. Method and apparatus for the control of elevator cars from a main floor during up peak traffic. 4,926,976, Cl. 187-125.000.
Schryver, James E.: *See—*
Hallings, Leonard L.; Bramer, Donald W.; Sanborn, Bruce A.; and Schryver, James E., 4,928,211, Cl. 362-33.000.
Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Braun, Erwin; Strobel, Michael; and Karl, Rupert, 4,926,627, Cl. 57-412.000.
Schuelke, Armin: *See—*
Taubitz, Bernd; Zieher, Peter; Kramer, Claus; Engelsdorf, Kurt; and Schuelke, Armin, 4,926,983, Cl. 188-299.000.
Schultheiss, Eberhard; and Wirz, Peter, to Leybold Aktiengesellschaft. Method and arrangement for fabricating magneto-optical, storable, and/or deletable data carriers. 4,927,513, Cl. 204-192.130.
Schultz, Ronald N.: *See—*
Adams, Frederic R.; Boyer, Jeffrey M.; Schultz, Ronald N.; and Taylor, Barry, 4,926,959, Cl. 180-315.000.
Schulz, Galyn A., to James River Corporation of Virginia. Method multi-ply embossed fibrous sheet. 4,927,588, Cl. 264-258.000.
Schumer, Leroy F. Ladder supports. 4,926,968, Cl. 182-172.000.
Schwartz, Alfred, to Hughes Aircraft Company. Multiple pupil projection display. 4,927,262, Cl. 353-13.000.
Schwartz, Paul A., to Eastman Kodak Company. Photographic stabilizing bath containing polyarcylic acid. 4,927,746, Cl. 430-372.000.
Schwarz, Albert J.; and Pietramale, Anthony M., to Pullman Company, The. Plug valve. 4,927,116, Cl. 251-312.000.
Schwarz, Joshua; and Accardi, Christine, to Lever Brothers Company. Low perborate to precursor ratio bleach systems. 4,927,559, Cl. 252-186.390.
Schweizer, Werner; McGuire, Daniel J.; and Archer, Edward D., to Curt G. Joa, Inc. Stack stripper for a stacking machine. 4,927,322, Cl. 414-794.700.
Schwengers, Dieter, to Pfeifer & Langen. Water soluble iron dextran and a process for its manufacture. 4,927,756, Cl. 435-103.000.
Schwerdt, Hans-Werner, to Carl Freudenberg, Firma. Elastic sleeve spring with reinforcement bodies for increased stiffness. 4,927,123, Cl. 267-140.100.
SCI Systems, Inc.: *See—*
Fulton, Alfred L., 4,928,133, Cl. 346-150.000.
Scimone, Anthony: *See—*
Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, 4,927,658, Cl. 426-611.000.
Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, 4,927,659, Cl. 426-611.000.
Scoates, Samuel W.: *See—*
Scoates, William D.; and Scoates, Samuel W., 4,927,328, Cl. 415-220.000.
Scoates, William D.; and Scoates, Samuel W. Shroud assembly for axial flow fans. 4,927,328, Cl. 415-220.000.
Scott, John C., to Raytheon Company. Amplifier having suppressed spurious frequency components. 4,928,072, Cl. 330-149.000.
Scozzafava, Michael; Tang, Ching W.; and Young, Ralph H., to Eastman Kodak Company. Photoreceptor with polynuclear bisoxazole or bisthizole. 4,927,726, Cl. 430-78.000.
Scully, Marlan O., to Agri Research and Development. Sustained release medicating device for livestock. 4,927,419, Cl. 604-892.100.
Seagate Technology, Inc.: *See—*
Martin-Lopez, Fernando, 4,928,054, Cl. 323-288.000.
Sealed Air Corporation: *See—*
Kannankeril, Charles P., 4,927,010, Cl. 206-204.000.
Security Services PLC: *See—*
Stapley, Gerald; Tate, Geoffrey; and Hardisty, Derek, 4,926,665, Cl. 70-277.000.
Sedivy, J. Gregory: *See—*
Fossum, Steven C.; Sedivy, J. Gregory; and Savick, Wayne K., 4,926,674, Cl. 73-4.00R
Segelken, John M.: *See—*
Pimpinella, Richard J.; and Segelken, John M., 4,926,545, Cl. 29-832.000.
Seguin, Marie-Christine: *See—*
Gueyne, Jean; and Seguin, Marie-Christine, 4,927,952, Cl. 556-419.000.
Seiford, Donald S., Sr., to DS Industrial & Marine Co., Inc. Rail car moving system. 4,926,755, Cl. 104-183.000.
Seiko Epson Corporation: *See—*
Aoki, Kenji; Nagata, Mitsuo; Nakamura, Haruo; and Miura, Teiji, 4,927,242, Cl. 350-346.000.
Seiko Instruments Inc.: *See—*
Kawahara, Yukito, 4,928,095, Cl. 340-784.000.
Seita, Yukio; and Emi, Makoto, to Terumo Kabushiki Kaisha (Terumo Corporation). Method for the manufacture of flat permeable membrane. 4,927,576, Cl. 264-49.000.
Sekiguchi, Jinichi, to Meikho Industry Corp., Ltd. Ornamental button. 4,926,527, Cl. 24-90.00A.
Sekiguchi, Sunao, to NEC Corporation. Scalar data arithmetic control system for vector arithmetic processor. 4,928,238, Cl. 364-200.000.
Sekine, Masato: *See—*
Sato, Mitsuru; Iizuka, Tetsuya; Furuya, Kiyoshi; Shoji, Norio; and Sekine, Masato, 4,928,074, Cl. 330-254.000.
Selenia Industrie Elettroniche Associate S.p.A.: *See—*
Volpe, Fulvio; and Perchiazzi, Michele, 4,928,208, Cl. 361-395.000.
Sellke, Richard G.: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.
Sells, Charles C.; and Martin, Robert N., to Sportsman's Market, Inc. Charcoal grilling unit. 4,926,838, Cl. 126-25.00A.
Semiconductor Energy Laboratory Co., Ltd.: *See—*
Hirose, Naoki; Inujima, Takashi; and Takayama, Toru, 4,926,791, Cl. 118-723.000.
Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, 4,927,493, Cl. 156-643.000.
Sempell Armaturen GmbH: *See—*
Windelbandt, Herbert, 4,926,534, Cl. 29-888.451.
Senckowski, Joseph M.: *See—*
Senckowski, Patrick D., 4,927,668, Cl. 427-168.000.
Senckowski, Patrick D., to Senckowski, Joseph M.; and Senckowski, Patrick D. Treatment for automobile windshields. 4,927,668, Cl. 427-168.000.
Senga, Mitsuo: *See—*
Hiraoka, Saburo; Hama, Shinji; and Senga, Mitsuo, 4,927,915, Cl. 528-490.000.
Senshu, Hisashi; and Otsuka, Masahiro, to Orient Chemical Industries, Ltd. Purification of C.I. solvent black 3. 4,927,538, Cl. 210-634.000.
Senturia, Stephen D.: *See—*
Haritonidis, Joseph H.; Senturia, Stephen D.; Warkentin, David J.; and Mehregany, Mehran, 4,926,696, Cl. 73-205.000.
Serpentix Conveyor Corporation: *See—*
Dolan, Michael S., 4,927,006, Cl. 198-822.000.

Sevrain, Christophe Jean-Paul; Schramm, Heather R.; Schmidt, Daniel G.; Hooper, Paul S.; and Thomas, Mary P., to Sevrain-Tech, Inc. Electro-tactile stimulator. 4,926,879, Cl. 128-798.000.
Sevrain-Tech, Inc.: *See—*
Sevrain, Christophe Jean-Paul; Schramm, Heather R.; Schmidt, Daniel G.; Hooper, Paul S.; and Thomas, Mary P., 4,926,879, Cl. 128-798.000.
Seyasu, Shiro: *See—*
Teraoka, Kazuharu; Satake, Mitsuo; Denda, Toshio; Katayama, Takashi; and Seyasu, Shiro, 4,928,229, Cl. 364-464.010.
SGS-Thomson Microelectronics S.p.A.: *See—*
Spatrisano, Antonio P.; Gandolfi, Luciano; Minotti, Carlo; and Di Cristina, Natale, 4,926,547, Cl. 29-841.000.
SGS-Thomson Microelectronics SRL: *See—*
Nguyen, Chinh, 4,928,261, Cl. 365-104.000.
Pietrobon, Giovanni; Rossi, Domenico; and Pappalardo, Salvatore, 4,928,049, Cl. 318-685.000.
Shaffer, John W., to GTE Products Corporation. Incandescent lamps including a combined getter. 4,927,398, Cl. 445-9.000.
Shang, Jean Y. Electrical push-pull connector. 4,927,381, Cl. 439-438.000.
Shannon, John K., Sr. Adjustable crimping tool. 4,926,685, Cl. 72-410.000.
Shapiro, Raymond E.: *See—*
Doyle, Peter L.; Ellenberger, John P.; Jones, Ellis O.; Carver, David C.; DiPirro, Steven D.; Gerovac, Branko J.; Armstrong, William P.; Gibson, Ellen S.; Shapiro, Raymond E.; Rushforth, Kevin C.; and Roach, William C., 4,928,247, Cl. 364-518.000.
Sharma, Ravinder K.; Geyer, Harry J.; and Mitchell, Douglas G., to Motorola Inc. Metallization scheme providing adhesion and barrier properties. 4,927,505, Cl. 204-34.500.
Sharp Kabushiki Kaisha: *See—*
Honda, Iwakazu, 4,928,129, Cl. 346-160.000.
Masuda, Masaaki; Kotani, Masanori; Wakahara, Katsuhiro; and Sakata, Shuichi, 4,926,653, Cl. 62-204.000.
Nakatsu, Hiroshi, 4,927,371, Cl. 439-79.000.
Okamoto, Yuji, 4,928,143, Cl. 355-218.000.
Shino, Katsuhide, 4,927,368, Cl. 439-66.000.
Takafuji, Yutaka, 4,928,123, Cl. 353-20.000.
Tanaka, Hironori; Kotani, Matahira; and Matsumoto, Masafumi, 4,927,130, Cl. 271-10.000.
Tanaka, Toshiyuki; Kuga, Shigeki; Nakamura, Nobuo; Morishita, Taro; and Wada, Masahiro, 4,928,236, Cl. 364-513.000.
Sharpe, Hillary M. Method of preventing cellulosic web degradation using an amine vapor. 4,927,497, Cl. 162-160.000.
Shaw, Henry, to Picanol N.V. Detection and standby weft supply apparatus break. 4,926,911, Cl. 139-435.100.
Shaw, Paul V.: *See—*
Buechele, James L.; Nielsen, Edward L.; Dong, Walter; and Shaw, Paul V., 4,927,978, Cl. 568-724.000.
Dong, Walter; Shaw, Paul V.; and Buechele, James L., 4,927,973, Cl. 568-724.000.
Shekleton, Jack R., to Sundstrand Corporation. Jet air cooled turbine shroud for improved swirl cooling and mixing. 4,926,630, Cl. 60-39.360.
Shell Internationale Research Maatschappij, B.V.: *See—*
Briggs, Stuart P.; and Wood, Derek A., 4,927,945, Cl. 549-305.000.
Wilson, John R. H.; and Pettman, Roger B., 4,927,840, Cl. 514-397.000.
Wilson, John R. H.; Pettman, Roger B.; and Reid, Derek J., 4,927,841, Cl. 514-400.000.
Shell Oil Company: *See—*
Buechele, James L.; Nielsen, Edward L.; Dong, Walter; and Shaw, Paul V., 4,927,978, Cl. 568-724.000.
Corley, Larry S., 4,927,907, Cl. 528-322.000.
Dong, Walter; Shaw, Paul V.; and Buechele, James L., 4,927,973, Cl. 568-724.000.
Drent, Eit; and Broekhuis, Antonius A., 4,927,892, Cl. 525-340.000.
Glandt, Carlos A.; Vinegar, Harold J.; and Prats, Michael, 4,926,941, Cl. 166-248.000.
Schofield, John A.; Betteridge, Peter R.; Ryback, George; and Geary, Philip J., 4,927,759, Cl. 435-156.000.
Wang, Pen C., 4,927,906, Cl. 528-228.000.
Wang, Pen C., 4,927,908, Cl. 528-323.000.
Zijsling, Djurre H., 4,926,950, Cl. 175-39.000.
Shellenberger, Timothy J.; and Harrigill, William T., to Rheem Manufacturing Company. Pilot gas bypass system for fuel-fired furnaces. 4,926,840, Cl. 126-110.00R.
Sherman, John B.: *See—*
Emerson, Richard C.; and Sherman, John B., 4,927,099, Cl. 244-152.000.
Sherwood Medical Company: *See—*
Lott, Gloria Y.; Britton, Scott M.; and Constantine, Barry E., 4,926,850, Cl. 128-155.000.
Shevtsov, Vitaly T.: *See—*
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.
Shiba, Takahumi, to Pioneer Electronic Corporation. Spindle motor stop control device. 4,928,044, Cl. 318-364.000.
Shibagaki, Taro: *See—*
Ibe, Hiroyuki; Shibagaki, Taro; and Shimizu, Fumihiko, 4,928,318, Cl. 455-608.000.
Shibamoto, Yuta: *See—*
Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi; Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, 4,927,941, Cl. 548-264.800.
Shibata, Katsuhiro; Azuma, Yuichi; Inoue, Masao; and Okumura, Shinichiro, to Honda Giken Kogyo Kabushiki Kaisha. Friction pad for use with disc brake. 4,926,978, Cl. 188-73.100.
Shibata, Terukazu; Numa, Nobushige; and Kawamura, Masafumi, to Kansai Paint Co., Ltd. Air-drying non-water-dispersible resin composition. 4,927,877, Cl. 525-7.000.
Shiga, Toshikazu; and Suzaki, Takuji, to Omron Tateisi Electronics Co. Non-invasive measuring method and apparatus of blood constituents. 4,927,264, Cl. 356-41.000.
Shigeki, Terumitsu: *See—*
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mitzutani, Satoshi; and Isono, Toru, 4,927,190, Cl. 285-175.000.
Shigemura, Takuro: *See—*
Kita, Tatsuya; Shigemura, Takuro; Nakamura, Setsuo; and Nakane, Hisanori, 4,926,816, Cl. 123-203.000.
Shigemura, Tatsuya: *See—*
Kaku, Nobuyuki; Shigemura, Tatsuya; Uesugi, Masaki; Kano, Kiyoshi; and Ogiro, Kenji, 4,928,191, Cl. 360-85.000.
Shigeto, Kashiwabara: *See—*
Kazuo, Inoue; Noriyuki, Kishi; Masao, Kubodera; Eitetsu, Akiyama; Shigeto, Kashiwabara; and Osamu, Takizawa, 4,926,640, Cl. 60-602.000.
Shih, Chuan: *See—*
Taylor, Edward C.; Beardsley, George P.; Shih, Chuan; and Fletcher, Stephen R., 4,927,828, Cl. 514-258.000.
Shih, Jenn S.; Smith, Terry E.; and Login, Robert B., to GAF Chemicals Corporation. Aqueous process for preparing water-resistant coatings of hydrophobic copolymers made from hydrophilic monomers. 4,927,667, Cl. 427-154.000.
Shiley Incorporated: *See—*
Kamiya, Tadao; and Leader, Matthew J., 4,927,222, Cl. 350-96.150.
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, to Snow Brand Milk Products Co., Ltd. Alprenolol derivatives. 4,927,959, Cl. 560-193.000.
Shimamune, Takayuki: *See—*
Nishiki, Yoshinori; Nakamatsu, Shuji; and Shimamune, Takayuki, 4,927,800, Cl. 502-349.000.
Shimazaki, Fumio, to Topia Industry Co., Ltd. Curtain drawing device. 4,926,922, Cl. 160-331.000.
Shimazaki, Osamu: *See—*
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, 4,928,167, Cl. 358-80.000.
Shimizu, Fumihiko: *See—*
Ibe, Hiroyuki; Shibagaki, Taro; and Shimizu, Fumihiko, 4,928,318, Cl. 455-608.000.
Shimizu, Keiko: *See—*
Konishi, Masataka; Shimizu, Keiko; Ohbayashi, Masaru; Tomita, Koji; Miyaki, Takeo; and Oki, Toshikazu, 4,927,848, Cl. 514-453.000.
Shimkus, John W.; and Brownell, Jane M. Adjustable elastic bandage. 4,926,848, Cl. 128-169.000.
Shimokawa, Kazuhiro: *See—*
Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi; Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, 4,927,941, Cl. 548-264.800.
Shimomura, Takeshi: *See—*
Yamaguchi, Shuichiro; Uchida, Naoto; Shimomura, Takeshi; and Oyama, Noboru, 4,927,516, Cl. 204-403.000.
Shimotsuhama, Isao; Emori, Shinji; Watanabe, Yoshio; and Tamamura, Masaya, to Fujitsu Limited. Referenceless ECL logic circuit. 4,928,024, Cl. 307-455.000.
Shimura, Kazuo, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,928,011, Cl. 250-327.200.
Shin-Etsu Chemical Co., Ltd.: *See—*
Takahashi, Masaharu; and Yoshida, Takeo, 4,927,587, Cl. 264-211.000.
Shin-Etsu Handotai Co., Ltd.: *See—*
Arima, Noburu; Ogino, Nobuyosi; and Kimura, Hirosi, 4,926,793, Cl. 118-730.000.
Shinbo, Haruo: *See—*
Naito, Kenzo; Ishibashi, Yukio; and Shinbo, Haruo, 4,927,964, Cl. 562-560.000.
Shino, Katsuhide, to Sharp Kabushiki Kaisha. Connector 4,927,368, Cl. 439-66.000.
Shinoda, Masaru: *See—*
Miyajima, Nobukazu; Tanaka, Akira; and Shinoda, Masaru, 4,926,862, Cl. 428-419.00D.
Shinozaki, Kenichi: *See—*
Otsuka, Tetsuji; Shinozaki, Kenichi; Toyoyama, Kenji; and Ishihara, Shinobu, 4,927,356, Cl. 431-351.000.
Shintani, Yooichi: *See—*
Kamada, Eiki; Shintani, Yooichi; Kuriyama, Kazunori; Shonai, Tohru; and Inoue, Kiyoshi, 4,928,226, Cl. 364-200.000.
Shionogi & Co., Ltd.: *See—*
Matsutani, Shigeru; and Mizushima, Yukio, 4,927,829, Cl. 514-258.000.
Shiota, Kazuo: *See—*
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, 4,928,167, Cl. 358-80.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Shioya, Yoshiaki: *See—*
Imoto, Koji; Omura, Tedao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki; and Shioya, Yoshiaki, 4,926,817, Cl. 123-292.000.

Shiozawa, Kouji: *See—*
Takatsuna, Kazutoshi; Shiozawa, Kouji; and Okumura, Yoshiharu, 4,927,953, Cl. 556-413.000.

Shiozawa, Shigeki: *See—*
Kudoh, Noboru; Hirukawa, Itsushi; Aoki, Satoshi; Yoshimura, Tsuyoshi; and Shiozawa, Shigeki, 4,927,390, Cl. 440-88.000.

Shipley Company, Inc.: *See—*
Sands, Philip W., 4,927,188, Cl. 285-89.000.

Shippey, Michael A.: *See—*
Erdman, Timothy R.; Shippey, Michael A.; and Wollenberg, Robert H., 4,927,551, Cl. 252-42.700.

Shiraki, Toshihiko: *See—*
Kusumoto, Hirotaka; and Shiraki, Toshihiko, 4,926,993, Cl. 192-98.000.

Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Modified block copolymer and a process for producing the same. 4,927,889, Cl. 525-285.000.

Shirley, Thomas F., Jr.; and Goldsmith, Eric S., to Motorola, Inc. Radio programming device with access to a remote database. 4,927,789, Cl. 455-67.000.

Shiroshita, Masao: *See—*
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, 4,927,827, Cl. 514-256.000.

Shoji, Norio: *See—*
Sato, Mitsuru; Iizuka, Tetsuya; Furuya, Kiyoshi; Shoji, Norio; and Sekine, Masato, 4,928,074, Cl. 330-254.000.

Shonai, Tohru: *See—*
Kamada, Eiki; Shintani, Yooichi; Kuriyama, Kazunori; Shonai, Tohru; and Inoue, Kiyoshi, 4,928,226, Cl. 364-200.000.

Shopsmith, Inc.: *See—*
Legler, John G.; Folkerth, Harold E.; and Flora, David D., 4,926,916, Cl. 144-136.00R.

Shou-Fu, Zhong: *See—*
Ma, Bao P.; Shou-Fu. Zhong; and Li, Qin Z., 4,926,742, Cl. 89-33.020.

Shrontz, Darrell G.: *See—*
Markiewicz, James E., and Shrontz, Darrell G., 4,926,667, Cl. 72-256.000.

Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, to Centre International de Recherches Dermatologiques C.I.R.D. Aromatic benzamido compounds, their preparation and their use in human or veterinary medicine or in cosmetic preparations. 4,927,928, Cl. 544-154.000.

Shutske, Gregory M.; and Kapples, Kevin J., to Hoechst Roussel Pharmaceuticals Inc. Fused heterocyclic derivatives of 1,2,3,4-tetrahydroacridine. 4,927,820, Cl. 514-229.500.

Shvartsman, Felix P.: *See—*
Krongauz, Valeri A.; and Shvartsman, Felix P., 4,927,917, Cl. 534-567.000.

Sicard, Thierry M. A.; and Suquet, Michel J., to Siemens Aktiengesellschaft. Control circuit for an inductive load. 4,928,053, Cl. 323-284.000.

Siddiq, Mohammed, to Tandy Corporation. Multifunctional magnetic head cleaning media. 4,928,189, Cl. 360-128.000.

Siemens Aktiengesellschaft *See—*
Dannhaeuser, Friedrich, 4,928,098, Cl. 340-825.560.
Huber, Anton, 4,927,382, Cl. 439-490.000.
Roessler, Bernward, 4,928,308, Cl. 379-411.000.
Schink, Helmut; and Schnell, Ralf D., 4,928,069, Cl. 330-5.500.
Sicard, Thierry M. A.; and Suquet, Michel J., 4,928,053, Cl. 323-284.000.
Wessels, Gerd, 4,926,857, Cl. 128-24.00A.
Wittchow, Eberhard, 4,926,799, Cl. 122-235.00A.

Siemens Energy & Automation, Inc.: *See—*
DiMarco, Bernard; and Kaufman, Steven A., 4,927,308, Cl. 411-437.000.
Wight, Donald C.; and Krueger, Keith T., 4,927,982, Cl. 174-50.000.

Siemens Transmission Systems, Inc.: *See—*
Lind, Paul U., 4,928,067, Cl. 324-96.000.

Siemon Company, The: *See—*
Reynolds, Howard, 4,927,380, Cl. 439-411.000.

Siems, Wolfgang: *See—*
Lorenzen, Heinz-Christen; Heitmann, Uwe; Siems, Wolfgang; and Pinck, Peter, 4,926,886, Cl. 131-84.400.

Sievert, Chester E., Jr.: *See—*
Stice, James D.; Sievert, Chester E., Jr.; and Christian, Steven C., 4,926,860, Cl. 606-144.000.

Signet Armorlite, Inc.: *See—*
Vaughan, Thomas L., 4,927,480, Cl. 156-228.000.

Silver, Scott C.: *See—*
Arbige, Michael V.; and Silver, Scott C., 4,927,644, Cl. 426-35.000.

Simcock, John H., to Inductotherm Europe Limited. Induction melting and stirring. 4,927,460, Cl. 75-10.140.

Simmons, Randall G.: *See—*
Mathur, Krishna K.; Resnik, Robert K.; and Simmons, Randall G., 4,927,618, Cl. 423-432.000.

Simmons, Ray A. Locking cylinder heating. 4,927,993, Cl. 219-201.000.

Simon, Arno: *See—*
Keens, Axel; and Simon, Arno, 4,927,269, Cl. 356-346.000.

Simon, Dieter: *See—*
Stolz, Robert; Mirring, Knut; Hein, Rudolf; Simon, Dieter; Raab, Lothar; and Glatz, Peter, 4,927,276, Cl. 384-572.000.

Simon, Mark A.: *See—*
Smith, Richard D.; Knowles, Steve; Cassady, R. J.; Smith, William; and Simon, Mark A., 4,926,632, Cl. 60-203.100.

Simons, Robert E.: *See—*
Chrysler, Gregory; Chu, Richard C.; and Simons, Robert E., 4,928,207, Cl. 361-385.000.

Simpson, James L., to Hemox, Inc. Medical appliance disposal container. 4,927,076, Cl. 229-132.000.

Simpson, Jeanette: *See—*
Dorn, Allan R., 4,927,749, Cl. 435-2.000.
Dorn, Allan R., 4,927,750, Cl. 435-2.000.

Simpson, John B.: *See—*
Gifford, Hanson S., III; Simpson, John B.; and Brown, Peter S., 4,926,858, Cl. 606-159.000.

Simpson, Stuart M.: *See—*
Garth, Peter; Simpson, Stuart M.; Parkinson, John E.; and Rogers, Alan H., 4,927,741, Cl. 430-309.000.

Simpson, William, to Clem Environmental Corporation. Leak prevention structure, method and apparatus. 4,927,297, Cl. 405-270.000.

Sims, Dewey M., Jr.; and Mick, Ray E., to Colt Industries Inc. Wiper for variable electrical resistor. 4,928,083, Cl. 338-202.000.

Sin-Etsu Quartz Products Co., Ltd.: *See—*
Arima, Noburu; Ogino, Nobuyosi; and Kimura, Hirosi, 4,926,793, Cl. 118-730.000.

Sirefelt, Lars. Actuator. 4,927,005, Cl. 198-781.000.

Sit, Sing-Yuen; and Wright, John J., to Bristol-Myers Company. Antihypercholesterolemic nitrile compounds. 4,927,944, Cl. 549-292.000.

Sjo: *See—*
Dahlinder, Lars-Erik D.; Johansson, Mats O.; Sandberg, John A.; and Sjo, 4,927,640, Cl. 424-497.000.

SKC Limited: *See—*
Park, Won B.; and Oh, Ju Y., 4,928,197, Cl. 360-132.000.

SKF GmbH: *See—*
Stolz, Robert; Mirring, Knut; Hein, Rudolf; Simon, Dieter; Raab, Lothar; and Glatz, Peter, 4,927,276, Cl. 384-572.000.

Skoch, Michael J.; and Hetzel, Frederick, to General Electric Company. Means for converting a lamp with a screw-type base into a lamp with a bi-pin base. 4,928,032, Cl. 313-318.000.

Small Products Limited: *See—*
Small, Richard F.; Patel, Dakshesh S.; Barrow, Lascelle A.; and Dix, Barry M., 4,927,663, Cl. 427-40.000.

Small, Richard F.; Patel, Dakshesh S.; Barrow, Lascelle A.; and Dix, Barry M., to Small Products Limited. Method for minimizing curling in screen printing. 4,927,663, Cl. 427-40.000.

Smedley, William H.: *See—*
Haber, Terry M.; Smedley, William H.; Foster, Clark B.; and Lewis, John A., Jr., 4,927,019, Cl. 206-365.000.

Smigel, Robert L.: *See—*
Gelinas, William A.; Holtz, Edwin R.; Argazzi, Dennis J.; Smigel, Robert L.; and Wiley, Dan W., 4,927,487, Cl. 156-351.000.

Smith, Bradford L., to Wovenwire Corporation. Woven wire apparatus. 4,927,674, Cl. 428-11.000.

Smith, Bruce A.: *See—*
Agoglia, Robert J.; Dayan, Richard A.; and Smith, Bruce A., 4,928,193, Cl. 360-78.040.

Smith, Clyde M. Work chamber with shifting ventilation zone. 4,926,746, Cl. 98-115.200.

Smith, Dave W. Mobile wheelchair lift and brakes therefore. 4,926,973, Cl. 187-11.000.

Smith, David H., to Binks Manufacturing Company. Plural component air spray gun and method. 4,927,079, Cl. 239-11.000.

Smith, Dennis C.; and Maijer, Rolf. Orthodontic attachments. 4,927,361, Cl. 433-9.000.

Smith, Donald R.: *See—*
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.

Smith, Gary, to Mobile Music, Inc.; Smith, Gary; and Stefano, Joseph. Heated rotatable musical instrument stand. 4,926,735, Cl. 84-453.000.

Smith, Harold F.: *See—*
Dhanakoti, Padmanabhan; Moore, Gerry W.; and Smith, Harold F., 4,927,692, Cl. 428-137.000.

Smith, Hugh L.: *See—*
Enterline, David L.; and Smith, Hugh L., 4,927,257, Cl. 350-631.000.

Smith, James E.: *See—*
Whitlow, Graham A.; Bruck, Gerald J.; and Smith, James E., 4,927,992, Cl. 219-121.650.

Smith, James I.: *See—*
Jacobs, Linda Y.; Palmieri, Joseph M.; and Smith, James I., 4,928,080, Cl. 335-202.000.

Smith, June; and Smith, Steve. Framework for supporting and tying stacked waste paper and newspaper. 4,926,748, Cl. 100-34.000.

Smith, Keith E. Sweeper. 4,926,517, Cl. 15-82.000.

Smith, Mark L., to Boeing Company, The. Battery-operated data collection apparatus having an infrared touch screen data entry device. 4,928,094, Cl. 340-712.000.

Smith, Michael G.: *See—*
Renga, James M.; Pon, Charles K.; Gulbenkian, Aylin H.; and Smith, Michael G., 4,927,508, Cl. 204-79.000.

Smith, Michael P.: *See—*
Blackburn, Martin J.; and Smith, Michael P., 4,927,458, Cl. 75-246.000.

Smith, Richard B.: *See—*
Brock-Fisher, George A.; Kranz, Paul R.; Mniece, James R.; Thiele, Karl E.; Savord, Bernard J.; and Smith, Richard B., 4,926,872, Cl. 128-661.010.

Smith, Richard D.; Knowles, Steve; Cassady, R. J.; Smith, William; and Simon, Mark A., to Olin Corporation. Performance arcjet thruster. 4,926,632, Cl. 60-203.100.

Smith, Robert L., to Northrop Corporation. Theodolite target adaptor and method of use. 4,926,563, Cl. 33-293.000.

Smith, Robert S. Slip ring air bearing. 4,927,274, Cl. 384-101.000.

Smith, Roy E.; and Timan, Peter E., to UTDC Inc. Longitudinal steering linkage for truck with interaxle yokes. 4,926,756, Cl. 105-167.000.

Smith, Steve: *See—*
Smith, June; and Smith, Steve, 4,926,748, Cl. 100-34.000.

Smith, Terence M., to Thyssen Industrie AG. Apparatus for registering a scene, especially for its reproduction on the screen of a video monitor. 4,928,174, Cl. 358-108.000.

Smith, Terry E.: *See—*
Shih, Jenn S.; Smith, Terry E.; and Login, Robert B., 4,927,667, Cl. 427-154.000.

Smith, William: *See—*
Smith, Richard D.; Knowles, Steve; Cassady, R. J.; Smith, William; and Simon, Mark A., 4,926,632, Cl. 60-203.100.

Smook, Jan; Vos, Gerardus J. H.; Juijn, Johannes A.; and Van Hees, Theodorus J., to AKZO N.V. Process for preparing polyvinyl alcohol yarn. 4,927,586, Cl. 264-185.000.

Smoot, Lanny S., to Bell Communications Research, Inc. Teleconferencing terminal with camera behind display screen. 4,928,301, Cl. 379-53.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Streubel, Hans, 4,926,929, Cl. 164-445.000.

Smyth, Malcolm R.: *See—*
Reading, Christopher L.; Smyth, Malcolm R.; and O'Kennedy, Richard, 4,927,502, Cl. 204-153.100.

Snead, Wilford A., to Unitek Corporation. Convertible buccal tube. 4,927,362, Cl. 433-17.000.

Snedeker, Marvin L., to Labeltape Meditect Inc. Medical electrode. 4,926,878, Cl. 128-798.000.

Snow Brand Milk Products Co., Ltd.: *See—*
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, 4,927,959, Cl. 560-193.000.

Snowball, Malcolm R.; and Hayes, Cecil, to W. M. Still & Sons Limited. Apparatus with steam trap for heating and dispensing hot liquids. 4,927,060, Cl. 222-146.500.

Snyder, Keith A.: *See—*
Jones, Alan L.; Snyder, Keith A.; and Winkler, Paul E., 4,927,983, Cl. 174-258.000.

Snyder, Stephen J., to UAS Support, Inc. Sound attenuating laminate for jet aircraft engines. 4,926,963, Cl. 181-290.000.

Sobukawa, Hiroshi: *See—*
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 4,926,648, Cl. 62-55.500.

Societa' Cavi Pirelli S.p.A.: *See—*
Magnani, Francesco; and Minardi, Paolo, 4,927,294, Cl. 405-177.000.

Societa' Italiana per L'Esercizio Delle Telecomunicazioni P.A.: *See—*
D'Aria, Giovanna; and Taricco, Giorgio, 4,928,288, Cl. 375-17.000.

Societe Anonyme dite: Alcatel Espace: *See—*
Franchini, Elisabeth, 4,928,317, Cl. 455-601.000.

Societe Anonyme dite: ALCATEL SATMAN: *See—*
Krasuski, Marek; and Prugnolle, Bernard, 4,926,612, Cl. 53-69.000.

Societe Anonyme dite: L'Oreal: *See—*
Lapoiriere, Claudine; Mahieu, Claude; and Papantoniou, Christos, 4,927,883, Cl. 525-154.000.

Societe Anonyme dite : SMH Alcatel: *See—*
Vermesse, Bernard, 4,928,244, Cl. 364-464.020.
Vermesse, Bernard, 4,928,249, Cl. 364-518.000.

Societe Chimique des Charbonnages S.A.: *See—*
Villard, Alexandre; and Cotonea, Yves, 4,927,617, Cl. 423-396.000.

Societe d'Applications Generales d'Electricite et de Mecanique Sagem: *See—*
Lacuve, Jean, 4,927,256, Cl. 350-619.000.

Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.): *See—*
Pirotzky, Eduardo; Dive, Georges; Godfroid, Jean-Jacques; and Heymans, Francoise, 4,927,825, Cl. 514-255.000.

Societe de Conseils de Recherches et d'Applicatios Scientifiques (S.C.R.A.S.): *See—*
De Lassauniere, Chabrier; and Colote, Acaye S., 4,927,755, Cl. 435-91.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Arretz, Emmanuel F. E., 4,927,972, Cl. 568-70.000.

Sodagar, Eleanor H.: *See—*
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.

Soejima, Katsumoto, to NEC Corporation. Method of producing semiconductor integrated circuit device including bipolar transistor and insulated gate field effect transistor. 4,927,776, Cl. 437-33.000.

Soejima, Yuji: *See—*
Takahashi, Akira; and Soejima, Yuji, 4,927,166, Cl. 280-91.000.

Sokal, Nathan O.: *See—*
Redl, Richard; and Sokal, Nathan O., 4,928,200, Cl. 361-93.000.

Solomon, Frank; and Genodman, Yury, to Eltech Systems Corporation. Platinum black air cathode, method of operating same, and layered gas diffusion electrode of improved inter-layer bonding. 4,927,514, Cl. 204-290.00R.

Soloveychik, Yakov G.; and Israel, Larry, to Visualtek, Inc. Automatic focus control for an image magnification system. 4,928,170, Cl. 358-94.000.

Somers, W. Karl: *See—*
Goble, E. Marlowe; Somers, W. Karl; and McGuire, David, 4,927,421, Cl. 606-73.000.

Sonesson, Harald V. Radio controllable spherical toy. 4,927,401, Cl. 446-456.000.

Song, Jae C. Lead wire connecting device for coaxial cable connector. 4,927,378, Cl. 439-394.000.

Sony Corporation: *See—*
Kitamura, Yoshio; Takizuka, Hiroshi; and Ishihara, Tadao, 4,928,234, Cl. 364-200.000.
Sato, Mitsuru; Iizuka, Tetsuya; Furuya, Kiyoshi; Shoji, Norio; and Sekine, Masato, 4,928,074, Cl. 330-254.000.
Tanaka, Masato, 4,928,287, Cl. 375-13.000.

Sorensen, Joseph A.; and Gatzemeyer, Dwight L., to Petersen Manufacturing Co., Inc. Quick-action bar clamp. 4,926,722, Cl. 81-487.000.

Sorenson, Kal K., to Allied-Signal, Inc. Pawl and ratchet clutch and air turbine starter having such a clutch. 4,926,631, Cl. 60-39.142.

Sorrentino, James V.; Kelleher, William J.; and Moye, Jeanne O., to Richardson-Vicks Inc. Pharmaceutical compositions containing dyclonine HCl and phenol. 4,927,634, Cl. 424-405.000.

Soszka, Barbara; Federowsky, Robert; and Mahler, Jacques, to Vetrotex Saint-Gobain. Apparatus for producing coated single twist glass yarns. 4,927,445, Cl. 65-11.100.

Sotomayor, Guy G.: *See—*
Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.

Sousa, John G.: *See—*
Hock, Allan G.; Larson, John R.; and Sousa, John G., 4,928,112, Cl. 346-25.000.

Souto, Sadario O.; and De Moura, Wilson G., to Brastemp S/A. Rigid polyurethane preparation process. 4,927,861, Cl. 521-99.000.

Spangler, Glenn E.; Carrico, John P., Jr.; and Campbell, Donald N., to Environmental Technologies Group, Inc. Thermionic ionization source. 4,928,033, Cl. 313-345.000.

Spatrisano, Antonio P.; Gandolfi, Luciano; Minotti, Carlo; and Di Cristina, Natale, to SGS-Thomson Microelectronics S.p.A. Method for manufacturing a modular semiconductor power device. 4,926,547, Cl. 29-841.000.

Spectra, Inc.: *See—*
Spehrley, Charles W., Jr.; Barss, Steven H.; Tomaszewski, David G.; and Hoisington, Paul A., 4,928,120, Cl. 346-140.00R.

Spectra Physics, Inc.: *See—*
Davidson, James B.; Kaz, Peter N.; Kidwell, Michael H.; and Zachman, Mark E., 4,926,948, Cl. 172-4.500.

Spedding, Colin E.; and Pollard, Andrew, to GKN Technology Limited. Spring assemblies. 4,927,124, Cl. 267-229.000.

Speer, Charles R. Stilt. 4,927,137, Cl. 272-70.100.

Spehrley, Charles W., Jr.; Barss, Steven H.; Tomaszewski, David G.; and Hoisington, Paul A., to Spectra, Inc. Orifice plate cleaner for hot melt ink jet. 4,928,120, Cl. 346-140.00R.

Spencer, Charles P., to Amsted Industries Incorporated. Electrically grounded railway truck. 4,926,757, Cl. 105-224.100.

Speranza, George P.; Lin, Jiang-Jen; and Templeton, James H., to Texaco Chemical Company. Secondary isopropyl amines derived from oxyalkylene triamines. 4,927,912, Cl. 528-405.000.

Speranza, George P.; and Su, Wei-Yang, to Texaco Chemical Co. Method for the preparation of imidazoles. 4,927,942, Cl. 548-335.000.

Spicer, Lyndon R.: *See—*
Pitt, Gilles D.; Jones, Roger E.; Antell, George R.; Spicer, Lyndon R.; Barnett, John A.; and Hill, Robert, 4,928,319, Cl. 455-612.000.

Spies, Karl-Heinz: *See—*
Heinemann, Joachim; Spies, Karl-Heinz; Keller, Frank; Beicht, Bernd; Leitermann, Wulf; and Lechler, Rolf, 4,926,921, Cl. 160-115.000.

Spinney, Mark A.: *See—*
Robson, Michael J.; Cleare, Peter J. V.; and Spinney, Mark A., 4,927,852, Cl. 514-531.000.

Sponer, Gisbert: *See—*
Leinert, Herbert; Tsaklakidis, Christos; and Sponer, Gisbert, 4,927,834, Cl. 514-422.000.

Spong, Richard V.: *See—*
Adlon, Daniel T.; Spong, Richard V.; Cerquone, Stephen M.; and Bickford, David E., 4,928,066, Cl. 324-539.000.

Sportsman's Market, Inc.: *See—*
Sells, Charles C.; and Martin, Robert N., 4,926,838, Cl. 126-25.00A.

Springman, Charles G., to AMSTED Industries Incorporated. Conveyor chain having detachable member for carrying articles. 4,927,002, Cl. 198-487.100.

Springs Industries, Inc.: *See—*
Jaco, Pamela J.; and Tolbert, Thomas W., 4,927,698, Cl. 428-198.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Sreekumar, Chandra: *See—*
Rimai, Donald S.; and Sreekumar, Chandra, 4,927,727, Cl. 430-99.000.
Srzanna, Kurt, to Wolter, Peter. Rachet spanner with open mouth. 4,926,720, Cl. 81-61.000.
SSI Medical Services, Inc.: *See—*
Carruth, Walter L.; Jones, Warren P.; and Stacy, Richard B., 4,926,951, Cl. 177-144.000.
Staab, Carl J.; Houser, Kirk D.; Jones, Donald J.; Ihrman, Robert T.; Poepsel, Donald A.; and Edblad, Warren A., to Westinghouse Electric Corp. Real time process control using multiple communication networks. 4,928,097, Cl. 340-825.500.
Stacy, Richard B.: *See—*
Carruth, Walter L.; Jones, Warren P.; and Stacy, Richard B., 4,926,951, Cl. 177-144.000.
Staggs, Darrell W.: *See—*
Kalnes, Tom N.; James, Robert B., Jr.; and Staggs, Darrell W., 4,927,520, Cl. 208-50.000.
Stamicarbon B.V.: *See—*
van Geem, Paul C.; and van den Brink, Franciscus T. B., 4,927,974, Cl. 568-357.000.
Standard Products Company, The: *See—*
Jackson, Norman C., 4,926,610, Cl. 52-716.000.
Standard Telephones Cables Public Limited Company: *See—*
Pitt, Gilles D.; Jones, Roger E.; Antell, George R.; Spicer, Lyndon R.; Barnett, John A.; and Hill, Robert, 4,928,319, Cl. 455-612.000.
Stanislaw, Peter P., to Morrison Berkshire, Inc. Method for manufacturing needled felts having machine direction oriented fibers. 4,926,530, Cl. 28-111.000.
Stanke, Fred E.: *See—*
Kimball, Christopher V.; Stanke, Fred E.; Randall, Curtis J.; and Hayman, Andrew J., 4,928,269, Cl. 367-35.000.
Stanley Aviation Corporation: *See—*
Gale, Edwin J.; Olsen, Albert B.; and Dinsmoor, John C., 4,928,202, Cl. 361-215.000.
Stanley Electric Co., Ltd.: *See—*
Oyama, Hiroo, 4,928,214, Cl. 362-61.000.
Stapley, Gerald; Tate, Geoffrey; and Hardisty, Derek, to Security Services PLC. Remotely programmable key and programming means therefor. 4,926,665, Cl. 70-277.000.
Statz, Robert J.: *See—*
Motz, Kaye L.; Latham, Roger A.; and Statz, Robert J., 4,926,582, Cl. 44-62.000.
Staub, Karl: *See—*
Fischer, Horst; and Staub, Karl, 4,927,332, Cl. 417-299.000.
Stavinoha, Jerome L.; and McCollum, Anthony W., to Eastman Kodak Company. Heat-curable compositions comprising a mixture of bis(2-hydroxyethyl) dicyclopentadiene-containing polyesters and unsaturated polyesters. 4,927,878, Cl. 525-44.000.
Stefano, Joseph: *See—*
Smith, Gary, 4,926,735, Cl. 84-453.000.
Stein, Herman H.; Pattner, Jacob J.; and Crowley, Steven R., to Abbott Laboratories. Glaucoma treatment. 4,927,807, Cl. 514-18.000.
Steinleitner, Gunther; and Roze, Philipp, to Asea Brown Boveri Aktiengesellschaft. Process for joining metallic and ceramic materials. 4,927,475, Cl. 156-89.000.
Steinmetz, Hans-Werner; and Reich, Fritz, to Georg Fischer Aktiengesellschaft. Adapting piece of thermoplastic material. 4,927,183, Cl. 285-21.000.
Stella KG Werner Deussen: *See—*
Deussen, Heino; and Deussen, Werner, 4,926,915, Cl. 141-290.000.
Stemmle, Denis J., to Xerox Corporation. Sheet circulation in a duplex printer. 4,928,127, Cl. 346-160.000.
Stemmle, Denis J., to Xerox Corporation. Sheet circulation in a duplex printer. 4,928,128, Cl. 346-160.000.
Stephens, Donald E.; and Unterbusch, Manfred W., to Beckman Instruments, Inc. Sample presence detector for automatic sample injector. 4,926,702, Cl. 73-864.830.
Stephens, W. F. N.: *See—*
McMurtry, D. R.; Stephens, W. F. N.; and Kirkbride, M., 4,926,566, Cl. 33-771.000.
Stern Metals, Inc.: *See—*
Kretchmer, Steven D., 4,927,070, Cl. 228-155.000.
Stevens, Timothy S.; Langhorst, Martin A.; and Randall, Osro W., III, to Dow Chemical Company, The. High performance anion-exchange chromatographic packing composition consisting of low porosity synthetic resin gel particle substrate coated with liquid water-soluble aminated resin. 4,927,539, Cl. 210-635.000.
Stewart, H. E.: *See—*
Oppenheim, A. K.; Stewart, H. E.; and Hom, K., 4,926,818, Cl. 123-297.000.
Stewart, Kevin R., to General Electric Company. Preparation of linear polycarbonates from cyclic oligomer compositions using aryl tetrahydropyranyl ether catalyst. 4,927,910, Cl. 528-371.000.
Stewart, Kevin R., to General Electric Company. Preparation of linear polycarbonates from cyclic oligomer compositions using zwitterionic catalyst. 4,927,911, Cl. 528-371.000.
Steyr-Daimler-Puch: *See—*
Valev, Assen, 4,926,800, Cl. 123-41.420.
Stice, James D.; Sievert, Chester E., Jr.; and Christian, Steven C., to Flexmedics Corporation. ARthroscopic instrumentation and method. 4,926,860, Cl. 606-144.000.
Stoeffler, Albert: *See—*
Fiedler, Juergen; Stoeffler, Albert; and Bergmann, Michael, 4,927,059, Cl. 222-136.000.
Stolov, Adi: *See—*
Stolov, Michael; and Stolov, Adi, 4,927,240, Cl. 350-335.000.
Stolov, Michael; and Stolov, Adi. Multiple liquid crystal display. 4,927,240, Cl. 350-335.000.
Stolz, Robert; Mirring, Knut; Hein, Rudolf; Simon, Dieter; Raab, Lothar; and Glatz, Peter, to SKF GmbH. Pocket cage. 4,927,276, Cl. 384-572.000.
Stone, Robert A.; and Kish, Jules G., to United Technologies Corporation. Actuated spring clutch assembly. 4,926,991, Cl. 192-41.00S.
Stonewall Landscape Systems, Inc.: *See—*
Dean, Robert W., Jr., 4,926,595, Cl. 52-300.000.
Storace, Anthony: *See—*
Gasiunas, Donatas V.; and Storace, Anthony, 4,928,089, Cl. 340-870.310.
Storage Technology Corporation: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.
Stormon, Robert D. Putter. 4,927,144, Cl. 273-80.00A.
Stout, Gary K., to Du Pont de Nemours, E. I., and Company. Conformation of vacuum - laminated solder mask coated printed circuit boards by fluid pressurizing. 4,927,733, Cl. 430-256.000.
Stout, James T., to Mead Corporation, The. Article carrier. 4,927,009, Cl. 206-188.000.
Stover, William A.: *See—*
Anderson, Conroy D.; Chou, Tai-Sheng; Cormier, William E., Jr.; Dwyer, Francis G.; Krambeck, Frederick J.; Pasquale, Gary M.; Schipper, Paul H.; and Stover, William A., 4,927,526, Cl. 208-152.000.
Strait, Chad A.; Tabor, Ricky L.; and Lancaster, Gerald M., to Dow Chemical Company, The. Maleic anhydride graft copolymers having low yellowness index and films containing the same. 4,927,888, Cl. 525-285.000.
Strait, Ronald: *See—*
Hemmerich, Louis; and Strait, Ronald, 4,927,066, Cl. 224-42.45R.
Strang, Robert H.: *See—*
Fest, Christa; Muller, Klaus-Helmut; Pfister, Theodor; Riebel, Hans-Jochem; Kysela, Ernst; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,927,454, Cl. 71-93.000.
Strauss, H. William: *See—*
Rubin, Robert H.; and Strauss, H. William, 4,926,869, Cl. 128-654.000.
Street, Peter F. S.: *See—*
Carson, Chrislyn M.; Copping, Leonard G.; Ehr, Robert J.; Gitlitz, Melvin H.; McNeil, Maynard W.; Street, Peter F. S.; and Liebeschuetz, John W., 4,927,812, Cl. 514-63.000.
Kirby, Neil V.; Street, Peter F. S.; and Markley, Lowell D., 4,927,833, Cl. 514-399.000.
Streubel, Hans, to SMS Schloemann-Siemag Aktiengesellschaft. Dummy bar for continuous casting machines. 4,926,929, Cl. 164-445.000.
Stribling, Donald: *See—*
Holloway, Brian R.; Howe, Ralph; Rao, Balbir S.; and Stribling, Donald, 4,927,836, Cl. 514-620.000.
Stripping Technologies Inc.: *See—*
Abbott, Kenneth E.; Lyons, Patrick J.; and Satariano, Richard M., 4,926,589, Cl. 51-427.000.
Stritzel, Gene A., to DK-Gleason, Inc. Worm wheel and method of hobbing same. 4,926,712, Cl. 475-227.000.
Strobel, Michael: *See—*
Braun, Erwin; Strobel, Michael; and Karl, Rupert, 4,926,627, Cl. 57-412.000.
Strobl, Georg: *See—*
Wang, Patrick S.; Strobl, Georg; and Chu, Raymond W. H., 4,927,379, Cl. 439-398.000.
Strock, Alvin E. Protective body appliance. 4,926,883, Cl. 128-888.000.
Stromberg, C. Bertil: *See—*
Meredith, Michael D.; Phillips, Joseph R.; Laakso, Richard O.; and Stromberg, C. Bertil, 4,927,312, Cl. 414-221.000.
Stromswold, David C., to Mobil Oil Corporation. Method for monitoring the hydraulic fracturing of a subsurface formation. 4,926,940, Cl. 166-247.000.
Stuber, Istvan; Nagy, Geza; and Petrak, Peter. Apparatus for the relative increase of depth sharpness and improvement of resolving power of magnifying systems, particularly microscopes. 4,927,253, Cl. 350-508.000.
Stuber, Michael G.; and Effertz, Charles E., to Cantainer Corporation. Insulated jacket for beverage container. 4,927,047, Cl. 220-90.200.
Stuber, Werner, to Behringwerke Aktiengesellschaft. Oligopeptidyl nitrile derivatives, agents containing them and their use. 4,927,809, Cl. 514-20.000.
Studebaker, Thomas J.: *See—*
Moy, Michael E.; Beavers, Kelly J.; Bray, Stuart W.; Goodknight, Frank A.; Kummli, Paul; Kutasy, Eugene; Lucchesi, Raymond L.; Munro, Frederick G.; Sellke, Richard G.; and Studebaker, Thomas J., 4,928,245, Cl. 364-513.000.
Su, Wei-Yang: *See—*
Speranza, George P.; and Su, Wei-Yang, 4,927,942, Cl. 548-335.000.
Suda, Shigeyuki, to Canon Kabushiki Kaisha. Optical system for compensating chromatic abherration of image. 4,927,250, Cl. 350-500.000.
Sudoma, A. Louis; and Dalebroux, Dean G., to Chr. Hansen's Laboratory, Inc. Stabilization of dried bacteria extended in particulate carriers. 4,927,763, Cl. 435-260.000.

Suchiro, Kikumitsu: *See—*
Ashihara, Ryohei; Suchiro, Kikumitsu; Sugino, Kazuo; and Miyoshi, Jun, 4,927,719, Cl. 429-54.000.
Suekuni, Einosuke: *See—*
Tadokoro, Tomoo; Tashima, Seiji; Okimoto, Haruo; Akagi, Toshimichi; Nakao, Masami; Matsuda, Ikuo; and Suekuni, Einosuke, 4,926,636, Cl. 60-312.000.
Sugama, Toshifumi, to Associated Universities, Inc. Oxidation of carbon fiber surfaces for use as reinforcement in high-temperature cementitious material systems. 4,927,462, Cl. 106-99.000.
Sugano, Masayo: *See—*
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, 4,927,827, Cl. 514-256.000.
Suganuma, Atsushi: *See—*
Monma, Hisayoshi; and Suganuma, Atsushi, 4,928,277, Cl. 369-116.000.
Sugawara, Sakuo; Hara, Masanori; and Suzuki, Takane, to Mitsubishi Denki Kabushiki Kaisha. Hot air type heater. 4,926,839, Cl. 126-96.000.
Sugi, Hideo: *See—*
Yamada, Nobutoshi; Sugi, Hideo; and Kon, Kenji, 4,927,919, Cl. 536-17.400.
Sugino, Kazuo: *See—*
Ashihara, Ryohei; Suchiro, Kikumitsu; Sugino, Kazuo; and Miyoshi, Jun, 4,927,719, Cl. 429-54.000.
Sugiura, Itsuo; Nishida, Yutaka; Ito, Kaoru; and Ozaki, Toshiyuki, to Anritsu Corporation. Optical signal generating apparatus and optical power meter calibrating system using the same. 4,927,266, Cl. 356-243.000.
Sullivan, Donald K.: *See—*
Bland, Gerald F.; and Sullivan, Donald K., 4,927,391, Cl. 440-84.000.
Sulzer-Escher Wyss AG: *See—*
Winkler, Robert; Sala, Siro; Kobayashi, Takayuki; and Yokota, Shinjiro, 4,927,494, Cl. 159-2.100.
Sumitomo Chemical Company, Limited: *See—*
Kakugo, Masahiro; and Ima, Seiichiro, 4,927,872, Cl. 524-232.000.
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, 4,927,827, Cl. 514-256.000.
Matsuda, Masaaki; and Yoshida, Yuji, 4,927,541, Cl. 210-656.000.
Sumitomo Electric Industries, Ltd.: *See—*
Kanda, Masahiko; and Miyagawa, Yuichi, 4,926,867, Cl. 128-633.000.
Suzuki, Fumio; Akasaka, Nobuhiro; and Honjo, Makoto, 4,927,585, Cl. 264-171.000.
Tsuji, Kazuo, 4,927,619, Cl. 423-446.000.
Sumitomo Heavy Industries, Ltd.: *See—*
Kada, Yoshio, 4,927,311, Cl. 414-[40.700.
Summer & Taylor, Inc.: *See—*
Raahauge, Jerald C., 4,928,121, Cl. 346-140.00R.
Sundown, Jeremiah: *See—*
Collins, William D.; and Sundown, Jeremiah, 4,926,732, Cl. 84-318.000.
Sundstrand Corporation: *See—*
Avny, Eli, 4,926,687, Cl. 73-161.000.
Dschida, Otto, 4,926,908, Cl. 137-846.000.
Shekleton, Jack R., 4,926,630, Cl. 60-39.360.
Walton, Derek N.; and Hoppe, Richard J., 4,928,138, Cl. 363-40.000.
Sunohara, Masaaki: *See—*
Tanaka, Yasuhiro; Sunohara, Masaaki; Nakajima, Yasuo; and Tanaka, Shinichi, 4,927,247, Cl. 350-432.000.
Sunshine, Abraham; and Laska, Eugene M., to Analgesic Associates. Sustained/enhanced analgesia. 4,927,854, Cl. 514-570.000.
Suquet, Michel J.: *See—*
Sicard, Thierry M. A.; and Suquet, Michel J., 4,928,053, Cl. 323-284.000.
Survil, Robert J.; and Weber, Robert T., to Flow Design, Inc. Valve test plug. 4,926,704, Cl. 73-866.500.
Sussman, Jennewein Bekleidungstechnik GmbH: *See—*
Heinhold, Hans, 4,927,054, Cl. 221-289.000.
Sutherland, Robert A.: *See—*
Ashjaee, Javad; Helkey, Roger J.; Lorenz, Robert G.; and Sutherland, Robert A., 4,928,106, Cl. 342-352.000.
Suzaki, Takuji: *See—*
Shiga, Toshikazu; and Suzaki, Takuji, 4,927,264, Cl. 356-41.000.
Suzuki, Chiharu: *See—*
Yamaguchi, Mikio; Suzuki, Chiharu; Matsunari, Kenji; Miyazawa, Takeshige; and Nakamura, Yasuo, 4,927,448, Cl. 71-90.000.
Suzuki, Fumio; Akasaka, Nobuhiro; and Honjo, Makoto, to Sumitomo Electric Industries, Ltd. Process for producing highly oriented resin-made reinforcing member. 4,927,585, Cl. 264-171.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Hirano, Sadayuki; Murano, Katsuaki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,926,716, Cl. 74-866.000.
Suzuki, Makoto: *See—*
Hakuta, Shinsaku; Yasaka, Yasuhiro; Nagura, Osamu; Tsuji, Eiji; Suzuki, Makoto; and Akagawa, Hirotaka, 4,926,541, Cl. 29-598.000.
Higuchi, Hisayuki; Homma, Noriyuki; Suzuki, Makoto; and Tachibana, Suguru, 4,928,265, Cl. 365-189.010.
Suzuki, Mituyoshi: *See—*
Tanaka, Yoshiyasu; Nagaishi, Toshimi; and Suzuki, Mituyoshi, 4,927,229, Cl. 350-96.210.
Suzuki, Naoki: *See—*
Naka, Hiroyuki; Hirono, Tomohide; Suzuki, Naoki; and Ichiyanagi, Takashi, 4,927,068, Cl. 228-103.000.
Suzuki, Takane: *See—*
Sugawara, Sakuo; Hara, Masanori; and Suzuki, Takane, 4,926,839, Cl. 126-96.000.
Suzuki, Toshikazu: *See—*
Okamoto, Hiroshi; Oka Tateki; Sako, Mineyuki; Kyogoku, Tetsuo; and Suzuki, Toshikazu, 4,928,145, Cl. 355-245.000.
Suzuki, Yutaka, to Nissan Motor Company, Limited. Vehicle speed sensor abnormality detection device. 4,928,242, Cl. 364-424.030.
Sven Bode, Auergesellschaft GmbH: *See—*
Bode, Sven, 4,926,854, Cl. 128-201.230.
Svenkeson, John W.: *See—*
Murphy, Patrick J.; and Svenkeson, John W., 4,927,370, Cl. 439-74.000.
Svetkoff, Donald J.: *See—*
Leonard, Patrick F.; Svetkoff, Donald J.; Kelley, Robert W.; Rohrer, Donald K.; and Coleman, E. North, Jr., 4,928,313, Cl. 382-8.000.
Swanson, Melvin E., to Lidseen of North Carolina, Inc. Pipe bender. 4,926,672, Cl. 72-458.000.
Swanson, Richard M., to Electric Power Research Inst. Corp. of District of Columbia; and Leland Stanford California Corporation, Board of Trustees of the. Method of fabricating back surface point contact solar cells. 4,927,770, Cl. 437-2.000.
Swanson, Roy E., Jr.: *See—*
Linyaev, Eugene J.; and Swanson, Roy E., Jr., 4,928,031, Cl. 310-346.000.
Swidwa, Kenneth J.: *See—*
Kaufmann, John W.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,927,595, Cl. 376-268.000.
Swindal, James L.; and Wiegand, Walter J., to United Technologies. Capacitive accelerometer with hinges on top and bottom surface. 4,928,203, Cl. 361-280.000.
Swinderman, Robert T.; and Mueller, David W., to Martin Engineering Company. Heated conveyor belt cleaner. 4,927,003, Cl. 198-497.000.
Sygnator, Henry A. Wire nail 4,927,309, Cl. 411-439.000.
Syme, Robert W.; and McKenna, Michael E. Insulating laminate. 4,927,705, Cl. 428-282.000.
Synektron Corporation: *See—*
Plunkett, Allan B., 4,928,043, Cl. 318-254.000.
Syntex (U.S.A.) Inc.: *See—*
Walker, Keith A. M.; and Kertesz, Denis J., 4,927,963, Cl. 562-501.000.
Synthetic Products Company: *See—*
Grossman, Richard F.; and McKane, Francis W., Jr., 4,927,929, Cl. 544-195.000.
Synthetic Vision Systems, Inc.: *See—*
Leonard, Patrick F.; Svetkoff, Donald J.; Kelley, Robert W.; Rohrer, Donald K.; and Coleman, E. North, Jr., 4,928,313, Cl. 382-8.000.
Systran Corporation: *See—*
Dingeman, Drake D., 4,928,289, Cl. 375-20.000.
Syuto, Kiyoaki: *See—*
Kabeta, Keiji; and Syuto, Kiyoaki, 4,927,951, Cl. 556-419.000.
Szakacs, Lajos: *See—*
Harsanyi, Jozsef; Kohanyi, Laszlo ; Domsa, Karoly; Szakacs, Lajos; Szentgyorgyi, Geza; and Imre, Aladar, 4,927,549, Cl. 252-25.000.
Szentgyorgyi, Geza: *See—*
Harsanyi, Jozsef; Kohanyi, Laszlo ; Domsa, Karoly; Szakacs, Lajos; Szentgyorgyi, Geza; and Imre, Aladar, 4,927,549, Cl. 252-25.000.
Szewczyk, Mattias; and Poting, Hans-Jurgen, to Paul Pleiger Maschinenfabrik GmbH & Co. KG. Radial-piston engine. 4,926,803, Cl. 123-55.00R.
T W Hamilton Design Limited: *See—*
Hamilton, Thomas W., 4,926,583, Cl. 47-1.010.
Tabler, Donald C.; and Johnson, Marvin M., to Phillips Petroleum Company. Passivation of metal contaminated cracking catalysts. 4,927,795, Cl. 502-33.000.
Tabor, Ricky L.: *See—*
Strait, Chad A.; Tabor, Ricky L.; and Lancaster, Gerald M., 4,927,888, Cl. 525-285.000.
Tachi, Susumu: *See—*
Arai, Hirohiko; and Tachi, Susumu, 4,928,047, Cl. 318-568.160.
Tachibana, Sadao: *See—*
Aoki, Kazuo; Chiba, Toshimi; Tachibana, Sadao; and Nagatomo, Yasushi, 4,927,990, Cl. 200-517.000.
Tachibana, Suguru: *See—*
Higuchi, Hisayuki; Homma, Noriyuki; Suzuki, Makoto; and Tachibana, Suguru, 4,928,265, Cl. 365-189.010.
Tachizawa, Shingo: *See—*
Fuchigami, Mitsuru; Tachizawa, Shingo; and Ishiguro, Mamoru, 4,927,971, Cl. 564-505.000.
Tadokoro, Tomoo; Tashima, Seiji; Okimoto, Haruo; Akagi, Toshimichi; Nakao, Masami; Matsuda, Ikuo; and Suekuni, Einosuke, to Mazda Motor Corporation. Engine-control apparatus. 4,926,636, Cl. 60-312.000.
Taft, Philip A.: *See—*
Harrison, Anthony W.; and Taft, Philip A., 4,927,212, Cl. 303-115.000.
Tagashira, Eijiro: *See—*
Inagaki, Tetsuya; Tagashira, Eijiro; Takaya, Masahiro; and Nishimura, Yasuhiro, 4,927,817, Cl. 514-184.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Tahara, Hideo: *See—*
Makihara, Nobuo; and Tahara, Hideo, 4,927,392, Cl. 440-88.000.

Tahara, Kazuo: *See—*
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Taillebois, Jacques: *See—*
Chovin, Andre ; and Taillebois, Jacques, 4,928,270, Cl. 368-82.000.

Takafuji, Yutaka, to Sharp Kabushiki Kaisha. Projection type liquid crystal display device. 4,928,123, Cl. 353-20.000.

Takagi, Yoshio: *See—*
Miyashita, Tsuneo; Nishio, Hiroaki; Yabuta, Kazuya; and Takagi, Yoshio, 4,927,600, Cl. 419-49.000.

Takahashi, Akira; and Soejima, Yuji, to Fuji Jukogyo Kabushiki Kaisha. Rear wheel steering device for automotive vehicles. 4,927,166, Cl. 280-91.000.

Takahashi, Akira; and Koishi, Musubu, to Hamamatsu Photonics Kabushiki Kaisha. Light source driving device. 4,928,248, Cl. 372-38.000.

Takahashi, Eiji: *See—*
Hayashida, Suetou; Kimura, Kyoichiro; and Takahashi, Eiji, 4,927,885, Cl. 525-211.000.
Yamagishi, Takanori; Idai, Tsutomu; and Takahashi, Eiji, 4,927,979, Cl. 568-791.000.

Takahashi, Katsuhiko: *See—*
Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Takahashi, Katsuhiko, 4,927,895, Cl. 525-438.000.

Takahashi, Katsumasa, to Kitagawa Industries Co., Ltd. Board mount. 4,927,111, Cl. 248-500.000.

Takahashi, Kimihide; Sasaki, Hidemi; and Nakayama, Yoshiaki, to Fuji Photo Film Co., Ltd. Video camera capable of effecting remote control operation. 4,928,179, Cl. 358-210.000.

Takahashi, Masaharu; and Yoshida, Takeo, to Shin-Etsu Chemical Co., Ltd. Method for manufacturing extrusion molded silicone insulating articles. 4,927,587, Cl. 264-211.000.

Takahashi, Ryuichi, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent polymerizable compound, and polar compound. 4,927,731, Cl. 430-138.000.

Takahashi, Satoshi: *See—*
Nakamura, Hisashi; Takahashi, Satoshi; Ikeda, Takayuki; and Ogino, Masaaki, 4,926,902, Cl. 137-493.300

Takahashi, Shigeyuki: *See—*
Ito, Toshiyasu; Minoura, Jun; Takahashi, Shigeyuki; Mori, Takaaki; Kato, Mamoru; and Funahashi, Toshikazu, 4,927,246, Cl. 350-357.000.

Takahashi, Shuzo; Tsuchida, Yutaka; Osada, Shiro; Hasebe, Nobuhisa; and Nakada, Masayuki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Nippon Kokan Kabushiki Kaisha. Pouring apparatus for moving-mold type continuous casting machine. 4,926,925, Cl. 164-154.000.

Takahashi, Tadashi: *See—*
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Takahashi, Tsukasa: *See—*
Osaka, Shigemi; Hata, Kazuo; and Takahashi, Tsukasa, 4,927,560, Cl. 252-315.100.

Takahaski, Toshinori: *See—*
Inui, Shuji; Hiramitsu, Tetsushi; Takahaski, Toshinori; Tamaki, Makoto; Kikuta, Mitsuhiro; and Mizutani, Junichi, 4,927,364, Cl. 439-15.000.

Takamatsu, Shuichi: *See—*
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Takao, Koji: *See—*
Koyanagi, Haruo; Kumasaka, Hideyuki; Takao, Koji; and Noda, Tomohiko, 4,926,544, Cl. 29-703.000.

Takara Shuzo Co., Ltd.: *See—*
Sakai, Takeshi; Matsui, Susumu; Akiyoshi, Sumiko; and Obayashi, Akira, 4,927,753, Cl. 435-26.000.
Sakai, Takeshi; Yokota, Hiroko; Yamamoto, Kazuki; Yokoyama, Sadaji; Matsui, Susumu; Kato, Ikunoshin; and Obayashi, Akira, 4,927,767, Cl. 436-64.000.

Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, to Fuji Photo Film Co., Ltd. Water deionizing apparatus. 4,927,533, Cl. 210-257.100.

Takashi, Yamaoko, to Precision Fukuhara Works, Ltd. Method of knitting jacquard knit fabric by circular knitting machine. 4,926,660, Cl. 66-9.00R.

Takashima, Yuji: *See—*
Yamamoto, Hajime; Takashima, Yuji; Kitagaki, Kazunori; and Nakamura, Masahiko, 4,927,724, Cl. 430-45.000.

Takatsuna, Kazutoshi; Shiozawa, Kouji; and Okumura, Yoshiharu, to Tonen Corporation. Process for preparing aminopropyl silanes. 4,927,953. Cl. 556-413.000

Takaya, Masahiro: *See—*
Inagaki, Tetsuya; Tagashira, Eijiro; Takaya, Masahiro; and Nishimura, Yasuhiro, 4,927,817, Cl. 514-184.000.

Takaya, Masanori: *See—*
Hotta, Saburo; Kikuchi, Yoshiaki; Takaya, Masanori; and Inoue, Takashi, 4,927,455, Cl. 71-64.130.

Takaya, Takao; Sakane, Kazuo; Miyai, Kenzi; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds and processes for preparation thereof. 4,927,818, Cl. 514-202.000.

Takayama, Toru: *See—*
Hirose, Naoki; Inujima, Takashi; and Takayama, Toru, 4,926,791, Cl. 118-723.000.

Takeda Chemical Industries, Ltd.: *See—*
Naito, Kenzo; Ishibashi, Yukio; and Shinbo, Haruo, 4,927,964, Cl. 562-560.000.

Takei, Makoto; and Tamura, Mamoru, to Ohwada Carbon Industrial Co., Ltd. Press cylinder for high-temperature, high-pressure pressing machine. 4,927,345, Cl. 424-4.000.

Takeshita, Yasuyoshi: *See—*
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, 4,927,959, Cl. 560-193.000.

Takeuchi, Toshiyuki, to Graphtec Kabushiki Kaisha. Thermal printout density control. 4,928,117, Cl. 346-76.0PH.

Takizuka, Hiroshi: *See—*
Kitamura, Yoshio; Takizuka, Hiroshi, and Ishihara, Tadao, 4,928,234, Cl. 364-200.000.

Taltre, Abraham K. Therapeutic back rest. 4,927,139, Cl. 272-144.000.

Tamagawa Seiki Kabushiki Kaisha: *See—*
Karasawa, Yutaka, 4,928,046, Cl. 318-654.000.

Tamagawa, Shigehisa, to Fuji Photo Film Co., Ltd. Support for photographic printing paper. 4,927,495, Cl. 162-135.000.

Tamaki, Makoto: *See—*
Inui, Shuji; Hiramitsu, Tetsushi; Takahaski, Toshinori; Tamaki, Makoto; Kikuta, Mitsuhiro; and Mizutani, Junichi, 4,927,364, Cl. 439-15.000.

Tamamura, Masaya: *See—*
Shimotsuhama, Isao; Emori, Shinji; Watanabe, Yoshio; and Tamamura, Masaya, 4,928,024, Cl. 307-455.000.

Tameran, Inc.: *See—*
Wise, David S., 4,928,140, Cl. 355-48.000.

Tamoto, Koji, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials having specified coupler, dir coupler and silver coverage. 4,927,743, Cl. 430-496.000.

Tamura, Haruhisa; Yamasaki, Takahiko; and Hasegawa, Mitsuhiro, to Matsushita Electric Industrial Co., Ltd. Apparatus for cooking by electric heating including means for providing intermittent temperature control thereof. 4,927,998, Cl. 219-494.000.

Tamura, Hiroki: *See—*
Imoto, Koji; Omura, Tadao; Kataoka, Yoichi; Nakajima, Kunihiko; Maekawa, Motoyuki; Tamura, Hiroki; and Shioya, Yoshiaki, 4,926,817, Cl. 123-292.000.

Tamura, Mamoru: *See—*
Takei, Makoto; and Tamura, Mamoru, 4,927,345, Cl. 424-4.000.

Tamura, Mitsunobu; Tsuchihashi, Toshifumi; and Kenmochi, Toshihisa, to Yokohama Rubber Co., Ltd., The; and Honda Giken Kogyo Kabushiki Kaisha. Apparatus for producing honeycomb panels. 4,927,358, Cl. 432-204.000.

Tanaka, Akira: *See—*
Miyajima, Nobukazu; Tanaka, Akira; and Shinoda, Masaru, 4,926,862, Cl. 428-419.00D.

Tanaka, Hironori; Kotani, Matahira; and Matsumoto, Masafumi, to Sharp Kabushiki Kaisha. Automatic sheet feeder. 4,927,130, Cl. 271-10.000.

Tanaka, Hiroyuki, to NIX Company, Ltd. Information-bearing sheet for X-ray film. 4,928,298, Cl. 378-162.000.

Tanaka, Koji; Ueda, Minoru; and Masuda, Taizo, to Japan Exlan Company Limited. Matting agent. 4,927,710, Cl. 428-394.000.

Tanaka, Masato, to Sony Corporation. Automatic equalizer 4,928,287, Cl. 375-13.000.

Tanaka, Seiichi; Koike, Yutaka; Nakano, Masato; Atsuumi, Shugo; Morishima, Hajime; and Matsuyama, Kenji, to Banyu Pharmaceutical Co., Ltd. 5-substituted amino-4-hydroxy-pentenoic acid derivatives and their use. 4,927,565, Cl. 260-404.500.

Tanaka, Shigeo: *See—*
Matsushima, Yasunobu; Tanaka, Shigeo; Aoki, Tomoyuki; and Ono, Yohji, 4,927,472, Cl. 148-261.000.

Tanaka, Shigeru, to Kabushiki Kaisha Toshiba. High-voltage generating device for use with an X-ray tube. 4,928,295, Cl. 378-104.000.

Tanaka, Shinichi: *See—*
Tanaka, Yasuhiro; Sunohara, Masaaki; Nakajima, Yasuo; and Tanaka, Shinichi, 4,927,247, Cl. 350-432.000.

Tanaka, Toshinori: *See—*
Morishita, Akira; Tanaka, Toshinori; and Isozumi, Shuzoo, 4,926,705, Cl. 74-6.000.

Tanaka, Toshiyuki; Kuga, Shigeki; Nakamura, Nobuo; Morishita, Taro; and Wada, Masahiro, to Sharp Kabushiki Kaisha. Display method in an inference trace of an expert system. 4,928,236, Cl. 364-513.000.

Tanaka, Yasuhiro; Sunohara, Masaaki; Nakajima, Yasuo; and Tanaka, Shinichi, to Matsushita Electric Industrial Co., Ltd. Objective lens for optical disk system and optical head using the same. 4,927,247, Cl. 350-432.000.

Tanaka, Yoshiyasu; Nagaishi, Toshimi; and Suzuki, Mituyoshi, to Du Pont de Nemours, E. I., and Company. Optical cable coupling adapter. 4,927,229, Cl. 350-96.210.

Tanako, Hirotaka: *See—*
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, 4,927,827, Cl. 514-256.000.

Tandy Corporation: *See—*
Siddiq, Mohammed, 4,928,189, Cl. 360-128.000.

Tang, Ching W.: *See—*
Scozzafava, Michael; Tang, Ching W., and Young, Ralph H., 4,927,726, Cl. 430-78.000.

Tani, Junichi: *See—*
Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, 4,926,906, Cl. 137-625.300.

Taniguchi, Masaharu; Ichijo, Chikara; and Fujikawa, Junichi, to Toray Industries, Inc. Photosensitive composition containing a gelling agent. 4,927,739, Cl. 430-286.000.

Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki, Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,928,124, Cl. 354-106.000.

Taniguchi, Osamu; Onitsuka, Yoshihiro; and Mihara, Tadashi, to Canon Kabushiki Kaisha. Method and apparatus for driving optical modulation device. 4,927,243, Cl. 350-350.0OS.

Tanizawa, Tetsu, to Fujitsu Limited. Integrated circuit device having a chip. 4,928,164, Cl. 357-45.000.

Tansky, John L.; Lagan, Edward F., Jr.; and McGarry, Patrick J., to Mars Incorporated. Coin operated telephone operation monitoring switch mounting arrangement. 4,928,299, Cl. 379-37.000.

Tarel Seven Design, Inc.: *See—*
Leopold, Arthur B., 4,926,796, Cl. 119-83.000.

Taricco, Giorgio: *See—*
D'Aria, Giovanna; and Taricco, Giorgio, 4,928,288, Cl. 375-17.000.

Tashima, Seiji: *See—*
Tadokoro, Tomoo; Tashima, Seiji; Okimoto, Haruo; Akagi, Toshimichi; Nakao, Masami; Matsuda, Ikuo; and Suekuni, Eimosuke, 4,926,636, Cl. 60-312.000.

Tate, David P.; and Graves, Daniel F., to Bridgestone/Firestone, Inc. Modified rubber compositions containing aromatic six-membered heterocyclic nitrogen-containing groups. 4,927,887, Cl. 525-279.000.

Tate, Geoffrey: *See—*
Stapley, Gerald; Tate, Geoffrey; and Hardisty, Derek, 4,926,665, Cl. 70-277.000.

Tate & Lyle PLC: *See—*
Jenner, Michael R.; and Jackson, Graham, 4,927,646, Cl. 426-96.000.

Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, to Fuji Photo Film Co., Ltd. Method of and apparatus for executing tone correction on an image according to a correction level. 4,928,167, Cl. 358-80.000.

Tatsumi, Takumi: *See—*
Hirano, Sadayuki; Murano, Katsuaki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,926,716, Cl. 74-866.000.

Tatsuzaki, Toru: *See—*
Ishikura, Hisatugu, Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.

Tauber, Gunter; and Dornauf, Andrea, to Schott Glaswerke. Reference electrode having immobilized electrolyte. 4,927,518, Cl. 204-421.000.

Taubitz, Bernd; Zieher, Peter; Kramer, Claus; Engelsdorf, Kurt, and Schuelke, Armin, to Robert Bosch GmbH. Hydraulic shock absorber. 4,926,983, Cl. 188-299.000.

Taubitz, Bernd: *See—*
Harms, Klaus; Schray, Hans-Dieter; Taubitz, Bernd; and Wirtz, Rainer, 4,928,042, Cl. 318-254.000.

Taylor, Barry: *See—*
Adams, Frederic R.; Boyer, Jeffrey M.; Schultz, Ronald N.; and Taylor, Barry, 4,926,959, Cl. 180-315.000.

Taylor, Edward C.; Beardsley, George P.; Shih, Chuan; and Fletcher, Stephen R., to Princeton University, The Trustees of. Diastereoisomeric tetrahydropyrido-(2,3,d) pyrimidine derivatives. 4,927,828, Cl 514-258.000.

Taylor, Steven C. Installer's briefcase. 4,927,021, Cl. 206-373.000.

Tazaki, Taketoshi: *See—*
Hara, Masaaki; Nishikawa, Seigo; Tazaki. Taketoshi; and Inokuchi, Hiroshi, 4,926,604, Cl. 51-165.880.

Tchetchick, Doron: *See—*
Zilberman, Moshe; Livne, Mordechai; Tchetchick, Doron; and Daniel, Moshe, 4,926,684, Cl. 73-147.000.

TDK Corporation: *See—*
Ezaki, Joichiro; Ito, Yoshiaki; and Matsuzaki, Mikio, 4,928,195, Cl 360-103.000.

Technolizenz Establishment: *See—*
Lichka, Helmut J., 4,927,045, Cl. 220-88.00R

Tecumseh Products Company: *See—*
Bonde, Kevin G., 4,926,813, Cl. 123-195.0HC.
Bonde, Kevin G., 4,926,814, Cl. 123-196.00W.
Kandler, William C., 4,926,808, Cl. 123-187.50R.

Teijin Limited: *See—*
Kitahara, Shigehisa; Ohtsu, Akira; and Fujii, Katsuhiko, 4,927,808, Cl. 514-19.000.

Teikoku Tsushin Kogyo Co., Ltd.: *See—*
Yagi, Nobuyuki; Inagaki, Jiro; Morita, Kozo; Kaku, Yasutoshi, Kikuchi, Nobuyuki; and Mizuno, Shinji, 4,928,082, Cl 338-174.000.

Teitz, Yael, to Ramot Univ. Authority for Applied Res. & Devp. Ltd Antiviral compositions. 4,927,843, Cl. 514-418.000.

Tektronix, Inc.: *See—*
Heidtmann, Denis L.; and Blouke, Morley M., 4,928,003, Cl. 250-211.00J.

Telefind Corporation: *See—*
Andros, Andrew A.; and Campana, Thomas J., 4,928,100, Cl. 340-825.440.

Telemus Electronic Systems, Inc.: *See—*
Langner, Paul, 4,928,105, Cl. 342-192.000.

Tellechea, Carlos: *See—*
Walls, John E.; Tellechea, Carlos; and Dhillon, Major S., 4,927,737, Cl. 430-278.000.

Temple, Victor A. K.: *See—*
Arthur, Stephen D.; and Temple, Victor A. K., 4,927,772, Cl. 437-6.000.

Templeton, James H.: *See—*
Speranza, George P.; Lin, Jiang-Jen, and Templeton, James H., 4,927,912, Cl. 528-405.000.

Tennessee Valley Authority: *See—*
Schohl, Gerald A.; and Vigander, Svein, 4,926,675, Cl. 73-19.000.

Terada, Takami: *See—*
Tsumura, Kenji; Yamada, Yukifumi; and Terada, Takami, 4,927,110, Cl. 248-430.000.

Teraoka, Kazuharu; Satake, Mitsuo; Denda, Toshio; Katayama, Takashi; and Seyasu, Shiro, to Teraoka Seiko Co., Ltd. Label printer. 4,928,229, Cl. 364-464.010.

Teraoka Seiko Co., Ltd.: *See—*
Teraoka, Kazuharu; Satake, Mitsuo; Denda, Toshio; Katayama, Takashi; and Seyasu, Shiro, 4,928,229, Cl. 364-464.010.

Terayama, Yoshimi: *See—*
Yoshizawa, Tetsuo; Terayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shunichi; Ichida, Yasuteru; and Konishi, Masaki, 4,926,549, Cl. 29-876.000.

Terraillon, societe anonyme: *See—*
Gagnepain, Didier, 4,926,521, Cl. 16-110.00A.

Terumo Kabushiki Kaisha: *See—*
Yamaguchi, Shuichiro; Uchida, Naoto; Shimomura, Takeshi; and Oyama, Noboru, 4,927,516, Cl. 204-403.000.

Terumo Kabushiki Kaisha (Terumo Corporation): *See—*
Seita, Yukio; and Emi, Makoto, 4,927,576, Cl. 264-49.000.

Terzis, Nicholas C.: *See—*
Green, James A.; and Terzis, Nicholas C., 4,927,238, Cl. 350-130.000.

Texaco Chemical Company: *See—*
Speranza, George P.; Lin, Jiang-Jen; and Templeton, James H., 4,927,912, Cl. 528-405.000.
Speranza, George P.; and Su, Wei-Yang, 4,927,942, Cl 548-335.000.

Texaco Inc.: *See—*
Karol, Thomas J.; and Nalesnik, Theodore E., 4,927,562, Cl. 252-51.50A.

Texas Instruments Incorporated: *See—*
Baglee, David A.; and Parker, Ronald N., 4,928,267, Cl. 365-218.000.
Marshall, Steven P., 4,928,023, Cl. 307-443.000
Miles, Philip D.; Moody, John R., Jr.; and O'Keefe, Sheila, 4,928,062, Cl. 324-158.00R
Misium, George R., 4,928,018, Cl. 250-492.200.

Texas Iron Works, Inc.: *See—*
Braddick, Britt O., 4,926,936, Cl. 166-217.000.

Textron Inc.: *See—*
Gassen, James, 4,926,637, Cl. 60-317.000.

Teyssie, Philippe; Varshney, Sunil K.; Jerome, Robert; and Fayt, Roger, to Norsolor. Process for the anionic polymerization of acrylic monomers and optionally of vinyl comonomers. 4,927,703, Cl 428-220.000.

Tezuka, Toshiaki: *See—*
Koshizuka, Kunihiro; Tezuka, Toshiaki; Abe, Takao, and Ebisawa, Harue, 4,927,693, Cl. 428-141.000.

Th. Goldschmidt AG: *See—*
Fock, Jurgen; and Schedlitzki, Dietmar, 4,927,961, Cl. 562-103.000

Thaler, Dietmar: *See—*
Bruehl, Klaus; and Thaler, Dietmar, 4,926,981, Cl. 188-111.000

Theeten, Jean-Bernard; Autier, Philippe; and Auger, Jean Marc, to U.S Philips Corporation. Method of manufacturing semiconductor devices. 4,927,785, Cl. 437-225.000.

Theeuwes, Felix: *See—*
Haak, Ronald P.; Theeuwes, Felix; and Gyory, J Richard, 4,927,408, Cl. 604-20.000.

Theiling Jr., Louis F.: *See—*
Knopf, Robert J., Theiling Jr., Louis F.; and Berti, Leroy P., 4,927,954, Cl 558-441.000.

Theophilou, Nicolas: *See—*
Naarmann, Herbert; and Theophilou, Nicolas, 4,927,578, Cl. 264-81.000.

Thermo King Corporation: *See—*
King, Donald D., 4,926,655, Cl. 62-244.000.

Thetford Corporation: *See—*
Sargent, Charles L.; Antos, John M.; and Biba, Scott I., 4,926,508, Cl. 4-329.000.

Thiele, Karl E.: *See—*
Brock-Fisher, George A.; Kranz, Paul R.; Mniece, James R.; Thiele, Karl E.; Savord, Bernard J.; and Smith, Richard B., 4,926,872, Cl. 128-661.010.

Thomas, J. W. No-till drill providing seed and fertilizer separation 4,926,767, Cl. 111-187.000.

Thomas, Mary P.: *See—*
Sevrain, Christophe Jean-Paul; Schramm, Heather R.; Schmidt, Daniel G.; Hooper, Paul S.; and Thomas, Mary P., 4,926,879, Cl. 128-798.000.

Thomas, Ronald E.: *See—*
Lesk, Israel A.; Thomas, Ronald E.; Hawkins, George W.; and Rugg, James M., 4,928,162, Cl. 357-72.000

VOL
1114
ISS
4
MY
22
1990
UMI

Thomas, William D.: *See—*
Crawley, H. Bert; Rosenberg, Eli I.; Meyer, W. Thomas; Gorbics, Mark S.; Thomas, William D.; McKay, Roy L.; and Homer, John F., Jr., 4,928,246, Cl. 364-514.000.
Thompson, Gregory E.; and Thompson, Paul V. Cast decoration kit. 4,927,025, Cl. 206-575.000.
Thompson, Paul V.: *See—*
Thompson, Gregory E.; and Thompson, Paul V., 4,927,025, Cl. 206-575.000.
Thompson, Wayne J.: *See—*
Eilon, Gabriel F.; and Thompson, Wayne J., 4,927,965, Cl. 562-560.000.
Thomson-CSF: *See—*
Devaux, Francois; Herail, Norbert; Lefevre, Denis; and Lehuede, Jean-Pierre, 4,928,077, Cl. 333-111.000.
Lefevre, Herve ; Bettini, Jean-Pierre; Botti, Serge; and Turpin, Marc, 4,928,005, Cl. 250-227.230.
Papuchon, Michel; Pocholle, Jean-Paul; and Delacourt, Dominique, 4,927,245, Cl. 350-354.000.
Pocholle, Jean P.; Papuchon, Michel; Puech, Claude; and Tournois, Pierre, 4,927,223, Cl. 350-96.150.
Thornton, Earl K., Jr.: *See—*
Parker, Tim; Edwards, Robert M.; Magnotta, Frank A.; Laprade, Jean-Paul; Smith, Donald R.; Sodagar, Eleanor H.; Anemaet, John M.; Benoit, Dennis R.; Thornton, Earl K., Jr.; and Galante, Richard J., 4,927,709, Cl. 428-352.000.
Thrasher, Robert, Jr.: *See—*
Mayer, Ronald F.; and Thrasher, Robert, Jr., 4,927,203, Cl. 292-201.000.
Thrlik, Jiri , to Elitex koncern textilniho strojirenstvi. Device for checking cylindrical bodies, especially tubes of open-end spinning machines. 4,927,029, Cl. 209-538.000.
Thukakoshi, Thuneo: *See—*
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 4,928,155, Cl. 357-23.400.
Thurne Engineering Co., Ltd : *See—*
Hoyland, Trevor B.; and Payne, Richard, 4,927,000, Cl. 198-418.400.
Thurner, Gunther: *See—*
Wittman, Jurgen; von Entress-Furstenеck, Wolfgang; and Thurner, Gunther, 4,926,751, Cl. 102-348.000.
Thyssen Industrie AG: *See—*
Smith, Terence M., 4,928,174, Cl. 358-108.000.
Tidd, Jonathan L.: *See—*
Frost, Martin; Horton, Bruce J.; and Tidd, Jonathan L., 4,926,603, Cl. 51-165.770.
Tilley, Jefferson W.: *See—*
Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,927,826, Cl. 514-256.000.
Guthrie, Robert W.; Kierstead, Richard W.; Mullin, John G.; and Tilley, Jefferson W., 4,927,838, Cl. 514-337.000.
Timan, Peter E.: *See—*
Smith, Roy E.; and Timan, Peter E., 4,926,756, Cl. 105-167.000.
Tioxide Group PLC: *See—*
Cowie, Alan G., 4,927,464, Cl. 106-436.000.
Tischer, Kurt-Manfred: *See—*
Mayer, Uwe; and Tischer, Kurt-Manfred, 4,928,041, Cl. 315-366.000.
Tobbe, Joseph D.: *See—*
Carlson, James R.; and Tobbe, Joseph D., 4,926,523, Cl. 16-125.000.
Tobin, Philip J.: *See—*
Roth, Scott S.; Nguyen, Bich-Yen; Tobin, Philip J.; Ray, Wayne; Wachholz, E. Petyr; and Wissen, Glenn, 4,927,780, Cl. 437-69.000.
Todaro, Frank A.: *See—*
Abildgaard, William H.; Chadwick, Charles; Hotkowski, Peter; and Todaro, Frank A., 4,927,310, Cl. 412-7.000.
Toja, Emilio: *See—*
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 4,927,837, Cl. 514-331.000.
Tokai Corp.: *See—*
Nitta, Tomio, 4,927,747, Cl. 431-344.000.
Tokitoh, Yasuo: *See—*
Maeda, Toshihiko; Tokitoh, Yasuo; and Yoshimura, Noriaki, 4,927,960, Cl. 562-512.000.
Tokumitsu, Jun, to Canon Kabushiki Kaisha. Optical switch array provided with a mask having openings of a predetermined pattern and shutters corresponding to the pattern. 4,927,230, Cl. 350-96.240.
Tokumo, Akio: *See—*
Yamamoto, Hideo; Sato, Takeshi; Yoshimi, Toshikazu; Mori, Shuichi; and Tokumo, Akio, 4,928,071, Cl. 330-129.000.
Tokyo Electric Co., Ltd.: *See—*
Muroi, Hidenori, 4,928,279, Cl. 371-11.200.
Tolbert, Thomas W.: *See—*
Jaco, Pamela J.; and Tolbert, Thomas W., 4,927,698, Cl. 428-198.000.
Tomaszewski, David G.: *See—*
Spehrley, Charles W., Jr., Barss, Steven H.; Tomaszewski, David G.; and Hoisington, Paul A., 4,928,120, Cl. 346-140.00R.
Tomforde, Johann; and Wall, Monika, to Daimler-Benz Aktiengesellschaft. Presentation podium. 4,927,106, Cl. 248-146.000.
Tomikawa, Kazuto; and Fujie, Hideo, to Toshiba Kikai Kabushiki Kaisha. System for compensatively correcting for displacements due to heat in machine tools. 4,928,019, Cl. 250-561.000.
Tomita, Koji: *See—*
Konishi, Masataka; Shimizu, Keiko; Ohbayashi, Masaru; Tomita, Koji; Miyaki, Takeo; and Oki, Toshikazu, 4,927,848, Cl. 514-453.000
Tomkiel, Stanley, to National Medical Device Corporation. User-protective hypodermic syringe holder. 4,927,416, Cl. 604-198.000.
Tomlinson, Robert A. Push rod tube for high lift rocker arms. 4,926,805, Cl. 123-90.610.
Tommerson, David P.; and Brekkestran, Kevin L., to Environwear, Inc. Fused electrical connector with sewing wings. 4,927,366, Cl. 439-37.000.
Tomoe Technical Research Company: *See—*
Kawai, Kouzi, 4,926,903, Cl. 137-554.000.
Tompkins, David J., to Kontron Instruments Holdings, NV. Pipetting method and apparatus. 4,926,701, Cl. 73-864.150.
Tone, Masatsugu: *See—*
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,926,624, Cl. 56-202.000.
Tonen Corporation: *See—*
Takatsuna, Kazutoshi; Shiozawa, Kouji; and Okumura, Yoshiharu, 4,927,953, Cl. 556-413.000.
Topia Industry Co., Ltd.: *See—*
Shimazaki, Fumio, 4,926,922, Cl. 160-331.000.
Toray Industries, Inc.: *See—*
Nagura, Satoru: Ebihara, Tsutomu; and Matsumoto, Toshihide, 4,927,682, Cl. 428-88.000.
Taniguchi, Masaharu; Ichijo, Chikara; and Fujikawa, Junichi, 4,927,739, Cl. 430-286.000.
Torisawa, Akira; Kakizaki, Masaaki; Ito, Noriaki; and Yoshimura, Shigeru, to Canon Kabushiki Kaisha. Recorder. 4,928,050, Cl. 318-696.000.
Torras, Robert M. Mowing tractor with towed mower. 4,926,621, Cl. 56-6.000.
Torrington Company, The: *See—*
Lawson, James L., 4,927,275, Cl. 384-117.000.
Toshiba Corp.: *See—*
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 4,926,648, Cl. 62-55.500.
Toshiba Kikai Kabushiki Kaisha: *See—*
Tomikawa, Kazuto; and Fujie, Hideo, 4,928,019, Cl. 250-561.000.
Toshiba Shilicone Co., Ltd.: *See—*
Kabeta, Keiji; and Zenbayashi, Michio, 4,927,949, Cl. 556-413.000.
Toshiba Silicone Co., Ltd.: *See—*
Kabeta, Keiji; and Syuto, Kiyoaki, 4,927,951, Cl. 556-419.000.
Tosoh Corporation: *See—*
Sakamoto, Kiyoaki; Matsubara, Kenichi; Nakahara, Yasuhiro; and Nomura, Masaki, 4,927,531, Cl. 210-198.200.
Toto Ltd.: *See—*
Higuchi, Mitsuhiro; and Yamamoto, Hirofumi, 4,926,504, Cl. 4-247.000.
Higuchi, Mitsuhiro; Yamamoto, Hirofumi; Yamamoto, Osamu; Fujii, Shokichi; and Nonomura, Katsumi, 4,926,505, Cl. 4-247.000.
Tournois, Pierre: *See—*
Pocholle, Jean P.; Papuchon, Michel; Puech, Claude; and Tournois, Pierre, 4,927,223, Cl. 350-96.150.
Townsend, Leroy B.; and Drach, John C., to University of Michigan, The Regents of the. Acyclic pyrrolo[2,3-D]pyrimidine analogs as antiviral agents. 4,927,830, Cl. 514-258.000.
Toyoda Gosei Co., Ltd.: *See—*
Inui, Shuji; Hiramitsu, Tetsushi; Takahaski, Toshinori; Tamaki, Makoto; Kikuta, Mitsuhiro; and Mizutani, Junichi, 4,927,364, Cl. 439-15.000.
Ito, Toshiyasu; Minoura, Jun; Takahashi, Shigeyuki; Mori, Takaaki; Kato, Mamoru; and Funahashi, Toshikazu, 4,927,246, Cl. 350-357.000.
Tsutsui, Masatoshi, 4,927,683, Cl. 428-90.000.
Toyoda Gosei Co., Ltd: *See—*
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mitzutani, Satoshi; and Isono, Toru, 4,927,190, Cl. 285-175.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Kato, Kichiro, 4,927,333, Cl. 417-316.000.
Matsumoto, Shinichi; Miyoshi, Naoto; Kimura, Mareo; Ozawa, Masakuni; and Isogai, Akio, 4,927,799, Cl. 502-303.000.
Nishikawa, Shoji; Ohkura, Akira; and Ichida, Katsuya, 4,926,958, Cl. 180-168.000.
Toyoyama, Kenji: *See—*
Otsuka, Tetsuji; Shinozaki, Kenichi; Toyoyama, Kenji; and Ishihara, Shinobu, 4,927,356, Cl. 431-351.000.
TransTechnology Corporation: *See—*
Westover, Dwight G., 4,927,132, Cl. 271-225.000.
Tremblay, Sylvain: *See—*
Ciloglu, Cavit; Gagne, Martin; Laraque, Edy; Poirier, Joel; Tremblay, Sylvain; and Trudel, Yves, 4,927,461, Cl. 75-254.000.
Treybig, Duane S., to Dow Chemical Company, The. Cured product from thermosettable prepolymer prepared from heterocyclic materials having alkyl substituents, mono- or dianhydrides, ethylenically unsaturated materials and a hydroxide, carbonate or bicarbonate of a metal of groups I-A or II-A. 4,927,913, Cl. 528-480.000.
Treybig, Duane S., to Dow Chemical Company, The. Reaction products of pyrimidine, pyridazine and 4-isopropenyl-1-cyclohexene-1-carboxaldehyde. 4,927,932, Cl. 544-357.000.
Triollier, Michel: *See—*
Leveque, Alain; and Triollier, Michel, 4,927,609, Cl. 423-21.500.

Troemel, Stephen T.: *See—*
Guerinot, William F.; Bradley, Ralph H.; and Troemel, Stephen T., 4,928,182, Cl. 358-245.000.
Trompler, Lyle D. Noise limiting circuit for earmuffs. 4,928,311, Cl. 381-72.000.
Trudel, Yves: *See—*
Ciloglu, Cavit; Gagne, Martin; Laraque, Edy; Poirier, Joel; Tremblay, Sylvain; and Trudel, Yves, 4,927,461, Cl. 75-254.000.
Trundle, Clive; and Brettle, Jack, to Plessey Overseas Limited. Marking of articles with photochromic compounds. 4,927,180, Cl. 283-70.000.
TRW Inc.: *See—*
Marum, John R., 4,928,022, Cl. 307-241.000.
TRW Repa GmbH: *See—*
Fohl, Artur, 4,927,175, Cl. 280-806.000.
Tsai, Allan. Pen-like eyeglass cleaner. 4,927,284, Cl. 401-195.000.
Tsai, Chong S.; Chen, Shou H.; Li, Bean T.; and Jean, King L., to Industrial Technology Research Institute. Process for applying electrically insulative layers. 4,927,664, Cl. 427-57.000.
Tsaklakidis, Christos: *See—*
Leinert, Herbert; Tsaklakidis, Christos; and Sponer, Gisbert, 4,927,834, Cl. 514-422.000.
Tsuboi, Masayoshi: *See—*
Kawata, Ken; Sato, Kozo; and Tsuboi, Masayoshi, 4,927,897, Cl. 526-240.000.
Tsuchida, Akiyoshi: *See—*
Rokutanda, Shuji; Higemitsu, Yasuo; Tsuchida, Akiyoshi; and Yamakoshi, Yukihiro, 4,927,734, Cl. 430-264.000.
Tsuchida, Yutaka: *See—*
Takahashi, Shuzo; Tsuchida, Yutaka; Osada, Shiro; Hasebe, Nobuhisa; and Nakada, Masayuki, 4,926,925, Cl. 164-154.000.
Tsuchihashi, Toshifumi: *See—*
Tamura, Mitsunobu; Tsuchihashi, Toshifumi; and Kenmochi, Toshihisa, 4,927,358, Cl. 432-204.000.
Tsuchiya Mfg. Co., Ltd.: *See—*
Morizumi, Mitsuo; Omura, Kinya; Arita, Eriya; Furuya, Katsuji; Yasuda, Sakae; and Kodera, Masaya, 4,926,914, Cl. 141-59.000.
Tsuji, Eiji: *See—*
Hakuta, Shinsaku; Yasaka, Yasuhiro; Nagura, Osamu; Tsuji, Eiji; Suzuki, Makoto; and Akagawa, Hirotaka, 4,926,541, Cl. 29-598.000.
Tsuji, Kazuo, to Sumitomo Electric Industries, Ltd. Diamond single crystal. 4,927,619, Cl. 423-446.000.
Tsujimura, Manabu: *See—*
Okumura, Katsuya; Kuriyama, Fumio; Murai, Yukio; Tsujimura, Manabu; and Sobukawa, Hiroshi, 4,926,648, Cl. 62-55.500.
Tsujimura, Osamu; Nakayama, Masaaki; and Okawa, Masayuki, to Mitsubishi Metal Corporation. Ball end mill. 4,927,303, Cl. 408-223.000.
Tsukazaki, Katsuhiko: *See—*
Ichihashi, Kouji; Tani, Junichi; Tsukazaki, Katsuhiko; Sakuyama, Hiroshi; Baba, Nobuo; Nakajima, Kiyoji; Arai, Takaaki; and Inaba, Akira, 4,926,906, Cl. 137-625.300.
Tsumura, Kenji; Yamada, Yukifumi; and Terada, Takami, to Daihatsu Motor Co., Ltd.; and Aishin Seiki Co., Ltd. Slide locking device for a car seat. 4,927,110, Cl. 248-430.000.
Tsunekawa, Tokuichi; Date, Nobuaki; Aizawa, Hiroshi; Hosoe, Kazuya; and Urushibara, Kazunori, to Canon Kabushiki Kaisha. Image recording system. 4,928,184, Cl. 358-335.000.
Tsutsui, Hiroshi; Baba, Sueki; Ohmori, Koichi; Yamamoto, Osamu; and Watanabe, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Radiographic diagnostic apparatus. 4,928,297, Cl. 378-146.000.
Tsutsui, Masatoshi, to Toyoda Gosei Co., Ltd. Color-bearing textile product. 4,927,683, Cl. 428-90.000.
Tuckey, Charles H., to Walbro Corporation. Pressure-responsive fuel delivery system. 4,926,829, Cl. 123-497.000.
Tufts, Timothy A., to Ashland Oil, Inc. Process for the preparation of a polyurethane from a storage stable polyol compositions. 4,927,862, Cl. 521-118.000.
Turley, Homer L.; Niksa, Marilyn J.; Pohto, Gerald R.; and Niksa, Andrew J., to ELTECH Systems Corporation. Bipolar metal/air battery. 4,927,717, Cl. 429-27.000.
Turpin, Marc: *See—*
Lefevre, Herve ; Bettini, Jean-Pierre; Botti, Serge; and Turpin, Marc, 4,928,005, Cl. 250-227.230.
Turrill, Frank H.: *See—*
Ward, Clifford; Chao, Eugene; Booth, Roy E.; Turrill, Frank H.; Wombles, Robert H.; Newman, John W.; and Hettinger, William P., Jr., 4,927,620, Cl. 423-447.200.
Tuszko, Wlodzimier J.; and Tuszko, Wojciech J. Cyclone separating method and apparatus. 4,927,298, Cl. 406-173.000.
Tuszko, Wojciech J.: *See—*
Tuszko, Wlodzimier J.; and Tuszko, Wojciech J., 4,927,298, Cl. 406-173.000.
Tuthill Corporation: *See—*
Gailey, Edward D., 4,926,895, Cl. 137-15.000.
Twenthieth Century Companies, Inc.: *See—*
Mikol, Erwin F., 4,927,191, Cl. 285-226.000.
Twentieth Century Companies, Inc.: *See—*
Mikol, Erwin F., 4,926,518, Cl. 15-104.330.
Twinpak Inc.: *See—*
Fattal, R. George; and Ringrose, Gordon, 4,927,486, Cl. 156-351.000.
Uarco Incorporated: *See—*
Ehret, Barbara A.; and Pearce, James H., III, 4,927,179, Cl. 283-79.000.
UAS Support, Inc.: *See—*
Snyder, Stephen J., 4,926,963, Cl. 181-290.000.
UBE Chemical Industries, LTD.: *See—*
Yamamoto, Kosei; Kaneyasu, Akira; and Iwamoto, Toshiichi, 4,927,611, Cl. 423-155.000.
Uchida, Naoto: *See—*
Yamaguchi, Shuichiro; Uchida, Naoto; Shimomura, Takeshi; and Oyama, Noboru, 4,927,516, Cl. 204-403.000.
Uchikubo, Akinobu: *See—*
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,928,172, Cl. 358-98.000.
Ueda, Chie: *See—*
Ueda, Iwao, 4,927,530, Cl. 210-149.000.
Ueda, Etsuko: *See—*
Ueda, Iwao, 4,927,530, Cl. 210-149.000.
Ueda, Hiroshi: *See—*
Taniguchi, Nobuyuki; Hoda, Takeo; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,928,124, Cl. 354-106.000.
Ueda, Iwao, to Ueda, Iwao; Ueda, Chie; and Ueda, Etsuko. Apparatus for processing sludge. 4,927,530, Cl. 210-149.000.
Ueda, Minoru: *See—*
Tanaka, Koji; Ueda, Minoru; and Masuda, Taizo, 4,927,710, Cl. 428-394.000.
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, to Olympus Optical Co., Ltd. Endoscope output signal control device and endoscope apparatus making use of the same. 4,928,172, Cl. 358-98.000.
Uenaka, Kazushige: *See—*
Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, 4,927,533, Cl. 210-257.100.
Uesaki, Osamu. Ultra violet ray generator by means of microwave excitation. 4,928,040, Cl. 315-248.000.
Uesugi, Masaki: *See—*
Kaku, Nobuyuki; Shigemura, Tatsuya; Uesugi, Masaki; Kano, Kiyoshi; and Ogiro, Kenji, 4,928,191, Cl. 360-85.000.
Ullah, Ismat: *See—*
Bykadi, Gururaj; Kaplan, Murray A.; Corrao, Richard G.; Bara, Edward J.; Ullah, Ismat; and Agharkar, Shreeram N., 4,927,638, Cl. 424-455.000.
Ulrich, Helmut: *See—*
Fauck, Gerhard; Pohl, Wolfgang; and Ulrich, Helmut, 4,926,907, Cl. 137-627.500.
Umeno, Masayoshi; Sakai, Shiro; and Yahagi, Shinichiro, to Daido Tokushuko Kabushiki Kaisha; and Nagoya Institute of Technology. Epitaxial gallium arsenide semiconductor on silicon substrate with gallium phosphide and superlattice intermediate layers. 4,928,154, Cl. 357-16.000.
Ungchusri, Tep; and Lemons, George D., to FMC Corporation. Pipe connector load element. 4,927,192, Cl. 285-305.000.
Ungruh, Josef; and Rohlmann, Maximilian, to H. Niemeyer Sohne GmbH & Co. KG. Hay-making machine. 4,926,619, Cl. 56-15.400.
UniDynamics Corporation: *See—*
Falk, Leonard P.; and Griner, Paul K., 4,927,051, Cl. 221-12.000.
Unilever Patent Holdings, B.V.: *See—*
Bradshaw, Noel J.; and Hughes, David, 4,927,661, Cl. 426-641.000.
Union Carbide Chemicals and Plastics Company Inc.: *See—*
King, Roswell; E., III; Foster, George N.; and Petty, Herbert E., 4,927,898, Cl. 528-27.000.
Knopf, Robert J.; Theiling Jr., Louis F.; and Berti, Leroy P., 4,927,954, Cl. 558-441.000.
Wegman, Richard W., 4,927,967, Cl. 562-607.000.
Uniroyal Chemical Company, Inc.: *See—*
Brouwer, Walter G.; Felauer, Ethel Ellen; and Bell, Allyn Roy, 4,927,451, Cl. 71-92.000.
Uniroyal Chemical Ltd/Ltee: *See—*
Brouwer, Walter G.; Felauer, Ethel Ellen; and Bell, Allyn Roy, 4,927,451, Cl. 71-92.000.
Unistrut International Corp.: *See—*
Nehls, Charles O., 4,926,592, Cl. 52-98.000.
Unisys Corporation: *See—*
Protopapas, Dimitrios, 4,928,273, Cl. 370-85.700.
Unisys Corporation (Formerly Burroughs Corp): *See—*
Murphy, Patrick J.; and Svenkeson, John W., 4,927,370, Cl. 439-74.000.
Unit Instruments, Inc.: *See—*
Doyle, James H., 4,928,048, Cl. 318-644.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Banbury, John R.; and Barter, Derek L., 4,927,234, Cl. 350-174.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Brittanic Majesty's Government of the: *See—*
Westerlund, Nils G., 4,927,171, Cl. 280-718.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for United Kingdom Atomic Energy Authority in Her Britannic Majesty's Government of the: *See—*
Reading, Anthony H.; and Miles, Brynley J., 4,927,761, Cl. 435-178.000.
United States of America
Air Force: *See—*
Leger, Kenneth B., 4,927,994, Cl. 219-343.000.
May, Roger A., 4,928,258, Cl. 364-724.170.

VOL 1114 ISS 4 MY 22 1990 UMI

Nash, Dudley O.; and Herzner, Frederick C., 4,926,633, Cl. 60-226.100.

Army: *See—*
Ferrett, Donald A., 4,927,771, Cl. 437-3.000.
Leupold, Herbert A., 4,928,081, Cl. 335-216.000.

Director, National Security Agency: *See—*
Beard, Warren T., Jr.; and Armstrong, Ronald W., 4,928,294, Cl. 378-74.000.

Energy: *See—*
Allen, Daniel T., 4,927,599, Cl. 376-321.000.
Birx, Daniel L.; and Reginato, Louis L., 4,928,020, Cl. 307-106.000.
Cioletti, Olisse C., 4,926,745, Cl. 92-256.000.
Johnson, Gerald D.; Lobsinger, Ralph J.; Hamilton, Margaret L.; and Gelles, David S., 4,927,468, Cl. 148-3.000.
Moyer, Bruce A.; and McDowell, W. J., 4,927,610, Cl. 423-24.000.
Petrovic, John J.; Carter, David H.; and Gac, Frank D., 4,927,792, Cl. 501-92.000.
Ross, Philip N., Jr., 4,927,718, Cl. 429-44.000.

Health and Human Services: *See—*
Chanock, Robert M.; Kapikian, Albert; Midthun, Karen; Flores, Jorge; Gorziglia, Mario; Hoshino, Yasutaka; and Peres-Schael, Irene, 4,927,628, Cl. 424-89.000.

National Aeronautics and Space Administration: *See—*
Crews, John H., Jr.; and Reeder, James R., 4,926,694, Cl. 73-794.000.
Deininger, William D.; and King, David Q., 4,928,027, Cl. 310-11.000.
von Pragenau, George L., 4,927,326, Cl. 415-170.100.

Navy: *See—*
Davey, John E.; and Christou, Aristos, 4,927,782, Cl. 437-184.000.
Kahn, Manfred, 4,928.264, Cl. 367-141.000.
Polly, Daniel R., 4,927,503, Cl. 204-153.110.

U.S. Philips Corp.: *See—*
Geertsma, Geert; Poel, Hendrik; and Weersink, Andreas, 4,926,550, Cl. 30-43.100.
Knibbe, Engel J., 4,928,180, Cl. 358-213.130.
Kroes, Anthony; and Van Engen, Pieter G., 4,927,217, Cl. 315-248.000.
Kuijk, Karel E., 4,927,241, Cl. 350-336.000.
Lock, Willem, 4,927,127, Cl. 269-322.000.
Theeten, Jean-Bernard; Autier, Philippe; and Auger, Jean Marc, 4,927,785, Cl. 437-225.000.
Van De Pas, Hermanus A., 4,927,228, Cl. 350-96.200.
Verhagen, Johannes P. C. M., 4,928,271, Cl. 369-292.000.
Wolfger, Arno, 4,926,551, Cl. 30-43.920.
Zegers, Antonius P. F., 4,927,218, Cl. 315-366.000.
Zieren, Victor; and Ruigrok, Jacobus J. M., 4,927,804, Cl. 505-1.000.

United Technologies: *See—*
Swindal, James L.; and Wiegand, Walter J., 4,928,203, Cl. 361-280.000.

United Technologies Corporation: *See—*
Blackburn, Martin J.; and Smith, Michael P., 4,927,458, Cl. 75-246.000.
Bluege, John, 4,927,790, Cl. 501-32.000.
Novotny, Rudolph J., 4,926,710, Cl. 74-573.00R.
Sanford, David L.; and Douglass, Gary W., 4,927,187, Cl. 285-80.000.
Stone, Robert A.; and Kish, Jules G., 4,926,991, Cl. 192-41.00S.
Wisner, George R., 4,927,249, Cl. 350-486.000.
Zabielski, Martin E., 4,927,350, Cl. 431-12.000.

United Technologies Electro Systems, Inc.: *See—*
Mayer, Ronald F.; and Thrasher, Robert, Jr., 4,927,203, Cl. 292-201.000.

Unitek Corporation: *See—*
Pospisil, Jirina V., 4,927,360, Cl. 433-8.000.
Snead, Wilford A., 4,927,362, Cl. 433-17.000.

Universite Paris X - Nanterre: *See—*
Herve, Philippe, 4,927,267, Cl. 356-336.000.

University of Bristol: *See—*
Frost, Martin; Horton, Bruce J.; and Tidd, Jonathan L., 4,926,603, Cl. 51-165.770.

University of California, The Regents of the: *See—*
Kramer, George C.; and Perron, Paul R., 4,927,806, Cl. 514-2.000.
Oppenheim, A. K.; Stewart, H. E.; and Horn, K., 4,926,818, Cl. 123-297.000.

University of Michigan, The Regents of the: *See—*
Townsend, Leroy B; and Drach, John C., 4,927,830, Cl. 514-258.000.

University of Minnesota, Regents of the: *See—*
Dorman, Frank, 4,927,407, Cl. 600-16.000.
Ramalingam, Subbiah; and Frohrib, Darrell A., 4,927,299, Cl. 407-120.000.
Ramalingam, Subbiah and Frohrib, Darrell A., 4,927,300, Cl. 407-120.000.

University of Rochester, The: *See—*
Bryant, Robert G.; and Listinsky, Jay J., 4,927,624, Cl. 424-9.000.
Mourou, Gerard A.; Nees, John A.; and Williamson, Steven L., 4,928,076, Cl. 330-4.300.
Williamson, Steven, 4,928,058, Cl. 324-96.000.

University of South Florida: *See—*
Kovacs, Stephen G., 4,927,410, Cl. 600-36.000.

Unterbusch, Manfred W.: *See—*
Stephens, Donald E.; and Unterbusch, Manfred W., 4,926,702, Cl. 73-864.830.

Unverferth Manufacturing Co., Inc.: *See—*
Van Mill, Michael D., 4,926,617, Cl. 53-587.000.

UOP: *See—*,
Cetinkaya, Ismail B.; and Culler, Robert P., 4,927,606, Cl. 422-144.000.
Coughlin, Peter K.; Mercer, William C.; and Flanigen, Edith M., 4,927,768, Cl. 436-172.000.
Kalnes, Tom N.; James, Robert B., Jr.; and Staggs, Darrell W., 4,927,520, Cl. 208-50.000.
St. Martin, Edward J., 4,927,760, Cl. 435-171.000.

Upmeier, Egon, to Kochs Adler Aktiengesellschaft. Automatic sewing device with a sewing head including a rotary housing. 4,926,769, Cl. 112-121.120.

Urabe, Hitoshi: *See—*
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, 4,928,167, Cl. 358-80.000.

Urakami, Fukashi. Device capable of suction-adhering to a wall surface and moving therealong. 4,926,957, Cl. 180-164.000.

Urushibara, Kazunori: *See—*
Tsunekawa, Tokuichi; Date, Nobuaki; Aizawa, Hiroshi; Hosoe, Kazuya; and Urushibara, Kazunori, 4,928,184, Cl. 358-335.000.

Ushikubo, Takao; Iwasa, Yasuhiro; and Yamaji, Yukinori, to Sanken Electric Co., Ltd. Soldering method capable of providing a joint of reduced thermal resistance. 4,927,069, Cl. 228-123.000.

Usines et Acieries de Sambre et Meuse: *See—*
Haesebrouck, Francis, 4,926,761, Cl. 109-49.500.

UTDC Inc.: *See—*
Smith, Roy E.; and Timan, Peter E., 4,926,756, Cl. 105-167.000.

Utter, Robert E.: *See—*
Riffe, Delmar R.; Kotlarek, Peter A.; and Utter, Robert E., 4,927,339, Cl. 418-55.000.

Uyeda, Alan K.: *See—*
Gartner, Klaus W.; and Uyeda, Alan K., 4,926,664, Cl. 70-119.000.

Vachette: *See—*
Girard, Joel; and Wattebled, Christian, 4,927,196, Cl. 292-201.000.

Vaiskauckas, Gary A.: *See—*
Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.

Valev, Assen, to Steyr-Daimler-Puch. Oil-cooled internal combustion engine. 4,926,800, Cl. 123-41.420.

Valmet-Ahlstrom, Inc.: *See—*
Wikman, Kai, 4,927,499, Cl. 162-336.000.

Valvo, Russell. Floor care apparatus. 4,926,516, Cl. 15-49.00C.

Van Brunt, Nicholas; Robertson, Jeffrey C.; and Homa, Daniel, to Eastman Kodak Company. Package for storing and remixing two materials. 4,927,013, Cl. 206-221.000.

Vance, Karen: *See—*
Kriauciunas, G. Vincent; and Vance, Karen, 4,927,427, Cl. 606-128.000.

van den Brink, Franciscus T. B.: *See—*
van Geem, Paul C.; and van den Brink, Franciscus T. B., 4,927,974, Cl. 568-357.000.

van den broek, Jos. Sewage sludge treatment system. 4,926,764, Cl. 110-221.000.

Van De Pas, Hermanus A., to U.S. Philips Corp. Optoelectronic arrangement having a coupling between an optical transmission fibre and a semiconductor laser diode. 4,927,228, Cl. 350-96.200.

van der Hoeven, Johannes C. W., to Hoechst Aktiengesellschaft. Method of making a decorative panel with improved surface characteristics. 4,927,572, Cl. 264-22.000.

Vanderlaan, Dirk, to Ihly Industries, Inc. Necked-down can having a false seam and an apparatus to form same. 4,927,043, Cl. 220-67.000.

Van Deventer, Bruce: *See—*
Huggins, Raymond W.; Van Deventer, Bruce; and Miller, Glen E., 4,928,008, Cl. 250-231.100.

Van Engen, Pieter G.: *See—*
Kroes, Anthony; and Van Engen, Pieter G., 4,927,217, Cl. 315-248.000.

van Gasse, Rene L. E., to DSM Resins B.V. Sheet moulding compound and a top for it. 4,927,701, Cl. 428-212.000.

van Geem, Paul C.; and van den Brink, Franciscus T. B., to Stamicarbon B.V. Process for the preparation of cyclohexanol and/or cyclohexanone. 4,927,974, Cl. 568-357.000.

Van Hees, Theodorus J.: *See—*
Smook, Jan; Vos, Gerardus J. H.; Juijn, Johannes A.; and Van Hees, Theodorus J., 4,927,586, Cl. 264-185.000.

Van Leeuwen, Hubert J.: *See—*
Saulnier, Kenneth D.; and Van Leeuwen, Hubert J., 4,927,395, Cl. 441-26.000.

Van Lommen, Guy R. E.: *See—*
Lutz, William R.; Verschueren, Wim G.; Fischer, Hanspeter; and Van Lommen, Guy R. E., 4,927,449, Cl. 71-90.000.

Van Mill, Michael D., to Unverferth Manufacturing Co., Inc. Apparatus for wrapping round bales. 4,926,617, Cl. 53-587.000.

van Opstal, Martin; Dewulf, Frans; Cleenewerck, Bernard; and Weber, Ernst, to N.V. Vandemoortele International. Process for the continuous removal of a gum phase from triglyceride oil. 4,927,544, Cl. 210-712.000.

Vanotti, Gerard, to Etablissements S.A. Device for elastically and rapidly fixing a railway rail. 4,927,078, Cl. 238-349.000.

Van Sloun, Peter H., to Honeywell Inc. Safety locking pull ring. 4,926,750, Cl. 102-261.000.

van Wingerden, Aart. Method and apparatus for propagating plants. 4,926,587, Cl. 47-85.000.

Varian Associates, Inc.: *See—*
Mears, Eric L.; and Jennings, Robert E., 4,927,438, Cl. 55-385.200.

Varo, Inc.: *See—*
Hart, Richard T., 4,927,237, Cl. 350-319.000.

Varshney, Sunil K.: *See—*
Teyssie, Philippe; Varshney, Sunil K.; Jerome, Robert; and Fayt, Roger, 4,927,703, Cl. 428-220.000.

Vartan-Boghossian, Razmik: *See—*
Coogan, Richard G.; and Vartan-Boghossian, Razmik, 4,927,876, Cl. 524-457.000.

Vatant, Robert: *See—*
Gay, Pierre; and Vatant, Robert, 4,926,930, Cl. 164-476.000.

Vaughan, Thomas L., to Signet Armorlite, Inc. Method and clamping device for bonding thin lens wafers. 4,927,480, Cl. 156-228.000.

VDO Adolf Schindling AG: *See—*
Porth, Wolfgang; Weibler, Wolfgang; Kern, Eckhart; Hannewald, Thomas; and Weingartner, Reiner, 4,926,821, Cl. 123-399.000.

Veerhusen, Dan S.; and Pattison, David C., to Rockwell International Corporation. Automatic fuel control and engine synchronizer system and apparatus. 4,926,628, Cl. 60-39.150.

VeloBind, Inc.: *See—*
Abildgaard, William H.; Chadwick, Charles; Hotkowski, Peter; and Todaro, Frank A., 4,927,310, Cl. 412-7.000.

Verhagen, Johannes P. C. M., to U.S. Philips Corporation. Holder for discs of different diameters. 4,928,271, Cl. 369-292.000.

Vermesse, Bernard, to Societe Anonyme dite : SMH Alcatel. Electronic franking machine including franking limit values. 4,928,244, Cl. 364-464.020.

Vermesse, Bernard, to Societe Anonyme dite : SMH Alcatel. Operating system for an electronic franking machine. 4,928,249, Cl. 364-518.000.

Verschueren, Wim G.: *See—*
Lutz, William R.; Verschueren, Wim G.; Fischer, Hanspeter; and Van Lommen, Guy R. E., 4,927,449, Cl. 71-90.000.

Vetrotex Saint-Gobain: *See—*
Soszka, Barbara; Federowsky, Robert; and Mahler, Jacques, 4,927,445, Cl. 65-11.100.

Vexcel Corp.: *See—*
Leberl, Franz W.; Karspeck, Milan; Johns, Bryan; and Lee, Scott, 4,928,169, Cl. 358-93.000.

Vicari, Richard; Aslam, Mohammad; Ray, Wilson B.; Davenport, Kenneth G.; Dammel, Ralph; Lingnau, Juergen; and Doessel, Karl-Friedrich, to Hoechst Celanese Corporation. 3,5-disubstituted-4-acetoxystyrene and process for its production. 4,927,956, Cl. 560-130.000.

Victoria University of Manchester, The: *See—*
Bruce, John M., 4,927,845, Cl. 514-440.000.

Vidal, Hugues: *See—*
Barlou, Andre ; Beltritti, Alexandre; Gramondi, Patrick; and Vidal, Hugues, 4,927,564, Cl. 252-628.000.

Vigander, Svein: *See—*
Schohl, Gerald A.; and Vigander, Svein, 4,926,675, Cl. 73-19.000.

Villaine, Philippe: *See—*
Gouttebessis, Jacques; and Villaine, Philippe, 4,926,920, Cl. 152-548.000.

Villard, Alexandre; and Cotonea, Yves, to Societe Chimique des Charbonnages S.A. Process of producing concentrated solutions of ammonium nitrate. 4,927,617, Cl. 423-396.000.

Vinegar, Harold J.: *See—*
Glandt, Carlos A.; Vinegar, Harold J.; and Prats, Michael, 4,926,941, Cl. 166-248.000.

Vinson, John R.: *See—*
Diaz, Stephen H.; Cherian. Gabe: Morris, Stephen; Vinson, John R.; Crofts, David; and Moore, Anthony J., 4,928,199, Cl. 361-56.000.

Viscount Industries Limited: *See—*
McNab, Wayne, 4,927,039, Cl. 220-3.700.

Visic, Inc.: *See—*
Abbott, Robert A.; Barbara, Bruce; and Roy, Richard S., 4,928,266, Cl. 365-189.010.

Visualtek, Inc.: *See—*
Soloveychik, Yakov G.; and Israel, Larry, 4,928,170, Cl. 358-94.000.

Vitsky, Sally J.; and Levine-Umans, Margaret P. Knockdown furniture. 4,926,759, Cl. 108-111.000.

Vivat, Michel; and Buendia, Jean, to Roussel Uclaf. Novel 23-keto-steroids. 4,927,921, Cl. 540-110.000.

Vo, Tri T., to NCR Corporation. Circuit for stable synchronization of asynchronous data. 4,928,290, Cl. 375-118.000.

Vocke, Henning L.; and Saarenko, Pauli, to Oy Alu AB. Cooking vessel. 4,926,843, Cl. 126-390.000.

Voest-Alpine Maschinenbau Gesellschaft m.b.H.: *See—*
Durchschlag, Gerald; Lang, Alfred; Rotter, Franz; Fritz, Dieter; and Kopilovitsch, Heinz, 4,927,102, Cl. 246-469.000.

Vogenthaler, James R.: *See—*
Duback, David W.; and Vogenthaler, James R., 4,928,205, Cl. 361-346.000.

Voisine, Gary R., to Emhart Industries, Inc. Pusher mechanism for glass forming machine. 4,927,444, Cl. 65-323.000.

Volkswagen AG: *See—*
Dahlmann, Gerd-Uwe, 4,926,824, Cl. 123-450.000.

Volpe, Fulvio; and Perchiazzi, Michele, to Selenia Industrie Elettroniche Associate S.p.A. Housing and connection device for electronic modules. 4,928,208, Cl. 361-395.000.

Von Roll Transportsysteme AG: *See—*
Feuz, Fritz, 4,926,754, Cl. 104-112.000.

von Entress-Fursteneck, Wolfgang: *See—*
Wittman, Jurgen; von Entress-Fursteneck, Wolfgang; and Thurner, Gunther, 4,926,751, Cl. 102-348.000.

von Pragenau, George L., to United States of America, National Aeronautics and Space Administration. Turbomachinery rotor support with damping. 4,927,326, Cl. 415-170.100

Vornado Air Circulation Systems, Inc.: *See—*
Coup, Michael C.; Israel, Gary P.; Ediger, Glen W.; and Moore, Donald J., 4,927,324, Cl. 415-121.200.

Vos, Gerardus J. H.: *See—*
Smook, Jan; Vos, Gerardus J. H.; Juijn, Johannes A.; and Van Hees, Theodorus J., 4,927,586, Cl. 264-185.000.

Vriezen, John J.; and Niemeyer, Robin N., to International Business Machines Corporation. Enhanced semaphore architecture. 4,928,222, Cl. 364-200.000.

VT-Verpackungstechnik Zurich: *See—*
Egger, Walter C., 4,926,971, Cl. 184-15.100.

Vuillet, Alain E., to Aerospatiale Societe Nationale Industrielle. Blade for high-performance shrouded propeller, multi-blade shrouded propeller provided with such blades and tail rotor arrangement with shrouded propeller for rotary wing aircraft. 4,927,331, Cl. 416-238.000.

Vyas, Dolatrai M.; Doyle, Terrence W.; and Partyka, Richard A., to Bristol-Myers Company. Substituted 7-oxomitosanes. 4,927,943, Cl. 548-422.000.

W. M Still & Sons Limited: *See—*
Snowball, Malcolm R.; and Hayes, Cecil, 4,927,060, Cl. 222-146.500.

W. R. Grace & Co.-Conn.: *See—*
Bekele, Solomon, 4,927,691, Cl. 428-35.200.
Herran, Vincent W.; and Wofford. George D., 4,927,708, Cl. 428-332.000.

W. R. Grace Limited: *See—*
Cusdin, George B., 4,927,723, Cl. 430-15.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Fauck, Gerhard; Pohl, Wolfgang; and Ulrich, Helmut, 4,926,907, Cl. 137-627.500.

Wachholz, E. Petyr: *See—*
Roth, Scott S.; Nguyen, Bich-Yen; Tobin, Philip J.; Ray, Wayne; Wachholz, E. Petyr; and Wissen, Glenn, 4,927,780, Cl. 437-69.000.

Wachtersbacher Keramik Otto Friedrich Furst zu Ysenburg und Budingen GmbH & Co. KG: *See—*
Nawothnig, Klaus, 4,927,671, Cl. 427-274.000.

Wacoal Corp.: *See—*
Miyamura, Tetsuo, 4,926,502, Cl. 2-44.000.

Wada, Katsuo: *See—*
Iwai, Kazumi; Koizumi, Hiromi; and Wada, Katsuo, 4,926,645, Cl 60-723.000.

Wada, Kou: *See—*
Saito, Kenichi; Wada, Kou; and Yoshizawa, Masahiro, 4,928,010, Cl. 250-310.000.

Wada, Masahiro: *See—*
Tanaka, Toshiyuki; Kuga, Shigeki; Nakamura, Nobuo; Morishita, Taro; and Wada, Masahiro, 4,928,236, Cl. 364-513.000.

Wada, Shunichi, to Mitsubishi Denki Kabushiki Kaisha. Suspension control apparatus for an automotive vehicle. 4,927,170, Cl. 280-707.000.

Wada, Sumio: *See—*
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,926,881, Cl. 128-804.000.

Wade, William D., to Lockheed Missiles & Space Company, Inc. Radio-frequency reflective fabric. 4,926,910, Cl. 139-425.00R.

Wadhwa, Lachhman; Bitritto, Michel; and Powers, Edward J., to Hoechst Celanese Corp. Fabrication of high performance polybenzimidazole films. 4,927,909, Cl. 528-331.000.

Wadley Technologies, Inc.: *See—*
Dorn, Gordon L.; and Johnson, Michael A., 4,927,605, Cl. 422-102.000.

Wagi, Susumu: *See—*
Kasahara, Nobuo; and Wagi, Susumu, 4,928,144, Cl. 355-245.000.

Wagner, Frederick W.; de la Motte, Rebecca S.; and Dean, Maria A., to Nebraska Department of Economic Development, State of Nebraska, U.S.A. Sugar ester synthesis. 4,927,920, Cl. 536-119.000.

Wagner, James L., to Notron Engineering AG. Interlock latch assembly for releasably securing cowl sections of an outboard motor. 4,927,194, Cl. 292-128.000.

Wagner, Joseph M., to C & C Incorporated. Convertible top vinyl push-out. 4,927,202, Cl. 296-107.000.

Waibel, Terry J.: *See—*
Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., 4,926,919, Cl. 152-209.00R.

Waidelich, Wilhelm: *See—*
Schmidt, Karl-Heinz; and Waidelich, Wilhelm, 4,928,176, Cl. 358-126.000.

Wakahara, Katsuhiro: *See—*
Masuda, Masaaki; Kotani, Masanori; Wakahara, Katsuhiro; and Sakata, Shuichi, 4,926,653, Cl. 62-204.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Wakaiki, Akinori: *See—*
Shimada, Shinichi; Kawaguchi, Noboru; Koyama, Tadayoshi; Wakaiki, Akinori; Hayashi, Keiji; Takeshita, Yasuyoshi; Nakakoshi, Masamichi; and Kawanishi, Gosei, 4,927,959, Cl. 560-193.000.
Wakamoto, Katsuyoshi: *See—*
Kusakawa, Takaji; Wakamoto, Katsuyoshi; and Imaizumi, Mitsuyuki, 4,927,467, Cl. 148-3.000.
Wakley, William D.: *See—*
Worrell, J. Robert; Wakley, William D.; and Young, Grant A., 4,927,536, Cl. 210-512.200.
Walberg, Per-Erik: *See—*
Bartlett, Kenneth G.; and Walberg, Per-Erik, 4,928,192, Cl. 360-77.080.
Walbro Corporation: *See—*
Tuckey, Charles H., 4,926,829, Cl. 123-497.000.
Waldner, Kurt. Die apparatus. 4,926,677, Cl. 72-430.000.
Walkden, Stephen A., to Hercules Incorporated. Sizing pulp. 4,927,496, Cl. 162-136.000.
Walker, Jimmy P.; and Barton, James T., to Eastman Kodak Company. Mount for linear assembly. 4,928,119, Cl. 346-108.000.
Walker, Jimmy P.: *See—*
Barton, James T.; and Walker, Jimmy P., 4,928,139, Cl. 355-1.000.
Walker, Keith A. M.; and Kertesz, Denis J., to Syntex (U.S.A.) Inc. Novel processes for the synthesis of certain bicyclo(4.2.0)octane derivatives with valuable therapeutic properties. 4,927,963, Cl. 562-501.000.
Wall, Monika: *See—*
Tomforde, Johann; and Wall, Monika, 4,927,106, Cl. 248-146.000.
Wallbillich, Guenter; Bleckmann, Gerhard; and Scholz, Dankmar, to BASF Aktiengesellschaft. Closing and/or sealing orifices, cavities or spaces in printing plates mounted on plate cylinders 4,927,740, Cl. 430-309.000.
Walls, John E.; Tellechea, Carlos; and Dhillon, Major S., to Hoechst Celanese Corporation. Radiation polymerizable composition and element containing a photopolymerizable acrylic monomer. 4,927,737, Cl. 430-278.000.
Walsh, James W. Precision micro-liter drop dispenser. 4,927,062, Cl. 222-420.000.
Waltenburg, Harold D. Fluid supply line flow control device. 4,926,901, Cl. 137-456.000.
Walter, Manfred: *See—*
Weber, Heinz; Nintz, Eckhard; Walter, Manfred; Ballweber, Dieter; and Ostermayer, Bertram, 4,927,859, Cl. 521-59.000.
Walters, James M., III: *See—*
McKenna, Peter L.; and Walters, James M., III, 4,927,258, Cl. 351-156.000.
Walton, Derek N.; and Hoppe, Richard J., to Sundstrand Corporation. Power supply with integral filter and cooling device. 4,928,138, Cl. 363-40.000.
Walton, Robert L., to Willett International Limited. Method for operating a valve. 4,928,111, Cl. 346-1.100.
Wandrey, Christian: *See—*
Memmert, Klaus; and Wandrey, Christian, 4,927,751, Cl. 435-3.000.
Wang, Grande. Sanitary lavatory seat system. 4,926,506, Cl. 4-247.000.
Wang, I-Chung W.: *See—*
DeRudder, James L.; Savenije, Herman; and Wang, I-Chung W., 4,927,880, Cl. 525-63.000.
Wang, Jui-Shang, to Duracraft Corporation. Portable electrical fan. 4,927,120, Cl. 248-676.000.
Wang, Jui-Shang, to Duracraft Corporation. Portable electrical appliance. 4,928,204, Cl. 361-331.000.
Wang, Moon-Yee: *See—*
Chuang, Patrick T.; Yau, Robert L.; Yoshida, Hiroshi; and Wang, Moon-Yee, 4,928,260, Cl. 365-49.000.
Wang, Patrick S.; Strobl, Georg; and Chu, Raymond W. H., to Johnson Electric Industrial Manufactory, Limited. Electrical connector. 4,927,379, Cl. 439-398.000.
Wang, Pen C., to Shell Oil Company. Novel polyamideimide polymers. 4,927,906, Cl. 528-228.000.
Wang, Pen C., to Shell Oil Company. Curable resin composition comprising cyanato aryl spirodilactam. 4,927,908, Cl. 528-323.000.
Wang, Wei. Utility tools. 4,926,522, Cl. 16-114.00R.
Waragai, Kenichi: *See—*
Gotoh, Masao; Hira, Yasuo; Waragai, Kenichi; Nakamura, Shozo; and Yokono, Hitoshi, 4,927,044, Cl. 220-83.000.
Ward, Clifford; Chao, Eugene; Booth, Roy E.; Turrill, Frank H.; Wombles, Robert H.; Newman, John W.; and Hettinger, William P., Jr., to Ashland Oil, Inc. Process for the manufacture of carbon fibers and feedstock therefor. 4,927,620, Cl. 423-447.200.
Ward, Robert E., Jr., to Warner & Swasey Company, The. Linear bearing with improved lubrication system and method. 4,927,272, Cl. 384-13.000.
Ward, Rodney L.: *See—*
Kaiser, Thomas A.; Mulder, Douglas C.; O'Ryan, David E.; Schneider, Douglas A.; and Ward, Rodney L., 4,927,346, Cl. 425-81.100.
Wareing, James R.: *See—*
Damon, Robert E., II; and Wareing, James R., 4,927,851, Cl. 514-460.000.
Warkentin, David J.: *See—*
Haritonidis, Joseph H.; Senturia, Stephen D.; Warkentin, David J.; and Mehregany, Mehran, 4,926,696, Cl. 73-205.000.
Warner-Lambert Company: *See—*
Ghebre-Sellassie, Isaac; Gordon, Robert H.; and Khan, Sadath U., 4,927,639, Cl. 424-497.000.
Warner & Swasey Company, The: *See—*
Ward, Robert E., Jr., 4,927,272, Cl. 384-13.000.
Wasco Products, Inc.: *See—*
Sampson, Robert; and Flanigan, Sean, 4,926,594, Cl. 52-200.000.
Waste Management, Inc.: *See—*
Acosta, Wilfred J., 4,927,317, Cl. 414-724.000.
Watanabe, Atsushi: *See—*
Kuroda, Hiroshi; and Watanabe, Atsushi, 4,928,107, Cl. 342-357.000.
Watanabe, Hiroshi: *See—*
Tsutsui, Hiroshi; Baba, Sueki; Ohmori, Koichi; Yamamoto, Osamu; and Watanabe, Hiroshi, 4,928,297, Cl. 378-146.000.
Watanabe, Kiminori: *See—*
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 4,928,155, Cl. 357-23.400.
Watanabe, Nobuhiro: *See—*
Hori, Saburo; and Watanabe, Nobuhiro, 4,927,793, Cl. 501-134.000.
Watanabe, Yoichiro: *See—*
Isoda, Tetsuo; Watanabe, Yoichiro; Nakayama, Nobuhiro; and Aoki, Mitsuo, 4,927,728, Cl. 430-108.000.
Watanabe, Yoshio: *See—*
Shimotsuhama, Isao; Emori, Shinji; Watanabe, Yoshio; and Tamamura, Masaya, 4,928,024, Cl. 307-455.000.
Wataya, Hideji: *See—*
Otsuka, Kiyotaka; and Wataya, Hideji, 4,926,552, Cl. 30-43.920.
Watkins, Jonathan, to Watkins Manufacturing Corporation. Hand held dry hydro-massage unit for a spa. 4,926,510, Cl. 4-542.000.
Watkins Manufacturing Corporation: *See—*
Watkins, Jonathan, 4,926,510, Cl. 4-542.000.
Watkins, Richard L. T. Method for making a reinforced thermosetting resin structure with integral flanged nozzle. 4,927,476, Cl. 156-173.000.
Watson, Claude F. Method and apparatus for cleaning carpet tiles. 4,926,520, Cl. 15-302.000.
Watson, Gary W.; Cheskis Harvey P.; and Sankaranarayanan, Ashok, to Olin Corporation. Vertical substrate orientation for gas-atomizing spray-deposition apparatus. 4,926,927, Cl. 164-429.000.
Watson, James E.; and Davies, Theodore E., to North American Mfg. Co. Immersion tube heater treater improved immersion tube heater treater. 4,926,842, Cl. 126-360.00R.
Wattebled, Christian: *See—*
Girard, Joel; and Wattebled, Christian, 4,927,196, Cl. 292-201.000.
Watts, Christopher: *See—*
Furstenau, Norbert; and Watts, Christopher, 4,928,007, Cl. 341-137.000.
Wearn, E. Stafford. Dental floss holding assembly. 4,926,820, Cl. 132-323.000.
Weaver, Robert M.: *See—*
Hyder, Walter J.; Kunkle, Albert C.; and Weaver, Robert M., 4,927,465, Cl. 106-486.000.
Weaver, Thomas D., to Du Pont de Nemours, E. I., and Company. Direct positive dimethine cyanine dyes containing 1-aryl-2-heteroaryl indole nucleus. 4,927,933, Cl. 546-113.000.
Weber, Ernst: *See—*
van Opstal, Martin; Dewulf, Frans; Cleenewerck, Bernard; and Weber, Ernst, 4,927,544, Cl. 210-712.000.
Weber, Heinz; Nintz, Eckhard; Walter, Manfred; Ballweber, Dieter; and Ostermayer, Bertram, to BASF Aktiengesellschaft. Expandable polymers in particle form. 4,927,859, Cl. 521-59.000.
Weber, Joerg. Apparatus and method for testing visual field. 4,927,259, Cl. 351-224.000.
Weber, Kenneth E., to Cyprus Mines Corporation. Beneficiated talcs. 4,927,874, Cl. 524-375.000.
Weber, Robert T.: *See—*
Survil, Robert J.; and Weber, Robert T., 4,926,704, Cl. 73-866.500.
Weersink, Andreas: *See—*
Geertsma, Geert; Poel, Hendrik; and Weersink, Andreas, 4,926,550, Cl. 30-43.100.
Wegman, Richard W., to Union Carbide Chemicals and Plastics Company Inc. Production of carboxylic acids from organic formate esters using rhodium complex catalysts. 4,927,967, Cl. 562-607.000.
Weibler, Wolfgang: *See—*
Porth, Wolfgang; Weibler, Wolfgang; Kern, Eckhart; Hannewald, Thomas; and Weingartner, Reiner, 4,926,821, Cl. 123-399.000.
Weidmann, Erich, to Gebruseder Loepfe AG. Method for braking a moving thread-like material and thread brake for carrying out said method. 4,927,093, Cl. 242-154.000.
Weiner, Andrew M.: *See—*
Heritage, Jonathan P.; and Weiner, Andrew M., 4,928,316, Cl. 455-600.000.
Weiner, Steven L. Lottery kit. 4,927,148, Cl. 273-148.00R.
Weingartner, Reiner: *See—*
Porth, Wolfgang; Weibler, Wolfgang; Kern, Eckhart; Hannewald, Thomas; and Weingartner, Reiner, 4,926,821, Cl. 123-399.000.
Weiss, Mitchell, to Programmation, Inc. Flexible material transport system. 4,926,753, Cl. 104-88.000.
Weiss, Peter; and Welkers, Knut, to Jagenberg Aktiengesellschaft. Device for winding and unwinding a web of material. 4,927,091, Cl. 242-68.400.
Welbourn, Anthony; and Heslop, Christopher, to British Telecommunications plc. Self aligned bipolar fabrication process. 4,927,774, Cl. 437-31.000.
Welkers, Knut: *See—*
Weiss, Peter; and Welkers, Knut, 4,927,091, Cl. 242-68.400.

Wellinga, Kobus; and Eussen, Jacobus H. H., to Duphar International Research B.V. 1-carbonyl-2-pyrazoline derivatives having herbicidal activity. 4,927,452, Cl. 71-92.000.
Welsh, Gary C., to Dow Chemical Company, The. Thermoformable laminated packaging material. 4,927,690, Cl. 428-35.700.
Wendler, John A.: *See—*
Marzalek, Michael S.; Peterson, Stephen R.; and Wendler, John A., 4,928,251, Cl. 364-484.000.
Wendt, Dan J.; Kemske, Jonathon D.; and Pesheck, Peter S., to Pillsbury Company, The. Susceptor in combination with grid for microwave oven package. 4,927,991, Cl. 219-10.55E.
Wenger, Hartmut; Martin, Peter; Rotzinger, Hans; and Denz, Martin, to Ciba-Geigy Corporation. Transport apparatus for boards. 4,926,789, Cl. 118-668.000.
Wenger SA: *See—*
Lemaire, Denis J., 4,926,555, Cl. 30-162.000.
Wenko-Wenselaar GmbH & Co. KG: *See—*
Glienke, Peter O., 4,927,436, Cl. 55-281.000.
Wenzlik, Klaus: *See—*
Brandner, Burkhard; and Wenzlik, Klaus, 4,927,084, Cl. 239-584.000.
Wessels, Gerd, to Siemens Aktiengesellschaft. Device for treating life forms with two different types of focused acoustical waves. 4,926,857, Cl. 128-24.00A.
Wessling, Ritchie A.; Whipple, Sharon S.; and Fibiger, Richard F., to Dow Chemical Company, The. Ionic complex for enhancing performance of water treatment membranes. 4,927,540, Cl. 210-638.000.
West Company, Incorporated, The: *See—*
Bayan, Ghawamedin, 4,927,882, Cl. 525-99.000.
Westerlund, Nils G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Britanic Majesty's Government of the. Vehicle suspension system. 4,927,171, Cl. 280-718.000.
Western Atlas International, Inc.: *See—*
Hademenos, Jim P., 4,926,937, Cl. 166-206.000.
Linyaev, Eugene J.; and Swanson, Roy E., Jr., 4,928,031, Cl. 310-346.000.
Westinghouse Electric Corp.: *See—*
Belkhiter, Bruno M., 4,928,221, Cl. 364-191.000.
Campbell, Robert B.; Kochka, Edgar L.; and Piotrowski, Paul A., 4,927,489, Cl. 156-620.100.
Goutzoulis, Anastosios P.; and Davies, David K., 4,928,310, Cl. 380-46.000.
Heibel, Michael D.; Impink, Albert J., Jr.; and Grobmyer, Louis R., 4,927,594, Cl. 376-258.000.
Huggins, Thomas B.; Widener, Wade H.; and Klapper, Kenneth K., 4,927,313, Cl. 414-414.000.
Impink, Albert J., Jr.; and Goldstein, Norman P., 4,927,593, Cl. 376-254.000.
Iyer, Natraj C.; Carr, Walter J., Jr.; and Male, Alan T., 4,927,985, Cl. 174-125.100.
Kaufmann, John W.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,927,595, Cl. 376-268.000.
Leksell, David; Kun, Zoltan K.; and Mandel, Alan F., 4,928,118, Cl. 346-107.00R.
Male, Andrew J.; and Carrodus, Melvin A., 4,928,079, Cl. 335-13.000.
Panson, Armand J., 4,927,492, Cl. 156-642.000.
Roslund, Charles J.; and Cook, Bruce M., 4,928,219, Cl. 363-54.000.
Schaffer, Timothy J., 4,928,104, Cl. 342-15.000.
Staab, Carl J.; Houser, Kirk D.; Jones, Donald J.; Ihrman, Robert T.; Poepsel, Donald A.; and Edblad, Warren A., 4,928,097, Cl. 340-825.500.
Whitlow, Graham A.; Bruck, Gerald J.; and Smith, James E., 4,927,992, Cl. 219-121.650.
Westover, Dwight G., to TransTechnology Corporation. Document transport apparatus. 4,927,132, Cl. 271-225.000.
Westvaco Corporation: *See—*
Knox, David E.; and Fischer, Eugene R., 4,927,669, Cl. 427-239.000.
Schilling, Peter, 4,926,944, Cl. 166-293.000.
Whaley, John F.: *See—*
Hosmer, Christopher E.; and Whaley, John F., 4,926,529, Cl. 26-89.000.
Whatley, Leslie H.: *See—*
Franklin, Hugh L.; Whatley, Leslie H.; and Klees, George N., 4,928,059, Cl. 324-123.00R.
Whipple, Sharon S.: *See—*
Wessling, Ritchie A.; Whipple, Sharon S.; and Fibiger, Richard F., 4,927,540, Cl. 210-638.000.
Whirlpool Corporation: *See—*
Patera, Ginger E.; Janke, Larry L.; and Lampman, William T., 4,927,033, Cl. 211-41.000.
White, Alan V., to Compaq Computer Inc. Switching mode DC-to-DC power supply with improved current sensing. 4,928,220, Cl. 363-56.000.
White, Charles M., to General Instrument Corporation. Method and apparatus for descrambling a television signal. 4,928,309, Cl. 380-15.000.
White, Richard S.: *See—*
Hayden, William; Hayden, Mark W.; and White, Richard S., 4,927,318, Cl. 414-786.000.
White, Thomas C. Restaurant signaling device. 4,926,786, Cl. 116-324.000.
Whitlow, Graham A.; Bruck, Gerald J.; and Smith, James E., to Westinghouse Electric Corp. Energy beam casting of metal articles. 4,927,992, Cl. 219-121.650.
Whittington, Robert D.: *See—*
Biswas, Gautam; Black, David C.; Duncan, Michael G.; Key, Gary R.; Leak, Gordon D.; and Whittington, Robert D., 4,928,306, Cl. 379-201.000.
Widdig, Arno: *See—*
Adler, Alfons; Widdig, Arno; Kuhle, Engelbert; Fuhrer, Wolfgang; Hagemann, Hermann; and Hanssler, Gerd, 4,927,824, Cl. 514-241.000.
Widener, Wade H.: *See—*
Huggins, Thomas B.; Widener, Wade H.; and Klapper, Kenneth K., 4,927,313, Cl. 414-414.000.
Wiedrich, Charles R.; and Sare, Edward J., to PPG Industries, Inc. Method for inhibiting growth of algae in recreational water 4,927,546, Cl. 210-755.000.
Wiegand, Walter J.: *See—*
Swindal, James L.; and Wiegand, Walter J., 4,928,203, Cl. 361-280.000.
Wiehagen, Fred A. Sea anchor deployment and storage device and associated method. 4,926,780, Cl. 114-311.000.
Wieland, Rolf H.; and Krongold, Martin A., to MG Industries. Apparatus for removing gas from a liquid. 4,927,433, Cl. 55-18.000.
Wight, Donald C.; and Krueger, Keith T., to Siemens Energy & Automation, Inc. Wire channel bushing and electrical enclosures coupled therewith. 4,927,982, Cl. 174-50.000.
Wight, Mark S.: *See—*
Moore, Thomas E.; McEachern, James A.; and Wight, Mark S., 4,928,275, Cl. 370-102.000.
Wikman, Kai, to Valmet-Ahlstrom, Inc. Apparatus for stabilizing the jet flow exiting a headbox of a paper machine. 4,927,499, Cl. 162-336.000.
Wilbanks International, Inc.: *See—*
Metcalf, Robert L., 4,926,788, Cl. 118-500.000.
Wiley, Dan W.: *See—*
Gelinas, William A.; Holtz, Edwin R.; Argazzi, Dennis J.; Smigel, Robert L.; and Wiley, Dan W., 4,927,487, Cl. 156-351.000.
Wilhelm Loh Wetzlar Optikmaschinen GmbH & Co. KG: *See—*
Brueck, Erhard, 4,926,588, Cl. 51-217.00T.
Wilkins, John D. Storage container and fastener assembly for cars. 4,927,200, Cl. 296-37.800.
Wilkinson, William H.: *See—*
Christensen, Richard N.; DeVuono, Anthony C.; Wilkinson, William H.; and Landstrom, D. Karl, 4,926,659, Cl. 62-476.000.
Wilkinson, William T. Storage device for personal dental hygiene and oral care products. 4,927,011, Cl. 206-217.000.
Willett International Limited: *See—*
Walton, Robert L., 4,928,111, Cl. 346-1.100.
Williams, Bruce T. High speed D.C. non-contacting electrostatic voltage follower. 4,928,057, Cl. 324-72.000.
Williams Controls, Inc.: *See—*
Helfenstein, Jim, 4,926,905, Cl. 137-625.600.
Williams, Donald D.: *See—*
Bealkowski, Richard; Dayan, Richard A.; Doria, David J.; Kinnear, Scott G.; Krantz, Jeffrey I.; Liverman, Robert B.; Sotomayor, Guy G.; Williams, Donald D.; and Vaiskauckas, Gary A., 4,928,237, Cl. 364-200.000.
Williams, Joel L.; Montgomery, David B.; and Baldwin, Lillian P., to Becton, Dickinson and Company. Method for rapid adherence of endothelial cells onto a surface and surfaces prepared thereby. 4,927,676, Cl. 428-36.000.
Williamson, Andrew H., Jr.: *See—*
Bensel, William H., III; Gladden, Robert H., Jr.; Malluck, John F.; Ross, Robert R.; and Williamson, Andrew H., Jr., 4,927,227, Cl. 350-96.200.
Williamson, John R.: *See—*
Eick, Christopher D.; Worcester, Kenneth P.; and Williamson, John R., 4,926,629, Cl. 60-39.281.
Williamson, Steven, to University of Rochester, The. Electro-optic signal measurement. 4,928,058, Cl. 324-96.000.
Williamson, Steven L.: *See—*
Mourou, Gerard A.; Nees, John A.; and Williamson, Steven L., 4,928,076, Cl. 330-4.300.
Willnat, Helmut; and Meichsner, Manfred, to Bender & Wirth GmbH & Co. Fixture for multiple-contact pin halogen lamps. 4,927,389, Cl. 439-682.000.
Wilson, Craig A.: *See—*
Kahle, Charles F., II; McCollum, Gregory J.; and Wilson, Craig A., 4,927,969, Cl. 564-377.000.
Wilson, Donald G. Water shedding device for boat covers. 4,927,109, Cl. 248-354.300.
Wilson, James A., to Doulbe-E Inc. Blowout preventer. 4,927,112, Cl. 251-1.300.
Wilson, John D., to Corstor (Proprietary) Limited. Core trays. 4,927,022, Cl. 206-443.000.
Wilson, John R. H.; and Pettman, Roger B., to Shell Internationale Research Maatschappij B.V. Fungicidal imidazole dioxolane and 1,3-dioxane derivatives. 4,927,840, Cl. 514-397.000.
Wilson, John R. H.; Pettman, Roger B.; and Reid, Derek J., to Shell Internationale Research Maatschappij, B.V. Fungicidal imidazole oxime derivatives. 4,927,841, Cl. 514-400.000.
Windelbandt, Herbert, to Sempell Armaturen GmbH. Method for manufacturing a poppet valve head. 4,926,534, Cl. 29-888.451.

VOL
1114
ISS
4
MY
22
1990
UMI

Winegardner, John B.: *See—*
Olsen, Mark W.; and Winegardner, John B., 4,926,658, Cl. 62-324.100.
Wingo Jr, James C., to Riddell, Inc. Athletic shock absorbing pad. 4,926,503, Cl. 2-267.000.
Winkler, Paul E.: *See—*
Jones, Alan L.; Snyder, Keith A.; and Winkler, Paul E., 4,927,983, Cl. 174-258.000.
Winkler, Robert; Sala, Siro; Kobayashi, Takayuki; and Yokota, Shinjiro, to Sulzer-Escher Wyss AG. Apparatus for preparing high-concentration alkali. 4,927,494, Cl. 159-2.100.
Winner, William K., to Bic Corporation. Wind propelled apparatus. 4,926,774, Cl. 114-123.000.
Wirth, Georg: *See—*
Worner, Siegfried; Zacke, Peter; and Wirth, Georg, 4,927,608, Cl. 422-179.000.
Wirtz, Rainer: *See—*
Harms, Klaus; Schray, Hans-Dieter; Taubitz, Bernd; and Wirtz, Rainer, 4,928,042, Cl. 318-254.000.
Wirz, Peter: *See—*
Schultheiss, Eberhard; and Wirz, Peter, 4,927,513, Cl. 204-192.130.
Wisconsin Alumni Research Foundation: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Kutner, Andrzej, 4,927,815, Cl. 514-167.000.
Wise, David S., to Tameran, Inc. High speed aperture card printer and method. 4,928,140, Cl. 355-48.000.
Wisner, George R., to United Technologies Corporation. Electromechanical light chopper arrangement. 4,927,249, Cl. 350-486.000.
Wissen, Glenn: *See—*
Roth, Scott S.; Nguyen, Bich-Yen; Tobin, Philip J.; Ray, Wayne; Wachholz, E. Petyr; and Wissen, Glenn, 4,927,780, Cl. 437-69.000.
Wittchow, Eberhard, to Siemens Aktiengesellschaft. Continuous flow steam generator. 4,926,799, Cl. 122-235.00A.
Wittman, Jurgen; von Entress-Furstenеck, Wolfgang; and Thurner, Gunther, to Diehl GmbH & Co. Arrangement for drawing a braking parachute out of an article of submunition. 4,926,751, Cl. 102-348.000.
Wittwer, Arthur J.: *See—*
Feder, Joseph; Howard, Susan C.; Wittwer, Arthur J.; Rademacher, Thomas W.; Parekh, Raj B.; and Dwek, Raymond A., 4,927,630, Cl. 424-94.640.
Witty, Michael J.: *See—*
Banks, Bernard J.; and Witty, Michael J., 4,927,918, Cl. 536-7.100.
Woelfel, James A.: *See—*
Golata, John H.; and Woelfel, James A., 4,927,347, Cl. 425-150.000.
Wofford, George D.: *See—*
Herran, Vincent W.; and Wofford, George D., 4,927,708, Cl. 428-332.000.
Wolff, Manfred: *See—*
Schauer, Friedrich; and Wolff, Manfred, 4,927,365, Cl. 439-15.000.
Wolfger, Arno, to U.S. Philips Corp. Dry-shaving apparatus comprising at least one shutter which is slidable on the apparatus housing 4,926,551, Cl. 30-43.920.
Wolke, Patrick J.: *See—*
Allen, Terry S.; and Wolke, Patrick J., 4,927,097, Cl. 244-118.100.
Wollenberg, Robert H.: *See—*
Erdman, Timothy R.; Shippey, Michael A.; and Wollenberg, Robert H., 4,927,551, Cl. 252-42.700.
Wollweber, Detlef; Kramer, Wolfgang; Brandes, Wilhelm; Dutzmann, Stefan; and Hanssler, Gerd, to Bayer Aktiengesellschaft. N-Substituted dichloromaleimides, and anti-bacterial and fungicidal use thereof. 4,927,844, Cl. 514-425.000.
Wolter, Peter: *See—*
Srzanna, Kurt, 4,926,720, Cl. 81-61.000.
Wombles, Robert H.: *See—*
Ward, Clifford; Chao, Eugene; Booth, Roy E.; Turrill, Frank H.; Wombles, Robert H.; Newman, John W.; and Hettinger, William P., Jr., 4,927,620, Cl. 423-447.200.
Wong, Patrick S.-L., to Alza Corporation. Selective pulsed drug delivery system. 4,927,632, Cl. 424-422.000.
Wood, Daniel J. Document carrier 4,927,071, Cl. 229-71.000.
Wood, Derek A.: *See—*
Briggs, Stuart P.; and Wood, Derek A., 4,927,945, Cl. 549-305.000.
Wood, Gordon H., to Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence. Sonobuoy. 4,927,396, Cl. 441-33.000.
Wood, Wendall L.: *See—*
Fagerquist, Randy L., Wood, Wendall L.; Atkins, Frank W.; and Bahl, Surinder K., 4,928,115, Cl. 346-75.000.
Wood, Wendell L., to Eastman Kodak Company. Ink jet printer having improved print head heater construction. 4,928,116, Cl. 346-75.000.
Wood, Wendell L.: *See—*
Fagerquist, Randy L.; Wood, Wendell L.; and Atkins, Frank W., 4,928,114, Cl. 346-75.000.
Howell, Margene C.; Katerberg, James A.; Pipkorn, David N.; and Wood, Wendell L., 4,928,113, Cl. 346-75.000.
Woodle, Martin: *See—*
Morano, Jacqueline K.; Martin, Francis J.; and Woodle, Martin, 4,927,637, Cl. 424-450.000.
Woodruff, Kenneth R.: *See—*
Nielson, Marlin C.; and Woodruff, Kenneth R., 4,928,280, Cl. 371-39.100.
Woolf, Douglas M. Weather proof ash containment system for barbeques. 4,926,841, Cl. 126-243.000.
Worcester, Kenneth P.: *See—*
Eick, Christopher D.; Worcester, Kenneth P.; and Williamson, John R., 4,926,629, Cl. 60-39.281.
Worner, Siegfried; Zacke, Peter; and Wirth, Georg, to J. Eberspacher. Device for catalytic cleaning of motor vehicle exhaust gases. 4,927,608, Cl. 422-179.000.
Worrell, J. Robert; Wakley, William D.; and Young, Grant A., to Amoco Corporation. Hydrocyclone separation system. 4,927,536, Cl. 210-512.200.
Worthington, Paul A.: *See—*
Parry, Keith P.; Worthington, Paul A.; and Rathmell, William G., 4,927,839, Cl. 514-383.000.
Wovenwire Corporation: *See—*
Smith, Bradford L., 4,927,674, Cl. 428-11.000.
Wraight, Peter: *See—*
Jorion, Bruno; Galiano, Christian; and Wraight, Peter, 4,928,088, Cl. 340-854.000.
Wrecsics, Ernest L.: *See—*
Garg, Diwakar; Wrecsics, Ernest L.; Schaffer, Leslie E.; Mueller, Carl F.; Dyer, Paul N.; and Fabregas, Keith R., 4,927,713, Cl. 428-627.000.
Wright, Geoffrey D.; and Pirali, Edmund, to NeuroSonics, Inc. Sensory-driven controller. 4,926,969, Cl. 128-731.000.
Wright, Harold T., to Maxtor Corporation. In-spindle motor assembly for disk drive and method for fabricating. 4,928,029, Cl. 310-89.000.
Wright, John J.: *See—*
Sit, Sing-Yuen; and Wright, John J., 4,927,944, Cl. 549-292.000.
Wright, Murray J.; and Ritchie, Gordon V. Current collector. 4,928,201, Cl. 361-215.000.
Wright, William E.; Davis, Bryan T.; Matteson, Donald S.; and Knapp, Gordon G., to Ethyl Corporation. Haze-free boronated antioxidant. 4,927,553, Cl. 252-49.600.
Wu, Rong-Faa; and Wu, Shoei-Jyi, to Posse Lock Manufacturing Co., Ltd. Dual backset deadbolt assembly. 4,927,195, Cl. 292-169.140.
Wu, Rong-Faa; and Wu, Shoei-Jyi. Latch assembly for cylinder lock. 4,927,199, Cl. 292-337.000.
Wu, Shoei-Jyi: *See—*
Wu, Rong-Faa; and Wu, Shoei-Jyi, 4,927,195, Cl. 292-169.140.
Wu, Rong-Faa; and Wu, Shoei-Jyi, 4,927,199, Cl. 292-337.000.
Wuest, Willi; Eskuchen, Rainer; Esser, Herbert; and Leischner, Hasso, to Henkel Kommanditgesellschaft auf Aktien. Process for the preparation of 5-bromo-5-nitro-1,3-dioxane. 4,927,946, Cl. 549-371.000.
Wurtman, Richard J., to Massachusetts Institute of Technology. Composition for increasing blood pressure. 4,927,853, Cl. 514-567.000.
Xerox Corporation: *See—*
Harmon, James E., 4,928,149, Cl. 355-305.000.
Nash, Thomas W., 4,926,790, Cl. 118-653.000.
Poehlein, Raymond E.; Reese, Franklin S.; and Adamek, John A., 4,928,141, Cl. 355-208.000.
Stemmle, Denis J., 4,928,127, Cl. 346-160.000.
Stemmle, Denis J., 4,928,128, Cl. 346-160.000.
Xiao, Guooing: *See—*
Kino, Gordon S.; and Xiao, Guooing, 4,927,254, Cl. 350-507.000.
Yabuta, Kazuya: *See—*
Miyashita, Tsuneo; Nishio, Hiroaki; Yabuta, Kazuya; and Takagi, Yoshio, 4,927,600, Cl. 419-49.000.
Yacobucci, Paul D.: *See—*
Bailey, David B.; Harrison, Daniel J.; and Yacobucci, Paul D., 4,927,803, Cl. 503-227.000.
Yagi, Nobuyuki; Inagaki, Jiro; Morita, Kozo; Kaku, Yasutoshi; Kikuchi, Nobuyuki; and Mizuno, Shinji, to Teikoku Tsushin Kogyo Co., Ltd. Molded resin casing of electronic part with flexible flat cable. 4,928,082, Cl. 338-174.000.
Yahagi, Shinichiro: *See—*
Umeno, Masayoshi; Sakai, Shiro; and Yahagi, Shinichiro, 4,928,154, Cl. 357-16.000.
Yajima, Hiroshi, to Casio Computer Co., Ltd. Manually scanning apparatus with straightening rollers. 4,928,183, Cl. 358-296.000.
Yamada, Kazuo: *See—*
Honjo, Seiichiro; Yamada, Kazuo; Fuchigami, Yasuhiro; and Mizusugi, Tetsuya, 4,927,443, Cl. 65-273.000.
Yamada, Nobutoshi; Sugi, Hideo; and Kon, Kenji, to Ishihara Sangyo Kaisha, Ltd. Chartreusin derivatives and salts thereof. 4,927,919, Cl. 536-17.400.
Yamada, Shinjiro, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Actuator for automotive door locking device. 4,926,707, Cl. 74-96.000.
Yamada, Takanobu, to Minolta Camera Co., Ltd. Developing device. 4,928,146, Cl. 355-253.000.
Yamada, Yukifumi: *See—*
Tsumura, Kenji; Yamada, Yukifumi; and Terada, Takami, 4,927,110, Cl. 248-430.000.
Yamagishi, Takanori; Idai, Tsutomu; and Takahashi, Eiji, to Maruzen Petrochemical Co., Ltd. Process for the preparation of p-ethylphenol. 4,927,979, Cl. 568-791.000.
Yamaguchi, Mikio; Suzuki, Chiharu; Matsunari, Kenji; Miyazawa, Takeshige; and Nakamura, Yasuo, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. Thiadiazabicyclononane derivatives and herbicidal compositions. 4,927,448, Cl. 71-90.000.
Yamaguchi, Sataro, to Mitsubishi Denki Kabushiki Kaisha. Reversed field pinch apparatus. 4,927,592, Cl. 376-123.000.
Yamaguchi, Shuichiro; Uchida, Naoto; Shimomura, Takeshi; and Oyama, Noboru, to Terumo Kabushiki Kaisha. Enzyme sensor. 4,927,516, Cl. 204-403.000.

Yamaguchi, Yoshihiro: *See—*
Nakagawa, Akio; Ohashi, Hiromichi; Yamaguchi, Yoshihiro; Watanabe, Kiminori; and Thukakoshi, Thuneo, 4,928,155, Cl. 357-23.400.
Yamaha Corporation: *See—*
Kondo, Masao; and Abe, Yasunao, 4,926,738, Cl. 84-618.000.
Kozuki, Koichi, 4,926,736, Cl. 84-609.000.
Yamaji, Yukinori: *See—*
Ushikubo, Takao; Iwasa, Yasuhiro; and Yamaji, Yukinori, 4,927,069, Cl. 228-123.000.
Yamakoshi, Yukihiro: *See—*
Rokutanda, Shuji; Higemitsu, Yasuo; Tsuchida, Akiyoshi; and Yamakoshi, Yukihiro, 4,927,734, Cl. 430-264.000.
Yamamoto, Hajime; Takashima, Yuji; Kitagaki, Kazunori; and Nakamura, Masahiko, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for color electrophotography. 4,927,724, Cl. 430-45.000.
Yamamoto, Hideo; Sato, Takeshi; Yoshimi Toshikazu; Mori, Shuichi; and Tokumo, Akio, to Pioneer Electronic Corporation. Limiter circuit. 4,928,071, Cl. 330-129.000.
Yamamoto, Hiroaki: *See—*
Hirano, Sadayuki; Murano, Katsuaki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,926,716, Cl. 74-866.000.
Yamamoto, Hirofumi: *See—*
Higuchi, Mitsuhiro; and Yamamoto, Hirofumi, 4,926,504, Cl. 4-247.000.
Higuchi, Mitsuhiro; Yamamoto, Hirofumi; Yamamoto, Osamu; Fujii, Shokichi; and Nonomura, Katsumi, 4,926,505, Cl. 4-247.000.
Yamamoto, Kazuki: *See—*
Sakai, Takeshi; Yokota, Hiroko; Yamamoto, Kazuki; Yokoyama, Sadaji; Matsui, Susumu; Kato, Ikunoshin; and Obayashi, Akira, 4,927,767, Cl. 436-64.000.
Yamamoto, Kosei; Kaneyasu, Akira; and Iwamoto, Toshiichi, to UBE Chemical Industries, LTD. Lightweight magnesia clinker and process for the preparation of the same. 4,927,611, Cl. 423-155.000.
Yamamoto, Osamu: *See—*
Higuchi, Mitsuhiro; Yamamoto, Hirofumi; Yamamoto, Osamu; Fujii, Shokichi; and Nonomura, Katsumi, 4,926,505, Cl. 4-247.000.
Tsutsui, Hiroshi; Baba, Sueki; Ohmori, Koichi; Yamamoto, Osamu; and Watanabe, Hiroshi, 4,928,297, Cl. 378-146.000.
Yamamoto, Yoshikazu. Domestic pets' chamberpot. 4,926,794, Cl. 119-1.000.
Yamamura, Hirohisa: *See—*
Ishikura, Hisatugu; Tahara, Kazuo; Abukawa, Toshimi; Marumoto, Katsuji; Koterazaka, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Yamamura, Hirohisa; Tatsuzaki, Toru; Ohmae, Tsutomu; and Takamatsu, Shuichi, 4,926,960, Cl. 180-79.100.
Yamamuro, Takahiko, to Mitsubishi Denki Kabushiki Kaisha. Picture display device. 4,928,173, Cl. 358-102.000.
Yamanaka, Hiromichi: *See—*
Hashimoto, Hiroshi; and Yamanaka, Hiromichi, 4,927,131, Cl. 271-215.000.
Yamasaki, Takahiko: *See—*
Tamura, Haruhisa; Yamasaki, Takahiko; and Hasegawa, Mitsuhiro, 4,927,998, Cl. 219-494.000.
Yamashita, Norihisa: *See—*
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; Inoue, Satoru; Sugano, Masayo; and Tanako, Hirotaka, 4,927,827, Cl. 514-256.000.
Yamashita, Shinji: *See—*
Uehara, Masao; Uchikubo, Akinobu; Saito, Katsuyuki; Kanno, Masahide; Hasegawa, Jun; Sasaki, Masahiko; Sasagawa, Katsuyoshi; and Yamashita, Shinji, 4,928,172, Cl. 358-98.000.
Yamashita, Yoshinori: *See—*
Hirano, Sadayuki; Murano, Katsuaki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,926,716, Cl. 74-866.000.
Yamauchi, Junichi; Maejima, Kimiko; Eguchi, Kaoru; and Kabuyama, Noriko, to Fujitsu Limited. Consecutive image processing system. 4,928,253, Cl. 364-521.000.
Yamauchi, Masahide: *See—*
Kawamura, Shigemi; and Yamauchi, Masahide, 4,928,230, Cl. 364-479.000.
Yamauchi, Mineo: *See—*
Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,927,666, Cl. 427-146.000.
Yamauchi, Yoshiyuki: *See—*
Ohara, Toshio; and Yamauchi, Yoshiyuki, 4,926,932, Cl. 165-111.000.
Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, to Semiconductor Energy Laboratory Co., Ltd. Method for manufacturing liquid crystal device having electrode strips of no use. 4,927,493, Cl. 156-643.000.
Yanagibashi, Katumi: *See—*
Kimura, Sakae; Nikaido, Masaru; Yanagibashi, Katumi; Homma, Katsuhisa; and Ouchi, Yoshiaki, 4,928,034, Cl. 313-346.00R.
Yang, Herbert; Han, Patrick; and Yu, Frank Disposable covered needle safety assembly. 4,927,018, Cl. 206-365.000.
Yang, Ming-he; Chen, Yan-rong; Liu, Geng-tao; and Huang, Liang, to Chinese Academy of Medical Science; and Bayer Aktiengesellschaft. Pharmacologically active ε-valerolactams. 4,927,937, Cl. 546-296.000.
Yano, Shunji, to Honda Giken Kogyo Kabushiki Kaisha. Variable-displacement turbine. 4,927,325, Cl. 415-161.000.
Yano, Toru: *See—*
Kato, Akira; and Yano, Toru, 4,926,827, Cl. 123-489.000.
Yano, Yutaka: *See—*
Ohta, Kazumi; Kawaguchi, Sotoaki; Doyama, Hisao; and Yano, Yutaka, 4,927,457, Cl. 75-10.630.
Yap, Loo T., to BOC Group, Inc., The. Method for gas lancing. 4,927,357, Cl. 432-22.000.
Yarrington, Robert M.: *See—*
McShea, William T., III; and Yarrington, Robert M., 4,927,857, Cl. 518-703.000.
Yasaka, Yasuhiro: *See—*
Hakuta, Shinsaku; Yasaka, Yasuhiro; Nagura, Osamu; Tsuji, Eiji, Suzuki, Makoto; and Akagawa, Hirotaka, 4,926,541, Cl. 29-598.000.
Yasuda, Sakae: *See—*
Morizumi, Mitsuo; Omura, Kinya; Arita, Enya; Furuya, Katsuji; Yasuda, Sakae; and Kodera, Masaya, 4,926,914, Cl. 141-59.000.
Yasuda, Seigou: *See—*
Kaneuchi, Kunihiro; Yasuda, Seigou; Ariyoshi, Takashi; Nakatani, Tomofumi; and Aizawa, Hiroshi, 4,928,302, Cl. 379-88.000.
Yasufuku, Shoji: *See—*
Kise, Masahiro; Yoshimoto, Yoshihiko; Fujisawa, Hiroshi; Sasaki, Yasuo; and Yasufuku, Shoji, 4,927,835, Cl. 514-448.000.
Yasunori Nishijima & Daikin Industries Ltd.: *See—*
Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi, Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, 4,927,941, Cl. 548-264.800.
Yatsenko, Vladislav P.: *See—*
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y., Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.
Yau, Robert L.: *See—*
Chuang, Patrick T.; Yau, Robert L.; Yoshida, Hiroshi; and Wang, Moon-Yee, 4,928,260, Cl. 365-49.000.
Yazaki Corporation: *See—*
Nakashima, Kazutaka; and Saito, Kazuya, 4,927,788, Cl. 439-887.000.
Yeager, Gregory H. Raft inflation valve. 4,927,397, Cl. 441-41.000
Yeamans, Robert C. Roof deck covering system. 4,926,596, Cl. 52-408.000.
Yeda Research and Development Co., Ltd.: *See—*
Krongauz, Valeri A.; and Shvartsman, Felix P., 4,927,917, Cl. 534-567.000.
Yerkes, James E.; and Lethen, Theodore H., to Bethlehem Steel Corporation. Method and apparatus for monitoring the thickness profile of a strip. 4,928,257, Cl. 364-563.000.
Ylvisaker, Jon A., to Borden, Inc. Method of preparing popcorn. 4,927,648, Cl. 426-234.000.
Yokohama Rubber Co., Ltd., The: *See—*
Tamura, Mitsunobu; Tsuchihashi, Toshifumi; and Kenmochi, Toshihisa, 4,927,358, Cl. 432-204.000.
Yokono, Hitoshi: *See—*
Gotoh, Masao; Hira, Yasuo; Waragai, Kenichi; Nakamura, Shozo; and Yokono, Hitoshi, 4,927,044, Cl. 220-83.000.
Yokota, Hiroko: *See—*
Sakai, Takeshi; Yokota, Hiroko; Yamamoto, Kazuki; Yokoyama, Sadaji; Matsui, Susumu; Kato, Ikunoshin; and Obayashi, Akira, 4,927,767, Cl. 436-64.000.
Yokota, Shinjiro: *See—*
Winkler, Robert; Sala, Siro; Kobayashi, Takayuki; and Yokota, Shinjiro, 4,927,494, Cl. 159-2.100.
Yokoyama, Sadaji: *See—*
Sakai, Takeshi; Yokota, Hiroko; Yamamoto, Kazuki; Yokoyama, Sadaji; Matsui, Susumu; Kato, Ikunoshin, and Obayashi, Akira, 4,927,767, Cl. 436-64.000.
Yonemoto, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Elevator control apparatus. 4,928,021, Cl. 187-108.000.
Yoon Technology: *See—*
Lhymn, Yoon O.; and Lhymn, Chang, 4,927,712, Cl. 428-614.000.
Yoshida, Hiroshi: *See—*
Chuang, Patrick T.; Yau, Robert L.; Yoshida, Hiroshi; and Wang, Moon-Yee, 4,928,260, Cl. 365-49.000.
Yoshida Kogyo K.K.: *See—*
Matsumoto, Masao, 4,927,090, Cl. 242-67.10R
Yoshida, Satoshi: *See—*
Matsumoto, Takashi; Sato, Masamichi; Yoshida, Satoshi; and Kato, Yoshiaki, 4,928,186, Cl. 360-21.000.
Yoshida, Takeo: *See—*
Takahashi, Masaharu; and Yoshida, Takeo, 4,927,587, Cl. 264-211.000.
Yoshida, Toshihiko; and Inaba, Toru, to Fujitsu Limited. Semiconductor device. 4,928,163, Cl. 357-23.300.
Yoshida, Yuji: *See—*
Matsuda, Masaaki; and Yoshida, Yuji, 4,927,541, Cl. 210-656.000.
Yoshimi, Tomohisa; Kodama, Satoru; Yoshinori, Takeshi; and Ito, Masahiko, to Nippondenso Co., Ltd. Arousal level judging apparatus and method. 4,928,090, Cl. 340-575.000.
Yoshimi, Toshikazu: *See—*
Yamamoto, Hideo; Sato, Takeshi; Yoshimi, Toshikazu; Mori, Shuichi; and Tokumo, Akio, 4,928,071, Cl. 330-129.000.
Yoshimoto, Yoshihiko: *See—*
Kise, Masahiro; Yoshimoto, Yoshihiko; Fujisawa, Hiroshi; Sasaki, Yasuo; and Yasufuku, Shoji, 4,927,835, Cl. 514-448.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Yoshimura, Noriaki: *See*—
Maeda, Toshihiko; Tokitoh, Yasuo; and Yoshimura, Noriaki, 4,927,960, Cl. 562-512.000.
Yoshimura, Shigeru: *See*—
Torisawa, Akira; Kakizaki, Masaaki; Ito, Noriaki; and Yoshimura, Shigeru, 4,928,050, Cl. 318-696.000.
Yoshimura, Tsuyoshi: *See*—
Kudoh, Noboru; Hirukawa, Itsushi; Aoki, Satoshi; Yoshimura, Tsuyoshi; and Shiozawa, Shigeki, 4,927,390, Cl. 440-88.000.
Yoshinori, Takeshi: *See*—
Yoshimi, Tomohisa; Kodama, Satoru; Yoshinori, Takeshi; and Ito, Masahiko, 4,928,090, Cl. 340-575.000.
Yoshioka, Hiroshi; Nagatsuma, Nobuyoshi; and Kobayashi, Shinobu, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for injecting liquid into boot for joint units. 4,926,972, Cl. 184-109.000.
Yoshizawa, Masahiro: *See*—
Saito, Kenichi; Wada, Kou; and Yoshizawa, Masahiro, 4,928,010, Cl. 250-310.000.
Yoshizawa, Tetsuo; Terayama, Yoshimi; Kondo, Hiroshi; Sakaki, Takashi; Haga, Shunichi; Ichida, Yasuteru; and Konishi, Masaki, to Canon Kabushiki Kaisha. Method of producing electrical connection members. 4,926,549, Cl. 29-876.000.
Yoshizawa, Toru: *See*—
Kagiya, Tsutomu; Abe, Mitsuyuki; Nishimoto, Seiichi; Shibamoto, Yuta; Shimokawa, Kazuhiro; Hisanaga, Yorisato; Nakada, Tatsuo; and Yoshizawa, Toru, 4,927,941, Cl. 548-264.800.
Young, Grant A.: *See*—
Worrell, J. Robert; Wakley, William D.; and Young, Grant A., 4,927,536, Cl. 210-512.200.
Young, John N., to Charles C. Worth Corporation. Planetary gear drive for fishing reel. 4,927,095, Cl. 242-261.000.
Young, Ralph H.: *See*—
Scozzafava, Michael; Tang, Ching W.; and Young, Ralph H., 4,927,726, Cl. 430-78.000.
Young, Ray A.: *See*—
Hopkins, William M.; Brightwell, Robert A.; Young, Ray A.; Clark, John K.; Miller, Frederick W.; Galante, Richard L.; Waibel, Terry J.; and Kolowski, Michael A., 4,926,919, Cl. 152-209.00R.
Young, Stephen L.: *See*—
Claude, John P.; and Young, Stephen L., 4,926,880, Cl. 128-800.000.
Youssef, Nabil N.; and Miller, Gene W. Soil amendment material and process for preparation thereof. 4,927,447, Cl. 71-27.000.
Yu, Frank: *See*—
Yang, Herbert; Han, Patrick; and Yu, Frank, 4,927,018, Cl. 206-365.000.
Yui, Eiichi, to Omron Tateisi Electronics Company. Intelligent modem with manual escape switch. 4,928,305, Cl. 379-98.000.
Yuki, Mikio: *See*—
Murakawa, Masatake; Bando, Niro; Tone, Masatsugu; Yuki, Mikio; Miyata, Junji; Hayashi, Tetsuaki; and Kurohara, Kazuaki, 4,926,624, Cl. 56-202.000.
Yunoki, Yutaka, to Olympus Optical Co., Ltd. Magnetic recording/reproduction apparatus. 4,928,190, Cl. 360-66.000.
Zabar, Zivan, to Polytechnic University. Apparatus for driving a coil launcher. 4,926,741, Cl. 89-8.000.
Zabielski, Martin E., to United Technologies Corporation. Combustion control. 4,927,350, Cl. 431-12.000.
Zachman, Mark E.: *See*—
Davidson, James B.; Kaz, Peter N.; Kidwell, Michael H.; and Zachman, Mark E., 4,926,948, Cl. 172-4.500.
Zacke, Peter: *See*—
Worner, Siegfried; Zacke, Peter; and Wirth, Georg, 4,927,608, Cl. 422-179.000.
Zahnraderfabrik Renk AG: *See*—
Hirt, Manfred; and Arndt, Heinrich, 4,926,715, Cl. 475-337.000.
Zaruba, John V.: *See*—
Breslow, Jeffrey D.; Zaruba, John V.; and Rosenwinkel, Donald A., 4,927,156, Cl. 273-256.000.
Zecman, Kenneth P. Three layer shot sleeve assembly. 4,926,926, Cl. 164-312.000.
Zeeff, Thomas J.: *See*—
Bowler, Peter T.; and Zeeff, Thomas J., 4,927,205, Cl. 294-94.000.
Zeger, Leroy: *See*—
Saxon, Ronald L.; Zeger, Leroy; and Horbatt, Kenneth, 4,927,765, Cl. 436-43.000.
Zegers, Antonius P. F., to U.S. Philips Corporation. Flat display tube comprising an emission system for emitting a planar electron beam, a deflection system and a modulation system. 4,927,218, Cl. 315-366.000.
Zema, Evgeny M.: *See*—
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.
Zema, Viktor E.: *See*—
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A., Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.
Zenbayashi, Michio: *See*—
Kabeta, Keiji; and Zenbayashi, Michio, 4,927,949, Cl. 556-413.000.
Zengerle, Paul L.: *See*—
Henzel, Richard P.; and Zengerle, Paul L., 4,927,744, Cl. 430-566.000.
Zenoni, Pietro, to L.G.L. Electronics S.p.A. Weft feeding drum with laming array brake. 4,926,912, Cl. 139-452.000.
Zeria Pharmaceutical Co., Ltd.: *See*—
Inagaki, Tetsuya; Tagashira, Eijiro; Takaya, Masahiro; and Nishimura, Yasuhiro, 4,927,817, Cl. 514-184.000.
Zezjulinsky, Andrei A.: *See*—
Komarov, Alexandr N.; Shevtsov, Vitaly T.; Zema, Viktor E.; Lebedik, Grigory L.; Zema, Evgeny M.; Nedorezov, Vladimir A.; Oblovatsky, Anatoly K.; Drozdov, Boris Y.; Zezjulinsky, Andrei A.; Kovalenko, Sergei V.; Litvin, Alexandr N.; Yatsenko, Vladislav P.; and Katunin, Alexandr N., 4,927,121, Cl. 267-47.000.
Zhang, Wesley W.: *See*—
Cheng, David; Hartlage, Robert P.; and Zhang, Wesley W., 4,927,485, Cl. 156-345.000.
Zieher, Peter: *See*—
Taubitz, Bernd; Zieher, Peter; Kramer, Claus; Engelsdorf, Kurt; and Schuelke, Armin, 4,926,983, Cl. 188-299.000.
Zielke, Darrell W.; and Dean, Kenneth D., to Paktec Automation Cassette packaging system. 4,926,616, Cl. 53-585.000.
Zieren, Victor; and Ruigrok, Jacobus J. M., to U.S. Philips Corp. Thin-film transformer and magnetic head provided with such a transformer. 4,927,804, Cl. 505-1.000.
Zijsling, Djurre H., to Shell Oil Company. Method for monitoring the wear of a rotary type drill bit. 4,926,950, Cl. 175-39.000.
Zilberman, Moshe; Livne, Mordechai; Tchetchick, Doron; and Daniel, Moshe, to Israel Aircraft Industries, Ltd. Apparatus for dissipating shock-wave energy experienced by a test model. 4,926,684, Cl. 73-147.000.
Zimmer, Inc.: *See*—
Lozier, Antony J., 4,927,425, Cl. 606-99.000.
Zimmermann, Bernd D.; Claus, Richard O.; and Murphy, Kent A., to Center for Innovative Technology. Method and apparatus for sensing strain. 4,928,004, Cl. 250-227.140.
Zoboli, Walter. Dielectric joint, particularly for metallic conduits for liquids and/gases. 4,927,186, Cl. 285-54.000.
Zoltai, Tibor: *See*—
Demeter, Jozsef; Zoltai, Tibor; and Navarro, Hector D., 4,928,051, Cl. 318-731.000.
Zoltan, Bart J.; Laube, Beth L.; and Adams, George K., III, to Johns Hopkins University, The. Medication delivery system phase one. 4,926,852, Cl. 128-200.230.
Zorn, Peter A.: *See*—
Provenzo, Eugene F., Jr.; and Zorn, Peter A., 4,927,100, Cl. 244-153.00R.
Zulian, Ferruccio, to Bull HN Information Systems Italia S.p.A. Multiprocessor system featuring global data multiplation. 4,928,224, Cl. 36' 200.000.
Zupancic, Anton Z.; and Deucher, Joseph S., to Picker International, Inc. Gantry tilt and support assembly for CT scanner. 4,928,292, Cl. 378-17.000.
501 Daido Metal Company Ltd.: *See*—
Mori, Sanae, 4,927,715, Cl. 428-645.000.
501 Kabushiki Kaisha Hayashibara Kagaku Kenkyujo: *See*—
Hijiya, Hiromi; and Miyake, Toshio, 4,927,636, Cl. 424-409.000.
501 Microphoretic Systems, Inc.: *See*—
Brownlee, Robert G., 4,927,265, Cl. 356-73.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MAY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Dental Association Health Foundation: *See*—
Brown, Walter E.; and Chow, Laurence C., Re. 33,221, Cl. 423-308.000.
Brown, Walter E.; and Chow, Laurence C., to American Dental Association Health Foundation. Dental restorative cement pastes Re. 33,221, Cl. 423-308.000.
Chow, Laurence C.: *See*—
Brown, Walter E.; and Chow, Laurence C., Re. 33,221, Cl. 423-308.000.
Collier, William R., to Interstitial Systems, Inc. Modular combination floor support and electrical isolation system for use in building structures. Re. 33,220, Cl. 52-263.000.
Daniell, Michael G.; and Martin, Gerald S., to Fisher & Paykel Limited. Clamp valves. Re. 33,219, Cl. 251-7.000.
Fisher & Paykel Limited: *See*—
Daniell, Michael G.; and Martin, Gerald S., Re. 33,219, Cl. 251-7.000.
Interstitial Systems, Inc.: *See*—
Collier, William R., Re. 33,220, Cl. 52-263.000.
Martin, Gerald S.: *See*—
Daniell, Michael G.; and Martin, Gerald S., Re. 33,219, Cl. 251-7.000.
Twardosz, Brian. Weight lifting bar. Re. 33,218, Cl. 272-123.000

LIST OF DESIGN PATENTEES

Aderman, Wayne L.; Garmon, Vincent S.; Rodd, Timothy J.; and Tennant, Robert P., to International Business Machines Corp. Data processor. 308,047, 5-22-90, Cl. D14-100.000.
Aiken, Keith R. Combined vehicle bumper and guard. 308,037, 5-22-90, Cl. D12-169.000.
Akagi, Kenichi: *See*—
Tedham, Thomas A.; and Akagi, Kenichi, 308,055, Cl. D14-114.000.
Alberta, Terry D., to Pro-Tec Sports International, Inc. Bicycle exerciser. 308,085, 5-22-90, Cl. D21-194.000.
Alfa Lancia Industriale S.p.A.: *See*—
Vitale, Carmelo; and Villa, Ezio, 308,115, Cl. D26-122.000.
Amemiya, Masatomo, to Janome Sewing Machine Co. Ltd. Slide plate of a sewing machine. 308,063, 5-22-90, Cl. D15-72.000.
Amerock Corporation: *See*—
Gresens, Stanley T.; and Green, A. Denton, 307,992, Cl. D6-523.000.
Andou, Takaharu: *See*—
Sugano, Yoshihiko; and Andou, Takaharu, 308,050, Cl. D14-106.000.
Apple Computer, Inc.: *See*—
Peart, Stephen, 308,053, Cl. D14-113.000.
Peart, Stephen, 308,054, Cl. D14-113.000.
Associated Mills Inc.: *See*—
Geneve, Francois; Heiligenstein, Luc; and Melamed, Stephen, 308,092, Cl. D23-209.000.
Astley, Graham J.; and Turner, Barry S., to Belanger, Inc. Vehicle air drying nozzle. 308,123, 5-22-90, Cl. D32-4.000.
Badgett, James L., to Conair Corporation. Hot lather machine. 308,117, 5-22-90, Cl. D28-9.000.
Banathy, Eugene D.; Davis, Augustus B.; and Carlson, David A., to Intermatic Electronics, Incorporated. Outdoor light fixture. 308,111, 5-22-90, Cl. D26-68.000.
Barron, Michael D.: *See*—
Leoni, Kathleen C.; Barron, Michael D.; and Johnson, Robby D., 308,062, Cl. D14-253.000.
Batts, Inc.: *See*—
Duester, Everett L., 307,982, Cl. D6-328.000.
Belanger, Inc.: *See*—
Astley, Graham J.; and Turner, Barry S., 308,123, Cl. D32-4.000.
Bernstein, David T. Ice distribution tray. 307,997, 5-22-90, Cl. D7-616.000.
Bishop, Keith A.; and Blake, William S., to Schering Corporation. Nasal spray pump. 308,100, 5-22-90, Cl. D24-62.000.
Bissell, Sheldon. Hose clamp. 308,008, 5-22-90, Cl. D8-72.000.
Blake, William S.: *See*—
Bishop, Keith A.; and Blake, William S., 308,100, Cl. D24-62.000.
Bonatrade International, Inc.: *See*—
Colani, Victor, 308,040, Cl. D12-155.000.
Bounce, Inc.: *See*—
Markham, Joseph P.; and Emily, Peter, 308,122, Cl. D30-160.000.
Braun Aktiengesellschaft: *See*—
Kahlcke, Hartwig, 307,999, Cl. D7-330.000.
Brill, Richard H., to Conair Corporation. Diffuser attachment for hair dryer. 308,118, 5-22-90, Cl. D28-18.000.
British Telecommunications public limited company: *See*—
Desbarats, Gus E., 308,059, Cl. D14-151.000.
Brown, John M. Illuminated menu display unit. 308,079, 5-22-90, Cl. D20-20.000.
Buffey, Peter D. Golf practice mat. 308,087, 5-22-90, Cl. D21-234.000.
Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Earring. 308,027, 5-22-90, Cl. D11-43.000.
Bustos, Rafael T., to Leggett & Platt, Incorporated. Beverage display stand. 307,987, 5-22-90, Cl. D6-450.000.
Butler, Gerald L. Aircraft. 308,043, 5-22-90, Cl. D12-342.000.
Calamia, Thomas J.: *See*—
Kitner, William M.; Calamia, Thomas J.; and Keahey, James R., 308,042, Cl. D12-317.000.
Carlson, David A.: *See*—
Banathy, Eugene D.; Davis, Augustus B.; and Carlson, David A., 308,111, Cl. D26-68.000.
CertainTeed Corporation: *See*—
Westphal, Dennis; and Piles, Jonathan, 308,103, Cl. D25-124.000.
Chandler, Bill B. Transformer housing. 308,044, 5-22-90, Cl. D13-110.000.
Choi, Hoi, to Sklar-Peppler Inc. Seat. 307,983, 5-22-90, Cl. D6-334.000.
Chuo Kagaku Kabushiki Kaisha: *See*—
Natori, Eiji, 308,021, Cl. D9-310.000.
Chynoweth, William T.: *See*—
Volpe, Joseph W.; and Chynoweth, William T., 308,015, Cl. D8-367.000.
Cignarella, Glenn. Bill center. 307,993, 5-22-90, Cl. D6-553.000.
Colani, Victor, to Bonatrade International, Inc. Automobile windshield wiper aid. 308,040, 5-22-90, Cl. D12-155.000.
Collins & Aikman: *See*—
Queen, Robert A.; and Faloon, Michael D., 308,036, Cl. D12-155.000.
Collins, John A., Jr. Orthodontic appliance. 308,095, 5-22-90, Cl. D24-10.000.
Collins, John A., Jr. Orthodontic face mask. 308,096, 5-22-90, Cl. D24-10.000.
Conair Corporation: *See*—
Badgett, James L., 308,117, Cl. D28-9.000.
Brill, Richard H., 308,118, Cl. D28-18.000.
Cornell, Wallace. Exterior shell of a camper kitchen trailer body. 308,033, 5-22-90, Cl. D12-102.000.
Costello, James J. J.; and Prindle, William A., to Igloo Products Corporation. Portable insulated chest. 307,998, 5-22-90, Cl. D7-605.000.
Counts, Richard C.; and Fiegenschue, David, to Prescolite Inc. Combined face plate and control operators for an electrical switch or similar articles. 308,045, 5-22-90, Cl. D13-170.000.
Culler, Randy, to Sklar-Peppler Inc. Seat. 307,984, 5-22-90, Cl. D6-334.000.
Dallal, Fred H.; and Glaser, Milton, to Media Holdings, Inc. Advertising sign adapted for installation at a check-out counter. 308,078, 5-22-90, Cl. D20-10.000.
Dallape, Donald A. Automobile storage bag. 307,978, 5-22-90, Cl. D3-40.000.
Darden, Julius C.; Praca, Miguel M. L.; and Tomasi, Philip J. Lockable and removable slidein assembly for a hard disk drive. 308,052, 5-22-90, Cl. D14-109.000.
Davidson, Grant M. N., to U.S. Philips Corporation. Remote control for a car radio receiver. 308,060, 5-22-90, Cl. D14-218.000.
Davis, Augustus B.: *See*—
Banathy, Eugene D.; Davis, Augustus B.; and Carlson, David A., 308,111, Cl. D26-68.000.
Dawley, Paul S.; and Dawley, Sally. Combined weeding and furrowing hoe head. 308,004, 5-22-90, Cl. D8-11.000.

VOL
1114
ISS
4
MY
22
1990
UMI

Dawley, Sally: *See—*
Dawley, Paul S.; and Dawley, Sally, 308,004, Cl. D8-11.000.
DeLong, Robert J.: *See—*
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., 308,109, Cl. D26-49.000.
De Luca, Paul V., to Porta Systems Corp. Telephone main frame module or similar article. 308,061, 5-22-90, Cl. D14-240.000.
DeMars, Robert A. Tumbler with a swizzle stick holder. 307,996, 5-22-90, Cl. D7-507.000.
Dennett, Carol J. Handheld reference computer. 308,049, 5-22-90, Cl. D14-100.000.
Desbarats, Gus E., to British Telecommunications public limited company. Telephone base unit. 308,059, 5-22-90, Cl. D14-151.000.
Digital Equipment Corporation: *See—*
Urbanus, David S.; and Lufkin, Walter E., 308,071, Cl. D18-13.000.
Dinand, Ateliers, to Worth Parfums. Perfume bottle. 308,023, 5-22-90, Cl. D9-377.000.
Disera, William P. Woodwind mouthpiece. 308,069, 5-22-90, Cl. D17-13.000.
Dohrmann, Edward. Pan or the like for pouring liquids into a drum. 308,002, 5-22-90, Cl. D7-700.000.
Duester, Everett L., to Batts, Inc. Hanger clamp. 307,982, 5-22-90, Cl. D6-328.000.
Eastern Company, The: *See—*
Russell, Richard H.; and McLinden, Thomas V., 308,010, Cl. D8-343.000.
Ed. Seiler Pianofortefabrik GmbH & Co KG: *See—*
Seiler, Steffen, 308,068, Cl. D17-8.000.
Egly, Robert A.; and Sullivan, Patrick. Disc storage container. 307,977, 5-22-90, Cl. D3-35.000.
Ellis, Reginald C. L. Traction mat for attachment to a vehicle tire. 308,039, 5-22-90, Cl. D12-154.000.
Emily, Peter: *See—*
Markham, Joseph P.; and Emily, Peter, 308,122, Cl. D30-160.000.
Eskilstuna Knivfabriks AB: *See—*
Evrell, Torbjorn, 308,009, Cl. D8-99.000.
Evrell, Torbjorn, to Eskilstuna Knivfabriks AB. Folding knife. 308,009, 5-22-90, Cl. D8-99.000.
Falero, Avelino. Automobile. 308,031, 5-22-90, Cl. D12-91.000.
Falk, Martin L. Display cabinet. 307,986, 5-22-90, Cl. D6-440.000.
Faloon, Michael D.: *See—*
Queen, Robert A.; and Faloon, Michael D., 308,036, Cl. D12-155.000.
Ferguson, Dennis A.; and Lettiere, Tracey B. Nail holding hammer. 308,007, 5-22-90, Cl. D8-75.000.
Fiegenschue, David: *See—*
Counts, Richard C.; and Fiegenschue, David, 308,045, Cl. D13-170.000.
Fiskars OY AB: *See—*
Linden, Erkki O.; and Sunila, Timo, 308,018, Cl. D8-93.000.
Fratelli Guzzini S.p.A.: *See—*
Gecchelin, Bruno, 308,076, Cl. D19-85.000.
Gecchelin, Bruno, 308,077, Cl. D19-90.000.
Frazer, John S.: *See—*
Mintz, Steven J.; Haidle, Ward J.; and Frazer, John S., 308,022, Cl. D9-375.000.
Freeman, Danny G. Flexible vehicle-like child's toy. 308,083, 5-22-90, Cl. D21-124.000.
Fujioka, Akio, to Kitagawa Industries Co., Ltd. Clamp for clamping wires. 308,017, 5-22-90, Cl. D8-396.000.
Funk, Robert R. Stemware rack. 307,990, 5-22-90, Cl. D6-513.000.
Gamble, Robert Mc. Golf tee. 308,086, 5-22-90, Cl. D21-208.000.
Garmon, Vincent S.: *See—*
Aderman, Wayne L.; Garmon, Vincent S.; Rodd, Timothy J.; and Tennant, Robert P., 308,047, Cl. D14-100.000.
Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Holder for writing instruments. 308,076, 5-22-90, Cl. D19-85.000.
Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Paper holder. 308,077, 5-22-90, Cl. D19-90.000.
Geneve, Francois; Heiligenstein, Luc; and Melamed, Stephen, to Associated Mills Inc. Faucet filter. 308,092, 5-22-90, Cl. D23-209.000.
Glaser, Milton: *See—*
Dallal, Fred H.; and Glaser, Milton, 308,078, Cl. D20-10.000.
Goodyear Tire & Rubber Company, The: *See—*
Graas, Maurice, 308,034, Cl. D12-147.000.
Goto, Makoto. Traction device for prevention of sliding of a vehicle tire. 308,035, 5-22-90, Cl. D12-154.000.
Graas, Maurice, to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 308,034, 5-22-90, Cl. D12-147.000.
Green, A. Denton: *See—*
Gresens, Stanley T.; and Green, A. Denton, 307,992, Cl. D6-523.000.
Gregory, Billy J., to Witco Corporation. Grease cartridge package. 308,025, 5-22-90, Cl. D9-415.000.
Gresens, Stanley T.; and Green, A. Denton, to Amerock Corporation. End cap for a toilet tissue holder. 307,992, 5-22-90, Cl. D6-523.000.
Guidry, Warren L., to Interco Tire Corporation. Tire. 308,038, 5-22-90, Cl. D12-146.000.
Gund, Inc.: *See—*
Raiffe, Rita, 308,082, Cl. D21-65.000.
Haas, Ulrich J., to Optyl Eyewear Fashion International Corp. Eyeglass frame. 308,065, 5-22-90, Cl. D16-102.000.
Haidle, Ward J.: *See—*
Mintz, Steven J.; Haidle, Ward J.; and Frazer, John S., 308,022, Cl. D9-375.000.
Hardy, Terence, to L. B. Plastics Limited. Window component. 308,104, 5-22-90, Cl. D25-124.000.
Hardy, Terence, to L. B. Plastics Limited. Window component. 308,105, 5-22-90, Cl. D25-124.000.
Hardy, Terence, to L. B. Plastics Limited. Window component. 308,106, 5-22-90, Cl. D25-124.000.
Heiligenstein, Luc: *See—*
Geneve, Francois; Heiligenstein, Luc; and Melamed, Stephen, 308,092, Cl. D23-209.000.
Hengesbach, Robert W. Combined handle-operated flow control valve and pressure gauge. 308,094, 5-22-90, Cl. D23-226.000.
Hill, Loran R.; and Spangler, Anthony G., to Masco Corporation of Indiana. Hand held spray. 308,093, 5-22-90, Cl. D23-226.000.
Hiseh, Jimmy. Workpiece clamp for flat bed jig. 308,064, 5-22-90, Cl. D15-138.000.
Hoff, Phyllis J. Storage chest or similar article. 307,985, 5-22-90, Cl. D6-440.000.
Holt, James R.: *See—*
Kittle, Christopher; Holt, James R.; and Schumacher, James H., 307,975, Cl. D2-320.000.
Hotsumi, Minoru; and Mizushima, Toshiaki, to NEC Corporation. Mobile telephone set. 308,058, 5-22-90, Cl. D14-138.000.
Huckenbeck, Claus O. Pair of binoculars. 308,066, 5-22-90, Cl. D16-133.000.
I.T.T. Industries Belgium S.A.: *See—*
Slany, Hans E.; and Renner, Reinhard, 308,000, Cl. D7-360.000.
Igloo Products Corporation: *See—*
Costello, James J. J.; and Prindle, William A., 307,998, Cl. D7-605.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Sottsass, Ettore, 308,048, Cl. D14-100.000.
Interco Tire Corporation: *See—*
Guidry, Warren L., 308,038, Cl. D12-146.000.
Intermatic Electronics, Incorporated: *See—*
Banathy, Eugene D.; Davis, Augustus B.; and Carlson, David A., 308,111, Cl. D26-68.000.
International Business Machines Corp.: *See—*
Aderman, Wayne L.; Garmon, Vincent S., Rodd, Timothy J.; and Tennant, Robert P., 308,047, Cl. D14-100.000.
Interplex Electronics, Inc.: *See—*
Melone, Robert A., 308,046, Cl. D13-164.000.
Issard, Gerard, to Wichard. Safety clip. 308,014, 5-22-90, Cl. D8-367.000.
Janome Sewing Machine Co. Ltd.: *See—*
Amemiya, Masatomo, 308,063, Cl. D15-72.000.
Janzer Corp., The: *See—*
Janzer, Thomas F., 308,124, Cl. D99-30.000.
Janzer, Thomas F., to Janzer Corp., The. Mailbox. 308,124, 5-22-90, Cl. D99-30.000.
Jimenez, Louis M. Catheter bag support hook or similar article. 308,099, 5-22-90, Cl. D24-54.000.
Johnson, Robby D.: *See—*
Leoni, Kathleen C.; Barron, Michael D.; and Johnson, Robby D., 308,062, Cl. D14-253.000.
Kabushiki Kaisha Kanemitsu: *See—*
Kanemitsu, Masahiro, 308,012, Cl. D8-360.000.
Kanemitsu, Masahiro, 308,013, Cl. D8-360.000.
Kabushiki Kaisha Toshiba: *See—*
Sugano, Yoshihiko; and Andou, Takaharu, 308,050, Cl. D14-106.000.
Kahlcke, Hartwig, to Braun Aktiengesellschaft. Toaster. 307,999, 5-22-90, Cl. D7-330.000.
Kanemitsu, Masahiro, to Kabushiki Kaisha Kanemitsu. Poly-V pulley with bearing hub. 308,012, 5-22-90, Cl. D8-360.000.
Kanemitsu, Masahiro, to Kabushiki Kaisha Kanemitsu. Poly-V pulley with axially displaced hub. 308,013, 5-22-90, Cl. D8-360.000.
Keahey, James R.: *See—*
Kitner, William M.; Calamia, Thomas J.; and Keahey, James R., 308,042, Cl. D12-317.000.
Kelldorf, Mitchell T. Chair cover. 307,995, 5-22-90, Cl. D6-610.000.
Kerney, Jeffery E.; Koske, Charles E.; and Oen, Daniel E., to Paccar Inc. Truck cab. 308,032, 5-22-90, Cl. D12-96.000.
Kitagawa Industries Co., Ltd.: *See—*
Fujioka, Akio, 308,017, Cl. D8-396.000.
Kitner, William M., Calamia, Thomas J.; and Keahey, James R. Watercraft stabilizing flotation structure. 308,042, 5-22-90, Cl. D12-317.000.
Kittle, Christopher; Holt, James R.; and Schumacher, James H., to Reebok International Ltd. Shoe outsole. 307,975, 5-22-90, Cl. D2-320.000.
Kladt, Juan, to Vase D-Lite. Floral foam holder for a vase. 308,029, 5-22-90, Cl. D11-164.000.
Kohler Co.: *See—*
Wigman, Lorin R., 308,119, Cl. D28-54.100.
Koske, Charles E.: *See—*
Kerney, Jeffery E.; Koske, Charles E.; and Oen, Daniel E., 308,032, Cl. D12-96.000.
Kraft General Foods, Inc.: *See—*
Mileos, George, 308,019, Cl. D9-306.000.
Mintz, Steven J.; Haidle, Ward J.; and Frazer, John S., 308,022, Cl. D9-375.000.
Kraynyk, Roy. Electric trimmer motor housing with an extendable handle. 308,003, 5-22-90, Cl. D8-8.000.
Kunesh, Edward J., to S. C. Johnson & Son, Inc. Bottle and cap. 308,024, 5-22-90, Cl. D9-403.000.
L.A. Gear, Inc.: *See—*
Maccano, Angelo; and Nakao, Dreanna, 307,971, Cl. D2-320.000.

McKinstry, Kimberly A., 307,974, Cl. D2-314.000.
L. B. Plastics Limited: *See—*
Hardy, Terence, 308,104, Cl. D25-124.000.
Hardy, Terence, 308,105, Cl. D25-124.000.
Hardy, Terence, 308,106, Cl. D25-124.000.
Larstrade Intl. AB: *See—*
Wannius, Ann-Charlotte, 307,973, Cl. D2-274.000.
Laverde, Edgar R. Canteen-shaped beverage container or similar article. 308,020, 5-22-90, Cl. D9-307.000.
Leggett & Platt, Incorporated: *See—*
Bustos, Rafael T., 307,987, Cl. D6-450.000.
Leoni, Kathleen C.; Barron, Michael D.; and Johnson, Robby D. Shoulder rest holder for a portable telephone handset. 308,062, 5-22-90, Cl. D14-253.000.
Les Entreprises Tritton Ltee: *See—*
Tritton, Gary E.; and Tritton, Victor R., 308,016, Cl. D8-394.000.
Lettiere, Tracey B.: *See—*
Ferguson, Dennis A.; and Lettiere, Tracey B., 308,007, Cl. D8-75.000.
Lewis, Armis L.: *See—*
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., 308,109, Cl. D26-49.000.
Lewis, Leonard O., Jr. Decorative wall lamp. 308,113, 5-22-90, Cl. D26-73.000.
Libman Broom Company: *See—*
Saunders, Jolyon, 307,981, Cl. D4-118.000.
Lievonen, Arvo E.; and Lievonen, Kari J. Massage roller. 308,098, 5-22-90, Cl. D24-36.000.
Lievonen, Kari J.: *See—*
Lievonen, Arvo E.; and Lievonen, Kari J., 308,098, Cl. D24-36.000.
Linden, Erkki O.; and Sunila, Timo, to Fiskars OY AB. Knife sharpener. 308,018, 5-22-90, Cl. D8-93.000.
Little Tikes Company, The: *See—*
Mariol, James F., 308,088, Cl. D21-252.000.
Lofquist, Larry M. Cup dispenser. 307,991, 5-22-90, Cl. D6-516.000.
Lufkin, Walter E.: *See—*
Urbanus, David S.; and Lufkin, Walter E., 308,071, Cl. D18-13.000.
Lund Industries, Inc.: *See—*
Lund, James R., 308,041, Cl. D12-181.000.
Lund, James R., to Lund Industries, Inc. Air spoiler for trucks. 308,041, 5-22-90, Cl. D12-181.000.
Maccano, Angelo; and Nakao, Dreanna, to L.A. Gear, Inc. Shoe sole. 307,971, 5-22-90, Cl. D2-320.000.
Mag Instrument, Inc.: *See—*
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., 308,109, Cl. D26-49.000.
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., to Mag Instrument, Inc. Flashlight. 308,109, 5-22-90, Cl. D26-49.000.
Maloney, William J., II, to Quaker Oats Company, The. Wedding cake. 307,970, 5-22-90, Cl. D1-129.000.
Manzo, Louis. Squared staircase baluster. 308,107, 5-22-90, Cl. D25-126.000.
Mariol, James F., to Little Tikes Company, The. Sandbox. 308,088, 5-22-90, Cl. D21-252.000.
Markham, Joseph P.; and Emily, Peter, to Bounce, Inc. Pet toy. 308,122, 5-22-90, Cl. D30-160.000.
Masco Corporation of Indiana: *See—*
Hill, Loran R.; and Spangler, Anthony G., 308,093, Cl. D23-226.000.
McCarn, Ellen D. Thread organizer. 307,976, 5-22-90, Cl. D3-21.000.
McKinstry, Kimberly A., to L.A. Gear, Inc. Shoe upper. 307,974, 5-22-90, Cl. D2-314.000.
McLinden, Thomas V.: *See—*
Russell, Richard H.; and McLinden, Thomas V., 308,010, Cl. D8-343.000.
McMahon, Robert W., to Third R.W.M., Inc. Fast service restaurant building. 308,097, 5-22-90, Cl. D25-1.000.
Media Holdings, Inc.: *See—*
Dallal, Fred H.; and Glaser, Milton, 308,078, Cl. D20-10.000.
Mednick, Howard. Rotary mount for a telescope or the like. 308,067, 5-22-90, Cl. D16-145.000.
Melamed, Stephen: *See—*
Geneve, Francois; Heiligenstein, Luc; and Melamed, Stephen, 308,092, Cl. D23-209.000.
Melone, Robert A., to Interplex Electronics, Inc. Electronic circuit setup station. 308,046, 5-22-90, Cl. D13-164.000.
Micro Peripherals, Inc.: *See—*
Salmonson, Duane L., 308,072, Cl. D18-13.000.
Mileos, George, to Kraft General Foods, Inc. Combined package and dispenser for extrusible comestibles. 308,019, 5-22-90, Cl. D9-306.000.
Mintz, Steven J.; Haidle, Ward J.; and Frazer, John S., to Kraft General Foods, Inc. Bottle. 308,022, 5-22-90, Cl. D9-375.000.
Mitsubishi Pencil Co., Ltd.: *See—*
Yazaki, Katsuhiko, 308,075, Cl. D19-43.000.
Mizushima, Toshiaki: *See—*
Hotsumi, Minoru; and Mizushima, Toshiaki, 308,058, Cl. D14-138.000.
Monheim, Jan. Combined dental floss and handles therefor. 308,120, 5-22-90, Cl. D28-64.000.
Moriarty, Wilson P. Christmas tree stand. 308,028, 5-22-90, Cl. D11-130.100.
Motorola Inc.: *See—*
Tokiyama, Masaru, 308,057, Cl. D14-137.000.
Moulinex (Societe Anonyme): *See—*
Ricard, Andre, 308,001, Cl. D7-376.000.
Mueller, Hans W.; and Vought, Kenneth D., to Smith Corona Corporation. Ribbon cassette. 308,070, 5-22-90, Cl. D18-12.000.
Nakamura, Yoko, to Ricoh Company, Ltd. Toner tank. 308,073, 5-22-90, Cl. D18-43.000.
Nakao, Dreanna: *See—*
Maccano, Angelo; and Nakao, Dreanna, 307,971, Cl. D2-320.000.
Natori, Eiji, to Chuo Kagaku Kabushiki Kaisha. Packaging container. 308,021, 5-22-90, Cl. D9-310.000.
NEC Corporation: *See—*
Hotsumi, Minoru; and Mizushima, Toshiaki, 308,058, Cl. D14-138.000.
Newfield, Gail F., to Sazerac Co., Inc. Display stand. 307,988, 5-22-90, Cl. D6-450.000.
Nickert, Ernest G. Combined tractor trailer pin puller and flashlight. 308,005, 5-22-90, Cl. D8-14.000.
Norris, Jerry D. Anchor for rope or the like. 308,011, 5-22-90, Cl. D8-356.000.
Oen, Daniel E.: *See—*
Kerney, Jeffery E.; Koske, Charles E.; and Oen, Daniel E., 308,032, Cl. D12-96.000.
Optyl Eyewear Fashion International Corp.: *See—*
Haas, Ulrich J., 308,065, Cl. D16-102.000.
Overturf, Geraldine M. Waterbed for pets or the like. 308,121, 5-22-90, Cl. D30-118.000.
Paccar Inc.: *See—*
Kerney, Jeffery E.; Koske, Charles E.; and Oen, Daniel E., 308,032, Cl. D12-96.000.
Sasamura, Ross, 308,108, Cl. D26-35.000.
Partecipazioni Bulgari S.p.A.: *See—*
Bulgari, Paolo, 308,027, Cl. D11-43.000.
Peart, Stephen, to Apple Computer, Inc. Video display for computer. 308,053, 5-22-90, Cl. D14-113.000.
Peart, Stephen, to Apple Computer, Inc. Video display for computer. 308,054, 5-22-90, Cl. D14-113.000.
Pickens, Ralph D. Bullet collator for shell reloading operations. 308,102, 5-22-90, Cl. D25-116.000.
Piles, Jonathan: *See—*
Westphal, Dennis; and Piles, Jonathan, 308,103, Cl. D25-124.000.
Plough, Inc.: *See—*
Tugwood, Edward, 308,101, Cl. D24-63.000.
Porta Systems Corp.: *See—*
De Luca, Paul V., 308,061, Cl. D14-240.000.
Praca, Miguel M. L.: *See—*
Darden, Julius C.; Praca, Miguel M. L.; and Tomasi, Philip J., 308,052, Cl. D14-109.000.
Prescolite Inc.: *See—*
Counts, Richard C.; and Fiegenschue, David, 308,045, Cl. D13-170.000.
Prindle, William A.: *See—*
Costello, James J. J.; and Prindle, William A., 307,998, Cl. D7-605.000.
Pro-Tec Sports International, Inc.: *See—*
Alberta, Terry D., 308,085, Cl. D21-194.000.
Purvis, Janet L. Combined key ring and change purse. 307,979, 5-22-90, Cl. D3-62.000.
Quaker Oats Company, The: *See—*
Maloney, William J., II, 307,970, Cl. D1-129.000.
Queen, Robert A.; and Faloon, Michael D., to Collins & Aikman. Automobile trunk liner. 308,036, 5-22-90, Cl. D12-155.000.
Raiffe, Rita, to Gund, Inc. Rattle. 308,082, 5-22-90, Cl. D21-65.000.
Reebok International Ltd.: *See—*
Kittle, Christopher; Holt, James R.; and Schumacher, James H., 307,975, Cl. D2-320.000.
Renner, Reinhard: *See—*
Slany, Hans E.; and Renner, Reinhard, 308,000, Cl. D7-360.000.
Restum, Hassan. Tie clasp. 308,030, 5-22-90, Cl. D11-204.000.
Ricard, Andre, to Moulinex (Societe Anonyme). Food mixer. 308,001, 5-22-90, Cl. D7-376.000.
Ricoh Company, Ltd.: *See—*
Nakamura, Yoko, 308,073, Cl. D18-43.000.
Robbins, Daniel T. Handle for manual release of a paper roll spindle. 308,006, 5-22-90, Cl. D8-14.000.
Rodd, Timothy J.: *See—*
Aderman, Wayne L.; Garmon, Vincent S.; Rodd, Timothy J.; and Tennant, Robert P., 308,047, Cl. D14-100.000.
Russell, Richard H.; and McLinden, Thomas V., to Eastern Company, The. Mounting bracket for latches and locks. 308,010, 5-22-90, Cl. D8-343.000.
S. C. Johnson & Son, Inc.: *See—*
Kunesh, Edward J., 308,024, Cl. D9-403.000.
Sachs, Isaac. Identification tag. 308,080, 5-22-90, Cl. D20-22.000.
Sakai, Hiroaki, to Seiko Epson Corporation. Portable computer. 308,051, 5-22-90, Cl. D14-106.000.
Salmonson, Duane L., to Micro Peripherals, Inc. Printer. 308,072, 5-22-90, Cl. D18-13.000.
Sanders, Ronald J. Sight aiming instrument for weaponry. 308,089, 5-22-90, Cl. D22-109.000.
Sasamura, Ross, to Paccar Inc. Headlight for a truck. 308,108, 5-22-90, Cl. D26-35.000.
Saunders, Jolyon, to Libman Broom Company. Combined push broom head and scraper. 307,981, 5-22-90, Cl. D4-118.000.
Sazerac Co., Inc.: *See—*
Newfield, Gail F., 307,988, Cl. D6-450.000.
Schering Corporation: *See—*
Bishop, Keith A.; and Blake, William S., 308,100, Cl. D24-62.000.

VOL 1114 ISS 4 MY 22 1990 UMI

Schumacher, James H.: *See—*
Kittle, Christopher; Holt, James R.; and Schumacher, James H., 307,975, Cl. D2-320.000.
Sebestik, Laddie. Sandal. 307,972, 5-22-90, Cl. D2-270.000.
Seiko Epson Corporation: *See—*
Sakai, Hiroaki, 308,051, Cl. D14-106.000.
Seiler, Steffen, to Ed. Seiler Pianofortefabrik GmbH & Co KG. Piano. 308,068, 5-22-90, Cl. D17-8.000.
Shemitz, Sylvan R., to Sylvan R. Shemitz Associates, Inc. Wall mounted indirect lighting fixture. 308,114, 5-22-90, Cl. D26-85.000.
Sklar-Peppler Inc.: *See—*
Choi, Hoi, 307,983, Cl. D3-334.000.
Culler, Randy, 307,984, Cl. D6-334.000.
Slany, Hans E.; and Renner, Reinhard, to I.T.T. Industries Belgium S.A. Deep fryer. 308,000, 5-22-90, Cl. D7-360.000.
Smith Corona Corporation: *See—*
Mueller, Hans W.; and Vought, Kenneth D., 308,070, Cl. D18-12.000.
Smith, Melanie M.; and Smith, William M. Stuffed toy shark. 308,084, 5-22-90, Cl. D21-157.000.
Smith, William M.: *See—*
Smith, Melanie M.; and Smith, William M., 308,084, Cl. D21-157.000.
Sony Corporation: *See—*
Takeda, Yuka, 308,056, Cl. D14-121.000.
Sottsass, Ettore, to Ing. C. Olivetti & C., S.p.A. Personal computer. 308,048, 5-22-90, Cl. D14-100.000.
Spangler, Anthony G.: *See—*
Hill, Loran R.; and Spangler, Anthony G., 308,093, Cl. D23-226.000.
Sprague, James D. Fish hook remover. 308,091, 5-22-90, Cl. D22-149.000.
Stewart, Janet L. Earring display stand. 307,989, 5-22-90, Cl. D6-467.000.
Stuckey, Joan. Inflatable mattress. 307,994, 5-22-90, Cl. D6-604.000.
Sugano, Yoshihiko; and Andou, Takaharu, to Kabushiki Kaisha Toshiba. Electronic computer. 308,050, 5-22-90, Cl. D14-106.000.
Sullivan, Patrick: *See—*
Egly, Robert A.; and Sullivan, Patrick, 307,977, Cl. D3-35.000.
Sunila, Timo: *See—*
Linden, Erkki O.; and Sunila, Timo, 308,018, Cl. D8-93.000.
Sylvan R. Shemitz Associates, Inc.: *See—*
Shemitz, Sylvan R., 308,114, Cl. D26-85.000.
Takeda, Yuka, to Sony Corporation. Hub for a tape reel. 308,056, 5-22-90, Cl. D14-121.000.
Targetti, Giampaolo, to Targetti Sankey, S.p.A. Indirect light fixture. 308,112, 5-22-90, Cl. D26-72.000.
Targetti Sankey, S.p.A.: *See—*
Targetti, Giampaolo, 308,112, Cl. D26-72.000.
Tedham, Thomas A.; and Akagi, Kenichi, to Wang Laboratories, Inc. Digitizing tablet for computer input. 308,055, 5-22-90, Cl. D14-114.000.
Tennant, Robert P.: *See—*
Aderman, Wayne L.; Garmon, Vincent S.; Rodd, Timothy J.; and Tennant, Robert P., 308,047, Cl. D14-100.000.
Third R.W.M., Inc.: *See—*
McMahon, Robert W., 308,097, Cl. D25-1.000.
Tokiyama, Masaru, to Motorola Inc. Housing for a two-way mobile radio or similar article. 308,057, 5-22-90, Cl. D14-137.000.
Tomasi, Philip J.: *See—*
Darden, Julius C.; Praca, Miguel M. L.; and Tomasi, Philip J., 308,052, Cl. D14-109.000.
Tritton, Gary E.; and Tritton, Victor R., to Les Entreprises Tritton Ltee. Seal. 308,016, 5-22-90, Cl. D8-394.000.
Tritton, Victor R.: *See—*
Tritton, Gary E.; and Tritton, Victor R., 308,016, Cl. D8-394.000.
Tugwood, Edward, to Plough, Inc. Oral medicament dispenser for liquid or cream. 308,101, 5-22-90, Cl. D24-63.000.
Turner, Barry S.: *See—*
Astley, Graham J.; and Turner, Barry S., 308,123, Cl. D32-4.000.
U.S. Philips Corporation: *See—*
Davidson, Grant M. N., 308,060, Cl. D14-218.000.
Urbanus, David S.; and Lufkin, Walter E., to Digital Equipment Corporation. Printer. 308,071, 5-22-90, Cl. D18-13.000.
Vandergriff, Robert R. Vehicle light mounting bracket. 308,116, 5-22-90, Cl. D26-149.000.
Vase D-Lite: *See—*
Kladt, Juan, 308,029, Cl. D11-164.000.
Victory, Donald G. Lapel communicator. 308,026, 5-22-90, Cl. D11-46.000.
Villa, Ezio: *See—*
Vitale, Carmelo; and Villa, Ezio, 308,115, Cl. D26-122.000.
Vitale, Carmelo; and Villa, Ezio, to Alfa Lancia Industriale S.p.A. Pair of vehicle rear signal lights. 308,115, 5-22-90, Cl. D26-122.000.
Volpe, Joseph W.; and Chynoweth, William T. Marine utility hook. 308,015, 5-22-90, Cl. D8-367.000.
Vought, Kenneth D.: *See—*
Mueller, Hans W.; and Vought, Kenneth D., 308,070, Cl. D18-12.000.
Walters, Kyrk. Surfer pen key ring. 307,980, 5-22-90, Cl. D3-62.000.
Wang Laboratories, Inc.: *See—*
Tedham, Thomas A.; and Akagi, Kenichi, 308,055, Cl. D14-114.000.
Wannius, Ann-Charlotte, to Larstrade Intl. AB. Riding-boot. 307,973, 5-22-90, Cl. D2-274.000.
Warkentin, William P. Greeting card. 308,074, 5-22-90, Cl. D19-1.000.
Westphal, Dennis; and Piles, Jonathan, to CertainTeed Corporation. Window component extrusion. 308,103, 5-22-90, Cl. D25-124.000.
Wichard: *See—*
Issard, Gerard, 308,014, Cl. D8-367.000.
Wigman, Lorin R., to Kohler Co. Dryer. 308,119, 5-22-90, Cl. D28-54.100.
Witco Corporation: *See—*
Gregory, Billy J., 308,025, Cl. D9-415.000.
Worth Parfums: *See—*
Dinand, Ateliers, 308,023, Cl. D9-377.000.
Wrixon, Fred B. Gameboard. 308,081, 5-22-90, Cl. D21-25.000.
Yazaki, Katsuhiko, to Mitsubishi Pencil Co., Ltd. Marking pen. 308,075, 5-22-90, Cl. D19-43.000.
Yeh, Shih-Yuan. Combined fishing reel and bait case. 308,090, 5-22-90, Cl. D22-139.000.
Ziaylek, Theodore, Jr. Luff light for a boat. 308,110, 5-22-90, Cl. D26-36.000.

LIST OF PLANT PATENTEES

Fruehwirth, Franz, to Paul Ecke Ranch, Inc. Poinsettia plant '135'. 7,234, 5-22-90, Cl. 86.000.
Fruehwirth, Franz, to Paul Ecke Ranch, Inc. Poinsettia plant 'C-27'. 7,235, 5-22-90, Cl. 86.000.
Herrera, Camilo, to Whitefield Corporation. Chrysanthemum plant named Yellow Comet. 7,233, 5-22-90, Cl. 78.000.
Hoff, Petrus M. M., to Hoffgaarde B.V. Lily plant named Penny Lane. 7,232, 5-22-90, Cl. 68.000.
Hoffgaarde B.V.: *See—*
Hoff, Petrus M. M., 7,232, Cl. 68.000.
Paul Ecke Ranch, Inc.: *See—*
Fruehwirth, Franz, 7,234, Cl. 86.000.
Fruehwirth, Franz, 7,235, Cl. 86.000.
Whitefield Corporation: *See—*
Herrera, Camilo, 7,233, Cl. 78.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 22, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
22 4,926,501
44 4,926,502
267 4,926,503

CLASS 4
247 4,926,504
4,926,505
4,926,506
295 4,926,507
329 4,926,508
448 4,926,509
542 4,926,510
605 4,926,511

CLASS 5
417 4,926,512
488 4,926,513

CLASS 8
150 4,926,514
583 4,927,429

CLASS 15
4 4,926,515
49 C 4,926,516
82 4,926,517
104.33 4,926,518
235.4 4,926,519
302 4,926,520

CLASS 16
110 A 4,926,521
114 R 4,926,522
125 4,926,523
386 4,926,524

CLASS 24
11 F 4,926,525
30.5 R 4,926,526
90 A 4,926,527
640 4,926,528

CLASS 26
89 4,926,529

CLASS 28
111 4,926,530
173 4,926,531

CLASS 29
25.35 4,926,532
33 F 4,926,533
238 4,926,536
275 4,926,537
559 4,926,538
568 4,926,539
596 4,926,540
598 4,926,541
619 4,926,542
623 4,926,543
703 4,926,544
832 4,926,545
840 4,926,546
841 4,926,547
860 4,926,548
876 4,926,549
888.451 4,926,534
890.144 4,926,535

CLASS 30
43.1 4,926,550
43.92 4,926,551
4,926,552
49 4,926,553
161 4,926,554
162 4,926,555
216 4,926,556
276 4,926,557
308.1 4,926,558

CLASS 33
244 4,926,560
293 4,926,561
4,926,563
414 4,926,562
474 4,926,564
567 4,926,565
771 4,926,566
832 4,926,559

CLASS 34
23 4,926,567

CLASS 36
15 4,926,568
43 4,926,570
91 4,926,569

CLASS 37
72 4,926,571

CLASS 40
448 4,926,572
663 4,926,573

CLASS 42
70.04 4,926,574
70.06 4,926,575
101 4,926,576

CLASS 43
42 4,926,577
42.24 4,926,578
42.44 4,926,579
44.89 4,926,580
61 4,926,581

CLASS 44
62 4,926,582

CLASS 47
1.01 4,926,583
52 4,926,597
59 4,926,584
61 4,926,598
64 4,926,585
66 4,926,586
85 4,926,587

CLASS 48
197 R 4,927,430

CLASS 49
88 4,926,599
491 4,926,600

CLASS 51
7 4,926,601
135 R 4,926,602
165.77 4,926,603
165.88 4,926,604
217 T 4,926,588
298 4,927,431
4,927,432
427 4,926,589

CLASS 52
8 4,926,590
63 4,926,591
4,926,605
98 4,926,592
126.4 4,926,593
200 4,926,594
263 Re 33,220
300 4,926,595
408 4,926,596
484 4,926,606
4,926,607
522 4,926,608
582 4,926,609
716 4,926,610
748 4,926,611

CLASS 53
69 4,926,612
433 4,926,613
434 4,926,614
564 4,926,615
585 4,926,616
587 4,926,617

CLASS 55
18 4,927,433
20 4,926,618
4,927,434
89 4,926,620
96 4,927,435
281 4,927,436
349 4,927,437
385.1 4,927,439
385.2 4,927,438

CLASS 56
6 4,926,621
12.8 4,927,440
15.4 4,926,619
16.8 4,926,622
60 4,926,623
202 4,926,624
376 4,926,625

CLASS 57
18 4,926,626
412 4,926,627

CLASS 60
39.142 4,926,631
39.15 4,926,628
39.281 4,926,629
39.36 4,926,630
203.1 4,926,632
226.1 4,926,633
274 4,926,634
299 4,926,635
312 4,926,636
317 4,926,637
319 4,926,638
522 4,926,639
602 4,926,640
605.3 4,926,641
607 4,926,642
691 4,926,643
715 4,926,644
723 4,926,645

CLASS 62
28 4,927,441
51.1 4,926,646
4,926,647
55.5 4,926,648
99 4,926,649
114 4,926,650
133 4,926,651
175 4,926,652
204 4,926,653
229 4,926,654
244 4,926,655
310 4,926,656
311 4,926,657
324.1 4,926,658
476 4,926,659

CLASS 65
11.1 4,927,445
18.1 4,927,442
273 4,927,443
323 4,927,444
347 4,927,446

CLASS 66
9 R 4,926,660

CLASS 68
200 4,926,661

CLASS 70
56 4,926,662
74 4,926,663
119 4,926,664
277 4,926,665
374 4,926,670

CLASS 71
27 4,927,447
64.13 4,927,455
90 4,927,448
4,927,449
91 4,927,450
92 4,927,451
4,927,452
4,927,453
93 4,927,454

CLASS 72
247 4,926,666
256 4,926,667
289 4,926,668
349 4,926,669
389 4,926,671
4,926,676
410 4,926,685
430 4,926,677
458 4,926,672
465 4,926,673

CLASS 73
3 4,926,678
4 R 4,926,674
19 4,926,675
28 4,926,679
46 4,926,680
52 4,926,681
54 4,926,682
118.1 4,926,683
147 4,926,684
151 4,926,686
161 4,926,687
205 4,926,696
497 4,926,689
514 4,926,690
579 4,926,691
597 4,926,692
4,926,693
794 4,926,694
861.24 4,926,695
861.48 4,926,697
861.61 4,926,698
862.21 4,926,699
862.23 4,926,700
864.15 4,926,701
864.83 4,926,702
865.1 4,926,703
866.5 4,926,704

CLASS 74
6 4,926,705
7 A 4,926,706
96 4,926,707
337.5 4,926,714
424.8 C 4,926,708
424.88 4,926,709
527 4,926,688
573 R 4,926,710
866 4,926,716

CLASS 75
10.14 4,927,460
10.63 4,927,457
246 4,927,458
254 4,927,461
346 4,927,456
685 4,927,459

CLASS 81
3.2 4,926,717
44 4,926,718
57.37 4,926,719
61 4,926,720
177.4 4,926,721
487 4,926,722

CLASS 82
118 4,926,723

CLASS 83
35 4,926,724
155 4,926,725
165 4,926,726
203 4,926,727
251 4,926,728
364 4,926,729
499 4,926,730
789 4,926,731
819 4,926,733

CLASS 84
318 4,926,732
423 R 4,926,734
453 4,926,735
609 4,926,736
611 4,926,737
618 4,926,738

CLASS 89
1.4 4,926,739
1.819 4,926,740
8 4,926,741
33.02 4,926,742
40.14 4,926,743

CLASS 92
58 4,926,744
256 4,926,745

CLASS 98
115.2 4,926,746

CLASS 99
486 4,926,747

CLASS 100
34 4,926,748
177 4,926,749

CLASS 102
261 4,926,750
348 4,926,751
486 4,926,752

CLASS 104
88 4,926,753
112 4,926,754
183 4,926,755

CLASS 105
167 4,926,756
224.1 4,926,757

CLASS 106
99 4,927,462
109 4,927,463
436 4,927,464
486 4,927,465
494 4,927,466

CLASS 108
43 4,926,758
111 4,926,759
145 4,926,760

CLASS 109
49.5 4,926,761
51 4,926,762

CLASS 110
215 4,926,763
221 4,926,764
234 4,926,765
342 4,926,766

CLASS 111
11 4,926,768
187 4,926,767

CLASS 112
121.12 4,926,769
453 4,926,770

CLASS 114
39.2 4,926,772
61 4,926,771
4,926,773
123 4,926,774
222 4,926,775
263 4,926,776
270 4,926,777
273 4,926,778
297 4,926,779
311 4,926,780
351 4,926,781
361 4,926,782
363 4,926,783

CLASS 116
209 4,926,785
324 4,926,786

CLASS 118
32 4,926,787
500 4,926,788
653 4,926,790
668 4,926,789
723 4,926,791
729 4,926,792
730 4,926,793

CLASS 119
1 4,926,794
3 4,926,795
83 4,926,796
106 4,926,784

CLASS 122
15 4,926,797
24 4,926,798
235 A 4,926,799

CLASS 123
41.42 4,926,800
41.84 4,926,801
52 M 4,926,802
55 R 4,926,803
90.16 4,926,804
90.61 4,926,805
179 BG 4,926,807
179 L 4,926,806
187.5 R 4,926,808
190 A 4,926,809
192 B 4,926,810
193 H 4,926,812
193 P 4,926,811
195 HC 4,926,813
196 W 4,926,814
198 DB 4,926,815
203 4,926,816
292 4,926,817
297 4,926,818
4,926,819
399 4,926,821
414 4,926,822
432 4,926,823
450 4,926,824
489 4,926,825
4,926,826
4,926,827
4,926,828
497 4,926,829
557 4,926,830
4,926,831

CLASS 124
23.1 4,926,833
25 4,926,834
25.6 4,926,832
35.2 4,926,835

CLASS 125
11.01 4,926,836

CLASS 126
21 H 4,926,837
25 A 4,926,838
96 4,926,839
110 R 4,926,840
243 4,926,841
360 R 4,926,842
390 4,926,843

CLASS 128
24 A 4,926,857
4,926,859
30 4,926,844
75 4,926,849
78 4,926,845
80 H 4,926,846
155 4,926,850
157 4,926,851
169 4,926,848
200.23 4,926,852
201.18 4,926,853
201.23 4,926,854
201.28 4,926,855
203.26 4,926,856
395 4,926,861
419 PG 4,926,863
421 4,926,864
4,926,865
630 4,926,866
633 4,926,867
653 R 4,926,868
654 4,926,869
660.01 4,926,870
660.07 4,926,871
661.01 4,926,872
681 4,926,873
682 4,926,874
691 4,926,875
731 4,926,969
736 4,926,876
754 4,926,877
798 4,926,878
4,926,879
800 4,926,880
804 4,926,881
850 4,926,882
888 4,926,883
892 4,926,884
898 4,926,885

CLASS 131
84.4 4,926,886
91 4,926,887
236 4,926,888
329 4,926,889

CLASS 132
73 4,926,890
214 4,926,891
323 4,926,820

CLASS 135
103 4,926,892
106 4,926,893

VOL
1114
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4
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CLASS 137

15 4,926,894
4,926,895
82 4,926,896
98 4,926,897
315 4,926,898
364 4,926,899
385 4,926,900
456 4,926,901
493.3 4,926,902
554 4,926,903
565 4,926,904
625.3 4,926,906
625.6 4,926,905
627.5 4,926,907
846 4,926,908

CLASS 138

109 4,926,909

CLASS 139

425 R 4,926,910
435.1 4,926,911
452 4,926,912

CLASS 141

1 4,926,913
59 4,926,914
290 4,926,915

CLASS 144

136 R 4,926,916
356 4,926,917

CLASS 148

3 4,927,467
4,927,468
11.5 A 4,927,469
12.7 A 4,927,470
33.5 4,927,471
261 4,927,472
306 4,927,473

CLASS 152

154 4,926,918
209 R 4,926,919
548 4,926,920

CLASS 156

66 4,927,474
89 4,927,475
173 4,927,476
182 4,927,477
185 4,927,478
228 4,927,479
4,927,480
243 4,927,482
245 4,927,481
306.6 4,927,483
345 4,927,484
4,927,485
351 4,927,486
4,927,487
460 4,927,488
620.1 4,927,489
630 4,927,491
634 4,927,490
642 4,927,492
643 4,927,493

CLASS 159

2.1 4,927,494

CLASS 160

115 4,926,921
331 4,926,922

CLASS 162

135 4,927,495
136 4,927,496
160 4,927,497
168.3 4,927,498
336 4,927,499

CLASS 164

5 4,926,923
4,926,924
154 4,926,925
312 4,926,926
429 4,926,927
445 4,926,929
452 4,926,928
476 4,926,930

CLASS 165

111 4,926,931
4,926,932
173 4,926,933
4,926,934
185 4,926,935

CLASS 166

206 4,926,937
208 4,926,938
4,926,939
217 4,926,936
247 4,926,940
248 4,926,941
250 4,926,942
270 4,926,943
293 4,926,944
321 4,926,945

CLASS 169

37 4,926,946

CLASS 172

4.5 4,926,948
22 4,926,947

CLASS 174

50 4,927,982
92 4,927,984
125.1 4,927,985
258 4,927,983

CLASS 175

17 4,926,949
39 4,926,950

CLASS 177

144 4,926,951

CLASS 178

18 4,927,986

CLASS 180

6.5 4,926,952
68.5 4,926,953
79.1 4,926,960
140 4,926,954
4,926,955
142 4,926,956
164 4,926,957
168 4,926,958
315 4,926,959

CLASS 181

22 4,926,961
150 4,926,962
290 4,926,963

CLASS 182

22 4,926,964
89 4,926,965
155 4,926,966
164 4,926,967
172 4,926,968

CLASS 184

6.11 4,926,970
15.1 4,926,971
109 4,926,972

CLASS 187

11 4,926,973
52 LC 4,926,974
57 4,926,975
108 4,928,021
125 4,926,976

CLASS 188

18 A 4,926,977
73.1 4,926,978
73.44 4,926,979
79.55 4,926,980
111 4,926,981
271 4,926,982
299 4,926,983
310 4,926,984
378 4,926,985

CLASS 192

0.02 R 4,926,986
3.3 4,926,988
8 C 4,926,987
18 A 4,926,989
28 4,926,990
41 S 4,926,991
48.2 4,926,992
98 4,926,993
110 R 4,926,994

CLASS 193

37 4,926,995

CLASS 194

212 4,926,996
231 4,926,997
315 4,926,998

CLASS 196

46 4,927,500

CLASS 198

358 4,926,999
418.4 4,927,000
463.5 4,927,001
487.1 4,927,002
497 4,927,003
704 4,927,004
781 4,927,005
822 4,927,006
823 4,927,007

CLASS 200

5 R 4,927,987
80 R 4,927,988
265 4,927,989
517 4,927,990

CLASS 202

248 4,927,501

CLASS 204

23 4,927,504
34.5 4,927,505
51 4,927,506
78 4,927,507
79 4,927,508
83 4,927,509
114 4,927,510
151 4,927,511
153.1 4,927,502
153.11 4,927,503
157.5 4,927,512
192.13 4,927,513
290 R 4,927,514
298.21 4,927,515
403 4,927,516
406 4,927,517
421 4,927,518

CLASS 206

45.31 4,927,008
188 4,927,009
204 4,927,010
217 4,927,011
219 4,927,012
221 4,927,013
287.1 4,927,014
315.11 4,927,016
315.9 4,927,015
316.2 4,927,017
365 4,927,018
4,927,019
373 4,927,021
378 4,927,020
443 4,927,022
523 4,927,023
562 4,927,024
575 4,927,025
600 4,927,026
611 4,927,027
618 4,927,028

CLASS 208

48 AA 4,927,519
50 4,927,520
65 4,927,521
120 4,927,522
4,927,523
131 4,927,524
138 4,927,525
152 4,927,526
161 4,927,527

CLASS 209

240 4,927,528
270 4,927,529
315 4,927,534
538 4,927,029
620 4,927,030
657 4,927,031

CLASS 210

149 4,927,530
198.2 4,927,531
4,927,532
257.1 4,927,533
500.23 4,927,535
512.2 4,927,536
527 4,927,537
634 4,927,538
635 4,927,539
638 4,927,540
656 4,927,541
711 4,927,542
4,927,543
712 4,927,544
745 4,927,545
755 4,927,546
771 4,927,547

CLASS 211

41 4,927,032
4,927,033

CLASS 212

218 4,927,034

CLASS 213

77 4,927,035

CLASS 215

203 4,927,036

CLASS 219

10.55 E 4,927,991
121.65 4,927,992
201 4,927,993
343 4,927,994
385 4,927,995
413 4,927,996
459 4,927,997
494 4,927,998
535 4,927,999

CLASS 220

1.5 4,927,037
3 4,927,038
3.7 4,927,039
5 R 4,927,040
20 4,927,041
23.83 4,927,042
67 4,927,043
83 4,927,044
88 R 4,927,045
90 4,927,046
90.2 4,927,047
4,927,048
201 4,927,049
445 4,927,050

CLASS 221

12 4,927,051
64 4,927,052
67 4,927,055
279 4,927,053
289 4,927,054

CLASS 222

1 4,927,056
5 4,927,057
106 4,927,058
136 4,927,059
146.5 4,927,060
212 4,927,061
420 4,927,062
520 4,927,065

CLASS 223

84 4,927,063

CLASS 224

42.45 R 4,927,066

CLASS 225

106 4,927,064

CLASS 227

128 4,927,067

CLASS 228

103 4,927,068
123 4,927,069
155 4,927,070

CLASS 229

71 4,927,071
92.3 4,927,072
117.07 4,927,073
125.21 4,927,074
125.34 4,927,075
132 4,927,076

CLASS 235

380 4,928,000
4,928,001
479 4,928,002

CLASS 237

2 A 4,927,077

CLASS 238

349 4,927,078

CLASS 239

11 4,927,079
77 4,927,080
223 4,927,081
230 4,927,082
282 4,927,083
584 4,927,084

CLASS 241

36 4,927,085
80 4,927,086
100.5 4,927,087
223 4,927,088
264 4,927,089

CLASS 242

67.1 R 4,927,090
68.4 4,927,091
107.2 4,927,092
154 4,927,093
242 4,927,094
261 4,927,095

CLASS 244

3.22 4,927,096
118.1 4,927,097
137.2 4,927,098
152 4,927,099
153 R 4,927,100
164 4,927,101

CLASS 246

469 4,927,102

CLASS 248

62 4,927,103
97 4,927,104
146 4,927,106
188.8 4,927,105
240.4 4,927,107
311.2 4,927,108
354.3 4,927,109
430 4,927,110
500 4,927,111
539 4,927,117
545 4,927,118
550 4,927,119
676 4,927,120

CLASS 250

201.1 4,928,006
211 J 4,928,003
227.14 4,928,004
227.23 4,928,005
231.1 4,928,008
231.13 4,928,009
310 4,928,010
327.2 4,928,011
338.1 4,928,012
339 4,928,013
341 4,928,014
343 4,928,015
440.1 4,928,016
483.1 4,928,017
492.2 4,928,018
561 4,928,019

CLASS 251

1.3 4,927,112
7 Re 33,219
165 4,927,113
240 4,927,114
241 4,927,115
312 4,927,116

CLASS 252

17 4,927,548
25 4,927,549
32.5 4,927,550
42.7 4,927,551
47 4,927,552
49.6 4,927,553
51.5 A 4,927,562
68 4,927,554
99 4,927,555
173 4,927,556
174.12 4,927,558
174.15 4,927,557
186.39 4,927,559
315.1 4,927,560
389.22 4,927,561
551 4,927,563
628 4,927,564

CLASS 260

404.5 4,927,565
412 4,927,566

CLASS 261

35 4,927,567
36.1 4,927,568
79.2 4,927,569

CLASS 264

1.4 4,927,570
4.3 4,927,571
22 4,927,572
40.1 4,927,573
40.6 4,927,574
46.4 4,927,575
49 4,927,576
63 4,927,577
81 4,927,578
101 4,927,579
102 4,927,580
108 4,927,581
113 4,927,582
136 4,927,583
154 4,927,584
171 4,927,585
185 4,927,586
211 4,927,587
258 4,927,588
259 4,927,589
272.17 4,927,590
532 4,927,591

CLASS 267

47 4,927,121
140.1 4,927,122
4,927,123
229 4,927,124

CLASS 269

60 4,927,126
74 4,927,125
322 4,927,127
4,927,128

CLASS 270

60 4,927,129

CLASS 271

10 4,927,130
215 4,927,131
225 4,927,132
4,927,133

CLASS 272

3 4,927,134
63 4,927,135
69 4,927,136
70 4,927,138
70.1 4,927,137
123 Re.33,218
144 4,927,139

CLASS 273

4 R 4,927,140
29 BB 4,927,142
58 K 4,927,141
73 D 4,927,143
80 A 4,927,144
94 4,927,145
146 4,927,147
148 R 4,927,148
150 4,927,146
4,927,149
153 S 4,927,150
162 B 4,927,151
186 R 4,927,152
187 R 4,927,153
200 R 4,927,154
255 4,927,155
256 4,927,156
260 4,927,157
268 4,927,158
338 4,927,159
371 4,927,160
402 4,927,161
408 4,927,162

CLASS 277

23 4,927,163
80 4,927,164

CLASS 280

43.23 4,927,165
91 4,927,166
250.1 4,927,167
615 4,927,168
661 4,927,169
707 4,927,170
718 4,927,171
734 4,927,172
755 4,927,173
777 4,927,174
806 4,927,175
813 4,927,176
851 4,927,177

CLASS 283

38 4,927,178
70 4,927,180
79 4,927,179

CLASS 285

15 4,927,181
4,927,182
21 4,927,183
4,927,184
39 4,927,185
54 4,927,186
80 4,927,187
89 4,927,188
109 4,927,189
175 4,927,190
226 4,927,191
305 4,927,192

CLASS 292

92 4,927,193
128 4,927,194
169.14 4,927,195
201 4,927,196
4,927,203
216 4,927,204
245 4,927,197
306 4,927,198
337 4,927,199

CLASS 294

94 4,927,205

CLASS 296

37.8 4,927,200
63 4,927,201
107 4,927,202
156 4,927,206
185 4,927,207
216 4,927,208

CLASS 297

180 4,927,209
366 4,927,210
465 4,927,211

CLASS 303

115 4,927,212
116 4,927,213

CLASS 307

106 4,928,020
241 4,928,022
443 4,928,023
455 4,928,024
4,928,025
479 4,928,026

CLASS 310

11 4,928,027
23 4,928,028
89 4,928,029
328 4,928,030
346 4,928,031

CLASS 312

195 4,927,214
224 4,927,215
339 4,927,216

CLASS 313

318 4,928,032
345 4,928,033
346 R 4,928,034
466 4,928,035

CLASS 315

82 4,928,036
127 4,928,037
209 R 4,928,038
4,928,039
248 4,927,217
4,928,040
366 4,927,218
4,928,041
371 4,927,219

CLASS 318

254 4,928,042
4,928,043
364 4,928,044
464 4,928,045
568.16 4,928,047
644 4,928,048
654 4,928,046
685 4,928,049
696 4,928,050
731 4,928,051
762 4,928,052

CLASS 323

284 4,928,053
288 4,928,054
300 4,928,055
314 4,928,056

CLASS 324

72 4,928,057
96 4,928,058
4,928,067
123 R 4,928,059
143 4,928,060
158 F 4,928,061
158 R 4,928,062
307 4,928,063
322 4,928,064
464 4,928,065
539 4,928,066

CLASS 329

324 4,928,068

CLASS 330

4.3 4,928,076
5.5 4,928,069
43 4,928,070
129 4,928,071
149 4,928,072
252 4,928,073
254 4,928,074

CLASS 331

17 4,928,075

CLASS 333

109 4,928,078
111 4,928,077

CLASS 335

13 4,928,079
202 4,928,080
216 4,928,081

CLASS 338

174 4,928,082
202 4,928,083

CLASS 340

479 4,928,084
544 4,928,085
575 4,928,090
686 4,928,091
707 4,928,092
709 4,928,093
712 4,928,094
784 4,928,095
825.280 4,928,099
825.440 4,928,086
4,928,096
4,928,100
825.500 4,928,097
825.56 4,928,098
825.71 4,928,087
854 4,928,088
870.31 4,928,089
943 4,928,101

CLASS 341

137 4,928,007
154 4,928,102
159 4,928,103

CLASS 342

9 4,928,130
15 4,928,104
188 4,928,131
192 4,928,105
352 4,928,106
357 4,928,107

CLASS 343

704 4,928,108
786 4,928,109

CLASS 346

1.1 4,928,110
4,928,111
25 4,928,112
75 4,928,113
4,928,114
4,928,115
4,928,116
76 PH 4,928,117
4,928,134
107 R 4,928,118
108 4,928,119
135.1 4,928,132
140 R 4,928,120
4,928,121
4,928,125
4,928,126
150 4,928,133
160 4,928,122
4,928,127
4,928,128
4,928,129

CLASS 350

3.64 4,927,220
96.14 4,927,221
96.15 4,927,222
4,927,223
4,927,224
96.18 4,927,225
96.20 4,927,227
4,927,228
4,928,135
96.21 4,927,229
96.24 4,927,230
96.29 4,927,232
96.32 4,927,231
128 4,927,233
130 4,927,238
165 4,927,239
174 4,927,234
252 4,927,235
276 R 4,927,236
319 4,927,237
335 4,927,240
336 4,927,241
346 4,927,242
350 S 4,927,243
4,927,244
354 4,927,245
357 4,927,246
432 4,927,247
452 4,927,248
486 4,927,249
500 4,927,250
503 4,927,251
4,927,252
507 4,927,254
508 4,927,253
616 4,927,255
619 4,927,256
631 4,927,257

CLASS 351

156 4,927,258
224 4,927,259
243 4,927,260

CLASS 352

39 4,927,261

CLASS 353

13 4,927,262
20 4,928,123

CLASS 354

106 4,928,124

CLASS 355

1 4,928,139
48 4,928,140
208 4,928,141
218 4,928,142
4,928,143
245 4,928,144
4,928,145
253 4,928,146
288 4,928,147
290 4,928,148
305 4,928,149
311 4,928,150
315 4,928,136
320 4,928,151

CLASS 356

5 4,927,263
4,928,152
41 4,927,264
73 4,927,265
243 4,927,266
336 4,927,267
4,927,268
343 4,928,153
346 4,927,269

CLASS 357

16 4,928,154
23.13 4,928,157
23.3 4,928,163
23.4 4,928,155
4,928,156
24 4,928,158
42 4,928,159
45 4,928,164
54 4,928,160
71 4,928,161
72 4,928,162

CLASS 358

36 4,928,165
4,928,166
80 4,928,167
84 4,928,168
93 4,928,169
94 4,928,170
97 4,928,171
98 4,928,172
102 4,928,173
108 4,928,174
4,928,175
126 4,928,176
142 4,928,177
160 4,928,178
210 4,928,179
213.13 4,928,180
213.26 4,928,137
230 4,928,181
245 4,928,182
296 4,928,183
335 4,928,184

CLASS 360

19.1 4,928,185
21 4,928,186
40 4,928,187
66 4,928,190
77.08 4,928,192
78.04 4,928,193
85 4,928,191
97.04 4,928,194
103 4,928,195
105 4,928,196
113 4,928,188
128 4,928,189
132 4,928,197

CLASS 361

1 4,928,198
56 4,928,199
93 4,928,200
215 4,928,201
4,928,202
280 4,928,203
331 4,928,204
346 4,928,205
385 4,928,206
4,928,207
395 4,928,208

CLASS 362

33 4,928,211
61 4,928,212
4,928,213
4,928,214
4,928,215
66 4,928,216
217 4,928,209
4,928,210
427 4,928,217

CLASS 363

37 4,928,218
40 4,928,138
54 4,928,219
56 4,928,220

CLASS 364

191 4,928,221
200 4,928,222
4,928,223
4,928,224
4,928,225
4,928,226
4,928,234
88 4,928,237
4,928,238
4,928,239
424.01 4,928,227
4,928,241
424.03 4,928,242
424.1 4,928,235
431.02 4,928,240
431.09 4,928,228
464.01 4,928,229
464.02 4,928,244
479 4,928,230
484 4,928,251
513 4,928,236
4,928,245
514 4,928,246
518 4,928,231
4,928,247
4,928,249
4,928,250
519 4,928,243
4,928,252
521 4,928,253
522 4,928,233
525 4,928,232
556 4,928,254
558 4,928,255
561 4,928,256
563 4,928,257
724.17 4,928,258
745 4,928,259

CLASS 365

49 4,928,260
104 4,928,261
189.01 4,928,265
4,928,266
218 4,928,267
230.03 4,928,268

CLASS 367

35 4,928,269
106 4,928,262
118 4,928,263
141 4,928,264

CLASS 368

82 4,928,270

CLASS 369

116 4,928,277
292 4,928,271

CLASS 370

50 4,928,272
85.7 4,928,273
92 4,928,274
102 4,928,275
110.1 4,928,276

CLASS 371

1 4,928,278
11.2 4,928,279
39.1 4,928,280
51.1 4,928,281

CLASS 372

18 4,928,282
31 4,928,284
38 4,928,248
45 4,928,285
90 4,928,286

CLASS 374

16 4,927,270

CLASS 375

13 4,928,287
17 4,928,288
20 4,928,289
118 4,928,290

CLASS 376

123 4,927,592
254 4,927,593
258 4,927,594
268 4,927,595
283 4,927,596
290 4,927,597
306 4,927,598
321 4,927,599
327 4,928,291

CLASS 378

17 4,928,292
20 4,928,283
50 4,928,293
74 4,928,294
104 4,928,295
141 4,928,296
146 4,928,297
162 4,928,298

CLASS 379

37 4,928,299
53 4,928,300
4,928,301
88 4,928,302
93 4,928,303
94 4,928,304
98 4,928,305
201 4,928,306
395 4,928,307
411 4,928,308

CLASS 380

15 4,928,309
46 4,928,310

CLASS 381

72 4,928,311
192 4,928,312

CLASS 382

8 4,928,313

CLASS 383

5 4,927,271

CLASS 384

13 4,927,272
45 4,927,273
101 4,927,274
117 4,927,275
572 4,927,276

CLASS 400

56 4,927,277
208 4,927,278
486 4,927,279
661 4,927,280

CLASS 401

129 4,927,281
4,927,282
132 4,927,283
195 4,927,284

CLASS 403

133 4,927,285
322 4,927,286
408.1 4,927,287

CLASS 404

1 4,927,288
26 4,927,290
64 4,927,291
117 4,927,289

CLASS 405

43 4,927,292
128 4,927,293
177 4,927,294
195 4,927,295
206 4,927,296
270 4,927,297

CLASS 406

173 4,927,298

CLASS 407

120 4,927,299
4,927,300

CLASS 408

180 4,927,301
221 4,927,302
223 4,927,303

CLASS 409

231 4,927,304

CLASS 411

14 4,927,305
182 4,927,306
302 4,927,307
437 4,927,308
439 4,927,309

CLASS 412

7 4,927,310

CLASS 414

140.7 4,927,311
221 4,927,312
414 4,927,313
416 4,927,314
510 4,927,316
563 4,927,315
724 4,927,317
786 4,927,318
4,927,320
788.4 4,927,319
788.9 4,927,321
794.7 4,927,322

CLASS 415

98 4,927,323
121.2 4,927,324
161 4,927,325
170.1 4,927,326
171.1 4,927,327
220 4,927,328

CLASS 416

127 4,927,329
223 R 4,927,330
238 4,927,331

CLASS 417

299 4,927,332
316 4,927,333
322 4,927,334
393 4,927,335
407 4,927,336
420 4,927,337
462 4,927,338

CLASS 418

55 4,927,339
4,927,340
4,927,341
63 4,927,342
102 4,927,343

CLASS 419

49 4,927,600

CLASS 420

111 4,927,601
586 4,927,602

CLASS 422

67 4,927,603
101 4,927,604
102 4,927,605
144 4,927,606
150 4,927,607
179 4,927,608

CLASS 423

21.5 4,927,609
24 4,927,610
155 4,927,611
235 4,927,612
244 4,927,613
305 4,927,614
4,927,615
308 Re.33,221
347 4,927,616
396 4,927,617
432 4,927,618
446 4,927,619
447.2 4,927,620
488 4,927,621
608 4,927,622

CLASS 424

4 4,927,345
5 4,927,623
9 4,927,624
52 4,927,625
61 4,927,626
62 4,927,627
89 4,927,628
94.6 4,927,629
94.64 4,927,630
195.1 4,927,631
405 4,927,634
409 4,927,635
4,927,636
422 4,927,632
438 4,927,633
449 4,927,687
450 4,927,637
455 4,927,638
497 4,927,639
4,927,640
665 4,927,641

CLASS 425

28.1 4,927,344
81.1 4,927,346
150 4,927,347
508 4,927,642

CLASS 426

1 4,927,643
35 4,927,644
93 4,927,645
96 4,927,646
126 4,927,647
234 4,927,648
273 4,927,649
295 4,927,650
324 4,927,651
330.6 4,927,652
399 4,927,653
548 4,927,654
549 4,927,655
4,927,656
589 4,927,657
611 4,927,658
4,927,659
618 4,927,660
641 4,927,661
658 4,927,662

VOL 1114 ISS 4 MY 22 1990 UMI

CLASS 427

40 4,927,663
57 4,927,664
131 4,927,665
146 4,927,666
154 4,927,667
168 4,927,668
239 4,927,669
255.3 4,927,670
274 4,927,671
336 4,927,672
376.2 4,927,673

CLASS 428

11 4,927,674
13 4,927,686
34.6 4,927,688
34.8 4,927,689
35.2 4,927,691
35.7 4,927,690
35.9 4,927,675
36 4,927,676
36.6 4,927,677
36.9 4,927,678
36.92 4,927,679
4,927,680
52 4,927,779
64 4,927,681
74 4,927,685
88 4,927,682
90 4,927,683
91 4,927,684
137 4,927,692
141 4,927,693
159 4,927,694
4,927,695
195 4,927,696
198 4,927,697
4,927,698
203 4,927,699
209 4,927,700
212 4,927,701
215 4,927,702
220 4,927,703
221 4,927,704
282 4,927,705
304.4 4,927,706
323 4,927,707
332 4,927,708
352 4,927,709
394 4,927,710
419 D 4,926,862
432 4,927,711
614 4,927,712
627 4,927,713
628 4,927,714
645 4,927,715
695 4,927,716

CLASS 429

27 4,927,717
44 4,927,718
54 4,927,719
4,927,720
111 4,927,721
147 4,927,722

CLASS 430

15 4,927,723
45 4,927,724
54 4,927,725
78 4,927,726
99 4,927,727
108 4,927,728
110 4,927,729
138 4,927,730
4,927,731
191 4,927,732
256 4,927,733
264 4,927,734
270 4,927,735
275 4,927,736
278 4,927,737
286 4,927,738
4,927,739
309 4,927,740
4,927,741
311 4,927,742
372 4,927,746
496 4,927,743
566 4,927,744
567 4,927,745

CLASS 431

7 4,927,348
10 4,927,349
12 4,927,350
4,927,351
184 4,927,352
215 4,927,353
253 4,927,354
329 4,927,355
344 4,927,747
351 4,927,356

CLASS 432

22 4,927,357
204 4,927,358
206 4,927,359

CLASS 433

8 4,927,360
9 4,927,361
17 4,927,362
173 4,927,363

CLASS 434

410 4,927,748

CLASS 435

2 4,927,749
4,927,750
3 4,927,751
8 4,927,752
26 4,927,753
71 4,927,754
91 4,927,755
103 4,927,756
105 4,927,757
107 4,927,758
156 4,927,759
171 4,927,760
178 4,927,761
240.31 4,927,762
260 4,927,763
296 4,927,764

CLASS 436

43 4,927,765
44 4,927,766
64 4,927,767
172 4,927,768
518 4,927,769

CLASS 437

2 4,927,770
3 4,927,771
6 4,927,772
22 4,927,773
31 4,927,774
4,927,775
33 4,927,776
44 4,927,777
51 4,927,778
69 4,927,780
71 4,927,781
184 4,927,782
196 4,927,783
203 4,927,784
225 4,927,785
233 4,927,786

CLASS 439

15 4,927,364
4,927,365
37 4,927,366
66 4,927,368
4,927,369
74 4,927,370
79 4,927,371
83 4,927,372
92 4,927,367
188 4,927,373
189 4,927,787
310 4,927,374
357 4,927,375
367 4,927,377
394 4,927,378
398 4,927,379
411 4,927,380
438 4,927,381
484 4,927,376
490 4,927,382
491 4,927,383
494 4,927,384
499 4,927,387
578 4,927,385
589 4,927,386
660 4,927,388
682 4,927,389
887 4,927,788

CLASS 440

84 4,927,391
88 4,927,390
4,927,392
112 4,927,393

CLASS 441

1 4,927,394
26 4,927,395
33 4,927,396
41 4,927,397

CLASS 445

9 4,927,398

CLASS 446

207 4,927,399
220 4,927,400
456 4,927,401
487 4,927,402

CLASS 455

67 4,927,789
236 4,928,314
307 4,928,315
600 4,928,316
601 4,928,317
608 4,928,318
611 4,927,226
612 4,928,319

CLASS 464

30 4,927,403

CLASS 474

242 4,927,404

CLASS 475

146 4,926,713
227 4,926,711
4,926,712
337 4,926,715

CLASS 493

194 4,927,405

CLASS 494

84 4,927,406

CLASS 501

32 4,927,790
87 4,927,791
92 4,927,792
134 4,927,793

CLASS 502

26 4,927,794
33 4,927,795
62 4,927,796
127 4,927,797
301 4,927,798
303 4,927,799
349 4,927,800

CLASS 503

200 4,927,801
214 4,927,802
227 4,927,803

CLASS 505

1 4,927,804

CLASS 512

27 4,927,805

CLASS 514

2 4,927,806
18 4,927,807
19 4,927,808
20 4,927,809
23 4,927,810
4,927,811
63 4,927,812
65 4,927,813
108 4,927,814
167 4,927,815
177 4,927,816
184 4,927,817
202 4,927,818
213 4,927,819
226.5 4,927,821
229.5 4,927,820
236.2 4,927,822
237.5 4,927,823
241 4,927,824
255 4,927,825
256 4,927,826
4,927,827
258 4,927,828
4,927,829
4,927,830
278 4,927,831
299 4,927,832
331 4,927,837
337 4,927,838
383 4,927,839
397 4,927,840
399 4,927,833
400 4,927,841
411 4,927,842
418 4,927,843
422 4,927,834
425 4,927,844
440 4,927,845
448 4,927,835
450 4,927,846
4,927,847
453 4,927,848
455 4,927,849
458 4,927,850
460 4,927,851
531 4,927,852
567 4,927,853
570 4,927,854
618 4,927,855
620 4,927,836

CLASS 518

702 4,927,856
703 4,927,857

CLASS 521

59 4,927,858
4,927,859
60 4,927,860
99 4,927,861
118 4,927,862
131 4,927,863
163 4,927,864
48 4,927,865

CLASS 523

115 4,927,866
339 4,927,867
439 4,927,868
502 4,927,869
140 4,927,870
230 4,927,871
232 4,927,872
288 4,927,873
375 4,927,874
457 4,927,875
4,927,876

CLASS 525

7 4,927,877
44 4,927,878
54.1 4,927,879
63 4,927,880
92 4,927,881
99 4,927,882
154 4,927,883
195 4,927,884
211 4,927,885
261 4,927,886
279 4,927,887
285 4,927,888
4,927,889
301 4,927,890
327.3 4,927,891
340 4,927,892
378 4,927,893
390 4,927,894
438 4,927,895

CLASS 526

93 4,927,896
240 4,927,897

CLASS 528

27 4,927,898
49 4,927,899
4,927,900
64 4,927,901
99 4,927,902
176 4,927,903
182 4,927,904
205 4,927,905
228 4,927,906
322 4,927,907
323 4,927,908
331 4,927,909
371 4,927,910
4,927,911
405 4,927,912
480 4,927,913
4,927,914
490 4,927,915

CLASS 530

387 4,927,916

CLASS 534

567 4,927,917

CLASS 536

7.1 4,927,918
17.4 4,927,919
119 4,927,920

CLASS 540

110 4,927,921
227 4,927,922
456 4,927,923
536 4,927,924
598 4,927,925

CLASS 544

101 4,927,926
106 4,927,927
154 4,927,928
195 4,927,929
198 4,927,930
357 4,927,931
4,927,932

CLASS 546

113 4,927,933
152 4,927,934
157 4,927,935
181 4,927,936
296 4,927,937
315 4,927,938

CLASS 548

188 4,927,939
263.2 4,927,940
264.8 4,927,941
335 4,927,942
422 4,927,943

CLASS 549

292 4,927,944
305 4,927,945
371 4,927,946
451 4,927,968
484 4,927,947

CLASS 556

401 4,927,948
413 4,927,949
4,927,953
419 4,927,950
4,927,951
4,927,952

CLASS 558

441 4,927,954

CLASS 560

45 4,927,955
53 4,927,958
130 4,927,956
193 4,927,959
202 4,927,957

CLASS 562

103 4,927,961
113 4,927,962
501 4,927,963
512 4,927,960
560 4,927,964
4,927,965
594 4,927,966
607 4,927,967

CLASS 564

377 4,927,969
462 4,927,970
505 4,927,971

CLASS 568

70 4,927,972
357 4,927,974
373 4,927,975
665 4,927,976
695 4,927,977
724 4,927,973
4,927,978
791 4,927,979
937 4,927,980

CLASS 570

255 4,927,981

CLASS 600

16 4,927,407
36 4,927,410

CLASS 604

20 4,927,408
4,927,409
65 4,927,411
88 4,927,423
95 4,927,413
96 4,927,412
110 4,927,414
164 4,927,415
198 4,927,416
4,927,417
264 4,927,418
892.1 4,927,419

CLASS 606

45 4,927,420
73 4,927,421
79 4,927,422
88 4,926,847
96 4,927,424
99 4,927,425
128 4,927,426
4,927,427
144 4,926,860
148 4,927,428
159 4,926,858

D1— 129 307,970
D2— 270 307,972
274 307,973
314 307,974
320 307,975
307,976
D3— 21 307,977
35 307,978
40 307,979
62 307,980
D4— 118 307,981
D6— 328 307,982
334 307,983
307,984
440 307,985
307,986
450 307,987
307,988
457 307,989
513 307,990
516 307,991
523 307,992
553 307,993
604 307,994
610 307,995

D7— 330 307,999
360 308,000
376 308,001
507 307,996
605 307,998
616 307,997
700 308,002
D8— 8 308,003
11 308,004
14 308,005
308,006
72 308,008
75 308,007
93 308,018
99 308,009
343 308,010
356 308,011
360 308,012
308,013
367 308,014
308,015
394 308,016
396 308,017
D9— 306 308,019
307 308,020
310 308,021

375 308,022
377 308,023
403 308,024
415 308,025
D11— 43 308,027
46 308,026
130.1 308,028
164 308,029
204 308,030
D12— 91 308,031
96 308,032
102 308,033
146 308,038
147 308,034
154 308,035
308,039
155 308,036
308,040
169 308,037
181 308,041
317 308,042
342 308,043
D13— 110 308,044
164 308,046
170 308,045
D14— 100 308,047

308,048
308,049
106 308,050
308,051
109 308,052
113 308,053
308,054
114 308,055
121 308,056
137 308,057
138 308,058
151 308,059
218 308,060
240 308,061
253 308,062
D15— 72 308,063
138 308,064
D16— 102 308,065
133 308,066
145 308,067
D17— 8 308,068
13 308,069
D18— 12 308,070
13 308,071
308,072
43 308,073

D19— 1 308,074
43 308,075
85 308,076
90 308,077
D20— 10 308,078
20 308,079
22 308,080
D21— 25 308,081
65 308,082
124 308,083
157 308,084
194 308,085
208 308,086
234 308,087
252 308,088
D22— 109 308,089
139 308,090
149 308,091
D23— 209 308,092
226 308,093
308,094
D24— 10 308,095
308,096
36 308,098
54 308,099
62 308,100

63 308,101
D25— 1 308,097
116 308,102
124 308,103
308,104
308,105
308,106
126 308,107
D26— 35 308,108
36 308,110
49 308,109
68 308,111
72 308,112
73 308,113
85 308,114
122 308,115
149 308,116
D28— 9 308,117
18 308,118
54.1 308,119
64 308,120
D30— 118 308,121
160 308,122
D32— 4 308,123
D99— 30 308,124

CLASSIFICATION OF PLANTS

P— 68 7,232
78 7,233
86 7,234
7,235

VOL
1114
ISS
4
MY
22
1990
UMI

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	4,927,103	4,927,001	4,927,599		4,928,260	4,927,453	4,927,009
	4,927,326	4,927,019	4,927,623		4,928,274	4,927,496	4,927,030
	4,928,133	4,927,043	4,927,629		4,928,284	4,927,498	4,927,053
04	4,926,561	4,927,079	4,927,632		4,928,290	4,927,581	4,927,055
	4,926,579	4,927,087	4,927,633		4,928,307	4,927,863	4,927,227
	4,926,589	4,927,095	4,927,637		4,928,315	4,927,934	4,927,258
	4,926,629	4,927,105	4,927,644	07	4,926,713	12 4,926,501	4,927,308
	4,926,631	4,927,113	4,927,657	08	4,926,669	4,926,517	4,927,465
	4,926,657	4,927,119	4,927,700		4,926,909	4,926,524	4,927,567
	4,926,892	4,927,126	4,927,718		4,927,006	4,926,575	4,927,670
	4,927,097	4,927,128	4,927,770		4,927,017	4,926,585	15 4,926,682
	4,927,139	4,927,132	4,927,773		4,927,158	4,926,605	4,926,693
	4,927,505	4,927,140	4,927,775		4,927,176	4,926,644	16 4,926,777
	4,927,638	4,927,143	4,927,794		4,927,252	4,926,710	4,927,757
	4,928,002	4,927,144	4,927,806		4,927,397	4,926,739	17 Re.33,218
	4,928,067	4,927,147	4,927,846		4,927,420	4,926,752	Re.33,220
	4,928,068	4,927,148	4,927,874		4,927,537	4,926,884	4,926,518
	4,928,162	4,927,182	4,927,947		4,927,622	4,926,889	4,926,553
	4,928,225	4,927,220	4,927,963		4,927,811	4,926,931	4,926,554
	4,928,276	4,927,222	4,927,973		4,928,147	4,926,962	4,926,599
05	4,926,622	4,927,225	4,927,986		4,928,160	4,927,015	4,926,601
	4,926,840	4,927,231	4,927,995		4,928,169	4,927,050	4,926,606
06	4,926,507	4,927,232	4,927,999		4,928,202	4,927,056	4,926,667
	4,926,510	4,927,254	4,928,013		4,928,245	4,927,076	4,926,687
	4,926,526	4,927,257	4,928,022		4,928,280	4,927,099	4,926,728
	4,926,556	4,927,262	4,928,027	09	4,926,699	4,927,100	4,926,730
	4,926,557	4,927,265	4,928,028		4,926,787	4,927,145	4,926,731
	4,926,616	4,927,274	4,928,029		4,926,927	4,927,146	4,926,757
	4,926,630	4,927,293	4,928,030		4,926,991	4,927,149	4,926,812
	4,926,639	4,927,298	4,928,048		4,927,012	4,927,151	4,926,849
	4,926,641	4,927,307	4,928,054		4,927,070	4,927,187	4,926,908
	4,926,650	4,927,310	4,928,056		4,927,193	4,927,292	4,927,003
	4,926,664	4,927,354	4,928,059		4,927,249	4,927,322	4,927,008
	4,926,670	4,927,360	4,928,078		4,927,255	4,927,402	4,927,016
	4,926,676	4,927,362	4,928,084		4,927,263	4,927,410	4,927,052
	4,926,677	4,927,377	4,928,102		4,927,275	4,927,418	4,927,065
	4,926,702	4,927,406	4,928,106		4,927,318	4,927,434	4,927,072
	4,926,743	4,927,408	4,928,109		4,927,350	4,927,504	4,927,116
	4,926,762	4,927,409	4,928,121		4,927,380	4,927,612	4,927,156
	4,926,778	4,927,411	4,928,170		4,927,386	4,927,790	4,927,169
	4,926,805	4,927,413	4,928,171		4,927,444	4,927,816	4,927,177
	4,926,818	4,927,414	4,928,177		4,927,458	4,928,086	4,927,191
	4,926,841	4,927,440	4,928,187		4,927,634	4,928,096	4,927,216
	4,926,858	4,927,459	4,928,188		4,927,662	4,928,193	4,927,297
	4,926,866	4,927,480	4,928,189		4,927,929	4,928,218	4,927,309
	4,926,874	4,927,485	4,928,192		4,927,944	4,928,237	4,927,391
	4,926,880	4,927,503	4,928,199		4,927,968	4,928,258	4,927,403
	4,926,890	4,927,508	4,928,206		4,928,080	4,928,312	4,927,417
	4,926,899	4,927,515	4,928,216		4,928,203	4,928,314	4,927,427
	4,926,910	4,927,535	4,928,223		4,928,269	13 4,926,621	4,927,520
	4,926,961	4,927,551	4,928,239		4,928,273	4,926,742	4,927,550
	4,926,963	4,927,571	4,928,251	10	4,926,661	4,926,845	4,927,606
	4,926,984	4,927,596	4,928,259		4,927,011	4,926,998	4,927,649

	4,927,673	4,926,610	4,927,680	4,927,631	4,927,563	45	4,927,736
	4,927,760	4,926,700	4,927,801	4,927,645	4,927,566		4,926,520
	4,927,787	4,926,783	4,928,020	4,927,648	4,927,717		4,926,529
	4,927,807	4,926,785	4,928,112	4,927,654	4,927,720		4,926,809
	4,927,813	4,926,810	4,928,231	4,927,686	4,927,805		4,926,944
	4,927,980	4,926,829	34 4,926,519	4,927,704	4,927,862		4,927,083
	4,928,039	4,926,832	4,926,536	4,927,711	4,927,886		4,927,117
	4,928,138	4,926,833	4,926,538	4,927,714	4,927,887		4,927,313
	4,928,205	4,926,842	4,926,545	4,927,726	4,927,982		4,927,405
18	4,926,618	4,926,846	4,926,577	4,927,727	4,927,994		4,927,669
	4,926,928	4,926,878	4,926,609	4,927,742	4,927,997		4,927,691
	4,927,002	4,926,926	4,926,717	4,927,744	4,928,032		4,927,698
	4,927,026	4,926,953	4,926,768	4,927,745	4,928,036		4,927,708
	4,927,125	4,926,956	4,926,786	4,927,746	4,928,038	47	4,926,563
	4,927,201	4,926,959	4,926,796	4,927,748	4,928,063		4,926,675
	4,927,271	4,926,980	4,926,852	4,927,766	4,928,113		4,926,697
	4,927,422	4,926,997	4,926,882	4,927,768	4,928,114		4,926,732
	4,927,425	4,927,023	4,926,943	4,927,772	4,928,115		4,926,746
	4,927,490	4,927,033	4,926,974	4,927,778	4,928,116		4,926,830
	4,927,675	4,927,057	4,926,975	4,927,779	4,928,140		4,926,838
	4,927,879	4,927,075	4,927,010	4,927,803	4,928,240		4,926,951
	4,927,880	4,927,108	4,927,036	4,927,847	4,928,241		4,927,042
	4,927,914	4,927,115	4,927,067	4,927,854	4,928,289		4,927,219
	4,928,257	4,927,150	4,927,133	4,927,883	4,928,292		4,927,302
19	4,926,537	4,927,167	4,927,155	4,927,891	40 4,926,582		4,927,584
	4,926,617	4,927,185	4,927,357	4,927,894	4,927,152		4,927,610
	4,926,628	4,927,202	4,927,359	4,927,898	4,927,349		4,927,695
	4,928,246	4,927,203	4,927,466	4,927,904	4,927,536		4,927,987
20	4,926,989	4,927,301	4,927,500	4,927,910	4,927,749		4,928,182
	4,927,109	4,927,347	4,927,506	4,927,911	4,927,750	48	4,926,503
	4,927,161	4,927,474	4,927,521	4,927,922	4,927,795		4,926,509
	4,927,324	4,927,539	4,927,522	4,927,927	4,927,993		4,926,513
	4,928,243	4,927,540	4,927,525	4,927,933	41 4,926,788		4,926,532
21	4,926,523	4,927,545	4,927,526	4,927,940	4,926,897		4,926,560
	4,926,654	4,927,553	4,927,527	4,927,943	4,926,905		4,926,620
	4,927,620	4,927,568	4,927,555	4,927,966	4,927,046		4,926,658
	4,928,085	4,927,579	4,927,590	4,927,983	4,927,320		4,926,680
22	4,926,649	4,927,626	4,927,639	4,928,057	4,928,003		4,926,704
	4,926,714	4,927,690	4,927,658	4,928,076	4,928,043		4,926,875
	4,926,894	4,927,812	4,927,659	4,928,089	4,928,266		4,926,936
	4,926,898	4,927,830	4,927,667	4,928,119	42 4,926,548		4,926,937
	4,926,964	4,927,901	4,927,685	4,928,127	4,926,573		4,926,938
	4,927,317	4,927,931	4,927,733	4,928,128	4,926,607		4,926,939
	4,927,607	4,928,015	4,927,737	4,928,139	4,926,668		4,926,940
	4,927,616	4,928,058	4,927,765	4,928,141	4,926,703		4,926,941
	4,927,896	4,928,083	4,927,777	4,928,142	4,926,735		4,926,942
23	4,926,594	4,928,153	4,927,820	4,928,149	4,926,745		4,926,945
24	Re.33,221	4,928,227	4,927,826	4,928,194	4,926,753		4,926,949
	4,926,643	4,928,235	4,927,828	4,928,196	4,926,766		4,927,021
	4,926,801	4,928,254	4,927,838	4,928,207	4,926,780		4,927,041
	4,926,831	4,928,313	4,927,842	4,928,209	4,926,946		4,927,074
	4,926,868	27 4,926,522	4,927,851	4,928,211	4,926,970		4,927,112
	4,926,969	4,926,655	4,927,857	4,928,217	4,926,995		4,927,137
	4,926,999	4,926,674	4,927,902	4,928,232	4,927,020		4,927,153
	4,927,062	4,926,678	4,927,909	4,928,250	4,927,073		4,927,192
	4,927,118	4,926,690	4,927,924	4,928,286	4,927,134		4,927,237
	4,927,173	4,926,695	4,927,956	4,928,296	4,927,159		4,927,260
	4,927,198	4,926,750	4,927,976	37 4,926,512	4,927,189		4,927,305
	4,927,251	4,926,755	4,927,977	4,926,535	4,927,215		4,927,328
	4,927,569	4,926,760	4,928,081	4,926,587	4,927,238		4,927,424
	4,927,628	4,926,797	4,928,299	4,926,602	4,927,315		4,927,437
	4,927,762	4,926,860	4,928,301	4,926,637	4,927,323		4,927,502
	4,928,014	4,926,864	4,928,316	4,926,672	4,927,348		4,927,519
	4,928,033	4,926,865	35 4,926,568	4,926,820	4,927,351		4,927,561
	4,928,104	4,926,901	4,926,679	4,927,092	4,927,369		4,927,605
	4,928,294	4,926,904	4,927,071	4,927,272	4,927,388		4,927,621
25	4,926,569	4,926,952	4,927,415	4,927,374	4,927,432		4,927,641
	4,926,696	4,927,047	4,927,419	4,927,384	4,927,433		4,927,692
	4,926,798	4,927,081	4,927,674	4,927,429	4,927,441		4,927,780
	4,926,847	4,927,157	4,927,792	4,927,647	4,927,456		4,927,781
	4,926,869	4,927,299	36 4,926,516	4,927,672	4,927,469		4,927,789
	4,926,870	4,927,300	4,926,581	4,927,676	4,927,489		4,927,797
	4,926,872	4,927,370	4,926,646	4,928,004	4,927,492		4,927,850
	4,926,883	4,927,407	4,926,647	4,928,103	4,927,523		4,927,870
	4,926,896	4,927,431	4,926,698	4,928,221	4,927,593		4,927,878
	4,926,966	4,927,556	4,926,712	38 4,926,781	4,927,594		4,927,888
	4,927,136	4,927,864	4,926,723	4,927,366	4,927,595		4,927,905
	4,927,337	4,927,991	4,926,741	39 4,926,596	4,927,618		4,927,906
	4,927,340	4,928,222	4,926,771	4,926,633	4,927,712		4,927,907
	4,927,394	28 4,926,795	4,926,784	4,926,659	4,927,713		4,927,908
	4,927,398	4,926,834	4,926,790	4,926,709	4,927,796		4,927,912
	4,927,426	4,926,844	4,926,848	4,926,724	4,927,798		4,927,913
	4,927,428	4,926,914	4,926,900	4,926,776	4,927,802		4,927,932
	4,927,438	29 4,926,543	4,927,013	4,926,893	4,927,831		4,927,942
	4,927,487	4,926,671	4,927,049	4,926,895	4,927,868		4,927,978
	4,927,604	4,926,850	4,927,063	4,926,916	4,927,869		4,928,006
	4,927,614	4,926,968	4,927,066	4,926,918	4,927,873		4,928,018
	4,927,668	4,927,025	4,927,114	4,926,919	4,927,875		4,928,023
	4,927,687	4,927,051	4,927,181	4,926,935	4,927,882		4,928,031
	4,927,709	4,927,154	4,927,206	4,926,948	4,927,965		4,928,088
	4,927,764	4,927,165	4,927,224	4,927,007	4,927,969		4,928,100
	4,927,769	4,927,399	4,927,226	4,927,040	4,927,981		4,928,156
	4,927,784	4,927,552	4,927,288	4,927,061	4,927,985		4,928,212
	4,927,853	4,927,602	4,927,312	4,927,205	4,927,992		4,928,220
	4,927,856	4,927,630	4,927,329	4,927,285	4,927,996		4,928,256
	4,927,876	31 4,926,542	4,927,342	4,927,290	4,928,065		4,928,262
	4,927,916	4,926,722	4,927,387	4,927,341	4,928,066		4,928,267
	4,928,070	4,926,947	4,927,416	4,927,343	4,928,079		4,928,268
	4,928,072	4,927,920	4,927,439	4,927,346	4,928,097		4,928,306
	4,928,075	32 4,927,048	4,927,462	4,927,352	4,928,101		4,928,311
	4,928,200	4,927,211	4,927,477	4,927,355	4,928,118	49	4,927,088
	4,928,247	4,928,099	4,927,514	4,927,430	4,928,219		4,927,291
	4,928,252	33 4,926,515	4,927,559	4,927,435	4,928,233		4,927,421
	4,928,283	4,926,885	4,927,562	4,927,546	4,928,309		4,927,447
26	4,926,508	4,927,164	4,927,574	4,927,554	4,928,310		4,927,478
	4,926,592	4,927,679	4,927,624	4,927,557	44 4,927,014		4,927,481

VOL
1114
ISS
4
MY
22
1990
UMI

50	4,926,530		4,927,771	4,926,767	4,927,468	4,926,685	4,927,194
	4,926,558		4,927,782	4,926,774	4,927,476	4,926,808	4,927,289
	4,926,877		4,927,858	4,926,782	4,928,008	4,926,813	4,927,339
	4,928,061		4,928,181	4,926,871	4,928,094	4,926,814	4,927,582
	4,928,120		4,928,264	4,926,965	54 : 4,927,214	4,926,835	4,927,588
51	4,926,578	53	4,926,632	4,927,085	4,927,954	4,926,856	4,927,643
	4,926,694		4,926,689	4,927,104	4,927,967	4,926,879	4,927,763
	4,926,759		4,926,726	4,927,141	55 : 4,926,546	4,926,891	4,927,815
	4,927,279		4,926,734	4,927,179	4,926,564	4,927,160	4,927,988
	4,927,470		4,926,758	4,927,400	4,926,595	4,927,163	56 . 4,926,815

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06 :	307,971		308,066	308,098	25 : 307,975	308,022	308,120
	307,974		308,067	13 . 307,987	308,055	308,082	42 308,003
	307,977		308,084	307,997	308,071	308,100	308,110
	307,978		308,085	308,117	308,087	308,107	308,118
	307,979		308,099	17 . 307,992	26 : 307,982	308,113	308,124
	307,985		308,108	308,069	308,005	36 . 307,970	43 308,031
	307,989		308,109	308,092	308,015	308,019	48 307,998
	307,990		308,116	308,111	308,030	308,020	308,011
	307,996	08	308,044	18 : 308,093	308,062	308,061	308,033
	308,004		308,121	308,095	308,123	308,070	308,043
	308,006		308,122	308,096	27 : 307,991	308,078	308,045
	308,007	09	308,010	20 : 308,028	308,041	37 . 307,984	308,057
	308,008		308,046	308,049	308,047	308,029	308,097
	308,032		308,114	308,091	308,089	308,036	55 308,024
	308,042	12	307,980	308,103	29 : 308,025	39 . 308,081	308,026
	308,052		307,986	21 : 308,083	32 : 308,079	308,088	308,119
	308,053		307,995	22 : 307,988	34 : 307,993	308,094	56 : 308,072

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06 .	7,234	7,235				

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5

MY
29

1990

UMI

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May 29, 1990 Volume 1114 Number 5

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1114 OG 70
Status of Appeal Cases	1114 OG 70
Notice of Maintenance Fees Payable	1114 OG 70
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1114 OG 71
Notification of Acceptance of Delayed Payment of Maintenance Fee	1114 OG 73
Reissue Applications Filed	1114 OG 73
Requests for Reexaminations Filed	1114 OG 74
Service by Publication	1114 OG 74
Registration to Practice	1114 OG 74
Notice of Examination for Registration, Wed., Oct. 10, 1990	1114 OG 74
Registration to Practice	1114 OC 75
Practice before the Patent and Trademark Office Government Employees	1114 OG 75
Status of PTO Services	1114 OG 77
Disclaimers and Dedication	1114 OG 79
Patent Certificates of Correction	1114 OC 79
Special Boxes for Mail	1114 OG 80
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1114 OC 81
Condition of Patent Applications	1114 OG 83
Reexaminations	2707
Reissue Patents Granted (33,222)	2713
Plant Patents Granted (7,236)	2715
Patents Granted	
General and Mechanical (4,928,320)	2717
Chemical (4,929,248)	3033
Electrical (4,929,801)	3183
Design Patents Granted (308,125)	3305
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 75
Classification of	
Patents (Including Reissues, and Reexaminations)	PI 81
Designs, and Plants Applications	PI 85
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 86
Designs and Plant Applications	PI 88
Change of Address Form and Subscription Order Form	Back Page

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VOL
1114
ISS
5
MY
29
1990
UMI

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Apr. 30, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of April 30, 1990.

Chemical Discipline - July 12, 1989
Mechanical Discipline - November 1, 1988
Electrical Discipline - November 2, 1988

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of April 30, 1990.

Chemical - November 1, 1988
*Electrical - April 4, 1989
Mechanical - March 2, 1989

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of February1990.

Affirmed.....219
Affirmed-in-Part.....52
Reversed.....150
Total Decided.....421

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(h) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on May 26, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,667,343 through 4,669,124
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on May 24, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,384,369 through 4,385,402
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 18, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,319,420	06/223,250	3/16/82
4,319,427	06/255,771	3/16/82
4,319,511	06/251,810	3/16/82
4,319,545	06/220,131	3/16/82
4,319,561	06/256,885	3/16/82
4,319,615	06/218,708	3/16/82
4,319,734	06/241,724	3/16/82
4,319,816	06/216,005	3/16/82
4,319,888	06/215,779	3/16/82
4,319,925	06/241,008	3/16/82
4,319,968	06/237,616	3/16/82
4,319,971	06/247,722	3/16/82
4,319,972	06/215,595	3/16/82
4,319,978	06/221,673	3/16/82
4,320,003	06/223,695	3/16/82
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4,320,068	06/233,736	3/16/82
4,320,072	06/239,096	3/16/82
4,320,095	06/225,913	3/16/82
4,320,096	06/225,905	3/16/82
4,320,118	06/218,886	3/16/82
4,320,131	06/244,426	3/16/82
4,320,336	06/234,996	3/16/82
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4,575,872	06/723,867	3/18/86
4,575,873	06/668,152	3/18/86
4,575,875	06/621,707	3/18/86
4,575,876	06/674,968	3/18/86
4,575,877	06/520,455	3/18/86
4,575,879	06/539,150	3/18/86
4,575,883	06/623,720	3/18/86
4,575,884	06/636,130	3/18/86
4,575,886	06/339,906	3/18/86
4,575,893	06/575,441	3/18/86
4,575,894	06/667,570	3/18/86
4,575,895	06/703,390	3/18/86
4,575,898	06/651,883	3/18/86
4,575,908	06/751,893	3/18/86
4,575,912	06/610,289	3/18/86
4,575,914	06/510,665	3/18/86
4,575,921	06/656,182	3/18/86
4,575,928	06/645,228	3/18/86
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4,575,971	06/546,951	3/18/86
4,575,979	06/638,910	3/18/86
4,575,982	06/675,614	3/18/86
4,575,984	06/502,744	3/18/86
4,575,986	06/568,704	3/18/86
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4,575,998	06/716,058	3/18/86
4,576,004	06/627,012	3/18/86
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4,576,010	06/543,059	3/18/86

*Due to a clerical error the March 1990, report *incorrectly* indicated that the date of the Examiners Answer of oldest Ex Parte appeal in the Electrical discipline awaiting the setting of a hearing date was October 7, 1989. The correct date should have been January 5, 1989

VOL
1114
ISS
5
MY
29
1990
UMI

Patent Number	Serial Number	Issue Date
4,576,013	06/592,464	3/18/86
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4,576,021	06/483,824	3/18/86
4,576,038	06/650,725	3/18/86
4,576,066	06/475,894	3/18/86
4,576,074	06/521,561	3/18/86
4,576,075	06/577,953	3/18/86
4,576,079	06/677,689	3/18/86
4,576,080	06/598,343	3/18/86
4,576,086	06/540,472	3/18/86
4,576,091	06/636,024	3/18/86
4,576,094	06/770,050	3/18/86
4,576,100	06/419,168	3/18/86
4,576,101	06/583,981	3/18/86
4,576,109	06/736,739	3/18/86
4,576,111	06/573,303	3/18/86
4,576,127	06/732,716	3/18/86
4,576,138	06/755,208	3/18/86
4,576,141	06/692,215	3/18/86
4,576,148	06/576,592	3/18/86
4,576,150	06/584,649	3/18/86
4,576,152	06/543,238	3/18/86
4,576,154	06/595,590	3/18/86
4,575,159	06/582,912	3/18/86
4,576,161	06/592,136	3/18/86
4,576,174	06/509,034	3/18/86
4,576,186	06/671,331	3/18/86
4,576,201	06/672,229	3/18/86
4,576,204	06/587,830	3/18/86
4,576,208	06/675,235	3/18/86
4,576,210	06/745,380	3/18/86
4,576,212	06/588,112	3/18/86
4,576,227	06/504,144	3/18/86
4,576,228	06/576,679	3/18/86
4,576,236	06/608,900	3/18/86
4,576,240	06/435,247	3/18/86
4,576,250	06/740,585	3/18/86
4,576,258	06/685,857	3/18/86
4,576,265	06/543,838	3/18/86
4,576,267	06/616,221	3/18/86
4,576,270	06/470,509	3/18/86
4,576,279	06/674,780	3/18/86
4,576,280	06/597,223	3/18/86
4,576,282	06/609,717	3/18/86
4,576,291	06/485,961	3/18/86
4,576,292	06/754,348	3/18/86
4,576,293	06/578,765	3/18/86
4,576,314	06/552,349	3/18/86
4,576,319	06/658,320	3/18/86
4,576,320	06/676,520	3/18/86
4,576,321	06/515,172	3/18/86
4,576,326	06/610,008	3/18/86
4,576,332	06/702,941	3/18/86
4,576,336	06/594,996	3/18/86
4,576,349	06/478,632	3/18/86
4,576,350	06/613,738	3/18/86
4,576,351	06/621,156	3/18/86
4,576,353	06/522,375	3/18/86
4,576,354	06/620,557	3/18/86
4,576,355	06/646,227	3/18/86
4,576,361	06/238,906	3/18/86
4,576,366	06/536,649	3/18/86
4,576,372	06/676,489	3/18/86
4,576,376	06/674,184	3/18/86
4,576,378	06/620,036	3/18/86
4,576,380	06/599,662	3/18/86
4,576,382	06/753,413	3/18/86
4,576,388	06/606,833	3/18/86
4,576,389	06/695,253	3/18/86
4,576,391	06/513,811	3/18/86
4,576,394	06/527,682	3/18/86
4,576,395	06/604,361	3/18/86
4,576,399	06/549,706	3/18/86
4,576,400	06/578,978	3/18/86
4,576,403	06/698,083	3/18/86
4,576,414	06/574,793	3/18/86
4,566,419	06/598,889	3/18/86
4,576,420	06/594,207	3/18/86
4,576,423	06/657,550	3/18/86
4,576,424	06/593,834	3/18/86
4,576,426	06/721,997	3/18/86
4,576,468	06/603,397	3/18/86
4,576,477	06/390,876	3/18/86
4,576,480	06/514,594	3/18/86
4,576,483	06/632,431	3/18/86
4,576,484	06/628,169	3/18/86
4,576,492	06/554,604	3/18/86
4,576,495	06/608,970	3/18/86
4,576,504	06/728,265	3/18/86
4,576,533	06/624,364	3/18/86
4,576,535	06/552,534	3/18/86
4,576,541	06/584,595	3/18/86
4,576,544	06/724,896	3/18/86
4,576,549	06/470,398	3/18/86
4,576,553	06/564,724	3/18/86
4,576,564	06/580,488	3/18/86
4,576,574	06/694,785	3/18/86
4,576,583	06/654,167	3/18/86
4,576,584	06/565,584	3/18/86
4,576,585	06/694,616	3/18/86
4,576,586	06/703,333	3/18/86
4,576,610	06/482,014	3/18/86
4,576,616	06/647,857	3/18/86
4,576,618	06/639,534	3/18/86
4,576,626	06/722,985	3/18/86
4,576,629	06/589,724	3/18/86
4,576,632	06/669,016	3/18/86
4,576,640	06/626,235	3/18/86
4,576,651	06/584,534	3/18/86
4,576,655	06/769,807	3/18/86
4,576,664	06/565,613	3/18/86
4,576,668	06/614,832	3/18/86
4,576,675	06/640,423	3/18/86
4,576,684	06/669,444	3/18/86
4,576,695	06/554,691	3/18/86
4,576,710	06/672,841	3/18/86
4,576,713	06/632,427	3/18/86
4,576,717	06/636,396	3/18/86
4,576,723	06/677,308	3/18/86
4,576,730	06/712,865	3/18/86
4,576,739	06/656,660	3/18/86
4,576,742	06/570,100	3/18/86
4,576,745	06/422,976	3/18/86
4,576,753	06/629,216	3/18/86
4,576,772	06/632,940	3/18/86
4,576,783	06/659,011	3/18/86
4,576,791	06/583,940	3/18/86
4,576,803	06/559,916	3/18/86
4,576,837	06/713,616	3/18/86
4,576,866	06/592,671	3/18/86
4,576,871	06/574,605	3/18/86
4,576,872	06/581,320	3/18/86
4,576,918	06/463,286	3/18/86
4,576,935	06/544,855	3/18/86
4,576,936	06/361,119	3/18/86
4,576,938	06/447,809	3/18/86
4,576,939	06/439,898	3/18/86
4,576,941	06/584,576	3/18/86
4,576,942	06/630,048	3/18/86
4,576,945	06/567,475	3/18/86
4,576,948	06/459,433	3/18/86
4,576,952	06/693,731	3/18/86
4,576,961	06/527,812	3/18/86
4,576,965	06/509,452	3/18/86
4,576,973	06/623,708	3/18/86
4,576,976	06/587,176	3/18/86
4,576,994	06/646,583	3/18/86
4,577,006	06/712,207	3/18/86
4,577,008	06/625,168	3/18/86
4,577,009	06/651,713	3/18/86
4,577,011	06/643,330	3/18/86
4,577,021	06/718,199	3/18/86
4,577,023	06/614,241	3/18/86
4,577,053	06/585,529	3/18/86
4,577,058	06/600,823	3/18/86
4,577,059	06/454,414	3/18/86

Patent Number	Serial Number	Issue Date
4,577,061	06/609,077	3/18/86
4,577,081	06/602,542	3/18/86
4,577,082	06/500,855	3/18/86
4,577,087	06/625,887	3/18/86
4,577,089	06/592,728	3/18/86
4,577,094	06/539,083	3/18/86
4,577,106	06/531,471	3/18/86
4,577,107	06/647,595	3/18/86
4,577,108	06/675,223	3/18/86
4,577,115	06/439,995	3/18/86
4,577,117	06/501,493	3/18/86
4,577,147	06/501,088	3/18/86
4,577,156	06/582,420	3/18/86
4,577,171	06/609,205	3/18/86
4,577,175	06/624,945	3/18/86
4,577,183	06/357,647	3/18/86
4,577,185	06/518,531	3/18/86
4,577,189	06/363,598	3/18/86
4,577,194	06/504,262	3/18/86
4,577,200	06/672,178	3/18/86
4,577,205	06/614,307	3/18/86
4,577,220	06/614,323	3/18/86
4,577,224	06/399,471	3/18/86
4,577,234	06/547,325	3/18/86
4,577,248	06/462,591	3/18/86
4,577,249	06/462,286	3/18/86
4,577,253	06/491,364	3/18/86
4,577,257	06/628,808	3/18/86
4,577,258	06/676,490	3/18/86
4,577,264	06/678,669	3/18/86
4,577,268	06/652,485	3/18/86
4,577,278	06/514,921	3/18/86
4,577,290	06/593,469	3/18/86
4,577,301	06/628,686	3/18/86
4,577,303	06/622,799	3/18/86
4,577,304	06/510,749	3/18/86
4,577,307	06/655,847	3/18/86
4,577,322	06/543,368	3/18/86
4,577,333	06/650,777	3/18/86
4,577,336	06/736,401	3/18/86
4,577,339	06/546,615	3/18/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,384,716	06/231,874	5/24/83	2/05/81	4/26/90
4,494,229	06/331,383	1/15/85	12/16/81	4/17/90
4,509,694	06/499,983	4/09/85	6/01/83	4/17/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,883,634, Re. S. N. 07/485,902, Filed Feb. 26, 1990, Cl. 423/87, LIQUID-LIQUID EXTRACTION OF GERMANIUM FROM AQUEROUS SOLUTION USING HYDROXY-OXIMES, Archille de Schepper, et al., Owner of Record: *Metallurgie Hoboken-Overpelt, Brussels, Belgium,* Attorney or Agent: Berj A. Terzian, Ex. Gp.: 113

4,596,743, Re. S. N. 07/512,310, Filed Apr. 20, 1990, Cl. 428/380, GREASE COMPATIBLE EXTENDED POLYURETHANES, Melvin Brauer, et al., Owner of Record: *Caschem Inc. Bayonne, New Jersey,* Attorney or Agent: Stanton T. Lawrence, Ex. Gp.: 154

4,704,792, Re. S. N. 07/435,164, Filed Nov. 13, 1989, Cl. 29/741, COMPONENTS FEEDING APPARATUS, Masato Itagki, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Ronald J. Shore, Ex. Gp.: 326

4,738,145, Re. S. N. 07/510,539, Filed Apr. 17, 1990, Cl. 73/862.23, MONITORING TORQUE IN TUBULAR GOODS, Darrell L. Vincent, et al., Owner of Record: *Inventor,* Attorney or Agent: Ned L. Conley, Ex. Gp.: 268

4,738,206, Re. S. N. 07/510,975, Filed Apr. 19, 1990, Cl. 110/346, APPARATUS AND METHOD FOR LOW TEMPERATURE THERMAL STRIPPING OF VOLATILE ORGANIC COMPOUNDS FROM SOIL, John W. Noland, Owner of Record: *Roy F. Weston, Inc., West Chester, Pa.* Attorney or Agent: Austin R. Miller, Ex. Gp.: 344

4,765,979, Re. S. N. 07/511,205, Filed Apr. 19, 1990, Cl. 424/84, METHOD AND COMPOSITON FOR KILLING TERESTRIAL MOLLUSCS, James W. Neilsen, Owner of Record: *Micro Flo Co., Mulber, Fla.,* Attorney or Agent: Lance G. Johnson, Ex. Gp.: 125

4,773,422, Re. S. N. 07/513,421, Filed Apr. 10, 1990, Cl. 128/633, PULSE OXIMETER WITH CIRCUIT LEAKAGE AND AMBIENT LIGHT COMPENSATION, Philip O. Isaacson, et al., Owner of Record: *Nonin Medical, Inc., Plymouth, Minn.,* Attorney or Agent: Thomas J. Nikolai, Ex. Gp.: 335

4,785,619, Re. S. N. 07/495,995, Filed Mar. 20, 1990, Cl. 57/313, APPARATUS FOR PRODUCING A STAPLE FIBER YARN, Fritz Stahlecker, et al., Owner of Record: *Inventor,* Attorney or Agent: Donald D. Evenson, Ex. Gp.: 245

4,789,132, Re. S. N. 07/513,437, Filed Apr. 23, 1990, Cl. 251/129, VALVE, Yuichi Fujita, et al., Owner of Record: *Toyo Engineering Corp., Tokyo, Japan,* Attorney or Agent: L. Martin Flynn, Ex. Gp.: 347

4,865,024, Re. S. N. 07/444,782, Filed Dec. 1, 1989, Cl. 128/80, EXTENSION DECELERATION ORTHOSIS, David E. Hensley, et al., Owner of Record: *Inventor,* Attorney or Agent: Richard D. Multer, Ex. Gp.: 337

4,865,775, Re. S. N. 07/510,585, Filed Apr. 18, 1990, Cl. 261/24, HUMIDIFIER WITH FLOATING WICK ASSEMBLY, Robert E. Steiner, Owner of Record: *Emerson Electric Co., St. Louis, Mo.,* Attorney or Agent: Michael Kovac, Ex. Gp.: 135

4,878,353, Re. S. N. 07/507,883, Filed Apr. 12, 1990, Cl. 62/521, CHAMBER AND PROCESS FOR THERMAL TREATMENT COMPRISING A COOLING PHASE, Claude Gibot, et al., Owner of Record: *Carboxyque Francaise Societe Nouvelle des Etablissements, Montelimar, France,* Attorney or Agent: R. J. Patch, Ex. Gp.: 344

4,892,825, Re. S. N. 07/512,823, Filed Apr. 23, 1990, Cl. 435/180, IMMOBILIZTION OF BIOLOGICALLY ACTIVE MA-

TERIAL WITH GLUTARALDEHYDE AND POLYAZETIDINE, Mogens Wumpelmann, et al., Owner of Record: *Novo Industri A/S, Bagvaerd, Denmark*, Attorney or Agent: Morris Fidelman, Ex. Gp.: 182

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,079,028, Reexam. No. 90/001,995, Requested Apr. 10, 1990, Cl. 524/507, POLYURETHANE THICKNERS IN LATEX COMPOSITIONS, W. D. Emmons, et al., Owner of Record: *Rohm & Haas Co., Philadelphia, Pa.*, Attorney or Agent: Michael Fein, Ex. Gp.: 150, Requester: Burns, Doane, Swecker & Mathis, Alexandria, Va.

4,189,551, Reexam. No. 90/001,990, Requested Mar. 29, 1990, Cl. 526/74 PROCESS FOR REDUCING ADHESIONS DURING SUSPENSION POLYMERIZATION, Subhash V. Gangal, Owner of Record: *E. I. du Pont de Nemours & Co., Wilmington, Del.*, Attorney or Agent: Unknown, Ex. Gp.: 150, Requester: Owner

4,193,499, Reexam. No. 90/001,996, Requested Apr. 11, 1990, Cl. 206/254, PREFABRICATED UNITARY PACKAGE WHICH WHEN SEALED AND IRRADIATED CONFORMS CLOSELY TO CONTENTS AND BECOMES IMPACT-ABSORBING, Thedore W. Lookholder, Owner of Record: *Sealed Air Corp., New York, N.Y.*, Attorney or Agent: Robert L. Finkel, Ex. Gp.: 240, Requester: 3M Co., St. Paul, Minn.

4,221,483, Reexam. No. 90/001,994, Requested Apr. 10, 1990, Cl. 356/250, LASER BEAM LEVEL INSTRUMENT, Joseph F. Rando, Owner of Record: *Spectra-Physics, Inc., Mountain View, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 250, Requester: CLS Laser Systems, Inc., Los Angeles, Calif.

4,620,633, Reexam. No. 90/001,997, Requested Apr. 11, 1990, Cl. 206/523, PROTECTIVE ENVELOPE DEVICE FOR PACKAGING FRAGILE ARTICLES, Thedore W. Lookholder, Owner of Record: *Inventor*, Attorney or Agent: Robert L. Finkel, Ex. Gp.: 240, Requester: 3M Co., St. Paul, Minn.

4,742,142, Reexam. No. 90/001,991, Requested Apr. 9, 1990, Cl. 528/15, METHOD FOR PRODUCING SILICONE RUBBER POWDER, Koji Shimizu, et al., Owner of Record: *Toray Silicone Co., Tokyo, Japan*, Attorney or Agent: Robert Spector, Ex. Gp.: 150, Requester: Owner

4,773,812, Reexam. No. 90/001,993, Requested Apr. 10, 1990, Cl. 414/408, RECEPTACLE LIFT AND SLIM PROFILE POWER UNIT THEREFOR, Jimmy O. Bayne, et al., Owner of Record: *Bayne Machine Works, Inc., Simpsonville, S.C.*, Attorney or Agent: Dority & Manning, Ex. Gp.: 310, Requester: Owner

4,812,544, Reexam. No. 90/001,989, Requested Apr. 9, 1990, Cl. 526/73, METHOD OF PRODUCING POLYMERS OF AMIDOSULFONIC ACID MONOMERS WITH HIGH ENERGY AGITATORS, Thomas M. Sopko, et al., Owner of Record: *The Lubrizol Corp., Wickliffe, Ohio*, Attorney or Agent: Unknown, Ex Gp.: 150, Requester: Owner

4,882,120, Reexam. No. 90/001,992, Requested Apr. 11, 1990, Cl. 363/98, DC CONTENT CONTROL FOR AN INVERTER, Derrick I. Roe, et al., Owner of Record: *Sunstrond Corp., Rockford, Ill.*, Attorney or Agent: William E. McCracken, Ex. Gp.: 210, Requester: Owner

4,913,396, Reexam. No. 90/001,998, Requested Apr. 12, 1990, Cl. 248/649, ADJUSTABLE INCLINE SYSTEM FOR EXERCISE EQUIPMENT, William T. Dalebout, et al., Owner of Record: *Weslo Inc., Logan, Utah*, Attorney or Agent: Trask, Britt & Rosa, Ex. Gp.: 350, Requester: Owner

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known adress having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Computerose, Inc., Arlington, Tex., Reg. No. 1,345,779, for the mark "COMPUTEROSE", Canc. No. 18,453.

Spare Parts, Los Angeles, Calif., Reg. No. 1,096,817, for the mark "SPARE PARTS", Canc. No. 18,519.

Wilbert Products Co., Inc., Bronx, N.Y., Reg. No. 652,519, for the mark "FRESH PINE", Canc. No. 17,711.

Net Cost Club, Inc., Montgomeryville, Pa., Reg. No. 1,463,143, for the mark "N.C.C.", Canc. No. 18,415.

BEI Restaurants of Albany, Inc., Wappingers Falls, N.Y., Reg. No. 1,327,558, for the mark "PAPA RAZZI" and design, Canc. No. 18,491.

JEAN BROWN
Administrator of the Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before June 22, 1990.

Hoch, Ramon R., 3004 Mt. Vernon Ave., Alexandria, Va., 22305
Hochenshell, Jeffrey J., 291 W. 7th St., #811, St. Paul, Minn., 55102
Jordan, Mervin L., 6636 S. Kings Hwy., Alexandria, Va., 22306
Petersen, Christine A., 14226 E. First Dr., #B-4, Aurora, Colo., 80011
Sioyan, Thomas J., 1600 S. Eads St., #629N, Arlington, Va., 22202
Sykes, Angela D., 5140 Woodford Dr., Centreville, Va., 22202

CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

NOTICE OF EXAMINATION FOR REGISTRATION WEDNESDAY, OCTOBER 10, 1990

Pusuant to the provisions of 37 CFR §§ 10.5, 10.6 and 10.7, an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys and agents will be held on *Wednesday, October 10, 1990*. The deadline for filing applications along with the $270.00 examination fee and *all* necessary showings required by 37 CFR §§ 10.7(a) and (b) is *July 31, 1990*.

With the exception of those persons who actively served four years or more in the examining corps of the United States Patent and Trademark Office for whom the examination may be waived, all persons who wish to become recognized to practice before the United States Patent and Trademark Office in patent cases must, pursuant to the above noted rules, pass the examination. Note that passing the examination does not qualify one for recognition for practice before the Patent and Trademark Office in trademark cases. Such recognition is governed by 37 CFR § 10.14 which does not require the passing of an examination.

There is no limit on the number of times the registration examination may be taken. The examination consists of two parts, a morning section and an afternoon section. To pass the examination, an applicant must pass both sections. An applicant who passes one section of the examination, but who fails the other section, willl not be required to retake the section passed, *provided* the applicant takes and passes the section failed in one of the next three examinations regularly scheduled by the Patent and Trademark Office. If the applicant does not pass the the section failed in one of the next three examinations scheduled, the applicant must retake both sections of the examination. No extensions of time will be granted except in extraordinary circumstancees, e.g., an accident or hospitalization just prior to the examination which prevented the applicant from taking the examination.

Application forms may be obtained from the Office of Enrollment and Discipline, Suite 810, Crystal Park One, 2011 Crystal Park Drive, Arlington, Va., or by mail addressed to U.S. Patent and Trademark Office, Box OED, Washington, D.C. 20231.

April 27, 1990 CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

Registration to Practice

The following list contains the names of persons who sucessfully passed the examination for registration to practice before the United States Patent and Trademark Office held on October 11, 1989. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registraion certificates are mailed to them. Final approval for registraion is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligiblity of any of the following persons on moral, ethical or other grounds should be furnished to the Director of Enrollment and Discipline on or before July 20, 1990. Send information to be considered to the following address: U.S. Patent and Trademark Office, Box OED, Washington, D.C. 20231.

Agris, Cheryl H., 500 E. 63rd St., #14K, New York, N.Y. 10021
Appollina, Mary A., 41 Almond Dr., Somerset, N.J. 08873
Billi, Ron, 165 N. 5th St., #202, Port Hueneme, Calif. 93041
Blackman, Scott H., 60 West 66th St., #7F, New York, N.Y. 10023
Chen, Fu, 19 Meadow View Dr., Newtown, Pa. 18940
Ching, Edwin P., 1070 Mercedes Crt., #16, Los Altos, Calif. 94022
Conser, Richard E., 24 Briar Rd., Box 206, Golf, Ill. 60029
Kantor, Sharon R., 893 Richard La., Danville, Calif. 94526
Leitereg, Elizabeth E., 3136 Park Estates Way, San Jose, Calif. 95135
Mazza, Michael P.,351 Bryant, Glen Ellyn, Ill. 60137
Messnick, Richard C., 9174B Breeds Hill La., St. Louis, Mo. 62123
Molberg, Dale W., 449 Tyrella Ave., #39, Mountain View, Calif. 94043
Pappas, Lia M., 1248 Old Meadow Rd., Pittsburg, Pa. 15241
Patashnick, Kent I., 32 Marion Ave., North Adams, Mass. 01247
Patterson, William B., 902 Shelterwood Dr., Houston, Tex. 77008
Pisner, Gary S., 9621 Lindenbrook St., Fairfax, Va. 22031
Pollack, Grant E., 48 Ferris Pl., Ossing, N.Y. 10562
Robitaille, Denis A., 383 Lexington St., Newton, Mass. 02166
Timiam, Susan J., 49-51 Fresh Meadow La., Fresh Meadows, N.Y. 11365

April 27, 1990 CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

PRACTICE BEFORE THE PATENT AND TRADEMARK OFFICE -GOVERNMENT EMPLOYEES

On October 4, 1988, the Federal Register contained a notice removing section 10.6(d) of Title 37 of the Code of Federal Regulations. 53 Fed. Reg. 38,948, October 4, 1988. A decision in the U.S. District Court for the District of Columbia held that paragraph (d) was invalid to the extent that it precluded registration of an otherwise qualified individual solely on the basis of his or her status as a U.S. Government employee. *Athridge v. Quigg*, 655 F. Supp 779, 3 USPQ2d 1391 (D.D.C. 1987).

Under section 10.6(d), registered patent practitioners who were disqualified by statute from practicing as an attorney or agent in patent proceedings or other matters before Government departments or agencies were endorsed on the register as "inactive." By removing section 10.6(d), U.S. Government employees, not employed by the U.S. Patent and Trademark Office, may now be registered as "active" on the register irrespective of their official duties. *In re Atheridge*, 4 USPQ2d 1656 (Comm'r Pat. 1987).

The Office of Enrollement and Discipline (OED) has compiled the names and addresses of registered patent attorneys and agents, not employees of the U.S. Patent and Trademark Office, who are currently endorsed as "inactive" on the register. On November 30, 1989, a letter was sent to the each of these individuals at the last address furnished to OED informing them that they may change their status to "active."

The following individuals have not responded to the letter.

Morris M. Abrams, National Highway Traffic Safety Admin., Nassif Bldg.., 400 7th St., S.W., Washington, D.C. 20590
Paul T. Allen, Jr., U.S. Army Legal Services, 5611 Columbia Pike, Falls Church, Va. 22041
Robert F. Allnutt, Commission on Government Procurement, 1717 H St., N.W., Washington, D.C. 20006
Robert P. Auber, U.S. Dept. of Commerce, NTIS, P.O. Box 1423, Springfield, Va. 22151
Morton W. Bachrach, U.S. Dept. of Health, Education & Welfare, Office of Education, 400 Maryland Ave., S.W., Washington, D.C. 20202
Walter R. Beam, U.S. Air Force, Office of the Secretary, Pentagon 4D961, Washington, D.C. 20330
Charles B. Brown, U.S. Dept. of Health, Education & Welfare, HEW Bldg., 300 Independence Ave., S.W., Washington, D.C. 20040
Herbert H. Brown, U.S. Air Force, Wright-Patterson Airforce Base. Base B Bldg. 11, Springfield St., Dayton, Ohio 45406
Allan R. Burke, U.S. Dept. of Transportation, 400 7th St., S.W., Washington, D.C. 20590
D. Robert Cervera, U.S. Securities & Exchange Comm., 150 Causeway St., Boston, Mass. 02114
Edward G. Conroy, U.S. Economic Dev. Admin., 14th & Constitutioin Ave., N.W., Washington, D.C. 20230
Susan M. Cooke, U.S. Environmental Protection Agency, Region 1, J.F. Kennedy Fed. Bldg., Boston, Mass. 02203
Jack C. Davis, U.S. Congressman William L. Scott, 1217 Longworth Bldg., Washington, D.C. 20515
Richard B. Dence, 4638 Gettyburg Dr., Sylvania, Ohio 43560
Nelson J. Edge, Defense Mapping Agency Topographic Center, 6500 Brookes La., Washington, D.C. 20315
John B. Farmakides, U.S. Dept. of Energy, Washington, D.C. 20545
James R. Fisher, U. S. Dept. of Labor-LMSA, Federal Bldg., Room 630, 231 W. Lafayette, Detroit, Mich. 48226
Steven J. Glassman, U.S. Attorney's Office, U.S. Courthouse, Foley Square, New York, N.Y. 10007
Leah K. Hendriksen, U.S. Environmental Protection Agency, S. Agriculture Bldg., Washington, D.C. 20460
James C. Herlihy, U.S. Environmental Protection Agency, 401 M St., S.W., Washington, D.C. 20460

VOL
1114
ISS
5
MY
29
1990
UMI

M. Frank. Hersman, U.S. National Science Foundation, 1800 G St., N.W., Washington, D.C. 20040
Kevin J. Kelley, U.S. Naval Ocean Systems Center, 271 Catalina Blvd., San Diego, Calif. 92152
Arthur E. Korkosz, U.S. Attorney's Office, 3rd & Constitution, N.W., Washington, D.C. 20510
Eugene R. LaRoche, U.S. Navy, Off. of Naval Res., Ballston Tower #1, 800 N. Quincy St., Arlington, Va. 22217
Norman J. Latker, U.S. Dept. of Commerce, Off. of Govt. Pat. Policy, 14th & Constituition Ave., N.W., Washington, D.C. 20231
Arthur L.Levine, U.S. Dept. of Commerce, Econ. Dev. Admin., 14th & Constitution Ave., N.W., Washington, D.C. 20231
Thomas J. Madden. U.S. Dept. of Justice, Law Enforcement Admin., 633 Indiana Ave., N.W., Washington, D.C. 20530
Curtis W. McBride, U.S. Air Force, Off. of Staff Judge Advocate, Procurement Law Div.., Elgin AFB, Fla. 32542
Carl D. McManamy, U.S. Dept. of Justice, HOLC Bldg., 101 Indiana Ave., N.W., Washington, D. C. 20530
William T. Mefford, U.S. Navy, Norfolk Naval Base, Bldg. N-26, Norfolk, Va. 23511
John C. Morris, U.S. Air Force, Forrestal Bldg., Washington, D.C. 20314
Joseph J. Natoli, U.S. Atomic Energy Comm., 7920 Norfolk Ave., Bethesda, Md. 20014
George M. Paddack, U. S. Dept. of Justice, HOLC Bldg, 101 Indiana Ave., N.W., Washington, D.C. 20530
Ottis R. Pannell, U S. Army, MERADCOM, Energy & Water Lab., Ft. Belvoir, Va. 22060
Irwin M. Pikus, U.S. Dept. of State, Bur. of Oceans & Internatl. Environmental & Scientific Affairs, Washington, D.C. 20520
James Renjilian, U.S. Securities & Exchange Comm., Washington, D.C. 20540
Frank W. Rose, U.S. Navy, Off. of Naval Res., Arlington, Va. 22217
Joseph F. Rosenthal, U.S. Federal Trade Comm., Washington, D.C. 20580
Frederick T. Sadler, U.S. Navy, Naval Air Systems Comm., Code: AIR 09B2, Washington, D.C. 20360
James E. Sak, U.S. Veterans Hospital, 800 Poly Place, Brooklyn, N.Y. 11209
David J. Schwartz, 2012 Hampstead Dr., Pittsburgh, Pa. 15235
Ralph W. Siskind, U.S. Mint, 5th & Arch Sts., Philadelphia, Pa. 19106
Edward M. Steutermann, U.S. Justice, 9010 Lakeridge Dr., Valley Station, Ky. 40272
Mollie Strum, U.S. Dept. of Justice, 201 Varick St., New York, N.Y. 10014
Gary Tabak, U.S. House of Representatives Banking & Currency Comm., Rayburn Bldg., Washington, D.C. 20515
Mardi R. Thompson, U.S. FAA, Philadelphia, Pa. 19076
John D. White, U.S. Dept. of Housing & Urban Dev., HPMC - Rm. 111, 1371 Peachtree St., N.E. , Atlanta, Ga. 30309
John J. White, CIA, 2430 E St., N.W., Washington, D.C. 20205
Jacob Ziegler, U.S. Dept. of Army, Edgewood Arsenal, Edgewood Arsenal, Md. 21010

The letter included a Data Sheet which was to be completed and returned to the Office of Enrollment and Discipline by Feb. 28, 1990. If your name appears in the listing above and you did not receive a letter from the Office of Enrollment and Discipline, please contact Patricia M. Jordan as soon as possible at (703) 557-2012.

Apr. 11, 1990 CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

Status of PTO Services

The following is an update of the status of PTO services for April 1990

Service Item	FY 1990 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	16
Trademarks	30	47
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	17 Hours
Window Coupons	5	4
Mail Coupons	12	7
Letter Orders	16	17
Electronic Ordering Service (EOS)	11	6
Certified Copies:		
Trademark Registrations	21	12
Applications-As-Filed	17	12
File-Wrapper/Contents	N/A	16
Walk-up Certification	1	1
Patent Application Expedited	5	7
Trademark Search Library:		
Filing Pending Marks	23	51
Filing Reg. Certificates	Issue Date+2 days	+1 Days
Filing Temp. Drawings	8	19
Assignments:		
Recording Patent-New Applications	43	34
Recording Patent-Mail Room Recpts.	20	28
Receipt Date of Bulk Pat. Docs. Returned by End of Month		Mar. 16-Mar. 21, 1990
Recording Trademarks	20	30
Receipt Date of Bulk Trademarks Documents Returned by end of Month		Mar. 16-Mar. 23, 1990
Avg. Days from Issue Fee Payment to Issue Date	90-100	107
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	+18 Days
Tradermark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.

IMPROVEMENT TO SERVICES

•*New File Ordering Service Introduced*•Members of the public can avoid standing in line to order patent files and instead can place orders using two computer terminals which have been installed in the Patent Search Room. The terminals are located next to the windows on the east side of the north stack area near the mezzanie elevator.

These terminals have been made available so that requesters may determine the location of files for *issued patents* and to place orders for them. Files ordered via the terminals may be picked up from the Files Information Unit (CP3-1D01A) in the usual manner. Instructions for using the terminals are posted at each terminal.

HELPFUL HINTS

Here are some helpful hints for facilitating the assignment recordation process:

1. Each assignment should be submitted with a cover letter. This cover letter should include, at a minimum:

   - application, patent or registration number of the application, patent or registration being transferred;
   - name of the party transferring the application, patent, or registration and to whom it is being transferred;
   - brief description of what the document intends to accomplish (such as an assignment, a security agreement, or a license);
   - total fee submitted or to be charged to a deposit account (at $8 per application, patent and registration being transferred) and the deposit account number. Avoid statements such as "Please charge the appropriate amount to my deposit account." However, you may authorize any additional fees to be charged to the deposit account to avoid receiving a non-recordation notice for insufficient fees.
   - address to which the document should be returned after it is recorded by the PTO.

Cover letters should be formatted for easy reading.

2. Each assignment should be accompanied by a separate cover letter. More than one application, patent, or registration can be identified in an assignment.

3. If an assignment is submitted with a new application, send two separate cover letters - one for the application and one for the assignment.

4. Assignment documents which transfer an interest in both patent and trademark matters are first processed through the automated patent assignment recordation system and then through the manual trademark assignment recordation system. This sequential processing causes a delay in returning these assignment documents. To avoid a delay, submit separate assignment documents, one for patent matters and one for trademark matters, each with its own cover letter.

5. All assignments should be submitted on bond weight paper that is no larger than 8 1/2" x 14". Only the front side of each sheet should be used, and a one inch margin should be left on all sides of each sheet of paper.

6. Assignments filed with new applications are stamped with the application number. Assignments of new applications not filed concurrently with the application should be held until the application number can be provided in the cover letter.

7. All assignments should be mailed to BOX ASSIGNMENTS unless they are filed concurrently with a new application.

8. Requests for assignment services (recordation, abstracts, certified copies) should be carefully proofread to ensure document numbers and addresses are correct.

SERVICE STATISTICS DEFINITIONS

The number of days to record patent and trademark assignments that is presented in the Service Statistics portion of the Official Gazette represents the time the majority of assignments are being recorded (mode). Some assignment documents will take a shorter or longer time. The two week date range for returning documents stated in Service Statistics represents the majority of documents being mailed on the last work day of the reporting period. Once again, this date is not absolute.

May 4, 1990

THERESA A. BRELSFORD
Assistant Commissioner
for Administration

PATENT NOTICES

Certificates of Correction For Week of May 29, 1990

D. 306,866	4,817,375	4,840,059	4,850,149
4,668,784	4,817,582	4,840,102	4,850,283
4,672,676	4,818,681	4,840,444	4,850,420
4,681,693	4,818,748	4,840,769	4,851,132
4,682,364	4,818,797	4,841,009	4,851,248
4,697,926	4,820,288	4,841,906	4,851,280
4,703,996	4,821,303	4,842,124	4,851,463
4,729,690	4,821,522	4,842,164	4,851,752
4,733,400	4,821,728	4,842,893	4,852,179
4,739,320	4,823,533	4,843,157	4,852,242
4,747,701	4,823,981	4,843,196	4,852,291
4,752,245	4,824,351	4,843,206	4,852,323
4,760,280	4,826,113	4,843,226	4,852,603
4,763,769	4,826,661	4,843,413	4,852,607
4,764,412	4,827,173	4,843,600	4,852,840
4,768,646	4,827,500	4,844,066	4,852,896
4,769,698	4,827,924	4,844,229	4,852,990
4,779,179	4,829,895	4,844,382	4,853,169
4,783,514	4,830,450	4,844,801	4,853,298
4,785,192	4,830,563	4,845,095	4,853,445
4,785,459	4,830,684	4,845,715	4,853,498
4,795,243	4,831,121	4,846,343	4,853,561
4,797,268	4,831,385	4,846,380	4,853,594
4,798,729	4,832,824	4,846,563	4,853,828
4,799,275	4,833,251	4,846,638	4,854,249
4,799,769	4,835,139	4,846,657	4,854,878
4,799,895	4,835,176	4,846,995	4,855,165
4,803,691	4,835,848	4,847,024	4,855,657
4,804,957	4,835,980	4,847,138	4,855,907
4,805,459	4,836,389	4,847,266	4,856,023
4,806,515	4,836,746	4,847,746	4,857,357
4,808,762	4,836,867	4,847,926	4,857,999
4,811,378	4,837,048	4,847,949	4,858,306
4,814,132	4,837,336	4,848,018	4,859,821
4,816,618	4,838,579	4,849,149	4,859,941
4,816,861	4,839,505	4,849,302	4,862,981
4,817,036	4,839,745	4,849,996	4,881,257
4,817,115	4,839,808	4,850,014	4,887,669
4,817,157	4,839,977	4,850,070	

Disclaimers

3,977,501.—*Juan Perez Alonzo*, Naucalpan de Juarez, Mexico. LUGGAGE CASE CONSTRUCTION. Patent dated Aug. 31, 1976. Disclaimer filed Jul. 17, 1989, by the assignee, Samsonite Corp.

Hereby enters this disclaimer to claim 1 of said patent.

4,428,428.—*Kenneth E. Smyrl*, Marrero, La.; *Bobby G. Redd*, Hobbs, N. Mex. TOOL AND METHOD FOR GRAVEL PACKING A WELL. Patent dated Jan. 31, 1984. Disclaimer filed Feb. 12, 1990, by the assignee, Dresser Industries, Inc.

The term of this patent subsequent to Feb. 1, 1990, has been disclaimed.

4,767,708.—*Edwin G. Minkley, Jr.*; *William E. Brown*, both of Pittsburg, Pa. ENZYME AMPLIFICATION AND PURIFICATION. Patent dated Aug. 30, 1988. Disclaimer filed Mar. 19, 1990, by the assignee, Carnegie-Mellon University.

Hereby enters this disclaimer to the remaining terms of said patent.

4,831,565.—*Steven J. Woodward*, Port Hope, Canada. PROCESS CONTROL EQUIPMENT FOR ADVERSE ENVIRONMENTS. Patent dated May 16, 1989. Disclaimer filed Mar. 19, 1990, by the assignee, Federal Industries Industrial Group Inc.

Hereby enters this disclaimer to claims 4 and 6 of said patent.

4,850,075.—*Franz Kresse*, Hilden; *Bernfrid Scheller*, Pulheim, both of the Fed. Rep. of Germany. MANUAL SURFACE WIPER ASSEMBLY WITH HANDLE AND SUPPORT THEREFOR. Patent dated Jul. 25, 1989. Disclaimer filed Dec. 21, 1989, by the assignee, Henkel Kommanditgesellschaft auf Aktien.

Hereby enters this disclaimer to claims 1, 2 and 9 of said patent.

4,909,803.—*Mohammed I. Aziz*, Cincinnati; *Ted L. Blaney*, West Chester, both of Ohio. DISPOSABLE ABSORBENT ARTICLE HAVING ELASTICIZED FLAPS PROVIDED WITH LEAKAGE RESISTANT PORTIONS. Patent dated Mar. 20, 1990. Disclaimer filed Feb. 5, 1990, by the assignee, The Proctor and Gamble Co.

The term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Dedication

3,745,820.—*Peter D. Weiner*, Bryan, Tex. LEAK-PROOF THREADED CONNECTIONS. Patent dated July 17, 1973. Dedication filed Feb. 28, 1989, by the assignee, Exxon Production Research Co.

Hereby dedicates to the Public the remaining term of said patent.

VOL 1114 ISS 5 MAY 29 1990 UMI

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
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Box AF	Expedited procedure for processing amendments and other responses after final rejection
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Box FWC	Requests for File Wrapper Continuation Applications.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue.
Box ITU	All Intent to Use documents excluding the initial application and amendments to allege use.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection.)
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are availal 'e for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 275-2562
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
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Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775

VOL
114
ISS
5
MY
29
990
UMI

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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF April 7, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-7-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	10-18-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	5-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	2-29-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	3-23-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director.	3-30-88
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-24-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during April 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,723,992 to 3,729,743 inclusive
Plant Patents ..... None

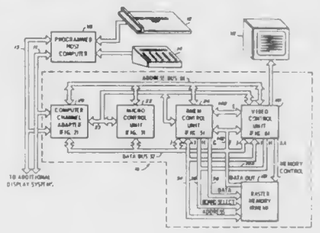
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REEXAMINATIONS

MAY 29, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 31,200 (1284th)
RASTER SCAN DISPLAY APPARATUS FOR DYNAMICALLY VIEWING IMAGE ELEMENTS STORED IN A RANDOM ACCESS MEMORY ARRAY
Josef S. Sukonick, Cupertino, and Greg J. Tilden, San Jose, both of Calif., assignors to Cadtrak Corporation
Filed Apr. 5, 1989, Ser. No. 82,592
Int. Cl.[5] G09G *1/06*
U.S. Cl. 340—721



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2**, **3**, **5–9**, **11**, **13–17**, **20–23**, **25**, **27–31** and **33–45** is confirmed.

Claims **1**, **4**, **10**, **12**, **18**, **19**, **24** and 32 were previously cancelled.

Claim **26** is determined to be patentable as amended.

2. A computer graphics display system for use in association with a host computer to provide a visual display of graphics information contained therein, comprising:

a data bus;

an address bus;

display means for developing a visible image corresponding to video signals input thereto;

channel adapter means for providing an interface for communicating information including bits of graphics data between the host computer and said data bus and said address bus;

system control means communicatively coupled to said data bus and said address bus and operative to generate first and second control signals;

raster memory means including an array of N rows and M columns of storage sites each capable of storing a bit of graphics data corresponding to a picture element of a graphics image to be formed by said display means;

raster memory control means communicatively coupled to said address bus, said data bus, said raster memory means and said system control means, said raster memory control means being responsive to said first control signal and operative to cause bits of graphics data input from the host computer to be stored in said raster memory means;

video control means communicatively coupled to said address bus, said data bus, said raster memory means, said display means, and said system control means, said video control means being responsive to said second control signal and operative to read out in raster fashion data stored in any selected block of n rows and m columns of said storage sites, where n is an integer less than N and m is an integer less than M, and to use such data to generate a video signal for input to said display means whereby said display means is caused to display an image comprised of picture elements corresponding in the data obtained in the selected block of storage sites; said video memory control means including:

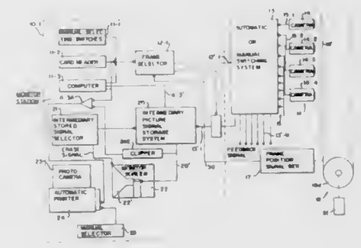
a first control memory for storing a first set of readout control instructions received from said system control means;

a second control memory for storing a second set of readout control instructions received from said system control means;

readout means for reading out bits of graphics data stored in said raster memory means; and

logic means for causing said readout means to read out data stored in a first selected block of storage sites of said raster memory means under control of said first set of instructions and to read out data stored in a second selected block of storage sites of said raster memory means under control of said second set of instructions, the data read out of said first and second blocks of storage sites being included in said video signal and said display means being caused to simultaneously display a first image corresponding to the data from said first block and a second image corresponding to the data from said second block.

B1 Re. 31,239 (1285th)
INFORMATION STORAGE AND REPRODUCTION SYSTEM
Jerome H. Lemelson, Metuchen, N.J., assignor to Patent Incentives, Inc., New York, N.Y.
Reexamination Request No. 90/001,584, Aug. 25, 1988.
Reexamination Certificate for Reissue Patent Re. 31,239, issued May 10, 1983, Ser. No. 68,484, Aug. 20, 1979.
Original No. 3,539,715, dated Nov. 10, 1970, Ser. No. 781,689, Nov. 21, 1968. Continuation of Ser. No. 247,999, Feb. 26, 1964, abandoned, which is a continuation-in-part of Ser. No. 615,417, Jun. 14, 1955, Pat. No. 3,003,109, Ser. No. 608,348, Jun. 27, 1957, Pat. No. 3,051,777, and Ser. No. 765,401, Oct. 6, 1958, abandoned. Request filed Aug. 25, 1988, Ser. No. 68,484
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—102



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–48** is confirmed.

1. An information storage and retrieval system comprising:

(a) a master information storage station having means carrying recorded information,

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(b) signal input and output means for two-way communication with said master information storage station,
(c) reading means for scanning said recorded information and converting same to electrical signals, and means for generating said electrical signals on said output means of said master information storage station,
(d) first control means operative to cause said reading means to read selected information recorded on said information carrying means of said storage station,
(e) a plurality of monitor stations each having a visual display means for displaying information,
(f) an erasable signal recording means associated with the means displaying information at each monitor station for electrically energizing said display means to generate and retain a pictorial presentation of the information transmitted from said master information storage station,
(g) a plurality of communication channels for signal communication between said monitor station and said master information storage station,
(h) a plurality of second control means including at least one associated with each monitor station for selectively effecting a communication link between the associated monitor station and said master information storage station through one of said communication channels so as to establish two-way communication between the monitor station and said master information storage station,
(i) third control means at each monitor station for selectively controlling said first control means to cause said reading means to read selected information from the means carrying recorded information and to effect the transmission of selected information signals from said master information storage station to the monitor station from which said selective control is effected, and
(j) means at the monitor station for receiving the information signals transmitted thereto from the master information storage station and applying said signals to the erasable recording means of the monitor station to permit the information to be displayed by said display means.

B1 Re. 32,393 (1286th)
COMPOSITION FOR ENHANCING THE ADMINISTRATION OF PHARMACOLOGICALLY ACTIVE AGENTS

Karl A. J. Wretlind, Stockholm; Stellan Ljungberg, Lidingö; Ivan Hakansson, Stockholm, and Bengt M. Ajaxon, Upsala, all of Sweden, assignors to KabiVitrum AB, Stockholm, Sweden

Reexamination Request No. 90/001,586, Aug. 25, 1988.
Reexamination Certificate for Reissue Patent Re. 32,393, issued Apr. 7, 1987, Ser. No. 605,760, Aug. 14, 1984.
Original No. 4,168,308, dated Sep. 18, 1979, Ser. No. 854,404, Nov. 23, 1977. Division of Ser. No. 666,264, Mar. 12, 1976, Pat. No. 4,073,943, which is a continuation-in-part of Ser. No. 504,880, Sep. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 88,474, Nov. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 754,738, Aug. 22, 1968, abandoned. Request filed Aug. 25, 1988, Ser. No. 57,600
Claims priority, application Sweden, Sep. 1, 1967, 12159/67
Int. Cl.[5] **A61K** *31/55*
U.S. Cl. 514—219

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1, 7, 9–44** is confirmed.

Claims **2–6** and **8** were previously cancelled.

1. A composition for enhancing intravenous administration comprising a stable, oil-in-water emulsion capable of withstanding autoclaving, containing a pharmacologically inert lipoid as a hydrophobic phase dispersed in a hydrophilic phase and an effective dose of a pharmacologically active, oil-soluble agent predominantly dissolved in said lipoid at a fraction ratio thereto in the hydrophobic phase, said lipoid being dispersed in the emulsion as finely divided particles having a mean particle size less than 1 micron to achieve rapid onset of an acceptable therapeutic effect attributable to said effective dose of the active agent, said active, oil soluble agent being selected from a class of substances consisting of central depressants, analgesics, muscle relaxants, and vasodepressants.

B2 3,905,809 (1287th)
ALLOY FOR MAKING DUCTILE IRON

Andrew B. Malizio, Delran; Martin A. Rice, Florence, both of N.J., and Harry F. Brooks, Levittown, Pa., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Reexamination Request No. 90/001,270, Jun. 29, 1987.
Reexamination Certificate for Patent No. 3,905,809, issued Sep. 16, 1975, Ser. No. 434,403, Jan. 18, 1974.
Reexamination Certificate B1 3,905,809, issued Aug. 18, 1987.
Int. Cl.[5] **C22C** *37/00*
U.S. Cl. 420—578

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

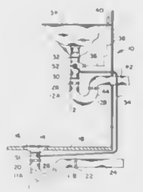
Claims **1–8** are cancelled.

[1. A nodularizing composition for use in the production of nodular cast iron comprising at least two nodularizing elements in a silicon-iron alloy or mixture of silicon-iron alloys, said elements selected from the group consisting of magnesium, cerium, yttrium, lanthanum, neodymium and praseodymium with each being present in the alloy or alloys in an amount of from about **1** to **3** percent by weight of the composition and the total amount of nodularizing elements in the composition not exceeding more than about **12** percent.**]**

B1 4,218,786 (1288th)
WATER SAVING TRAP PRIMER

Joseph Taglarino, 107 S. Lincoln Ave., Tampa, Fla. 36609

Reexamination Request No. 90/001,180, Feb. 24, 1987.
Reexamination Certificate for Patent No. 4,218,786, issued Aug. 26, 1980, Ser. No. 10,373, Feb. 8, 1979.
Int. Cl.[5] **E03C** *1/24*
U.S. Cl. 4—206



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 2, 4, 5, 7** and **8** are determined to be patentable as amended.

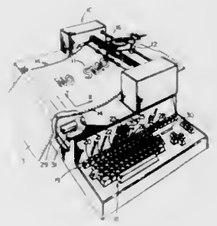
Claims **3** and **6** dependent on an amended claim, are determined to be patentable.

1. A primer for a **[**first**]** *floor drain* water trap, *the floor drain water trap having an inlet and an outlet adapted to be connected to sewer system with the floor drain water trap being* located below a *sink* drain *having an inlet adapted to be connected to a drainage part of a sink for* receiving waste water *and an outlet adapted to be connected to a sewer system*, comprising in combination:
a first fitting connected to the **[**first**]** *floor drain* water trap *above the normal water level therein;*
a second fitting connected to the *sink* drain *intermediate said inlet and outlet of said sinkk drain*; and
conduit means **[**interconnecting**]** *directly connecting* said first and second **[**fitting**]** *fittings* enabling the waste water received by the *sink* drain to be diverted by said conduit means to said **[**first**]** *floor drain* water trap for maintaining a constant water level in the **[**first**]** *floor drain water* trap to insure a proper seal therein upon use of the drain.

B1 4,591,999 (1290th)
METHOD AND APPARATUS FOR AUTOMATICALLY SPACING CHARACTERS DURING COMPOSITION

David J. Logan, Glastonbury, Conn., assignor to Gerber Scientific Products Inc., Manchester, Conn.

Reexamination Request No. 90/001,817, Jul. 25, 1989.
Reexamination Certificate for Patent No. 4,591,999, issued May 27, 1986, Ser. No. 529,834, Sep. 6, 1983.
Int. Cl.[5] **G06F** *15/46;* **B41J** *19/32*
U.S. Cl. 364—523



B1 4,323,071 (1289th)
VASCULAR GUIDING CATHETER ASSEMBLY AND VASCULAR DILATING CATHETER ASSEMBLY AND A COMBINATION THEREOF AND METHODS OF MAKING THE SAME

John B. Simpson, Menlo Park, and Edward W. Robert, Los Altos, both of Calif., assignors to Advanced Cardiovascular Systems, Inc.

Reexamination Request Nos. 90/001,327, Sep. 10, 1987 and 90/001,386, Dec. 1, 1987.
Reexamination Certificate for Patent No. 4,323,071, issued Apr. 6, 1982, Ser. No. 151,175, May 19, 1980.
Continuation-in-part of Ser. No. 123,713, Feb. 21, 1984, abandoned, which is a continuation of Ser. No. 899,061, Apr. 24, 1978, abandoned.
Int. Cl.[5] **A61M** *25/00*
U.S. Cl. 128—343

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4, 6, 8, 9** and **11–16** is confirmed.

Claims **5, 10, 17, 20** and **21** are determined to be patentable as amended.

Claims **7, 18** and **19**, dependent on an amended claim, are determined to be patentable.

New claims **22–52** are added and determined to be patentable.

1. In a combination of a guiding catheter assembly and a dilating catheter assembly, the guiding catheter assembly comprising a first flexible tubular member formed of a material which has a low coefficient of friction, a second flexible tubular member encasing said first tubular member so that the first tubular member fits tightly in the second tubular member, said combined first and second tubular members having proximal and distal ends and a fitting mounted on the proximal ends, the dilating catheter assembly comprising a flexible tubular member, said tubular member of said dilating catheter assembly having proximal and distal ends and an inflatable annular portion formed integral with the tubular member of said dilating catheter assembly near the distal end thereof, a fitting mounted on the proximal end of the tubular member of the dilating catheter assembly, said dilating catheter assembly being disposed within said guiding catheter assembly and means for inflating and def. .ing said inflatable annular portion.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **13** is confirmed.

Claim **14** is cancelled.

Claims **1–4** and **7** are determined to be patentable as amended.

Claims **5, 6** and **8–12**, dependent on an amended claim, are determined to be patentable.

New claims **15–20** are added and determined to be patentable.

1. A method for establishing the spacing between adjacent characters in a system for generating text lines of characters through the use of a computer and an associated computer memory device, said method comprising:
providing a memory device storing data describing a font of characters of a given size and including for each such character a first data set defining the shape of the character and a second data set defining approximately the shape of the left side of the character by way of a plurality of left side digital *space* values and the shape of the right side of the character by way of a plurality of right side digital *space* values, *the number of said left side digital space values being equal to that of said right side digital space values*, said left side digital *space* values being related to the shape of the left side of said character at respectively different levels along the height of said character and said right side digital *space* values being related the shape of the right side of said character at *said* respectively different levels along the height of said character,
reading from said memory device the data for a sequence of selected characters to be generated as a line of text,
for each adjacent pair of selected characters of said sequence, processing in said computer said plurality of right side digital *space* values of the left character and said plurality of left side digital *space* values of the right character in accordance with a *given* program to produce spacing data *defining the spacing to be introduced between said each adjacent pair of selected characters*, and
generating a line of characters using for the generation of each character said first data set defining its shape and

using for the [space] *spacing* between each adjacent pair of characters said spacing data derived from said processing of said digital *space* values[.].

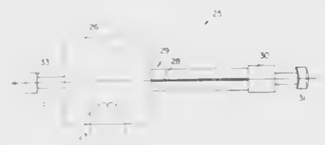
said step of processing in said computer the right side digital space values of the left character and the left side digital space values of the right character including for each of said different levels adding the right side digital space value to the left side digital space value to provide a sum value for each level, combining said sum value for one level with said sum value for another level to provide an openness factor related to the openness of the space between said adjacent pair of selected characters, and using said openness factor in the generation of said spacing data.

B1 4,615,034 (1291st)

ULTRA-NARROW BANDWITH OPTICAL THIN FILM INTERFERENCE COATING FOR SINGLE WAVELENGTH LASERS

Marc K. von Gunten; Benjamin H. Cook, both of San Jose, and David C. Gerstenberger, Mountain View, all of Calif., assignors to Spectra-Physics, Inc.

Reexamination Request No. 90/001,785, Jun. 13, 1989.
Reexamination Certificate for Patent No. 4,615,034, issued Sep. 30, 1986, Ser. No. 595,296, Mar. 30, 1984.
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—99



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **6**, **7**, **10** and **12–14** is confirmed.

Claims **1–5**, **8**, **9**, and **11** are cancelled.

Claim **15** is determined to be patentable as amended.

New claims **16–18** are added and determined to be patentable.

15. A method of producing single wavelength operation of [a] *an ion* laser of the kind which can oscillate on a number of lines simultaneously, at substantially any input power level, said method comprising,

coating a mirror surface with a coating having optical characteristics which provide for operation of said *ion* laser at any selected single or band of wavelengths, including any weak or low gain wavelengths, independent of their optical gains and at substantially any current or power level while suppressing non-selected wavelengths such that, said coating adjusts thresholds of all selected and non-selected wavelengths, including any dominant or high gain wavelengths, said coating having a coating reflectance to support laser oscillation for said selected single or band of wavelengths such that said selected single wavelength or band of wavelengths are above threshold, said coating further having acoating reflectance to suppress laser oscillation at said non-selected wavelengths, including dominant or high gain wavelengths, such that said non-selected wavelengths are below threshold,

mounting the mirror with respect to an optical cavity of the laser in a position where the mirror coating is effective to allow oscillation for said selected single or band of wavelengths, and

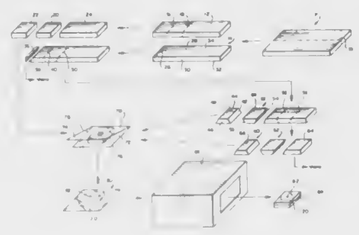
operating the laser at a high input power level, above a threshold at which the laser would otherwise begin to oscillate a number of lines simultaneously.

B1 4,642,970 (1292nd)

REUSABLE INSULATED BOX AND METHOD OF MANUFACTURE

William Bane, 1303 Del. Ave., Wilmington, Del. 19806

Reexamination Request No. 90/001,436, Feb. 12, 1988.
Reexamination Certificate for Patent No. 4,642,970, issued Feb. 17, 1987, Ser. No. 815,937, Jan. 3, 1985.
Int. Cl.[5] B65B *31/02*
U.S. Cl. 53—433



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

Claims **5–7** are cancelled.

1. A process for manufacturing a reusable insulated box, comprising the steps of:

(a) providing a rectangular foam panel having one surface thereof coated with a reflective material;

(b) slicing said panel into first and second portions;

(c) slicing said first portion into a top and a bottom for the box, said top and bottom having corresponding configuration and dimension;

(d) slicing said second portion into a plurality of sides for the box, said second portion being sliced at an angle to said material for providing oppositely disposed mitred complementary edges for each of said sides;

(e) wrapping each of said top, bottom and sides in a heat shrinkable thermoplastic film;

(f) sealing the edges of said film and thereby encapsulating each of said top, bottom and sides in a film envelope;

(g) piercing the film adjacent the major surfaces of each of said top, bottom and sides and thereby providing each envelope with a pair of anti-blister openings; and,

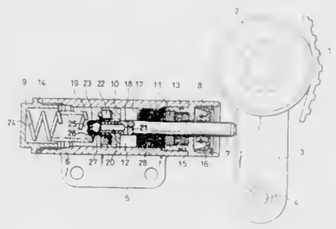
(h) heating each of said envelopes to a temperature sufficient to cause the film to shrink so that entrapped air vents through said anti-blister openings during shrinking and thereby permits the thermoplastic film to tightly sheath the top, bottom and sides and thereby provide top, bottom and side insert members for the box.

B1 4,708,696 (1293rd)

TENSIONER FOR TOOTHED DRIVE BELTS

Kazuo Kimura, Tokorozawa, and Masao Maruyama, Hanno, both of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Reexamination Request No. 90/001,874, Oct. 30, 1989.
Reexamination Certificate for Patent No. 4,708,696, issued Nov. 24, 1987, Ser. No. 872,928, Jun. 11, 1986.
Claims priority, application Japan, Aug. 30, 1985, 60-131595; Aug. 30, 1985, 60-131591; Aug. 30, 1985, 60-131592; Aug. 30, 1985, 60-131593; Aug. 30, 1985, 60-131594
Int. Cl.[5] F16H *7/12*
U.S. Cl. 474—103



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **11** are determined to be patentable as amended

Claims **2–10** and **12–21**, dependent on an amended claim, are determined to be patentable.

New claims **22–25** are added and determined to be patentable.

1. A tensioner for a toothed belt comprising means providing a cylindrical interior wall, a piston slidable within, and substantially conforming to, the cylindrical wall, a rod connected to the piston and extending, substantially along the axis of the interior wall, from the piston to the exterior of the interior wall providing means, packing means surrounding the rod and, with the cylindrical wall and piston, forming a substantially enclosed first chamber on one side of the piston, means cooperating with the interior wall providing means and the piston forming a substantially enclosed second chamber on the opposite side of the piston, hydraulic fluid substantially filling both chambers, a first fluid passage having one-way check valve means allowing flow of hydraulic fluid from [one of the chambers] *said first chamber* to [the other] *said second chamber* as the piston moves in a direction to decrease the volume of said [one of the chambers] *first chamber*, spring means urging the piston in said direction, means providing a second fluid passage allowing relatively restricted flow of hydraulic fluid from said [other] *second* chamber to said [one of said chambers] *first chamber* as the piston moves in the opposite direction;

in which the second fluid passage [allowing relatively restricted flow of hydraulic fluid from said other chamber to said one of said chambers] is provided by a clearance between the piston and the cylindrical interior wall;

[in which the check valve is carried by the piston; and]

in which the first fluid passage comprises a first part extending axially through the piston and a second part, communicating with the first part, said second part extending [transversly] *transversely* through the rod; *and*

in which the check valve is carried by the piston and comprises a valve element, a valve seat, and means continuously urging the valve element toward engagement with the valve seat so thot the check valve is always immediately closed when the piston stops moving in said direction to decrease the volume of said first chamber, whereby, whenever the piston begins to move in said opposite direction, the check valve is either already closed or is immediately closed, and substontially all of the flow of fluid from the second chamber toward the first chamber, during movement of the piston in said opposite direction, takes place through said second fluid passage.

B1 4,802,732 (1294th)

OPTICAL FIBER CABLE PREVENTING WATER FROM SPREADING TOWARD CABLE INTERIOR

Masumi Fukuma, and Nobuhiro Akasaka, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Inc. Ltd., Osaka, Japan

Reexamination Request No. 90/001,857, Oct. 5, 1989.
Reexamination Certificate for Patent No. 4,802,732, issued Feb. 7, 1989, Ser. No. 98,839, Sep. 21, 1987.
Claims priority, application Japan, Sep. 19, 1986, 61-221384; May 13, 1987, 62-116659
Int. Cl.[5] G02B *6/44*
U.S. Cl. 350—96.23



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

1. An optical fiber cable comprising:

an optical fiber unit comprising:

a rod-like spacer formed with a plurality of grooves at its outer peripheral surface, an

at least one optical fiber tape disposed in each of said grooves; and,

at least one water blockage tape disposed in each of said grooves of said spacer in said unit together with said optical fiber tape, said water blockage tape comprising,

a film like flexible base member, and a water absorbing and swelling member bonded to at least one surface of said base member, said water absorbing and swelling member is formed of a cross-linked polyethylene oxide comprising,

polyethylene oxide having average molecular weight of not less than 20,000; and

one of two functional cross linking agent and three functional cross linking agent, having 0.1 to 1% by weight relative to said polyethylene oxide

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B1 4,806,579 (1295th)

POLYMER COMPOSITES

Paul D. Calvert, Lewes; Raymond M. Ellul, Blackboys, and Brian D. Moyle, Lewes, all of England, assignors to British Petroleum Co., London, England

Reexamination Request No. 90/001,908, Dec. 7, 1989.
Reexamination Certificate for Patent No. 4,806,579, issued Feb. 21, 1989, Ser. No. 7,002, Jan. 23, 1987.
Claims priority, application United Kingdom, Jan. 30, 1986, 8602318; May 20, 1986, 8612283
Int. Cl.[5] C08K *5/34, 5/21, 3/32, 3/10*
U.S. Cl. 524—99

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-7 is confirmed.

1. A polymer matrix having grown therein in vitro and in situ, non-centrosymmetric crystals of an organic or inorganic compound capable of forming such crystals.

REISSUES

MAY 29, 1990

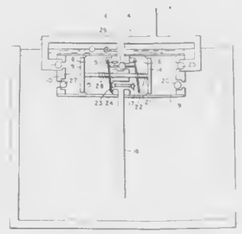
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue

Re. 33,222

PRESSURE TRANSFER FLUID HEATER

William H. Zebuhr, Nashua, N.H., assignor to American Thermal, L.P., Del.

Original No. 4,658,760, dated Apr. 21, 1987, Ser. No. 745,444, Jun. 17, 1985. Application for reissue Apr. 20, 1989, Ser. No. 340,854
Int. Cl.[5] F22B *5/00*
U.S. Cl. 122—13 R **13 Claims**



[1. For providing a non-pressurized reservoir in a pressurized-fluid line, the combination comprising:

A. a vessel for containing fluid; and

B. a fluid-driven pump including a control inlet, a control outlet, a pump inlet, and a pump outlet, the pump being operable by flow of liquid into the control inlet, through the pump, and out the control outlet to draw liquid in the pump inlet, through the pump and out the pump outlet, the control outlet and the pump inlet being disposed in communication with the interior of the vessel so that fluid that has flowed from the control inlet through the pump and out the control outlet is discharged into the vessel and that fluid thus contained in the vessel is drawn by the pump from the vessel into the pump inlet, through the pump, and out through the pump outlet, whereby pressure is effectively transmitted from the fluid at the control inlet to the fluid at the pump outlet without imposing the pressure on the fluid in the vessel.]

Re. 33,223

ORGANIC POLYMERS CONTAINING TCNQ COMPLEXES AND STABILIZED AGAINST THE EMISSION OF HCN

Friedrich Jonas, Aachen, and Jurgen Hocker, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Original No. 4,568,485, dated Feb. 4, 1986, Ser. No. 651.625, Sep. 17, 1984. Application for reissue Jan. 15, 1988, Ser. No. 144,801
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3335513
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—518 **6 Claims**

1. A composition which comprises:

(a) a plastic material

(b) a charge transfer complex of tetracyanoquinodimethane, and

(c) an effective amount of a metal cation to stabilize the composition against the emission of HCN wherein said metal cation is *Ni* (*II*)Cu(II), Cu(I), Zn(II), Pd(II), Ag(I), Cd(II), Pt(II), Au(III) or Hg(II).

Re. 33,224

DRIVE FOR END LOADING AND TRANSVERSELY SHIFTING TAPE CARTRIDGE

Wolfgang Speigelstein, Glendale, Calif., assignor to Irwin Magnetic Systems, Inc., Ann Arbor, Mich.

Original No. 4,673,995, dated Jun. 16, 1987, Ser. No. 628,110, Jul. 6, 1984. Application for reissue Jun. 15, 1989, Ser. No. 371,416
Int. Cl.[5] G11B *5/008, 15/00, 17/00*
U.S. Cl. 360—93 **19 Claims**

12. A tape drive for a digital magnetic cartridge of the type described in ANSI X3.55-1977 having a generally flat rectangular body, a tape access opening in the frontal edge of the body, a hinged door normally covering the tape access opening and pivotable about an axis perpendicular to a plane of the body, and a tape drive capstan in the frontal edge of the body, said drive comprising:

a housing adapted to receive said cartridge by manual loading, said housing dimensioned to fit within a 5¼" footprint of a disk drive;

guide means defining a generally rectilinear loading path of travel within said housing for said cartridge;

a magnetic head mounted in said housing adjacent said path;

a motor capstan mounted in said housing adjacent said path;

means for shifting said cartridge transversely of said loading path to and from engagement with said magnetic head and said motor capstan when the cartridge is disposed within said housing;

said housing having a loading slot configured to permit only endwise loading of the cartridge into the housing; and

said drive including means for opening said door whereby to present the tape access opening to the magnetic head.

Re. 33,225

METHOD FOR MATING TELEVISION CRT CATHODE COMPONENTS

Janice L. Wichmann, Park Ridge, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Original No. 4,250,602, dated Feb. 17, 1981, Ser. No. 65,,481, Aug. 10, 1979. Continuation-in-part of Ser. No. 35,885, Apr. 4, 1979, abandoned. Application for reissue Jun. 2, 1989, Ser. No. 360,954
Int. Cl.[5] H01J *9/02*
U.S. Cl. 445—36 **1 Claim**

1. A method for mating production quantities of the tubular caps and shanks of the cathode assemblies of the TV CRT electron guns, each of said shanks having a base end larger in outside diameter than said cap, and a narrow end adapted to fit into said cap, the method comprising:

depositing a quantity of said caps onto a first shaker plate having a plurality of receptacles adapted to receive said caps open-end-down, by positioning in each receptacle a pin smaller in diameter than the opening in said caps and concentric with the axis of the said receptacle, said pin being effective to prevent the closed-end-down entry of said caps into said receptacle;

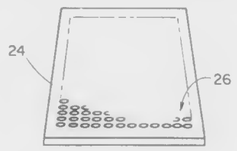
shaking said first shaker plate to cause said caps to fall open-end-down into said receptacles, and removing any excess of said caps;

positioning contiguous to said first shaker plate a second shaker plate having receptacles matching in number, location and alignment the receptacles of said first shaker plate, and inverting said plates in conjunctive alignment, causing said caps to fall open-end-up into the receptacles of said second shaker plate;

removing said first shaker plate and depositing a quantity of said shanks onto said second shaker plate and shaking said second shaker plate, causing said shanks to fall narrow-end-down into said receptacles and into said caps, said receptacles being adapted to reject the larger end of said shanks by virtue of being smaller in diameter than the larger end of said shanks;

removing any excess of said shanks;

repositioning and inverting said first and second shaker



plates, causing the mated cap-and-shank assemblies to fall shank-end-down into said receptacles and onto said pins of said first shaker plate, and removing said second shaker plate, said first shaker plate holding said assemblies cap-end-up for further processing.

PLANT PATENTS

GRANTED MAY 29, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,236

ROSE PLANT NAMED BURALP

Larry J. Burks, Rte. 22, Box 289, Tyler, Tex. 75704, assignor to Larry J. Burks, Tyler, Tex.

Filed Mar. 10, 1989, Ser. No. 321,721
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—21 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by attractive deep red flowers which are long lasting on the plant and after cutting.

7,237

APPLE TREE: "SALI VARIETY"

Kasper B. Sali, 2004 Birchfield Rd., Yakima, Wash. 98901

Filed Jan. 11, 1989, Ser. No. 295,935
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—35 1 Claim

1. A new and distinct variety of apple tree substantially as shown and described.

7,238

GERBERA PLANT NAMED "BISMUT"

Th. A. Segers, RM Hoofddorp, Netherlands, assignor to Twyford Plant Laboratories, Inc., Santa Paula, Calif.

Filed Feb. 28, 1989, Ser. No. 317,241
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. The new distinct variety of gerbera plant herein described and illustrated and identified by the characteristics enumerated above.

7,239

IRIS PLANT NAMED TOKYO

Joseph P. van Eijk, Ve Bennekom, Netherlands, assignor to H.J.A. Rooyakkers B.V. and World Flower B.V., both of, Netherlands

Filed Apr. 10, 1989, Ser. No. 336,004
Int. Cl.[5] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Iris plant named Tokyo, as illustrated and described.

VOL
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PATENTS

GRANTED MAY 29, 1990

ERRATA

For CLASS	See PATENT NO.
034-007	4,928,409
052-239	4,928,465
052-511	4,928,467
052-574	4,928,468
052-607	4,928,469
052-664	4,928,471
052-678	4,928,472
053-053	4,928,473
053-425	4,928,474
475-196	4,928,543
475-005	4,928,552
475-268	4,928,553
475-149	4,928,556
100-170	4,928,589
099-576	4,928,590
099-485	4,928,591
099-450	4,928,592
606-062	4,928,679
354-272	4,928,925
206-328	4,928,934
272-123	4,928,961
606-142	4,929,239
606-151	4,929,240
423-025	4,929,274
540-004	4,929,395
562-595	4,929,396
503-213	4,929,411
420-012	4,929,416
427-057	4,929,422
424-638	4,929,454
514-227	4,929,549
502-035	4,929,576
514-058	4,929,577
525-339	4,929,699
530-351	4,929,700
525-539	4,929,701
548-187	4,929,743
548-202	4,929,744
564-399	4,929,764

VOL
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364-525 4,929,824
324-318 4,929,881
371-025 4,929,888
371-022 4,929,889
324-347 4,929,915
340-407 4,929,948
365-226 4,930,112

PATENTS

GRANTED MAY 29, 1990

GENERAL AND MECHANICAL

4,928,320
BASEBALL CATCHING APPARATUS
Akio Aoki, Osaka, Japan, assignor to Trion Corporation, Osaka, Japan
Continuation of Ser. No. 37,297, Apr. 8, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 275,626
Claims priority, application Japan, Jan. 17, 1987, 62-5218[U]
Int. Cl.[5] A41D *13/10*; A63B *71/14*
U.S. Cl. 2—19 **6 Claims**



1. A baseball catching apparatus, comprising:
an outer face member constituting a ball-catching face of a palm side;
a string;
an inner face member which comes into contact with a palm, said inner face member being fastened at a lower edge portion thereof to said outer face member by means of said string;
holding means disposed at a predetermined position in between said outer face member and said inner face member, said holding means being provided at least at two positions separately from each other in an area extending from approximately a root of a thumb through the wrist to a root of a little finger, said holding means being secured to either of said outer face member and said inner face member over an entire periphery thereof except for opening portions thereof corresponding to positions of the root of the thumb and the root of the little finger, respectively; and
shock-absorbing means to be accommodated in said holding means and adapted for relieving ball-catching shock, said shock-absorbing means being formed thinner at a central portion thereof than at a peripheral portion thereof.

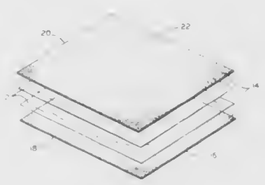
4,928,321
HOOD AND HOODED GARMENT
Marguerite A. R. Dobson, 43 Tredegar Square, London, England (E3 5AE)
Filed Nov. 10, 1988, Ser. No. 269,992
Claims priority, application United Kingdom, Nov. 10, 1987, 8726249
Int. Cl.[5] A41D *3/02*
U.S. Cl. 2—84 **2 Claims**

1. A garment comprising, a body portion, and a hood, said hood having oppositely facing front and rear portions, a center panel extending from said front portion to said rear portion, and at least two side panels, said center panel being attached at lateral edges to said side panels, said front portion having a face opening therein and said rear portion having indicia suggesting the appearance of a single face covering substantially the entirety of said rear portion of said hood, said body portion of said garment including a neck seam, and at least two raglan sleeves, said at least two raglan sleeves being separated by a spaced distance along said neck seam, said center panel of said hood joining said body portion at said neck seam along said spaced distance between said raglan sleeves, wherein said



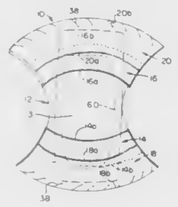
center panel of said hood extends along said neck seam from one of said raglan sleeves to the other of said raglan sleeves.

4,928,322
DISPOSABLE GLOVE
Athoi G. Bradfield, Edmonton, Canada, assignor to Bradfield AG Inc., Seattle, Wash.
Filed Jul. 22, 1988, Ser. No. 223,090
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—169 **18 Claims**



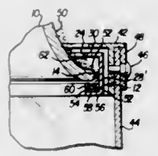
13. A disposable glove, comprising:
a. two plys of thermoplastic sheet material dispensed in a roll having opposed sides, the sheet material being sealed together to form a plurality of gloves, each glove having an opening along one of the opposed sides of the roll to permit hand entry, each glove being separated from an adjacent glove by perforations which extend between the opposed sides whereby the glove may be detached from the roll, the glove being a mitten having a thumb portion and a finger portion and having a partially perforated arcuate cut with a plurality of uncut portions along the length of the cut, spaced from the perforations which extend between the opposed sides and extending between the thumb portion and the finger portion of the glove, thereby permitting the thumb portion and the material adjacent the thumb portion to be manipulated relative to the finger portion after fracture of the uncut portions.

4,928,323
GARMENTS AND PARTS THEREOF
Efraim Nathan, Philadelphia, Pa., assignor to Lontex Corporation, Perkasie, Pa.
Filed Feb. 21, 1989, Ser. No. 313,403
Int. Cl.[5] A41B *9/00, 9/12*
U.S. Cl. 2—406 9 Claims



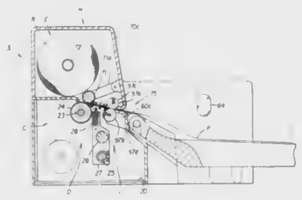
1. A crotch assembly for a garment comprising:
a fabric crotch piece having a pair of opposing sides defined in part by a part of longitudinally extending, opposing, generally concave edges;
inner fabric means on one side of the crotch piece attached to the crotch piece for receiving and retaining a generally elongated, removable absorbent pad of up to only a first length flush on the one side of the crotch piece, extending longitudinally along the crotch piece between the concave edges; and
outer fabric means on the one side of the crotch piece attached to the crotch piece for receiving and retaining a generally elongated, removable absorbent pad of a length longer than the first length flush on the one side of the crotch piece, extending longitudinally along the crotch piece between the concave edges, at least one of the inner and outer fabric means comprising a pair of pockets on the one side of the crotch piece, each pocket of the pair extending generally between the concave edges of the crotch piece and each pocket of the pair having an open side facing the remaining pocket of the pair.

4,928,324
HARD HAT FACE SHIELD BRACKET
Jerry Evans, 36 Reynolds Dr., Hampton, Va. 23664, and Ravadean Ashely, 58 Linda Dr., Newport News, Va. 23602
Filed Oct. 18, 1988, Ser. No. 259,230
Int. Cl.[5] A42B *3/00*
U.S. Cl. 2—424 3 Claims



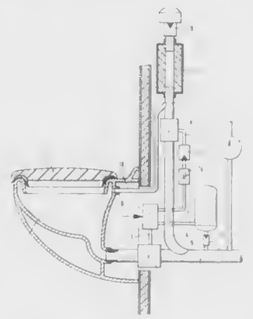
1. A bracket for securing a face shield onto a hard hat of a type having a rigid crown terminating at a front lower-level rim in front of a wearer's head, said bracket comprising:
an elongated channel-shaped member shaped in length generally similarly to the front lower-level rim, said channel-shaped member, when viewed in cross section, having a central vertical web and upper and lower flanges extending laterally from opposite ends of the web to define a continuous groove extending along the length of the channel-shaped member for receiving the front lower-level rim of the hard hat;
securing means for securing the channel-shaped member onto the hard hat with said front lower-level rim thereof being in said continuous groove; and
a face shield assembly including a pivot means for pivotally securing a transparent face protective shield to the channel-shaped member at points approximately aligned with temples of the head of wearer of the hard hat and for allowing said protective shield to be pivoted between a position below said hard hat in front of said wearer's head and a position above said hard hat away from the front of the wearer's head;
said lower flange of said channel-shaped member comprising an upwardly-directed wall for forming a continuous sump below the front lower-level rim for catching and retaining particles passing about the front lower-level rim inside said groove;
whereby said particles falling down the hard hat crown and passing about the lower-level rim inside the groove are caught in said sump and thereby prevented from falling in said wearer's face.

4,928,325
TOILET SEAT STRUCTURE CAPABLE OF AUTOMATICALLY FEEDING A SEAT COVERING PAPER ONTO A TOILET SEAT
Mitsuhiro Higuchi, and Hirofumi Yamamoto, both of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan
Continuation of Ser. No. 197,531, May 23, 1988. This application May 11, 1989, Ser. No. 350,419
Claims priority, application Japan, May 28, 1987, 62-134531; Aug. 22, 1987, 62-208537; Oct. 28, 1987, 62-165962; Dec. 18, 1987, 62-322571
Int. Cl.[5] A47K *13/20*
U.S. Cl. 4—247 3 Claims



1. A toilet seat structure which comprises:
(a) a toilet seat body having an upper surface;
(b) a paper roll storage box and rotatably stored therein a paper roll having a length of paper sufficient for being cut into a plurality of seat covering papers;
(c) a paper feeding mechanism for feeding paper from the paper roll onto the upper surface of the toilet seat body, said paper feeding mechanism including a feed roller and a press roller biased together to form a nip through which the paper is conducted from the paper roll and which clamps the paper, the feed roller and the press roller being disposed below the paper roll;
(d) a paper clamping mechanism disposed at a position a predetermined distance away from the paper feeding mechanism toward the toilet seat body;
(e) a paper cutting mechanism for cutting the paper at a position a predetermined distance away from the front end of the paper to provide a piece of seat covering paper on the toilet seat body, the paper cutting mechanism being disposed between the paper feeding mechanism and the paper clamping mechanism for cutting the paper while the paper is clamped by the paper feeding mechanism and by the paper clamping mechanism;
(f) a control unit comprising a central processing unit for accurately controlling the operation of the paper feeding mechanism and the paper cutting mechanism to feed a specified length of the paper onto the toilet seat body and cut the paper fed onto the toilet seat body to provide a seat covering paper on said toilet seat body;
(g) a control board for transmitting control signals to the control unit; and
(h) a functional casing provided at the rear of the toilet seat body, said functional casing containing all the above elements as one unit.

4,928,326
VACUUM SEWER ARRANGEMENT
Henry Olin, Espoo; Gunnar Lindroos, Helsinki, both of Finland, and Sven Oldfelt, Vaxholm, Sweden, assignors to Oy Wärtsilä Ab, Helsinki, Finland
Filed Apr. 4, 1988, Ser. No. 177,070
Claims priority, application Finland, Apr. 6, 1987, 871491
Int. Cl.[5] E03D *5/00, 9/14*
U.S. Cl. 4—300 17 Claims

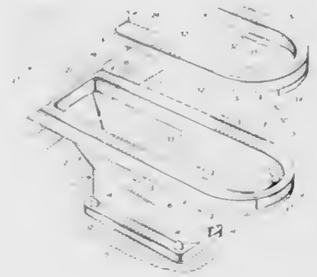


16. An arrangement according to claim 9, wherein the lid is made of sound insulating material.

4,928,327
DEVICE FOR REDUCING RINSING WATER CONSUMPTION
Dieter Kuhn, Krauskopfalle 39, 6229 Georgenborn, Fed. Rep. of Germany
Filed May 11, 1988, Ser. No. 195,241
Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716624
Int. Cl.[5] E03D *1/35*
U.S. Cl. 4—395 8 Claims

1 A device for the reduction of the amount of rinsing water in a WC-water tank including a housing to be filled with water and having an outlet opening, a rinsing knob supported on the housing, a closing element operatively connected to the knob for closing and opening the outlet opening, the closing element being formed as a buoyant element, and pulling means connecting the closing element to the knob, said reduction device comprising a ring-shaped suppressing element provided on the closing element and made of elastic material with high specific weight, said suppressing element encircling the pulling means and exerting on the closing element a force which is greater than a force required to maintain the closing element in a buoyant state, said ring-shaped suppressing element including at least one ring; and a friction disc mounted on said pulling element between said closing element and said ring-shaped suppressing element for joint movement therewith for delaying closing of the outlet opening, said friction disc having a diameter which is larger than that of said ring-shaped suppressing element so that only a very short pressing of the knob enables the tank to discharge a predetermined portion of water which is smaller than an entire filling amount of water in the tank.

4,928,328
COMMODE AND REMOVABLE SEAT
John W. Davis, Rt. 2, Box F, Rayville, La. 71269
Continuation-in-part of Ser. No. 940,741, Dec. 11, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 231,908
Int. Cl.[5] E03D *11/02*
U.S. Cl. 4—420 2 Claims



1. A commode for receiving handicapped and wheelchair-bound persons, comprising a bowl mounted on a floor and having a water trap therein and a hollow, bottom-perforated rim having a generally U-shaped portion defined by parallel rim portions connected by a curved rim frontal portion bordering the top of said bowl; said U-shaped portion extending integrally from a flush chamber provided in said rim opposite said rim frontal portion of said rim; a water tank stacked on said flush chamber, a valve seat provided in said water tank and said flush chamber and a flush valve seated in said valve seat; flush apparatus provided in said water tank and connected to said flush valve, for selectively opening said flush valve and allowing water to flow from said water tank to said flush chamber and through said rim; a generally U-shaped, elongated, reversible seat defined by parallel side portions connected by a curved frontal portion and having a substantially flat top segment and a substantially flat bottom bounded by an inside wall and an outside wall and further comprising a continuous, generally U-shaped inside flange extending downwardly from the inside edge of said seat for engaging the inside surface of said rim portions and locating said flat bottom on said rim portions and a curved from flange carried by said seat and downwardly extending from said outside wall of said seat for engaging the outside surface of said curved rim frontal portion when said seat is disposed on said rim in a first configuration, said curved front flange spanning a lateral distance less than the distance between said parallel rim portions so as to be positionable against said flush chamber while projecting downwardly between said parallel rim portions when said seat is reversed on said rim in a second configuration,the length of said side portions being less than said parallel rim portions such

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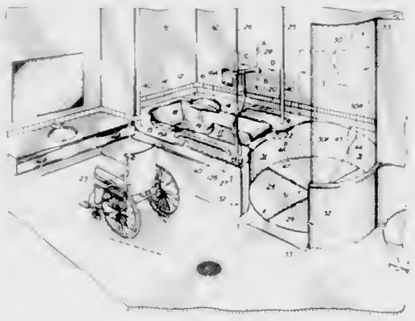
as to allow said inside flange to extend between said parallel rim portions but not into said curved rim frontal portion when said curved front flange engages said flush chamber with said seat positioned on said rim in said second configuration.

4,928,329

BATHROOM ASSEMBLY FOR HANDICAPPED INDIVIDUALS

Richard P. Palmeri, 6112 E. Mockingbird La., Paradise Valley, Ariz. 85253

Filed Apr. 25, 1988, Ser. No. 185,461
Int. Cl.[5] A47K *4/00. 3/022. 3/22*
U.S. Cl. 4—552 **10 Claims**



6. A bathtub including

(a) a tub having a floor and a surrounding wall for holding a quantity of water, said wall having a top portion;

(b) a support surface abutting adjacent to and extending away from said tub for a bather to position a wheelchair on;

(c) an opening in said tub wall located above said first level and said support surface and extending from the top portion of said wall downwardly a selected distance toward said floor for permitting a bather seated in a wheelchair setting on said support surface to transfer himself from said wheelchair to a seated position in said opening;

(d) a shower stall adjacent said tub and having access opening means in communication with said opening and having a shower stall floor which comprises said support surface;

(e) a wheelchair accessway formed in said shower stall;

(f) a faucet means mounted with respect to said tub and shower stall to have at least two operative positions,

(i) a first operative position for directing water into said tub, and

(ii) a second operator position for directing water into said shower stall, and,

(g) valve means for directing water into said faucet;

said valve means being positioned to be reached and operated by a bather seated in

(h) a wheel chair outside of said tub and said shower stall without having to reach out over said floor or said support surface to operate said valve means;

(i) a wheel chair inside of said shower stall;

(j) said opening in said tub wall; and,

(k) said tub.

4,928,330

HANDICAP BATHTUB LIFT

Arnold L. Moore, 1505 N. Locust St., P.O. Box 200, Canby, Oreg. 97013

Filed Sep. 16, 1988, Ser. No. 245,218
Int. Cl.[5] A47K *13/00*
U.S. Cl. 4—562 **3 Claims**

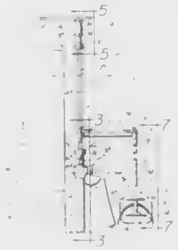
1. A handicap bathtub lift comprising:

an adjustable vertical post being attached to both floor and ceiling surfaces and including a base member with the lower portion thereof attached to the floor surface by a base plate and anchor bolts, a slotted frame and guide housing attached to the upper end of the base member by means of securing flanges and bolts, an uppermost section attached at the lower end thereof to the top section of the slotted frame and guide housing by means of securing flanges and bolts, said uppermost section being telescoped to adjust for various heights, a collar flanged ceiling anchor which fits over the top portion of the uppermost section and is attached thereto by means of set screws, and at the opposite end attached to the ceiling surface by means of securing and anchoring flanges and bolts;

a threaded screw journalled within the slotted frame and guide housing for rotation on bearings located at each end of the housing;

a carriage block threadably attached to the threaded screw and having a yoke section extending through a slot in the frame and guide housing;

means for selectively rotating the threaded screw;



a horizontal swinging arm with one end pivotally attached to the threaded screw through the carriage block by a swing pin and being rotatable in a 180° arc with respect to said post;

a pivot connection attached to the other end of the swinging arm by a thrust bearing and being rotatable in a 360° arc about a vertical axis,

a C-shaped carriage rod with a top section attached to the pivot connection, said carriage rod being disposed to support a seat assembly including a back rest attached to the C-shaped carriage rod by means of a clamp, a seat belt anchored at one end to the C-shaped carriage rod below the back rest clamp, a metal seat frame welded to the end of the C-shaped carriage rod and having a fiberglass seat attached thereto, and metal arm rest support bolted to the metal seat frame and having fiberglass arm rests attached thereto; and

swing stops attached to the horizontal swinging arm and being disposed to selectively engage said swing pin and said pivot connection to selectively prevent the pivotal movement with respect to said horizontal swinging arm.

4,928,331

ADJUSTABLE SEAT PITCH SOFA SLEEPER MECHANISM

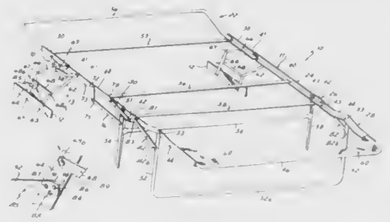
Dennis E. Arft, Joplin, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 22, 1989, Ser. No. 327,017
Int. Cl.[5] A47C *17/22*
U.S. Cl. 5—13 **12 Claims**

11. A foldable sofa sleeper mechanism adapted to be mounted upon a sofa frame and stored within a storage enclosure of the sofa frame, said mechanism comprising

a bed frame having pivotally interconnected head, body, intermediate and foot sections each having a pair of opposed side rails, a mattress supporting fabric extending between said sections and connected thereto,

linkage mechanism for supporting said bed frame from the sofa frame, said linkage mechanism comprising a base plate adapted to be fixedly secured to said sofa frame, a front pilot arm pivotally mounted upon said base plate, a rear support link pivotally mounted upon said base plate, and a pair of center legs connected to a center actuating leg means operable to retract and extend said center legs, said sofa sleeper mechanism being movable between a folded position in which said bed frame and said linkage mechanism are folded and contained within said storage



enclosure of said sofa frame and said center legs are retracted, and an extended unfolded position in which said bed frame extends forwardly from said sofa frame and said center legs extend downwardly from said bed frame, and

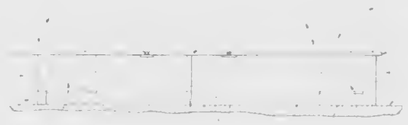
seat pitch adjustment means comprising a stop mounted upon said rear support link for varying the angle of pitch of said foot section of said bed frame by limiting and thereby controlling the downward movement of the rear of said folded bed frame, including the rear of said foot section, when said sofa sleeper mechanism is in a folded position within said storage enclosure.

4,928,332

ADJUSTABLE MATTRESS FOUNDATION FOR BEDS

Ralph Ogden, 1304 Fisher Street, Munster, Ind. 46321, and Heikki Huik, 227 Washington Street, Rensselaer, Ind. 47978

Filed Nov. 7, 1988, Ser. No. 268,078
Int. Cl.[5] A61G *7/015, 7/018*
U.S. Cl. 5—68 **10 Claims**



1. An adjustable foundation for bed mattresses and operable by the bed user, said foundation comprising:

a head section articulated to a center section,

said sections each comprising a generally planar member extending longitudinally of said foundation,

means for mounting said center section in a stationary, substantially horizontal position,

said center section having opposite sides that extend longitudinally of said foundation and are spaced apart across the width of said foundation,

with said head section being hinged to one side of said center section for swinging movement with respect thereto about an axis extending transversely of said foundation,

means for selectively moving said head section relative to said center section in a predetermined movement range between a position of substantially coplanar relation with said center section and positions that are upwardly inclined relative to said center section,

means for locking said head section at said coplanar relation position, and at all other selected positions that are in said movement range of said head section,

said moving and locking means for said head section comprising a locking type fluid cylinder device for said head section,

said cylinder device being disposed and mounted below said foundation center section, and having one end of same fixed relative to said foundation center section and the other end of same in torque transmitting relation relative to said head section for swinging said head section about said axis to move said head section from said position to selected of said positions within its said movement range when said cylinder device is unlocked,

said cylinder device including means for unlocking same for said selected movement of said head section from said position to and between said positions,

and means for selectively controlling said movement of said head section and comprising:

a crank arm extending transversely of and below said foundation intermediate said center section and between said opposite sides of said center section and having a pivotal axis extending transversely of said foundation,

said crank arm defining adjacent each of said center section opposite sides a handle portion for selectively pivoting same by the bed user from either such handle portion from a bed user position lying on the bed, and from a selected one of said sides of said center section,

said crank arm axis having a neutral pivotal position,

means connecting said crank arm to said cylinder device unlocking means for activating said cylinder device in only one direction of pivoting of said crank arm from said neutral position thereof and for returning said cylinder device to locked relation when said crank arm is returned to said neutral position,

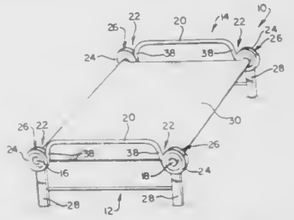
and means for biasing said crank arm for pivoting same back to said neutral position on completion of said selected actuation of said cylinder device.

4,928,333

COLLAPSIBLE ARTICLE OF FURNITURE

Werner H. Ewert, Johannesburg, South Africa, assignor to Hans Bonatz, Rosenweg, Fed. Rep. of Germany

Continuation of Ser. No. 109,950, Oct. 19, 1987, abandoned. This application Aug. 24, 1989, Ser. No. 398,295
Claims priority, application South Africa, Oct. 23, 1986, 86/8073
Int. Cl.[5] A47C *19/12*
U.S. Cl. 5—110 **7 Claims**



1. A collapsible article of furniture, such as a bed comprising: two, spaced apart, rigid head and foot board support members, each said support member having a base portion and a cylindrical element connected to and extending along the upper part of the base portion, each said cylindrical element having a pair of substantially U-shaped receiving portions extending substantially vertically upwardly from said base portion and being positioned at opposite ends thereof; a pair of elongated elements, each having a pair of disc components mounted at opposite ends thereof; a flexible web spanning said elongated elements and extending therebetween; and each said elongated element extending between said head and foot sup-

port members so that when said disc components are inserted into the U-shaped receiving portions, said flexible web is stretched and made taut.

4,928,334

JOINT STRUCTURE FOR FABRIC WEB HAVING HIGH MODULUS OF ELASTICITY

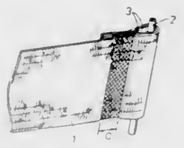
Tetsuo Kita, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 8,961, Jan. 30, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 302,094

Claims priority, application Japan, Feb. 5, 1986, 61-14495; Apr. 22, 1986, 61-59573; Apr. 22, 1986, 61-59574

Int. Cl.[5] A47C *19/00*

U.S. Cl. 5—191 **6 Claims**



1. A joint structure for joining a fabric web as a spring element to a metal rod in an upholstered article, comprising:
   - a metal rod;
   - a fabric web having a high modulus of elasticity having an end portion folded on itself over said metal rod, providing folded and unfolded layers of the fabric web on opposite sides of said metal rod; and
   - a heat-fusible resin film sandwiched between said folded and unfolded layers of the fabric web and stretched at a temperature below its melting point for molecular orientation to provide increased mechanical strength in a direction in which said fabric web is subject to tension, said heat-fusible resin film being fused to unite said folded and unfolded layers of said fabric web.

4,928,335

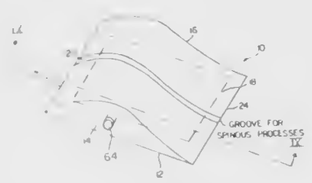
ORTHOPEDIC PILLOW AND SIZING KIT THEREFOR

John Pedrow, 14429 Rte. 30, North Huntingdon, Pa. 15642

Continuation-in-part of Ser. No. 164,971, Mar. 7, 1988, which is a division of Ser. No. 84,674, Aug. 12, 1987, Pat. No. 4,756,090. This application Dec. 5, 1988, Ser. No. 280,135

Int. Cl.[5] A47G *9/00*

U.S. Cl. 5—436 **4 Claims**



1. A cervical orthopedic pillow, said cervical orthopedic pillow comprising:
   - a block of deformable material;
   - a surface of said block of material being shaped to accommodate and support the neck and the cervical vertebrae of a user in a supine position;
   - a chamber provided in the interior of said block of material;
   - means for placing and retaining in said chamber a material, the temperature of which may be altered, the material retainable in said chamber comprising at least one nongaseous component;
   - said surface which is shaped to accommodate and support the neck and the cervical vertebrae of a user in a supine position having a substantially airfoil-shaped reverse curved surface when said block of material is viewed in elevation; and
   - a groove formed in said surface which is shaped for accommodating and partially surrounding the cervical vertebrae;
   - said groove running from one end of said pillow to the opposite end of said pillow.

4,928,336

COMBINED INFLATABLE HEADREST AND STORAGE DEVICE

John J. Petillo, Sr., P.O. Box 47, Waretown, N.J. 08758

Filed Aug. 26, 1988, Ser. No. 236,854

Int. Cl.[5] A47C *20/00*

U.S. Cl. 5—441 **1 Claim**



1. A headrest for use at the beach by a user in reclined position, said headrest comprising a storage base and an inflatable compartment, said inflatable compartment including a bottom wall of generally rectangular configuration, a top wall overlying said bottom wall, a peripheral side wall interconnecting the periphery of the bottom wall and top wall, said top wall being generally rectangular and slightly larger than the bottom wall, a plurality of partitions interconnecting the top wall and bottom wall, each of said partitions having a straight lower edge and an arcuate upper edge, and an inflation valve in said side wall to inflate the compartment into a generally rectangular pillow having a convex upper surface, said side wall including elongated portions forming the sides of the pillow and shorter portions forming the ends of the pillow, one of said elongated portions having a greater vertical height than the other, said shorter portions including an inclined upper edge extending between the upper edges of the elongated portions thereby orienting the top wall of the pillow in inclined relation to the bottom wall, said storage base including a bottom wall spaced below the bottom wall of the inflatable compartment, a peripheral side wall interconnecting said bottom walls to form a storage compartment, said storage base side wall including an elongated slit opening therein spaced from said bottom walls and generally parallel to the bottom walls, and closure means for closing said slit opening to enable the storage of articles therein and positioning of sand therein to serve as an anchor for the headrest at the beach when windy conditions are encountered, all of the walls and partitions forming the headrest being constructed of flexible vinyl material sealed together to enable the headrest to be folded into compact condition when not inflated and the storage base is empty.

4,928,337

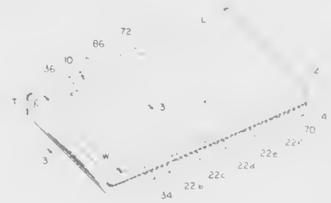
COMPACTIBLE FUTON

Jeffrey B. Chauncey, 8100 McKim Ct., Los Angeles, Calif. 90046

Filed Apr. 4, 1989, Ser. No. 333,292

Int. Cl.[5] A47C *27/22*

U.S. Cl. 5—465 **12 Claims**



1. A mattress that is changeable between a flat configuration and a folded configuration, comprising:
   - a foam layer having a pair of opposed upper and lower faces and a plurality of parallel channels, where said foam layer is of reduced thickness, and which separate said foam layer into a plurality of block portions arranged in a row;
   - a pair of cushioning layers each lying on an opposite one of said faces of said foam layer;
   - a thin flexible outer casing surrounding the combination of said foam layer and said cushioning layers thereon, and having upper and lower outer casing layers;
   - a plurality of tufts, each extending through said outer casing layers, through said cushioning layers, and through said foam layer at said channels therein, including a plurality of tufts extending through each of said channels.

4,928,338

PROCESS FOR THE WET TREATMENT OF TEXTILE MATERIAL

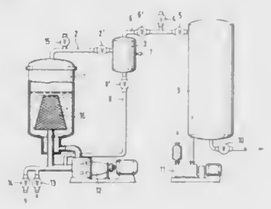
Berthold Magin, Hassloch, Fed. Rep. of Germany, assignor to MTM Obermaier GmbH & Co. KG

Continuation-in-part of Ser. No. 25,513, Mar. 13, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,963

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3608742

Int. Cl.[5] D06B *3/10*

U.S. Cl. 8—149.1 **16 Claims**



1. In a process for the wet treatment of materials by means of chemicals dissolved in a liquid contained in a vessel, including the steps of heating the liquid to a predetermined temperature and moving the liquid through the materials by means of a pumping unit at least during a part of the duration of the treatment, the improvement comprising initially heating the liquid to a temperature of between 50° and 80° C., subsequently reducing the pressure in the vessel until a preselected negative pressure value is reached, wherein the preselected negative pressure corresponds to a saturation vapor temperature which is between 5° and 30° C. lower than the predetermined temperature of the liquid, and generating a plurality of bubbles forming fine pores within the entire liquid, whereby an intensive additional movement is imparted to the liquid, wherein the bubbles are generated by introducing small quantities of a gas into the vessel, the gas being of the type which does not condense under operating conditions defined by the predetermined temperature, the preselected negative pressure value and the liquid, and which does not dilute the liquid.

4,928,339

POT-TYPE BEARING FOR CONSTRUCTIONS SUCH AS BRIDGES OR THE LIKE

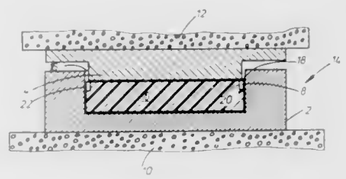
Ernst Klawe, Erding, Fed. Rep. of Germany, assignor to Friedrich Maurer Söhne GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,330

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802580

Int. Cl.[5] E01D *19/06*; F16C *27/06*

U.S. Cl. 14—16.1 **12 Claims**



1. A pot bearing which includes a bearing pot having a cylindrical internal pot wall, a pressure pad mounted within said bearing pot and having a circumferential groove which extends about the upper peripheral edge thereof, a bearing cap including a cylindrical portion which extends within said bearing pot and has a lower portion which abuts against the upper portion of said pressure pad whereby said pressure pad supports said bearing cap, the outer periphery of said cylindrical portion being spaced apart from said cylindrical internal pot wall to provide a gap therebetween, and wherein the tilting of said bearing cap in said bearing pot is allowed by a minimum play of $\Delta d = g \times \sin \alpha$ in which Δd corresponds to the difference between the inner diameter of said cylindrical internal pot wall and the outer diameter of the said cylindrical portion of said bearing cap, g is the height of that part of said bearing cap which extends within said bearing pot, and α is the maximum occurring tilt angle of said bearing cap in said bearing pot, and a cylindrical bearing seal mounted within said circumferential groove of said pressure pad, said bearing seal having a peripheral surface for abutment against said cylindrical internal pot wall of said bearing pot and being of a height for engagement of the upper portion thereof with said lower portion of said bearing cap, said bearing seal overlapping said pressure pad and being of a width for sealing off the gap between the outer periphery of said cylindrical portion of said bearing cap when said bearing cap is normal to said bearing pot and when said bearing cap is tilted from the normal of said bearing pot as allowed by a minimum play of $\Delta d = g \times \sin \alpha$.

4,928,340

DOCK LEVELER

James C. Alexander, London, Canada, assignor to Serco Corporation, London, Canada

Filed Feb. 24, 1989, Ser. No. 315,060

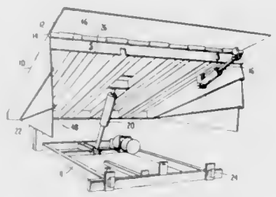
Int. Cl.[5] E01D *1/00*

U.S. Cl. 14—71.3 **9 Claims**

1. A dock leveler comprising:
   - a platform
   - hinge means coupling said platform to a stationary member,

means to move said platform from one position to another position, and

a series of spaced split box beams mounted to said platform to provide support for said platform with torsional flexibility,



wherein each of said split box beams comprise a pair of elongated angle sections held in place by web plates positioned between said angle sections, and

said angle sections separated to have a split extending the length of each said split box beam.

4,928,341

ATTACHMENT FOR A SQUEEZE MOP

Albert J. Pacione, 656 Elm St., Englewood, Fla. 34223

Continuation-in-part of Ser. No. 102,167, Sep. 29, 1987, Pat. No. 4,856,835. This application Feb. 23, 1989, Ser. No. 314,030

Int. Cl.[5] B08B *13/00*

U.S. Cl. 15—105 **6 Claims**



1. A litter picking conversion kit for converting a butterfly-type sponge mop into a litter picking device, wherein the butterfly-type sponge mop is comprised of:

an elongated handle having a support plate secured at one end thereof, a pair of operating plates pivotally secured to said support plate at opposite sides thereof, means for pivoting said operating plates from a first position wherein the operating plates are located in a common plane to a second position wherein said plates are disposed substantially parallel to each other and sponge means secured to said operating plates whereby water may be squeezed from the sponge means upon pivotal movement of said operating plates from said position to second position;

said conversion kit comprising rigid litter engaging means adapted to be secured to an undersurface of each of said operating plates in lieu of said sponge means and securing means for connecting said litter engaging means to said operating plates whereby upon pivotal movement of said operating plates from said first position to said second position, said litter engaging means will move toward each other to engage litter and hold it for pick-up and transfer to a suitable trash receptacle.

4,928,342

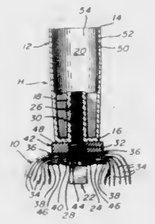
MOP HOLDER

Herbert D. Friedman, and Mark A. Friedman, both of Montreal, Canada, assignors to Cancot Industries Inc., Montreal, Canada

Filed Feb. 21, 1989, Ser. No. 312,470

Int. Cl.[5] A47L *13/24*

U.S. Cl. 15—145 **9 Claims**



1. A mop holder for a yarn-type mop head comprises a shank including a tubular sidewall, a bottom wall at a lower end of said sidewall and a threaded sleeve extending substantially at right angles from said bottom wall inside said shank, at least an upper part of said sidewall being adapted for connection to a mop handle; an elongated member having a threaded rod extending generally at right angles therefrom and intermediate thereof wherein the elongated member defines a pair of shoulders on either side of the rod, said rod comprising first and second threaded parts, said second threaded part being located intermediate said elongated member and said first threaded part, said second threaded part being of larger diameter than said first threaded part, said mop head defining an opening of larger diameter than said second threaded part of said rod for being positioned therearound; and a mop head retaining member including a threaded opening defined therethrough being adapted for threadably engaging said second threaded part of said rod whereas said sleeve of said shank is adapted for threadably engaging said first threaded part of said rod, whereby said mop head is secured to said mop holder by way of said mop head retaining member cooperating with said elongated member.

4,928,343

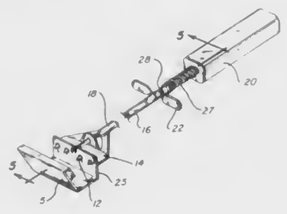
SCOURING PAD TOOL

Mark R. Kissinger, 1374 Buckwood La., Monument, Colo. 80132

Filed Oct. 31, 1988, Ser. No. 264,367

Int. Cl.[5] A47L *17/08, 13/04*

U.S. Cl. 15—209 D **3 Claims**



1. A holding implement for a flexible pad comprising in combination:

an elongated handle forming shaft;

a pad mounting shoe having upturned side members,

the first of which side members is attached to the shaft and contains at least one aperture

and the second of which side members has an overturned edge forming pad gripping means;

reciprocally movable pad clamping means slidably carried by the shaft to engage a pad disposed against the handle facing surface of the first side member where the pad clamping means includes at least one tooth projection sized and positioned to be introduced into the said aperture when the pad clamping means is moved toward the said first side member.

4,928,344

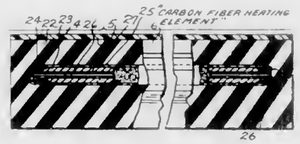
ELECTRICALLY HEATED WIPER BLADE UTILIZING FIBROUS CARBON HEATING ELEMENT

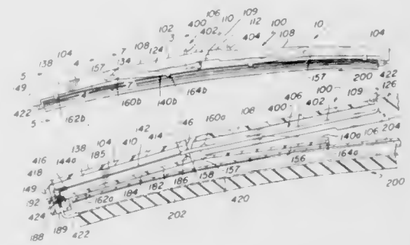
William R. Bliss, 120 Possum Hollow Rd., Newark, Del. 19711

Filed Apr. 18, 1988, Ser. No. 182,507

Int. Cl.[5] H05B *3/14, 3/36;* **B60S** *1/38*

U.S. Cl. 15—250.06 **5 Claims**





1. A heated wiper blade unit, comprising:

an elastic, electrically non-conductive wiper blade having a length and, in cross section, a geometric center;

a flexible, fibrous carbon heating element, including a plurality of elongated, fibrous carbon strands and a heat shrunk polymeric tube coaxially surrounding the strands, said heating element being disposed in the wiper blade, extending substantially along the length of the blade, and having first and second ends;

a first live wire entering said blade at an intermediate point along said length and extending through said blade to establish an electrical connection with said carbon strands at the first end of the heating element; and

a second ground wire entering said blade at an intermediate point along said length and establishing an electrical connection with the second end of the heating element.

4,928,345

HEATED WINDSHIELD WIPER BLADE AND HOLDER

Elliott A. Meltzer, Cherry Hill, N.J., and Albert A. DiIoia, Willow Grove, Pa., assignors to Thermo-Blade, Inc., Bensalem, Pa.

Continuation of Ser. No. 123,682, Nov. 23, 1987, abandoned. This application May 10, 1989, Ser. No. 351,292

Int. Cl.[5] B60S *1/04;* **B60L** *1/02*

U.S. Cl. 15—250.06 **17 Claims**

1. An electrically heated windshield wiper assembly adapted to be mounted on a wiper arm which sweeps across the windshield of a motor vehicle and adapted to be connected to an electrical source, said wiper assembly comprising:

wiper blade means for wiping said windshield;

blade carrier means adapted to receive said wiper blade means for holding said wiper blade means therein in conformation to the shape of windshield, said blade carrier means being connectable to said wiper arm; and

heating means passing through said blade carrier means and said wiper blade means for heating said wiper blade means and said blade carrier means, said heating means being adapted to be connected to said electrical power source;

said wiper blade means being comprised of:

resilient blade member means for wiping the surface of said windshield, said blade member means being elongated and having a passageway running longitudinally through the entire length thereof, said passageway being open at each end of said blade member means;

said blade carrier means being comprised of:

a body member having first and second ends,

a pair of blade holder members pivotally connected one each to said first and second ends of said body member, each blade holder member having an enclosed hollow interior compartment; and

said heating means being comprised of:

a pair of first electrical conductors passing through said body member of said blade carrier means,

a first heating element within each enclosed hollow compartment of said blade holder members, each first heating element being an exposed filament connected at a first end thereof to one of said first electrical conductors within said hollow compartment and spaced from the interior surface of said compartment,

a second heating element having first and second ends positioned within said passageway in said blade member means, said first and second ends of said second heating element being spaced within said passageway a distance from the respective ends of said passageway,

a plurality of second electrical conductors each having a first end and each second electrical conductor at said first end thereof being connected to said second heating element within said passageway in said blade member means, and

connecting means located at a second end of each of said first heating elements and at a second end of each of said second conductors for electrically connecting said first heating elements and said second electrical conductors.

4,928,346

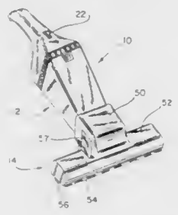
HAND-HELD VACUUM CLEANER WITH POWER BRUSH

Donald E. Elson, Baltimore, Md.; Burton E. Gerke, Jr., Newtown, Conn.; Michael E. Bitzel, Monroe, Conn.; Bruce A. Wilder, Clinton, Conn.; Stanley J. Rodowsky, Jr., Baltimore; William R. Lessig, III, Hunt Valley, both of Md.; Jeffrey S. Adams, Baltimore, and Todd A. Hagan, Hampstead, both of Md., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 929,103, Nov. 7, 1986, Pat. No. 4,841,594. This application Apr. 28, 1989, Ser. No. 344,383

Int. Cl.[5] A47L *5/26*

U.S. Cl. 15—338 12 Claims



1. A hand-held vacuum cleaner, comprising:

a dust bowl having first and second surfaces disposed at an angle relative to one another to converge toward an air intake opening at an end of said dust bowl;

a power brush attachment having an air inlet and an air outlet and detachably connectable to said end of said dust bowl, said power brush attachment including a rotatably mounted brush adjacent said air inlet thereof and including an electric motor connected to said rotatably mounted brush to effect rotation thereof;

a power unit at the end of said dust bowl opposite from said air intake opening end of said dust bowl and including another electric motor and means connected to said other electric motor for inducing an air flow into said air inlet of said power brush attachment to said air outlet thereof and into said air intake opening of said dust bowl;

means for detachably connecting said power brush attachment and said air intake opening end of said dust bowl, said connecting means including a first electrical contact pair mounted adjacent the air intake opening end of said dust bowl and a second electrical contact pair mounted on said power brush attachment, said first electrical contact pair detachably engagable with said second electrical contact pair, said connecting means including means for telescopically interengaging said air outlet of said power brush attachment and the air intake opening end of said dust bowl; and

an electrical circuit for electrically interconnecting said first- and second-mentioned electric motors through said first and second contact pairs and including a user-operable switch for selectively applying and interrupting the electrical circuit to said first- and second-mentioned electric motors.

4,928,347

VACUUM CLEANER DUST BOWL LATCH AND RELEASE SYSTEM

Charles Z. Krasznai, Trumbull, and Richard B. Kosten, West Haven, both of Conn., assignors to Black & Decker Inc., Newark, Del.

Filed Jan. 9, 1989, Ser. No. 294,615

Int. Cl.[5] A47L *5/24*

U.S. Cl. 15—344 5 Claims

1. A hand-held vacuum cleaner comprising:

a power unit;

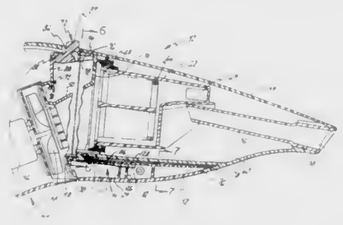
a dust bowl;

a first latch means for securing a first portion of said dust bowl to said power unit;

a second latch means for securing a second portion of said dust bowl to said power unit;

said first latch means including actuation means for releasing said first portion of said dust bowl from said power unit, in response to manual actuation thereof;

interconnection means operatively coupling said actuation means to said second latch means for operating said second latch means in response to said manual actuation of said actuation means to thereby release said second portion of said dust bowl from said power unit, whereby coordinated operation of said first and second latches is attained, said interconnection means includes a first member displaced by actuation of said first latch means and at least one leg fixed to said first member and contacting said



second latch means for operating said second latch means upon actuation of said first latch means; and

said second latch means includes:

a spring bar;

means for clamping a first portion of said spring bar to said power unit, and leaving a second portion thereof free to be displaced against the resilient resistence thereof; and

a latch cam fixed to said spring bar for engaging said dust bowl;

wherein said interconnection means includes at least one leg for contacting said spring bar, when actuated by the operation of said actuation means; and

wherein an end of said spring bar is displaced by said at least one leg sufficiently to disengage said latch cam from said dust bowl, whereby said second latch means is released and said power unit is released from said dust bowl.

4,928,348

METHOD AND APPARATUS FOR REMOVING AND COLLECTING DUST

James E. Clayton, P.O. Box 589, 30 Southard Ave., Hebertsville, N.J. 07727

Division of Ser. No. 894,386, Aug. 11, 1986, Pat. No. 4,780,927, which is a continuation of Ser. No. 650,197, Sep. 13, 1984, abandoned. This application Oct. 28, 1988, Ser. No. 263,699

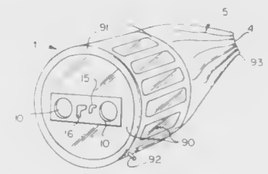
Int. Cl.[5] A47L *5/14, 9/14*

U.S. Cl. 15—345 6 Claims

3. An apparatus for removing and collecting dust from a brake assembly fixed to a horizontally extending vehicle axle before, during and after brake drum removal, said apparatus comprising:

a containment hood comprising shroud means and a visually transparent upper portion superposed above a lowest horizontal plane of the containment hood that comprises a substantially planar tray made of a material sufficiently strong and supported so as to bear at least the weight of a removed brake drum, an open front end defined within a vertical plane by an edge of said visually transparent upper hood portion and an edge of said planar lower tray and sufficiently large so that a brake assembly, with the brake drum still in place upon said axle horizontally may enter into said containment hood through said shroud means connected to said open front end, said containment hood further comprising, at least two portals for providing manual access to said brake assembly;

wherein said containment hood open front end is adapted to be horizontally moved over a brake drum still in place upon an axle, whereupon said shroud means is adapted to substantially close said open end in a surrounding relationship with respect to said axle, whereupon further said brake drum may then be removed within said containment hood by manipulation through said portals and temporary placement upon said planar tray; and



a base supporting a self-contained vacuum means and filtering means; and

supporting means fixed to said base for supporting said planar tray and superposed containment hood at an adjustable height above said base so as to permit said horizontal movement of the containment hood over said axle; and

conducting means extending from proximate the planar tray and through the containment hood for allowing a current of air induced by said vacuum means to flow between the inside of said hood and high efficiency filtering means.

4,928,349

GROMMET STRUCTURE

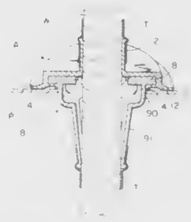
Ryuetsu Oikawa, and Akihiko Fujita, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 217,029, Jul. 11, 1988. This application Apr. 14, 1989, Ser. No. 337,804

Claims priority, application Japan, Jul. 15, 1987, 62-107512[U]

Int. Cl.[5] F16L *5/02*

U.S. Cl. 16—2 7 Claims



6. A grommet as claimed in claim 5, wherein said stop portion is located from said hinge portion at a distance greater than a thickness of said resinous lock member.

4,928,350

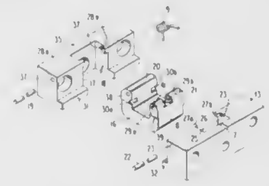
MULTIPLE AXIS HIDDEN HINGE

James C. Morgan, 2922 Vancouver Dr., Little Rock, Ark. 72204

Continuation-in-part of Ser. No. 229,437, Apr. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 59,430, Jun. 8, 1987, abandoned. This application Jul. 27, 1989, Ser. No. 385,701

Int. Cl.[5] E05F *1/10*

U.S. Cl. 16—297 42 Claims



1. A multiple axis hidden hinge suitable for joining a first member and a second member, said hinge comprising:

(a) a first mounting plate, said mounting plate including a pair of bracket members;

(b) a substantially U-shaped link having a base and two substantially parallel arms, the first arm of said link being pivotally attached near its end to and between said first plate bracket members, the axis of rotation of said attachment being substantially perpendicular to the U-shaped plane of the link, said link and first mounting plate being pivotable between a first limit and a second limit;

(c) a second mounting plate also having a pair of bracket members, the second arm of said link being pivotally attached near its end to and between said second plate bracket members, the axis of rotation of said attachment being substantially perpendicular to the U-shaped plane of the link, said link and second plate being pivotable between a first limit and a second limit; and

(d) means for increasing the inertial resistance between said first mounting plate and said link, partially restraining said first mounting plate and said link from being swung apart when they are at their first limit of pivot, said hinge including no such means for increasing the inertial resistance between said link and said second mounting plate.

4,928,351

METHOD AND DEVICE FOR OPERATING AN INSTALLATION FOR DIVIDING UP SLAUGHTERED POULTRY AND FOR TEMPORARILY INTERRUPTING THE TRANSPORT OF POULTRY CARCASSES OR PARTS

Adrianus J. van den Nieuwelaar, Gemert, and Petrus C. H. Janssen, Wilbertoord, both of Netherlands, assignors to Stork PMT B.V., Netherlands

Filed Dec. 1, 1988, Ser. No. 278,584

Claims priority, application Netherlands, Dec. 1, 1987, 8702887

Int. Cl.[5] A27C *21/00*

U.S. Cl. 17—11 23 Claims

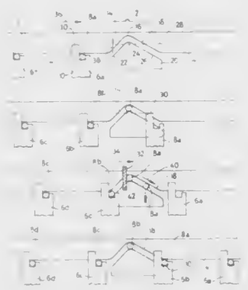
1. Installation for dividing up slaughtered poultry or parts thereof comprising:

a plurality of operating stations at which the poultry or parts may be operated upon; a transport track for transporting the poultry or parts thereof along a path past the operating stations in sequence; support and moving means at spaced intervals along the transport track for supporting a poultry or part thereof and moveable along the path of the transport track to the stations in sequence;

at a first one of the operating stations, an interrupting device for temporarily interrupting the transport by the respective moving means of the poultry or part then passing the first station, while maintaining the movement of the transport track and the moving means and of the other poultry

or parts thereof, the interrupting device comprising means for displacing the poultry or part off the path of the transport track;

examining means at the first station for examining at least



one criterion of the poultry or part; an evaluating device for evaluating the result of the examination by the examining means and a control device for controlling the subsequent operation upon the poultry or part depending upon the evaluation by the evaluating device.

4,928,352

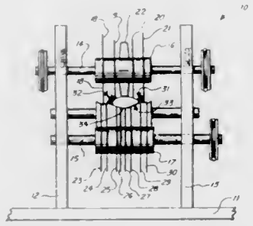
CRAWFISH PEELING APPARATUS

Glenn Thibodeaux, Rte. 3, Box 75-A, Church Point, La. 70525

Filed Jun. 9, 1989, Ser. No. 364,808

Int. Cl.[5] A22C *29/02*

U.S. Cl. 17—73 **9 Claims**



1. A crawfish peeling apparatus for separating the crawfish dorsal and ventral tail exoskeleton portions from the soft inner meat product comprising:

a. a frame;

b. scissor cutter means supported by the frame for making longitudinal edge cuts along the left and right sides of the crawfish tail by a scissor action of cooperating upper and lower blades positioned during cutting respectively to cut the dorsal and ventral tail shell sections so that the cuts extend substantially the full length of the crawfish tail;

c. feed means for advancing a crawfish tail to be peeled along a travel path that traverses the cutter means; and

d positioning means for aligning the crawfish tail and cutter means during cutting so that both the dorsal and ventral tail exoskeleton portions are cut by the cutter means.

4,928,353

METHOD AND MEANS FOR EFFECTING A CONTROLLABLE CHANGE IN THE PRODUCTION OF A FIBER-PROCESSING MACHINE

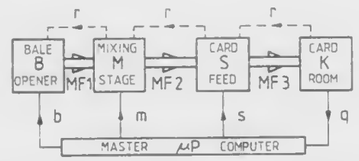
Robert Demuth, Nürensdorf; Paul Stäheli, Wilen b. Wil; Rene Wäber; Christoph Gründler, both of Winterthur, and Franz Mächler, Neftenbach, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Oct. 3, 1988, Ser. No. 252,901

Claims priority, application Switzerland, Oct. 7, 1987, 03911/87

Int. Cl.[5] D01G *23/00*

U.S. Cl. 19—65 A **8 Claims**



1. A method of adjusting the production of a fiber-processing installation containing a plurality of consecutive different fiber-processing stages, comprising the steps of:

monitoring the total production of the fiber-processing installation in terms of material throughflow per unit time and per unit length of an effective working width of a last one of the plurality of consecutive different fiber-processing stages; and

changing a variable effective working width of at least one predetermined fiber-processing stage preceding said last one of the plurality of consecutive different fiber-processing stages of the fiber-processing installation in order to effect a change in the production of the fiber-processing installation in terms of said material throughflow per unit time and per unit length of said effective working width of said last one of said plurality of consecutive different fiber-processing stages.

4,928,354

METHOD AND APPARATUS FOR REMOVAL OF FIBER FLOCKS FROM FIBER BALES

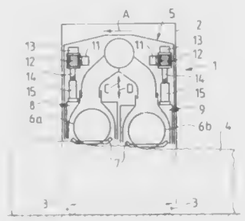
Daniel Hanselmann, and Walter Schlepfer, both of Winterthur, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 26, 1989, Ser. No. 302,815

Claims priority, application Switzerland, Feb. 4, 1988, 00400/88

Int. Cl.[5] D01B *1/00*

U.S. Cl. 19—97 **23 Claims**



1. A method of removing fiber flocks from a row of fiber bales, said method comprising the steps of

passing at least a pair of parallel rotating removal rolls over the fiber bales for removing fiber flocks from the bales: and

maintaining the rolls at different levels from each other

during travel over the bales to obtain different depths of penetration of the rolls into the fiber bales.

4,928,355

LAP EVENER FOR A FIBER PROCESSING MACHINE

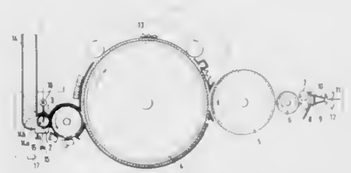
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchengladbach, Fed. Rep. of Germany

Filed Oct. 3, 1988, Ser. No. 261,518

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1987, 3733631

Int. Cl.[5] D01G *15/40*

U.S. Cl. 19—105 **11 Claims**



1. In a textile fiber processing assembly including

a feed chute adapted to be charged with fiber material and having a bottom portion provided with an outlet opening through which the fiber material is discharged;

a fiber feeding arrangement positioned externally of the feed chute downstream of the outlet opening as viewed in a direction of advance of the fiber material upon discharge thereof from said outlet opening: said fiber feeding arrangement including two cooperating components; one of said components being a feed roller and the other of said components being a counterelement; one of said components being stationarily supported and the other of said components being movably supported to allow excursions thereof towards and away from the respective other component as a function of the thickness of fiber material passing through the fiber feeding arrangement;

a drive motor connected to said feed roller for rotating said feed roller; and

a carding machine having an input and licker-in situated at said input downstream of said fiber feeding arrangement and arranged for receiving the fiber material advanced by said fiber feeding arrangement;

the improvement wherein said feed roller adjoins said outlet opening for drawing fiber material from the feed chute through said outlet opening; further wherein said feed roller immediately adjoins said licker-in for advancing the fiber material directly to said licker-in;

the improvement further comprising a measuring member connected to the movably supported component and arranged for generating signals representing said excursions; and control means for connecting said measuring member to said drive motor for controlling the rotation of said feed roller as a function of said signals.

4,928,356

TOP COMB FOR TEXTILE MACHINERY AND PROCESS FOR CLEANING SAME

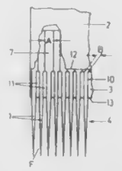
Josef Egerer, Schwabach, Fed. Rep. of Germany, assignor to Staedtler & Uhl, Schwabach, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 239,339

Int. Cl.[5] D01G *19/00*

U.S. Cl. 19—129 R **13 Claims**

1. Needle strip, in particular a top comb, for textile machinery and the like, comprising at least one row of needles and first and second cover plates, said first and second cover plates holding in place said row of needles, wherein the points of the needles extend to a certain distance past the bottom edge of said cover plates, thus forming open passageways between the needles, and wherein a cleaning appliance for the removal of deposits that have settled in the open passageways is associated



with the needle strip, characterized in that the needle strip comprises at least one air channel (11) in order to conduct a flow of air (17) through or past the open passageways (F) to clean them.

4,928,357

LAP GUIDE ARRANGEMENT FOR A COMBING MACHINE

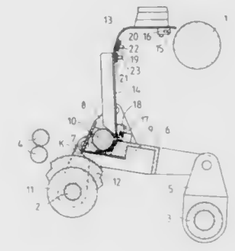
Heinz Clement, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Apr. 5, 1989, Ser. No. 333,459

Claims priority, application Switzerland, Apr. 19, 1988, 01425/88

Int. Cl.[5] D01G *19/16*

U.S. Cl. 19—225 **20 Claims**



1. A lap guide arrangement for a combing machine comprising

a first guide plate having first means at one end for mounting on a frame adjacent a lap roller;

a second guide plate having second means at one end for moutning on a reciprocal nipper adjacent a feed roller; and

at least one strip of flexible material fixed to and between said plates to permit pivoting of said plates relative to each other.

4,928,358

PULL TAB FOR SLIDE FASTENER SLIDERS

Susumu Ishii, Kurobe, and Hideyuki Matsushima, Toyama, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 9, 1989, Ser. No. 307,959

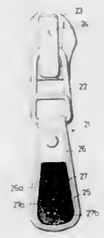
Claims priority, application Japan, Feb. 12, 1988, 63-17787[U]

Int. Cl.[5] A44B *19/26*

U.S. Cl. 24—431 **6 Claims**

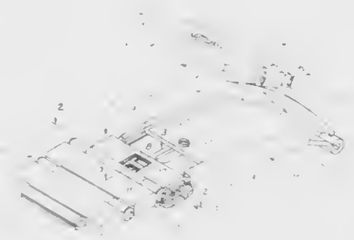
1. A pull tab for slide fastener sliders of the type having a one-piece pull tab body formed of a soft elastic material such as soft synthetic rubber or soft synthetic resin, and pivotally connected to a support lug on a slider body by means of a connector, said one-piece pull tab body having an integral grip

portion for being gripped by the user's fingers and constituting a major part of said pull tab body, wherein the improvement comprises: a single soft elastic grip mound provided integrally on said grip portion and raising from at least one of front and rear surfaces of said pull tab body, said grip mound having a



roughened outer surface of a leather-like appearance and being elastically deformable to fit the shape of the user's finger when said grip portion is gripped, said grip mound being inwardly spaced from an outer peripheral edge of said pull tab body and having an outer peripheral wall extending substantially parallel to said outer peripheral edge of said pull tab body.

4,928,359
EXTENDABLE BRACELET CLASP WITH FINE ADJUSTMENT
Gaston Gagnebin, Bienne, Switzerland, assignor to Omega SA, Bienne, Switzerland
Filed Jul. 14, 1989, Ser. No. 379,814
Claims priority, application France, Jul. 15, 1988, 88 09716
Int. Cl.[5] A44C *5/24*
U.S. Cl. 24—71 J 5 Claims



1. A bracelet clasp including a first element attached to one end of the bracelet and a second element attached to the other end of the bracelet the longitudinal extent of said bracelet between said ends defining a longitudinal direction, the first and second elements cooperating to assure latching of the clasp by superposition of said elements, the first element bearing a hook provided with a beak directed perpendicular to the longitudinal direction of the bracelet and the second element being pierced with at least one opening into which the hook may be introduced, a catch being captively mounted under the second element and slidable relative thereto in a direction perpendicular to said longitudinal direction, the catch exhibiting a portion emerging laterally from said second element in a direction perpendicular to said longitudinal direction under the return force of a spring, said portion serving as a push button adapted to be operated by a finger so as to displace the catch against the spring action, said catch being provided with a first hole partially set off relative to the opening in the second element so that when the hook is introduced into the opening of the second element it then engages with said first hole of the catch so as to displace said catch gradually against the action of the spring until the beak of the hook passes under the catch and latches the first element to the second element, said catch being displacable by finger pressure on the push button so as to align said opening with said first hole thus to permit opening of the clasp, and said catch being provided with a second hole identical with the first hole and placed therebeside in the longitudinal sense of the bracelet, the hook thus being capable of introduction into the first or the second hole in accordance with whether the bracelet is to embrace tightly or loosely the member bearing it.

4,928,360
BOARD ANCHOR
John W. Wilbanks, 6806 Log Hollow, #210, Houston, Tex. 77088
Filed Jul. 10, 1989, Ser. No. 377,145
Int. Cl.[5] A44B *13/02*
U.S. Cl. 24—235 6 Claims



1

A spine board anchor comprising:

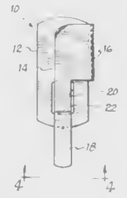
A body portion having a hook-like portion with a leading edge adapted to pass through a board aperture and an adjacent leg extending laterally from said hook-like portion, said leg having a trailing edge and a pair of spaced apertures through said leg adjacent said trailing edge;

a bifurcated gate, said gate including a pair of spaced jaws linked by pivot means and coiled spring means biasing one of said jaws toward a position blocking removal of said board anchor from said board, the other of said jaws including a pair of spaced apertures therethrough, each of said jaws including pivot-pin-accommodating tube means, pivot pin means insertable through said tube means, said spring means encircling said pivot pin and adapted to regulate movement of said one jaw relative to the other jaw;

a retainer member having a central slot therethrough adapted to receive a section of webbing, said retainer also having a pair of apertures therethrough; and

said body portion, gate and retainer are each fabricated of materials rendering them autoclavable and each of their respective pairs of apertures are aligned and removably secured together, sandwich style, by removable fastener means, said sandwich comprising a central member formed by said gate's other jaw and outer members formed respectively by said body portion's adjacent leg and said retainer member, said retainer's slot, stubs and said removable fasteners comprising means permitting ready field disassembly and assembly of said anchor.

4,928,361
PAPER CLIP
James Brown, 2330-10 Grove Ave., San Diego, Calif. 92154
Filed Oct. 10, 1989, Ser. No. 418,521
Int. Cl.[5] B42F *1/02*
U.S. Cl. 24—67.9 4 Claims



1. A clip comprising:

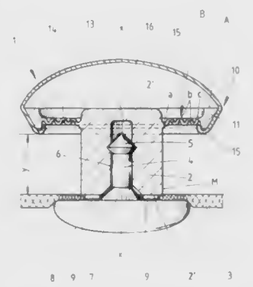
(a) a back panel;

(b) a resilient front panel connected to said back panel along the edge thereof adjacent the upper edge of said back panel;

(c) said back panel extending down further than said front panel, and said panels lying substantially flush against one another; and

(d) a resilient spring finger extending down from said front panel and being pressed against said back panel and being oriented to at least partially press against paper captured between said front and back panels, wherein said back panel has an opening in the lower portion thereof aligned with said finger such that said finger extends across said opening and extends well past the lower edge of said back panel.

4,928,362
BUTTON, PARTICULARLY FOR ARTICLES OF CLOTHING
Wolfgang Collas; Günter Wolfertz, and Roger Wolfertz, all of Wuppertal, Fed. Rep. of Germany, assignors to Schaeffer GmbH, Wuppertal, Fed. Rep. of Germany
Filed Oct. 20, 1988, Ser. No. 260,801
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 8714192[U]
Int. Cl.[5] A44B *18/00, 42/00*
U.S. Cl. 24—90 R 8 Claims



1. A button comprising

a button shank adapted to be fastened to an article of clothing; and

a button plate integrally formed with said shank; and wherein

said button plate comprises an edge bead concentric to an axis of the shank, and a bridge of flexible material connecting the bead to the shank; and wherein

said bridge receives buttoning forces and concentrically surrounds the button shank; and

said bridge is sufficiently flexible to permit displacement of said bead along an axis of said shank.

4,928,363
ZIPPER SECURING RING
Wayne Easton, R.R. 1, Box 156H, East Carondelet, Ill. 62240
Filed Jun. 26, 1989, Ser. No. 371,318
Int. Cl.[5] A44B *19/26*
U.S. Cl. 24—390 1 Claim



1. A fastening attachment secured to the top portion of a zipper slide to prevent inadvertent opening of the closure wherein the improvement comprises:

(a), a flat strip of metal having an orifice at one end;

(b), the strip of metal tapering down to a point at the other end;

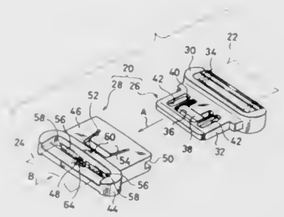
(c), the diameter of the orifice sufficiently large to encircle the securing button on the waist band of a mans jeans, or trousers;

(d), a hook shaped clamp, extending normal to the surface of the flat strip, at the pointed end of the strip;

(e), the hook clamp having a width compatible with the orifice in the top of the slidable zipper fastener; and,

(f), hook of the flat metal strip engaging the slidable zipper with the top orifice over a support button locks the zipper in the upward closed position.

4,928,364
BUCKLE
Yasuhiko Ikeda, Toyonaka, Japan, assignor to NIFCO, Inc., Yokohama, Japan
Filed Jun. 20, 1989, Ser. No. 368,758
Claims priority, application Japan, Jun. 22, 1988, 63-82767[U]
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—614 6 Claims



1. A push-type buckle, comprising:

a first buckle body having an engaging portion;

a second buckle body having an opening into which said first buckle body is inserted;

a receiving portion provided upon said second buckle body

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for housing and engaging said engaging portion of said first buckle body upon insertion of said first buckle body into said second buckle body so as to prevent withdrawal of said first buckle body from said second buckle body but permitting further insertion of said first buckle body into said second buckle body;

a movable member provided upon said first buckle body for movement in the direction of insertion into and withdrawl from said second buckle body and functioning to release said engagement defined between said first and second buckle bodies upon further insertion of said first buckle body into said second buckle body from the state of engagement; and

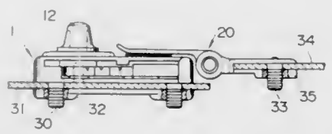
elastic flexing portions, formed upon a portion of said receiving portion of said second buckle body facing the insertion end of said first buckle body, extending in a direction perpendicular to the directions of insertion and withdrawal of said first buckle body with respect to said second buckle body and being elastic in the direction of insertion of said first buckle body for engaging said engaging portion of said first buckle body with a first predetermined force in order to prevent insertion of said first buckle body into said second buckle body beyond said, state of engagement, and for defining a second predetermined force against which said first buckle body must be moved from said state of engagement and in said direction of insertion in order to achieve disengagement of said first buckle body from said second buckle body.

4,928,365

BUCKLE

Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 23, 1989, Ser. No. 370,717
Claims priority, application Japan, Jun. 25, 1988, 63-84146[U]
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—635 **9 Claims**



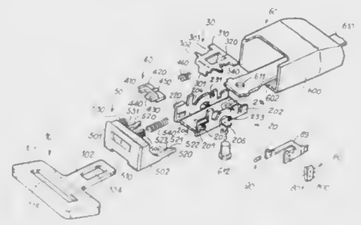
1. A buckle comprising: a male member having a tongue-shaped presser having on its lower side a pair of engaging legs; a female member being in the form of a case and including in its upper side an aperture for insertion of the engaging legs, and a pair of transversely spaced resilient arms formed integrally to one end of the female member and terminating in free ends for angular movement around their proximal ends against their own resiliency, the arms having engaging means for engagement with the engaging legs when the engaging legs are forced through an aperture; and an uncoupling means for bringing the engaging means out of engagement with the engaging legs, the uncoupling means having a disk rotatably mounted on the upper side of the female member; the uncoupling means further including linking means for so operatively linking the disk and the resilient arms that the rotation of the disk causes the resilient arms angularly move against their own resiliency, thereby bringing the engaging means out of engagement with the engaging legs.

4,928,366

SIMPLIFIED AND IMPROVED SAFETY-BELT BUCKLE

Jean-Noël Ballet, Aillevilliers, France, assignor to ECIA - Equipements et Composants pour l'Industrie Automobile, Audincourt, France

Filed May 3, 1989, Ser. No. 346,683
Claims priority, application France, May 6, 1988, 88 06170
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—641 **17 Claims**



1. Safety-belt buckle in particular for a land-type automotive vehicle, which is intended to join a strap to an anchorage point and which consists, in particular, of a latch (**10**) and of a keeper comprising, among other things, a base (**20**) and, carried by the latter, a lock (**30**), an ejector guide (**40**), an actuating button (**50**) and, if necessary, a protective covering (**60**), in which this base (**20**) defines a channel (**200**) intended to receive at least partially the latch (**10**), this lock (**30**) being mounted on this base (**20**) by means of an articulation (**230**) which allows it to move in practice only by pivoting so as to be movable between at least two positions towards which it is elastically biased, a first releasing position where the latch (**10**) is unlocked and the lock (**30**) is away from the ejector guide (**40**) and a second retaining position where the latch (**10**) is locked on the keeper by the lock (**30**), this ejector guide (**40**) having a seat (**400**) intended to receive the latch (**10**) at least partially and being mounted on this base (**20**) so as to be displaceable there in translation such that it is movable between a rest position towards which it is normally elastically biased and which it occupies when the lock (**30**) is in its first position and a set position which it occupies when the lock (**30**) is not in its first position, this actuating button (**50**) being mounted on this base (**20**) so as to be displaceable there in translation such that it is movable between an inactive position towards which it is normally elastically biased and an active position in which it causes the latch (**30**) to pass into its first position, characterized in that this lock (**30**) is deformable elastically towards a third permanently locked position where it is directly

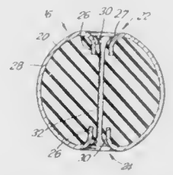
and positively locked to the base (**20**) only through a direct engagement of a lock edge (**71**) with a permanent-locking notch (**72**) of the base (**20**) when it occupies its second position and wherein the locked buckle is subjected to a force tending to open it which is greater than a given value and in that operating and locking means (**70**) associate this actuating button (**50**) and this lock (**30**) and this base (**20**) such that in a first mode, when a force tending to open the locked buckle does not exceed this given value, when the actuating button (**50**) passes from its inactive position to its active position, the lock (**30**) moves from its second to its first position so as to release the latch (**10**) and the ejector guide (**40**) passes from its set position to its rest position so as to eject the latch (**10**) released from the base (**20**) and, in a second mode, when a force tending to open the locked buckle is equal to or exceeds this given value, the actuating button (**50**) is unable to pass from its inactive position to its active position so as to dislodge the latch (**30**) from its third position, cause it to pass through its second position and reach its first position.

4,928,367

EARRING CLUTCH

Sheldon Seidman, Brooklyn, N.Y., assignor to Automatic Findings, Inc., Brooklyn, N.Y.

Division of Ser. No. 154,918, Feb. 11, 1988, Pat. No. 4,843,699.
This application Feb. 6, 1989, Ser. No. 306,696
Int. Cl.[5] A44C *7/00*
U.S. Cl. 24—705 **9 Claims**



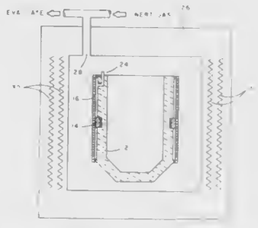
1. An earring clutch comprising a body portion having a hollow shell filled with an elastomer material, said body portion being formed with at least one aperture communicating with an interior of said elastomer material and having a bore in said elastomer material extending from said aperture into the interior of said elastomer material for receiving and releasably frictionally retaining a post portion of the earring, and further comprising at least one flange formed on said shell and defining said aperture, said flange being annularly continuous about an axis of said bore and projecting inwardly of said shell into said interior so that a portion of said elastomer material is located between an inner wall of said flange and said bore thereby covering both sides of said flange in said elastomer material.

4,928,368

METHOD OF DIFFUSION BONDING COPPER AND TITANIUM ALLOYS TO PRODUCE A PROJECTILE

Jacob Greenspan, Newton, Mass., and Gasper J. Sacco, Succasunna, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1989, Ser. No. 320,242
Int. Cl.[5] B21K *21/06*
U.S. Cl. 29—1.22 **6 Claims**



1. A method of diffusion bonding copper and titanium alloy comprising the steps of:

a. providing a copper workpiece and a titanium alloy workpiece to be joined;

b. forming a mating surface between said workpieces;

c. juxtaposing said workpieces at said surface;

d. providing an additional plate of titanium and welding said plate over said copper workpiece and said alloy workpiece to create an assembly having a sealed space between said plate and said alloy workpiece, said plate being in contact with said copper workpiece;

e. evacuating and sealing said space;

f. providing an antoclave chamber and placing said assembly in said chamber;

g. pressurizing said chamber at a selected pressure with an inert gas;

h. heating said chamber at a selected temperature for a selected dwell time;

i. air cooling said chamber;

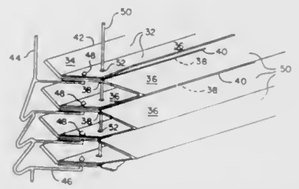
j. removing said assembly from said chamber and removing said plate from said assembly.

4,928,369

METHOD OF MAKING A PLEATED BLIND WITH ARTICULATIVE SLAT EXTENSIONS

John Schnebly, Albany, and Thomas J. Marusak, Loudonville, both of N.Y., assignors to Comfortex Corporation, Cohoes, N.Y.

Continuation of Ser. No. 209,090, Jun. 20, 1988, Pat. No. 4,884,612. This application Jun. 7, 1989, Ser. No. 362,566
Int. Cl.[5] A47H *5/00*; B23P *19/04*
U.S. Cl. 29—24.5 **7 Claims**



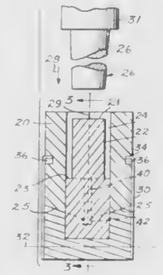
1. The method of making a pleated blind having hingably attached to pleat troughs thereof a plurality of slats, said method comprising demarcating on a sheet of shading material transverse lines of fold and areas to receive adhesive-stiffener coating, applying said adhesive-stiffener, and folding said sheet along a first set of said lines to acquire expandable pleats in non-adhesive areas and along a second set of lines to acquire cojoined adhesively bound pleat-trough extensions in and about one-half the width of the adhesive areas.

4,928,370

TOOL SET FOR CONNECTING SUPERPOSED SHEET METAL WORK PIECES

Gerd-Jurgen Eckold, Silberhutte 11, 3424 St. Andreasberg, and Hans Maass, Germelmannstra. 12, 3422 Bad Lauterberg, both of Fed. Rep. of Germany

Filed Mar. 17, 1989, Ser. No. 324,825
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 8803773
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—243.5 **16 Claims**



1. A tool set to be mounted in and to be driven by a press for

connecting a plurality of superposed sheet metal work pieces of predetermined thickness by forming a joint therebetween, said tool set comprising:

a punch member having a substantially flat end face, and

a die comprising an anvil having a substantially flat end face mounted opposite said punch end face and a forming member surrounding said anvil, thereby defining the sides and a bottom of a die cavity, said forming member being spaced a predetermined distance from at least a portion of said anvil so as to define a gap therebetween which opens toward said anvil face so that upon press actuation metal material can be deformed into said die cavity and said gap, said gap being present when said die is not in use and said gap encompassing the entire circumference of said anvil, said gap being dimensioned so that it is deeper than necessary to form the joint and so said metal material cannot fill said gap, said die including means for supporting said forming member in a stationary manner relative to said anvil during said deformation.

4,928,371

METHOD OF MAKING A SEAL FOR BEARING ASSEMBLY

Franco Colanzi, and Angelo Vignotto, both of Turin, Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Dec. 2, 1988, Ser. No. 278,846
Claims priority, application Italy, Dec. 23, 1987, 68114 A/87
Int. Cl.[5] B21D *53/10*
U.S. Cl. 29—89.064 **2 Claims**



1. Method for producing a sealed rolling bearing assembly including inner and outer rings and a plurality of rolling elements in an annular space between the rings and a rim consisting of the steps of:

a. producing one of the rings with a circumferentially extending seat having a radially directed shoulder (**32**) spaced inwardly from one axial end face of the ring and with a stepped throat area (**31**) between the axial end face and the shoulder, the throat area being defined by a conical lateral wall segment (**34**), and a frusto conical outwardly directed tapered wall segment (**35**);

b. inserting a sealing element comprising a shield member of relatively rigid and plastically deformable material and an elastomeric material completely covering the outer periphery of the shield member, the seal being prior to installation of an inverted L-shaped cross section by an axially extending rim section and a radial section;

c. inserting the seal into the annular space between the rings so that the radial section abuts the shoulder (**32**);

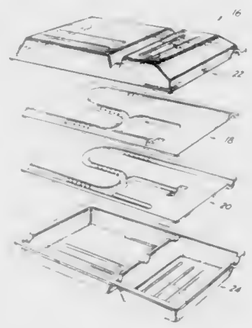
d. and applying a radially outwardly directed sealing force on the axially extending rim section of the seal so that the elastomeric material covering fills the entire throat area and is pinched between the wall segments (**34, 35**), and the seal is seated firmly in place in the throat area.

4,928,372

PROCESS FOR MANUFACTURING STAMP FORMED MUFFLERS

Jon W. Harwood, Toledo, Ohio; Wayne A. Karlgaard, Dyersburg, Tenn., and Michael W. Clegg, Toledo, Ohio, assignors to AP Parts Manufacturing Company, Toledo, Ohio

Filed Apr. 7, 1989, Ser. No. 335,120
Int. Cl.[5] B21K *29/00*
U.S. Cl. 29—890.08 **24 Claims**



1. A process for manufacturing exhaust mufflers, each of said mufflers comprising first and second plates having peripheries, at least one of said plates having an array of channels therein, said muffler further comprising at least one external shell having a peripheral flange and at least one chamber extending from the peripheral flange, said process comprising the steps of:

fixturing said plates in opposed face-to-face aligned relationship such that one plate and the array of channels in the opposed plate define an array of tubes;

securely gripping the plates in aligned relationship;

connecting said plates at a plurality of spaced locations on opposed sides of the channels formed in the plates;

presenting said external shell and the plates to a second fixturing apparatus for disposing the peripheries of the plates and the peripheral flange of the shell in register with one another;

securely urging the peripheries of the plates and the peripheral flange of the shell into direct abutting face-to-face contact;

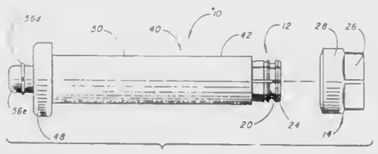
securely connecting the peripheries of the plates and the peripheral flange of the shell to one another.

4,928,373

COLLET TOOL

Ted R. Massa, Latrobe, and David R. Siddle, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Jul. 17, 1989, Ser. No. 380,822
Int. Cl.[5] B25B *27/14*
U.S. Cl. 29—278 **10 Claims**



1. A tool for handling a collet of the type having a forward end portion adapted to be confined within a retainer and a tapered rear end portion where the outside diameter becomes progressively smaller toward the rear end of the collet, said tool comprising:

(a) an elongated sleeve having a collet receiving end section having a collet receiving area including a tapered inlet adapted to be extended over the tapered rear end portion of the collet such that as the sleeve is pushed over the rear end portion of the collet toward the front end portion the collet compresses radially to such a degree that the collet is lodged within the receiving end of the sleeve and the collet is freely removable from the retainer;

(b) a collet ejector reciprocally mounted in the sleeve;

(c) the collet ejector including an elongated plunger having a collet engaging end disposed within the sleeve and an actuator end that extends from the end of the sleeve opposite the collet receiving end; and

(d) wherein the plunger is movably mounted within the sleeve for movement between a retracted position and an extended position wherein in moving from the retracted position to the extended position the plunger is operative to engage and dislodge the collet from the receiving end of a sleeve.

4,928,374

METHOD OF VEHICLE SEAT LATCH

John J. Allen, Cambridge, Md., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 200,339, Jun. 1, 1988, Pat. No. 4,846,526.
This application Apr. 24, 1989, Ser. No. 342,050
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—436 **1 Claim**



1. A method of pivotally connecting a seat back with a seat cushion along a first pivotal axis allowing the seat back to have free pivotal movement forward under low angular accelerations and to restrain pivotal movement of the seat back forward under high angular accelerations, said method in combination comprising:

pivotally connecting said seat back with said seat cushion along said first pivotal axis;

connecting with said seat cushion a first stop fixed with respect to said seat back;

connecting with said seat back a second pivot pin along a second pivotal axis;

pivotally mounting with respect to said seat cushion a slip block along a third pivot pin said third pivot pin being fixed with respect to said seat back;

angularly biasing said slip block against a second angular stop generally fixed with respect to said seat back; and

pivotally connecting on said second pivot pin a pendulum;

contacting said slip block with said pendulum in a direction pivoting said slip block away from said second angular stop when said seat back is pivotally moved forward under low acceleration whereby allowing said seat back to further pivot forward; and

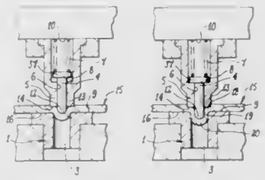
exposing said pendulum to a rearward acceleration of a predetermined value and pivoting said pendulum on said second pivot pin to contact said slip block to pivot in an angular direction towards said second angular stop whereby limiting the forward pivotal travel of said seat back when said seat back has pivotal movement forward under a high angular acceleration.

4,928,375

METHOD OF FORMING A HOLLOW FASTENER FROM SHEET METAL

Bernard M. Hadaway, 10 Highland Avenue, Highett, Victoria, Australia (3190)

Continuation of Ser. No. 86,177, Aug. 13, 1987, abandoned, which is a continuation of Ser. No. 785,610, Oct. 8, 1985, abandoned. This application Sep. 26, 1988, Ser. No. 249,192
Claims priority, application Australia, Oct. 11, 1984, PG7593
Int. Cl.[5] B21D *39/00*; **B23P** *11/00*
U.S. Cl. 29—509 **15 Claims**



1. A method of forming a hollow fastener from metal sheet including the steps of: placing the metal sheet between two dies, one of which has a cavity therein and the other has a plunger connected thereto, said plunger being axially movable relative to the respective said die and being receivable in said cavity with clearance such that an annular space is defined between said plunger and said cavity; causing said plunger to engage a portion of said sheet which overlies said cavity and which is to form an end of said fastener; subjecting said plunger to a bias force so as to urge it towards said cavity and thereby apply pressure against said sheet portion, said pressure being sufficient to apply plastic and elastic stresses to cause said sheet portion to distort and protrude into said cavity but being insufficient to cause said plunger to break through said metal sheet, and to thereby introduce predominant tensile forces into said sheet portion and the immediately surrounding portion of said sheet; closing said dies while maintaining said pressure on the distorted sheet portion and thereby compressing an annular portion of said sheet which surrounds said cavity so as to cause metal to be displaced from that annular portion; and maintaining said bias force on the plunger during said compression so that the pressure thereby applied to said distorted portion causes said displaced metal to be directed to flow and be drawn into the mouth of said cavity and be formed around said plunger under the influence of said predominant tensile forces, and to cause the plunger to move into said cavity while continuing to engage and press against said fastener end, whereby the metal which is displaced flows and is drawn into said cavity through said space to form a constant thickness cylindrical tubular portion between said annular portion and said fastener end and tension is maintained in said tubular portion as it is being formed.

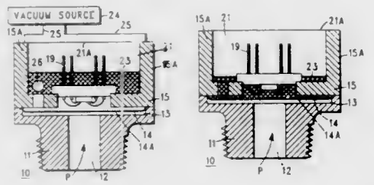
8. A method of securing two sheets in face to face relationship, at least one of which is metal sheet, including the steps of forming at least one hollow fastener on said metal sheet in accordance with the method of claim **1**, forming a hole in the other said sheet to receive said fastener, placing said sheets in face to face engagement with said fastener projecting through said hole, and mechanically deforming the terminal end of said fastener so as to secure said sheets together.

4,928,376

METHOD FOR FILLING A CAVITY, SUCH AS A SENSOR CAVITY, WITH AN INCOMPRESSIBLE FLUID

Lawrence R. Poglitsch, Mt. Prospect, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jul. 31, 1989, Ser. No. 387,563
Int. Cl.[5] B23P *19/04;* B65B *3/04*
U.S. Cl. 29—530 24 Claims



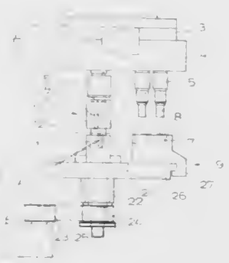
1. A method for filling a sensor cavity with an incompressible fluid comprising the steps of:
providing an external cavity of a sensor fixed to and adjacent to an internal sensor cavity associated with a sensor element, said internal cavity being sealed except for an opening connecting it to said external cavity;
providing a predetermined amount of incompressible fluid in said external cavity;
evacuating gas from said external and internal cavities after said fluid is provided in said external cavity and thereby providing at least a partial vacuum in said internal cavity,
subsequently releasing vacuum pressure on said external cavity such that said fluid is drawn into said internal sensor cavity through said opening from said external cavity: and
subsequently sealing said opening and thereby isolating said external and internal cavities and sealing said internal sensor cavity, whereby said internal sensor cavity is sealed after being filled with said incompressible fluid.

4,928,377

MACHINE TOOL

Karl-Heinz Schulte, Lennestadt, Fed. Rep. of Germany, assignor to Muhr und Bender Maschinenbau GmbH, Attendorn, Fed. Rep. of Germany

Filed Oct. 19, 1989, Ser. No. 424,031
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1988, 3838198
Int. Cl.[5] B23P *23/00;* B21D *43/00;* B26D *9/00*
U.S. Cl. 29—560 18 Claims



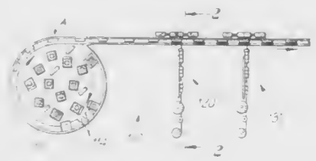
1. A machine tool having a machine frame open on three sides, in approximately the shape of the letter C, comprising, an upper die support disposed on the machine frame and vertically movable by a drive cradle, at least two die holding fixtures placed side by side and having corresponding upper dies, a lower die support disposed on said machine frame with a corresponding number of die holding fixtures placed side by side and having corresponding lower dies, and a matrix plate placed on the lower die support, disposed in a frame and containing the die holding fixtures, wherein instead of a lower die a tool unit, comprising an upper die and a lower die in a guide frame, cutting unit or coping unit, is disposed in a corresponding die holding fixture on the matrix plate and is drivingly connected with the upper die support.

4,928,378

APPARATUS FOR MAKING PLASTIC LEADED CHIP CARRIER CONNECTORS

Donald A. Smith; William H. Carter, both of Union City; Howard E. Dingfelder, Corry; Dale L. Burgess, Union City, and Alan B. Gates, Corry, all of Pa., assignors to Barnes Group Inc., Bristol, Conn.

Division of Ser. No. 230,810, Aug. 10, 1988, Pat. No. 4,879,808.
This application Sep. 5, 1989, Ser. No. 383,464
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—564.6 24 Claims



1. An apparatus for making a plastic leaded chip carrier connector comprising:
means for aligning a base having a plurality of apertures with a wire feed device;
means for advancing one end of a wire from said wire feed device from one side of said base and through a first aperture therein and such that said wire end extends from said base;
means for forming a predetermined configuration of the wire at said end which has passed through the aperture of said base;
means for retracting said formed wire end into said aperture so that said predetermined configuration lockingly engages said wire end with said aperture; and
means for cutting said wire end so that said wire end forms a pin locked in said first aperture for conducting electrical information through said base.

4,928,379

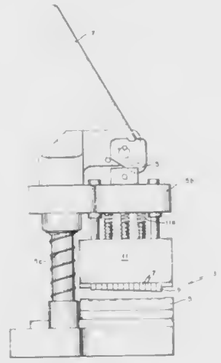
PRESS FOR USE IN ALIGNING AND TERMINATING FLAT CABLE

Patrick J. Paquin, Hamden, and Robert L. Baran, Plymouth, both of Conn., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Apr. 24, 1986, Ser. No. 855,253
Int. Cl.[5] H01R *43/01*
U.S. Cl. 29—566.3 4 Claims

1. A cable terminating press for terminating flat cable of the type having multiple individual conductors extending therethrough, said press comprising:
locating and clamp means having at least two clamp portions, at least one clamp portion being individually operable for first positioning and clamping a first predetermined portion of said cable in a manner wherein the conductors within said portion are clamped in a desired position, and for subsequently selectively clamping additional predetermined portions of said cable with conductors thereof in desired positions;

cable cutting means located relative to said locating and clamp means for substantially uniformly cutting off the end of the cable to permit subsequent termination in a connector, said cable cutting means comprising an upwardly spring braced blade moveable between a first cutting position for cutting cable and a second non-cutting



position for permitting said press means to terminate the cable with a connector; and
press means for supporting a flat cable connector in open engagement with the cut end of the cable and for pressing closed said connector onto the cut end of the cable whereby the cable is terminated.

4,928,380

APPARATUS FOR TERMINATING A CABLE TO A TWO PART CIRCULAR CONNECTOR

John G. Hatfield, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1989, Ser. No. 453,439
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—566.3 12 Claims



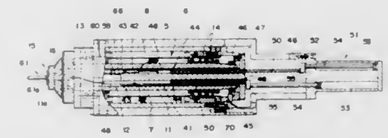
1. An apparatus for terminating a plurality of conductors of a cable to insulation displacement terminals of a two part circular connector and assembly thereof, said connector including a wire hub part having a plurality of radial hub slots on a given angular spacing and a contact housing part having a plurality of insulation displacement terminals on said given angular spacing and having a one to one correspondence with said radial hub slots, the apparatus comprising:
(a) a die with an inner cylindrical surface having a major axis, said inner cylindrical surface terminating in a seat for receiving and positioning both said wire hub part and said contact housing part in mutual alignment along said major axis, said die including a plurality of radial die slots intersecting said inner cylindrical surface on said given angular spacing for receiving said plurality of conductors; and
(b) a punch having an outer cylindrical surface arranged concentric with said inner cylindrical surface for reciprocating movement along said major axis into and out of engagement with said die, said punch including means for engaging said contact housing part and moving it along said major axis into mating engagement with said wire hub part and means for severing said conductors to length, so that when said plurality of conductors are arranged one conductor in each radial hub slot and extending into said radial die slot adjacent thereto, said conductors are severed to length and each said conductor positioned in a radial wire hub slot is terminated to a respective insulation displacement terminal.

4,928,381

AUTOMATIC TOOL CHANGER

Yoshinori Yaguchi; Masahiro Kubota, and Masamitsu Nakaminami, all of Yamatokoriyamashi, Japan, assignors to Kabushiki Kaisha Mori Seiki Seisikusho, Japan

Filed Apr. 14, 1989, Ser. No. 338,221
Claims priority, application Japan, Apr. 15, 1988, 63-93867; Sep. 12, 1988, 63-228092
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 29—568 10 Claims



1. An automatic tool changer for exchanging one tool with another, the automatic tool changer comprising:
a main spindle having an internal bore;
a chuck provided at an opening of the main spindle;
a plurality of tools accommodated in the internal bore of the main spindle, wherein the tools are individually slidable axially of the main spindle: and
means for pulling the tools out of the chuck and pushing the tools toward the opening of the main spindle, thereby replacing a first tool on the chuck with a second tool accommodated in the bore of the main spindle.

4,928,382

METHOD OF THE PRODUCTION OF A MAGNETIC HEAD

Hideo Fujiwara, Ibaragi; Takeshi Tottori, Toride; Osamu Inagoya, and Hirosuke Mikami, both of Ibaragi, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

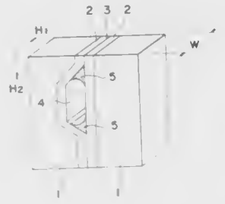
Continuation of Ser. No. 899,083, Aug. 22, 1986, abandoned.
This application Jan. 9, 1989, Ser. No. 296,368
Claims priority, application Japan, Aug. 23, 1985, 60-183833
Int. Cl.[5] G11B *5/127*
U.S. Cl. 29—603 13 Claims

1. A method in the production of a magnetic head having a magnetic circuit, at least one part of the circuit being formed of a magnetic head core of magnetic material of a predetermined width in which anisotropy can be induced, comprising:
providing a magnetic head which comprises a core material including substrates which each have a magnetic thin layer of magnetic material formed on opposing surfaces thereof, said magnetic thin layers each having a thickness of from 1–100 μm, and a head gap film formed between said magnetic thin layers;
annealing said magnetic head in a first annealing process at a first temperature under a first magnetic field of a first intensity for inducing one axis of easy magnetization in a

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part of the magnetic material in said magnetic head, the direction of said magnetic field during said first annealing process coinciding with the width direction of said head gap film along a first surface of said head core; and

annealing said magnetic head in a second annealing process at a second temperature under a second magnetic field of a second intensity following said first annealing process, the direction of said second magnetic field during said second annealing process coinciding with the depth direc-



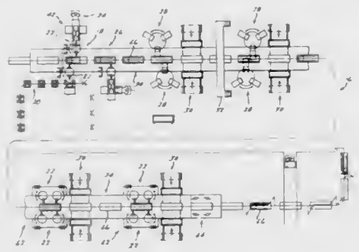
tion of said head gap film and being perpendicular to the direction of said first magnetic field and to said one axis of easy magnetization along a second surface of said head core such that a magnetic anisotropy generated by said first annealing process is relaxed by said second annealing process whereby the permeability of said magnetic material is increased to improved the magnetic characteristics of said magnetic head, said annealing temperature being higher than 200° C.

4,928,383

NON-SYNCHRONOUS ASSEMBLY SYSTEM

James S. Kaczmarek, Northville, and Kenneth C. Kareta, Mount Clemens, both of Mich., assignors to Permaflex Company, Detroit, Mich.

Filed Oct. 18, 1988, Ser. No. 259,216
Int. Cl.[5] B23P *24/00*
U.S. Cl. 29—711 27 Claims



1. A production line for performing a series of different operations on a variety of workpieces in seriatim, the line comprising:

a plurality of successive work stations each containing at least one machine for performing one of said operations on said workpieces, at least one of said work stations containing at least one machine, wherein said machine performs at least one operation from at least two of said series of different operations;

transport means for carrying said workpieces through said succession of work stations, said transport means being selectively operable to move every said workpiece on said line simultaneously or to move any select number of said workpieces on said line asynchronously; and

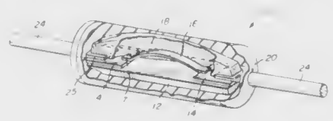
means for orienting and holding each said workpiece at the respective work stations.

4,928,384

METHOD OF MAKING A WIRE BONDED MICROFUSE

Leon Gurevich, St. Louis, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 148,263, Jan. 28, 1988, abandoned, which is a division of Ser. No. 29,831, Mar. 24, 1987, Pat. No. 4,771,260. This application Oct. 6, 1989, Ser. No. 417,930
Int. Cl.[5] H01H *69/02*
U.S. Cl. 29—623 38 Claims



1. A method of making a fuse element subassembly comprising the steps of:

providing a substrate of insulating material;

producing two separate metallized areas on the substrate;

bonding one end of a fusible element to one of the separate metallized areas without using solder or flux;

extending the fusible element across the substrate to the other of the separate metallized areas;

bonding the other end of the fusible element to the other separate metallized area to electrically connect the metallized areas on the substrate; and

attaching a lead to each one of the separate metallized areas without causing the lead to contact the fusible element.

4,928,385

AUTOMOTIVE DOOR HANDLE ASSEMBLING ROBOT

Hiroyuki Noguchi, and Ichiho Yamada, both of Marysville, Ohio, assignors to Honda Giken Kogyo, Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 333,907
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—788 9 Claims



1. An apparatus for assembling a door handle by installing a key guard assembly in the door handle in automatically assembling the door handle assembly to be mounted on the outer surface of an automotive door panel, said apparatus comprising:

first feed means for feeding components of the key guard assembly supplied from a parts feeder;

superposing means for superposing the components of the key guard assembly supplied by said first feed means, into a key guard assembly;

an industrial robot for installing the key guard assembly in a door handle and;

second feed means for delivering the key guard assembly to said industrial robot;

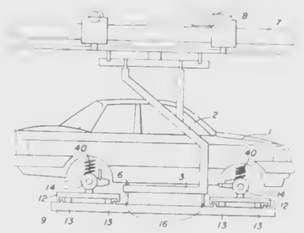
said industrial robot comprising chuck means for gripping said key guard assembly and installing the key guard assembly in the door handle, and an end effector having staking means for bending tongues of said key guard assembly to fix the key guard assembly to the door handle.

4,928,386

MOUNTING ARRANGEMENT FOR THE AUTOMATIC ASSEMBLY OF AGGREGATES PREFABRICATED PARTS TO A CAR BODY FROM BELOW

Gerhard Schupp; Klaus Tscheschlok, both of Friedberg, and Maischberger Johann, Dinkelscherben, all of Fed. Rep. of Germany, assignors to KUKA Schweissanlagen and Roboter GmbH, Augsburg, Fed. Rep. of Germany

Filed Mar. 28, 1989, Ser. No. 329,582
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 38011107
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—824 8 Claims



1. An automatic mounting device for assembling prefabricated parts to a car body, comprising:

suspension means for carrying a car body from a first location to a centered location at an assembly station;

a mounting frame positioned at the assembly station, said mounting frame carrying installation plates arranged substantially in parallel with respect to each other, said installation plates being slidable with respect to the mounting frame, said mounting frame being adjustable to move against a bottom part of the car body, said installation plates being liftable from a first precentered position with respect to the mounting frame, to a second floating position allowing limited floating movement with respect to the mounting frame, the prefabricated parts being arranged on the installation plates;

a vertical centering journal connected to each installation plate, the prefabricated parts having alignment bores for receiving the corresponding vertical centering journal, each said vertical centering journal protruding beyond the corresponding alignment bore;

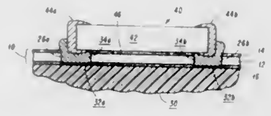
centering bores formed at a bottom part of the car body for receiving the portion of the vertical centering journal protruding beyond the corresponding alignment bore, the prefabricated parts being automatically aligned in an assembly position by means of the floating movement of the installation plates upon movement of the mounting frame toward the car body.

4,928,387

TEMPORARY SOLDERING AID FOR MANUFACTURE OF PRINTED WIRING ASSEMBLIES

John C. Mather, and Jerald A. Young, both of Cedar Rapids, Iowa, assignors to Rockwell International Corp., El Segundo, Calif.

Filed Sep. 7, 1989, Ser. No. 404,233
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—840 5 Claims



1. Method of attaching a surface mount component to a printed wiring board having a multiplicity of solder pads positioned thereon to receive the terminations on the component, comprising the steps of:

providing a mask blank coextensive with the printed wiring board, comprising a base layer material coated on both top and a bottom sides with an adhesive layer and protected by a coextensive backing on both top and bottom sides thereof, the combined thickness of the base layer and the adhesive layers being equal to desired standoff distance between said printed wiring board and said component;

selectively forming openings through the mask blank, sized and positioned to correspond to the locations of selected ones of the solder pads;

removing said backing from the bottom side of said mask blank to expose the underlying bottom adhesive layer;

applying said mask blank with said exposed adhesive layer to said printed wiring board, positioned with the openings therein in registry with said solder pads;

filling said holes with solder paste;

removing said backing from the top side of said mask blank to expose the top underlying adhesive layer;

positioning said surface mount component onto said exposed top adhesive layer with its terminations over said paste filled holes to form a printed wiring board assembly;

heating said printed wiring board assembly to melt said solder paste into a solder mass; and

cooling said printed wiring board assembly to solidify said solder mass.

4,928,388

SINGLE STATION HEMMING TOOLING

Ernest A. Dacey, Jr., Sterling Heights, Mich., assignor to Utica Enterprises, Inc., Sterling Heights, Mich.

Division of Ser. No. 891,292, Jul. 31, 1986, Pat. No. 4,827,595, which is a continuation-in-part of Ser. No. 805,893, Dec. 5, 1985, Pat. No. 4,706,489. This application Mar. 1, 1989, Ser. No. 317,834
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—798 3 Claims

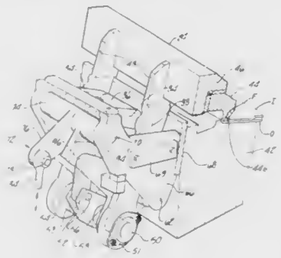
1. Apparatus for hemming an upstanding flange at the periphery of an outer piece to overlie the periphery of an inner piece which overlies said outer piece to thereby join said outer piece and for piercing a tab extending from said flange and an adjacent surface of a portion of said inner piece to thereby at least partially interlock said outer piece and said inner piece, said apparatus comprising:

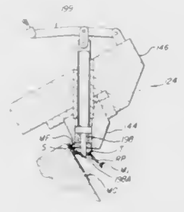
a tool element having a first contact surface and a second contact surface contiguous to said first contact surface, said first contact surface engaging said upstanding flange at the periphery of said outer piece to partially fold said upstanding flange over said periphery of said inner piece, said second contact surface engaging said partially folded upstanding flange to completely fold over said upstanding

flange of said outer piece over said periphery of said inner piece such as to complete the hemming of said flange;

a piercing tool integrally mounted with said tool element for movement therewith, said piercing tool being reciprocable within said tool element;

means for moving said tool element in a first arcuate motion towards said upstanding flange to engage said upstanding flange of said outer piece and to partially fold said upstanding flange of said outer piece over the periphery of





said inner piece, said means for moving said tool element further comprising means for completely folding over and joining said outer piece to said inner piece such that said folded over flange of said outer piece is in intimate contact with said inner piece; and

means for reciprocating said piercing tool within said tool element, said reciprocating means moving said piercing tool to pierce said tab in said folded over flange of said outer piece and said periphery of said inner piece to interlock said outer piece and said inner piece.

4,928,389

SHAVING HEAD FOR A DRY-SHAVING APPARATUS

Harald Melwisch, Klagenfurt, and Norbert Schneider, Ebental, both of, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 29, 1987, Ser. No. 103,079

Claims priority, application Austria, Oct. 3, 1986, 2629/86

Int. Cl.[5] B26B *19/02*

U.S. Cl. 30—43.92 **9 Claims**

1. A shaving head for a dry-shaving apparatus which comprises:

a shaving-head frame which comprises two longitudinal members, two side walls and slots with open ends formed in the side walls;

an arcuate shear foil detachably secured to said shaving-head frame, said foil having longitudinal edges and comprising at both ends of at least one of its longitudinal edges projections which are insertable into the open ends of the shaving-head frame slots during mounting of the shear foil on the shaving-head frame; and

at least one raised portion for securing the shear foil to the shaving-head frame and which is carried by one of said longitudinal members of the shaving-head frame adjacent a longitudinal edge of the shear foil and at a distance from said slots, wherein:

said raised portion comprises a first ramp which is upwardly inclined in the direction of insertion, which ramp projects



from the shaving-head frame and engages beneath a longitudinal edge of the shear foil; and wherein said raised portion also comprises a second ramp which is downwardly inclined in the direction of insertion and which substantially adjoins said first ramp.

4,928,390

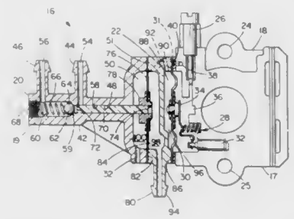
CARBURETOR AND OIL PUMP ASSEMBLY AND METHOD OF MAKING THE SAME

James R. Gassen, and Lakhbir S. Suchdev, both of Charlotte, N.C., assignors to Textron, Inc., Providence, R.I.

Filed Aug. 22, 1989, Ser. No. 397,047

Int. Cl.[5] B23D *59/04;* **B27B** *17/02;* **F02B** *33/04*

U.S. Cl. 30—123.4 **18 Claims**



1. A chain saw having an engine with a crankcase, a saw chain, and a carburetor and saw chain oiler assembly, said assembly comprising:

first frame means having an oil inlet, an oil outlet, a first conduit means connecting said inlet and said outlet, and a first recess;

piston means having a piston member at least partially positioned in said first conduit means and adapted for reciprocal movement therein;

an oil pump diaphragm connected to said first frame means and said piston member proximate said first recess;

carburetor means having a carburetor housing and a carburetor fuel diaphragm; and

second frame means having a first side with a second recess, a second side with a third recess and a first gas conduit means between said second recess and said second side adapted for communication with a gas conduit in said carburetor housing extending from said crankcase, said second side being mounted to said carburetor housing with said third recess adapted to allow said fuel diaphragm of said carburetor relatively free movement, said first frame means being mounted to said second frame means with said first and second recesses forming a diaphragm movement area for said oil pump diaphragm with a working chamber formed by said second recess and said oil diaphragm such that gas pressure pulses from said crankcase can be supplied to said second recess to move said oil pump diaphragm for moving said piston member to pump oil from said inlet to said outlet for oiling said saw chain whereby the carburetor and chain oiler assembly has a relatively small size, relatively light weight and a relatively few number of parts.

4,928,391

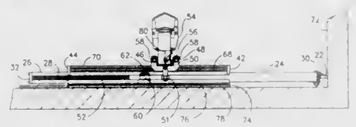
CARPET TILE CUTTING MACHINE

Kenneth B. Higgins, LaGrange, Ga., and Walter Engels, Tryon, N.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 31, 1989, Ser. No. 331,165

Int. Cl.[5] B26B *29/00*

U.S. Cl. 30—293 **14 Claims**



1. Apparatus to cut carpet tiles accurately for placement in an area smaller than a standard carpet tile comprising: a pair of tubular members spaced from one another, a first means interconnecting said tubular members at one end, a second means pivotally connected to each of tubular members at the other end, each of tubular members having a first fixed tube and a second tube slidably mounted in said first fixed tube, biasing means in each of said tubular members biasing said second tube outwardly from said first fixed tube, a wall abutment means mounted on said second means and a cutter means operably associated with each of said second tubes substantially parallel to said second means to cut carpet tiles thereunder when said second tube is slid in said fixed tube when said wall abutment means is forced against a wall member.

4,928,392

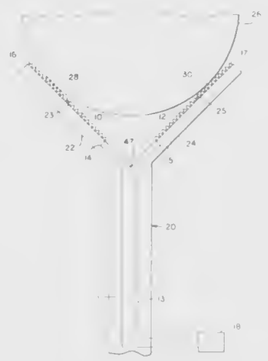
DIAMETER GAUGE

Charles W. Donaldson, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 16, 1988, Ser. No. 156,507

Int. Cl.[5] G01B *7/12*

U.S. Cl. 33—178 E **9 Claims**



1. Apparatus for measuring an outside diameter of a part having a circular cross section comprising:

first and second arms affixed to a common support, said arms including a pair of mutually facing, planar reference surfaces converging at a right angle to define a line of intersection, wherein at least one of said reference surfaces includes a linear groove perpendicular to said line of intersection;

at least one contact surface associated with each of said reference surfaces, each of said contact surfaces being oriented to make contact at least at a point of tangency with said part when said part is positioned between said arms for a diameter measurement;

an elongated resistor element disposed in said groove having a resistance that varies linearly with its length;

a flexible conductor element having negligible resistance and including one of said contact surfaces, said conductor element being coextensive in length with said resistor element and being positioned parallel thereto;

resiliently compressible spacer means mutually spaced to flank said resistor element; said spacer means normally maintaining said conductor element out of contact with said resistor element;

said conductor element being responsive to pressure on its contact surface by said part to compress said spacer elements until electrical contact with said resistor element is established;

means for measuring the resistance of that portion of the resistor element which is connected in series with said conductor element through said electrical contact; and

means for determining the diameter of said part as a function of the measured resistance.

4,928,393

LANE MARKER STEERING GUIDE

Wilbur B. Van Schaack, 4215 25th St. West, Bradenton, Fla. 33505

Continuation of Ser. No. 152,971, Feb. 8, 1988, Pat. No. 4,823,471. This application Apr. 20, 1989, Ser. No. 340,912

Int. Cl.[5] G01C *21/04*

U.S. Cl. 33—264 **2 Claims**



1. A lane marker steering guide releasably connectable to the inner surface of a windshield comprising:

a suction cup having a base with an inner surface attachable to the inside of the vehicle windshield;

said suction cup having an outer surface including a central raised portion laterally extending from said base;

an elongated sight member formed of flat, relatively thin, flexible material and having a proximal end, a distal end, and a mid-portion therebetween;

said sight member pivotally connected by a threaded fastener at said proximal end to said suction cup raised portion by threadable engagement of said threaded fastener into an aperture in said suction cup raised portion;

said sight member distal end arrow-shaped and terminating at a point in very close proximity radially outwardly from said base;

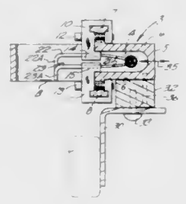
said sight member having a first and second transverse bend, said first transverse bend dividing said proximal end and said mid-portion, said second transverse bend dividing said distal end and said mid-portion;

said first bend positioned adjacent and in close proximity to said suction cup raised portion and disposing said mid-portion toward the windshield inner surface and said base outer edge margin;

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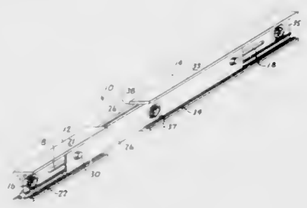
said second bend positioned adjacent and in close proximity to said base outer edge margin and disposing and biasing said distal end generally parallel to and against the inner surface of the windshield;
said distal end opaque, the remainder of said sight member transparent;
said pivotal connection proximal end between said sight member and said suction cup raised portion frictionally adjustable by tightening and loosening said threaded fastener.

4,928,394
SIGHT FOR ARCHERY BOW
James R. Sherman, 2951 Rudo Rd., Urofino, Id. 83544
Filed Apr. 3, 1989, Ser. No. 331,833
Int. Cl.[5] F41G *1/46, 1/34*
U.S. Cl. 33—265 5 Claims



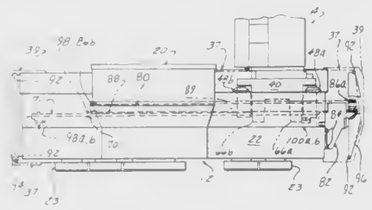
1. An archery bow sight comprising,
a base having parallel guides each defining a slot,
sight pin carriers adjustably mounted on said guides, said carriers of C-shape and including a clamping screw extending through said slot to clamp the carrier to the guide,
mounting means for coupling said base to the bow, and fiber optic means including at least one fiber optic having a first end carried by one of said sight pin carriers in the field of vision of an archer during aiming of the bow, said fiber optic having a remaining end for disposition toward a light source.

4,928,395
EXTENSIBLE LEVEL
Laverne C. Good, R.D. #4 Box 331B, Reading, Pa. 19606
Filed Jun. 6, 1989, Ser. No. 362,017
Int. Cl.[5] G01C *9/24*
U.S. Cl. 33—374 9 Claims



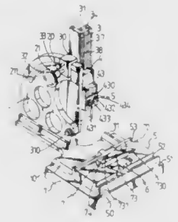
1. An extensible carpenter's level comprising:
at least a pair of body members, each said body member having a level means indicating at least one orientation angle of the level at a reference edge of said body member, said body members being related in an end-to-end arrangement such that reference edges of at least endmost ones of the body members are co-linear, said body members being I-shaped in cross section with a connecting portion and bottom and top base portions, said base portions having longitudinal extensions parallel to and forming top and bottom tracks with said connecting portion;
an extender mounted on said body members such that the body members are slidable along the extender, said extender being slideably retained in said top and a bottom opposing track of said body members, said extender mounted coextensively such that the body members are slidable along the extender in said tracks; and,
locking means on said extender and said pair of body members for locking the body members into relative portion on the extender.

4,928,396
COORDINATE MEASURING MACHINE WITH IMPROVED CARRIAGE DRIVE SYSTEM
Freddie L. Raleigh, Centerville, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Mar. 7, 1989, Ser. No. 320,189
Int. Cl.[5] G01B *7/03, 5/03*
U.S. Cl. 33—503 10 Claims



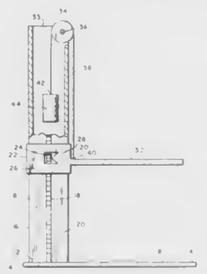
1. In combination with a coordinate measuring machine (10) of the type having an improved carriage drive system, said coordinate measuring machine of the type including a base (12), a probe shaft (16) having a tip (18); mounting means mounting said probe (16) for movement along each of three orthogonal axes (X,Y,Z), said mounting means including: a carriage (40) supporting said probe (16) way surfaces (32, 34) extending along one (X) of said axes, supporting way bearing means (46*a, b*; 48*a, b*) and guide bearing means (72,74,76*a,b*; 78*a,b*) supporting and guiding said carriage (40) on said way surfaces (32, 34) for linear movement along said way surface (32,34), and a drive system for driving said carriage (40) along said one (X) axis, the improvement, wherein the drive for said carriage system comprises a drive system for said carriage (40) comprising:
an elongated rigid spar member (88), and means (198, 152) mounting said spar member (88) relative to said base (12) to extend along said one (X) axis adjacent to said way surfaces (32, 34), comprising a first means (154, 152) fixing one end of said spar member (88) to said base (12) and second means (198, 200, 202) positioning the other end of said spar member (88) laterally and vertically on said base (12) while not restraining said other end in a lengthwise direction whereby tension stress in said flexible belt (89) is not transmitted through said spar member (88) into said machine, nor stress caused by differential thermal expansion;
an elongated flexible belt (89); means (86*a*, 86*b*) mounting said flexible belt (89) to be stretched along said one (X) axis, said means (86*b*) attaching one end of said flexible belt (89) to one end of said spar member (88);
drive means (118) attached to said carriage (40) including a rotary drive member (126) engaging said flexible belt and means (120) for rotating said rotary drive member (126) to cause said carriage (40) to be advanced along said flexible belt (89) and said one (X) axis.

4,928,397
GOLF CLUB HEAD SURVEYING INSTRUMENT
Kuen-Yi Wang, No. 46, Lane 380, Chung San East Rd., Fong San, Kaohsiung Hsien, Taiwan
Filed Dec. 20, 1988, Ser. No. 286,813
Int. Cl.[5] G01B *5/24*
U.S. Cl. 33—508 8 Claims



1. A golf club head surveying instrument for checking a head of any golf club, which comprises a bottom block having a quarter circle scale plate mounted thereon;
said bottom block having a balance block mounted thereon, a slide block removably and reversibly mounted on said balance block for supporting a rectangular block and for receiving a right-handed head and left-handed head of any golf club, said rectangular block having a trifurcate balance board for balance checking of a head of a golf club to be tested;
said quarter circle scale plate including an adjusting frame fixed thereto at its rear end, a V-shaped block mounted on said adjusting frame having a clamping element for holding said golf club, and an adjusting knob arranged for angular adjustment of adjusting frame.

4,928,398
ANTHROPOMETER
Michael Delfiner, 33 Harold St., Sharon, Mass. 02067
Filed Apr. 10, 1989, Ser. No. 335,765
Int. Cl.[5] G01B *5/00*
U.S. Cl. 33—512 9 Claims



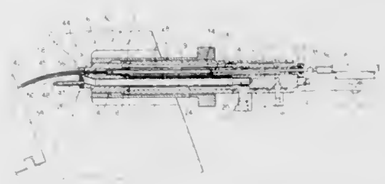
1. An anthropometer for determining the crotch height of a standing individual comprising:
support means including a fixed upright portion;
first measuring means depending from said upright portion including an upper surface adapted to bear against the crotch of said individual, said upper surface being freely moveable in the vertical direction; and
means for urging said upper surface upwardly with a predetermined force.

4,928,399
MARKING TEMPLATE
Gerald A. Kragt, Marne, Mich., assignor to Jer's Pattern Project, Inc., Marne, Mich.
Filed Feb. 9, 1989, Ser. No. 288,487
Int. Cl.[5] B43L *13/20*
U.S. Cl. 33—562 6 Claims



1. A marking template including at least two elongated panel sections each having a fold line adjacent one edge, and an array of marking slots, having portions extending on both sides of said fold line in coplanar relationship, in the folded condition of said template, corresponding to cutting lines to be made on pieces of material, said sections, when folded 90 degrees along said fold lines, being adapted to engage an edge and an adjacent face of a piece of material of standard width and thickness, wherein the improvement comprises:
overlapping end portions on said sections, said portions having aligned holes when said sections are in longitudinal alignment in sequence.

4,928,400
BEARING CLEARANCE DETECTOR
David N. Schuh, 300, 1615 - 10th Avenue S.W., Calgary, Alberta, Canada (T3C 0J7)
Filed Jan. 19, 1988, Ser. No. 145,503
Int. Cl.[5] G01B *5/14*
U.S. Cl. 33—605 7 Claims

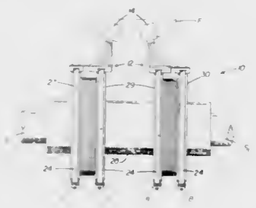


1. A measuring device for use in detecting clearances in an engine cylinder comprising tubular casing means with closed ends for insertion into an engine cylinder; plunger means slidable in said casing means and extending beyond said closed ends of said casing means; probe means engaging one end of said plunger means for engaging a piston in the cylinder; spring means in said casing means for biasing said plunger means against said probe means, and consequently said probe means against the piston; a first fluid passageway communicating said engine cylinder with a source of fluid alternatively under pressure and vacuum, a second fluid passageway communicating said engine cylinder with a source of a lubricating fluid, and micrometer means on the other end of said casing means for engagement by said plunger means to provide an indication

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of piston movement in response to fluid pressure and vacuum in said first fluid passageway.

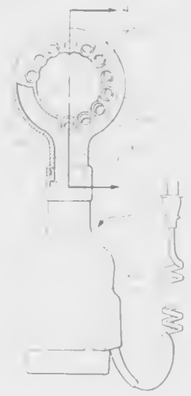
4,928,401
SHAFT ALIGNMENT SYSTEM
Malcolm G. Murray, Jr., 220 E. Texas Ave., Baytown, Tex. 77520
Filed Jan. 3, 1989, Ser. No. 292,923
Int. Cl.[5] G01B *5/25*
U.S. Cl. 33—645 10 Claims



1. Apparatus for obtaining rotating alignment data for a driving/driven shaft with a coupling, comprising:
stroboscopic means for providing timed flashes of light,
scale means for determining cold and hot running alignment measurements; and
means for mounting said scale means to the shaft across said coupling so as to be stabilized for accurate hot running measurements;
said stroboscopic means being synchronized to the shaft speed in order to illuminate said scale means at various relative positions, whereby the desired shaft alignment data can be obtained;
said scale means including two relatively sliding scale components each including a base member for mounting.

4,928,402
FLUID FLOW APPARATUS AND PROCESS
Donavan J. Allen, Taylors, S.C., assignor to Torus Corporation, Greenville, S.C.
Division of Ser. No. 338,489, Apr. 13, 1989, which is a continuation of Ser. No. 157,053, Feb. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 124,051, Nov. 23, 1987, Pat. No. 4,836,702. This application May 9, 1989, Ser. No. 349,434
Int. Cl.[5] F26B *3/10*
U.S. Cl. 34—97 15 Claims

1. An apparatus for drying hair comprising:
(a) a tubular body defining a fluid passageway therewithin and an opening therethrough;
(b) a plurality of nozzles located in a generally circular array about said opening and being in fluid communication with said passageway, said nozzles being adapted to focus fluid passing therethrough towards a common point away from said tubular body with fluid passing through said nozzles collectively following a conical pattern; and
(c) means for supplying fluid through said passageway and out of said nozzles at adequate pressure that upon striking a surface having hair thereon to be dried that is apart from said body but short of said common point, fluid will be



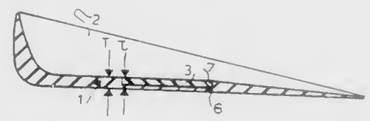
reflected rearwardly and pass through said opening while lifting hair being dried in the direction of said opening.

4,928,403
PLASTIC HEELS OF SHOES AND BOOTS
Keizi Nakamura, Chiba, Japan, assignor to Roman Shoji Co., Ltd.
Filed Sep. 8, 1988, Ser. No. 241,857
Claims priority, application Japan, Feb. 10, 1988, 63-29832
Int. Cl.[5] A43B *21/00*
U.S. Cl. 36—34 A 5 Claims



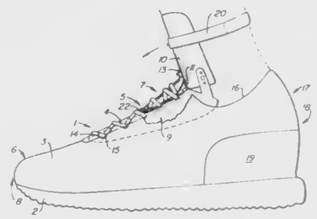
1. A plastic heel for shoes and boots having an outer surface of plastic material, said outer surface having an irregular figure which is a copy of a leather or leather-like surface, said plastic material comprising a thermoset resin selected from the group consisting essentially of phenol-formaldehyde resin, phenol-furfural resin, xylene-formaldehyde resin, ketone-formaldehyde resin, ureaformaldehyde resin, melamine-formaldehyde resin, anilineformaldehyde resin, alkyd resin, unsaturated polyester resin, and unsaturated epoxy resin; a thermoplastic resin selected from the group consisting essentially of polyethylene, polypropylene, polystyrene, poly-p-xylene, polyvinyl acetate, polyacrylate, polymethacrylate, polyvinyl chloride, polyvinylidene chloride, fluoroplastic, polyacrylonitrile, polyvinyl ether, polyvinyl ketone, polyether, polycarbonate, thermoplastic polyester, polyamide, diene-type plastic, polyurethane, and silicon; and a natural plastic selected from the group consisting essentially of natural gum, cellulose, protein and starch.

4,928,404
HEEL CUSHION
Rainer Scheuermann, Raisdorf, Fed. Rep. of Germany, assignor to Bauerfeind GmbH & Co., Kempen, Fed. Rep. of Germany
Filed Jan. 4, 1989, Ser. No. 293,222
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 8800116
Int. Cl.[5] A43B *13/12, 13/18*
U.S. Cl. 36—37 5 Claims



1. A heel cushion for incorporation in footwear below the heel of a user, comprising a heel bed composed of a relatively hard silicone rubber, and means inserted to form a soft region of silicone rubber located below the heel of the wearer and adapted to absorb excessive pressure, said bed being continuous below said region and said region being embedded in said bed.

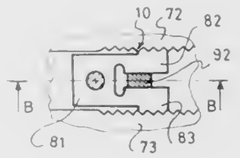
4,928,405
SHOE DYNAMIC FITTING SYSTEM
Richard G. Spademan, P.O. Box 6410, Incline Village, Nev. 89450
Continuation-in-part of Ser. No. 751,828, Jul. 5, 1985, which is a continuation-in-part of Ser. No. 461,832, Jan. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 50,436, Jun. 20, 1979, Pat. No. 4,494,324, which is a continuation-in-part of Ser. No. 886,946, Mar. 15, 1978, Pat. No. 4,382,342. This application Jun. 6, 1986, Ser. No. 871,733
Int. Cl.[5] A43B *23/26*
U.S. Cl. 36—50 24 Claims



1. A sport shoe comprising a sole and a relatively flexible upper adapted to enclose a foot of a user of the shoe, first tongue means adapted to be disposed between the foot and the upper, second tongue means adapted to engage a portion of a leg of the user, movement means interconnecting the first and second tongue means and permitting movement of the second tongue means relative to the first tongue means in response to relative movements between the user's foot and leg, and tightening means operatively coupled with the first and second tongue means for increasing the tightness with which the user's foot is enclosed by the shoe in response to a predetermined relative movement between the user's foot and leg.

4,928,406
SLIDE DEVICE FOR ADJUSTING THE RELATIVE ELEMENTS OF A SKI BOOT
Benoit Montfort, Annecy, France, assignor to Salomon S. A., Annecy Cedex, France
Filed Dec. 28, 1988, Ser. No. 291,166
Claims priority, application France, Dec. 28, 1987, 87 18507
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 10 Claims





1. Device for the adjustment of the relative positions of two elements, a first of said elements being unitary with a guide track, and a second of said elements being unitary with a slider which is movable within and along said guide track, wherein said slider comprises two flexible arms at least substantially parallel to said guide track, each one of said arms enters laterally into contact with one side of the guide track and a control and locking lever jointed onto the slider about an axis which is parallel to a general plane of said flexible arms and perpendicular to their general direction, and wherein said lever further comprises a projection which, for the purpose of immobilizing the slider in position, fits between said two flexible arms so as to hold them laterally against said guide track when said lever is set in locked position, and which is withdrawn from between said flexible arms when said lever is placed in unlocked position.

4,928,407
SKI BOOT HAVING A HINGED SOLE
Marco T. Ottieri, 15 W. 53rd St., Apartment 15C, New York, N.Y. 10019
Filed Nov. 22, 1988, Ser. No. 274,910
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—119 15 Claims

1. In a ski boot having an outer shell, with at least a sole portion and an upper portion, and a rear closure element higedly connected to the outer shell and movable between open and closed positions, the improvement comprising
inner sole means for supporting a wearer's foot, said inner sole means being disposed adjacent the sole portion of the outer shell and generally conforming in shape to the underside of the human foot, and having phalanx, arch, metatarsal and heel regions,
fastening means for securing a portion of said inner sole means to said sole portion of said outer shell,
hinge means for allowing pivotal movement of he arch, heel and metatarsal regions of said inner sole means relative to the phalanx region, and

means engaged with said rear closure element and with said inner sole means for moving at least said heel and arch regions relative to said phalanx region, about said hinge



means, upon movement of said closure element between said open and closed positions, said means being located forward of the hinged connection of said rear closure element to said outer shell.

4,928,408

SKI BOOT WITH IMPROVED WEARABILITY

Giorgio Baggio, San Martino Du Lupari; Mario Gonella, Conegliano, and Mariano Sartor, Montebelluna, all of Italy, assignors to NORDICA S.P.A., Montebelluna, Italy

Filed Sep. 7, 1988, Ser. No. 240,908

Claims priority, application Italy, Sep. 17, 1987, 82587 A/87; Oct. 16, 1987, 82595 A/87

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—119 **37 Claims**



1. Ski boot comprising a shell, a rear quarter and a front quarter, at least said rear quarter being pivoted to said shell, said rear quarter being furthermore articulated to an element of said boot by means of rigid articulation means, wherein said rigid articulation means comprise two pairs of rod-like elements, each of said two pairs of rod-like elements interacting with at least one traction element acting on at least one foot presser.

4,928,409

MOBILE EARTH MOVER BOWL WITH LOADING ROTOR

Jan Mantingh, Broek 8, 9511 PT Gieterveen, Netherlands

Filed Sep. 23, 1988, Ser. No. 248,984

Claims priority, application Netherlands, Sep. 25, 1987, 8702301

Int. Cl.[5] B60P *1/00;* **E02F** *1/00*

U.S. Cl. 37—9 **10 Claims**

1. An earth mover comprising

(A) at least one wheeled axle;

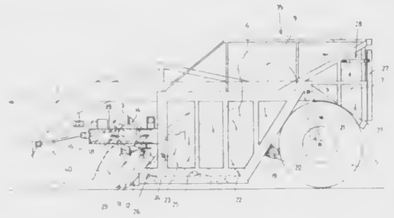
(B) a supported frame movable by said axle, said frame further including means for pushing up earth, comprising an elongate scraper blade with a ground-facing sharp longitudinal edge being substantially right-angled to the forward direction of travel of said frame,

characterized by

(C) a cylindrical rotor spaced from, and in operative position above, said scraper blade and substantially parallel thereto;

(D) means for rotating said rotor in a direction from said longitudinal edge towards the upper portion of said scraper blade;

(E) bars fixedly mounted on said rotor, with the distance



from the turning circle circumference of said bars to said scraper blade decreasing in the rotation direction of said rotor; and

(F) a frame-mounted bowl for earth transport having at least one compartment located behind said scraper blade, with at least one bottom portion extending obliquely downwards as a flap for unloading earth; said bottom flap being connected pivotally to said scraper blade near said one longitudinal edge and adapted to coact therewith for releasing and closing said compartment bottom portion, said bottom flap being connected furthermore to said frame by means of a sliding connection.

4,928,410

REVERSIBLE CLAM SHELL BUCKET

Darrell L. Walters, 2441 Cornelius Ave., Rio Oso, Calif. 95674, and Steven D. Larsen, 2165 California St., Sutter, Calif. 95982

Filed Jun. 17, 1987, Ser. No. 63,226

Int. Cl.[5] E02F *3/76*

U.S. Cl. 37—117.5 **18 Claims**

15. A material working tool used by operative connection to a prime mover comprising:

a first jaw having a one side connected to the prime mover and a second side facing away therefrom,

a second jaw removeably connected to said first jaw so as to assume one of two orientations, a first orientation wherein said second jaw has one tined edge which is turned toward said first jaw, and a second orientation wherein said tined edge is turned away from said first jaw,

wherein each said orientation has two extreme positions,

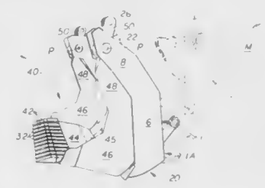
a first position wherein said second jaw is proximate to said first jaw,

a second position wherein said second jaw is remote therefrom,

wherein removable fastening means connects said first and second jaws and includes a pivot at an upward extremity connecting said first and second jaw,

and a hydrualic cylinder connected between a lower portion of said first jaw and an upper portion of said second jaw,

wherein said distance between said pivot and a leading and trailing edge of said second jaw are of equal distance,





wherein the distance between a lowermost edge of said first jaw and said pivot equals the distance of the pivot to said leading and trailing edge of said second jaw.

4,928,411

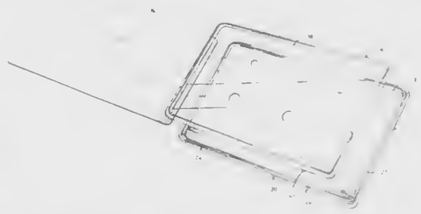
TRAY INCLUDING DISPLAY

Sara L. Danis, McLean; Charles L. Skaggs, Great Falls, and Charles A. Thomas, Fairfax, all of Va., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 14, 1988, Ser. No. 218,794

Int. Cl.[5] G03F *3/00*

U.S. Cl. 40—324 **20 Claims**



1. A tray assembly comprising:

a substantially flat, rectangular, base having opposing longitudinal and transverse edges including an upper surface and a peripheral ridge extending upwardly from said upper surface;

a rectangular cover having opposing longitudinal and transverse edges mounted to said base, said cover including a channel defined in a lower surface thereof, said ridge being positioned within said channel;

an opening extending through said base, said opening providing access to said cover; and

means for locking said base to said cover, wherein said locking means includes a plurality of projections integral with and extending downwardly from opposing longitudinal edges of said cover, a plurality of slots defined within said base along the longitudinal edges of the base, said projections being positioned respectively within said slots, each of said slots, having a clearance below the peripheral ridge and extending inward, toward the opposing edge, said clearance permitting limited axial rotation of said projection when engaged in their respective slots along a common edge and enabling said cover to pivot away from the base for insertion or removal of a substrate.

4,928,412

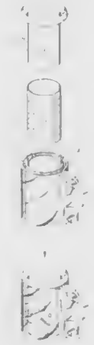
DECORATIVE CUP

Gary S. Nishiyama, 12103 Culver Blvd., Los Angeles, Calif. 90066

Filed Feb. 24, 1988, Ser. No. 160,487

Int. Cl.[5] G09F *3/00*

U.S. Cl. 40—324 **19 Claims**



1. A cup comprising

a base;

an inner wall, defining together with the base a recess for holding a beverage;

an outer wall connected to the inner wall, defining together with the inner wall a cavity, the cavity partially filled with liquid fluid surmounted by an air space, said outer wall being at least partially transparent;

a pump in communication with the cavity, the pump, upon activation, capable of forcing liquid fluid into the cavity and compressing the air space to create currents in any fluid in the cavity;

a handle affixed to the outer wall; and

means on said handle for activation of the pump.

4,928,413

DISPLAY DEVICE

Robert K. Rutchik, Lyons, Ill., assignor to Rapid Mounting & Finishing Company, Chicago, Ill.

Filed Jun. 9, 1988, Ser. No. 204,248

Int. Cl.[5] G09F *11/30*

U.S. Cl. 40—511 **11 Claims**

1. A display device comprising:

a first panel having a first display surface;

a second panel having a second display surface;

a cabinet having a viewing opening at the front thereof;

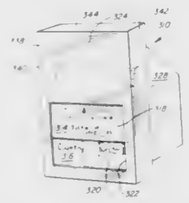
means for mounting the first and second panels in a first overlying relationship wherein the display surface on one of the first and second panels is exposed to view at the front of the cabinet and the one of the first and second panels blocks viewing of the display surface on the other of the first and second panels from the front side of the cabinet;

means for repositioning the first and second panels in a second overlying relationship wherein the display surface on the other of the first and second panels is exposed to

view at the front of the cabinet and the other of the first and second panels blocks viewing of the display surface on the one of the first and second panels from the one side of the cabinet,

said repositioning means including an arm, means for mounting the arm to the cabinet for reciprocating pivoting movement in first and second opposite directions in a predetermined path, drive means for moving said arm in said predetermined path, a yoke having means thereon for individually engaging and lifting said panels, and means for pivotably connecting the yoke to the arm for pivoting of the yoke relative to the arm about a single axis; and

cooperating means on the repositioning means and cabinet for causing the lifting means to (a) engage the one of the



first and second display panels that has its display surface exposed to view through the viewing opening, (b) lift the one display panel above the other display panel as said arm moves in a first portion of said predetermined path, (c) shift the one display panel behind the other display panel as the arm moves in another portion of said predetermined path and the yoke pivots relative to the arm and (d) release the one display panel as said arm moves in still another portion of said predetermined path so that the other display panel has its display surface exposed for viewing through the panel viewing opening,

whereby each time said arm moves in said first and second opposite direction in said predetermined path, the display surface exposed to view at the front of the cabinet can be changed.

4,928,414

SELF LUMINOUS CHARACTERS AND SIGNS INCORPORATING SAME

Alfred N. Bright, Marlow, England, assignor to Saunders-Roe Development Limited, Middlesex, United Kingdom

Filed Nov. 4, 1988, Ser. No. 267,436

Claims priority, application United Kingdom, Nov. 5, 1987, 8725925

Int. Cl.[5] G09F *13/28*

U.S. Cl. 40—551 **7 Claims**



1. A self-luminous character including a transparent light carrier having a plan shape defining substantially the desired shape of the character, a channel formed in a front surface of the light carrier, at least one longitudinally extending recess in the carrier located at the bottom of said channel, at least one self luminous light source located in said recess, and reflector means, whereby light emitted by the light source diffuses through the transparent carrier and is reflected by the reflector means to be emitted through the front surface of the carrier and illuminate the plan shape of the character.

4,928,415

FOLDING SIGN

Dale E. Walters, 569 Monceau Dr., St. Louis, Mo. 63135

Filed Jun. 14, 1989, Ser. No. 366,511

Int. Cl.[5] G09F *15/00*

U.S. Cl. 40—610 **15 Claims**



1 A durable, invertible, self-supporting sign formed of a single synthetic resin material board blank, comprising two stiffly resilient side panels, each side-panel having two flat surfaces for display of visual messages, said side panels when erected having an upper edge comprising a common integral resilient hinge for permanently reversibly interengaging said side panels, said side panels further having base portions for contacting a ground or floor surface and supporting the erected sign, said base portions forming legs located at each lower corner of the base portions for supporting the sign and raising it from the ground or floor surface, whereby to permit upright durable selective display of multiple different messages on the reverse sides of the sign and to permit selectively opened-flat or folded-flat shipping and storage of said sign.

4,928,416

AN ACCESSORY FOR ATTACHMENT OF PROMOTIONAL CHARACTERS TO PENS, KEY HOLDERS AND THE LIKE

Gianluca Penno, Strada Maiole, 3/8 Moncalieri (TO), Italy

Filed Jul. 29, 1988, Ser. No. 226,203

Claims priority, application Italy, Jul. 30, 1987, 67664 A/87

Int. Cl.[5] G09F *7/02*

U.S. Cl. 40—618 **9 Claims**



1. An accessory to be attached to pens, key holders and similar products, for publicity and promotional ends, comprising:

an elongated body;

three-dimensional symbols, said symbols containing an aperture through which said body is inserted, and said aperture being of the same shape and of a size slightly greater than the cross-section of said body; and

coupling means on said symbols to fasten said symbols to said body, said coupling means including a toothed member projecting from said symbol.

4,928,417

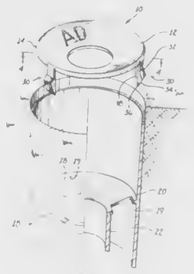
GOLF CUP ADVERTISING DEVICE AND METHOD

Louis H. Boudreau, Phoenix, Ariz., assignor to Boudreau/-Darque, Inc., St. Louis, Mo.

Filed Jun. 10, 1988, Ser. No. 205,119

Int. Cl.[5] G09F *3/00*

U.S. Cl. 40—642 **13 Claims**



1. An advertising device for a golf cup comprising:

a golf cup;

a substantially doughnut-shaped annular ring member having a center opening and having an external peripheral portion dimensioned to co-axially fit into said golf cup; and

advertising display means coupled to said ring member for displaying an advertisement visible to a golfer when adjacent to said golf cup.

4,928,418

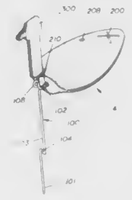
EXPANDABLE GOOSE DECOY

Mark Stelly, 2211 Coryell St., League City, Tex. 77573

Filed May 16, 1989, Ser. No. 353,401

Int. Cl.[5] A01M *31/06*

U.S. Cl. 43—3 **12 Claims**



1. A decoy apparatus resembling a goose, comprising:

a vertical stand;

a body loop rigidly attached to and extending in an ellipse from the stand, having its major axis horizontal and its minor axis vertical;

an expandable two-ply resilient body envelope in the shape of a goose body rotatably enveloping the body loop; and

wherein said body envelope can be selectively expanded to resemble a goose body by rotating the body envelope approximately perpendicular to the body loop, and the body envelope can be selectively flattened for storage by rotating the body envelope approximately coplanar with the body loop.

4,928,419

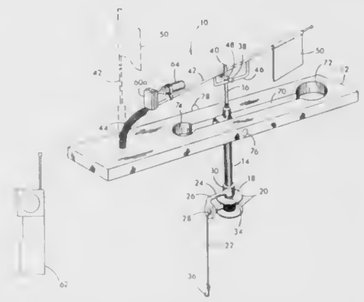
ICE FISHING APPARATUS AND SIGNALING DEVICE

Joseph M. Forrestal, 1800 Patton Pl., Janesville, Wis. 53546

Filed Feb. 27, 1989, Ser. No. 316,234

Int. Cl.[5] A01K *93/00*

U.S. Cl. 43—17 **4 Claims**



1. An apparatus for ice fishing comprising:

(a) a base adaptable to span a hole in the ice;

(b) a fishing line depending from the base;

(c) a trigger located proximate the base and engageable with the fishing line to be operated in response to a strike on the fishing line;

(d) a transmitter engageable with the trigger, the transmitter producing a radio signal when the trigger is operated in response to a strike on the fishing line such that the radio signal is remotely receivable by a receiver;

(e) an arm that is spring mounted to the base and extending between the trigger and the transmitter, the arm being movable from a trigger-held horizontal position to a vertical position, which actuates the transmitter to produce a signal; and,

a switch attached to the arm which forms a part of a completed circuit that enables the transmitter to produce a signal when the arm is in the vertical position.

4,928,420

COLLAPSIBLE DOWNRIGGER ARM ASSEMBLY

Noel E. Jackson, 03400 22nd St., Otsego, Mich. 49078

Continuation of Ser. No. 42,708, Apr. 27, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 314,307

Int. Cl.[5] A01K *89/00*

U.S. Cl. 43—27.4 **5 Claims**



1. A collapsible downrigger arm assembly capable of being

stored in a knocked-down condition and suitable for use with a fishing rod holding means and an associated downrigger mount and reel adjacent to said fishing rod holding means, said arm assembly comprising:

a plurality of elongated, cylindrical downrigger arm sections positionable in longitudinally aligned, end-to-end relationship;

guide pulley means mounted on the distal free end of the outermost one of said downrigger arm sections, said guide pulley means including a guide pulley about which an associated downrigger line is trained and guided;

means for releasably securing an innermost one of said downrigger arm sections to said downrigger mount; and

releasable joint means for releasably joining each contiguous pair of said downrigger arm sections to each other in said end-to-end relationship;

each said joint means comprising on the end portion of one of said downrigger arm sections of the respective contiguous pair a threaded shank and an unthreaded, anti-vibration support boss adjacent to and inwardly of said threaded shank the cross-sectional dimension of said boss being at least as large as the outer diameter of said threaded shank, and a bore defined in the abutting end portion of the other one of said downrigger arm sections of the respective adjacent pair, said bore having a threaded portion and a boss-receiving support socket positioned adjacent to and outwardly of said threaded bore, the cross-sectional dimension of said support socket being at least as large as the inner diameter of said threaded portion of said bore, the cross-sectional dimensions of said boss and support socket being substantially the same,

each said joint means further including a pair of abutting annular, cooperating locking surfaces provided on the downrigger arm sections of the respective adjacent pair, one of said locking surfaces being provided about and adjacent to said anti-vibration support boss and extending radially outwardly therefrom, and the other of said locking surfaces being positioned adjacent to and outwardly of said boss-receiving support socket and extending radially outwardly therefrom, and

each said joint means being releasably connectable by threaded engagement of said threaded shank with said threaded bore so that said anti-vibration support boss is received in closely-fitting relationship within said support socket and said locking surfaces are urged into an abutting relationship with one another pre-loading the threadedly engaged portions of the shank and the bore to resist bending flexure of said arm assembly and vibration-induced loosening of said joint means.

4,928,421

FISHHOOK DEVICE AND METHOD OF MAKING SAME

Rupert A. Staudner, Margate, Fla., assignor to Janet L. Staudner, Margate, Fla.

Continuation-in-part of Ser. No. 270,015, Nov. 14, 1988, abandoned. This application Sep. 8, 1989, Ser. No. 404,785

Int. Cl.[5] A01K *83/02*

U.S. Cl. 43—36 22 Claims



1. A fishhook device including a fishhook having a front side and a back side, a barb on the front side, a bend, a shank and an eye portion, the improvement comprising:

at least one piece of wire attached by substantially encircling the fishhook shank adjacent to the eye portion forming an attached end, and having a free end opposite the attached end;

at least one biasing bend substantially adjacent to the attached end and being adapted to bias the free end of the wire to a position distanced from the shank of the hook on the back side of the fishhook opposite to the front side with the barb; and,

a retaining member at least partially encircling the wire and the shank of the fishhook, and adapted for sliding movement relative to said wire and to said shank, whereby said fishing line can be secured to said retaining member and a fish strike on the fishhook will cause relative movement between the fishing line and the retaining member, and whereby said retaining member will release said wire and said wire will move under the force of said biasing bend to said position distanced from said shank to prevent the fish from swallowing the fishhook.

4,928,422

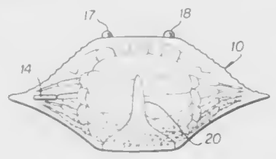
ARTIFICIAL BAIT CRAB-LIKE FISHING LURE

Michael G. Pitre, 309 E. 85th St., Cut Off, La. 70345

Filed Oct. 16, 1989, Ser. No. 421,908

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42 6 Claims



1. An artificial bait crablike fishing lure comprising an anatomical outline on the lure underside resembling the underside of a real crab, and thereby being a legless, clawless bouyant wood crab body having upwardly tappered front and rear ends, a line securing eye on the upper front leading tappered end and a hook attaching eye on the lower trailing end of said crab body, and a weight mass in said body forwardly of its center causing its center of gravity to be shifted forward and the crab body to tilt downwardly when a line attached to the lure is being reeled in.

4,928,423

FISHHOOK AND METHOD FOR PRODUCING THE SAME

Yoshikazu Furuta, 116, Takiro-cho 6-chome, Tajimi-shi, Gifuken, Japan

Continuation-in-part of Ser. No. 222,081, Jul. 20, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 383,301

Int. Cl.[5] A01K *97/02*

U.S. Cl. 43—43.16 13 Claims



1. A fishhook consisting of:

(a) a metallic base member having a fishhook-like shape provided with a point, a barb and a shank, and

(b) at least one film layer made of a hard metallic compound selected from the group consisting of TiC, TiN and Ti(C,N), which is formed on said base member by chemical vapor deposition, whereby said fishhook resists wear and corrosion.

4,928,424

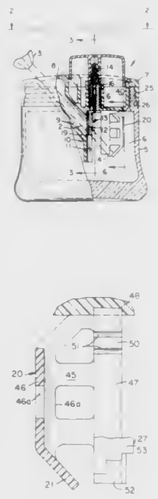
FLOWER STEM CUTTER

Anthony S. Campanelli, and Daniel A. Matré, both of Milwaukee, Wis., assignors to Rosestar® Incorporated, Milwaukee, Wis.

Filed Jul. 12, 1988, Ser. No. 217,943

Int. Cl.[5] A01G *3/00*

U.S. Cl. 47—1.01 15 Claims



1. A flower stem cutter for severing of the outer end of an individual flower, comprising a manually portable container, a cover releasably attached to the upper end of said container, said cover being a generally cup-shaped member having a rim releasably secured to said container with the inner edge of the cover abutting said rim and having an upper curved enclosure wall projecting upwardly of the end of said container, said cover including a diametric tubular slot projecting inwardly from one side of the cover across about one-half the diameter of the cover and the container, a guide member projecting inwardly and downwardly into said container, said guide member terminating in a vertical fixed blade support wall, a flat cutting blade secured to said support wall, said support wall and blade including an opening generally aligned with each other and the guide member, a lower edge of said fixed blade opening defining a flat cutting surface, a movable blade unit having a supporting stem extending through said cover and having a horizontal wall and a vertical blade support abutting said fixed blade, a guillotine blade secured to the ax inner face of said vertical blade support and being secured in angular relationship thereto, said movable guillotine balde extending from said wall and terminating in a pointed inner end, said pointed inner end having a surface abutting the fixed blade and locating the cutting edge of said movable blade in sliding abutting engagement with said fixed blade, means coupled to said stem and resiliently supporting said movable blade in a raised position with said cutting edge of said movable balde located immediately above said fixed blade opening and said fixed blade, said stem being movable inwardly against said resilient means to move said movable blade downwardly across said opening and past said flat cutting surface of said fixed blade, a generally U-shaped guard, said guard having side walls projecting downwardly from the opposite sides of said horizontal wall to enclose the movable blade, said side walls projecting outwardly of said support wall, an outer base wall secured to said sidewalls and generally aligned with said movable blade, said outer base wall having a bottom lip extending inwardly toward said support wall, said lip being a solid wall member generally aligned with an extension of the path of said tubular guide opening and defining a stop wall engaged by the stem for locating of the stem with respect to said cutting blade.

4,928,425

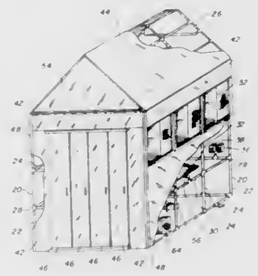
GREENHOUSE WITH INTEGRAL HUMIDIFIER

Robert M. Walker, Jr.; Robert M. Walker, Sr., and Laura B. Walker, all of 3620 Homeway Dr., Los Angeles, Calif. 90008

Filed Nov. 28, 1988, Ser. No. 276,522

Int. Cl.[5] A01G *9/00*

U.S. Cl. 47—18 18 Claims



1. A light permeable greenouse plant enclosure with an integral humidifier comprising:

(a) a hollow framework structure having upwardly extending corner members, a plurality of connecting members disposed therebetween and a plurality of roof members, all having internal communication with each other, capable of support pressure inside and sufficient structural integrity to reinforce the greenhouse:

(b) water under pressure fluidly disposed within said hollow framework defining a distribution network therethrough such that the framework becomes a conduit to circulate water throughout the greenhouse enclosure;

(c) water atomizing means in communication with both framework structure and said pressurized water, positioned in such a manner as to spray the water in a mist form within the confines of the framework to elevate the humidity of air within the greenhouse;

(d) transparent enclosure means contiguously encompassing said framework such that sunlight penetrates therethrough while impeding the transmission of air creating an isolated environment conclusive to the growing of plants in a humidified surrounding;

(e) non-penetrating attaching means connecting the transparent enclosure means securely onto the framework creating a structural bond therebetween allowing the transparent enclosure means to withstand environmental forces, such as wind loading, rain and snow;

(f) air circulating means integral with said enclosure means defined by said enclosure having a plurality of adjustable openings that allow air entrance and egress providing limited temperature control relative to air heated by the sun's penetration through the transparent enclosure through natural air moving phenomenon; and

(g) a shelf substructure integral with said hollow framework structure having a plurality of shelves projecting inwardly

in a horizontal manner with the shelves removably resting thereupon providing a platform for mounting plants and an attachment position for said atomizing means.

4,928,426

TROUGH FOR SOIL IRRIGATION AND MOISTENING

Luc Janssens, 19, Berkenlaan, B-2610 Wilrijk-Antwerpen, Belgium

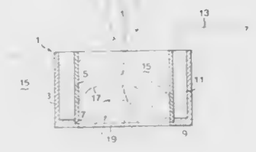
PCT No. PCT/BE88/00006, § 371 Date Oct. 31, 1988, § 102(e) Date Oct. 31, 1988, PCT Pub. No. WO88/06401, PCT Pub. Date Sep. 7, 1988

PCT Filed Mar. 2, 1988, Ser. No. 278,942

Claims priority, application Luxembourg, Mar. 4, 1987, 86799

Int. Cl.[5] A01G *25/06;* **E02B** *13/00*

U.S. Cl. 47—48.5 12 Claims



1. A trough for irrigating and moistening soil, said trough having a closed bottom end and an open top end and comprising:

a water impermeable bottom member defining the closed bottom end; and

sidewalls extending upwardly from the water impermeable bottom member to open top end, said sidewalls comprising a mixture of a calcium sulfate cement with from 40 wt % to about 80 wt % water and said sidewalls exhibiting a selected permeability.

4,928,427

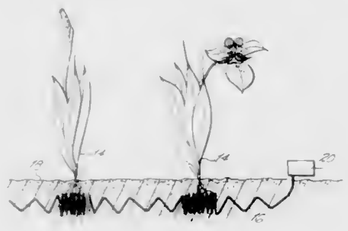
IRRIGATION SYSTEM

James A. Patterson, 2074 20th St., Sarasota, Fla. 34234

Filed Aug. 14, 1989, Ser. No. 393,539

Int. Cl.[5] A01G *25/06;* **E02B** *13/00*

U.S. Cl. 47—58 23 Claims



1. A method of irrigating soil below the surface comprising the steps of:

placing a coil having a coil axis in the soil with said coil axis substantially parallel to the soil surface;

said coil having constant overall dimensions and formed of a flexible and pliable, hollow tubular fiber;

said fiber having a constant diameter and having a wall permeable to water;

introducing water into said coil.

4,928,428

LEVER-ACTIVATED LOCKING BAR BRACE FOR A WINDOW OR A DOOR

Axel Gebhardt; Bernd Diekmann, both of Bielefeld, and Rüdiger Schmidt, Lage, all of Fed. Rep. of Germany, assignors to Schuco Heinz Schurmann GmbH & Co., Fed. Rep. of Germany

Filed Dec. 18, 1986, Ser. No. 943,665

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, 3545861525

Int. Cl.[5] E05D *15/52*

U.S. Cl. 49—192 20 Claims



1. A housing outlet, such as a window or a door, comprising

(a) an inner closure frame provided with a C-shaped receiving groove and having a plurality of sections including lower and upper horizontal sections and a hinge-side vertical wing, said receiving groove having a bottom wall;

(b) a locking bar brace including a handle and a plurality of locking bars slidably supported in said receiving groove, said locking bars each having a U-shaped cross-section with two side legs of a predetermined length, each of said side legs having a side groove extending over a full length of said legs, each of said side grooves being limited by a lower web having a thickness of S_1 and an upper web with a thickness S_2, said side grooves having a height N, said receiving groove having a height H_1 which is greater than a height H_2 of said locking bar by the thickness S_1 of said lower web, said receiving groove and said locking bar having a cross-section which is the same in all of said sections of said closure frame, and said receiving groove having an inwardly extending edge strip which has a height H_3 less than the height N of said side grooves, said locking bars being slidably supported with said legs on said bottom wall of said receiving groove in said lower and upper horizontal sections and being supported at a handle-side on said edge strip of said receiving groove in said hinge-side vertical wing;

(c) a plurality of locking pieces connected with said locking bars of said vertical hinge-side section and said lower horizontal section;

(d) anchoring pins connecting said locking pieces with said vertical and lower horizontal sections, said locking pieces being provided with rectangular plates having longitudinal sides with side grooves, said plates having a side opposite to said anchoring pins and being provided at said side with a bearing pin; and

(e) a metal roller rotatably supported on said bearing pin.

4,928,429

SECURITY VESTIBULE ENTRY FOR CONTROLLED ACCESS TO BANKS AND THE LIKE

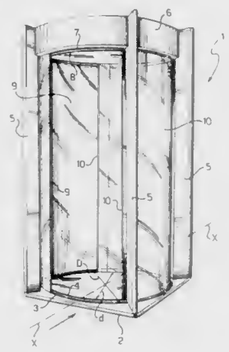
Attilio Colombo, Busto Arsizio, Italy, assignor to Tonali S.p.A., Varese, Italy

Filed Aug. 24, 1988, Ser. No. 236,011

Claims priority, application Italy, Aug. 28, 1987, 21748A/87

Int. Cl.[5] E06B *3/34*

U.S. Cl. 49—41 5 Claims



1. A security vestibule comprising a base, a top, a first wall extending from said base to said top along an arc of a circle having a first diameter, a second wall extending from said base to said top along an arc of a circle having a second diameter larger than said first diameter, opposed first circular tracks associated with said base and said top for engaging said first wall for displacement along said first tracks, opposed second circular tracks associated with said base and said top for engaging said second wall for displacement along said second tracks, said second tracks being concentric with and of larger diameter than said first tracks, said first and second walls forming doors of said vestibule and having a combined angular breadth equal to or greater than by a small amount 360°, said base and said top closing said vestibule at opposed ends thereof and said walls in selected positions thereof defining an entrance into and an exit from said vestibule across at least a portion of said base, said base being suitable for supporting at least one person thereon for passage through said vestibule between said entrance and said exit, and four vertically extending supports for supporting said top, said supports being at corners of a square having sides adjacent one of said first and said second tracks.

4,928,430

PIVOTABLE BUMPER GUARD

Harry George, 8 S. 511 Bell Dr., Naperville, Ill. 60565

Filed Apr. 4, 1989, Ser. No. 333,126

Int. Cl.[5] E06B *3/30*

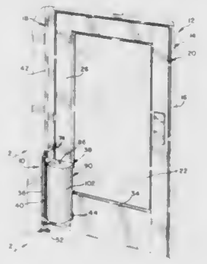
U.S. Cl. 49—460 14 Claims

1. A bumper guard pivotable between a normal and a retracted position for use with a door which pivots inward and outward from a closed position about a pivoting door stile, comprising:

a stationary support:

a bumper, said bumper being in abutting contact with said stationary support and being located adjacent to said pivoting door stile when in its normal position; and

pivot means pivotally joining said bumper to said stationary support, said pivot means allowing said bumper to pivot between its normal and its retracted positions, wherein said bumper, when in the retracted position, will allow said door to pivot towards said bumper to a position



which is disposed from said closed position of said door by at least 90°.

4,928,431

DOOR WEATHER STRIP FOR MOTOR VEHICLE

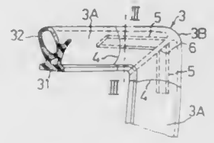
Michio Kuzuhara, Kakegawa; Jun Shibasaki, Ichinomiya, both of Japan; Andree St. Louis, Waterville, Canada; Christian St. Laurent, Waterville, Canada, and Michel Bedard, Waterville, Canada, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan and Waterville TG, Inc., Waterville, Canada

Filed May 19, 1989, Ser. No. 354,297

Claims priority, application Japan, May 25, 1988, 63-128080

Int. Cl.[5] E06B *7/16*

U.S. Cl. 49—479 6 Claims



1. A weather strip for providing a seal between a door opening of a body of a motor vehicle and a door frame, comprising:

extruded members; and

a molded member for connecting ends of said extruded members;

each of said extruded members and said molded member being provided with a base portion to be attached along the door opening or the door frame, and a tubular sealing portion projecting from said base portion to be pressed by the body of the motor vehicle or the door frame when a door is closed;

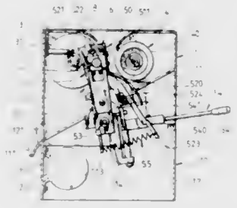
said tubular sealing portion being provided with a bridge connecting opposing inner side surfaces of said sealing portion, said bridge extending so as to cross a connection boundary between each of said extruded members and said molded member in a direction perpendicular to said connection boundary.

4,928,432

RODS PRECISION CUTTING-OFF AND END SURFACE GRINDING MACHINE

Chin-lung Yang, 9 Lane 166, Chimei St., Sanchung City, Taipei Hsien, and Cheng-tien Lee, 78 Lane 29, Huacheng Road, Hsinchuang City, Taipei Hsien, both of Taiwan

Filed Aug. 29, 1988, Ser. No. 237,844
Int. Cl.[5] B24B *27/06*
U.S. Cl. 51—5 C **3 Claims**



1. A rod precision cut-off and end surface grinding machine, comprising:

a housing, which is generally a rectangular housing body, consisting of an inclined plate in the shape of a ramp with a lower end extending to an outer side of a left side wall of the housing whereon a U-shaped discharge hopper with a supporting edge on two sides is installed, a plurality of longitudinal and lateral partitions, a notch provided to the upper side of a front side wall and an upper wall of said housing respectively, a T-slot provided to a right side wall thereof, and a rear cover plate capable of optional opening and closing pivotally installed on the back thereof;

a set of drive devices, consisting chiefly of a motor, a double-grooved drive belt roller, two single-grooved driven belt rollers, two transmission belts and a set of belt automatic tension adjusting devices, wherein the motor is installed on the lower side of a side wall of said housing body, the double-grooved drive belt roller is installed on the said motor, the two single-grooved driven belt rollers are installed on drive shafts of cut-off and end surface devices respectively and each device connected to the double-grooved drive belt roller by a belt, one end of said belt automatic tension adjusting device is pivotally installed on the inner side of a side wall of said housing body, and another end thereof is provided with a roller between the said two transmission belts;

a cut-off device, consisting chiefly of a cut-off sander installed on one end of a sander drive shaft by a positioning nut and a locking nut, wherein the sander drive shaft is pivotally installed between two lateral partitions on one side in the housing body, and another end thereof is provided with said single-grooved belt roller of said drive devices;

an end surface grinding device, consisting chiefly of a cylindrical grinding sander locked on one end of cylindrical sander drive shaft pivotally installed in a crank hollow shaft which is pivotally installed, together with the cylindrical sander drive shaft, between two lateral partitions on another side in the housing body, and another end of the cylindrical sander drive shaft is provided with said other single-grooved belt roller of said drive device; and

a rod chucking device, consisting chiefly of a primary chuck, a secondary chuck, a fixing shaft, a controlling lever, a chucking spring, and two sets of tapered fixing stud and nut, wherein the primary chuck is generally a rectangular plate with a central slot penetrating therethrough, provided with a chuck jaw and a chuck mouth at an upper end, and an extension rod for securing the chucking spring at the lower end; the secondary chuck body is roughly a Z-shaped member, provided with a chuck jaw and a chuck mouth at an upper end, corresponding to the said jaw and mouth of primary chuck, and an extension rod at the lower end for securing the chucking spring, and inserted in the central slot of primary chuck body and pivotally installed by a pin shaft so that the secondary chuck cooperates with the primary chuck to open and close as a pincer fixture; the chucking spring is installed between the two extension rods at the lower ends of said two chuck bodies; the fixing shaft having eyelets at both ends is installed on the lower side of primary chuck body and parallels the edge of the mouth of primary chuck body, and the two ends of said shaft are pivotally installed between the lateral partition in the housing body and the front side wall of said housing body by means of a tapered fixing screw and an adjusting nut; the controlling lever is generally a T-lever body pivotally installed on a U-frame which is integrally made together with the primary chuck body, an arc-shaped inclined cam is installed on the front end of said lever body, and a roller is pivotally installed on the secondary chuck body;

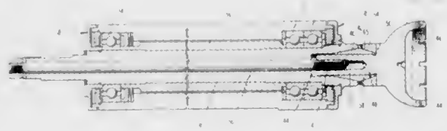
which is chiefly characterized by the following operations: to put the controlling lever of the rod chucking device in the central position of T-slot on the right side of housing body and move the said lever in the right horizontal direction along the said slot so that the arc-shaped cam at the front end of said lever pushes the secondary chuck body to open its mouth to receive a rod, then to move the said lever back to its original position and then up and down along the said T-slot so that the pincer fixture of rod chucking device can chuck the rod to be precisely cut off by the cut-off device and then the end surface of said rod is precisely ground by the end surface grinding device, therefore, the rod can be precisely shortened and the end surface thereof can be ground and flattened at the same time.

4,928,433

APPARATUS FOR EFFECTING RAPID REPLACEMENT OF LENS CUTTING TOOLS

Roy R. Gray, Muskogee, Okla., assignor to Coburn Optical Industries Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 937,251, Dec. 3, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 172,553
Int. Cl.[5] B24B *13/01*
U.S. Cl. 51—33 W **11 Claims**



1. A lens cutting machine for generating a surface on a lens blank, comprising:

support means defining a reference plane,

tool mounting means mounted on said support means for rotation about a longitudinal axis of rotation which intersects said reference plane, said tool mounting means including a first stop surface disposed at a preset relationship relative to said reference plane, and

a tool assembly including a tool element having a cutting edge for grinding a lens, and a stop element carried by said tool element and defining a second stop surface, said tool assembly being removably mounted to said tool mounting means to bring said second stop surface into engagement with said first stop surface,

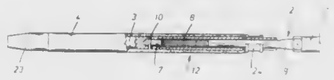
said stop element being longitudinally adjustable relative to said tool element prior to mounting of said tool assembly to said tool mounting means to adjust the location of said cutting edge relative to said second stop surface so that said cutting edge is disposed at a predetermined relationship relative to said reference plane in response to engagement between said first and second stop surfaces during mounting of said tool assembly to said tool mounting means.

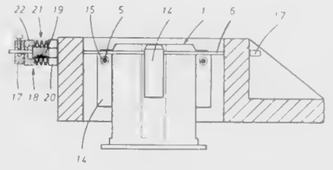
4,928,434

LAPPING INTERNAL SURFACES

Cassanelli Gianfranco, Bologna, Italy, assignor to Trimate, Bologna, Italy

Filed Oct. 7, 1988, Ser. No. 254,699
Claims priority, application Italy, Oct. 30, 1987, 3676 A/87
Int. Cl.[5] B24B *33/00*
U.S. Cl. 51—3.4 H **11 Claims**





1. Improved equipment for lapping internal surfaces, comprising

a composite lapping tool comprising a vertical rod uppermost, carried by a spindle, a cone at bottom which ensheaths the rod in a loose fit so as to allow a marginal freedom of transverse movement between the rod and the cone, and an abrasive diamond shell ensheathing and rigidly associated with the cone; and

a work chucking mechanism, positioned beneath the spindle and capable of oscillating about an axis disposed substantially coaxial with, or parallel to, that of the tool, wherein the vertical rod comprises three rigidly connected sections: a bottom section of polygonal transverse profile engaging to an exact fit in a corresponding axial socket afforded by the cone and accommodating a diametral pin, a middle section, possessing a moderate degree of elasticity commensurate with the tolerances prescribed for the lapping operation and ensuring sufficient torsional rigidity to function as a flexible coupling, and a top section connected to the spindle.

wherein the chucking mechanism is suspended from at least three cables passing through respective peripheral hollow mountings on the chucking mechanism itself.

4,928,435

APPARATUS FOR WORKING CURVED SURFACES ON A WORKPIECE

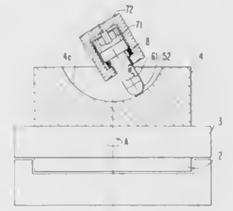
Takeshi Masaki, Kawasaki; Koichi Kawata, Tama, and Yukuo Sakagaito, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 865,419, May 21, 1986, abandoned. This application Jun. 15, 1988, Ser. No. 206,724
Claims priority, application Japan, May 21, 1985, 60-108815; Nov. 8, 1985, 60-251339
Int. Cl.[5] B24B *13/00*
U.S. Cl. 51—55 **11 Claims**

1. An apparatus for working aspherical surfaces on a workpiece comprising:

a spindle having a tool on an end portion thereof;

means for adjusting said spindle so that a center axis of said spindle coincides with a normal direction at every point on an assumed aspherical surface to be fabricated on the workpiece where said center axis of said spindle intersects the assumed aspherical surface;



means for driving said spindle;

means for rotating said workpiece; and

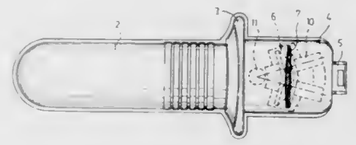
means for applying said tool to said workpiece with a substantially constant pressure.

4,928,436

DEVICE FOR SHARPENING KNIVES

Olavi Lindén, Billnäs, Finland, assignor to Fiskars Oy Ab, Helsinki, Finland

Filed Jan. 17, 1989, Ser. No. 297,964
Claims priority, application Finland, Jan. 20, 1988, 880233
Int. Cl.[5] B24B *7/08*
U.S. Cl. 51—80 BS **17 Claims**



1. A device for sharpening knives, comprising a frame, a grinding element freely rotatably mounted on an axle of the frame, which grinding element consists of two truncated cones, the axles of which are turned 180° in relation to each other, and a means arranged in said frame for steering the knife in the sharpening direction, whereby the grinding element is pivotally mounted between two end grinding positions, the grinding element being pivoted around one end of its axle, which in said end grinding positions forms angles with respect to the sharpening direction of the knife, which angles are smaller and larger, respectively, than 90°.

4,928,437

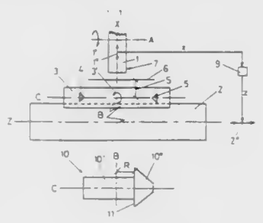
MEANS AND METHOD FOR RESETTING A CYLINDRICAL GRINDING MACHINE

Werner Waelti, Selzach, Switzerland, assignor to Werkzeugmaschinenfabrik Tschudin, Grenchen, Switzerland

PCT No. PCT/CH86/00161, § 371 Date Sep. 2, 1987, § 102(e) Date Sep. 2, 1987, PCT Pub. No. WO87/03237, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 24, 1986, Ser. No. 102,019
Claims priority, application Switzerland, Nov. 25, 1985, 5042/85
Int. Cl.[4] B24B *49/00*
U.S. Cl. 51—165.71 **4 Claims**

1. In a method of resetting a cylindrical grinding machine comprising: at least one grinding wheel (1), said at least one

grinding wheel being rotatable about an axis A, said at least one grinding wheel being translatable along an axis X, said axis X being perpendicular to said axis A; a turning slide (2), said turning slide being translatable along an axis Z; a rotary table (3) rotatably disposed on said turning slide (2), said rotary table being rotatable around an axis B, said axis B being perpendicular to said axis Z, said rotary table (3) being designed and equipped to receive a workpiece (10) which is to be ground, said workpiece being held between two turning centers (4,5) defining an axis C; and a numerical control computer means (a) for effecting relative movement between said at least one grinding wheel, said turning slide and said rotary table; said method comprising: grinding a workpiece (10) along a grind-



ing line (6), with rotation of said rotary table (3) about said axis B until said axis of said workpiece (10) is parallel to said axis Z of said turning slide (2) as determined by the production of a calibration cylinder having predetermined dimensional requirements; wherein the improvement comprises inputting the thus defined rotational position of the C axis with respect to the B axis into said numerical control computer means for resetting said axis C parallel to said axis Z; and, based on the position of the grinding wheel on said X-axis and the diameter of the calibration cylinder, calculating a distance (S) between the grinding line (6) and the axis C and inputting said distance (S) to the computer for resetting the final position of said grinding wheel on said axis X during grinding.

4,928,438

WAFER PROCESSING FILM

Osamu Narimatsu, Nagoya; Michiyasu Ito, Kuwana; Kazuyoshi Komatsu, and Yasuhiro Shibata, both of Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 823,492, Jan. 16, 1986, Pat. No. 4,853,286. This application May 26, 1988, Ser. No. 357,351

Claims priority, application Japan, Aug. 7, 1984, 59-16438; May 29, 1987, 59-107539

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—283 R **5 Claims**

1. A method of grinding the surface of a wafer comprising the following steps:

affixing an adhesive layer disposed on one surface of a base film having a Shore D hardness of 40 or less, to a first surface of a wafer having first and second surfaces; and

grinding said second surface of said wafer.

4,928,439

LENS EDGING MACHINE AND METHOD

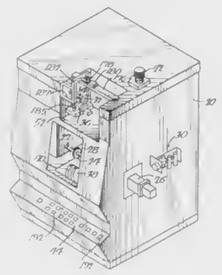
Rolando P. Ramos, Des Plaines; Wilfredo P. Loreto, Hoffman Estates, and Yordan Vulich, Oak Lawn, all of Ill., assignors to AIT Industries, Inc., Schaumburg, Ill.

Division of Ser. No. 551,148, Nov. 14, 1983, Pat. No. 4,807,398. This application Jan. 9, 1989, Ser. No. 294,231

Int. Cl.[5] B24B *9/14*

U.S. Cl. 51—284 E **19 Claims**

10. A method of grinding the peripheries of ophthalmic lenses, comprising the steps of mounting a pattern for rotation about an axis and on a clapper switch and for movement of the axis toward and away from the clapper switch; actuating the clapper switch upon engagement thereof by the pattern; mounting a lens for rotation about an axis and for movement of the lens periphery against and away from a grinding surface of a grinding wheel; moving the axis of rotation of the lens toward and away from the grinding surface in accordance with movement of the axis of rotation of the pattern toward and



away from the clapper switch; rotating the pattern and lens conjointly whenever the clapper switch is actuated to grind the lens periphery to a configuration complementary to that of the pattern; and terminating grinding of the lens periphery only upon uninterrupted actuation of the clapper switch for at least a selected time.

4,928,440

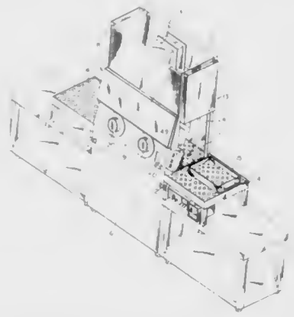
DECONTAMINATION BOOTH

Joel J. Hughes, Wilmington, N.C., assignor to Container Products Corp., Wilmington, N.C.

Filed Mar. 30, 1987, Ser. No. 31,611

Int. Cl.[5] B24C *3/00*

U.S. Cl. 51—426 **4 Claims**



1. A decontamination booth including an atmospherically sealed cabinet having a source of vacuum connected thereto for applying a negative pressure in a work area within the cabinet and a steam/abrasive application gun within the work area, comprising:

(a) a cabinet having a base for housing a decontamination refuse container,

(b) a work area within said cabinet having a work piece supporting grate separating it from said base,

(c) an inclined viewing window for said work area including work glove ports,

(d) a air intake plenum including a means for directing a current of air over the inclined interior surface of said viewing window,

(e) a pair of access doors for said work area on each side wall of said cabinet,

(f) pneumatic cylinders positioned exteriorly of said cabinet and above the side door openings and having their movable pistons connected to the outside surface of each of said doors for moving the same through a vertical plane within the confines of said work area and above said work piece supporting grate into an open or closed position, and

(g) stationary door edge receiving gaskets sealing the periphery of said access doors against the ambient atmosphere when in a closed position.

4,928,441

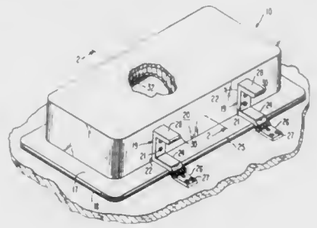
ATTIC ACCESS STAIRWAY COVER

John G. Daley, 2143 Echo La., Wilmington, N.C. 28403, assignor to John G. Daley, Wilmington, N.C.

Filed Jul. 31, 1989, Ser. No. 387,751

Int. Cl.[5] E04B *7/18*

U.S. Cl. 52—19 **2 Claims**



1. An attic access stairway cover, comprising in combination, an inverted tub-shaped main body for removable placement over an attic access opening through an attic floor, hinge means attached to said main body for upwardly pivoting of said main body away from said opening, and a cavity on an underside of said main body for an attic folding stairway to be upwardly stored therewithin from below; said main body comprising a strong central core sandwiched between layers of plastic; said main body being rectangular in shape and having a padded outwardly flange around its edge for resting upon said attic floor; and said hinge means comprising a pair of hinges attached to a longer side of said main body and each said hinge including stop means for abutment against said attic floor and limit a pivotal travel thereof.

4,928,442

INFLATABLE TENTS

Keith Kroetch, and Colleen Fitzpatrick, both of 1725 N. Fairmont Loop, Coeur D'Alene, Id. 83814

Filed May 9, 1989, Ser. No. 349,483

Int. Cl.[5] E04H *15/20*

U.S. Cl. 52—2 J **1 Claim**

1. An inflatable tent comprising:

a rectangular mattress element which includes

(1) a ground-engaging surface,

(2) a user-supporting surface,

(3) first and second sides and first and second end walls connecting said surfaces together to define a closed compartment having a chamber therein,

(4) a mattress manifold system located in said chamber and being adapted to hold air for inflating said mattress element and which includes

(a) a first manifold extending adjacent and parallel to said first end wall and including a first mattress-mounted check valve fluidically connected thereto and having an inflation stem fluidically connected thereto,

(b) a second manifold extending adjacent and parallel to said first side wall and being fluidically connected to said first manifold and including a second mattress-mounted check valve fluidically connected thereto,

(c) a third manifold extending adjacent and parallel to said second end wall and including a third mattress-mounted check valve fluidically connected thereto and being fluidically connected to said second manifold, and

(d) a fourth manifold extending adjacent and parallel to said second side wall and including a fourth mattress-mounted check valve fluidically connected thereto and being fluidically connected to said first end manifold and to said third manifold,

(5) an air inlet valve fluidically connected to said first manifold inflation stem and mounted on said mattress element for conducting air from a source into said first manifold,

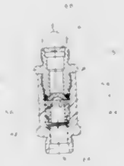
(6) a plurality of air conduits each connected to said first and third manifolds to receive air therefrom to inflate said mattress element, said air conduits being spaced apart from each other and extending parallel to each other and parallel to said second and fourth manifolds, and being connected together only via said first and third manifolds,

(7) each mattress element check valve of said mattress element check valves having means for normally closing said each mattress element check valve and including

(a) an in-line check valve having a casing mounted on said mattress element,

(b) a poppet slidably mounted in said casing and having a plurality of orifices defined therein,





(c) a land element on said casing to close said orifices when said poppet is in a first position, and

(d) a spring urging said poppet towards said first position,

(8) accessory attaching means mounted on said mattress element adjacent to each mattress element check valve; and

(9) a user-covering accessory which includes

(a) an accessory manifold,

(b) a plurality of accessory air conduits each fluidically connected to said accessory manifold to receive air therefrom to inflate said accessory,

(c) an accessory check valve fluidically connected to said accessory manifold to conduct air into said accessory manifold, and

(d) means on said accessory check valve to releasably couple said accessory check valve to one mattress element check valve of said mattress element check valves, and which includes

(i) a body which is sized to slidably fit into said one mattress element check valve casing to engage the check valve poppet of said one mattress element check valve and move that poppet away from said first position when pressed into the casing of said one mattress element check valve, and

(ii) a back-flow preventing ball on said body and which includes a spring biasing said ball into said body to prevent flow of air from said accessory manifold into said mattress manifold system, and

(e) mattress element attaching elements mounted on said accessory adjacent to each accessory check valve for releasably coupling said accessory to said mattress element, and

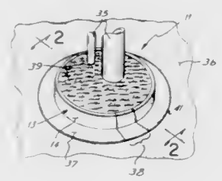
(10) said user-covering accessory including a portion covering a user's head.

4,928,443

POURABLE SEALER POCKET

Ronald L. Goodman, and Richard E. Kelley, Sr., both of Carlisle, Pa., assignors to Carlisle Corporation, Cincinnati, Ohio

Filed Mar. 1, 1989, Ser. No. 317,540
Int. Cl.[5] E04D *1/36*
U.S. Cl. 52—58 6 Claims



1. A pourable sealer pocket comprising a collar having elongated upper and lower edges, a first end and a second end and means to connect the first and second ends of the collar to form a cylinder;

a water impervious, stretchable membrane strip bonded to said collar, a first lower portion of said membrane extending below the lower edge of the collar,

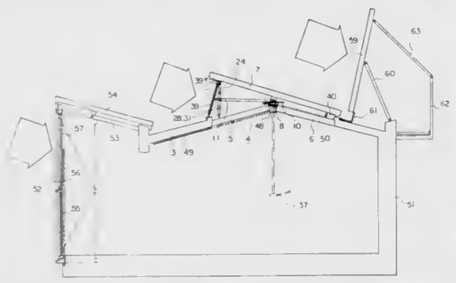
wherein said membrane strip is effectively stretchable to permit bending of said lower portion of said membrane normal to said collar to form an annular flange when said collar is formed into said cylinder.

4,928,444

SOLAR HOUSE WITH ROOF BOARD OF ADJUSTABLE INCLINATION

Mitsukazu Horie; Shigemitsu Horie, and Haruo Horie, all of Hiromi 2381-1, Kani-shi, Gifu-ken 509-02, Japan

Filed Jul. 7, 1988, Ser. No. 216,093
Claims priority, application Japan, Jul. 8, 1987, 62-171620
Int. Cl.[5] E04B *7/16*
U.S. Cl. 52—66 8 Claims



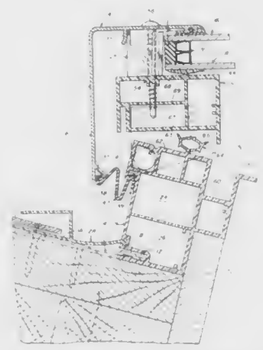
1. In a roof structure of a building having two roof surfaces which meet at a top ridge, one said roof surface being downwardly inclined away from the ridge in a generally southernly direction, and the other roof surface being downwardly inclined away from the ridge in a generally northernly direction, comprising a south side opening extending upwardly through said one roof surface in the vicinity of said top ridge, a north side opening extending upwardly through said other roof surface in the vicinity of said ridge, said south side and north side openings being disposed in adjacent relationship to one another on opposite sides of said ridge, a rotary shaft rotatably supported on the roof structure and extending generally along the top ridge, a roof board for selectively closing one of the south side and north side openings, the roof board having a central part supported by said rotary shaft as a fulcrum for swinging movement between a first position wherein a southern portion of said roof board closes said south side opening and a second position wherein a northern portion of said roof board closes the north side opening, said southern and northern portions of said roof board being disposed on opposite sides of the fulcrum, said north side opening being uncovered when the roof board is in said first position, said south side opening being uncovered when the roof board is in said second position, said roof board defining outer end edge portions which define opposite free ends of the north and south portions of the roof board and which extend generally parallel with said rotary shaft, one of the end edge portions being spaced upwardly above the respective opening when the other opening is covered by its respective northern or southern portion, and a skylight supported on said roof board adjacent said one end edge portion thereof.

4,928,445

SKYLIGHT CONSTRUCTION

Robert Sampson, Sanford, and Sean Flanigan, Wells, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Filed Dec. 13, 1988, Ser. No. 283,803
Int. Cl.[5] E04B *7/18*
U.S. Cl. 52—72 29 Claims



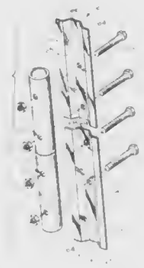
21. A sealing gasket for use between separable components of a skylight or the like, said gasket having substantially single-point attachment to one of said components in a manner to permit at least limited deflection of said gasket, said single-point attachment being formed by coextrusion of the gasket with said one component, said gasket being of substantially tubular construction having a hollow interior for enhancing pliability and sealing function of the gasket, said gasket having multiple and separate contact sealing locations to form multiple seal areas disposed at a side of the gasket remote from the attachment point of the gasket to said one component.

4,928,446

BREAK-AWAY SIGN POST AND POST GROUND ANCHOR

Walter A. Alexander, Sr., 1805 Roswell Rd., Apt. 19E, Marietta, Ga. 30062

Continuation-in-part of Ser. No. 156,220, Feb. 16, 1988, which is a continuation-in-part of Ser. No. 123,709, Nov. 23, 1987. This application Dec. 14, 1988, Ser. No. 286,031
Int. Cl.[5] F16B *7/00*; E02D *5/74*
U.S. Cl. 52—98 7 Claims



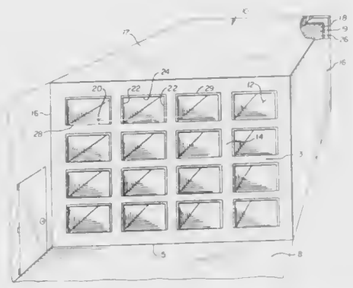
1. A break-away post comprising two elongated channels of generally U-shaped construction each having a web from which two side walls divergently extend, a stud having a tubular wall of a selected thickness with an outside cylindrical surface sized to abut the inside surfaces of said two side walls and web of said channels and with a central portion of said stud having a tubular wall thickness less than said selected thickness to provide an area of structural weakness for allowing said stud to fracture omnidirectionally, and means for mounting said stud to said two channels with said channels aligned in mutually spaced relation, with said stud central portion located between said two channels and with said stud cylindrical outside surface abutting said two side walls and web of each of said channels.

4,928,447

CRYPT INSULATION PANEL AND METHOD OF INSTALLATION

Walter Stoecklein, 293B, R.D. #2, Rte. 910, Cheswick, Pa. 15024

Filed Nov. 28, 1988, Ser. No. 276,948
Int. Cl.[5] E04A *13/00*
U.S. Cl. 52—136 28 Claims



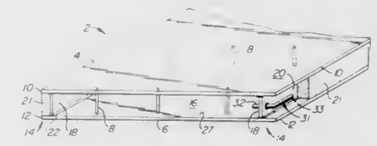
7. The improvement of claim 6, wherein said polyurethane comprises at least 90% closed cells.

4,928,448

THERMALLY INSULATING WINDOW AND METHOD OF FORMING

Bradley L. Phillip, San Francisco, Calif., assignor to Enhanced Insulations, Inc., Shaker Heights, Ohio

Filed May 2, 1988, Ser. No. 188,820
Int. Cl.[5] E06B *7/12*
U.S. Cl. 52—174 37 Claims



1. A thermally insulating window comprising:

an enclosure including first and second spaced-apart window panes and an edge seal sealably connecting the window panes to define a sealed insulating region between the window panes; and

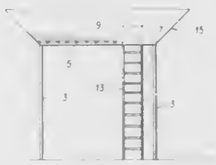
a first gas filling the insulation region at a first pressure of about 100–200 torr to about 10^{-3} to 10^{-4} torr, which is sufficiently low to substantially eliminate convective heat flow through the insulating region but not so low as to substantially reduce conductive heat flow through the insulating region, the thermal conductivity of the first gas at said first pressure being substantially less than that of air.

4,928,449

ELEVATED SUNDECK

Eugene Anderson, 3293 Stockland Rd., Battle Creek, Mich. 49017

Filed Jul. 12, 1989, Ser. No. 378,770
Int. Cl.[5] E04H *1/12*
U.S. Cl. 52—194 9 Claims



7. An improved deck comprising:

(a) a decking having a deck surface; and

(b) at least one side wall adjacent to said decking, said side wall being angularly related to said deck surface and covered with a reflective covering.

4,928,450

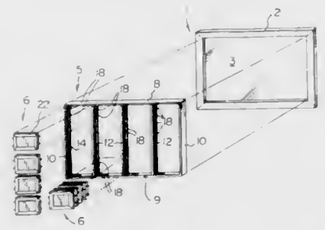
PANEL SYSTEM FOR WINDOWS

F. Wayne Rutledge, 716 Acadia Drive Southeast, Calgary, Alberta, Canada (T2J 0C3)

Filed Aug. 30, 1988, Ser. No. 238,179
Int. Cl.[5] E06B *3/26*
U.S. Cl. 52—202 10 Claims

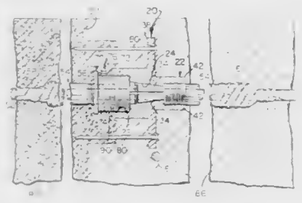
1. In combination, a window having a window frame, and an accessory light-controlling panel system comprising a pair of first track means mounted adjacent the window frame in parallel relationship with the window and frame; longitudinally and transversely extending slot means in opposing, parallel surfaces of said first track means; and a plurality of discrete light-con-

trolling panel means for slidable mounting in said slot means, whereby each said panel means can be independently moved



longitudinally and transversely with respect to said first track means to block selected portions of the window opening.

4,928,451
ANCHOR APPARATUS FOR A TENDON IN PRESTRESSED CONCRETE SLAB
Gordon H. Reigstad, North St. Paul; A. Norris Breivik, Forest Lake, and Hanley S. Reigstad, Sunburg, all of Minn., assignors to Tech Research, Inc., St. Paul, Minn.
Division of Ser. No. 916,151, Oct. 7, 1986, Pat. No. 4,743,354, which is a continuation-in-part of Ser. No. 870,654, May 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 785,333, Oct. 7, 1985, abandoned. This application Nov. 18, 1988, Ser. No. 273,197
Int. Cl.[5] E04C *5/08*
U.S. Cl. 52—223 L 2 Claims



1. A device for holding a tendon in a stressed condition in a prestressed concrete slab, said tendon having a corrosion resistant covering, said covering being incomplete in a region around where said device holds said tendon, said device comprising:

wedges;

an anchor body having a central passage for receiving said tendon, said passage having a longitudinal centerline, said passage having an inlet section, an outlet section and a central section therebetween, said central section including a conical portion for receiving and providing a seat for said wedges, said inlet section having a smaller transverse dimension through the longitudinal centerline than said outlet section, said body further including means for resisting longitudinal movement with respect to said slab;

a first conduit having first and second end portions;

means for sealingly attaching said first end portion of said first conduit to said inlet section of said anchor body, said attaching means including said inlet section having a first threaded portion and said first end portion of said first conduit being threaded to mate with said first threaded portion;

first means for sealing said second end portion of said first conduit to said covering on said tendon to enclose one end of said region where said corrosion resistant covering is incomplete; and

means for sealingly closing said outlet section of said anchor body with respect to the other end of said region of said tendon where said corrosion resistant covering is incomplete, said closing means including said outlet section having a second threaded portion, said closing means also including a second conduit like said first conduit and second sealing means like said first sealing means, said closing means further including a reducer having a first threaded end mating with said second threaded portion of the outlet section of said anchor body and a second threaded end for mating with a first threaded end portion of said second conduit, said reducer having a central passage for receiving said tendon therethrough, said covering of said tendon, said reducer, said second conduit and said second sealing means enclosing said other end of said region of said tendon where said corrosion resisting covering is incomplete thereby protecting said entire region from outside corrosive fluids.

4,928,452
BUILDING STRUCTURE
Charles H. Sacks, c/o Hallandale Rehabilitation Center, 2400 E. Hallandale Beach Blvd., Hallandale, Fla. 33009
Filed Mar. 28, 1989, Ser. No. 329,767
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—236.3 20 Claims



1. A multi-story building structure, comprising at least one pair of levels, each pair of levels including one sleeping level, one living level and one public corridor on said living level, duplex apartments each having at least one room on said sleeping level and at least one room on said living level of a respective pair of levels, and an elevator system including two elevators, each of said elevators having a respective stop disposed at each one of said public corridors and each of said elevators skipping said sleeping levels.

4,928,453
APPARATUS FOR TRANSFERRING ELONGATED SAMPLE TUBE HOLDERS TO AND FROM WORKSTATIONS
Michael A. Ferkany, Southfield, Mich., assignor to Biomedical Devices Company, Inc., Farmington, Mich.
Filed Dec. 29, 1987, Ser. No. 138,875
Int. Cl.[5] B65B *57/04, 61/00, 3/04*
U.S. Cl. 53—67 38 Claims

1. A device for transferring sample tubes arranged in elongated sample holders to and from consecutive workstations positioned along a transfer path, comprising:

entrance support means for supplying said sample holders to said transfer path;

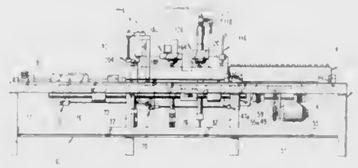
exit support means for receiving said sample holders from said transfer path;

workstation support means extending between said entrance support means and said exit support means for supporting said sample holder during transfer to and from said workstations, said workstation support means defining an entrance area for receiving said sample holders from said entrance support means;

guide means disposed along said workstation support means for guiding said sample holders within said workstation support means toward said exit support means;

first transfer means disposed along said entrance support means for transferring each of said sample holders individually into said entrance area of said workstation support means;

second transfer means disposed along said workstation support means for engaging said sample holders to transfer said sample holders a predetermined amount along said workstation support means;



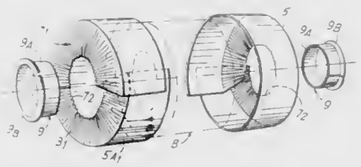
control means for coordinating actuation of said first transfer means, said second transfer means and said workstations to ensure smooth operation of said device,

said control means including first monitoring means for monitoring the presence of a sample holder in said entrance area,

first signal means operatively connected to said first monitoring means for actuating said second transfer means when a sample holder is present in said entrance area; and

second signal means operatively connected to said first monitoring means for actuating said second transfer means a first predetermined number of times when a sample holder is not present in said entrance area.

4,928,454
PROCESS FOR WRAPPING RIBBON TYPE METAL COILS
Luigi Bertolotti, S. Giovanni Valdarno, Italy, assignor to Bertolotti S.p.A., Genoa and Nuova Italsider S.p.A., Valdarno, both of, Italy
Division of Ser. No. 124,415, Nov. 23, 1987, Pat. No. 4,793,485, which is a continuation of Ser. No. 836,317, Mar. 5, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 267,171
Claims priority, application Italy, Mar. 15, 1985, 9362 A/85; Dec. 20, 1985, 9549 A/85
Int. Cl.[5] B65B *25/24*
U.S. Cl. 53—409 4 Claims



1. A process of wrapping a coil of strip metal which comprises the steps of:

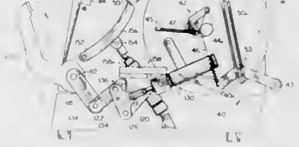
cutting two strips of metal having the same width as said strip metal and a combined length slightly greater than two times the outer circumference of said coil,

bending each of said strips at right angles about a longitudinal fold line to form first and second longitudinally extending wings disposed at right angles to one another, said first wing having a width slightly greater than half the width of said coil,

forming in said second wing a series of triangular pleats with the apexes of said pleats at said fold line to reduce the length of a free edge of said second wing while bending said first wing into an arc having a radius substantially equal to the radius of the outer periphery of said coil,

assembling said bent and pleated strips on said coil with said pleated second wing of one strip overlying one end of said coil said pleated second wing of another strip overlying an opposite end of said coil, with said arcuately curved first wings of said strips overlapping one another and covering the outer periphery of said coil, and said coil being annular with a cental hole having an inner periphery, and said second wings of said strips having a width which is approximately equal to the radial distance between the inner periphery and the outer periphery of said coil.

4,928,455
PACKAGING MACHINE AND METHOD
John L. Gereby, Rocky River; Eric P. Gifford, Orange; Rick S. Wehrmann, Hudson, and William M. Easter, Solon, all of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio
Continuation of Ser. No. 127,255, Dec. 1, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 346,376
Int. Cl.[5] B65B *43/26*
U.S. Cl. 53—570 8 Claims



1. A table top packaging machine, comprising:

(a) a machine housing including a raisable top cover;

(b) a first guide structure carried by said top cover and second guide structure carried by a frame portion in said machine which together define a path of travel for a web of interconnected bag-like containers, when said cover is closed;

(c) web advancing means operative to periodically advance said web along said path to successively position each of said containers at a loading station;

(d) means for expanding a container positioned at said loading station, comprising:

(i) an electrically operated blower including a shutter controlled outlet;

(ii) a nozzle position near said loading station for directing air towards a mouth of said container;

(iii) conduit means for connecting said shutter controlled outlet with said nozzle;

(e) container separating means for severing a loaded container from said web comprising:

(i) a blade-like member movable into and out of a portion of said web path intermediate a heat sealing assembly and said web advancing means in order to sever said container along a line of weakness;

(ii) fluid pressure actuating means for effecting reciprocal movement in said blade-like member;

(f) said heat sealing assembly comprising:

(i) a clamping bar movable towards and away from a heat sealing unit;
(ii) a toggle mechanism for driving said clamping bar towards and away from said heat sealing unit and operative to apply an increasing clamping force to said clamping bar as said bar approaches said sealing unit;
(g) an electrically powered air compressor forming part of said packaging machine for providing a source of pressurized air for said fluid pressure actuator.

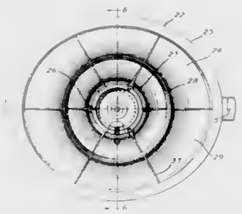
4,928,456
PROCESS FOR RAPPING OF ELECTROSTATIC PRECIPITATOR SURFACES
Henry J. Del Gatto, New Egypt, and John E. Trainor, Willingboro, both of N.J., assignors to NWL Transformers, Bordentown, N.J.
Filed Jun. 16, 1988, Ser. No. 207,778
Int. Cl.[5] B03C *3/76*
U.S. Cl. 55—12 **8 Claims**
MICROFICHE APPENDIX INCLUDED
(10 Microfiche, 616 Pages)



1. A method for removing precipitate from a collecting surface of an electrostatic precipitator having at least one rapper for applying a level of mechanical energy of variable time duration to an application point on a collecting surface in accordance with a level of electrical excitation applied to the rapper, comprising the steps of:
(a) applying mechanical energy to the application point through a single rap of a rapper, said single rap being of predetermined intensity, and
(b) further applying mechanical energy of variable time duration to the application point through discrete raps of a rapper wherein the time duration is controlled by applying a predetermined number of full half cycle pulses followed by a single cycle of reduced conduction of electrical power and wherein the intensity of the applied mechanical energy is increased from one application of energy to another to prevent dispersion of precipitate removed from regions of the collecting surface relatively near the application point while removing precipitate from regions relatively distant from the application point.

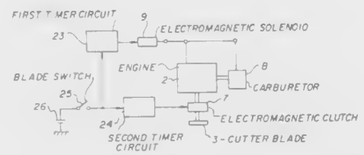
4,928,457
WEED CUTTER
Guy Laperle, 27 Clifton Street, Sawyerville, Canada (J0B 3A0)
Filed Mar. 29, 1988, Ser. No. 174,907
Int. Cl.[5] A01D *34/67*
U.S. Cl. 56—12.7 **13 Claims**

1. A vegetation cutting device of the rotary type comprising a drive shaft, a support for said drive shaft, a cutting assembly rotatably connected to said drive shaft, said cutting assembly including a cutting element to cut vegetation when rotating in a cutting plane substantially normal to the axis of said drive shaft, a skirt fixed to said support and overlying said cutting assembly, said skirt having a peripheral edge lying in a plane generally parallel to said cutting plane, said cutting element having a radially outer portion protruding radially outwardly from said peripheral edge of said skirt when rotating, the peripheral edge of said skirt defining a first zone at a minimum radial distance from said drive shaft axis and a second zone at a maximum radial distance from said drive shaft axis, the radial



distance of said edge from said drive shaft axis progressively increasing from said first zone to said second zone in the rotation direction of said cutting assembly.

4,928,458
ENGINE CONTROL DEVICE FOR MOWER
Fumio Muroya, and Yoshiaki Kotani, both of Saitama, Japan, assignors to Honda Giken Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 19, 1989, Ser. No. 367,582
Claims priority, application Japan, Jun. 20, 1988, 63-81494[U]
Int. Cl.[5] A01D *34/64, 34/82;* **F02D** *9/02, 11/10*
U.S. Cl. 56—11.8 **4 Claims**

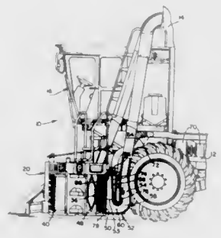


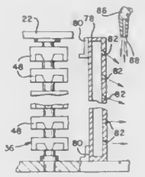
1. A control device in a mower in which an engine output is transmitted to a cutter blade through a coupling of a clutch for performing mowing, the control device comprising: a blade engagement switch for sending a drive signal for engaging the cutter blade; a first control means for electrically increasing a degree of opening of a throttle valve of the engine; a second control means for electrically performing coupling and decoupling of the clutch; a first timer circuit for actuating the first control means for a predetermined period upon closure of the blade engagement switch; and a second timer circuit for actuating the second control means to provide coupling of the clutch at a predetermined timing within the predetermined period after closure of the blade engagement switch.

4,928,459
AIR SYSTEM FOR A COTTON HARVESTER
Guy N. Thedford, Naperville, and Gary L. Wells, Downers Grover, both of Ill., assignors to J. I. Case Company, Racine, Wis.
Filed Mar. 27, 1989, Ser. No. 329,001
Int. Cl.[5] A01D *46/10*
U.S. Cl. 56—13.3 **12 Claims**

4. An air system for a cotton harvester adapted for movement over a field of cotton plants, said cotton harvester including a cotton harvester unit comprising a housing assembly, spindle means rotatably mounted on said housing assembly for removing cotton from the cotton plants, and doffer means rotatably mounted on said housing assembly for doffing cotton from the spindle means, an upright compartment structure supported by the housing assembly into which doffed cotton is received, said structure defining an upper area and an opening

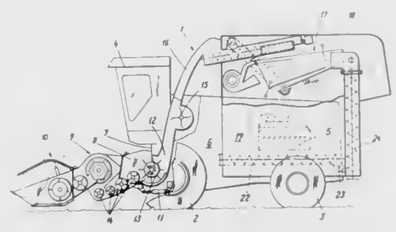
arranged toward a lower area thereof through which cotton passes, duct means leading upwardly from said opening for directing cotton toward a cotton receptacle, said air system comprising:
first operative means connected to a source of pressurized air for discharging a stream of air upwardly into said duct means in a manner creating a vacuum at said opening sufficient to draw cotton therethrough; and





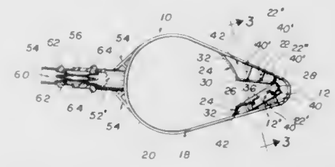
second operative means arranged toward an upper area of said compartment structure and connected to said source of pressurized air for directing a column of air downwardly into said compartment structure to entrain the doffed cotton within the air column and inhibit an accumulation of doffed cotton in an upper area of the compartment structure.

4,928,460
SELF-PROPELLING FIELD CHOPPING MACHINE
Dirk Bruer; Franz Heidjann, and Heinrich Hemker, all of Harsewinkel, Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 888,793, Jul. 21, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 187,947
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3533773
Int. Cl.[5] A01D *41/02;* **A01F** *12/60*
U.S. Cl. 56—14.6 **10 Claims**



1. A self-propelling field chopping machine, comprising a chassis; a front cutting mechanism; a transporting channel provided with a throwing out pipe having a downstream end; a rotatable conveyor arranged upstream of said transporting channel and formed as a rotatable conveyor drum provided with paddles; a threshing device arranged between said cutting mechanism and said rotatable conveyor drum and operating in accordance with an axial flow system; a wind sieve device located at said end of said throwing out pipe so that a grain-chaff mixture without straw is supplied to said wind sieve device; and a grain tank located under said wind sieve device and removably mounted on said chassis so that with said grain tank
the self-propelling field chopping machine can be
used as a self-propelling harvester thresher and without said grain tank it can be used as the self-propelling chopping machine.

4,928,461
FRUIT PICKING ASSEMBLY
John S. King, 16500 SW. 102 Ct., Miami, Fla. 33157
Filed Sep. 15, 1988, Ser. No. 244,837
Int. Cl.[5] A01D *46/24*
U.S. Cl. 56—339 **15 Claims**



1. A picking head and support assembly for a fruit containing bag designed to be secured to an elongated pole, said assembly comprising:
a. a support frame having a continuous, substantially elongated and curvilinear configuration including a nose portion formed on and defining a distal end thereof and a base portion formed on and defining a proximal end thereof,
b. said support frame structured to support the fruit containing bag thereon and being disposed in supporting engagement with an open peripheral portion of the bag; said base portion having a greater transverse dimension than said nose portion and being of sufficiently large dimension to allow a piece of fruit being cut to pass therethrough,
c. a guide means mounted on said nose portion and disposed and configured for guiding a stem of the fruit into a cutting portion,
d. said guide means comprising two elongated guide rails located interiorly of said support frame and extending along at least a majority of the length of said nose portion, said guide rails defining an elongated channel having an open end communicating directly with said base portion and a closed end oppositely disposed to said open end, said channel disposed at an angular, off-set relation to a central longitudinal axis of said nose portion,
e. a cutting blade connected to said support frame in an angular orientation to the length of said channel and including a cutting edge thereof extending angularly along at least a majority of the length of said channel, and
f. a retaining structure mounted on said guide means in retaining engagement with the peripheral portion of the bag and being disposed and configured to maintain the bag in an operative fruit-retaining position.

4,928,462

AGRICULTURAL BALER WITH SIX STROKE FEEDER MECHANISM

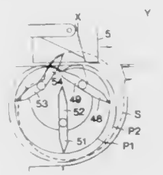
Christiaan A. C. Lippens, Sint-Laureins, and Adrianus Naaktgeboren, Zedelgem, both of Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed May 18, 1989, Ser. No. 354,180

Claims priority, application United Kingdom, May 24, 1988, 8812270

Int. Cl.[5] A01D *39/00*

U.S. Cl. 56—341 **6 Claims**



1. In an agricultural baler including:

a bale case having an inlet opening formed therein;

a feeder duct communicating with the bale case through the inlet opening for charges of crop material to be transferred from the feeder duct into the bale case;

a plunger reciprocable within the bale case to compress successive charges of crop material received from the feeder duct to form a bale;

feeder means operable within the feeder duct to accumulate a charge of crop material therein and then stuff that accumulated charge into the bale case; the feeder means including a plurality of rotatable tine bars a first of which carries a set of packer tines and a second of which carries a set of stuffer tines; the packer tines carried by the first tine bar having outer ends following, during operation, a first path of movement and the stuffer tines carried on the second tine bar having outer ends following, during operation, a second path of movement which is offset relative to the first path of movement; and

an improvement wherein the feeder means comprises a third tine bar carrying a set of combination packer and stuffer tines, whereby the feeder means subjects the crop material in the feeder duct to two stuffing strokes in transferring a charge of crop material from the feeder duct to the bale case, the combination packer and stuffer tines carried on the third tine bar having outer ends following a third path of movement which is offset relative to both the first and second paths of movement.

4,928,463

YARN BRAKE MECHANISM FOR A TWO-FOR-ONE TEXTILE YARN TWISTING MACHINE SPINDLE ASSEMBLY

Johannes Frentzel-Beyme, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 246,879

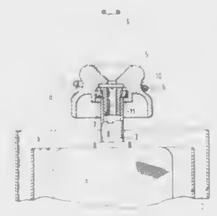
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732904

Int. Cl.[5] D01H *7/86, 13/10;* **B65H** *59/06, 59/36*

U.S. Cl. 57—58.86 **14 Claims**

1. In a two-for-one textile yarn twisting machine spindle assembly including at least two supply packages of yarn mounted concentrically therein one above the other for simultaneous and separate withdrawal of yarns therefrom in a common direction, and a yarn inlet tube mounted concentrically with said yarn supply packages and having an upper end portion extending above said yarn supply packages for simultaneously receiving therein the yarns withdrawn from said supply packages; the improvement therein of a yarn brake mechanism for applying substantially uniform tension to the yarns moving from said supply packages to said yarn inlet tube without one yarn affecting the tension on the other yarn and comprising:

slip-on member means including bearing means for being rotatably mounted on said upper end portion of said yarn inlet tube for rotation relative thereto by frictional engagement of the yarns moving into said yarn inlet tube from said supply packages so that the rotational speed of



said slip-on member means is commensurate with the rotational speed of the yarns, said slip-on member comprising a rotationally symmetrical member having a necked-down portion; and

brake ring means for being floatingly received and mounted in said necked-down portion of said slip-on member means and for receiving the separate yarns between said brake ring means and said slip-on member means as the yarns move from said supply packages to said yarn inlet tube.

4,928,464

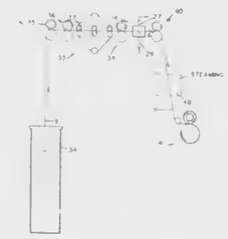
YARN PRODUCED BY SPINNING WITH VACUUM

Elbert F. Morrison, Clarksville, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 680,510, Dec. 11, 1984, Pat. No. 4,719,744, and a continuation-in-part of Ser. No. 386,078, Jun. 7, 1982, Pat. No. 4,507,913. This application Apr. 21, 1987, Ser. No. 41,835

Int. Cl.[5] D02G *3/36, 3/34;* **D01H** *1/12, 5/28*

U.S. Cl. 57—224 **4 Claims**



1. A method of spinning yarn having surface effects and simulating the appearance of a fully twisted yarn, comprising the steps of:

(a) acting upon a sliver or roving to separate free ends of surface fibers having short staple length of between about 0.5–6 inches;

(b) transporting the fibers in a linear direction A at a substantially constant linear speed; and

(c) while transporting the fibers, rotating the free ends to provide a core formed by approximately 20–40% of the fibers of the sliver or roving, the core having a limited amount of real twist, and approximately 80–60% of the fibers wrapped about the core, to provide surface effects, the yarn simulating the appearance of a fully twisted yarn.

4,928,465

MODULAR PRIVACY SCREEN ASSEMBLIES

Juan M. Del Castillo Von Haucke, Salamanca No. 34, 20 Piso, Mexico, Mexico

Filed Apr. 7, 1989, Ser. No. 334,528

Int. Cl.[5] E04B *2/74*

U.S. Cl. 52—239 **1 Claim**



1. Modular privacy screen assemblies comprising vertical stiles and plane panels, said vertical stiles including at least one longitudinally extending channel within which and extending horizontally and transversely thereof are two vertically spaced supporting elements, the upper supporting element being vertically spaced below the top of the stile with which it is associated and the lower supporting member being vertically spaced from and above the bottom of the stile with which it is associated, each of said plane panels having a left side and a right side, a top margin and a bottom margin, each of said plane panel sides being formed with three vertically spaced, inwardly and upwardly extending slots, the lower slot on each panel side being relatively close to its corresponding panel bottom, and the upper slot being spaced below the panel top for a greater distance than the distance between the uppermost slot and the second or middle slot, the distance between the second or middle slot and the lowermost slot being equal to the distance between the uppermost slot and the middle slot, whereby when the uppermost slots and the middle slots are engaged with the two supporting members associated with the stiles the panel will be in its lowermost position, and when the middle slots and the lowermost slots are associated with the two supporting members in each stile the panel will be in its uppermost position and the panel top will be level.

4,928,466

RETAINING AND ANCHORING HARDWARE FOR A CERAMIC FIBER MODULE

Michael E. Alexander, 3616 Ashbury, Ponca City, Okla. 74601

Filed Jun. 5, 1989, Ser. No. 361,318

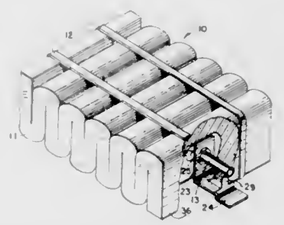
Int. Cl.[5] E04B *1/38*

U.S. Cl. 52—509 **6 Claims**

1. An insulation support apparatus for use in attaching blanket insulation to a surface comprising:

(a) an elongated cylindrical tubular member means having an inner diameter, an outer diameter and having a first and second end portions, said first end portion having its outer diameter equal to or less than the inner diameter of said tubular means so that said first end portion can slidably fit into a second end portion of a preceding cylindrical tubular member;

(b) a bracket means having a first and second end, means at said first end for attachment to said surface, an opening means at said second end for receiving said elongated cylindrical tubular member means; and



(c) means for retaining said elongated tubular member means at a selected location along its length when received by said opening means.

4,928,467

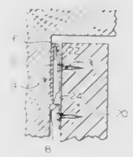
PANEL FASTENER

Roy A. Hintsa, 198 National Drive, Woodbridge, Ontario, Canada (L4L 3E4)

Filed May 13, 1988, Ser. No. 193,584

Int. Cl.[5] E04B *1/38*

U.S. Cl. 52—511 **12 Claims**



1. A wall panel hanging system comprising a top hanging track to be horizontally secured to a wall and clips for securement to a panel, said top hanging track having a forwardly facing shank receiving portion at the upper edge thereof and a forwardly extending shoulder therebelow, said track further including a flange area for receiving fasteners; each clip including a top shank sized for close, free sliding reception in said shank receiving portion and an integral clip shoulder spaced below said top shank and cooperating with said forwardly extending shoulder when said top shank is generally fully received in said top hanging track whereafter said clip shoulder may be brought into support engagement with said forwardly facing shoulder with said top shank generally fully received in said top hanging track, said clip shoulder acting as the only surface of said clip opposing movement of said clip shoulder past said forwardly facing shoulder when said clip shoulder is in support engagement with said forwardly facing shoulder.

4,928,468

BUILDING PANEL MODULE

Edward H. Phillips, 3601 Bay Shore Rd., Fort Collins, Colo. 80524

Filed Dec. 5, 1988, Ser. No. 279,895

Int. Cl.[5] E04B *2/62*

U.S. Cl. 52—574 **20 Claims**

1. A generally rectangular building panel module for defining at least a portion of a building wall, floor, or ceiling when a plurality of modules are assembled, the module comprising:

(a) at least three rectangular metallic plates arranged in parallel to define a hollow, generally rectangular panel module having a pair of spaced, substantially parallel

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outer faces, at least one of the plates including inwardly extending legs and being symmetrical relative to a longitudinal centerline, at least two of the plates including at least one inwardly extending leg that is joined to an inwardly extending leg of an adjacent plate on the same face of the module to define a longitudinally extending I-beam element having a central web member and a pair of spaced, substantially parallel transverse end members extending outwardly from longitudinally extending edges of the central web member, the end members including an outer end member defining a part of a panel module outer face and an inner end member spaced inwardly from each of the panel module faces, the inner end members each defining first baffle members positioned within the interior of the panel module, the I-beam element providing longitudinal stiffness to the panel module to withstand longitudinally applied compression loads and to provide transverse strength to the panel module to withstand tranversely applied bending loads;



(b) a discontinuous intermediate inner wall positioned between the outer faces, the inner wall defined by respective ones of the first baffle members and by transversely offset second baffle members carried by at least one end leg of each of the plates plates, the first and second baffle members being substantially planar and positioned relative to each other in overlapping relationship and spaced from each other in a transverse direction of the module to prevent direct transmission therebetween of heat and sound and to prevent unimpeded passage through the module of ballistic projectiles that penetrate one face of the module, and thereby provide resistance to passage through the module of ballistic projectiles heat, and sound; and

(c) end cap means extending across respective longitudinally spaced ends of the panel module for interconnecting respective ones of the plates to provide a unitary panel module that can be handled and transported as a unit for assembly with correspondingly-shaped panel modules for defining a portion of a structural, load bearing building surface.

4,928,469

MODULAR CONSTRUCTION BLOCK

Marcel Dorier, "La Vinette" Saint-Denis d'Authou, 28480 Thiron-Gardais, France

Continuation of Ser. No. 87,188, Aug. 20, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 304,859

Claims priority, application France, Aug. 26, 1986, 86 12065

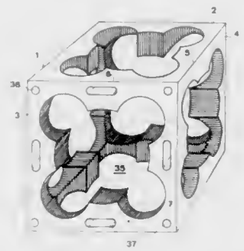
Int. Cl.[5] E04C *1/00*

U.S. Cl. 52—607 **14 Claims**

1. A modular block for making constructions, said block comprising a body having:

at least three contiguous plane faces such that perpendiculars to any two of each of said contiguous faces form a rectangular frame of reference; and

three groups of laterally intersecting, parallel cylindrical hollows, each hollow opening out into a respective one of said contiguous faces and each group of said hollows comprising at least two of said hollows, the generator line of each of the hollows in a group being perpendicular to the face into which said hollow opens out, each cylindrical hollow within a group including two lines in common with another cylindrical hollow within the group at the lateral intersection therebetween, the outline of each group of hollows forming an opening of corresponding outline along the respective face of the body, and wherein a section of each cylindrical hollow forms a partially closed curved surface for receiving a cylinder of complementary shape to the hollow and preventing the cylinder, when received therein, from moving radially within the cylindrical hollow receiving said cylinder.



4,928,470

ASSEMBLY PIECES FOR METALLIC CARPENTRY SECTIONS

Maria I. Perez, Gral. Margallo, 24, Entresuelo; Escalera 28020, Spain

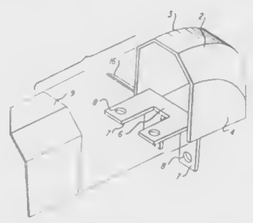
Filed Feb. 26, 1987, Ser. No. 19,145

Claims priority, application Spain, Feb. 27, 1986, 292590

The portion of the term of this patent subsequent to Jan. 29, 2006, has been disclaimed.

Int. Cl.[5] E04C *2/38*

U.S. Cl. 56—656 **4 Claims**



1. An assembly piece for connecting metallic carpentry sections having ends provided with radial runners, said assembly piece comprising:

an angle piece having two parallel and superimposed quadrants, each said quadrant defined by diverging radial lines and a connecting arc, said angle piece further having an arced middle portion which is curved parallel to said connecting arcs and which connects said connecting arcs;

a flat angled bar defined by two perpendicular portions, said angled bar being attached between said quadrants with a respective said perpendicular portion extending from between said quadrants parallel to a respective plane including superimposed said radial lines; each said perpendicular portion having two radially directed arms separated by a radial space opening away from the other said perpendicular portion such that the two said arms of each said perpendicular portion are received in an adjacent respective radial runner of the carpentry section, and each said arm including an aperture therein through which a screw passing through the carpentry section is received to hold the carpentry section to the angle piece.

4,928,471

GRATING CONSTRUCTION

David W. Bartley, Canton, Ohio, assignor to Ohio Gratings, Inc., Canton, Ohio

Filed Jun. 8, 1988, Ser. No. 203,265

Int. Cl.[5] E04C *2/42*

U.S. Cl. 52—664 5 Claims



1. An improved grating construction of the type intended for closing or flooring an opening, said grating including:

(a) a plurality of spaced, parallel, elongated aluminum bearing bars, each having a plurality of spaced cutouts formed along a longitudinal top edge thereof, said cutouts each comprising a generally rectangular-shaped upper portion and an outwardly flared lower portion;

(b) a plurality of spaced, parallel, elongated aluminum crossbars, each having a generally rectangular-shaped upper portion and an outwardly flared lower portion complementary in shape and size to the upper and lower portions, respectively, of the bearing bar cutouts, said crossbar being loosely slideably engaged within a plurality of transversely aligned bearing bar cutouts; and

(c) deformations formed on certain of the outwardly flared lower portions of the aluminum crossbars adjacent to the aluminum bearing bars for locking the bearing bars with the crossbars so that an upper surface of the rectangular portions of the crossbars are generally flush with the longitudinal top edges of the bearing bars.

4,928,472

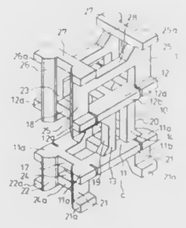
CHAIR FOR REINFORCEMENT ROD

Jyh-Chin Chang, 38, Kuang-Ming St., Pei-Chen Li, Lo-Tung, Y:-Lan Hsien, Taiwan

Filed Apr. 24, 1989, Ser. No. 342,992

Int. Cl.[5] E04C *5/16*

U.S. Cl. 52—678 5 Claims



1. A chair for concrete reinforcing rods comprising:

a body having a planar rectangular transverse top frame member and a planar rectangular transverse bottom frame member, each of said top and bottom frame members having a front side, a rear side, a left side and a right side, and two pairs of first connecting members placed between and connected to intermediate parts of said top and bottom frame members;

said body further having two pairs of first leg members respectively extending upward from the corners of said top frame member, and two pairs of second leg members respectively extending downward from the corners of said bottom frame member,

said first connecting members and top and bottom frame members confining a left and right channel-like first support seat adjacent said left and right sides of said top and bottom frame members,

said first leg members and said top frame member confining a channel-like second support seat,

said second leg members and said bottom frame member confining a channel-like third support seat,

said second support seat being operative and said left and right sides of said bottom frame member serving as an additional lower level supporting seat when said second leg members are placed downward, said third support seat being operative and said left and right sides of said top frame member serving as an additional lower level supporting seat when said first leg members are placed downward, said first and second leg members being different in length so that said second and third support seats provide different supporting levels,

said left first support seat being operative when said right sides of said top and bottom frame members are placed downward, said right first support seat being operative when said left sides of said top and bottom frame members are placed downward,

said first connecting members having different distances from said left and right sides of said top and bottom frame members so that said left and right first support seats provide different supporting levels.

4,928,473

DEVICE FOR AUTOMATICALLY FILLING AND PACKING PREDETERMINED WEIGHT OF PRODUCT IN CONTAINERS

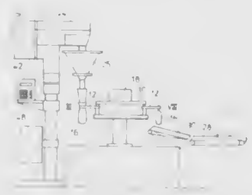
Takeyoshi Nagao, Kakogawa, and Toru Kohashi, Hyogo, both of Japan, assignors to Yamato Scale Company, Limited, Akashi, Japan

Filed Jun. 9, 1989, Ser. No. 364,259

Claims priority, application Japan, Jun. 20, 1988, 63-153058

Int. Cl.[5] B65B *57/02;* **G01G** *15/00*

U.S. Cl. 53—53 **17 Claims**



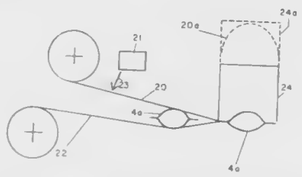
1. A device for automatically filling and packing a predetermined weight of product in containers, comprising a first rotary table including a plurality of weighing heads arranged at equal intervals around said table, each weighing head including weight detecting elements and a bag-like container holding mechanism, and a plurality of operating means disposed at first to sixth operating locations arranged in this order around said first rotary table for applying specific treatments to each weighing heads passing said locations; characterized by said operating means comprising:

container feeding means for feeding a bag-like container to said holding mechanism to be held thereby when each of said weighing heads arrives at said first operating location,

memory means for reading and storing the weight of said container detected by said weight detecting elements

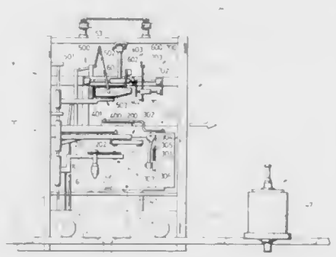
when each weighing head arrives at said second operating location,
product feeding means for filling said container with a predetermined target weight of product when each weighing head arrives at said third operating location,
arithmetic means for subtracting the stored weight of said container from the weight of the filled container detected by said weight detecting elements to calculate the net weight of said product for comparing said net weight with a predetermined allowable range to judge the acceptability thereof and for storing the result of judgement when each weighing head arrives at said fourth operating location,
feed control means for adjusting the amount of feed of said product feeding means based upon the deviation of said net weight from said target weight while each weighing head is at said fourth operating location,
sealing means for sealing the opening of said container to complete a packed product when each weighing head arrives at said fifth operating location, and
delivery means for discharging said packed product from said holding mechanism and, if not acceptable, removing said product based upon said stored result of judgement when each said weighing head arrives at said sixth operating location.

4,928,474
OXYGEN-BARRIER RETORT POUCH
Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.
Filed Sep. 21, 1988, Ser. No. 247,202
Int. Cl.[5] B65B *55/06, 11/58*
U.S. Cl. 53—425 **9 Claims**



1. A method of making an oxygen barrier retorted container comprising:
(a) providing a container,
(b) filling the container with a product sensitive to spoilage from oxygen content,
(c) sealing the filled container,
(d) retorting the filled container under moisture at a sterilizing temperature for a sufficient time to sterilize the product,
(e) removing excess moisture from the retorted, filled container outside and cooling the retorted, filled container at about room temperature, and
(f) enclosing the retorted, filled container with a separate oxygen barrier material.

4,928,475
FIXED LENGTH WINDING METHOD IN A TWO-FOR-ONE TWISTER
Isamu Matsui; Masao Uehara, both of Kyoto; Shinji Noshi, Yawata, and Tsukasa Kawarabashi, Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Aug. 16, 1989, Ser. No. 394,624
Claims priority, application Japan, Aug. 25, 1988, 63-210956; Feb. 24, 1989, 1-44364
Int. Cl.[5] D01H *1/38, 7/86, 9/14*
U.S. Cl. 57—264 **9 Claims**



1. A fixed length winding method in a two-for-one twister, the method comprising winding a yarn having a fixed length by a winder to form a package, once cutting a yarn and thereafter further winding the same amount of yarn on said package to form a maximum yarn-supply package capable of being mounted on the two-for-one twister, and mounting said yarn-supply package on said two-for-one twister to produce a plurality of twist-yarn packages having a fixed length of yarn from a single yarn-supply package

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4,928,476
TWO-FOR-ONE TWISTING MACHINE
Hiroo Otoshima, Shiga; Hiroshi Tsuji, Joyo; Shigeki Mori, Ohtsu, and Yoshihiro Nishimura, Nagaokakyo, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Jul. 18, 1988, Ser. No. 220,733
Claims priority, application Japan, Jul. 22, 1987, 62-182602
Int. Cl.[5] D01H *9/10, 9/18;* **B65H** *67/04*
U.S. Cl. 57—268 **18 Claims**

1. A two-for-one twisting machine comprising:
a plurality of two-for-one twisting units arranged in rows, said two-for-one twisting units each having a twisting machine, at least one feed package and a take-up device,
a travelling member adapted to travel in front of said plural two-for-one twisting units, said travelling member being provided with a main rod, a feed package changing device operable with the two-for-one twisting units, and a take-up package changing device operable with the two-for-one twisting units,
wherein said feed package changing device comprises a tensor moving device, comprising:
a first support beam adapted to move up and down along the main rod the first support beam having a top end,
a first arm supported slidable vertically relative to the main rod and rotatable on the main rod in the directions toward and away from the two-for-one twisting units, the first arm positioned below the first support beam and in a direction substantially perpendicular thereto,
a first lever pivotally supported on the top end of the first arm at the intermediate portion thereof,
a link arm pivotally supported with and connecting the top end of said first support beam and one end of said first lever,
a driving means for driving the first arm,
a rocking lever supported rockably by the first lever,
two opposed chucks rockably supported by the first lever, the two opposed chucks being adapted to hold a tensor therebetween when the first arm is turned toward the two-for-one twisting units and to release a tensor held therebetween when the first arm is turned away from the two-for-one twisting units, and
an opening/closing pin fixed to the rocking lever.

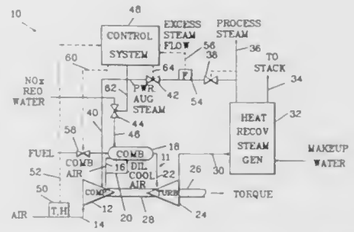
4,928,477
PROCESS FOR FORMING A FIBER OR YARN CONTACTED ELEMENT OF A TEXTILE MACHINE
Siegfried Kalitzki, Würselen-Bardenberg; Josef Peters, Geilenkirchen-Grot, both of Fed. Rep. of Germany, and Gottfried Schürmann, JG Schinveld, Netherlands, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany
Filed Mar. 30, 1989, Ser. No. 331,638
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810775
Int. Cl.[5] D01H *7/882*
U.S. Cl. 57—416 **7 Claims**



1. A fiber or yarn contacted element of a textile machine having a plurality of layers at the fiber or yarn contacting surface thereof, comprising:
an inner body portion of steel;
a boronized layer formed on said body portion;
an alpha-iron layer formed on said boronized layer; and
a nickel coating layer, said alpha-iron layer being disposed intermediate said nickel coating layer and said boronized layer.

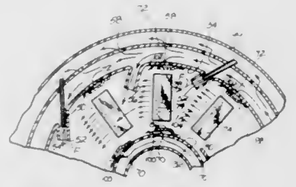
4,928,478
WATER AND STEAM INJECTION IN COGENERATION SYSTEM
Chris E. Maslak, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Jul. 22, 1985, Ser. No. 757,177
Int. Cl.[5] F02C *7/00*
U.S. Cl. 60—39.05 **6 Claims**

6. A method for controlling a cogeneration system of a type including a gas turbine and a heat recovery steam generator, said gas turbine including an air compressor, a combustor and a turbine effective, in combination, for producing a torque, and a quantity of hot gasses, said heat recovery steam generator being effective to absorb heat energy from said quantity of hot gasses for producing steam, the method comprising:
injecting at least one of a steam and a water into a combustion zone of said combustor at a flow effective for producing a predetermined level of reduction in a NOx in said quantity of hot gasses;
adding at least part of an excess steam from said heat recovery steam generator to compressed air from said air compressor whereby power output of said gas turbine is augmented; and



reducing said at least one of a steam and a water in a proportion to said excess steam added to said compressed air effective to maintain said predetermined level of reduction in a NOx in said quantity of hot gasses.

4,928,479
ANNULAR COMBUSTOR WITH TANGENTIAL COOLING AIR INJECTION
Jack R. Shekleton; Colin Rodgers, both of San Diego, and John P. Archibald, LaJolla, all of Calif., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Dec. 28, 1987, Ser. No. 138,342
Int. Cl.[5] F02C *3/08*
U.S. Cl. 60—39.36 **9 Claims**



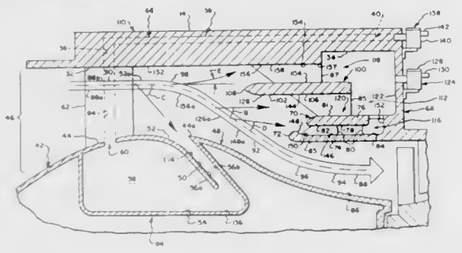
1. A gas turbine comprising:
a rotor including compressor blades and turbine blades;
an inlet adjacent one side of said compressor blades;
a diffuser adjacent the other side of said compressor blades;
a nozzle adjacent said turbine blades for directing hot gasses at said turbine blades to cause rotation of said rotor;
an annular combustor having radially inner and outer walls connected by a generally radially extending wall about said rotor and having an outlet connected to said nozzle and a primary combustion annulus defined by said walls remote from said outlet, a plurality of fuel injectors to said primary combustion annulus and being substantially equally angular spaced therearound and configured to inject fuel into said primary combustion annulus in a nominally tangential direction; and
means associated with each of said walls for injecting a film-like stream of cooling air into said primary combustion annulus in a generally tangential direction.

4,928,480

SEPARATOR HAVING MULTIPLE PARTICLE EXTRACTION PASSAGEWAYS

Wayne R. Oliver, Peabody, Mass.; Roy E. Moyer, Cincinnati, Ohio, and Dennis R. Girardin, Peabody, Mass., assignors to General Electric Company, Lynn, Mass.

Filed Mar. 4, 1988, Ser. No. 164,371
Int. Cl.[5] F07C *7/052*
U.S. Cl. 60—39.092 **33 Claims**



1. A particle separator system for a gas turbine engine including interior walls defining an engine intake passageway including a throat for receiving engine intake air and an annular compressor inlet passageway in flow communication with the engine intake passageway, said system comprising:

a main particle separator including an inlet passageway disposed downstream of said throat and in flow communication with the engine intake passageway for receiving a portion of foreign particles carried by the air entering the engine intake passageway, said inlet passageway of said main particle separator being provided by a pair of interior walls of the engine arranged so as to face one another, and

an auxiliary particle separator associated with one interior wall of the engine including means defining an auxiliary passageway having an inlet downstream of said throat and in flow communication with said engine intake passageway for receiving an additional portion of foreign particles carried by the air entering the engine intake passageway so that the main and auxiliary particle separators provide the engine with an enhanced capacity for separating foreign particles from the engine intake air.

4,928,481

STAGED LOW NOX PREMIX GAS TURBINE COMBUSTOR

Narendra D. Josbi, Phoenix, Ariz., and Frederick E. Moreno, Los Altos, Calif., assignors to PruTech II, San Jose, Calif.

Filed Jul. 13, 1988, Ser. No. 218,252
Int. Cl.[5] F23R *3/32*
U.S. Cl. 60—737 **20 Claims**

1. In a staged low NOx lean premix hot wall method for combusting fuel in a gas turbine combustor, the steps of:

inducting a first lean premixture of fuel and compressed air into a first stage of a combustion chamber;

igniting and combusting the inducted first premixture of fuel and air within the first stage of the combustion chamber to produce a stream of combustion products exiting the first stage of the combustion chamber;

inducting a plurality of streams of a second premixture of fuel and compressed air into a second stage of the combustion chamber downstream of the first stage from generally opposite directions and colliding the streams in an impact region within the stream of combustion products exiting the first stage of the combustion chamber to produce a divergent intensely turbulent flow emanating from the impact region to define a Stirred Reactor region within the second stage of the combustion chamber;

igniting and burning the second lean premixture of fuel and compressed air in the second stage of the hot wall combustion chamber to produce combustion products exiting the second stage of the combustion chamber; and

maintaining the interior wall surface of the combustion



chamber which faces the combustion flame at a temperature near the flame temperature within the combustor, whereby high stability low NOx operation is obtained over a wide range of turndown heat release values

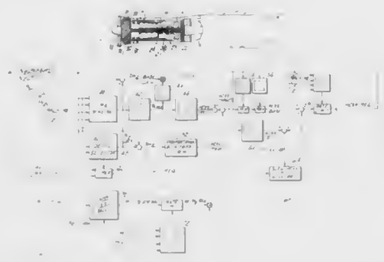
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4,928,482

CONTROL OF HIGH COMPRESSOR VANES AND FUEL FOR A GAS TURBINE ENGINE

Robert R. Pollak, North Palm Beach, and Juan A. Marcos, Jupiter, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 20, 1988, Ser. No. 246,728
Int. Cl.[5] F02C *9/54*
U.S. Cl. 60—39.161 **7 Claims**



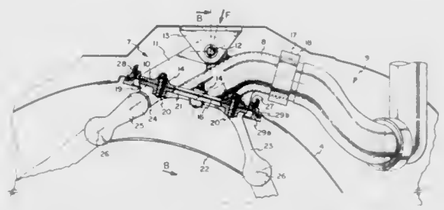
1. A control for controlling a gas turbine engine for powering aircraft during rapid accelerations and decelerations operating modes, said gas turbine engine having a first spool comprising a high pressure compressor and a first turbine driving said high pressure compressor and a second spool comprising a low pressure compressor and a second turbine driving said low pressure compressor and said first spool and said second spool being solely aerodynamically coupled, fuel metering means for regulating the flow of fuel to said engine, and variable vanes for said high pressure compressor for regulating the airflow thereto, means for controlling said engine to operate on a predetermined high pressure compressor steady state operating curve and having the speed of said first spool and said second spool being at a predetermined relationship, a power lever, said control including means responsive to the position of said power level for establishing a thrust value for adjusting said engine to accelerate and decelerate rapidly, said control having additional control means responsive to engine and aircraft operating variables for generating a first signal requesting a desired corrected low compressor speed (N_1), means responsive to said first signal and a preselected fixed corrected high pressure compressor speed (N_2) for generating a desired airflow from said variable vanes, means responsive too said power lever for selecting a constant N_2, means responsive to the difference of said selected constant N_2 and measured N_2 including a proportional and integral controller for adjusting said variable vanes to accelerate or decelerate said engine to said value established by said power lever, and means responsive to a timed signal to adjust said variable vanes as a function of said desired corrected low pressure speed operating in cooperation with said means for adjusting said fuel metering means to return said engine to operate on said high pressure compressor steady state operating curve.

4,928,483

AIR TAP AND ENGINE MOUNT FOR A TURBOJET ENGINE

Bernard LeFort, Ponthierry; Jean-Pierre Maulat, Saint Maur, and Guy R. Bacbomoff, Corbeil Essonnes, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Evry Cedex, France

Filed Jun. 19, 1989, Ser. No. 367,627
Claims priority, application France, Jun. 30, 1988, 88 08802
Int. Cl.[5] F02K *3/04*
U.S. Cl. 60—226.1 **9 Claims**



1. A device for tapping a portion of the air from a bypass duct of fan-type turbojet engine, the bypass duct being defined between a primary engine casing and a secondary casing, and for attaching the turbojet engine to an aircraft structure comprising:

(a) a base plate extending over an opening defined by the secondary casing, the base plate defining an air tapping orifice;

(b) means connecting the base plate to an air tapping tube such that the orifice communicates with the interior of the tube;

(c) first attaching means attaching the base plate to the aircraft structure; and,

(d) second attaching means attaching the base plate to the primary engine casing.

4,928,484

NONLINEAR MULTIVARIABLE CONTROL SYSTEM

Joseph L. Peczkowski, Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 20, 1988, Ser. No. 286,690
Int. Cl.[5] F02K *3/00*
U.S. Cl. 60—240 **11 Claims**

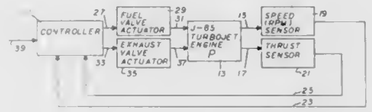
1. A multivariable control system for an engine or like plant which is responsive to input request signals for effecting plant operation in accordance with those input request signals comprising:

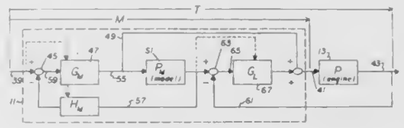
input means for receiving the request signals and providing output signals in response thereto;

a model of the plant for simulating plant performance and providing outputs indicative of such performance in response to signals from the input means;

first feedback means for returning the plant model output signals to the input means;

the input means including means for comparing the input request signals and the returned output signals, and for providing error output signals to the model of the plant to enable the plant model to more nearly exhibit the request operation;





means for supplying the input means output signals to the plant;

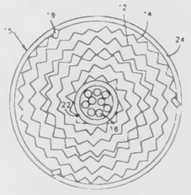
second feedback means for comparing a plant performance with the corresponding performance of the model of the plant and for applying corrective signals to the plant to modify plant performance in response to discrepancies between the plant performance and the performance of the model of the plant.

4,928,485

METALLIC CORE MEMBER FOR CATALYTIC CONVERTER AND CATALYTIC CONVERTER CONTAINING SAME

William A. Whittenberger, Garrettsville, Ohio, assignor to W. R. Grace & Co.,-Conn., New York, N.Y.

Filed Jun. 6, 1989, Ser. No. 362,089
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—299 **16 Claims**



1. A core member useful in a catalytic converter comprising:

(a) a strip of corrugated nonnesting thin metal foil having a given length and a given width, said strip being folded to provide portions of about equal length; and

(b) a wire secured along the fold line of said folded strip.

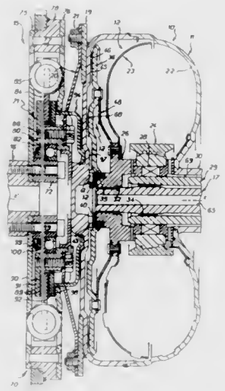
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4,928,486

VARIABLE-FORCE CLAMPING MECHANISM BETWEEN TORQUE-VARIATION DAMPING FLYWHEEL AND TORQUE CONVERTER

Dominique Despres, Clichy, France, assignor to Valeo, Paris, France

Filed Jul. 27, 1988, Ser. No. 224,988
Claims priority, application France, Jul. 29, 1987, 87 10750
Int. Cl.[5] F16H *45/02*; F16F *15/12*
U.S. Cl. 60—338 8 Claims



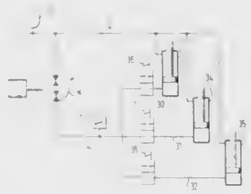
1. A fluid coupling device, including a rotatable coupling means comprising, in series, a torsion damping flywheel and a fluid coupling device assembled together by means of a rotatable output portion of said damping flywheel, said damping flywheel including at least one friction means and wherein a clamping means, adapted so as in operation to modify the clamping torque of said friction means, is interposed between a casing of the fluid coupling device and said friction means.

4,928,487

CONTROL APPARATUS FOR DOUBLE ACTING HYDRAULIC CYLINDER UNITS

Heinrich Nikolaus, Hamburg, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Continuation of Ser. No. 487,615, Apr. 22, 1983, abandoned. This application Jun. 5, 1985, Ser. No. 741,216
Claims priority, application Fed. Rep. of Germany, May 10, 1982, 3217527
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—414 12 Claims



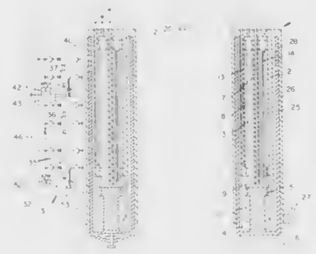
1. A hydraulic system for operating a load comprising a double acting hydraulic cylinder unit supplied with fluid from a pressure line, a constant pressure source continuously supplying fluid under a constant pressure to said pressure line including means for recovering energy in both directions of piston movement, said pressure line being connected to one cylinder space of said cylinder unit directly for actuating the piston thereof in a first direction and a conduit means connecting said pressure line to the other cylinder space, a hydraulic machine interposed in said conduit means and having a variable flow for controlling the volume of pressurized medium flowing between said other cylinder space and said pressure line, said machine being operable in either a pump mode to increase the pressure in said other cylinder space to move said piston in a direction opposite to said first direction or operable as motor when said piston moves in said first direction to generate energy when functioning in the motor mode.

4,928,488

HYDRAULICALLY-OPERATED SUPPORT DEVICE FOR SEMITRAILERS

Walter Hunger, Otto-Nagler-Strasse 13, 87 Wuerzburg, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 309,133
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—480 11 Claims



1. A hydraulically-operated support device for semitrailers, comprising:

at least one hydraulic cylinder semitrailer support comprising an extending piston and an extending cylinder defining a first annular space therebetween and a load-raising piston and a load-raising cylinder defining a second annular space therebetween, the load-raising cylinder formed at a bottom end of the extending cylinder; and

a pump subassembly for generating and controlling the hydraulic operating pressure comprising three independently-operable pumps:

an extending pump communicating with and acting on the extending piston,

a load-raising pump communicating with and acting on the load-raising piston, and

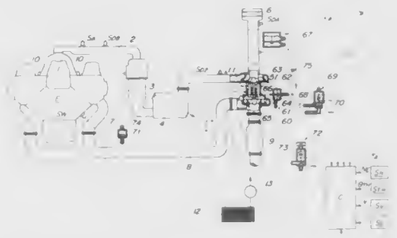
a retracting pump communicating with and acting on the first and second annular spaces; wherein the transmission ratio between the load-raising pump and the load-raising piston is substantially lower than the transmission ratio between the extending pump and the extending piston.

4,928,489

SUPERCHARGING PRESSURE CONTROL METHOD FOR TURBOCHARGED INTERNAL COMBUSTION ENGINES

Kazuo Inoue; Noriyuki Kishi, and Eitetsu Akiyama, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,299
Claims priority, application Japan, Dec. 29, 1987, 62-334196; Mar. 18, 1988, 63-65322
Int. Cl.[5] F02B *37/12*
U.S. Cl. 60—602 6 Claims



1. A method of controlling supercharging pressure in an internal combustion engine by means of a basic control amount dependent upon operation conditions of the engine, comprising the steps of:

(1) detecting a rate of change of the supercharging pressure; and

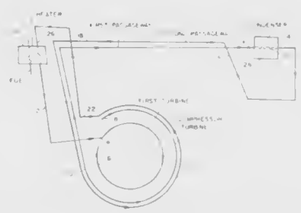
(2) when the supercharging pressure is in a transient state where it is increasing, correcting said basic control amount in response to the detected rate of change of the supercharging pressure, in a manner such that the rate of increase of the supercharging pressure is decreased as the detected rate of change of the supercharging pressure increases so as to make the supercharging pressure increase at a predetermined rate.

4,928,490

TURBINE HOUSING POWER SYSTEM WITH GEAR HOUSING

Demos Papastavros, 2429 NE. 184th Ter., N. Miami Beach, Fla. 33160

Filed Jul. 24, 1989, Ser. No. 384,408
Int. Cl.[5] F01K *19/04*
U.S. Cl. 60—670 11 Claims



1. A turbine housing power system contining a turbine housing which has a fluid inlet and a fluid outlet and further comprising:

a power tubine located inside said turbine housing having a fluid inlet and fluid outlet, said power turbine being operatively connected to a first shaft,

a compressor turbine located inside said turbine housing having a fluid inlet and fluid outlet, said compressor turbine being operatively connected to a second shaft, said second shaft having a hollow core inside which said first shaft is located therefore allowing said second shaft to rotate independentiy around said first shaft,

a first fluid conduit means operatively connecting said inlet of said turbine housing to said inlet of said power turbine, said first fluid conduit is designed to pass outside the rotor blades of said power turbine, "tapering in", decreasing in size from said inlet of said turbine housing to said inlet of said power turbine,

a means for allowing working fluid to flow from said outlet of said power turbine to the inlet of said compressor turbine,

a second fluid conduit means operatively connecting said outlet of said compressor turbine to said outlet of said turbine housing, said second fluid conduit is designed to pass outside the rotor blades of said compressor turbine, "tapering out", increasing in size, from said outlet of said compressor turbine to said outlet of said turbine housing,

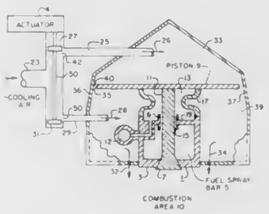
a third fluid conduit means having a heat exchange relationship with said second fluid conduit means, said third fluid conduit containing condensed working fluid from an outside condensing source, the working fluid in said third fluid conduit absorbs the heat energy from the hot exhaust fluid flowing in said second fluid conduit through a heat exchange relationship, preheating the working fluid in said third fluid conduit before it reaches an outside heating source which adds addtional heat energy to the system.

4,928,491

FUEL SUPPLY DEVICE FOR SUPPLYING FUEL TO AN ENGINE COMBUSTOR

Mitchell H. Lindsay, Palm City, and Walter B. Kerr, W. Palm Beach, both of Fla., assignors to United States of America as represented by the Secretary of Air Force, Washington, D.C.

Filed Jun. 29, 1988, Ser. No. 213,198
Int. Cl.[5] F02C *1/00*
U.S. Cl. 60—734 13 Claims



1. A variable flow rate fuel supply device for supplying fuel to an engine combustor (**10**) comprising:

(a) fuel metering means (**1**) having a fuel valve means (**3**, **7**) for controlling the flow rate of fuel to said combustor;

(b) piston means (**9**) for dividing a first cooling fluid chamber (**33**) from a second cooling fluid chamber (**39**);

(c) coupling means (**11**) for coupling said piston means to said fuel valve means (**3**, **7**); and

(d) cooling fluid supply means (**23**, **25**, **29**, **41**, **42**, **50**, **27**, **31**, **30**) in communication with said first and second cooling fluid chamber for producing a first pressure differential across said piston means (**9**) for actuating said fuel valve means in a first direction, and for producing a second pressure differential across said piston means for actuating said valve means in a second direction opposite said first direction, to control the flow rate of said fuel through said fuel metering means and into said engine combustor; and

(e) means for positioning (**12**) said fuel metering means (**1**) within said second cooling air chamber (**39**), enabling said cooling air supply means to both cool said fuel metering

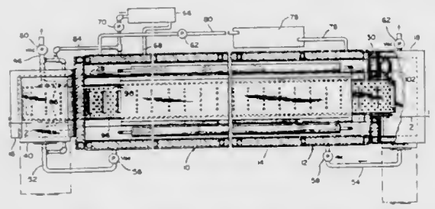
means and control the fuel supply rate of fuel supplied by said fuel metering means to said combustor.

4,928,492

CRYOGENIC PRODUCT TREATING APPARATUS

Henry H. Howard, 611 N. Franklin St., Modesto, Calif. 95351

Filed Dec. 8, 1988, Ser. No. 281,282
Int. Cl.[5] F25D *13/06*
U.S. Cl. 62—63 15 Claims



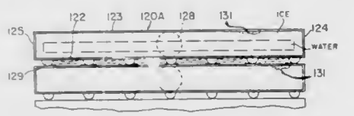
1. A method of exterior surfacing cleansing and outer boundary layer cooling a product, said method including providing a closed vessel having a cooled bath liquid therein and wherein said bath liquid has a boiling point temperature considerably below ambient temperature and the temperature of said bath liquid is below said boiling point temperature, introducing said product into said pressure vessel, from the exterior thereof, through mechanical vapor lock structure and placing said product in said bath liquid with said product at an initial temperature appreciably above said boiling point temperature, allowing said product to remain in said bath liquid only for a time interval sufficient to cause the outer boundary layer, only, of said product to be appreciably cooled below said boiling point temperature, withdrawing said product from said bath liquid and, after a predetermined time, removing said product from said vessel through vapor lock structure, said predetermined time period being only of sufficient duration to allow residual heat in said product inwardly of said outer boundary layer and above the boiling point temperature of said bath liquid to migrate, by conduction, to the outer surfaces of said product for vaporizing any remaining bath liquid on said outer surfaces.

4,928,493

ICE BUILDING, CHILLED WATER SYSTEM AND METHOD

Thomas A. Gilbertson, Moraga; Michael R. Meyers, Sonoma, and Bruce Kinneberg, Martinez, all of Calif., assignors to Reaction Thermal Systems, Inc., Napa, Calif.

Continuation-in-part of Ser. No. 284,890, Dec. 6, 1988, which is a continuation-in-part of Ser. No. 11,617, Feb. 6, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 311,215
Int. Cl.[5] F25D *3/00*
U.S. Cl. 62—185 6 Claims



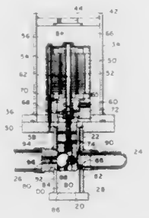
1. In a chill water system, in combination:
structural means defining a vessel for containing a volume of a first liquid characterized by a first freezing temperature substantially lower than water;
a multiplicity of ice encapsulating units disposed in said vessel and occupying a major portion of the volume thereof, each of said ice encapsulating units comprising sealed container means being filled with water and having a volume of cholesterol therein serving as an ice nucleating agent for said water; and
a liquid chilling system operatively associated with said vessel for cooling said first liquid in said vessel to a temperature above said first freezing temperature and below the freezing temperature of water.

4,928,494

INCREMENTAL ELECTRICALLY ACTUATED VALVE

Paul R. Glamm, La Crosse, Wis., assignor to American Standard Inc., New York, N.Y.

Filed Dec. 20, 1988, Ser. No. 286,683
Int. Cl.[5] F25B *41/04*; F16K *31/04*
U.S. Cl. 62—222 19 Claims



1. A refrigeration system for controllably circulating refrigerant in closed loop connection comprised of:
an evaporator for gasifying refrigerant;
a compressor in flow connection with said evaporator for receiving and compressing said gasified refrigerant;
a condenser in flow connection with said compressor for receiving and liquefying said refrigerant;
a variable flow rate expansion valve in flow connection with said condenser for receiving said liquefied refrigerant and controllably expanding said refrigerant, said valve in flow connection with said evaporator for directing said expanded refrigerant to said evaporator, said valve comprised of:
a valve body defining an internal metering chamber having a substantially planar outlet surface, said valve body having a first wall with an inlet aperture for permitting fluid flow into said metering chamber and a second wall including a planar outlet surface with an outlet aperture for permitting fluid flow from said metering chamber;
a metering piston disposed in said metering chamber in sliding engagement with said planar outlet surface, said metering piston having a metering orifice; and
means for incrementally moving said metering piston in said metering chamber normal to said outlet aperture, said metering piston moving means fixed in said internal metering chamber.

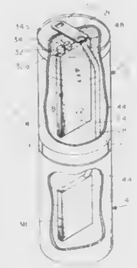
4,928,495

SELF COOLING AND SELF HEATING CONTAINER

Israel Siegel, 2980 Point East Dr., Apt. D-612, North Miami Beach, Fla. 33160

Filed Jun. 22, 1989, Ser. No. 369,828
Int. Cl.[5] F25D *5/00*
U.S. Cl. 62—4 14 Claims

1. A temperature changing device consisting of a chamber, a liquid in said chamber, at least a partial air-vacuum in said chamber to lower the boiling temperature of said liquid, a second chamber, a dessicant in said second chamber, said dessicant having an affinity for vapors generated by said liquid, a communication between said vapors and said dessicant to obtain a sorption of said vapors by said dessicant, means to reversibly close said communication to obtain an unlimited storage of the temperature changing potential of said temperature changing device, a container associated with said dessicant chamber, said dessicant chamber and said container spatially arranged so that the dessicant chamber is present inside



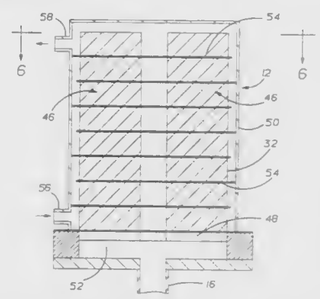
said container, water inside said container, said water and said dessicant chamber spatially arranged so that dessicant chamber is immersed in said water.

4,928,496

HYDROGEN HEAT PUMP

W. Edward Wallace; H. Kevin Smith; W. Bryan Lynch; Raymond S. Craig, all of Pittsburgh, and Fiaz Pourarian, Verona, all of Pa., assignors to Advanced Materials Corporation, Pittsburgh, Pa.

Filed Apr. 14, 1989, Ser. No. 337,960
Int. Cl.[5] F17C *11/00*
U.S. Cl. 62—46.2 24 Claims



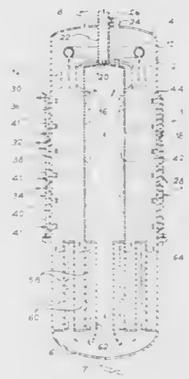
1. A bed of hydride forming material for use in a heat pump, operating by transferring hydrogen between two reaction vessels, each vessel employing at least one bed, said bed containing a higher temperature more stable metal hydride forming material in one reaction vessel, and said bed containing a lower temperature less stable metal hydride forming material in the other reaction vessel, each of said beds comprising:
a heat conducting metal tube closed at one end and open at its other end;
a plurality of heat conducting metal discs having an outer periphery conforming to the inside diameter of said tube;
a plurality of layers of powdered metal hydride forming material;
said metal discs being pressed into said tube with alternate layers of powdered metal hydride forming material sandwiched between the discs;
said bed allowing the flow of hydrogen gas into and out of the open end of said tube for absorption and desorption of gas by the layers of metal hydride forming material.

4,928,497

COLD TRAP FOR THE PURIFICATION OF A LIQUID METAL HAVING SEPARATE TRAPPING ZONES

Christian Latge, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 30, 1988, Ser. No. 278,032
Claims priority, application France, Dec. 3, 1987, 87 16786
Int. Cl.[5] G21C *19/30*
U.S. Cl. 62—55.5 9 Claims



1. Cold trap for purifying a liquid metal containing oxygen and hydrogen in solution, said cold trap comprising a liquid metal circulation enclosure (**1**), a supply pipe (**8**) for introducing the liquid metal to be purified into enclosure (**1**), a distributor (**10**) for distributing the liquid metal on the enclosure periphery, a central passage (**18**) defining for the liquid metal a hairpin-like path between an annular zone of the dropping of said metal and a central raising zone with a view to the discharge thereof, cooling means (**30**, **32**, **34**) located outside enclosure (**1**) and downstream of distributor (**10**) in order to create a cooling zone (**28**) for the liquid metal to be purified, at least one oxide retention element (**58**) downstream of the cooling means and a discharge pipe (**22**) for discharging the purified liquid metal, characterized in that said cold trap further comprises structures (**44**) for the attachment of hydrides, said attachment structures being located within the enclosure (**1**) and level with external cooling means (**30**, **32**, **34**) as well as a thermal insulating layer (**42**) placed on the wall of said passage (**18**), said insulating layer (**42**) having the function of limiting the heat exchange on the wall of said passage (**18**).

4,928,498

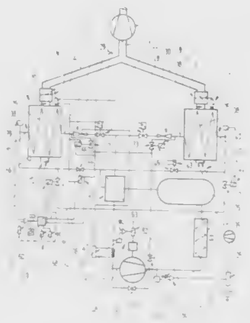
METHOD AND DEVICE FOR COMPRESSION OF GASES

Ewald Gossler, 73 Traunsteinstrasse, A-4810 Gmunden, Austria

Continuation of Ser. No. 927,262, Nov. 4, 1986, abandoned. This application Jan. 18, 1989, Ser. No. 298,833
Claims priority, application Austria, Nov. 8, 1985, 3224/85; Nov. 28, 1985, 3467/85
Int. Cl.[5] F25D *21/06*
U.S. Cl. 62—81 9 Claims

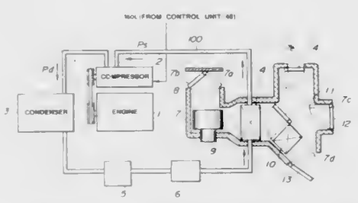
1. A method of compressing a gas in a gas compressor having a suction intake, which comprises the steps of
(a) cooling the gas to a temperature below 0° C. in a gas cooling zone having a freeze-dehumidifier whereby an icy condensate is precipitated on the surface of the freeze-dehumidifier,
(b) circulating a cooled refrigerant medium through the freeze-dehumidifier in a closed cycle including a suction conduit leading from the freeze-dehumidifier and a pressure conduit leading to the freeze-dehumidifier to cool the

gas in said zone to below 0° C. whereby an icy condensate is precipitated on the surface of the freeze-dehumidifier,
(c) intermittently defrosting the freeze-dehumidifier surface to remove the icy condensate therefrom while interrupting the circulation of the cooled refrigerant medium therethrough whereby cooled refrigerant medium remains standing in the freeze-dehumidifier,
(d) monitoring the pressure of the cooled refrigerant medium standing in the freeze-dehumidifier after interruption of the circulation of the cooled refrigerant medium,



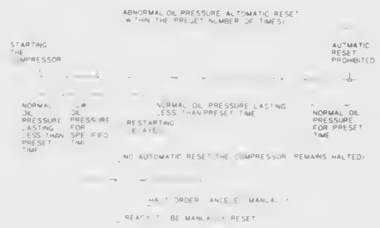
(e) terminating the defrosting of the freeze-dehumidifier when the monitored pressure of the refrigerant medium exceeds a pressure corresponding to about 0° C. at the surface of the freeze-dehumidifier, and
(f) monitoring the temperature of the gas in the suction intake of the compressor after it has passed through the gas cooling zone, and terminating the defrosting when the monitored gas temperature exceeds about 0° C.

4,928,499
AUTOMATIC AIR CONDITIONER SYSTEM WITH VARIABLE DISPLACEMENT COMPRESSOR FOR AUTOMOTIVE VEHICLES
Ikuo Kiminami; Hideyuki Sakamoto, and Toshimitsu Nose, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan
Filed Mar. 29, 1989, Ser. No. 330,259
Claims priority, application Japan, Mar. 31, 1988, 63-81996
Int. Cl.[5] F25D *17/04*
U.S. Cl. 62—186 **7 Claims**



1. An automatic air conditioning system for automotive vehicles with a variable displacement compressor comprising:
first detecting means for detecting an intake air temperature defined by a temperature of air flowing through an evaporator of said air conditioning system placed just behind said evaporator;
discharge changing means for essentially changing the discharge volume of refrigerant discharged from said compressor on the basis of the difference between said intake air temperature and its target value;
mode signal generating means for generating a mode signal representing whether said air conditioning system is operated in a first mode wherein conditioned air is simultaneously discharged from both of upper and lower discharge outlets or is operated in a second mode wherein conditioned air is discharged from either the upper or lower of said discharge outlets; and
target value deriving means for deriving said target value of said intake air temperature on the basis of said mode signal in such a manner that said target value in said first mode is smaller than said target value in said second mode.

4,928,500
CONTROL DEVICE FOR FREEZER
Nobuhiro Funahashi; Toshio Yamashita, and Hiroshi Ogawa, all of Aichi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 5, 1988, Ser. No. 190,476
Claims priority, application Japan, May 7, 1987, 62-67430
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—193 **4 Claims**

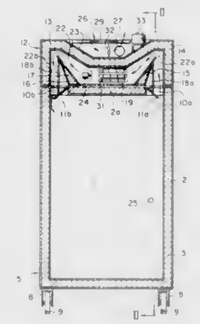


1. A control device for a freezer, comprising:
an oil pressure sensor for sensing the oil pressure of a compressor used in said freezer and developing an oil pressure signal representative thereof;
means for comparing said oil pressure signal with a reference value, determining the oil pressure to be abnormal if said oil pressure signal is less than said reference value, and developing an abnormality signal in response to said determination;
means responsive to said abnormality signal for halting the operation of said compressor;
resetting means responsive to the halting of said compressor for restarting the operation of said compressor after a predetermined cool-off period has elapsed;
means for measuring the amount of time during continuous operation of said compressor that said abnormality signal is not developed and producing a preset time signal when said amount of time reaches a preset time; and
means responsive to said preset time signal for preventing said resetting means from restarting the operation of said compressor.

4,928,501
COLD PRESERVING CONTAINER
Kozabro Negishi, Isesaki, Japan, assignor to Sanden Corporation, Japan
Continuation of Ser. No. 324,030, Mar. 16, 1989, abandoned.
This application Aug. 11, 1989, Ser. No. 393,030
Claims priority, application Japan, Mar. 17, 1988, 63-3441[U]
Int. Cl.[5] F25D *17/04*
U.S. Cl. 62—406 **31 Claims**

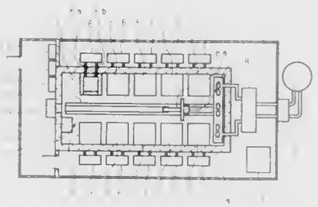
1. A cold preserving container comprising:
first heat insulating walls surrounding a goods container space;

an upwardly-opening, dish-like member positioned above said goods container space;
a cold accumulator positioned in said dish-like member;
cold regenerative material enclosed in said cold accumulator;
a second heat insulating wall covering and spaced above said dish-like member;



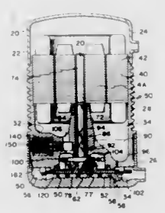
an air path positioned between said second insulating wall and said dish-like member and having air path end portions, said air path communicating at said air path end portions with said goods container space; and
a blower means for circulating air between said air path and said goods container space.

4,928,502
EQUIPMENT FOR STORING BLOOD
Susumu Kumada; Mikio Mori; Ryoji Nagatani, and Tadami Ano, all of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 28, 1989, Ser. No. 386,116
Claims priority, application Japan, Aug. 26, 1988, 63-213210
Int. Cl.[5] F25D *11/00*
U.S. Cl. 62—440 **11 Claims**



1. An equipment for storing blood, comprising:
a keeping-cool room kept at a low temperature,
a plurality of storing cases for storing blood provided in said keeping-cool room, and
Stirling refrigerators each of which is connected to each of said storing cases and refrigerates the interior of each of them to a very low temperature.

4,928,503
SCROLL APPARATUS WITH PRESSURE REGULATION
Delmar R. Riffe, La Crosse, Wis., assignor to American Standard Inc., New York, N.Y.
Filed Jul. 15, 1988, Ser. No. 219,127
Int. Cl.[5] F04C *18/04, 29/02, 29/10*
U.S. Cl. 62—498 **43 Claims**

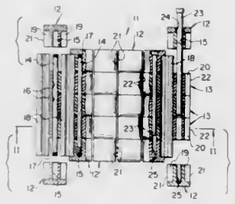


1. A fluid compressor comprised of:
a first scroll member having an end plate, an upstanding involute wrap disclosed on said end plate, said first scroll member end plate further including a discharge aperture and a circular drive stub on said end plate;
a fixed second scroll member having an end plate and an upstanding involute wrap disclosed on said end plate for interleaving engagement with said upstanding involute wrap of said first scroll member;
means for driving said first scroll member, said drive means including a drive shaft having an eccentric crank portion and a crank portion for engaging said first scroll member drive stub;
a frame defining a pressure regulation chamber concentric with said drive means, said frame including a bore defining a pressure regulation passage and an aperture for flow communication from said chamber, said discharge aperture of said first scroll member end plate providing flow communication to said chamber;
a pressure regulation device for regulating fluid pressure in said pressure regulating chamber including a piston having a portion disposed in said pressure regulation passage, said pressure regulation device having a first element responsive to discharge pressure and a second element responsive to suction pressure;
an annular seal element disposed about said concentric chamber between said first scroll member end plate and said frame for sealing said chamber so that said regulated fluid pressure acts upon said first scroll end plate to bias said first scroll member toward said second scroll member; and
means for biasing said annular seal toward said first scroll member end plate.

4,928,504
ARTICULATED BRACELET WITH COMPOSITE ELEMENTS
Remigio Tuppini, Verona, Italy, assignor to Tuppini Bigiotterie S.r.l., Verona, Italy
Filed Dec. 15, 1988, Ser. No. 284,705
Claims priority, application Italy, Dec. 17, 1987, 23063 A/87
Int. Cl.[5] A44C *5/00*
U.S. Cl. 63—9 **7 Claims**

1. An articulated bracelet with a number of composite elements arranged with respect to one another to form a continuous longitudinal chain wherein each composite element represents a link in the chain of the bracelet, each of said composite elements comprising a number of unitary elements, each unitary element having a bore therethrough, the number of unitary elements of each composite element being positioned in side-by-side relationship with one another transversely of the longitudinal chain, each composite element having a first pin

element extending transversely through the bores of its respective unitary elements, each of the unitary elements of the composite element having a pair of opposing seats which extend parallel to the bore of the unitary element, and a number of second pin elements having articulation means for interconnecting one composite element with an adjacent composite



element whereby each second pin element is positioned within one of the opposed seats of the unitary elements of the one composite element and also positioned within one of the opposed seats of the unitary elements of the adjacent composite element, a number of composite elements being articulately connected to one another to form the links of the chain of the bracelet.

4,928,505

POWERED PORTABLE WRINGER

Lee R. Parks, 2520 Lodi La., San Jose, Calif. 95124, and Wiley A. Kittrell, Milpitas, Calif., assignors to Lee R. Parks, San Jose, Calif.

Filed Sep. 15, 1986, Ser. No. 907,846
Int Cl.[5] D06F *45/18*
U.S. Cl. 68—253 R 5 Claims



3. A wringer for squeezing liquid from a wet cloth comprising:

a housing formed to support a first roller and a second roller;

said first roller being formed as a hollow cylinder and having an electric motor disposed therewithin for providing rotational power to said first and second rollers; said first roller also having a means for providing electrical energy to said motor; and wherein the casing of said electric motor is fixedly engaged to said first roller such that said casing rotates along with said first roller;

a power communication means formed within said first roller and said housing, and disposed to communicate rotational power from said electric motor to said second roller;

resilient means formed within said housing and disposed to urge said first and second rollers proximate each other;

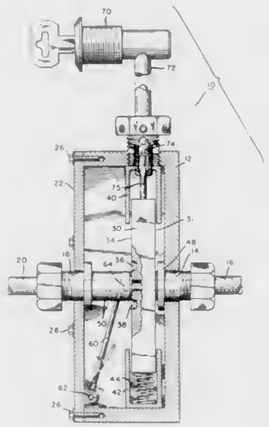
whereby said rollers will rotate in opposite directions upon activation of said electric motor and simultaneously squeeze and draw a wet cloth through said rollers.

4,928,506

ANTI-THEFT LOCKING VALVE FOR MOTOR VEHICLES

Edmund Radziewicz, 1000 River Rd., Belmar, N.J. 07719

Filed May 11, 1989, Ser. No. 350,234
Int. Cl.[5] F16K *35/00*
U.S. Cl. 70—176 6 Claims



1. An anti-theft, tamper-proof lock for automobile applications for securing the fuel line or hydraulic brake line to prevent theft comprising:

a manually-operated turnkey-type tumbler lock means;

a housing disposed in the selective fluid line having an inlet port secured to an upstream fluid line in communication with a fluid reservoir, an outlet port secured to a downstream fluid line, said outlet port and said inlet port in alignment, said housing having a removable face plate, said housing having disposed therein a channeled guide having a biased mounted slide valve disposed therein, said slide valve having an aperture therethrough for selective alignment with said inlet port and said outlet port of said housing for the passage of fluid therethrough;

a communication means comprising a conduit in communication with said turnkey-type tumbler lock means and said housing, said communication means having positioned therein, a plurality of spherical bearings in communication with each other, said conduit having a pin positioned at a housing end, said pin and said spherical bearings movably engaged through the action of said turnkey-type tumbler lock means and said biased mount for said slide valve to selectively align and disalign said aperture in said slide valve with said inlet port and said outlet port for selectively opening and closing said slide valve to permit the passage of fluid therethrough;

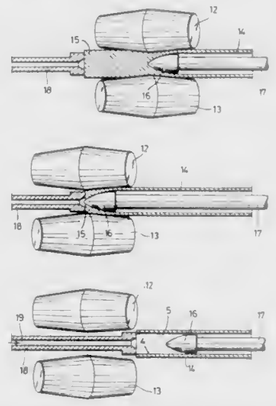
an anti-tamper lock mechanism disposed in said housing, said anti-tamper lock mechanism comprising a biased mounted locking arm, biasly mounted to an inside of said housing and frictionally engaged with a face of said slide valve, said locking arm in alignment with vertically aligned indents in said face of said slide valve, said indents disposed laterally from said aperture in said slide valve.

4,928,507

METHODS AND APPARATUS FOR MANUFACTURING SEAMLESS TUBE

Karlhans Staat, Ratingen, and Hermano Möltner, Grevenbroich, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 770,730, Aug. 29, 1985, abandoned. This application Dec. 23, 1987, Ser. No. 137,463
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1984, 3432288
Int. Cl.[5] B21B *9/00, 19/04, 19/10*
U.S. Cl. 72—38 7 Claims



3. A method of manufacturing seamless tubes comprising the steps of:

(a) piercing hot ingots by means of an internal piercing tool comprising an elongated piercing rod in one of a press and a skew rolling line to form a hollow ingot;

(b) withdrawing the piercing tool from said hollow ingot;

(c) simultaneously introducing one of an inert gas and a non-oxidizing gas through a borehole in the forward end of said piercing tool into the space within the hollow ingot being vacated by the withdrawal of the piercing tool as said piercing tool is withdrawn whereby said hollow ingot is filled with said gas when said piercing tool is withdrawn.

4,928,508

METHOD OF FORMING PRELUBRICATED FINSTOCK

Gregory J. Courval, Napanee, Canada, assignor to Alcan International Limited, Canada

Filed May 27, 1987, Ser. No. 54,522
Claims priority, application Canada, May 30, 1986, 510495
Int. Cl.[5] B21D *22/00, 28/00, 53/04*
U.S. Cl. 72—42 2 Claims



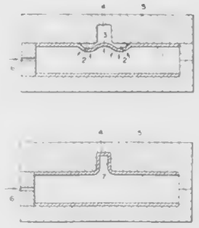
1. A process which comprises: (a) forming a coating of water soluble lubricant on a continuous strip of aluminum alloy finstock having a thickness of 75 to 150 microns, said lubricant having a solubility of at least 50 gpl and a viscosity of at least 50 mPas, and coiling the coated strip to form a prelubricated coil having an Olsen cup rating of greater than 0.30, (b) subsequently uncoiling the prelubricated coil and passing the coated strip through a forming device to form aluminum alloy heat exchange fins, and (c) thereafter removing the lubricant from the heat exchange fins by applying an aqueous medium thereto.

4,928,509

METHOD FOR MANUFACTURING A PIPE WITH PROJECTIONS

Masanobu Nakamura, Kamakura, Japan, assignor to Mitsui & Co., Ltd., Tokyo and Kokan Kako Co., Ltd., Yokohama, both of, Japan

Division of Ser. No. 139,811, Dec. 30, 1987, Pat. No. 4,840,053. This application Mar. 22, 1989, Ser. No. 327,512
Claims priority, application Japan, Jul. 29, 1987, 62-189384; Aug. 17, 1987, 62-203841
Int. Cl.[5] B21D *26/02*
U.S. Cl. 72—61 9 Claims



1. A method for manufacturing a pipe with a projection at a predetermined position, comprising the steps of:

(a) deforming a pipe to provide a recess close to the predetermined position, the deformation of the pipe altering an inner dimension of the pipe;

(b) placing the pipe in a bulge mold; and

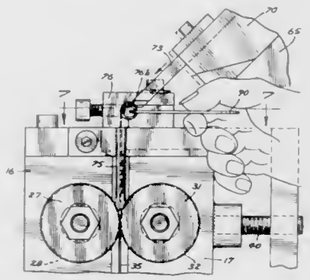
(c) forcing pressurized fluid into the pipe to bulge the pipe at the predetermined position so as to form the projection.

4,928,510

RING COILING MACHINE

Jerome Hillsted, Blaine, Minn., assignor to Merit Enterprises, Inc., Isle, Minn.

Filed Sep. 15, 1989, Ser. No. 407,591
Int. Cl.[5] B21F *37/00*
U.S. Cl. 72—131 2 Claims



1. An automatic ring coiling machine, having in combination

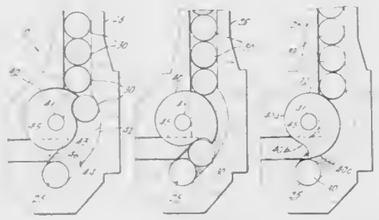
actuating means mounted within a housing,

means operating said actuating means,

timing means in connection with said operating means,

wire advancing means,
a wire advanced by said last mentioned means,
a die member in operative association with said wire advancing means having a wire passage therethrough and a cavity therein, said passage and said cavity respectively being adapted to apply a radius to said wire and to coil the same,
means operatively associated with said die severing said coil from said wire,
said timing means comprises a pre-set operating time interval,
means in connection with said timing means extending said pre-set timing interval,
said actuating means causing the advance of said wire upon completion of a coil, and
means limiting said advance of said wire to a very short projection from said passage in said die.

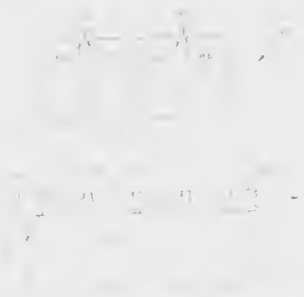
4,928,511
ROTARY CUP INFEED
Enn Sirvet, Washington Township, N.J., assignor to Sequa Corporation, New York, N.Y.
Filed Dec. 13, 1988, Ser. No. 283,678
Int. Cl.[5] B21D *43/04, 43/16, 43/20*
U.S. Cl. 72—361 **29 Claims**



21. Feeding apparatus for moving cylindrical cups one at a time to a location where each of them dwells in a position to have its sidewall elongated by being operated upon by a reciprocating tool during its working stroke which extends through such location;
said feeding apparatus including a chute constructed to position cups as they move side-by-side in a stack, first means defining a receiving station remote from said chute, and a rotatably mounted member for separating the most downstream cup of the stack from the cups upstream of the most downstream cup and then transferring the latter from said chute to said receiving station;
said rotatably mounted member having pocket means to receive cups from said chute; and
second means for continuously rotating said member about an axis in coordination with operation of a reciprocating tool means whereby a cup is delivered to and dwells at said location for each working stroke of such reciprocating tool means.

4,928,512
DIE SET FOR THE FORMATION OF CAVITIES FOR METAL PACKAGES TO HOUSE ELECTRONIC DEVICES
James F. Rooney, Bethany, and Harvey P. Cheskis, North Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.
Filed Nov. 14, 1988, Ser. No. 270,919
Int. Cl.[5] B21D *22/06*
U.S. Cl. 72—404 **17 Claims**

9. A progressive sequence of dies for forming a cavity having a desired length, width and depth, comprising:
a plurality of extendable punches, each with an impact surface, said impact surfaces alternating between a first desired pattern comprising a plurality of piercing points and a second desired pattern comprising an essentially flat surface, the length and width of each said impact surface approximately equal to the desired length and width of said cavity;
a die body including a plurality of apertures adapted to receive each said punch;



an opposing post positioned within each said aperture having an impact surface congruent with each said impact surface; and
at least one moveable forming bushing supported by at least one forming bushing actuator slideably engaged to each said opposing post.

4,928,513
SENSOR
Takashi Sugihara, Nara; Kazutaka Uda, Tenri; Hiroki Tabuchi; Yasuhiko Inami, both of Nara; Masaya Hijikigawa, Yamatokoriyama, and Shoei Kataoka, Tanashi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 28, 1987, Ser. No. 78,741
Claims priority, application Japan, Jul. 29, 1986, 61-179625; Apr. 22, 1987, 62-99323; May 21, 1987, 62-126164; May 27, 1987, 62-130607; Jun. 8, 1987, 62-143496
Int. Cl.[5] G01N *27/04*
U.S. Cl. 73—1 G **23 Claims**



1. A sensor having a pair of sensor units, one of which is a detecting sensor unit and the other of which is a reference sensor unit, wherein said detecting sensor unit comprises
a substrate with a hollow portion, a thin insulating layer with a bridge shape disposed on said substrate, a sensitive film disposed on the bridge portion of said thin insulating layer, and a pair of electrodes being in contact with said sensitive film, the sensitive film section being exposed to an atmosphere to be measured so that the electrical resistance of said sensitive film changes with a variation in the physical quantity of said atmosphere to be detected; and
said reference sensor unit comprises a substrate having a hollow portion, a thin insulating layer with a bridge shape disposed on said substrate, a sensitive film disposed on the bridge portion of said thin insulating layer, and a pair of electrodes being in contact with said sensitive film, the sensitive film section being sealed within a shielding container so that the electrical resistance of said sensitive film is not influenced by a variation in the physical quantity of the atmosphere outside of said container, whereby the absolute physical quantity of the atmosphere to be detected is determined by the output power of said sensor based on a difference between said electrical resistance of the detecting sensor unit and said electrical resistance of the reference sensor unit.

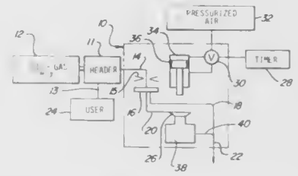
4,928,514
CALIBRATION CONTAINER
Brook J. Beaston, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.
Continuation-in-part of Ser. No. 96,846, Sep. 15, 1987, and a continuation of Ser. No. 170,152, Mar. 18, 1988, abandoned.
This application Jul. 12, 1989, Ser. No. 379,585
Int. Cl.[5] G01F *25/00*
U.S. Cl. 73—3 **5 Claims**



1. A calibration container for measuring a precise quantity of liquid, the calibration container comprising:
an open-top vessel constructed of a polymeric material and having a generally cylindrically shaped main body portion and a substantially transparent neck portion, the neck portion being substantially smaller in diameter than the main body portion, the neck portion extending substantially vertically from the main body portion and having at least one scale support rib extending along the length thereof; and
scale means slidably supported on the neck portion of the vessel for indicating the meniscus level of a measured amount of a liquid, the scale means secured to the neck portion to establish such meniscus level, the scale means comprising a graduated indicator scale having a zero indicator pointer, the indicator slidably supported on the scale support rib and permanently attachable thereto when the zero indicator is aligned with the liquid meniscus.

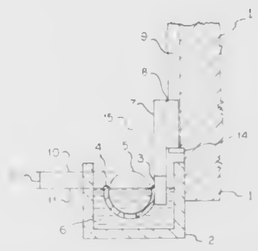
5. A method of providing and calibrating a calibration container for measuring a precise quantity of a selected liquid, comprising:
forming a substantially transparent vessel having a body portion and a neck portion, the neck portion being smaller in diameter than the body portion and extending vertically therefrom, the neck portion having a pair of scale support ribs extending along the length thereof;
forming an indicator scale having a zero pointer and shaped to be slidably supported on the scale support ribs;
filling the vessel with a precise quantity of selected calibration liquid so that a meniscus level of the liquid appears within the neck portion;
moving the indicator scale along the scale support ribs to align the zero pointer with the liquid meniscus as same is viewed through the neck portion;
affixing the indicator scale to the neck portion so that the indicator scale is permanently secured at the position established by the preceding step; and
removing the calibration liquid contained therein for achieving the above steps.

4,928,515
OIL MIST SENSOR
Nils O. Rosaen, P.O. Box 242, Clarkston, Mich. 48016
Filed Nov. 30, 1988, Ser. No. 277,869
Int. Cl.[5] B01D *17/02*
U.S. Cl. 73—61 R **21 Claims**



1. A device for detecting the presence of oil in an oil-gas mixture, said device comprising:
a fluid passageway through which said mixture is directed;
means included in said fluid passageway for separating a quantity of oil from said oil-gas mixture;
means for collecting said quantity of separated oil in a reservoir for a predetermined collecting cycle;
means for sampling said reservoir at the end of said collecting cycle to detect the presence of oil;
means for indicating the presence of oil in said reservoir;
said separating means comprising means disposed in said fluid passageway for defining at least one restricted portion and a collecting plate disposed in said fluid passageway downstream from said restricted portion;
said last mentioned means comprising a cylindrical spindle disposed in said fluid passageway and having a downstream and facing said collection plate; and
wherein said fluid passageway is formed in part by a centrally disposed portion of said spindle having a reduced diameter defining a spindle wall; and wherein said at least one restricted portion comprises at least one bore through said wall, extending from said annular chamber to said downstream end of said spindle.

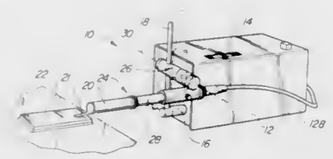
4,928,516
APPARATUS FOR DETERMINING THE CENTER OF GRAVITY OF A SPHERICAL BALL
Nyle O. Movick, 4600 Macky Way, Boulder, Colo. 80303
Filed Feb. 29, 1988, Ser. No. 162,075
Int. Cl.[5] G01M *1/12*
U.S. Cl. 73—65 **2 Claims**



1. Apparatus for determining the axis of at least one unbalanced spherical ball, which axis includes the ball's geometric center and the ball's center of gravity, said apparatus comprising:

a container means for holding a predetermined liquid,
at least one spherical cup for holding said spherical ball, said spherical cup fitting closely to the spherical ball yet allowing the ball to freely rotate when immersed in said predetermined liquid,
a rigid assembly, to which is affixed said at least one spherical cup,
support means to which the assembly is attached, said support means allowing the raising and lowering of said assembly and allowing the lowering and raising of said spherical ball into and out of said predetermined liquid.

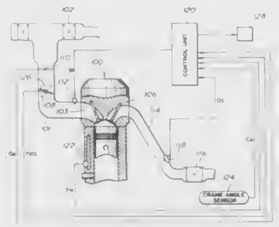
4,928,517
SURFACE MEASURING INSTRUMENT LINK ARM ASSEMBLY
Frederick L. Fitts, Ann Arbor, Mich., assignor to Precision Devices Inc., Milan, Mich.
Filed Aug. 10, 1987, Ser. No. 83,358
Int. Cl.[5] G01B *5/28*
U.S. Cl. 73—105 **5 Claims**



1. A link arm assembly for coupling a surface finish measuring unit to a surface evaluating probe comprising:
a probe mounting arm having mounting means for mounting said probe,
a pivot bearing assembly having a first portion thereof coupled to said probe mounting arm and a second portion thereof coupled to said unit wherein said first and second portions are rotatable with respect to each other such that said probe mounting arm is movable between a normal generally vertical position to an operating generally horizontal position in which said probe rests on a workpiece, and
clutching means for permitting said probe mounting arm to be freely moved from said operating to said normal position but providing damping when said probe mounting arm is moved from said normal to said operating position thereby limiting the impact forces acting on said probe when contacting said workpiece.

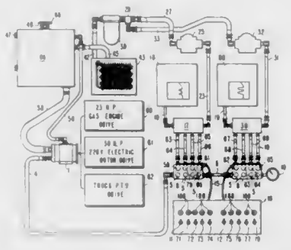
4,928,518
OXYGEN SENSOR OPERABILITY SENSING ARRANGEMENT
Hideyuki Tamura, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Feb. 17, 1989, Ser. No. 311,796
Claims priority, application Japan, Feb. 25, 1988, 63-43488
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 **6 Claims**

1. A method of monitoring the operation of a oxygen sensor and diagnosing a malfunction thereof, comprising the steps of:
sensing the oxygen content of exhaust gases emitted from an internal combustion engine using an oxygen sensor, said oxygen sensor being operatively disposed in an exhaust conduit and arranged to be exposed to the exhaust gases emitted from said engine;
sensing said engine having assumed a warmed-up status;
sensing the engine load and the engine speed and determining the instant engine operational status using said engine load and engine speed after the engine has warmed-up;
determining if the instant engine operational status falls within a predetermined operational zone; and
indicating a oxygen sensor malfunction in the even that the



oxygen sensor output remains continuously below a first predetermined value and above a second predetermined value for a predetermined period of time with said engine operating in said predetermined operational zone.

4,928,519
BRAKE TESTING APPARATUS
Earl Frederick, Albuquerque, N. Mex., assignor to Vehicle Safety Controls, Inc., Columbia City, Ind.
Filed Sep. 28, 1988, Ser. No. 250,081
Int. Cl.[5] G01L *5/28*
U.S. Cl. 73—126 **35 Claims**

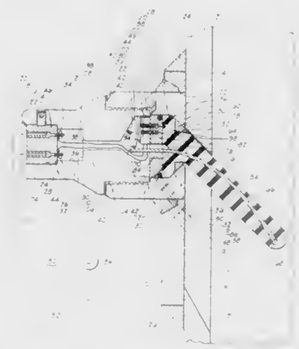


1. A braking force measuring system comprising:
a pair of spaced rollers capable of supporting a wheel with the axis of the wheel generally parallel with the axes of the rollers,
means for driving at least one of said rollers at a constant speed,
means for measuring the energy required to rotate said driven roller(s), in which said driving means comprises at least one hydraulic motor operatively associated with said measuring means; and said measuring means comprises hydraulic fluid pressure measuring means.

4,928,520
PLUG RELEASE INDICATOR
Burchus Q. Barrington, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Continuation of Ser. No. 318,215, Mar. 2, 1989, abandoned. This application Nov. 7, 1989, Ser. No. 433,398
Int. Cl.[5] E21B *33/00*
U.S. Cl. 73—151 **19 Claims**

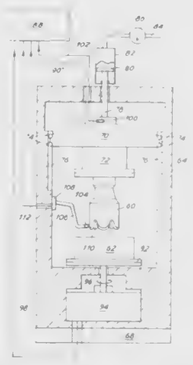
1. A plug release indicator for determining when a cementing plug passes a predetermined point, said indicator comprising:
a casing having a slotted portion defined therethrough;

switch means, disposed proximate said casing, for closing an electrical circuit;
resilient probe means, extending through said slotted portion and into the interior of said casing, for contacting said cementing plug;



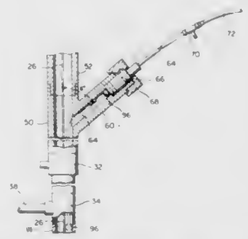
a wire embedded within said probe means, said wire having a lip formed on an end thereof extending from said probe, said lip actuating said switch means upon passage of said cementing plug; and
indicating means electrically connectable to said switch means, for indicating the passage of said cementing plug.

4,928,521
METHOD OF DETERMINING DRILL BIT WEAR
Stuart Jardine, Cambridge, England, assignor to Schlumberger Technology Corporation, Houston, Tex.
Filed Mar. 27, 1989, Ser. No. 328,655
Claims priority, application United Kingdom, Apr. 5, 1988, 8807889
Int. Cl.[5] E21B *47/00*
U.S. Cl. 73—151 **11 Claims**



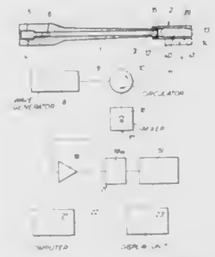
1. A method of determining the state of wear of a multicone drill bit fixed at the lower end of a drill string for drilling a borehole in the earth, according to which vibrations generated by the working drill bit are detected and converted into a time oscillatory signal from which a frequency spectrum is derived, characterized by extracting the periodicity of the frequency spectrum, determining from said periodicity the rate of rotation of at least one cone and deriving the state of wear of the drill bit from said rate of cone rotation.

4,928,522
STEAM INJECTION SURVEY APPARATUS AND METHOD FOR TESTING WELLS
Gerald J. Tonnelli, Bakersfield, Calif., assignor to Production Data, Inc., Bakersfield, Calif.
Filed Feb. 10, 1989, Ser. No. 308,519
Int. Cl.[5] E21B *49/00*
U.S. Cl. 73—155 **19 Claims**



18. In combination with a tubing string for a well to which a steam line is connected above ground, a logging tool assembly having a radiation detecting device and an elongated wire line extending therefrom, a stuffing box through which the wire line extends while blocking outflow of well fluids, a lubricator pipe connected to the stuffing box and enclosing the radiation detecting device in a storage position, a tubular riser coupled to the lubricator pipe and a swab valve interconnecting the riser and the tubing string in axial alignment with each other above the steam line, means for injecting a radio-active tracer into the tubing string, including an injection port mounted on the riser having an injection axis at an acute angle to the riser and the tubing string, an injection tube through which the tracer is conducted, means mounted by the injection port for slidably guiding displacement of the injection tube along said injection axis thereof from a retracted position to an extended position below the steam line within the tubing string.

4,928,523
METHOD AND APPARATUS FOR IDENTIFYING BALLISTIC CHARACTERISTICS WITHIN A WEAPON BARREL
Gerhard Muhrer; Reinhard Pannold, and Reinhard Boschanig, all of Graz, Austria, assignors to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr.Dr.h.c. Hans List, Austria
Filed Mar. 3, 1989, Ser. No. 319,098
Claims priority, application Austria, Mar. 4, 1988, 575/88
Int. Cl.[5] G01L *5/14*
U.S. Cl. 73—167 **21 Claims**



1. In a method for non-destructive identification of ballistic characteristics within a barrel of a weapon, wherein an electro-

magnetic wave is introduced into the barrel of the weapon via a waveguide adaptor coupled to a muzzle of the barrel, wherein a reflected electromagnetic wave is received out from the barrel after reflection off of a projectile positioned within the barrel, and wherein changes in phase relationships between the introduced and received electromagnetic waves are employed as a measure of change of position of the projectile, the steps of:

dividing the wave to be introduced into the barrel into wave parts; and

supplying the wave parts to at least two preselected spaced apart locations on the waveguide adaptor so that wave parts propagating into the barrel in the direction of the projectile situated therein add up and wave parts propagating in the opposite direction cancel each other out.

4,928,524

METHOD AND APPARATUS FOR MEASURING FLOW RATE OF A GAS CONTAINING CONDENSABLE COMPONENTS AND MISTS

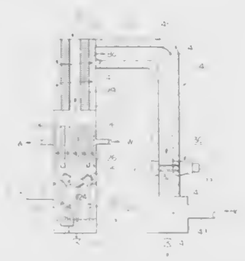
Tokio Sugi; Yasuo Mori, both of Tokyo, and Yugi Takahashi, Chigasaki, all of Japan, assignors to Tokyo Keiso Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 328,067

Claims priority, application Japan, Jul. 22, 1988, 63-181644; Aug. 2, 1988, 63-102054[U]

Int. Cl.[5] G01F *1/74*

U.S. Cl. 73—200 **9 Claims**



1. A method for measuring a flow rate of a gas in which condensable components; and mist are contained in such as a blow by gas leaking from combustion chambers of cylinders into a crank case in a reciprocating internal combustion engine comprising the steps of: principally removing said mists from said gas; principally removing said condensable components from said gas from which most of said mists have been removed in the previous step, by cooling said gas to a temperature close to atmospheric temperature; and measuring the flow rate of said gas from which substantially all of said mists and said condensable components have been removed by means of a gas flow meter.

4,928,525

SONIC TANK INVENTORY CONTROL SYSTEM AND METHOD

Gary L. Aderholt, R.R. 14, Box 132, and Michael A. Lenox, R.R. 14, Box 132-A, both of Athens, Ala. 35611

Filed Mar. 2, 1989, Ser. No. 318,223

Int. Cl.[5] G01F *23/28*

U.S. Cl. 73—290 V **29 Claims**

1. A system for measuring the level of a fluid in a tank, comprising:

a plurality of reflectors positioned in the tank with said reflectors being a known distance from one another and a first reflector being an unknown distance from the top of the tank; and

an apparatus for producing and outputting a sonic signal and for receiving echoes from said plurality of reflectors and a surface of the fluid in the tank, said apparatus producing electrical signals representative of said received echoes, said apparatus including processor means responsive to said electrical signals for,

(i) calculating the distance between said apparatus and said first reflector,

(ii) calculating the distance between a last reflector above the fluid surface and the fluid surface, and

(iii) determining the total distance from said apparatus to the fluid surface based on the distances calculated in (i), (ii), and the distance between said first and last reflectors.



20. A method of measuring the level of a fluid in a tank having a plurality of reflectors positioned therein with the reflectors being a known distance from one another and a first reflector being an unknown distance from the top of the tank, said method comprising the steps of:

outputting a sonic signal into the tank;

producing input signals in response to echoes from the plurality of reflectors and a surface of the fluid in the tank;

(i) calculating the distance between the top of the tank and the first reflector;

(ii) calculating the distance between a last reflector above the fluid surface and the fluid surface; and

determining the total distance from the top of the tank to the fluid surface based on the distances calculated in (i), (ii), and the distance between the first and last reflectors.

4,928,526

UNIVERSAL FUEL SENDER

Frank C. Weaver, Chicago, Ill., assignor to Stewart Warner Instrument Corporation, Chicago, Ill.

Filed Nov. 29, 1988, Ser. No. 277,292

Int. Cl.[5] G01F *23/36*

U.S. Cl. 73—313 **4 Claims**



1. A universal fuel sender adapted to be mounted within a fuel tank, comprising;

a top plate adapted to be fastened over an opening in the fuel tank,

a support rod having an axially uniform cross-section so that it may be manufactured in long lengths,

means for attaching said support rod to said top plate so that said support rod extends into the fuel tank,

a substantially U-shaped rheostat mounting bracket having a pair of spaced rod receiving openings therein each having a shape complementary to the rod cross-section so that the mounting bracket is adjustable to any desired position along the rod, said mounting bracket defining a pocket facing said rod,

means for adjustably clamping the bracket to the rod,

a rheostat comprising a pivotally moveable wiper arm and a generally arcuate thick film resistor applied to a substrate, said wiper arm and said substrate being mounted on the mounting bracket within said pocket, and

a float arm assembly means for driving said rheostat including at least a float arm wire and a float, said float arm wire being connected to said wiper arm and pivotally mounted to said mounting bracket so as to be pivotable in a plane parallel to said substrate concentrically with said thick film resistor, said float being arranged on a distal end of said float arm wire so that movement of said float causes the float arm wire to pivot and drive the wiper arm of said rheostat.

4,928,527

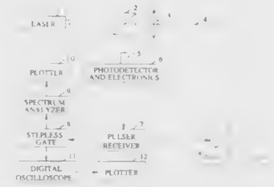
METHOD AND DEVICE FOR NONDESTRUCTIVE EVALUATION

Christian P. Burger, College Station, Tex.; Thomas D. Dudderar, Chatham, N.J.; John A. Gilbert; Bruce R. Peters, both of Huntsville, Ala., and James A. Smith, Idaho Falls, Id., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 29, 1988, Ser. No. 187,805

Int. Cl.[5] G01N *29/00*

U.S. Cl. 73—657 **16 Claims**



1. In the manufacture or maintenance of an article, a method for examining at least a portion of a surface of said article with respect to inhomogeneity of a surface property, said method comprising (i) providing energy to said surface, and (ii) sensing a surface wave at least at a point of said portion,

characterized in that sensing of said surface wave comprises fiber-optical interferometry between first and second optical signals here designated as reference and object signals,

said reference and object signals being derived from an optical signal here designated as laser signal and having been transmitted by an optical fiber,

said first optical signal being derived from said laser signal by internal reflection of a first portion of the power of said laser signal at the end of said optical fiber, and

said second optical signal being derived from said laser signal by emission of a second portion of the power of said laser signal from the end of said fiber, followed by reflection from said surface at said point.

4,928,528

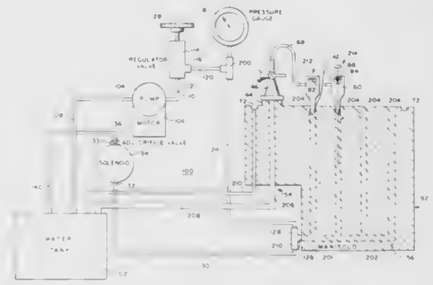
ARTERIAL/VENOUS SIMULATOR

Jose A. Marques, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jul. 25, 1988, Ser. No. 223,868

Int. Cl.[5] G01M *3/28*

U.S. Cl. 73—40 **18 Claims**



1. A testing device for testing the sealing strength of a seal in a catheter sheath introducer comprising:

means for receiving the introducer;

means for supplying pulsating liquid to the inside of the introducer; and

means for controlling the upper and lower pressures of the fluid supplied to the introducer while observing the sealing strength of the seal, with or without an elongate, rod-like member received therein.

4,928,529

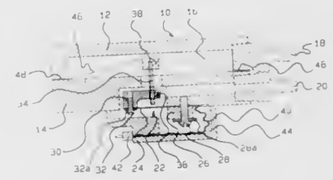
FORCE MULTIPLYING MEMBRANE INSTRUMENT

Robert O. Brandt, Jr., 5404 Pond Dr., Wilmington, N.C. 28403

Continuation-in-part of Ser. No. 128,777, Dec. 4, 1987, abandoned. This application Nov. 3, 1988, Ser. No. 266,822

Int. Cl.[5] G01L *7/08, 9/04*

U.S. Cl. 73—726 **16 Claims**



1. A force multiplying membrane instrument comprising:

a housing structure having an open internal chamber;

a substantially constant area membrane spanning the open chamber and secured about its perimeter by the housing structure such that it includes concave and convex opposite sides as disposed in the open chamber;

a force sensor disposed on the concave side of the membrane, said force sensor comprising a beam secured about one end to the housing and extending in cantilever fashion therefrom;

means interposed between the force sensor and the membrane for transferring a force applied to the membrane to the force sensor comprising a bracket secured to the end of the beam opposite the end attached to the housing, a rod secured to the bracket and extending upwardly therefrom and an engager attached to the rod for engaging and supporting the membrane about a central portion thereof;

and wherein the convex side of the membrane forms an input side for receiving an input force that is effectively multi-

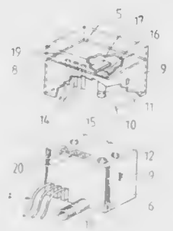
plied by the membrane due to its convex orientation and its physical characteristics, and wherein the multiplied force generated by the membrane is transferred to the force sensor that produces an output which represents the input force as multiplied by the membrane.

4,928,530

PRESSURE TRANSDUCER

Ari Lehto, Helsinki, Finland, and Frank Chen, Broom Manor, United Kingdom, assignors to Vaisala Oy, Helsinki, Finland

Filed Dec. 6, 1988, Ser. No. 280,362
Claims priority, application Finland, Dec. 7, 1987, 875387
Int. Cl.[5] G01L *9/00*
U.S. Cl. 73—756 **6 Claims**



1. A pressure transducer comprising:
(a) a box-like socket having
an upper side,
an external pressure connection,
first internal pressure connection means at the upper side and being connected to the external pressure connection,
external electrical conductors, and
first internal electrical connection means at the side and being connected to the conductors; and
(b) a plug-in unit having
a box-like splash-water protection sheath open at one side thereof, said sheath having internal dimensions at least approximately corresponding to external dimensions of the box-like socket,
an electronic circuitry port provided inside the sheath,
second internal pressure connection means, and
second internal electrical connection means,
the sheath of the plug-in unit being placed over the box-like socket to encase the socket from above and from the sides thereof, the second internal pressure connection means being received in the first internal pressure connection means and the second electrical connection means being received in the first electrical connection means when the sheath is over the plug-in unit.

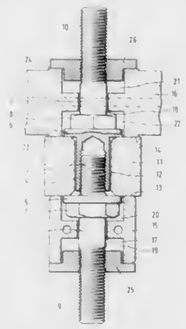
4,928,531

FASTENING DEVICE FOR THE ATTACHING OF AN ELECTRIC TRANSMITTER

Klaus Schult, Frankfurt am Main; Horst Kister, Wehrheim, Fed. Rep. of Germany, and Michael Quenzer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 179,720
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712424
Int. Cl.[5] G01L *1/00*
U.S. Cl. 73—855 **8 Claims**

1. In a fastening device for the attaching of an electrical shear-stress transmitter to a supporting structural part of an aircraft landing gear; and wherein
the structural part has two extensions spaced apart from each other, each extension having a hole passing through it, said transmitter having an attachment end with a hole therein, there being plural threaded bolts with at least one nut engageable with each bolt, each of said extensions being bolted to at least one attachment end of the transmitter by a threaded bolt which extends through the extension into the attachment end, and at least one nut for engagement with a threaded bolt, the attachment end lying against one side of the extension; the improvement wherein
two of said transmitter are attached on opposite sides of each said extension, said device having plural bolt assemblies each of which incorporates the threaded structure of at least one of said bolts and one of said nuts; and wherein
each said bolt assembly comprises a first collar means and a second collar means for engagement with opposite sides of one of said extensions, each said bolt assembly including bolt means passing through a hole of said one extension for



urging said first and said second collar means against opposite sides of said one extension for securing thereto said bolt means, said bolt means extending outwardly of each said collar means for receipt of attachment ends of said two transmitters on opposed termini of said bolt means; and wherein
said bolt means is bolted to each said collar means, each said collar means being of widened diameter on both sides of a shank of the bolt means;
each of the attachment ends has a recess large enough to envelope a collar means to permit resting on an extension, without resting on the collar means; and
the bolt means has on each terminus a threaded section for engagement with at least one nut which is screwed on each threaded section, each nut pressing one of the two attachment ends against an extension.

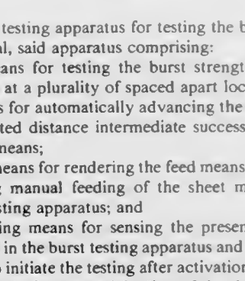
4,928,532

HYDROSTATIC SELF-ALIGNING AXIAL/TORSIONAL MECHANISM

Daniel G. O'Connor, and Howard L. Gerth, both of Knoxville, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 23, 1989, Ser. No. 355,585
Int. Cl.[5] G01N *3/02*
U.S. Cl. 73—856 **2 Claims**

1. A self-aligning loading mechanism for applying a controlled axial and/or torsional load to a test specimen comprising:
(a) a split support housing having a distal half and a proximal half defining a spherical cavity; said proximal half, having an opening from said spherical cavity;
(b) annular recesses equally spaced within said support housing about said spherical cavity;
(c) an essentially frictionless ball stud, the ball portion of said ball stud being a spherical bearing, and having a flat surface about the equator of said ball portion of said ball stud.
(d) a flexure ring having a thickened portion, rigidly affixed to said flat portion about the equator of said ball portion of said ball stud;



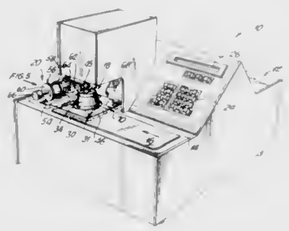
(e) a means for supplying pressurized oil to each of said annular recesses at the same oil pressure;
(f) a stud portion of said ball stud extending through said opening in said proximal half support housing; and said stud portion of said ball stud being adapted to attach a load or gripping means.

4,928,533

BURST TESTING APPARATUS

Walter F. Bachelder, Salonga; John L. Sullivan, Kings Park; Peter J. Fiore, Mt. Sinai, and Godfrey L. Hansen, Amityville, all of N.Y., assignors to Testing Machines Inc., Amityville, N.Y.

Filed Jun. 30, 1989, Ser. No. 374,480
Int. Cl.[5] G01N *3/00*
U.S. Cl. 73—838 **11 Claims**



1. A burst testing apparatus for testing the burst strength of sheet material, said apparatus comprising:
testing means for testing the burst strength of a sheet of material at a plurality of spaced apart locations thereon;
feed means for automatically advancing the sheet material a preselected distance intermediate successive tests by the testing means;
override means for rendering the feed means inoperative and enabling manual feeding of the sheet material into the burst testing apparatus; and
sheet sensing means for sensing the presence of the sheet material in the burst testing apparatus and for generating a signal to initiate the testing after activation of the override means and after manual feeding of the sheet material.

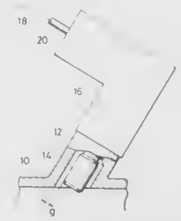
9. A burst testing apparatus for testing the burst strength of sheet material, said apparatus comprising:
a generally horizontal support surface for supporting a sheet of material to be tested;
testing means for testing the burst strength of the sheet of material on the support surface;
a generally cylindrical rotatable drive roller disposed gravitationally below the sheet of material on the support surface and in frictional engagement with the sheet of material;
motor means for selectively rotatably driving the drive roller;
control means operatively connected to the motor means for alternately enabling automatic or semiautomatic operation of the testing apparatus such that during automatic operation of the testing apparatus the control means enables operation of the motor means after a test by the testing means for rotatably driving the drive roller and such that during semiautomatic operation of the testing apparatus the control means prevents the motor means from rotatably driving the drive roller; and
a weighted follower roller rotatably mounted along an axis disposed gravitationally above the drive roller, said weighted follower roller comprising a double hinge for enabling said weighted follower roller to translate in an alignment generally parallel to the drive roller in response to different thicknesses of the sheet material passing therebetween and being rotatable away from the drive roller to enable semiautomatic operation of the testing apparatus.

4,928,534

SOCKET STRUCTURE FOR MOUNTING ULTRASONIC GAS FLOW MEASURING DEVICE WITH RESPECT TO GAS FLOW PIPE

Kouji Ichino, Tokyo, Japan, assignor to Kaijo Denki Co. Ltd., Japan

Continuation of Ser. No. 687, Jul. 10, 1986, Pat. No. 4,823,612.
This application Jan. 12, 1989, Ser. No. 295,990
Int. Cl.[5] G01F *1/66*
U.S. Cl. 73—861.18 **1 Claim**



1. A socket structure for mounting an ultrasonic gas flow measuring device with respect to a gas flow pipe, comprising:
a pair of sockets provided at said pipe to respectively receive therein ultrasonic transmit-receive elements of said ultrasonic gas flow measuring device therein with a suitable gap being defined therebetween and communicated to said pipe, said sockets being arranged in a manner to be spaced from each other at an angle of 180 degrees in the circumferential direction of said pipe and oblique with respect to an axis of said pipe;
a moisture collection preventing means provided at each of said sockets for preventing moisture contained in said gas from being condensed and collected between each of said sockets and said ultrasonic transmit-receive element received therein to a degree sufficient enough to form a bridge therebetween, said moisture collection preventing means comprising
a gap defined between said socket and said ultrasonic transmit-receive element received in said socket, said gap having a dimension of about 5 mm or more, which is sufficient to prevent condensed moisture from being collected

therein to form a bridge between said socket and said ultransonic transmit-receive element.

4,928,535

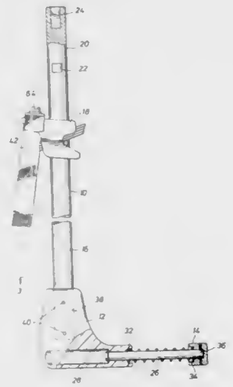
METHODS AND APPARATUS FOR MEASURING SKI BOOT BINDING TORQUE

John S. Perryman, Kinnelon, N.J., assignor to Oshman's Sporting Goods, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 255,125, Oct. 7, 1988, abandoned. This applicatioo Feb. 21, 1989, Ser. No. 317,091

Int. Cl.[5] G01L *5/03*

U.S. Cl. 73—862.02 **16 Claims**



1. A device for testing the release torque of a ski binding holding a boot, the device comprising:

a foot,

a toe movably connected to the foot for accommodating ski boots of different size,

a leg secured to and extending upwardly from the foot,

a clamp disposed about the leg and movable therealong for tightly securing a strap around a ski boot in which the foot is positioned to stabilize the leg in the ski boot, and

means in the leg for receiving and bolding a torque measuring apparatus.

4,928,536

FLUID SAMPLE APPARATUS FEATURING INTEGRAL CONSTRUCTION WITH A MOTOR DRIVEN SAMPLING SYSTEM

Brian H. Welker, Sugarland, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Oct. 10, 1989, Ser. No. 418,522

Int. Cl.[5] G01N *1/14*

U.S. Cl. 73—863.83 **13 Claims**

1. An assembly for obtaining a fluid sample from a pressurized pipeline comprising:

(a) an elongate body having

(i) a first end formed to connect to a pipeline to position a pressurized fluid inlet in the pipeline to receive pressurized fluid;

(ii) a central body portion connected to said first end; and

(iii) a second end deployed from said first end;

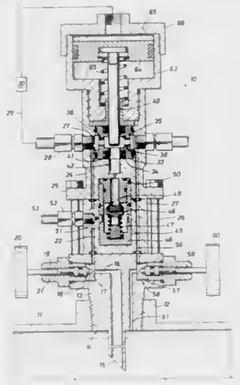
(b) a fluid flow line connected from said fluid inlet to deliver a flow of fluid;

(c) fluid sampling means connected to said fluid flow line to deliver fluid thereto in a volume in excess of said sample;

(d) said sampling means periodically removing fluid from said fluid flow line;

(e) outlet means connected to said sampling means for delivery of a fluid sample without regard to the pressure in the pipeline;

(f) check valve means cooperative with said outlet means to enable fluid to flow through said outlet means to overcome back pressure encountered by fluid flow;



(g) rigid chamber connecting means connecting said sample means and check valve means; and

(h) motor means in said body for operating said sampling means to direct fluid through said outlet means.

4,928,537

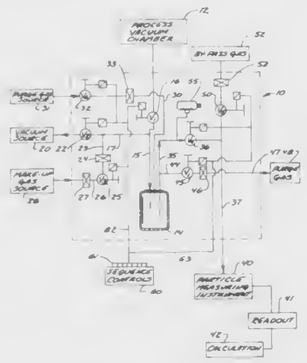
SYSTEM FOR AIRBORNE PARTICLE MEASUREMENT IN A VACUUM

Benjamin Y. H. Liu, North Oaks, Minn., and Wladyslaw W. Szymanski, Vienna, Australia, assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Dec. 6, 1988, Ser. No. 280,483

Int. Cl.[5] G01N *15/10, 1/24;* **G06M** *11/00*

U.S. Cl. 73—863.86 **11 Claims**



1. A particle measuring apparatus for sampling a gas in a first chamber having a vacuum level comprising:

a sample vacuum chamber that is maintained at a vacuum lower than that of the vacuum in the first chamber;

first valve means for controlling gas flow from the first chamber into the sample vacuum chamber when the first valve means is open;

second valve means for providing gas into the sample vacuum chamber subsequent to closing of the first valve means, and operable to provide as gas flow through the sample vacuum chamber; and

particle measuring means connected to the sample vacuum chamber and controlled to receive gas from the sample vacuum chamber when the flow through the second valve means is occurring, whereby the gas in the sample vacuum chamber is purged through the sample vacuum chamber and into the particle measuring means.

4,928,538

MONITORING TENSION IN AN ELONGATE FLEXIBLE MEMBER

James S. Burdess, 12 Earnshaw Way, Whitley Bay; John N. Fawcett, 5 Kingsland, Jesmond, Newcastle upon Tyne, and James R. Hewit, Loughborough, all of United Kingdom, assignors to James Stonehouse Burdess, Whitley Bay and John Neville Fawcett, New Castle Upon Tyne, both of, United Kingdom

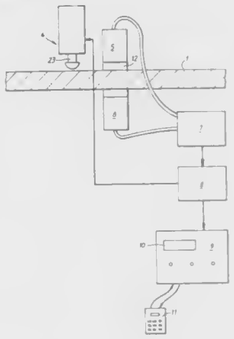
PCT No. PCT/GB87/00171, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO87/05699, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 12, 1987, Ser. No. 250,619

Claims priority, application United Kingdom, Mar. 12, 1986, 8606074

Int. Cl.[5] G01L *5/04, 1/10*

U.S. Cl. 73—862.41 **15 Claims**



1. A method of monitoring the tension in an elongate flexible member, the method including the steps of causing at least a portion of the flexible member to vibrate at a natural frequency and detecting the frequency of the resulting vibrations with a pair of transducers arranged on opposite sides of the flexible member and subtracting one transducer output signal from the other transducer output signal to provide an enhanced flexible member vibration signal and to reduce extraneous noise signals.

4,928,539

DEVICE FOR AUTOMATICALLY TAKING LIQUID FROM A BOTTLE

Henri Champseix, Montesson, and Serge Champseix, Les Mureaux, both of France, assignors to A.B.X., Hauts-de-Seine, France

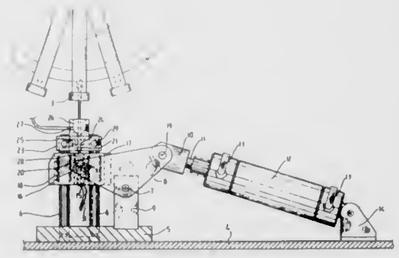
Filed Oct. 5, 1987, Ser. No. 104,101

Claims priority, application France, Oct. 6, 1986, 86 13875

Int. Cl.[5] G01N *35/00, 1/10, 35/06*

U.S. Cl. 73—864.24 **16 Claims**

1. In a device for automatically taking liquid from a bottle presented upside down opposite a sample taking needle intended to pierce the stopper of the bottle and penetrate into the liquid, including a mobile support for storing a plurality of bottles and moving a bottle into a preselected position with respect to a stopper piercing assembly, said assembly including a mobile block serving as a support for the sample taking needle and being movable under the action of an actuating cylinder, with the sample taking needle being essentially centered on the mobile block, and a rinsing receptacle which is fixedly mounted and through which the needle passes, wherein said mobile block slides on two fixed vertical guide columns



between which the actuating cylinder is operatively connected to the mobile block essentially at the middle of the block, and between which the sample taking needle moves vertically by transmission of the action of the actuating cylinder by transmission of a horizontal movement produced therewith, and wherein a fixed spacer is mounted on the two columns at their upper ends and serves as a support for the rinsing receptacle.

4,928,540

METHOD OF DISPENSING COAGULATIVE TEST LIQUID

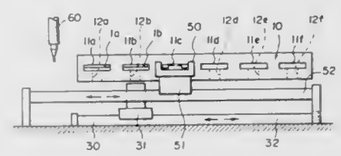
Keishiro Kido, and Sigeru Tezuka, both of Saitama, Japan, assignors to Fuji Photo Film, Co., Ltd., Kanagawa, Japan

Filed Jan. 18, 1989, Ser. No. 299,272

Claims priority, application Japan, Jan. 18, 1988, 63-7858

Int. Cl.[5] B01L *3/02*

U.S. Cl. 73—864.11 **5 Claims**



1. A process of repeatedly supplying a predetermined amount of a coagulative test liquid onto a chemical assay slide for incubation of the test liquid, said process comprising the steps of;

filling a nozzle of a dispenser with said test liquid,

drawing said test liquid back into said dispenser such that a lower surface of said test liquid is retracted from a lower tip end of said nozzle by a distance which is not smaller than an inner diameter of said nozzle,

holding said test liquid for a period of time of 3 minutes or more retracted from the lower tip end of the nozzle by said distance to prevent coagulation of said test liquid, and then

discharging a predetermined amount of said test liquid.

4,928,541

GROUNDWATER SAMPLING APPARATUS

Donald A. Toon, Burlington, and Douglas J. Belshaw, Georgetown, both of Canada, assignors to Solinst Canada Limited, Ontario, Canada

Filed Feb. 2, 1989, Ser. No. 305,447

Claims priority, application United Kingdom, Feb. 5, 1988, 8802700

Int. Cl.[5] G01N *1/12*

U.S. Cl. 73—864.63 **8 Claims**



1. Apparatus for collecting a sample of fluid, and for containing the collected sample, wherein:

the apparatus includes a chamber, and the chamber is defined by a fixed wall and a movable wall, and the chamber is of variable volume in that the movable wall is movable with respect to the fixed wall;

the apparatus includes first and second one-way check-valves, each check-valve being arranged so as to permit fluid to flow through itself in one direction only;

one of the check valves is located in the fixed wall, and the other of the check valves is located in the movable wall;

the first check valve is so arranged as to permit fluid to flow into the chamber only;

the second check valve is so arranged as to permit fluid to flow out of the chamber only;

the apparatus includes a supply line, which is in fluid-flow communication with the chamber via the second check valve;

the arrangement of the apparatus is such that, when the pressure in the chamber exceeds the pressure in the supply line, the second check valve is open, and fluid can flow from the chamber into the supply line;

and the arrangement of the apparatus is such that, when the pressure in the supply line exceeds the pressure in the chamber, the second check valve is closed, and excess of pressure in the supply line acts upon the movable wall in the direction to reduce the volume of the chamber.

4,928,542

CONTINUOUSLY VARIABLE TRACTION ROLLER TRANSMISSION

Masaki Nakano, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 22, 1989, Ser. No. 313,418

Claims priority, application Japan, Feb. 23, 1988, 63-39813

Int. Cl.[5] F16H *15/38*

U.S. Cl. 74—200 **11 Claims**

1. A continuously variable traction roller transmission of a double cavity type, comprising:

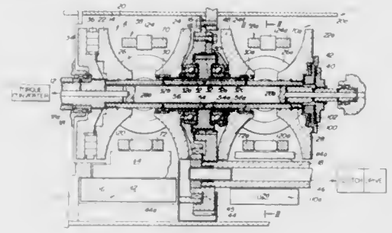
a casing;

a partition wall installed in said casing to define front and rear cavities in the same;

a first shaft extending through said front and rear cavities;

first and second motion transmitting traction mechanisms respectively installed in said front and rear cavities, each mechanism being disposed about said first shaft and operatively connected to the same;

first and second control valve body structures respectively installed in said front and rear cavities, each structure



producing a hydraulic pressure for controlling the corresponding motion transmitting traction mechanism;

a second shaft extending through only said rear cavity; and

means for operatively connecting said second shaft to both of said first and second motion transmitting traction mechanisms,

wherein said second control valve body structure has a passage through which said second shaft is passed.

4,928,543

ELECTRICALLY OPERATED DRUM BRAKE

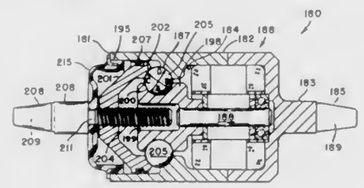
Donald D. Johannesen, South Bend, Ind., and Alistair G. Taig, Edwardsburg, Mich., assignors to Allied-Signal Inc., Morristown, N.J.

Division of Ser. No. 183,128, Apr. 19, 1988, Pat. No. 4,850,459.

This application May 4, 1989, Ser. No. 347,134

Int. Cl.[5] F16H *13/04, 13/08*

U.S. Cl. 475—196 **17 Claims**



1. A traction roller drive that may be operated by motor means, comprising a housing for said roller drive, the motor means connected with a bearing drive member, the bearing drive member engaging rotatably bearing means, the bearing means in bearing engagement with a portion at said housing and a rotatable bearing member, the rotatable bearing member engaging output means and including about a periphery thereof a flexible bearing member which engages an interior surface of said housing, a first end of the housing being disposed oppositely from said output means, actuation of said motor means effecting operation of said output means so that the bearing means absorbs loading exerted upon the output means, and the bearing drive member including a curved track receiving the bearing means, a contact distance extending between said curved track and said portion which comprises a curved surface being different from a contact distance extending between said curved track and said rotatable bearing member so that rotation of said bearing means causes rotation of said rotatable bearing member.

4,928,544

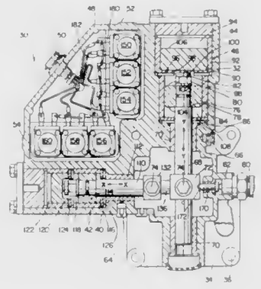
DUAL PRESSURE PRESSURIZED FLUID ACTUATED SHIFTING MECHANISM

Ronald K. Markyvech, Allen Park, and Thomas A. Genise, Dearborn, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 19, 1989, Ser. No. 368,010

Int. Cl.[5] F16H *5/06*

U.S. Cl. 74—335 **14 Claims**



1. A control system for controlling pressurized fluid operated shift actuators (**30**) for mechanical transmissions, said actuators including a first (**88**) and a second (**86**) pressurizable chamber, pressurization of said first chamber effective to urge said actuator into a first position for causing engagement of a selected ratio of said transmission and pressurization of said second chamber effective to urge said actuator into a second position for causing disengagement of said selected ratio, and shift control means for selectively pressurizing and venting selected ones of said first and second chambers by selectively connecting same to a controlled source (**236**) of pressurized fluid and to an exhaust (**54**), said system characterized by:

means (**220**) for causing said controlled source to be pressurized to a selected one of a first pressure level or a second relatively lesser pressure level.

4,928,545

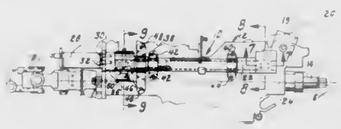
STEERING COLUMN MOUNTED TRANSMISSION GEAR SHIFT MECHANISM

John C. Singer, III, Plymouth Township, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 16, 1989, Ser. No. 324,127

Int. Cl.[5] G05G *9/16*

U.S. Cl. 74—473 SW **13 Claims**



1. A gear shift mechanism for selecting operating ranges of an automatic transmission comprising:

a shift lever movable among multiple positions corresponding to operating ranges of the transmission, the positions being mutually spaced angularly and axially;

a selector lever spaced axially from the shift lever;

means in continual contact with the selector lever and shift lever for transmitting movement of the shift lever to the selector lever;

a selector position insert located adjacent the selector lever, defining spaced detent surfaces corresponding to positions among which the shift lever moves; and

spring means for biasing the selector lever toward contact with said detent surfaces.

4,928,546

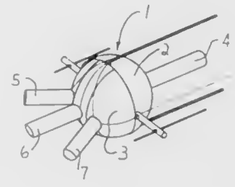
ROBOTIC DEVICES

David A. Walters, P.O. Box 26776, Kansas City, Mo. 64196

Filed Aug. 17, 1988, Ser. No. 233,333

Int. Cl.[5] A61F *2/58;* **B25J** *17/02*

U.S. Cl. 74—479 **1 Claim**



1. An artificial wrist apparatus comprising a ball divided into n segments along n-1 parallel planes intersecting said ball, n first rods, each of said n first rods attached to each of said n segments, a half-sherical hollow lubricated socket into which said ball fits, a second rod attached to the back outer side of said socket, a lubricated cylindrical third rod attached at the circular center of the first of said n segments, a cylindrical hole through the center of each of said next n segments except the said nth segment, said nth segment with a cylindrical hole into but not through, said holes allowing said cylindrical third rod attached to said 1st segment to pass throught said n−2 segments and into said nth segment, four equally spaced guides attached equally spaced around the edge of said socket, allowing 2n+2 tendons or cables to pass through said four guides and be free to slide and be held in position by said four guides, two fourth rods attached at opposite sides of said socket, said fourth rods attached over the locations of two of said four guides attached to said socket, said two fourth rods holding additional guides for additional tendons other than the said 2n+2 tendons and said four guides, one of said 2n+2 tendons connecting to the said n=1 first rod attached to the said n=1 segment and one of said 2n+2 tendons being connected to the said n=nth first rod attached to the said n=nth segment, arranged so that said two tendons of the said 2n+2 tendons pull said ball back and forth in said socket when said two tendons are alternatly pulled, and two said 2n+2 tendons being connected to each of said first n rods connected to n segments, one of said 2n+2 tendons connected to the bottom of said first n rods and one of said 2n+2 tendons connected to the top of said n first rods, arranged so that when the said tendons are pulled, the said segment to which each said tendon is attached moves either upward or downward.

4,928,547

CRANK DEVICE

Johannes N. Huyer, Velserbroek, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., Netherlands

Filed Oct. 17, 1988, Ser. No. 258,390

Claims priority, application Netherlands, Oct. 19, 1987, 8702494

Int. Cl.[5] G05G *1/00*

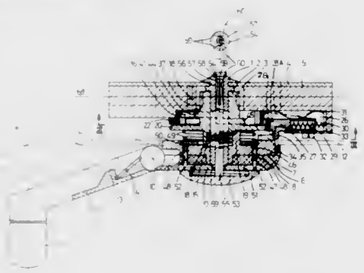
U.S. Cl. 74—545 **20 Claims**

1. Crank device for driving a movable member of a vehicle, such as a panel of an open roof construction, comprising:

a stationary part;

a drive pinion operatively connected to the movable member and rotatably supported by the stationary part;

a crank arm connected to the drive pinion during a driving operation wherein rotation of the crank rotates the pinion;
stop means rotating with the drive pinion in a known relationship, the stop means comprising two co-operating rotatable elements, comprising a stop element directly connected to the drive pinion and including a stop member, and a retaining element rotatably driven by rotation of the pinion and provided with a releasing member;
a locking member engageable with the stop member of the stop element in a predetermined position of the movable member in order to lock the movable member in the predetermined position;



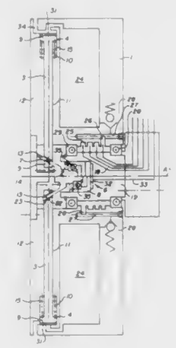
means for releasing the locking member from the stop member; and
a drive transmission between the retaining element and the drive pinion having a different transmission ratio of rotation relative to rotation of the drive pinion from the stop element, chosen such that the releasing member on the retaining element permits engagement between the locking member and the stop member only in a mutual aligned rotational position of both elements corresponding to the predetermined position of the movable member.

4,928,548
ARRANGEMENT FOR CONTINUOUSLY COMPENSATING FOR UNBALANCE ON A ROTARY MEMBER

Eugen Lulay, Bensheim, Fed. Rep. of Germany, assignor to Hofmann Werkstatt-Technik GmbH, Pfungstadt, Fed. Rep. of Germany

Filed Oct. 27, 1989, Ser. No. 427,486
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837373
Int. Cl.[5] F16F *15/22*
U.S. Cl. 74—573 F **28 Claims**

1. An arrangement for continuously compensating for unbalance of a rotary member, comprising: an annular container adapted to be secured to the rotary member in coaxial relationship therewith and subdivided in its circumferential direction into a plurality of balancing chambers at different angular positions; means for introducing a compensating medium which is capable of flow into the balancing chambers for an unbalance compensating operation; chamber emptying valves operatively associated with respective ones of the balancing chambers and arranged outside the axis of rotation of the arrangement, the chamber emptying valves being closed in normal operation of the arrangement; and an actuating means for opening the chamber emptying valves when the balancing chambers are filled with compensating medium, for emptying of the associated balancing chambers, the actuating means comprising an actuating piston which is arranged coaxially with respect to the annular container and which is axially displaceable relative thereto, a drive means which is controlled from the exterior of the arrangement for displacing the actuating piston, and valve displacement elements which extend radially from the actuating piston and are displaceable radially



by the actuating piston upon said axial displacement thereof, for actuating the chamber emptying valves

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4,928,549
PEDAL FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Sep. 7, 1988, Ser. No. 241,356
Claims priority, application Japan, Sep. 10, 1987, 62-227703; Aug. 30, 1988, 63-217263
Int. Cl.[5] G05G *1/14*
U.S. Cl. 74—594.6 **7 Claims**



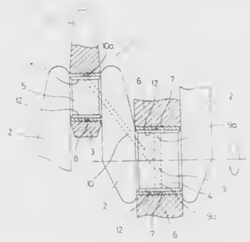
1. A pedal for a bicycle for use together with a shoe plate fixed to the sole of a shoe of a cyclist and provided at its front and rear portions with engaging portions respectively, said pedal comprising:
a pedal shaft;
a pedal body rotatably supported to said pedal shaft, said pedal body comprising a fixing pawl disposed at a front portion thereof, said fixing pawl comprising means for retaining said front engaging portion of said shoe plate and a swinging member disposed at a rear portion thereof, said swinging member being swingable at an upper portion thereof in a direction of moving toward or away from said pedal body, a movable pawl being provided at said upper portion of said swinging member, said movable pawl having a fore end which projects toward said pedal body, said fore end of said movable pawl comprising means for retaining said rear engaging portion of said shoe plate, said movable pawl being pivoted to said upper portion of said swinging member to enable said fore end thereof to move toward or away from said pedal body, said pedal body further comprising impeding means for impeding said shoe plate from rearward movement with respect to said pedal body;
a stopper means for regulating respective swinging motions of said swinging member and said movable pawl in said direction of moving toward said pedal body; and

a biasing means for biasing said swinging member and said movable pawl in said direction of moving toward said pedal body.

4,928,550
SLIDING BEARING AND CRANKSHAFT USED FOR CRANKSHAFT-CONNECTING ROD ASSEMBLY

Takeshi Sakai, and Tsuneo Ito, both of Chiba, Japan, assignors to NDC Company, Ltd., Chiba, Japan

Filed Oct. 7, 1988, Ser. No. 254,638
Int. Cl.[5] F16C *3/04*
U.S. Cl. 74—595 **4 Claims**



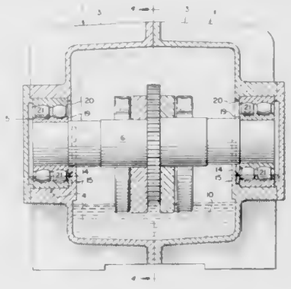
1. A sliding bearing for a crankshaft-connecting rod assembly (1), said assembly including at least one crank portion (2) having a main journal section (4) provided at one end thereof and a connecting rod journal section (5) provided on an opposite end of said crank portion, said main journal section and said connecting rod journal section each having a lubricant port opening at the surface for supplying lubricant thereto, said sliding bearing being provided to rotatably support one of said main journal section and said connecting rod journal section, said sliding bearing comprising:
(a) a pair of split bearing halves having opposite ends which are thinner in radial thickness than a remainder of each bearing half to thereby form a predetermined clearance (12) between said sliding bearing and one of said main journal section and said connecting rod journal section;
(b) a shallow recess (11) formed in an inner bearing surface of each split bearing half and axially aligned in a position opposed to said lubricant port, said recess extending in a circumferential direction of said inner bearing surface.

4,928,551
VIBRATING MECHANISM

James D. Connelly, and Darrel Huff, both of Princeton, W. Va., assignors to Conn-Weld Industries, Inc., Princeton, W. Va.

Filed Mar. 23, 1988, Ser. No. 172,252
Int. Cl.[5] F16C *33/66*
U.S. Cl. 74—606 R **6 Claims**

1. Vibrating mechanism comprising a housing, cylindrical sockets in opposite sides of said housing, bearings seated in said sockets, a shaft journaled in a pair of bearings in opposite sides of said housing, a sump in said housing between said sides and containing a pool of oil, counterweight means mounted on said shaft between said pair of bearings and projecting on rotation into said pool, and an individual reservoir in said housing for each socket, each reservoir being outwardly closed and inwardly open for receiving oil splashed thereto from said pool by said counterweight means and of a capacity to maintain said

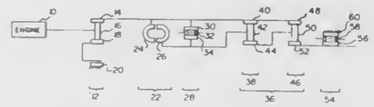


oil at a level sufficient to continuously lubricate a bearing in said socket.

4,928,552
METHOD AND APPARATUS FOR POWER TRANSMISSION FROM AN ENGINE

Darcy Gabriele, 1890 Fifth Avenue, Prince George, British Columbia, Canada (V2M 1J5)

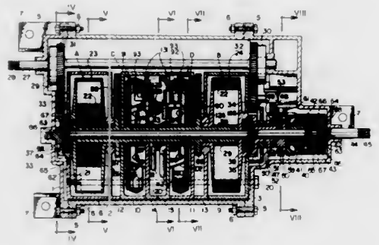
Division of Ser. No. 846,369, Mar. 31, 1986, Pat. No. 4,825,721, which is a continuation-in-part of Ser. No. 361,359, Mar. 24, 1982, Pat. No. 4,579,019, which is a continuation-in-part of Ser. No. 137,428, Apr. 4, 1980, abandoned. This application Jan. 23, 1989, Ser. No. 300,338
Claims priority, application Canada, Mar. 27, 1981, 374035
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[5] F16H *37/06*
U.S. Cl. 475—5 **12 Claims**



1. An apparatus for transmitting power comprising:
a first prime mover;
a second prime mover;
means for controlling the respective speeds of the first and second primer movers such that the speed of at least one of the first and second prime movers can be varied without affecting the speed of the other;
a first planetary gear assembly having a primary driving member, a second driving member and a driven follower member;
a second planetary gear assembly having a primary driving member, a secondary driving member and a driven follower member;
the first and second planetary gear assemblies each having a ring gear, a sun gear and a planetary carrier cage corresponding to one of the primary driving member, secondary driving member and driven follower member;
the primary driving member of the first gear assembly being coupled to the first prime mover, the secondary driving members of both gear assemblies being coupled to the second prime mover, the driven follower member of the first gear assembly being coupled to the primary driving member of the second gear assembly; and
an output shaft coupled to the driven follower member of the second gear assembly for driving a load, the output

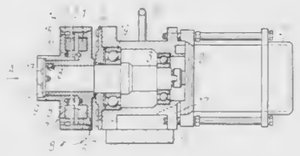
shaft serving to drive the load under most operating conditions.

4,928,553
VARIABLE-INERTIA FLYWHEELS AND TRANSMISSION
John T. Wagner, 510 Wilde Ave., Drexel Hill, Pa. 19026
Filed Apr. 30, 1986, Ser. No. 857,839
Int. Cl.[5] F16H *37/06*
U.S. Cl. 475—268 21 Claims



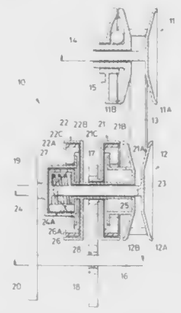
1. An energy storage apparatus comprising:
a pair of variable inertia flywheels;
an output shaft;
means for coupling the output shaft with either of said variable inertia flywheels; and
control means for simultaneously increasing the moment of inertia of one of the pair of variable inertia flywheels while reducing the moment of inertia of the remaining one of the pair of variable inertia flywheels.

4,928,554
UNBALANCE VIBRATOR
Alexandre I. Dryga, ulitsa Marata, 6, kv. 64.; Vyacheslav M. Alexeev, ulitsa Jubileinaya, 44, kv. 62., both of Kramatorsk, and Sergei A. Polovoi, ulitsa Fryazevskaya, 15, korpus 5, kv. 404., Moscow, all of U.S.S.R.
Filed Dec. 29, 1988, Ser. No. 291,778
Int. Cl.[5] F16H *33/10*
U.S. Cl. 74—87 4 Claims



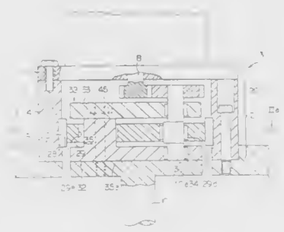
1. An unbalance vibrator comprising:
a drive shaft;
unbalance weights in a clearance fit on said drive shaft and turnable with respect to each other,
a mechanism for adjusting the mutual position of said unbalance weights,
said mechanism made in the form of two coaxially arranged carrying members, of which one member is rigidly secured to said drive shaft, while the other member is mounted so as to be turnable and axially movable with respect to said drive shaft,
said carrying members being two cylinders inserted one into the other, said cylinders being provided with joining members to be engaged therewith,
portions of said cylinders having said joining members including grooves having a width greater than a distance between adjacent grooves.

4,928,555
AUTOMATIC TRANSMISSION FOR VEHICLES IN GENERAL
Marco Nuti, Pisa, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy
Filed Oct. 28, 1988, Ser. No. 263,949
Claims priority, application Italy, Nov. 27, 1987, 22792 A/87
Int. Cl.[5] F16H *3/02*; F16D *21/00*
U.S. Cl. 74—745 10 Claims



1. An automatic transmission for a vehicle comprising a first transmission unit with a transmission ratio which is variable with continuity, said first transmission unit being adapted to be connected to a driving shaft of vehicle, at least a second transmission unit and a third transmission unit, each of said second and third transmission units having a fixed transmission ratio which differ from each other, a driven side of said second and third transmission units being connected to a drive side of said first transmission unit, a drive side of said second and third transmission units being connected to a driven shaft of a vehicle to which motion is alternatively transmitted, the connection between said first transmission unit and each of said second transmission unit and said third transmission unit being through first and second coupling means each including a driving portion and a driven portion, said driving and driven portions being automatically engageable and disengageable as a function of the speed of actuation of said driving portions, the speed of actuation of said first and second coupling means driving portions differing for the engagement of the second and third transmission units, each of said second transmission unit and third transmission unit includes at least a respective first and second pair of meshed gear wheels, a first gear wheel of said first pair of meshed gears being rigidly connected to the driven portion of said first coupling means, a second gear wheel of said first pair of meshed gear wheels being connected to said driven shaft, a first gear wheel of said second pair of meshed gear wheels being rigidly connected to the driving portion of said second coupling means, and a second gear wheel of said second pair of meshed gear wheels being rigidly connected to the driven shaft.

4,928,556
ARTICULATION DRIVE APPARATUS OF INDUSTRIAL ROBOT
Kazuyuki Matsumoto, Ogaki; Masataka Hashimoto, and Michiyoshi Iwata, both of Fuwa, all of Japan, assignors to Teijin Seiki Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 945,577, Nov. 17, 1986, Pat. No. 4,846,018. This application Feb. 26, 1988, Ser. No. 162,793
Claims priority, application Japan, Mar. 18, 1985, 60-53866
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[5] F16H *1/32*
U.S. Cl. 475—149 10 Claims

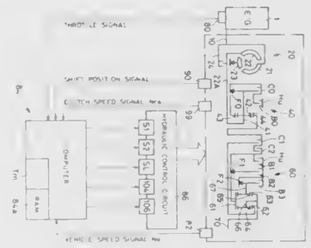


1. A robot arm drive apparatus of an industrial robot comprising:
an electric motor having a drive shaft;
a first robot member having said electric motor mounted thereon,
a second robot member rotatably supported on said first robot member; and
reduction gear means for reducing rotation of said electric motor and then transmitting to said second robot member;
said reduction gear means comprising a primary reduction gear for reducing said rotation of said electric motor and a secondary, planetary reduction gear for further reducing rotation of output of said primary reduction gear;
said primary reduction gear having a predetermined reduction ratio i_1;
said secondary reduction gear comprising input shaft means having cam surface means and connected with said primary reduction gear, external gear means, an internal gear held in mesh with said external gear means and different in number of teeth from said external gear means, the external gear means being connected to said cam surface means of said input shaft means in such a manner that differential motion between said external gear means and said internal gear is developed;
said cam surface means of said input shaft means comprising a plurality of cam surfaces and said external gear means comprising a plurality of external gears;
said predetermined reduction ratio i_t of said primary reduction gear being given by the following equation

$$0.1 < i_t < 60 f_0 / T_f N_{max}$$

wherein f_0 indicates the natural frequency (Hertz) of a drive system comprising said electric motor, said second robot member and said reduction gear means, T_f indicates the number of torque fluctuations per one revolution in said input shaft means of said secondary reduction gear, and N_{max} indicates the maximum number of rotations (rpm) of said electric motor in the predetermined operational region thereof.

4,928,557
HYDRAULIC TRANSMISSION CONTROLLER WITH COUPLING PRESSURE COMPENSATION
Mitsuru Takada, Toyota; Tokuyuki Takahashi, Aichi, and Hiroshi Itoh, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Nov. 23, 1988, Ser. No. 275,511
Claims priority, application Japan, Dec. 4, 1987, 62-306970; Dec. 4, 1987, 62-308188
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—867 10 Claims

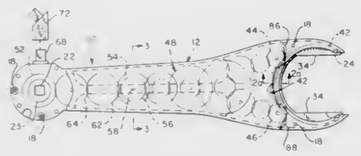


1. A hydraulic control apparatus for controlling a hydraulically operated frictional coupling device of an automatic transmission connected to an engine of a motor vehicle, said hydraulic control apparatus including a shift valve for effecting an engaging action of said frictional coupling device from a first position to a second position, and means for automatically controlling a control value for regulating a hydraulic pressure applied to said frictional coupling device during said engaging action, based on a parameter associated with an output of said engine, and according to a predetermined relationship bet ween said control value and said parameter, so as to reduce a shifting shock of said automatic transmission, said means for automatically controlling a control value comprising:
detecting means for detecting an engaging time during which said engaging action of said frictional coupling device from said first position to said second position is effected; and
compensating means for updating said relationship depending upon the engaging time detecting by said detecting means, with respect to a specific value of said parameter at which said engaging action takes place, said compensating means maintaining the updated relationship for use for a subsequent occurrence of said engaging action of said frictional coupling device from said first position to said second position,
said compensating means updating said relationship, with respect to an entire range of said parameter, based on said updated relationship with respect to said specific value of said paramenter, said compensating means maintaining the updated relationship with respect to said entire range of said parameter, for use for said subsequent occurrence of the engaging action.

4,928,558
TORQUE MASTER
Samir B. Makhlouf, 36 Huyler Ct., Setauket, N.Y. 11733
Filed Dec. 15, 1988, Ser. No. 284,737
Int. Cl.[5] B25B *17/00*
U.S. Cl. 81—57.3 11 Claims

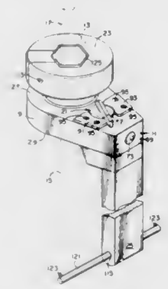
1. A torque multiplying wrench comprising:
a. an elongated housing comprising a lower section and an upper section assembled to form said housing;

b. toothed jaw means within and adjacent one end of said housing exposed for engaging a member to be driven;
c. input drive means adjacent the opposite end of said housing for receiving an input driving force;
d. gear means for multiplying and delivering the torque received by said input drive means to said toothed jaw means;
e. said gear means including oppositely facing spine means within and extending down through the length of said housing means for supporting a plurality of removable posts to support gears for multiplying and delivering said torque, whereby upon removing said upper section a



failed gear or post may readily be replaced by the user of said wrench;
f. said opposite end of said housing including means to transfer reaction forces away from said wrench and to select the direction of said reaction forces; and
g. said toothed jaw means comprising a circular member with a jaw-like opening and flat side walls, side shoulders extending out from said toothed jaw means, and shoulders extending inwardly from both sections of said housing to engage said side shoulders when said toothed jaw means expands under load to limit expansion of said jaw means under load.

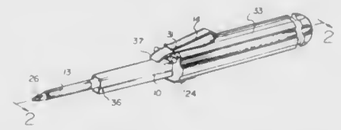
4,928,559
RATCHET WRENCH
Erwin H. Stielow, 1164 Glenn St., Philadelphia, Pa. 19115
Filed Nov. 9, 1987, Ser. No. 118,542
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—63 **3 Claims**



1. An offset basin ratchet wrench for loosening and tightening nuts connecting copper tubing to faucet connections comprising
a wrench body portion having a top surface and a bottom surface,
the wrench body portion having a circular hole extending between the wrench body portion top surface and the wrench body portion bottom surface,
the wrench body portion having a passageway between the circular hole and an outer front side portion of the wrench body portion,
the wrench body portion having a recess in its top surface next to and in partial contact with the circular hole,
a pawl mounted on the wrench body portion inside the recess,
pawl holding means for holding the pawl in position after the pawl has been set in a tightening position or a loosening position,
a nut driver having a hole extending through the nut driver from its top to its bottom,
the nut driver having an upper portion and a lower portion,
the hole through the nut driver in the nut driver upper portion having a hexagonal-shaped periphery for engaging a nut connecting copper tubing to a faucet connection,
the lower portion of the nut driver having a substantially circular outer periphery and having a row of teeth encircling its outer periphery that are engaged by the pawl when the lower portion of the nut driver rests inside the circular hole of the wrench body portion,
the nut driver having a main portion and a detachable wedge portion mounted on the main portion,
the nut driver having an opening extending from the top of the nut driver to the bottom of the nut driver created by detaching the nut driver wedge portion from the nut driver main portion, and
a handle attached to the bottom surface of the wrench body portion,
whereby the nut driver may be placed onto the tubing by detaching the nut driver wedge portion from the nut driver main portion, placing the nut driver main portion onto the tubing, and reattaching the nut driver wedge portion to the nut driver main portion such that the nut driver surrounds the tubing,
whereby the nut driver may then be slid into the hole in the wrench body portion after the wrench body portion has been inserted around the tubing so that the pawl engages the teeth encircling the lower portion of the nut driver, and
whereby the wrench may then be moved such that the nut is positioned inside the hexagonal-shaped portion of the hole in the nut driver,
the nut driver detachable wedge portion being detachably secured to the nut driver main portion by a pair of spring members that are mounted in bores in the nut driver main portion that engage depressions in the side walls of the nut driver wedge portion,
the spring members each having a spring that is in contact with a plug at one end and a ball at the other,
whereby the spring causes the ball to partially protrude from each of the bores and to rest in a depression in the sidewall of the nut driver wedge portion holding the nut driver wedge portion in place, and
whereby pulling outwardly on the nut driver wedge portion forces the balls into the bores so that the nut driver wedge portion may be removed.

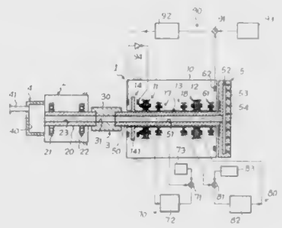
4,928,560
POWER DRIVEN SCREW DRIVER
Kook B. Bang, 115 Bryn Mawr Ave., Newtown Square, Pa. 19073
Filed Feb. 2, 1989, Ser. No. 305,404
Int. Cl.[5] B25B *19/00*
U.S. Cl. 81—463 **10 Claims**

1. A power driven screw driver having screw means which comprises:
a hollow screw driver body;
a main spindle member disposed within said hollow screw driver body, said main spindle member including a first slot disposed in the front portion thereof for receiving a first locking member, and a first spring connected to the rear end thereof for biasing the main spindle member,
an auxiliary spindle member, in parallel to said main spindle member, disposed within said hollow screw driver body, said auxiliary spindle member operatively associated with an auxiliary engagement which is slidably engaged in a second slot disposed in the front end portion, a third slot disposed in the rear end portion for receiving a second locking member operatively connected to a movable ball button, and a second spring connected to the rear end thereof,
a movable shank operatively associated with said main spindle member, said movable shank including a groove disposed in the rear end portion thereof for slidably engaging



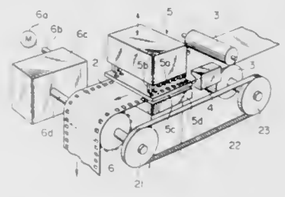
the auxiliary engagement and extending a screw driver head having screw holding means, and
a lever pivotably attached to said hollow screw driver body for releasing the first locking member, whereby after pushing the movable shank while pressing the ball button and locking the main spindle member, when the first locking member is released, the main spindle member hits the movable shank for initially driving a screw held by the screw holding means into a portion of an object.

4,928,561
METHOD AND APPARATUS FOR ULTRA-PRECISE MACHINING APPLIED TO EXECUTING ATYPICAL SURFACES OF REVOLUTION AND TO SERVO-CONTROLLED MACHINING
Claude Fouche, Gasny, France, assignor to S.A.: Societe Europeenne de Propulsion, Suresnes, France
PCT No. PCT/FR87/00447, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO88/03459, PCT Pub. Date May 19, 1988
PCT Filed Nov. 13, 1987, Ser. No. 224,778
Claims priority, application France, Nov. 13, 1986, 86 15763
Int. Cl.[5] F16C *39/06*
U.S. Cl. 82—1.11 **13 Claims**



12. Apparatus for machining typical and atypical ultra-precise surfaces of revolution, the apparatus comprising tool guide means displaceable in translation along a predetermined direction or in rotation about a predetermined axis of rotation in order to position a tool, a spindle slide for guiding a workpiece-carrier spindle assembly along an axis, first and second sensors for measuring displacement respectively of the spindle slide and of the tool guide means, and means for displacing the tool guide means at a determined speed corresponding to a given machining frequency,
wherein the workpiece-carrier assembly comprises a stator fixed to the spindle slide and a spindle mounted in the stator by means of an active magnetic suspension having five servo-controlled axes and comprising at least two radial bearings and an axial bearing, wherein the radial and axial magnetic bearings are servo-controlled at natural frequencies which are less than about 80 Hz, wherein means are provided for rotating the spindle of the assembly at a predetermined speed less than the natural frequencies and lying between about 20 Hz and about 75 Hz, and
wherein it further comprises means for applying variable reference voltages to the servo-control circuits of the radial and axial magnetic bearings, which reference voltages are varied as a function of machining control signals for the purpose of selectively modifying the radial and axial positions of the spindle of the workpiece-carrier assembly about a nominal position, and means for authorizing displacement of the spindle slide only when said control signals exceed predetermined values.

4,928,562
FILM PERFORATOR
Toyokiti Tanimura, Akishima, and Masahiro Ikeda, Tama, both of Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Apr. 19, 1989, Ser. No. 340,349
Claims priority, application Japan, Apr. 20, 1988, 63-97955
Int. Cl.[5] B26F *1/02*
U.S. Cl. 83—278 **5 Claims**



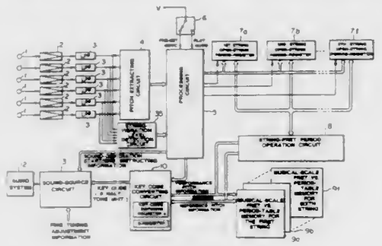
1. An apparatus for perforating a photographic film comprising:
perforation means for perforating the film;
a feed roller and a pad roller for nipping the film therebetween and feeding the film at a high speed to the perforation means;
means for advancing the film from the perforation means, the advancing means comprising a sprocket for engagement with the film perforations, the sprocket being coupled to the feed roller for conveying the film in synchronization with the sprocket, and the advancing means including means for maintaining the speed of the sprocket higher than the speed of the feed roller for producing a backward tension on the film.

4,928,563
ELECTRONIC TUNING APPARATUS FOR AN ELECTRONIC STRINGED MUSICAL INSTRUMENT
Yoshiyuki Murata, Tachikawa, and Hajime Manabe, Higashiyamato, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 28, 1988, Ser. No. 290,981
Claims priority, application Japan, Dec. 31, 1987, 62-332196; Oct. 20, 1988, 62-262919
Int. Cl.[5] G10G *7/02;* **G10H** *3/18*
U.S. Cl. 84—726 **47 Claims**

45. An electronic tuning apparatus for a stringed instrument, comprising:
extracting means for extracting a fundamental period data of a string vibration which is supplied thereto;
measuring means for measuring a tension state of said string based on the fundamental period data which is extracted by said extracting means prior to a musical performance; and
converting means for converting said fundamental period

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data which is extracted during the musical performance by said extracting means into a corresponding tuned tone



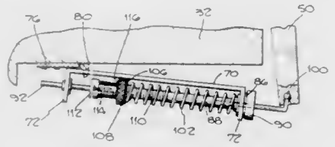
pitch data in accordance with said tension state measured by said measuring means.

4,928,564

APPARATUS AND METHOD FOR STABILIZING A TREMOLO ON A MUSICAL INSTRUMENT SUCH AS A GUITAR

David J. Borisoff, 22119 Victory Blvd., Canoga Park, Calif. 91303, and Boris Borisoff, 5403 Blanco Ave., Woodland Hills, Calif. 91367

Filed Aug. 22, 1988, Ser. No. 234,886
Int. Cl.[5] G10D *3/12*
U.S. Cl. 84—313 **8 Claims**



1. A stabilizer device for use with a tremolo on a guitar having a bridge assembly with a sustain lever arm, comprising in combination:

an elongated bracket member adapted to provide a pivotal connection at one end to a guitar body;

a pull rod carried by said bracket member, movable relative thereto, and adapted to be connected at one end to the bridge assembly lever arm;

said bracket member providing a first stop adjacent to said one end of said pull rod;

a tube sleeved over said pull rod and having a tube nut at one end cooperable with said first stop in one position of the lever arm;

an adjustable collar fixed to said pull rod adjacent the other end of said tube and adapted to abut said other end of the tube to provide a second stop at a selected adjustable distance from the lever arm;

and a main spring means on said tube biasing said tube nut against said first stop;

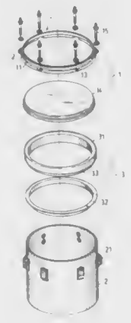
whereby said first and second stops determine a neutral position of said lever arm.

4,928,565

MUSICAL DRUM WITH PRESSURE BUFFER ELEMENT

Wu H. Hsieh, No. 178, Chung Shan Erh Rd., Lu Chou Hslang, Taipei Hsien, Taiwan

Filed Sep. 12, 1989, Ser. No. 406,400
Int. Cl.[5] G10D *13/02*
U.S. Cl. 84—411 R **1 Claim**



1. A musical drum with a buffer element substantially comprising drumface (1). a wooden drum body (2) and a buffer element (3), wherein:

said buffer element (3) is disposed between said drum face (1) and said wooden drum body (2);

said drum face (1) comprises a drumhead (14) and a rim (11) for the purpose of clamping said drumhead (14) to said buffer element (3); said rim (11) further comprises an outer lip on which is disposed a plurality of equally spaced tabs (12); through each respective tab (12) is a hole (13) through which a respective clamping screw (15) is passable; said buffer element (3) comprises a metal ring (31) on the outside bottom edge of which is cut a concavity (32) for receiving a brim of the drum body (2); said buffer element (3) further comprises a flexible washer (32) which fits into the concavity (31) and is disposed between the metal ring (31) of the buffer element (3) and said brim of the drum body (2); a downward pressure exerted on the buffer element (3) by the stretching of the drumhead (14) across said buffer element, due to the tightening of said clamping screws (15) is absorbable by said flexible washer (32) thereby preventing deformation of the wooden drum body (2).

4,928,566

DEVICE FOR APPLYING TENSION TO A PAIR OF DRUM HEADS

Mitsuo Yanagisawa, Yachiyo, Japan, assignor to Pearl Musical Instrument Co., Tokyo, Japan

Filed May 15, 1989, Ser. No. 352,103
Claims priority, application Japan, Oct. 20, 1988, 63-136139[U]
Int. Cl.[5] G10D *13/02*
U.S. Cl. 84—413 **6 Claims**

1. A tightening device for applying tension to a pair of drum heads individually covering two opposite end openings of a drum shell open at both ends in the axial direction and having first holes, comprising:

a pair of hoops arranged along the respective edges of the drum heads, each said hoop having second holes arranged circumferentially at regular intervals;

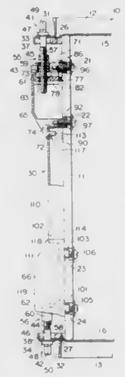
tension bolts, each including a shank portion having an external thread, said shank portion being passed through each corresponding second hole;

nuts, each including a cylinder portion and a flange situated at one end thereof, said cylinder portion having an internal thread mating with the external thread of each corresponding tension bolt;

a pair of metallic lug bodies formed by casting, each said lug body being in the form of a box open on the drum shell side and having first and second ends situated opposite each other, said first end having a first opening in which the cylinder portion of each corresponding nut is inserted, and said second end having a second opening, said first and second openings extending in the axial direction of the drum shell;

first projections, each located in the vicinity of the first end of each said lug body and adapted to be inserted into the first hole of the drum shell, each said first projection having a tapped hole,

second projections, each located in the vicinity of the second end of each said lug body and projecting toward the drum shell;



rotation preventing means inside each said lug body for preventing each said nut from rotating;

first screws screwed individually in the tapped holes of the first projections of the lug bodies, said lug bodies being adapted to be fixed to the drum shell as the screws are screwed into the tapped holes; and

a connecting member for connecting the paired lug bodies, said connecting member having a longitudinal axis extending in the axial direction of the drum shell and two opposite end portions fitted individually in the second openings of the lug bodies, the cross section of said connecting member, with respect to the direction perpendicular to said longitudinal axis, being uniform throughout the axial length, each said opposite end portion of said connecting member having a third hole in which the second projection of each corresponding lug body is fitted.

4,928,567

CLUTCH UNIT FOR HIGH-HAT CYMBALS

Makoto Kurosaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

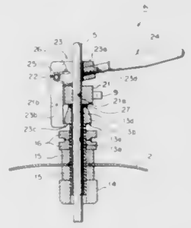
Filed Jul. 6, 1989, Ser. No. 375,890
Claims priority, application Japan, Jul. 14, 1988, 63-93130[U]
Int. Cl.[5] G10G *5/00*
U.S. Cl. 84—422.3 **1 Claim**

1. A clutch unit for a high-hat cymbal, in which a lower cymbal plate is mounted atop a vertical post, an extension rod is idly inserted through said post and normally elastically urged to move upwards and an upper cymbal plate is mechanically connected to said extension rod via said clutch unit for selective percussive contact with said lower cymbal plate, comprising

a clutch bolt idly inserted over said extension rod in fixed connection to said upper cymbal plate and provided with a depression,

a holder secured to said extension rod above said clutch bolt,

a hook block pivoted to said holder, and provided with at



least one hook engageable with said depression in said clutch bolt and a clutch lever substantially horizontally fixed thereto, and

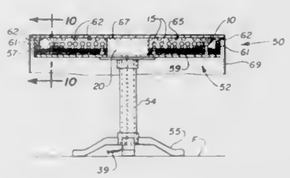
means for elastically holding said hooking in engagement with said depression.

4,928,568

COLOR ORGAN DISPLAY DEVICE

Donald E. Snavely, 210 N. Hoover Ave., New Holland, Pa. 17557

Filed Apr. 12, 1989, Ser. No. 337,153
Int. Cl.[5] A63J *17/00*
U.S. Cl. 84—464 R **14 Claims**



1. In a table having a tabletop supported above the floor by a support apparatus engagable with the floor, the improvement comprising:

a color organ display device forming a base member of said tabletop and being positioned beneath a top cover operable to permit the passage of light energy emanating from said color organ display device, which has a plurality of light bulbs arranged in groups of like color; and

a color organ operably associated with said display device for receiving an audio input signal from a source of sound and effecting an illumination of said groups of light bulbs in response to said audio input signal.

4,928,569

ENVELOPE SHAPE GENERATOR FOR TONE SIGNAL CONTROL

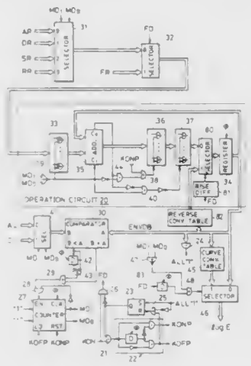
Masaki Kudo, and Hideo Suzuki, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 13, 1987, Ser. No. 120,071
Claims priority, application Japan, Nov. 15, 1986, 61-272672; Nov. 15, 1986, 61-272673
Int. Cl.[5] G10H *7/00, 1/02, 5/00*
U.S. Cl. 84—626 **25 Claims**

1. An envelope shape generator having a rapid attenuation capability comprising:

envelope shape forming means for forming envelope shape data for controlling a tone signal in the form of data in decibel representation; and

rapid attenuation means operative within a rapid attenuation period during which rapid attenuation is desired for rapidly attenuation the envelope shape data in decibel repre-



sentation with such a characteristic that inclination of attenuation becomes increasingly steeper to achieve rapid attenuation.

4,928,570

METHOD AND SYSTEM FOR TRANSMITTING A COMMAND TO START UP A DEVICE ON BOARD A MISSILE

Jacques Esterlin, Checy; Guy Le Parquier, Paris, and Jean Pierre Roux, St. Cyr En Val, all of France, assignors to Thomson Brandt Armements, Boulogne Billan Court, France

Continuation of Ser. No. 69,987, Jul. 6, 1987, abandoned. This application Jan. 24, 1989, Ser. No. 300,228
Claims priority, application France, Jul. 8, 1986, 86 09892
Int. Cl.[5] F42C *11/06, 15/06*
U.S. Cl. 89—6.5 3 Claims

3. A system for starting up a device placed in a missile launched from a carrier system, comprising:

a control wire for receiving from said carrier system temporal data specifying a predetermined time period after launch of said missile which must elapse before the start up of said device, and a missile firing command signal;

a first filter connected to said control wire for passing said temporal data;

a memory, connected to said control wire via said first filter, for storing said temporal data;

a timing unit which begins a timing operation upon receipt of said missile firing command signal;

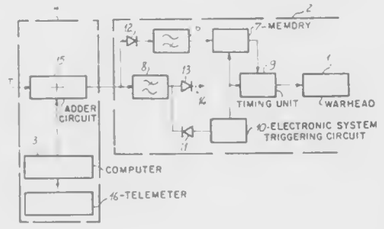
a second filter connected to said control wire for passing said missile firing command signal and said temporal data. an output of said second filter being applied to a firing command signal input of said missile;

an electronic system triggering circuit, connected to said output of said second filter, for starting the timing operation has commenced for the predetermined time period specified by said stored temporal data;

a first diode connected between said second filter and said electronic system triggering circuit so as to pass only negative pulses of said temporal data to said electronic system triggering circuit for triggering said memory and said timing unit,

a second diode connected between said control wire and said first filter for passing only a positive pulses of said temporal data to said first filter, and

a third diode connected to said output of said second filter to pass only positive pulses to said firing command signal input of said missile.

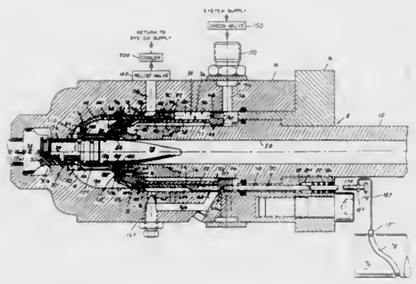


4,928,571

LIQUID PROPELLANT GUN

Melvin J. Bulman, Shelburne, Vt., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 840,074, Oct. 6, 1977, abandoned. This application Aug. 10, 1989, Ser. No. 403,275
Int. Cl.[5] F41F *1/04*
U.S. Cl. 89—7 29 Claims



25. A liquid propellant gun comprising:

a combustion chamber extending longitudinally into the firing bore of a gun barrel;

a first conduit outlet means for providing liquid propellant into said combustion chamber;

means for igniting liquid propellant from said first conduit outlet means to provide a longitudinally forward flow of combustion gas through said combustion chamber and firing bore; and

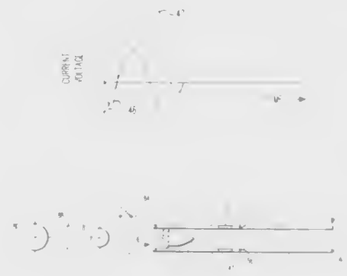
a second conduit outlet means, longitudinally forward of said first conduit outlet means, for providing liquid propellant into said combustion chamber including means in conjunction with said flow of combustion gas for deflecting the flow of liquid propellant longitudinally forwardly as a surface film along the inner wall of said combustion chamber and firing bore.

4,928,572

PULSED AC ELECTROMAGNETIC PROJECTILE LAUNCHER APPARATUS

Dennis J. Scott, Jeannette, and Raymond M. Calfo, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 17, 1989, Ser. No. 339,339
Int. Cl.[5] F41F *1/02*
U.S. Cl. 89—8 5 Claims



1. Electromagnetic projectile launcher apparatus, comprising:

(A) a pair of generally parallel conductive launcher rails having a breech end and a muzzle end;

(B) said rails including a high current connection at a location intermediate said ends;

(C) said rails including a high resistance portion disposed between said high current connection and said breech end;

(D) an armature for conducting current between said rails for propelling a projectile along said rails, said armature being initially located near said breech end;

(E) pulsed AC generator means having first output terminals for providing a relatively high current pulse, and second output terminals for providing a relatively low current pulse;

(F) means connecting said first output terminals to said high current connection;

(G) means including switch means connecting said second output terminals to said breech end;

(H) said pulsed AC generator means and said switch means being constructed and arranged to deliver said lower current pulse just prior to said higher current pulse to initially accelerate said armature past said high resistance portion whereupon said high current pulse delivered to said current connection will accelerate said armature to its desired exit velocity.

4,928,573

SILENCER FOR SABOTED PROJECTILES

Kevin S. Fansler, Harre'de Grace, and David H. Lyon, Forest Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

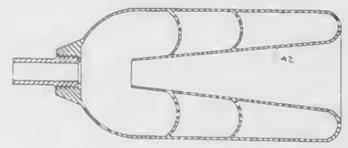
Filed Oct. 26, 1988, Ser. No. 262,656
Int. Cl.[5] F41F *17/12*
U.S. Cl. 89—14.4 4 Claims

1. A silencer for a gun which fires a saboted projectile comprising:

a casing which defines a chamber of the silencer through which the saboted projectile passes when fired from the gun, the chamber having an axis, a rear projectile entrance hole, and a front projectile exit hole, both the entrance hole and the exit hole being disposed on the chamber axis;

means for securing the casing to the gun barrel so that the chamber axis coincides with the gun barrel axis, the gun barrel closes the chamber entrance hole, and the axial distance between the gun muzzle and the exit hole is less than the axial length of the saboted projectile;

wherein the casing defines a truncated exit cone whose smallest diameter is the chamber exit hole, the diameter of



the chamber exit hole and shape of the exit cone being selected so that no sabot part will impinge upon the casing as the sabot components separate from the projectile, and the silencer chamber includes an annular front portion surrounding the exit cone;

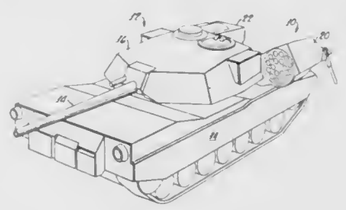
at least one annular perforated baffle extending around the exit cone in the front portion of the chamber.

4,928,574

AMMUNITION MAGAZINE SYSTEM

Michael D. Golden, Corona del Mar, Calif., assignor to Western Design Corporation, Irvine, Calif.

Filed Oct. 5, 1987, Ser. No. 104,786
Int. Cl.[5] F41F *9/06*
U.S. Cl. 89—34 17 Claims



1. An ammunition magazine system for a large caliber gun installed on a vehicle, said gun being mounted for loading from inside the vehicle, said ammunition magazine system comprising:

magazine means for supporting a plurality of ammunition rounds comprising a plurality of attached modular canisters, each modular canister being configured for supporting an ammunition round and having means for attaching each modular canister to other modular canisters to form a monocoque structure, said means for attaching each modular canister to other modular canisters comprising means for aligning the attached modular canisters in a circular array about a centerline of the ammunition magazine;

means attaching the magazine means to the vehicle for enabling the magazine means to be moved from a first posi-

tion, at which ammunition rounds can be removed from the magazine means from within the vehicle, to a second position, at which ammunition rounds can be inserted into the magazine means from outside the vehicle, said means attaching the magazine means to the vehicle comprising hinge means for enabling the magazine to be rotated from the first to the second position; and

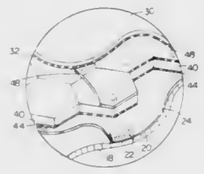
means for separating the magazine means from the vehicle when the magazine means is in the second position.

4,928,575

SURVIVABILITY ENHANCEMENT

Martin E. Smirlock, Concord; William A. Ribich, Lexington; Paul J. Marinaccio, East Orleans, all of Mass., and Bernard E. Sawaf, Nashua, N.H., assignors to Foster-Miller, Inc., Waltham, Mass.

Filed Jun. 3, 1988, Ser. No. 202,218
Int. Cl.[5] F41H *7/04*
U.S. Cl. 89—36.02 19 Claims



1. A survivability enhancement system for use on a vehicle that has a surface to which armor is to be releasably applied, comprising

separable fastener structure of a first type fixed on said surface of said vehicle whose survivability is to be enhanced, and

an array of armor tile elements for providing a composite supplementary layer of armor, each said armor tile element having a complementary surface that corresponds to said surface of said vehicle, and

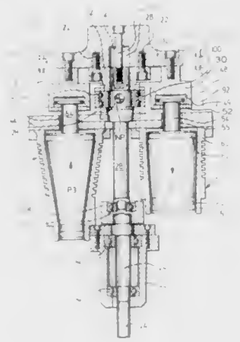
separable fastener structure of a second type and complementary to said first type separable fastener structure secured to said armor tile array, one of said separable fastener structures having a multiplicity of hooking elements and a cooperating other said fastener structure having complementary structure that is in releasable interengagement with said hooking elements, each said tile having perimeter surface portions in mating juxtaposition with perimeter surface portions of adjacent tiles to provide a composite supplementary armor layer on said vehicle, said survivability enhancement system having energy absorbing characteristics and providing progressive energy dissipation of energy resulting from impact of a ballistic missile on an armor tile element of said array such that an adjacent tile element that is not directly impacted by said ballistic missile but is subjected to lateral force, remains attached to said surface of said vehicle due to reengagement with said complementary structure by said hooking elements associated with said adjacent tile element that release from said complementary structure under influence of said lateral force.

4,928,576

COMPRESSED GAS MOTOR

Richard J. Armstrong, 1216 Yonge Street, Suite 102, Toronto, Ontario, Canada (M4T 1W1)

Continuation-in-part of Ser. No. 31,358, Mar. 30, 1987, Pat. No. 4,852,418. This application Apr. 28, 1988, Ser. No. 187,362
Int. Cl.[5] F01B *3/02*; F16J *1/00*
U.S. Cl. 91—499 16 Claims



9. Compressed gas engine with nutating drive for an output rotating shaft defining a rotating axis, including:

at least three piston-cylinder sets, each set comprising relatively reciprocal piston and cylinder each defining a reciprocation axis having its major component parallel to the rotation axis,

a nutation frame mounted to nutate about a nutation point, said mounting allowing sufficient universal movement for said frame to nutate under activation of said pistons,

connections between the movable component of said piston-cylinder sets and said frame angularly disposed about said nutation point relative to said rotary axis,

said connections allowing coupling of the reciprocating action of said pistons to cause nutation of the nutation frame, whereby operation of said pistons in selected phase relationship causes nutation of said frame,

a rod projecting from said frame to a location spaced in an axial direction, relative to said axis of shaft rotation from said nutation point,

a crank on said output shaft connected to said rod at said location to allow relative rotation about the axis of said rod, whereby said rod causes rotation of said output shaft,

each of said at least three piston-cylinder sets comprising a piston tapering in said reciprocation direction at an angle of less than 45° thereto and a means defining a complementary shaped cylinder,

whereby during reciprocation of said piston a variable volume chamber is defined between said piston and cylinder, wherein the wall are defining said chamber is mainly composed of tapering piston and chamber walls,

means for admitting gas at a higher pressure to and allowing the escape of compressed gas at a lower pressure from said cylinders at times to produce operation of said piston in said selected phase relationship,

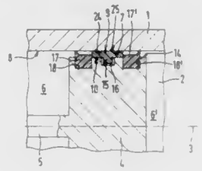
wherein a stem of a uniform cross section in the reciprocation direction projects from the narrow end of the tapering walls of said piston, and the material defining the chamber walls is shaped to provide a bore complementary to said stem, said stem and said bore being so arranged that a portion of said stem remains in said bore in the extended position of said piston.

4,928,577

PISTON AND CYLINDER UNIT

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 235,386
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731158
Int. Cl.[5] F16J *1/00*
U.S. Cl. 92—177 15 Claims



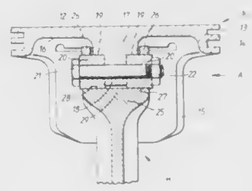
1. A piston and cylinder unit comprising a cylinder barrel defining a piston space, a piston with a non-circular cross section able to run axially in said barrel with a support action due to a peripheral bearing surface of the barrel, said piston including at least one annular runner belt arranged on said piston extending along at least part of the length of the piston, said belt being coaxially arranged thereon along part of the length of the piston, said belt having a surface facing radially outwardly which makes contact with the inner bearing surface of the barrel with sliding fit to support the piston, an inwardly directed surface of the belt bearing on an outer peripheral surface of the piston, said outer peripheral surface of the piston being spaced from the bearing surface of the barrel, said belt further having an inwardly directed retainer spur fitting into a groove-like peripheral recess in the piston, said belt being made of a material with resiliently elastic properties and being interrupted at one position on its periphery.

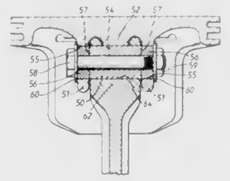
4,928,578

PISTONS WITH BEARING MEMBERS

Michael L. P. Rhodes, Rugby, England, assignor to AE PLC, Rugby, England

Filed Nov. 23, 1987, Ser. No. 123,786
Claims priority, application United Kingdom, Dec. 5, 1986, 8629207
Int. Cl.[5] F16J *1/14*; F22B *5/00*
U.S. Cl. 92—187 6 Claims





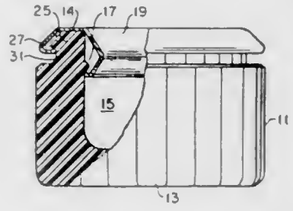
1. A piston comprising a crown portion and a skirt portion, the crown position having a single boss depending from the underside thereof, said boss including two generally axially extending faces, said faces each having a rebate formed therein, said boss having secured thereto, in fixed relationship to the piston body, two cylindrical bearing members, one said bearing member located in each of said rebate, and which bearing members cooperate with the small end of an associated connecting rod so as to transmit combustion firing loads to said connecting rod substantially in compression while providing bearing surfaces for relative oscillating movement between the piston and connecting rod.

4,928,579

PISTON FOR DISC BRAKES

John E. Emmett, Farmington Hills, Mich., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 293,645, Aug. 17, 1981, abandoned, which is a continuation-in-part of Ser. No. 270,731, Jun. 5, 1981, Pat. No. 4,401,012, which is a continuation-in-part of Ser. No. 202,510, Oct. 31, 1980, abandoned. This application Apr. 8, 1985, Ser. No. 720,782
Int. Cl.[5] F16J *1/00*
U.S. Cl. 92—248 20 Claims



1. A composite vehicular brake piston for activating a vehicular brake shoe during braking of a vehicle comprised of a cylindrical resin body having an open end and a closed end and a metallic cap extending over the end wall of said open end and secured to said body by an anchoring means positioned within the open end of said body, wherein said metallic cap has means for engaging a vehicular brake shoe or brake shoe assembly so that the brake shoe moves in unison with the piston during braking and debraking of the vehicle.

4,928,580

AUTOMOBILE WINDSCREEN CLEANING SYSTEM

Keith W. McIntyre, Tigard, Oreg., and Scott J. McIntyre, Fort Meyers, Fla., assignors to H. Novis Inc., Auburn Hills, Mich.

Filed Jan. 27, 1989, Ser. No. 302,371
Int. Cl.[5] B60S *1/54*
U.S. Cl. 98—2.1 16 Claims



1. For use in combination with the windscreen of an automotive vehicle:

an elongate, flexible body adapted to be adhesively mounted on and extending across the lower extension surface of said windscreen and having a lower portion defining a plenum, said body further having an upper portion contiguous with said lower portion which, in combination with said windscreen surface, defines a continuous lineal nozzle extending across a substantial area of the windscreen;

a plurality of spaced-apart spacer means bonded to and between said upper portion and said windscreen surface for mounting the body on the windscreen with the upper portion in substantially uniformly spaced relation to the outer surface of the windscreen to direct air at high velocity from the plenum across the windscreen surface; and

means for supplying air under pressure to the plenum such that the air directed from the nozzle portion flows at high velocity across the windscreen surface.

4,928,581

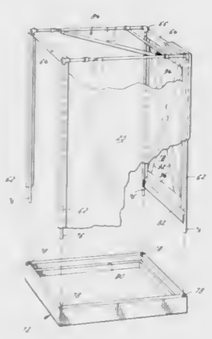
NEGATIVE AIR CONTROL UNIT AND CLOSURE STRUCTURE

Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014

Filed Nov. 30, 1988, Ser. No. 277,772

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—1.5 **11 Claims**



1. A door closure structure for utilization in negative air control modules having walls and a base, said structure comprising:

a structure door frame having an inner peripheral edge and an outer periphery including at least one wall attaching means sealingly secured thereto around said periphery, said attaching means are zipper means and include an outer sealing flap over said zipper means;

a door panel mounted to said frame, including a rectangular frame having an outer peripheral edge and a fabric covering sealingly secured to said rectangular frame and extending beyond said inner peripheral edge, to seal against said structure door frame; and

said door frame including means for mounting said structure door frame into the base.

4,928,582

NOZZLE FOR DISCHARGING VENTILATION AIR FROM A VENTILATION SYSTEM

Sven E. Elfverson, Mullsjö , Sweden, assignor to Saab-Scania Aktiebolag, Sweden

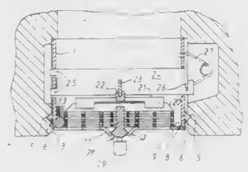
PCT No. PCT/SE87/00432, § 371 Date Mar. 29, 1989, § 102(e) Date Mar. 29, 1989, PCT Pub. No. WO88/02319, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 25, 1987, Ser. No. 339,614

Claims priority, application Sweden, Sep. 29, 1986, 8604094

Int. Cl.[5] B60H *1/34*; **F24F** *13/12*

U.S. Cl. 98—2 **25 Claims**



1. A nozzle for discharging ventilation air from a ventilation system, comprising:

(A) a housing with a through-flow duct for conducting the ventilation air through said housing;

(B) a plurality of relatively displaceable plates across said duct, said plates being disposed over one another and being oriented generally parallel, said plates each having a hole therethrough for air flow, said holes being arranged over said plates to that said holes in said plates coact to form a ventilation duct for conducting ventilation air through said through-flow duct of said housing, said plates being displaceable transverse to said through-flow duct to move their said holes to change the flow direction of the ventilation air;

(C) guide means for preventing adjacent said plates from turning with respect to each other and for permitting said adjacent plates to shift in a direction transverse to said through-flow duct with respect to each other, said guide means including guide members defined on each of said plates, said guide members being shaped and placed so that said guide members of adjacent said plates cooperate to prevent said turning and to permit said shifting; and

(D) means engaging said plates for displacing them with respect to each other for redirecting air flow.

4,928,583

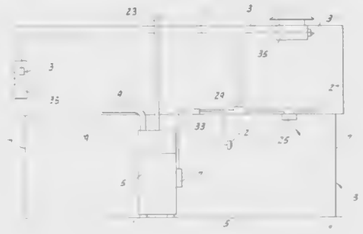
AIR FLOW CONTROL SYSTEM

Harry L. Taylor, and Charles O. Ehret, both of 54 Buckley Meadows Dr., St. Louis, Mo. 63125

Filed Jul. 22, 1988, Ser. No. 222,956

Int. Cl.[5] F24F *11/02*

U.S. Cl. 98—31.6 **12 Claims**



1. An air flow control system for controlling the air flow within a building having a blower for circulating the air in the building, the system comprising:

means for venting air out of the building;

means for detecting fire, smoke, or high heat in the building;

means for closing the venting means upon the detection of fire, smoke, or high heat in the building connected to the detecting means; and

means for disabling the blower to stop recirculation of the air upon the detection of fire, smoke, or high heat in the building connected to the detection means.

4,928,584

INFUSER

Michael J. R. Young, Ashburton, England, assignor to General Dispensing Systems Limited, Croydon, England

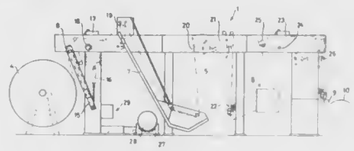
PCT No. PCT/GB88/00326, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO88/08268, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 27, 1988, Ser. No. 294,484

Claims priority, application United Kingdom, Apr. 28, 1987, 8710045

Int. Cl.[5] A47J *31/00*

U.S. Cl. 99—289 T **9 Claims**



1. An infuser comprising a movable continuous mesh belt, roller means around which said mesh belt may pass, means to cause movement of the belt, means to deposit infusible solid and infusing liquid onto the mesh belt, collection means below the mesh belt to collect the infusion, contact means contacting the mesh belt, and ultrasonic vibration generating means connected to said contact means to impart ultrasonic vibration to the mesh belt to aid cleaning thereof.

4,928,585

METHOD FOR CONTROLLING THE PASSAGE OF FABRIC THROUGH A ROTARY SCREEN PRINTING INSTALLATION

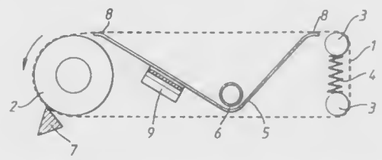
Gerardus H. van Mondfrans, Sambeek, and Pieter de Vries, Boxmeer, both of Netherlands, assignors to Stork Brabant B.V., Boxmeer, Netherlands

Filed Oct. 6, 1988, Ser. No. 254,164

Claims priority, application Netherlands, Oct. 9, 1987, 8702409

Int. Cl.[5] B41F *15/12*

U.S. Cl. 101—129 **5 Claims**



1. A method for controlling the passage of a fabric through a rotary screen printing installation, whereby a web of substrate to be printed upon is wound from a first stock roll via a wind-off roller and fed to a printing machine of the installation, and the substrate is then fed through a drying installation and wound up, comprising the steps of:

A. feeding a leader, a pre-determined length of a fabric of low quality, into the installation, a portion of said leader being stored in a buffer,

B. sewing the substrate to be printed to said leader,

C. storing the length of a print order in a memory of an electronic processing unit,

D. setting the printing machine using said leader, while emptying the buffer,

E. starting the intake of substrate at a low speed,

F. sending to the processing unit a signal for measuring the length of the strength fed in when the seam between the leader and the substrate passes the wind-off roller,

G. sending to the processing unit a signal for measuring the length of the printed substrate of a first quality after the seam between the leader and the substrate has passed through the printing machine and after the printing machine is set to a first quality,

H. comparing the measured length of substrate of first quality with the length of the print order stored in the memory.

4,928,586

SHEET REVERSING UNIT FOR SHEET PRINTING PRESS

Kenji Kida, Ibaraki, Japan, assignor to Kormori Printing Machinery Co., Ltd., Japan

Continuation of Ser. No. 178,772, Mar. 31, 1988, abandoned, which is a continuation of Ser. No. 15,976, Feb. 18, 1987, abandoned. This application Jul. 13, 1989, Ser. No. 380,725

Int. Cl.[5] B41F *21/04*, *21/10*

U.S. Cl. 101—230 **3 Claims**



1. A sheet reversing unit for a sheet printing press, said sheet reversing unit comprising:

a sheet reversing cylinder rotatably mounted to a sheet printing press frame, said sheet reversing cylinder having a peripheral surface and at least one notch in said peripheral surface;

means mounted to said sheet printing press frame for rotating said sheet reversing cylinder;

first and second reversing cam surface means attached to said sheet printing press frame, said first reversing cam surface means having smaller and larger diameter portions concentric with said sheet reversing cylinder and cam surface portions of upwardly and downwardly inclined surfaces therebetween;

reversing gripper means pivotally mounted in said at least one notch of said sheet reversing cylinder for gripping a sheet, said reversing gripper means further comprising:

at least one sheet reversing gripper;

a gripper opening and closing can means mounted to said sheet printing press frame in spaced relationship to said sheet reversing cylinder; and

at least one gripper opening and closing cam follower means mounted in spaced relationship to said gripper opening and closing cam means to open and close said at least one sheet reversing gripper;

reversing cam follower means mounted to said sheet reversing cylinder, said reversing cam follower means being

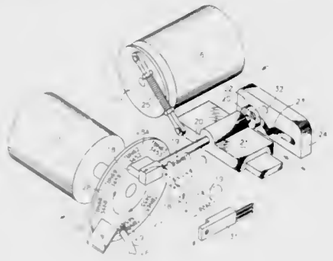
brought into contact with said first reversing cam surface means for pivoting said reversing gripper means;
suction lever means pivotally mounted in said at least one notch of said sheet reversing cylinder for holding said sheet by suction;
means for providing suction to said suction lever means;
suction lever cam follower means mounted to said sheet reversing cylinder, said suction lever cam follower means being brought into contact with said second reversing cam surface means for pivoting said suction lever means; and
regulating cam means attached to said sheet printing press frame for regulating said reversing cam follower means, said regulating cam means having a cam surface in spaced relationship to said opening and closing cam follower means, whereby said opening and closing cam follower means and said regulating cam means selectively cooperate to ensure the pivoting movement of said at least one sheet reversing gripper as said reversing cam follower means travels along said first reversing cam surface means from said larger diameter portions and along said downwardly inclined surface of said cam surface portions such that said reversing cam follower means is maintained in engaging contact with said first reversing cam surface means.

4,928,587

PROGRAMMABLE PAD PRINTER

Douglas L. Glover, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 160,974, Feb. 26, 1988, abandoned. This application Jul. 3, 1989, Ser. No. 373,704
Int. Cl.[5] B41F *17/00*
U.S. Cl. 101—42 **4 Claims**



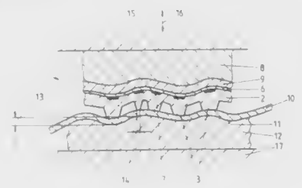
1. A programmable pad printer comprising:
programmable selecting means for selecting a designated mark from a plurality of marks;
ink means for supplying ink to said programmable selecting means;
a device to be marked;
printing means for transferring said designated mark from said programmable selecting means to said device;
wherein said programmable selecting means comprises:
a mark containing device having a surface containing a plurality of marks thereon;
first driving means for driving said mark containing device;
control means for controlling said first driving means; and
wiping means for wiping an excess of ink from said mark containing device;
wherein said printing means comprises:
a print head; and
second driving means for driving said print head between said programmable selecting means and said device;
wherein said second driving means comprises:
a shaft having a first end coupled to said print head and a second end;
a slide defining an opening therein through which said shaft is disposed;
a cam being coupled to said second end of said shaft;
a pin extending from said cam opposite said shaft;
a cam guide block defining an opening in which said pin is slideably disposed; and
a motor coupled to said slide.

4,928,588

APPARATUS FOR DRY PRINTING ONTO A WORKPIECE USING A HOT EMBOSSING FILM AND AN EMBOSSING DIE

Walter Mathis, Feldheim 1, CH - 6312 Steinhausen, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,753
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1988, 3802885; Aug. 30, 1988, 3829297
Int. Cl.[5] B41F *17/00*
U.S. Cl. 101—9 **19 Claims**



1. Apparatus for dry printing onto a workpiece, comprising:
a hot embossing film and an embossing die with a die face;
means for moving the workpiece and said embossing die together under heat and pressure over time;
means for intermediate clamping of said hot embossing film to hold the workpiece and said embossing die in contact so that heat is transferred and then removed for said hot embossing film to adhere onto the workpiece corresponding to said embossing die;
means for releasing said film from the workpiece after a cooling period;
a receiving station for the workpiece;
synchronized feeding means for feeding said hot embossing film;
means for heating said embossing die, said embossing die being a die body of elastically formable material;
said die body having a wall thickness so that a side of said die body facing away from the die face has projection means forming a positive force transfer relief as said die body is placed onto the workpiece to be printed and forms locally and elastically onto the workplace surface;
said relief corresponding substantially to said die face;
an elastic pressure pad on a side of said die body facing away from said die face to form said die body locally and elastically.

4,928,589

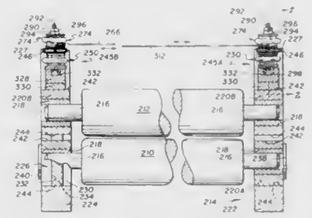
SQUEEZE ROLL AND ACTUATOR ASSEMBLY UTILIZING INFLATABLE BAGS

Robert C. Schofield, 5520 Melton Rd., Portage, Ind. 46368

Filed Jun. 14, 1988, Ser. No. 206,347
Int. Cl.[5] B30B *3/04*
U.S. Cl. 100—170 **19 Claims**

1. A roll assembly for sheet material comprising a support structure adapted to be disposed on a horizontal surface, said support structure defining a pair of spaced confronting keyways extending vertically upward from a lower end thereof, a first bearing block mounted in a fixed position on the support structure at the lower end of one of the keyways and a second bearing block mounted in a fixed position on the support structure at the lower end of the other of the keyways, a first roll having a central axis of elongation journaled at opposite ends on the first and second bearing blocks, a third bearing block translatably keyed within the one keyway and a fourth bearing block translatably keyed within the other keyway of the pair of keyways, a second roll having a central axis of elongation

journaled at opposite ends on the third and fourth bearing blocks, the axes of elongation of the first and second rolls being disposed in a vertical plan, the third and fourth bearing blocks and the second roll forming an assembly translatable in the keyways and movable with respect to the first roll, an actuator having a first support bar extending across the one keyway of the pair of keyways above the third bearing block and mounted on the support structure, said bar having an underside confronting the third bearing block and an upperside opposite the underside, said actuator having a first bag having opposite ends and a flexible elastic wall extending between ends thereof defining a first cavity, one end of the first bag being mounted in a fixed position on the underside of the bar and extending toward the third bearing block, means connecting the other end of the first bag to the third bearing block, a second bag



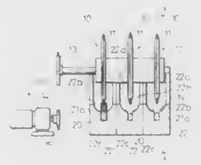
having opposite ends and a flexible elastic wall extending between the ends thereof defining a second cavity, one end of the second bag being mounted on the upper side of the bar and the second bag extending away from the third bearing block, a mechanical linking member attached to the other end of the first bag and coupled to the other end of the the second bag, said linking member extending through the cavities of the first and second bags for transmitting force from the other end of the first bag to the other end of the second bag, the cavities having fluid therein at a pressure above atmospheric pressure, the volume of the cavities of the first and second bags being a direct function of the distance between the ends thereof and the fluid pressure within the first and second cavities, whereby the actuator exerts a force on the third bearing block which is a direct function of the pressure difference of the fluid within the first cavity and the second cavity.

4,928,590

NUTCRACKER

Norio Joyama, and Ikumi Aoki, both of Kawasaki, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 265,994
Claims priority, application Japan, Nov. 6, 1987, 62-168966[U]
Int. Cl.[5] A23N *5/00*
U.S. Cl. 99—576 **3 Claims**



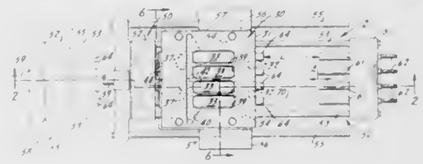
1. A nutcracker comprising:
at least one rotary disc having indentations on its circumference;
means for rotating said at least one rotary disc;
a stator plate having a curved surface and further indentations formed on said curved surface, said stator plate being positioned with said curved surface in confronting relation with said rotary disc and extending along a predetermined arc of a circumference of said disc, defining a gap that progressively narrows downstream between the curved surface of said stator plate and the disc circumference, said indentations made on the circumference of said rotary disc and further said indentations on the curved surface of said stator plate being formed by teeth which are V-shaped in lateral cross-section;
and a dispensing inclination for dispensing nuts in the shell to the narrowing gap between the curved surface of the stator plate and the disc circumference.

4,928,591

MOLDING MECHANISM FOR ROD-SHAPED FOOD PRODUCT

Scott A. Lindee, New Lenox, Ill., assignor to Formax, Inc., Mokena, Ill.

Filed Aug. 7, 1989, Ser. No. 390,373
Int. Cl.[5] A22C *7/00*
U.S. Cl. 99—485 **27 Claims**



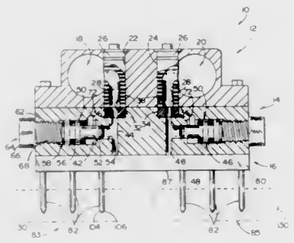
1. A food product molding mechanism for molding rod-shaped food products, comprising:
food pump means for pumping a moldable food material under pressure into one end of a fill passage;
a mold tube assembly mounted in alignment with the other end of the fill passage, the mold tube assembly including a plurality of N elongated mold tubes each of given length, each mold tube aligned parallel to a predetermined mold path and each mold tube having a fill opening aligned with the fill passage;
a mold rod assembly comprising:
a front drawbar;
a rear drawbar;
guide means, interconnecting the drawbars, for maintaining the drawbars in fixed spaced relation to each other adjacent opposite ends of the mold tube assembly, with each drawbar extending across the mold path;
a set of N front mold rods, mounted on the front drawbar, each projecting toward the mold tube assembly parallel to the mold path and in alignment with one of the mold tubes;
a set of N rear mold rods, mounted on the rear drawbar, each projecting toward the mold tube assembly parallel to the mold path and into one of the mold tubes;
the ends of the front and rear mold rods aligned with each mold tube being spaced from each other by a predetermined distance L less than the length of that mold tube; and
drive means, connected to the mold rod assembly, for cyclically reciprocally driving the mold rod assembly along the mold path between a fill position, in which food material flows from the fill passage into each mold tube between the spaced ends of the mold rods to form a rod-shaped food product of length L in each mold tube, and a discharge position, in which the ends of both sets of mold rods are clear of the front ends of the mold tubes and each rear mold rod fills the interior of its associated mold tube.

4,928,592

DUAL INJECTION CAKE FILLER APPARATUS

Mark Moshier, Manchester, and Ron Politte, Bridgeton, both of Mo., assignors to Continental Baking Company, St. Louis, Mo.

Filed May 15, 1989, Ser. No. 352,005
Int. Cl.[5] A21C *9/00*; A23G *1/20*
U.S. Cl. 99—450.8 30 Claims



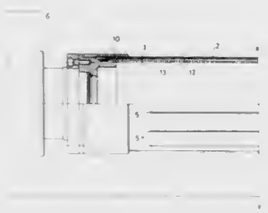
1. A dual injection cake filler assembly for injecting cakes with semi-fluid substances, said assembly comprising:
a manifold defining a pair of spaced supply channels each having an outlet passage;
valve means on said manifold for controlling flow from said channels to said outlet passages;
a needle plate secured to said manifold, said needle plate defining a pair of inlet recesses, a plurality of needle apertures, a pair of delivery channels with each channel extending from one of said inlet recesses and a plurality of needle inlet portions between said channels and said needle apertures; and
a plurality of split needles each disposed in one of said needle apertures and defining a pair of passages having upper inlets and lower needle outlet ports, said upper inlets each communicating with one of said channels through one of said needle inlet portions, said channels and needle inlet portions being dimensioned so that substantially uniform quantities of semi-fluid material are ejected from said needle discharge ports whereby a single cake may be simultaneously filled with two different fillings.

4,928,593

TENSIONING ROLLER, AND DEVICE PROVIDED WITH SUCH A TENSIONING ROLLER

Siegfried Rückl, Kufstein, Austria, assignor to Schablonentechnik Kufstein GmbH, Austria

Filed Feb. 3, 1989, Ser. No. 306,631
Claims priority, application Netherlands, Feb. 12, 1988, 8800354
Int. Cl.[5] B41F *27/00*
U.S. Cl. 101—389.1 8 Claims



1. Tensioning roller for centred accommodation during the treating of a medium according to a pattern with high-energy radiation, at least comprising a central shaft around which is placed a supporting element for the medium to be treated, which is expandable in the peripheral direction and in the expanded state is arranged symmetrically round the shaft and, measured in the radial direction going out from the shaft comprises a supporting cylinder, an inflatable bag made of elastic material, a thin-walled metal cylindrical sleeve disposed around it, centring means for centring said supporting cylinder, inflatable bag and cylindrical sleeve, and means for the supply and discharge of inflation medium for the inflatable bag, in which the cylindrical sleeve is provided with slots extending essentially in the axial direction and uniformly distributed in the peripheral direction.

4,928,594

FOLDABLE RUBBER STAMP HANDLE

Charles R. Bostick, 833 W. 11th St., San Pedro, Calif. 90731

Filed Apr. 17, 1989, Ser. No. 339,258
Int. Cl.[5] B41K *1/56*
U.S. Cl. 101—405 4 Claims



1. A foldable stamp handle comprising:
a central base having opposite ends;
a pair of end sections extending from each end of said base to provide a linear arrangement with said central base established between opposite pairs of said end sections;
an operable fold line defined between adjacent ends of each end section of said pair of end sections and between said central base and each pair of each sections;
a peelable tape backing joining said central base and said opposite pairs of end sections together in end-to-end relationship;
an adhesive layer carried on said central base and pairs of end sections beneath said peelable tape backing adapted to be exposed for securing selected end sections together and other selected end sections to said central base when said end sections are folded about said fold lines whereby said selected end sections provide a handle suitable for finger grasping; and
a rubber-like stamp carried on said central base on its side opposite from its side carrying said handle.

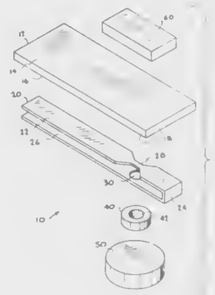
4,928,595

REVERSE SLAPPER DETONATOR

Richard C. Weingart, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 27, 1988, Ser. No. 186,527
Int. Cl.[5] F42B *3/12*
U.S. Cl. 102—202.7 5 Claims

1. A detonator, that is adapted to be driven by an externally supplied pulse of electric power, the detonator comprising:
a sheetlike insulator, having a first extended and continuous external surface, a second extended and continuous external surface that is parallel to and thinly spaced apart from the first surface, and an edging external surface that adjoins the first surface and the second surface and separates the first surface from the second surface;
a conductor, disposed along a path that proceeds along the first surface, then proceeds to fold around the edging surface, and then proceeds along the second surface, with a portion of the part of the conductor that is disposed along the path proceeding along the first surface comprising a bridge, with an aperture positioned within the part of the conductor that is disposed along the path proceeding along the second surface at a location that is directly across the insulator from the bridge, and with the conductor adapted to receive and transport the pulse of electric power along its path;
a barrel, positioned adjacent to and in alignment with the aperture in the conductor;



an explosive charge, positioned adjacent to and in alignment with the barrel; and
means for buttressing the bridge in the spatial region adjacent to the bridge that is not occupied by the insulator;
whereby, when the pulse of electric power explosively vaporizes the bridge, a portion of the insulator adjacent to the bridge is propelled through the aperture in the conductor, then through the barrel, and then against the explosive charge, thereby detonating the explosive charge.

4,928,596

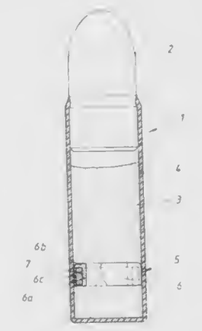
Patent Not Issued For This Number

4,928,597

RING FUZE FOR FIREARM AMMUNITION

Ulrich Zedrosser, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed May 15, 1989, Ser. No. 351,761
Claims priority, application Austria, Jun. 21, 1988, A1601/88
Int. Cl.[5] F42B *5/00*
U.S. Cl. 102—430 8 Claims



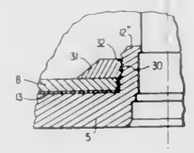
1. A ring fuze for firearm ammunition, comprising
a hollow fuze ring for mounting in a cartridge case and a primer contained in said fuze ring,
said fuze ring being substantially U-shaped in cross-section and comprising a bottom, an axially extending outer leg positioned adjacent an outer wall of said cartridge case which extends parallel to said outer leg, and an axially extending inner leg,
said inner leg being thicker than said outer leg, said fuze ring being open to the interior of said cartridge case on a side away from said bottom,
said outer leg igniting said primer when said outer wall is struck laterally by a firing pin.

4,928,598

PROPELLING CHARGE CASE

Udo Sabranski, Willich; Hans W. Luther, Kaarst; Horst Sabinski, Kaarst, and Jürgen Winkelmann, Kaarst, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 61,348, Jun. 15, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,530
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1986, 3619960
Int. Cl.[5] F42B *5/26*
U.S. Cl. 102—467 22 Claims



1. In a propelling charge case for a munition, which charge case has a body which is made of nonwoven nitrocellulose-

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based fibers, which is to be fastened to a noncombustible base having an axial collar, and which is formed to have an axial bore in one end of a size corresponding substantially to that of the outer circumference of the collar and a radially inwardly curved portion which extends to an edge surface defining said bore; the improvement wherein said body further comprises a reinforcement member, formed of one of metal and plastic, which is fixedly attached to said body, and which is disposed around said bore and extends from said edge surface toward said curved portion, whereby when said charge case is disposed in the base, the axial collar extends through said bore and a portion adjacent a portion of said body which is reinforced by said reinforcement member.

4,928,599

CONTINUOUSLY ADVANCING TRACK LEVELING, LINING AND TAMPING MACHINE

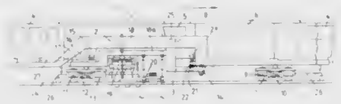
Johann Hansmann, Klosterneuburg, Austria, and Jörg Ganz, Etoy, Switzerland, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 14, 1989, Ser. No. 323,431

Claims priority, application European Pat. Off., Jul. 26, 1988, 88890196

Int. Cl.[5] E01B *27/17*

U.S. Cl. 104—12 13 Claims



1. A continuously advancing machine for leveling, lining and tamping a railroad track, which comprises

(a) a main frame extending longitudinally in the direction of the track,

(b) a single undercarriage supporting the main frame on the track and the main frame having a portion projecting in this direction from the single undercarriage,

(c) a drive means connected to the single undercarriage for continuously advancing the main frame in an operating direction,

(d) a brake means connected to the single undercarriage for stopping the advancing main frame,

(e) an operator's cab, an operating control arrangement and a power plant mounted on the continuously advancing main frame,

(f) a tool-carrying frame,

(g) an undercarriage supporting the tool-carrying frame on the track,

(1) the tool-carrying frame supporting undercarriage being spaced from the main frame supporting undercarriage, and

(2) the projecting main frame portion being longitudinally displaceably supported on the tool-carrying frame in said direction,

(h) a drive means for intermittently advancing the tool-carrying frame,

(i) track leveling and lining and tie tamping tool means mounted on the tool-carrying frame within sight of the operator's cab, the tool means including drives for operating the tool means and the drives being actuated by the control arrangement, and

(j) a track leveling and lining reference system connected to the control arrangement for actuating the drives of the track leveling and lining tools in response to the track position detected by the reference system.

4,928,600

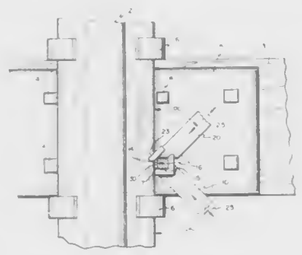
RAILROAD SPIKE HOLDING APPARATUS WITH ACUTE ANGLED JAWS

William T. Urmson, Jr., Bakerstown; Emeric Gaslevic, Glenshaw, and Ronald K. Junk, Sarver, all of Pa., assignors to Harsco Corporation, Wormleysburg, Pa.

Filed Nov. 17, 1988, Ser. No. 272,616

Int. Cl.[5] E01B *29/24*

U.S. Cl. 104—17.1 20 Claims



1. Apparatus for holding a railroad spike in a substantially vertical position while said spike is being driven into a railroad tie supporting at least one railroad rail which is being restrained against longitudinal movement by at least one rail anchor attached to said rail in abutting relationship with said tie, said apparatus being supported in a railroad spiking machine, comprising: a support member; a pair of jaws, each jaw pivotally connected to depend from said support member and to pivot in a substantially vertical plane located at an acute angle α to the vertical plane of the rail, said angle α being great enough to avoid interference between said jaws and said anchor when said jaws are pivoted out of contact with said spike and said angle α being small enough to impose sufficient mechanical leverage to firmly hold said spike when said jaws are pivoted into contact with said spike; means to rotate said jaws relative to said support member and relative to each other; the first jaw of said pair of jaws having a cradle formed therein adapted to receive a spike and further adapted to avoid interference with said spike after said spike has been partially driven into a tie and said first jaw is pivoted out of contact with said spike; and the second jaw of said pair of jaws having contact surfaces adapted to contact said spike so as to force it into said cradle and to firmly hold said spike in said cradle.

4,928,601

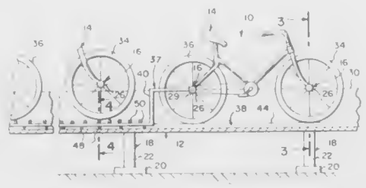
BIKE MONORAIL SYSTEM

Leroy Harder, 232 W. Laurel St., Salinas, Calif. 93906, and George Spector, 233 Broadway #3815, New York City, N.Y. 10007

Filed Jul. 10, 1989, Ser. No. 377,599

Int. Cl.[5] A63G *1/12*

U.S. Cl. 104—53 1 Claim



1. A bicycle monorail system which comprises:

(a) a monorail track having an irregular continuous path;

(b) at least two bicycles, each peddled by a rider to run within said monorail track along said irregular continuous path;

(c) means carried on each of said bicycles for keeping said bicycles centered within said monorail track;

(d) means for preventing said first and second bicycles from bumping into each other on said monorail track;

(e) a plurality of spaced apart support stands, each having a base portion and an upright post so as to elevate the entire monorail track and

(f) a loading platform disposed near said monorail track so that the riders can get on and get off said bicycles; wherein said centering means includes a ball bearing race carried on each opposite distal end of front and rear axles of said bicycles which will bear against top edges and side edges of said monorail track to keep front wheels and rear wheels of said bicycles centered therein; wherein said bumping preventing means includes:

(g) said monorail track having a centered narrow bottom recess which runs parallel therealong;

(h) a pair of elongated Z-shaped drag bars each extending from rear axle on one of said bicycles and goes within said bottom recess;

(i) ball bearings carried within opposite side walls of said bottom recess to guide said drag bars;

(j) a first set of rollers carried on bottom surface of each of said drag bars to ride within said bottom recess of said monorail track and

(k) a second set of rollers carried on top surface of each of said drag bars so that if said bicycles gets close to each other the front and rear wheels of one of said bicycles will ride upon said second set of rollers instead of bottom of said monorail track to prevent said bicycles from bumping against each other.

4,928,602

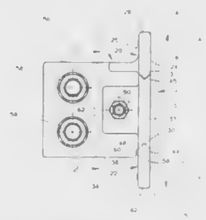
TRACK CLAMP ASSEMBLY

Edward Duczkowski, Jr., South Lyon, and Clayton C. McDonald, Howell, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Mar. 6, 1989, Ser. No. 319,544

Int. Cl.[5] E01B *25/22, 9/38;* B25G *3/20*

U.S. Cl. 104—111 16 Claims



1. A track clamp assembly engageable with a track having an I-shaped cross-sectional configuration formed by a vertical web with parallel horizontal flanges extending perpendicular thereto and having a pair of longitudinally extending oppositely facing grooves provided in the flanges on at least one side of the web adjacent to the junctions between the web and the flanges, said track clamp assembly comprising:

an upper clamp member having parallel ends spaced apart a desired distance longitudinally of said track, one end being longer than the other end, an upper edge extending between the upper extremities of said ends, and upper ramp surface means disposed between the lower extremities of said ends, said upper ramp surface means facing oppositely from said upper edge and extending obliquely relative thereto, said upper edge being insertable in the upper groove of the pair of grooves on said one side of the vertical web of the track;

a lower clamp member, said lower clamp member having shorter and longer ends arranged oppositely to said upper member ends, a lower edge extending between the lower extremities of of said shorter and longer ends, and lower ramp surface means disposed between the upper extremities of said shorter and longer ends, said lower ramp surface means facing oppositely from and extending obliquely to said lower edge in complementary relation to said upper ramp surface means, said lower edge being insertable in the lower groove of said pair of grooves on said one side of the vertical web of the track; and

means for forcing said upper and lower edges into clamped engagement with the track comprising connecting means securing said upper and lower clamp members to each other with their said upper and lower edges respectively inserted in the upper and lower grooves of said pair of grooves, and with their said upper and lower ramp surface means in interengagement, said connecting means being operable to relatively move said clamp members together along said upper and lower ramp surface means, the width dimension of said track clamp assembly between said upper and lower edges being increasable in response to such relative movement.

4,928,603

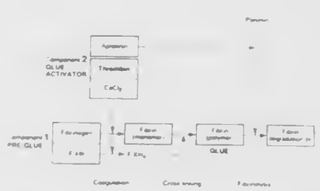
METHOD OF PREPARING A CRYOPRECIPITATED SUSPENSION AND USE THEREOF

Eric Rose, Palisades, N.Y., and Arthur Dresdale, Plainfield, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation of Ser. No. 893,338, Aug. 5, 1986, abandoned, which is a division of Ser. No. 688,601, Jan. 13, 1985, Pat. No. 4,627,879, which is a continuation-in-part of Ser. No. 648,752, Sep. 9, 1984, abandoned. This application Jun. 6, 1988, Ser. No. 203,006

Int. Cl.[5] A61B *17/04;* A61K *37/00;* C08L *89/00*

U.S. Cl. 106—124 8 Claims



1. A method of preparing a cryoprecipitated suspension containing fibrinogen and Factor XIII useful as a precursor in the preparation of a fibrin glue which consists essentially of·

(a) freezing fresh frozen plasma from a single donor which has been screened for blood transmitted diseases at about −80° C. for at least 6 hours,

(b) raising the temperature of the frozen plasma so as to form a supernatant and a cryoprecipitated suspension containing fibrinogen and Factor XIII, and

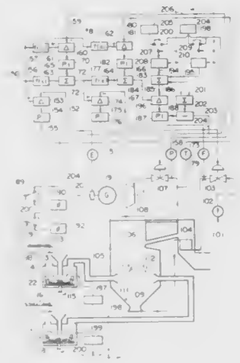
(c) recovering the cryoprecipitated suspension.

4,928,604

CONTROL SYSTEM FOR PULVERIZED COAL FIRED BOILER

Yukio Fukayama, and Taku Oshima, both of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,412
Claims priority, application Japan, May 31, 1988, 63-131342
Int. Cl.[5] F23K *3/00*; F22B *37/42*
U.S. Cl. 110—103 1 Claim



1. A control system for a pulverized coal first boiler provided with a pulverized coal producing equipment including a coal feeding section, a milling section and a classifying section and an adjuster for adjusting a coaling rate thereof, and a pulverized coal burning equipment for burning the pulverized coal supplied from said pulverized coal producing equipment, said control system comprising:

first calculating means reading in a flow rate and a grain size distribution of coal supplied from said coal feeding section, and a flow rate and a grain size distribution of coal supplied from said classifying section and calculating and outputting a flow rate and a grain size distribution of coal at an inlet of said milling section on the basis of said read flow rates and said read distributions;

second calculating means reading in said flow rate and said grain size distribution of the coal at said inlet of said milling section from said first calculating means and calculating and outputting a low rate and a grain size distribution of coal at an outlet of said milling section;

third calculating means reading in said flow rate and said grain size distribution of the coal at said outlet of said milling section from said second calculating means and calculating and outputting a flow rate and a grain size distribution of coal to be returned from an outlet of said classifying section to said milling section and a coaling rate at which coal is to be supplied to said pulverized coal burning equipment; and

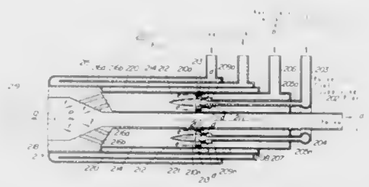
means for operating said adjuster to adjust a coaling rate at which coal is supplied from said pulverized coal producing equipment to said pulverized coal burning equipment on the basis of said coaling rate from said third calculating means.

4,928,605

OXYGEN HEATER, HOT OXYGEN LANCE HAVING AN OXYGEN HEATER AND PULVERIZED SOLID FUEL BURNER

Toshio Suwa, Kawasaki; Nobuaki Kobayashi, and Takashi Hirano, both of Tokyo, all of Japan, assignors to Nippon Sanso Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00582, § 371 Date Jul. 9, 1987, § 102(e) Date Jul. 9, 1987, PCT Pub. No. WO87/03065, PCT Pub. Date May 21, 1987
PCT Filed Nov. 14, 1986, Ser. No. 86,734
Claims priority, application Japan, Nov. 15, 1985, 60-256351; Nov. 15, 1985, 60-256352; Nov. 15, 1985, 60-256353
Int. Cl.[5] F23C *1/10*; F23D *1/00*
U.S. Cl. 110—261 12 Claims



1. A hot oxygen lance comprising an outer cylinder, oxygen supply means for supplying oxygen to the inside of the outer cylinder, and

an oxygen heater and a center pipe, both disposed within the outer cylinder, the center pipe serving as a pipe for supplying a pulverized material to the outer cylinder, the oxygen heater

defining a plurality of combustion chambers communicating with the oxygen supply means and circumferencially disposed around the center pipe, for both mixing and burning fuel with oxygen supplied thereto, each of the combustion chambers having an opening for blowing a flame, the oxygen heater including:

fuel supply means for supplying fuel to said plurality of combustion chambers; and

oxygen nozzles, surrounding the opening of each of said combustion chambers and communicating with the oxygen supply means, for allowing oxygen supplied thereto to flow out therefrom and to form oxygen curtains, each of the curtains surrounding a flame due to the combustion in the corresponding combustion chamber to protect both the outer cylinder and the center pipe from heat emitted by the flame.

4,928,606

COMBUSTION OF LOW B.T.U./HIGH MOISTURE CONTENT FUELS

Walter T. Mullen, Burlington, Canada, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 13, 1988, Ser. No. 143,902
Int. Cl.[5] F23D *1/00*
U.S. Cl. 110—347 1 Claim

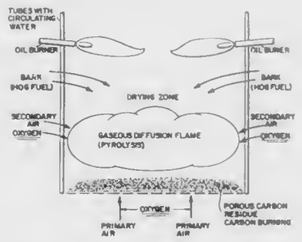
1. In a method for controlling combustion in a furnace producing steam and having a bed of burning fuel said method comprising:

measuring the long term brightness of said bed of burning fuel;

measuring the short term brightness of said bed of burning fuel; and

determining the difference between said long-term brightness and said short term brightness;

the improvement comprising admitting oxygen under or at the bed in the primary air and/or above the bed for stabilizing the combustion rate of the fuel or increasing the combustion rate of the fuel,



and controlling the amount of oxygen admitted into said furnace based on said difference.

4,928,607

ELECTRONICALLY CONTROLLED PNEUMATIC SEEDER

Luigi Gaspardo, Morsano Al Tagliamento, Italy, assignor to Gaspardo S.p.A., Italy

Filed Mar. 7, 1989, Ser. No. 320,169
Claims priority, application Italy, Mar. 16, 1988, 19792 A/88
Int. Cl.[5] A01C *7/04*; B23Q *7/02*; G07F *11/00*
U.S. Cl. 111—185 3 Claims

1. A pneumatic seeder, comprising:

a support;

a seeding unit connected to said support;

a revolving disc distributor mounted for rotation to said seeding unit and having a plurality of holes for engaging a plurality of seeds, the holes being movable in a trajectory with rotation of said distributor;

a distributor motor connected to said distributor for rotating said distributor;

a wheel rotatably mounted about an axis to said support, said wheel being adapted for contacting the ground for rotation of said wheel with movement of the support over the ground;

a speed transducer operatively connected to said wheel for transmitting a series of impulses which are indicative of speed of the support over the ground;

a blade connected to said seeding unit and movable toward and away from the trajectory of the holes of the distributor, for contacting seeds engaged with the holes of the distributor;

a blade motor connected to said blade for moving said blade;

a photocell located in the proximity of the trajectory of the holes for sensing the presence of seeds engaged with the holes;

first electronic control means connected between said speed transducer and said distributor motor for receiving the series of impulses and for controlling the speed of the distributor motor as a function of the speed of the support over the ground; and

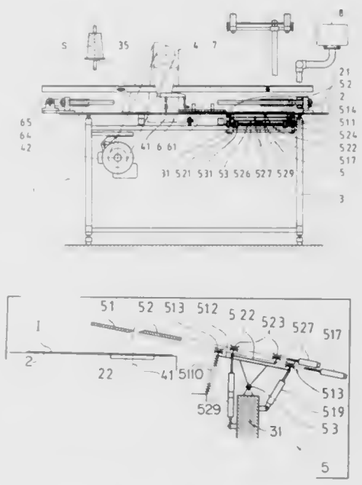
second electronic control means connected between said photocell and said blade motor for controlling the movement of said blade as a function of signals from said photocell, to move said blade motor to a greater or lesser extent into engagement with the trajectory of the holes of said distributor.

4,928,608

APPARATUS FOR JOINING THE POCKET TRIMMING AND THE POCKET BAG IN TROUSER POCKETS

Helmut Schips, Klosterweidlistrasse 1, CH-9010 St. Gallen, Switzerland

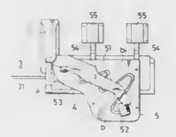
Filed Mar. 20, 1987, Ser. No. 28,568
Claims priority, application Switzerland, Mar. 24, 1986, 01171/86
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—121.12 12 Claims



1. An apparatus for joining a pocket bag to a pocket trimming at a folded fabric edge of the pocket trimming comprising means for sewing said pocket bag with said pocket trimming, means for folding said pocket trimming prior to sewing, and means for conveying said pocket bag and said pocket trimming to said means for sewing after folding of said pocket trimming, said means for folding comprising a folding plate and a holding-down plate, each of which is power operable and arranged to be pivotable up and down relative to a table plate and linearly displaceable in a direction transverse to a longitudinal extension of the table plate, said folding plate and said holding-down plate being movable independently of each other, said folding plate including a pressure cylinder for pivoting said folding plate upwardly from a horizontal position into an inclined position relative to said table plate, and a tension spring for pivoting said folding plate downwardly into a horizontal position relative to said table plate, said holding-down plate including a pressure cylinder for pivoting said holding-down plate both upwardly from a horizontal position into an inclined position relative to said table plate and downwardly into a horizontal position relative to said table plate, said folding plate and said holding-down plate each having a pressure cylinder for linearly disposing said folding plate and said holding-down plate relative to said table plate.

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4,928,609
AUTOMATIC SEWING APPARATUS
Kiyoshi Kawasaki, Akishima, Japan, assignor to Tachi-S Company, Ltd., Tokyo, Japan
Filed Mar. 20, 1989, Ser. No. 325,410
Claims priority, application Japan, Aug. 9, 1988, 63-198698
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—121.12 13 Claims

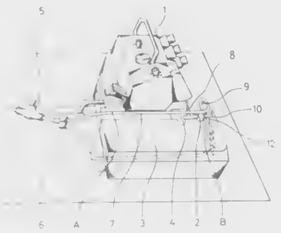




1. An automatic sewing apparatus, which is adapted for sewing a curved edge of a first blank material with an edge of a second blank material, comprising:
a sewing means;
a table of said sewing means;
a lower guide plate which is movably mounted on said table, upon which lower guide plate, secured is said second blank material;
an upper guide plate which is fixedly supported in such as manner as to be disposed above said lower guide plate, upon which upper guide plate, secured is said first blank material; and
said upper guide plate being formed with a guide groove and having a movable guide piece movable along said guide groove, said movable guide piece being adapted to secure thereon a rearward end of said first blank material and further having a slidable means which is slidably fitted in said guide groove, wherein said guide groove is formed in a shape conforming to a track which is to be shown by said slidable means in order to orient said curved edge of said first blank material in a tangentially identical direction to a sewing path of said sewing means.

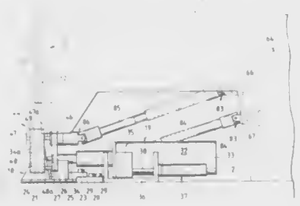
4,928,610
SEWING MACHINE PNEUMATIC DECURLER
Hiromi Akutsu, Shioya, Japan, assignor to Juki Corporation, Tokyo, Japan
Filed Oct. 31, 1988, Ser. No. 265,044
Claims priority, application Japan, Oct. 31, 1987, 62-167259[U]
Int. Cl.[5] D05B *35/00*
U.S. Cl. 112—153 9 Claims

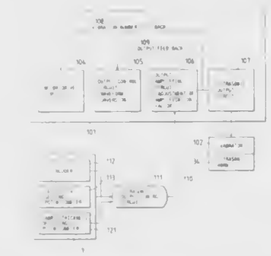
1. An apparatus for eliminating curls at the edge of a first fabric workpiece before sewing the first fabric workpiece to a second fabric workpiece along the curled edge on a sewing device having a vertically movable presser foot and a throat plate, the curl eliminating apparatus comprising:
means for generating air flow;
a first tube having a first end portion connected to said means for generating air flow and a second end portion fixed on the presser foot, said second end portion including an opening facing said curls and a contact portion extending horizontally and overlapping said curled edge of said first fabric workpiece for contacting with said curled edge when said presser foot moves downwardly;
a second tube having a first end connected to said means for generating air flow and a second end situated under the throat plate and including an opening facing said curls, and



a valve positioned between said means for generating air flow and first and second tubes for controlling air flow.

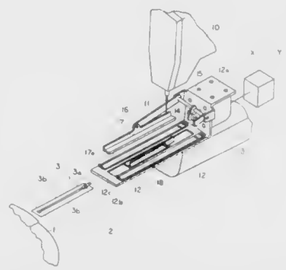
4,928,611
SEWING MACHINE WITH GUIDE AND IRONING MEANS FOR FOLDING BACK AND PRESSING STITCHED FABRIC MARGINS
Yoshitake Ogawa, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Nov. 8, 1989, Ser. No. 433,225
Claims priority, application Japan, Nov. 15, 1988, 63-288497; Nov. 15, 1988, 63-288498
Int. Cl.[5] D05B *35/02*
U.S. Cl. 112—217 7 Claims





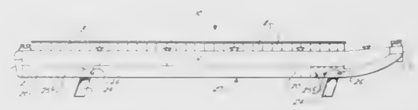
1. In a sewing machine including:
stitching means for stitching upper and lower fabric pieces;
feed means for feeding the upper and lower fabric pieces which are stitched together;
a guide means for folding back, away from each other, stitched margins of the upper and lower fabric pieces fed by the feed means, the guide means being disposed downstream of a point where the upper and lower fabric pieces are stitched by the stitching means with respect to the direction in which the upper and lower fabric pieces are fed by the feed means; and
ultrasonic heating means for ironing the stitched margins of the fabric pieces which have been folded back by the guide means, the improvement comprising:
fabric thickness detecting means for detecting the thickness of the upper and lower fabric pieces upstream of a point where the upper and lower fabric pieces are heated by the ultrasonic heating means, and for producing a thickness signal representing the detected thickness;
determining means for producing a determining signal when a region of the upper and lower fabric pieces which has been detected by the fabric thickness detecting means is fed by the feed means and reaches the point where the upper and lower fabric pieces are heated by the ultrasonic heating means; and
control means responsive to the determining signal for producing a control signal to iron and heat the upper and lower fabric pieces depending on the thickness thereof based on the thickness signal from the fabric thickness detecting means and for applying the control signal to the ultrasonic heating means.

4,928,612
AUTOMATIC SEWING MACHINE EXCLUSIVELY USED FOR SEWING ZIPPER ON WORKPIECE
Tohru Hiramatsu; Kazuya Tami, and Torao Ohchi, all of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Division of Ser. No. 882,884, Jun. 24, 1986, Pat. No. 4,854,251.
This application May 2, 1989, Ser. No. 346,122
Int. Cl.[5] D05B *75/00, 29/00*
U.S. Cl. 112—257 4 Claims



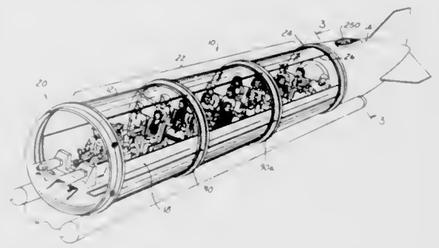
1. A zipper setting device adapted to be detachably attached to a drive device biaxially movable in a plane vertical to the movement direction of the needle of a sewing machine comprising:
a platform having an attachment portion detachably secured to said drive device and an opening through which said needle passes;
a zipper holding-down member provided on said platform adjacent to said opening in the platform for detachably holding said zipper on the platform in alignment with a predetermined position on the platform; and
a workpiece holding-down mechanism provided on said mount for detachably holding said workpiece on the platform in a predetermined position with respect to said zipper.

4,928,613
RETRACTABLE STEERING DEVICE FOR CARGO BARGES THAT INCREASES MANEUVERABILITY BY PROVIDING A PIVOT POINT OR POINTS WHEN ALTERING COURSE
William B. Rudolf, 10001 Point Aux Chenes Rd., Ocean Springs, Miss. 39564
Filed Nov. 9, 1988, Ser. No. 269,242
Int. Cl.[5] B63H *25/00*
U.S. Cl. 114—26 14 Claims



1. A retractable steering device for maneuvering liquid/bulk cargo carrying barges that can be lashed together to form a tow, comprising:
(a) a rectangular barge hull having a generally flat bottom defining a lowermost horizontal base plane surface and an upper deck, and generally vertical port and starboard sidewalls;
(b) a cargo hold contained at the central portion of and extending over a substantial portion of the barge hull area for containing a bulk or liquid cargo;
(c) port and starboard wing tanks positioned respectively between the port and starboard sidewalls of the hull and the cargo hold;
(d) a pair of longitudinally extending slots positioned adjacent the respective port and starboard wing tanks and defining an opening that communicates at least with the barge bottom to provide an opening to the sea under the barge horizontal base plane surface at the respective wing tanks; and
(e) a pair of steering members adapted to move within the respective slots and each being movable between an extended position wherein the steering member extends downwardly well below the barge hull bottom horizontal base plane surface when the barge hull floats high such as when empty to increase tow maneuverability by creating a steering pivot point when the barge is being pushed, and a retracted position wherein the steering member is protectively contained within the slot.

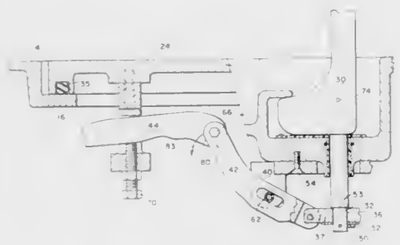
4,928,614
SUBMERSIBLE OBSERVATION VESSEL
Willis R. Forman, San Diego, Calif., assignor to Ronald Nilson and Sea View Enterprises, both of St. Clair Shores, Mich., a part interest
Filed Apr. 12, 1989, Ser. No. 337,179
Int. Cl.[5] B63B *35/72*
U.S. Cl. 114—66 21 Claims



1. A hull comprising:
(a) first and second encircling end sealing means;

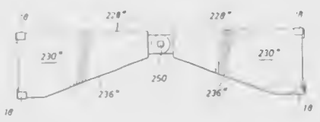
(b) a hatch mounted on and closing one side of said first end sealing means;
(c) a bulkhead mounted on one side of and closing said second end sealing means;
(d) at least one intermediary encircling sealing means; and
(e) a plurality of transparent cylinders with peripheral ends interposed between said intermediary sealing means and said first and second end sealing means.

4,928,615
HATCH COVER
John E. Williams, 5727 Nakat Way, Blaine, Wash. 98230
Filed Mar. 27, 1989, Ser. No. 328,620
Int. Cl.[5] E05D *15/54*
U.S. Cl. 114—203 5 Claims



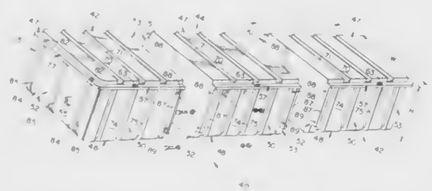
1. A cover for a hatch which cover will engage with a rim to produce a water tight seal, which comprises:
a. a plate capable of seating in said rim:
b. a shaft extending vertically through an aperture in said plate and slidably received the rein:
c. handle means on one size of said plate, one end of said handle means pivotally connected to said shaft to move said handle from a closed position parallel to said plate to an open position substantially perpendicular to said plate where by said handle means may impart vertical movement to said shaft with respect to said plate; and
d. a plurality of arm assemblies extending radially outward from said shaft on the size of said plate opposite said handle, whereby movement of said handle vertically moves said shaft which imparts movement to said arm assemblies, thereby extending or retracting said arm assemblies to engage with or disengage from said rim.

4,928,616
CONSTRUCTION TRANSPORATION SYSTEM
Alces P. Robishaw, and Paul A. Robishaw, both of Houston, Tex., assignors to Robishaw Engineering, Inc., Houston, Tex.
Division of Ser. No. 70,348, Jul. 7, 1987, Pat. No. 4,811,681, which is a continuation of Ser. No. 757,631, Jul. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 642,181, Aug. 17, 1984, Pat. No. 4,610,215. This application Mar. 14, 1989, Ser. No. 323,344
Int. Cl.[5] B60P *7/13*
U.S. Cl. 114—267 4 Claims



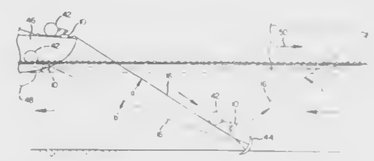
1. A transportation and construction method comprising the steps of:
connecting together at least two construction components to form a transport assembly having gross dimensions generally corresponding to those of an ISO standard freight container, said two components being rake components each having a bottom which is graduated, whereby the rake component has a deep end and a shallow end, the two rake components being connected in said transport assembly with their shallow ends adjacent to and facing each other and their deep ends forming respective outer ends of the assembly;
transporting the assembly to a construction site in the manner of an ISO standard freight container;
disconnecting the components of the assembly; and
reassembling said components with other components in a configuration different from the transport assembly, to form a structure.

4,928,617
MODULAR FLOAT DRUM SYSTEM
Jon D. Meriwether, Follansbee, W. Va., assignor to The Louis Berkman Company, Steubenville, Ohio
Continuation of Ser. No. 280,214, Dec. 5, 1988, abandoned, which is a continuation of Ser. No. 84,159, Aug. 12, 1987, Pat. No. 4,799,445. This application Nov. 22, 1989, Ser. No. 440,444
Int. Cl.[5] B63B *35/00*
U.S. Cl. 114—267 7 Claims



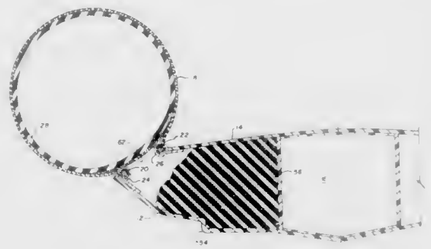
1. A modular float drum assembly for use in supporting a floating structure comprising:
at least two one-piece, plastic molded float drum modules, each drum module having a top wall, a bottom wall and contiguous first, second, third and fourth side walls extending between said top and bottom walls to define a buoyant enclosure contained therein;
rigidizing means integrally formed in each module to rigidize each module against deformation, said rigidizing means including a generally flat first wall segment contiguous with said top wall, a generally flat second wall segment spaced a distance away from said first wall segment and contiguous with one of said side walls, and an end wall segment interconnecting said first wall segment with said second wall segment, said first and second wall segments having essentially identical openings formed therein and aligned with one another, and an interconnecting wall segment extending about at least a portion of the peripheral edge of said openings and also interconnecting said first and second wall segments whereby a double wall construction rigidizes said module when fasteners securing said module to said floating structure are applied through said openings; and
module securing means formed in one of the side walls of each module for releasably joining one module to another module in an aligned relationship where the modules are in side-by-side physical contact with one another.

4,928,618
CONNECTOR FOR ATTACHING A FLOAT TO A SMALL BOAT ANCHOR LINE
Walter R. Kubli, 5040 S.W. Texas St., Portland, Oreg. 97219
Filed Mar. 3, 1989, Ser. No. 318,545
Int. Cl.[5] B63B *21/22*
U.S. Cl. 114—293 2 Claims



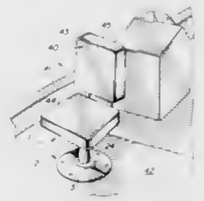
1. A connector for attaching a float to an anchor line, comprising:
a tubular member having open ends,
said tubular member including a pair of cooperating sections hingedly connected together longitudinally thereof and arranged to be opened to allow the anchor line to be inserted or removed laterally from the side,
releasable fastening means on said tubular member arranged to connect said sections together to confine the anchor line therein or to allow insertion or removal of the anchor line,
and a lever pivotally mounted on said tubular member having a projecting end connected directly to a float and an inner blade end engageable with the anchor line for providing unidirectional movement of the anchor line under the influence of the float.

4,928,619
MODULAR RIGID INFLATABLE AQUATIC VESSEL STRUCTURE
William H. Cochran, P.O. Box 252, Exeter, R.I. 02822
Filed Nov. 29, 1988, Ser. No. 277,381
Int. Cl.[5] B63B *7/00*
U.S. Cl. 114—345 41 Claims



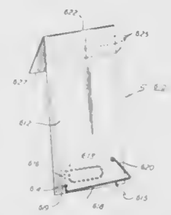
1. A boat having a hull and comprising:
a hull portion disposed generally at and below the water level of the hull;
a flexible hull portion, said flexible hull portion including a flexible shroud element and at least one buoyant element, said flexible hull portion being disposed generally at and above the water level of the hull;
first connecting means for connecting said shroud element to said hull portion along at least a longitudinal side edge of said shroud element;
a deck part extending longitudinally at least a substantial portion of the length of the hull portion and transversely at least a substantial portion of the width of the hull portion;
a box girder means provided along the longitudinal axis of the boat and mounted between said deck part and said hull portion, said box girder means having first and second longitudinally extending sidewalls, said sidewalls being laterally spaced from said at least one buoyant element; and
second connecting means for connecting said shroud element to said deck part along at least a longitudinal side edge of said shroud element so that said shroud element surrounds said at least one buoyant element and mounts the same to said deck part and said hull portion.

4,928,620
SEAT PEDESTAL MOUNT
Lesley B. Currey, 122 Park St., Monticello, Ark. 71655
Filed Sep. 1, 1988, Ser. No. 239,407
Int. Cl.[5] B63B *29/00*
U.S. Cl. 114—363 13 Claims



1. A seat pedestal mount for removably mounting a seat having a seat pedestal on a stable surface, comprising a base plate having a plate flange adapted for mounting on the stable surface; a bushing seat carried by said plate flange, said bushing seat adapted for recessing in the stable surface; a seat slot provided in said bushing seat and a nut provided in said seat slot; a seat shoulder located above said seat slot and a lock washer located on said seat shoulder; a threaded nipple projecting from the seat pedestal for threadably engaging said lock washer and said nut; and bushing means inserted in said bushing seat, whereby the seat pedestal is inserted in said bushing means and the seat is securely mounted above the stable surface.

4,928,621
BOOKMARKER
Scott A. Capamaggio, 6377 Mill Pond Road, Byron, N.Y. 14422
Continuation-in-part of Ser. No. 184,369, Apr. 21, 1988, Pat. No. 4,813,370. This application Dec. 21, 1988, Ser. No. 287,118
Int. Cl.[5] B42D *9/02*
U.S. Cl. 116—234 8 Claims



7. A bookmarker for use with a book comprising:
a removable rigid support structure having a first end and a second end, said rigid support structure being substantially flat and designed for placement between pages of a book, said second end of said rigid structure extends below the edge of the page, said second end being capable

of being folded to help source said bookmarker within said book;

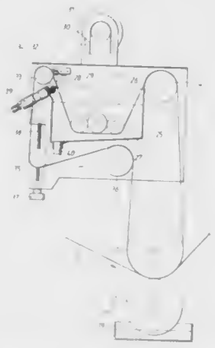
a retaining spring for marking a place in said book, said retaining spring being secured to said first end of said rigid support structure and comprising generally a horizontal section and a generally vertical section which extends into said book for placement against the pages of the book.

4,928,622

MACHINE FOR APPLYING ADHESIVE TO AN ELONGATE SHEET MATERIAL

Lennart Larsson, Malmö , and Arne Andersson, Dalby, both of Sweden, assignors to AB Akerlund & Rausing, Sweden

Filed Jan. 27, 1989, Ser. No. 303,750
Claims priority, application Sweden, Feb. 12, 1988, 88004700
Int. Cl.[5] B05C *1/12*
U.S. Cl. 118—70 **3 Claims**



1. A machine for applying adhesive on one side of an elongate sheet material comprising:

an adhesive application roller having a width along a rotational axis,

a driven pressure roller having a width along a rotational axis, said pressure roller disposed adjacent said application roller so that a nip is formed between said pressure roller and said application roller,

means for passing the sheet material through said nip, said width of each of said application roller and said pressure roller surpassing the width of the sheet material,

an adhesive containing trough disposed in spaced relation to said application roller so that said application roller extends into said adhesive containing trough,

an endless belt arranged for rotation around said pressure roller, said endless belt having an outer surface acting as the contact surface of said pressure roller upon the sheet material,

second trough means containing a rinsing fluid,

at least one guide roller means guiding said endless belt through said second trough to rinse a section of said belt,

brush roller means mounted in said second trough adjacent said outer surface of said endless belt, said brush roller means being driven in counter rotation to said direction of rotation of said endless belt, and

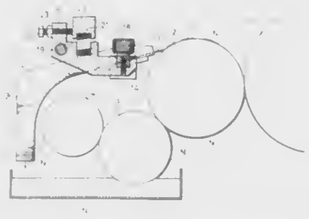
further guiding means to guide said rinsed section of said endless belt back to said pressure roller.

4,928,623

VARNISH COATING MECHANISM

Yasutaka Kojima, Tokyo, Japan, assignor to Akiyama Printing Machine Manufacturing Company, Ltd., Tokyo, Japan

Filed Sep. 13, 1988, Ser. No. 243,806
Claims priority, application Japan, Apr. 26, 1988, 63-103488
Int. Cl.[5] B05C *1/02*
U.S. Cl. 118—249 **4 Claims**



1. In an offset printer comprising a frame, a storage vessel, an applicator roller transferring varnish from the storage vessel to a blanket drum, the blanket drum transferring said varnish to a printed surface, the improvement comprising apparatus for scraping varnish from the applicator roller after the applicator roller has transferred varnish from the storge vessel to the blanket drum, said apparatus comprising a scraping blade, a support to which said scraping blade is mounted and means for mounting said support to the frame of said printer to resiliently bias said scraping blade in contact with said applicator roller for removing any remaining varnish from the applicator roller after transferring varnish to said blanket drum, said support comprising a vessel guiding the removed varnish from the applicator roller to said storage vessel whereby the scraped varnish is recycled.

4,928,624

POWDER SPRAY BOOTH WITH OVERSPRAY COLLECTION SYSTEM

Duncan E. Overton, Jr., 1016 Oglewood Ave., Knoxville, Tenn. 37917

Continuation-in-part of Ser. No. 12,798, Feb. 9, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 240,075
Int. Cl.[5] B05B *15/12*
U.S. Cl. 118—308 **4 Claims**



1. A powder spray booth for spray coating articles with powder using a spray gun, said powder spray booth being connectable to an external blower means, said spray booth comprising:

a spray chamber defined by a pair of oppositely disposed end walls and front and rear walls thereby defining an interior volume wherein said articles are sprayed, said spray chamber defining a first opening in said front wall for receiving said spray gun therethrough and a further opening in a selected one of said front wall and said rear wall for accessing said interior volume for cleaning, said spray chamber having an open bottom portion;

closure means for selectively closing said further opening, said closure means including top and bottom frame members provided with cooperating channels and removable panel members disposed in said channels, said panel members being inserted into said channels by a lift-up/slide-in motion and being removed from said channels by a lift-up/slide-out motion;

a base portion secured to said open bottom portion of said spray chamber, said base portion including an oversprayed powder collection section disposed beneath said spray chamber, said oversprayed powder collection section having at least two oppositely disposed downwardly converging sidewalls, a clean air plenum section having a common wall with said oversprayed powder collection section, and means for supporting said booth above a floor, said oversprayed powder collection section having an open top portion which cooperates with said open bottom portion of said spray chamber whereby heavier particles of oversprayed powder fall by gravity into said oversprayed powder collection section and whereby said oversprayed powder collection section is accessible through said further opening in said spray chamber;

cantilevered support means attached to said common wall between said clean air plenum section and said oversprayed powder collection section;

filter means supported on said support means and in fluid communication with said clean air plenum section, said filter means comprising at least one canister-type filter clement provided with an axial passageway, said filter means accessible from said further opening of said spray chamber;

fastening means for releasably securing said filter means to said common wall between said oversprayed powder collection section and said clean air plenum section

an exhaust port means for connection to said external blower means, said exhaust port means being positioned in an exterior wall panel of said clean air plenum section whereby air is drawn from said spray chamber through said filter means into said clean air plenum section through an opening in said common wall and exhausted exterior to said booth by said blower means, thereby causing lighter oversprayed powder particles entrained in said air to be collected on an exterior surface of said filter means; and

container means releasably secured to said base portion proximate an opening defined by a bottom portion of said oversprayed powder collection section whereby heavier particles of oversprayed powder fall by gravity into said container means.

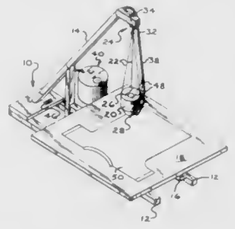
4,928,625

PENDULUM MOUNTED AIRBRUSH

William A. Woods, Redford, Mich., assignor to Spirotron Corporation, Detroit, Mich.

Filed Sep. 25, 1989, Ser. No. 412,189
Int. Cl.[5] B05B *13/04;* B05C *5/00*
U.S. Cl. 118—323 **11 Claims**

1. An apparatus for painting unique abstract designs on substrate utilizing pendulum motion, comprising, in combination, a frame member, a pendulum mass, support means suspending said mass from said frame member permitting said mass to swing freely in any direction under the influence of gravity, a substrate support located below said pendulum mass, a reservoir capable of containing one or more colors of a pigment containing medium, and medium applying means defined on said pendulum mass in communication with said



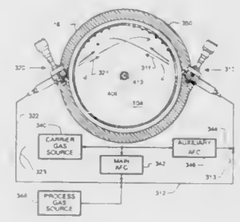
reservoir capable of applying said one or more colors of said medium to the associated substrate as said mass is swinging.

4,928,626

REACTANT GAS INJECTION FOR IC PROCESSING

David K. Carlson, Santa Clara, and Paul R. Lindstrom, Aptos, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed May 19, 1989, Ser. No. 353,929
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—715 **10 Claims**



1. In a thermal reactor for semiconductor processing, a gas injection system comprising:

a reaction chamber, said chamber having a chamber axis of symmetry generally parallel to which semiconductor wafers are arranged so that reactant gas flowing generally parallel to said chamber axis can interact with major surfaces of said wafers, said chamber including a shroud means for diverting injected gas, said shroud means including an injection origin defining an injection plane therethrough perpendicular to said chamber axis and an injection line therethrough parallel to said chamber axis;

a first nozzle for injecting a first gas jet into said chamber along a first path toward said shroud;

a second nozzle for injecting a second gas jet into said chamber along a second path toward said shroud;

nozzle control means for controlling said first and second nozzles so that said first and second gas jets flow at least partially against each other and against said shroud to promote a combined gas flow generally parallel to said chamber axis, said nozzle control means providing for direction control of each of said first and second nozzles so that the direction of each gas jet can be changed azimuthally relative to said injection line and in elevation relative to said injection plane to control said combined gas flow; and

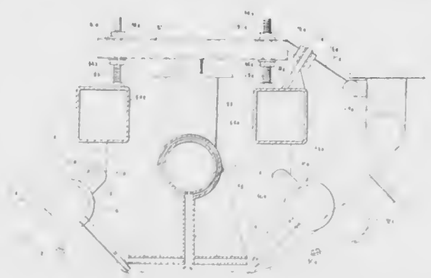
gas source means for providing reactant gas flow to said first and second nozzles for introduction into said chamber;

a coarse flow controller for providing a relatively coarsely regulated gas flow from said gas source, said first coarse

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flow controller having a coarse control input for controlling the rate of gas flow therethrough;
a first conduit for conveying gas provided by said coarse flow controller to said first nozzle
a second conduit for conveying gas provided by said coarse flow controller to said second nozzle, said first and second conduits being designed so that more of the gas flow provided by said coarse flow controller is directed through said first nozzle than through said second nozzle;
a third conduit for conveying gas from said gas source to said first nozzle; and
a fine flow controller for providing a relatively finely regulated gas flow from said gas source through said third conduit, said fine flow controller having a fine control input for controlling the rate of gas flow through said third conduit so that the gas flows through said first and second nozzles can be precisely balanced.

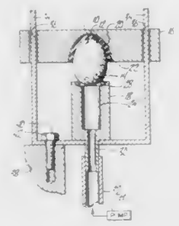
4,928,627
APPARATUS FOR COATING A SUBSTRATE
Georg H. Lindner, Haydnlaan, Netherlands, assignor to Atochem North America, Inc., Somerville, N.J.
Continuation-in-part of Ser. No. 812,873, Dec. 23, 1985, abandoned. This application Jul. 9, 1987, Ser. No. 71,501
Int. Cl.[5] B05B *15/12, 15/08*
U.S. Cl. 118—718 **21 Claims**



1. Apparatus for depositing a film on a surface of a substrate maintained at a deposition temperature comprising:
a pair of opposing coating nozzle means directed toward each other for applying a vaporized coating chemical in a carrier gas to said surface at such a concentration and vapor velocity that deposition of said film is carried out under substantially reaction-rate-controlled conditions, said nozzle means having angle-adjustment means,
each of said nozzle means being positioned adjacent said surface of said substrate with a clearance therebetween which is open to the outside atmosphere and at an angle of from about 30 to about 70 degrees with respect to a normal to said surface such that there is substantially no intermixing of chemical vapors with said outside atmosphere,
supply means for said vaporized coating chemical and carrier gas to said nozzles, and
exhaust means for removing exhaust material.

4,928,628
EGG INOCULATION DEVICE AND METHOD OF USING SAME
Max P. Gassman; David J. Larson, and Darrell W. Trampel, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Jun. 13, 1988, Ser. No. 205,950
Int. Cl.[5] A01K *45/00*
U.S. Cl. 119—1 **16 Claims**

1. An apparatus for inoculating soluble materials into an egg having a shell, a smaller end and a larger end, comprising:
a support means for holding said egg against movement;
means for supplying said soluble materials to the surface of said egg at positive pore-penetrating pressure including a

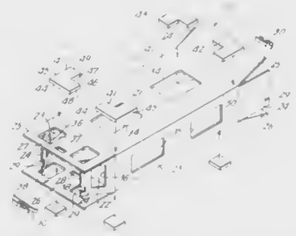


transport means having two open ends and a hollow center for carrying said soluble materials to said egg, one of said ends of said transport means abutting one of said ends of said egg.

4,928,629
EGG INOCULATION METHOD
Darrell W. Trampel, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Jun. 13, 1988, Ser. No. 205,861
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—1 **14 Claims**

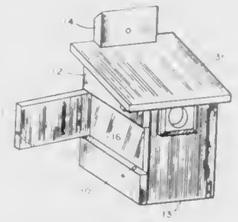
1. A method of inoculating soluble materials into an egg having a large end and a small end, a shell with pores, and a cuticle surrounding said shell, comprising:
removing at least a portion of said cuticle from said egg;
forcing soluble materials with a pump to said egg having said cuticle removed at a positive pore-penetrating pressure above ambient atmospheric pressure which allows said shell to remain intact so that said soluble materials pass through said pores into said egg.

4,928,630
CONTAINER FOR SHIPPING LABORATORY ANIMALS
Julius B. Kupersmit, 299 W. 12th St., New York, N.Y. 10014
Filed Apr. 24, 1985, Ser. No. 726,910
Int. Cl.[5] A01K *31/00*
U.S. Cl. 119—17 **3 Claims**



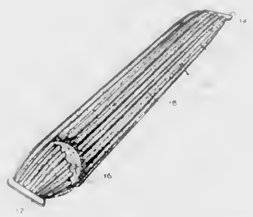
1. A container for shipping laboratory animals comprising: an outer container element and at least one inner container element selectively positionable within said outer container element; said outer container element being formed of corrugated material and including an upper wall, a lower wall, a pair of side walls, and plural flaps forming closures at first and second ends thereof; said upper wall and at least one of said side wall and end flaps having through openings therein for the circulation of ambient air therethrough when said outer container is in assembled closed condition. Said upper wall having an upper surface, a plurality of planar generally L-shaped tabs secured to said upper surface at the corners thereof in such location that a pair of mutually perpendicular corners thereof extend outwardly beyond said corners; whereby upon the stacking of a plurality of said outer containers, said tabs maintain a predetermined distance between said upper surface of one container and a lower surface of a second container supported immediately thereabove to provide a path for the flowing of air through said opening in said upper wall thereof.

4,928,631
BLUEBIRD HOUSE
Cliff A. Smith, 5617 Kenilworth Cir., Shreveport, La. 71129
Filed Feb. 13, 1989, Ser. No. 310,213
Int. Cl.[5] A01K *31/14*
U.S. Cl. 119—23 **1 Claim**



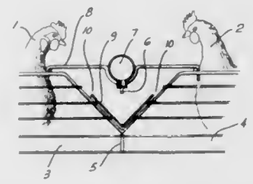
1. In a house for the nesting of birds having, in combination, a box-like structure consisting of left and right sidewalls, a back wall, a front wall, a roof and a floor; an entry-way in said front wall for the ingress and egress of said birds, a transparent window affixed to said front and back walls, said left wall consisting of three sections, one of which is hinged to said back wall and serving as a shutter for said window, said hinged section being of an area equal to, or less than, one third of the area of the entire area of said left wall, said right wall constituting an upper and a lower section, said lower section being removably affixed to the edge portions of said front and back walls to provide emergency access to the nesting area within said box-like structure, and wherein said back wall is provided with vertically disposed channels thereon to assist in diverting rain water away from said house and means for mounting said house to a tree or the like.

4,928,632
CAT TOY
Richard A. Gordon, 95 W. 3rd St., Freeport, N.Y. 11520
Filed Sep. 13, 1988, Ser. No. 243,805
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—29.5 **20 Claims**



1. An animal toy comprising an elongated tubular container formed of a flexible maleable plastic, said container having disposed in the interior thereof at least one material which exhibits a positive attraction to an animal, the wall of said container being provided with a plurality of random pores which, when said wall is in relaxed condition, are sealed but which open to release a portion of said material from said container when an animal manipulates said container, whereby the attraction of said animal to the top formed by said container is prolonged, and said animal is caused to further bite and play with said toy.

4,928,633
WATER SUPPLY APPARATUS
Norman T. Jennings, Mile End Road, Rouse Hill, New South Wales 2153, Australia
Continuation of Ser. No. 104,823, Oct. 5, 1987, abandoned. This application May 30, 1989, Ser. No. 361,789
Int. Cl.[5] A01K *39/02*
U.S. Cl. 119—75 **5 Claims**

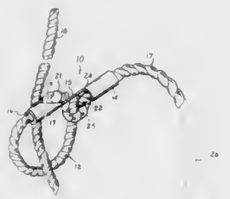


1. A water supply apparatus for caged fowls comprising a water supply channel having a water oulet with nipple means actuable by said fowl to enable said fowl to drink directly from said water outlet;
trough means positioned immediately below said water outlet and extending generally parallel to said water supply channel to catch substantially all water spillage from said water outlet, nipple means and from the beaks and necks of said fowl during drinking;
said trough means being located closely adjacent said water outlet and well above the level of excrement of said caged fowl such that said fowl is prevented from excreting into said trough means; and physical barrier means positioned close to said water oulet and said nipple means to allow said caged fowl to only approach and drink water from said water outlet with their necks substantially horizontal or inclined downwardly toward said trough means so that substantially all spilled water during drinking tends to drip down the necks and beaks of said caged fowl and into said trough means; said water outlet, nipple means and said physical barrier means being at a level with respect to ground bascially vertically aligned with the necks of said fowl when said fowl stands erect.

4,928,634
HONDA BREAKAWAY
Dean J. Voigt, R.R. 1 Box 292, Zap, N. Dak. 58580
Filed Dec. 15, 1988, Ser. No. 284,906
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—153 **8 Claims**

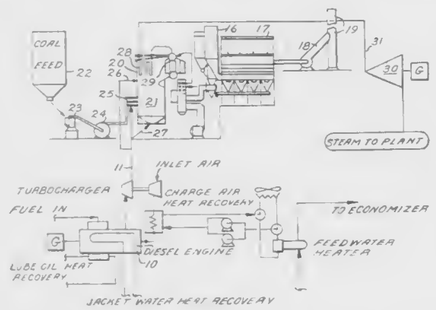
1. A honda breakaway for attaching to a rope in making a lariat, comprising:
an elongated unitary member having first and second ends, a central portion connecting said first and second ends, said first end having means to grasp a first end of a rope;
said second end adapted to grasp and hold an end of said rope and slidably release said rope upon application of a predetermined amount of force
wherein said second end is substantially tubular throughout

its entire length and includes an axial slit completely through said second end permitting said end to flex and



permit said rope to slide through said slit upon application of said predetermined amount of force.

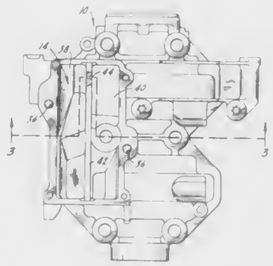
4,928,635
POWER PLANT AND METHOD OF RETROFITTING EXISTING POWER PLANTS
Mack Shelor, 14304 Longate Rd., Midlothian, Va. 23112
Filed Jul. 20, 1989, Ser. No. 383,064
Int. Cl.[5] F22D *1/00*
U.S. Cl. 122—7 R 11 Claims

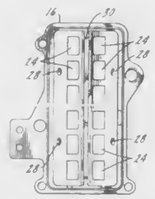


1. A power plant comprising:
a. a coal-fired boiler, having a boiler space, heat exchanging means for generating steam, one or more air ports and exhaust means
b. an internal combustion engine, having an exhaust means, wherein the exhaust means of the engine are connected to the air ports of the boiler;
c. a thermal NO_x reduction system disposed in said boiler;
d. steam generation means operably connected to said boiler.

4,928,636
EQUALIZER PORT
Lyle E. Weed, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Apr. 13, 1989, Ser. No. 337,424
Int. Cl.[5] F02N *17/00*
U.S. Cl. 123—73 R 15 Claims

1. In a two-cycle internal combustion crankcase compression engine having a fuel induction system including at least two separate crankcase compartments and a reed block shared by and separating at least two of the crankcase compartments, the reed block having an inlet into each shared compartment, the improvement comprising means communicating between





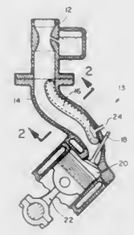
the crankcase compartments for equalizing pressure between the compartments.

4,928,637
SYSTEM FOR COOLING AN INTERNAL COMBUSTION ENGINE INCLUDING A TURBOCHARGER
Takao Naitoh, and Seidai Nakayama, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 24, 1989, Ser. No. 397,961
Claims priority, application Japan, Aug. 30, 1988, 63-216093
Int. Cl.[5] F01P *3/12*
U.S. Cl. 123—41.31 2 Claims



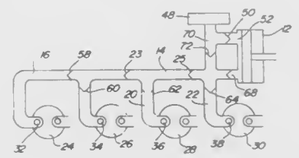
1. In a system for cooling an internal combustion engine having a turbocharger attached thereto wherein said system includes a pump driven by said engine, a water jacket provided for the engine including an engine coolant recirculating circuit between said water jacket for the engine and a radiator, a water jacket provided for said turbocharger, said water jacket for the turbocharger being branched from said water jacket for the engine, and a coolant feeding tank of which water level is set to a position higher than those of the turbocharger and an air venting portion at an upper part of said radiator, said coolant feeding tank including a turbocharger coolant recirculating circuit between the turbocharger and the water pump, the improvement comprising;
an air chamber provided at an upper part of the coolant feeding tank, said air chamber being communicated with an outlet of the water jacket for the turbocharger via an outlet pipe,
an outlet connected to the tank at a bottom of the tank, said outlet being communicated with a suction side of the pump via a return pipe,
an air venting passage connected to the air chamber in the tank at a higher position than the water level in the coolant feeding tank, said air venting passage being equipped with an one-way valve at an outlet opening portion thereof, an inlet of said air venting passage being communicated with said air venting portion of the radiator via an air venting pipe, and
the air chamber being arranged in the turbocharger coolant recirculating circuit.

4,928,638
VARIABLE INTAKE MANIFOLD
Wayne W. Overbeck, 329 Ingalls St., Santa Cruz, Calif. 95060
Filed Sep. 12, 1989, Ser. No. 406,368
Int. Cl.[5] F02M *35/00*
U.S. Cl. 123—52 M 9 Claims



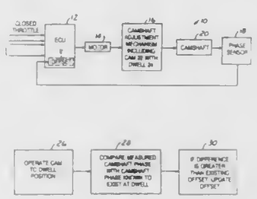
1. A variable intake manifold system for an internal combustion engine comprising:
an inflatable bladder installed within the intake manifold so as to partially cross sectionally occlude a fuel/air mixture flow path;
means for inflating and deflating the bladder so as to occlude a cross-section of said flow path; and
means for controlling the inflating and deflating means in response to preselected engine parameter conditions.

4,928,639
MULTICYLINDER IC ENGINE WITH A STROKE CHARGING DEVICE
Oskar Schatz, Waldpromenade 16, 8035 Gauting, Fed. Rep. of Germany
Filed Nov. 4, 1988, Ser. No. 267,445
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737829
Int. Cl.[5] F02M *35/10*
U.S. Cl. 123—52 MF 8 Claims



1. A multicylinder IC engine of the piston type with a stroke charging device (12; 12, 74, 92; 92), in the case of which branch ducts (16, 18, 20, 22; 76, 78, 80 and 82) extend from at least an air manifold (14 and 14') to the individual engine cylinders (24, 26, 28 and 30) and are able to be shut off at the respective cylinder (24, 26, 28 and 30) by at least one inlet valve (32, 34, 36 and 38) characterized in that each branch (16, 18, 20, 22; 76, 78, 80 and 82) is provided with a further valve (58, 60, 62, 64; 84, 86, 88 and 90) and additional valve means arranged in said air manifold between the respective sequential branches of branch ducts.

4,928,640
AUTOCALIBRATION OF CAMSHAFT PHASING FEEDBACK IN A VARIABLE VALVE TIMING SYSTEM
Willem N. J. van Vuuren, Williamsburg, and Russell J. Wakeman, Newport News, both of Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.
Filed Jul. 20, 1989, Ser. No. 383,385
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.17 18 Claims



1. In a variable valve timing system for an automobile engine wherein a camshaft that operates valves associated with cylinders of the engine is adjustably phased relative to the engine's crankshaft by means of a closed-loop control that includes a sensor that senses the phase of the camshaft relative to the phase of the crankshaft, the improvement comprising autocalibration means for enabling the system to automatically calibrate itself such that discrepancies between the true camshaft phasing relative to the crankshaft and the apparent camshaft phasing as determined by said sensor are substantially eliminated, said autocalibration means comprising means defining a zone of operation for said system at a known phase relation to the camshaft wherein a certain commanded adjustment of the camshaft phasing produces no corresponding adjustment of the camshaft phasing and hence no corresponding change in the camshaft phasing indicated by said sensor, comparison means responsive to this lack of response of the camshaft to the commanded adjustment for comparing the phasing of the camshaft that is being concurrently indicated by said sensor with the known phasing of said zone of operation, and modifying means for modifying the indicated camshaft phasing from said sensor by the amount of said comparison to thereby calibrate said sensor.

4,928,641

LUBRICANT SUPPLYING SYSTEM FOR DOHC TYPE MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

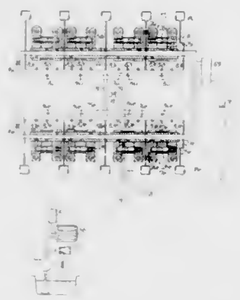
Tomonori Niizato; Tsuneo Tanai; Kazuhiro Kasahara; Tsutomu Saka, and Toshihiro Oikawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,313

Claims priority, application Japan, Dec. 28, 1987, 62-200642[U]; Jun. 22, 1988, 63-82587[U]; Jun. 22, 1988, 63-82588[U]; Aug. 1, 1988, 63-102104[U]; Aug. 1, 1988, 63-102105[U]

Int. Cl.[5] F01L *1/26*

U.S. Cl. 123—90.16 6 Claims



1. A lubricant supplying system for a DOHC type multi-cylinder internal combustion engine comprising a plurality of cylinders arranged in series in a cylinder block, a pair of cam shafts parallel to each other and rotatably supported by a cylinder head and cam holders fixed to the cylinder head at opposite sides of the respective cylinders along the cylinder arranging direction, a plurality of cams including low speed cams corresponding to intake and exhaust valves of the respective cylinders and fixed to the cam shafts, a plurality of rocker arms disposed to be slidably contacted with the respective cams and corresponding to each of the intake and exhaust valves of the respective cylinders, and a connection switching mechanism for switching connection and disconnection of the rocker arms in response to a hydraulic pressure to vary operating states of the intake and exhaust valves responsive to an operating state of the engine, wherein a hydraulic pressure supply passage independent from an oil supply passage for supplying a hydraulic pressure to the connection switching mechanism is provided in the cylinder head substantially at a center portion thereof in the arranging direction of the cylinders so as to extend vertically, and a branch oil passage is provided to have intake side and exhaust side portions disposed in one cam holder of substantially central location along the arranging direction of the respective cylinders, the branch oil passage communicating with an upper end of the hydraulic pressure supply passage to supply lubricant to slidably contacting portions of the low speed cams of the respective cylinders for the intake and exhaust valves with the rocker arms and to cam journal portions of the cam shafts.

4,928,642

AUTOMATIC STARTING FLUID INJECTION APPARATUS AND METHOD

Robert W. Atkinson, Normal; John W. Crayton, Washington; James I. Portscheller, Sparland, and Daniel C. Wood, East Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 19, 1989, Ser. No. 367,999

Int. Cl.[5] F02D *41/06;* F02N *17/08*

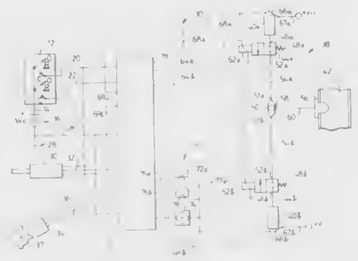
U.S. Cl. 123—180 R 8 Claims

1. An apparatus for automatically injecting starting fluid into a passageway of an internal combustion engine, comprising:

speed sensor means for producing a speed signal in response the speed of said engine;

temperature sensor means for producing a temperature signal in response to the temperature of said engine;

processor means for receiving said temperature and speed signals, calculating an injection time in response to said



engine temperature signal, and producing an injection signal in response to said speed signal for a period of time equal to said calculated injection time; and,

fluid delivery means for receiving said injection signal and injecting said starting fluid into the engine passageway in response to said injection signal.

4,928,643

STARTER HAVING A MANUAL DRIVE FOR INTERNAL COMBUSTION ENGINES

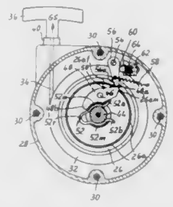
Guenter Kampichler, Ruhstorf, and Erich Eder, Vornbach am Inn, both of Fed. Rep. of Germany, assignors to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,697

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816099

Int. Cl.[5] F02N *3/02*

U.S. Cl. 123—185 B 4 Claims



1. A rewind or recoil starter for an internal combustion engine which is adapted to be coupled to the engine element to be started, and which is returned to its resting position by a rewind or recoil device after manual operation of its actuating means and after the engine has started, comprising at least one safety means in the starter which, in the event of an unsuccessful starting operation and upon kick-back of said engine element against the starting direction, uncouples the actuating means of the starter from the back-kicking engine element, said starter being equipped with a driven member rigidly seated on said engine element to be started, and with a driving member which, during starting, is driven by way of said actuating means, in the form of a pulley having a cord and a cord handle, to drive said engine element in the starting direction, said safety means comprising a fixedly mounted, spring-loaded decoupler pawl which does not affect the driving engagement between the driven member and the manually operated driving

member when the elements of the starter are in their resting positions and during their starting movement, whereas, upon kick-back of the engine element to be started, the decoupler pawl is brought into a decoupling position by means of an element which then kicks back, and thereby releases the driving engagement.

4,928,644

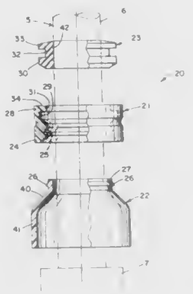
LUBRICATION CONTROL

Gilbert E. Travis, 5287 S. Cleveland Massillon Rd., Norton, Ohio 44203

Filed Jul. 30, 1989, Ser. No. 387,358

Int. Cl.[5] F01L *3/08*

U.S. Cl. 123—188 P 7 Claims



1. A lubricating control for a valve stem reciprocating in a valve guide, comprising:

a first relatively stiff ring member,

a second, relatively stiff, annular sleeve member separably engaged with said ring member; and

a resilient grommet held within said ring member and encircling said valve stem.

4,928,645

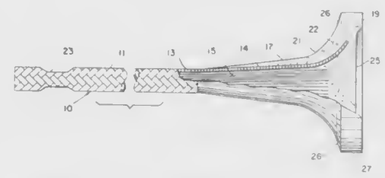
CERAMIC COMPOSITE VALVE FOR INTERNAL COMBUSTION ENGINES AND THE LIKE

Philip L. Berneburg, Potomac, Md., and Roy W. Rice, Alexandria, Va., assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Filed Sep. 14, 1989, Ser. No. 406,997

Int. Cl.[5] F01L *3/02*

U.S. Cl. 123—188 AA 26 Claims



1. A finished ceramic composite valve for an internal combustion engine or the like, or a preform valve, including:

(a) an elongated valve stem shaped for insertion in the valve guide of an engine and comprising fibrous ceramic sleeving which is packed with an axially aligned unidirectional cluster of ceramic reinforcing fibers; and

(b) a ceramic bell shaped for mating with the valve seat of an engine and containing discontinuous ceramic fibers; one end of the stem sleeving being molded into the bell to form a valve-shaped structure.

4,928,646

COUPLING APPARATUS FOR A SPEED GOVERNOR

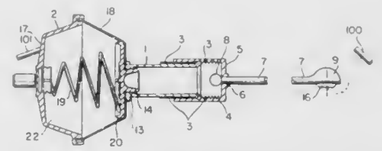
Friedhelm Diller, Rheda-Wiedenbruck, Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,264

Claims priority, application Fed. Rep. of Germany, May 30, 1988, 3818310

Int. Cl.[5] B60K *31/00;* F02D *11/04;* F02M *19/12*

U.S. Cl. 123—376 14 Claims



1. A coupling apparatus for a motor throttle of a type including pieces that are movable relative to one another but which can be more rigidly engaged with one another for coupling a governor positioning drive of a governor with a speed adjusting apparatus of a throttle, said coupling apparatus comprising:

an adjustment mechanism including a cylindrically formed, elongated, hollow connecting stud connected to the governor positioning drive at a driven end portion and a cylindrically formed, hollow, adjustment piece telescoped to the connecting stud at an opposite driving end portion, the adjustment piece including a cap for covering a hollow cavity of the adjustment piece with a cap opening therein;

a coupling rod slidably extending through the opening in the adjustment-piece cap, a driven end of the coupling rod directed toward the governor positioning drive having an enlargement thereon that is larger than that portion of the cap opening in which the coupling rod is positioned, a driving end of the coupling rod directed away from the governor positioning drive including a connecting apparatus for coupling the coupling rod with the speed adjustment apparatus.

4,928,647

DUAL ACTING-DOUBLE BREAKOVER THROTTLE LEVER

Tibor J. Villanyi, Columbus, and Kevin W. Westerson, Nashville, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 301,057, Jan. 25, 1989, abandoned. This application Nov. 1, 1989, Ser. No. 430,064

Int. Cl.[5] F02D *11/04*

U.S. Cl. 123—400 12 Claims

1. A throttle lever assembly for operating a throttle shaft adapted to control the flow of fuel to an internal combustion engine as the throttle shaft is moved between an idle position and a full throttle position in response to a throttle control, comprising

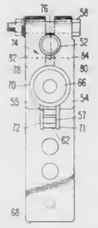
(a) a throttle lever means adapted to be connected with the throttle shaft for moving the throttle shaft between the idle and the full throttle positions in response to movement of the throttle control,

(b) throttle link means connected to said throttle lever means and to the throttle control for limiting the degree of force which may be applied to said throttle lever means when the throttle shaft reaches at least one of said idle and full

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throttle positions, said throttle link means including a link lever pivotally connected to said throttle lever means, and

(c) throttle link stop means for limiting the rotation of said link lever relative to said throttle lever means to a predetermined maximum first breakover position, said throttle



link stop means including a first stop on said link lever positioned to engage the throttle shaft when said link lever reaches said first breakover position, whereby control of said throttle shaft may be continued by the throttle control even if said throttle link means malfunctions.

4,928,648

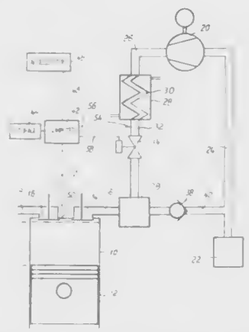
METHOD OF OPERATING AN IC ENGINE AND AN IC ENGINE FOR PERFORMING THE METHOD

Oskar Schatz, Waldpromenade 16, D-8035 Gauting; Georg Mehne, Altenberg 26, D-7162 Gschwend, and Thomas Steidele, Hauzenbergerstrasse 29, D-8000 Munich 21, all of Fed. Rep. of Germany

Filed Nov. 4, 1988, Ser. No. 267,173

Int. Cl.[5] **F02D** *31/00*; **F02M** *51/00*; **F02B** *33/00, 29/00*

U.S. Cl. 123—403 **34 Claims**



1. An IC engine of the piston type, more particularly a reciprocating piston engine, with at least one combustion chamber (**10**), at least one inlet valve (**14**) with an inlet duct (**36**) coupled with said at least one combustion chamber, a charger (**20**) producing a continuous pressure associated with said inlet duct and with a storage space (**28**), an air control valve (**34**) coupled with said inlet duct between the storage space (**28**) and each inlet valve (**14**), said air control valve opens and closes in a way dependent on the ignition frequency of the associated combustion chambers (**10**), means for modifying the phase position of the inlet valve (**14**) and the air control valve (**34**), said means for modifying phase associated with said inlet valve and air control valve for shifting opening of said valves such that a supply of compressed air is concentrated at the start of opening of the inlet valve, compressed air is supplied during full opening of the inlet valve, or compressed air is concentrated at the closing of the inlet valve, and means for supplying non-compressed air to said at least one combustion chamber when said air control valve is closed, said means for supplying non-compressed air bypasses a compress branch of said duct including the charger, storage space and air control valve, and is coupled with said inlet duct, said means for supplying non-compressed air is able to be shut off by a valve means (**38**) when said air control valve is opened.

4,928,649

IGNITION TIMING CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

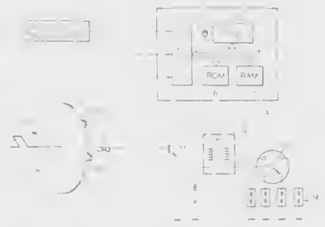
Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1989, Ser. No. 358,164

Claims priority, application Japan, May 31, 1988, 63-133828

Int. Cl.[5] **F02P** *5/15*

U.S. Cl. 123—414 **4 Claims**



1. A system for controlling ignition timing of an internal combustion engine, having a rotary member provided to be rotated in synchronism with a crankshaft of said engine, at least two indicator means formed on said rotary member, and a sensor for sensing said indicator means and for producing signals, comprising:

a memory storing an angle between said two indicator means in a form of $K \cdot 2^n$, where K is resolution of the system and n is a natural number;

first calculator means for calculating a time interval between said indicator means and for producing a time interval signal in binary;

shifting means for shifting the time interval signal by n times and for producing a quotient signal representing the quotient of division of the time interval by the said angle;

second calculator means for calculating an ignition timing based on the quotient signal and for producing an ignition signal; and

an ignition device responsive to the ignition signal for sparking a spark plug of the engine.

4,928,650

OPERATING ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE POPPET VALVES AND THE LIKE

Yutaka Matayoshi; Toru Yoshimura, both of Yokosuka; Shigeru Kamegaya, Tokyo, and Kyugo Hamai, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 28, 1989, Ser. No. 329,846

Claims priority, application Japan, Mar. 28, 1988, 63-40678[U]; Mar. 28, 1988, 63-40680[U]; Mar. 28, 1988, 63-40681; Mar. 28, 1988, 63-40684[U]; Mar. 29, 1988, 63-41288[U]

Int. Cl.[5] **F01L** *1/30, 1/32*

U.S. Cl. 123—90.24 **16 Claims**

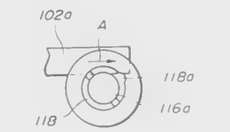
1. In a device having a valve, said valve having a valve stem which is reciprocal along an axis:

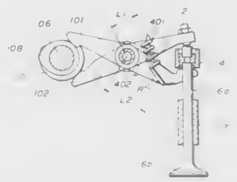
a valve operating mechanism comprising:

a cam shaft, said cam shaft having first and second cams operatively disposed thereon;

first and second pivotally mounted rocker arms, said first and second rocker arms each having first ends which are arranged to engage said first and second cams, respectively;

said first rocker arm being operatively connected with said valve in a manner to selectively move the same in a first direction which opens the valve when the high lift portion of said first cam engages a first cam follower formed on said first rocker arm;





said second rocker arm being operatively connected with said valve in a manner to selectively move the same in a second direction which closes the valve when the high lift portion of said second cam engages a second cam follower formed on said second rocker arm; and

means for producing a force which acts as a finite distance from said axis and which produces a torque which rotates said valve stem about said axis when the valve is being one of opened and closed.

4,928,651

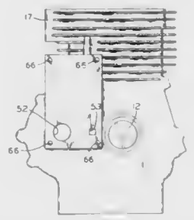
INTEGRAL ENGINE BLOCK AIR COOLED ENGINE OIL COOLER

Peter G. Kronich, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jun. 26, 1989, Ser. No. 371,455

Int. Cl.[5] **F01M** *1/00*

U.S. Cl. 123—196 AB **23 Claims**



1. In an internal combustion engine comprising a crankshaft, a crankcase having an external surface, an oil sump in said crankcase, and a pressure lubrication means for forcing liquid lubricating oil from said oil sump through a lubrication path in the engine, an oil cooler comprising:

a heat exchanger having an inner surface mounted on the external surface of said crankcase, said heat exchanger having an oil passageway therein in flow communication with said lubrication path;

said heat exchanger further having an external surface having a plurality of fins projecting outwardly therefrom;

said lubrication means pumping the liquid oil through said heat exchanger passageway under positive pressure; and

means associated with said engine for creating a flow of circulating air whereby the lubricating oil is cooled by direct convection heat exchange between said fins and said circulating air.

4,928,652

ENGINE CONTROL SYSTEM FOR SUPPRESSING CAR BODY VIBRATION

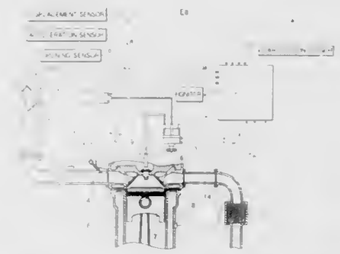
Yoshiyuki Shinya, Hiroshima; Yoshitaka Tabara, Higashihiroshima; Itaru Okuno, Hiroshima; Tadashi Kaneko, Hiroshima, and Tomomi Watanabe, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 14, 1988, Ser. No. 244,115

Claims priority, application Japan, Sep. 17, 1987, 62-235969; Jan. 29, 1988, 63-17420

Int. Cl.[5] **F02P** *1/00*

U.S. Cl. 123—417 **15 Claims**



1. An engine control system for suppressing vibration of a car body by varying engine output torque, comprising:

vibration data detecting means for intermittently detecting data relating to car body vibration;

period setting means for setting a period of car body vibration;

delay time setting means for setting a delay time corresponding to a detection delay time due to the intermittent detection of said vibration data detection means; and

torque control means for controlling engine output torque by advancing a phase of engine output torque control timing by the delay time corresponding to the detection delay time, which is set by said delay time setting means, in each period of car body vibration set by said period setting means, thereby suppressing car vibration.

4,928,653

AIR-FUEL RATIO CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Satoru Ohkubo, Amagasaki, and Toshio Iwata, Himeji, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 27, 1989, Ser. No. 329,287

Claims priority, application Japan, Apr. 19, 1988, 63-97865

Int. Cl.[5] **F02D** *41/14*

U.S. Cl. 123—435 **17 Claims**

1. A control device for controlling an air-to-fuel ratio of a mixture of fuel and air supplied to an internal combustion engine, comprising:

air quantity detecting means for measuring a quantity of air supplied to said internal combustion engine;

crank angle sensor means for detecting a crank angle (θ) of said internal combustion engine;

pressure sensor means for detecting a pressure (P) within a cylinder of said internal combustion engine;

feedback value computation means, coupled to outputs of said pressure sensor means and said crank angle sensor means, for computing an actual ratio of a maximum rate of pressure change $(dP/d\theta)max$ within said cylinder with respect to said crank angle during a predetermined interval of time within a cycle of strokes in said cylinder to a maximum pressure (Pmax) within said cylinder during the same predetermined interval of time within a cycle of strokes in said cylinder;

optimum air-to-fuel ratio computation means, coupled to outputs of said air quantity detecting means and said crank angle sensor means, for determining an optimum air-to-fuel ratio corresponding to an operating condition of said internal combustion engine determined by parameters including said outputs of said air quantity detecting means and said crank angle sensor means;

conversion means, coupled to an output of said optimum air-to-fuel ratio computation means, for determining a value of a target ratio of the maximum rate of pressure change $(dP/d\theta)max$ within said cylinder with respect to said crank angle during said predetermined interval of time within a cycle of strokes in said cylinder to the maximum pressure (Pmax) within said cylinder during the same predetermined interval of time within a cycle of strokes in said cylinder by means of a relationship between values of air-to-fuel ratio and values of said ratio of the maximum rate of pressure change $(dP/d\theta)max$ within said cylinder with respect to the crank angle during said predetermined interval of time to the maximum pressure (Pmax) within said cylinder during the same predetermined interval of time within a cycle of strokes in said cylinder, said target ratio corresponding to said optimum air-to-fuel ratio determined by said optimum air-to-fuel ratio computation means;

error computation means, coupled to said feedback value computation means and said conversion means, for computing a deviation of said actual ratio, computed by said feedback value computation means, with respect to said target value determined by said conversion means;

fuel injection means for injecting an amount of fuel into an air intake passage coupled to said cylinder of the internal combustion engine; and

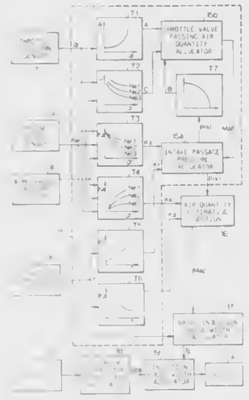
control means, coupled to an output of said error computation means, for controlling said amount of fuel injected by said fuel injection means to reduce said deviation, outputted from said error computation means, of said actual ratio with respect to said target ratio.

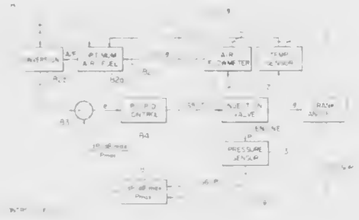
4,928,654

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

Hiroshi Hosaka, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1988, Ser. No. 287,473
Claims priority, application Japan, Dec. 28, 1987, 62-332627
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—486 **8 Claims**





1 A system for controlling fuel injection of an engine for a motor vehicle having an intake system comprising an intake passage, a throttle valve provided in the intake passage, and a fuel injector, the controlling system comprising

engine speed detector means for detecting engine speed and for producing an engine speed signal;

throttle position detector means for detecting throttle position and for producing a throttle position signal,

intake air temperature detector means for detecting intake air temperature and for producing an intake air temperature signal,

first calculator means responsive to the engine speed signal, throttle position signal and intake air temperature signal for calculating pressure in the intake passage pressure based on a model equation of the intake system representing fluctuation of the intake passage pressure as a function of variations of the engine speed, throttle position and intake air temperature and for producing an intake passage pressure signal corresponding to the calculated intake passage pressure,

second calculating means responsive to the engine speed signal, throttle position signal, intake air temperature signal and intake passage pressure signal for calculating an engine inducted air quantity in accordance with an equation of state of fluid in the intake passage and for producing an inducted air quantity signal corresponding to the calculated engine inducted air quantity, and

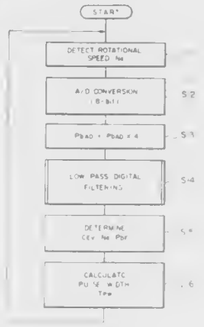
third calculator means responsive to the engine speed signal and inducted air quantity signal for calculating an injection pulse width to inject an optimum amount of fuel from the injector.

4,928,655

FUEL INJECTION CONTROLLER FOR AN INTERNAL COMBUSTION ENGINE

Hajime Kako, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,116
Claims priority, application Japan, Jun. 15, 1988, 63-147278
Int. Cl.[5] F02D *41/18, 41/28*
U.S. Cl. 123—488 **3 Claims**



1. A fuel controller for an engine equipped with a pressure sensor which generates an analog signal corresponding to the pressure in an air intake pipe of the engine, the fuel controller comprising:

an N-bit A/D converter which performs A/D conversion of the analog signal of the pressure sensor and generates an N-bit digital signal;

multiplying means for multiplying the N-bit digital signal by a prescribed constant to obtain a digital output signal having at least $(N+1)$ bits;

a low-pass digital filter which filters the output signal of said multiplying means and generates a filtered output; and

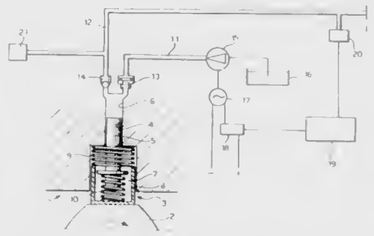
control means for controlling the operation of a fuel injector of the engine in accordance with the filtered output so as to obtain a desired air/fuel ratio.

4,928,656

FUEL-INJECTION PUMP WITH VARIABLE CYLINDER CAPACITY FOR DIESEL ENGINE INJECTION SYSTEMS

Francesco Paolo Ausiello, Turin, Italy, assignor to Weber S.r.l., Turin, Italy

Filed Dec. 2, 1988, Ser. No. 279,209
Claims priority, application Italy, Dec. 9, 1987, 68053 A/87
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—504 **3 Claims**



1. A fuel-injected device for diesel engine injection systems, comprising:

means defining a fuel-injection pump cylinder (4);

a pumping piston (5) mounted for floating sliding movement in said cylinder between a bottom dead center position and a top dead center position, said pumping piston having one end defining a pumping chamber (6) in said cylinder, and an opposite end;

a rotatably mounted eccentric (2);

a tappet member (8) engaged with said eccentric for reciprocal movement with rotation of said eccentric;

biasing means (10) engaged between said tappet member and said opposite end of said piston for transmitting reciprocal movement of said tappet member into equalized and floating reciprocal movement of said piston;

a fuel-intake duct (11) having an intake valve (13) therein and being connected to said pumping chamber for supplying fuel thereto;

a fuel delivery (12) having a delivery valve (14) therein and being connected to said pumping chamber for delivering fuel therefrom, said fuel delivery duct being adapted for connection to a fuel engine injection system for supplying fuel to the fuel engine injection system;

an electric supply pump (15) connected to said fuel intake duct for supplying fuel from a fuel supply tank to the pumping chamber through said intake valve at a variable pressure;

electronic modulation means (17, 18, 19) connected to said electric supply pump for varying the pressure of fuel supplied to said pumping chamber, for varying the bottom dead center position of said piston as it is biased by said biasing means and as a function of pressure in said pumping chamber and before the movement of said piston for executing a stroke for pumping the fuel from said pumping chamber through said delivery valve to said fuel delivery duct; and

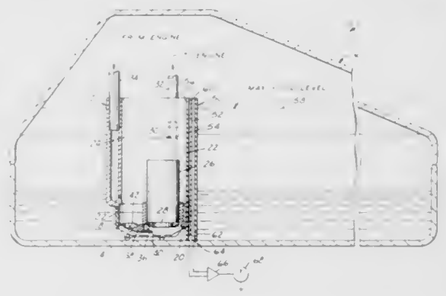
an electrical pressure sensor (20) connected to said fuel delivery duct for sensing the pressure therein and connected to said electronic modulation means for adjusting the effect of said electronic modulation means on said electric supply pump.

4,928,657

IN-TANK FUEL RESERVOIR WITH FUEL LEVEL SENSOR

Brian K. Asselin, Caro, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Mar. 2, 1989, Ser. No. 318,126
Int. Cl.[5] F02M *39/00*
U.S. Cl. 123—514 **13 Claims**



1 A fuel delivery system for automotive engine and like applications comprising: an electric-motor fuel pump for positioning within a fuel tank and having an inlet and an outlet for feeding fuel under pressure to an engine, the tank having a maximum design fuel level, means for returning excess fuel from the engine to the tank, and means for sensing fuel level within the tank, characterized that said level-sensing means comprises:

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means positioned at a lower portion of the tank responsive to fuel head pressure within the surrounding tank for providing an electrical signal as a function thereof, and means responsive to said electrical signal for indicating fuel level in the tank,

said level-sensing means comprising reference head pressure means, including a reference column for holding fuel and means for feeding fuel returned from the engine to said reference column for maintaining fuel level in said reference column above said maximum design fuel level, said pressure-responsive means being responsive to fuel head pressure in said reference column in comparison to head pressure in the tank.

4,928,658

REGENERATIVE INTERNAL COMBUSTION ENGINE

Allan J. Ferrenberg, 7829 Fallbrook Ave., Canoga Park, Calif. 91304, and William T. Webber, 30704 Davey Jones Dr., Agoura, Calif. 91301

Division of Ser. No. 782,959, Oct. 2, 1985, Pat. No. 4,790,284. This application Jun. 10, 1988, Ser. No. 205,287

Int. Cl.[5] F02G *5/00*

U.S. Cl. 123—543 **16 Claims**



1. A process for operating a thermally regenerated reciprocating cyclic internal combustion engine having a rotating power output shaft composed of a number of similar working units, each working unit comprising (a) a cylinder closed at one end by a cylinder head, with a number of intake valves to draw cool fresh air into the cylinder, and with a number of exhaust valves to exhaust the spent combustion gases from the cylinder, said intake valves and exhaust valves communicating with the cylinder portion close to the cylinder head; (b) a first means for opening and closing said intake valves and exhaust valves in a predetermined manner once in each engine cycle; (c) a piston inside the cylinder moving along the axis of the cylinder in a reciprocating manner toward and away from the cylinder head between the top dead center position closest to the cylinder head and the bottom dead center position furthest away from the cylinder head, said piston being connected by a second means to the power output shaft, where said second means translates the reciprocating motion of said piston to rotation of the power output shaft; (d) a thermal regenerator inside the cylinder between the cylinder head and the piston, capable of being moved in predetermined cyclic reciprocating motion along the axis of the cylinder and comprising a permeable core and other structure to absorb heat from the hot combustion gases when moved in one direction, and to transfer the absorbed heat to the cool fresh air when moved in the opposite direction; (e) a third means for imparting a predetermined periodic motion to said thermal regenerator, (f) an injection means for injecting combustible fuel into the cylinder, said injection means communicating with the cylinder portion and cylinder head but closer to piston to dead center; and (g) an ignition means for igniting the mixture of said air and said fuel in the cylinder, said ignition means communicating with the cylinder portioned cylinder head but closer to piston top dead center, causing said fuel to be ignited and combusted in the cylinder portion between the regenerator and the piston;

in a two-stroke cycle comprising piston motion from top dead center to bottom dead center back and forth once and comprising the steps of:

opening the intake valves with the exhaust valves closed, the regenerator near the cylinder head and the piston near bottom dead center;

moving the regenerator to a position close to the piston, near bottom dead center, thereby transferring high temperature heat from the combustion gases in the cylinder into the regenerator;

drawing fresh air into the cylinder by the reduction in pressure and volume caused by the transfer of heat from the working fluid to the regenerator;

closing the intake valves with the piston and regenerator near bottom dead center;

moving the piston to a position near top dead center, while simultaneously moving the regenerator in the same direction closely ahead of the piston, thereby compressing the air in the cylinder;

moving the regenerator from its position close to the piston to a position close to the cylinder head, thereby causing the compressed air to flow into and through the regenerator, thereby transferring stored high temperature heat from the regenerator into the compressed air;

injecting fuel using the injection means into the compressed, regeneratively heated air in the cylinder between the regenerator and the piston head;

igniting and burning the fuel-air mixture using the ignition means to form hot combustion gases with the piston near top dead center;

extracting work from the hot combustion gases which expand and push the piston to near bottom dead center while simultaneously the regenerator is maintained in its position close to the cylinder head;

opening the exhaust valves, permitting the hot combustion gases at high pressure to flow through the regenerator and out of the engine through the exhaust valves, thereby transferring high temperature heat from the combustion gases into the re regenerator; and

closing the exhaust valves.

4,928,659

APPARATUS FOR SUPPLYING AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINE

Yukihiro Ohmura; Yoshiyuki Kobayashi; Keiji Hosoi, and Kazuharu Shimoda, all of Shizuoka, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 28, 1989, Ser. No. 345,464

Claims priority, application Japan, Jul. 14, 1988, 63-176139

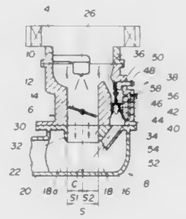
Int. Cl.[5] F02M *23/10*

U.S. Cl. 123—588 **3 Claims**

1. An apparatus for supplying an air-fuel mixture in an internal combustion engine, comprising:

a pipe member provided in a collecting passageway of an intake manifold collecting pipe, said pipe member being provided so as to form an extension passageway having a discharge end port opening into said collecting passageway, said extension passageway having an inlet end port which communicates with a discharge end opening of an intake passageway formed in a throttle body of an internal combustion engine; and

an auxiliary air passageway formed in said pipe member which bypasses a throttle valve of the throttle body by passing through the inside of said pipe member, said auxiliary air passageway terminating in an auxiliary air outlet, said auxiliary air outlet being disposed on an opposite side of said extension passageway from the engine cylinder and said auxiliary air outlet being oriented so as to discharge a stream of auxiliary air toward a center of collision located substantially at the center of a region of a side surface of



the collecting passageway where the air-fuel mixture flowing through the extension passageway collides with said side surface.

4,928,660

PROTECTIVE CASE FOR COMBINATION IGNITION COIL AND ELECTRONIC CONTROL

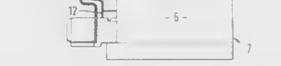
Gerhard Söhner, Geradstetten; Helmut Roth, Schwieberdingen; Hartmut Brammer, Vaihingen; Richard Schleupen, Grossingersheim, and Karl-Heinz Nübel, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 23, 1989, Ser. No. 327,816

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3811216

Int. Cl.[5] F02P *15/00*

U.S. Cl. 123—647 **8 Claims**



1. An elastic protective case for a vehicle ignition system having an ignition coil and an electronic control device, comprising, in accordance with the invention,

an integrally formed enclosure (**13**) defining a portion shaped to receive and secure said ignition coil (**5**); a portion shaped to receive and secure said electronic control device (**6**), said portions defining therebetween a space for electrical terminals (**11**) and conductors (**12**) interconnecting said coil (**5**) and said electronic control device.

4,928,661

COCKING DEVICE FOR A COMPRESSED AIR WEAPON

Wolfgang Bordt, Ulm, and Friedrich Gerstenberger, Duernach, both of Fed. Rep. of Germany, assignors to J. G. Anschuetz GmbH, Ulm, Fed. Rep. of Germany

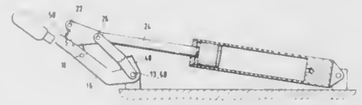
Filed Mar. 17, 1989, Ser. No. 324,666

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1988, 3809239

Int. Cl.[5] F41B *11/00*

U.S. Cl. 124—69 **5 Claims**

1. A cocking assembly in combination with a compression assembly of a compressed air weapon having a rod extending from a piston of the compression assembly, the cocking assembly comprising a cocking member pivotally connected to the weapon, a link member pivotally connected to one end thereof to the cocking member and at an opposite end thereof to said rod, and a toggle arm having one end pivotally connected to the weapon and another end pivotally connected to the rod



between the connection thereto of the link member and the piston.

4,928,662

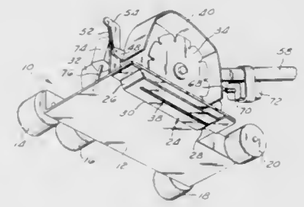
SKID PLATE FOR CUTTING UNHARDENED CONCRETE

Edward Chiuminatta, and Alan R. Chiuminatta, both of 6677 Columbus, Riverside, Calif. 92504

Continuation of Ser. No. 185,055, Apr. 22, 1988, Pat. No. 4,889,675, which is a continuation of Ser. No. 843,779, Mar. 25, 1988, Pat. No. 4,769,201. This application Nov. 23, 1988, Ser. No. 275,428

Int. Cl.[5] B28D *1/04*

U.S. Cl. 125—13.01 **19 Claims**



1. A skid plate for use with a saw, comprising:

a skid plate having a slot therein through which a rotating cutting blade extends to cut a surface, the slot having a closed leading end which contacts said surface during cutting, sides extending beyond the cutting edge of the cutting blade, and a trailing end which is not in contact with said surface during cutting, when the entire skid plate is resting on the surface being cut.

4,928,663

ENHANCED AIR-FLOW CONVECTION OVEN

Ira Nevin, Eastchester, and Narendra Nath, Copiague, both of N.Y., assignors to Bakers Pride Oven Co., New Rochelle, N.Y.

Filed Jan. 31, 1989, Ser. No. 304,770

Int. Cl.[5] F24C *15/32;* **A21B** *1/00*

U.S. Cl. 126—21 A **19 Claims**

1. An enhanced air flow convection oven comprising:

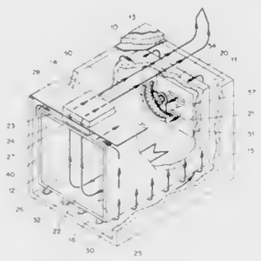
an oven chamber enclosed by an oven chamber liner having a top, a bottom, two sides, a back with an air inlet opening therethrough effectively located between an upper and lower portion thereof, and an air outlet opening;

a heat source located outside said oven chamber liner;

a thermally insulated outer shell, circumscribing said oven chamber liner at a distance from said oven chamber liner forming a space between said oven chamber liner and the outer shell, said space formed along the sides, top, and upper and lower portions of the back of said oven chamber liner for allowing air to flow from said heat source, through said space and into the air inlet opening;

a blower wheel assembly mounted for rotation within the oven chamber liner adjacent to said air inlet opening, said

blower wheel assembly capable of mixing air from within the oven chamber liner with air from the air inlet opening within the blower wheel assembly;



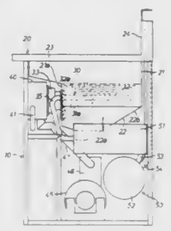
wherein air heated by the heat source moves along the sides, top and back of the oven chamber liner into the air inlet opening where it is mixed within the blower wheel assembly with air from within the oven chamber to provide for balanced heat.

4,928,664

PULSE COMBUSTION HEATING APPARATUS

Hiroshi Nishino; Susumu Ejiri, and Nobuyoshi Yokoyama, all of Nagoya, Japan, assignors to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 1, 1989, Ser. No. 401,913
Claims priority, application Japan, Sep. 2, 1988, 63-116334[U]
Int. Cl.[5] A47J *27/00*
U.S. Cl. 126—391 5 Claims



1. A pulse combustion heating apparatus comprising a liquid vessel assembled within a support frame to store an amount of liquid such as cooking oil or other fluid medium to be heated, and a pulse combustion burner mounted to said vessel and having a combustion chamber secured at its inlet end to a side wall of said vessel and immersed in the liquid in said vessel and at least a pair of tailpipes each connected at their inner ends to an exhaust port of said combustion chamber in such a manner that said tailpipes are arranged symmetrically in said vessel and immersed in the liquid and being extended outwardly from said vessel,

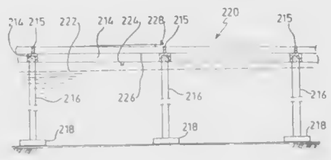
wherein said vessel has a pair of parallel bottom walls inclined downwardly inwardly toward the center of said vessel, and a pair of cylindrical decouplers are housed in a pair of spaces just below the bottom walls of said vessel within said support frame, said decouplers being connected to each exhaust end of said tailpipes.

4,928,665

LIGHT TRANSMISSIVE INSULATION APPARATUS

Shimon Klier, Simat Magal 4, Savyon, and Ofer Novik, Rehovot, both of Israel, assignors to Shimon Klier, Savyon, Israel

Continuation of Ser. No. 82,237, Aug. 6, 1987, Pat. No. 4,815,442, which is a continuation-in-part of Ser. No. 839,967, Mar. 17, 1986, Pat. No. 4,719,902, which is a continuation-in-part of Ser. No. 800,915, Nov. 25, 1985, abandoned, which is a continuation of Ser. No. 541,119, Oct. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 363,451, Mar. 30, 1982, Pat. No. 4,480,632. This application Feb. 10, 1989, Ser. No. 308,738
Claims priority, application Israel, Mar. 30, 1981, 62528; Aug. 27, 1981, 63678
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] F24J *2/42*
U.S. Cl. 126—415 15 Claims



1. A solar collector comprising:

a body of material sought to be heated;

a layer of solar spectrum radiation transmissive insulation; and

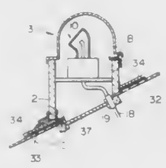
means for supporting said layer of solar spectrum radiation transmissive insulation between said body of material and a source of solar radiation and in spaced relationship with said body of material, said layer of solar spectrum radiation transmissive insulation comprising an array of cells operative to minimize heat losses from said body of material through convection and conduction, and being generally transmissive to solar spectrum radiation and generally opaque to thermal radiation, said array of cells also being coated with a coating operative to reduce scattering of incoming solar radiation and to enhance absorption of radiated thermal radiation by said cells.

4,928,666

CONTAINER FOR ACCOMMODATING A SOLAR RAY-COLLECTING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo; Hakaru Akaishi, Osaka; Kenji Kakihara, Osaka, and Yoshiro Kitayama, Osaka, all of Japan, assignors to Kei Mori, Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 246,566
Claims priority, application Japan, Sep. 28, 1987, 62-243254
Int. Cl.[5] F24J *2/08*
U.S. Cl. 126—440 3 Claims



1. A solar ray-collecting device mountable on a roof of a building in which said roof is inclined relative to horizontal,

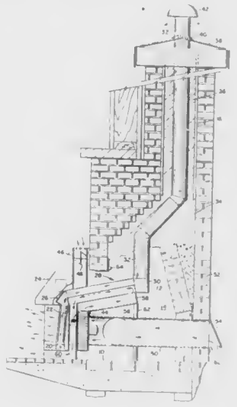
comprising a cylindrical body having a longitudinal axis and upper and lower longitudinal ends, a transparent dome, mounting means mounting said transparent dome on said upper longitudinal end of said cylindrical body, said mounting means comprising a flange extending from said transparent dome, a receptacle member on said upper longitudinal end of said cylindrical body, a joint member interposed between said flange and said receptacle member, first fastening means fastening said joint member to said flange, and second fastening means fastening said joint member and said receptacle member to said upper longitudinal end of said cylindrical body, solar ray-collecting means disposed within said transparent dome, said lower longitudinal end of said cylindrical body being disposed at an inclined angle relative to said longitudinal axis of said cylindrical body, said inclined angle corresponding to the incline of said inclined roof, securing means connected to said lower longitudinal end of said cylindrical body for securing said cylindrical body to said inclined roof such that said lower end of said cylindrical body is thereby mountable on said inclined roof with said longitudinal axis of said cylindrical body being disposed vertically upright, said solar ray-collecting means comprising an optical conductor cable means passing through said cylindrical body and extending through an opening in said roof to thereby conduct collected solar rays to the interior of said building.

4,928,667

GAS FIRE HEATING UNIT

William S. Shaw, Prince George, Canada, assignor to Tri Fire Holdings, Ltd., Prince George, Canada

Filed Sep. 12, 1989, Ser. No. 406,016
Int. Cl.[5] F24B *7/00*
U.S. Cl. 126—512 10 Claims



1. A space heater for a structure adapted to be mounted in the fire box of a fireplace or as a free standing unit comprising:

a housing having a base, side walls and a rear wall;

a gas burner mounted in said housing on the base;

and a plurality of ceramic radiants covering the front of said housing and forming a front wall thereof so that when gas is consumed at said burner the radiants will be heated;

a hood mounted over said housing and defining a collection plenum means for collecting the hot products of combustion when gas is consumed in said housing;

a flue and a flue plenum in communication therewith;

a concertina heat exchanger having a plurality of inlets in communication with said collection plenum and a plurality of outlets at an opposite end thereof in communication with said flue plenum, said heat exchanger further defining a plurality of inlets for air to be heated adjacent the outlets and a plurality of outlets for heated air adjacent the inlets, said heat exchanger further includes a plurality of first and second passages for combustion products and air to be heated, respectively, wherein the first and second passages are in heat exchange relationship with one another;

blower means in communication with the heat exchanger inlets for supplying air to be heated thereto and circulating duct means in communication with the heated air outlets for directing said heated air into the space to be heated;

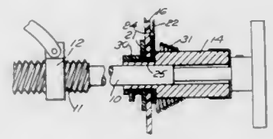
insulating means surrounding said flue, and thermostatic control means coupled to said blower means for terminating the air supplied by said means to the heat exchanger when the temperature in said flue falls below a predetermined limit.

4,928,668

FIREPLACE DAMPER INDICATOR

Frederick J. Reusch, Sr., Melville Towers, Apt. 616, New Bedford, Mass. 02740, assignor to Frederick J. Reusch, Sr., New Bedford; J. Reusch, Jr. and Paul R. Reusch, Sr., Mattepoisett, all of, Mass.

Filed Oct. 23, 1989, Ser. No. 425,112
Int. Cl.[5] F24B *7/00*
U.S. Cl. 126—537 2 Claims



1. A fireplace damper indicator comprising a housing having a central cylindrical coupler mounted therein for rotation, said coupler having a bore to receive a damper operating rod, means gripping the rod, a contact arm fixed to the shaft, spiral contact wire means arranged to engage the arm, a no-contact area adjacent a circular path traversed by the arm, indicator means, a source of e.m.f., means establishing a circuit with the arm, wire, e.m.f and an indicator whereby the indicator shows open or closed damper position.

4,928,669

STRAIGHTENING DEVICE FOR FLEXIBLE TUBULAR STRUCTURES

Michael J. Sullivan, 1116 Radcliffe Ave., Kingsport, Tenn. 37664-2026

Filed Jun. 26, 1989, Ser. No. 371,311
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—4 6 Claims



1. A straightening device for tubular medical instruments or the like, comprising an elongated cable having shoulder means adjacent its distal end, an elongated, normally flexible, non-compressible, coiled wire sheath surrounding said cable in sliding contact therewith, the adjacent coils of said sheath always contacting each other over at least a portion of their adjacent surfaces, the distance end of said sheath being in abutment with said distal shoulder means of said cable, bearing block means having bore means slidably receiving a proximal end portion of said cable, slide bar means axially, non-rotatably

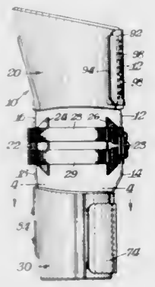
slidably mounted in said bore means, said proximal end portion of said cable being affixed to said slide bar means, stop means on said block means in abutment with the proximal end of said sheath, a threaded shaft segment affixed to said slide bar means and slidably extending through a distal portion of said bore means, and nut means threadedly mounted on said segment and adapted to abut said block means when rotated relative to said segment to tension said cable and apply straightening force to said sheath.

4,928,670

HUMAN KNEE JOINT STABILIZING ORTHOSIS WITH SEMI-RIGID, SUBSTANTIAL ENCASEMENT MEANS FOR LOWER LEG

Richard DeLorenzo, 3246 Champions Dr., Wilmington, Del. 19808

Filed Dec. 6, 1988, Ser. No. 280,677
Int. Cl.[5] A61F *3/00*
U.S. Cl. 128—80 C 15 Claims



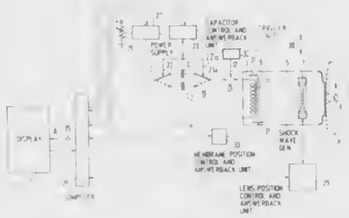
1. A human knee stabilizer comprising:
a semi-rigid, posteriorly open U-shaped, upper leg-engaging cuff having medial and lateral sides;
a semi-rigid, generally triangular prism-shaped lower leg-engaging cuff constructed and arranged such that: the vertex of the triangular cross-section of the triangular prism-shaped lower leg-engaging cuff is generally located at the sharp anterior border of the shaft of the wearer's tibia and the lateral and medial faces corresponding to the lateral and medial sides of said triangular cross-section engage the lateral and medial sides of the wearer's lower leg, while the posterior face corresponding to the base of said triangular cross-section engages the posterior of the wearer's calf muscle, and said cuff encircles at least 315° of the wearer's calf and shin and thereby defines a vertically-extending gap in said cuff remote from said vertex and in closely-spaced relation to the corner at the intersection of said base and a said of said triangular cross-section, to facillate engagement of the wearer's lower leg with said cuff, the interior medial face of the lower leg-engaging cuff including a vertically-extending, substantially planar portion, medially extending from said vertex, for conforming to the anterior, planar-shaped medial flare of the wearer's tibia;
rigid lateral and medial upper support arms integral with the lateral and media sides of the upper leg-engaging cuff and extending downwardly from said sides;
rigid lateral and medial lower support arms integral with the lateral and medial faces of said lower leg-engaging cuff and extending upwardly from said faces;
lateral and medial polycentric pivot means connecting the upper support arms to the lower support arms to complete the lateral and medial support and to provide range-of-motion control, each said polycentric pivot means including an inner face arranged to face the wearer's lateral or medial femoral condyle;
at least one pre-molded condylar pad attached to a said inner face for engaging a said condyle;
an interior generally inelastic strap attached at one end to one of the two faces of the lower leg-engaging cuff which is adjacent said vertically-extending gap and having a free end attachable to the other face adjacent said vertically extending gap to complete the encirclement of the wearer's lower leg when the lower leg-engaging cuff is in position on the wearer's lower leg;
an exterior, elastic strap attached at one end to a face of the lower leg-engaging cuff and having a free end attachable to a different face, for superposition upon said interior generally inelastic strap when the free end of said inelastic strap is attached; and
an elastic strap attached at one end on one side of the posterior opening of the upper leg-engaging cuff and having a free end attachable to the other side of the posterior opening to complete the encirclement of the wearer's upper leg.

4,928,671

SHOCK WAVE GENERATOR FOR GENERATING AN ACOUSTICAL SHOCK WAVE PULSE

Helmut Reichenberger, Eckental, and Georg Naser, Zirndorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 71,992
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3624069; Apr. 7, 1987, 3711639
Int. Cl.[5] A61B *17/22*
U.S. Cl. 128—24 A 20 Claims



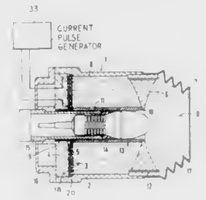
1. A shock wave generator comprising:
means for generating a shock wave pulse having a path of travel;
a plurality of acoustic lenses having respectively different concentrating characteristics;
means for holding said lenses; and
means for moving said means for holding in a direction transverse to said path of travel for selectively introducing at least one of said lenses into said path of said shock wave pulse from a standby position out of said path of said shock wave pulse.

4,928,672

SHOCKWAVE SOURCE HAVING A CENTRALLY DISPOSED ULTRASOUND LOCATING SYSTEM

Franz Grasser, Eggolsheim; Helmut Reichenberger, Eckental; Dietrich Hassler, Uttenreuth; Georg Naser, Zirndorf, and Erhard Schmidt, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,334
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725533; Aug. 19, 1987, 3727691
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—24 A 12 Claims



1. A shockwave generator for extracorporeal disintegration of a calculus in a patient comprising:
a housing:
a flat coil in said housing having a central opening therein;
an electrically conductive membrane having a central opening therein;
means for insulating said membrane from said coil and having a central opening therein;
means for applying a current pulse to said coil to cause said membrane to be rapidly repelled therefrom, thereby generating a pressure pulse;
means in said housing adapted for focussing said pressure pulse to a calculus in a patient;
means in said housing disposed between said membrane and said patient adapted for coupling said pressure pulse into said patient;
ultrasound means for transmitting and receiving ultrasound signals to and from said patient, all of said central openings of said coil, said membrane and said means for insulating being in registry, and said ultrasound means having an ultrasound head received in said central openings.

4,928,673

ELECTRIC PASSIVE PEDAL EXERCISER

Floyd Heneger, 139 S. 8th, Brighton. Colo. 80601

Filed Apr. 3, 1989, Ser. No. 332,046
Int. Cl.[5] A61H *1/02*
U.S. Cl. 128—25 R 2 Claims

1. A light weight portable electric passive exercise device comprising:
a light weight portable frame means having a handle for ease of use and portability by a paraplegic;
a crank assembly housing mounted on said frame means;
a crank assembly means rotatably mounted in said crank assembly housing;
a motor mounted on said crank assembly housing and a gear means drivably connected said motor to said crank assembly means for rotatably driving said crank assembly;
said motor electrically connected with a rheostat for controlling the speed of said crank assembly means;
a tilt switch means electrically interconnected with said motor to automatically disengage power if said exercise device becomes unbalanced,
and a reset switch electrically interconnected with said tilt switch means and said motor for resetting said exercise device to operational status after said tilt switch means has been activated;





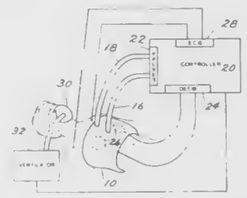
a pedal means pivotally mounted at the outer ends of said crank assembly means having a foot restraint means for holding an individual's foot in place while using said exercise device.

4,928,674

CARDIOPULMONARY RESUSCITATION AND ASSISTED CIRCULATION SYSTEM

Henry Halperin, Baltimore; Joshua Tsitlik, Reisterstown; Myron Weisfeldt, Baltimore, and Mark Gelfand, Reisterstown, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

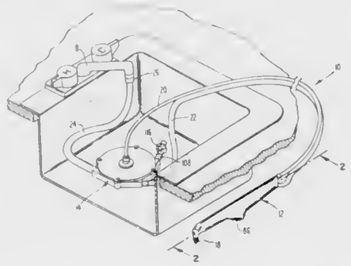
Filed Nov. 21, 1988, Ser. No. 273,810
Int. Cl.[5] A61H *31/00*
U.S. Cl. 128—30.2 30 Claims



1. A system for generating cyclic fluctuations in intrathoracic pressure for use in cardiopulmonary resuscitation of a patient comprising:
a first inflatable bladder means;
means for cyclically inflating and deflating said inflatable bladder means;
means for mounting said inflatable bladder means adjacent the chest wall of a patient so that cyclic inflation of deflation of the bladder means will produce pressure on the chest wall thus generating changes in intrathoracic pressure;
means for (a) urging said inflatable bladder means against the chest wall of the patient to generate an initial pressure on the chest wall (b) cyclically inflating said bladder means to generate large changes in intrathoracic pressure and, (c) periodically interrupting said urging to release said initial pressure and allow the chest to expand for adequate ventilation of the patient.

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4,928,675
DENTAL TREATMENT APPARATUS
Thomas F. Thornton, 43 Contentment Island Rd., Darien, Conn. 06820
Division of Ser. No. 112,278, Oct. 26, 1987, Pat. No. 4,808,109. This application Nov. 22, 1988, Ser. No. 274,568
Int. Cl.[5] A61H *9/00*
U.S. Cl. 128—66 2 Claims



2. An apparatus for removing plaque from dental surfaces by simultaneous brushing and treating with hot water at least 40° C. comprising:
(a) means for supplying hot water,
(b) toothbrush means having an elongate handle and a brush,
(c) a flexible hose connecting the means for supplying hot water to the toothbrush means and extending along the handle to the brush to dispense hot water adjacent the brush, and
(d) a hot-water-temperature-reading thermometer mounted on the apparatus and exposed to the hot water to measure the temperature of the water delivered to the brush.

4,928,676
KNEE BRACE WITH FLEXIBLE SECONDARY JOINT
Timothy Pansiera, 1050 N.W. First Ave., Boca Raton, Fla. 33432
Filed Feb. 27, 1989, Ser. No. 315,760
Int. Cl.[5] A61F *5/04*
U.S. Cl. 128—80 F 5 Claims



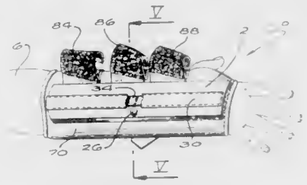
1. A knee brace having a primary joint and a flexible secondary joint, the brace comprising:
(a) an upper member for the support of a lateral side of a leg above the knee thereof, said upper member having an upper end and a lower end;
(b) a lower means for the support of said lateral side of the leg below the knee thereof, said lower member having an upper end and a lower end;
(c) a bi-axial element having a primary axis and a second axis, said lower end of said upper member being rotationally coupled to said primary axis, said upper end of said lower member being rotationally coupled to said secondary axis;
(d) lock means for selectively locking said lower end of said upper member to said primary axis, thereby selectably overriding said rotational coupling between said upper member and said primary axis of said bi-axial element, in which actuation of said locking means operates to change the effective axis of said bi-axial element from said primary axis to said second axis; and
(e) mechanical damping means oriented in said bi-axial element and applied against said secondary axis, said damping means comprising means for angularly biasing said secondary axis relative to said primary axis in a direction of rotation anterior to said primary axis,
whereby said knee brace will permit a more natural flexibility of the knee and of the lower leg, both when the knee is straight and when the knee is bent as is the case during sitting.

4,928,677
HYGIENE SPLINT
Lois M. Barber, Pismo Beach, Calif., assignor to LMB Hand Rehab Products, San Luis Obispo, Calif.
Filed Feb. 13, 1989, Ser. No. 309,115
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—87 R 17 Claims



1. A hygiene splint useable for a right hand or a left hand by turning the splint over comprising:
a hand grip for holding the fingers out of the palm of a user;
a ventral wrist support adapted to contact the ulnar side of a wrist and palm of a user and adapted to leave the thumb and thenar eminence substantially free from contact;
a ventral forearm support for support of said forearm;
means joining said hand grip, said ventral wrist support, and said ventral forearm support;
said means joining said hand grip, said ventral wrist support and said ventral forearm support comprising at least one wire which extends from said hand grip to said ventral wrist support and from said ventral wrist support to said ventral forearm support;
strap means for securing said splint to the hand, wrist, and forearm of a user;
a manually bendable support framework with a pliant cushioning material enclosing at least a portion of said framework; and wherein:
said framework is formed of a continuous unbroken length of malleable wire.

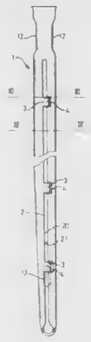
4,928,678
SOFT-GOODS TYPE, FORMABLE ORTHOPAEDIC CAST
Tracy E. Grim, Broken Arrow, Okla., assignor to Royce Medical Company, Westlake Village, Calif.
Filed Aug. 11, 1989, Ser. No. 392,836
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] A61F *5/04*
U.S. Cl. 128—90 28 Claims



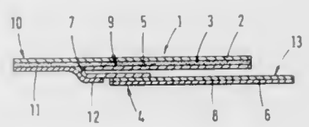
1. An orthopaedic soft-goods type cast assembly comprising:
means including a flexible casing, for enclosing a limb or other portion of the anatomy, having opposed edges;
said casing being manufactured or initially formed or tailored specifically to fit a selected portion of the anatomy of a patient, and having an initial irregular contour or pattern which follows the irregular and unique shape of said selected portion of the anatomy;
means for holding the two opposed edges of said casing toward one-another and securing said casing onto a limb or the like adjustably to accommodate variations in swelling;
liquid or gas permeable material impregnated with an activatable, hardenable material which structurally conforms to said portion of the anatomy when activated, said liquid permeable material being mounted to and secured to conform with the configuration of said casing;
a gas and water impervious pouch for preventing premature activation of said hardenable material; and
means for activating said hardenable material to form a cast or a splint for the limb or other portion of the anatomy.

4,928,679
CENTRO-MEDULLARY NAILING ROD
Francis Chagneau, Rennes; Michel Levasseur, Cesson-Sevigne; Patrick Landanger, Foulain; Frantz Langlais, Rennes, and Jean-Jacques Rolland, Dinan, all of France, assignors to Landos Applications Orthopediques Francaises, Chaumont Cedex, France
Filed Jul. 20, 1988, Ser. No. 221,949
Claims priority, application France, Jul. 21, 1987, 8710428
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—62 3 Claims

1. A centro-medullary nailing rod for treating bone fractures, said rod comprising an elongated hollow tube having a thin metal wall formed with a longitudinally extending slot having generally straight confronting edges extending from an open lower end to terminate in a blind end of said slot spaced longitudinally, down from an open upper end of said tube thereby forming a relatively short length, unslotted, annular upper end portion of said nailing rod, said wall "including locking means for preventing and substantial relative displacement between said confronting edges of said slot in a longitudinal direction, while allowing relative displacement thereof in a transverse direction, said locking means comprising a series of longitudinally spaced apart transversely extending tongues integrally formed on an edge of said slot and penetrating into cut-outs of complementary shape formed in a confronting edge of said slot, thereby imparting an intermeshing shape to said edges of said slot.



4,928,680
ADHESIVE COATED DRESSING AND APPLICATORS THEREFOR
Barry M. Sandbank, Herts, United Kingdom, assignor to Smith & Nephew plc, United Kingdom
Filed Sep. 9, 1988, Ser. No. 242,727
Claims priority, application United Kingdom, Sep. 15, 1987, 8721659
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—155 12 Claims

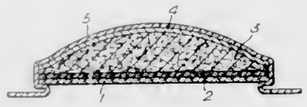


1. An adhesive coated thin film dressing in combination with an applicator therefor wherein the applicator comprises a pair of superposed laminar members hinged at one end, the lower member being adapted to be grasped at the end remote from the hinge and the upper member being adapted to support the dressing and being in releasable contact with a major portion of the adhesive surface thereof; and wherein a protector, in releasable contact with the remaining portion of the adhesive surface, extends beyond the hinged end of the upper member.

4,928,681
WOUND DRESSING
Richard D. Langston, Wokingham; Frances C. Webb, Maidenhead, and Simon C. McBeath, Poole, all of United Kingdom, assignors to Charcoal Cloth Limited, Berkshire, England
Filed Jun. 30, 1988, Ser. No. 213,663
Claims priority, application United Kingdom, Jul. 1, 1987, 8715421
Int. Cl.[5] A61L *15/00*
U.S. Cl. 128—156 16 Claims

1. A wound dressing which comprises, in order

a layer of a permeable material suitable for putting in contact with the wound;
a layer of a charcoal fabric;

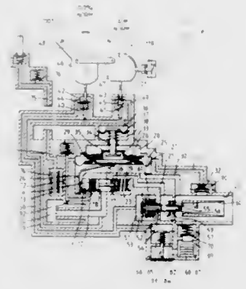


an absorbent pad; and
one or more layers including an impermeable material which protect and substantially prevent liquid strike-through.

4,928,682
AIRCRAFT ON-BOARD OXYGEN GENERATING SYSTEMS

George F. Stevenson; James C. Foote, and Humphrey A. S. Hamlin, all of Somerset, England, assignors to Normalair-Garrett (Holdings) Limited, United Kingdom

Filed Oct. 3, 1988, Ser. No. 252,141
Claims priority, application United Kingdom, Oct. 14, 1987, 8724081
Int. Cl.[5] A61M *15/00*
U.S. Cl. 128—202.26 **11 Claims**



1. An on-board oxygen generating system including an aircraft aircrew breathing demand regulator comprising inlet means for receiving a supply of oxygen-enriched breathable gas from a molecular sieve oxygen generating system (MSOGS), outlet means for delivering breathable gas to an end user, demand valve means connected between said inlet means and said outlet means for controlling delivery of MSOGS oxygen-enriched breathable gas from said inlet means to said outlet means in response to breathing demands of the end user, injector means including an injector nozzle connected between said demand valve means and said outlet means and operable by said MSOGS oxygen-enriched breathable gas, injector nozzle bypass means including control means for controlling flow of MSOGS oxygen-enriched breathable gas to bypass said injector nozzle or to be entirely through said injector nozzle in passing from said demand valve means to said outlet means, ambient air inlet means including ambient air inlet control valve means for permitting ambient air to be drawn into said regulator by said injector means, and regulator mode selector switch means for controlling said injector nozzle bypass control means and said ambient air inlet control valve means, whereby in one mode of regulator operation said ambient air inlet control valve means is closed and said injector nozzle bypass means is open to permit undiluted MSOGS oxygen-enriched breathable gas to be delivered to said outlet means and in another mode of regulator operation said ambient air inlet control valve means is open and said injector nozzle bypass means is closed so that MSOGS oxygen-enriched breathable gas flows through said injector nozzle to induce ambient air to enter said regulator to mix with MSOGS oxygen-enriched breathable gas and breathable gas of diluted oxygen concentration is delivered to said outlet means.

4,928,683
RESPIRATING APPARATUS FOR PATIENTS

Bart Westerkamp, and Geert Van Dijk, both of Pampuslaan 90, Weesp, Netherlands

Filed Feb. 2, 1988, Ser. No. 151,675
Claims priority, application Netherlands, Feb. 17, 1987, 8700389
Int. Cl.[5] A61M *15/00*
U.S. Cl. 128—203.12 **5 Claims**



1. An anesthesia respirating apparatus for patients comprising a closed line system that is provided with a first pump by means of which respiratory gas may be circulated in said closed line system and with a second pump by means of which the respiratory gas in said closed line system may be alternately compressed and decompressed to make the patient respire in accordance with a certain respiratory pattern, the closed line system being provided with means for connecting said closed line system with the patient and with further connecting means for supplying the various components of the respiratory gas to said closed line system and with still further means for withdrawing carbon dioxide that has been exhaled by the patient into the closed line system, the second pump including a plurality of simultaneously operable pump chambers connected in parallel with one another, each pump chamber having a flexible membrane which extends completely across said chamber and which separates said chamber into a primary and a secondary portion, the secondary portion of each pump chamber being connected to the closed line system and the primary portion of each pump chamber being connected to a supply of compressed air whose pressure may be varied to effect a pumping action of the membrane, and a plurality of externally controllable valves located respectively between said compressed air supply and the primary portions of said pump chambers and between the secondary portions of said pump chambers and said closed line system for selectively varying the number of said parallel pump chambers that are simultaneously operative to effect a pumping action at any given time thereby to control the pressure of the respiratory gas being circulated in said closed line system.

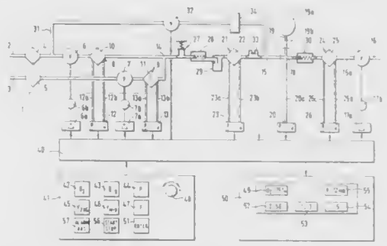
4,928,684
APPARATUS FOR ASSISTING THE SPONTANEOUS RESPIRATION OF A PATIENT

Wilhelm Breitenfelder, Friedberg, and Fritz Trenkner, Taunus, both of Fed. Rep. of Germany, assignors to Salvia-Werk Gesellschaft zur Herstellung chemischer and pharmazeutischer Erzeuginisse mbH, Saar, Fed. Rep. of Germany

Filed May 22, 1989, Ser. No. 354,610
Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3817985
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—204.21 **10 Claims**

1. An apparatus for assisting the spontaneous breathing of a patient, comprising:

a respiratory-gas mixing unit (1) for mixing air and oxygen in a desired ratio in order to supply the patient with a respiratory gas of an adjustable oxygen concentration, said mixing unit including,
(a) an air conduit (2) having an air flow sensor for generating an electrical air flow signal corresponding to the air flow, and an electrically controlled air valve (6) for adjusting the air flow,
(b) an oxygen conduit (3) having an oxygen sensor (9) for generating an electrical oxygen flow signal corresponding to the oxygen flow, and an oxygen valve (7) for adjusting the oxygen flow, and
(c) a mixing area (14) combining said air and oxygen conduits;
an outlet (16) having
an electrically controlled outlet valve (17) for adjusting the gas flow through said outlet (16)



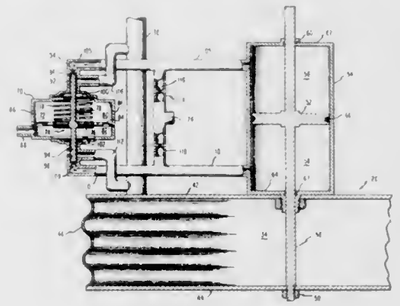
a gas duct (15) connected to said respiratory-gas mixing unit (1) and extending to said outlet (16);
a patient line (19) branching off from said gas duct (15) for providing an air/oxygen mixture to the patient;
a respiratory-gas pressure sensor (20) in connection with said patient line for generating an electrical signal corresponding to the pressure of the respiratory-gas in the patient line; and
an electronic control unit operatively connected to said air flow sensor (8), said oxygen flow sensor (9), said respiratory-gas pressure sensor (20), said air valve (6), said oxygen valve (7), and said outlet valve (17), such that signals from said sensor are input to said control unit as variables, and said control unit outputs control signals to said valves in response thereto.

4,928,685
CLOSED-CIRCUIT POSITIVE PRESSURE BREATHING APPARATUS WITH PNEUMATICALLY OPERATED STORAGE CHAMBER

Robert E. Gray, Glen Mills, Pa., assignor to Cairns & Brother Inc., Clifton, N.J.

Filed Oct. 5, 1988, Ser. No. 253,710
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—204.24 **9 Claims**

1. A rebreathing apparatus for use by a wearer having a respiratory system, which comprises:
an inhale/exhale breathing conduit;
an exhaust gas scrubber means for removing carbon dioxide from an exhaled gaseous stream and having an inlet connected to said inhale/exhale breathing conduit;
a breathing storage chamber including means for varying volume of said breathing storage chamber;
a conduit means for providing fluid flow between said exhaust gas scrubber means and said breathing storage chamber;
a conduit means for providing fluid flow between said breathing storage chamber and said inhale/exhale breathing conduit;
a breathing gas supply tank;
a pressure reducer valve having an inlet and an outlet;
a conduit means for providing fluid flow between said breathing gas supply tank and said inlet of said pressure reducer valve;
a pressure sensor means having a housing in fluid flow communication with said outlet of said pressure reducer valve, said pressure sensor means having a piston defining at least two fluidically separate chambers within said housing, one of said chambers being in constant fluid communication with ambient pressure and the other of said chambers being in fluid communication with said inhale/exhale

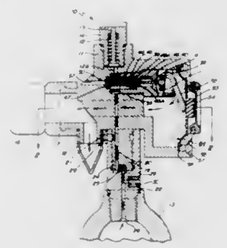


breathing conduit, said pressure sensor means including means within said housing for reciprocally actuating said piston in response to a change of pressure within said other of said chambers due to a change of pressure within said inhale/exhale breathing conduit, said pressure sensor means having valve chambers in alternating fluid flow communication with said means for varying volume of said breathing storage chamber whereby pressure of inhalation/exhalation drives said means for varying pressure of said breathing storage chamber to increase/decrease pressure, respectively, of said breathing storage chamber.

4,928,686
LIGHTWEIGHT BREATHING DEVICE

Guy S. Nelepka, 2327 N. Tustin Ave., Newport Beach, Calif. 92660

Filed Jan. 3, 1989, Ser. No. 293,071
Int. Cl.[5] A62B *9/02*
U.S. Cl. 128—205.24 **8 Claims**



1. An air breathing device, comprising
a. a main body including a fill port for supplying air to an air supply tank mounted on the breathing device;
b. a rotatable cylinder stem defining a first orifice bore, the cylinder stem being mounted on the breathing device and attached to the air supply tank, the first orifice bore being connected to the air supply tank;
c. an on-off valve mounted on the cylinder stem and defining

a second orifice bore, the first and second orifice bores being adapted to form an air connection upon sufficient rotation of the cylinder stem, thereby turning on and admitting air from the air supply tank to the device;

d. an air regulator housing mounted within the main body and connecting from the second orifice bore to a poppet bore cavity;

e. an elongate, spring loaded poppet means defining a longitudinal, axial bore, one end of the poppet means seating into an atmospheric bore, and an opposed end of the poppet means, including a poppet head, seating into and sealing the poppet bore cavity, and a poppet stem mounted and secured within the longitudinal, axial bore of the poppet;

f. a body portion mounted in the on-off valve and providing an air connection between the valve and the poppet means of the air regulator housing;

g. a breathing mouthpiece and exhaust port mounted on the air breathing device, the breathing mouthpiece being air connected through the body portion to the air regulator, housing and the poppet bore cavity, and the exhaust port being air connected to the body portion; and,

h. a lever adapted to actuate the stem of the poppet means the poppet stem being connected to the lever through a poppet stem cavity contiguous with the poppet bore cavity and secured in the poppet stem cavity by a shoulder formed on the poppet stem; whereby: i. when the on-off valve is turned on, and a user inhales on the mouthpiece, sufficient suction is produced to unseat the poppet from the poppet bore cavity and admit air to the user from the air supply tank and through the connected first orifice bore, and then through the body portion; ii. when the user exhales on the mouthpiece, the poppet closes and exhaust air passes through the body portion to the exhaust port; and, iii. when the lever is pressed, the poppet will be unseated and release or blow out water and moisture through the body portion and exhaust port.

4,928,687

CO_2 DIAGNOSTIC MONITOR

Samsun Lampotang; Dietrich Gravenstein; Joachim S. Gravenstein; Nikolaus Gravenstein, and Michael J. Banner, all of Gainesville, Fla., assignors to The University of Florida, Gainesville, Fla.

Filed Oct. 11, 1988, Ser. No. 255,400
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—207.14 **30 Claims**



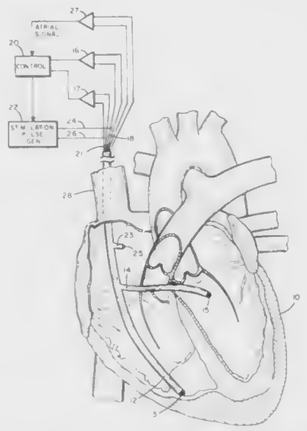
1. A self-contained diagnostic monitor for screening the CO_2 content of a gas exiting a patient during endotracheal or esophageal intubation comprising: (1) a reservoir containing at least one portion of a composition having an initial pH in solution above about 3.8 and which substantially changes color in solution in response to exposure to CO_2, said reservoir having an opening adapted for communication only with said gas exiting and entering said patient during endotracheal or esophageal intubation; and (2) a semipermeable membrane which is permeable to CO_2, said membrane separating said at least one composition portion from said exiting and entering gases, and wherein said reservoir contains a plurality of composition portions having initial pH is solution above about 3.8 and which substantially change color in solution in response to exposure to CO_2, and further comprising a plurality of semi-permeable membranes having differing thicknesses and/or CO_2 permeabilities and/or surface areas, each semi-permeable membrane separating a corresponding composition portion from said exiting and said entering gas, and each one of said plurality of composition portions separated from every other composition portion by at least one semi-permeable membrane, and each of said plurality of composition portions requiring a different time of exposure to CO_2 to effect said change in pH thereby causing said color change.

4,928,688

METHOD AND APPARATUS FOR TREATING HEMODYNAMIC DISFUNCTION

Morton M. Mower, Lutherville, Md., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Jan. 23, 1989, Ser. No. 299,895
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 PG **14 Claims**



1. A method for improving the hemodynamic efficiency of a sick heart comprising the steps of:

(a) detecting respective cardiac signals originating in the left and right ventricles of the heart;

(b) analyzing said cardiac signals and the absence thereof in an electronic control circuit; and

(c) providing electrical pulses from a stimulating circuit controlled by said control circuit to one, the other or both ventricles as required for effecting substantially simultaneous contraction of both ventricles, said step of analyzing including providing a control signal from said control circuit to said stimulating circuit for producing an electrical stimulating pulse to one or both ventricles in response to the absence of a detected cardiac signal from one or both ventricles within a time interval which is a small fraction of the pulse width of a detected cardiac signal.

4,928,689

RATE ADAPTIVE CARDIAC PACER SYSTEM HAVING LIVING CELL TISSUE FOR SENSING PHYSIOLOGIC DEMAND

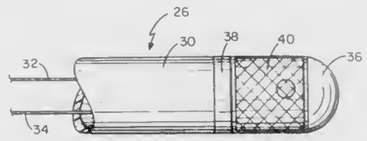
Robert G. Hauser, Long Lake, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed May 15, 1989, Ser. No. 351,482
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 P **11 Claims**

1. An implantable apparatus for pacing the heart in accordance with a sensed physiologic demand comprising:

(a) adjustable rate demand pacer for implantation in a human body, including means for sensing naturally occurring ventricular depolarization signals originating within the heart tissue and coordinating the application of electrical stimulation signals to said heart tissue with said naturally occurring ventricular depolarization signals; and

(b) a pacing lead for implantation in said human body, at least a portion of said lead being disposed within the heart, said lead being electrically coupled to said adjustable rate demand pacer and having a stimulating electrode, a sensing electrode and a substrate supporting iving sinus, node, cell tissue, said sensing electrode detecting through said substrate depolarization of said sinus node cell tissue and delivering a rate control signal to said adjustable rate demand pacer for controlling the rate at which said electrical stimulation signals are delivered to said stimulating electrode.



4,928,690

PORTABLE DEVICE FOR SENSING CARDIAC FUNCTION AND AUTOMATICALLY DELIVERING ELECTRICAL THERAPY

Marlin S. Heilman, Sarver; Arlan J. Brandt, Gibsonia; Larry D. Bowling, and Joseph F. Russial, both of Pittsburgh, all of Pa., assignors to Lifecor, Inc., Pittsburgh, Pa.

Filed Apr. 25, 1988, Ser. No. 185,781
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—421 **51 Claims**



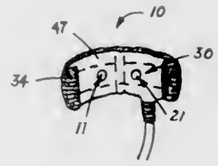
1. A patient-worn device for automatically delivering electrical therapy to the heart upon the occurrence of a treatable heart arrhythmia, the device comprising: monitoring means for continuously sensing the patient's heart condition, skin-contacting treatment electrode means having a surface adapted for contact with the patient's skin, a source of electrical energy for supplying electrical pulses to the electrode means, discrimination means for receiving signals from the monitoring means and determining the presence of a treatable heart arrhythmia, impedance reducing means associated with the electrode means for actuation by the discrimination means responsive to the detection of a treatable heart arrhythmia for automatically reducing the impedance to electrical current flow at an interface between said surface of the electrode means and the patient's skin, and switching means actuated by the discrimination means responsive to the detection of a treatable arrhythmia for connecting the source of electrical energy to the electrode means thereby applying appropriate electrical pulses to the heart.

4,928,691

LINGUAL OXIMETER PROBE

Susan C. Nicolson, and David R. Jobes, both of Cherry Hill, N.J., assignors to Nellcor Incorporated, Hayward, Calif.

Filed Oct. 8, 1987, Ser. No. 106,608
Int. Cl.[5] A61B *6/00, 5/02*
U.S. Cl. 128—633 **8 Claims**



1. A non-invasive, electro-optical sensor probe for attachment to a patient for use in measuring light extinction during transillumination of a portion of blood-perfused tissue of the patient's body part, comprising:

a light source for directing light through the tissue portion to be transilluminated;

a photosensor for receiving light directed through the tissue portion transilluminated by the light source; and

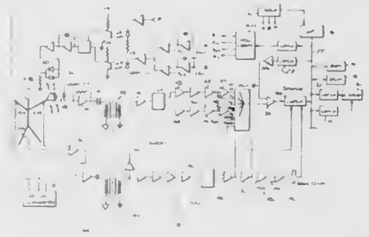
malleable, flexible, non-resilient, shape retentive attachment means for securing the light source and the photosensor to a cutaneous layer of the tissue portion such that the probe is held in conformance with said tissue portion, wherein said attachment means can be shaped to the body part being transilluminated.

4,928,692

METHOD AND APPARATUS FOR DETECTING OPTICAL PULSES

David E. Goodman, 454 Roosevelt Way, San Francisco, Calif. 94114, and James E. Coreman, 1095 Sherman Ave., Menlo Park, Calif. 94025

Continuation of Ser. No. 742,720, Jun. 5, 1985, Pat. No. 4,802,486, which is a continuation of Ser. No. 718,525, Apr. 1, 1985, abandoned. This application Nov. 23, 1988, Ser. No. 275,727
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—633 **13 Claims**



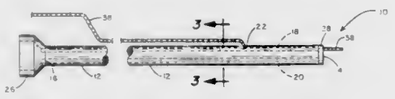
1. An improved method for photoelectrically detecting arterial pulses of a patient comprising:

detecting the blood flow, which may include arterial pulses and artifacts, at the patient's body tissue using a device that calculates blood constituents from the detected blood flow;

detecting the occurrence of a selected portion of the pa-

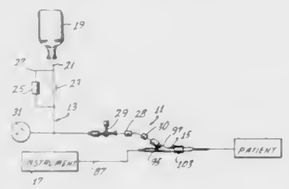
tient's EKG waveform as the occurrence of the heartbeat of the patient;
correlating the occurrence of the heartbeat with the detection of pulses by the blood constituent calculating device; and
determining whether or not a detected pulse is likely to be a detected arterial pulse by using the determined correlation and a detected heartbeat.

4,928,693
PRESSURE MONITOR CATHETER
Richard L. Goodin, Blaine; Mark A. Rydell, Golden Valley, and Rick L. Shockey, Eagan, all of Minn., assignors to Schneider (USA), Inc., Minneapolis, Minn.
Filed Mar. 13, 1989, Ser. No. 322,362
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—637 **3 Claims**



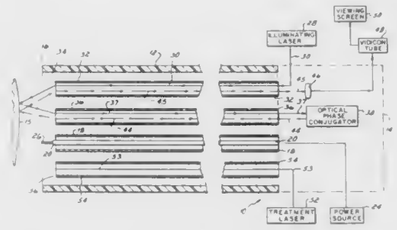
1. A pressure monitor catheter comprising:
an elongated flexible plastic tubular member having a distal end and a proximal end with a pressure sensing lumen extending from said proximal end to a pressure sensing port located proximate said distal end and a guidewire lumen extending from said distal end to a guidewire port extending through the side wall of said tubular member at a location a relatively short predetermined distance proximal of said distal end, and an elongated guidewire extending exterior of said tubular member with a relatively short distal end portion of said guidewire extending through said guidewire port, said guidewire lumen and out said distal end of said tubular member.

4,928,694
INTRAVASCULAR BLOOD PARAMETER MEASUREMENT SYSTEM
Thomas P. Maxwell, Santa Ana, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 8,937, Jan. 30, 1987, Pat. No. 4,830,013. This application Mar. 23, 1989, Ser. No. 328,041
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—637 **21 Claims**



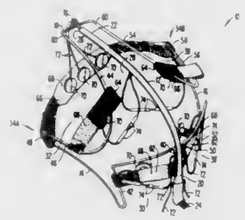
1. A probe for sensing at least one parameter in blood comprising:
first and second optical sensors for sensing at least one parameter in blood selected from the group consisting of blood gases, pH, electrolytes, glucose, and temperature and for providing a signal in response thereto; and
elongated transmission means for transmitting the signals from the first and second sensors proximally;
said first and second sensors being carried by a distal portion of the transmission means with the first and second sensors being at different longitudinal positions along the distal portion of the transmission means; and
said transmission means and said first and second sensors being sized to be received in the cardiovascular system of a patient.

4,928,695
LASER DIAGNOSTIC AND TREATMENT DEVICE
Leon Goldman, The Devonshire House, 7811 Eads, No. 304, La Jolla, Calif. 92037; Ellet H. Drake, 706 Spring St., Wausau, Wis. 54401, and Steven Goldman, 4425 W. Flying Diamond Dr., Tucson, Ariz. 85704
Filed Feb. 17, 1989, Ser. No. 312,887
Int. Cl.[5] A61N *5/00*; A61B *1/06, 17/35*
U.S. Cl. 128—642 **18 Claims**



1. Apparatus for scanning organs of the body having abnormal, electrical conducting tissue, comprising:
an optical imaginary catheter tube means adapted to be inserted in vivo in proximity to the abnormal, electrical conducting tissue of a body organ;
optical phase conjugation means associated with said tube for producing a relatively undistorted image of said abnormal, electrical conducting tissue for viewing.

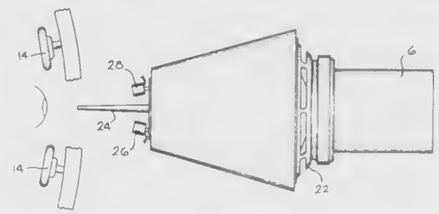
4,928,696
ELECTRODE-SUPPORTING HEADSET
Don J. Henderson, Danville; Robert Brady, Pescadero; Foster R. Gamble, Woodside; James V. Hardt, San Francisco; Howard Friedfeld, Palo Alto; Don Salerno, Mountain View; Tad Swanson, Menlo Park, and Maureen R. Sansing, Oakland, all of Calif., assignors to MindCenter Corporation, Palo Alto, Calif.
Filed Jul. 26, 1989, Ser. No. 385,595
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—644 **9 Claims**



1. A headset apparatus for detecting electrical signals from a head of a subject for extended periods comprising:
a tubular support member having a base end and a frontal end, said tubular support member shaped to extend from a base to a forehead of said head along a central distal contour;

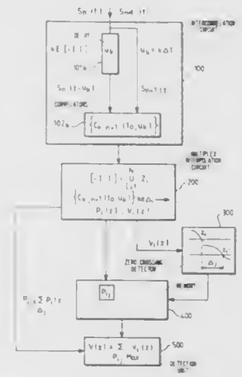
a first tubular mount member rigidly attached to a right occipital side of said base end, said first tubular mount member comprising a first suspension segment, a second suspension segment and a first half of a third suspension segment, each said suspension segment comprising opposing parallel pole members separated by a space, said first suspension segment being disposed between said base end and a right vertical side pole member disposed behind a right ear position, said second suspension segment being disposed between said frontal end and a right horizontal pole member above said right ear position, and said first half of said third segment being disposed at a right forward position adjacent a right temple portion;
a second tubular mount member rigidly attached to a left occipital side of said base end, said second tubular mount member comprising a fourth suspension segment, a fifth suspension segment and a second half of said third suspension segment, each said suspension segment comprising opposing parallel pole members separated by a space, said fourth suspension segment being disposed between said base end and a left vertical side pole member disposed behind a left ear position, said fifth suspension segment being disposed between said forward end and a left horizontal pole member above said left ear position, and said second half of said third segment being disposed at a left forward position adjacent a left temple portion; and
a plurality of flexible electrode supporting band means, including at least one electrode mounted to each said band means, each of said band means are for pressing said electrodes against said head at occipital, frontal and central portions of said head, each said band means having at each end means for forming a tube slidably attachable on opposing pairs of said pole members and including means for adjusting the length of said band means between said opposing pole member pairs to adjust pressure between the band means and the head.

4,928,697
NON-CONTACT HIGH FREQUENCY TONOMETER
Hsiung Hsu, Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio
Filed Sep. 28, 1988, Ser. No. 250,165
Int. Cl.[5] A61B *3/16*
U.S. Cl. 128—649 **4 Claims**



1. A tonometer for use in the non-contact measurement of intraocular pressure of an eye comprising, in combination:
support means for placing such eye in a fixed position;
means for producing a low frequency perturbating sound wave positioned proximate of such eye wherein such perturbating sound wave is directed toward such eye for causing a vibration on the surface of such eye, the intensity of such vibration being dependent upon such intraocular pressure;
means for transmitting a high frequency wave positioned proximate said perturbating wave producing means, said high frequency wave being transmitted toward such eye for reflection of such perturbated surface of such eye;
means for receiving such reflected high frequency wave and detecting any modulation in the amplitude of such high frequency wave created by such vibration of the surface of such eye;
means for creating an output signal based upon such modulation; and,
means for displaying such output signal for viewing.

4,928,698
DEVICE FOR MEASURING THE SPEED OF MOVING ORGANS AND BLOOD FLOWS BY CORRELATION
Odile M. A. Bonnefous, Nogent Sur Marne, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 12, 1989, Ser. No. 337,024
Claims priority, application France, Apr. 19, 1988, 88 05146
Int. Cl.[5] A61B *8/06*
U.S. Cl. 128—661.09 **2 Claims**



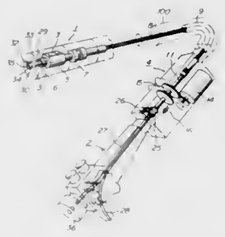
1. In an ultrasonic examination system for measuring the speed of moving organs and blood flows of the type responsive to an echographic signal representing recurrent emission with a recurrent period T comprising intercorrelation means which operates with a sampling step Δt which supplies on the basis of two successive echographic lines shifted by $k\Delta t$ ($k=-I, -I+1, \ldots, I$), $2I+1$ correlation function values and multiplex/interpolation means which supplies, on the basis of correlation function values, a signal representing an estimate of the speed and the value manifested by the corresponding correlation peak, the improvement therewith comprising:
said intercorrelation means and multiplex means including means responsive to said echographic signal applied as an input thereto for generating an output signal having first and second values respectively manifesting an estimate of (1) the speed and (2) the value of the correlation peak within each of N zones defined in the time shift interval $\{-I\Delta t, +I\Delta t\}$,
zero crossing detector means responsive to said output signal first value for generating a signal defining M segments limited by the values of the scanning depth for which the estimate of the speed passes through zero in the set of N zones,
memory means responsive to said output signal second value and to the zero crossing detector means generated signal for storing the accumulated values P_{ij} of the correlation peak corresponding to the ith zone ($i=1, \ldots N$) and to the jth segment ($j=1, \ldots, M$); and
detection means responsive to the stored accumulated values P_{ij} for reconstructing the speed profile searched by retaining for each segment j the speed profile in the zone i for which P_{ij} is maximum.

4,928,699

ULTRASONIC DIAGNOSIS DEVICE

Tsuguhisa Sasai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,658
Claims priority, application Japan, May 18, 1987, 62-119026; May 18, 1987, 62-119028; Jul. 29, 1987, 62-187837
Int. Cl.[5] A61B *8/12*
U.S. Cl. 128—662.06 **15 Claims**



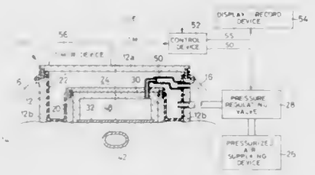
1. An ultrasonic diagnosis device comprising an ultrasonic probe arranged in a front end region of an insertion portion to be inserted into a cavity, the ultrasonic probe being supported by a hollow cylindrical member which is rotatable about a center axis of the insertion portion, a drive means arranged in an external drive portion located outside of the cavity, for causing the rotation of the ultrasonic probe, a hollow power transmission means which passes through the insertion portion, for drivably connecting said hollow cylindrical member with said drive means, a hollow channel extending from an end surface of the front end region, through said hollow cylindrical member and an interior of said hollow power transmission means to a manipulation portion located outside the cavity which controls operational functions of the front end region of the insertion portion, and an image transmission means arranged within said hollow channel, for obtaining an optical image for a visual field on the front side of the device in the insertion direction of the front end region and for transmitting said optical image to the manipulation portion.

4,928,700

PULSE WAVE DETECTING APPARATUS

Chikao Harada, Nagoya, Japan, assignor to Colin Electronics Co., Ltd., Aichi, Japan

Filed Jan. 23, 1989, Ser. No. 299,410
Claims priority, application Japan, Jan. 28, 1988, 63-10112[U]
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—672 **6 Claims**



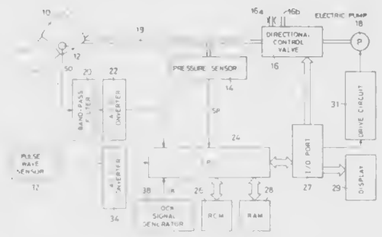
1. A blood pressure monitoring apparatus comprising:
a pressure sensitive semiconductor element for detecting pulse wave produced from an arterial vessel of a subject and generating a pulse wave signal representing the detected pulse wave, the semiconductor element being pressed against said arterial vessel via a body surface of the subject so as to detect the pulse wave;
a housing for accommodating said semiconductor element;
control means for monitoring blood pressure of the subject based on the pulse wave signal supplied from said semiconductor element, said housing and said control means being separate from each other, and connectable to each other; and
timer means for measuring an operation time of said semiconductor element, and generating a full-use signal when said operation time exceeds a reference value which represents that the semiconductor element has been used for a permitted period of time, said timer means being supported by said housing.

4,928,701

METHOD AND APPARATUS FOR MONITORING BLOOD PRESSURE

Chikao Harada, and Minoru Niwa, both of Nagoya, Japan, assignors to Colin Electronics Co., Ltd., Aichi, Japan

Filed Feb. 21, 1989, Ser. No. 312,183
Claims priority, application Japan, Feb. 23, 1988, 63-40248; Feb. 24, 1988, 63-41677
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—677 **25 Claims**



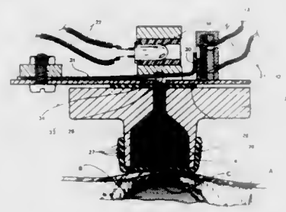
1. A method of monitoring blood pressure of a subject, the method comprising the steps of:
(a) continuously detecting pulse wave which is produced from an arterial vessel of a subject synchronously with heartbeat of said subject, said pulse wave consisting of a plurality of pulses,
(b) measuring at least one blood pressure of said subject by inflating an inflatable cuff set on a body portion of said subject so as to press said body portion, and subsequently deflating said inflatable cuff,
(c) selecting one of a first pulse group consisting of at least one pulse of the pulse wave detected during a first time period immediately before beginning of the inflation of said inflatable cuff, and a second pulse group consisting of at least one pulse of the pulse wave detected during a second time period following said first time period, such that said first pulse group is selected if a magnitude of the at least one pulse of said second pulse group is smaller more than a predetermined value than a magnitude of the at least one pulse of said first pulse group, and such that said second pulse group is selected if said magnitude of said at least one pulse of said second pulse group is not smaller more than said predetermined value than said magnitude of said at least one pulse of said first pulse group,
(d) determining a relationship between blood pressure and magnitude of pulse wave, based on the measured at least one blood pressure and at least one magnitude of the at least one pulse of the selected one of said first and second pulse groups,
(e) repeating the above steps (b) to (d) and thereby updating the relationship between blood pressure and magnitude of pulse wave, and
(f) continuously determining blood pressures of said subject based on magnitudes of the pulses of the continuously detected pulse wave, according to a currently effective one of the repetitively updated relationships.

4,928,702

DEVICE FOR PICKING OFF AND EVALUATING A PRESSURE, IN PARTICULAR A PRESSURE OF A FLUID

Bernard M. Cousin, 37460 Montresor, France

Division of Ser. No. 324,551, Nov. 24, 1981, abandoned. This application Apr. 20, 1987, Ser. No. 40,735
Claims priority, application France, Dec. 5, 1980, 8025815; Jun. 25, 1981, 8112457
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—678 **17 Claims**



1. A device for detecting blood pressure through the skin of a patient comprising capsule means defining a chamber having an opening, a flexible membrane extending across and closing said opening, a noncompressible liquid contained in said chamber, solid elastic means positioned opposite said opening to exert a pressure on said noncompressible liquid operating to automatically and instantaneously return said flexible membrane to its rest position when the membrane is momentarily displaced from its rest position, said solid elastic means deforming to a degree varying with the pressure transmitted into said liquid through said membrane means mounting said capsule to enable said membrane to be applied directly against the skin of a patient from which a pressure is to be detected, said membrane comprising a flexible sheet adapted and arranged to conform to the shape of and lie flat against the skin of a patient, said opening being large enough to transmit blood pressure through the skin of a patient, and said membrane into said liquid, and means to detect the degree of deformation of said solid elastic means in response to variations in pressure applied to said noncompressible liquid and to indicate the blood pressure of the patient.

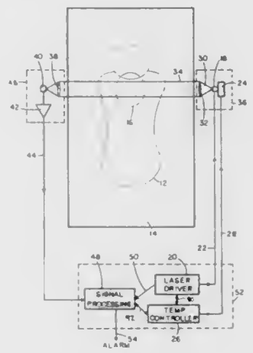
4,928,703

NON-CONTACT RESPIRATION RATE AND APNEA MONITOR USING PULMONARY GAS EXCHANGE TECHNIQUE

Jacob Y. Wong, Santa Barbara, Calif., assignor to Evionics, Inc., Santa Barbara, Calif.

Filed Nov. 23, 1988, Ser. No. 275,762
Int. Cl.[5] A61B *5/08*
U.S. Cl. 128—719 **10 Claims**

1. Apparatus for detecting apnea of a sleeping patient without the need to confine the patient under a hood or to require the patient to breathe through a tube or a mask, said apparatus comprising:
a semiconductor laser diode means for emitting substantially monochromatic coherent radiation in the 0.762 micron absorption band of oxygen;
first means located so as to collect some of the radiation emitted by said semiconductor laser diode, for forming it into a collimated beam of radiation and for directing the collimated beam to pass through a space into which the patient is exhaling;
second means located so as to intercept and collect the collimated beam after it has passed through the space into which the patient is exhaling;
third means located so as to detect the collected radiation and to produce an electrical signal representative of the quantity of radiation collected and,



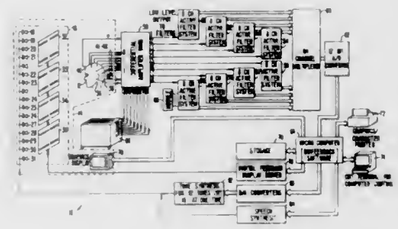
fourth means electrically connected to said third means for analyzing the electrical signal to determine whether it undergoes variations of appropriate magnitude and frequency to indicate satisfactory breathing by the patient, and for producing an output signal when satisfactory breathing is not indicated.

4,928,704

EEG BIOFEEDBACK METHOD AND SYSTEM FOR TRAINING VOLUNTARY CONTROL OF HUMAN EEG ACTIVITY

James V. Hardt, San Francisco, Calif., assignor to MindCenter Corporation, Palo Alto, Calif.

Filed Jan. 31, 1989, Ser. No. 304,979
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—732 **37 Claims**



1. A method for training a person to develop useful degrees of voluntary control of personal electroencephalographic (EEG) activity, said method comprising the steps of:
(a) placing a plurality of EEG sensors at a plurality of cortical sites on a head of said person;
(b) placing said person in an environment of controlled light and sound to control the arousal level and the distractibility of the person;
(c) sensing electric potentials from said plurality of cortical sites to obtain a plurality of channel signals in a plurality of channels;
(d) individually filtering said channel signals within predefined frequency subbands, each said predefined frequency subband having an abrupt cutoff at a low-frequency skirt,

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an abrupt cutoff at a high-frequency skirt and near instantaneous propagation for processing in accordance within time constraints limited by natural neurological reactivity to obtain a resultant signal for each said channel;

(e) processing each said resultant signal to obtain objective data on brain energies as a function of channel; and

(f) presenting said objective data substantially instantaneously as feedback to said person to indicate to said person personal EEG activity at a said plurality of cortical sites within said predefined frequency spectra in order to facilitate voluntary conscious and unconscious control over said personal EEG activity.

4,928,705

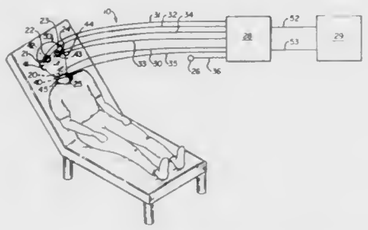
ACOUSTIC ANEURYSM DETECTOR AND ASSOCIATED METHOD

Laligam N. Sekhar; Robert J. Scalbassi; Mingui Sun, all of Pittsburgh, Pa., and Jacob F. Wasserman, Knoxville, Tenn., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa. and University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Dec. 8, 1987, Ser. No. 130,108

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—773 **32 Claims**



1. An acoustic intracranial aneurysm detector consisting of as plurality of hydrophone sensors adapted to be in contact with a patient for receiving sound emanating from said patient and for converting the sound to be responsive electronic signals, means for adjustably positioning said sensors in contact with the patient's head,

electronic means for filtering and amplifying the responsive electric signals to create processed electrical signals, and

analysis means operatively associated with said electronic means for receiving said processed electrical signals and for simultaneously providing an output indication of the frequency and relative magnitude of said sound at each of a plurality of time intervals within a cardiac cycle of said patient, whereby the presence or absence of an aneurysm in said patient can be detected.

4,928,706

NOCTURNAL PENILE TUMESCENCE AND RIGIDITY MONITOR

Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Filed May 27, 1988, Ser. No. 200,041

Int. Cl.[5] A61B *5/10*

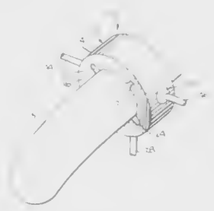
U.S. Cl. 128—774 **19 Claims**

1. A nocturnal penile tumescence and rigidity sensor comprising,

(a) a cuff member disposable on a penis, said cuff member having a substantially rigid support shell,

(b) a flexible membrane adjoined to said shell portion to define a chamber within said cuff for holding fluid, said chamber being adapted to hold selected predetermined amounts of fluid respectively correlatable with a condition of penile flaccidity and a condition of penile tumescence to permit a detection of the conditions of penile flaccidity and penile tumescence,

(c) fluid inlet and outlet means joined to said shell portion and communicable with said chamber to permit flow of said fluid into said chamber and out of said chamber in response to conditions of penile flaccidity and penile tumescence, and



(d) rigidity sensing means joined to said shell and including projectable means in said chamber for projection against said penis through said membrane to enable the rigidity of said penis to be measured as a function of pressure data detected as a result of pressure between the projectable means and the penis.

4,928,707

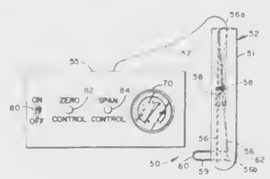
ELECTRONIC PRESSURE ALGOMETER APPARATUS

Eric L. Schiffman; James R. Fricton, both of Minneapolis, and Lawrence M. Espy, Edin, all of Minn., assignors to Regents of the University of Minnesota, St. Paul, Minn.

Continuation-in-part of Ser. No. 26,625, Mar. 17, 1987, Pat. No. 4,768,521. This application Sep. 2, 1988, Ser. No. 241,112

Int. Cl.[5] A61B *5/10*

U.S. Cl. 128—774 **21 Claims**



1. A pressure algometer apparatus, comprising:

pressure sensitive means sensing pressure applied to a localized site on a patient's body, the pressure sensitive means including transducer means having a muscle engaging surface of constant geometry for providing an electrical output signal indicative of the pressure sensed;

pressure responsive means electrically interconnected to the pressure sensitive means for receiving the electrical output signal from the pressure sensitive means, the pressure responsive means including readout means for indicating the pressure sensed by the pressure sensitive means;

coupling means for electrical interconnection of the pressure algometer apparatus to source of electrical energy; and

flexible structure means for electrically and flexibly interconnecting the pressure sensitive means to the pressure responsive means whereby the pressure sensitive means can be manipulated independently of the pressure responsive means, the pressure responsive means including supporting bridge electronics having a plurality of resistors cooperating with the pressure sensitive means to provide a bridge function, a trim resistor being further provided in the pressure responsive means so as to enable balancing of the bridge electronics when in a neutral or unstressed state.

4,928,708

REPRODUCING HUMAN POSTURE

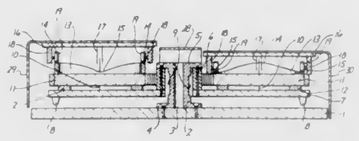
Ulrich M. Landwehr, Bahnhofstrasse 8, D-3000 Hannover, and Guenter Rackwitz, Berliner Allee 9, D-3162 Uetze/Dolbergen, both of Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 186,621

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1987, 3714015

Int. Cl.[5] A61B *5/10*

U.S. Cl. 128—774 **16 Claims**



1. Apparatus for reproducibly ascertaining the posture of a free-standing human being, including a base plate connected to a central bending post; and a stand plate connected to the central post, and being provided for exerting tension upon the central post, there being strain gauges connected to the central post, the improvement comprising:

a pair of foot plates; and

means connected to the stand plate, for elevationally adjustably mounting each of the foot plates to the stand plate.

4,928,709

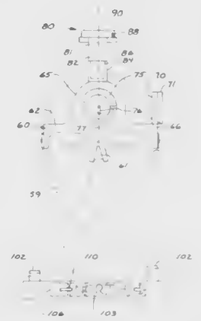
CERVICAL RANGE OF MOTION MEASURING DEVICE

John D. Allison, Shoreview, and Gordon Hanson, Roseville, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis and Performance Attainment Associates, Inc., Roseville, both of, Minn., a part interest

Filed Apr. 27, 1988, Ser. No. 186,795

Int. Cl.[5] A61B *5/10*

U.S. Cl. 128—782 **22 Claims**



1. An apparatus for measuring the range of cervical motion about at least two axes of rotation including:

a frame for detachably mounting the apparatus to a human head, said frame having a nose pad adapted to be supported on the bridge of the nose as a reference location and as a support for the frame, and temple pieces adapted to be positioned on opposite sides of a head and to rest on the top exterior of each ear for supporting and stabilizing the frame on the head of a wearer;

first angle meter means mounted on said frame for determining changes in angles about a first axis;

second magnetic type angle meter means adapted to be supported relative to the frame for determination of changes in angles of rotation about a second upright axis substantially perpendicular to the first axis and relative to a magnetic pole;

means mounted on the frame for mounting the second magnetic type angle meter means in a position adapted to overlie the head of a subject wearing the frame adjacent the axis of cervical rotation of such subject and without acting as a support for the frame; and

a magnetic field creating device means adapted to be mounted on such subject at a location spaced from the second magnetic type angle meter means, said magnetic field creating device means creating a magnetic field having a north magnetic pole for controlling orientation of the needle of the second magnetic type angle meter means.

4,928,710

BREATHING MOUTHPIECE FOR A SNORKEL

Steven M. Campbell, Laguna Beach, Calif., assignor to U.S. Divers Company, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 106,388, Oct. 9, 1987, Pat. No. 4,862,903. This application Oct. 11, 1988, Ser. No. 255,595

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] A61F *5/56*

U.S. Cl. 128—861 **19 Claims**



1. A mouthpiece for a snorkel wherein said snorkel has a breathing tube for conduction of breathing gas thereinto, a purge valve connected to said breathing tube for purging liquid from said breathing tube and means associated with said breathing tube for connection to said mouthpiece, said mouthpiece comprising:

conduit means adapted for connection to a breathing tube of a snorkel so that air carried through said breathing tube can pass in through said conduit means as well as exhaust from a user's mouth out through said conduit means;

a mouthpiece portion extending from said conduit means, said mouthpiece portion having a curved upper lip flange adapted generally for conforming to the interior region of a user's mouth between the upper teeth and the user's upper lips and a curved lower lip flange adapted generally for conforming to the interior region of a user's mouth between the user's lower teeth and the inner lower lips respectively;

said upper lip flange and said lower lip flange being joined to each other in a region intermediate between them;

each said upper lip flange and said lower lip flange including a frontal portion substantially coextensive with said conduit means and two opposed lateral portions extending from said frontal portion;

an upper interior web joined to and extending from said region intermediate between said upper and lower lip flanges, and being anatomically shaped for contact with at least part of the inside surfaces of at least the frontal upper teeth of a user and for extension at least partly in contact with a user's palate;

a lower web joined to and extending from the region inter-

mediate between said upper and said lower lip flanges, said lower web being anatomically shaped for contact with at least a portion of the inside surfaces of the lower teeth of a user and for extension at least partly in contact with a user's interior lower jaw portion; and,

each said upper web and said lower web including a frontal portion substantially coextensive with said conduit means and two opposed lateral portions extending from said frontal portion.

4,928,711

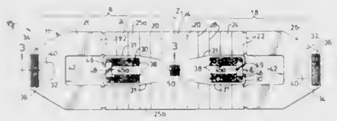
HEAD IMMOBILIZER AND METHOD FOR IMMOBILIZING

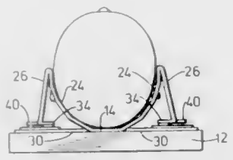
Gary R. Williams, 943 Daisy Ave., Carlsbad, Calif. 92009

Filed Nov. 29, 1989, Ser. No. 443,563

Int. Cl.[5] A61F *5/04;* **A61G** *1/00;* **A47C** *21/08*

U.S. Cl. 128—869 **23 Claims**





1. A head immobilizer of the type which can be attached to a support backboard, said immobilizer comprising:

a base;

a pair of laterally extending side panels, each side panel further comprising an inner panel and an outer panel, said inner panel having means for conforming appropriately to a shape necessary to snugly support a head to be immobilized, said inner panel further comprising an opening which effectively divides a portion of said inner panel into a pair of spaced inner support members, said outer panel having inner and outer edges and being hingedly attached adjacent its inner edge to said inner panel and foldable relative to said inner panel to provide a substantially rigid brace for securing said inner panel in a desired immobilizing position, said outer panel comprising means for providing substantial access to said opening when said inner panel is braced in a desired immobilizing position; and

means for securing said outer panel in a bracing position to support said inner panel in a desired immobilizing position, said securing means further comprising an attachment panel hingedly attached adjacent said outer edge of said outer panel and means for attaching said attachment panel adjacent said base.

4,928,712

INTRAVENOUS BOARDS

William D. Mele, 65 Park Terrace, Mill Valley, Calif. 94941

Filed Nov. 29, 1988, Ser. No. 277,650

Int. Cl.[5] A61M *5/00*

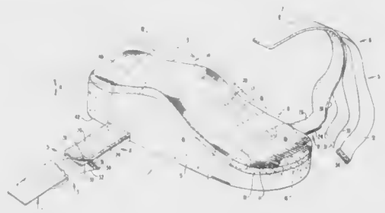
U.S. Cl. 128—877 **10 Claims**

1. A board for attaching an intravenous tube to a patient including:

a rigid base forming an arm board;

at least two straps affixed to the base by a first layer of strongly adhering adhesive, the straps having interlocking hook and loop material for securing the straps about the base;

a second layer of tape adhesive material on a surface of each strap for attaching the tube to the straps;



a plastic flap covering the second tape adhesive layer of each strap;

loop material on one end of each of the plastic flaps;

a removeable paper strip between the second tape adhesive layer and the flap;

a bottom surface of the base; and

an L-shaped leg on at least one strap on the bottom surface of the base.

4,928,713

CIGARETTE MAKING MACHINES

Hugh M. Arthur, Bucks, England, assignor to Molins PLC, Milton Keynes, England

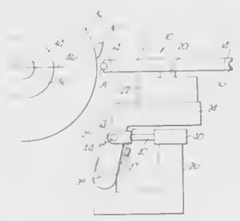
PCT No. PCT/GB86/00785, § 371 Date Aug. 20, 1987, § 102(e) Date Aug. 20, 1987, PCT Pub. No. WO87/03787, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 19, 1986, Ser. No. 94,727

Claims priority, application United Kingdom, Dec. 20, 1985, 8531506

Int. Cl.[5] A24C *5/28, 5/31*

U.S. Cl. 131—84.1 **8 Claims**



1. A rod-making machine of the cigarette industry including two cyclically movable devices which are arranged to co-operate during use, comprising separate drives for the two devices, means for electronically synchronising the two drives during normal operation, and means for displacing one of the devices from the other until the drives have been brought into synchronisation.

4,928,714

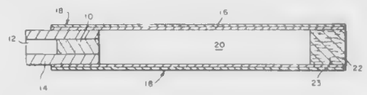
SMOKING ARTICLE WITH EMBEDDED SUBSTRATE

Michael D. Shannon, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 15, 1985, Ser. No. 723,382

Int. Cl.[5] A24D *1/18, 1/00, 1/02*

U.S. Cl. 131—359 **28 Claims**



1. A smoking article comprising:

(a) a carbonaceous fuel element having a cavity therein; and

(b) a physically separate aerosol generating means including an aerosol forming material,

the aerosol generating means being at least partially embedded within the cavity in said fuel element.

4,928,715

CIGARETTE

Edgar Mentzel, Quickborn, and Ferdinand Meixner, Gaggenau, both of Fed. Rep. of Germany, assignors to H. F. & Ph. F. Reemtsma GmbH & Co. and Schoeller & Hoesch GmbH, both of, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,112

Int. Cl.[5] A74B *15/28*

U.S. Cl. 131—365 **11 Claims**

1. A cigarette having less side stream smoke and a decreased smouldering rate for a constant average number of puffs, said cigarette having a tobacco core that is enveloped by a cigarette paper wrapping, which has areas with higher and lower air permeability in the form of patterned zones, comprising a cigarette paper adjusted from an initial air permeability of 10 to 250 P, determined as the air quantity in cubic centimeters per minute per square centimeter and per kilopascal to an average total air permeability of 85 to 20% of the initial value by batonneing patterned zones on said paper.

11. The cigarette according to claim 1 wherein the cigarette paper is batonned on both sides.

4,928,716

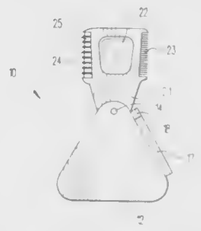
PORTABLE HAIR TRIMMING DEVICE

Freddie W. Greene, 15 Brinton Ave., Trenton, N.J. 08618

Filed Aug. 21, 1989, Ser. No. 396,064

Int. Cl.[5] A45D *7/02*

U.S. Cl. 132—212 **13 Claims**



1. A portable hair trimming device, comprising:

a housing having a pair of opposite faces separated by a hollow interior portion and connected by a plurality of side walls;

an open slotted portion formed in one of said side walls of said housing;

a trimming implement having one end pivotally mounted on said housing, said trimming implement mounted for movement into and out of said hollow interior portion;

a moustache combe formed on a first side edge of said trimming implement;

a trimming razor on a second side edge of said trimming implement, said trimming razor including:

a plurality of laterally extending, longitudinally spaced comb-like projections on said trimming implement;

said projections having aligned slot;

a double-edged razor blade frictionally engaged in said slots and extending between said projections;

a pair of parallel axially extending bores in said razor blade;

a laterally extending mounting tab on said trimming implement and in abutment with an inner end wall of said razor blade;

an aperture formed through said tab in axial alignment with one of said parallel axial bores in said razor blade; and

a retaining pin removably received through said aligned mounting tab aperture and said axial razor blade bore securing said razor blade in a reversible manner in said trimming implement.

4,928,717

EQUIPMENT FOR SURFACE TREATMENT OF CONTINUOUSLY, RUNNING STRIPS PARTICULARLY PICKLING EQUIPMENT

Werner Osarek, Bochum; Franz G. Pempera, Neuwied, and Dieter Schonert, Bochum, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

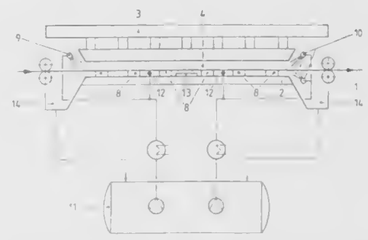
PCT No. PCT/DE87/00393, § 371 Date Jun. 29, 1988, § 102(e) Date Jun. 29, 1988, PCT Pub. No. WO88/01657, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 28, 1987, Ser. No. 246,297

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629894

Int. Cl.[5] B08B *3/02, 3/04, 7/04*

U.S. Cl. 134—64 R **6 Claims**



1. Equipment for surface treatment of continuously passing strips, particularly pickling equipment wherein the strip runs in longitudinal direction through a horizontally arranged closed treatment channel, said treatment channel being arranged in a container enclosing the treatment channel, and further including a lid closing the container, the container provided for receiving the treatment medium being passed into and out of the treatment channel, the channel having an inlet and an outlet, the improvement comprising said treatment channel being bounded by a bottom of the container, by two inner walls of the container arranged on the bottom and constituting treatment channel walls, as well as by an intermediate cover;

run off troughs established between the two inner walls and outer walls of the container, for receiving treatment medium;

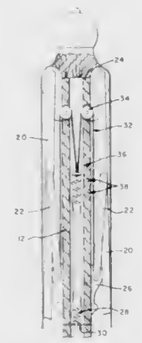
openings provided in the treatment channel walls;

means for simultaneously spraying the treatment medium at the inlet and the outlet of the treatment channel, and through said openings;

a collection chamber, and a separately provided storage container; and

means for connecting the run-off troughs to the collection chamber through which the treatment medium can be fed to the separately provided storage container.

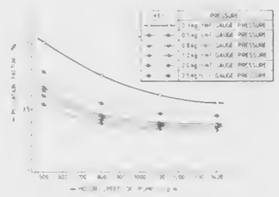
4,928,718
UMBRELLA
Phillip C. Apple, Mt. Pleasant Mills, Pa., assignor to American Holtzkraft, Inc., Mt. Pleasant Mills, Pa.
Continuation-in-part of Ser. No. 237,432, Aug. 8, 1988, abandoned. This application Jul. 28, 1989, Ser. No. 386,436
Int. Cl.[5] A45B *25/14, 25/16*
U.S. Cl. 135—22 **8 Claims**



1. An umbrella including a central straight post, a plurality of ribs surrounding the post and pivotally connected to the upper end of the post, a sliding hub surrounding the post between the upper and lower ends of the post, a plurality of struts surrounding the post and having post ends pivotally connected to the hub and rib ends pivotally connected to the ribs so that moving the hub upwardly along the post opens the ribs, a canopy attached to the ribs, a spring having a lower end fixed to the lower end of the post, a pulley mounted on the upper end of the post and a first strand having a first end attached to the upper end of the spring, a second end attached to the hub and a central portion extending up from the upper end of the spring, around the pulley and down to the hub, an umbrella having a collapsed position where the canopy, ribs and struts are adjacent the post, the hub is located in an elevated position on the post and the spring is extended, and an open position where the ribs, struts and canopy are opened away from the post, the hub is located in a lowered position on the post and the spring is retracted.

4,928,719
METHOD AND APPARATUS FOR PREVENTING PULSATIONS IN A FLOWING FLUID
Yuzo Inukai, and Mitsuyuki Nakayama, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 4, 1989, Ser. No. 332,915
Claims priority, application Japan, Apr. 5, 1988, 63-082172
Int. Cl.[5] F15D *1/02, 1/20*
U.S. Cl. 137—1 **13 Claims**

1. A method of mechanically compensating for and thus preventing pulsations in a flowing fluid experiencing pulsations during pressure-feeding of a fluid along a path by means of a pump, said method comprising the steps of:
connecting a flexible hose in said path and passing said fluid through said flexible hose;
elastically controlling and allowing the cross-sectional area of said flexible hose to fluctuate within a range defined between a maximum cross section and a predetermined smaller cross section in accordance with pulsating experienced in pressure feeding of said fluid to thus absorb and prevent the pulsation, wherein said hose is biased by flattening into said predetermined smaller cross-sectional area



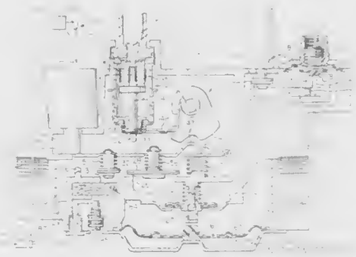
smaller than said maximum sectional area using coil springs connected to rigid plates in contact with said hose so that force of said coil springs deforms said flexible hose through said rigid plates.

4,928,720
COPOLYMERS OF ETHYLENE AND METHOXYACETIC ACID VINYL ESTER AND THEIR USE AS ADDITIVES FOR MINERAL OIL DISTILLATES
Wolfgang Payer, Wesel; Heinz D. Bühnen, and Wilhelm Zoller, both of Oberhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany
Division of Ser. No. 372,235, Jun. 26, 1989, which is a continuation of Ser. No. 248,549, Sep. 23, 1988, abandoned. This application Jul. 13, 1989, Ser. No. 379,370
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732721
Int. Cl.[5] C08L *31/00*
U.S. Cl. 137—13 **7 Claims**

1. A method of improving the flowability of mineral oil distillates comprising the addition, to said mineral oil distillate, of a copolymer comprising 95 to 50 percent by weight ethylene and 5 to 50 percent by weight methoxyacetic acid vinyl ester having an average molecular mass (Mn) of 500 to 10,000 g mol^{-1}.

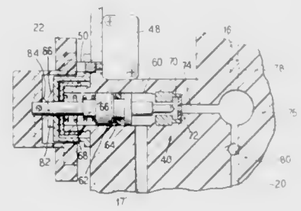
4,928,721
FUEL CONTROL VALVE CONSTRUCTION, PARTS THEREFOR AND METHODS
Samuel T. Kelly, 3506 W. 224 St., Torrance, Calif. 90505, and Jay R. Katcbka, 10455 Hampshire Ct., Cypress, Calif. 90630
Division of Ser. No. 241,966, Sep. 8, 1988, which is a division of Ser. No. 87,419, Aug. 20, 1987, Pat. No. 4,787,414, which is a division of Ser. No. 938,621, Dec. 5, 1986, Pat. No. 4,729,396. This application Apr. 21, 1989, Ser. No. 341,437
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[5] F16K *11/18*
U.S. Cl. 137—66 **11 Claims**

1. In a fuel control valve construction comprising a housing means having an inlet means adapted to be interconnected to a main burner means, said housing means having a main valve seat for interconnecting said inlet means with said main outlet means, said housing means having a movable main valve member for opening and closing said main valve seat, said housing means having a movable lever carrying said main valve member and having a manually operable actuator means for controlling the operating positions of said lever, said lever having an intermediate cam follower portion and opposed ends disposed one each side of said cam follower portion with one end of said opposed ends being pivotally mounted to said housing means and with the other end of said opposed ends carrying said main valve member, said housing means having biasing means operatively interconnected to said lever to tend to pivot said lever in one direction that opens said main valve member away from its said main valve seat, said actuator means having a cam means operatively associated with said cam follower portion of said lever to tend to control the pivoted position of said lever under the force of said biasing means, said actuator means having an "off" position thereof that causes said cam means to hold said lever in an "off" pivoted position thereof that maintains said main valve member in its closed condition against its said valve seat, said actuator means having an "on" position thereof that causes said cam means to tend to hold said



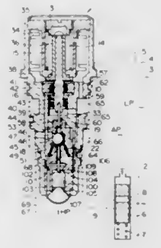
lever in an "on" pivoted position thereof that maintains said main valve member in its open condition away from its said valve seat, the improvement wherein said housing means has a thermostatically controlled means that is operatively associated with said lever and is adapted to engage and hold said lever in a position wherein said main valve member is in a closed condition against its said main valve seat when said thermostatically controlled means is in one operating condition thereof and said actuator means is in said "on" condition thereof.

4,928,722
PRESSURE RELIEF AFTER ELECTRIC SHUT-OFF OF PUMP
Warren J. Walsb, Waverly, and Bruce Kallevig, Monticello, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.
Division of Ser. No. 899,316, Aug. 22, 1986, Pat. No. 4,834,287. This application Mar. 6, 1989, Ser. No. 318,971
Int. Cl.[5] F16K *11/00*
U.S. Cl. 137—881 **2 Claims**



2. A valve system comprising:
a valve body, including a fluid inlet receiving fluid under pressure, a first fluid outlet connected in continuous communication with said fluid inlet and adapted to be opened and closed, a second fluid outlet, an opening defining a valve seat between said first fluid inlet and said second fluid outlet, a bore communicating with said valve seat and said second fluid outlet, a piston slidably mounted in said bore, a valve carried by said piston for receiving said valve seat, spring means moving in said bore and urging said piston to mate said valve with said valve seat;
a shaft connected to said piston and extending out of said valve body;
a first rotatable knob connected to said shaft;
cooperable cam means on said first rotatable knob and on said valve body operable to move said shaft axially upon rotation of said first rotatable knob to a predetermined position and unseat said valve from said valve seat to place said fluid inlet and said second fluid outlet in communication and to bypass and remove pressure from said first fluid outlet; and
a second rotatable knob operatively interconnected with said first rotatable knob to prevent rotation of said first rotatable knob until said second rotatable knob is rotated to a selected position.

4,928,723
CAPACITY CONTROL VALVE FOR A COMPRESSOR
Tsutomu Itahana; Hideo Kanno; Tetsuo Ono; Futoru Furuta; Susumu Kobayashi; Ryosaku Akimoto, and Ryuhei Tanigaki, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 7, 1989, Ser. No. 362,478
Claims priority, application Japan, Jun. 10, 1988, 63-76433
Int. Cl.[5] G05D *16/10*
U.S. Cl. 137—116.3 **1 Claim**

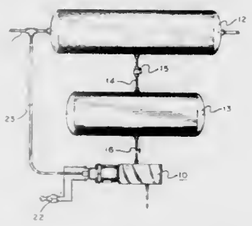


1. A capacity control valve for use in a fluid compressor with a relatively high pressure HP and a relatively low pressure LP thereacross, said capacity control valve being operative to take said intermediate pressure AP, for the control of a specific amount of compressed gas to be bypassed to the suction side of said fluid compressor, as a linear function of said relatively low pressure LP using a differential pressure between said relatively high pressure HP and said relatively low pressure LP of said fluid compressor; which comprises an adjusting means adapted to adjust said intermediate pressure AP in such a manner that said relative low pressure LP is made lower as said relatively high pressure HP becomes higher, and that said relatively low pressure LP is made higher as said relatively high pressure HP becomes lower.

4,928,724
AUTOMATIC WET TANK DRAIN VALVE
Wayne R. Margerum, 15 Alden Ave., Delran, N.J. 08075
Filed Mar. 30, 1989, Ser. No. 331,595
Int. Cl.[5] B01D *5/00*
U.S. Cl. 137—204 **4 Claims**

1. Apparatus for use in an automotive air pressure system employing an air pressure tank, a wet tank for accumulating moisture within the system and drain line and manual valving for draining the moisture from the wet tank, the improvements providing for automatic draining of the wet tank upon vehicle shut down comprising:

valving means having an inlet port connected to the drain line and an outlet port vented to atmosphere and including a valve body having a piston therein, a valve piston movable within the valve bore between open and closed positions in respect to the inlet and outlet ports and a piston shut off spring urging the piston into closed position; and



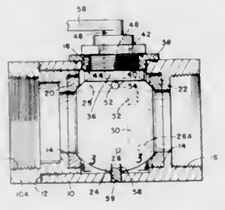
fluid valve actuation means operably connected to the valving means and adapted to move the valving means to closed position during vehicle operation and to open position during vehicle shut down and wherein the fluid valve actuation means during vehicle shut down applies a counter pressure against the piston shut off spring to cause the valve piston to move to open position.

4,928,725

COMBINATION PLUG AND TWO-WAY CHECK VALVE

John G. Graves, 3107 Woodward Blvd., Tulsa, Okla. 74105

Filed Aug. 7, 1989, Ser. No. 390,279
Int. Cl.[5] F16K *5/06, 15/03*
U.S. Cl. 137—269.5 **8 Claims**



1. A combination plug and two-way check and plug valve comprising:

a valve body having a flow passageway therethrough and means to connect other fluid flow members thereto with such passageway in series therebetween, the body having an opening in the top thereof communicating with said passageway;

a first and a second valve seat in said body, each seat having a flow passageway therethrough, the seats being spaced apart and the flow passageways therethrough being in communication with said valve body flow passageway;

a ball member rotatably received in said body between said seats, the ball member having a flow passageway therethrough which is alignable by rotatably positioning the ball with said passageways in said seats, the ball having a top and bottom and having a top opening therein communicating with said passageway therethrough;

a clapper pivotally supported within said ball member and pivotal to a closed position blocking said passageway therethrough and to an open position opening said passageway therethrough;

a bonnet member removably closing said body top opening and having a smaller diameter opening therethrough;

stem means rotatably received in said bonnet member smaller diameter opening and removably affixed to said ball; and

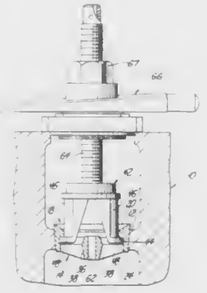
means external of said valve body to rotate said stem means and thereby said ball whereby said ball may be rotated to a first position to align the said passageway therethrough with said passageways through said seats and valve body to permit the flow of fluid in one direction, said clapper blocking fluid flow in the opposite direction, and rotation to a second position to align the said passageway therethrough with said passageway through said seats and valve body to permit the flow of fluid in the opposite direction, said clapper blocking counter fluid flow, and rotated to a third position wherein said passageway therethrough is out of alignment with said passageway through said seals and body to block fluid flow in either direction through said body, and wherein in said third position , said bonnet may be removed to expose said ball and to permit access to clapper.

4,928,726

CROSSARM VALVE SEAT WITH PULLING LEDGE

Jerry E. Johnson, and Clinton C. Hoerner, Jr., both of Houston, Tex., assignors to TRW Inc., Cleveland, Ohio

Filed Jun. 29, 1988, Ser. No. 212,936
Int. Cl.[5] F16K *15/02*
U.S. Cl. 137—327 **18 Claims**



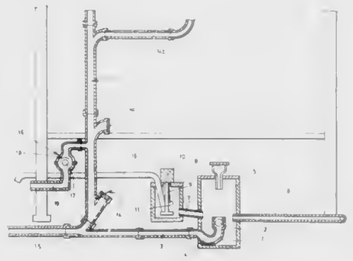
1. A valve seat assembly comprising an annular valve seat surface concentrically disposed about an axis for sealingly engaging a valve member, means for defining an internal wall extending axially from said valve seat surface and at least partially defining a flow passage through said assembly, an exterior wall adapted to engage and be supported by a support member, guide means disposed in said flow passage for guiding movement of the valve member in a direction parallel to said axis, and at least one arm extending between said guide means and said internal wall to position said guide means in said flow passage, said valve seat assembly being characterized by extraction means disposed axially between said valve seat surface and said arm for engaging a tool inserted into said flow passage to permit said assembly to be removed from the support member in response to a force exerted on said extraction means by the tool, said extraction means comprising an abutment surface facing generally away from said valve seat surface, a radially inner edge of said abutment surface being spaced axially from a radially inner edge of said valve seat surface, an annular surface extending from said radially inner edge of said valve seat surface to said radially inner edge of said abutment surface said annular surface being of constant diameter.

4,928,727

FLASH FLOOD CONTROL UNITS FOR HOUSING CONSTRUCTION

Jacques Dufresne, 6889 avenue Lamont, Montreal, Quebec, Canada (H4E 2T8)

Filed Nov. 24, 1989, Ser. No. 440,648
Int. Cl.[5] E03F *3/00*
U.S. Cl. 137—360 **15 Claims**



1. In a drainage system for a dwelling having a basement, comprising:

at least one fixture drain connected to a main drain;

a building sewer for evacuating waste waters from said main drain to a city drain; and

a sump pump located in a water collecting reservoir in the basement of the housing for evacuating any water accumulating into said reservoir through a discharge line, said reservoir having a bottom outlet leading to said sewer; the improvements comprising:

a check valve mounted at the outlet of said reservoir to prevent back flow from the building sewer, said check valve being readily accessible from said reservoir; and

a discharge line, used to expell excess waters with said sump pump, running from said pump outside of the house.

4,928,728

GAS SHUTOFF APPARATUS

Mitsuo Namba, Machida, and Reppei Uematsu, Yokohama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and The High Pressure Gas Safety Institute of Japan, Tokyo, both of, Japan

Filed Feb. 9, 1989, Ser. No. 308,212
Claims priority, application Japan, Feb. 10, 1988, 63-29242; Feb. 10, 1988, 63-29243; Nov. 25, 1988, 63-298702
Int. Cl.[5] G05D *7/06*
U.S. Cl. 137—486 **5 Claims**

1. A gas shutoff apparatus for interrupting a gas supply in a gas supply line, comprising:

flow rate measurement means for generating a flow rate signal corresponding to a flow rate of said gas in said gas supply line,

consumption state detection means for detecting a consumption state shown by said flow rate and a consumption time of the gas on the basis of said flow rate signal,

initial consumption condition setting means for setting a reference consumption condition as an initial condition,

consumption state judging means comprising means for comparing said detected consumption state with said reference consumption condition and means for generating a gas shutoff signal when said consumption state is in excess of said reference consumption condition,

a first timer for measuring a first predetermined time period,

starting signal generating means for starting operation of said first timer,

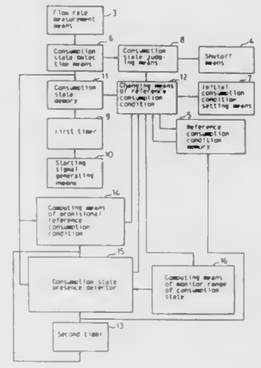
consumption state memory for storing said output consumption state by said consumption state detection means during a time period of operation of said first timer and comprising means for calculating a consumption condition on the basis of said stored consumption state,

means for changing said reference consumption condition in accordance with said calculated consumption condition,

means for computing a monitor range of said consumption condition output by said changing means,

a second timer for measuring a second predetermined time period,

means for computing a provisional reference consumption condition and setting said provisional reference consumption condition into said means for changing said reference consumption condition on the basis of an output of said consumption state detection means,



a consumption state presence detector for detecting an occurrence of said consumption state within said monitor range, for outputting a signal for starting operation of said second timer at said occurrence of said consumption state, for storing a consumption state which is present in said monitor range during operation of said second timer, and for calculating and outputting to said changing means a new reference consumption condition on the basis of said consumption state stored by said consumption state presence detector, and

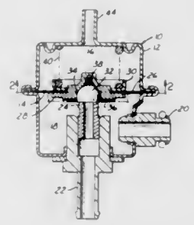
shutoff means for interrupting said gas supply by reception of said shutoff signal.

4,928,729

FUEL PRESSURE REGULATOR VALVE

Michael J. Hornby, Yorktown, Va., assignor to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Apr. 11, 1989, Ser. No. 336,363
Int. Cl.[5] F16K *31/126*
U.S. Cl. 137—510 **2 Claims**



1. In a fuel pressure regulator valve comprising a housing containing a diaphragm assembly that divides the housing into

two chambers, one chamber being a fuel chamber, and the other chamber being a control chamber, said fuel chamber having an inlet adapted to be communicated to a supply of pressurized fluid whose pressure is to be regulated and an outlet adapted to return excess fuel to a tank, said outlet having an inner end containing a valve seat with which a valve element carried by said diaphragm assembly coacts, said control chamber comprising means for establishing the pressure in said fuel chamber at which said valve element unseats from said valve seat, said valve element being a truncated sphere having a circular flat face at is truncation and having a size greater than a hemisphere, said sphere being received within a cavity in a mount carried by said diaphragm assembly such that said circular face of said sphere is presented to coact with said valve seat while said sphere is capable of swivelling within said mount, and said valve seat being flat, the improvement in retaining said sphere within said mount which comprises a single flat washer having a circular inside diameter that is less than the nominal diameter of said sphere but greater than the diameter of said flat circular face, said mount containing a recess surrounding said cavity and within which the entirety of said washer is disposed, and means comprising staking means on said mount around said recess for engaging said washer and securing said washing to said mount such that said sphere can protrude through the inside diameter of said washer to present said flat circular face to said flat valve seat while the sphere remains capable of swivelling within said mount.

4,928,730

PROPORTIONAL ELECTROMAGNETIC VALVE HAVING AMPLIFIER THEREIN

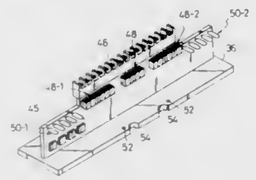
Tsuyoshi Ando, Sano; Nakayasu Hirono, Yokohama; Hirotoshi Nakao, Sano; Akio Mito, Sano; Kazuyuki Kihara, Sano; Kosuke Hatakenaka, Sano, and Hiroshi Ogawa, Sano, all of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,416

Claims priority, application Japan, Jul. 30, 1987, 62-117330[U]; Jul. 30, 1987, 62-117331[U]

Int. Cl.[5] F15B *13/044*

U.S. Cl. 137—554 **20 Claims**



1. An electromagnetic valve comprising:
a valve main body, having opposite side surfaces and a top surface, for controlling at least one of a flow rate, direction, shut off, and pressure of a fluid;
two solenoids, for controlling said valve main body, each having opposite first and second end portions and each respectively attached at said first end portion to said opposite side portions of said valve main body;
an amplifier unit having a bottom plate, said bottom plate being attached to said top surface of said valve main body, said amplifier unit further having two opposite end portions extending over said two solenoids, said two opposite end portions of said amplifier unit respectively disposed over said second end portions of said two solenoids;
a printed circuit board disposed in said amplifier unit and having amplifying circuitry for driving said two solenoids, said printed circuit board having opposite end portions respectively disposed over said two solenoids within said amplifier unit,
wherein said printed circuit board if vertically attached to said bottom plate of said amplifier unit, said bottom plate being substantially parallel said top surface of said valve main body.

4,928,731

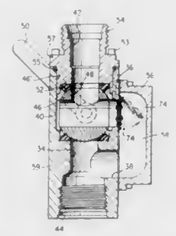
AIRCRAFT TOILET TANK FILLING VALVE ASSEMBLY

Floyd G. Koller, Dayton, Ohio, assignor to Auto-Valve, Inc., Madison Township, Ohio

Filed Jun. 22, 1989, Ser. No. 369,957

Int. Cl.[5] F16K *15/18*

U.S. Cl. 137—599 **8 Claims**



1. Aircraft toilet tank filling valve assembly comprising:
an elongated main body defining an elongated passage therethrough extending longitudinally from a first end to a second end of said main body, a first lateral passage extending laterally from said elongated passage to a bypass outer-surface side of said main body, and a second lateral passage extending laterally from said elongated passage to said bypass outer surface side of said main body, said second lateral passage being longitudinally spaced from said first lateral passage along said main body, said main body defining a smooth main-body oblong sealing facing on said bypass outer surface side surrounding said first and second lateral passages and a valve cavity at the intersection of said elongated passage and said first lateral passage for receiving a movable valve member and an actuator for allowing said movable valve member to be moved therein from outside said main body;
a one piece, elongated bypass casing defining an elongated bypass channel being open at a bypass opening on one elongated side thereof, but otherwise being closed, said bypass casing defining a bypass casing oblong sealing facing corresponding to said main-body oblong sealing facing surrounding said bypass opening, said main-body and bypass-casing oblong sealing facings being shaped and sized such that they can be placed together with a gasket therebetween to form a seal, with said elongated channel forming a passage between said first and second lateral passages;
a movable valve member mounted in said valve cavity with a valve actuator extending outside said main body, said movable valve member defining valve passages such that when it is placed in a closed valve position it does not allow flow through said straight elongated passage, but does allow flow between a first end of said elongated passage and said first lateral passage and when it is placed in an open valve position it allows flow through said elongated passage as well as communication between said elongated passage and said first lateral passage;
a one-way check valve mounted at an interface between said main body and said bypass casing for allowing fluid to flow from said first lateral passage to said elongated passage, but not in the reverse direction;
whereby said aircraft toilet tank filling valve assembly can be mounted on an aircraft with said first end of said elongated passage coupled to an aircraft toilet tank and a second end of said elongated passage being accessible for attaching a source of pressurized toilet fluid thereto for filling said aircraft toilet tank when said movable valve member is in said open position, such that the flow of said toilet fluid to said aircraft toilet tank can be interrupted by actuating said valve actuator to move said movable valve member to said closed position, and after said toilet fluid pressure is removed from said second end of said elongated passage any toilet fluid remaining in a pipe extending between said valve assembly and said aircraft toilet tank is allowed to flow through said bypass channel out of said second end of said elongated passage.

4,928,732

FLUID FAUCET

Lee-Ping Hu, Taipei Hsien, Taiwan, assignor to Hydrotek Corporation, Nan-Tou, Taiwan

Division of Ser. No. 925,498, Oct. 29, 1986, Pat. No. 4,741,363, which is a continuation of Ser. No. 784,709, Oct. 4, 1985, abandoned, which is a continuation of Ser. No. 574,670, Jan. 27, 1984, abandoned. This application Mar. 29, 1988, Ser. No. 174,782

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[5] F16K *11/20, 31/40*

U.S. Cl. 137—607 **3 Claims**

1. A fluid faucet comprising:
a body portion;
a first passage defined in said body portion having a first mouth and adapted for connection to a first fluid source;
a second passage defined in said body portion having a second mouth and adapted for connection to a second fluid source;
a third passage defined in said body portion having a third mouth for passing a mixed fluid therethrough;
an outlet defined in said body portion in communication with said third passage for discharging the mixed fluid;
a guarding valve means adjacent said first and second passages for selectively sealing each of said first and second mouths, said guarding valve means having a first hole defined therein which is not in communication with said first mouth when said guarding means is in a first position and fully communicates with said first mouth when said guarding means is in the second position, and a second hole defined therein which is not in communication with said second mouth when said guarding means is in the second position and fully communicates with said second mouth when said guarding means is in the first position, a chamber defined therein in communication with said first and second holes, and a third hole defined therein in communication with said chamber for permitting the mixed fluid to enter said third passage, whereby said guarding means will control the opening amounts of both of said first and second mouths to regulate fluid passed through said firs and second mouths from the first and said second fluid sources;
a handle connected to said guarding valve means for moving said guarding valve means between the first position and the second position without resulting in axial translation of said guarding valve means;
mouth engaging disk means for sealingly engaging said third mouth;
electromagnetic valve actuating means for engaging said disk means, whereby actuation of said actuating means results in displacement of the disk means to allow fluid to pass from said third mouth to said third passage and to thus be discharged from said outlet, said valve including means for sensing a body and a circuit means for actuating said electromagnetic valve actuating means when a body is sensed by said sensing means to be near said faucet and for deactuating said electromagnetic valve actuating means when the body is at a distance from said faucet, wherein said circuit means includes an infrared coupling and controlling circuit which is powered by a voltage regulator.

4,928,733

STEAM VALVE WITH VARIABLE ACTUATION FORCES

James M. Sudolnik, Lunenburg, and Stephen R. Prince, Fitchburg, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1989, Ser. No. 343,236

Int. Cl.[5] F16K *1/00*

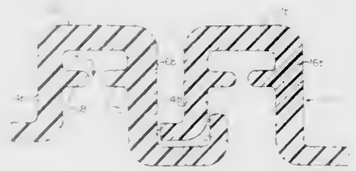
U.S. Cl. 137—630.13 **3 Claims**

1. A steam valve comprising:
a main valve;
a main valve seat;
a balance cylinder;
a balance piston in said balance cylinder;
means for transmitting a balancing force from said balance piston to said main valve;
means for permitting steam to act on said balance piston in a direction tending to open said steam valve;
said balance cylinder includes first and second effective diameters;
said balance piston includes a third effective diameter at least partly sealable to said first effective diameter;
said balance piston includes a fourth effective diameter at least partly sealable to said second effective diameter;
means for permitting said first and third effective diameters to control said balancing force when said main valve is within a predetermined distance from said main valve seat;
means for permitting said second and fourth diameters to control said balancing force when said main valve is more than said predetermined distance from said main valve seat; and
said first effective diameter is smaller than said second effective diameter, whereby a valve actuating force is substantially reduced when said main valve is more than said predetermined distance from said main valve seat.

4,928,734
REINFORCED STRIP AND FLEXIBLE HOSES PRODUCED THEREWITH

Toby D. Richards, Morris Plains, and Anthony I. Antonio, Jr., Bridgewater, both of N.J., assignors to Fabricated Plastics, Inc., Morristown, N.J.

Division of Ser. No. 298,839, Jan. 18, 1989, Pat. No. 4,860,796, which is a continuation of Ser. No. 52,553, May 21, 1987, abandoned. This application Apr. 25, 1989, Ser. No. 343,012
Int. Cl.[5] F16L *11/08*
U.S. Cl. 138—154 4 Claims

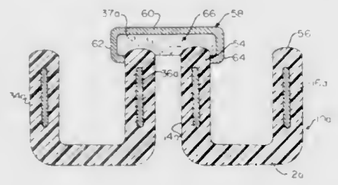


1. A strip for use in forming a flexible hose from helically wound convolutions of said strip, said strip consisting essentially of a substantially U-shaped body portion including a pair of radially projecting, spaced-apart wall members connected by a transverse portion, said spaced-apart wall members including an inner surface, a first end at said transverse portion and a second end defining said opening of said U-shaped body portion, said body portion comprising a polymeric material having a predetermined Young's modulus, substantially the entire surface of said body portion comprising said polymeric material, whereby adjacent portions of said body portion can be directly bonded together to form said flexible hose upon said helical winding of said strip, and a pair of projecting members extending from juxtaposed portions of said pair of wall members, said pair of projecting members extending from said inner surface of said wall members at a location displaced inwardly from said second ends of said wall members and defining a gap within said U-shaped body portion whereby upon the application of external force on said body portion said gap is closed and further distortion of said body portion is prevented thereby and said U-shaped body portion can substantially maintain its U-shaped configuration.

4,928,735
REINFORCED STRIP AND FLEXIBLE HOSES PRODUCED THEREWITH

Toby D. Richards, Morris Plains, and Anthony I. Antonio, Jr., Bridgewater, both of N.J., assignors to Fabricated Plastics, Inc., Morristown, N.J.

Division of Ser. No. 298,839, Jan. 18, 1989, Pat. No. 4,860,796, which is a continuation of Ser. No. 52,553, May 21, 1987, abandoned. This application Apr. 25, 1989, Ser. No. 343,044
Int. Cl.[5] F16L *11/08*
U.S. Cl. 138—154 6 Claims

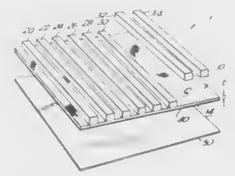


1. A hose comprising a helically wound strip defining a plurality of turns, said strip consisting essentially for a substantially U-shaped body portion including a pair of radially projecting spaced-apart wall members connected by a transverse portion, a body portion comprising a first polymeric material having a predetermined Youngs modulus, substantially the entire surface of said body portion comprising said first polymeric material, whereby displaced sections of each of said wall members are juxtaposed with one another, support means comprising plate-like support members of a second polymeric material having a predetermined Youngs modulus which is higher than said predetermined Youngs modulus of said first polymeric material, said support means being imbedded within said wall portions for reinforcing said wall member and permitting said body portion to substantially retain its shape upon the application of external force thereto, and a generally U-shaped cap member including a crown wall and a pair of lateral walls extending from said crown wall substantially parallel to each other, so as to define a slot therebetween, said juxtaposed sections of said wall members are contained within said slot and bonded to the cap member.

4,928,736
PIPELINE CASING INSULATOR

Larry C. Muszynski, Houston, Tex., assignor to Lone Star Industries, Inc., Houston, Tex.

Filed Jul. 29, 1988, Ser. No. 225,926
Int. Cl.[5] F16L *9/18, 9/14*
U.S. Cl. 138—178 2 Claims



1. A pipeline casing insulator to support a coated pipe within a tubular metallic casing, said pipeline casing insulator comprising:

a flexible belt including a strip of material capable of bonding to an organic resin and including a pair of opposed spaced, inner and outer facing surfaces separated by the thickness of said belt and having a length such that said belt may be mounted on said pipe by circumferentially wrapping said belt around the outer coated surface of said pipe with said inner facing surface abutting the outer coated surface of said pipe;

a plurality of runners mounted on said outer facing surface, each runner comprising a hardened casting formed from a polymer concrete that includes an organic resin connecting agent and an aggregate, said aggregate including a mixture of a coarse particulate, substantially incompressible material and a fine filler material, said runners being substantially spaced in an array to support said pipe within said casing and to prevent the outer coated surface of said pipe from contacting the inner surface of said casing, said material forming said runners capable of bonding to said belt when in a plastic state, and said runners are cast directly onto said outer facing surface to mount said runners on said belt; and

means for connecting said belt to said pipe when said belt is mounted on said pipe.

4,928,737
FABRIC FOR THE SHEET FORMING SECTION OF A PAPERMAKING MACHINE

Georg Borel, Reutlingen, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co. KG, Reutlingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 104,905, Oct. 6, 1987. This application Feb. 14, 1989, Ser. No. 309,893
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634134
Int. Cl.[5] D21F *7/10*
U.S. Cl. 139—383 A 4 Claims

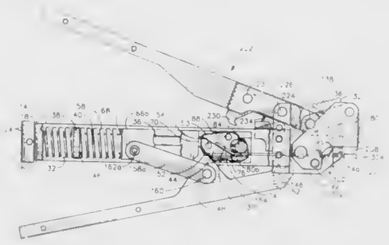


1. A fabric for the sheet forming section of a paper making machine comprising a double-layer fabric having a longitudinal thread system interwoven with three transverse thread systems including upper layer transverse threads and lower layer transverse threads disposed in pairs one over the other and additional transverse threads, each additional transverse thread having floats on the paper supporting side of the fabric in the same plane as the upper transverse threads and being interwoven by at least one longitudinal thread in the level of the lower transverse threads, the additional transverse threads being disposed at the point of interweaving in the plane of the lower transverse threads.

4,928,738
TOOL FOR TIGHTENING CABLE TIES

Hans R. Hinnen, Lakewood, and Miklos B. Marelin, Denver, both of Colo., assignors to Idex, Inc., Denver, Colo.

Filed Jul. 25, 1988, Ser. No. 224,562
Int. Cl.[5] B21F *9/02*
U.S. Cl. 140—93.4 19 Claims



1. An apparatus for tightening and locking a band clamp having a free end usable in a restricted space, comprising:

first means for engaging a first portion of the band clamp, said means comprising a first substantially flat surface and a first substantially smooth body, said smooth body slidably mounted in a slot angled relative to said first flat surface to allow said first smooth body to slide toward said first flat surface to engage said first portion and to slide away from said flat surface to release said first portion;

second means for holding the band clamp relatively more adjacent to the free end than said first means, said second means comprising a second substantially flat surface and a second substantially smooth body, said second smooth body slidably mounted in a second slot angled relative to said second flat surface to allow said second substantially smooth body to slide toward said second flat surface to securely hold the band clamp therebetween and to slide away from said second flat surface to selectively release the band clamp;

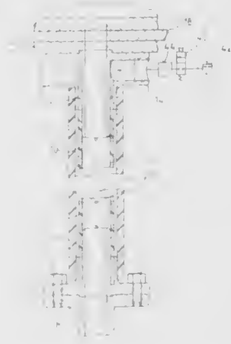
third means for pulling the band clamp in a direction defining a longitudinal axis, away from said first portion, to place the band clamp in a tensioned condition; and

fourth means for locking the band in said tensioned condition without substantially rotating said longitudinal axis with respect to the band clamp.

4,928,739
MOLD FILLING METHOD AND TRANSPORT APPARATUS FOR BEAD-LIKE RESILIENT MATERIAL TRANSPORTED BY A FLUID

Joachim Teubert, 15 Waldshuter Strasse, 7712 Blumberg 1, Fed. Rep. of Germany

Filed Apr. 14, 1987, Ser. No. 37,968
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1986, 3613380
Int. Cl.[5] B65G *53/06*
U.S. Cl. 141—5 9 Claims



1. A method for filling a mold with resilient beads which comprises:

passing the resilient beads from a bunker to the mold through a transport tube by means of a transporting fluid;

passing a second fluid, having a pressure equal to or greater than the pressure of the transporting fluid, through one or more channels which are operatively connected to the transport tube by means or orifices in the wall of the tube, whereby an interchange of fluid takes place and the pressure within the tube is equalized so that expansion of the resilient beads and blockage of the tube is prevented

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4,928,740
STUD LINK

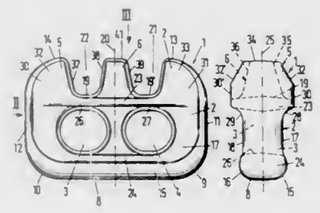
Hubert König, Aalen, Fed. Rep. of Germany, assignor to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Filed Jan. 13, 1989, Ser. No. 297,839
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 8800326[U]
Int. Cl.[5] B60C *27/20*
U.S. Cl. 152—243 20 Claims

1. In a stud link for a tire chain, including a plate-shaped link body that has a tire contact surface and a wearing surface, with said link body having at least one attachment hole for connection of a chain link, and at least one central wearing element and two other wearing elements, one on each side of said central wearing element, with said wearing elements being

disposed one after the other in longitudinal direction of said stud link, the improvement wherein:

said wearing elements each have oppositely disposed side faces that extend essentially parallel to the longitudinal direction of said stud link, with at least one of said side faces of said central wearing element being recessed relative to the adjacent side face of said other wearing elements, said other wearing elements having a wider configuration than said central wearing element as well as consequently having greater traction as a result of projecting edges thereof, and in addition, volumes of harder regions of the stud link on the wearing side is increased so that the service lift of said stud link is increased.



4,928,741

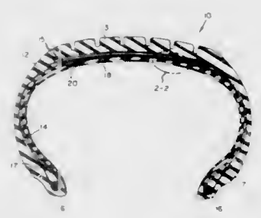
RUBBER TIRE HAVING POLYVINYLIDENE CHLORIDE/ELASTOMER INNER LINER COATING

Grover W. Rye, and John C. Pitman, both of Cuyahoga Falls, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 931,370, Nov. 14, 1986, abandoned. This application Jun. 1, 1988, Ser. No. 200,878

Int. Cl.[5] B60C *5/14*

U.S. Cl. 152—504 **14 Claims**



1. An inflatable rubber article comprising

(a) a cured rubber substrate and

(b) a coating of a polymer blend of low air permeability and high elongation on the inside surface of said substrate, said blend comprising (1) from about 25 to about 85 percent by weight of a copolymer of vinylidene chloride with one or more halogen-free comonomers in which said vinylidene chloride constitutes from about 80 to about 95 percent by weight of said copolymer, and (2) from about 75 to about 15 percent by weight of an elastomer, based on the total weight of polymer present, said polymer blend being a substantially uniform intimate mixture of said vinylidene chloride copolymer and said elastomer in which each is distributed substantially uniformly throughout the entire blend, said coating being formed on said substrate by applying said vinylidene chloride copolymer and said elastomer in aqueous emulsion form to an uncured rubber substrate, evaporating the water of said emulsion and curing the substrate;

said polymer having an elongation of at least 50 percent and an air permeability substantially less than that of an equal thickness of halobutyl rubber.

4,928,742

PNEUMATIC RADIAL TIRE

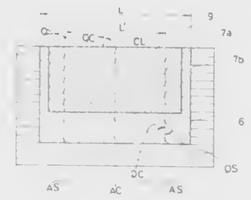
Masahiro Oku, Osaka, and Kazumitsu Iwamura, Kobe, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Oct. 13, 1988, Ser. No. 257,000

Claims priority, application Japan, Oct. 13, 1987, 62-259246

Int. Cl.[5] B60C *9/18*

U.S. Cl. 152—53.4 **10 Claims**



1 A pneumatic radial tire comprising:

a carcass of at least one ply of radially arranged cords turned up around bead cords from the inside to the outside thereof, and

a breaker comprising at least two radially adjacent plies of cords disposed radially outside said carcass,

said breaker having at least a portion in which the cords of each of said two plies are inclined with respect to an equatorial plane of the tire and the cords of one ply are inclined in a direction opposite to the cords of the other ply,

said cords of each of said breaker plies being arranged such that the cord angle in a crown portion of the breaker with respect to the equatorial plane is larger than the cord angle in each shoulder portion of the breaker with respect to the equatorial plane,

the difference between said cord angle in the crown portion and said cord angle in the shoulder portions being not less than 2 degrees, and said cord angles being in the range of 15 to 35 degrees throughout all of the portions of the breaker,

wherein said crown portion is centered on a tire equator and has a width of 0.4 to 0.8 times the maximum width of the breaker, and said shoulder portions are located one on each side of said crown portion.

4,928,743

SINGLE ROD AND LOCK BRACKET SOFT SHADE SYSTEM, KIT AND METHOD

Pamela Wojtysiak, P.O. Box 224, St. John, Ind. 46373

Filed May 8, 1989, Ser. No. 348,408

Int. Cl.[5] A47H *13/14*

U.S. Cl. 160—84.1 **11 Claims**

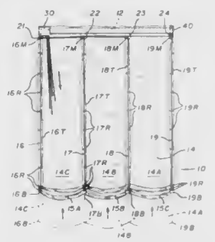
1. A kit for making a raisable soft curtain from a conventional U-shaped curtain rod and a sheet of suitable curtain fabric, the kit comprising:

a plurality of support loops of strong but flexible material and sized so as to freely receive the curtain rod inside the loop and depend below it, each of said loops mounting a main ring such that the main ring may be positioned at or below the curtain rod when the loop is in use, said loops being adapted to be securable to fabric sheet;

a plurality of sets of cord guide rings, one set for each of said loops, each of said sets including a number of rings which may be secured to the fabric in a vertical spaced-apart series under one of said loops;

lengths of cord sufficiently long so as to extend from the bottom of the finished curtain up through said series of guide rings through said main ring and laterally to one edge of the finished curtain and downward therefrom for a sufficient distance to serve as a pull;

a cord releasable lock device for accepting said lengths of cord and means for securing said cord lock device at the upper side of the finished curtain, said kit being for use in combination with rod-receiving brackets of the type having a vertical horn which projects out of a hole in the top of the receiving end of the curtain rod wherein at least one of said support loops has a wide mesh upper surface so that it can be captivated by the horn of the bracket.



4,928,744

CLUTCH FOR A VERTICAL LOUVRE BLIND

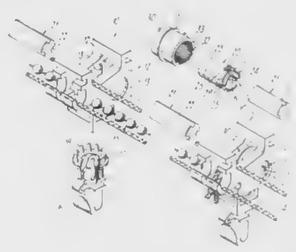
Herman Oskam, Bergambacht, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands

Filed Feb. 16, 1984, Ser. No. 580,679

Claims priority, application United Kingdom, Aug. 16, 1983, 8321980

Int. Cl.[5] E06B *9/38*

U.S. Cl. 160—178.1 **10 Claims**



1. A clutch for a vertical louvre blind traveller, said clutch comprising an inner sleeve having an inner surface and an outer surface, at least one key on the inner surface of the inner sleeve engageable in a groove in a tilt rod which passes through said sleeve, whereby the sleeve may be rotated thereby, at least one pair of slots each defining therebetween an axially extending tongue on said inner sleeve said tongue having an outer surface, an outer sleeve having an inner surface and an outer surface surrounding said inner sleeve, a worm forming element on the outer surface of the outer sleeve, a plurality of splines on the inner surface of said outer sleeve and means on the outer surface of the tongue engageable with the splines effective to cause rotation of the outer sleeve as the inner sleeve rotates, said at least one tongue being at a circumferential location on said inner sleeve corresponding with a groove in said tilt rod, whereby said at least one tongue can flex resiliently radially inwardly into said corresponding groove of said tilt rod, effective to allow continued rotation of said tilt rod and inner sleeve if rotation of the outer sleeve is arrested.

4,928,745

METAL MATRIX COMPOSITE MANUFACTURE

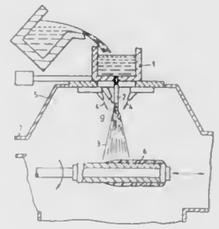
Eric A. Feest, Didcot, England; Peter F. Chesney, Swansea, and Jeffrey S. Coombs, Neath, both of Wales, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 25, 1986, Ser. No. 843,687

Claims priority, application United Kingdom, Mar. 25, 1985, 8507674

Int. Cl.[5] B22D *23/00*

U.S. Cl. 164—46 **3 Claims**



1. A method of making a metal matrix composite material comprising the steps of atomizing a stream of molten metal to form a spray of hot metal particles by subjecting the stream to relatively cold gas directed at the stream, generating a fluidized bed of fine, solid particles of mean particle size less than 10 micrometers and of a ceramic material, allowing fluidized particles to issue from the bed, conveying said particles issuing from the bed by means of a carrier gas and applying the conveyed particles issuing from the bed to the stream or spray, and depositing the metal having said fine particles incorporated therein.

4,928,746

MOULDS FOR METAL CASTING AND SLEEVES CONTAINING FILTERS FOR USE THEREIN

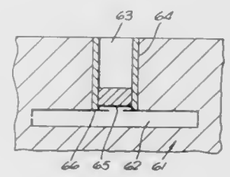
David R. Butler, Lichfield; George Snow, Worcester; Philip Sandford, Birmingham; Max G. Neu, Lichfield, all of England; Jean P. Villani, Charleville Mezieres, France; Alain Teyssedre, Charleville Mezieres, France, and Roland Lenoir, Flize, France, assignors to Foseco International Limited, Birmingham, England

Filed Jan. 18, 1989, Ser. No. 298,049

Claims priority, application United Kingdom, Jan. 30, 1988, 8802082; Jan. 30, 1988, 8802083; Jul. 30, 1988, 8818186; Jul. 30, 1988, 8818229

Int. Cl.[5] B22C *9/08*

U.S. Cl. 164—362 **40 Claims**



1. A mould for metal casting comprising:

means defining a mould cavity;

means defining one or more sprues communicating directly with said mould cavity and providing the sole means of entry of molten metal into said mould cavity for forming a casting;

a sleeve of refractory material located in each said sprue;

a ceramic foam filter disposed in each said sleeve; and

means cooperable between each said filter and said sleeve for fixing said filter in said sleeve at a location spaced from the surface of the casting defined by the mould cavity.

4,928,747

SIDE WALL GEOMETRY FOR MOLDS FOR CASTING OF THIN SLABS

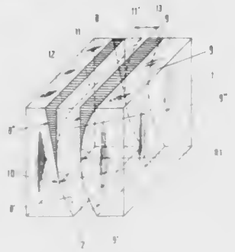
Fritz-Peter Pleschiutschnigg, Duisburg; Gerd Moellers, Oberhausen; Hans-Georg Eberhardt, Duisburg; Werner Rahmfeld, Moelheim; Lothar Parschat, Ratingen, and Hans-Juergen Ehrenberg, Duesseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 21, 1988, Ser. No. 209,689

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724628

Int. Cl.[5] B22D *11/04*

U.S. Cl. 164—418 **6 Claims**



1. In a mold for continuous casting in a vertical direction and having a plurality of walls, including two walls defining respectively the two long or wide sides of a slab ingot to be cast, the two corresponding walls respectively having inwardly oriented and facing wall surfaces, one of said surfaces being convex, the other one concave, the inprovement comprising respectively lower surface portions of the two wall surfaces being concentrically curved, at least one of said lower surface portions merging into an upper surface portion along a tangent that extends upwardly and outwardly vis-a-vis the interior of the mold.

4,928,748

CONTINUOUS CASTING OF THIN METAL STRIP

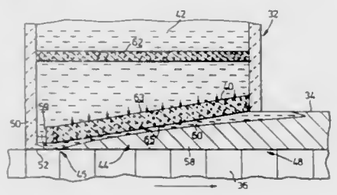
Roderick I. L. Guthrie, Quebec, Canada, and Joseph G. Herbertson, New South Wales, Australia, assignors to R. Guthrie Research Associates Inc., Westmount, Canada

Filed May 6, 1988, Ser. No. 190,916

Claims priority, application Canada, May 6, 1987, 536533

Int. Cl.[5] B22D *11/06, 11/10*

U.S. Cl. 164—479 **18 Claims**



1. Apparatus for casting metal continuously in strip form, the apparatus comprising:

a tundish for containing molten metal and having an outlet through which the molten metal flows under pressure into a work zone having upstream and downstream ends;

a travelling chilled substrate positioned to receive the molten metal in the work zone and moveable from the upstream to the downstream end of the work zone, the tundish and the substrate combining to close the said upstream end to substantially exclude entry of air into the work zone through said upstream end, and a portion of the metal flow through the outlet being at the upstream end of the work zone;

means adapted to drive the substrate at a selected velocity; and

a pervious flow restricting element at the outlet of the tundish and having an efficient cross-section for flow of molten metal through the element to maintain essentially non-turbulent flow as the molten metal meets the substrate and solidifies as a shell on the substrate, the shell increasing in thickness from the upstream end to the downstream end of the work zone as the molten metal solidifies in the work zone, and the restricting element being spaced from the shell to provide space for a layer of molten metal under pressure and in lubricating contact with th- element such that the molten metal flows from the restricting element onto the shell and then in the direction of motion of the substrate.

12. A method of continuously casting molten metal comprising the steps of:

containing the molten metal for flow downwardly into a work zone having a closed upstream and an open downstream end, part of the flow being at the upstream end of the work zone, and at least some of the flow being through a pervious flow restricting element having an inlet surface in fluid communication with the molten metal and an outlet surface in fluid communication with the work zone where the metal is restrained and shaped, and wherein fluid communication is established through said element by a plurality of openings extending along the width and length of the element;

cooling the metal in the work zone to cause at least some of the metal to solidify against a chilled substrate passing through the work zone from the upstream to the downstream end of the work zone to form a growing shell of solidified metal in the work zone;

maintaining a depth of molten metal between the shell and the outlet surface of the element sufficient to provide lubrication between the outlet surface and the solidifying metal without significant turbulence; and

driving the substrate at a rate commensurate with the molten metal supply rate and adapted to ensure that the molten metal in the work zone is under positive pressure to enhance the finish on the solid metal in contact with the substrate.

4,928,749

HEAT EXCHANGE RECOVERY METHOD

James B. Paull, Andover, Mass., assignor to Industrial Energy Corporation, Andover, Mass.

Continuation-in-part of Ser. No. 731,525, May 8, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,991

Int. Cl.[5] F23F *19/00*

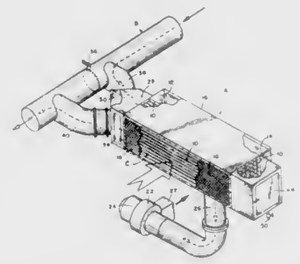
U.S. Cl. 165—1 **5 Claims**

1. A method for cooling and purifying an exhaust stream of hot air flowing through a lateral duct and for at least partially heating fresh air, said exhaust stream being contaminated with finely divided solids and vaporized liquids said method comprising the steps of:

laterally diverting said exhaust stream away from said duct through first lateral indirect heat exchange means, comprising lateral heat exchange tubes next laterally centrifugally flowing said exhaust stream through a transfer chamber and then laterally returning said exhaust stream to said duct through second lateral indirect heat exchange means comprising lateral heat exchange tubes,

simultaneously laterally cross-flowing fresh air across said first and second indirect heat exchange means in indirect heat exchange contact with said exhaust stream,

setting the rate of flow of said fresh air to provide a fresh air flow sufficient to cool said exhaust stream in said first indirect heat exchange means to a temperature not lower than a temperature within 5° F. above the dew point of said vaporized liquids and to cool said exhaust stream in said second indirect heat exchange means to a temperature



below the dew point of said vaporized liquids sufficiently to at least partially liquefy said vaporized liquids,

a. separating and collecting said finely divided solids in said transfer chamber for discharge therefrom,

b. collecting said liquefied vaporized liquids condensed within said second indirect heat exchange means in said transfer chamber for discharge therefrom, and

c. collecting heated fresh air from said first and second indirect heat exchange means for discharge to a heating operation.

4,928,750

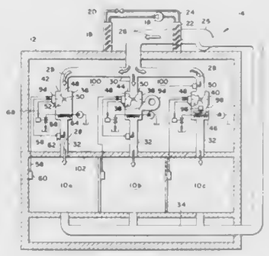
VAV VALVE WITH PWM HOT WATER COIL

Mark E. Nurczyk, Eastman, Wis., assignor to American Standard Inc., New York, N.Y.

Filed Oct. 14, 1988, Ser. No. 257,566

Int. Cl.[5] F24F *11/053, 11/06;* **F25B** *29/00*

U.S. Cl. 165—2 **11 Claims**



10. A method of temperature conditioning a comfort zone comprising the steps of:

drawing air from said comfort zone;

cooling said air to produce temperature conditioned supply air;

conveying said supply air back to said comfort zone by way of a VAV valve;

sensing the flow rate of said supply air passing through said VAV valve;

setting a desired set point temperature of said comfort zone;

sensing a zone temperature of said comfort zone;

when said zone temperature is above said set point temperature, varying the degree of opening of said VAV valve as a function of said temperature of said comfort zone, said set point temperature, and the flow rate of said supply air; and

when said zone temperature is below said set point temperature,

i. positioning said VAV valve to provide a substantially constant flow rate of said supply air,

ii. drawing ambient air from above said comfort zone into said VAV valve.

iii. heating said supply air and said ambient air to a temperature greater than said zone temperature using a coil conveying a heated fluid through said VAV valve, and

iv. regulating the average flow rate of said fluid by open and close cycling of a solenoid valve connected to said coil with an open period of said solenoid valve relative to a closed period of said solenoid valve increasing as said zone temperature decreases, said closed period being of a predetermined maximum closed-period to avoid uncomfortable temperature fluctuations of said supply air.

4,928,751

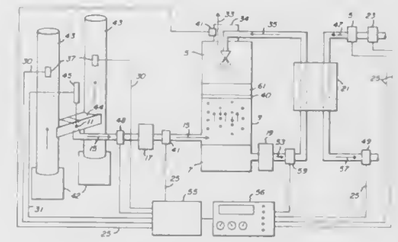
COMPUTER CONTROLLED WASTE HEAT RECLAIMER

Frank P. Fischer, Jr., New Orleans, La., assignor to The Eldon Corporation, Jefferson, La.

Filed May 25, 1988, Ser. No. 198,506

Int. Cl.[5] F28F *27/00, 27/02;* **G01K** *17/06;* **B01D** *19/00*

U.S. Cl. 165—11.1 **2 Claims**



1. A control device for a heat reclaiming unit, which heat reclaiming unit is of the type which includes:

a primary heat exchanger for receiving waste gases from a stack or other source and for receiving cool water from a primary source of water and for mixing said gases and water to heat the primary water while cooling the gases,

a secondary heat exchanger having a secondary flow of water,

means for delivering the heated primary water to the secondary heat exchanger and into heat exchanging relation with the secondary flow of water to heat the secondary flow of water,

means for delivering waste gases to said primary heat exchanger, said control unit including:

means for sensing the temperature of said gases being delivered to said primary heat exchanger and for creating a signal indicative of said temperature,

means for sensing the temperatures of said secondary flow of water both before it enters heat exchanging relation with said primary flow and after it leaves such heat exchanging relation and for creating electrical signals indicative of said termperatures,

means for sensing the flow pressure of said secondary flow of water and for creating an electrical signal indicative of said flow pressure,

means for sensing the flow pressure of the heated primary water and for creating an electrical signal indicative of said flow pressure,

logic and control means for receiving said signals and displaying indications of the flow pressures and temperatures, said logic and control further including

means responsive to the sensed temperature of the gases being delivered to the primary heat exchanging means for warning an operator if the gases are below a given low temperature and for shutting off said means for delivering waste gases and said means for delivering primary water if said temperature is above a given high temperature,

means for warning the operator if the flow pressure in either said means for delivering waste gases or said means for delivering primary water is below a given level indicative that the respective flow has ceased,

means responsive to said signals indicative of the temperatures and flow pressure of the secondary source of water for calculating the rate of heat energy gain in said secondary flow of water as a result of passing through said secondary heat exchanger, and for displaying the rate of heat energy gain calculated

means for indicating to an operator that said heat gain amount is below a given amount, and

means to display an indication of the time since a particular component of said unit has been serviced.

4,928,752

METHOD FOR RECOVERING LATENT HEAT FROM A HEAT TRANSFER MEDIUM

Magnus H. Von Platen, Lupingatan 8, S-233 00 Svedala, Sweden

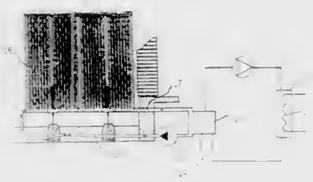
PCT No. PCT/SE88/00140, § 371 Date Sep. 26, 1989, § 102(e) Date Sep. 26, 1989, PCT Pub. No. WO88/07161, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 21, 1988, Ser. No. 411,456

Claims priority, application Sweden, Mar. 20, 1987, 8701157

Int. Cl.[5] F25D *17/02*

U.S. Cl. 165—104.17 **1 Claim**



1. Method for recovering latent heat from a heat transfer medium which is circulated through a closed system through a heat collector and a heat exchanger for heat exchange with the evaporator in a refrigerating circuit, characterized in that the heat transfer medium, comprising a mixture of water and alcohol, is sucked from the heat exchanger to provide an underpressure for atomization of the heat transfer medium with following generation of bubbles in the heat transfer medium, ice crystals then being precipitated and the ratio of water and alcohol thus being changed, the heat transfer medium with ice crystals entrained therein then being supplied to the heat collector under overpressure.

4,928,753

HEAT EXCHANGER

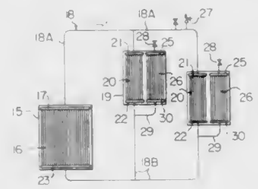
Ikuo Kotaka, Hiroshima, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 728,869, Apr. 30, 1985, abandoned, which is a division of Ser. No. 622,725, Jun. 20, 1984, Pat. No. 4,616,697. This application May 19, 1989, Ser. No. 355,109

Claims priority, application Japan, Jun. 21, 1983, 58-110235; Jun. 21, 1983, 58-110233; Jun. 22, 1983, 58-94949[U]

Int. Cl.[5] F28D *15/02*

U.S. Cl. 165—104.27 **12 Claims**



1. A heat exchanger incorporating a heat pipe apparatus, said heat pipe apparatus comprising:

evaporative pipe group means disposed within a flow of a heating fluid;

first condenser pipe group means for transmitting heat outside thereof, spaced from said evaporative pipe group means;

first passage means for connecting said evaporative pipe group means with said first condenser pipe group means and for circulating therethrough a working medium between said evaporative pipe group means and said first condenser pipe group means;

second condenser pipe group means for transmitting heat outside thereof and operatively associated with said evaporative pipe group means;

said first condenser pipe group means and said second condenser pipe group means being disposed within at least one flow of fluid to be heated;

second single passage means for connecting a lower header of said second condenser pipe group means with said first passage means between a lower header of said first condenser pipe group means and said evaporative pipe group means for improving removal of non-condensible medium; and

separator means for non-condensible gas provided at an upper header of said second condenser pipe group means, through which an interior portion of said second condenser pipe group means is to be communicated with an exterior portion thereof.

4,928,754

HEAT EXCHANGING APPARATUS

Anders Westerberg, Gnejsstigen 20, S-951 64 Luleå , Sweden

PCT No. PCT/SE88/00161, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO88/07608, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 30, 1988, Ser. No. 411,457

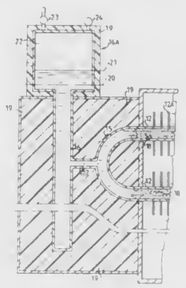
Claims priority, applicatinn Sweden, Mar. 30, 1987, 8701318

Int. Cl.[5] F28F *17/00;* **E03B** *7/10*

U.S. Cl. 165—134.1 **10 Claims**

1. Heat exchanging or circulation apparatus comprising a system of conduits connected to an inlet and an outlet for circulating water or other practically incompressible liquid through the system, heat being transferred through the conduit walls, circulation in said apparatus being periodically shut off, whereupon continued heat transfer through the conduit walls causes freezing of the liquid to ice in the conduits, characterized in that two first portions of said system are relatively heat-insulated or shielded from flowing cold air to obtain

delayed freezing of water in said portions in relation to the freezing of the liquid to ice in uninsulated second portions of said system located between said first two portions so that ice growing in said second portions towards the ends thereof being in communication with said two first portions will result



in an increased pressure on the unfrozen liquid in said insulated portions of the system, said increased water pressure being relieved by having said two first portions each connected through insulated branch conduits with a closed insulated pressure relief or absorbing means so as to avoid rupture of the conduits in any portion of the system.

4,928,755

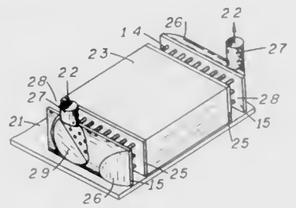
MICROTUBE STRIP SURFACE EXCHANGER

Francis D. Doty, and Jonathan B. Spitzmesser, both of Columbia, S.C., assignors to Doty Scientific, Inc., Columbia, S.C.

Filed May 31, 1988, Ser. No. 200,139

Int. Cl.[5] F28F *3/12*

U.S. Cl. 165—168 **8 Claims**



1. An exchanger for the transfer of heat between an objective surface and a working fluid, comprising:

a plurality of parallel disposed planar rows of metallic tubes, said tubes having outside diameter of less than 3 millimeters, and a length between 40 and 1000 times said outside diameter;

a first header tubestrip joined to one end of each of said tubes;

a second header tubestrip joined to the other end of each of said tubes;

first manifold means connected to said first tubestrip for defining a fluid inlet flow path into one end of each of said tubes;

second manifold means connected to said second tubestrip for defining a fluid inlet flow path from said other end of each of said tubes; and

a solid metal matrix in thermal contact with the surfaces of said tubes, said matrix occupying a major fraction of the rectangular prismatic space between and defined by said first and second tubestrips, said matrix having at least one external transfer surface suitable to be in thermal contact with said objective surface, and said matrix having a melting point below that of said tubes.

4,928,756

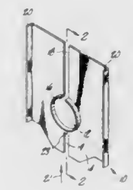
HEAT DISSIPATING FIN AND METHOD FOR MAKING FIN ASSEMBLY

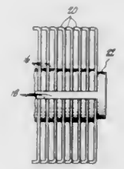
William Shull, Aptos; Rudolph Nissen, Pescadero, and Alexander Drobshoff, Mountain View, all of Calif., assignors to Spectra-Physics, San Jose, Calif.

Filed Aug. 4, 1988, Ser. No. 228,296

Int. Cl.[5] F28F *1/30*

U.S. Cl. 165—182 **17 Claims**





1. A compressible heat-dissipating fin, attached to a tube, comprising a metal plate having a flange and a peripheral edge, said flange defining an aperture adapted to compress against the tube, said peripheral edge of the plate defining a pair of opposed substantially parallel lips, and wherein the plate, the pair of lips, and the flange are formed from a single piece of metal, said plate further comprising a first slit defined by the plate and extending from the aperture to the peripheral edge of the plate and a second slit defined by the plate and extending from the flange to the peripheral edge of the plate, and wherein the compressible heat-dissipating fin is attached to the tube by means other than welding.

4,928,757

HYDRAULIC WELL PENETRATION APPARATUS

Herman J. Schellstede, New Iberia, La.; Robert W. McQueen, Houston, and Alan D. Peters, Katy, both of Tex., assignors to Penetrators, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 42,191, Apr. 24, 1987, Pat. No. 4,790,384. This application Dec. 5, 1988, Ser. No. 279,648

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.[5] E21B *43/112, 7/18*

U.S. Cl. 166—55.1 **28 Claims**

1. In a well penetrator of the type including housing means capable of being lowered down the interior of a well casing, a work fluid input means in said housing means, a movable punch member having an inner end and an outer end and being movable between a retracted position and an extended position, said outer end of said movable punch member including casing cutting means for cutting an opening in a casing when moved forcefully outwardly toward said extended position, punch support means supporting said punch member for movement relative to said housing means between said retracted position in which said outer end of said punch member is positioned substantially within the confines of said housing

means and said extended position in which said outer end of said punch member is positioned outwardly of said housing means, power actuated punch drive means mounted in said housing means for selectively moving said punch member between its retracted and extended positions, high pressure lance means having nozzle means mounted on one end for movement in said punch member between a retracted position in which said nozzle means is positioned internally of said punch member and an extended position in which said nozzle means is positioned outwardly of said punch member for discharging a high pressure jet outwardly beyond the outer end of said punch member for cutting and removing the surrounding earth formation, lance positioning drive means mounted in said housing means for selectively moving said lance and nozzle toward their extended position and for retracting said lance and nozzle toward their retracted position, first punch work fluid supply means connected to said punch drive means for actuating said punch drive means to cause the punch to move toward its extended position, second punch work fluid supply means connected to said punch drive means for activating said punch drive means to move the punch toward its retracted position, first lance work fluid supply means connected to lance positioning drive means to cause movement of said nozzle toward its extended position, second lance work fluid supply means connected to said lance positioning drive means to cause said nozzle to move toward its retracted position, control valve means mounted in said housing means including a movable valve member mounted for movement between a first position in which said control valve means directs work fluid to said first punch work fluid supply means and said first lance work fluid supply means and a second position in which said control valve means directs work fluid to said second punch work fluid supply means and said second lance work fluid supply means, said movable valve means having a portion contacted by work fluid from said work fluid input means so that said movable valve member is urged toward said second position by the pressure of work fluid in said work fluid input means, the improvement comprising spring means for applying force to said moveable valve member for urging said movable valve member toward its first position in response to the pressure of said work fluid in said work fluid input means being below a predetermined critical value so that said punch means and said nozzle means are positioned in their retracted positions and for permitting said movable valve member to move its second position in response to the pressure of said work fluid in said work fluid input means exceeding said critical pressure.



4,928,758

DOWNHOLE WELLBORE FLOWMETER TOOL

Robert W. Siegfried, II, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 10, 1989, Ser. No. 418,507
Int. Cl.[4] E21B *47/00*
U.S. Cl. 166—66 11 Claims



1 A downhole flowmeter tool adapted to be lowered into a wellbore for measuring a flow parameter, said tool comprising:

expansible means for forming an annulus between said tool and the wall of the wellbore thereby providing a restrictive flow passage around said tool; and

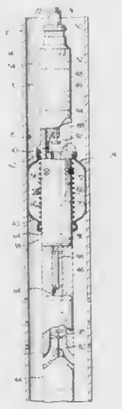
means positioned in said annulus for sensing flow through said restrictive flow passage.

4,928,759

TUBING CONVEYED WELLBORE FLUID FLOW MEASUREMENT SYSTEM

Robert W. Siegfried, II, Richardson; Lonnie J. Smith, Allen, and H. Mitchell Cornette, Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 1, 1989, Ser. No. 305,250
Int. Cl.[5] E21B *43/119*
U.S. Cl. 166—65.1 9 Claims



1. An instrument for insertion into a wellbore for determining at least one of the fluid flow rate and the composition of fluids being produced in the wellbore, said instrument being adapted to be inserted in the wellbore at the end of an elongated tubing string, said tubing string being adapted to conduct pressure fluid to said instrument, said instrument being characterized by: a first section including means for connecting said instrument to said tubing string and first passage means for receiving pressure fluid from said tubing string:

a second section including a portion of said first passage means and second passage means for conducting wellbore fluids from a first space in said wellbore to a second space in said wellbore;

fluid pressure actuated seal means on said instrument including means forming a chamber operable to be in receipt of pressure fluid from said tubing string for causing said seal means to move into substantially fluid tight engagement with a wall of said wellbore to form said first and second spaces in said wellbore;

valve means in communication with said first passage means and with said chamber for controlling the flow of pressure fluid to said chamber from said tubing string for causing said seal means to form said seal between said first space and said second space in said wellbore; and

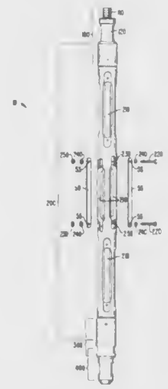
shutoff valve means interposed in said second passage means and operable at will for controlling the flow of wellbore fluid through said instrument.

4,928,760

DOWNHOLE COUPON HOLDER

Elizabeth A. Freitas, Rangely, Colo., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 24, 1988, Ser. No. 261,452
Int. Cl.[5] E21B *41/02, 49/08*
U.S. Cl. 166—113 11 Claims



1. An apparatus for holding elongated coupons within a wellbore comprising a non-metallic, elongated member having:

a. longitudinally elongated recessed slots and

b. mounting means for mounting said elongated coupons completely within said recessed slots.

8. An apparatus for holding coupons within a wellbore comprising a non-metallic, elongated member having:

a. pairs of recessed slots, with each pair of slots being on opposite sides of said elongated member; and

b. mounting means for mounting said coupons within said recessed slots;

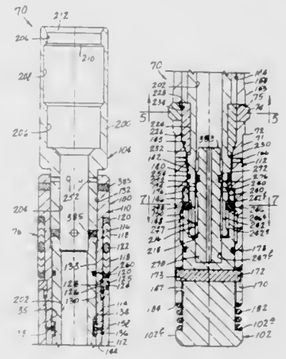
wherein said pairs of slots share a common mounting means that fixes the ends of coupons within those pairs of slots, and wherein said common mounting means are metallic bolts and nuts which form electrical connections for coupons within those pairs of slots for galvanic testing of said coupons.

4,928,761

TWO-WAY PLUGS FOR WELLS

Imre I. Gazda, Fort Worth, and Dannie R. Collins, The Colony, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jul. 17, 1989, Ser. No. 381,161
Int. Cl.[5] E21B *23/02*
U.S. Cl. 166—123 26 Claims



1 A device for plugging a well flow conductor having a landing receptacle therein, said device comprising:

(a) tubular housing means having a bore extending therethrough;

(b) means on said housing means for releasably locking said housing means in said landing receptacle;

(c) means sealing between said housing means and the inner wall of said landing receptacle;

(d) means including a plug member for closing the lower end of said bore of said housing means, said plug member being movable longitudinally relative to said housing means between upper and lower positions;

(e) mandrel means reciprocable in said bore of said housing means for actuating said locking means to locking position in response to relative downward movement of said mandrel means and for allowing said locking means to move to releasing position in response to relative upward movement of said mandrel means, said mandrel means having a fishing neck at its upper end providing a downwardly facing shoulder engageable by a running tool; and

(f) means for releasably locking said mandrel means to said plug member when said mandrel means in its lower position and said plug member is in its upper position, said mandrel means being released from said plug member in response to relative downward movement of said plug member.

4,928,762

RETRIEVABLE BRIDGE PLUG AND PACKER

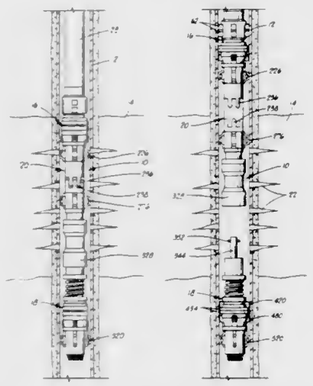
Kevin R. Mamke, Lewisville, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 13, 1989, Ser. No. 310,276
Int. Cl.[5] E21B *33/12*
U.S. Cl. 166—192 16 Claims

1. An apparatus for use in a well bore, said apparatus comprising:

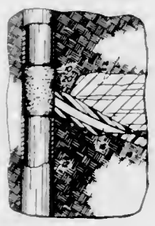
plug means for sealingly engaging said well bore when in a set position;

plug setting means for setting said plug means by applying torque in one direction to a portion thereof;
packer means, disconnectable from said plug means, for sealingly engaging said well bore when in a set position at a location spaced from said plug means;



means for disconnecting said packer means from said plug means after setting of said plug means; and
packer setting means for setting said packer means by applying torque in said one direction to a portion thereof.

4,928,763
METHOD OF TREATING A PERMEABLE FORMATION
David O. Falk, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Filed Mar. 31, 1989, Ser. No. 331,486
Int. Cl.[5] F21B *33/138, 43/32, 47/00*
U.S. Cl. 166—250 10 Claims



1. In an oil well having a vertical wall bore and a transverse bore extending therefrom, a method of permanently plugging a zone intersected by the transverse bore to prevent fluid flow from said zone into the transverse bore, comprising the steps of:
temporarily blocking the transverse bore against fluid flow therethrough at a location below said zone, subsequent to all drilling equipment being removed from said vertical well bore and said transverse bore;
introducing plugging material into said zone to permanently block fluid flow from said zone into the transverse bore; and
removing the temporary blockage from the transverse bore to permit fluid flow through the transverse bore and into the vertical bore.

4,928,764
WIRELINE TOOL CABLE HEAD OVERLOAD APPARATUS
Dennis E. Roessler, Houston, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.
Filed Sep. 20, 1989, Ser. No. 409,897
Int. Cl.[5] G01L *1/00;* E21B *47/12*
U.S. Cl. 166—250 7 Claims

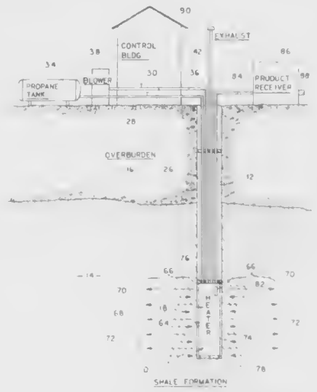


1. A cable head adapted to support a sonde in a well borehole which comprises:
(a) an upper end assembly adapted for connection with a cable extending into a well borehole;
(b) a lower end assembly adapted for connection to a sonde to be supported by the cable in the well borehole;
(c) yieldable means joining said upper and lower assemblies together in a fixed but yieldable relationship wherein a controllable and variable load is imparted to the cable thereabove during movement and variations in load on the cable are maintained within specified limits;
(d) said yieldable means further including dead weight adjustable means notwithstanding variations in the dead weight of the load, and said yieldable means includes resilient means permitting movements within a desired range dependent on the adjustment thereof and bracketing a selected relative position of said upper and lower end assemblies;
(e) an electrical contact;
(f) a centrally located cam having a cam surface with an axis of rotation through said cam, said cam axis extending lengthwise of said upper and lower end assemblies;
(g) means controllably rotating said cam to index said cam surface;
(h) means supporting said contact operatively positioned relative to said cam surface for load variant contact to said cam surface; and
(i) a circuit connected through said contact to form an electrical signal indicative of excessive load at the cable head.

4,928,765
METHOD AND APPARATUS FOR SHALE GAS RECOVERY
Donald H. Nielson, Salt Lake City, Utah, assignor to Ramex Syn-Fuels International, Nev.
Filed Sep. 27, 1988, Ser. No. 249,649
Int. Cl.[5] E21B *43/243*
U.S. Cl. 166—251 3 Claims

1. A method for the in situ recovery of natural gas from an undisturbed shale bed formation in a condition ready for transmission through a gas pipeline to end users and substantially without the formation of liquid products comprising:

forming a heater assembly having an elongated substantially cylindrical outer housing.
providing said elongated heater assembly with an interior containing a fuel gas burner therewithin joined to an upwardly extending fuel gas supply line and including in said interior an upwardly extending product gas line disposed adjacent an upwardly extending combustion air line.
drilling a borehole into a subterranean shale bed formation.
lowering said heater assembly into said borehole to a position surrounded by the shale bed formation with said borehole having been drilled to define a diameter relative said heater assembly housing insuring a close fit therebetween while providing a gas space therebetween,
supplying fuel gas to said fuel gas supply line from fuel gas supply means disposed above ground,
supplying combustion air to said combustion air line from combustion air supply means disposed above ground,
regulating said gas supply means and said combustion air supply means to operate said fuel gas burner to heater said heater assembly outer housing and thence, through convection and radiation, to progressively and radially heat the surrounding undisturbed shale bed formation,

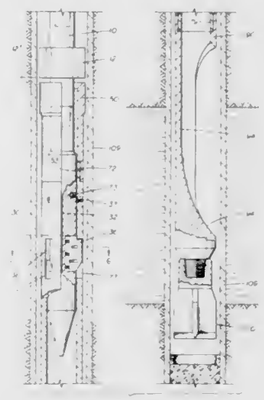


monitoring the temperature of the heated shale bed formation and manipulating said regulating of said supply means to maintain the temperature of the heated shale bed formation at approximately 1200 degrees F.,
insuring, during said regulating of said gas supply means and said combustion air supply means, that a temperature of over 1000 degrees F. is maintained,
insuring, during said monitoring of the temperature of the heated shale bed formation, that a temperature of less than 1500 degrees F. is maintained, whereby,
maintenance of the temperature at approximately 1200 degrees F. reports the kerogen content of the shale bed formation to evolve substantially solely natural gas with the natural gas migrating to said borehole adjacent said heater assembly without significant disturbance of the shale bed formation,
collecting the natural gas from said borehole through said product gas line and
providing a seal member within aid borehole above said heater assembly, whereby
natural gas within said borehole is precluded from exiting said borehole other than through said product gas line.

4,928,766
STABILIZING AGENT FOR PROFILE CONTROL GELS AND POLYMERIC GELS OF IMPROVED STABILITY
Dennis H. Hoskin, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Feb. 16, 1989, Ser. No. 311,303
Int. Cl.[5] E21B *33/138, 43/22, 43/24*
U.S. Cl. 166—270 9 Claims

1. A process for recovering oil from a subterranean oil-bearing formation having relatively high permeability zones and relatively low permeability zones penentrated by at least one injection well and at least one production well in fluid communication with a substantial portion of the formation, comprising the steps of:
(a) injecting into the relatively high permeability zones of the formation via the injection well an aqueous gel-forming solution comprising water, a vicosifying amount of a water-dispersible polymer; a crosslinking agent in an amount effective to cause gelation of the aqueous solution of the water-dispersible polymer; and a stabilizing agent comprising a heterocyclic compound in an amount effective to reduce syneresis of the gel-forming composition, whereby upon gelation of the solution the zones of relatively high permeabilty of the formation are selectively plugged;
(b) injecting a flooding fluid into the formation via the injection well that preferentially enters the low permeability zones; and
(c) recovering fluids including oil from the formation via the production well.

4,928,767
METHOD AND APPARATUS FOR SETTING AND RETRIEVING A DEFLECTION TOOL
Henk H. Jelsma, Spring, Tex., assignor to Baroid Technology, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 174,083, Mar. 28, 1988, abandoned. This application Apr. 27, 1989, Ser. No. 344,019
Int. Cl.[5] E21B *7/08, 23/00*
U.S. Cl. 166—377 5 Claims



2. In a method of setting and retrieving a deflector section from an earth borehole, wherein said deflector section has already been set in said borehole, the improvement comprising running a retrievable tool into the borehole until a portion of the retrievable tool rests against said deflector section, rotating said retrievable tool no more than one complete revolution, without picking up on said retrievable tool, to thereby latch up the retrievable tool to the deflector section; and lifting up the retrievable tool to thereby retrieve the said deflector section from the earth borehole.

VOL
1114
ISS
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MY
29
1990
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3. A system for setting and retrieving a deflector section from an earth borehole, comprising:

a first assembly having first and second ends and a longitudinal axis between said first and second ends, wherein said second end comprises a deflector section, said first assembly including a cylindrical shell of a given internal diameter and said first end having at least one shear pin receiving hole in said shell and at least one latch pin receptacle in said shell;

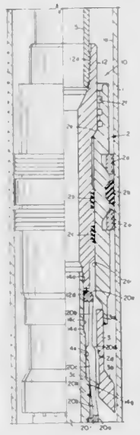
a second assembly having first and second ends and a longitudinal axis between said first and second ends wherein the second end of said second assembly comprises a probe sized to fit within the said interior of said first assembly, said second assembly including at least one shear pin sized to fit said at least one shear pin receiving hole, and also including at least one spring-loaded latch pin mechanism sized to fit within the said at least one latch pin receptacle, said second assembly further comprising stop means to limit the travel of said probe within the interior of said first assembly, whereby said at least one latch pin mechanism is in the same plane as that of the said at least one latch pin receptacle, said plane being perpendicular to the longitudinal axis of each of the said first and second assemblies, whenever the travel of said probe is so limited.

4,928,768

SUMP PACKER LATCHING MECHANISM

Elmer R. Peterson, The Woodlands, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 9, 1989, Ser. No. 308,878
Int. Cl.[5] E21B *22/02*
U.S. Cl. 166—380 **22 Claims**



1. Apparatus for effecting successive locking and unlocking of a tubing string to a hollow bore packer secured downhole in a subterranean well bore wherein the locking of the tubing string to the hollow bore packer can withstand a tensile force on the order of about 100,000 pounds, comprising, in combination:

means on said hollow bore packer defining a downwardly facing internal shoulder;

a tubular locking mechanism secured to the bottom of said tubing string;

said locking mechanism comprising an inner mandrel element secured to said bottom end of the tubing string, and a locking sleeve freely surrounding said inner mandrel element and carrying a plurality of peripherally spaced, radially shiftable locking means;

supporting means on said inner mandrel element engagable and disengagable with said locking means by axial movements of said inner mandrel relative to said locking sleeve to permit radial shifting and retraction of said locking means into and out of engagement with said downwardly facing internal shoulder; and

J-pin and slot means interconnecting said inner mandrel and said locking sleeve, said J-pin and slot means permitting rotational movements of said locking sleeve relative to said mandrel but permitting only limited axial movements of said packing sleeve relative to said mandrel whereby a first cycle of successive downward and upward movements of the tubing string effects the rigid locking of said locking means with said downwardly facing, internal shoulder and a second cycle of downward and upward movements of the tubing string effects the release of said locking means from said internal shoulder.

18. The method of releasably, lockingly engaging the end of a tubing string in a hollow bore packer set in a subterranean well comprising the steps of:

providing a downwardly facing internal shoulder in said hollow bore packer;

securing a locking tool to the end of a tubing string and inserting the locking tool through the well bore to a locking position adjacent and below said downwardly facing shoulder only by downward movement of said tubing string followed by upward movement of said tubing string; and

releasing said locking tool from said locking position relative to said downwardly facing locking shoulder only by downward movement of said tubing string to a releasing position and retaining said locking tool in said releasing position during subsequent upward movement of said tubing string.

4,928,769

CASING HANGER RUNNING TOOL USING STRING WEIGHT

Lionel J. Milberger, Houston, Tex.; Philippe C. Nobileau, Paris, France, and Bruce J. Watkins, Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Dec. 16, 1988, Ser. No. 286,603
Int. Cl.[5] E21B *23/02, 43/10*
U.S. Cl. 166—382 **8 Claims**

2. A running tool for running a casing hanger and setting a packoff in an annulus between the casing hanger ar ł a wellhead, comprising in combination:

a mandrel having means on an upper end for connection to a string of drill pipe;

a lower body carried by the mandrel;

connection means on the lower body for releasably connecting the lower body to the casing hanger;

an upper body carried by the mandrel above the lower body;

a setting sleeve carried by the upper body and adapted to be releasably connected to the packoff;

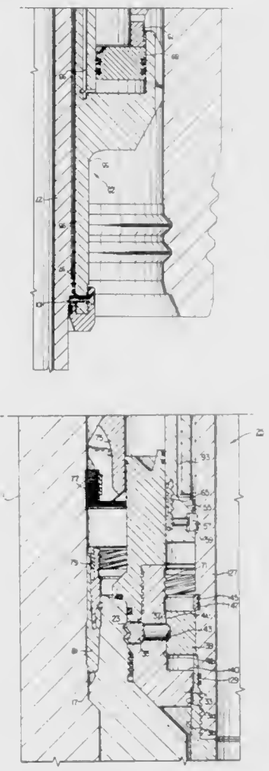
means for moving the upper body and setting sleeve from an upper position relative to the casing hanger and lower body to a lower position with the packoff located between the casing hanger and the wellhead by downward movement of the drill string and mandrel after the casing hanger has been cemented in place;

latch means for latching the upper body to the lower body when the lower body is in the lower position, to prevent upward movement of the upper body relative to the lower body;

a setting sleeve piston carried in a setting sleeve chamber in the upper body for movement relative to the upper body and positioned to contact an upper end of the setting sleeve;

a mandrel piston carried by the mandrel for movement therewith in a mandrel chamber located between the mandrel and the upper body, the mandrel piston having a smaller pressure area than the setting sleeve piston;

passage means sealed from the annulus and located in the upper body for communicating the mandrel chamber with the setting sleeve chamber, the mandrel chamber containing an incompressible fluid whereby downward movement of the mandrel piston and mandrel due to downward movement of the drill string after the packoff is in the lower position will increase pressure of the fluid to exert a



downward force on the setting sleeve piston to move the setting sleeve downward to set the packoff; and

release means for releasing the connection means from the casing hanger and the setting sleeve from the packoff to allow the running tool to be retrieved after the packoff has been set.

4,928,770

MECHANICAL MANIPULATION TOOL WITH HYDRAULIC HAMMER

Douglas J. Murray, Tulsa, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 9, 1989, Ser. No. 308,884
The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.
Int. Cl.[5] E21B *4/14*
U.S. Cl. 166—385 **4 Claims**

1. An apparatus for introduction into a subterranean well on a continuous length of remedial tubing concentrically insertable through production tubing previously positioned within said well, said production tubing carrying thereon at least one longitudinally manipulatable member, said apparatus comprising:

(1) a cylindricaly tubular housing having a fluid passageway therethrough communicable with the interior of the remedial tubing for transmission of fluid from within the remedial tubing, through the apparatus, and within an auxiliary apparatus carryable within said well by said remedial tubing, and positionable in said well in proximity to one of said longitudnally manipulatable members;

(2) means selectively co-engagable with said longitudinally manipulatable member for manipulating said manipulatable member in at least one direction upon longitudinal manipulation of said remedial tubing; and

(3) hammer means positionable on said apparatus above said



selectively co-engagable means and sealingly engagable around the interior of said longitudinally manipulatable member to prevent the transmission thereacross of fluid in an annular area between the exterior of the apparatus and the interior of the longitudinally manipulatable member and extending to the top of the well, whereby an increase of pressure in said fluid in said annular area will be applied to said hammer means to urge the apparatus to longitudinally reposition the manipulatable member.

4,928,771

CABLE SUSPENDED PUMPING SYSTEM

Joseph E. Vandevier, Claremore, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jul. 25, 1989, Ser. No. 385,208
Int. Cl.[5] E21B *43/00*
U.S. Cl. 166—385 **5 Claims**

1. In a well having casing containing formation fluid, an improved means for pumping the fluid to the surface, comprising in combination:

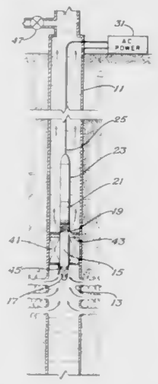
a centrifugal pump located within the well;

a submersible three-phase electrical motor located within the well and coupled to the pump for driving the pump;

a cable having a conductor, the cable having a lower end connected to the motor and an upper end extending to the surface, the cable having sufficient strength to support the weight of the pump and motor, allowing the pump and motor to be lowered into and retrieved from the well on the cable;

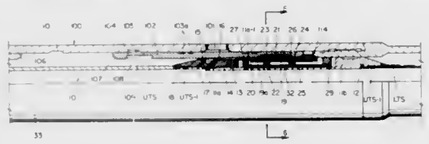
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means for supplying single-phase AC power from the surface down the conductor; and



means located at the lower end of the cable for converting the single-phase AC power to three-phase electrical power to power the motor.

4,928,772
METHOD AND APPARATUS FOR SHIFTING A PORTED MEMBER USING CONTINUOUS TUBING
Mark E. Hopmann, Broken Arrow, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.
Filed Feb. 9, 1989, Ser. No. 308,875
Int. Cl.[5] E21B *34/06*
U.S. Cl. 166—386 10 Claims

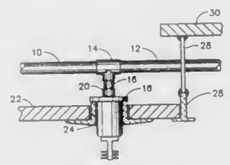


1. An apparatus for introduction into a subterranean well on a continuous length of remedial tubing concentrically insertable through production tubing previously positioned within said well, said production tubing carrying thereon at least one ported member for selective transmission of fluids between the exterior and interior of the production tubing, each of said ported members receiving means movable in each of opening and closing directions for opening or closing the respective ported member, said apparatus comprising:

(1) a cylndrical tubular housing having a fluid passageway therethrough communicable with the interior of the remedial tubing for transmission of fluid from within the remedial tubing, through the apparatus, and within an auxiliary apparatus carryable within said well by said remedial tubing, and positionable in said well in proximity to one of said ported members; and

(2) means selectively co-engageable with said opening and closing means for moving said opening and closing means in only one of opening and closing directions.

4,928,773
FIRE SPRINKLER HEAD JIG
Jerry H. White, 27911 Paseo El Concho, San Juan Capistrano, Calif. 92675
Filed Jul. 21, 1989, Ser. No. 384,306
Int. Cl.[5] A62C *37/12*
U.S. Cl. 169—37 12 Claims



1. A sprinkler head jig for substituting for a fire sprinkler head during construction, comprising:

a body having dimensions including a length and outer configuration conforming generally to those of a fire sprinkler head to be installed, and conduit means formed in and along the length of said body and having threads on opposite ends thereof for installing in a sprinkler fitting and for receiving a removable closure, wherein said closure is a cap having marking means thereon for marking a panel engaged thereby for locating a hole for receiving said jig.

4,928,774
CULTIVATOR WITH IMPROVED DISC POSITIONING MEANS
Dennis E. Bell, Brazil, Ind., assignor to Landoll Corporation, Marysville, Kans.
Filed Aug. 4, 1987, Ser. No. 81,331
Int. Cl.[5] A01B *21/08, 71/02*
U.S. Cl. 172—430 11 Claims



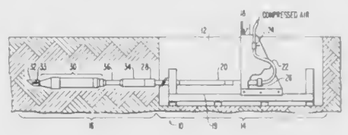
1. In an implement for working the earth and cultivating a field which comprises one or more similar carrier units having individual earth-working means disposed thereon, an adjustment means for positioning the individual earth-working means, said adjustment means comprising:

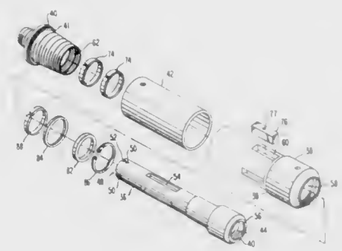
vertical positioning means for supporting and vertically positioning the earth-working means in a definite, fixed position relative to its carrier unit, thereby controlling the depth of penetration into the field;

angular positioning means directly supported by said carrier unit for angularly positioning the earth-working means in a definite, fixed position relative to the direction of travel of the implement through the field; and

lateral positioning means for laterally positioning the earth-working means in a definite, fixed position relative to its carrier unit, said angular and lateral positioning means each including at least two relatively movable parts, one of which incluoes a plurality of positioning openings therein to establish a fixed position for the part, the other having a complementary opening adapted to be aligned with one of said positioning openings, a rod-like member insertable through the aligned openings for fixing their positions in alignment, and separate clamping means for firmly holding the relatively movable parts of said angular and lateral positioning means in the selected aligned position.

4,928,775
DOWNHOLE SURGE VALVE FOR EARTH BORING APPARATUS
Douglas W. Lee, Enid, Okla., assignor to Gas Research Institute, Chicago, Ill.
Filed Dec. 30, 1988, Ser. No. 292,243
Int. Cl.[5] E21B *4/14, 21/10*
U.S. Cl. 175—19 3 Claims





1. In a boring tool assembly having an underground percussion mole boring tool powered by a working fluid, said tool being driven through the earth by a rigid drill string pushed by a drilling frame, and a downhole valve assembly fixed between the downhole end of said drill string and said tool, the improved downhole valve assembly comprising:

a valve spool having an open first end, a closed second end and a peripheral sidewall, an axial bore extending partly through said valve spool from said open first end;

a radial passage adjacent said closed second and of said valve spool, said radial passage extending radially from said valve spool axial bore through said valve spool peripheral sidewall;

an axial groove in said peripheral sidewall of said valve spool;

a valve body having a first end, a second end and a peripheral sidewall, an axial bore extending through the valve body, said valve spool extending through said valve body axial bore so that said second end of said valve body is adjacent said closed second end of said valve spool, said valve spool being axially moveable within said valve body axial bore;

an axial slot through said peripheral sidewall of said valve body, said axial slot positioned adjacent and mating with said valve spool axial groove, and said valve spool axial groove extending axially beyond said valve body axial slot;

a free-floating key element fitting within said valve spool axial groove and said valve body axial slot, said key element having an axial extent less than the axial extent of said valve spool axial groove so that said key element allows said valve spool limited axial movement within said valve body;

a valve housing, said housing having an axial bore therethrough and a peripheral sidewall, said valve body extending through said housing axial bore, said housing peripheral sidewall covering said valve body axial slot to thereby retain said free-floating key element within said valve body axial slot;

seal means for closing said radial passage in said valve spool when said second end of said valve spool is moved axially towards said first end of said valve body so that working fluid entering said open first end of said valve spool axial bore is effectively prevented from passing out of said valve spool, and for opening said radial passage when said second end of said valve spool is moved axially towards said second end of said valve body so that working fluid entering said open first end of said valve spool is permitted to pass through said radial passage into the axial bore of said valve body and out of said second end of said valve body.

4,928,776
DEVIATION CONTROL TOOL
Thomas E. Falgout, Sr., Rt. 2, Box 11B, Youngsville, La. 70592
Filed Oct. 31, 1988, Ser. No. 264,617
Int. Cl.[5] E21B *7/08*
U.S. Cl. 175—45 4 Claims



1. A drilling assembly for use as a segment of a drill string in downhole well drilling applications for deflecting the drill string centerline to select straight hole or directional drilling configuration of a downhole assembly by manipulation of drilling controls at the surface, apparatus comprising:

(a) an elongated body, having a first end and a second end, each end having means for fluid tight attachment to a continuing drill string, with at least one fluid channel to conduct drilling fluid through the length of said body, said body comprising a first portion, having a longitudinal axis, and a second portion, having a longitudinal axis, said two axes being generally concentric when the drilling assembly is in said straight hole configuration;

(b) said first portion comprising said first end and an oppo-

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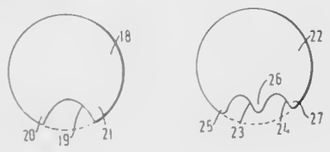
site end with an extension of reduced transverse dimension, and a first shoulder therebetween;
(c) said second portion comprising said second end and an opposite end with a second shoulder and an opening arranged to telescopingly receive said extension for limited axial movement therein between a first position, a corresponding to a minimum overall body length, and a second position, corresponding to a maximum overall body length, for limited rotation about a transverse axis to deflect said axis in said second portion relative to said axis in said first portion;
(d) rotational coupling means comprising non-circular surfaces on each said portions arranged to cooperate to prevent relative rotation therebetween;
(e) cam surfaces on each of said shoulders situated to engage and cooperate to urge said portions in opposite radial directions when said first portion is in said first position;
(f) fulcrum means on said extension, some distance from said first shoulder arranged to engage said second portion to deflect said axis in said first portion from said axis in said second portion when said first portion is in said first position;
(g) a plurality of sprockets in the wall of said opening with each socket opening radially inward therefrom;
(h) four lock bolts, each situated to operate as fluid power pistons in a transverse bore in said extension and to extend therefrom to engage said sockets, two of which extend in generally opposite radial directions from the other two and arranged such that two of said lock bolts engage said sockets when said second portion is in one of said first or said second positions and four said lock bolts engage said sockets when said second portion is in the other of said first or said second positions; and
(i) fluid communication means between said channel and said bores such that fluid pressure in said channel will urge said lock bolts radially therefrom.

4,928,777

CUTTING ELEMENTS FOR ROTARY DRILL BITS

David N. Shirley-Fisher, Cheltenham, England, assignor to NL Petroleum Products Limited, Gloucestershire, England

Continuation of Ser. No. 808,325, Dec. 12, 1985, abandoned. This application Nov. 5, 1987, Ser. No. 120,718
Claims priority, application United Kingdom, Dec. 22, 1984, 8432587
Int. Cl.[5] E21B *10/46*
U.S. Cl. 175—329 8 Claims



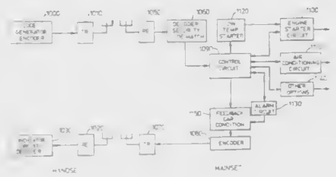
1. A rotary well drill bit comprising a bit body having an end face, a shank for connection to a drill string, an inner channel for supplying drilling fluid to said face and a plurality of cutting elements carried at various radial distances from the centerline of the bit body on said end face, at least some of said cutting elements each comprising a tablet having a front face, a rear face and a peripheral edge, said tablet including a front cutting layer of superhard material defining said front face, said front cutting layer bonded to a less hard backing layer defining said rear face, the front layer being continous and coextensive with the backing layer along the peripheral edge, and said peripheral edge of said tablet being formed with at least two re-entrant portions which define between them a projecting cutting portion comprised of continous coextensive projecting portions of both said layers; and wherein the radius of the end face of the bit body is several times larger than the maximum transverse dimension of the front face of one of said cutting elements.

4,928,778

REMOTE CONTROL CAR STARTER

Joshua K. Tin, Scarborough, Canada, assignor to Remote Automation & Control Electronics Inc., Scarborough, Canada

Filed Dec. 11, 1987, Ser. No. 131,998
Int. Cl.[5] F02N *11/08*
U.S. Cl. 180—167 34 Claims



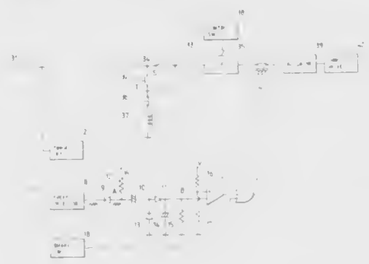
1. A system for remotely controlling a component of a vehicle, the system comprising a remote controller operable by a user, and a mainset mounted at any suitable location on the vehicle, to be controlled by said remote controller, wherein said remote controller includes:
(a) remote controller code generating means for generating a remote controller command code for controlling the vehicle component, said command code having a characteristic;
(b) remote controller transmission means, responsive to said remote controller code generating means, for transmitting said remote controller command code to said mainset;
(c) remote controller reception means for receiving a feedback code transmitted from said mainset, indicative of the condition of the vehicle component controlled in accordance with said command code;
(d) remote controller indicator means, responsive to said remote controller reception means and to said transmitted feedback code, for providing the user an indication correlatable with said transmitted feedback code;
and wherein said mainset includes
(a) mainset reception means for receiving said command code transmitted from said remote controller transmission means;
(b) mainset security means, responsive to said mainset reception means, having a mainset characteristic, for producing a verification that said command code characteristic matches said mainset characteristic;
(c) mainset implementation means, responsive to said verification and said mainset reception means, and coupled to the vehicle component, for implementing the control function on the vehicle component in accordance with said command code;
(d) mainset feedback means, coupled to the vehicle component, for generating said feedback code indicative of the condition of the vehicle component following the implementation of said command code; and
(e) mainset transmission means, responsive to said mainset feedback means, for transmitting said feedback code to said remote controller reception means, said mainset feedback means having means for generating said feedback code with a characteristic and said remote controller having security means, responsive to said remote controller reception means and coupled to said remote controller indicator means, said remote controller security means having (i) a remote controller characteristic, (ii) means for producing a verification that said transmitted feedback code characteristic matches said remote controller characteristic, and (iii) means for rendering said remote controller indicator means unresponsive to said transmitted feedback code if there is no verification.

4,928,779

VEHICLE SPEED CONTROL DEVICE

Kazuhiko Yamada, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Aug. 9, 1988, Ser. No. 230,100
Claims priority, application Japan, Aug. 13, 1987, 62-124154[U]
Int. Cl.[5] B60K *31/02*
U.S. Cl. 180—178 9 Claims



1. A vehicle speed control device for maintaining a substantially constant speed travelling of a vehicle, comprising:
a main switch circuit for enabling and disabling the constant speed travelling;
control signal means for providing a control signal for said constant speed travelling, provided the main switch circuit is enabled;
an actuator responsive to the control signal means for initiating the constant speed travelling in response to the control signal and thereafter adjusting the travelling speed to be substantially constant;
interruption means coupled to the actuator for inhibiting the constant speed travelling; and
a timer circuit coupled to the interruption means for effecting the inhibiting for a predetermined time period after the operation of an ignition switch of the vehicle has commenced.

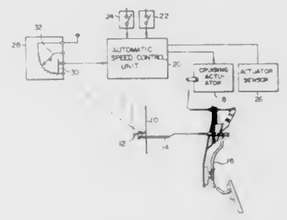
4,928,780

SPEED CONTROL APPARATUS WITH COMPENSATION FOR ACTUATOR LINK PLAY

Tetsuya Tada, Anjyo, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 11, 1989, Ser. No. 336,327
Claims priority, application Japan, Apr. 20, 1988, 63-98994
Int. Cl.[5] B60K *31/02*
U.S. Cl. 180—179 7 Claims

1. An automatic speed control apparatus for vehicles comprising:
an actuator for opening and closing a throttle valve independently of an accel pedal;
a link for connecting said throttle valve and said actuator;
a means for detecting the amount of idle working of said actuator caused by the play of said link when said throttle valve is opened by said actuator;
a speed sensor for detecting the vehicle speed;
a speed control means for controlling said actuator so that the vehicle speed from said speed sensor is maintained at a predetermined speed; and
a means for setting the amount of offset working by adding the amount of idle working detected by said means for detecting the amount of idle working to the amount of control of said speed control means as an amount of offset working in the direction in which said throttle valve is opened.

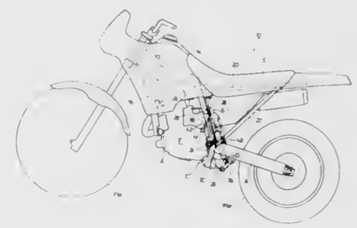


4,928,781

REAR WHEEL SUSPENSION DEVICE FOR VEHICLES OF SMALL SIZE

Shizuo Kawano, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,865
Int. Cl.[5] B62K *25/20*
U.S. Cl. 180—227 5 Claims



1. A vehicle comprising:
a body frame;
longitudinally spaced front and rear wheels and an engine therebetween;
a rear fork pivotally mounted at its front end to said body frame and rotatably supporting said rear wheel at its rear end;
a damper connecting between said rear fork and said body frame; and
a suspension device including an auxiliary frame connecting at one end said damper with said body frame and at its other end to another position on said vehicle, wherein said auxiliary frame and said damper are coaxially pivotably connected to said body frame.

4,928,782

MOTOR VEHICLE COMPRISING TWO DRIVEN AXLES

Hans D. Sommer, Graz, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Nov. 21, 1988, Ser. No. 274,446
Claims priority, application Austria, Nov. 23, 1987, 3072/87
Int. Cl.[5] B60K *17/354*
U.S. Cl. 180—244 9 Claims

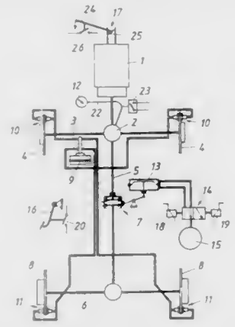
1. A motor vehicle comprising
first and second axles,
a motor connected to and driving said first axle,
an accelerator pedal for controlling said motor,
a power train connecting said motor to said second axle and driving same,

disconnecting clutch means incorporated in said power train for disconnecting said second axle from said motor, said disconnecting clutch means being a mechanically actuated positive clutch,

mechanical actuation means connected mechanically to said disconnecting clutch means for disengaging and re-engaging said disconnecting clutch means,

braking means comprising a brake pedal operative to actuate said braking means,

a clutch control connected to said mechanical actuation means and including first switching means responsive to actuation of said braking means, second switching means responsive to actuation of said accelerator pedal, third



switching means responsive to vehicle speed, means responsive to said first switching means for causing said mechanical actuation means to disengage said disconnecting clutch means in response to actuation of said braking means, and means responsive to said first and third switching means for causing said mechanical actuation means to re-engage said disconnecting clutch in response to release of said brake pedal when said vehicle speed is above a predetermined threshold.

wherein said clutch control comprises means responsive to said first and third switching means for causing said mechanical actuation means to disengage said disconnecting clutch means only when said vehicle speed is above a second predetermined threshold.

4,928,783

WELL BOREHOLE SOUND SOURCE

Troy N. Crook, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 22, 1989, Ser. No. 355,233

Int. Cl.[5] G01V *1/00*

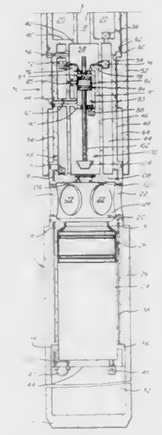
U.S. Cl. 181—106 **35 Claims**

18. A method of forming acoustic pulses in drilling fluid in a well borehole, comprising the steps of:

storing a charge of drilling fluid in a chamber in a body member in the well borehole;

increasing the pressure in the well borehole to arm a shuttle member adjacent the chamber with a gas compressed in part by means internal to said body member;

firing the shuttle member; and



displacing the charge of drilling fluid from the chamber into the well borehole.

4,928,784

ANTI-BOUNCE DEVICE FOR PREVENTING THE MULTIPLE SHOCKS OF A MOVING MASS AFTER A FIRST IMPACT AGAINST ANOTHER ELEMENT

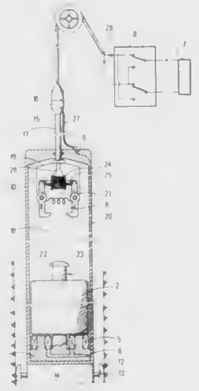
Patrick Meynier, Chatou, France, assignor to Institut Fancais du Petrole, Rueil-Malmaison, France

Filed May 11, 1989, Ser. No. 350,166

Claims priority, application France, May 11, 1988, 88 06425

Int. Cl.[5] G01V *1/40*

U.S. Cl. 181—106 **12 Claims**



2. An anti-bounce device for preventing multiple bouncing of a moving mass upon a first impact of the moving mass against a fixed target element in contact with geological formations, the device comprising magnetic means for exerting a magnetic attractive force on the moving mass in an axial direction of the moving mass, and means for selectively actuating the magnetic means so as to apply the attractive force against the moving mass to hold the moving mass against the target element and prevent the moving mass from bouncing off the target element upon the first impact of the moving mass against the target element.

4,928,785

FULL FLOW SOLENOID VALVE FOR AIR GUN OPERATION

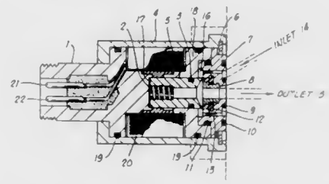
Earnest R. Harrison, Plano, Tex., assignor to Halliburton Geophysical Services, Inc., Houston, Tex.

Continuation of Ser. No. 87,003, Aug. 18, 1987, Pat. No. 4,825,973. This application Dec. 22, 1988, Ser. No. 289,949

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] H04R *1/02*

U.S. Cl. 181—120 **4 Claims**



1. A valve assembly for controlling the actuation of a seismic energy source, comprising:

a valve housing;

first fluid port means for communicating fluid with said valve assembly, said first fluid port means including a nose portion defining an annular chamber within said housing;

second fluid port means for communicating fluid with said valve assembly, said second fluid port means including a seal retainer having a hollow center portion coaxial with said annular chamber within said housing, said seal retainer connected to said nose portion;

an annular face seal disposed between and adjacent to both said nose portion and said seal retainer;

a reciprocable annular plunger including a cylindrical outer surface terminating at a forward annular sharp edge, said plunger disposed in said housing for movement relative to said nose portion, said seal retainer and said face seal so that said edge engages and disengages said face seal to isolate and communicate said annular chamber and said hollow center portion along a 360° port opening; wherein in response to said edge engaging said face seal, said 360° port opening is closed with a portion of said cylindrical outer surface adjacent said annular chamber; and wherein in response to said edge disengaging said face seal, said 360° port opening opens so that flow rate of fluid through said 360° port opening begins immediately and increases linearly with plunger displacement by which said edge disengages said face seal; and

plunger actuation means within said housing for selectively effecting said plunger displacement of said plunger.

4,928,786

SELF-SEALING DUAL STETHOSCOPE HEAD

Derek R. Allen, 30994 Steeplechase Dr., San Juan Capistrano, Calif. 92675

Filed Apr. 20, 1989, Ser. No. 340,667

Int. Cl.[5] A61B *7/02;* **H04R** *25/00*

U.S. Cl. 181—137 **17 Claims**

1. A self-sealing dual stethoscope head comprising:

a low frequency sound receiving bell;

a high frequency sound receiving diaphragm;

a selectively movable valve assembly comprising a valve housing having a cylindrical bore valve seat having an axis and an interior surface;

a first acoustical passage within said valve housing which opens into said interior surface of said cylindrical bore for sound communication with said bell;

a second acoustical passage within said valve housing which opens into said interior surface of said cylindrical bore for sound communication with said diaphragm;

a substantially cylindrical valve having an axis, two ends, and an exterior surface, said valve being seated within said cylindrical bore and having a channel therein for selective alignment and sound communication with said first acoustical passage or with said second acoustical passage upon rotation of said cylindrical valve within said cylindrical bore;



means connected to said cylindrical valve for selectively moving said cylindrical valve between said first and said second acoustical passages; and,

said substantially cylindrical valve comprising a first lengthwise accurate segment which has a radius sized to conform with and closely contact said interior surface of said cylindrical bore; and, said cylindrical valve further comprising a second lengthwise accurate segment which has a radius sized to avoid close contact with said interior surface of said cylindrical bore.

4,928,787

MOBILE SPEAKER SYSTEM

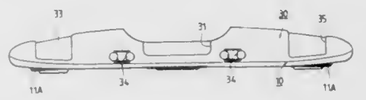
Toshifumi Kato, Yamagata, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 25, 1989, Ser. No. 342,825

Claims priority, application Japan, Aug. 26, 1988, 63-111828[U]; Aug. 26, 1988, 63-111829[U]

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—141 **19 Claims**



1. A mobile speaker enclosure system for enclosing at least one speaker unit suited for mounting on a rear parcel tray attachment portion of a vehicle, the speaker enclosure system comprising:

a bottom casing elongated in a direction of a width of said vehicle;

an upper casing mounted over said elongated bottom casing so as to form a speaker enclosure cabinet for enclosing said at least one speaker unit, said bottom casing having a plurality of first selective support ribs projecting in a first direction, and a plurality of second selective support ribs

projecting in a second direction which is substantially perpendicular to the first direction; and

fixing metal fittings selectively attachable to at least one of said selective support ribs so as to increase a rigidity of said bottom casing along said at least one of said selective support ribs and prevent shape transformation of said bottom casing.

4,928,788

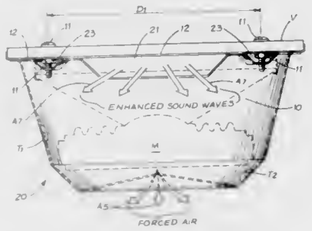
PORTED AUTOMOTIVE SPEAKER ENCLOSURE APPARATUS AND METHOD

Jon B. Erickson, 112 Kaibab Way, Cochise, Ariz. 85606

Filed Jun. 12, 1989, Ser. No. 364,160

Int. Cl.[5] **H05K** *5/00*

U.S. Cl. 181—141 **11 Claims**



1. A speaker enclosure apparatus for enclosing a speaker having a flexible cone member of an audio system and enhancing sound fidelity of said audio system, said apparatus comprising:

a concave body having a rim portion and a convex bottom;

first sound fidelity enhancement means for directing sound waves to a listening compartment, said first sound fidelity enhancement means comprising an open duct port disposed on said rim portion;

second sound fidelity enhancement means for controlling movement of said cone member of said speaker, said second sound fidelity enhancement means comprising an opening at an apex of said convex bottom that controls compressed air being exhausted from said concave body and corresponding to back pressure on said cone member that controls movement of said cone member, said opening also enabling convection cooling of said speaker; and

a plurality of third sound fidelity enhancement means for equalizing sound wave pressure emanated from said speaker, said plurality of third sound fidelity enhancement means comprises a plurality of perimeter disposed U-shaped notches on said rim portion adjacent said first sound fidelity enhancement means.

4,928,789

IRON WORKER'S SEAT PROTECTOR AND GRIPPING DEVICE

Shane C. Claeys, 3036 N. 97th St., Omaha, Nebr. 68134

Filed Apr. 3, 1989, Ser. No. 331,951

Int. Cl.[5] **A62B** *35/00*

U.S. Cl. 182—3 **6 Claims**

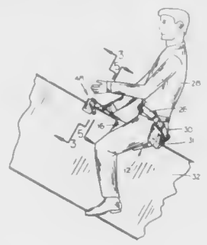
1. An iron worker's seat protector and gripping device, comprising,

an elongated flexible safety belt for attachment to the user's waist,

connecting strap means removably connected to said belt so as to normally hang downwardly therefrom.

a substantially flat, flexible sheet member connected to said connecting strap, one surface of said sheet member having a gripping surface provided thereon,

said connecting strap having a length sufficient so that said sheet member normally hangs downwardly therefrom below the user's rump and so that the user may pull the lower end



thereof upwardly and forwardly to position the sheet member on a beam between the user's legs to enable the user to apply gripping pressure to the sides of the beam with his legs.

4,928,790

RESTRAINING DEVICE

Jerry L. Franks, Hanahan, S.C., assignor to South Carolina State Ports Authority, Charleston, S.C.

Filed Jul. 17, 1989, Ser. No. 380,515

Int. Cl.[5] **A62B** *35/00*

U.S. Cl. 182—3 **9 Claims**



1. A restraining device comprising:

a. an anchorage whose length may be expanded and contracted, so as to cause each end of said anchorage to apply pressure to a work surface when the length of said anchorage is contracted, and to release said anchorage from said work surface when said length of said anchorage is expanded;

b. actuation means for contracting the length of said anchorage and expanding the length of said anchorage;

c. one or more restraining lines and means for removably attaching said restraining lines to said anchorage; and

d. one or more safety harnesses worn by one or more workers to which an end of said restraining line opposite said anchorage is removably attached.

4,928,791

ROPE CLIMBER

Chie F. Hong, 4F, No. 45, Lane 289, Hsin Tai Road, Hsin Chuang City, Taipei Hsien, Talwan

Filed Aug. 22, 1989, Ser. No. 396,618

Int. Cl.[5] **A63B** *27/00*

U.S. Cl. 182—135 **11 Claims**

1. A rope climber hanging fastenedly in pair on a steel cable, a rope or a long pole suspending in the air and by alternating operation by hand and foot enabling a person's body to be

lifted up or lowered down by the rope and to stop at any position on the cable or rope, characterized by that said rope climber includes in pair grooved wheels having the outer circumferences in close contact and capable of rotating towards the opposite direction, one or both of said grooved wheels having on the middle of the outer circumferences provided by engraving with cam paths eccentric grooves or ring grooves of unequal diameter, said grooved wheels formed



at the close contact point of the outer circumferences with a hole capable of slipping through the abovesaid cable or rope, and following rotation of said grooved wheels said hole being capable of varying its size, whereby said rope climber is able to slide up and down by the cable or rope when said hole has become large in size and to hold the cable or rope in between tightly and stay at any fixed place on the latter without being concerned about it being slid down when said hole has become small.

4,928,792

JOINT FOR LADDERS

Gunther Krause, Alsfeld, Fed. Rep. of Germany, assignor to Krause Werk GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 4, 1988, Ser. No. 267,147

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1987, 3737295

Int. Cl.[5] **F16C** *11/00;* **E06C** *7/50*

U.S. Cl. 182—163 **9 Claims**

1. An improved joint for connecting the uprights of a foldable multipurpose ladder, comprising:

first and second joint elements pivotable around a common axis, each element consisting of left and right halves secured together with said first joint element being located between the halves of said second joint element;

detent-receiving grooves formed on the circumference of said first joint element, and distributed in accordance with the operating positions of said ladder, whereby said first joint element comprises a double shell detent wheel;

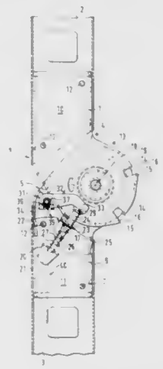
detent means mounted within said second joint element and movable into and out of engagement with a selected one of said grooves;

first and second bores coaxially formed in the left and right halves of said second joint, said first and second bores including aligned curved recesses;

a release lever including a pair of spaced, parallel arms having first ends and second ends, said first ends including means mounting said release lever for pivotal motion in said first and second bores of said second joint element and said second ends engaging said detent means whereby pivotal motion of said release lever will retract said detent means out of a groove in said detent wheel, said means mounting said release lever including first and second protrusions extending from said release lever into corresponding bores in first and second halves, respectively, of said second joint element, said protrusions having generally cylindrical coaxial apertures and including radially extending shoulder portions forming offset recesses in said apertures, said protrusions forming bearings for said release lever to permit pivotal motion of said release lever in said bores with said shoulder portions of said protrusions extending into, and movable in, said curved recesses;

eccentrically located bar means interconnecting said first ends of said release lever arms;

slot means in said bar means;



an operating lever for pivoting said release lever to lift said detent means, said operating lever including a shaft portion external to said joint elements and an elbow portion including a key bit having a cam, said key bit extending into said coaxial aperture of one of said protrusions, through said release lever, and into the coaxial aperture of the other of said protrusions with said cam engaging said offset recesses thereof and engaging said slot means in said bar between said release lever arms, whereby rotation of said operating lever rotates said key bit and cam to thereby rotate said release lever, and wherein said curved recesses limit the rotational motion of said protrusions to thereby limit the rotation of said release lever.

4,928,793

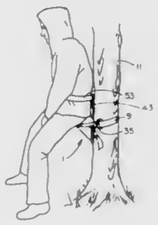
RIGID TREE SEAT

Anthony J. Westimayer, N6585 St. Helena Rd., and Gary Spettel, 118 South Palmatory St., both of Horicon, Wis. 53032

Filed May 25, 1989, Ser. No. 356,940

Int. Cl.[5] **A45F** *3/26;* **A01M** *31/02*

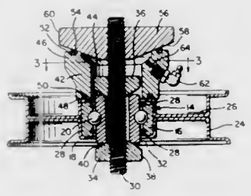
U.S. Cl. 182—187 **21 Claims**



1. A rigid tree seat comprising:

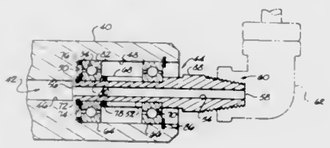
a. a frame comprising:
i. a seat portion; and
ii. rib means depending from the seat portion and joined thereto;
b. covering means for removeably covering the frame; and
c. strap means passing through the frame and covering means for releaseably securing the frame to a selected support.

4,928,794
SEALED BEARING LUBRICATOR
Timothy W. Bangerger, P.O. Box 119, Leoti, Kans. 67861
Filed May 4, 1989, Ser. No. 347,019
Int. Cl.[5] F16C *1/24*
U.S. Cl. 184—5.1 11 Claims



1. A sealed bearing lubricator comprising an externally threaded bolt adapted to extend through an inner race of a sealed bearing, spaced nuts threadedly engaged with the bolt and engaging the ends of the inner race of the sealed bearing to mount the bolt rigidly with respect to the sealed bearing, a cylindrical member mounted on the bolt in enclosing relation to one of the nuts and in sealed relation to the sealed bearing, a retaining nut on the bolt threadedly engaged therewith and engaged with the outer end of the cylindrical member to retain the cylindrical member against the sealed bearing, and pressurized lubricant introduction means in the cylinder to pressurize the interior of the cylinder with lubricant to force lubricant past an external seal on the sealed bearing.

4,928,795
LUBRICATION APPARATUS
Joseph J. Maloney, Hartsville, Ind., assignor to Reliance Electric Company, Greenville, S.C.
Filed Feb. 16, 1988, Ser. No. 156,425
Int. Cl.[5] F16N *27/00*
U.S. Cl. 184—7.4 21 Claims



1. A lubrication apparatus for supplying lubrication to a main shaft supporting rotatable members thereon for lubricating such rotatable members, said apparatus comprising:
a lube shaft for the passage of lubricant therethrough, having a central bore and respective input and output ends interconnected by said central bore, said lube shaft adapted for being received within the bore of a main shaft supporting rotatable members thereon to be lubricated; and
bearing means for rotatably supporting said lube shaft in a bore of a main shaft with said lube shaft input end remaining accessible for the application of grease thereto, whereby grease so applied may traverse said central bore for application to the main shaft upon exiting said lube shaft output end.

4,928,796
LIFT
Otto L. Poon, 17th Floor, Java Centre, 124-134 Java Road, North Point, Hong Kong
Filed Jun. 15, 1988, Ser. No. 207,179
Claims priority, application United Kingdom, Nov. 25, 1987, 8727634
Int. Cl.[5] B66B *5/16*
U.S. Cl. 187—89 25 Claims

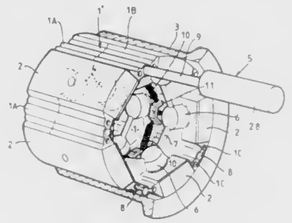


1. A lift apparatus comprising a lift, means for raising and lowering the lift, a first brake actuable to prevent movement of the lift, means for detecting actuation of said means for raising and lowering, movement detecting means for detecting a movement of the means for raising and lowering when the first brake is actuated, guide means for directing the lift, a second brake actuable to prevent movement of the lift by acting on the guide means, and control means responsive to at least said means for detecting actuation of said means for raising and lowering and said movement detecting means for actuating the second brake when movement of the lift is detected by the movement detecting means, so that the second brake stops slippage of the lift when the first brake is actuated, the means for raising and lowering the lift is stopped, and the lift is moving.

4,928,797
BRAKE
Anthony W. Harrison, Birmingham, Great Britain, assignor to Lucas Industries Public Limited Company, Birmingham, England
Filed Nov. 17, 1988, Ser. No. 272,385
Claims priority, application United Kingdom, Jan. 19, 1988, 8801089
Int. Cl.[5] F16D *65/27*
U.S. Cl. 188—156 20 Claims

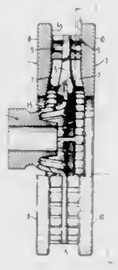
1. A brake comprising:
a housing;
a friction element supported on said housing;
slave cylinder-piston means supported by said housing in engagement with said friction element and operable to engage said friction element with a member to be braked;
an actuator for operating said slave cylinder-piston means having a hydraulic pressure generating device connected to said slave cylinder-piston means for producing a brake-applying force in both dynamic and static braking modes 2; and
an electrical stepper motor for driving said hydraulic pressure generating device, said hydraulic pressure generating device comprising,

a pressure generating cylinder,
a pressure generating piston axially reciprocable in said pressure generating cylinder,
a screw rotatable by said stepper motor;
a helical ball race connected to said pressure generating piston,
a nut mounted in said helical ball race and engaged with said screw, and,



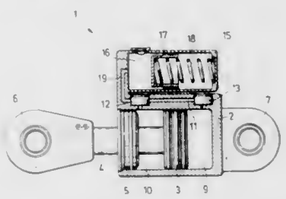
a torsion spring rotationally restraining said nut, so that said torsion spring restrains said nut against rotation during initial take up of brake clearances upon actuation of said pressure generating piston, but yields upon application of a predetermined braking load applied by said friction element on the member to be braked causing said nut to rotate in said helical ball race to increase the braking load.

4,928,798
DISC FOR DISC BRAKES
John C. Watson, Ness; Stephen P. Gaskill, Liverpool; David F. Russell, Hoole, all of England, and Robert L. D. Burns, Colwyn Bay, Wales, assignors to Lucas Industries public limited company, Birmingham, England
Filed Feb. 6, 1986, Ser. No. 826,630
Claims priority, application United Kingdom, Feb. 6, 1985, 8502954
Int. Cl.[5] F16N *65/10*
U.S. Cl. 188—218 XL 10 Claims



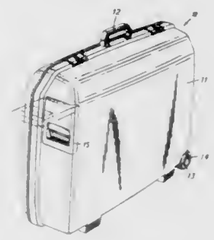
1. A disc for a disc brake comprising two annular members arranged coaxially with respect to each other and with respect to a central hub, a central web radiating from the central hub and extending between said annular members, generally radially extending vanes projecting from each side of the central web and interconnecting said central web with each said annular member , and pillars separate and distinct from said vanes and also projecting from each side of the central web and interconnecting said central web with each said annular member, said vanes extending for part of the radial extent of said annular members, and each of said pillars having a radial extent less than said vanes and being located in a radial region not occupied by said vanes.

4,928,799
HYDRAULIC DASHPOT
Lothar Zschiesche, Godenstedt, Fed. Rep. of Germany, assignor to LISEGA GmbH, Fed. Rep. of Germany
Filed May 15, 1989, Ser. No. 351,619
Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816821
Int. Cl.[5] F15B *15/22;* F16L *3/24*
U.S. Cl. 188—314 14 Claims



1. A hydraulic dashpot comprising a cylinder, a piston separating said cylinder into a pair of chambers, a rod connected to said piston and projecting outwardly of said cylinder, means for defining a storage chamber for compensating fluid, passage means for conducting compensating fluid between said storage chamber and said pair of chambers, first valve means in said passage means for controlling fluid flow between said passage means and at least one of said pair of chambers, a first valve body accommodating said first valve means, and second valve means immediately upstream of said first valve body for closing fluid flow through said passage means in a direction away from said storage chamber in automatic response to the removal of said first valve body from said passage means wherein the first valve means be removed and repaired, if necessary, without affecting the integrity of the storage chamber.

4,928,800
STEERING HANDLE FOR LUGGAGE CASE
Stephen T. Green, Oxford, England, and Willibald Van Hoye, Zwijnaarde, Belgium, assignors to Samsonite Corporation, Denver, Colo.
PCT No. PCT/GB85/00399, § 371 Date May 5, 1986, § 102(e) Date May 5, 1986, PCT Pub. No. WO86/01384, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 6, 1985, Ser. No. 866,200
Claims priority, application European Pat. Off., Sep. 6, 1984, 84306083.1
Int. Cl.[5] A45C *13/00*
U.S. Cl. 190—115 8 Claims



1. A luggage case comprising a shell, a steering handle for

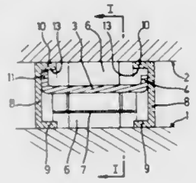
steering the case when it is being rolled on the ground, means for pivotally mounting the steering handle for pivotal movement between a first closed position in which the handle lies adjacent the shell and a second extended position in which the handle projects at a predetermined angle from the shell, the pivotal movement of the handle being limited at the second position by means of a stay connected at one end to the steering handle at a position spaced from the means for pivotally mounting towards the free end of the handle and at the other end to the shell, the stay being of resilient flexible material, and means for holding the stay in a flexed condition when the handle is in the first position whereby, when in said flexed condition, said stay exerts a force on the handle tending to hold the handle in the first position.

4,928,801

SELF-CENTERING FREEWHEEL MECHANISM

Jean M. Laurent, Villebon sur Yvette, France, assignor to SKF France, Clamart, France

Filed Jun. 17, 1988, Ser. No. 207,852
Claims priority, application France, Jul. 15, 1987, 87 09955
Int. Cl.[5] F16D *41/07*
U.S. Cl. 192—45.1 10 Claims



1. Self-centering freewheel mechanism comprising at least one cage, wedging cams in said at least one cage, U-shaped bearings having inner and outer branches oriented towards said at least one cage, and fastening means for fastening said cage to both of said bearings to prohibit movement of said bearings in an axial direction, said fastening means including a plurality of circumferentially spaced radial protuberances on said at least one cage, said radial protuberances bearing elastically against at least one of said branches of each bearing facing towards the inside of the U-shape to fasten said at least one cage and said bearings together in the axial direction.

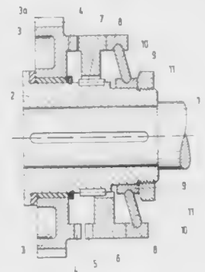
4,928,802

OVERLOAD RELEASE CLUTCH FOR THE TRANSMISSION OF ROTARY MOVEMENT BETWEEN SHAFTS

Hermann Weiss, and Rudolf Weiss, both of Vreden, Fed. Rep. of Germany, assignors to ATEC-Weiss KG, Vreden, Fed. Rep. of Germany

Filed Jun. 1, 1989, Ser. No. 359,610
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819481
Int. Cl.[5] F16D *23/00*
U.S. Cl. 192—56 R 8 Claims

1. An overload release clutch for the transmission of rotary movements between shafts, having two axially disengageable clutch halves borne by a hub and the other clutch half being rigidly connected axially to the hub, a spring arrangement being provided which has a snap-over characteristic and which acts with an adjustable axial force on the axially movable clutch half in the engaged state, the spring arrangement consisting of a concentric ring connected to the axially movable clutch half, and radially directed bearing elements which are pivotably disposed at an inclination to the axial plane of the clutch on the ring and the hub disposed at a radial distance inside the ring, wherein the bearing elements are rigid and the ring is so resilient that, when acted upon with an axial force



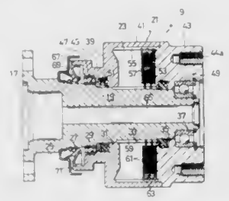
directed towards the direction of inclination of the bearing elements, the ring can be radially expanded.

4,928,803

POWER TRANSMISSION APPARATUS

Osamu Ishikawa, and Kazuyoshi Watanabe, both of Tochigi, Japan, assignors to Tochigifujisangyo Kabushiki Kaisha, Tochigi, Japan

Filed Feb. 27, 1989, Ser. No. 316,287
Claims priority, application Japan, Mar. 1, 1988, 63-45746
Int. Cl.[5] F16D *31/00*
U.S. Cl. 192—58 B 2 Claims



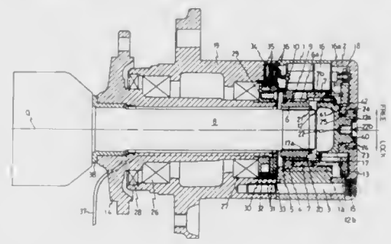
1. A power transmission apparatus comprising:
(a) a multistep shaft formed with a first connecting portion at a first end thereof and multistep shoulder portions successively reduced in diameter toward a second end thereof opposite to the first end, two sealing members being disposed at two inwardly formed multistep shoulder portions and two bearing members being disposed at two outwardly formed multistep shoulder portions, respectively;
(b) a casing fitted to said shaft from the second end thereof, with the sealing members and the bearing members interposed between the multistep shoulder portions of said multistep shaft and said casing, aid casing being formed with a second connecting portion near the second end of said multistep shaft, a working chamber being formed between said multistep shaft and said casing so as to be filled with viscous fluid;
(c) a plurality of first resistance plates engaged with and arranged axially along a portion of said multistep shaft within the working chamber; and
(d) a plurality of second resistance piates engaged with and arranged axially along a portion of said casing within the working chamber, said first and second resistance plates being alternately arranged with respect to each other.

4,928,804

FREE WHEEL HUB CLUTCH

Hideaki Wakabayashi, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 24, 1989, Ser. No. 315,160
Claims priority, application Japan, Feb. 29, 1988, 63-046386
Int. Cl.[5] F16D *1/06*; B60K *23/08*
U.S. Cl. 192—83 3 Claims



1. A free wheel hub clutch for an axle shaft, comprising:
an outer casing;
inner sleeve means in the casing for connection to the axle shaft;
slidable clutch means in the casing for selecting alternating movement between a lock position wherein the clutch means is connected with the inner sleeve means, and a free position wherein the clutch means is disconnected from the inner sleeve means for free rotation with respect thereto; and
manual operating means for manually alternating the movement of the clutch means between the lock position and the free position;
remote operating mans for remotely alternating the movement of the clutch means between the lock position and the free position.

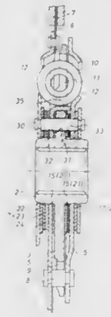
4,928,805

FRICTION DEVICE IN A DAMPER DISK

Hiroshi Takeuchi, and Yoshinari Yoshimura, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP88/00562, § 371 Date Feb. 6, 1989, § 102(e) Date Feb. 6, 1989, PCT Pub. No. WO88/10375, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 10, 1988, Ser. No. 350,581
Claims priority, application Japan, Jun. 15, 1987, 62-91797[U]
Int. Cl.[5] F16D *3/14*
U.S. Cl. 192—106.2 1 Claim

1. A friction device of a damper disk comprising:
a hub provided with a flange which is an output member;
a pair of annular side plates, which are input members and are disposed at opposite sides of said flange;
springs disposed in openings in said side plates and said flange for circumferentially connecting said side plates to said flange;
a pair of annular sub-plates disposed around said hub with said side plates and said flange therebetween;
first friction mechanisms disposed radially inside said openings and between said side plates and said flange, respectively;
second friction mechanisms disposed between said side plates and said plates, respectively, said second friction mechanisms being adapted to cause a friction force by relative rotation between said side plates and said subplates which is larger than the friction force caused on said first friction mechanism by relative rotation between said side plates and said flange;
stud pins extending in an axial direction of the disk and rigidly connecting said both of the sub-plates together;
stop mechanism for preventing relative rotation between said flange and said sub-plates over a predetermined angle; and



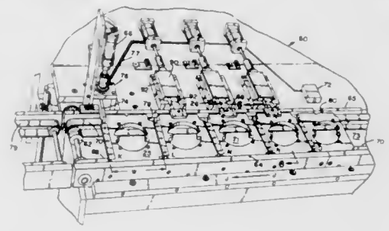
bent portions formed at radially inner edges of said openings in one of said side plates and extending axially toward the other of said side plates, said bent portions passing through said openings in said flange with an outer end of each of said bent portions in contact with an inner surface of said other side plate.

4,928,806

SYSTEM FOR REMOVING A PALLET FROM A MOVING TRANSFER MECHANISM AND FOR ACCURATELY LOCKING THE PALLET AT A PRECISE LOCATION

Edmund J. Anderson, Minneapolis, and Wayne P. Desrude, Brooklyn Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 8, 1988, Ser. No. 179,586
Int. Cl.[5] B65G *47/22*
U.S. Cl. 198—345 7 Claims



1. A system for removing a pallet from a moving transfer mechanism and for accurately locking the pallet at a precise location, the system comprising:
(a) pallet means for supporting a workpiece, said pallet means including a first sidewall engaging surface and a second sidewall engaging surface, said pallet means further defining a receiving cavity on said first sidewall;
(b) a transfer mechanism comprising at least one moving surface for supporting the bottom surface of the pallet means;
(c) guide rail means located above and adjacent to said transfer mechanism moving surface substantially along the length of said mechanism, said guide rail means having a surface for guiding the travel of a substantially adjacent pallet means as the pallet means moves along the transfer mechanism moving surface;

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(d) means for roughly locating said pallet means moving along said transfer mechanism; and

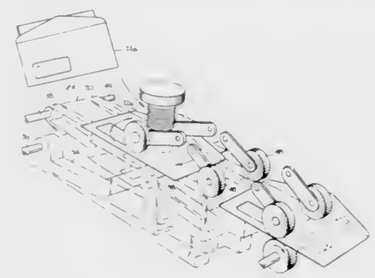
(e) lift and lock means for lifting said roughly located pallet means from said transfer mechanism moving surface and for locking said pallet means into a precise location by applying forces against said first and second sidewall surfaces, said lift and lock means including an engaging bar with a top and a pallet engaging end, said engaging end being formed by side surfaces depending from the top and having an intersection with a forward slope angle from said top and having a triangular cross section formed by the forward slope angle of the engaging bar engaging end and the angle between each side surface and the top of said engaging bar, said receiving cavity in said pallet means being configured for a substantially conformal fit with said triangular cross section, said receiving cavity being defined by said first sidewall and having an apex having a radius and said tapered engaging end of said engaging bar comprising a radius, such that said radius at the apex of said receiving cavity is less than said radius at said tapered engaging end of said engaging bar.

4,928,807

METHOD AND APPARATUS FOR TURNING FLAT ARTICLES

David R. Auerbach, West Redding, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 2, 1988, Ser. No. 279,000
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—379 14 Claims



1. Apparatus for turning flat articles, comprising:

a frame;

a pair of substantially horizontal, pivotable belt assemblies for receiving a serial stream of said articles traveling along a path, each of said belt assemblies having an upper and a lower reach and an entrance and an exit end;

a rotatable and vertically reciprocable disk member suitably mounted to said frame and situated between said belt assemblies for lifting each of said articles off said belt assemblies;

a biased, pivot ball suitably mounted to said frame and located above said reciprocable disk member for pinning each of said articles when each of said articles is lifted by said disk member; and

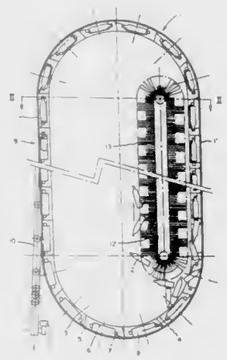
an idler roller situated above the upper reaches of said belt assemblies at the exit end of said belt assemblies for transporting said flat articles downstream from said disk member and ball.

4,928,808

MACHINE FOR UNSCRAMBLING AND POSITIONING CONTAINERS

Jaime S. Marti, Emancipacion No. 8, Barcelona, Spain

Filed Dec. 19, 1988, Ser. No. 286,067
Claims priority, application France, Dec. 18, 1987, 87 18194
Int. Cl.[5] B65G *17/32*
U.S. Cl. 198—397 31 Claims



1. An automatic unscrambler for orientating containers such as plastic bottles and lightweight articles comprising:

a hopper for receiving a plurality of randomly positioned containers;

a side wall on said hopper;

a bottom on said hopper having a peripheral portion spaced from said side wall to provide a space through which the containers can pass;

a plurality of carriages supported below said hopper for movement in a path adjacent said peripheral portion of said bottom;

at least one flexible drive means connected to each carriage for interconnecting said carriages and driving said carriages in said path;

container holders mounted on said carriages for movement therewith and in position for receiving containers from said peripheral portion of said bottom of said hopper;

openings in said container holders for allowing the containers to pass therethrough;

means on each holder engaging one part of each container in a respective holder for tilting the container into a predetermined position as the container passes through the respective opening;

container support means extending below said holders for supporting the containers in said holders during movement of the holders;

a discharge section in said support means for discontinuing support of the containers at a predetermined location so that containers in said holders pass through said container holder openings at said discharge section; and

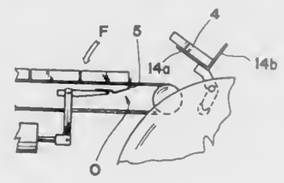
passageway means mounted on said carriages below said container holder openings for receiving and orientating containers passing through said openings into a predetermined position.

4,928,809

DEVICE FOR TRANSFERRING ARTICLES FROM A FIRST TO A SECOND CONVEYOR WITH PREDETERMINED ROTATION OF THE ARTICLES DURING THE SAID TRANSFER

Ireneo Bozza, Bologna, Italy

Filed May 9, 1984, Ser. No. 608,458
Claims priority, application Italy, Aug. 4, 1983, 3520 A/83
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—408 5 Claims



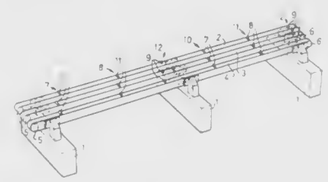
1. Device for transferring articles from a first to a second conveyor through first and second stations, with predetermined rotation of the articles during the said transfer, comprising: a first and second conveyor, a rotatable disc interposed between said conveyors; a plurality of transfer means, each pivotally articulated to said disc, said pivots being angularly equidistant with respect to one another, as well as equidistant from the axis of rotation of said disc, each transfer means defining inner and outer arms, said outer arm having fixed thereto a right angular receiving element for receiver and/or grasping said articles; means for halting and unloosening the leading article in the row of articles present on the first conveyor, positioned upstream of the said first station, said means being operated on a time relationship basis with the passing through the first station of said transfer means; and means for constantly regulating the spatial orientation of said transfer means, so that the article in moving from the first conveyor to the second conveyor will pass through an arc of 90°.

4,928,810

CONVEYOR

Jimmy Hultberg, Ryd, Sweden, assignor to AB Volvo, Goteborg, Sweden

PCT No. PCT/SE87/00411, § 371 Date Feb. 8, 1989, § 102(e) Date Feb. 8, 1989, PCT Pub. No. WO88/01976, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 11, 1987, Ser. No. 313,266
Claims priority, application Sweden, Sep. 19, 1986, 860361
Int. Cl.[5] B65G *15, 44*
U.S. Cl. 198—699.1 2 Claims



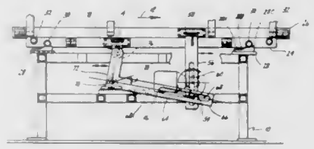
1. A conveyor comprising at least one endless conveyor element, a plurality of pusher means (7, 8, 9) which are carried by said at least one conveyor element and which are adapted to push objects on the conveyor, said pusher means (7, 8, 9) having at least two different cross sectional shapes that vary from pusher means to pusher means lengthwise of the conveyor for pushing different types of solid objects along the conveyor, said different shapes of pusher means (7, 8, 9) being arranged in predetermined fixed positions and in sequential order along said at least one conveyor element (2, 3, 4) and the distance along said at least one conveyor element (2, 3, 4) between a pusher means (7, 8, 9) and the next pusher means of the same cross sectional shape being the same for all types of pusher means (7, 8, 9).

4,928,811

WALKING BEAM APPARATUS

Glenn Waineo, 39001 Schoolcraft Rd., Livonia, Mich. 48150

Filed Dec. 7, 1988, Ser. No. 280,953
Int. Cl.[5] B65G *25/00*
U.S. Cl. 198—774 9 Claims



1. Apparatus for advancing a workpiece along a stepped path of motion, comprising:

a base;

a rail mounted on the base to intermittently support the workpiece as it is being stepped along said path of motion;

a rotary shaft;

power means connected to the shaft for rotating same;

a lifting member mounted on the base for motion therealong, and a first cam member carried by the lifting member;

a second cam member mounted on the base and engageable with the first cam member;

one of said cam members having a cam contour engaged with the other of said cam members such that the lifting member is raised with respect to the base in a cammed path that is in accordance with the contour of said one of said cam members, as the lifting member is being moved along the base;

a transfer bar having means for engaging the workpiece mounted on the rail, and means movably supporting the transfer bar on the lifting member;

first linkage means connecting the shaft to the lifting member such that it is moved on the second cam member in said cammed path in a first direction and then is raised, and then is moved in the opposite direction and then is lowered, as the shaft is being rotated in an arc of motion;

said first linkage means comprising:

a crank carried on the shaft;

a drive member and means mounting same on the base for a rocking motion;

first connecting means comprising the drive member having a slot, and a cam follower carried on the crank and received in the drive member slot such that as the crank is being rotated by the shaft in said arc of motion, the drive member is rocked in a first direction and then is rocked in the opposite direction;

second connecting means connecting the drive member to the transfer bar such that as the drive member is being rocked in said first direction, the transfer bar is moved sequentially from an initial position to engage the workpiece to lift it from the rail and then to advance the workpiece in a step in said first direction along the rail, and then as the drive member is rocked in the opposite direction, the transfer bar lowers the workpiece to deposit it on the rail to complete the step and then returns in the opposite direction to said initial position.

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4,928,812

CONVEYOR BELT OF PVC PROVIDED WITH A COMPOUND LAYER OF REINFORCING MATERIAL AND A PROCESS OF WEAVING SAID REINFORCING LAYER

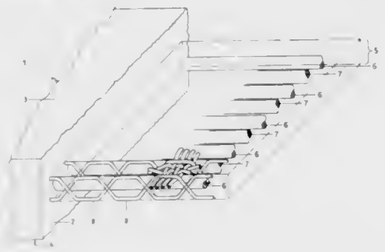
Freerk R. van Calker, Lathum, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Filed Jun. 2, 1988, Ser. No. 203,732

Claims priority, application Netherlands, Jun. 4, 1987, 8701304

Int. Cl.[5] B65G *15/30*

U.S. Cl. 198—847 4 Claims



1. A conveyor belt comprising:
a matrix based on polyvinyl chloride; and
a reinforcing construction embedded in said matrix, said reinforcing construction comprising a compound woven fabric including:
(a) a first layer including (i) a plurality of primary load-bearing warp members each formed by a plurality of substantially parallel cables or cords of continuous filaments of aramid and extending rectilinearly in a longitudinal direction of the belt, each of said primary load-bearing members having an outer diameter D, adjacent ones of said primary load-bearing members being spaced apart from one another to form spaces therebetween having a width which is 0.5–2.0 times said outer diameter D of said primary load-bearing members and (ii) a plurality of second nonaramid cotton comprising filling warp members respectively disposed rectilinearly in said spaces between said primary load-bearing members;
(b) a second layer provided on an upper side of said first layer and a third layer provided on a lower side of said first layer, said second and third layers each comprising cotton yarns adhered to said polyvinyl chloride matrix; and
(c) a plurality of binder warp yarns or filaments which interconnect said first layer, said second layer and said third layer

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4,928,813

ENCASED POOL CHEMICAL CAPSULE WITH EXTENDED ENDS AND METHOD OF MAKING THE SAME

John M. Casberg, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.

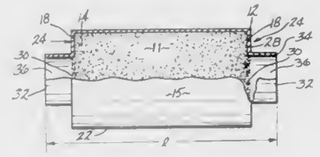
Filed Jun. 2, 1989, Ser. No. 360,666

Int. Cl.[5] B65D *85/62;* C02B *1/18*

U.S. Cl. 206—0.5 17 Claims

1. A capsule for use in the dissolution of a halogen chemical compound into a body of water, the capsule comprising:
a tablet section comprising at least one halogen chemical compound tablet, said tablet section having an elongate center section with two opposite end sections; and
shell means securely fitted about said tablet section, said shell means having an elongate center portion substantially encasing said tablet section and two end portions adjacent said tablet end sections, each of said end portions comprising a tablet wall with an aperture therethrough and an extension having a conduit means therethrough, said extensions extending away from said tablet section in substantially opposite directions whereby water must pass through said extensions and said apertures to access said tablet section such that said shell means reduces the dissolving rate of said halogen compound into a body of water, the dissolving rate being at a relatively constant rate.

11. A capsule for use in the dissolution of a halogen chemical compound into a body of water, the capsule comprising:
a tablet section comprising at least one halogen chemical compound tablet, said tablet section having an elongate center section with two opposite end sections; and



a shell comprising a heat shrinkable tube securely fitted about said tablet section, said tube forming an elongate center portion substantially encasing said tablet section and two end portions extending away from said center portion in opposite directions with relatively smaller cross-sectional shapes than said center portion.

15. A method of manufacturing a capsule for use in the dissolution of a halogen chemical compound into a body of water, the method comprising the steps of:
positioning a halogen compound tablet into a heat shrinkable tubing; and
shrinking the tubing about the tablet such that the tablet is substantially encased by the tubing except for a first end extension and a second end extension of the tubing extending away from the tablet and providing reduced size conduits for providing water access to the tablet.

4,928,814

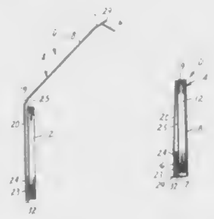
PAD ENCLOSURE

Klaus Rondot, Düsseldorf, and Jörg Schlichting, Neuss, both of Fed. Rep. of Germany, assignors to Minnesota Mining & Manufacturing Comp., St. Paul, Minn.

Filed Apr. 30, 1987, Ser. No. 44,234

Int. Cl.[5] B65D *85/00*

U.S. Cl. 206—215 13 Claims



1. An enclosure for a pad of sheets having front, rear, top and bottom surfaces with said front and rear surfaces being substantially larger than said top and bottom surfaces, said enclosure comprising a rectangular elongate sheet of stiff paper material, said paper material having spaced transverse scores and being bent at said scores to define sequentially along the length of said sheet an end portion, a bottom portion adapted to overlie and be coextensive with the bottom surface of the pad, a front portion substantially larger than said end and bottom portions adapted to overlie and be coextensive with the front surface of the pad, a top portion of about the same size as said bottom portion adapted to overlie and be coextensive with the top surface of the pad, a rear portion of about the same size as said front portion adapted to overlie and be coextensive with the rear surface of the pad, and outer and inner recess-forming portions, said outer recess-forming portion being generally parallel to and along the surface of said rear portion adapted to be adjacent the pad and said inner recess-forming portion being parallel to and along the surface of the outer recess-forming portion adapted to be adjacent the pad, said rear portion and said recess-forming portions being attached together adjacent the score between said outer and inner recess-forming portions to define a recess between said outer and inner recess-forming portions opening along the adjacent end of said rear portion which recess is adapted to frictionally and removably receive said end portion to close said enclosure.

4,928,815

LENS CONTAINER ASSEMBLY

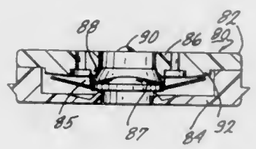
Lyle E. Paul, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 100,297, Sep. 23, 1987, Pat. No. 4,817,789. This application Mar. 3, 1989, Ser. No. 319,639

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] B65D *85/38*

U.S. Cl. 206—5.1 14 Claims



1. A lens container for holding a lens comprising:
base means;
lens cover means associated with said base means and together with said base means acting to form a compartment of sufficient size to contain a lens; and
clamp means attached to said lens cover means, being movable relative to said base means and said lens cover means, and adapted to be activated to hold said lens in place in said compartment in contact with said clamp means and said base means.

7. A lens container for holding a lens comprising:
base means;
lens cover means associated with said base means and together with said base means acting to form a compartment of sufficient size to contain a lens; and
clamp means including a hollow contact ring and being movable relative to said base means to hold said lens in place in said compartment so that both said hollow contact ring and said base means contact said lens to hold said lens in place in said compartment and substantially prevent movement of said lens.

13. A lens container for holding a lens comprising:
base means;
lens cover means secured to said base means at at least one point and together with said base means acting to form a compartment of sufficient size to contain a lens, said lens cover means being constructed of resilient material;
clamp means being movable relative to said base means and said lens cover means and adapted to be activated to hold said lens in place in said compartment; and
projection means secured to said lens cover means and adapted to be contacted to activate said clamp means.

4,928,816

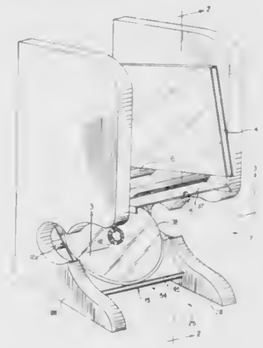
APPARATUS FOR MANIPULATING COMPACT DISC JEWEL BOXED

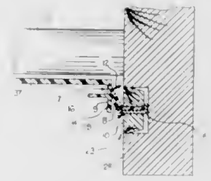
Matthew S. Zusy, 1202 Brookview Blvd., Parma, Ohio 44134

Filed Nov. 28, 1988, Ser. No. 276,944

Int. Cl.[5] B65D *85/57*

U.S. Cl. 206—232 16 Claims





1. An apparatus for manipulating a jewel box to assist in the opening and closing of said jewel box, thereby allowing the extraction and return of a compact disc stored therein, said prior art jewel box comprising:
a shallow rectangular box having a body adapted to releasably hold within it a compact disc, a cooperating rectangular lid having slots paired on opposite edges thereof and being hingedly attached to said body at substantially a third edge, the fourth edge being referred to as the lip edge, and a detent mechanism operatively positioned at mating surfaces of said body and said lid to releasably retain said lid in a closed position; and
said apparatus comprising:
a plurality of oppositely disposed paired catch members supported in a substantially horizontal plane and adapted to selectively engage and release said slots in said lid, thereby to selectively either support said jewel box by its lid therebetween or release said jewel box, the selection being made at the discretion of the user by manually imposing appropriate movement of said box relative to said catch members for engagement or release thereof;
wherein while said jewel box is supported by said catch members, light pressure on the center of the lip edge of said lid causes said cover to flex in a way to release said detent mechanism, thereby allowing said body of the box to open away from said lip by pivoting on said hinged attachment, thus allowing access to a compact disc stored within.

9. A combination comprising a jewel box and an apparatus for assisting in the opening and closing of said jewel box, thereby allowing the extraction and return of a compact disc stored therein, said prior art jewel box comprising:

a shallow rectangular box having a body adapted to releasably hold within it a compact disc, a cooperating rectangular lid having slots paired on opposite edges thereof and being hingedly attached to said body at substantially a third edge, the fourth edge being referred to as the lip edge, and a detent mechanism operatively positioned at mating surfaces of said body and said lid to releasably retain said lid in a closed position; and

said apparatus comprising:

a plurality of oppositely disposed paired catch members supported in a substantially horizontal plane and adapted to selectively engage and release said slots in said lid, thereby to selectively either support said jewel box by its lid therebetween or release said jewel box, the selection being made at the discretion of the user by manually imposing appropriate movement of said box relative to said catch members for engagement or release thereof;

wherein while said jewel box is supported by said catch members, light pressure on the center of the lip edge of said lid causes said cover to flex in a way to release said detent mechanism, thereby allowing said body of the box to open away from said lip by pivoting on said hinged attachment, thus allowing access to a compact disc stored within.

4,928,817

PACKAGING FOR A PLURALITY OF SMALL PACKS, ESPECIALLY CIGARETTE PACKS

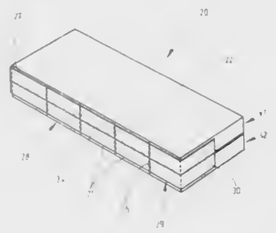
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed May 5, 1989, Ser. No. 347,850

Claims priority, application Fed. Rep. of Germany, May 30, 1988, 3818285

Int. Cl.[5] **B65D** *5/48*

U.S. Cl. 206—256 **7 Claims**



1. Packaging for a plurality of cigarette packs (**20**) and including a wrapping (**22**) in which the cigarette packs are wrapped to form an elongated stick of cigarette packs, opposite end walls (**26**, **27**) of the packs facing respective opposite side faces (**28**, **50**) of the wrapping.

wherein said wrapping (**22**) is open at least in the region of one of its side faces (**28**, **50**) so that the pack end walls (**27**) facing this open side face (**28**) are not covered by said wrapping (**22**) in which the cigarette packs (**21**) are wrapped;

wherein said pack end walls (**27**) not covered by said wrapping (**22**) are connected to one another and to said wrapping (**22**) solely by adhesive strip means (**36**, **37**) which is glued across the open side face (**28**) of said wrapping (**22**) on the uncovered pack end walls (**27**) of the wrapped packs (**21**), and which has opposite ends (**30**) glued on respective opposite narrow sides (**31**) of said wrapping (**22**); and

wherein the uncovered end wall (**27**) of each cigarette pack (**21**) is assigned a different section (**33**) of a plurality of sections of said adhesive strip (**29**, **36**, **37**), said sections being adapted to receive markings and being defined by weakened dividing lines.

4,928,818

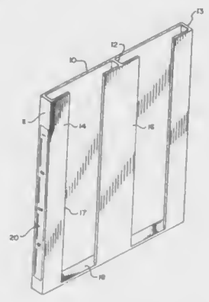
CONTAINER FOR COMPACT DISKS

Alan Friess, 3604 Hillview Crescent, Edmonton, Alberta, Canada (T6L 1C4), and Colin Friess, 1432 - 63 Street, Edmonton, Alberta, Canada (T6L 1X7)

Filed Aug. 28, 1989, Ser. No. 399,027

Int. Cl.[5] **B65D** *65/672*

U.S. Cl. 206—309 **19 Claims**



1. A container for storing compact disks comprising a planar support member which is square in plan defining four sides each substantially equal to twelve inches in length, and receiving means mounted on at least one side of the support member for receiving a plurality of said compact disks, said receiving means being shaped to receive said compact disks mounted parallel to the support member and so as to confine said compact disks to lie spaced apart on and within the square face of the support member, said container being self-supporting and thin so as to simulate the size of a conventional twelve inch record.

4,928,819

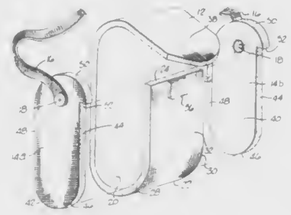
AIR PERMEABLE CAMERA CASE

Katherine Jakobsen, Aurora, Colo., assignor to Satter, Inc., Denver, Colo.

Filed Sep. 14, 1989, Ser. No. 407,262

Int. Cl.[5] **A45C** *11/38;* **B31B** *1/72*

U.S. Cl. 206—316.2 **12 Claims**



1. A camera case comprising:

an air permeable, resilient body having inner and outer surfaces which are connected by a first peripheral edge, said first peripheral edge having a first end edge portion, a second end edge portion, a first side edge portion and a second side edge portion, said body also defining a front wall, a bottom wall, a rear wall and a closing flap of said case; and

first and second air permeable, resilient end plates, each of which has inner and outer surfaces which are connected by a second peripheral edge, said second peripheral edge of each end plate having a front edge portion, a bottom edge portion, a rear edge portion, a top edge portion and a notched edge portion, said notched edge portion adjoining said top edge portion and said front edge portion, said notched edge portion also being sized and configured to mate with said first end edge of said body so that said outer surface of said front wall of said body is capable of being flush with said top edge portion of each end plate, said body and said end plates being secured to each other such that said first end edge of said body is bonded to said notched edge portion of said end plates and so that said inner surfaces of said front, said bottom and said rear walls of said body are bonded, respectively, to said front, said bottom and rear edge portions of said end plates, said end plates further being aligned with respect to said body so that said outer surface of said first end plate is flush with said first side edge of said body and said outer surface of said second end plate is flush with said second side edge of said body.

10. A method of assembling a camera case comprising:

providing an air permeable, resilient body having inner and outer surfaces which are connected by a first peripheral edge, the first peripheral edge having a first end edge portion, a second end edge portion, a first side edge portion and a second side edge portion, the body also defining a front wall, a bottom wall, a rear wall and a closing flap of the case;

providing first and second air permeable, resilient end plates, each of which has inner and outer surfaces which are connected by a second peripheral edge, the second peripheral edge of each end plate having a front edge portion, a bottom edge portion, a rear edge portion, a top edge portion and a notched edge portion, the notched edge portion connecting the top edge portion to the front edge portion, the notched edge portion also being sized and configured to mate with the first end edge portion of the body so that the outer surfaces of the front wall of the body and the top edge portions of each end plate are capable of being flush with each other when they are bonded to each other;

applying adhesive to the notched edge portions, the front edge portions, the bottom edge portions and the rear edge portions of the end plates;

locating the first end edge of the body up against the adhesive coated notched portion of each end plate so that the top edge portions of the end plates are flush with the outer surface of the front wall of the body and so that the outer surface of the first end plate is flush with the first side edge of the body and the outer surface of the second end plate is flush with the second side edge of the body;

after so locating the first end edge of the body, wrapping the body about the second peripheral edges of the end plates so that the outer surface of the first end plate is flush with the first side edge of the body and the outer surface of the second end plate is flush with the second side edge of the body; and

maintaining the body in the wrapped position about the end plates until the front, bottom and rear walls of the body bond, respectively, to the front, bottom and rear edge portions of the end plates.

4,928,820

SNAP ON BUMPER FOR ELECTRONIC PACKAGES

Robert H. Murphy, Merrimack, and Roland Gosselin, Nashua, both of N.H., assignors to R. H. Murphy Company, Inc., Amherst, N.H.

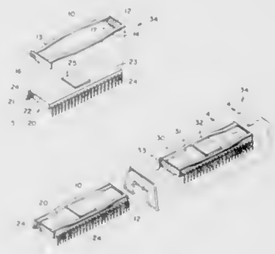
Filed Jul. 7, 1989, Ser. No. 377,164

Int. Cl.[5] **B65D** *73/02*

U.S. Cl. 206—328 **12 Claims**

1. A shock absorbing bumper for oppositely disposed planar end surfaces of a device that is adapted to move along a longitudinal axis transverse to the planar end surfaces, the end surfaces being spaced a predetermined distance from each other, and that has a surface extending between the end surfaces, said bumper comprising:

A. overlying end means for overlying the opposite end surfaces of the device thereby to form a shock-absorbing bumper surface at each end surface parallel thereto,



B integral interconnecting means for establishing a parallel relationship between said end means with a spacing between said end means corresponding to the predetermined distance, said interconnecting means being positioned adjacent to the surface of the device and being capable of elastic elongation for increasing the spacing between said overlying end means and producing a restoring force for clamping a device between said overlying end means.

4,928,821

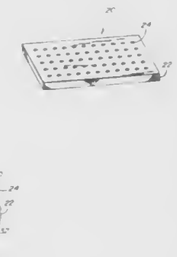
SPRING TENSION HOLDING MEANS

William R. Belko, Jr., 2005 Pintoresco Ct., Rancho La Costa, Calif. 92009

Filed Jul. 8, 1988, Ser. No. 216,893

Int. Cl.[5] **B65D** *73/02*

U.S. Cl. 206—329 **5 Claims**



1. A holding means for miniature electronic components having substantially squared edges comprising a base plate having upper and lower major surfaces and an array of spaced apart openings which extend through the base plate and provide communication between such upper and lower surfaces, the diameter of the openings being at least as large as the largest areal dimension of the components being held; a first layer of an elastomeric material removably attached to the upper surface of the base plate, the first layer of elastomeric material having an array of openings therein aligned with the openings in the base plate, the cross-sectional area of the openings being smaller than the cross-sectional area of the components to be held, and at least one slit cut into the elastomeric material adjacent each opening such that when a component is inserted into such opening the areal dimensions of the opening are substantially the same as the areal dimensions of such

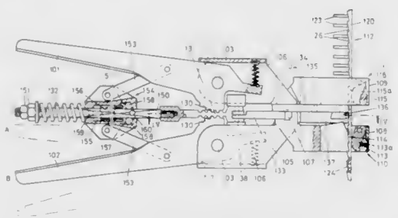
components; and, a second layer of elastomeric material removably attached to the lower surface of the base plate, the second layer of the elastomeric material having an array of openings therein aligned with the openings in the base plate and the openings in the first layer of elastomeric material, the cross-sectional area of the openings in the second layer of elastomeric material being smaller than the cross-sectional area of the components to be held therein, wherein when components are inserted into the holding means they are held in place by the gripping action of the elastomeric material, in tension, along the sides of the components.

4,928,822

CABLE END SLEEVE MAGAZINE

Carl Geisser, Letzigraben 156, CH-8047 Zürich, Switzerland

Division of Ser. No. 26,571, Mar. 17, 1987, Pat. No. 4,765,176.
This applicatioo May 25, 1988, Ser. No. 202,573
Claims priority, application Switzerland, Mar. 25, 1986, 1215/86
Int. Cl.[5] B65D *73/02*
U.S. Cl. 206—330 **1 Claim**



1. A cable end sleeve magazine comprising

a unitary disposable, elongated carrier formed of plastic material having a side surface extending in a longitudinal direction of said carrier, said carrier having a plurality of uniformly spaced throughgoing openings in a single row and perpendicular to said side surface, said openings extending through said carrier from said side surface to an opposing surface, and a plurality of saw-tooth shaped recesses transversely displaced from said openings for advancing said carrier in a crimping tool, the recesses having opposed flat and steep flanks, the flat flanks being inclined relative to said side surface, the recesses being uniformly spaced with the same spacing as the openings, and

a plurality of cable end sleeves removably inserted and held in said openings, said cable end sleeves projecting from said opposing surfaces of the carrier to be fed to said crimping tool for crimping one at a time, onto a cable end and removing the crimped-on cable end sleeve from the carrier.

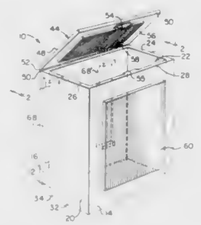
4,928,823

HOLDER FOR STAPLES, CARPET TACKS, NAILS, SCREWS AND OTHER DISCRETE MAGNETIZABLE ITEMS

James P. Campbell, 144 Laurel St., Bridgewater, Mass. 02324

Filed Sep. 29, 1988, Ser. No. 250,535
Int. Cl.[5] B65D *85/24*
U.S. Cl. 206—338 **5 Claims**

4. Holder for a plurality of loose carpet tacks, nails, screws and the like discrete items capable of being attracted to a magnet, said holder being of a box-like structure and being defined by planar, spaced-apart, parallel front and back walls, and parallel, spaced-apart side walls, said box-like structure being further defined by a closed bottom and an open top whereby to define an internal, elongated cavity for the holding of said plurality of loose, discrete items for use, a closure member for said open top defined by an inner planar surface, and a planar magnet being attached to said planar inner surface of the said closure, whereby as the discrete items in the holder are used and the number of loose discrete items remaining in the holder diminishes so that any of such items remaining becomes less accessible, certain of the remaining such items can be made



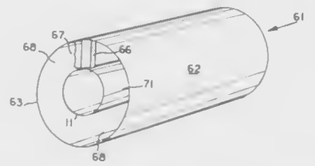
readily available to the user at the top of the holder and easily accessible for use by the user shaking the holder and causing the diminished supply of discrete items to contact the said magnet whereby certain of said discrete items will be attracted and separated from the others in the diminished supply and detachably held by the magnet.

4,928,824

HYPODERMIC NEEDLE SHEATH PROTECTION SHIELD APPARATUS

Stephen T. Barasch, 2335 Edgewater La., Largo, Fla. 34644

Filed Sep. 15, 1987, Ser. No. 96,732
Int. Cl.[5] A61M *5/00*
U.S. Cl. 206—365 **2 Claims**



1. An apparatus for the sheathing of a hypodermic needle which is adapted to protect a person's sheath-holding hand during sheathing, said apparatus comprising;

a sheath for a hypodermic needle;

said sheath being fastened at some point to at least one joining member, said joining member being further fastened to a shrouding member such that such fastened joining member is of adequate strength and rigidity to remain fastened under the pressure caused by the impact of a stray needle during a sheathing operation to either said joining member, said sheath, or said shrouding member;

said shrouding member further comprising an external surface which is generally parallel with the external surface of said sheath and surrounds said sheath along some part of the length of said sheath;

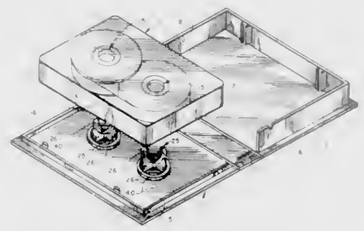
said shrouding member external surface being, at all points, some distance from the nearest point on said sheath external surface.

4,928,825

CASSETTE STORAGE CONTAINER

Bruce A. Hehn, Massillon, Ohio, assignor to Alpha Enterprises, Inc., Canton, Ohio

Filed May 31, 1989, Ser. No. 359,104
Int. Cl.[5] B65D *85/67*
U.S. Cl. 206—387 **14 Claims**



1. A container for storing a tape cassette of the type having at least one tape reel hub comprising a cylindrical sidewall defining a recess in the hub, said hub recess being accessible through an opening formed in a bottom wall of the cassette, said storage container including enclosure means for receiving and enclosing a tape cassette in the storage container; and hub engaging means formed on the storage container and located for entering the hub recess through the access opening when a cassette is placed in said container for preventing rotation of the tape reel hub, said hub engaging means including at least a pair of flexible, generally opposed fingers movable between normal biased and flexed positions, said fingers being formed on the storage container in a diametrically opposed relationship with each of the fingers being a generally flat member formed with a concave inner edge and a generally convex outer edge, said convex outer edge having an undercut lower portion, an arcuate upper portion which serves as a camming surface for moving the finger to the flexed position upon initial placement of a cassette into the storage container and into engagement with the cylindrical sidewall of the tape reel hub, and a generally elongated straight intermediate portion which engages the sidewall of the hub in an axially extending direction to provide frictional line contact therebetween to prevent rotation of the hub when the cassette is fully inserted into the storage container and the fingers urge toward the normal biased position.

4,928,826

PATRONE FOR PHOTOGRAPHIC FILM

Osamu Shibazaki, Hino; Yorikatu Miyazawa, and Toshio Kato, both of Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,794
Claims priority, application Japan, Mar. 18, 1988, 63-36801[U]; Mar. 18, 1988, 63-36802[U]
Int. Cl.[5] G03B *17/26*
U.S. Cl. 206—409 **11 Claims**

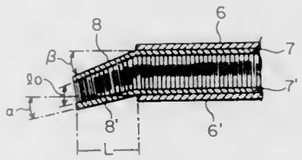
1. A cartridge for packaging a roll of film comprising:

a shell having inner and outer faces, longitudinal side edges and first and second ends, said shell being substantially cylindrical rolled to form an interior for housing the roll of film;

said first and second ends of said shell forming upper and lower lips overlapping and spaced a distance from one another to form a slit for the insertion and removal of the film forming the roll of film;

first and second ribbons having a flat surface and a pile surface to shield said interior of said shell from light, said first and second ribbons being attached to said upper and lower lips, respectively and extending at first and second angles, respectively to said lip and beyond said slit, for first angle of said first ribbon being greater than said second angle of said second ribbon; and

a plurality of caps having a central face and including a



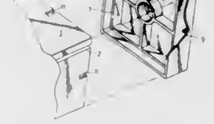
circumferential edge extending therearound said circumferential edge of said caps forming a U-shaped groove for receiving and contacting said inner and outer faces of longitudinal side edges of said shell.

4,928,827

LIGHT-TIGHT CASSETTE

Yoshio Hara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Apr. 29, 1988, Ser. No. 188,432
Claims priority, application Japan, May 1, 1987, 62-65306[U]; Jun. 24, 1987, 62-95901[U]
Int. Cl.[5] B65D *85/67*
U.S. Cl. 206—416 **1 Claim**



1. A light-tight cassette for holding a roll of light sensitive material and which includes a tubular body of polygonal cross-section; said body being open at each end thereof and having a slot adjacent to an edge of said body and extending along said body so as to provide an outlet opening through which said material passes; said slot provided with a construction for keeping light from reaching said material in said container through said slot; and, end cap means for closing said each end of said body comprising, an outer frame and an inner frame for said end cap means, said frames extending circumferentially of said cap means, said frames positioned at a substantially uniform distance from each other so that a groove is defined between said outer and inner frames with said each end of the body being received in said groove; and, a plurality of ribs being provided at regular intervals in said groove, wherein the open ends of the tubular body are provided with notches for receiving the ribs when the end caps are positioned to cover said each end of said body.

4,928,828

STORAGE HOLDER FOR COMPUTER DISKETTES

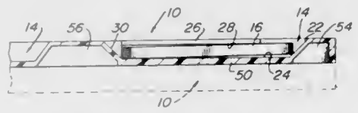
Jay B. Cohen, Philadelphia, Pa., assignor to Cobar, Inc., Cheltenham, Pa.

Continuation of Ser. No. 103,871, Oct. 2, 1987, abandoned. This application Oct. 4, 1989, Ser. No. 418,746
Int. Cl.[5] B65D *85/30*
U.S. Cl. 206—444 **5 Claims**

1. For use in a binder of the loose-leaf type, an insert for

holding and protecting computer diskettes and the like, comprising:

a page-like member having therein a plurality of recesses adapted to receive diskettes, said recesses being defined by respective side and end walls extending across said recesses, one of said end walls providing a ramp portion to facilitate insertion of a diskette into the recess, said diskettes having respective first and second faces, access to said recesses being provided through slots defined by an entrance portion having a width in excess of the width of a diskette and an open slot portion intersecting said entrance portion and extending generally perpendicularly thereto, said slots being generally T-shaped, said entrance portion defining the top of the "T" and said open slot portion defining the stem of the "T", the width of said open slot portions being sufficient to facilitate entry of a diskette into said recesses, said ramp portion being associated with said entrance portion and juxtaposed to said flap portions, said ramp portion and said flap portions cooperating to provide a snap action to retain diskettes in said recesses, said ramp portion and said flap portions partly closing said recesses and adapted to engage diskettes received in said recesses, said flap portions being disposed on opposite sides of said open slot portion so as to partly overly lateral edges of a diskette received in a recess, said



flap portions being resiliently displaceable to provide said snap action to facilitate entry of diskettes into said recesses and to frictionally engage the first faces of the diskettes when diskettes are disposed in said recesses to thereby retain said diskettes in said recesses, said recesses having bottom wall portions, the second faces of the diskettes abuttable with said bottom wall portions when diskettes are disposed in said recesses, said page-like member being made of plastic polymeric material and having a sinuous cross-section defining said recesses and flap portions, said flap portions having surfaces flush with and in part defining one face of said page-like member, said one face being the uppermost surface of said member and said bottom wall portions of said recesses being flush with and having surfaces in part defining the other face of said page-like member, said other face of said page-like member being the lowermost surface of said member, the respective faces of said member being substantially flat and adapted to conform to and abut with respective faces of an adjacent page-like member when a plurality of such members are disposed in a loose-leaf binder, said bottom wall portions of said recesses being juxtaposed to and covering open slot portions of an adjacent member to aid in retaining diskettes in said recesses when said page-like members are disposed in a binder.

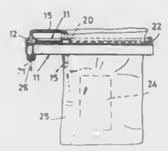
4,928,829

DEVICE FOR TIGHTLY SEALING BAGS DESTINED TO THE VACUUM PACKAGING OF VARIOUS PRODUCTS, IN PARTICULAR FOODSTUFFS

Pietro Di Bernardo, Milan, Italy, assignor to Interdibipack S.p.A., Mazzo Di Rho, Italy

Filed Jan. 18, 1989, Ser. No. 298,167
Claims priority, application Italy, Jan. 22, 1988, 19170 A/88
Int. Cl.[5] B65B *31/06*; B65D *33/17*
U.S. Cl. 206—524.8 5 Claims

1 A clamping mechanism for tightly sealing a bag and for vacuum packing of product within the bag without any other seal, the bag having an open side with a pair of mutually opposed edges, said clamping mechanism comprising a clamping member and a valve element cooperating with each other to evacuate air contained inside the bag containing the product when said valve element is connected a source of vacuum in order to produce the vacuum packaging of the product, said clamping member having means for grasping and tightly closing the mutually opposed edges of the bag against each other



whereby the open side of the bag is sealed closed, said valve element having a connection duct which extends through said grasping and tightly closing means and is insertable into the interior of the bag.

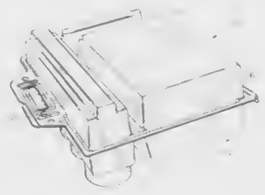
wherein said grasping and tightly closing means are a pair of mutually opposed rod-shaped jaws pivoted together at one end on a pivot with said valve mounted at said pivot.

4,928,830

SUCTIONING SUPPLY KIT

Cecil C. Brewer, Missouri City, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Oct. 31, 1988, Ser. No. 265,389
Int. Cl.[5] B65D *71/00*
U.S. Cl. 206—570 27 Claims



1. A kit for use in performing a suctioning procedure, comprising:

a tray; and

suctioning supplies, including

a pair of surgical gloves;

an ampule containing a saline solution;

a suction catheter;

a lubricating gel; and

a disposable bottle containing water;

the suctioning supplies being removably disposed within the tray.

4,928,831

GARMENT-GREETING CARD COMBINATION

Carol L. Kirsch, 1638 Huntington Dr., Apt. C, S. Pasadena, Calif. 91030

Filed Oct. 10, 1989, Ser. No. 419,079
Int. Cl.[5] B65D *5/06*
U.S. Cl. 206—575 14 Claims

1. A novelty greeting card having a greeting card design comprising a combination of a stiffener element disposed in an item of wearing apparel, wherein:

(a) the stiffener element has at least one score line to facilitate the folding of the stiffener element;

(b) the item of wearing apparel comprises a wearing apparel design and is attached to the stiffener element;

(c) the combination is foldable along the score line so that the combination can assume a greeting card shape comprising a front facing planar surface, at least two interior planar surfaces and a back facing planar surface; and

(d) at least one of the planar surfaces comprises a portion of



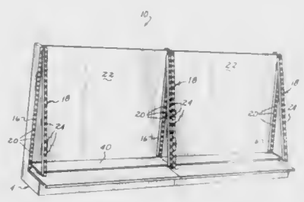
the item of wearing apparel disposed flat against the stiffener element with at least a portion of the wearing apparel design disposed in the planar surface in such a way that the wearing apparel design forms an integral part of the greeting card design.

4,928,832

ADJUSTABLE MERCHANDISE DISPLAY RACK

John L. Overmann, Cincinnati, Ohio, assignor to Hamilton Fixture Company, Ohio

Filed Oct. 25, 1988, Ser. No. 262,275
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—187 4 Claims



1. A merchandise display rack comprising:

a base structure;

a plurality of substantially parallel vertical standards, each said vertical standard having an upper and a lower end, said standards affixed at their lower ends to said base structure and extending upwardly at spaced positions along said base structure, each standard having a series of vertically spaced slots for receiving hook means; and

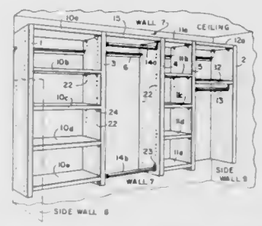
a plurality of angled legs, each having an upper end, a lower end opposite sides and having a hook means at its upper end which is laterally slidably adjustable between said opposite sides for attaching said upper end of said leg to a slot o a corresponding vertical standard, each leg adapted to be attached at its lower end to said base structure outwardly of a corresponding vertical standard so that said leg slants downwardly and outwardly from said standard, each leg having along its height a series of vertically spaced slots, similar to those of the standards, to which merchandise display means can be interconnected.

4,928,833

STORAGE ORGANIZER SYSTEM AND MEANS FOR INSTALLING THE SAME

Lee M. Huizenga, 1298 Waukazoo Dr., Holland, Mich. 49424

Filed Aug. 24, 1988, Ser. No. 235,976
Int. Cl.[5] A47F *5/08*
U.S. Cl. 211—187 15 Claims



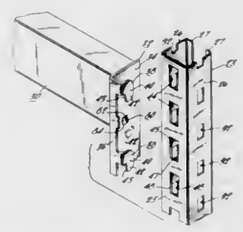
1. In a storage organizer system mounted adjacent a wall of a storage space comprising a plurality of upright panels extending perpendicular to said wall and supporting support members therebetween, the improvement comprising a horizontal rail mounted on said wall and having a projection extending upwardly and away from said wall; and each of said panels having an edge abutting said wall with a cutout portion receiving said projection whereby said panels and the support members therebetween are hung on said rail; said cutout portions being shaped so as to receive said projection as said panel is moved perpendicular to said wall and said cutout portion is dropped down and over said projection.

4,928,834

SAFETY BEAM LOCK

Richard D. Neiman, Chester Springs, Pa., assignor to Vesper Corporation, Bala-Cynwyd, Pa.

Filed Jun. 6, 1988, Ser. No. 203,172
Int. Cl.[5] A47B *47/00*
U.S. Cl. 211—191 9 Claims



1. In a metal structural frame for shelving having

(1) upright posts

(a) of open box construction in cross section with

(b) a front face and sides extending from the front face, and

(c) spaced vertical slots in the front face; and

(2) horizontal beams having

(a) a plate at the end of a beam, and

(b) lugs extending from the plate in a direction generally transverse to the beam;

wherein a beam is connected to a post by engaging the lugs in the slots; the improvement comprising

a safety lock for preventing dislodgment of the beam from the post, having

(1) vertically spaced slots in the post sides,

(2) a tab projection at the end of the beam extending from the plate for
(a) causing the post side to yield inwardly during engagement of the beam lugs into the post front face slots, and
(b) entering a slot on the post side when the lugs are fully engaged in the front face slots;

wherein the post side springs back outwardly, locking the tab projection in the post side slot, thus preventing the lugs from being disengaged from the post front face slot, and from being dislodged from the post.

4,928,835

INJECTION MOLDED PREFORM, METHOD OF TREATING SAME AND CONTAINER FORMED THEREFROM

Wayne N. Collette, Merrimack, N.H., and Ralph Armstrong, Weston, Conn., assignors to Continental PET Technologies, Inc., Norwalk, Conn.

Filed Jan. 31, 1989, Ser. No. 304,469
Int. Cl.[5] B29C *49/06, 49/04;* **B65D** *1/02, 23/00*
U.S. Cl. 215—31 **19 Claims**



13. A blow molded plastic container comprising a neck portion, a shoulder portion leading from said neck portion to a tubular body, and said tubular body being closed by a bottom portion, a crystallized ring portion between said neck portion and said shoulder portion maintaining axial alignment of said tubular body with said neck portion, said neck portion having an open end defined by a crystallized end sealing surface and said neck portion between said crystallized end sealing surface and said crystallized ring portion being a non-treated amorphous region and including thread means for receiving a closure.

4,928,836

BABY BOTTLE WITH AIR VALVE

Min-Yu Wu, and Andrew H. Wu, both of 1219 Brandybuck Way, San Jose, Calif. 95121

Filed Sep. 28, 1988, Ser. No. 252,813
Int. Cl.[4] A61J *9/04*
U.S. Cl. 215—11.5 **4 Claims**

1. A baby bottle having a pressure-sensitive air valve, comprising:
a baby bottle having a portion of the wall thereof removed;
an air valve having a means for engagement thereof to said baby bottle, such that said air valve will enclose said portion of said baby bottle where said wall portion is removed, whereby said baby bottle will retain liquid upon the engagement of said air valve therewith;
said air valve including a rigid valve housing and an air pressure-sensitive member, said air pressure-sensitive member being sealingly engaged within said housing and forming a wall of said baby bottle;
said air pressure-sensitive member having at least one air hole formed therethrough to permit air to enter said baby bottle;
portions of said air valve being formed as an air chamber, said air chamber being sealingly engaged to said air pressure-sensitive member proximate said air hole, whereby air passing through said air hole will enter said air chamber;
a valve means being fixedly engaged to said air pressure-sensitive member and disposed for forming an airtight seal with portions of said valve housing;



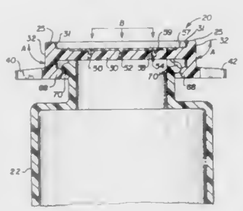
said air pressure-sensitive member including a thin-walled diaphragm;
whereupon movement of said air pressure-sensitive member will cause disengagement of said valve means from said valve housing, whereupon air from said air chamber will enter said baby bottle.

4,928,837

TAMPER EVIDENT CLOSURE

Yoram Curiel, Aurora, Colo., assignor to TSL Incorporated, Aurora, Colo.

Filed May 4, 1989, Ser. No. 347,363
Int. Cl.[5] B65D *51/00*
U.S. Cl. 215—250 **23 Claims**



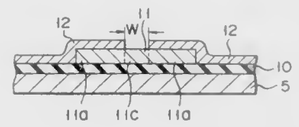
1. A resilient closure for a container, comprising:
an end wall having at least one upwardly open elongated groove;
an annular skirt depending from said end wall; and
a resin deposited on the top surface of said end wall and in said groove, whereby moving said closure cap away from said container will cause a portion of said resin to fracture.

4,928,838

TRIMMING PROCESS BY A LASER BEAM

Kaoru Imamura, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 4, 1989, Ser. No. 293,278
Claims priority, application Japan, Jan. 13, 1988, 63-5566
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 **14 Claims**



1. A trimming process by a laser beam comprising the steps of:
forming a laser shield layer over an untrimmed region of a trimmed material adjacent to a trimmed region, said laser shield layer having a higher heat conductivity than said trimmed material and a higher reflectivity for the laser beam than said trimmed material; and
cutting off a first portion of said trimmed material by applying a laser beam onto the upper surface of said trimmed region of said trimmed material and vaporizing the trimmed material in said trimmed region.

4,928,839

PLASTIC DRUMS FOR STORING OR TRANSPORTING LIQUID AND SOLID PRODUCTS

Donald A. Kruelskie, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 8, 1989, Ser. No. 404,994
Int. Cl.[5] B65D *7/00*
U.S. Cl. 220—5 R **9 Claims**



1. A stackable drum fabricated of a plastic material, which comprises:
an elongate, circular drum wall that tapers downwardly from the top end to the bottom end of the drum wall;
a removable circular lid for closing the top end of the drum wall;
a bottom member joined to the bottom end of the drum wall, for closing the drum wall;
the drum wall having an outside surface, and the top end of the drum wall defining a lip portion;
a removable support ring that fits snugly against the outside surface of the drum wall, and the ring being positioned just below the lip portion of the drum wall;
the circular lid having a convex profile, and an outer edge that defines a hook structure;
the circular lid having a top surface in which is formed a large diameter rib portion, and a small diameter rib portion;
the large diameter rib portion of the lid being located adjacent to the hook structure, and the small diameter rib portion of the lid being surrounded by the large diameter rib portion;
the bottom member having a concave profile, and an underside surface in which is formed a spline portion and a slot portion;
the spline portion being formed at the periphery of the bottom member, and the slot portion being surrounded by the spline portion;
wherein, the hook structure on the lid of the drum defined herein is adapted to seat down onto the lip portion of the drum wall;
the spline portion on the bottom member of the drum defined herein is adapted to seat down against the large diameter rib portion in the lid of another drum having a similar design;
the slot portion on the bottom member of the drum defined herein is adapted to seat down over the small diameter rib portion in the lid of another drum having a similar design;
such that the drum defined herein is adapted for combining with other drums of a similar design to provide a stable drum stack.

4,928,840

TAMPER PROOF ENCAPSULATED MEDICAMENTS

Stanley F. Barshay, Old Westbury, and Peter Mayer, New York, both of N.Y., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 25, 1986, Ser. No. 834,989
Int. Cl.[5] B65D *8/00, 53/06;* **A61K** *9/48*
U.S. Cl. 220—8 **1 Claim**



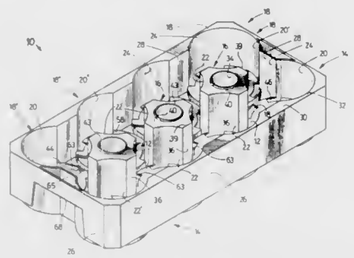
1. A tamper-proof capsule dosage form containing a pharmaceutical medicament for oral administration comprising:
(a) an elongated essentially round hard gelatin capsule made in two sections slip-fit joinable;
(b) a solid caplet containing a medicament substance shaped and sized closely to fit within the assembled capsule; and
(c) a pharmaceutically acceptable adhesive situated between each caplet end and the adjacent inner surface of the capsule

4,928,841

BOTTLE TRAY

Raymond C. Arthurs, Scarborough, Canada, assignor to Scepter Manufacturing Company Limited, Don Mills, Canada

Filed May 13, 1988, Ser. No. 193,757
Int. Cl.[5] B65D *1/24, 21/02, 71/00, 75/00*
U.S. Cl. 220—21 13 Claims



1. A tray for holding bottles having cylindrically round lower portions comprising:

a generally rectilinear box with an open top, a bottom and resilient side walls;

at least one free-standing upright pillar, the base of the pillar resiliently attached to the interior bottom of the box;

wherein each such pillar is located to be interposed between adjacent bottles whereby the tray is divided into circular bottle receiving compartments formed from the pillar and the resilient side walls;

wherein each such pillar is placed along a line parallel to a longitudinal box side whereby the box is divided into two or more rows, each having a plurality of compartments;

wherein each such pillar and resilient side walls provide curved surfaces which match the side walls of a bottle to be received therein such that the side walls of each pillar have surface portions of arcuate horizontal section spaced around the perimeter of the pillar, the sidewalls of the box have surface portions of arcuate horizontal section, and respective curved surfaces of each compartment are concentrically arranged about and equally spaced from a central upright axis of said compartment;

wherein each pillar further comprises an upright, hollow inner cylinder wherein a pillar roof connects the pillar side walls and inner cylinder; and

wherein when empty of bottles, opposite wall surface portions of each compartment are spaced at a distance slightly less than that of the corresponding width of a bottle to be received in that compartment.

4,928,842

DEVICE FOR STOPPING THE SPILLAGE OF POPCORN

Julius A. Swenson, 4209 Sandwood Dr., Columbia, S.C. 29206

Filed Sep. 15, 1989, Ser. No. 407,815
Int. Cl.[5] A47J *43/00*
U.S. Cl. 220—85 R 5 Claims

1. A device for serving popcorn, comprising:

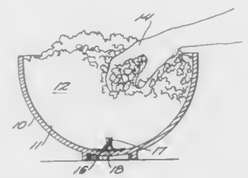
a container with a generally concave interior;

a vertical member having an irregular exterior surface attached to the interior surface of said container at approximately the center thereof;

said vertical member having a cross-section that is smaller in the middle than at the ends;

said vertical member irregular surface comprising a plurality of fluted sides;

whereby during removal of the popcorn from the container, the popped kernals tend to interlock with each other and against the vertical member, thus causing the popcorn to



remain in the container rather than spill from the opposite side of the container.

4,928,843

INTEGRATED PAINT CAN AND ROLLER PAN

Roger Gunderson, 33191 Paseo Mono, San Juan Capistrano, Calif. 92675

Filed Jan. 2, 1990, Ser. No. 459,971
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—90 8 Claims



1. An integral paint can/roller pan which serves the functions of storing a volume of paint in a first configuration and serving as a roller pan in a second configuration, comprising:

a paint can base;

a peripheral channel about the upper surface of said paint can base; and

a lid, said lid having a first and second surface;

wherein said lid may be configured in the first configuration wherein said lid is secured against and seals paint within the paint can base, and a second configuration wherein said lid is engagable to said peripheral channel such that said lid extends upwardly from said paint can base to receive a roller brush.

4,928,844

PRESSURE RELEASE FOR CARBONATED BEVERAGE CONTAINERS

Robert L. LaBarge, Ben Avon Borough, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 14, 1989, Ser. No. 338,311
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—207 15 Claims

1. A sheet metal end closure for a container comprising:

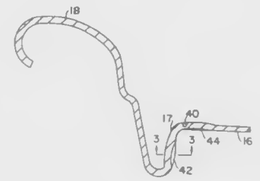
a generally planar wall portion having a peripheral chime for securement to a container body,

a peripheral countersink defining wall disposed immediately inward of said peripheral chime,

an integral, score line defined, opening panel,

a second score line defining a deformation inducible fracture line disposed in closely spaced adjacent relation with a portion of said countersink defining wall, and

a shallow outwardly directed buckle inducing indentation in said countersink defining wall located adjacent to said second score line to promote initiation of pressure induced buckling of said countersink defining wall thereat and a



concentration of buckle created fracture inducing forces at said second score line.

4,928,845

END FACE WITH TEAR-OFF LIP CLOSURE FOR PRESSURIZED CONTAINER

Michael J. M. Doyle, Warmoesstraat 16P, 1012 3D Amsterdam, Netherlands

Filed Oct. 18, 1988, Ser. No. 259,258
Claims priority, application Netherlands, Oct. 19, 1987, 8705497
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—271 9 Claims



1. End face for a can which can be under excess pressure on the inside and which is provided with a tear-away lip closure, provided with a throttle device for controlled release of the excess pressure on tearing open the lip closure characterized in that the throttle device is connected to the inner region of the end face close to the section of the lip closure which is torn open first, and also to the region of the lip closure bordering said end face section so as to provide a seal.

4,928,846

PAINT CAN CONSTRUCTION

John A. Murrin, Jr., 30 Clark St. Extension, Randolph, Mass. 02368

Filed Feb. 16, 1989, Ser. No. 310,888
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—354 7 Claims

1. A paint can construction comprising:

a container formed with an annular trough formed about an opening of the container wherein the trough is defined by an interior outwardly slanting wall spaced radially inwardly of an exterior inwardly slanting wall, each wall including an upper end and a lower end wherein the walls are joined together at their lower ends by a trough floor,

the trough floor including a series of through-extending apertures therethrough, the trough is further defined by a first diameter defined by the upper end of the exterior wall formed symmetrically about the opening of the container, and

a lid formed with a downwardly extending rib defining a lid trough therewithin wherein said rib includes an interior lid wall and exterior lid wall with a connecting lid floor of

complementary configuration to said annular trough and defined by a diameter equal to said first diameter, and

wherein the lid trough includes a series of downwardly extending rods extending through the lid floor, and

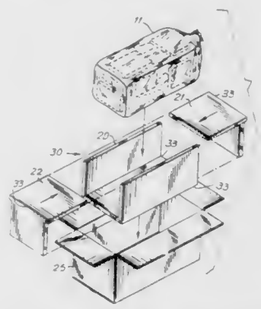
wherein said downwardly extending rods are commonly joined at upper terminal ends thereof by an annular ring orthogonally and fixedly secured to said rods and overlying said lid trough.

4,928,847

APPARATUS FOR PACKAGING REFRIGERATED GOODS

David S. Hollander, 2083 Parson St., Brooklyn, N.Y. 11234, and Mark S. Rubenstein, 208 Cinder Rd., Edison, N.J. 08820

Filed Jun. 8, 1988, Ser. No. 203,943
Int. Cl.[5] B65D *77/00, 30/00*
U.S. Cl. 220—408 10 Claims



1. A chill box adapted to provide insulated packaging for refrigerated goods, comprising:

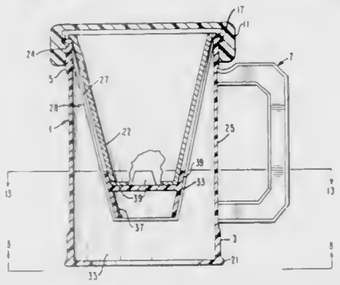
a plurality of separate portions, each portion having at least two panels and a bendable corner edge therebetween, each of said panels having foils on its top and bottom surfaces and covering its edges and an insulating material disposed therebetween to insulate refrigerated goods packaged within said chill box, said insulating material being formed by application of cured polyurethane foam to created air space between said foils.

4,928,848

COMBINATION DRINKING VESSEL AND CUP HOLDER WITH CONVERTIBLE CAP/COASTER

John A. Ballway, 93 North Stoughton Street, Bergenfield, N.J. 07621

Filed Mar. 20, 1989, Ser. No. 326,157
Int. Cl.[5] A47G *19/22, 23/02, 23/03;* A41J *41/00*
U.S. Cl. 220—444 22 Claims



22. A drinking vessel providing for both drinking directly therefrom, or use as a cup holder, comprising:

a cylindrically shaped outer container having an open top, and an open bottom;

outwardly projecting first and second band-like flanges about the upper most and lowermost portions of the outside wall of said outer container, respectively;

a first rolled over lip projecting from the topmost portion of the first flange;

a second rolled over lip projecting from the lowermost portion of said second flange;

a truncated conically shaped inner container having downwardly converging side wall terminating at a closed bottom, the outside uppermost circumferential wall portion thereof being rigidly attached to the topmost circumferential inside wall portion of such outer container;

said inner container serving to either contain fluid, or a relatively large drinking cup dimensioned to be received snugly therein, so that the lip of said cup is juxtaposed to said first lip of said outer container;

a handle rigidly attached to the outside wall of said outer container;

a cap including interior juxtaposed uppermost and lowermost juxtaposed circumferential grooves, separated by a circumferential rim therebetween, said lowermost groove serving to snap lock onto said first lip for securing said cap to the top of said outer container, said rim limiting the extent said cap can be pushed downupon the top of said outer container, the combination of said rim, and the area provided by said uppermost groove, protecting a lip or top portion of a cup held within said inner container;

said cap serving as a coaster via said lowermost groove being snap locked over said second lip, for securing said cap to the bottom of said outer container;

said cap including on its top surface a through hole for receiving a straw therethrough into said inner container, and sealing means for effectively sealing said through hole when not in use;

truncated cone-shaped inserts dimensioned to fit snugly within a lower portion of said inner container at a predetermined level relative to a relatively smaller drinking cup, for permitting said smaller drinking cup to be contained within said inner container, with a lip of said drinking cup juxtaposed to said first lip, thereby permitting different size drinking cups to be stored within said inner container in a manner facilitating direct drinking therefrom, said inserts including a plurality of upwardly projecting tabs evenly spaced about the circumference of said inserts for snugly receiving the lower portion of a cup therebetween, with the bottom of said cup resting on a bottom of said insert; and

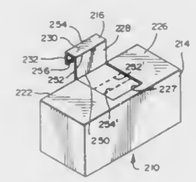
thermal insulating material filling the space within said outer container not occupied by said inner container, for maintaining fluids kept in said inner container at a given temperature for extended periods of time.

4,928,849

SHOE COVER PACKAGE

Bahram Khozai, 4701 Kenmore Ave., #904, Alexandria, Va. 22304

Filed Sep. 20, 1988, Ser. No. 246,717
Int. Cl.[5] B65D *85/18*
U.S. Cl. 221—45 4 Claims



1. A package of disposable shoe covers comprising in combination a dispensing container with hanging means formed as an integral part thereof and extending therefrom and a series of shoe covers enclosed within said container with:

a. said container being made of cardboard thus suitable for discarding after contents of said container have been dispensed and including at least a front wall, a rear wall, a bottom wall, and an upper wall enclosing said shoe covers;

b. said hanging means being formed originally as part of said upper wall and including at least a first generally vertical portion extending upwardly from said rear wall above said upper wall to an intermediate generally horizontal portion, said intermediate portion extending rearwardly from said first portion at the upper extremity of said first portion, and a second generally vertical portion extending downwardly from said intermediate portion at the rearward edge of said intermediate portion, said hanging means also including a first hinge line between said first generally vertical portion and said rear wall, a second hinge line between said intermediate portion and said first generally vertical portion, and a third hinge line between said intermediate portion and said second generally vertical portion, said second generally vertical portion having a coating of adhesive or gum on its surface for adhering contact with a door with no adhesive being on other portions of said hanging means, said intermediate portion extending for a distance of at least the thickness of conventional doors so that said package may be suspended or hung thereby from the upper end of a door and permit the door to open and close without interference between said container and any entrance frame for the door;

c. said container also including an opening adjacent said bottom wall through which said shoe covers may be dispensed; and

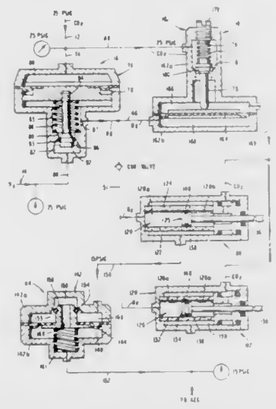
d. said series of shoe covers being made of flexible plastic material or the like and interrelated with each other in such manner that each shoe cover of said series may be dispensed individually and consecutively through said dispensing opening from said container.

4,928,850

GAS BLENDING APPARATUS

Merton R. Fallon, Woodland Hills, Calif., and Thomas W. Clements, Ambler, Pa., assignors to McDantim, Inc., Woodland Hills, Calif.

Continuation-in-part of Ser. No. 201,002, Jun. 1, 1988, Pat. No. 4,874,116. This application May 2, 1989, Ser. No. 346,538
Int. Cl.[5] B67B *7/24*
U.S. Cl. 222—3 7 Claims



1. An apparatus for supplying a gaseous mixture to an external system on demand, comprising:

(a) a source of a first gas under pressure;

(b) a source of a second gas under pressure;

(c) a gas blanding means in communication with the external system and in communication with said sources of said first and second gases for adjustably blending said gases into a gaseous mixture of pre-determined proportions and for supplying said gaseous mixture to the external system on demand, said gas blending means comprising a high flow rate stage and a low flow rate stage;

(d) pneumatic rely means in communication with said high flow rate and low flow rate stages of said gas blending means and said sources of said first and second gases for supplying said second gas to said gas blending means on the demand of the external system, said pneumatic rely means including first valving means operable by said first gas under pressure for controlling the flow of said second gas to said gas blending means upon the demand of the external system;

(e) differential pressure control means in communication with said high flow rate stage of said gas blending means and with said external system for controlling the flow of gases between said high flow rate stage and said external system; and

(f) control means in communication with said sources of said first and second gases for controlling the flow of said first gas to said pneumatic rely means, said control means including second valving means operable by said second gas under a predetermined elevated pressure for controlling the flow of said first gas to said pneumatic rely means.

4,928,851

TUBE CONTENTS EXPULSION SLEEVE

Pauline C. Eatherly, 12528 Kenobi Ct., Cerritos, Calif. 90701

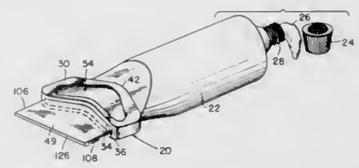
Continuation of Ser. No. 115,817, Nov. 2, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,169
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—103 11 Claims

1. A sleeve for use with a container tube for movement in a direction longitudinal of the tube to assist in removing contents from the tube, the sleeve including:

first and second arrowhead shaped sides, each of said sides having a leading edge having a centrally located nose;

an outer surface with manual grip enhancement means thereon;

the sleeve being deformable by manual pressure on the grip enhancement means to assist in expressing contents from the tube;



an inner surface having at least one upstanding land thereon, said land having a central portion extending at least a substantial portion of the length of the sleeve longitudinal of the tube, the outer portions of the land extending a substantially less distance than the central portion; and

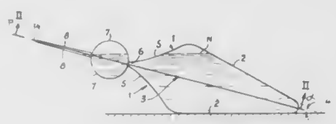
first and second opposite edges connecting said first and second sides together in a closely spaced relationship.

4,928,852

CONTAINER OF FLEXIBLE MATERIAL FOR RECEIVING A LIQUID

Michel Guiffary, 136 Rue Vulfran Warmé , 80000 Amiens, France

Continuation of Ser. No. 574,457, Jan. 27, 1984, abandoned. This application Aug. 21, 1986, Ser. No. 898,879
Claims priority, application France, Jan. 28, 1983, 83 01359
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—107 5 Claims



1. A container of a semi-rigid material for receiving a liquid, manufactured from films, by molding, thermal blowing or thermal forming, comprising:

two semi-shells, each of which includes only one planar bearing side, forming together a dihedron which has an angle less than 90° when the container contains a liquid, and each having an extended portion opposite the apex of said dihedron to define when said shells are fixed together an extended neck having a liquid expelling opening at the outer end thereof, said container resting on only one of said sides when placed on a surface, said liquid expelling opening being located at a level higher than the maximum level of the liquid in said container when full and resting on one of said sides and when resting on the other of said one of said sides, so that liquid cannot accidentally flow out of said container; and

means for fixing said semi-shells with each other along their peripheries in a meridian plane relative to which said semi-shells are symmetrical.

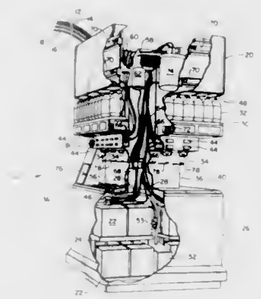
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4,928,853

END AISLE FLUID MIXING AND DISPENSING SYSTEM

William R. Isham, Farmington; E. Brent Cragun, Mountain Green, both of Utah; Christopher Gault, Middletown, Wis., and William J. Wermeling, Wilton, Conn., assignors to Fountain Fresh, Inc., Salt Lake City, Utah

Filed Aug. 19, 1988, Ser. No. 234,174
Int. Cl.[5] B67D *1/16, 5/56, 5/62*
U.S. Cl. 222—108 46 Claims



1. A self-contained apparatus for preparing, mixing, and dispensing liquid mixtures comprising:

a cabinet;

a framework enclosed by said cabinet and having an upper portion, a center portion and a lower portion;

a source of at least one first liquid component of said liquid mixture carried on said framework;

means for supplying to said apparatus at least one second liquid component of said liquid mixture from a source remote from said apparatus;

means carried by said framework for mixing said components of the mixture;

means carried by said framework for dispensing the mixture into a container outside said cabinet;

means disposed within said framework for collecting excess liquid mixture and liquid waste generated during mixing and dispensing; and

means for removing excess liquid mixture and liquid waste from said collecting means, said means for removing extending and moving said liquids from said means for collecting to and through the upper portion of the framework.

4,928,854

SUPERFLOW DIFFUSER AND SPOUT ASSEMBLY

Gerald P. McCann, Los Angeles, and Andrew J. Holoubek, Burbank, both of Calif., assignors to Mc Cann's Engineering and Manufacturing and Co., Los Angeles, Calif.

Filed May 19, 1988, Ser. No. 195,947
Int. Cl.[4] B67D *5/56;* B05B *15/02*
U.S. Cl. 222—129.1 19 Claims

19. A dispensing apparatus including a superflow diffuser and spout assembly, comprising:

a valve body,

a diluent inlet in said valve body,

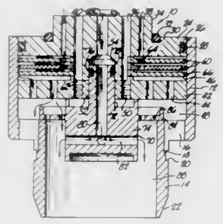
a beverage concentrate inlet in said valve body,

a spout attached to said valve body,

a beverage concentrate distributor in fluid communication with said beverage concentrate inlet, said beverage concentrate distributor adapted to direct beverage concentrate into said spout,

a diffuser, said diffuser in fluid communication with said diluent inlet,

a flow separator, said flow separator in fluid communication with said diluent inlet, said flow separator adapted to direct a first portion of diluent along an outside surface of



said spout, said flow separator adapted to direct a second portion of diluent into said spout.

4,928,855

DISPENSER APPARATUS FOR BEVERAGE BOTTLES

John A. Ramsey, 14831 Easingwold, Houston, Tex. 77015

Filed Aug. 1, 1988, Ser. No. 226,865
Int. Cl.[5] B67D *5/60*
U.S. Cl. 222—131 11 Claims



1 A dispensing apparatus, for large size bottles for carbonated beverages having open tops normally closed by screw top closures, comprising

a supporting base having a top surface with at least one vertical, female-threaded, opening comprising a removable tubular female-threaded insert configured to receive and hermetically seal the open, male-threaded, end of a large size carbonated beverage bottle in an inverted position, and a least one horizontal front opening,

a short vertical passageway in said base extending from said top opening,

a horizontal passageway extending from said front opening to open into said vertical passageway,

a bleed passageway extending horizontally substantially in parallel to said horizontal passageway from said front opening and then vertically through said vertical opening to a point adjacent to the bottom of an inverted carbonated beverage bottle when installed thereon,

valve means supported on said base and connected to said horizontal passageway and said bleed passageway operable to open and close said passageways simultaneously to bleed air into a bottle installed thereon and permit flow of a beverage out of the bottle through said front opening,

a removable cover supported on said base in an inverted position of a size and shape for enclosing a bottle supported on said base,

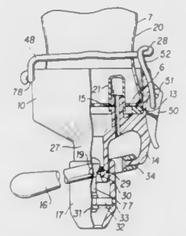
said removable cover being of a hollow construction fitting over said base and having a removable top closure usable as a serving container.

4,928,856

BOTTLED WATER DISPENSING SYSTEM

Jonathan Z. White, 2208 Falcon Hill Pl., Lynchburg, Va. 24503

Continuation-in-part of Ser. No. 25,210, Mar. 11, 1987, abandoned. This application Mar. 3, 1988, Ser. No. 160,353
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—174 12 Claims



1. In combination:

(a) a fluid dispenser comprising an articulable valve member normally biased in the closed position,

(b) closure means to secure and seal said dispenser removably to a container having a bottom, wall, mouth, and neck,

(c) supporting means to suspend said container securely in an inverted position, allowing access to and manipulation of said dispenser,

(d) a vent comprising a vent tube leading from the atmosphere at said dispenser to an interior position near the container bottom,

(e) a flow tube, comprising a tubular opening through said closure means to the interior of said container,

(f) a coaxial valve seat on the inner wall of said flow tube,

(g) a valve member bearing in coaxial sealing contact with said valve seat on the container side of the valve seat, said valve member having diameters in decreasing graduation as it extends outwardly through the valve seat,

(h) a stem of lesser cross-sectional area, in coaxial attachment and adapted to actuate said valve member by moving it from sealing contact inwardly,

(i) a sleeve, surrounding and extending beyond the outer end of said flow tube and having a common axis therewith, with clearance for air passage between sleeve and flow tube,

(j) coupling means interior to said sleeve, to flexibly fasten the outer end of said stem central to the sleeve, allowing resilient angular displacement of stem from the common axis of sleeve and flow tube,

(k) operator means adapted to reciprocally actuate said sleeve, comprising a handle pivotally fixed at one end to said closure means, and further fixed in pivotal contact intermediate the ends, on a diametral axis of said sleeve.

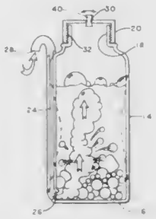
4,928,857

HAND OPERATED SOAP DISPENSER

Frederick K. Ecker, 8402 Shady Glen Dr., Orlando, Fla. 32819

Filed May 15, 1987, Ser. No. 50,043
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—211 8 Claims

1. A hand operated device for dispensing a solution, comprising a dispenser container having generally cylindrically configured sidewalls of resilient material, and a fill opening at the top equipped with a closure cap, the sidewalls of said container being constructed of non-rigid material that can be readily squeezed by a user, said container having a dispensing passage, with the inlet for said dispensing passage being operatively connected near the bottom interior of said container, and the discharge opening from said dispensing passage located adjacent an upper portion of said container and being non-valved, a plurality of non-floating beads residing in a bottom portion of said container, which beads are surrounded by solution, the deformation of said sidewalls at the time of being squeezed inwardly by the user causing said beads to undergo a



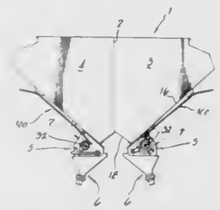
significant amount of motion, and also causing the dispensing of a quantity of the solution from said dispensing passage, such motion of the beads serving to break up and disperse any lumps of material existing in said container.

4,928,858

METERING DEVICE FOR SEED OR FERTILIZER

Raymond C. Tite, Coventry, United Kingdom, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

Continuation of Ser. No. 871,395, Apr. 17, 1986, abandoned. This application Apr. 22, 1988, Ser. No. 184,928
Claims priority, application United Kingdom, Aug. 22, 1984, 8421337
Int. Cl.[5] B65D *88/54*
U.S. Cl. 222—312 23 Claims



2. A metering comprising a housing having a pair of side walls each formed with an open slot, a feed roll and cut-off member mounted on a rotary drive shaft that extends through said slots transversely of said side walls with the feed roll located for axial movement in one of said slots and the cut-off member located for axial movement in the other of said slots, a rotary sealing means located in said one slot to seal around the slot between the side wall and the feed roll so as to allow rotation and axial movement of the feed roll relative to the side wall, and a cut-off flap connected with an external control lever and pivotally mounted within the housing to co-operate with the feed roll and cut-off member so as to control metering, said slots vertically supporting said feed roll, cut-off member and drive shaft but allowing removal of these members in a direction laterally of said drive shaft, and a closure member pivotally connected to the housing and having side wall potions that co-operate with the side walls of the housing to close said slots and encircle the rotary sealing means and cut-off member to hold them radially captive but allow said axial movement of both the feed roll and cut-off member in their respective slots, the control lever being selectively co-operable with stop means on the closure member to hold the control lever in any one of a plurality of angular positions relative to

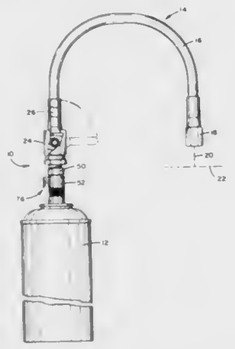
the housing to provide variable control of the metering and to hold the closure member in position closing the slots.

4,928,859

QUICK DISCONNECT FOR AEROSOL SPRAY CAN

Roy J. Krahn, 3870 E. County Line Rd., Birchwood, Minn. 55110, and Brian J. Blenkush, 9921 96th Pl., Maple Grove, Minn. 55369

Filed Oct. 28, 1988, Ser. No. 263,717
Int. Cl.[5] B05B *7/24*
U.S. Cl. 222—402.14 **20 Claims**



1 A quick connect/disconnect assembly for coupling a line to a source of fluid under pressure having a port with a normally closed valve therein, comprising:

an insert having a threaded portion at one end for connection to the line, a cylindrical male portion at the other end, and an axial first fluid passage extending therebetween;

a hollow actuator pin positioned in the first fluid passage and extending axially outward from the male end of said insert for extension through the port of the fluid source and engagement with the valve therein;

an adapter having a cylindrical female portion at one end for receiving said insert, a threaded portion at the other end for connection to the port of the fluid source, and an axial second fluid passage extending therebetween;

seal means within the second fluid passage of said adapter for defining a sealed connection between said insert, said adapter, and the fluid source upon insertion of said insert into said adapter;

slide means mounted on the female end of said adapter for transverse movement into and out of locking engagement with a groove on the male end of said insert; and

means for normally biasing said slide means into locking engagement with the groove on said insert.

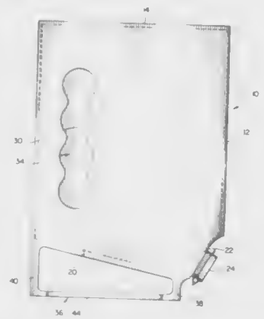
4,928,860

DISPENSING CONTAINER

Jeffrey J. Knight, 426 Fairgrounds Rd., West Kingston, R.I. 02892

Filed Jan. 23, 1989, Ser. No. 300,512
Int. Cl.[5] A47G *19/14*
U.S. Cl. 222—466 **7 Claims**

1. A dispensing container for assuring complete drainage of liquids especially slow flow liquids contained therein, said container having a bottom wall for normally supporting said container in a first non-dispensing upright position, side walls extending upwardly therefrom and a connecting top wall, a dispensing opening and closure disposed in said top wall proximal one side thereof, said top wall evenly sloping downwardly in a generally straight line from said one side proximal to said dispensing opening to the top wall side opposite said one side, and an upper support spaced above said top wall and having an upper generally flat supporting surface generally parallel to said bottom wall such that liquid drains by gravity from said



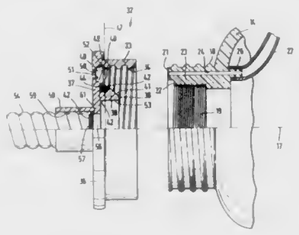
top wall to said opening when said container is supported in an inverted alternate dispensing position by said upper supporting surface.

4,928,861

PLASTIC-CANISTER SCREW CLOSURE

Wolfram Schiemann, Eugen-Nagele-Strasse 17, 7140 Ludwigsburg, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 295,052
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—481.5 **20 Claims**



1. In a screw closure for a plastic canister, the plastic canister having a pouring nozzle that bears an external screw thread and one air venting through hole in a wall of the pouring nozzle, which opens into an end face of the pouring nozzle and leads to inside the canister,

the screw closure comprising

a screw closure shroud with an internal thread complementary to the external screw thread on the plastic canister and coaxial to a geometrical longitudinal axis of the screw closure,

a screw closure bottom substantially perpendicular to the geometrical longitudinal axis,

a coaxial annular wall having an outer wall region, emerging from the bottom and extending a distance shorter than the shroud,

a coaxial sealing ring with an inner region held in defined contact by the outer wall region of the annular wall, and defining a sealing plane for the pouring nozzle, the improvement wherein

(a) the annular wall resists radial forces from deforming the pouring nozzle.

(b) on the far side of the sealing ring relative to the sealing plane, the screw closure bottom has an annular channel that is arranged coaxially, is open away from the screw closure bottom and extends widthwise between the annular wall and the shroud,

(c) at least one through air hole is provided in the screw closure bottom and is positioned within the annular channel,

(d) a liquid outflow hole is provided in the screw closure bottom within the annular wall,

(e) downstream of the liquid outflow hole, a flexible pouring spout is connected in liquid-tight manner to the screw closure,

(f) in a screwed-on position the sealing ring engages with an inner surface of the pouring nozzle, and

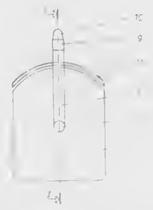
(g) the annular channel is defined between an inner surface of the shroud and the outer wall region of the annular wall and communicates with the air venting through hole.

4,928,862

TILTABLE LADLE AND COVER FOR SUCH LADLE

Douglas S. White, Cap D'Antibes, France, assignor to Elkem a/s, Norway

Filed Jun. 23, 1989, Ser. No. 371,282
Claims priority, application Norway, Aug. 4, 1988, 883455
Int. Cl.[5] B22D *41/04*
U.S. Cl. 222—604 **4 Claims**



1. In a tiltable ladle having a cover and a suspension frame said suspension frame comprising two lifting arms rotatably connected to trunnions affixed to the outside of the wall of the ladle and a horizontal beam above the ladle equipped with a hook, the improvement comprising the top of the ladle and the ladle cover are formed as segments of a cylinder, the focal axis at these cylinder segments being the pivotal axis at the ladle, and that the cover being affixed to the suspension frame.

4,928,863

BICYCLE RACK FOR CARRYING SPORT BOARDS

Robert D. Morgan, 1539 Jay St., Carpinteria, Calif. 93013

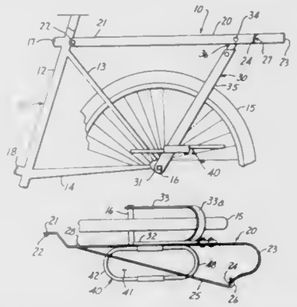
Filed Feb. 6, 1989, Ser. No. 307,106
Int. Cl.[5] B62J *11/00*
U.S. Cl. 224—39 **10 Claims**

1. In combination:

a bicycle frame providing a structural support and also providing a mount for a rear wheel, and;

a bicycle rack comprising a retainer member having a first end pivotally attached to said frame at a first point, a U-shaped bend spaced from said first point and a free end on said bend, and an elastic strap attached to said retainer member at a point between its ends, and to the said free end of said ends being detachably to said retainer member; a strut rotatably pivotally mounted to said frame at a second point, and rotatably mounted to said retainer member at a third point, said strut including adjustment means enabling its length adjustably to be changed; and a pocket member attached to said strut forming an open loop to receive an end of a sport board;

whereby said bicycle rack can be adjusted to said frame to place the retainer member substantially horizontally on said frame by adjusting the length of the strut with said adjustment means, and whereby a sport board can be carried by said rack, by releasing said elastic cord to exert



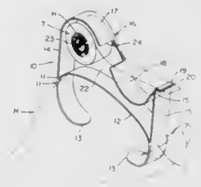
a retentive force on the board pressing it toward the retainer member and into the bend.

4,928,864

HAND CLASP TAPE DISPENSER

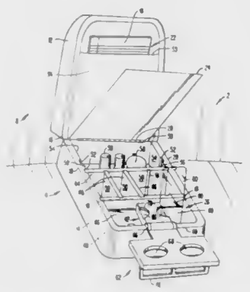
Jerry Walker, and Troy Waddell, both of P.O. Box 1164, Hereford, Tex. 79045

Filed Aug. 22, 1988, Ser. No. 234,637
Int. Cl.[5] B26F *3/02*
U.S. Cl. 224—162 **8 Claims**



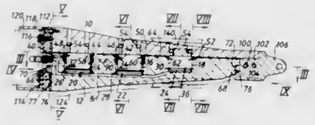
1. A tape dispenser for selectively severing a free end of tape from a tape supply reel and which dispenser is worn along the back, sides and palm of an individual's hand so as to extend between the thumb and forefinger comprising a base member, said base member including an intermediate arcuate portion and spaced opposing outermost portions, said base member being of a size to at least extend along the back and sides of an individual's hand with said intermediate portion being generally continuously engageable with the back of an individual's hand, a housing mounted to said base member and extending outwardly with respect to said intermediate portion thereof, said housing including a pair of spaced end walls, a tape supply reel support means carried by said housing adjacent one of said end walls, and a cutter means spaced from said tape supply reel support means and adjacent the other of said end walls whereby said dispenser may be positioned about an individual's hand so that the housing extends from the back of the individual's hand so that the thumb and fingers are free for normal manipulation.

4,928,865
BILATERAL BEVERAGE CONTAINER HOLDER
Brian S. Lorence, Warren; Richard A. Phelps, Ferndale, and David N. Grabowski, Rochester Hills, all of Mich., assignors to Chivas Products Limited, Sterling Heights, Mich.
Filed Mar. 3, 1989, Ser. No. 318,306
Int. Cl.[5] A47C 7/62
U.S. Cl. 224—275 19 Claims



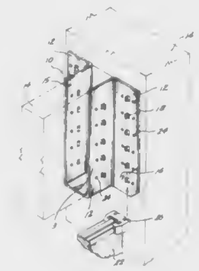
1. A vehicle arm rest for use with a beverage container, comprising:
a lower member defining an interior therein;
an upper member hinged to the lower member for movement between an open position, providing access to the interior, and a closed position, substantially covering the interior; and
a bilateral beverage holder, hingedly attached to the lower member for movement between first and second positions, the first position being vertically aligned with a portion of the interior, the second position being vertically offset from the interior, the bilateral beverage holder including a tray member movable with said bilateral beverage holder between the first and second positions, said tray member defining an opening for receiving a beverage container when the tray member is in either the first or second positions.

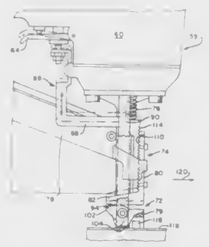
4,928,866
PIPE BURSTER
Alec R. Carruthers, Bratton, England, assignor to British Gas plc, London, England
Filed Jan. 11, 1989, Ser. No. 299,544
Claims priority, application United Kingdom, Jan. 12, 1988, 8800597
Int. Cl.[5] F16L 55/18
U.S. Cl. 225—106 6 Claims



1. A pipe burster comprising an elongated body in two parts extending in the lengthwise direction of the body, the two parts being mutually guided by guide surfaces so as to be capable of relative rectilinear separating and approach movements transversely to said direction, hydraulic piston-and-cylinder means spaced apart along the body being operable in unison to effect at least said separating movement.

4,928,867
SYSTEM FOR POSITIONING FASTENERS
Mark B. Jensen, 1656 N. Sunview, Mesa, Ariz. 85205
Continuation-in-part of Ser. No. 135,605, Dec. 21, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 376,207
Int. Cl.[5] B25C 1/00, 7/00
U.S. Cl. 227—7 35 Claims





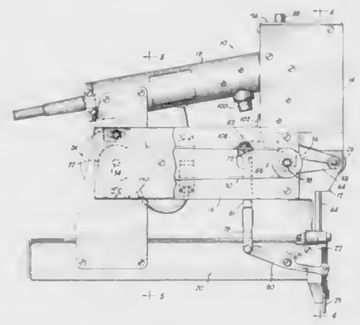
1. A tool for driving fasteners through a predetermined position on a connector, the connector having one or more tab members projecting above a top surface on the connector, the tool comprising:
means for ejecting a fastener from the tool; and
means for triggering said ejecting means, said triggering means including a follower means that cooperates with the one or more tab members on the connector to activate said ejecting means to eject a fastener from the tool and through the predetermined position on the connector.

4. A connector for positioning fasteners that are driven by a powered fastener tool, the tool being activated by a trigger mechanism to eject a fastener therefrom, the connector comprising:
at least one wall, said at least one wall having a top surface on which the powered fastener tool is placed and a back surface on which structural members bear against; and
means on said top surface for aligning the powered fastener tool with a predetermined position on said at least one wall when the powered fastener tool is brought into engagement with said aligning means.

4,928,868
FASTENER DRIVING TOOL
James E. Kerrigan, Des Plaines, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.
Filed Mar. 17, 1983, Ser. No. 476,321
Int. Cl.[5] B25L 1/00
U.S. Cl. 227—131 35 Claims

1. A tool for driving impact driven fasteners into a workpiece comprising:
a housing;

a ram having a metal surface disposed within said housing and mounted for reciprocation between an upper and a lower position within said housing;
a motor mounted to said housing;
a flywheel having a metal peripheral surface which is adapted to directly contact said metal surface of said ram, mounted to said housing and rotated by said motor for developing a predetermined amount of energy in said flywheel sufficient to drive a fastener into the workpiece; and



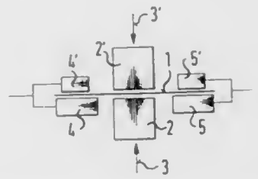
means for effecting metal to metal contact between the metal surface of said ram and the metal peripheral surface of said already rotating flywheel thereby to drive said ram into engagement with a fastener wherein energy stored in said flywheel is transferred to said ram to drive said fastener into said workpiece and wherein the metal surface of the ram and the metal peripheral surface of the flywheel are fabricated from steel.

4,928,869
SOLDER LEVELLER
Peter P. A. Lymn, Lime Kiln Cottage, Buriton, Petersfield, Hampshire, United Kingdom (GU31 5SJ)
PCT No. PCT/GB87/00367, § 371 Date Nov. 25, 1988, § 102(e) Date Nov. 25, 1988, PCT Pub. No. WO87/07196, PCT Pub. Date Dec. 3, 1987
PCT Filed May 27, 1987, Ser. No. 282,313
Claims priority, application United Kingdom, May 29, 1986, 8613105
Int. Cl.[5] B23K 3/06, 1/08
U.S. Cl. 228—20 25 Claims



1. A solder leveller having a bath for containing molten solder with a free surface, said solder leveller including:
curved-path defining rollers arranged across said bath to define a curved portion of a board path through said solder leveller;
at least two of said curved-path defining rollers comprising a pair of superimposed, biased together, board-gripping rollers having a nip therebetween beneath said free surface of said molten solder at which the board (B) is gripped for drive;
means for rotational drive of at least one of said pair of board-gripping rollers;
means for levelling solder deposited on a board (B) as it leaves said bath; and
means for providing a layer of solder-oxidation-inhibiting oil over said molten solder in said bath, said means including a sump from which said oil is pumped onto said molten solder and a weir over which said oil flows back to said sump to regulate depth of said oil over said molten solder, said nip of said pair of said board-gripping rollers being below the level of said weir;
said board path having:
an upstream portion above the free surface of the molten solder leading to,
the curved, board-heating and tinning portion below the surface of the solder, including said nips of the or each said pair of board-gripping rollers at which the board is gripped and leading to,
a downstream portion above the free surface of the solder leading to said levelling means.

4,928,870
PROCESS FOR JOINING CERAMIC PARTS WITH A REACTIVE CONDUCTING MATERIAL
Martin Gat-Liquornik, and Aristides Naoumidis, both of Julich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany
Filed Jun. 6, 1989, Ser. No. 362,274
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 3820459
Int. Cl.[5] B23K 11/00, 11/16
U.S. Cl. 228—107 11 Claims



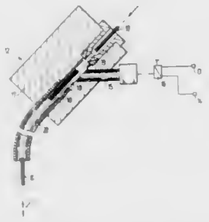
1. A thermal bonding process for joining ceramic parts which does not require an inert surrounding atmosphere, comprising the steps of:
cleaning and polishing respective surfaces at which two ceramic parts are to be joined;
fitting together said parts at said surfaces with insertion of between said surfaces a conducting material in a form selected from the group consisting of foils, wire arrays, webs and mats in each case of a thickness not exceeding 50 μm, said conducting material being selected from the group consisting of graphite and metallic materials;
connecting said conducting material, by portions thereof accessible in the vicinity of boundaries of said fitted-together surfaces, into an electric circuit for passage of electric current through said conducting material interposed between said surfaces, and
subjecting said conducting material to electric and thermal shock by passing therethrough an intense pulse of electric current of less than 100 microseconds duration, of such intensity that said conducting material interposed between said surfaces, as well as said surfaces are heated to reactive bonding temperature for said surfaces and of such brevity that said ceramic parts do not absorb enough energy through said surfaces to lower the bonding temperature and reaction of said conducting material with a surrounding atmosphere is likewise inhibited

4,928,871

APPARATUS AND METHOD OF CONTROLLED FEED OF A BONDING WIRE TO THE "WEDGE" OF A BONDING HEAD

Farhad Farassat, Munich, Fed. Rep. of Germany, assignor to Embart Deutschland GmbH, Oberbaching, Fed. Rep. of Germany

Filed Feb. 22, 1989, Ser. No. 314,191
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1988, 3805584; Jul. 26, 1988, 3825373
Int. Cl.[5] H05K *13/06*
U.S. Cl. 228—179 14 Claims



1. Apparatus for the controlled feed of a bonding wire, specifically a golden bonding wire, to the wedge or the capillary tube of a bonding head which may be traversed up and down, comprising a abonding wire guide duct which is disposed ahead of said wedge or said bonding capillary tube, a fluid pipe opening into said capillary tube, a vacuum source capable of being placed in fluid communication with said fluid pipe, an air blast source capable of being placed in fluid communication with said fluid pipe, and means for controlling whether said vacuum source or said air blast source is in fluid communication with said fluid pipe.

13. Method for controlled feed of a bonding wire, specifically a golden bonding wire, to the wedge or the capillary tube of a bonding head which may be traversed up and down comprising the following steps of operation:

(a) lowering said bonding head from an initial or starting position, while carrying along said bonding wire by means of a clamping means disposed at said bonding head and movable along with said bonding head, while the bonding wire is transported against the effects of a coaxial fluid stream and/or slip clamp which maintains a slight traction of the bonding wire, while a "ball" is formed at the free end of said bonding wire either previously or simultaneously;

(b) performing a "touch-down" operation with ultrasonic excitation of said capillary tube as well as opening of said bonding head clamp shortly before "touch-down", and formation of a first bond pad;

(c) raising the bonding head up to a defined loop height, preferably while opening said slip claim, and, whatever required, with closure or change-over of said coaxial fluid flow;

(d) positioning of said second bond pad in opposition to said capillary tube lowering said bonding head while carrying along said bonding wire against the effect of the possibly reactivated coaxial fluid flow as well as of the slip clamp which is possibly closed again, up to the second "touch-down", and formation of a second bond pad under ultrasonic effect;

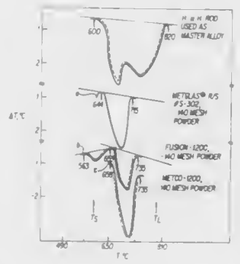
(e) and raising the bonding head up to a so-called "tail-length" level, with said bonding head clamp being open, preferably even with the said slip clamp being open, however with a preferably continuously effective coaxial flow, whereupon said bonding head clamp is closed again while the upward movement of said bonding head is continued until the latter's initial position will be reached, while said bonding wire is torn off.

4,928,872

METHOD OF BRAZING EMPLOYING BAG-GROUP HOMOGENEOUS MICROCRYSTALLINE BRAZING POWDERS

Anatol Rabinkin, Morris Plains, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 97,016, Sep. 14, 1987, Pat. No. 4,842,955.
This application Mar. 6, 1989, Ser. No. 319,376
Int. Cl.[5] B23K *35/14, 35/28*
U.S. Cl. 228—203 1 Claim



1. A process for joining together two or more metal parts, the process comprising the steps of:

a. interposing between the parts to be joined a brazing paste comprising metal powder having a homogeneous, microcrystalline structure, a composition consisting essentially of about 15 to 40 weight percent copper, 0 to 32 weight percent zinc, 0 to 24 weight percent cadmium, 0 to 3 weight percent nickel, 0 to 10 weight percent tin, and the balance being silver and incidental impurities, and a phase structure such that the largest dimension of any precipitated phase ranges from about 0.01 to 0.1 micrometer;

b. heating to cause substantially complete melting of the metal powder; and

c. cooling the melted powder to produce a brazed joint between the parts.

4,928,873

FOLDABLE CUP HOLDER

Wayne A. Johnson, P.O. Box 3400, Corpus Christi, Tex. 78463

Filed Jul. 31, 1989, Ser. No. 388,344
Int. Cl.[5] B65D *6/18*
U.S. Cl. 229—1.5 H 7 Claims



1. A foldable cup holder comprising

a body comprising a plurality of rigid sections in a closed generally circular path and having adjacent sides, means pivotally connecting all but two of the adjacent sides leaving a pair of pivotally movable sections providing free section ends;

separable closing means carried by the two adjacent sides for releasably securing the free section end together;

means on the sections providing a support for a cup positionable in the closed path;

means on the sections for supporting the sections on an underlying surface; and

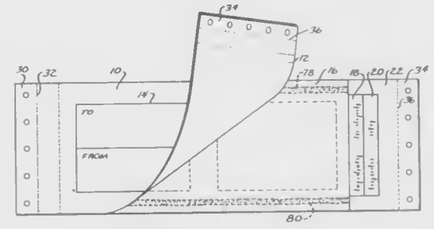
a handle connected to one of the rigid sections.

4,928,874

MAILER-LIKE BUSINESS FORM WITH TRANSPARENT FRONT

Paul T. Henry, Palatine; Roger L. Haase, Arlington Heights, and Gary W. Fitzgibbons, Barrington, all of Ill., assignors to Uarco Incorporated, Barrington, Ill.

Filed Nov. 8, 1989, Ser. No. 433,669
Int. Cl.[5] B65D *27/00, 27/30*
U.S. Cl. 229—74 12 Claims



1. A business form comprising:

a sheet of face stock having pressure sensitive adhesive on one side thereof;

a release liner removably adhered to said pressure sensitive adhesive;

a transparent sheet adhered along two spaced marginal edges to said face stock sheet on the side thereof opposite said one side with at least one marginal edge terminating short of the corresponding marginal edge of the face stock sheet and being free from adhesion thereto; and

at least one imaging data sheet between said transparent sheet and said face stock sheet and having marginal edges inward of said two marginal edges so as to be free from adhesion to said transparent sheet and said face stock sheet thereat and having a third marginal edge extending past said one marginal edge to be grippable thereat and removed from said form.

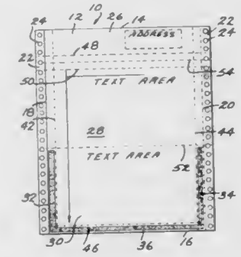
4,928,875

ECCENTRIC "Z" FOLD MAILER WITH NESTING CAPABILITIES

Wilbur P. Hutchinson, 318 N. School St., Mt. Prospect, Ill. 60056

Continuation of Ser. No. 81,792, Aug. 5, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,258
Int. Cl.[5] B65D *27/00*
U.S. Cl. 229—92.1 9 Claims

1. A mailer comprising a sheet having front and rear surfaces and having top, bottom and side edges, the top and bottom edges parallel to one another and the side edges parallel to one another, first and second fold lines located between and parallel to the top and bottom edges, an address area between the top edge and the first fold line, a text area between the first fold line and the bottom edge, the distance between the top edge and the first fold line being substantially less than the distance between the first and second fold lines, a first strip of adhesive on the front surface adjacent one side edge between the bottom edge and the second fold line, a second strip of adhesive on the front surface adjacent the other side edge between the bottom edge and the second fold line, a third strip of adhesive on the front surface of the sheet adjacent the bottom edge, respective strips of adhesive on the rear surface adjacent to each side edge between the top edge and the first fold line, the arrangement



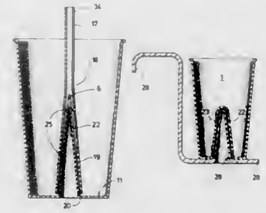
being such that the sheet may be Z-folded to place the text area on the inside and the address area on the outside of the mailer, and when activated the strips of adhesive will seal the mailer along the edges.

4,928,876

BIFRUSTOCONICAL BEVERAGE CONTAINER, LID, MULTI-SECITONAL STRAW, AND FASTENING DEVICES

Allen S. Marshall, Columbia, S.C., assignor to Brockington and Marshall, Columbia, S.C.

Filed May 11, 1989, Ser. No. 350,226
Int. Cl.[5] B65D *5/44*
U.S. Cl. 229—103.1 14 Claims



1. A beverage container having substantially a frustoconical hollow core external body member, wherein the core of the external body member shall be referred to as the inside, where said external body member terminates in a rim at an upper extremity and a base at the other extremity, wherein said base is contiguous with an internal body member, said internal body member forming a bottom of the beverage container, wherein said internal body member is also a functional component and a fastening means of a unique multi-sectional straw, and a component of a fastening means for temporarily attaching the beverage container to a surface, the improvement in combination therewith comprising:

a. an internal body member that is substantially a second, smaller inverted, conical hollow core frustum terminating in an apical closure at the upper extremity and open ended and fitted with a joining flange at the other extremity, where the flange integrally joins the internal body member to the base of the external body member forming, substantially, a bifrustoconical container, where the frustum of the internal body member emanates centrally, coaxially and upwardly from the inside of the base, wherein the inverted hollow core frustum results inn a beverage container having a bottom with two functional

fastening means, one fastening means for securing the container to a fastening device having a vertical fastening element, wherein fastening is affected by interpositioning the vertical fastening element within the core of the internal body member, and a second fastening means for holding upright a unique multi-sectional straw;

b. a multi-sectional straw, which rests and is superimposed on the frustum of the internal body member, wherein said multi-sectional straw is comprised of an upper substantially linear tubular section, a lower hollow core frustoconical section, and an intermediate expander section which integrally joins the tubular section to the frustoconical section, where the multi-sectional straw has an overall length that is sufficient to extend from the base of the beverage container to above the rim, where the frustoconical section of the straw is sized such that when superimposed on the frustum of the internal body member, the superimposed straw and the internal body member form a thin annular chamber between an inside surface of the core of the straw and an outside surface of the frustum of the internal body member, wherein said annular chamber enables a fluid to be conveyed, under the force of slight suction, from the inside at the base of the container upward through and out of the tubular section of the straw;

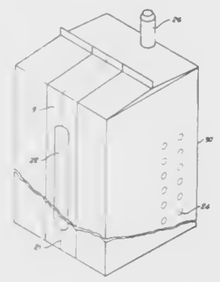
c. a closing lid which fastens to the rim of the beverage container, where said lid has a closed straw passage and an opening means, and where the passage is of sufficient size to allow an inserted straw to pass through when the passage is open.

4,928,877

METHOD OF MAKING A LAMINATED TUBULAR BODY

Dusan S. Lajovic, Smithfield, Australia, assignor to Impact International Pty, Ltd., Smithfield, Australia

Filed Oct. 14, 1988, Ser. No. 257,534
Claims priority, application Australia, Oct. 15, 1987, PI4901; Feb. 3, 1988, PI6552; Sep. 2, 1988, 21802/88
Int. Cl.[5] B65D *5/40, 5/74*
U.S. Cl. 229—125.42 21 Claims



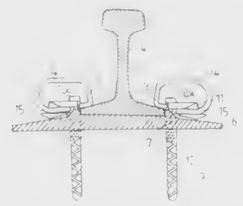
1. A laminated tubular body comprising an outer layer having an inner surface and an outer surface and a substantially continuous inner layer in intimate contact with said outer layer to define a lining substantially covering said inner surface, said outer layer having at least one aperture through which said inner layer extends to form a sealed protuberance projecting outwardly beyond the outer surface of the outer layer.

4,928,878

FASTENING RAILS TO WOODEN SLEEPERS

Hartley F. Young, Victoria, Australia, assignor to Ralph McKay Limited, Maidstone, Australia

Continuation of Ser. No. 822,883, Jan. 27, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 163,192
Claims priority, application Australia, Feb. 1, 1985, PG9104
Int. Cl.[5] E01B *9/28*
U.S. Cl. 238—351 20 Claims



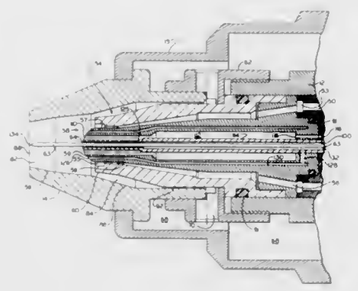
1. A support for an elastic rail clamp to be inserted into a wooden rail tie, said support including a receiving portion adapted to be above the surface of the wooden rail tie and to receive a portion of the elastic rail clamp, and a securing portion extending into the rail tie, said securing portion comprising a vertical leg portion having a longitudinal axis disposed in a plane substantially parallel to a plane established by the vertical center line of the rail, said vertical leg portion comprising a body having an outer surface, a lower end remote from said receiving portion and a side adapted to face the rail, said vertical leg portion having recesses relieved relative to said outer surface and located over at least a portion of said outer surface to accommodate an adhesive which promotes adhesion between the wooden rail tie and said securing portion, each of said recesses having an inner surface disposed in a plane substantially parallel to the plane of said outer surface, and said vertical leg portion including a series of raised ribs defined relative to said outer surface and located on the side of the lower remote end of said vertical leg portion adapted to face the rail which ribs are forced into said wooden tie when said rail clamp imparts a component force tending to move said receiving portion of said support away from the rail.

4,928,879

WIRE AND POWER THERMAL SPRAY GUN

Anthony J. Rotolico, Hauppauge, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 22, 1988, Ser. No. 289,067
Int. Cl.[5] B05B *7/20*
U.S. Cl. 239—8 27 Claims



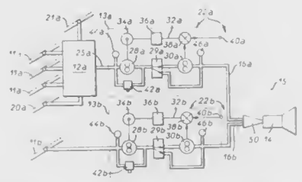
19. A method of producing a dense and tenacious coating with a thermal spray gun including a nozzle member with a nozzle face and a gas cap extending from the nozzle member, the gas cap having an inwardly facing cylindrical wall defining a combustion chamber with an open end and an opposite end bounded by the nozzle face, the method comprising injecting an annular flow of a combustible mixture of a combustion gas and oxygen from the nozzle coaxially into the combustion chamber at a pressure of at least two atmospheres above ambient atmospheric pressure, injecting an annular outer flow of pressurized non-combustible gas adjacent to the cylindrical wall, combusting the combustible mixture, feeding heat fusible thermal spray wire axially from the nozzle into the combustion chamber to a point where a wire tip is formed where material is melted and disintegrated such that a supersonic spray stream containing the heat fusible material in finely divided form is propelled from the wire tip, feeding powder in a carrier gas coaxially from the nozzle into the combustion chamber, between the wire and the combustible mixture, and directing the spray stream toward a substrate such as to produce a coating thereon.

4,928,880

PUMPED COATING PRODUCT SPRAYING INSTALLATION

Eric Prus, Grenoble; André Frene, Vourey; Pascal Bordaz, Domene; Patrick Guerange, Tullins, and Caryl Thome, Saint Egreve, all of France, assignors to Sames S.A., Meylan, France

Filed May 9, 1988, Ser. No. 191,955
Claims priority, application France, May 19, 1987, 87 06969; Jun. 5, 1987, 87 07939
Int. Cl.[5] B05B *12/04, 12/14*
U.S. Cl. 239—8 14 Claims



1. Installation for spraying a coating product in liquid form, comprising at least one circuit including a pump, at least one sprayer, a flexible conduit connecting an outlet of said pump to said at least one sprayer, and servo-control means for controlling the flow rate of liquid in said conduit to a set-point by controlling said pump; and rinsing product feed means and switching means capable of controlling said rinsing product feed means to introduce rinsing product into said at least one circuit prior to completion of a coating product spray sequence to thereby cause the rinsing product to propel the coating product towards said at least one sprayer.

4,928,881

AIR FRESHENER

John J. Barlics, North Edison, and Glen D. Barlics, South Plainfield, both of N.J., assignors to Inman Mold Manufacturing Co., Inc., Rahway, N.J.

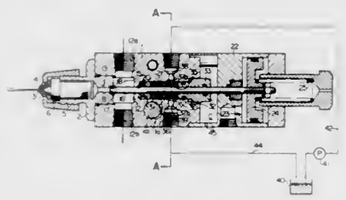
Filed Apr. 1, 1988, Ser. No. 176,792
Int. Cl.[5] A61L *9/08*
U.S. Cl. 239—44 15 Claims

1. An air freshener, comprising a base having an open end, an closed end, and receiving means located between said open end and said closed end for receiving a scent-producing liquid; conveying means for conveying the scent-producing liquid from said receiving means to a liquid-diffusing site located in said open end of said base such that the scent-producing liquid can be evaporatively diffused into the atmosphere surrounding said liquid-diffusing site, said conveying means including a wick-like member made from numerous strands of material capable of conveying the scent-producing liquid along said wick-like member from a first end located in said receiving means to a second end located at said liquid-diffusing site by capillary action, each of said strands extending continuously from said receiving means to said liquid-diffusing site such that the scent-producing liquid can be diffused into the surrounding atmosphere directly from said second end of said wick-like member at a relatively constant and uniform rate, said second end of said wick-like member being flared so as to promote the diffusion of the scent-producing liquid and matted so as to maintain the conveyance of the scent-producing liquid by capillary action; a wick holder attached to said base, said wick holder including first holding means for holding said first end of said wick-like member such that said strands of said first end are tightly bundled so as to promote the conveyance of the scent-producing liquid along said wick-like member by capillary action and second holding means for holding said second end of said wick-like member such that said strands of said second end substantially fill said open end of said base,



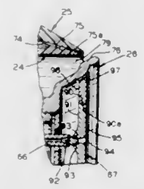
whereby the diffusion of the scent-producing liquid is enhanced as a result of the increased surface area of said second end of said wick-like member, said second holding means including a pan positioned in said open end of said base, said pan having a sidewall and a bottom which cooperate to define an interior chamber sized and shaped so as to receive said second end of said wick-like member, and said first holding means including a stem extending from said bottom of said pan to said receiving means of said base, said stem having a solid outer wall defining a conduit through which said strands of said wick-like member extend from said interior chamber of said pan to said receiving means of said base; supporting means for supporting said wick holder in abutting relationship with said base, whereby an internal joint is formed between said base and said wick holder; and sealing means for sealing said joint in a liquid-tight manner, whereby the inadvertent leakage of the scent-producing liquid from said receiving means is inhibited, said sealing means including a spring-like member having an elasticity selected such that said spring-like member is constantly and automatically urged into intimate contact with said base.

4,928,882
COATING GUN
Hikaru Awano, Owariasahi; Seiichi Asai, Seto; Katsuo Kaneko, Kashiwa; Hiroshi Kaida, Nagareyama, and Fujio Yoshida, Hiroshima, all of Japan, assignors to Cashew Company, Ltd., Saitama, Japan
Filed Mar. 20, 1989, Ser. No. 326,034
Claims priority, application Japan, Mar. 29, 1988, 63-75107
Int. Cl.[5] B05B *15/02*
U.S. Cl. 239—112 1 Claim



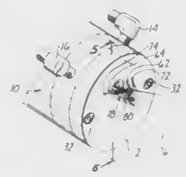
1. The coating gun for discharging a coating material, comprising:
a gun body having a forward end with a discharge nozzle thereon;
a coating material feed path extending through said gun body to said discharge nozzle and having an on-off valve means therein;
a guide hole extending from said feed path to the rear end of said gun body;
a valve rod slidably mounted in said guide hole and closely fitted therein and extending from said valve means to the rear end of said gun body and having a driving mechanism connected thereto at the rear end of said gun body for moving said valve rod for opening and closing said valve means;
said guide hole having a portion along the length thereof with an increased diameter for forming a cleaning chamber around the outer periphery of said valve rod; and
said gun body having a solvent feed port opening into said cleaning chamber and a solvent discharge port opening out of said cleaning chamber for leading solvent out of said gun body other than through said guide hole.

4,928,883
AIR TURBINE DRIVEN ROTARY ATOMIZER
Richard Weinstein, Toledo, Ohio, assignor to The DeVilbiss Company, Toledo, Ohio
Division of Ser. No. 879,082, Jun. 26, 1986, Pat. No. 4,887,768. This application Jun. 21, 1989, Ser. No. 369,306
Int. Cl.[5] B05B *5/04*
U.S. Cl. 239—223 6 Claims



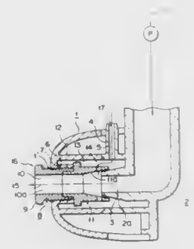
1. A rotary atomizer for coating with a coating fluid comprising, in combination, a housing, a rotary fluid atomizing device rotatably supported at one end of said housing, said device having a front surface facing away from said housing and a rear surface facing toward said housing and an annular edge from which such coating fluid is discharged by centrifugal force for atomization, said housing including an annular portion at said one end surrounding at least a portion of said atomizing device, said annular portion and said rear surface of said device forming a chamber therebetween which opens behind said annular edge, an air driven turbine located in said housing and connected for rotating said atomizer device, said turbine generating pressurized exhaust air during operation, said chamber having an annular opening formed between said annular edge of said atomizing device and said housing and vented to atmosphere, means for delivering said turbine exhaust air to said chamber for maintaining said chamber above atmospheric pressure during operation of said rotary atomizer to prevent atomized coating fluid from entering said chamber, said annular opening directing turbine exhaust air at atomized fluid discharged from said annular edge, wherein said housing includes an air cap surrounding at least a portion of said rear surface of said atomizing device, said air cap including an annular opening surrounding said annular chamber opening located for directing pattern shaping air at atomized fluid discharged from said annular edge of said device, and means for delivering pressurized air to said annular air cap opening.

4,928,884
FLUID ASSIST AIRLESS SPRAY NOZZLE
Gary L. Smith, 2896 Tabago, Costa Mesa, Calif. 92626
Continuation-in-part of Ser. No. 936,364, Dec. 1, 1986, Pat. No. 4,749,128. This application Jun. 1, 1988, Ser. No. 200,798
Int. Cl.[5] B05B *7/08*
U.S. Cl. 239—290 22 Claims



1. A nozzle system for a plural component spray gun which comprises:
a nozzle plate;
an airless discharge orifice located in said nozzle plate;
first and second fluid discharge orifices located in said nozzle plate in association with said airless discharge orifice, said first fluid discharge orifice located on one side of said airless discharge orifice and said second fluid discharge orifice located on the opposite side of said airless discharge orifice;
first and second gas discharge orifices located in said nozzle plate in association with both said airless discharge orifice and said first and second fluid discharge orifices, said first gas discharge orifice located adjacent to and outboard of said first fluid discharge orifice positioning said first fluid discharge orifice between said first gas discharge orifice and said airless discharge orifice, said second gas discharge orifice located adjacent to and outboard of said second fluid discharge orifice positioning said second fluid discharge orifice between said second gas discharge orifice and said airless discharge orifice;
means for supplying a component of a plural component system to said airless discharge orifice;
means for supplying a second component of said plural component system to said first and second fluid discharge orifices; and
means for supplying a gas to said gas discharge orifice.

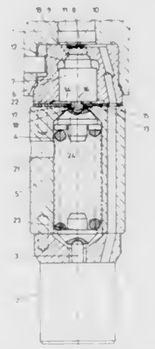
4,928,885
NOZZLE DEVICE
Haruki Nakao, Tokyo, Japan, assignor to Nikki Co., Ltd., Tokyo, Japan
Filed Mar. 31, 1989, Ser. No. 331,300
Claims priority, application Japan, Apr. 7, 1988, 63-46942
Int. Cl.[5] A61H *33/02*
U.S. Cl. 239—417 4 Claims



1. A nozzle device comprising:
a nozzle body provided with a nozzle opening at a front end portion thereof for jetting hot water supplied from a hot water supply source;
a nozzle casing fixed to the nozzle body so as to circumferentially enclose said front end portion, said nozzle casing having a hole arranged coaxially with said nozzle opening; a fixed sleeve projecting inwardly from said hole toward said front end portion and having a female thread; a partition wall for partitioning the fixed sleeve and the front end portion of the nozzle body; an annular chamber enclosed by said partition wall, said fixed sleeve, and said front end portion; and an air introducing sleeve for allowing the chamber to communicate with the atmosphere;
an operation sleeve having a first end protruding from said nozzle casing, a second end received in said nozzle casing; an outer surface of said operation sleeve provided with a male thread to be engaged with said female thread of said fixed sleeve, said operation sleeve being axially movable within the fixed sleeve; and
a slide sleeve having a first end connected to said second end of said operation sleeve for axial movement therewith, and a second end, at least a portion of which overlaps said front end portion of said nozzle body, said slide sleeve also formed with a radial hole communicating with said annular chamber and located adjacent to said front end portion of the nozzle body, an open area of said radial hole being controlled by said front end portion of said nozzle body when said slide sleeve is moved in an axial direction by said operation sleeve.

4,928,886
FUEL INJECTION NOZZLE
Maximilian H. Kronberger, Steyr, Austria, assignor to Voest-Alpine Automotive Gesellschaft M.B.H., Linz, Austria
Continuation of Ser. No. 151,301, Feb. 1, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 415,470
Claims priority, application Austria, Feb. 4, 1987, 228/87
Int. Cl.[5] F02M *61/16*
U.S. Cl. 239—533.5 8 Claims

1. A fuel injection pump nozzle, comprising:
longitudinally elongated housing means having an axial bore including at an upstream end an inlet for exposure, in use, to fuel under pressure, and at a downstream end an outlet for delivering fuel to a combustion chamber of an engine;
means defining a needle valve seat in said bore of said housing means;
a valve needle longitudinally slidably received in said bore for opening and closing said outlet by sliding out of and into seating relation with said needle valve seat;
a spring means received in said axial bore and urging said valve needle axially downstream towards said seating relation with said needle valve seat;
surface means on said valve needle subject to fuel pressure in said bore for longitudinally temporarily moving said valve needle for opening said bore to dispense fuel through said outlet;
means defining a yield piston seat in said bore of said housing means upstream from said needle valve seat;
a yield piston longitudinally slidably received in said bore between said valve needle and said yield piston seat for opening and closing said bore between said inlet and said needle valve seat;
a fuel bore having an inlet end communicated with said axial bore upstream of said yield piston seat and an outlet end communicated with said axial bore at said needle valve seat, whereby pressurized fuel can flow from upstream of said yield piston seat to said outlet of said axial bore of said housing means, through said fuel bore, only when said valve needle is slid out of seating relation with said needle valve seat;
surface means on said valve needle subject to fuel pressure in said fuel bore for longitudinally temporarily moving said valve needle for opening communication of said fuel bore



to said axial bore at said needle valve seat to dispense fuel through said outlet;
said yield piston including a longitudinally extending outer peripheral sidewall portion extending downstream from an annular sealing surface thereof, said sealing surface being arranged to contact said yield piston seat for closing said axial bore; said yield piston further including a piston surface axially opposed to said annular sealing surface and located downstream of said annular sealing surface; said yield piston further including an end surface facing axially towards upstream and exposed to said axial bore upstream of said yield piston seat, whereby fuel inlet pressure is communicated to said yield piston through said inlet of said axial bore;
said spring means received in said axial bore also urging said yield piston axially upstream towards said yield piston seat;
means defining a fuel drain outlet from said axial bore of said housing means between said yield piston seat and said valve needle seat;
means defining a storage space in said axial bore surrounding said yield piston and being located between said peripheral sidewall portion and said annular sealing surface of said yield piston when said yield piston is disposed in closing relation to said axial bore;
throttle plate means disposed effectively between said yield piston and said fuel drain outlet, said throttle plate means

having an opening therethrough which is more restricted in volumetric throughput capacity per unit time than is said fuel drain outlet, whereby said axial bore, between said yield piston and said throttle plate means defines an attenuation space containing said piston surface, which attenuation space, when filled with fuel modulates how rapidly said yield piston can move longitudinally in said bore in relation to said yield piston seat, whereby yielding movement of the yielding piston is reduced during engine idling; and

means defining a pathway for admitting pressurized fuel to said axial bore downstream of said yield piston seat, for filling said attenuation space;

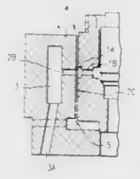
said pathway comprising a fuel leakage pathway defined between said peripheral sidewall portion of said yield piston and said axial bore, whereby fuel admitted to said storage space when said yield piston is disposed in open relation to said axial bore may leak around said yield piston in said axial bore to downstream of said yield piston for filling said attenuation space.

4,928,887

CYLINDRICAL GUIDE DEVICE WITH OPERATING PLAY COMPENSATION FOR FUEL INJECTION SYSTEM

Marc Miettaux, Decines, France, assignor to Renault Vehicules Industriels, Lyon, France

Filed Dec. 2, 1988, Ser. No. 279,062
Claims priority, application France, Dec. 4, 1987, 87-16859
Int. Cl.[5] F08M *59/44, 61/16*
U.S. Cl. 239—584 **9 Claims**



1. A pressurized fluid transfer system comprising:

a nozzle having a cylindrical bore;

a needle valve slidably positioned in said bore with sufficient play for said needle valve to freely slide in said bore; and

means for transferring a pressurized fluid to said needle valve, comprising:

(a) an annular volume in said nozzle, a side of said volume facing said bore having a surface area whose value comprises a major portion of the value of the surface area of said bore,

(b) means for communicating said volume with a source of the pressurized fluid, and

(c) passage means traversing said play for communicating said volume with said needle valve whereby said pressurized fluid can fill said play;

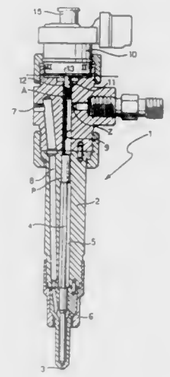
wherein a length of said volume along the axis of said bore is selected to be sufficient that a pressure of pressurized fluid therein substantially cancels any increase in said play due to distortions of said nozzle resulting from said pressurized fluid in said play.

4,928,888

FAST SOLENOID VALVE, PARTICULARLY A FUEL INJECTION PILOT VALVE FOR DIESEL ENGINES

Mario Ricco, Bari, Italy, assignor to Weber S.r.l., Turin, Italy

Filed Aug. 25, 1988, Ser. No. 236,535
Claims priority, application Italy, Aug. 25, 1987, 53614/87[U]
Int. Cl.[5] F02M *41/16*
U.S. Cl. 239—533.8 **3 Claims**



1. An electromagnetically-controlled fuel injection valve for diesel engines, including:

a hollow body housing an injection chamber and a control chamber both supplied with fuel under pressure,

an injection nozzle provided at one end of said hollow body and communicating with said injection chamber,

a needle operatively associated with said nozzle to control communication between said injection chamber and said nozzle,

piston means secured to said needle and cooperating with said control chamber to keep said needle in a position closing said communication by the sole action of said fuel under pressure,

and an electromagnetic metering valve mounted at the other end of said hollow body, said metering valve comprising:

a discharge port communicating with said control chamber, the opening of which causes a drop in the pressure of said control chamber to cause said piston to move said needle to a position opening said communication,

an obturator normally closing said discharge port,

a selectively energizable cylindrical solenoid secured to said hollow body,

an armature secured to said obturator and operable by said solenoid to cause said obturator to open said discharge port,

said armature having a generally circular shape and being provided with a plurality of apertures in the form of radial notches, which open onto the peripheral of said armature to reduce the inertia and the overall magnetic inductance of said armature and hence the formation therein of parasitic electric currents.

4,928,889

WATERING SYSTEM FOR GREENHOUSE

Gary H. Lucas, Hightstown, N.J., assignor to Integrated Tech Systems, Inc., Windsor, N.J.

Filed Dec. 30, 1988, Ser. No. 292,376
Int. Cl.[5] A01G *25/09*
U.S. Cl. 239—751 **32 Claims**

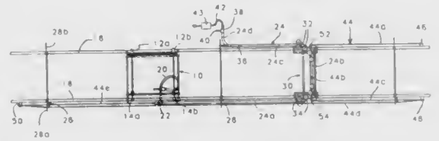
1. A sprinkler watering system for a greenhouse, comprising in combination:

a first horizontal rail and a second horizontal rail extending parallel to one another to define an elevated path in the greenhouse;

a carriage movably mounted to said rails;

a fluid outlet disposed at a substantially midway point along said path;

fluid transfer means for guiding fluid from said fluid outlet to said carriage, said fluid transfer means including a hose connected at one end to said fluid outlet and at an opposite end to said carriage, said hose having a first end portion extending from said fluid outlet along said first rail and a second end portion extending to said carriage along said second rail, said hose further having a middle portion connecting said first end portion to said second end portion;



first support means disposed along said first rail for supporting said first end portion of said hose;

second support means including a plurality of roller members spaced from one another along said second rail for rollably supporting said second end portion of said hose;

third support means for carrying said middle portion of said hose, said third support means including a hosecar movably mounted to said rails; and

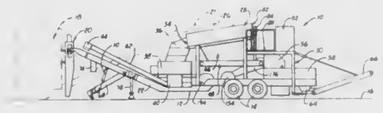
tensioning means for maintaining tension on said hose, said tensioning means including a cable operatively connected to said hosecar to exert thereon a force directed along said path and essentially directly opposed to a force exerted on said hosecar by said hose.

4,928,890

APPARATUS AND METHOD FOR PRODUCING COLD MIX ASPHALT

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Jan. 14, 1985, Ser. No. 691,498
Int. Cl.[5] B02C *21/02*
U.S. Cl. 241—24 **34 Claims**



1. An apparatus for producing cold mix asphalt from liquid asphaltic composition and aggregate received by the apparatus at an uncontrolled rate, comprising:

a surge bin for receiving the aggregate;

a pugmill;

a conveyor operable to transport aggregate from the surge bin to the pugmill;

conveyor drive means for operating said conveyor at rates selectable to maintain the quantity of aggregate in the surge bin between selected high and low levels;

a pump operable to deliver asphaltic composition to the pugmill; and

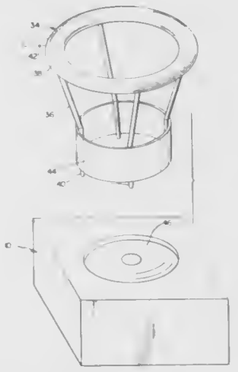
pump drive means coupling the pump to the conveyor drive means for operating the pump at a rate proportional to the rate of operation of the conveyor.

4,928,891

CRUSHING APPARATUS HAVING A FLUID SUPPLY MEANS ASSOCIATED WITH A ROTARY CRUSHER

Larie Richardson, 8835 Barrette Ave., Rosemead, Calif. 91770, and Harold Steingold, 407 16th St., Santa Monica, Calif. 90402

Filed Dec. 23, 1988, Ser. No. 289,038
Int. Cl.[5] B02C *4/00*
U.S. Cl. 247—41 **2 Claims**



1. An apparatus comprising:

a. at least one fluid supply means associated with a rotary crusher, with a crushing region located between an eccentrically rotated mantle and a stationary liner; and

b. at least one injecting apparatus for injecting air into a crushing region of said crushing apparatus, said injecting apparatus including:

(1) a port for injecting said air, said port being generally oriented in a direction of a material flow through said crushing region of said crushing apparatus; and

(2) an air manifold located adjacent to said crushing area;

(a) said air manifold being generally toroidal and located adjacent to said crushing chamber, and having a slotted opening along a region generally closest to said crushing chamber; and

(b) a single continuous air nozzle using said slotted opening, so that said manifold and said nozzle form an integrated nozzle unit having an outlet in said chamber, said integrated nozzle unit being oriented to provide an air flow generally coincident with said direction of said material flow through said chamber.

4,928,892

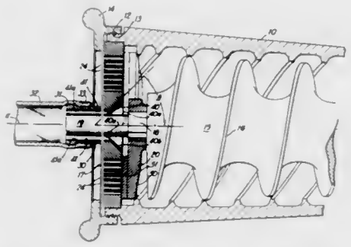
APPARATUS AND PROCESS FOR SEPARATING BONE FRAGMENTS, GRISTLE AND SINEWS FROM MEAT AS THE MEAT IS BEING GROUND

Patrick H. Huebner, Le Mars; Joseph G. Sebranek; Dennis G. Olson, both of Ames, all of Iowa, and Eugene A. Anderson, College Park, Ga., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 14, 1988, Ser. No. 258,169
Int. Cl.[5] B02C *18/36*
U.S. Cl. 241—82.5 **13 Claims**

1. A meat grinder for comminuting meat while separating the bone fragments, gristle and sinews from the meat, the meat grinder being of the type having a tubular housing, a rotatable auger within said housing rotatable about a longitudinal axis for urging meat toward one end of said housing, a rotatable shaft connected to said auger for rotation with said auger about said axis, a chopper plate disposed at said one end of said housing and toward which said meat is urged by said auger, said chopper plate having a central portion receiving said shaft

and being provided with an inner surface and an outer surface, said chopper plate having a plurality of relatively small holes passing from one surface to the other surface through said chopper plate outwardly of said central portion, a rotatable chopper blade within said housing for riding against the inner surface of said chopper plate, said chopper blade urging the bone, gristle and sinews toward the central portion of said plate, the improvement comprising:



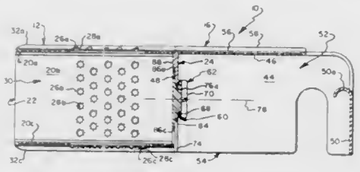
said central portion having a wall means defining a progressively tapering discharge passageway surrounding said rotatable shaft and being open except for said shaft, said discharge passageway having a relatively large throat on the inner side of said chopper plate and a smaller discharge end axially spaced and outwardly of said throat, said bone, gristle and sinews passing in generally an axial direction through said discharge end and outwardly of the outer periphery of said shaft for being discharged from said meat grinder.

4,928,893

FOOD PROCESSOR

William A. Prindle, Santa Barbara, Calif., assignor to Robinson Knife Manufacturing Co., Inc., Springville, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,224
Int. Cl.[5] A47J *43/06*
U.S. Cl. 241—95 8 Claims



1. A food processor comprising in combination:

a hollow food shredder member having an open end, a mounting end and plural sides extending between said open end and said mounting end, said sides being provided with a food cutting element each formed with at least one aperture opening through said sides into the interior of said shredder member;

an open mouth processed food receiving container removably insertable within said shredder member through said open end for selectively positioning said open mouth thereof in alignment with a selected one of said sides to receive food processed by said cutting element thereof;

a handle member having a hollow interior and including an upper wall defining a food guide surface, opposite ends and a pair of a side walls depending from said upper wall intermediate said opposite ends and cooperating with said opposite ends to define an opening communicating with said hollow interior, said opening and said hollow interior being sized to permit said shredder member to be removably inserted into said hollow interior between said side walls with said open end and mounting end of said shredder member disposed adjacent said opposite ends;

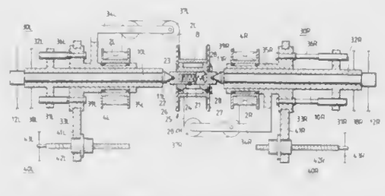
mounting means for removably joining said mounting end of said shredder member for rotation relative to one of said opposite ends of said handle member to selectively, removably position said selected ones of said sides in end-to-end alignment with said guide surface and alternatively for removably retaining said shredder member within said hollow interior of said handle member.

4,928,894

COIL WINDING MACHINE AND COIL WINDING METHOD USING THE SAME

Aritaka Ohno, Hachiouji; Kanji Shitara, Tokyo, and Masakazu Harashima, Akikawa, all of Japan, assignors to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 390,787
Claims priority, application Japan, Aug. 26, 1988, 63-212717
Int. Cl.[5] H01F *11/04;* B21F *45/00;* G02B *6/00*
U.S. Cl. 242—7.09 3 Claims



1. A coil winding machine comprising:

first and second spindles axially aligned but spaced apart from each other, for holding therebetween a take-up bobbin;

frist and second spinner means rotatable mounted about said first and second spindles, respectively, for rotatably holding first and second supply bobbins having prestored thereon an optical fiber;

first and second driving means for rotating said first and second spinner means relative to said first and second spindles, respectively;

first and second guide means mounted on said first and second spinner means, respectively, and spaced from one another in directions transverse to the axis of said take-up bobbin, for guiding optical fiber supplied from said first and second supply bobbins onto said take-up bobbin in directions parallel to the axis of said take-up bobbin;

first and second moving means for moving said first and second spinner means axially thereof as said optical fiber is wound onto said take-up bobbin;

said first and second moving means including first and second index means rotatably mounted on said first and second spindles and fixed axially thereof for slidably holding said first and second spinner means, respectively, and first and second axial driving means engaged with said first and second spinner means axially thereof for sliding said first and second spinner means axially thereof during the rotation of said first and second index means;

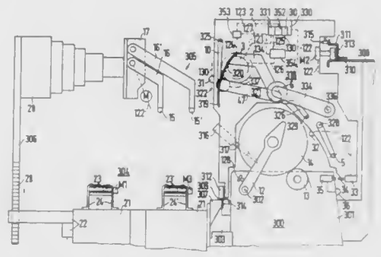
said first and second driving means including first and second index driving means for driving said first and second index means independently of each other.

4,928,895

METHOD AND APPARATUS FOR ASSEMBLING A PLURALITY OF PACKAGES FOR TRANSPORT ALONG A TEXTILE MACHINE

Edmund Wey, Nettetal, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 330,452
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810773
Int. Cl.[5] B65H *67/04, 67/06*
U.S. Cl. 242—35.5 A 13 Claims



1. In the operation of a textile machine of the type having a plurality of winding stations for building yarn packages and a pair of independently operable package transporting devices for transporting packages from the stations to a location for further handling or processing, a method comprising:

transferring a plurality of packages from the stations to a package support means;

maintaining said package support means, and said packages supported thereon, at a clearance from said pair of package transport devices sufficient to permit said devices to transport packages therepast; and

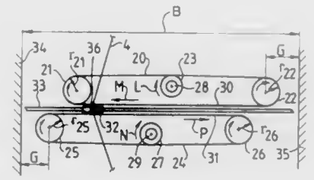
placing said plurality of packages from said package support means selectively onto either one of said pair of package transport devices for transporting said plurality of packages by said selected packages transport device from said stations to the location for further handling or processing.

4,928,896

TRAVERSING APPARATUS FOR TRAVERSING A LONGITUDINALLY MOVING YARN WHICH IS TO BE WOUND UP THROUGHOUT A TRAVERSING STROKE

Georg Symon, Winterthur, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Dec. 22, 1988, Ser. No. 288,602
Claims priority, application Switzerland, Dec. 24, 1987, 05060/87
Int. Cl.[5] B65H *54/30*
U.S. Cl. 242—43 R 4 Claims



1. A traversing apparatus for traversing a longitudinally moving yarn over a predetermined stroke length, comprising:

two counter-directionally moving travelling endless belts each containing two counter-directionally moving belt runs;

means for guiding the two counter-directionally moving belt runs of each of the two counter-directionally moving travelling endless belts substantially parallel to one another between stroke reversal zones of said predetermined stroke length;

said guiding means comprising for each associated counter-directionally moving travelling endless belt reversing rollers over which there is guided the associated counter-directionally moving travelling endless belt to form the two counter-directionally moving belt runs of the associated counter-directionally moving travelling endless belt;

two entrainment members defining a respective entrainment member provided for each of said two counter-directionally moving travelling endless belts for traversing the yarn in alternation in successive opposite traversing directions over an entrainment path of the predetermined stroke length along a yarn plane;

drive means for driving the two counter-directionally moving travelling endless belts;

said two counter-directionally moving travelling endless belts being provided with a yarn guide member for the yarn;

said yarn guide member being guided along the yarn plane and being movable therealong by means of one respective entrainment member of the two entrainment members of one of the two counter directionally moving travelling endless belts in one of the successive opposite traversing directions and by means of the other respective entrainment member of the two entrainment members of the other one of the two counter directionally moving travelling endless belts in an opposite one of the successive opposite traversing directions;

said predetermined stroke length including a respective stroke reversal zone at opposite end regions of said predetermined stroke length;

means defining an impact wall provided at each stroke reversal zone;

each said impact wall being disposed separately from the two entrainment members to intercept the yarn guide member; and

said yarn guide member disengaging from entrainment by an associated one of the two entrainment members in each of the stroke reversal zones and impacting against an associated one of the impact walls in free flight and changing its traversing direction and being entrainably driven in an opposite traversing direction by the other associated one of the two entrainment members only after impacting against the associated impact wall.

4,928,897

FEEDER FOR FEEDING PHOTOSENSITIVE MATERIAL

Hiroyuki Satou, and Norio Ookawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 18, 1989, Ser. No. 298,600
Claims priority, application Japan, Jan. 18, 1988, 63-4351[U]; Jan. 18, 1988, 63-4353[U]; Jan. 18, 1988, 63-4354[U]; Jan. 18, 1988, 63-4355[U]; Feb. 9, 1988, 63-28491
Int. Cl.[5] B65H *16/00*
U.S. Cl. 242—55 24 Claims

1. A feeder, incorporated into a photosensitive material processor of a printing device, for feeding a photosensitive material to the printing device, said feeder comprising:

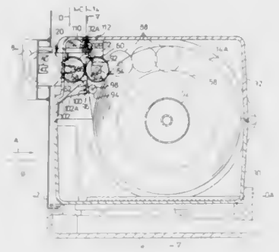
(a) a magazine body accommodating said photosensitive material therein and being formed with a take-out port for feeding out said photosensitive material;

(b) a pair of rollers, provided in said magazine body, for imparting a driving force while sezing a mid-portion of said photosensitive material;

(c) biasing means for separating one roller of said pair of rollers from the other roller of said pair of rollers; and

(d) driving force conveying means, partially exposed to the

outside of said magazine body, for selectively displacing said one roller close to said other roller by applying pressing and rotational forces from outside of said magazine body to said pair of rollers, and for feeding out said photosensitive material from said take-out port by moving said photosensitive material while seizing said material,



whereby said photosensitive material is totally stored in said magazine body before loading said magazine into said photosensitive material processor, thus preventing exposure of said photosensitive material to light to thus avoid the generation of unnecessary fogging in said photosensitive material.

4,928,898

COMPRESSION COILING MACHINE

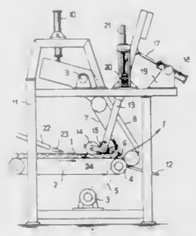
Yves Audren, and Guy Tuffal, both of Orange, France, assignors to Isover Saint-Gobain

Filed Jun. 3, 1988, Ser. No. 201,863

Claims priority, application France, Jun. 3, 1987, 87 07731

Int. Cl.[5] **B65H** *18/16*

U.S. Cl. 242—55.1 **16 Claims**



1. A process for forming rolls from strips of compressible materials, comprising the steps of:

feeding a strip of compressible material to a space defined by three rotatable members, one of said members being the first to contact said strip and another of said members comprising a compressor roller which is movable so as to progressively increase the size of said space, said members comprising means to cause said strip to coil upon itself so as to form a roll; and

driving said compressor roller during the coiling of said strip at speeds V_1 determined as a variable function of a driven speed V_2 of said one member and as a function of a length of said strip which has already been coiled, wherein $V_1 < V_2$ during at least one phase of the coiling of said strip.

4,928,899

MOBILE STORAGE UNIT FOR PROCESSING PRINTED PRODUCTS, SUCH AS NEWSPAPERS, PERIODICALS AND THE LIKE

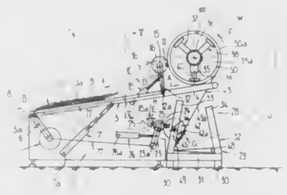
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Division of Ser. No. 42,238, Apr. 24, 1987, Pat. No. 4,768,768. This application Jun. 6, 1988, Ser. No. 202,820

Claims priority, application Switzerland, Apr. 30, 1986, 1788/86

Int. Cl.[5] **B65B** *63/04;* **B65H** *29/16*

U.S. Cl. 242—59 **14 Claims**



1. A mobile storage unit movable to a stationary winding station and a stationary unwinding station for respectively winding up and unwinding a product package of printed products, such as newspapers, periodicals and the like conjointly with a winding band, comprising:

frame means for rotatably mounting a hollow substantially cylindrical winding core and a winding band spool for a winding band;

said frame means, in its selective location at either one of the stationary winding station or the stationary unwinding station, being positioned for connection to drive means and conveying means solely provided at said stationary winding station and said stationary unwinding station for respectively carrying out the winding-up operation and the unwinding operation;

first mounting means provided at said frame means for the removable mounting of the winding core; and

second mounting means provided at said frame means for the removable mounting of the winding band spool.

4,928,900

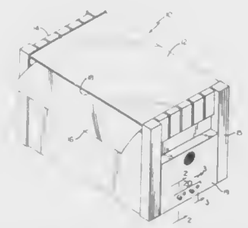
ENCODED CARTRIDGE

Jack Beery, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 21, 1988, Ser. No. 274,872

Int. Cl.[5] **B65M** *19/00;* **G03B** *17/26*

U.S. Cl. 242—71.1 **1 Claim**



1. In a cartridge for containing light sensitive web type medial material for application to utilization apparatus and having a molded plastic body portion in which the body portion forms a cavity for containing such light sensitive material and provides light excluding integrity to said cartridge, the improvement in cartridge encoding comprising:

means on said cartridge body portion forming a plurality of binary encoding positions, wherein in each said position there is either a recess or a protrusion formed integrally with the body portion, and in which each said protrusion is hollow and is formed by an enclosing wall and a closed outer end and defining therein a hollow interior communicating directly with said body cavity such that the breaking off of a protrusion impairs the light excluding integrity of said cartridge.

4,928,901

CABLE REEL

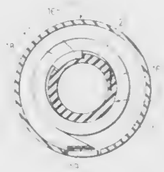
Hiroyuki Bannai; Yuichi Ida, and Hironori Kato, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 311,927

Claims priority, application Japan, Apr. 30, 1988, 63-57305[U]

Int. Cl.[5] **B65H** *75/02;* **H01R** *39/00*

U.S. Cl. 242—85 **2 Claims**



1. In a cable reel including a fixed member having an outer ring wall, a movable member having an inner ring wall and rotatably mounted to said fixed member, and a cable wound with a plurality of turns between said fixed member and said movable member and having opposite ends fixed to said outer ring wall and said inner ring wall, wherein when said movable member is rotated in either of a winding direction or an unwinding direction of said cable, said cable is wound up around said inner ring wall or is unwound to said outer ring wall; the improvement comprising:

a stopper formed of a rigid material and fixed to said cable at a position near the inner circumferential end thereof,

wherein when said cable is unwound by a predetermined amount or more, said stopper interposes as a prop between said cable unwound to said outer ring wall and said cable inverted on said inner ring wall, thereby stopping further inversion of said cable,

at least one of said stopper and said inner ring wall provided with a cutter portion for cutting said cable when a tension in the unwinding direction is applied to said cable.

4,928,902

VEHICLE SEAT BELT RETRACTOR

Yasuo Tsuji, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

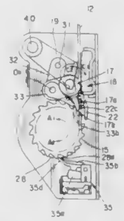
Filed Jul. 25, 1989, Ser. No. 384,981

Claims priority, application Japan, Jul. 27, 1988, 63-185522

Int. Cl.[5] **B60R** *22/38, 22/40, 22/42*

U.S. Cl. 242—107.2 **5 Claims**

1. A vehicle seat belt retractor having a frame, a belt reel rotatably mounted on the frame, an emergency locking mechanism for locking the belt reel to the frame against rotation in the belt-unwinding direction in response to rapid acceleration of the vehicle and including a reel-locking pawl pivotably mounted on the frame for engagement with a ratchet wheel affixed to the belt reel and an actuator plate coupled to the reel-locking pawl and movable in response to rotation of the belt reel in the belt-unwinding direction upon operation of the emergency locking mechanism to cause the reel-locking pawl to engage the ratchet wheel, and a belt-clamping mechanism including a fixed clamping member mounted on the frame and a movable clamping member carried on a lever arm mounted on the frame for pivotal movement between an inactive position in which the clamping members are spaced apart such that the belt can pass freely between them and a clamping position in which the movable clamping member clamps the belt against the fixed clamping member and prevents it from moving, and a link pivotably coupled to the lever arm and controlling the movements of the lever arm between the inactive and clamping positions, characterized in that the link is pivotably attached to the frame such as to form with the lever arm a



compound lever, in that the link includes a projection selectively engageable with the ratchet wheel, and in that the link is resiliently biassed to engage a cam follower portion thereof with a cam surface of the reel-locking pawl such that the link is pivoted in response to movement of the reel-locking pawl into engagement with the ratchet wheel by camming action of the cam surface and cam follower portion to engage the projection of the link with the ratchet wheel, whereby the rotation of the ratchet wheel in the belt-unwinding direction causes the link to pivot about its pivot mounting on the frame and to move the lever arm and movable clamping member to the clamping position.

4,928,903

PALLET FOR TRANSPORTING COPS

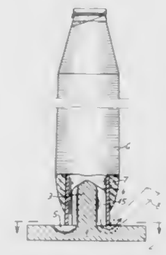
Ulrich Wirtz, and Dietmar Engelhardt, both of Mönchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Sep. 29, 1989, Ser. No. 415,062

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833259

Int. Cl.[5] **B65H** *49/00, 49/38*

U.S. Cl. 242—130 **5 Claims**



1. Pallet for transporting cops, comprising a disk-like base plate, a creel spindle disposed on said base plate for holding a cop having a cop tube with a tube bottom and an open interior, and a base for supporting the tube bottom, said base being interrupted at least at one point to form an air duct extending

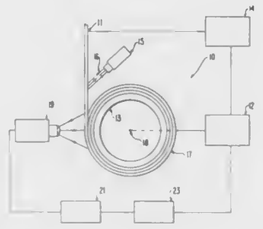
into the open interior of the cop tube for guiding an air flow through the cop tube.

4,928,904

GAP, OVERWIND, AND LEAD ANGLE SENSOR FOR FIBER OPTIC BOBBINS

Robert M. Watts, Harvest, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 5, 1988, Ser. No. 253,761
Int. Cl.[5] B65H *54/28*
U.S. Cl. 242—158 R **18 Claims**



1. An apparatus for winding an optical fiber on a bobbin, comprising:

means for winding an unwound length of said optical fiber back and forth a predetermined distance along the axial length of said bobbin;

means for transmitting energy into said fiber to be internally transmitted through a selected portion of said fiber being wound;

means responsive to loss of said internally transmitted energy radially out of the longitudinal said selected portion of said fiber for detecting the position of said selected portion of said optical fiber within said predetermined distance; and

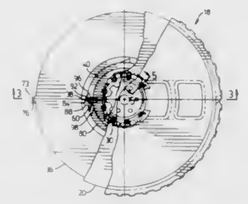
means responsive to said detecting means for controlling said winding means.

4,928,905

ONE-WAY CLUTCH ASSEMBLY

Robert Granzotto, and Wah K. J. Wong, both of Toronto, Canada, assignors to Arena Recreations (Toronto) Limited and William Lawrence Heisey, A Partnership Trading as Single Play Video, both of Toronto, Canada

Filed May 1, 1989, Ser. No. 345,663
Int. Cl.[5] G11B *15/32*
U.S. Cl. 242—201 **29 Claims**



29. A reel assembly for use in a tape cassette having a reel member which is mounted for rotation with respect to a stationary member which is held against rotation by the cassette, and a one-way clutch assembly for preventing rotation of the reel member in a first rotational direction with respect to the stationary member about said axis of rotation, the improvement comprising;

(a) a pawl which is mounted on one of said members for pivotal movement into and out of engagement with a shoulder formed on the other of said members to dock the members against relative rotation in one direction about said axis which permits rotation of the other direction,

(b) a slipway channel formed between said members and arranged on the perimeter of a circle which has its center aligned with said axis of rotation,

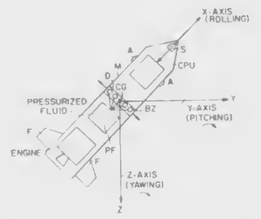
(c) pawl displacer means slidably mounted in said slipway channel for to and fro movement therealong, said pawl displacer means engaging one of said members so as to be driven into engagement with the pawl in response to said relative rotation in said first rotational direction to urge the pawl to move toward engagement with said shoulder, said pawl displacer means also being driven in response to relative rotation in the second rotational direction to urge the pawl to move out of engagement, with said shoulder to permit free rotation of the reel member with respect to the stationary member in the second rotational direction.

4,928,906

REMOTE CONTROL SYSTEM FOR A ROLLING FLYING BODY

Richard Sturm, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 300,960
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1988, 3801795
Int. Cl.[5] F42B *15/033*
U.S. Cl. 244—3.22 **9 Claims**



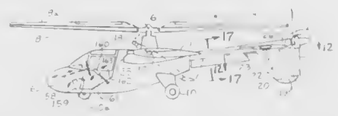
1. A remote control system for controlling pitching and yawing movements of a rolling flying body, comprising a plurality of radially arranged fluid flow control nozzles located around the circumference of said flying body, said control nozzles providing control forces for influencing movements of said flying body, a control valve operatively connected to each control nozzle for individually controlling fluid flow through the respective control nozzle, impulse signal control circuit means for providing control impulse signals to each of said control valves in such a way that at any time at least two control nozzles forming a cooperating pair of control nozzles, are activated for controlling fluid flow from a source of pressurized fluid to said nozzles for a duration determined by said control impulse signals, and means for sensing a roll angle of said flying body for supplying a respective roll angle signal to said impulse signal control circuit means so that the impulse duration of said control impulse signals is determined exclusively by a rolling frequency of said flying body.

4,928,907

COMPOUND HELICOPTER WITH NO TAIL ROTOR

Daniel R. Zuck, Sylmar, Calif., assignor to Y & B Investment Corporation, Sylmar, Calif.

Filed Feb. 29, 1988, Ser. No. 161,714
Int. Cl.[5] B64C *27/22*
U.S. Cl. 244—6 **9 Claims**



1. In combination a compound helicopter with lifting rotor for flight comprising horizontally supported wings, left and right, on a horizontal axle means free to rotate with the direction of airflow, the said left and right wings fixedly secured to the said axle, a fuselage between the said wings to support the wings, bearing means associated with the fuselage and wing axle means for free rotation of the wings with respect to the said fuselage, the wings having counter balancing weight means to statically balance the wings about the axle axis of rotation, moveable aerodynamic control tab means on the trailing edges of the wings to vary and to control the wing angle attitude relative to the airflow direction over the wings, outboard ailerons on said wings to vary differentially the lift forces of the outer wing tips.

4,928,908

BALLOON MADE OF METAL VAPOR DEPOSITED FILM

Shigeo Horii, Kyoto, Japan, assignor to Reiko Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 127,643, Dec. 2, 1987, abandoned. This application Nov. 16, 1989, Ser. No. 437,767
Claims priority, application Japan, Jun. 12, 1987, 62-147635; Jul. 29, 1987, 62-189806
Int. Cl.[5] B64B *1/58, 1/40*
U.S. Cl. 244—31 **8 Claims**

1. A balloon formed by heat-sealing at least one heat-sealable sheet which comprises a plastic film and a metal vapor deposition layer formed on one side of the plastic film, characterized in that the metal vapor deposition layer is composed of Sn and discontinuously formed so that the sheet has a metallic appearance but has a dielectric breakdown voltage of at least 1000 V.

4,928,909

ELLIPTICAL RAM AIR PRESSURIZED AIRFOIL PARACHUTE

John G. Bouchard, P.O. Box 688, North Conway, N.H. 03860

Filed Jun. 18, 1987, Ser. No. 64,178
Int. Cl.[5] B64D *17/02*
U.S. Cl. 244—145 **6 Claims**

1. A ram air parachute comprising in combination:

an upper surface, having a truncated elliptical plan configuration;

a lower surface having a configuration similar to said upper surface;

a plurality of ribs connecting said upper and lower surfaces together, said ribs having a plurality of openings therein:

a leading edge defining a relatively large opening for admitting ram air into said ram air parachute;

a trailing edge configured so as to minimize the flow of air through said ram air parachute;

a plurality of chambers defined by said upper and lower surfaces, said ribs, said leading edge, and said trailing edge, said plurality of chambers communicating through said plurality of openings in said ribs so as to maintain equal air pressure in all of said chambers;

two stabilizer surfaces depending downward on opposite sides of said ram air parachute, said stabilizer surfaces being attached to said upper and lower surfaces; and

means for controllably attaching said ram air parachute to a parachutist;





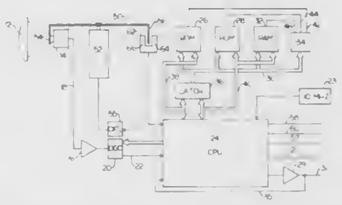
wherein the truncated elliptical plan configuration provides an aspect ratio approaching 3.23 and thereby results in a glide ratio of about 4.0 for a ram air parachute.

4,928,910

DETECTION OF OVERHEATED RAILROAD WHEEL AND AXLE COMPONENTS

Jeffery J. Utterback, Harrisonville, and Randall S. Mecca, Warrensburg, both of Mo., assignors to Harmon Industries, Inc., Blue Springs, Mo.

Filed Oct. 11, 1988, Ser. No. 255,787
Int. Cl.[5] B61K *9/06*
U.S. Cl. 246—169 A **18 Claims**



8. In apparatus for detecting an overheated component of a railroad train:

a sensing unit adapted to be disposed at trackside and having an infrared sensing element and means for focusing incident infrared radiation from a passing component on said sensing element,

a shutter movable between a normally open position and a closed position in which the shutter blocks radiation that would otherwise reach said sensing element via said focusing means so that the sensing element is subjected only to ambient heat,

means responsive to said sensing element for producing a heat signal during a period in which the sensing element is scanning the passing component,

drive means connected to said shutter for repeatedly momentarily closing the same at successive time spacings each shorter in duration than said period, and

output means responsive to said heat signal for comparing its amplitude between said time spacings with its amplitude at said time spacings.

4,928,911

SUPPORTING BRACKET FOR PIPES

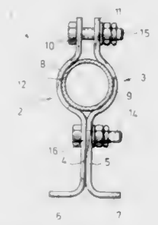
Hans H. Hardtke, Zeven, Fed. Rep. of Germany, assignor to Lisega GmbH, Fed. Rep. of Germany

Filed May 15, 1989, Ser. No. 351,636

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 8806646[U]

Int. Cl.[5] F16L *3/08*

U.S. Cl. 248—74.1 **15 Claims**



1. A pipe support bracket comprising a pair of clip elements, each clip element including a foot disposed generally transverse to a lower bar portion which is in turn joined to an upper bar portion by an intervening semicircular pipe gripping portion, said clip elements being positioned with said semicircular pipe gripping portions opening in opposed relationship to each other whereby a pipe can be housed therebetween, said feet projecting in opposite directions away from each other, said lower bar portions being disposed generally intimately adjacent each other and contiguous a plane passing through a center defining the generatrix of said semicircular pipe gripping portions, said upper bar portions being disposed in spaced relationship from each other and from said plane passing through said center, the spacing between said upper bar portions being greater than that between said lower bar portions, a first opening in each of said upper bar portions, said first openings being generally aligned, a pair of second openings in each of said lower bar portions, said second openings of said lower bar portions being generally aligned, said second openings of each pair of openings of said lower bar portions being located on opposite sides of a second plane normal to said first-mentioned plane and passing through centers of said first openings, and means for securing said upper and lower bar portions to each other through said associated openings.

4,928,912

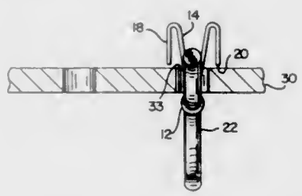
PEGBOARD HANGER ANCHOR

Bronislaw B. Florek, Chicago, Ill., assignor to ABC Consulting Services, Inc., Oak Brook Terrace, Ill.

Filed Aug. 24, 1989, Ser. No. 397,905

Int. Cl.[5] E04G *3/00*

U.S. Cl. 248—221.2 **10 Claims**



1. An anchor to stabilize a hanger in a pegboard, the pegboard having a plurality of perforations and front and rear surfaces, the hanger having a vertically elongated shank with a forwardly extending hook to support articles thereon, said anchor comprising:

means for attaching said anchor to said elongated shank;

a pair of legs extending rearwardly from opposing ends of said attaching means, and adapted for insertion through one of the perforations; and,

a pair of feet having terminal ends extending forwardly from each of said legs and directed substantially toward said attaching means, said feet further adapted to abut the rear surface of the pegboard at said terminal ends.

4,928,913

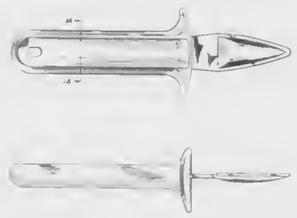
WALL MOUNTING SYSTEM

Thomas C. Laughon; Roy Y. Nicholson; Michael E. Barrett, all of Hickory, and Robert C. Beckmann, Vale, all of N.C., assignors to McCalla/Lackey Products Corporation, Hickory, N.C.

Filed Mar. 10, 1989, Ser. No. 321,378

Int. Cl.[5] A47B *67/02*

U.S. Cl. 248—224.1 **10 Claims**



1. A wall mounting system comprising:

a horizontally mounted rail attached to a wall structure said rail having a top surface which is undercut to form an acute angle at the juncture with said wall structure, said undercut forming on the top surface with juncture of said wall structure a suspending cleat,

said horizontally mounted rail including a first horizontal flange with a first vertical flange extending upwardly from one end thereof, a flange extending downwardly at an acute angle from the top end of the first vertical flange in the direction of the other end of the first horizontal flange and spaced therefrom, a second horizontal flange extending at one end from the bottom end of the angled flange toward the one end of the first horizontal flange and spaced therebelow, and a second vertical flange extending downwardly from the other end of the second horizontal flange and being coplanar with the first vertical flange, with the cleat being formed by the angled flange and a locking area located between the first and second horizontal flanges. said suspending cleat to support said suspended structure from said rail.

4,928,914

TILTABLE MOUNTING BRACKET

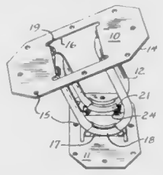
W. S. Snodell, Glen Ellyn, Ill., assignor to Peerless Industries, Inc., Melrose Park, Ill.

Filed Feb. 21, 1989, Ser. No. 312,202

Int. Cl.[5] E04G *3/00*

U.S. Cl. 248—274 **18 Claims**

1. A tiltable mounting bracket for adjustably securing an appliance to a surface, said bracket comprising a first plate adapted for securing said bracket to said surface, a second plated adapted for attachment of said appliance on to said bracket, and a U-shaped member having a tubular cross-section connected to and arranged for selected movable securement between said plates, said plates and said U-shaped member having cooperative arcuate means for adjustably tilting one plate relative to the other plate both in vertical and horizontal direction and wherein one plate may be disposed angularly to the other plate.



4,928,915

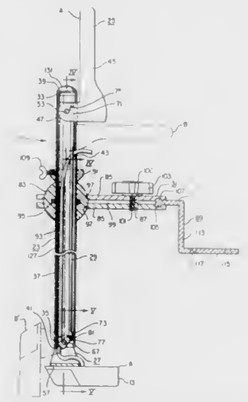
MOUNTING APPARATUS FOR SONAR TRANSDUCER

Felton H. Havins, 300 N. E. 6th St., Fort Worth, Tex. 76106

Filed Feb. 24, 1989, Ser. No. 314,903

Int. Cl.[5] E04G *3/00*; H04R *1/44*

U.S. Cl. 248—288.5 **23 Claims**



1. An apparatus for mounting a sonar transducer to a boat, comprising:

(a) a first member having first and second end portions;

(b) handle means pivotally coupled to said first member first end portion;

(c) transducer mounting means being adapted for coupling to said sonar transducer, said transducer mounting means being pivotally coupled to said first member second end portion such that said transducer mounting means can change elevational orientation with respect to a water line of said boat;

(d) a second member located adjacent to said first member, said second member coupled to said handle means and to aid transducer mounting means so as to link said transducer mounting means to said handle means, wherein when said handle means is pivoted the elevational orientation of said transducer mounting means correspondingly changes;

(e) first member mounting means for mounting said first member to said boat said first member mounting means having an opening for receiving said first member, said first member being able to slide in said opening relative to said first member mounting means, said first member mounting means allowing said first member, said handle means, and said transducer mounting means to turn wherein the azimuthal orientation of said transducer mounting means changes;

(f) retaining means for retaining said first member in a selected position relative to said first member mounting means.

4,928,916

CEILING PANEL INSTALLATION SUPPORT WITH TELESCOPING PANEL REST FOR EASE OF CARRYING

John F. Molloy, P.O. Box 3482, Stamford, Conn. 06905

Filed Apr. 28, 1989, Ser. No. 344,693

Int. Cl.[5] E04G *25/00*

U.S. Cl. 248—354.1 **7 Claims**



1. In a temporary support device for use in installing overhead construction material for aiding the installer in positioning and attaching such construction material to overhead structure, wherein said temporary support device includes a horizontally extending member upon which construction material can be supported temporarily, an elongated support rod adapted for being positioned generally vertically and having upper and lower ends, means connecting said horizontally extending member in generally perpendicular relationship to said upper end of said elongated support rod for permitting said elongated support rod to be tilted somewhat away from vertical while said horizontally extending member remains horizontal, a tubular support column having top and bottom ends, said lower end of said elongated support rod being received in said top end of said tubular support column in telescoping relationship therein for permitting said elongated support rod to be moved upwardly and downwardly relative to said tubular support column, a manually releasable one-way friction clutch assembly operably associated with said tubular support column and frictionally engageable with said elongated support rod for allowing said elongated support rod to be moved freely upwardly for extending said elongated support rod upwardly relative to said tubular support comumn while normally frictionally gripping said elongated support rod for preventing said elongated support rod from moving downwardly relative to said tubular support column, a vertically elongated, floor-engaging member adapted to rest upon a floor, said vertically elongated, floor-engaging member being in telescoping relationship with said bottom end of said tubular support column for permitting said bottom end of said tubular support column to be moved upwardly and downwardly relative to said floor-engaging member, a compression spring having first and second ends, said first end of said compression spring exerting a downward force on said floor-engaging member and said second end of said compression spring exerting an

upward force on said tubular support column, the improvement comprising:

said vertically elongated floor-engaging member being tubular and having an interior and having said compression spring positioned entirely within said interior,

said vertically elongated floor-engaging member having vertically extending guide slots therein,

a transversely extending pin secured to said tubular support column and extending through said guide slots and transversely through the interior of said vertically elongated floor-engaging member,

spring stop means within said interior held by said pin, and

said second end of said spring thrusting upwardly against said spring stop means.

4,928,917

HOLDING FIXTURE, IN PARTICULAR FOR MEDICAL USE

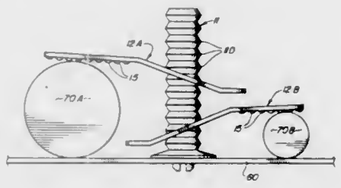
Hans-Joachim Wolf, Theodor-Schweitzer-Str. 1, D-7137, Sternenfels-1, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,475

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3710016

Int. Cl.[5] B65D *45/00*

U.S. Cl. 248—507 **12 Claims**



1. A holding fixture mountable in an insertion opening provided in a support panel which has a plurality of insertion openings for receiving a plurality of such holding fixtures, and fixture serving for supporting and securing an article and said fixture comprising: a retaining member having an outer surface which has an at least partially ribbed profile; and a resiliently deformable bracket member detachably engageable with said retaining member and having an aperture dimensioned to permit passage of said retaining member therethrough, when said bracket member has a first selected orientation relative to said retaining member, and to establish locking engagement directly between said bracket member, in the region of the edge of said aperture, and said retaining member, accompanied by elastic deformation of said bracket member, when said bracket member has a second selected orientation relative to said retaining member.

4,928,918

PRINTER AND STAND ASSEMBLY

William A. Bowes, Kettering, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 12, 1989, Ser. No. 350,864

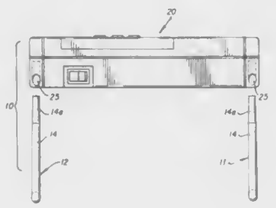
Int. Cl.[5] E21F *17/02*

U.S. Cl. 248—688 **5 Claims**

1. An improved printer/stand assembly comprising:

(a) a printer having a bottom wall with two pairs of spaced, opposing leg recesses formed therein; and

(b) two U-shaped members comprised of substantially linear opposing leg portions and substantially linear interconnector portion, each of said leg portions having ends that are sized to loosely fit into said leg recesses, the interconnector portion of each of said members being deflectable and the span between said leg portion ends being sufficiently less than the spacing between the centers of opposing leg recesses that when said leg portions are spread and fit into said leg recesses, the U-shape members are retained by member restoring forces and the deflection of their interconnector portions form into a concave-down configuration for providing support surface, point-type contact regions proximate each leg-interconnector portions juncture.



4,928,919

STOP VALVE

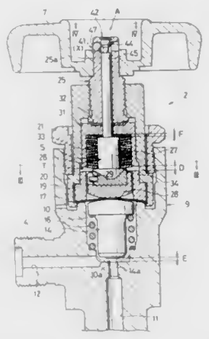
Norio Daicho; Masakatsu Kawahara; Jiro Nitta; Koji Miyazaki, and Keitaro Yonezawa, all of Hyogoken, Japan, assignors to Kabushiki Kaisha Neriki, Hyogoken, Japan

Filed Oct. 18, 1989, Ser. No. 423,284

Claims priority, application Japan, Oct. 21, 1988, 1-266814; Apr. 5, 1989, 64-87647

Int. Cl.[5] F16K *31/50, 35/00*

U.S. Cl. 251—89 **9 Claims**



1. A stop valve, including a handle used for valve opening and closing manipulations and adapted to be detached after completion of a valve closing manipulation, comprising:

a valve box, provided with a valve chamber having a valve seat;

a movable valve body provided with a sealing surface selectively movable to a valve opening position and to a valve closing position with respect to said valve seat within the valve chamber;

a thrust threaded member provided with an input portion, threadably engaged with the valve box so as to be adjustably advanced and returned with respect thereto;

a handle, adapted to be rotatably interlockingly connected to said input portion and to be attached and detached in the axial direction with respect thereto wherein, when said handle is turned in a valve closing direction the thrust threaded member is advanced with respect to the valve box and said valve body is moved toward the valve closing side by a thrust imparted by the thrust threaded member so that the sealing surface thereof is brought into contact with the valve seat to attain a valve closing;

a valve closing thrust transmission mechanism comprising at least coned disc spring surrounding an intermediate transmission member arranged in order from the thrust threaded member to the valve body, so that the intermediate transmission member is urged in the valve closing direction by said at least one coned disc spring under its condition capable of being advanced and returned within a first predetermined distance in the valve opening and closing directions of the valve body with respect to the thrust threaded member;

means for restraining a stopper for the handle, formed cooperatively by the thrust threaded member and the intermediate transmission member,

said restraining means being so constructed as to be changed over between a handle-holding condition wherein the stopper is restrained in an engagement position with respect to the handle and a handle-releasing condition wherein its restraint against the stopper is released, whereby when the intermediate transmission member has been advanced toward the valve closing side by means of the at least one coned disc spring with respect to the thrust threaded member the restraining means is brought into the handle-holding condition, and when the thrust threaded member has been advanced toward the valve closing side against the at least one coned disc spring with respect to the intermediate transmission member the restraining means is brought into the handle-releasing condition;

a contact receiving means, provided in at least one of the intermediate transmission member and the fixing side portion of the valve box so as to limit the advancing movement of the thrust threaded member toward the valve closing side to a second predetermined distance with a contact receiving position of said contact receiving means being set at a midway position of the compression range of the at least one coned disc spring to thereby ensure that said at least one, coned disc spring is not subjected to complete compression so that said valve body sealing surface is not subjected to an abnormally large sealing contact force.

4,928,920

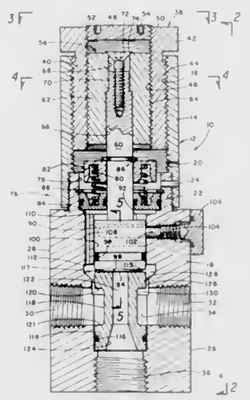
FINELY-ADJUSTABLE FLOW CONTROL VALVE

Eugene P. Feild, Ft. Wayne, Ind., assignor to Laminar Fluid Controls, Inc., Fort Wayne, Ind.

Filed May 18, 1989, Ser. No. 353,596

Int. Cl.[5] F16K *31/50, 47/08, 1/04*

U.S. Cl. 251—118 **9 Claims**



1. Apparatus for adjusting flow through a valve body of the type having a valve member mounted on one end of a valve stem which is axially movable relative to the valve body for positioning the valve member relative to a valve seat, said apparatus comprising:

an annular member;

a pair of coaxial threaded connections, the first being formed between the valve body and said annular member and the second being formed between said annular member and the valve stem, said first threaded connection having a different number of threads per unit of axial length than said second threaded connection;

means for constraining rotational movement of the valve stem relative to the valve body;

a first side of said valve member directed toward said valve seat;

a second side of said valve member opposite said first side; and

means for equalizing pressure between said first and second sides of said valve member.

4,928,921

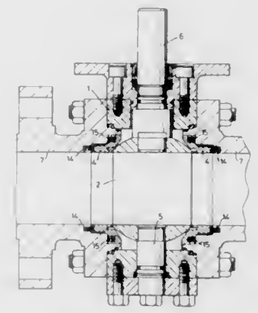
BALL VALVES FOR PIPELINES

John Steele, Fife, United Kingdom, assignor to T K Valve Limited, United Kingdom

Filed Oct. 10, 1989, Ser. No. 419,615

Int. Cl.[5] F16K *5/22*

U.S. Cl. 251—175 **3 Claims**



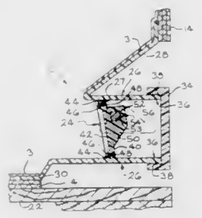
1. A ball valve comprising a valve housing, a valve ball in the housing turnable between open and closed position, pipe connectors or so-called adaptors connected to opposite ends of the housing and valve seats located in recesses in said adaptors and/or housing and resiliently into sealing engagement with the ball, wherein each valve seat has an annular face confronting the ball, the face being a surface of revolution about the axis of the seat of a line inclined to the said axis, the face being interrupted by an annular groove so as to leave a radially inner annular rib having a radially inner part of the said face, the said face being so arranged relative to the ball that at low pressures there is line contact of the ball with the seat nearer the radially outer edge of the radially inner part of the said face, and at high pressures where the ball undergoes elastic deformation from a true sphere towards an oblate spheroid there is an accompanying elastic radially outward flexing of the radially inner annular rib so that the line contact of the ball with the seat moves nearer the radially inner edge of the radially inner part of the said face, and the radially outer part of the said face is clear of the ball in normal operations but is available to come into contact with ball in the event of failure of the ball valve.

4,928,922

BUTTERFLY DISCHARGE VALVE ASSEMBLY FOR A LIQUID BULK CONTAINER

Dwight E. Nichols, Beatrice, Nebr., assignor to Hoover Group, Inc., Alpharetta, Ga.

Filed Nov. 13, 1989, Ser. No. 435,690
Int. Cl.[5] F16K *1/22*
U.S. Cl. 251—180 11 Claims



I. In a liquid bulk container, a butterfly discharge valve assembly comprising:

a body member having a discharge passage in fluid communication with said container and having an inner wall of generally circular cross-section, said discharge passage being operable to allow liquid from a liquid bulk container to be discharged therethrough;

a valve member of substantially disc shape disposed within said discharge passage, said valve member having opposite side faces and being of a diameter slightly larger than the diameter of said inner wall of said discharge passage, said valve member being moveable in said passage between open and closed positions, said valve member having a sealing edge surface and a groove in one of said faces at a position in close proximity to said edge surface; and

compressible, resilient material substantially filling said groove for enabling said edge surface to be deflected inwardly toward said groove by said inner wall when said valve member is moved into said closed position, said groove and said sealing edge surface coacting to effect a leak-proof seal between said edge surface and said inner wall when said valve element is moved into said closed position.

4,928,923

FLANGED VALVE

Gunter M. Lassally, Amsterdam, Netherlands, assignor to Amstelstaal B.V., Amsterdam, Netherlands

Filed Feb. 21, 1985, Ser. No. 704,304
Claims priority, application Netherlands, Feb. 28, 1984, 8400607
Int. Cl.[5] F16K *31/44*
U.S. Cl. 251—221 8 Claims



1. A flanged valve comprising:

a valve box having a substantially axially extending channel formed therein, said channel at one side being adapted to be connected to a supply line and at the other side to a discharge line, the valve box substantially forming a cylindrical flange that has one side adapted to be connected to an end of a line comprising a flange and the other side being adapted to be connected to an end of a line comprising a thread,

a valve means and associated operating mechanism positioned entirely within the valve box to shut-off the channel entirely or partially,

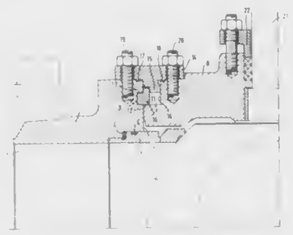
means for mounting the valve box between the supply line and the discharge line, said mounting means including passing through bores through which mounting bolts can extend.

4,928,924

VALVE

Pekka J. Kivipelto, Helsinki, Finland, assignor to Neles Oy, Helsinki, Finland

Continuation of Ser. No. 258,589, Oct. 17, 1988, abandoned.
This application Oct. 27, 1989, Ser. No. 428,003
Claims priority, application Finland, Oct. 21, 1987, 874642
Int. Cl.[5] F16K *5/06*
U.S. Cl. 251—315 4 Claims



1. A valve comprising a housing having a through flow duct; an opening in said housing, sealing means in said duct and a closing member disposed in said housing in engagement with said sealing means so as to be rotatable between a position where flow through said housing is permitted and a closed position where flow is prevented, said closing member being of a size to permit insertion thereof through said opening in said housing; said closing member including a shaft engaged therewith for rotating said closing member, said shaft extending through said opening in said housing;

a first cover means for said opening in said housing and including a passage for said shaft of said closing member, said passage having seal means for sealingly engaging said shaft, a locking member for locking said first cover means with respect to said opening in said housing, said locking member including a stop face facing toward the interior of said opening in said housing, a second cover means detachably secured by first attachment means directly to said housing and be second attachment means directly to said first cover means, said second cover means including seal means between said second cover means and said housing and between said first cover means and said second cover means.

4,928,925

CONSTANT TENSION HOISTING MEMBER

S. Grant Christison, 723 Sudden Valley, Bellingham, Wash. 98226

Continuation of Ser. No. 653,942, Sep. 20, 1984, Pat. No. 4,624,450. This application Apr. 2, 1986, Ser. No. 847,496
Int. Cl.[5] B66D *1/52, 1/08*
U.S. Cl. 254—277 8 Claims

1. A constant tension hoisting system having a single-lever control for a winch having a drive torque variable from minimum to maximum in a constant tension mode and that is operable to be switched between a normal mode and a constant tension mode for raising and lowering an object supported by a cable on the winch between a relatively stable platform and a surface undergoing vertical wave motion relative to the platform, said lever control being capable of switching the system between the normal and the constant tension mode, comprising:

a single, manually actuated control lever means positionable for controlling the winch for (1) hoisting and lowering in the normal mode, (2) varying the cable tension of the constant tension mode, and (3) activating a constant tension mode selection circuit to allow switching between the normal mode and the constant tension mode;



said control lever being positionable into a commit-to-constant-tension position when activating the constant tension mode selection circuit;

means responsive to the control lever being placed in the commit-to-constant-tension position for activating the constant tension mode selection circuit to allow switching between the normal mode and the constant tension mode; and

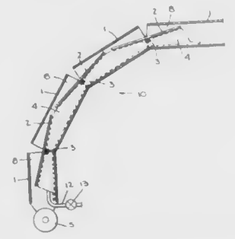
means responsive to a change to minimum cable tension for automatically switching the winch from the normal mode to the constant tension mode when the constant tension mode selection circuit is activated.

4,928,926

FLUID PRESSURE OPERATED PUSH BEAM AND APPARATUS COMPRISING ONE OR MORE OF SUCH PUSH BEAMS

Berend J. Bloemendal, Emmen, and Marinus J. G. Bromhaar, Hengelo, both of Netherlands, assignors to Persluchtring Advies B.V., Emmen, Netherlands

Filed Feb. 10, 1988, Ser. No. 154,551
Claims priority, application Netherlands, Feb. 10, 1987, 8700307
Int. Cl.[5] B66F *3/24*
U.S. Cl. 254—93 R 13 Claims



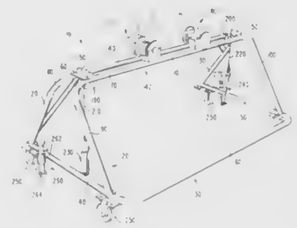
1. A fluid pressure operated push beam, comprising a plurality of similar rigid open-ended tubular sections; a plurality of hinge pins articulating said tubular sections to each other in head-to-tail relationship perpendicular to a longitudinal median plane of the push beam; a number of plates corresponding to the number of hinge pins, each connected to a respective one of the hinge pins for pivotal movement about the axis thereof, the portions of each plate which are situated on either side of the associated hinge pins being disposed in the respective tubular section which is located on the corresponding side of that hinge pin and having a width smaller than the width of said respective tubular section; and inflatable inner arc hose means having a length less than that of the series of tubular sections but larger than the distance between the outermost ones of said hinge pins, said inner arc hose means being disposed within the series of tubular sections in longitudinal direction in the space defined on the same side of said hinge pins and said plates connected thereto, and said inner arc hose means further having closable supply means for directing into said inner arc hose means a pressure fluid operative for inflating said inner arc hose means.

4,928,927

LIFTING MECHANISM FOR HEAVY STREET GRATINGS

William R. Fredrick, 909 Lagoon La., and Robert H. Stubler, 1024 Barnegat La., both of Mantoloking, N.J. 08738

Filed Dec. 21, 1987, Ser. No. 135,599
Int. Cl.[5] B66D *1/26;* B66C *23/00*
U.S. Cl. 254—279 7 Claims



1. A lifting mechanism for heavy covers of catch basins, street manholes, and the like, comprising:

a rigid frame;

wheels on said frame for moving said frame about on a surface;

winch means including at least two drums mounted on said frame, each drum having an irreversible worm drive, said worm drives being independent of each other;

cable means coupled to and operated by said winch means;

coupling means connected to said cable means and adapted to be coupled to a heavy cover to be lifted and moved about; and

surface-engaging means on said frame for securing a portion of said frame in place so that said frame can be pivoted on its wheel about said surface-engaging means as a pivot point.

4,928,928

GUARDRAIL EXTRUDER TERMINAL

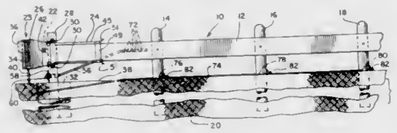
C. Eugene Buth; Asif Quresby, both of College Station; Hayes E. Ross, Jr., Bryan, and Dean L. Sicking, College Station, all of Tex., assignors to The Texas A&M University System, College Station, Tex.

Filed Jan. 12, 1988, Ser. No. 143,367
Int. Cl.[5] E01F *15/00*
U.S. Cl. 256—13.1 8 Claims

1. A highway guardrail system comprising a horizontally extending W-beam type guardrail mounted on a plurality of posts, and an extruder terminal connected to an end of said guardrail for engaging an impacting vehicle at the end of said guardrail, said terminal including a housing having an inlet for

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receiving the end of said guardrail, a squeezing extruder throat within said housing for telescoping over said guard rail and flattening the guardrail as said terminal is advanced longitudinally along the guardrail by an impacting vehicle, thereby dissipating energy to decelerate the impacting vehicle, and



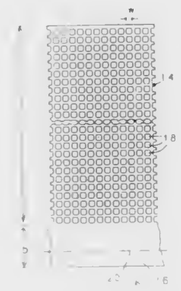
bending means extending laterally from said squeezing extruder throat for bending the flattened guardrail laterally away from the longitudinal axis of said guardrail so as to remote the flattened guardrail from the path of an impacting vehicle advancing said terminal along the guardrail.

4,928,929

CONSTRUCTION SAFETY NETTING

Jay Kinder, 37 - 10 Lenox Dr., P.O. Box 2635, Fair Lawn, N.J. 07410

Filed Feb. 5, 1988, Ser. No. 152,626
Int. Cl.[5] E04H *17/16*
U.S. Cl. 256—24 **27 Claims**



7. Construction safety netting comprising a flexible web in turn comprising:

a main portion provided with an array of apertures to form a lattice; and

a secondary portion including a substantially continuous toeboard strip integral with said main portion, said secondary portion further including means for attaching the netting to a substantially horizontal surface along said toeboard strip, at an edge thereof opposite said main portion, so that said toeboard portion is substantially contiguous with the horizontal surface to prevent small objects from passing along the horizontal surface beyond the safety netting.

4,928,930

BALUSTRADE

Yu-Kuei Chung, No. 15, Yung-An St., Feng-Yu City, Taiwan

Filed Nov. 2, 1989, Ser. No. 430,561
Int. Cl.[5] E04H *17/14*
U.S. Cl. 256—67 **3 Claims**

1. A balustrade comprising:

a top and bottom rail each of which has a face having a plurality of aligned grooves formed along a length thereof;

a plurality of plug members each of which includes a U-shaped portion having two arms and an open side, and two flap portions extending respectively from said two arms of said U-shaped portion in an opposite direction relative to said open side of said U-shaped portion, each of said plug members being fixed in said grooves of said rails with said open side of said U-shaped portion thereof facing said faces of said rails, each of said U-shaped portions of said plug members having a guiding slot with two enlarged ends formed therein; and



a plurality of balusters of equal length parallelly mounted between said top and bottom rails, each of said balusters having two end portions respectively and rotatably received in one of said U-shaped portions of said plug members on said top rail and one of said U-shaped portions of said plug members on said bottom rail, each of said end portions of said balusters having a retaining member fixed thereto which is slidably retained in said guiding slots to prevent said end portions of said balusters from separating from said plug members of said rails, so that an angle between said top rail and ea-h of said balusters can be adjusted by means of parallelly moving said top rail relative to said bottom rail.

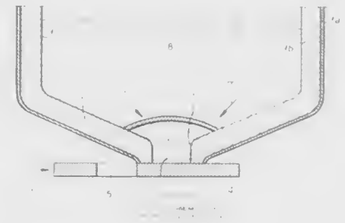
4,928,931

METHOD FOR CONTROLLING DISCHARGE OF STEEL FROM A CASTING LADLE

Heinz Dislich, Am Botanischen Garten, 8, 4100 Duisburg, and Horst Richter, Duisburg, both of Fed. Rep. of Germany, assignors to Heinz Dislich, Duisburg and Krupp Stahl, Bochum, both of, Fed. Rep. of Germany

Division of Ser. No. 735,957, May 20, 1985, abandoned. This application Sep. 20, 1988, Ser. No. 247,112
Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419306
Int. Cl.[5] C21B *7/12*
U.S. Cl. 266—45 **6 Claims**

1. A method for controlling the discharge of a steel melt from a casting ladle comprising filling the pouring spout of said ladle with a particulate filling mass consisting essentially of 50 to 70% by weight of chromium ore sand, 0.03 to 0.2% by weight iron oxide and the balance quartz sand intimately mixed together, forming a cap at an interface of said mass and said melt to support said melt in said spout, moving a slider to cover a mouth of said spout into an open position for discharging said



melt, and rupturing said cap by discharge of said mass from below said melt.

4,928,932

BAND CASTING-SETTING-BURN-CUTTING MACHINE IN A LINE-LIKE LAYOUT

Horst K. Lotz, Königstein-Johanniswald, and Günther Thomma, Wiesbaden-Delkenheim, both of Fed. Rep. of Germany, assignors to Aute Gesellschaft fuer autogene Technik mbH, Switzerland

Filed Jul. 1, 1988, Ser. No. 214,215
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3721685
Int. Cl.[5] B23K *7/02*
U.S. Cl. 266—58 **20 Claims**



1. A burn cutting apparatus for separating a piece from a sheet metal band having a pair of lateral edges, said burn cutting apparatus comprising:

a conveyor line for transporting said metal band;

a burn cutting machine moveably mounted to a pair of rails, said machine moveable by a motor along said pair of rails in a direction parallel to said conveyor line, said burner cutting machine having at least one burner arm moveable in a direction normal to the direction of movement of said metal band on said conveyor line, each said burner arm having a least one burner for cutting said metal band to separate said piece therefrom; and

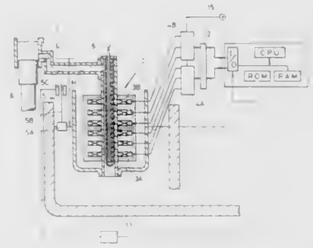
means for moving said burn cutting machine along said rails at a speed equal to the speed of said band moving along said conveyor, said means for moving comprising a first roller having an impulse generator, said roller mounted transversely across said conveyor line upstream of said burn cutting machine, said roller contacting said band, said impulse generator producing a predetermined number of impulses in response to a speed of movement of said roller, means for controlling the speed of said motor of said burn cutting machine in response to said predetermined number of impulses, said means for controlling measuring said number of impulses per unit of time to produce an electrical analog to control said motor to produce a rate of travel of said burn cutting machine equal to the speed of travel of said band.

4,928,933

ELECTROMAGNETIC MOLTEN METAL SUPPLY SYSTEM

Noriyuki Motomura, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha

Filed Apr. 3, 1989, Ser. No. 332,174
Int. Cl.[5] C21C *5/42*
U.S. Cl. 266—237 **3 Claims**



1. An electromagnetic molten metal supply system comprising:

a supply tube;

an electromagnetic pump, disposed in a furnace, for maintaining molten metal and for supplying a fixed quantity of molten metal through the supply tube, said pump including an exciting coil arrangement comprising a first exclusive coil for maintaining a surface of the molten metal in the furnace and a second exclusive coil for supplying the molten metal;

a first control device for controlling the first exclusive coil;

a second control device for controlling the second exclusive coil; and

a controller for supplying first and second control signals to said first and second control devices, said controller regulating a predetermined exciting current in accordance with the surface of the molten metal

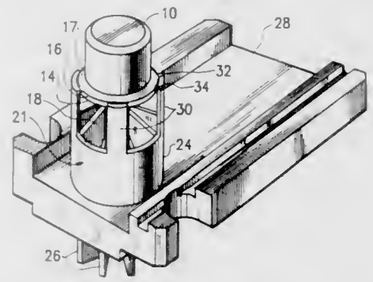
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4,928,934

POSITIVE RETENTION CHIP CARRIER

William D. Morton, Jr., Santa Clara, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 263,370, Oct. 27, 1988, abandoned. This application Jul. 27, 1989, Ser. No. 386,562
Int. Cl.[5] B65D *73/02*
U.S. Cl. 206—328 **13 Claims**



1. A carrier for an integrated circuit (IC) can, said can having a lower end, a plurality of electrical leads extending from the lower end, a stand-off projecting from the lower end, a

flange around the perimeter of the lower end, said flange having an upper surface, and a surrounding wall extending upward from the flange, the carrier comprising:

a base having a plurality of openings to receive said plurality of leads;

a support section projecting from the base, the support section having a top end for supporting the stand-off and a plurality of openings to receive said plurality of leads; and

at least three stiffly flexible arms projecting from the base and arranged in a generally symmetrical configuration to flex in opposition to each other and bear against the flange of an IC can inserted therebetween, the end of each arm having an inward projection with a lower surface which lodges against the upper flange surface of an IC can inserted between the arms to retain the can in the carrier, said projections extending inwardly from their respective arms by about 0.005–0.01 inch, said projections being tapered so that said arms terminate not more than about 0.02 inches above said lower projection surfaces, whereby substantially the entire surface of said surrounding wall is exposed for printing and said arms avoid substantial obstruction to the placement of printed information on said surrounding wall while the can is retained in the carrier, said projections bearing against the flange of an IC can when the can is inserted between said arms to flex said arms backward to admit the IC can.

4,928,935

MOUNTING ARRANGEMENT FOR AUTOMOTIVE ENGINE OR THE LIKE HAVING MULTIPLE VARIABLE ORIFICES

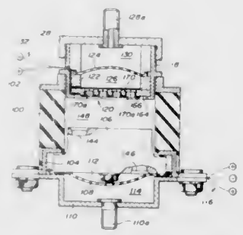
Shinichi Matsui, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Feb. 27, 1989, Ser. No. 315,925

Claims priority, application Japan, Feb. 29, 1988, 63-46542

Int. Cl.[5] F16F *9/34*

U.S. Cl. 267—140.1 9 Claims



1. A variable viscosity type vibration damper comprising:

first and second connection assemblies, said first and second connection assemblies being arranged to be connectable to first and second bodies, one of said bodies being subject to vibration;

a hollow elastomeric body, said hollow elastomeric body being fixedly connected with said first and second connection assemblies in a manner to define an enclosed space; and

first and second independent orifice units connected to said first and second connection assemblies respectively, said first and second orifice units being disposed in a manner to partition said enclosed space into a main fluid chamber and first and second auxiliary chambers respectively, said first and second orifice units including means for selectively and individually varying throttling effect provided thereby so that the throttling effect of one of said first and second orifice units can be varied independently of the other.

4,928,936

LOADING APPARATUS

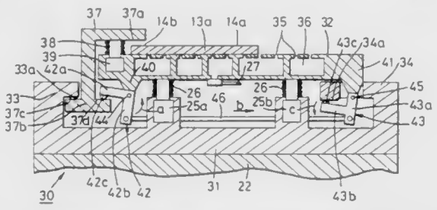
Yukibaru Ohkubo, Machida; Manabu Hosoya, Yokohama; Shinji Miura, Yokohama, and Yuichi Aoki, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 128,307, Nov. 24, 1987, abandoned. This application Sep. 12, 1989, Ser. No. 406,813

Claims priority, application Japan, Dec. 2, 1986, 61-287309; Dec. 18, 1986, 61-302421

Int. Cl.[5] B25B *1/22*

U.S. Cl. 269—73 13 Claims



1. An apparatus for loading a planar subject to be worked at a predetermined level, including:

(a) holding means operative to hold one end portion of the surface of said subject to be worked at a first level; and

(b) regulating means for detecting the thickness of said subject to be worked from the amount of operation of said holding means and regulating the other end portion of the surface of said subject to be worked to a second level on the basis of a result of said detection.

4,928,937

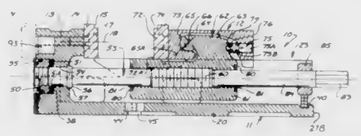
MULTI-PURPOSE MACHINE VISE

Leon M. Bernstein, Minneapolis, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Jun. 10, 1988, Ser. No. 205,465

Int. Cl.[5] B23Q *3/02*

U.S. Cl. 269—136 13 Claims



1. A machine vise having a cast unitary body, body including a base plate having side edge portions and end portions, said side edge portions having outer side surfaces, said outer side surfaces defining a plane, a fixed jaw block, and longitudinally extending rails for mounting a movable jaw, a movable jaw mounted on said rails, means for moving the movable jaw along the rails, said rails being spaced apart and extending from an end of the body adjacent the fixed jaw block toward a distal end, web means integral with the base plate for integrally supporting the rails, said web means having outer side surfaces spaced inwardly from the outer side surfaces of the base plate to provide a ledge around the periphery of at least substantial portions of the base plate, and said rails having rail side surfaces extending outwardly from the respective outer side surfaces of said web means to a position closely adjacent the planes of respective side surfaces of said base plate to provide a recess above the ledge at the side edge portions of the base plate, the fixed jaw and movable jaw having jaw side edge surfaces substantially coplanar with the planes of the base plate side surfaces; said rails comprising a pair of laterally spaced apart rails integrally formed with the base plate and webs and which overlie the base plate at the distal end of the base plate, and the rails each having machined surfaces on a lower side thereof facing toward the base plate and being substantially coplanar, the means for moving the movable jaw comprising a vise screw for actuating the movable jaw rotatably mounted on the body at the fixed jaw end and said vise screw carrying loads on the movable jaw under tension to the fixed jaw end of the body, said vise screw having a non-load carrying remote end portion extending outwardly from the movable jaw toward the distal end of the body, a housing for remotely mounting the remote end portion of the vise screw at the distal end of the body, said housing having surfaces that fit between the spaced apart rails for laterally positioning the housing and having machined shoulder surfaces that engage the machined lower side surfaces of said rails, and force generating screw means threaded through one of the housing and base plate and being threadable to act against a surface of the other of said housing and base plate to urge said machined shoulder surfaces of the housing upwardly to bear against the machined lower surfaces of said rails for compression loading, said housing having a lower end spaced upwardly from the base plate to leave an opening between the webs at the distal end of the base plate and being held on the body only by the compression loading between said housing and base plate.

4,928,938

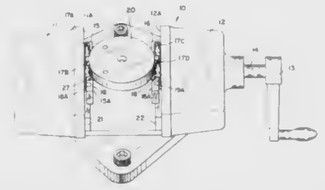
CLAMPING DEVICE

Leo R. Ross, R.R. #1, Box 333, Kendall Rd., Ashby, Mass. 01431-9770

Filed Apr. 13, 1989, Ser. No. 337,370

Int. Cl.[5] B23Q *1/04*

U.S. Cl. 269—261 9 Claims



1. Clamping means for holding a work piece between first and second parallel clamping surfaces that are movable relative to each other, said clamping means comprising:

i. a plurality of clamping members, each said clamping member having a stem portion and a collinear work piece engaging portions, and

ii. first and second support means for supporting said clamping members, each said support means having a planar surface and positioning means for capturing a said stem portion with a portion thereof being external to said support in a tangent plane that is displaced from and parallel to the said planar surface with each said work piece engagement portion being external to said support means whereby the clamping surfaces engage said clamping member stem portions along the tangent plane to move said work piece engaging portions into clamping engagement with the work piece.

4,928,939

LOCATOR AND CLAMPING MEANS FOR A JUG FIXTURE

Michael G. Bell, 9435 Flower St., #125, Bellflower, Calif. 90706, and Robert L. Stevens, 4605 Silver Tip Dr., Whittier, Calif. 90601

Filed Aug. 3, 1989, Ser. No. 389,167

Int. Cl.[5] B23Q *1/08*

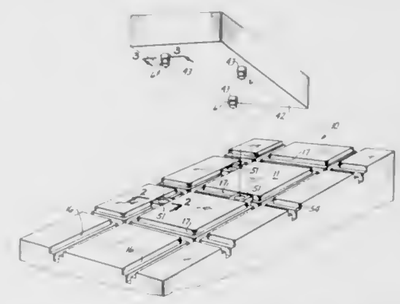
U.S. Cl. 269—309 5 Claims

1. In combination, a dowel and a key adopted to be used to secure a jig onto a flat-surface bed of a machine tool wherein said jig has a flat surface and at least one accurately positioned bore having an opening at said flat surface and said bed having a plurality of longitudinal grooves disposed criss-crossing a plurality of transverse grooves formed in the flat surface thereon;

said dowel being symetrical about an axis and disposed removeably fixed and partially within said bore on said jig leaving a portion extending from said flat surface, and

said portion extending from said flat surface having a smaller diameter at its exposed end than its diameter adjacent said jig; and

said key being disposed within one of said grooves and having a pair of opposing sides spaced apart a sufficient



distance so that said key is capable of sliding along said groove, and

said key having a symetrical hole formed therein wherein the diameter of said hole adjacent said top surface is larger than the diameter of said hole extending into said groove;

said dowel includes means for fixing and removing said dowel to and from said bore, said means comprising:

said dowel having an axially aligned well and having a pair of axially aligned slots disposed on opposite sides thereof, and

means dispsoed within said well for forcing said slots open while said dowel is disposed within said bore and fixing said dowel therein.

4,928,940

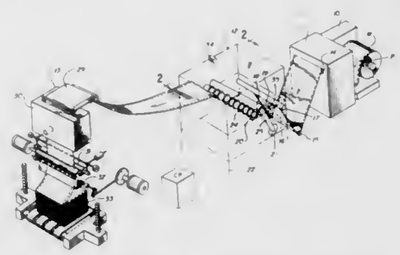
APPARATUS AND METHOD FOR PRINTING SEPARATING CONTINUOUS FORMS INTO FOLDED DISCRETE JOBS INCLUDING ACCUMULATOR

Thomas E. Dash, Aurora, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Filed Feb. 6, 1989, Ser. No. 306,100

Int. Cl.[5] B41F *13/54*

U.S. Cl. 270—1.1 5 Claims



1. A method of printing and separating continuous forms into discrete jobs from a single moving web comprising the steps of advancing said web through a printer at a predeter-

mined speed and thereafter through a job separator at a speed higher than said predetermined speed, cyclically interrupting the advance of said web through said job separator to develop separate stacks of folded web, during said interruption accumulating a length of said web in random loops arrangement in bin means interposed between said printer and said job separator, and sensing the level of the random loops in said bin means for controlling said printer and job separator.

4,928,941

SHEET SORTER WITH STAPLER

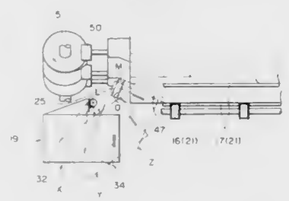
Nobutaka Uto, Yokohama; Hironori Shido; Jun Saito, both of Kawasaki; Masakazu Hiroi, Yokohama; Kenji Kobayashi, Tokyo; Koichi Murakami, Yokohama, and Masataka Naito, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,118

Claims priority, application Japan, Jul. 9, 1987, 62-172681; Jul. 30, 1987, 62-191934; Jul. 30, 1987, 62-191936; Aug. 10, 1987, 62-200288; Aug. 10, 1987, 62-200289

Int. Cl.[5] B42B *1/02*

U.S. Cl. 270—53 15 Claims



1. A sheet sorting apparatus with a stapler, comprising:

a plurality of bin trays which are arranged substantially vertically with predetermined clearances between adjacent bin trays, which are inclined to provide an inclined sheet receiving surface and which are independently movable substantially in the vertical direction;

bin tray shifting means for moving said plurality of the bin trays stepwisely substantially in the vertical direction to oppose the respective bin trays to a sheet inlet of said sorting apparatus, while expanding the clearance between the bin tray opposed to the sheet inlet and an upper adjacent bin tray to provide a larger clearance than said predetermined clearances;

a shaft extending substantially perpendicularly to an extension of the inclined sheet receiving surface; and

stapling means, supported rotatably about said shaft and having a stapling head movable to above the sheet receiving surface in a lateral direction by rotation about said shaft and an anvil movable to below the sheet receiving surface by the rotation, for stapling the sheets interposed between the stapling head and the anvil;

wherein said bin trays are so disposed that between those ends of adjacent ones of said bin trays which are closer to the sheet inlet are deviated in the direction of movement of the sheet when seen in a direction substantially perpendicular to the sheet receiving surface, and wherein the stapling head is laterally moved using a space provided by the deviation, and wherein said expanded clearance is smaller than a height of the stapling head.

4,928,942

DEVICE FOR FEEDING FLATTENED BOXES IN PACKAGING MACHINES

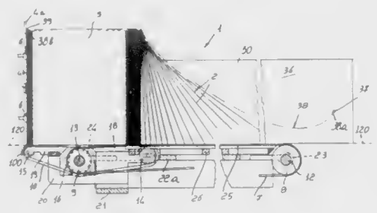
Franco Aiuola, Bologna, and Herbert Rueff, Casalecchio Di Reno, both of Italy, assignors to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

Filed Apr. 19, 1988, Ser. No. 183,210

Claims priority, application Italy, Apr. 24, 1987, 3446A/87

Int. Cl.[5] B65H *39/04*

U.S. Cl. 210—58 18 Claims



1. A device for feeding flattened boxes from a folding-pasting machine to a packaging machine, said device comprising;

a supporting framework,

at least one box magazine mounted on said framework and defining a box inlet zone, whereat flattened boxes are laid substantially horizontally and sequentially superimposed and a box extraction zone,

abutment means located at said extraction zone for positioning boxes substantially vertically at said extraction zone of said magazine, and means for conveying flattened boxes from said box inlet zone to said box extraction zone,

wherein said means for conveying flattened boxes from said box inlet zone to said box extraction zone upwardly define a single uninterrupted linear advancement plane, and wherein said means for conveying flattened boxes from said inlet zone to said box-extraction zone comprise;

first drive means,

a first drive shaft rotatably associated with said framework and being driven by said first drive means,

at least two drive pulleys keyed to said first drive shaft,

intermittent drive means,

a second drive shaft rotatably associated with said framework and being driven by said intermittent drive means,

at least two return pulleys rotatably idly journalled on said second drive shaft,

at least two belts trained around said drive pulleys and said return pulleys and each defining a closed-loop formation,

at least one frame fixed to said fixed framework,

at least two guides supported by said frame,

a plurality of toothed wheels supported by each of said guides and including at least one first toothed wheel and at least one second toothed wheel,

at least one chain trained around each said plurality of toothed wheels, each said chain defining a closed-loop configuration having a central portion,

at least two drive gears keyed to said second drive shaft and engaging said central portion of said closed-loop formation of each said chain, in meshing engagement relationship therewith,

and wherein said guides each rotatably support at least one first toothed wheel and at least one second toothed wheel, and upwardly slideably support at least a portion of said closed-loop configuration defined by each of said chains.

4,928,943

SHEET FEEDING ARRANGEMENT

Toshiki Nishibori, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 2, 1988, Ser. No. 265,919

Claims priority, application Japan, Nov. 9, 1987, 62-282816

Int. Cl.[5] B65H *5/22*

U.S. Cl. 271—4 12 Claims



1. A sheet handling apparatus for copying and transporting sheets which comprises:

an image processing apparatus containing an image processing face,

a sheet processing device disposed above said image processing face and operative to move toward and away from said image processing face,

a sheet transport device including a pair of wrapping connector driving devices constituted by a combination of chains and sprockets, said sheet transport device turning on itself to form a loop which passes between said image processing apparatus and said sheet pressing device in sequential, opposite directions,

a driving means for driving the sheet transport device,

a sheet gripping means connected to said wrapping connector driving device for gripping the edges of the sheet being transported,

a sheet pickup means for successsively selecting the sheets, one-by-one, for distribution to the sheet gripping means,

and a sheet discharge device for receving and transporting sheets received from the sheet transport device, whereby the front and reverse surfaces of said sheet can be successively brought into close contact with the image processing face through the use of the sheet pressing device.

4,928,944

HIGH SPEED SHEET FEEDER SINGULATOR

Roman M. Golicz, Clinton, Conn., assignor to Intelligent Technologies Corporation, Chester, Conn.

Filed Dec. 19, 1988, Ser. No. 286,608

Int. Cl.[5] B65H *5/22;* **B25B** *1/02*

U.S. Cl. 271—6 17 Claims

1. A high speed sheet feeder comprising:

a supporting base having a feed end and a delivery end,

an upstanding feed pedestal mounted at the feed end of the base and slanting steeply downward toward a central portion of the base,

a supply ramp mounted on and spaced above the base, slanting downward toward the feed pedestal and defining therewith a feed slot region therebetween,

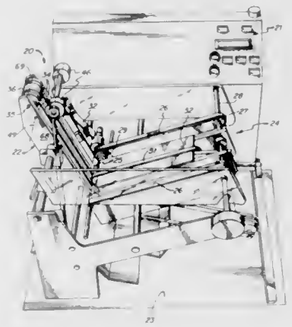
sheet supply means mounted on the supply ramp and positioned to support a large plurality of individual sheets stacked as a brick thereon with their edges facing the supply ramp and with the face of the forwardmost sheet leaning against the pedestal above the feed slot region,

a pair of endless flexible feed belts mounted on power-driven roller means on the pedestal with substantially straight and parallel portions of their respective outer traction surfaces spaced apart along descending paths facing said forwardmost sheet, defining a feed plane, and traveling in synchronism downward toward the feed slot region,

a downwardly curving central singulator positioned at the feed end of the supply ramp extending across the feed slot region and the feed plane between the pair of feed belts, and presenting a traction face to the side of the forwardmost sheet opposite to said feed belts' traction surfaces,

an endless flexible discharge belt mounted on power-driven roller means, below the feed slot region, having a downwardsloping upward-facing traction run crossing the feed plane below the supply ramp, midway between the descending feed belt paths,

a discharge pinch roller rotatably mounted beneath the supply ramp tractively engaged with and depressing the traction run of the discharge belt to produce tractive engagement thereof with the pinch roller over an arcuate sector of the pinch roller leading to a delivery path extending between the base and the supply ramp toward the delivery end of the base,



and means driving the discharge belt's traction run at a substantially faster linear velocity than the velocity of the synchronized feed belts traveling downward in the feed plane,

whereby each forwardmost sheet of the brick of stacked sheets in turn is tractively engaged by the feed belts with its lower edge arched between the feed belts by the singulator, thereby breaking the fibre-lock friction bond between the forwardmost sheet and its next adjacent sheet, and whereby the forwardmost sheet is propelled downward edgewise by the synchronized feed belts along a feed path substantially coinciding with the feed plane, with the centered discharge belt receiving and guiding its lower edge between the discharge belt and the discharge pinch roller, through the arcuate sector of their tractive engagement, thereby propelling the sheet along the delivery path.

4,928,945

SHEET COLLATING MACHINE WITH AUTOMATIC DOUBLE FEED PREVENTION

Terje Söderberg, Lidingo; Rolf Södersteen, Enskede, and Ulrik Töreman, Bandhagen, all of Sweden, assignors to Plockmatic International AB, Stockholm, Sweden

Filed Mar. 15, 1989, Ser. No. 323,704

Claims priority, application Sweden, Mar. 15, 1988, 8800939

Int. Cl.[5] B65H *7/18, 3/06, 1/04*

U.S. Cl. 271—9 7 Claims

1. A device for collating sheets in an elongated sheet collating machine, comprising:

a conveying path (**3**),

a conveying belt (**5**), and

conveying members,

said conveying members comprising a plurality of conveying and press rollers (**4**) along one side of which a corre-

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sponding plurality of backing rollers (**6**) are disposed, said conveying members being disposed along said conveying path,

a plurality of bins (**1**),

said bins being located in a longitudinal direction of the machine below said conveying path and being disposed for holding sheets of paper in the form of stacks (**2**),

said conveyor belt running between said conveying and press rollers and said backing rollers, with one of said conveying and press rollers being disposed after each individual bin,

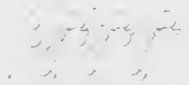
a plurality of feed-up devices (**7**),

a plurality of feed-up wheels (**8**), and

a plurality of drive means (**16–22**) individually connected to said feed-up wheels,

said feed-up devices each comprising a lifting device (**23**) and at least one of said feed-up wheels, and being individually disposed at an associated one of said bins,

each feed-up device being pivotal between a lowered position, in which said at least one feed-up wheel engages a respective stack of sheets for feeding up one sheet at a time towards said conveying path, and a raised position, in which said at least one feed-up wheel is disengaged from said stack, and being at said associated bin connected to an associated one of said drive means disposed at said associated bin,



a control device,

each of said lifting devices being individually connected (**24**) to an associated one of said drive means and to said control device for individually causing said associated drive means together with said lifting device to lift the associated feed-up device to a raised position,

a plurality of sensors in the form of microswitches (**12**),

said control device being connected to said sensors, and a plurality of spring members (**11**),

said spring members extending across said conveying path,

said microswitches being individually maintained actuated by an associated one of said spring members when no sheet protrudes between a respective press roller and said conveyor belt,

each spring member being moved from contact with the associated sensor when a sheet passes the latter,

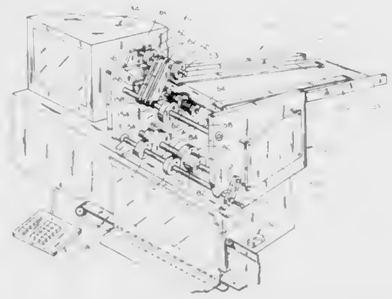
and each of said sensors delivering, when a sheet is not advanced within a predetermined period, a signal to said control device for automatically causing said associated drive means to lift the associated lifting device and feed-up device to said raised position, and wherein each of said drive means comprises a reversible electric motor (**17**), which is connected to at least one of said feed-up wheels over a drive shaft (**16**) and a power transmission, with a member (**18**) in the power transmission being connected to said drive shaft via a first free wheeling hub (**19**).

4,928,946

VERTICAL FEED MECHANISM FOR DOCUMENTS

Eduard Svyatsky, Chicago; Jerry W. Loftis, Libertyville, and Thomas Faber, Skokie, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed May 25, 1988, Ser. No. 198,474
Int. Cl.[5] B65H *5/06*
U.S. Cl. 271—10 **18 Claims**



1. An improved document feed mechanism for feeding documents in a vertical direction through at least two stations including means for shingling said documents in at least one station by having successive ones of said documents overlap one another a predetermined amount to thereby compress the amount of vertical space required for the feeding operation as opposed to the space that would be required if said documents were fed top edge to bottom edge, respectively, while exposing indicia on a document in at least one of said stations, said feed mechanism further including means for delivering documents to said feed mechanism located at an upper elevation and means for transporting documents away from said feed mechanism at a lower elevation, and said feed mechanism controlling and moving said documents between said elevations through a plurality of stations, at least one in-feed roller for moving a facing document downwardly from the end of an edge-stacked stack of documents being moved broadside by said delivery means towards said feed mechanism, said feed mechanism also including as one of said plurality of stations a separation station that insures that only one document is moved downwardly from said stack by said at least one in-feed roller, one of said plurality of stations being a pre-conditioning station having a drive roller that moves a separated document with a predetermined torque and coefficient of friction against one face of said document, guide diverter means acting on the other face of said document to move said document to a predetermined offset location relative to its predetermined vertical path through said feed mechanism.

4,928,947

SHEET FEEDERS FOR SOFT COATED SHEET MATERIAL

Jack Beery, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 125,841, Nov. 27, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 271,485
Int. Cl.[5] B65H *3/02*
U.S. Cl. 271—24 **2 Claims**

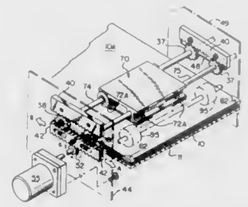
1. In a sheet feed mechanism in which single sheets which have a soft of pressure sensitive coating are selectively fed in a feed direction from the top of a tray of such sheets, the improvement to prevent scuffing or marking of the sheet immediately underlying the top sheet being fed, comprising:

sheet feed means positioned adjacent the top of said tray, said sheet feed means including a pad support body,

a pad of elastomer material mounted on a bottom surface of said support body, and defining a lower generally planar sheet-engaging surface,

said pad being relatively thin and having a length in said feed direction, which is a substantial multiple of the thickness of said pad to provide rigidity of said pad in said feed direction,

drive means for said pad support body including a generally vertically oriented slot extending transversely through said body adjacent a leading edge thereof in relation to said feed direction,



a drive shaft received in said slot movable against a wall of said slot in said feed direction while permitting the weight of said pad support body to rest on a top sheet in said tray of sheets, and

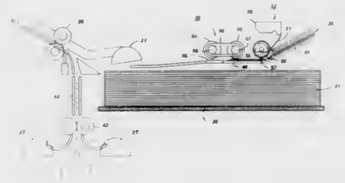
means for moving said shaft in said feed direction against said slot wall to carry said pad support body in said feed direction without inducing any substantial tipping force on said pad.

4,928,948

FEEDER REVERSING DRIVE

Donato D. Evangelista, Webster; Norman E. LaTour, Rochester, and Bobby Kirven, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 23, 1989, Ser. No. 327,500
Int. Cl.[5] B65H *7/00, 3/06, 3/04, 3/52*
U.S. Cl. 271—110 **14 Claims**



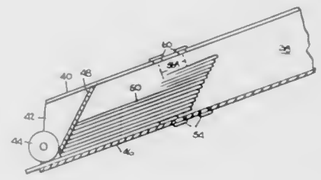
1. Apparatus for feeding sheets comprising a surface over which a sheet may be fed, means for feeding sheets over said surface comprising at least one feed roll rotatably driven in the feeding direction, at least one nudger roll upstream of said feed roll for urging a sheet to be fed toward said feed roll, said at least one nudger roll being pivotally supported about said at least one feed roll, drive means to rotate said feed roll in the feeding direction, an endless belt drive means to couple the rotational movement of said feed roll to said nudger roll, means responsive to identified feeding conditions to stop said drive means and terminate the rotation of said feed roll in the feeding direction and means to reverse the direction of rotation of said feed roll whereby the endless belt drive coupling reverses the direction of rotation of the nudger roll and creates a drive torque on the nudger roll which urges it upwardly away from said feed surface.

4,928,949

LOW PAPER INDICATOR

James S. Ramsey, Shelton, and John L. Lorenzo, Southbury, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 30, 1988, Ser. No. 292,052
Int. Cl.[5] B65H *7/00, 43/00*
U.S. Cl. 271—111 **12 Claims**



1. A document feeder having a detector arrangement for detecting a partially depleted supply of documents, said detector arrangement comprising:

a feeder having a support surface for supporting a supply of documents in a stack,

means for aligning the stack of documents so that trailing edges of the documents form an acute angle with said support surface, and

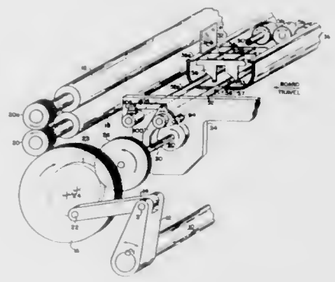
sensing means mounted in said feeder for sensing a partial supply of documents, said sensing means being positioned wherein when said feeder has a fully supply of documents said sensing means is between the trailing edges of a bottom document and a top document in the stack of documents.

4,928,950

ROTARY TYPE FEEDER MACHINES AND METHODS

Louis M. Sardella, 19 Pickburn Ct., Cockeysville, Md. 21030

Continuation of Ser. No. 936,953, Dec. 1, 1986, which is a continuation of Ser. No. 674,294, Nov. 23, 1984, abandoned. This application Aug. 3, 1988, Ser. No. 228,399
Int. Cl.[5] B65H *3/06*
U.S. Cl. 271—112 **11 Claims**



1. A method of making a lead edge feeder which feeds corrugated paperboard individually from the bottom of a stack of corrugated paperboard without the need for a complex indexing transmission, comprising the steps of:

(a) connecting a rocker shaft to a rocker gear by means for rotating said rocker gear in a feed direction and then in a direction opposite to said feed direction;

(b) coupling said rocker gear to rotatingly drive feed means alternately in said feed and opposite directions; and

(c) providing means to intermittently move the stack of corrugated paperboard and the feed means relative to each other so that initial contact between a lowermost sheet of corrugated paperboard to be fed and the feed means occurs when the feed means are rotating in said direction opposite to said feed direction.

4,928,951

AUTOMATIC PAPER FEED DEVICE

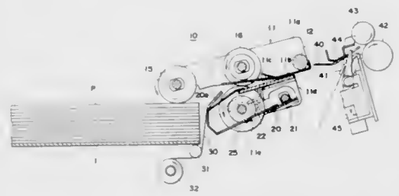
Kazuyuki Fukui, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1988, Ser. No. 261,993

Claims priority, application Japan, Oct. 28, 1987, 62-272885

Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—113 9 Claims



1. An automatic feed device for feeding sheets from a stack thereof one at a time in a sheet feed direction, said device comprising:

a feed frame including a shaft having an axis of rotation about which said feed frame is pivotally supported in the device;

a first feed roller rotatably supported by said feed frame about an axis of rotation of said first feed roller spaced from the axis of rotation of said feed frame;

a second feed roller rotatably supported by said feed frame about an axis of rotation of said second feed roller spaced from the axis of rotation of said feed roller, said second feed roller disposed downstream of said first feed roller with respect to the feed direction in which sheets are fed in the device;

a separating roller, and a support means rotatably supporting said separating roller in the device in pressing contact with said second feed roller, said support means operatively engaged with said feed frame in a manner in which said separating roller supported by said support means moves in conjunction with pivotal movement of said feed frame in the device about the axis of rotation of said feed frame; and

guide means disposed adjacent said separating roller for guiding sheets in the feed direction in the device to the nip between said second feed roller and said separating roller in pressing contact therewith.

4,928,952

MECHANICAL DOCUMENT FEED APPARATUS

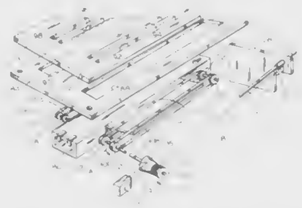
Eduard Svyatsky, Chicago, Ill., assignor to Bell & Howell Co., Chicago, Ill.

Filed Oct. 16, 1987, Ser. No. 109,491

Int. Cl.[5] B65H *1/02*

U.S. Cl. 271—150 1 Claim

1. In a document feed system including means for advancing a stack of documents arrayed in a feed tray towards a document removal assembly disposed at one end of said feed tray for removing documents one at a time from said stack of documents in said feed tray, said means for advancing said stack of documents including belt means disposed at the bottom of said feed tray and in contact with said stack of documents, said belt means extending around first and second pulley means, one of said pulley means being rotated by a shaft, spool means connected to said shaft, said spool means having a constant diameter section and a variable diameter section, back plate means movably supported by said feed tray means for movement along said feed tray mean and disposed in abutting relation to the last document in said stack of documents to apply a compressive force to said stack of documents, linkage means connecting said back plate means to said constant diameter portion of said spool means, said variable diameter section of said spool means being connected to a constant force power source which applies a variable pressure force to said back plate



means through said variable diameter section of said spool means and said linkage means as said back plate advances in said feed tray means at a constant rate of speed and said constant force power source drives said belt means at said constant rate of speed, whereby said back plate and said belt means advance at the same rate of speed toward said document removal assembly as the pressure force applied by said back plate to said stack of documents decreases progressively as said stack of documents becomes shorter.

4,928,953

ROTARY SHEET FEEDER

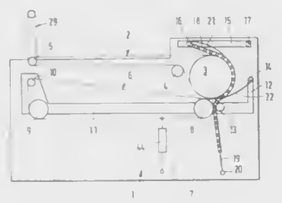
Karl-Fritz Heina, Murrhardt; Horst Schwarz, and Wolfgang Weber, both of Grosserlach, all of Fed. Rep. of Germany, assignors to Maschinenbau Oppenweiler Binder GmbH & Co., Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 239,199

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732419

Int. Cl.[5] B65H *29/00*

U.S. Cl. 271—185 11 Claims



1. A rotary sheet feeder comprising:

(a) a feeder frame;

(b) an upper feeder table mounted on said feeder frame for carrying imbricated stacks of sheets into the rotary sheet feeder, said upper feeder table comprising a first endless belt conveyor, a reversing drum mounted for rotation about a drum axis and at least one roller, said first endless belt conveyor being wound around said reversing drum and roller and having a delivery zone below said reversing drum;

(c) flexible guide means having an upper end and a lower end and being disposed about the periphery of said reversing drum for pressing said stacks of sheets against said first endless belt conveyor as it travels around said reversing drum;

(d) means for supporting the upper end of said flexible guide means above said upper feeder table;

(e) tensioning means attached to the lower end of said flexible guide means for tensioning said flexible guide means;

(f) a withdrawal table which is pivotably mounted on said feeder frame at a pivot axis which is parallel and spaced apart from said drum axis, said withdrawal table being disposed below said reversing drum for receiving imbricated stacks of sheets from said delivery zone and carrying them out of the delivery zone, said withdrawal table comprising at least two further rollers and a second endless belt conveyor wound around said further rollers, one of said further rollers being located adjacent said delivery zones;

(g) means for urging said withdrawal table upwardly towards said reversing drum; and

(h) further support means mounted on said withdrawal table adjacent said delivery zone for supporting a portion of said flexible guide means intermediate said upper and lower ends, said portion of said flexible guide means curving away from said reversing drum around said further support means between said one further roller and said further support means.

4,928,954

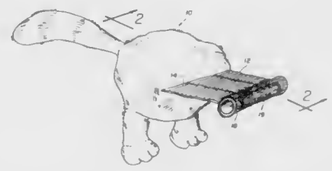
NOVELTY FIGURE WITH ATTACHMENT MEANS

Anthony H. Levine, Tarzana, and Eduard A. Jaeger, Encino, both of Calif., assignors to Krushed Kritter Kompany of California, Inc., Tarzana, Calif.

Filed Apr. 18, 1988, Ser. No. 182,426

Int. Cl.[5] A63J *5/00*

U.S. Cl. 272—8 N 2 Claims



1. A novelty device comprising: (a) a portion of a recognizable object having an end that appears to be missing; (b) a flexible band of material having a first end and a second end said first end of said flexible band being attached to said portion of the recognizable object that appears to be missing; (c) a restraining member comprising a tubular member attached to said second end of said flexible band of material.

4,928,955

TOY HAVING SLIDING RAIL

Chuan-Tien Chuang, No. 40, Lane 174, Ta Hsin St., Tainan, Taiwan

Filed May 25, 1989, Ser. No. 356,556

Int. Cl.[5] A63H *13/20*

U.S. Cl. 272—31 R 4 Claims

1. A toy comprising:

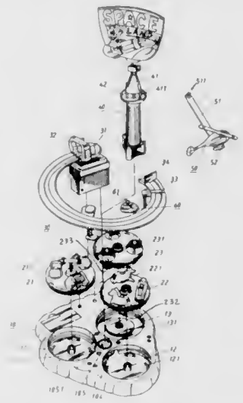
a base adapted to receive a power means; a curved sliding rail mounted above said base, and including a first end having a platform and an adjacent separating means and a second opposite end having a stopping means and an adjacent obstacle means;

a tower secured on said base and having thereon a waved continuous guiding surface;

a shaft rotatably mounted in said tower and adapted to be driven by said power means;

a flying piece having a carrying means and an extended arm which is pivotally attached to said shaft and guided to revolve along said wave guiding surface; and

a sliding piece supportable by said platform including means engagable by said carrying means so as to be capable of



being carried by said flying piece when it stops at said stopping means to fly over said obstacle means and capable of being separated by said separating means from said carrying flying piece to drop down on said sliding rail to slide to said stopping means.

4,928,956

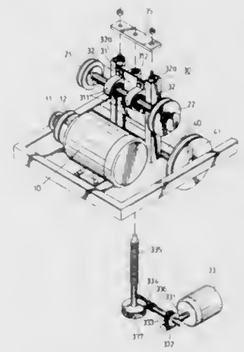
SPEED-ADJUSTING MECHANISM OF A TREAD MILL

Chao-Yang Chen, No. 585, San Feng Rd., Feng-Yuan City, Taiwan

Continuation-in-part of Ser. No. 121,355, Nov. 16, 1987, Pat. No. 4,792,134. This application Sep. 13, 1988, Ser. No. 244,046

Int. Cl.[5] A63B *23/06;* **F16H** *9/12*

U.S. Cl. 272—69 5 Claims



5. A speed adjusting transmission mechanism for adjusting the speed of a rotative belt of a tread mill which comprises

a driving motor having an output shaft,

a driven shaft associated with said rotative belt,

a transmission shaft provided between said output shaft and said driven shaft,

a pair of spaced apart vertical guide supports each of which has a vertical rail groove,

a shaft holding means mounted slideably on said guide supports and carrying said transmission shaft, said means

being movable along said rail groove to increase or decrease distances between said transmission shaft and said output and driven shafts,

a first pulley mounted on said output shaft,

a second pulley mounted on a first end of said transmission shaft,

a third pulley mounted on a second end of said transmission shaft,

a fourth pulley mounted on said driven shaft,

a first V-belt passing over said first pulley and said second pulley,

a second V-belt passing over said third pulley and said fourth pulley,

at least one of said pulleys having a structure including two cone-shaped discs, one of which is slideable relative to the other, and

means for displacing said shaft holding means, thereby to change a distance between said transmission shaft and at least one of said output and said driven shaft and to position at least one of said first and second V-belts more or less deeply into at least one of said pulleys,

whereby said fourth pulley is rotated at slower or faster speeds, to drive the rotative belt at slower or faster speeds.

4,928,957

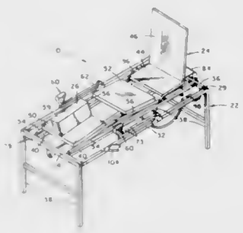
EXERCISE APPARATUS FOR ACTIVELY EXERCISING THE UPPER BODY WHILE PASSIVELY EXERCISING THE LOWER BODY

Joel P. Lanier, Nashville; Tamuel A. Hall, Chattanooga, and Kent R. Moore, Hixson, all of Tenn., assignors to University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Dec. 2, 1988, Ser. No. 279,470

Int. Cl.[5] H63B *69/06*

U.S. Cl. 272—72 6 Claims



1. Exercise apparatus for actively exercising the upper body of the user while passively exercising the lower body of the user comprising:

a frame;

a seat mounted upon the frame for generally horizontal movement relative thereto between forward and rearward positions, said seat having a bottom portion for supporting the buttocks of the user and a back portion for supporting the user's back in an upright position when the user is seated upon the bottom portion;

leg-supporting means disposed forwardly of the seat including two elongated sections for separately supporting a corresponding one of the upper and lower leg portions of at least one leg of the user, one of said two sections being connected at one of its ends to the seat for hinged movement relative thereto about a first pivot axis, the other of said two sections being connected at one of its ends to the frame for hinged movement about a second pivot axis, and said two sections being connected to one another at the ends thereof opposite said first and second pivot axes for hinged movement relative to one another about a third pivot axis so that when the user is operatively seated upon the seat with his leg operatively supported by the leg-supporting means and the seat is moved forwardly and rearwardly relative to the frame, said two sections hingedly move relative to one another, said one section hingedly moves relative to the seat and said other section hingedly moves relative to the frame in a manner effecting a folding and unfolding of the two sections and a bending of the user's leg supported by the leg-supporting means at the waist and at the knee; and

handgrip means fixed in a stationary condition with respect to said frame and at about the same horizontal level as the chest of the user when the user is seated upon the seat enabling the user to push and pull upon the handgrip means with his arms to alternately extend his arms from and pull in his arms toward his chest as his hands are maintained at about chest level and to effect forward and rearward movement of the seat along the frame as the user's hands move away from and toward the user's chest and the direction of pressure applied upon the handgrip means from the hands is generally parallel to the direction of movement of the seat along the frame so that the action of the user's upper body simulates a rowing action and so that the hinged movement of said two sections of the leg-supporting means effects a bending of his supported leg at the waist and knee.

4,928,958

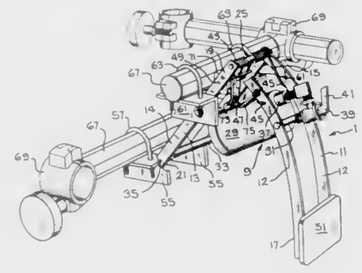
EXERCISE DEVICE

Jeffrey J. Sabin, Rossford, Ohio, assignor to Medical College of Ohio, Toledo, Ohio

Filed Mar. 7, 1988, Ser. No. 165,040

Int. Cl.[5] A63B *21/008*

U.S. Cl. 272—96 13 Claims



1 An exercise device for the soleus muscle of the lower extremities to reduce deep vein thrombosis as a complication for both trauma and post-operative patients that can be mounted on a support comprising:

a frame having a first leg and a second leg, said first and second legs each having a first end and a second end, said first end of said first and second legs being pivotally connected;

a means for providing resistance being connected to the first and second legs, said resistance means having a cylinder with a movable piston positioned in the cylinder and a rod connected to the piston and extending from the cylinder, the cylinder being connected to said second leg of said frame and said rod being connected to said first leg, a discharge port positioned in said cylinder on the side of said piston that is opposite to the side of said piston where said rod is connected, whereby advancing said second end of said first leg towards said second leg causes said piston to move in said cylinder and to discharge fluid from said discharge port to provide resistance to the movement of said second leg;

a resilient member connected to said second leg, said resilient member acting to move said second end of said first leg away from said second leg;

a control means for varying the resistance of said resistance means, said control means being a valve that is operatively connected to said discharge port, said valve controlling the effective opening of said discharge port to control the resistance provided by said resistance means; and,

means for mounting said frame to a support.

4,928,959

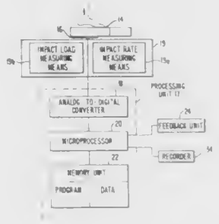
METHOD AND DEVICE FOR PROVIDING ACTIVE EXERCISE TREATMENT FOR A PATIENT SUFFERING FROM A BONE DISORDER

C. Andrew L. Bassett, and Ian A. Cook, both of Bronxville, N.Y., assignors to Osteo-Dyne, Inc., Charlotte, N.C.

Filed Dec. 16, 1988, Ser. No. 285,420

Int. Cl.[5] A63B *23/04*

U.S. Cl. 272—96 21 Claims





6. A device for providing active exercise treatment for increasing the amount, strength and proper anatomical distribution of skeletal tissue in a patient suffering from a bone disorder by causing a desired impact load value to be imparted to the patient at a desired impact rate value such that the impact at the desired load value and rate value causes said patient's skeletal tissue to generate an electrical signal having the majority of its energy between 0.1 Hz and 100 KHz, with notable energy distribution in the range of 6 to 16 Hz, the device comprising:

impact generating means for producing an impact load to the patient along the axis of a bone experiencing the bone disorder when struck by the patient;

sensing means, operatively connected to said impact generating means, for forming an impact signal indicating the impact load generated when the impact generating means is struck by the patient;

measuring means including impact load measuring means, coupled to said sensing means, for receiving the impact signal from the sensing means and measuring the impact load generated from said striking of said impact generating means; and impact rate measuring means, coupled to said sensing means, for receiving the impact signal from the sensing means and measuring the rate of striking said impact generating means by said patient;

processing means, coupled to said impact load measuring means and to said impact rate measuring means, for comparing the measured impact load with said desired impact load values and for comparing the measured impact rate with the desired impact rate values to determined a success indicator value indicating the difference between said desired impact load and impact rate values and the measured impact load and impact rate values;

feedback means, coupled to said processing means, for converting said success indicator value to feedback perceivable by said patient in the active exercise treatment; and

recording means, coupled to said processing means, for recording said determined success indicator value of the active exercise treatment.

4,928,960

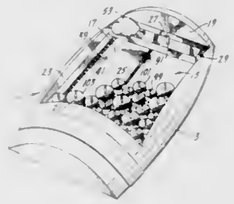
LATCH & LATCH RELEASE MECHANISM FOR A GAME

Gordon A. Barlow, Highland Park, Ill., assignor to Gordon Barlow Design, Skokie, Ill.

Filed Jun. 5, 1989, Ser. No. 361,570

Int. Cl.[5] A63F *9/00*

U.S. Cl. 273—1 CG 1 Claim



1. In a game having a sliding bar biased for movement in one direction across a base and adapted to be held stationary only by engagement with an entrapped matrix of playing pieces located on the base, an indicator means carried on said sliding bar and formed and adapted to swing to an upright position when said sliding bar moves from a stationary position, a signal means including an indicator pivotally mounted on the sliding bar for movement between a generally horizontal and a generally upright position, means to bias said indicator to said upright position, latch means carried by said indicator and engageable with said sliding bar to hold said indicator in its horizontal position, a trip mechanism to release said latch means when said sliding bar moves in its biased direction, said trip mechanism including a finger formed on said indicator and engageable with any one of a series of teeth formed on said base to tilt the indicator and release the latch from the sliding bar when the bar moves in its biased direction, the improvement comprising:

a trip finger mounted for vertical movement between a tooth-engaging position and a tooth-clearing position to permit the indicator to be latched to the sliding bar in any position of the sliding bar relative to the teeth

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4,928,961

WEIGHT LIFTING APPARATUS

Raymond Madden, 222 Woodcroft Rd., Baden, Pa. 15005

Filed Sep. 30, 1988, Ser. No. 252,163

Int. Cl.[5] A63B *13/00*

U.S. Cl. 272—123 14 Claims

1. A bench press apparatus comprised of a back and a pair of sides attached to the back each side comprised of:

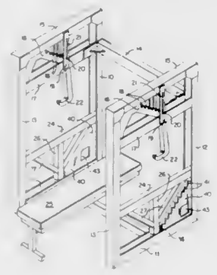
a. a base;

b. a top;

c. at least one upright attached to and between the base and the top; and

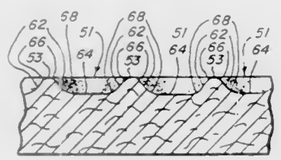
d. a hook having a mouth of sufficient size to hold one end of a barbell at a point within the mouth and pivotably attached to the top so that the hook will pivot through a plane which passes through the base and the top and will

not rotate about a vertical axis and that the point will move through an arc when the hook is pivoted, said arc



being created when a lifter moves a barbell from a position above his eyes to a position directly above his shoulders.

4,928,962
GRIP ENHANCED FOOTBALL
Charles O. Finley, 155 North Michigan Avenue, Chicago, Ill. 60601
Filed Sep. 8, 1989, Ser. No. 404,663
Int. Cl.[5] A63B *41/08*
U.S. Cl. 273—65 E G **5 Claims**



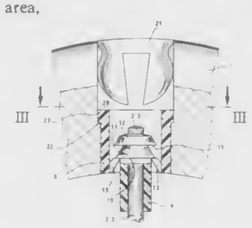
5. A grip enhanced prolate spheroidal football comprising a cover having an exterior surface provided with an intaglio pattern, said pattern including a plurality of laterally spaced recesses, each of said recesses having a substantially crater-like configuration with converging side walls, and a network of interconnected ridges separating adjacent recesses, each ridge in cross section having a narrow outer surface, sides diverging from the outer surface, and rounded segments interconnecting the outer surface to the sides.

4,928,963
RACKET, PARTICULARLY A TENNIS OR SQUASH RACKET
Reinhold Garbosch, Obertorstr. 1, D-7778 Markdorf 1, Fed. Rep. of Germany
PCT No. PCT/DE87/00474, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO88/03040, PCT Pub. Date May 5, 1988
PCT Filed Oct. 21, 1987, Ser. No. 243,024
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1986, 3636470
Int. Cl.[5] A63B *51/00, 51/14*
U.S. Cl. 273—73 D **11 Claims**

1. A racket assembly including a frame extending around a generally planar head area and having a plurality of holes therein extending in the plane of the area and opening into the latter, a plurality of strings arranged in said area, and connector structure for securing the ends of the strings in respective corresponding holes, said connector structure including a string connector assemblage comprising:

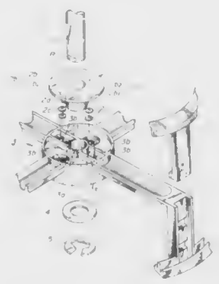
a coupling element rigidly secured to one end of a said string and including a shoulder surface facing away from said one end and toward the other end of the string; and

a locating element in the corresponding hole for said one end of the string and having an abutment surface facing away from said area,



said string and said coupling element being adapted to be pushed into said corresponding hole together so that said surfaces become engaged, without any further manipulations, to hold the coupling element and the string in a predetermined string tensioning position relative to the racket frame.

4,928,964
REEL DRIVING DEVICE FOR USE IN THE SLOT MACHINE
Kikuo Nakamura, Iruma, Japan, assignor to Sigma Incorporated, Tokyo, Japan
Filed Nov. 1, 1988, Ser. No. 265,711
Claims priority, application Japan, Nov. 13, 1987, 62-287928
Int. Cl.[5] A63F *5/04*
U.S. Cl. 273—143 R **17 Claims**

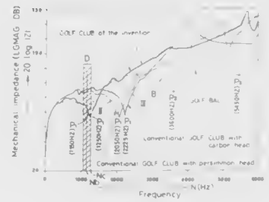


1. A reel driving device comprising:

a drive disk having at the center thereof a drive shaft fixing boss for receiving a drive shaft of a motor and fixing the drive shaft relative thereto, and impact mitigating means including boss members for mitigating an impact force of said motor, said boss members being integral with said drive disk and being symmetrically disposed about said drive shaft fixing boss; and

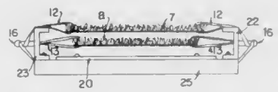
a reel having holes for receiving said drive shaft fixing boss and said impact mitigating boss members formed at corresponding positions thereon.

4,928,965
GOLF CLUB AND METHOD OF DESIGNING SAME
Tetsuo Yamaguchi, and Hiroomi Matsushita, both of Kobe, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Continuation-in-part of Ser. No. 753,624, Jul. 10, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 181,523
Claims priority, application Japan, Jul. 10, 1984, 59-143429; Jun. 12, 1985, 60-127752
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—78 **18 Claims**



17. A golf club for providing an increased ball travelling distance comprising a club head having a primary natural frequency within a range of 600 Hz to 1,600 Hz.

4,928,966
GROUND SIMULATOR
Omer E. Miller, 416 Dunes Wildwood Trail, Myrtle Beach, S.C. 29577
Filed Mar. 22, 1989, Ser. No. 327,136
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—195 A **19 Claims**



1. A golf shot practice device simulating the conditions of a natural surface comprising:

(a) a frame;

(b) a first surface layer for supporting a golf ball thereon;

(c) at least one second layer located below the top surface layer and vertically spaced therefrom so as to normally be out of contact with the first surface layer;

(d) first connecting means connecting the first surface layer to the frame and permitting the first surface layer to engage said second layer in response to the downward deflection of said first layer by the force of a swing golf club head thereagainst; and,

(e) second connecting means connecting the at least one second layer to the frame.

4,928,967
MAP BOARD GAME
Ann S. Woodliff, P.O. Box 9938, Seattle, Wash. 98109
Filed Oct. 10, 1989, Ser. No. 419,316
Int. Cl.[5] A63F *3/00, 9/18*
U.S. Cl. 273—254 **8 Claims**

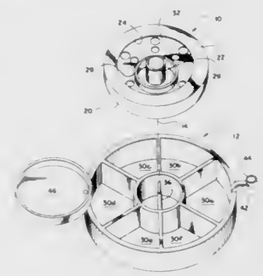
1. A board game comprised of:

a board having a map of the world surrounded by a playing path divided into sections that identify major regions of the world; a plurality of world businesses, each major region representing at least one of said businesses a plurality of transportation cards, each of said transportation cards indicating various modes of transportation and indicating the sections which said player blocks are allowed to be moved to; a plurality of player blocks; a plurality of question cards corresponding to each of said major regions, each question card comprises a question relating to one of said major regions and indicia thereon depicting a business of said major region; world market currency in



various denominations; a world market business listing; a transport listing; and business certificates corresponding to each of said plurality of world businesses, wherein each business certificate comprising said indicia depicting a business, and a monetary value indicating the cost to buy said business.

4,928,968
SPINNING TOP AND PROJECTILE GAME
Paul Gebert, 4 Benham Cir., Cartersville, Ga. 30120
Filed Jun. 27, 1989, Ser. No. 371,923
Int. Cl.[5] A63B *67/12, 69/40;* A63F *9/16*
U.S. Cl. 273—357 **17 Claims**



9. An apparatus, comprising:

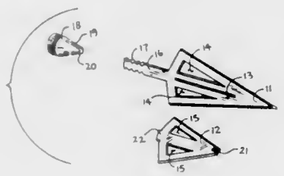
a bottom member having a plurality of pockets;

a top member having a base with a plurality of openings therein, a sidewall attached to said base and a cover having a central opening attached to said sidewall;

a spindle connecting said top and bottom members, said top member being rotatable about said spindle whereby each of said openings is vertically aligned with each of said pockets during each revolution of said top member; and

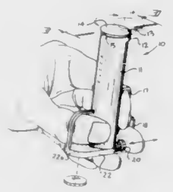
a flipper having a cup thereon and being mounted on said bottom member at a location sufficient for flipping a projectile from said cup toward said opening is said cover of said top member, said pocket adjacent said flipper having a negative number thereon.

4,928,969
ARROWHEAD
Wesley S. Nagatori, P.O. Box 845, Captain Cook, Hi. 96704
Filed Aug. 7, 1989, Ser. No. 390,982
Int. Cl.[5] F41B *5/02*
U.S. Cl. 273—422 8 Claims



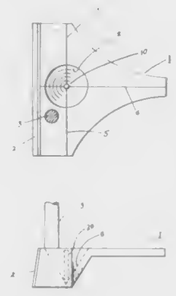
1. An arrowhead assembly comprising,
a primary delta shaped blade formed with an elongate axial slot and a secondary delta shaped blade receivable within the axial slot orthogonally relative to the primary blade, and
the primary blade including an elongate axially aligned rearwardly extending shaft wherein the secondary blade includes a positioning stem extending axially rearwardly of the secondary blade of a second length less than that defined by a first length of the extending shaft, and
a ferrule including orthogonally arranged first and second bisecting slots formed through a forward end of the ferrule to receive and align the primary and secondary blades relative to one another.

4,928,970
BINGO CHIP DISPENSER
Richard G. Latimer, Jr., 12 W. 4th St., Oswego, N.Y. 13126
Filed May 5, 1989, Ser. No. 347,587
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—148 R 7 Claims



1. A bingo chip dispenser for selectively depositing bingo chips onto a playing surface, comprising,
an elongate cylindrical body including a through-extending opening at an upper end and including a floor at an opposed end, the upper end includes a lid member selectively closing the upper end overlying the opening, and
a first finger engagement member directed orthogonally outwardly of an exterior surface of the cylindrical body, and
a second finger engagement member aligned with the first finger engagement member and formed contiguously thereto, and
including a plunger positioned within the first finger engagement member directed diametrically interiorly of the cylindrical body, and
an opening positioned adjacent the floor diametrically opposed to the plunger and receiving a bingo chip directed through the opening when the plunger is in a contracted orientation relative to the cylindrical body, and
wherein a pivot hinge is integrally secured to an upper edge of the cylindrical body adjacent the opening and includes a pivot pin extending orthogonally upwardly thereof to pivotally mount the lid thereto, and the lid further including a projection diametrically opposed to the pivot pin and integrally secured to the lid and receivable within a semi-cylindrical recess formed within an upper edge of the cylindrical body diametrically opposed to the pivot hinge.

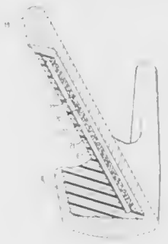
4,928,971
ALIGNMENT SYSTEM
Thomas D. Soles, Jr., 3412 Porter St., N. W., Washington, D.C. 20016
Filed Apr. 4, 1989, Ser. No. 332,977
Int. Cl.[5] A63B *69/36, 53/04*
U.S. Cl. 273—164 6 Claims



1. An alignment system for a golf club to allow a player to establish alignment in a precise manner, said golf club having a ball striking face, a lower surface, and an upper surface parallel to said lower surface, said upper surface comprising:
(a) a first indicia line extending substantially across the length of the upper surface parallel to the ball striking face, but removed from said face;
(b) a second indicia line extending substantially across the width of the upper surface perpendicular to the ball striking face and intersecting said first indicia line;
(c) a conical depression formed at the intersection of said first and second indicia lines, said conical depression having an internal surface extending substantially from said upper surface to said lower surface and having an apex disposed substantially closer to said lower surface, said first and second indicia lines extending longitudinally to the apex along the internal surface of said conical depression;
(d) an indication of the proper alignment of the club occurring when said first and second indicia lines located on said internal surface form a straight right angled intersection at the apex when viewed by a player.

4,928,972
IRON CLUB HEAD FOR GOLF
Tatsuo Nakanishi; Toyohiko Tadokoro, and Masaki Fujimura, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan
Continuation-in-part of Ser. No. 70,906, Jul. 8, 1987, abandoned. This application May 23, 1989, Ser. No. 355,665
Claims priority, application Japan, Jul. 9, 1986, 61-161663; Jul. 9, 1986, 61-161665
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—78 12 Claims

1. An iron-type golf club head comprising, a main body member having a front side and a rear side, said main body member being made of a metal, said rear side including a recess, said front side including a wall section having an inner surface in communication with said recess and a shooting surface remote from said inner surface, a fiber reinforcement member disposed in said recess adjacent said inner surface of said wall section, a back plate disposed in said recess adjacent and generally coextensive in area with said fiber reinforcement



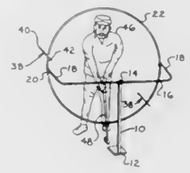
member and remote from said inner surface of said wall section, and support means for fixing said fiber reinforcement member and said back plate in said recess, said fiber reinforcement member and said back plate establishing a reinforcement for said shooting surface when said golf club head strikes a ball.

4,928,973
METHOD AND COURSE FOR PLAYING A GOLF-LIKE GAME
Ralph Perry, 5731 Pine Acres La., and Edgar N. Weaver, Jr., 2502 Stanley Ave., S.E., both of Roanoke, Va. 24014
Filed Sep. 16, 1987, Ser. No. 97,640
Int. Cl.[5] A63B *67/02*
U.S. Cl. 273—176 A 22 Claims



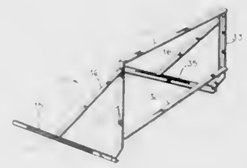
1. A method of playing a golf-like game with a plurality of holes on a course having a fairway of predetermined length and width and a series of target greens, a single pitching green, and a teeing area separate from the fairway and from each other, the fairway including a plurality of yardage markers, and the target greens each corresponding to at least one hole of the game, said method comprising the steps of:
(a) a placing a first golf ball in a designated area of the teeing area and driving the ball up the fairway in the direction of a preselected one of the yardage markers;
(b) following step (a), placing a second golf ball in the designated area of the teeing area and hitting the second golf ball to one of the series of target greens corresponding to the hole being played;
(c) following step (b), if the second golf ball fails to land on the target green, repeatedly placing an additional golf ball in the designated area of the teeing area and hitting the additional ball to the pitching green until the additional golf ball lands on the pitching green.

4,928,974
GOLF SWING TRAINER
Raymond J. VanKirk, 5370 Folks Rd., Horton, Mich. 49246
Filed Mar. 21, 1989, Ser. No. 326,734
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186 R 8 Claims



1. A golf swing trainer comprising, in combination, a vertically extending support, feeler support means mounted on said support having a configuration defining the desired path of movement of a golf club swing, and at least a pair of spaced feelers mounted upon said support means, each of said feelers comprising a lightweight elongated element having first and second ends, said elements each being cantilever mounted upon said support means remotely from said first ends, and said first ends being resiliently laterally deflectable whereby engagement of said element first ends by a swung golf club will cause the engaged ends to be momentarily deflected without damage to said elements, and said engagement will be sensed by the golfer, said elements being sufficiently spaced apart on said support means to indicate to the golfer departure of the golf club swing from said desired planar path of movement upon said elements being engaged.

4,928,975
GOLF PUTTING PRACTICE APPARATUS
Keith Skelley, and William G. Skelley, both of 115 Broadmeadow Cove, Roswell, Ga. 30075
Filed Jun. 12, 1989, Ser. No. 364,175
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—192 5 Claims



1. Apparatus for use in practicing golf strokes with a golf club of the type having a shaft extending between a handle and a head, and with the apparatus comprising guide means having a pair of parallel slide rails that provide guide surfaces for guiding a portion of the club shaft located adjacent to the club handle and a portion of the club shaft located adjacent to the club head along a common plane, and means for supporting said guide means guide surfaces above a golf ball playing surface with said common plane positionable at selected angles of incline with respect to the ball playing surface, said support means comprising a first pair of legs coplanar with said rails and to which said pair of slide rails are rigidly mounted and a second pair of legs pivotably mounted to said first pair of legs.

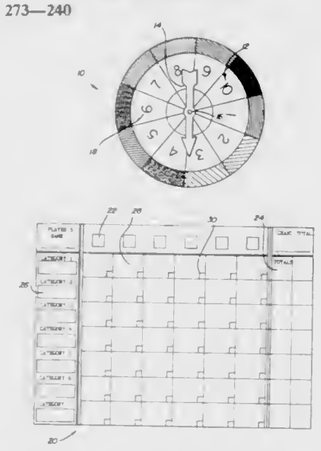
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4,928,976

WORD QUESTION ASSOCIATION GAME

Barbara Vano, and Bruno Vano, both of 36324 Moravian, Fraser, Mich. 48026

Filed Jun. 16, 1989, Ser. No. 368,413
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—240 3 Claims



1. A method for playing a word association game for at least two players, comprising:

(a) spinning a pointer rotatably attached to a multi-colored, pie sectioned spinner having each pie section a different color and having a numerical value associated with each color to randomly determine a starter, said starter being the player with the highest score on the spinner;

(b) selecting a word from a play word list and revealing that word to the other players, said starter selecting the word, and having the each player write that word on a game score sheet, said sheet having a first plurality of squares arranged in a row across the top of said sheet, each square having space for a single letter, said sheet further having a second plurality of squares arranged vertically in columns under each of said first plurality of squares and in rows in relation to each other horizontally, said second plurality of squares further having an area therein to write a partial score for the letter played, said game sheet further provided with a first plurality of boxes arranged in a column along one side of the sheet, said first boxes designated as category and arranged so that horizontally they form a row with the said second plurality of squares, said sheet further provided with a second plurality of boxes arranged in a column along the opposite side of said sheet, said second plurality of boxes arranged so that horizontally they form a row with the said second plurality of squares;

(c) having each player spin the spinner and select a category card based upon the color indicated by the random spin of the spinner, each player proceeding successively in this manner until all the categories are selected, each player writing the categories into the said first plurality of boxes on the game sheet;

(d) filling the second plurality of squares with words associated with the category corresponding to that row on the game sheet and beginning with the letter indicated in the square of the first plurality of squares which corresponds to the column in which the second square is situated;

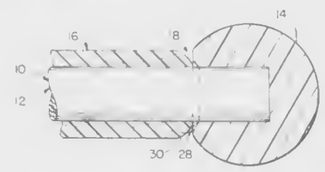
(e) stopping the game at some predetermined time and determining the score each player has earned by totalling the points earned for the words each player has selected in the second plurality of squares.

4,928,977

THROWN AND BOUNCED TOY HAVING A HAND GRIP TERMINATING IN HIGH BOUNCE BALLS

Timothy D. Chambers, P.O. Box 668, Gold Bar, Wash. 98251

Filed Jan. 9, 1989, Ser. No. 295,431
Int. Cl.[5] A63B *65/00*
U.S. Cl. 273—428 7 Claims



1. A thrown, caught, and bounced toy, comprising:

(a) a cylindrical rod having a length to be conveniently gripped by at least one hand of a person, and to extend into respective interiors of specially formed high bounce balls; and

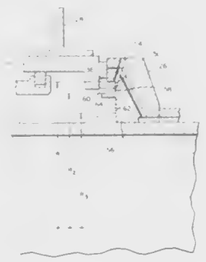
(b) specially formed high bounce balls having respective interiors to fit over the respective ends of the cylindrical rod, wherein each interior of each specially formed high bounce ball has an overall entry profile, which is inclusive of both a radial circumferential surface and an interior inwardly tapered surface, thereby providing a clearance into which respective impact distorted portions of the high bounce balls freely move, to avoid their otherwise fatigue stressing, and thereby prolong their effective operating game life, as this toy is effectively used upon bouncing off of hard surfaces.

4,928,978

ROTATING SHAFT SEAL

Harold K. Shaffer, Tolland, and Roger M. Barnsby, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 7, 1988, Ser. No. 178,694
Int. Cl.[5] F16J *15/16, 15/42*
U.S. Cl. 277—25 5 Claims



1. A rotating shaft seal arrangement comprising:

a high speed rotating shaft;

a circular seal ring rotating with said shaft and having a radial seal face near its outer periphery, said seal ring also including a radial support portion supporting said seal face and having a radial exposed face radially inward of said seal face;

a stationary fixed seal element having a radial seal surface, in interfacial sealing contact with said seal face;

means for supplying oil to the interface between said seal face and said seal surface;

said seal element and said seal ring shaped to form an inwardly facing circumferential annulus at the inner edge of said seal surface and said seal face;

said seal ring having at least one hole through said seal ring from said annulus to the outer periphery of said seal ring; and

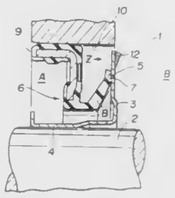
an axially extending flange integral with said seal ring dividing said radially exposed face into inner and outer annular portions.

4,928,979

SEALING APPARATUS

Shinji Nagasawa, Fukushima, Japan, assignor to NOK Corporation, Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 238,562
Claims priority, application Japan, May 30, 1988, 63-71460[U]
Int. Cl.[5] F16J *15/32, 15/34, 15/40*
U.S. Cl. 277—38 5 Claims



1. A sealing apparatus comprising:

a housing;

a sealing apparatus main body mounted on said housing and provided with a sealing lip;

a rotary body mounted on a rotary shaft of a member with which said apparatus is combined, said rotary body extending in a radial direction of said rotary shaft and having a side surface which is in sliding contact with said sealing lip; and

a bent portion formed by bending a notch portion formed in an outer edge portion of a side surface of said rotary body at a portion circumferentially outward of said contacting of said sealing lip with said side surface of the rotary body.

4,928,980

SEALING COVER, PARTICULARLY FOR MOTOR VEHICLE CRANKCASES AND GEAR BOXES

Hans Deuring, Im Eulenflug 29, D-5093 Burscheid, Fed. Rep. of Germany

Continuation of Ser. No. 103,750, Oct. 2, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 333,694
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1986, 3634735
Int. Cl.[5] F16J *15/10, 15/32*
U.S. Cl. 277—153 20 Claims

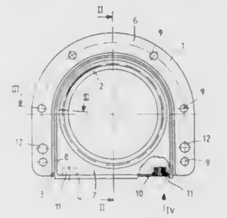
1. In a sealing cover for a housing; provided with a hole having a center axis, for passage of a shaft which extends through the cover along this axis, the cover comprising a metal cover body having a substantially arcuate-shaped cover flange face which extends radially outward with respect to said axis, said cover flange face having an inner edge; a dynamically acting seal for the shaft, the dynamically acting seal comprising at least one elastic sealing lip which is vulcanized to the body; a statically acting seal means, including first and second elastic sealing strips projecting in an axial direction substantially parallel to said axis of said hole and vulcanized to said body, for sealing the cover flange face, the improvement wherein:

said body is composed of a profiled, drawn sheet-metal body including:

a first axially extending face having an axially outward end connected to the inner edge of said cover flange face;

a first radially inwardly extending face surrounding said hole and having an arcuate first face portion and a second face portion connecting opposite ends of said first face portion, said first portion having a radially outward end connected to an axially inward end of said first axially extending face, so that said first face portion of said first radially inwardly extending face is axially offset relative to said cover flange face;

a second axially extending face having an axially outward end connected to a radially inward end of said first face portion of said first radially extending face; and



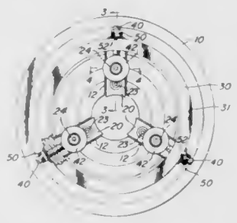
a second radially inwardly extending face having a radially outward end connected to an axially inward end of said second axially extending face so that said first face portion of said first radially inwardly extending face is disposed radially inward of said cover flange face and radially outward of said second radially inwardly extending face; and wherein said cover flange face includes means for connecting said body to the housing, said first face portion of said first radially extending face receives said first sealing strip and said second face portion of said first radially extending face receives said second sealing strip such that said first and second sealing strips are formed in one plane, and said sealing lip is vulcanized to a radially inward end of said second radially extending face.

4,928,981

JAW LOCKING MEANS FOR CHUCKS

Lawrence H. Brown, Ambler, Pa., assignor to Accu-Ring Jaw Systems, Inc., Ambler, Pa.

Filed Feb. 10, 1989, Ser. No. 308,559
Int. Cl.[5] B23B *31/10*
U.S. Cl. 279—1 SJ 12 Claims



1. For use with a chuck, such as a lathe chuck or the like, having a plurality of hard jaws guided for sliding movement toward and away from a chuck center and radially to the chuck axis by the jaw setting means of the lathe or the like, and a soft jaw secured on top of each of said hard jaws for conjoint movement therewith as a unit radially to the chuck axis,

jaw positioning means for locking each soft jaw at a desired

position for the machining of the workpiece engaging surface thereof comprising:

a ring means adapted to be arranged with portions in the proximity of the soft jaws, said ring means having radially extending holes,

a plurality of studs, one stud associated with each soft jaw,

means for securing each of said studs to an associated soft jaw and the hard jaw therebeneath with each stud extending through a radial hole in said ring means to provide a threaded portion projecting radially outwardly from the outer surface of said ring means and with each stud extending on a radial axis parallel to and spaced apart from the axis of radial movement of the associated soft jaw,

and a plurality of nut means, one of said nut means being threadedly engaged on each of said studs at the outwardly projecting portion thereof,

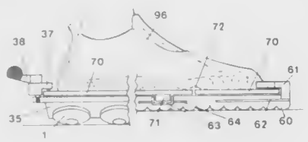
said nut means being adjustable radially along the threaded portion of said studs to a position to limit the radial inward movement of said soft jaws to lock said soft jaws at a desired position for the machining of said workpiece engaging surfaces of said soft jaws.

4,928,982

CONVERTIBLE RUNNING SHOES/ROLLER SKATES

Kenneth C. Logan, P.O. Box 48168 Bentall Centre, Vancouver, B.C., Canada (V7X 1N8)

Filed Mar. 18, 1988, Ser. No. 170,002
Int. Cl.[5] A63C *17/14*
U.S. Cl. 280—11.22 **2 Claims**



1. A convertible roller skate comprising: footwear including a sole plate having a heel portion, a toe portion hinged to the heel portion for permitting normal flexure of the sole plate during walking or running by a user, and a pivot pin extending downwardly from said heel portion at a central portion of said sole plate:

a disk plate including a toe retention channel for receiving the toe portion of said sole plate, a pivot pin seat for rotatably receiving said pivot pin, means for removably locking said sole plate to said disk plate at selected angles of rotation about said pivot pin, and a plurality of truncated conical disks rotatably attached to the lower surface of said disk plate along two longitudinally extending rows, each row of disks comprising a plurality of front disks having an axis of rotation extending inwardly and downwardly with respect to a vertical plane intersecting the center line of said disk plate and a plurality of rear disks having an axis of rotation extending inwardly and upwardly with respect to said vertical plane; and

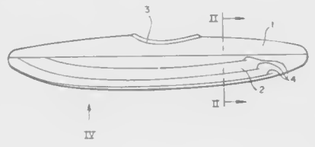
a flexible tread plate including means for removably securing said tread plate to said sole plate, wherein said tread plate may be secured to the sole plate of said footwear for use as a conventional shoe or said disk plate may be secured to the sole plate of said footwear for use as a roller skate.

4,928,983

SNOW GLIDER

Freimut Maass, Kreuznacher Str. 5, D-7000 Stuttgart 50, Fed. Rep. of Germany

PCT No. PCT/DE87/00023, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO87/04397, PCT Pub. Date Jul. 30, 1987
Continuation of Ser. No. 116,946, Nov. 23, 1987, abandoned.
This PCT application Jan. 21, 1987, Ser. No. 315,186
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1986, 3601607; Feb. 8, 1986, 3604017
Int. Cl.[5] B62B *13/06*
U.S. Cl. 280—18 **13 Claims**



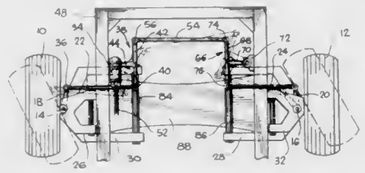
1. A snow glider comprising a body having front and aft ends to accommodate at least one person, said body having a vertical transverse cross section of an ellipsoid configuration and having a longitudinal and transverse convex bottom bottom provided with runners extending therefrom, said runners having a longitudinal extent and being disposed on said bottom in parallel spaced relation from said front end to a point removed from said aft end thereof, whereby said person can shift his weight rearwardly to lift said runners from the snow for steering.

4,928,984

STEERING SYSTEM FOR TRACKING OF WHEELS

John K. Bauer, 510 Lenox Ave., Miami Beach, Fla. 33139

Filed Jun. 9, 1989, Ser. No. 363,680
Int. Cl.[5] B62D *7/00*
U.S. Cl. 280—95.1 **17 Claims**



1. A steering system for a vehicle having a frame and a pair of axially aligned steerable wheels supported on laterally opposed sides of the frame comprising,

first and second linkage assemblies for exerting a turning force on steerable wheels of a vehicle, each linkage assembly having an inboard end and an outboard end and being substantially parallel to the other during straight-line driving, said outboard end of the first linkage assembly coupled to a first steerable wheel and said outboard end of said second linkage assembly coupled to a second steerable wheel,

a first track-inducing member having horizontally extending motion transfer and pivot extension segments, said motion transfer segment having spaced apart first and second pivot couplings, said first pivot coupling being attached to said inboard end of the first linkage assembly, said pivot extension segment extending from between said pivot couplings and attaching to said vehicle for rotation about a first vertical axis spaced apart from said motion transfer segment,

a third linkage assembly having opposed extremities, with one extremity attached to said second pivot coupling,

a second track-inducing member having horizontally extending motion transfer and pivot extension segments, said motion transfer segment having spaced apart third and fourth pivot couplings, said third pivot coupling being attached to the extremity of said third linkage assembly opposite said second pivot coupling, said fourth pivot coupling being attached to the inboard end of the second linkage assembly, said pivot extension segment extending from between said third and fourth pivot couplings and attached to said vehicle for rotation about a second vertical pivot axis spaced apart from said first, and

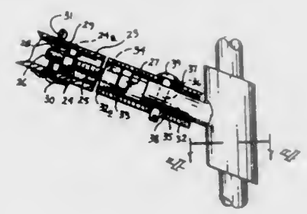
manually operated steering means for rotating said first track-inducing member about said first vertical axis, said rotation of the first track-inducing member causing rotation of said second track-inducing member via said third linkage assembly, said track inducing members providing dissimilar lateral displacements of said first and second linkage assemblies.

4,928,985

BICYCLE BUGGY APPARATUS

Bobby R. Nowlin, 5753 Beth Rd., Huber Heights, Ohio 45424

Filed Feb. 16, 1989, Ser. No. 310,891
Int. Cl.[5] B62K *27/00, 27/12*
U.S. Cl. 280—204 **5 Claims**



1. A bicycle buggy apparatus in combination with a bicycle, said bicycle including a framework and a bicycle seat with a seat stud extending downwardly of the bicycle seat and receivable within the framework, and the bicycle buggy apparatus comprising,

a buggy including a seat overlying a floor with a plurality of wheels positioned under said floor proximate a rear end of said floor,

and

an elongate mount extending along and integrally secured to a forward edge of said floor,

and

a coupling shaft fixedly secured to said mount,

and

a sleeve member mounted to said seat stud,

and

connecting means joining said sleeve member to said coupling shaft for selectively joining said coupling shaft to said sleeve member,

and

wherein said coupling shaft is of a generally "S" shaped configuration extending orthogonally outwardly of said mount and fixedly secured to said mount at a lower end and terminating at its other end in elevation above the lower end at and upper end, and said upper end including joining means securing said upper end to said connecting means,

and

wherein said joining means includes a securement member fixedly secured interiorly of said upper end and spaced from said upper end, and said securement member including a threaded aperture axially aligned with said upper end, and a threaded member receivable within the threaded aperture of the securement member,

and

wherein the threaded member includes an elongate threaded shank receivably threaded through the threaded aperture and an enlarged head of a diameter greater than that of the threaded shank, and the threaded shank formed with a shank aperture formed orthogonally through the threaded shank proximate a distal end thereof,

and

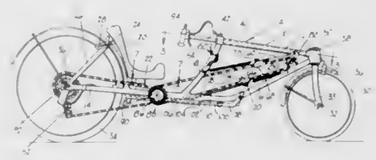
wherein the upper end of the coupling shaft includes an upper and lower coupling shaft aperture diametrically opposed and alignable with said shank aperture, and a first locking pin extending through said upper and lower coupling shaft apertures and simultaneously through said shank aperture to secure said threaded shank relative to said upper end.

4,928,986

ARM AND LEG POWERED CYCLE

Paul R. Carpenter, Lakewood, Colo., assignor to P. D. Enterprises, Inc., Lakewood, Colo.

Filed May 6, 1988, Ser. No. 190,927
Int. Cl.[5] B62M *1/12*
U.S. Cl. 280—234 **9 Claims**



1. An arm and leg-powered cycle apparatus, comprising:

a chassis having a forward end and a rear end and having a seat for an operator;

an upper drive member on said chassis forward of said seat, said upper drive member linearly reciprocating through a drive stroke and a return stroks;

a lower drive member on said chassis below said upper drive member and forward of said seat, said lower drive member linearly reciprocating through a drive stroke and a return stroke;

a forward wheel and a rear wheel, each wheel rotatably mounted on said chassis;

gear means connected to said rear wheel for receiving power to drive said rear wheel;

drive gear means on said chassis spaced from and forward of said rear wheel gear means;

an endless transmission chain slung between said rear wheel gear means and said drive gear means for transmitting motion from said drive gear member to said rear wheel;

a freewheeling sprocket on said chassis forward of said drive gear means;

an endless drive chain slung between said sprocket and said drive gear means; and

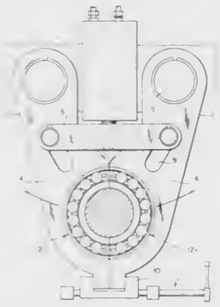
one-way chain engaging means connected to said drive members for transmitting the linear motion of said upper and lower drive strokes to said drive chain to drive said rear wheel.

4,928,987

FIFTH WHEEL COUPLING

Walter Hunger, Otto-Nagler-Strasse 13, 87 Wuerzburg, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 309,132
Int. Cl.[5] B62D *53/08, 53/12*
U.S. Cl. 280—435 **11 Claims**



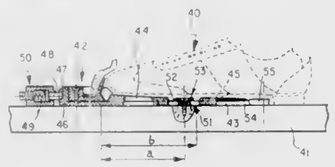
1. A fifth wheel coupling for the connection of a semitrailer to a tractor unit, comprising:
- a pair of symmetrical, swivel-articulated closing jaws, said jaws having a mating pair of semicircular recesses for grasping a king pin of the semitrailer;
- a split bearing positioned in said recesses of the closing jaws, said bearing comprising an outer bearing half fixed in each closing jaw and a pair of inner bearing halves rotatable with respect to the outer bearing halves; and
- means for returning each inner bearing half to an initial position aligned with its respective outer bearing half.

4,928,988

SAFETY BINDING FOR A SKI

Jean Hue, Annecy, France, assignor to Salomon S.A., Annecy Cedex, France

Division of Ser. No. 816,962, Jan. 8, 1986, abandoned, which is a continuation of Ser. No. 482,370, Apr. 5, 1983, abandoned. This application Feb. 24, 1987, Ser. No. 17,638
Claims priority, application France, Apr. 8, 1982, 82 06434
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[5] A63C *9/10*
U.S. Cl. 280—607 **13 Claims**



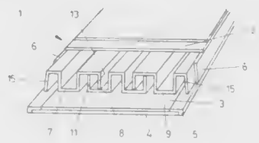
1. An apparatus for connecting a ski boot having a sole and a heel to a ski, wherein said boot is adapted to receive a foot having a metatarsal region associated therewith, wherein said apparatus comprises a binding comprising:
- a plate adapted to receive the sole of said boot;
- means attached to said plate at a first end thereof for attaching the front end of said boot to said ski so as to permit said heel of said boot to be lifted off said ski in normal use;
- means for permitting said plate with said boot received thereon to pivot about a substantially vertical pivot axis, wherein said vertical pivot axis extends through said metatarsal region of said foot when said foot is received in said boot held by said apparatus; and
- wherein said plate comprises a second end adapted to be operatively positioned adjacent said heel of said ski boot and wherein said heel of said ski boot is adapted to extend beyond said second end when connected to said ski by means of said apparatus.

4,928,989

SKI HAVING A CORE COMPRISING ANGLED PROFILES

Bernhard Mayr, Hard, and Heinz Lampl, Hohenems, both of Austria, assignors to Head Sportgeraete Gesellschaft m.b.H. & Co. OHG, Kennelbach, Austria

Filed Dec. 5, 1988, Ser. No. 279,682
Claims priority, application Austria, Dec. 9, 1987, 3239/87
Int. Cl.[5] A63C *5/12*
U.S. Cl. 280—610 **10 Claims**



1. A ski comprising:
- a running surface extending in a longitudinal direction;
- a top surface extending parallel to and spaced from the running surface;
- a plurality of side surfaces extending between the running surface and the top surface;
- a core defined by the running surface, the top surface and the side surfaces;
- a plurality of angled profiles formed inside the core, each angled profile comprising a plurality of longitudinally extending and laterally spaced bases extending substantially parallel to the running surface, said bases including upper base portions adjacent said top surface and lower base portions adjacent said running surface, said upper and lower base portions having longitudinally extending side edges a plurality of inner legs, and a plurality of outer legs adjacent the side surfaces, each of the inner legs extending from the longitudinal side edges of the respective base upper and lower portions in substantially normal relationship thereto and each of said outer legs extending from the outer side edge of a respective outermost upper base portion, said profiles defining cavities between adjacent legs, characterized in that at least two of the angled profiles are at least partially enclosed in each other in overlapping relationship such that the height of one of the inner legs is decreased by an amount corresponding to the height of the bases of each of the overlapping angled profiles.

4,928,990

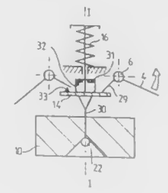
FREELY SLIDABLE ANTIFRICTION PLATE WHICH AUTOMATICALLY RECENTERS FOR SAFETY BINDING

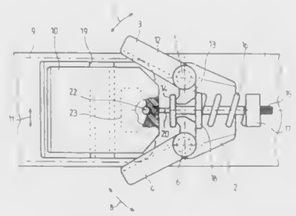
Pierre Rullier, Annecy, France, assignor to Salomon S.A., Annecy Cedex, France

Filed Jan. 28, 1988, Ser. No. 149,665
Claims priority, application France, Jan. 28, 1987, 87 01287
Int. Cl.[5] A63C *9/081, 9/085*
U.S. Cl. 280—625 **25 Claims**

18. A safety binding comprising:
- (a) a first wing and a second wing for retaining one end of a boot on a ski, said wings being independently laterally pivotable about respective first and second axes;

- (b) means for supporting said boot on said ski, said supporting means being slidable with respect to said ski to and from a centered position relative to said ski;
- (c) means for biasing said wings towards a retention position for retaining said one end of said boot on said ski, and for biasing said supporting means toward said centered position;
- (d) a linkage assembly comprising a longitudinally movable member and an abutment, said linkage assembly operatively associating said supporting means with said wings for permitting said supporting means to move laterally free from the effect of said biasing means in response to lateral pivoting of either of said wings, said abutment being movable independently of said longitudinally movable member, wherein respective portions of each of said wings contact said abutment, and wherein said biasing means act through said abutment for biasing said wings in said retention position; and
- (e) means for guiding said longitudinally movable member for movement between a first extreme position, in contact with said abutment, and a second extreme position, displaced from said abutment, wherein, in said first extreme position, said supporting means is in said centered position and wherein, in said second extreme position, said supporting means is permitted to slide laterally relative to said ski, and wherein upon pivoting of either of said wings, said longitudinally movable member is movable freed from the effect of said biasing means between said first and second extreme positions.





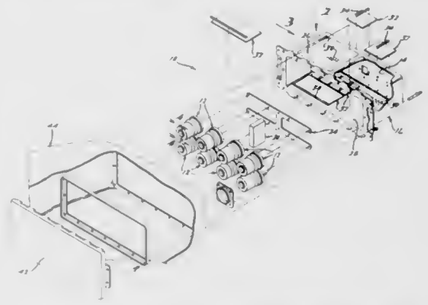
4,928,991

ASPIRATING INFLATOR ASSEMBLY

William F. Thorn, Redmond, Wash., assignor to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.

Filed Mar. 8, 1989, Ser. No. 320,396
Int. Cl.[5] B60R *21/16, 21/26*
U.S. Cl. 280—738 **10 Claims**

1. An aspirating inflator assembly for a vehicle occupant restraint system comprising,
- a housing defined by spaced sidewalls, a back wall and an openable front panel,
- an airbag attached to and stored internally of said housing,
- a plurality of gas generators supported adjacent to the back wall of said housing,
- a plurality of apertures in at least one sidewall of said housing, and
- a valve on said housing for admitting ambient air thereinto through said apertures but precluding exhaust of air outwardly of said housing, the frontal panel on said housing being openable upon energization of said gas generator to facilitate deployment of said airbag.

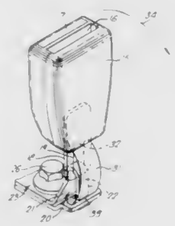


4,928,992

SEAT BELT BUCKLE ARRANGEMENT

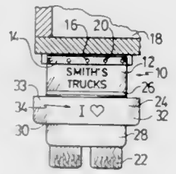
Peter Qvint, Vargarda; Tommy Andersson, Alingsas, and Lennart Eksell, Boras, all of Sweden, assignors to General Engineering (Netherlands) B.V., Utrecht, Netherlands

PCT No. PCT/SE88/00084, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/06543, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 26, 1988, Ser. No. 265,139
Claims priority, application United Kingdom, Feb. 26, 1987, 8704496
Int. Cl.[5] B60R *22/22*
U.S. Cl. 280—801 **13 Claims**



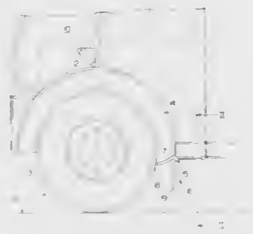
1. A safety belt arrangement comprising:
- a buckle having an open mouth for receiving a tongue, said buckle comprising means for retaining said tongue therein;
- a flexible connection means for connecting said buckle to an anchoring point on a motor vehicle, said flexible connection means comprising two or more interconnected rigid links for preventing said buckle from moving more than a predetermined distance away from said anchoring point and for allowing said buckle to be moved closer than the predetermined distance towards said anchoring point and;
- a resilient member connected to said anchoring point and said buckle for holding said buckle in a position in which the open mouth of the buckle is presented for receiving said tongue.

4,928,993
SPLASH GUARD
Darma L. Appavoo, P.O. Box 98, Kerrobert, Saskatchewan, Canada (S0L 1R0)
Filed Jun. 26, 1989, Ser. No. 371,197
Int. Cl.[5] G09F *21/00*
U.S. Cl. 280—851 4 Claims



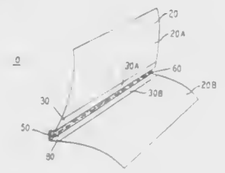
1. A splash guard for a vehicle comprising:
a main panel adapted to be mounted on the vehicle so as to depend therefrom, the main panel having a predetermined width and a predetermined height;
a secondary panel pivotally mounted on a back face of the main panel to pivot freely about a lateral hinge line and normally depending from the hinge line with a front face of the secondary panel confronting and covering a portion of the back face of the main panel, the secondary panel having a width greater than the predetermined width of the main panel and a height less than the predetermined height of the main panel;
first indicia marked on a back face of the secondary panel;
second indicia marked on that portion of the back face of the main panel that is normally covered by the secondary panel;
whereby air passing by the main panel in a front to back direction will impinge upon exposed portions of the secondary panel and pivot the secondary panel upwards to the rear, thus exposing the secondary indicia to view.

4,928,994
MOTOR VEHICLE WATER AND MUD SPLASH GUARD
Fritz Buchner, E 7, D-6800 Mannheim, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 109,926, Oct. 19, 1987, abandoned. This application Dec. 30, 1988, Ser. No. 292,177
Int. Cl.[5] B60R *27/00*; B62B *9/16*
U.S. Cl. 280—851 3 Claims



1. A splash guard for preventing or reducing throwing of water bursts from wheel boxes of a power driven vehicle during driving on wet roads, comprising
a two-wing splash guard arranged to extend substantially over the entire width of a wheel box substantially parallel to the wheel axis of the vehicle at its rear lower end as considered in a traveling direction,
each of said wings being adjustably mounted about a common support axis by means of threaded bolt and nut means,
one wing extending from said axis in a predetermined mounted position from the wheel box toward a road surface, and another wing in a predetermined mounted position toward a running surface of a wheel so as to form a guarding part therefor.

4,928,995
BINDABLE COVER FOLDERS
John H. Pickering, Wayland; Sushil K. Bhatia, Framingham; Mihira K. Rath, Milford, all of Mass., and Roger N. Chevrette, Woonsocket, R.I., assignors to Dennison Manufacturing Company, Framingham, Mass.
Continuation-in-part of Ser. No. 239,455, Sep. 1, 1988. This application Mar. 28, 1989, Ser. No. 329,724
Int. Cl.[5] B42D *3/00, 17/00*; B42C *9/00*; B42B *3/04*
U.S. Cl. 281—29 8 Claims

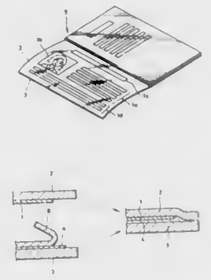


1. A folder for permanently binding a stack of paper sheets comprising:
a binder spline comprising an elongated rigid member having a channel running along its length,
said elongated rigid member having an aperture through a side thereof,
a cover sheet affixed to the elongated rigid member,
and a closed squeezable elongated member containing a book binding adhesive therein, said squeezable member having one end thereof passing through said aperture, and said squeezable member contained substantially within and along the length of said channel,
so that as said squeezable member is pulled out of said channel through said aperture the squeezable member can rupture thereby releasing said adhesive into the channel.

4,928,996
BOOKLET WITH PHOTOGRAPH
Yuji Oshikoshi; Yoshimi Suganuma, both of Tokyo; Hiroshi Hara, Kanagawa; Kazuo Shiota, Kanagawa; Nobumitsu Takehara, Kanagawa, and Kiichiro Sakamoto, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 24, 1988, Ser. No. 261,195
Claims priority, application Japan, Oct. 23, 1987, 62-267848; Mar. 4, 1988, 63-51199; Mar. 4, 1988, 63-51200
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—109 17 Claims

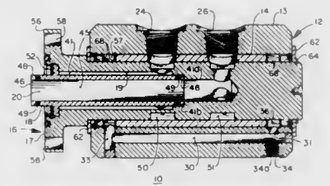
1. A booklet for identifying a holder thereof, said booklet being provided with a picture of the face and personal data of said holder, which comprises:
a transparent sheet bound in said booklet;
an image receiving layer formed on one surface of said transparent sheet, said image receiving layer including a composite image of said picture and said personal data; and

a supporting sheet bound in said booklet separately from and next to said transparent sheet, said supporting sheet being



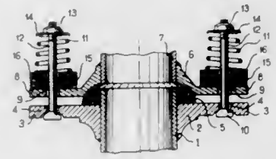
adhered to said transparent sheet to sandwich said image receiving layer therebetween.

4,928,997
ROTATING UNION WITH CARBON GRAPHITE LABYRINTHINE SEAL
Delbert C. Reisener, Glenview, and Dennis G. Pearson, Lake Zurich, both of Ill., assignors to Deublin Company, Northbrook, Ill.
Filed Mar. 13, 1989, Ser. No. 322,657
Int. Cl.[5] F16L *39/04*
U.S. Cl. 285—13 12 Claims



1. In a multiple passage rotating union including a housing having an axial bore therethrough and rotor means rotatably supported within the axial bore of the housing, the housing defining a plurality of fluid inlet ports, the rotor means defining a plurality of fluid outlet ports, the rotor means having a plurality of fluid passageways communicating the fluid outlet ports with the fluid inlet ports, the improvement comprising: an elongated generally cylindrical one-piece sleeve member of a hard, rigid anti-friction material, said sleeve member being assembled with said housing, located in the axial bore of the housing, interposed between an inner surface of the housing and the outer surface of the rotor means, said sleeve member providing a bearing surface for the rotor means, said sleeve member extending along the portion of the housing which includes all of the inlet ports, said sleeve member having a plurality of apertures in registry with the inlet ports whereby all of the inlet ports are communicated with the fluid passageways through said sleeve member, and the outer diameter of said sleeve member being greater than the inner diameter of the bore through the housing prior to assembly therewith, and said housing being expanded by heating to increase the inner diameter of its bore to facilitate location of said sleeve therewithin, thereby providing an interference fit between said sleeve member and the housing upon subsequent cooling of said housing with said sleeve member assembled together with the housing, said sleeve member providing a seal between the housing and the rotor means for adjacent inlet ports.

4,928,998
FLEXIBLE EXHAUST COUPLING
Louis Brandener, Poissy, France, assignor to Societe Jacques DuBois, Barentin, France
Filed Apr. 4, 1989, Ser. No. 332,736
Claims priority, application France, Apr. 12, 1988, 8804813
Int. Cl.[5] F16L *55/04*
U.S. Cl. 285—49 9 Claims



1. A flexible exhaust coupling comprising a first length of pipe terminating in a convex spherical bearing part, a first connecting flange associated with the first length of pipe, a second length of pipe terminating in a concave spherical bearing part which faces the convex spherical bearing part of the first length of pipe, a second connecting flange associated with the second length of pipe, bolt means having ends for holding said bearing parts in sealing engagement with said bolt means extending through openings in said connecting flanges, helical springs surrounding stems of bolt means, said helical springs having one end facing an end of said bolt means and a second end facing one of said connecting flanges, and at least one vibration damping annular pad surrounding the stem of each bolt means and pressed between one end of the corresponding helical spring and an adjacent portion of said coupling.

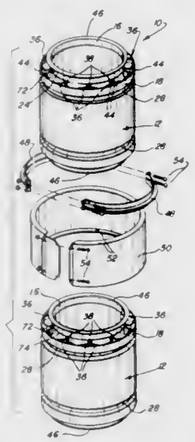
4,928,999
ELASTOMERIC GUARD SEAL FOR TUBULAR CONNECTIONS
L. Steven Landriault, Jersey Village; Donald J. Ortloff, and Charles A. Bollfrass, both of Houston, all of Tex., assignors to Hydril Company, Houston, Tex.
Filed Apr. 30, 1984, Ser. No. 605,378
Int. Cl.[5] F16L *15/04*
U.S. Cl. 285—113 17 Claims



1. In combination with a tubular connection including
a pin end having
at least one thread set, and
a conical metal sealing surface adjacent said thread set, and
an accommodating box end having

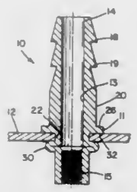
at least one box end thread set for making up the connection with said pin end thread set, and
a conical metal sealing surface for making a metal-to-metal seal with said pin end metal sealing surface,
said sealing improvement comprising
said pin end having a circumferential groove forward of said pin end metal sealing surface, tightening of the metal-to-metal seal after surface contact causing wedge separation of said pin end and box end forward of the pin end metal sealing surface, and
a compressible elastomeric sealing ring located in said groove and extending radially outwardly therefrom prior to connection makeup,
whereby during makeup said elastomeric sealing ring extrudes in the direction of said metal-to-metal seal to form a compound wedge seal therewith in front thereof against pressures from within.

4,929,000
MULTIPLE WALLED CHIMNEY
James W. Annestedt, Sr., Memphis, Tenn., assignor to American Metal Products Company, Los Angeles, Calif.
Filed Dec. 2, 1988, Ser. No. 279,379
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—133.1 **25 Claims**



24. A multiple walled metal chimney comprising:
at least two chimney sections having a cylindrical inner wall member with a radially extending flange at each end, a cylindrical outer wall member in concentric spaced-apart relationship to said inner wall member, said outer wall member having a diameter greater than said inner wall member to form an annulus between said wall m embers, and a pair of corrugated spacer rings positionally captured within said annulus between said wall members proximate the ends of said chimney section, said wall members including annular shoulders extending into said annulus to prevent longitudinal movement of said spacer rings, said shoulders engaging said spacer rings;
said spacer rings including a plurality of corrugations and overlapping ends which form an expansible seam, said corrugations separated by planar segments which engage said inner wall member and include a pair of side wall segments extending perpendicular to said wall members, an intermediate segment which engages said outer wall member, and a pair of connecting segments formed at an angle to said intermediate segments and extending between said intermediate segment and said side wall segments;
an inner clamp means extending around adjoining end flanges of adjacent chimney sections to joint one chimney section with another chimney section in axial alignment, said clamp means including means for securing said inner clamp means; and
an outer clamp means extending around said outer wall members of adjacent chimney sections for closing the gap between adjacent outer wall members, said outer clamp means including flanges which are received in annular grooves formed in said outer wall members to facilitate attachment of said outer clamp means, said annular grooves corresponding to said annular shoulders of said outer wall members.

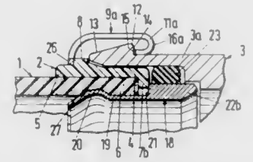
4,929,001
TUBULAR CONNECTOR
Ronald W. Phillips, II, Doylestown, Pa., assignor to The B.F. Goodrich Company, Akron, Ohio
Continuation-in-part of Ser. No. 360,688, Jun. 2, 1989, abandoned. This application Aug. 3, 1989, Ser. No. 388,883
Int. Cl.[5] F16L *3/04*
U.S. Cl. 285—158 **13 Claims**



1. A tubular connector for a fluid line (for connection to a thin walled member), said connector consisting of a longitudinally extending tubular member, said member having an annular flange along the intermediate external portion of said tubular member, said flange having an annular face, a central passageway extending longitudinally from one end of said connector to the other end of said connector, the portion of said passageway extending from said flange to said one end of said tubular member having a smooth walled portion and a threaded portion, said smooth walled portion lying closer to said flange than said thread portion, said threaded portion lying adjacent to said one end, the wall thickness of said smooth walled portion that lies between said flange and said threaded portion of said tubular member being thinner in cross-section than said threaded portion to facilitate upsetting of said thin smooth walled portion, and the external end portion of said tubular member lying adjacent to the other end of said tubular member having a plurality of axially spaced circumferentially extending barbs to facilitate the locking onto a hose.

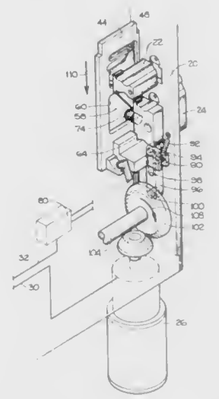
4,929,002
DEVICE FOR COUPLING A HOSE TO A PIPE
Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany
Filed Apr. 11, 1989, Ser. No. 336,661
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 3813192
Int. Cl.[5] F16L *39/02*
U.S. Cl. 285—319 **26 Claims**

1. A device for joining a first conduit having a collar to a second conduit having a peripheral wall of predetermined thickness, particularly for joining a pipe and a hose, comprising a tubular coupling element having a first end receivable in the first conduit and a second end which is axially spaced from said first end, said coupling element including a plurality of hook-like members engageable with the collar on the first conduit, and said coupling element being designed to receive the second conduit via said second end and further including an abutment for the second conduit; a tubular retaining element having a first section receivable in said coupling element so as to define therewith an annular space designed to accommodate the wall of the second conduit such that the wall forms a seal with both said coupling element and said retaining element, said retaining element further having a second section designed to project outward from the annular space into the first conduit, and to define an annular gap with the latter, when said first section is received in said coupling element, said second section and said coupling element being provided with complementary surface



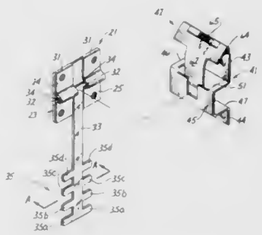
portions which are arranged to abut one another when said first section is received in said coupling element; and an annular sealing element for sealing the gap between said second section and the first conduit, said sealing element being designed to surround and form a seal with said second section, and said sealing element being deformable and having a predetermined width in undeformed condition thereof as considered axially of said coupling element and said second section, said second section having an axial length at least equal to said predetermined width.

4,929,003
MOTORIZED LOCKING MECHANISM FOR A DOOR
Lloyd T. McConnell, Duncanville, Tex., assignor to Adtec Incorporated, San Antonio, Tex.
Filed Oct. 7, 1988, Ser. No. 255,017
Int. Cl.[5] E05C *3/06*
U.S. Cl. 292—144 **20 Claims**



1. A mechanism for locking a door in a closed relationship with a doorjamb which comprises:
a base plate;
a bolt slideably mounted on said base plate for movement with respect thereto between a locked position wherein said bolt holds the door and doorjamb in the closed relationship and an unlocked position;
a cam plate operatively engaged with said bolt and slideably mounted on said base plate for movement on said base between a first position wherein said cam plate holds said bolt in said locked position, a second position wherein said cam plate holds said bolt in said unlocked position and a third position wherein said cam plate allows said bolt to move between said locked position and said unlocked position;
means for moving said cam plate;
a latch operatively engaged with said cam plate and slideably mounted on said base plate for movement with respect thereto between a forward position and a retracted position; and
means for urging said latch toward said forward position to hold said cam plate in said third position while the door is open.

4,929,004
VEHICLE DOOR LATCH
Patrick H. Chidester, 11828 Old River School Rd. #E, Downey, Calif. 90241
Filed Mar. 27, 1989, Ser. No. 329,319
Int. Cl.[5] F05C *17/00*
U.S. Cl. 292—267 **4 Claims**



1. A latch for mounting on a first and a second surfaces comprising in combination a bar assembly and a keeper assembly:
said bar assembly having:
a mounting means adapted to be fixed to said first surface;
an elongated bar made of a rigid sheet material and rotatably mounted to said mounting means by one end thereof;
at least two pairs of aligned fingers made integral with and being laterally disposed on said bar at its other end whereby the distance between the first and second surfaces can be adjusted by removing at least one pair of fingers; and
each pair of aligned fingers being spaced from the adjacent pair; and
each of said fingers being disposed within the plain of said sheet material;
said keeper assembly comprising:
a bracket adapted to be fixed to said second surface;
said bracket being shaped so that a portion thereof is spaced from said second surface to form a space therebetween which has width, as measured between said second surface and said portion, greater than the width of one pair of said fingers and less than the width of two adjacent pairs of said fingers, measured longitudinally along said bar;
said portion of said bracket having a T-shaped opening formed therein;
a lock flap having one edge rotatably mounted to said bracket and having another edge remote from said one edge depending into said T-shaped opening;
a spring means urging said other edge of said flap away from said second surface so that the pair of fingers located on the end said bar is capable of being nested between said portion of said bracket and said second surface.

4,929,005

DEVICE FOR TRANSFERRING ELECTRIC POWER

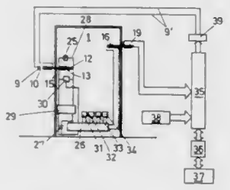
Hans-Dieter Heinen, Malmedy, Belgium, assignor to S.A. Ets. R. Heinen N.V., Malmedy, Belgium

Filed Oct. 28, 1988, Ser. No. 263,761

Claims priority, application European Pat. Off., Oct. 30, 1987, 87870153

Int. Cl.[5] **E05C** *19/16*

U.S. Cl. 292—251.5 **7 Claims**



1. A device for transferring electric power and/or information between two parts movable with respect to each other, in particular between a door frame and a door leaf or a casement window leaf, mounted in the door frame, comprising a first coil of an insulated conductor wire wound onto a first magnetic core, and a second coil of an insulated conductor wire wound onto a second magnetic core, the first coil intended to be connected to a power energy source and the core of the first coil mounted on the door frame, the core of the second coil mounted on an edge of the leaf, the first coil positioned opposite the second coil with its core when the leaf is in its closed position in the door frame forming a minimum air gap between the magnetic cores of the two coils so that said two cores determine a magnetic circuit in at least one determined position of said parts with respect to each other and allow a variable electric current travelling in said first coil to induce a variable magnetic flux in both cores, by inducing an electromotive force in the second coil and providing an electric current in said second coil when the latter is connected in a closed electric circuit, the device characterized in that each of said coils is connected in parallel to a capacitor so as to form resonant circuits, so that transfer of energy is essentially made at the resonance frequency of said circuits.

4,929,006

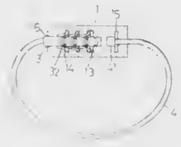
STRUCTURE OF SEALING STRING

Wen-Her Tsay, No. 29, Lane 111, Cheng-Ho Road, Kaohsiung, R.O.C., Taiwan

Filed Aug. 22, 1988, Ser. No. 234,744

Int. Cl.[5] **B65D** *33/34*

U.S. Cl. 292—324 **3 Claims**



1. A lock seal comprising:

a housing;

at least two lock retention sleeves disposed in said housing, each of said sleeves having a frustoconical portion defining large and small diameter opposite ends and a radially outwardly directed flange adjacent the larger diameter end thereof extending in a plane generally normal to the axes of said frustoconical sleeve portion, said sleeve being axially aligned within said housing;

a split ring disposed within each of the frustoconical portions of the sleeves;

means for retaining the split ring within said sleeve and enabling axial movement thereof;

a flexible element having opposite ends;

means cooperable between one end of said element and said housing for retaining the one end of said element in said housing; and

a pin carried by the opposite end of said flexible element and receivable axially within said sleeves, said pin having a plurality of circumferentially extending, axially spaced grooves, said split ring having an internal diameter smaller than the diameter of said pin such that each ring will at first expand upon insertion of the pin and then contract in a pin groove to retain the pin within the body upon attempted retracting movement of the pin from the body.

4,929,007

LATCH MECHANISM

Andrzej Bartczak, Newmarket, and Roman Cetnar, Aurora, both of Canada, assignors to Magna International Inc., Markham, Canada

Filed Mar. 29, 1988, Ser. No. 174,947

Claims priority, application Canada, Mar. 30, 1987, 533372; Jul. 31, 1987, 543600

Int. Cl.[5] **E05C** *3/26*

U.S. Cl. 292—336.3 **131 Claims**



1. An operating mechanism suitable for use in a vehicle door latch mechanism comprising structural components for locking, the operating mechanism comprising:

(a) an inside handle release lever for being operated from the inside of the door;

(b) an outside handle release lever for being operated from the outside of the door;

(c) means for being engaged by the inside handle release lever and outside handle release lever, said means being connected to release the structural components of the latch mechanism for operation;

(d) at least one of the said inside handle release lever and outside handle release lever being movable to a position whereat the release lever cannot engage said means to release the structural components when operated.

4,929,008

IMPACT ABSORBER FOR VEHICLES

Rahman A. Esfandiary, 13148 Victory Blvd., Van Nuys, Calif. 91401

Filed Feb. 14, 1989, Ser. No. 309,849

Int. Cl.[5] **B60R** *19/18, 19/03, 19/34;* **F16F** *7/12*

U.S. Cl. 293—108 **2 Claims**

1. An impact absorber for vehicles comprising the combination of:

a vehicle;

bumper means carried on said vehicle;

said bumper means includes an elongated bumper outwardly supported from said vehicle by a pair of spaced-apart members;

said bumper is an elongated inflatable element having a central chamber occupied by pressurized air;

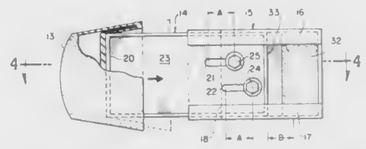
an air valve operably carried on said inflatable element in gated communication with said central chamber for passing pressurized air into said chamber;

each of said spaced-apart members constituting an elongated collapsible member having impact absorbing means and rate of collapse means midway between its opposite ends adapted to irreversibly collapse at a rate upon impact within a predetermined impact range;

each of said elongated members further including a pair of elongated member sections having their respective adjacent ends overlapped and yieldably coupled together to define said elongated member;

frictional release means yieldably joining said overlapped member section ends together;

said impact absorbing means includes a resilient material of greater resiliency than said member section carried on each end of said elongated member sections opposite to their overlapped ends;



one of said resilient materials being a cap fixed to said member section exteriorly thereof and the other one of said resilient materials being a pad internally carried by said member in direct interfering alignment with said other member section;

said frictional release means includes a pair of elongated, spaced-apart slots provided in one member section and a pair of holes provided in the other member section adjacent with and in alignment with said slots and holes respectively;

said bolt fasteners characterized as tightened with a predetermined torque sufficient to hold said member sections together and being yieldable to permit sliding of one member section respective to said other member section upon increase of impact force beyond said impact range; and

said bolt fasteners further characterized as shear off bolts breakage upon attainment of impact forces beyond said impact range of permanent collapse.

4,929,009

END EFFECTOR

Ron Vandersluis, Bramalea, and Erik Quittner, Toronto, both of Canada, assignors to National Research Council of Canada/-Conseil National de Reserches du Canada, Ottawa, Canada

Continuation-in-part of Ser. No. 152,392, Feb. 4, 1988, abandoned. This application Apr. 14, 1989, Ser. No. 338,155

Claims priority, application Canada, Sep. 28, 1987, 548057

Int. Cl.[5] **B25J** *15/08;* **B64G** *1/64*

U.S. Cl. 294—2 **4 Claims**

1. An end effector comprising;

(a) a grapple housing having a proximal end, a distal end, a grapple chamber and a grapple passage opening extending from the grapple chamber through the distal end,

(b) grappling means in the grapple chamber, the grapple means being for snaring a grapple fixture,

(c) latching means on the exterior of said grapple housing, said latching means being operable to latch the end effector to the grapple fixture to prevent separation of the end effector and the fixture whereby substantial forces can be transmitted through the end effector,

(d) first umbilical connector means mounted on said grapple housing for, in operation, movement towards the distal end of said grapple housing to mate with second umbilical cord connector means carried by a grapple fixture,



(e) connector drive means mounted on said grapple housing for, in operation, driving the first umbilical connector means towards and away from the distal end.

4,929,010

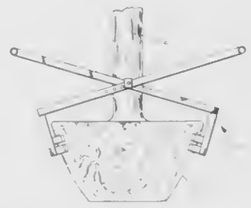
PORTABLE LIFTER

Gary P. Lahti, 520 Howard St., Lunenburg, Mass. 01462

Filed Oct. 25, 1989, Ser. No. 426,563

Int. Cl.[5] **B25B** *7/04*

U.S. Cl. 294—16 **1 Claim**



1. A lifter, said lifter comprising in combination

a left leg and a right leg which legs are pivotally joined at or near their mid-section by a pin;

each said leg comprising a handle at one end and a foot at it's opposite end;

each said handle being attached such that it forms a T-shape with it's leg;

one such foot being attached to the right leg such that it forms an L-shape;

one such foot being attached to the left leg such that it forms a J-shape;

said handles and said feet being aligned in the same plane;

each said foot having attached thereto an arm;

each arm having at least one semicircular cross finger attached thereto and all semicircular cross fingers arranged such that their concave sides face each other;

said legs being arranged such that they pivot around the pin when the handles are moved toward each other.

4,929,011

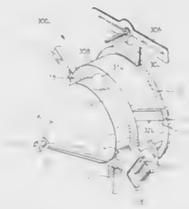
GRAPPLE FIXTURE

Ron Vandersluis, Brampton, and Erik Quittner, Toronto, both of Canada, assignors to National Research Counsil of Canada/-Conseil National de Recherches du Canada, Ottawa, Canada

Continuation-in-part of Ser. No. 152,392, Feb. 4, 1988, abandoned. This application Apr. 14, 1989, Ser. No. 338,156

Int. Cl.[5] **B25J** *19/00;* **B64G** *1/64*

U.S. Cl. 294—86.4 **6 Claims**



1. A grapple fixture, comprising;

(a) a base comprising a mounting flange with an outwardly extending cylindrical body having an outer, annular, end effector abutment face,

(b) an end effector latching trunnion attached to, and extending radially in a lateral direction from, the cylindrical body,

(c) a substantially cone-shaped, grapple fixture aligning body extending outwardly from the cylindrical body, the cone-shaped body having a cylindrical, end effector locating, base portion attached to the abutment face, and

(d) a laterally extending, grapple fixture recess engaging, rounded shoulder extending around a portion of the cylindrical base and secured against relative movement to the abutment face.

4,929,012

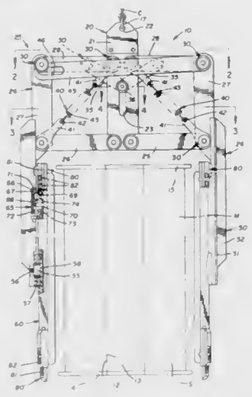
CREEL LOADING APPARATUS

Raymond J. Slezak, Harberton, Ohio, assignor to RJS Corporation, Akron, Ohio

Filed May 12, 1988, Ser. No. 193,355

Int. Cl.[5] **B66C** *1/30*

U.S. Cl. 294—86.41 **11 Claims**



1. A loading apparatus suspended by a cable for grasping a containerized spool, including strand material disposed thereon, transporting the spool to a position proximate a creel and orienting the spool for positioning on a creel spindle comprising, a plurality of substantially parallel arm means, shoe means carried by said arm means, gripping means on said shoe means for engaging the spool, lifting link means adapted for attachment to the cable, linkage means interposed between said lifting link means and said arm means and maintaining said arm means substantially parallel while bringing said gripping means into and out of engagement with the spool, and means pivotally mounting said shoe means relative to said arm means for selectively rotationally orienting the spool, said shoe means having a longitudinally elongate, laterally curved plate configured to circumferentially engage a portion of the circumference of the strand material on a spool and finger means projecting from the longitudinal extremities of said plate to engage radially outward extremities of flanges at the axial extremities of the spools.

4,929,013

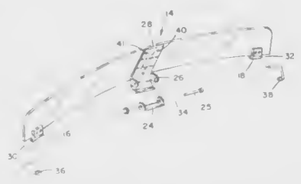
AIRFLOW DEFLECTOR APPARATUS

Alan B. Eke, Menomonie, Wis., assignor to Lund Industries, Inc., Coon Rapids, Minn.

Filed Jun. 27, 1989, Ser. No. 372,034

Int. Cl.[5] **B60T** *1/20*

U.S. Cl. 296—91 **4 Claims**



1. Airflow deflector apparatus adapted to be mounted on the hood of a vehicle comprising:

first and second wing means for deflecting airflow;

a center hinge means, coupled to said wing means, for permitting said wing means to be rotated into a collapsed position in substantial conformity with said hood, and for permitting said wing means to be rotated into an erected position to deflect airflow over said hood,

first and second side hinge means defining first and second hinge axis, said hinge means being coupled to said wing means for permitting rotational and longitudinal movement of each of said wing means relative to a respective one of said first and second axis.

4,929,014

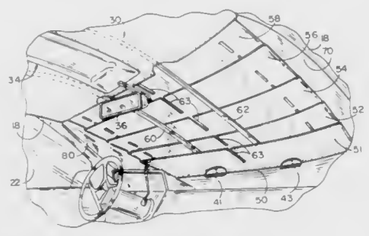
FULL WINDSHIELD SUNSHADE

Robert J. Clark, and Patrick W. Binish, both of Holland, Mich., assignors to Prince, Holland, Mich.

Filed Dec. 27, 1988, Ser. No. 290,703

Int. Cl.[5] **B60J** *3/02*

U.S. Cl. 296—97.8 **30 Claims**



1. A visor system for a vehicle comprising:

a visor including a plurality of horizontally extending elongated generally rectangular panels arranged in sliding overlapping relationship to each other; and

means for mounting said panels for movement between a stored substantially overlapped position adjacent a vehicle roof to extended positions covering a vehicle window, wherein said panels are interconnected by means of a pair of flexible spaced ribbons coupled to each panel.

4,929,015

CONVERTIBLE TOP FOR VEHICLES, PARTICULARY FOR MOTOR CARS

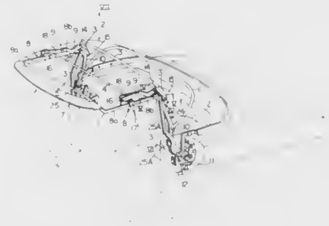
Theodor Bauer, Altenriet, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 14,848, Feb. 13, 1987, abandoned, which is a continuation of Ser. No. 702,660, Feb. 19, 1985, abandoned. This application Jul. 6, 1988, Ser. No. 215,505

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405920

Int. Cl.[5] **B60** *7/12*

U.S. Cl. 296—116 **12 Claims**



8. A foldable frame for supporting a convertible top of a vehicle having a tonneau space, the foldable frame being movable between a retracted and an extended position, and comprising;

a main hoop mounted to respective opposite sides of the vehicle for pivotable movement about a transverse axis of the vehicle, the main hoop defining a pair of diverging, laterally spaced-apart side members and an integral top therebetween, each side member being inclined in relation to the top member to define an obtuse angle therebetween,

a pair of foldable side frame linkage means, each of said pair of said foldable side frame linkage means being connected to a corresponding side member and being folded to substantially half of an extended length when said foldable frame is in said retracted position, and

aligning means for aligning each of said folded frame linkage means substantially parallel to a corresponding said side member when said foldable frame is in said retracted position.

4,929,016

BI-DIRECTIONAL ROOF MOUNTED CAR PROTECTIVE DEVICE

Paraskevas N. Kastanis, 6009 Woodbridge Rd., Charlotte, N.C. 28212

Filed Mar. 8, 1989, Ser. No. 320,510

Int. Cl.[5] **B60J** *7/20*

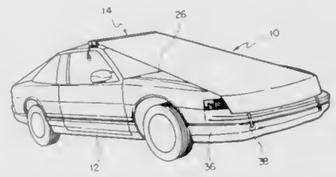
U.S. Cl. 296—136 **5 Claims**

1. An apparatus for covering selected portions of a vehicle, comprising:

a pair of extendable and retractable, flexible, sheet-like covering means, each covering means having a lateral extent corresponding generally to the lateral extent of a vehicle on which the cover is to be used, and the pair of covering means having a combined longitudinal extent corresponding generally to the longitudinal extent of the selected portion of the vehicle to be covered, each covering means being movable between a first, fully extended position for covering the selected portion of the vehicle and a second, retracted position for storage;

a pair of means, each coupled to a respective one of the covering means, for winding the covering means about an axis;

a housing for supporting the pair of winding means relative to one another such that they are closely adjacent and



their winding axes are in substantially parallel relation to one another;

means, connected to the housing, for selectively securing the housing to an exterior surface of the vehicle, said means including a plurality of suction devices for engaging opposite side windows of the vehicle; and

means, connected to said covering means, for selectively securing said covering means in extended covering relation to the vehicle.

4,929,017

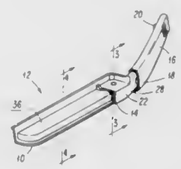
ARMREST FOR VEHICLES AND METHOD OF MAKING SAME

Cal A. Lilienthal, and Ronald L. Christensen, both of Iowa City, Iowa, assignors to Purethane Incorporated, West Branch, Iowa

Filed Oct. 28, 1988, Ser. No. 263,880

Int. Cl.[5] **B60N** *1/02*

U.S. Cl. 296—153 **4 Claims**



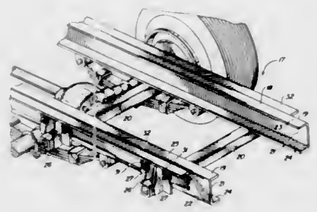
1. A grab-handle armrest unit for a vehicle door and having an outboard side engageable with the door when the unit is affixed to it and an inboard side facing away from the door, said unit comprising a structural insert of generally rigid material, the insert including a grab-handle portion and an armrest portion separable from the grab-handle portion, a vinyl skin covering the unit on all surfaces except that portion of the outboard side that engages the vehicle door, urethane foam filling all spaces in the unit between the insert and the vinyl skin, the grab-handle portion of the unit being covered only with vinyl, and the urethane foam filling the unit along the inboard side and top of the armrest to provide cushioned surfaces.

4,929,018

TRUCK RAMP STORAGE ARRANGEMENT

William E. Carty, Tempe, Ariz., assignor to U-Haul International, Phoenix, Ariz.

Filed Jul. 1, 1988, Ser. No. 214,516
Int. Cl.[5] B62D 27/02
U.S. Cl. 296—204 9 Claims



1. In a truck chassis, a pair of longitudinal frame members, said longitudinal frame members being characterized by having C-shaped cross-sections providing closed outer faces and having open regions facing each other, a transverse frame member positioned beneath said longitudinal members and having end regions extending beyond the transverse extent of said longitudinal members, and bracket means secured to the outer face of each of said longitudinal members and extending downwardly from said longitudinal members, said bracket means being secured to the end regions of said transverse member, the arrangement being such that the space above said transverse member and between said longitudinal members including the open regions of said longitudinal members is open to provide a storage space.

4,929,019

DEVICE FOR OPENING AND CLOSING THE ROOF HATCH OF A VEHICLE

Taisto Pääkkönen, Raisio; Vainino Veijo, and Turpeinen Jarkko, both of Parainen, all of Finland, assignors to Oy Parton Ab, Parainen, Finland

Filed Jan. 17, 1989, Ser. No. 297,905
Claims priority, application Finland, Jan. 19, 1988, 880218
Int. Cl.[5] B60J 7/057
U.S. Cl. 296—223 7 Claims



1. An opening and closing device for a vehicle roof hatch (1), comprising a bar (4) fixedly fitted to an edge surrounding a vehicle roof aperture and two lever systems (5, 6, 7) which are identical but installed as mirror images of each other, each lever system consisting of a long arm (5) one end (5c) of which is movably fastened to the bar and another, upper end (5d) thereof fastened to the roof hatch, and of a short arm (6) one end (6b) of which is fastened pivotably to the bar and another end is pivotably fastened between the ends of the long arm (5), in which case a corresponding area of the roof hatch can be caused to move in a vertical direction by moving the movable end of the long arm; wherein the bar (4) is threaded so that two halves thereof are threaded longitudinally in opposite directions, a length of the short arm (6) is one-half of a length of the long arm (5) and the short arm (6) is articulated (7) to a middle of the long arm.

4,929,020

STRUT FOR A FOLDING VEHICLE COVER

Jürgen Schrader, Stuttgart, and Klaus Claar, Sindelfingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 254,806
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733842
Int. Cl.[5] B60J 7/12
U.S. Cl. 296—118 5 Claims



1. A strut for a folding vehicle cover movable between a stored position and a raised, closed position and having a roof skin and a vehicle cover frame, the folding vehicle cover bridging a roof width and comprising:

a central strut section;

a strut flank extending outwardly at an angle from each end of the central strut section, the central strut section and strut flanks being raisable in a strut plane relative to braced ends of the strut flanks between a stored position and a raised, locked position;

spring loading means formed by the central strut section and at least a portion of the strut flanks and having a bowed, relaxes configuration and a stressed tensioned configuration for providing a taut roof skin when the folding vehicle cover is closed, such that when the strut in in the raised locked position, the spring loading means occupies an upper limit position while in the bowed relaxed configuration which is located above a lower tensioned position of the spring loading means while in the stressed tensioned configuration; and

means for integrating the strut into the vehicle cover frame by articulately bracing the strut flanks against associated side wall frame parts of the vehicle cover frame,

wherein in a final closing phase of the folding cover the spring loading means in automatically lowered out of the bowed, relaxed position counter to a spring biasing force of the roof skin into the stressed, tensioned position under the influence of longitudinal tensile forces in the roof skin resulting from a final closing movement of the folding cover form a partially closed position to a fully closed position.

4,929,021

ORNAMENT DISPLAYING FURNITURE

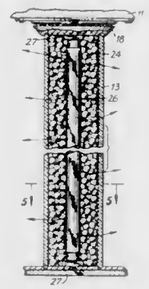
Howard Kaye, Greenwich, Conn., assignor to Designs For Leisure, Ltd., Mount Kisco, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,681
Int. Cl.[5] A47C 7/00
U.S. Cl. 297—193 2 Claims

1. An ornament displaying article of furniture comprising a weight-bearing surface member constructed as a seat for an occupant, a base and a hollow support element interconnecting said base and weight-bearing surface member and being releasably connected to one of said weight-bearing surface member and base, an ornamental display within the hollow interior of said support element, said ornamental display being visible from outside the article of furniture and changeable upon releasing one of said weight bearing surface member and base from said hollow support element,

said hollow support element comprising a cylindrical column member having a light transmitting portion and a transparent section thereof through which said ornamental display is visible from outside of the article of furniture, and

said ornamental display comprising a plurality of light reflective materials substantially filling said hollow support element, said light reflective materials comprising colored marbles.

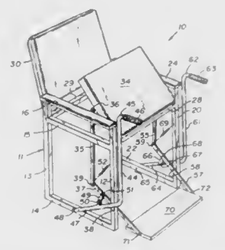


4,929,022

CHAIR HAVING LIFT APPARATUS

Alexander Geraci, 5221 N. Lind Ave., Chicago, Ill. 60630

Filed Feb. 23, 1989, Ser. No. 314,164
Int. Cl.[5] A47C 1/02
U.S. Cl. 297—313 16 Claims



1. A chair having lifting means for assisting a physically impaired occupant to arise out of the chair, comprising:

a frame,

a seat hingedly mounted at its forward edge to said frame,

foot-operated lever means pivotally mounted on said frame having a foot rest to one end,

manually operated lever means pivotally mounted on said frame having hand engaging means at one end,

coupling means pivotally connected to both said foot-operated means and said manually operated means arranged to combine the forces generated by each of said lever means, and

seat lift lever means pivotally connected at one end to one of said foot-operated lever means or said manually operated lever means, and at the other end to said seat,

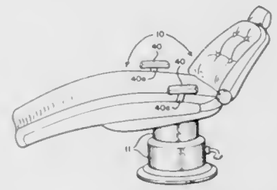
the arrangement being such that when the occupant applies force to both said foot-operated lever means and said manually operated lever means, the combined force is transmitted to said seat and causes said seat to push said occupant out of the chair.

4,929,023

POSITION-ADJUSTING APPARATUS FOR MOUNTING A RECLINING CHAIR ON A PEDESTAL BASE

Lyle S. Rasmussen, 245 N. Vine St., Salt Lake City, Utah 84103

Filed Mar. 14, 1989, Ser. No. 323,309
Int. Cl.[5] A47C 1/00
U.S. Cl. 297—330 16 Claims



1. A conversion unit for pedestal mounted, reclining chairs, comprising an elongate chassis frame having a chair seat frame section and a chair back frame section interconnected end-to-end for pivotal movement relative to each other; means pivotally interconnecting the two frame sections; a mounting plate intermediate the length of said chassis frame for fixed attachment to a pedestal base; motivating mechanism supported by said frame for rocking said chassis frame either backwardly or forwardly along its longitudinal axis and including a reversible electric motor, a screw extending longitudinally of said frame, and an elongate actuator arranged to be moved back or forth by said screw; master bell crank means; means pivotally interconnecting said master bell crank means with said actuator; linkage means pivotally interconnecting said master bell crank means with said chair seat frame; a rocker shaft extending transversely of said chair seat frame section, said shaft being carried by said mounting plate and journaled by said master bell crank means; respective secondary bell crank means pivotally connected to opposite ends, respectively, of said shaft; a second transverse shaft; structural means extending from fixed connection with said chair back frame section to pivotal connection with opposite ends, respectively, of said second transverse shaft; respective second linkage means pivotally interconnecting said secondary bell crank means with opposite ends of said second transverse shaft, respectively; respective third linkage means pivotally interconnecting said secondary bell crank means, respectively, with said chair seat frame section; respective bracket members fixedly secured to said chair seat frame section in mutually spaced relationship transversely of said chassis frame; respective rods extending longitudinally of each chassis frame and having one set of corresponding ends pivotally attached to said second transverse shaft, the opposite set of corresponding ends passing slidably through said bracket members, respectively; and respective coil compression springs carried longitudinally by said rods, respectively, with their opposite ends abutting said second transverse shaft and said bracket members, respectively.

4,929,024

POWER SEAT RECLINER

Tyrone R. Secord, Sterling Heights, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Jun. 29, 1989, Ser. No. 373,248
Int. Cl.[5] B60N 1/06
U.S. Cl. 297—362 5 Claims

1. A motor vehicle power seat recliner comprising:

an upper recliner structure for supporting a seat back cushion,

a lower recliner structure for supporting a seat bottom cushion,

first pivot means for enabling the reclined angle between said upper and lower recliner structure to be adjusted,

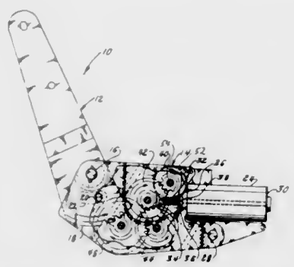
a toothed quadrant coupled to said upper recliner structure,

an electric motor having an elongated casing with first and

second axial ends, with a drive shaft extending from said first end, said lower recliner structure supporting said motor adjacent both said first and second ends,

a worm gear affixed to said drive shaft and fixed thereto for rotation, and

gear train means for providing a gear reduction and for communicating rotation of said drive shaft to said toothed



rack, said gear train means including a plurality of gears consecutively intermeshed and each having a larger diameter toothed section for driving an adjacent gear through its smaller diameter toothed section, one of said gears meshed with said worm gear and another of said gears driving said toothed quadrant whereby rotation of said drive shaft causes the reclined angle between said upper and lower recliner structures to be varied.

4,929,025

SPRING-LOADED SEAT ASSEMBLY

Chin S. Lu, No. 50, Lane 262, Chen Hsing Rd., Taichung City, Taiwan

Filed Oct. 11, 1989, Ser. No. 419,676
Int. Cl.[5] A47C *7/02*
U.S. Cl. 297—452 4 Claims



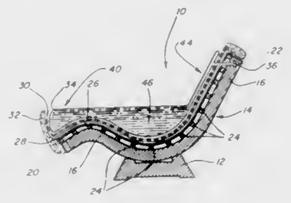
1. A spring-loaded seat assembly comprising an upper seat and a lower seat with a plurality of spring members connected therebetween; a recess being formed on a respective outer surface of said upper and said lower seats; a number of hooks being formed on a respective inner surface of said seats for engaging both ends of said spring members so that said seats are resiliently connected together; a peripheral flange being formed on a respective inner peripheral surface of each said seat and extending vertically toward each other; and a damping mechanism being provided between said seats.

4,929,026

SEATING STRUCTURE WITH DISPLACEABLE WATER BLADDER

Barry D. Barbelet, 405 6th St., Pinetops, N.C. 27864

Filed Mar. 15, 1989, Ser. No. 324,010
Int. Cl.[5] A41C *3/00*
U.S. Cl. 257—454 6 Claims



1. A water containing seat structure having a displacable well portion comprising:

(a) a base;

(b) a contoured frame structure supported by the base and including a leg support area, a well cavity, and an inclined back;

(c) a water containing bladder supported on the contoured frame structure and including a water well lying between the back and the leg area and wherein in a no-load mode the upper most level of the water well terminates about a lower portion of the back;

(d) the water bladder further including a leg support portion that extends from the water well over the leg support area;

(e) the water bladder further including in a no-load mode an empty back portion that is communicatively open to the water well and extends up the inclined back of the contoured frame; and

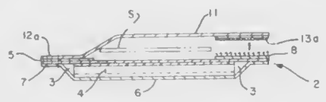
(f) wherein the water well forms a relatively deep water pocket in the no-load mode and is particularly disposed with respect to the empty back portion of the water bladder such that by placing a load on the water well results in the water within the water well being displaced therefrom and upwardly into the back portion of the water bladder where the displaced water generally conforms to the shape of the back area of a person imposing the load on the water well.

4,929,027

PASSIVE RESISTANCE ENHANCER FOR SAFETY SEAT BELT

Roger R. Beauvias, II, 6246 Dulin Creek Rd., House Springs, Mo. 63051

Filed Oct. 24, 1988, Ser. No. 261,421
Int. Cl.[5] B60R *21/00*
U.S. Cl. 297—482 1 Claim



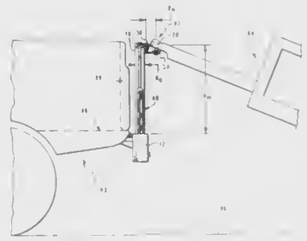
1. A passive resistance enhancer for application in supplementing the safety of a seat belt during usage, and for application in conjunction with a seat belt of the shoulder harnessing type as provided in vehicles, comprising, a sleeve means of flexible material having first and second channels provided therethrough and extending approximately throughout its length, said sleeve means having a forward surface and a rearward surface, a first channel provided proximate the forward surface within the structure of the sleeve means, and a second channel disposed proximate the rearward surface within the structure of the sleeve means, said seat belt being disposed within said first channel provided proximate the forward surface within the structure of the sleeve means, said passive resistance enhancer including a substantially rigid support, said substantially rigid support contained within the second channel and disposed proximate the rearward surface within the structure of the sleeve means, so as to retain said substantially rigid support and seat belt in separate but adjacent locations within said sleeve means, said rearward surface of the sleeve disposed for resting against the user of the seat belt, said rigid support being at least equal to or wider than the adjacent seat belt, and said rigid support being integral and extending approximately the length of said sleeve, such that upon encountering an impacting force the seat belt biases against said rigid support for dissemination of the forces of impact over a greater surface area for minimizing any damage to the person being passively restrained, said rigid support substantially incorporating undulations along its length to provide for its further cushioning and flattening through longitudinal expansion upon its wearer encountering an impacting force, said sleeve means and substantially rigid support being removable affixed to said seat belt, said second channel within the sleeve means forming a first pocket within which the substantially rigid support inserts, and closure means provided for retaining said substantially rigid support entirely within said first pocket, said first channel provided within said sleeve forming a second pocket into which said belt inserts, and closure means provided for retaining said seat belt within said second pocket, said first and second channels having an intermediate layer disposed longitudinally therebetween, and a liner forming the forward surface of the first channel, closure means provided at least along one side of the liner and layer for providing for their securement together, wherein said closure means comprises stitching along one side edge of the line, securing it within the underlying sleeve means to the layer, and a hook and pile fastening means provided along the other side edge of said liner, removably securing it to the layer of the underlying sleeve means, wherein said hook and pile fastening means capable of being opened for removal of the seat belt from within the first channel and its separation from the sleeve means and the substantially rigid support, said rigid support is formed of a resilient polymer, and said polymer comprising polycarbonate, and wherein said sleeve means incorporates cushioning material so as to cushion the impact of the sleeve means against the wearer upon encountering an impacting force.

4,929,028

LIFT HITCH

Lowell A. Underwood, P.O. Box 452, Prosper, Tex. 75078

Filed May 13, 1988, Ser. No. 193,774
Int. Cl.[5] B60P *1/16;* B62D *53/04*
U.S. Cl. 298—19 R 33 Claims



1. A hitch comprising:

a. an elongated chamber-like structure having an open top and an interior in communication with said top, said chamber-like structure having a configuration adapted for anchoring to a structural part of a mobile transporting means and is sized and configured like a conventional pickup truck bumper;

b. an engageable member mounted for movement with respect to said chamber-like structure, said engageable member adapted for connection to a structural trailer part;

c. means for causing said engageable member to move with respect to said chamber-like structure, said causing means being extendable through said top of said chamber-like structure in order to move said engageable member to a desired location away from said chamber-like structure, said causing means being retractable to a stowed configuration inside said chamber-like structure so as to position said engageable member immediately adjacent said chamber-like structure; and

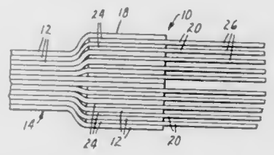
d. means for actuating said causing means.

4,929,029

BRUSH MANUFACTURING METHOD

Edward W. Deziel; John T. Rueb; Mark D. Sorlien; Jack A. Dahlstrom, and David W. Erismann, all of St Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 57,214, May 8, 1987, Pat. No. 4,821,359.
This application Feb. 21, 1989, Ser. No. 312,718
Int. Cl.[5] A46D *1/08*
U.S. Cl. 300—21 10 Claims



1. A method for forming brushes comprising the steps of:

cutting one or more sheets to form a plurality of plies each having a handle end portion and an opposite head end portion, the plies being attached together at spaced locations in a single layer and being disposed with the head end portions of the plies projecting in opposite directions, the head end portions of the plies projecting in each direction being closely adjacent in side by side relationship and having generally aligned end surfaces, and the handle end portions of plies projecting in one of the directions being interdigitated with the handle end portions of plies projecting in the other of the directions;

forming a fibrillatable oriented polymeric film;

cutting the film into a plurality of pieces having generally uniform lengths in the direction of orientation and including a first set of pieces having widths transverse to the direction of orientation generally corresponding to the total width of the head portions projecting in one direction and a second set of pieces having widths transverse to the direction of orientation generally corresponding to the total width of the head portions projecting in the other direction;

adhering one piece of the film from each set to each of certain ones of the single layers with the end surfaces transverse to the direction of orientation and a minor end portion of one of the pieces of film overlaying and adhered to the head end portions of the plies projecting one of the directions to which it corresponds in width, and a minor end portion of the other of the pieces of film overlaying and adhered to the head end portions of the plies projecting in the other of the directions and with major end portions of the pieces of film projecting from the head end portions in opposite directions;

separating the major end portions of the pieces of film adhered to the single layers into individual bristles; and

laminating the single layers together in aligned relationship with the minor end portions of the pieces of film laminated between the single layers to form a composite comprising a plurality of the brushes each comprising a laminate having a handle end portion adapted for manual engagement, and an opposite head end portion; and a plurality of rows of bristles, each row having a base end portion formed by a part of one of the minor portions of the pieces of film adhered between a different pair of adjacent plies in the head end portion of the laminate and having distal end portions projecting outwardly from the head end portion, the distal end portions of the rows of bristles extending generally in the same direction, the laminates being attached together at the spaced locations to form a single plate like structure and being disposed with the head end portions of the laminates projecting in opposite directions, the head end portions of the laminates projecting in each direction being closely adjacent in side by side relationship, and the handle end portions of laminates projecting in one of the directions being interdigitated with the handle end portions of laminates projecting in the other of the directions, the laminates being separable by breaking the spaced locations to separate individual ones of the brushes.

4,929,030

STATIONARY MEMBER ON AUTOMOTIVE HUB CAP

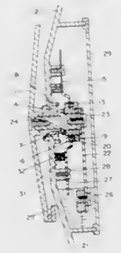
Seung M. Park, #92-12, Yonhee-2dong, Seodaemunku, Seoul, Rep. of Korea

Filed Jan. 30, 1989, Ser. No. 302,895

Claims priority, application Rep. of Korea, Feb. 2, 1988, 88-1204

Int. Cl.[5] B60B *7/00*

U.S. Cl. 301—37 N 2 Claims



1. An (The) automobile hub cap having a center on which a static lateral axle is supported by a bearing and a bushing with ribs at the center of said static lateral axle, a supporting plate fixed by screws and bosses to an inner side of said hub cap, said supporting plate supporting said bearing, said bushing and said static lateral axle supported by said bearing and said bushing; a clutch plate fixed at one of its ends to the inner end of said static lateral axle, an eccentric bob fixed to the other end of said clutch plate, a static member fixed at an outer end of said static lateral axle and on a front side of said hub cap; a rubber sealing ring between said hub cap and said supporting plate; a rear cover over a rear side of said hub cap covering said supporting plate and said clutch plate; and a lubricating oil supply between said rear side of said hub cap and said rear cover.

4,929,031

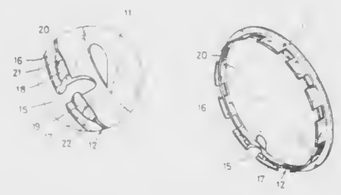
STRUCTURE OF HUB CAP FOR CAR WHEEL

Liou Shenq-Gwo, P.O. Box 96-405, Taipei 10098, Taiwan

Filed Nov. 21, 1988, Ser. No. 274,339

Int. Cl.[5] B60B *7/00*

U.S. Cl. 301—37 P 1 Claim



1. A hub cap for car wheel mainly comprising a hub cap and a flexible ring insert;

said hub cap including a plurality of click sheets and a notch; and each of said click sheets having a flange end to be retained under the flange of a wheel rim edge, and each said click sheet having a groove in the inner side thereof for retaining a section of said flexible ring insert; and two click sheets adjacent each side of said notch being furnished with positioning flanges for receiving two ends of said flexible ring insert;

said flexible ring insert including a metal ring having two ends, two rubber caps mounted on two ends of said metal ring; and said rubber caps being positioned in said positioning flanges respectively, and the remainder of said metal ring being mounted in said grooves on the inner side of said click sheets of said hub cap; thereby enabling said hub cap to be mounted on a car wheel flexibly and firmly.

4,929,032

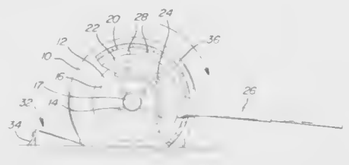
EMERGENCY SPARE WHEEL AND METHOD AND APPARATUS FOR INSTALLING SAME

Manfred A. Isaacson, 2323 Oakway, West Bloomfield, Mich. 48033

Filed Jul. 11, 1988, Ser. No. 217,313

Int. Cl.[5] B60B *19/00*

U.S. Cl. 301—38 R 2 Claims



1. A method for mounting a spare tire on a vehicle wheel and tire assembly having a flat tire without removing the flat tire from the vehicle wheel, wherein the spare tire comprises two complemental sections having ground-engaging peripheral portions and, together, forming a circular spare tire, comprising the following steps:

mounting a first spare tire section on an upper part of said vehicle wheel and tire assembly such that the spare tire section is not in contact with the ground;

placing a ramp block adjacent the ground-contacting portion of said flat tire opposite the ground-contacting end of said first spare tire section, said ramp block being of sufficient height to elevate the vehicle onto the ground engaging portion of the installed spare tire section;

applying torque to rotate said vehicle tire and wheel assembly up, over and beyond said ramp block such that said vehicle tire and wheel assembly is essentially resting upon the ground-engaging portion of said first spare tire section; and, thereafter,

mounting a second spare tire section complemental with the first section on said vehicle wheel and tire assembly.

4,929,033

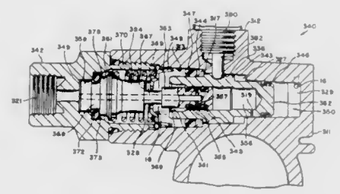
PRIMARY AND SECONDARY PRESSURE-BALANCED PROPORTIONING VALVE

Richard A. Zander, Niles; Robert F. Gaiser, Stevensville, both of Mich.; William F. Dillon, Jr., South Bend, and Donald A. Crumb, Granger, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 7/067,514, Jun. 29, 1987, Pat. No. 4,821,519, and a continuation-in-part of Ser. No. 7/160,784, Feb. 18, 1988, Pat. No. 4,815,292. This application Nov. 3, 1988, Ser. No. 266,964

Int. Cl.[5] B60T *11/20*

U.S. Cl. 303—9.63 8 Claims



1. A proportioning valve in combination with warning means, the proportioning valve received in a bore having communication means for receiving fluid pressure communicated to the bore, the bore having at one end a first pressure receiving chamber and at the other end a second pressure receiving chamber, the second pressure receiving chamber having an outlet opening, a differential area piston disposed within said bore and having a first end received in the first pressure receiving chamber and a second end received in the second pressure receiving chamber, the first end having a seal thereat in order to define a part of the primary pressure receiving chamber, the second end having first sealing means disposed thereat, the differential area piston comprising a first piston part and a second piston part, the first piston part having a blind bore with an end opening at the second piston part, the first piston part having an orifice communicating the blind bore with an intermediate chamber defined between said seal and second sealing means disposed at an opposite end of the first piston part, the second piston part having an extension extending into the blind bore, the extension having a seal member which controls fluid flow through a first opening in the extension, the blind bore in the first piston part and the orifice sized so that the velocity of movement of the extension out of the blind bore is reduced during a release phase of braking, the first opening communicating with a longitudinal opening extending in said second piston part, the second piston part biased by resilient means toward said outlet opening, the first piston part having an exterior which includes a circumferential groove thereabout, and warning means extending into the intermediate chamber to engage the groove, so that failure of pressure in one of the first and second pressure receiving chambers causes the first piston part to be displaced and effect operation of said warning means.

4,929,034

ANTI-LOCKING BRAKE CONTROL SYSTEM

Volker Braschel, Heilbronn, and Dieter Seitz, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Fed. Rep. of Germany

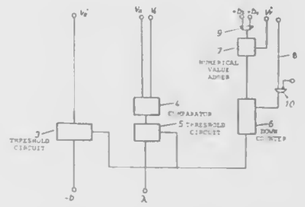
PCT No. PCT/EP87/00167, § 371 Date Sep. 26, 1988, § 102(e) Date Sep. 26, 1988, PCT Pub. No. WO87/05872, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 25, 1987, Ser. No. 274,143

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610186

Int. Cl.[5] B60T *8/58, 8/60, 8/32*

U.S. Cl. 303—103 13 Claims



1. An anti-locking brake control system of the type comprising wheel velocity pickups, an evaluation circuit, and brake pressure control valves, said pickups providing signals to said evaluation circuit which determines therefrom the wheel retardation, wheel slippage, and wheel acceleration, said evaluation circuit providing signals to the brake pressure control valves to relieve pressure when an instability threshold based on at least one of wheel retardation and wheel slippage is reached, said evaluation circuit comprising

a summing circuit which provides a sum indicative of said instability threshold at which braking pressure is relieved,

means for reducing the sum in accordance with a given function,

means for increasing said sum by a numerical value whenever a wheel acceleration of a given magnitude occurs after an instability threshold is reached, the instability threshold at any time being determined by the magnitude of the sum at that time.

4,929,035

ANTI-LOCK CONTROL SYSTEM FOR MOTOR VEHICLES

Haruki Shimanuki, Kasukabe, Japan, assignor to Akebono Brake Industry Co. Ltd., Japan

Filed Feb. 7, 1989, Ser. No. 307,617

Claims priority, application Japan, Feb. 8, 1988, 63-25705

Int. Cl.[5] B60T *8/62*

U.S. Cl. 303—106 4 Claims

1. An anti-lock control system for motor vehicles, wherein a low peak of a wheel speed is detected which occurs when the wheel speed as decreased by a pressure buildup of a brake hydraulic pressure is changed from decrease to increase by a pressure reduction of the brake hydraulic pressure, and said pressure reduction is interrupted at a time point when said low peak of the wheel speed is detected, said anti-lock control system comprising:

means for judging the friction coefficient of a road surface on which the motor vehicle runs;

means for setting up a normal pressure reduction period for the brake hydraulic pressure;

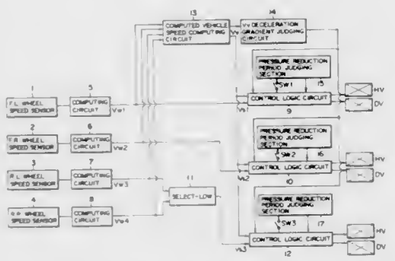
means arranged to interrupt said pressure reduction at the end of said normal pressure reduction period under such conditions that said friction coefficient is equal to or higher than a predetermined value and said normal pressure reduction period elapses before said low peak occurs;

means for computing a computed vehicle speed by selecting

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the highest one of four wheel speeds and limiting the deceleration and acceleration of the selected highest wheel speed to be in a predetermined range; and

means for computing a pressure reduction resuming threshold speed which is lower than and follows said computed vehicle speed in a predetermined relationship therewith, wherein when said normal pressure reduction period elapses at a time point that is later than a time point when the pressure reduction is started but earlier than a time point when the wheel speed becomes lower than said



pressure reduction resuming threshold, the interruption of the pressure reduction is effected at the end of said normal pressure reduction period; and when the wheel speed becomes lower than said pressure reduction resuming threshold speed after the pressure reduction has been interrupted, reduction of the brake hydraulic pressure is resumed at a time point when the wheel speed reaches said pressure reduction resuming threshold, and the pressure reduction is continued until a low peak of the wheel speed occurs.

4,929,036

HYDRAULIC BRAKE PRESSURE CONTROL DEVICE FOR A VEHICLE

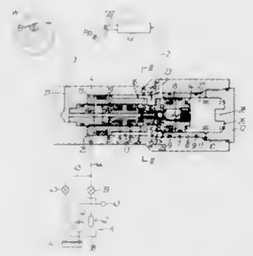
Yoshibiro Iwagawa; Toshio Yahagi, and Etsuo Fujii, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1989, Ser. No. 369,887

Claims priority, application Japan, Jun. 24, 1988, 63-157088

Int. Cl.[5] B60T *8/42*

U.S. Cl. 303—115 **5 Claims**



1. A hydraulic brake pressure control device for a vehicle comprising an input hydraulic pressure chamber in communication with an output port of a master cylinder, and an output hydraulic pressure chamber in communication with a wheel brake to generate a brake hydraulic pressure corresponding to a hydraulic pressure of the input hydraulic pressure chamber, in which when the wheel is about to assume a locked state, a volume of said output hydraulic pressure chamber increases in response to an introduction of a controlled liquid pressure from anti-lock control means to a control chamber, the hydraulic brake pressure control device comprising a casing which includes therein a first cylinder portion, a second cylinder portion in coaxial arrangement with said first cylinder portion and a pillar-like projecting portion which projects into said first cylinder portion, said casing receiving therein a piston comprising a first piston portion slidably fitted in said first cylinder portion, a second piston portion connected to the first piston portion and slidably fitted in said second cylinder portion and a third cylinder portion positioned in the center of said first piston portion and slidably fitted over said projecting portion, and a spring for urging the piston in one direction, said first cylinder portion defining therein said control chamber for exerting a pressing force on said piston in the opposite direction upon introduction of liquid pressure, said first and second cylinder portions defining therein said input hydraulic pressure chamber for exerting a pressing force on said piston in said one direction upon introduction of hydraulic pressure, said third cylinder portion defining therein said output hydraulic pressure chamber for exerting a pressing force on said piston in the opposite direction upon introduction of hydraulic pressure, said piston being provided with an oil passage for communicating the input and output hydraulic pressure chambers and a valve mechanism for closing the oil passage in response to movement of the piston in the opposite direction.

4,929,037

HYDRAULIC ANTI-LOCK BRAKING SYSTEMS FOR VEHICLES

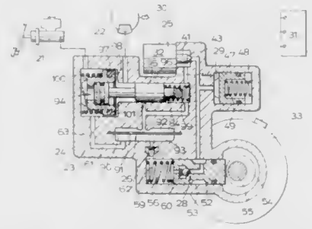
Glyn P. R. Farr, Warwicksbire, England, assignor to Lucas Industries public limited company, England

Filed Mar. 2, 1989, Ser. No. 317,937

Claims priority, application United Kingdom, Mar. 9, 1988, 8805598; Jul. 21, 1988, 8817412

Int. Cl.[5] B60T *8/40, 8/48, 8/36*

U.S. Cl. 303—116 **6 Claims**



1. A hydraulic anti-lock braking system for vehicles comprising a master cylinder for applying hydraulic fluid under pressure to a brake on a wheel to apply said brake, a modulator responsive to the behaviour of said braked wheel to modulate the supply of fluid from said master cylinder to said brake in an anti-lock mode, and a pump having an output which generates the energy necessary to recover fluid after the pressure applied to said brake had first been released to prevent said wheel from locking, wherein said modulator comprises means defining a control chamber, a solenoid-operated valve for determining the pressure in said control chamber, a poppet valve for controlling communication between said master cylinder and said brake in accordance with pressure in said control chamber, means defining an expansion chamber to which fluid is relieved from said brake in an anti-lock mode, a re-application valve for determining the rate of re-application of pressure to said brake upon recovery of said braked wheel, and a restricted connection between said master cylinder and said output from said pump, and wherein said poppet valve comprises a means defining a passage, a spool responsive to pressure in said control chamber for controlling the supply of fluid to the brake

through said passage, a valve seating, and a valve head movable relative to said spool and which, in an open position, is normally spaced from said seating to provide unrestricted communication between said master cylinder and said brake, movement of said spool in a direction to open said passage to cause said head to co-operate with the seating to cut-off unrestricted communication between said master cylinder and said brake.

4,929,038

HYDRAULIC UNIT

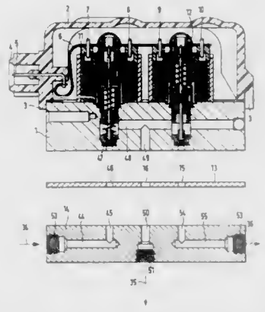
Hans-Dieter Reinartz, Frankfurt am Main, and Helmut Steffes, Hattersheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,487

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729216

Int. Cl.[5] F15B *13/08;* **B60T** *8/32;* **B60K** *28/16*

U.S. Cl. 303—119 **21 Claims**



1. A hydraulic unit for a hydraulic braking pressure control device comprising:

at least one standardized valve block having a plurality of electromagnetically operable valves with pressure medium inlets and outlets disposed on an external surface of the valve block at predetermined standardized positions, said pressure medium inlets and outlets interconnected with one another through said valves forming a plurality of valve block fluid flow passages capable of being opened and closed by said valves;

a connection element having an external surface area with pressure medium inlets and outlets disposed thereon at random positions selected as required for a particular control device for connection with other external components of said control device, said pressure medium inlets forming a plurality of connection element fluid flow inlet passages and said pressure medium outlets forming a plurality of connection element fluid flow outlet passages, said inlet passages being separate and independent of said outlet passages;

at least one distributing element having pressure medium channel means for connecting the inlets and outlets of the valve block fluid flow passages with the other external components of the control device through said connection element inlet passages and outlet passages.

4,929,039

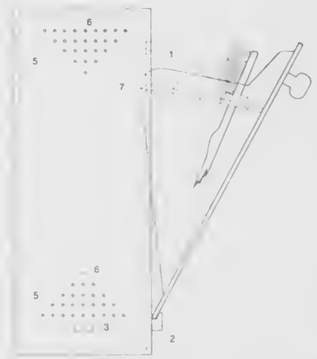
TOOTHBRUSH CABINET FOR HOLDING OF TOOTHBRUSHES AND TOOTHPASTE IN BATHROOM

Paul Thomas, 271 Hanakapiai St., and Lionel M. Ahina, 1096-D Wainiha St., both of Honolulu, Hi. 96825

Filed Nov. 16, 1988, Ser. No. 271,668

Int. Cl.[5] A47B *75/00*

U.S. Cl. 312—213 **1 Claim**



1. A wall mountable cabinet for holding toothbrushes comprising:

A mounting plate having front and rear faces and means for attaching to a wall extending from the rear face and at least two hooks projecting outwardly and upwardly from the front face;

A cabinet having a pair of side walls, a top wall, a bottom wall, a back wall, and a front wall having an opening;

Said back wall having apertures corresponding in number to the number of hooks projecting from the front face of the mounting plate, said hooks and apertures cooperating to support the cabinet;

A pair of upwardly projecting hinge members attached to a lower extremity of the opening in the front wall, said hinge members each having a first horizontal portion and a second rearwardly inclined portion, said hinge members adapted to pivotably support a door;

A door, for closing the open front, said door having a bottom resting on the hinge members, providing means to allow the door to pivot with respect to the cabinet;

Shelf means connected to said door and extending into said cabinet, said shelf having a plurality of upwardly projecting circular lugs that surround apertures and provide structure capable of supporting toothbrushes;

Said shelf means having stop means located at the side opposite the side connected to the door, said stop means adapted to engage the cabinet for stopping the door from pivoting too far;

Said side walls having ventilation openings and a plurality of removable plugs;

And a toothpaste holding receptacle which may be secured to the cabinet after removal of the removable plugs.

4,929,040

FIVE MIRROR, TWO PERPENDICULAR PLANE IMAGE DEROTATOR

Thomas S. Pagano, and RObert R. Turtle, both of Goleta, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Sep. 1, 1988, Ser. No. 239,251

Int. Cl.[5] G02B *26/10, 27/64*

U.S. Cl. 350—6.5 **15 Claims**

1. An optical apparatus comprising:

a support means rotatable about an axis;

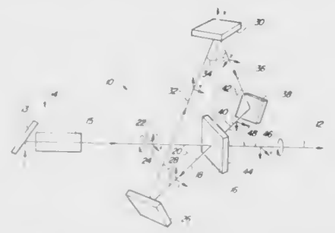
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a first mirror fixedly attached to said support means, wherein said axis is incident upon said first mirror and said first mirror is disposed to receive and reflect an incident beam of light at a first angle;

a second mirror fixedly attached to said support means, said second mirror disposed to receive and reflect, at a second angle, the light that is reflected by the first mirror at a first angle;

a third mirror fixedly attached to said support means, said third mirror disposed to receive and reflect at a third angle, said light that is reflected by the second mirror at a second angle;

a fourth mirror fixedly attached to said support means, said fourth mirror disposed to receive and reflect at a fourth



angle, said light that is reflected by the third mirror at a third angle; and

a fifth mirror fixedly attached to said support means, said fifth mirror disposed to receive and reflect at a fifth angle, said light that is reflected by the fourth mirror at a fourth angle, wherein said fifth mirror is also disposed so that said light that is received at a fifth angle is reflected colinear to the incident beam of light and wherein said mirrors are disposed so that the optical axis of the incident beam and the optical axis of said light that is reflected by said first mirror at a first angle lie in a first plane, and the light that is reflected by the second mirror, the third mirror and the fourth mirror lies in a second plane, and the light that is reflected by said fifth mirror lies in the first plane.

4,929,041

CATHODOLUMINESCENCE SYSTEM FOR USE IN A SCANNING ELECTRON MICROSCOPE INCLUDING MEANS FOR CONTROLLING OPTICAL FIBER APERTURE

Kerry J. Vahala, San Gabriel, and Michael E. Hoenk, Pasadena, both of Calif., assignors to Johnston Pump/General Valve, Inc., Brookshire, Tex.

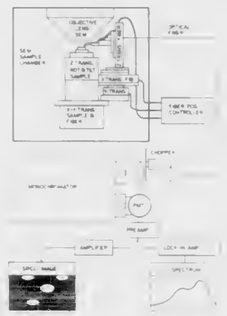
Filed Jan. 9, 1989, Ser. No. 294,234

Int. Cl.[5] G02B *6/00*; G01N *23/00*

U.S. Cl. 350—96.10 **19 Claims**

1. An improved cathodoluminescence light collection system for use in scanning electron microscopes of the type using a scanning electron beam directed through an objective lens into a sample chamber and onto a sample within the chamber; the improvement comprising:

an optical fiber having a light entry aperture positioned between said sample and said objective lens for collecting at least a portion of the cathodoluminescence light emitted by said sample in response to said electron beam; and



means for precisely controlling the position of said aperture relative to said sample from a location outside said chamber.

4,929,042

VARIABLE ACOUSTICAL DEFLECTION OF AN OPTICAL WAVE IN AN OPTICAL WAVEGUIDE

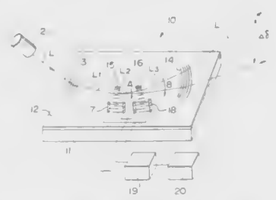
Masami Hatori; Nobuharu Nozaki, and Kozi Kamiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 27, 1987, Ser. No. 127,020

Claims priority, application Japan, Nov. 28, 1986, 61-283646; Jun. 25, 1987, 62-158612

Int. Cl.[5] G02B *6/10*

U.S. Cl. 350—96.13 **14 Claims**



7. An optical deflecting apparatus comprising:

(i) an optical waveguide formed of a material allowing propagation of surface acoustic waves therethrough,

(ii) a first surface acoustic wave generating means for generating a first surface acoustic wave, which advances in a direction intersecting an optical path of a guided optical wave advancing inside of said optical waveguide and diffracts and deflects said guided optical wave, in said optical waveguide, and

(iii) a second surface acoustic wave generating means for generating a second surface acoustic wave, which advances in a direction intersecting the optical path of said guided and diffracted optical wave and diffracts and deflects said guided and diffracted optical wave in a direction that amplifies the deflection caused by said diffraction, in said optical waveguide,

wherein said first surface acoustic wave generating means and said second surface acoustic wave generating means are operated to continuously change the frequencies of said first surface acoustic wave and said second surface acoustic wave and the directions of advance thereof while satisfying the conditions of

$k1 + K1 = k2$, and

$k2 + K2 = k3$

with the angle of deflection of said guided optical wave by said first surface acoustic wave and said second surface acoustic wave being within the range of $\delta 2$ to $\delta 3$ ($\delta 2 < \delta 3$), wherein k1 and k2 respectively denote wave vectors of the guided optical wave before and after being diffracted by said first surface acoustic wave, k3 denotes the wave vector of the guided optical wave after being diffracted by said second surface acoustic wave, and K1 and K2 respectively denote wave vectors of said first surface acoustic wave and said second surface acoustic wave, and

in such a range that said deflection angle becomes smaller than $\delta 2$, the operation of said second surface acoustic wave generating means is stopped, and said first surface acoustic wave generating means is operated to continuously deflect said guided optical wave within a deflection angle range of $\delta 1$ to $\delta 2$ ($\delta 1 < \delta 2$).

4,929,043

LIGHT BEAM DEFLECTOR

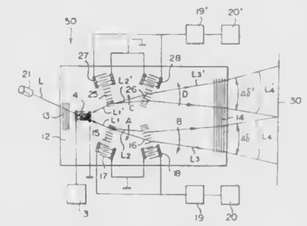
Masami Hatori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 30, 1989, Ser. No. 358,228

Claims priority, application Japan, May 31, 1988, 63-133738; May 31, 1988, 63-133739

Int. Cl.[5] G02B *6/10*

U.S. Cl. 350—96.13 **17 Claims**



5. A light beam deflector comprising:

(i) an optical waveguide made of a material capable of propagating surface elastic waves therethrough and exhibiting electrooptic effects;

(ii) an electrooptic light switch which diffracts a single light beam, which is introduced into the optical waveguide and guided therethrough, and divides it into first and second guided waves, said electrooptic light switch varying an electric field applied to said optical waveguide, which in turn varies the efficiency with which the light beam is diffracted, thereby varying the ratio between the intensities of said first and second guided waves;

(iii) first surface elastic wave generating means for generating in said optical waveguide a first surface elastic wave which travels across the path of the first guided wave travelling in said optical waveguide and thereby diffracts and deflects the first guided wave;

(iv) second surface elastic wave generating means for generating in said optical waveguide a second surface elastic wave which travels across the path of the first guided wave which is diffracted by said first surface elastic wave and thereby diffracts and deflects said second guided wave in a direction which amplifies the deflection of the guided wave due to the diffraction thereof;

(v) third surface elastic wave generating means for generating in said optical waveguide a third surface elastic wave which travels across the path of the second guided wave travelling in said optical waveguide and thereby diffracts and deflects said second guided wave;

(vi) fourth surface elastic wave generating means for generating in said optical waveguide a fourth surface elastic wave which travels across the path of the second guided wave which is diffracted by said third surface elastic wave and thereby diffracts and deflects said second guided wave in a direction which amplifies the deflection of the second guided wave due to the diffraction thereof;

(vii) said first and second surface elastic wave generating means being arranged such that the frequencies and directions of said first and second surface elastic waves may be continuously varied while the following conditions are met:

$$k_1 + K_1 = k_2$$

$$k_2 + K_2 = k_3$$

wherein k_1 is the wave vector of the first guided wave before it is diffracted by said first surface elastic wave, k_2 is the wave vector of the first guided wave after it is diffracted by said first surface elastic wave, k_3 is the wave vector of the first guided wave diffracted by said second surface elastic wave, and K_1, K_2 are the wave vectors of said first and second surface elastic waves;

(viii) said third and fourth elastic wave generating means being arranged such that the frequencies and directions of said third and fourth surface elastic waves may be continuously varied while the following conditions are met:

$$k_4 + K_3 = k_5$$

$$k_5 + K_4 = k_6$$

where k_4 is the wave vector of the second guided wave before it is diffracted by said third surface elastic wave, k_5 is the wave vector of the second guided wave after it is diffracted by said third surface elastic wave, k_6 is the wave vector of the second guided wave diffracted by said fourth surface elastic wave, and K_3, K_4 are the wave vectors of said third and fourth surface elastic waves; and

(ix) said first, second, third, and fourth surface elastic wave generating means being arranged such that said first and second guided waves emitted from said optical waveguide will scan a surface along respective aligned lines, which lines have ends which are adjacent to each other.

4,929,044

OPTICAL PICKUP USING WAVEGUIDE

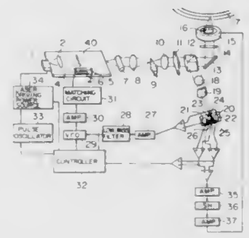
Akira Arimoto, Kodaira, Japan; Sachiko Ishikawa, Braunschweig, Fed. Rep. of Germany, and Keiji Kataoka, Kawagoe, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 13, 1988, Ser. No. 193,594

Claims priority, application Japan, May 13, 1987, 62-114602; Jul. 31, 1987, 62-190038; Sep. 4, 1987, 62-220230

Int. Cl.[5] G02B *6/10*

U.S. Cl. 350—96.13 **30 Claims**



1. An optical pickup in which a light deflector element using a surface acoustic wave is provided in a waveguide, and a

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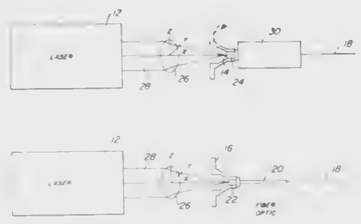
semiconductor laser capable of stably operating in longitudinal modes the number of which is not larger than 5 is disposed in proximity to said waveguide at a distance not larger than 1 μm.

4,929,045

METHOD AND APPARATUS FOR ALIGNING OPTICAL ENERGY TO A WAVE GUIDE

Terry A. Fuller, Highland Park, Ill., assignor to Fuller Research Corporation, Vernon Hills, Ill.

Filed Sep. 29, 1988, Ser. No. 252,171
Int. Cl.[5] G02B 6/42
U.S. Cl. 350—96.15 6 Claims



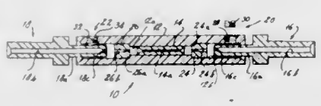
1. Method of aligning a source of optical energy and a fiber optic, comprising the steps of:
(a) inserting an optical detector into a holder,
(b) illuminating the optical detector by a source of optical energy to cause the detector to generate an output representative of intensity of illumination incident on the detector,
(c) moving a selected one of the source and holder to a position in which the output of the detector corresponds to maximum intensity of illumination,
(d) maintaining the moved one of the source and holder in said position and
(e) replacing the optical detector by a fiber optic to be aligned.

4,929,046

REMATEABLE FIBER OPTIC SPLICE

Robert W. Barlow, P.O. Box 133, Canton, Pa. 17724

Filed Feb. 1, 1989, Ser. No. 305,350
Int. Cl.[5] G02B 6/38
U.S. Cl. 350—96.21 5 Claims



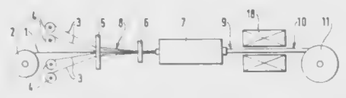
1. A fiber optic, rematerable splice assembly comprising: an elongated housing; a flexible, fiber receiving and positioning unit centrally located within said housing; first and second slidably removable, cylindrical ferrules, one within each end of said housing; and holding means associated with said housing for releasably maintaining said ferrules within said housing, said cylindrical ferrules being rotatable within said elongated housing when said holding means are disengaged, said rotation having no effect upon the transverse placement of said ferrules within said ends.

4,929,047

METHOD OF MANUFACTURING AN OPTICAL FIBER CABLE AND A CABLE OBTAINED BY THE METHOD

Patrick Dubots, Neauphle Le Chateau; Denis Legat, Lisses, and Raymond Vic, Soulages Bonneval, all of France, assignors to Societe Anonyme dite: Compagnie Generale D'Electricite, Paris, France

Filed Oct. 17, 1988, Ser. No. 258,411
Claims priority, application France, Oct. 16, 1987, 87 14285
Int. Cl.[5] G02B 5/16; B32B 17/00
U.S. Cl. 350—96.23 11 Claims



1. A method of manufacturing a cable comprising an assembly of at least one optical fiber and metal reinforcing elements extending parallel to said fiber, said assembly being coated with a coating of plastic material, the method including the improvements whereby:
strands having a diameter of between 0.06 mm and 0.5 mm and constituted by elementary metal filaments are selected for the reinforcing elements;
the optical fiber is coated with a substance preventing it from subsequently adhering to said plastic coating material;
said fiber is placed between a plurality of strands parallel with said fiber to form a bundle of component parts;
the bundle formed in this way is passed through a set of successive combs and dies in order to bring the component parts of said bundle closer together while maintaining a degree of longitudinal traction on said components; and
a resin is deposited on said bundle by electrostatic powdering, and is then melted by passing through an oven at a temperature of less than 250 degrees C. for about 1 minute to form said plastic coating and solidified to encapsulate said bundle.

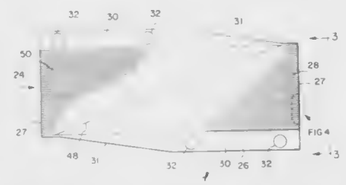
8. A cable obtained by the method of claim 1, wherein a diameter of the cable lies in a range 0.5 mm to 1 mm.

4,929,048

FIBER OPTIC DISPLAY

Michel J. Cuypers, Longmont, Colo., assignor to Fiberview Corporation, Boulder, Colo.

Filed Nov. 10, 1988, Ser. No. 271,234
Int. Cl.[5] G02B 6/04
U.S. Cl. 350—96.24 8 Claims



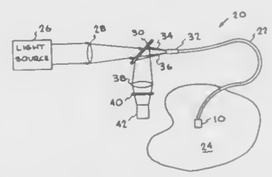
1. In a fiber optic display of the type comprising an array of optical fibers arranged in a matrix having a plurality of rows, each row having a plurality of discrete optical fibers, wherein said array of optical fibers has first and second ends, the improvement comprising:
a plurality of spacers, each spacer defining an array of parallel grooves on one side thereof, each of said grooves sized to receive a respective one of said optical fibers such that the grooves of each spacer receive the optical fibers of a respective one of the rows, each of said grooves separated by a land having a width such that adjacent optical fibers in each row are laterally separated from one another by a distance no less than the width of the respective land;
said optical fibers secured in said grooves with no more than one optical fiber in each groove such that the grooves position the optical fibers precisely with respect to one another in each row;
said spacers secured together in aligned registration to form a surface aligned with the first ends of the optical fibers;
said surface positioned at an acute angle with respect to said grooves such that the first ends are elongated in a direction extending along the rows.

4,929,049

FIBER OPTIC REFRACTIVE INDEX SENSOR USING A METAL CLAD

Donald Le Goullon, Tracy, and Kisboloy Goswami, Walnut Creek, both of Calif., assignors to FiberChem, Inc., Las Vegas, Nev.

Filed Jan. 29, 1988, Ser. No. 150,197
Int. Cl.[5] G02B 6/16
U.S. Cl. 350—96.29 21 Claims



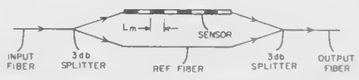
1. A fiber optic sensor for differentiating solvents of different refractive index, comprising:
a fiber optic core;
a thin film metal clad made of a material selected from platinum, rhodium and palladium formed on and surrounding the fiber optic core of a thickness which modulates the transmission of light through the fiber optic core as a function of the refractive index of a surrounding solvent.

4,929,050

TRAVELING WAVE FIBER OPTIC INTERFEROMETRIC SENSOR AND METHOD OF POLARIZATION POLING FIBER OPTIC

Mark L. Wilson, Vadnais Heights, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 31, 1988, Ser. No. 264,915
Int. Cl.[5] G02B 6/02; G01B 9/02; G01D 5/34; B05D 5/06
U.S. Cl. 250—227.17 32 Claims



PVF_2 EM SENSOR

1. A fiber optic sensing element comprising an optical light conducting fiber and a stress sensitive coating over a periodic group of substantially equal length segments of said fiber, wherein each of said segments are separated by equal uncoated segments of substantially the same length as said coated segments.

9. A method of polarization poling of an optical fiber having a polarizable stress-sensitive coating over at least a portion of the total length of said fiber comprising the steps of
(a) winding a predetermined length of said fiber on a hollow spool which has a circumference that is substantially equal to one wavelength of a light source that is to be coupled to said fiber,
(b) wrapping a metallic foil on said wrapped fiber on said spool,
(c) grounding said foil to a reference ground,
(d) placing a generally D-shaped electrically-conductive electrode having a flat surface and a curved surface in the hollow inside of said spool so that the curved surface of said electrode is adjacent said fiber around substantially half of the inner circumference of said spool,
(e) heating said electrode until said fiber reaches a temperature in the range of 50° C. to 70° C.,
(f) applying a voltage to said electrode to provide a sufficiently intense electrical field to polarize said stress-sensitive coating, and
(g) terminating said heating and the application of said voltage.

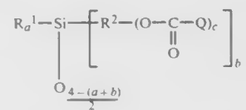
4,929,051

OPTICAL GLASS FIBER WITH A PRIMARY COATING OF ORGANO-POLYSILOXANES CONTAINING ACRYLIC ACID ESTER GROUPS

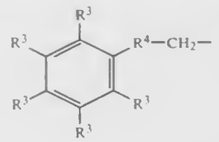
Wolfgang Rogler, Erlangen; Christian Weitemeyer, Essen; Dietmar Wewers, Bottrop; Frederic Zapf, and Bernhard Stapp, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,271
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710240
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.30 5 Claims

1. An optical glass fiber with a primary coating of cured organopolysiloxane wherein the pre-cured organopolysiloxane contains acrylic acid ester groups, has alkyl or aryl groups or mixtures thereof bound to silicon, is liquid at the temperature of its application to the fiber, is polymerizable with high-energy radiation, and said organopolysiloxane has the formula



wherein:
R^1 is alkyl with 1 to 4 carbon atoms or phenyl or aralkyl of the following structure or mixtures thereof:



wherein
R^3 is at least one of hydrogen, alkyl with 1 to 12 carbon atoms and halogen, and
R^4 being a linear-chain or branched alkylene with 1 to 8 carbon atoms,
R^2 is a linear-chain, branched, or cyclic alkylene residue with 1 to 20 carbon atoms, which is unsubstituted or substituted by oxyalkylene units, phenylene groups, acrylic acid or methacrylic acid residues, and
Q is one of the following esters which is bound to the carbon atom of a carbonyloxy group through the oxygen atom of

a hydroxyl group of said ester, less the hydrogen atom thereof:

(i) a (meth-)acrylate of a diol with 1 to 10 carbon atoms or its oxyalkylene derivatives with 1 to 10 oxyalkylene units, or

(ii) a multi-acrylate or methacrylate of a polyol selected from the group of pentaerythritol, trimethylolethane, trimethylolpropane, and glycerin or a dimer or oxyalkylene derivative thereof with a total of 1 to 10 units of at least one of oxyethylene and oxypropylene units;

a is 1.6 to 2.2; b is 0.001 to 1.6; a plus b is less than or equal to 3, and c is 1to 4.

4,929,052

FLEXIBLE GUIDES FOR INFRA-RED ENERGY

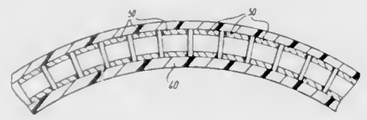
Michael J. Colles, and George R. Smith, both of Edinburg, Scotland, assignors to Medical Laser Uit of Heriot-Watt University of Research Park, Edinburgh, Scotland

Filed Mar. 16, 1988, Ser. No. 168,897

Claims priority, application United Kingdom, Feb. 17, 1988, 8803620

Int. Cl.[5] G02B *6/20*

U.S. Cl. 350—96.32 **7 Claims**



1. An infra-red energy guide having a relatively long overall length, said guide comprising a plurality of infra-red energy guide sections which are individually short relative to said overall length, each said guide section being substantially rigid and having an energy-guiding internal section, guide section mounting means mounting said guide sections in a concatenation with each guide section aligned to project infra-red energy into the succeeding guide section in the concatenation, said guide section mounting means providing an angular deviatinn between adjacent guide sections in said concatination, said angular deviation being such that said infra-red energy guide is transmissive of infra-red energy along its overall length, wherein the adjacent ends of each adjacent pair of said infra-red energy guide sections are externally overlapped by a respective length of outer tubing having ann inner surface with an internal diameter slightly greater than the external dimensions of said guide sections, the length and internal diameter of each said length of outer tubing permitting the respective overlapped guide sections to undergo a variable mutual angular deviation that can increase until said guide sections jam against the inner surface of the respective length of outer tubing to prevent a further increase in said mutual angular deviation.

4,929,053

DISPLAY UNIT AND OPTICAL WAVEGUIDE FOR USE IN SAME

Friedrich Müller-Stute, Neumünster, and Günter Weil, Asslar, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1989, Ser. No. 301,004

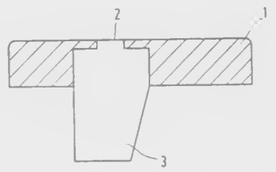
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1988, 3802868

Int. Cl.[5] G02B *6/00*; H05B *33/00*

U.S. Cl. 350—96.34 **4 Claims**

1. An optical waveguide formed of a material consisting essentially of a polycarbonate, a quantity of titanium dioxide sufficient to disperse transmitted light but less than that at which no light is transmitted and a fluorescent, light-converting organic dye.

2. A display unit comprising an optical waveguide (3), said waveguide being formed of a material consisting essentially of



a polycarbonate, titanium dioxide in an amount sufficiently high to disperse transmitted light but less than a quantity at which no light is transmitted and a fluorescent, light-converting organic dye.

4,929,054

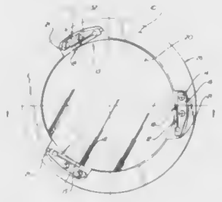
MOUNTING FOR HIGH RESOLUTION PROJECTION LENSES

Anees Ahmad, Bethel, and Richard L. Huse, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 856,882, Apr. 28, 1986, abandoned. This application Oct. 3, 1986, Ser. No. 914,953

Int. Cl.[5] G02B *7/02*

U.S. Cl. 350—252 **2 Claims**



1. A lens mount comprising:

a lens having a first surface of spherical configuration and a second surface;

a lens cell having a top surface, a bottom surface, an outer diameter and an inner diameter;

said outer diameter being concentric about an axis of rotation of said lens cell;

said top surface and said bottom surface being substantially perpendicular to said axis of rotation;

a lens seat projecting inwardly from said inner diameter;

said lens seat having a radius of curvature match-mated to the curvature of said first surface of said lens;

the rotational symmetry axis of said lens seat being coincident with the axis of rotation of said lens cell;

the first surface of said lens being substantially in contact with said lens seat;

the optical axis of said second surface being aligned substantially coincident with the axis of rotation of said lens cell;

a plurality of flexures holding said lens to said lens cell;

each of said flexures being removably attached to said lens cell;

each of said flexures comprising:

a flexure assembly attached to said lens cell;

a flexure arm attached at both ends to said flexure assembly and at its center to said lens; and

said flexure arm being substantially parallel to and spaced from said flexure assembly.

4,929,055

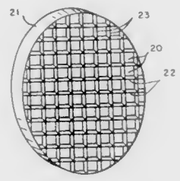
ANTI-REFLECTION TECHNIQUE

Peter W. J. Jones, 70 Oakley Rd., Belmont, Mass. 02178

Filed Sep. 19, 1988, Ser. No. 246,436

Int. Cl.[5] G02B *27/00*

U.S. Cl. 350—276 R **22 Claims**



1. A structure for reducing reflections from a light reflective surface of an optical device having a field of view with an aspect ratio, said structure comprising:

a plurality of substantially tubular elements, each having an aspect ratio, mounted in front of said reflective surface, the aspect ratio of each of said tubular elements having a selected relationship with respect to the aspect ratio of the field of view of said optical device to substantially reduce said reflections.

4,929,056

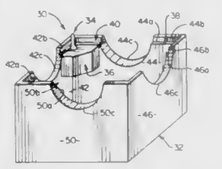
APPARATUS FOR OPENING AND HOLDING A FRAME AND A METHOD OF MOUNTING AN OPTICAL ELEMENT IN A FRAME

Kenneth G. Leib, Wantagh, and Edward V. Sullivan, Huntington Station, both of N.Y., assignors to Grumman Aerospace Corporation

Filed Sep. 8, 1988, Ser. No. 241,593

Int. Cl.[5] G02B *27/00*

U.S. Cl. 350—321 **21 Claims**



1. Apparatus for opening and holding a frame of the type that is flexible between open and closed positions and that forms an opening, the apparatus comprising:

a mounting member defining a seating surface adapted to seat against the frame; and

an expansion member connected to the mounting member, and adapted to extend into the opening of the frame to force the frame into the open position, and to hold the frame in the open position when the frame is seated on the mounting member.

4,929,057

LIQUID CRYSTAL OPTICAL DEVICE

Kenji Aoki; Katsumori Takei; Haruo Nakamura, and Yoshikazu Matsushita, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 159,453, Feb. 18, 1988, abandoned, which is a continuation of Ser. No. 947,796, Dec. 30, 1986, abandoned, which is a continuation of Ser. No. 838,876, Mar. 10, 1986, Pat. No. 4,671,616, which is a continuation of Ser. No. 733,400, May 13, 1985, abandoned, which is a continuation of Ser. No. 368,323, Apr. 14, 1982, abandoned. This application Jun. 12, 1989, Ser. No. 366,228

Claims priority, application Japan, Apr. 15, 1981, 56-56418

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.[5] G02F *1/13*; G09G *3/02*

U.S. Cl. 350—333 **4 Claims**



1. A liquid crystal optical device for operation in a time-sharing manner to transmit light to a moving photosensitive surface, the liquid crystal device comprising:

liquid crystal cell means formed from a first transparent plate means and a cooperating second transparent plate means;

a plurality of N common electrode means disposed in spaced, parallel strips on the interior surface of the first transparent plate means to provide a plurality of M spaced regions for forming light micro-shutters;

a plurality of M cooperating signal electrode means disposed on the interior surface of the second transparent plate means substantially orthogonal to the common electrode means and in registration with the micro-shutter forming regions thereof and extending in a direction substantially parallel to the moving photosensitive surface, both N and M being integers, the transparent plate means being spaced apart from and substantially parallel to each other for forming a space therebetween and the transparent plate means being disposed so that the respective electrode means cross in plan view;

opaque means including transparent regions for defining micro-shutters located where the respective electrode means cross, there being M transparent regions diagonally offset from each other across the width of the signal electrode means and with respect to the crossed common electrode means, the transparent regions repeating along the signal electrode means at each crossing common electrode means so that the micro-shutters are disposed in a diagonal line which is substantially transverse to the direction of motion of an associated photosensitive surface, there being intervals of $L=(m+1/N)T_1v$ between the centers of adjacent transparent regions of adjacent common electrodes, wherein v is the speed of transfer of the photo-sensitive surface, T_1 is a writing period, and m is an integer equal to or greater than 2;

liquid crystal means encapsulated in the space between the transparent plate means; and

time sharing liquid crystal driving circuit means coupled to

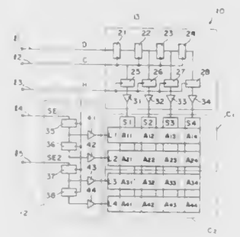
the N common and M signal electrode means for applying signals to the electrode means which optically switch the light micro-shutters, whereby transmission of light through the liquid crystal is stopped.

4,929,058

METHOD FOR DRIVING A DISPLAY DEVICE

Takaji Numao, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1988, Ser. No. 238,257
Claims priority, application Japan, Aug. 31, 1987, 62-218477
Int. Cl.[5] G02F *1/13*; G09G *3/36*
U.S. Cl. 350—333 **6 Claims**





1. A method for driving a liquid crystal display device comprised of a matrix of columns and row electrodes intersecting with each other, and forming a display picture element at each point of intersection between said column and row electrodes, each said display picture element adapted to be selectively set in one of bright and dark memory states so as to achieve a desired multi-gradation display, the driving method comprising the steps of:

(1) dividing, to achieve a multi-gradation display of 2^n levels (n being an integer not smaller than 3), the row electrodes into K groups of row electrodes wherein K is an integer not smaller than 2 and has the following relationship,

$$K \leq \frac{(2^n - 1)}{n},$$

(2) defining the number Z of row electrode lines in each group of the row electrodes, wherein y represents the total number of row electrodes and Z is a positive integer and has the following relationship,

$$Z \geq \frac{Y}{K};$$

(3) defining one frame period T_F, composed of $(2^n - 1)$ time blocks, to have the following relationship,

$$T_F = (2^n - 1)\, Z t_0,$$

wherein T_0 represents the selection time during which the picture elements on each of the row electrodes are selectively set in one of the bright and dark memory states;

(4) sequentially selecting each one of said K groups of the row electrodes, during a time width ZT_0 defining each of the time blocks, such that each picture element in the selected one of the groups of the row electrodes can be set in one of the bright and dark memory states according to a predetermined selection signal; and

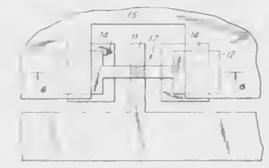
(5) selecting a number of time blocks, not smaller than n, that the K groups of the row electrodes, during each one-frame period T_F, will reset each picture element according to said predetermined signal wherein each predetermined selection signal for each of said K groups, is determined such that each of said K groups will operate so as to reset picture elements during different of said time blocks, said selected number of time blocks being equal for each of said K groups, thereby allowing for an efficient multi-gradation display device.

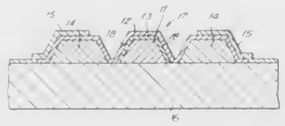
4,929,059

NON-LINEAR ELEMENT FOR LIQUID CRYSTAL DISPLAYS

Kotoyoshi Takahashi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,239
Claims priority, application Japan, Dec. 10, 1987, 62-312608; Sep. 19, 1988, 63-234023
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—334 **9 Claims**





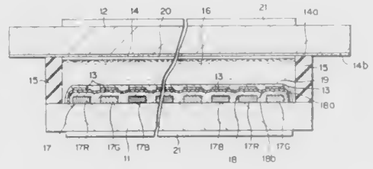
9. A non-linear element forming on a substrate comprising a first electric conductor formed on said substrate, said first electric conductor formed as an island having a first side and a second side opposed to said first side, a protective layer formed on said substrate adjacent said first side and said second side of said island being out of electrical contact with said island, the protective layer being formed as a second island and a third island, an insulator formed on said first electric conductor, a second electric conductor formed on said insulator forming a laminate of said second electric conductor, insulator and first electric conductor, and extending to adhere to said second island and third island, said protective layer preventing said second electrode from disconnecting from said substrate.

4,929,060

COLOR LIQUID CRYSTAL DISPLAY DEVICE

Naoshige Sugimoto, Hino; Tetsushi Yoshida, Hachioji, and Tadahisa Toyama, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 4, 1988, Ser. No. 190,100
Claims priority, application Japan, May 6, 1987, 62-66760[U]; Apr. 28, 1988, 63-106539
Int. Cl.[5] G02F *1/133*
U.S. Cl. 350—339 F **20 Claims**



1. A color liquid crystal display device for displaying an image, comprising:

first and second substrates facing each other;

a color filter comprised of three types of filters associated with primary colors of red, green and blue, formed on that surface of said first substrate which faces said second substrate, so that different color filters are arranged in a predetermined order;

a first insulative film formed over said color filter and made of a substantially transparent organic material;

a second insulative film formed over said first insulative film and made of a substantially transparent inorganic material;

a plurality of first electrodes formed on said second insulative film in association with the three types of filters that comprise said color filter, and made of a substantially transparent conductive material;

a plurality of second electrodes formed on that surface of said second substrate which faces said first substrate in such a manner as to face at least one of said first electrodes and made of a conductive material;

a first aligning film formed over said first electrodes and said second insulative film, for arranging liquid crystal molecules adjacent to the surface of the second insulative film in a predetermined direction;

a second aligning film formed over said second electrodes and said second substrate, for arranging liquid crystal molecules adjacent to the surface of the second substrate which faces the first substrate in a predetermined direction;

liquid crystal disposed between said first and said second aligning films so that molecules of the liquid crystal are twisted substantially by 90 degrees between the first and the second aligning films; and

a pair of polarizing means provided on both sides of an exterior of said liquid crystal and arranged so that polarizing axes of the polarizing means are parallel to one another;

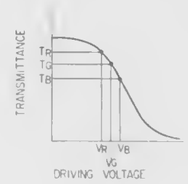
wherein a number of small regions between the first and the second electrodes form a number of pixels which are normally set in a light shielded state, and the light transmission state of the pixels can be controlled to display a desired image.

4,929,061

COLOR LIQUID CRYSTAL DISPLAY DEVICE

Mamoru Tominaga, Kawagoe; Naoyuki Kokado; Katsuhiro Gonpei, both of Yokohama; Hisami Nira, and Akira Taya, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 5, 1988, Ser. No. 215,172
Claims priority, application Japan, Oct. 29, 1987, 62-271757
Int. Cl.[5] G02F *1/133*
U.S. Cl. 350—338 **9 Claims**



1. A color liquid crystal display device for displaying a color image comprising:

a back light unit having

a light source,

at least one reflective plane, and

a diffusion plate; and

a liquid crystal panel disposed adjacent the back light unit and receiving light from the back light unit, the liquid crystal panel having a plurality of pixels aligned horizontally in rows and vertically in columns, each of the pixels including at least three pixel components each corresponding to a different primary color, and

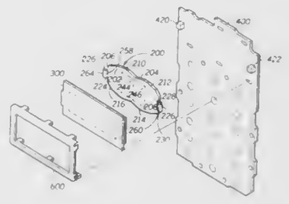
a plurality of liquid crystal shutters each corresponding to one of the pixel components for controlling transmission of light from the back light unit to the pixel components of each of the pixels in response to a driving voltage such that spectral transmittances of the liquid crystal shutters corresponding to each of the pixels are set initially to a substantially equal value to produce a reference white visual output.

4,929,062

LIGHT GUIDE FOR LCD

Andrzej T. Guzik, Pompano Beach; James H. Curtis, Coral Springs; Faris S. Habbaba, Boca Raton, and Kirit Shah, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 2, 1988, Ser. No. 265,977
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—345 **5 Claims**



1. A liquid crystal display system, comprising in combination:

a liquid crystal display;

two surface mounted light sources, and

a light guide having a display surface positioned behind said

liquid crystal display, said light guide is made from a slab of transparent plastic material substantially uniform in thickness having a front surface adjacent said crystal liquid display, a rear surface, and six bordering surfaces perpendicular to said front and rear surface, two of the bordering surfaces are substantially mutually parallel and are located at opposite ends of the slab, the other four bordering surfaces are substantially arcuate in shape, said rear surface has two rectangular plane depressions;

two generally half barrel shaped concave extensions, positioned over said light sources, being carried by said ends for receiving light emitted by said light sources, substantially perpendicular to the light guide and directing it into said light guide, said arcuate bordering surface, said rear surface, and said depressed planes including the means for reflecting light

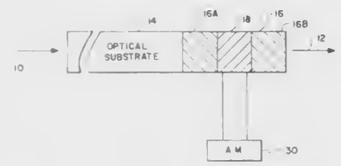
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4,929,063

NONLINEAR TUNABLE OPTICAL BANDPASS FILTER

William W. Durand, Edina, and Ronald E. Peterson, Shoreview, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 22, 1986, Ser. No. 821,291
Int. Cl.[5] G02B *5/28*; G02F *1/23, 1/01*
U.S. Cl. 350—353 3 Claims



1. A tunable Fabry-Perot filter comprising:

a substrate;

a first coating on said substrate;

a second coating on said first coating, the second coating having activatable nonlinear optical properties and an optical thickness of one-half of the design transmittance wavelengths at ambient temperatures and wherein the second coating comprises silver sulfide;

a third coating on said second coating wherein the first and third coatings include material selected from the group consisting of thallium chloride and silver chloride; and

activation means for changing the optical properties of said second coating so as to tune the filter to a desired wavelength.

4,929,064

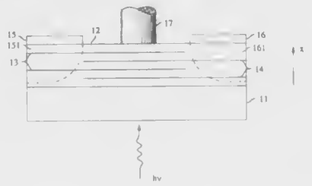
OPTICAL COMMUNICATIONS MODULATOR DEVICE

Erdmann F. Schubert, New Providence, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Jul. 21, 1988, Ser. No. 222,603
Int. Cl.[5] G02F *1/015*
U.S. Cl. 350—355 10 Claims

1. In an optical communications system, a modulator device comprising a substrate-supported semiconductor structure,

said structure comprising a semiconductor material comprising a first plurality of p-type regions commonly contacted by a first contact, and a second plurality of n-type regions commonly contacted by a second contact, said first plurality of regions being interleaved with said second plurality of regions, and



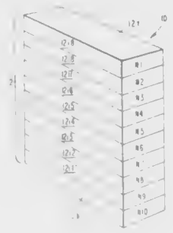
the thickness of said regions being less than the spatial extent of the lowest subband corresponding to a V-shaped potential well.

4,929,065

GLASS PLATE FUSION FOR MACRO-GRADIENT REFRACTIVE INDEX MATERIALS

James J. Hagerty, Saratoga, and David N. Pulsifer, Mountain View, both of Calif., assignors to ISOTEC Partners, Ltd., Tucson, Ariz.

Filed Nov. 3, 1988, Ser. No. 266,670
Int. Cl.[5] G02B *5/00*
U.S. Cl. 350—413 16 Claims



1. A process for fabricating a glass member having a varying index of refraction along an optic axis comprising

(a) stacking a plurality of intermediate glass plates between a top plate and a bottom plate to form an assembly, said top plate comprising a glass of a first composition having a first selected index of refraction and a first softening temperature and said bottom plate comprising a glass of a second composition having a second selected index of refraction and a second softening temperature, said plurality of intermediate glass plates each comprising a composition intermediate that of said top and bottom plates and stacked to achieve a change in composition varying from said first composition to said second composition;

(b) heating said assembly to a fusion temperature to fuse said plates to form a fused assembly; and

(c) cooling said fused assembly to room temperature.

4,929,066

TELECENTRIC IMAGE-FORMING OPTICAL SYSTEM FOR LARGE IMAGE SIZE

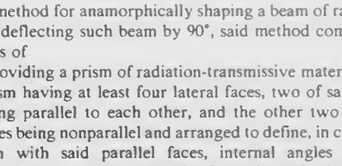
Zenji Wakimoto, and Takahisa Hayashi, both of kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jul. 14, 1988, Ser. No. 219,552
Claims priority, application Japan, Jul. 14, 1987, 62-176808
Int. Cl.[4] G02B *13/22, 9/64*
U.S. Cl. 350—415 15 Claims

1. A telecentric image-forming optical system comprising:

a first lens group including a first double-convex lens, either a meniscus or plano-convex lens whose convex surface is directed to an object, and a double-concave lens arranged in order from an object side of said system;

a second lens group including a double-concave lens, either a meniscus or plano-convex lens whose convex surface is directed to an image, and a second double convex lens arranged in order from an image side of said system; and



a third double-convex lens disposed between said first and second lens groups;

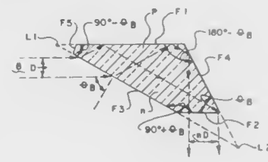
wherein the secondary focal point of the first lens group and the principal focal point of the second lens group substantially coincides with each other at the third double-convex lens or in the vicinity of the third double-convex lens.

4,929,067

METHOD AND APPARATUS FOR ANAMORPHICALLY SHAPING AND DEFLECTING ELECTROMAGNETIC BEAMS

Ingolf Sander, Cuputino, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Jan. 3, 1989, Ser. No. 292,720
Int. Cl.[5] G02B *13/10, 13/08*
U.S. Cl. 350—421 4 Claims



1. A method for anamorphically shaping a beam of radiation and for deflecting such beam by 90°, said method comprising the steps of

(a) providing a prism of radiation-transmissive material, said prism having at least four lateral faces, two of said faces being parallel to each other, and the other two of said faces being nonparallel and arranged to define, in cooperation with said parallel faces, internal angles of Θ_B, $90°+\Theta_B$, $90°-\Theta_B$ and $180°-\Theta_B$, where Θ_B is the intended angle of incidence of the beam on said prism, and

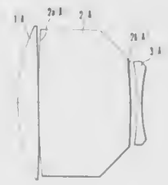
(b) arranging said prism in such beam so that the beam enters the prism through one of said nonparallel faces from a direction parallel to said parallel faces, said lateral faces being arranged with respect to each other so that the beam, upon entering the prism, is refracted toward one of said parallel faces, undergoes double internal reflection, first from said one of said parallel faces and then from the other of said nonparallel faces, and emerges from said prism through said perpendicular to the other of said parallel faces.

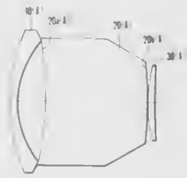
4,929,068

CONVERSION LENS

Sadahiko Tsuji, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 89,750, Aug. 27, 1987, abandoned. This application Sep. 21, 1989, Ser. No. 411,203
Claims priority, application Japan, Sep. 1, 1986, 61-205644; Sep. 1, 1986, 61-205645; Sep. 1, 1986, 61-205646; Sep. 1, 1986, 61-205647; Sep. 1, 1986, 61-205648; Sep. 1, 1986, 61-205649
Int. Cl.[5] G02B *15/02, 13/18, 9/12, 9/60*
U.S. Cl. 350—422 17 Claims





1. A conversion lens comprising, from front to rear:

a first lens unit or group made of glass material;

a second lens unit or group made of plastic material; and

a third lens unit or group made of glass material said lens units or groups being separated from each other with at least a partial air space therebetween.

4,929,069

ZOOM LENS

Atsushi Shibayama, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Sep. 5, 1989, Ser. No. 403,173
Claims priority, application Japan, Sep. 9, 1988, 63-225959
Int. Cl.[5] G02B *15/14*
U.S. Cl. 350—423 15 Claims



1. A compact zoom lens provided with a first lens group G1 of a positive refractive power and a second lens group G2 of a negative refractive power and adapted for performing a zooming operation by varying the air gap between said lens groups;

wherein said first lens group G1 comprises, in the order from the object side, a positive meniscus lens component L11

with faces convex to the object side, a biconcave lens component L12, a biconvex lens component L13, and a positive lens component L14;

said second lens group G2 comprises, in the order from the object side, a positive meniscus lens component L21 with faces convex to the image side, and a negative meniscus lens component L22 with faces concave to the object side; and

said lens components L11, L12, L13, L14, L21 and L22 satisfy following conditions (1) to (5);

$$0.49 < K/f_w < 0.7 \quad (1)$$

$$-12 < \frac{r_b + r_a}{r_b - r_a} < -3.4 \quad (2)$$

$$0.075 < D_{21}/f_w < 0.170 \quad (3)$$

$$1.25 < \frac{r_d + r_c}{r_d - r_c} < 1.80 \quad (4)$$

$$-0.13 < n_{21} - n_{22} < 0.06 \quad (5)$$

wherein

K: $d_{12}\cdot n_{12}+d_{13}\cdot n_{13}+d_{14}+D_{12}+D_{13}$

d_{12}: axial thickness of biconcave lens component L_{12};

d_{13}: axial thickness of biconvex lens component L_{13};

d_{14}: axial thickness of positive lens component L_{14};

n_{12}: refractive index of biconcave lens component L_{12};

n_{13}; refractive index of biconvex lens component L_{13};

n_{14}: refractive index of positive lens component L_{14};

D_{12}: axial air gap between biconcave lens component L_{12} and biconvex lens component L_{13};

D_{13}: axial air gap between biconvex lens component L_{13} and positive lens component L_{14};

f_w: focal length of entire system at wide angle end;

r_a: radius of curvature of the face, closest to the object, of the positive meniscus lens component L_{21} of the second lens group;

r_b: radius of curvature of the face, closest to the image, of positive meniscus lens component L_{21} in the second lens group;

D_{21}: axial air gap between positive meniscus lens component L_{21} and negative meniscus lens component L_{22} in the second lens group;

r_c: radius of curvature of the face, closest to the object, of negative meniscus lens component L_{22} of the second lens group;

r_d: radius of curvature of the face, closest to the image, of negative meniscus lens component L_{22} of the second lens group;

n_{21}: refractive index of positive meniscus lens component L_{21} of the second lens group; and

n_{22}: refractive index of negative meniscus lens component L_{22} of the second lens group.

4,929,070

ILLUMINATION OPTICAL SYSTEM FOR ENDOSCOPES

Akira Yokota, and Masao Kuga, both of Hachiouji, Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

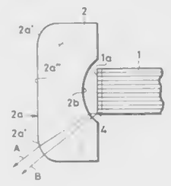
Continuation of Ser. No. 729,354, May 1, 1985, abandoned. This application Nov. 17, 1988, Ser. No. 273,714

Claims priority, application Japan, May 2, 1984, 59-089129

Int. Cl.[5] G02B *3/00, 6/00*

U.S. Cl. 350—432 **20 Claims**

1. An illumination optical system for endoscopes comprising a fiber bundle having an exit end face and emitting light from said exit end face and a cover lens arranged in front of the exit end face of said fiber bundle so that the light emitted from the exit end face of said fiber bundle is irradiated toward an object to be observed by an endoscope in order to illuminate the object to be observed by the endoscope through said cover lens, said cover lens consisting of at most two lens elements arranged along an optical axis of said illumination optical system, each of said at most two lens elements being composed of an inhomogeneous medium in which the refractive index of a peripheral part distant from the optical axis of said illumination optical system is larger than that of a center part close to



the optical axis, wherein said cover lens has negative refractive power as a whole and each of said at most two lens elements is provided with a convex spherical surface, toward the object, on the side of the object.

4,929,071

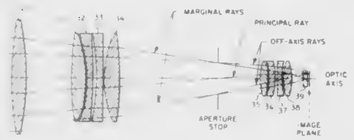
LONG-FOCUS COLOR-CORRECTED PETZVAL-TYPE OPTICAL OBJECTIVE

Romeo I. Mercado, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 20, 1985, Ser. No. 811,848

Int. Cl.[5] G02B *9/00*

U.S. Cl. 350—463 **14 Claims**



1. A optical objective of net positive dioptric power, said objective having an image plane at which four discrete wavelength come to a common focus, said optical objective comprising:

(a) a first lens group consisting of five lens elements,

(b) a second lens group consisting of four lens elements, and

(c) a field flattener consisting of one lens element,

all of said lens elements being disposed along an optic axis, each of said lens elements being rotationally symmetric with respect to said optic axis, said second group of lens elements being separated from said first group of lens elements along said optic axis by an aperture stop, said field flattener being located adjacent said image plane, said lens elements being made from only two different optical glasses, at least one of said lens elements being made from a first one of said optical glasses, at least one other of said lens elements being made from a second one of said optical glasses.

4,929,072

SELF CLEANING MIRROR FOR A VEHICLE

Naofumi Fujie, Nagoya; Tomoaki Imaizumi, Hoi; Koji Ito, Kariya, and Shoji Okada, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 31, 1989, Ser. No. 386,703

Claims priority, application Japan, Jul. 30, 1988, 63-190967

Int. Cl.[5] G02B *5/10*

U.S. Cl. 350—582 **9 Claims**

8. A self-cleaning mirror for a vehicle comprising:

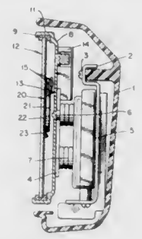
a mirror of predetermined curvature,

an electric control means, and

an ultrasonic vibrator joined to a rear surface of said mirror and electrically connected to said control means, said ultrasonic vibrator including:

a vibratory element,

first and second electrode terminals mounted on first and second sides, respectively, of said vibratory element, each



electrode terminal including a projecting connecting portion connected to a lead wire from said control means, and

a molding material occupying a space between a rear side of said mirror and a terminal defined by a connection between said connecting portion and lead wire, said molding material suppressing vibration of said connecting portions.

4,929,074

MIRROR AND BRACKET ASSEMBLY

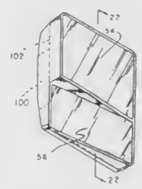
Milfred W. Urban, 1819 N. Edwards, Wichita, Kans. 67203

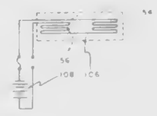
Filed Oct. 24, 1988, Ser. No. 261,749

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[5] G02B *5/08*

U.S. Cl. 350—625 **4 Claims**





4. A break-away rearview mirror comprising a mirror housing means; a remote control means having a movable face for moving mirrors and mounted within said housing means, said remote control means being controlled remotely manually; a backing means secured to the face; a bonding means with a predetermined setting time positioned on top of said backing means whereby when said bonding means sets, it sets into an elastic, rubbery solid; a flat mirror of unitary magnification disposed against said backing means and bonded thereto by said bonding means after the same has solidified; a convex mirror optically pre-aligned disposed against said backing means bonded thereto by said bonding means after the same has solidified; said bonding means adapted upon solidifications to provide a cushion effect for the flat mirror and the convex mirror against the backing means to prevent the mirror from breaking or becoming misaligned in the event the mirror housing is dropped or jarred; said backing means having a structure defining a flat portion whereupon the flat mirror is supported and a triangular portion whereupon the convex mirror is supported.

4,929,073

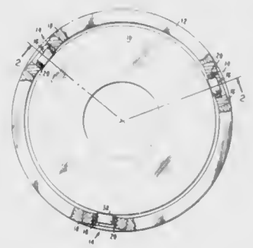
KINEMATIC MOUNT

John A. La Plante, Winchester, Mass., and Robert D. Schaefer, Huntington Beach, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 664,442, Oct. 24, 1984, abandoned. This application Apr. 12, 1988, Ser. No. 183,353

Int. Cl.[5] G02B *5/08*

U.S. Cl. 350—609 **13 Claims**



1. A coupling between a support and an element having a center and lying generally in a plane within the support for relieving any stresses between the element and the support and any distortions on the element, comprising:

first means having both a sliding engagement with the support for movement in the element plane towards and away from the element center, and a spherical surface centered within a plane which is normal to the element plane; and

second means coupled to the element and provided with a spherical surface in engagement with said first means spherical surface,

said spherical surfaces being so arranged that one of said surfaces resides within the other of said surfaces.

4,929,075

OPTICAL VIEWING SYSTEM

Isaac Eliakim, 23 Omri Street, Tel-Aviv, Israel

Continuation of Ser. No. 63,314, Jun. 18, 1987, abandoned. This application Jul. 31, 1989, Ser. No. 387,443

Claims priority, application Israel, Jun. 18, 1986, 79139

Int. Cl.[5] G02C *1/00*; G02B *25/00*

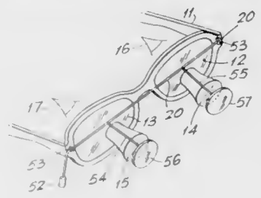
U.S. Cl. 351—158 **7 Claims**

1. An optical spectacle-type device for use by persons suffering from substantial deficiencies of sight, comprising:

a conventional spectacle frame equipped with corrective optical lenses, correcting the acuity of vision, each lens having an inner surface and an outer surface with the inner surfaces of the lenses being positionable adjacent an eye of the person;

a telescopic lens system being attached in front of each lens to the outer surface of said lens, said telescopic lenses focused at a common focus at a predetermined distance from the spectacle frame to provide a sharp vision at a first distance from the viewer; and

a further frame being hingedly attached to said spectacle frame, said further frame having two prismatic lenses and a lever to move the two prismatic lenses in front of the telescopic systems to change the focal length of the entire



system to provide a sharp vision at a second distance from the viewer, said lever also serving to remove the two prismatic lenses from in front of each of the telescopic systems so that a sharp vision is again provided at the first distance from the viewer.

4,929,076

OPHTHALMIC MEASURING APPARATUS

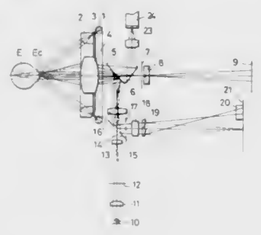
Takashi Masuda, Kawasaki, and Kyoji Sekiguchi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 96,260, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 808,883, Dec. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 580,813, Feb. 16, 1984, abandoned. This application Apr. 24, 1989, Ser. No. 342,708

Claims priority, application Japan, Jun. 13, 1983, 58-105593; Feb. 9, 1985, 60-23727

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—212 **2 Claims**



1. An ophthalmic measuring apparatus capable of both measuring the cornea shape and eye refractive power of an eye to be examined, comprising:

(a) a cornea shape measuring system, having:

(a1) a projecting optical system for projecting a target image onto the cornea of the eye to be examined,

(a2) an imaging optical system for reproducing an image of the target reflected at the cornea, and

(a3) light detecting means for detecting the reflected target image to measure the shape of the cornea,

(b) a refractive power measuring system, having:

(b1) a projection optical system for projecting a target image onto the fundus of the eye to be examined,

(b2) an imaging optical system for reproducing a target image reflected by the fundus of the eye, wherein at least a part of the optical path of each of said imaging optical systems is shared by the other of said imaging optical systems, and

(b3) light detecting means for detecting the reflected target image to measure the eye refractive power, and

(c) a fixation chart projecting system, having:

(c1) first fixation chart means for fixing the gazing axis of the eye during the measurement of the shape of the cornea of the eye,

(c2) second fixation chart means for fixing the gazing axis of the eye during the measurement of the refractive power of the eye, and

(c3) driving means for shifting a part of said fixation chart projecting system so that said first fixation chart means is projected from a position corresponding to the refractive power of the eye measured by said refractive power measuring system.

4,929,077

INTERFEROMETRIC RANGE FINDER

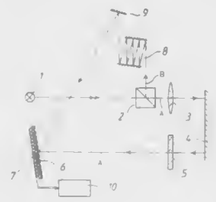
André Huisen, Lüchingen, Switzerland, assignor to Wild Leitz AG, Switzerland

Filed Mar. 22, 1988, Ser. No. 171,715

Claims priority, application Switzerland, Mar. 24, 1987, 1113/87

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—4.5 **13 Claims**



1. A range finder for accurately measuring distances, the combination comprising a time partially coherent source means for producing a beam of electromagnetic waves, beam splitter means for splitting said beam from said source into a reference beam and a measuring beam, means defining a reference path for said reference beam, means defining a measuring path for said measuring beam, said measuring path defining means including means to focus said measuring beam onto and to reflect said measuring beam off of a testpiece, position sensitive detector array means, said reference path means and said measuring path means including means to bring said reference beam and said measuring beam into interference with each other and to cause said two beams to be superimposed over at least one zone of path differences between said reference and said measuring beams, whereby a direct determination of the coherence of said two beams can be made based on the intensity distribution of the interferences of said beams on said array means, and program controlled signal processing means for evaluating said intensity distribution, whereby distances concerning the location of said testpiece can be accurately derived by said signal processing means.

4,929,078

CONVERSION OF DUAL WAVE BEAM SPECTROPHOTOMETER TO DUAL WAVELENGTH SPECTROPHOTOMETER

Harold J. Harmon, Edmond, Okla., assignor to Oklahoma State University, Stillwater, Okla.

Continuation-in-part of Ser. No. 35,963, Apr. 8, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 269,964

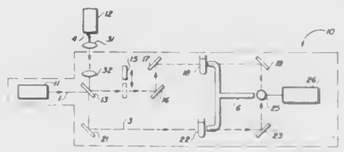
Int. Cl.[5] G01J *3/427*

U.S. Cl. 356—320 **15 Claims**

1. A retrofit conversion means for converting a dual beam spectrophotometer having a sample cycle and a reference cycle to a dual wavelength spectrophotometer, where the dual beam spectrophotometer has a first light source for generating

a first beam of light of preselected wavelength, first and second optical paths, a detector means, synchronous means for cyclically alternating said first beam between said first and second optical paths, and sample and reference receiving means disposed in said first and second optical paths respectively, said retrofit conversion means comprising:

a. a second light source for generating a second beam of light of a preselected second wavelength;



b. means for transmitting said second beam from said source to said first optical path;

c. meams for injecting said second beam into said first optical path during the reference cycle with the first beam from the first light source and the injected beam from the second light source cyclically transmitted along said first optical path to said sample; and,

d. means for blocking the second optical path and preventing transmission of light therethrough.

4,929,079

OPTICAL GRANULOMETRY PROCESS AND DEVICES FOR BROAD MEASURING RANGES

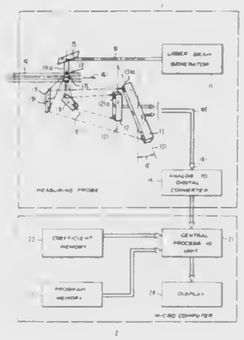
André Delfour, Ramonville; Francois Falempin, St Michel Sur Orge; Jacques Isbert, Toulouse, and Claude Sans, Massy, all of France, assignors to Office Natioanl D'Etudes Et De Recherches Aerospatiales styled O.N.E.R.A, Chatillon, France

Filed Jul. 11, 1988, Ser. No. 217,737

Claims priority, application France, Jul. 10, 1987, 87 09785

Int. Cl.[5] G01N *15/02*

U.S. Cl. 356—336 **12 Claims**



1. A process of evaluating a size distribution of particles in a fluid from measurements of scattered radiation along predetermined spacial directions in a finished integral number P by a sample of said fluid illuminated by an incident light beam, said process comprising:

from a radiation measuring vector having, as components, mean radiations along said P directions determined after several successive measurements and from a matrix of theoretical radiation coefficients, calculating a first estimation of said distribution expressed by a first discrete distribution function contained in a mathematical envelope function of predetermined type and respectively fixing concentration values at size nodes for which said first function is defined, said size nodes being distributed thereby satisfying a recursive relation of predetermined type,

determining by an iterative calculation involving digital filterings an optimum recursive relation to which the nodes of a discrete distribution function should satisfy, said determining step being performed in response to said first function being taken as starting data, whereby said discrete distribution function nodes are distributed in such a way that said discrete distribution function offers maximum correlation with a discrete measurement uncertainty function resulting from several successive radiation measurements in said P directions, and then calculating from said radiation measuring vector and said matrix all the discrete distribution functions compatible with said measurement uncertainties, the nodes of which satisfy said optimum recursive relation, thereby deducing an optimum statistical evaluation of said size distribution.

4,929,080

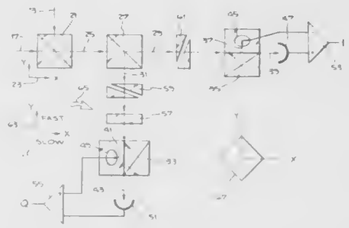
APPARATUS FOR THE OPTICAL MEASUREMENT OF SPECTRA DISTRIBUTION

Herschel Burstyn, Plainsboro, N.J., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 16, 1988, Ser. No. 194,391

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—338 **10 Claims**



1. Apparatus for measuring scattered light from a sample comprising:

a. means for generating a monochromatic beam of light along a first optical path;

b. first beam splitting means positioned along said first path for splitting said monochromatic beam of light along a second and third optical path;

c. means carrying a sample interposed in said optical path which produces a scattered beam of light after said second optical path passes therethrough, said beam on said second and third optical paths being, respectively, linearly polarized and perpendicular one to the other;

d. beam combining means for receiving beams on said second and third optical paths for combining the same on to a single path;

e. non polarized first beam splitting beams oriented along said single path emanating from said beam combining means along a fourth and fifth optical path;

f. second beam splitting means oriented along said fourth optical path for receiving the beam along said fourth optical path and for splitting the beam along a sixth and seventh optical path, said second beam splitting means being polarized;

g. third beam splitting means oriented along said fifth optical path for receiving the beam along said fifth optical path and for splitting the same along an eighth and ninth optical path, said third beam splitting means being polarized and

h. beam retardation means interposed between at least one of said fourth and fifth optical paths for shifting the relative phase between the orthonormal polarization components

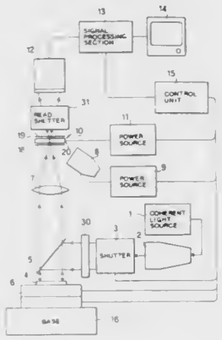
of the light beam travelling along said optical path substantially ninety degrees as it passes through said beam retardation means.

4,929,081

SYSTEM FOR DETECTING DEFECTS IN A REGULARLY ARRANGED PATTERN SUCH AS AN INTEGRATED CIRCUIT OR THE LIKE

Yoko Yamamoto; Hitoshi Tanaka, and Noboru Mikami, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 161,089, Feb. 26, 1988, abandoned.
This application Oct. 13, 1989, Ser. No. 423,551
Claims priority, application Japan, Feb. 27, 1987, 62-45631
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—354 8 Claims



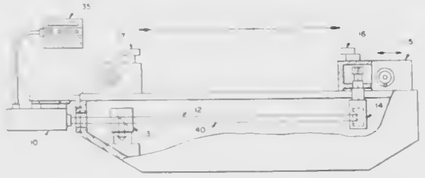
1. A pattern defect detecting system for an integrated circuit device or the like, for detecting defects or foreign matter on a regularly arranged test pattern on a test sample by spatially filtering diffracted light from the test sample obtained by using a coherent light beam impinging on said test sample, said pattern defect detecting system having a spatial filtering means which includes an optical space element including a polarizing means and being capable of receiving and erasably recording therein a selected filter pattern including a diffraction image of said regularly arranged test pattern projected by said coherent light beam in real-time operation and erasing said selected filter pattern in real-time operation, said erasably recorded diffraction image providing a filter characteristic for the direct filtering of diffracted light from said coherent light beam.

4,929,082

LASER LINEAR DISTANCE MEASUREMENT SYSTEM AND APPARATUS

George B. Webber, Rocky River, Ohio, assignor to Webber Gage Division of L.S.

Filed Jul. 13, 1988, Ser. No. 218,624
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—358 5 Claims



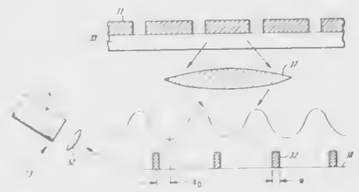
1. A linear measurement system having a laser generating source directing a first laser beam to an interferometer and thence to a retroreflector, said retroreflector adapted to move on a surface to be measured, optical reflecting means carried by a pendulum mounted within a mounting for the retroreflector adapted to reflect a laser beam directed parallel to the said first beam through the linear measuring interferometer to the laser generating source.

4,929,083

FOCUS AND OVERLAY CHARACTERIZATION AND OPTIMIZATION FOR PHOTOLITHOGRAPHIC EXPOSURE

Timothy A. Brunner, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 876,316, Jun. 19, 1986, abandoned.
This application Mar. 20, 1989, Ser. No. 326,482
Int. Cl.[5] G01B *11/00;* G01J *1/00*
U.S. Cl. 356—400 6 Claims



1. In combination with a photolithographic exposure tool having a reticle platen, a wafer stage, a light source for illuminating said platen, and imaging optics disposed between said reticle platen and said wafer stage; the improvement comprising

a calibration wafer mounted on said wafer stage, said wafer having a plurality of test dies positioned at different locations thereon, each of said test dies being patterned to have a checkerboard-like array of periodic, mutually orthogonal gratings oriented to align along an x-axis and a y-axis of said exposure tool, the gratings on said test dies having a predetermined spatial frequency and a predetermined duty ratio;

a calibration mask mounted on said reticle platen, said mask being imaged onto said calibration wafer by said imaging optics to produce an aerial image of said mask, said mask being patterned to have a checkerboard-like array of periodic, mutually orthogonal gratings oriented to aling along the x-axis and the y-axis of said exposure tool, the aerial image of said mask gratings having a spatial frequency and a duty ratio which are essentially equal to and substantially greater than said predetermined spatial frequency and said predetermined duty ratio, respectively;

a single photodetector positioned to produce an electrical output signal in response to light angularly radiated from said test dies; and

means for scanning one after another of said test dies transversely with respect to the aerial image of said mask gratings, first along one of said axis and then along the other of said axis;

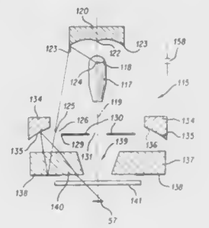
whereby the output signal of said photodetector varies over time to provide an x-y scanned representation of the aerial image of said mask gratings at each of said test die locations.

4,929,084

MEASURING HEAD

Fred Mast, Wil, and Jean A. Knus, Zurich, both of Switzerland, assignors to GRETAG Aktiengesellschaft, Regensdorf, Switzerland

Filed Jan. 24, 1989, Ser. No. 300,936
Claims priority, application Switzerland, Feb. 2, 1988, 360/88
Int. Cl.[5] G01N *21/27, 21/47;* G01J *3/10*
U.S. Cl. 356—446 13 Claims



1. Measuring head for an apparatus to determine photographic data comprising:

a light source;

an optical projection means to illuminate a measuring spot on a measuring surface;

a spherical annular mirror;

a flat annular mirror applied to a glass ring;

an optical measuring means; and,

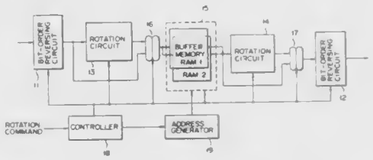
a rotationally symmetrical, aspherical mirror coordinated with the source of light, said aspherical mirror being provided, on a side facing the light source, with an annular groove having a cross-sectional configuration of an elliptical segment of an ellipse, a first focal point of which coincides with a location of the light source on the axis of rotational symmetry of the asperical mirror, and a second focal point of which is located laterally offset relative to the axis of rotational symmetry of the aspherical mirror, in an annular diaphragm surrounded by the spherical annular mirror.

4,929,085

IMAGE DATA ROTATION PROCESSING METHOD AND APPARATUS THEREFOR

Shigehiro Kajihara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 24, 1987, Ser. No. 100,713
Claims priority, application Japan, Sep. 30, 1986, 61-231717; Nov. 29, 1986, 61-284518
Int. Cl.[5] G06F *15/40, 15/626*
U.S. Cl. 364—518 14 Claims



1. A rotation processing system capable of continuously rotating input data, comprising:

buffer means, including first and second memory means and responsive to a first instruction, for sequentially receiving a series of first words, the series of first words being raster-scanned data and each first work includes n data bits, where n≧2, for sequentially storing the series of first words in said first memory means in a first direction in units of n data bits, for sequentially reading out a series of second words from said second memory means in a second direction in units of n data bits to obtain a series of second words, each second word including n data bits, while the series of first words is being stored in said first memory means, the second direction being orthogonal to the first direction, and for switching the functions of said first and second memory means when a predetermined number of first words is stored in said first memory means;

first matrix conversion means, connected to said buffer means and responsive to a second instruction, for selectively passing the series of second words and for selectively receiving the series of second words from said buffer means, for holding the series of second words in the received order in units of n second words, and for sequentially outputting n data bits of each of said n second words held therein, one by one in a designated bit order to obtain a series of third words, in an input raster mode;

first bit-order reversing means, connected to said first matrix conversion means and responsive to a third instruction, for selectively passing one of the series of second words and the series of the third words, and for selectively receiving one of the series of second words and the series of the third words to reverse the bit order of each received word to obtain a series of rotated words such that ith bit data of each received word is (n−*i*)th bit data of each respective rotated word, in the input raster mode; and

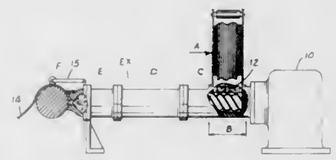
control means, connected to said buffer means, said first matrix conversion means, and said first bit-order reversing means and responsive to an input rotation command, for selectively setting the input raster mode, for generating the first to third instructions, and for outputting the first instruction to said buffer means, the second instruction to said first matrix conversion means, and the third instruction to said first bit-order reversing means so that the rotation processing system operates in a pipelined manner.

4,929,086

CONTINUOUS RATE FEED HOPPER

Paul Geyer, 15660 Tacoma, Detroit, Mich. 48025

Filed May 4, 1989, Ser. No. 347,118
Int. Cl.[5] B28C *7/04;* B29B *1/06*
U.S. Cl. 366—76 12 Claims



1. An apparatus for the continuous feeding, at a uniform rate, of rubber like polymer in the form of standard bales or in multiple strip form of know weight per unit length and chemical additives, into a continuous mixing machine having a hopper, a multi-purpose hopper rotor and a hopper barrel, said hopper having a feed throat communicating with said hopper rotor which is rotatably mounted in the hopper barrel; first means operable to advance the said polymer at an exact uniform preset rate, in relation to the mixing machine rotor speed, capable of firmly clamping the polymer with adequate pressure to force the polymer into said hopper rotor without change of feed rate; second means including said multi-purpose hopper rotor consisting of helical grooves or groove formed by helical ridges provided with, at their outer portion, multiple longitudinal and radial knives, arranged to cut strips of polymer from said incoming bales; third means including an opening in said

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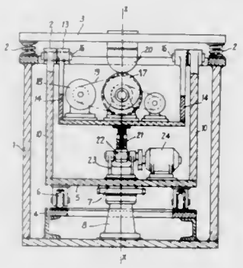
barrel before or at the said bale cutting operation, to provide an entrance for the chemical additives, in a manner which tends to coat the freshly cut surfaces of the polymer with the additives, to initiate the mixing action; and fourth means integral with said rotor and said helical grooves, to cause excess extrusion capacity to create turbulence flow to initiate mixing, develop pressure and to transport the process material at a continuous and uniform rate downstream and into the entrance of a rotor and barrel type mixing machine.

4,929,087

METHOD FOR APPLYING VIBRATIONS TO A RESILIENT SUPPORT AND APPARATUS FOR PUTTING THIS METHOD INTO PRACTICE

Roger Brigolle, Heulecourt, France, assignor to Societe Anonyme des Machines Osborn, France

Filed Apr. 2, 1987, Ser. No. 33,148
Claims priority, application France, Apr. 2, 1986, 86 04681
Int. Cl.[5] B01F *11/00;* B22C *15/10*
U.S. Cl. 366—111 **4 Claims**



1. A method for applying multidirectiional vibrations to a resilient support, which comprises the steps of:

(a) securing said resilient support against rotation in its plane,

(b) applying to the resilient support unidirectional vibrations from a unidirectional vibration generator,

(c) simultaneously with step (b) rotating said unidirectional vibration generator in a plane parallel to the plane of said resilient support, and

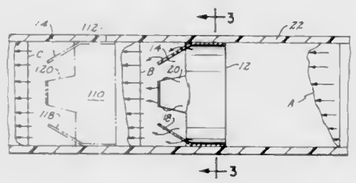
(d) simultaneously with steps (b) and (c) pivoting said unidirectional vibration generator in a plane perpendicular to the plane of said resilient support.

4,929,088

STATIC FLUID FLOW MIXING APPARATUS

Charles R. Smith, Bethlehem, Pa., assignor to Vortab Corporation, Englwood Cliff, N.J.

Continuation-in-part of Ser. No. 224,690, Jul. 27, 1988. This application Jun. 6, 1989, Ser. No. 360,037
Int. Cl.[5] B01F *5/00*
U.S. Cl. 366—337 **19 Claims**



1. A static mixing device adapted to be inserted in a fluid stream having a main flow direction with respect to at least one bounding surface, comprising:

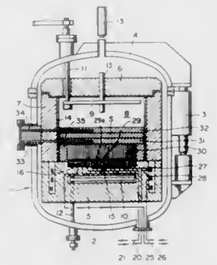
at least two tabs projecting from said at least one bounding surface and inclined in the flow direction at a preselected elevation to said bounding surface, said tabs being spaced apart in a direction transverse to said flow direction, the length (L), width (W) and elevation angle being selected so as to generate pairs of oppositely rotating, predominantly streamwise vortices at the tips of each tab.

4,929,089

APPARATUS FOR MEASURING TEMPERATURES INDICATIVE OF THERMAL CONDUCTIVITY

Yoshiki Tsuchida, Tokyo, Japan, assignor to Ishikawajima-Harima Heavy Industries Co., Tokyo, Japan

Filed Jan. 18, 1989, Ser. No. 298,052
Claims priority, application Japan, Jan. 18, 1988, 63-4310; Jan. 18, 1988, 63-7803; Jan. 18, 1988, 63-7804; Jan. 28, 1988, 63-18172; Feb. 19, 1988, 63-21100; Feb. 19, 1988, 63-21101
Int. Cl.[5] G01K *17/00;* G01N *25/18*
U.S. Cl. 374—44 **15 Claims**



1. An apparatus for measuring thermal conductivity of a specimen, said specimen defining a first and a second surface and a periphery, said apparatus comprising:

(a) a measuring chamber adiabatically enclosing an inner space, said measuring chamber containing the specimen and being maintained in contact with the lateral peripheral surface of the specimen to be measured;

(b) a heat source for uniformly heating the first surface of the specimen;

(c) a first thermometer to measure the temperature of the first surface of the specimen;

(d) a heat flow measuring means disposed in contact with the second surface of the specimen in said second space, for maintaining the temperature of the second surface of the specimen at a predetermined temperature and for measuring the thermal energy flowing through the second surface; and

(e) a second thermometer for measuring the temperature of the second surface of the specimen;

by which means creating a constant heat flow through the specimen from the first surface of the specimen, through the specimen, and then through the second surface of the specimen, the direction of said constant heat flow defining an axial orientation;

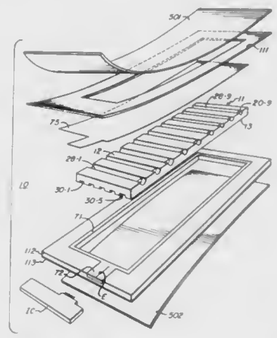
and measuring the temperature of the first and the second surface of the specimen and thermal energy flowing through the specimen, from which said temperatures and thermal energy the thermal conductivity of the specimen can be determined.

4,929,090

TEMPERATURE HISTORY INDICATIANG LABEL

Isabelle Grahm, 2157 N. Vine Ave., No. 4, Hollywood, Calif. 90068

Filed Oct. 24, 1988, Ser. No. 261,588
Int. Cl.[5] G01K *3/04;* G04F *13/04*
U.S. Cl. 374—102 **10 Claims**



1. An indicating label for indicating temperature history with time, comprising:

an electrically insulative panel of substantially planar configuration characterized by a first and second surface on the opposing sides thereof, said first surface including a plurality of first elongate grooves aligned along a first direction thereon, said second surface including a plurality of second elongate grooves aligned along a second direction thereon, said first and second grooves being formed to intersecting depths whereby a corresponding opening is formed in said panel at each intersection of said first and second grooves;

a plurality of first electrode strips conformed for corresponding receipt in said first grooves;

a plurality of second electrode strips conformed for corresponding receipt in said grooves;

a plurality of electrolyte layers deposited in said second recesses in electric contact between the corresponding ones of said first and second electrodes, said electrolyte layers being of a chemical composition selected to consume said first electrodes in the course of producing electrical current; and

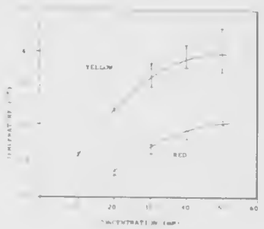
switching means operatively connected between said first and second electrodes including corresponding temperature responsive contacts in circuit with respective ones of said second electrodes for completing an electrical circuit with the respective ones of said second electrodes at predetermined levels of temperature.

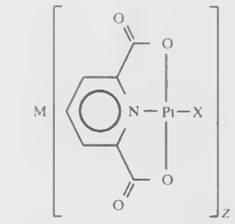
4,929,091

THERMOCHROMIC PLATINUM COMPLEXES

Nenad M. Kostic, and Xia-Ying Zhou, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 202,456, Jun. 6, 1988, Pat. No. 4,857,231. This application Mar. 27, 1989, Ser. No. 329,405
Int. Cl.[5] G01K *11/00;* C07D *279/00, 285/00*
U.S. Cl. 374—162 **1 Claim**





wherein M is a cation, X is a halide, and Z is a whole number equal to the positive charge of M;

(b) placing said aqueous solution in an environment in which the complex is monomeric and yellow in solution at a given temperature, but is red and a polymeric at a different temperature;

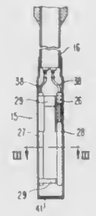
(c) observing the color of said thermochromic complex to determine whether a particular "alert temperature" or a particular temperature range has been reached or passed.

4,929,092

RESISTANCE TEMPERATURE DETECTOR

Seizo Taguchi; Toshiharu Oketani; Michihiro Ohashi; Hideaki Tanaka, all of Kobe, and Hiroshi Terao, Akashi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Okazaki Seisakusho, Hyogo, both of, Japan

Filed May 25, 1988, Ser. No. 198,495
Claims priority, application Japan, Jun. 12, 1987, 62-145313; Sep. 16, 1987, 62-140002[U]
Int. Cl.[5] H01C *7/02*
U.S. Cl. 374—183 **14 Claims**



1. A resistance temperature detector for measuring the temperature of a fluid flow, comprising:

a thin-walled tubular case having a first closed end;

a sheath cable assembly secured to a second end of said tubular case to thereby define a sealed vacant space within said case;

normal and backup temperature sensing resistance elements secured in spaced circumferential relation directly to the inner annular wall of said case within said sealed vacant space, said resistance elements being secured to the inner wall of said case with an inorganic adhesive; and

a plurality of insulated lead wires extending between and electrically connecting said normal resistance element and said cable assembly, and extending between and electrically connecting said backup resistance element and said cable assembly.

4,929,093

FIRE DETECTOR HAVING A PROTECTIVE COVER

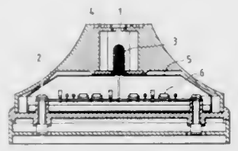
Takashi Suzuki, and Hideto Amemiya, both of Tokyo, Japan, assignors to Nittan Company

Filed Jan. 23, 1989, Ser. No. 299,449

Claims priority, application Japan, Feb. 2, 1988, 63-12163

Int. Cl.[5] **G08B** *17/00;* **G01K** *7/18, 7/22, 1/08*

U.S. Cl. 374—208 **6 Claims**



1. A fire detector for detecting a fire occurrence, comprising:

a temperature sensor for sensing a temperature increase due to a fire, and

a protective cover for enclosing said temperature sensor and protecting said temperature sensor from external impacts said fire detector further comprising electrical circuits for converting into a sensing signal a temperature signal from said temperature sensor, and a shield case containing said electric circuits therein, thereby to eliminate the effects of external electrical noises and said shield case being electrically connected to said protective cover.

4,929,094

PORTABLE, INSULATED STORAGE CONTAINER

Dawn M. Becker, Byron, Calif., assignor to Bye, Moms Inc., San Francisco, Calif.

Filed Jan. 22, 1989, Ser. No. 369,868

Int. Cl.[5] **B65D** *33/06, 33/16*

U.S. Cl. 383—7 **10 Claims**

1. A portable, insulated, storage container comprising, in combination:

a bag having interconnected bag bottom, side, and end walls defining an interior and a cover connected to at least one of said bag walls and moveable between a first position whereat said cover closes said interior and a second position whereat said cover does not close said interior; and

a receptacle adapted for insertion into said bag interior, said receptacle having a body portion including bottom, side, and end walls having a configuration generally corresponding to the configuration of said bag interior whereby said receptacle body portion is in engagement with said bag bottom, side, and end walls when said receptacle is disposed in said bag interior, and said receptacle further including a closure portion integral with said body portion to selectively open and close said receptacle, said closure portion including a first primary flap hingedly connected to a first body portion side wall, along a first fold line, a second primary flap hingedly connected along a second fold line to a second body portion side wall in spaced opposition to said first body portion side wall, and manually graspable end flap structure comprising a plurality of interconnected auxiliary flaps disposed between said first and second primary flaps and extending from opposed receptacle body portion end walls, said first and second primary flaps being in at least partially overlapping relationship when said receptacle is closed by said closure portion, and said end flap structure projecting outwardly beyond said body portion end walls when said primary flaps are in said at least partially overlapping relationship.



4,929,095

BALL RETAINER OF A LINEAR GUIDE APPARATUS

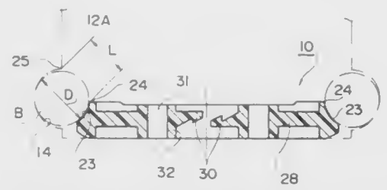
Nobuyuki Osawa, Takasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,482

Claims priority, application Japan, May 31, 1988, 63-72338[U]

Int. Cl.[5] **F16C** *29/06*

U.S. Cl. 384—45 **2 Claims**



1. A ball retainer used with a linear guide apparatus, wherein said linear guide apparatus includes an axially extending guide rail and has ball rolling grooves formed in both corner edges between an upper surface and both side surfaces, a slider mounted on said guide rail and movable in an axial direction and having ball rolling grooves formed in an inner surface at positions respectively opposing the ball rolling grooves of said guide rail, and a plurality of balls mounted in mutually opposing ball rolling grooves of said guide rail and said slider, said ball retainer comprising:

a rectangular substantially flat frame-shaped main portion;

supporting portions protruding axially from opposite ends of said main portion;

side frame portions respectively having ball holding grooves of an arcuate cross section formed in outer side surfaces thereof, said ball holding grooves extending axially over an overall length of said frame portions, said side frame portions having a wall thickness and a width which allows said side frame portions to deflect inwardly in a curved shape by elastic deformations by an external force applied thereto; and

hook portions respectively protruding inwardly from intermediate positions of the overall length of said side frame portions to normally oppose each other with a predetermined interval therebetween, said hook portions being releasably engageable with each other by deflection of said side frame portions inwardly in a curved shape to hold the deflected state of said side frame portions.

4,929,096

LINEAR GUIDE APPARATUS

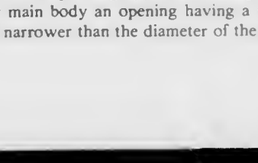
Nobuyuki Osawa, Takasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1989, Ser. No. 358,543

Claims priority, application Japan, May 31, 1988, 63-72337[U]

Int. Cl.[5] **F16C** *29/06*

U.S. Cl. 384—45 **3 Claims**



1. In a linear guide apparatus including a guide rail having axially extending upper ball rolling grooves formed in both edge portions between an upper surface and both side surfaces, and lower ball rolling grooves formed in both side surfaces, a slider main body mounted on said guide rail and movable in the axial direction and having upper and lower ball rolling grooves formed in an inner surface at positions respectively corresponding to the upper and lower ball rolling grooves of said guide rail, a pair of end caps respectively attached to opposite ends of said slider main body and having supporting holes formed therein, a plurality of balls inserted in the corresponding ball rolling grooves of said guide rail and said slider main body, and ball retainer means for holding the balls in the upper and lower ball rolling grooves of said slider main body,

the improvement comprising:

said ball retainer means comprises an upper ball retainer for holding the balls of the upper ball rolling grooves, and a pair of lower ball retainers,

said upper ball retainer is made of a synthetic resin material and has a substantially rectangular shape, said upper ball retainer supporting portions provided at axial opposite ends of said ball retainer and protruding axially therefrom and inserted into supporting holes of said end caps to support said upper ball retainer in a space between the upper surface of said guide rail and the inner surface of said slider main body facing the upper surface,

a ball holding groove having an arcuate cross section formed in each of lateral side surfaces of said upper ball retainer extending over a whole length thereof, and

a lip portion formed at an lower end portion of each the ball holding groove of said upper ball retainer, said lip portion being elastically deformable in a direction to expand the ball holding groove and forming together with a corresponding upper ball rolling groove of said slider main body an opening having a width substantially narrower than the diameter of the balls.

4,929,097

THIN-WALLED RECIPROCATING RECTILINEAR MOTION ROLLING GUIDE UNIT EQUIPPED WITH STRESS-RESISTING BALL RETAINER

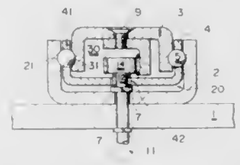
Tatsuo Mottate, Mitaka, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 407,743

Claims priority, application Japan, May 11, 1989, 64-116060

Int. Cl.[5] **F16C** *29/04*

U.S. Cl. 384—49 **8 Claims**



1. A thin-walled rectilinear motion guide unit equipped with stress-resisting ball retainer, comprising a plate-like base member (**1**) having a vertically extending pinion bolt (**11**) penetrating therethrough in a freely rotatable fashion, an elongated bed member (**2**) having a U shaped cross section to form a trough-shaped groove (**20**) therein and secured onto the upper surface of said base member (**1**), a horizontal ball track groove (**21**) being provided on the inner surface of each of the opposing side walls of said bed member (**2**) at a predetermined height from the bottom wall thereof, an elongated table member (**3**) having an inverted U shaped cross section and adapted to be inserted within said trough-shaped groove (**20**) of the bed member (**2**) in a spaced and longitudinally freely slidable fashion, a horizontal ball track groove (**31**) being provided on the outer surface of each of the opposing side walls of said table member (**3**) at such a height as capable of oppositely facing the above-mentioned horizontal ball track groove (**21**) of the bed member (**2**), an elongated ball retainer (**4**) having a U-shaped cross section and adapted to be interposed within said trough-shaped groove (**20**) of the bed member (**2**), and between said bed member (**2**) and said table member (**3**), said ball retainer (**4**) providing, in the opposing side walls, a plurality of ball retaining openings (**41**) aligned in an equispaced relation with one another in a horizontal row at such a height as capable of directly facing, at both sides, the above-mentioned horizontal ball track grooves (**21, 31**) of the bed and table members (**2, 3**), respectively, so as to retain the respective balls (**5**) therein in a freely rotatable fashion, as well as a longitudinally and centrally extending elongated opening (**42**) in the bottom wall of said ball retainer (**4**) with a first rack (**43**) being provided on and along one of the side edges thereof, the above-mentioned vertically extending pinion bolt (**11**) further penetrating through the bottom wall of the overlying bed member (**2**) at a substantially central position thereof relative to both the longitudinal and lateral directions until it passes through said elongated opening (**42**) of the ball retainer (**4**) wherein is securely mounted on the upper portion of said pinion bolt (**11**), a composite pinion assembly consisting of a lower or first pinion part (**12**) having a smaller diameter adapted to mesh said first rack (**43**) and an upper or second pinion part (**14**) integrally and concentrically formed with said first pinion part (**12**) directly thereon, an elongated second rack member (**32**) having an L-shaped cross section and a longitudinal length substantially the same as that of the table member (**3**), forming a second rack (**33**) on and along one of the inner sidewalls thereof, said second rack member (**32**) being attached in cantilever fashion on the lower surface of said table member (**3**) extending in the longitudinal direction in such a manner that the second rack (**33**) is brought into meshing engagement with the above-mentioned upper or second pinion part (**14**) within the trough-shaped groove (**30**) of the table member (**3**) and the teeth of said first pinion part (**12**) and second pinion part (**14**) being

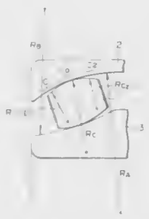
formed the same in form and size but the number of the former teeth being twice the number of the latter teeth.

4,929,098

SELF-ALIGNING ROLLER BEARING

Hirotoshi Takata, Yokohama; Eihiro Suruga, and Gentei Inoue, both of Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 298,916
Claims priority, application Japan, Mar. 4, 1988, 63-49781
Int. Cl.[5] F16C *33/36*
U.S. Cl. 384—450 3 Claims



1. A self-aligning roller bearing having a plurality of spherical rollers disposed between the track surface of an inner race and the track surface of an outer race, characterized in that the generator of the track surface of the outer race has a single radius of curvature R_A, the generator of the track surface of the inner race has a single radius of curvature R_B, and the generator of the rolling surface of each roller is constituted by a curve having a plurality of radii of curvature, with a central portion of the rolling surface generator corresponding to at least 80% of the full axial length of the rolling surface and having a single radius of curvature R_C, and with opposite end portions of the rolling surface generator having respective radii of curvature $R_{C1}(l)$ and $R_{C2}(l)$, where

$$R_{C1}(l),\ R_{C2}(l) < R_C < R_A,\ R_B$$

and where each of $R_{C1}(l)$ and $R_{C2}(l)$ represents either a single radius of curvature or a greater number of radii of curvature progressively decreasing toward the corresponding end of said rolling surface generator.

4,929,099

MULTI-LINE SERIAL PRINTER

Scott M. Graham; Kenneth R. Ewing, both of Fremont; Marshall H. Trackman, San Leandro, and Duane R. Darr, San Jose, all of Calif., assignors to Qume Corporation, San Jose, Calif.

Filed Jan. 19, 1988, Ser. No. 145,272
Int. Cl.[5] B41J *3/02*
U.S. Cl. 400—76 4 Claims

1. A method for printing character oriented data comprising the steps:

first processing data representative of a plurality of printed characters and their relative locations with respect to a page to be printed into a first list sorted by the vertical distance from a baseline point of each particular character to the top of the page, said first list including a first character and a last character

then sequentially converting the data in said first list starting with said first character into a second list of characters sorted by the horizontal distance from a particular character to a specified edge of the page until either

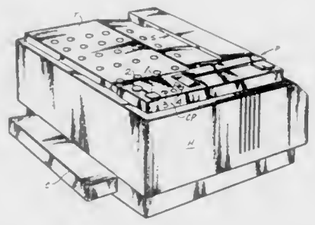
a first out-of-range character is reached in said second list that does not fall within a current print window having a predetermined window height at least three times the height of said printed characters, but less than the height of said page, or

said last character has been so converted

then sequentially printing the characters in said second list,

then reinitializing said second list

then continuing to convert the characters in said first list into characters in the reinitialized second list, until either



a second out-of-range character is reached in said first list that does not fall within said print window, or

said last character has been so converted

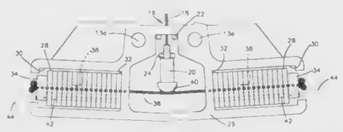
then sequentially printing the characters in said reinitialized second list.

4,929,100

TAUT BAND PIEZOELECTRIC ACTUATOR FOR WIRE MATRIX PRINTING ELEMENTS

William A. Patterson; Dien H. Tong, and James R. Wooden, all of Charlotte, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 4, 1989, Ser. No. 347,373
Int. Cl.[5] B41J *3/10*
U.S. Cl. 400—124 10 Claims



1. In a wire matrix printer having a plurality of driven wire printing elements the improvement comprising;

each printing element having actuation means operably associated therewith to drive the element against a printing medium from a retracted position to an actuated position and return,

said actuation means comprising an elongated flexible drive element anchored at opposite ends thereof, at least one end of said drive element having anchor means anchored to a piezoelectric crystal arrangement,

said piezoelectric crystal arrangement having electrical supply means for causing change in the length of said crystal arrangement responsive to a change in the applied electrical potential,

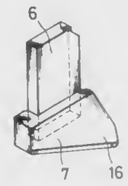
said drive element being normally maintained in a fully bowed retracted position and secured to said piezoelectric crystal arrangement so as to be driven toward an actuated less bowed condition by tightening said drive element upon a change in the electrical potential applied to the piezoelectric crystal arrangement to thereby drive said printing element axially to the actuated position from the retracted position.

4,929,101

RELEASE-TYPE DOT PRINT HEAD

Kuniaki Ochiai, and Shigeo Komakine, both of Shizuoka, Japan, assignors to Tokyo Electric Company, Ltd., Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,776
Claims priority, application Japan, May 27, 1988, 63-130002
Int. Cl.[5] B41J *3/10*
U.S. Cl. 400—124 3 Claims



1. A release type dot print head comprising:

a plurality of cores placed respectively in solenoid coils and arranged on a plane;

a plurality of armatures swingably supported, urged away from the corresponding cores and fixedly provided with needles at the extremities thereof, respectively;

a yoke; and

a permanent magnet disposed between the cores and the yoke;

said cores, said armatures, said yoke and said permanent magnet forming magnetic paths;

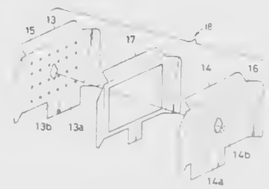
wherein said cores are each formed of a plurality of plates of a magnetic alloy containing iron and cobalt as the principal components, and an auxiliary core associated with each of said cores is formed of a magnetic material which is different from that of said cores, said auxiliary cores being joined closely to the side surfaces of the cores and the permanent magnet, respectively.

4,929,102

RIBBON PROTECTOR INCLUDING ELECTRO-CONDUCTIVE ELEMENTS AND PLATEN GAP ADJUSTMENT DEVICE INCORPORATING THE SAME

Minoru Mizutani; Hiroshi Kikuchi; Shoichi Watanabe; Kunibaru Hayashi, and Masanori Maekawa, all of Tokyo, Japan, assignors to Oki Electric Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1987, Ser. No. 131,093
Claims priority, application Japan, Dec. 10, 1986, 61-292608[U]; Dec. 10, 1986, 61-292609; Dec. 10, 1986, 61-189062
Int. Cl.[5] B41J *35/26*
U.S. Cl. 400—248 9 Claims



1. A platen gap adjustment device for use in a printer for adjustment of a gap between a tip of a printing head and a surface of a paper installed between a platen and a ribbon protector of the printer, the printing head being mounted on a carriage which is rotatably and slidably mounted on a carriage shaft which extends parallel to the platen to permit a spacing movement of said carriage along said platen comprising:

displacement means for displacing the rear end of said carriage to rotate said carriage about said carriage shaft so that said tip of said printing head is moved selectively toward and away from said platen; said displacement means including a parallel link element connected at one end to said rear end of said carriage and slidably fitted at the other end with a guide which is generally parallel to said platen;

said ribbon protector having an electrode which is conductive when a predetermined pressure is applied to said electrode during adjustment;

said carriage having a connector which receives said electrode;

drive means for driving said displacement means to obtain a reference position of said carriage for the adjustment of said platen gap based on conduction of said electrode of said ribbon protector; said drive means including a gap adjustment motor which causes said parallel link element to be resiliently deformed;

a control means for controlling operation of said gap adjustment motor, said gap adjustment motor and said control means being mounted on said carriage;

wherein, when said gap adjustment motor rotates in a predetermined direction, said parallel link element is resiliently deformed and said carriage is rotated about said carriage shaft in a first direction causing said tip of said printing head to be moved toward said platen;

when said gap adjustment motor rotates in an opposite direction, pressure on said parallel link element is released such that said parallel link element returns toward its original shape, causing said carriage to move about said carriage shaft in a second direction, thereby causing said tip of said printing head to be moved away from said platen; and

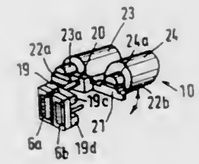
when, during rotation of said gap adjustment motor in said predetermined direction, said printing head reaches a position in which said tip of said printing head develops a predetermined pressure against said surface of said paper, said predetermined pressure is detected by conduction of said electrode of said ribbon protector, said position being determined by said control means as said reference position for said gap adjustment, said gap adjustment motor then being driven in said opposite direction through a predetermined angle of rotation of said carriage so that said tip of said printing head is pulled away from said platen so as to obtain a predetermined platen gap.

4,929,103

SHIFTABLE GUIDE FOR A MATRIX PRINTHEAD

Wolfgang Hendrischk, Neu-Ulm, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 107,888, Oct. 13, 1987, abandoned, which is a continuation of Ser. No. 317,130, Nov. 2, 1981, abandoned. This application Feb. 10, 1989, Ser. No. 309,986
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041877
Int. Cl.[5] B41J *3/12*
U.S. Cl. 400—124 5 Claims



1. Matrix print head, having a case containing a plurality of print styli drives, there being a plurality of print styli extending through said case and from the respective drives therein,

through a mouthpiece at an end of the case, to be positioned adjacent a printing platen, the head provided for movement along the platen the improvement comprising:

said mouthpiece being movable within said case in a direction transverse to an extension of the styli;

a print styli and mouthpiece adjusting device in said case, including an electromagnet drive inside said case, said drive including a magnetic coil wound around a core to establish a coil/core configuration, said configuration having a longitudinal axis around which the coil extends, opposite magnetic poles developing at opposite ends of said configuration being spaced along said axis said axis extending along said print styli but being laterally offset with respect to said print styli; and

said electromagnet drive having an actuation end coupled to said mouthpiece for adjusting the position of a mouthpiece in said direction being also transversely to a direction of movement of said matrix print head and to the extension of said axis of said drive.

4,929,104

PRINTER SYSTEM FOR ENABLING USER TO SELECT VARIOUS FORMS-FEED MODES

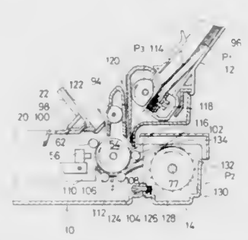
Takeshi Yokoi, Kagamigahara, and Shuhei Okamori, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 946,303, Dec. 24, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,712

Claims priority, application Japan, Dec. 25, 1985, 60-294505; Jan. 22, 1986, 61-11680

Int. Cl.[5] B41J *11/50*

U.S. Cl. 400—605 **8 Claims**



1. A method of selecting different form-feed modes in a printer including a printer main body, a cut form feed unit and a continuous form feed unit, for feeding cut forms and continuous forms, respectively,

said printer means main body having a print unit for conducting a printing operation in a printing position and form-driving unit for transporting a form to said printing position, said method comprising;

selecting said form-feed modes according to the presence of said cut form or said continuous form by a mode-selection switch;

comparing a selected present mode with its preceding mode to determine whether said present mode is the same as or different from said preceding mode;

examining by means of a sensor whether one of said form is in said form-driving unit, and emitting a detection signal when the sensor detects the presence of one of said forms in the form-driving unit;

issuing a form-feed starting signal to drive the form-driving unit in a forward or reverse direction;

driving the form in the forward or reverse direction based on the detection of the presence or absence of the form by said sensor, mode-selection by said mode-selection switch, and determination that the present mode is or is not the same as the preceding mode;

driving said form-driving unit in the forward direction when said sensor emits a detection signal indicating that said preceding mode is the cut form feed mode, whereby said form-driving unit is driven to discharge said remaining cut form from said form-driving unit; and

driving said form-driving unit in the reverse direction when said sensor emits a detecting signal indicating that said preceding mode is the continuous form feed mode and that said preceding mode is different from said present mode, whereby said form-driving unit is driven to discharge said remaining continuous form from the form-driving unit.

4,929,105

PAPER FEEDING APPARATUS FOR PRINTER

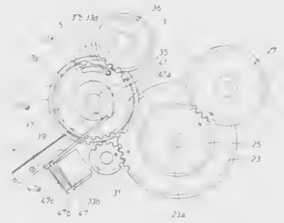
Takanobu Hirayama, Chita; Hiroyuki Funahashi, Nagoya; Eiji Yokota, Nagoya; Mitsuyoshi Uehara, Nagoya; Isao Kagami, Nagoya; Makoto Hasegawa, Kasugai, and Masaru Mizuno, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 112,218, Oct. 26, 1987, abandoned. This application May 15, 1989, Ser. No. 355,072

Claims priority, application Japan, Oct. 31, 1986, 61-261425; Sep. 17, 1987, 62-141910[U]

Int. Cl.[5] B41J *11/42, 13/10, 13/26*

U.S. Cl. 400—625 **6 Claims**



1. A paper feeder for a printing device having a motor for rotating a platen in normal and reverse direction, a paper feeding roller activated by said motor via an intermittent mechanism for feeding a sheet of paper toward said platen, said intermittent mechanism comprising:

a first intermittent gear rotatably supported on a shaft and having a first gear portion which engages with a drive gear connected to said motor and a toothless portion which does not engage therewith;

a second intermittent gear rotatably supported on the shaft and having a second gear portion which engages with a gear of said paper feeding roller and a toothless portion which does not engage therewith;

engagement means for making an engagement between said first gear portion of said first intermittent gear and said drive gear;

stop means for stopping said first intermittent gear such that said toothless portion thereof and said drive gear are opposed to each other; and

rotation means for integrally rotating said first and second intermittent gears when said first intermittent gear is rotated in normal direction, and for rotating at first only said first intermittent gear within a predetermined range and thereafter integrally rotating said first and second intermittent gears when said first intermittent gear is rotated in reverse direction.

4,929,106

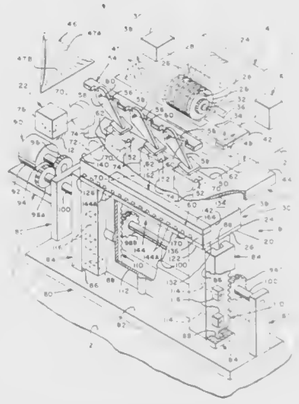
PLATEN MODULE

Danilo P. Buan, Easton; Jovito N. Abellana, Trumbull, and Donald T. Dolan, Ridgefield, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 12, 1988, Ser. No. 256,513

Int. Cl.[5] B41J *11/08*

U.S. Cl. 400—649 **25 Claims**



1. An article of manufacture comprising:

a. a molded piece-part including a substantially rectangularly-shaped plate portion having opposed surfaces, the piece-part including a pair of elongate parallel-spaced rack gear portions depending from one of the surfaces of the plate portion; and

b. a member made of a resilient material, the member having an inner surface facing the other of the surfaces of the plate portion and fixedly attached thereto, and the member including a plurality of intersecting channels extending thereinto from the inner surface thereof.

4,929,107

SWING-TYPE MECHANICAL PENCIL

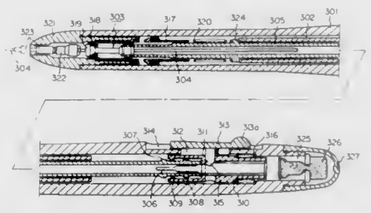
Shuhei Kageyama; Takahiko Suzuki, and Yuichi Yamagishi, all of Kawagoeshi, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Jun. 7, 1988, Ser. No. 203,784

Claims priority, application Japan, Jun. 12, 1987, 62-90663[U]; Jul. 31, 1987, 62-117960[U]; Oct. 14, 1987, 62-157740[U]; Mar. 18, 1988, 63-36964[U]

Int. Cl.[5] B43K *21/02, 21/06, 24/04*

U.S. Cl. 401—65 **6 Claims**



1. In a swing-type mechanical pencil having an outer sleeve (**201**) containing a lead feeder (**203**), a lead case (**205**) containing lead in said lead feeder (**203**), a knocking hammer (**202**) for knocking on said lead feeder (**203**) to extend lead (**204**) out of a head end (**221**) of said outer sleeve (**201**) by swinging said outer sleeve (**201**), the improvement comprising; a lead case bearing (**206**) engaging a rearward portion of said lead case (**205**); said lead case bearing (**206**) having a hole (**207**) through one side; an axial slit (**208**) in said outer sleeve (**201**) facing said hole (**207**) in said lead bearing case (**206**); a recess (**210**) in said outer sleeve (**201**) surrounding said axial slit (**208**); a slifer (**209**) slidably fitting said recess (**210**); said slider (**209**) having a projecting part (**211**) extending through said axial slit (**208**) into said hole (**207**) in said lead bearing case (**206**); said axial slit (**208**) having a narrowing neck portion (**212**) when said slider (**209**) is moved fully backward; said narrowing neck portion (**212**) locking said slider (**209**) against movement when said projecting part (**211**) is being retained; whereby lead may not be advanced out of the head end of said outer sleeve by the action of said knocking hammer when said slider is locked and may be manually extended out of head end of said slider by sliding said slider forward.

4,929,108

APPLICATOR VENTING ARRANGEMENT

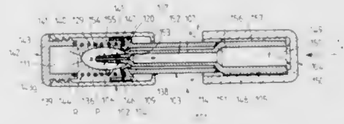
Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Jun. 19, 1989, Ser. No. 367,724

Claims priority, application France, Jun. 27, 1988, 88 08591

Int. Cl.[5] A45D *33/02, 40/00*

U.S. Cl. 401—126 **15 Claims**



1 An applicator set (**101, 201**) for a powdered or paste product, in particular a cosmetic product (P), including a container (**102, 202**) provided with a neck (**103, 203**) and intended to contain the product (P), a cap (**104, 204**) for closing the container (**102, 202**), and an applicator (**106, 206**) disposed at the end of a rod (**107, 207**) attached to the cap (**104, 204**), said container (**102, 202**) including means (C) for compacting the product (P) around the applicator (**106, 206**), means (C) on which the user can act to generate a compacting of the product, and elastic means (R) for returning said compacting means (C) to their position of repose when the user ceases acting upon it, characterized in that the applicator (**106, 206**) is made of a material permeable to air, and that the rod (**107, 207**) of the applicator (**106, 206**) includes at least one passage for evacuation of the air which is present in the container (**102, 202**) and which is compressed at the time of compacting, the air to be evacuated penetrating said rod (**107, 207**) after passing through the material permeable to the air of which the applicator (**106, 206**) is made, and escaping via said evacuation passage or passages to outside the cap (**104, 204**).

4,929,109

INK CARTRIDGE

Yasunori Ikenaga, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 29, 1989, Ser. No. 414,300

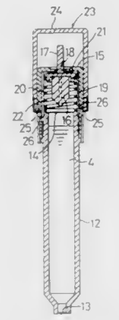
Claims priority, application Japan, Oct. 3, 1988, 63-129745[U]

Int. Cl.[5] B43K *23/02, 5/14, 7/02;* **G01D** *15/16*

U.S. Cl. 101—134 **3 Claims**

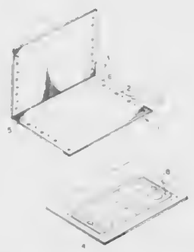
1. An ink cartridge comprising a cylindrically shaped cartridge body, both ends of which have openings that are sealed with sealing members to seal ink in said cartridge body, said sealing members being torn open to supply the ink to an ink tank in an ink jet printer through the lower opened end of said cartridge body inserted in said ink tank; a cylindrically shaped

holder cap having a closed end and fitted around the upper end of the cartridge body; a seal opener disposed facing said upper sealing member and connected to the lower end of an operating shaft inserted through a guide hole in the upper end of said holder cap; an elastic member urging said seal opener in an upward direction to separate it from said upper sealing member; and a seal packing provided on the upper end surface of



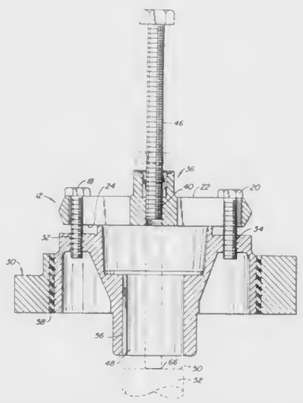
said seal opener and pressed onto the upper inner surface of said holder cap by the urging force of said elastic member to block an air inlet that is formed by a gap between said operating shaft and said guide hole, said operating shaft being pushed downward against the urging force of said elastic member to cause said upper sealing member to be torn open by said seal opener.

4,929,110
SPORTS BOARD
Larry Berg, 578 Sage Crescent, Sherwood Park, Alberta, Canada (T8A 0N1); Ricky A. Wright, 6009 Spruce Drive, Stettler, Alberta, Canada (T0C 2L0), and Philip A. Caswell, 11831 - 135 Street, Edmonton, Alberta, Canada (T5L 1W7)
Filed Dec. 29, 1988, Ser. No. 291,860
Int. Cl.[5] B42F *13/12, 13/14*
U.S. Cl. 402—73 **20 Claims**



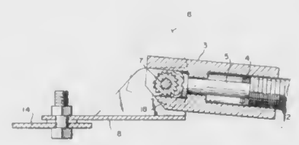
1. A record board comprising in combination:
a first surface adapted to be written upon which is of a substantially rectangular shape, having two longer parallel sides, and two shorter parallel sides;
a second writing surface adapted to be written upon which is of substantially the same shape and size as the first writing surface;
a flexible hinge means connecting the first and second writing surfaces together along adjacent sides thereof, the connected sides of the first and second surfaces being of the same length, wherein the hinge means provides sufficient movement for either the writing faces or the rear faces of the first and second surfaces to be placed together; and
at least one paper or other writing sheet adapted to be positioned on each or either writing surface and retained thereon by attachment means;
wherein the attachment means comprises in combination:
a line of regularly spaced holes proximate two parallel edges of each surface;
each line comprising alternately holes of a first and a second diameter, the second diameter being larger than the first diameter;
male peg means inserted into each first diameter hole to provide an upstanding portion of a diameter smaller than the second diameter, and adapted to retain the writing sheet or sheets by engagement into matching holes provided therein;
holes provided in the writing sheet or sheets corresponding to and contiguous with the second diameter holes, of substantially the same size as the second diameter holes;
and wherein the lines of holes are placed in each writing surface so that when the two writing surfaces are closed together the upstanding portions of the male pegs on one writing surface enter into the second diameter holes in the other surface releasably thus permitting the two writing surfaces to be closed together.

4,929,111
TOOL MANIPULATING HARMONIC BALANCER
Giuseppe Lauritano, 534 Laurel St., Redwood City, Calif. 94063
Filed Mar. 2, 1987, Ser. No. 22,321
Int. Cl.[5] B23P *19/04*
U.S. Cl. 403—16 **3 Claims**



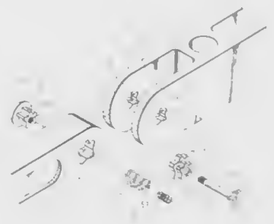
1. A tool for permitting a wrench to turn a harmonic balancer and crank shaft connected thereto, and for separating the harmonic balancer from the connected crank shaft, comprising:
a. a base, said base including an opening therethrough forming a cavity having an enclosing wall portion, said enclosing wall portion including a threaded surface and faceted surface, said faceted surface being capable of engaging a wrench for turning said base;
b. a threaded member capable of threadingly engaging and moving along said threaded surface of said cavity enclosing wall portion, said threaded member being capable of extending through said opening of said base into engagement with said crank shaft while engaging and moving along said threaded surface of said cavity enclosing wall portion;
c. means for fixing said base to the harmonic balancer such that said turning of said base turns the fixed harmonic balancer;
d. at least one closed slot through said base; said means for fixing said base to the harmonic balancer passing through said one closed slot.

4,929,112
TOOL HANDLE WITH PIVOTING HEAD
Robert Wilcox, P.O. Box 1401, Hanford, Calif. 93232-1401
Filed Sep. 30, 1985, Ser. No. 782,027
Int. Cl.[5] B25G *1/06, 3/38*
U.S. Cl. 403—93 **5 Claims**



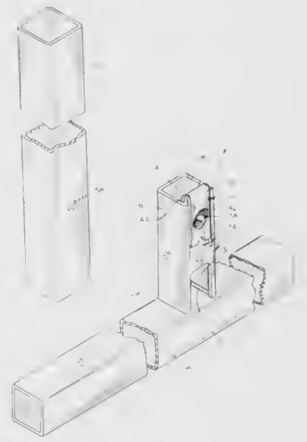
1. A tool holder having an attachment for interchangeable tools comprising:
A. a handle;
B. first angular control means, threadably attached to said handle, such that said first angular control means can be removed from said handle;
C. locking means disposed within said first angular control means and activated by said handle when said handle is attached thereto;
D. a wrist portion rotatably attached to, and angularly controlled by, said first angular control means such that said wrist portion can be positioned at a chosen operating angle and locked in place by said locking means;
E. an attachment plate rotatably fastened to said wrist portion;
F. second angular control means attached to said wrist portion such that said attachment plate can be rotated to a selected angle and locked into position.

4,929,113
KNUCKLE JOINT
Yin-Ping Sheu, No. 3, Fl. 11-7, Fu Hsing Erh Rd., Ling Ya District, Kaohsiung City, Taiwan
Filed May 30, 1989, Ser. No. 357,798
Int. Cl.[5] F16C *11/06*
U.S. Cl. 403—157 **4 Claims**



1. A knuckle joint in which a first piece with an eye enters a jaw between two corresponding projections of a second piece having a first and a second eye respectively formed therein, and is retained by a pin assembly, wherein said pin assembly comprises:
a pin having a first end with a button fixed thereat and a second end, said pin being passed through said eye of said first piece, said pin retractably protruding said button out from said first eye of said second piece and extending said second end to a position near said second eye of said second piece;
a stopper having a protrusion passed through said second eye of said second piece, extending into said eye of said first piece, and joined with said second end of said pin; and
a slide block which is passed through by said pin and extended into said eye of said first piece, retractably protruding into said first eye of said second piece;
whereby said knuckle joint can be pivotally rotated while said button is depressed to push said protrusion of said stopper out from said eye of said first piece and to push said slide block out from said first eye of said second piece.

4,929,114
TUBING CONNECTOR
Errol D. Young, 3505 Old Maple Rd., Omaha, Nebr. 68134
Filed Feb. 13, 1989, Ser. No. 309,215
Int. Cl.[5] F16B *7/00*
U.S. Cl. 403—172 **4 Claims**



1. In combination
a base tube having opposite ends and a first side;
an attachment tube for connection to said base tube, having first and second ends and a first side, said first side having an aperture therethrough adjacent the first end thereof;
connector means for removably connecting said first end of said attachment tube to said first side of said first base tube, comprising:
a hollow tubular support member having upper and lower ends, a forward wall, a rearward wall and opposing side walls affixed to said base tube first side and projecting therefrom;
threaded means on said forward wall for operably receiving a set screw means;
set screw means having a head end and an opposite second end, operably mounted in said threaded means and having a length slightly less than the distance between the forward and rearward walls of said tubular support member;
said attachment tube having dimensions so as to slidably receive said support member within said first end thereof;
said attachment tube aperture located so as to be aligned with said threaded means when said attachment tube is placed on said support member;

VOL
1114
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whereby rotation of said set screw means inwardly will cause said second end to contact the rearward wall of said support member and bias said forward and rearward walls of the support member apart into frictional contact with the walls of said attachment tube;

said threaded means comprising:

said forward walls of said support member having an aperture therethrough of a diameter greater than that of said set screw means, such that said set screw means will pass freely therethrough; and

clip means connected to said forward wall having a threaded aperture therethrough adapted to operably receive a set screw, said clip means mounted with said threaded aperture axial to said support member aperture;

said clip means including a bracket means bent to form a forward leg generally parallel to a rearward leg, said rearward leg having a threaded aperture therethrough adapted to operably receive said set screw, said forward leg having an aperture axial to said rearward leg aperture and having a diameter greater than said set screw such that said set screw will pass freely therethrough, said bracket means being connected to said support member forward wall with said forward and rearward legs on opposite sides thereof and with the apertures in said legs aligned with the aperture in said forward wall.

4,929,115

RESILIENT SHAFT COUPLING

Manfred Lunke; Ulrich Falz, both of Dortmund, and Jürgen Walter, Haltern, all of Fed. Rep. of Germany, assignors to Hackforth GmbH & Co., KG, Herne

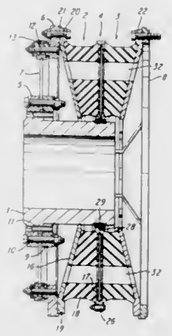
Filed Mar. 25, 1988, Ser. No. 173,287

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710390

The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.

Int. Cl.[5] F16D *3/56*

U.S. Cl. 403—228 2 Claims



1. A resilient shaft coupling for interconnecting a rigid coupling member on a driving side and a rigid coupling member on a driven side particularly for a diesel engine drive mechanism with which considerably greater thermal stressability especially with elastomeric bodies having larger dimensions must be provided to avoid unacceptably high heating therein, said coupling having an axial direction and having the improvement in combination therewith comprising:

at least one resilient annular assembly that provides said interconnection between said rigid coupling members and that includes two ring halves that are disposed in axially abutting relationship as mirror images of one another, with each of said ring halves being divided into segments that are successively arranged in a circumferential direction, with each of said segments having a location of radial end faces thereof and comprising, when viewed in the axial direction of said coupling, an outer segment plate, an inner segment plate, and therebetween an elastomeric body that is vulcanized to said inner and outer segment plates, with said elastomeric body having a trapezoidal cross-sectional shape and including an entire axial width thereof which increases in a radially outer direction; the segments of one of said ring halves are offset relative to the segments of the other of said ring halves by one half of a segment division, with said inner segment plates of abutting ring half segments being clamped together; said elastomeric body of each of said segments is provided with at least one window, with each such window extending in a circumferential direction, as well as over the entire axial width of said elastomeric body, and having two end walls and therebetween two essentially concentric curved walls, with said end walls of said window terminating in the location of radial end faces of said segment; each of said inner and outer segment plates of each of said segments is provided with at least one opening, which is congruent with said at least one window of said elastomeric body of that segment, said window and said opening collectively forming an axial passage through which cooling air flows to alleviate problems of greater thermal stressability.

4,929,116

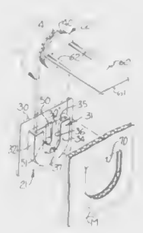
COUPLER ASSEMBLY FOR CONNECTING CORRUGATED SHEET MATERIAL

Robert R. Mahl, Cincinnati, Ohio, assignor to Chesapeake Display and Packaging Company, Winston-Salem, N.C.

Filed Mar. 31, 1988, Ser. No. 175,950

Int. Cl.[5] F16B *9/02*

U.S. Cl. 403—263 6 Claims



1. A coupler assembly adapted for interconnecting pieces of corrugated sheet material or the like to form point of purchase advertising displays, and characterized by the ability to permit the pieces to be interconnected in a selected rotational orientation, said coupler assembly comprising

a female connecting member including a generally planar back wall, and a receiving portion mounted on one side of said back wall and comprising a generally U-shaped side wall extending outwardly from said back wall, and a front wall joined to said U-shaped side wall so as to be parallel to said front wall and said back wall which is bounded by said side wall and open at the top, said back wall including a back wall portion positioned so as to define the rear surface of said pocket, an opening positioned in said back wall portion within the area bounded by said receiving pocket, and a slot in said front wall which extends from said top of said pocket to a slot terminus at a medial location on said front wall, and

a male connecting member comprising a pair of front and rear flanges, and a hub defining a central axis and extending between and interconnecting said flanges in an axially spaced apart and parallel relationship which is transverse to said central axis, with the axial separation being at least about the thickness of said front wall, and with said rear flange being dimensioned to rotatably fit within said pocket and with said hub dimensioned to rotatably fit within said slot, an extension on the side of said rear flange opposite said front flange and aligned along said central axis and sized and positioned so that said extension is received into said opening positioned on said back wall portion when said members are in an assembled position, and a flat planar tab joined to the side of said front flange opposite said hub and extending parallel to said central axis,

whereby said male connecting member can be releasably coupled to said female connecting member with said male connecting member in substantially any rotational orientation about said central axis by sliding said rear flange laterally into said pocket to an assembled position wherein said rear flange is substantially completely received in said pocket, said front flange overlies the side of said front wall opposite said pocket, and said hub is received in said slot adjacent said slot terminus.

4,929,117

MECHANISM FOR DETACHEABLY FITTING A MALE FIXING MEMBER AND A FEMALE ENGAGING MEMBER

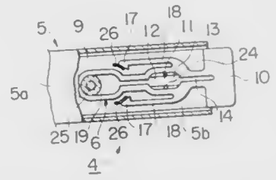
Seijichi Yamanoi, Ina, Japan, assignor to Yamanoi Seiki Co., Ltd., Ibaraki, Japan

Filed Apr. 28, 1989, Ser. No. 344,349

Claims priority, application Japan, Dec. 26, 1988, 62-168515

Int. Cl.[5] F16B *21/00*

U.S. Cl. 403—328 6 Claims



1. A mechanism for detachably fitting a male fixing member and a female engaging member, comprising:

a male fixing member having a recessed neck and a head formed adjacent therewith at a top end of said fixing member;

a female engaging member which is detachably fit to said fixing member,

said engaging member having a hollow casing and an engaging body slidably inserted inside said casing so as to reciprocate along a longitudinal centerline of said engaging member,

said casing having a top plate and a base plate having an operation opening formed at one end thereof for inserting said engaging body, at least one of said top plate and said base plate having an insertion aperture for inserting the head of said fixing member and an engaging protrusion for engaging said engaging body to a predetermined position, and

said engaging body having a frame main body with a top end portion extended in the longitudinal direction and having, perforated therein, an engaging hole including an insertion portion for receiving the head of said fixing member and a sliding portion for engaging the neck of said fixing member that are continuous to each other in a longitudinal direction, at least one engaging arm integrally formed to the frame main body adjacent said engaging hole and resiliently extended outwardly therefrom, and a resilient member for resiliently urging the engaging body to the operation opening 8 of said casing,

said insertion portion of the engaging hole having a bulged portion formed with tapered surfaces, for abutment against the top end of the head of said fixing member, so that the engaging hole and the engaging arm are expanded and deformed laterally when the head of said fixing member and said tapered surfaces, are brought into press-contact, and

said insertion portion of the engaging hole being aligned with the insertion aperture of said casing when the engaging arm of said engaging body resiliently urged by the resilient member is snap-fit with the engaging protrusion of said casing.

4,929,118

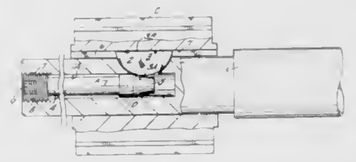
SHAFT MOUNTED LOCKING MEANS

Ronald L. Anderson, 3641 Agate St., Eugene, Oreg. 97405

Filed Sep. 26, 1988, Ser. No. 248,640

Int. Cl.[5] F16B *3/00*

U.S. Cl. 403—356 7 Claims



1. Locking means for securing a shaft carried article in place, said locking means comprising,

a shaft segment having a radial key opening in communication with a shaft bore therein said shaft segment having a single key located

in said opening and having an inner surface disposed in said bore and an outer edge located outwardly of said shaft, and

an integral elongated lock axially positionable in said bore including a head portion of a size to occupy a segment of the shaft bore, a lock end engageable with the inner surface of said key to urge same outward of the shaft segment and into engagement with the shaft carried article, said head portion having a diameter substantially equal to the shaft bore diameter so as to be supported by the shaft segment against undue lateral displacement during locking engagement with the key.

4,929,119

SYSTEM FOR DISENGAGEABLY COUPLING A ROTOR BODY TO THE SHAFT OF ROTARY MACHINES, IN PARTICULAR GAS TURBINES AND ROTARY DOBBIES

Constantino Vinciguerra, and Massimo Coppini, both of Florence, Italy, assignors to Nuovopignone-Industrie Meccaniche e Fonderia, S.p.A., Italy

Filed Jul. 5, 1989, Ser. No. 375,462

Claims priority, application Italy, Jul. 15, 1988, 21381 A/88

Int. Cl.[5] B25G *3/28*

U.S. Cl. 403—359 6 Claims

1. An improved system for disengageably coupling two members, comprising:

a shaft having an end portion, at least said end portion of said shaft being hollow so as to form a cavity, said end portion having a cylindrical outer coupling surface of a certain length, said cavity being frustro-conical in shape with a frusto-conical cavity wall and a wider end and a narrower end, said wider end lying nearer said end of said shaft than said narrower end;

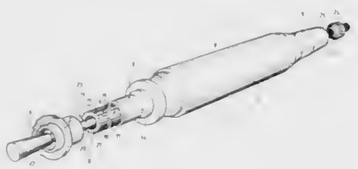
a rotor body having a relatively smooth cylindrical inner coupling surface of a length that is about the same as that

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of said cylindrical outer coupling surface, said inner and outer coupling surfaces being of approximately the same diameter and dimensioned so that said rotor body and said end portion of said shaft slidably engage one another, allowing said rotor body to be slid onto said end portion;

a frustro-conical plug having a wider end and a narrower end, said plug being slidably disposed within said cavity with said wider end lying nearer said end of said shaft than said narrower end, said plug having a frustro-conical outer surface matching that of said cavity wall so that when said plug is inwardly slid into said cavity said frustro-conical surface of said plug engages said frustro-conical cavity wall; and,

means for controllably urging said plug inward into said cavity;



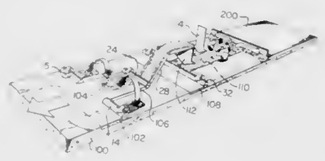
said cylindrical outer coupling surface having a plurality of sharp-edged grooves of relatively small depth extending along approximately said length of said cylindrical outer coupling surface, said grooves being distributed approximately symmetrically about said cylindrical outer coupling surface, said grooves being dimensioned so that when said means for controllably urging presses said plug into said cavity said end portion is elastically deformed so as to be displaced outward, causing said end portion to radially interfere with said rotor body, whereby said cylindrical outer coupling surface disposed between said grooves presses outward against and engages said cylindrical inner coupling surface, elastically compressing said rotor so that those portions of said cylindrical inner coupling surface disposed adjacent to said grooves extend at least partially inward into said grooves to form a plurality of projections which cooperate with said grooves to prevent relative motion between said shaft and said rotor body.

4,929,120

TWO STAGE PROCESS FOR REJUVENATING ASPHALT-PAVED ROAD SURFACES

Patrick C. Wiley, Williams Lake, and Allen H. Rorison, Kamloops, both of Canada, assignors to 373249 B.C. Ltd., Vancouver, Canada

Filed Apr. 19, 1988, Ser. No. 183,682
Claims priority, application Canada, Feb. 26, 1988, 559989
Int. Cl.[5] E01C *23/14*
U.S. Cl. 404—77 **8 Claims**



1. A method of rejuvenating an asphalt-paved road surface, comprising:

(a) heating an exposed upper layer of said asphalt to a selected temperature and to a depth of approximately one inch;

(b) grinding first and second approximately one inch deep outer strips of said heated upper layer from said road surface;

(c) windrowing asphalt ground from said first and second upper layer outer strips onto a central strip of said heated upper layer to expose first and second lower layer outer strips of said asphalt;

(d) grinding said upper layer central strip from said road surface to a depth of approximately one inch;

(e) removing said windrowed asphalt and said ground upper layer central strip asphalt from said road surface to expose a lower layer central strip of said asphalt;

(f) heating said lower layer to a selected temperature and to a depth of approximately one inch;

(g) rupturing said heated lower layer to a depth of approximately one inch;

(h) replacing said removed asphalt on top of said ruptured lower layer; and then,

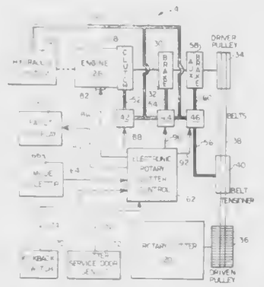
(i) applying pressure to force said removed/ruptured asphalt against said road surface.

4,929,121

CONTROL SYSTEM FOR A ROAD PLANER

Kevin C. Lent, Maple Grove; Conwell K. Rife, Jr., Champlin, both of Minn.; Gerald P. Simmons, Morton, and Albert J. Speck, Springfield, both of Ill., assignors to Caterpillar Paving Products Inc., Minneapolis, Minn.

Filed Sep. 5, 1989, Ser. No. 403,270
Int. Cl.[5] E01C *23/12*
U.S. Cl. 404—84 **14 Claims**



1. A control system for a road planer having a cutter rotatably mounted on said road planer, an engine operatively connected to the rotatable cutter, and at least one panel covering an access opening in said road planer, said control system comprising:

a clutch operatively connected to said engine and having an output shaft extending therefrom;

clutch control means for selectively engaging and disengaging said clutch;

a brake operatively connected to the output shaft;

brake control means for selectively applying and releasing said brake;

a first pulley operatively connected to said output shaft;

a second pulley connected to said rotatably mounted cutter;

an endless belt extending between said pulleys;

means for tensioning said belt and urging said belt into driving contact with said first and second pulleys;

belt tensioning control means for selectively engaging and releasing said belt tensioning means;

means for selecting one of a plurality of predetermined cutter operating modes and developing and delivering a first output signal corresponding to said selected operating mode; and,

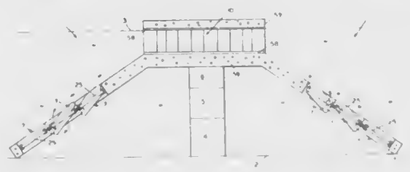
means for controlling preselected ones of said belt tensioning control means, brake control means and clutch control means in a preselected sequential order in response to receiving said first output signal.

4,929,122

FISH PROTECTION SYSTEM FOR DAMS

Harold E. Yoas, 1110 W. Antber Ave., Redmond, Oreg. 97756

Continuation of Ser. No. 13,899, Feb. 11, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 316,597
Int. Cl.[5] E02B *8/08*
U.S. Cl. 405—81 **16 Claims**



1. A fish protection system for dams comprising:

(a) at least one modular unit where said modular unit comprises:

(i) frame means;

(ii) means for attaching said modular unit to a stream bed which comprises:

at least one casing of said modular unit fixably attached to a stream bed; an outer box of said modular unit positioned around the outside of said casing and resting on said stream bed; and an inner box of said modular unit positioned inside of said outer box and around the outside of said casing where concrete fixably attaches said inner box and said outer box to said casing;

(iii) means for attaching said frame means to the means for attaching the modular unit to the stream bed;

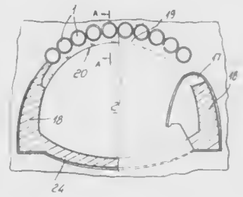
(iv) a stationary screen and moving cleaning mechanism which is slideably positionable within said frame means for diverting fish away from turbines in a dam.

4,929,123

METHOD FOR BUILDING LARGE SPAN TUNNELS BY MEANS OF A CELLULAR ARCH

Pietro Lunardi, Piazza San Marco, 1, 20121 Milano, Italy

Filed Mar. 9, 1989, Ser. No. 320,969
Claims priority, application Italy, Mar. 16, 1988, 19807 A/88
Int. Cl.[5] E21D *9/04*
U.S. Cl. 405—150 **2 Claims**



1. A method for making large span tunnels through a ground formation, comprising the steps of excavating two channels at pier members of a top vault to be made, driving into said ground formation a plurality of adjoining tubes in parallel with a longitudinal axis of a tunnel to be made, said adjoining tubes being driven from a well formed transversely of said tunnel, further excavating said two channels at bottom portions thereof and casting therein said pier members, excavating bearing arch members and casting concrete around said tubes to interconnect said tubes, excavating a tunnel neck portion and a reverse arch and casting said reverse arch.

4,929,124

METHOD AND APPARATUS FOR CONSTRUCTING AND MOVING LONG PIPELINES

George S. Lockwood, Carmel Valley, Calif., assignor to Ocean Farms of Hawaii Limited Partnership, Hi.

Filed Jul. 28, 1988, Ser. No. 225,248
Int. Cl.[5] F16L *1/04*
U.S. Cl. 405—165 **28 Claims**



1. An apparatus for assembling a long pipe on land and rapidly launching the pipe into a body of water in a single, substantially continuous operation comprising:

a plurality of bearing means having bases capable of mounting on unprepared ground surface, arranged in spaced relation from a launch point to an end point located inland the approximate length of the completed pipe; and,

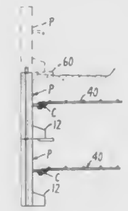
at least one traction means for concentric frictional engagement of the pipe to provide selectably continuous longitudinal force axially along the pipe, the traction means aligned with the bearing means and coaxially located between the end point and the launch point to receive the pipe through the traction means for moving the pipe along the bearing means.

4,929,125

REINFORCED SOIL RETAINING WALL AND CONNECTOR THEREFOR

William K. Hilfiker, P.O. Drawer L, Eureka, Calif. 95501

Filed Mar. 8, 1989, Ser. No. 320,630
Int. Cl.[5] E02D *29/02*
U.S. Cl. 405—262 **9 Claims**



8. An improved precast concrete face panel for reinforced soil embankments, said panel comprising:

(a) a vertically extensive planar body section with steel reinforcing rods embedded therein, said section having top and bottom edges so formed that the top edge of one

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of said sections is mutually engagable with the bottom edge of a like panel stacked thereabove;

(b) a cantilever section fixed to and extending longitudinally of and laterally from one side of the body section adjacent the bottom edge thereof for extension into a soil embankment being reinforced;

(c) a soil reinforcing polymer geogrid having;

(1) closed sided slots formed therein;

(2) a folded over end embedded in the planar body section to extend certain of the slots around reinforcing rods embedded within the face section; and,

(3) an extended end extending from the folded over end and the side of the planar body section from which the cantilever section extends at a level intermediate the top and bottom edges of the body section;

(d) a retaining rod embedded within the body section and extending through the folded over end of the geogrid to one side of the reinforcing rods about which the slots within the geogrid extend to secure the geogrid against separation from said reinforcing rods.

4,929,126

METHOD FOR INSTALLING A SCREEN OF FLEXIBLE MATERIAL IN THE SOIL

Bastiaan G. Steenbergen, Essen, Belgium; Arie A. Hofman, Renkum, and Willem De Waard, Oud-Beijerland, both of Netherlands, assignors to Digging Trading Company N.V., Klaaswaal, Netherlands

Filed Jan. 15, 1988, Ser. No. 144,087

Claims priority, application Netherlands, Jan. 21, 1987, 8700147

Int. Cl.[5] E02D *5/18*

U.S. Cl. 405—267 11 Claims



1. In a ground barrier including a vertical longitudinally elongate trench and a barrier screen positioned vertically within and longitudinally along said trench, said trench including an open top and a bottom, said screen including a top edge generally at the open top of said trench, and a bottom edge generally adjacent the bottom of said trench; the improvement wherein said screen comprises an elongate inflatable sleeve formed longitudinally along at least said top edge of said screen, and inflatable to transversely span said trench and define a substantially continuous support for said screen within said trench.

4,929,127

DRILL BIT FOR PRODUCING DRILLED HOLES WITH AN UNDERCUT

Artur Fischer, Waldachtal, Fed. Rep. of Germany, assignor to Fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal/-Tumlingen, Fed. Rep. of Germany

Filed Jun. 22, 1989, Ser. No. 369,728

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3821056

Int. Cl.[5] B23B *41/00*

U.S. Cl. 408—81 8 Claims

1. A drill bit for producing drilled holes with an undercut and comprising a drill bit shank having an end; at least one drill bit tip which is mounted at said end, projects laterally beyond said drill bit shank, and has a maximum width; a rounded collar having a diameter spaced from the drill bit tip, and integrally formed on the drill bit shank; and a longitudinally displaceable guide sleeve mounted between the drill bit tip and the collar and having an internal diameter which is smaller than the



diameter of the collar and smaller than the maximum width of the drill bit tip; the drill bit tip having lateral cutting edges, the drill bit shank having a flared enlargement in a region of the lateral cutting edges of the drill bit tip, and the guide sleeve having a continuous longitudinal slot.

4,929,128

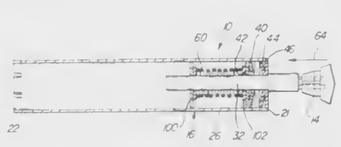
MASONRY DRILL ASSEMBLY

Robert J. Affleck, Box 745, Harrow, Ontario, Canada (N0R 1G0)

Filed Jun. 23, 1989, Ser. No. 370,826

Int. Cl.[5] B23B *41/02*

U.S. Cl. 408—139 7 Claims



1. A device for use with a drill motor having a chuck for drilling holes in masonry materials comprising:

a tube,

at least one masonry cutting element attached to one end of said tube,

a rod, said rod being adapted to be received in the chuck of the drill motor and rotatably driven about its axis by the drill motor,

means for coaxially attaching said rod to said tube so that said rod extends coaxially outwardly from the other end of said tube,

said attaching means comprising a clutch assembly having an engaged operating position and a released operating position, wherein in said engaged position said rod and said tube rotate in unison with each other while in said released position, said clutch assembly permits relative rotational movement between said rod and said tube.

4,929,129

KEY CUTTING APPARATUS

Russell A. Dickson, 5847 Venisota Rd., Venice, Fla. 34293

Filed Oct. 11, 1988, Ser. No. 255,453

Int. Cl.[5] B23C *3/35*

U.S. Cl. 409—81 19 Claims

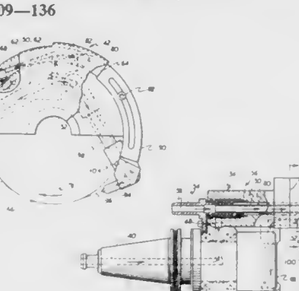
1. A key cutting apparatus for cutting a blank key substantially from the cut dimensions of a pattern key comprising:

a frame portion having two sides, a back and a front;

a first movable portion mounted on said frame portion having a depth plate and a space plate removably mounted thereon, said first movable portion being movable side to side;

a second movable portion mounted on said first movable portion, said movable portion providing forward and backward motions for depth control;

means for cutting said blank key mounted on said frame portion;



a telescoping stylus portion capable of following along by telescoping action the serrations of said pattern key; and

means for transmitting said telescoping action of said stylus portion to said depth plate and for adjusting said depth plate.

4,929,130

GRINDING WHEEL GUARD APPARATUS

Richard A. Diebolt, Wethersfield; Stephen Kidd, East Hampton, and Donald E. Rivers, Jr., Tolland, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 28, 1989, Ser. No. 372,725

Int. Cl.[5] B23Q *11/10*

U.S. Cl. 409—136 17 Claims

1. A grinding wheel apparatus comprising:

a machining center including a drive spindle for receiving a tool holder, and having a flow hole through the centerline thereof;

a primary pump for circulating primary coolant;

a secondary pump for circulating a secondary coolant;

a static flow connector located adjacent to said spindle;

a primary coolant flowpath from said pump to said hole through the centerline of said spindle;

a secondary coolant path from said secondary pump to said static flow connector;

a tool holder including a static holder portion and a rotary portion;

said rotary portion securable in said drive spindle and rotatably mounted in said static holder portion, and suitable for mounting an arbor supported superabrasive grinding wheel therein;

a holder primary flowpath entering said rotary portion through the centerline thereof, and in fluid communication with said primary coolant path, and exiting through said static holder portion;

a holder secondary flowpath entering and exiting said static holder portion;

a guard assembly, secured to said static tool holder portion including an arcuate frame surrounding an imaginary circle representing a potential grinding wheel;

a primary guard flowpath through said arcuate frame in fluid communication with one of said holder flowpaths;

said arcuate frame also including a secondary guard flowpath through said frame in fluid communication with the other of said holder flowpaths;

a cooling nozzle located at one arcuate end of said frame and arranged to discharge coolant tangential to said imaginary circle;

said primary guard path in fluid communication with said cooling nozzle;

at least one cleaning nozzle oriented substantially 30 degrees from the radial direction of said imaginary circle; and

said secondary guard flowpath arranged to discharge coolant through said cleaning nozzles.

4,929,131

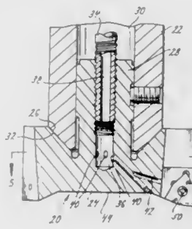
METHOD AND APPARATUS FOR A LINEAL MACHINE TOOL

James D. Allemann, Eureka, Mo., assignor to Westhoff Toll and Die Company, St. Louis, Mo.

Filed Mar. 24, 1989, Ser. No. 328,431

Int. Cl.[5] B23C *5/26*

U.S. Cl. 409—234 13 Claims



1. In a milling machine for lineal machining of metal from a workpiece, the milling machine having means to mount a cutting tool and advance it axially into the workpiece to thereby remove material therefrom, said tool mounting means including a spindle characterized by an outer, tapered annular surface and an axial cavity, the improvement comprising a cutting tool having an axial shank and an inner, tapered annular surface, and wherein said tool mounting means includes means to urge said axial shank into said axial cavity and said tapered surfaces into contact to thereby provide a bearing surface for supporting said tool as the machine is operated.

4,929,132

ARTICULATED PLATFORM CAR FOR THREE OR FOUR TRAILERS

Richard P. Yeates; Bruce E. Keating, both of Aurora, Ill., and William R. Halliar, Whiting, Ind., assignors to Trailer Train Company, Chicago, Ill.

Filed Jan. 9, 1989, Ser. No. 294,363

Int. Cl.[5] B61D *3/18, 47/00*

U.S. Cl. 410—56 16 Claims



1. A railroad flat car for transporting trailers having at least

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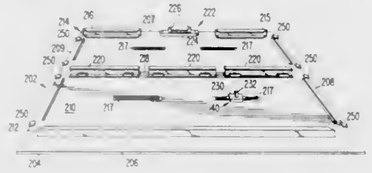
one tandem, comprising first and second units each having a frame mounted at either end on pairs of trucks, the units being connected by a drawbar, one of the units having a span hitch mounted thereon and positioned such that a trailer is attachable to the span hitch with the trailer spanning the drawbar and the tandem supported on the other unit, and said other unit having a floor mounted on its frame, the floor having a first portion of a width which is not large enough to fully support the tandem of a trailer whose longitudinal axis is angled from about 10 degrees to about 15 degrees from the longitudinal axis of said other unit, and a second portion, wider than the first portion, and having a width sufficient to fully support the tandem of the spanning trailer when the longitudinal axis of said tandem is angled from about 10 degrees to about 15 degrees from the longitudinal axis of said other unit.

4,929,133

LOADING PALLET FOR AIRCRAFT CARGO CONTAINERS

Albert D. Wiseman, Wilmington, Ohio, assignor to Airborne Express, Inc., Wilmington, Ohio

Filed Apr. 14, 1989, Ser. No. 338,039
Int. Cl.[5] B64C *1/20*; B60P *3/06*
U.S. Cl. 410—52 **21 Claims**



11. A pallet for loading cargo containers into a fuselage of an aircraft comprising

a generally planar rectangular base dimensioned to fit within the fuselage of an aircraft, said fuselage having a longitudinal axis and sidewalls, and said base having a pair of lateral edges positioned adjacent to said sidewalls and oriented generally parallel to said longitudinal axis and a pair of transverse edges oriented generally at right angles to said longitudinal axis and a centerline located substantially midway between said lateral edges and oriented generally parallel to said longitudinal axis;

a first lateral guide rail mounted on said pallet base adjacent to a first lateral edge of said pallet base and extending along substantially the entire extent of said first lateral edge;

a second lateral guide rail mounted on said pallet base at the second of said lateral edges and extending parallel to said lateral edge, said second lateral guide rail comprising two collinear rails having their adjacent ends spaced apart, said adjacent ends thereby defining an transfer space wide enough to permit the passage therethrough of a cargo container;

each of said guide rails comprising a lateral rail base for supporting said rail on said pallet base, a generally vertical lateral rail web, supported on said lateral rail base, extending upward from said lateral rail base and terminating in an upper extremity, and a generally horizontal flange projecting from said upper extremity of said vertical lateral rail web toward said centerline;

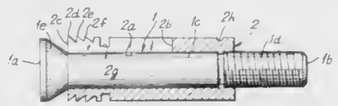
central anchor means located on said centerline for removably attaching to said pallet base a central guide rail, said central guide rail extending generally along said centerline; and retractable side lock means located generally within said transfer space.

4,929,134

EXPANSION DOWEL ASSEMBLY

Arndt Bergner, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Sep. 22, 1988, Ser. No. 247,956
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731819
Int. Cl.[5] F16B *13/04, 13/06*
U.S. Cl. 411—30 **3 Claims**



1 Expansion dowel assembly comprising an axially elongated anchor bolt having a leading end and a trailing end spaced apart in the axial direction, an expanding member located at the leading end of said anchor bolt and having an axially extending conically shaped surface converging toward the trailing end, an axially elongated shank extending from said expanding member toward the trailing end, means on said shank adjacent the trailing end for attaching a load on said anchor bolt, an axially elongated expansion sleeve laterally enclosing said anchor bolt and being axially displaceable relative to said anchor bolt, said expansion sleeve having a leading end closer to the leading end of said anchor bolt and a trailing end closer to the trailing end of said anchor bolt with slots in said expansion sleeve extending from the leading end toward the trailing end, said expansion sleeve having an inside diameter corresponding to and being displaceable relative to the outside diameter of said shank, said expansion sleeve having an axially extending outer surface with a circumferentially extending first cutting tooth thereon at the leading end thereof, wherein the improvement comprises two additional cutting teeth are formed on the outer surface of said expansion sleeve adjoining said first cutting tooth, and said cutting teeth forming a sawtooth-shaped section facing outwardly from the outer surface of said expansion sleeve, said expansion sleeve has a cross-sectional reduction spaced from and located closely adjacent to said cutting teeth and formed on the opposite side thereof from the leading end of said sleeve, said cross-sectional reduction is formed by a circumferentially extending annular groove located in the outer surface of said expansion sleeve, within the axial extent of the slots.

4,929,135

DEVICE FOR TEMPORARILY COUPLING-UNCOUPLING TWO MEMBERS, AND FOR SUBSEQUENT SEPARATION THEREOF

Jean-Jacques Delarue, Paris Cedex; Michel Patin, Les Mureaux, and Jean-Claude Slama, Plaisir, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Oct. 5, 1989, Ser. No. 417,760
Claims priority, application France, Oct. 5, 1988, 88 13028
Int. Cl.[5] F16B *19/00*; F42B *15/10*
U.S. Cl. 411—354 **12 Claims**

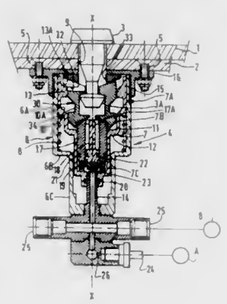
1. Device for temporarily coupling together and subsequently separating a first member and a second member, comprising:

a male member joined to the first member;

a female member joined to the second member and comprising an axially elongate hollow body in which are disposed a retaining sleeve adapted to retract radially onto the male member or to expand, a piston sliding axially to retract-/expand the retaining sleeve and, in the piston, disposed along the axis, an ejector finger joined to the piston by a readily broken member, and

selective control means for the piston adapted to command

movement of the piston and optionally simultaneous breaking of the readily broken member and to cause the



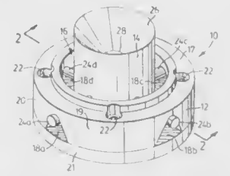
ejector finger to slide axially, the finger projecting axially relative to the piston.

4,929,136

FLOATING MATABLE ELEMENT

Francis H. A. Mee, Aurora, Canada, assignor to Spar Aerospace Limited, Mississauga, Canada

Filed Mar. 17, 1989, Ser. No. 324,818
Int. Cl.[5] F16B *37/08*; B25B *13/00*; B25G *1/00*
U.S. Cl. 411—432 **23 Claims**



1. A compliant engageable apparatus comprising:

(a) a housing having an opening in its top surface opening and at least two receptors in its side;

(b) a floating member received by said housing having a projecting end projecting through said top surface opening and having wings such that a wing is received by each of said .eceptors, said projecting end having a tapered guide surface, said tapered guide surface tapering to engaging means, and

(c) urging means to urge said floating member to a floating position at which said wings abut the surface of said receptors which is proximate the top surface of said housing whereby said floating member has a preset aligment within said housing.

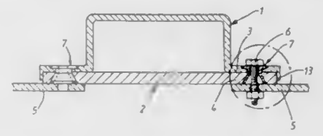
4,929,137

SAFETY ARRANGEMENT FOR PROVING THE UNAUTHORIZED OPENING OF A HOUSING

Alban Bossenmaier, Stuttgart, Fed. Rep. of Germany, assignor to Dasmler-Benz AG, Fed. Rep. of Germany

Filed Nov. 18, 1987, Ser. No. 122,364
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639870
Int. Cl.[5] F16B *19/04*
U.S. Cl. 411—501 **14 Claims**

1. A safety rivet arrangement for indicating an unauthorized opening of housing parts including a housing in which wall parts of the housing enclose a space and are connected at a formed by flanges on each of said wall parts, one of said wall parts having an apron integral therewith extending over the separating joint and engaging the flange of the other of said wall parts, the wall parts enclosing the space being riveted together by at least one safety rivet which can be removed only destructively and which is made of a harder material than the material of at least one of the connected wall parts, the



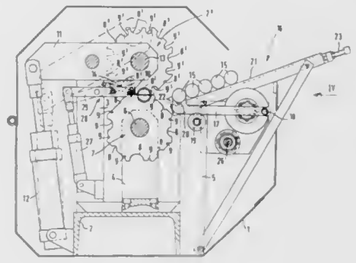
safety rivet consisting of steel, wherein a construction of at least one of the housing wall parts is of an aluminum or plastic material and the rivet having ends, one of which ends is peened-over in such a manner that the rivet is readily rotatable without any play.

4,929,138

DEVICE FOR FEEDING RODLIKE WORKPIECES

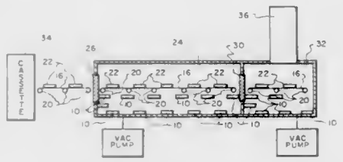
Kurt Breuning, Sindelfinger Strasse 9,, 7031 Steinenbronn, Fed. Rep. of Germany

Continuation of Ser. No. 170,041, Mar. 11, 1988, abandoned, which is a continuation of Ser. No. 893,687, Aug. 6, 1986, abandoned. This application Aug. 15, 1989, Ser. No. 394,071
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528743
Int. Cl.[5] B23Q *5/22*
U.S. Cl. 414—16 **32 Claims**



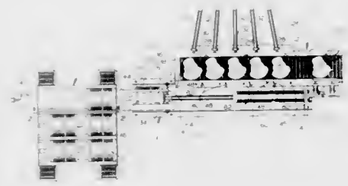
1. A device for feeding rodlike workpieces to a machine tool with at least one rod guide pipe for a rodlike workpiece to be processed, fed from a magazine into the rod guide pipe, characterized by the rod guide pipe being formed by two guide elements which can be lifted off each other for inserting the rodlike workpiece, and that the magazine is mounted adjacent the guide elements, said guide elements being respectively rotatably mounted about spaced axes and each having several separate recess means for respective support of rodlike workpieces of varying diameters, and means for controlling the rotational position of the guide elements to align like size recess means of respective guide elements to form said pipe, in each rotational position of the guide elements for which workpiece feeding occurs.

4,929,139
PASSIVE ELECTROSTATIC VACUUM PARTICLE COLLECTOR
John W. Vorreiter, Sunnyvale, and Robert L. Dean, Castro Valley, both of Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Jul. 26, 1989, Ser. No. 385,042
Int. Cl.[5] B65H *1/00*
U.S. Cl. 414—217 11 Claims



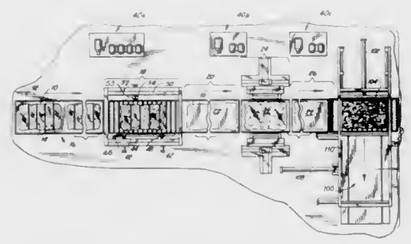
1. In a particle beam lithography system having means for transporting processed and unprocessed wafers in vacuum chambers, a methol comprising the steps of:
mounting passive particulate collectors on a bracket plate means, and placing a plurality of such plates at strategic locations in said vacuum chambers.

4,929,140
RACK LOADER
John B. Baker, 306A Maple St., Litchfield, Conn. 06759
Filed Feb. 17, 1989, Ser. No. 311,829
Int. Cl.[5] B65G *1/10*
U.S. Cl. 414—267 13 Claims



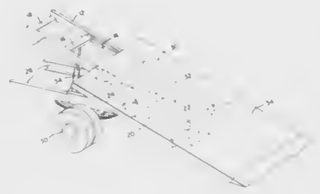
1. A loader for loading containers standing contiguously in a line on a generally horizontal conveyor onto a rack having a plurality of spaced superposed horizontal shelves, the loader comprising a transfer table spaced from the conveyor and having a first position generally coplanar with the conveyor, the table having vertical support means thereon having spacing corresponding to the spacing of the shelves of the rack, guide means disposed intermediate the conveyor and the table and adapted to guide the containers in diverging paths from the conveyor into the spaces on the table between the vertical support means respectively, means for moving the containers laterally from the conveyor along the guide means and into the spaces, table pivot means at one end of the table having a horizontal axis generally perpendicular to the conveyor and means for moving the table upward about the pivot means to assume a second position wherein the table is vertical and the vertical support means now horizontal, are aligned with the shelves of the rack.

4,929,141
BALE-OPENING METHOD AND APPARATUS
Charles R. Keesey, Sanderson, and Ted C. Flood, Jacksonville, both of Fla., assignors to International Baler Corp., Jacksonville, Fla.
Filed Feb. 21, 1989, Ser. No. 312,276
Int. Cl.[5] B65B *69/00*; B65G *65/02*
U.S. Cl. 414—412 8 Claims



1. A method for removing packaging from a cotton or similar bale when the bale is covered by such packaging in the form of sheet-like wrappings bound by a plurality of straps, comprising the steps of:
delivering the bale to a first station;
fixing the bale in position at said first station;
driving a cutter mechanism along the length of the bale, whereby the bale straps are cut;
releasing the bale and passing the bale to a second station;
removing the strapping and a portion of the sheet-like wrappings from the bale;
passing the bale to a third station;
rotating the bale 180° about a transverse axis;
passing the bale to a fourth station;
removing the remaining sheet-like wrappings from the bale; and
passing the bale to a fifth station, whereby the bale is made available for further processing of the cotton contained therein.

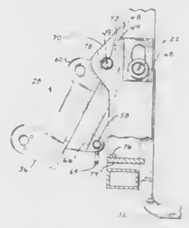
4,929,142
VEHICLE CARRIER WITH WHEEL LIFT
Ronald R. Nespor, Sharpsville, Pa., assignor to Chevron, Inc., Mercer, Pa.
Filed Jun. 9, 1988, Ser. No. 204,642
Int. Cl.[5] B60P *1/04*
U.S. Cl. 414—563 15 Claims



1. A combination tilting bed carrier and attached wheel lift apparatus for mounting on the chassis of a towing vehicle comprising,
a tilting bed platform,

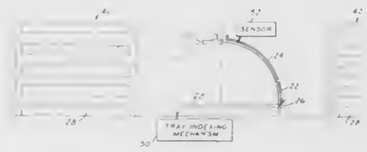
a tilting bed including first and second elongated beams for supporting said tilting bed platform,
said beams each having a forward end relatively near the cab of said towing vehicle and a rearward end relatively remote from the cab of said towing vehicle,
brace means for securing said beams in a spaced apart parallel relationship,
first bracket means secured to and extending downwardly from said first beam,
second bracket means secured to and extending downwardly from said second beam,
said first bracket means and said second bracket means depending from similar longitudinal positions on said beams,
first chassis pivot means for pivotally securing said first bracket to said chassis,
second chassis pivot means for pivotally securing said second bracket to said chassis,
a wheel lift including a front end and a rearward end, said rearward end extending rearwardly from beneath said tilting bed for lifting the wheels of a towed vehicle,
pivot means supported by said first and second brackets for pivotally mounting said front end of said wheel lift,
motive means mounted on said wheel lift for actuating pivotal movement thereoff about said pivot means,
first strut means having a forward end and a rearward end,
second strut means having a forward end and a rearward end,
the forward end of said first strut means secured to said first beam at a position on said first beam forwardly of said first bracket and the rearward end of said first strut means supported by said first bracket,
the forward end of said second strut means secured to said second beam at a position on said second beam forwardly of said second bracket and the rearward end of said second strut means supported by said first bracket, and
said first and second strut means being operable to transfer stresses applied to said wheel lift from said first and second brackets along the length of said first and second strut means to said first and second beams respectively at a point thereon forwardly of said first and second brackets.

4,929,143
QUICK-ATTACHING MECHANISM
Martin F. Dohnalik, Yankton, S. Dak., assignor to Gehl Company, West Bend, Wis.
Filed Jan. 31, 1989, Ser. No. 304,666
Int. Cl.[5] E02F *9/00*
U.S. Cl. 414—723 18 Claims



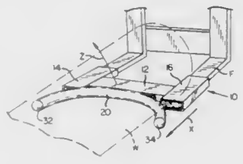
1. A quick-attaching mechanism for coupling an implement to the remote end of a boom structure or the like, comprising:
a mounting structure provided at the remote end of the boom structure;
a receiving structure provided on said implement and engageable by said mounting structure for removably attaching said implement to said boom structure;
upper pivoting engagement means for pivotably engaging said mounting structure and said receiving structure and providing an upper pivot axis, said upper pivot axis providing pivoting movement of said mounting structure and said receiving structure between an engaged position and a disengaged position;
lower latching means provided on one of said structures, said lower latching means being pivotable between a latching position and a release position and comprising a depending latch member pivotably mounted about a pivot axis to said structure and biased toward a downward position; and
lower stationary engagement means comprising a plate member mounted to the other of said structures;
wherein, after movement of said mounting structure and said receiving structure from their disengaged position to their engaged position, the downward bias on said lower latch member causes movement of said latch member to its latching position wherein it engages said plate member, and wherein the distance between said plate member and said latch member pivot axis when said mounting structure and said receiving structure are in their engaged position is less than the length of said latch member, so that said latch member returns only partially to its depending position to attain its latching position, said latch member engaging an upper surface of said plate member to securely couple said implement to said boom structure, whereafter movement of said latch member to its release position uncouples said implement and said boom structure by allowing pivoting movement between said mounting structure and said receiving structure from their engaged position to their disengaged position.

4,929,144
APPARATUS FOR LOADING RADIATOR FINS INTO TRAYS
Ian Fraser, Westcliff, Great Britain, assignor to Ford Motor Company, Dearborn, Mich.
PCT No. PCT/GB87/00418, § 371 Date Dec. 16, 1988, § 102(e) Date Dec. 16, 1988, PCT Pub. No. WO87/07855, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 15, 1987, Ser. No. 288,641
Claims priority, application United Kingdom, Jun. 17, 1986, 8614753
Int. Cl.[5] B65G *57/28*; B21D *53/08*
U.S. Cl. 414—799 5 Claims



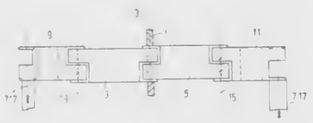
1. Apparatus for loading convoluted radiator fins into parallel slots in a tray, characterised by an input conveyor (**10**) for transporting the fins in a horizontal attitude and lengthways, a part-cylindrical chute (**22**) disposed with its convex surface facing upwards and its axis of curvature generally horizontal and parallel with direction of movement of the input conveyor (**10**), the upper end of the chute being contiguous with the end of the conveyor, means for supporting a tray (**28**) beneath the chute with a slot adjacent the lower edge of the chute (**22**), and means (**20**) for laterally deflecting a fin off the conveyor (**10**) onto the chute (**22**) to cause the fin to slide over the surface of the chute (**22**) and, in doing so, to turn and fall in a vertical attitude into the slot in the tray (**28**) aligned with the lower edge of the chute (**22**).

4,929,145
FORKLIFT ADAPTER FOR STOCKING VERTICAL RACKS
George O. Thompson, 15917 SE. Clinton, Portland, Oreg. 97236
Filed Sep. 12, 1988, Ser. No. 243,429
Int. Cl.[5] B66F *9/12*
U.S. Cl. 414—607 8 Claims



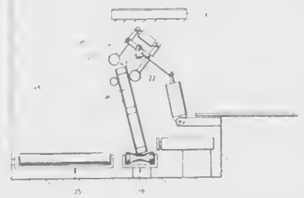
1. A forklift adapter for mounting to a forklift having at least one raisable fork positioned generally in a first plane, the mounted adapter to handle long slender workpieces and bundles of such workpieces, the adapter comprising:
- a frame;
- attachment means positioned generally in the first plane and mounted to the frame for attaching the forklift adapter to the forks; and
- cradling means rigidly mounted to the frame for cradling a long slender workpiece or bundle of such workpieces during a transfer of the workpiece between horizontal and vertical orientations, the cradling means being an arcuate member having a central region rigidly mounted to the frame in the first plane and having two arcuate extending arms curved upwardly above the first plane.

4,929,146
MANIPULATOR
Marinus P. Koster; Willem Van Der Hoek; Nicolaas R. Kemper, and Hermanus M. J. R. Soemers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 29, 1988, Ser. No. 188,586
Claims priority, application Netherlands, Nov. 13, 1987, 8702715
Int. Cl.[5] B25J *18/00*
U.S. Cl. 414—744.5 8 Claims



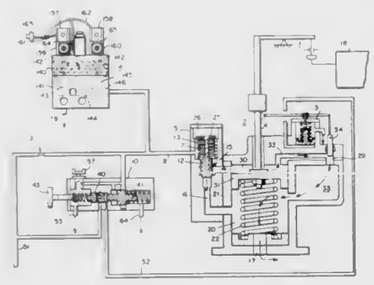
1. A manipulator comprising an end effector and a four rod mechanism with each rod coupled to two of the other three rods, said four rods being capable of moving said end effector in a predetermined plane, two of said four rods being rotatable about a main axis extending perpendicularly to said predetermined plane,
- each of said rods comprising a bearing plate, a tubular section and a bridge between said bearing plate and said tubular section, said bridge extending parallel to said main axis, each said bearing plate being in a respective plane which is perpendicular to said main axis, and,
- for each said rod, the respective bearing plate and tubular section being disposed to opposite sides of a common reference plane extending parallel to said predetermined plane, said tubular sections of rods coupled to each other being located on opposite sides of said common reference plane.

4,929,147
PROCESS FOR CONVEYING A TRANSPORT PLATFORM TO A LIFTING TABLE OF A STACKING STATION
Erwin Jenkner, Lindenstr. 13, D-7261 Bechingen-Bergwald, Fed. Rep. of Germany
Filed May 13, 1988, Ser. No. 194,679
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716203
Int. Cl.[5] B65G *57/24*
U.S. Cl. 414—786 11 Claims



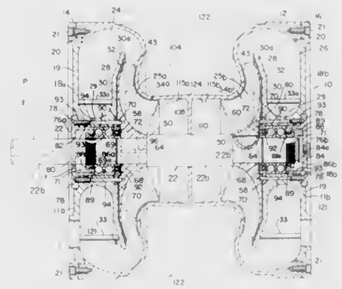
1. In a process for conveying at least one transport platform having an approximately rectangular outline, which can be a pallet or a plate, whose length and width is larger than its thickness, to at least one lifting table of at least one stacking station at which a plurality of panels are stacked on said transport platform oriented horizontally on said lifting table, the improvement wherein an empty one of said transport platforms located in a normal position inclined from vertical adjacent said lifting table is placed on said lifting table located in a receiving position by tipping it into a horizontal position, said empty transport platform being tipped by the force of gravity onto said lifting table and said transport platform in said normal position adjacent said lifting table of said stacking station is oriented at an angle to said vertical from which said transport platform can tip by the weight of said transport platform to said lifting table as soon as a stop device retaining said transport platform in said normal position is released.

4,929,148
TURBINE TRIP THROTTLE VALVE CONTROL SYSTEM
Norman E. Nutter, Lunenburg, Mass., assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 27, 1988, Ser. No. 289,842
Int. Cl.[5] F01D *21/00*
U.S. Cl. 415—32 31 Claims



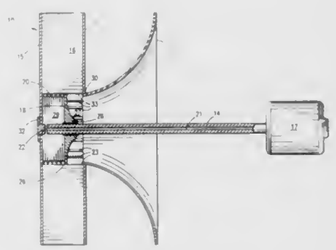
1. In a hydraulic control system for a steam turbine wherein turbine speed is controlled through a throttle valve operator to regulate steam delivered to the steam turbine, and a trip mechanism is provided for shutting the steam turbine down, a combined pressure regulator, trip/reset valve comprising:
- a pressure regulator valve for controlling the pressure of hydraulic fluid delivered to the throttle valve;
- a trip/reset valve adapted to redirect hydraulic fluid from that delivered to the throttle valve to a drain to thereby actuate, the trip mechanism;
- a hand trip control integral with said pressure regulator valve and said trip reset valve to connect said hydraulic fluid to said drain to shut said steam turbine down;
- means for maintaining the trip mechanism in a tripped position until reset by an operator;
- a control member to enable the operator to actuate said pressure regulator valve to selectively control the steam to the turbine, and to reset said trip mechanism
- by further actuation of said pressure regulator valve to move said trip/reset valve out of said tripped position and to reestablish the pressure of the hydraulic fluid under control of said pressure regulator valve.

4,929,149
GAS BLOWER
Alexander Greenspan, Chesterland, Ohio, assignor to Superstream, Inc., Warrensville Heights, Ohio
Continuation of Ser. No. 175,649, Mar. 21, 1988, abandoned, which is a continuation of Ser. No. 864,927, May 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 689,642, Jan. 8, 1985, abandoned. This application Oct. 26, 1988, Ser. No. 265,284
Int. Cl.[5] F01D *3/02*
U.S. Cl. 415—99 17 Claims



1. A centrifugal, inline, opposed balanced gas blower comprising a housing having a pair of opposed end walls aligned at opposite ends of a central axis, the housing including
- a pair of opposed, axially spaced, generally annular radially symmetric impeller chambers;
- a pair of opposed, axially spaced, generally annular, radially symmetric plenum chambers, each plenum chamber being disposed between an impeller chamber and the end wall closest to the impeller chamber, a radial outer portion of each impeller chamber being in communication for the flow of gas to a radial outer portion of the respective plenum chamber;
- a pair of opposed, axially spaced, generally annular, radially symmetric deflectors, each connected to the end walls and disposed between the impeller chamber and the respective plenum chamber;
- a rotatable drive shaft extending along the central axis into the plenum chambers and the impeller chambers;
- a dividing wall extending perpendicular to the central axis through which the drive shaft extends;
- a pair of gas inlets formed in the housing so that gas enters the housing on opposite sides of the dividing wall;
- a pair of gas outlets formed in the housing opposed to and aligned with the gas inlets along a transverse axis perpendicular to the central axis so that gas is exhausted from the housing through the gas outlets from opposite sides of the dividing wall;
- a pair of impellers mounted on the drive shaft, each disposed in the respective impeller chamber for rotation with respect there to; and
- a pair of opposed, axially spaced inlet gas chambers for receiving gas from the gas inlets and for directing gas axially to the impellers;
- each plenum chamber having an outlet portion including an exhausts gas displacement port formed in an inward radial wall of the plenum chamber in communication with an outlet gas chamber which is in communication with the gas outlet, the impellers being adapted for generally axial intake of gas from the in let gas chambers and generally centrifugal radially symmetric exhaust of the gas to the plenum chambers to initially pressurize the plenum chambers from which gas is displaced through the exhaust gas displacement ports, the impellers, impeller chambers, plenum chambers and deflectors being disposed in the housing such that there is substantially no axial load on the shaft.

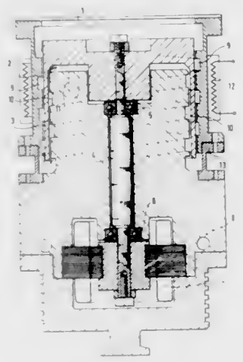
4,929,150
APPARATUS FOR ADJUSTING FLOW RATE THROUGH A FAN
Terry L. Daw, Murray, Utah, assignor to Daw Technologies, Salt Lake City, Utah
Filed Mar. 31, 1989, Ser. No. 330,911
Int. Cl.[5] F01D *17/14*
U.S. Cl. 415—157 14 Claims



1. A fluid transport system comprising:
- an inlet opening,
- a flow channel extending from the inlet opening to carry fluid in a controlled path through the drive system,
- a fan chamber coupled in line with the flow channel and having a chamber opening communicating with the flow channel,
- a fan member mounted within the fan chamber and including fan blades rotationally mounted to a base plate, said fan blades drawing fluid through the fan chamber upon rotation of the fan member to develop fluid flow through the channel and fan chamber,
- means for adjusting an amount of fan blade exposure to the flow channel during rotation to provide variable adjustment to the rate of fluid flow through the transport drive system without the need for varying the rate of fan rotation, said adjustment means including a plate means located in said fan chamber, and
- means attached to said base plate and to said plate means forming an adjustment chamber between said base plate and said plate means, whereby the flow rate through the fan changes as the location of the plate means in the fan chamber changes, said plate means being movable in the fan chamber in response to fluid changes in said adjustment chamber.

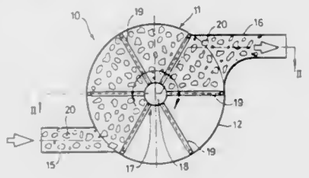
VOL
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4,929,151
VACUUM PUMP
Jacques Long, Annecy, and Denis Perrillat-Amédé, Annecy Le Vieux, both of France, assignors to Societe Anonyme dite: Alcatel Cit, Paris, France
Filed Jun. 21, 1989, Ser. No. 369,401
Claims priority, application France, Jul. 27, 1988, 88 10120
Int. Cl.[5] F01D *5/08*
U.S. Cl. 415—177 4 Claims



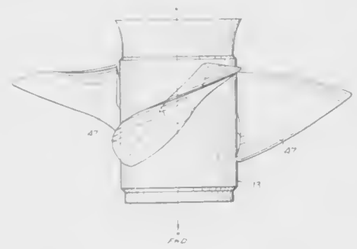
1. A molecular or turbomolecular type of pump comprising a stator and a rotor rotated by a motor, the stator having a first zone overlying the rotor and in which gas is admitted, and a second zone adjacent to the drive motor and cooled by a flow of fluid, wherein the first zone is provided with heater means for maintaining the temperature of said zone above the condensation threshold of the gas being admitted, with the first and second zones being separated from each other by a thermal impedance element.

4,929,152
METHOD AND APPARATUS FOR MAINTAINING A MIXTURE OF PRODUCTS AT A CERTAIN TEMPERATURE
Willem F. Hermans, Amstelveen, Netherlands, assignor to Stork Amsterdam B.V., Amsterdam, Netherlands
Division of Ser. No. 49,617, May 13, 1987, Pat. No. 4,802,825. This application Jun. 17, 1988, Ser. No. 218,552
Claims priority, application Netherlands, May 14, 1986, 8601221
Int. Cl.[5] F04D *29/18*
U.S. Cl. 415—203 11 Claims



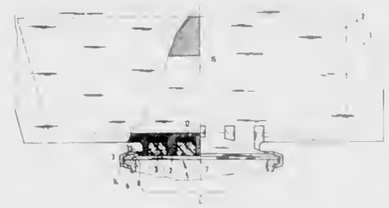
1. An apparatus for maintaining at a certain temperature, and for a certain period of time, a flow of a mixture of products which includes a liquid of low to medium viscosity having solid particles contained therein, comprising:
(a) a vessel for holding a mixture of products therein, the vessel having a peripheral inner wall;
(b) a mixture inlet pipe connected to the vessel and in fluid communication therewith;
(c) a mixture outlet pipe connected to the vessel and in fluid communication therewith; and
(d) means for controlling residence time in the vessel of substantially all solid particles which pass thereinto from the inlet pipe, the residence time controlling means comprising a conveyor mechanism having a central shaft disposed axially in the vessel, and at least one conveyor element which extends from the central shaft substantially radially outwardly in the vessel, the conveyor element extending close to the peripheral inner wall of the vessel to prevent passage of solid particles between the conveyor element and the inner wall.

4,929,153
SELF-ACTUATING VARIABLE PITCH MARINE PROPELLER
Stephen R. Speer, Spokane, Wash., assignor to Nautical Development, Inc., Spokane, Wash.
Filed Jul. 7, 1988, Ser. No. 216,014
Int. Cl.[5] B63H *3/10*
U.S. Cl. 416—46 11 Claims



1. A variable pitch marine propeller comprising a hub case; drive securing means designed to secure the propeller to a rotating drive shaft on a boat such that the entire propeller rotates with the drive shaft; a plurality of blades extending radially outwardly from the hub case and comprising a hydrodynamic surface and a retainer shaft means extending axially from the hydrodynamic surface and being pivotally secured to the hub case such that each blade is mounted to the hub case for pivotal movement about a blade axis between two extreme angular pitch positions: a first locked angular position defining a lower pitch position, and second angular position defining a high pitch position; pitch shifting means comprising a mass member operably secured to the retainer shaft means and designed to cause the blade to pivot from one angular position to the other angular position in response to the reaction force generated upon rotation of the propeller; positive locking means comprising a locking member operably connected between the hub case and the retainer shaft means for preventing pivoting of the blade in response to the pitch shifting means when the blades are in the first locked angular position; and release means comprising a second mass member operably engaging the locking member and designed to move in response to the rotation of the propeller at a minimum threshold rotation velocity so as to release the locking means and to permit the pitch shifting mass to cause the pivoting of the blades.

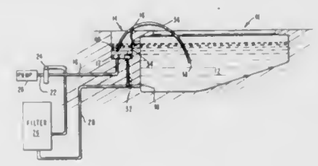
4,929,154
BLADE ARRANGEMENT FOR A PROPULSION ROTOR
Walter Wildner, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen, Munich, Fed. Rep. of Germany
Filed Jan. 27, 1989, Ser. No. 302,327
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802774
Int. Cl.[5] F01D *5/14*
U.S. Cl. 416—230 12 Claims

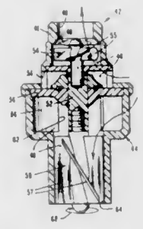


1. A rotor blade arrangement for a propulsion rotor of a turbojet engine or the like, comprising:
blade core means provided with a plurality of core webs spaced from one another and extending radially toward a rotor rotational axis when in an in use position on a rotor,
fiber loops made of fiber strands wound onto the blade core means to form a blade with a portion of said fiber loops extending between said core webs to anchor said fiber loops at the blade core means,
and blade core anchoring means for anchoring said blade core means to a rotor by way of said core webs and separately of the fiber loops, whereby said fiber strands are securely anchored to said rotor while being stressed only in tension in response to centrifugal forces acting on the blade during rotational operation of the rotor.

4,929,155
METHOD AND APPARATUS FOR CREATING A SECONDARY SOURCE OF POWER BY A PUMP
Richard O. Finley, Huntington Beach, Calif., assignor to Plastiflex Company International, Fountain Valley, Calif.
Division of Ser. No. 22,480, Mar. 5, 1987, Pat. No. 4,808,081, which is a continuation of Ser. No. 636,332, Jul. 31, 1984, abandoned. This application Nov. 7, 1988, Ser. No. 268,022
Int. Cl.[5] F04B *47/12*
U.S. Cl. 417—53 20 Claims

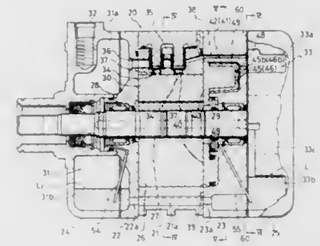
1. In a swimming pool having a skimmer with a water inlet and a pump coupled to the inlet for enabling the pump to draw water from the skimmer and to return the water to the pool, a system for creating a secondary source of power, comprising:
first means adapted to be coupled to the inlet for enabling the pump to flow the water through the first means towards the pump and for deriving a primary source of power from the water flow; and





second means coupled to said first means and the primary source of power for creating the secondary source of power.

4,929,156
VARIABLE CAPACITY COMPRESSOR
Kazuo Eital, and Hidehiko Takayama, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Jan. 30, 1989, Ser. No. 303,931
Claims priority, application Japan, Mar. 15, 1988, 63-61663
Int. Cl.[5] F04C *29/08;* F04B *49/02*
U.S. Cl. 417—295 5 Claims



1. In a variable capacity compressor having a rotor, a cylinder accommodating said rotor, a plurality of compression chambers being defined in said cylinder between said rotor and said cylinder, said compression chambers varying in volume by rotation of said rotor, a first discharge pressure chamber provided on one side of said cylinder and having a discharge pressure chamber section located at an upper portion thereof to be supplied with compression medium as high pressure from associated one of said compression chambers, and an oil sump portion located at a lower portion thereof, a discharge port provided on said one side of said cylinder and directly communicating with said discharge pressure chamber section, a second discharge pressure chamber provided on the other side of said cylinder and having a high pressure-introducing section located at an upper portion thereof to be supplied with compression medium from associated one of said compression

VOL
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chambers, and an oil sump section located at a lower portion thereof, first communication passage means communicating said oil sump sections of said first and second discharge pressure chambers with each other, capacity control means operable in response to control pressure for controlling the capacity of said compressor, said capacity control means having a control pressure chamber in which said control pressure prevails, and second communication passage means communicating said high pressure-introducing section of said second discharge pressure chamber with said control pressure chamber,

the improvement comprising means in said second discharge pressure chamber isolating said high pressure-introducing section from said oil sump section; and

means for introducing said medium into said control pressure chamber from associated one of said compression chambers through said high pressure-introducing section and said second communication passage means while having no effect upon said oil sump section of said second discharge pressure chamber.

4,929,157

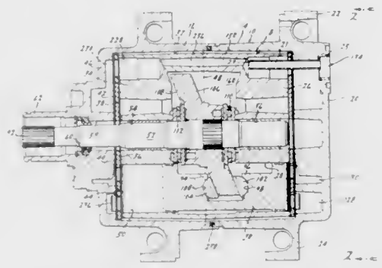
PULSATION DAMPER FOR AIR CONDITIONING COMPRESSOR

Duane F. Steele, Dearborn; Eugene C. Warman, Royal Oak, and Robert J. Hutter, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 23, 1987, Ser. No. 124,196

Int. Cl.[5] F04B *39/00*

U.S. Cl. 417—312 4 Claims



1. In a swashplate air conditioning compressor having a rotary swashplate and axially movable pistons located in cylinder bodies, said compressor having a refrigerant flow discharge port structure at one axial end of said compressor;

a damper comprising a damper tube of a calibrated length having a cross-sectional area less than the cross-sectional area of said port; and

a plenum chamber in one of said cylinder bodies surrounding said tube which communicates with the discharge sides of said cylinders;

said tube having an open flow intake end located within said plenum chamber whereby refrigerant flow follows a reentrant flow path and the pressure pulsations due to the pumping action of said cylinders tend to cancel each other thus reducing noise, vibration and harshness of said compressor.

4,929,158

TURBOPUMP WITH ACTINE SUSPENSION FOR A PROPULSION SYSTEM

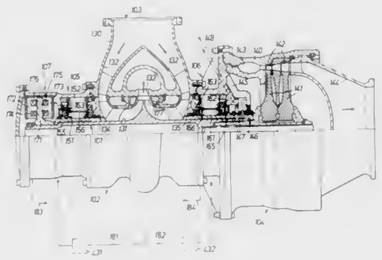
Jean-Philippe Girault, Tourny, France, assignor to Societe Europeenne de Propulsion, Suresnes, France

Filed Mar. 30, 1988, Ser. No. 175,165

Claims priority, application France, Apr. 9, 1987, 87 05042

Int. Cl.[5] F04B *17/00*

U.S. Cl. 417—405 13 Claims



1. Turbopump with active suspension for a propulsive system comprising a fixed casing, a rotary shaft fast with at least one turbine wheel, an axial active inside the casing, axial sensing means including detectors for detecting the axial position of the rotary shaft, two radial active magnetic bearings for the radial positioning of the rotary shaft inside the casing, at least two radial sensing means including detectors for detecting the radial position of the rotary shaft, and a control system receiving signals delivered by all the detectors in order to control, via said radial and axial active magnetic bearings, axial and radial play between the components of the machine fast with the casing and the components of the machine fast with the rotary shaft, wherein

said turbopump further comprises at least two back-up bearings, each constituted by a first ring fast with the rotary shaft, and a second ring fast with the casing, said second ring being concentric with the first ring and defining with said first ring a free space the length of which in the radial direction is about one half the length of the mean air gap of the radial magnetic bearings, said first and second rings being made of a composite material or a fluorinated thermoplastic resin,

said turbopump further comprising channels formed in the stator ferromagnetic cores of the radial active magnetic bearings so as to bring a fluid pressurized by the pump into the air gaps of said bearings, said air gaps of the radial magnetic bearings being defined by surfaces of geometrical shape varying slightly from one to the other in order to create significant hydrodynamic effects at the level of each of the radial active magnetic bearings.

4,929,159

VARIABLE-DISPLACEMENT ROTARY COMPRESSOR

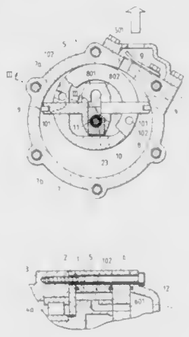
Isao Hayase, Katsuta; Kenichi Ushiku, Toukai; Kunisuke Tejima, Mito; Seiichi Hayashi, Hitachi, and Kazuhiko Satoh, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,585

Claims priority, application Japan, Oct. 16, 1987, 62-260873; Jan. 8, 1988, 63-1202

Int. Cl.[5] F04C *18/344, 29/08*

U.S. Cl. 417—295 16 Claims



2. A variable-displacement rotary compressor as define in claim 1, further comprising means for changing said terminating end of said suction port formed in said side plate means.

4,929,160

SCROLL COMPRESSOR HAVING EXHAUSTING PIPE PRESSED INTO MUFFLER CHAMBER UNDER PRESSURE

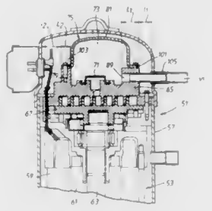
Toshinobu Inoue, Numazu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 2, 1988, Ser. No. 239,990

Claims priority, application Japan, Sep. 10, 1987, 62-137577[U]

Int. Cl.[5] F04C *18/04, 29/06*

U.S. Cl. 418—55 9 Claims



1. A scroll type compressing apparatus comprising:

compressing means for compressing gaseous fluid, including a movable scroll member and a stationary scroll member engaging with the movable scroll member for defining a compressing cell therebetween, the stationary scroll member having an upper wall and a discharging opening formed to the upper wall for discharging gaseous fluid from the compressing cell;

muffler means for receiving gaseous fluid from the compressing cell through the discharge opening, including a circumferential side wall member substantially perpendicularly and integrally extending from the upper wall of the stationary scroll member and a substantially cup-shaped upper wall member supported by the circumferential side wall member, the circumferential side wall member having an exhausting port; and

an exhausting pipe inserted into the exhausting port of the circumferential side wall member under pressure.

4,929,161

AIR-COOLED OIL-FREE ROTARY-TYPE COMPRESSOR

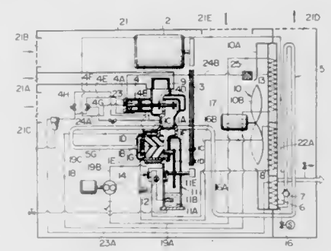
Masakazu Aoki, and Akira Suzuki, both of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1988, Ser. No. 260,774

Claims priority, application Japan, Oct. 28, 1987, 62-270452; Mar. 30, 1988, 63-74342

Int. Cl.[5] F04C *29/02, 29/04*

U.S. Cl. 418—83 21 Claims



1. An air-cooled oil-free rotary-type compressor comprising:

a first air cooling-type air cooler means including a plurality of cooling pipes; back flow preventing means; and a second air cooling-type air cooler means, wherein said first air cooling-type air cooler means, said back-flow preventing means and said second air cooling-type air cooler means are disposed in a channel of a discharge gas compressed in a compressor body.

4,929,162

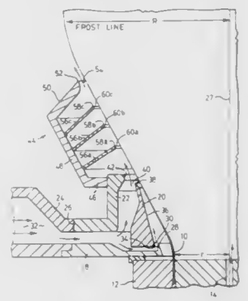
AIR RINGS FOR PRODUCTION OF BLOWN PLASTIC FILM

Mirek Planeta, 228 McCraney St., West, Oakville, Ontario, Canada (L6H 1H7)

Filed Mar. 9, 1989, Ser. No. 321,260

Int. Cl.[5] B29C *47/88*

U.S. Cl. 425—72.1 6 Claims

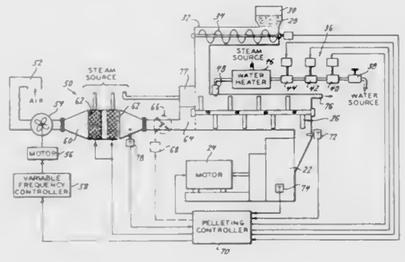


1. An air ring for the supply of cooling air to the exterior surface of an extruded tube of molten plastics material as it moves in a corresponding path of movement having a longitudinal axis, the ring comprising:

an annular bottom member, and an annular top member, each having an opening therein of circular cross-section

concentric with the tube path axis for the passage therethrough of the extruded tube moving in the said path;
the bottom member providing the radially inner lip of an orifice discharging an annular stream of air against the tube outer surface and in the same direction as that of the tube movement, and the top member providing the radially outer lip of the said orifice; and
an annular chamber forming member connected with and extending beyond the top member in the direction of tube movement;
the chamber forming member comprising a chamber forming lower end wall portion extending transversely of the longitudinal axis, a side wall portion that diverges progressively radially outwardly so as to be spaced a minimum predetermined distance along its entire length from the adjacent portion of the tube surface, and so as to conform in shape to the shape of the said adjacent portion of the tube surface, and an upper end wall portion that extends radially inwards transversely of the longitudinal axis; the chamber forming member having in its interior a plurality of longitudinally-spaced partition members each extending from the side wall portion toward the tube surface, the upper end wall portion and each partition member having a radially inner edge of relatively small dimension in the direction of tube movement adapted to be disposed adjacent the outer surface of the tube to form a respective annular gap between itself and the tube outer surface of radial dimension smaller than said minimum predetermined distance;
each partition member forming between itself and the immediately adjacent partition member, or between itself and the immediately adjacent radially inwardly extending lower end wall portion or upper end wall portion, a respective minor turbulence-producing chamber in which the air flow is turbulent to disrupt laminar flow of air over the adjacent portion of the tube outer wall;
each turbulence-producing chamber also having produced therein by the passage of the air past the succeeding partition member radially inner edge a respective vacuum urging the tube radially outward toward the edge.

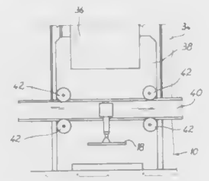
4,929,163
APPARATUS FOR A PELLET MILL WITHOUT STEAM ADDITION
Joseph A. Volk, Jr., Creve Coeur, Mo., assignor to Beta Raven, Inc., Earth City, Mo.
Filed Mar. 28, 1988, Ser. No. 172,755
Int. Cl.[5] B29B *13/02*
U.S. Cl. 425—143 **10 Claims**



1. In a pellet mill for mixing dry material and moisture into a mash and forming pellets therefrom, the pellet mill including a conditioner means for mixing moisture and dry material into a mash and a pellet producing means for forming pellets from the mash, the improvement comprising means for supplying heat to the conditioner means which is substantially moisture free as the principal source of heat for the pelleting process, and a separate means for supplying moisture substantially in its liquid phase only to the conditioning means.

6. An automatic control and heat source for a pellet mill, said heat source comprising means for injecting heat into said pellet mill with substantially no moisture as the principal source of heat for the pelleting process, said pellet mill having a separate moisture supply means, said heat source including an air duct connected to and communicating with said pellet mill, means for pressurizing air into said air duct, and means for heating the air passing through said air duct, the control having means for varying the heat injected into the pellet mill by the heat source.

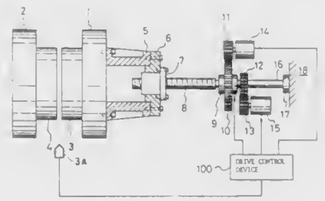
4,929,164
COMPOUND PRESS FOR PIECE MOLDING
Gianfranco Duina, Brescia, Italy, assignor to Norda S.P.A. Via Vallecamonica, Italy
Filed Oct. 19, 1988, Ser. No. 259,974
Claims priority, application Italy, Oct. 22, 1987, 22373A/87
Int. Cl.[5] B28B *13/02, 13/06;* **B29C** *43/34*
U.S. Cl. 425—145 **1 Claim**



1. A press apparatus for molding work pieces and for discharging the molded work pieces from a press (**10**) comprising a frame (**34**) for supporting said press, feeding means (**14**) for feeding the work pieces one by one to the press, said feeding means being incorporated in said press, said press having molding parts and means for moving said work pieces incorporated in said press, said frame supporting said molding parts and said means for moving said work pieces, a single command and control unit (**30**), means (**32**) for connecting said control unit to said press, said feeding means comprising a vertically movable carriage (**38**), a feed rod (**40**) to position the pieces in the press, said rod being provided with gripping means and being slidably supported in the horizontal direction by said movable carriage, said feed rod (**40**) being supported on the movable carriage by means of rollers (**42**) carried by said carriage and placed above and below said feed rod, and a program control mechanism whereby after each work piece is positioned in the correct position for molding, said carriage is lowered and after the molding is completed, said carriage is raised, each molded piece is discharged and said apparatus operates totally autonomously.

4,929,165
DIRECT-PRESSURE MOLD CLAMPING MECHANISM
Yoshiharu Inaba, 3509, Ikuta, Tama-ku, Kawasaki-shi; Fumio Mitoguchi, 1-10-9, Hinohon-machi, Hino-shi, and Hiromasa Yamashita, 1218-7, Otaueno-machi, Takamatsu-shi, all of Japan
Continuation of Ser. No. 167,852, Feb. 25, 1988, abandoned. This application Apr. 6, 1989, Ser. No. 333,811
Claims priority, application Japan, Jun. 30, 1986, 61-151523
Int. Cl.[5] B29C *33/22, 45/66*
U.S. Cl. 425—150 **6 Claims**

1. A direct-pressure mold clamping mechanism for use in an injection-molding machine having a moving platen, said mechanism comprising:
a single ball nut connected for movement in unison with said moving platen;
a rotatable single ball screw threadedly engaged with said single ball nut whereby rotation of said ball screw effects rectilinear motion of said ball nut;
a ball screw shaft integrally connected to said ball screw;
a coarse-adjustment servomotor, having a motor shaft extending in parallel with said ball screw, for driving said single ball screw;
transmission means, having a first spur gear fixed on said motor shaft of said coarse-adjustment servomotor and a second spur gear meshing directly with said first gear and fixed on said ball screw shaft, for transmitting rotation of said coarse-adjustment servomotor to said single ball screw, thereby rotating said single ball screw at high speed;
a fine-adjustment servomotor, having a motor shaft extending in parallel with said ball screw, for driving said single ball screw, said fine-adjustment servomotor having a rotation speed and a rotary force when operating;

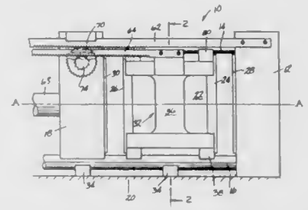


a speed reducer, having a first spur gear fixed on said motor shaft of said fine-adjustment servomotor and a second spur gear meshing directly with said first gear of said speed reducer, for reducing the rotation speed and enhancing the rotary force of said fine-adjustment motor, and for transmitting the thus enhanced rotary force of said fine-adjustment servomotor to said single ball screw;
a clutch fixed on said ball screw shaft for releasably coupling said ball screw shaft to said second spur gear of said speed reducer;
a detector operatively coupled to at least one of said fine- and coarse-adjustment servomotors, for detecting a moving position of said moving platen; and
control means connected in control relation with said coarse- and fine-adjustment servomotors, said detector, and said clutch, for controlling said servomotors and said clutch in accordance with a detected moving position of said moving platen.

4,929,166
SUPPORT FOR QUICK MOLD CHANGING
John DiSimone, Woodbridge; Paul Brown, Orangeville, and Christopher Huntington, Everett, all of Canada, assignors to Husky Injection Molding Systems Ltd, Bolton, Canada
Filed Nov. 21, 1988, Ser. No. 274,469
Int. Cl.[5] B29C *45/66*
U.S. Cl. 425—190 **18 Claims**

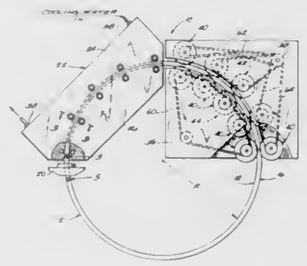
1. An injection molding machine comprising:
a stationary platen;
upper and lower tiebars extending from said stationary platen;
an outer platen along said tiebars;
a movable central mold portion and a non-uniform width slot in each sidewall of said central portion;
means for moving said central mold portion to and from an installed position;
means for supporting said central portion so as to facilitate its quick removal and installation;

said supporting means including a movable frame on each side of said movable central portion; and



each said movable frame having means for engaging one of said slots on said central portion as said central mold portion is being moved from and to said installed position.

4,929,167
APPARATUS FOR PRODUCING A HELICAL TUBE
Kenneth V. Pepper, Rte. 3, Pamela La., Plymouth, Wis. 53073
Continuation of Ser. No. 62,534, Jun. 12, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 219,885
Int. Cl.[5] B29C *53/08*
U.S. Cl. 425—325 **11 Claims**



10. An apparatus for conveying an elongate object, said apparatus comprising a roller having therein a circumferentially extending groove positioned to receive the object, said groove having a radially innermost portion having a relatively high coefficient of friction, and said groove having a radially outer portion defined by opposed side walls extending radially outwardly from said radially innermost portion of said roller and having a relatively low coefficient of friction, and means for rotating said roller so that said radially innermost portion of said roller drivingly engages the object and said side walls slidably engage the object and retain the object within said groove.

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4,929,168

APPARATUS FOR PRODUCING A TUBULAR OBJECT OF POLYETHELENE TEREPHTHALATE OR OTHER THERMOPLASTIC MATERIAL FROM A TUBULAR BLANK OF AMORPHOUS MATERIAL

Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Loddeköpinge, both of Sweden, assignors to PLM AB, Malmo, Sweden

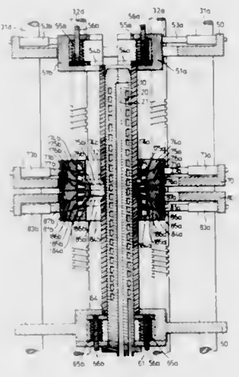
Continuation of Ser. No. 559,666, Dec. 9, 1983, Pat. No. 4,631,163, Division of Ser. No. 489,750, Apr. 29, 1983, Pat. No. 4,580,968, which is a division of Ser. No. 264,665, May 18, 1981, Pat. No. 4,405,546. This application Oct. 21, 1986, Ser. No. 921,336

Claims priority, application Sweden, May 29, 1980, 8004003

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.[5] B29C *55/00*

U.S. Cl. 425—384 3 Claims



1. An apparatus for the production of a tubular object of polyethylene terephthalate material with cylindrical sections in which a thickness of the material has been reduced and formed from a tubular blank of said material which is in an amorphous state, said apparatus comprising a plurality of draw rings to surround said blank and a plurality of driving devices to move the draw rings relative to the blank along the axis of the blank, the draw rings being provided with channels for passage of a liquid for controlling a temperature of the material in the blank at a value close to the range of the glass transition temperature of the material in at least one transitional zone which is moved along the blank by the draw rings and in which the material has bearing surfaces against the draw rings during the reduction in thickness, said draw rings being dimensioned so that as said transitional zone of the material is moved by the draw rings, the material undergoes change of state from the amorphorous state to a monoaxially oriented state as the material is reduced in thickness, the temperature control of the blank at said transitional zone acting in combination with the axial displacement of the transitional zone along said blank to produce substantially no radial force at the interior surface of said blank.

4,929,169

WORKING EQUIPMENT FOR ROUGHENING THE SIDE OF OPTICAL FIBER

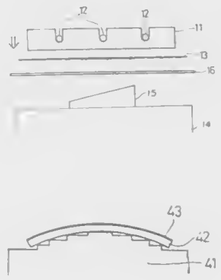
Takashi Fujigaki, Kanagawa; Yoshikazu Fujinaga, Aichi; Shuichiro Tokuda, Aichi; Noriyuki Furukawa, Aichi; Kiyoshi Ichimura, Tokyo; Yukio Shibuya, Tokyo, and Shigeru Iuchi, Tokyo, all of Japan, assignors to Mitsubishi Rayon Co., Japan

Filed Jun. 13, 1988, Ser. No. 206,065

Claims priority, application Japan, Jun. 19, 1987, 62-93351[U]

Int. Cl.[5] B24B *7/20*

U.S. Cl. 425—385 3 Claims



1. A working equipment for roughening a side of optical fiber ribbon, comprising: a hot stamper, a sheet having a rough surface to be transferred disposed below said stamper, a cushion disposed below said sheet and a cushion-mounting plate disposed said cushion disposed below said sheet, said cushion mounting plate having a mounting surface portion on which said cushion is mounted, said mounting surface portion having a profile selected from the group consisting of a stepped shape, a continuously curved form, and an inclined form, wherein said ribbon is to be disposed between said sheet and said cushion.

4,929,170

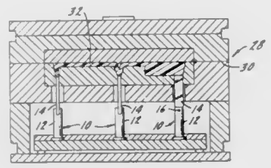
EJECTOR BLADE

Borislav Boskovic, 2102 Bannockburn, Inverness, Ill. 60067

Filed Apr. 27, 1989, Ser. No. 343,676

Int. Cl.[5] B29C *45/40*

U.S. Cl. 425—556 17 Claims



1. An ejector blade for a plastic injection mold, the ejector blade comprising

a. an elongated shank portion,

b. a blade portion having a first end extending from one end of said shank portion, and

c. means releasably joining said shank portion to said blade portion at said ends so that a different blade portion can be mounted on said shank portion, said means releasably joining comprising a transverse aperture in said first end of said blade portion, a transverse aperture in said one end of said shank portion, said apertures being in registration with one another, and means engaged in said apertures to flexibly join said portions.

4,929,171

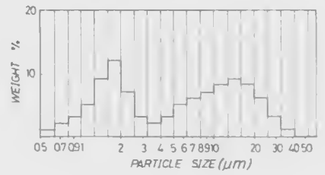
COMPOSITE POLYVINYLCHLORIDE PLASTISOL COATING AND METHOD OF APPLYING IT TO A METAL SHEET

Yoshio Hayashi; Tetsuo Nakamoto; Katsumi Kanada, and Yoshikazu Kondo, all of Yamaguchi, Japan, assignors to Toyo Kahan Co., Ltd., Japan

Filed Nov. 22, 1988, Ser. No. 275,567

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—54.1 11 Claims



1. A method of applying a composite polyvinylchloride coating to a metal sheet, comprising:

applying a coating of a composite polyvinylchloride plastisol to a metal sheet, said composite polyvinylchloride plastisol comprising,

100 parts by weight of a polyvinylchloride powder of which more than 95 weight percent is composed of particles whose sizes are in the range of 0.5 to 40 μm, and wherein of that, 20 to 60 weight percent is composed of particles in the range of 0.5 to 5 μm and 35 to 75 weight percent is composed of particles in the range of 5 to 40 μm, so that a distribution curve of particle sizes shows 2 peaks in the ranges of 1 to 3 μm and 8 to 15 μm,

5 to 60 parts by weight of an acrylic resin powder having an average degree of polymerization of 500 to 30,000 and having particle sizes of more than 0.1 μm and less than 40 μm,

5 to 60 parts by weight of an acrylic monomer, an acrylic oligomer or a mixture thereof, which monomers or oligomers have at least one functional group, and

at least one heat setting initiator or photoinitiator,

whereby a composite polyvinylchloride coated metal sheet is obtained; and,

heating the composite polyvinylchloride coated metal sheet at 150° to 250° C. so as to obtain a composite polyvinylchloride coated metal sheet.

4,929,172

STABLY OPERATING PULSE COMBUSTOR AND METHOD

Ben T. Zinn, Atlanta, Ga., and David Reiner, Haifa, Israel, assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Apr. 25, 1989, Ser. No. 343,084

Int. Cl.[5] F23C *11/04*

U.S. Cl. 431—1 15 Claims

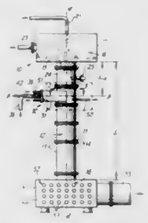
1. Method for stabilizing a pulse combustion process within a preselected volume of a pulse combustor, said pulse combustor having an elongated combustor body, an intake and an exhaust, and defining an interior combustion chamber, comprising the steps of:

(a) introducing secondary air axially into said combustion chamber;

(b) creating a fuel-air mixture by mixing fuel and primary air;

(c) introducing said fuel-air mixture tangentially into said preselected volume within said combustion chamber of said combustor body; and

(d) creating a combustion process by igniting said fuel-air mixture in said preselected volume within said combustion chamber, whereby said pulse combustion process occurs



within said preselected volume and combustion products are thereby created.

4,929,173

HEATING APPLIANCE WITH COMBUSTION AIR PREHEAT

Thomas G. M. Jacobs, Boxmeer, and Clemens J. M. De Vroome, Beugen, both of Netherlands, assignors to Stork Contiweb B.V., Netherlands

Filed Jan. 27, 1989, Ser. No. 303,484

Claims priority, application Netherlands, Jan. 29, 1988, 8800226

Int. Cl.[5] F23D *11/44*

U.S. Cl. 431—215 5 Claims



1. A heating appliance for a drier, comprising a combustion unit having a burner and a combustion chamber, wherein said combustion chamber comprises an elongated first portion, extending away from said burner and merging into an elongated second portion via a bend of 180°, said two portions and said bend defining a U-shaped path for combustion gases and said portions being approximately of equal lengths and said combustion chamber being provided with at least one discharge opening for discharging part of said combustion gases, said opening being located in said combustion chamber prior to said second portion and being controllable by means of a valve.

4,929,174

GAS LIGHTER WITH SPARK IGNITION

Ming-I Wang, No. 6, Lane 97 Hsi-Yuan Rd. Homei, Changhua, Taiwan

Filed Mar. 21, 1989, Ser. No. 326,793

Int. Cl.[5] F23Q *1/02*

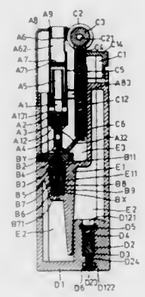
U.S. Cl. 431—276 4 Claims

1. A lighter comprising a machine housing attaching thereto a nozzle assembly capable of providing a flame, an adjusting assembly capable of adjusting the flaming degree of said flame, a grinding assembly capable of providing a spark to enable said nozzle assembly to provide said flame, and a filling assembly capable of filling in said machine body a fuel gas for said flame, characterized in that said nozzle assembly includes:

a nozzle seat positioned in said machine housing and capable of mixing therein an air and a gas supplied from said fuel gas;

an accelerating piece connected to said nozzle seat and having a relatively small hole therethrough by which said gas to be mixed with said air is accelerated;

a burning tube secured to said machine housing, connected to said nozzle seat, and having an intermediate portion and an upper side hole capable of receiving therefrom said spark; and

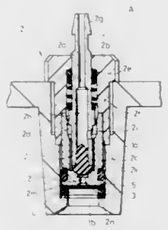


a distrubing disk transversely secured in and to said intermediate portion to define thereabove a combustion chamber, having a plurality of holes evenly distributed around an axis of said burning tube, and capable of decelerating said mixed air and gas coming from said nozzle seat.

4,929,175
NONCONTROLLING TYPE VALVE

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Apr. 24, 1989, Ser. No. 342,199
Claims priority, application Japan, Apr. 27, 1988, 63-55863[U]
Int. Cl.[5] F23D *14/28*
U.S. Cl. 431—344 **2 Claims**

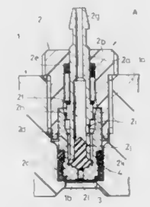


1. A noncontrolling type valve comprising: a recess formed in a top plate of a gas container, said recess having a through aperture in its bottom communicating with the inside of said gas container; valve means push-fitted in said recess; a through aperture in said valve means in alignment with said through aperture in said bottom of said recess; a valve in said valve means for opening and closing said through aperture in said valve means; and, a filter positioned in said recess below said valve means and between said through aperture in said valve means and said through aperture in said bottom of said recess for permitting a given constant flow of gas to pass to said valve means when said valve in said valve means is opened, said filter further comprises, in said recess, an annular spacer fixed to said filter and a net structure sandwiched between said filter and a bottom of said through aperture in said valve means.

4,929,176
NONCONTROLLING TYPE VALVE

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Apr. 24, 1989, Ser. No. 342,209
Claims priority, application Japan, Apr. 27, 1988, 63-55864[U]
Int. Cl.[5] F23D *14/28*
U.S. Cl. 431—344 **8 Claims**

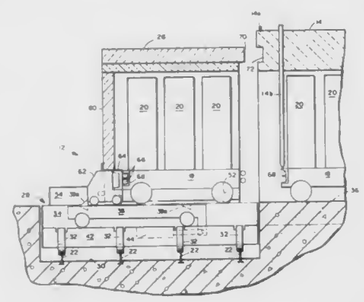


1. A noncontrolling type valve for a gas container having a top plate, a recess formed in said top plate and said recess having a through aperture in its bottom to communicate with the inside of said gas container comprising: a valve body push-fitted in said recess; and a filter positioned under said valve body for permitting a given constant flow of gas to pass to said valve body when said valve opens, characterized in that said valve further comprises, in said recess, an annular spacer of a synthetic resin fixed to an annular inside edge of an uppersurface of said filter, said valve body having a bottom end in contact with the remaining area of said uppersurface of said filter, said filter having an undersurface laid across said through aperture in the bottom of said recess, said valve further comprising, in said recess, an O-ring fitted around said bottom end of said valve body and pushed against an uppersurface of said annular spacer and an inner wall of said recess.

4,929,177
TRANSFER APPARATUS FOR LATERALLY TRANSFERRING KILN CARS BETWEEN TUNNEL KILNS

Ernst Paul, Kotz, Fed. Rep. of Germany, assignor to LINGL GmbH & Co. KG, Neu-Ulm, Fed. Rep. of Germany

Filed Nov. 10, 1988, Ser. No. 269,691
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738527
Int. Cl.[5] F27B *9/02;* **F27D** *3/00*
U.S. Cl. 432—11 **38 Claims**

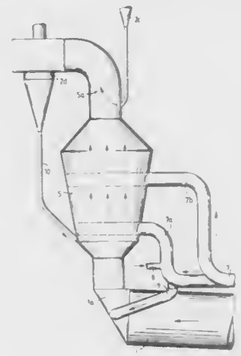


1. A transfer apparatus for transferring a kiln car relative to a tunnel kiln, said transfer apparatus comprising:
(a) a transfer carriage including (i) a housing structure which defines a space longitudinally alignable with an end of said tunnel kiln for accommodating a kiln car which is transferred form said tunnel kiln end and into said defined space of said housing structure, and (ii) a wall disposed within said defined space; and
(b) mounting means for mounting said wall relative to said housing structure for reciprocal longitudinal movements within said defined space between forward and rearward positions, said wall being farther from said tunnel kiln end when in said rearward position as compared to said forward position thereof so as to allow said transferred kiln car to be accommodated within said defined space.

4,929,178
METHOD FOR THE HEAT TREATMENT OF FINELY GRANULAR MATERIAL

Hans-Dietmar Maury, Ahlen, and Wolfgang Buslowski, Ennigerloh, both of Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 867,644, May 28, 1986. This application Dec. 19, 1988, Ser. No. 287,759
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3520058
Int. Cl.[5] F27B *7/02*
U.S. Cl. 432—14 **2 Claims**

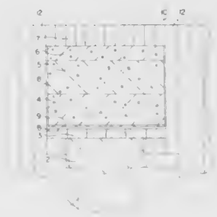


2. A method for the heat treatment of finely granular material, particularly for the production of cement, with a preferably multi-stage cyclone preheater, a rotary tubular kiln, a cooler as well as a single kiln off-gas line which is formed between rotary tubular kiln and cyclone preheater and is flow through substantially in upward direction by the off-gases of the rotary tubular kiln and to which tertiary air is fed in two partial streams for the combustion of an additional fuel from the cooler arranged behind the rotary tubular kiln on the material side, said streams being introduced at different heights into the kiln off-gas line; the method comprising the steps of:
feeding the additional fuel exclusively to the lower partial stream of the tertiary air to provide for sub-stoiciometric combustion in the off-gas line before the entrance of the second partial stream of tertiary air; feeding the second partial stream of the tertiary air free of fuel to affect a complete combustion of the additional fuel in the upper part of the kiln off-gas line;
directing the material to be treated, after the conclusion of the complete combustion of the additional fuel, to the kiln off-gas line above the second partial stream of tertiary air;
applying the precalcined material coming from the last stage of the cyclone preheater in countercurrent to the lower part of the kiln off-gas line below the partial stream of tertiary air which is charged with additional fuel; and wherein
said step of directing provides for passing the material past entry points of the upper and the lower tertiary air streams into the kiln off-gas line; the method further comprising
a step of enlarging the diameter of a portion of the kiln off-gas line at the junctions with the two streams of tertiary air.

4,929,179
ROOF STRUCTURE

Dieter Breidenbach, Bochum-Stiepel; Hans Oldengott, Hamm, and Burckard Vitt, Lohmar, all of Fed. Rep. of Germany, assignors to Ruhrkohle AG, Essen, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,549
Int. Cl.[5] F27D *1/00*
U.S. Cl. 432—247 **14 Claims**



1. A roof structure comprising:
a plurality of layers of heat resistant material;
at least a first of said layers including a first brick layer;
said first brick layer including an upper surface;
said upper surface of said first brick layer being defined by a plurality of preformed refractory bricks disposed in a side-by-side manner;
at least a second of said layers above said first of said layers including a heat resistant compound;
said second of said layers extending across said roof structure;
said second of said layers including at least a portion of a said lower surface entirely supported by said first of said layers;
said lower surface of said second of said layers being generally supported at said upper surface of said first brick layer;
means for defining said lower surface of said second of said layers including said heat resistant compound of said second of said layers having been unshaped concrete when initially installed above said first brick layer of said first of said layers;
said first brick layer comprising support means for supporting said unshaped concrete at least when initially installed; and
said means for defining said lower surface of said second of said layers including said upper surface of said first brick layer.

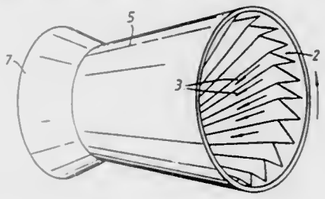
4,929,180
STAY FULL-EASY LOAD "TURBO" PROPHYLACTIC POLISHING CUP

Ronald Moreschini, 2929 7th Ave., Pueblo, Colo. 81008

Filed Dec. 7, 1988, Ser. No. 281,321
Int. Cl.[5] A61C *3/06*
U.S. Cl. 433—166 **20 Claims**

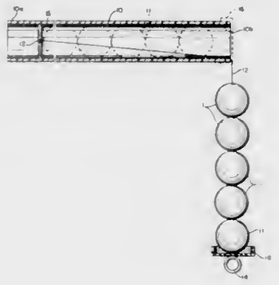
1. A prophy cup for use with a prophy angle and dental polishing compound comprising: a conically shaped body member, attachment means at the smaller end of said body member, the larger end of said body member having a central opening cavity for holding said polishing compound, and a

plurality of internal turbine like vanes or ribs around the inside wall of said cavity, each vane or rib being at a slight angle



towards the direction of intended cup rotation so as to hold said compound within the cup cavity during rotation and use thereof.

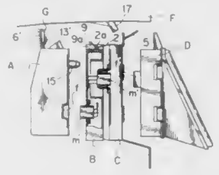
4,929,181
TOY & INSTRUCTIONAL APPARATUS
Becky A. Undlin, 14523-C 13th Avenue North, Plymouth, Minn. 55441
Filed Jul. 31, 1989, Ser. No. 386,994
Int. Cl.[5] G09B *19/00*; **A63H** *33/40*
U.S. Cl. 434—236 **12 Claims**



1. Toy and instructional apparatus comprising a hollow elongated member having open inlet and discharge ends,
- a plurality of light weight elements inserted into the hollow member, and arranged in successive orientation within the hollow member,
- flexible means connecting the elements, and
- means connecting the flexible means to the hollow member but permitting the connected elements to be discharged from the discharge end of the member by blowing into the inlet end of the member.

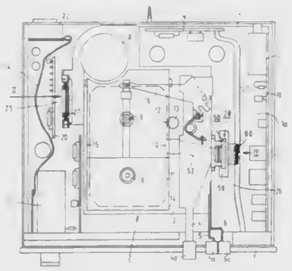
4,929,182
MOUNTING CONSTRUCTION FOR ON-VEHICLE ELECTRICAL CONNECTION APPARATUS
Yokihiro Hyogo, and Akio Kuribara, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jul. 12, 1989, Ser. No. 378,672
Claims priority, application Japan, Jul. 13, 1988, 63-172576
Int. Cl.[5] H01R *33/00*
U.S. Cl. 439—34 **4 Claims**

1. A mounting construction of an on-vehicle electrical connection apparatus comprising:
- a first electrical connection apparatus secured in a car body;
- a second electrical connection apparatus electrically connected with said first electrical connection apparatus;
- an instrument panel frame secured to a dash board and with means for temporarily holding said second electrical connection apparatus so that said second electrical connection apparatus opposes said first electrical connection apparatus; and



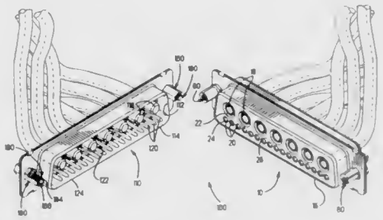
- an instrument board mounted to said instrument panel frame, said instrument board being electrically connected to said second electrical connection apparatus by means of connectors.

4,929,183
DEVICE FOR ELECTRICALLY INTERCONNECTING ELECTRICAL AND/OR ELECTROMECHANICAL ASSEMBLIES, METHOD OF ELECTRICALLY INTERCONNECTING SUCH ASSEMBLIES, AND APPARATUS MANUFACTURED IN ACCORDANCE WITH THE METHOD
Klaus P. K. Rinneburger, Wilnsdorf, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 14, 1987, Ser. No. 73,680
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622355
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—67 **20 Claims**



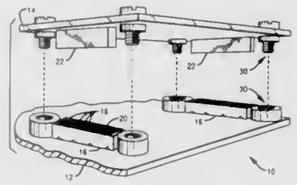
1. A device for electrically interconnecting assemblies in a housing of an electrical apparatus, comprising:
- a first assembly including a plurality of electrical components and a first connector element connected thereto by flexible electrical leads, and a second assembly including a second connector element disposed thereon, at least said first connector element being disposed in a hard-to-access area within said housing,
- characterized in that said first assembly further comprises:
- a holder on which said first connector element is arranged, said holder extending into a conveniently accessible area of said housing,
- a support, and means for detachably aligning said holder to said support in an initial relative position, and
- means for detaching said holder from said support by pressing said holder in a given direction, in response to relative movement of said holder in said given direction said holder being released from the support and said first connector element then engaging electrically with said second connector element.

4,929,184
KEYED ELECTRICAL CONNECTORS WITH JACKSCREWS
Atahusain E. Emadi, Carlisle; Eric T. Green, Hummelstown; John S. Margosiak, Middletown; Daniel J. Mignogna, Harrisburg, and Dennis E. Smith, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 362,736, Jun. 7, 1989, Pat. No. 4,895,535. This application Aug. 30, 1989, Ser. No. 400,640
Int. Cl.[5] H01R *13/645*
U.S. Cl. 439—681 **15 Claims**



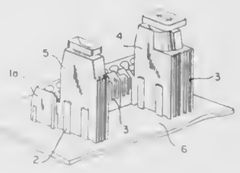
1. A keying and fastening system for matable first and second electrical connectors of the type having flanges of the housing means laterally of the terminal arrays where the flanges have a very small axial dimension, comprising key members and jackscrew members secured to housing means of first and second connectors matable together, the system being of the type wherein first key members of the first connector have axially oriented aperture means in body sections thereof within which said jackscrews are rotatable and forwardly from which extend threaded forward jackscrew shanks, and second key members of the second connector are adapted to threadedly receive thereinto the threaded forward jackscrew shanks to fasten together the matchingly keyed connectors after keying and mating thereof, the system comprising:
- said first key members each have a keying projections extending forwardly to a leading end;
- said second key members each have a keying projection cooperable with a said first key member keying projection, each said second key member keying projection extending forwardly to a leading end and having an aperture means extending thereinto from said leading end, said aperture means being threaded to correspond to said threaded forward shank of a respective said jackscrew for said jackscrew to threadedly engage said second key member during connector fastening upon rotation of said jackscrew; and
- said first and second keying projection leading ends being chamfered at edges engageable with each other upon the leading ends meeting each other during connector mating, and said jackscrew leading ends being at least tapered peripherally therearound and shaped and positioned with respect to said first key member leading ends in a manner minimizing susceptibility of said jackscrew leading ends to being at least laterally stressed upon incidental engagement therewith by foreign objects,
- whereby in mating, matchingly keyed connectors the key members relatively adjust their angular alignment for their keying projections to pass by each other during keying, and said jackscrew adjusts its angular alignment to enter the threaded aperture of the respective second key member and begin threaded engagement therewith almost immediately after said leading ends of said keying projections of said first and second key members begin to pass by each other, thereby overcoming possible slight relative angular misalignment of said jackscrews and said key members.

4,929,185
PRINTED CIRCUIT BOARD ASSEMBLY
Daniel T. Wong, West Columbia, and Floyd G. Speraw, Lexington, both of S.C., assignors to NRC Corporation, Dayton, Ohio
Filed Apr. 3, 1989, Ser. No. 331,915
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—74 **23 Claims**



1. A device for joining and separating first and second printed circuit boards connectable by a socket on one of said boards and a plurality of pins projecting from the other of said boards, comprising:
- a screw held captive to said first board but rotatable therein;
- means for preventing longitudinal movement of said screw relative to said first board; and
- a spacer fastened to said second board and having a threaded hole for receiving said screw;
- wherein said pins are inserted into and withdrawn from said socket by the engagement and disengagement, respectively, of said threaded hole by said screw.

4,929,186
CIRCUIT BOARD TERMINAL ASSEMBLY
Ferdinand Steinkuhle, Paderborn-Wewer; Klaus Strate, Detmold; Willi Dürkop, Reinheim, and Ulrich Möller, Detmold, all of Fed. Rep. of Germany, assignors to C. A. Weidmüller GmbH & Co., Fed. Rep. of Germany
Filed Mar. 23, 1989, Ser. No. 327,698
Claims priority, application European Pat. Off., Mar. 26, 1988, 88 104910.0
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—78 **4 Claims**



1. An electrical terminal assembly, comprising
(a) a generally planar circuit board having electrical conductor strips arranged thereon in a predetermined configuration;
(b) a plurality of electrical terminal means mounted on said circuit board, said terminal means including
(1) at least one connector terminal adapted for electrical connection with at least one flexible-wire type electrical conductor and with said circuit board conductor strips; and
(2) at least one functional adapted for electrical connection solely with said circuit board conductor strips, whereby said functional terminal is selectively electrically connected with said connector terminal via said circuit board conductor strips; and
(c) each of said at least one connector and functional terminals including plural side walls containing interfitting

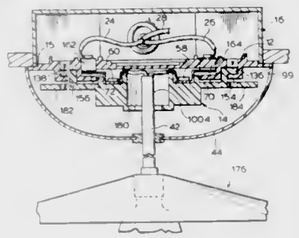
means for mechanically connecting adjacent terminals together whereby said connector and functional terminals can be joined to one another and also joined in rows of like ones of said connector and functional terminals.

4,929,187

LIGHT FIXTURE CONNECTOR

Trudy M. Hudson, and Henry R. Hudson, both of 10819 63 Avenue, Edmonton, Alberta, Canada (T6H 1P9)

Filed Apr. 12, 1989, Ser. No. 336,695
Claims priority, application Canada, Nov. 25, 1988, 584099
Int. Cl.[5] H01R *13/625*
U.S. Cl. 439—334 19 Claims



1. An electrical coupling device for detachably securing a fixture to an electrical junction box, said coupling device comprising male and female interconnecting components, said fixture being connected to said female component when said male component is secured to said female component by rotating one component relative to the other, said female component having a plurality of catches, said male component having a plurality of studs for insertion and engagement with said catches by way of rotational movement of said studs into said catches, said catches and studs being spaced apart in circular arrays at a first radius, the improvement comprising:

(1) at least two spaced-apart female resilient clips of electrically conductive metal, said clips being in a circular pattern at a second radius on said female component;

(2) said male component having at least two spaced-apart contacts of electrically conductive metal, said contacts being located in a circular pattern at said second radius;

(3) said male contacts being in register with said clips when said studs are in register with said catches,

rotation of said male component to engage said studs with said catches simultaneously engages said contacts with said clips to depress said clips slightly to ensure electrical contact.

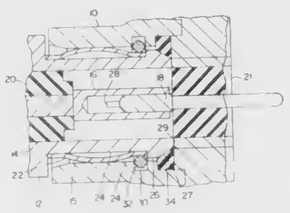
4,929,188

COAXIAL CONNECTOR ASSEMBLY

Gene Lionetto, Milford, and Stephen Brown, Derry, both of N.H., assignors to M/A-Com Omni Spectra, Inc., Merrimack, N.H.

Filed Apr. 13, 1989, Ser. No. 337,363
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—349 7 Claims

1. A micro-miniature coaxial connector comprising, in combination, a male half and a female half having facing surfaces, and an annular electrical spring contact member which functions to provide continuous annular outer conductor electrical contact and RFI suppression, wherein the annular spring member provides continuous annular outer conductor contact between facing surfaces at said male and female surfaces even during slight conductor misalignment, said spring being retained on said female member by a groove adjacent the outer end thereof, said outer end being tapered away from a collar defining the outer end of the groove towards its axis, an engaging diameter of outer end of said male connector half having a tapered surface adjacent to said tapered end of said female connector half to aid in aligning said halves when mating, said male member being at least 5% larger in diameter than the diameter of said female member adjacent the collar and said spring member extending at least 5% beyond the diameter of said collar; and a snap ring of larger outer diameter than said male surface and of smaller inner diameter than said collar



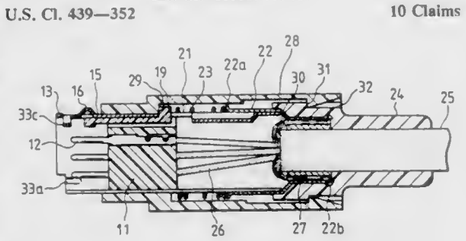
carried in a groove in said male surface into which the snap ring can expand when the female member is inserted into engagement with the male surface, said lock ring contrating into said groove behind the collar when said surfaces are in full engagement to lock said surfaces against axial movement.

4,929,189

CONNECTOR WITH LOCKING MECHANISM

Shigemi Sekiguchi, Kiryu, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Mar. 30, 1989, Ser. No. 330,534
Claims priority, application Japan, Apr. 13, 1988, 63-50105[U]
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—352 10 Claims



1. A connector with a locking mechanism comprising:

an elongated body of synthetic resin having contact pins therein, said body having a guide groove formed in its outer peripheral surface and extending in the lengthwise direction of said body;

a cylindrical metal cover which receives said body therein, said cover having a U-shaped groove cut in a forward portion thereof to define a tongue that is substantially in level with a peripheral wall of said cylindrical metal cover, said tongue having a front end portion which includes a radially outward locking protrusion and having a rear end portion which is connected integrally with said cylindrical metal cover;

an elastic piece of an elastic synthetic resin material which carries at a rear end thereof a drive member formed integrally therewith, said elastic piece being inserted into said cylindrical metal cover through a slot formed therein and being guided in said guide groove of said body so that said elastic piece is held in contact with the underside of said tongue in slidable relation relative to said tongue, said drive member being held in the outside of said cylindrical metal cover;

a metal shell mounted on a rear end portion of said cylindrical metal cover;

a coiled spring mounted around said cylindrical metal cover and interposed between said drive member and said metal shell;

a bush of synthetic resin which is fixedly mounted on said metal shell for protecting a cable which is led out therefrom; and

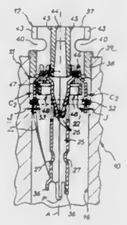
a cylindrical unlocking member which covers said bush, said metal shell and said cylindrical metal cover, said unlocking member being engaged with said drive member for selectively shifting said elastic piece in a rearward direction.

4,929,190

INSULATION DISPLACEMENT CONNECTOR

Jean-Louis Gonon, and Pierre Moulin, both of Saint-Marcellin, France, assignors to Arnould Fabrique d'Appareillage Electrique, Saint-Marcellin, France

Filed Oct. 12, 1988, Ser. No. 256,859
Claims priority, application France, Oct. 13, 1987, 87 14105; Jun. 24, 1988, 88 08509
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—409 27 Claims



1. An insulation displacement connector comprising an insulative material body and in said body a generally tubular metal contact member including inner and outer part-cylindrical shell members, said outer shell member being a floating shell member and extending circumferentially in cantilever fashion from a root generatrix, said floating shell member being elastically radially deformable relative to the root generatrix between a radially inward position in an unstressed condition of said connector and a radially outward position in a stressed condition of said connector, said inner and outer shell members having respective inner and outer lips, a slit being defined between said inner and outer lips and extending around at least part of the circumference of said contact member, and a barrel member rotatable about an axis of said connector and adapted to force an electrical conductor into said slit, there being peripheral clearance between said floating shell member and said insulative material body at least in the unstressed condition of said connector whereby the floating shell member permits the connector to accommodate electrical conductors of different diameters.

4,929,191

BATTERY CABLE CLAMP APPARATUS

Raymond A. Dufresne, 2937 E. Oraibi Dr., Phoenix, Ariz. 85024

Filed May 23, 1989, Ser. No. 355,404
Int. Cl.[5] H01R *11/26*
U.S. Cl. 439—429 13 Claims

1. Battery cable clamp apparatus for securing a cable to a battery post, comprising, in combination:

dielectric block means for covering the battery post, including

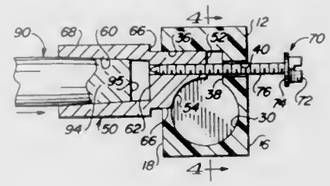
a dielectric block,

a first bore in the dielectric block for receiving a battery post, and

a second bore in the dielectric block intersecting the first bore;

conductive connector means extending into the second bore of the dielectric block means for connecting the cable to the battery post, including

a first connector bore for receiving a portion of the cable, and



an electrical contact portion extending into and movable in the first bore in the block and contacting the battery post to provide electrical contact between the connector means and the battery post; and

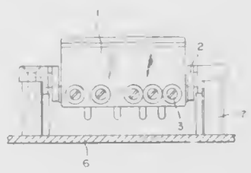
means for securing the conductive connector means to the dielectric block and to the battery post.

4,929,192

CONNECTION AND FIXING SYSTEM FOR ELECTRONIC UNIT

Gian Pietro Beghelli, Via J. Barozzi 6, Monteveglio (BO), Italy

Filed Jun. 29, 1988, Ser. No. 213,174
Int. Cl.[5] H01R *13/60*
U.S. Cl. 439—534 6 Claims



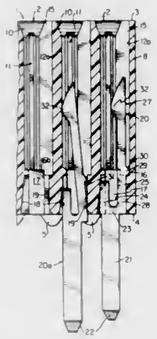
1. An electrical connection system comprising a first housing part provided with an electrically-operated device with terminals for supplying electrical power to said device, a second housing part adapted to be releasably connected to the first housing part, the second housing part including a connector for electrically connecting said terminals of said device to an electrical supply, the connector including electrical contacts for receiving said terminals and connections for leads from said supply, wherein said connector has a pivotal mounting on supports in said second housing part for selective pivotal movement of the connector between first and second pivotal positions respectively facilitating attachment of the terminals to said contacts and attachment of the leads to said connections, a third housing part in the form of a cover and adapted to be releasably connected to said first and second housing parts over the first housing part, so that the third housing part acts as a shield for at least the first housing part and the electrically-operated device, and fastener means for releasably connecting said first, second and third housing parts together.

4,929,193

CONNECTOR

Robert Taylor, Coventry, R.I., assignor to North American Specialities Corporation, N.Y.

Filed Nov. 22, 1988, Ser. No. 275,225
Int. Cl.[5] H01R *13/428, 13/73*
U.S. Cl. 439—567 4 Claims



1. A connector adapted to an interface between a printed circuit board and a circuit component or plug having a terminal pin, the connector comprising:

an insulating block including a channel which extends substantially the depth of the block between a top surface and a bottom surface of said block, said channel being sized to accept a pin of a connecting component or plug therein, the block further including a slot in a wall of said channel, the block further including a socket at an end of said channel at said bottom surface; and

a contact insertable through said bottom surface into said slot and being in said slot, said contact including a terminal end, a mounting section and a contact arm, the mounting section being sized to engage said socket of the connector block, said contact arm being sized for resilient retention in said slot, said contact arm including means for engaging a terminal pin disposed within said channel, said contact arm extending from the mounting section and including a projection which extends into the channel, a gap existing between the contact arm and a wall of said slot prior to insertion of a pin within the channel, the contact arm being resiliently disposed within the slot, each contact arm further including locking means extending from the contact arm which is matable with a corresponding step disposed in the slot in the insulating block to prevent removal of said contact from said insulating block through said bottom surface, said socket including a slanted wall and a vertical wall, and said contact having a short leg engageable with said slanted wall when said contact is placed in said socket, the vertical wall being engagable by a portion of the contact arm.

4,929,194

POST MEANS FOR USE WITH A MOLDED CONNECTOR

Iosif Korsunsky, Harrisburg, and Richard C. Schroepfer, Thompsontown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

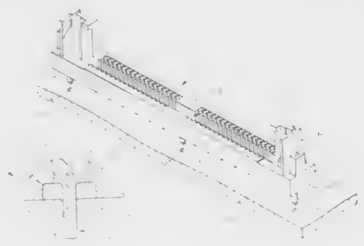
Filed Aug. 18, 1988, Ser. No. 234,362
Int. Cl.[5] H01R *13/13*
U.S. Cl. 439—571 16 Claims

1. A connector comprising:

a housing having a first surface and a second surface;

a cavity provided in the housing, the cavity extending from the first surface toward the second surface, the cavity having cavity side surfaces and a cavity bottom surface;

a projection provided proximate the cavity bottom surface, the projection extends from the cavity bottom surface toward the first surface, the projection extends beyond the first surface, such that a free end portion of the projection is provided beyond the housing, a midportion of the projection extends from the free end portion to a fixed end portion which is proximate the cavity bottom surface;



ribs which extend into the cavity, at a position which is proximate the first surface of the housing, the ribs extend from the cavity side surfaces toward the projection, ends of the ribs are provided adjacent the midportion the projection;

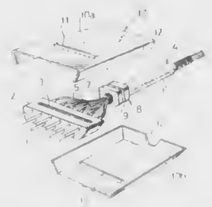
whereby as forces are applied to the free end portion of the projection, the midportion of the projection cooperates with the ribs so that the forces are distributed through the midportion, thereby preventing the failure of the projections.

4,929,195

SHIELD CONNECTOR

Masami Seidoh, Tokyo, Japan, assignor to Jupiter Dentsu Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 15,118, Feb. 17, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 257,817
Claims priority, application Japan, Feb. 21, 1986, 61-22938
Int. Cl.[5] H01R *9/03*
U.S. Cl. 439—610 1 Claim



1. A shield connector for multi-core shield cable, said cable having an insulated coating, a shield coating, and a plurality of core wires, said connector comprising:

an insulated holding member on the end of said cable and having a plurality of contacting elements implanted therein, said plurality of core wires being connected to the contacting elements;

a stopper on the end of said cable, the stopper having an annular groove in the surface thereof and being formed integrally with the insulated coating;

a shield case on the end of the cable and covering the holding member and contacting elements, said case being formed by joining two shield case pieces, said case having a hole therein, the edge of said hole engaging said annular groove of said stopper;

one of said shield case pieces being constructed to have outwardly flared sides, the other thereof being constructed to have inwardly narrowed sides, and when said pieces are engaged with each other, said case is formed to a tubular shape having a trapezoidal cross section;

an attaching flange surrounding the shield case pieces to hold them together and for securing the shield connector to a complimentary connector;

means for maintaining said case in position on said holding member, including an inwardly directed projection on at least one of said shield pieces and a recess in said holding member for receiving said projection; and

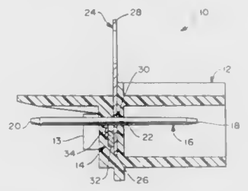
the attaching flange being formed around the shield case pieces and into the inwardly directed projection on at least one of the pieces so as to maintain the attaching flange on the pieces.

4,929,196

INSERT MOLDED FILTER CONNECTOR

Timothy R. Ponn, Aurora; Mark Gutierrez, Joliet, and Robert J. Gugelmeyer, Aurora, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Aug. 1, 1989, Ser. No. 387,731
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 15 Claims



1. A filter connector having a plurality of electrically conductive terminals, a ground disposed in spaced relationship to the terminals and a plurality of capacitors, each said capacitor being electrically connected to the ground and to one of said terminals, wherein the improvement comprises:

a molded plastic housing defining a continuous unitary plastic matrix surrounding at least the capacitors, portions of the ground electrically connected to said capacitors and resilient generally "L" shaped electrically conductive connector means separate from said capacitors and said terminals for electrically connecting portions of the terminals to the capacitors, each said connector means having two legs generally perpendicular to each other, a side of one leg being electrically attached to a respective said capacitor and a side of the other leg being electrically attached to a side of a respective said terminal where the longitudinal axis of said other leg and said terminal are generally parallel to one another,

whereby the unitary matrix of plastic material simultaneously insulates and supports the capacitors, the ground, the terminals, and the connections therebetween.

4,929,197

HIGH DENSITY CONNECTOR

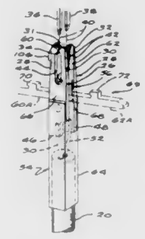
Robert E. Finney, Los Angeles, Calif., assignor to ITT Corporation, New York, N.Y.

Filed May 30, 1989, Ser. No. 357,832
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—660 15 Claims

1. In a connector which has a plurality of contacts, the improvement comprising:

first and second dual-arm socket contacts, each having a forward mating end portion with a pair of arms for receiving between them a plug contact moving along a mating path, and a rearward end portion, said socket contacts lying primarily in a pair of spaced parallel planes;

a dielectric support having a spacer portion of about the same thickness as the space between the forward portions of said contacts, said spacer portion lying between said contacts;



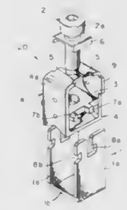
said dielectric support having a rearward portion molded tightly to said contact rearward end portions, but said arms of said contact forward end portions being free to deflect apart and together independently of said spacer portions.

4,929,198

CONDUCTOR CONNECTION ASSEMBLY

Rüdiger Strate; Rainer Schulze, both of Detmold; Michael Schnatwinkel, Herford; Georg Wagner, Oerlinghausen; Manfred Wilmes; Bernd Haller, both of Detmold; Ernst Herkner, Lemgo; Jörg Diekmann, Bielefeld, and Herbert Henning, Detmold, all of Fed. Rep. of Germany, assignors to C. A. Weidmüller GmbH & Co., Fed. Rep. of Germany

Filed Mar. 23, 1989, Ser. No. 327,604
Claims priority, application European Pat. Off., Mar. 26, 1988, 88104911.8
Int. Cl.[5] H01R *4/38*
U.S. Cl. 439—709 9 Claims



1. A conductor connector assembly, comprising

(a) a generally U-shaped receptacle adapted for receiving a conductor for connection with a bus bar, said receptacle including a bottom wall and a pair of opposed spaced side walls arranged normal to said bottom wall, said side walls each containing at least one recess having a vertically accessible offset portion; and

(b) means connected with said receptacle for clamping the conductor therein, said clamping means including

(1) a screw arranged between and parallel to said receptacle side walls and having a screw axis;

(2) a collar connected with said screw and having a configuration for insertion into said receptacle; and

(3) a nut threadably connected with said screw and including at least one lateral projection on and protruding from opposite sides thereof for insertion into said recep-

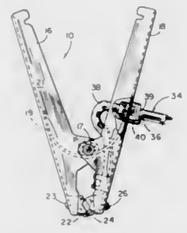
tacle wall recesses, respectively, whereby when said clamping means are initially vertically inserted into said receptacle and then laterally displaced in a direction normal to said screw axis without being rotated, said nut projections are arranged in said receptacle recess offset portions, and when said screw is tightened, said collar is displaced toward said receptacle bottom wall relative to said nut and said receptacle side walls to clamp the conductor against said receptacle bottom wall.

4,929,199

BATTERY CABLE CLIP AND CABLE CONNECTION

Donald C. McKinnon, Cheboygan, Mich., assignor to Ferret, Cheboygan, Mich.

Filed Jul. 13, 1988, Ser. No. 218,135
Int. Cl.[5] H01R *4/48*
U.S. Cl. 439—759 **4 Claims**



1. An automobile battery clip comprising:
a pair of substantially identical legs;
a pivot member joining said pair of legs;
a spring positioned about said pivot member and extending away from the pivot member toward the end of each of said pair of legs, which form a handle, to force the two opposite ends of said pair of legs into tight contact;
a pair of co-acting jaws fastened on the inner surface of the contacting ends of said legs with one jaw being connected to each of said legs so that said pair of jaws is normally biased in a tightly closed condition;
a cable clamp on one jaw of said pair of jaws; and
a heavy electrical conductor having one end held by said cable clamp and extending away from said clamp along the inside of one of said legs to an aperture formed in said leg approximately midway between the ends of said leg where said heavy electrical conductor is bent at approximately a 90° angle to pass through the aperture in a direction substantially orthogonal to the longitudinal axis of said leg.

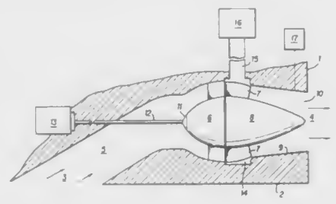
4,929,200

VESSEL PROVIDED WITH AT LEAST ONE WATER JET PROPULSION UNIT

Jean-Pierre Guezou, Athis-Mons, and Jacques Pichard, Meudon, both of France, assignors to L'Etat Francais, France

Filed Nov. 16, 1988, Ser. No. 272,013
Claims priority, application France, Nov. 16, 1987, 87 15782
Int. Cl.[5] B63H *11/00*
U.S. Cl. 440—38 **10 Claims**

9. A vessel provided with at least one water jet propulsion unit comprisiing a water intake at a tangent to the hull and a rear outlet for the water, an axial impeller, flow-correction guide vanes and a tail cone carried on the vanes which, together with a surrounding casing from the tail pipe, wherein the cross section area of water flow through the tail pipe is varied within narrow limits between the vanes and the outlet by a volume of gas introduced in the tail pipe by means comprising gas injection nozzle placed in the area of the vanes and connected to a means of supply of compressed gas.



4,929,201

VARIABLE PITCH MARINE PROPELLER SYSTEM

Donald R. Pitt, Murray, Utah, assignor to Vari-Prop, Inc., Salt Lake City, Utah

Filed Apr. 6, 1987, Ser. No. 34,718
Int. Cl.[5] B63H *3/00*
U.S. Cl. 440—50 **11 Claims**



1. A variable pitch marine propeller system comprising: two removable symmetrical propeller blades with cylindrical bases each having a drive lug attached proximate the driving edge of the point of attachment of each blade, a sliding block activated by drive means mounted between the bases of the propeller with vertically aligned slots into which the drive lugs are inserted to hold said blades by the bases to align and simultaneously rotate the pitch of said blades in equal and opposite directions in response to movement of the sliding block;
a hub sub-assembly encasing the coupling means and bases of the blades and structured to journal mount and allow said blades to pivot and assume a forward or rearward pitch, and having a front end, and a rear end capable of mounting onto a drive shaft;
biasing means associated with the coupling means to initially position said coupling means in a position which holds said blades in a rear pitch configuration; and drive means associated with the sliding block to provide a predetermined fixed pressure on said sliding block to alter the biasing
means pressure and move said sliding block to a position which causes the blades to assume the desired forward or rearward blade pitch.

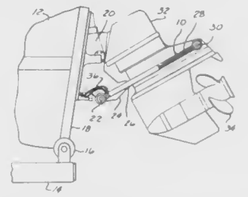
4,929,202

POWER TRIM CYLINDER PROTECTIVE LOCKING DEVICE FOR AN INBOARD/OUTBOARD BOAT MOTOR

John J. Tengelitsch, 13103 Red Bud Trail, Buchanan, Mich. 49107

Filed Mar. 13, 1989, Ser. No. 322,646
Int. Cl.[5] F15B *15/26*
U.S. Cl. 440—55 **6 Claims**

1. A support device for maintaining an outboard unit of a boat engine in a tilted position for travel, said outboard unit having a stationary drive shaft housing attached to a boat transom, a movable propeller drive unit pivotally mounted with respect to the stationary drive shaft housing, and trim means including a cylinder, a hydraulically operated piston, and an actuator rod engaged between the movable propeller drive unit and the stationary drive shaft housing for tilting the movable propeller drive unit to a desired angle between a lowered position and a raised position, the support device comprising:
a single-piece, elongated rigid plastic sleeve having a longitudinal axis and a radial slot extending along the entire longitudinal length of the sleeve; and
a semi-rigid styrofoam lining adhesively secured within the sleeve extending along the entire longitudinal length of the sleeve; the lining having a longitudinal key-hole-shaped aperture in transverse cross section communicating with the radial slot through the sleeve, such that with the trim means in the raised position and the actuator rod extended, the sleeve is engageable over the actuator rod for supporting the movable propeller drive unit in the raised position for travel, wherein the sleeve engages against the cylinder at one end and against a pivot support of the actuator rod at another end, and the styrofoam lining substantially covers the actuator rod for protecting the actuator rod against nicks and abrasions.

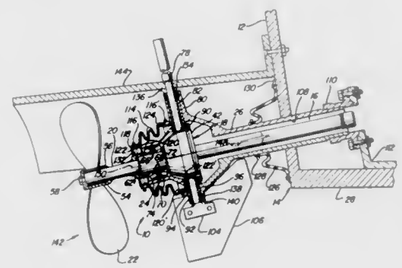


4,929,203

MARINE PROPELLER DRIVE SYSTEM

Steven C. Haho, Mt. Clemens, Mich., assignor to GKN Automotive, Inc., Auburn Hills, Mich.

Continuation of Ser. No. 163,778, Mar. 8, 1988, abandoned. This application Aug. 22, 1989, Ser. No. 397,378
Int. Cl.[5] B63H *25/42*
U.S. Cl. 440—75 **25 Claims**



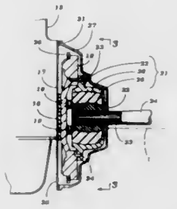
1. A marine propeller drive system for a boat having a power plant and a propeller comprising:
an inner propeller shaft having a first end connectable to said power plant and a second end;
a constant velocity universal joint having a first end connected to said second end of said inner propeller shaft, said universal joint having a second end articulatable with respect to said first end about an articulation axis;
an outer propeller shaft having a first end connected to said second end of said universal joint and a second end connectable to said propeller;
an inner thrust housing having a first end connected to said boat and a second end adjacent to said universal joint, said inner thrust housing enclosing at least a portion of said inner propeller shaft;
an outer thrust housing pivotably connected to said second end of said inner thrust housing about a vertical pivot axis coincident with said articulation axis, said outer thrust housing rotatably supporting said outer propeller shaft;
a thrust bearing connected between said outer propeller shaft and said outer thrust housing transferring the axial forces generated by said propeller on said outer propeller shaft to said outer thrust housing;
a skag plate connected to said outer thrust housing and pivotable therewith, said skag plate extending downward from said outer thrust housing and forward of said vertical pivot axis; and
means for angularly displacing said outer thrust housing with respect to said inner thrust housing about said vertical pivot axis.

4,929,204

WATER ENTRY PREVENTING STRUCTURE FOR INBOARD/OUTBOARD MOTOR

Shigeki Shiozawa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Nippashi, Japan

Filed Aug. 19, 1988, Ser. No. 262,723
Claims priority, application Japan, Aug. 20, 1987, 62-206647
Int. Cl.[5] B63H *21/30*
U.S. Cl. 440—112 **17 Claims**



1. In a marine inboard/outboard drive comprising an engine adapted to be positioned within a hull and driving a propulsion device positioned externally of the hull and in which said propulsion device includes an input shaft that extends through the hull into proximity to said engine, said engine having an output shaft, and an elastic flexible coupling driven by said output shaft, said input shaft having a splined connection to said flexible coupling for driving said input shaft from said engine output shaft, said elastic flexible coupling having sufficient resilience to accommodate angular misalignment between said engine output shaft and said input shaft, the improvement comprising a housing affixed to said engine and completely enclosing said flexible coupling, said housing having an enlarged opening through which the input shaft passes, said enlarged opening being sufficiently larger than said input shaft to accommodate angular misalignment, and means for precluding leakage through said housing opening.

4,929,205

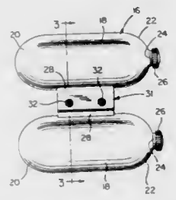
LEG IMMOBILIZER-DRAG FOR TRAINING SWIMMERS

Elene K. Jones, 1571 Hillview Dr., Sarasota, Fla. 33579

Filed Oct. 7, 1988, Ser. No. 254,720
Int. Cl.[5] A63C *5/00*
U.S. Cl. 441—60 **8 Claims**

1. A training leg immobilizing drag for swimmers, said drag including a pair of side-by-side elongated and laterally spaced

apart substantially rigid bodies joined by a thin connecting flange assembly extending therebetween, said bodies being streamlined in shape for longitudinal movement through water with little resistance, said connecting flange assembly being at least substantially rigid and at least substantially rigid with said bodies, said bodies including portions adjacent said connecting flange assembly of a cross sectional shape such that when said drag is held between closely adjacent thighs of a swimmer, with said bodies extending along said thighs and said connecting flange assembly passing between said thighs, the adjacent portions of said thighs are primarily seated against said adjacent portions of said bodies on opposite sides of said connecting flange assembly as opposed to being primarily seated against said connecting flange assembly, said bodies being hollow and including fluid ingress and egress ports having fluid tight closures removably associated therewith, said bodies including a pair of corresponding end walls and said ports being formed in said corresponding end walls of said bodies.



4,929,206

SWIM FIN WITH FLEXIBLE FIN MEMBER HAVING MOVABLE TIPS

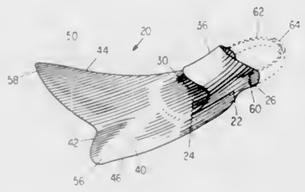
Robert B. Evans, 28 Anacapa St., Santa Barbara, Calif. 93101

Continuation of Ser. No. 311,436, Oct. 14, 1984, abandoned. This application Nov. 16, 1984, Ser. No. 662,443

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] A63B *31/08*

U.S. Cl. 441—64 **10 Claims**



1. A swim fin adapted to be mounted onto a foot of a swimmer comprising

a foot receiving portion having a substantially planar base section terminating at one end thereof in an integrally downwardly extending heel section and terminating at the other end thereof in an open toe section which encloses only the upper portion of the foot;

an elongated flexible fin member formed of a resilient material and being integral with and extending from said substantially planar base section of the foot receiving portion, said elongated flexible fin member being generally trapezoidal in shape having a short end, a deflectable end, sloping sides and an upper surface and a lower surface with the short end thereof positioned adjacent the open toe section of said foot receiving portion and with the deflectable end thereof terminating in a pair of upwardly extending, symmetrically spaced movable tips, which are deflectable, said elongated flexible fin member having along a line normal to a center line extending substantially perpendicular between said short end and said deflectable end of the elongated flexible fin member a cross-sectional shape which varies its thickness from a center thickness to a relatively smaller thickness to define a valley in each side of the lower surface of the elongated flexible fin member and then back to a slightly greater thickness which then tapers from each slightly greater thickness to the thin edge of each of the sloping sides of said elongated flexible fin member;

said elongated flexible fin member being responsive to a force being urged against the lower surface thereof to flex its deflective end including the movable tips formed thereon through an arcuate shaped path towards the open toe section and being responsive to an abrupt reversal in the urging force from the lower surface to the upper surface to immediately deflect the deflectable end of said elongated flexible fin member toward said heel portion of said foot receiving portion which moves said movable tips along an arcuate shaped path as the deflectable end is urged towards said heel section causing the movable tips to exhibit a snapping action wherein the movable tips abruptly reverse direction and extend toward the heel section of the foot receiving portion wherein the combination of the deflection of the deflectable end and the snapping action of the movable tips are capable of producing a propelling force as said elongated flexible fin member is subjected to abrupt reversal of forces on its upper surface and lower surface.

4,929,207

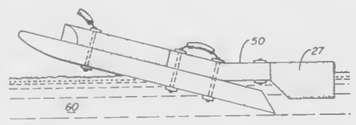
BODY SURFBOARD WITH ADDED FLOTATION

John A. Piatt, 226 Getchell St., Santa Cruz, Calif. 95060

Filed Feb. 16, 1989, Ser. No. 310,957

Int. Cl.[5] B63B *43/14*

U.S. Cl. 441—65 **3 Claims**



1. The method of adding buoyancy to a a body surfboard having front, side and rear edges, comprising the steps of:

providing a pair of buoyant float members which, when fixed to the surfboard adjacent the side edges thereof, are sufficiently small to allow a swimmer's upper torso to fit on the planar member between the float members;

drilling holes in said float members and said surfboard;

passing fasteners through said float members and surfboard and fastening said fasteners to hold the float members on said surfboard; and

including a buoyant extension fixed to each float member to extend past the rear edge of said surfboard and flex relative to the attached float member to add buoyancy and stability to the surfboard.

4,929,208

SURFBOARDS FOR DOING AERIALS

Joseph P. Corica, 2308 Altisma #222, Carlsbad, Calif. 92008

Filed Apr. 7, 1989, Ser. No. 334,344

Int. Cl.[5] A63C *15/00*

U.S. Cl. 441—75 **13 Claims**

13. The improvement in an elongated surfboard, comprising:

(a) an elongated flexible member having its ends secured in said surfboard to be pulled on by a surfer to press said surfboard against his feet, said flexible member elongating under force and extending above the upper surface of said surfboard to a height convenient to be held by a surfer standing on said surfboard, said flexible member retracting when it isn't grasped by a surfer,

(b) the ends of said flexible member being disposed generally in the area of the surfboard upon which a surfer stands and located rearward of the center of the surfboard longitudinally thereof and

(c) an elongated handle attached to said flexible member at each end of said handle and attached centrally of said flexible member to facilitate grasping by a surfer, said handle being pliable so as to give under the weight of a surfer lying on said surfboard.



4,929,209

METHOD OF AGING CATHODE-RAY TUBE

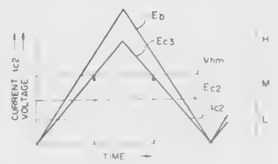
Teruo Matsuo; Tadayoshi Ibara, and Yoshinori Oyamada, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,352

Claims priority, application Japan, Sep. 18, 1987, 62-232158

Int. Cl.[5] H01J *9/00*

U.S. Cl. 445—6 **6 Claims**



1. A method of aging a cathode-ray tube having a cathode capable of emitting an electron beam, a first electrode for limiting said electron beam, a second electrode for accelerating electrons of the limited electron beam, a third electrode for focusing the accelerated electron beam and an anode, all being housed in an envelope, the method comprising the steps of:

energizing said cathode so that an electron beam is emitted therefrom with D.C. voltages applied to said first and second electrodes, the applied D.C. voltages being substantially equal to respective rated voltages for said electrodes; and

applying first and second voltages to said third electrode and said anode for a predetermined time, respectively, said first and second voltages being time-varying within first and second zones, each of said zones being between a first level lower than said D.C. voltage to be applied to said second electrode and a second level higher than the highest one of voltages on said third electrode with which an electric current flows in said second electrode with said electron beam emitted from said cathode, said first time-varying voltage being in phase with and lower than said second time-varying voltage, said first time-varying voltage varying so as to be at a level between said first and second levels at least for a part of said predetermined time.

4,929,210

CATHODE-RAY TUBE SUPPORTING RACK

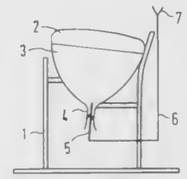
Walter Kornaker, Ulm, Fed. Rep. of Germany, assignor to Nokia Graetz, Pforzheim, Fed. Rep. of Germany

Filed Oct. 21, 1985, Ser. No. 789,717

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1984, 3439198

Int. Cl.[5] H01J *9/50*

U.S. Cl. 445—73 **3 Claims**



1. A rack for supporting a cathode-ray tube during attachment of a faceplate and a bulb together with a glass solder while being moved through a continuous furnace comprising, purge gas tubing mounted to said rack including an exit portion extending into a neck portion of the bulb, the exit portion of the tubing which extends into the neck being flexible, said tubing including a free end positioned above the rack defining an inlet, said free end inlet configured to receive said purge gas blown thereinto.

4,929,211

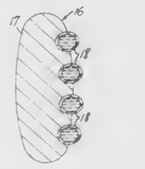
HAND HELD TACTILE TOY

Susan D. Resnick, New York, N.Y., and Angela M. Nuyens, Nashville, Tenn., assignors to Softspot, Inc., Nashville, Tenn.

Filed Dec. 2, 1988, Ser. No. 278,905

Int. Cl.[5] A63H *33/00, 3/52;* **A63B** *11/08*

U.S. Cl. 446—14 **18 Claims**





1. A tactile relaxation object comprising a hard body sized to fit within an adult human hand and having a smooth surface containing at least one cavity, each said cavity containing and filled by a generally round, smooth resilient soft body, a substantial portion of which protrudes from and extends beyond

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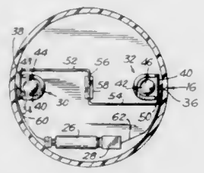
said smooth surface of the hard body and which comprises an outer elastomeric shell and an inner viscous fluid whereby an adult would be able to hold said tactile object and manipulate said soft body.

4,929,212

AERIAL TOY WITH ON-BOARD SIGNALING DEVICE

Shing-Lam Li, Tuen Mun, Hong Koog, assignor to Antibes, Inc., Monrovia, Liberia

Filed Jul. 27, 1989, Ser. No. 385,424
Int. Cl.[5] A63H *27/00*
U.S. Cl. 446—47 **8 Claims**



1. An aerial toy, comprising:
(a) a disc-shaped body having a central axis about which the body spins in a sustained flight when the body is hurled into the air, thereby generating centrifugal force;
(b) an actuatable, electrically-powered signaling means supported by the body, and operative for producing a distinctive signal when actuated;
(c) a battery supported by the body, and operative for supplying electrical power for the signaling means; and
(d) means for actuating the signaling means only during flight, including a pair of centrifugally-actuated electrical switches both located off the central axis on the body, both switches being switchable substantially simultaneously between first-switched states in which the battery is electrically disconnected from the signaling means, and second switched states in which the battery is electrically connected to the signaling means for actuating the same and producing said distinctive signal only during flight, said switches being mounted diametrically opposite each other and equidistant from the central axis, each switch including a stationary contact, a movable contact, and a pushing means for pushing a respective movable contact into engagement with a respective stationary contact under the influence of the centrifugal force, each movable contact being a resilient arm normally biased away from a respective stationary contact.

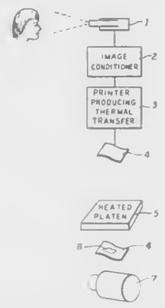
4,929,213

FLEXIBLE FOAM PICTURES

Richard H. Morgan, 134 S. Gain St., Anaheim, Calif. 92804

Filed Jun. 26, 1989, Ser. No. 371,625
Int. Cl.[5] A63H *3/16, 3/02, 3/36;* B41M *3/12*
U.S. Cl. 446—97 **4 Claims**

1. A method of creating a colored image on flexible plastic foam, comprising:
recording the image on magnetic tape by conventional videotaping methods, and
repeatedly scanning a single frame on a thermal transfer printer of the type in which wax is deposited on the surface of the flat transfer itself, and
placing the transfer against a formed three dimensional flexible plastic foam surface and pressing said foam surface flat and heating said transfer to cause the wax to migrate to the foam, and stripping the



backing from the transfer, whereby the colored image is created on the formed flexible plastic foam surface.

4,929,214

INFLATABLE ENCLOSURE AND MEANS TO INFLATE SAME

Ron B. Liebermann, 2805 Lime Kiln La., Louisville, Ky. 40222

Filed Nov. 2, 1987, Ser. No. 115,372
Int. Cl.[5] A63H *27/10;* B63B *22/22;* B63C *9/12*
U.S. Cl. 446—221 **6 Claims**



1. An inflatable enclosure comprising:
(a) a fracturable first envelope;
(b) a first reactive component of a multi-component gas generating chemical system contained within said first envelope;
(c) a second non-inflatable, air permeable envelope in fluid-communication with said first envelope upon fracture of said first envelope wherein said first envelope is affixed inside the entire interior surface of the second envelope;
(d) a second reactive component of said gas generating chemical system contained within said second envelope; and
(e) a third envelope fabricated of a fluid-impermeable, gas-impermeable material surrounding said second envelope wherein said second envelope is affixed to the inside surface of the third envelope.

4,929,215

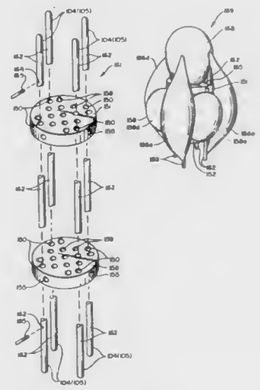
BALLOON SCULPTURING METHODS, APPARATUS AND PRODUCTS

Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240

Division of Ser. No. 183,720, Apr. 19, 1988, Pat. No. 4,850,926.
This application Jun. 21, 1989, Ser. No. 369,657
Int. Cl.[5] A63H *3/06, 33/08;* A21B *1/00*
U.S. Cl. 446—226 **9 Claims**

1. A basic balloon building block for forming a balloon sculpture from at least one (1) balloon of the type having a constricted neck portion terminating at one end in an inflation aperture and at the other end in an imperforate inflatable sidewall, said basic balloon building block comprising, in combination:
(a) a skeletal frame-like balloon former including:

(i) a first disk-like coupling device having a plurality of peripherally spaced axial bores formed therein;
(ii) a second disk-like coupling device having a plurality of peripherally spaced axial bores formed therein; and,
(iii) a plurality of rigid rod-like former elements each having a first portion mounted within respective different ones of said plurality of axial bores in said first disk-like coupling device and a second portion spaced axially from said first portion mounted within respective different ones of said plurality of bores in said second disk-like coupling device, said plurality of rigid rod-like former elements and said first and second disk-like coupling devices defining a plurality of outwardly facing open spaces therebetween; and,



(b) a first balloon positioned within said skeletal frame-like balloon former, said first balloon being inflated to a sufficient degree that said sidewall thereof is distended outwardly through said plurality of outwardly facing open spaces defined by said first and second disk-like coupling devices and said plurality of rigid rod-like former elements so as to form a plurality of outwardly extending, adjacent, abutting, bulbous lobes substantially overlying and concealing the intermediate ones of said rigid rod-like former elements and simulating the appearance of a plurality of balloons arranged in a cluster.

4,929,216

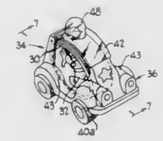
ROTATING RING AND CHARACTER TOY

Lamont C. Morris, Chicago; Wayne A. Kuna, River Forest, and Rouben T. Terzian, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 11, 1988, Ser. No. 255,763
Int. Cl.[5] A63H *11/08, 29/08, 5/00, 17/26*
U.S. Cl. 446—324 **16 Claims**

1. A toy comprising in combination:
a cylindrical ring having a central axis, an inner diameter, a cylindrical inner surface which is linear from edge to edge and an outside curved surface;
a character having two or more extremities with free ends;
the free ends being circumscribed by a circle of a diameter substantially equal to the inner diameter of the ring;
one of the ring or character being sufficiently flexible to permit insertion and removal of the character into and out of the ring while providing sufficient frictional engagement between the free ends and the inside of the ring to engage the character within the ring so that the character





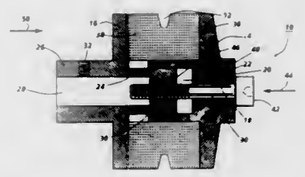
rotates with the ring as the ring is rolled about its outside curved surface.

4,929,217

VARIABLE SPEED PULLEY

Rudolph Merbler, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 1, 1989, Ser. No. 387,738
Int. Cl.[5] F16H *11/02*
U.S. Cl. 474—54 **11 Claims**



1. A variable speed pulley adapted to be mounted on a shaft, including:
a resilient member adapted to be located on the shaft and having an exterior surface adapted to support a belt thereon with the distance between the shaft center and the exterior surface of the resilient member corresponding to the pulley diameter; and
means for controlling the compression of said resilient member to adjust the position of the exterior surface of said resilient member to thereby increase or decrease the pulley diameter.

4,929,218

CONTINUOUSLY VARIABLE TRANSMISSION

Robert L. Clough, 44 Rochman Blvd., Scarborough, Ontario, Canada (M1H 1S2)

Filed Jul. 21, 1989, Ser. No. 383,017
Int. Cl.[5] F16H *9/00*
U.S. Cl. 474—83 **12 Claims**

1. A continuously variable transmission comprising:
two drive pulley members,
a first of the drive pulley members journalled for rotation about a first axis,

a second of the drive pulley members journalled for rotation about a second axis parallel to the first axis, spaced therefrom,

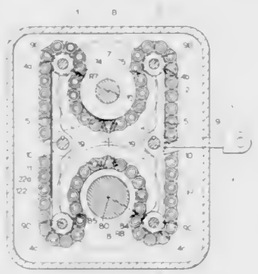
each drive pulley member having a circumferential groove therein between opposing, conical pulley interior side contact surfaces which diverge away from each other with increased radius from the axis of each drive pulley member,

the drive pulley members journalled on their axes with the groove of the first drive pulley member aligned with the groove of the second drive pulley member,

closed-loop chain means passing about the drive pulley members received in the groove of each drive pulley member to frictionally engage each drive pulley member and couple the drive pulley members together,

the chain means having side contact surfaces on opposite sides thereof,

the chain means engaging each drive pulley member with the side contact surfaces on one side of the chain means in contact with the pulley interior side contact surface on one side of each groove and with side contact surfaces on the other side of the chain means in contact with the drive



pulley interior side contact surface on the other side of each groove,

means permitting adjustable variation of the width of the chain means between its side contact surfaces over the length of the chain means,

releasable locking means to lock the width of the chain means over sections of the chain means in engagement with each drive pulley member,

control means to vary the width at which the locking means locks the width of the chain means about each drive pulley member,

wherein with variation of the width at which the locking means locks the width of the chain means about one drive pulley member, the side contact surfaces of the chain means engage the interior side contact surfaces of the one drive pulley member at varying radii from the axis of the one drive pulley member, and

wherein by variation of the width at which the chain means is locked about one drive pulley member relative to the width at which the chain means is locked about the other drive pulley member, the relative speeds of rotation of the drive pulley members are varied.

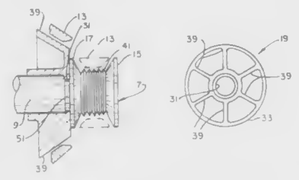
4,929,219

BELT LOCATOR FOR LOCATING A BELT ON A PULLEY

Gerald N. Baker, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 16, 1989, Ser. No. 367,449
Int. Cl.[5] F16H *7/22*
U.S. Cl. 474—102 **10 Claims**

1. In a belt driven system employing a dynamoelectric machine to rotate a pulley on which is positioned a drive belt, the improvement comprising belt locator means for locating the belt on the pulley, the locator means being effective to locate the belt properly on the pulley if the belt is initially misinstalled with respect to the pulley, the dynamoelectric machine including a shaft on which the pulley is mounted, the belt locator means also being mounted on the shaft, the pulley being mounted on the outer end of the motor shaft and the locator means includes a collar mounted on the shaft inboard



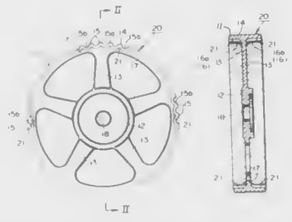
of the pulley, the collar having a frusto-conical shape and a longitudinal central bore for mounting the collar on the shaft, the shaft being a stepped shaft having a larger diameter section on which the collar fits, a smaller diameter section on which the pulley fits and a transition section therebetween, the collar having a lip formed about an opening adjacent the outer end of the bore and conforming to the shape of the transition section thereby permitting the lip to fit over the transition section.

4,929,220

PULLEYS

Katsuaki Hosono, and Kenji Kushita, both of Niigata, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1988, Ser. No. 233,434
Int. Cl.[5] F16H *55/30*
U.S. Cl. 474—152 **5 Claims**



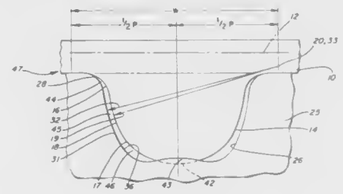
1. A pulley comprising a rim including an outer peripheral surface having plural fillets circumferentially disposed thereon at equal angular intervals about an axis of said rim, an inner surface having a ridge portion circumferentially disposed on the center thereof so as to project radially inwardly, a hub having an aperture disposed at the center thereof so as to be coaxial therewith and connecting means connecting said hub and said rim, said rim having plural recesses circumferentially formed in said inner surface thereof at equal angular intervals about an axis thereof, each of said recesses disposed at a position of said inner surface opposite that of said fillet.

4,929,221

POWER TRANSMISSION TOOTHED BELT AND DRIVE

Hiroyuki Tanaka; Kuniharu Uto; Kazumi Kawai; Tsuneo Shaura, and Motonobu Yasuhuku, all of Kobe, Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Dec. 5, 1988, Ser. No. 280,589
Claims priority, application Japan, Nov. 12, 1987, 62-286842; Dec. 29, 1987, 62-335908
Int. Cl.[5] F16G *1/28*
U.S. Cl. 474—205 **21 Claims**



1. A power transmission toothed belt comprising:

a belt body defining a longitudinal pitch line and an inner land line; and

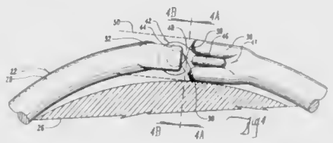
a plurality of teeth projecting inwardly from said body, each tooth defining a centerline and being symmetrical about said centerline, each side of the tooth being defined by a convex radially outer root surface, an inner tip surface, and an intermediate power transmission surface, said power transmission surface defining a circular arc having a radius centered at a point spaced from said centerline approximately one-half the pitch of the teeth, and said radius having a length less than the pitch of the teeth.

4,929,222

CONNECTABLE BELT AND METHOD FOR FORMING SAME

Thomas R. Smith, and Thomas M. Tripp, both of Newton, Iowa, assignors to Pyramid, Inc., Newton, Iowa

Filed Sep. 5, 1989, Ser. No. 402,557
Int. Cl.[5] F16G *3/00*
U.S. Cl. 474—255 **8 Claims**



1. A connectable drive belt comprising:

an elongated thermoplastic elastomer member having a central portion, a first end portion, and a second end portion, said central portion being circular in cross section and having a constant diameter along its length;

said first end portion having a cross-sectional first thickness and a cross-sectional first width of greater dimension than said first thickness;

said second end portion having a cross-sectional second thickness and a cross-sectional second width of greater dimension than said second thickness;

said cross-sectional first and second widths of said first and second end portions each being of a dimension at least as great as said diameter of said central portion;

said first and second end portions having a first hole and a second hole respectively extending therethrough in a direction perpendicular to said first and second crosssectional widths respectively;

clip means having a first loop extending through said first hole and a second loop extending through said second hole so as to retentively grasp said first and second end portions to join said first and second end portions together;

said first and second widths of said first and second end portions defining a cylindrical boundary;

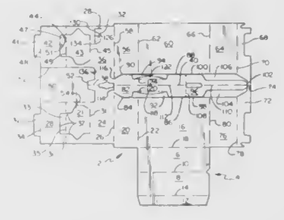
said entire clip means being located within and spaced radially inwardly from said cylindrical boundary.

4,929,223

PACKAGING ALIGNMENT SYSTEM

Joseph C. Walsh, Longmont, Colo., assignor to Adolph Coors Company, Golden, Colo.

Division of Ser. No. 830,356, Feb. 18, 1986, Pat. No. 4,722,437. This application Jan. 11, 1988, Ser. No. 141,935
Int. Cl.[5] B31B *5/20, 3/26*
U.S. Cl. 493—56 **5 Claims**



1. A method for aligned portions of a carrier blank while folding said carrier blank into a folded carrier comprising:

providing a relatively flat carrier blank having in a partially folded condition at least a first portion and a second portion joined together by a fold line with said first and second portions having oppositely facing generally planar surfaces when folded around said fold line so that said first and second portions are in superposed relationship;

forming an abutment tab in said first portion of said carrier blank, said abutment tab comprising at least one linear cut line and at least one fold line;

moving a portion of said abutment tab to a position projecting out of said generally planar surface of said first location to form a linear abutment edge from said linear cut line;

folding said carrier blank so that said first portion of said folded carrier blank has a first linear edge;

folding said carrier blank so said second portion of said folded carrier blank has a second linear edge adapted to be positioned in superposed and parallel relationship to said first linear edge;

providing a linear abutment edge on said second portion, said linear abutment edge in said second portion being parallel to said linear cut line;

said linear abutment edges in said first and second portions being parallel to said first and second linear edges;

producing relative folding movement between said first and second portions so that said linear abutment edge on said second portion and said linear abutment edge of said abutment tab are moved into contacting relationship; and

continuing said folding movement so that said linear abutment edges guide said first and second linear edges into a superposed and parallel relationship.

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PLASTIC BAG FORMING MACHINE

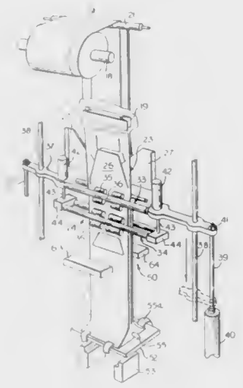
Violet Hanson, P.O. Box 163, Plainview, N.Y. 11803, and Ralph Johnson, Ridge, N.Y., assignors to Violet Hanson, Plainview, N.Y.

Continuation-in-part of Ser. No. 687,859, Dec. 31, 1984. This application Jun. 3, 1988, Ser. No. 202,695

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[5] B31B *33/14*

U.S. Cl. 493—194 23 Claims



1. In a machine for making and folding open top flat bottom bags from a heat sealable material,

means on said machine supplying a continuous length of heat sealable material including means for feeding said material leading end first over a bag forming means,

sealing means operable, on passing of said leading end and beyond said bag forming means, to form a closure seal at the leading end of said material,

said bag forming means being operable to expand said material to form in the material opposed faces and opposed sides and a flat bottom for a bag including said opposed faces and sides,

material severing means operable to sever at a distance spaced from the leading end a length of said material to form the open top of the flat bottom bag and to form a closure seal for the next succeeding bag,

folding means operable in cooperation with said bag forming means to seal portions of the opposed sides to the flat bottom of the bag and to remove the severed length of material from said bag forming means while folding the flat bottom of the bag alongside at least a portion of the material severed, and

means selectively controlling the sequence of operations of said bag forming means, folding means, sealing means and severing means.

4,929,225

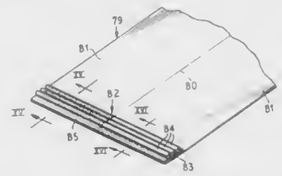
METHOD OF MAKING BAGS AND BAG MATERIAL HAVING HINGED ZIPPER STRIPS

Steven Ausnit, New York City, N.Y., and Hugo Boeckmann, Arlington Heights, Ill., assignors to Minigrip, Inc., Orangeburg, N.Y.

Continuation-in-part of Ser. No. 106,920, Oct. 6, 1987, Pat. No. 4,792,240, Ser. No. 75,636, Jul. 20, 1987, Pat. No. 4,787,880, and Ser. No. 812,467, Dec. 23, 1985, abandoned, said Ser. No. 106,920, is a continuation of Ser. No. 812,467, , said Ser. No. 75,636, is a division of Ser. No. 812,467,. This application Jun. 10, 1988, Ser. No. 205,331

Int. Cl.[5] B31B *1/90*

U.S. Cl. 493—213 16 Claims



11. A method of making a reclosable bag having a mouth end, and comprising:

providing said bag with opposite film walls having longitudinal formation axis;

applying an extruded plastic profiled reclosable fastener strip of continuous length lengthwise across the longitudinal formation axis of the film walls located at said mouth end of the bag, and the strip having a base web;

bonding said base web to the film walls with a lengthwise portion of said base web bonded to one of the walls at a location only above the centerline of profile means on the strip, and bonding another lengthwise portion of the base web to another of the walls both above and below said profile means; and

forming said walls with the fastener strip hereon into bag form with closed sides and closed bottom and said open end which is reclosable by means of said fastener strip.

4,929,226

PROCESS AND APPARATUS FOR PRODUCING AND CONVEYING PACK BLANKS

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 261,041

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735675

Int. Cl.[5] B31B *1/16*

U.S. Cl. 493—343 11 Claims



1. In a process for producing pack blanks (10, 11) by tearing the blanks (10, 11) from a web of material conveyed in a conveying direction (12), said blanks being defined by perforations in the web which run only transversely relative to the conveying direction in the web of material (12), the improvement comprising the steps of:

performing said tearing step by tearing off from the web of material (12) two of the blanks (10, 11), in succession in the conveying direction, as an attached unit (23);

then, severing the unit (23) into two individual blanks (10, 11) by exerting tensile force only in the conveying direction; and then simultaneously feeding the two severed blanks (10, 11), transversely to the conveying direction of the web of material (12), to a folding unit (20).

4,929,227

CENTRIFUGE DRUM FOR SEPARATING MIXTURES OF LIQUIDS

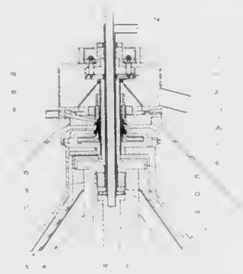
Karl-Heinz Zettier, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 249,048

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735031

Int. Cl.[5] B04B *1/04, 7/04, 11/08*

U.S. Cl. 494—41 7 Claims



1. In a centrifuge drum rotatable around an axis for separating refrigerated milk into cream and skim milk, comprising a stationary housing, an intake pipe secured to the stationary housing to supply refrigerated milk to a separation space in the centrifuge drum and a peeling disk for diverting the separated skim milk, a peeling chamber in which the peeling disk is positioned and that communicates through conveying channels with a peripheral portion of the separation space, a stationary interception chamber, and a diversion chamber between the separation space and the peeling chamber that communicates with a central portion of the separation space and has a diversion channel for diverting cream into the stationary interception chamber, the improvement wherein the peeling chamber is positioned axially between the diversion chamber and the interception chamber and the diversion channel is positioned concentric with the axis of rotation of the drum and rotatable therewith and wherein the diversion channel extends radially inwardly of the diversion chamber, through the center of the peeling disk and into the interception chamber and further comprising an intake chamber having an intake pipe and an overflow chamber positioned between the diversion chamber and the intake chamber, a peeling device in the overflow chamber and secured to the intake pipe and a channel communicating the peeling device with the atmosphere, the peeling device being arranged for directing liquid from the overflow chamber through the channel.

4,929,228

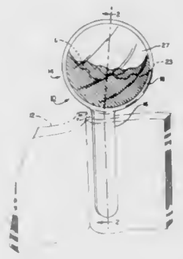
ANTI-MOTION SICKNESS APPARATUS

Katherine A. Hendricks, Chicago, Ill., assignor to Boris Tabakoff and John Newton, part interest to each

Continuation of Ser. No. 86, Jan. 2, 1987, abandoned, which is a continuation of Ser. No. 430,172, Sep. 30, 1982, abandoned. This application Sep. 17, 1987, Ser. No. 98,507

Int. Cl.[5] A61M *21/00*

U.S. Cl. 600—27 1 Claim



1. An anti-motion sickness apparatus for use in a moving vehicle, comprising:

vehicular motion simulating means responsive to motion of said vehicle for providing a visually discernible fluid motion image to create visually discernible orientation information for the user to confirm the inner ear information of the user, thereby preventing or at least greatly alleviating, the occurrence of motion sickness;

means for positioning at least a portion of said vehicular motion simulating means in the field of view of the user;

said vehicular motion simulating means including closed container means having a translucent portion, said container means confining a visually discernible fluid and permitting it to move freely therein as a result of the motion of the vehicle to provide a visually discernible fluid motion image, thereby generating visually discernible orientation information directly indicative of the motion of the vehicle, so that the user can view said fluid through said translucent portion thereof; and

said closed container means including walls having spaced-apart portions that enhance the movement of said fluid therebetween as the container means moves in unison with said vehicle to create thereby the wave motion image, and said vehicular motion simulating means including means for displaying aid visually discernible wave motion image.

4,929,229

BREASTPUMP HAVING IMPROVED VALVE MECHANISM

Karl O. A. H. Larsson, Lindenweg, Switzerland, assignor to ISG/AG, Switzerland

Filed Nov. 30, 1988, Ser. No. 278,047

Int. Cl.[5] A61M *1/00*

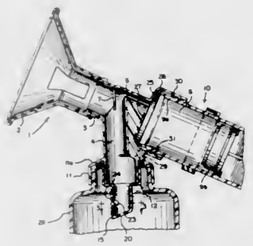
U.S. Cl. 604—74 6 Claims

4. In a breastpump comprising a hood body for placement over a breast, the hood body having a main funnel-shaped portion within which the breast is received and a tubular extension extending downstream from the main funnel portion, means for connecting the tubular extension of the hood body with a vacuum line to periodically withdraw air from the hood body in a manner that draws the breast into the main funnel portion and thereby expresses milk from the breast into the tubular extension, the vacuum line connecting means including a sleeve having interior threads to which a vacuum pump is threadably attached in an airtight engagement, said sleeve threads being broken in places, a catch chamber for expressed

VOL
1114
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milk connected with the tubular extension, the catch chamber being located downstream from the tubular extension and having an inlet and an outlet which outlet communicates with a container to which the breastpump is attached in an airtight fit via a collared cap, the improvement comprising:

a valve mechanism having a housing including an upper portion removably attachable to said catch chamber outlet and a lower portion having a first widened opening defined through said lower portion adjacent a bottom to said lower portion through which first widened opening milk can pass, and a thin flexible membrane sized to cover and close said first widened opening when a negative pressure is applied within said housing and allow milk to pass through said first widened opening when said negative pressure is removed, said thin flexible membrane being generally circular in shape and removably mounted to said lower portion by a knob formed integral with and at the



center of said membrane, which knob is inserted into a second opening defined in said lower portion in a snap fit, said thin flexible membrane having bosses located on the side of the membrane that is outboard to said lower portion, said bosses overlying said first and widened opening and being of sufficient size to reinforce said thin flexible membrane to prevent said thin flexible membrane from being drawn into said first opening when said negative pressure is applied inside said housing member, and

a closed airflow path provided in said breastpump for forcibly moving said thin flexible membrane away from said first opening and purging milk from said lower portion, said airpath extending from the vacuum line through the tubular extension and catch chamber into said valve mechanism, then through said first opening into the container, then through a passageway in the cap extending between the cap and the sleeve, and out from the sleeve through the broken threads.

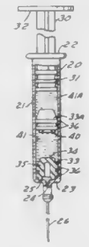
4,929,230

SYRINGE CONSTRUCTION

Frederick W. Pfleger, 1152 Barbara Dr., Cherry Hill, N.J. 08003

Filed Sep. 30, 1988, Ser. No. 252,792
Int. Cl.[5] A61M *5/22*
U.S. Cl. 604—90 **23 Claims**

1. A hypodermic syringe comprising; a cylindrical tube, an outlet port at one end of said tube, a resilient material pressurizing piston extending inwardly from the other end of said tube, a resilient material free piston located between said pressurizing piston and said outlet port, said pressurizing piston said free piston and said cylindrical tube forming a chamber, said chamber capable of holding contents, an external sealing surface on



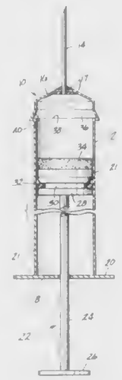
a first end of said free piston, said first end located capable of compressing by movement of said collapsible wall.

4,929,231

NON-REUSABLE HYPODERMIC SYRINGE

Mark A. Pawlikowski, Box 101D Wolf Neck Rd., Stonington, Conn. 06378

Filed Feb. 2, 1989, Ser. No. 305,708
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **7 Claims**



1. A non-reusable hypodermic syringe comprising a syringe body having a front end, a rear end and an inner wall extending from said front end to said rear end, a needle extending from said front end, and a plunger assembly including a rod member having a rearward end extending from said rear end of said body and a forward end within said body and a head portion integral with said forward end of said rod member and having an outwardly facing circumferential groove and an O-ring seated in and protruding outwardly therefrom and engaging said inner wall of said body, said body having an inwardly facing circumferential groove adjacent said front end of said body and positioned to receive said O-ring therein when said grooves confront each other, thereafter to resist movement of said rod member in the direction away from said front end of said body and render said syringe non-reusable, said syringe further comprising a deflectable cap affixed to the face of said head portion confronting said front end of said body, said cap being subject to deflection by said front end as said outwardly facing circumferential groove approaches said inwardly facing circumferential groove, such that an administrator of an injection will sense a change in the action of said syringe and know

that slight further movement of said rod member toward said front end will bring said grooves into radial alignment.

4,929,232

SYRINGE HAVING TAMPER EVIDENCE FEATURES

Niall Sweeney, Rutherford, and Sandor Gyure, West Orange, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 30, 1989, Ser. No. 330,676
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—111 **18 Claims**



1. A syringe assembly having tamper evidence features comprising:

an elongate barrel having a chamber for retaining fluid, said barrel including an open proximal end and a distal end;

a tip extending from said distal end of said barrel having a passageway therethrough in fluid communication with said chamber;

a needle cannula extending outwardly from said distal end, said needle cannula having a lumen therethrough in fluid communication with said passageway;

an elongate hollow needle shield having a longitudinal axis, a closed distal end and an open proximal end, said shield slidably engaging said tip and covering said needle cannula, said shield having an outwardly projecting shield lug having a cam surface;

a cup-shaped collar having an annular side wall, an open proximal end and a distal end having an aperture therethrough, said collar proximal end being adjacent to said distal end of said barrel, said needle shield projecting distally through said aperture, said aperture being sized and shaped so that said proximal end of said needle shield cannot pass therethrough, said collar including an inwardly projecting lug having a follower surface for contacting said cam surface of said needle shield, said cam surface and said follower surface being configured so that rotational force applied to said needle shield around said longitudinal axis causes said cam surface to contact said follower surface to apply a force to said follower surface; and

securement means for releasably holding said collar adjacent to said barrel, said securement means positioned so that force applied to said follower surface through said cam surface can disengage said securement means allowing said cam surface of said needle shield to move said collar and allowing said needle shield to be removed from said barrel.

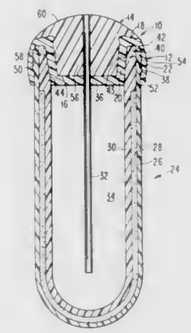
4,929,233

IMPLANTABLE FLUID IMBIBING PUMP WITH IMPROVED CLOSURE

Nathan Roth, San Francisco, and Su I. Yum, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Aug. 26, 1988, Ser. No. 236,974
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—131 **26 Claims**

1. In an osmotically driven agent dispenser including an inner flexible bag adapted to contain the agent and having an open end, an intermediate layer of an osmotically effective solute composition at least partly encapsulating the bag, an outer shape-retaining membrane encapsulating the layer of osmotically effective solute composition, said membrane being at least in part permeable to water, and a port that extends from the interior of the bag to the exterior of the dispenser through which the agent may be charged into the bag and dispensed



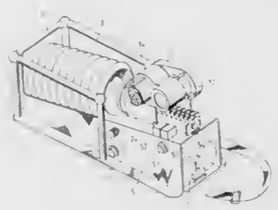
from the bag, the improvement comprising a locking snap-on closure for closing the open end of the bag, the closure having a biasing member for sealingly engaging the open end of the bag and a locking means preventing removal of the closure when the closure is in sealing engagement with the open end of the bag.

4,929,234

AUTOMATIC DRIP INFUSION SET

A-Ten Chen, 6, Lane 71, Min Hsing St., Taichung, Taiwan

Filed Mar. 30, 1989, Ser. No. 330,643
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—132 **3 Claims**



1. An automatic drip infusion set, including

a compressible drip bottle to be compressed by a push plate to let the solution contained therein be infused into patient's body;

a rack holder to receive a main rack and an auxiliary rack and to let the main rack be sliding therein, having a driving gear wheel mounted thereon at the top to drive the main and the auxiliary racks to move;

a main rack movably set in the rack holder, having a toothed portion made thereon at the top, said toothed portion being arranged in a length smaller than the length of the main rack so as to confine a flat front top end, a slide way made therein at the middle portion for sliding thereon of a small rack, a stop pin pivotally made at one side to slightly project into the slide way;

an auxiliary rack movably set in the slide way of the main rack, having a toothed portion made at the top, and a push plate connected at the front end; and

a driving gear wheel mounted in the rack holder at an upper

VOL
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position to engage with the toothed portions of the main rack and the auxiliary rack, being driven by a motor through a speed variator to drive the main rack and the auxiliary rack to move forward or backward;

characterized in that the rotation of the driving gear drives the auxiliary rack to move forward to further let the tenon which is made at the rear end of the auxiliary rack be retained with the stop pin of the main rack so as to carry the main rack to move forward and to let the toothed portion of the main rack be engaged with the driving gear wheel.

4,929,235

SELF-SEALING PERCUTANEOUS TUBE INTRODUCER

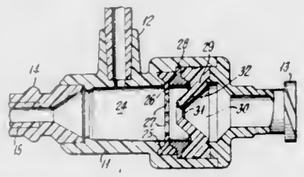
Jack D. Merry, Glens Falls, and E. David Fink, Schenectady, both of N.Y., assignors to Universal Medical Instrument Corp., Ballston Spa, N.Y.

Filed Jul. 31, 1985, Ser. No. 760,817

The portion of the term of this patent subsequent to Jan. 29, 2004, has been disclaimed.

Int. Cl.[5] **A61M** *5/00, 25/00*

U.S. Cl. 604—167 **13 Claims**



1. A self-sealing percutaneous tube introducer comprising a body having a passage therethrough adapted to receive a catheter or similar medical device, a flexible hole gasket mounted transverse to and within said passage having a round hole centered therein, a flexible slit gasket mounted transverse to and within said passage having a slit which permits said catheter to pass through by deflecting or stretching portions of the gasket adjacent said slit, and an inflexible spacing ring mounted between said gaskets, said slit gasket being spaced distally from said hole gasket but close enough that said slit gaskets if moved proximally by said catheter may reach and rest upon the perimeter of said hole, but not interfere with catheter movement.

4,929,236

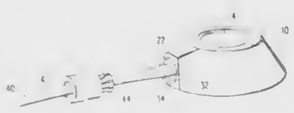
SNAP-LOCK FITTING CATHETER FOR AN IMPLANTABLE DEVICE

Edward J. Sampson, Carlisle, Mass., assignor to Shiley Infusaid, Inc., Norwood, Mass.

Filed May 26, 1988, Ser. No. 200,156

Int. Cl.[5] **A61M** *5/00*

U.S. Cl. 604—175 **25 Claims**



1. An access device for implantation comprising,

a housing with at least a first reservoir therein, a self-sealing septum to provide subcutaneous access to said reservoir, an outlet in fluid communication with said reservoir and having a barbed nipple therein, a catheter having one end slidably mounted over said barbed nipple, and a locking sleeve having a through-hole for slidably mounting onto said catheter, said locking sleeve having a series of radially movable fingers which slide over said barbed nipple and engage said housing while compressing said catheter thereby locking said catheter and said sleeve to said housing and provide, upon engagement, a sensory indication that locking has been achieved.

4,929,237

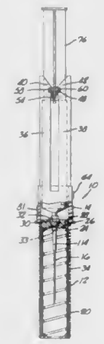
HYPODERMIC NEEDLE PROTECTION DEVICE

David Medway, 2401 H St., NW. #805, Washington, D.C. 20037

Filed Nov. 7, 1988, Ser. No. 268,242

Int. Cl.[5] **A61M** *5/32*

U.S. Cl. 604—198 **13 Claims**



1. A device for preventing exposure of a contaminated hypodermic needle comprising:

a housing unit having a larger proximal and smaller distal aperture for receiving a syringe and hypodermic needle attached to said syringe;

a syringe operatively engageable within and removable from said housing unit comprising a syringe chamber for containing liquid medicament or body fluid and a hypodermic needle having a base, said needle operatively engageable with and removable from said syringe;

spring means positioned at the distal end of said housing unit, said spring means engaging the base of said hypodermic needle, such that a pushing force applied to the proximal end of said syringe compresses said spring means and moves said syringe distally within said housing unit;

safety catch means for retaining said housing unit and syringe in engaged relationship in the absence of any pushing or retaining force applied to said syringe; and

locking means for selectively preventing relative movement between said housing and syringe and hypodermic needle when the hypodermic needle is in use with the spring means compressed,

whereby, when said pushing force is released said spring means extends and said syringe retracts proximally within said housing unit, retracting said hypodermic needle within said housing unit to prevent contact of said hypodermic needle with the operator of said device.

4,929,238

MULTI-PRESSURE INJECTOR DEVICE

Thomas M. Baum, Raleigh, N.C., assignor to Coeur Laboratories, Inc., Raleigh, N.C.

Filed Nov. 23, 1988, Ser. No. 275,272

Int. Cl.[5] **A61M** *5/00*

U.S. Cl. 604—208 **26 Claims**

1. A multi-pressure injector device, comprising:

an outer barrel attachable at a distal end thereof to a catheter or other fluid delivery means, and having at its proximal end laterally outwardly extending manual gripping means,

the outer barrel enclosing an interior volume fillable with a selected fluid;

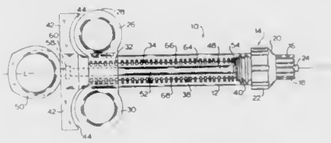
an inner barrel/plunger longitudinally slidable in the outer barrel, the inner barrel/plunger having (i) an interior volume in open flow communications with the interior volume of the outer barrel, and (ii) at its proximal end, second laterally outwardly extending manual gripping means; and

a second plunger longitudinally slidable in the inner barrel; wherein:

the second plunger and the inner barrel/plunger are independently translatable relative to one another;

the inner barrel/plunger and the outer barrel comprise locking means for selectively longitudinally locking the inner barrel/plunger and outer barrel relative to one another within the outer barrel, to preclude longitudinal translation therebetween, the inner barrel/plunger and outer barrel being selectively longitudinally lockable relative to one another along substantially the entire length of travel of the inner barrel/plunger in the outer barrel;

the second plunger is longitudinally slidable in the inner



barrel/plunger while the inner barrel/plunger and outer barrel are locked relative to one another by said locking means;

the inner locking means is characterized in that the barrel/plunger comprises on an exterior surface thereof a track portion extending along substantially the entire length of the exterior surface, and wherein the outer barrel comprises, on an inner surface thereof, along a proximal portion of the interior surface, a track portion which is complementarily configured relative to the track portion on the outer wall of the inner barrel/plunger, for mating therewith, when the respective tracks on the outer barrel inner surface and inner barrel/plunger outer surface are brought into engagement with one another; and

the track portion on the outer surface of the inner barrel/plunger may be selectively engaged with or disengaged from the track portion on the inner wall of the outer barrel, by selective rotation of the inner barrel/plunger relative to the outer barrel, such that when the respective track portions on the inner barrel/plunger and outer barrel are not in engagement, the inner barrel/plunger is freely longitudinally slidable in the outer barrel.

4,929,239

DEVICE FOR FILLING THE MAGAZINE OF A SCALP CLIP APPLICATOR WITH C-SHAPED SCALP CLIPS

Karl Braun, Talheim, Fed. Rep. of Germany, assignor to Aesculap-Werke AG vormals Jetter & Scheerer, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,762

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704759; Sep. 19, 1987, 3731613

Int. Cl.[5] **A63B** *17/04;* **B65H** *1/00;* **B31B** *1/00*

U.S. Cl. 606—142 **7 Claims**

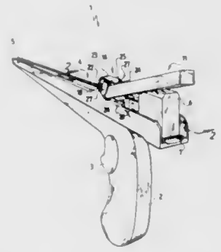
1. A device for filling the magazine of a scalp clip applicator with C-shaped scalp clips, comprising:

a feed container (**11**) for accommodating a row of scalp clips (**12**);

a scalp clip applicator (**1**) having a magazine (**4**) adapted to hold C-shaped scalp clips;

insert means (**17, 18, 19, 20**) provided on the magazine (**4**) for connecting the feed container with the magazine such that the scalp clips can be sequentially transferred from the feed container to the magazine, the insert means (**17, 18, 19**) on the magazine (**4**) forming a closeable insert opening;

at least one support (**20**) being formed on the magazine for supporting the feed container (**11**); and



a roll spring enclosed within a housing (**6**), said housing being mounted for displacement on the magazine (**4**) whereby the insert opening (**17, 18, 19**) can be opened and closed.

4,929,240

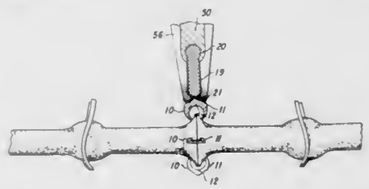
SURGICAL CLIP AND APPLIER

Wolff M. Kirsch; Yong H. Zhu, both of Albuquerque, and Robert B. Cushman, Cedar Crest, all of N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Division of Ser. No. 787,101, Oct. 15, 1985, Pat. No. 4,733,660, and a continuation-in-part of Ser. No. 556,917, Dec. 1, 1983, Pat. No. 4,586,503. This application Dec. 21, 1987, Ser. No. 135,445

Int. Cl.[5] **A61B** *17/12*

U.S. Cl. 606—151 **5 Claims**



1. A surgical clip for permanently joining apposed tissues, comprising

a bridge portion made of a plastically deformable material,

a pair of spaced arcuate arms extending generally parallel in one direction from opposite ends of said bridge, each of said arms having a concave surface facing the other arm, and said arms terminating at distal tips which are sufficiently rounded to avoid puncturing tissue captured therebetween,

a tang extending from said bridge in a direction opposite that of said arms,

a neck connecting said tang to said bridge,

said neck being breakable upon application of a predetermined tensile force to said tang,

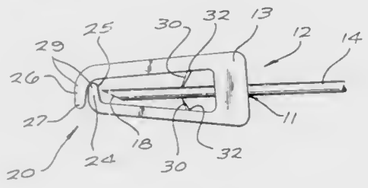
a pair of spaced shoulders on said bridge portion, one on either side of said neck, for supporting said clip as tension is applied to said tang, to create a bending moment in said bridge for deforming the same,

said bridge being of such dimensions as to be plastically and permanently deformed by bending upon application to the tang of a force less than said predetermined tensile force while the clip is supported by a tool engaging its shoulders, said bending closing said arms around said apposed

VOL
1114
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tissues, said plastically and permanently deformed bridge retaining said arms in their closed positions after said tang is broken away.

4,929,241
MEDICAL NEEDLE PUNCTURE GUARD
John C. Kulli, 30 Widewaters La., Pittsford, N.Y. 14534
Filed Aug. 5, 1988, Ser. No. 228,581
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—263 19 Claims



1. A safety guard for forming a protective barrier to prevent accidental puncture by a sharp tip of a used needle, said guard comprising:
means for mounting substantially the entire guard for sliding motion along the needle toward the tip; and
a front portion, secured to the mounting means and comprising a transverse shield, for collapsing to form a barrier in front of the needle tip, when the front portion is advanced past the tip.

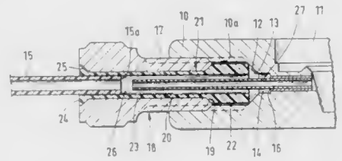
4,929,242
SOLUTION AND METHOD FOR MAINTAINING PATENCY OF A CATHETER
Vince C. Desecki, Ingelside, and Michael R. Prisco, Aurora, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.
Continuation of Ser. No. 935,655, Nov. 26, 1986, abandoned.
This application May 8, 1989, Ser. No. 349,948
Int. Cl.[5] A61M *5/325*
U.S. Cl. 604—266 4 Claims



1. A liquid for minimizing blood entry from a patient into a vascular access device, wherein said liquid has a density approximately equal to the density of whole blood of the patient and includes water, glycerol and NaCl in a proportion such that for each 100 ml of water the liquid includes approximately 23.87 grams of glycerol and approximately 900 mg of NaCl.

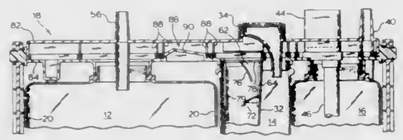
4,929,243
CATHETER COUPLING
Heinrich Koch, Lichtenau, and Jügen Fuchs, Emstal-Sand, both of Fed. Rep. of Germany, assignors to B. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany
Filed Jan. 25, 1989, Ser. No. 301,438
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1988, 8801583
Int. Cl.[5] A61M *25/02*
U.S. Cl. 604—283 6 Claims

1. A catheter coupling comprising:
a connecting member having a cavity and configured to receive an end of the catheter,
a thrust element having a pressure receiving shoulder and being configured to extend into the connecting member and defining a channel for the catheter, and
a compressible clamping member affixed to the thrust element, the clamping member having a head and a substantially tubular projection attached to the channel of the



thrust element, the head having an outer diameter and the tubular projection having an outer diameter, the outer diameter of the head being greater than the outer diameter of the tubular projection, the tubular projection extending beyond the pressure receiving shoulder in the channel of the thrust element,
whereby the head is compressed axially and the projection is deformed radially when the thrust element extends into the connecting member.

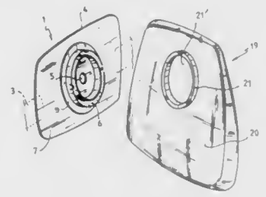
4,929,244
BAFFLE SYSTEM FOR USE IN UNDERWATER DRAINAGE DEVICES
David R. Swisher, St. Louis, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.
Filed Sep. 2, 1988, Ser. No. 240,317
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—319 22 Claims



1. An underwater drainage device for removing liquids and gases from the body of a patient comprising,
a first collection chamber in flow communication with the body of a patient wherein fluid from the patient will be suctioned into the first collection chamber,
an underwater seal chamber having a predetermined amount of liquid therein and wherein the underwater seal chamber is in flow communication with the first collection chamber,
a source of negative suction pressure in flow communication with the underwater seal chamber,
a means for providing the flow communication between the first collection chamber, the underwater seal chamber and the source of suction,
said underwater seal chamber including a water seal column and an upper baffle chamber wherein, as the pressure in the first collection chamber decreases below the regulated suction pressure from the suction source, the liquid in the underwater seal chamber will be drawn upwardly through the water seal column into the upper baffle chamber,
the baffle chamber further having a volume greater than the predetermined volume of liquid capable of being drawn into the water seal column and said baffle chamber including a top and bottom end and opposed sidewalls,

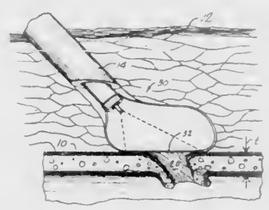
a plurality of baffles spaced along and extending from the sidewalls of said baffle chamber to obstruct the flow of liquid through the baffle chamber, and
wherein the bottom end of said baffle chamber includes a baffle tube extending upwardly therefrom and having top and bottom ends aligned in flow communication with the water seal column wherein said bottom end of said baffle tube has a bottom opening therein having a larger area than the top opening on said top end of said baffle tube.

4,929,245
SAFETY DEVICE FOR OSTOMY BAG COUPLING SYSTEM
Henri Holtermann, Saint-Jean-De-Luz, and Claude Hamelin, Ascain, both of France, assignors to Laboratoires Biotrol, Paris Cedex, France
Filed Apr. 8, 1988, Ser. No. 179,629
Claims priority, application France, Apr. 10, 1987, 8705146
Int. Cl.[5] A61F *5/44*
U.S. Cl. 604—338 12 Claims



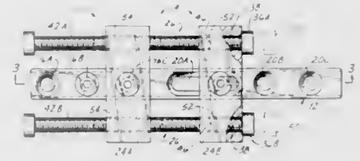
1. An ostomy bag system comprising a first assembly intended to be fixed about an artificial opening of a user's body by an appropriate fixing means, a second assembly including a body fluid and/or waste collecting bag intended to be removably fitted to said first assembly, said first assembly including a pad forming a cutaneous protector for the peristomeal zone, a first end-piece attached to said pad, said second assembly including a second end-piece operatively attached to the bag and adapted to interfit with said first end-piece and be immobilized with respect thereof when said first and second end-pieces are fitted together by a plurality of resiliently deformably snap-fit members provided on said first end-piece, and a rotary locking member rotatably attached to said first end-piece and rotatable between first and second positions for locking the position of said snap-fit members with respect to said second end-piece when in one of said first or second positions.

4,929,246
METHOD FOR CLOSING AND SEALING AN ARTERY AFTER REMOVING A CATHETER
Edward L. Sinofsky, Reading, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Filed Oct. 27, 1988, Ser. No. 263,277
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—8 14 Claims



1. A method for closing and sealing a puncture at a puncture site in an artery located beneath the skin, after a medical device is removed from the puncture, comprising the steps of:
applying pressure directly to the artery at the puncture site, said pressure being sufficient to substantially close the puncture, the step of applying pressure including the steps of advancing a tube having an inflatable balloon at its distal end through overlying tissue to the puncture site, and inflating the balloon so that the balloon and the tube apply pressure to the puncture site; and
applying laser energy directly to the artery at the puncture site while pressure is applied, said laser energy being sufficient to thermally weld the artery at the puncture site.

4,929,247
BONE COMPRESSION AND DISTRACTION DEVICE
John M. Rayhack, 13919 Shady Shores Dr., Tampa, Fla. 33613
Filed Oct. 6, 1988, Ser. No. 254,158
Int. Cl.[5] A61F *2/00*
U.S. Cl. 606—53 12 Claims



1. A bone compression and distraction device for compressing or distracting the ends of a bone, comprising in combination:
a splint plate including a first and a second hole at one end and a third and a fourth hole at another end, said third hold comprising a slotted hole, said one end of said splint plate being positioned on one end of the bone and said other end of said splint plate being positioned on the other end of the bone;
a tensioning assembly including a first block seat on one end of said plate and a second block seated on said other end, respectively, of said splint plate and means for adjustably interconnecting said blocks, each said block comprising a transverse hole positioned therethrough;
first bone/block screw positioned through said transverse hole of said first block and through said first hole of said splint plate and threaded into the one end of the bone;
second bone screw positioned through said second hole of said split plate into the one end of the bone;
third bone/block screw positioned through said transverse hole of said second block and through said third hole of said splint plate and threaded into the other end of the bone;
fourth bone screw for positioning through said fourth hole of said splint plate and threaded into the other end of the bone after said tensioning assembly is operated;
fifth bone screw for positioning through said first hole in said splint plate and threaded into said one end of the bone after said first bone/block screw and said first block are removed from seated positioning on said splint plate; and
sixth bone screw for positioning through said third hole in said splint plate and threaded into the other end of the bone after said third bone/block screw and said second block are removed from seated positioning on said splint plate,
whereby said blocks may be rigidly secured to the respective ends of the bone with said splint plate therebetween and said tensioning assembly operated allowing said third bone/block screw to slide within said third hole of said splint plate to compress or distract the ends of the bone whereupon said fourth bone screw may be installed and then said first and third bone screws are removed with said blocks and replaced with said fifth and sixth bone screws.

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4,929,248

SILK FIBER HAVING GOOD ABRASION RESISTANCE AND GOOD LIGHT RESISTANCE AND METHODS FOR THE PREPARATION THEREOF

Toshikazu Fuse, Nagahama; Atsushi Yamamoto, Hikone, and Junji Sano, Amagasaki, all of Japan, assignors to Kanebo Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,846

Claims priority, application Japan, Apr. 28, 1987, 62-103199; Feb. 19, 1988, 63-35126

Int. Cl.[5] D06M *3/02, 13/00*

U.S. Cl. 8—128.1 10 Claims

1. Silk fiber crosslinked with an epoxy compound having at least two epoxy groups wherein the solubility of the silk fiber is at most 30% by weight when the silk fiber is soaked in an aqueous 5 wt.% sodium hydroxide solution at a temperature of 65° C. for 60 minutes, and dyeing depth, K/S, at 520 nm with 9% owf. of a red reactive dye, Color Index Reactive Red 63 at the temperature of 60° C. for 60 minutes is at most 7, prepared by treating a silk fiber with an aqueous solution containing a water-soluble epoxy compound and a catalyst selected from the group consisting of alkali metal and alkali earth metal salts of dicarboxylic acids, tricarboxylic acids and amino polycarboxylic acids, 2-methyl imidazole, triethylenetetramine, 2,4,6-tris (dimethylaminoethyl) phenol and magnesium chloride and then subjected to heat treatment at a temperature range of 50° C. to 150° C.

4,929,249

DISCHARGE AND DISCHARGE RESIST PRINTING USING AMINOREDUCTONES

Peter Lechtken, Frankenthal, and Peter Kutschera, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

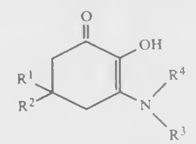
Filed May 4, 1989, Ser. No. 347,223

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3816999

Int. Cl.[5] D06P *5/15;* A61K *31/47*

U.S. Cl. 8—464 4 Claims

1. A process for printing a textile material made of polyester, triacetate, acetate or polyamide or a mixture thereof with a disperse dye by the discharge printing or discharge resist printing technique, which comprises using as the discharging agent a 3-aminoreductone of the general formula



where R^1, R^2 and R^3 are identical or different and each is hydrogen, methyl or ethyl and R^4 is linear or branched alkyl or alkenyl of from 1 to 20 carbon atoms, which may be monosubstituted or polysubstituted by hydroxyl, alkoxy of from 1 to 3 carbon atoms in the alkyl or acetoxy, or is a radical $—(CH_2—CH_2—O)_nH$ where n is from 1 to 10 and which may be etherified with alkyl of from 1 to 3 carbon atoms or esterified with acetyl, or R^4 together with the N-atom is the radical of an aliphatic α- or β-amino acid of from 2 to 15 carbon atoms, where the carboxyl group may be present in neutralized form as an alkali metal, alkaline earth metal or ammonium salt or in esterified form as a C_1-C_{10}-alkyl ester, or a mineral acid salt thereof.

4,929,250

ULTRAVIOLET ABSORBING LENSES AND METHOD OF MAKING THE SAME

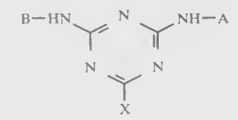
William M. Hung, and Kai C. Su, both of Alpharetta, Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,354

Int. Cl.[5] D06P *5/00;* C07D *251/00, 253/00*

U.S. Cl. 8—507 9 Claims

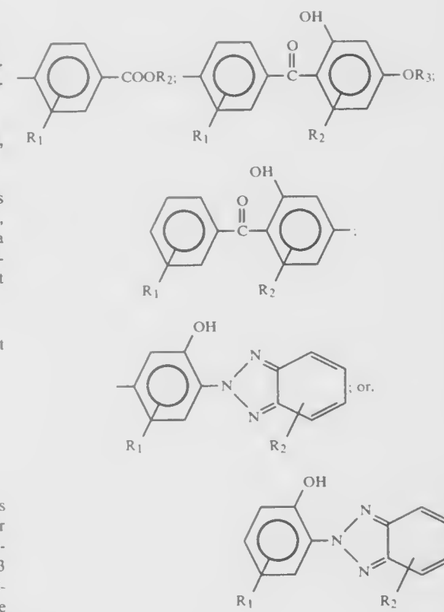
1. A process for preparing an ultraviolet radiation absorbing contact or intraocular lens material, comprising the steps of preparing an aqueous solution of effective amounts of a halotriazine reactive ultraviolet radiation absorbing agent and a base, wherein said reactive ultraviolet radiation absorbing agent is of the formula:



where

X=Cl or F;

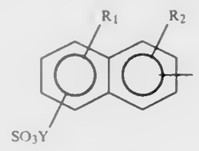
A=an ultraviolet radiation absorbing component selected from the group consisting of



where

R_1-R_3 are selected from the group consisting of hydrogen, alkyl chains varying from C_1 to C_{18}, alkoxy, halogen, nitro, hydroxy, carboxy, sulfonic acid, or sulfonic acid salt substituents; and

B=an aqueous soluble moiety of the formula



where

Y is an amine salt or an alkali salt; and

R_1–R_2 are selected from the group consisting of hydrogen, alkyl chains varying from C_1 to C_{18}, alkoxy, halogen, nitro, hydroxy, carboxy, sulfonic acid, or sulfonic acid salt substituents,

maintaining said solution for a preselected period of time at a temperature up to at least 30° C.; adding a polymeric contact or intraocular lens material to said solution; said polymeric lens material having an exoskeletal functional group selected from the group consisting of hydroxyl, amino, amide and mercapto groups and removing said polymeric lens material from the solution after a preselected time.

4,929,251

METHOD FOR PRODUCING LEAD ACCUMULATOR WITH THIXOTROPIC GEL

Otto Jache, Am Molkenborn 73, D-6470 Budingen 1, Fed. Rep. of Germany

Continuation of Ser. No. 23,126, Feb. 13, 1987, abandoned. This application Feb. 3, 1989, Ser. No. 306,217

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521200

Int. Cl.[5] H01M *10/10*

U.S. Cl. 29—623.5 **6 Claims**

1. Method for the production of a lead accumulator with a thixotrophic gel as an electrolyte that consists essentially of sulphuric acid and a gel former, comprising the steps of:

(a) impregnating the pores of active material in the electrodes and the pores of the separators that are arranged in relationship to the electrodes with a first electrolyte solution consisting essentially of sulphuric acid-based electrolyte that is free of gel former and which possesses a higher concentration of sulphuric acid than that which is present in the entire electrolyte after an equilibration of the concentration, and then;

(b) filling remaining free spaces between the electrodes including the remaining electrolyte spaces with a second electrolyte solution consisting essentially of sulphuric acid and a thixotropic gel former wherein said second solution possess a lower concentration of sulphuric acid than that which is present in the entire electrolyte after equilibration of the concentration.

4,929,252

FUEL

Donald D. Brillhart, 14713 Rockside Rd., Cleveland, Ohio 44137

Filed Jun. 15, 1989, Ser. No. 367,198

Int. Cl.[5] C10L *1/02*

U.S. Cl. 44—53 **3 Claims**

1. A method of making a fuel suitable for diesel engine use, comprising the blending of castor oil and an azeotrope of ethyl alcohol and water.

4,929,253

SULFURIZED OLEFIN - GLYCEROL MONOOLEATE ADDUCTS AND LUBRICANT COMPOSITIONS CONTAINING SAME

Angeline B. Cardis, Florence, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 3, 1988, Ser. No. 227,949

Int. Cl.[5] C10L *1/24*

U.S. Cl. 44—76 **27 Claims**

1. A process for preparing a multifunctional load carrying, antiwear and friction modifying liquid fuels additive which comprises reacting a sulfurized olefin with glycerol monooleate.

19. A liquid fuel composition comprising a major proportion of a liquid fuel and between 0.01 and 20 percent by weight of an additive which is the reaction product of a sulfurized olefin with glycerol monooleate.

4,929,254

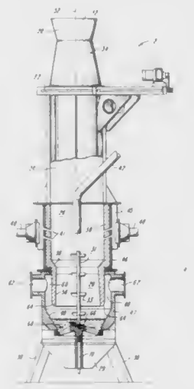
DOWN-DRAFT FIXED BED GASIFIER SYSTEM

Cornelis A. Kooiman, Rhoon, Netherlands, and John J. McDevitt, Sr., Bow, N.H., assignors to SET Technology B.V., Goes, Netherlands

Filed Jul. 13, 1989, Ser. No. 379,590

Int. Cl.[5] C10J *3/26, 3/42*

U.S. Cl. 48—76 **23 Claims**



1. A gasifier apparatus for obtaining combustible gaseous products from solid fuel materials comprising:

a plurality of vertically aligned, modular, interconnected chamber means for housing a gasification reaction including a hopper chamber disposed at a top portion of said gasifier, a drying chamber disposed below and in communication with said hopper chamber, an intermediate chamber disposed below and in communication with said drying chamber, and a lower chamber disposed below and in communication with said pyrolysis chamber;

radial air inlet means extending through an outer skin of said gasifier for directing air into said intermediate and lower chamber means to maintain the gasification reaction;

an annular flange means, integral with an inner refractory wall of said intermediate chamber and extending downwardly into a portion of said lower chamber, for defining a gas discharge pathway within said lower chamber, said gas discharge pathway defined by the outer wall of said flange and the inner wall of said lower chamber; and

first and second gas discharge conduits disposed at a top portion of said gas discharge pathway, said conduits disposed on opposite sides of said gasifier and offset by an angle of about 45° to 90° degrees from said radial air inlets.

4,929,255

METHOD FOR GASIFYING OR COMBUSTING SOLID CARBONACEOUS MATERIAL

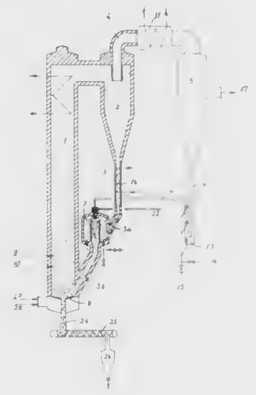
Bertel K. Hakulin, Helsinki, and Jorma J. Nieminen, Varkaus, both of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Aug. 23, 1988, Ser. No. 235,077

Claims priority, application Finland, Aug. 28, 1987, 873735

Int. Cl.[5] C01J *3/54*

U.S. Cl. 48—197 R **22 Claims**



1. A method of gasifying or combusting of solid carbonaceous material in a circulating fluidized bed reactor having a reactor chamber, and a particle separator connected to the reactor chamber; comprising the steps of:

(a) discharging gas resulting from the carbonaceous material from the reactor chamber to the particle separator;

(b) controlling the flow of gas in the reactor chamber at a level such that solid particles are discharged with gas from the reactor chamber to the particle separator;

(c) separating from the gas a major part of the solid particles entering the particle separator;

(d) returning the particles separated in step (c) to the reactor chamber;

(e) conveying gas with unremoved fine particles from the particle separator to a gas purification stage;

(f) separating the fine particles from the gas at the gas purification stage; and

(g) agglomerating the fine particles separated in step (e) with the particles separated in step (c), prior to step (d).

4,929,256

MULTI-DISC CUTTER AND METHOD OF MANUFACTURE

Mark R. Shepherd, Royston, England, assignor to AM International, Inc., Chicago, Ill.

Filed Sep. 19, 1988, Ser. No. 246,225

Claims priority, application United Kingdom, Sep. 19, 1987, 8722085

Int. Cl.[5] B24D *3/00*

U.S. Cl. 51—293 **21 Claims**

1. A method of making an abrasive cutting tool having precisely controlled dimensions, comprising the steps of:

uniformly coating at least a portion of a cylindrical holder with a mixture of diamond powder and resin;

rotating said cylindrical holder about its longitudinal axis; and

exposing the rotating coating to an optical beam having an energy level less than the ablation threshold of said diamond powder and adapted for ablating the resin in said mixture so as to form a plurality of spaced annular depressions in said coating, each pair of successive depressions defining therebetween an abrasive cutting disc.



4,929,257

ABRASIVE COMPOSITION AND PROCESS FOR POLISHING

Kunihiro Miyazaki; Ken Ishitobi, both of Shiojiri, and Yosinobu Yamaguchi, Nagoya, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo and Yamaguchi Seiken Kogyo Kabushiki Kaisha, Aichi, both of, Japan

Filed Mar. 30, 1989, Ser. No. 330,581

Claims priority, application Japan, Apr. 8, 1988, 63-86490

Int. Cl.[5] B24D *3/02*

U.S. Cl. 51—309 **15 Claims**

1. A weak acid or neutral abrasive composition comprising an alpha alumina, a polishing accelerator of nickel sulfamate and/or sulfate, a surface modifying agent of about 0.1 to about 12% by weight of the composition magnesium nitrate, and water.

4,929,258

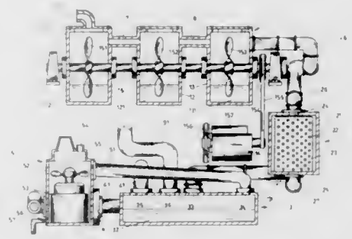
METHOD USED TO PURIFY SMOKE POLLUTANT

Wang Chin-Hua, No. 12, Ning An St., Sung Shan, Taipei, Taiwan

Filed Feb. 7, 1989, Ser. No. 307,610

Int. Cl.[5] B01D *47/12*

U.S. Cl. 55—86 **12 Claims**



1. A method of separating smoke pollutants from air, said method comprising:

providing a plurality of hollow tanks;

aero-communicatively connecting said hollow tanks in series;

partially filling each said hollow tanks with water, each said hollow tank substantially enclosing water, preventing circulation of the enclosed water to a location external to said hollow tank;

agitating the water in said hollow tanks to form droplets;

introducing the smoke-polluted air to a first of said hollow tank in series, the smoke pollutants being mixed and condensed with the droplets so as to purify the air before passing the air to the next hollow tank in series;

passing the purified air to a filter tank; and

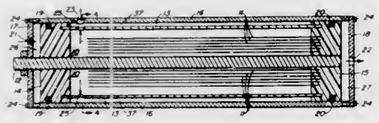
filtering the purified air in said filter tank to further remove smoke pollutants from the air.

4,929,259

HOLLOW FIBER MEMBRANE FLUID SEPARATION MODULE FOR BORESIDE FEED

Terrence L. Caskey, Concord; Johnny L. Trimmer, Antioch, and Janine L. Jorgensen, Clayton, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 9, 1989, Ser. No. 309,756
Int. Cl.[5] B01D *53/22*
U.S. Cl. 55—158 31 Claims



1. A fluid separation module comprising:

A. a plurality of hollow fiber membranes, wherein the hollow fiber membranes are arranged in a bundle form and are adapted for the separation of one or more fluids from one or more other fluids;

B. a first tubesheet comprised of a thermoset or thermoplastic polymeric material at the first end of the bundle, arranged such that the hollow fiber membranes are embedded in the first tubesheet and communicate through the first tubesheet and are open on the opposite face of the first tubesheet;

C. a second tubesheet comprised of a thermoset or thermoplastic polymeric material at the second end of the bundle opposite the first end, arranged such that the hollow fiber membranes are embedded in the second tubesheet and communicate through the second tubesheet and are open on the opposite face of the second tubesheet;

D. a tubesheet support means which comprises a cylinder which encircles the bundle wherein a first end is bonded to or embedded in the first tubesheet, and a second end is bonded to or embedded in the second tubesheet;

E. a feed inlet means adapted for introducing a feed mixture of fluids to be separated into the bores of the hollow fiber membranes by contacting the feed mixture with the hollow fiber membranes at the opposite face of the first tubesheet;

F. a non-permeate outlet means adapted for removing the fluids, which do not permeate through the hollow fiber membranes, from the bore of the hollow fiber membranes at the opposite face of the second tubesheet;

G. means for removing the fluids which permeate through the hollow fiber membranes from the vicinity of the hollow fiber membranes;

H. a core, about which is arranged the hollow fiber membrane bundle, further arranged such that the core extends through and is bonded to the first tubesheet and the second tubesheet;

I. a feed inlet region adjacent to the opposite face of the first tubesheet arranged to form a cavity into which the feed inlet means introduces the feed mixture, wherein the region is sealed such that fluid can only enter or leave the region through the feed inlet means or the hollow fiber membranes, and the feed inlet region is arranged to introduce the feed fluid mixture into the bores of the hollow fiber membranes;

J. a non-permeate outlet region adjacent to the opposite face of the second tubesheet arranged to form a cavity into which the hollow fiber membranes introduce fluids which do not permeate the membrane, and from which the non-permeate outlet removes the non-permeating fluids from the module, wherein the non-permeate outlet region is sealed such that fluid can only enter or leave the region through the hollow fiber membranes or the non-permeate outlet means;

K. one or more means for channeling flow, such means arranged to channel flow of permeate in the longitudinal direction parallel to the core toward the permeate outlet, wherein the means for channeling flow have one end embedded in the second tubesheet and the second end placed at a short distance from the first tubesheet, said distance between the end of the means for channeling flow and the first tubesheet being sufficient to allow the permeate stream flowing along the means for channeling flow to flow to the permeate outlet means;

L. a casing means about the membrane module arranged to encase the entire hollow fiber membrane bundle and the two tubesheets;

M. a means for forming a seal between the first tubesheet means and the casing such that fluid cannot communicate between the feed inlet region and the region between the two tubesheets which is outside of the hollow fibers;

N. a means for forming a seal between the second tubesheet means and the casing such that gas cannot communicate between the non-permeate outlet region and the region between the two tubesheets which is outside of the hollow fibers;

O. a first end capping means arranged for sealing the end of the casing means at the end of the casing means near the first tubesheet, thereby forming the feed inlet region;

P. a second end capping means arranged for sealing the end of the casing means at the end of the casing means near the second tubesheet thereby forming the non-permeate outlet region;

Q. a first attachment means arranged for attaching the first end capping means to the casing means; and

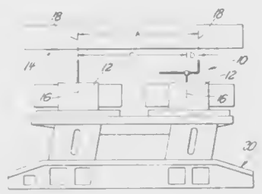
R. a second attachment means arranged for attaching the second end capping means to the casing means.

4,929,260

ADJUSTABLE AIR CLEANER FASTENING ASSEMBLY

David D. Bauerle, St. Clair Shores, Mich., assignor to Colt Industries Inc., New York, N.Y.

Continuation of Ser. No. 164,128, Mar. 4, 1988, abandoned. This application Oct. 11, 1989, Ser. No. 419,815
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—510 8 Claims



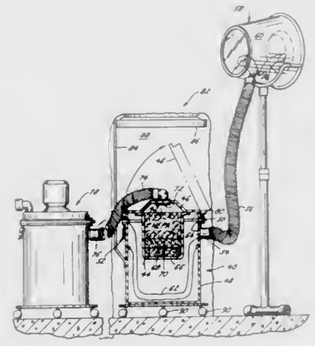
1. An adjustable air cleaner assembly interconnecting predetermined centers of an air cleaner cover and a carburetor on an engine, the centers being eccentric, said assembly comprising in combination base fastening means threadably engaging the predetermined center of a carburetor of an engine, said base fastening means comprising a base stud having a threaded portion at one end threadably engaging an aperture at the predetermined center of the carburetor and an enlarged head portion at the other end having a diameter greater than the diameter of said threaded portion, said enlarged head portion having an aperture communicating diametrically therethrough and being threaded, and cover fastening means engaging said base fastening mean and the predetermined center of said air cleaner cover and adjustably maintaining a predetermined distance between the predetermined centers of the air cleaner cover and the carburetor, said cover fastening means comprising a cover stud being L-shaped and having a threaded portion at each end thereof, the threaded portion at one end of said cover fastening means being disposed in an aperture at the predetermined center of the air cleaner cover and the threaded portion at the other end of said cover fastening means being threadably engageable with said aperture.

4,929,261

HEPA FILTER MODULE

Earl B. Jacobson, 501 S. Shore Dr., Crystal Lake, Ill. 60014

Filed Mar. 28, 1989, Ser. No. 329,573
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—213 7 Claims



1. A HEPA-type filter, comprising:

a vacuum cannister body, having an inlet opening therein and adapted to contain a replaceable vacuum liner therein and a lid sealingly and pivotably mounted on an open portion of said cannister body;

said lid including an outlet opening therein and communicating with said inlet opening through a filter unit including at least a HEPA-type filter adjacent said outlet opening and two prefilters between said HEPA-type filter and said inlet opening to protect said HEPA-type filter, said prefilters mounted adjacent one another and said HEPA-type filter; and

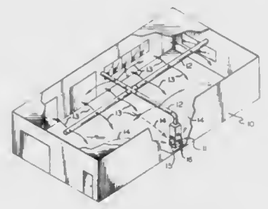
and a fume hood having a wall depending over said cannister body to prevent hazardous materials from escaping to the environment when the liner is replaced.

4,929,262

DOWN DRAFT RE-CIRCULATING SYSTEM

John Balon, Jr., 25 Jefferson Rd., Bedford, N.H. 03102, and Richard J. Egan, 6 Springdale Rd., Manchester, N.H. 03103

Filed Dec. 17, 1987, Ser. No. 134,184
Int. Cl.[5] B01D *46/00*
U.S. Cl. 55—341.2 4 Claims



1. A down draft air recirculating filtration system for an enclosed space comprising in combination: a floor mounted filtration unit and a flexible fabric duct

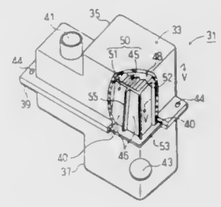
receiving air from said filtration unit and adapted to distribute the same through a multiplicity of outlets across and just under the ceiling of said enclosed space; said filtration unit being adapted to intake air from the floor of said enclosed space and having a fan to propel said air and upstream of said fan at least three filter elements in series through which said air passes, the first of which is a course filter, the second of which removes 95% of all particles greater than 10 microns and the third of which removes 95% of all particles greater than 1 micron, the second filter element being comprised of crimped fibers of plastic fiber coated with tackifier and the third filter being a bag filter, said filter elements being readily removable and replaceable in said filtration unit, said filtration system creating a blanket of filtered air at said ceiling under positive pressure and a zone of lower pressure at said floor, which filtered air drifts downwardly to said floor and to said filtration unit.

4,929,263

AIR CLEANER

Joji Kasugai, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 10, 1989, Ser. No. 308,681
Claims priority, application Japan, Feb. 26, 1988, 63-045311; May 27, 1988, 63-131163
Int. Cl.[5] B01D *46/10*
U.S. Cl. 55—502 6 Claims



1. An air cleaner comprising:

a case formed continuously and integrally by blow molding, said case having an air inlet port, an air outlet port, a flange portion which divides said air inlet port and said air outlet port on the outer surface of said case, and a groove formed in said flange portion and opening into the interior of said case;

a filter arranged within said case; and

a filter holder on the outer peripheral edge of said filter for holding the shape of the filter, said filter holder being substantially non-deformable in a thickness direction thereof, the outer periphery of siad filter holder being in direct, airtight contact with the inner surface of said groove, said filter holder comprising a perpherical wall, a peripheral rib formed on the other surface of said wall and in air tight contact with the inner surface of said groove, and a connecting rib which connects said peripheral wall and the inner surface of said case.

4,929,264

APPARATUS FOR REDUCING OPTICAL-FIBER ATTENUATION

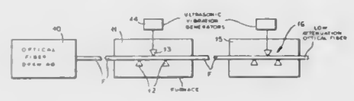
Pietro Di Vita, Turin, Italy, assignor to Cselt Centro Studi E Laboratori Telecommunicazioni S.P.A., Turin, Italy

Continuation-in-part of Ser. No. 266,734, Nov. 3, 1988. This application May 10, 1989, Ser. No. 349,992
Claims priority, application Italy, Nov. 5, 1987, 67942 A/87
Int. Cl.[5] C03B *37/15*
U.S. Cl. 65—12 3 Claims

1 An apparatus for reducing attenuation in an optical fiber, comprising:

means for heating an optical fiber to an elevated temperature below a softening temperature of the material of said optical fiber; and

means for vibrating said optical fiber while it is at said elevated temperature with an ultrasonic vibration to effect atomic redistribution in said optical fiber to a lower energy condition than the atoms possess prior to vibrating of said optical fiber, thereby reducing sizes of inhomogeneity domains in said material.



4,929,265

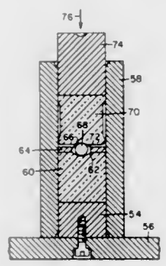
METHOD OF MOLDING GLASS OPTICAL ELEMENTS

Larry L. Carpenter; Robert J. Hagerty, both of Painted Post; Richard O. Maschmeyer, Corning; Mark L. Morrell, Horseheads, and Peter A. Schrauth, Elmira, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Mar. 8, 1989, Ser. No. 320,459

Int. Cl.[5] **C03B** *23/00*

U.S. Cl. 65—64 **40 Claims**



1. The method of molding a glass optical element having first and second opposed optical surfaces comprising the steps of

providing a first master defining a first master mold cavity adapted to form a first glass mold,

disposing a first quantity of glass mold material within said first master mold cavity,

molding a first glass mold having a first glass molding surface adapted to form said first optical surface,

providing a second master defining a second master mold cavity adapted to form a second glass mold,

disposing a second quantity of glass mold material within said second master mold cavity,

molding a second glass mold having a second glass molding surface adapted to form a second optical surface,

disposing said first and second glass molds in opposed cooperative relationship such that said first and second glass molding surfaces in part define a glass mold cavity having a predetermined volume,

disposing a predetermined quantity of glass optical element material within said glass mold cavity, and

molding said glass optical element having first and second opposed optical surfaces.

4,929,266

METHOD OF MANUFACTURING GLASS

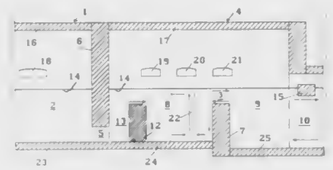
Daniel Cozac, Braine l'Alleud, and Jean-Francois Simon, Brussels, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Apr. 29, 1988, Ser. No. 188,553

Claims priority, application United Kingdom, Apr. 30, 1987, 8710298

Int. Cl.[5] **C03B** *5/225*

U.S. Cl. 65—135 **24 Claims**



1. A method of manufacturing glass wherein raw material is batch fed to a continuous glass-melting furnace which includes a melting tank connected by a submerged throat to a refining tank, the refining tank having an upstream refining cell and a downstream refining cell separated by a transverse sill, each of the upstream refining cell and the downstream refining cell having respective upstream ends downstream ends, and the downstream cell of the refining tank is connected to a conditioning tank, said method comprising the steps of:

a. melting the batch material in the melting tank to provide a melt;

b. passing the melt from the melting tank to the upstream refining cell of the refining tank via the submerged throat;

c. heating the melt in the upstream refining cell to thereby degas the melt, to thereby produce within the upstream refining cell a spring zone, which spring zone is a localized area of rising melt located towards the downstream end of the upstream refining cell, and to thereby produce within the upstream refining cell a circulation of melt which feeds the spring zone; and

d. delivering the melt of step c over the transverse sill into the downstream refining cell and subsequently into the conditioning tank.

4,929,267

PLANT GROWTH PROMOTION

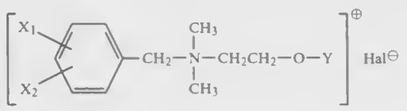
Akinori Suzuki, Chiba; Suong B. Hyeon, Urawa; Tosbio Kajita, Yachiyo; Masakazu Furushima, Nagareyama; Shigeo Yoshinaka, Niigata; Takashi Suzuki, Niigata; Mitsunori Oda, Niigata, and Akinori Tanaka, Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Company, Japan

Filed Dec. 8, 1986, Ser. No. 938,872

Int. Cl.[5] **A01N** *33/08*

U.S. Cl. 71—77 **6 Claims**

1. A method of promoting the growth of a plant, which comprises applying an effective amount of at least one active compound selected from the group consisting of agriculturally acceptable salts of compounds represented by the formula:



(I)

wherein Hal represents a chlorine, bromine or iodine atom, X_1 represents a hydrogen or chlorine atom, or a methyl, trifluoromethyl, nitro, methoxy or t-butyl group, and X_2 represents a hydrogen atom, or both X_1 and X_2 represent

a chlorine atom or a methyl group; and Y represents a hydrogen atom, or a C_{2-6} alkylcarbonyl, benzoyl, N-phenylcarbamoyl, N-3,4-dichlorophenylcarbamoyl, chloropropylcarbonyl, methoxycarbonyl, carbamoyl or methacryloyl group,

to the stalks, leaves, roots or seeds of the plant or to soil.

4,929,268

SUBSTITUTED OXIRANE COMPOUNDS

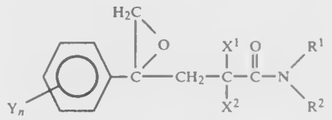
R. Garth Pews, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 27, 1985, Ser. No. 716,861

Int. Cl.[5] **A01N** *43/00*

U.S. Cl. 71—88 **18 Claims**

1. A compound of the formula



(I)

wherein

Y represents halogen, $-CF_3$ or methyl;

n represents an integer from 1 to 5, inclusive;

X^1 and X^2 independently represent chlorine, fluorine, bromine or iodine; and

R^1 and R^2 independently represent

hydrogen,

cyano,

loweralkyl,

cycloalkyl,

aryl,

aralkyl,

—COOR wherein R represents hydrogen or loweralkyl or

$-CONZ^1Z^2$ wherein

Z^1 and Z^2 independently represent

hydrogen,

cyano,

loweralkyl,

cycloalkyl,

aryl or

aralkyl.

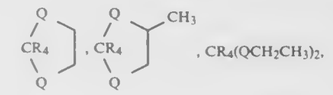
E is O, $S(O)_m$ or $N-R_3$;

E_1 is CH_2, CH_2CH_2, $CH(C_1-C_4$ alkyl), $C(CH_3)_2$ or CH aryl;

R_1 is hydrogen, halogen, C_1-C_4 alkyl, C_1-C_4 haloalkyl, C_1-C_4 alkoxy, C_1-C_4 halo-alkoxy, C_1-C_4 alkoxycarbonyl, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, sulfamoyl, C_1-C_4 alkylsulfamoyl, di(C_1-C_4 alkyl)sulfamoyl, amino, C_1-C_4 alkylamino. or di(C_1-C_4 alkyl)amino;

R, R_2 and R_3 are independently hydrogen, C_1-C_4 alkyl, C_2-C_4 alkenyl or C_2-C_4 alkynyl; m=0, 1 or 2;

X is CH_3, OCH_3, OCH_2CH_3, Cl, F, Br, I, OCF_2H, CH_2F or CF_3, Y is H, CH_3, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$, C_2H_5, CF_3, SCH_3, $N(OCH_3)CH_3$, OCH_2CH-CH_2, OCH_2C-CH, OCH_2CF_3, cyclopropyl, Q $OCH_2CH_2OCH_3$, CH_2SCH_3, $(C=O)R_4$, $CR_4(QCH_3)_2$,



, $CR_4(QCH_2CH_3)_2$.

OCF_2H, SCF_2H, C≡CH or C≡CCH_3 where Q is O or S and R_4 is H or CH_3; and

Z is CH, CCH_3, CC_2H_5, CCl or CBr.

6. A herbicidal composition comprising an effective amount of a compound according to claim 1 and a carrier therefor.

4,929,269

HERBICIDAL SULFONOMIDES

Keith G. Watson, Blackburn; Peter Drygala, Niddrie, and Stephen Bell, Vale, all of Australia, assignors to ICI Australia Operations Proprietary Limited, Melbourne, Australia

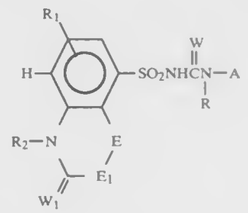
Filed Oct. 19, 1988, Ser. No. 259,762

Claims priority, application Australia, Oct. 20, 1987, P14989

Int. Cl.[5] **C07D** *401/12, 403/12, 417/12;* **A01N** *43/54*

U.S. Cl. 71—92 **10 Claims**

1. A compound of formula I and the salts thereof

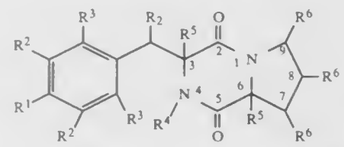


wherein

W and W_1 are independently O or S;

1. A method of selectively inducing chlorosis on a knapweed plant, comprising

applying a knapweed phytotoxic amount of the 3,6- L,L isomer of a cyclodipeptide of the formula

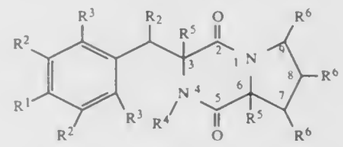


wherein R^1 is H and R^2 to R^6 are H, to the plant; and

allowing for the cyclodipeptide to remain in contact with the plant for a period of time effective to attain said effect.

5. A method of selectively inducing chlorosis on a knapweed plant, comprising

applying a knapweed phytotoxic amount of the 3,6 L,L isomer of a cyclodipeptide of the formula



wherein R^1 is OH and R^2 to R^6 are H to the plant; and

allowing for the cyclodipeptide to remain in contact with the plant for a period of time effective to attain said effect.

4,929,270

METHOD OF INDUCING CHLOROSIS IN A KNAPWEED PLANT

John H. Cardellina, II, Bozeman; Andrea C. Stierle, Butte, and Gary A. Strobel, Bozeman, all of Mont., assignors to Research and Development Institute, Inc. at Montana State University, Bozeman, Mont.

Filed Apr. 4, 1988, Ser. No. 177,536

Int. Cl.[5] **A01N** *43/90;* **C07D** *487/04, 487/14, 513/18*

U.S. Cl. 71—92 **8 Claims**

4,929,271

HERBICIDAL METHOD USING DIFLUFENICAN

Richard H. Hewett, Thaxted, and Brian M. Luscombe, Chelmsford, both of England, assignors to May & Baker Limited, Dagenham, England

Filed Dec. 23, 1987, Ser. No. 137,370

Claims priority, application United Kingdom, Dec. 23, 1986, 8630806

Int. Cl.[5] A01N *43/40, 37/38*

U.S. Cl. 71—94 18 Claims

1. A method of controlling the growth of weeds at a cereal crop locus which comprises applying to the locus, post-emergence of the weeds, an effective amount of (a) a phenoxyalkanoic acid herbicide selected from the group consisting of MCPA and CMPP or an agriculturally acceptable salt or ester thereof at an application rate of from 125 g to 250 g a.e. per hectare, and (b) diflufenican, which is N-(2,4-difluorophenyl)-2-(3-trifluromethyl-phenoxy)-nicotinamide at an application rate of from 25 g to 250 g per hectare.

4,929,272

N-PHENYL-MALEIMIDES AND N-PHENYL-SUCCINIMIDES AND THEIR USE IN A HERBICIDAL AND/OR PLANT GROWTH REGULATING ACTION

Hans Moser, Magden, Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Hans-Georg Brunner, Lausen, Switzerland; Beat Böhner, Binningen, Switzerland, and Marcus Banmann, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

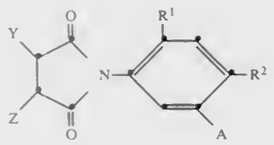
Continuation of Ser. No. 92,793, Sep. 3, 1987, Pat. No. 4,804,400. This application Dec. 8, 1988, Ser. No. 281,562

Claims priority, application Switzerland, Sep. 12, 1986, 3664/86; Apr. 28, 1987, 1616/87

Int. Cl.[5] C07D *207/448, 207/452;* A01N *37/24*

U.S. Cl. 71—95 19 Claims

1 N-phenylsuccinic acid-imides of the formula



wherein

R^1 is hydrogen or fluorine,

R^2 is halogen,

Y is C_1–C_8-alkyl,

Z is hydrogen or C_1–C_8-alkyl,

A is hydrogen or a group $-XR^8$,

X is oxygen or sulfur and

R^8 is C_1–C_8-alkyl, C_2–C_8-alkoxyalkyl, C_2–C_8-alkylthioalkyl, C_2–C_8-alkylaminoalkyl, C_2–C_8-haloalkyl, C_2–C_8-cyanoalkyl, C_3–C_8-alkenyl, C_3–C_8-haloalkenyl or C_3–C_8-alkynyl.

4,929,273

N-BENZYL-2-(4-FLUORO-3-TRIFLUOROMETHYL-PHENOXY)BUTANOIC AMIDE AND HERBICIDAL COMPOSITION CONTAINING THE SAME

Tetsuo Takematsu; Yasutomo Yakeuchi, both of Utsunomiya; Mitsuaki Takenaka, Ube; Seiji Takamura, Ube, and Akio Matsushita, Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

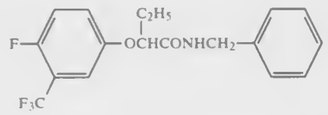
Continuation of Ser. No. 29,432, Mar. 23, 1987. This application Sep. 22, 1989, Ser. No. 412,635

Claims priority, application Japan, Mar. 28, 1986, 61-68805

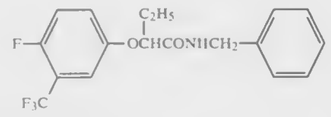
Int. Cl.[5] A01N *37/18;* C07C *103/178*

U.S. Cl. 71—118 6 Claims

1. N-benzyl-2-(4-fluoro-3-trifluoromethylphenoxy)butanoic amide represented by the formula:



3. A herbicidal composition comprising an herbicidally effective amount of N-benzyl-2-(4-fluoro-3-trifluoromethyl-phenoxy)butanoic amide represented by the formula:



in an agricultural carrier.

4,929,274

RECOVERY OF METAL VALUES FROM ORES

Lionel B. Luttinger, Erwinna, Pa., assignor to Drew Chemical Corporation, Boonton, N.J.

Filed Jun. 7, 1989, Ser. No. 362,896

Int. Cl.[5] C22B *11/04*

U.S. Cl. 423—25 4 Claims

1. In a process for recovering gold and silver values in which an aqueous alkali cyanide leach solution of about pH 10–11 is percolated through a heap of particulated gold/silver-bearing ore to form a pregnant leach solution containing extracted gold and silver as metal cyanide complexes; separating said extracted metal cyanide complexes from said pregnant leach solution by absorption on a column of activated carbon; and subjecting said activated carbon column to a stripping circuit in which the metal cyanide complexes are desorbed, the improvement which comprises extracting said gold and silver values using an aqueous alkali cyanide leach solution containing at least about 1 ppm of a surfactant which is hydrolyzable at the alkalinity of said leach solution and which does not interfer with the effectiveness of the subsequent carbon absorption of the metal cyanide complexes from said pregnant leach solution.

4,929,275

MAGNETIC ALLOY COMPOSITIONS AND PERMANENT MAGNETS

Yakov Bogatin, Philadelphia, Pa., assignor to SPS Technologies, Inc., Newtown, Pa.

Filed May 30, 1989, Ser. No. 357,845

Int. Cl.[5] B22F *1/00*

U.S. Cl. 75—246 39 Claims

1. A permanent magnet alloy composition comprising from about 0.5 to about 27 atomic percent R wherein R is at least one rare earth element including Y and Sc, from about 0.1 to about 53 atomic percent A wherein A is at least one actinide element, and the balance being at least one metal wherein at least about 50 weight percent of the balance is at least one metal selected from the group consisting of Fe, Co, Ni, and Mn.

4,929,276

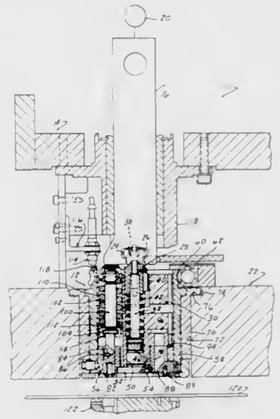
MULTITOOL PUNCH HOLDER

Victor L. Chun, Holland; James R. Hunter, Chadds Ford, and George Jaworski, Bala Cynwyd, all of Pa., assignors to Murata Wiedemann, Inc., King of Prussia, Pa.

Filed May 22, 1989, Ser. No. 355,237

Int. Cl.[5] B26F *1/08*

U.S. Cl. 83—552 12 Claims



1. In combination with a multitool punch holder (12) for engagement with a reciprocating ram (16) of a punch press apparatus (10), said multitool punch holder (12) including a rotary tool carrier (56) holding a circumferential array of punches (80) and enabling selective ram driving of any one of said plurality of punches (80) by rotation of said tool carrier (56) about an axis by an indexing drive therefor, characterized by a body member (30) interposed between said tool carrier (56) and said ram (16); a coupling means (26) connecting said ram (16) to said body member (30) to prevent rotation but allow relative axial movement therebetween; a striker rod (100) extending parallel to said punches (80) and slidably mounted in said body member at a location offset from the axis of rotation of said carrier so as to be aligned with each punch (80) successively as said tool carrier (56) is rotated; a stripper spring (110) urging said striker rod (100) to an elevated position in said body member (30) above said punches (80); said striker rod (100) having an upper end extending above said body member (30) and a lower end adapted to engage a punch; an engagement feature (108) on said ram (16) located to engage said striker rod (100) upper end after a predetermined relative axial movement between said ram (16) and said body member (30) from a separated position; separator spring means (42) urging said ram (16) and said body member (30) apart to said separated position; whereby upon continued downward movement of said ram (16), driving engagement of said body member (30) with a workpiece (120) arrests further downward movement of said body member (30), said separator spring means (42) thereafter overcome to cause said ram engagement feature (108) to engage and advance said striker rod (100), by continued downward movement of said ram (16) against the resistance of said stripper spring (110) enabling said striker rod (100) to contact and drive a punch (80) disposed beneath said striker rod (100) to cause punching of said workpiece (W) by said punch (80).

4,929,277

RECORDING LIQUID

Mitsugu Tanaka, and Takeo Sakai, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

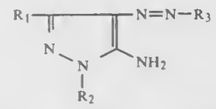
Filed Jul. 11, 1988, Ser. No. 217,205

Claims priority, application Japan, Jul. 10, 1987, 62-172433

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—22 13 Claims

1. A recording liquid comprising an organic solvent and at least one compound represented by formula (I):



(I)

wherein R_1 represents a hydrogen atom, an alkyl group, an alkoxy group, an aryl group, a carboxylic acid ester group or a carbamoyl group; R_2 represents a hydrogen atom, an alkyl group or an aryl group; and R_3 represents an aryl group; provided that none of R_1, R_2 and R_3 is substituted with a sulfonic acid group wherein said liquid has a specific resistance of from about 10^5 to 10^{11} Ωcm.

4,929,278

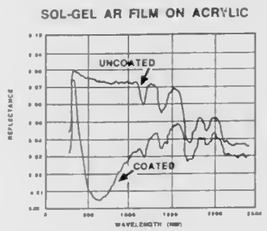
SOL-GEL ANTIREFLECTIVE COATING ON PLASTICS

Carol S. Ashley, and Scott T. Reed, both of Albuquerque, N. Mex., assignors to United States Department of Energy, Washington, D.C.

Filed Jan. 26, 1988, Ser. No. 148,458

Int. Cl.[5] C09K *3/00;* C03C *3/00*

U.S. Cl. 106—287.12 6 Claims



1. A method for preparing a sol-gel antireflective surface coating solution comprising:

(a) subjecting a solution of a silicon alkoxide, a metal alkoxide, or a mixture thereof to hydrolyzation and condensation in a reaction system containing water and a catalyst in an alcohol solution;

(b) aging said system to form a sol-gel hydrolyzation-condensation polymeric reaction product;

(c) reliquifying the gel of said sol-gel reaction product by breaking the polymer-polymer bonds of said gel; and

(d) diluting said reliquified sol-gel reaction product to produce said surface coating solution.

4,929,279

PROCESS FOR DISPERSING ORGANIC PIGMENTS WITH ULTRASONIC RADIATION

Byron G. Hays, Verona, N.J., assignor to BASF Corporation, Parsippany, N.J.

Filed Feb. 21, 1989, Ser. No. 312,870

Int. Cl.[5] C09B *67/50;* C09D *3/387*

U.S. Cl. 106—412 26 Claims

1. A method of dispersing an organic pigment, the method comprising the steps of:

(A) adding a surfactant to an aqueous slurry of an organic pigment, the surfactant being selected from the group consisting of

1. the acidic salt of N-alkyl-N,N',N'trimethyl-1,3-propanediamine,
2. the acidic salt of N-alkyl-N,N',N'tris(2-hydroxypropyl)-1,3-propanediamine,
3. N-alkyl-N,N,N',N',N'-pentamethyl-1,3,-propanediamine dichloride,
4. the acidic salt of N-(N-alkyl-3-aminopropane)-N'(3 aminopropane)-1,3propanediamine,

wherein the alkyl group contains from about 12 to about 22 carbon atoms, and

5. a poly(ethyleneoxide) ether of an 18 carbon alcohol having 9 units of ethylene oxide thereon;

(B) dispersing the pigment by subjecting the slurry to ultrasonic radiation.

4,929,280

HYDROFORMYLATION OF CARBON BLACK

Lawson G. Wideman, Tallmadge, and Thomas J. Botzman, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 14, 1988, Ser. No. 244,233
Int. Cl.[5] C09C *1/44*
U.S. Cl. 106—472 **16 Claims**

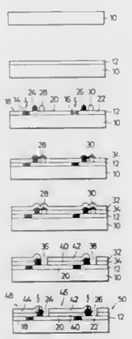
1. A carbon containing compound comprising hydroformylated carbon black cold forming of metal objects by pressure.

4,929,281

METHOD FOR PRODUCING THIN-FILM SOLAR CELLS IN A SERIES-CONNECTED ARRAY

Jörg Wörner, Grosskrotzenburg, Fed. Rep. of Germany, assignor to NUKEM GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,268
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 3712589
Int. Cl.[5] H01L *35/34*
U.S. Cl. 136—201 **24 Claims**



1. A method for producing thin-film solar cells connected in series, said method comprising the steps of:

depositing a first electrode layer on a substrate having a large area,

structuring said first electrode layer,

after said structuring of said first electrode layer, depositing at least one layer of semiconductive material over said first electrode layer,

depositing a second electrode layer over said at least one layer of semiconductive material, and

structuring said at least one layer of semiconductive material and said second electrode layer for producing said thin-film solar cells and connecting said solar cells in a side-by-side arrangement in series.

4,929,282

SILVER, THALLIUM, COPPER AND TELLURIUM-BASED THERMOELECTRICAL SEMICONDUCTIVE THERMOELECTRIC MATERIAL, PREPARATION AND APPLICATION TO THERMOELECTRIC CONVERTERS

Gérard Brun, Saint-Gely du Fesc; Rose-Marie Marin-Ayral, Montpellier; Maurice Maurin, Montpellier; Bernard Pistoulet, Montpellier, and Jean-Claude Tedenac, Frontignan, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

PCT No. PCT/FR87/00041, § 371 Date Apr. 19, 1988, § 102(e) Date Apr. 19, 1988, PCT Pub. No. WO87/05154, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 17, 1987, Ser. No. 124,783
Claims priority, application France, Feb. 19, 1986, 86 02226
Int. Cl.[5] H01L *35/20*
U.S. Cl. 136—239 **4 Claims**

1. Silver, thallium, copper and tellurium-based thermoelectric semiconductor materials, characterized in that they are represented by the general formula (I)

$$Ag_xCu_yTlTe_{1+z} \qquad (I)$$

wherein, x, y and z are:

$0.55<x<0.75$; $0.25<y<0.40$ and $0<z<0.10$.

4,929,283

VAPOR PHASE ARTIFICIAL AGING OF METAL ALLOYS USING FLUOROCHEMICALS

John C. W. King, Orefield; Donald J. Bowe, Allentown, and Paul T. Kilhefiner, III, Wescosville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 320,199, Mar. 7, 1989, abandoned. This application Sep. 7, 1989, Ser. No. 404,160
Int. Cl.[5] C22F *1/02*
U.S. Cl. 148—13.2 **20 Claims**

1. In a process for the artificial aging at elevated temperatures of metal alloys to impart precipitation hardening, the improvement comprising aging said alloy in the elevated temperature vapor of a fluorochemical compound.

4,929,284

WATER REMOVABLE SOLDER STOP

James A. Clanton, Wenonah, N.J., assignor to General Electric Company, Camden, N.J.

Filed Dec. 16, 1988, Ser. No. 285,697
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 **16 Claims**

1. A solder stop composition capable of being cured to a dried state on a substrate and removable from the substrate by water, comprising:

(a) a water soluble binder dissolved in water;

(b) a viscosity control agent in an amount sufficient to increase the consistency of the composition to a semisolid paste;

(c) a thermal insulator filler in an amount which prevents heat from passing through the composition in a dried, solid state on a substrate; and

(d) a water soluble moisturizer extender control agent in an amount sufficient to prevent cracking and tackiness of the solder stop composition in the dried, solid state on a substrate.

4,929,285

ALUMINUM SHEET PRODUCT HAVING REDUCED EARING AND METHOD OF MAKING

Mohammad A. Zaidi, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 4, 1989, Ser. No. 347,183
Int. Cl.[5] C22F *1/04*
U.S. Cl. 148—11.5 A **16 Claims**

1. A method of fabricating sheet stock having reduced earing during container forming, the method comprising the steps of:

(a) providing a body of an aluminum base alloy suitable for rolling into sheet stock for forming containers therefrom;

(b) hot rolling said body to provide a flat rolled product having a partially recrystallized but predominantly hot rolled structure with 5 to 20% of said structure being recrystallized;

(c) annealing said flat rolled product at a controlled heat-up rate of 0.5° to 50° F./hr. in a temperature range of 400° to 700° F. to provide said product in a fully recrystallized condition; and

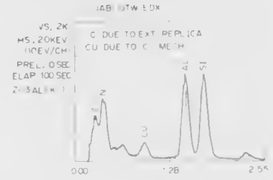
(d) cold rolling said annealed product to sheet stock which has reduced earing during container forming.

4,929,286

METHOD FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET

Hajime Komatsu; Mitsuru Tanino, both of Kawasaki; Yozo Suga, and Toyohiko Konno, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 883,962, Jul. 10, 1986, abandoned. This application Oct. 7, 1988, Ser. No. 267,729
Claims priority, application Japan, Aug. 15, 1985, 60-179855
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—111 **10 Claims**



1. In a method for producing a grain-oriented electrical steel sheet having a high magnetic flux density, said method including the steps of:

providing a silicon steel slab containing from 1.5 to 4.5% Si as well as Al and N;

hot rolling said slab to provide a hot rolled strip;

annealing said hot rolled strip;

cold rolling said hot rolled strip once or twice to produce a cold roll strip having a final sheet thickness;

decarburization annealing said strip after cold rolling;

applying an annealing separator to said strip after said decarburization annealing; and thereafter,

finish annealing said strip to carry out secondary recrystallization and purification;

the improvement comprising:

heating said slab prior to hot rolling to a temperature at which incomplete solution of Al and N occurs;

nitriding said strip after said decarburization annealing and prior to initiation of secondary recrystallization in said finishing annealing step thereby forming precipitates of (Si, Al)N, said precipitates causing said secondary recrystallization.

4,929,287

METHOD FOR SURFACE TREATMENT OF METAL ALLOYS

Modjtaba Hirbod, Finspong, Sweden, assignor to ABB Stal AB, Sweden

Filed Sep. 22, 1988, Ser. No. 247,640
Claims priority, application Sweden, Jun. 13, 1988, 8802186
Int. Cl.[5] C23F *17/00*; C23C *8/10*
U.S. Cl. 148—276 **11 Claims**

1. A method for improving the corrosion/erosion resistance of a high-temperature Fe, Co or Ni-based alloy having a surface that is exposed to combustion products of coal, coal products, waste or the like and which contains a metal selected from the group consisting of Cr and Al, said method comprising the steps of

(a) heating the surface of said alloy to a temperature between 500° and 1200° C. to selectively oxidize Cr and Al at said surface to form an oxide layer,

(b) applying a substance to said oxide layer to promote adhesion and ductility of said oxide layer, and

(c) subjecting said surface to an elevated temperature in an environment adapted to facilitate incorporation of said substance into said oxide layer, thereby providing an oxide layer having a thickness which does not exceed 20 μm.

4,929,288

CORROSION AND ABRASION RESISTANT ALLOY

Robert J. Borges, 14130 Parliament Dr., Chesterfield, Mo. 63017

Filed Jan. 4, 1988, Ser. No. 140,740
Int. Cl.[5] C22C *38/22*
U.S. Cl. 148—326 **18 Claims**

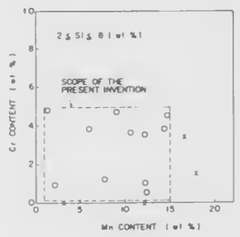
1. In a white iron alloy the improvement comprising a high chromium iron base having a ferritic matrix containing a dispersed phase, the alloy containing a dispersed phase, the alloy containing between about 26 to 28% chromium, between about 0.9 to 12% carbon, between about 0.4 to 0.75% silicon and between about 0.5 to 1.0% tungsten, and a portion of the tungsten being present in the dispersed phase, the alloy having substantial resistance to combined corrosion and abrasion in hot acid slurries.

4,929,289

IRON-BASED SHAPE-MEMORY ALLOY EXCELLENT IN SHAPE-MEMORY PROPERTY AND CORROSION RESISTANCE

Yutaka Moriya; Tetsuya Sanpei, and Hisatoshi Tagawa, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 314,564
Claims priority, application Japan, Apr. 5, 1988, 63-83495
Int. Cl.[5] C22C *38/34, 38/38*
U.S. Cl. 148—402 **12 Claims**



1. An iron-based shape-memory alloy excellent in a shape-memory property and a corrosion resistance, consisting essentially of:

chromium:	from 0.1 to 5.0 wt. %,
silicon:	from 2.0 to 8.0 wt. %,
manganese:	from 1.0 to 14.8 wt. %,
at least one element selected from the group consisting of	
nickel:	from 0.1 to 20.0 wt. %,
cobalt:	from 0.1 to 30.0 wt. %,
copper:	from 0.1 to 3.0 wt. %,
and	
nitrogen:	from 0.001 to 0.400 wt. %,
where, Ni + 0.5 Mn + 0.4 Co + 0.06 Cu + 0.002 N ≧ 0.67 (Cr + 1.2 Si),	
and	
the balance being iron and incidental impurities.	

4,929,290

CRASH BAG PROPELLANT COMPOSITION AND METHOD FOR GENERATING NITROGEN GAS

Richard V. Cartwright, Sussex, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 223,965, Jul. 25, 1988. This application Nov. 17, 1989, Ser. No. 437,861
Int. Cl.[5] C06B *35/00*
U.S. Cl. 149—35 16 Claims

1. A propellant composition comprising, in combination,
(a) a metal azide salt component of a group 1(a)- or 2(a)-type metal; and
(b) an oxide of a non-toxic transition metal element sufficient to react with up to about 70% of said metal azide salt component; and
(c) an effective amount of a modifier component represented by the formula

$$Me_x(An)_o$$

wherein
Me is defined as a cation of a non-toxic transition metal element;
An is defined as a member selected from the group consisting of a carbon-containing, a silicon-containing, and a boron-containing anion group chemically compatible with Me and capable of reacting with said metal azide salt component to obtain non-toxic by-products less basic than a metal hydroxide corresponding to said metal azide salt component; and
x and o are individually defined as positive numbers appropriate to indicate the corresponding chemical formula.

4,929,291

PROPELLANT CONTAINING 2-HYDROXYMETHYL-1,3-PROPANEDIOL TRINITRATE

Michael W. Barnes, Brigham City, Utah, assignor to Thiokol Corporation, Ogden, Utah

Continuation of Ser. No. 757,191, Jul. 22, 1985, abandoned, which is a continuation of Ser. No. 592,732, Mar. 22, 1984, abandoned, which is a continuation of Ser. No. 332,030, Dec. 15, 1981, abandoned, which is a continuation of Ser. No. 66,195, Aug. 13, 1979, abandoned, which is a continuation of Ser. No. 854,946, Nov. 25, 1977, abandoned. This application Mar. 30, 1989, Ser. No. 333,728
Int. Cl.[5] C06B *45/10*
U.S. Cl. 149—19.4 1 Claim

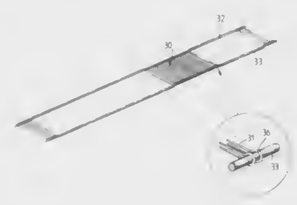
1. A propellant composition consisting of:
A. about 19.989% by weight trimethylolmethane trinitrate;
B. about 4.872% by weight hydroxy-terminated polycaprolactone;
C. about 0.839% by weight of a polyfunctional isocyanate based on hexamethylene diisocyanate;
D. about 0.25% by weight 4-nitrodiphenylamine;
E. about 1.0% by weight carbon black;
F. about 0.05% by weight triphenylbismuth;
G. about 23.00% by weight cyclotetramethylene tetranitramine;
H. about 20.00% by weight ammonium perchlorate; and
I. about 30.00% by weight ammonium nitrate.

4,929,292

METHOD FOR THE MANUFACTURE OF A PNEUMATIC TIRE

Eric Holroyd, High Legh Park, and Anthony R. Wright, Southport, both of England, assignors to Apsley Metals Limited, England

Continuation of Ser. No. 891,113, Jul. 31, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 214,842
Claims priority, application United Kingdom, Aug. 3, 1985, 85 19579
Int. Cl.[5] B29D *30/32*
U.S. Cl. 156—132 7 Claims



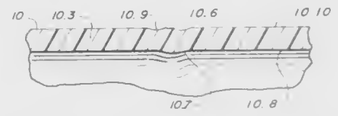
1. A method of manufacture of a pneumatic tire including the steps of:
(a) winding a single continuous reinforcing cord around a pair of spaced apart spindles to form a cord ply comprising a series of adjacent windings of said single cored with a series of cord loops adjacent each edge of the cord ply;
(b) rubberizing the cord ply as it emerges from the spindles to form a cord reinforced elastomeric ply with said series of cord loops adjacent each edge thereof being unrubbered;
(c) locating at least one support element in each said series of loops either prior to or after the rubberizing step;
(d) convoulte winding the elastomeric ply with said at least one support element in situ into a cylindrical form with said support elements being formed into rings by circling said support elements and winding the elastomeric ply around a former of a diameter greater than the diameter of bead wire assemblies to be incorporated in the tire, the ends of said support elements then being joined and the circled support elements crimped to reduce their diameters and turn down the edge portions of the ply;
(e) locating bead wire assemblies coaxially of the cylindrical elastomeric ply and in situ support elements by passing each bead wire assembly over the respective reduced-diameter support element and pressing said bead wire assembly against the respective turned down edge portion of the ply, the support elements being subsequently released to expand radially and resume their natural circular configuration; and
(f) incorporating the support elements into each bead assembly by pressing said elements into engagement with the respective bead wire assemblies to anchor the loops of cord to each respective bead assembly.

4,929,293

WELDING FLUOROPOLYMER PIPE AND FITTINGS

Michael L. Osgar, Eagan, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Continuation of Ser. No. 628,794, Jul. 9, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 881,969
Int. Cl.[5] B29C *27/06*
U.S. Cl. 156—158 10 Claims



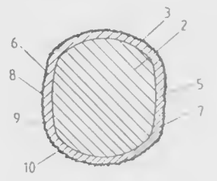
1. The method of joining together the ends of tubular flow ducts of melt processible fluoropolymers which material has a high degree of chemical inertness and continuous service temperatures in the general range of 300° to 500° F., consisting in the steps of
shaping the end faces of the ducts to lie flat and normal to the duct axis,
placing a flat faced infrared heater in confronting relation with the duct ends and spaced therefrom by a distance in the range of up to two inches, maintaining the heater face at temperatures in the range of 1250° to 2000° F. and at the duct ends for a period up to sixty seconds until the fluoropolymer material in the duct becomes visibly molten to depths of up to one-eigth inch from the end faces of the ducts,
removing the heater from the duct ends, and
immediately moving one of the duct ends into engagement with the other duct end, and with only a minimum of pressure pressing and holding the duct ends together for a period up to forty-five seconds until the molten duct material solidifies again.

4,929,294

METHOD OF CREATING PROFILING PROJECTIONS ON PLASTIC-COVERED STEEL PARTS

Peter Blome, Herne, Fed. Rep. of Germany, assignor to Blome GmbH & Co. Kommanditgesellschaft, and Strabag Bau-Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 86,101
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628704; Apr. 4, 1987, 3711420
Int. Cl.[5] B05D *1/06, 3/02, 5/00;* B32B *3/00*
U.S. Cl. 156—187 25 Claims



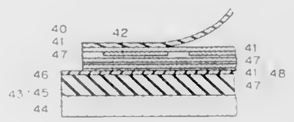
1. A method of covering a steel part wherein, on an outer surface of the part, there has been applied a plastic coating which can be brought into or is in contact, at least in individual regions, with an embedding material, comprising the steps of:
under the action of heat, applying a plastic material consisting solely of a granular thermosetting plastic powder or granulate to the plastic coating to form an interface to the embedding material by an outer surface of the plastic coating with profiling projections, the plastic coating being a thermosetting plastic in a tacky partially hardened state during said applying step, the plastic coating allowing individual particles of the powder or granulate to protrude from the plastic coating to form the profiling projection, said projections consisting solely of said particles of powder or granulate; and
hardening the plastic coating and the plastic material thereon to a fully hardened state.

4,929,295

METHOD OF MANUFACTURING CERAMIC LAMINATE

Yoshiaki Kohno, and Norio Sakai, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 6, 1989, Ser. No. 295,047
Claims priority, application Japan, Jan. 7, 1988, 63-1702
Int. Cl.[5] B32B *18/00, 31/04*
U.S. Cl. 156—230 16 Claims



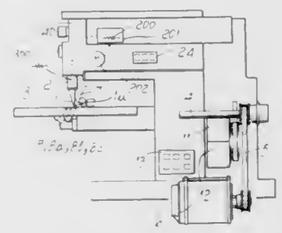
1. A method of manufacturing a ceramic laminate, said method comprising the steps of:
preparing first and second ceramic green sheets containing a first ceramic powder and a first binder;
forming a metal paste film containing a metal powder and a second binder on one major surface of said second ceramic green sheets;
preparing a junction member containing a solvent capable of dissolving both said first binder and said second binder; and
stacking said first and second ceramic green sheets and said junction member together in such a manner that said metal paste film and said junction member are located between opposing surfaces of said first and second ceramic green sheets.

4,929,296

MACHINE FOR GLUEING AND FOLDING SHEET-LIKE MATERIALS

Luciano Zorzolo, Vigevano, Italy, assignor to Comelz S.p.A., Vigevano, Italy

Filed May 2, 1989, Ser. No. 346,198
Claims priority, application Italy, May 3, 1988, 20434 A/88
Int. Cl.[5] B05C *5/00*
U.S. Cl. 156—357 5 Claims



1. A machine for folding and glueing edges of sheetlike workpieces, such as leather parts of shoe uppers, comprising a worktable, a foot for folding an edge of a workpiece, a cutting blade for cutting inwardly curved portions, means for advancing the workpiece, a glue dosage and delivery device, a main motor, photo-reponsive means for detecting presence and

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shape of the workpiece, and kinematic elements arranged between said main motor and said foot, blade and advancing means, comprising at least one electronic control unit, for memorizing groups of machine setting parameters related to a plurality of workpieces of various types and dimensions, so as to automatically select settings suitable for the instant Workpiece, and a plurality of drivers for transmitting said settings to said kinematc elements, the memorization comprising at least the following setting parameters:

preset dosage of glue quantity, glue temperature and temperature of the glue delivery device;

delay time for starting glue dispensing;

advancement pitch of the machine during treatment of outwardly curved regions of the workpiece;

maximum rotation rate of the machine during treatment of the outwardly curved regions of the workpiece;

advancement pitch during the treatment of straight portions of the workpiece;

machine maximum rotation rate during treatment of the straight portions of the workpiece;

advancement pitch during the treatment of the inwardly curved regions of the workpiece;

maximum rotation rate of the machine during treatment of inwardly curved portions of the workpiece;

possible actuation of the cutting blade;

manual and automatic actuation of the glue delivery device;

selection of the light-reponsive means intended to detect the shape of the workpiece and to cause change in the pitch and rotation rate;

selection of the light-reponsive means causing actuation of the cutting blade;

operation mode of the machine selected between manual mode or automatical mode with startup when workpiece is inserted at set speed, or continuous mode at set speed: displays for displaying the selected parameters for each workpiece and means for setting desired parameter values being furthermore provided.

4,929,297

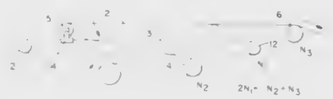
SPLICING SYSTEM

Hiroshi Sato, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,101

Int. Cl.[5] B65H *19/14*

U.S. Cl. 156—361 **2 Claims**



1. A splicing system for paying out a rolled sheet and continuously feeding a sheet to a downstream machine, which includes a sheet splicer for stopping a running sheet and splicing a tip end of another new sheet therewith, a tension roll in a dancer roll section for forming a sheet pool downstream of said sheet splicer, which tension roll is provided for the purpose of feeding the running sheet without changing the speed of said downstream machine, an accelerating roll for stopping a running old sheet and accelerating the new sheet upstream of said dancer roll section and downstream of said sheet splicer, and a guide roll provided downstream of said dancer roll section and upstream of said downstream machine for feeding the sheet coming from said dancer roll section to the downstream machine; characterized in that when a rotational speed of said accelerating roll is represented by $-N_2$, a rotational speed of said guide roll is represented by $+N_3$, and a rotational speed of a drive shaft for moving the tension roll in said dancer roll section is represented by N_1, said drive shaft is driven so as to fulfil the relation of

$$N_1 = \frac{(-N_2) + N_3}{2},$$

and thereby variation of the tension in the sheet applied to said tension roll accompanying the variation of the rotational speed of said accelerating roll can be made zero, wherein the rotational speed of the accelerating roll is set to be somewhat faster than the rotational speed of the guide roll, and thereby the tension roll in the dancer roll section can be moved in the direction for increasing the pooled amount of the sheet, according to the rotational speed of

$$N_1 = \frac{(-N_2) + N_3}{2},$$

and wherein the drive shaft for moving the tension roll in said dancer roll section is coupled to said guide roll and said accelerating roll via planetary gears.

4,929,298

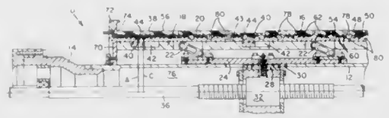
TIRE BUILDING DRUM INCLUDING AN EXPANDABLE SEGMENTAL CYLINDER ASSEMBLY AND A VACUUM CHAMBER

Robert J. Van Der Poel, Cruchten, and Armand Wantz, Bissen, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 13, 1988, Ser. No. 193,808

Int. Cl.[5] B29D *30/24*

U.S. Cl. 156—414 **10 Claims**



1. A tire building drum comprising a drum support shaft, an expandable segmental cylinder assembly mounted on said support shaft, said cylinder assembly having a plurality of axially extending, circumferentially spaced-apart segments, each of said segments being expandable from a first radius in a contracted condition of said drum to a second radius in an expanded condition of said drum, an elastic cover sleeve comprising an outboard sleeve section, a center sleeve section and an inboard sleeve section in abutting, sealing relation, sealing means at each end of said cover sleeve defining a vacuum chamber within said cover sleeve, said center sleeve section having vacuum openings at predetermined positions on a radially outer surface of said center sleeve for holding tire components on said radially outer surface, a source of vacuum in communication with said vacuum chamber within said cover sleeve, and said sealing means at said inboard end comprising a shoulder of an inboard edge of said inboard sleeve section engageable with a lip of an end flange mounted on said support shaft when the segmental cylinder assembly is expanded to said second radius.

4,929,299

SEALING DEVICE WITH MULTIPLE DIFFERENTIAL ACTION FOR MACHINES PRODUCING DUAL-USE FILTER SACHETS FOR INFUSION PRODUCTS

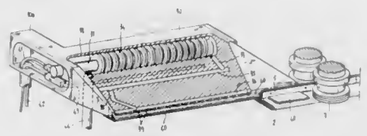
Andrea Romagnoli, San Lazzaro di Savena, Italy, assignor to Cestind - Centro Studi Industriali-S.R.L., San Pietro Terme, Italy

Continuation of Ser. No. 154,784, Feb. 10, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 366,303

Claims priority, application Japan, Mar. 9, 1987, 62-3378

Int. Cl.[5] B65B *51/20*

U.S. Cl. 156—466 **4 Claims**



1. A sealing device for sealing a longitudinal crest of a strip of thermally weldable paper having longitudinal edges turned inwardly and vertically into contact with one another to form said strip into a tube, preferably for receiving portions of an infusion product in the production of infusion-beverage bags, said sealing device comprising:

means for advancing said tube along a path, said tube being formed with a flattened tubular bottom portion bridging two horizontal sides of said strip, each of said horizontal sides running into a respective vertical side of the strip, said vertical sides of the strip being formed with said longitudinal edges of said strip turned inwardly and vertically;

horizontal supporting means below said path for quiding said bottom portion of said tube; and

a pair of blocks extending along said path for welding said longitudinal edges forming said crest together, said blocks having:

mutually juxtaposed mirror-symmetrical stepped edges flanking said crest and extending along said path, each of said stepped edges having a laminar step extending closest to the other stepped edge and slidingly guiding respective sides of said crest, each of said laminar steps being formed with a horizontal bottom of the laminar step above said horizontal supporting means and a vertical side of said laminar step flanking the respective vertical side of said strip, said horizontal bottom of said laminar step being engaged with the respective horizontal side of said strip forming said crest having the respective longitudinal edge of said strip above said laminar step, and a setback step confronting the respective vertical side of said strip and formed with a plurality of bores opening toward the respective vertical side of said strip;

a heat source in each block, and

passage means in each block communicating with said heat source, connected to a source of fluid, and connected with said bores for training streams of said fluid after heating by said source upon said vertical sides of said strip to weld said longitudinal edges at said crest, said blocks being of trapezoidal configuration and having sides tapering toward said crest and the other block and formed with said stepped edges, said blocks each being formed with an elongated chamber parallel to the respective edge, each heat source being a resistance heater received in the respective chamber, said passage means including means connecting an air source to one end of said chamber and a passage connecting an opposite end of each chamber with the respective bores of the respective body, said resistance heater having a generally helical winding, said bores of each body opening into a respective conduit extending along the respective stepped edge and the respective passage connects said opposite end of the chamber with the horizontal conduit of the respective body.

4,929,300

PROCESS FOR THE SEPARATION OF MONOLITHIC LED CHIP ARRANGEMENTS GENERATED ON A SEMICONDUCTOR SUBSTRATE WAFER

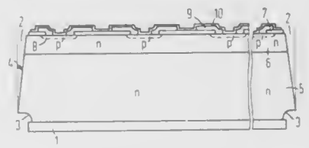
Walter Wegleiter, Nittendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,451

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1988, 3826736

Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C23F** *1/02;* **C03C** *15/00*

U.S. Cl. 156—645 **4 Claims**



1. A process for the separation of high-resolution LED chip arrangements fabricated monolithically on a semiconductor substrate wafer and having on their back side a pervasive metallization layer and on their border regions separation tracks for arraying the LED chip arrangements in series with further LED chip arrangements, said process comprising the steps of:

patterning the metallization on the back side to form areas corresponding to the separation tracks,

etching in the formed areas to provide depressions into the back side of the semiconductor substrate wafer, and then

separating the LED chip arrangements along said tracks.

4,929,301

ANISOTROPIC ETCHING METHOD AND ETCHANT

Nicholas Beechko, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1986, Ser. No. 875,833

Int. Cl.[5] C09K *13/00*

U.S. Cl. 156—657 **7 Claims**

1. A method for etching silicon including the steps of preparing an etch solution comprising:

preparing an ethylene-diamine free etch solution comprising ethanol-amine, pyrocatechol, water, piperidine and hydrogen peroxide,

applying said etch solution to said silicon at temperatures for time sufficient to affect a desired etched pattern.

4,929,302

PROCESS FOR THE PRODUCTION OF LIGHT MICROGUIDES WITH LOW OPTICAL PROPAGATION LOSSES BY MULTICOATING DEPOSITION

Serge Valette, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 20, 1988, Ser. No. 287,076

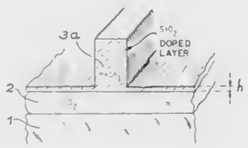
Claims priority, application France, Dec. 24, 1987, 87 18155

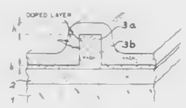
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

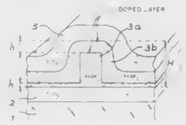
U.S. Cl. 156—657 **6 Claims**

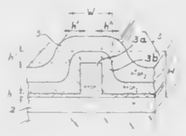
1. A process for the production of light microguides with low optical propagation losses by multilayer deposition comprising, deposited in this order on a substrate (**1**), a first layer (**2**) of index n, a second guide layer (**3**) of index $n+\Delta n_1$ and a third layer (**5**) covering the two aforementioned layers of index $n+\Delta n_2$, with $\Delta n_2 < \Delta n_1$ or $n-\Delta n_2$, characterized in that the

second guide layer (3) is deposited in two successive stages involving a first deposition stage followed by a partial etching of a first intermediate layer (3*a*) through an appropriate mask, in order that the unmasked part of the first intermediate layer has a thickness, countered from the interface located between the first layer and the first intermediate layer equal to h and compatible with the accuracy of the etching so as not to reach









the interface between the first layer (2) and the second layer (3), a second stage of depositing a second intermediate layer (3*b*) of a material having the same index $n+\Delta n_1$ as the first preceding intermediate layer (3*a*) and surmounting the same by a height h' adequate not to reproduce the etching defects of said preceding intermediate layer (3*a*), the total thickness h+h' of the etched part of the second layer having to be compatible with the operation of the microguide.

4,929,303

COMPOSITE BREATHABLE HOUSEWRAP FILMS

Paresh J. Sheth, Sugarland, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 24,503, Mar. 11, 1987. This application Sep. 25, 1987, Ser. No. 101,118

Int. Cl.[5] **B31F** *1/20*

U.S. Cl. 156—209 **17 Claims**

11. The method of claim 10, wherein the lamination comprises heating the fabric and pressing the unheated film to the heated fabric.

4,929,304

METHOD FOR MANUFACTURING AUTOMOTIVE SEAT

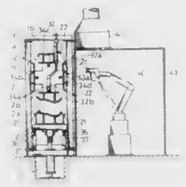
Muneharu Urai; Hiroyuki Makino, and Makoto Shimada, all of Akishima, Japan, assignors to Tachi-S Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 300,181

Claims priority, application Japan, May 31, 1988, 63-134071; May 31, 1988, 63-134072

Int. Cl.[5] **B32B** *31/20*

U.S. Cl. 156—245 **4 Claims**



1. A method for manufacturing an automotive seat, which uses an apparatus comprising a revolvable body, a plurality of upper molding dies, a plurality of padding securing members, such that said upper molding dies and padding securing members are provided on said revolvable body in a manner alternating with each other, and a plurality of lower molding dies disposed under said revolvable body, said lower molding dies being movable horizontally relative to said revolvable body and having a surface corresponding in shape to an outer contour of said seat, said method comprising the steps of:

placing a top cover member on one of said lower molding dies;

raising said one of said lower molding dies towards one of said upper molding die so as to press said top cover member against the latter, to thereby mold said top cover member into said outer contour of said seat, while at the same time, securing a seat padding on one of said padding securing members;

then, lowering said one of said lower molding dies, while at the same time, revolving said revolvable body to bring said seat padding to a mutually faced relation with said one of said lower molding dies; and

then, again, raising said one of said lower molding dies with said top cover member placed thereon towards said seat padding so as to bond said top cover member to said seat padding in an integral manner.

4,929,305

METHOD OF BONDING USING UV CURABLE EPOXY RESIN COMPOSITIONS WITH DELAYED CURE

Thomas P. Wacker, Schenectady, and Raymond J. Zabinski, Albany, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 168,528, Mar. 7, 1988, Pat. No. 4,857,562, which is a continuation of Ser. No. 8,905, Jan. 30, 1987, abandoned. This application Apr. 20, 1989, Ser. No. 340,947

Int. Cl.[5] **B32B** *31/00*

U.S. Cl. 156—273.3 **10 Claims**

1. A method for employing an epoxy resin composition comprising the steps:

(a) exposing a composition to sufficient UV radiation to activate a UV catalyst, said composition comprising:

(i) an epoxy resin,

(ii) a sufficient amount of the UV catalyst to render the composition UV curable, and

(iii) a sufficient amount of an epoxy functional fixing agent comprising poly(alkylene oxide) moieties, the fixing agent capable of delaying the cure of the composition for a fixed period of time after exposure to UV radiation; and

(b) positioning the epoxy composition between two opaque surfaces for bonding; and

(c) curing the epoxy composition by heating to a temperature between about 40° C. and 150° C.

4,929,306

FIXTURE FOR MOUNTING SMALL PARTS FOR PROCESSING

Larry R. Foreman, 2456 36th St., Los Alamos, N. Mex. 87544; Veronica M. Gomez, Rte. 5 Box 283, Santa Fe, N. Mex. 87501, and Michael H. Thomas, Rte. 3-193-1, Espanola, N. Mex. 87532

Filed Sep. 29, 1988, Ser. No. 250,672

Int. Cl.[5] **B32B** *31/00*

U.S. Cl. 156—306.3 **8 Claims**



5. A method of mounting small parts for processing, comprising the steps of:

forming a truncated conical glass stalk having a tip end and a base end;

forming on said tip end a quantity of cured adhesive having an extending streamer; and

touching said small parts to said streamer to adhere said parts to said streamer.

4,929,307

METHOD OF DECREASING BLACK LIQUOR VISCOSITY

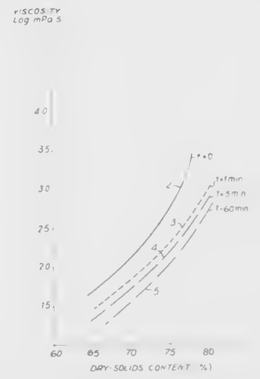
Erkki J. Kiiskilä, Karhula, and Nils E. Virkola, Helsinki, both of Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland

Continuation of Ser. No. 110,710, Jul. 29, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,424

Claims priority, application Finland, Nov. 29, 1985, 85 4732

Int. Cl.[5] **B01D** *1/26;* **D21C** *11/10*

U.S. Cl. 159—47.3 **7 Claims**



1. A method for decreasing the viscosity and improving the evaporability of sulfate black liquor containing different macro-molecular lignin fractions and substantially no fibrous material from a cellulose cook being cooked in a digester at a cooking temperature, consisting essentially of:

withdrawing said sulfate black liquor from said digester;

raising the temperature by pressure heating said sulfate black liquor to a temperature above the cooking temperature prior to final evaporation thereof without separating said different fractions;

maintaining said black liquor at said raised temperature for 1–60 minutes so as to split the macro-molecular lignin fractions contained in said liquor; and thereafter

evaporating said black liquor.

4,929,308

PAPERMAKING PROCESS AND COMPOSITION FOR THE PRODUCTION OF TRIDIMENSIONAL PRODUCTS CONTAINING THERMOPLASTICS RESIN AND REINFORCING FIBERS

Patrice Gerault, Puteaux; Michel Goguelin, and Pierre Fredeoucci, both of Charavines, all of France, assignors to Arjomari-Prioux, Paris, France

Filed Sep. 24, 1987, Ser. No. 101,076

Claims priority, application France, Sep. 25, 1986, 86 13408; Feb. 23, 1987, 87 02335

Int. Cl.[5] **D21H** *13/36*

U.S. Cl. 162—145 **13 Claims**

1. A process for producing a tridimensional piece from an aqueous suspension containing at least a thermoplastic resin and reinforcing fibers, comprising the following successive steps:

(a) preparing a suspension consisting essentially of the following composition (in % by weight):

Binding fibers	5–13
Reinforcing fibers	26–34
Thermoplastics resin	40–60
Fillers	0–40

(b) wet-molding the elements of the suspension into a preform having, in the three dimensions, the general outline of the final piece in a preforming station before de-watering;

(c) at least partly de-watering the preform;

(d) pre-heating said preform to a temperature higher than the melting point of the thermoplastics resin; and

(e) molding said preform under pressure into its final shape in a press heated to a temperature below the melting point of the thermoplastics resin, wherein said pressure is less than 100 bars.

4,929,309

NITROGEN-CONTAINING WATER-SOLUBLE POLYMERIC COMPOUNDS

Henning Bachem, Cologne; Carlhans Süling, Odenthal; Janos Muszik, Leverkusen, and Wolf-Dieter Schröer, Munich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 324,365

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810425

Int. Cl.[5] **C08G** *73/00*

U.S. Cl. 162—164.3 **10 Claims**

1. Water soluble crosslinkable polymeric compounds which are obtainable by reaction of reaction products, containing halogenohydrin groups, of ammonia or mono- or polyamines and an epihalogenohydrin with inorganic bases and subsequent reaction of the resulting compounds containing epoxide groups with halogen-free sulphonic acids to give compounds containing sulphonic acid ester groups.

4,929,310

APPARATUS FOR DEODORIZING ORGANIC LIQUIDS

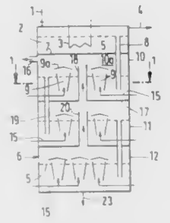
Helmut Saft, Friedberg, Fed. Rep. of Germany, assignor to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 344,650

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1988, 3814254

Int. Cl.[5] B01D *3/10, 3/38*

U.S. Cl. 202—158 **4 Claims**



1. An apparatus for deodorizing an organic liquid, comprising:

a treatment vessel;

means connected with said treatment vessel for applying a subatmospheric pressure thereto;

means in said treatment vessel defining at least one treatment level upon which a body of predetermined height of an organic liquid to be deodorized is maintained, said organic liquid being at a temperature of substantially 130° to 260° C.;

a plurality of upwardly upon frustoconical circulating ducts spaced apart at said level and diverging upwardly with a cone angle A, measured against the vertical, of substantially 5° to 20° from an open lower portion having a small cross section and receiving said liquid from below;

each of said ducts having a height of 0.3 to 1.5 m and a ratio of a smallest diameter to said height of said duct of substantially 1:3 to 1:15;

each of said ducts at said lower portion being provided with an annular conduit coaxial with said duct and having a multiplicity of bores for discharging water vapor into said liquid within said duct for inducing upward flow of said liquid in said duct; and

means for introducing water vapor into said annular conduit of each duct.

4,929,311

APPARATUS FOR DEODORIZING AN ORGANIC LIQUID

Helmut Saft, Niddatal, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 27, 1989, Ser. No. 344,659

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1988, 3814255

Int. Cl.[5] B01D *3/10, 3/38*

U.S. Cl. 202—158 **4 Claims**

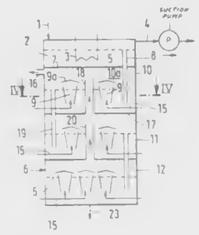
1. An apparatus for deodorizing an organic liquid, comprising:

a treatment vessel;

means connected with said treatment vessel for applying a subatmospheric pressure thereto;

means in said treatment vessel defining at least one treatment level upon which a body of predetermined height of an organic liquid to be deodorized is maintained and forming at said level at least two concentric upwardly open annular channel-like passages along which said body of liquid is conducted on said level, said concentric passages having a common cylindrical wall and a vertical partition extending across said passages transversly of the common wall, and an aperture in said wall adjacent said parition for allowing liquid flow between said passages;

each passage having a plurality of downwardly and upwardly open circulating ducts arranged in spaced relationship along each passage, each duct receiving said liquid from below and being traversed upwardly by said liquid



whereby said liquid overflows from an upper edge of said duct, each circulating duct having a frustoconical shape diverging upwardly with a cone angle A, measured against the vertical, of substantially 5° to 20°; and

means for introducing water vapor into said duct at a lower portion thereof for stripping said liquid with said water vapor and for inducing upward flow of said liquid in said duct.

4,929,312

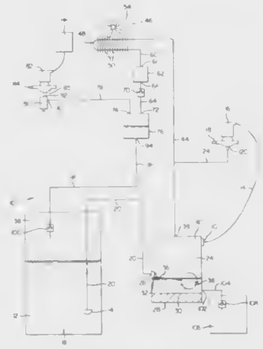
SOLVENT RECOVERY APPARATUS AND METHOD

Robert D. Westcott, 1073 N. Grant, Canby, Oreg. 97013

Filed Jan. 27, 1988, Ser. No. 148,996

Int. Cl.[5] B01D *3/42*

U.S. Cl. 203—2 **18 Claims**



1. A solvent purification apparatus comprising:

a vessel for holding solvent, said vessel being open to the atmosphere;

evaporator means in fluid communication with said vessel for receiving contaminated solvent from said vessel and for vaporizing said solvent, said vaporizing of said solvent causing the separation of contaminants therefrom;

condensation means in fluid communication with said evaporator means for condensing said vaporized solvent;

accumulator means positioned between said condensation means and said vessel for temporarily storing condensed solvent received from said condensation means, said accumulator means comprising a primary accumulator chamber having an inlet communicating with said condensation means and an outlet for directing condensed solvent from said condensation means back into said vessel;

depressurization means for establishing a negative pressure within said accumulator means, evaporator means and condensation means, said negative pressure enhancing the operating efficiency of said apparatus;

a condensate control valve between said inlet of said primary accumulator chamber and said condensation means, said control valve comprising sensing means for automatically responding to changes in pressure within said apparatus, said sensing means of said control valve causing said control valve to remain open only so long as said depressurization means maintains a negative pressure in said accumulator chamber and to automatically close when said accumulator chamber is at atmospheric pressure;

a solvent return valve communicating with the outlet of said accumulator chamber, said return valve comprising sensing means for automatically responding to changes in pressure within said apparatus, said sensing means of said return valve causing said return valve to remain closed only so long as said depressurization means maintains a negative pressure in said accumulator chamber and to automatically open when said accumulator chamber is at atmospheric pressure; and

control means operatively connected to said depressurization means for periodically allowing the accumulator chamber to return to atmospheric pressure.

4,929,313

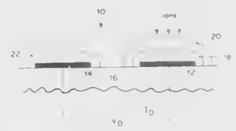
AMPEROMETRIC ELECTROCHEMICAL ION SENSORS AND METHOD FOR DETERMINING ION CONCENTRATION

Mark S. Wrighton, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 674,410, Nov. 23, 1984, Pat. No. 4,721,601, and a continuation-in-part of Ser. No. 114,566, Oct. 29, 1987. This application Jan. 4, 1988, Ser. No. 140,621

Int. Cl.[5] G01N *27/30*

U.S. Cl. 204—153.1 **23 Claims**



1. An amperometric electrochemical sensor comprising:

a pair of electrically conductive electrodes each overlaid with electroactive polymeric material, at least one electrode having an ion-selective coating thereon, wherein said electrodes are electrically connected and said coating actively and selectively transports ions into the electroactive polymeric material effecting a change in the measured current correlated with the concentration of a substance to be measured.

12. A method for determining ion concentration comprising providing a pair of electrically conductive electrodes each overlaid with electroactive polymeric material, at least one electrode having an ion-selective coating thereon, wherein said electrodes are electrically connected and said coating actively and selectively transports ions into the electroactive polymeric material effecting a change in the measured current correlated with the concentration of a substance to be measured.

4,929,314

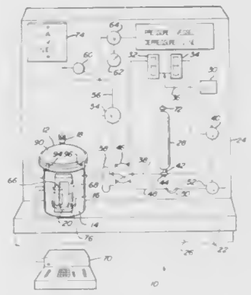
COULOMETRIC TITRATOR APPARATUS AND METHOD

Frederick Simonson, III, Port Allen, and Timothy M. Gunn, Baton Rouge, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1989, Ser. No. 376,823

Int. Cl.[5] G01N *27/42*

U.S. Cl. 204—153.23 **15 Claims**



1. A coulometric titration apparatus for enabling a sample which is normally a vapor under atmospheric conditions to be analyzed in the liquid phase, comprising:

pressure vessel means for providing a chamber capable of being subjected to a predetermined pressure level which is above the vaporization level of said sample, said pressure vessel means being constructed to contain a titration vessel and permit said titration vessel to communicate with a coulometric titration analyzer;

regulator means for causing the pressure in said chamber to be maintained at said predetermined level; and

fluid control means for enabling said chamber to be purged with an inert gas and for injecting said sample into said titration vessel from a source of said sample.

13. A method of analyzing a sample by coulometric titration which is normally a vapor under atmospheric conditions, comprising the steps of:

enclosing a titration vessel within a chamber capable of being pressurized;

subjecting said chamber to a predetermined pressure level which is above the vaporization pressure of said sample by injecting an inert gas into said chamber;

loading a sample into a container which provides a predetermined volume; and

injecting said sample from said container into said titration vessel for analysis.

4,929,315

METHOD FOR ELECTROPLATING A CONDUCTING SURFACE

Siegfried Schaper, Wettstetten, and Martin Seufert, Kipfenberg, both of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00433, § 371 Date Feb. 9, 1989, § 102(e) Date Feb. 9, 1989, PCT Pub. No. WO88/03183, PCT Pub. Date May 5, 1988

PCT Filed Aug. 7, 1987, Ser. No. 328,033

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637088

Int. Cl.[5] C25D *5/02*

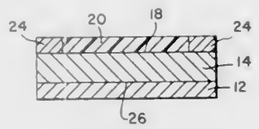
U.S. Cl. 204—18.1 **11 Claims**

1. A process for galvanic coating of at least a selected area on a preform comprising,

(a) applying an electrically conducting metallic primer to substantially the entire surface of the preform;

VOL
1114
ISS
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MY
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1990
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(b) masking a portion of the surface coated leaving exposed an unmasked portion not to be coated;
(c) forming a clear coat to the exposed portion not to be galvanized;



(d) removing the mask to expose the portion of the surface not clear coated; and
(e) galvanically coating the area of metallic primer.

4,929,316

METHOD OF MANUFACTURING ORGANIC SEMI-CONDUCTOR SOLID ELECTROLYTIC CAPACITOR

Yoshibiro Harakawa; Seiya Takahashi; Koji Izawa; Hidemitsu Takeuchi, and Keizo Ikari, all of Kawasaki, Japan, assignors to Niksuko Corporation, Kanagawa, Japan

Filed Aug. 30, 1989, Ser. No. 400,906
Claims priority, application Japan, Sep. 2, 1988, 63-219667
Int. Cl.[5] C25D *9/02*
U.S. Cl. 204—56.1 **10 Claims**



1. A method of manufacturing an organic semi-conductor solid electrolytic capacitor comprising at least the following means:
means for forming a dielectric oxide film on the surface of a metal substrate; and
means for forming a conductive polymer thin film layer of a heterocyclic compound on the surface of said dielectric oxide film by electrolytic oxidation polymerization carried out in an electrolytic solution which contains a heterocyclic compound and an aliphatic or aromatic sulfonic acid or a salt thereof as a supporting electrolyte in an organic solvent.

4,929,317

PROCESS FOR PREPARATION OF PERFLUORO ORGANIC COMPOUNDS

Masakatsu Nishimura, Tokuyama; Naoya Okada, Nanyo; Yasuo Murata, Kudamatsu, and Yasuhiko Hirai, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Dec. 1, 1987, Ser. No. 127,115
Claims priority, application Japan, Dec. 1, 1986, 61-284260; Dec. 1, 1986, 61-284261
Int. Cl.[5] C25C *3/08*
U.S. Cl. 204—59 R **10 Claims**

1. A process for the preparation of a perfluoro organic compound by perfluorination of an organic compound having carbon-to-hydrogen bonds, which consisting essentially of:
(i) a first step of fluorinating an organic compound having carbon-to-hydrogen bonds by electromechanical fluorination with anhydrous hydrogen fluoride for a time sufficient to form a mixture of a perfluoro organic compound with partially fluorinated organic compounds in which the ratio (F/H) of the number of fluorine atoms to the number of hydrogen atoms is at least 8; and
(ii) a second step of contacting substantially all of said mixture formed in said first step with molecular fluorine at a temperature of 110° to 180° C. to convert said partially fluorinated organic compounds to a perfluoro organic compound and recovering the perfluoro organic compound having no C-H bonds as the product.

4,929,318

PROCESS FOR PREPARING HALOGENATED ALKANE

Yasuhisa Furutaka; Hirokazu Aoyama, and Tsunetoshi Honda, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Sep. 21, 1988, Ser. No. 247,354
Claims priority, application Japan, Sep. 22, 1987, 62-238149; Dec. 29, 1987, 62-332719
Int. Cl.[5] B01J *19/12*
U.S. Cl. 204—157.6 **3 Claims**

1. A process for preparing a halogenated alkane of the formula:

$$R—CHXY \quad (I)$$

wherein R is a trifluoromethyl group, a chlorodifluoromethyl group, a dichlorofluoromethyl group, a chlorofluoromethyl group, a difluoromethyl group, a fluoromethyl group or a 2-chloro-1,1,2,2-tetrafluoroethyl group, and X and Y are the same or different and are selected from hydrogen, chlorine or fluorine, which comprises reducing a halogenated alkane of the formula:

$$R—CCIXY \quad (II)$$

wherein R, X and Y are the same as defined above with the irradiation of light having a wavelength of not longer than 300 nm in an oxygen-free reaction atmosphere in the presence of 3 to 10 moles of an alcohol per mole of the halogenated alkane of the formula (II) or in the presence of 0.1 to 10 moles of an alcohol per mole of the halogenated alkane of the formula (II) and an alkali.

4,929,319

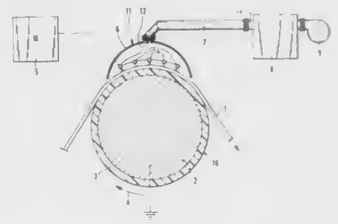
PROCESS AND DEVICE FOR SURFACE PRE-TREATMENT OF PLASTIC BY MEANS OF AN ELECTRICAL CORONA DISCHARGE

Peter Dinter, Hallgarten; Lothar Bothe, Mainz-Gonsenheim, and John D. Gribbin, Schlangenbad, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 17, 1988, Ser. No. 156,572
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705482
Int. Cl.[5] C07C *3/24*
U.S. Cl. 204—164 **11 Claims**

1. A process for corona-discharge surface pre-treatment of plastic, comprising the steps of:
producing an electrical corona discharge in a corona-discharge zone between at least one voltage-conducting electrode and a grounded counter-electrode;

placing a plastic article in the corona-discharge zone onto the surface of said grounded counter-electrode;
atomizing a liquid to produce an aerosol; and



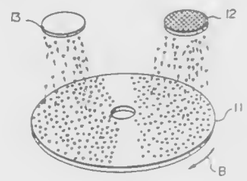
introducing the aerosol into the corona-discharge zone by means of a stream of gas.

4,929,320

METHOD OF MAKING MAGNETO-OPTICAL RECORDING MEDIUM

Takashi Yamada; Masaaki Nomura; Ryoichi Yamamoto; Satoshi Matsubaguchi, and Akira Nahara, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 179,022, Apr. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 36,484, Apr. 9, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 368,107
Claims priority, application Japan, Apr. 11, 1986, 62-83720; Apr. 10, 1987, 62-87974
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—192.2 **9 Claims**



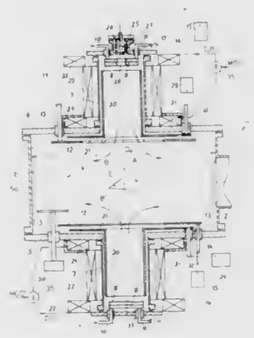
1. A method of making a magneto-optical recording medium by forming a magneto-optical recording layer on a substrate by simultaneously sputtering a transition metal and a rare earth metal onto the substrate comprising the steps of:
a. rotating the substrate in a predetermined direction beneath both a transition metal target and a rare earth metal target, said targets being separate from one another and each of said targets being located above a separate half region of said substrate;
b. sputtering a rare earth metal from the rare earth metal target onto a first half region of the surface of said substrate using radio frequency sputtering while said substrate is rotating;
c. simultaneously sputtering a transition metal from the transition metal target onto a second half region of said substrate using direct current sputtering while said substrate is rotating, and
d. continuing to sputter both the rare earth metal and the transition metal onto the substrate as the substrate rotates to deposit a layer of uniform thickness of rare earth metal and a layer of uniform thickness of transition metal with each rotation of the substrate to produce a first helical spiral formation consisting only of a rare earth metal overlaid with a second helical spiral formation consisting only of a transition metal such that in cross-section said magneto-optical recording layer comprises a plurality of thin transition metal layers of uniform thickness parallel to one another and obliquely oriented with respect to said substrate, and a plurality of thin rare earth metal layers of uniform thickness parallel to one another and obliquely oriented with respect to said substrate wherein adjacent transition metal layers are separated by an intervening rare earth metal layer and adjacent rare earth metal layers are separated by an intervening transition metal layer.

4,929,321

METHOD AND APPARATUS FOR COATING WORKPIECES

Rainer Buhl, Sargans, Switzerland, assignor to Balzers Aktiengesellschaft, Balzers, Liechtenstein

Filed Mar. 17, 1989, Ser. No. 325,301
Claims priority, application Switzerland, Mar. 23, 1988, 1095/88
Int. Cl.[5] C23C *14/32*
U.S. Cl. 204—192.38 **21 Claims**



1. A method for coating workpieces by arc evaporation, comprising the steps of:
evaporating ions from a cathode surface having an axis intersecting said surface;
arranging workpieces to be coated around said axis at locations radially outward and axially distant from said cathode surface;
providing visual shield means between said cathode surface and said workpieces at least partially surrounding said axis to prevent said workpieces from line of sight communication with said cathode surface; and
deflecting said ions radially outwardly around said visual shield means towards said workpieces.

4,929,322

APPARATUS AND PROCESS FOR ARC VAPOR DEPOSITING A COATING IN AN EVACUATED CHAMBER

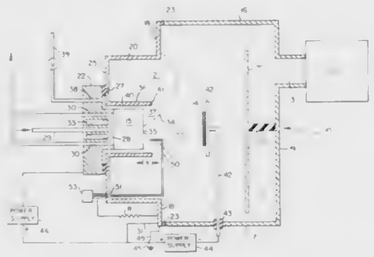
Jiinjen A. Sue, Indianapolis, and Harden H. Troue, Plainfield, both of Ind., assignors to Union Carbide Corporation, Anbury, Conn.

Continuation of Ser. No. 906,514, Sep. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 781,460, Sep. 30, 1985, abandoned. This application Jun. 8, 1989, Ser. No. 363,332
Int. Cl.[5] C23C *14/34*; B05D *3/06*
U.S. Cl. 204—192.38 **23 Claims**

1. A process for coating an object with source material in a vacuum chamber which comprises;
(a) providing within said vacuum chamber a solid cathode and an anode with each being spaced apart from one another and from said object and with said cathode having

VOL
1114
ISS
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MY
29
1990
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an evaporable and surface for supplying said source material;
(b) arranging said cathode in said vacuum chamber with its evaporable end surface facing said object;
(c) evacuating said vacuum chamber to an operating pressure of between 10^{-1} and 5×10^{-4} torr;
(d) surrounding said cathode with an elongated member uniform in cross sectional dimension over its length to form a narrow space between the elongated member and said cathode with said elongated member having an open end extending beyond the evaporable end surface of the cathode a distance calculated from the ratio of x/d of from 0.07 to 2 forming a cathode chamber between said evaporable end surface and said open end where "x" represents the axial dimension between said evaporable end surface and said open end and "d" represents the major dimension of the cross-section of said evaporable end surface;
(e) generating an electric arc between the evaporable end surface of the cathode and the anode;



(f) maintaining said elongated member electrically insulated from both the cathode and the anode for preventing arcing between the cathode and said member and from between said member and the anode;
(g) introducing gas into said narrow space at a pressure higher than the operating pressure established within the vacuum chamber and in a direction so as to envelop the arc in said cathode chamber before entering the vacuum chamber such that the arc termination at the cathode is confined to the evaporable end surface with the arc caused to traverse a path extending from said evaporable end surface around the open end of said elongated member to said anode;
(h) withdrawing gas from the vacuum chamber to maintain the pressure within the vacuum chamber at said operating pressure; and
(i) depositing a coating of source material upon the object.

4,929,323

APPARATUS FOR REMOVING ELECTROPLATING METAL DEPOSITED ONTO SURFACE OF CONDUCTOR ROLL

Tsutomu Watanabe; Masari Sagiyama; Masaki Kawabe; Toshiyuki Tsujihara, and Shigehiro Takushima, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

PCT No. PCT/JP88/01284, § 371 Date Aug. 14, 1989, § 102(e) Date Aug. 14, 1989, PCT Pub. No. WO89/05875, PCT Pub. Date Jun. 29, 1989

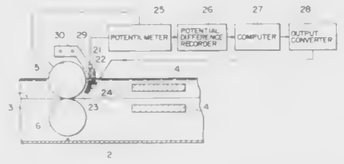
PCT Filed Dec. 19, 1988, Ser. No. 392,985

Claims priority, application Japan, Dec. 18, 1987, 62-322318

Int. Cl.[5] C25D *17/00*

U.S. Cl. 204—206 **1 Claim**

1. An apparatus for removing an electroplating metal deposited onto the surface of a conductor roll, comprising:
a reverse-electrolyzing electrode (**23**), provided in an electroplating solution (**3**) in a horizontal type electroplating tank (**2**), near a conductor roll (**5**), the lower portion of which is immersed in said electroplating solution (**3**), for electrolytically removing an electroplating metal deposited onto the surface of said conductor roll (**5**), the surface of said reverse-electrolyzing electrode (**23**), except for the portion facing said conductor roll (**5**), being electrically shielded by mean of an insulating cover (**24**);
a reference electrode (**21**), at least the lower portion of which is immersed in said electroplating solution (**3**), provided near said conductor roll (**5**), the surface of said reference electrode (**21**), except for the portion facing said conductor roll (**5**), being electrically shielded by means of an insulating cover (**22**);



a reverse-electrolyzing electrode moving mechanism (**30**) for causing said reverse-electrolyzing electrode (**23**) to return-travel, together with said reference electrode (**21**), in the axial direction of said conductor roll (**5**);
a potentiometer (**25**) for continuously measuring a value of potential difference between said reference electrode (**21**) and said conductor roll (**5**); and
an output converter (**28**) for controlling the start and the end of said electrolytic removal of said electroplating metal deposited onto the surface of said conductor roll (**5**) by means of said reverse-electrolyzing electrode (**23**), on the basis of said value of potential difference as measured by means of said potentiometer (**25**).

4,929,324

APPARATUS FOR REMOVING ELECTROPLATING METAL DEPOSITED ONTO SURFACE OF CONDUCTOR ROLL

Tsutomu Watanabe; Masaru Sagiyama; Masaki Kawabe; Toshiyuki Tsujihara, and Shigehiro Takushima, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

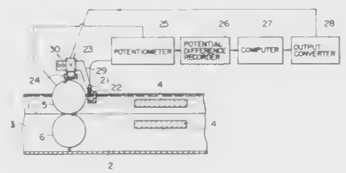
PCT No. PCT/JP88/01283, § 371 Date Aug. 14, 1989, § 102(e) Date Aug. 14, 1989, PCT Pub. No. WO89/05874, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 19, 1988, Ser. No. 392,972

Claims priority, application Japan, Dec. 18, 1987, 62-322316

Int. Cl.[5] C25D *17/00*

U.S. Cl. 204—206 **1 Claim**



1. An apparatus for removing an electroplating metal deposited onto the surface of a conductor roll, comprising:
a scraper (**23**), provided above a conductor roll (**5**), the lower portion of which is immersed in an electroplating solution (**3**) in a horizontal type electroplating tank (**2**), for scraping off an electroplating metal deposited onto the surface of said conductor roll (**5**);
a reference electrode (**21**), at least the lower portion of which is immersed in said electroplating solution (**3**), provided near said conductor roll (**5**), the surface of said reference electrode (**21**), except for the portion facing said conductor roll (**5**), being electrically shielded by means of an insulating cover (**22**);
a scraper moving mechanism (**30**) for causing said scraper (**23**) to return-travel, together with said reference electrode (**21**), in the axial direction of said conductor roll (**5**);
a potentiometer (**25**) for continuously measuring a value of potential difference between said reference electrode (**21**) and said conductor roll (**5**); and
an output converter (**28**) for controlling the start and the end of said scraping of said electroplating metal deposited onto the surface of said conductor roll (**5**) by means of said scraper (**23**), on the basis of said value of potential difference as measured by means of said potentiometer (**25**).

4,929,325

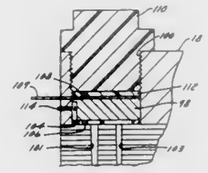
REMOVABLE PROTECTIVE ELECTRODE IN A BIPOLAR BATTERY

Gerald K. Bowen, Cedarburg, and Jeffrey P. Zagrodnik, Hales Corners, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Sep. 8, 1988, Ser. No. 241,714

Int. Cl.[5] H01M *8/24*; **C25B** *9/00*

U.S. Cl. 204—268 **13 Claims**



1. An electrode protective assembly for use in a bipolar battery having a plurality of electrodes, each with an anodic surface and a cathodic surface with each electrode being separated by an ionic penetratable separator, said electrodes positioned between end blocks, at least one pair of tunnels adapted to respectively carry aqueous anolyte and catholyte to respective anodic and cathodic surfaces and a corresponding number of shunt tunnels extending from one end block to the other and adapted to carry aqueous anolyte and catholyte, said assembly including:
means removably positioned in a bore of one of said end blocks for electrically contacting an electric current source and said aqueous anolyte and catholyte in said shunt tunnels, and
means for removably securing said electrically contacting means in said bore of said one end block.

4,929,326

ELECTROLYTIC TREATMENT APPARATUS

Akio Uesugi; Ritsu Dobashi, and Takeshi Ohishi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 3, 1989, Ser. No. 374,797

Claims priority, application Japan, Jul. 4, 1988, 63-164906

Int. Cl.[5] C25F *7/00*

U.S. Cl. 204—206 **6 Claims**

1. An electrolytic treatment apparatus for applying an electrochemical treatment to a material to be treated in an electrolyte, the apparatus comprising:
a main counter electrode;
an auxiliary counter electrode consisting of an electrode containing magnetic iron oxide;
a first circuit connected to the main counter electrode including an alternating current source;

reference electrode (**21**), except for the portion facing said conductor roll (**5**), being electrically shielded by means of an insulating cover (**22**);
a scraper moving mechanism (**30**) for causing said scraper (**23**) to return-travel, together with said reference electrode (**21**), in the axial direction of said conductor roll (**5**);
a potentiometer (**25**) for continuously measuring a value of potential difference between said reference electrode (**21**) and said conductor roll (**5**); and
an output converter (**28**) for controlling the start and the end of said scraping of said electroplating metal deposited onto the surface of said conductor roll (**5**) by means of said scraper (**23**), on the basis of said value of potential difference as measured by means of said potentiometer (**25**).

4,929,327

ARRANGEMENT FOR PRODUCING DISPERSION LAYERS

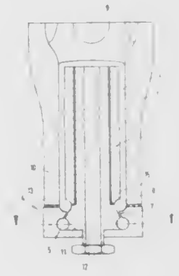
Goetz Mielsch, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,941

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742602

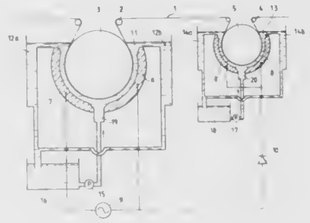
Int. Cl.[5] C25D *17/00*

U.S. Cl. 204—272 **12 Claims**



1. An arrangement for depositing variable thickness dispersion layers on inner surfaces of hollow cylinders open at least on one side thereof, comprising anode means, swirl-producing flow body means, an electrolyte together with solid particles to be deposited being conducted to contact the inner surface of the hollow cylinder to be coated and along the outer circumference of the anode means arranged substantially centrally in the cylinder axis, the electrolyte being conducted into the cylinder by means of the swirl-producing flow body means, and the swirl-producing flow body means conducting the electrolyte in such a manner that the electrolyte flow is divided into a laminar and a turbulent portion to deposit a thicker layer of electrolyte on the cylinder inner surface where the turbulent portion contacts the cylinder and a thinner layer where the laminar portion contacts the cylinder.

a second circuit for the auxiliary counter electrode connected to the first circuit in parallel; and



diode means for performing a diode-like action in the second circuit so as to control an anode current passing through the main counter electrode.

4,929,328

TITANIUM DIBORIDE CERAMIC FIBER COMPOSITES FOR HALL-HEROULT CELLS

Theodore M. Besmann, and Richard A. Lowden, both of Knoxville, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Mar. 7, 1989, Ser. No. 319,770
Int. Cl.[5] C25C *7/02*
U.S. Cl. 204—279 20 Claims

18. A cathode structure for use in a Hall-Heroult electrolysis cell for aluminum smelting, which comprises:

a preform matrix of matrix of fibers selected from fibers of silicon carbide, carbon, alumina, mullite, aluminum nitride, boron nitride and mixtures thereof, said preform matrix provided with means for mounting said cathode in said cell; and

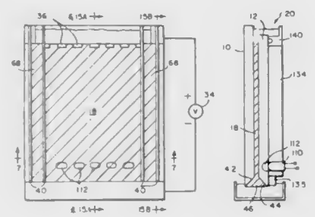
an infiltration of titanium diboride throughout said preform matrix to coat said fibers and provide a substantially theoretical density to said cathode, said infiltration being a result of passing hydrogen, boron trichloride and titanium tetrachloride through said preform matrix while maintaining said preform matrix at about 900 deg. C.

4,929,329

ELECTROPHORESIS CASSETTE SYSTEM WITH APPARATUS AND METHOD FOR FILLING SAME

Philip C. Danby, Chestnut Hill, Mass.; Hal C. Danby, Sudbury, England, and Eric R. Hungerman, Woburn, Mass., assignors to EG&G, Inc., Wellesley, Mass.

Continuation-in-part of Ser. No. 43,212, Apr. 27, 1987, abandoned. This application Dec. 2, 1987, Ser. No. 127,655
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—299 R 36 Claims



1. An electrophoresis cassette, comprising:

a first flat plate having two sides which are substantially parallel to each other and having top and bottom edges;

a second flat plate having two sides which are substantially parallel to each other and having top and bottom edges;

means for holding the first and second plate in a fixed relationship with each other wherein the sides of the first plate are substantially parallel to the sides of the second plate and the opposing faces of the plates are separated by a predetermined distance to form a space therebetween, the sides, bottom edges and top edges of the plates corresponding to the sides, bottom edge and top edge of the assembled cassette;

the space between the plates being adapted for filling with a gel in which an electrophoresis separation may be performed;

the means for holding including;

means for providing a line contact seal between the first and second plates along each of the sides of the cassette immediately adjacent to said space adapted to be filled with a gel, and including at least one elongate sealing piece along each side of the space which serves both to provide said line contact seal and to maintain the separation between the plates at said predetermined distance; and

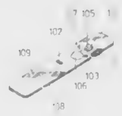
means for clamping the two plates together along the side thereof.

4,929,330

DIFFUSION-LIMITING MEMBRANE HOLDING MEANS FOR SENSOR

Tatsuhiko Osaka, Kurita; Hiroshi Terawaki, Kouka, and Mitsunari Okamoto, Sakai, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 176,287, Mar. 31, 1988, abandoned. This application Oct. 16, 1989, Ser. No. 423,533
Claims priority, application Japan, Mar. 31, 1987, 62-49736; Apr. 30, 1987, 62-65508; Apr. 30, 1987, 62-65507; Dec. 26, 1987, 62-197711; Dec. 26, 1987, 62-197708
Int. Cl.[5] G01N *27/30*
U.S. Cl. 204—402 22 Claims



1. A diffusion-limiting membrane holding means for a sensor, comprising:

a thin resilient plate provided in a predetermined position with an opening through which a target solution to be measured is adapted to penetrate, said thin resilient plate adapted to be bent into operative position; and

a diffusion-limiting membrane for limiting diffusion of the target solution attached to said thin resilient plate so as to cover said opening, and said diffusion-limiting membrane being dimensioned and attached to said resilient plate such that, upon a bending of said resilient plate into operative position, said plate causes a similar bending in said attached membrane.

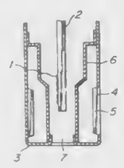
10. A diffusion-limiting membrane holding means for a sensor as set forth in claim 1, wherein said thin resilient plate is provided at a predetermined position thereof with a housing portion for housing a standard solution for calibration, said housing portion being adapted to supply the standard solution for calibration to the opening.

4,929,331

OXYGEN SENSOR

Nobuhide Kato, Ama, and Yasuhiko Hamada, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jan. 24, 1989, Ser. No. 300,972
Claims priority, application Japan, Jan. 29, 1988, 63-9730[U]
Int. Cl.[5] G01N *27/46*
U.S. Cl. 204—426 6 Claims



1. An oxygen sensor, comprising:

a planar oxygen sensor element having a measuring electrode arranged on a broad width surface thereof;

a protective cover surrounding the planar sensor element, said protective cover having gas inlet holes through which a gas to be measured is introduced into said protective cover and at least one gas outlet hole at a central portion of a bottom end thereof through which the gas exits said protective cover after measurement and having no gas vent hole on its side wall, said at least one gas outlet hole being defined by a wall member upwardly protruding from the bottom of said protective cover; and

a cylindrical body provided between the protective cover and the planar oxygen sensor element, said cylindrical body having a first open end and a second open end opposed to said first open end, said second open end being fixed to said wall member upwardly protruding from the bottom of said protective cover;

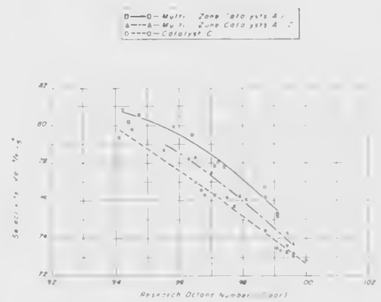
wherein said cylindrical body isolates said planar oxygen sensor element from direct contact with the measurement gas.

4,929,332

MULTIZONE CATALYTIC REFORMING PROCESS

Mark D. Moser, Elk Grove Village; R. Joe Lawson, Palatine; George J. Antos, Elgin, all of Ill.; Li Wang, Huntington, Conn., and Vivekanand N. Parulekar, Wichita, Kans., assignors to UOP, Des Plaines, Ill.

Filed Feb. 6, 1989, Ser. No. 306,731
Int. Cl.[5] C10G *35/085*
U.S. Cl. 208—65 15 Claims



1. A process for the catalytic reforming of hydrocarbons comprising contacting the hydrocarbon feed in two sequential catalyst zones, wherein:

(a) a first catalyst zone contains a first catalytic composite consisting essentially of a platinum component, a germanium component, a refractory inorganic oxide, and a halogen component; and

(b) a second catalyst zone contains a second catalytic composite comprising a platinum component, a germanium component, a refractory inorganic oxide, a halogen component, and catalytically effective amounts of a metal promoter selected from rhenium, rhodium, ruthenium, cobalt, nickel, and iridium, and mixtures thereof.

4,929,333

MULTIZONE CATALYTIC REFORMING PROCESS

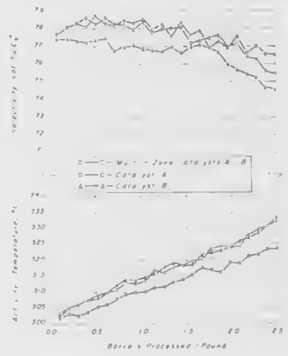
Mark D. Moser, Elk Grove Village; R. Joe Lawson, Palatine, both of Ill.; Li Wang, Huntington, Conn., and Vivekanand N. Parulekar, Wichita, Kans., assignors to UOP, Des Plaines, Ill.

Filed Feb. 6, 1989, Ser. No. 306,732
Int. Cl.[5] C10G *35/085*
U.S. Cl. 208—65 16 Claims

1. A process for the catalystic reforming of hydrocarbons comprising contacting the hydrocarbon feed in two sequential catalyst zones, wherein:

(a) an initial catalyst zone contains an initial catalytic composite comprising a platinum component, a germanium component, a refractory inorganic oxide, and a halogen component; and

(b) a terminal catalyst zone contains a terminal catalytic composite having the essential absence of germanium and comprising a platinum component, a refractory inorganic oxide, a halogen component, and catalytically effective



amounts of a metal promoter selected from rhenium, indium, rhodium, ruthenium, cobalt, nickel, iridium, and mixtures thereof.

4,929,334

FLUID-BED REACTION PROCESS

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Nov. 18, 1988, Ser. No. 272,958
Int. Cl.[5] C10G *57/00*
U.S. Cl. 208—91 10 Claims

1. A process for the conversion of hydrocarbons comprising the steps of:

(a) fluidizing a finely divided dehydrogenation catalyst in a dehydrogenation reaction zone;

(b) withdrawing spent dehydrogenation catalyst from said dehydrogenation reaction zone;

(c) contacting an aliphatic feedstream with said spent dehydrogenation catalyst in a preheat zone to preheat said aliphatic feedstream and to convert at least a portion of the coke precursors in the aliphatic feedstream to coke;

(d) depositing said coke on said spent dehydrogenation catalyst in said preheat zone;

(e) withdrawing said spent dehydrogenation catalyst from said preheat zone of step (c);

(f) charging said preheated aliphatic feedstream of step (d) to said dehydrogenation reaction zone of step (a) under dehydrogenation conversion conditions;

(g) stripping hydrocarbon from said spent dehydrogenation catalyst;

(h) regenerating said spent dehydrogenation catalyst; and

(i) recycling regenerated dehydrogenation catalyst to said dehydrogenation reaction zone.

4,929,335

METHOD FOR CONTROL OF VISBREAKER SEVERITY

Lawrence J. Altman; Byung C. Choi, both of Cherry Hill, and Grant G. Karsner, Voorhees Township, Camden County, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 222,858, Jul. 22, 1988, Pat. No. 4,880,748. This application Jul. 28, 1989, Ser. No. 386,173
Int. Cl.[5] C10G *9/00*
U.S. Cl. 208—106 5 Claims

1. A method for controlling the severity of visbreaking, which method comprises:

sampling the effluent from a visbreaker;

preparing three blends of said effluent with a distillate cutter stock, the first at a viscosity higher than that of a specific viscosity for the visbroken product, the second at a viscosity about equal to the specific viscosity, and the third at a viscosity lower than the specific viscosity;

measuring the total light absorbance of each of said blends at a selected wavelength in the range of 1200 to 3000 nm to determine the presence or absence of incompatible sediment by the total light absorbance of said samples at the selected wavelength;

and adjusting visbreaker severity as needed to maintain compatibility in said first and second samples as evidenced by the absence of incompatible sediment in said first and second samples and to force incompatibility on said third sample as evidenced by the formation during the visbreaking of incompatible sediment.

4,929,336

TREATMENT OF SPENT CRACKING CATALYSTS

Richard E. Lowery, Tolsa; Chia M. Fu, Bartlesville, and Michael K. Maholland, Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 12, 1989, Ser. No. 420,790

Int. Cl.[5] C10G *11/05*

U.S. Cl. 208—120 **34 Claims**

18. A catalytic cracking process comprising the step of contacting a hydrocarbon-containing feed stream with a zeolite-containing catalytic cracking catalyst composition, under such cracking conditions as to obtain at least one normally liquid hydrocarbon-containing product stream having a lower initial boiling point and higher API gravity than said hydrocarbon-containing feed stream;

wherein at least a portion of said cracking catalyst composition is a reactivated spent catalyst composition having undergone a reactivation process comprising the steps of

(a) contacting a spent zeolite-containing catalytic cracking catalyst composition, which contains at least one metal contaminant and at least a portion of which has previously been used in a catalytic cracking process, with an acidified aqueous solution of ammonium nitrate having a pH in the range of from about 0 to about 5, under such contacting conditions as to enhance the catalytic cracking activity of said cracking catalyst composition;

(b) at least partially separating the cracking catalyst composition having enhanced cracking activity obtained in step (a) from said solution used in step (a); and

(c) contacting the at least partially separated cracking catalyst composition having undergone steps (a) and (b) with at least one fluorine compound selected from the group consisting of NH_4F, NH_4HF_2 and HF, under such conditions as to enhance the catalyst cracking activity of the catalyst composition having undergone steps (a) and (b).

4,929,337

PROCESS FOR CATALYTIC CRACKING OF HEAVY HYDROCARBON FEED TO LIGHTER PRODUCTS

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,205

Int. Cl.[5] C10G *11/05, 35/095*; C07C *2/12, 5/22*

U.S. Cl. 208—120 **3 Claims**

1. A process for catalytic cracking of a feed of hydrocarbons boiling in the gas oil and heavier boiling range to lighter products by contacting the feed at catalytic cracking conditions and catalytically cracking the feed to lighter products with a cracking catalyst comprising a mixture of separate particles of:

(a) a bulk conversion cracking catalyst containing at least one component with an equivalent pore size of at least about 7 angstroms in a matrix, said bulk conversion cracking catalyst having fluidization properties which permit use in a fluidized or moving bed catalytic cracking reactor;

(b) a light paraffin upgrading catalyst comprising at least one zeolite having a constraint index of 1–12 and paraffin cracking/isomerization activity; and,

(c) a light paraffin upgrading catalyst comprising at least one zeolite having a constraint index of 1–12 and paraffin aromatization activity; and

wherein said upgrading catalysts have substantially the same fluidization properties as the bulk conversion cracking catalyst.

4,929,338

CATALYTIC CRACKING CATALYST AND PROCESS

Richard F. Wormsbecher, Baltimore, Md., assignor to W. R. Grace & Co. - Conn., New York, N.Y.

Continuation of Ser. No. 942,648, Dec. 17, 1986, abandoned, which is a division of Ser. No. 739,645, May 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 487,165, Apr. 21, 1983, abandoned, and Ser. No. 689,280, Jan. 7, 1985, abandoned. This application Dec. 19, 1988, Ser. No. 286,096

Int. Cl.[5] C10G *11/14*

U.S. Cl. 208—120 **10 Claims**

1. In a method for the catalytic cracking of vanadium containing hydrocarbons wherein said hydrocarbon is reacted under catalytic cracking conditions in the presence of catalyst which comprises synthetic faujasite dispersed in an inorganic oxide matrix, the improvement comprising conducting the reaction in the presence of a catalyst which includes from about 5 to 80 percent by weight expressed as the oxides of a composition for scavenging vanadium which comprises a magnesia-silica gel having the weight composition 30 to 80 percent MgO, a pore volume of at least 0.1 cc/g in pores having an average pore diameter of greater than about 600 Å in pores which range from about 200 to 10,000 Å in diameter.

4,929,339

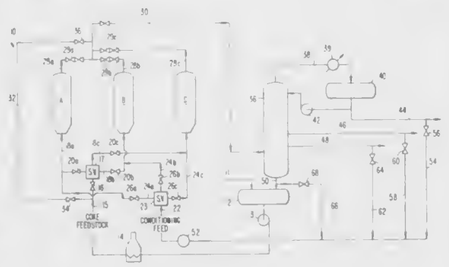
METHOD FOR EXTENDED CONDITIONING OF DELAYED COKE

John D. Elliott, Jr., Randolph, N.J., and Robert DeBiase, Staten Island, N.Y., assignors to Foster Wheeler U.S.A. Corporation, Clinton, N.J.

Continuation-in-part of Ser. No. 588,635, Mar. 12, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 784,950

Int. Cl.[5] C10G *9/14*

U.S. Cl. 208—131 **8 Claims**



1. A delayed coking process for producing conditioned anisotropic coke comprising the steps of:

forming coke in a first of a plurality of coke drums including feeding coke feedstock to the first drum at an elevated temperature;

conditioning the coke in the first drum at an elevated temperature to lower its volatile matter content and increase its hardness and crystallinity;

decoking the first drum;

forming coke in a second of said coke drums, including feeding coke feedstock to the second drum at an elevated temperature, during the conditioning of the coke in the first drum;

conditioning the coke in the second drum at an elevated temperature to lower its volatile matter content and increase its hardness and crystallinity during the decoking of the first drum;

decoking the second drum;

forming coke in a third of said coke drums, including feeding coke feedstock to the third drum at an elevated temperature, during the conditioning of the coke in the second drum;

conditioning the coke in the third drum at an elevated temperature to lower its volatile matter content and increase its hardness and crystallinity during the decoking of the second drum; and

decoking the third drum,

wherein each step of conditioning the coke at an elevated temperature comprises flowing through the coke a conditioning fluid having a temperature of more than 750° F. and less than 1000° F.

4,929,340

CATALYST AND PROCESS FOR SWEETENING A SOUR HYDROCARBON FRACTION USING DIPOLAR COMPOUNDS

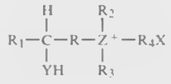
Sheila Pollastrini, Bloomingdale; Jeffery C. Bricker, Buffalo Grove, and Robert R. Frame, Glenview, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jul. 31, 1989, Ser. No. 386,923

Int. Cl.[5] C10G *19/00, 27/00, 29/00*

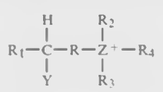
U.S. Cl. 208—189 **22 Claims**

1. In a process for treating a sour hydrocarbon fraction containing mercaptans comprising contacting the hydrocarbon fraction in the presence of an oxidizing agent with a basic solution containing a metal chelate effective in oxidizing said mercaptans to disulfides, the improvement comprising a dipolar compound present in the basic solution, the dipolar compound having the structural formula



(A)

where Z is nitrogen or phosphorus, R is a linear alkyl group having from one to about 18 carbon atoms, R_1 and R_2 are each individually hydrogen or a hydrocarbon group selected from the group consisting of alkyl, aryl, alkaryl, aralkyl and cycloalkyl, R_3 and R_4 are each individually a hydrocarbon group selected from the group consisting of alkyl, aryl, alkaryl, aralkyl and cycloalkyl, YH is an electronegative group selected from the group consisting of OH, SH, COOH, SO_3H and NH_2, the electronegative group characterized in that it is capable of being deprotonated in a basic solution, and X is an anion selected from the group consisting of the halogens, and hydroxide; or the structural formula



(B)

where Y^- is the deprotonated form of YH.

4,929,341

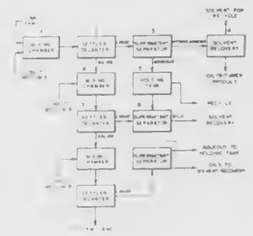
PROCESS AND SYSTEM FOR RECOVERING OIL FROM OIL BEARING SOIL SUCH AS SHALE AND TAR SANDS AND OIL PRODUCED BY SUCH PROCESS

M. Jeersannidhi Thirumalachar, and M. Jeersannidhi Narasimhan, Jr., both of Walnut Creek, Calif., assignors to Source Technology Earth Oils, Inc., Walnut Creek, Calif.

Continuation-in-part of Ser. No. 633,942, Jul. 24, 1984, abandoned, which is a continuation of Ser. No. 416,507, Sep. 10, 1982, abandoned. This application Apr. 28, 1986, Ser. No. 856,811

Int. Cl.[5] C10G *1/00*

U.S. Cl. 208—390 **11 Claims**



3. A process for recovering bitumen from tar sand comprising the steps of:

(a) contacting tar sand in a first contacting zone with a first liquid medium comprising an intimately mixed, phase emulsion comprising (1) about 10 to about 40 volume percent of a solvent and (2) about 60 to about 90 volume percent of an aqueous solution comprising water, about 0.025 to about 0.5 weight percent of a surfactant and about 0.1 to about 5.0 weight percent of a non-caustic alkali compound;

(b) mixing said tar sand and said first liquid medium to release bitumen from the tar sand;

(c) separating the released bitumen and solvent from the mixture of step (b) from the remaining sand;

(d) contacting the remaining sand with a second liquid medium comprising an aqueous solution comprising water, about 0.025 to about 0.5 weight percent of a surfactant and about 0.1 to about 5.0 weight percent of a non-caustic alkali compound;

(e) mixing said remaining sand and said second liquid medium to further release bitumen from the sand and

(f) recovering the further released bitumen from the mixture of step (e).

4,929,342

APPARATUS AND METHOD FOR SEPARATING RECYCLABLE MATERIALS

Gerald Johnston, Vestaburg, Mich., assignor to Lenco Machines & Tool Co., Vestabury, Mich.

Filed Dec. 23, 1988, Ser. No. 290,183

Int. Cl.[5] B03C *1/30*; B07B *15/00*

U.S. Cl. 209—12 **17 Claims**

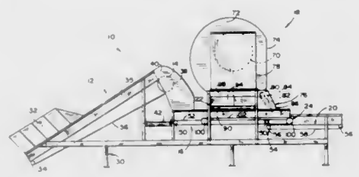
1. An apparatus for separating recyclable materials, comprising:

a frame;

a conveying mechanism mounted on said frame and including a magnetic element thereon, said conveying mechanism adapted to convey a flow of said recyclable materials and said magnetic element disposed and adapted to direct magnetic materials out of said recyclable material flow;

a vacuum inducing mechanism mounted on said frame and disposed adjacent said conveying mechanism so as to pull materials having a preselected lighter weight from said recyclable material flow, said vacuum inducing mecha-

nism having a vacuum discharge region for discharging said lighter weight materials;
a size separator mechanism disposed at said vacuum discharge region;
said conveying mechanism having a heavy material collecting region, whereby said apparatus separates said metallic



material from the remainder of said recyclable materials, said lighter weight materials such as aluminum, plastic and the like are pulled from the remainder of said recyclable materials and sorted by size, and non-magnetic heavy materials such as glass and the like are collected at said heavy material collecting region.

4,929,343

NOVEL COLLECTORS AND PROCESSES FOR MAKING AND USING SAME

Samuel S. Wang, Cheshire, and D. R. Nagarai, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 108,611, Oct. 15, 1987, Pat. No. 4,871,466. This application Jul. 5, 1989, Ser. No. 375,443
Int. Cl.[5] B03D *1/01, 1/008, 1/018*
U.S. Cl. 209—166 **16 Claims**

1. In a froth flotation process for beneficiating a non-sulfide ore containing value and impurity minerals comprising slurrying said ore in an aqueous medium, conditioning said slurry with effective amounts of a frothing agent and a collector selective for only one of said value or impurity minerals and frothing the slurry to produce a concentrate containing said value minerals by froth flotation, the improvement comprising employing, as the collector, a composition comprising a mixture of water, a C_8–C_{22} alcohol, a fatty hydroxamic acid salt of 6–22 carbon atoms and an alkali metal sulfate.

4,929,344

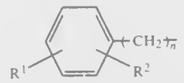
METALS RECOVERY BY FLOTATION

Shane D. Fleming, Montville, N.J., assignor to American Cyanamid, Stamford, Conn.

Filed May 1, 1989, Ser. No. 345,749
Int. Cl.[5] B03D *1/02*
U.S. Cl. 209—166 **11 Claims**

1. In a froth flotation process for beneficiating a gold, silver or platinum group ore comprising slurrying liberation-sized particles of said ore in an aqueous medium, conditioning the resultant slurry with effective amounts of a frothing agent and a collector, respectively, and floating the desired gold, silver or platinum group minerals by froth flotation methods, the improvement comprising: conducting said flotation step at a pH of above 7.0 and in the presence of a primary collector for said gold, silver or platinum group minerals consisting essentially of at least one monothiophosphate compound having the formula:

wherein each R is, individually, selected from C_2–C_8 alkyl and



radicals wherein R^1 and R^2 are, individually, hydrogen or C_1–C_4 alkyl radicals, n is 0 or 1 and X is a cation, alone or in combination with an auxiliary collector selected from the group consisting of xanthates, dithiophosphates, dithiophosphinates, thioureas and mercaptobenzothiazoles and selectively recovering the gold, silver or platinum group metal from said froth.

4,929,345

CARPET SWEEPER

Hilman J. Meador, 2712 Dick Taylor St., Monroe, La. 71202-3216

Filed Jul. 6, 1989, Ser. No. 375,883
Int. Cl.[5] B03C *1/30*
U.S. Cl. 209—215 **9 Claims**



1. A carpet sweeper comprising a base member, a wire mesh fabric secured to the forward end of said base member and engaging the surface of the carpet to be swept, magnetic means secured to the bottom of the base member adjacent the wire mesh fabric, handle means secured to the base member to thereby facilitate the manual pushing of the sweeper over the carpet to be cleaned, whereby the mechanical action of the wire mesh fabric dislodges metallic fasteners caught in the carpet, and the magnetic force of the magnet attracts and accumulates the dislodged fasteners away, from the carpet, and a scraper attachably connected to the base member for manually removing accumulated metallic fasteners from the magnetic means.

4,929,346

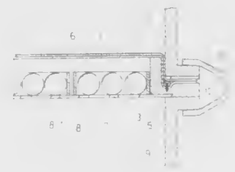
VIBRATORY SEPARTOR SCREEN ASSEMBLY

Yu Si-Lin, No. 67, 38th Alley, Kuang-Fu Rd., Sec. 2, San-Chung City, Taiwan

Filed Jan. 20, 1988, Ser. No. 145,912
Int. Cl.[5] B07B *1/28*
U.S. Cl. 209—323 **7 Claims**

1. A screen structure for vibratory separator comprising:
a screen frame for supporting screens, the screen frame including an upstanding wall having an upper edge and having a radially outwardly extending edge flange around the upstanding wall down from the upper edge of the screen frame;
a coarse screen placed atop the upper edge of the frame wall, and including a first peripheral edge portion wrapped down the outside of the frame wall and secured stretched tight to the edge flange of the screen frame, and attaching means attaching the coarse screen to the edge flange;
a main screen laid on top of the coarse screen and extending across the surface of the coarse screen, the main screen including a second peripheral edge portion which also

extends down the outside of the upstanding wall of the screen frame on the outside of the coarse screen and then extends over the edge flange of the screen frame above the coarse screen on the edge flange, said main screen being removable from said screen frame while the coarse screen remains stretched tight and attached to the edge flange of the screen frame by the attaching means;
an upper spacing frame projecting above the screen frame and above the screens supported on the screen frame, and the upper spacing frame having a wall which extends down past and outside the wall of the screen frame down to the edge flange of the screen frame; the upper spacing frame having a first peripheral flange which extends radially outwardly from the wall thereof above the screens which are on the edge flange of the screen frame, and the



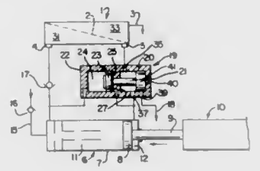
upper frame being pressed down toward the edge flange of the screen frame for squeezing the screens between the first peripheral flange of the upper spacing frame and the edge flange of the screen frame;
a lower spacing frame disposed beneath and extending down from the edge flange of the screen frame, the lower spacing frame also including a second peripheral flange projecting radially outwardly and also disposed below the edge flange of the screen frame;
a V clamp ring extending around the periphery of the structure and around the first and second peripheral flanges, the clamp ring having legs which sandwich between them the first peripheral flange of the upper spacing frame and the second peripheral flange of the lower spacing frame and clamps the peripheral flanges together over the edge flange and the coarse screen and the main screen.

4,929,347

CONCENTRATING APPARATUS WITH REVERSE OSMOSIS MEMBRANE

Masaaki Imai, Nishinomiya, and Minoru Uemura, Itami, both of Japan, assignors to Sasakura Engineering Co., Ltd., Osaka, Japan

Filed Jul. 10, 1989, Ser. No. 377,882
Claims priority, application Japan, Jul. 11, 1988, 63-173172
Int. Cl.[5] B01D *13/00, 31/00*
U.S. Cl. 210—101 **1 Claim**



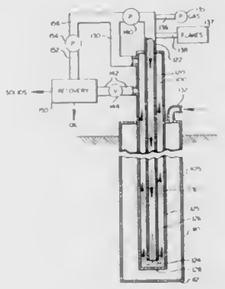
1. Reverse osmosis apparatus comprising:
a reciprocating pump means including a first cylinder chamber and a second cylinder chamber, which is smaller in volume than said first chamber and has a piston rod extending through said second cylinder chamber,
feed conduit means connected to said first cylinder chamber for feeding fluid thereto through a first one-way flow means for fluid flow thereto,
a reverse osmosis membrane module including an inlet and outlet to collect permeate fluid,
a second one-way flow means connecting said first cylinder chamber with said reverse osmosis membrane module inlet for fluid flow to said inlet, and
a selector connecting said second cylinder chamber with said reverse osmosis membrane module outlet,
a drain conduit means connected to said selector for draining concentrated fluid from said second cylinder chamber,
said selector having a first position where said reverse osmosis membrane module outlet and said second cylinder chamber communicate together and said drain conduit means is isolated, and a second position where said outlet is blocked and said second cylinder chamber and said drain conduit means communicate together,
means for continuous pump operation including means for enabling said selector to be connected in pressure communication with said cylinder chambers to shift to said first position when the pressure in said first cylinder chamber increases, and to said second position when the pressure in said second cylinder chamber increases.

4,929,348

APPARATUS FOR CARRYING OUT EXTRACTIONS IN SUBTERRANEAN WELL

Wayne K. Rice, P.O. Box 9, Wanatah, Ind. 46390, assignor to Wayne K. Rice, Wanatah, Ind.

Division of Ser. No. 74,091, Jul. 16, 1987, Pat. No. 4,810,373, which is a division of Ser. No. 732,362, May 8, 1985, Pat. No. 4,683,063. This application Mar. 6, 1989, Ser. No. 320,214
Int. Cl.[5] B01D *11/04*
U.S. Cl. 210—109 **12 Claims**



1. An apparatus for carrying out a co-current solvent extraction using as the solvent a liquefiable fluid, which apparatus comprises:
a long, small-diameter, vertical cylinder extraction vessel;
a vertical pipe concentrically disposed within said extraction vessel extending downwardly from the top of said extraction vessel to near the bottom of said extraction vessel, said pipe defining an annular opening within said extraction vessel;
means to continuously charge said fluid at a pressure of at least about 2,000 psi; into the top of said extraction vessel to fill said extraction vessel;
means to circulate said pressurized fluid through said extraction vessel;
means to charge a material to be extracted into the circulating fluid within said extraction vessel, whereby said charged material is mixed with said fluid and the resulting

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mixture is carried to the bottom of said extraction vessel where the pressure head formed by the mixture of said charged fluid and said charged material increases the total pressure at the bottom of said extraction vessel, to a pressure selected to provide solubility of selected components of said material to be extracted in said fluid, means to continuously circulate said fluid through said extraction vessel to cause the charged material to be extracted to move upwardly to the top of the extraction vessel; and

recovery means located near the top of said extraction vessel constructed to separate solids from fluids having a pressure of at least about 2,000 psi, said recovery means comprising a porous membrane means for receiving a portion said mixture from said extraction vessel, said membrane constructed to allow passage of fluid from said mixture, but not solids; said membrane positioned within a pressure jacket; said recovery means having apertures to permit the flow of fluid from said extraction vessel through said membrane to said pressure jacket, and

control means to regulate the pressure within said jacket to control the rate of flow of said fluid through said membrane.

4,929,349

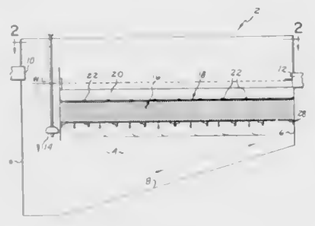
BIO-FILTRATION APPARATUS AND METHOD FOR WASTEWATER TREATMENT

William J. Beckman, 842 Ohio Pike, Cincinnati, Ohio 45245

Filed Aug. 24, 1988, Ser. No. 236,515

Int. Cl.[5] C02F *3/06*

U.S. Cl. 210—151 **5 Claims**



1. In a sewage treatment apparatus having a treatment tank into which effluent to be treated is introduced and then exits said tank after treatment, the improvement comprising, in combination,

wedge wire panels mounted horizontally in said tank, and

a fixed film media reactor mounted directly below said wedge wire panels, said media reactor having a plurality of vertical channels therethrough which form a surface for the growth of aerobic microorganisms, and

means for introducing effluent into said tank and causing said effluent to pass upwardly through said vertical channels and then through said wedge wire panels

wherein said wedge wire panels and fixed film media reactor are constructed and arranged to establish laminar flow throughout the fixed film media reactor.

4,929,350

ROTARY SCREW FISH COLLECTOR

Mark G. Wade, 1005 SE. Park, Corvallis, Oreg. 97330, and Kenneth R. Kenaston, P.O. Box 991, Philomath, Oreg. 97370

Continuation-in-part of Ser. No. 256,589, Oct. 12, 1988, abandoned. This application Aug. 2, 1989, Ser. No. 395,731

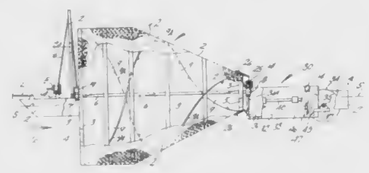
Int. Cl.[5] B01D *33/02, 35/02*

U.S. Cl. 210—157 **20 Claims**

1. A fish and debris collector for use in a body of water, said collector comprising,

a support structure including bearing means, and

a porous structure including a screen of frustoconical shape, said screen having an inlet end opening and an outlet end opening the latter being lesser size than said inlet end opening, shaft means journalled in said bearing means, a tapered screw blade located interiorly of said screen and having an outer edge attached to said screen, said screw blade submersible in the body of water,



said screw blade comprising means for rotating

said porous structure by water acting on said screw blade whereby submerged spaced apart segments of the screw blade in conjunction with the screen effect a traveling enclosure for the fish for the transfer of same and water borne debris to the outlet opening of the structure.

4,929,351

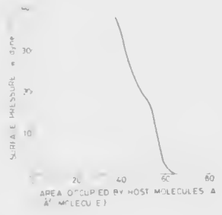
PORTABLE ULTRA-FILTRATION SYSTEM

George W. Sanborn, Walpole, Mass., assignor to Sanborn, Inc., Wrentham, Mass.

Continuation of Ser. No. 256,749, Oct. 12, 1988, abandoned. This application May 26, 1989, Ser. No. 357,685

Int. Cl.[5] B01D *61/18*

U.S. Cl. 210—195.2 **14 Claims**



1. A portable ultra-filtration system for filtering waste fluid contained in a storage drum, comprising:

A. a base member having a periphery formed to engage the upper rim of the drum;

B. a panel positioned on a front portion of the base member, the panel having a fluid inlet port, a permeate outlet port, and a compressed air port disposed therein;

C. a compressed-air-operated pump located behind the front panel;

D. means for enabling the pump to draw fluid from the drum;

E. a prefilter housing containing a cartridge prefilter arranged to receive the outflow of the pump;

F. an ultra-filter containing a membrane ultra-filter, the ultra-filter housing having a permeate outlet and a concentrate outlet;

G. a rigid conduit for mechanically coupling an outlet of the prefilter housing to an inlet of the ultra-filter housing;

H. support means for supporting the rigid conduit so that the prefilter and ultra-filter are maintained in vertical orientation;

I. means for maintaining the pressure of fluid flowing through the ultra-filter; and

J. means for directing the fluid from the concentrate outlet of the ultra-filter to the drum.

4,929,352

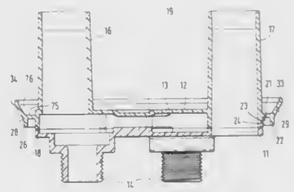
DEVICE FOR FILTERS, INSERT FOR FILTERS AND FILTER

Joachim Wolf, Malmsheimer Str. 67, 7252 Weil der Stadt, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,480

Int. Cl.[5] B01D *27/08, 35/02*

U.S. Cl. 210—232 **14 Claims**



1. A filter insert including a filter device, which device has an underside and a top side and comprises:

a circular adapter,

a circular head,

said adapter and circular head having a common outer periphery,

a sealing device in the area radially outside of said outer periphery,

said head and said adapter being firmly and integrally connected together at adjacent surfaces thereof that are positioned inward relative to said sealing device to contain

said distribution compartment fluid-tight between said head and said adapter, and

a solid annular collar extending radially outside of said outer periphery and having an underside with a conical outer surface and forming part of said sealing device,

said insert comprising filter cartridges hanging from said underside of said device within a flexible bag below a top region of said bag, which top region is secured in a fluid-tight manner on said conical outer surface of said collar.

4,929,353

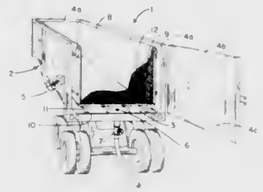
PORTABLE LIQUID-SOLID SEPARATOR FOR BULK SLUDGE

Ronald B. Harris, 28191 Range Rd., Livingston, La. 70754

Filed Feb. 6, 1989, Ser. No. 306,700

Int. Cl.[5] B01D *35/30*

U.S. Cl. 210—237 **8 Claims**



1. A portable liquid-solid separator for sludge, comprising:

(a) an upright trailer having a bed and surrounding sides, said bed having a drain;

(b) a first grate overlaying said bed;

(c) a first means to support said first grate in a position to allow said liquid to flow through said grate to said drain;

(d) a second grate extending upright from said bed;

(e) a second means to support said second grate in a position to create a gap between said second grate and one of said sides of said trailer; and

(f) a filter inducing capillary attraction between said filter and said liquid, said filter overlaying said first grate and said second grate, and said filter overlapping a top edge of said second grate and extending into said gap.

4,929,354

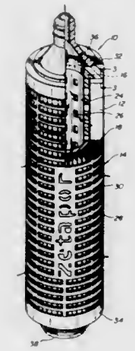
FILTER ELEMENT HAVING MICROPOROUS MEMBRANE

Mark T. Meyering, Middlefield, and Eugene A. Ostreicher, Farmington, both of Conn., assignors to Cuno, Incorporated, Menden, Conn.

Continuation of Ser. No. 102,314, Sep. 25, 1987, abandoned, which is a continuation of Ser. No. 758,934, Jul. 25, 1985, abandoned, which is a division of Ser. No. 700,784, Feb. 12, 1985, Pat. No. 4,579,698. This application Apr. 17, 1989, Ser. No. 339,922

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—321.61 **18 Claims**



1. A filter cartridge for filtration of aqueous liquids comprising:

(a) an end cap having hydrophobic thermoplastic sealing material therein;

(b) a hydrophilic microporous membrane in sheet form having a microporous filtering surface and nonporous crushed border surface with substantially closed micropores;

(c) the nonporous border surface partially inserted and thermoplastically sealed within the hydrophobic thermoplastic sealing material of the end cap, wherein no portion of the microporous filtering surface contacts the hydrophobic thermoplastic sealing material.

4,929,355

METHOD AND APPARATUS FOR THE SEPARATION OF CAUSTIC LIQUOR, LIME SLUDGE AND SLUDGE IN A CAUSTICIZING PROCESS

Samuel Ragnegård, and Arne Sjöberg, both of Hedemora, Sweden, assignors to AB Hedemora Verkstäder, Hedemora, Sweden

Continuation of Ser. No. 858,763, May 2, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 154,459

Claims priority, application Sweden, Feb. 5, 1985, 85021236

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[5] B01D *33/08*

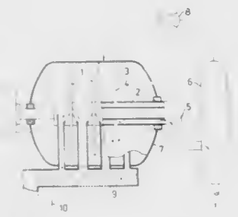
U.S. Cl. 210—784 **10 Claims**

1. Apparatus for operating in a continuous causticizing process for separating either white liquor from lime sludge or green liquor from sludge under positive pressure, said apparatus comprising:

a pressure vessel;

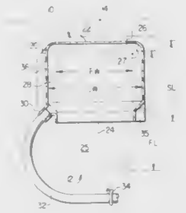
rotatable filter element means arranged in the pressure vessel

so as to pass for each revolution through a filtering cycle having filtering zones in a liquid phase and a gaseous phase;
means for removing filter cake formed on said filter element means during filtering;
means for discharging removed filter cake from the pressure vessel;
a common outlet means for discharging a mixture of filtrate and gaseous medium from the pressure vessel;
means outside of the pressure vessel and connected to said means for discharging the mixture of filtrate and gaseous medium for separating the filtrate and the gaseous medium from each other;



first outlet means for discharging the filtrate from said separating means;
second outlet means for discharging the gaseous medium from said separating means;
conduit means connecting said gaseous medium outlet means to the interior space of the pressure vessel between the inner surface of the pressure vessel and the outer surface of said filter element means; and
means arranged between said separating means and the pressure vessel and connected to said conduit means for increasing the pressure of the gaseous medium before conducting the gaseous medium back to the pressure vessel through said conduit means.

4,929,356
ENVIRONMENT PROTECTOR FOR REPLACEABLE CARTRIDGE FILTERS
John A. Todd, Berlin, Md., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed May 31, 1988, Ser. No. 200,396
Int. Cl.[5] B01D *27/00*
U.S. Cl. 210—248 **5 Claims**



1. A self-sealing cover for an in-line fuel filter, comprising:
an elastomeric sleeve dimensioned to fit over a canister assembly;
said sleeve having flexible first and second open ends to allow said sleeve to slidably fit over said canister assembly and form a liquid tight seal therebetween;
said sleeve and canister assembly cooperating to form a chamber therebetween for containment of spilled fuel;
means for removing said spilled fuel from said canister assembly without allowing said spilled fuel to contaminate the environment; and
said means including a hole extending through said sleeve into said chamber and located adjacent the second open end of said sleeve and a flexible tube connected with said hole to allow drainage of spilled fuel from said chamber into a separate container.

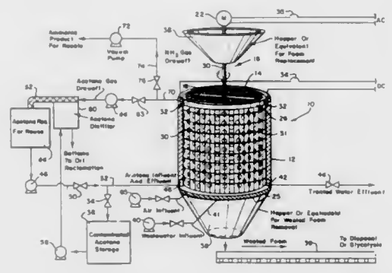
4,929,357
ISOCYANURATE CROSSLINKED POLYURETHANE MEMBRANES AND THEIR USE FOR THE SEPARATION OF AROMATICS FROM NON-AROMATICS
Robert C. Schucker, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Aug. 9, 1989, Ser. No. 391,058
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—640 **3 Claims**

1. A method comprising separating aromatic hydrocarbons from mixtures of same with non-aromatic hydrocarbons by contacting the mixture with one side of a non-porous isocyanurate crosslinked polyurethane membrane under conditions such that the aromatic hydrocarbon selectively permeates through the membrane.

4,929,358
POLYURETHANE-IMIDE MEMBRANES AND THEIR USE FOR THE SEPARATION OF AROMATICS FROM NON-AROMATICS
Bernd A. Koenitzer, Clearwater, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Aug. 9, 1989, Ser. No. 391,068
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—640 **10 Claims**

1. A method for separating aromatic hydrocarbons from a mixture containing said aromatic hydrocarbons in combination with non-aromatic hydrocarbons, the method comprising contacting said mixture under appropriate separation conditions with a membrane comprising a polyurethane-imide membrane to thereby selectively permeate the aromatic hydrocarbon through the membrane.

4,929,359
TREATMENT OF CONCENTRATED INDUSTRIAL WASTEWATERS ORIGINATING FROM OIL SHALE AND THE LIKE BY ELECTROLYSIS POLYURETHANE FOAM INTERACTION
Joan E. Tiernan, Novato, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jan. 26, 1988, Ser. No. 148,721
Int. Cl.[5] C02F *1/28, 1/46*
U.S. Cl. 210—663 **19 Claims**



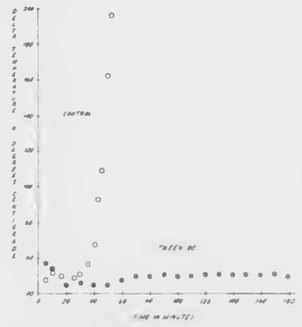
1. A method of removing pollutants from concentrated synthetic fuel wastewater comprising:

mixing open-celled polyurethane foam shapes with said wastewater in a container,
applying an electric current through the wastewater, and
producing laminar flow conditions of said wastewater through said foam shapes.

4,929,360
USE OF LAMINATES CONTAINING SUPERABSORBENT POLYMERS FOR ASBESTOS ABATEMENT
Thomas J. Bohnert, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Jul. 19, 1989, Ser. No. 381,896
Int. Cl.[5] B08B *1/00*
U.S. Cl. 210—679 **1 Claim**

1. A method which comprises immobilizing water which contains asbestos fibers by incorporating aqueous-fluid absorbing polymer in a vehicle for holding aqueous-fluid absorbing polymer, exposing the vehicle to water containing asbestos fibers, wherein the aqueous-fluid absorbing polymer absorbs the water containing asbestos fibers.

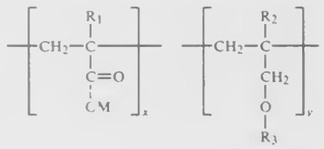
4,929,361
METHOD OF INHIBITING FOULING IN PROTEIN-CONTAINING FLUIDS
David M. Polizzotti, Yardley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.
Filed May 25, 1989, Ser. No. 357,145
Int. Cl.[5] C02F *5/10*
U.S. Cl. 210—698 **8 Claims**



1. A process for controlling organic fouling of heat transfer surfaces exposed to an aqueous, acidic proteinaceous solution which comprises adding to said solution an effective inhibiting amount of a nonionic surfactant.

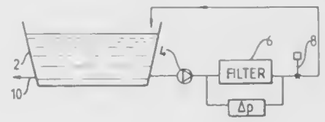
4,929,362
CALCIUM PHOSPHATE SCALE CONTROL METHODS
Fu Chen, Newtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.
Division of Ser. No. 201,645, Jun. 1, 1988, abandoned, which is a continuation of Ser. No. 944,160, Dec. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, which is a continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application May 2, 1989, Ser. No. 346,103
Int. Cl.[5] C02F *5/10*
U.S. Cl. 210—701 **4 Claims**

1. Method of inhibiting calcium phosphate deposition on the metallic parts in contact with an aqueous medium, comprising adding to said system from 0.1 to 500 parts per million, based on one million parts of said aqueous medium, of an effective water soluble, polymeric calcium phosphate scale control agent, wherein the repeat units of said water soluble calcium phosphate scale control agent have the structure



wherein R_1 and R_2 are H, R_3 is 2-hydroxypropyl, M is a cation or H, wherein the number average molecular weight of said polymeric calcium phosphate scale control agent is within the range of 1,500 to 10,000 and wherein the molar ratio x:y of said repeat units is within the range of about 6.2:1 to 3.2:1.

4,929,363
METHOD FOR FILTERING A FLUID
Ytzhak Barzuza, Petach Tikva, Israel, assignor to Filtration L.T.D., Herzlia, Israel
Filed Feb. 19, 1988, Ser. No. 157,873
Claims priority, application Israel, Feb. 27, 1987, 81713
Int. Cl.[4] B01D *37/04*
U.S. Cl. 210—741 **10 Claims**



1. A method for filtering a fluid in a filter system, including a filter housing and a filter element, comprising the step of:
modifying filter throughput in such a way that differential pressure across said filter system caused by build-up of filter cake is substantially maintained at a predeterminable level for at least part of filter-operation time between flushings.

4,929,364
AMINE/GALLIC ACID BLENDS AS OXYGEN SCAVENGERS
Patricia A. Reardon, Downers Grove, and David A. Grattan, La Grange Highlands, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.
Continuation of Ser. No. 64,161, Jun. 19, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 268,661
Int. Cl.[5] C02F *1/20*
U.S. Cl. 210—750 **4 Claims**

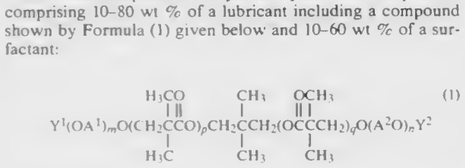
1. A method for scavenging dissolved oxygen from waters used to generate steam which comprises treating said waters with at least 0.5 mole of propyl gallate per mole of oxygen contained in said boiler water using an aqueous concentrate containing at least 0.3 weight percent propyl gallate, said aqueous concentrate having a pH of at least 8.5, said pH having been adjusted by a water-soluble neutralizing amine of the type used to treat boiler waters said neutralizing amine being present in sufficient amount to solubilize said propyl gallate in said waters used to generate steam.

4,929,365
BIOFILM CONTROL
James B. Clark, and Deborah E. Langley, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.
Filed Sep. 18, 1989, Ser. No. 408,851
Int. Cl.[5] C02F *1/76*
U.S. Cl. 210—754 9 Claims

1. A method for the removal of biofilms composed of microorganisms from a submerged surface in an aqueous medium comprising contacting said biofilm with
(i) an aqueous stabilized chlorine dioxide; followed by;
(ii) at least one nutrient source; wherein said nutrient source is provided in an effective amount to result in the microorganisms in the biofilm generating one or more acidic compounds and said aqueous stabilized chlorine dioxide is provided in an amount sufficient, when activated, by said one or more acidic compounds generated by said microorganisms to kill a sufficient number of the microorganisms in the biofilm to result in the removal of said biofilm from said submerged surface.

4,929,366
FINISH COMPOSITIONS FOR SYNTHETIC YARNS
Hisao Yamamoto, and Atsushi Nakamura, both of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan
Filed Dec. 20, 1988, Ser. No. 287,426
Claims priority, application Japan, Jan. 9, 1988, 63-2752
Int. Cl.[5] D06M *1/00*
U.S. Cl. 252—8.6 15 Claims

1. A finish composition for synthetic yarns, said composition comprising 10–80 wt % of a lubricant including a compound shown by Formula (1) given below and 10–60 wt % of a surfactant:



(1)

where Y^1 and Y^2 are monocarboxylic acid residues shown by Formula (2) or Formula (3) given below, at least one of Y^1 and Y^2 being monocarboxylic acid residue shown by Formula (2), A^1 and A^2 are alkylene groups with 2–4 carbon atoms, m and n are same or different, each being 0 or an integer in the range of 1–10, p and q are equal or different, each being 0 or an integer in the range of 1–4 such that (p+q) is an integer in the range of 1–4:

$$R^1S(CH_2)_rCO- \quad (2)$$

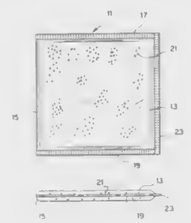
wherein R^1 is alkyl group or alkenyl group with 6–22 carbon atoms and r is an integer in the range of 1–3, and

$$R^2CO- \quad (3)$$

where R^2 is alkyl or alkenyl group with 7–25 carbon atoms.

4,929,367
ANTISTATIC AND FABRIC SOFTENING LAUNDRY WASH CYCLE ADDITIVE COMPOSITION IN FILTERING POUCH
James M. Thomas, Woodbridge, and Ronald D. Kern, Buttzville, both of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.
Filed Oct. 6, 1986, Ser. No. 916,069
Int. Cl.[5] D06M *13/34, 13/46*
U.S. Cl. 252—8.8 19 Claims

1. An antistatic and fabric softening laundry wash cycle additive article which comprises an antistatic and fabric softening composition in a filtering container, which composition comprises a complex of a cationic surfactant and an anionic surfactant, in which complex the molar proportion of the anionic surfactant is at least equimolar with respect to that of the cationic surfactant, or a mixture of cationic surfactant and anionic surfactant in which mixture the proportion of the anionic surfactant is at least equimolar with respect to that of the cationic surfactant, which complex or mixture is in a filtering container which is a non-woven pouch of fibrous material having wall openings which prevent passage therethrough of



particles larger than 250 microns, when the container and its contents are added to wash water in an automatic washing machine, filters materials passing through it so that cationic-/anionic surfactant complex passing through walls of the container is of a small enough size so that it does not form greasy deposits on laundry being washed.

4,929,368
FLUOROETHER GREASE ACOUSTIC COUPLANT
Joseph Baumoel, 155 Plant Ave., Hauppauge, N.Y. 11788
Filed Jul. 7, 1989, Ser. No. 376,529
Int. Cl.[5] C10M *107/38*
U.S. Cl. 252—11 5 Claims

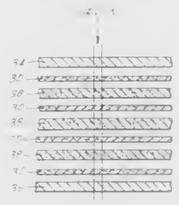
1. In combination, an ultrasonic transducer, a conduit for carrying fluid which is at a temperature in excess of 500° F., a clamping structure for clamping a surface of said transducer to the exterior surface of said conduit, and a sonic coupling fluid disposed between said surface of said transducer and said exterior surface; said coupling fluid comprising a fluoroether grease.

4,929,369
GREASE COMPOSITION
Bernard Tury, Prestwich, England, assignor to Imperial Chemical Industries PLC, London, United Kingdom
Filed Oct. 5, 1989, Ser. No. 417,335
Claims priority, application United Kingdom, Oct. 26, 1988, 8825073
Int. Cl.[5] C10M *129/50*
U.S. Cl. 252—12 15 Claims

1. A composition which comprises
(a) a salt of a monovalent metal (M) of a carboxylic acid in which the carboxylic acid group is attached to a ring atom of a fused ring system; and
(b) a grease which is a non-soap thickened mineral or synthetic oil.

4,929,370
DRY LUBRICANT DRILLING OF THRU-HOLES IN PRINTED CIRCUIT BOARDS
William R. Hatch, Diamond Bar, Calif., and John W. Foster, Edina, Minn., assignors to Lubra Sheet Corporation, Eden Prairie, Minn.
Continuation of Ser. No. 227,687, Sep. 30, 1988, abandoned, which is a division of Ser. No. 919,085, Oct. 14, 1986, Pat. No. 4,781,495. This application Aug. 1, 1989, Ser. No. 390,496
Int. Cl.[5] B23B *51/06, 35/00*
U.S. Cl. 252—12.2 10 Claims

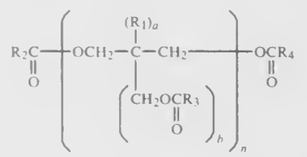
1. A dry film lubricating sheet for use in a drilling process for lubricating a rotary drilling tool during the process of drilling a thru-hole in a printed circuit board in a dry state so that drill life is extended and the thru-holes are cleanly formed by preventing dielectric smear on the face of a metal layer through which the thru-hole is drilled, the lubricating sheet comprising a porous carrier sheet, and a lubricating material impregnated in and coating at least one surface of the carrier sheet in thin film form, the lubricating material comprising a mixture of a water soluble hardener comprising a principal component of the lubricating material, and a water soluble lubricant, com-



bined to form a water soluble and substantially dry lubricating film in solid film form on the surface of the carrier sheet, so the film-coated carrier sheet comprises a separate lubricating sheet which can be overlaid on and removed from the surface of the printed circuit board, in which the lubricating film on the carrier sheet is in a film thickness sufficient to transfer lubricating properties to a rotary drill penetrating the overlaid carrier sheet, and in which the melting temperature of the dry film is lower than the drill tool temperature during normal use to liquify the film to transfer its lubricating properties from the lubricating sheet to the rotary drill.

4,929,372
LUBRICATING OIL COMPOSITIONS FOR CHAINS
Hideo Akanuma, Tokyo; Masashi Murata, Funabashi; Kiyoshi Inoue, Hiratsuka, and Ryoji Ohgake, Yachimata, all of Japan, assignors to Asahi Glass Co., Ltd. and Nippon Oil Co., Ltd., both of Tokyo, Japan, a part interest
Filed May 23, 1989, Ser. No. 356,795
Claims priority, application Japan, May 26, 1988, 63-127172
Int. Cl.[5] C10M *125/02*
U.S. Cl. 252—29 6 Claims

1. A lubricating oil composition for chains which consists essentially of
(A) as the base oil, a polyol ester represented by the general formula



wherein R_1 is an alkyl group having 1 to 4 carbon atoms, R_2 to R_4 are each an alkyl group having 2 to 17 carbon atoms, a and b are each an integer of 0 to 2 with the proviso that the total of a and b is 2, and n is an integer of 1 to 4, and
(B) as an additive, a graphite fluoride represented by the formula

CF_x

wherein x is a number of 0.5 to 1.2, in an amount of 0.5 to 30% by weight based on the total amount of the composition.

4,929,371
STEEL MILL GREASE
John A. Waynick, Bolingbrook, Ill., assignor to Amoco Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 77,607, Jul. 24, 1987, Pat. No. 4,830,767, which is a continuation-in-part of Ser. No. 830,710, Feb. 18, 1986, abandoned. This application Mar. 31, 1989, Ser. No. 332,523
Int. Cl.[5] C05M *117/00;* C10M *125/10, 125/24*
U.S. Cl. 252—25 19 Claims

1. A grease, comprising:
a substantial proportion of a base oil;
a thickener comprising a member selected from the group consisting of biurea, triurea, and polyurea;
extreme pressure wear-resistant additives in the absence of sulfur-containing compounds for imparting extreme pressure properties to said lubricating grease, said additives comprising at least one member selected from the group consisting of a phosphate of a Group 1a alkali metal, a phosphate of a Group 2a alkaline earth metal, a carbonate of a Group 1a alkali metal, and a carbonate of a Group 2a alkaline earth metal;
said alkaline earth metal being selected from the group consisting of beryllium, magnesium, calcium, strontium, and barium;
said alkali metal being selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, and francium; and
a water-resistant hydrophobic polymeric additive in the absence of polyester, said additive being different than said base oil.

4,929,373
PROCESS FOR PREPARING OVERBASED CALCIUM SULFONATES
William J. Powers, III; Leonard A. Matthews, both of Port Arthur, Tex., and Tze-Chi Jao, Fishkill, N.Y., assignors to Texaco Inc., White Plains, N.Y.
Filed Oct. 10, 1989, Ser. No. 419,558
Int. Cl.[5] C10M *135/10*
U.S. Cl. 252—33 8 Claims

1. A process for preparing an overbased oil-soluble calcium sulfonate, comprising:
(a) diluting a neutral calcium sulfonate with a light hydrocarbon solvent and a lower alkanol;
(b) adding water, calcium oxide and about 15 to 25 mole % of the total calcium hydroxide;
(c) heating the resulting admixture to about 100° F. to 155° F. at pressure of about 1 to 5 atm;
(d) introducing carbon dioxide into the heated admixture over a time of about 60 to 240 minutes while adding the remaining calcium hydroxide in amounts whereby the molar ratio of carbon dioxide to the sum of calcium hydroxide and calcium oxide is in the range of 0.65 to 0.90,
(e) adding a diluent oil;
(f) separating solids from the liquid; and
(g) stripping the solvent and alcohol from the resulting liquid product.

4,929,374

LUBRICATING OIL COMPOSITION

Feike De Jong; Willem Dannenberg, and Jacob Vermeule, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 8, 1988, Ser. No. 229,202

Claims priority, application United Kingdom, Sep. 22, 1987, 8722323

Int. Cl.[5] C10M *133/16*

U.S. Cl. 252—39 16 Claims

1. A lubricating oil composition comprising a lubricating base oil, an overbased alkaline earth metal salt of an alkyl salicyclic acid in which the alkyl group has at least 8 carbon atoms, a succinimide derivative being the reaction product of a hydrocarbyl-substituted succinic anhydride and an amine, and an anti-gelling agent of an alkanolamine derivative.

14. A lubricating oil concentrate comprising a lubricating base oil, up to 80 w% of an overbased metal alkyl salicylate in which the alkyl gorup has at least 8 carbon atoms, up to 60 w% of a succinimide derivative being the reaction product of a hydrocarbyl-substituted succinic anhydride and an imine and from 0.5 to 10 w% of an anti-gelling agent of an alkanolamine derivative, all of weight percentages being based on the weight of the lubicating base oil.

4,929,375

CONVEYOR LUBRICANT CONTAINING ALKYL AMINE COUPLING AGENTS

Charles E. Rossio, Carleton, and Wladyslaw W. Koziol, Ann Arbor, both of Mich., assignors to Diversey Corporation, Ontario, Canada

Filed Jul. 14, 1988, Ser. No. 218,893

Int. Cl.[5] C10M *173/02*

U.S. Cl. 252—49.3 22 Claims

1. An aqueous conveyor lubricant composition concentrate consisting essentially of:

(a) a carrier selected from the group consisting of water, alkanols, a polyhydric alcohol; and mixtures thereof; and

(b) a first solubilizing agent consisting essentially of an alkyl tertiary amine having between 8 and 10 carbon atoms; and

(c) a fatty acid selected from the group consisting of C12 to C22 saturated and unsaturated carboxylic acids and mixtures thereof;

(d) a second solubilizing agent selected from the group consisting of alkyl aryl sulfonates; and

(e) a harness sequestering agent.

4,929,376

QUATERNARY AMMONIUM SALT OF AN ALKOXYSILANE AS A DISPERSANT FOR MAGNETIC PIGMENT

Gary A. Vincent; Jnditb M. Sylvester, and Harold L. Vincent, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 23, 1988, Ser. No. 171,613

Int. Cl.[5] C04B *35/26*

U.S. Cl. 252—62.56 1 Claim

1. A composition comprising:

(A) from about 1 to 8 parts by weight of a quaternary ammonium salt of an alkoxysilane having the formula

$$n\text{-}C_{18}H_{37}\overset{+}{N}(CH_3)_2\text{—}CH_2CH_2CH_2\text{—}Si(OMe)_3 \quad X^-$$

wherein Me denotes the methyl radical and X is a hydrolyzable group selected from the group consisting of chloride, bromide, iodide, acetate, and methoxide;

(B) 100 parts by weight of a magnetic pigment; and

(C) a phosphate ester dispersant.

4,929,377

STABLE, AQUEOUS BLEACH COMPOSITIONS CONTAINING SOLID ORGANIC PEROXY ACID

Stuart A. Emmons, Tremeirchion, and Perry Hale, Wallasey, both of Great Britain, assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 21, 1989, Ser. No. 313,408

Claims priority, application United Kingdom, Mar. 1, 1988, 8806704

Int. Cl.[5] C11D *1/14, 3/39*

U.S. Cl. 251—100 9 Claims

1. An aqueous, liquid, bleach composition having a pH of from about 2 to about 6 and a viscosity of from about 0.05 to about 1.0 PaS, measured at a shear rate of 21 second^{-1} at 20° C., comprising:

(a) from 1.5 to 20% by weight of a solid, particulate, substantially water-insoluble, organic peroxy acid;

(b) from 2.0 to 20% by weight of a surfactant mixture consisting of a secondary C_{10}–C_{20} alkane sulphonate (SAS) and an ethoxylated fatty alcohol (NI) having a Hydrophilic-Lipophilic Balance (HLB) of not more than 10.5 in a weight ratio of from 5:5 to 9:1; and

(c) from 7 to 16% by weight of sodium sulphate.

4,929,378

BATH PREPARATION

Yasuhiko Morita, Kyoto; Yoshitomi Kakiguchi, Osaka, and Seiji Izuhara, Tondabayashi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 63,916, Jun. 19, 1987, abandoned. This application May 10, 1989, Ser. No. 352,680

Claims priority, application Japan, Jul. 3, 1986, 61-156697

Int. Cl.[5] C11D *7/32;* D06L *3/10*

U.S. Cl. 252—105 3 Claims

1. In a bath preparation the combination of

(a) at least one member selected from the group consisting of ascorbic acid, sodium ascorbate, and calcium ascorbate, and

(b) at least one reducing agent selected from the group consisting of sodium dithionite, potassium dithionite, L-cysteine hydrochloride, glutathione and propyl gallate,

the proportion of component (b) to component (a) being 0.02 to 2 parts by weight.

4,929,379

PARTICULATE DETERGENT COMPOSITION

Willem Oldenburg, Vlaardingen; Simon N. Hemmes, Bilthoven, and Jaap E. Hobbel, De Meern, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 727,201, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 572,045, Jan. 19, 1984, abandoned. This application Jun. 10, 1988, Ser. No. 206,906

Claims priority, application United Kingdom, Jan. 20, 1983, 8301503; May 27, 1983, 8314839

Int. Cl.[5] C11D *9/14, 17/08*

U.S. Cl. 252—109 14 Claims

1. A particulate detergent composition with improved stock solution behaviour comprising:

(a) from 5 to 40% by weight of a detergent active system which consists essentially of

1. up to 75% by weight of a water-soluble fatty acid soap component having a Krafft-temperature of below 30° C., said component constituting at least 5% of the detergent composition; and

2. an alkoxylated alcohol nonionic component having an HLB-value of between 12 and 16;

(b) from 20 to 70% by weight of an alkaline buffering agent such that a 1% solution of said composition has a pH of above 11.5; and

(c) up to 40% by weight of a detergency builder selected from the group consisting of sodium, potassium, ammonium, and substituted ammonium pyrophosphates, -tripolyphosphates, -ethylene diamine tetracetates, -nitrilotriacetates, -etherpolycarboxylates, -citrates, -carbonates, -orthophosphates, -carboxymethyloxysuccinates, and mixtures thereof; and water;

wherein an aqueous stock solution at 10% concentration of said detergent composition exhibits substantially no gelation, phase separation or turbidity at 20° C.

4,929,380

PROCESS FOR THE PREPARATION OF A STORAGE-STABLE LIQUID DETERGENT COMPOSITION

Paul Schulz, Wuppertal; Karl Schwadtke, Leverkusen, and Eduard Smulders, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft aug Aktien, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 67,518, Jun. 26, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 262,204

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621536

Int. Cl.[5] C11D *11/00, 1/83*

U.S. Cl. 252—121 17 Claims

1. A process for producing a detergent having a liquid surfactant component comprising

(a) a non-ionic surfactant selected from the group consisting of adducts of a C_{10}–C_{20}-fatty alcohol with from 2 to 8 moles ethylene oxide per mole fatty alcohol;

(b) an anionic surfactant selected from the group consisting of surface active soaps, sulfates, sulfonates, and mixtures thereof; and

(c) polyethylene glycol having a molecular weight of from about 200 to 600; and a particulate solids component comprising

(d) a first finely divided fraction having an average particle size of from about 0.01 to 30 microns; and

(e) a second more coarsely divided fraction having an average particle size of from about 200 to 2000 microns;

wherein the particulate solids component includes at least one member selected from the group consisting of a builder, a redeposition inhibitor, an optical brightener, a detergency-promoting enzyme, a bleach, a bleach activator, and a foam inhibitor; said process comprising

(f) admixing the liquid components of the detergent including the liquid surfactant component with the solid components of the detergent which do not substantially chemically interact with each other or with the liquid components to form a suspension;

(g) wet grinding the suspension to reduce the particle size of the solid components to an average particle size of 30 microns or less to provide a ground suspension;

(h) admixing the ground suspension with the second coarsely divided solids fraction; and

(i) degassing the mixture.

4,929,381

INORGANIC ANION EXCHANGERS AND PREPARATION THEREOF

Howard W. Clark, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 876,603, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 748,274, Jun. 24, 1985, abandoned. This application Mar. 1, 1988, Ser. No. 162,714

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.[5] C11D *3/14*

U.S. Cl. 252—174.25 29 Claims

1. An anion exchanger material comprising a substantially crystalline material exhibiting anion exchange properties represented by the formula

$$[M^{a}_{1-x}Q_{x}^{a+1}(OH)_{z}](A^{-1})_{hd}$$
$$d(A^{-2})_{e}(A^{-3})_{f}(A^{-4})_{g}\cdot nH_2O$$

where M is a metal element or elements each with a positive valence of a; Q is a metal element or elements each with a positive valence of a+1; a is 2, 3, 4, or 5; A^{-1}, A^{-2}, A^{-3}, and A^{-4} are each one or more exchangeable anions each having a negative valence of 1, 2, 3, and 4, respectively; x is $0<x\leqq 0.5$; and n, y, z, d, e, f and g are real numbers greater than or equal to zero and satisfy the following:

$$2y+z=a;\ y<z$$

$$0<d+2e+3f+4g\leq x$$

$$0\leq n\leq 10$$

provided that when y=0, a is not equal to 2.

4,929,382

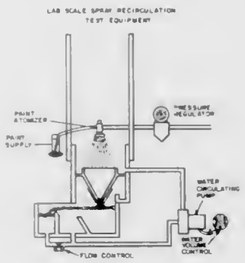
CATIONIC COAGULANTS PLUS COLLOIDAL SILICA FOR USE IN PAINT DETACKIFICATION

Claudia V. Stenger, and Shu-Jen W. Huang, both of Naperville, Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 226,595, Aug. 1, 1988, Pat. No. 4,863,615. This application Mar. 3, 1989, Ser. No. 318,308

Int. Cl.[5] C02F *1/56*

U.S. Cl. 252—181 2 Claims



1. A composition useful in detackifying paint contained in the circulating waters which collects surplus paint from a paint spray booth which comprises:

(A) A water soluble cationic polymeric coagulant formed by the reaction of epichlorohydrin, dimethylamine, and ammonia, and having a molecular weight less than 100,000, and;

(B) An aqueous colloidal silica sol having an average particle size between about 1–150 nm,

with the ratio of A to B being from 1/5 to 5/1 on an actives basis.

4,929,383

STABLE EMULSTIFIED BLEACHING COMPOSITIONS

Blanca L. Haendler, Livermore, Calif., assignor to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 840,974, Mar. 13, 1986, abandoned, which is a continuation of Ser. No. 574,565, Jan. 27, 1984, abandoned. This application Oct. 20, 1986, Ser. No. 921,236

Int. Cl.[5] A01N *59/08*

U.S. Cl. 252—187.26 10 Claims

1. A method of preparing a liquid composition useful for treating fabrics comprising:

providing a quantity of an oxidized polyethylene, a polyethylene-acrylic acid copolymer, or a mixture thereof;

subjecting the polymer in the presence of water to turbulent jet interaction sufficient to form a latex in which a lipophilic phase thereof is formed of polymer droplets having an average diameter of submicron size;

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admixing a quantity of substantially water insoluble discrete particles suitable for treating fabrics into the latex; and

slowly admixing an aqueous bleaching solution into the latex until the polymer droplets form a lipophilic reticulum in which the discrete particles are entrapped.

4,929,384

PROCESS FOR IMPROVING THE LUMINESCENCE OF NIOBIUM ACTIVATED YTTRIUM TANTALATE X-RAY PHOSPHOR

Vaddi B. Reddy, Sayre, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 7, 1989, Ser. No. 362,717

Int. Cl.[5] C09K *11/78*

U.S. Cl. 252—301.4 R **1 Claim**

1. A process for preparing M'$YTaO_4$:Nb X-ray phosphor, said process comprising:

(a) forming a uniform mixture consisting essentially of Y_2O_3, Ta_2O_5, and Nb_2O_5 components, and a flux selected from the group consisting of lithium chloride, lithium sulfate and a mix of lithium sulfate and potassium sulfate the mole ratio of lithium sulfate to potassium sulfate in said mix being about 80 to 20, wherein said flux makes up from about 25% to about 50% by weight of said mixture, said components being provided in an amount equal to approximately the stoichiometric amounts required to form said phosphor;

(b) firing said mixture in a furnace by heating said mixture in said furnace from a temperature of about 300° C. to a temperature of from about 1200° C. to about 1300° C. at a heating rate of from about 1.0° C. per minute to about 1.5° C. per minute and maintaining said temperature for from about 10 hours to about 14 hours to react said components and produce a fired material containing luminescent material;

(c) cooling the resulting fired material by turning off the heat to said furnace and allowing said fired material to remain in said furnace until the temperature in said furnace is no higher than about 300° C.;

(d) washing the resulting cooled material with deionized water to remove essentially all of said flux therefrom and produce a washed M' niobium activated yttrium tantalate phosphor;

(e) removing the wash water from and drying said washed phosphor;

(f) classifying the resulting dried phosphor to obtain a −325 mesh particle size in said phosphor;

(g) forming a uniform mixture consisting essentially of the resulting classified phosphor and a flux selected from the group consisting of lithium chloride, lithium sulfate and a mix of lithium sulfate and potassium sulfate the mole ratio of lithium sulfate to potassium sulfate in said mix being about 80 to 20, wherein said flux makes up from about 10% to about 50% by weight off said phosphor-flux mixture;

(h) firing said phosphor-flux mixture in a furnace by heating said phosphor-flux mixture in said furnace from a temperature of about 300° C. to a temperature of from about 1100° C. to about 1300° C. at a heating rate of from about 1.0° C. per minute to about 1.5° C. per minute and maintaining said temperature for from about 2 hours to about 10 hours to produce a fired material containing the re-fired phosphor;

(i) cooling said fired material containing said re-fired phosphor by turning off the heat to said furnace and allowing said fired material containing said re-fired phosphor to remain in said furnace until the temperature in said furnace is no higher than about 300° C.;

(j) washing the resulting cooled material containing said re-fired phosphor with deionized water to remove essentially all of said flux therefrom and produce a washed re-fired M' niobium activated yttrium tantalate phosphor;

(k) removing the wash water from and drying said washed re-fired phosphor; and

(l) classifying the resulting dried re-fired phosphor to obtain a −325 mesh particle size in said re-fired phosphor, said re-fired phosphor having a higher luminescence intensity than the phosphor obtained in step (f).

4,929,385

FREON FREE PROCESS FOR PREPARING A NIOBIUM ACTIVATED YTTRIUM TANTALATE X-RAY PHOSPHOR

Vaddi B. Reddy, Sayre, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 7, 1989, Ser. No. 362,720

Int. Cl.[5] C09K *11/78*

U.S. Cl. 252—301.4 R **2 Claims**

1. A process for preparing M' $YTaO_4$:Nb X-ray phosphor, said process comprising:

(a) forming a uniform first mixture consisting essentially of Y_2O_3, Ta_2O_5, and Nb_2O_5 components, said components being provided in an amount equal to approximately the stoichiometric amounts required to form said phosphor;

(b) milling said first mixture with deionized water;

(c) removing said water from the resulting milled first mixture;

(d) forming a uniform second mixture consisting essentially of said first mixture and a flux, said flux selected from the group consisting of lithium sulfate, lithium chloride and a mix of lithium sulfate and potassium sulfate wherein the mole ratio of lithium sulfate to potassium sulfate in said mix is about 80 to 20, said flux making up from about 25% to about 50% by weight of said second mixture;

(e) firing said second mixture in a furnace by heating said mixture in said furnace from a temperature below about 300° C. to a temperature of from about 1200° C. to about 1300° C. at a heating rate of from about 1.0° C./minute to about 1.5° C. per minute and maintaining said temperature for from about 10 hours to about 14 hours to react said components and produce a fired material containing luminescent material;

(f) cooling the resulting fired material by turning off the heat to said furnace and allowing said fired material to remain in said furnace until the temperature in said furnace is no higher than about 300° C.;

(g) washing the resulting cooled material with deionized water to remove essentially all of said flux therefrom and produce a washed M' niobium activated yttrium tantalate phosphor;

(h) removing the wash water from and drying said washed phosphor; and

(i) classifying the resulting dried phosphor to obtain a −325 mesh particle size in said phosphor,.

4,929,386

PROCESS FOR PREPARING A NIOBIUM ACTIVATED YTTRIUM TANTALATE X-RAY PHOSPHOR

Vaddi B. Reddy, Sayre, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 7, 1989, Ser. No. 362,721

Int. Cl.[5] C09K *11/78*

U.S. Cl. 252—301.4 R **4 Claims**

1. A process for preparing a single phase M'$YTaO_4$:Nb X-ray phosphor, said process comprising:

(a) forming a uniform mixture consisting essentially of Y_2O_3, Ta_2O_5, and Nb_2O_5 components, and a flux consisting essentially of lithium sulfate and potassium sulfate in a mole ratio of lithium sulfate to potassium sulfate of about 80 to 20, wherein said flux makes up from about 25% to about 50% by weight of said mixture, said components being provided in an amount equal to approximately the stoichiometric amounts required to form said phosphor;

(b) milling said mixture with a milling fluid in which said components and flux are insoluble;

(c) removing said milling fluid from the resulting milled mixture;

(d) firing said milled mixture in a furnace by heating said mixture in said furnace from a temperature below about 300° C. to a temperature of from about 1200° C. to about 1300° C. at a heating rate of from about 1.0° C. per minute to about 1.5° C. per minute and maintaining said temperature for from about 10 hours to about 14 hours to react said components and produce a fired material containing luminescent material;

(e) cooling the resulting fired material by turning off the heat to said furnace and allowing said fired material to remain in said furnace until the temperature in said furnace is no higher than about 300° C.;

(f) washing the resulting cooled material with deionized water to remove essentially all of said flux therefrom and produce a washed single phase M' niobium activated yttrium tantalate phosphor;

(g) removing the wash water from and drying said washed phosphor; and

(h) classifying the resulting dried phosphor to obtain a −325 mesh particle size in said phosphor, said phosphor being essentially free of Y_3TaO_7 phase.

4,929,387

PHOSPHATE GLASS USEFUL IN HIGH POWER LASERS

Joseph S. Hayden, South Abington Township, Lackawana County; David L. Sapak, Avoca, and Julia M. Ward, Hollidaysburg, all of Pa., assignors to Schott Glass Technologies, Inc., Duryea, Pa.

Continuation-in-part of Ser. No. 238,437, Aug. 31, 1988, abandoned. This application Apr. 3, 1989, Ser. No. 331,782

Int. Cl.[5] C03C *3/16, 3/19, 3/17, 3/062*

U.S. Cl. 252—301.4 P **23 Claims**

1. A low- or no-silica phosphate glass useful as a laser medium and having a high thermal conductivity, $K_{90°\ C.}$ >0.8 W/mK, and a low coefficient of thermal expansion, $\alpha_{20°-40°\ C.}$ <80×10^{-7}/°C., consisting essentially of (on a batch composition basis):

	Mole %
P_2O_5	45–70
Li_2O	15–35
Na_2O	0–10
Al_2O_3	10–15
K_2O	0–3
lasable ion	0.01–6
La_2O_3	0–6
SiO_2	0–8
B_2O_3	0–8
MgO	0–18
CaO	0–15
SrO	0–9
Bao	0–9
ZnO	0–15

the amounts of Li_2O and Na_2O providing an average alkali metal ionic radius sufficiently low whereby said glass has $K_{90°\ C.}$ >0.8 W/mK and $\alpha_{20°-40°\ C.}$ <80×10^{-7}/°C., and wherein, when the batch composition is melted in contact with a silica-containing surface, the final glass composition contains at most about 3.5 mole % of additional silica derived from such contact during melting.

4,929,388

ANTISTATIC OR ELECTRICALLY SEMICONDUCTING THERMOPLASTIC POLYMER BLENDS, METHOD OF MAKING SAME AND THEIR USE

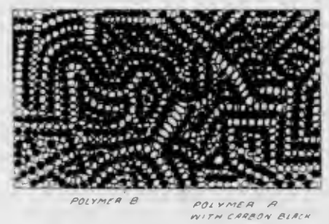
Bernhard M. Wessling, Tremsbuttel, Fed. Rep. of Germany, assignor to Zipperling Kessler & Co. (GmbH & Co.), Ahrensburg, Fed. Rep. of Germany

Filed Nov. 5, 1985, Ser. No. 795,250

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1984, 3440617

Int. Cl.[5] H01B *1/06*

U.S. Cl. 252—500 **15 Claims**



1. Antistatic or electrically semiconducting thermoplastic polymer blends based on organic polymers and electrically conductive substances, said polymer blends containing two partially compatible thermoplastic polymers A and B, wherein polymer A at a given temperature has a lower melt viscosity than polymer B, wherein there is a solubility parameter difference between polymer A and polymer B of approximately 0.3 to 1.5 $(cal/cm^3)^{\frac{1}{2}}$, wherein the weight ratio of polymer A:-polymer B is≦1:1, wherein polymer A forms the continuous phase essentially containing the electrically conductive substances, wherein said polymer blends contain conductive substances in a quantity of 0.5 to 30% by weight, based on the polymer blend, and said conductive substances are selected from the group consisting of metal powders or fibers, carbon fibers, conductive carbon black with a BET-surface>250 m^2/g and a dibutyl phthalate absorption>140 $cm^3/100$ g, electrically conductive doped organic polymers, non-polymeric organic conductors, and mixtures thereof.

4,929,389

WATER-SOLUBLE CONDUCTIVE POLYMERS

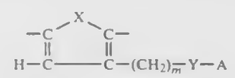
Mahmoud Aldissi, Sante Fe, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 12, 1988, Ser. No. 155,450

Int. Cl.[5] H01B *1/00*

U.S. Cl. 252—500 **9 Claims**

1. An electrically conductive self-doped polymeric composition of matter having a monomer repeat unit comprising:



where the monomer-to-monomer bonds of said polymer are located between the carbon atoms adjacent to X;

where X is chosen from a group consistng of NH and S;

where m is a whole number having a value of from 1 to 20, inclusive;

where Y is chosen from a group consisting of SO_3, SO_4, and CO_2; and

where A is chosen from a group consisting of hydrogen, lithium, sodium, potassium, rubidium, and cesium.

4,929,390

CONDUCTIVE COMPOSITION AND METHOD OF USE

Delbert E. Sayles, Sr., Omaha, Nebr., assignor to Sayles & Scheel Enterprises, Incorporated, Council Bluffs, Iowa

Filed Jul. 12, 1988, Ser. No. 218,543
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—510 14 Claims

1. A conductive composition comprising electrically conductive metal, butyl acetate, toluene, and carbon.

4,929,391

ELECTRICALLY CONDUCTIVE SILICON COMPOSITIONS

Loretta N. Kroupa, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 20, 1988, Ser. No. 221,841
Int. Cl.[5] H01B *7/06*
U.S. Cl. 252—511 8 Claims

1. An electrically conductive composition comprising polydiorganosiloxane and conductive carbon particles, wherein the improvement comprises adding from 6 to 30 parts by weight per 100 parts of the carbon particles of conductivity improver comprising disilazane of the formula $(R_3Si)_2NH$ where R is a substituted or unsubstituted alkyl radical of from 1 to 6 carbon atoms.

4,929,392

INCLUSION COMPLEXES PROVIDING SECOND HARMONIC GENERATION

John E. Trend, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 11, 1985, Ser. No. 774,941
Int. Cl.[5] G02B *5/20;* G02F *1/01*
U.S. Cl. 252—582 5 Claims

1. A non-centrosy m metric inclusion complex comprising:
a non-centrosy m metric host material wherein said host material is selected from the group consisting of amyloses and cyclodextrins, and
a guest material wherein said guest material is selected from the group consisting of 5-nitroindoline and 4-(N,N-dimethylamino)-benzylidene-2-hydroxyaniline
wherein said guest material is entrapped within the molecular structure of said host material or entrapped between two or more adjacent molecules of said host material, said complex having a non-zero second order molecular hyperpolarizability, said complex further exhibiting greater second harmonic generation efficiency than either said host material or said guest material exhibits alone.

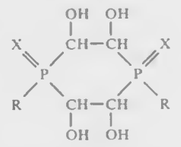
4,929,393

1,4-DISUBSTITUTED-2,3,5,6-TETRAHYDROXY-1,4-DIPHOSPHORINANES AND THEIR OXIDES OR SULFIDES

Allan J. Robertson, Ontario, Canada, and James B. Gallivan, Norwalk, Conn., assignors to Cyanamid Canada Inc., Willowdale, Canada

Division of Ser. No. 309,572, Feb. 13, 1989, Pat. No. 4,855,507. This application May 22, 1989, Ser. No. 409,919
Claims priority, application Canada, Mar. 28, 1988, 562688
Int. Cl.[5] B03D *1/02;* C08K *5/53*
U.S. Cl. 252—609 7 Claims

1. A composition of matter comprising a polymeric material containing a flame-retarding amount of the compound having the formula:



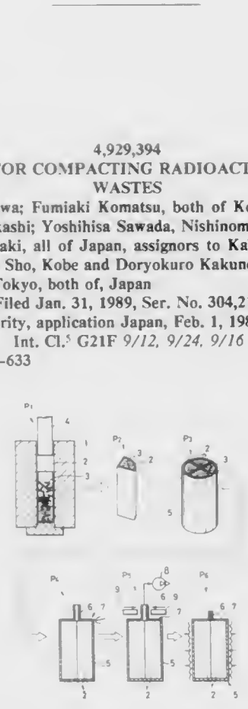
wherein R is a substituted or unsubstituted C_1-C_{12} alkyl, C_5-C_7 cycloalkyl, C_8-C_{12} aralkyl or C_6-C_{12} aryl radical and X is oxygen or sulfuer.

4,929,394

PROCESS FOR COMPACTING RADIOACTIVE METAL WASTES

Kazuo Kitagawa; Fumiaki Komatsu, both of Kobe; Takayoshi Masaki, Akashi; Yoshihisa Sawada, Nishinomiya, and Eiichi Inada, Ibaraki, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe and Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, both of, Japan

Filed Jan. 31, 1989, Ser. No. 304,218
Claims priority, application Japan, Feb. 1, 1988, 63-22208
Int. Cl.[5] G21F *9/12, 9/24, 9/16*
U.S. Cl. 252—633 13 Claims



1. A process for compacting radioactive metal waste comprising the steps of:
filling the waste into a plurality of capsules, each of said capsules being positioned in a die during said filling step;
precompressing only the waste in each of said capsules during said filling step, whereby said capsules are not compressed, wherein each of said capsules is filled with the waste in a compressed state and each of said capsules have a cross sectional form corresponding to a divided segment of the cross section of an HIP treatment container;
placing said capsules into an HIP treatment container;
filling the HIP treatment container with a metal powder serving as a filler; and
sealing the HIP treatment container and subjecting said HIP treatment container to an HIP treatment in its entirety.

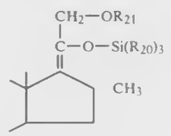
4,929,395

16α-METHYLATION PROCESS

Verlan H. VanRheenen, Portage, and Joel E. Huber, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

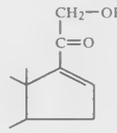
Continuation of Ser. No. 724,380, Apr. 18, 1985, Pat. No. 4,704,455, which is a continuation-in-part of Ser. No. 618,986, Jun. 11, 1984, abandoned. This application Nov. 14, 1986, Ser. No. 930,830
Int. Cl.[5] C07J *1/00;* A61K *31/56*
U.S. Cl. 540—4 19 Claims

1. A process for the preparation of a $\Delta^{17(20)}$-steroid of the formula



(II)

which comprises starting with a 16-unsaturated corticoid of the formula



(I)

and

(1) contacting the 16-unsaturated corticoid (I) with a methylating agent in the presence of a copper catalyst and
(2) contacting the product of step (1)with a silylating agent where
R_{20} is alkyl of 1 thru 4 carbon atoms or phenyl, the R_{20}'s can be can be the same or different;
R_{21} is a hydrogen atom, -CO-$R_{21'}$, or -Si(R_{121})$_3$;
$R_{21'}$ is alkyl of 1 thru 4 carbon atoms or phenyl;
R_{121} is alkyl of 1 thru 4 carbon atoms or phenyl, the R_{121}'s can be the same or different.

4,929,396

PRODUCTION OF HEXAMETHYLENEDIAMINE MUCONATE SALT

Sol J. Barer, Fanwood; Peter C. Maxwell, New Providence, and Jih-Han Hsieh, Parsippany, all of N.J., assignors to Celgene Corporation, Warren, N.J.

Division of Ser. No. 457,808, Jan. 13, 1983, Pat. No. 4,725,542. This application Oct. 17, 1984, Ser. No. 661,705
Int. Cl.[5] C07C *87/14*
U.S. Cl. 562—595 3 Claims

1. Hexamethylenediamine muconate salt.

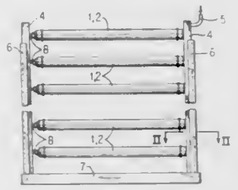
4,929,397

APPARATUS FOR AERATING WATER

Andreas Jäger, Burgdorf, Fed. Rep. of Germany, assignor to Arnold Jäger, Burgdorf, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 331,470
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810790
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—65 12 Claims

1. An apparatus for aerating water, comprising:
rigid supporting pipes that serve to receive air and are provided with first opening means for the discharge of air; and
respective covers closely disposed on said supporting pipes for receiving air from said first opening means thereof, with said covers being provided with second opening means in the form of slits that are resiliently expandable in response to air received from said supporting pipes, whereby said supporting pipes and said covers together are disposed in an essentially vertical plane, with respective supporting pipes, with their covers, being horizontally disposed above and parallel to one another, and with



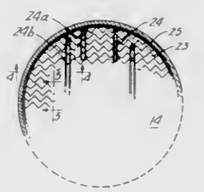
at least one of said first and second opening means having throughput capacities such that when viewed from the bottom to the top, said throughput capacities become progressively smaller, so that in the case of a common air supply means for all of said supporting pipes and covers of said apparatus, at least essentially identical air throughputs are assured at the different vertical levels of said supporting pipes and their covers.

4,929,398

TOWER PACKING CARTRIDGE

George C. Pedersen, Box 570846, Perrine, Fla. 33157

Filed Mar. 29, 1989, Ser. No. 330,223
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—94 10 Claims



1. A cartridge of tower packing material, for installation in an axially elongated processing tower having flow passage means, which comprises
(a) a plurality of strip-like sections of high bulk, high void fraction filamentary fabric-like material,
(b) said strip-like sections being arranged in face-to-face contact, and being assembled in sufficient number and of such length as to form a cartridge of predetermined cross section for close reception in a flow passage of said processing tower,
(c) said fabric-like material being of a waffle-weave construction comprising a first set of generally parallel strands extending in substantially straight fashion in one predetermined direction and a second set of strands extending at right angles to said predetermined direction,
(d) each repeating group of strands of said first set being arranged in a generally saw-tooth cross sectional configuration whereby the thickness of said fabric-like material is substantially equal to the height of said saw-tooth cross sectional configuration,
(e) each repeating group of strands of said second set being arranged in a generally saw-tooth cross sectional configuration intersecting at right angles with the strands of said first set,

(f) the intersecting strands of saw-tooth configuration forming a substantially non-nestable waffle-weave construction, whereby a plurality of layers of the material may be assembled in face-to-face contact without significant reduction in the void fraction of the assembled layers in relation to the individual layers, and providing a void fraction of the assembled, contacting layers of at least about 80%,

(g) said strip-like sections being set on edge in said cartridge, with said strands lying generally in planes parallel to the general direction of fluid flow through the passage in which said cartridge is installed.

4,929,399

STRUCTURED COLUMN PACKING WITH LIQUID HOLDUP

Michael J. Lockett, and Richard A. Victor, both of Grand Island, N.Y., assignors to Union Carbide Industrial Gases Technology Inc., Danbury, Conn.

Continuation of Ser. No. 169,592, Mar. 17, 1988, abandoned. This application Oct. 12, 1989, Ser. No. 420,825

Int. Cl.[5] **B01F** *3/04*

U.S. Cl. 261—112.2 12 Claims

1. A column packing element comprising a corrugated sheet having a top and a bottom and a plurality of flutes laterally disposed on said sheet, each said flute comprising an elevation with respect to said sheet, the elevation disposed at an angle to said sheet, said elevation angle being 90 degrees or less with respect to an axis from said top to said bottom thereby forming a shelf along the sheet sufficient to cause liquid flowing down the packing element to form a pool on said shelf.

4,929,400

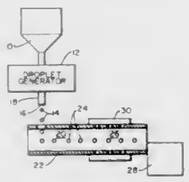
PRODUCTION OF MONODISPERSE, POLYMERIC MICROSPHERES

Alan Rembaum; Won-Kyu Rhim, both of Pasadena; Michael T. Hyson, Glendale, and Manchium Chang, Los Angeles, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 28, 1986, Ser. No. 856,201

Int. Cl.[5] **B28B** *9/10*

U.S. Cl. 264—10 14 Claims



1. A method of forming uniformly sized, small, spherical, polymeric particles having a diameter from 100 Angstroms to 100 microns varying no more than plus or minus 5 percent from the average diameter without use of a catalyst comprising repeating the steps of:

deploying a spheroidal droplet consisting essentially of a radiation polymerizable, unsaturated liquid monomer and absent catalyst or surfactant into a zone consisting of inert gas;

levitating the droplet while in the zone;

applying polymerization inducing radiation to the spherical droplet while in the zone and polymerizing the droplet throughout its volume to form a solid spherical particle; and

recovering the solid particle.

14. A method of forming uniformly-sized, spherical polymeric particles comprising repeating the steps of:

deploying a spheroidal droplet consisting essentially of radiation-polymerizable, unsaturated liquid monomer into a zone containing inert gas;

levitating the droplet while in the zone;

solidifying the droplet into a solid, spheroid droplet while in the zone by lowering the temperature of the liquid droplet below its melting point; and

then polymerizing the solid droplet by applying polymerizing inducing radiation to the solid droplet to form a polymerized solid particle.

4,929,401

METHOD OF MAKING A REUSABLE ADHESIVE PRODUCT

Mark A. Shippen, 108 St. Francis Pl., Prattville, Ala. 36067

Filed Jan. 26, 1989, Ser. No. 301,968

Int. Cl.[5] **B29C** *35/18, 43/20;* **B32B** *25/08*

U.S. Cl. 264—22 7 Claims

1. A method of preparing a reusable adhesive product comprising

(a) applying a room-temperature vulcanizing rubber composition onto a substrate; (b) applying a molding release film onto said rubber composition; and (c) pressing out a thin film coating of the rubber composition with a mechanical device.

4,929,402

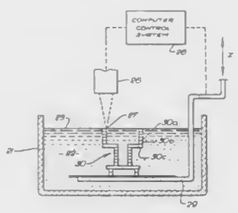
METHOD FOR PRODUCTION OF THREE-DIMENSIONAL OBJECTS BY STEREOLITHOGRAPHY

Charles W. Hull, Arcadia, Calif., assignor to 3D Systems, Inc., Valencia, Calif.

Continuation of Ser. No. 161,346, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 792,979, Dec. 9, 1985, abandoned, which is a division of Ser. No. 638,905, Aug. 8, 1984, Pat. No. 4,575,330. This application Apr. 19, 1989, Ser. No. 340,894

Int. Cl.[5] **G03B** *35/00;* **B29C** *67/24*

U.S. Cl. 264—22 34 Claims



1. A method for producing a three-dimensional object from a medium capable of solidification when subjected to prescribed radiation, said method comprising:

containing a body of said medium capable of solidification;

drawing upon and forming successive cross-sectional laminae of said object at a two-dimensional interface of said medium defining a designated working surface, said laminae including a first cross-sectional layer of structure at said working surface;

automatically coating over the entire said first cross-sectional layer of structure with a body of said medium and decreasing a substantial portion of said body of medium in thickness from a layer of excess fluid thickness to a successive layer of less thickness in preparation for formation of a second cross-sectional layer of structure adhered to said first cross-sectional layer; and

moving said cross-sectional layers as they are formed and building up said object from a plurality of successively adhered layers of structure in stepwise fashion, whereby a three-dimensional object is extracted from a substantially two-dimensional surface.

4,929,403

PROCESS FOR FORMING MULTI-LAYER FLEXIBLE MOLDS

Edwin F. Audsley, c/o Chem-Form, Inc., 18 W. Windermere Ter., Landsdowne, Pa. 19050

Filed Jul. 25, 1989, Ser. No. 385,007

Int. Cl.[5] **B29C** *35/08, 41/22*

U.S. Cl. 264—22 21 Claims

1. A process for rapidly forming a multilayer flexible mold for finely detailed objects from a radiatively curable molding composition, the process comprising:

(a) coating at least a portion of the surface of a three-dimensional object with a fluid molding composition, the molding composition being radiatively curable;

(b) curing the coating to form an elastic, flexible layer of cured molding composition on the three-dimensional object by exposing the fluid coating composition to radiative energy;

(c) repeating steps (a) and (b) successively until a self-supporting multilayer elastic coating of cured molding composition has been formed on the three-dimensional object, the multilayer coating being sufficiently strong so as to not distort perceptibly when filled with a molding material having a low to moderate density; and

(d) removing the three-dimensional object.

4,929,404

GRAPHITIC OR CARBONACEOUS MOLDINGS AND PROCESSES FOR PRODUCING THE SAME

Kunimasa Takahashi, Ichikawa; Takashi Kameda, Ami, and Haruo Shibatani, Sakura, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Continuation of Ser. No. 779,590, Sep. 24, 1985, abandoned. This application May 17, 1988, Ser. No. 196,760

Claims priority, application Japan, Sep. 25, 1984, 59-199737; Dec. 3, 1984, 59-255270; Mar. 29, 1985, 60-63329; Apr. 23, 1985, 60-87264

Int. Cl.[5] **C10C** *3/00;* **B29C** *43/52*

U.S. Cl. 264—29.5 31 Claims

1 A process for producing a carbonaceous or graphitic composite molding comprising a filler of at least one material in powder form selected from the group consisting of graphitic carbon, carbonaceous carbon, metals, metal compounds and other inorganic compounds qualified as a filler to a carbonaceous or graphitic molding derived from a mesophase-containing pitch, which comprises the four steps of:

(1) suspending a filler comprising at least one material in powder form selected from the group consisting of graphitic carbon, carbonaceous carbon, metals, and metal compounds or other inorganic compounds qualified as a filler to a carbonaceous or graphitic molding in a tar containing a mesophase pitch precursor;

(2) heating said suspension system to evaporate the light distillates contained in the tar by blowing of an inert gas into the suspension or by subjecting the suspension to a reduced pressure and subjecting said mesophase pitch precursor to heat treatment at 350° to 500° C. to obtain a carbonaceous precursor having a mesophase-containing pitch containing 30 to 80% by weight of quinoline insolubles, 40% or more of mesophase content, an upper limit of 400° C. and a carbonization yield at 1,000° C. of at least 70% by weight;

(3) molding said carbonaceous precursor into a green molding containing mesophase-containing pitch; and

(4) providing said green molding for carbonization or graphitization reaction in an inert atmosphere to form a carbonaceous or graphitic composite.

4,929,405

ULTRATHIN POLYIMIDE POLYMER FLIMS AND THEIR PREPARATION

Rachel S. Kohn, Springfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Continuation-in-part of Ser. No. 339,903, Apr. 17, 1989, Pat. No. 4,880,699, which is a continuation of Ser. No. 267,712, Nov. 4, 1988, abandoned, which is a continuation of Ser. No. 149,824, Jan. 29, 1988, abandoned, which is a division of Ser. No. 917,731, Oct. 10, 1986, Pat. No. 4,746,474. This application May 22, 1989, Ser. No. 355,711

Int. Cl.[5] **B29C** *41/12*

U.S. Cl. 264—41 29 Claims

1. A process for preparing a pinhole-free, polyimide polymer film having a thickness of about 400 angstroms or less wherein the process comprises:

(a) preparing a casting solution containing a fluorinated polyimide polymer in 1,2,3-trichloropropane, propyl acetate or butyl acetate;

(b) depositing the casting solution on water to form a free-standing film; and

(c) removing the film from the water.

4,929,406

PROCESS FOR PRODUCING AN INORGANIC POROUS MEMBRANE

Fumio Abe, Handa; Hiroshi Mori, Nagoya, and Shigekazu Takagi, Aichi, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 26, 1989, Ser. No. 357,268

Claims priority, application Japan, May 27, 1988, 63-130827; May 27, 1988, 63-130828; May 31, 1988, 63-133771

Int. Cl.[5] **B01D** *13/04*

U.S. Cl. 264—45.5 3 Claims

1. A process for the production of an inorganic porous membrane, comprising the steps of:

providing a porous support;

providing a hydrosol containing titanium hydroxide or titanium oxide, wherein a precursor forming the hydrosol is hydrolyzed under the presence of acid at a molar ratio of the precursor to water of more than 1/200 and a molar ratio of titanium compound contained in the hydrosol to water is diluted to less than 1/500;

coating at least one surface of said porous support by immersion thereof in said hydrosol, so as to form a porous thin layer on said support;

drying the hydrosol coated porous support; and

firing the hydrosol coated porous support at a temperature of about 300°–700° C.

4,929,407

PROCESS OF MAKING A GOLF BALL COVER

John Giza, Acushnet, Mass., assignor to Acushnet Company, New Bedford, Mass.

Filed Dec. 6, 1988, Ser. No. 280,565

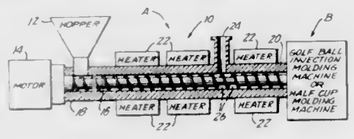
Int. Cl.[5] **B29C** *33/10, 43/56, 45/63*

U.S. Cl. 264—101 18 Claims

1. In a method for forming a golf ball cover from an ionomeric resin cover stock comprising an ionomeric resin of a copolymer of an olefin and an alpha, beta ethylenically unsaturated carboxylic acid with 10–90% of the carboxylic groups being neutralized by metal ions by subjecting said ionomeric

resin cover stock to heating, venting and forming into a golf ball cover, the improvement comprising:

(a) heating said ionomeric resin cover stock to form a melted ionomeric resin cover stock; and



(b) flashing said melted ionomeric resin cover stock at a temperature above about 400° F. (204° C.) in a vented barrel to release moisture from said melted ionomeric resin cover stock thereby reducing the moisture of said melted ionomeric resin cover stock to below about 900 ppm.

4,929,408

METHOD OF LOCATING AN ELECTRICAL CONDUCTOR BETWEEN A FIRST EXTRUDED TUBE AND AN EXTRUDED LINING

Bernhard Lodder, Baalderesch 29, 7772 EW Hardenberg; Hendrik Severiens, De Hoge Esch 55, 7783 CB Gramsbergen; Jan A. van Houten, St. Pietersland 35, 7943 EM Meppel, and Berend J. van Dijk, Prinses Marijkelaan 13, 7776 XA Slagharen, all of Netherlands

Continuation of Ser. No. 102,491, Sep. 29, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 337,994

Claims priority, applicatioo Netherlands, Sep. 30, 1986, 8602469

Int. Cl.[5] B29C *47/02*

U.S. Cl. 264—149 6 Claims



1. A method of producing by extrusion, electroweldable fittings of thermoplastic which are provided internally with at least one electrical conductor extending helically substantially in a cylindrical plane wherein a first tube is provided on its outer side with at least one spiral groove and on its inside wall with a smooth surface, said first tube is fed to a transverse lining extruder after said at least one electrical conductor has been fitted into the spiral groove whereby a lining of thermoplastic material is applied to the outer side of the first tube in excess of the wall thickness of the first tube to form a continuously interfused tube provided with said electrical conductor located internally, and the continuously interfused tube is divided into electroweldable fittings of a desired length; wherein a first extruder in a first stage extrudes the first tube which is non-rotating and is internally sized and cooled, while said first tube is in a plastic state and non-rotating said at least one spiral groove being formed on the outer side of the first tube, introducing at least one electrical conductor into said at least one spiral groove after cooling and internal sizing of said first tube, and feeding the first tube with the electrical conductor to the lining extruder and applying the lining, the lining extruder being positioned in line with the first extruder, the speeds of the first tube from the first extruder and the continuously interfused tube from the lining extruder are adjusted to one another, the continuously interfused tube being cooling and non-rotating and the diameter and circular shape of the inside wall of the first tube are maintained in the cooled continuous non-rotated interfused tube with the electrical conductor close to the inside wall.

4,929,409

METHOD IN MANUFACTURING A HEAT INSULATED TUBE AND A DEVICE IN EXTRUDERS FOR MANUFACTURING THE TUBE

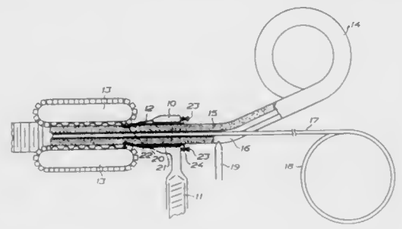
Lennart Agren, Borås, and Eino Hölsö, Viskafors, both of Sweden, assignors to Oy Uponor AB, Nastola, Finland

Continuation of Ser. No. 940,764, Dec. 19, 1986, abandoned. This application Feb. 3, 1989, Ser. No. 307,196

Claims priority, application Sweden, Dec. 3, 1985, 8501212

Int. Cl.[5] B29C *47/28*

U.S. Cl. 264—508 10 Claims



1. Method for manufacturing a heat insulated tube including an inner tube for conducting fluid, a heat insulating layer enclosing said inner tube, and a sheath covering the heat insulating layer, comprising the steps of:

feeding the inner tube and the insulating layer enclosing the inner tube axially through an angle extruder, extruding the sheath from the angle extruder around the heat insulating layer radially spaced therefrom,

maintaining the sheath spaced from the insulating layer when moving together with said layer and said inner tube, over an initial distance from the angle extruder, and

forming said sheath against chill molds under the influence of negative pressure downstream of said initial distance for compressing said sheath toward the insulating layer and imparting a corrugated shape to the sheath.

4. In an extruder having an angle extruder die defining a passage for prefabricated tubing having an insulating layer and overlying sheath, the improvement comprising sleeve means projecting from said angle extruder die coaxially with said passage and forming an extension of the passage at the outlet of the angle extruder die and corrugation means at the downstream end of said sleeve, said means together extruding and then corrugating the sheath onto said insulating layer, said corrugation means comprising chill molds forming said sheath under the influence of negative pressure.

4,929,410

METHOD FOR BLOW-MOLDING A CONTAINER HAVING A NECK-PORTION WITH INTERNAL ATTACHMENT MEANS

Eric W. Meyer, Brussels, Belgium, and Robert H. Van Coney, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 6, 1984, Ser. No. 678,621

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[5] B29C *49/30, 49/58, 49/64;* B29D *1/00*

U.S. Cl. 264—533 7 Claims

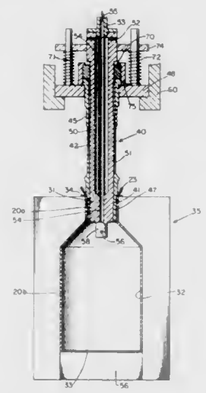
1. A method of blow-molding a thermoplastic container having a body-portion and a neck-portion provided with a dispensing orifice and internal attachment means, said method comprising the following steps:

(a) forming a hollow parison of thermoplastic material having an open end;

(b) placing said parison within a female mold cavity having a body-forming portion and a neck-forming portion such that the open end of said parison is located within said neck-forming portion of said mold cavity;

(c) inserting an expandable core pin into the open end of said parison, said core pin having relieved areas formed on its exterior surfaces and including blowing means connected to a pressure source;

(d) introducing means within said corepin and thereby expanding said core pin such that said open end of said parison is forced against the neck-forming portion of said mold cavity and into the relieved areas on the exterior of said core pin, thereby forming said internal attachment



means on the inner surface of the open end of said parison, and such that a seal is created by said parison between said corepin and said neck-forming portion of said mold cavity and the entire upper end of said mold cavity is effectively sealed other than said blowing means;

(e) introducing pressure through said blowing means of said core pin to the interior of said parison thereby expanding said parison against the inner surfaces of said body-forming portion of said female mold cavity to form the body-portion of said thermoplastic container;

(f) removing said molded thermoplastic container from said female mold cavity; and

(g) collapsing said expandable core pin and, thereafter, removing said core pin from the neck portion of said thermoplastic container.

4,929,411

HEAT-SENSITIVE RECORDING MATERIAL

Toshimasa Usami, and Akihiro Shimomura, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 1, 1988, Ser. No. 278,320

Claims priority, application Japan, Dec. 1, 1987, 62-301561

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—213 8 Claims

1. A heat-sensitive recording material which is comprised of a support having thereon at least one transparent heat-sensitive layer containing an organic base and microcapsules enclosing at least one colorless or light colored coloring material which can color by reaction with the organic base, wherein the transparent heat-sensitive layer is provided by coating a solution prepared by mixing the microcapsules with an emulsified dispersion obtained by mixing and emulsifying the organic base dissolved in an organic solvent which is slightly soluble or insoluble in water with aqueous solution, then drying the coat.

4,929,412

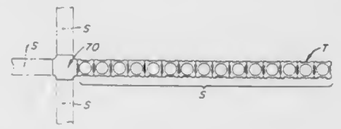
CONTROL ROD

Robert C. Dixon, Morgan Hill; James E. Cearley; Paul Van Diemen, both of San Jose; Edwin D. Sayre, Los Gatos, and Gerald M. Gordon, Soquel, all of Calif., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 31,633, Mar. 30, 1987. This application Apr. 11, 1989, Ser. No. 336,941

Int. Cl.[5] G21C *21/18*

U.S. Cl. 376—260 5 Claims



1. A process for forming an elongate flat planar member comprising a portion of a nuclear reactor control rod for insertion within the core of a nuclear reactor for control of the reaction, said process comprising the steps of:

providing a plurality of tubes defining cylindrical volumes and having square cross section, each said tube defining a cylinder of constant side wall thickness sufficient for defining therewithin the cylindrical volume for the containment of neutron absorbing poisons;

providing on each said tube of said plurality of tubes four discrete right angle corner sections integrally formed to said constant side wall thickness cylinder having a placement on the outside of said cylinder at 90° intervals to the side walls of said constant side wall thickness tube, said four corner sections defining four volumes of increased thickness in said tube wall with four areas of constant thickness of said tube wall defined therebetween;

fastening said tubes in juxtaposed side-by-side relation with the two discrete right angle corner sections of one tube adjoining two discrete right angle corner sections of an adjacent tube;

joining said tubes at said corner sections in side-by-side juxtaposed relation to form said elongate planar member of said control rod;

placing neutron absorbing poisons confined within each said tube for absorption of neutrons for control of said nuclear reaction; and

plugging said tubes at the respective ends of said tubes to confine said neutron absorbing materials within said tubes.

4,929,413

TELEVISION ALIGNMENT OF MAST ASSEMBLY IN REFUELING OF NUCLEAR REACTOR

John W. Kaufmann, Murrysville; Kenneth J. Swidwa, Harmar Township, Allegheny County, and Leonard P. Hornak, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 382,269, May 26, 1982, Pat. No. 4,832,902. This application Aug. 19, 1988, Ser. No. 234,114

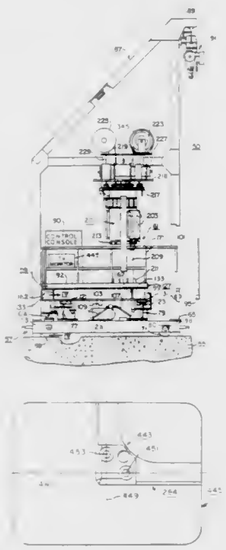
Int. Cl.[5] G21C *19/10*

U.S. Cl. 376—268 6 Claims

6. In the refueling of a nuclear reactor having component assemblies of at least one type and being disposed in a pit in a containment under water, said refueling being carried out with a mast movable axially and circumferentially for raising and lowering said component assemblies, a mechanism, connected to an end of said mast, cooperative with said mast, for engaging a component assembly to be raised by said mast, a television camera, and a television monitor having an image-reference

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indication, said mechanism being connected to said mast movable with said mast; the method of positioning said mechanism to engage said component assembly appropriately for raising and lowering, comprising: mounting said camera on said mechanism movable therewith, suspending said mast in the water of said pit with said mechanism extending from said end of said mast in said pit in position to engage said component assembly, and with said camera in a position where it picks up a view of a portion of the surface of said component assembly with



reference to which surface the mechanism is to be positioned to engage said component assembly appropriately for raising and lowering, connecting said camera to said monitor in view communication relationship to produce on said monitor an image of said portion of said surface, and while viewing said image moving said mechanism and the camera movable therewith relative to said surface to align said image with said reference indication to set said mechanism in a referenced position to be appropriate for engaging said component assembly for raising and lowering.

4,929,414

METHOD OF MANUFACTURING HEAT PIPE WICKS AND ARTERIES

John F. Leonard, and Jerry E. Beam, both of Beavercreek, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

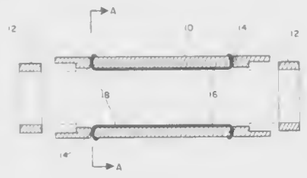
Filed Oct. 24, 1988, Ser. No. 261,807
Int. Cl.[5] B22F *3/00*

U.S. Cl. 419—2 **5 Claims**

1. A method for making arteries inside a heat pipe wick comprising the steps of:

(a) securing at least one line at a preselected position generally within a volume to be occupied by the wick;

(b) fabricating the wick so that it covers the secured line; and,



(c) heating the wick to a temperature above the decomposition temperature of the line so that the line disintegrates leaving in its place an artery through the wick.

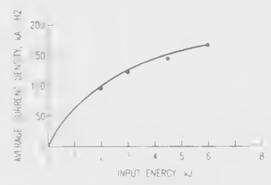
4,929,415

METHOD OF SINTERING POWDER

Kenji Okazaki, 62 Candlewood Dr., Nicholasville, Ky. 40356

Filed Mar. 1, 1988, Ser. No. 162,591
Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—52 **4 Claims**



1. A method for sintering powder, comprising applying a voltage of 3 KV or more to a mold filled with powder using an electrode which maintains a current of 50 KA cm^{-2} of greater for a period of time of 10 to 500 microseconds.

4,929,416

CAST STEEL

Vadim I. Tikhonovich, ulitsa N.Uzhvy 4V, kv. 63, Kiev; Vladimir D. Pavljuk, pereulok Parkhomenko, 8a, Asbest; Bertold B. Vinokur, ulitsa Komsomolskaya, 3, kv. 38, Kiev; Stanislav E. Kondratjuk, ulitsa L.Pervomaiskogo, 3, kv. 15, Kiev; Georgy G. Lutsenko, ulitsa Borschagovskaya, 46/1, kv. 27, Kiev; Vladimir K. Edemsky, ulitsa Ushakova, 12, kv. 156, Kiev; Vladimir B. Kiselev, ulitsa Chigorina, 49, kv. 77, Kiev; Nikolai M. Karasev, ulitsa Plekhanova, 26, and Anatoly K. Myakishev, ulitsa Mira, 4, kv. 52, both of Asbest, all of U.S.S.R.

PCT No. PCT/SU87/00092, § 371 Date Apr. 7, 1989, § 102(e) Date Apr. 7, 1989, PCT Pub. No. WO89/01987, PCT Pub. Date Mar. 9, 1989
PCT Filed Aug. 25, 1987, Ser. No. 348,495
Int. Cl.[5] C22C *38/38*

U.S. Cl. 420—12 **3 Claims**

1. A cast steel, having the composition (% by mass):

carbon	1.6–3.0
silicon	1.2–1.6
manganese	11.0–15.0
chromium	9.0–10.8
cerium	0.001–0.2
vanadium	0.15–0.3
titanium	0.05–0.3
aluminium	0.05–0.15
boron	0.005–0.015

-continued

iron	the balance.

4,929,417

METHOD OF MANUFACTURE METAL DIBORIDE CERAMICS

Tadahiko Watanabe; Kazuhisa Shobu, both of Tosu; Yukio Kai, Ohmuta; Hideki Yamamoto, Obmuta; Eiichi Sudoh, Ohmuta; Osamu Yagishita, Ohmuta, and Junshiro Hayakawa, Higashinihonbashi, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,461
Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—12 **9 Claims**

1. A method of manufacturing metal diboride ceramics comprising:

mixing a powder of at least one of TiB_2, ZrB_2 and HfB_2, a powder of at least one of Ti, Zr, Hf, TiB, ZrB and HfB and a powder of boron to prepare a mixed powder which can form a sintered product having a boron content of 65 to 67 atom %; and

sintering said mixed powder.

4,929,418

METHOD OF MAKING A CATHODE FROM TUNGSTEN POWDER

Louis E. Branovich, Howell; Bernard Smith, Ocean; Gerard L. Freeman, Freehold, and Eckart Donald W., Wall, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 22, 1990, Ser. No. 468,335
Int. Cl.[5] B22F *3/26*

U.S. Cl. 419—19 **3 Claims**

1. Method of making a cathode for operation in microwave devices from tungsten powder, said method including the steps of:

(A) ball milling the tungsten powder for a bout 8 hours,

(B) pressing the ball milled powder into a billet at about 48,000 psi in a die,

(C) sintering the billet at about 70° C. to 1325 ° C. for about thirty minutes in dry hydrogen of less than −100 dew-point,

(D) backfilling the billet with methyl methacrylate;

(E) machining the billet to the desired geometry,

(F) removing the methyl methacrylate by dissolution in acetone,

(G) thoroughly rinsing in deionized water, methanol and then drying,

(H) firing the billet in dry hydrogen at about 700° C. to 1325° C. for about 15 minutes,

(I) impregnating the billet with an impregnant formed from adding about 1 mole of a member selected from the group consisting of zirconium, zirconium dioxide, hafnium, hafnium dioxide, uranium, uranium dioxide, titanium, and titanium dioxide to about 50 to about 100 moles of a compound selected from the group consisting of $Ba_3Al_2O_6$, Ba_3WO_6, and $Ba_4Al_2O_7$ by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts for about two minutes,

(J) removing the billet from the furnace after the furnace is cooled, and

(K) removing any loose pieces of impregnant from the billet.

4,929,419

HEAT, CORROSION, AND WEAR RESISTANT STEEL ALLOY AND ARTICLE

Dwight D. Wegman, Oley; Edward A. Wanner, Leesport; Wilson P. Rehrer, Reading, and Sunil Widge, Dryville, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Mar. 16, 1988, Ser. No. 168,924
Int. Cl.[5] C22C *38/58*

U.S. Cl. 420—56 **34 Claims**

1. A precipitation strengthenable, austenitic steel alloy having a good combination of high temperature strength, corrosion resistance and wear resistance, said alloy in weight percent consisting essentially of about

	w/o
Carbon	0.35–0.90
Manganese	4.5–8.5
Silicon	0.75 max.
Phosphorus	0.05 max.
Sulfur	0.015 max.
Chromium	19.0–25.0
Nickel	4.5–8.5
Molybdenum	0.5 max.
Vanadium	0.75–3.5
Boron	Up to 0.02
Nitrogen	[0.35–0.75] 1.0 max.
Tungsten	0.5 max.
Niobium	0.5 max.

and the balance essentially Iron, wherein

$C+N \geqq 0.65+0.15(\%\ V)+0.04(\%\ Mo+0.5(\%\ W))$, and

$C+N \leqq 0.65+0.38(\%\ V)+0.08(\%\ Mo+0.5(\%\ W))$, and

Ni+Mn is about 10.00–16.0 weight percent.

4,929,420

ALLOY USEFUL PARTICULARLY IN DENTISTRY

Peter Cook, Horstead, England, assignor to The National Research Development Corporation, London, England

Filed Jan. 23, 1989, Ser. No. 300,509
Claims priority, application United Kingdom, Jan. 23, 1988, 8801532
Int. Cl.[5] C22C *5/04*

U.S. Cl. 420—466 **11 Claims**

1. An alloy consisting essentially of platinum, iridium and indium, which contains from about 0.05 to about 8% by weight of indium and whose weight ratio of platinum to iridium is from about 84:15 to about 86:15.

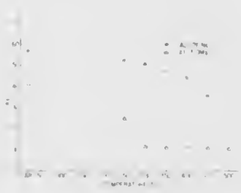
4,929,421

ALUMINUM ALLOYS AND A METHOD OF PRODUCTION

Iljoon Jin, and David J. Lloyd, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Aug. 15, 1988, Ser. No. 232,613
Claims priority, application Canada, Aug. 18, 1987, 544746
Int. Cl.[5] C22C *21/00*

U.S. Cl. 420—545 **14 Claims**



1. An aluminum-base alloy consisting essentially of the following: 0.4 to 1.2% by weight chromium; 0.3 to 0.8% by

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weight zirconium; 1.5 to 2.5% by weight manganese; 0.01 to 2.0% by weight magnesium; balance essentially aluminum.

4,929,422

PROCESS FOR THE ADHESIVE METALLIZATION OF SYNTHETIC MATERIALS

Hartmut Mahlkow; Michael Römer; Günther Rosskamp; Hubert-Matthias Seidenspinner; Ludwig Stein, and Waltraud Strache, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,832

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3708214

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—57 **10 Claims**

1. In a process for adhesive metallization of synthetic material by pre-treatment of said material and subsequent activation, followed by chemical deposition, the improvement comprising the pre-treatment of said synthetic material with an alkaline solution of an oxidizing agent and then subsequently with a metal salt solution, and simultaneously with the pre-treatment applying ultrasonic waves.

4,929,423

LOW TOXICITY ALLOY COMPOSITIONS FOR JOINING AND SEALING

Kay L. Tucker, Pinner, and Ulysses Ma, London, both of England, assignors to Cookson Group plc, London, United Kingdom

Filed Mar. 31, 1989, Ser. No. 331,189

Claims priority, application United Kingdom, Mar. 31, 1988, 8807730

Int. Cl.[5] C22C *13/02*

U.S. Cl. 420—561 **11 Claims**

1. A low toxicity alloy composition for joining and sealing consisting essentially of from 0.08 to 20% by weight of bismuth, from 0.02 to 1.5% by weight of copper, from 0.01 to 1.5% by weight of silver, from 0 to 0.10% by weight of phosphorus, from 0 to 0.02% by weight of a rare earth mixture consisting of a mixture of 53% cerium, 24% lanthanum, 16% neodymium and 5% praesedymium, no more than 0.01% by weight antimony and the balance tin, together with incidental impurities.

4,929,424

PREVENTION OF VAPOR PHASE CORROSION CAUSED BY HALOGENS IN BREWERY PASTEURIZERS

Daniel A. Meier, Naperville, and Michael J. Groshans, Lombard, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 11, 1988, Ser. No. 180,219

Int. Cl.[5] C23F *11/02, 11/06*

U.S. Cl. 422—9 **5 Claims**



1 A method of inhibiting the halogens vapor phase corrosion of the metal surfaces of beer pasteurizing units which utilize halogenated water which produces a halogen vapor phase which comprise treating these halogenated waters with from ¼ to 4 ppm of sulfamic acid for each ppm of halogen present in these waters and an alkalinizing amount of a soluble alkali.

4,929,425

COOLING WATER CORROSION INHIBITION METHOD

John E. Hoots; Donald A. Johnson; Dodd W. Fong, all of Naperville, and James F. Kneller, LaGrange, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 861,763, May 9, 1986, Pat. No. 4,752,443. This application Feb. 12, 1988, Ser. No. 155,397

Int. Cl.[5] C23F *11/06*

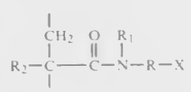
U.S. Cl. 422—13 **12 Claims**

1. A method for improving the performance of corrosion inhibitors in aqueous systems having hardness and a pH of at least 6.5 by dosing said system with:

From 10–50 ppm of a composition comprising:

I. a water-soluble inorganic phosphate capable of inhibiting corrosion in an aqueous alkaline environment, and

II. N-substituted acrylamide polymer containing an amide structure as follows:



where R_2 is hydrogen or methyl where R_1 is a hydrogen or an alkyl and R is alkylene or phenylene and X is, poly hyroxyl, poly carboxyl or carbonyl, and combinations thereof,

with the weight ratio of polymer:phosphate being within the range of 0.1:1 to 5:1

4,929,426

PORTABLE BLOOD CHEMISTRY MEASURING APPARATUS

Balazs I. Bodai, Sacramento; Michael D. Grandon, Sausalito; Scott J. Gilbert, Cupertino; Douglas J. Littlejohn, Sunnyvale; Kyle E. Lemons, San Jose; Richard L. Fellows, Mountain View; Michael R. Barry, Palo Alto, and Michael D. Delapp, San Jose, all of Calif., assignors to Biologix, Inc., Sacramento, Calif.

Division of Ser. No. 115,714, Nov. 2, 1987. This application Nov. 2, 1988, Ser. No. 266,474

Int. Cl.[5] G01N *35/06*

U.S. Cl. 422—63 **4 Claims**

1 A portable apparatus for measuring the electrochemical characteristics of a sample, said apparatus comprising:

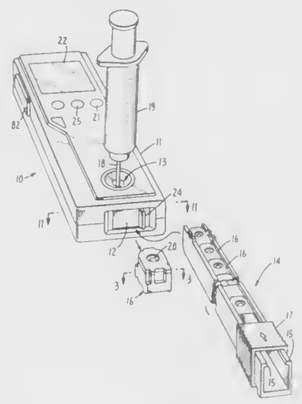
a shell housing a cartridge bay configured so as to receive a plurality of cartridges from a clip;

spring loaded means for advancing one of the cartridges into a measurement position within said shell;

measuring structure means for measuring an electrochemical characteristic of a sample;

means for in situ, automatic calibration of the measuring structure means within the cartridge prior to introduction of the sample into the cartridge when said cartridge is in the measurement position;

means for indicating the electrochemical characteristics of the sample as measured by and received from the measuring structure means; and



means for ejecting the cartridge holding the sample from the shell after information corresponding to the electrical characteristics of the sample has been indicated.

4,929,428

QUANTITATIVE PIPETTE

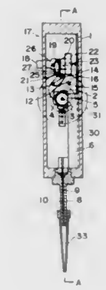
Sigeru Tezuka, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 21, 1989, Ser. No. 312,697

Claims priority, application Japan, Feb. 19, 1988, 63-035124; Mar. 4, 1988, 63-49858

Int. Cl.[5] B01L *3/02;* **B67D** *5/08*

U.S. Cl. 422—100 **8 Claims**



1. A quantitative pipette comprising:

a frame having a liquid sample receiving chamber;

a shaft rotatably supported by said frame;

a ratchet mounted on said shaft for rotation therewith;

a pinion mounted on said shaft for rotation therewith;

a rack movably supported by said frame and engageable with said pinion, said rack being moveable between an ascended position and a descended position upon rotation of said pinion;

a plunger connected to said rack, said plunger being conjointly moveable with said rack and reciprocally moveable within said receiving chamber;

resiliently biased ratchet driving means supported by said frame for effecting rotation of said ratchet in a first direction;

fluid operative damping means supported by said frame for reducing the rotational speed of said ratchet in said first direction to a value not greater than a prescribed speed;

ratchet engaging means supported by said frame and engageable with said ratchet to limit rotation thereof in said first direction;

activating means supported by said frame and operative for rotating said ratchet in a second direction, opposite to said first direction and against the action of said driving means, and for rotating said pinion in said second direction to effect ascended movement of said rack; and

release means supported by said frame and operatively connected to said ratchet engaging means to permit intermittent disengagement of said ratchet engaging means from said ratchet, permitting intermittent rotation of said ratchet in said first direction, and thereby permitting similar rotation of said pinion in said first direction to effect descended movement of said rack;

whereby ascended movement of said rack effects corresponding movement of said plunger to suck a prescribed amount of liquid sample into said receiving chamber, and descended movement of said rack effects corresponding movement of said plunger to discharge the liquid sample from said pipette.

4,929,427

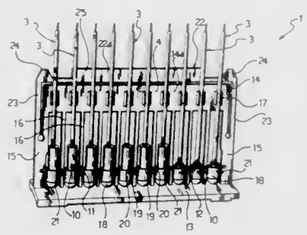
EQUIPMENT FOR MEASURING THE ERYTHROSETTLING RATE OF BLOOD USING PIPETTES

Piergiacomo Guala, Via Trotti, 20, 15100 Alessandria, Italy

Filed May 2, 1988, Ser. No. 188,973

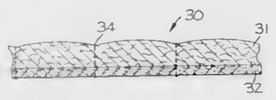
Int. Cl.[5] B01L *9/06*

U.S. Cl. 422—100 **5 Claims**



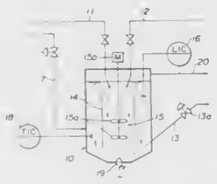
1. Equipment for measuring the rate of erythrosettling, of a type which comprises in combination a plurality of pipettes, a rack for holding said pipettes upright, and a plurality of elements, each for closing the bottom end of a respective pipette, wherein said rack comprises an elongate pedestal, a portal attached to the pedestal, a plurality of seats constructed to receive and hold by snap action pipettes provided in the portal, a bridge element positioned and arranged to straddle the portal, wherein the bridge element is elastically movable from a home position to a working position to simultaneously remove each of the pipettes from the snap-action holding seats of the rack.

4,929,429
CATALYTIC CONVERTER
Richard P. Merry, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 11, 1988, Ser. No. 155,086
Int. Cl.[5] F01N *3/28*
U.S. Cl. 422—179 14 Claims



1. In a catalytic converter having a metallic casing, a unitary, solid catalytic element disposed within said casing, and resilient means disposed between said catalytic element and said metallic casing for positioning said catalytic element and for absorbing mechanical and thermal shock, the improvement comprising; said resilient means being a resilient, flexible, fibrous mat of shot-free ceramic fibers having a stitchbonded compressed thickness in the range of 4 to 25 mm wrapped about the lateral surface of said catalytic element to a mount density of about 0.25 to about 0.50 g/cm^3.

4,929,430
PROCESS FOR PREPARATION OF URANIUM TETRAFLUORIDE
Keiichiro Otomura, Kurayoshi; Takayuki Yamashita, Tomata; Setsuo Kanemitsu, Kurayoshi; Shigetoshi Nakabayashi, Naka, and Hideo Miki, Yasu, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan
Filed Jun. 12, 1989, Ser. No. 365,115
Claims priority, application Japan, Jun. 23, 1988, 63-155780
Int. Cl.[5] C01G *56/00*
U.S. Cl. 423—11 5 Claims



1. A process for preparing uranium tetrafluoride by reacting a uranous solution with a hydrofluoric acid solution in a fluorination precipitation tank, characterized in that (1) an inner tube of a cylindrical shape having upper and lower ends opened is arranged in said fluorination precipitation tank in the longitudinal direction thereof to partition the interior of said tank into a central portion and a peripheral portion, and an agitator is arranged in said inner tube to generate a descending or ascending stream in the central portion inside said inner tube and an ascending or descending stream in the peripheral portion outside said inner tube, whereby a reaction mother liquor in said tank is circulated to produce a completely mixed state; (2) the uranous solution and the hydrofluoric acid solution are introduced into said tank from the upper part thereof to react with each other to produce crystals of uranium tetrafluoride and the thus produced uranium tetrafluoride crystals are withdrawn from the lower part of said tank together with a part of the reaction mother liquor; and (3) the amount of the hydrofluoric acid solution added to the uranous solution is adjusted so that the concentration of fluorine in the reaction mother liquor in said tank is maintained at 2 to 4 g/l.

4,929,431
PROCESS FOR PRODUCING AMORPHOUS ALUMINOSILICATES
Zenji Hagiwara, Shiga; Satoshi Ando, Osaka, and Saburo Nohara, Hyogo, all of Japan, assignors to Hagiwara Research Corp., Shiga and Kanebo Ltd., Tokyo, both of, Japan
Continuation-in-part of Ser. No. 899,026, Aug. 22, 1986, abandoned. This application Aug. 10, 1987, Ser. No. 83,710
Claims priority, application Japan, Aug. 23, 1985, 60-185634; Aug. 23, 1985, 60-185635
Int. Cl.[5] C01B *33/26*
U.S. Cl. 423—328 5 Claims



1. A process for producing an amorphous aluminosilicate having an average particle size of no larger 0.5 μm and a specific surface area of at least 5 m^2/g having the formula:

$$xNA_2O.Al_2O_3.YSiO_2$$

wherein x is a number between 0.6 and 1.8 inclusive; and y is a number between 1.3 and 7 inclusive; which comprises:
maintaining an alkali solution (Solution-C), the alkalinity of which is within the range of 1.2–3.5 N under stirring;
adding a sodium aluminate solution (Solution-A), containing free alkali, and sodium silicate solution or collodial silica solution (Solution-B) containing free alkali, to the Solution-C, separately to prepare a slurry which contains an amorphous sodium aluminosilicate in the form of finely divided particles which are only slightly soluble in water; and
aging the slurry after completing said addition at 55° C. or lower for at least one hour until ripe, wherein the addition of Solution-A and Solution-B into Solution-C is carried out so that the Si/Al ratio in the resultant mixture is kept within the range of 0.7 to 7.6 during and after the addition, and mixing effected at 55° C. or lower, and Solution-A and Solution-B are prepared so that the alkalinity of the aqueous solution phase during the formation of the slurry and during the aging is kept within ±0.30 N of the alkalinity of Solution-C.

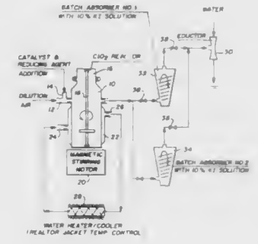
4,929,432
PROCESS FOR PRODUCING CRYSTALLINE SILICON NITRIDE POWDER
Wei-Ming Shen, Strongsville, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.
Filed Oct. 19, 1988, Ser. No. 259,892
Int. Cl.[5] C01B *21/036, 33/06*
U.S. Cl. 423—344 18 Claims

1. A process for producing crystalline silicon nitride powders having at least a 90% α-Si_3N_4 phase, said process comprising the steps:
(a) preparing a gaseous mixture of ammonia and silane in which the molar ratio of ammonia to silane is from 7:1 to 18:1;
(b) heating the gaseous mixture of step (a) from 900° C. to 1450° C. for a time period sufficient to produce amorphous silicon nitride powders having less than 5% elemental silicon based on the weight of the powders; and
(c) heating the amorphous silicon nitride powders of step (b) in an inert atmosphere at a temperature from 1350° C. to 1800° C. for a time period sufficient to produce crystalline silicon nitride powders comprising at least a 90% α-Si_3N_4 phase.

4,929,433
METHOD FOR THE PREPARATION OF SINTERABLE NITRIDES
Richard L. Hexemer, Jr., Lewiston; Scott R. Axelson, Frewsburg; Philip H. McCluskey, Alfred, and Thomas J. Mroz, Jr., Derby, all of N.Y., assignors to Alfred University, Alfred, N.Y.
Continuation-in-part of Ser. No. 111,831, Oct. 22, 1987, abandoned. This application Apr. 29, 1988, Ser. No. 188,236
Int. Cl.[5] C01B *21/072, 21/076;* C04B *35/58*
U.S. Cl. 423—411 21 Claims

1. A method of preparing a sinterable aluminum nitride powder which comprises
(a) mixing an aqueous solution or aqueous dispersion of an aluminum salt or of colloidal hydrated alumina with an aqueous solution or aqueous dispersion of a carboxylic acid polymer to form a precipitate,
(b) drying the precipitate, and
(c) calcining the precipitate in a nitriding atmosphere.

4,929,434
CATALYTIC GENERATION OF CHLORINE DIOXIDE
Derek G. Lobley, 18775 54th Avenue, Surrey, British Columbia, and Kenneth Pinder, 4195 Doncaster Way, Vancouver, British Columbia V6S 1W1, both of Canada
Filed Mar. 9, 1989, Ser. No. 321,009
Int. Cl.[5] C01B *11/02*
U.S. Cl. 423—479 4 Claims



1. In a process for producing chlorine dioxide by reducing a chlorate in sulphuric acid of at least 4N with a reducing agent the improvement comprising introducing into the process acetic anhydride.

4,929,435
MANUFACTURE OF HIGH PURITY LOW ARSENIC ANHYDROUS HYDROGEN FLUORIDE
Barry J. Boghean, St. Clair Beach, Canada; Somanahalli N. Subbanna, East Amherst, N.Y.; Charles L. Redmon, Hamburg, N.Y., and Christian A. Wamser, Camillus, N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Continuation-in-part of Ser. No. 14,422, Feb. 12, 1987, Pat. No. 4,756,899. This application Jul. 11, 1988, Ser. No. 217,497
Int. Cl.[5] C01B *7/19;* B01D *3/34*
U.S. Cl. 423—484 20 Claims

1. A process for manufacturing anhydrous hydrogen fluoride with reduced levels of arsenic impurity from arsenic contaminated anhydrous hydrogen fluoride which comprises the steps of:
(a) contacting said anhydrous hydrogen fluoride with an effective amount of hydrogen peroxide to oxidize the arsenic impurity in the presence of a catalyst which comprises a catalytic amount of
(i) a component selected from the group consisting of an organic molybdenum compound, vanadium, and a vanadium compound and,
(ii) a phosphate compound, at a temperature and for a period of time sufficient to oxidize volatile trivalent arsenic impurities in the anhydrous hydrogen fluoride to non-volatile pentavalent arsenic compounds, and
(b) distilling the resulting mixture and recovering anhydrous hydrogen fluoride with reduced levels of arsenic impurity.

4,929,436
PROCESS FOR THE MANUFACTURE OF A POWDER OF MIXED METAL OXIDES, AND MIXED METAL OXIDE POWDERS
Franz Legrand, Quaregnon; Luc Lerot, and Patricia De Bruycker, both of Brussels, all of Belgium, assignors to Solvay & Cie (Societe Anonyme), Brussels, Belgium
Continuation of Ser. No. 165,298, Mar. 8, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 372,185
Claims priority, application Belgium, Mar. 26, 1987, 08700311
Int. Cl.[5] C01F *1/00;* C01G *1/02*
U.S. Cl. 423—593 10 Claims



1. Process for the manufacture of a powder of mixed metal oxides, comprising dissolving metal alcoholates in an organic solvent to have an organic solution of metal alcoholates, treating the organic solution of the metal alcoholates with water in the presence of an acidic organic compound containing more than six carbon atoms in its molecule to cohydrolyze the metal alcoholates and precipitate mixed metal oxides as a powder without any bulk gelling, and collecting said powder with particles having a diameter not exceeding 5 microns.

4,929,437
COENZYME Q_{10} WITH HMG-COA REDUCTASE INHIBITORS
Jonathan A. Tobert, Maplewood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.
Filed Feb. 2, 1989, Ser. No. 305,140
Int. Cl.[5] A61K *45/00, 31/405, 31/35, 31/12*
U.S. Cl. 424—10 2 Claims

1. A method of counteracting HMG-CoA reductase inhibitor-associated elevated transaminase levels in a subject in need of such treatment which comprises the adjunct administration of an effective amount of HMG-CoA reductase inhibitor and an effective amount of Coenzyme Q_{10}.

4,929,438
PREVENTIVES AND REMEDIES FOR MEDICINAL AND ALCOHOLIC POISONING
Kiichi Sawai; Masayasu Kurono; Hiromiotu Asai; Takahiko Mitani; Naohisa Ninomiya; Takao Sugiyama; Eiji Furukawa, and Hisashi Michishita, all of Nagoya, Japan, assignors to Kabushiki Kaisha Sanwa Kagaku Kenkyusho, Nagoya, Japan
Filed Feb. 15, 1989, Ser. No. 310,162
Claims priority, application Japan, May 13, 1988, 63-116338
Int. Cl.[5] A61K *27/00*
U.S. Cl. 424—10 5 Claims

1. A method for preventing or treating alcohol poisoning which comprises administering to an animal in need of such

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treatment an effective amount of phytic acid or a pharmaceutically acceptable salt thereof.

4,929,439

COSMETIC SCREENING COMPOSITION IN THE FORM OF AN OIL-IN-WATER EMULSION COMPRISING A UV-A SCREENING COMPOUND AND A UV-B SCREENING COMPOUND AND ITS USE FOR THE PROTECTION OF THE SKIN AGAINST ULTRA-VIOLET RADIATION

Jean Cotteret, Verneuil-sur-Seine, and Jean F. Grollier, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Feb. 4, 1988, Ser. No. 152,346
Claims priority, application Luxembourg, Feb. 6, 1987, 86762
Int. Cl.[5] A61K *7/40, 7/42, 7/44*
U.S. Cl. 424—59 12 Claims

1. In a sunscreening cosmetic composition that screens out ultraviolet radiation wavelengths between 280 and 400 nm. and that is in the form of an oil-in-water emulsion which contains 0.5 to 10% by weight of N-(2-ethylhexyl)-4-(3-methylidenecamphor) benzene sulfonamide in the oil phase of said emulsion, wherein said oil phase consists essentially of fats selected from the group consisting of modified mineral oils, unmodified mineral oils, modified vegetable oils, unmodified vegetable oils, modified animal oils, and unmodified animal oils, and waxes, esters of saturated fatty acids, esters of unsaturated fatty acids, synthetic oils, and C_{12}-C_{18} fatty alcohols and acids, wherein the improvement comprises adding 0.1 to 10% by weight of partially or fully neutralized benzene-[1,4-bis(3-methylidenecamphomethylsulphonic acid] to the aqueous phase of said emulsion, whereby the protection index of said sunscreening composition is increased.

4,929,440

PROCESS FOR THE PREPARATION OF (−) EBURNAMENIN-14-(15H)-ONE RESINATES

Fernando C. Mondelo, and Maria T. M. Ferrero, both of Madrid, Spain, assignors to Covex, S.A., Madrid, Spain

Division of Ser. No. 926,561, Oct. 31, 1986, abandoned. This application Mar. 22, 1988, Ser. No. 171,672
Claims priority, application Spain, Nov. 8, 1985, 548735
Int. Cl.[5] A61K *31/795*
U.S. Cl. 424—79 2 Claims

1. The (−)eburnamenin-14-(15H)-one resinates, wherein the cationic resin is selected from polyvinyl or aryl sulfonates copolymerized with 3–12 divinyl benzene.

4,929,441

UNNATURAL SEX ATTRACTANTS FOR MALE PINK BOLLWORMS AND PINKSPOTTED BOLLWORMS AND USE THEREOF

Hollis M. Flint, and John R. Merkle, both of Tempe, Ariz., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 600,259, Apr. 13, 1984, abandoned. This application Nov. 20, 1985, Ser. No. 800,891
Int. Cl.[5] A01N *25/00*
U.S. Cl. 424—84 14 Claims

1. A composition comprising a mixture of first and second pheromone dispensers selected from the group consisting of flake dispensers, hollow fibers, and microcapsules, wherein said first dispenser contains Z,Z- or Z,E-isomer of 7-11-hexadecadien-1-ol acetate in an amount sufficient to shift the preference of a male pink boolworm from a volume ratio of Z,Z-:Z,E-isomer naturally occurring in the pheromone emitted by a female pink boolworm and to a different volume ratio, and wherein said second dispenser contains an effective attractant amount of Z,Z- and Z,E-isomers of 7,11-hexadecadiene-1-ol acetate, wherein said Z,Z-:Z,E-isomer volume ratio in said second dispenser is about 75:25 to 99:1 when said first dispenser contains Z,Z-isomer, and wherein said Z,Z-:Z,E-isomer volume ratio in said second dispenser is about 25:75 to 1:99 when said first dispenser contains Z,E-isomer.

4,929,442

COMPOSITIONS SUITABLE FOR HUMAN TOPICAL APPLICATION INCLUDING A GROWTH FACTOR AND/OR RELATED MATERIALS

Maxwell M. Powell, Great Neck, N.Y., assignor to Exovir, Inc., Great Neck, N.Y.

Filed Sep. 26, 1986, Ser. No. 912,828
Int. Cl.[5] A61K *37/66, 45/05, 37/02*
U.S. Cl. 424—85.2 12 Claims

1. A composition suitable for topical or subcutaneous application to a human for the treatment of cancerous or virus-caused skin disorders consisting essentially of a physiologically acceptable carrier, an antiviral or anti-cancer effective amount of a biologically active material selected from the group consisting of tissue plasminogen activator (t-PA), epidermal growth factor (EGF), transforming growth factor-alpha (TGF-α), transforming growth factor-beta (TGF-β), human endothelial cell growth factor (ECGF), granulocyte macrophage colony stimulating factor (GM-CSF), and a fibronectin or large external transformation sensitive protein (LETS) selected from the group of cell surface protein (CSP), cell adhesion protein (CAP), cell insoluble globulin (CIG) and opsonic-alpha 2 surface binding protein, an effective antiviral amount of an antiviral surfactant, an effective antiviral amount of human interferon and an effective amount of an adjuvant to assist in the transdermal transport or transfer of said composition through the skin.

4,929,443

METHOD OF TREATING INTERFERON SENSITIVE DISEASES, AND A METHOD AND DEVICE FOR PREPARING γ-INTERFERON CONTAINING PREPARATION

Ragnvald E. Lindblom, Alsäter, S-740 10 Almunge, and Ulf S. Rothman, Box 120, S-230 10 Skanör, both of Sweden

Continuation of Ser. No. 711,567, Feb. 13, 1985, abandoned, which is a continuation of Ser. No. 503,575, Jun. 13, 1983, abandoned. This application May 18, 1987, Ser. No. 50,470
Int. Cl.[5] A61K *45/02;* C12P *21/00*
U.S. Cl. 424—85.5 6 Claims

1. A method of treating interferon sensitive diseases, comprising the steps of taking a whole blood sample from a human or animal patient suffering from such disease, incubating said whole blood sample in vitro in the presence of a mitogen to produce γ-interferon, subjecting said incubated whole blood sample to a separation step so as to produce a blood plasma preparation which is free of said mitogen but contains a therapeutically effective amount of said produced γ-interferon, and re-administering said blood plasma preparation to the same patient.

4,929,444

LOW PH PHARMACEUTICAL FORMULATION CONTAINING T-PA

Michael D. Johnston, Beckenham, England, and Henry Berger, Cary, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 13, 1986, Ser. No. 862,817
Claims priority, application United Kingdom, May 28, 1985, 8513358; Aug. 31, 1985, 8521705
Int. Cl.[5] A61K *37/547*
U.S. Cl. 424—94.64 22 Claims

1. A lyophilized pharmaceutical formulation of t-PA having been prepared by vacuum drying a frozen sterilized unbuffered aqueous solution of t-PA, in which the pH is from 2 to 5.

4,929,445

METHOD FOR INHIBITING *LISTERIA MONOCYTOGENES* USING A BACTERIOCIN

Peter A. Vandenbergh; Michael J. Pucci, both of Sarasota; Blair S. Kunka, Bradenton, and Ebenezer R. Vedamuthu, Bradenton, all of Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Jan. 25, 1988, Ser. No. 148,044
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[5] A01N *59/00, 65/00;* A23C *9/12*
U.S. Cl. 424—115 26 Claims

1. A method for inhibiting growth of *Listeria monocytogenes* in an unspoiled material which can be contaminated with the *Listeria monocytogenes* which comprises:

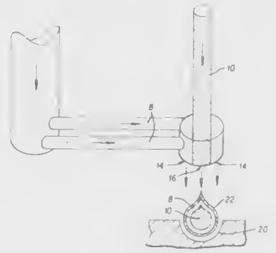
providing a bacteriocin in an unspoiled material in an effective amount which inhibits the *Listeria monocytogenes*, wherein the bacteriocin is derived from a *Pediococcus acidilactici* containing DNA derived from a plasmid measuring about 9.4 kilobase pairs in molecular size which encodes for the production of the bacteriocin and wherein the bacteriocin inhibits the *Listeria monocytogenes* in a pH range between about pH 4 to 9.

4,929,446

UNIT DOSAGE FORM

Raymond A. Bartolucci, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 19, 1988, Ser. No. 183,683
Int. Cl.[5] A61K *47/00*
U.S. Cl. 424—439 16 Claims



1. An edible unit dosage form for delivering a medicament selected from the group consisting of menthol, eucalyptus, benzocane, dextramethorphan or a mixture of any of the foregoing comprising:

(a) an outer relatively hard, unitary shell consisting essentially of a sugar which crystallizes slowly from the melt, said sugar consisting of sucrose, glucose or a mixture thereof; and

(b) a liquid or semi-solid center core contained within said shell comprising an accurate dose of a medicament, said dose being within about ±5% by weight of the prescribed dosage.

4,929,447

ENCAPSULATION COMPOSITION FOR USE WITH CHEWING GUM AND EDIBLE PRODUCTS

Robert K. Yang, Randolph, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 816,769, Jan. 7, 1986. This application Jun. 29, 1987, Ser. No. 67,894
Int. Cl.[5] A61K *9/68*
U.S. Cl. 424—440 12 Claims

7. An edible product comprising an encapsualted active ingredient which is protected from moisture deterioration and which exhibits controlled release, wherein said active ingredient is selected from the group consisting of soluble dietary fibers, bio-effecting agents, and mixtures thereof and said encapsulant is solvent-free and comprises a blend of high molecular weight polyvinyl acetate and a hydrophobic plasticizer in an edible matrix wherein the active ingredient and encapsulant are mixed in a melt blend.

4,929,448

ORAL COMPOSITION CONTAINING PARTICLES COMPRISING AN ACTIVE SUBSTANCE

Lars S. Ibsen, Frederiksberg, Denmark, assignor to A/S Alfred Benzon, Copenhagen, Denmark

Filed Mar. 11, 1988, Ser. No. 166,638
Claims priority, application Denmark, Mar. 13, 1987, 1302/87
Int. Cl.[5] A61K *9/14, 9/50*
U.S. Cl. 424—489 22 Claims

1. An oral composition in dry form adapted to be reconstituted in water, the composition comprising a multiplicity of solid particles which have sizes and shapes such that they normally feel gritty and which remain solid after reconstitution with water, the particles:

(a) containing at least one active substance selected from the group consisting of drugs, vitamins and nutrients; and

(b) comprising a viscosity-increasing substance which, upon reconstitution with water, provides the surfaces of the particles with an aqueous masking surface layer of higher viscosity than the viscosity prevailing in the aqueous medium resulting from reconstitution with water, the masking surface layer being in intimate contact with the surfaces of the solid particles and thereby reducing the grittiness of said particles and/or contributing to masking any unpleasant taste of the active substance, and said viscosity-increasing substance being selected from the group consisting of:

(i) at least one gelling or swelling agent,

(ii) a substance having a redox potential such that, in the aqueous medium resulting from reconstitution with water, it is oxidized or reduced,

(iii) a substance which forms a salt or chelate with a gelling or swelling agent dispersed in said aqueous medium, and

(iv) a surfactant which reduces the surface tension of the water in said aqueous medium.

4,929,449

CONTAINERS FOR REDOX ACTIVE ELECTROLYTES AND METHOD OF USING SAME

Richard L. Veech, Laboratory of Metabolism, NIAAA, Room 55A, 12501 Washington Ave., Rockville, Md. 20852

Continuation-in-part of Ser. No. 810,815, Dec. 18, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 940,331
Int. Cl.[5] A61K *33/00, 31/22*
U.S. Cl. 424—700 2 Claims

1. A method for preparing a therapeutic aqueous solution which contains dissolved therein carbon dioxide, said method comprising the steps of:

(A) charging a first composition into a first chamber of a container,

(B) charging a second composition into a second chamber of said container, each of said first and second chambers being hermetically sealed with said respective compositions therein, and said container being hermetically sealed with respect to each of said chambers, each of said chambers being in communicatable relationship with the other thereof while said container is in such sealed condition, and said container including means for externally producing communication between said respective first and second chambers,

(C) opening a communication pathway between said first and said second chambers,

(D) intermixing the first composition with the second composition within said sealed container, and

(E) administering the resulting so formed therapeutic aque-

ous solution containing dissolved therein said carbon dioxide,

said second composition being a dry powder consisting essentially of at least one material selected from the group consisting of redox active metabolite ketoacids and metabolite sulfhyryl-containing amino acids, said first composition being an aqueous solution containing dissolved therein at least one material selected from the group consisting of (a) inorganic electrolytes, (b) nutrients, and (c) stable metabolites and an above ambient concentration of dissolved carbon dioxide.

4,929,450

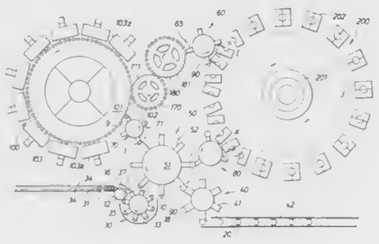
DELIVERY APPARATUS IN MACHINE FOR PREPARING PLASTIC HOLLOW VESSELS

Nobuyuki Takakusaki, Yokohama; Yohji Mizutani; Nobuhiro Kishida, both of Tokyo, and Manabu Hosokawa, Kawasaki, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 82,466, Aug. 7, 1987, Pat. No. 4,790,741. This application Jan. 14, 1988, Ser. No. 144,717

Int. Cl.[5] **B29C** *49/36*

U.S. Cl. 425—526 **3 Claims**



1 A delivery apparatus in a machine for preparing drawn plastic hollow vessels, said delivery apparatus comprising:

(A) a mandrel for supporting a preform composed of a plastic material and a hollow vessel formed from the preform;

(B) a loading means for loading the preform on the mandrel;

(C) a preheating means having a rotary turret comprising a plurality of supporting seats for supporting the mandrel on the periphery thereof and a heating mechanism arranged along the periphery of the turret to heat the preform loaded on the mandrel;

(D) a blow-forming means comprising a rotary member having, arranged along the periphery thereof, a plurality of openable and closable blow-forming molds and mandrel-supporting members corresponding to said molds;

(E) a delivery means for delivering the preheated preform-loaded mandrel to the blow-forming means from the preheating means; and

(F) a withdrawal means for withdrawing the blow-formed vessel-loaded mandrel from the blow-forming means;

wherein said loading means comprises:

(1) a preform supply mechanism for supplying the preform;

(2) a unitary preform-loading and vessel-unloading mechanism for pushing the preform coming from the supply mechanism onto the mandrel to fix the preform thereto and withdrawing the vessel from the vessel-loaded mandrel supplied from the withdrawal means;

a preform delivery mechanism for delivering the preform-loaded mandrel to the preheating means; and

(4) a vessel delivery mechanism for delivering the vessel withdrawn from the mandrel to the outside of the apparatus from the loading and unloading mechanism;

wherein said preform-loading and vessel-unloading mechanism comprises:

(a) a first rotary member,

(b) a clamping mechanism having grippers arranged equidistantly along the periphery of said first rotary member to hold the neck portions of the preform and vessel,

(c) an opening and closing drive mechanism for opening and closing the grippers of the clamping mechanism,

(d) a reciprocating drive mechanism for driving the clamping mechainsm reciprocatively in the axial direction of said first rotary member,

(e) a second rotary member arranged coaxially with said first rotary member below said first rotary member and spaced therefrom in the axial direction, and

(f) mandrel supporting seats arranged equidistantly along the periphery of the second rotary members and located at positions coaxial with the positions for gripping the neck portions of the preform and vessel in the clamping mechanism;

said preform supply mechainsm, said preform delivery mechanism, said vessel withdrawal means and the vessel delivery mechanism being arranged in the recited order in the rotation direction of the first and second rotary member along the periphery of the preform-loading and vessel-unloading mechanism; and

said opening and closing drive mechanism and said reciprocating drive mechanism for the clamping mechanism being timed with each other so that motions (i) and (vi) occur in operation;

(i) the grippers close to hold the preform from the preform supply mechanism,

(ii) the grippers move downwardly to insert the preform onto the mandrel,

(iii) the grippers open to release the preform to the preform delivery mechanism,

(iv) the grippers close to hold the neck portions of the vessel from the vessel withdrawal means,

(v) the grippers move upwardly to withdraw the vessel from the mandrel, and

(vi) the grippers open to release the vessel to the vessel delivery mechanism.

4,929,451

PROCESS FOR ELIMINATING DISAGREEABLE ODOR FROM SOYA MILK

Seishi Takenawa, Nara; Hideki Takeda, Tenri, and Mie Horikoshi, Higashiosaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Filed Feb. 6, 1989, Ser. No. 306,558

Claims priority, application Japan, Feb. 12, 1988, 63-31107

Int. Cl.[5] **A23J** *1/14;* **A23L** *1/20*

U.S. Cl. 426—10 **6 Claims**

1. A process for preparation of disagreeable odors-free soya milk which comprises

soaking raw soybean in water,

draining,

grinding the soaked soybean with water whose dissolved oxygen has been decreased by addition of glucose and glucose oxidase,

steaming the ground soybean, and filtering the resulting materials to obtain disagreeable odors-free soya milk.

4,929,452

METHOD FOR RAPIDLY FERMENTING ALCOHOLIC BEVERAGES

Mostafa K. Hamdy, Athens, Ga., assignor to University of Georgia Researeb Foundation, Inc., Athens, Ga.

Continuation of Ser. No. 103,049, Sep. 30, 1987, abandoned. This application Jun. 22, 1989, Ser. No. 370,839

Int. Cl.[5] **C12C** *11/00;* **C12G** *1/00, 3/00*

U.S. Cl. 426—11 **13 Claims**

1. A process for producing an alcohol solution comprising fermenting a sugar mixture with a strain of *Saccharomyces cerevisiae* which can tolerate alcohol concentrations of greater than 12% and sugar concentrations of greater than 20%, wherein said strain of *S. cerevisiae* rapidly ferments sugar substrates, producing alcohol at a rate of at least about 0.026 grams alcohol per hour per gram sugar per 10^{12} yeast cells.

4,929,453

SOYBEAN PROTEIN CLOTTING ENZYME PRODUCED BY MICROORGANISM FERM BP-1778

Tatuo Emura, Sapporo, and Kiyoshi Ohba, Chitose, both of Japan, assignors to Kabushiki Kaisha Hokkaido Nissin, Hokkaido, Japan

Division of Ser. No. 167,508, Mar. 14, 1988, Pat. No. 4,885,178. This application Mar. 29, 1989, Ser. No. 330,005

Int. Cl.[5] **C12N** *9/54*

U.S. Cl. 426—63 **1 Claim**

1. An essentially pure soybean protein clotting enzyme produced by a Bacillus microorganism designed FERM BP-1778 and having the following properties;

(a) approximately 30000 molecular weight;

(b) a first peak soybean protein clotting activity at a temperature of about 80° C. and a second peak soybean clotting activity at a temperature of about 65° C.;

(c) stable for 30 min. at a temperature of 35°–40° C.;

(d) stable for 17 hours at a temperature of 4° C. under a pH condition ranged from pH 4 to 9 with 70% soybean protein clotting activity remaining;

(e) an increased soybean protein clotting activity at a pH range below 6.0 and termination of soybean protein clotting activity at a pH range above 7.0;

(f) said first peak soybean protein clotting activity being completely inhibited by phenyl methyl sulfonyl fluoride and tosyl fluorine, and said second peak soybean protein clotting activity being completely inhibited by ethylene diamine tetra-acetic acid; and

(g) a soybean protein clotting activity without influence of metal ions thereupon.

4,929,454

WOOD TREATMENT COMPOSITION

David M. Findlay, deceased, late of Terrasse Vaudreuil (by Jean Findlay, executrix), and Neil G. Richardson, St-Laurent, both of Canada, assignors to Domtar Inc., Montreal, Canada

Continuation-in-part of Ser. No. 231,588, Feb. 5, 1981, abandoned. This application Oct. 18, 1985, Ser. No. 788,881

Int. Cl.[5] **A01N** *59/20*

U.S. Cl. 424—638 **11 Claims**

1. A method of preserving wood which comprises impregnating a wood substrate with a wood preservative formulation comprising an aqueous ammoniacal solvent comprising ammonium hydroxide having a wood treating composition dissolved therein; where said composition contains a quaternary ammonium compound and a metallic cation consisting essentially of at least one of copper and zinc, where said quaternary ammonium compound can be represented by the general formula $(R_1R_2R_3R_4N^+)X^-$, where R_1 and R_2 are independently chosen from the group consisting of alkyl groups having 1 to 3 carbon atoms, R_3 is chosen from the group consisting of alkyl groups having 8 to 20 carbon atoms, and R_4 is chosen from the group consisting of alkyl groups having 8 to 20 carbon atoms, aryl groups and aryl-substituted alkyl groups where said substituted alkyl groups have 1–3 carbon atoms and X^- is chosen so as to render said quaternary ammonium compound soluble in said ammoniacal solvent where said quaternary ammonium compound and said metallic cation are present in said formulation in biocidally effective amounts, and where the ratio of said quaternary ammonium compound to said metallic cation ranges from about 0.003 to about 30.

4,929,455

FLOUR-BASED POT PIE CRUSTS WITH IMPROVED TEXTURE

James M. Connaughton, Jr., Alworth, Ga.; James E. Sexton, Cincinnati, Ohio, and James A. Hegener, Cold Spring, Ky., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jul. 7, 1988, Ser. No. 216,031

Int. Cl.[5] **A21D** *8/00;* **A23L** *3/00*

U.S. Cl. 426—92 **11 Claims**

1. A microwavable flour-based pot pie comprising a food filling and a flour-based crust composition made from a dough consisting essentially of an intimate mixture of flour and a protein having low affinity for water upon storage separately added thereto throughout said mixture, said protein selected from the group of zein, soy isolate, gliadin, hordein or mixtures thereof in an amount adapted to obtain a firm texture throughout the crust composition upon microwave cooking.

4,929,456

MELTING TOLERANT SAUCE AND SEASONING PARTICULATE

Celso O. Bejarano-Wallens; Julie E. Gage, both of East Windsor, N.J., and Donald Hodapp, Boise, Id., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Aug. 25, 1988, Ser. No. 236,566

Int. Cl.[5] **A23L** *1/39*

U.S. Cl. 426—99 **10 Claims**

1. A process for preparing a melting tolerant, portioned controlled sauce and seasoning particulate comprising the steps of:

(a) a first mixture comprising a 3–14% gelatin solution in water and combining same with a seasoning blend;

(b) preparing a second mixture comprising non-solid ingredients selected from a group consisting of soy sauce, beef base, sesame oil, mustard, heavy cream, margarine, tomato base, olive oil, mushroom base, lemon juice, processed swiss cheese, parmesan cheese, chicken base, cheese flavors and combinations thereof;

(c) combining the first mixture in amount ranging from 50% to 85% to the second mixture in amounts ranging from 10% to 50% by weight and mixing to form a uniform mixture;

(d) heating the said uniform mixture with agitation for a time ranging from 1 to 5 minutes and at a temperature ranging from 180° F. to 190° F. effective to pasteurize the said mixture;

(e) cooling the pasteurized sauce mixture with agitation to a temperature ranging from 70° F. to 130° F.;

(f) depositing the cooled sauce onto a freezer belt to form particulate drops of sufficient size to provide portion control;

(g) maintaining the particulate drops on the freezer belt for sufficient time to freeze said particulate drops to temperatures ranging from −5° F. to −15° F.;

(h) removing the frozen sauce particulate drops from the freezer belt; and,

(i) freezing to temperatures ranging from 0° F to −15° F for packaging.

4,929,457

ICE-CREAM CONES

Takayoshi Sato, 97-5, Ohganedaira 2-chome, Matsudo-shi, Chiba-ken, Japan

Filed Dec. 28, 1988, Ser. No. 291,295
Claims priority, application Japan, Dec. 30, 1987, 62-336131
Int. Cl.[5] A21D *13/00*
U.S. Cl. 426—139 4 Claims



1. An ice-cream cone comprising an elongated molded shell having an open top portion and a closed bottom portion,

said open top portion comprising an integral annular bowl-shaped holding part for receiving and holding ice cream, said holding part lying horizontal relative to the vertically extending longitudinal axis of said cone,

said closed bottom portion integrally extending downwardly from said top portion and constituting a gripping part for gripping the ice-cream cone, said closed bottom portion gradually converging in diameter to an end distal to the open top portion,

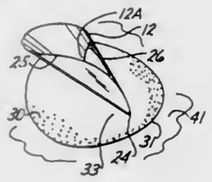
said molded shell having a plurality of walls including a pair of vertical flat radial walls, each vertical wall extending continuously from the top of said holding part to said converged bottom closed end, and each vertical wall being formed in the shape of an inverted triangle and angularly connected to each other at their respective adjacent vertical sides, said pair of vertical walls being vertical relative to the horizontally oriented holding part and converging at an angle relative to each other such that a plurality of at least three ice-cream cones can be positioned with their respective vertical walls adjacent and abutting each other in a united state while simultaneously maintaining the holding parts horizontal.

4,929,458

METHOD OF MAKING A CONICALLY SHAPED TORTILLA SHELL

Leo P. Smietana, 16696 Forrest St., Victorville, Calif. 92392

Division of Ser. No. 293,889, Jan. 5, 1989. This application Sep. 21, 1989, Ser. No. 410,314
Int. Cl.[5] A23L *1/164;* A23P *1/10*
U.S. Cl. 426—391 8 Claims



1. A method of making a conically shaped tortilla shell, which comprises:

placing a pliable corn or wheat flour tortilla patty having a rounded tip end portion on a substantially flat surface;

positioning a conically shaped mold, having an apex portion and a pair of overlapping sides, on its side on the surface of said tortilla patty;

aligning the rounded tip end portion of said tortilla patty adjacent the apex portion of said mold;

moving relative to one another the mold and said aligned rounded tip end portion of the tortilla patty to wrap the tip end portion about the apex portion of said mold;

moving a peripheral surface, near the rounded tip end portion of said patty, into engagement flatly against the apex portion of the mold;

holding the peripheral surface firmly against said apex portion;

rolling the patty and the mold along the substantially flat surface until the patty peripheral surface commences to be moved under the mold and against the top surface of the patty adjacent its rounded tip end portion;

continuing to roll said mold and said patty to cause the rounded tip end portion of the patty to tuck inwardly to form a closed apex tucked in portion thereby forming a conically shaped tortilla shell having a closed apex portion; and then

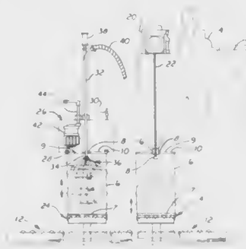
removing the conically shaped tortilla shell from said mold.

4,929,459

METHOD OF FILLING DRUMS WITH COOKED SOLID FOOD PRODUCTS

Jesus A. Silvestrini, Mendoza, Argentina, assignor to IMDEC S.A., Mendoza, Argentina

Continuation-in-part of Ser. No. 216,874, Jul. 8, 1988. This application Oct. 17, 1988, Ser. No. 258,730
Int. Cl.[5] A23L *3/00*
U.S. Cl. 426—399 7 Claims



1. A method of filling drums with cooked, sterile pieces of solid food products in a packing liquid, comprising the sequential steps of

a. sterilizing the interior of an empty drum, which drum comprises a substantially rigid cylinder having at one axial end thereof a base closed by a base member and at the opposite axial end a head closed by a head member;

b. depositing by gravity flow and at substantially atmospheric pressure into said sterilized drum through an opening in said head member a predetermined quantity of cooked, sterile pieces of solid food product having a temperature of not less than 200° F. and substantially without packing liquid;

c. engaging said drum head in a pressure-tight manner with a liquid filling head and maintaining said pressure-tight engagement between said drum head and said liquid filling head throughout said filling process while exposing the exterior of said drum base and the drum sides to ambient conditions;

d. introducing pressurized steam through said liquid filling head into said drum and thereby expelling substantially all air from within said drum and maintaining within said drum and between said drum head and said liquid filling head steam pressure substantially greater than atmospheric pressure;

e. introducing through said liquid filling head and into said drum and onto said quantity of pieces of solid food product a quantity of food packing liquid sufficient to substantially fill the space remaining in said drum;

f. appiying an air tight seal to said drum head member opening, whereby the drum is sealed against outside contaminants, and

g. releasing said steam pressure from said liquid filling head and removing said liquid filling head, whereby the filled and sealed drum may be removed for cooling and storing.

4,929,460

ELASTOMERIC SILICONE BINDING THREADS FOR COOKABLE FOODSTUFF ITEMS

Robert Lagarde, Feyzin; Daniel Ariagno, Craponne, and Jacques Nys, Le Chesnay, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Division of Ser. No. 338,559, Apr. 14, 1989, which is a continuation of Ser. No. 939,031, Dec. 8, 1986, abandoned. This application Oct. 3, 1989, Ser. No. 416,403
Claims priority, application France, Dec. 6, 1985, 85 18287
Int. Cl.[5] B65B *25/06, 25/22*
U.S. Cl. 426—420 11 Claims

1. A process for wrapping a food product to be cooked comprising the steps of: providing a tie comprising a silicone elastomer capable of being heated up to 250° C.; wrapping said food with said provided tie; and securing said tie to said food product.

4,929,461

PROCESS FOR PRODUCING BATCH TYPE POTATO CHIPS ON A CONTINUOUS BASIS

Sylvia L. Schonauer; Linda M. Medina, both of Irving, and Donald V. Neel, Lewisville, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 6/944,208, Dec. 22, 1986, abandoned. This application Oct. 25, 1988, Ser. No. 262,127
Int. Cl.[5] A23L *1/217*
U.S. Cl. 426—438 10 Claims

1. A continuous process for the production of potato chips having batch-fried texture and flavor characteristics comprising:

(a) continuously introducing potato slices into an initial frying region of frying oil, the initial frying region having a temperature of from about 115° C. to about 155° C. (about 240° F. to about 310° F.);

(b) preparing partially fried potato slices by partially frying the potato slices in the initial frying region for at least 1 minute;

(c) continuously conveying the partially fried potato slices from said initial frying region to a final frying region of frying oil, the final frying region having a temperature of about 165° C. to about 185° C. (about 330° F. to about 365° F.);

(d) producing potato chips having batch-fried texture and flavor characteristics by finish-frying the partially fried potato slices in the final frying region to about the bubble end point of the potato slices; and

(e) continuously removing the potato chips from the final frying region of frying oil.

4,929,462

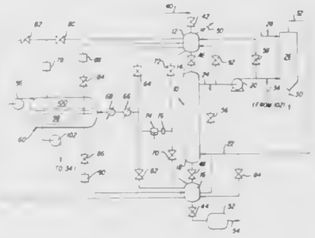
METHOD AND APPARATUS FOR CONTINUOUS CONTACT OF SUPERCRITICAL FLUID WITH PARTICULATE SOLIDS

Charles T. Moorman, Harrington Park; Joseph L. Sabadics, Nutley, and Joseph A. Bruscino, Saddle Brook, all of N.J., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Jun. 21, 1989, Ser. No. 368,729
Int. Cl.[5] A23F *5/20;* B01D *11/02*
U.S. Cl. 426—478 31 Claims

1. In a method of contacting particulate solid matter with a fluid in an elongate pressure vessel which comprises continuously passing a supercritical fluid through an elongate pressure vessel at supercritical pressure while periodically moving the particulate solid matter through the pressure vessel via isolatable pressurizable vessels, said pressurizable vessels being periodically pressurized to the supercritical pressure of said fluid for facilitating the periodic movement of particulate solid matter between said pressurizable vessels and said pressure vessel, and depressurized for facilitating the periodic movement of said solid particulate solid matter into and out of said pressurizable vessels, the improvement wherein pressurizing said pressurizable vessels comprises:

(a) maintaining a supply of said fluid at an intermediate,



non-critical pressure, at which pressure said fluid exists in both the liquid and gaseous state;

(b) introducing into said pressurizable vessels said fluid, in the gaseous state, from said supply of said fluid maintained at said intermediate pressure, to raise the pressure within said pressurizable vessels;

(c) introducing into said pressurizable vessels said fluid, in the liquid state, from said supply of fluid to further raise the pressure within said vessels to approximately the pressure of the fluid in said supply; and

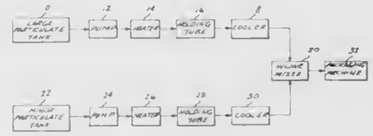
(d) introducing, into said pressurizable vessels, said fluid in the supercritical state, to further raise the pressure within said vessels to the supercritical state.

4,929,463

PROCESS FOR ASEPTIC PREPARATION OF PARTICULATE FOOD PRODUCTS

Richard S. Meyer, Tacoma, Wash., assignor to Curtice-Burns, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 231,592, Aug. 10, 1988, abandoned, which is a continuation of Ser. No. 929,061, Nov. 7, 1986, abandoned. This application Mar. 1, 1989, Ser. No. 317,828
Int. Cl.[5] A23L *3/18*
U.S. Cl. 426—521 10 Claims



1. A process for the aseptic preparation of food products containing a large particulate component and a minor particulate component comprising:

(a) treating a stream of said large particulate component to sterilize said component, said large particulate component comprising a plurality of large particles, all flowing at substantially the same velocity;

(b) treating a stream of said minor particulate component separately from said large particulate component to sterilize said minor particulate component, said minor particu-

late component comprising a plurality if minor particles, all flowing at substantially the same velocity; and,

(c) combining said treated large particulate component and said treated minor particulate component for packaging.

4,929,464

FROZEN DONUT BATTER AND METHOD FOR PREPARING COOKED PRODUCT THEREFROM

Marvin R. Willyard, Franklin, and Jean M. Lingg, Hales Corners, both of Wis., assignors to Ph. Orth Co., Oak Creek, Wis.

Filed Mar. 27, 1989, Ser. No. 329,357
Int. Cl.[5] A21D *6/00*
U.S. Cl. 426—549 9 Claims

1. A process for preparing cake donuts consisting of a first step of preparing a cake donut batter, a second step of forming donuts from said batter, a third step of freezing said formed donuts, and a final step of deep frying said donuts without thawing same and wherein the cross-sectional area of said donuts is selected to permit adequate interior cooking before the exterior of said donut becomes overcooked.

4,929,465

CONTROL OF SYMMETRY OF MICROWAVE CAKES

Hanny Kanafani, Champlin; Bruce M. Patrick, Richfield, and William A. Atwell, Andover, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Division of Ser. No. 113,134, Oct. 27, 1987, Pat. No. 4,847,100. This application Mar. 13, 1989, Ser. No. 322,597
Int. Cl.[5] A23L *1/00;* A21D *10/04*
U.S. Cl. 426—552 16 Claims

1. A culinary mix for preparing a starch-based batter for cakes with controlled symmetry comprising:

(a) from about 60% to about 85% by weight of a mixture of sugar and flour; and

(b) a sufficient amount of a leavening system effective to provide a gas evolution in the range of between about 38 cc and about 118 cc when combined with at least one liquid to form a starch-based batter, the batter forming a cake layer with controlled symmetry when exposed to microwave radiation.

4,929,466

FOOD AND FEEDSTUFF

Maud I. C. Knutsson, Vagnhärad, Sweden, assignor to Ewos Aktiebolag, Sodertalje, Sweden

Filed May 3, 1988, Ser. No. 190,269
Claims priority, application Sweden, May 5, 1987, 8701839
Int. Cl.[5] A23K *1/17*
U.S. Cl. 426—615 15 Claims

2. A method for the preparation of a feedstuff comprising vegetable matter in combination with an antibacterial system, the antibacterial system being selected from the group consisting of a lactoperoxidase-thiocyanate hydrogen peroxide donor and a salivary peroxidase-thiocynate-hydrogen peroxide donor, comprising deactivating the vegetable peroxidases present in the vegetable matter by heat treating the vegetable matter for at least 15 minutes and combining said deactivated vegetable matter with said antibacterial system.

4,929,467

PROCESSES FOR PRODUCTS FROM LOTUS

Kareo M. Slimak, 9207 Shotgun Ct., Springfield, Va. 22153

Filed Jan. 31, 1986, Ser. No. 825,660
Int. Cl.[5] A23L *1/214*
U.S. Cl. 426—637 18 Claims

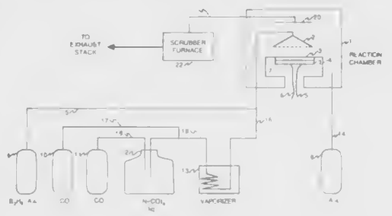
1. A non-grain edible flour possessing the ability to maintain a risen structure in the absence of grain flour, legume flour, or added fiber, said non-grain edible flour consisting essentially of comminuted particles of the entire lotus including substantially all of the starch and fiber content of the lotus, comminuted to a size so that all of said particle pass through a screen of 0.02 inch mesh, wherein said flour has a moisture content of less than 20% by weight.

4,929,468

FORMATION OF AMORPHOUS METAL ALLOYS BY CHEMICAL VAPOR DEPOSITION

Arthur W. Mullendore, Sandia Park, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 18, 1988, Ser. No. 170,228
Int. Cl.[5] B05D *3/14;* C23C *16/18*
U.S. Cl. 427—47 14 Claims



1. A method of forming amorphous alloy deposite on heated surfaces by thermal dissociation of various mixtures of organometallic compounds, and metalloid hydrides in a neutral or reducing diluent gas atmosphere at temperatures ranging from about 20 to about 500° C., wherein the temperature selected for the dissociation is lower than the crystallization temperature of the alloy produced.

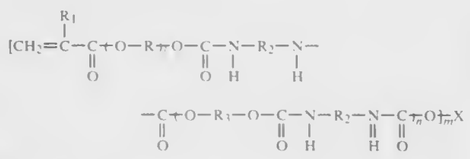
4,929,469

METHOD OF FORMING A TENTATIVE SURFACE PROTECTIVE COATING

Tetsuya Kimura; Toshihiro Fujii, and Hiroki Nii, all of Fukuyama, Japan, assignors to Hayakawa Rubber Co., Ltd., Japan

Filed Jul. 6, 1988, Ser. No. 215,564
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—54.1 7 Claims

1. A method of forming a temporary surface protective coating on a surface of a substance before treating the surface by any of electrolytic plating, electroless plating, or a soldering treatment, comprising preparing a solventless or solvent free type screen ink essentially based on an ultraviolet ray-curable rubber copolymer obtained by polymerizing 100 parts by weight of a liquidus dienic rubber having at least one hydroxyl group and a M.W. of 1,000–10,000, 5–190 parts by weight of a diisocyanate compound, 1–90 parts by weight of a dihydric alcohol having a M.W. of not more than 300, and 2–25 parts by weight of an ethylenically unsaturated monomer having at least one hydroxyl group; the ultraviolet ray-curable rubber copolymer having a formula:



wherein R is an alkylene group having 2–8 carbon atoms, R_1 is H or CH_3, R_2 is a residue of diisocyanate, R_3 is a residue of dihydric alcohol from which at least one hydroxyl group is removed, X is a liquidus dienic rubber having one or more hydroxyl groups from which at least one hydroxyl group is removed, l is an integer of 1–4, n is an integer of 1–12, and m

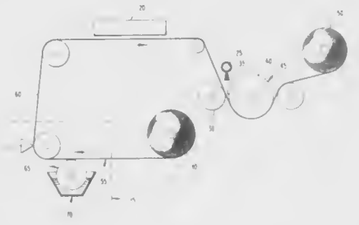
is a number of $1<m<3$, applying a coating of the ink on the surface of the substance by screen printing or thin film coating, and curing the coating of ink by irradiation with ultraviolet rays to form the temporary surface protective coating.

4,929,470

METHOD OF MAKING DECORATIVE CAST-COATED PAPER

David A. Rittenbouse, Midlothian; Fred Neurohr, Richmond, and Doug R. Estridge, Midlothian, all of Va., assignors to James River Corporation, Richmond, Va.

Filed Feb. 24, 1989, Ser. No. 315,159
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—55 16 Claims



1. A method for making a decorative cast-coated paper including particulate matter in the coating, comprising the steps of:

preparing a coating including an effective amount of particulate matter selected from the group consisting of flock, fiber, and metal flake;

coating a paper web with the coating; and

casting the coating by passing the coated paper around a casting drum.

8. The method of claim 2, wherein a heating means is used to gel the coating.

9. The method of claim 8, wherein the heating means comprises an infrared heater.

4,929,471

METHOD OF TREATING POLYESTER FABRIC

Howard Groelinger, Massapequa Park, N.Y., assignor to The Balson-Hercules Group Ltd., Pawtucket, R.I.

Filed Apr. 13, 1989, Ser. No. 338,231
Int. Cl.[5] B05D *3/02, 3/12*
U.S. Cl. 427—173 8 Claims

1. A method of treating a polyester fabric comprising the steps of:

a. exposing said fabric to a solution comprising between approximately 0.5% and 2% by weight of a wetting agent, 4% and 16% by weight of nonionic fluorocarbon long chain polymer, 1% and 6% by weight of nonionic, cationic or anionic nonsilicone based softener, 1% and 10% by weight of gum and 66% and 93½ by weight of a carrier, the nonionic fluorocarbon long chain polymer comprising a copolymer of at least 25% by weight of a fluoroalkyl monomer and an alkylvinyl ether having the formula CH_2=CH-OR wherein R represents a halogen substituted lower alkyl group, the carrier being selected from a group consisting of water, water plus a water soluble organic solvent, and a water soluble organic solvent wherein the water soluble organic solvent is of a type which can be volatilized at a temperature below 360° F. without leaving a significant residue and also of a type which can be mixed with the nonionic fluorocarbon long chain polymer without reacting therewith;

b. heating said fabric to a temperature sufficient to evaporate substantially all of the carrier thereon;

c. heating said fabric from which the carrier has been evaporated to a temperature of between 360° F. and 440° F. to effect curing of said fabric and the remaining components of said solution thereon; and

d. applying between approximately 0.5 lbs. per linear in. and 2.0 lbs. per linear in. of tension to said fabric in both longitudinal and transverse directions.

4,929,472

SURFACE-COATED SIC WHISKERS, PROCESSES FOR PREPARING THE SAME, CERAMIC REINFORCED WITH THE SAME, AND PROCESS FOR PREPARING SAID REINFORCED CERAMIC

Kanji Sugihara; Motobiro Yamamoto; Tohru Kida, and Minoru Fukazawa, all of Gotenba, Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,265
Claims priority, application Japan, Jun. 26, 1987, 62-157520; Oct. 20, 1987, 62-271644
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—215 6 Claims

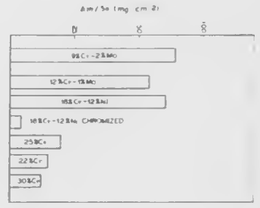
1. A process for preparing surface-coated SiC whiskers comprising the steps of dissolving a thermosetting resin in an organic solvent to prepare a perfect solution, dispersing SiC whiskers in said perfect solution, separating the SiC whiskers by filtration and drying it to remove said organic solvent, heating the whiskers coated with said thermosetting resin to cure said thermosetting resin, firing the whiskers coated with the cured thermosetting resin in a non-oxidizing atmosphere at 800 to 1,600° C. to carbonize said cured thermosetting resin to thereby form thin carbonaceous layers on the surfaces of said SiC whiskers.

4,929,473

CORROSION RESISTANCE OF LOW CARBON STEELS IN A VANADIUM, SULFUR AND SODIUM ENVIRONMENT AT HIGH TEMPERATURES

Edmundo M. Marquez, Caracas, Venezuela; Jean-Francois Nowak, Etienne, France, and Antonio Robles, Miranda, Venezuela, assignors to Intevep, S. A., Caracas, Venezuela

Continuation of Ser. No. 79,693, Jul. 30, 1987, abandoned. This application May 8, 1989, Ser. No. 349,951
Int. Cl.[5] C23C *11/04*
U.S. Cl. 427—252 7 Claims



1. A process for improving the corrosion resistance of iron alloys having a low carbon content to be used in a high temperature environment containing vanadium, sulfur and sodium, said process comprising:

providing an article formed from an iron alloy containing less than about 0.25% carbon; and

forming a diffusion coating containing aluminum and chromium on at least one surface of said element, said coating forming step comprising initially forming an aluminum diffusion coating on said at least one surface at a temperature of from about 700° C. to about 1150° C. and subse-

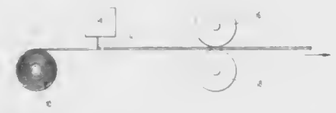
quently converting said coating into said coating containing aluminum and chromium by the diffusion of chromium at a temperature of greater than about 900° C.

4,929,474

METHOD OF MAKING HIGH QUALITY EXTRUSION COATED PAPER FOR QUALITY PRINTING

Eitan Avni; Simon Salama, both of Monroe, N.Y., and Eran Turi, Springfield, Mass., assignors to Union Camp Corporation, Wayne, N.J.

Filed Apr. 3, 1989, Ser. No. 333,163
Int. Cl.[5] B29C *47/06;* B32B *27/10*
U.S. Cl. 427—326 11 Claims



1. A process of manufacturing a polyolefin coated paper substrate having high quality printing thereon, said process comprising the steps of:

providing a highly smooth base sheet of paper;

extruding a coat of polyolefin on at least one side of the base sheet;

pressing the coat of polyolefin and the base sheet together by passing them through a nip of a pair of cooperating rollers wherein at least one of said pair of rollers is a low-friction chill roller which contacts the polyolefin coating for reducing a plurality of surface defects in said polyolefin coating which are of a size equal to or greater than a dot element of print, and

printing on said polyolefin coating.

4,929,475

NOVEL STOVING LACQUERS AND THEIR USE

Hendrikus de Jong, Maasdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands

Continuation of Ser. No. 169,717, Mar. 18, 1988, abandoned. This application Aug. 28, 1989, Ser. No. 399,363
Claims priority, application United Kingdom, Mar. 18, 1987, 8706362
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—407.1 8 Claims



1. A process for producing a stoved lacquer layer having a metallic-lacquer appearance which comprises:

selecting a stoving lacquer composition comprising a stovable transparent film-forming binder composition having dispersed therein transparent thermoplastic particles, wherein one of said binder composition or said particles is substantially colorless and the other is colored by transparent pigments, said particles being selected to be insoluble in the binder composition, to have a melting point which allows the particles after stoving to appear in the stoved lacquer in one of an independent, agglomerated or interfused but otherwise non-melted state, to have a general particle size within a range of 2 to 50 micrometers, and to have a volume ratio of binder/particles and a particle size within the said range so that, after stoving, the particles do not substantially protrude from the surface of the stoved lacquer layer and a predetermined "metallic effect" can be obtained;

applying said stoving lacquer composition to a reflective surface of a stoving-heat-resistant material having one or more reflective surfaces; and

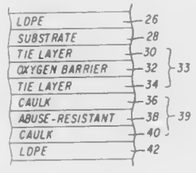
forming substantially colorless transparent zones through the thickness of the stoved lacquer layer, and forming colorless transparent zones extending only partly through the said layer, which zones appear as randomly distributed minute "windows" in the lacquer layer, by stoving the lacquer under controlled conditions with respect to curing temperature and curing time thereby effectuating a specific predetermined particle-flow and particle-agglomeration to produce a stove lacquer layer having a predetermined optical "metallic lacquer" effect wherein the particles do not substantially protrude from the surface of the stoved lacquer layer.

4,929,476

OXYGEN IMPERMEABLE LEAK FREE CONTAINER

Charles E. Gibbons; Gerald A. Marano; James M. Kittrell; Allan A. Whillock; Robert L. Lanham, all of Mobile, and Donald Evans, South Mobile, all of Ala., assignors to International Paper Company, Purchase, N.Y.

Filed May 22, 1989, Ser. No. 354,570
The portion of the term of this patent subsequent to Feb. 5, 2090, has been disclaimed.
Int. Cl.[5] B65D *5/56;* B32B *27/10*
U.S. Cl. 428—34.2 27 Claims



1. An oxygen barrier laminate structure for producing an oxygen impermeable leak free container comprising:

(a) a mechanically stable structural substrate having an inner and an outer surface;

(b) an outer layer of a heat-sealable polymer material coated on the outer surface of said mechanically stable structural substrate;

(c) a first inner sandwich layer of: a first adhesive tie layer, an oxygen barrier material layer, a second adhesive tie layer, all coated in the sequence listed on the inner surface of said mechanically stable structural substrate;

(d) a second inner sandwich layer of: a first caulking polymer resin layer, an abuse-resistant polymer resin layer, a second caulking polymer resin layer, all coated in the sequence listed on the inner surface of the second adhesive tie layer of the first inner sandwich layer, and;

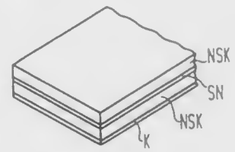
(e) an inner heat-sealable product contact polymer material layer of low density polyethylene polymer extrusion coated on said inner surface of said second caulking polymer resin layer of said second inner sandwich layer, which is heat-sealable with the outer layer of polymer material on conventional equipment at temperatures ranging from 250° F. to 500° F. and wherein said first and second caulking polymer resins are selected from the group consisting of zinc salts of ethylene methacrylic acid copolymers, sodium salts of ethylene methacrylic acid copolymers, ethylene acrylic acid copolymers, ethylene methacrylic acid copolymers, ethylene vinyl acetate copolymers, ethylene methacrylate copolymers, and ethylene based graft copolymers.

4,929,477

HEAT-SHRINKABLE SLEEVE AND THE PROCESS FOR THE PRODUCTION THEREOF

Horst Will, Hagen, Fed. Rep. of Germany, assignor to Firma RXS Schrumpftechnik-Garnituren GmbH, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,513
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723396
Int. Cl.[5] B27N *5/02*
U.S. Cl. 428—34.9 24 Claims



1. In a heat-shrinkable sleeve comprising a shrinkable component arranged with a non-shrinkable component, the improvements comprising the shrinkable component consisting of a cross-linked polymer having a shrinking temperature, said shrinkable component being elements in the form of an open grid with intersecting points of the elements forming grid cells of the grid being undetachably connected to one another at each point of intersection, said grid being embedded in the non-shrinkable component and being in a stretched condition, said non-shrinkable component being of a material that is softened at said shrinking temperature without melting and running.

4,929,478

PROTECTIVE FABRIC SLEEVES

Thomas B. Conaghan, Rock Hall, Md.; Harry F. Gladfelter, Phoenixville, Pa.; Joseph S. Kite, III, West Chester, Pa., and Marie C. Tresslar, Plymouth Meeting, Pa., assignors to The Bentley-Harris Manufacturing Company, Lionville, Pa.

Filed Jun. 17, 1988, Ser. No. 208,305
Int. Cl.[5] F16L *11/00*
U.S. Cl. 428—35.1 12 Claims



1. An elongated fabric sleeve for the protection of conduit, cable or the like elongated substrate, said sleeve being formed of a resilient heat-settable ribbon comprised of interlaced plastic monofilament material characterized by an open construction, said monofilament material being heat settable to bias said sleeve into a tubular cross-sectional configuration with the side edges of the material being biased into a partial overlapping relationship throughout substantially the entire length thereof.

4,929,479

MEDICAL BAG

Kihachi Shishido; Masami Matsuoka, both of Yokohama; Noriyuki Ishihara, Amagasaki, and Masahiro Tamura, Kyoto, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo and Fuso Pharmaceutical Industries, Ltd., Osaka, both of, Japan

Continuation of Ser. No. 82,915, Aug. 10, 1987, abandoned, which is a continuation of Ser. No. 535,117, Sep. 23, 1983, abandoned. This application May 24, 1988, Ser. No. 198,252
Int. Cl.[5] B65D *30/26, 85/00;* B32B *27/08, 27/32*
U.S. Cl. 428—35.2 6 Claims

1. A medical bag composed of a laminate having a total thickness of 0.15 to 0.6 mm comprising:

(i) an inner low-density polyethylene layer,

(ii) an intermediate layer having a thickness of 60% to 90% of the total thickness and composed of

(a) a non-hydrolyzed ethylene-vinyl acetate copolymer having a vinyl acetate content of 15% to 28% by weight;

(b) an ethylene-propylene type elastomer having a propylene content of 15 to 40 mole %, or

(c) an ethylene-butene-1 type elastomer having a butene-1 content of 8 to 20 mole %, and

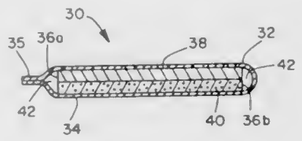
(iii) an outer low-density polyethylene layer.

4,929,480

ABSORBENT STRUCTURE FOR ABSORBING FOOD PRODUCT LIQUIDS

David G. Midkiff, Alpharetta; Carl G. Rippl, Woodstock; Nancy D. Twyman, Norcross, and Joseph D. Wahlquist, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 20, 1987, Ser. No. 75,382
Int. Cl.[5] B32B *15/16*
U.S. Cl. 428—35.6 5 Claims



1. An absorbent structure for collecting and retaining fluids released from foods comprising:

a fluid permeable top sheet,

a fluid impermeable bottom sheet, and

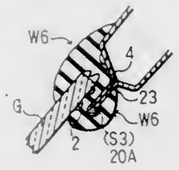
an absorbent inner core of pulp conform material positioned between and joined to said top and bottom sheets, said absorbent inner core containing between 50 and 90 percent by weight wood pulp fluff and between 10 and 50 percent by weight synthetic fibers based upon the combined weight of said wood pulp fluff and said synthetic fibers, said absorbent inner core being divided into a first layer adjacent said top sheet and a second layer adjacent said bottom sheet, said second layer having a higher synthetic fiber concentration than said first layer, said first layer being substantially devoid of a superabsorbent material and said second layer containing a superabsorbent material in a weight percent add on from 5 to 100 percent based upon the combined weight of said wood pulp fluff and said synthetic fibers in said second layer.

4,929,481

WEATHER STRIP FOR AUTOMOBILE

Tadanobu Iwasa, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jan. 24, 1989, Ser. No. 301,400
Claims priority, application Japan, Mar. 2, 1988, 63-049235; Mar. 2, 1988, 63-049236
Int. Cl.[5] B60J *1/20;* E06B *7/14*
U.S. Cl. 428—36.1 15 Claims



1. A weather strip for use in an automobile, characterized by the fact that the main body thereof is provided in the portion thereof destined to contact such sheet metal parts as a body flange and a sash with a strip of rustproofing agent retaining member comprising a core, a core coating layer, and a surface layer, said core is formed of a fabric impregnated with rustproofing agents, the amount of said rustproofing agents is in the range of 0.1 to 1 g per cm^2 of the fabric being impregnated, said core coating layer is formed of a water-diffusing material, and said surface layer is formed with a flexible planar material, and said planar material is furnished at least on the side thereof contiguous to said sheet metal parts with a water-permeating texture.

4,929,482

HEAT RESISTANT CONTAINER

Tohei Moritani; Hidemasa Oda; Toshiaki Sato; Taichi Negi; Keiji Matsumura; Syuji Kawai, all of Kurashiki; Nobuo Tanaka, Nishinomiya, and Satoshi Hirofuji, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jul. 14, 1988, Ser. No. 219,113
Claims priority, application Japan, Jul. 23, 1987, 62-184959
Int. Cl.[5] B65D *81/26*
U.S. Cl. 428—36.4 13 Claims

1. A heat resistant container suitable for retort treatment and ovenability comprising an ethylene-vinyl alcohol copolymer layer containing a drying agent and a crystalline polyester resin layer, said crystalline polyester resin layer comprising a thermoplastic polyester and a crystallization accelerator consisting essentially of a polyolefin.

4,929,483

METHOD OF REINFORCING SHEET METAL PANELS, SHAPED PLASTIC PANELS OR THE LIKE AND A STIFFENING MEMBER USABLE FOR PERFORMING THE METHOD

Paul Hälg, Richterswil, and Paul Rohrer, Herrliberg, both of Switzerland, assignors to Gurit-Essex AG, Freienbach, Switzerland

Filed Jun. 10, 1988, Ser. No. 205,314
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720267; Switzerland, Jun. 6, 1988, 2155/88
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—47 46 Claims

1. An essentially flat stiffening member for the reinforcement of a panel, comprising a first layer containing a thermosetting resin provided with reinforcing means, and a second layer containing a sticky thermosetting resin, said second layer being covered by a foil shrinking under the influence of heat and essentially freely exposing said second layer upon shrinking to



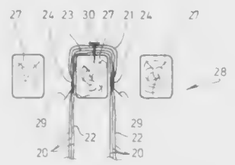
render one surface of said stiffening member sticky upon having been subjected to a heat treatment.

4,929,484

FILLING MATERIAL FOR PERCOLATING FILTERS FOR THE TREATMENT OF LIQUIDS AND PROCESS FOR PRODUCING AND ASSEMBLING IT

Hartwig Basse, Nordenham, Fed. Rep. of Germany, assignor to Norddeutsche Seekabelwerke AG, Nordenham, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 128,845
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3641960
Int. Cl.[5] B01D *39/04;* C02F *3/04*
U.S. Cl. 428—53 26 Claims



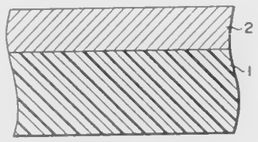
1. Filling material for percolating filters for the treatment of liquids, especially for biological sewage purification, and which is adapted to be suspended on a supporting arrangement, said material comprising a plurality of plastic strips (20) and a single holding sheet (21, 33) which connects said strips (20) to one another, said holding sheet (21, 33) being directed transversely relative to said strips longitudinal direction.

4,929,485

INFORMATION STORAGE MEDIUM AND METHOD OF MANUFACTURING THE SAME

Hideki Ohkawa, Tokyo, and Norio Ozawa, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 27, 1989, Ser. No. 302,680
Claims priority, application Japan, Feb. 1, 1988, 63-19684
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 22 Claims



1. An information storage medium comprising:

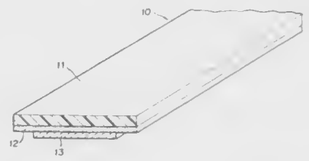
a substrate; and
a recording layer, provided on said substrate and containing carbon and M (M represents at least one type of element selected from the group consisting of a metal element, a semimetal element, and a semiconductor element),
said recording layer including an amorphous structure confirmed by X-ray diffractometry, and activation energy required to transform a state of said recording layer from said amorphous state into a crystalline state confirmed by X-ray diffractometry being not less than 1.5 eV.

4,929,486

COVER TAPE FOR SEALING CHIP-HOLDING PARTS OF CARRIER TAPE

Kazumi Itou; Kazuyoshi Ebe, and Toshio Minagawa, all of Saitama, Japan, assignors to FSK Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 224,016
Claims priority, application Japan, Jul. 24, 1987, 62-184985; Jul. 24, 1987, 62-184986
Int. Cl.[5] C09J *7/02*
U.S. Cl. 428—77 4 Claims



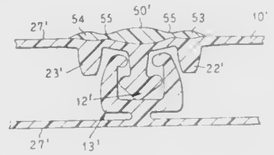
1. A cover tape for sealing chips in chip-holding parts of a carrier tape having said parts provided intermittently and longitudinally of said carrier tape, which cover tape comprises a base tape, an adhesive layer formed on only one surface of said base tape and a layer of non-adhesive radiation-cured or oxidation-cured ink pattern printed on said adhesive layer along the longitudinal direction of said base tape so that said non-adhesive layer has a width greater than that of the chips and less than that of said adhesive layer.

4,929,487

BAG MAKING MATERIAL HAVING FASTENER PROFILES AND ALIGNMENT RIBS WITH REINFORCING AND STABILIZING BEAM EFFECT RIDGE MEANS

Paul A. Tilman, New City; Zdenek Machacek, Nanuet, and Richmond Scott, Pleasantville, all of N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 95,835, Sep. 14, 1987, Pat. No. 4,672,723. This application Dec. 12, 1988, Ser. No. 282,694
Int. Cl.[5] B32B *3/28;* B65D *33/16;* A41F *1/00;* A44B *1/04*
U.S. Cl. 428—163 14 Claims



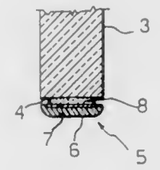
1. Bag making material including film and a male zipper profile, comprising:
an extruded plastic film;
an elongated extruded plastic male zipper profile having a base attached to said film;
an extruded plastic alignment rib having a base attached to said film in adjacent spaced parallel relation to said male profile; and
a stabilizing ridge on said film along the back of said male profile base and extending at least partially onto the back of said rib base and having a stabilizing beam effect with respect to the relation of said male profile and alignment rib.

4,929,488

PIECE OF FURNITURE MADE OF GLASS AND THE LIKE HAVING A RESTING PROFILE MEMBER OF RUBBER

Vittorio Livi, Pesaro, Italy, assignor to FIAM S.r.l., Tavullia, Italy

Filed Jul. 29, 1988, Ser. No. 225,851
Claims priority, application Italy, Jul. 30, 1987, 22136/87[U]
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—192 2 Claims



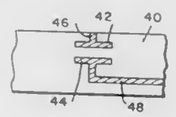
1 An item of furniture comprising at least one glass leg having a flat resting edge, said flat resting edge being provided with a rubber strip having a metal foil embedded therein, said metal foil having a size equal to or smaller than that of the rubber strip, and an adhesive means attached to the metal foil and the resting edge for making the rubber strip unitary with the leg.

4,929,489

METHOD OF MAKING AND USING SELECTIVE CONDUCTIVE REGIONS IN DIAMOND LAYERS

Gisela A. M. Dreschhoff, and Edward J. Zeller, both of 2908 W. 19th St., Lawrence, Kans. 66044

Continuation of Ser. No. 75,393, Jul. 20, 1987, abandoned. This application Mar. 9, 1989, Ser. No. 321,219
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 17 Claims



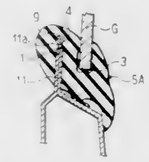
1. An electrical device comprising:
a conductive region in a diamond lattice substrate including a zone of conductive graphite below the surface of the diamond lattice and formed by localized heating of the diamond substrate;
conductor contacts at the surface of said diamond substrate in current conducting communication with said conductive region; and
a source of potential connected to said conductor contacts.

4,929,490

WINDOW FRAME RUBBER MOLDINGS FOR AUTOMOBILE

Tadanobu Iwasa, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jan. 27, 1989, Ser. No. 302,265
Claims priority, application Japan, Mar. 18, 1988, 63-066530
Int. Cl.[5] B60J *1/20*; E06B *7/14*
U.S. Cl. 428—195 **2 Claims**



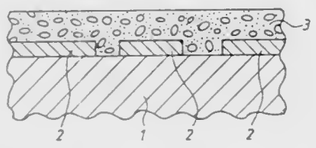
1. A window frame rubber molding for an automobile, comprising a main body incorporating therein an automobile body flange retaining groove and a glass retaining groove opening in mutually opposite directions and possessing an approximately S-shaped cross section, which window frame rubber molding is characterized by the fact that said flange retaining groove is provided in the bottom wall thereof with a strand retaining groove converted in the direction of the opening thereof and said strand retaining groove has fitted therein a strand impregnated with rustproofing agents, the amount of said rustproofing agents to be used for the impregnation of said strand being in the range of 0.1 to 20 g per 100 g of the matrix of said strand.

4,929,491

PRINTED WIRING BOARD

Shin Kawakami; Satoshi Haruyama, and Hirotaka Okonogi, all of Saitama, Japan, assignors to Nippon CMK Corp., Japan

Filed Nov. 1, 1988, Ser. No. 265,688
Claims priority, application Japan, Jun. 16, 1988, 63-148933; Jun. 16, 1988, 63-148934
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 **12 Claims**



6. A printed wiring board according to claim **4**; wherein the solder resist film-forming ink contains a foam control agent.

4,929,492

STRETCHABLE INSULATING FABRIC

Patrick H. Carey, Jr., and Charles D. Cowman, Jr., both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 77,438, Jul. 24, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 312,334
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—198 **21 Claims**

1. An elastically stretchable fabric having enhanced thermal insulation properties comprising at least one elastically stretchable fibrous carrier web having substantially uniform stretch properties and that may be repeatedly stretched and yet return to its original dimensions; and, as a separate layer different in composition from the carrier web, a thin coherent layer of blown microfibers averaging less than 10 micrometers in diameter coated on at least one surface of the carrier web, the layer of microfibers having an average weight of less than about 30 g/m^2 and being deposited on the carrier web and mechanically intertwined with the fibers of the carrier web.

4,929,493

METHOD OF APPLYING A COLORATION COATING TO A GLASS PANE

Gerhard Tünker, Dulsburg, Fed. Rep. of Germany, assignor to Flachglas Aktiengesellschaft, Furth, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,473
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1987, 3724013
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—207 **13 Claims**

1. A method of applying a coloration coating to a glass pane, comprising the steps of:

(a) forming a screen-applicable glass-frit-free coating composition of a flowable consistency from at least one flake-form or platelet-form inorganic pigment selected from the group which consists of lamellar silicates, oxides, metals, carbon and mixtures thereof in a particle size less than 40 μm, and an aluminum phosphate solution binder, said aluminum phosphate solution binder being a 50% aqueous solution containing aluminum measured as Al_2O_3 and phosphate measured as P_2O_5 in a ratio P_2O_5/Al_2O_3 of substantially 5.3 to 3.7 and is present in said composition in an amount of 15 to 20 percent by weight in terms of solids of the solution;

(b) screening said composition onto a glass pane to form a coating of said composition on at least a limited area of a surface of said pane; and

(c) thereafter firing the glass pane with said coating thereon at a temperature of substantially 550° C. to 700° C. to burn said coating onto said pane.

13. A coated automotive-vehicle glass pane made by the method of claim 1.

4,929,494

FIBROUS SUBSTRATES IMPREGNATED WITH A CURABLE COMPOSITION

Fumio Matsui; Noboru Suzuki, both of Kanagawa; Minoru Takaishi, Tokyo; Ryushi Ogura, Gunma; Noriaki Harigai, Saitama; Tadayoshi Hashimoto, and Tomoe Uematu, both of Kanagawa, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,605
Claims priority, application Japan, Mar. 5, 1986, 61-48902; Nov. 7, 1986, 61-266129; Nov. 7, 1986, 61-266121; Nov. 13, 1986, 61-270071; Nov. 13, 1986, 61-270069; Nov. 14, 1986, 61-272441; Mar. 5, 1987, 62-48903; Mar. 5, 1987, 62-48904; Apr. 16, 1987, 62-92035; Apr. 16, 1987, 62-92036; Aug. 13, 1987, 62-200895; Aug. 13, 1987, 62-200896; Aug. 13, 1987, 62-200897; Aug. 13, 1987, 62-200898
Int. Cl.[5] B32B *27/00, 27/38*
U.S. Cl. 428—286 **23 Claims**

1. A laminate comprising fibrous substrates which are impregnated with a curable composition, laminated and cured, the curable composition comprising,

(i) a curable prepolymer having a main chain consisting essentially of a random copolymer of a vinyl monomer and an acrylic or methacrylic monomer, and a side chain containing an acryloyl or methacryloyl group at the terminal, as a main component, and

(ii) a crosslinkable vinyl monomer.

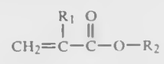
4,929,495

NONWOVEN FABRIC COATED WITH CARBOXYLATED ACRYLATE POLYMERS, AND PROCESS FOR MAKING THE NONWOVEN FABRIC

Vic Stanislawczyk, North Ridgeville, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 921,165, Oct. 20, 1986, abandoned. This application Apr. 13, 1989, Ser. No. 337,516
Int. Cl.[5] B05D *3/02*; B32B *27/10, 27/12, 27/30*; D04H *1/64*
U.S. Cl. 428—288 **23 Claims**

1. A nonwoven fibrous material comprising fibers bonded together with a binder consisting essentially of predominantly acrylate-containing, crosslinked polymer chains including repeating units derived from itaconic acid and an acrylate represented by the structure



(I)

wherein

R_1 is hydrogen or methyl;

R_2 represents C_1–C_{20} alkyl, C_2**14** C_7 alkokyalkyl, C_2**14** C_7 alkylthioalkyl, or C_2**14** C_7 cyanoalkyl;

said crosslinking is effected by a crosslinking monomer present in an amount in the range from 0.1 phr to 20 phr;

said itaconic acid is present in the range from about 1 phr to about 20 phr;

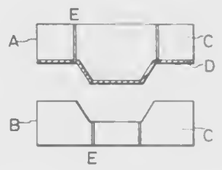
at least 40 phr of said acrylate in said polymer is present as an alkyl acrylate in which alkyl is C_4**14** C_8; said polymer in the aqueous emulsion form as suitably applied in the fabric had a concentration of at least 5 COOH groups/nm^2 of surface, near the surface of the latex particles of the emulsion, a T_g in the range from −20° C. to −60° C.; and, said non-woven fibrous material is characterized by being substantially non-blocking at ambient temperature and pressure of about 689 kPa (100 psig) and by 70% recovery upon releasing said material from under 100 psi pressure exerted for 15 min on said fabric maintained at 49° C. (120° F.).

4,929,496

ELECTROCONDUCTIVE THERMOPLASTIC RESIN MOLDED PRODUCT

Takashi Daimon; Hideshi Sakamoto, and Osamu Akimoto, all of Ichihara, Japan, assignors to Chisso Corporation, Japan

Filed Dec. 30, 1988, Ser. No. 291,958
Claims priority, application Japan, Jan. 5, 1988, 63-543; Mar. 14, 1988, 63-59795
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[5] B32B *7/00*
U.S. Cl. 428—246 **12 Claims**



1. An electroconductive thermoplastic resin molded product comprising

(a) an electroconductive thermoplastic resin sheet including a thermoplastic resin film;

(b) a non-woven fabric consisting of hot-melt-adhesive fibers and electroconductive fibers irregularly entangled with each other and applied and integrally melt-adhered to one or both surfaces of said film and then subjected to surface treatment; and

(c) a coating having a curing composition composed mainly of an unsaturated resin and a reactive diluent applied to the treated surface and crosslinked and cured and having a coating thickness of 1 to 10 μm,

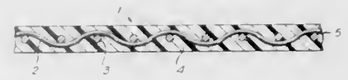
said electroconductive thermoplastic resin sheet being fixed between a pair of male and female molds at least one surface of which has a heat-resistant rubber thereat and molded between the molds to each other.

4,929,497

FLAME RETARDANT ROLLING DOOR

Larry L. Mitchell, Homer, and Crayton G. Toney, McGraw, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Mar. 27, 1989, Ser. No. 329,020
Int. Cl.[5] B32B *7/00, 25/00*
U.S. Cl. 428—265 **20 Claims**



1. A flame-retardant rolling-door panel comprising:

a flame-retardant base fabric, said base fabric woven from a monofilament yarn, said monofilament yarn extruded from a mixture of a thermoplastic material and a flame-retardant additive; and

a flame-retardant coating agent applied to the surface of said base fabric.

4,929,498

ENGINEERED-PULP WET WIPER FABRIC

Stuart P. Suskind, Greer, and Joseph H. Miller, Greenville, both of S.C., assignors to James River Corporation of Virginia, Norwalk, Conn.

Filed Jan. 31, 1989, Ser. No. 304,981
Int. Cl.[5] A01N *25/34*; A61F *13/15*; A61L *15/46*; D21H *11/16, 21/36*
U.S. Cl. 428—288 **18 Claims**

1. An antimicrobially-active nonwoven fabric suitable for use as a wet wiper that comprises fibers and an antimicrobial agent distributed on from 10% through 50% of said fibers, said antimicrobial agent being substantive to said fibers such that said antimicrobial agent is substantially prevented from diffusing from said fabric.

4,929,499

USE OF NICKEL-PHOSPHOROUS UNDERCOAT FOR PARTICULATE MEDIA IN MAGNETIC STORAGE DEVICES

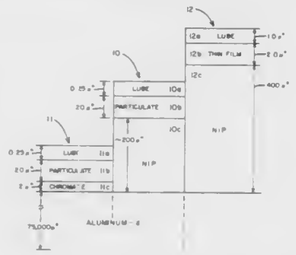
Bahram Shadzi, and Christopher A. Weaver, both of Omaha, Nebr., assignors to Magnetic Peripherals Inc., Minnetonka, Minn.

Division of Ser. No. 183,863, Apr. 20, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 380,758
Int. Cl.[5] G11B *5/66*
U.S. Cl. 428—336 **4 Claims**

1. Apparatus comprising:

a substrate:

a first layer electrolessly plated onto said substrate comprising nickel and phosphorous, and



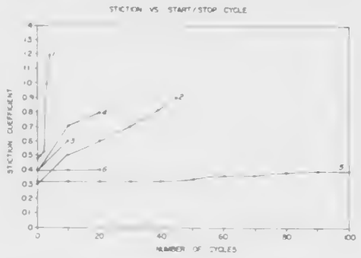
a second layer of particulate magnetic media spin-coated onto said first layer; said particulate magnetic media comprising magnetic particles suspended in a binder.

4,929,500

CORROSION RESISTANT MAGNETIC DISK

Tsutomu T. Yamashita; Ching-Cheng Shir, both of San Jose, and Tu Chen, Saratoga, all of Calif., assignors to Komag, Inc., Milpitas, Calif.

Filed Apr. 3, 1986, Ser. No. 847,990
Int. Cl.[5] G11B *5/72*
U.S. Cl. 428—336 **15 Claims**



1. A hard magnetic disk for use in magnetic induction recording comprising:

a nonmagnetic substrate;

a magnetic film of recording media formed on said substrate; and

a protective layer formed above said film, said protective layer comprising sputtered ZrO_2 and a stabilizer, said protective layer being the uppermost vacuum-deposited layer on said disk and being substantially free of other vacuum-deposited solid lubricants.

4,929,501

THERMAL TRANSFER MEDIUM

Takuji Okada, and Kunio Murakami, both of Uji, Japan, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Aug. 17, 1988, Ser. No. 233,125
Claims priority, application Japan, Aug. 18, 1987, 62-206140
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 428—337 **8 Claims**

1. Thermal transfer medium which has a heat-meltable or heat-sublimable ink layer on one side of a polymer film, wherein the film comprises at least one layer consisting of polytetramethylene adipamide homopolymer, a polyamide blend containing at least 60% by weight polytetramethylene adipamide or a copolyamide containing at least 60% by weight tetramethylene adipamide units, the polyamide containing layer having a melting point of at least 270° C.

4,929,502

FIBRILLATED FIBERS AND ARTICLES MADE THEREFROM

Robert D. Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 14, 1986, Ser. No. 918,246
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—357 **15 Claims**



1. A fibrillated monoethylenically unsaturated monomer based fiber wherein said fiber has a Canadian Standard Freeness of less than 100 in combination with a Tensile Strength of at least 5 pounds per inch.

4,929,503

COMPOSITE FIBROUS MATERIAL

Yoshikazu Shirasaki, and Yoshio Tadokoro, both of Shiga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Dec. 18, 1986, Ser. No. 943,002
Claims priority, application Japan, Dec. 19, 1985, 60-286750
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—373 **24 Claims**



1. A bundle of fibers which comprises 50 to 95% by weight of (A) polyethylene fibers having a tenacity of at least 20 g/denier and a tensile modulus of at least 500 g/denier, 5 to 50% by weight of (B) all aromatic polyamide fibers and (C) all aromatic polyester fibers, wherein the all aromatic polyamide fibers (B) and the all aromatic polyester fibers (C) have a tenacity of at least 15 g/denier and a tensile modulus of at least 500 g/denier.

6. A bundle of fibers which comprises 50 to 95% by weight of (A) polyethylene fibers having a tenacity of at least 20 g/denier and a tensile modulus of at least 500 g/denier and 5 to 50% by weight of (C) all aromatic polyester fibers, wherein the all aromatic polyester fibers (C) have a tenacity of at least 15 g/denier and a tensile modulus of at least 500 g/denier.

4,929,504

ETHER SULFONATES AS ANTISTATIC AGENTS

Rudolf Veitenhansl, Haan; Wolfgang Froeschke, Wuppertal, and Robert Piorr, Ratingen-Hoesel, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 772,836, Sep. 5, 1985, Pat. No. 4,826,998.
This application Feb. 3, 1989, Ser. No. 306,377
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435841
Int. Cl.[5] B32B *27/34*
U.S. Cl. 428—395 **20 Claims**

1. A process for controlling static on plastic surfaces comprising applying to a plastic surface an antistatic quantity of a water-soluble sulfonic acid salt of the formula:

$$Y^{(+m)}(^{\ominus}O_3S{-}R^3{-}O(C_nH_{2n}O)_x{-}R^1)_m \quad (IV)$$

wherein m is 1 or 2, R^3 is a C_{10}–C_{22} alkenylene, hydroxyalkylene, or hydroxyalkenylene group, R^1 is a C_1–C_{12} alkyl group, n is an integer of from 2 to 4, x is an integer of from 0 to 35, and y is an alkali metal cation, an alkaline earth metal cation, the ammonium cation or a C_2–C_9 alkanolammonium cation.

10. A process in accordance with claim 1 wherein the plastic surface is the surface of a synthetic fiber.

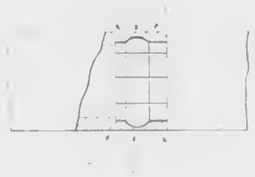
11. A process in accordance with claim 10 wherein the synthetic fiber is a polyamide fiber.

4,929,505

CARBON-CARBON COMPOSITE STRUCTURAL ASSEMBLIES AND METHODS OF MAKING THE SAME

Robert M. Washburn, Santa Clara, and Jerry D. Dodson, Fremont, both of Calif., assignors to Acurex Corporation, Mt. View, Calif.

Filed Dec. 30, 1986, Ser. No. 947,760
Int. Cl.[5] B32B *9/00*
U.S. Cl. 728—408 **34 Claims**



15. A structural assembly, comprising:

(a) first and second carbon-carbon composite structures having predetermined first and second surface segments, respectively, at least one of said surface segments being sufficiently resilient such that said surface segments engage one another in a compression fitted manner without the aid of external forces, whereby to hold said structures together; and

(b) a layer of charred material disposed between said surface segments for fixedly connecting said composite structures together, said charred material being the result of coating a char forming but uncharred material over at least one of said surface segments prior to engaging said surface segments to one another and after so engaging these surface segments subjecting the coated char forming material to a heated environment sufficient to char the material.

4,929,506

COATED POLYCARBONATE ARTICLES

Stuart R. Kerr, III, Evansville, and James E. Moore, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1987, Ser. No. 140,084
Int. Cl.[5] B32B *27/36;* **B29D** *11/00*
U.S. Cl. 428—412 **16 Claims**

1. A polycarbonate article is coated with the photoreaction product of a composition, said composition consisting essentially of:

(a) from 50% by weight to 90% by weight of an acrylated urethane oligomer, which has a molecular weight of from about 800 to about 50,000 and a degree of functionality of from 1 to about 4;

(b) from 10% by weight to about 50% by weight of a difunctional acrylate monomer; and

(c) a photosensitizing amount of a photosensitizer;

wherein relative proportions of the acrylated urethane oligomer and the difunctional acrylate monomer are such as to provide a flexible, thermoformable cured coating.

4,929,507

HEAT-RESISTANT PAINT COMPRISING POLYMETALLOCARBOSILANE

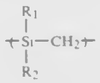
Yoshio Nishihara, Ube; Noriyuki Isobe, Kyoto, and Satoshi Kotera, Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Continuation of Ser. No. 900,381, Aug. 26, 1986, abandoned.
This application Mar. 23, 1988, Ser. No. 172,962
Claims priority, application Japan, Aug. 27, 1985, 60-186591; Sep. 4, 1985, 60-193786
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[5] C08K *3/00, 3/14, 3/38*
U.S. Cl. 428—447 **8 Claims**

1. A heat-resistant paint comprising a dispersion or solution of a polymetallocarbosilane and an inorganic filter in an organic solvent,

wherein said polymetallocarbosilane is an organometallic polymer having a number average molecular weight of 400 to 50,000 comprising

(A) carbosilane bond units of the formula



wherein R_1 and R_2 may be identical or different and each represents a lower alkyl group, a phenyl group or a hydrogen atom, and

(B) metalloxane bond units of the formula

—M—O—

wherein M represents at least one element selected from the group consisting of Ti, Zr, Cr and Mo, and optionally at least a part of each of the above elements has at least one lower alkoxy group or a phenoxy group as a side-chain group, in which the bond units (A) and (B) are bonded at random in the main-chain skeleton, and/or at least one of the silicon atoms of the bond units (A) is bonded to each of the above elements of the bond units (B) via an oxygen atom, whereby the polycarbosilane portion obtained by chaining of the bond units (A) is crosslinked with the bond units (B), and in which the ratio of the total number of the bond units (A) to the total number of bond units (B) is in the range of from 1:1 to 10:1;

wherein said inorganic filter is at least one material selected from the group consisting of oxides, borates, phosphates, silicates, silicides, borides, nitrides and carbides: and

wherein said inorganic filler is present is an amount of 10 to 900 parts by weight per 100 parts by weight of said polymetallocarbosilane.

4,929,508

NOVEL DRUG DELIVERY SYSTEM FOR ANTITUSSIVES

Shri C. Sharma, Mendham; James J. Shaw, Morristown, and Robert K. Yang, Morris Plains, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 701,470, Feb. 14, 1985, Pat. No. 4,797,288, which is a continuation-in-part of Ser. No. 658,101, Oct. 5, 1984, Pat. No. 4,752,485. This application Jul. 26, 1988, Ser. No. 224,601

Int. Cl.[5] A61K *47/00*

U.S. Cl. 424—439 **21 Claims**



1. A dry particulate drug delivery system designed to be chewed or swallowed whole comprising:

(A) an antitussive in an amount of about 1% to about 75%; and

(B) a hydrophobic matrix comprising

(i) about 0.5% to about 20% by weight of an emulsifier; and

(ii) about 61% to about 95% by weight of an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of (a) fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; and

(iii) at least one glyceride, wherein the antitussive and hydrophobic matrix form an agglomerate, and

(C) a coating surrounding said agglomerate effective to delay hydration until ingested comprising about 200% to about 400% by weight of the agglomerate an edible material having a melting point in the range of about 25° C. to about 100° C. selected from the group consisting of (a) fatty acids having an iodine value of about 1 to about 10, (b) natural waxes, (c) synthetic waxes and (d) mixtures thereof; wherein the coating forms a protective barrier effective to prevent unpleasant taste perception for the antitussive agglomerate.

4,929,509

ADHESIVES BASED ON AMORPHOUS PROPYLENE/HEXENE COPOLYMERS

Darryl A. Godfrey, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1988, Ser. No. 215,681

Int. Cl.[5] B32B *15/08, 27/32, 21/08;* C08L *23/20*

U.S. Cl. 428—461 **26 Claims**

1. A hot-melt adhesive composition suitable for making a glue gun stick comprising a blend of:

(1) about 40 to 80 weight percent of an unmodified substantially amorphous propylene-hexene copolymer having a melt viscosity of about 2,000 to 30,000 cps at 190° C.; and an amount of 1-hexene of from about 6 to less than 15 mole percent; and

(2) about 60 to 20 weight percent of at least one compatible tackifying resin;

wherein said adhesive composition has substantially no amount of plasticizing oil, is non-tacky at room temperature, has a bond strength of at least about 150 pounds on oak and a time to bond failure greater than about 2 minutes using ASTM Procedure D-1002 with a tensile tester crosshead speed of 0.05 inches per minute; and a good to excellent bond flexure rating.

4,929,510

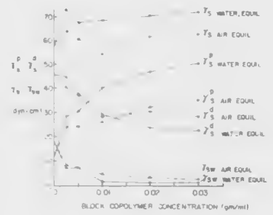
BIOCOMPATIBLE POLYMER ARTICLES

Eli Ruckenstein, Amherst, N.Y., and Dennis B. Chung, Upper Marlboro, Md., assignors to State University of New York, Albany, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,731

Int. Cl.[5] B32B *27/30*

U.S. Cl. 428—520 **15 Claims**



1. A polymer article comprising

(a) a hydrophobic polymer substrate having a substrate surface; and

(b) a block copolymer having at least first and second blocks within each of the molecules of the block copolymer, the first block being more hydrophobic than the second block, the molecules of said block copolymer being secured into the surface of said substrate by means of the first block and at least a portion of the second block outwardly extending from the surface.

4,929,511

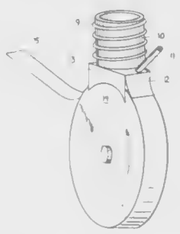
LOW TEMPERATURE ALUMINUM BASED BRAZING ALLOYS

Richard L. Bye, Jr., Morristown; Debasis Bose, Piscataway; Santosh K. Das, Randolph; Amitava Datta, Morris Township, Morris County, and Colin M. Adam, Morristown, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 169,123, Mar. 9, 1988, Pat. No. 4,838,341. This application Aug. 1, 1988, Ser. No. 226,924

Int. Cl.[5] B23K *35/28*

U.S. Cl. 428—606 **3 Claims**



1. A rapidly solidified foil having a thickness ranging from about 25 μm to about 100 μm and a composition consisting

essentially of about 10 to 13 weight percent Si, 0 to 3 weight percent Mg, 0 to 4 weight percent Cu, 0 to 0.2 weight percent of at least one of Bi, P, Sr, Li, Sc, Y, Na, Ca, and 0 to 2 weight percent of at least one of the rare earth elements, the balance being aluminum and incidental impurities, said foil being capable of being bent to a round radius of about 0.16 cm without fracturing and having silicon particles distributed therethrough with an average silicon partcial size of less than 1 μm.

4,929,512

METAL AND COMPOSITE MATERIAL MADE OF THE METAL AND RUBBER

Yoshifumi Nishimura; Susumu Yamamoto; Hidekazu Nakata, all of Itami; Kiyoshige Muraoka, Kobe; Mamoru Uchida, Akashi, and Takafumi Taguchi, Nishinomiya, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Sumitomo Rubber Industries, Ltd., Hyogo, both of, Japan

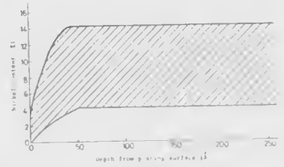
PCT No. PCT/JP88/01081, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO89/03901, PCT Pub. Date May 5, 1989

PCT Filed Oct. 25, 1988, Ser. No. 362,416

Claims priority, application Japan, Oct. 26, 1987, 62-271455; Mar. 3, 1988, 63-50931; Apr. 22, 1988, 63-101012

Int. Cl.[5] B32B *15/06*

U.S. Cl. 428—610 **3 Claims**



1. A metal plated with a copper/zinc/nickel ternary alloy plating comprising 60 to 75 per cent by weight of copper, 4 to 14 per cent by weight of nickel and the remainder of zinc, and the content of nickel being not more than 4 per cent by weight at the outer surface of the plating, increasing gradually with depth from the outer surface to the depth of 50 angstroms, and being about 4 to 14 per cent by weight in the deeper area.

4,929,513

PREFORM WIRE FOR A CARBON FIBER REINFORCED ALUMINUM COMPOSITE MATERIAL AND A METHOD FOR MANUFACTURING THE SAME

Tetsuyuki Kyono; Seiichiro Ohnishi, both of Shiga; Tohru Hanano, Kyoto, and Tohru Hotta, Shiga, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 208,039

Claims priority, application Japan, Jun. 17, 1987, 62-149085

Int. Cl.[5] C22C *1/09;* B32B *15/14*

U.S. Cl. 428—611 **15 Claims**

1. A preform wire for manufacturing a carbon fiber reinforced aluminum composite material comprising:

a continuous fiber bundle of carbon filaments having a $\frac{3}{4}$-width ranging from 25 to 75 cm^{-1}, as measured on the basis of Raman spectroscopy, said $\frac{3}{4}$-width corresponding to $\frac{3}{4}$ of the peak level of a Raman band obtained corresponding to a wave number of about 1,585 cm^{-1}, said peak level attributed to E_{2g} symmetric vibration of a graphite structure;

one or two materials selected from the group consisting of carbon, silicon carbide, titanium, titanium carbide, boron, and titanium boride, said one or two materials covering each of the filaments constituting said continuous fiber bundle; and

a matrix consisting essentially of aluminum or aluminum alloy each of which contains not more than 0.1% of copper and not more than 0.45% of silicon, both based by weight on the weight of the matrix, and infiltrated into said continuous fiber bundle.

4,929,514

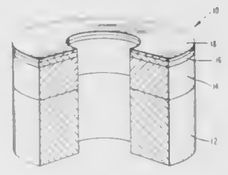
THIN FILM MEDIA FOR HIGH DENSITY LONGITUDINAL MAGNETIC RECORDING

Bangalore R. Natarajan, Cupertino, and Robert G. Walmsley, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 22, 1988, Ser. No. 171,587

Int. Cl.[5] H01F *10/00*

U.S. Cl. 428—611 **23 Claims**



21. The disc of claim 19 wherein said magnetic layer consists essentially of about 3 to 10 at% platinum, 14 to 16 at% chromium, and the balance cobalt.

4,929,515

INSULATING ARRANGEMENT FOR OPTICAL INSULATION OF INTEGRATED COMPONENTS AND THE METHOD OF MANUFACTURE

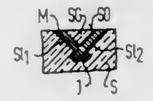
Richard Matz, Feldkirchen/Westerham, and Jutta Zirrgiebel, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 302,480

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805278

Int. Cl.[5] B32B *15/00*

U.S. Cl. 428—614 **6 Claims**



1. An arrangement for optical insulation of an optical component on a substrate for integrated optical devices, said arrangement comprising insulating means for insulating a substrate region from a remaining portion of the substrate, said insulating means being formed by at least two slots formed in the substrate and extending obliquely in from a substrate surface to intersect each other in the interior of the substrate to form a substrate region therebetween having a monolithic connection to the remaining portion of the substrate at least at one end, said substrate region having a size determined by the spacing of the slots at the surface of the substrate and a length defined by the length of the two slots.

4,929,516

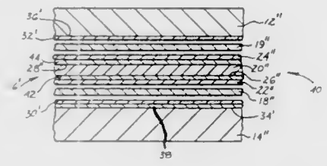
SEMICONDUCTOR DIE ATTACH SYSTEM

Michael J. Pryor, Woodbridge; Julius C. Fister, Hamden; Narendra N. Singhdeo, New Haven; Deepak Mahulikar, Meriden, and Satyam C. Cherukuri, West Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 740,789, Jun. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 711,868, Mar. 14, 1985, abandoned. This application Feb. 10, 1986, Ser. No. 826,808

Int. Cl.[5] **B32B** *15/00*

U.S. Cl. 428—620 **6 Claims**



1. A semiconductor die attach system adapted for attaching a semiconductor die to a substrate, comprising:

a substrate having an oxidation resistant layer on a surface adapted to have the semiconductor die attached thereto, said oxidation resistant layer being of a material selected from the group consisting of gold, silver, palladium, platinum and alloys thereof, said substrate further having a barrier layer between said oxidation resistant layer and said substrate, said barrier layer being of a material selected from the group consisting of nickel, cobalt and alloys thereof;

a semiconductor die having an oxidation resistant layer on a surface;

means disposed between and bonded to said substrate and said semiconductor die for dissipating thermal stress from thermal cycling of said substrate and die, the thermal stress dissipating means comprising:

a thin buffer component having a coefficient of thermal expansion of between about 35×10^{-7} to about 100×10^{-7} in/in/°C.;

bonding means for bonding said buffer component to said substrate and to said surface of said die having said oxidation resistant layer, said bonding means comprising first and second layers of bonding material disposed against opposite bonding surfaces of said buffer component, said bonding material being an alloy of silver-tin having from about 20% by weight to about 40 % by weight silver;

first and second oxidation resistant layers arranged between said first and second layers of bonding material and said opposite bonding surfaces of said buffer component, said first and second oxidation resistant layers being selected from the group consisting of gold, silver, palladium, platinum and alloys thereof; and

first and second barrier layers arranged between said first and second oxidation resistant layers, respectively, and said buffer component, said first and second barrier layers being selected from the group consisting of nickel, cobalt and alloys thereof.

4,929,517

ELECTROCHEMICAL CELL ASSEMBLY

Warren L. Luoma, Manchester, Conn.; Ronald G. Martin, Monson, Mass., and Richard D. Breault, Coventry, Conn., assignors to International Fuel Cells Corp., South Windsor, Conn.

Division of Ser. No. 246,246, Sep. 19, 1988. This application Oct. 31, 1989, Ser. No. 429,893

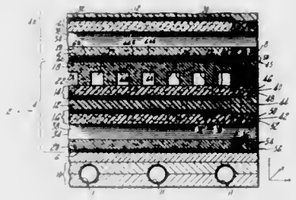
Int. Cl.[5] **H01M** *2/00*

U.S. Cl. 429—34 **19 Claims**

1. An electrochemical cell assembly which includes a pair of adjacent gas porous plates having electrically and thermally conductive particles joined together leaving a void structure therebetween, the plates being joined together to form an integral structure that is electrically and thermally conductive and which includes a region that blocks the flow of gas and electrolyte, wherein the improvement comprises:

a first porous plate having electrically and thermally conductive particles which are joined together leaving a void structure therebetween, the first plate having a first surface which has a boundary defined by the particles;

a second porous plate having electrically and thermally conductive particles which are joined together leaving a void structure therebetween, the second plate having a second surface which has a boundary defined by the particles, the second surface being spaced from the first surface leaving a region therebetween; and,



binder which is disposed in the region between the plates, the binder extending through the boundary of the first plate into the void structure to form a first layer of particles in binder in the first plate, and extending through the boundary of the second plate into the void structure to form a second layer of particles in binder in the second plate;

wherein electrically and thermally conductive particles are disposed in the region between the plates in the binder to form a third layer of particles in binder, the third layer having a first surface adjacent to the first surface of the first porous plate and a boundary defined by the particles of the third layer which is merged with the boundary of the first porous plate, the third layer having a second surface adjacent to the second surface of the porous plate and a boundary defined by the particles of the third layer which is merged with the boundary of the second porous plate.

4,929,518

SEALED LEAD-ACID STORAGE BATTERY

Minoru Yoshinaka, Osaka; Koujirou Matsuo, Chigasaki; Kiichi Koike, Fujisawa; Yoshie Suzuki, and Mansaku Sugimoto, both of Chigasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP87/00164, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/05749, PCT Pub. Date Sep. 24, 1987

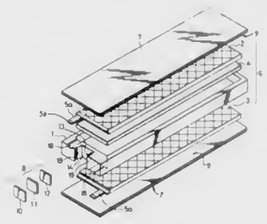
PCT Filed Mar. 16, 1987, Ser. No. 138,458

Claims priority, application Japan, Mar. 19, 1986, 61-62125; Mar. 20, 1986, 61-62222

Int. Cl.[5] **H01M** *2/12, 2/02, 6/04*

U.S. Cl. 429—54 **10 Claims**

1. A sealed lead-acid storage battery comprising a group of electrodes consisting of a positive electrode, a negative electrode, and a separator sandwiched between two metal plates having a polyolefin resin film or sheet laminated on one surface thereof such that said polyolefin resin layers of said metal plates face said group of electrodes, said group of electrodes is hermetically sealed in a casing made of said polyolefin resin, said casing is thermally bonded to a periphery of said group of electrodes and a peripheral rim of said metal plates, said battery further comprising, a protruding portion of a positive electrode and a negative electrode coated with an epoxy resin and again coated with said polyolefin resin on said epoxy resin layer, said resulting protruding portions are sandwiched between said casing and said metal plates having said polyolefin layer so that said group of electrodes is hermetically sealed and



said protruding portions are hermetically sealed between said casing and said resin layer surfaces of said metal plates, with an uncoated edge of said protruding portions in direct contact with a film-removed portion of an adjacent metal plate.

4,929,519

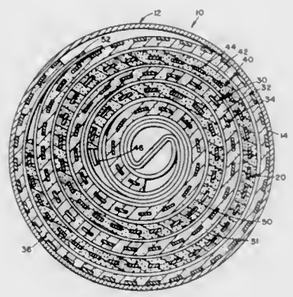
WOUND ELECTRODE ASSEMBLY FOR AN ELECTROCHEMICAL CELL

Arthur J. Catotti, Gainesville, Fla., assignor to Gates Energy Products, Inc., Gainesville, Fla.

Filed Jul. 20, 1989, Ser. No. 383,376

Int. Cl.[5] **H01M** *6/10*

U.S. Cl. 429—94 **30 Claims**



1. In a sealed electrochemical cell having a wound electrode assembly positioned within a container, said electrode assembly having at least one electrode comprised of an electrically conductive substrate and an electrochemically active material secured to at least one face of the substrate, said one electrode defining an outer wrap for said electrode assembly, the improvement comprising:

at least a portion of said substrate on one side thereof in said outer wrap being free of electrochemically active material and directly contacting a portion of said container, and said electrochemically active material being secured to at least a portion of the substrate in said outer wrap on the other side thereof directly opposite said one side making contact with the container.

4,929,520

RECHARGEABLE ALKALINE MANGANESE DIOXIDE-ZINC CELL WITH LOW INTERNAL RESISTANCE AND IMPROVED CYCLE LIFE

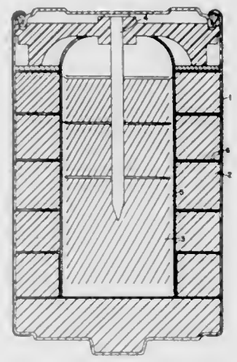
Karl Kordesch, and Wilhelm Harer, both of Graz, Austria, assignors to Battery Technologies Inc., Canada

Filed Apr. 10, 1989, Ser. No. 335,290

Claims priority, application Canada, Apr. 11, 1988, 563843

Int. Cl.[5] **H01M** *2/18, 6/10*

U.S. Cl. 429—94 **8 Claims**



1. Rechargeable alkaline manganese dioxide—zinc cell of the type comprising a metal container including a porous cathode consisting of a plurality of adjoining blocks, a zinc anode and a separator separating the cathode and anode, and an electrolyte impregnating said cathode and contacting with said separator and anode, characterized in that an electrically conducting cloth member is arranged between said blocks, said member comprising fibres wetted by said electrolyte to increase conductivity between said electrolyte and said blocks.

4,929,521

SOLID ELECTROLYTE BATTERY

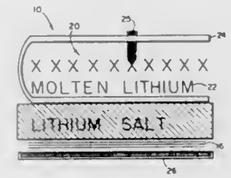
Robert A. Cipriano, Lake Jackson; R. Vernon Snelgrove, Damon, and Francis P. McCullough, Jr., Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 250,789, Sep. 28, 1988, Pat. No. 4,886,715, which is a continuation-in-part of Ser. No. 4,003, Jan. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 3,974, Jan. 16, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 265,653

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] **H01M** *6/18*

U.S. Cl. 429—102 **10 Claims**



1. In a primary rechargeable electrical energy storage device comprising at least one cell having an anode, a cathode and a solid electrolyte, the improvement which comprises said elec-

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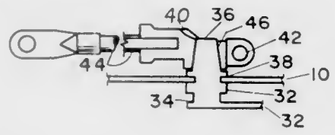
trolyte comprising a lithium salt of an aliphatic acid having 10 to 24 carbon atoms.

4,929,522

HIGH CURRENT CAPACITY ELECTRICAL CORROSIVE ELECTROLYTE BATTERY ELECTRICAL INTERCONNECTION SYSTEM

Edwin J. Ward, P.O. Box 482, Hatch, N. Mex. 87937, and Thomas C. Ward, II, P.O. Box 215, Carrizozo, N. Mex. 88301

Filed Dec. 19, 1988, Ser. No. 286,504
Int. Cl.[5] H01M *2/32*
U.S. Cl. 429—178 **3 Claims**



1. A battery electrical connection system for use with corrosive electrolyte batteries comprising;
   a. a plurality of battery terminals, each being integrally attached to a plate strap within a battery;
   b. a plurality of conductor cables, each securely cast and engaged into one of said battery terminals to form an electrical connection;
   c. conductor cable insulation;
   d. a plurality of battery seals integral with and extending the exterior of said battery over said electrical connections, wherein said seals electrically and chemically isolate each of said electrical connections;
   e. a conductor cable terminal lug connector; and
   f. an insulated ungrounded connector;
   wherein one of said conductor cables is securely engaged into one of said battery terminals to provide an electrical connection within a battery; and wherein said cable insulation covers each of said conductor cables above said electrical connection between said conductor cables and said battery terminals; and wherein said battery case seals are integral with and extend the exterior of said battery over said battery terminals, said conductor cables, and said cable insulation; and wherein said conductor cable terminal lug connector extends from one of said conductor cables and connects to a common ground for a battery load; and wherein said insulated ungrounded connector extends from the other of said conductor cables and connects to an ungrounded battery load terminal for completion of an electrical circuit.

4,929,523

LIGHT CONTROL SHEETS

Shinichiro Kitayama, Minoo; Teruho Adachi, Hirakata; Masahiro Ueda, Minoo; Yuichi Aoki, Tsukuba; Satoshi Shiiki, Yokohama; Akio Takigawa, Nishinomiya; Motoaki Yoshida, Kawanishi; Naoya Imamura, Fujinomiya; Koichi Maeda, Nishinomiya, and Hisayuki Kayanoki, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company Limited and Nippon Sheet Glass Co., Ltd., both of Osaka, Japan

Filed Dec. 16, 1987, Ser. No. 133,603
Claims priority, application Japan, Dec. 18, 1986, 61-302500; Jun. 11, 1987, 62-146564; Jun. 11, 1987, 62-146565; Aug. 7, 1987, 62-197833; Aug. 7, 1987, 62-197834; Aug. 7, 1987, 62-197836; Aug. 7, 1987, 62-197837
Int. Cl.[5] G03F *1/02*
U.S. Cl. 430—4 **10 Claims**

1. A light control sheet capable of scattering a plurality of incident lights each of particular incident angle, said sheet being produced according to a process comprising a first step of preparing a film of a composition composed of at least two photopolymerizable components having different refractive indexes and irradiating on said film a light from a particular direction to obtain a first cured film, a second step of preparing on the first cured film a film of a composition composed of at least two photopolymerizable compositions having different



refractive indexes and irradiating on said film a light from a particular direction different from that in the first step to obtain a second cured film on the first cured film, and a step of repeating the second step, if desired.

4,929,524

ORGANIC PHOTO CONDUCTIVE MEDIUM

Kunihiro Sakai, Yamato; Toshihiko Miyazaki, Atsugi; Ken Eguchi, Atsugi; Haruki Kawada, Atsugi; Yoshinori Tomida, Atsugi; Toshiaki Kimura, Sagamihara; Hiroshi Matsuda, Yokohama; Kiyoshi Takimoto, Atsugi, and Kenji Saito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 99,345
Claims priority, application Japan, Sep. 12, 1986, 61-213973; Sep. 12, 1986, 61-213974; Sep. 12, 1986, 61-213975; Sep. 12, 1986, 61-213976; Sep. 12, 1986, 61-213977
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—56 **58 Claims**

1. An organic photoconductive medium, comprising a substrate having an uneven pattern and an organic photoconductive layer which exhibits an insulating property in the direction of a layer thickness and a photoconductive property in the direction of a layer plane and which is provided on the substrate, an anisotropic property being imparted to the photoconductive property of the photoconductive layer in the direction of a layer plane, wherein the photoconductive organic layer is the monomolecular film of a photoconductive organic compound having a hydrophobic site and a hydrophilic site in one molecule or a built-up film thereof.

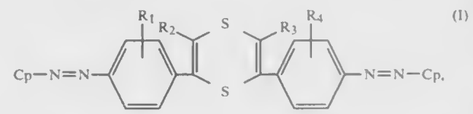
4,929,525

PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY CONTAINING AZO OR DISAZO

Masami Kuroda; Yoshimasa Hattori, and Noboru Furusho, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd.

Filed Dec. 6, 1988, Ser. No. 283,060
Claims priority, application Japan, Dec. 8, 1987, 62-310508; Dec. 8, 1987, 62-310509; Dec. 23, 1987, 62-325962; Jan. 13, 1988, 63-5138; Jan. 18, 1988, 63-7681
Int. Cl.[5] G03G *5/06*
U.S. Cl. 430—75 **18 Claims**

1. A photoconductor for electrophotography, comprising:
   an electroconductive substrate; and
   a photosensitive layer formed on said electroconductive substrate and including at least one azo compound represented by the following general formula (1) as a charge generating substance:



wherein each of R_1, R_2, R_3 and R_4 stands for a hydrogen atom, a halogen atom, a hydroxy group, an alkyl group, an alkoxy group, an allyl group, an aryl group, an aralkyl group, a carboxyl group, or an ester group, and
wherein C_p stands for a residual group of a coupler.

4,929,526

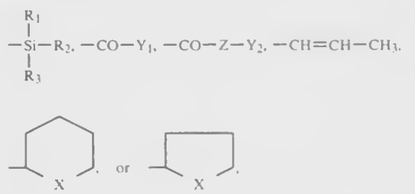
ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE PRECURSOR

Eiichi Kato; Kazuo Ishii; Ryosuke Itakura, and Hidefumi Sera, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 17,408, Feb. 24, 1987, abandoned. This application Mar. 7, 1989, Ser. No. 319,895
Claims priority, application Japan, Feb. 24, 1986, 61-37321; Mar. 12, 1986, 61-52364
Int. Cl.[5] G03G *5/087*
U.S. Cl. 430—87 **54 Claims**

1. An electrophotographic lithographic element produced by a process comprising an electrophotographically imaging a lithographic printing plate precursor comprising a conductive support having provided thereon at least one photoconductive layer containing photoconductive zinc oxide and a resin binder followed by subjecting said photoconductive layer to an oil-desensitization treatment, wherein said resin binder comprises a resin containing at least one functional group per molecule thereof capable of forming at least one hydroxyl group upon being decomposed by said oil-desensitization treatment, wherein said resin contains at least one functional group per molecule thereof represented by formula (I):

wherein L represents



wherein R_1, R_2, and R_3 each represents a hydrogen atom, a hydrocarbon group, or —O—R', wherein R' represents a hydrocarbon group; X represents a sulfur atom or an oxygen atom; Y_1 represents a substituted straight chain or branched chain alkyl group having 1 to 6 carbon atoms; Y_2 represents a hydrocarbon group; and Z represents an oxygen atom, a sulfur atom or -NH- or wherein said resin contains at least one functional group in which at least two hydroxyl groups spaced sterically close together are protected with one protective group.

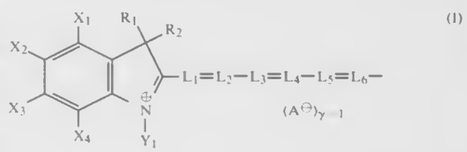
4,929,527

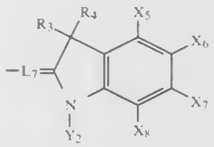
METHOD OF IMAGE FORMATION WHICH INCLUDES SCANNING EXPOSURE PROCESS

Eiichi Kato; Shigeru Ohno; Kazuo Ishii, and Ryosuke Itakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

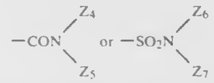
Filed Apr. 22, 1988, Ser. No. 185,181
Claims priority, application Japan, Apr. 22, 1987, 62-97523
Int. Cl.[5] G03G *5/09, 13/22*
U.S. Cl. 430—92 **9 Claims**

1. A method of electrographic image formation which comprises exposing a photosensitive body comprising a photoconductive composition to a scanning laser beam and developing the exposed photosensitive body,
   wherein said photoconductive composition comprises at least an inorganic photoconductor, a spectral sensitizing dye and a cyclic acid anhydride dispersed in a binding resin, said cyclic acid anhydride being present in an amount of from 0.0001 to 1.0 part by weight per 100 parts by weight of said photoconductor,
   wherein said dye is a compound containing at least one carboxyl group, sulfo group and/or phospho group and is represented by formula (1),





wherein R_1, R_2, R_3 and R_4 may be the same or different and each represents an alkyl group,
wherein L_1 to L_7 may be the same or different each is a substituted or unsubstituted methine group,
wherein X_1 to X_8 may be the same or different and each is a hydrogen atom; a carboxyl group; a sulfo group; a halogen atom; a nitro group; a cyano group; a substituted or unsubstituted alkyl group; a substituted or unsubstituted aralkyl group; a substituted or unsubstituted aryl group; an OZ_1, $—OCOZ_2$ or $—COOZ_3$ group wherein Z_1, Z_2 and Z_3 may be the same or different and each represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aromatic group or a substituted or unsubstituted heterocyclic group; a



group wherein Z_4, Z_5, Z_6 and Z_7 may be the same or different and each represents a hydrogen atom, a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aromatic group, or Z_4, Z_5 or Z_6 and Z_7 together, with the adjacent atom, N, form a heterocyclic group,
with the further proviso that X_5 and X_6 may be connected to each other to form a benzene ring,
with the even further proviso that at least one of X_1 to X_8 represents a group other than a hydrogen atom;
wherein Y_1 and Y_2 may be the same or different and each is a substituted or unsubstituted alkyl group;

A $\ominus$ represents an anion;
γ represents 1 or 2, further providing that when Y_1 and/or Y_2 contains a sulfo or phospho group, γ is 1.

4,929,528

COATED CARRIER FOR DEVELOPER

Masayoshi Shinoki; Masahiro Takagi; Ikutaroh Nagatsuka; Koichi Kumashiro; Takayoshi Aoki, and Masayuki Takeda, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 267,882
Claims priority, application Japan, Nov. 5, 1987, 62-278362; Nov. 5, 1987, 62-278363
Int. Cl.[5] G03G *9/14*
U.S. Cl. 430—108 **13 Claims**

1. A carrier for a developer comprising a core material coated with a coating material consisting essentially of a copolymer of vinylidene fluoride and trifluorethylene.

4,929,529

METHOD OF INCREASING SENSITIVITY OF DIGITAL PHOTOSENSITIVE MEMBER

Koichi Kinoshita, 34-13, Nishi-Kusabuka-Cho, Shizuoka-Shi, Shizuoka-Ken, Jnpan

Filed Oct. 20, 1988, Ser. No. 260,601
Claims priority, application Japan, Dec. 26, 1987, 62-331308
Int. Cl.[5] G03G *5/02*
U.S. Cl. 430—127 **21 Claims**

1. A method for increasing the sensitivity to a light signal of a digital photosensitive member which undergoes an avalanche effect when illuminated with light above a threshold intensity level, comprising
uniformly illuminating said photosensitive member with light at an intensity level below said threshold level required to trigger said avalanche effect, and
illuminating said photosensitive member with said light signal during said uniform illumination, the total intensity of said uniform illumination and said light signal being greater than said threshold level.

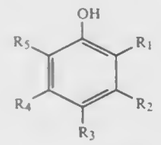
4,929,530

LIGHT IMAGE FORMING MATERIAL AND IMAGE-RECORDING METHOD USING SUCH

Keiso Saeki, and Tosiaki Endo, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

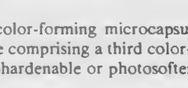
Filed Mar. 16, 1989, Ser. No. 324,504
Claims priority, application Japan, Mar. 16, 1988, 63-62146; Apr. 1, 1988, 63-80281
Int. Cl.[5] G03C *1/72*
U.S. Cl. 430—138 **18 Claims**

1. A light image forming material comprising:
a support;
(A) at least one member selected from the group consisting of oxidative-developable leuco dyes;
(B) at least one member selected from the group consisting of photo-oxidizing agents;
(C) at least one reducing agent; and
(D) at least one organic sulfonamide compound and/or at least one member selected from the group consisting of hydroxy compounds represented by the following Formula (I) or (II),

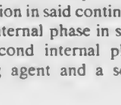


(I)

wherein R_1, R_2, R_3, R_4 and R_5, which may be the same or different, each represents a hydrogen atom, an alkyl group, a cycloalkyl group, an aryl group, an alkoxy group, a group of the formula $COOR_6$ or a group of the formula



wherein each of said alkyl group, said aryl group and said alkoxy group may be substituted with at least one of a halogen atom, a hydroxyl group, an alkoxy group, an aryl group and an aryloxy group; R_6 represents an alkyl group and R_7 and R_8, which may be the same or different, each represents a hydrogen atom or an alkyl group,



(II)

wherein R_9, R_{10} and R_{11}, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, a hydroxyalkyl group or an aryloxyalkyl group and each group may be substituted with at least one of a halogen atom, a hydroxyl group, an alkoxy group, an aryl group, an aryloxy group, a hydroxyalkyl group and a hydroxyalkoxy group, said leuco dye (A) and said photo-oxidizing agent (B) being present in microcapsules, and said reducing agent (C) and said organic sulfonamide compound and/or said hydroxy compound (D) being present outside said microcapsule.

4,929,531

PROCESS FOR PRODUCING PHOTOSENSITIVE COMPOSITION CAPABLE OF FORMING FULL COLOR IMAGES FROM A SINGLE CAPSULE BATCH

Chuan Lee, and Kerry Kovacs, both of Centerville, Ohio, assignors to The Mead Corporation, Daytoo, Ohio

Filed Jul. 13, 1988, Ser. No. 218,717
Int. Cl.[5] G03C *1/68, 1/72*
U.S. Cl. 430—138 **16 Claims**

1. A photosensitive material capable of forming full color images having controlled continuous tone comprising:
a substrate having front and back surfaces;
a first set of color-forming microcapsules having a first internal phase comprising a first color-forming agent and a first photohardenable or photosoftenable composition;
a second set of color-forming microcapsules having a second internal phase comprising a second color-forming agent and a second photohardenable or photosoftenable composition;
a third set of color-forming microcapsules having a third internal phase comprising a third color-forming agent and a third photohardenable or photosoftenable composition; and
a coating located on either of said front or back surfaces, said coating comprising said first, second and third sets of microcapsules;
wherein said coating is produced by a continuous phase, single batch process comprising the steps of:
providing an agitating aqueous phase;
dispersing a first internal phase comprising a first color-forming agent and a first photohardenable or photosoftenable composition in said continuous phase to form droplets of said first internal phase in said continuous phase;
dispersing a second internal phase comprising a second color-forming agent and a second photohardenable or photosoftenable composition in said continuous phase to form droplets of said second internal phase in said continuous phase;
dispersing a third internal phase comprising a third color-forming agent and a third photohardenable or photosoftenable composition in said continuous phase to form droplets of said third internal phase in said continuous phase, wherein each of said first, second and third internal phases are independently dispersed in said continuous phase in the presence of a pre-wall-forming agent which controls droplet intermixing; and
forming discrete microcapsule walls around said droplets of said first, second and third internal phases, wherein each of said first, second and third color-forming agents is different and in combination are capable of producing full color images upon reaction with a developer material.

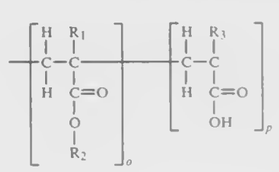
4,929,532

DIAZO NEGATIVE COLOR PROOFING PROCESS UTILIZING ACRYLIC/ACRYLATE POLYMERS

Thomas A. Dunder, Chapel Hill, N.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 6/909,138, Sep. 19, 1986, abandoned, Continuation-in-part of Ser. No. 6/880,770, Jul. 1, 1986, abandoned. This application Apr. 12, 1989, Ser. No. 338,356
Int. Cl.[5] G03C *5/18, 7/00*
U.S. Cl. 430—143 **20 Claims**

1. A method for forming a colored image which comprises
(A) providing a photosensitive element which comprises, in order:
(i) a substrate having a release surface; and
(ii) a single photosensitive layer on said release surface, which photosensitive layer comprises in admixture a light sensitive, negative working, polymeric diazonium compound in an amount sufficient to photosensitize the layer; a resinous binder composition in an amount sufficient to bind the layer components, which composition consists essentially of a major amount of an acid containing acrylic copolymer having the formula



wherein:
R_1 is H or, CH_3
R_2 is CH_3, CH_2CH_3, $(CH_2)_3CH_3$, n-octyl, or 2-ethyl hexyl
R_3 is H, CH_3, or COOH
o is equal to 4 to 12, and
p is equal to 1, and
said copolymer having an average molecular weight in the range of from about 10,000 to about 300,000, and at least one colorant in an amount sufficient to color the layer; and
(iii) an adhesive layer directly adhered to said color photosensitive layer, which adhesive layer comprises a polyvinyl acetate polymer and which adhesive layer has a softening point in the range of from about 60° C. to about 180° C.; and thereafter
(B) either
(i) laminating said element with heat and pressure via said adhesive layer to a developer resistant receiver sheet; and removing said substrate by the application of peeling forces; and imagewise exposing said photosensitive layer to actinic radiation; or
(ii) imagewise exposing said photosensitive layer to actinic radiation; and laminating said element with heat and pressure via said adhesive layer to a developer resistant receiver sheet; and removing said substrate by the application of peeling forces; or
(iii) laminating said element with heat and pressure via said adhesive layer to a developer resistant receiver sheet; and imagewise exposing said photosensitive layer to actinic radiation; and removing said substrate by the application of peeling forces; and
(C) removing the non-exposed areas of said photosensitive layer with a liquid developer, which removing is conducted at a temperature at which said adhesive layer is substantially non-tacky.

4,929,533

PROCESS FOR PRODUCING PRESENSITIZED DIAZO RESIN LITHOGRAPHIC PRINTING PLATE USING 1-METHOXY-2-PROPANOL AS COATING SOLVENT

Nobuo Nishikawa, and Hiroshi Misu, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 896,025, Aug. 13, 1986, abandoned. This application Jul. 1, 1988, Ser. No. 214,805
Claims priority, application Japan, Aug. 14, 1985, 60-178716
Int. Cl.[5] G03C *1/74, 1/60*
U.S. Cl. 430—169 **13 Claims**

1. A process for producing a presensitized lithographic printing plate by coating onto a surface-roughened aluminum plate a solution having dissolved in a solvent containing at least 10 wt % of 1-methoxy-2-propanol a negative working, light-sensitive composition consisting of a light-sensitive diazo resin in an amount sufficient to harden the composition by light illumination, a high-molecular weight copolymer which will dissolve or swell in an aqueous alkali developer in an amount from 97 to 60 wt % of the total weight of the diazo resin and the high-molecular weight copolymer which will dissolve or swell in an aqueous alkali developer and from 0 to 30 wt % based on the total weight of the composition of an additive selected from the group consisting of coatability improving agents, plasticizers which impart flexibility or wear resistance to the light-sensitive composition, colorants, and stabilizers for the diazo resin, and which composition becomes insolubilized or less-swellable in the aqueous alkali developer upon light illumination and development with the aqueous alkali developer, and drying the coated solution wherein the 1-methoxy-2-propanol is present in sufficient amount during coating to provide resistance to soiling in non-image areas during printing of the lithographic printing plate.

4,929,534

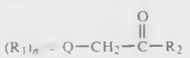
POSITIVE-WORKING PHOTOSENSITIVE MIXTURE AND PHOTOLITHOGRAPHIC COPYING MATERIAL PRODUCED THEREFROM WITH O-QUINONE DIALIDE SULFONYL ESTER AND AZO COUPLER

Trutz-Ulrich Stephani, Erding; Dieter Mohr, Budenheim; Britta Maisel, Bischofsheim, and Werner Frass, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am/Main, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 236,916
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1987, 3729035
Int. Cl.[5] G03C *1/60, 1/58, 1/54*
U.S. Cl. 430—191 **7 Claims**

1. A positive-working photosensitive, mixture consisting essentially of:
about 10% to 30% by weight, based on the nonvolatile constituents of a photosensitive sulfonic acid ester of o-quinine diazide with an aromatic hydroxyl compound having a molecular weight of about 800 to 8,000 daltons,
a polymeric water-insoluble binder which is soluble or at least swellable in aqueous-alkaline solutions in an amount sufficient to produce a uniform film, and
a coupler compound which can form an azo coupling with

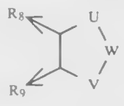
the o-quinine diazide, wherein the coupler is a compound of the formula I



I

where
n = 1, Q = carbonyl, and
n = 0, Q = cyano,

R_1, R_2 are identical or different and denote alkyl, cycloalkyl, alkoxy, alkyl-, aryl- or acylamino, alkoxycarbonylamido, heteroaryl or a heteroarylimino of the formula III



III

wherein
U,V,W are identical or different, and denote in each case one of the following groups: methylene, which may be unsubstituted or substituted by alkyl, aryl, phenyl, carboxyl, or carboxylamide; carbonyl, carbonylimino, sulfur, selenium, oxygen, amino, imino, which may be unsubstituted or substituted by alkyl or aryl; and
R_8 and R_9 are identical or different and denote hydrogen or alkyl
wherein the equivalent ratio of coupler to o-quinine diazide compound is about 0.5 to 3.

4,929,535
HIGH CONTRAST NEGATIVE IMAGE-FORMING PROCESS

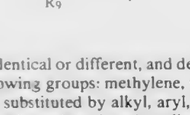
Toshiro Takahashi; Kimitaka Kameoka, and Yoshio Inagaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 907,770, Sep. 12, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 214,892
Claims priority, application Japan, Jan. 22, 1985, 60-9347
Int. Cl.[5] G03C *1/06, 5/24*
U.S. Cl. 430—264 **6 Claims**

1. A high contrast negative image-forming process which comprises image-wise exposing and subsequently developing a silver halide photographic material having on a support at least one silver halide emulsion layer, said silver halide emulsion layer or at least one other hydrophilic colloid layer containing a high contrast imparting hydrazine derivative represented by general formula (I)

$$R_1—NHNH—G—R_2 \qquad (I)$$

wherein R_1 represents an aliphatic group or an aromatic group; R_2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and G represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted iminomethylene group, and said development occurring in the presence of a compound represented by the following general formula (A):



(A)

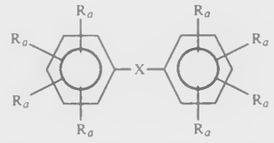
wherein R_1, R_2 and R_3 each represent an alkyl group, a cycloalkyl group, an aryl group, an alkenyl group, a cycloalkenyl group, or a heterocyclic ring residue; these groups each may have a substituent; m represents an interger; L represents an m-valent organic group bonded to the P atom through a carbon atom; n represents an integer of 1 to 3; X represents an n-valent anion; said X may be bonded to L; and wherein development time is from 15 to 60 seconds.

4,929,536
IMAGE REVERSAL NEGATIVE WORKING O-NAPTHOQUINONE DIAZIDE AND CROSS-LINKING COMPOUND CONTAINING PHOTORESIST PROCESS WITH THERMAL CURING

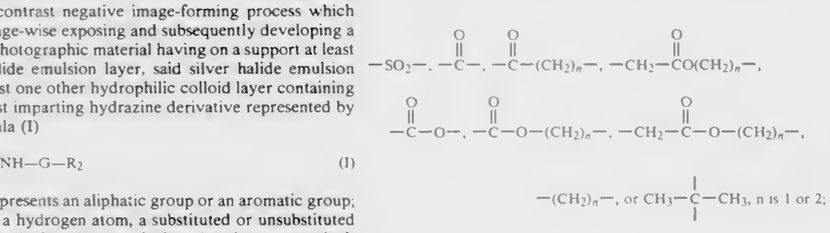
Mark A. Spak, Edison; Donald Mammato, Lebanon; Dana Durham, Bloomsbury, and Sangya Jain, Bridgewater, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 895,609, Aug. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 889,032, Jul. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 764,700, Aug. 12, 1985, abandoned. This application Nov. 8, 1988, Ser. No. 268,639
Int. Cl.[5] G03F *7/26*
U.S. Cl. 430—325 **16 Claims**

1. A process for preparing and using a negative working photographic element which consists essentially of, in order:
(a) forming a composition which consists essentially of in admixture:
(i) from about 1% to about 25% based on the weight of a the solid parts of the composition of a photosensitive composition comprising the condensation product of:
I. A phenolic compound having the structure:



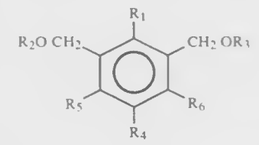
wherein: R_a is H, OH, halogen or lower alkyl, with at least two and not greater than six R_a radicals being OH, and X is a single C—C bond, —O—, —S—,



II. A 1,2 naphthoquinonediazide-4-sulfonic acid (Diazo I), and
III. A 1,2 naphthoquinonediazide-5-sulfonic acid (Diazo II) or an organic acid of the formula W—R_3,
wherein W is



or —SO_2—V, V is halogen and R_3 is alkyl, aryl, substituted alkyl or substituted aryl;
wherein the molar ratio of the amount of Diazo I reacted to the amount of Diazo II and/or organic acid reacted is the range of from about 1:1 to about 39:1;
(ii) from about 75% to about 99% based on the weight of the solid parts of the composition of a novolak resin; and
(iii) from about 0.5% to about 20% based on the weight of the solids parts of the composition of a crosslinking compound which, when in the presence of that amount and strength of the acid generated when said diazide is exposed to actinic radiation, is capable of crosslinking said resin under the application of the heating conditions of step (e), said crosslinking compound has the formula



wherein R_1, R_4, R_5, R_6 are independently H, (C_1-C_6)alkyl, (C_3-C_6)cycloalkyl, aryl, arylalkyl or OR_2; and R_2, R_3 are independently H, (C_1-C_6)alkyl, (C_3-C_6)cycloalkyl, aryl or arylalkyl; and
(iv) sufficient solvent to dissolve the foregoing composition components; and
(b) coating said composition on a substrate; and
(c) heating said coated substrate at a temperature of from about 20° to about 100° C. until substantially all of said solvent is dried off; and
(d) imagewise exposing said composition to actinic, electron beam, ion beam or x-ray radiation; and
(e) heating said coated substrate at a temperature of at least about 95° C. to about 160° C. for about 10 seconds or more to crosslink said resin; and
(f) removing the unexposed non-image areas of said composition with a developer wherein the process is conducted in the absence of a flood exposure after heating step (e).

4,929,537
PHOTORESIST COMPOSITIONS BASED ON HYDROXYSTYRENE COPOLYMERS

Balaram Gupta, North Plainfield, and Palaiyur S. Kalyanaraman, Fanwood, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 148,261, Jan. 25, 1988, Pat. No. 4,869,994. This application Jul. 27, 1989, Ser. No. 385,747
Int. Cl.[5] G03C *5/16, 1/68*
U.S. Cl. 430—325 **13 Claims**

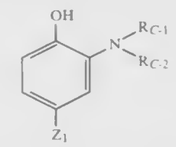
1. A process for forming an image on a surface comprising depositing a negative acting photoresist composition on said surface as a film, wherein said composition consists essentially of a solution of (A) a copolymer of 4-hydroxystyrene and a monomer selected from the group consisting of dialkyl muconate, alkyl sorbate, alkadiene monomers and allyl esters of ethylenically unsaturated acids wherein the alkyl groups contain 1 to 4 carbon atoms and (B) an aromatic bisazide compound, heating the film to remove solvent, exposing a portion of the film to ultraviolet radiation which decreases the solubility of the copolymer, and removing the unexposed portion of said film with solvent.

4,929,538
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Masakazu Morigaki, and Kozo Aoki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

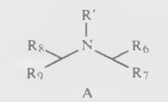
Filed Sep. 29, 1987, Ser. No. 102,511
Claims priority, application Japan, Sep. 29, 1986, 61-230854
Int. Cl.[5] G03C *1/34, 7/34*
U.S. Cl. 430—551 **21 Claims**

1. A silver halide color photographic material comprising a support having thereon a silver halide emulsion layer containing at least one coupler represented by formula (C-I) and at least one compound represented by formula (A-II) which are co-emulsified with each other



(C-I)

wherein Q_1 represents an atomic group containing at least one nitrogen atom required to form a 5- or more membered nitrogen-containing heterocyclic ring together with the carbon atoms to which it is bonded, said atomic group being represented by the formula —$NR_{C-3}CO—Q_1$—, wherein Q_1 is selected from the group consisting of a divalent amino group, an ether group, a thioether group, an alkylene group, a vinylene group, an imino group, a sulfonyl group, a carbonyl group, an arylene group, a divalent heterocyclic group, and combinations thereof, and R_{C-3} represents a hydrogen atom or an alkyl group; Z_1 represents a hydrogen atom or a coupling-off group; R_{C-1} represents an acyl group or a sulfonyl group; and R_{C-2} represents a hydrogen atom or a C_{1-8} aliphatic group; or the substituents for R_{C-1}, R_{C-2}, Z_1, or Q_1 form a dimeric or polymeric coupler



(A-II)

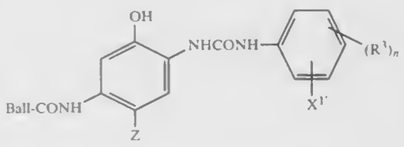
wherein R' represents a hydrogen atom, an aliphatic group, an acyl group, a sulfonyl group, a sulfinyl group, an oxyradical group, or a hydroxyl group; A represents a non-metallic atomic group forming a 5-, 6-, or 7-membered ring; and R_6, R_7, R_8, and R_9 each represents a hydrogen atom or an alkyl group, or the substituents represented by R_6 and R_7, R_8 and R_9, or R' and R_6 are bonded to each other to form a 5-, 6-, or 7-membered ring.

4,929,539
SILVER HALIDE PHOTOSENSITIVE MATERIALS FOR COLOR PHOTOGRAPHY

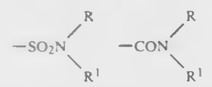
Ryosuke Sato; Katsunori Kato; Takashi Sasaki, and Hiroshi Sugita, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 540,720, Oct. 11, 1983, Pat. No. 4,772,542, which is a division of Ser. No. 522,818, Aug. 12, 1983, Pat. No. 4,451,559, which is a continuation of Ser. No. 385,096, Jun. 4, 1982, abandoned. This application May 6, 1988, Ser. No. 191,224
Claims priority, application Japan, Jun. 11, 1981, 56-90334; Jun. 11, 1981, 56-90335; Jun. 11, 1981, 56-90336
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[5] G03C *7/34*
U.S. Cl. 430—553 **5 Claims**

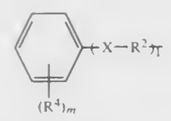
1. A silver halide color photosensitive material for color photography which comprises a phenol type cyan coupler having the formula:



wherein
R^3 is a hydrogen atom, a halogen atom, a hydroxy group, a nitro group, or a monovalent organic group;
X^1 is $-COOR^1$, $-COR^1$, $-SO_2OR^1$,



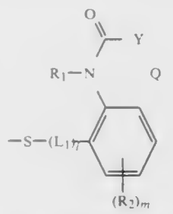
$-NO_2$ or $-CF_3$, in which R is a hydrogen atom, an alkyl group or an aryl group and R^1 is an alkyl group or an aryl group;
Z is a hydrogen atom or a removable group upon a coupling reaction with an oxidized product of a color developing agent:
n is 0 to 3; and
Ball has the formula:



wherein
X is an oxygen atom or a sulfur atom;
R^4 is a group selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a heterocyclic group, an aralkyl group, an alkoxy group, an aryloxy group, a hydroxy group, an acyloxy group, a carboxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a mercapto group, an alkylthio group, an arylthio group, an alkylsulfonyl group, an arylsulfonyl group, an acyl group, an acylamino group, a sulfonamido group, a carbamoyl group and a sulfamoyl group;
R^2 is a straight or branched alkylene group;
m is 1 to 4; and
l is 0 or 1.

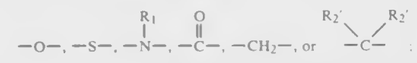
4,929,540
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL
Nobuo Furutachi, and Takeshi Hirose, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 17, 1989, Ser. No. 380,489
Claims priority, application Japan, Jul. 18, 1988, 63-178486
Int. Cl.[5] G03C *1/08*
U.S. Cl. 430—555 **7 Claims**

1. A silver halide color photographic light-sensitive material comprising a support and at least one silver halide photographic emulsion layer on the support, said emulsion layer containing a 5-pyrazolone coupler having a coupling eliminable group of the following general formula (I) at the coupling site thereof:

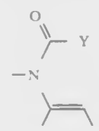


(I)

wherein L_1 represents a substituted or an unsubstituted methylene or ethylene group; l represents 0 or 1; m represents 0 or an integer from 1 to 3; R_1 represents a hydrogen atom, or a substituted or an unsubstituted alkyl, aryl or heterocyclic group; Y represents

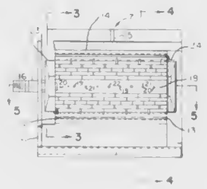


Q represents a single bond or nonmetal atoms necessary to complete a 5- to 8-membered ring together with



said 5- to 8-membered ring may further has a saturated or an unsaturated ring condensed thereto; R_2 represents a halogen atom, an alkyl group; an aryl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an alkylsulfonyl group, an arylsulfonyl group, an acylamino group, an alkoxycarbonylamino group, a sulfonamido group, a sulfamoyl group, an ureido group, an alkoxycarbonyl group, an aryloxycarbonyl group, an acyl group, a cyano group, a trifluoromethyl group, an amino group, an N-alkylamino group, an N-arylamino group, an N,N-dialkylamino group, a diacylamino group, an imido group or a carbamoyl group, and when m represents 2 or 3, R_2 groups may be the same or different; R_2' represents a hydrogen atom, or has the same meaning as R_2 and two R_2' groups may be linked to form a 5- to 7-membered saturated or unsaturated ring; and —Y Z may be a substituted or an unsubstituted carbon-carbon or carbon-nitrogen double bond.

4,929,541
DIRECT GAS FIRED INDUSTRIAL AIR HEATER BURNER
Gary J. Potter, Marthasville; David S. Schlote, House Springs, and Robert W. Reinkemeyer, Wentzville, all of Mo., assignors to Cambridge Engineering, Inc., Chesterfield, Mo.
Filed Sep. 2, 1988, Ser. No. 240,150
Int. Cl.[5] F24H *1/00*
U.S. Cl. 432—222 **25 Claims**



1. In a burner assembly for location within an air supply housing and ductwork for a heater and disposed for inducing the movement of air through a blower and into and around a burner assembly during heater operation to create a supply of heated air for a space to be warmed, said burner assembly being of the type having opposite side walls and upper and lower tiered baffles forming a combustion chamber for reception and combustion of gas delivered from a gas manifold arranged approximately at the intake end of the burner assembly, the improvement which comprises said gas manifold having a series of gas discharge ports provided along its length, and said discharge ports being of varying sizes.

4,929,542
IN VITRO SCREENING TEST FOR MUTAGENICITY AND GENOTOXICITY DURING SPERMATOGENESIS
Michael S. Risley, City Island, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Oct. 30, 1987, Ser. No. 114,986
Int. Cl.[5] A01N *1/02;* **C12Q** *1/00, 1/02;* **C12N** *5/00*
U.S. Cl. 435—2 **12 Claims**

1. An in vitro screening test for identifying mutagenic and genotoxic agents during spermatogenesis, comprising:
(1) Culturing Xenopus testis explants in vitro in the presence of at least one suspected mutagenic and/or genotoxic agent;
(2) Separating said Xenopus testis explants from step (2) from said at least one suspected mutagenic and/or genotoxic agent;
(3) Culturing said Xenopus testis explants from step (2) in the absence of said at least one suspected mutagenic and/or genotoxic agent such that spermatogonia in said Xenopus testis explants undergo spermatogenesis;
(4) Isolating at least one type of spermatogenic cell at timed intervals during said step (3); and
(5) Determining the mutagenic and/or genotoxic affect of said at least one suspected mutagenic and/or genotoxic agent.

9. A serum-free media formulation for culturing Xenopus testis explants comprising one member selected from the group consisting of medium 1 and medium 2:

Serum-Free Media Formulations (mg/L)

Medium 1:			
NaCl	3786	Proline	60
KCl	186	Serine	240
$Na_2HPO_4.12H_2O$	358	Threonine	70
$CaCl_2.2H_2O$	147	Tryptophan	20
$MgCl_2.6H_2O$	102	Tyrosine	40
$MgSO_4.7H_2O$	123	Valine	60
$FeSO_4$	0.834	Glucose	1000
HEPES (pH 7.4)	3576	Oxaloacetate	152
Alanine	130	Sodium Pyruvate	110
Arginine-HCl	140	Bovine Serum Albumin	1000
Aspartate-Mg	450	(fatty acid-free)	
Cysteine-HCl.H_2O	20	Transferrin (human)	10
Cystine	10	Basal Medium Eagles Vitamin Mix	(1X)
Glutamate-HCl	1200	Ascorbate	50
Glutamine	292	DL-a-Tocopherol	0.2
Glycine	60	Retinol	0.029
Histidine-HCl.H_2O	60	Bovine Insulin (Zn)	10
Isoleucine	50	Dihydrotestosterone	0.03
Leucine	80	Testosterone	0.03
Lysine-HCl	280	Follicle-Stimulating Hormone	5
Methionine	50	Antibiotic-	(1X)
Phenylalanine	50	Antimycotic Mix (100 units/ml penicillin; 100 mcg/ml streptomycin sulfate; 0.25 mcg/ml Fungizone)	

Medium 2:

Medium 1 - not containing tocopherol, ascorbate and testosterone, supplemented with linoleic acid (5 μg/ml).

4,929,543
PROCESS FOR THE DETERMINATION OF AN ANTIBODY IN HUMAN BODY FLUIDS
Rosemarie Kientsch-Engel, Pähl; Walter Wörner, Weilheim, and Gerd Kleinhammer, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany
Filed May 12, 1988, Ser. No. 192,957
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716217; Jan. 4, 1988, 3800048
Int. Cl.[5] G01N *33/563, 33/543, 33/544, 33/53*
U.S. Cl. 435—5 **14 Claims**

1. In a method for determining an antibody in a sample of body fluid wherein said sample is incubated with two receptors R_1 and R_2, wherein R_1 has an antigenic determinant which binds to said antibody to be determined and R_2 is labelled with a label which gives a detectable signal so as to form (i) a complex of label and bound antibody and (ii) uncomplexed label, and measuring label in said complex or uncomplexed label as a measurement of said antibody, the improvement comprising comparing said measurement to a control measurement obtained by incubating R_1 and R_2 with a conjugate of (i) a non-human antibody, an Fab fragment of said non-human antibody of an $F(ab')_2$ fragment of said non-human antibody and (ii) a human immunoglobulin or an Fc portion of said human immuno-globulin, wherein said non-human antibody, Fab, or $F(ab')_2$ fragment binds to the same receptor as the antibody to be determined and measuring complexed or uncomplexed label, and comparing said control measurement to said sample measurement as a measure of antibody in said sample.

4,929,544
REAGENTS, METHODS, AND TEST KIT FOR DIAGNOSING/MONITORING CANCER IN HUMANS
Barbara S. Vold, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.
Continuation-in-part of Ser. No. 532,998, Sep. 16, 1983, Pat. No. 4,665,018, which is a continuation-in-part of Ser. No. 371,287, Apr. 23, 1982, abandoned. This application Aug. 27, 1986, Ser. No. 900,634
The portion of the term of this patent subsequent to May 21, 2004, has been disclaimed.
Int. Cl.[5] G01N *33/577, 33/574*
U.S. Cl. 435—6 **20 Claims**

1. A method for detecting cancer in a human patient comprising:
(a) determining the amount of N-[8 9-(beta-D-ribofuranosyl)purin-6-ylcarbamoyl[9 -L-threonine (t^6A) in a specimen of physiological fluid from the patient by a quantitative immiunoassay in which the specimen is incubated with a monoclonal antibody that specifically binds t^6A; and
(b) then comparing said amount with the standard amount of t^6A present in corresponding physiological fluid of normal human subjects to determine whether said amount is substantially greater than the standard amount, a substantially greater amount being an indication of the presence of cancer.

4,929,545
METHOD AND REAGENT FOR DETERMINATION OF AN ANALYTE VIA ENZYMATIC MEANS USING A FERRICYANIDE/FERRIC COMPOUND SYSTEM
Helmut Freitag, Indianapolis, Ind., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.
Filed Apr. 14, 1989, Ser. No. 339,051
Int. Cl.[5] C12Q *1/58*
U.S. Cl. 435—11 **23 Claims**

1. Composition useful in determining an analyte in a sample, comprising:
(a) an enzyme which specifically reacts with said analyte;
(b) a soluble ferricyanide compound which is reducible in

the presence of an electron to produce a ferrocyanide compound;
(c) a soluble ferric compound which reacts with a ferrocyanide compound to form a reaction product therebetween, and
(d) a buffer which does not prevent formation of said reaction product, wherein said composition has a pH of from about 3.0 to about 6.0.

4,929,546

TEST SET AND A PROCESS FOR THE DETERMINATION OF ANTIBIOTICS IN MILK AND A NOVEL STREPTOCOCCUS THERMOPHILUS STRAIN TO BE USED THEREIN

Annika Mayra-Makinen, Helsinki, Finland, assignor to Valio Meijerien Keskusosuusliike, Helsinki, Finland

Filed Apr. 6, 1988, Ser. No. 178,257
Claims priority, application Finland, Apr. 7, 1987, 871512
Int. Cl.[5] C12Q *1/02*
U.S. Cl. 435—29 **25 Claims**

9 A process for determining the presence of antibiotics in milk comprising the steps of:
(a) adding a sample of milk to a test set comprising a *Streptococcus thermophilus* T101, DSM 4022 concentrate and a water-based protective agent,
(b) adding an indicator to said test set,
(c) incubating the test set and the sample, and (d) evaluating the color of the test set, wherein a color change is an indication of the presence of an antibiotic in the milk sample.

4,929,547

ANTITUMOR PROTEIN GENE OF STREPTOCOCCUS PYOGENES SU, PLASMIDS CONTAINING THE GENE, TRANSFORMANT CELLS HARBORING THE PLASMIDS, AND PROCESS FOR PRODUCING THE ANTITUMOR PROTEIN

Masaharu Kanaoka, Toyonaka; Chigusa Kawanaka, Kobe; Takaharu Negoro, Takarazuka, and Hideo Agui, Ikeda, all of Japan, assignors to Ohgen Research Laboratories, Limited, Ishikawa, Japan

Filed Dec. 24, 1986, Ser. No. 946,025
Claims priority, application Japan, Dec. 28, 1985, 60-298014; Aug. 21, 1986, 61-194077
Int. Cl.[5] C12P *1/00*; C12N *5/00, 1/22, 1/20*
U.S. Cl. 435—69.1 **12 Claims**

1 Isolated DNA coding for antitumor protein produced by *Streptococcus pyogenes* which is characterized in that the DNA sequence coding for the antitumor protein is specified by the amino acid sequence described in FIG. 2.

4,929,548

SUBSTANCE GIF-2 AND PROCESS FOR PRODUCTION OF THE SAME

Sachio Wakayama, Tokyo; Fumiyasu Ishikawa, Kanagawa, and Kunio Oishi, Tokyo, all of Japan, assignors to Kibun Co., Ltd., Tokyo, Japan

Division of Ser. No. 807,066, Nov. 27, 1985, Pat. No. 4,771,121. This application Dec. 2, 1987, Ser. No. 128,338
Claims priority, application Japan, Apr. 25, 1984, 59-82000; PCT Int'l Appl., Mar. 29, 1985, PCT/JP85/00154
Int. Cl.[5] C12P *21/00, 21/02*; C12N *1/20*
U.S. Cl. 435—71.2 **1 Claim**

1. A process for producing the substance GIF-2 which comprises culturing bacteria capable of producing GIF-2 and belonging to species *Bacillus cereus* Ferm BP-746 under conditions sufficient to produce GIF-2 and recovering GIF-2 from the culture medium.

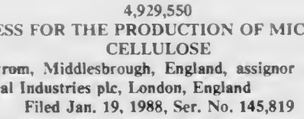
4,929,549

5-CARBAMOYLTHIENO[2,3-B]THIOPHENE-2-SULFONAMIDES AS TOPICALLY ACTIVE CARBONIC ANHYDRASE INHIBITORS

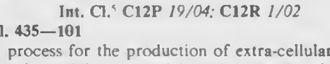
George D. Hartman, Lansdale, and John D. Prugh, Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 8, 1989, Ser. No. 307,800
Int. Cl.[5] C07D *295/12, 265/30, 495/02*
U.S. Cl. 514—227.8 **6 Claims**

1. A compound of structural formula:



or ophthamologically or pharmaceutically acceptable salt thereof, wherein
R_1 and R_2 are independently selected from hydrogen or C_{1-6} straight or branched alkyl, either unsubstituted or substituted with:
(a) amino;
(b) di(C_{1-3} alkyl)amino;
(c) [C_{1-3} alkoxy-C_{2-4} alkyl]amino;
(d) di[(C_{1-3} alkoxy)-C_{2-4} alkyl]amino;
(e) di[C_{1-3} alkoxy-(C_{2-4} alkoxy)$_n$(C_{2-6} alkyl)]-amino, wherein n = 1–4;
(f) C_{1-4} alkoxy;
(g) C_{1-4} alkoxy-(C_{2-4} alkoxy)$_n$, wherein n = 1–4;
(h) C_{1-6} alkylamino-(C_{2-4} alkoxy)$_n$, wherein n = 1–4;
(i) hydroxy;
(j) C_{1-3} alkylsulfonyl;
(k) C_{1-3} alkylsulfinyl;
(l) morpholino;
(m) thiomorpholino
(n) thiomorpholino-S-oxide;



(o) $-C-[C_{2-4}\text{ alkyl-}(C_{2-4}\text{ alkoxy})_n]$.

wherein n = 1–4.

(p) $-CO-(C_{1-6}\text{ alkyl})$;



(q) $-CO-[C_{2-4}\text{ alkyl-}C_{2-4}\text{ alkoxy})_n]$.

wherein n = 1–4;

(r) [(C_{1-3} alkoxy)(C_{2-4} alkoxy)(C_{1-3} alkyl)][(C_{1-3} alkoxy)(C_{1-3} alkyl] amino;
(s) [(C_{1-3} alkoxy)(C_{2-4} alkoxy)(C_{1-3} alkyl)] amino; or
(t) [(C_{1-3} alkoxy)(C_{2-4} alkyl)][(C_{1-3} alkyl)] amino (C_{1-3} alkoxy);
provided that no more than one heteroatom is bonded to any one carbon.

4,929,550

PROCESS FOR THE PRODUCTION OF MICROBIAL CELLULOSE

David Byrom, Middlesbrough, England, assignor to Imperial Chemical Industries plc, London, England

Filed Jan. 19, 1988, Ser. No. 145,819
Claims priority, application United Kingdom, Jan. 22, 1987, 8701396
Int. Cl.[5] C12P *19/04*; C12R *1/02*
U.S. Cl. 435—101 **7 Claims**

1. A process for the production of extra-cellular microbial cellulose in which a bacterial strain capable of producing extra-cellular microbial cellulose is aerobically cultivated in a culture medium containing a carbon source wherein the process comprises the steps:
(a) a growth step in which the bacterial strain is cultivated at a temperature within the range 15° C. to 35° C. and an initial pH within the range 4 to 6.5 in stirred batch culture until substantially all the carbon source present has been utilized and the culture is carbon limited;
(b) an accumulation step carried out at a temperature within the range 15° C. to 35° C. and an initial pH within the range 4 to 6.5 in which the carbon source is supplied continuously to the carbon limited culture at a rate sufficient to maintain it in the supernatant at a level not greater than 0.5 g/l and to maintain the culture in carbon limitation thereby enabling microbial cellulose to accumulate during stirred cultivation;
(c) a removal step in which bacterial cells and accumulated microbial cellulose are removed from the culture at the end of the accumulation step; and
(d) a separation step in which microbial cellulose is separated from the cells.

4,929,551

PROCESS FOR PRODUCING L(−)-TETRAHYDROFOLIC ACID

Tamotsu Eguchi; Takashi Oshiro, both of Machida; Yukihiro Kuge, Osakasayama; Kenichi Mochida, Hiratsuka, and Takayuki Uwajima, Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1989, Ser. No. 393,795
Claims priority, application Japan, Aug. 30, 1988, 63-216045
Int. Cl.[5] C12P *13/04*; C12N *9/06*
U.S. Cl. 435—106 **7 Claims**

1. A process for producing L(−)-tetrahydrofolic acid which comprises allowing dihydrofolate reductase to act upon dihydrofolic acid in the presence of (1) NADP or NADPH, (2) glucose and (3) glucose dehydrogenase in an aqueous solution; accumulating L(−)-tetrahydrofolic acid in the aqueous solution; and recovering the L(−)-tetrahydrofolic acid therefrom.

4,929,552

CHEMICAL AND ENZYMATIC PROCESS FOR THE DENITRATION OF DIETHYLENEGLYCOL DINITRATE, NITROGLYCERIN AND OTHER NITRATE ESTERS

Kenneth Gold, Hastings-On-Hudson, N.Y., and Bruce Brodman, Stroudsburg, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 87,942, Aug. 17, 1987, abandoned. This application Nov. 17, 1989, Ser. No. 438,955
Int. Cl.[5] C12P *13/00*
U.S. Cl. 435—128 **5 Claims**

1. An improved process of denitrating the dinitrate ester of diethyleneglycol comprising introducing the dinitrate ester of diethyleneglycol into an aqueous phosphate buffer containing the tripeptide reduced glutathione and the enzyme glutathione S-transferase.

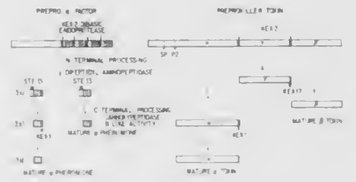
4,929,553

PROTEASE FOR SPECIFIC PROCESSING OF SECRETED PROTEINS

Howard Bussey, Westmount, Canada; Aleksandra Dmochowska, Warsaw, Poland; David Y. Thomas, and Daniel Dignard, both of Montreal, Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed May 29, 1987, Ser. No. 55,555
Int. Cl.[5] C12N *15/00, 1/00*; C12P *21/02*
U.S. Cl. 435—172.3 **8 Claims**

6. A method for the specific processing of precursors of cellular secreted proteins comprising:
(a) providing one of (i) a recombinant vector comprising a DNA KEX1 gene sequence and a second recombinant vector comprising a DNA sequence encoding a precursor of a cellular secreted protein, containing basic amino acid residues at the COOH-terminal and requiring KEX-1-dependent removal of said amino acids for activity, or (ii) a single recombinant vector comprising both said sequences;
(b) transforming a yeast host organism with the recombinant vector or vectors of step (a);
(c) culturing the transformed host cells whereby the DNA



of the recombinant vector or vectors express both the encoded KEX1 product and the precursor of the cellular secreted protein;
(d) processing said precursor to said cellular secreted protein whereby the basic amino acid residues at the COOH terminal are removal and whose removal is KEX1-dependent; and
(e) recovering said cellular secreted protein from the medium.

4,929,554

HUMAN IMMUNE INTERFERON

David V. Goeddel, 1449 Benito, Burlingame, Calif. 94010, and Patrick W. Gray, 1836 16th Ave., San Francisco, Calif. 94122

Continuation of Ser. No. 746,813, Jun. 20, 1985, Pat. No. 4,762,791, which is a continuation of Ser. No. 312,489, Oct. 19, 1981, abandoned. This application Sep. 4, 1987, Ser. No. 94,477
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[5] C12N *15/00, 5/00, 1/20*; C12P *21/00, 21/02*; C07H *21/04*
U.S. Cl. 435—172.3 **2 Claims**

1. A process for producing a replicable expression vehicle capable, in a transformant microorganism or cell culture, of expressing a polypeptide comprising the amino acid sequence of des-CYS-TYR-CYS recombinant human immune interferon, the process comprising constructing a first DNA sequence coding for said polypeptide and operably linking said first DNA sequence with a second DNA sequence capable of effecting expression of said first DNA sequence.

2. A process for producing a replicable expression vehicle capable, in a transformant microorganism or cell culture, of expressing a polypeptide comprising the amino acid sequence of recombinant human immune interferon, the process comprising constructing a first DNA sequence coding for said polypeptide and operably linking said first DNA sequence with a second DNA sequence capable of effecting expression of said first DNA sequence.

4,929,555

PICHIA TRANSFORMATION

James M. Cregg, and Kevin J. Barringer, both of San Diego, Calif., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1987, Ser. No. 110,148
Int. Cl.[5] C12N *15/00, 5/00*
U.S. Cl. 435—172.3 **23 Claims**

1. A method for making whole cells of *Pichia pastoris* competent for transformation which comprises maintaining said cells in suspension for a period of from 45 to 120 minutes at a cell concentration in the range of 5×10^7 to 5×10^8 per ml in an

aqueous solution of a non-toxic salt of an alkali metal selected from LiCl and Li_2SO_4 at a concentration of between 50 mM and about 500 mM, said solution being maintained at a temperature in the range of about 27° C.–33° C. and buffered at a pH in the range of about 7 to about 8.

4,929,556

ENZYME IMMOBILIZATION WITH POLYSULFONIUM SALTS

Roberta C. Cheng; Ritchie A. Wessling, and Donald L. Schmidt, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

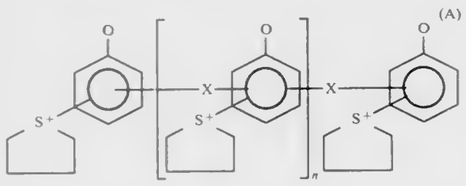
Continuation-in-part of Ser. No. 826,639, Feb. 6, 1986, abandoned. This application Jul. 8, 1988, Ser. No. 216,916

Int. Cl.[5] C12N *11/08, 9/92, 11/04;* **C12P** *19/24*

U.S. Cl. 435—180 **10 Claims**

1. A process for immobilizing an enzyme or cellular material containing said enzyme which comprises:

(a) forming a mixture by contacting said enzyme or cellular material with a water-compatible, chemically reactive polysulfonium salt selected from the group consisting of

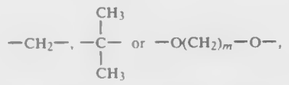


(A)

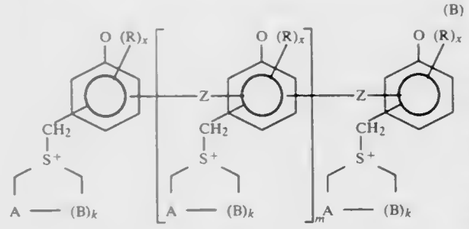
wherein:

n represents an integer of from 0 through 5;

X represents a covalent bond,



in which m is an integer of from 1 through 6; and



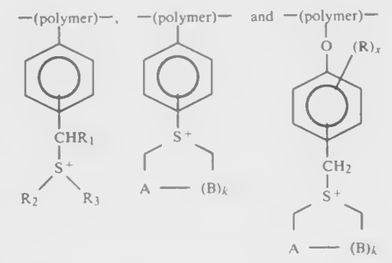
(B)

wherein:

Z represents a covalent bond, —O—, —S—, —CH_2—, —CHR′—, —CR'_2—, where R′ is C_1–C_4 alkyl, or Z represents —O—$[C_aH_{2a-b}(OH)_b]$—O— where a is an integer from 1 through 6, and b is an integer of from 0 through 4;

each R independently represents chloro, hydroxyl, C_1–C_4 alkyl or C_1–C_4 alkoxy; x represents an integer of from 0 through 2; A and B each independently represent —CH_2— or —CHR″—, where each R″ independently represents hydrogen, hydroxyl or C_1–C_8 alkyl; k represents the integer 1 or 2; and m is an integer of from 0 through 20; and

(C) a polysulfonium salt polymer containing 2 or more reactive sulfonium groups selected from the group consisting of



wherein:

R_1 independently represents hydrogen or methyl;

R_2 and R_3 each independently represent C_1–C_4 alkyl or C_1–C_4 hydroxyalkyl;

R independently represents chloro, hydroxyl, C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl or C_1–C_4 alkoxy;

x represents an integer of from 0 through 2;

A and B each independently represent —CH_2— or —CHR″— in which R″ is independently hydrogen, hydroxyl or C_1–C_8 alkyl; and k represents the integer 1 or 2; and

(b) subjecting the mixture to conditions wherein the sulfonium ions react with nucleophilic groups contained by the enzyme or cellular material present in the mixture to form covalently cross-linked and water-insoluble products.

4,929,557

THERMOSTABLE AMYLASES AND PULLULANASES FROM TWO ANAEROBIC MICROORGANISMS

Garabed Antranikian, and Gerhard Gottschalk, both of Goettingen, Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,344

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712051

Int. Cl.[5] C12N *9/28*

U.S. Cl. 435—202 **27 Claims**

1. A preparation comprising at least one type of excretable, thermostable, amylolytic enzyme produced by a process comprised of the steps of (a) continuously culturing in a medium, under anaerobic conditions, a species of thermophilic anaerobic bacteria capable of excreting at least one type of amylolytic enzyme into the medium, and then (b) separating the bacteria from the medium, wherein said species of bacteria is selected from the group consisting of *Thermoanaerobacter finii* and *Thermobacteroides acetoethylicus*, and said medium comprises a nitrogen source, mineral salts and a carbon source that comprises an amount of a higher saccharide limiting to the growth of said bacteria.

4,929,558

CULTURE OF STRAIN OF BACILLUS BACTERIA FOR PRODUCING SOYBEAN PROTEIN CLOTTING ENZYME

Tatuo Emura, Sapporo, and Kiyoshi Ohba, Chitose, both of Japan, assignors to Kabushiki Kaisha Hokkaido Nissin, Hokkaido, Japan

Filed Mar. 29, 1989, Ser. No. 330,064

Int. Cl.[5] C12N *1/22;* **C12R** *1/07*

U.S. Cl. 435—252.5 **1 Claim**

1. A substantially pure culture of strain of bacteria belonging to the genus Bacillus and designated FERM BP-1778.

4,929,559

DNA CONTAINING THE PROLIPOPROTEIN SIGNAL PEPTIDASE GENE

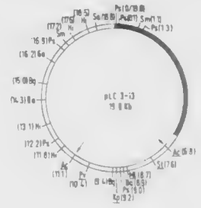
Shoji Mizushima, and Hideo Yamagata, both of Nagoya, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 634,441, Jul. 25, 1984. This application Feb. 23, 1988, Ser. No. 161,414

Claims priority, application Japan, Sep. 27, 1983, 58-179046

Int. Cl.[5] C12N *1/20, 15/00;* **C07H** *15/12*

U.S. Cl. 435—252.33 **15 Claims**



1. An isolated and purified DNA sequence coding for the prolipoprotein signal peptidase of *E. coli* and wherein said sequence is separate from the native *E. coli* chromosome and its native *E. coli* plasmid.

4,929,560

RECOVERY OF TISSUE PLASMINOGEN ACTIVATOR

Timothy Edmunds, Weymouth, and Susan F. Foley, Brighton, both of Mass., assignors to Damon Biotech, Inc., Needham Heights, Mass.

Filed Feb. 3, 1988, Ser. No. 151,707

Int. Cl.[5] C12N *9/64, 9/48, 9/50*

U.S. Cl. 435—226 **13 Claims**

1. A method for extracting tissue plasminogen activator (tPA) from a solution of tPA and other proteins, said method comprising the steps of:

(a) containing a tPA-containing protein matrix under conditions in which tPA in solution with a particulate, silicaceous said solution binds to said matrix, said matrix comprising the covalently bound, carboxylated reaction product of said particulate, silicaceous matrix with polyethyleniminopropyl trimethoxy silane;

(b) separating unbound protein from said matrix; and

(c) releasing tPA from said matrix.

4,929,561

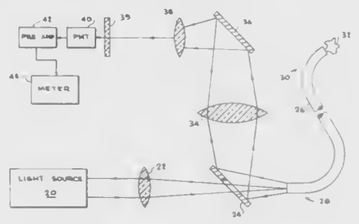
ABSORPTION-EMISSION OPTRODE AND METHODS OF USE THEREOF

Tomas B. Hirschfeld, Livermore, Calif., assignor to Regents of the University of California, Oakland, Calif.

Filed Aug. 8, 1985, Ser. No. 763,557

Int. Cl.[5] G01N *21/64, 21/65*

U.S. Cl. 436—116 **39 Claims**



1. A method for monitoring physical and chemical parameters of a sample substance and for generating a signal related to said physical and chemical parameters, the method comprising the steps of:

immobilizing on a substrate, a fluorescent substance having an emission band and an absorption band;

immobilizing on the same substrate, an absorber substance having an absorption band overlapping the emission band of the fluorescent substance, the degree of overlap being responsive to the physical and chemical parameters of the sample substance, and the absorber substance being immobilized such that an effective number of molecules of the absorber substance are closely adjacent to an effective number of molecules of the fluorescent substance to produce detectable resonant energy transfer therebetween;

contacting the substrate with the sample substance;

illuminating the fluorescent substance with an illumination beam having a frequency within the sbsorption band of the fluorescent substance, so that excited fluorescent states are generated in the fluorescent substance;

detecting a signal resulting from the decay of the excited fluorescent states;

providing a fiber optic through which said illumination beam is transmitted from a first end of the fiber optic to a second end of the fiber optic;

attaching said substrate to the second end of the fiber optic such that light from said illumination beam emanating from the second end of the fiber optic illuminates said fluorescent substance and such that said resulting signal is collected by the second end of the fiber optic and transmitted to the first end of the fiber optic;

separating at the first end of the fiber optic said illumination beam from said resuting signal;

measuring the intensity of backscattered Raman emissions from the fiber;

forming a ratio of the resulting signal to the backscattered Raman intensity;

extracting information concerning the physical and chemical parameters of the sample substance from the ratio.

4,929,562

METHOD AND APPARATUS FOR DETECTING GEM-POLYHALOGENATED HYDROCARBONS

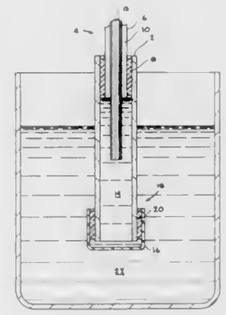
William G. Anderson, deceased, late of Livermore, and Johanna S. Anderson, legal representative, Palm Spring, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 20, 1986, Ser. No. 898,078

The portion of the term of this patent subsequent to Dec. 29, 2005, has been disclaimed.

Int. Cl.[5] G01N *33/48, 21/78*

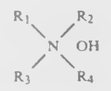
U.S. Cl. 436—126 **20 Claims**



1. A method of detecting gem-polyhalogenated hydrocarbons, the method comprising the steps of:

combining a pyridine reaction constituent selected from the

group consisting of pyridine and derivatives thereof with an aqueous solution of a hindered nitrogen base to form a reaction mixture, the reaction mixture comprising the pyridine reaction constituent at a concentration in the range of between 60 to about 96 percent by volume of the reaction mixture, the remaining volume comprising the aqueous solution such that the hindered nitrogen base is present in the reaction mixture at a concentration in the range of between about 0.01–0.05 molar, the hindered nitrogen base being selected from the group consisting of the formula:



wherein R_1, R_2, R_3, and R_4 are substituents independently selected from the group consisting of lower alkyl, hydroxy-substituted lower alkyl, phenyl, lower alkyl-substituted phenyl, and phenyl-substituted lower alkyl;

reacting the reaction mixture with a gem-polyhalogenated hydrocarbon to form a reaction product which is at least one of fluorescent and chromogenic;

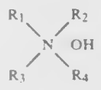
illuminating the reaction product with an illumination beam; and

detecting the gem-polyhalogenated hydrocarbon by at least one of the fluorescence and absorbance of the reaction product.

15. An apparatus for monitoring the concentration of gem-polyhalogenated hydrocarbons in a sample fluid, the apparatus comprising:

a fiber optic through which an illumination beam from an associated light source is transmitted from a first end of the fiber optic to a second end of the fiber optic;

a reaction mixture held adjacent to the second end of the fiber optic such that light from the illumination beam emanating from the second end of the fiber optic illuminates a portion of the reaction mixture causing it to produce a fluorescent signal related to the concentration of gem-polyhalogenated hydrocarbons when the second end of the fiber optic is immersed in a sample fluid, the reaction mixture comprising an aqueous solution of a pyridine reaction constituent selected from the group consisting of pyridine and derivatives thereof at a concentration in the range of between about 60 to about 96 percent by volume of the reaction mixture, and a hindered nitrogen base at a concentration in the range of between about 0.01 to 0.05 molar, the hindered nitrogen base being selected from the group consisting of the formula



wherein R_1, R_2, R_3, and R_4 are substituents independently selected from the group consisting of lower alkyl, hydroxy-substituted lower alkyl, phenyl, lower alkyl-substituted phenyl, and phenyl-substituted lower alkyl;

means attached to the second end of the fiber optic for holding the reaction mixture adjacent the second end of the fiber optic and for separating the reaction mixture from a sample fluid whenever the second end of the fiber optic is immersed in a sample fluid;

means adjacent to the first end of the fiber optic for separating light from the associated light source from the fluorescent signal collected and transmitted by the fiber optic; and

detection means adjacent to the separation means for collecting and analyzing the fluorescent signal generated by the reaction mixture.

4,929,563

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE WITH OVERVOLTAGE SELF-PROTECTION

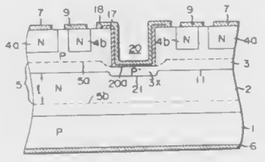
Yoshiaki Tsunoda, Kawasaki, and Masatoshi Kanaya, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 18, 1988, Ser. No. 272,842

Claims priority, application Japan, Nov. 21, 1987, 62-294364

Int. Cl.[5] H01L *21/223, 21/265*

U.S. Cl. 437—6 **13 Claims**



1. A method of manufacturing a semiconductor device with overvoltage self-protection, comprising a four-layer structure extending from a top surface to a bottom surface of a semiconductor substrate and including an emitter layer of one conductivity type, a gate-base layer of an opposite conductivity type, a base layer of said one conductivity type and another emitter layer of said opposite conductivity type, said method comprising the steps of:

a first step of making a recess in said gate-base layer from its surface exposed to the top surface of said substrate, the depth of said recess being such that the bottom of said recess reaches at least a space-charge layer produced in said gate-base layer when a predetermined forward voltage is applied to said semiconductor device, and further extends close to a junction between said base layer and said gate-base layer;

a second step of doping said semiconductor substrate with impurities of said opposite conductivity type from the bottom of said recess to form a region under said recess having an impurity concentration lower than said gate-base layer, the amount of said impurities being substantially equal to $N_D \times l$ (atoms/cm^2) which is the product of the depth l (cm) of the space-charge layer produced in said base layer when the forward voltage is applied to said semiconductor device and a concentration N_D (atoms/cm^3) of impurities of said one conductivity type in said base layer; and

a third step of forming an electrode on the surface of said recess.

4,929,564

METHOD FOR PRODUCING COMPOUND SEMICONDUCTOR SINGLE CRYSTALS AND METHOD FOR PRODUCING COMPOUND SEMICONDUCTOR DEVICES

Keiji Kainosho; Haruhito Shimakura, and Osamu Oda, all of Toda, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1989, Ser. No. 421,680

Claims priority, application Japan, Oct. 21, 1988, 63-265340; Dec. 28, 1988, 63-334588

Int. Cl.[5] H01L *21/265*

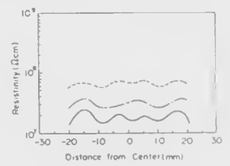
U.S. Cl. 437—20 **4 Claims**

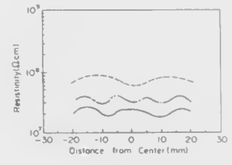
4. A method for producing compound semiconductor devices comprising;

(a) a heat-treatment step for heat-treating the wafers of a Fe-doped InP single crystal at temperatures ranging from 400° C. to 690° C.;

(b) a mirror surface polishing step for polishing said heat-treated wafers;

(c) an ion implantation step for implanting ions into said polished wafers; and





(d) an activating heat-treatment step for heat-treating said wafers at the temperature of 690° C. or lower.

4,929,565

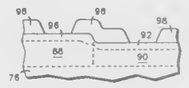
HIGH/LOW DOPING PROFILE FOR TWIN WELL PROCESS

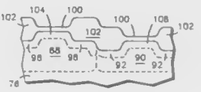
Louis C. Parrillo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 147,635, Jan. 25, 1988, Pat. No. 4,889,825, which is a division of Ser. No. 841,383, Mar. 4, 1986, abandoned. This application Oct. 30, 1989, Ser. No. 429,953

Int. Cl.[5] H01L *21/265, 27/00*

U.S. Cl. 437—34 **5 Claims**





1. A process for fabricating a CMOS integrated circuit having a high/low doping profile in each of twin wells comprising the steps of:

providing a semiconductor substrate having a surface;

blanket implanting the surface with first P-type ions;

forming a patterned layer of oxidation masking material over selected portions of the surface thereby leaving the substrate unmasked in non-selected portions;

thermally oxidizing the unmasked portions of the substrate to grow a first thick oxide and to incorporate therein first P-type ions from the unmasked portions of the substrate, thereby removing the first P-type ions from the unmasked portions of the substrate;

physically removing the first thick oxide and the first P-type ions incorporated therein;

implanting first N-type ions into the unmasked portions of the substrate;

driving in the first P-type and N-type ions to form P-type and N-type wells in the substrate having a first and a second selected depth, respectively;

implanting second N-type ions into the unmasked portions of the substrate and driving in the second N-type ions to form an N-type surface layer having a third selected depth less than the second selected depth, the N-type surface layer being laterally coextensive with the N-type well;

forming a second thick oxide over the N-type surface layer;

removing the patterned layer of oxidation masking material;

implanting second P-type ions using the second thick oxide as an implantation mask; and

driving in the second P-type ions to form a P-type surface layer having a fourth selected depth less than the first selected depth, the P-type surface layer being laterally coextensive with the P-type well.

4,929,566

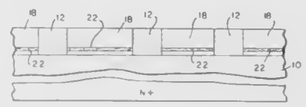
METHOD OF MAKING DIELECTRICALLY ISOLATED INTEGRATED CIRCUITS USING OXYGEN IMPLANTATION AND EXPITAXIAL GROWTH

Bruce A. Beitman, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 6, 1989, Ser. No. 376,019

Int. Cl.[5] H01L *21/20, 21/265, 21/76*

U.S. Cl. 437—24 **9 Claims**



1. A method of forming an integrated circuit having laterally dielectrically isolated islands comprising:

forming a first insulative layer of a first thickness on a substrate;

patterning said first insulating layer to form lateral dielectric walls and exposed island areas of said substrate;

epitaxially growing islands of a first conductivity type on exposed island areas of said substrate to a second thickness less than said first thickness;

implanting an oxygen into said epitaxial island to form a horizontal dielectric isolation wall extending lateral between said lateral dielectric walls and displaced from a top surface of said epitaxial island to form totally dielectrically isolated islands; and

epitaxially increasing the total thickness of said islands to said first thickness subsequent to implanting said oxygen.

4,929,567

METHOD OF MANUFACTURING A SELF-ALIGNED GAAS MESFET WITH T TYPE TUNGSTEN GATE

Hyung M. Park, and Dong G. Kim, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon and Korea Telecommunication Authority, Seoul, both of, Rep. of Korea

Filed Nov. 30, 1989, Ser. No. 443,750

Claims priority, application Rep. of Korea, Dec. 1, 1988, 1988-15986[U]

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—41 **4 Claims**

1. A method of manufacturing a self-aligned MESFET with T type gate electrode of the tungsten comprising the processes of:

depositing a silicon (Si) thin film onto entire surface of a semi-insulating GaAs substrate by PECVD(plasma enhanced chemical vapor deposition), depositing a Si_3N_4 film onto the silicon (Si) thin film by PCVD (photo chemical vapor deposition), and ion implanting for a n active layer using a photoresist as a mask;

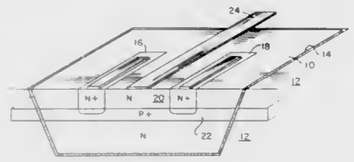
forming a gate electrode pattern by etching said Si_3N_4 film using a photoresist as a mask to form the gate electrode;
growing the tungsten by selective chemical vapor deposition only onto the exposed Si thin film in order not to deposit the tungsten onto said Si_3N_4 film;
growing the tungsten film transversely for forming a tungsten gate electrode with T type;
forming a n+ layer by ion implantation so that the gap between said gate electrode and said n+ layer is 1000 Å through 2000 Å using said T type tungsten gate;
activating said n and n+ layer using said Si thin film and Si_3N_4 film as a capping film;
ion implanting for said n and n+ active layers and for isolation between devices through said Si thin film and Si_3N_4 film;
etching said Si thin film and Si_3N_4 film and depositing an ohmic metal (AuGe/Ni) by a lift-off technique using a photoresist as a mask to form a source and a drain.

4,929,568

METHOD OF ISOLATING A TOP GATE OF A MESFET AND THE RESULTING DEVICE

James D. Beasom Melb. Village, Fla., and William E. O'Mara, Jr., Kingston, N.H., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 11, 1989, Ser. No. 405,282
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—40 13 Claims



1. A method of manufacturing an isolated top gate MESFET in an island of a first conductivity type isolated by dielectric isolation from a substrate comprising:
forming source and drain regions of said first conductivity type spaced in said island to define a channel therebetween;
forming a bottom gate region of a second conductivity type in and below the surface of said island;
removing said dielectric isolation at two opposing portions of said dielectric isolation adjacent said channel to a first depth from said surface; and
forming a top gate on said top surface of said island of a material which forms a Schottky barrier therewith and extends across a portion of said island forming said channel between said source and drain regions and beyond said two opposing portions of said dielectric isolation onto said substrate of a thickness small enough compared to said first depth to be disconnected at said dielectric isolation.

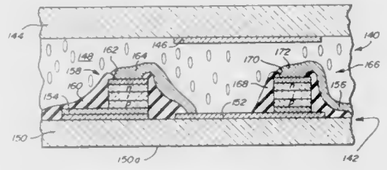
8. A method of manufacturing an isolated top gate MESFET in a silicon island of a first conductivity type isolated by dielectric isolation from a silicon substrate comprising:
forming source and drain regions of said first conductivity type spaced in said island to define a channel therebetween;
forming a bottom gate region of a second conductivity type in and below the surface of said island;
forming a mask over said island and substrate having an aperture which extends across a portion of said island forming said channel between said source and drain regions and beyond two opposing sides of said dielectric isolation onto said substrate;
forming a layer of gate material, whose silicide will form a Schottky barrier top gate with said channel, in said aperture;
heating to alloy said material with said island and substrate; and
selectively removing unalloyed portion of said material to form a Schottky barrier top gate with and extending totally across said channel and being discontinuous at said dielectric isolation.

4,929,569

METHOD OF FABRICATING AMORPHOUS SILICAN DIODE ADDRESSED LIQUID CRYSTAL DISPLAY

Zvi Yaniv, Southfield; Vincent D. Cannella, Birmingham, both of Mich.; Gregory L. Hansell, Camarillo, Calif., and Louis D. Swartz, Holly, Mich., assignors to Ovonic Imaging Systems, Inc., Troy, Mich.

Continuation of Ser. No. 82,266, Aug. 6, 1987, abandoned, which is a continuation of Ser. No. 675,941, Dec. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 573,004, Jan. 23, 1984, abandoned. This application Sep. 22, 1988, Ser. No. 247,815
Int. Cl.[5] H01L *45/00, 27/06*
U.S. Cl. 437—51 19 Claims



1. A method of making a display of the type including at least one pixel including at least one pair of isolation devices, said method comprising the steps of:
(A) providing an insulative substrate having a conductive layer thereover;
(B) depositing a first metal layer over said conductive layer;
(C) depositing a first doped semiconductor layer over said first metal layer;
(D) depositing a substantially intrinsic semiconductor layer over said first doped layer;
(E) depositing a second doped semiconductor layer over said intrinsic layer, said second doped layer being opposite in conductivity with respect to said first doped layer;
(F) depositing a second metal layer over said second doped semiconductor layer;
(G) removing portions of said second metal layer for providing discrete portions of said second metal layer to define the location of said isolation devices;
(H) removing portions of said semiconductor layers while using at least said second metal discrete portions as a mask to form said isolation devices;
(I) removing portions of said first metal layer to form a first address lead with at least one of said isolation devices electrically connected thereto;
(J) removing portions of said conductive layer to form a first pixel electrode with the other of said isolation devices electrically connected thereto;
(K) forming an interconnect lead to electrically couple said at least one isolation device on the side thereof opposite said first address lead to said first pixel electrode;
(L) forming a second address lead insulated from said first address lead and electrically coupled to said at least one other isolation device on the side thereof opposite said first pixel electrode;
(M) forming a second pixel electrode spaced from and substantially parallel to said first pixel electrode; and
(N) applying light influencing material between said pixel electrodes.

4,929,570

SELECTIVE EPITAXY BICMOS PROCESS

Paul J. Howell, Federal Way, Wash., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 239,052, Aug. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 915,450, Oct. 6, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,163
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—89 24 Claims



1. In a structure having a semiconductor substrate of first conductivity type, an epitaxial layer of second conductivity type, and a buried layer of second conductivity type separating the substrate from the epitaxial layer, a method of fabricating both bipolar and field effect transistors comprising:
(a) removing all of the epitaxial layer and all of the buried layer from first regions where first channel type field effect transistors are desired to thereby leave second regions of the epitaxial layer and buried layer having sidewalls protruding above the substrate, said step of removing further comprising the steps of:
(i) masking the second regions of the epitaxial layer with an etch-resistant material by forming a first layer of silicon dioxide on the epitaxial layer and a layer of silicon nitride on the silicon dioxide; and
(ii) etching the epitaxial layer and the buried layer to expose the substrate in the first regions;
(b) forming a layer of insulating material at least over the sidewalls of the second regions;
(c) depositing semiconductor material over at least the first regions to thereby reform the epitaxial layer over the first regions, the epitaxial layer in the second regions being separated from the epitaxial layer in the first regions by the insulating material;
(d) implanting first conductivity type impurity into the first regions, the second regions being protected by the layer of silicon nitride; and
(e) forming at least one first channel type field effect transistor in one of the first regions and one bipolar transistor in one of the second regions.

4,929,571

METHOD OF MAKING A BURIED CRESCENT LASER WITH AIR GAP INSULATOR

Etsuji Omura, and Hirofumi Namizaki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 130,426, Dec. 9, 1987, Pat. No. 4,847,949.
This application Mar. 10, 1989, Ser. No. 321,775
Claims priority, application Japan, Feb. 27, 1987, 62-45632
Int. Cl.[5] H01L *21/20, 21/203*
U.S. Cl. 437—129 5 Claims



1. A method of producing a semiconductor laser comprising:
growing a current blocking layer on a first conductivity type semiconductor substrate;
depositing a selectively removable mask layer on said current blocking layer;
removing a portion of said mask layer to define a longitudinal window on said current blocking layer in a direction of a resonator of the laser;
selectively etching at the longitudinal window through the current blocking layer to said semiconductor substrate to form a longitudinal groove;
successively growing a first cladding layer and an active layer in said groove;
growing a second cladding layer on said active layer in said groove and on said mask layer outside said groove; and
removing said mask layer to leave a gap separating the second cladding layer from the current blocking layer outside said groove.

4,929,572

DOPANT OF ARSENIC, METHOD FOR THE PREPARATION THEREOF AND METHOD FOR DOPING OF SEMICONDUCTOR THEREWITH

Shigeaki Saito; Toshiharu Matsueda, both of Tokyo; Yoshibiro Kubota, Gunma, and Masaaki Iguchi, Tokyo, all of Japan, assignors to Furukawa Co., Ltd. and Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 380,616
Claims priority, application Japan, Jul. 18, 1988, 63-178836
Int. Cl.[5] H01L *21/00, 21/02, 21/225, 21/22*
U.S. Cl. 437—164 9 Claims

1. A dopant body of arsenic for doping of a semiconductor which is a sintered body of a powder mixture comprising 100 parts by weight of a powder of silicon arsenide and from 100 to 300 parts by weight of a silica powder.

4,929,573

HIGHLY DENSIFIED BODIES FROM ORGANOPOLYSILOXANES FILLED WITH SILICON CARBIDE POWDERS

William H. Atwell; Gary T. Burns, and Chandan K. Saha, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,036
Int. Cl.[5] C04B *35/52*
U.S. Cl. 501—90 31 Claims

1. A method of preparing a sintered body of silicon carbide, said method comprising

(a) forming a handleable green body by

(i) preparing an intimate mixture consisting essentially of silicon carbide powder, a metal-containing sintering aid, and a preceramic organopolysiloxane, where the metal-containing sintering aid is present at 0.1 to 3.0 weight percent of the metal based on the weight of silicon carbide powder and where the preceramic organopolysiloxane is present at such a level that the free carbon value of the mixture is greater than 0.2 weight percent based on the total weight of the silicon carbide powder and the char derived from the preceramic organopolysiloxane and

(ii) then forming the intimate mixture into the desired shape under pressure at a temperature less than about 500° C. to obtain a handleable green body; and

(b) sintering the handleable green body in an inert atmosphere at a temperature greater than 1900° C. to obtain a sintered body of silicon carbide with a density greater than 2.4 g/cm^3.

4,929,574

ELECTROMAGNETIC WAVE ABSORBERS COMPRISED OF BARIUM TITANATE POWDERS

Alain Iltis, Aubervilliers, and Patrick Maestro, Fosses, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Mar. 30, 1989, Ser. No. 330,484
Claims priority, application France, Mar. 30, 1988, 88 04168
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—137 18 Claims

1. A composition of matter comprising an electromagnetic wave absorbing amount of finely divided barium titanate particulates homogeneously dispersed in a solid organic matrix material, the mean diameter of such barium titanate particulates being equal to or greater than 1 micron at least 50% by volume of such barium titanate particulates being in the quadratic crystalline state.

4,929,575

MELT PROCESSABLE, GREEN, CERAMIC PRECURSOR POWDER

Issam A. Khoury, Midland, Mich., and Horst G. Langer, Wayland, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1988, Ser. No. 171,099
Int. Cl.[5] C04B *35/46, 35/48, 35/49*
U.S. Cl. 501—137 16 Claims

1. A melt processable, green ceramic precursor powder prepared by a process comprising (a) preparing a solution comprising a melt processable organic polymer and a metal polyahl coordination complex, and (b) drying the solution under conditions sufficient to form the melt processable, green ceramic precursor powder.

4,929,576

REACTIVATING CATALYSTS CONTAINING NOBLE METALS ON MOLECULAR SIEVES CONTAINING OXIDES OF ALUMINUM AND PHOSPHORUS

Ying-Yen P. Tsao, Lahaska, Pa., and Roland von Ballmoos, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 140,358, Jan. 4, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 323,178
Int. Cl.[5] B01J *29/38, 23/94, 38/42*
U.S. Cl. 502—35 20 Claims

1. A process for rejuvenating a deactivated noble metal-containing molecular sieve catalyst, said deactivated catalyst containing agglomerated platinum metal, said process comprising the steps of:

(i) dispersing said agglomerated platinum associated with the deactivated catalyst by contacting said catalyst with a stream of gas containing a sufficient amount of molecular chlorine under conditions and for a period of time sufficient to achieve dispersion of the platinum metal;

(ii) subsequently purging said catalyst with a purging gas; and

(iii) reducing said purged catalyst in the presence of dry hydrogen at an elevated temperature,

wherein said catalyst comprises a crystalline aluminum and phosphorus oxide-containing material, said crystalline material having a three-dimensional microporous crystal framework of corner-sharing oxide tetrahedra of the emperical formula:

$$(M_xAl_yP_z)O_2$$

where x is from 0 to 0.5, y is from 0.1 to 0.9 and z is from 0.1 to 0.9, wherein $x+y+z=1$, and where M represents at least one element other than Al or P capable of forming said three-dimensional oxide framework, wherein M is selected from the group consisting of Si, Mg, Mn, Co, Zn, Fe, Ti, and mixtures thereof.

4,929,577

TRANSPARENT WOUND DRESSINGS IN SHEET FORM

John Cornell, West Chester, Pa., assignor to Medi-Tech International Corporation, Brooklyn, N.Y.

Filed Mar. 11, 1987, Ser. No. 24,265
Int. Cl.[5] A61L *15/00*
U.S. Cl. 514—58 9 Claims

1. A transparent gel composition for dressing skin wounds in the form of a sheet comprising:

(i) a dextrin; and

(ii) a water-swellable, cross-linked polymer selected from polyacrylamide or polymethacrylamide, wherein the ratio of dextrin to polymer is from about 2:1 to 1:1.

4,929,578

REFRACTORY FIBERS OF ALUMINA AND ORGANIC RESIDUE

Harold G. Sowman, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 49,017, May 7, 1987, Pat. No. 4,801,562, which is a continuation-in-part of Ser. No. 854,319, Apr. 21, 1986, abandoned. This application Nov. 1, 1988, Ser. No. 265,758
Int. Cl.[5] C04B *35/02*
U.S. Cl. 501—95 12 Claims

1. An amorphous organic-inorganic hybrid fiber consisting essentially of 70 to 90 weight percent alumina and 10 to 30 weight percent of organic residue based on the total hybrid fiber composition, wherein said fiber contains alumina, carbon, and one element or group of elements selected from the group consisting of H, O, N, and Cl.

4,929,579

METHOD OF MANUFACTURING CAST FUSED SILICA ARTICLES

Perry B. Lassiter, Johnson City, Tenn., assignor to Premier Refractories & Chemicals Inc., King of Prussia, Pa.

Continuation of Ser. No. 212,825, Jun. 29, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 366,295
Int. Cl.[5] C04B *35/14*
U.S. Cl. 501—133 17 Claims

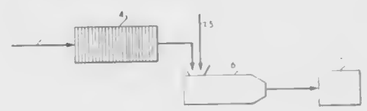
1. In a method of producing a cast fused silica product wherein a flowable aqueous slurry of fine fused silica particles and a dry coarse fused silica aggregate are admixed and poured into a mold to form a cast product which is subsequently dried and sintered, the improvement comprising admixing additional fused silica particulate to the aqueous mixture of said fine fused silica slurry and said coarse fused silica aggregate to form a resultant aqueous casting mix prior to the pouring of the resultant aqueous casting mix into the mold, said additional fused silica particulate being added to the aqueous mixture of said fine fused silica slurry and said coarse fused silica aggregate to reduce the water content of the resultant aqueous casting mix to a water content ranging from about 7.5% to about 9.5% by weight, said additional fused silica particulate formed of dry agglomerates of fused silica particles having an agglomerated size less than about 100 mesh, said dry agglomerates of fused silica particles formed by drying an aqueous slurry having a water content less than about 20 percent by weight and including fine fused silica particles having a particle size ground to less than about 325 mesh, and dry grinding the resulting dried fused silica particles.

4,929,580

PROCESS FOR TREATING CLAY MINERALS

Thomas R. Jones, St. Austell, United Kingdom, assignor to ECC International Limited, United Kingdom

Continuation of Ser. No. 171,139, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 940,544, Dec. 12, 1986, abandoned. This application Jun. 15, 1989, Ser. No. 368,068
Claims priority, application United Kingdom, Dec. 9, 1985, 8531253
Int. Cl.[5] C04B *33/00*
U.S. Cl. 501—148 6 Claims



1. In the process for preparing a clay mineral which provides reduced viscosity when formed into an aqueous completely deflocculated paper coating suspension of a given solids content; which process includes the steps of (1) preparing a slurry of the clay mineral at 5 to 30% solids; (2) mixing the slurry and thereby said clay mineral with a minor proportion by weight of a water-soluble organic compound which is free of hydroxy or carboxylic acid groups and has a plurality of basic groups and a number average molecular weight not greater than 1000; (3) dewatering the mixed slurry to yield a filter cake of the clay mineral having a plastic consistency; (4) mechanically working the filter cake while in a plastic state containing from 22% to 50% by weight water, under conditions such that from 25 to 1000 KJ of energy per Kg of dry clay mineral are dissipated in the mixture; and (5) thermally drying the product from said mechanical working; THE IMPROVEMENT COMPRISING:

displaying the point of addition of said water-soluble organic compound to said mechanical working step (4), and effecting mixing of said compound and clay simultaneously with said working; thereby combining said mixing and working steps; said displacement of said addition point for said water-soluble organic compound acting further to reduce water retention in the said filter cake, thereby to reduce the quantity of heat energy required during said thermal drying step.

4,929,581

CATALYTIC DIESEL SOOT FILTER

Juergen Steinwandel; Juergen Haas, and Carsten Plog, all of Markdorf, Fed. Rep. of Germany, assignors to Dornier-System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,606
Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716446
Int. Cl.[5] B01J *29/22, 35/04*
U.S. Cl. 502—2 11 Claims

1. Catalytically active coating of filter material for Dieselsoot filter characterized in that the coating is comprised of a zeolite having a pore diameter from 0.55 to 1.3 nanometers, the zeolite being doped with a metal of the platinum group.

2. Catalytically-active coating in accordance with claim 1 characterized in that the coating is a zeolite of the mordenite group.

8. Catalytic dieselsoot filter characterized in that the catalytically-active coating in accordance with claim 1 is deposited as a structural strengthener of a filter element.

9. Catalytic filter in accordance with claim 8 characterized in that the filter element is a packing of minerals of metal wool of ceramic foam of a monolithic honeycomb structure or a monolithic honeycomb structure with alternating-closed channels.

4,929,582

HYDROUS OXIDE ION-EXCHANGE COMPOUND CATALYSTS

Robert G. Dosch, and Howard P. Stephens, both of Albuquerque, N. Mex., assignors to The United States of American as Represented by The United States Department of Energy, Washington, D.C.

Filed Apr. 9, 1986, Ser. No. 849,913
The portion of the term of this patent subsequent to Apr. 29, 2005, has been disclaimed.
Int. Cl.[5] B01J *21/06, 23/20*
U.S. Cl. 502—11 5 Claims

1. A catalytic material comprising a hydrous, alkali metal, alkaline earth metal, or quaternary ammonium titanate, zirconate, niobate, or tantalate, in which the metal or quaternary ammonium cations have been exchanged with a catalytically effective quantity of catalytically active metal cations, and which has been subsequently treated with a dilute aqueous solution of a Bronsted acid.

4,929,583

VANADIUM PASSIVATION IN A HYDROCARBON CATALYTIC CRACKING PROCESS

Eugene A. Pasek, Monroeville, and Norman C. Morgan, Ford City, both of Pa., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 752,994, Jul. 8, 1985, abandoned. This application Jun. 16, 1988, Ser. No. 207,604
Int. Cl.[5] B01J *29/06*
U.S. Cl. 502—64 3 Claims

1. A catalyst composition comprising a crystalline aluminosilicate zeolite, a matrix material, and from 5 to 40 weight percent, based on the total catalyst composition, of a vanadium passivator having a passivation factor of at least 2.0, the anion of said vanadium passivator to be of a weak non-volatile acid having a pKa >5 and the cation is a Group IIA metal having an atomic number greater than 20.

4,929,584

ALKYLATION OF BENZENE COMPOUNDS WITH DETERGENT RANGE OLEFINS

Lynn H. Slaugh, Cypress; Thomas H. Johnson, and Ronald J. Hoxmeier, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1989, Ser. No. 330,516
Int. Cl.[5] B01J *31/14*
U.S. Cl. 502—112 12 Claims

1. A catalyst composition prepared by reacting in a hydrocarbon solvent a molybdenum or tungsten halide with diethylaluminumtriethylsilaneolate.

4,929,585

MIXED-SOLID SOLUTION TRI-METALLIC OXIDE/SULFIDE CATALYST AND PROCESS FOR ITS PREPARATION

Anthony L. Lee, Glen Ellyn; Howard S. Meyer, Hoffman Estates, and Vern L. Hill, Niles, all of Ill., assignors to Gas Research Institute, Chicago, Ill.

Filed Jan. 9, 1989, Ser. No. 364,701
Int. Cl.[5] B01J *21/06, 23/02, 23/28, 27/051*
U.S. Cl. 502—220 16 Claims

1. A mixed-solid solution tri-metallic oxide/sulfide catalyst having the formula:

$$M_IO_aS_b\text{-}M_{II}O_cM_{III}O_d$$

wherein

M_I is selected from the group consisting of vanadium, neodymium, tantalum, chromium, molybdenum, tungsten, and mixtures thereof;

O is oxygen;

S is sulfur;

a is selected from zero and a number up to a positive real number representing the stoichiometric requirement, and

b is selected from zero and a number up to a positive real number representing the stoichiometric requirement, provided one of a and b is a positive real number;

M_{II} is selected from the group consisting of titanium, zirconium, hafnium, and mixtures thereof;

c is a positive real number up to the stoichiometric requirement;

M_{III} is selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, francium, beryllium, magnesium, calcium, strontium, barium, radium, zinc, cadmium, mercury, scandium, yttrium, lanthanum, actinium, and mixtures thereof; and

d is a positive real number up to the stoichiometric requirement; and

wherein $M_IO_aS_b$ is mixed in a solid solution of $M_{II}O_c$-$M_{III}O_d$.

4,929,586

CATALYSTS FOR SELECTIVE CATALYTIC REDUCTION DENOX TECHNOLOGY

Louis Hegedus, Rockville; Jean W. Beeckman; Wie-Hin Pan, both of Columbia, and Jeffrey P. Solar, Silver Spring, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jun. 9, 1988, Ser. No. 204,641
Int. Cl.[5] B01J *21/00, 23/16, 27/02*
U.S. Cl. 502—217 53 Claims

1. A catalyst for the selective removal of nitrogen oxides from exhaust and waste gases in the presence of ammonia comprising:

(a) a formed support of titania particles further containing other porous inorganic oxide particles, said formed support having

(i) a total porosity of up to 0.80 cc/cc which is made up of a micropore porosity (comprising pores having a pore diameter 600 Angstrom units or less) of 0.05 to 0.5 cc/cc and a macroporosity (comprising pores having diameters greater than 600 Angstrom units) of 0.05 to 0.5 cc/cc, and

(ii) said titania being substantially present in the anatase phase, and

(b) a metal oxide catalytic component deposited on said support selected from the group consisting of V_2O_5, MoO_3, WO_3, Fe_2O_3, $CuSO_4$, $VOSO_4$, SnO_2, Mn_2O_3, Mn_3O_4, and mixtures thereof, said metal oxide being present in an amount from a catalytically effective amount to 25% by weight of the entire catalyst.

2. A catalyst according to claim 1, wherein said other inorganic oxide is selected from the group consisting of SiO_2, Al_2O_3, ZrO_2, $AlPO_4$, Fe_2O_3, B_2O_3 and mixtures thereof.

6. A catalyst according to claim 1, further comprising barium sulfate in an amount of from 1–15% by weight of the formed support.

7. A catalyst according to claim 2, wherein the porous inorganic oxide is silica gel or precipitated silica.

4,929,587

METHOD FOR INTERCALATING ORGANIC-SWELLED LAYERED METAL CHALCOGENIDE WITH POLYMER CHALCOGENIDE BY TREATMENT WITH POLYMERIC CHALCOGENIDE PRECURSOR IN INERT ATMOSPHERE

Brent A. Aufdembrink, Wilmington, Del., and Michael E. Landis, Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 140,529, Jan. 4, 1988, abandoned. This application Feb. 23, 1989, Ser. No. 314,611
Int. Cl.[5] B01J *21/06, 20/10*
U.S. Cl. 502—242 20 Claims

1. A method for intercalating an organic-swelled layered metal chalcogenide with a polymeric chalcogenide which comprises:

(a) contacting said organic-swelled layered metal chalcogenide with a compound capable of conversion to said polymeric chalcogenide by hydrolysis, said contacting taking place in an inert atmosphere; and

(b) converting said compound in the presence of water to the polymeric chalcogenide.

6. The method of claim 1 wherein said polymeric chalcogenide is an polymeric oxide and said layered metal chalcogenide is a layered oxide.

8. The method of claim 6 wherein said polymeric oxide comprises polymeric silica.

9. The method of claim 1 wherein said layered metal chalcogenide is titanometallate-type layered metal oxide product comprising a layered metal oxide wherein each layer of the metal oxide has the general formula

$$[M_x[\ ]_yZ_{2-(x+y)}O_4]^q$$

wherein M is at least one metal of valence n wherein n is an integer between 0 and 7 and preferably is 2 or 3, [ ] represents a vacancy site, Z is a tetravalent metal, preferably titanium, and wherein

$$q=4y-x(n-4), \text{ and } 0<x+y<2$$

4,929,588

SODIUM REMOVAL, FROM BRINES

Teresita C. Frianeza-Kullberg, and Darrish W. Barnette, both of Gastonia, N.C., assignors to Lithium Corporation of America, Gastonia, N.C.

Division of Ser. No. 127,819, Dec. 2, 1987, Pat. No. 4,859,343. This application Jun. 8, 1989, Ser. No. 363,037
Int. Cl.[5] B01J *20/06, 20/08, 20/16*
U.S. Cl. 502—402 3 Claims

3. A method of producing supported antimonic acid comprising:

(a) impregnating a particulate ion exchange supporte material selected from anion exchange resins, alumina and silica-alumina with antimony (V) pentachloride;

(b) drying the impregnated particulate support material under an inert atmosphere;

(c) slowly adding, with agitation, ammonium hydroxide to the dried impregnated particulate support material to precipitate antimonic acid;

(d) adding water to the mixture and heating the mixture at the reflux temperature for about 24 hours;

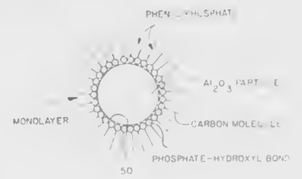
(e) separating the particulate material from the liquid.

4,929,589

METAL OXIDE/HYDROXIDE PARTICLES COATED WITH PHOSPHATE ESTERS

Edward S. Martin, New Kensington, and Larry F. Wieserman, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 23,312, Mar. 9, 1987, Pat. No. 4,871,411, which is a continuation-in-part of Ser. No. 946,870, Dec. 29, 1986, abandoned. This application Jun. 2, 1989, Ser. No. 360,979
The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.
Int. Cl.[5] B01J *20/04, 20/32;* B01D *15/08;* B32B *9/00*
U.S. Cl. 502—406 36 Claims



20. An active material comprising metal oxide/hydroxide particles comprised of an oxide/hydroxide of a metal selected from the group consisting of titanium, zirconium, iron, chromium, zinc, vanadium, and combinations thereof having chemically bonded to substantially all of the reactive sites on a surface thereof, a monomolecular layer of a phosphoric acid ester having a phosphorus-containing group and a carbon-containing group, said phosphoric acid ester being selected from the class consisting of:

(a) phosphoric acid monoester having the formula (RO)-$PO(OH)_2$; and

(b) phosphoric acid diester having the formula (RO)(R'O)-PO(OH); where R and R' are selected from the group consisting of long and short chain aliphatic hydrocarbons, aromatic hydrocarbons, carboxylic acids, aldehydes, ketones, amines, amides, thioamides, imides, lactams, anilines, pyridines, piperidines, carbohydrates, lactones, ethers, alkenes, alkynes, alcohols, nitriles, oximes, organosilicones, ureas, thioureas and combinations of these groups; said bond being formed by reaction of said phosphorus-containing group with said metal oxide/hydroxide surface, said carbon-containing group being oriented away from said metal oxide/hydroxide surface.

4,929,590

THERMOSENSITIVE RECORDING MATERIAL

Keiichi Maruta; Takashi Ueda, both of Numazu, and Yasuhiko Watanabe, Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 2, 1989, Ser. No. 317,979
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—207 11 Claims

1. A thermosensitive recording material comprising:

(a) a support,

(b) an undercoat layer formed on said support, which comprises spherical hollow particles made of a plastic material having a glass transition temperature ranging from 40° C. to 90° C., said spherical hollow particles having a mean particle diameter of 0.20 um to 1.5 μm, and a voidage of 40% to 90%, and a binder resin in an effective amount, and

(c) a thermosensitive coloring layer formed on said undercoat layer, which comprises as the main components a leuco dye and a color developer capable of inducing color formation in said leuco dye upon application of heat thereto.

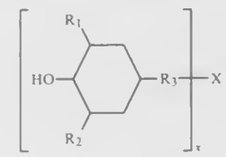
4,929,591

IMAGE-RECEIVING SHEET

Noritaka Egashira; Kenichiro Suto, and Atsushi Muro, all of Shinjuku, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Nov. 9, 1988, Ser. No. 268,987
Claims priority, application Japan, Nov. 13, 1987, 62-286574; Oct. 24, 1988, 63-266243
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 5 Claims

1. An image-receiving sheet for thermal dye transfer, comprising a substrate sheet and a dye receiving layer formed on at least one surface of said substrate sheet, said dye receiving layer comprising a synthetic resin and at least one antioxidant represented by the following formula:

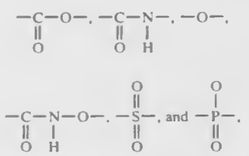


wherein

$R_1=C_lH_{2l+1}$ ($l\geqq 0$),

$R_2=C_mH_{2m+1}$ ($m\geqq 0$),

R_3 is a substituted or unsubstituted alkyl having at least one bond represented below in its main skeleton



X is a sulfur atom, carbon atom or null, and

x is an integer from 2 to 4.

4,929,592

HEAT TRANSFER SHEET

Jumpei Kanto, Komae, and Hiroshi Eguchi, Shinjuku, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Dec. 14, 1988, Ser. No. 284,403
Claims priority, application Japan, Dec. 17, 1987, 62-317576
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 5 Claims

1. A heat transfer sheet comprising a base film and a sublimable dye layer containing a binder formed on the base film,

characterized in that an adhesive layer comprising an organic titanate is provided between said base film and said dye layer



and wherein the weight ratio of the dye to the binder (dye/binder ratio) both constituting said dye layer is 1.4 or more.

4,929,593

THERMAL TRANSFER RECORDING MATERIAL

Toshiaki Tezuka; Kunihiro Koshizuka, and Takao Abe, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 28, 1989, Ser. No. 386,784
Claims priority, application Japan, Aug. 2, 1988, 63-192981
Int. Cl.[5] B41M *5/26*
U.S. Cl. 503—227 10 Claims

1. A thermal transfer recording material, comprising

a thermal transfer recording medium comprising a support (A) having thereon a heat softening colorant layer and

a recording sheet comprising a support (B) having thereon an image-receiving layer,

in which one of said heat softening colorant layer and said image-receiving layer contains a curable polymer, and the other of them contains a curing agent capable of curing said curable polymer.

4,929,594

SUPERCONDUCTING COMPOSITION $Tl_2BA_2CUO_{6+x}$ AND PROCESS FOR MANUFACTURE

Jagannatha Gopalakrishnan, Wilmington, and Munirpallam A. Subramanian, New Castle, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 14, 1988, Ser. No. 167,616
Int. Cl.[5] C01F *11/02;* C01G *3/02, 15/00;* H01L *39/12*
U.S. Cl. 505—1 2 Claims

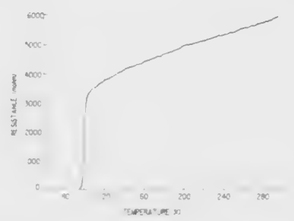
1. Single phase crystalline metal oxide having the formula $Tl_2Ba_2CuO_{6+x}$ wherein x is from 0 to about 0.5.

4,929,595

SUPERCONDUCTING THIN FILM FABRICATION

Maw-Kuen Wu, Huntsville, Ala., assignor to The University of Alabama at Huntsville, Huntsville, Ala.

Filed Feb. 26, 1988, Ser. No. 161,012
Int. Cl.[5] H01L *39/12, 39/24;* C23C *14/34*
U.S. Cl. 505—1 3 Claims



1. A superconducting cuprate oxide thin film on a substrate prepared by the steps of:

forming a target material by mixing together appropriate amounts of metal oxide in order to form a superconducting phase of a cuprate oxide;

annealing said target material in oxygen;

forming a substrate material by mixing together appropriate amounts of metal oxides to form at least one semiconducting phase of said superconducting cuprate oxide superconductor;

sputtering said target material to form a film on said substrate material; and

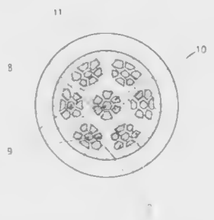
annealing said film and substrate in an oxygen environment.

4,929,596

PROCESS FOR PRODUCING A MULTIPLE-FILAMENT OXIDE SUPERCONDUCTOR

Gundolf Meyer, Birmenstorf; Erwin Schönfeld, Baden-Dättwil, and Clemens Verpoort, Fislisbach, all of Switzerland, assignors to Asea Brown Boveri AG, Baden, Switzerland

Filed Jul. 18, 1988, Ser. No. 220,251
Claims priority, application Switzerland, Jul. 24, 1987, 2818/87; Oct. 30, 1987, 4263/87; Jan. 14, 1988, 113/88
Int. Cl.[5] H01L *39/24;* B22F *7/00*
U.S. Cl. 505—1 2 Claims



1. A process for producing a multiple-filament oxide superconductor, wherein, at least one group of holes is arranged in a silver body provided with a nickel cladding which serves as a framework, in a manner such that around one central hole in each group there are arranged further holes, and wherein an oxygen-releasing substance whose oxygen saturation vapor pressure is between 10^{-3} bar and 2000 bar in a temperature range of 400° to 950° C. selected from the group consisting of BaO_2; a mixture of BaO_2 and BaO; MnO_2; a mixture of MnO_2 and Mn_2O_3; Pb_3O_4; and a mixture of Pb_3O_4 and PbO is poured into at least one of the central holes, and wherein a mixture of pulverulent starting substances consisting essentially of a rare earth metal oxide, a barium-oxygen compound selected from the group consisting of a BaO_2 and a mixture of BaO_2 and BaO and a copper oxide (CuO) in an approximately stoichiometric ratio to provide a desired superconductor or a preformed superconductor powder produced from the same starting substances is poured into the other holes, and wherein, the cross-section of the entire structure is successively reduced by at most 2% using grooved rolls and drawing and a multiple-filament oxide superconductor is formed by annealing the entire structure under a pressure of at least 10 bar at a temperature of 500° to 900° C. for at least 1 hr.

4,929,597

SUPERCONDUCTOR CONTAINING INTERNAL STRESS ABSORBER

Takuo Takeshita; Tadashi Sugihara, and Sbuichi Fujino, all of Saitama, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Mar. 27, 1989, Ser. No. 328,653
Claims priority, application Japan, Mar. 25, 1988, 63-71633
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 8 Claims

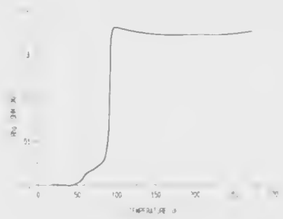
1. A superconductor containing a superconductive oxide and an internal stress absorbing substance distributed over the superconductive oxide, in which said internal stress absorbing substance ranges from about 0.12% by volume to about 7.9% by volume, and in which said internal stress absorbing substance is selected from the group consisting of a copper oxide and a barium oxide.

4,929,598

OXYGEN PLASMA TREATMENT OF YTTRIUM BARIUM COPPER OXIDE

Brian G. Bagley, Watchung Boro, and Jean-Marie Tarascon, Millington, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Division of Ser. No. 64,803, Jun. 19, 1987, abandoned. This application Dec. 30, 1988, Ser. No. 292,020
Int. Cl.[5] B05D *5/12, 3/06*
U.S. Cl. 505—1 3 Claims



1. Method for the preparation of a superconducting thin film composition of the formula $YBa_2Cu_3O_{(7-x)}$ wherein x has a value less than 0.75 which comprises subjecting a thin film of non-superconducting $YBa_2Cu_3O_{(7-x)}$ wherein x has a value greater than 0.75 to an oxygen plasma near room temperature for at least one hour.

4,929,599

PERFUMING INGREDIENT

Wolfgang K. Giersch, Bernex, and Karl-Heinrich Schulte-Elte, Onex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Apr. 12, 1989, Ser. No. 336,967
Claims priority, application Switzerland, Apr. 27, 1988, 1575/88
Int. Cl.[5] A61K *7/46*
U.S. Cl. 512—18 12 Claims

1. A method for enhancing, improving or modifying the odor properties of a perfuming composition or perfumed product, which method comprises adding to said composition or product a fragrance effective amount of 2-(2,3,4,5,6,7-hexahydro-1,1,4,4-tetramethyl-2(1H)-indenyl)-ethyl acetate.

4,929,600

ENDOCRINE MANIPULATION TO IMPROVE BODY COMPOSITION OF POULTRY

Larry A. Cogburn, New London, Pa., assignor to University of Deleware, Newark, Del.

Filed Mar. 18, 1988, Ser. No. 169,737
Int. Cl.[5] A61K *37/36, 35/55, 31/195*
U.S. Cl. 514—2 16 Claims

1. A method for lowering the extent of fat deposition in living poultry grown substantially for meat production and having normal or enhanced pituitary functions during the normal growth cycle of the poultry, which comprises:

(a) providing growth hormone so that the poultry have an enhanced blood level of growth hormone, and

(b) providing exogenous thyroid hormone to the living poultry during the finishing phase of the normal growth cycle of the poultry, said providing of the exogenous thyroid hormone being delayed until the poultry are at least about three weeks of age, said thyroid hormone, when compared to 3,3',5-triiodothyronine as a standard, having at least 30% of the thyroid activity and at least about 15% of the receptor-binding capability of 3,3',5-triiodo-L-thyronine.

4,929,601

TRIPEPTIDES USEFUL AS IMMUNOSTIMULANTS AS WELL AS IN THE PREVENTION OF METASTASES

Brunetto Brunetti, Milan, and Marco Prada, Casaipusterlengo, both of Italy, assignors to Ellem Industria Farmaceutica, S.p.A., Milan, Italy

Filed Aug. 2, 1988, Ser. No. 227,356
Claims priority, application Italy, Aug. 4, 1987, 21575 A/87
Int. Cl.[5] A61K *37/02;* C07K *5/08*
U.S. Cl. 514—18 11 Claims

1. A method of treating a metastatic disorder comprising administering to a subject in need of treatment, a pharmaceutically effective amount of a tripeptide of the general formula

X-Gly-Y

where X is L-Arg or D-Arg and Y is L-Asp or D-Asp, or a pharmaceutically acceptable salt thereof.

4,929,602

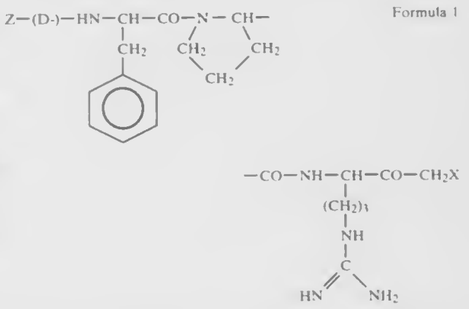
METHOD OF INHIBITING PLATELET DEPENDENT ARTERIAL THROMBOSIS

Laurence A. Harker, San Diego, and Stephen R. Hanson, Encinitas, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 125,178, Nov. 25, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 275,330
Int. Cl.[5] A61K *37/02;* C07K *5/08*
U.S. Cl. 514—18 21 Claims

1. A method of inhibiting platelet dependent arterial thrombosis in a patient which method comprises administering to said patient a therapeutically effective amount of peptide represented by Formula 1

Formula 1



wherein Z is hydrogen or a C_1–C_6 acyl; X is a halogen atom; and the hydrohalic acid addition products thereof.

4,929,603

USE OF PHYTOSTERYL GLYCOSIDES FOR THE TREATMENT OF EPOXYCHOLESTEROL LEVELS

Karl H. Pegel, Durban, South Africa, and Hans Walker, Eschwege, Fed. Rep. of Germany, assignors to Rooperal (NA) NV, Amsterd AM

Continuation of Ser. No. 918,940, Oct. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 690,607, Jan. 11, 1985, abandoned. This application Oct. 25, 1988, Ser. No. 262,130
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1984, 3401178
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—26 1 Claim

1. The method of treatment of increased endogenous 5(6)α-

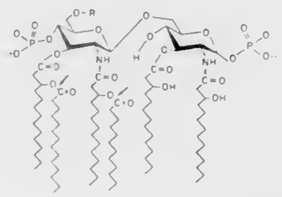
epoxycholesterol level in the prostate gland of a human comprising providing a daily administration of a dose as small as 0.45 mg of β-sitosterol glucoside.

4,929,604

LIPOPOLYSACCHARIDES OF REDUCED TOXICITY AND THE PRODUCTION THEREOF

Robert S. Munford, and Catherine L. Hall, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed May 28, 1986, Ser. No. 868,428
Int. Cl.[5] A61K *31/715;* C12P *19/26;* C12N *9/16;* C07H *13/10*
U.S. Cl. 514—53 14 Claims



1. An altered Gram-negative bacterial lipopolysaccharide
(1) with 3-hydroxyfatty acids having at least 90% unesterified 3-hydroxy functions and
(2) having toxicity reduced to a greater extent than immunostimulatory activity when compared to the unaltered lipopolysaccharide shown in FIG. 1, wherein said 3-hydroxyfatty acids are covalently linked to glucosaminyl moieties of the lipopolysaccharide lipid A.;

4,929,605

PHARMACEUTICAL COMPOSITION FOR PIPERIDINOALKANOL DERIVATIVES

Jack Domet, and Dhiren N. Shah, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 152,689, Feb. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 117,166, Nov. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 105,928, Oct. 7, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 325,254
Int. Cl.[5] A61K *31/44, 9/20, 47/00*
U.S. Cl. 514—54 20 Claims

1. A pharmaceutical composition in solid unit dosage form comprising (a) a therapeutically effective amount of a piperidinoalkanol compound, or a pharmaceutically acceptable salt thereof, (b) pharmaceutically acceptable nonionic surfactant in an amount of from about 0.1% to about 6% by weight of the composition, and (c) pharmaceutically acceptable carbonate salt in an amount of from about 2% to about 50% by weight of the composition.

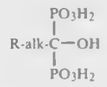
4,929,606

AZACYCLOALKYLALKANEDIPHOSPHONIC ACIDS USEFUL FOR TREATING DISEASES ATTRIBUTED TO CALCIUM METABOLISM DISORDERS

Knut A. Jaeggi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 7, 1988, Ser. No. 267,585
Claims priority, application Switzerland, Nov. 13, 1987, 4435/87
Int. Cl.[5] C07F *9/65;* A61K *31/675*
U.S. Cl. 514—80 7 Claims

1. Azacycloalkylalkanediphosphonic acids of formula (I)



(I)

wherein R is a 3-azabicyclo[3.2.2]nonane radical which is unsubstituted by up to and including three C_1–C_4 alkyl groups and is attached by way of the aza ring member and alk is lower alkylene and pharmaceutically acceptable salts thereof.

7. A method of treating diseases in which an anomalous deposition of sparingly soluble calcium salts or an anomalous degeneration of hard body tissues is the principal symptom which comprises administering an effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof to a warm-blooded animal in need thereof.

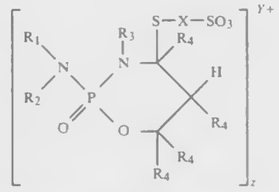
4,929,607

OXAZAPHOSPHORIN-4-THIO ALKANESULPHONIC ACIDS, NEUTRAL SALTS THEREOF AND METHOD TO TREAT CANCER DISEASES AND TO PRODUCE IMMUNOSUPPRESSION

Gerhard Scheffler; Ulf Niemeyer; Norbert Brock, all of Bielefeld, and Jörg Pohl, Halle, all of Fed. Rep. of Germany, assignors to ASTA Pharma Aktiengesellshaft, Frankfurt

Continuation of Ser. No. 5,375, Jan. 12, 1987, abandoned, which is a continuation of Ser. No. 712,952, Mar. 15, 1985, abandoned, which is a continuation of Ser. No. 509,385, Jun. 30, 1983, abandoned, which is a division of Ser. No. 356,636, Mar. 10, 1982, abandoned. This application Feb. 2, 1988, Ser. No. 149,954
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111428
Int. Cl.[5] A61K *31/66*
U.S. Cl. 514—110 13 Claims

1. A method of treating in animals or humans a malignant condition susceptible to treatment and selected from the group consisting of leukemia, lymphoma, myeloma, neutroblastoma, retinoblastoma, mycosis fungoides, breast tumors, lung tumors, bronchial carcinoma, testicular carcinoma, Ewing sarcoma, Hodgkin's disease, and ovarial tumors which comprises administration to an animal or human in need thereof of a pharmcologically effective amount to treat the indicated malignant conditions of a compound according to Formula I:



I

in which R_1 and R_2 represent 2-chloroethyl; R_3 and R_4 represent hydrogen; X represents a straight or branched chain C_{2-6} alkylene group which may have a mercapto group at the carbon atom in the 1, 2, 3, 4 or 5 position of the alkylene chain, and Y^+ represents a hydrogen cation, an alkali metal or alkaline earth metal cation, a quanidinium, morpholinium or cyclohexylammonium cation or a cation which is derived from an amine of the formula $NR_5R_6R_7$, in which the radicals R_5 to R_7 are the same or different and represent hydrogen, a C_1–C_2 alkyl group or an oxyethyl group, or Y^+ represents an ethylene diammonium cation (H_3H^+—CH_2CH_2—NH_3) or a piperazonium cation, and z represents 1 when Y^+ represents a mono-basic cation, or z represents 2 when Y^+ represents a dibasic cation, or the cation of the compound having two mono-basic cations.

4,929,608

EMULSIFIABLE CONCENTRATES OF MALATHION

Tario Mahmood, Flanders, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 2, 1985, Ser. No. 729,723
Int. Cl.[5] A01N *57/00*
U.S. Cl. 514—122 8 Claims

1. Emulsifiable concentrate compositions comprising, on a weight basis: 10.0% to 55.0% [S-1,2-bis-(ethoxycarbonyl) ethyl] 0,0-dimethyl phosphorodithioate (malathion); 8.0% to 15.0% the ethoxylated nonionic surfactant blend having a boiling point of 300° F., a specific gravity of 0.971, a percent volatiles by volume of 8.0% and identified by the Infrared Spectrum indicated in FIG. 1; and a vegetable oil to total said composition to 100.0%.

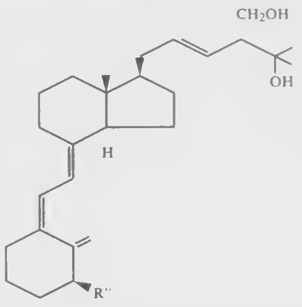
4,929,609

25, 28-DIHYDROXYERGOCALCIFEROL AND 1,25,28-TRIHYDROXYERGOCALCIFEROL COMPOSITIONS THEREOF AND THEIR USE IN THE TREATMENT OF HYPERPROLIFERATIVE DISEASE

Andrew D. Batcho, North Caldwell, N.J.; Ronald L. Horst, Huxley, Iowa, and Milan R. Uskokovic, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J. and The United States of America as represented by the Department of Agriculture, Washington, D.C.

Continuation of Ser. No. 24,944, Mar. 12, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 272,170
Int. Cl.[5] A61K *31/59;* C07J *9/00*
U.S. Cl. 514—167 17 Claims

1. A compound of the formula



I

wherein R'' is hydrogen or hydroxy, an epimer at the 24-position of a compound of formula I, or a diastereomeric mixture of compounds of formula I which are epimeric at the 24-position.

4,929,610

COMPOSITION WHICH CONTAIN HYDROXYLATED DERIVATIVES OF VITAMIN D_3

Werner Meier, Bottmingen, Switzerland; Walter A. Rambeck, Munich, Fed. Rep. of Germany; Harald Weiser, Hochwald, Switzerland, and Hermann Zucker, Munich, Fed. Rep. of Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 880,620, Jun. 25, 1986, abandoned. This application Jul. 21, 1989, Ser. No. 384,865
Claims priority, application Switzerland, Jul. 1, 1985, 2798/85; Apr. 24, 1986, 1663/86
Int. Cl.[5] A01N *45/00;* A61K *31/59*
U.S. Cl. 514—167 23 Claims

1. A pharmaceutical composition wherein a pharmaceutical carrier is combined with a mixture of hydroxylated derivatives of vitamin D which mixtures are selected from the group consisting of the following mixtures: 1α,25-dihydroxy-vitamin D_3 and 1α,24,25-trihydroxy-vitamin D_3; 1α,25-dihydroxy-vitamin D_3 and 1α,25,26-trihydroxy-vitamin D_3; 1α,25-dihydroxy-vitamin D_3 and 25,26-dihydroxy-vitamin D_3; 1α,25-dihydroxy-vitamin D_3, 24,25-dihydroxy-vitamin D_3, and 1α,24,25-trihydroxy-vitamin D_3; 1α,25-dihydroxy-vitamin D_3, 25,26-dihydroxy-vitamin D_3, and 1α,25,26-trihydroxy-vitamin D_3; 1α-hydroxy-vitamin D_3; and 1α,24,25-trihydroxy-vitamin D_3; and 1α-hydroxy-vitamin D_3 and 1α,25,26-trihydroxy-vitamin D_3; and a pharmaceutical carrier material.

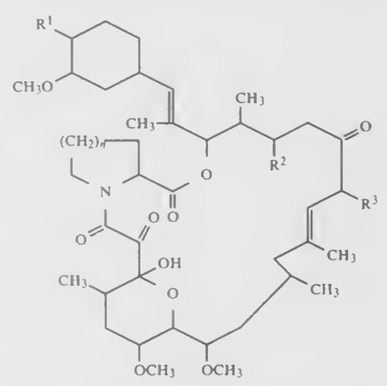
4,929,611

METHOD FOR IMMUNOSUPPRESSION

Masakuni Okuhara; Hirokazu Tanaka; Toshio Goto, all of Ibaraki; Tobru Kino, Tsuchiura, and Hirosbi Hatanaka, Ibaraki, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 799,855, Nov. 24, 1985, Pat. No. 4,894,366. This application May 30, 1986, Ser. No. 868,749
Claims priority, application United Kingdom, Dec. 3, 1984, 8430455; Feb. 5, 1985, 8502869; Apr. 1, 1985, 8508420
Int. Cl.[5] A61K *31/395*
U.S. Cl. 514—183 5 Claims

1. A method for treating resistance to transplantation which comprises administering an effective amount of a compound of the formula:



wherein
R^1 is hydroxy or pharmaceutically acceptable protected hydroxy selected from 1-(lower alkylthio)(lower)alkyloxy, tri(lower)alkylsilyloxy, lower alkyl-diphenylsilyloxy, pharmaceutically acceptable organic carboxylic acyloxy, pharmaceutically acceptable organic sulfonic acyloxy, and pharmaceutically acceptable organic carbamic acyloxy,
R^2 is hydrogen, hydroxy or lower alkanoyloxy,
R^3 is methyl, ethyl, propyl or allyl,
n is an integer of 1 or 2, and
the symbol of a line and dotted line is a single bond or a double bond,
or pharmaceutically acceptable basic salt thereof to a subject in need of said treatment.

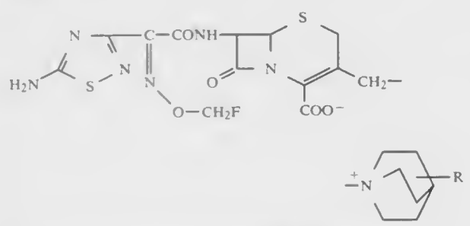
4,929,612

THIADIAZOLYLACETAMIDE CEPHEM DERIVATIVES

Yoshimasa Machida; Shigeto Negi; Takashi Kamiya; Yuuki Komatu; Isao Sagiyama; Yasunobu Kai, all of Ibaraki; Takaharu Nakamura, Chiba; Toshihiko Naito, Ibaraki; Kyosuke Kitoh, Ibarski; Kanemasa Katsu, Ibaraki, and Hiroshi Yamauchi, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,427
Claims priority, application Japan, Apr. 17, 1987, 62-93234
Int. Cl.[5] C07D *501/46;* **A61K** *31/545*
U.S. Cl. 514—202 **5 Claims**

1. A thiadiazolylacetamide cephem compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein
R is carbamoyl or hydroxy lower alkyl.

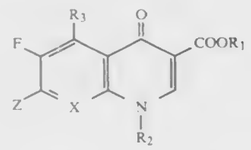
4,929,613

ANTIBACTERIAL AGENTS

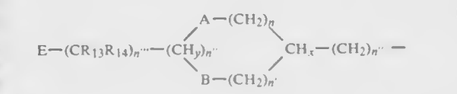
Townley P. Culbertson, Ann Arbor; John M. Domagala, Canton; Susan E. Hagen, Canton Township, Wayne County, and Joseph P. Sanchez, Canton, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 89,382, Aug. 26, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 222,608
Int. Cl.[5] C07D *401/04, 215/22;* **A61K** *31/47, 31/435*
U.S. Cl. 514—210 **28 Claims**

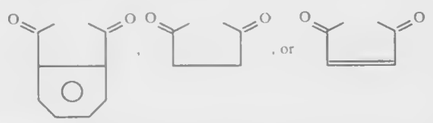
1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein:
R_1 is hydrogen, alkyl of from one to six carbon atoms, or a cation selected from sodium, potassium, magnesium and calcium;
R_2 is alkyl of from one to six carbon atoms, cycloalkyl of from three to six carbon atoms, vinyl, 4-fluorophenyl, 2,4-difluorophenyl, 2-aminopyridyl, 3-aminopyridyl or 4-aminopyridyl;
R_3 is hydrogen, halogen, OR_4, wherein R_4 is hydrogen or alkyl of from one to three carbon atoms, NHR_5 wherein R_5 is hydrogen or lower alkyl of from one to three carbon atoms, CF_3, or COOH;
X is CH, CF, CBr, CCl, CNO_2, CNH_2, CCF_3, or COR_6 wherein R_6 is hydrogen or alkyl of from one to three carbon atoms;
Z is



wherein one endocyclic double bond may be present between any two consecutive ring positions or two alternating or nonalternating endocyclic double bonds may be present in the ring;
wherein
n, n′, n‴, and n⁗ are each independently 0, 1, or 2;
n″ is 0, 1, 2, or 3;
y is 0 or 1;
x is 0 or 1;
A and B are each independently CH, CH_2, NR_7 wherein R_7 is hydrogen or R_7 is R_8CO wherein R_8 is alkyl of from one to ten carbon atoms, wherein alkyl may be substituted by hydroxy, halogen, COOH, or $CONHR_9$ wherein R_9 is hydrogen or alkyl of from one to four carbon atoms and when B is NR_7, A can be absent; with the proviso that Z is a carbocycle or a four to six member ring with one nitrogen;
R_{13} and R_{14} are each independently hydrogen or lower alkyl of from one to three carbon atoms; and
E is hydrogen, alkyl of from one to three carbon atoms, OR_{10} wherein R_{10} is hydrogen or alkyl of from one to three carbon atoms, $NR_{11}R_{12}$ wherein R_{11} and R_{12} are each independently hydrogen, lower alkyl of from one to three carbon atoms, cycloalkyl of from three to six carbon atoms, alkanoyl with a carbon chain of from one to three atoms, or R_{11} and R_{12} when taken together with the nitrogen to which they are attached form a ring of from three to six carbon atoms or



with the proviso that E must be $NR_{11}R_{12}$ when both A and B are C or CH_2.

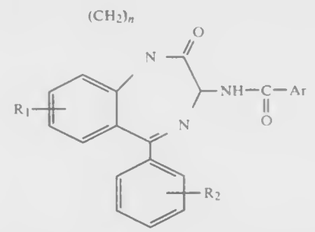
4,929,614

BENZODIAZEPINES, PROCESS AND INTERMEDIATES FOR THE PREPARATION THEREOF AND THEIR APPLICATION IN THERAPY

Alain P. Calvet, L'Hay-les-Roses; Jean-Louis Junien, Sevres; Ives R. Pascal, Rueil Malmaison; Xavier B. Pascaud, Paris, and Francois J. Roman, Courbevoie, all of France, assignors to Jouveinal S.A., Paris, France

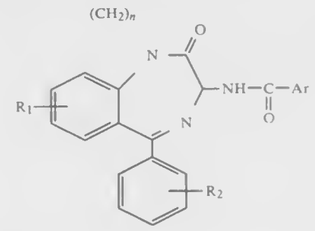
Filed Apr. 14, 1989, Ser. No. 337,940
Claims priority, application France, Apr. 25, 1988, 88 05443
Int. Cl.[5] A61K *31/55;* **C07D** *487/04, 471/04*
U.S. Cl. 514—214 **10 Claims**

1. Benzodiazepines of formula



in which R_1 is H or halogen, R_2 is H or halogen, Ar is indolyl, phenyl, naphthyl, indolyl monosubstituted with a halogen or with a methoxy or phenyl mono-, di- or trisubstituted with a halogen or with a methoxy or with a trifluoromethyl group, and n is 2 or 3; and their optical isomers.

8. A medicinal product for combatting gastrointestinal disorders; disorders of the pancreas, gall bladder and appetite; pain; and disorders of the central nervous system, said composition comprising in a pharmaceutically acceptable vehicle in an amount effective to combat said disorders and pain a benzodiazepine having the formula.



wherein
R_1 is hydrogen or halogen,
R_2 is hydrogen or halogen,
Ar is indolyl, phenyl, naphthyl, indolyl monosubstituted with halogen or methoxy, or phenyl mono-, di- or trisubstituted with halogen, methoxy or trifluoromethyl, and
n is 2 or 3;
and the optical isomers thereof.

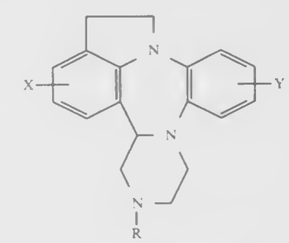
4,929,615

7H-BENZO[B]PYRAZINO[1,2-D]PYRROLO[3,2,1-JK][1,4]BENZODIAZEPINES

Edward J. Glamkowski, Warren, and Barbara E. Kurys, Elmwood Park, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jun. 12, 1989, Ser. No. 364,395
Int. Cl.[5] C07D *487/06;* **A61K** *31/55*
U.S. Cl. 514—219 **8 Claims**

1. A compound of the formula



wherein R is hydrogen, loweralkyl, or a group of the formula $COO(CR^1Z)_mCR^2R^3R^4$ wherein R^1, R^2, R^3 and R^4 are hydrogen or loweralkyl, Z is hydrogen, loweralkyl, or halogen, and m is 0 or 1; X and Y are independently hydrogen, halogen, loweralkyl, or trifluoromethyl; the dotted line represents an optional carbon-to-carbon bond; an optical isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

7. A method of treating depression comprising administering to a mammal in need of depression treatment a depression treating effective amount of a compound according to claim 1

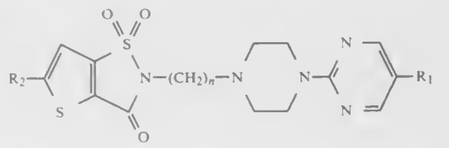
4,929,616

NOVEL BASIC-SUBSTITUTED 5-HALO-THIENOISOTHIAZOL-3(2H)-ONE 1,1-DIOXIDES, A PROCESS FOR THE PREPARATION THEREOF, AND PHARMACEUTICAL PREPARATIONS CONTAINING THESE COMPOUNDS

Dieter Binder, Wien, and Franz Rovensky, Bruck an der Leitha, both of Austria, assignors to Chemisch Pharmazeutische Forschungsgesellschaft, Linz, Austria

Filed Feb. 6, 1989, Ser. No. 306,744
Claims priority, application Austria, Feb. 18, 1988, 390/88
Int. Cl.[5] A61K *31/505;* **C07D** *521/00*
U.S. Cl. 514—253 **4 Claims**

4. A method for the treatment of anxiety states in humans which comprises administering to a patient an anxiolytically effective amount of a compound of the formula



defined in claim 1 or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable excipient, carrier or diluent.

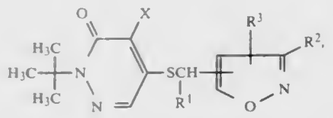
4,929,617

2-TERT-BUTYL-5-ISOXAZOLYLMETHYLTHIO-3(2H)-PYRIDAZIN-3-ONE

Joachim Leyendecker, Mannheim; Rainer Buerstinghaus, Telgte; Hans Theobald, Limburgerhof; Christoph Kuenast, Otterstadt, and Peter Hofmeister, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 12, 1988, Ser. No. 283,128
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1987, 3742266
Int. Cl.[5] A31K *31/50;* **C07D** *231/04*
U.S. Cl. 514—252 **5 Claims**

1. A 2-tert-butyl-5-isoxazolylmethylthio-3(2H)-pyridazin-3-one compound of the formula I



(I)

where R^1 is hydrogen or C_1–C_4-alkyl, R^2 is hydrogen, C_1–C_8-alkyl, C_2–C_8-alkenyl, C_1–C_4-haloalkyl, C_2–C_8-alkoxyalkyl, C_3–C_{10}-cycloalkyl, C_2–C_5-alkoxycarbonyl, phenyl, C_7–C_{10}-phenylalkyl, phenyl which is mono-, di- or trisubstituted by halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, phenyl, phenoxy or cyano, and/or mono- or disubstituted by nitro, or is C_7–C_{10}-phenylalkyl substituted in the phenyl moiety. R^3 is hydrogen, halogen, C_1–C_8-alkyl or C_2–C_8-alkenyl, and X is chlorine or bromine.

4,929,618

PIPERDINE AND PIPERAZINE DERIVATIVES, AND ANTIHISTAMINIC PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Akihide Koda, Gifu; Jun'ichiro Kita, Ube; Yoshiaki Kuroki, Ube; Hiroshi Fujiwara, Ube; Shinji Takamura, Ube, and Kayoko Yamano, Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

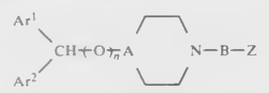
Filed Mar. 16, 1989, Ser. No. 325,306

Claims priority, application Japan, Mar. 25, 1988, 63-69711; Jul. 15, 1988, 63-175142

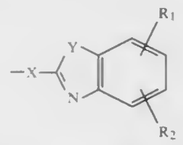
Int. Cl.[5] **A61K** *31/495, 31/445;* **C07D** *417/14, 401/14*

U.S. Cl. 514—253 **49 Claims**

1. A compound represented by Formula (I):



wherein Ar^1 and Ar^2 each independently represent a group selected from the group consisting of a phenyl group; phenyl groups having a halogen atom, a nitro group, a lower alkoxy group, a lower alkyl group or a lower alkyl group substituted with halogen atoms; and a pyridyl group; n is an integer of 0 or 1; A is a group selected from the group consisting of >N— and >CH—, with the proviso that when A is >N—, n is 0, and when A is >CH—, n is 1; B represents an alkylene group or an alkenylene which may be a straight chain having 2 to 6 carbon atoms or a branched chain having at least 2 carbon atoms in the main chain; Z is represented by Formula (II):



(wherein X and Y each independently represent a group selected from the group consisting of >NH, —O— and —S—, R_1 and R_2 each independently represent a group selected from the group consisting of a hydrogen atom, halogen atoms, a lower alkyl group and a lower alkoxy group) or a group of Formula (II'):



(wherein Z' represents a group selected from the group consisting of a lower alkyl group, hydroxyl group, a lower alkoxy group, a phenoxy group, an amino group, a lower alkylamino group, an anilino group, a phenyl group and phenyl groups substituted with a lower alkyl group, with the proviso that when Z' is a phenyl group or a phenyl group substituted with a lower alkyl group, at least either one of said Ar^1 and Ar^2 is a pyridyl group, and, when Z is represented by Formula (II'), A is >CH and n is 1), or its pharmaceutically acceptable acid adduct.

15. An antihistaminic and antiallergic pharmaceutical composition which comprises the compound or its pharmaceutically acceptable acid adduct as described in claim 1 as an active component.

4,929,619

ANTI-INFECTIVE METHODS AND COMPOSITIONS

Steven T. Blackman, New York, N.Y., assignor to Thames Pharmacal Co., Inc., Ronkonkoma, TIONS 5 03121990 36 05291990 ZZX None 7 1 1 Henley, III; Raymond J. Robinson; Douglas W. 0 0

Continuation of Ser. No. 218,956, Jul. 14, 1988, Pat. No. 4,873,265. This application Aug. 7, 1989, Ser. No. 389,962

Int. Cl.[5] **A61K** *31/52, 31/045*

U.S. Cl. 514—263 **7 Claims**

1. A method of providing local bactericidal or bacteriostatic treatment to a human or animal tissue area in need thereof comprising applying to said tissue area an effective amount of a composition containing (a) about 2.0% by weight of diphenhydramine or a pharmaceutically acceptable salt thereof; (b) about 60% by weight of ethyl alcohol; and (c) a pharmaceutically acceptable topical vehicle.

4,929,620

5-PYRIMIDINYL-3,5-DIHYDROXY-6-HEPTENOIC ACID COMPOUNDS USEFUL AS INHIBITORS OF CHOLESTEROL BIOSYNTHESIS

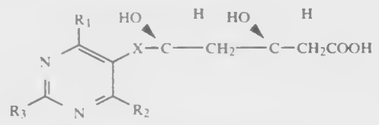
Alexander W. Chucholowski, Ypsilanti; Bruce D. Roth, Ann Arbor, and Drago R. Sliskovic, Ypsilanti, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 130,870, Dec. 10, 1987, Pat. No. 4,868,185. This application Jun. 1, 1989, Ser. No. 361,155

Int. Cl.[5] **C07D** *405/06*

U.S. Cl. 514—269 **8 Claims**

1. A compound of the formula:



wherein X is $—CH_2CH_2—$ or —CH=CH—;
wherein R_1 and R_2 are independently selected from
hydrogen;
alkyl of from one to six carbons;
alkoxy of from one to four carbon atoms;
trifluoromethyl;
cyclopropyl;
cyclohexyl;
cyclohexylmethyl;
phenyl;
phenyl substituted with
fluorine,
chlorine,
bromine,
hydroxy,
trifluoromethyl,
alkyl of from one to four carbon atoms, or
alkoxy of from one to four carbon atoms;
phenylmethyl; or
phenylmethyl substituted with
fluorine,
chlorine,
bromine,
hydroxy,
trifluoromethyl,
alkyl of from one to four carbon atoms, or
alkoxy of from one to four carbon atoms;
wherein R_3 is
hydrogen;
alkyl of from one to six carbon atoms;
trifluoromethyl;
cyclopropyl;
phenyl; or
phenyl substituted with
fluorine,
chlorine,
bromine,
hydroxy,
trifluoromethyl,
alkyl of from one to four carbon atoms, or
alkoxy of from one to four carbon atoms;
or a pharmaceutically acceptable salt thereof.

4,929,621

1-1[(2-PYRIMIDINYL)AMINO-ALKYL]PIPERIDINES, THEIR PREPARATION AND THEIR APPLICATION IN THERAPY

Philippe Manoury, Verrieres le Buisson, and Alfred Saarmets, Sucy en Brie, both of France, assignors to Synthelabo, Paris, France

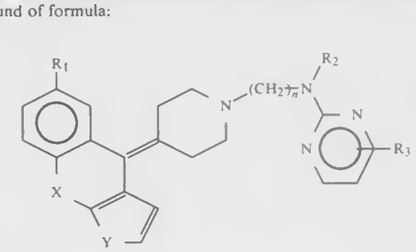
Division of Ser. No. 242,430, Sep. 8, 1988, Pat. No. 4,891,376. This application Aug. 29, 1989, Ser. No. 399,983

Claims priority, application France, Sep. 20, 1987, 8712502

Int. Cl.[5] **A61K** *31/505;* **C07D** *401/06, 405/14*

U.S. Cl. 514—275 **1 Claim**

1. A method for the treatment of anxiety or depression which comprises administering to a subject suffering therefrom or biable to suffer therefrom an effective amount of a compound of formula:



in which:
X is $(CH_2)_2$, CH=CH or CH_2—CO group;
Y is a CH=CH group or sulphur;
n is 2, 3 or 4;
R_1 is hydrogen or a halogen;
R_2 is hydrogen or a (C_{1-4}) alkyl group; and
R_3 is hydrogen or a hydroxy group;
or a pharmaceutically acceptable acid addition salt thereof.

4,929,622

2,6-METHANOPYRROLO-3-BENZAZOCINES

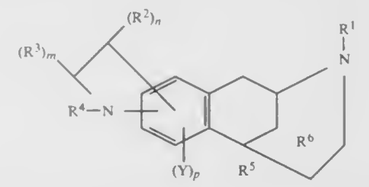
Richard C. Allen, Flemington, and David G. Wettlaufer, Phillipsburg, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 101,716, Sep. 24, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 272,045

Int. Cl.[5] **C07D** *471/08;* **A61K** *31/435*

U.S. Cl. 514—281 **62 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of hydrogen, loweralkyl, loweralkenyl, cycloalkylloweralkyl, arylloweralkyl, arylaminoloweralkyl, cyano, and —C(O)R^9 wherein R^9 is hydrogen, loweralkyl or loweralkoxy; R^2 and R^3 are independently selected from the group consisting of loweralkyl, arylloweralkyl, halogen, oxo, and —C(O)R^7 wherein R^7 is selected from the group consisting of hydrogen, loweralkyl, aryl, arylloweralkyl, hydroxy, loweralkoxy, arylloweralkoxy, aryloxy and amino; R^4 is selected from the group consisting of hydrogen, loweralkyl, arylloweralkyl, and —C(O)R^8 wherein R^8 is selected from the group consisting of hydrogen, loweralkyl, arylloweralkyl, aryl, loweralkoxy, arylloweralkoxy and aryloxy; R^5 and R^6 are independently hydrogen or loweralkyl, or taken together are a bivalent radical of the formula $—(CH_2)_4$; m, n, and p are integers independently having values of zero or 1, with the proviso that the sum of m and n only exceeds 1 when at least one of R^2 and R^3 is linear loweralkyl, hydrogen, or oxo; Y is halogen or loweralkyl; and the dotted line in said compound is an optional bond; with the additional proviso that the pyrrole group is fused on adjacent carbons of the benzene ring, not bridging the ring; the term "aryl" in each case designating a phenyl group optionally substituted by up to 3 substituents each of which is independently loweralkyl, loweralkoxy, halogen, trifluoromethyl, nitro or cyano; and the geometrical isomers, optical antipodes; or pharmaceutically acceptable acid addition salts thereof.

4,929,623

BENZOTHIAZOLE DERIVATIVE

Shinya Abe, Ushiku; Mitsuaki Miyamoto; Masayuki Tanaka, both of Tsukuba; Kozo Akasaka, Ushiku; Kenji Hayashi, Tsukuba; Tetsuya Kawahara, Tsuknba; Satoshi Katayama, Tsukuba; Yoshinori Sakuma, Ushiku; Takeshi Suzuki, Ushiku, and Isao Yamatsu, Ushiku, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

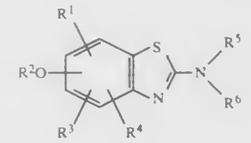
Filed Jun. 16, 1988, Ser. No. 207,329

Claims priority, application Japan, Jun. 17, 1987, 62-150987

Int. Cl.[5] **C07D** *277/82;* **A61K** *31/425*

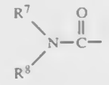
U.S. Cl. 514—293 **27 Claims**

1. A benzothiazole compound having the formula:

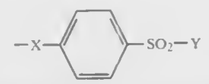


wherein R^1, R^3, and R^4 may be the same or different and are each a hydrogen atom, a lower alkyl group, a halogen atom, an acyl group, a hydroxyl group, a lower alkoxy group, a hydroxy lower alkyl group, a nitro group, an amino group, or a lower dialkylamino group, provided that any two of R^1, R^3 and R^4 may be combined together to form an aromatic ring which may consist of only carbon atoms or additionally contain a nitrogen atom,

R^2 is a hydrogen atom, an acyl group, a group represented by the formula:



wherein R^7 and R^8 may be the same or different and are each a hydrogen atom or a lower alkyl group,
R^5 is a hydrogen atom, and
R^6 is a group represented by the formula:



wherein X is a —CO— or a —CH_2—, and Y is a lower alkyl group or a group represented by the formula:



wherein R^9 and R^{10} may be the same or different and are each a hydrogen atom, a lower alkyl group, a halogen atom, a lower alkoxy group, a hydroxy lower alkyl group or a lower dialkyl group or a pharmaceutically acceptable salt thereof.

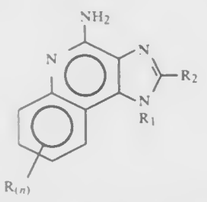
4,929,624

OLEFINIC 1H-IMIDAZO(4,5-C)QUINOLIN-4-AMINES

John F. Gerster, and Roy T. Knafla, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 23, 1989, Ser. No. 327,693
Int. Cl.[5] C07D *471/02*
U.S. Cl. 514—293 **7 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of straight chain or branched chain alkenyl containing 2 to about 10 carbon atoms and substituted straight chain or branched chain alkenyl containing 2 to about 10 carbon atoms, wherein the substituent is selected from the group consisting of straight chain or branched chain alkyl containing 1 to about 4 carbon atoms; cycloalkyl containing 3 to about 6 carbon atoms; and cycloalkyl containing 3 to about 6 carbon atoms substituted by straight chain or branched chain alkyl containing 1 to about 4 carbon atoms; and

R_2 is selected from the group consisting of hydrogen, straight chain or branched chain alkyl containing one to about eight carbon atoms, benzyl, (phenyl)ethyl and phenyl, the benzyl, (phenyl)ethyl or phenyl substituent being optionally substituted on the benzene ring by one or two moieties independently selected from the group consisting of straight chain or branched chain alkyl containing one to about four carbon atoms, straight chain or branched chain alkoxy containing one to about four carbon atoms, and halogen, with the proviso that when the benzene ring is substituted by two such moieties, then the moieties together contain no more than 6 carbon atoms; and

each R is independently selected from the group consisting of straight chain or branched chain alkoxy containing one to about four carbon atoms, halogen, and straight chain or branched chain alkyl containing one to about four carbon atoms, and n is an integer from zero to 2, with the proviso that if n is 2, then said R groups together contain no more than 6 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

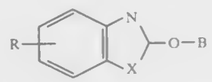
4,929,625

ETHERS

Ian A. Cliffe, Cippenham, England, assignor to John Wyeth and Brothers Limited, Maidenhead, England

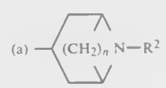
Filed Aug. 1, 1988, Ser. No. 226,657
Claims priority, application United Kingdom, Aug. 4, 1987, 8718444; May 20, 1988, 8811975
Int. Cl.[5] A61K *31/435*
U.S. Cl. 514—304 **11 Claims**

1. A compound of the formula



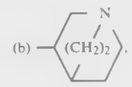
IA

wherein
X is O or S;
R is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, amino, mono-C_{1-4}alkylamino, di(C_{1-4}-alkyl)amino, fluorine, chlorine, trifluoromethyl, phenyl, mono-chloro- or fluorophenyl, C_{1-4}alkylphenyl, mono-C_{1-4}-alkoxyphenyl, carboxy, carboxamido, nitro, thiol, C_{1-4}-alkylthio, and C_{1-4}-alkoxycarbonyl; and
B is

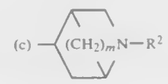


(II)

where n is 2,3 or 4 and R^2 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, allyl, methallyl, cycopentyl, cyclohexyl, cyclopentylmethyl, cyclohexylmethyl or benzyl,

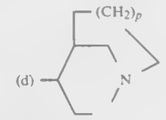


(III)



(IV)

where R^2 has the meaning given above and m is 1, 2 or 3



(V)

where p is 0, 1 or 2,
or a N-oxide of the 2-benzoxazolyl or 2-benzothiazolyl nitrogen thereof, or a pharmaceutically acceptable acid addition salt of a compound of formula IA or of said N-oxide thereof.

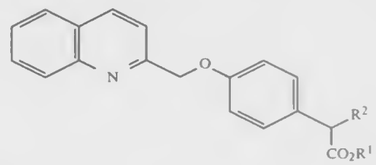
4,929,626

α-SUBSTITUTED 4-(QUINOLIN-2-YL-METHOXY)PHENYLACETIC ACIDS AND ESTERS AND LIPOXYGENASE INHIBITION THEREWITH

Klaus Mohrs, Wuppertal; Siegfried Raddatz; Romanis Fruchtmann, both of Cologne; Christian Kohlsdorfer, Erfstadt, and Reiner Müller-Peddinghaus, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,974
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3814504
Int. Cl.[5] C07D *215/14*; A61K *31/47*
U.S. Cl. 514—311 **11 Claims**

1. An α-substituted 4-(quinolin-2-yl-methoxy)phenylacetic acid or ester thereof of the formula



(I)

in which
R^1 - stands for hydrogen, alkyl, arylalkyl, aryl or
- for a group of the formula

$$—CH_2—CO_2—R^3,$$

where
R^3 - stands for hydrogen, alkyl, arylalkyl or aryl and
R^2 - stands for hydrogen, alkyl, alkenyl or alkinyl, or a pharmaceutically acceptable salt thereof.

10. A method of inhibiting lipoxygenase in a patient in need thereof which comprises administering to such patient an amount effective therefor of a compound or salt according to claim **1**.

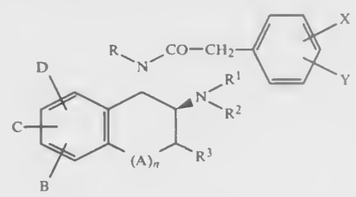
4,929,627

BENZO-FUSED CYCLOALKANE AND OXA- AND THIA-, CYCLOALKANE TRANS-1,2-DIAMINE DERIVATIVES

Penio Penney, Chadds Ford, Pa.; Parthasarathi Rajagopalan, and Richard M. Scribner, both of Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 71,028, Jul. 16, 1987, which is a continuation-in-part of Ser. No. 905,543, Sep. 10, 1986, abandoned. This application Jun. 7, 1989, Ser. No. 362,681
Int. Cl.[5] C07D *407/04, 409/04*; A61K *31/40*
U.S. Cl. 514—320 **30 Claims**

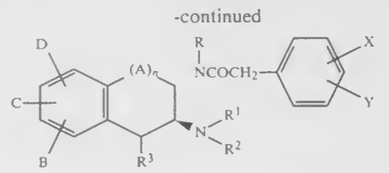
1. A compound having the formula:



(I)

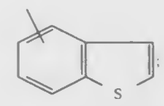
or

-continued



(II)

wherein for the enantiomers and racemic mixtures
n is 1;
A is —O—, or —S—;
B, C and D independently are selected from the group consisting of H, OH, $OCOR_5$, $OCH_2CH_2OR_5$, OR_6, R_6, CH_2OR_6, CH_2COR_7, Cl, F, Br, I, NH_2, NHR_8, NR_8R_9, SH, SR_6, CH_2SR_6 and $OC(S)N(CH_3)_2$;
X and Y independently are selected from the group consisting of H, OCH_3, Cl, F, Br, I, NO_2, CF_3, CN, SO_2R^{10}, and SO_2CF_3 or;



X and Y taken together with the benzene ring form
R and R^1 independently are selected from the group consisting of H, and alkyl of 1 to 3 carbon atoms;
R^2 and H; alkyl of 1 to 6 carbon atoms; CH_2CF_3; alkenylmethyl of 3 to 6 carbon atoms; hydroxyalkylmethyl of 2 to 5 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; cyclopropylmethyl; cyclobutylmethyl, or phenylalkyl of 7 to 9 carbon atoms; or R2 can be taken together with R^1 and the nitrogen to which they are attached to be 1-azetidinyl; 1-pyrrolidinyl 1-piperazinyl optionally substituted at the 4-position by alkyl of 1 to 3 carbon atoms; 1-morpholino;
R^3 is H;
R^5 is alkyl of 1 to 6 carbon atoms, phenyl, or mono-substituted phenyl;
R^6, R^8, R^9, R^{10} and R^{13} are independently an alkyl group of 1 to 3 carbon atoms; and
R^7 is selected from the group consisting of H, OH, OR^{13}, NHR^{13}, and NR_2^{13}; or
a stable N-oxide or a pharmaceutically acceptable salt thereof.

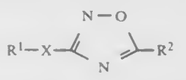
4,929,628

OXADIAZOLE COMPOUNDS, THEIR PREPARATION AND THEIR USE AS PESTICIDES

Alastair McArthur; Royston H. Davis; Mark D. Hiltoo; Trevor W. Newton, and Dinesh M. Patel, all of Sittingbourne, England, assignors to Shell Internationale Research Maatschappij, B. V., The Hague, Netherlands

Filed Jan. 19, 1989, Ser. No. 298,691
Claims priority, application United Kingdom, Jan. 21, 1988, 8801289
Int. Cl.[5] C07D *271/06*; A01N *43/26*
U.S. Cl. 514—364 **9 Claims**

1. A 1,2,4-oxadiazole compound of the general formula



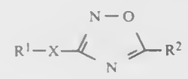
(I)

wherein
R^1 is a group selected from phenyl and phenyl substituted by one to three substituents independently selected from halogen atoms, C_{1-6} alkoxy groups and C_{1-6} hydroxyimino alkyl groups,

R^2 is a group selected from phenyl and phenyl substituted by one to three substituents independently selected from halogen atoms, C_{1-6} alkoxy groups and nitro groups, and

X is oxygen.

2. A pesticidal composition exhibiting acaricidal activity comprising a carrier and, as an active ingredient, an acaricidally effective amount of a 1,2,4-oxadiazole compound of the general formula



(I)

wherein

R^1 is a group selected from phenyl and phenyl substituted by one to three substituents independently selected from halogen atoms, C_{1-6} alkoxy groups and C_{1-6} hydroxyimino alkyl groups,

R^2 is a group selected from phenyl and phenyl substituted by one to three substituents independently selected from halogen atoms, C_{1-6} alkoxy groups and nitro groups, and

X is oxygen or sulfur.

4,929,629

THERAPEUTIC COMPOUND

James E. Jeffery, and Derek Whybrow, both of Nottingham, England, assignors to Boots Company, PLC, Nottingham, England

Continuation of Ser. No. 938,395, Dec. 5, 1986, abandoned. This application Apr. 19, 1989, Ser. No. 342,638

Claims priority, application United Kingdom, Dec. 17, 1985, 8531071

Int. Cl.[5] **A61K** *31/135*

U.S. Cl. 514—646 **3 Claims**

1. An N,N-dimethyl-1-[1-(4-chlorophenyl)cyclobutyl]-3-methylbutylamine hydrochloride monohydrate product in crystalline solid form essentially comprising equimolar amounts of N,N-dimethyl-1-[1-(4-chlorophenyl)cyclobutyl]-3-methylbutylamine hydrochloride and molecularly combined water of hydration, said product exhibiting substantially non-hydroscopic properties when exposed to atmospheric moisture environmental conditions.

4,929,630

TRANSGLUTAMINASE INHIBITORS

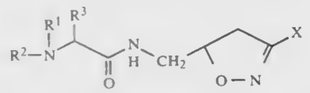
Arlindo L. Castelhano, Mississauga, Canada; Lawrence M. DeYoung, Half Moon Bay, Calif.; Alexander Krantz, Toronto, Canada; Diana H. Pliura, Mississauga, Canada, and Michael C. Venuti, San Francisco, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 25,451, Mar. 13, 1987, Pat. No. 4,912,120, which is a continuation-in-part of Ser. No. 839,743, Mar. 14, 1986, abandoned. This application Sep. 8, 1989, Ser. No. 404,791

Int. Cl.[5] **A61K** *31/44, 31/445, 31/42;* **C07D** *261/04*

U.S. Cl. 514—380 **13 Claims**

1. A method for treating mammals which have a disease stated characterized by elevated transglutaminsase activity comprising administering to the mammals a therapeutically effective amount of a compound of the formula;



(I)

or an optical isomer thereof, or a pharmaceutically acceptable salt thereof, wherein:

R^1 and R^2, together with the nitrogen atom to which they are attached, represent phthalimido; or R^1 and R^3 together form $—CH_2—CH_2—CH_2—$ or $CH_2—CHOH—CH_2$; or

R^1, R^2 and R^3 are defined as follows:

R^1 is hydrogen or methyl;

R^2 is selected from the group consisting of:

(1) hydrogen;

(2) alkyl;

(3) lower alkyl sulfonyl;

(4) aryl sulfonyl;

(5) aryl sulfonyl substituted with lower alkyl on the aryl moiety;

(6) 9-fluorenylmethyloxycarbonyl, succinyl or cinnamoyl;

(7) a radical of the formula:

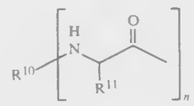


(II)

wherein:

R^9 is hydrogen; alkyl of 1 to 4 carbon atoms; aryl; aryl substituted with up to 2 substituents where the substituents are independently halo, lower alkyl, alkoxy, nitro, trifluoromethyl, carboxyl, or alkoxycarbonyl; aralkyl; pyridinyl; furanyl; alkoxy; aralkoxy; aralkoxy substituted on the aryl radical with up to 2 substituents where the substituents are independently halo, lower alkyl, alkoxy, nitro, or trifluoromethyl; adamantyloxy; aralkylamino; or aralkyl substituted on the aryl radical with up to 2 substituents where the substituents are independently hydroxy, alkoxy or halo; and

(8) a radical of the formula:



(III)

wherein:

n=0 or 1;

R^{10} is independently hydrogen, alkyl or the radical defined by formula (II) above;

R^{11} is selected from the group consisting of: hydrogen; lower alkyl; $—(CHR^{12})_mWR^{13}$ wherein m is 1 or 2, W is oxygen or sulfur and R^{12} and R^{13} are independently hydrogen or methyl; $—CH(CH_3)—OCH_2C_6H_5$;

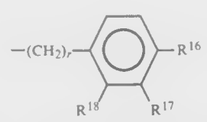
$—(CH_2)_kC(O)Y$ wherein k is 1 or 2 and Y is hydroxy, amino, alkoxy, or aralkoxy;

$—(CH_2)_pNHCH(NHR^{14})NR^{15}$ wherein p is 2,3, or 4 and R^{14} and R^{15} are independently hydrogen or lower alkyl;

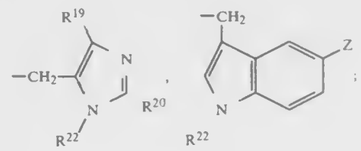
$—(CH_2)_qNH_2$ wherein q is 2, 3, 4, or 5;

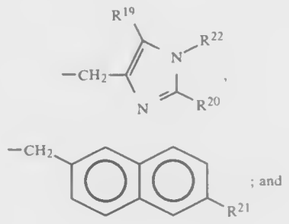
$—(CH_2)_4NHCOOC(CH_3)_3$;

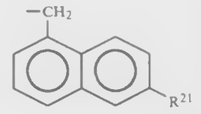
$—(CH_2)_2CHOHCH_2NH_2$; a radical of formula:



wherein r is 1 or 2 and R^{16}, R^{17} and R^{18} are independently hydrogen, hydroxy, halo, methoxy, lower alkyl, halo lower alkyl, amino, N-protected amino, guanidino, nitro cyano, —COOH, $—CONH_2$, —COOR''' where R''' is lower alkyl, or —OR* where R* is an O-protecting group; and a radical chosen from



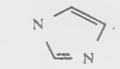




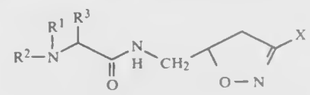
wherein R^{19} and R^{20} are independently hydrogen, lower alkyl, halo or trifluoromethyl alkyl; R^{21} is hydrogen, hydroxy or methoxy; and Z is hydrogen, hydroxy, or —OR* where R* is an O-protecting group; R^{22} is hydrogen or an N-protecting group for imidazole or indole functionalities;

R^3 is independently selected from the group recited for R^{11} above; and

X is selected from the group consisting of: halo; —OR, —SR, —S(O)R, $—S(O_2)R$, $—S(O)_2NH_2$ or $—S(O)_2NHR$ wherein R is lower alkyl, mono-, di- or tri-fluoro alkyl of 2 or 3 carbon atoms, aryl, or optionally substituted aryl; —NR'R'' wherein R' and R'' are independently hydrogen, lower alkyl, or aryl; and



5. A method for treating mammals which have a disease state characterized by elevated transglutaminase activity comprising administering to the mammal a thereapeutically effective amount of a compound of the formula:



(I)

or an optical isomer thereof, or a pharmaceutically acceptable salt thereof, wherein:

R^1 and R^2, together with the nitrogen atom to which they are attached, represent phthalimido; or R^1, R^2 and R^3 are defined as follows:

R^1 is hydrogen;

R^2 is selected from the group consisting of:

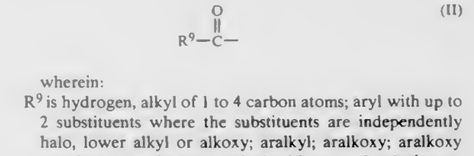
aryl sulfonyl substituted with lower alkyl on the aryl moiety;

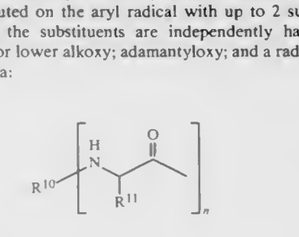
9-fluorenylmethyloxycarbonyl;

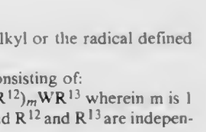
succinyl;

cinnamoyl; and

a radical of the formula:







(III)

wherein:

n=0 or 1;

R^{10} is independently hydrogen, alkyl or the radical defined by formula (II) above;

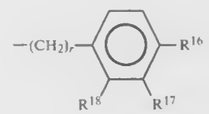
R^{11} is selected from the group consisting of:

hydrogen; lower alkyl; $—(CHR^{12})_mWR^{13}$ wherein m is 1 or 2, W is oxygen or sulfur and R^{12} and R^{13} are independently hydrogen or methyl;

$—(CH_2)_kC(O)Y$ wherein k is 1 or 2 and Y is hydroxy or amino, $—(CH_2)_pNHCH(NHR^{14})NR^{15}$ wherein p is 2,3, or 4 and R^{14} and R^{15} are independently hydrogen;

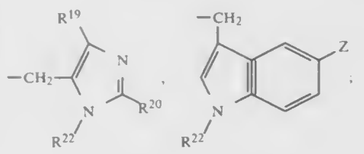
$—(CH_2)_qNH_2$ wherein q is 2, 3, 4, or 5;

a radical of formula:

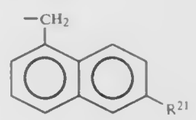


wherein:

r is 1 and R^{16}, R^{17} and R^{18} are independently hydrogen, hydroxy, halo, methoxy, or amino, and a radical chosen from:



; and



wherein:

R^{19} and R^{20} are independently hydrogen, R^{21} is hydrogen, hydroxy or methoxy; and Z is hydrogen, hydroxy, or —OR* where R* is an O-protecting group;

R^{22} is hydrogen or an N-protecting group for imidazole or indole functionalities;

R^3 is independently selected from the group recited for R^{11} above; and

X is selected from the group consisting of chloro and bromo.

6. A method for treating a hyman having a disease state characterized by elevated transglutaminase activity comprising administering to the human a therapeutically effective amount of a compound, or an optical isomer thereof, selected from the group consisting of: 5-(N-benzyloxycarbonyl-L-phenylalaninamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-para-tyrosinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-ortho-tyrosinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-D-naphthylalaninamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-D-para-chlorophenylalaninamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-tert-butoxycarbonyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-aspartic acid-α-amidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-N-ε-tert-butoxycarbonyl-L-lysine-amidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-β-benzyl-L-aspartic acid amidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-glutamic acid amidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-β-benzyl-L-aspartic acid amidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-acetyl-L-naphthylalaninamidomethyl)-3-bromo-4,5-diihydroisoxazole;

5-(N-benzyloxycarbonyl-glycinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-isoleucinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-(9-fluorenylmethyloxycarbonyl)-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-tert-butoxycarbonyl-O-benzyl-L-threoninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-threoninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-phenylalaninyl-L-alaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-alanyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzoyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-D-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-naphthylmethylglycinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-γ-glutamine amidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-phthaloyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-D,L-meta-tyrosinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-para-tyrosinamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-para-tyrosinamidomethyl)-5-(S)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-ortho-tyrosinamidomethyl)-3-cloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-meta-tyrosinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-meta-tyrosinamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-2-methoxyphenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-4-methoxyphenylalaninamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-3-methoxyphenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-3-methoxyphenylalaninamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-3,4-dihydroxy-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-3,4-dihydroxy-phenylalaninamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-3-methoxy-tyrosinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-3-methoxy-tyrosinamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-tryptophanamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-tryptophanamidomethyl-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-5-hydroxytryptophanamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-5-hydroxytryptophanamidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-histidinamidomethyl-3-bromo-4,5-dihydroisoxazole;

5-(N-im-benzoyl-N-α-benzyloxycarbonyl-L-histidinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-toluenesulfonyl glycinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzylcarbamoyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-4-(R)-hydroxyl-L-prolinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-para-methoxy-L-phenyl-alaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N^{α}, O-dibenzyloxycarbonyl-L-5-hydroxytryptophanamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-tryptophanamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N,O,O-tribenzyloxycarbonyl-(±)-3,4-dihydroxy-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-(±)-3,4-dihydroxy-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-(±)-para-fluoro-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-tert-butoxycarbonyl-L-phenylalanyl-L-tyrosinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N^{α},N-dibenzyloxycarbonyl-L-4-amino-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N^{α}-benzyloxycarbonyl-N^{in}-formyl-L-tryptophanamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-para-amino-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(L-phenylalanyl-L-tyrosinamidomethyl)-3-bromo-4,5-dihydroisoxazole-para-toluene-sulfonic acid;

5-(N-benzyloxycarbonyl-S-benzyl-L-cysteinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-methioninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-O-acetyl-L-tyrosinamidomethyl)-5-(S)-3-bromo-4,5-dihydroisoxazole;

5-(N,O-dibenzyloxycarbonyl-3-methoxy-L-tyrosinamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-(±)-para-iodophenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-2-(S)-(6methoxy-2-naphthyl)-propionyl-L-tyrosinamidomethyl)-5-(S)-3-bromo-4,5-dihydroisoxazole;

5-(N-α-benzyloxycarbonyl-L-glutamic acid α-amidomethyl)-3-chloro-4,5-dihydroisoxazole;

5-(N-para-methoxybenzyloxycarbonyl-L-tyrosinamidomethyl)-5-(S)-3-chloro-4,5-dihydroisoxazole;

5-(N-(2-(S)-(6-methoxy-2-naphthyl)-propionyl)-L-tyrosinamidomethyl) 5-(S)-3-chloro-4,5-dihydroisoxazole;

5-(N-(2-naphthyl-acetyl)-L-tyrosinamidomethyl-5-(S)-3-chloro-4,5-dihydroisoxazole;

5-(N-(1-naphthyl-acetyl)-L-tyrosinamidomethyl)-5-(S)-3-chloro-4,5-dihydroisoxazole;

5-(N-isobutyloxycarbonyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-succinyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-benzyloxycarbonyl-L-threonyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-cinnamoyl-L-phyenylalaninamidomethyl)3-bromo-4,5-dihydroisoxazole;

5-(N-(2(S)-6-methoxy-2-naphthylpropionyl)-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-(2(S)-6-methoxy-2-naphthylpropionyl)-L-phenylalaninamidomethyl)5-(R)-3-bromo-4,5-dihydroisoxazole;

5-(N-(2-(S)-6-methoxy-2-naphthylpropionyl)-L-phenylalaninamidomethyl)-5-(S)-3-bromo-4,5-dihydroisoxazole;

5-(N-adamantyloxycarbonyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-2-chlorobenzyloxycarbonyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-(4-methoxybenzyloxycarbonyl)-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-(4-methoxybenzyloxycarbonyl)-L-phenylalaminamidomethyl)-5-(R)-3-bromo-4,5-dihydroisoxazole;

5-(N-(4-methoxybenzyloxycarbonyl)-L-phenylalaninamidomethyl)-5-(S)-3-bromo-4,5-dihydroisoxazole;

5-(N-tertbutoxycarbonyl-glycyl-L-phenylalaninamidomethyl)-3-bromo-4,5-dihydroisoxazole;

5-(N-α-benzyloxycarbonyl-L-lysinamidomethyl)-3-bromo-4,5-dihydroisoxazole oxalic acid;

5-(glycyl-L-phenylalaninamidomethyl)-3-bromo-4,5--hydroisoxazole oxalate salt;

5-(N-(6-methoxy-2-naphthyl)acetyl-L-phenylalaninamidomethyl)-3-chloro-4,5-dihydrosoxazole; and

5-(N-(6-methoxy-2-naphthyl)acetyl)-L-tyrosinamidomethyl)3-chloro-4,5-diydroisoxazole; or an optical isomer thereof.

4,929,631

FUNGICIDE AZOLYL-DERIVATIVES

Roberto Colle, Basiglio; Giovanni Camaggi, Novara; Franco Gozzo, San Donato Milanese; Gluseppina Ratti, Seregno; Carlo Garavaglia, Cuggiono, and Luigi Mirenna, Milan, all of Italy, assignors to Agrimont S.r.l., Milan, Italy

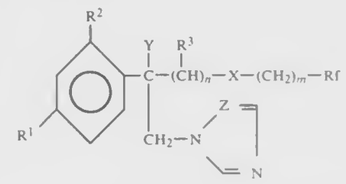
Filed Dec. 16, 1987, Ser. No. 133,602

Claims priority, application Italy, Dec. 23, 1986, 22828 A/86

Int. Cl.[5] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **5 Claims**

1. The compounds having the formula:



(I)

wherein:

R^1 is selected from the group consisting of F, Cl, Br, CF_3, a phenyl, a C_1–C_2 alkoxy, and a C_1–C_2 haloalkoxy, radical, in which the halogen is F, Cl, or Br;

R^2 is selected from the group consisting of H, F, Cl, Br, and CF_3;

R^3 is H, a C_1–C_4 alkyl or a C_3–C_6 cycloalkyl radical;

Y is OH;

n is 1, 2, 3, 4 with the proviso that Y can only be OH when n is 1;

m is 0 or 1;

X is O or S;

R_f is selected from the group consisting of C_1–C_5 polyfluoroalkyl and C_2–C_4 polyfluoroalkenyl radicals, each of these containing at least two fluorine atoms and

Z is N.

4,929,632

MEDICAMENTS

Michael B. Tyers, Welwyn; Jan H. Coates, Hertford; David C. Humber, London; George B. Ewan, Gerrards Cross, and James A. Bell, Royston, all of England, assignors to Glaxo Group Limited, London, England

Division of Ser. No. 877,805, Jun. 24, 1986, Pat. No. 4,753,789. This application Apr. 4, 1988, Ser. No. 177,042

Claims priority, application United Kingdom, Jun. 25, 1985, 8516083

Int. Cl.[5] A61K *31/415;* **C07D** *403/06*

U.S. Cl. 514—397 **9 Claims**

1. A method of treatment for the promotion of gastric emptying in a human or animal subject which comprises administering to the human or animal subject in need thereof an effective amount for the promotion of gastric emptying of 1,2,3,9-tetrahydro-9-methyl-3-[(2-methyl-1H-imidazol-1-yl)methyl]-4H-carbazol-4-one or a physiologically acceptable salt or solvate thereof.

4,929,633

ACTINONIN DERIVATIVES HAVING PHYSIOLOGICAL ACTIVITIES

Seiji Shibahara, Machida; Yukiko Takahashi, Kawasaki; Yuji Matsuhashi, Yokohama; Mitsugu Hachisu, Yokohama; Shinichi Kondo, Yokohama; Tomio Takeuchi, Shinagawa, and Takaaki Aoyagi, Fujisawa, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai and Meiji Seika Kaisha, Ltd., Tokyo, Japan

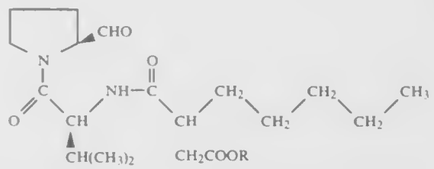
Filed Jun. 8, 1988, Ser. No. 203,888

Claims priority, application Japan, Jun. 11, 1987, 62-144176

Int. Cl.[5] C07C *207/08;* **A61K** *31/40*

U.S. Cl. 514—423 **6 Claims**

1. An actinonin derivative represented by the general formula (I):



(I)

wherein R means a hydrogen atom or a lower alkali group.

6. A method of treating an amnesia in an amnestic human patient, which comprises administering an actinonin derivative of the formula (I) as defined in claim 1, to the patient in an amount sufficient to reduce or eliminate a sympton of the amnesia.

4,929,634

METHOD OF AND BAIT COMPOSITIONS FOR CONTROLLING MOLLUSKS

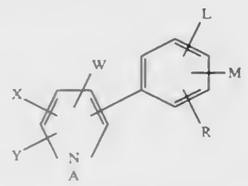
Rod A. Herman, Monmouth County, and Christine F. Kukel, Somerset County, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 112,904, Oct. 23, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 216,097

Int. Cl.[5] A01N *43/36*

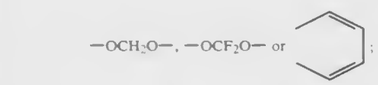
U.S. Cl. 514—426 **14 Claims**

1. A method for controlling mollusks comprising externally contacting said mollusks or internally administering to said mollusks a molluscicidally effective amount of an arylpyrrole compound having the structure:



(I)

wherein X is F, Cl, Br, I, or CF_3; Y is F, Cl, Br, I, CF_3 or CN; W is CN or NO_2; A is H; C_1–C_4 alkyl optionally substituted with from one to three halogen atoms, one hydroxy, one C_1–C_4 alkoxy, one C_1–C_4 alkylthio, one phenyl optionally substituted with C_1–C_3 alkyl, C_1–C_3 alkoxy or from one to three halogen atoms, one phenoxy optionally substituted with one to three halogen atoms or one benzyloxy optionally substituted with one halogen substituent; C_1–C_4 carbalkoxymethyl; C_3–C_4 alkenyl optionally substituted with from one to three halogen atoms; cyano; C_3–C_4 alkynyl optionally substituted with one halogen atom; di-(C_1–C_4 alkyl) aminocarbonyl; or C_4–C_6 cycloalkylaminocarbonyl; L is H, F, Cl or Br; and M and R are each independently H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, cyano, F, Cl, Br, I, nitro, CF_3, R_1CF_2Z, R_2CO or NR_3R_4, and when M and R are on adjacent positions and taken with the carbon atoms to which they are attached they may form a ring in which MR represents the structure:



Z is S(O)n or O; R_1 is H, F, CHF_2, CHFCl, or CF_3; R_2 is C_1–C_3 alkyl, C_1–C_3 alkoxy, or NR_3R_4; R_3 is H or C_1–C_3 alkyl; R_4 is H, C_1–C_3 alkyl, or R_5CO; R_5 is H or C_1–C_3 alkyl; and n is an integer of 0, 1 or 2.

4,929,635

NEW DERIVATIVES OF 4-VINYL BENZOIC ACID, PROCESS FOR THEIR PREPARATION AND THEIR USES IN THERAPEUTICS AND AS LIGANDS

Claude Coquelet, St Gely-du-Fesc; Samia Roussillon, Gignac; Daniel Sincholle, St-Clement-la-Riviere; Claude Bonne, Bry-sur-Marne, and Alain Alazet, Agde, all of France, assignors to Laboratoires Chauvin-Blache, Montpellier, France

PCT No. PCT/FR85/00074, § 371 Date Dec. 5, 1985, § 102(e) Date Dec. 5, 1985, PCT Pub. No. WO85/04652, PCT Pub. Date Oct. 24, 1985

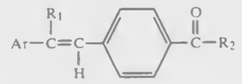
PCT Filed Apr. 3, 1985, Ser. No. 817,839

Claims priority, application France, Apr. 6, 1984, 84 05531

Int. Cl.[5] A61K *31/38; C07D 333/22*

U.S. Cl. 514—438 **14 Claims**

1. Compounds of the formula



in which:

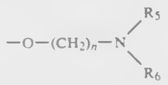
R_1 represents a methyl group;

Ar represents phenyl, 4-(C_{1-4} alkyl) phenyl, thienyl and C_{1-4} alkyl thienyl;

R_2 represents a hydroxy group; an amino group of the formula



in which R_3 and R_4 represent, independently from one another, a hydrogen atom, a C_1–C_6 alkyl group or amino (C_1–C_6) alkyl or R_3 and R_4 form, with the nitrogen atom to which they are attached, a 5–8 membered heterocyclic group saturated or not and which can contain another heteroatom selected from nitrogen, oxygen and sulfur; C_1–C_4 alkoxy group; a group of the formula —O— Ar, Ar having the above-given meaning; and aminoalkoxy group of the formula



in which R_5 and R_6 represent, independently from one another a C_1–C_4 alkyl group and n=1 to 4; and their pharmaceutically acceptable salts.

4,929,636

POSITIVE INOTROPHIC BENZOTHIAZOLE AND BENZOTHIOPHENE COMPOSITIONS AND METHOD OF USE THEREFOR

James Redpath, Bishopbriggs; Robert T. Logan, Lanark; David B. McFadzen, Hamiltom, and Robert G. Roy, Larkhall, all of Scotland, assignors to Akzo N.V., Arnhem, Netherlands

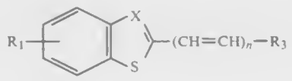
Continuation of Ser. No. 140,953, Dec. 28, 1987, abandoned, which is a continuation of Ser. No. 466, Jan. 5, 1987, abandoned, which is a division of Ser. No. 709,396, Mar. 7, 1985, Pat. No. 4,665,206. This application Apr. 6, 1989, Ser. No. 333,806

Claims priority, application United Kingdom, Mar. 16, 1984, 8406906

Int. Cl.[5] A61K *31/425, 31/38, 31/36*

U.S. Cl. 514—443 **17 Claims**

1. A pharmaceutical composition providing a positive inotropic effect to a subject which comprises an inotropically effective amount of a compound of the formula



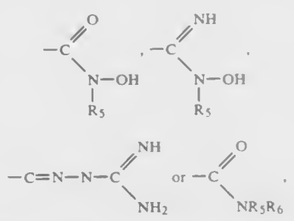
wherein

each R_1 is independently alkyl (1–6 C), alkoxy (1–6 C), hydroxy, halogen, NO_2, CF_3 or the group $—NR_5R_6$, or two adjacent substituents taken together may form a single methylene dioxy group,

m is from 1 to 4,

X represents nitrogen or the group

n has the value 0, 1 or 2, R_3 represents one of the moieties:



the latter meaning of R_3 (amide) only under the condition that for X is nitrogen the meaning of R_1 is limited to substituents selected from hydroxy, alkoxy (1–6 C) and methylene dioxy, and R_4, R_5 and R_6 represent hydrogen or alkyl (1–6 C) and pharmaceutically acceptable salts thereof in admixture with a pharamaceutically acceptable carrier therefor.

4,929,637

SUBSTITUTED THIOPHENE-2-SULFONAMIDE ANTIGLAUCOMA AGENTS

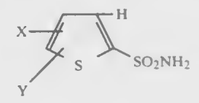
John J. Baldwin, Gwynedd Valley; Gerald S. Ponticello, and Charles N. Habecker, both of Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 231,650, Aug. 10, 1988, abandoned, which is a continuation of Ser. No. 80,714, Jul. 31, 1987, abandoned, which is a continuation of Ser. No. 813,318, Dec. 24, 1985, abandoned. This application Dec. 14, 1988, Ser. No. 285,336

Int. Cl.[5] A61K *31/38*

U.S. Cl. 514—445 **5 Claims**

1. A method of treating elevated intraocular pressure which comprises the administration to a patient in need of such treatment of an effective intraocular pressure-lowering amount of a compound of structural formula:



wherein:

X is

(1) R wherein R is C_{1-5}alkyl, either straight or branched chain and either unsubstituted or substituted with one or more of:

(i) —OH

(ii)



wherein R^1 and R^2 are independently hydrogen, C_{1-5}alkyl or C_{2-5}alkanoyl,

(iii) phenyl or naphthyl, either unsubstituted or substituted with one or more of —OH, or C_{1-3}alkyl, or

(iv) a 6-membered nitrogen-containing heteroaryl selected from pyridyl, pyrazinyl or pyrimidinyl; or

(2)



wherein n is 0, 1 or 2;

Y

(1) C_{1-5}alkyl, either straight chain, branched chain or cyclic, and substituted with

(a) hydroxy,

(b) C_{1-3}alkoxy,

(c) methoxyethoxymethoxy,

(d) amino,

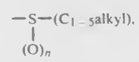
(e) C_{1-5}alkylamino,

(f) C_{2-5}alkanoylamino,

(g) phenyl or naphthyl, either unsubstituted or substituted with one or more of —OH or C_{1-3}alkyl, or

(h) a 6-membered nitrogen containing heteroaryl selected from pyridyl, pyrazinyl, and pyrimidinyl; or

(2)



where the alkyl is either straight, branched or cyclic, and either unsubstituted or substituted with items (a) through (h) as defined above.

4,929,638

C.25 [SUBSTITUTED2-PROPENYL)]MILBEMYCINS

Christopher Dutton, and David Perry, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

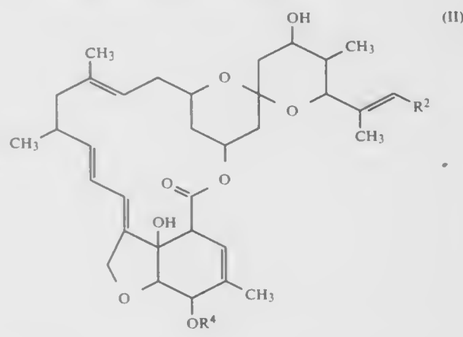
Division of Ser. No. 227,921, Aug. 3, 1988, abandoned. This application May 25, 1989, Ser. No. 356,952

Claims priority, application United Kingdom, Sep. 15, 1987, 8721647

Int. Cl.[5] A61K *31/365;* **C07D** *407/14*

U.S. Cl. 514—450 **11 Claims**

1. A compound having the formula:



(II)

wherein

R^2 is a 3 to 6 membered oxygen or sulphur containing heterocyclic ring which may be saturated or fully or partially unsaturated and which may be substituted by one or more C_1–C_4 alkyl groups or halogen atoms;

R^4 is hydrogen or methyl.

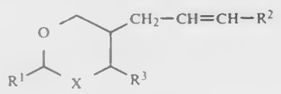
4,929,639

OXYGEN-CONTAINING HETEROCYCLIC COMPOUND

Hiroyuki Setoi; Akio Kuroda; Hirokazu Tanaka; Hideo Hirai; Hiroshi Marusawa, and Masashi Hashimoto, all of Tsukuba, Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Filed Jun. 20, 1988, Ser. No. 208,665
Int. Cl.[5] A61K *31/335;* C07D *319/06*
U.S. Cl. 514—452 9 Claims

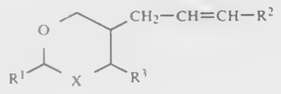
1. A compound of the formula:



(I)

wherein
R^1 is hydrogen or lower alkyl,
R^2 is carboxy(lower)alkyl or protected carboxy(lower)alkyl and
R^3 is —CH=N—R^4 in which R^4 is arylureido or arylthioureido and
X is —O—,
or pharmaceutically acceptable salt thereof.

8. A thromboxane A_2-antagonist pharmaceutical composition comprising an effective amount of a compound of the formula:



(I)

wherein
R^1 is hydrogen or lower alkyl,
R^2 is carboxy(lower)alkyl or protected carboxy(lower)alkyl and
R^3 is —CH=N—R^4 in which R^4 is arylureido or arylthioureido and
X is —O—,
or pharmaceutically acceptable salt thereof and pharmaceutically acceptable carrier.

4,929,640

MEDICAMENTS INTENDED FOR COMBINED USE IN THE IMPROVEMENT OF LYMPHOCYTE FUNCTION

R. Arnold Smith, Jackson, Miss., assignor to George D. McAdory, Jackson, Miss.

Filed Apr. 4, 1988, Ser. No. 177,121
Int. Cl.[5] A61K *31/34*
U.S. Cl. 514—474 12 Claims

1. A method for stimulating enhanced lymphocyte function in human beings requiring such treatment comprising administering to a said human being one part by weight of a dopamine agonist compound selected from the group consisting of bromocriptine, lergotrile and pergolide and at least 400 parts by weight of an ascorbate.

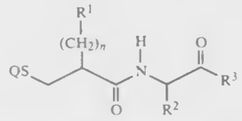
4,929,641

MERCAPTO-ACYLAMINO ACID ANTIHYPERTENSIVES

Martin F. Haslanger, Ridgewood; Bernard R. Neustadt, West Orange, and Elizabeth M. Smith, Verona, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed May 11, 1988, Ser. No. 192,435
Int. Cl.[5] C07C *149/40, 156/00, 157/09*
U.S. Cl. 514—506 20 Claims

1. A compound having the structural formula



wherein R^1 is phenyl substituted by alkyl, R^2 is alkyl-$S(O)_{0-2}(CH_2)_q$, R^3 is OR^7 wherein R^7 is hydrogen or lower alkyl, Q is hydrogen or $R^{10}CO$— wherein R^{10} is alkyl, n is 0–2 and q is 1–4.

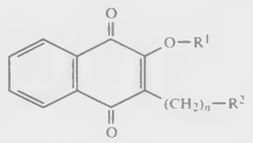
4,929,642

PEST-COMBATING AGENTS BASED ON SUBSTITUTED 1,4-NAPHTHOQUINONES AND NEW SUBSTITUTED 1,4-NAPHTHOQUINONES

Werner Lindner, Cologne; Benedikt Becker, Mettmann; Robert Steffens, Cologne; Ulrike Wachendorff-Neumann, Leverkusen; Wilhelm Brandes, Leichlingen; Wilhelm Stendel, Wuppertal, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 212,816
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722018; Jan. 22, 1988, 3801743
Int. Cl.[5] A01N *9/00, 9/24*
U.S. Cl. 514—510 6 Claims

1. A method of combating agricultural pests comprising applying a pesticidally effective amount of a substituted 1,4-naphthoquinone on agricultural pests and/or their environment, said 1,4-naphthoquinone being of the formula



in which
n represents the numbers zero, 1 or 2,
R^1 represents hydrogen, t-butylcarbonyl or acetyl and
R^2 represents phenyl which is substituted by bromine, fluorine, chlorine, [C_1–C_4-alkyl,] trifluoromethyl, trifluoromethoxy, trifluoromethylsulphenyl, trifluoromethylsulphonyl or trimethylsilyl or cyclohexyl which is substituted by methyl, trifluoromethyl or trimethylsilyl or R^2 represents C_1–C_8-alkyl which is substituted by fluorine, chlorine or bromine.

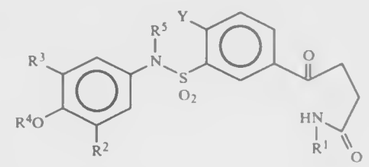
4,929,643

BENZENESULFONAMIDE DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF

Hans-Jochen Lang, Hofheim am Taunus; Max Hropot, Flörsheim am Main; Ernold Granzer, Kelkheim, and Bela Kerekjarto, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 184,963, Apr. 22, 1988. This application May 1, 1989, Ser. No. 345,168
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713757
Int. Cl.[5] A61K *31/18;* C07C *143/80*
U.S. Cl. 514—603 7 Claims

1. An open-chain tautomeric form of a benzenesulfonamide derivative of the formula Ia



Ia

in which
R^1 is hydrogen, alkyl or alkenyl having 1–4 carbon atoms, or cycloalkyl having 3 to 5 ring members,
R^2 is hydrogen or an alkyl radical having 1 to 6 carbon atoms,
R^3 is an alkyl radical having 3 to 5 carbon atoms,
R^4 and R^5 represent hydrogen, a (C_1–C_3)-alkyl radical or an acyl radical of an aliphatic carboxylic acid having 1 to 3 carbon atoms, and
Y is hydrogen, methyl, trifluoromethyl, F or Cl.

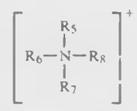
4,929,644

THICKENED ORGANIC COMPOSITION HAVING BIOCIDAL ACTIVITY AND AN ADDITIVE FOR THICKENING AND IMPARTING BIOCIDAL ACTIVITY TO AN ORGANIC COMPOSITION

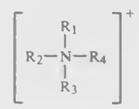
Ronald D. Guilbeaux, New Hope, Pa., assignor to Rheox, Inc., Hightstown, N.J.

Filed Oct. 24, 1986, Ser. No. 923,106
Int. Cl.[5] A61K *31/14*
U.S. Cl. 514—642 37 Claims

1. A thickened organic topical composition having biocidal activity comprising:
(a) an organic liquid;
(b) a first organophilic clay in an amount of from about 0.1 to about 10% by weight of the composition and which will increase the viscosity of the organic liquid; and said first organophilic clay being the reaction product of (i) a smectite-type clay having a cation exchange capacity of at least about 75 milliequivalents per 100 grams of clay, 100% active basis, and (ii) an organic cation having the following formula



wherein R_5 is a linear or branched, saturated or unsaturated alkyl group having 8 to 22 carbon atoms; and R_6, R_7 and R_8 are selected from (a) linear branched alkyl groups having 1 to 22 carbon atoms; (b) aralkyl groups including fused ring moieties having linear or branched 1 to 22 carbon atoms in the alkyl portion of the structure; (c) aryl groups such as phenyl and substituted phenyl including fused ring aromatic substituents; (d) beta, gamma, unsaturated groups having 6 or less carbon atoms or hydroxyalkyl groups having 2 to 6 carbon atoms; and (e) hydrogen, with the proviso that none of R_6, R_7 or R_8 is benzyl; and
(c) a second organophilic clay in an amount of from about 0.03 to about 3.0% by weight of the composition, which is different from the first organophilic clay and which has biocidal activity, said second organophilic clay being the reaction product of
(i) a smectite-type clay having a cation exchange capacity of at least about 75 milliequivalents per 100 grams of clay, 100% active basis, and
(ii) an organic cation having the following formula



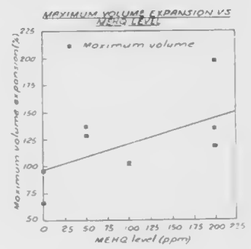
wherein R_1 is benzyl; R_2 is linear or branched, saturated or unsaturated alkyl group having 8 to 22 carbon atoms; and R_3 and R_4 are selected from (a) linear or branched alkyl groups having 1 to 22 carbon atoms; (b) aralkyl groups which are benzyl and substituted benzyl moieties including fused ring moieties having linear or branched 1 to 22 carbon atoms in the alkyl portion of the structure; (c) aryl groups such as phenyl and substituted phenyl including fused ring aromatic substituents; (d) beta, gamma, unsaturated groups having 6 or less carbon atoms or hydroxyalkyl groups having 2 to 6 carbon atoms; and (e) hydrogen.

4,929,645

EXPANDABLE AND EXPANDED PLASTIC MATERIALS AND METHODS FOR CASTING METAL CASTINGS EMPLOYING SUCH EXPANDED CELLULAR PLASTIC MATERIALS

Norman G. Moll, Sanford, and David R. Johnson, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 283,332, Dec. 12, 1988, Ser. No. 149,288, Jan. 28, 1988, Pat. No. 4,790,367, and Ser. No. 890,036, Jul. 28, 1986, abandoned. This application Oct. 30, 1989, Ser. No. 429,955
Int. Cl.[5] C08J *9/16*
U.S. Cl. 521—98 6 Claims



1. An expanded closed-cell cellular plastic material article comprising:
(A) a plastic material, polymerized from one or more monomers, containing a majority, by weight of the plastic material, of monomeric repeat units of the formula:

—$CH_2CR'(COOR)$—

wherein R is selected from the group consisting of alkanes having 1–4 carbon atoms (C), hydroxy alkanes having 1–4 C and cycloalkanes having 3–6 C, and R' is selected from the group consisting of CH_3 and C_2H_5;
(B) a volatile blowing agent entrapped in the expanded closed-cell cellular plastic material selected from the group consisting of:
(a) 2,2-dimethylbutane;
(b) 2,3-dimethylbutane;
(c) 2,2-dimethylbutane and 2,3-dimethylbutane
(d) mixtures of (a), (b) and (c) with 1-chloro-1,1-difluoroethane: and
(e) a mixture of at least 30 percent of (a), (b) and (c) by

weight of the mixture with one or more other volatile blowing agents.

4,929,646

POLYURETHANE FOAM PREPARED USING HIGH FUNCTIONALITY CELL OPENERS

Jerram B. Nichols, Alvin; Douglas Hunter, Lake Jackson; Ronald M. Herrington, Brazoria; John F. Serratelli, Lake Jackson, all of Tex., and David G. Carey, Sarnia, Canada, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 186,418, Apr. 26, 1988, Pat. No. 4,863,976. This application Nov. 14, 1988, Ser. No. 280,178

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—137 **10 Claims**

1. An active hydrogen-containing composition comprising

(a) at least one relatively high equivalent weight polyester polyol or polyether polyol containing at least about 50 weight percent of oxypropylene units, an amine-terminated derivative of such polyester or polyether polyol, or polymer polyol based on such polyester or polyether polyol or mixture thereof;

(b) a high functionality polyether polyol based on an initiator or initiator mixture having at least about 4.0 active hydrogens per molecule, which high functionality polyether polyol has a molecular weight of at least about 5000 and contains at least about 50 weight percent oxyethylene units and sufficient oxypropylene units to render it compatible with component (a) at the relative proportions thereof present in the reaction mixture, in an amount sufficient to measurably increase the proportion of open cells in a form made by reacting the active hydrogen-containing composition with a polyisocyanate as compared with a similar foam prepared in the absence of said high functionality polyether polyol.

4,929,647

COMPOSITIONS WHICH CAN BE CROSSLINKED BY RADIATION TO FORM ELASTOMERS

Christa Burger; Johann Müller, and Erhard Bosch, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 221,960

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723421

Int. Cl.[5] C08L *83/08;* **C08G** *77/04*

U.S. Cl. 522—99 **28 Claims**

1 A composition which can be crosslinked by radiation to form elastomers comprising (a) an organopolysiloxane containing triorganosiloxane units of the formula

$$H_2C{=}CHCXOR^1SiR_2O_{\frac{1}{2}}$$

in which R is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals which are free of aliphatic multiple bonds, R^1 is selected from the group consisting of divalent hydrocarbon radicals and halogenated divalent hydrocarbon radicals which are free of aliphatic multiple bonds and X is selected from the group consisting of oxygen and sulphur, in which at least 80 percent of the siloxane units other than the triorganosiloxane units are diorganosiloxane units, where the SiC-bonded organic radicals of the diorganosiloxane units are selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, and wherein the organopolysiloxane (a) contains diorganosiloxane units one of those whose SiC-bonded bonded organic radicals contains an aliphatic carbon-carbon double bond, (b) a filler having a surface area of at least 50 m^2/g and (d) at least one organopolysiloxane resin comprising units selected from the group consisting of

(i) $R_3^2SiO_{\frac{1}{2}}$ and $R^2SiO_{3/2}$,

(ii) $R_3^2SiO_{\frac{1}{2}}$, $R^2SiO_{3/2}$ and $SiO_{4/2}$ and

(iii) $R_3^2SiO_{\frac{1}{2}}$ and $SiO_{4/2}$

where R^2 is independently selected from the group consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and hydrogen, with the proviso that only one hydrogen atom is bonded to one and the same silicon atom, and an average of at least 4 Si-bonded hydrogen atoms are present in each molecule of the organopolysiloxane resin.

4,929,648

ALKALINE PHENOLIC RESOLE RESIN BINDERS

David R. Armbruster, Forest Park, and Kwok-Tuen Tse, Chicago, both of Ill., assignors to Acme Resin Corporation, Westchester, Ill.

Filed Mar. 24, 1989, Ser. No. 328,174

Int. Cl.[5] B22G *1/22*

U.S. Cl. 523—147 **15 Claims**

1. A binder composition which comprises:

(a) an aqueous alkaline solution of a phenolic resole resin, said aqueous solution having a solids content of from about 40% to about 75% by weight, said phenolic resole having an aldehyde:phenol molar ratio of from about 1.2:1 to about 2.6:1 and an alkali:phenol molar ratio of from about 0.2:1 to about 1.2:1; and

(b) an additive in an amount of at least about 1% by weight of the phenolic resole resin, said additive being soluble in the aqueous alkaline solution and having the general formula:

$$Ar{-}O{-}CHR^1{-}CHR^2{-}OH$$

where Ar = phenyl or phenyl substituted with one or more halogen, hydroxy, alkoxy or alkyl groups and where R^1 and R^2 may be the same or different and = hydrogen, alkyl or alkoxy.

4,929,649

COLD-SETTING MOULDING BINDERS AND THEIR USE (PHENOLS AND GASEOUS ACETALS)

Marek Torbus; Franz Jerman, both of Düsseldorf; Gerard Ladegourdie, Kaarst; Dirk Lingemann, Neuss; Willi Seiss, Neuss-Allerheiligen, and Aleksandar Vujevic, Ratingen, all of Fed. Rep. of Germany, assignors to Huttenes-Albertus Chemische Werke GmbH, Dusseldorf-Heerdt, Fed. Rep. of Germany

PCT No. PCT/EP87/00691, § 371 Date Jul. 13, 1988, § 102(e) Date Jul. 13, 1988, PCT Pub. No. WO88/03847, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 7, 1987, Ser. No. 228,931

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639233

Int. Cl.[5] C08J *61/10*

U.S. Cl. 523—145 **10 Claims**

1 Cold-setting moulding binder for producing synthetic resin bonded foundry moulds, characterized in that the binder comprises a solution of aldehyde reactive phenol substances and strong acids, and the reaction product of said solution with gaseous acetal, said solution being first mixed with the moulding mixture and shaped, and the gaseous acetal being then passed through the shaped moulding mixture.

4,929,650

COATING MATERIAL FOR TENDON FOR PRESTRESSED CONCRETE

Makoto Kurauchi, Houston, Tex.; Michio Hashimoto, Chiba, Japan; Kiyoshi Hayasaki, Hyogo, Japan; Toshikazu Minami, Hyogo, Japan; Mutsuhiko Ohnishi, Hyogo, Japan, and Yohei Suzuki, Chiba, Japan, assignors to Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha, Tokyo and Shinko Kosen Kogyo Kabushiki Kaisha, Amagasaki, both of, Japan

Filed Jul. 25, 1988, Ser. No. 223,588

Claims priority, application Japan, Jul. 27, 1987, 62-188608

Int. Cl.[5] G08G *59/68, 59/40, 59/56*

U.S. Cl. 523—455 **10 Claims**

1. A coating material for a tendon for prestressed concrete comprising 100 parts of epoxy resin, a latent curing agent, and 0.03 to 0.5 parts by weight of a curing accelerator, the latent curing agent being selected from the group consisting of dihydrazide, diphenyldiaminosulphone, dicyandiamide, 2-methylimidazole and derivatives thereof, and BF_3:amine complex, the curing accelerator being 2,4,6-tris(N,N-dimethylaminomethyl) phenol, the coating material being curable in at least more than three days at ambient temperature.

4,929,651

PROCESS FOR FORMING THICK BALLISTIC RESISTANT MATERIALS

James V. Gauchel; Edward L. Wilson, both of Newark, and Edward J. Kerle, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 88,637, Aug. 24, 1987, Pat. No. 4,822,439. This application Nov. 10, 1988, Ser. No. 269,842

Int. Cl.[5] C08L *67/06*

U.S. Cl. 523—505 **1 Claim**

1. An impregnating composition having preselected controlled viscosity levels at preselected times, said impregnating composition being formed of (i) a solution of a low acid number isophthalic-maleic-propylene glycol polyester in a solvent of styrene or a solvent mixture of styrene and diallyl phthalate and (ii) calcium hydroxide, and (iii) 2,5-dimethyl-2,5-(2-ethylhexanoylperoxy) hexane, and, (iv) optionally tertiary butyl perbenzoate initiator and (v) optionally, alpha methylstyrene and (vi) water or glycerin or mixtures of water and gylcerin, the amount of said calcium hydroxide being about 0.5% to about 4% and the amount of said water or ghycerin or water and glycerin being about 0.02% to about 1% (based on solution of the polyester), said impregnating solution having a viscosity of between about 500 to about 4000 cps after the elapse of about no more than 27 minutes from the time of combining the ingredients to form said impregnating solution, and a viscosity in excess of about 15000 cps after the elapse of about 37 minutes from the time of forming said solution and a viscosity of about 50,000 to about 500,000 cps after about no more than one day from the combining of the ingredients to form the impregnating solution, said viscosity after said one day being substantially constant and in said 50,000–500,000 range, the viscosity being such that the impregnating composition can flow and conform to the shape of a mold when vacuum bag molded at a temperature of about 140 ° to about 150° F. and said composition having a self-sustaining curing initiation temperature of about 165° F.

4,929,652

POLYOLEFINS STABILIZED AGAINST DAMAGE CAUSED BY LIGHT

Francois Gugumus, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 27, 1988, Ser. No. 186,835

Claims priority, application Switzerland, May 5, 1987, 1708/87

Int. Cl.[5] C08K *5/34, 5/54*

U.S. Cl. 524—91 **13 Claims**

1. A polyolefin stabilized against damage caused by light and containing

(A) at least one polyalkylpiperidine light stabilizer,

(B) an organic salt of zinc or magnesium and

(C) either

(C_1) a UV absorber or

(C_2) a pigment or

(C_3) a UV absorber and a pigment.

4,929,653

STABILIZED PIGMENTED POLYPROPYLENE FIBER RESISTANT TO GAS FADE

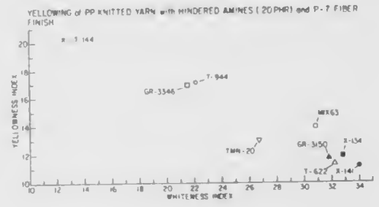
George Kletecka, Fairview Park; John T. Lai, Broadview Heights, and Pyong N. Son, Akron, all of Ohio, assignors to The BF Goodrich Company, Akron, Ohio

Filed Jul. 13, 1987, Ser. No. 73,244

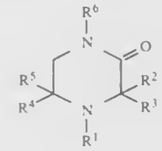
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[5] C08K *5/34*

U.S. Cl. 524—96 **2 Claims**



1. A method for imparting gas fade resistance to pigmented polypropylene fiber, which method comprises mixing into a melt of said polypropylene, which is essentially free of an antioxidant, an effective amount sufficient to attenuate gas fade of said polypropylene fiber due to nitrogen oxide gases, of a hindered amine stabilizer selected from the group consisting of (i) a triazine ring substituted at each triazine ring carbon atom with a PSP moiety (ii) a bis-compound consisting of a C_2–C_{12} alkylene connecting two PSP moieties, and (iii) a polyalkylene polyamine having pendant triazine rings with substituents having at least one PSP moiety on each of the rings, said stabilizer containing as an essential portion of its basic structure a polysubstituted piperazin-2-one (PSP) moiety having the structure



wherein,

R^1 represents hydrogen, oxygen, C_1–C_{18} alkyl, C_1–C_6 hydroxyalkyl, C_2–C_{12} acyl, C_3–C_8 alkenyl, C_3–C_8 alkynyl, C_7–C_{12} aralkyl which is unsubstituted or substituted in the

alkyl moiety by hydroxyl, or C_1-C_8 alkanoyl or C_3-C_5 alkenoyl;

R^2, R^3, R^4 and R^5 independently represent hydrogen, C_1-C_{24} alkyl, C_1-C_{12} hydroxyalkyl, C_1-C_{12} haloalkyl, C_1-C_{12} cyanoalkyl, C_2-C_{12} aminoalkyl or iminoalkyl, C_3-C_{18} ether groups, C_4-C_{18} hydroxyalkyl ether or cyanoalkyl ether groups, C_7-C_{14} alkenyl or aralkyl, C_2-C_7 alkylene, and optionally containing a phosphite, or ester group, and which in combination, one with another, represent C_5-C_{14} cycloalkyl at least four of which C atoms are cyclized, and, optionally containing a keto, ester, amide, ether, thio or hydroxy group; but, only one of R^2 and R^3, and only one of R^4 and R^5 may be hydrogen;

and, R^6 represents a free valency through which the PSP moiety is connected to the remaining structure of the stabilizer;

and spinning said melt into fibers in the range from about 8 denier to about 30 denier.

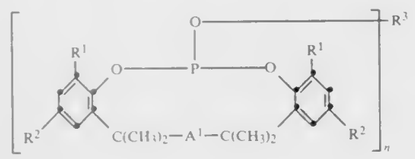
4,929,654

CYCLIC PHOSPHITES AND STABILIZED POLYMERIC COMPOSITIONS

Richard H. S. Wang, and Garry L. Myers, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 4, 1988, Ser. No. 253,168
Int. Cl.[5] C08K *5/524;* **C07D** *9/15*
U.S. Cl. 524—117 **22 Claims**

1. A compound having the formula



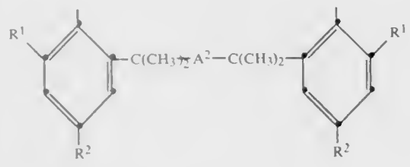
(I)

wherein

each R^1 is independently selected from hydrogen, alkyl, aralkyl, aryl, carboxy, alkoxycarbonyl or halogen;

each R^2 is independently selected from hydrogen, alkyl, aralkyl, alkoxy, aryl, carboxy, alkoxycarbonyl or halogen;

R^3 is (a) hydrogen, alkyl, cyclohexyl or aryl when n is 1; (b) alkylene, cyclohexylene, cyclohexylenedialkylene, arylene or a divalent group having the formula



wherein

R^1 and R^2 are defined above and

A^2 is 1,3- or 1,4-phenylene when n is 2; (c) alkanetriyl when n is 3, or (d) alkanetetrayl when n is 4;

n is 1, 2, 3 or 4; and

A^1 is 1,3-phenylene.

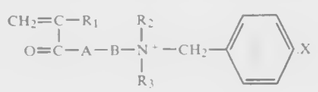
4,929,655

PROCESS FOR PRODUCTION OF WATER-SOLUBLE POLYMER DISPERSION

Hisao Takeda, Zama, and Mutsumi Kawano, Chigasaki, both of Japan, assignors to Kyoritsu Yuki Co., Ltd., Japan

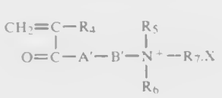
Continuation-in-part of Ser. No. 798,739, Nov. 15, 1985, abandoned. This application Dec. 20, 1988, Ser. No. 286,976
Claims priority, application Japan, Nov. 19, 1984, 59-244152; Jul. 18, 1985, 60-158709; Jul. 18, 1985, 60-158711
Int. Cl.[5] C08F *2/16*
U.S. Cl. 524—458 **8 Claims**

1. A process for the production of a water-soluble polymer dispersion which is characterized by polymerizing water-soluble monomers of 5 to 100 mole % of a cationic monomer represented by the following formula (I), 0 to 50 mole % of another cationic monomer represented by the following formula (II) and 0 to 95 mole % of (meth)acrylamide in the presence of 1 to 10% by weight of an organic high-molecular multivalent cation comprising a water soluble polymer containing at least a monomer of formula (II) based on the total weight of the monomers in a multivalent anionic salt aqueous solution having a concentration of 15% by weight or more:



(I)

wherein R_1 is H or CH_3; each of R_2 and R_3 is an alkyl group having 1 to 3 carbon atoms; A is an oxygen atom or NH; B is an alkylene group having 2 to 4 carbon atoms or a hydroxypropylene group; and X^- is an anionic counterion.



(II)

wherein R_4 is H or CH_3; each of R_5 and R_6 is an alkyl group having 1 or 2 carbon atoms; R_7 is H or an alkyl group having 1 or 2 carbon atoms; A' is an oxygen atom or NH; B' is an alkylene group having 2 to 4 carbon atoms or a hydroxypropylene group; and X^- is an anionic counterion.

4,929,656

BLENDS COPOLYESTER ELASTOMERS AND CHLORINATED POLYETHYLENE

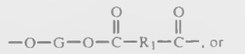
Michael D. Golder, Allendale, N.J., assignor to Hoechst Celanese Corporation, Summit, N.J.

Filed May 11, 1989, Ser. No. 350,212
Int. Cl.[5] C08L *67/02, 71/02*
U.S. Cl. 524—195 **15 Claims**

1. An elastomeric composition comprising a blend of:

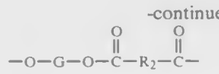
(A) about 60 to about 95 weight percent thermoplastic copolyester elastomer; and

(B) about 5 to about 40 weight percent of a chlorinated polyethylene, said weight percents being based on the total weight of (A) and (B), wherein (A), the segmented copolyester elastomer, is comprised of a multiplicity of recurring long chain ester units and short chain ester units joined head to tail through ester linkages, said long chain units being represented at least one of the structures:



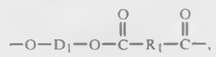
(a)

-continued

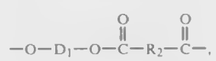


(b)

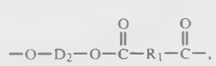
and the short chain ester units are represented by at least one of the following structures:



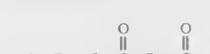
(c)



(d)



(e)



(f)

wherein G is a divalent radical remaining after the removal of the terminal hydroxyl groups from a long chain polymeric glycol having a molecular weight above about 400 and a melting point below about 55° C.;

wherein R_1 and R_2 are different divalent hydrocarbon radicals remaining after removal of carboxyl groups from different dicarboxylic acids, each having a molecular wright less than about 300; and

wherein D_1 and D_2 are different divalent radicals remaining after removal of hydroxyl groups from different low molecular weight diols having molecular weights less than about 250, provided said short chain segments amount to between about 25 and about 95 percent by weight of the copolyester and wherein about 50 to about 100 percent of the short chain ester units are identical; and

wherein (B) the chlorinated polyethylene, is derived from high density polyethylene chlorinated with about 25 to about 45 weight percent chlorine.

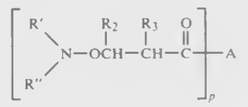
4,929,657

SUBSTITUTED AMINOXY-PROPIONAMIDES

Ramanathan Ravichandran, Yonkers, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 848,106, Apr. 4, 1986, Pat. No. 4,760,179. This application Apr. 25, 1988, Ser. No. 185,595
Int. Cl.[5] C07C *103/22;* **C10M** *133/16*
U.S. Cl. 524—196 **11 Claims**

1. A composition of matter comprising an organic polymeric material subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of the formula



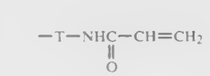
wherein

p is 1 to 4;

R^1 and R'' are independently hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms,

R_2 and R_3 are independently hydrogen or alkyl of 1 to 12 carbon atoms;

A, when p=1, is a group NHR_4, wherein R_4 is hydrogen, amino, alkyl of 1 to 18 carbon atoms or



and

T is a direct bond or alkylene of 1 to 10 carbon atoms;

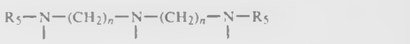
A, when p=2, is a group

$$-N(R_4)-T-N(R_4)-$$

and

T and R_4 have the meanings given above;

A, when p=3, is a group of the formula

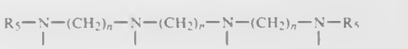


and

n is 2 to 6 and R_5 is hydrogen or alkyl of 1 to 4 carbon atoms;

and

A, when p=4, is a group of the formula



and

R_5 and n have the meanings given above.

4,929,658

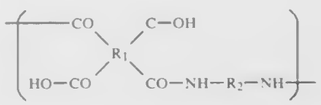
COMPOSITION FOR LIQUID CRYSTAL ALIGNING AGENT

Noriaki Kohtoh; Yoshihiro Tsuruoka; Toyohiko Abe, and Hiroyoshi Fukuro, all of Ichihara, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 7, 1989, Ser. No. 334,571
Claims priority, application Japan, Apr. 14, 1988, 63-92601; Apr. 14, 1988, 63-92602
Int. Cl.[5] C08K *5/20*
U.S. Cl. 524—219 **5 Claims**

1. A composition for a liquid crystal aligning agent characterized by that it consists essentially of:

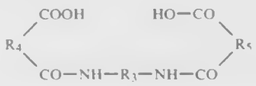
a polyimide resin precursor having repeating units represented by the formula (I):



(I)

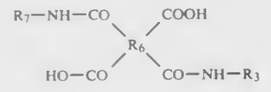
wherein R_1 denotes an organic group constituting a tetracarboxylic acid or its derivative; and R_2 represents a divalent organic group constituting a diamine; and

a precursor of a diimide compound represented by the formula (II) or (III):



(II)

wherein R_3 denotes a divalent organic group constituting a diamine; each of R_4 and R_5 represents an organic group constituting a dicarboxylic acid containing an alkyl group having 6 to 20 carbon atoms, or its derivative,



(III)

wherein R_6 denotes an organic group constituting a tetracarboxylic acid or its derivative; and each of R_7 and R_8 represents an organic group constituting a monoamine containing an alkyl group having 6 to 20 carbon atoms.

4,929,659

SUBSTITUTED AMINOXYETHYL SULFOXIDES AND SULFONES

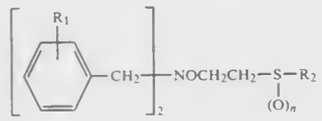
Ramanathan Ravichandran, Yonkers, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 133,205, Dec. 15, 1987, abandoned, which is a continuation of Ser. No. 809,637, Dec. 16, 1985, abandoned. This application Jul. 14, 1988, Ser. No. 220,333

Int. Cl.[5] **C08K** *5/41;* **C09K** *15/26*

U.S. Cl. 524—155 **16 Claims**

1. A composition of matter comprising polymer, resin or lubrication oil subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of the formula

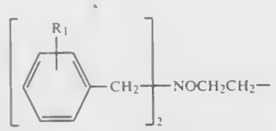


wherein

n is 1 or 2,

R_1 is hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenyl, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms, and

R_2 is alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenyl, aralkyl of 7 to 9 atoms, said aralkyl substituted by alkyl of 1 to 36 carbon atoms or the group



wherein R_1 is as defined hereinabove.

4,929,660

ACRYLIC ADHESIVE COMPOSITIONS HAVING IMPROVED STABILITY

Samuel J. Chen, Lexington, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Mar. 14, 1986, Ser. No. 839,759

Int. Cl.[5] **C08L** *5/32*

U.S. Cl. 524—236 **8 Claims**

1. An acrylic composition comprising at least one free radical acrylic monomer and a free radical initiator, said composition further including a stabilizer mixture for providing improved shelf life for said composition, said stabilizer mixture comprising effective amounts of: (1) a hydroquinone polymerization inhibitor; (2) a metal chelating agent; and (3) a N,N-diarylalkyl or an N,N-dialkyl hydroxylamine-free radical scavenger.

4,929,661

AQUEOUS COATING COMPOSITION CONTAINING A FUNCTIONAL ORGANIC COMPOUND, A CURING AGENT, AND A DISPERSING AGENT

Arie Noomen, and Petrus J. Peters, both of Voorhout, Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 100,670, Sep. 24, 1987, abandoned. This application Oct. 20, 1989, Ser. No. 425,515

Claims priority, application Netherlands, Sep. 24, 1986, 8602412; Jul. 20, 1987, 8701708

Int. Cl.[5] **C08K** *5/17*

U.S. Cl. 524—259 **26 Claims**

1. A water-dispersible aqueous coating composition based on a polyacetoacetate-comprising compound, said coating composition comprising:

(a) an organic compound having at least 2 acetoacetate groups, wherein said organic compound is comprised of the reaction product of a polyol having two or more hydroxyl groups with a reactant selected from the group consisting of diketene and alkyl acetoacetate;

(b) a curing agent comprising a polyamino amide having an amine number of 60–1,000 built up from a polyamine having 2–6 primary amino groups and 2–20 carbon atoms and a reactant selected from the group consisting of monocarboxylic acid, dicarboxylic acid and combinations thereof, wherein the carboxylic acid comprises from 2 to 40 carbon atoms; and

(c) a dispersing agent selected from the group consisting of a nitroalkane having 1–6 carbon atoms; an organic compound occurring in at least 2 tautomeric forms, and in one of the tautomeric forms a labile hydrogen atom is linked to a carbon atom and which compound contains at least one carboxyl group or sulphonyl group; a formic acid ester having a solubility of at least 0.2 g in 100 g of water having a temperature of 20° C., with the exception of ter. butyl formiate; and combinations thereof.

4,929,662

PROCESS FOR THE PREPARATION OF POLYMER PARTICLES POSSESSING, IMPLANTED ON THEIR SURFACE, AMPHOPHILIC MOLECULES CARRYING ION-FORMING OR REACTIVE GROUPS, AND A PROCESS FOR THE PREPARATION OF A LATEX COMPRISING THESE PARTICLES

Roger Hogenmuller, Sainte Foy les Lyon; Bernard Chauvel, Ermont, and Jean-Claude Daniel, Fontenay/Sous/Bois, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed May 6, 1988, Ser. No. 191,176

Claims priority, application France, May 11, 1987, 87 06550

Int. Cl.[5] **C08K** *5/06*

U.S. Cl. 524—376 **19 Claims**

1. A process for the preparation of an aqueous dispersion of polymer particles possessing, implanted on their surface, amphiphilic molecules carrying ion-forming or reactive groups, comprising the following steps:

(1) diffusing, into a previously prepared aqueous seeding dispersion of polymer particles, an organosoluble polymerization initiator having a solubility in water of from about 10^{-3} to 10^{-2} g/liter of water, said diffusion being carried out at a temperature below the decomposition temperature of said initiator;

(2) swelling said particles of said dispersion thus obtained by introducing a monomer composition comprising (a) at least one monomer and (b) at least one amphiphilic compound having an HLB greater than or equal to 10 and a molecular weight greater than or equal to 400, wherein the hydrophilic block of said amphiphilic compound is a hydrophilic oligomer block terminated by at least one ion-forming or reactive group, said swelling being carried out by the monomer component (a) with a quantity of monomer composition less than the maximum quantity of said composition which said seeding dispersion can absorb, at a temperature below the decomposition temperature of said initiator; and

(3) polymerizing said at least one monomer of said monomer composition at a temperature at least equal to the decomposition temperature of said initiator, the nature of said seeding polymer and the nature of said at least one monomer of said monomer composition, being such that the final polymer has a glass transition temperature Tg above about 40° C., said polymerzation resulting in the implantation of said amphiphilic compound (b) of the monomer composition in the surface layer of the polymer particles.

4,929,663

FIRE RETARDANT IMPACT MODIFIED CARBONATE POLYMER COMPOSITION

Michael K. Laughner, Lake Jackson, and Samuel A. Ogoe, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 46,364, May 6, 1987, Pat. No. 4,786,686. This application Mar. 20, 1989, Ser. No. 325,418

Int. Cl.[5] **C08K** *3/30*

U.S. Cl. 524—423 **4 Claims**

1. A flame retardant impact resistant aromatic polycarbonate polymer composition consisting essentially of:

(a) one or more aromatic carbonate polymers;

(b) an impact modifying quantity of a rubbery polymer selected from the group consisting of styrene/methylmethacrylate copolymer grafted homopolymers and interpolymers of butadiene;

(c) from 0.01 to 10 percent by weight of the total composition of a fluorine containing polymer of the fibril forming type; and

(d) from 0.001 to 1 percent by weight of a metal salt of an inorganic acid.

4,929,664

CROSSLINKABLE SILICONE POLYMERS WITH TALC REINFORCING AGENTS HAVING IMPROVED NON-SAG AND MODULUS PROPERTIES

Herbert M. Turk, Willoughby, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

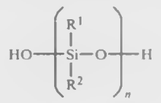
Filed Dec. 19, 1988, Ser. No. 286,099

Int. Cl.[5] **C08K** *3/34*

U.S. Cl. 524—451 **8 Claims**

1. A silicone sealant system comprising;

a silanol terminated silicone polymer of the formula



wherein R^1 and R^2, independently, are alkyl C_1 to C_6 or aryl or alkylaryl C_6 to C_{12}, wherein n is a value such that the viscosity of the polymer should be from 5,000 to 500,000 centistokes;

from about 5 to about 25 parts by weight per 100 parts polymer of a crosslinking agent or a curative;

from about 10 to about 100 parts by weight per 100 parts polymer of a non-reactive silicone fluid having a viscosity of 50 to 20,000 centistokes;

from about 0.1 to about 5 parts by weight per 100 parts polymer of an adhesion promoter;

from about 0 to about 3 parts by weight per 100 parts polymer of a catalyst;

and a reinforcing agent comprising a platy talc, said silicone sealant system having a sag of 0.08 inch or less as measured by he Boeing Jig Test without the use of a fumed silica and having a stress at 50 percent strain of at least 40 psi.

4,929,665

THERMOPLASTIC RESIN COMPOSITION

Toshio Inoue, Osaka; Takayuki Mine, Nara; Hitoshi Izutsu, Osaka; Toshihide Yamaguchi, Izumi-ohtsu; Fumihiro Kobata, Izumi, and Juheiji Kawabata, Takaishi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,552

Claims priority, application Japan, Jan. 20, 1987, 62-10938; Feb. 20, 1987, 62-35576; Mar. 6, 1987, 62-49911

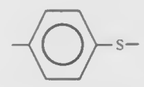
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.

Int. Cl.[5] **C08G** *75/20;* **C08L** *81/06, 81/02*

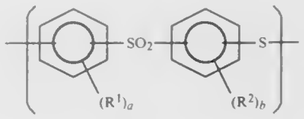
U.S. Cl. 524—500 **17 Claims**

10. A resin composition comprising:

(a) 99 to 1 parts by weight of a block copolymer composed of polyphenylene sulfide segments and polyphenylene sulfide sulfone segments, said polyphenylene sulfide segments comprising a polymer having at least 70 mole % of recurring structural units of the formula



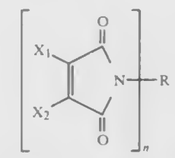
and said polyphenylene sulfide sulfone segments comprising a polymer having at least 70 mole % of recurring structural units of the formula



wherein groups bonded to both terminals of the polymer are ortho- or para- to the sulfone group, R^1 and R^2 represent hydrogen or a C_1–C_8 alkyl group and/or an aryl group, and a and b are integers of 0 to 4;

(b) 1 to 99 parts by weight of another thermoplastic resin;

(c) 0.01 to 20 parts by weight, per 100 parts by weight of the components (a) and (b) combined, of at least one compound selected from the group consisting of maleimide compounds represented by the formula



wherein R represents an aromatic, alicyclic or aliphatic organic group, X_1 and X_2 represent hydrogen, halogen or an alkyl group, and n is 1 to 10; and

(d) 0 to 280 parts by weight, per 100 parts by weight of the components (a) and (b) combined, of an inorganic filler.

11. The composition of claim 10, wherein said another thermoplastic resin is at least one thermoplastic resin selected from the group consisting of polyesters, polyphenylene sulfides, polyphenylene sulfide sulfones, polyamides, polyimides, polyphenylene oxides, polycarbonates, polysulfones, polyetherketones and alpha-olefin polymers.

4,929,666

FLUOROCARBON CONTAINING, REACTIVE POLYMERIC SURFACTANTS AND COATING COMPOSITIONS THEREFROM

Donald L. Schmidt; Perry J. McCrackin, and Charles E. Coburn, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 49,490, May 14, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 402,176

Int. Cl.[5] C08L *39/00*

U.S. Cl. 524—516 11 Claims

1. A water-based crosslinkable coating composition comprising an aqueous solution of

(a) a water-soluble or water-dispersible crosslinkable polymeric surfactant having (1) at least one pendant fluorocarbon moiety and (2) at least one pendant ionic moiety which is capable of reacting with a counterion to form a crosslinked polymer, and

(b) a polymeric crosslinking agent having an ionic or potentially ionic moiety counterion capable of reacting with the ionic moiety of the surfactant;

said composition having the capability of forming a uniform, thin film, on a surface to be coated, and the capability, on crosslinking, to form a uniform, thin coating having a critical surface tension less than about 19 dynes/cm.

4,929,667

URETHANE PREPOLYMER COMPOSITION AND A POLYURETHANE COATING COMPOSITION SYSTEM

Kazuki Ban, and Norio Oyabu, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 1, 1989, Ser. No. 304,607

Claims priority, application Japan, Feb. 1, 1988, 63-19542

Int. Cl.[5] C08G *18/10*

U.S. Cl. 524—718 14 Claims

1. A urethane prepolymer composition comprising:

(a) a terminal isocyanate group-containing urethane prepolymer obtained by reacting a polytetramethylene glycol having a number average molecular weight of from 700 to 1500 with at least one diisocyanate selected from the group consisting of an aliphatic diisocyanate and an alicyclic diisocyanate at an equivalent ratio of the isocyanate groups of said diisocyanate to the hydroxyl groups of said glycol of at least 5/1, and

(b) a terminal isocyanate group-containing urethane prepolymer obtained by reacting at least one polycaprolactone having at least two terminal hydroxyl groups, said polycaprolactone being selected from the group consisting of a polycaprolactone diol and a polycaprolactone polyol each having a number average molecular weight of from 500 to 1500, with at least one diisocyanate selected from the group consisting of an aliphatic diisocyanate and an alicyclic diisocyanate at an equivalent ratio of the isocyanate groups of said diisocyanate to the hydroxyl groups of said polycaprolactone of at least 5/1,

the weight ratio of (a) to (b) being in the range of from 80/20 to 20/80.

4,929,668

AQUEOUS SYNTHETIC DISPERSIONS

Winfried Zeibig, Moers, and Heinrich Hüskes, Krefeld, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,582

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724858

Int. Cl.[5] C08J *5/01*

U.S. Cl. 524—745 9 Claims

1. An aqueous dispersion comprising an emulsion of a copolymer composed of:

(a) 20 to 60 weight percent of a monomer which is a vinyl benzene, a C_1 to C_4 substituted vinyl benzene, a t-butyl acrylate, an ester of alkylmethacrylic acid and C_1–C_5 monoalcohol, a vinyl ester of a monocarboxylic acid, or a mixture of said monomers, each of the individual monomers having a homopolymer glass temperature higher than 35° C.;

(b) 25 to 55 weight percent of a monomer which is an ester of acrylic acid and C–C8 monoalcohol, an ester of methacrylic acid with a C_5–C_{10} monoalcohol, a vinyl ester of a C_1–C_{11} monocarboxylic acid, or a mixture of said monomers, each of the individual monomers having a homopolymer glass temperature of less than 35° C.;

(c) 8 to 15 weight percent of an ester of methacrylic acid and a C_2–C_8 alkane polyol, or an ester of acrylic acid and a C_2–C_8 alkane polyol;

(d) 8 to 15 weight percent of a methacrylamide or acrylamide of the general formula

$$CH_2{=}C(R_1){-}CONCH{-}A{-}O{-}R_2$$

wherein R_1 is hydrogen or methyl, A is C_1–C_4 n- or isoalkylene and R_2 is C_1–C_4-alkyl; and

(e) 0.5 to 5 weight percent of an alpha, beta-unsaturated monocarboxylic acid having 3 to 5 carbon atoms or of an alpha, beta-unsaturated dicarboxylic acid with 3 to 5 carbon atoms.

4,929,669

ORGANOSILOXANE COMPOSITIONS YIELDING ELASTOMERS WITH IMPROVED RECOVERY FOLLOWING PROLONGED COMPRESSION

Jary D. Jensen, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 27, 1988, Ser. No. 289,891

Int. Cl.[5] C08L *83/04*

U.S. Cl. 524—861 14 Claims

1. In an improved multi-part organosiloxane composition comprising

A. at least one liquid diorganopolysiloxane containing at least two silicon-bonded vinyl radicals per molecule,

B. an amount sufficient to cure said composition of an organohydrogensiloxane that is miscible with (A), and contains an average of more than two silicon bonded hydrogen atoms per molecule,

C. a platinum-containing hydrosilation catalyst in an amount sufficient to promote curing of said composition at a temperature of from ambient to 250 degrees C., where said organohydrogensiloxane and said hydrosilation catalyst are located in different parts of said multi-part curable composition, and

D. from 10 to 60 weight percent, based on the weight of said composition, of a reinforcing silica filler, the improvement comprising (1) the presence in at least one part of said multi-part composition of at least 0.2 percent, based on the total weight of said composition, of a vinyl specific organic peroxide and (2) for cured elastomers prepared from said composition, a recovery from prolonged compression of at least 90 composition of the initial sample thickness in the absence of post-curing, said recovery being determined in accordance with ASTM test method D395.

4,929,670

POLYSACCHARIDES CONTAINING AROMATIC ALDEHYDES AND THEIR DERIVATIZATION VIA AMINE-ALDEHYDE INTERACTIONS

Robert L. Billmers, Stockton; David M. Del Giudice, Somerset; Martin M. Tessler, Edison, and Michael J. Hasuly, South Plainfield, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Bridgewater, N.J.

Division of Ser. No. 112,634, Oct. 26, 1987, Pat. No. 4,839,449. This application Apr. 14, 1989, Ser. No. 338,827

Int. Cl.[5] C08F *89/00;* C08L *1/00;* D02G *3/02;* A61K *37/02*

U.S. Cl. 525—54.1 17 Claims

1. A polysaccharide derivative having the structure Sacch—O—Z—Ar—CH=N—Y or

$$\text{Sacch-O}-\overset{\overset{O}{\|}}{C}-Z-Ar-CH{=}N-Y,$$

where Sacch—O— represents a polysaccharide molecule; Z is —(CH_2)n— or

$$-CH_2-\overset{\overset{OH}{|}}{CH}-(CH_2)_m-O-.$$

Ar is a divalent aromatic group; Y is a multivalent group derived from a water-soluble protein containing more than one primary amine group; n is one or greater; and m is zero or greater.

4,929,671

ALLYLIC SIDE CHAIN-CONTAINING SOLID PHASE SYSTEMS, PROCESSES FOR THE PREPARATION THEREOF AND THE USE THEREOF IN SOLID PHASE REACTIONS

Horst Kunz, Mainz-Drais, and Berthold Dombo, Wiesbaden-Medenbach, both of Fed. Rep. of Germany, assignors to Orpengen Medizinisch-Molekularbiologische Forschungsgesellschaft mbH, Heidelberg, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,453

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720269; Feb. 5, 1988, 3803545

Int. Cl.[5] C07K *1/04, 17/06, 17/08, 17/14*

U.S. Cl. 525—54.11 21 Claims

1. A solid phase system comprising allylic side chains bound to a solid carrier material, said system having the formula:

$$F{+}R^3{-}\overset{\overset{R^2}{|}}{C}{=}\overset{\overset{R^1}{|}}{C}{-}CH_2{-}X)_n$$

wherein F is a solid carrier material, R^1 and R^2 are hydrogen atoms, halogen atoms, alkyl radicals or aryl radicals, R^3 is a linking group or spacer, X is hdyroxyl, halogen, sulphonate, phosphonate or acyloxy radical containing a residue of an aliphatic carboxyl acid or RCO-, wherein R is an organic radical bound to the carbonyl group, and n is the number of allylic side chains bound to said carrier material.

4,929,672

POLYCARBONATE MODIFIED WITH A GRAFTED OLEFIN COPOLYMER

Michael K. Laughner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 4, 1989, Ser. No. 347,846

Int. Cl.[5] C08L *51/08*

U.S. Cl. 525—63 24 Claims

1. A composition of matter comprising, in admixture, an aromatic polycarbonate and an olefin/carbon monoxide copolymer grafted with one or more vinyl or vinylidene monomers or polymers or copolymers of such monomers or mixtures thereof.

4,929,673

POLYCARBONATE/STYRENIC BLENDS MODIFIED WITH A GRAFTED OLEFIN COPOLYMER

Michael K. Laughner, Lake Jackson; Gerald M. Lancaster, Freeport, both of Tex., and Yun C. Sun, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 4, 1989, Ser. No. 347,847

Int. Cl.[5] C08L *51/08*

U.S. Cl. 525—63 28 Claims

1. A composition of matter comprising, in admixture, an aromatic polycarbonate, a styrenic thermoplastic resin and an olefin/carbon monoxide copolymer grafted with one or more vinyl or vinylidene monomers or polymers or copolymers of such monomers or mixtures thereof.

4,929,674

MIXTURES OF THERMOPLASTIC POLY(ESTER) CARBONATES WITH THERMOPLASTIC POLYURETHANES

Werner Nouvertné; Franz-Josef Gielen; Peter Tacke, all of Krefeld; Ulrich Grigo, Kempen; Bernd Quiring, Leverkusen, and Christian Lindner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 4, 1989, Ser. No. 332,997

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 3812051

Int. Cl.[5] C08L *75/04*

U.S. Cl. 325—66 6 Claims

1. Mixtures containing

(A) 45 to 87% by weight thermoplastic, aromatic poly(ester) carbonates,

(B) 30 to 12% by weight thermoplastic polyurethanes and

(C) 25 to 1% by weight graft polymer obtained by the known grafting of

(C1) 5 to 30 parts by weight alkyl (meth)acrylates onto (C2) 95 to 70 parts by weight crosslinked diene rubbers, the sum of (C1)+(C2) being 100 parts by weight and the average particle diameter d_{50} of the crosslinked diene rubbers (C2) being from 0.2 μm to 0.6 μm.

4,929,675

THERMOPLASTIC RESIN COMPOSITION

Hiroomi Abe; Taichi Nishio; Yasurou Suzuki; Takashi Sanada, and Mitsuji Tsuji, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Jun. 7, 1988, Ser. No. 203,775

Claims priority, application Japan, Jun. 12, 1987, 62-147349

Int. Cl.[5] C08L *53/02, 77/06*

U.S. Cl. 525—66 8 Claims

1. A thermoplastic resin composition which comprises

100 parts by weight of a composition (A) which comprises 5-95% by weight of a polyphenylene ether resin and 95-5% by weight of a polyamide,

5-50 parts by weight of a modified rubber-like material (B) wherein 5-100 parts by weight of an aromatic vinyl compound is graft-polymerized with 100 parts by weight of a rubber-like material, the grafting ratio of the aromatic vinyl compound being 50% by weight or more, and

0.05-20 parts by weight of an α, β-unsaturated carboxylic acid or its derivative (C).

4,929,676
IMPACT AND CHEMICAL RESISTANT POLYCARBONATE BLEND

Michael K. Laughner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 24, 1989, Ser. No. 342,145
Int. Cl.[5] C08L *69/00*
U.S. Cl. 525—67 20 Claims

1. A thermoplastic molding composition comprising:
A. an aromatic polycarbonate;
B. an aromatic polyester;
C. a copolymer of one or more ethylenically unsaturated monomers with carbon monoxide; and
D. a polyalkylene oxide rubber having a glass transition temperature (Tg) lower than 0° C.

4,929,677
ACETOPHENONE BASED BISPHENOL POLYARYLATE RESINS

Barry D. Dean, Broomall, and Robert G. Gastinger, Brookhaven, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Continuation of Ser. No. 848,658, Apr. 7, 1986, abandoned. This application Mar. 8, 1988, Ser. No. 165,649
Int. Cl.[5] E08L *67/02, 35/06*
U.S. Cl. 525—151 3 Claims

1. A moldable polymer composition comprising:
(a) from about 1 to about 99 weight percent of a polyarylate containing in mole percent from about 15 to about 35 isophthalic acid or a reactive derivative of isophthalic acid, from about 15 to about 35 terephthalic acid, or a reactive derivative of isophthalic acid and about 50 of at least one polyarylate material selected from the group consisting of 1,1-bis(4-hydroxyphenyl)-1-phenylethane; 1,1-bis(4-hydroxyphenyl)-diphenyl methane; and 1,1-bis(4-hydroxyphenyl) fluorenone; and
(b) from about 99 to about 1 weight percent of a copolymer containing in mole percent from about 75 to about 87 recurring units of a monovinyl aromatic monomer and from about 13 to about 25 recurring units of an N-arylmaleimide monomer, wherein the polyarylate and the copolymer are fully compatible upon blending and the resulting polymer composition exhibits a single phase and a single glass transition temperature value.

4,929,678
RUBBER COMPOSITION AND A SOLID GOLF BALL OBTAINED THEREFROM

Akihiko Hamada, Kakogawa; Hidenori Hiraoka, Kobe; Yoshinobu Nakamura, Nishinomiya, and Hiroshi Ohtsuru, Akashi, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Jan. 14, 1988, Ser. No. 143,768
Claims priority, application Japan, May 2, 1987, 62-109147
Int. Cl.[5] C08F *8/42*
U.S. Cl. 525—193 16 Claims

1 A rubber composition for a solid golf ball having excellent durability and rebound properties comprising:
(a) a rubber component comprising at least 40% by weight of a polybutadiene rubber which has a Mooney viscosity $\{ML_{1-4}(100° C.)\}$ of 50 to 70 and a cis-1,4 bond content of at least 80%,
(b) a co-crosslinking agent, and
(c) a peroxide.

4,929,679
RUBBER COMPOSITION FOR TIRE TREAD

Shuichi Akita; Fumitoshi Suzuki, both of Yokohama; Yasushi Kikuchi, Odawara, and Hideyuki Oishi, Hiratsuka, all of Japan, assignors to Nippon Zeon Co., Ltd. and The Yokohama Ruhber Co., Ltd., both of Tokyo, Japan

Filed Mar. 22, 1989, Ser. No. 327,457
Claims priority, application Japan, Apr. 2, 1988, 63-80253
Int. Cl.[5] C08L *7/00, 9/00, 9/06*
U.S. Cl. 525—194 4 Claims

1. A rubber composition for tire tread comprising a rubber mixture composed of the following components (a) to (d):
(a) 5 to 30% by weight of styrene-butadiene copolymer rubber, designated as SBR-A, having 35 to 60% by weight of bound styrene content and 35 to 60% by mole of vinyl bond in the butadiene unit and having a Mooney viscosity of 20 to 200 and a weight average molecular weight of 100000 to 1000000 wherein said SBR-A is prepared by solution polymerization in the presence of an organic lithium compound;
(b) 15 to 40% by weight of styrene-butadiene copolymer rubber, designated as SBR-B, having 5 to 20% by weight of bound styrene content and 50 to 90% by mole of vinyl bond in the butadiene unit, and having a Mooney viscosity of 20 to 200 and a weight average molecular weight of 100000 to 1000000 and prepared by solution polymerization in the presence of an organic lithium compound;
(c) 5 to 30% by weight of polybutadiene rubber, designated as BR, having 20% by mole or less of vinyl bond; and
(d) 10 to 60% by weight of natural rubber and/or synthetic polyisoprene rubber having 90% by mole or more of cis-1,4 bond.

4,929,680
PREPARATION METHOD OF MASTERBATCH COMPOSITION FOR THERMOPLASTIC RESIN MODIFICATION

Saburo Matsubara; Yoshihiro Gohshi; Seizo Kobayashi, and Katsumi Usui, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1989, Ser. No. 373,009
Claims priority, application Japan, Jun. 30, 1988, 63-160706
Int. Cl.[5] C08L *23/18, 23/08*
U.S. Cl. 525—240 10 Claims

1. A method for the preparation of a masterbatch composition for use in thermoplastic resin modification which comprises kneading and extruding a component mixture in the temperature range from the maximum peak temperature (Tm) to (Tm-45)° C in accordance with differential scanning calorimetry (DSC) of an ethylene α-olefin copolymer, the component mixture comprising:
(A) 30–95 parts by weight of the ethylene α-olefin copolymer obtained by copolymerizing ethylene with an α-olefin having 3–12 carbon atoms in the presence of a catalyst composed of an organic aluminum compound and a solid component containing at least magnesium and titanium, and characterized by the properties (I)–(IV):
(I) Melt index of from 0.01 to 100 g/10 min,
(II) Density of more than 0.910 g/cm^3 and 0.940 g/cm^3 or less
(III) Maximum peak temperature (Tm) of 100° C or more in accordance with differential scanning calorimetry (DSC), and
(IV) Boiling n-hexane insoluble matter of 10 wt % or more; and
(B) 5–70 parts by weight of polybutene having a number average molecular weight of 300–4000.

4,929,681
BLENDS OF LLDPE, POLYPROPYLENE AND AROMATIC POLYMERS AND HIGH MODULUS FILMS THEREOF

Surinder K. Bahl, Chandigarh, India; Peter J. Canterino, Towaco; Theresa L. Cunningham, Manalapan, both of N.J.; Susan P. Evans, Canandaigua, and Richard G. Shaw, Remsen, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 61,596, Jun. 18, 1987, abandoned, which is a continuation of Ser. No. 814,716, Dec. 30, 1985, abandoned. This application Nov. 4, 1988, Ser. No. 267,471
Int. Cl.[5] C08L *23/20, 23/12, 25/06;* C08J *5/18*
U.S. Cl. 525—240 9 Claims

1. A film comprising a blend of:
75 to 90 weight percent of a linear low density copolymer of ethylene and an olefin having 4 to 10 carbon atoms (LLDPE) said linear low density copolymer having a density of less than 0.94;
1 to 20 weight percent of polypropylene (PP) or propylene-ethylene copolymer with a high propylene content; and
1 to 20 weight percent of a polymer of an aromatic monomer.

4,929,682
PROCESS FOR CRAFTING MALEIC ANHYDRIDE ON OLEFINIC POLYMERS

Viviano Banzi, and Roberto Fabri, both of Ferrara, Italy, assignors to Ausimont S.p.A., Milan, Italy

Continuation of Ser. No. 816,407, Jan. 6, 1986, abandoned. This application May 6, 1988, Ser. No. 191,809
Claims priority, application Italy, Jan. 8, 1985, 19048 A/85
Int. Cl.[5] C08F *255/04, 255/06, 291/02*
U.S. Cl. 525—257 7 Claims

1. Process for grafting maleic anhydride, alone or together with styrene, onto copolymers of ethylene with alpha-olefins of the formula, $R—CH=CH_2$, wherein $R=C_1-C_6$ alkyl, which comprises reacting said copolymers with an amount of maleic anhydride between 3 and 60% by weight with respect to the copolymer, in the presence of radical starters, at temperatures between 20° C. and 250° C., in a liquid medium consisting at least prevailingly of an aliphatic, cycloaliphatic or aromatic ketone containing from 3 to 22 carbon atoms, said copolymer being maintained in a state of suspension.

4,929,683
LIVING POLYMERIZATION OF OLEFIN TO END-FUNCTIONALIZED POLYMERS

Joseph P. Kennedy, and Munmaya K. Mishra, both of Akron, Ohio, assignors to University of Akron, Akron, Ohio

Division of Ser. No. 899,655, Aug. 25, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 173,049
Int. Cl.[5] C08F *4/06, 297/08*
U.S. Cl. 525—268 18 Claims

1. A living polymer complex exhibiting supernonnucleophilic counter anions formed from olefinic monomer and a product formed at −10° C. and lower from a Lewis acid and a tertiary organic ether, said complex reacting to polymerize said monomer until said monomer is consumed or the complex is destroyed.

4,929,684
STIFF SIDEWALLS FOR PNEUMATIC TIRES

Charles M. Roland, Waldorf, Md.; Georg G. A. Bohm, and Steven E. Schonfeld, both of Akron, Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jun. 17, 1988, Ser. No. 207,845
Int. Cl.[5] C08K *5/09;* C08L *7/00, 9/00*
U.S. Cl. 525—274 6 Claims

1. A sidewall for the construction of pneumatic tires comprising a rubber selected from the group consisting of natural rubber, addition polymerized synthetic rubber and blends thereof and from about 20 to 80 parts of zinc dimethacrylate, per 100 parts of rubber, capable of providing a tensile modulus of elasticity of from about 30 to 200 MPa at 10 percent elongation.

4,929,685
METHOD FOR MODIFYING THE SURFACE OF POLYCARBONATE RESIN

Rikizo Kobashi; Shigeyuki Takase; Hiroyuki Enomoto; Yasushi Hayasaki, all of Nishinomiya; Toyohisa Kobayashi, Kawasaki, and Shingo Yamazaki, Nishinomiya, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Japan and PPG Industries, Inc., Pa.

Filed Jul. 11, 1988, Ser. No. 217,408
Claims priority, application Japan, Jun. 7, 1986, 61-132388; Jul. 15, 1987, 62-174777
Int. Cl.[5] C08F *263/00*
U.S. Cl. 525—277 4 Claims

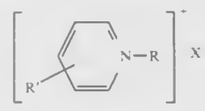
1. A method for modifying the surface of a polycarbonate resin substrate, comprising the steps of:
providing a polycarbonate resin substrate, said polycarbonate resin comprising a copolymer of 50–99 wt % diethylene glycol bis(allyl carbonate), and 1–50 wt % of one member of monomers of glycidyl acrylate or glycidyl methacrylate, homopolymers thereof and copolymers thereof with a monomer copolymerizable therewith;
providing an amine, or solution thereof, having an active hydrogen atom, said amine, or solution thereof, being maintained at a temperature of about 50°–100° C.; and
immersing said polycarbonate resin substrate in said amine, or solution thereof, for about 1–180 minutes to react the glycidyl group present in the surface of the polycarbonate resin substrate with the amine.

4,929,686
FLUORINE-CONTAINING ELASTOMER COMPOSITION

Takehiro Sonoi, and Okimasa Yamada, both of Kitaibaraki, Japan, assignors to Nippon Mektron Ltd., Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 313,871
Claims priority, application Japan, May 23, 1988, 63-123766
Int. Cl.[5] C08F *8/32*
U.S. Cl. 525—279 19 Claims

1. A fluorine-containing elastomer composition which comprises:
(a) 100 parts by weight of a fluorine-containing elastomer,
(b) 1 to 40 parts by weight of at least one of oxide and hydroxide of divalent metal, (c) 0.5 to 10 parts by weight of a polyhydroxyaromatic compound, and (d) 0.1 to 10 parts by weight of a quaternary ammonium salt compound represented by the following general formula [I]:



(I)

wherein R is an alkyl group having 1 to 24 carbon atoms or an aralkyl group having 7 to 20 carbon atoms, R' is a piperidino radical or a pyrrolidinyl radical, and X^- is an anion.

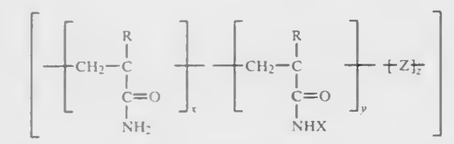
4,929,687

POLYMERS AND PROCESS OF MAKING SAME

Peter A. Jarovitzky, Stamford; Yun-Lung Fu, Milford, and Robin W. Dexter, Wilton, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 5, 1986, Ser. No. 859,681
Int. Cl.[5] C08F *8/22*
U.S. Cl. 525—328.2 8 Claims

1. A water-soluble polymer comprising recurring units of the formula:



wherein R is hydrogen or methyl, X is a halogen atom, the ratio of x to y ranges from about 99.9:0.1 to about 50:50, respectively, the ratio of (x plus y) to z ranges from about 99.9 to 0.1 to about 50:50, respectively, and Z is the residue of a copolymerized cationic monomer, the molecular weight of the polymer being at least about 100,000.

4,929,688

CURE SYSTEM FOR OPEN STEAM CURING OF MINERAL-LOADED CHLOROBUTYL COMPOUNDS

Terry F. Allen, and Robert C. Schisler, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 231,288, Aug. 11, 1988, Pat. No. 4,873,290. This application Jul. 3, 1989, Ser. No. 374,807
Int. Cl.[5] C08C *19/26*
U.S. Cl. 525—332.5 10 Claims

1. A vulcanizable composition comprising a blend of chlorobutyl rubber with (1) 25 to about 200 phr of a filler selected from the group consisting of calcium carbonate, magnesium carbonate, magnesium silicate, calcium silicate, aluminum silicate, whiting, pyrogenic silica, hydrated silica, barium sulfate, calcium sulfate, titanium dioxide and mica and (2) a vulcanization agent comprising from about 0.25 to about 10 phr of an alkyl phenol disulfide and from about 0.25 to about 10 phr of a guanidine compound selected from the group consisting of diphenyl guanidine, di-ortho-tolylguanidine, triphenyl guanidine and di-ortho-tolylguanidine salt of dicatechol borate.

4,929,689

POLYOLEFINECARBOXYLIC ACIDS, THEIR PREPARATION AND THEIR USE FOR PREPARING POLYOLEFINE-POLYCARBONATE BLOCK COPOLYMERS

Kurt P. Meurer; Helmut Waniczek, both of Cologne; Gerd Sylvester, Leverkusen, and Josef Witte, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 50,165, May 14, 1987, Pat. No. 4,798,873. This application Sep. 27, 1988, Ser. No. 250,014
Claims priority, application Fed. Rep. of Germany, May 31, 1986, 3618378
Int. Cl.[5] C08F *200/00*
U.S. Cl. 525—333.9 7 Claims



1. A poly-(C_2–C_{10}-α-olefine)-carbonyl halide having molecular weights $\bar{M}_w$ of 2000 to 235,000.

4,929,690

PREPARATION OF METAL SALTS OF CARBOXYL-CONTAINING POLYMERS

Hans-Helmut Goertz, Freinsheim; Walter Denzinger, Speyer, and Hans-Juergen Raubenheimer, Ketsch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,021
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1987, 3736997
Int. Cl.[5] C08F *8/42*
U.S. Cl. 525—366 9 Claims

1. A process for preparing a metal salt of a carboxyl-containing polymer, comprising the steps of:

reacting a carboxyl- and/or carboxylic anhydride group-containing polymer suspended in an inert solvent in which the polymer and its metal salt are insoluble with a pulverulent basic metal compound;

drying the resulting suspension of polymeric metal salt;

adding water to the suspension of the polymeric metal salt; and

removing the solvent by distillation.

4,929,691

LIQUID SILICONE RESIN COMPOSITIONS

Danielle M. Fillmore, Midland, County, Mich.; John G. Price, South Glamorgan, United Kingdom, and Terence J. Swihart, Bay County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 28, 1989, Ser. No. 329,911
Int. Cl.[5] C08F *283/00*
U.S. Cl. 525—477 24 Claims

1. A liquid silicone resin composition prepared by a process comprising:

(I) reacting a mixture consisting essentially of

(A) a polydimethylsiloxane,

(B) a methyltrialkoxysilane having the formula $MeSi(OR)_3$, wherein Me denotes a methyl radical and R is an alkyl radical having from 1 to 3 carbon atoms, and

(C) an equilibrating amount of an acid catalyst having the formula

$R'SO_3H$

wherein R' is a perfluoroalkyl group having 1 to 10 carbon atoms, the molar ratio of said methyltrialkoxysilane (B) to said polydimethylsiloxane (A) being between about 1:1 and about 10:1;

(II) hydrolyzing the reaction product formed in step (I) with sufficient water to provide from about 0.48 to about 0.81 mole of residual alkoxy functionality per 100 parts by weight of said liquid silicone resin; and

(III) neutralizing said acid catalyst (C).

4,929,692

CROSSLINKED COPOLYMERS AND OPHTHALMIC DEVICES MADE FROM VINYLIC MACROMERS CONTAINING PERFLUOROPOLYALKYL ETHER AND POLYALKYL ETHER SEGMENTS AND MINOR AMOUNTS OF VINYLIC COMONOMERS

Merrill Goldenberg, Teaneck, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 11, 1989, Ser. No. 296,169
Int. Cl.[5] C08F *16/24, 18/20*
U.S. Cl. 526—247 16 Claims

1. A crosslinked polymer which is the addition polymerization product of (a) a macromer containing perfluoropolyalkylether and polyalkylether segments and ethylenically unsaturated moieties, having the formula I, more specifically as seen in formulas Ia to Id,

E—T—L—Q—X—Z—X—Q—L—T—E, (Ia)

E—T—L—Q—X—Z—X—Q—L, (Ib)

E—T—L—Q—X—G—X—Q—L—T—E, or (Ic)

E—T—L—Q—X—G—X—Q—L (Id)

wherein

Z is $—(C_aF_{2a}O)_b—CF_2—$, where

a is 1 to 4, b is 2 to 200;

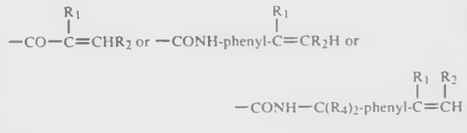
X is a direct bond, $—CH_2—$, $—CH_2OCH_2CHOHCH_2—$, $—CH_2(OCH_2CH_2)_y—$ or carbonyl where y is 1 to 10 and where in each case the carbon atom is attached to Z or G;

Q is a direct bond or —ACONH—R—NHCO— where A is oxa or imino and R is a divalent aliphatic group having from 2 to 14 carbon atoms, a divalent 5- or 6-membered cycloaliphatic group having 5 to 14 carbon atoms or an arylene group having 6 to 14 carbon atoms;

L is $—A(C_mH_{2m}O)_nC_mH_{2m}AY—$ or L_1 where Y is a direct bond or H and m is 2 to 4 or mixtures thereof and n is 5 to 100, where A is attached to Q;

T is $—CONH—R_5A—$ or $—CONH—R—NHCOOR_5A—$ or —CONH—R—NHCO—A— or $—R_5A—$ or direct bond where the carbonyl group is attached to L, where R_5 is alkylene or hydroxy-substituted alkylene of 2 to 15 carbon atoms and R is as above;

E is



where

R_1 is hydrogen or methyl, and

R_2 is hydrogen, methyl or $—COOR_3$

where

R_3 is hydrogen or alkyl of 1 to 4 carbon atoms with the proviso that, when R_1 is methyl, R_2 is hydrogen, R_4 is hydrogen or methyl and G is $—(C_aF_{2a}O)_b—CF_2[CH_2—OCONH—R—NHCOOCH_2CF_2(OC_aF_{2a})_b]_x$ or $—(C_aF_{2a}O)_b—CF_2[CH_2—NHCONH—R—NHCONHCH_2CF_2(OC_aF_{2a})_b]_x$

where

x is 1 to 3;

L_1 is $—A(C_mH_{2m}O)_n[C_mH_{2m}ACONH—R—NHCOA(C_mH_{2m}O)_{n1}]_zC_mH_{2m}AY$

where n_1 is 5 to 100, z is 1 to 10 and Y is a direct bond or H; and (b) a vinylic comonomer selected from

(i) hydrophilic monomers selected from hydroxy-substituted lower alkyl acrylates and methacrylates, acrylamide, methacrylamide, C_1–C_2 lower alkyl acrylamide and methacrylamide, ethoxylated acrylates and methacrylates, hydroxy substituted lower alkyl acrylamide and methacrylamide, hydroxy substituted lower alkyl vinyl ethers, sodium ethylene sulfonate, sodium styrenesulfonate, 2-acrylamido-2-methylpropanesulfonic acid, N-vinylpyrrole, N-vinylsuccinimide, N-vinylpyrrolidone, 2- and 4-vinylpyridine, acrylic acid, methacrylic acid, amino (by amino including quaternary ammonium),-monoloweralkylamino- or diloweralkylamino- lower alkyl acrylates or methacrylates and allyl alcohol;

(ii) hydrophobic monomers selected from

C_1 to C_{18} alkyl acrylates and methacrylate, C_3 to C_{18} alkyl acrylamides and methacrylamides, acrylonitrile, methacrylonitrile, vinyl C_1 to C_{18} alkanoates, C_2 to C_{18} alkenes, C_2 to C_{18} haloalkenes, styrene, C_1 to C_6 alkyl styrenes, vinyl alkyl ethers wherein the alkyl portion has 1 to 6 carbon atoms, C_3–C_{12} perfluoroalkyl ethyl thiocarbonylaminoethyl acrylates and methacrylates, C_3–C_{12} fluoroalkyl acrylates and methacrylates, acryloxy and methacryloxy-alkyl-siloxanes, N-vinylcarbazole, C_1–C_{12} alkyl esters of maleic, fumaric, itaconic, and mesaconic acids;

(iii) polyreactive crosslinking agents such as allyl methacrylate, diallyl itaconate, monoallyl itaconate, diallyl maleate, diallyl fumarate, diallyl succinate, diallyl phthalate, triallyl cyanurate, triallyl isocyanurate, diethylene glycol bis-allyl carbonate, triallyl phosphate, triallyl trimellitate, allyl ether, N,N-diallylmelamine; vinyl compounds, e.g. divinyl benzene, N,N'-methylene-bis-acrylamide, ethylene glycol dimethacrylate, neopentylglycol dimethacrylate, tetraethylene glycol dimethacrylate, hexamethylene-bis-maleimide, divinyl urea, bisphenol A bis methacrylate, divinyl adipate, glycerin trimethacrylate, trimethylolpropane triacrylate, trivinyl trimellitate, 1,5-pentadiene, 1,3-bis(4-methacryloxybutyl) tetramethyl disiloxane, divinyl ether, and divinyl sulfone; and the dimethacrylate formed by reacting perfluoropolyalkylether dimethanol or poly-(ethylene glycol) with two moles of isocyanatoethyl methacrylate; and

(iv) mixtures of (i), (ii) and (iii).

4,929,693

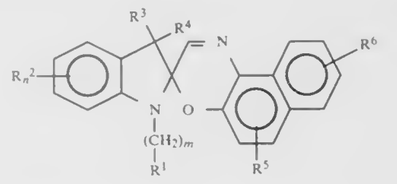
PHOTOCHROMIC COMPOUND

Ryojiro Akashi, Otsu, and Takashi Taniguchi, Yasu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 2, 1988, Ser. No. 151,601
Claims priority, application Japan, Feb. 2, 1987, 62-20379; Feb. 13, 1987, 62-29703; Apr. 9, 1987, 62-87607; Jun. 9, 1987, 62-144461; Aug. 17, 1987, 62-204574; Dec. 8, 1987, 62-311635; Dec. 22, 1987, 62-326498
Int. Cl.[5] C08F *26/06*
U.S. Cl. 526—259 22 Claims

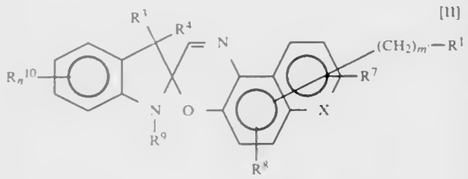
1. A photochromic polymer comprising a photochromic spirooxazine compound of the formula:

[1]



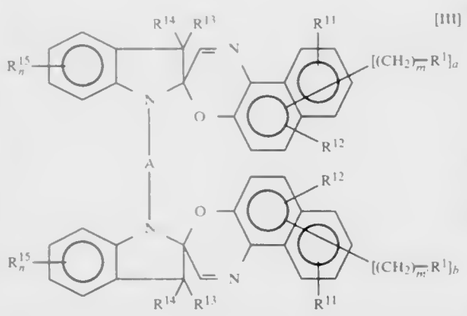
wherein R^1 represents an addition polymerizable or a ring-opening polymerizable organic functional group; R^2, R^5 and R^6 are the same or different, and represent a hydroxyl group, amino group, organic substituted amino group, C_1–C_6 alkoxyl group, C_1C_{20} alkyl group, halogen, carboxyl group, C_2–C_{10} acyl group, nitro group or hydrogen; R^3 and R^4 are the same or different, and represent a C_1–C_{10} alkyl group, C_7–C_{12} aralkyl group, or R^3 and R^4 cooperatively represent a C_6–C_8 alicyclic ring with a spiro carbon atom, norbornyl group or adamantyl group; m is an integer of 1–30; and n is an integer of 0–4,

[II]



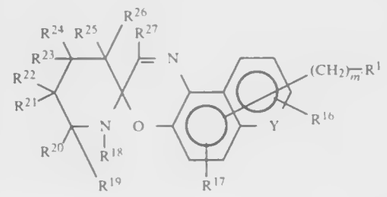
wherein R^1 has the same as in formula; [I]; R^7, R^8 and R^{10} are the same or different, and represent an organic substituted amino group, C_1–C_6 alkoxy group, C_1–C_{20} alkyl group, halogen, carboxyl group, C_2–C_{10} acyl group, nitro group or hydrogen; R_9 represents C_1–C_{30} alkyl group, phenyl group, substituted phenyl group, C_7–C_{12} aralkyl group, C_7–C_{12} substituted aralkyl group, C_1–C_{30} hydroxyalkyl group, C_1–C_{30} aminoalkyl group, C_4–C_{30} acryloxyalkyl group, C_4–C_{30} acrylamidoalkyl group, C_5–C_{30} metacryloxyalkyl group or C_5–C_{30} methacrylamidoalkyl group; R^3 and R^4 have the same meaning as R^3 and R^4 in formula; X represents N or CH; m′ represents an integer of 0-10; and n has the same meaning as in formula, with the proviso that when X is nitrogen, the $(CH_2)_{m'}$-R^1 group does not bond to this nitrogen atom,

[III]



wherein R^1 has the same meaning as in formula; R^{11}, R^{12} and R^{15} are the same or different, and represent an organic substituted amino group, C_1–C_6 alkoxy group, C_1–C_{20} alkyl group, halogen, carboxyl group, C_2–C_{10} acyl group, hydroxyl group, nitro group, C_1–C_{10} hydroxyalkyl group or hydrogen; R^{13} and R^{14} are the same or different, and represent a C_1–C_{10} alkyl group, aryl group, C_7–C_{12} aralkyl group, or R^{13} and R^{14} cooperatively represent a C_6–C_8 alicyclic ring with a spiro carbon atom, norbornyl group or adamantyl group; A represents a C_1–C_{30} alkylene group, C_1–C_{30} alkylene(poly)oxyalkylene group, or C_8–C_{20} alkylenearylalkylene group; a and b are the same or different, and are 0 or 1 and (a+b) is 1 or 2; m′ and n have the same meaning as in formula, [II], respectively or

[IV]



wherein R^1 has the same meaning as in formula; R^{16} and R^{17} are the same or different, and represent an organic amino group, C_1–C_6 alkoxyl group, C_1–C_{20} alkyl group, halogen, carboxyl group, C_2–C_{10} acyl group, cyano group, nitro group or hydrogen; R^{18} is a C_1–C_{30} alkyl group, phenyl group, substituted phenyl group, C_7–C_{12} aralkyl group or C_7–C_{12} substituted aralkyl group; R^{19} to R^{26} are the same or different and represent a C_1–C_{30} alkyl group, phenyl group, substituted phenyl group, C_7–C_{12} aralkyl group, C_7–C_{12} substituted aralkyl group, C_1–C_6 alkoxyl group, carboxyl group, nitro group or hydrogen; R^{27} represents a C_1–C_{30} alkyl group, phenyl group, substituted phenyl group, C_7–C_{12} aralkyl group, C_7–C_{12} substituted aralkyl group, C_1–C_6 alkoxy group, carboxyl group, or hydrogen; Y represents N or C—R^{16} (wherein R^{16} has the same meaning as mentioned above); and m′ has the same meaning as in formula, with the proviso that when Y is nitrogen, the —$(CH_2)_{m'}R^1$ group does not bond to this nitrogen atom,

said photochromic polymer is prepared by polymerization of said photochromic spirooxazine compound, wherein the polymerization occurs through R^1 of each of formulae [I], [II], [III] and [IV].

4,929,694

COPOLYMERS OF P-MERCAPTOSTYRENE AND ITS ESTERS

Mohammad Aslam, Corpus Christi, Tex.; Richard Vicari, Chatham Township, and Kenneth G. Davenport, Basking Ridge, both of N.J., assignors to Hoechst Celanese Corporation, North Somerville, N.J.

Filed May 4, 1989, Ser. No. 348,337
Int. Cl.[5] C08F *228/02*
U.S. Cl. 526—262 6 Claims

1 Copolymers of a p-mercaptostyrene ester where in ester group is derived from a carboxylic acid containing 2 to 4 carbon atoms, with at least one comonomer selected from the group consisting of styrene, N-methylmaleimide, maleic anhydride and p-acetoxystyrene.

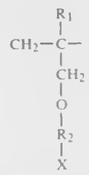
4,929,695

WATER TREATMENT POLYMERS AND METHODS OF USE THEREOF

Fu Chen, Newtown, and William S. Carey, Ridley Park, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 215,105, Jul. 5, 1988, Pat. No. 4,895,916, which is a continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, which is a continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Oct. 27, 1989, Ser. No. 428,813
Int. Cl.[5] C08F *20/42*
U.S. Cl. 526—297 7 Claims

1 Composition of a water soluble polymer comprising substantially repeat units having the structure:

E (Monomer g)  (Monomer h)

wherein E in the above formula is the repeat unit obtained after polymerization of an ethylenically unsaturated compound or compounds; wherein R_1 is hydrogen or lower alkyl (C_1–C_3); R_2 is a hydroxy substituted lower alkylene group having from 1 to 6 carbon atoms or a non-substituted lower alkylene group having from 1 to 6carbon atoms; X is selected from the group consisting of CN and $CONR_3R_4$; wherein R_3 and R_4 is independently hydrogen or lower alkyl (C_1–C_3); the molar ration g:h of said polymer being between about 30:1 to 1:20.

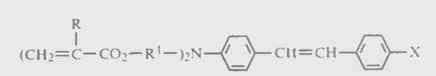
4,929,696

BISACRYLATE MONOMERS AND POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Ronald N. DeMartino, Wayne; Anthony J. East, Madison, and Gordon W. Calundann, North Plainfield, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 135,764, Dec. 21, 1987. This application Nov. 13, 1989, Ser. No. 434,260
Int. Cl.[5] C07C *69/52*
U.S. Cl. 526—312 11 Claims

1. A process for producing a thermoset polymer product which comprises polymerizing a monomer corresponding to the formula:



where R is a C_1–C_4 alkyl substituent, R^1 is a divalent C_2–C_{12} alkylene radical, and X is $—NO_2$, —CN or $—CF_3$.

4,929,697

USE OF ESTER GROUP CONTAINING POLYOLS IN A RIM PROCESS

Neil H. Nodelman, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 83,558, Aug. 7, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 302,654
Int. Cl.[5] C08G *18/32, 18/38*
U.S. Cl. 528—77 3 Claims

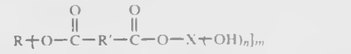
1. In a process for the production of polyurethane moldings by reacting a reaction mixture comprising

(a) a polyisocyanate,

(b) an isocyanate-reactive material having a molecular weight of from about 840 to about 5,000, and

(c) a chain extender, said reaction mixture being processed as a one-shot system by the RIM process at an isocyanate index of from about 70 to about 130,

the improvement wherein component (b) comprises a polyester polyol having the structure



wherein

R represents the residue of a polyepoxide after ring opening with a carboxylic acid group,

R′ represents the residue of a cyclic anhydride,

X represents the organic residue of a polyol,

m represents the number of epoxy groups of the polyepoxide ring opened with carboxylic acid groups, and

n is an integer of from 1 to 7.

4,929,698

NEW POLYESTER YARNS HAVING PLEASING AESTHETICS

John F. Hagewood, Mathews, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 207,077, Jun. 14, 1988, abandoned, Continuation-in-part of Ser. No. 53,308, May 22, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 318,798
Int. Cl.[5] C08G *63/02*
U.S. Cl. 528—272 4 Claims

1. An interlaced multifilament draw-warping feed yarn consisting essentially of spin-oriented poly[ethylene terephthalate/5-sodium-sulfo-isophthalate] copolyester filaments containing about 2 mole % of ethylene 5-sodium-sulfo-isophthalate repeat units, being of denier about 40 to about 300, having an average interlace level of about 5.5 to about 9.5 RPC, and being provided with a finish that is stable enough to persist on such yarn after draw-warping in sufficient quantity and in such condition as to provide finish to enhance knitting performance.

4,929,699

PROCESS FOR HYDROGENATION OF POLYMERS

David R. Wilson, and James C. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1989, Ser. No. 349,549
Int. Cl.[5] C08F *8/04*
U.S. Cl. 525—339 11 Claims

1. A process for hydrogenation of a polymer containing ethylenic unsaturation comprising contacting the polymer with a bis(alkyl substituted cyclopentadienyl) lanthanide-based compound and a hydrogenating agent under hydrogenation conditions.

4,929,700

PRODUCTION OF PURIFIED, BIOLOGICALLY ACTIVE, BACTERIALLY PRODUCED RECOMBINANT HUMAN CSF-1

Robert Halenbeck, San Rafael; Kriston Koths, El Cerrito; Cynthia Cowgill, Berkeley, and Walter J. Laird, Pinole, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 114,001, Oct. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 40,174, Apr. 16, 1987, abandoned. This application Apr. 8, 1988, Ser. No. 173,428
Int. Cl.[5] C07K *3/28*
U.S. Cl. 530—351 41 Claims

1. A method to obtain purified, biologically active CSF-1 dimer from the product of a CSF-1 gene recombinantly expressed in bacteria, which method comprises:

(a) recovering in a chaotropic environment and under reducing conditions, the reduced monomeric, solubilized form of said CSF-1 product from bacterial cells;

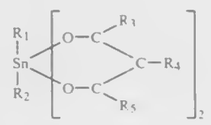
(b) refolding, including formation of CSF-1 dimer, the monomer of (a) under refolding conditions; and
(c) purifying the refolded, dimerized CSF-1 of (b).

4,929,701
HYDROGENATION OF CO/OLEFIN COPOLYMER
Johannes A. M. van Broekhoven, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Filed Mar. 20, 1989, Ser. No. 325,793
Claims priority, application Netherlands, Mar. 21, 1988, 8800699
Int. Cl.[5] C08G 67/02
U.S. Cl. 525—539 11 Claims

1. A process for producing a linear alternating polymer product wherein two-carbon monomeric units, optionally containing a methyl substituent, alternate with 2,5-tetrahydrofurandiyl units optionally containing a methyl substituent on one of the carbon atoms in the 3 or 4 positions which comprises hydrogenating under hydrogenation conditions a linear reactant linear alternating polymer of carbon monoxide and at least one α-olefin, in an inert reaction diluent, in the presence of a catalyst formed from a ruthenium carbonyl and an organic iodide.

4,929,702
TIN MONOCHELATE CATALYSIS OF ORGANOPOLYSILOXANE COMPOSITIONS
Jacques Cavezzan; Jean-Marc Frances, both of Villeurbanne, and Pierre Lancelin, Marcy l'Etoile, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Jun. 27, 1988, Ser. No. 211,897
Claims priority, application France, Jun. 25, 1987, 87 09179
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—18 6 Claims

1. An organopolysiloxane composition of matter curable into elastomeric state, comprising (1) a curable organopolysiloxane base which is an organopolysiloxane polymer and a crosslinking agent therefor, and (2) a catalytically effective amount of the product of reaction between (a) a diorganotin bischelate of the formula:



(1)

in which:
the symbols R_1 and R_2, which may be identical or different, are each an optionally substituted, monovalent C_1–C_{18} hydrocarbon radical;
the symbols R_3 and R_5, which may be identical or different, are each one of the radicals R_1 or R_2, a hydrogen atom, C_1–C_5 alkoxy radical or an $Si(R_1)_3$ silyl radical; and
the symbol R_4 is a hydrogen atom, or an optionally halogenated C_1–C_8 hydrocarbon radical, with the proviso that R_4 and R_5 may together form, with the carbon atoms from which they depend, a divalent C_5–C_{12} cyclic hydrocarbon radical, or an optionally substituted such cyclic radical bearing at least one chloro, nitro and/or cyano substituent, with (b) an organic acid of the formula:

XH (2)

in which X is a radical of the formula R_6COO wherein R_6 has the same definition as R_1, in a molar ratio (1)/(2) ranging from 0.01 to 100 said product of reaction being a monochelate of pentacoordinated tin of valency IV.

4,929,703
SOLVENTLESS SILICONE COATING COMPOSITION
Dipak B. Narula; Anh Be, both of Midland County, and Terence J. Swihart, Bay County, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Mar. 30, 1989, Ser. No. 330,540
Int. Cl.[5] C08G 77/06
U.S. Cl. 528—23 22 Claims

1. A composition comprising:
(A) 100 parts by weight of a liquid silicone resin prepared by a process comprising
(1) reacting a mixture consisting essentially of
(i) a first silane having the average general formula

$$R^1_aSi(OR)_{4-a}$$

wherein R is selected from the group consisting of methyl, ethyl, propyl and acetyl radicals, R^1 is a monovalent hydrocarbyl group selected from the group consisting of phenyl and alkyl radicals having 1 to 3 carbon atoms and a is 1 to 2,
(ii) a first diorganopolysiloxane, having organic groups independently selected from the group consisting of phenyl, vinyl, alkyl radicals having 1 to 4 carbon atoms and halogenated alkyl radicals having 1 to 4 carbon atoms and
(iii) an equilibrating amount of an acid catalyst having the formula

$$ZSO_3H$$

wherein Z is a perfluoroalkyl group having 1 to about 10 carbon atoms, the molar ratio of said silane (i) to said diorganopolysiloxane (ii) being between about 1:1 and about 10:1,
(II) hydrolyzing the reaction product formed in step (1) with sufficient water to provide from about 0.5 to about 1 mole of residual —OR functionality per 100 parts by weight of said liquid silicone resin and
(III) neutralizing said acid catalyst (iii);
(B) from about 1 to 100 parts by weight of a second silane having the general formula

$$R^3Si(OR)_3$$

wherein R^3 is selected from the group consisting of phenyl vinyl, alkyl radicals having 1 to 4 carbon atoms and halogenated alkyl radicals having 1 to 4 carbon atoms and R has the definition set forth in (A)(1)(i) above; and
(C) from about 1 to 200 parts by weight of a second diorganopolysiloxane having the average formula

$$R^4O(R^5R^6SiO)_yR^4$$

wherein y is about 3 to 10, R^4 is selected from the group consisting of hydrogen and the above defined R groups and R^5 and R^6 are selected from the group consisting of phenyl, vinyl, alkyl radicals having 1 to 4 carbon atoms and halogenated alkyl radicals having 1 to 4 carbon atoms.

4,929,704
ISOCYANATE- AND ISOTHIOCYANATE-MODIFIED POLYSILAZANE CERAMIC PRECURSORS
Joanne M. Schwark, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Dec. 20, 1988, Ser. No. 286,839
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—28 8 Claims

1. A process for preparing a partially cross-linked polysilazane addition polymer comprising
(1) preparing a silazane ammonolysis product by reacting ammonia with a halogenated silicon compound selected from the group consisting of $RSiX_3$, $RR'SiX_2$ and mixtures thereof, wherein X is selected from the group consisting of Cl, Br and I; and R and R' are the same or different and are selected from the group consisting of H, substituted or unsubstituted 1–6 carbon alkyl, aryl, 1–6 carbon alkenyl and 1–6 carbon alkynyl groups, at least one of the halogenated silicon compounds containing a Si-H bond,
(2) reacting the silazane ammonolysis product with from about 0.1% to about 30% by weight, based on the weight of the ammonolysis product, of a compound selected from the group consisting of isocyanates, isothiocyanates, ketenes, thioketenes, carbodiimides and carbon disulfide to form a polysilazane addition polymer, and
(3) heating to a temperature not exceeding 300° C. for a time sufficient to partially cross-link the addition polymer and increase the viscosity to a value suitable for the desired end use of the polymer.

4,929,705
NEW POLYISOCYANATE-POLYADDITION COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE FOR THE DISPERSION OF SOLIDS
Jan Mazanek, Cologne; Ulrich von Gizycki, Leverkusen; Hanns P. Müller, Bergisch-Gladbach; Martin Wienkenhöver; Karl-Heinz Wieser, both of Leverkusen; Volker Paulat, Monheim; Werner Theuer, and Walter Müller, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Mar. 28, 1989, Ser. No. 329,462
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810781
Int. Cl.[5] C08G 18/30
U.S. Cl. 528—49 26 Claims

1. Polyisocyanate-polyaddition compounds which are obtainable by the reaction of polyisocyanates containing from 3 to 8 isocyanate groups per molecule with
(A) from 5 to 60 equivalents % (based on the isocyanate groups of the polyisocyanates put into the process) of one or more compounds selected from the group represented by the following formulae:

$$R_1—(—AO—)_x—X \quad (I)$$

and

$$R_1—R_2—X \quad (II)$$

wherein
R_1 denotes an aliphatic group containing 1 to 60 carbon atoms, an aromatic or an araliphatic group containing 6 to 60 carbon atoms or the residue of a carboxylic acid, a carboxylic acid derivative or a sulphonamide containing from 1 to 60 carbon atoms,
AO denotes an alkylene oxide group containing from 2 to 22 carbon atoms,
x stands for a number from 0 to 200,
X denotes a HO, HS, H_2N or HRN group in which $R = C_1$ to C_6 alkyl, and
R_2 denotes an aliphatic polyester group having a molecular weight in the range of from 200 to 10,000 and
(B) from 20 to 80 equivalents % (based on the isocyanate groups of the polyisocyanates put into the process) of a tertiary amine which has from 3 to 20 carbon atoms and in addition contains a HO, HS, H_2N or HRN group in which $R = C_1$ to C_6 alkyl, the sum of (A) + (B) amounting to 40 to 98 equivalents % (based on the isocyanate groups of the polyisocyanates put into the process).

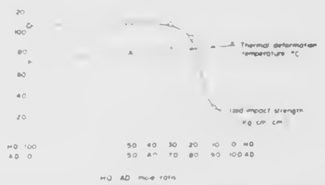
4,929,706
CELL GROWTH ENHANCERS AND/OR ANTIBODY PRODUCTION STIMULATORS COMPRISING CHEMICALLY MODIFIED HYDROPHILIC POLYUREA-URETHANE PREPOLYMERS AND POLYMERS
Aaron H. Heifetz, Columbia, Md.; Richard A. Wolfe, Ellisville, Mo.; James A. Braatz, Beltsville, and Narender P. Luthra, Columbia, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Continuation-in-part of Ser. No. 266,445, Nov. 2, 1988. This application Mar. 3, 1989, Ser. No. 319,458
Int. Cl.[5] C08G 18/10
U.S. Cl. 528—49 60 Claims

1. A modified hydrophilic polymer comprising oxyethylene-based diols or polyol units on which at least some of the hydroxy groups have been capped with polyisocyanate wherein the isocyanates of said polyisocyanates have been modified by an isocyanate (NCO) reactive functional group and wherein said modified polymer expresses a free functional group, said isocyanates being modified to the extent that said modified polymer effectively enhances mammalian cell growth and/or stimulates antibody production.

4,929,707
POLYURETHANE BASE LENS RESIN, PLASTIC LENS COMPRISING THE RESIN AND PREPARATION METHOD OF THE LENS
Teruyuki Nagata; Koju Okazaki, both of Fukuoka; Nobuyuki Kajimoto, Kanagawa; Tohru Miura, Kanagawa; Yoshinobu Kanemura, Kanagawa, and Katsuyoshi Sasagawa, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Feb. 3, 1989, Ser. No. 305,905
Claims priority, application Japan, Feb. 16, 1988, 63-31788; Feb. 22, 1988, 63-37514
Int. Cl.[5] C08G 18/38
U.S. Cl. 528—76 27 Claims

1. A polyurethane base resin comprising reacting one or more of sulfur-containing polyisocyanate compounds with one or .nore of sulfur-containing polyol compounds.

4,929,708
EPOXY RESIN COMPOSITIONS
Kaoru Tominaga, and Tadao Iwata, both of Chiba, Japan, assignors to Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 26, 1986, Ser. No. 935,303
Claims priority, application Japan, Nov. 26, 1985, 60-263904; Dec. 27, 1985, 60-292594
Int. Cl.[5] C08G 59/22, 59/50
U.S. Cl. 528—118 6 Claims



1. A liquid epoxy resin composition comprising 1,1-bis (4-hydroxyphenyl ethane diglycidylether and an aminoalkyl piperazine compound selected from N-aminoalkyl piperazines in which the alkyl group has from 1 to 6 carbon atoms and N,N'-bis (aminoalkyl) piperazines in which the alkyl groups have from 1 to 6 carbons atoms, wherein the equivalent weight ratio of the epoxy groups in the composition to the active

hydrogen of the aminoalkyl piperazine compound is from 0.8 to 1.2.

4,929,709

POLYCARBONATE CONTAINING ARALKYLPHENYL END GROUPS

Ralf Dujardin; Rolf-Volker Meyer, both of Krefeld, and Wolfgang Siebourg, Bonn, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

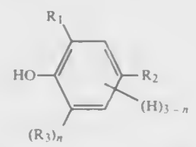
Filed Jan. 25, 1989, Ser. No. 301,690

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3803939

Int. Cl.[5] C08G *63/62*

U.S. Cl. 528—198 **7 Claims**

1. Thermoplastic, aromatic polycarbonate having a number average molecular weights $\overline{M}_n$ (number average determined by gel chromatography after calibration) of at least 5000 g/mol based on diphenols, chain terminating agents and optionally branching agents, characterised in that the chain terminating agent correspond to formula (I)



(I)

where R_1, R_2 and R_3 are identical or different and stand for C_2–C_{12}–alkyl or C_8–C_{20}–aralkyl, at least one of the groups R_1 or R_2 being a C_8–C_{20}–aralkyl group and "n" having a value of from 0.5 to 1.

4,929,710

HYDROXYCARBOXYLIC ACID/UNSATURATED AROMATIC HYDROCARBON RESIN USEFUL AS RECORDING MATERIAL

Thomas Scholl, Meerbusch; Gert Jabs, Odenthal, both of Fed. Rep. of Germany, and Adolf Richartz, Apapa, Nigeria, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

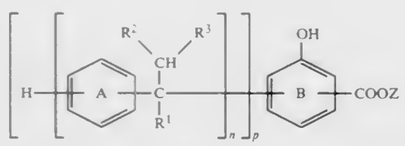
Filed Oct. 7, 1987, Ser. No. 105,799

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1986, 3635742

Int. Cl.[5] C08G *83/00*

U.S. Cl. 528—205 **6 Claims**

1. A compound of the following formula (I)



(I)

wherein the rings A and B are unsubstituted or substituted and wherein

R^1 to R^3 independently of one another denote H or alkyl or together with at least 2 C atoms of ring A denote the remainder to complete a ring,

Z denotes M/m

M denotes an m-valent metal ion,

m denotes a whole number,

n denotes a whole, at least 2 and

p denotes a whole number from 1 to 3.

4,929,711

PROCESS FOR CONVERTING POLYKETONES TO POLYESTERS

Biau-Hung Chang, West Chester; Lester Y. Lee, Hamilton, and Jack Kwiatek, Cincinnati, all of Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Oct. 4, 1989, Ser. No. 416,903

Int. Cl.[5] C08G *2/06*

U.S. Cl. 528—220 **16 Claims**

1. A process for converting polyketones to polyesters which comprises contacting a polyketone of molecular weight greater than 1,000 and having a carbonyl content from 0.01% to 50% by weight with an organic peroxyacid oxidizing agent having from 2 to 30 carbon atoms in an inert liquid medium at a temperature from −20° C. to 150° C.; the molar ratio of said oxidizing agent to carbonyl ranging from 0.1:1 to 30:1 and the weight ratio of said inert liquid medium to said polyketone ranging from 1:1 to 100:1.

4,929,712

POLYACETAL RESIN COMPOSITION

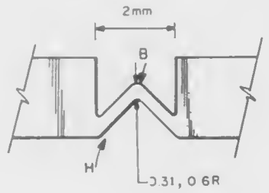
Noriyuki Sugiyama, Shizuoka, and Mitsuhiro Mochizuki, Fuji, both of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Jun. 26, 1989, Ser. No. 371,067

Claims priority, application Japan, Jul. 4, 1988, 63-166387; Mar. 13, 1989, 60232

Int. Cl.[5] C08G *2/00*

U.S. Cl. 528—230 **14 Claims**



1. A polyacetal resin composition prepared by melt-kneading a polyacetal resin (A) (99 to 40 wt. %) with a thermoplastic polyurethane (B) (1 to 60 wt. %) in the presence of a polyisocyanate compound, a polyisothiocyanate compound or a dimer or trimer thereof (C) in an amount of 0.1 to 10 wt. % based on the total of A and B.

4,929,713

PREPARATION OF OPEN CHAIN POLY(REISSERT COMPOUNDS)

Harry W. Gibson, and Yajnanarayana H. R. Jois, both of Blacksburg, Va., assignors to Virginia Polytechnic Institute and State University, Blacksburg, Va.

Filed Oct. 6, 1989, Ser. No. 418,312

Int. Cl.[5] C08G *2/00*

U.S. Cl. 528—230 **8 Claims**

1. A process for the formation of the open chain poly Reissert product of the reaction product of an aromatic dialdehyde, a primary amine and an aliphatic diacid chloride which comprises:

(a) reaction of an aromatic dialdehyde with a primary amine in the presence of cyanide and bisulfite to yield a reaction product thereof; and

(b) reaction of the reaction product with an aliphatic diacid chloride to yield the open chain poly Reissert product thereof.

4,929,714

FLEXIBLE, BIAXIALLY ORIENTED FILMS OF MODIFIED POLY (ETHYLENE TEREPHTHALATE)

Jimmy R. Trotter, and Bobby J. Sublett, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 19, 1988, Ser. No. 246,045

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 **5 Claims**

1. The method of rendering a polymer having an I.V. of at least 0.6 and repeat units from terephthalic acid and ethylene glycol resistant to flex cracking when in the form of a biaxially oriented film having a thickness of about 0.5–5 mils comprising copolymerizing therewith a monomer having (a) or (b) or a combination of (a) and (b) as follows:

(a) repeat units from a dibasic acid having a molecular weight of about 200–600 in an amount of about 2–20 mole % based on 200 mole % for carboxyl and hydroxyl moieties;

(b) repeat units from a glycol having a molecular weight of about 200–6,000 in an amount of 2–20 percent based on polymer weight, the total of (a) and (b) not exceeding about 20%.

4,929,715

REDUCTION OF CARBOXYL END GROUPS IN POLYESTER WITH DILACTIM ETHERS

Yousef Mohajer, Midlothian, and Stanley D. Lazarus, Petersburg, both of Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

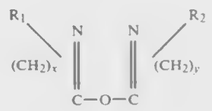
Filed Jan. 3, 1989, Ser. No. 292,863

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 **15 Claims**

1. A method of melt spinning high molecular weight polyester polymer to produce fibers with reduced carboxyl end group concentration comprising

admixing and reacting with molten polyester polymer an effective amount of at least one lactim compound of the formula



wherein

x and y may be alike or different and represent an integer of 2 to 15 and

R_1 and R_2 are independently hydrogen, halogen, nitro, amine, C_1–C_{10} alkyl, C_5–C_{12} cycloalkyl, C_7–C_9 alkyl aromatic, or C_6–C_{10} aromatic;

forcing the reacted molten polymer under pressure to a spinneret;

and extruding the lactim reacted polymer into a zone of lower pressure and temperature to form a fiber.

4,929,716

POLYOXYALKYLENE POLYIMIDE POLYMERS

John A. Tyrell, Dalton, Mass., and Russell J. McGready, Downingtown, Pa., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1987, Ser. No. 140,304

Int. Cl.[5] C08G *69/26*

U.S. Cl. 528—353 **19 Claims**

1. A polyoxyalkylene polyimide polyester composition which is the reaction product of:

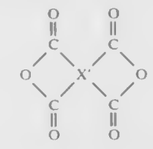
(a) at least one low molecular weight diol;

(b) at least one dicarboxylic acid; and

(c) at least one diacid derived from:

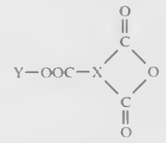
(i) at least one poly(oxy alkylene)diamine;

(ii) at least one tetracarboxylic acid or derivative thereof having the formula:



wherein X' is a tetravalent organic radical; and

(iii) at least one tricarboxylic acid or derivative thereof having the formula



wherein:

X is a trivalent organic radical; and

Y is hydrogen or a monovalent organic radical.

4,929,717

METHOD OF PREPARING POLYMERS WITH A LOW RESIDUAL CONTENT OF MONOMERS

Miroslav Chmelir, Krefeld, Fed. Rep. of Germany, assignor to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,434

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724709

Int. Cl.[5] C08F *6/10*

U.S. Cl. 528—490 **13 Claims**

1. In the treatment of a homopolymer or copolymer based on at least one of acrylic acid and acrylamide with a compound that can react with the double bond of residual monomer contained therein which homopolymer or copolymer is water-soluble or swells up in water and has a low residual monomer content, the improvement which comprises effecting such treatment with hydroxylamine or a salt thereof acting on the homopolymer or copolymer in swollen form and in the form of a gel.

4,929,718

SYNTHETIC NOXIUSTOXIN RELATED PEPTIDES

Lourival D. P. Possani; Georgina B. Gurrola, both of Cuernavaca; Marco A. A. C. Bayon, and Maria B. Sitges, both of Mexico, all of Mexico, assignors to Universidad Nacional Autonoma De Mexico, Dependence, Mexico

Filed Dec. 14, 1987, Ser. No. 132,169

Int. Cl.[5] C07K *7/06, 7/08*

U.S. Cl. 530—326 **3 Claims**

1. A peptide that is capable of specifically blocking the potassium channels of excitable membranes consisting of the following amino acid sequence: Threonine-Isoleucine-Isoleucine-Asparagine-Valine-Lysine-Cysteine-Threonine-Serine.

4,929,719

FIBER-REACTIVE DYES CONTAINING AN ANILINE RADICAL WHICH CARRIES TWO DIFFERENT VINYLSULFONYL MOIETIES

Hansrudolf Schwander, Rieben; Athanassios Tzikas, Pratteln, and Peter Aeschlimann, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

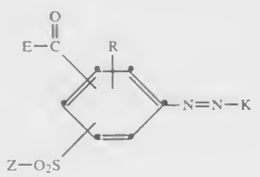
Continuation of Ser. No. 172,617, Mar. 24, 1988, abandoned. This application Aug. 10, 1989, Ser. No. 394,302

Claims priority, application Switzerland, Mar. 27, 1987, 1182/87

Int. Cl.[5] **C09B** *62/02, 62/507, 62/44, 62/62*

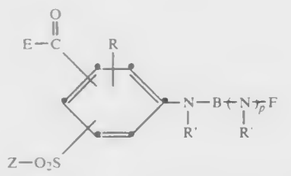
U.S. Cl. 534—604 **21 Claims**

1. A reactive dye of the formula



(2)

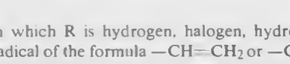
or of the formula

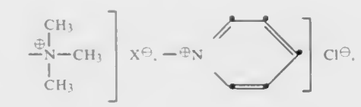


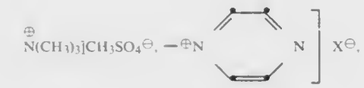
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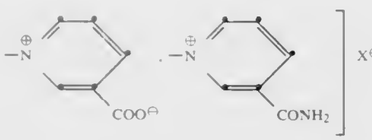
in which R is hydrogen, halogen, hydroxyl or sulfo, Z is a radical of the formula $-CH=CH_2$ or $-CH_2-CH_2-Y$, Y is a radical selected from the group consisting of

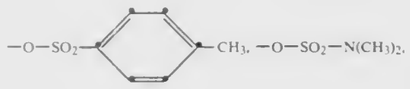
$-OSO_3H$, $-SSO_3H$, $-OCOCH_3$, $-OPO_3H_2$,



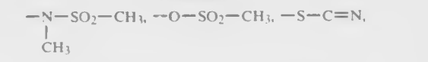


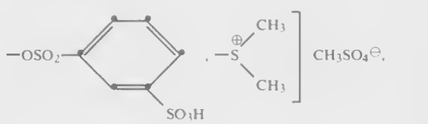


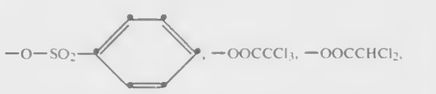


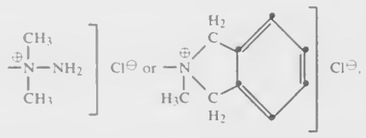


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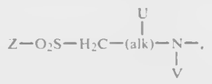




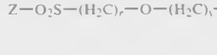




wherein X is halogen and R''' is alkyl or aryl, R' is hydrogen or C_1-C_4alkyl which is unsubstituted or substituted by —COOH, —CN, —OH or $-SO_3H$, and E is a radical of the formula



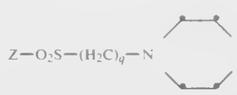
(1a)



(1b)

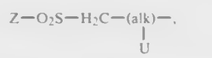
(1c)

or



(1d)

in which R' and Z are as defined above, alk, alk' and alk'' independently of one another are C_1-C_6alkylene, U is hydrogen, halogen, hydroxyl, sulfato, C_1-C_4alkanoyloxy, cyano, carboxyl, C_1-C_4alkoxycarbonyl, carbamoyl or a radical $-SO_2-Z$ in which Z is as defined above, V is hydrogen, C_1-C_4alkyl which is unsubstituted or substituted by halogen, hydroxyl, cyano, carboxyl, sulfo, sulfato, C_1-C_4-alkoxy or C_1-C_4alkoxycarbonyl, or a radical of the formula



in which Z, alk and U are as defined above, q, r and s independently of one another are an integer from 1 to 6; K is a coupling component benzene, naphthalene or heterocyclic radical, B is a bridge member and F is a metal-free or metal-containing monoazo or disazo dye radical containing at least one —SO_3H— group, a 1-aminoanthraquinone or 1-anilinoanthraquinone radical, a sulfophthalocyanine dye radical or a

formazan, phenazine, oxazine or nitroaryl dye radical and p is 0 or 1; and a metal complex of a dye of formula (2).

4,929,720

ISOTHIAZOLEAZO HYDROXYPYRIDONE DYES

Guenter Hansen; Ernst Schefczik, both of Ludwigshafen, and Helmut Reichelt, Neustadt, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

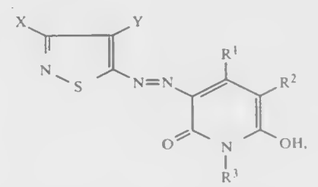
Filed Nov. 10, 1988, Ser. No. 269,686

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738372

Int. Cl.[5] **C09B** *29/039, 29/42, 29/042;* **D06P** *3/54*

U.S. Cl. 534—766 **4 Claims**

1. An isothiazoleazo of the formula I:



(I)

where

X is a C_1-C_8-alkyl, a C_1-C_8-alkyl substituted with chlorine, bromine, cyano, hydroxyl, C_1-C_4-alkoxy, phenoxy, C_1-C_4-alkoxycarbonyl, phenyl or phenyl substituted with C_1-C_4-alkyl, C_1-C_4-alkoxy, chlorine, bromine or cyano, or X is phenyl or phenyl substituted with C_1-C_4-alkyl, hydroxyl, C_1-C_4-alkoxy, phenoxy, chlorine, bromine, C_1-C_4-alkoxycarbonyl, cyano or C_1-C_4-dialkylaminosulphonyl,

Y is hydrogen, cyano, chlorine or bromine,

R^1 is hydrogen, C_1-C_4-alkyl or phenyl,

R^2 is hydrogen, cyano, carbamoyl, C_1-C_4-monoalkyl- or -dialkyl-carbamoyl, C_1-C_6-alkanoyl, C_1-C_6-alkoxycarbonyl or 2-(C_1-C_4-alkoxy)-ethoxycarbonyl and

R^3 is hydrogen, C_1-C_8-alkyl, C_1-C_8-alkyl substituted with phenyl, cyano, C_1-C_8-alkoxycarbonyl, phenoxycarbonyl, halogen, hydroxyl, C_1-C_8-alkanoyloxy, benzoyloxy, C_5-C_7-cycloalkoxy or phenoxy or C_1-C_8-alkyl interrupted by one or two oxygen atoms, or is C_5-C_7-cycloalkyl, C_3-C_6-alkenyl or phenyl.

4,929,721

POLYMERIZABLE AROMATIC-AZO-ALIPHATIC COMPOUNDS CAPABLE OF GENERATING PHOTOINITIATED FREE RADICALS

Richard A. Wolf, Midland, Mich., and Paul V. Grosso, West Hartford, Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 29, 1988, Ser. No. 213,208

Int. Cl.[5] **C07C** *107/02, 107/04;* **C08G** *63/100*

U.S. Cl. 534—885 **14 Claims**

1. An azo compound comprising:

(1) an azo group;

(2) an aromatic moiety bonded to one nitrogen atom of said azo group, said aromatic moiety having a polymerization olefin substituent; and

(3) an aliphatic moiety bonded to the other nitrogen atom of said azo group, said aliphatic group having an oxygen-containing, nitrogen-containing, sulfur-containing or halogen substituent bonded to the α carbon thereof

wherein the olefin moiety comprises no more than about 6 carbon atoms; the aromatic moiety is a carbocyclic group with no more than about 10 carbon atoms; the aliphatic moiety comprises no more than about 12 carbon atoms; and the substituent on the α carbon is a hydroxy, alkoxy, amine, aminoalkyl, thioalkyl, thiol or halo group.

4,929,722

ACID DECRYSTALLIZATION OF AMINOPOLYSACCHARIDES AND DERIVATIVES THEREOF

Emmett M. Partain, III, and George L. Brode, II, both of Bound Brook, N.J., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

PCT No. PCT/US87/01246, § 371 Date Feb. 3, 1988, § 102(e) Date Feb. 3, 1988, PCT Pub. No. WO87/07618, PCT Pub. Date Dec. 17, 1987

Continuation-in-part of Ser. No. 871,381, Jun. 6, 1986, abandoned. This PCT application Jun. 2, 1987, Ser. No. 189,312

Int. Cl.[5] **C08B** *37/08;* **A61K** *7/48;* **A61L** *15/01*

U.S. Cl. 536—20 **22 Claims**

1. A heterogeneous method for preparing chitin or chitosan derivative from highly crystalline, partially deacetylated chitin or chitosan which comprises the steps of:

(a) forming a mixture of a pulverulent, partially deacetylated chitin or chitosan and

(1) a diluent medium in which the chitin or chitosan is swellable but essentially insoluble; the medium comprised of:

(i) an inert, water soluble polar organic diluent in which the chitin or chitosan is insoluble and the chitin or chitosan derivative is insoluble;

(ii) at least one organic acid which is at least partially soluble in water, is sufficiently acidic to form the ammonium salt of the chitin or chitosan and yet not sufficiently acidic to cause hydrolysis of the chitin or chitosan or the chitin or chitosan derivative, and which is present in an amount sufficient to protonate the reactive sites of the decacetylated chitin or chitosan;

(2) water in an amount in excess of the amount of organic acid and up to about 65 weight percent of the medium;

(b) agitating the mixture at a temperature and for a period of time to effect at least partial decrystallization; and

(c) recovering the chitin or chitosan derivative from the mixture.

4,929,723

PROCESS FOR PREPARING 2-DEOXYNUCLEOSIDES

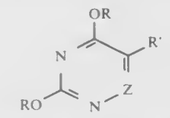
John N. Freskos, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 76,100, Jul. 21, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 341,428

Int. Cl.[5] **C07H** *19/073, 19/173*

U.S. Cl. 536—23 **13 Claims**

11. In a process for preparing a nucleoside by reacting a pyrimidine corresponding to the formula:



wherein R is trimethylsilyl, R' is hydrogen, alkyl, alkoxy, chloro, bromo, fluoro, iodo, nitro, cyano, trifluoromethyl, bromovinyl, or acetyl, and Z is CH or N, with a protected 1-halo-2-deoxy sugar in which the free hydroxy groups are blocked with acetyl, benzoyl, p-chlorobenzoyl, p-nitrobenzoyl, p-toluyl, or benzyl groups in the presence of a Lewis acid catalyst and a halohydrocarbon solvent, the improvement which comprises increasing the beta-anomer selectivity by employing cuprous iodide as the Lewis acid.

4,929,724

PROCESS FOR THE PRODUCTION OF URETDIONE GROUP-CONTAINING COMPOUNDS, THE COMPOUNDS OBTAINED ACCORDING TO THIS PROCESS AND THE USE THEREOF IN THE PRODUCTION OF POLYURETHANE PLASTICS MATERIAL

Theodor Engbert, Dormagen; Jürg Fröhlich, Burscheid; Werner Kubitza, Leverkusen, all of Fed. Rep. of Germany; Peter Breidenbach, Baytown, Tex., and Gerhard Mennicken, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,704

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437635

Int. Cl.[5] **C07D** *229/00*

U.S. Cl. 540—202 **15 Claims**

1. A process for the production of compounds having uretdione groups by dimerizing at least a portion of the isocyanate groups of organic isocyanates having aliphatically-bound isocyanate groups in the presence of catalysts having phosphorus-nitrogen bonds and, additionally, in the presence of co-catalysts which are H-active organic compounds with a pKs-value of at least 6, said H-active organic compounds having at least one hydrogen atom bonded to oxygen, sulphur or nitrogen.

4,929,725

PERFLUOROAMINOETHERS

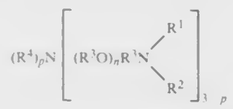
George G. I. Moore, P.O. Box 33427, and John C. Hansen, both of P.O. Box 33427, St. Paul, Minn. 55133

Division of Ser. No. 894,311, Aug. 14, 1986, Pat. No. 4,788,339, and a continuation-in-part of Ser. No. 773,314, Sep. 6, 1985, abandoned. This application Aug. 24, 1988, Ser. No. 236,033

Int. Cl.[5] **C07D** *211/04, 265/30*

U.S. Cl. 544—87 **7 Claims**

1. Perfluoroaminoethers having the general formula



where each R^1 and R^2 are perfluoroalkyl radicals which together with the nitrogen atom form a 5— or 6—member ring which may be substituted with one or more $—CF_3$, $—C_2F_5$, or $—C_3F_7$ radicals and may contain ether oxygen or additional tertiary amino nitrogen as ring atoms, each R^3 is independently selected from acyclic perfluoroalkylene groups having 2 to 3 carbon atoms at least 2 of which are vicinal, catenary atoms, and perfluorocyclohexylene groups, R^4 is a perfluoroalkyl radical having one to six carbon atoms, or perfluorocyclohexyl, and n is 1 to 3 and p is 0 or 1.

4,929,726

NOVEL DIAZINES AND THEIR METHOD OF PREPARATION

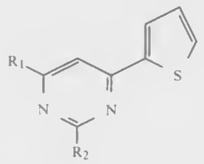
Lucjan Strekowski, Stone Mountain; Maria Mokrosz, Decatur, and Donald B. Harden, Atlanta, all of Ga., assignors to Georgia State University Foundation, Inc., Atlanta, Ga.

Filed Feb. 9, 1988, Ser. No. 153,998

Int. Cl.[5] **C07D** *413/04, 413/14*

U.S. Cl. 544—122 **17 Claims**

11. A pyrimidine of the general formula



wherein:

R_1 is any aromatic or substituted aromatic group and R_2 is a hydroxide, alkoxide, or mercaptide.

4,929,727

IMPROVED PROCESS FOR PRECIPITATING CYTOSINE FROM ALKALINE SOLUTIONS WITH SULFURIC ACID

Georg Hilgers, Ingelheim am Rhein, and Joachim Hess, Bingen, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

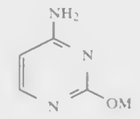
Filed Aug. 25, 1989, Ser. No. 398,864

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1988, 3829100

Int. Cl.[5] **C07D** *239/34, 239/42*

U.S. Cl. 544—317 **9 Claims**

1. A process for precipitating cytosine from an aqueous solution of



wherein

M is a cation which comprises:

(a) heating the solution to about 50°–80° C.;

(b) adjusting the pH of such heated solution with sulphuric acid to about 2–7;

(c) removing solid constituents from the resulting solution; and

(d) cooling the remaining solution to about 20° C.; and

(e) recovering the precipitated cytosine.

4,929,728

PROCESS FOR PREPARING 3-(1H-TETRAZOL-5-YL)-4(3H)-QUINAZOLINONE

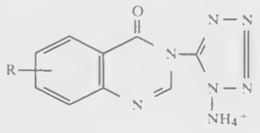
Ji-Wang Chern; Kang-Chien Liu, and Chia-Yin Chen, all of Taipei, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Nov. 2, 1989, Ser. No. 430,285

Int. Cl.[5] **C07D** *401/04*

U.S. Cl. 544—284 **5 Claims**

1. A process for preparing 3-(1H-tetrazol-5-yl)-4(3H)-quinazolinone ammonium salts of formula I:

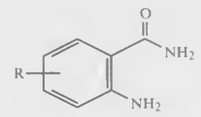


(I)

wherein:

R is hydrogen, halogen, C_1–C_3 alkyl or C_1–C_3 alkoxy, which process comprises:

reacting ethyl N-(1H-tetrazol-5-yl) formimidate in an inert solvent with substituted anthranilamide of formula IV



(IV)

wherein R is as define above.

4,929,729

PROCESS FOR PRODUCING 2-AMINO-4,6-DICHLOROPYRIMIDINE

Takabiro Haga; Yasuhiro Tsujii; Tatsuo Isogai; Shigeo Murai, and Toshihiro Tanaka, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Jan. 31, 1989, Ser. No. 304,031

Claims priority, application Japan, Feb. 19, 1988, 63-37023

Int. Cl.[5] **C07D** *239/42;* **C07F** *9/65*

U.S. Cl. 544—330 **11 Claims**

1. A process for producing 2-amino-4,6-dichloropyrimidine, which comprises reacting 2-amino-4,6-dihydroxypyrimidine or its salt with phosphorus oxychloride at a temperature of from 50°to 100° C. in the presence of a solvent and an acid removing agent.

4,929,730

BIS(1,2,5)THIADIAZOLO(3,4-B:3',4'-E) PYRAZINE, A PROCESS FOR THE PREPARATION THEREOF AND A METHOD OF USING SAME

Toshio Mukai, 1-2, Tsunogoro 2-chome, Sendai-shi, Miyagi, and Yoshiro Yamashita, Miyagi, both of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo and Toshio Mukai, Miyagi, both of, Japan

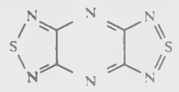
Filed Sep. 7, 1988, Ser. No. 241,278

Claims priority, application Japan, Sep. 8, 1987, 62-223142

Int. Cl.[5] **C07D** *513/14*

U.S. Cl. 544—345 **1 Claim**

1. A compound having the formula (I):



(I)

4,929,731

METHOD FOR THE SYNTHESIS OF HUPERZINE A AND ANALOGS THEREOF AND COMPOUNDS USEFUL THEREIN

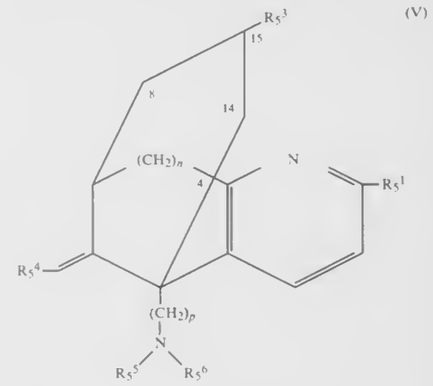
Alan P. Kozikowski, Pittsburgh, Pa., and Yan Xia, Baltimore, Md., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Feb. 21, 1989, Ser. No. 313,118

Int. Cl.[5] **C07D** *221/22*

U.S. Cl. 546—97 **3 Claims**

1. A compound of general formula V:



(V)

wherein:

R_5^1 is selected from the group consisting of H and C_1–C_8 linear or branched alkoxy;

R_5^3 is selected from the group consisting of H and C_1–C_8 linear or branched alkyl;

R_5^4 is selected from the group consisting of H and C_1–C_8 linear or branched alkyl;

R_5^5 is selected from the group consisting of H and C_1–C_8 linear or branched alkyl;

R_5^6 is selected from the group consisting of H and C_1–C_8 linear or branched alkyl;

n_4 is an integer from 0 to 4;

p is 0 or 1;

represents a double bond between carbon 14 and 15 or a double bond between carbon 8 and 15.

4,929,732

N-SUBSTITUTED TETRAHYDROQUINOLINES FOR USE AS ANTIOXIDANTS IN LUBRICANTS

Hans R. Meier, and Samuel Evans, both of Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

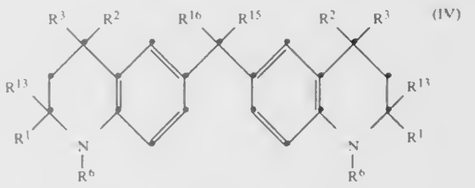
Division of Ser. No. 135,964, Dec. 21, 1987, Pat. No. 4,828,741. This application Feb. 2, 1989, Ser. No. 305,039

Claims priority, application Switzerland, Dec. 30, 1986, 5253/86

Int. Cl.[5] **C07D** *215/06*

U.S. Cl. 546—158 **3 Claims**

2. A compound of the formula IV



(IV)

in which R^1 and R^2 are independently of each other C_1–C_8-alkyl, unsubstituted or C_1–C_{12}-alkyl or C_1–C_{12}-alkoxy-mono- or di-substituted phenyl or naphthyl, or benzyl, R^3 is hydrogen or methyl, R^6 is C_1–C_{18}-alkyl, C_3–C_8-alkenyl, C_7–C_{12}-alkaryl or C_1–C_{12}-alkyl- or C_1–C_{12}-alkoxy-mono- or di- ring-substituted benzyl, R^{13} is hydrogen or methyl, R^{15} and R^{16} are independently of each other hydrogen, C_1–C_9-alkyl, unsubstituted or C_1–C_{12}-alkyl-substituted phenyl, benzyl, α-methylbenzyl or α,α-dimethylbenzyl.

4,929,733

PREPARATION OF N-HETEROCYCLES

Michael Hesse, Ludwigshafen; Wolfgang Hoelderich, Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

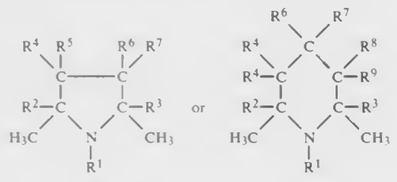
Filed Jun. 17, 1988, Ser. No. 207,861

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721777

Int. Cl.[5] **C07D** *207/06, 211/14*

U.S. Cl. 546—184 **9 Claims**

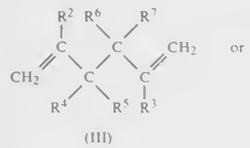
1. A process for the preparation of an N-heterocycle of the formula (I) or (II)



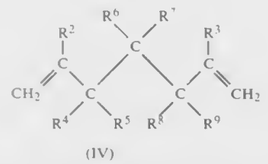
(I)

(II)

wherein R^1 and R^4 to R^9 are each hydrogen or alkyl, wherein each of R^2 and R^3 is alkyl, and wherein an olefin of the formula (III) or (IV)



(III)



(IV)

where R^2 to R^9 have the above meanings, is reacted with NH_3 or with a primary amine of the formula H_2NR^1, where R^1 has the above meanings, in the presence of a zeolite as a catalyst.

4,929,734

TETRAHYDROPYRIDINE OXIME COMPOUNDS

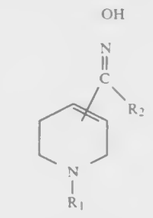
Linda L. Conghenour; Robert E. Davis; David A. Downs; Thomas G. Heffner; Leonard T. Meltzer; Walter H. Moos; David W. Moreland, and Haile Tecle, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 32,839, Mar. 31, 1987, Pat. No. 4,798,841. This application Oct. 18, 1988, Ser. No. 259,081

Int. Cl.[5] **A61K** *31/44;* **C07D** *211/70*

U.S. Cl. 546—338 **6 Claims**

1. A compound having the formula

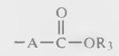


wherein R^1 is selected from hydrogen;

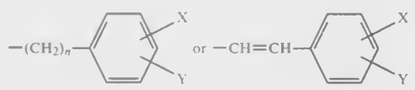
straight or branched alkyl of from one to six carbon atoms unsubstituted or substituted with hydroxy or alkoxy of from one to four carbon atoms;

straight or branched alkenyl of from two to six carbon atoms unsubstituted or substituted with hydroxy or alkoxy of from one to four carbon atoms;

straight or branched alkynyl of from two to six carbon atoms unsubstituted or substituted with hydroxy or alkoxy of from one to four carbon atoms;



where A is a bond or is a hydrocarbon chain of from one to four carbon atoms, unsubstituted or substituted with halogen, and when containing two or more carbon atoms may contain one double bond and R_3 is alkyl of from one to six carbon atoms; or



where n is zero, two, three or four and X and Y are independently selected from

hydrogen,

fluorine,

chlorine,

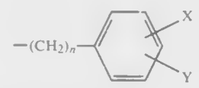
bromine,

hydroxy,

straight or branched alkyl of from one to three carbon atoms, or

alkoxy of from one to four carbon atoms; or

R_2 is selected from: straight or branched alkynyl of from two to six carbon atoms unsubstituted or substituted with hydroxy or alkoxy of from one to four carbon atoms;



where n is zero to six and

X and Y are independently selected from

hydrogen,

fluorine,

chlorine,

bromine,

hydroxy,

straight or branched alkyl of from one to three carbon atoms, or alkoxy of from one to four carbon atoms;

with the proviso that R_1 and R_2 may not both simultaneously be hydrogen; or a pharmaceutically acceptable salt thereof.

4,929,735

PROCESS FOR THE PREPARATION OF OXIRANES

Wolf Reiser, Wuppertal, and Peter Feyen, Mettmann, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

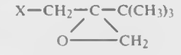
Continuation of Ser. No. 921,712, Oct. 20, 1986, abandoned. This application Apr. 22, 1988, Ser. No. 185,211

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1985, 3537817

Int. Cl.[5] **C07D** *301/04, 405/06*

U.S. Cl. 548—268.8 **6 Claims**

1. A process for the preparation of an oxirane of the formula



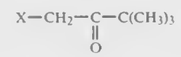
in which

X is 4-chlorobenzyl, 4-phenylphenoxy or 1H-(1,2,4)-triazolyl,

comprising reacting dimethyl sulphate with an excess of dimethyl sulphide thereby to form trimethylsulphonium methylsulphate of the formula

$$(CH_3)_3S^{\oplus}CH_3SO_4^{\ominus},$$

and without prior isolation reacting the trimethylsulphonium methyl-sulphate with a ketone of the formula



in the presence of solid potassium hydroxide or sodium hydroxide in dimethyl sulphide at a temperature between 0° C. and 50° C., 2 to 15 moles of dimethyl sulphide, 1 to 3 moles of dimethyl sulphate and 1 to 6 moles of potassium hydroxide or sodium hydroxide being employed per mole of ketone.

4,929,736

LATENT ISOCYNATE DERIVATIVES USEFUL FOR DEACTIVATING ENZYMES

William C. Groutas, Wichita, Kans., assignor to Board of Trustees of the Wichita State University, Wichita, Kans.

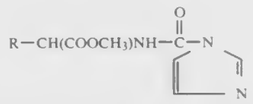
Continuation-in-part of Ser. No. 756,252, Jul. 18, 1985, abandoned. This application Nov. 6, 1987, Ser. No. 117,531

Claims priority, application Canada, Jul. 17, 1986, 514030; Japan, Jul. 18, 1986, 61-168235

Int. Cl.[5] **C07D** *233/54*

U.S. Cl. 548—341 **1 Claim**

1. A compound having the formula:



wherein R is a member selected from the group consisting of L $(CH_3)_2CH$—; L CH_3—CH_2—CH_2—; DL CH_3—CH_2—CH_2—CH_2; L$(CH_3)_2$ CH—CH_2—; and L CH_3—CH_2—CH—$(CH_3)_2$.

4,929,737

HYDROGENATION OF HALONITROAROMATIC COMPOUNDS

Carl M. Lentz, Kingsport; Edward T. Mullins, Church Hill, and Charles L. Gibson, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,726

Int. Cl.[5] **C07D** *231/00, 127/19, 143/80, 103/22*

U.S. Cl. 548—365 **5 Claims**

1. Process for the preparation of a haloaromatic amine which comprises hydrogenating the corresponding halonitroaromatic compound in the presence of a catalytic amount of a chromium containing Raney cobalt catalyst under hydrogenation conditions of temperature and pressure.

4,929,738

THIENYL AND FURYL CONTAINING DERIVATIVES

Klaus Jelich, Wuppertal; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

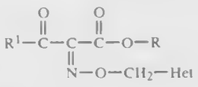
Division of Ser. No. 192,799, May 11, 1988, Pat. No. 4,864,029, which is a division of Ser. No. 890,245, Jul. 24, 1986, Pat. No. 4,767,775. This application May 10, 1989, Ser. No. 350,064

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528573

Int. Cl.[5] **C07D** *307/16, 307/46, 333/24*

U.S. Cl. 549—76 **2 Claims**

1. An alkoximinocarboxylic acid ester of the formula

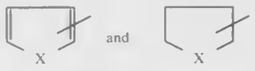


in which

R represents alkyl,

R^1 represents hydrogen, alkyl, alkenyl, alkinyl, cyanoalkyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, alkoxycarbonyl, hydroxycarbonylalkyl, alkoxycarbonylalkyl, aminocarbonylalkyl, alkylaminocarbonylalkyl or dialkylaminocarbonylalkyl or optionally substituted oxiranylalkyl, aralkyl, heterocyclyl or aryl and

Het represents a heterocyclic radical selected from the group consisting of



which is optionally mono-, di- or trisubstituted by identical or different substituents and/or benzo-fused, the optional substituents being selected from the group consisting of fluorine, chlorine, bromine, methyl, ethyl, n- or i-propyl, n-, i-, s-, or t-butyl, methoxy, ethoxy, trifluoromethyl and phenyl which is optionally mono-, di-, or substituents from the group consisting of chlorine, nitro, methyl and methoxy, and

X represents oxygen or sulphur.

4,929,739

COMPLEXES OF TELLURIUM AND SELENIUM DERIVATIVES

Benjamin Sredni, Beni Brak, Israel; Leo Pavliv, Somerville, N.J., and Michael Albeck, Ramat-Gan, Israel, assignors to Bar-Ilan University, Ramat-Gan, Israel

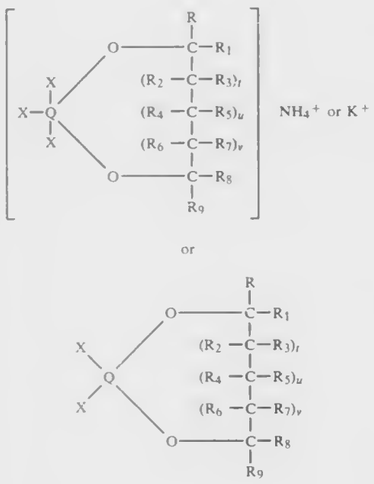
Filed Mar. 24, 1988, Ser. No. 172,643

The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.

Int. Cl.[5] C07D *321/02, 321/12, 319/04, 317/08*

U.S. Cl. 549—347 **17 Claims**

1. A complex of a compound of the formula:



(A)

NH_4^+ or K^+

or

(B)

or

$PhTeCl_3$ (C)

or

$(C_6H_5)_4{}^+P(TeCl_3(O_2C_2H_4))^-$ (D)

wherein Q is Te or Se; t is 1 or 0; u is 1 or 0; v is 1 or 0; R, R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, and R_9 are the same or different and are independently selected from the group consisting of hydrogen, hydroxyalkyl of 1 to 5 carbons, hydroxy, alkyl of from 1 to 5 carbon atoms, halogen, haloalkyl of 1 to 5 carbon atoms, carboxy, alkylcarbonylalkyl of 2 to 10 carbons, alkanoyloxy of 1 to 5 carbon atoms, carboxyalkyl of 1 to 5 carbons atoms, acyl, amido, cyano, amidoalkyl of 1 to 5 carbons, N-monoalkylamidoalkyl of 2 to 10 carbons, N,N-dialkylamidoalkyl of 4 to 10 carbons, cyanoalkyl of 1 to 5 carbons, alkoxy of 1 to 5 carbon atoms, alkoxyalkyl of 2 to 10 carbon atoms and $—COR_{10}$ wherein R_{10} is alkyl of from 1 to 5 carbons; and X is halogen with a non-toxic pharmaceutically acceptable complexing agent selected from the group consisting of hydroxy polycarboxylic acids, polycarboxylic acids or polyhydroxy polycarboxylic acids.

4,929,740

PROCESS FOR MAKING 16-PHENOXY- AND 16-(SUBSTITUTED PHENOXY)-PROSTATRIENOIC ACID DERIVATIVES

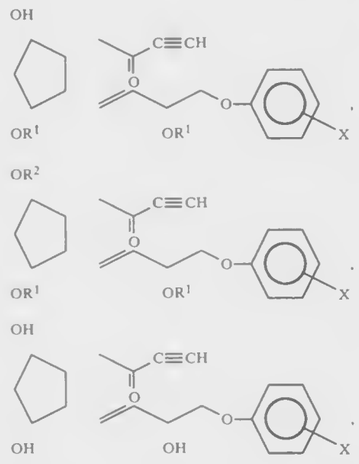
Gary F. Cooper, Mountain View, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 2,339, Jan. 9, 1987, Pat. No. 4,778,904, which is a continuation of Ser. No. 774,814, Sep. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 658,950, Oct. 10, 1984, abandoned. This application Jul. 11, 1988, Ser. No. 217,241

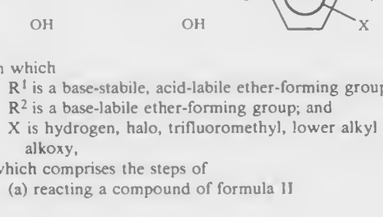
Int. Cl.[5] C07D *309/08;* C07C *49/207*

U.S. Cl. 549—415 **6 Claims**

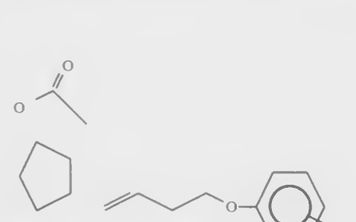
1. A method of preparing a compound selected from the group consisting of compounds of formulae Ia, Ib, and Ic



Ia



Ib



Ic

in which

R^1 is a base-stabile, acid-labile ether-forming group;

R^2 is a base-labile ether-forming group; and

X is hydrogen, halo, trifluoromethyl, lower alkyl or lower alkoxy,

which comprises the steps of

(a) reacting a compound of formula II

II

in which

X and R^1 are as defined above with dichlorocerium acetylide to obtain a compound of formula Ia;

optionally followed by

(b) protecting the 1-hydroxy group to obtain a compound of formula Ib; and/or

(c) removing the protecting groups to obtain a compound of formula Ic.

4,929,741

PROPIOLOPHENONE DERIVATIVES

Albert Fischli, Riehen, Switzerland; Eva-Maria Gutknecht, Buggingen-Seefelden, Fed. Rep. of Germany, and Daniel Obrecht, Basel, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

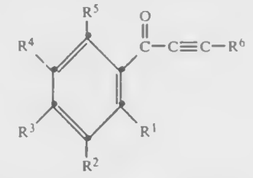
Filed Mar. 17, 1988, Ser. No. 169,643

Claims priority, application Switzerland, Mar. 20, 1987, 1072/87

Int. Cl.[5] C07D *317/44*

U.S. Cl. 549—447 **25 Claims**

1. A compound of the formula



wherein R^1, R^2, R^3, R^4 and R^5 are independently hydrogen, halogen, lower alkyl, lower alkoxy-lower-alkyl, hydroxy, lower alkoxy, lower alkenyloxy, lower alkynyloxy, lower alkoxy-lower-alkoxy, acyloxy, aryl-lower-alkoxy, lower alkylthio, lower alkoxy-lower-alkylthio, lower alkenylthio, lower alkynylthio, aryl-lower-alkylthio, amino which can be monosubstituted by lower alkyl or disubstituted with lower alkyl or lower alkyl and acyl or trifluoromethyl, or two of these substituents which are adjacent jointly and together with the carbon atoms to which they are attached form a 5- to 7-membered ring, and wherein of the substituents R^1 to R^5 at least two are hydrogen and at least one is different from hydrogen; and R^6 is a group of the formula

$—COOR^7$, (a)

$—CONR^8R^9$, (b)

$—C(R^{10})=O$, (c)

$—C(R^{11})(OR^{12})_2$, (d)

$—C(OR^{13})_3$ (e)

or

$OC(R^{14})(R^{15})OR^{16}$; (f)

in which R^7 is hydrogen, lower alkyl, lower alkoxy-lower-alkoxy-lower alkyl, aryl-lower alkyl or lower alkenyl, R^8 and R^9 are lower alkyl, R^{10} is hydrogen, R^{11} is hydrogen, R^{12} is lower alkyl, R^{13} is lower alkyl, R^{14} is hydrogen, R^{15} is hydrogen or lower alkyl and R^{16} is hydrogen, lower alkenyl, lower alkoxy-lower-alkyl or acyl, or a pharmaceutically acceptable salt of an acidic compound of formula with an acid base or of a basic compound of formula with an acid.

4,929,742

SILANE MODIFIED POLYSILACYCLOBUTASILAZANES

Gary T. Burns, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 28, 1988, Ser. No. 277,080

Int. Cl.[5] C07F *7/10*

U.S. Cl. 556—406 **24 Claims**

1. A process for preparing modified polysilacyclobutasilazanes comprising:

(A) contacting and reacting in an inert, essentially anhydrous atmosphere, a polysilacyclobutasilazane polymer with a compound or mixture of compounds selected from the group consisting of

(i) chlorosilanes having the general formula

$(R^v)_mSiCl_{4-m}$ and

(ii) chlorodisilanes having the general formula

$\{Si(R^v)_tCl_{3-t}\}_2$

where, in the general formulae for chlorosilanes and chlorodisilanes, each R^v is independently selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms, aryl radicals, and the vinyl radical; m is 0, 1, or 2; and t is 0 to 2;

at a temperature less than 100° C for a time sufficient to form a partially modified polysilacyclobutasilazane polymer,

(B) contacting and reacting the partially modified polysilacyclobutasilazane polymer with dry ammonia, and

(C) recovering modified polysilacyclobutasilazane polymer.

4,929,743

NOVEL 4,5-DISUBSTITUTED 1,3-THIAZOL-2-YLOXYACETAMIDE HERBICIDES

Heinz Förster, Wuppertal; Gunther Beck, Leverkusen; Erich Klauke, Odenthal; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

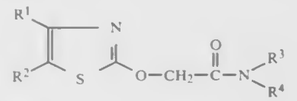
Division of Ser. No. 826,479, Feb. 5, 1986, Pat. No. 4,788,291. This application Jun. 15, 1988, Ser. No. 207,073

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505902

Int. Cl.[5] C07D *277/04*

U.S. Cl. 548—187 **13 Claims**

1. A 4,5-disubstituted 1,3-thiazol-2-yloxyacetamide of the formula



in which

R^1 is fluorine or chlorine,

R^2 is alkyl with 1 to 4 carbon atoms or halogenomethyl, and

R^3 and R^4 each independently is alkyl with 1 to 8 carbon atoms, alkenyl or alkinyl each with 2 to 8 carbon atoms, cycloalkyl or cycloalkenyl each with 3 to 7 carbon atoms being unsubstituted or substituted by alkyl with 1 to 4 carbon atoms, alkoxy, alkoxyalkyleneoxy or alkoxyalkyl each with 1 to 8 carbon atoms in the individual alkyl or alkylene moieties, halogenoalkyl with 1 to 8 carbon atoms and 1 to 5 halogen atoms, aralkyl with 6 to 10 carbon atoms in the aryl moiety and 1 to 2 carbon atoms in the alkyl moiety, or aryl with 6 to 10 carbon atoms and optionally substituted by at least one of halogen, alkyl, alkoxy or alkylthio each with 1 to 4 carbon atoms, and halogenoalkyl, halogenoalkoxy or halogenoalkylthio each with 1 to 2 carbon atoms and 1 to 5 halogen atoms, or nitro or

R^3 and R^4 together with the nitrogen atom to which they are bonded form a 5- to 7-membered heterocyclic ring optionally substituted by alkyl with 1 to 6 carbon atoms optionally in the form of a fused ring system, aryl with 6 to 10 carbon atoms optionally in the form of a fused ring system, or dioxyalkylene with 2 to 3 carbon atoms,

with the exception of the compound 2-(4-chloro-5-difluoromethylthiazol-2-yloxy)-acetic acid N-methyl-anilide.

4,929,744

PROCESS FOR PREPARING HETEROAROMATIC METHYL)-2,2'-BI-1H-IMIDAZOLES

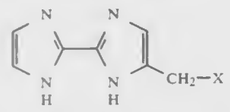
Donald P. Matthews; James R. McCarthy, both of West Chester, Ohio, and Jeffrey P. Whitten, Zionsville, Ind., assignors to Merrell Dow Pharmaceuticals, Cincinnati, Ohio

Division of Ser. No. 78,352, Jul. 28, 1987. This application Mar. 27, 1989, Ser. No. 329,148

Int. Cl.[5] **C07D** *233/54, 277/20*

U.S. Cl. 548—202 **2 Claims**

1. A process for preparing a compound of the formula

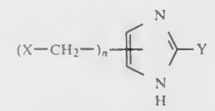


wherein X is 2- or 3-thienyl, 2- or 3-furyl 2- or 4-thiazolyl or phenyl, with each of said groups optionally being substituted; the optional substitution on said thienyl, furyl or thiazolyl groups being 1 or 2 moieties selected from the group consisting of chloro, fluoro, bromo and lower alkyl of from 1 to 6 carbon atoms; the optional substitution on said phenyl group being 1 or 2 moieties selected from the group consisting of chloro, bromo, fluoro, lower alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, trifluoromethyl, amino, sulfhydryl, and S(0)mR wherein m is 0, 1or 2 is lower alkyl of from 1 to 6 carbon atoms; which comprises reacting an appropriate α-brominated or α-chlorinated methylated, substituted or non-substituted, monoaromatic ring of the formula

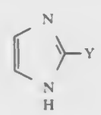
X-CH_2-Br or X-CH_2-Cl

wherein X is as defined above, with 2,2'-bi-1H-imidazole in a solvent such as ethanol and in the presence of a base such as sodium hydroxide under reflux conditions.

2. A process for preparing compounds of the formula



wherein X is 2- or 3-thienyl, 22- or 3-furyl, 2- or 4-thiazolyl or phenyl, with each of said groups optionally being substituted; the optional substitution on said thienyl, furyl or thiazolyl groups being 1 or 2 moieties selected from the group consisting of chloro, fluoro, bromo and lower alkyl of from 1 to 6 carbon atoms; the optional substitution on said phenyl group being 1 or 2 moieties selected from the group consisting of chloro, bromo, fluoro, lower alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, trifluromethyl, amino, sulfhydryl, and $S(O)_mR$ wherein m is 0, 1 or 2 and R is lower alkyl of from 1 to 6 carbon atoms and n is 1 or 2; and wherein Y is alkyl, or trialkylsilyl, the alkyl groups being straight- or branched-chain and containing one to ten carbon atoms, and the aryl groups being phenyl or naphthyl, optionally substituted with from 1 to 3 substituents selected from the group containing alkyl of from 1 to 6 carbon atoms, chloro, bromo, fluoro and alkoxy of from 1 to 6 carbon atoms, which comprises reacting a 2-substituted imidazole of the formula



with an appropriate α-brominated or α-chlorinated methylated, substituted or non-substituted, monoaromatic ring of the formula X—CH_2-Br, or X—CH_2-Cl wherein X is an defined above, in a solvent such as ethanol in the presence of a base such as sodium hydroxide under reflux conditions.

4,929,745

TRANSHALOGENATION OF HALOPHOSPHORUS COMPOUNDS

Kestutis A. Keblys; Meng-Sheng Ao, and Lester P. J. Burton, all of Baton Rouge, La., assignors to Ehtyl Corporation, Richmond, Va.

Filed Aug. 1, 1988, Ser. No. 227,231

Int. Cl.[5] **C07F** *9/14, 9/34, 9/42*

U.S. Cl. 558—84 **14 Claims**

1. A process for exchanging a halogen bonded to a phosphorus atom with fluorine said process comprising reacting a phosphorus compound, having 1-2 halogen atoms selected from chlorine, bromine or iodine bonded directly to phosphorus, with a hydrogen fluoride salt of a pyridine-type compound in an inert solvent at a temperature in the range of 20°-300° C. which is high enough to cause the halogen exchange to proceed but not so high as to cause degradation of the reaction products.

4,929,746

DENTIN AND ENAMEL ADHESIVE

James E. Bunker, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 33,520, Apr. 1, 1987, abandoned, which is a division of Ser. No. 665,960, Oct. 29, 1984, Pat. No. 4,669,983, which is a division of Ser. No. 234,560, Feb. 13, 1981. This application Mar. 23, 1989, Ser. No. 328,753

Int. Cl.[5] **C07F** *9/14*

U.S. Cl. 558—92 **5 Claims**

1. A method for preparing a polymerizable dentin and enamel adhesive comprising an organic ester of one or more acids of phosphorus, comprising the step of mixing BIS-GMA with an acid of phosphorus having chlorine or bromine bonded directly to phosphorus, the amount of said acid of phosphorus being sufficient to cause a mixture of one drop each of (a) said adhesive plus one percent by weight benzoyl peroxide and (b) a solution of three percent by weight sodium benzene sulfinate and one percent by weight N,N-dihydroxyethyl-p-toluidine in ethanol to have an average shear strength on unetched dentin of at least 25 Kg/cm^2.

4,929,747

ORGANIC PEROXIDE HAVING A POLYMERIZATION-REGULATING ABILITY

Takeshi Komai, Chita; Kazuo Matsuyama, Gamagori, and Isao Honma, Chita, all of Japan, assignors to Nippon Oil & Fats Company, Ltd., Japan

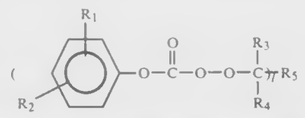
Filed Aug. 13, 1986, Ser. No. 895,995

Claims priority, application Japan, Aug. 21, 1985, 60-181623; Aug. 21, 1985, 60-181624

Int. Cl.[5] **C07C** *179/18*

U.S. Cl. 558—263 **4 Claims**

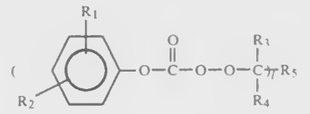
1. An organic peroxide represented by the following general formula (I)



(I)

wherein l is 1, R_1 is a hydrogen atom, R_2 is 2-position-substituting isopropyl group, and R_3, R_4 and R_5 are methyl groups.

4. An organic peroxide represented by the following general formula (I)



(I)

wherein l is 2, R_1 and R_2 are hydrogen atoms, R_3 and R_4 are methyl groups and R_5 is an ethylene group.

4,929,748

METHOD OF PREPARING DIALKYL DICARBONATES

Ralph Franklin, Naperville, Ill., assignor to Akzo America Inc., New York, N.Y.

Filed Dec. 7, 1988, Ser. No. 281,123

Int. Cl.[5] **C07C** *68/04, 69/96*

U.S. Cl. 558—276 **21 Claims**

1. A method for preparing a dialkyl dicarbonate comprising contacting together:

(a) an alkyl haloformate wherein the alkyl group contains 1 to 20 carbon atoms; and

(b) an alkali metal carbonate; in the presence of

(c) a catalytic amount of a crown ether; and

(d) a solvating amount of a liquid which will dissolve a complex of the alkali metal and the crown ether.

4,929,749

PRODUCTION OF TEREPHTHALATE ESTERS BY DEGRADATIVE TRANSESTERIFICATION OF SCRAP OR VIRGIN TEREPHTHALATE POLYESTERS

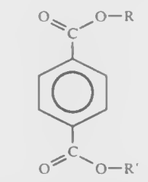
Ved P. Gupta, LaSalle, and Louis A. DuPont, Brossard, both of Canada, assignors to Synergistics Industries, Limited, Canada

Filed Mar. 15, 1989, Ser. No. 323,977

Int. Cl.[5] **C07C** *67/48*

U.S. Cl. 560—79 **11 Claims**

1. A process for producing a compound having the following formula (I):



wherein R and R' are the same or different and represent a straight chain or branched alkyl group having from 6 to 15 carbon atoms, said process comprising, reacting a terephthalate polyester with an alcohol or mixture of alcohols having from six to 15 carbon atoms in the presence of a catalyst and recovering the compound according to formula (I).

4,929,750

COMPOUNDS HAVING HYPOLIPEMIZING ACTIVITY

Paolo Ferruti, and Giancarlo Scapini, both of Rome, Italy, assignors to Nuovo Consorzio Sanitario Nazionale, Rome, Italy

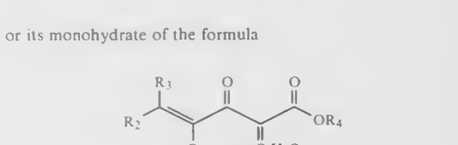
Continuation of Ser. No. 929,788, Nov. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 701,858, Feb. 15, 1985, abandoned. This application Jul. 22, 1988, Ser. No. 224,185

Claims priority, application Italy, Feb. 17, 1984, 19683 A/84

Int. Cl.[5] **C07C** *69/76*

U.S. Cl. 560—87 **6 Claims**

1. An oligomer or a polymer compound of 1,10-bis(2-hydroxyethylthio)decane and a dicarboxylic acid, of the formula

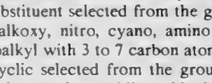


wherein

n is an integer ranging from 2 to 100

R is an organic biradical which comprises —CH_2CH_2—, —$CH_2CH_2CH_2$—, —$CH_2CH_2CH_2CH_2$—, —$CH_2CH_2CH_2CH_2CH_2$—, —$CH_2CH_2CH_2CH_2CH_2CH_2$—, 1,2-phenylene or 1,3-phenylene,

X is HO— or



where R has the above mentioned meaning and Y is H or $CH_2CH_2S(CH_2)_{10}SCH_2CH_2OH$

4,929,751

VINYL TRICARBONYL COMPOUNDS AND METHODS OF MAKING THE SAME

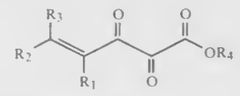
Harry H. Wasserman, New Haven, Conn.; Natesan Murugesan, Lawrenceville, N.J., and John H. Van Duzer, New Haven, Conn., assignors to Yale University, New Haven, Conn.

Filed Oct. 19, 1987, Ser. No. 109,804

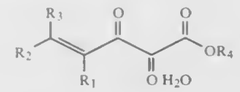
Int. Cl.[5] **C07C** *69/66, 79/46, 101/02, 101/30;* **C07D** *401/06, 403/06, 405/06, 409/06, 239/26, 277/24, 263/32, 307/46*

U.S. Cl. 560—174 **16 Claims**

1. A vinyl tricarbonyl of the formula



or its monohydrate of the formula



wherein

R_1 is hydrogen, halogen, unsubstituted C_1 to C_{30} alkyl, C_1 to C_{30} alkyl substituted by a substituent selected from the group consisting of halogen, alkoxy, nitro, cyano, amino and hydroxyl, unsubstituted phenyl, unsubstituted naphthyl, substituted phenyl and substituted naphthyl, said substituted phenyl and said substituted naphthyl being substituted by a substituent selected from the group consisting of halogen, alkoxy, nitro, cyano, amino and hydroxyl, benzyl, and cycloalkyl with 3 to 7 carbon atoms,

R_2 is hydrogen, halogen, unsubstituted C_1 to C_{30} alkyl, C_1 to C_{30} alkyl substituted by a substituent selected from the group consisting of halogen, alkoxy, nitro, cyano, amino and hydroxyl, unsubstituted phenyl, unsubstituted naphthyl, substituted phenyl, substituted naphthyl, said substituted phenyl and said substituted naphthyl being substituted by a substituent selected from the group consisting of halogen, alkoxy, nitro, cyano, amino and hydroxyl, benzyl, cycloalkyl with 3 to 7 carbon atoms, cyano, nitro or a heterocyclic selected from the group consisting of furan, furfural, pyrrole, pyridine, thiophene, imidazole, oxazole, thiazole, pyrimidine, purine, guinoline and carbazole,

R_3 is hydrogen, halogen, unsubstituted C_1 to C_{30} alkyl, C_1 to C_{30} alkyl substituted by a substituent selected from the

group consisting of halogen, alkoxy, nitro, cyano, amino and hydroxyl, unsubstituted phenyl, unsubstituted naphthyl, substituted phenyl, substituted naphthyl, said substituted phenyl and said substituted naphthyl being substituted by a substituent selected from the group consisting of halogen, alkoxy, nitro, cyano, amino and hydroxyl, benzyl, cycloalkyl with 3 to 7 carbon atoms, cyano, nitro, or a heterocyclic selected from the group consisting of furan, furfural, pyrrole, pyridine, thiophene, imidazole, oxazole, thiazole, pyrimidine, purine, quinoline and carbazole and

R_4 is unsubstituted C_1 to C_{30} alkyl, C_1 to C_{30} alkyl substituted by a substituent selected from the group consisting of halogen, alkoxy, nitro, cyano, amino and hydroxyl, unsubstituted phenyl, unsubstituted naphthyl, substituted phenyl, substituted naphthyl, said substituted phenyl and said substituted naphthyl being substituted by a substituent selected from the group consisting of halogen, alkoxy, nitro, cyano, amino and hydroxyl, benzyl or cycloalkyl with 3 to 7 carbon atoms.

4,929,752

PROCESS FOR THE PREPARATION OF 1-AMINE-2-NAPHTHOL-4-SULFONIC ACID

Bernhard Albrecht, Buus, Switzerland, and Jürgen Beyrich, Huttingen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 95,727, Sep. 14, 1987, abandoned. This application May 12, 1989, Ser. No. 352,652

Claims priority, application Switzerland, Sep. 23, 1986, 3794/86

Int. Cl.[5] C07C *143/66*

U.S. Cl. 562—70 9 Claims

1 In a process for the preparation of 1-amino-2-naphthol-4-sulfonic acid by nitrosation of 2-naphthol, addition of bisulfite, acidification with mineral acid and reduction of the reaction product so obtained, the improvement which comprises carrying out said nitrosation of 2-naphthol semi-continuously or continuously in a reaction medium which is free of water-miscible organic solvents and which consists essentially of water, and either (a) in the semi-continuous process, charging the reactor with the nitrosating agent and adding an aqueous suspension of 2-naphthol and mineral acid simultaneously in separate streams, or (b) in the continuous process, charging the reactor with a reaction mass obtained from a previous nitrosation and adding said 2-naphthol suspension, mineral acid and the nitrosating agent simultaneously in separate streams to said reaction mass.

4,929,753

PREPARATION OF TRIFLUOROMETHYLBENZOIC ACID FROM HEXAFLUOROXYLENE

Yoshihiko Gotoh, Kamifukuoka, and Toshikazu Kawai, Kawagoe, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Apr. 19, 1988, Ser. No. 183,243

Claims priority, application Japan, Apr. 22, 1987, 62-97288

Int. Cl.[5] C07C *51/16*

U.S. Cl. 562—411 9 Claims

1 A method of preparing trifluoromethylbenzoic acid, comprising the step of reacting α, α, α, α′, α′, α′-hexafluoroxylene with a strong acid in sulfuric acid at least a portion of which is fuming sulfuric acid to thereby hydrolyze one trifluoromethyl group of said hexafluoroxylene.

4,929,754

BENZENESULPHONAMIDOINDANYL COMPOUNDS

Josef Nickl; Armin Heckel; Erich Muller; Berthold Narr; Johannes Weisenberger; Wolfgang Eisert, and Thomas Muller, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

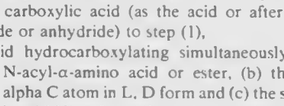
Division of Ser. No. 73,950, Jul. 16, 1987, Pat. No. 4,820,705. This application Feb. 1, 1989, Ser. No. 305,255

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623944

Int. Cl.[5] C07C *147/107*

U.S. Cl. 562—428 7 Claims

1. Benzenesulphonamidoindanyl compounds of the general formula



(I)

in which

R_1 is phenyl optionally mono- or di- substituted by halo, methyl or methoxy, and

R_2 is hydroxycarbonyl or (C_1-C_3-alkoxy)carbonyl, which groups are optionally attached via C_1-C_5 alkylene or C_2-C_5 alkenylene in which optional attachment the methylene group attached to the indanyl may be replaced by hydroxymethylene or carbonyl and further for the methylene group via which the C_2-C_4 alkoxycarbonyl is attached to be substituted by a further C_2-C_4 alkoxycarbonyl.

4,929,755

PROCESS FOR MAKING AN OPTICALLY ACTIVE MIXTURE OF AN N-ACYL-AMINO ACID OR ESTER CONTAINING AT LEAST TWO CHIRAL CENTERS

Mark C. Cesa, South Euclid; Robert A. Dubbert, Solon, and James D. Burrington, Richmond Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 784,977, Oct. 7, 1985, abandoned. This application Dec. 19, 1986, Ser. No. 943,480

Int. Cl.[5] C07C *99/00*

U.S. Cl. 562—443 8 Claims

1. A process which comprises (1) reacting a carboxylic acid, acid halide or anhydride, each of which is optically active and essentially all L or D, with ammonia or a primary amine to make the corresponding amide of such acid, (2) then condensing such amide with an aldehyde to yield an optically active α-enamide which is essentially free of enantiomeric pairs, (3) making an N-acyl-α-amino acid or ester whose α C atom and another C atom are chiral, by hydrocarboxylating said optically active α-enamide with CO and H_2O or an organic hydroxyl compound to produce an N-acyl-α-amino acid or ester, respectively, having essentially no enantiomeric pairs, and containing diastereomeric N-acyl-α-amino acids or esters having two chiral centers, (4) separating the diastereomers by conventional physical means, (5) hydrolyzing each diastereomer to make the L and D α-amino acids, respectively, plus said optically active carboxylic acid, and recycling at least a part of said carboxylic acid (as the acid or after conversion to the halide or anhydride) to step (1),

said hydrocarboxylating simultaneously creating (a) said N-acyl-α-amino acid or ester, (b) the chirality of said alpha C atom in L, D form and (c) the second chiral center in said N-acyl-α-amino acid or ester in essentially all L or all D form.

4,929,756

PROCESS FOR PREPARING OXIMES

Kiyoji Kuma, Kitakyushu, Japan, assignor to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 360,034

Claims priority, application Japan, Jun. 13, 1988, 63-145033

Int. Cl.[5] C07C *131/04*

U.S. Cl. 564—267 12 Claims

1. A process for preparing an oxime, which comprises reacting a ketone or aldehyde selected from the group consisting of cyclohexanone, cyclododecanone, acetone, dimethylacetone, acetophenone, benzophenone, acetaldehyde, propionaldehyde, butylaldehyde, caproic aldehyde, benzaldehyde and anisaldehyde with nitrogen monoxide and hydrogen in the presence of a platinum group metal catalyst selected from the group consisting of platinum, palladium, rhodium, ruthenium, osmium and iridium, and oxides, inorganic acid salts, organic acid salts, sulfides, cyanides and complex salts thereof, at a temperature of 10–150° C., the catalyst being in an amount of 0.001–20 mmol as metal per kg of the reaction solution, the hydrogen being in an amount of at least 1.5 mols per mol of the ketone or aldehyde, and the nitrogen monoxide being in an amount of at least one mol per mol of the ketone or aldehyde.

4,929,757

PROCESS FOR THE PREPARATION OF 3-AMINOPHENYL 2-HYDROXY-ETHYL SULPHONE

Karl-Josef Herd, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

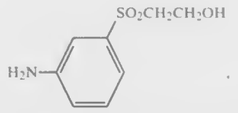
Filed Jun. 17, 1988, Ser. No. 208,349

Claims priority, application Fed. Rep. of Germany, Jun. 17, 1987, 3720213

Int. Cl.[5] C07C *87/48, 147/06, 147/11, 85/11*

U.S. Cl. 564—423 5 Claims

1. A process for the preparation of the sulphone of the formula



wherein 2-chloro-5-nitrobenzenesulphochloride is reacted with sodium sulphite to give 2-chloro-5-nitrobenzenesulphinic acid, the benzenesulphinic acid product is then reacted with ethylene oxide to give 2-chloro-5-nitrophenyl hydroxyethyl sulphone and the latter is then treated with hydrogen in the presence of hydrogenation catalysts to form the sulphone.

4,929,758

PREPARATION OF TERT-BUTYLAMINE FROM ISOBUTENE

Volker Taglieber, Eppelheim; Wolfgang Hoelderich, Frankenthal; Rudolf Kummer, Frankenthal; Wolf D. Mross, Frankenthal, and Guenter Saladin, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 908,297, Sep. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 663,283, Jul. 23, 1984, abandoned. This application Jun. 13, 1988, Ser. No. 212,161

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326579

Int. Cl.[5] C07C *85/02, 85/18*

U.S. Cl. 564—485 7 Claims

1. A process for preparing tert-butylamine from isobutene, which comprises the steps of:

(a) reacting isobutene with ammonia, or a primary or secondary amine, or a mixture thereof in the presence of an iron silicate catalyst of the pentasil type at from 250°–350° C. and under 200–300 bar;

(b) isolating the tert-butylamine; and

(c) recycling unreacted starting materials.

4,929,759

PRODUCTION OF AMINES FROM AN OLEFIN AND AMMONIA OR A PRIMARY OR SECONDARY AMINE

Volker Taglieber, Eppelheim; Wolfgang Hoelderich, Frankenthal; Rudolf Kummer, Frankenthal; Wolf D. Mross, Frankenthal, and Guenter Saladin, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 273,160, Nov. 18, 1988, abandoned, Continuation of Ser. No. 5,339, Jan. 15, 1987, abandoned, Continuation of Ser. No. 633,281, Jul. 23, 1984, abandoned. This application Oct. 6, 1989, Ser. No. 418,939

Int. Cl.[5] C07C *85/18*

U.S. Cl. 564—485 14 Claims

1. A process for the preparation of an amine from an olefin and ammonia or a primary or secondary amine at from 80° to 400° C. and under from 40 to 700 bar in the presence of a zeolite catalyst, wherein an olefin is reacted with ammonia or a primary or secondary amine, or a mixture of these, in the presence of a borosilicate or borogermanate zeolite of the pentasil type as a catalyst, the resulting amine is isolated and the unreacted starting materials are recycled.

4,929,760

FLUORINE-CONTAINING CARBONYL COMPOUNDS AND METHOD FOR PREPARING THE SAME

Tomoya Kitazume, Tokyo; Takashi Yamazaki, Kanagawa, and Seiten Rin, Tokyo, all of Japan, assignors to Showa Sbell Sekiyu Kabushiki Kaisha, Tokyo, Japan

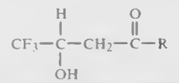
Filed Jul. 19, 1988, Ser. No. 221,371

Claims priority, application Japan, Nov. 24, 1987, 62-294195; Nov. 24, 1987, 62-294196

Int. Cl.[5] C07C *49/167*

U.S. Cl. 568—308 13 Claims

1. Fluorine-containing carbonyl compounds of the formula



wherein R stands for a substituted or not-substituted C_5-C_{10} alkyl group, a substituted or not-substituted aromatic group or a substituted or not-substituted arylalkyl group.

4,929,761

PREPARATION OF SUBSTITUTED BENZOPHENONES

Gregory P. Hussmann, Warrenville, and Carl A. Udovich, Joliet, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 22, 1986, Ser. No. 944,515

Int. Cl.[5] C07C *45/48*

U.S. Cl. 568—319 6 Claims

1. A process for preparing a benzophenone from an aromatic carboxylic acid, which process comprises contacting a feed comprising said aromatic carboxylic acid in the vapor phase and at a temperature within the range of from about 250° C. to about 500° C., a pressure within the range of from about 5 psia to about 200 psia and a contact time within the range of about 1 sec to 10 sec with a catalyst selected from the group consisting essentially of Nd_2O_3 and ThO_2/MgO, said MgO in an amount within the range of about 21.5 wt. % to about 75 wt. %, based on sum of weights of ThO_2 and MgO, to convert said aromatic carboxylic acid to a benzophenone.

4,929,762
PROCESS FOR PRODUCING A PHENOL AND/OR A CYCLOHEXANONE
Fujihisa Matsunaga, and Hiroshi Fukuhara, both of Chiba, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Mar. 2, 1989, Ser. No. 318,117
Claims priority, application Japan, Mar. 7, 1988, 63-53071
Int. Cl.[5] C07C *45/00*
U.S. Cl. 568—361 **6 Claims**

1. A process for producing a phenol, a cyclohexanone or both wherein a cyclohexenone and a cyclohexenol are dehydrogenated in liquid phase under the presence of a solid catalyst comprising a platinum-group metal loaded on a carrier.

4,929,763
ALCOHOL CONVERSION
Melvin L. Luetkens, Jr., Batavia; Steve T. McKenna, Lisle, and John L. Melquist, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Mar. 29, 1989, Ser. No. 330,417
Int. Cl.[5] C07C *45/39*
U.S. Cl. 568—402 **48 Claims**

1. A process for chemical conversion of alcohol to at least one alkene, aldehyde or ketone compound which comprises contacting the alcohol in a fluid phase with a heterogeneous catalyst composition comprising aluminum, boron, oxygen, and at least one transition element selected from the group consisting of Group IIIB of the Periodic Table, the heterogeneous catalyst composition having at lease one X-ray identifiable crystalline phase selected from the group consisting of phase I having an X-ray diffraction pattern comprising significant lines and assigned strengths substantially as follows

Interplanar Spacing d, Angstroms	Assigned Strength
9.15 ± 0.25	Medium-Strong
4.57 ± 0.15	Weak-Medium
3.62 ± 0.10	Very Strong
2.98 ± 0.08	Strong
2.41 ± 0.05	Weak
2.28 ± 0.05	Weak
1.98 ± 0.04	Weak
1.82 ± 0.04	Weak

and phase II having an X-ray diffraction pattern comprising significant lines and assigned strengths substantially as follows

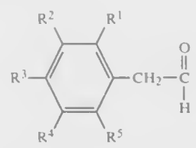
Interplanar Spacing d, Angstroms	Assigned Strength
5.37 ± 0.15	Medium
3.52 ± 0.10	Medium-Strong
2.69 ± 0.08	Very Strong
2.33 ± 0.05	Weak-Medium
2.14 ± 0.05	Weak-Medium
1.79 ± 0.05	Medium
1.67 ± 0.04	Weak-Medium.

4,929,764
ALKYLATION OF AROMATIC AMINES
Duane C. Hargis, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Continuation-in-part of Ser. No. 618,005, Jun. 6, 1984, Pat. No. 4,721,810. This application Sep. 16, 1985, Ser. No. 776,753
Int. Cl.[5] C07C *85/24*
U.S. Cl. 564—399 **15 Claims**

1. A process for alkylating aromatic amines comprising the step of reacting (a) an aromatic amine having at least one replaceable hydrogen atom on a primary amino group and on an aromatic ring carrying such amino group, with (b) a dialkyl ether in which each alkyl group has 2 to 4 carbon atoms, in the presence of a metal oxide alkylation catalyst consisting essentially of titanium dioxide having a surface area below 130 square meters per gram and at a temperature in the range of 300° C. to 400° C. at which alkylation of the aromatic amine occurs and at which the amount of exclusively ring-alkylated product formed exceeds the amount of exclusively N-alkylated product formed.

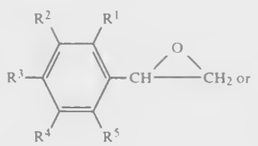
4,929,765
PREPARATION OF PHENYLACETALDEHYDES
Hubert Smuda, Heidelberg; Wolfgang Hoelderich, Frankenthal; Norbert Goetz, Worms, all of Fed. Rep. of Germany, and Hans-Gert Recker, Irvine, Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Nov. 22, 1988, Ser. No. 274,930
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740270
Int. Cl.[5] C07C *45/67, 45/70*
U.S. Cl. 568—427 **6 Claims**

1. A process for preparing a phenylacetaldehyde of the general formula I

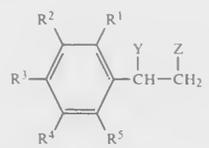


(I)

where R^1 to R^5 are each independently of the others hydrogen, . alkoxy, halogen, haloalkyl, haloalkoxy or haloalkylthio, by catalytic rearrangement in the presence of a zeolite, which comprises reacting an epoxy of the formula II or a phenylglycol of the formula III



(II)



(III)

where Y and Z can be identical to or different from each other and are each hydroxyl, alkoxy, aryloxy or acyloxy, in the gas phase over a borosilicate zeolite catalyst at from 70° to 200° C. under reduced pressure at a residence time over the catalyst of less than 4 seconds.

4,929,766
PROCESS ARE THE PREPARATION OF P-HYDROXY-BENZALDEHYDES
Albert Schnatterer, and Helmut Fiege, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Feb. 16, 1989, Ser. No. 311,481
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805697
Int. Cl.[5] C07C *45/36*
U.S. Cl. 568—432 **20 Claims**

1. A process for the preparation of p-hydroxybenzaldehydes of the formula



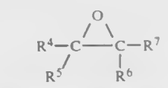
in which
R^1 to R^4 independently of one another denote hydrogen, halogen, C_1-C_{10}-alkyl, C_3-C_8-cycloalkyl, phenyl or C_1-C_{10}-alkoxy,
comprising oxidizing p-cresols of the formula



in which
R^1 to R^4 have the meaning given, with oxygen in the presence of 1-10 equivalents of basic substances per mole of p-cresol in a solvent in the presence of a chelate complex of iron, manganese or iron and manganese wherein the basic substances are metal hydroxides, metal alcoholates or metal amides of alkali metals or alkaline earth metals or alcoholates or amides of aluminum and the reaction is carried out at a temperature of from 0°-200° C.

4,929,767
TREATMENT OF RHODIUM CATALYSTS
David J. Miller, Charleston; David R. Bryant, South Charleston; Ernst Billig, Charleston, all of W. Va., and Bernard L. Shaw, Leeds, England, assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.
Continuation-in-part of Ser. No. 231,508, Aug. 12, 1988. This application Oct. 6, 1988, Ser. No. 254,197
Int. Cl.[5] C07C *45/50*; C04B *35/00*
U.S. Cl. 568—454 **27 Claims**

1. A process for increasing the amount of rhodium capable of being extracted into an aqueous solution containing an ionic organophosphine ligand, which rhodium is present in an organic solution containing a partially deactivated rhodium - tertiary non-ionic organophosphine complex catalyst, said process comprising mixing under non-hydroformylation conditions, said organic solution with an organic reagent selected from the group consisting of (a) alkyne compounds having the formula $R—C{\equiv}C—CH_2—X$, (b) alkene compounds having the formula $(R^1)(R^2)C{=}C(R^3)—CH_2—X$, (c) diketene, (d) methyl halides, (e) methyl sulfonates, (f) propiolate compounds having the formula $HC{\equiv}C—C(O)OR^{14}$, and (g) oxide compounds having the formula



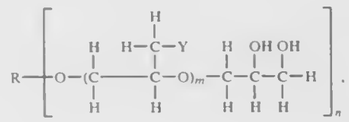
wherein X represents a radical selected from the group consisting of halogen atoms, a hydroxyl radical, a carboxylate radical of the formula $—OC(O)R^8$, a sulfonate radical of the formula $—OSO_2R^8$ a phosphonium radical of the formula $[—P^{30}(R^8)_3][Y—]$; wherein R^8 in the above formulae for X, each individually represent a monovalent hydrocarbon radical having from 1 to 18 carbon atoms selected from the group consisting of alkyl, aryl, aralkyl, alkaryl and cycloalkyl radicals and wherein Y represents an acid anion; and wherein each R, R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^{14} radical individually represents hydrogen or a monovalent hydrocarbon radical having from 1 to 18 carbon atoms selected from the group consisting of alkyl, aryl, alkaryl, aralkyl and cycloalkyl radicals; with the following provisos: that R^8 in the above carboxylate formula can also be hydrogen; that R^2 and R^3 in the above formula for the alkene compounds can also be bonded together to form a five or six membered heterocyclic ring or monocyclic hydrocarbon ring along with the C=C group shown in said formula; and wherein any two of said R^4, R^5, R^6 and R^7 groups in the above formula for the oxides can be bonded together to form a five or six membered monocyclic hydrocarbon ring along with the C—C group shown in said formula; to obtain an organic solution of an organic reagent treated solubilized rhodium - tertiary non-ionic organophosphine complex product that contains more rhodium correspondingly capable of being extracted into an aqueous solution containing an ionic organophosphine ligand than contained in the organic solution starting material of this process.

4,929,768
PROCESS FOR PREPARING DIALDEHYDE
Sumio Nakagawa, Ogaki; Masaoki Toiyama; Yoshinobu Uno, both of Gifu, and Hiromichi Kohda, Hirakata, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Feb. 16, 1989, Ser. No. 311,253
Claims priority, application Japan, Feb. 19, 1988, 63-37782
Int. Cl.[5] C07C *45/29, 45/38*
U.S. Cl. 568—473 **1 Claim**

1. A process for preparing a dialdehyde from a glycol of the formula $HO—(CH_2)_n—OH$, where n is an integer of not less than 2, comprising subjecting the glycol to oxidation-dehydrogenation in the presence of silver particles having a surface partially coated with a powder selected from the group consisting of a silicone carbide powder and a silicone nitride powder, using oxygen or air as the oxidant, the oxidation-dehydrogenation reaction being conducted at a temperature of 300° to 700° C. and at atmospheric pressure.

4,929,769
NOVEL POLYETHER CONTAINING AT LEAST ONE 2-HALOMETHYLOXYETHYLENE UNIT AND 2,3-DIHYDROXYPROPYL END GROUPS
Norman S. Anderson; Albert L. Promislow, both of Charlotte, N.C.; Randy L. Rayborn, Winder, Ga., and Rastko Vukov, Mississauga, Canada, assignors to Hoechst Celanese Corporation, Somerville, N.J. and Alkaril Chemicals, Inc., Ontario, Canada
Filed Apr. 28, 1989, Ser. No. 344,598
Int. Cl.[5] C07C *43/11*
U.S. Cl. 568—614 **41 Claims**

1. A halogenated polyether containing at least one 2-halomethyloxyethylene unit and 2,3-dihydroxypropyl end groups in the substantial absence of epoxy groups which exhibits the following structural formula:



where R is the residual portion of an etherified organic polyhydroxy compound; n is 2 to 8 and designates the number of ether chains extending from R; m is 0 to 7 and designates the number of the illustrated Y-substituted methyloxyethylene units present in each ether chain; Y is selected from the group consisting of hydroxy, chlorine, bromine, iodine, and mixtures of the foregoing; the sum of all of the illustrated Y-substituted methyloxyethylene units in the overall molecule is 1 to 25; and Y must be chlorine, bromine, and/or iodine in at least a portion of the overall molecule, with the proviso that when bromine and iodine are absent in Y there must be at least two 2-chloromethyloxyethylene units in the overall molecule, and when bromine or iodine are present in Y there must be at least one 2-bromoethyloxyethylene or 2-iodomethyloxyethylene unit in the overall molecule.

4,929,770

ALUMINUM PHENOXIDE CATALYST REMOVAL

Charles W. Matthews, Orangeburg, S.C.; Eric S. Batman, Belleville, Ill., and Jeffrey F. King, Orangeburg, S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 8, 1989, Ser. No. 320,540
Int. Cl.[5] C07C *37/70, 37/74*
U.S. Cl. 568—756 5 Claims

1. A method of removing aluminum phenoxide catalyst from a phenol alkylation mixture containing 15–450 moles of phenolic compound per mole of aluminum phenoxide, said method comprising:

(A) adding about 15–30 moles of water per mole of aluminum phenoxide to the phenol alkylation mixture to obtain a wet alkylation mixture,

(B) maintaining said wet alkylation mixture at about 30°–100° C. for about 5–120 minutes and then,

(C) maintaining the wet alkylation mixture at a temperature of 120°–160° C. while distilling out water until filterable solid particulates form and,

(D) removing said solid particulates from said alkylation mixture.

4,929,771

PROCESS FOR THE PREPARATION OF ALKYL-SUBSTITUTED PHENOLS OR NAPHTHOLS

Martin Clausen; Paul Rys, and Wang Junkuan, all of Zurich, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 1, 1988, Ser. No. 278,396
Claims priority, application Switzerland, Dec. 9, 1987, 4800/87
Int. Cl.[5] C07C *37/08*
U.S. Cl. 568—798 9 Claims

1. A process for the preparation of compounds of the formula

(1) HO - Ar - R,

in which Ar is substituted or unsubstituted phenylene or naphthalene and R is C_1-C_5alkyl, which comprises oxidizing dialkylaryl compounds of the formula

in which R_1 and R_2 independently of one another are C_1-C_5alkyl, but are not simultaneously methyl or C_5alkyl, and Ar is as defined above in the absence of solvents, at temperatures from 70° to 130° C. by means of oxygen or oxygen donors in the presence of an alkali metal salt or alkaline earth metal salt of an organic carboxylic acid having 5 to 14 carbon atoms, to give the corresponding dialkylaryl monohydroperoxides and then hydrolysing the latter under acidic conditions to give the compounds of the formula (1).

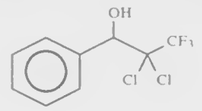
4,929,772

PROCESS FOR PREPARING POLYHALOGENATED CARBINOLS

Pietro Massardo, Milan; Franco Bettarini, Novara; Paolo Piccardi, Milan, and Franco Rama, Varese, all of Italy, assignors to Istituto Guido Donegani, Milan, Italy

Division of Ser. No. 205,506, Jun. 7, 1988, abandoned, which is a continuation of Ser. No. 71,540, Jul. 7, 1987, abandoned, which is a continuation of Ser. No. 817,542, Jan. 10, 1986, abandoned. This application Mar. 9, 1989, Ser. No. 321,171
Claims priority, application Italy, Jan. 11, 1985, 19080 A/85
Int. Cl.[5] C07C *33/46*
U.S. Cl. 568—812 1 Claim

1. A polyhalogenated carbinol of the formula:



4,929,773

METHOD OF PRODUCING 1-(4'-ISOBUTYLPHENYL)ETHANOL

Debra A. Ryan, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 7, 1988, Ser. No. 242,082
Int. Cl.[5] C07C *29/14, 29/132*
U.S. Cl. 568—814 9 Claims

1. A method of producing 1-(4'-isobutylphenyl)ethanol (IBPE) comprising hydrogenating 4-isobutylacetophenone (IBAP) with hydrogen in the absence of a solvent using a treated activated sponge nickel catalyst obtained by subjecting such a catalyst wetted with a protective liquid composed preponderantly of water to a washing treatment with an organic washing liquid in which the aqueous protective liquid is substantially soluble, such washing liquid being substantially soluble in IBAP or IBPE.

4,929,774

STABLE MIXTURE CONTAINING OXIDATION-SENSITIVE COMPOUNDS, PREPARATION THEREOF AND USE OF A COMBINATION OF SUBSTANCES FOR STABILIZING OXIDATION-SENSITIVE COMPOUNDS

Chiharu Fukamachi, Uedashi, Japan; Horst Schumacher, Bobenheim am Berg, Fed. Rep. of Germany; Wolfgang Bewert, Frankenthal, Fed. Rep. of Germany, and Joachim Schneider, Weisenheim am Berg, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 302,611
Int. Cl.[5] C07C *35/18*
U.S. Cl. 568—824 16 Claims

1. A stable mixture containing an oxidation-sensitive compound selected from the group consisting of a fat-soluble vitamin and a carotenoid, a triglyceride, a complexing agent selected from the group consisting of phytic acid, phosphoric acid, meta-, pyro- or polyphosphoric acid and a salt thereof, and a coating substance.

4,929,775

PROCESS FOR PREPARING BROMINATED PENTAERYTHRITOLS

Saadat Hussain, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 30, 1989, Ser. No. 358,591
Int. Cl.[5] C07C *31/36, 31/42*
U.S. Cl. 568—844 7 Claims

1. A process for preparing a product predominate in brominated pentaerythritols, which process comprises:

(a) charging a vessel with pentaerythritol, a first portion of aqueous HBr and a catalyst selected from the group consisting of mono- or di-carboxylic acids, their anhydrides, their esters and mixtures of two or more of such acids, anhydrides and esters;

(b) after (a), maintaining the liquid contents of the vessel at a temperature within the range of from about 80° C. to about 130° C. for period within the range of from about 1 to about 3 hours;

(c) after (b), adding a second portion of aqueous HBr to the vessel over a period of from about 0.5 to about 2 hours while maintaining the liquid contents of the vessel at a temperature within the range of from about 80° C. to about 130° C., the first portion and the second portion providing a mole ratio of pentaerythritol to HBr which is within the range of from about 1:3 to about 1:6;

(d) after the addition of the second portion of aqueous HBr is at least substantially complete, raising the temperature of the liquid contents of the vessel to a temperature within the range of from about 120° C. to about 180° C. and maintaining such temperature for a period of at least 0.5 hours; and

(e) during at least steps (b), (c), and (d), sweeping the headspace of the vessel with an inert gas and removing from the vessel the sweep gas and any vapors formed during the process.

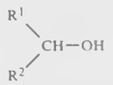
4,929,776

PROCESS FOR THE PREPARATION OF UNSATURATED ALCOHOLS

Jean-Michel Grosselin, and Claude Mercier, both of Lyon, France, assignors to Rhone-Poulenc Sante, Antony, France

Filed Nov. 29, 1988, Ser. No. 277,306
Claims priority, application France, Dec. 1, 1987, 87 16628
The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.
Int. Cl.[5] C07C *29/14, 27/04*
U.S. Cl. 568—862 10 Claims

1. A process for the preparation of an unsaturated alcohol of the formula:



in which each of R^1 and R^2, which are identical or different, represents a hydrogen atom, a saturated or unsaturated aliphatic radical of 1 to 30 carbon atoms, a saturated or unsaturated aliphatic radical of 1 to 30 carbon atoms substituted by a saturated or unsaturated alicyclic radical of 5 or 6 carbon atoms by a phenyl radical, a saturated or unsaturated alicyclic radical of 5 or 6 carbon atoms or a phenyl radical, at least one of the radicals R^1 and R^2 containing an ethylenic double bond, or R^1 and R^2 together form an ethylenically unsaturated alicyclic radical of 5 or 6 carbon atoms, each of the aforesaid aliphatic, alicyclic or phenyl radicals being unsubstituted or substituted by one or more identical or different alkyl radicals of 1 to 4 carbon atoms, which comprises hydrogenating a carbonyl compound of the formula:



in which R^1 and R^2 are as defined above, in a homogeneous liquid medium with hydrogen in the presence of a neutral ruthenium-based catalyst."

4,929,777

CATALYST COMPOSITIONS AND THE USE THEREOF IN THE HYDROGENATION OF CARBOXYLIC ACID ESTERS

Gether Irick, Jr., Gray; Patricia N. Mercer, Kingsport, and Kenneth E. Simmons, Blountville, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 13, 1989, Ser. No. 309,641
Int. Cl.[5] C07C *27/04*
U.S. Cl. 568—864 17 Claims

1. A process for hydrogenating an ester of an aliphatic or cycloaliphatic carboxylic acid to obtain the alcohol corresponding to the acid residue of the ester which comprises contacting the ester with hydrogen in the presence of catalyst comprising as the essential ingredient chemically-mixed, copper-titanium oxide under hydrogenation conditions of temperature and pressure.

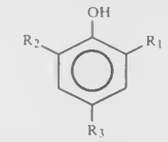
4,929,778

METHODS AND COMPOSITIONS FOR INHIBITING STYRENE POLYMERIZATION

Paul V. Roling, Spring, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Jun. 5, 1989, Ser. No. 361,170
Int. Cl.[5] C07C *7/20*
U.S. Cl. 585—3 30 Claims

1. A method of inhibiting polymerization of a vinyl aromatic compound monomer comprising adding to the vinyl aromatic compound monomer an effective inhibiting amount of (a) a phenylenediamine compound having at least one N—H bond therein, and (b) a hindered phenol having the structure



wherein R_1 and R_2 may be the same or different, with R_1 and R_2 being independently chosen and selected from the group of C_1-C_{20} alkyl, C_1-C_{30} alkaryl, and substituted C_1-C_{30} alkaryl; R_3 is selected from the group of C_1-C_{20} alkyl, thiophenol, substituted thiophenol, C_1-C_{40} alkanoic acid ester, C_1-C_{30} alkaryl, substituted C_1-C_{30} alkaryl, C_1-C_6 alkylamino, C_1-C_6 alkoxy, amine, polynuclear aryl and substituted polynuclear aryl.

18. Vinyl aromatic monomer anti-polymerization composition as recited in claim **17** wherein (a) comprises N-phenyl-N'-(1,4-dimethylpentyl)-p-phenylenediamine.

4,929,779

METHOD AND COMPOSITIONS FOR CONTROLLING THE PEAR LEAF BLISTER MOTH, *LEUCOPTERA SCITELLA*

Wittko Francke, Reinbek, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 45,453, May 4, 1987, Pat. No. 4,853,217. This application Jan. 26, 1989, Ser. No. 301,946

Claims priority, application Fed. Rep. of Germany, May 10, 1986, 3615854

Int. Cl.[5] C07C *9/00*

U.S. Cl. 585—16 2 Claims

1. Racemic 5,9-dimethylheptadecane.

2. 5,9-dimethylheptadecane free from other substances indigenous to the pear leaf blister moth, *Leucoptera scitella.*

4,929,780

MULTISTAGE PROCESS FOR CONVERTING OXYGENATES TO LIQUID HYDROCARBONS AND ETHENE

Bernard S. Wright, East Windsor; Ronald M. Gould, Sewell, and Hartley Owen, Belle Mead, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 12, 1988, Ser. No. 861,820

Int. Cl.[5] C07C *1/20*

U.S. Cl. 585—303 11 Claims



1. An integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons and ethene, comprising the steps of:

reacting a major portion of feedstock comprising lower aliphatic oxygenate in a continuous primary conversion unit comprising a low pressure fluidized bed reactor containing zeolite oxygenate conversion catalyst to dehydrate and convert at least a portion of the feedstock to hydrocarbons containing a major fraction of C_2–C_4 olefins having less than 10% by weight ethene and a minor fraction of C_5^+ heavy hydrocarbons;

intermittently reacting a minor portion of the lower aliphatic oxygenate feedstock in the presence of a diluent under partial conversion conditions to convert about 25 to 90% of feedstock per pass in an auxiliary conversion unit comprising a low pressure fixed bed reactor containing an acidic zeolite catalyst to dehydrate and convert at least a portion of the feedstock to hydrocarbons containing a major fraction of C_2–C_4 olefins having at least 15% by weight ethene and a minor fraction of C_5^+ heavy hydrocarbons, thereby increasing ethene production;

cooling and separating reactor effluent from the primary conversion unit to provide an aqueous liquid stream, a heavy hydrocarbon liquid stream, and recovering a primary light hydrocarbon vapor stream rich in C_2–C_4 olefins;

cooling and separating reactor effluent from the auxiliary conversion unit to provide an aqueous liquid stream, a heavy hydrocarbon liquid stream, and recovering an auxiliary light hydrocarbon vapor stream rich in ethene;

combining the primary and auxiliary light hydrocarbon vapor streams, compressing and selectively sorbing C_3^+ vapor hydrocarbons in a gasoline sorbent stream to recover an ethene-rich vapor stream and a liquid stream rich in C_3^+ sorbate; and

contacting the sorbate-rich streams in a reaction zone with a shape selective medium pore zeolite oligomerization catalyst at elevated temperature and pressure to convert olefins to an oligomerization effluent stream comprising olefinic gasoline and distilled range liquids.

4,929,781

PROCESS FOR THE SIMULTANEOUS HYDROCONVERSION OF A FIRST FEEDSTOCK COMPRISING UNSATURATED, HALOGENATED ORGANIC COMPOUNDS AND A SECOND FEEDSTOCK COMPRISING SATURATED, HALOGENATED ORGANIC COMPOUNDS

Robert B. James, Jr., Northbrook, and Tom N. Kalnes, La Grange, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 30, 1988, Ser. No. 277,743

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[5] C10C *1/00*

U.S. Cl. 585—310 17 Claims

1. A process for the simultaneous hydrodehalogenation of a first feedstock comprising unsaturated, halogenated organic compounds and a second feedstock comprising saturated, halogenated organic compounds which process comprises:

(a) contacting said first feedstock comprising unsaturated, halogenated organic compounds with hydrogen in a first hydrogenation reaction zone operated at hydrogenation conditions selected to minimize the polymerization of unsaturated organic compounds and to produce a first hydrogenated hydrocarbonaceous stream;

(b) contacting at least a portion of said first hydrogenated hydrocarbonaceous stream and said second feedstock comprising saturated, halogenated organic compounds with hydrogen in a second hydrogenation reaction zone operated at hydrogenation conditions selected to produce a second hydrogenated hydrocarbonaceous stream and to generate at least one water-soluble hydrogen halide compound;

(c) contacting the resulting effluent from said second hydrogenation zone containing hydrogenated hydrocarbonaceous compounds, a hydrogen-rich gas and at least one water-soluble hydrogen halide compound with a halide-lean absorber solution in an absorption zone;

(d) withdrawing a halide-rich absorber solution containing at least a portion of said water-soluble hydrogen halide compound from said absorption zone;

(e) withdrawing a stream comprising hydrogenated hydrocarbonaceous compounds and a hydrogen-rich gas from said absorption zone; and

(f) introducing said stream recovered in step (e) into a separation zone to provide a hydrogen-rich gaseous stream and a third hydrogenated hydrocarbonaceous stream.

4,929,782

LUBRICANTS COMPRISING NOVEL CYCLOPENTANES, CYCLOPENTADIENES, CYCLOPENTENES, AND MIXTURES THEREOF AND METHODS OF MANUFACTURE

Clifford G. Venier, and Edward W. Casserly, both of The Woodlands, Tex., assignors to Pennzoil Products Company, Houston, Tex.

Continuation of Ser. No. 170,653, Mar. 15, 1988, abandoned, which is a division of Ser. No. 112,378, Oct. 22, 1987, Pat. No. 4,849,566, which is a continuation-in-part of Ser. No. 909,305, Sep. 19, 1986, Pat. No. 4,721,823. This application Mar. 15, 1989, Ser. No. 323,164

Int. Cl.[5] C07C *2/86*

U.S. Cl. 585—375 8 Claims

1. A method for the production of a hydrocarbylated cyclopentadiene which comprises reaction of a hydrocarbyl-substituted or hydrocarbyl-unsusbtituted cyclopentadiene starting material with a molar excess of at least 3:1 of at least one primary or secondary alcohol of the formula:

R_2OH

wherein R_2 is individually and independently selected from the group consisting of hydrocarbyl groups of 4 to 36 carbon atoms, the reaction being conducted in the presence of a basic catalyst and in closed vessel at temperatures ranging from about 180° to 300° C., by addition of the cyclopentadiene starting material to a reaction vessel containing the basic catalyst in a solution of said alcohol, heating the reaction vessel while removing water from the reaction mixture as it is formed during the reaction, and recovering the hydrocarbylated cyclopentadiene which contains at least one more hydrocarbyl substituent than the cyclopentadiene starting material.

4,929,783

COUPLING PROCESS

R. Scott Smith, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 276,532, Nov. 28, 1988, abandoned. This application Jun. 27, 1989, Ser. No. 372,272

Int. Cl.[5] C07C *2/64, 15/067*

U.S. Cl. 585—452 14 Claims

1. In a process for coupling an alkene selected from ethene, propene, and mixtures thereof with an aromatic hydrocarbon having an active hydrogen on a saturated alpha-carbon in the presence of a supported potassium or potassium alloy as a catalyst, the improvement which comprises conducting the reaction in the presence of an alkaline earth metal oxide as a co-catalyst, the catalyst composition containing about 200–1500 weight % of support and about 4–40 mol % of co-catalyst, based on the amount of potassium or potassium alloy.

4,929,784

PROCESS FOR THE PREPARATION OF OPTIONALLY SUBSTITUTED BENZYL-BENZENES

Kurt Klinkmann, Nettersheim; Michael Herzhoff, Mueb, and Gerhard Burmeister, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

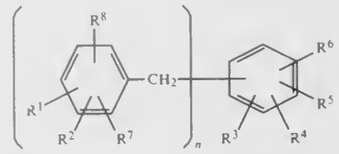
Filed Oct. 11, 1989, Ser. No. 419,994

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1988, 3836780

Int. Cl.[5] C07C *2/02*

U.S. Cl. 585—422 11 Claims

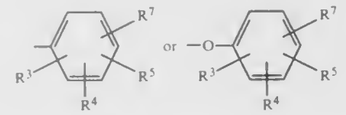
1. A process for the preparation of benzyl-benzenes of the formula



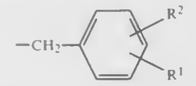
in which

R^1, R^2, R^3, R^4 and R^5 independently of one another denote hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine or chlorine, where R^1, R^2, R^3 and R^4 independently of one another may also represent hydroxyl and R^5 may additionally be C_5–C_8-alkyl,

R^6 represents hydrogen or one of the groups

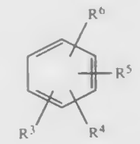


R^7 represents hydrogen or the group

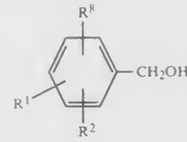


n represents the number 1 or 2 and may also represent the number 3 in the case in which one of the radicals R^3, R^4, R^5 or R^6 denotes hydrogen,

wherein a benzene of the formula



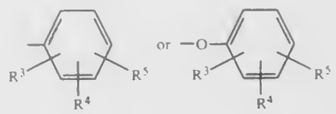
is reacted with a benzyl alcohol of the formula



where

R^1 to R^5 have the abovementioned meaning,

R^6 represents hydrogen or one of the groups



and

R^8 denotes hydrogen or hydroxymethyl.

in a ratio of 1 mole of benzene to 0.5–5 moles of benzyl alcohol in the presence of an amount of activated bleaching earth of 0.05–5% by weight, relative to the amount of benzyl alcohol, at a temperature between 90° C. and 140° C. in the presence of a diluent.

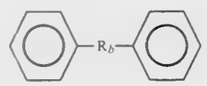
4,929,785

PROCESS FOR PREPARING DIPHENYLALKANE

Saadat Hussain, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 20, 1989, Ser. No. 326,096
Int. Cl.[5] C07C *2/02, 2/72, 1/20*
U.S. Cl. 585—426 21 Claims

1. A process for preparing diphenylalkanes of the formula,



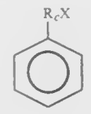
wherein R is a methylene group and b is 2, 4, 6, 8, or 10, which process comprises:

(a) forming a reaction mass which initially contains,

(i) iron,

(ii) a catalytic quantity of copper, a Cu(I) salt of an inorganic or organic acid or a mixture of copper and said Cu(I) salt,

(iii) a phenylalkylhalide of the formula,



wherein R is a methylene group, c = ½ b and X is a halide radical,

(iv) a solvent in which Fe(II) halide is substantially soluble, and

(b) maintaining said reaction mass at a temperature of at least 40° C. until said diphenylalkane is formed.

4,929,786

PREPARATION OF 1-ARYL-1-ALKENES

Walter Himmele, Walldorf; Kaspar Bott, Mannheim, and Klaus Bronstert, Carlsberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,081
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736819
Int. Cl.[5] C07C *1/20*
U.S. Cl. 585—469 5 Claims

1. A process for the preparation of a 1-aryl-1-alkene, the process comprising dehydrating a 1-aryl-1-alkanol in the presence of a substance promoting elimination of water wherein said substance is a triester of phosphorous acid of the general formula (III)

$$R^4O—P(OR^5)—OR^6 \quad (III)$$

wherein R^4, R^5, and R^6 are identical or different aryl, alkyl of from 1 to 20 carbon atoms, arylalkyl of from 7 to 20 carbon atoms, or cycloalkyl of from 3 to 8 carbon atoms, provided that at least one of R^4, R^5 and R^6 is aryl.

4,929,787

PROCESS FOR CONVERGING METHANE TO HIGHER HYDROCARBONS

Charles Cameron, Paris; Hubert Mimoun, Rueil Malmaison; Serge Bonnaudet, Paris, and Alain Robine, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 4, 1988, Ser. No. 228,341
Claims priority, application France, Aug. 5, 1987, 87 11183; Nov. 27, 1987, 87 16614
Int. Cl.[5] C07C *2/00, 5/00*
U.S. Cl. 585—500 20 Claims

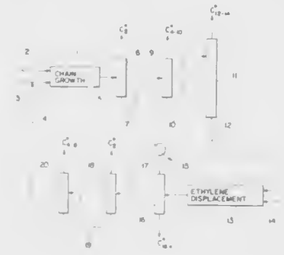
1. A process for converting methane to higher hydrocarbons comprising contacting at conversion conditions a mixture of methane- and oxygen-containing gas with a solid contact mass containing at least one rare-earth metal carbonate wherein the rare-earth metal is lanthanum, neodymium or samarium, and wherein the conversion conditions are such that the carbonate remains essentially carbonate during the conversion.

4,929,788

PROCESS FOR SEPARATING 1-DODECENE AND 1-TETRADECENE FROM AN ALUMINUM ALKYL CHAIN GROWTH PRODUCT

C. S. Warren Huang, Chesterfield, Mo., and Karl W. Meyer, Webster, Tex., assignors to Ethyl Corporation, Richmond, Va.

Filed May 1, 1989, Ser. No. 345,699
Int. Cl.[5] B01D *3/00*; C07C *7/04*
U.S. Cl. 585—522 8 Claims



1. A process for separating an aluminum alkyl chain growth product comprising C_{12-14} α-olefins including 1-dodecene and 1-tetradecene and triethyl aluminum said process comprising:

(A) feeding said chain growth product to an intermediate point of a rectification column, said rectification column being maintained under vacuum such that in operation the rectification section at said intermediate point is at a temperature in the range of 250°–260° F. and the overhead temperature is about 190°–240° F. whereby triethyl aluminum entering said rectification section is in the form of triethyl aluminum dimer thereby increasing its molecular weight and decreasing its volatility,

(B) distilling at least 10 weight percent of said C_{12-14} α-olefins in the feed mixture overhead from said rectification section and

(C) removing over 50 weight percent of said triethyl aluminum in the feed mixture as a bottoms stream from said rectification column.

8. An aluminum alkyl chain growth process comprising:

(A) feeding ethylene, triethyl aluminum and a recycle stream comprising triethyl aluminum and C_{10-14} α-olefins to an ethylene chain growth reactor, said ethylene, triethyl aluminum and recycle stream being in proportion such that the ethylene:triethyl aluminum mole ratio is about 4–10:1, to obtain a chain growth product,

(B) flashing ethylene and C_{4-10} α-olefins from said chain growth product to obtain a topped chain growth product comprising C_{12-20} α-olefins including 1-dodecene and 1-tetradecene, triethyl aluminum and tri-C_{4-20} alkyl aluminum,

(C) feeding said topped chain growth product to an intermediate point in a rectification column, said rectification column being maintained such that the temperature at said intermediate point is about 250°–260° F. and the overhead temperature is about 190°–240° F. and under vacuum sufficient to cause at least 10 weight percent of said 1-dodecene and 1-tetradecene to distill overhead resulting in a bottoms stream comprising C_{14-20} α-olefins, triethyl aluminum and a mixture of tri-C_{4-20} alkyl aluminums,

(D) feeding said bottoms stream and ethylene to an ethylene displacement reactor to obtain a displacement product comprising ethylene, C_{4-20} α-olefins, triethyl aluminum and minor amounts of higher alkyl aluminums,

(E) separating ethylene from said displacement product,

(F) distilling C_{4-8} olefins from said displacement product to obtain a bottoms stream comprising triethyl aluminum and C_{10-14} α-olefins and

(G) recycling said bottoms stream from (F) to said chain growth reactor in step (A).

4,929,789

PROCESS FOR PYROLYZING OR THERMAL CRACKING A GASEOUS OR VAPORIZED HYDROCARBON FEEDSTOCK USING A NOVEL GAS-SOLIDS CONTACTING DEVICE AND AN OXIDATION CATALYST

Victor R. Gupta, Cleveland Hts., and Christopher J. Clark, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 15, 1988, Ser. No. 144,545
Int. Cl.[5] C07C *4/04*
U.S. Cl. 585—648 29 Claims

1. A process for converting a gaseous or vaporized hydrocarbon feedstock to a product comprising ethylene, acetylene or a mixture thereof, the process comprising:

advancing a gaseous or vaporous stream comprising a gaseous or vaporous fuel and an oxygen source into contact with particulate solids in one section of an annular gas-solids contacting zone, said stream being deflected at the entrance to said one section of said contacting zone sufficiently to move said solids in a generally circumferential and horizontal direction, said particulate solids being at a sufficiently high temperature to effect combustion of said fuel, said particulate solids comprising an effective amount of at least one oxidation catalyst to enhance the combustion of said fuel, combusting said fuel, the heat from said combustion heating said solid and removing a gaseous or vaporous material comprising exhaust gases or vapor from said combustion from said one section of said contacting zone;

moving said particulate solids to another section of said contacting zone to effect contact between said solids and said feedstock, the movement of said solids being effected by the flow of said gaseous stream;

advancing said feedstock into said another section of said annular contacting zone into contact with said particulate solids, said feedstock being deflected at the entrance to said another section of said contacting zone sufficiently to move said solids in a generally circumferential and horizontal direction, converting at least part of said feedstock to said product, and removing said product from said another section of said contacting zone; and

returning said particulate solids to said one section of said contacting zone.

4,929,790

CATALYTIC CONVERSION OF PROPANE TO ETHYLENE OVER ZSM-23

Warren W. Kaeding, Lawrenceville, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 784,966, Oct. 7, 1985, abandoned. This application Jul. 7, 1988, Ser. No. 217,112
Int. Cl.[5] C07C *4/06*
U.S. Cl. 585—651 13 Claims

1. A process for converting propane to ethylene, said process comprising contacting said propane with a catalyst comprising a crystalline aluminosilicate zeolite ZSM-23 having x-ray diffraction pattern as set forth in Table 1 under conditions sufficient to effect said propane to ethylene conversion.

4,929,791

CATALYTIC CONVERSION OF PROPANE TO ETHYLENE OVER ZSM-50

Warren W. Kaeding, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 784,967, Oct. 7, 1985, abandoned. This application Jul. 7, 1988, Ser. No. 217,111
Int. Cl.[5] C07C *4/06*
U.S. Cl. 585—651 7 Claims

1. A process for converting propane to ethylene, said process comprising contacting said propane with a catalyst comprising a crystalline aluminosilicate zeolite ZSM-50 having x-ray diffraction pattern as set forth in Table 1 under conditions sufficient to effect said propane to ethylene conversion.

4,929,792

DEHYDROGENATION, DEHYDROCYCLIZATION AND REFORMING CATALYST

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 283,779, Dec. 13, 1988, Pat. No. 4,867,864. This application Aug. 3, 1989, Ser. No. 389,214
Int. Cl.[5] C07C *5/333*
U.S. Cl. 585—661 12 Claims

1. A process for altering the hydrogen content of a C_2–C_{12} paraffin containing feed, comprising contacting the feed with a non-acidic catalyst composition under conditions effective to alter the hydrogen content of said feed, wherein the non-acidic catalyst comprises a dehydrogenation/hydrogenation metal and zeolite beta in non-acidic form;

altering the hydrogen content of said feed and recovering the altered feed.

4,929,793

PRODUCTION OF MIDDLE DISTILLATES BY PARAFFIN DISPROPORTIONATION

Roger A. Morrison, Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

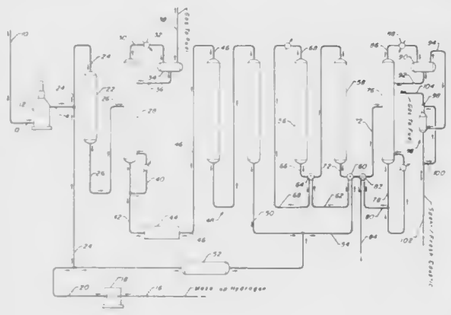
Filed Oct. 21, 1988, Ser. No. 260,636
Int. Cl.[5] C07C *6/08*
U.S. Cl. 585—708 9 Claims

1. A process for producing distillate range products by disproportionating a C_5 to C_8 paraffinic feedstream boiling below the distillate boiling range in the presence of an acidic, solid, porous catalyst comprising an intermediate pore size zeolite at a pressure from 50 to 100 psig and recovering a paraffinic distillate range product.

4,929,794
HYDROTHREATMENT-ISOMERIZATION WITHOUT HYDROGEN RECYCLE

Robert J. Schmidt, and Robert S. Haizmann, both of Rolling Meadows, Ill., assignors to UOP, Des Plaines, Ill.

Filed Dec. 30, 1988, Ser. No. 292,034
Int. Cl.[5] C07C *5/13*
U.S. Cl. 585—737 11 Claims



1 A method of supplying hydrogen to a combined hydrotreatment and isomerization process, said method comprising:

(a) forming a hydrotreater feed by combining a hydrocarbon feedstock comprising C_4–C_7 hydrocarbons, and including sulfur and oxygen-containing hydrocarbon compounds, with a first hydrogen containing stream to produce a hydrogen to hydrocarbon ratio of from 0.2 to 0.9 $stdm^3/m^3$ (10 to 50 SCFB) in said hydrotreater feed;

(b) contacting said hydrotreater feed in a hydrotreater reactor with a catalyst comprising a Group VIB metal and a Group VIII metal on an alumina support at conditions including a temperature in the range of 200°–350° C., a pressure of from 700 to 5600 kPa and a liquid hourly space velocity of from 1 to 20 to convert said sulfur and oxygen-containing compounds to hydrocarbons, hydrogen sulfide and water;

(c) recovering a hydrotreater effluent from said hydrotreater reactor;

(d) passing said hydrotreater effluent to a first separator, and separating said effluent into a first gas stream comprising hydrogen, hydrogen sulfide, and water and a treated stream comprising hydrocarbons having from 4–7 carbon atoms;

(e) rejecting said first gas stream from said process;

(f) forming an isomerization feed by combining said treated stream with a second hydrogen-containing stream in a proportion that produces a hydrogen to hydrocarbon ratio of from 0.9 to 1.8 $stdm^3/m^3$ (50 to 100 SCFB);

(g) contacting said isomerization feed in an isomerization reaction zone with an isomerization catalyst comprising alumina, having from 0.01 to 0.25 wt.% platinum and from 2 to 10 wt.% of a chloride component at isomerization conditions including a temperature in a range of from 40°–235° C., a pressure of from 700 to 7000 kPa and a space velocity of from 0.1 to 10;

(h) maintaining a chloride concentration in said isomerization reaction zone of from 30 to 300 ppm;

(i) recovering a second effluent stream from said isomerization reaction zone; and

(j) separating said second effluent stream in a stabilizer column into a product stream, C_4–C_7 hydrocarbons and a second gas stream which is removed from the process.

4,929,795
METHOD FOR ISOMERIZING WAX TO LUBE BASE OILS USING AN ISOMERIZATION CATALYST

Ian A. Cody, Clearwater, Canada; Glen P. Hamner, deceased, late of Baton Rouge (by Annabelle Hamner, executrix), and James T. Schorfheide, Baton Rouge, both of La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

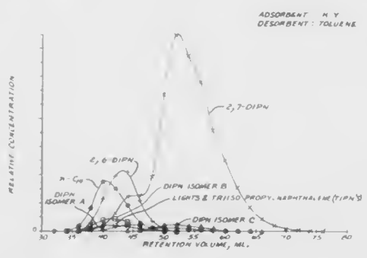
Continuation-in-part of Ser. No. 134,952, Dec. 8, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 283,665
Int. Cl.[5] C07C *15/13*
U.S. Cl. 585—739 12 Claims

1. An improved method for producing lube oil base stocks or blending stocks by the catalytic isomerization of wax under typical isomerization conditions, said improvements comprising using a hydrogenation metal loaded fluorided alumina or material containing alumina catalyst which catalyst as introduced to waxy feed is characterized by possessing (1) a hydrate level of 60 or less determined as the relative amount of hydrate represented by a peak in the X-ray diffraction (XRD) pattern at $2\theta = 5.66$ Å when a hydrate level of 100 corresponds to the $2\theta = 5.66$ Å peak height exhibited in the XRD by a standard material constituting 0.6 wt% Pt on 150 m^2/g γ alumina containing 7.2 wt% fluorine wherein the fluorine has been deposited using an aqueous solution containing a high concentration of HF and the material dried at 150° C. for 16 hours; (2) a surface nitrogen content N/Al ratio of 0.01 or less as determined by X-ray photo electron spectroscopy; (3) a bulk fluorine concentration of between 2 to 10 wt% and (4) a surface fluorine concentration defined as the amount of fluorine present in a layer between the surface of the catalyst to a depth of about 1/100 inch of less than about 3 wt% provided that the surface fluoride concentration is less than the bulk fluoride concentration.

4,929,796
SEPARATION OF 2,7 DIISOPROPYLNAPHTHALENE FROM A FEED MIXTURE COMPRISING VARIOUS DIISOPROPYLNAPHTHALENE ISOMERS WITH A ZEOLITE ADSORBENT

Timothy J. Barder, Addison, Ill., assignor to UOP, Des Plaines, Ill.

Filed Mar. 10, 1989, Ser. No. 322,329
Int. Cl.[5] C07C *7/12*
U.S. Cl. 585—828 12 Claims

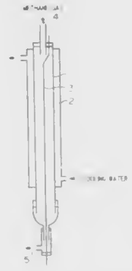


1. A process for separating 2,7 DIPN from a feed mixture comprising, 2,7 DIPN and at least one other DIPN isomer, which process comprises contacting, at adsorption conditions, said feed with an adsorbent comprising a Y zeolite which has been at least partially exchanged at exchangeable sites, with potassium cations, to effect the adsorption of 2,7 DIPN and thereafter recovering the 2,7 DIPN.

4,929,797
METHOD FOR PRODUCING HYDROCARBONS HAVING TWO CARBON ATOMS

Tatsuaki Yamaguchi, Tokyo, and Kozo Hirota, Chiba, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,638
Claims priority, application Japan, Nov. 14, 1987, 62-287656
Int. Cl.[5] C07C *2/00*
U.S. Cl. 585—921 4 Claims



1. A method for producing hydrocarbons having two carbon atoms, which comprises introducing methane gas into a reactor downwardly from the top, said reactor comprising a pair of reactor walls extending vertically and facing each other, one of said walls being maintained at a high temperature and the other being maintained at a low temperature, so that the methane gas is dimerized primarily through the dehydrogenation on the surface of the high temperature wall to form C_2 hydrocarbons and hydrogen, and the C_2 hydrocarbons are preferentially diffused and transferred to the low temperature wall side by thermal diffusion effects.

4,929,798
PSEUDOADIABATIC REACTOR FOR EXOTHERMAL CATALYTIC CONVERSIONS

Hugo I. de Lasa, London, Canada, assignor to Canadian Patents and Development Limited, Ontario, Canada

Division of Ser. No. 189,404, Apr. 27, 1988, which is a continuation of Ser. No. 702,576, Feb. 19, 1985, abandoned. This application Dec. 22, 1988, Ser. No. 288,158
Claims priority, application Canada, Mar. 5, 1984, 448807
Int. Cl.[5] C07C *1/20*
U.S. Cl. 585—922 1 Claim

1. A pseudoadiabatic process for exothermic catalytic conversion of gasoline constituent forming reactants including C_1 to C_3 alcohols, conducted in a multi-tubular catalytic reactor, wherein the reactor includes a bundle of parallel tubes having inlet and outlet ends and a consistent confined volume of catalyst within each of the tubes along their length, each of said tubes being continuous along its length and independent of all other tubes and having effective reactive regions therein all of essentially the same length as defined by said consistent confined volume of catalyst in each of said tubes, each tube further having an inlet and an outlet side, and means defining a discrete channel along adjacent tubes of the bundle to provide thereby a plurality of channels through the bundle where each tube of the bundle is in contact with a coolant flowing in one or more of said channels, said plurality of channels having an inlet side and an outlet side, wherein said process comprises:

passing said reactants at a known preselected concentration through said bundle of parallel tubes wherein the inlet temperature is high enough to initiate said catalytic conversion throughout said volume of catalyst;

introducing said coolant to said discrete channels at a temperature substantially the same as the inlet temperature of said reactants and passing said coolant through each of said discrete channels in a direction co-current with the direction of flow of said reactants through said bundle of tubes at a preselected flow rate sufficient to substantially match the temperature rise of the catalytic conversion reaction for the partial pressure of reactants selected and the heat transfer characteristics of the catalyst and said tubes so that the coolant is substantially the same temperature as the temperature of the reaction product stream leaving the outlet of the tubes containing the confined volume of catalyst substantially encompassing the reaction time, said outlet temperature not exceeding a preselected maximum temperature suitable for maximum conversion of said reactants into desired reaction product without the need for recycle of the reaction product and unreacted reactants to achieve further conversion;

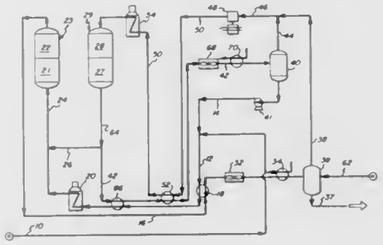
sensing the temperature of reaction products at said outlet side of said tube bundle; and

varying either said partial pressure of reactants or said coolant flow rate to maintain said sensed temperature to said highest temperature level at said outlet side.

4,929,799
ISOMERIZATION PROCESS

Thomas C. Holcombe, South Salem; Thomas C. Sager, Mahopac; Warren K. Volles, Mount Kisco, and Andrew S. Zarchy, Amawalk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 62,762, Jun. 15, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 311,399
Int. Cl.[5] C07C *9/14*
U.S. Cl. 585—737 29 Claims



1. A process for upgrading the octane of a hydrocarbon feed containing non-normal hydrocarbon compounds and normal pentane and hexane by a combined isomerization-adsorption process in the adsorber-lead configuration, comprising:

(a) passing an adsorber feed stream comprising hydrogen, reactor hydrocarbon product and said hydrocarbon feed in vapor phase to an adsorber bed having adsorbent and bed void space during an adsorption step, to adsorb normal hydrocarbons from said adsorber feed stream and produce an adsorption effluent comprising hydrogen and non-normal hydrocarbons wherein the bed void space contains a mixture of hydrogen and unadsorbed adsorber feed comprising non-normal hydrocarbons upon completion of said adsorption step:

(b) passing a hydrogen-rich purge gas through said adsorber bed containing adsorbed normal hydrocarbons and a bed void space containing said mixture of hydrogen and unadsorbed adsorber feed comprising non-normal hydrocarbons during a desorption step to desorb normal hydrocarbons and produce a desorption effluent comprising purge gas and normal hydrocarbons;

(c) passing said desorption effluent through an isomerization reactor in vapor phase to convert at least a portion of the normal hydrocarbons in said desorption effluent to non-normal hydrocarbons and produce a reactor effluent com-

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prising purge gas and reactor hydrocarbon product comprising non-normal and normal hydrocarbons;

(d) recycling a portion of said reactor effluent, without substantial cooling thereof, to provide a portion of said adsorber feed.

(e) separating the remaining portion of said reactor effluent into a hydrogen-rich fraction and a hydrocarbon-rich fraction; and

(f) recycling at least a portion of said hydrogen-rich fraction to provide a portion of said purge gas.

4,929,800

HYDROCARBON CONVERSION AND POLYMERIZATION CATALYST AND METHOD OF MAKING AND USING SAME

Russell S. Drago, and Edward E. Getty, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Division of Ser. No. 113,996, Oct. 29, 1987, Pat. No. 4,798,667, which is a division of Ser. No. 921,688, Oct. 22, 1986, Pat. No. 4,719,190. This application Aug. 9, 1988, Ser. No. 230,017

Int. Cl.[5] C07C *5/13*

U.S. Cl. 585—744 5 Claims

1. In a hydrocarbon conversion process selected from the group consisting of isomerization and alkylation wherein at least one hydrocarbon is contacted with a conversation catalyst under conversion conditions, the improvement comprising contacting aid hydrocarbon with a catalyst prepared by reacting an adsorbent solid containing surface hydroxyl groups with a Lewis acid selected from the group consisting of aluminum halides, antimony halides and mixtures thereof and a halogenated organic solvent selected from the group consisting of CCl_4, $CHCl_3$ and mixtures thereof at a temperature and for a time sufficient for said Lewis acid to react with at least a portion of said surface hydroxyl groups.

4,929,801

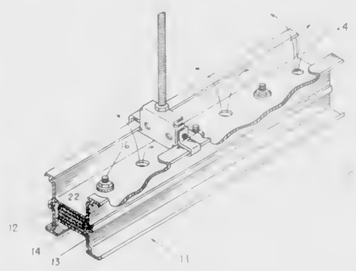
THERMALLY EFFICIENT VENTILATED ELECTRIC BUSWAY SYSTEM

David A. Hibbert, South Windsor, Conn., assignor to General Electric Company, New York, N.Y.

Filed Aug. 30, 1989, Ser. No. 400,904

Int. Cl.[5] H02G *5/06, 5/10*

U.S. Cl. 174—16.2 3 Claims



1. Electric power busway comprising:

a pair of opposing side rail supports;

a plurality of planar bus bars intermediate said side rail supports, said bus bars having a first plurality of longitudinally spaced apertures, each aperture of said first plurality of apertures receiving an insulated bolt holding said bus bars fixedly to said support and said bus bars having a second plurality of longitudinally spaced apertures, said apertures of said second plurality of apertures being unobstructed providing airways for passage of cooling air through said bus bars,

wherein said apertures of said first plurality of apertures have a first diameter and said apertures of said second plurality of apertures have a second diameter larger than said first diameter.

4,929,802

ELECTROMAGNETICALLY SHIELDED CABIN

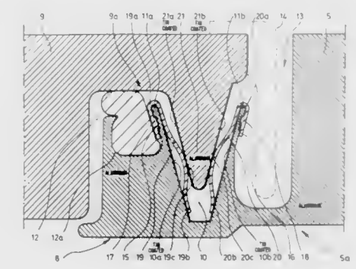
Arno Schaepers, Friedrichshaften, and Bernd Grabherr, Ravensburg, both of Fed. Rep. of Germany, assignors to Zeppelin-Metallwerke GmbH, Fed. Rep. of Germany

Filed Dec. 14, 1988, Ser. No. 284,393

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 8716599[U]

Int. Cl.[5] H05K *9/00*

U.S. Cl. 174—35 MS 9 Claims



1. An electromagnetically shielded cabin with a sealing system for an abutting area between a stationary component and a movable wall component such as a door, a flap, a hatch or a window, said sealing system comprising two spaced, bent contact springs being connected to the one component between which a contact web connected to the other component can be pressed, contact surfaces being in each case formed between the contact web and the contact springs and the contact springs and the one component, at least one of said contact surfaces is comprised of aluminum and in particular, said contact surfaces comprised of aluminum are provided with a coating of tin.

4,929,803

PLANAR CONDUCTIVE PIECE WITH ELECTRICAL ANISOTROPHY

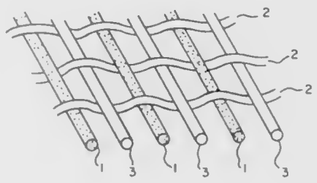
Masaru Yoshida; Mitsuhiko Yoshikawa; Yoshikazu Yoshimoto; Hiroshi Wada; Tomonari Suzuki, and Shigeo Nakajima, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 164,252, Mar. 4, 1988, abandoned. This application Jun. 20, 1989, Ser. No. 370,130

Claims priority, application Japan, Mar. 25, 1987, 62-72892

Int. Cl.[5] H01B *7/08*

U.S. Cl. 174—117 M 10 Claims



1. An electrically anisotropic planar conductive piece capable of simultaneously transmitting mutually independent electrical signals through a plurality of mutually parallel paths in a specified direction, said piece comprising

a first group of conductive lines arranged substantially in said specified direction,

a second group of insulative lines arranged substantially in said specified direction, and

a third group of insulative lines crossing said first and second groups of lines,

said lines all having a diameter no less than 10 micrometers and less than 0.05 millimeter, said first and second groups of lines being arranged together at linear density of more than 10 lines but less than 200 lines per inch, said conductive lines being kept in mutually non-contacting and electrically insulated relationship so as to form mutually insulated current paths.

4,929,804

PUSH BUTTON SWITCH

Nobuyuki Kawai, Gunma, and Mitsuhiro Nakamura, Tokyo, both of Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Filed Dec. 1, 1988, Ser. No. 278,408

Claims priority, application Japan, Dec. 4, 1987, 62-306944

Int. Cl.[5] H01H *21/80, 13/12;* H01C *10/10*

U.S. Cl. 200—5 A 1 Claim

1. A push button switch having a resistance value varying in response to variations in a pressure applied thereto, said push button switch comprising:

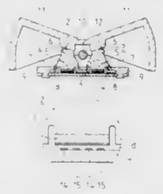
a printed circuit board having electrode patterns;

a pressure-sensitive resistance element to be pressed against said electrode patterns, said pressure-sensitive resistance element comprising a conductive layer coated with a layer of solidified pressure-sensitive conductive paste and molded together by press curing under heat;

an insulated push button comprising a pressing surface at a base portion thereof, two projection portions at an upper portion of said insulated push button, and a flange portion fixed to said printed circuit board, said conductive layer of

said pressure-sensitive resistance element being fixed to said pressing surface and being spaced from said electrode patterns by a predetermined gap, and said two projection portions being separated by a thin portion for allowing vertical movement of said insulated push button;

a button cover having two protrusions adjacent in one-to-one correspondence to said two projection portions, either of said protrusions exclusively pressing against one of



said projection portions when said button cover is pressed by a user;

a shaft between said two projection portions for movably supporting said button cover on said printed circuit board, said button cover being movable in a seesawing motion; and

a supporting member fixed to said printed circuit board such that said flange portion is fixedly sandwiched between said supporting member and said printed circuit board.

4,929,805

GAS DAMPED DECELERATION SWITCH

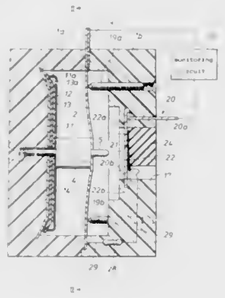
Kazumi Otsubo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1988, Ser. No. 239,894

Claims priority, application Japan, Sep. 4, 1987, 62-135273[U]

Int. Cl.[5] H01H *35/14*

U.S. Cl. 200—61.45 R **8 Claims**



1. A deceleration switch for detecting deceleration of a certain magnitude, comprising:

a casing;

a pair of electrodes having internal ends and external ends;

contact means including a retainer member and a spring leaf connector electrically connected to said internal ends of said electrodes;

a mass supported by said retainer member to move from a rest position to an active position for actuating said contact means under its inertial force when deceleration of a certain magnitude is applied to said mass; and

means for checking an electric conductance pathway including at least one of said retainer member and said spring leaf connector of said contact means and at least one of said pair of electrodes.

4,929,806

HEADLIGHT DIMMER SWITCH DEVICE

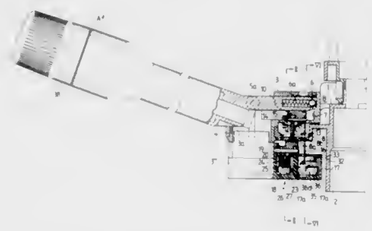
Kenshi Furuhashi, and Hiroyuki Sawada, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 9, 1989, Ser. No. 321,129

Claims priority, application Japan, Mar. 18, 1988, 63-36664[U]

Int. Cl.[5] H01H *9/00, 13/62, 19/00*

U.S. Cl. 200—61.54 **4 Claims**



1. A switch device comprising:

(a) an actuator member having means for moving linearly in a first direction;

(b) an angularly movable member pivotably movable in second and third directions in response to the movement of said actuator member, the direction of angular movement of said angularly movable member alternating between said second and third directions when said actuator member is moved in said first direction;

(c) a first switch of the momentary type having a first movable contact and a pair of first fixed contacts, means for alternately pivoting said movable contact into contact with said pair of fixed contacts to effect a switching operation in response to said angularly movable member changing from said second to third directions and said third to second directions;

(d) a second switch having a second movable contact and a second fixed contact disposed in opposed relation to said second movable contact; and

(e) a cam member having an operation portion engaged with said second movable contact, means for angularly moving said cam member in response to the movement of said actuator member to cause said operation portion to place said second movable contact in contact with said second fixed contact before said first switch is switched, said operation portion being movable a first distance, said first distance being smaller than the distance traveled by said actuator member.

4,929,807

MINIATURE ILLUMINATED ROCKER SWITCH AND CASE THEREFORE

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., Plainville, Conn.

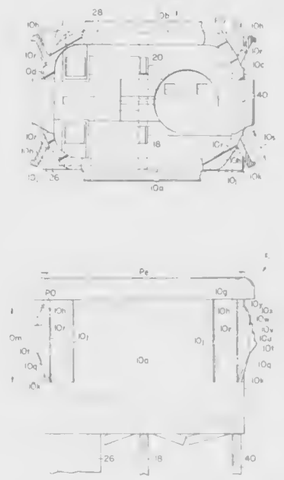
Continuation-in-part of Ser. No. 165,744, Mar. 9, 1988, Pat. No. 4,853,503. This application Feb. 21, 1989, Ser. No. 313,383

Int. Cl.[5] H01H *9/04*

U.S. Cl. 200—296 **17 Claims**

1. A switch case adapted for mounting in a generally rectangular panel opening, said opening having side and end edges, and said panel having a range of thickness, said case comprising an upwardly open generally rectangular housing with first and second opposed pairs of walls associated with said opening side edges and end edges, said walls integrally connected at their adjacent vertical edges to form four corners, said housing having a bottom wall, said pairs of walls having bottom edges integrally joined to said bottom wall, said housing also having an integrally formed outwardly extending peripheral flange,

said first and second pairs of walls having upper edges adjacent said peripheral flange, and four resilient wings integrally connected to the case end walls intermediate the bottom and upper edges thereof, said wings arranged in adjacent pairs and each wing having a root end defining a hinge axis oriented parallel to one of said case corners, each wing having a tip that is adjacent one of said case corners and adapted to be resiliently based to move toward said case end wall during panel mount-



ing, said wings having outer portions that normally extend beyond said case end walls but not beyond the side walls of the switch case so that said outer portions of said wings are adapted to engage the end edges of the rectangular panel opening as a result of which said wings are pivoted about vertical axes spaced inwardly of said switch case corners during the mounting of the switch case in the generally rectangular panel opening.

4,929,808

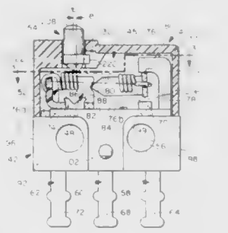
ELECTRICAL SWITCH COMPONENT AND SWITCHES FORMED THEREBY

John O. Roeser, Barrington, and Bruce L. Graham, Schaumburg, both of Ill., assignors to Otto Engineering, Inc., Carpentersville, Ill.

Filed Jun. 13, 1989, Ser. No. 366,146

Int. Cl.[5] H01H *5/08*

U.S. Cl. 200—467 **34 Claims**



19. A snap switch mechanism comprising:

(a) a movable contact means,

(b) switch envelope means formed of insulating material having a first portion and a second portion, said first portion and second portion being cooperable to form an enclosure for said movable contact means;

(c) first, second and third fixed contact means fixedly disposed to said first portion and each respectively having interior and exterior sections, said interior section of said first fixed contact means being an upper contact, means said interior section of said second fixed contact means being a lower contact means, and said interior section of said third contact means being a common contact means, said upper and lower contact means being spaced apart a first distance;

(d) movable contact means mounted on said third contact means for movement between said upper and lower contact means;

(e) coil spring means having a coil diameter and having a first and second ends, said first end being engagable with said movable contact means and said second end being engagable with said third contact means, said coil spring means extending between said movable contact means and said third contact means to bias said movable contact means into engagement with said first fixed contact means;

(f) actuator means movably extending through said second portion for engagement with said coil spring means to cause movement of said movable contact means;

(g) said movable contact means being characterized as being formed solely from sheet metal stock of predetermined thickness and characterized as a stamping having a generally U-shaped con figuration when viewed in a plane substantially transverse to said predetermined thickness, first and second spaced connected by a bail portion, said first and second leg portions being pivotally connected to said third fixed contact means, said bail portion having upper and lower edge portions spaced apart a distance defining a material height, said upper and lower edge portion respectively providing spaced apart upper and lower contact surfaces for engagement respectively with said first and second fixed contact means, said material height substantially greater than and transverse to said predetermined thickness and less than said first distance.

4,929,809

WIRE DRIVE APPARATUS IN A WIRE-CUT ELECTRIC DISCHARGE MACHINE

Toshiyuki Aso, Room 7-208, Fanuc Manshonharimomi, 3539-1, Shibokusa, and Yasuo Arakawa, Fanuc Dai3virakaramatsu, 3527-1, Shibokusa, both of Oshino-mura, Minamitsuru-gun, Yamanashi, 401-05, Japan

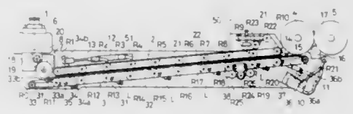
PCT No. PCT/JP88/01052, § 371 Date Apr. 13, 1989, § 102(e) Date Apr. 13, 1989, PCT Pub. No. WO89/03271, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 15, 1988, Ser. No. 340,293

Claims priority, application Japan, Oct. 15, 1987, 62-258271

Int. Cl.[5] B23H *7/02;* **B65G** *15/14;* **B65H** *51/00*

U.S. Cl. 219—69.12 **11 Claims**



1. A wire drive apparatus in a wire-cut electric discharge machine, comprising:

a pair of belt sections for feeding a wire and each having a belt, said pair of belt sections being arranged to be movable relative to each other between a wire extension operating position where said belts are in contact with each other and a retracted position where said belts are out of contact with said wire;

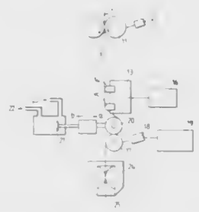
means for causing the relative movement of said pair of belt section between said wire extension operating position and said retracted position;
a pair of rollers disposed downstream from said pair of belt sections for feeding said wire held therebetween;
means for rotatively driving at least one of said pair of rollers; and
means for establishing the operative coupling of said at least one rotatively driven roller with at least one of said pair of belt sections during wire extension so that at least one of said belts is driven in synchronism with rotation of said at least one rotatively driven roller, and for releasing the operative coupling after completion of the wire extension.

4,929,810

WIRE CUT ELECTRIC DISCHARGE MACHINE

Hiroyasu Kawase, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,886
Claims priority, application Japan, Jul. 6, 1988, 63-166947
Int. Cl.[5] B23H *7/10;* **B21F** *11/00*
U.S. Cl. 219—69.12 **7 Claims**



1. A wire cut electric discharge machine comprising:
a wire electrode confronted with a workpiece with a small gap therebetween;
wire electrode feeding rollers driven by a driving motor;
first means for applying a force of tension to said wire electrode to cut said wire electrode, which including controlling circuit having first selecting means for automatically selecting a force of tension which is best for said wire electrode to be cut according to the diameter and kind of said wire electrode;
second means for applying a current to said wire electrode to fuse said wire electrode, which including a cutting portion and a cutting circuit, said cutting circuit having second selecting means for automatically selecting a current which is best for a wire electrode to be cut according to the diameter and the kind of said wire electrode; and
a wire electrode retaining roller coupled to an air cylinder which is moved by receiving air pressure from an air pressure source.

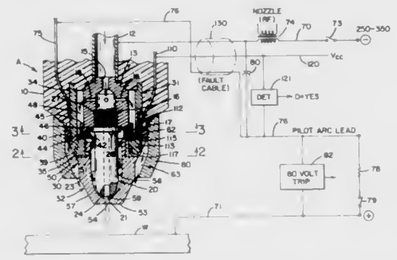
4,929,811

PLASMA ARC TORCH INTERLOCK WITH DISABLING CONTROL ARRANGEMENT SYSTEM

George D. Blankenship, Chardon, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio

Filed Dec. 5, 1988, Ser. No. 280,240
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.54 **48 Claims**

1. A plasma arc torch system for effecting various metal processes on a workpiece comprising:
an electrical power source;
a gas supply source for generating a plasma;
a torch body including an electrode and an insulated, electrically conductive nozzle assembly circumscribing said electrode at a fixed distance therefrom;
fault detect circuit means including a pilot arc lead connected to the nozzle assembly at one end and at its other end to ground for sensing a short circuit between said nozzle assembly and said electrode and disabling said power source in response thereto;
a cable connected to said torch body, a main electrical conductor within said cable connected at one end to said electrode and at its other end to said power source; and
sensing means within said cable detecting a puncture of the cable sufficient to contact said main conductor and in



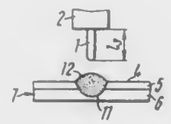
response to said contact actuating said fault detect circuit means to disable said power source; said sensing means including a continuous, electrically conductive shield circumscribing the main conductor and a drain lead in electrical contact with said shield and said pilot arc lead so that a short between the drain lead and main conductor will be sensed and conveyed to pilot arc lead to actuate said fault detect circuit means.

4,929,812

METHOD FOR ELECTRICAL ARC SPOT WELDING WITH CONSUMABLE ELECTRODE

Alfred V. Ivannikov, and Vladimir Z. Abudardin, both of Leningrad, U.S.S.R., assignors to Tsentr Nauchno-Tekhnicheskogo Tvorchestva Molodezhi "ASTRON" , Leningrad, U.S.S.R.

Continuation of Ser. No. 134,783, Sep. 23, 1987, abandoned. This application Sep. 20, 1989, Ser. No. 410,014
Int. Cl.[5] B23K *9/28*
U.S. Cl. 219—137.2 **2 Claims**



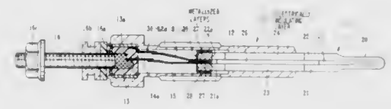
1. A method of electrical arc spot welding with a consumable electrode, comprising securing a consumable electrode (1) in a current carrying device (2), positioning the consumable electrode (1) over a surface (4) of a part (5) to be fused, firing a welding arc (8) between an end face (3) of the consumable electrode (1) and the surface (4) of the part (5) being fused, moving the current carrying device (2) with the consumable electrode secured therein towards the surface (4) of the part (5), and carrying out the welding with the formation of a weld spot (11), wherein the feeding of the consumable electrode (1) to the fusion space (9) is produced by an accelerated movement of the current carrying device (2) in a direction to the surface (4) of the part (5) at a speed exceeding the rate of fusion of the electrode.

4,929,813

GLOW PLUG FOR DIESEL ENGINE

Mitusuke Masaka; Koji Hatanaka; Kenji Maruta, and Seiji Okazaki, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,383
Claims priority, application Japan, May 28, 1987, 62-132085
Int. Cl.[5] F23Q *7/22;* **F02P** *19/02;* **H05B** *3/00*
U.S. Cl. 219—270 **8 Claims**



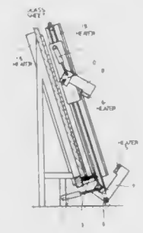
1. A glow plug for a diesel engine, comprising:
an elongated hollow electrically conductive holder;
a rod-like ceramic heater held at a distal end of said hollow holder such that one end of said rod-like ceramic heater extends outside;
an external connecting terminal positioned in the other end of said hollow holder;
an insulating member for electrically insulating said external connecting terminal from said hollow holder; and
a metal pipe positioned between an inner surface of the other end of said hollow holder and said insulating member;
said ceramic heater comprising a U-shaped heating element and a pair of parallel lead portions extending backward from both ends of said U-shaped heating element, said U-shaped heating element and said pair of parallel lead portions being made of a resistive ceramic material and being arranged such that outer surfaces of said lead portions are held by the distal end of said holder through electrical insulating layers between the inner surface of said holder and the outer surface of said lead portions, rear end portions of said lead portions constituting electrode extraction ends and being separated from said holder in said holder, the electrode extraction end of one lead portion being electrically connected to said external connecting terminal through a conductive material, and said electrode extraction end of the other lead portion being electrically connected to said metal pipe, said metal pipe being electrically connected to said holder.

4,929,814

APPARATUS FOR HEATING THE MARGINAL ZONE OF GLASS SHEETS

Peter Lisec, Bahnhofstrasse 34, Amstetten-Hausmening, Austria (A-3363)

Filed Oct. 4, 1988, Ser. No. 252,931
Claims priority, application Austria, Oct. 5, 1987, A252887
Int. Cl.[5] H05B *3/06*
U.S. Cl. 219—388 **5 Claims**



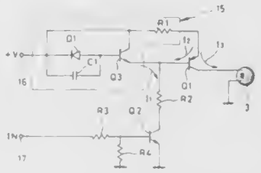
1. Apparatus for heating the marginal zone of glass sheets to which prefabricated spacer strips are to be applied, comprising a lateral support (1) for glass sheets, with a linear conveyor (2) provided at a lower rim of the support (1), said conveyor including a series of conveying rollers (3), with two horizontally aligned, clongated heating elements (5, 6) associated with horizontal marginal zones of the glass sheets, one (5) of the horizontally aligned heating elements (5, 6) being arranged immediately above the linear conveyor (2) and the other one (6) of the horizontally aligned heating elements (5, 6) being movable upwards and downwards (arrow 18) along the lateral support (1), and with an elongated heating device (14) oriented substantially vertically, characterized in that the horizontally aligned heating elements (5, 6) are attached to supports (7, 8) pivotable about horizontal axes (9, 10), so that the heating elements (5, 6) can be swung away from their operative position associated with the glass sheet, and that the elongated heating device (14) is provided beside a vertical rim (13) of the lateral support (1) on a discharge side and includes two mutually facing heating elements (15, 16).

4,929,815

HEATING RESISTOR DRIVING CIRCUIT WHICH SUPPRESSES CURRENT SPIKES

Satoru Takemoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1989, Ser. No. 340,733
Claims priority, application Japan, Apr. 20, 1988, 63-97469
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—501 **3 Claims**



1. A drive circuit for a heating resistor element, comprising:
a first transistor having first, second, and third terminals, said first terminal being connected in series to said heating resistor element relative to a power source terminal;
a second transistor having first, second, and third terminals, said first terminal of said second transistor being connected in series to said second terminal of said first transistor, said second transistor being turned on in response to an actuating signal; and
suppression means, responsive to a conductive state of said second transistor, for raising gradually a base current of said first transistor to a predetermined level, so as to suppress a current spike through the heating resistor element at a beginning of driving said heating resistor element.

4,929,816

ELECTRIC FLASH-BUTT WELDING MACHINE AND METHOD OF PROVIDING A WELDED JOINT BETWEEN ADJACENT ENDS OF RAIL SECTIONS

Josef Theurer, Vienna; Friedrich Oellerer, Linz, and Leopold R. Gruber, Scheibbs, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft GmbH, Vienna, Austria

Filed Jan. 24, 1989, Ser. No. 301,330
Claims priority, application European Pat. Off., Feb. 1, 1988, 88890021.4; Feb. 1, 1988, 88890022.2
Int. Cl.[5] B23K *11/04*
U.S. Cl. 219—53 **23 Claims**

1. A mobile electric flash-butt welding machine for welding together adjacent ends of successive rail sections of a rail of a

track consisting of two rails fastened to successive ties, which comprises

(a) a machine frame,

(b) undercarriages supporting the machine frame on the track for mobility therealong in an operating direction,

(c) a drive for propelling the machine frame along the track, and the machine frame carrying

(d) a hydraulic fluid supply pump means,

(e) an electric current generator,

(f) motor means for operating the pump means and the generator,

(g) a longitudinally, transversely and vertically adjustable electric flash-butt welding head for selectively welding together the adjacent rail section ends of a respective one of the track rails, the welding head comprising

(1) two welding head halves movable towards and away from each other in a direction of the rail,

(2) hydraulic cylinders for moving the two welding head halves in said direction,



(3) a pair of clamping and welding jaws on each welding head half, and

(4) a hydraulic clamping cylinder connecting the jaws of each pair,

(h) a welding control connecting the pump means and generator to the hydraulic cylinders and jaws respectively for hydraulically and electrically operating the clamping and welding jaws, and

(i) an apparatus for tensioning or longitudinally sliding the rail, the apparatus being associated with the welding head for encompassing the welding head in a horizontal plane passing through the rail and comprising

(1) two pairs of rail clamping jaw means for engaging the rail section ends immediately ahead of, and behind, the welding head, and

(2) a hydraulic cylinder-piston arrangement extending in the direction of the rail and comprising respective operating cylinders connecting the pairs of rail clamping jaw means for operation thereof.

4,929,817

ELECTROFUSION JOINT

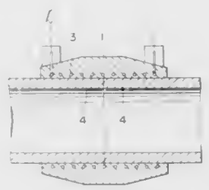
Kazunori Mito, Iwakuni, and Masahiro Hirata, Hiroshima, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,658

Claims priority, application Japan, Jul. 29, 1987, 62-117411[U]

Int. Cl.[5] H05B *3/58*

U.S. Cl. 219—544 **17 Claims**



1. In an electrofusion joint for connecting plastic pipes with each other comprising a molded body, receivable of said pipes, and a metallic heating coil, embedded in said molded body, for application of heat to said molded body and said pipes to thermally fuse said joint and said pipes to one another, the improvement comprising:

(A) providing said metallic heating coil with a substantially non-oxidized surface; and

(B) (1) forming said molded body from an adhesive resin or (2) coating the surface of said metallic heating coil with a substance which has an affinity to both of said molded body and said metallic heating coil.

4,929,818

METHOD AND APPARATUS FOR VENDING A CONTAINERIZED PRODUCT ON MULTIPLE OCCASIONS FOLLOWING AT LEAST ONE REFILL OF THE CONTAINER WITH THE PRODUCT

Harold M. Bradbury; Dwight B. Pfenning, both of Norman; William R. Corlett, Afton, and Roscoe Mays, Jr., Edmond, all of Okla., assignors to Rainbarrel Corporation, Afton, Okla.

Filed Nov. 15, 1988, Ser. No. 271,900

Int. Cl.[5] G06F *15/24*

U.S. Cl. 235—381 **16 Claims**



1. The method of vending a containerized product by selling multiple fillings of the same product in the same container, the container having machine-readable indicia thereon indicative of at least the price of the product, the method comprising:

placing adjacent the indicia at the time of, or subsequently to, placement of said indicia, a stimulus-responsive machine-readable indicator capable of responding to a stimulus to undergo a change of state readable by the machine capable of reading the indicia, and readable conjunctively with said indicia to indicate a price to be charged for the product alone in the refilled container;

then, after initial vending of the container and product, refilling the container with the product at least once while concurrently, during at least the initial refill, stimulating said indicator to cause it to respond to the stimulus by undergoing said change of state, whereby the customer buying a refill of product is charged, on the basis of the subsequent machine reading, only for the product, and not for the container which is refilled.

4,929,819

METHOD AND APPARATUS FOR CUSTOMER PERFORMED ARTICLE SCANNING IN SELF-SERVICE SHOPPING

Donald A. Collins, Jr., Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 12, 1988, Ser. No. 283,116

Int. Cl.[5] G06F *15/84;* **G06K** *19/06*

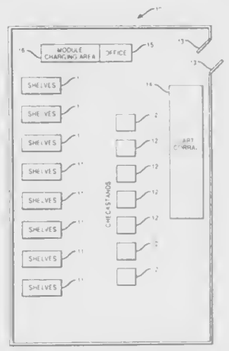
U.S. Cl. 235—383 **27 Claims**

1. A system for self-service selection and purchasing of articles bearing coded indicia in a retail establishment, comprising:

a plurality of customer-operated carts moveable about the retail establishment, each cart including a multi-walled receptacle for receiving and transporting articles having product codes thereon, which articles may be selected for purchase;

a plurality of detachable modules, one for each cart, which are secured to said carts adjacent one end of said receptacle; each said module including a scanner for scanning said product code on said articles, each said module also including video camera means capable of covering a first area to record images of articles being scanned by the scanner and capable of covering a second area to record images of articles being placed in the receptacle; each said module also including data processing means for associating the information scanned by the scanner with the images recorded by the video camera means and for storing such associated information; each said module also including display means for displaying the data scanned by the scanner; and each said module also including a power supply; and

checkout means to which the carts are directed when the purchasing of articles to be placed in their receptacles has been completed; said checkout means including means for receiving the module for each cart; said checkout means also including means for totaling and printing out the information scanned by the scanner and stored by the data processing means of said module; and said checkout means also including means for displaying the video information recorded by the module to enable an operator at the checkout means to verify the correctness of the actions of the customer in scanning and transporting articles to be purchased.



4,929,820

PROCEDURE AND LABEL FOR BAR CODE MARKING ON VULCANIZABLE OR VULCANIZED RUBBER PRODUCTS

Frank Jespersen, Lystrup, Denmark, assignor to Milliken Denmark A/S, Morke, Denmark

Filed Oct. 13, 1988, Ser. No. 257,460

Claims priority, application Denmark, Aug. 1, 1988, 4280/88

Int. Cl.[5] G06K *19/00*

U.S. Cl. 235—487 **6 Claims**

1. Method of bar coding a vulcanizable or vulcanized rubber product with a plurality of different bar code markings comprising the steps of: providing a source of electromagnetic radiation, applying varying wave lengths and levels of radiation from the electromagnetic radiation source onto the surface of the rubber product to form a bar code pattern thereon and controlling the radiation from the electromagnetic radiation source by an electronic control system to cause the electromagnetic source to provide radiation in the wave lengths and levels of energy to form the predetermined bar code pattern on the rubber product.



4,929,821

METHOD OF FORGERY-PROTECTING A DATA CARRIER, A FORGERY-PROTECTED DATA CARRIER AND APPARATUSES FOR HANDLING, PROCESSING AND MONITORING THE DATA CARRIER

Wolfram Kocznar, Innsbruck, and Kurt Wallerstorfer, Strasswalchen, both of Austria, assignors to Skidata Computer G.m.b.H., Gartenau-St. Leonhard, Austria

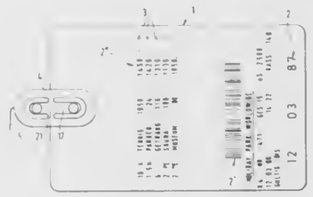
PCT No. PCT/AT87/00017, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/05728, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 12, 1987, Ser. No. 127,895

Claims priority, application Austria, Mar. 12, 1986, 644/86; Mar. 12, 1986, 645/86; Mar. 12, 1986, 646/86; Mar. 12, 1986, 647/86; Mar. 12, 1986, 648/86

Int. Cl.[5] G06K *19/06*

U.S. Cl. 235—493 **34 Claims**



1 Forgery-protected data carrier with physical authenticating features in the form of characteristic inhomogeneities of a magnetic layer of the data carrier, the magnetic layer comprising at least two superimposed films having substantially identical magnetic properties, whereby at least one of said films has localized discontinuities producing said characteristic inhomogeneities.

4,929,822

DETECTION SYSTEM WITH AN OPTICAL ENCODER TO OPTICALLY DETECT DISPLACEMENT AMOUNT OF A MOVABLE DEVICE

Nobuaki Nakamura; Yukimi Hirose, both of Fujieda; Masakatsu Kai, and Makoto Itonaga, both of Yokahama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 22, 1989, Ser. No. 313,672

Claims priority, application Japan, Feb. 22, 1988, 63-37630; Feb. 22, 1988, 63-37631; Feb. 22, 1988, 63-37632; Mar. 17, 1988, 63-64369

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.4 **19 Claims**

1. An optical detection system for detecting a displacement amount of a movable device, comprising:

optical encoder means adapted to be movable in accordance

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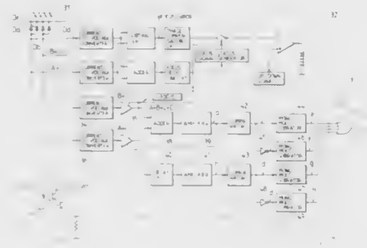
with a movement of said movable device, said optical encoder being composed of at least a light-reflecting layer and having on said light-reflecting layer a plurality of pits formed in geometric convex or concave configuration and successively strung in a predetermined direction;

optical pickup means disposed in opposed relation to said optical encoder means for optical picking up the pit information by irradiating said optical encoder with a light beam and by receiving a reflection light beam from said optical encoder means, said optical pickup means including:

(a) a light-emitting device for emitting the light beam to said optical encoder means;

(b) an optical device for introducing the light beam from said light-emitting device into the pit string to apply a light spot to the pit string; and

(c) a photodetector having a plurality of photosensitive elements for receiving a light beam due to reflection of the light spot applied to the pit string, each of said photosensitive elements generating an electrical signal corresponding to the incident light beam thereon;



focus control circuit means responsive to the electrical signals from said plurality of photosensitive elements of said photo detector and coupled to said optical device for controlling said optical device on the basis of the electrical signals therefrom so that the light beam from said light-emitting device is focused on the pit string of said optical encoder; and detection circuit means responsive to the electrical signals from said plurality of photosensitive elements thereof for detecting information of the movement of said movable device and producing a pit detection signal indicative of the information of the movement thereof, said detection circuit means including:

(a) an adder for obtaining a sum signal of the electrical signals from said photosensitive elements;

(b) a delay circuit connected to said adder to delay said sum signal by a predetermined amount so as to give a predetermined phase difference between said sum signal and the delayed sum signal; and (c) a pit-information generating circuit connected to said adder and said delay circuit so as to produce said pit detection signal on the basis of said sum signal from said adder and the delayed sum signal from said delay circuit.

4,929,823

OPTICAL PICKUP HEAD WITH HOLOGRAPHIC SERVO SIGNAL DETECTION USING A SPOT SIZE DETECTION SYSTEM

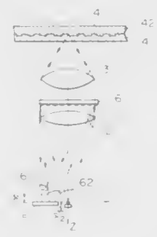
Makoto Kato, Nishinomiya; Tetsuo Saimi, Hirakata, and Shunji Ohara, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 4, 1988, Ser. No. 253,076

Claims priority, application Japan, Oct. 5, 1987, 62-251025; Oct. 5, 1987, 62-251026

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.5 **16 Claims**



1. An optical pickup head apparatus comprising:

a light source for emitting a coherent beam or a quasi-monochromatic beam;

an imaging optics for focusing the coherent beam or quasi-monochromatic beam into a small spot;

a diffraction element, disposed in an optical path on which the coherent beam or semi-monochromatic beam passing through said optics is reflected from a given optical storage medium or diffracted thereby, for producing two wave fronts of the same diffraction order and of different focal points in off-axis directions relative to the optical axis of said optics; and

first and second photodetectors each having a plurality of photodetecting element boundaries extending in an optional direction between one direction coincident with and another direction substantially parallel to a radial line with a center located at a focal point of a 0-order diffraction beam produced from said diffraction element, for receiving said two wave fronts on their coplanar detection surfaces near the different focal points.

4,929,824

LIGHT METERING DEVICE WITH DETECTOR MATRIX AND MEAN VALUE DETECTION

Takao Miyazaki, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 24, 1989, Ser. No. 315,113

Claims priority, application Japan, Feb. 26, 1988, 63-43453; Feb. 26, 1988, 63-43454; Mar. 11, 1988, 63-57965

Int. Cl.[5] H01J *40/14*

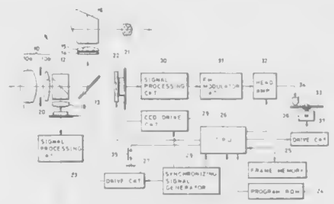
U.S. Cl. 364—525 **9 Claims**

1. A light metering device comprising:

light detecting means consisting of a plurality of light detecting elements arranged in a matrix for defining a plurality of light metering areas different in area in an image field in such a manner as to contain a smaller light metering area within a larger light metering area;

calculating means for obtaining a mean brightness value of each light metering area by calculating an arithmetic mean value of outputs from light detecting elements corresponding to each of said plurality of light metering areas; and

determining means for comparing the difference of mean brightness value between two of each said plurality of light metering areas with a predetermined certain value given for each said two light metering areas to determine lighting conditions under which a subject exists.



4,929,825

MEANS FOR DETECTING DAMAGE TO THE CARD CONNECTING THE PHOTOSENSOR AND MAIN BODY PULSIMETER

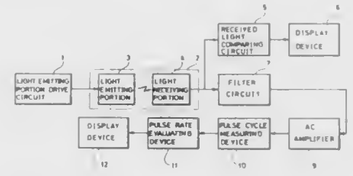
Hachiro Maeyama, Nara, Japan, assignor to Tsuyama Mfg. Co., Ltd., Osaka, Japan

Filed Aug. 8, 1988, Ser. No. 230,294

Claims priority, application Japan, Aug. 7, 1987, 62-121946[U]

Int. Cl.[5] G01V *9/04*

U.S. Cl. 250—221 **7 Claims**



1. A pulsimeter comprising:

a pulse sensor portion including a photosensor formed by a light emitting portion and a light receiving portion, said photosensor adapted for contact with a human body,

a main body for measuring pulse of the human body based on a quantity of light received by said light receiving portion, means connecting the photosensor and the main body, and

indication means for indicating when said quantity of light exceeds a predetermined value, to give an indication of damage to the means connecting the photosensor and the main body.

4,929,826

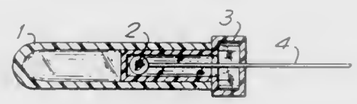
MOUTH-OPERATED CONTROL DEVICE

Joseph Truchsess, 11 Windward La., City Island, N.Y. 10464, and Michael Matthews, 245 E. 63rd St., New York, N.Y. 10021

Filed Sep. 26, 1988, Ser. No. 249,709

Int. Cl.[5] G01V *9/04*

U.S. Cl. 250—221 **13 Claims**



10. A method for performing machine control function by use of the machine operator's mouth movements, comprising positioning an electronic light-sensitive element relative to the operator for receiving a portion of the ambient light energy present within the mouth of the operator, and using the output of said element to control said machine function.

4,929,827

INTELLIGENT PALLET

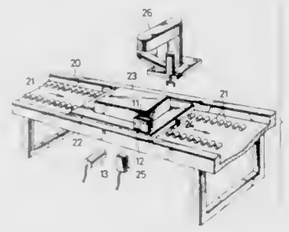
Takahide Nakayama, Kumamoto, Japan, assignor to Hirata Industrial Machineries Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,801

Claims priority, application Japan, Dec. 14, 1987, 62-189797[U]

Int. Cl.[5] G01N *9/04*

U.S. Cl. 250—223 R **3 Claims**



1. An intelligent pallet comprising a memory unit, a light emitter means and a data processing unit disposed in remote, cooperative relation with said light emitter means, said memory unit comprising a photoelectric voltage converter and an electric cell, said voltage converter powering only data for processing, said voltage converter being activatable to receive and convert a light energy emitted from said emitter means into an electric energy and to send said electric energy to said processing unit thereby effecting a series of operation including receiving, transmitting, recording, reading out a stream of data, external to said memory unit, said cell being operable to generate an electric energy solely for storage of the data.

4,929,828

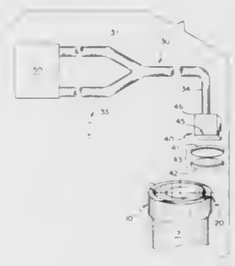
INSPECTING GLASS CONTAINERS FOR LINE-OVER FINISH DEFECTS WITH BIFURCATED FIBER OPTIC BUNDLE

Mark P. Claypool, Horseheads, N.Y., assignor to Embart Industries, Inc., Hartford, Conn.

Filed Feb. 29, 1988, Ser. No. 161,623

Int. Cl.[5] G01N *9/04;* **B07C** *5/00*

U.S. Cl. 280—223 B **19 Claims**



1. Apparatus for optically inspecting the sealing surface of glass containers, comprising:

a scanning head, comprising a bifurcated fiber optic bundle including sender and receiver bifurcations respectively containing sender and receiver optical fibers, and a joined portion containing said sender and receiver fibers, said joined portion terminating at a probe end;
a light source for illuminating the sender fibers;
a lens system for imaging the light emitted from the probe end onto said sealing surface, and for transmitting light reflected by said sealing surface toward said probe end; and
processing means for producing output signals essentially representative of the intensity of light transmitted by the receiver fibers;
said sealing surface substantially defining a plane, and the probe end located substantially along a perpendicular to the sealing surface plane at the location where said light from the probe end is imaged on said surface.

4,929,829

METHOD FOR DETECTING FLOODING OF A SURFACE

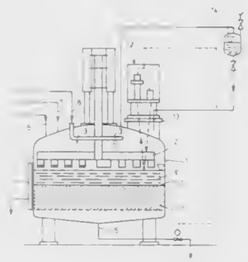
Hubert Dedden, Waldbroel-Hermesdorf; Eckhard Gieger, Leverkusen, and Christian Lauer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,443

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828821

Int. Cl.[5] G01N *15/06*

U.S. Cl. 250—208.4 **8 Claims**



1. A method for detecting the point of immersion or emergence of a solid or porous body into or out of a liquid, comprising
(a) generating surface waves in the liquid,
illuminating the surface of the liquid and scanning the reflected light photoelectrically,
(c) detecting only an alternating light component of the reflected light and
(d) comparing the alternating light signal component with a preset threshold value and generating a control signal when the actual value falls below or exceeds the threshold value.

4,929,830

FIBER-OPTIC ELECTRIC FIELD SENSOR WITH PIEZOELECTRIC BODY SENSOR

Klaus Bohnert, Niederrohrdorf; Meinolph Kaufmann, Baden, and Jürgen Nehring, Wettingen, all of Switzerland, assignors to Asea Brown Boveri AG, Baden, Switzerland

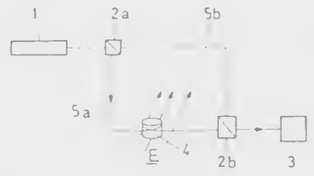
Filed Nov. 4, 1988, Ser. No. 267,299

Claims priority, application Switzerland, Nov. 5, 1987, 4322/87; May 2, 1988, 1628/88

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.14 **10 Claims**

1. Fiber-optic sensor for measuring a predetermined directional component of an electric field, comprising
(a) a piezoelectric body (**4**) and
(b) a glass fiber (**5***a*) which is rigidly connected to the piezoelectric body (**4**) in a given length section, and
(c) means for detecting a change in the length of the glass fiber (**5***a*),
wherein
(d) the piezoelectric body (**4**) has the shape of a disk,
(e) the glass fiber (**5***a*) is attached to a disk edge (**6**) in the given length section,



(f) the piezoelectric body (**4**) belongs to one of crystal classes C2v, C4v, C4, C3, C3v, C6, C6v, C∞, C∞v, C2, D3, D3h,
(g) a disk normal is parallel to the predetermined directional component, and
(h) the crystallographic orientation, given by a crystallographic axis of rotation which is parallel to the disk normal is selected as follows:

TABLE IV

Crystal class (Schoenflies [international])	Axis of rotation parallel to the disk normal
C2 [2]	2-fold axis
C2v [2 mm]	2-fold axis
C3 [3]	3-fold axis
C3v [3 m]	3-fold axis
D3 [32]	2-fold axis
D3h [62 m]	2-fold axis
C4 [4]	4-fold axis
C6 [6]	6-fold axis
C∞ [∞]	∞-fold axis
C4v [4 mm]	4-fold axis
C6v [6 mm]	6-fold axis
C∞v [∞ mm]	∞-fold axis.

4,929,831

ELECTRON BEAM APPARATUS FOR TESTING INFRARED DETECTORS IN A CRYOGENICALLY SHIELDED ENVIRONMENT

Larry D. Flesner, San Diego; Welsey L. Eisenman; James D. Merriam, both of Del Mar; Richard L. Bates; Rolf N. Dahle, both of San Diego, all of Calif., and Douglas C. Arrington, Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

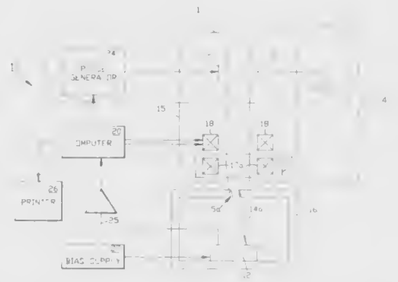
Filed Dec. 8, 1988, Ser. No. 282,717

Int. Cl.[5] H01J *37/252*

U.S. Cl. 250—307 **10 Claims**

1. An apparatus for testing an infrared detector in a shielded environment, comprising:
first means for shielding said detector from infrared radiation having a wavelength of at least 1 micrometer;

second means for propagating a selectively focusable and directable electron beam upon said detector; and



third means operably coupled to said detector for detecting a response of said detector to exposure to said beam.

4,929,832

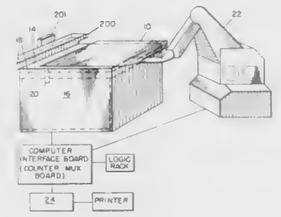
METHODS AND APPARATUS FOR DETERMINING DISTRIBUTIONS OF RADIOACTIVE MATERIALS

Robert S. Ledley, 1002 LaGrande Rd., Silver Spring, Md. 20903

Continuation of Ser. No. 170,042, Mar. 11, 1988, abandoned, which is a continuation of Ser. No. 797,725, Nov. 13, 1985, abandoned. This application Dec. 27, 1988, Ser. No. 291,393

Int. Cl.[5] G01T *1/00*

U.S. Cl. 250—328 **9 Claims**



5. Apparatus for determining the distribution of a radioactive material in a medium which is in the form of a narrow elongated track, said radioactive material comprising a radioactive isotope which emits radiation, said apparatus comprising:
(a) first means for supporting a plurality of identical radiation detectors at a set of predetermined locations spaced along the length of the track, said radiation detectors being arranged in a straight line, said predetermined locations being equally spaced from one another, center to center, by a distance D, and each of said detectors producing an electrical output indicative of the amount of radioactive material in each said band in the vicinity of the detector;
(b) second means for receiving the medium containing the radioactive material;
(c) third means for moving the first and second means relative to one another in a step-like manner only along a path parallel to the straight line and parallel to the long axis of the track so as to position the medium and radioactive bands relative to the detectors at a plurality of predetermined positions which are equally spaced from one another by a distance d, the spacing D between the predetermined locations being several times greater than the spacing d between the predetermined positions, the total relative movement of the first and second means being equal to the spacing D between the predetermined locations; and
(d) fourth means for simultaneously recording the electrical output of each of the detectors after each step at each of the predetermined positions.

4,929,833

FEEDBACK STABILIZED DIGITAL INFRARED DETECTOR CIRCUIT

Edgar M. Smith, Millersville, Pa., assignor to Burle Technologies, Inc., Wilmington, Del.

Filed Mar. 17, 1989, Ser. No. 324,680

Int. Cl.[5] G01J *5/22*

U.S. Cl. 250—338.1 **6 Claims**



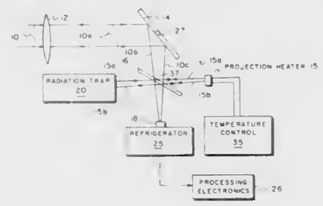
1. A digital control circuit operated by changes of radiation received by an infrared detector comprising:
an infrared detector with first and second terminals which varies the current flowing through it based upon variations of radiation within its field of view with its first terminal interconnected with a circuit return;
a first capacitor with first and second terminals the first terminal being connected to the second terminal of the infrared detector;
a diode with a positive and a negative terminal and its negative terminal connected to the junction of the first capacitor and the infrared detector;
a digital clock generator generating a clock pulse;
a sample pulse generator connected to the output of the clock generator and generating a sample pulse synchronized to the clock pulse, the sample pulse being of sufficient voltage, current and pulse length to charge the first capacitor to a measurable voltage during the sample pulse length, and the sample generator pulse output being connected to the positive terminal of the diode;
a first logic circuit, with an input and an output, which generates an output pulse on its output when the voltage on its input is raised to a specific level, the input of the first logic circuit being connected to the positive terminal of the diode and the output being interconnected with the second capacitor terminal;
a reference pulse generator connected to the output of the clock generator and synchronized with the sample pulse generator, the reference pulse generator producing a reference pulse which begins during the sample pulse; and
a trigger circuit, one input connected to the output of the reference pulse generator and another input to the output of the first logic circuit, the trigger circuit generating a signal on a first output to activate an external control circuit when the reference pulse and the output of the first logic circuit deviate in time by more than a preselected amount.

4,929,834

THERMAL MASK FOR CRYOGENIC DETECTORS IN A THERMAL IMAGING DEVICE

Wilbur Liebson, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 20, 1976, Ser. No. 726,369
Int. Cl.[5] G01J *1/00;* **G02B** *27/00*
U.S. Cl. 250—352 **10 Claims**



1. A thermal mask for masking radiation from cryogenic detectors comprising in a thermal imaging device:
an array of cryogenic detectors;
optical means comprising a primary optical path for focusing infrared radiation from a scene onto said array of cryogenic detectors;
a beam splitter positioned in said primary optical path in front of said array of cryogenic detectors;
a temperature control means;
a projection heater for generating heat radiation therefrom that is temperature controlled by said temperature control means, wherein said projection heater is positioned to one side of said beam splitter at a distance from said beam splitter that is about the same as the distance of said array of cryogenic detectors from said beam splitter and further wherein the physical size of a heater surface which emits heat radiation from said projection heater is about the physical size of said array of cryogenic detectors whereby said heat radiation from said projection heater is projected onto said beam splitter in a geometrical size that masks cold spot radiation from said array of cryogenic detectors that is projected onto said beam splitter; and
a radiation trap positioned on the opposite side of said beam splitter from said projection heater wherein said radiation trap receives and completely dissipates the portion of said heat radiation that is transmitted through said beam splitter and wherein the remaining portion of said heat radiation is reflected off said beam splitter along the same cross-sectional area of said primary optical path as the cross-sectional area of said cold spot radiation along said primary optical path for masking said cold spot radiation from any black hole radiometer capable of detecting said cold spot radiation.

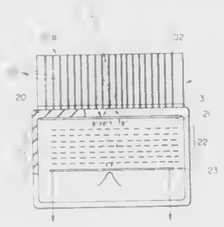
4,929,835

POSITION-SENSITIVE RADIATION DETECTOR

Takaji Yamashita, and Hiroshi Uchida, both of c/o Hamamatsu Photonics Kabushiki Kaisha, No. 1126-1, Ichino-cho, Hamamatsu-shi, Shizuoka, Japan

Filed Apr. 11, 1986, Ser. No. 850,775
Claims priority, application Japan, Apr. 12, 1985, 60-78929; May 28, 1985, 60-114790
Int. Cl.[5] G01T *1/202*
U.S. Cl. 250—367 **16 Claims**

2. A position-sensitive radiation detector comprising:
a scintillator plate comprising a plurality of scintillator elements formed from scintillator material having a high atomic number and having polished side surfaces, a roughly-ground incident end face for receiving incident radiation, and a polished output end face for emitting scintillation light in response to radiation incident upon said incident end face;
a light incident position detecting tube having a photocathode opposite to said output end faces for emitting photoelectrons in response to said scintillation light emitted from said output end faces of said plurality of scintillator elements, said photoelectrons being emitted from locations on said photocathode corresponding to the position of said scintillator elements in said plate which receive said radiation;



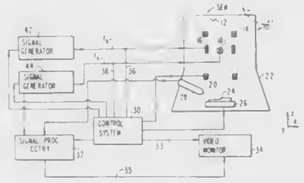
a photomultiplier for multiplying said emitted electrons;
an incident electron detecting unit for receiving said electrons from said photomultiplier and for outputting a position signal representing in two dimensions the generation position of said electrons emitted from said photocathode; and
an arithmetic unit for processing said position signal to generate a distribution output indicating the position and intensity of radiation incident upon said scintillator plate.

4,929,836

FOCUSING IN INSTRUMENTS, SUCH AS SEMS AND CRTS

Albert Sicignano, Mount Kisco, and Mehdi Vaez-Iravani, Peekskill, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 151,367, Feb. 2, 1988, Pat. No. 4,845,362. This application Apr. 3, 1989, Ser. No. 333,059
Int. Cl.[5] H01J *37/21*
U.S. Cl. 250—397 **4 Claims**



1. A method of image focusing comprising the steps of
directing an electron beam to a focus at an edge of an object surface,
generating a spatial differential signal by superimposing an oscillating local deflection field on said electron beam to optimize said focus at a variation of said object surface, and
determining a minimum spot size of said electron beam.

4,929,837

METHOD FOR DETECTING PINHOLES AND INCOMPLETE COVERAGE OF HERMETIC COATINGS ON OPTICAL FIBER WAVEGUIDES

Sam DiVita, West Long Branch, N.J., and Howard E. Rast, Jr., Solana Beach, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 23, 1987, Ser. No. 29,125
Int. Cl.[5] G01N *21/64, 21/88*
U.S. Cl. 250—461.1 **13 Claims**



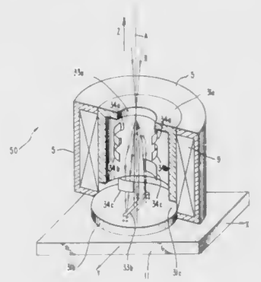
13. A method of detecting the coverage of a hermetic coating over a member having light transmissive properties comprising:
providing a fluorescent material in the member;
exciting the fluorescent material to emit fluorescence in response to energy radiated in a cladding mode; and
detectiing levels of emitted fluorescence along the length of the member to indicate where the hermetic coating is incomplete and where the hermetic coating has pinholes.

4,929,838

MAGNETIC OBJECT LENS FOR AN ELECTRON BEAM EXPOSURE APPARATUS WHICH PROCESSES A WAFER CARRIED ON A CONTINUOUSLY MOVING STAGE

Hiroshi Yasuda, Yokohama, Japan, and Masahiko Suzuki, deceased, late of Aichi, Japan (by Yoshikazu Suzuki, Fumie Suzuki, heirs), assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 14, 1989, Ser. No. 310,347
Claims priority, application Japan, Feb. 16, 1988, 63-033088
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.2 **23 Claims**



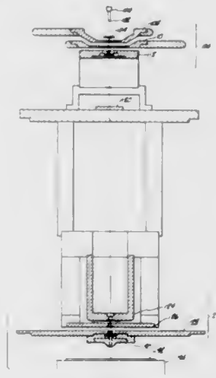
1. An electron beam exposure apparatus for projecting an electron beam onto an object which is continuously moving in a moving direction, by scanning the electron beam in a predetermined scanning space extending in a scanning direction, comprising:
a movable stage having a surface for supporting the object, said stage being substantially continuously movable in the moving direction;
a magnetic lens system including:
means for emitting electrons;
means for focusing the electrons into an electron beam, said focusing means having a magnetic object lens comprising.
a coil for generating magnetic flux;
an upper pole piece made of magnetic material and positioned adjacent said coil; and
a lower pole piece made of magnetic material, positioned adjacent said coil and disposed to face the object, said lower pole piece having an opening coincident with the predetermined scanning space of the electron beam, the electron beam passing through said opening, said lower pole piece substantially preventing magnetic flux generated by said lens from reaching said stage; and
means for deflecting the electron beam.

4,929,839

FOCUSED ION BEAM COLUMN

Norman W. Parker, Westlake Villiage, and William P. Robinson, Newbury Park, both of Calif., assignors to MicroBeam Inc., Newbury Park, Calif.

Filed Oct. 11, 1988, Ser. No. 256,005
Int. Cl.[5] H01J *37/08*
U.S. Cl. 250—492.3 **2 Claims**



1. A focused ion beam column capable or operation over a wide range of final beam voltages, wherein the particular operating range can be changed by a sample modification of the column design, where a large working distance between the column and target surface allows for installation of imaging and/or charge neutralization optics, and comprising:
a high intensity ion source for emitting a first ion beam along the optical axis of said column, wherein said first ion beam may contain a plurality of ion species,
a first electrode adjacent to said ion source for extracting ions from said ion source,
a target onto which said ion beam is to be focused and scanned in a controlled manner,
a beam-defining aperture for determining the acceptance angle of said ions into the portion of the column beyond said aperture,
an upper focusing means for imaging said ion source into an intermediate crossover, and wherein the exit beam voltage relative to said ion source is kept constant and is substantially increased over the entrance beam voltage, independent of variations in said entrance beam voltage,
a lower focusing means for imaging said intermediate cross-

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over onto the surface of said target, wherein the entrance beam voltage relative to said ion source is kept constant end equal to said exit voltage from said upper focusing means, and the exit beam voltage is higher, lower, or equal to said entrance beam voltage, depending on the requirements for the final beam energy, said lower focusing means comprising an electrostatic round lens having first, second, and third electrodes, wherein the third electrode of said electrostatic round lens is movable in the x-y directions transverse to said optical axis to align said third electrode with the first and second electrodes of said electrostatic round lens,

a constant high voltage enclosure between the exit of said upper focusing means and the entrance of said lower focusing means, wherein the beam voltage relative to the ion source is constant and equal to said exit voltage from said upper focusing means,

a main deflector means for deflecting said ions in a controlled manner across said target surface.

4,929,840

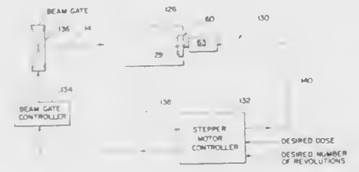
WAFER ROTATION CONTROL FOR AN ION IMPLANTER

Jerald P. Dykstra, and Andrew M. Ray, both of Austin, Tex., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 28, 1989, Ser. No. 317,226

Int. Cl.[5] H01J *37/08*

U.S. Cl. 250—492.3 **6 Claims**



1. In an ion implanter comprising a vacuum chamber, wafer-receiving support means within said vacuum chamber, means for directing a beam of ions onto a wafer received on said support means, said support means maintaining said wafer in position to continuously intercept said beam of ions, and means for rotating said support means in discrete steps about an axis coinciding with an axis normal to and intersecting the surface of a wafer received on said support means; means for controlling the dose implanted in said wafer comprising means for measuring the dose of ions implanted in a wafer received on said support means, means for interrupting the beam of ions received by the wafer, and control means operable to receive dose information signals from said dose measuring means and to transmit signals to said rotating means to provide stepwise rotation of said support means in response to said dose information signals.

4,929,841

DYNAMIC INFRARED TARGET

David B. Chang, Tustin, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 26, 1988, Ser. No. 249,143

Int. Cl.[5] G02F *2/00*

U.S. Cl. 250—504 R **15 Claims**

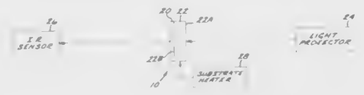
1. A dynamic infrared target system for producing desired infrared images, comprising:

an image light projector for projecting a light image representative of a desired infrared image; and

an infrared target comprising:

(i) a substrate transparent to infrared radiation and disposed with respect to said projected light image so that said light image impinges on a first surface of said substrate; and

(ii) a thin film of a photo-conductive material formed on a second surface of said substrate and having a thickness



comparable to the skin depth of the infrared wavelength of interest;

whereby said light image impinges on said thin film photo-conductive material and causes a change in emissivity to occur in said thin film material.

4,929,842

ELECTRO-OPTICAL MEASURING AND TRANSMISSION DEVICE USING OVERLOAD AND OVERVOLTAGE PROTECTION CIRCUITS

Jan L. ter Hasebrg, Buchholz; Joachim Nedwig, Ulm, and Klaus-Dieter Kruse, Vögelsen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 12, 1989, Ser. No. 352,547

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 8809093[U]

Int. Cl.[5] G02B *27/00*

U.S. Cl. 250—551 **11 Claims**



1. An electro-optical measuring and transmitting device comprising:

a signal input configured for receiving electrical signals from a sensor responsive to an electromagnetic field;

a signal output for providing signals to a signal receiving device;

an electro-optical transducer connected to said signal input for evaluating said signals and providing a corresponding light signal at said signal output,

a voltage supply for providing an operating voltage for said transducer;

an overload protection circuit connected between said voltage supply and said transducer; and

an overvoltage protection circuit, connected between said signal input and said transducer, for protecting said transducer from excessive voltage signals.

4,929,843

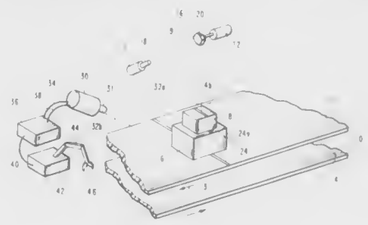
APPARATUS AND METHOD FOR DETERMINING A DIMENSION OF AN OBJECT

Thomas A. Chmielewski, Jr., Southampton Township, Bucks County, Pa., and Richard J. Tarzaiski, Magnolia Borough, Camden County, N.J., assignors to General Electric Company, Morrestown, N.J.

Filed Jun. 28, 1989, Ser. No. 372,580

Int. Cl.[5] G01N *21/86;* **G01B** *11/24;* **H04N** *7/18*

U.S. Cl. 250—561 **21 Claims**



1. A method for determining the centroid of an imaged feature, comprising the steps of:

generating line scan digital video representative of the feature, in which said feature extends over several adjacent pixels in the line scan direction;

storing the magnitude of the historic maximum value of said digital video under the control of a strobe; continually comparing a current value of said digital video with the stored historic maximum value, and generating said strobe when said current value exceeds said stored historic value, whereby said stored historic value is updated to represent the current value at the occurrence of each strobe;

multiplying the values of each of selected pixels of said digital video by a predetermined constant to produce first products, and summing said first products to produce a sum-of-intensities signal, said selected pixels being adjacent that pixel representing said historic maximum;

multiplying said values of each of said selected pixels by a selected multiplier to thereby produce second products, the values of said selected multipliers being monotonically related to the positions of the associated selected pixels, and summing said second products to produce a sum-of-weighted intensities signal; and

transmitting said sum-of-intensities and sum- o of-weighted intensities signals to a ratio calculator;

in response to the beginning of each said line scan, initiating pixel-rate counting;

in response to said strobe, storing the count resulting from said pixel-rate counting, to produce a position signal representative of the position of the pixel at which said historic maximum occurs; and

transmitting said position signal representing the position of the pixel at which historic maximum value occurs.

4,929,844

APPARATUS FOR DETECTING THE PRESENCE AND SIZE OF A DOCUMENT

Yuji Houjiyou, Hashima; Hiroyuki Hayasaki, Ogaki, and Kyoichi Yonezawa, Tottori, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 18, 1988, Ser. No. 272,957

Claims priority, application Japan, Nov. 20, 1987, 62-294857

Int. Cl.[5] G01N *21/86*

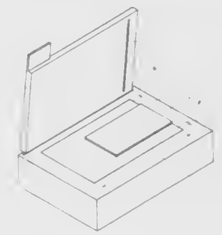
U.S. Cl. 250—561 **15 Claims**

1. A reading apparatus which automatically detects the presence or absence of a document on a document table, comprising;

a light source which illuminates said document table;

a collecting means which collects information about light intensity of said document table;

a comparing means which compares said information when said light source is off with that when said light source is on; and



means for determining the presence or absence of a document on said document table in accordance with the result of comparison executed by said comparing means.

4,929,845

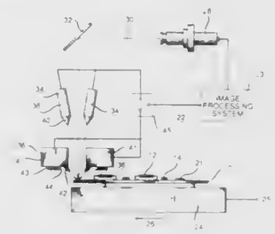
METHOD AND APPARATUS FOR INSPECTION OF SUBSTRATES

Israel Amir, and Frank P. Higgins, both of Ewing, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 27, 1989, Ser. No. 316,004

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—561 **7 Claims**



1. A method of fabricating a substrate comprising the steps of:

placing at least one of a first type and at least one of a second type of component, having electrically conductive members, on a substrate so that each of the components has its conductive members in registration with corresponding metallized areas on the substrate;

adhering the first and second types of components to the substrate; and

soldering the conductive members of the components to the substrate, characterized in that prior to the soldering step, the substrate is inspected to detect whether any of the first and second types of components are missing or misaligned, the inspection being accomplished by the steps of:

(a) illuminating the substrate with top light by directing light at the surface of the substrate so the light strikes the board substantially normal to the plane of the substrate surface to enhance the image of the conductive members of the first type of component;

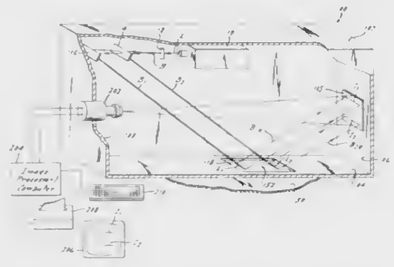
(b) capturing, with a linescan camera, the image of a thin strip of area running across the surface of the substrate;

(c) imparting a relative motion between the substrate and the linescan camera so the camera captures the image of successive strips of surface area running across the board;

(d) storing the captured images for subsequent processing to

determine if any of the first type of component are missing or misaligned;
(e) illuminating the substrate with side light by directing light at the substrate at a grazing angle wth respect to the surface to enhance the image of the conductive members on the second type of component;
(f) imparting a relative motion between the substrate and the linescan camera so the camera captures the image of successive strips of surface area running across the substrate; and
(g) storing the captured images for subsequent processing to determine if any of the second type of component are missing or misaligned.

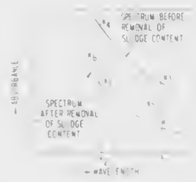
4,929,846
SURFACE QUALITY ANALYZER APPARATUS AND METHOD
Tahir M. Mansour, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Oct. 5, 1988, Ser. No. 253,453
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—571 **36 Claims**



1. An apparatus for simultaneously projecting a pair of light beams onto a test surface and imaging the reflected beams or quality analysis, comprising
means for generating a collimated beam of monochromatic light energy;
means for diverging said collimated beam in a single plane, splitting said diverging beam into at least one pair of beams and directing said beams towards said test surface;
means providing a housing for mounting said generating means and said diverging, splitting and directing means in a predetermined orientation and including an opening through which said beams can impinge upon a test surface located adjacent said housing;
screen means located within said housing for imaging the monochromatic light reflected from said test surface; and
means for recording the images on said screen means and analyzing the recorded images to categorize the quality of the test surface against predetermined levels of quality.

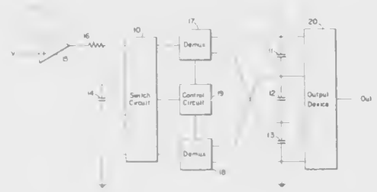
4,929,847
RAPID DETERMINATION OF SLUDGE CONTENT AND DEVICE THEREFOR
Seigo Yamazoe; Sadao Nakai, and Yukimasa Fukui, all of Saitama, Japan, assignors to Cosmo Oil Co., Ltd., Tokyo, Japan
Filed May 4, 1989, Ser. No. 348,742
Claims priority, application Japan, May 9, 1988, 63-110512; Nov. 1, 1988, 63-274383
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—573 **10 Claims**

1. A method for determining a sludge content in a heavy hydrocarbon oil, which comprises the steps of:
(A) measuring absorbances of a heavy hydrocarbon oil sample having an oil film thickness of from about 0.01 to 5 mm at two different wavelengths selected from the visible light region of from 500 to 1000 nm; and



(B) determining a sludge content of the sample by comparing the two measured absorbances according to the relationship between known sludge contents and absorbances at the two wavelength.

4,929,848
HIGH ACCURACY REFERENCE LADDER
Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890
Filed Jan. 31, 1989, Ser. No. 304,510
Int. Cl.[5] H03K *3/53*; G06F *1/00*
U.S. Cl. 307—246 **11 Claims**

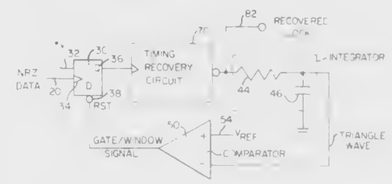


1. Reference apparatus for providing reference signals, comprising:
an input capacitive means for storing a base signal;
a source means for charging the input capacitive means;
a switch means having outputs, for coupling the input capacitive means to these outputs or to the source means;
an output capacitive means having a plurality of terminals for providing the reference signals; and
a selective means for selecting at least a pair of the output capacitive means terminals and coupling the switch means outputs thereto.

4,929,849
NOISE SUPPRESSION IN RECOVERY OF CLOCK FROM NRZ DATA
Christopher R. Paul, Bayport, N.Y., assignor to Coherent Communications Systems Corp., Hauppauge, N.Y.
Filed Dec. 9, 1988, Ser. No. 283,148
Int. Cl.[5] H03K *5/08, 5/153*
U.S. Cl. 307—269 **11 Claims**

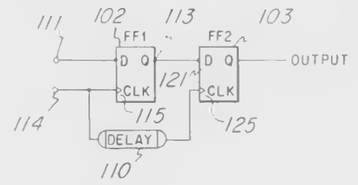
1. A clock generator for extracting a clock signal from a data signal, comprising:
a timing recovery circuit operable to produce a recovered clock signal substantially synchronized with transitions occurring at an input to said timing recovery circuit, the timing recovery circuit being operable to seek and find a constant phase relationship between the data signal and the recovered clock signal during phase excursions of the data signal;
a triangle wave generator responsive to the recovered clock signal, the triangle wave generator producing a triangle wave from the recovered clock signal;

a comparator operable to compare the triangle wave to a reference voltage, and to produce an output at one of two discrete levels as a function of relative levels of the triangle wave and the reference voltage; and,



a gate operable to generate a data transition flag which is supplied to the timing recovery circuit only when the comparator output is at one of said two levels, thereby defining a gate window, the gate window defining a maximum phase excursion for valid transitions in the data.

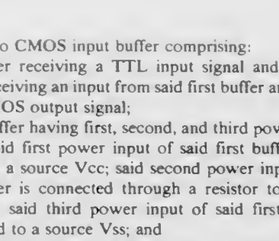
4,929,850
METASTABLE RESISTANT FLIP-FLOP
Robert K. Breuninger, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 17, 1987, Ser. No. 98,093
Int. Cl.[5] H03K *3/284, 17/16*
U.S. Cl. 307—272.1 **5 Claims**



1. A circuit comprising: a first flip-flop circuit having, clock and output terminals;
a second flip-flop circuit having input, clock and terminals;
each of said flip-flops having stable high and stable low logic states and each having propagation and set up times;
the output terminal of the first flip-flop connected to the input terminal of the second flip-flop; and
a clock delay connected between the first clock terminal and the second clock terminal for delaying a clock input received at the first clock terminal a predetermined time; wherein the sum of the propagation time of the first flip-flop and the set up time of the second flip-flop is less than the clock delay.

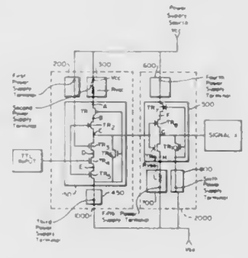
4,929,851
DATA LIMITER FOR A RADIO PAGER
Gary L. Pace, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 23, 1989, Ser. No. 299,180
Int. Cl.[5] H03K *5/08*
U.S. Cl. 307—359 **25 Claims**

1. A data limiter, comprising:
comparison means having a first input for receiving a first signal and a second input for receiving a reference signal;
first and second transconductance amplifiers, each having a first input coupled to receive said first signal, a second input coupled to receive said reference signal, and an output, each amplifier having a respective predetermined input offset voltage; and
an integrator having an input coupled to the outputs of said first and second transconductance amplifiers and an output coupled to the second input of said comparison means



and to the second inputs of each of said first and second amplifiers to provide said reference signal.

4,929,852
TTL TO CMOS INPUT BUFFER CIRCUIT
Myung H. Bae, Songtan, Rep. of Korea, assignor to Samsung Semiconductor & Telecommunications Co., Gumi, Japan
Filed Jul. 29, 1988, Ser. No. 225,848
Claims priority, application Rep. of Korea, Aug. 1, 1987, 87-8475
Int. Cl.[5] H03K *19/094*
U.S. Cl. 307—475 **11 Claims**



1. A TTL to CMOS input buffer comprising:
a first buffer receiving a TTL input signal and a second buffer receiving an input from said first buffer and providing a CMOS output signal;
said first buffer having first, second, and third power supply inputs; said first power input of said first buffer is connected to a source Vcc; said second power input of said first buffer is connected through a resistor to a source Vcc; and said third power input of said first buffer is connected to a source Vss; and
said second buffer having a first, second, and third power supply inputs; said first power input of said second buffer is connected to a source Vcc; said second power input of said second buffer is connected through a resistor to a source Vss; and said third power input of said second buffer is connected to a source Vss.

4,929,853

INPUT TRANSLATING CIRCUIT FOR CMOS DEVICE

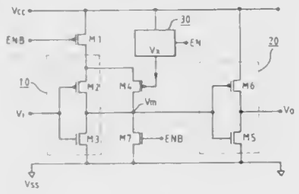
Byeng-yun Kim, Seoul, and Yong-bo Park, Busan, both of Rep. of Korea, assignors to Samsung Electronics, Co., Ltd., Kyunggi, Rep. of Korea

Filed Apr. 25, 1989, Ser. No. 342,923

Claims priority, application Rep. of Korea, Jul. 19, 1988, 88-9009

Int. Cl.[5] H03K *19/094;* G06F *7/38*

U.S. Cl. 307—475 6 Claims



1. An input translating circuit for a CMOS device comprising:

a first p-channel MOS transistor (**M1**) for receiving inverted enable signals ENB at a gate thereof;

a first CMOS inverting means (**10**) comprising a second p-channel MOS transistor (**M2**) having a source for receiving a supply voltage through said first p-channel MOS transistor M1, and a first n-channel MOS transistor (**M3**) having a grounded source, external input signals of a TTL level applied to a first connection node of the gates of said second p-channel and first n-channel MOS transistors (M2) and (M3), the connection node of drains of said transistors (M2) and (M3) serving as a first output terminal;

a second CMOS inverting means (**20**) comprising a third p-channel MOS transistor (**M6**) having a source for receiving a supply voltage, and a second n-channel MOS transistor (**M5**) with a grounded source, said first output terminal of said first CMOS inverting means (**10**) connected to a second connection node comprising the gates of said third p-channel and said second n-channel MOS transistors (M6) and (M5); the connection node of drains of said transistors (M6) and (M5), serving as an second output terminal;

a third grounded source n-channel MOS transistor M7 with inverted enable signals (ENB) applied to its gate, its drain connected to said second connection node of said second CMOS inverting means (**20**);

a fourth p-channel MOS transistor (**M4**) having a drain and a source connected respectively to a drain and a source of said second p-channel MOS transistor (**M2**) of said first CMOS inverting means (**10**);

a supply voltage level discrimination means (**30**) including a voltage dividing means (**31**) for producing a predetermined supply voltage, and a level comparing means (**32**) for comparing the predetermined voltage produced from said supply voltage level discrimination means (**31**) with the reference voltage to produce a control voltage (Vx) for said fourth p-channel MOS transistor (**M4**); said supply voltage level discrimination means (**30**) turning on or off said fourth p-channel MOS transistor (**M4**) in correspondence with the level of the supply voltage, wherein the geometrical aspect ratio $(W/L)_1$ of the first p-channel MOS transistor (**M1**) is made to be sufficiently larger than the geometrical aspect ratios $(W/L)_2$ and $(W/L)_4$ of said second and fourth p-channel MOS transistors (**M2**) and (M4) connected in parallel.

4,929,854

CLOCK CIRCUIT HAVING A CLOCKED OUTPUT BUFFER

Hideyuki Iino, Yokohama; Akihiro Yoshitake, Kawasaki, and Hidenori Hida, Yokohama, all of Japan, assignors to Fujitsu Limited and Fujitsu Microcomputer Systems Limited, both of Kawasaki, Japan

Filed Apr. 10, 1989, Ser. No. 335,260

Claims priority, application Japan, Apr. 15, 1988, 63-93837

Int. Cl.[5] H03K *19/096*

U.S. Cl. 307—480 14 Claims



1. A semiconductor integrated circuit device comprising:

internal logic means for carrying out a logic operation and generating an output signal based on said logic operation;

output buffer means, connected to said internal logic means, for outputting said output signal through an output terminal in synchronism with a clock signal;

first means for generating a first internal clock signal which falls in synchronism with a falling edge of an external clock signal and for generating a second internal clock signal which falls in synchronism with a rising edge of said external clock signal, said internal logic means carrying out said logic operation in synchronism with said first and second internal clock signals; and

second means, connected to said first means, for generating a third internal clock which rises in synchronism with the falling edge of said second internal clock signal and which falls in synchronism with the falling edge of said first internal clock signal, said third internal clock signal being supplied, as said clock signal, to said output buffer means.

4,929,855

HIGH FREQUENCY SWITCHING DEVICE

Amin K. Ezzeddine, Plainsboro, N.J., assignor to Grumman Corporation, Bethpage, N.Y.

Filed Dec. 9, 1988, Ser. No. 281,764

Int. Cl.[5] H03K *17/60*

U.S. Cl. 307—571 10 Claims



1. A high frequency switch comprising:

at least two field-effect transistors, each including a control electrode and two other electrodes, connected to each other in series between a high frequency electric signal source and reference potential means for providing a reference potential, said two other electrodes of said at least two field effect transistors forming the series connection between said transistors;

first means for biasing the control electrode of each of said transistors to cause components of an electric signal which exceed a threshold frequency to flow from said electric signal source to said reference potential means through a channel between said two other electrodes of each of said transistors, said first means having an impedance which is high compared to the internal impedances of said transistors; and

second means connected between each junction of said series connection of said at least two transistors and said reference potential means for establishing an impedance between each junction of said series connection and said reference potential which is high compared to the internal impedances of said transistors.

4,929,856

HEAVY-DUTY CIRCUIT BREAKER

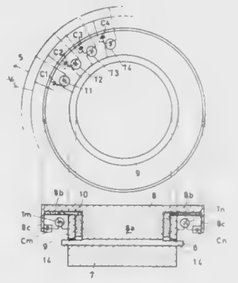
Horst Güning, Baden, Switzerland, assignor to Asea Brown Boveri AG, Baden, Switzerland

Filed Jan. 26, 1989, Ser. No. 301,828

Claims priority, application Switzerland, Jan. 26, 1988, 262/88-3

Int. Cl.[5] H03K *17/72*

U.S. Cl. 307—633 8 Claims



1. Heavy-duty circuit breaker comprising:

(a) a semiconductor component which can be turned off via a gate, and

(b) a control unit (AS) which generates the gate current necessary for turn off:

wherein

(c) the control unit (AS) is divided into a plurality of sub units (AS1, . . . , ASn) operating in parallel, which in each case generate a part of the gate current necessary for the turn off;

wherein

(d) the turn-off-type semiconductor component exhibits a gate electrode (**14**) which is arranged to be spatially distributed; and

(e) the sub units are connected at various places of the spatially distributed gate electrode (**14**).

4,929,857

ELECTRIC STARTER WITH BIASED FULCRUM

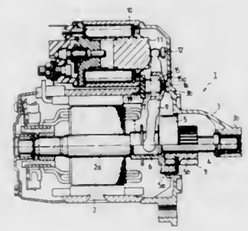
Shuzoo Isozumi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,793

Claims priority, application Japan, Jun. 22, 1988, 63-155842

Int. Cl.[5] H02K *7/118;* H01H *9/02*

U.S. Cl. 310—83 4 Claims



1. An electric starter comprising: a dc motor;

a front bracket integrally conjoined to a front end of an armature shaft of said dc motor;

an output rotary shaft which is rotated by the armature shaft of the dc motor;

an overrunning clutch fitted on said output rotary shaft so that said clutch is slidable in the axial direction thereof;

a splined tube coupled to an outer member of said clutch and engaged with a helical spline integrally formed on said output rotary shaft so as to transmit the torque of said output rotary shaft to said outer member of said clutch;

a shift lever engaged at a lower end thereof with a peripheral portion of said splined tube end at an upper end thereof with an actuator of an electromagnetic switch provided at a peripheral portion of the dc motor, so that said lever is swingable about a fulcrum portion thereof, said fulcrum portion being shaped as a hollow cylindrical body, the bottom of the inside of which is being shaped as an arc;

a holder having a surface curved to correspond to the arc-shaped bottom of the inside of said fulcrum portion, said holder being provided in said fulcrum portion so that said curved surface is in contact with said bottom; and

a spring provided on said holder so that said fulcrum portion is pushed toward a support projection of said front bracket.

4,929,858

STARTER WITH OVERRUNNING CLUTCH AND BALANCED ARMATURE

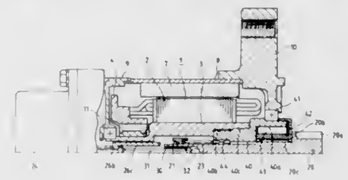
Keiichi Konishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1989, Ser. No. 354,562

Claims priority, application Japan, Jun. 13, 1988, 63-145169

Int. Cl.[5] H02K *7/10;* F16D *23/00*

U.S. Cl. 310—83 4 Claims



1. A starter comprising:

VOL
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1990
UMI

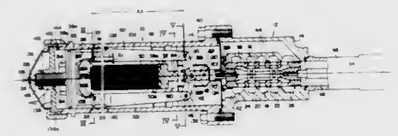
an electric motor which produces torque for starting an engine and has a hollow armature shaft;
a one-way clutch having an outer member and a hollow inner member said outer member being engaged with said armature shaft;
a pinion shaft which is provided with a pinion capable of being engaged with the ring gear of said engine and is engaged with the inside of said inner member by splines so that said pinion shaft is movable in the axial direction thereof;
an electromagnetic switch for applying electricity to said motor and moving said pinion shaft in the axial direction thereof;
a bearing supporting a rear end of said armature shaft;
a cover supporting said outer member in such a manner that said outer member is rotated together with the hollow armature shaft of said motor; and
roller means provided between said outer member and said hollow inner member at positions surrounding said hollow inner member and operative to rotatably support a portion of said outer member.

4,929,859

PIEZOELECTRIC ACTUATOR HAVING PARALLEL ARRANGEMENT OF A SINGLE PIEZOELECTRIC ELEMENT AND A PAIR OF DISPLACEMENT MAGNIFICATION ARMS

Toshitake Suzuki, Susono; Norio Komoda, Gotenba; Susumu Oda, Toyota, and Motoo Harata, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 12, 1988, Ser. No. 283,386
Claims priority, application Japan, Dec. 25, 1987, 62-328644; Dec. 25, 1987, 62-197229; Dec. 25, 1987, 62-197230
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 **16 Claims**



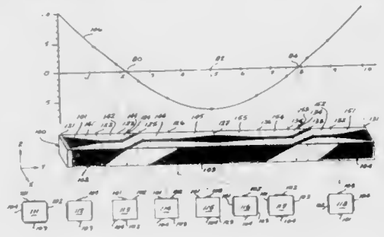
1. A piezoelectric actuator comprising an output member to reciprocate along a central axis, a piezoelectric element aligned substantially along said central axis, a retainer structure supporting a first end of said piezoelectric element, a first displacement magnification mechanism having a pair of arms each having a first end and a second end and pivotably supported on said retainer structure at an intermediate portion thereof via an elastic integral hinge, said first ends of said arms each abutting a second end of said piezoelectric element opposite to said first end thereof, a second displacement magnification mechanism having a pair of links pivotably connected at first ends thereof respectively with said second ends of said arms and pivotably connected with said output member at second ends thereof opposite to said first ends thereof, a housing enclosing said retainer structure with said first displacement magnification mechanism, and means for adjustably fastening said retainer structure to said housing so that said retainer structure is adjustably shiftable relative to said housing along said central axis, wherein said housing is a substantially cylindrical housing having a longitudinal axis aligned with said central axis.

4,929,860

ELECTRODE CONFIGURATION FOR VIBRATING BEAM TRANSDUCERS

Rand H. Hulsing, II, Redmond, and Mitchell Novack, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed May 17, 1988, Ser. No. 194,806
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—366 **11 Claims**



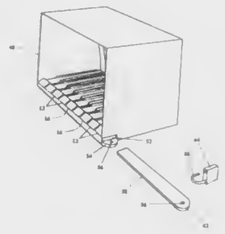
1. A transducer comprising a substantially solid piezoelectric beam having a natural resonant frequency and a longitudinal axis that extends between two opposed clamped ends; and a plurality of electrodes mounted by the beam for causing the beam to vibrate by producing forces directed along the longitudinal axis, at least one of the electrodes defining means for increasing the tendency of the beam to vibrate in a predetermined flexure mode at the natural resonant frequency, to the exclusion of harmonic frequencies, said means comprising a configuration of said at least one electrode that varies as a function of longitudinal position along the beam such that when a voltage difference is applied between the electrodes, the longitudinal force produced by the electrodes as a function of longitudinal position, approximates a longitudinal strain versus longitudinal position profile of the predetermined flexure mode at the natural resonant frequency.

4,929,861

QUICK RELEASE LATCHING AND DISPENSING DEVICE

Darrell J. Metcalf, 520 First St., Fillmore, Calif. 93015

Filed Dec. 19, 1988, Ser. No. 286,150
Int. Cl.[5] B65D *85/672*
U.S. Cl. 312—18 **28 Claims**



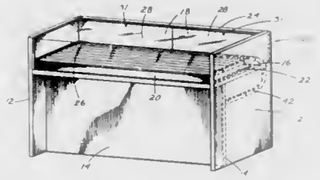
1. Storage means for storing and retrieving articles, said storage means including at least one latching means for releasably retaining said articles, (The latching means of claim 2 wherein:)
a base member,
a resilient lever portion projecting forwardly from said base member and formed with a latching projection extending upwardly adjacent the forward end of said lever portion to releasably retain an article on said latching means when said lever portion is in its normal raised position,
resilient means located adjacent the rear end of said base member and operable to eject an article from said base member when said lever portion is depressed, and
lock means movable into and out of a position to prevent depression of said lever to prevent unauthorized removal of articles from said latching means,
said base member (is) being formed with a projection extending forwardly below said lever portion, and
said lock means (is) being pivotally mounted on said projection and (is) movable into and out of a position to block depression of said lever portion.

4,929,862

SECURITY SHIELD FOR DISPLAY CASES

Gregory C. Hamilton, and Danielle R. Hamilton, both of P.O. Box 2261, Chico, Calif. 95927

Continuation-in-part of Ser. No. 209,007, Jun. 20, 1988, abandoned. This application Jan. 25, 1989, Ser. No. 302,051
Int. Cl.[5] A47F *3/00*
U.S. Cl. 312—138.1 **10 Claims**



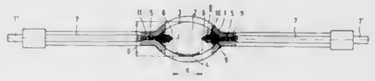
1. A display case comprising a glass top, a front panel, a pair of side panels, and a display tray shelf attached to the said panels directly below said glass top;
said display tray shelf having a shield passage opening formed therein;
a U-shaped track attached to each side panel in such a way that each said U-shaped track passes through the said shield opening in the display tray shelf so that a portion of each said U-shaped track appears above the tray shelf and another portion of each said U-shaped track appears below the tray shelf, said U-shaped tracks each opened along one full side with lipped grooves;
means for mounting said U-shaped tracks to the side panels with said U-shaped tracks in parallel alignment and said lipped grooves interfaced;
a plurality of slats, each said slat having means that hingedly connect the slats longitudinally together to form a flexible shield panel;
said flexible shield panel having means for attaching the shield panel to the U-shaped tracks and allows the shield panel to move along said U-shaped tracks between an on-top protective position covering said display tray shelf to a storage position which is below the display tray shelf, said flexible shield panel passing through the shield passage opening when moving from the protective position to the storage position;
and means for locking said flexible shield panel when in said protective position.

4,929,863

HIGH-PRESSURE GAS DISCHARGE LAMP AND LUMINAIRE PROVIDED WITH SAID LAMP

Willibrordus G. C. Verbeek, Turnhout; Hendrik Wijbenga, and Marie-Madelene Vossen-Bergmans, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1988, Ser. No. 237,341
Claims priority, application Netherlands, Sep. 4, 1987, 8702086
Int. Cl.[5] H01J *61/073, 61/20*
U.S. Cl. 313—113 **16 Claims**



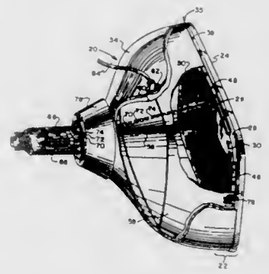
1. A high pressure gas discharge lamp, comprising:
a lamp vessel enclosing an ovoidal discharge space defining a major axis of said lamp, said discharge space having a largest diameter D transverse to the major axis;
a pair of opposing electrodes disposed in said discharge space, each electrode comprising an electrode rod extending from said lamp vessel along the major axis and terminating at a tip end and an electrode coil on said electrode rod spaced from said tip end,
said tip ends of said electrode rods being spaced a distance d between 15 and 30 mm and said discharge space having largest diameter D chosen such that $0.75 \leqq d/D \leqq 1.25$;
said discharge space having an ionizable filling comprising mercury, a rare gas, and bromine and iodine rare earth halides, the ratio between bromine and iodine atoms being between 1.5 and 4;
a pair of current-supply conductors, each connected to a respective electrode rod and extending through the lamp vessel to the exterior in a gas-tight manner; and
said lamp consuming during normal lamp operation a power between 1600 and 2000 Watts.

4,929,864

NI-BASED FTM SHADOW MASKS HAVING A NICKEL PHOSPHIDE BLACK LAYER

Hua Son Tung, Mundelein, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

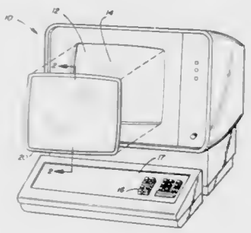
Continuation-in-part of Ser. No. 127,724, Dec. 7, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 308,904
Int. Cl.[5] H01J *29/07*
U.S. Cl. 313—402 **8 Claims**



1. For use in a color cathode ray tube having a flat faceplate, a shadow mask comprising a nickel-iron-based apertured foil, said foil having a thin surface layer of a nickel phosphide compound to increase its emissivity, said nickel of said surface layer of nickel phosphide being provided from the nickel of an

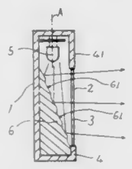
iron-depleted surface region of said nickel-iron-based apertured foil.

4,929,865
EYE COMFORT PANEL
Jerome V. Blum, Los Altos Hills, Calif., assignor to Visual Ease, Inc., Los Altos Hills, Calif.
Continuation-in-part of Ser. No. 8,514, Jan. 29, 1987, abandoned. This application Mar. 9, 1989, Ser. No. 321,632
Int. Cl.[5] H01J *29/89*
U.S. Cl. 313—478 10 Claims



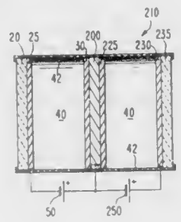
1. An eye comfort device for optically adjusting the focal distance for screen viewing of a video display comprising a transparent plate constituting a lens with a diopter vergence value in the range of from 0.4 to 0.8 diopters.

4,929,866
LIGHT EMITTING DIODE LAMP
Hiroaki Murata; Terubisa Inomata, and Masatoshi Tabira, all of Itamishi, Japan, assignors to Mitsubishi Cable Industries, Ltd., Amagasaki, Japan
Filed Nov. 7, 1988, Ser. No. 267,852
Claims priority, application Japan, Nov. 17, 1987, 62-290139; Dec. 29, 1987, 62-336314
Int. Cl.[5] H01J *5/16;* G09F *13/18*
U.S. Cl. 313—500 7 Claims



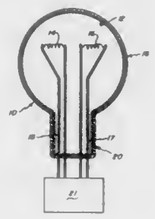
1. A light emitting diode lamp comprising: a case;
a plurality of light emitting diodes disposed within said case;
a window forming a part of said case and having at least one window frame, said window allowing light emitted from said plurality of light emitting diodes to pass therethrough, said plurality of light emitting diodes being secured at a corner of said window and behind said window frame;
light reflector means having a plurality of light reflecting faces for dividing and reflecting said light from said plurality of light emitting diodes, and
light-scattering means for scattering said light from said light reflector means to thereby have said light substantially uniformly pass through said window.

4,929,867
TWO STAGE LIGHT CONVERTING VACUUM TUBE
Kenneth A. Costello, and Hugh F. MacMillan, both of Palo Alto, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.
Filed Jun. 3, 1988, Ser. No. 202,640
Int. Cl.[5] H01J *40/06*
U.S. Cl. 313—525 1 Claim



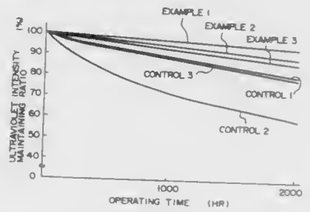
1. A vacuum tube comprising at least two stages and further comprising,
an input photocathode in the first stage of said vacuum tube for receiving photons from outside of said vacuum tube and converting them into electrons to be released into a first stage vacuum portion of said tube,
means within the first stage of said vacuum tube for accelerating said electrons emitted from said photocathode,
a first stage output screen within the first stage of said vacuum tube for receiving said accelerated electrons and converting the electron energy into photons,
a second stage photocathode for converting the photons emitted by said first stage output screen into electrons which are released into a second stage vacuum portion of said tube,
wherein said first stage output screen and said second stage photocathode comprise single crystal III–V semiconductor compounds and said first stage output screen and said second stage photocathode are on opposite sides of and lattice matched to a support member comprising a III–V semiconductor compound.

4,929,868
GLOW DISCHARGE LAMP CONTAINING NITROGEN
Andre C. Bouchard, Peabody, Mass., assignor to GTE Products Corporation, Danvers, Mass.
Filed Jan. 5, 1989, Ser. No. 295,611
Int. Cl.[5] H01J *61/16, 61/64*
U.S. Cl. 313—619 16 Claims



1. A negative glow discharge lamp comprising:
a light transmitting envelope containing a gas fill material at a low pressure including at least one noble gas and nitrogen, said nitrogen being in an amount from 1.5 percent to less than 10 percent of the total fill material, said nitrogen being effective to increase lamp efficiency without adversely affecting the starting characteristics of said lamp,
a pair of electrodes disposed in said envelope and exposed to said gas fill material, and
lead-in wires coupled to the electrodes and extending through and hermetically sealed in said envelope.

4,929,869
HIGH INTENSITY DISCHARGE LAMP CONTAINING IRON AND SILVER IN THE ARC TUBE FILLING
Akihiro Yonezawa, Yokosuka; Hiroki Sasaki, Yokohama; Yoichiro Mitsuyuki, Tokyo; Yasuki Mori, Yokohama, and Toshihiko Ishigami, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 10, 1988, Ser. No. 269,367
Claims priority, application Japan, Nov. 12, 1987, 62-284209; Sep. 6, 1988, 63-223006
Int. Cl.[5] H01J *61/20*
U.S. Cl. 313—639 4 Claims



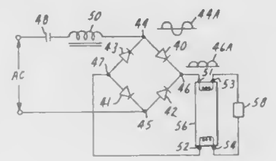
1. A high intensity discharge lamp comprising:
a radiation transmitting arc tube;
a pair of electrodes tightly sealed in said arc tube for generating discharge therebetween; and
a filling within said arc tube, including rare gas, mercury, iron, a predetermined amount of halogen, and silver, the molar ratio of said silver iron being 0.05 to 0.2.

4,929,870
METHOD FOR THE TRANSMISSION OF CONTROL SIGNALS TO THE ROW DRIVE CIRCUITS IN THE CONTROL OF THIN-FILM ELECTROLUMINESCENT DISPLAYS
Terho Harju, Juhonkatu 1 D 27, 08200 Lohja 20, Finland
Continuation of Ser. No. 739,199, May 30, 1985, abandoned. This application Jun. 8, 1988, Ser. No. 206,899
Claims priority, application Finland, Jun. 5, 1984, 842257
Int. Cl.[5] H01Q *19/14;* G09G *3/30*
U.S. Cl. 315—169.3 7 Claims



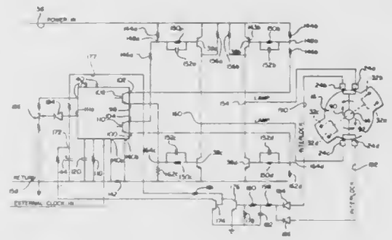
1. A method for transmission of pulses of control signals to row drive circuits for control of thin-film electroluminescent displays, wherein the control signals include a data signal, a clock signal for clocking the data signal, a strobe signal that activates all input stages of the row drive circuits simultaneously, and two signals by means of which the drive circuits controlling odd rows and even rows are respectively chosen to be activated (odd row enable and even row enable), comprising steps of:
transmitting all of the control signals, with the exception of said strobe signal, via one first line and one second line, providing a timing of the pulses on the first line and on the second line so that the signal of the first line is a combination of both the odd (or even) row enable and the data signal, and the signal of the second line is a combination of both the even (or odd) row enable and the clock signal, and
forming the strobe signal, by means of one logic gate, from the signals of the first line and of the second line, wherein the strobe signal is provided on a third line which is connected to an output of the gate.

4,929,871
TRANSFORMERLESS CURRENT-LIMITING CIRCUIT
Sten R. Gerfast, 1802 Valley Curve Rd., Mendota Heights, Minn. 55118
Continuation-in-part of Ser. No. 874,539, Jun. 16, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,764
Int. Cl.[5] H05B *39/09, 41/16*
U.S. Cl. 315—205 17 Claims



17. An appliance including (a) a fluorescent lamp having two cathode leads at each end and (b) a transformerless current-limiting circuit comprising:
(1) a 4-rectifier bridge circuit having a pair of AC inputs and two pairs of DC outputs,
(2) a pair of single-phase or two-phase AC terminals,
(3) means for connecting two cathode leads at opposite ends of the fluorescent lamp across one pair of the DC outputs and for connecting the other two cathode leads across the other pair of DC outputs, and
(4) a current-limiting capacitor and an inductive coil connected in series between one of the AC inputs and one of the AC terminals and providing the sole connection therebetween, the other of the AC inputs and AC terminals being directly interconnected.

4,929,872
LIGHT BULB SOCKET SOFT START AND POWER INTERRUPT ASSEMBLY
Mark E. Bridges, Spencerport, and Robert W. Easterly, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 11, 1988, Ser. No. 142,629
Int. Cl.[5] H05B *37/02, 39/04*
U.S. Cl. 315—209 R 20 Claims



19. Apparatus comprising:

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an assembly for mounting a light bulb, said mounting assembly including a wall having first and second oppositely facing surfaces and an opening therethrough, with first and second pairs of contacts located on said first surface of said wall radially outward from said opening; and including a socket member having first and second radially extending wings with first and second contacts respectively supported in radially extending positions spaced out from said wings; said socket member being movable relative to said wall between an engaged position in which said first and second contacts are brought through said opening from the second surface side of said wall to establish electrical connection respectively with said first and second pairs of contacts, with said wings remaining on said second surface side to releasably lock said socket member to said wall, and a disengaged position in which said established electrical connection is broken and said socket member is separated from said wall;

first switching means, including a capacitor, connected to one contact of each of said pairs of contacts for controlling supply of electrical power from a source to said one contacts in accordance with charging of said capacitor; and

second switching means connected to said other contact of each of said pairs of contacts, said second switching means being responsive to movement of said socket member from said disengaged to said engaged position for causing the charging of said capacitor for activating said first switching means to supply said electrical power to said one contacts to light said bulb, and being responsive to movement of said socket member from said engaged to said disengaged position for causing the discharging of said capacitor for deactivating said first switching means to remove said electrical power from said one contacts.

4,929,873

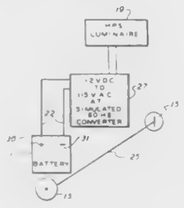
LUMINAIRE SYSTEM

Steven E. Summer, Setauket, N.Y., assignor to Powr-Ups Corporation, Bohemia, N.Y.

Filed Jun. 6, 1988, Ser. No. 203,077

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—219 4 Claims



1. A high pressure sodium lamp lighting system having portable characteristics, said system including

(a) a portable power supply providing at least 12 volts direct current;

(b) means for converting said portable power supply into an alternating current power supply providing a voltage level of at least 115 volts, said alternating current characterized by a symmetrical quasi-square wave with 60 degrees of zero voltage and 120 degrees of full voltage per half cyle;

(c) mean for applying said alternating current power supply to a starting circuit said starting circuit connected to a high pressure sodium lamp including an envelope containing gas and two spaced apart terminals, said gas adapted to be ionized by high voltage pulses applied to at least one terminal of said two spaced apart terminals; and,

(d) means for applying said symmetrical quasi-square wave supply across said two spaced apart terminals of said high pressure sodium lamp for maintaining said lamp in an ionized state after said gas is ionized by said high voltage pulses.

4,929,874

VIBRATION CONTROL SYSTEM

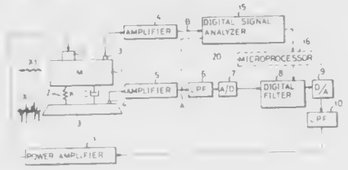
Keiichiro Mizuno, Tokyo; Kazuyoshi Iida, and Kazutomo Murakami, both of Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,562

Claims priority, application Japan, Sep. 25, 1987, 62-241479

Int. Cl.[5] F16M *13/00;* **B64C** *17/06*

U.S. Cl. 318—128 5 Claims



1. A vibration control system for isolating or damping vibration of a body to be protected from the vibration, said body being supported on a movable foundation through the medium of a vibration isolating supporting structure, comprising:

a vibration sensor for detecting vibration of said movable foundation;

an inverse vibration signal generating device supplied with the detection signal output from said vibration sensor for generating a vibration signal of such a waveform as to cancel out the vibration of said body through interference therewith; and

an actuator connected operatively to said body and said inverse vibration signal generating device for converting said vibration signal derived from said inverse vibration signal generating device into a mechanical vibration to be applied to said body to thereby decrease the vibration thereof.

4,929,875

METHOD TO CONTROL STOPS OF AN INTERMITTENTLY OPERATING DRIVING MOTOR

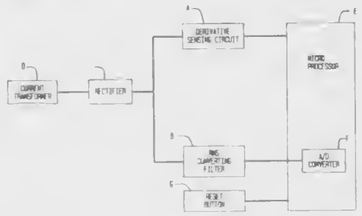
Staffan Olsson, Stockholm, Sweden, assignor to Flyct AB, Solna, Sweden

Continuation-in-part of Ser. No. 316,276, Feb. 27, 1989. This application Jun. 28, 1989, Ser. No. 372,988

Claims priority, application Sweden, Mar. 4, 1988, 8800772

Int. Cl.[5] H02P *3/18*

U.S. Cl. 318—362 2 Claims



1. A method to control stopping of an electric motor for a pump, the stopping being dependent upon the current consumption of the motor, comprising the steps of:

coupling a current signal from one phase of said motor to a transformer, and connecting said current signal from the output of the transformer to a rectifier;

rectifying said current signal and coupling said rectified signal to a derivative sensing circuit and an RMS converting filter circuit;

generating a derivative signal representing an actual current consumption value in said derivating sensing circuit and coupling said derivative signal to a microprocessor;

producing a mean current value in said RMS circuit and coupling said mean current value to said microprocessor, said microprocessor having previous predetermined stored mean values;

comparing in said microprocessor the actual current consumption value with a stored mean value of the nearest previous predetermined stored mean values; and

stopping the motor when a predetermined difference is detected between the actual current consumption value and the stored mean value of the nearest previous predetermined stored mean values.

4,929,876

ELECTRIC WINDSHIELD WIPING APPARATUS

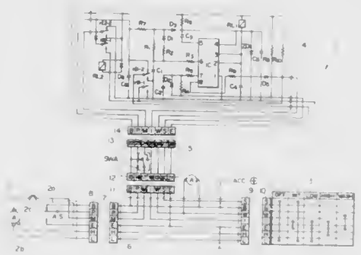
Masaru Kato, Hiratsuka, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Continuation-in-part of Ser. No. 26,921, Mar. 17, 1987, abandoned. This application Aug. 12, 1988, Ser. No. 233,986

Claims priority, application Japan, Apr. 14, 1986, 61-56322[U]

Int. Cl.[5] B60S *1/08*

U.S. Cl. 318—444 3 Claims



1. An electric windsheld wiping apparatus, comprising:

a wiper switch for changing between a plurality of wiper modes;

a wiper motor for rotating forwardly and reversely;

a link connector mechanism connected to the wiper motor;

a wiper blade connected to said link connector mechanism and reciprocally moving between an upper turning position and a lower turning position on a wiped surface of a window;

a wiper control mechanism provided with an intermittent amplifier for the reciprocal movement of the wiper blade;

a wiring harness connecting said wiper switch and said wiper motor;

concealing means for moving the wiper blade downward from the lower turning position by a reverse rotation of the wiper motor and stopping said wiper blade at a given housing position; and

a unit arranged detachably using a connector between said intermittent amplifier and said wiring harness and having a change-over switch therein for electrically controlling the actuation of the reverse rotation of the wiper motor.

4,929,877

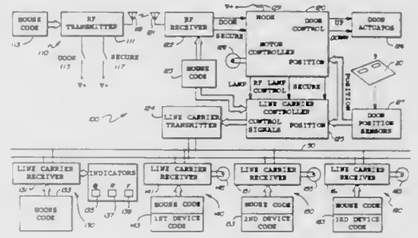
AUTOMATIC GARAGE DOOR OPERATOR WITH REMOTE LOAD CONTROL

John Clark, 2427 Shannondale Rd., Ann Arbor, Mich. 48104; Brian J. Martel, 1560 Robell, Walled Lake, Mich. 48088, and James S. Murray, 14403 Dixie, Redford, Mich. 48239

Divislon of Ser. No. 111,408, Oct. 22, 1987, Pat. No. 4,847,542. This applicatioo May 23, 1989, Ser. No. 356,010

Int. Cl.[5] E05F *15/10*

U.S. Cl. 318—560 10 Claims



1. An automatic garage door operator for controlling a remote load and the position of a garage door comprising:

a radio frequency receiver for generating a door signal upon receipt of a first encoded radio frequency signal and a secure signal upon receipt of a second encoded radio frequency signal;

a door actuator connected to the garage door for operating the garage door; and

a controller means connected to said radio frequency receiver, said door actuator and the remote load, said controller means having a secure mode, a non-secure mode, a load on mode and a load off mode for

controlling said door actuator to operate the garage door upon receipt of said door signal when said controller means is in said non-secure ode,

inhibiting said door actuator to prevent operation of the garage door upon receipt of said door signal when said controller means is in said secure mode,

toggling between said secure mode and said non-secure mode upon receipt of said secure signal when the garage door is closed,

turning the remote load ON upon receipt of said secure signal when the garage door is not closed and said controller means is in said load off mode, and

turning the remote load OFF upon receipt of said secure signal when the garage door is not closed and said controller means is in said load on mode.

4,929,878

MEMORY MIRROR CONTROL SYSTEM FOR VEHICLES AND THE LIKE

Randall F. Hansen, Dearborn, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Jun. 27, 1989, Ser. No. 372,500

Int. Cl.[5] G05B *19/19;* **G02B** *7/18*

U.S. Cl. 318—560 18 Claims

1. In an electrically powered mirror control system, including

an electrically powered mirror of the "memory" type having at least two position motors driving it about two axes, a first axis (a) and a second axis (b), with each motor having an "on"/"off" switch associated therewith; and

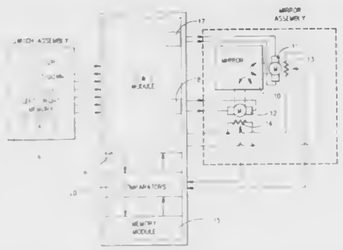
a memory module, in which at least one selected "memory" position (a_F, b_F) for the mirror with respect to the axes is encoded;

the improvement comprising:

mirror position sensor elements which produce electrical

signals indicative of the position (a_X, b_Y) of the mirror with respect to the two axes at a particular point in time;

a computational and control module associated with said sensor elements, the memory module, the motors and the switches, and having comparators for comparing an initial position (a_I, b_I) of the mirror determined by said sensor elements with the "memory" position of the mirror and determining the relative direction of the "memory" position from the initial position, from the relative values of the positions with respect to the axes, and cyclically monitoring the sensed current position of the mirror from the signals from said sensor elements, and generating signals



turning both of the motors "on" through the switches in the directions which moves the mirror toward the "memory" position (a_F, b_F), monitoring the changing position (a_X, b_Y) of the mirror with respect to the axes by the comparators comparing the changing mirror position (a_X, b_Y) to the "memory" position (a_F, b_F), and maintaining both of the motors "on" until at least one of the relationships $a_X = a_F$ and $b_Y = b_F$ is satisfied;

turning "off" the motor which moves the mirror about the axis for which the relationship is satisfied; and

turning "off" the other motor when the other relationship is satisfied;

moving the mirror from its initial position (a_I, b_I) toward the "memory" position (a_F, b_F).

4,929,879

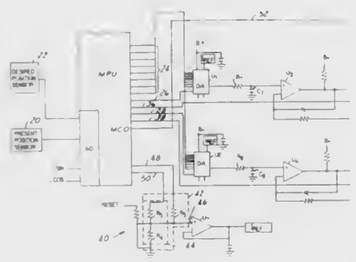
MICROSTEPPING OF AN UNIPOLAR STEPPING MOTOR

Danny O. Wright, Newport News, and Kregg S. Wiggins, Tabb, both of Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Division of Ser. No. 158,015, Feb. 18, 1988, Pat. No. 4,855,668. This application Jun. 20, 1989, Ser. No. 369,445

Int. Cl.[5] H02P *8/00*

U.S. Cl. 318—696 **3 Claims**



1. A control system to control the amount of torque output of a stepper motor having windings, said system comprising:

means responsive to a control signal for generating at least one torque control signal representing a predetermined amount of motor current control;

means responsive to said one torque control signal for generating an analog signal having a sinusoidal waveshape at a frequency proportional to the rotational speed of the stepper motor;

means responsive to said sinusoidal waveshape signal for providing an amplitude value to said sinusoidal waveshape; and

means responsive to said amplitude sinusoidal waveshape and operable for switching the power to selected ones of the windings of the motor for causing the motor to rotate at a desired value of torque as controlled by said at least one torque control signal.

4,929,880

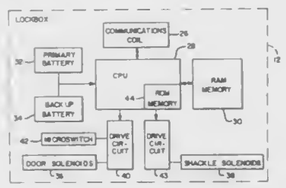
ELECTRONIC LOCK SYSTEM WITH BATTERY CONSERVATION FEATURES

Walter G. Henderson; George A. Ellson, both of Salem, and Edgar J. Unrein, Newberg, all of Oreg., assignors to Supra Products, Inc., Salem, Oreg.

Continuation-in-part of Ser. No. 192,833, May 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 15,864, Feb. 17, 1987, Pat. No. 4,766,746, which is a continuation-in-part of Ser. No. 831,601, Feb. 21, 1986, Pat. No. 4,727,368, which is a continuation-in-part of Ser. No. 814,364, Dec. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 788,072, Oct. 16, 1985, abandoned. This application Dec. 27, 1988, Ser. No. 290,988

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—30 **14 Claims**



1. In an electronic lock system that includes a battery powered lock, an improvement comprising:

battery monitoring means for monitoring the status of the battery;

means for permitting usual operation of the lock if the battery monitoring means indicates that the battery is in a first state;

means for permitting usual operation of the lock and for indicating a low battery condition if the battery monitoring means indicates that the battery is in a second state corresponding to a battery energy lower than the first state; and

means for curtailing usual operation of the lock and for thereafter permitting operation of the lock only by a specially authorized key if the battery monitoring means indicates that the battery is in a third state corresponding to a battery energy lower than the second state.

4,929,881

PROBE FOR NUCLEAR MAGNETIC RESONANCE APPARATUS

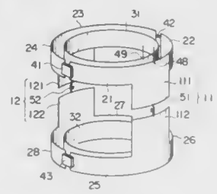
Masao Yabusaki, Tokyo; Etsuji Yamamoto, Akishima; Hiroyuki Takeuchi, Kashiwa, and Hideki Kohno, Tama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Medical Corporation, Tokyo, both of, Japan

Filed May 25, 1989, Ser. No. 356,423

Claims priority, application Japan, May 27, 1988, 63-128359

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **8 Claims**



1. A probe for a nuclear magnetic resonance apparatus comprising:

are arranged at a plurality of

arms which positions along an almost cylindrical surface and form a current path;

a plurality of wings made of conductor plates which are respectively extended to the right and left from upper and lower edges of said arms along said cylindrical surface and in which front edges of each of said plurality of wings are capacitively coupled with front edges of the wing adjacent to said wing; and

first and second guard rings made of ring-shaped conductor plates which are respectively provided at upper and lower edge positions of said arms and are respectively capacitively coupled with said wings,

wherein each of the arms comprises two conductor plates divided into upper and lower portions and an inductor connecting said two conductor plates.

4,929,882

APPARATUS FOR CONVERTING DC TO DC HAVING NON-FEED BACK VARIABLE HYSTERETIC CURRENT-MODE CONTROL FOR MAINTAINING APPROXIMATELY CONSTANT FREQUENCY

Tamas S. Szepesi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 23, 1987, Ser. No. 65,584

Int. Cl.[5] H02M *3/156*

U.S. Cl. 323—222 **4 Claims**

3. An hysteretic current-mode controlled stable frequency DC to DC boost power stage converter having an input voltage and an output voltage comprising:

a. a power stage circuit having:

(1) an inductor having an inductor current for forming the output voltage;

(2) a capacitor coupled to said inductor;

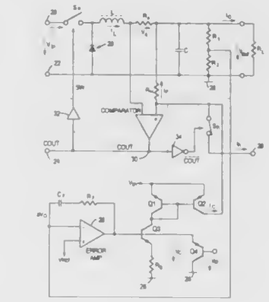
(3) a first control switch coupled to said inductor having an open position and a closed position;

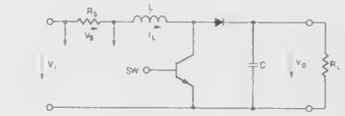
(4) means for oscillating said switch between said open position and said closed position thereby establishing a first duty cycle, said switch in said closed position coupling said input voltage to said power stage and said switch in said open position uncoupling said input voltage from said power stage; and

(5) feedback means for controlling a peak value of the inductor current wherein the feedback means controls an average inductor current with a control signal whereby the non-feedback means establishes the turn-on and said turn-off limits symmetrically around the control signal; and

b. non-feedback hysteretic control circuit for controlling said inductor current having a turn-on limit for closing said switch and a turn-off limit for opening the switch, said turn-on and turn-off limits being adjustable by said non-feedback control circuit to approximately maintain a constant frequency of oscillation wherein said control circuit establishes a duty cycle proportional control having;

(1) a controlled switch having a first pole and a second





pole, said controlled switch being controlled by a switching signal for switching said controlled switch between said first pole and said second pole, said first pole being coupled to a first voltage and said second pole coupled to a second voltage;

(2) a voltage filter and storage means coupled to a wiper of said controlled switch; and

(3) a driver means coupled to said filter and storage means for forming said control current.

4,929,883

CIRCUIT FOR SENSING THE TRANSISTOR CURRENT WAVEFORM

Davide Chieli, Milan, Italy, assignor to SGS-Thomson Mircroelectronics S.r.l., Agrate Brianza MI, Italy

Filed Sep. 13, 1989, Ser. No. 406,500

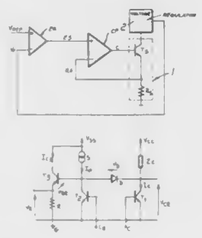
Claims priority, application Italy, Sep. 15, 1988, 21955 A/88

Int. Cl.[5] G05F *1/565*

U.S. Cl. 323—282 **9 Claims**

1. A circuit for sensing a transistor current waveform, including a switching transistor having collector and emitter terminals connected between a first and a second reference potential line, and a base terminal receiving a switching signal, and a transducing differential amplifier circuit connected at the input to said collector and emitter terminals of said switching transistor and generating at the output a transduced voltage proportional to the emitter to collector voltage of said switching transistor, said transduced voltage being fed to a sensing

resistor arranged between the output of said transducing differential amplifier circuit and said second reference potential line



and generating a sensing current proportional to the collector current of said switching transistor.

4,929,884

HIGH VOLTAGE SEMICONDUCTOR WITH INTEGRATED LOW VOLTAGE CIRCUITRY

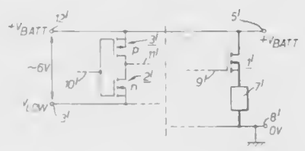
Philip H. Bird, Sidcup, England; David J. Coe, East Grinstead, Great Britain; David H. Paxman, Redhill, England, and Aart G. Korteling, Waalre, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 6, 1988, Ser. No. 203,407

Claims priority, applicatioo United Kingdom, Jun. 8, 1987, 8713385

Int. Cl.[5] G05F *3/16*

U.S. Cl. 323—313 12 Claims



1. A power switching circuit suitable for controlling a load in an electrical system having a positive, high-voltage supply terminal and a negative common return terminal, the circuit being connected in operation between the high-voltage supply terminal and one terminal of the load, another terminal of the load being connected to the return terminal, the circuit comprising an electrically conductive semiconductor substrate carrying a high-voltage semiconductor output device in which conduction is predominantly by electrons, the substrate comprising a region of the output device for connection to the high-voltage supply terminal, the substrate also carrying at least one low-voltage semiconductor device forming part of a low-voltage circuit connected in operation to two low-voltage supply terminals, characterized in that the circuit further comprises means for eliminating the need for high-voltage isolation between the low-voltage device and the semiconductor substrate by maintaining each of the two low-voltage supply terminals at no more than a low and substantially constant voltage with respect to the positive high-voltage supply terminal.

4,929,885

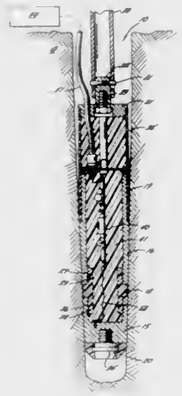
APPARATUS FOR MEASURING GROUND MOISTURE CONTENT OF SOIL

Michael R. Dishman, Raleigh, N.C., assignor to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Nov. 8, 1988, Ser. No. 268,935

Int. Cl.[5] G01R *27/26*

U.S. Cl. 324—664 6 Claims



1. A capacitance moisture sensor probe for sensing the ground moisture content of soil, the moisture sensor probe having a generally cylindrical body with first and second opposite ends, the generally cylindrical body comprising:

a first substantially rigid structural component having a tapered outer surface portion defining a first electrically conductive capacitance sensing electrode;

a second substantially rigid structural component having a tapered outer surface portion defining a second electrically conductive capacitance sensing electrode;

a dielectric spacer securely attached to each of said first and second components such that said components are dielectrically and longitudinally spaced apart at opposite ends of said spacer so that the moisture sensor probe senses the capacitance of soil in the proximity of the first and second electrodes and wherein said dielectric spacer includes threaded opposite end portions, and each said first and second structural components have threaded end portions cooperating with said threaded end portions of said dielectric spacer to secure the first and second structural components to the dielectric spacer; and

wherein one of said components has an internal cavity and said body includes an electronic circuit located within said internal cavity and electrically connected to each of said first and second electrodes, and said internal cavity further including a dielectric filler surrounding the electronic circuit and filling said internal cavity to prevent water from permeating the internal cavity and harming the electronic circuit.

4,929,886

APPARATUS FOR DETECTING NOISE IN THE MEASUREMENT OF VERY SMALL RESISTANCE

Nakaie Toshiyuki, Wakayama, Japan, assignor to Hanwa Electronic Co., Ltd., Wakayama, Japan

Filed Jul. 26, 1989, Ser. No. 386,364

Int. Cl.[5] G01R *27/00*

U.S. Cl. 324—691 2 Claims

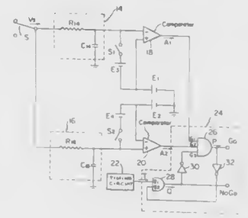
1. In an ohmmeter which includes a phase detection means to split each cycle of a voltage signal to be measured into a first and second series of half waves, an inverter means to inverse

the second series of half waves, an integrating R-C circuit means to combine the first and second series of half waves in such a manner as to achieved a reduction in the noise component of the superimposition of noise and a signal to be measured, the improvement comprising:

the integrating R-C circuit means comprising a pair of first R-C integrating circuit and second R-C integrating circuit connected in parallel:

a first switch means S_1 adapted to charge a first capacitor in the first R-C integrating circuit with a first combined voltage E_1+E_3 of a first positive threshold voltage E_1 with positive initial set up voltage E_3;

a second switch means S_2 adapted to charge a second capacitor in the second R-C integrating circuit with a second combined voltage E_2-E_4 of a second positive threshold voltage E_2 with negative initial set up voltage $-E_4$, the first threshold voltage E_1 and second threshold voltage E_2 being set to differ in magnitude from each other so as to define a threshold voltage range, the first switch means S_1 and second switch means S_2 being actuated to close a supply circuit which in turn supplies both the first combined voltage E_1+E_3 to the first capacitor, and the second combined voltage E_2-E_4 to the second capacitor, respectively, a predetermined time before the entrance of a voltage signal to be measured, the first and second switch means being opened to break the supply circuit upon the input of the voltage signal to be measured;



a first comparator connected to the first R-C integrating circuit and adapted to compare the first threshold voltage and a first output voltage discharged from the first capacitor;

a second comparator connected to the second R-C integrating circuit and adapted to compare the second threshold voltage and a second output voltage discharged from the second capacitor;

a logic circuit connected to the first and second comparators and a timing circuit, the timing circuit adapted to supply timing signals to the logic circuit, the logic circuit adapted to determine whether the first and second discharged voltages are within the range of their associated threshold voltages E_1 and E_2 in a set time following the input of the voltage signal to be measured in conjunction with the timing signal from the timing circuit.

4,929,887

ELECTRICAL OUTLET MONITOR

James M. Robitaille, Maple Heights, Ohio, and Robert W. Wilson, Austin, Tex., assignors to Minnesota Mining and Manufacturing Company. St. Paul, Minn.

Filed Jan. 19, 1989, Ser. No. 300,091

Int. Cl.[5] G01R *31/04, 31/02*

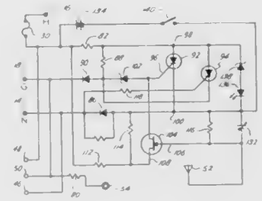
U.S. Cl. 324—66 16 Claims

5. An apparatus for monitoring an electrical power supply having hot, neutral and ground spades, comprising:

indicator means having at least two states, a first state corresponding to a properly wired power supply, and a second state corresponding to an improperly wired power supply, said indicator means being energized in said first state;

prong means for electrically connecting said indicator means to the electrical power supply, including hot, neutral and ground prongs for mating with the hot, neutral and ground spades of the power supply;

shunting means for preventing electrical current from energizing said indicator means when the electrical power



supply is miswired, said shunting means being connected in parallel to said indicator means, said shunting means including first and second silicon controlled rectifiers each connected in parallel with said indicator means; and

means for housing said indicator means, prong means, and shunting means.

4,929,888

PIN ELECTRONICS DEVICE HAVING A PHASE ADJUSTMENT FUNCTION FOR IC TESTERS AND PHASE ADJUSTMENT METHOD THEREFOR

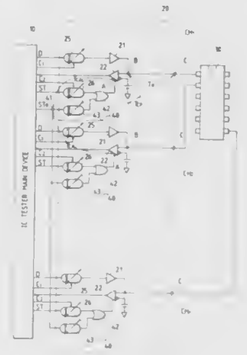
Kenji Yoshida, Gyoda, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Aug. 23, 1989, Ser. No. 397,884

Claims priority, application Japan, Aug. 29, 1988, 63-215855

Int. Cl.[5] G01R *15/12, 31/02*

U.S. Cl. 371—25.1 7 Claims



1. A pin electronics device comprising:

a driver provided for each of a plurality of channels, for supplying a drive signal to the corresponding terminal of an IC under test;

a logical comparator means provided in said each channel, which has an input connected to the output of said driver, receives a response signal from said corresponding terminal of said IC under test, and determines the logic of its level;

a first variable delay means provided in said each channel, for adjusting the phase of said drive signal which is output from said driver in said each channel;

a second variable delay means inserted in a path for applying therethrough a reference strobe signal from a common

reference strobe output terminal to a strobe terminal of said logical comparator means of said each channel, for adjusting the phase of said reference strobe signal; and

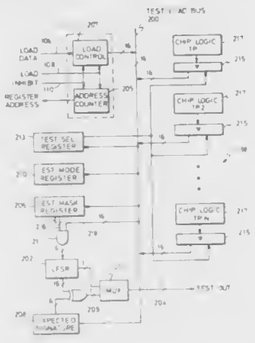
a third variable delay means provided in said each channel, for adjusting the phase of a strobe pulse which is applied to said strobe terminal of said logical comparator means.

4,929,889

DATA PATH CHIP TEST ARCHITECTURE

Larry D. Seiler, Boylston; James L. Pappas, Leominster, and Robert C. Rose, Hudson, all of Mass., assignors to Digital Equipment Corporation

Filed Jun. 13, 1988, Ser. No. 206,194
Int. Cl.[5] G01R *31/26*
U.S. Cl. 371—22.3 12 Claims



1. In a clocked integrated circuit implemented on a semiconductor chip, and having a control register, a multiple input linear feedback shift register, a plurality of test points located at predetermined nodes in said circuit, a plurality of memory registers, and further having a common load/test circuit implemented on the semiconductor chip, a method of testing the integrated circuit using the common load/test circuit to provide a resultant test signature indicative of the values at said nodes, comprising the steps of:

a. specifying in the control register the set of test points to be tested;

b. loading test data into at least one of the memory registers by way of the common load/test circuit;

c. commencing testing of the test points during a test period, the test period having defined subperiods in which the test is not performed, the test period defined by several of the integrated circuit clock cycles;

d. sampling the set of test points during each clock cycle to provide a set of test data;

e. entering said test data into the multiple input linear feedback shift register; and

f. at the conclusion of the test period, shifting the resulting test data out of the shift register thereby to provide said signature;

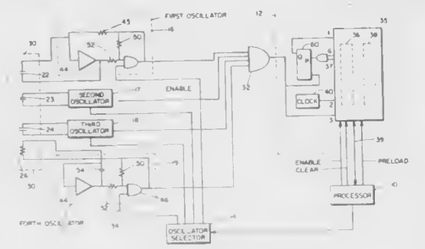
wherein the semiconductor chip comprises a data path logic unit in a video graphics system and wherein the testing of step is performed during video monitor refresh and wherein the step of shifting the resulting test data of step is performed during video monitor vertical retrace.

4,929,890

SYSTEM FOR OBTAINING DIGITAL OUTPUTS FROM MULTIPLE TRANSDUCERS

Robert L. Bell, Agoura Hills, and Herman L. Renger, Calabasa, both of Calif., assignors to Bell Microsensors, Inc.

Division of Ser. No. 895,904, Aug. 11, 1986, Pat. No. 4,732,043.
This application Nov. 6, 1987, Ser. No. 118,294
Int. Cl.[5] G01R *23/02*
U.S. Cl. 324—78 R 5 Claims



1. Apparatus for determining the frequency of an oscillator, comprising:

means for generating enabling commands including means for receiving count data;

first counter means responsive to the enabling command for counting a preselected number of oscillations of the oscillator, and said first counter means can be preset to a given value such that the resolution of the reading of the frequency can be varied and producing an indication when the preselected number of oscillations have occured;

high frequency clock means having a frequency higher than the oscillator; and

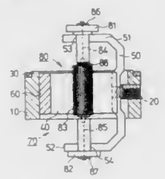
second counter means coupled to the means for generating commands and responseive to signals from the clock means and the indication produced by the first counter means for counting signals from the clock source which occur subsequent to the command and prior to the indication, and wherein the means for generating commands presets the second counter means and is responseive to both overflows and the final count from the second counter means, such that the second counter means can provide a higher resolution count than its nominal capacity.

4,929,891

EXCITING UNIT FOR INTERNAL MAGNET TYPE METERS

Akira Yoneda, and Katsuyoshi Miura, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Continuation of Ser. No. 74,366, Jul. 16, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,218
Claims priority, application Japan, Aug. 7, 1986, 61-185528
Int. Cl.[5] G01R *1/16*
U.S. Cl. 324—154 PB 2 Claims



1. In an exciting unit for use with an internal magnet type meter, comprising a cylindrical permanent magnet of a first axial dimension, said permanent magnet having pole shoes of a dimension substantially equal to said first axial dimension, and a cylindrical yoke incorporating said permanent magnet through an air gap arranged to make rotatable effective sides of a movable coil, the improvement comprising

a generally rectangular column-like spacer formed of a non-magnetic material and having a radial thickness corresponding to said air gap of an dimensional substantially equal to said first axial dimension, one side of said spacer being secured to a peripheral surface of said permanent magnet, and an opposite site of said spacer being formed with two chamferred angular portions;

a holding frame formed of a long, flat and tubular non-magnetic material, both ends of which are shaped by folding to be crooked at right angles in the same direction, said frame comprising an arm member to which said movable coil is attached and a stem formed with a hole or recess, said stem being fitted to said peripheral surface of said permanent magnet on the opposite side of said spacer, said holding frame being disposed inwardly of said cylindrical yoke;

a flange secured to said yoke and formed with a mounting hole for mounting said exciting unit on a base;

a single screw hole formed in said cylindrical yoke; and

a single mounting screw fitted into said single screw hole of said cylindrical yoke and having a tip thereof engaging said hole or recess of said stem of said holding frame so as to mount in said cylindrical yoke said permanent magnet secured to said holding frame through said spacer;

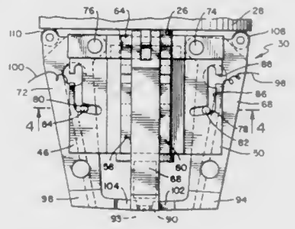
wherein by rotating said single mounting screw only said chamferred portions of said spacer are thrust against an inner surface of said cylindrical yoke so that said cylindrical permanent magnet is mounted in said cylindrical yoke and accurately positioned in the axial and peripheral directions and locked in position by use of only said single mounting screw engaged in said hole or recess of said stem of said holding frame and without requiring the circular shape of said cylindrical permanent magnet to be altered, or the cylindrical yoke to have any other positioning hole.

4,929,892

PROCESS FOR ELECTRICALLY TESTING A COMPONENT IN TRANSIT TO ASSEMBLY AND COMPONENT TEST CHUCK

Alan B. Larsen, Provo, Utah, assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 9, 1989, Ser. No. 309,463
Int. Cl.[5] G01R *31/02, 1/06*
U.S. Cl. 324—158 F 12 Claims



1. A component test chuck for use on a transfer arm comprising:

a holder, said holder having first, second, third and fourth pairs of flanges extending therefrom;

at least four pivot openings on said holder, first, second, third and fourth pivot pins respectively in said pivot openings in said holder, said first and second pivot pins being opposite each other and on substantially parallel axes, and said third and fourth pivot pins being opposite each other and on substantially parallel axes to each other and at substantially right angles to the axes of said first and second pivot pins;

first and second arms mounted between said first and second pairs of flanges on said first and second pivot pins, said third and fourth arms respectively pivotally mounted between said third and fourth pairs of flanges on said third and fourth pivot pins;

a collar, cam follower means on each of said first, second, third and fourth arms for being engaged by said collar for thrusting said arms in a direction to rotate said arms on said pivot pins to close said fingers toward each other;

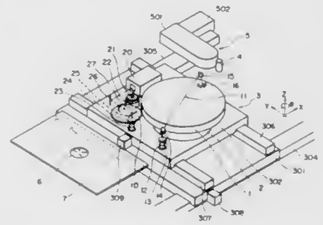
first and second fingers respectively mounted on said first and second arms and third and fourth fingers respectively mounted on said third and fourth arms, said fingers being sized to grasp an electrical component when said arms are pivoted on said pivot pins in a direction to move said fingers toward each other, said first and second fingers being dielectric and said third and fourth fingers being electrically conductive so that a component grasped between said third and fourth fingers can be electrically tested.

4,929,893

WAFER PROBER

Mitsuya Sato; Takao Ukaji; Nobuhito Yamaguchi; Taro Ohmori, and Eiichi Murakami, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1988, Ser. No. 252,997
Claims priority, application Japan, Oct. 6, 1987, 62-252822; Oct. 31, 1987, 62-276341
Int. Cl.[5] G01R *31/02, 1/06;* G06K *9/00*
U.S. Cl. 324—158 F 14 Claims



1. A wafer prober, comprising:

a wafer chuck for holding a wafer;

an X-Y stage for moving said wafer chuck in X and Y directions;

a contact plate;

a driving mechanism for moving said contact plate in a Z direction relatively to said X-Y stage;

detecting means for detecting information which can be used to press contact said contact plate against at least one of tips of probe needles of a probe card with use of said X-Y stage and said driving mechanism;

image pickup means for observing said at least one needle tip press contacted to said contact plate, from a side of said contact plate opposite to the side thereof engaged by said at least one needle tip; and

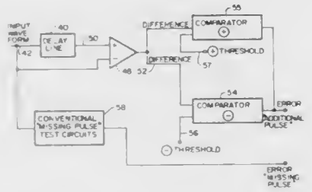
processing means for processing a signal from said image pickup means to obtain information to be used for alignment of the probe needles with the wafer.

4,929,894

METHOD AND APPARATUS FOR INCREASING THROUGHPUT ON DISK DRIVE QUALITY CONTROL TESTING

Michael R. Monett, Santa Clara, Calif., assignor to Memory Technology, Boulder, Colo.

Filed Aug. 23, 1988, Ser. No. 235,404
Int. Cl.[5] G01R *33/12;* **G11B** *27/36*
U.S. Cl. 324—212 **5 Claims**



1. An apparatus for increasing throughput for disk drive quality control testing comprises of "missing pulse" and "extra pulse" tests comprising:

means for writing test data on the tracks to be tested of a disk drive;

means for reading said test data and for simultaneously performing said "missing pulse" and "extra pulse" tests; and

wherein said means for reading comprises:

delay means for receiving a periodic input signal indicative of the magnetic transitions embodying said test data and for delaying said input signal by an interval equal to one period of said input signal;

difference means coupled to receive said delayed input signal and to receive an undelayed version of said input signal, for subtracting the delayed input signal from said undelayed input signal to determine the difference between the amplitudes of these two signals and for generating a signal indicative of said difference;

comparator means having an input for receiving a reference signal representative of a test threshold used in said "extra pulse" test and coupled to receive the output of said difference means, for comparing said difference signal to said threshold and for generating an error signal indicating when said difference signal exceeds said threshold, said error signal indicating the location of a probable defect on the track under test.

4,929,895

THICKNESS GAUGE FOR MOVING SHEET MATERIAL WITH INNER AND OUTER FLEXIBLY MOUNTED BEARINGS

Pekka M. Typpo, Cupertino, Calif., assignor to Impact Systems, Inc., San Jose, Calif.

Filed Mar. 22, 1989, Ser. No. 326,906
Int. Cl.[5] G01B *7/10;* **D21F** *7/06;* **G01R** *33/12*
U.S. Cl. 324—231 **8 Claims**

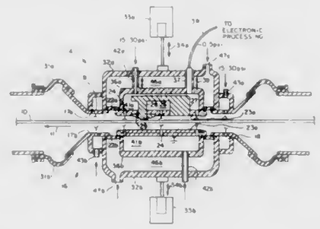
1. A thickness gauge for moving sheet material comprising:

first and second magnetic circuit means juxtaposed on opposite sides of said sheet indicative of the thickness of said sheet; upper and lower means on opposite sides of said sheet for respectively flexibly carrying said first and second magnetic circuit means, each of said upper and lower means including:

outer bearing means including an outer rigid ring with a plurality of spaced air exit means around the circumference of such outer ring for providing an air bearing between said ring and said sheet;

means for flexibly causing said outer ring to move toward engagement with said sheet, said opposed outer rings of said upper and lower means tending to flatten a portion of said sheet encompassed by said rings;

rigid inner disk-like bearing means respectively carrying said first and second magnetic circuit means;



means for flexibly connecting said inner disk-like bearing means to said rigid ring of said outer bearing means to place them in substantially the same plane;

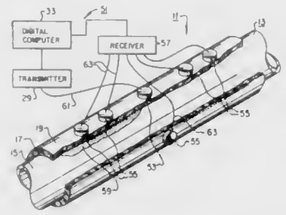
and means for flexibly causing said inner bearing means to move said magnetic circuit means toward engagement with said sheet.

4,929,896

TRANSIENT ELECTROMAGNETIC METHOD FOR DETECTING IRREGULARIES ON CONDUCTIVE CONTAINERS HAVING VARIATIONS IN JACKET THICKNESS

Pedro F. Lara, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 292,563, Dec. 29, 1988, abandoned. This application Nov. 21, 1989, Ser. No. 442,426
Int. Cl.[5] G01N *27/82;* **G01R** *33/12;* **G01B** *7/10*
U.S. Cl. 324—240 **29 Claims**



1. A method for detecting irregularities on electrically conductive walls of container means, comprising the steps of:

(a) providing transmitting antenna means and transmitter means connected with said transmitting antenna means;

(b) providing receiving antenna means and receiver means connected with said receiving antenna means;

(c) placing said transmitting antenna means in proximity to that portion of the container means wall which is to be investigated;

(d) placing said receiving antenna means in proximity to the container means wall portion and in proximity to said transmitting antenna means, said receiving antenna means being separated from said transmitting antenna means;

(e) providing an abruptly changing current to said transmitting antenna means from said transmitter means so as to induce current into the container means wall portion;

(f) detecting the presence of and the decay of said induced current in said container means wall portion with said receiving antenna means to produce a received signal, said received signal having an intermediate time range and a late time range, said received signal having a maximum occurring in the intermediate or late time ranges, said received signal having an arrival time which is the time when said maximum occurs;

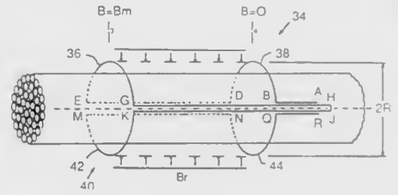
(g) examining said received signal to determine the maximum of said received signal and examining the received signal to determine the arrival time of said maximum, said maximum and said arrival time providing an indication of the presence or absence of irregularities in said container means wall portion, wherein the presence of irregularities is indicated by a maximum which is greater than a maximum obtained from an irregularity-free container means wall portion.

4,929,897

METHOD AND APPARATUS FOR DETECTING CROSS SECTIONAL AREA VARIATIONS IN A ELONGATE OBJECT BY MEASURING RADIAL MAGNETIC FLUX VARIATIONS USING SPACED-APART COILS

Nicholaas T. Van Der Walt, Kibler Helghts, South Africa, assignor to Crucible Societe Anonyme

Filed Nov. 18, 1988, Ser. No. 273,268
Claims priority, application South Africa, Nov. 23, 1987, 87/8753
Int. Cl.[5] G01N *27/82, 27/72;* **G01R** *33/12*
U.S. Cl. 324—240 **9 Claims**



1. Apparatus for detecting cross-sectional variations in an elongate object which comprises a magnetizing head for establishing a first magnetic field and at least a second magnetic field which is adjacent the first magnetic field, means for forming a pathway which permits the elongate object to travel in an axial direction through the first magnetic field and through the second magnetic field so that the elongate object is magnetized in opposing axial directions by the first and second magnetic fields respectively, at least two saddle coils positioned opposite one another on opposing sides of the pathway, each saddle coil having at least first and second half circumferential windings which are positioned axially spaced from one another, the first half circumferential windings of the respective saddle coils being positioned at a location where the magnetic flux density in the object is at a maximum value and the second half circumferential windings being positioned at a location where the magnetic flux density in the object is zero, and means for detecting a voltage which is induced in the saddle coils.

4,929,898

TRANSIENT ELECTROMAGNETIC METHOD FOR DETECTING IRREGULARITIES ON CONDUCTIVE CONTAINERS

Brian R. Spies, McKinney, Tex., assignor to Atlantic Richfield, Los Angeles, Calif.

Continuation-in-part of Ser. No. 134,368, Dec. 17, 1987, Pat. No. 4,843,320. This application Dec. 29, 1988, Ser. No. 291,632
Int. Cl.[5] G01N *27/90;* **G01R** *33/12;* **G01B** *7/10*
U.S. Cl. 324—242 **24 Claims**

1. A method of detecting irregularities on electrically conductive walls of container means, comprising the steps of:

(a) providing transmitting antenna means and transmitter means connected with said transmitting antenna means;

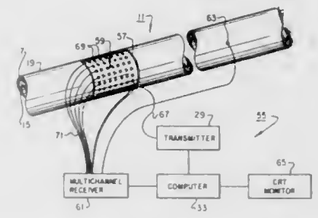
(b) providing receiving antenna means and receiver means, said receiving antenna means comprising many receiving antennas, said receiver means being connected with each of said receiving antennas;

(c) providing a two-dimensional display means for displaying the received signals;

(d) placing said transmitting antenna means in proximity to that portion of the container means wall which is to be investigated for irregularities;

(e) placing said receiving antenna means in proximity to that portion of the container means wall which is to be investigated for irregularities, said receiving antenna means being placed near said transmitting antenna means, said individual receiving antennas being distributed over said container means wall portion in a predetermined spatial relationship with one another;

(f) providing an abruptly changing current to said transmitting antenna means from said transmitter means so as to induce current into the investigated container means wall portion;



(g) detecting the presence of and the decay of said induced current in said investigated container means wall portion with said receiving antennas and said receiver means to produce many received signals, said many received signals being obtained simultaneously by said receiving antennas and said receiver means;

(h) dividing the received signals into samples of time, such that the respective samples of time of each received signal correspond to respective samples of time of the other received signals;

(i) creating a two-dimensional display on said display means for a sample of time by displaying the respective corresponding time sample of each of the received signals in a spatial arrangement on said display means that corresponds to the spatial arrangement of said receiving antennas on said container means wall portion, wherein for each sample of time there is a corresponding two-dimensional display.

4,929,899

FLUXGATE MAGNETOMETER APPARATUS AND ADJUSTMENT METHOD TO MAINTAIN ACCURACY OVER A WIDE TEMPERATURE RANGE

Lawrence M. Weixelman, and Richard D. Swanson, both of Wichita, Kans., assignors to Boeing Company

Filed Feb. 24, 1988, Ser. No. 159,751
Int. Cl.[5] G01R *33/04;* **G01C** *17/28*
U.S. Cl. 324—253 **15 Claims**

1. A fluxgate magnetometer for maintaining accuracy over a wide temperature range comprising

a high permeable magnetic core means of essentially constant magnetic path cross section;

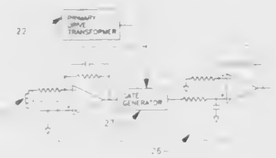
a primary winding means disposed on said core means for applying an alternating voltage to alternately saturate and unsaturate said core means with magnetic fields of opposite polarities;

a secondary winding means disposed on said core means and said primary winding means to form a fluxgate and being responsive to said alternate saturation and unsaturation of said core means inducing in said secondary winding means

a voltage pulse upon each transition from core saturation to unsaturation;

means for creating a saturation field strength of more than 20 times that required to drive said core means to flux saturation;

input means for supplying an alternating voltage to said primary winding means;



output circuit means for measuring and summing the voltage pulses induced in said secondary winding means; and

means for determining the magnitude or direction of said external magnetic field from said measured and summed voltage pulses for given orientations of said fluxgate.

4,929,900

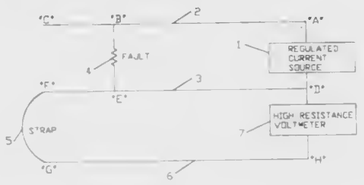
METHOD FOR LOCATING CONDUCTIVE FAULTS IN TELEPHONE AND SIMILAR CABLES

Mark W. Hastings, Weatherford, and James M. Buzbee, Mineral Wells, both of Tex., assignors to Industrial Technology, Inc., Mineral Wells, Tex.

Continuation of Ser. No. 138,939, Dec. 29, 1987, abandoned. This application May 19, 1989, Ser. No. 356,646

Int. Cl.[5] G01R *31/08*

U.S. Cl. 324—525 **4 Claims**



1. A method of locating a conductive fault in a telephone or similar shielded cable, comprising the steps of;

a. connecting a constant current source and establishing a known and constant current flow from the constant current source located at a reference point location through a first faulted conductor, an unknown fault resistance and a second faulted conductor and back to the constant current source;

b. connecting said second faulted conductor at a point beyond the fault to a non-faulted conductor which extends to the reference point location;

c. connecting a high resistance voltmeter and measuring the voltage between the second faulted conductor and the non-faulted conductor at the reference point location, with the resistance of said high resistance voltmeter being such that the current flow through it is negligible when compared with said constant current;

d. utilizing the magnitude of the known current flow in said second faulted conductor between said reference point location and the fault location and the magnitude of the voltage indicated by said high resistance voltmeter to determine the distance from said reference point location to the fault location.

4,929,901

DC GROUND FAULT DETECTION

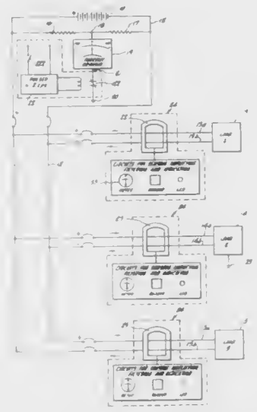
Dorr Kimball, 304 N. El Molino, Alhambra, Calif. 91801; Michael G. Cox, 19009 Laurel Park Rd., #299, Dominguez Hills, Calif. 90220, and Manoel R. Cabison, 717 E. Norwood, San Gabriel, Calif. 91776

Continuation of Ser. No. 182,996, Apr. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 773,333, Sep. 6, 1985, Pat. No. 4,739,274. This application Jul. 13, 1989, Ser. No. 380,728

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.[5] G01R *31/08, 31/02*

U.S. Cl. 324—529 **70 Claims**



15. Apparatus for the detection of low level ground leakage current in a normally ungrounded DC system in a multifeeder distribution system having a relatively high capacitive reactance and being associated with a relatively strong electromagnetic and electrostatic field, said system including a DC power supply, conductors from the supply for supplying power to a load connected in the DC system comprising a resistor element for connection across the DC power supply, a tapping point to the resistor element, a connector between the tapping point and a ground point such that a ground leakage current in the system completes a ground circuit, a relay between the tapping point and ground, a pulser for periodically opening and closing said relay while the ungrounded DC system remains substantially closed and operational, the opening and closing of said relay interrupting said ground circuit effectively thereby to generate a DC pulse interrupted ground fault signal and a magnetic sensor for location relative to the DC system for sensing said magnetic field changes and thereby said DC pulse interrupted ground fault signal and thereby providing for detecting the location of the low level ground leakage current in the relatively high capacitive reactance system, said DC system remaining substantially closed and operational during the ground leakage current detection, the pulse interruption rate being less than about 2 times per second.

4,929,902

MULTIPLE SIZE CABLE TESTING DEVICE

William A. Nelson, III, R.D. 1, Box 300, Old York Rd., Ringoes, N.J. 08551

Filed Apr. 7, 1989, Ser. No. 334,729

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—542 **20 Claims**

1. A multiple size coaxial cable testing device for signaling the malfunction of a particular wire of a three wire coaxial cable, which comprises:

(a) a housing;

(b) a transmitter-analyzer unit located in said housing which contains:

(i) an on/off switch;

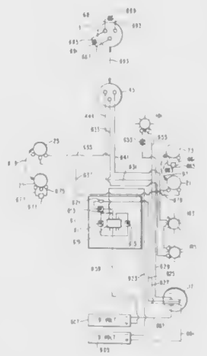
(ii) a power source;

(iii) wiring;

(iv) a circuit board with resistors to regulate current flow;

(v) three or more different size, three-wire coaxial cable connectors, including one cable connector for receiving a plug at one end of a first cable of a defined size, one cable connector for receiving a plug at one end of a second cable of a different defined size, and one cable connector for receiving a microphone cable plug of a size different from those of said first and said second cables; and,

(vi) at least two signal lights; wherein said power source is connected to each of said cable connectors through said circuit board via said wiring, and said signal lights are connected to the wiring to signal the malfunction of a particular wire of a three-wire coaxial cable when tested; and,



(c) a receiver unit for receiving current from the transmitter-analyzer unit and returning current to it when a cable is tested, said receiver unit located at least in part in said housing, which receiver unit contains:

(i) three or more different size, three-wire coaxial cable connectors of the same type and size as the connectors of said transmitter-analyzer, at least one of said cable connectors being removably attached to said housing for connection to the opposite end of a cable to be tested;

(ii) each of said connectors having wiring; and,

(iii) diodes and/or resistors;

wherein said diodes and/or resistors are connected via said wiring to the three-wire cable connectors so as to complete a circuit for testing in conjunction with said transmitter-analyzer unit when the on/off switch is on and a plug at one end of a cable to be tested is connected to a connector of said transmitter unit and the plug at the opposite end of cable to be tested is connected to a connector of said receiver unit.

4,929,903

METHOD OF AND APPARATUS FOR ASSESSING INSULATION CONDITIONS

Akira Saigo, Chiba; Shigenari Maezawa, Kashiwa; Tomoaki Kageyama, Kuga; Keizaburo Ishikura, Kuga; Akio Sera, Kuga, and Junji Suehiro, Otake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,578

Claims priority, application Japan, Aug. 7, 1987, 62-197812; Feb. 17, 1988, 63-34800; Feb. 26, 1988, 63-43529; Feb. 29, 1988, 63-47213

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—544 **8 Claims**



1. An apparatus for detecting deterioration in insulation of electrical equipment and cables, comprising a first coil 1 composed of two primary windings 11, 12 and a secondary winding 13 wound on a core whose magnetomotive force and magnetic flux density are approximately proportional to each other, said primary windings 11 and 12 being wound with the same number of turns and in the same direction,

a second coil 2 composed of a primary winding 21 and a secondary winding 22 wound on a core whose magnetomotive force and magnetic flux density are approximately proportional to each other, and

an impedance circuit 3,

the terminals 21-*a* and 21-*b* of the primary winding 21 in the second coil 2 being respectively connected to the winding end terminal 11-*b* of the primary winding 11 and the winding end terminal 12-*b* of the primary winding 12 in the first coil 1, said impedance circuit 3 being connected to the winding end terminal 11-*b* of the primary winding 11 and the winding start terminal 12-*a* of the primary winding 12 in the first coil 1, a signal indicative of deterioration in insulation of electrical equipment or cables being obtained at the terminals 13-*a* and 13-*b* of the secondary winding 13 in the first coil 1 or at the terminals 22-*a* and 22-*b* of the secondary winding 22 in the second coil 2 when the winding start terminal 11*a* of the primary winding 11 and the winding start terminal 12-*a* of the primary winding 12 in the first coil 1 are connected to the shielding case of said electrical equipment or the shield of said cable and the ground, respectively.

4,929,904

MOISTURE SENSING APPARATUS WITH MOVABLE PROBE IN COMBINATION WITH AN AGRICULTURAL BALER HAVING A PICKUP

Carl E. Bohman, and Shaun A. Seymour, both of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Jul. 24, 1989, Ser. No. 383,694

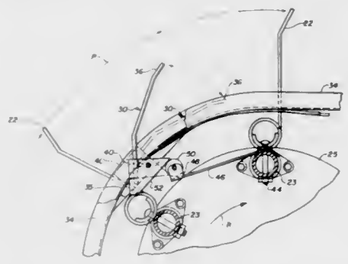
Int. Cl.[5] G01R *27/14*

U.S. Cl. 324—696 **10 Claims**

1. In combination with an agricultural baler having a pickup including a plurality of tines movable in a preselected path for picking up crop material and a bale case in which crop material is formed into bales, moisture sensing apparatus comprising:

a probe mounted on said pickup for movement between a retracted position and an operative position in order to

check the moisture content of the crop material being picked up by said tines before it enters said bale case; and



means actuated when said times move in said preselected path for moving said probe from said retracted position to said operative position and into the crop material picked up by said tines.

4,929,905

SYNCHRONOUS DEMODULATION CIRCUIT FOR A CARRIER-MODULATED TELEVISION SIGNAL

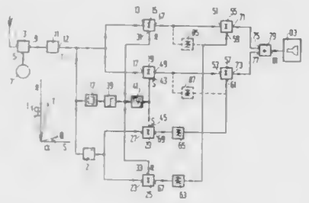
Leonardus J. M. Ruitenburg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1989, Ser. No. 320,133

Claims priority, application Netherlands, Mar. 7, 1988, 8800555

Int. Cl.[5] H03D *1/00*

U.S. Cl. 329—358 **9 Claims**



1. A synchronous demodulation circuit for a carrier-modulated television signal (T), comprising a passive carrier regeneration circuit for obtaining an in-phase (R) and quadrature reference signal (S) for synchronously demodulating the television signal in an in-phase and a quadrature demodulator, respectively, outputs of the in-phase and quadrature demodulators being coupled, respectively, to a first and a second input, respectively, of a combination circuit having an output from which a video signal is obtained, characterized in that the synchronous demodulation circuit further comprises a first and a second multiplier having respective inputs coupled via at least a first and a second low-pass filter, respectively, to corresponding outputs of a circuit for obtaining a synchronous in-phase and a quadrature-demodulated television signal, said first and second multipliers being arranged in such a manner that the amplitudes of the signals at the first and the second input, respectively, of the combination circuit are also substantially proportional to that of the signals at said respective inputs of the multipliers.

4,929,906

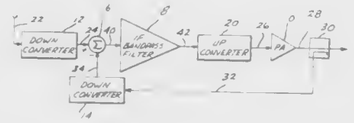
AMPLIFIER LINEARIZATION USING DOWN/UP CONVERSION

Kenneth G. Voyce, Bellevue, and Jay H. McCandless, Issaquah, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 23, 1989, Ser. No. 299,950

Int. Cl.[5] H03F *1/32;* H03C *1/06*

U.S. Cl. 330—149 **13 Claims**



1. A circuit for linearizing an amplifier, the amplifier having input and output terminals and means for amplifying an amplifier input signal at the input terminal to produce an amplifier output signal at the output terminal, the circuit comprising:

first down conversion means for receiving an RF input signal to be amplified and for down converting the RF input signal to produce a first IF signal;

coupler means connected to the output terminal of the amplifier, the coupler means including means for dividing the amplifier output signal to produce an RF output signal and a feedback signal;

second down conversion means connected to the coupler means for down converting the feedback signal to produce a second IF signal;

combining means connected to the first and second down conversion means for subtracting one IF signal from the other IF signal to produce a difference signal;

up conversion means connected to the combining means and to the input terminal of the amplifier, for up converting the difference signal to produce the amplifier input signal and for coupling the amplifier input signal to the input terminal of the amplifier.

4,929,907

OUTPUT AMPLIFIER

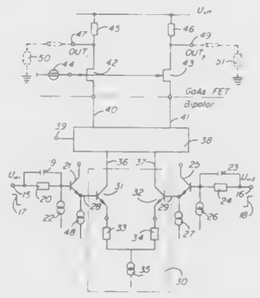
Werner Berkel, Weil der Stadt, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 8, 1989, Ser. No. 320,672

Claims priority, application European Pat. Off., Mar. 9, 1988, 88103693.3

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—252 **6 Claims**



1. An output amplifier for high output swing in pulse generators, comprising a first bipolar transistor linear amplifier stage receiving an internal pulse signal, and a second amplifier stage which is controller by the output of said first amplifier stage and comprises at least one field-effect transistor, in which:

said first bipolar transistor linear amplifier stage comprises a high gain differential amplifier with differential inputs and differential outputs;

said second amplifier stage comprises two gallium arsenide field-effect transistors for providing high output voltage swing;

said two gallium arsenide field-effect transistors are wired as a common gate;

means for applying a constant voltage to said common gate, and

a multiplier stage having an adjustable multiplication factor, provided by an adjustable input connection, connecting said first amplifier stage to said second amplifier stage.

4,929,908

GAIN CONTROLLABLE AMPLIFIER CIRCUIT

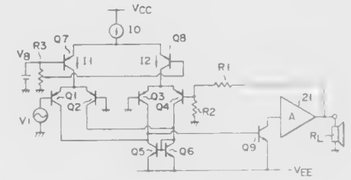
Kazuo Imanishi, Yokohama, Japan, assignor to Kubushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 28, 1989, Ser. No. 344,775

Claims priority, application Japan, May 2, 1988, 63-109313

Int. Cl.[5] H03F *3/45;* H03G *3/30*

U.S. Cl. 330—254 **10 Claims**



1. An amplifier circuit comprising:

first voltage-current converter means for converting an input signal voltage into a corresponding first output current;

second voltage-current converter means for converting a negative feedback signal voltage into a corresponding second output current, said second voltage-current converter having first and second input terminals to which a DC voltage of a predetermined level and the negative feedback signal voltage are applied, respectively;

coupling means for coupling said first and second output currents of said first and second voltage-current converter means, and for generating an output voltage corresponding to the sum of said first and second output currents;

voltage amplifier means for applying the output voltage of said coupling means;

feedback means for supplying part of the output voltage of said voltage amplifier means as the negative feedback signal voltage only to the second inputs terminal of said second voltagecurrent converter means, the DC voltage level of the output voltage of said voltage amplifier means being determined in accordance with both the negative feedback signal voltage supplied from said feedback means and the DC voltage of the predetermined level; and

control means for controlling the ratio of the mutual conductances of said first and second voltage-current converter means.

4,929,909

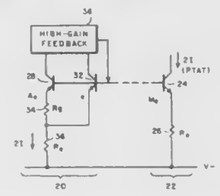
DIFFERENTIAL AMPLIFIER WITH GAIN COMPENSATION

Barrie Gilbert, Beaverton, Oreg., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Mar. 27, 1989, Ser. No. 328,946

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—256 **10 Claims**



1. A gain-compensated differential amplifier circuit comprising:

(a) a transistor differential amplifier, with reasonably matched current gains, operating at a tail current I_{tail};

(b) a transistor current source responsive to a control voltage for generating said tail current as a function of the control voltage;

(c) control voltage generating means for generating, as the control voltage, a voltage which varies proportionately to absolute temperature; and

(d) the control voltage generating means including means for functionally relating the control voltage to the intrinsic emitter resistance of the current source.

4,929,910

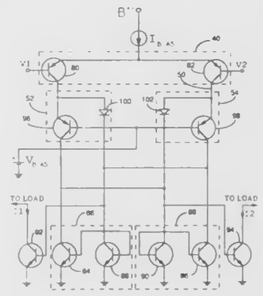
LOW CURRENT AMPLIFIER WITH CONTROLLED HYSTERESIS

Gary L. Pace, and David H. Overton, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 10, 1989, Ser. No. 377,033

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—257 **14 Claims**



1. An amplifier comprising:

a current source;

a differential amplifier for receiving a first input voltage and a second input voltage, said amplifier coupled to said current source and having a first output and a second output;

a first current mirror having an input and an output;

a second current mirror having an input and an output, said input and output cross-coupled to the output and input, respectively, of said first current mirror;

first means for preventing voltage saturation across said second current mirror, having a first and second input and

a first and second output, said first input coupled to said first output of said differential amplifier, said second input for coupling to a first supply voltage, said first output coupled to said input of said first current mirror, and said second output coupled to said output of said first current mirror; and

second means for preventing voltage saturation across said first current mirror, having a first and second input and a first and second output, said first input coupled to said second output of said differential amplifier, said second input for coupling to said first supply voltage, said first output coupled to said input of said second current mirror, and said second output coupled to said output of said second current mirror.

4,929,911

PUSH-PULL OUTPUT CIRCUIT HAVING THREE TRANSISTORS

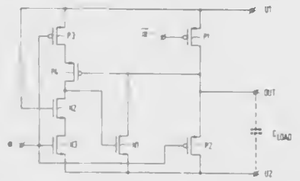
Thomas J. Davies; Evert Seevinck, both of Eindhoven, Netherlands; Leonardus C. M. G. Pfennings, deceased, late of Sittard; Henricus J. Kennen, Valkenswaard, both of Netherlands (legal representative); Peter H. Voss, Eindhoven; Cormac M. O'Connell, Eindhoven; Cathal G. Phelan, Eindhoven, and Hans Ontrop, Eindhoven, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed May 22, 1989, Ser. No. 296,462

Claims priority, application Netherlands, Jan. 14, 1988, 8800075

Int. Cl.[5] H03F *3/26*

U.S. Cl. 330—264 **5 Claims**



1. A push-pull output circuit comprising first and second output transistors, in which current channels of the first and second output transistors are connected between a first power supply terminal and an output terminal and between the output terminal and a second power supply terminal, respectively, the first output transistor being a p-type transistor, a first and a second output terminal being coupled to a control electrode of the first and the second output transistor, respectively, which input terminals receive a logic input signal and the inverse thereof, respectively, characterized in that the second output transistor is also a p-type transistor and in that a third output transistor of the n-type is provided, the current channel of said third transistor being connected directly in parallel with the current channel of the second output transistor, and in that detection means for turning on the third output transistor when the voltage on the output terminal drops below the predetermined voltage level are coupled to said third transistor.

4,929,912

CURRENT MIRROR CIRCUIT, AND VIDEO OUTPUT AMPLIFIER CIRCUIT PROVIDED WITH THE CURRENT MIRROR CIRCUIT

Pieter G. Blanken, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

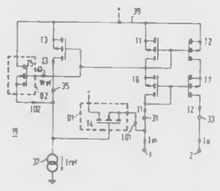
Filed Dec. 1, 1988, Ser. No. 280,103

Claims priority, application Netherlands, Dec. 10, 1987, 8702980

Int. Cl.[5] H03F *3/16*

U.S. Cl. 330—288 **12 Claims**

1. A current mirror circuit being provided with a current mirror, an input and an output of which are coupled to an input and an output, respectively, of the current mirror circuit, and a limiter circuit comprising a reference current source and a unilaterally conducting element which includes a transistor, a source electrode of which is coupled to the input of the current mirror circuit, characterized in that a control electrode of the



transistor is coupled to the reference current source, to a further output of the current mirror and to a reference voltage terminal via a further unilaterally conducting element, and in that a drain electrode of the transistor is coupled to a power supply terminal.

4,929,913

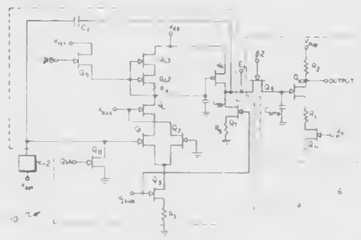
GAAS FOCAL PLANE ARRAY READOUT

Robert N. Sato, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 14, 1989, Ser. No. 393,193

Int. Cl.[5] H03F *3/08, 3/16*

U.S. Cl. 330—308 **13 Claims**



1. A capacitive feedback transimpedance amplifier comprising:

means, having an input terminal for coupling to an output signal of an infrared detector, for amplifying the detector output signal to produce at an amplifier output terminal an output signal;

means, coupled between said output terminal and said input terminal, for capacitively feeding back to said input terminal a feedback signal having a magnitude related to a magnitude of said output signal; and

load means coupled between said amplifier means output terminal and a source of amplifier means power, said load means comprising a resistor having a first terminal coupled to said output terminal and a second terminal coupled to a first load transistor, said first load transistor further being serially coupled to a second load transistor, a control terminal of each of said first and said second load transistors being coupled to said output terminal.

4,929,915

PROTECTIVE DEVICE FOR ENLARGING THE EFFECTIVE DIAMETER OF A PROBE IN LARGE DIAMETER WELLS

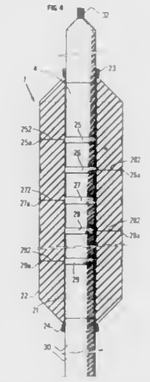
Christian Wittrisch, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 2, 1987, Ser. No. 69,174

Claims priority, application France, Feb. 27, 1987, 87 02757

Int. Cl.[5] G01V *3/20, 3/28, 5/04*

U.S. Cl. 324—347 **8 Claims**



1. A protective device for a logging probe having a longitudinal axis and having a small diameter relative to a well in which the probe is to operate, said device comprising a rigid tubular-like casing adapted to be connected to the probe and acting to enlarge the effective diameter of the probe in comparison with the well diameter, fastening means for locating said rigid casing coaxially on the probe and for fastening the casing circumferentially around the probe on at least one level of said probe, said rigid casing having an exterior surface longitudinally surrounding at least an active part of said probe for carrying out the logging measurement, said casing being capable of transmitting a signal emitted and/or received by said probe without substantial attenuation on the signal, wherein the exterior surface of the casing is spaced from the active part of the probe thereby enlarging the effective diameter of the probe and the fastening means for the casing are located on the probe so that mechanical stresses occurring in the well are applied and transmitted along the exterior surface of ssid casing without adversely acting on the active part of the probe; said probe being provided with electrodes on an exterior surface, said casing including electrodes located along the longitudinal axis of the casing, each of said electrodes being associated with an electrode of the probe and at least one of the electrodes on the casing being electrically connected to an electrode on the probe by an electrical connection extending through a space defined between the probe and the casing.

4,929,916

CIRCUIT FOR DETECTING A LOCK OF A PHASE LOCKED LOOP

Shinri Fukuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

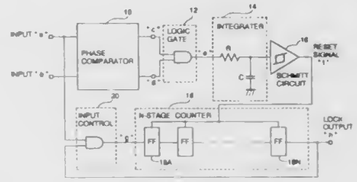
Filed Mar. 10, 1989, Ser. No. 321,685

Claims priority, application Japan, Mar. 10, 1988, 63-57481

Int. Cl.[5] H03L *7/08*

U.S. Cl. 331—1 A **4 Claims**

1. A circuit for detecting a lock of a phase locked loop comprising phase comparison means receiving a first signal and a second signal for generating a phase difference signal, waveform shaping means connected to receive the phase difference signal for generating an output signal when the phase difference signal indicates a phase difference exceeding a predetermined value, a multi-stage counter having a frequency division function and having a reset input connected to receive the output signal of the waveform shaping means, input control means connected to receive the first signal and an output of the



multi-stage counter and having an output connected to an input of the multi-stage counter for allowing the first signal to be applied to the multi-stage counter only when the output of the multi-stage counter is at a predetermined logic level, the output of the counter providing an lock output.

4,929,917

PHASE-LOCKED LOOP CIRCUIT

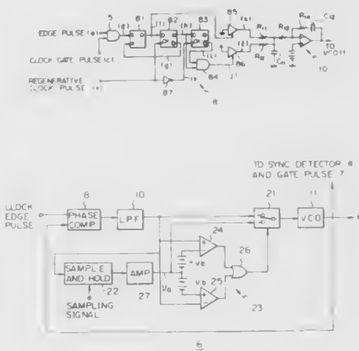
Fumihiko Yokogawa, Saitama, and Ryuichi Naito, Tokorozawa, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,575

Claims priority, application Japan, Jul. 15, 1988, 63-176651

Int. Cl.[5] H03L *7/08;* **G11B** *5/02*

U.S. Cl. 331—1 A **5 Claims**



1. A recording medium drive apparatus which drives a recording medium on which clock marks are recorded to produce a read signal having a period which may vary about a clock period T_s, comprising:

a phase-locked loop (PLL) circuit for producing a clock signal comprising:

phase comparator means having a linear characteristic range of $\pm\sigma$, wherein said phase comparator means produces a clock control signal having a magnitude which varies depending upon a phase difference between the clock signal and the read signal; and

variable frequency oscillator means for generating the clock signal so that the frequency of said clock signal varies in response to the magnitude of said clock control signal;

wherein the following relation stands:

$$|\omega_n \cdot \zeta| \leqq |\alpha/2\pi \cdot T_s|$$

where ω_2 and ζ are the natural angular frequency and the damping factor of the PLL loop, respectively.

3. A recording medium drive apparatus which drives a recording medium on which clock marks are recorded to produce a read signal having a period which may vary about a clock period T_s, comprising:

a phase-locked loop (PLL) circuit for producing a clock signal comprising:

phase comparator means having a linear characteristic range, wherein said phase comparator means produces a clock control signal having a magnitude which varies depending upon a phase difference between the clock signal and the read signal;

variable frequency oscillator means for generating the clock signal so that the frequency of said clock signal varies in response to the magnitude of said clock control signal; and

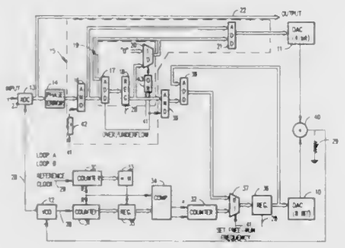
level limiter means for preventing the magnitude of said clock control signal from exceeding a predetermined value.

4,929,918

SETTING AND DYNAMICALLY ADJUSTING VCO FREE-RUNNING FREQUENCY AT SYSTEM LEVEL

Paul W. Chung; Ralph L. Gee, both of San Jose; Luke C. K. Lang, Santa Clara, and Paik Saber, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1989, Ser. No. 363,566
Int. Cl.[5] H03L *7/113*
U.S. Cl. 331—10 13 Claims



1. A method for setting the free-running frequency of a VCO that forms part of a PLL comprising the steps of:

at system power on, disabling the PLL and setting a DAC and the PLL to a value corresponding substantially to the center of a preselected frequency lock range;

supplying the VCO output pulses to a first counter;

supplying pulses from a reference clock to a second counter;

when the second counter counts to a preselected count, storing the count then in said first counter in a register and resetting both counters;

comparing the stored count with a preselected expected count corresponding to said value; and

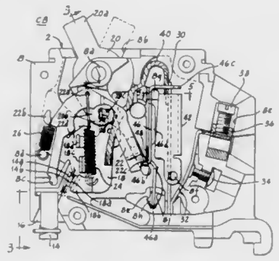
incrementing or decrementing the VCO frequency according to whether the stored count is lower or higher than the expected count.

4,929,919

TWIN UNIT CIRCUIT BREAKER WITH IMPROVED MAGNET STRUCTURE

Donald A. Link, Hubertus; Dean A. Hubbard, Sussex, and Michael R. Larsen, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 27, 1988, Ser. No. 211,739
Int. Cl.[5] H01H *75/10*
U.S. Cl. 335—38 25 Claims



1. A current responsive circuit breaker comprising:

an insulating housing;

a stationary contact mounted in said housing;

a movable contact in said housing engagable with said stationary contact;

magnetic current sensing means in said housing comprising a pole piece having a pair of pole faces thereon and an armature pivotally mounted in spaced proximity to said pole faces, said armature being movable into engagement with said pole faces;

means operable to effect separation of said movable contact from said stationary contact in response to movement of said armature toward engagement with said pole faces; and

metallic bearing means mounted in said housing, said bearing means having a smooth surface trough and said armature having a blade edge pivot received in said trough.

4,929,920

COMPACT CIRCUIT BREAKER WITH AN ELECTRONIC TRIP UNIT

David J. Meiners, Southington; Robert A. Morris, Burlington; David Arnold, Chester; Roger N. Castonguay, Terryville, and Joseph M. Palmieri, Southington, all of Conn., assignors to General Electric Company, New York, N.Y.

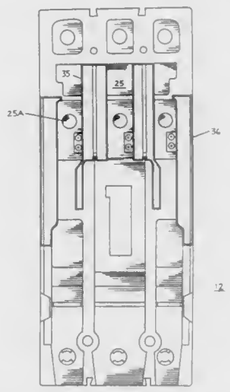
Filed Jun. 23, 1989, Ser. No. 370,948
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—202 8 Claims

1. A circuit breaker comprising:

a molded plastic circuit breaker case and cover;

a pair of separable contacts within said case and arranged for separation upon occurrence of an overcurrent condition by means of an operating mechanism and an electronic trip unit;

a plurality of current transformers within said case under said trip unit and connected with said trip unit by pin connectors projecting through said circuit breaker cover and said trip unit; and



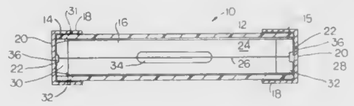
reinforcing ribs integrally-formed within a bottom of said circuit breaker cover to provide added strength to said circuit breaker cover during said overcurrent condition.

4,929,921

AUTOMATABLE FUSE

Varioder K. Kalra, Chesterfield, and Keith A. Spalding, Fenton, both of Mo., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 16, 1989, Ser. No. 324,474
Int. Cl.[5] H01H *85/16*
U.S. Cl. 337—233 25 Claims



1. A fuse, comprising:

an insulating housing having opposed electrically conductive end caps;

a bridge having opposed ends disposed within said housing and extending between said end caps;

a fusing wire disposed on said bridge;

a metal foil disposed on at least one side of the ends of said bridge; and

solder connecting said fusing wire and metal foil to one of said end caps.

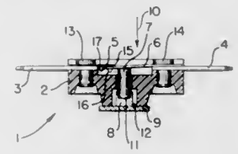
4,929,922

TEMPERATURE SAFETY DEVICE FOR ELECTRIC DEVICES

Walter Hollweck, Heroldsberg, Fed. Rep. of Germany, assignor to Inter Control Hermann Kohler Elektrik GmbH

Filed Dec. 20, 1988, Ser. No. 287,336
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744238
Int. Cl.[5] H01H *37/76*
U.S. Cl. 337—407 13 Claims

1. In a temperature safety device of the type having an electrically insulative support, electrical connectors extending outwardly of the support, first and second contact elements having first fixed ends connected with said electrical connectors and free ends engageable to provide a switch within the support in series circuit with said electrical connectors, a melt material insert adapted for heat transfer relative with apparatus being protected by the safety device, and a mechanical force transfer element disposed between said insert and said second contact element and applying force thereto to effect closure of said contact elements in part attributable to counter-forces exerted by said contact elements, the improvement wherein said device first contact element has a lower directional quantity at its free end that the directional quantity of said second contact element at its free end, and wherein said device includes stop means disposed by said support in confronting relation with said first contact element and coactive therewith upon melting of said insert to limit movement of said first contact element, thereby to enhance opening of said switch and interruption of said series circuit.



4,929,923

THIN FILM RESISTORS AND METHOD OF TRIMMING

Vineet S. Dharmadhikari, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed May 26, 1989, Ser. No. 357,898
Int. Cl.[5] H01C *1/012;* B23K *26/00*
U.S. Cl. 338—308 17 Claims



1. A method of trimming resistors in an integrated circuit comprising:

forming a first resistor on a substrate having a first portion of a first material having a first resistivity and a second portion of a second material having a second resistivity substantially smaller than said first resistivity; and

trimming at least a selective portion of said second portion of said first resistor to increase the total resistance of said resistor over a range of resistances.

4,929,924

ELECTRONIC ALARM HORN

William P. Buyak, New Hartford; Bruce V. Testa, Cromwell, and Robert W. Right, Huntington, all of Conn., assignors to General Signal Corporation, Stamford, Conn.

Filed Jan. 27, 1989, Ser. No. 303,516
Int. Cl.[5] G08B *3/00*
U.S. Cl. 340—384 E 6 Claims

1. An electronic horn for alarm systems of the type in which an alarm condition is indicated by a reversal of polarity in the d.c. power supply for said horn, comprising:

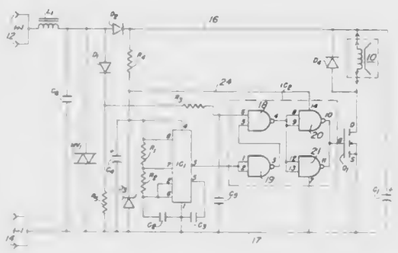
a pair of terminals for connection to said d.c. power supply;

a series circuit including a current limiting element, a diode

and a capacitor connected across said terminals and operable to charge said capacitor when the polarity of said d.c. supply appearing at said terminals is that which indicates an alarm condition;

a speaker operable to produce sound in response to current flow through said speaker, said speaker being constructed so that it will reverberate for a period after said current flow through said speaker has stopped;

switch means for connecting said speaker in parallel to said capacitor for the discharge of energy stored in said capacitor through said speaker when said switch means is in its conductive state; and



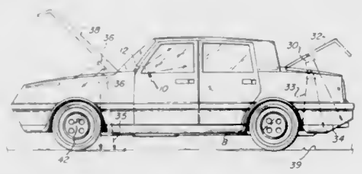
means for continuously cycling said switch means between its conductive and non-conductive states at a predetermined frequency and with a predetermined percentage of "on" time for each cycle such that the sound produced by current pulses through said speaker resulting from said cycling combines with that produced by the reverberant characteristic of the speaker when the current pulses through the speaker are cut off to provide a continuous tone as long as said pair of terminals is connected to said power supply in the polarity indicative of an alarm condition.

4,929,925

ALARM SYSTEM

David B. Bodine, 25 E. Common Rd., and Joseph R. Farkas, 52 Tersana Dr., both of Easton, Conn. 06612

Filed Feb. 24, 1988, Ser. No. 161,199
Int. Cl.[5] B60R *25/10;* B60Q *1/00*
U.S. Cl. 340—426 11 Claims



1. An alarm system for detecting movement of a vehicle upwardly from a surface supporting said vehicle, said alarm system comprising:

transducer means, facing downwardly toward said surface, for transmitting a sonic wave toward and receiving an echo from said surface;

an alarm;

electronic means for activating said transducer means to transmit a sonic wave and receive an echo and thereby determine a parameter indicative of a reference distance from said transducer means to said support surface; and

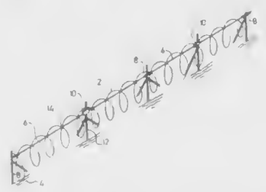
means for periodically activating said transducer means and comparing current data corresponding to the distance from said transducer means to said support surface to said reference distance, and activating said alarm if said current data indicates a current distance that is significantly greater than said reference distance.

4,929,926

INTRUSION DETECTION BARRIER

Chaim Porat, Beer Sheba, Israel, assignor to Magal Security Systems, Ltd., Israel

Filed Apr. 13, 1989, Ser. No. 337,675
Claims priority, application Israel, May 6, 1988, 86294
Int. Cl.[5] G08B *13/00;* H01H *3/02*
U.S. Cl. 340—541 20 Claims



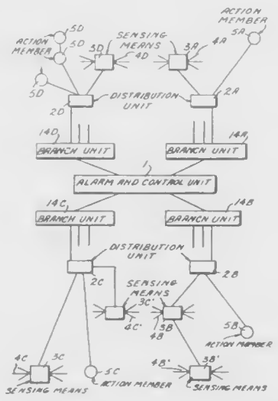
1. An intrusion detection barrier, comprising: a coiled wire fence deployable over the ground or over another fence; a sensor wire tensioned between a pair of wire-supporting posts anchored in the ground; an intrusion detector connected to said sensor wire to sense any change in tension thereof; and coupling members coupling said sensor wire to spaced points of said coiled wire fence.

4,929,927

SURVEILLANCE INSTALLATION

Per A. Uhlin, Backen, Stensfält, 54500 Töreboda, Sweden

PCT No. PCT/SE86/00359, § 371 Date Apr. 20, 1987, § 102(e) Date Apr. 20, 1987, PCT Pub. No. WO87/01226, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 8, 1986, Ser. No. 50,000
Claims priority, application Sweden, Aug. 19, 1985, 8503863
Int. Cl.[5] G08B *13/08*
U.S. Cl. 340—547 18 Claims



1. An intrusion detection system for protecting an area of ground at ground level, a central monitoring and control unit, a plurality of distribution units placed at selected locations in said area of ground to be protected, said distribution units being wired in circuit relationship with said central monitoring and control unit, a plurality of sensing means wired in circuit relationship with said distribution units, each sensing means

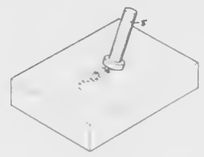
comprising an electric switch in said circuit relationship, a movable magnetic operator for said switch, said switch being in a first switching position when said movable magnetic operator is in close proximity thereto, said switch moving to a second switching position when released by moving said magnetic operator away from said switch, an elongated strand means connected to said magnetic operator and inconspicuously deployed over a portion of said area of ground, said elongated strand means connected to said magnetic operator and inconspicuously deployed over a portion of said area of ground comprises a net, said strand means being tripped by movement of an intruder to pull said magnetic operator away from said switch to generate an alarm signal when said switch moves from said first position to said second position, and a low voltage direct current supply in said control unit for supplying direct current operating power for said intrusion detecting system.

4,929,928

MAGNETIZED INK, PAINT OR DYE USED ON MERCHANDISE TO PREVENT THEFT

Eric Hultåker, Västerås, Sweden, assignor to AB Aros Avancerad Butikskontroll, Västerås, Sweden

Filed Feb. 19, 1988, Ser. No. 157,983
Claims priority, application Sweden, Feb. 20, 1987, 870713-4
Int. Cl.[5] G08B *13/14*
U.S. Cl. 340—572 12 Claims



1. A printing medium selected from the group consisting of ink, dye and paint for use in applying an anti-theft marking to articles, said printing medium containing particles of at least two different magnetizable materials, said materials differing in permeability and/or particle size, wherein said particles are intended to be magnetized when the printing medium is applied on an article or on a layer of a printing medium already applied to an article.

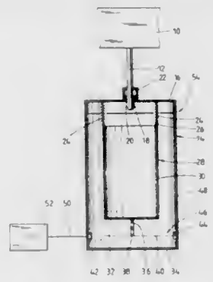
4,929,929

LEAKAGE CONTROL MECHANISM

Eike Romer, Seevetal, Fed. Rep. of Germany, assignor to Dipl.-Ing. Wrede & Niedecken Verwaltung GmbH, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 358,885
Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818416
Int. Cl.[5] G08B *23/00;* G01F *23/20*
U.S. Cl. 340—613 12 Claims

1. Leakage control mechanism for aggregates (10) containing liquid and/or with liquid running through them, with a receptacle (28) for liquid escaping from the aggregate (10), mounted elastically, in vertical direction and equipped with a device (46, 66) for detecting the vertical position of the receptacle (28) and triggering a signal when a pre-set position of lowering is reached by the receptacle (28), in which the receptacle (28) is arranged in a container (14) the lid (16) of which



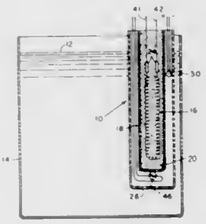
has an opening (18, 60) for inserting a feed-pipe (12) for the leakage liquid.

4,929,930

LIQUID LEVEL CONTROLLER UTILIZING THE RATE OF CHANGE OF A THERMOCOUPLE

Dennis J. Rezabek, Kirkland, Ohio, assignor to Process Technology Inc.

Filed Oct. 24, 1988, Ser. No. 261,314
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—622 30 Claims



1. A level controller for sensing the level of a containerized fluid comprising a heater element, a temperature sensitive element operatively associated with said heater element, said temperature sensitive element establishing a first signal indicative of the temperature at a location adjacent said heater element, which temperature is indicative of whether said temperature sensitive element is immersed in the fluid, first means for setting a predetermined maximum rate of change for said first signal which is indicative that said temperature sensitive element is sensing a temperature rise in excess of a predetermined maximum rate and that the temperature sensitive element is not immersed in the fluid and control means responsive to said first signal for establishing a second signal in the event that the rate of change of said first signal exceeds said predetermined maximum rate of change for said first signal.

4,929,931

BATTERY MONITOR

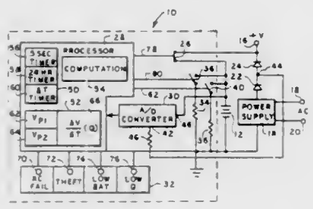
Steven W. McCuen, Lake Zurich, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 22, 1988, Ser. No. 289,601
Int. Cl.[5] G08B *21/00;* G01N *27/46*
U.S. Cl. 340—636 16 Claims

1. A battery monitor for monitoring the condition of a battery utilized within a system as the primary or auxiliary power source of said system, said battery monitor comprising:

voltage measuring means for measuring the voltage of said battery; and

processor means coupled to said voltage measuring means for utilizing the voltage measurement of said voltage measuring means, said processor means being arranged to test said battery by determining responsive to said voltage measuring means, the presence or absence of said battery, whether the battery voltage is equal to or greater than a



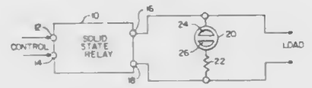
nominal voltage level, and the discharge rate of said battery, said processor means being adapted to compare said battery voltage to a first predetermined voltage level to determine the presence or absence of said battery, said processor means further being adapted to compare said battery voltage to a second predetermined voltage level to determine whether said battery voltage is equal to or greater than said nominal voltage.

4,929,932

SOLID STATE RELAY HAVING VISUAL CONTACT MONITOR

James P. Shipkowski, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,772
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—644 **8 Claims**



1. Solid state relay apparatus for switching an electrical load between two output terminals, said apparatus comprising:

relay means for electrically connecting said output terminals together in a first mode of operation and for isolating said output terminals in a second mode of operation; and

a visual indicator effectively connected in parallel across said output terminals, said indicator including means for visually indicating when a voltage is across the indicator and the polarity of any DC voltage across the indicator.

4,929,933

DIGITAL COLOR VIDEO MONITOR

Les L. McBeath, Elmhurst; Amir M. Sheikholeslami, Arlington Heights, and Glenn T. Turro, Oak Park, all of Ill., assignors to Zenith Electronics Corporations, Glenview, Ill.

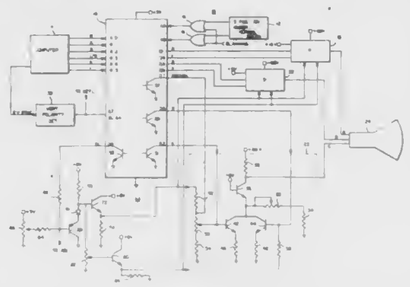
Filed Jul. 30, 1987, Ser. No. 79,369
Int. Cl.[5] G09G *1/28*
U.S. Cl. 340—703 **8 Claims**

1. A video processing system comprising:

means selectively providing a first and a second plurality of address signals, corresponding to two groups of logic level color video input signals including R, B, G and I, and R, B, G, r, b and g and a logic level control signal, respectively;

PROM means having a plurality of memory locations addressable by said plurality of address signals for developing corresponding open collector logic level color video output signals including R, G, B, r, g, and b;

amplifier means including Red, Green and Blue amplifiers supplied with said R, r; B, b; and G, g logic level color



video output signals, respectively and producing analog signals therefrom; and

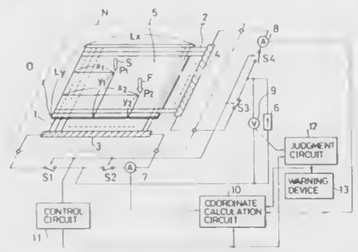
said PROM developing a brightness compensation signal for altering the magnitude of said analog signals as a function of said control signal.

4,929,934

PRESSURE-SENSITIVE INPUT APPARATUS

Kenichi Ueda; Kouji Hattori; Akihiko Terada, and Kazuyoshi Inohara, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,782
Claims priority, application Japan, Sep. 28, 1987, 62-240961
Int. Cl.[5] G08C *21/00*
U.S. Cl. 340—706 **11 Claims**



1. A pressure-sensitive input apparatus comprising:

vertical electrodes which are parallel with each other;

horizontal electrodes which are parallel with each other, intersect said vertical electrodes and are separated from the vertical electrodes;

the electrical resistance between said vertical electrodes and said horizontal electrodes being reduced at a location where a pressure is applied;

an X-coordinate detection resistive member connected to the vertical electrodes;

a Y-coordinate detection resistive member connected to the horizontal electrodes;

current supply means for supplying an electric current through said vertical electrodes, said horizontal electrodes, said X-coordinate detection resistive member and said Y-coordinate detection resistive member;

coordinate calculating means for detecting currents through said X-coordinate detection resistive member and said Y-coordinate detection resistive member and calculating the positional coordinate at which a pressure is applied;

switching means for on-off control of the current flowing

through both ends of the X-coordinate detection resistive member and the Y-coordinate detection resistive member;

voltage detection means for detecting the voltage between the X-coordinate detection resistive member and the Y-coordinate detection resistive member;

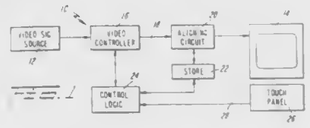
judgment means responsive to the voltage detection means for detecting multiple input according to the results obtained from the voltage detection means when the currents are switched by the switching means.

4,929,935

APPARATUS FOR ALIGNING RASTER SCANNED IMAGE TO TOUCH PANEL

Peter B. Rysavy, and Maurice J. Fuller, both of Seattle, Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed May 2, 1986, Ser. No. 858,679
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—712 **11 Claims**



10. In a display system for generating a raster scan display, having a user input means and a synchronizing signal generating means for generating a synchronizing signal for synchronizing an image displayed on said raster scan display, said synchronizing signal generating means including count registering means for establishing a timing relationship among portions of said synchronizing signal generated thereby and count establishing means for establishing counts for said count registering means to define a timing relationship among portions of said synchronizing signal, the improvement comprising:

said user input means including key means comprising a touch control screen means over said display,

means for generating for display on said raster scan display an alignment screen including therein a plurality of indicia for indicating an alignment of the generated screen relative to predetermined orientation and displacement,

location means responsive to ones of said key means operated by a user for correcting misalignment of the displayed alignment screen relative to said predetermined orientation and displacement, said location means including said count establishing means operable responsively to said said user operated key means to displace said displayed alignment screen in a respective predetermined direction in accordance with a respective one of said alignment key means operated by the user,

by varying respective one of said counts.

4,929,936

LED ILLUMINATED SIGN

Don Friedman, and Thomas T. Chang, both of Las Vegas, Nev., assignors to Home Security Systems, Inc., Las Vegas, Nev.

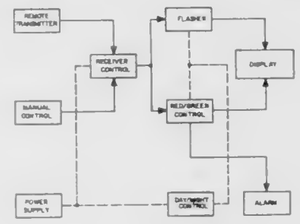
Filed Mar. 21, 1988, Ser. No. 170,949
Int. Cl.[5] G09G *1/16*
U.S. Cl. 340—715 **10 Claims**

1. An illuminated sign comprises an enclosure, a plurality of display members mounted in the enclosure, each display member comprising a housing, an indicia display panel having a plurality of discrete display segments selectively illuminable to form lighted indicia, each display segment comprising an aligned row of a plurality of LED's,

first electronic circuit means comprising a DC power source, the display segments, and first switch means actuated by a predetermined decrease in ambient lighting for connecting the power source to the display segments, and

second electronic circuit means comprising the DC power source, means for changing the color of the display segments from a first color to a second color comprising a first linear array of LED dices connected in series in each display segment, a second linear array of LED dices connected in series in each display segment, and third switch means for selectively actuating the first or second arrays in each display segment,

second switch means for connecting the power source to the display segments, receiver means for receiving a remotely



generated signal, receiver switch means responsive to the reception of such signal for connecting the DC power source to the display segments, and manual switch means connected to the power source in parallel with the receiver switch means, flasher means for intermittently connecting the DC power source to the display segments, and

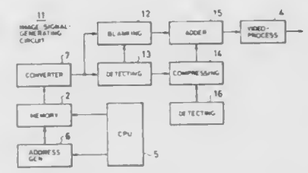
a plurality of display segment actuating switches, one for each disply segment, adapted to be manually actuated for selectively disconnecting each display segment from the DC power source such that when the power source is connected to the display members, each indicia display panel displays a preselected indicia.

4,929,937

CIRCUIT FOR GENERATING IMAGE SIGNAL

Kouichi Ara, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Feb. 25, 1988, Ser. No. 160,375
Claims priority, application Japan, Feb. 27, 1987, 62-44599
Int. Cl.[5] G09G *1/16*
U.S. Cl. 340—728 **7 Claims**



1. A circuit for generating an image signal for use in a projection TV receiver, comprising:

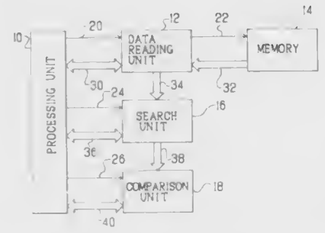
a memory means in which data about an image is stored;

an image pattern creating means for successively reading data from the memory means in step with a deflection operation and for creating an image pattern consisting of dots the minimum width of which is determined by the storage capacity of the memory; and

a compressing means which receives data from the image pattern creating means and compresses the width of the dots forming the image pattern, said compressing means

including a detecting means to detect the horizontal edges of the image pattern and delaying means to delay the horizontal edges by a period shorter than the period corresponding to the minimum width of the dots.

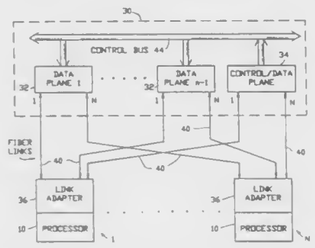
4,929,938
AREA SEARCHING SYSTEM
Ryuji Horiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 16, 1988, Ser. No. 156,117
Claims priority, application Japan, Feb. 13, 1987, 62-31025
Int. Cl.[5] G09G *1/14*
U.S. Cl. 340—747 **3 Claims**



1. A system for searching a predetermined boundary of a closed pattern comprising a memory for storing data of a given closed pattern, a reading unit for sequentially reading each pair of vertically adjacent words of each pair of vertically adjacent lines of the given closed pattern from the memory in the same data reading direction, a search unit receiving the pair of vertically adjacent words from the reading unit for searching a boundary in each of the pair of vertically adjacent words and for generating data indicative of a position of a boundary found in each of the pair of vertically adjacent words, a comparison unit receiving the boundary position data of the each pair of vertically adjacent words so as to judge in which of the vertically adjacent words the boundary is found earlier than the other, and a processing unit coupled to the comparison unit for determining whether or not the found boundary is the predetermined boundary.

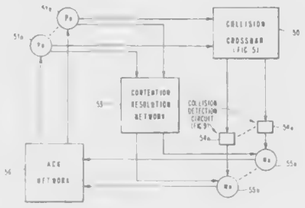
4,929,939
HIGH-SPEED SWITCHING SYSTEM WITH FLEXIBLE PROTOCOL CAPABILITY
Anujan M. Varma, Croton-On-Hudson, and Christos J. Georgiou, White Plains, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 31, 1988, Ser. No. 264,596
Int. Cl.[5] H04Q *1/00*; H03K *17/00*
U.S. Cl. 340—825.80 **16 Claims**

1. A switching system for selectively connecting a plurality of processors, comprising:
a switching station comprising a plurality of switching planes for transferring data therethrough;
a plurality of data links, each of said data links being coupled at a first end thereof to a respective one of said switching planes and at a second end thereof to one of said processors;
at least one of said switching planes being a control/data plane including control means for controlling the transfer therethrough of data and for controlling data transfer through other of said switching planes; and
said switching station being operable in a first mode wherein only said one switching plane is used for data transfer and



in a second mode wherein said one switching plane and said other switching planes are used for data transfer.

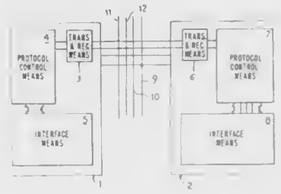
4,929,940
COLLISION CROSSBAR SWITCH
Peter A. Franaszek, Katonah, and Christos J. Georgiou, White Plains, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 18, 1988, Ser. No. 275,164
Int. Cl.[5] H04Q *1/00*
U.S. Cl. 340—825.020 **21 Claims**



1. A collision crossbar switch comprising:
an array of NXM cross-points C_{ij}, said array having N input ports and M output ports, said output ports being connected to corresponding output buses and each of said input ports being selectively connectable to any one of said output buses via said output ports;
current detecting and limiting means for connecting said output ports to said buses for limiting current through said cross-points when a contention occurs as the result of more than one of said input ports being simultaneously connected to any one of said output buses; and
collision detecting means connected to each of said output buses for detecting a contention on a bus and initiating a remedial action in the event a contention is detected.

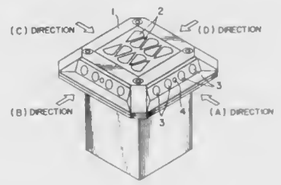
4,929,941
DEVICE FOR TRANSMITTING ITEMS OF INFORMATION FOR AN AUTOMOBILE VEHICLE AND A METHOD OF USING SAID DEVICE
Jean-Luc Lecocq, Sevres, France, assignor to Automobiles Peugeot, Paris; Automobiles Citroen, Neuilly Sur Seine and Regie Nationale des Usines Renault, Boulogne Billancourt, all of, France
Filed Nov. 21, 1988, Ser. No. 274,311
Claims priority, application France, Nov. 25, 1987, 87 16367
Int. Cl.[5] H04B *14/00*; H04L *7/00*
U.S. Cl. 340—825.14 **6 Claims**

1. A device for a differential transmission of items of information between at least two elements of an automobile vehicle, each of which elements comprises: information transmitting means and information receiving means and two information transmission lines interconnecting said information transmitting means and information receiving means, means for processing signals circulating on the information transmission lines, wherein the processing means comprise means for establishing a derivative of the signals travelling on the information transmission lines and means for shaping output signals of said derivative-establishing means provided in the information



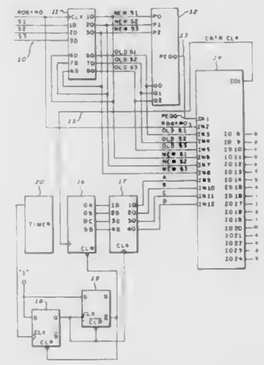
receiving means, wherein the receiving means comprise means for generating a bias voltage connected to the derivative-establishing means, wherein the means for shaping comprises a comparator having a small offset and a centered hysteresis relative to the output from the means for generating a bias voltage whereby the transmission of items of information may occur with a normal differential mode by a transmission on two lines or in a degraded mode on a single line by determining the derivative of the signals in this line and putting the output signals of the derivative-establishing means back into shape.

4,929,942
LIGHTING PEG
Kikuo Niimi, Aichi, Japan, assignor to Kictec Incorporation, Aichi, Japan
Filed Dec. 9, 1988, Ser. No. 282,435
Claims priority, application Japan, Apr. 11, 1988, 63-47741[U]
Int. Cl.[5] E01F *9/00*; G08G *1/00*; B60Q *7/00*
U.S. Cl. 340—908.1 **7 Claims**



1. A lighting peg comprising:
an outer casing;
a solar cell provided on an upper surface of said casing;
a battery installed in said casing and connected in series with said solar cell;
a photoelectric conversion element provided on a side surface of said casing and connected in series with a variable resistor;
a differential circuit connected to an output side of said photoelectric conversion element;
a comparator comparing the output of said differential circuit with a reference voltage;
a multivibrator which generates output pulses when the output of said comparator is high level;
a counter which starts counting said pulses generated from said multivibrator when the output of said comparator becomes low level, and stops operation of said multivibrator when the counter counts a predetermined number of pulses; and
a plurality of light emitting elements provided on the side surface of said casing to be operable in a pulsating manner when said multivibrator is operated.

4,929,943
MARINE COMPASS RATE-OF-TURN INDICATOR
Chris J. Baldwin, Earlysville, Va., assignor to Sperry Marine, Inc.
Filed Jul. 1, 1988, Ser. No. 214,704
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—984 **7 Claims**



1. Rate-of-turn indicator apparatus for use with a marine compass that provides heading data in incremental coded sequence format, comprising:
detecting means coupled to said marine compass for detecting increments of change of said heading data and for providing increment of change representative signals,
counting means responsive to said increment of change representative signals for counting said increments of change over a predetermined time interval, thereby providing a rate-of-turn count signal,
first logic means responsive to said coded sequence heading data for generating a signal representative of direction of turn,
a plurality of discrete visual indicator means responsive to said rate-of-turn count signal for providing visual indications of discrete increments of rate-of-turn, and responsive to said signal respresentative of direction of turn for providing a visual indication of said direction of turn, and
second logic means responsive to said count signal for activating and indicator means in accordance with said count signal so as to provide a discrete indication of said discrete increments of said rate-of-turn.

4,929,944
KEY INPUT APPARATUS
Akira Nakajima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jun. 16, 1988, Ser. No. 207,426
Claims priority, application Japan, Jun. 16, 1987, 62-150493
Int. Cl.[5] H04B *15/00*
U.S. Cl. 341—24 **3 Claims**

1. An input key apparatus comprising:
a keyboard including a plurality of keys and generating key signals when keys are pressed;
a key input decoder receiving the key signals from the keyboard for generating decoded key signals, the key input decoder generating a single key depression signal when a

key of the keyboard is pressed one time, and a multi-key depression signal when two or more keys of the keyboard are simultaneously pressed;

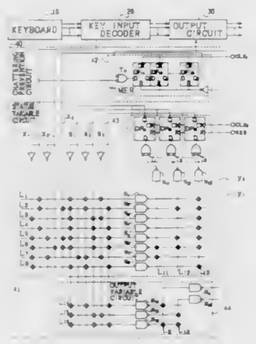
a chattering prevention circuit receiving the single key depression signal and the multi-key depression signal for determining on the basis of the received signals whether or not the key signal received by the decoder is valid, for the purpose of generating a key input valid signal; and

an output circuit receiving the decoded key signal for latching the decoded key signal in response to the key input valid signal;

wherein the chattering prevention circuit includes;

a timer starting its operation in response to a timer start signal for generating a timer out signal after a predetermined time;

a status variable circuit which assumes any one of first to fifth status on the basis of the single key depression signal and the multi-key depression signal from the decoder and the timer out signal from the timer, the status variable circuit outputting status information indicative of which status the status variable circuit is in, the status variable circuit being put in a first status when the apparatus is powered on, the status variable circuit operating to shift from the first status to a second status if the single key depression signal is made active when it is in the first status, the status variable circuit also operating to return to



the first status if the single key depression signal is made inactive before the timer out signal is made active, but to shift to a third status if the timer out signal is made active while the single key depression signal is maintained in the active condition, the status variable circuit also operating to shift to a fourth status if the single key depression signal is made inactive after the circuit is in the third status, the status variable circuit also operating to return to the third status if the single key depression signal is made active before the timer out signal is made active and after the circuit has been put in the fourth status, but to respond to a variation of the multi-key depression signal, the status variable circuit also operating to shift to the first status if both of the single key depression signal and the multi-key depression signal are made inactive after the active timer out signal is outputted, but to shift to a fifth status if the single key depression signal is made inactive but the multi-key depression signal is active after the active timer out signal is outputted, the status variable circuit also operating to maintain the fifth status until both of the single key depression signal and the multi-key depression signal are made inactive after the circuit has been put in the fifth status, and to thereafter shift to the first status; and

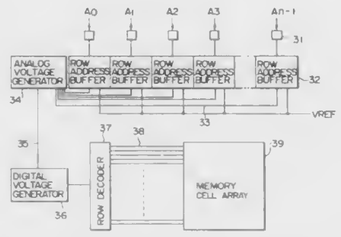
an output variable circuit in response to the status information from the status variable circuit to selectively activate the key in put valid signal so as to allow the output circuit to latch the output of the decoder only when the second status is changed to the third status whereby an error operation which would be caused at a rising edge of the key signal is prevented, the output variable circuit also operating to control the status variable circuit so as to return the status variable circuit to the first or fifth status after it is put in the fourth status and only when both of the single key depression signal and the multi-key depression signal are made inactive after the predetermined time, so that an error operation which would be caused at a falling edge of the key signal is prevented.

4,929,945

SEMICONDUCTOR MEMORY DEVICE HAVING A SMALL NUMBER OF SIGNAL LINES

Natsuki Kushiyama, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1988, Ser. No. 171,104
Claims priority, application Japan, Mar. 31, 1987, 62-78610
Int. Cl.[5] H03M *1/00*
U.S. Cl. 341—50 **10 Claims**



1. A semiconductor memory device, comprising:

a buffer for receiving and outputting a first digital signal;

a digital-to-analog converter for receiving said first digital signal output from said buffer, converting the first digital signal into an analog signal, and outputting the analog signal;

an analog-to-digital converter for receiving said analog signal output from said digital-to-analog converter, converting the analog signal into a second digital signal, and outputting the second digital signal;

a decoder for receiving said second digital signal output from said analog-to-digital converter, and decoding the second digital signal;

at least two digital signal lines for transferring said first digital signal output from said buffer to said digital-to-analog converter; and

at least one analog signal line for transferring said analog signal output from said digital-to-analog converter to said analog-to-digital converter.

4,929,946

ADAPTIVE DATA COMPRESSION APPARATUS INCLUDING RUN LENGTH ENCODING FOR A TAPE DRIVE SYSTEM

John T. O'Brien, Lafayette; Neil L. Thomas, Boulder, and Tracy D. Dyer, Aurora, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Feb. 9, 1989, Ser. No. 308,767
Int. Cl.[5] H03M *7/48*
U.S. Cl. 341—87 **17 Claims**

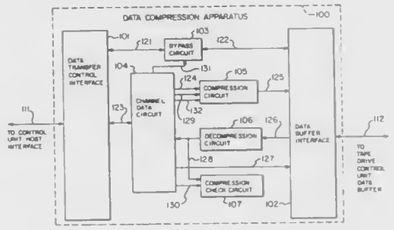
1. A data compression apparatus for efficiently compressing a user block data into a bit compressed data block for storage on a data storage medium comprising:

means for dividing said user data block into a plurality of equal sized segments of data;

means for compressing each of said segments of data independent of all other segments of data in said user data block comprising:

means responsive to a received user data byte in one of said segments of data for determining whether said received user data byte is identical to the n previous data bytes, the last byte of a string or a single user data byte in said one segment of data;

means responsive to said determining means for assigning one of a plurality of run length reference values to a user data byte that is identical to at least the n previous user data bytes, where n is an integer >2;



means responsive to said determining means for assigning one of a plurality of byte compression reference values to a user data byte;

means responsive to said determining means for assigning one of a plurality of string compression reference values to a user data byte that comprises the last byte of a data string; and

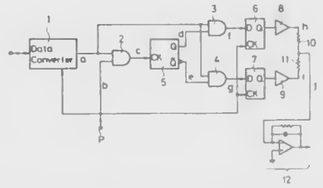
means for writing each of said reference values successively received from said compressing means on to a data storage medium to form said bit compressed data block.

4,929,947

CONSTANT WIDTH PULSE DISTRIBUTION IN A DIGITAL TO ANALOG CONVERTER FOR SERIAL DIGITAL DATA

Akira Toyama, Tokyo, Japan, assignor to Nippon Precision Circuits Ltd., Japan

Filed Apr. 4, 1988, Ser. No. 176,921
Claims priority, application Japan, Apr. 2, 1987, 62-81644
Int. Cl.[5] H03M *1/66*
U.S. Cl. 341—146 **4 Claims**



1. A digital to analog converting circuit for converting serial digital data into analog signal output, comprising:

distributing means receptive of serial bit data pulses supplied sequentially for distributing the data pulses to at least two parallel channels, each distributed pulse of each channel having a constant width and a constant time interval between a termination of one pulse and a beginning of the next pulse in each channel;

converting means disposed in each channel for converting each pulse having said constant width into an analog value; and

adding means for adding the analog values of said each channel and producing an analog signal output corresponding thereto.

4,929,948

PORTABLE DATA SYSTEM

Göran I. Holmberg, Boca Raton, Fla., assignor to Basics Corporation, Boca Raton, Fla.

Filed Mar. 9, 1989, Ser. No. 321,241
Int. Cl.[5] G08B *1/00*; G06F *1/00*
U.S. Cl. 340—407 **2 Claims**



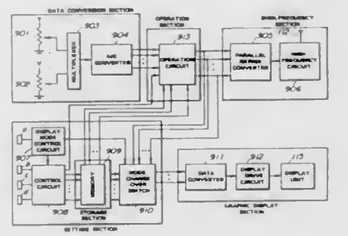
1. A transportable data system comprising at least two mutually cooperating units (**3**, **4**), for instance a personal computer and a printer, said system being fitted in a rigid case which includes a lid (**2**) and a bottom part (**1**) and, in which system when the case is closed the one unit (**3**), which is supported by a displaceable carrier plate (**5**), is located above the other (**4**) of said units, and when the case is open, with the lid (**2**) substantially vertical, can be displaced towards and partially into the lid so as to expose the said other unit (**4**) so that said other unit will come into a working position, characterised in that firmly attached to the bottom part of the case (**1**) are two separate side-wall elements (**14**, **15**) each of which has an upper guide rail (**18**, **19**, **20**) which is parallel with said bottom part, said guide rails being parallel with each other, and in that the carrier plate (**5**) is displaceably mounted on the guide rails **18**, **19**, **20** with the aid of guide means (**21**, **22**).

4,929,949

RADIO CONTROL TRANSMITTER HAVING IMPROVED DISPLAY CHARACTERISTICS

Michio Yamamoto, and Satoshi Sekiya, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Apr. 22, 1988, Ser. No. 184,670
Claims priority, application Japan, Apr. 24, 1987, 62-099933
Int. Cl.[5] H04Q *9/14*
U.S. Cl. 341—176 **6 Claims**



1. A radio control transmitter comprising:

a data conversion section for generating digital output signals responsive to the operation of control sticks;

a setting section for setting a trimming operation of said control sticks for adjusting said output from said control sticks and for generating output signals;

an operation section for processing the output signals of said data conversion section and setting section to generate output signals;

a high-frequency section for modulating the output signal of said operation section into a high-frequency signal in the form of a predetermined shape and generating said signal; and

a graphic display section of displaying control characteristics of said control sticks with respect to a controlled object responsive to the output signal of said operation section.

4,929,950

SYNTHETIC APERTURE RADAR SYSTEMS

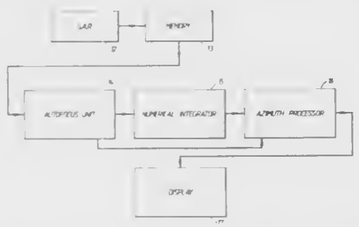
Anthony Freeman, La Crescenta, Calif.; David Blacknell; Shaun Quegan, both of Sheffield, England; Ian A. Ward, Chelmsford, England; Christopher J. Oliver, Malvern, England; Ian P. Finley, St. Johns, England; Richard G. White, Malvern, England, and James W. Wood, Malvern Link, England, assignors to The General Electric Company, plc and The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, both of London, United Kingdom

Continuation of Ser. No. 79,966, Jul. 31, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,599

Claims priority, application United Kingdom, Dec. 18, 1986, 8630315

Int. Cl.[5] G01S *13/90*

U.S. Cl. 342—25 **3 Claims**



1. In a synthetic aperture radar system having a moving antenna for transmitting radar signals into a region containing a number of objects of interest and receiving a reflected signal from each of said number of objects, and an azimuth processor means for azimuth processing said received reflected signals to calculate relative positions of said number of objects; the improvement comprising

means for determining distortions, caused by deviations of the moving antenna from a straight line trajectory, in each of said reflected signals and for supplying signals for correcting said distortions to said azimuth processing means, said distortion determining means including:

an autofocus unit for determining the slope of a linear approximation of the frequency modulation of the received signals with respect to position, and for providing a first output signal corresponding to said slope,

an integrator means, to whose input is fed a said first output signal of said autofocus unit, for integrating said first output signal to determine the intercept of the linear approximation of the frequency modulation of the received signals, and for providing a second output signal corresponding to said intercept; and

means for supplying said first and second output signals to said azimuth processor means whereby the azimuth processing is carried out in said azimuth process or means using the thus determined slope and intercept of the linear approximation of the frequency modulation of the received signals.

4,929,951

APPARATUS AND METHOD FOR TRANSFORM SPACE SCANNING IMAGING

James G. Small, Westlake Village, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 23, 1988, Ser. No. 289,275

Int. Cl.[5] G01S *13/89*

U.S. Cl. 342—179 **26 Claims**



1. Apparatus for transform space scanning imaging, comprising:

means for illuminating a target with wave energy selected from the group consisting of acoustic and electromagnetic radiation said wave energy capable of producing an interference pattern, said means comprising at least one pair of spaced apart sources of said wave energy, said pair comprising a first source emitting said wave energy having a first frequency, and a second source emitting said wave energy at a second frequency, said first and second sources producing overlapping fields of illumination for producing at least one interference pattern;

receiver means for receiving said wave energy reflected from said target, and producing first signals indicative of the amplitude and phase of said reflected illumination;

signal processing means responsive to said first signals for determining spatial frequencies of said reflected illumination received from said target, and for producing signals representative of a two dimensional spatial frequency map of said target; and

image forming means responsive to said second signals for producing a two dimensional image of said target.

4,929,952

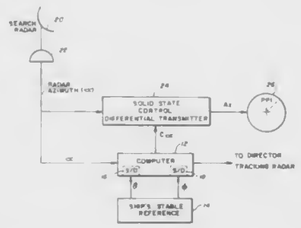
SEARCH-RADAR AZIMUTH CORRECTION

Alan M. Schneider, La Jolla, and Donald W. Doherty, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 619,248, Jun. 11, 1984, abandoned. This application Oct. 10, 1989, Ser. No. 420,623

Int. Cl.[5] H01Q *3/02*

U.S. Cl. 342—184 **8 Claims**



1. In a radar system having a radar antenna mounted on a non-stable platform and a radar polar coordinate plan position indicator display, said radar antenna mounted on a non-stable platform being mounted on a craft or vehicle that is subject to motion and that has a stable reference source that is stable in attitude, the improvement comprising a correction system for generating a correction-to-azimuth signal, $C\alpha$, said correction system comprising:

a computer having a first input connected to said stable reference source, having a second input connected to said radar antenna, and having at least a first output;

means having a first input connected to said antenna and a second input connected to said first computer output for generating an output signal that comprises said correction-to-azimuth signal, $C\alpha$, said means having an output that is connected to said radar display; and further wherein:

said radar antenna is not mounted on a platform that moves independently with respect to the motion of said craft or vehicle and wherein said non-stable platform does not move independently with respect to the motion of said craft or vehicle; and

wherein said correction-to-azimuth signal, C_α, is the correction angle which must be added to the antenna radar azimuth angle, α, to obtain the true value of the azimuth of the target in the horizontal plane relative to the projection of the longitudinal axis of said craft or vehicle in the horizontal plane.

4,929,953

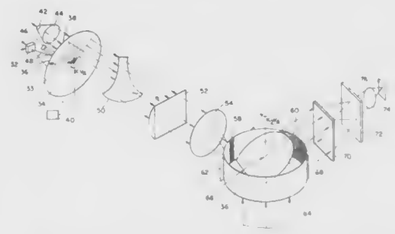
METHOD AND APPARATUS FOR CONTINUOUS ON LINE RECORDING AND PROCESSING OF SYNTHETIC APERTURE RADAR SIGNALS IN REAL TIME

Robert W. Brandstetter, Levittown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 28, 1988, Ser. No. 291,008

Int. Cl.[5] G01S *9/42*

U.S. Cl. 342—190 **36 Claims**



1. A real time SAR recording and processing system comprising:

a first movable recording medium being successively movable through a write zone and a read zone, said first movable recording medium being comprised of reusable material;

means for recording SAR data on said first movable recording medium as said recording medium passes through said write zone;

means for processing said SAR data as said first movable recording medium passes through said read zone to produce an SAR image in real time; and

means for continuously moving said first movable recording medium through said write and read zones to continuously record and process new SAR data on said first movable recording medium on an area of said first movable recording medium on which SAR data has been previously recorded and processed.

4,929,954

DEVICE FOR COMPUTING A SLIDING AND NONRECURSIVE DISCRETE FOURIER TRANSFORM AND ITS APPLICATION TO A RADAR SYSTEM

Philippe Elleaume, Antony, France, assignor to Thomson-CSF, Paris, France

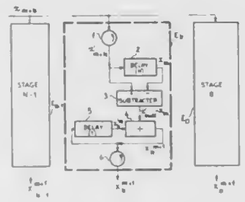
Filed Sep. 23, 1986, Ser. No. 910,578

Claims priority, application France, Sep. 24, 1985, 85 14136

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[5] G01S *7/44*

U.S. Cl. 342—194 **7 Claims**



1. A device for computing a sliding discrete Fourier transform in a time window of duration T for producing an output representing at least one component (X_k^{m+1}) of said transform from N samples (x_{m+N}) of an input signal whose transform is to be computed, wherein said computing device has at least one stage (E_k) for receiving samples and comprising complex rotation operator means as well as adding and/or subtracting means and delay circuits for delivering said component (X_k^{m+1}) defined by

$$X_k^{m+1} = X'_k{}^{m+1} \cdot \exp\{j \cdot 2\pi \cdot (m+1 \cdot k/N)\} \quad (1)$$

with

$$X'_k{}^{m+1} = X'_k{}^{m} + x'_{m+N} - x'_m \quad (2)$$

$$x'_m = x_{m+N} \cdot \exp\{-j \cdot 2\pi \cdot (m \cdot k/N)\} \quad (3)$$

where k is the stage index and m is the window index.

4,929,955

CIRCULAR WAVEGUIDE AMPLITUDE COMMUTATOR

Thomas O. Miles, Madeira Beach, and Carl E. Kreitzer, St. Petersburg, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Mar. 7, 1988, Ser. No. 165,002

Int. Cl.[5] H01Q *3/26;* H01P *5/12*

U.S. Cl. 342—371 **9 Claims**

9. A microwave signal amplitude commutator for an R.F. receiver, said commutator receiving at N ports a cosine-squared-on-a-pedestal amplitude distribution signal from N elements of a circular or cylindrical phased antenna forming a low sidelobe antenna array, said commutator comprising:

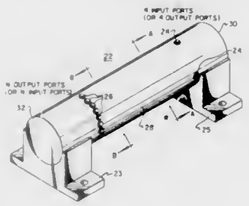
a circular waveguide section having N ports at one end for receiving said signal from the N corresponding elements of the antenna array for exciting a TM_{01} mode signal and spatially orthogonal TE_{11} mode signals in selected quadrants of the waveguide, four quadrature ports at the other end and both ends short circuited,

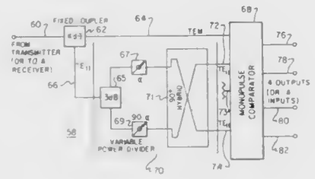
means coupled to said quadrature ports for commutating a signal amplitude distribution comprising of the TM_{01} mode signal and spatially orthogonal TE_{11} mode signals in the waveguide,

means coupled to the commutating means for recovering the TM_{01} mode signal and the spatially orthogonal TE_{11} mode signals at the four quadrature ports,

means coupled to the signal recovering means for separating

the signals at the quadrature ports into TEM and spatially orthogonal TE_{11} signals, and





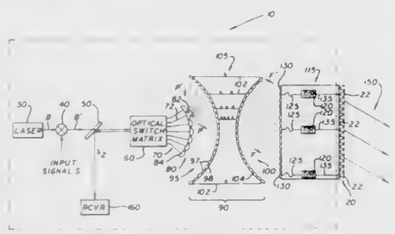
means coupled to the separating means for receiving the separated TEM and spatially orthogonal TE_{11} signals and generating a composite TEM signal for transfer to the receiver.

4,929,956

OPTICAL BEAM FORMER FOR HIGH FREQUENCY ANTENNA ARRAYS

Jar J. Lee, Irvine, and Huan-Wun Yen, Westlake, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 10, 1988, Ser. No. 246,394
Int. Cl.[5] H01Q *3/00*
U.S. Cl. 342—376 **18 Claims**



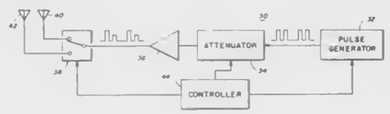
1. A transmit antenna beamforming network comprising:
means for generating a beam of optical energy;
modulating means for modulating said beam of optical energy in response to an input signal modulated about a first frequency;
radiating means for generating a first electromagnetic field pattern by radiating said modulated beam in a first direction;
constrained lens means including a first array of radiating elements for receiving said first field pattern and a second array of radiating elements for emitting an antenna driver feed beam in a second direction in response thereto;
antenna array driving means electromagnetically coupled to said constrained lens means by said feed beam for providing a set of signals modulated about said first frequency; and
antenna array means for radiating an electromagnetic scan beam modulated about said first frequency substantially in said second direction in response to said set of signals.

4,929,957

METHOD AND APPARATUS FOR DETECTING RECEIVER COMPRESSION IN MULTIPLE LOBE GUIDANCE SYSTEMS

Charles W. Davidson, Renton, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 17, 1989, Ser. No. 380,912
Int. Cl.[5] G01S *1/16, 1/18*
U.S. Cl. 342—410 **6 Claims**



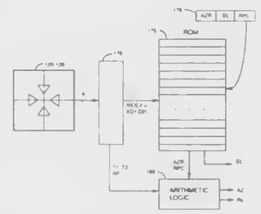
1. A multiple beam guidance system comprising:
means for transmitting a plurality of pulses on each of a plurality of overlapping directional beams, with the pulses transmitted on each beam having two different amplitudes with a predetermined amplitude differential therebetween; and
means for receiving pulses from said plurality of beams and comparing the amplitudes of pulses from different beams to provide a guidance signal, said receiving and comparing means including means for comparing the amplitudes of pulses received from an individual beam and generating a compression indication if the difference therebetween is not substantially equal to the predetermined amplitude differential between the amplitudes of the transmited pulses.

4,929,958

HIGH PRECISION RADAR DETECTION SYSTEM AND METHOD

P. Lloyd Hodel, Redwood City, and Paul V. Atkins, Pacifica, both of Calif., assignors to Dalmo Victor, Inc., Belmont, Calif.

Filed Jul. 26, 1989, Ser. No. 386,417
Int. Cl.[5] G01S *3/80*
U.S. Cl. 342—432 **8 Claims**



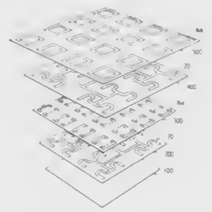
1. A radar detection system, comprising:
a set of four transducer means for receiving signals indicative of the location of an object;
sorting means coupled to said set of transducer means for selecting the first, second and third strongest of said received signals and for generating therefrom first and second differential signals, said first differential signal corresponding to the difference between the strongest and second strongest of said received signals and said second differential signal corresponding to the difference between the second strongest and third strongest of said received signals;
table means for storing at least one angular value corresponding to each of a predefined set of pairs of said two differential signals; and
lookup means coupled to said sorting means and said table means for retrieving from said table means an angular value corresponding to the differential signal values generated by said sorting means.

4,929,959

DUAL-POLARIZED PRINTED CIRCUIT ANTENNA HAVING ITS ELEMENTS CAPACITIVELY COUPLED TO FEEDLINES

Robert M. Sorbello, Potomac; John E. Effland, Gaithersburg, and Amir I. Zaghloul, Bethesda, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Mar. 8, 1988, Ser. No. 165,332
Int. Cl.[5] H01Q *00/00*
U.S. Cl. 343—700 MS **20 Claims**



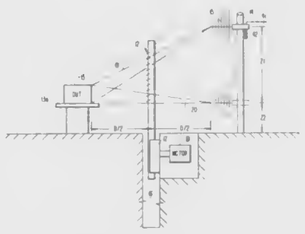
1. A dual-polarized printed circuit antenna comprising:
a ground plane;
a first power divider array disposed over said ground plane;
a first array of radiating elements disposed over said first power divider array;
a second power divider array disposed over said first array of radiating elements; and
a second array of radiating elements disposed over said second power divider array;
wherein said first power divider array and said first array of radiating elements are capacitively coupled to each other, and said second power divider array and second array of radiating elements are capactively coupled to each other.

4,929,960

PEAK RADIATED ENERGY LOCATOR

William R. Kaylor, Morristown, and Frederick A. Fisher, Jefferson City, both of Tenn., assignors to North American Philips Corporation, New York, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,474
Int. Cl.[5] G01R *23/18*
U.S. Cl. 343—703 **14 Claims**



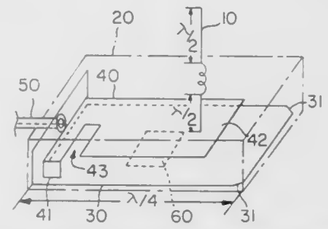
1. A peak radiated energy locator of the type including a turn table for mounting a device from which radiated energy is to be detected and a vertically positionable antenna for receiving radiated energy from the device comprising:
a mast removably positioned between said antenna and said device;
a plurality of broadband antennas positioned in vertical alignment on said mast;
means coupled to said plurality of broadband antennas for determining a vertical angle at which peak radiated energy from said device is detected and providing signals representative of said vertical angle; and
means responsive to said vertical angle representative signals for vertically locating said vertically positionable antenna at a height determined from said vertical angle.

4,929,961

NON-GROUNDED TYPE ULTRAHIGH FREQUENCY ANTENNA

Kazuhiko Nakase, Tokyo, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1989, Ser. No. 342,181
Int. Cl.[5] H01Q *1/32, 9/38*
U.S. Cl. 343—715 **4 Claims**



1. A non-grounded type ultrahigh frequency antenna characterized in that said antenna comprises:
an antenna element having a length substantially equal to $\lambda/2$ at a working frequency;
a casing provided at the base of said antenna element;
a metal section which is a part of said casing, said metal section having a length of approximately $\lambda/4$ at said working frequency;
a first metal plate provided in said casing, one end of said metal plate being grounded and another end being coupled to said antenna element, said first metal plate further being provided above said metal section and parallel thereto; and
a second metal plate provided between said antenna element and said first metal plate, said second metal plate being provided above said first metal plate and parallel thereto;
wherein a constant K-filter is formed by an electrostatic capacitance between said first and second metal plates and a residual inductance of said antenna element, and said antenna is made parallel-resonant within said working frequency by said electrostatic capacitance created between said first metal and said second metal plate and an inductance of said first metal plate.

4,929,962

FEED HORN FOR A TELECOMMUNICATIONS ANTENNA

Eric Bégout, Nogent Sur Marne; Alain Bourgeois, Eaubonne; Raymond Gueuret, Nanterre, and Pascal Lapeyre, Ermont, all of France, assignors to Societe Anonyme dite: Alcatel Thomson Faisceaux Hertiziens, Levallois Perret Cedex, France

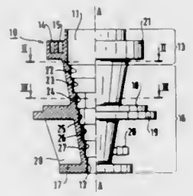
Filed Dec. 9, 1987, Ser. No. 130,593
Claims priority, application France, Dec. 9, 1986, 86 17210
Int. Cl.[5] H01Q *13/00*
U.S. Cl. 343—786 **13 Claims**

1. A feed horn for a telecommunications antenna, said feed

horn being fabricated from a moldable material, said feed horn comprising:

a radiating portion having a circular aperture, said radiating portion being formed by an annular flange provided with a least two concentric grooves forming two traps, said grooves having open ends which are substantially coplanar;

a transition having first and second ends and formed by waveguide sections of progressively varying cross-sec-



tion, said transition being coupled at said first end to said radiating portion;

a flange surrounding said second end of said transition and which provides a coupling with a rectangular waveguide; and

fixing means for fixing said feed horn in a support, said fixing means comprising two concentric cylindrical flanges having different diameters and located in the external central portion of said horn.

4,929,963

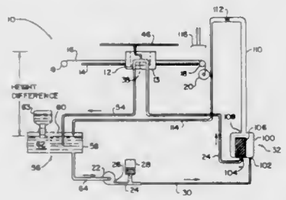
INK DELIVERY SYSTEM FOR INKJET PRINTER

Leonard Balazar, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 2, 1988, Ser. No. 240,786

Int. Cl.[5] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—1.1 **16 Claims**



15. A process for supplying ink to an ink jet printer, comprising the steps of:

supplying an ink jet print head, from which droplets of ink may be ejected, the ink jet print head having an ink flow channel therethrough;

pumping ink through the ink flow channel of the print head to provide ink for ejection and to cool the print head, as the print head operates during printing, at a flow rate greater than required to supply the printing requirements of the print head, while maintaining the pressure of the ink in the ink flow channel of the ink jet print head below atmospheric pressure; and

withdrawing a portion of the ink flowing through the ink flow channel for ejection from the print head.

4,929,964

METHOD FOR PREPARING LIQUID JET RECORDING HEAD, LIQUID JET RECORDING HEAD PREPARED BY SAID METHOD AND LIQUID JET RECORDING DEVICE HAVING SAID LIQUID JET RECORDING HEAD MOUNTED THEREON

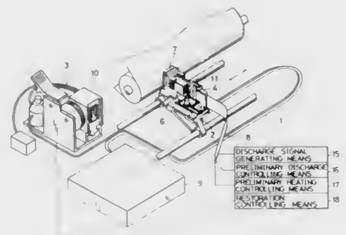
Koichi Sato, Yokohama, and Masami Ikeda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1989, Ser. No. 363,524

Claims priority, application Japan, Jan. 7, 1988, 63-138418

Int. Cl.[5] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—1.1 **33 Claims**



1. A method for preparing a liquid jet recording head, comprising the steps of:

providing a liquid jet recording head having an electro-thermal energy convertor for generating heat energy for discharging ink by applying electrical signals to said electro-thermal convertor, said electro-thermal energy convertor comprising a heat-generating resistor and a pair of electrodes for applying electrical signals to said heat-generating resistor; and

aging said heat-generating resistor by applying to said electrodes electrical signals sufficient to stabilize the resistance value of said heat-generating resistor by heat treating said heat-generating resistor through heat generation therein.

4,929,965

OPTICAL WRITING HEAD

Masashi Fuse, Morioka, Japan, assignor to Alps Electric Co., Japan

Filed Aug. 4, 1988, Ser. No. 228,886

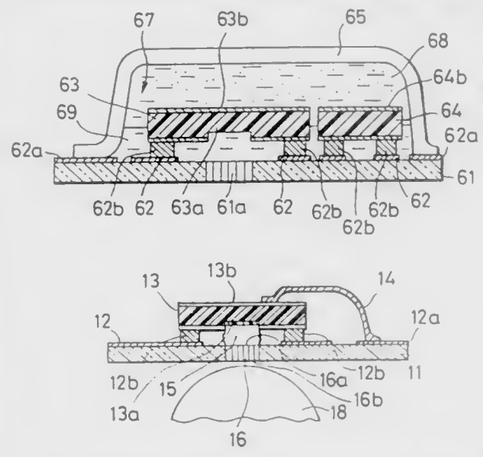
Claims priority, application Japan, Sep. 2, 1987, 62-220007; Sep. 2, 1987, 62-220008; Nov. 7, 1987, 62-281342; Nov. 7, 1987, 62-281343; Nov. 7, 1987, 62-281344; Nov. 7, 1987, 62-281345

Int. Cl.[5] G01D *9/42*; G02B *6/08*; H01L *23/28*

U.S. Cl. 346—107 R **6 Claims**

1. An optical writing head, comprising a light emitting means, and a substrate on which said light emitting means is mounted, said substrate having a light transmitting property at a portion thereof which opposes to said light emitting means, whereby light emitted from said light emitting means is taken out through said substrate so that it may be irradiated upon a light receiving body, wherein said light emitting means is covered with a cover, and wherein a filler is filled up between said light emitting means and said cover.

5. An optical writing head, comprising a light emitting means, a substrate on which said light emitting means is mounted, said substrate having a fiber bundle composed of a plurality of optical fibers positioned in at least a portion thereof which opposes to said light emitting means, whereby light emitted from said light emitting means is incident to one end of said fiber bundle and emitted out the other end of said fiber bundle, and wherein a transparent resin having a high refrac-



tivity is positioned between said light emitting means and said one end of said fiber bundle.

4,929,966

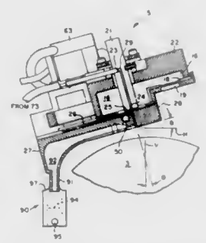
CONTINUOUS INK JET PRINTER WITH A GRAVITY DRAIN, CATCHER RETURN SYSTEM

Gregory J. Sexton, Dayton, and Gregory M. Kopp, Huber Heights, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,846

Int. Cl.[5] G01D *15/18*

U.S. Cl. 346—75 **3 Claims**



3. In continuous ink jet printer apparatus of the kind having a print head assembly including generator means for directing droplet streams toward a print zone, and catcher means laterally offset from the droplet stream print path and droplet charge means for selectively effecting charge deflection of non-print drops from the droplet stream print path to said catcher means the improvement wherein:

(a) said generator means is mounted so that, in the nominal operating orientation of said printer, said droplet stream print path is offset from vertical in the range of 50° to 20° in the direction toward said catch means; and

(b) said catcher means includes a surface generally parallel to said droplet print path and an ink return passage located at the bottom of said surface and generally normal to said droplet print path whereby ink intercepted by said catcher means flows by gravity from said catcher.

4,929,967

EXPOSURE DEVICE USING CRT AS EXPOSURE LIGHT SOURCE

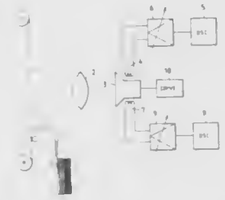
Yoshimasa Hara, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha

Filed Apr. 14, 1989, Ser. No. 337,855

Claims priority, application Japan, Apr. 14, 1988, 63-49403[U]

Int. Cl.[5] G01D *9/42*, *15/14*

U.S. Cl. 346—110 R **4 Claims**



1. An exposure device for exposing a photosensitive recording medium to light to record an image thereon, comprising:

a cathode ray tube for displaying an image on a display screen, said cathode ray tube comprising an electron gun for emitting an electron beam, a horizontal deflection means for horizontally deflecting said electron beam, and a vertical deflection means for vertically deflecting said electron beam;

a horizontal deflection angle changing means for changing the horizontal deflection of said electron beam to change a horizontal length of said image displayed on said display screen;

a vertical deflection angle changing means for changing the vertical deflection of said electron beam to change a vertical length of said image displayed o said display screen: and

wherein said photosensitive recording medium is disposed to face said display screen to be exposed to an image bearing light emanated from said display screen, whereby the size of the image recorded on said photosensitive recording medium can be changed by changing the size of the image displayed on the display screen.

4,929,968

PRINTING HEAD ASSEMBLY

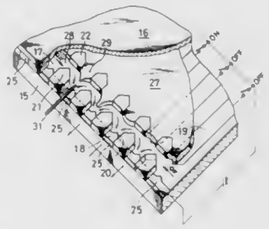
Takatoshi Ishikawa, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,657

Claims priority, application Japan, Aug. 29, 1988, 63-112956[U]

Int. Cl.[5] G01D *15/16*; B41J *3/04*

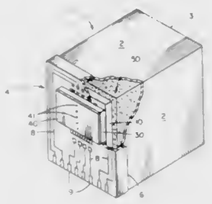
U.S. Cl. 346—140 R **4 Claims**



4. An ink jet printer comprising:

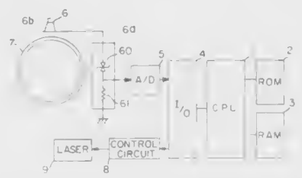
an insulative substrate having a top surface;
an electrically conductive first electrode provided on the top surface;
a plurality of spaced apart second electrodes provided on the top surface, each of the second electrodes being spaced apart from the first electrode so as to define an electrical field gap between the respective second electrode and the first electrode;
ink chamber defining means for containing a body of ink in an ink chamber area of the top surface;
nozzle defining means for defining one or more ink jet nozzles in a nozzle area of the top surface; and
air chamber defining means for defining an air chamber area of the top surface interposed between the nozzle area and the ink chamber area.

4,929,969
INK SUPPLY CONSTRUCTION AND PRINTING METHOD FOR DROP-ON-DEMAND INK JET PRINTING
Brian G. Morris, Dayton, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 25, 1989, Ser. No. 398,580
Int. Cl.[5] B41J *2/175*
U.S. Cl. 346—140 R **36 Claims**



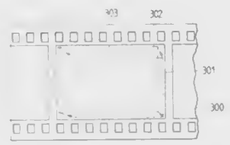
1. In a drop-on-demand, ink jet system of the kind having a print head component including orifices, drop ejection transducers and passage means for supplying ink to drop ejection regions proximate said transducers, an improved ink supply reservoir comprising:
(a) a housing defining an ink storage volume and having a vent opening and an ink outlet connected to said passage means;
(b) a mass of foam material occupying a major portion of said housing and covering said ink outlet, said foam comprising three dimensionally branched network of fine filaments interconnected so as to form a large void volume composed of uniform size interstitial pores.

4,929,970
LASER PRINTER
Koichi Inui, Higashiosaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 21, 1988, Ser. No. 287,886
Claims priority, application Japan, Dec. 21, 1987, 62-324801
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—160 **3 Claims**



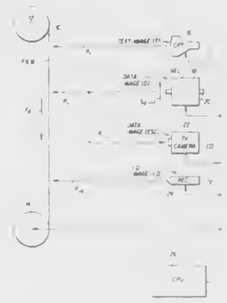
1. In a laser printer comprising a photoreceptive means, and a laser beam emitting device, said laser printer further comprises a compensation means for compensating the degradation of the image quality originating in said photoreceptive means, said compensation means comprising: a detecting means for detecting a factor of the degradation of the image quality; and a control means which controls the output level of said laser beam emitting device in accordance with the detected level of said factor.

4,929,971
CAMERA AND IMAGE OUTPUT APPARATUS CAPABLE OF TRIMMED PHOTOGRAPHING
Yoshio Imura, Machida, and Tsugio Takahashi, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Jun. 1, 1989, Ser. No. 360,245
Claims priority, application Japan, Jun. 3, 1988, 63-136754
Int. Cl.[5] G03B *17/24*
U.S. Cl. 354—75 **10 Claims**



1. A camera in which the optical axis of a photographing lens is positioned different from that of a view finder and to which detachably mounted is record means capable of recording therein an image to be photographed, comprising:
(a) means for producing an object distance signal according to the object distance;
(b) information producing means for producing parallax information corresponding to the difference between the photographing field of the photographing lens and the viewing field of the view finder, based on said object distance signal; and
(c) writing means for recording said parallax information on said record means in response to said producing means.

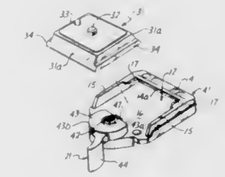
4,929,972
METHOD AND APPARATUS FOR ELECTRONIC AND PHOTOGRAPHIC IMAGE RECORDING
Norman G. Anderson, Rockville, Md., and Norman L. Anderson, Washington, D.C., assignors to Large Scale Biology, Rockville, Md.
Filed May 15, 1987, Ser. No. 49,982
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—75 **26 Claims**



1. An apparatus for photographically and electronically acquiring, recording and storing a data image, and information in the form of a text image and an identification image, each associated with said data image, on photographic film and electronic media, comprising:
means for photographing the data image on film;
means for generating and displaying the text image representing information associated with the data image from stored data in response to a call for the text image;
means for photographing the text image onto the film in association with the data image;
means for generating the identification image associated with the data image from stored data in response to a call for said identification image;
means for recording the identification image onto the photographic film in association with said data image and text image;
means for electronically acquiring the data image and retrievably transferring the data image to storage in association with the stored data called for generating the text image and the identification image.

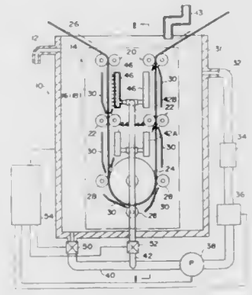
4,929,973
PANHEAD WITH QUICK RELEASE SHOE
Kouichiro Nakatani, Tokyo, Japan, assignor to Velbon International Corporation, Torrance, Calif.
Filed Jun. 6, 1988, Ser. No. 202,403
Claims priority, applicatioo Japan, Aug. 7, 1987, 62-197344
Int. Cl.[5] G03B *17/00*
U.S. Cl. 354—293 **15 Claims**

1. In a panhead of the type including a tray mounted for movement about one or more axes relative to a panhead base, a shoe attachable to a device such as a camera, and shoe locking means movable between the locked position and a release position for releasably locking said shoe to said tray, the improvement comprising:
said tray including an interior wall and a pair of side walls which meet the interior wall and the bottom wall,
retaining means on said side walls adjacent said interior wall of said tray,
said shoe including means cooperating with said retaining mean on said tray for holding said shoe against separation from said tray by force of gravity alone notwithstanding tilting of said tray about any of said axes with said shoe locking means in said release position, and



said shoe being manually disengageable from said retaining means with said shoe locking means in the release position.

4,929,974
DEVELOPING APPARATUS
Kiichiro Sakamoto, Kanagawa, and Hideo Iwasaki, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 4, 1989, Ser. No. 389,717
Claims priority, application Japan, Aug. 8, 1988, 63-197469
Int. Cl.[5] G03D *3/02*
U.S. Cl. 354—299 **18 Claims**



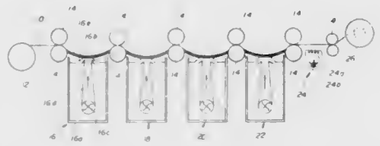
1. A developing apparatus comprising:
a tank for holding a processing solution for a photosensitive material;
means for conveying said photosensitive material, provided in said tank; and
means for circulating said processing solution including discharge means for discharging said processing solution contained in said developing tank and supply means for supplying said discharged processing solution to said developing tank, said supply means comprising;
first supply means for supplying a part of said discharged processing solution to said developing tank, and second supply means provided with guide means for supplying, as a jet, a part of said discharged processing solution to a surface of said photosensitive material while said photosensitive material is being conveyed through said developing tank,
and in said supply means a ratio of supply amounts of said first and second supply means can be changed;
whereby a degree of developing progress of said photosensitive material is adjusted and graduation of said photosensitive material is achieved.

4,929,975

AUTOMATIC FILM PROCESSOR

Shinichi Shidara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 12, 1988, Ser. No. 243,349
Claims priority, application Japan, Sep. 11, 1987, 62-226669; Sep. 11, 1987, 62-226670; Sep. 11, 1987, 62-226671; Sep. 11, 1987, 62-226672
Int. Cl.[5] G03D *3/04, 3/08*
U.S. Cl. 354—317 14 Claims



1. An automatic film processor for passing an exposed film successively through a series of treating liquid vessels respectively containing developing liquid, fixing liquid and rinsing water, which comprises:

pump means for forming a constant regular flow to raise a portion of a liquid surface of at least one of a plurality of treating liquid vessels; and

flow guide means for guiding said constant regular flow onto said liquid surface;

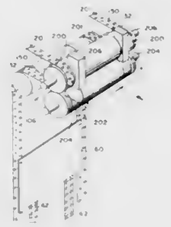
whereby the underside of an exposed film is allowed to contact the surface of said raised portion of said liquid.

4,929,976

FILM TRANSPORT SYSTEM

John A. Cunningham, Garland; Mark O. Prestjohn, Coppell; Bobby P. Reed, Seagoville, and Martin D. Smith, Lewisville, all of Tex., assignors to Jamieson Film Company, Dallas, Tex.

Filed Mar. 15, 1989, Ser. No. 323,838
Int. Cl.[5] G03D *3/13*
U.S. Cl. 354—322 11 Claims



1. Film processing apparatus, comprising:

a housing;

a pair of continuous belts disposed within said housing in a laterally spaced relationship;

guide means within said housing for guiding said belts about parallel paths through said housing;

drive means engaged with said belts for driving said belts in synchronization about said paths;

a film carrier having attachment means for selectably engaging said belts, such that said film carrier is transported through said housing by said belts; and

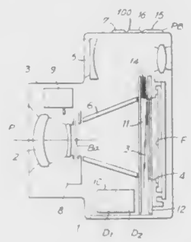
wherein each of said belts has two laterally spaced longitudinal rows of apertures, with apertures of a first one of said rows being engageable with said drive means and apertures of a second one of said rows being engageable with said film carrier.

4,929,977

FLASH PHOTOGRAPHY CHANGEOVER DEVICE

Tadashi Ishikawa; Shigeru Tagami; Kazuo Akimoto; Hiroto Tsuyuki; Michio Kawai; Kanji Ito; Takayuki Sato; Takahito Otora, and Teruyo Hayakawa, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1989, Ser. No. 377,674
Claims priority, application Japan, Jul. 11, 1988, 63-172189; Jul. 11, 1988, 63-172190
Int. Cl.[5] G03B *7/00, 15/03*
U.S. Cl. 354—420 10 Claims



1. In a camera having a lens shutter for performing a programmed exposure and aperture control, and a focal-plane shutter, a flash photography changeover device comprising:

(a) first changeover means for selecting one of the following modes of operation:

(i) a lens shutter mode in which the lens shutter is operated as a programmed shutter, and

(ii) a focal-plane shutter mode in which the shutter speed is controlled by the focal-plane shutter and the aperture is controlled by the lens shutter;

(b) first driving means for controlling at least one of the following:

(i) a programmed exposure value of the lens shutter, and

(ii) the size of said aperture of said lens shutter;

(c) second driving means for controlling the shutter speed of the focal-plane shutter; and

(d) sequence control means for controlling operation timings of said first and second driving means;

(e) setting means for selecting and setting automatic exposures with ambient light and a flash light; and

(f) coercive changeover means for setting said lens shutter mode irrespective of the setting of said first changeover means when said setting means is set to automatic exposure with the flash light.

4,929,978

COLOR CORRECTION METHOD FOR COLOR COPIER UTILIZING CORRECTION TABLE DERIVED FROM PRINTED COLOR SAMPLES

Katsuhiro Kanamori, Kawasaki; Yoshimitsu Kanno, Sagamihara; Toshiharu Kurosawa, Yokohama; Hidehiko Kawakami, Tokyo; Motohiko Naka, and Hiroaki Kotera, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 24, 1988, Ser. No. 261,254
Claims priority, application Japan, Oct. 23, 1987, 62-268575; Nov. 4, 1987, 62-278623; Jul. 13, 1988, 63-174559
Int. Cl.[5] G03B *27/80*
U.S. Cl. 355—38 6 Claims

1. In a method for developing a color correction table for color correction for a color copier apparatus including color scanning means for scanning an original color image to obtain successive input color values each expressed in a tri-color space, a color correction table memory responsive to respective ones of said input color values for producing corrected data comprising corresponding output color values, and color

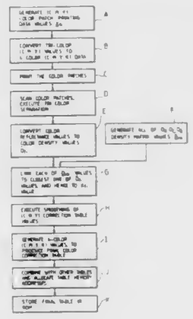
printing means responsive to said output color values for reproducing said original color image as an input color image, the improvement whereby said color correction table memory is produced by steps of:

(a) computing a set of color patch printing color values for use in printing respective ones of a set of color patches of respectively different sample colors;

(b) supplying said color patch printing color values to said color printing means for producing a printed set of color patches;

(c) scanning said printed set of color patches by said color scanning means for obtaining a set of color patch input data values, and temporarily storing said color patch input data values;

(d) generating a set of matrix input data values which form a regular 3-dimensional matrix array of color vanes when expressed in said tri-color color space, said set of matrix



input data values comprising all of said input color values that can be produced by said color scanning means;

(e) for each of said matrix input data values, executing a computation to find one of said color patch input data values that is closest to said each matrix input data value within said tri-color space, and linking said each matrix input data value to one of said color patch printing color values which corresponds to said closest color patch input data value, to establishing said each matrix input data value and said corresponding color patch printing color value as input and output values respectively of an initial color correction table;

(f) executing 3-dimensional smoothing processing of all output values of said initial color correction table to obtain a final color correction table; and

(g) storing said final color correction table in memory means as said color correction table memory.

4,929,979

METHOD AND APPARATUS FOR PROCESSING IMAGE

Tetsuo Kimoto, and Yoshinori Abe, both of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Jan. 27, 1989, Ser. No. 303,724
Claims priority, application Japan, Jan. 29, 1988, 63-18868; Jan. 29, 1988, 63-18877; Jan. 29, 1988, 63-18878; Aug. 2, 1988, 63-193038
Int. Cl.[5] G03B *27/72*
U.S. Cl. 355—38 7 Claims

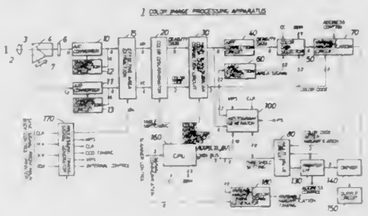
1. An image processing apparatus comprising:

pixel data generating means for generating density data representing a density of each pixel of original image data and color data representing a color of each pixel, the density and color data being parallel data;

mode setting means for outputting a mode setting signal for setting a write mode and a read mode;

memory means capable of being arbitrarily set in the write mode and the read mode in response to the mode setting signal, said memory means being operated such that a memory content is changed in correspondence with the density data and the color data in the write mode and that a memory content corresponding to the color data externally accessed is read out in the read mode;

threshold value setting means for setting threshold values in



units of color data on the basis of the memory content read out from said memory means in the read mode;

recording density data forming means for forming recording density data having a smaller number of bits by the set threshold values on the basis of the density data; and

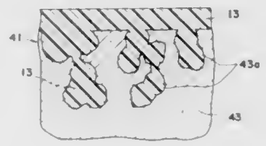
recording means for performing recording on the basis of the recording density data.

4,929,980

DOCUMENT SUPPORT TABLE WITH LUBRICANT AND METHOD FOR FORMING THE SAME

Tetsuo Kyogoku; Masamitsu Ishiyama, and Masayuki Mino, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Dec. 7, 1988, Ser. No. 281,253
Claims priority, application Japan, Dec. 10, 1987, 62-312595; Dec. 10, 1987, 62-312596
Int. Cl.[5] G03B *27/62*
U.S. Cl. 355—75 13 Claims



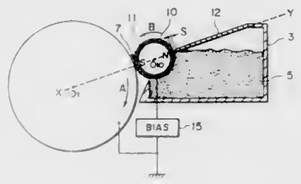
1. A document support member for use in a copier, comprising:

a transparent substrate;

a transparent surface layer formed on the surface of said transparent substrate, said surface layer being formed by spreading fine ceramic particles on said transparent substrate and subsequently sintering said fine ceramic particles to thereby form numerous minute spaces on said surface layer; and

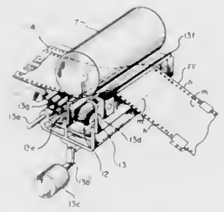
a lubricant filling said numerous minute spaces to provide a thin lubricant layer.

4,929,981
DEVELOPING APPARATUS
Takahiro Kubo, Tokyo, and Hatsuo Tajima, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 23, 1988, Ser. No. 210,250
Claims priority, application Japan, Jun. 29, 1987, 62-159714
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—253 9 Claims



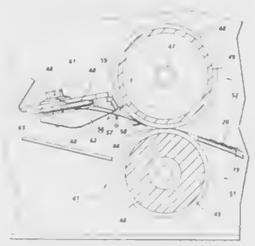
1. A developing apparatus for developing an electrostatic latent image, comprising:
- a rotatable cylindrical member, disposed opposed or contacted to an image bearing member in a developing zone, for carrying a developer thereon to the developing zone to supply the developer to the image bearing member;
- magnetic field generating means stationarily disposed in said cylindrical member, said magnetic field generating means including only two magnetic poles adjacent outer periphery thereof, said two magnetic poles being substantially on a line passing through a center of said cylindrical member, wherein one of said magnetic poles forms a magnetic field in the developing zone;
- means for supplying a developer on said cylindrical member; and
- regulating means for regulating a thickness of a developer layer formed on said cylindrical member, wherein said regulating member is disposed in a magnetic field formed by the other magnetic pole.

4,929,982
SHEET PATH IN AN ELECTROPHOTOGRAPHIC PRINTER
Masayuki Ainoya, Mito; Takeyuki Ishihara, Yokohama; Tesuo Kanno, Fujisawa; Takahiro Kikuchi, Katsuta; Seiichi Mori, Fujisawa; Shogo Nobumori, and Junji Shirakawa, both of Katsuta, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 18, 1989, Ser. No. 353,846
Claims priority, application Japan, May 25, 1988, 63-126019
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—311 9 Claims



1. An electrophotographic printer comprising a photosensitive drum comprising;
- a form feeder having means for feeding cut sheets to said photosensitive drum and means for feeding fan-fold forms to said photosensitive drum both means being provided in parallel adjacent to said photosensitive drum;
- a frame being driven toward said photosensitive drum to allow forms fed by said form feeder to make contact with said photosensitive drum;
- means provided on said frame for transferring images on said photosensitive drum to the forms made contact with said drum;
- a conveyor belt for sucking forms from said transfer means with a suction pressure to convey said forms;
- means for fixing transferred images on the forms conveyed by said conveyor belt; and
- means for discharging the forms from said fixing means.

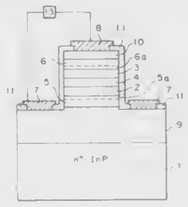
4,929,983
STRIPPER MECHANISM
Arthur A. Barton, Webster; Frederick C. DeBolt, Penfield; Michael R. Elter, Webster; Paul M. Fromm, Rochester; Frank A. Grossi, Webster; Mark T. Miller, Rochester; Kenneth R. Rasch, Webster, and Thomas F. Szlucha, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 7, 1989, Ser. No. 334,416
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—315 23 Claims



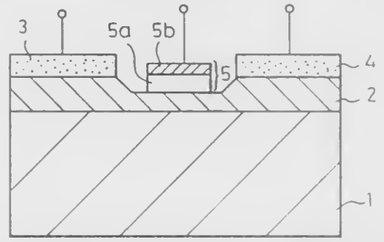
1. A stripper member for separating a print substrate from a fuser member in an electrostatographic printing machine comprising a substantially flat, thin, resiliently flexible finger-like member having a raised dimple-like bump adjacent one end of said finger-like member for contacting said print substrate when stripped from said fuser member, said finger-like member being coated on both sides with a smooth low surface energy film.

4,929,984
RESONANT TUNNELLING BARRIER STRUCTURE DEVICE
Sbunichi Muto; Tsuguo Inata; Atsushi Takeuchi, all of Isehara, and Yoshihiro Sugiyama, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Nov. 1, 1988, Ser. No. 265,814
Claims priority, application Japan, Nov. 10, 1987, 62-282057
Int. Cl.[5] H01L *27/12*
U.S. Cl. 357—4 7 Claims

1. A resonant tunnelling barrier structure device comprising:
an InP substrate; and
a resonant tunnelling barrier structure formed on said InP substrate and consisting of at least two barrier layers of $Al_xGa_{1-x}As$-ySb_{1-y} ($0 \leqq x \leqq 1$, $y=0.51+0.05x$), at least one well layer of InP or $In_zGa_{1-z}As$ ($0.52 \leqq z \leqq 0.54$) sandwiched between said barrier layers, and two doped layers of InP or $In_zGa_{1-z}As$ holding all of said barrier layers and said well layer therebetween, said barrier layers, well layers and doped layers being lattice-matched to InP of said substrate.



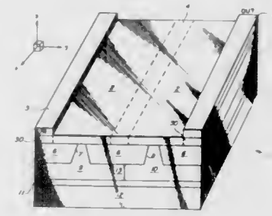
4,929,985
COMPOUND SEMICONDUCTOR DEVICE
Kanetake Takasaki, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed May 2, 1989, Ser. No. 346,456
Claims priority, application Japan, May 18, 1988, 63-119390
Int. Cl.[5] H01L *29/48*
U.S. Cl. 357—15 5 Claims



1. A compound semiconductor device comprising: a III–V group compound semiconductor substrate and a Schottky junction electrode of a p-type amorphous silicon carbide (a-SiC) layer provided on the III–V group compound semiconductor substrate and an amorphous silicon-germanium-boron (a-Si-Ge-B) layer provided on the p-type amorphous silicon carbide layer.

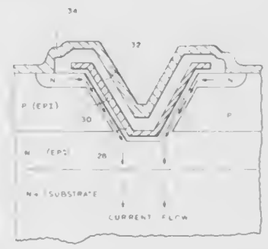
4,929,986
HIGH POWER DIAMOND TRAVELING WAVE AMPLIFIER
Max N. Yoder, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sep. 25, 1987, Ser. No. 101,919
Int. Cl.[5] H01L *29/80*
U.S. Cl. 357—22 5 Claims

1. An FET device comprising one or more FET stages, each stage of said one or more stages comprising:
- a channel, a source, a gate and a drain formed in a single monolith;
- said each stage comprising an input portion comprised of said source and said gate, an output portion comprised of said drain and said gate, said input and said output portions having mirror image geometry with respect to one another;
- said mirror image geometry and the forming of said input portion and said output portion from said single monolith, being effective to make the phase velocity of electromagnetic signals propagating in said input portion and said output portion virtually identical; and



said channel of said each stage is a diamond layer in said monolith.

4,929,987
METHOD FOR SETTING THE THRESHOLD VOLTAGE OF A POWER MOSFET
Willem G. Einthoven, Belle Meade, N.J., assignor to General Instrument Corporation, New York, N.Y.
Division of Ser. No. 150,755, Feb. 1, 1988, Pat. No. 4,859,621.
This application May 30, 1989, Ser. No. 358,883
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—234 2 Claims



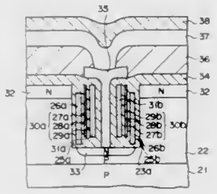
1. A vertical MOSFET formed on a substrate with a <100> crystal orientation comprising a top layer of a first conductivity type, a middle layer of a lightly doped second conductivity type, a bottom layer of a relatively heavily doped second conductivity type, the middle and bottom layers being formed to act as a drain, the top and middle layers forming a junction at least a portion of which is substantially parallel to the substrate surface and a second conductivity type region formed in said top layer to act as a source, the threshold voltage of the MOSFET being set by a method comprising the steps of: an anisotropically etching a groove with a substantially flat bottom through the second conductivity type region and into the top layer, the bottom of the groove initially being above the junction; exposing the substrate to a beam of ions of the second conductivity determining type so as to form as substantially continuous implanted region extending below said junction; anisotropically etching the substrate a second time to remove the portion of the implanted region proximate the groove bottom such that the final level of the groove bottom is within the middle layer below the junction and said implanted region operably connects the second conductivity type region with said middle layer, and after the threshold voltage is set, forming an insulating layer along the sides and bottom of the groove and forming a gate on said insulating layer.

4,929,988

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD OF THE MANUFACTURE THEREOF

Kuniyoshi Yoshikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 23, 1988, Ser. No. 235,121
Claims priority, application Japan, Aug. 25, 1987, 62-210774
Int. Cl.[5] H01L *29/78, 29/34, 29/06, 23/48*
U.S. Cl. 357—23.5 **7 Claims**



1. A non-volatile memory device comprising:
first semiconductor region of a first conductivity type;
a groove formed in said first semiconductor region to extend in a predetermined direction;
insulating separation regions formed to selectively fill the inside of said groove so that said groove is divided into a plurality of groove portions;
a second semiconductor region of a second conductivity type formed in a surface of said first semiconductor region and serving as a source region;
a pair of first gate insulating layers formed on opposed side walls of a groove portion of said plurality of groove portions defined by said insulating separation regions and said first semiconductor region, said side walls extending along the direction of extension of said groove;
a pair of floating gate electrodes formed on surfaces of said first gate insulating layers opposite to surfaces of said first gate insulating layers contacting said side walls of said groove portion, with said floating gate electrodes having tops on a plane different from a plane of a top of said second semiconductor region;
a pair of second gate insulating layers formed on surfaces of said floating gate electrodes opposite to surfaces thereof contacting said first gate insulating layers;
a pair of control gate electrodes formed on surfaces of said second gate insulating layers opposite to surfaces thereof contacting said floating gate electrodes;
a third semiconductor region of said second conductivity type formed in a surface region of said first semiconductor region and located at a bottom of said groove portion, said third semiconductor region serving as a drain region; and
a fourth semiconductor region formed within said groove portion and contacting said third semiconductor region, said fourth semiconductor region being doped with impurities of said second conductivity type.

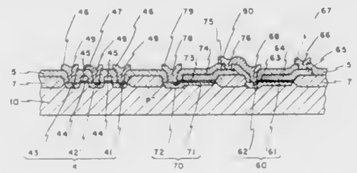
4,929,989

MOS TYPE SEMICONDUCTOR DEVICE POTENTIAL STABILIZING CIRCUIT WITH SERIES MOS CAPACITORS

Kiminori Hayano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 9, 1989, Ser. No. 349,093
Claims priority, application Japan, May 10, 1988, 63-114292
Int. Cl.[5] H01L *29/78, 27/02;* **H03K** *3/01*
U.S. Cl. 357—23.6 **6 Claims**

1. A semiconductor device comprising a semiconductor substrate having a major surface of a first conductivity type, a thick field insulating layer selectively formed on said major surface of said substrate, a first power voltage supply line for supplying a first voltage extending on said thick field insulating layer, a second power voltage supply line for supplying a second voltage different from said first voltage extending on said thick field insulating layer, an insulated gate field effect transistor formed on said substrate, said transistor having a gate insulating film formed on said major surface of said substrate, a first impurity region of a second conductivity type opposite to said first conductivity type formed in said major surface of said substrate and surrounded by said thick field insulating layer, a first dielectric film formed on said first impurity region, said first dielectric film being made of the same material as said gate insulating film of said transistor and having the same thickness as said gate insulating film of said transistor, a first electrode formed on said first dielectric film, a second impurity region of said second conductivity type formed in said major surface of said substrate and surrounded by said thick field insulating layer, a second dielectric film formed on said second impurity region, said second dielectric film being made of the same material as said gate insulating film of said transistor and



having the same thickness as said gate insulating film of said transistor, a second electrode formed on said second dielectric film, a first connecting means for connecting electrically said first power voltage supply line and said first impurity region each other, a second connecting means for connecting electrically said first electrode and said second impurity region each other, and a third connecting means for connecting electrically said second impurity region and said second power voltage supply line each other,

whereby a first MOS type capacitor is constituted by said first impurity region, said first dielectric film and said first electrode; a second MOS type capacitor is constituted by said second impurity region, said second dielectric film and said second electrode; and a stabilizing circuit for suppressing a voltage fluctuation on said first and/or second power voltage supply line is constituted by the series connection of said first and second MOS type capacitors and is connected to and between said first and second power voltage supply lines.

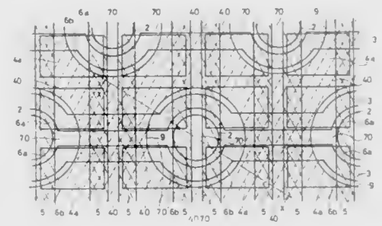
4,929,990

SEMICONDUCTOR MEMORY DEVICE

Masahiro Yoneda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,492
Claims priority, application Japan, Jul. 1, 1987, 62-164409
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.
Int. Cl.[5] H01L *27/04;* **G11C** *11/40*
U.S. Cl. 357—23.6 **8 Claims**

1. A dynamic-type semiconductor memory device, comprising:
a semiconductor substrate (1) having a main surface;
a plurality of word lines formed on said substrate;
a plurality of bit lines intersecting with said plurality of word lines;
a plurality of memory cells provided in correspondence with intersections of said word lines and said bit lines, each of said memory cells being included within a memory cell group formed of four adjacent memory cells arranged symmetrically about a common contact hole, each memory cell having a transistor (6) including a source region (6*a*) formed around the common contact hole and a drain region (6*b*) formed radially outside of said source region (6*a*) with respect to said contact hole and a capacitor formed adjacent to an outer edge of said drain region (6*b*) with respect to said contact hole, said capacitor having a surface capacitor region (4*a*) parallel to said main surface and a trench capacitor region (40*a*) parallel to a side wall of a trench (40) formed in said main surface around an outer periphery of said capacitor region (4*a*);
a first electrical connection formed between two of said transistors and a common one of said bit lines through said common contact hole;



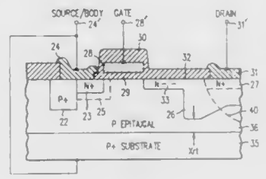
a second electrical connection formed between the remaining two of said transistors and another common one of said bit lines through said common contact hole;
a third electrical connection formed between two of said transistors which are respectively connected to different bit lines by said first electrical connection and a common one of said word lines; and
a fourth electrical connection formed between another remaining two of said transistors and another common one of said word lines,
whereby four memory cells included within a said memory cell group are controlled by only two said bit lines and two said word lines.

4,929,991

RUGGED LATERAL DMOS TRANSISTOR STRUCTURE

Richard A. Blanchard, Los Altos, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Continuation of Ser. No. 119,761, Nov. 12, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 334,806
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.8 **8 Claims**



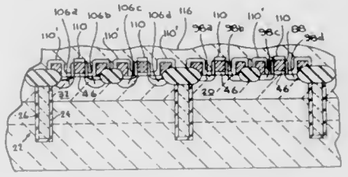
1. A DMOS transistor having source, body, gate and drain regions arrayed laterally on the surface of a semiconductor, said transistor comprising:
a substrate having a first conductivity type;
an epitaxial layer of semiconductor material having said first conductivity type and a doping level less than that of said substrate deposited on said substrate to a first thickness;
a body contact region having said first conductivity type and extending from said epitaxial layer surface part way therethrough to form an ohmic contact;
a source region having a conductivity type opposite to said first conductivity type abutting said body contact region along one edge and extending from said epitaxial layer into said epitaxial layer with the opposite edge of said source region facing said body contact region of said DMOS transistor:
a body region having said first conductivity type in said epitaxial layer and in contact with said source region;
a drain region, spaced laterally from and facing said source region and having said opposite conductivity type, extending from said epitaxial layer surface into said epitaxial layer to a second thickness that is less than said first thickness by an amount that creates a drain depletion region reachthrough breakdown voltage, associated with reverse drain bias, at a voltage level below that of an avalanche breakdown voltage of said drain electrode; and
a gate region extending from said source region to said drain region;
wherein said drain region includes a region doped with impurities of said first conductivity type, said drain region having a concave shaped portion at a surface thereof facing said substrate to control the behavior of said drain depletion region under reverse bias conditions.

4,929,992

MOS TRANSISTOR CONSTRUCTION WITH SELF ALIGNED SILICIDED CONTACTS TO GATE, SOURCE, AND DRAIN REGIONS

Mammen Thomas, San Jose, and Matthew Weinberg, Mountain View, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 777,149, Sep. 18, 1985. This application Jun. 2, 1986, Ser. No. 869,759
Int. Cl.[5] H01L *29/78, 29/04, 27/12*
U.S. Cl. 357—23.9 **1 Claim**



1. An improved integrated circuit structure having one or more MOS devices formed therein comprising:
(a) a P type silicon substrate having an N+ buried layer formed therein, an N type epitaxial silicon layer grown over said buried layer, and oxide isolation regions formed in said epitaxial layer and extending into said structure sufficiently to provide isolation between adjacent devices formed therein;
(b) a polysilicon gate having a raised contact portion formed over a gate oxide layer on said epitaxial layer overlying a channel region formed in said epitaxial layer;
(c) oxide spacer means on the sidewall of said raised gate contact portion;
(d) source and drain regions formed in said epitaxial layer contiguous with said channel region and separated from adjacent devices in said structure by said isolation oxide regions;
(e) polysilicon source and drain contacts on said epitaxial layer raised to approximately the same level as said raised polysilicon gate contact;
(f) metal silicide conductive layer portions respectively overlying said source and drain regions in said epitaxial layer and over the sides and tops of said raised polysilicon source and drain contacts to thereby provide horizontal conductive paths extending from said oxide spacer means on the sidewalls of said raised polysilicon gate contact to said raised polysilicon source and drain contacts, and

vertical conductive paths from said respective horizontal conductive paths up the sides of said raised polysilicon source and drain contacts to decrease the resistance of the horizontal and vertical conductive paths respectively between the source and drain regions in said epitaxial layer and the metal silicide on the top of said raised polysilicon source and drain contacts to which metal contacts will subsequently be formed; and

(g) a layer of insulating material over said structure which has been planarized to expose the tops of said raised source, gate, and drain contacts;

whereby said structure having said raised contacts of even height comprises a highly planarized surface with self-aligned contacts and low resistance paths respectively between said tops of said raised source and drain contacts and said source and drain regions in said epitaxial layer.

4,929,993

HALL ELEMENT DEVICE WITH DEPLETION REGION PROTECTION BARRIER

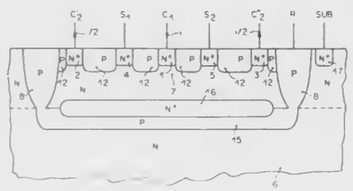
Radivoje Popovic, Zug, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Apr. 25, 1986, Ser. No. 856,460

Claims priority, application Switzerland, May 22, 1985, 02175/85

Int. Cl.[5] H01L *27/22*

U.S. Cl. 357—27 **6 Claims**



1. An electronic comprising a Hall element incorporated in an integrated circuit, said Hall element having a surface and having an active zone below said surface, said Hall element comprising

at least two sensor connection contacts,

at least three current connection contacts arranged at said surface,

a depletion region located at least between said surface and said active zone,

an oxide layer arranged on said surface, and

an electronically conducting gate layer having a gate connection and arranged on top of said oxide layer to cover at least the top of said active zone, whereby a portion of said depletion region covering said active zone is generated when an electrical voltage is connected to said gate connection,

said conducting gate layer comprising three parallel and separated sub-gate layers, one of said sub-gate layers being a center gate layer covering the part of said active zone which incorporates three of said sensor and current connection contacts of said Hall element, each of the other two sub-gate layers covering a portion of said active zone incorporating a remaining connection contact of said Hall element, each of said sub-gate layers having a gate connection.

4,929,994

SOLID-STATE IMAGING DEVICE WITH MULTIPLE DIELECTRIC LAYERS

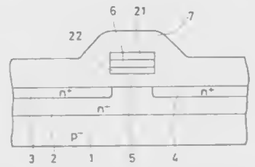
Kazuya Matsumoto, Ina, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,280

Claims priority, application Japan, Apr. 28, 1987, 62-103135

Int. Cl.[5] H01L *27/14*

U.S. Cl. 357—30 **3 Claims**



1. A solid-state imaging device using an MIS light-receiving device which includes a photoelectrical conversion portion and a signal storage portion, said solid-state imaging device comprising:

a gate electrode disposed on a surface of a semiconductor with a gate insulating film, formed of SiO_2, therebetween, said gate electrode formed of a polysilicon film having a thickness of 600 Å;

a protection film formed on said gate electrode formed of SiO_2;

a first intermediate film disposed between said gate electrode and said protection film, and said first intermediate film formed of a Si_3N_4 film having a thickness of 600 Å; and

a second intermediate film disposed between said gate electrode and said gate insulating film, and said second intermediate film formed of a Si_3N_4 film having a thickness of 900 Å wherein the thickness of each said film of said solid-state imaging device reduces a level of reflection between said films to enable maximum light transmissivity.

4,929,995

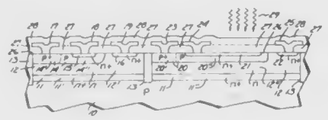
SELECTIVE INTEGRATED CIRCUIT INTERCONNECTION

David R. Gifford, San Antonio, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 156,378, Feb. 16, 1988, Pat. No. 4,849,365. This application Mar. 17, 1989, Ser. No. 324,933

Int. Cl.[5] H01L *21/265, 21/263, 21/26*

U.S. Cl. 357—34 **2 Claims**



1. A monolithic integrated circuit structure permitting selectively providing a permanent, relatively high conductivity electric current flow path between two regions therein which are initially electrically isolated from one another, said structure comprising:

a semiconductor material body of a first conductivity type in at least a first portion thereof, said first portion serving as a first interconnection region, except in a selected region in said first portion, said semiconductor matrerial body having a major surface wherein said first interconnection region intersects said major surface to form a first major surface area a first ohmic contact made to said first major surface area by a first interconnection means;

said selected region being of a second conductivity type except in a surface intersecting portion therein which intersects said major surface, said selected region being removed in said first portion from any contact with said first ohmic contact; and

said surface intersecting portion serving as a second interconnection region and being of said first conductivity type, said second interconnection region having a first dopant distributed tehrein, said second interconnection region having a second ohmic contact made thereto at said major surface by a second interconnection means, said selected region and said second interconnection region extending in a direction substantially parallel to said first major surface area in said first interconnection region asymmetrically with respect to said first ohmic contact a sufficient extent to provide an irradiation location in said major surface intersecting said second interconnection region, said irradiation location capable of receiving radiation to diffuse said first dopant through said selected region.

4,929,996

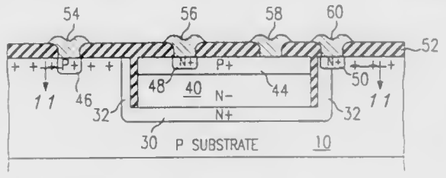
TRENCH BIPOLAR TRANSISTOR

Louis N. Hutter, Richardson, Tex., assignor to Texas Instruments Incorporated, Tex.

Filed Jun. 29, 1988, Ser. No. 213,212

Int. Cl.[5] H01L *29/72*

U.S. Cl. 357—34 **25 Claims**



1. A bipolar transistor, comprising:

a trench depression having side walls formed in a semiconductor substrate;

a heavily doped layer of semiconductor material in the said sidewalls of trench depression forming a shell around said trench depression;

an insulating layer formed on sidewalls of said trench depression, a bottom portion of said trench depression being defined by said heavily doped shell;

a semiconductor collector material formed in a lower portion of said trench depression;

a semiconductor base material formed within said collector material; and

a semiconductor emitter material formed in said base material.

4,929,997

HETEROJUNCTION BIPOLAR TRANSISTOR WITH BALLISTIC OPERATION

Kazuhiko Honjo, and Shin-Ichi Tanaka, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,589

Claims priority, application Japan, Dec. 22, 1986, 61-307044; Jun. 2, 1987, 62-139154; Jun. 24, 1987, 62-158100; Jun. 24, 1987, 62-158101

Int. Cl.[5] H01L *29/72*

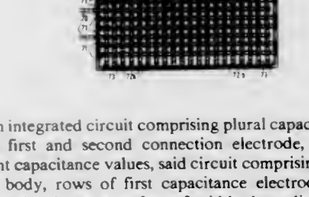
U.S. Cl. 357—34 **22 Claims**

1. A heterojunction bipolar transistor comprising:

(a) an emitter region formed of a first semiconductor material of a first conductivity type;

(b) a base region having a plurality of base areas including first and second base areas respectively formed of second and third semiconductor materials of a second conductivity type opposite to said first conductivity type; and

(c) a collector region formed of a fourth semiconductor material of said first conductivity type and forming a junction together with said base region, wherein said first and second semiconductor materials form a first heterojunction with a first abrupt potential discontinuity providing a first kinetic energy to a carrier injected from said emitter region, and said second and third semiconductor



materials form a second heterojunction with a second abrupt potential discontinuity providing a second kinetic energy to said carrier traveling over said base region, said first, second and third semiconductor materials being different in electron affinity from one another, wherein said first and second kinetic energies respectively correspond to energy gaps between the bottom edges of the conduction bands of said first and second semiconductor materials and between the bottom edges of the conduction bands of said second and third semiconductor materials.

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INTEGRATED CIRCUIT HAVING PLURAL CAPACITANCES OF DIFFERENT VALUES

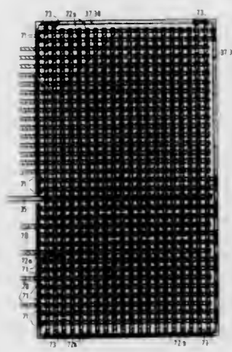
Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 810,440, Dec. 17, 1985, abandoned. This application Oct. 25, 1988, Ser. No. 263,992

Claims priority, application Netherlands, Dec. 24, 1984, 8403932

Int. Cl.[5] H01L *27/10, 27/15*

U.S. Cl. 357—45 **9 Claims**



1. An integrated circuit comprising plural capacitances, each with a first and second connection electrode, which have different capacitance values, said circuit comprising a semiconductor body, rows of first capacitance electrodes arranged beside each other at a surface of said body, a dielectric layer, and second capacitance electrodes, each of said first capacitance electrodes being separated by said dielectric layer from one of said second capacitance electrodes, the first and second connection electrodes comprising the electrodes of a plurality

of basic capacitances arranged in rows, different numbers of basic capacitances between one or more first and one or more associated second connection electrodes being connected in parallel with each other to form the capacitances having different capacitance values by interconnection of first and second capacitance electrodes, plural rows of basic capacitances having the same number n of first capacitance electrodes and each of these rows of n basic capacitances having a first row conductor by means of which all n first capacitance electrodes of the row are interconnected, one or more rows of interconnected first capacitance electrodes forming a first connection electrode, a first group of interconnected second capacitance electrodes of said rows of n basic capacitances forming a second connection electrode associated with said first electrode, a plurality of dummy basic capacitances, and a second group of interconnected second capacitance electrodes of said rows of n basic capacitances which form a third connection electrode, the third connection electrode comprising second capacitance electrodes of said dummy basic capacitances, and, in a first row of n basic capacitances, the number of second capacitance electrodes in said first row belonging to an associated second connection electrode being at least one and smaller than in a second of said rows of n basic electrodes.

4,929,999

COMBINATION OF A SUPPORT AND A SEMICONDUCTOR BODY AND METHOD OF MANUFACTURING SUCH A COMBINATION

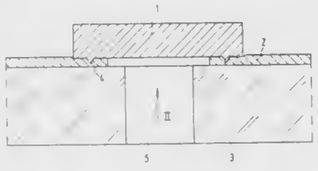
Arthur M. E. Hoeberechts, and Petrus J. M. Peters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1989, Ser. No. 334,063

Claims priority, application Netherlands, Apr. 8, 1988, 8800901

Int. Cl.[5] **H01L** *23/48, 29/44, 29/52*

U.S. Cl. 357—68 **4 Claims**



1. A combination of a support and a semiconductor body, in which a deformable metal layer is disposed between the semiconductor body and the support and the semiconductor body is connected to the support by pressing the semiconductor body and the support against each other under pressure while heating the metal layer, characterized in that the semiconductor body is provided at its surface facing the support with at least one projecting part, which is embedded in the metal layer.

4,930,000

TERMINAL ASSEMBLY FOR AN INTEGRATED SEMICONDUCTOR CIRCUIT

Dieter Kantz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 868,778, May 29, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 243,206

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519571

Int. Cl.[5] **H01L** *23/48, 29/44, 29/52, 29/60*

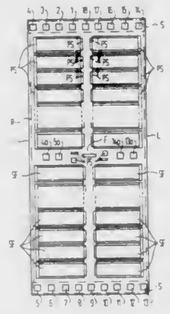
U.S. Cl. 357—68 **7 Claims**

1. Connecting arrangement for an integrated semiconductor circuit, comprising:

a semiconductor chip having a main surface and two opposite end surfaces; two contact regions within the main surface, each disposed adjacent a respective end surface and each having a respective first and second plurality of contact pads therein;

an electrically active surface within the main surface, disposed between the contact regions;

a first and a second circuit area disposed within said electrically active surface, each being adjacent a respective contact region; said first and second circuit area having first and second electrical circuit elements connected with said first and second plurality of contact pads in said contact regions;



at least one surface area free of electrical circuit elements disposed within said electrically active surface;

a further contact region having a third plurality of contact pads therein connected with said second circuit elements in said first and second circuit area, disposed within said electrically active surface; said further contact region disposed within said at least one surface area free of electrical circuit elements; and

wherein at least one of said contact pads in said further contact region is redundantly connected with a respective circuit element of said second electrical circuit elements.

4,930,001

ALLOY BONDED INDIUM BUMPS AND METHODS OF PROCESSING SAME

Ronald L. Williams, San Marcos, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 23, 1989, Ser. No. 327,867

Int. Cl.[5] **H01L** *23/48;* **B44C** *1/22;* **C23F** *1/02*

U.S. Cl. 357—71 **15 Claims**

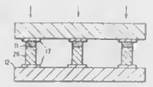
15. Apparatus comprising:

a substrate;

a bonding pad disposed on the substrate comprising a layer of titanium, a layer of nickel deposited over the titanium and a layer of gold deposited over the layer of titanium;

an indium bump etched in a low concentration of hydrochloric acid and pressed onto the bonding pad for a short period of time to temporarily fuse the bump to the pad and heated for about one hour at approximately 100 degrees Celsius to form an alloy bond between the bump and the pad.





4,930,002

MULTI-CHIP MODULE STRUCTURE

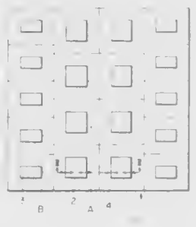
Takaji Takenaka; Tositada Netsu; Hidetaka Shigi, all of Hadano, and Masakazu Yamamoto, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,770

Claims priority, application Japan, Apr. 1, 1987, 62-77518

Int. Cl.[5] **H01L** *23/16, 39/02*

U.S. Cl. 357—75 **4 Claims**



1. A pin grid array type multi-chip module structure comprising:

a ceramic multi-layer wiring board having opposing first and second surfaces;

a plurality of connecting pads arrayed on said first surface to mount a plurality of semiconductor devices on said first surface;

a plurality of through-holes within said board;

a plurality of I/O pins arrayed on said second surface including power supply pins and signal pins,

wherein a predetermined area of said board is divided into a plurality of divisional board areas each having the same size, each of said divisional board areas being allotted to individual semiconductor devices of a same type, said connecting pads, said through-holes and said I/O pins being supplied equally to each of said divisional board areas, and wherein positional relationships between said connecting pads, said through-holes and said I/O pins are substantially identical for each divisional board area; and,

a plurality of selected layers, wherein said selected layers include metallized patterns for supplying power inside said board, said patterns being connectable to said power supply pins via said through-holes whereby said patterns are made constant for each divisional board area.

4,930,003

BURST/CONTINUOUS WAVE CONVERTING APPARATUS FOR CONVERTING CONTINUOUS WAVE IN RESPONSE TO BURSTS

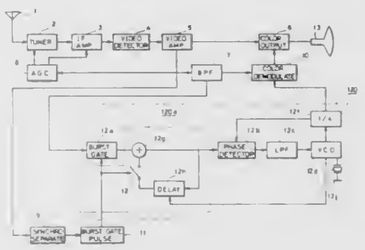
Nobukazu Hosoya, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 9, 1988, Ser. No. 242,108

Claims priority, application Japan, Sep. 10, 1987, 62-226914

Int. Cl.[5] **H04N** *9/46*

U.S. Cl. 358—19 **8 Claims**



1. A burst/continuous wave converting apparatus, comprising:

burst signal means for intermittently supplying a burst signal having a predetermined frequency and phase at a constant repetition frequency;

PLL circuit means responsive to said supplied burst signal for generating a continuous wave having a controlled frequency and phase, said PLL circuit means comprises voltage controlled oscillator means for generating said continuous wave, and

phase detector means for comparing phases of said supplied burst signal with said continuous wave output from said voltage controlled oscillator means;

delay means having a delay time which is approximately integer multiples of a cycle of said burst signal, said delay means utilizes an output of said voltage controlled oscillator means as a clock; and

switching means for directly applying said burst signal to said PLL circuit means in a period during which said burst signal is supplied and for applying said burst signal to said delay means to delay said burst signal by said delay time and to apply the delayed burst signal to said PLL circuit means in a period other than the period during which said burst signal is supplied.

4,930,004

AUTOMATIC LEVEL ADJUSTING SYSTEM FOR A TELEVISION RECEIVER

Yoshihiro Yamamoto, Tokyo; Junya Saito, and Masakazu Suzuki, both of Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 332,003

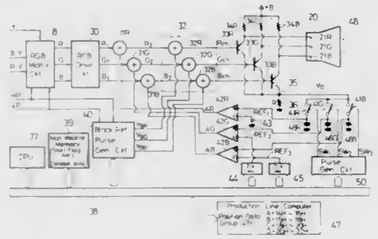
Claims priority, application Japan, Apr. 15, 1988, 63-092690

Int. Cl.[5] **H04N** *9/73*

U.S. Cl. 358—29 **17 Claims**

1. An improved television receiver of the type which includes a video signal source for supplying a video signal, picture reproducing means, an automatic level control circuit connected between said video signal source and said picture reproducing means, said automatic level control circuit including reference pulse insertion means for inserting a reference pulse signal into said video signal at a predetermined position,

level detecting means connected between said reference pulse insertion means and said picture reproducing means for detecting a signal level at said predetermined position, level correction means connected between said video signal source and said picture reproducing means, and control means connected to said level detecting means for controlling said level correction means such that the level of the video signal is corrected in response to said detected level, wherein the improvement comprises:



a non-volatile memory for storing a positional datum corresponding to said predetermined position, and

activating means connected between said non-volatile memory and said reference pulse insertion means for activating the latter to generate said reference pulse signal at said predetermined position in response to said positional datum stored in said non-volatile memory.

4,930,005

CIRCUIT FOR REMOVING CROSSTALK COMPONENTS IN A CARRIER CHROMINANCE SIGNAL

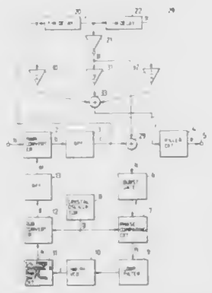
Hiroshi Yamada; Ryo Nakano, both of Yokohama; Yasutoshi Matsuo, Kawasaki, and Seiichi Mikami, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 16, 1988, Ser. No. 285,263

Claims priority, application Japan, Dec. 18, 1987, 62-320872; May 19, 1988, 63-120576

Int. Cl.[5] H04N *5/21*

U.S. Cl. 358—36 **3 Claims**



1. A circuit for removing crosstalk components in a carrier chrominance signal, comprising:

(a) first delay circuit means responsive to said carrier chrominance signal;

(b) first ½ attenuation circuit means responsive to said carrier chrominance signal;

(c) inverter means responsive to an output signal from said first delay circuit means;

(d) second delay circuit means responsive to said output signal from said first delay circuit means;

(e) second ½ attenuation circuit means responsive to an output signal from said second delay circuit means;

(f) ½ attenuation circuit means responsive to an output signal from said inverter means;

(g) first adder means responsive to output signals from said first and second ½ attenuation circuit means and an output signal from said ½ attenuation circuit means thereby producing a crosstalk-removed carrier chrominance signal; and

(h) a second adder means responsive to said carrier chrominance signal and to said output signal from said inverter means, said first delay circuit, inverter means and said second adder means forming a comb filter for correcting a time delay due to said circuit for removing crosstalk components.

4,930,006

COLOR SOLID STATE IMAGE PICKUP ELEMENT WITH PLURAL PHOTOCELLS OF A SAME COLOR WITHIN A SUBUNIT THEREOF CONTROLLED BY A COMMON CONTROL LINE AND OUTPUTTING TO A COMMON SIGNAL LINE

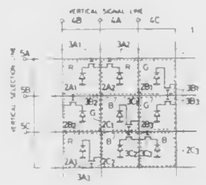
Jin Murayama; Yoshimitsu Kudoh, and Ryuji Kondo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 31, 1987, Ser. No. 32,644

Claims priority, application Japan, Mar. 31, 1986, 61-71299

Int. Cl.[5] H04N *9/077, 9/07*

U.S. Cl. 358—44 **8 Claims**



1. A solid state image pickup element comprising:

an MOS image sensor comprising:

photoelectric conversion elements arranged in rows and columns;

vertical selection lines extending along the rows;

vertical signal lines extending along the columns;

a vertical switching means associated with each photoelectric conversion element and controlled by an associated vertical selection line for selectively connecting an output of the associated photoelectric element to an associated vertical signal line;

a horizontal switching means associated with each column for selectively connecting an associated vertical signal line to an output line;

a vertical shift register for controlling the vertical switching means through the vertical selection lines; and

a horizontal shift register for controlling the horizontal switching means;

the solid state image pickup element further comprising a color filter having one of l colors associated with each photoelectric conversion element; wherein

the photoelectric conversion elements are divided into sets of m×n contiguous photoelectric conversion elements, m and n being integers greater than one;

each set is divided into l groups of photoelectric conversion elements, wherein all of the photoelectric conversion elements in each group are associated with color filters having the same color; and

the vertical switching means associated with the photoelectric conversion elements in each group except one selectively connect the outputs of all of the photoelectric conversion elements in the group to one vertical signal line associated with the group, thereby producing a sum of the outputs of all of the photoelectric conversion elements in the group on the one vertical signal line, and the vertical switching means associated with the photoelectric conversion elements of said one group selectively connect the outputs of all of the photoelectric conversion elements in said one group to a plurality of vertical signal lines associated with said one group, thereby producing a sum of the outputs of all of the photoelectric conversion elements in said one group on the plurality of vertical signal lines.

4,930,007

DIGITAL COLOR IMAGE PROCESSING METHOD AND APPARATUS FOR DISCRIMINATING HIGH RESOLUTION AREAS OF A COLOR IMAGE SIGNAL AND CONTROLLING IMAGE PROCESSING IN ACCORDANCE WITH THE DISCRIMINATION

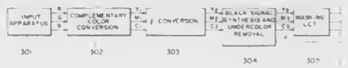
Susumu Sugiura, Yamato; Yasuo Kouzato, Tokyo, and Yukio Masuda, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

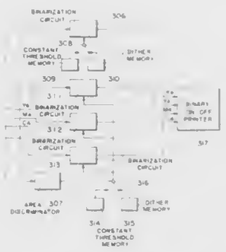
Continuation of Ser. No. 58,625, Jun. 4, 1987, abandoned, which is a continuation of Ser. No. 608,238, May 8, 1984, abandoned. This application May 30, 1989, Ser. No. 358,498

Claims priority, application Japan, May 10, 1983, 58-81140

Int. Cl.[5] H04N *1/46, 1/40*

U.S. Cl. 358—75 **33 Claims**





1. A color image processing method comprising the steps of:

discriminating whether a given area of a color image is a high-resolution area by performing an area-type discriminating operation on a specified color component of a color image signal, the color image signal having a plurality of color components and representing the color image; and

changing an image processing for the plurality of color components of the color image signal, including an image processing for the specified color component thereof, to an image processing for a line image on the basis of the result of discrimination in said discriminating step that the given area is a high-resolution area.

2. A color image processing method according to claim 1, wherein the specified color component is a black component.

18. An apparatus comprising:

(a) means for supplying a color image signal including a plurality of color component signals;

(b) means for generating a non-color component signal by using at least two of said plurality of color component signals; and

(c) means for discriminating whether an area of a color image with which the color image signal is associated is a high-resolution area on the basis of the non-color component signal generated by said generating means.

26. An apparatus comprising:

(a) means for supplying a color image signal including a plurality of color component signals;

(b) means for generating a non-color component signal by using at least two of said plurality of color component signals; and

(c) means for discriminating whether an area of a color image with which the color image signal is associated is a gray-level area on the basis of the non-color component signal generated by said generating means.

4,930,008

SCANNER FOR READING COLOR IMAGE

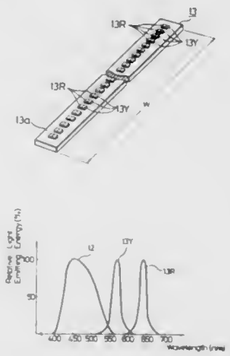
Kiyosuke Suzuki, and Hideki Wanami, both of Saitama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 336,722

Claims priority, application Japan, Apr. 25, 1988, 63-102303

Int. Cl.[5] H04N *1/028*

U.S. Cl. 358—75 **10 Claims**



1. A scanner of the type which optically scans an original color image, comprising:

(a) a plurality of light sources composed of a reddish-orange light emitting diode for emitting a reddish-orange light, a yellow light emitting diode for emitting a yellow light and a fluorescent light source for emitting a blue light, said plurality of light sources being arranged to selectively illuminate an original image and wherein the characteristic value of the light emitted from said reddish-orange light emitting diode is selected so as to have an overlap in wavelength with that of the light emitted from said yellow light emitting diode, and the characteristic value of the light emitted from said fluorescent light source is selected so as to have an overlap in wavelength with that of the light emitted from said yellow light emitting diode;

(b) a diode unit plate upon which said reddish-orange and yellow light emitting diodes are mounted;

(c) a line image sensor for receiving light supplied by said plurality of light sources which is reflected from the original image and producing a corresponding output signal;

(d) means for effecting relative movement between the original image and the line image sensor and plurality of light sources so that the original image is illuminated and sequentially scanned over a plurality of width-wise lines; and

(e) controlling means supplied with the output signal of said line image sensor for switching on and off said plurality of

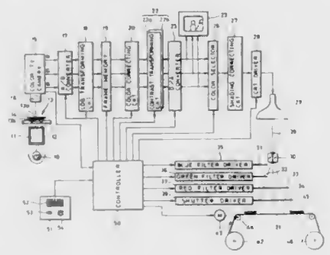
light sources sequentially and processing the line image sensor output signal to produce corresponding primary color image signals.

4,930,009

METHOD OF MAKING A PRINT OF COLOR SLIDE

Kazuo Shiota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1988, Ser. No. 207,977
Claims priority, application Japan, Jun. 19, 1987, 62-152980
Int. Cl.[5] H04N *1/23, 1/46*
U.S. Cl. 358—76 **14 Claims**



1. A method of making a color print from a color slide, comprising the steps of:

generating red, green and blue sets of positive image signals, together representing an image of the color slide, using a color TV camera;

displaying said sets of positive image signals as a positive color image on a color monitor;

determining if said color slide is invertedly mounted by monitoring the focus of the image on said color monitor, and, if out-of-focus, readjusting said color TV camera to focus on a back side of said color slide, and electronically converting said sets of positive image signals so as to display a mirror image of said positive color image on said color monitor;

converting said red, green and blue sets of positive image signals into respective negative image signals if said color slide is determined within said determining step to be properly mounted, and said red, green an d blue sets of positive image signals into negative mirror image signals if said color slide is determined within said determining step to be invertedly mounted;

sequentially displaying said negative image signals if said color slide is determined within said determined step to be properly mounted and said negative mirror image signals if said color slide is determined within said determining step to be invertedly mounted, as black-and-white negative image on a black-and-white CRT so as to expose a color photographic paper to said black-and-white negative images through respective red, green and blue filters, each sequentially inserted between said black-and-white CRT and said color photographic paper independently of the other two, thereby forming three monocolor latent images overlapping one another in said color photographic paper; and

processing said exposed color photographic paper to provide a color print of said color slide.

4,930,010

APPARATUS FOR GENERATING A TWO-DIMENSIONAL COLOURED DISPLAY

Lindsay W. MacDonald, Bedfordshire, England, assignor to Crossfield Electronics Limited, London, England

Filed Dec. 27, 1988, Ser. No. 289,893
Claims priority, application United Kingdom, Jan. 11, 1988, 8800503
Int. Cl.[5] H04N *1/415*
U.S. Cl. 358—78 **7 Claims**



1. Apparatus for generating a two-dimensional coloured display in which there is a variation of colour across the display in a predetermined manner, the colour of each pixel in the display being defined by at least one colour components, the apparatus comprising, for each colour component, a memory for storing a pair of gradation curves (X(i), Y(i)) representing the variation in intensity of said colour component in orthogonal directions X, Y across said display; processing means for determining a resultant colour component value V(i,j) for a pixel to be displayed at a location (i,j) in said display in accordance with the following formula:

$$V(i,j) = f[a(X(i)b(Y(j)) + c(X(i)d(Y(j))]$$

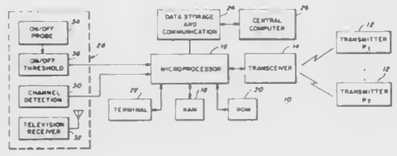
where the pixel has coordinates i,j and k is a normalizing constant, and where a, c, are functions of X(i), b, d are functions of Y(j) and f is an output function, said functions being chosen such that V(i,j) exhibits no discontinuities for all values of X(i), Y(j); and display means, responsive to said resultant colour component values V(i,j) for displaying a corresponding colour at a position in said display corresponding to that pixel.

4,930,011

METHOD AND APPARATUS FOR IDENTIFYING INDIVIDUAL MEMBERS OF A MARKETING AND VIEWING AUDIENCE

David A. Kiewit, Palm Harbor, Fla., assignor to A. C. Neilsen Company, Northbrook, Ill.

Filed Aug. 2, 1988, Ser. No. 227,187
Int. Cl.[5] H04H *9/00*
U.S. Cl. 358—84 **19 Claims**



14. A method for identifying predetermined individual members in a plurality of monitored areas comprising the steps of:

storing a plurality of predetermined identification signals, each of said predetermined identification signals corresponding to one of the predetermined individual members;

providing a transmitter device associated with each of the predetermined individual members for transmitting a unique predetermined identification signal;

providing a receiver device in each of said plurality of monitored areas for receiving said transmitted identification signals, said plurality of monitored areas including at least one retail establishment monitored area and at least one television viewing monitored area;

comparing each of said received identification signals with said stored predetermined identification signals to identify each predetermined individual member; and

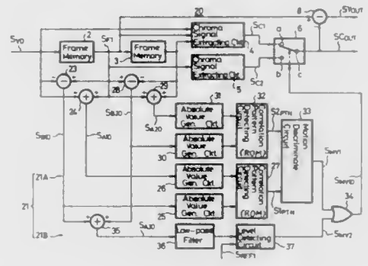
correlating each said identified predetermined individual member at different ones of the monitored areas.

4,930,012

CIRCUIT FOR DETECTING MOTION IN A VIDEO SIGNAL ON THE BASIS OF DETECTED CORRELATION PATTERNS

Tadao Fujita, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,470
Claims priority, application Japan, Apr. 8, 1988, 63-87821
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—105 **7 Claims**



1. A motion detecting circuit for detecting motion of a video signal, comprising:

serially-connected first and second frame memories for storing the video signal frame-by-frame;

means for producing first and second difference video signals respectively corresponding to the difference between input and output signals of said first frame memory and the difference between input and output signals of said second frame memory;

means for generating first and second absolute values in response to said first and second difference video signals, respectively;

means receiving said first and second absolute values and being responsive thereto for detecting first and second correlation patterns of said first and second difference video signals; and

means receiving the detected correlation patterns for discriminating motion of the video signal on the basis thereof.

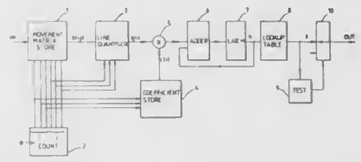
4,930,013

PATTERN PROCESSING

Anthony R. Leaning, Ipswich, England, assignor to British Telecommunications public limited company, Great Britain

PCT No. PCT/GB87/00816, § 371 Date Sep. 2, 1988, § 102(e) Date Sep. 2, 1988, PCT Pub. No. WO88/04084, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 17, 1987, Ser. No. 221,790
Claims priority, application United Kingdom, Nov. 20, 1986, 8627787
Int. Cl.[5] G06K *9/62;* **H04N** *7/137*
U.S. Cl. 358—133 **16 Claims**

1. An apparatus for classifying a set of values representing a two-dimensional pattern, comprising summation means for forming a weighted sum, modulo x, of those values, where x is an integer less than 2^P, p being the number of values in the set; and a store having x locations each containing a class identification word representing one of a set of standard patterns, the



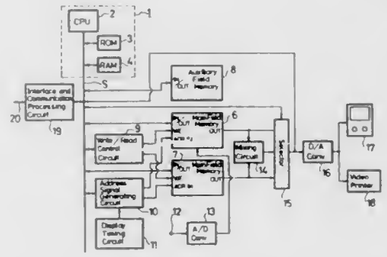
address inputs of the store being connected to receive the output of the summation means.

4,930,014

METHOD AND APPARATUS FOR PROCESSING A STILL PICTURE SIGNAL

Satoru Maeda, Kanagawa; Yasushi Noguchi, Saitama; Kazunori Yasuda, and Shyunsuke Takano, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1989, Ser. No. 352,487
Claims priority, application Japan, May 17, 1988, 63-120236
Int. Cl.[5] H04N *5/272*
U.S. Cl. 358—209 **5 Claims**



1. A still picture signal processing apparatus for processing a still picture signal and for displaying a still picture according to a still picture signal comprising:

(a) still picture signal source means for generating a still picture signal;

(b) analog-to-digital converting means for converting said still picture signal into a digitized still picture signal;

(c) first and second main field memory means;

(d) auxiliary field memory means;

(e) signal processing means for processing a still picture signal;

(f) display means for displaying a still picture;

(g) means for supplying a signal selectively read out from said first and second main field memory means to said display means; and

(h) memory control means for controlling read and write operations of said first and second main field memory means and auxiliary field memory means, thereby a digitized still picture signal from said analog-to-digital converting means is supplied to said first main field memory means, said digitized still picture signal is read out from said first main field memory means, and is compressed by 1/n in data amount and is separated into first and second compressed signals by said signal processing means, said first and second compressed signals are supplied to said second main field memory means and auxiliary field memory means, respectively and written in portions of said second main field memory means and auxiliary field mem-

ory means, respectively, said second compressed signal is read out from said auxiliary field memory means and is supplied to said first main field memory means, and said first and second compressed signals are read out from said second and first main field memory means, combined and supplied to said display means.

4,930,015

FLAT TENSION MASK CATHODE RAY TUBE IMPLOSION SYSTEM

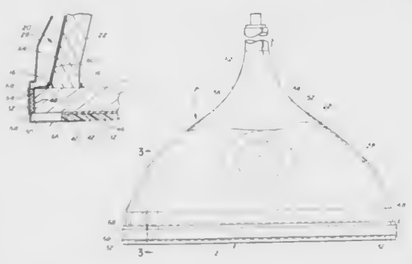
Lawrence W. Dougherty, Sleepy Hollow; Sae D. Lee, Buffalo Grove, and Melvin F. Rogers, Western Spring, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 941,458, Dec. 15, 1986, and Ser. No. 894,984, Aug. 8, 1986. This application Apr. 6, 1988, Ser. No. 178,111

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.[5] H04N *5/65*

U.S. Cl. 358—246 **18 Claims**



1. A flat tension mask cathode ray tube comprising a brittle faceplate member, an implosion protection panel member, an adhesive system bonding said panel member to said faceplate member, and a tension band system around the periphery of said faceplate member which exerts compression on said faceplate member.

4,930,016

IMAGE SCANNING READING AND RECORDING SYSTEM

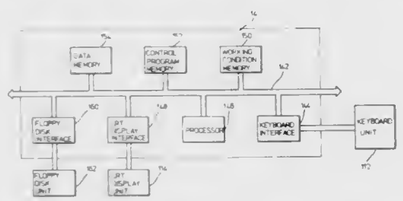
Hiromi Yazawa; Masahiro Inoda, and Hideaki Kimura, all of Kanagawa, Japan, assignors to Fuji Photo Film, Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 39,195, Apr. 16, 1987, abandoned. This application Jul. 6, 1989, Ser. No. 376,186

Claims priority, application Japan, Apr. 16, 1986, 6187758

Int. Cl.[5] H04N *1/21*

U.S. Cl. 358—296 **11 Claims**



1. A system for reading and recording an image by scanning the same, comprising:

entry means for allowing, prior to scanning and recording processing of a plurality of respective single-sheet originals, entry, for each respective single-sheet original, of predetermined image recording conditions, and identifying information affixed in physical relation with the respective single-sheet original, and for associating said predetermined image recording conditions for each respective single-sheet original with its identifying information;

an image scanning reading and recording apparatus for

delivering selected ones of said single-sheet originals bearing an image and identifying information to a reading position,

scanning a selected one of said single-sheet originals with a first light beam to read the image to produce image information,

processing the image information according to said predetermined image recording conditions to produce an image signal,

modulating a second light beam with the image signal to produce a halftone dot signal, and

applying the halftone dot signal to a photosensitive medium to record the image thereon; and including

control unit means including primary memory means for storing data items used to produce the image signal, said control unit means being connectable to additional memory means for storing said predetermined image recording conditions in association with identifying information for each respective single-sheet original; and

original feeding mechanism means including means for successively feeding selected ones of said single-sheet originals to said image scanning reading and recording apparatus and identifying means for identifying each selected single-sheet original as it is fed based on identifying information located on said selected single-sheet original, said control unit means being arranged to select those of said predetermined image recording conditions stored in said additional memory means which correspond to said selected single-sheet original identified by said identifying means on the basis of said identifying information, and to effect the recording of the image on said photosensitive medium according to selected said predetermined image recording conditions.

4,930,017

COMMUNICATION TERMINAL DEVICE

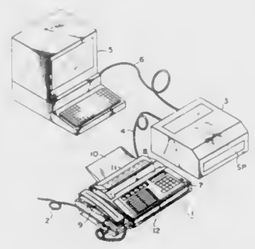
Shoji Izawa, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 256,767

Claims priority, application Japan, Oct. 19, 1987, 62-263144

Int. Cl.[5] H04N *1/32*

U.S. Cl. 358—296 **10 Claims**



1. A communication terminal device comprising:

a communication circuit for receiving information;

a built-in recording device for recording the received information on a specified recording medium;

a connector section to which an optional recording device is selectively connected;

selection means for selecting one of said recording devices;

control means connected to receive the information supplied from said communication circuit, for supplying the information to the recording device selected by said selection means; and

wherein said control means includes processing means for repeatedly checking the selected recording device, and for causing the information to be supplied to the other recording device when it is detected that the selected recording device is not accessible.

4,930,018

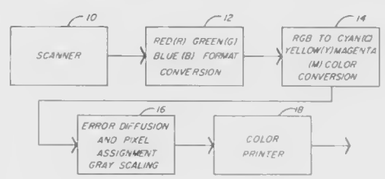
METHOD AND SYSTEM FOR ENHANCING THE QUALITY OF BOTH COLOR AND BLACK AND WHITE IMAGES PRODUCED BY INK JET PRINTERS

C. S. Chan; James G. Bearss, and Terry M. Nelson, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 2, 1988, Ser. No. 278,881

Int. Cl.[5] H04N *1/034, 1/23;* **G01D** *15/16;* **B41J** *2/21*

U.S. Cl. 358—298 **37 Claims**



Example of filling in the image plane

Color Dye Load	Black	Cyan	Magenta	Yellow
High	78 / 80	84 / 82	88 / 90	92
Medium	94 / 96	102 / 104 / 100	106	108 / 110
Low	112	114	116 / 118 / 120	122

Example

	High	Medium	Low
K =	2,	2,	0)
C =	2,	2,	0)
M =	1,	0,	2)
Y =	0,	1,	0)

1. A method for decreasing color contrast in a printed image which includes:

a. generating cyan, yellow, magenta and black pixel information,

b. assigning said information a gray scale drop count number based upon a count of ink drops having a known dye loading and the dye loading thereof,

c. decrementing said drop count number to a lower level number on said gray scale in response to a measure of the available number of ink drops and the dye loading representative of cyan, yellow, magenta and black pixel information, and

d. ejecting a volume of ink into a selected print area which corresponds to said lower level number on said gray scale.

4,930,019

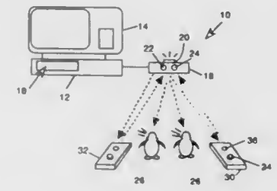
MULTIPLE-USER INTERACTIVE AUDIO/VIDEO APPARATUS WITH AUTOMATIC RESPONSE UNITS

Chi Wai Chu, 2-88 Ma Ling Path, House No. 28, Windsor Park, Kau Tau Shan, Shatin, N.T., Hong Kong

Filed Nov. 29, 1988, Ser. No. 277,548

Int. Cl.[5] G09B *5/04, 7/06;* **H04N** *5/93*

U.S. Cl. 358—335 **1 Claim**



1. A player-interactive audio/video apparatus usable with a video monitor and a video cassette player connectable to the monitor for displaying a video signal comprising:

an audio/video tape having an audio track and a video track, playable on the player and prerecorded with video display information on the video track for producing the video signal when played back on the player, said tape also being prerecorded with an audio signal on the audio track comprising a first voice signal associated with the video signal, a second voice signal not associated with the video signal, and three control signals, the two voice signals and three control signals being recorded with separate bandwidths of the audio track;

a control unit connectable to the player for receiving the audio signal when said tape is played on the player, said control unit comprising: a decoder for decoding the audio signal into separate voice signals and control signals; a first voice speaker responsive to the first voice signal for broadcasting the first voice signal; means for detecting a first of the control signals in the audio signal; first voice switch means disposed between said decoder means and said first voice speaker and controllable for selectively coupling the first voice signal to said first voice speaker; first transmitter means for transmitting the second voice signal and the second and third control signals remotely from said control unit; second voice switch means controllable for selectively coupling the second voice signal and the second and third control signals to said first transmitter means; means for generating a disabling signal distinct from the first, second and third control signals; third switch means controllable for selectively coupling the disabling-signal generating means to said first transmitter means; first receiver means for receiving an indicating signal remotely transmitted; detector means coupled between said first receiver means and said third switch means and responsive to a received indicating signal for operating said third switch means in a manner transmitting the disabling signal for a predetermined period of time when the indicating signal is received;

a plurality of automatic response units positionable remotely from said control unit, each comprising: a second receiver means for receiving the transmitted second voice signal and second and third control signals; a second speaker means for broadcasting said second voice signal; fourth switch means controllable for selectively connecting said second receiver means to said second speaker means; a detector means responsive to a predetermined one of the second and third control signals for operating said fourth switch means in a manner connecting said second receiver means to said second speaker means when the predetermined one of the control signals occurs; and

a plurality of manually operable indicator units positionable remotely from said control unit and said response units,

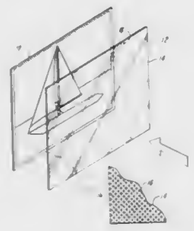
each indicator unit comprising: manually operable switch means; means for generating an indicating signal; indicator transmitter means for transmitting the indicator signal remotely of said indicator unit; first indicator switch means controllable for selectively coupling said indicator signal generating means to said indicator transmitter means; second indicator switch means controllable for selectively coupling said manual switch means to said first indicator switch means; and indicator receiver means responsive to a received disabling signal for controlling operation of said first indicator switch means in such a manner that said first indicator switch means is open when said disabling signal is received by said indicator receiver means, thereby preventing transmission of the indicating signal when said manual switch is operated.

4,930,020

FACSIMILE TRANSMISSION OF PHOTOGRAPHIC IMAGES

James F. Martin, 6914 Woodhaven Rd., NW., Roanoke, Va. 24019

Filed Dec. 29, 1986, Ser. No. 947,390
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—400 **10 Claims**



1. A method of preparing a photographic image for facsimile transmission comprising,

preparing a photocopy of said photographic image through a screen comprising a plurality of spaced dots on said screen in which one of the screen and dots are transparent and the other opaque to light transmission, whereby the photocopy has reproduced thereon said photographic image and the pattern of said dots with either said dots or the spaces therebetween forming the image of said photographic image and wherein said screen is a transparent flexible sheet between about 0.001 and 0.016 inches in thickness, and said dots are white or yellow dots dispersed at even intervals over a surface of said sheet, the density of said dots being between 48 and 52 lines per inch and the overall gray tone of said sheet being between 15 and 30 percent.

4,930,021

PROCESS AND APPARATUS FOR REDUCING A PICTURE WITH FINE LINE DISAPPEARANCE PREVENTION

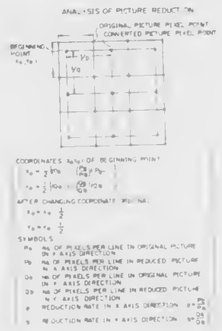
Yoshiyuki Okada, Isebara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 20, 1989, Ser. No. 325,912
Claims priority, application Japan, Mar. 18, 1988, 63-063802; Aug. 30, 1988, 63-213673
Int. Cl.[5] H04N *1/393*
U.S. Cl. 358—451 **13 Claims**

1. A process for reducing a picture by determining monochrome data of converted picture pixels based on monochrome data of original picture pixels, and for avoiding disappearance of fine lines from the converted picture,

said process comprising the steps of:

(a) successively receiving monochrome data of original picture pixels in the vicinity of a converted picture pixel;
(b) generating data of a line susceptible to disappearance;
(c) discriminating a divisional region in which said converted picture pixel is located;



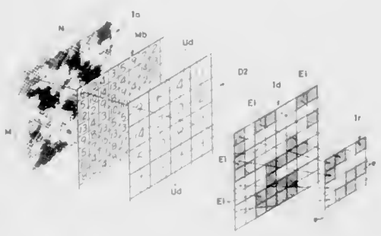
(d) calculating, according to logic calculations, monochrome data of said converted picture pixel based on said generated data, said discriminated divisional region, and said monochrome data of original picture pixels; and
(e) producing a signal indicating said monochrome data of said converted picture pixel according to said calculation.

4,930,022

METHOD AND DEVICE FOR IMAGE REDUCTION IN IMAGE PROCESSING

Mineo Kubota, Kofu, Japan, assignor to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan

Filed Dec. 8, 1988, Ser. No. 281,329
Claims priority, application Japan, Jun. 2, 1988, 63-136221
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—451 **5 Claims**



3. A device for image processing capable of reducing a read-out image obtained in a matrix by digitizing a given original image in accordance with a predetermined n×n dither pattern, comprising:

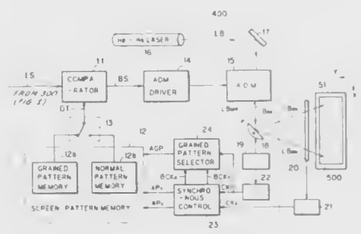
a subscanning encoder for outputting a subscanning encoder pulse each time updating of subscanning;
a timing pulse generator for outputting regularly timing pulses;
a dither setting circuit having the dither pattern with dither element values with which picture elements constituting the matrix of said read-out image are compared to obtain an intermediate dither image;
a mode selection circuit for selecting one of at least equality and reducing modes;
a scanning control circuit for outputting said dither element values so that when said mode selection circuit selects the image reducing mode at a 1/m reduction rate, one dither element value is delivered each time m-subscanning encoder pulses from said subscanning encoder or m-timing pulses from said timing pulse generator are outputted so as to derive an mn×mn dither pattern composed of n×n dither element values defined in a matrix from said n×n dither matrix pattern;
a dither matrix resistance circuit having a plurality of resistors for obtaining said intermediate dither image; and
a dither decision circuit for selecting said resistors of said dither matrix resistance circuit in accordance with the dither pattern,
whereby a reduced image represented by said brightness features corresponding to said original image is obtained by comparing brightness of each pixel of said read-out image with said dither element values prescribed in said mn×mn dither pattern at a pixel corresponding to that of said read-out image to obtain said intermediate dither image having a plurality of unit matrices and extracting brightness features of the respective unit matrices in said intermediate dither image.

4,930,023

HALFTONE DOT GENERATOR USING GRAINED SCREEN PATTERNS

Kazunori Yakame, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co. Ltd., Japan

Filed Feb. 27, 1989, Ser. No. 315,907
Claims priority, application Japan, Mar. 1, 1988, 63-49343
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—460 **12 Claims**



1. A method of producing a halftone dot image on the basis of original image data expressing an original image, comprising the steps of:

(a) preparing grained screen patterns that are different from each other;
(b) arranging said grained screen patterns in a random order, so as to obtain a random arrangement of said grained screen patterns;
(c) comparing said original image data with said random arrangement of said grained screen patterns for each pixel and thereby generating a halftone dot signal; and
(d) producing a halftone dot image on the basis of said halftone dot signal.

4,930,024

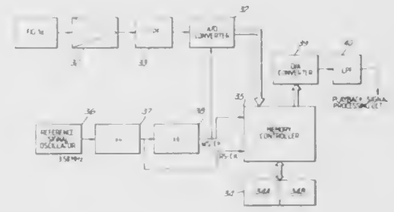
VARIABLE SPEED MAGNETIC MEDIUM RECORDING AND PLAYBACK APPARATUS

Shuhei Kanda; Mitugu Hirota, and Teruo Narushima, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 25, 1987, Ser. No. 29,820
Claims priority, application Japan, Mar. 26, 1986, 61-65862; Mar. 26, 1986, 61-65863
Int. Cl.[5] H04N *5/783*
U.S. Cl. 360—10.1 **12 Claims**

1. A magnetic reproducing apparatus for reproducing signals prerecorded in defined tracks on a magnetic recording medium, said apparatus comprising:

mode selection means for selecting between a normal mode and another mode;
variable speed rotary head means for helically scanning the prerecorded signals on the recording medium to produce an output signal, said rotary head means rotating at a first speed during the normal mode;
variable speed drive means for selectively moving the recording medium relative to said rotary head means, said drive means moving said recording medium at a second speed during the normal mode; and
speed control means operatively coupled to and responsive to said mode selection means for controlling the speed of said rotary head means in correspondence with the speed of said drive means, said speed control means causing said rotary head means to rotate at a third speed equal to a predetermined rotary head constant times the first speed and causing said drive means to move said recording medium at a fourth speed equal to a predetermined drive constant times the second speed during the other mode, the rotary head constant and the drive constant having values other than zero and one and differing from one another;
storage means operatively coupled to said rotary head means and including at least three storage elements for storing the output signal;
clock means for generating a write clock signal and a read clock signal;
storage control means operatively coupled to said storage means and to said clock means for sequentially writing selected portions of the output signal to each of said storage elements except a selected one of said storage elements at a first rate in accordance with the write clock signal during a first time period, for reading the selected portions of the output signal from the selected one of said storage elements at a second rate different from the first rate in accordance with the read clock signal during the first time period, and for sequentially reading the selected portions of the output signal from each of said storage elements except the selected one of said storage elements at the second rate in accordance with the read clock signal during a second time period different from the first time period, said storage control means sequentially selecting each of said storage elements as the selected one.



4,930,025

ARRANGEMENT FOR INDICATING ANGULAR POSITION OF HEADWHEEL DISK IN A TAPE RECORDER

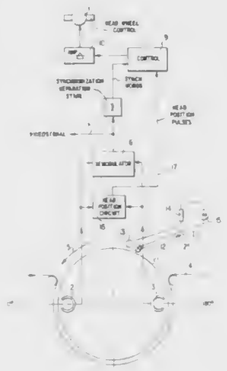
Günter Oberjatzas, Barsinghausen, and Heinz-Werner Keesen, Hannover, both of Fed. Rep. of Germany, assignors to Deutsche Thomson Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Continuation of Ser. No. 019,079, Feb. 26, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,203

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1986, 3606091

Int. Cl.[5] G11B *15/14, 21/02*

U.S. Cl. 360—64 12 Claims



1. In a device for transferring signals between itself and a record carrier tape, including a rotating head wheel disk having an axis of rotation and mounted for movement along said axis, and at least one head disposed on said rotating head wheel disk for cooperating with a record carrier tape; the improvement comprising

means for detecting the angular position and the linear position along said axis of said head wheel disk during rotation thereof, said means for detecting comprising sensor means disposed on said rotating head wheel disk, and signal emitter means for producing signals in said sensor means indicating the angular position and the linear position along said axis of rotation of the head wheel disk, with said signal emitter means including:

a first elongated conductor loop positioned adjacent said head wheel disk with the elongate axis of said loop oriented generally parallel to said axis of rotation,

a second elongated conductor loop positioned adjacent said head wheel disk with the elongate axis of said second loop forming an acute angle with the elongate axis of said first loop, and such that said sensor means passes said first and second conductor loops successively during rotation of said head wheel disk, and

means for producing a current in each of said first and second loops, whereby the signal produced in said sensor means by one of said loops is an indication of the angular position, and the relative time between the signals produced in said sensor means by said first and second loops is an indication of the linear position of said head wheel disk.

4,930,026

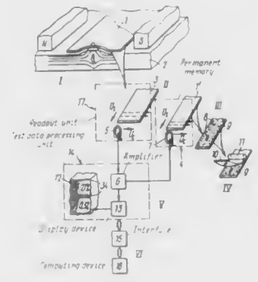
FLAW DETECTOR FOR MAGNETOGRAPHIC QUALITY INSPECTION

Vladimir V. Kljuev, 3 Frunzenskava ulitsa, 14, kv. 5., Moscow; Valery S. Kozlov, Leninsky prospekt, 16, kv. 76., Minsk; Dmitry B. Volodchenko, ulitsa Novovilenskaya, 3, kv. 32., Minsk; Alexandr V. Stepanenko, ulitsa Surganova, 40, kv. 25., Minsk; Vladimir I. Baranovsky, ulitsa Minskaya, 105, kv. 4.; Mikhail I. Korolkov, ulitsa Ryabinovaya, 27., both of Bobruisk, and Orest S. Semenov, ulitsa Verkhnyaya Pervomaiskaya, 53/35, korpus 3, kv. 27., Moscow, all of U.S.S.R.

Division of Ser. No. 919,879, Oct. 16, 1986. This application Mar. 21, 1988, Ser. No. 170,851

Int. Cl.[5] G11B *5/02;* G01N *27/82*

U.S. Cl. 360—67 7 Claims



1. A flaw detector for magnetographic quality inspection, comprising:

a readout unit having:

a drum with a cylindrical surface adapted to rotate about a shaft thereof;

a magnetosensitive transducer disposed on the cylindrical surface of said drum;

a modulation disk featuring holes arranged along the perimeter thereof and installed on the shaft of said drum;

a sensor of lines, installed in the immediate vicinity of said holes of said modulation disk;

a mechanism for driving a magnetogram and said drum with said magnetosensitive transducer;

a test data processing unit having:

an amplifier whose input is connected to said magnetosensitive transducer;

a display device having at least five inputs and three outputs, the first said input being connected to an output of said amplifier, the second said input being connected to said line sensor;

a permanent memory comprising:

a magnetic medium disposed in said mechanism for driving said magnetogram and magnetosensitive transducer;

at least one recording magnetic head electrically coupled to said amplifier.

4,930,027

METHOD AND APPARATUS FOR TAPE SPEED OVERRIDE OPERATION WHEN RECOVERING HELICAL AUDIO

Robert B. Steele, Menlo Park, and Leonard A. Pasdera, San Carlos, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

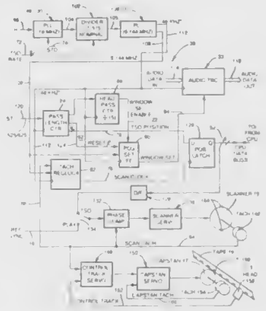
Filed Nov. 23, 1988, Ser. No. 275,257

Int. Cl.[5] G11B *15/473;* H04N *5/783*

U.S. Cl. 360—70 21 Claims

15. A circuit for effecting tape speed override in a video tape recorder having a helical scanner with a controllable scan tracking head for recovering helical audio data from a recorded tape, comprising;

means for providing a variable audio clock indicative of a desired rate of tape speed override; and



means responsive to the variable audio clock for moving the recorded tape at a speed commensurate with the desired rate while maintaining a selected phase relationship between the tape and scanner which prevents the scan tracking head from jumping between tracks to provide the faithful recovery of the helical audio data.

4,930,028

TAPE RECORDER

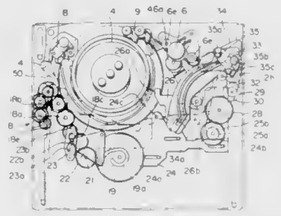
Noritaka Kunimaru; Katsuhiro Shiba; Norio Kudo; Gen Inoshita, and Shogo Sato, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 166,595, Mar. 10, 1988. This application Apr. 27, 1989, Ser. No. 343,709

Claims priority, application Japan, Mar. 11, 1987, 62-35351[U]; Mar. 11, 1987, 62-35357[U]; Mar. 11, 1987, 62-35359[U]; Mar. 13, 1987, 62-35978[U]

Int. Cl.[5] G11B *15/66, 5/08*

U.S. Cl. 360—85 1 Claim



1. A tape draw-out mechanism in a tape recorder which mounts a tape cassette thereon, said tape recorder including a rotary drum having a magnetic head, a tape drawn-out from said tape cassette being wound on said rotary drum by a certain amount for recording and reproduction with said tape, the position of said drum being offset in the width direction of said tape from the position of said tape cassette; said tape draw-out mechanism, comprising:

first and second guide members adapted to be movable along an outer periphery of said rotary drum, each of said guide members having a tape draw-out pin for drawing out said tape from said tape cassette; and

a third guide member movably disposed in said tape recorder for drawing out the tape from said cassette prior to the drawing out the tape by said first and second guide members, said third guide member having a first tape draw-out pin which changes the position of said tape in said width direction of said tape from said drum position to said tape cassette position, and said third guide member also having a second tape draw-out pin for directing said tape subjected to positional change by said first pin to a direction parallel to the tape cassette, wherein the distance between a terminal end position of said tape wound around said drum to said tape draw-out pins resulting in a compact recorder.

4,930,029

MAGNETIC DISK APPARATUS

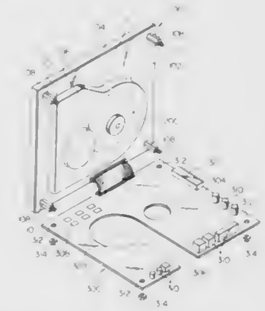
Isao Morita, Akishima, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 8, 1988, Ser. No. 216,582

Claims priority, application Japan, Jul. 10, 1987, 62-106017[U]

Int. Cl.[5] G11B *5/012*

U.S. Cl. 360—97.01 5 Claims



1. A magnetic disk apparatus, comprising:

a base plate having a first surface and a second surface opposite said first surface, said base plate having an indentation therein, said indentation being concave on said first surface and convex on said second surface, and defining an inset area on said second surface about the circumference of said indentation;

a mechanical portion having a magnetic disk assembly and a magnetic head assembly mounted on said first surface in said indentation;

a cover for covering at least said mechanical portion, said cover mounted on said first surface of said base plate;

a printed circuit board having a plurality of taller and shorter electrical parts disposed thereon, said printed circuit board being mounted on said second surface of said base plate, said taller electrical parts being arranged to protrude into said inset area of said base plate.

4,930,030

SIGNAL RECORDING/REPRODUCING DEVICE

Atsuhiro Yabu, and Toshiro Tsukahara, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,410

Claims priority, application Japan, Aug. 6, 1987, 62-198468

Int. Cl.[5] G11B *5/588*

U.S. Cl. 360—107 7 Claims

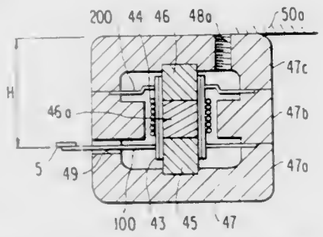
1. A signal recording/reproducing device, comprising:

(a) a rotary drum (3),

(b) a magnetic tape (13) wrapped obliquely around an outer peripheral surface of the drum,

(c) a drive unit (4a) mounted to the drum for rotation therewith and including a yoke assembly (47), a bobbin (43) disposed proximate the yoke assembly, first and second spaced, parallel spring plates (100, 200) mounting the

bobbin to the yoke assembly, a magnetic r/w head (5) mounted to the first spring plate and disposed in engagement with the tape, and a coil (44) wound around the bobbin for axially deflecting the bobbin and thus the spring plates and magnetic head in response to an automatic tracking speed compensation signal applied thereto, and



(d) means for preventing tracking errors caused by thermally induced axial elongations of the bobbin, said preventing means being characterized by the first spring plate having a larger spring constant than the second spring plate such that axial bobbin elongations are primarily absorbed by the deflection of the second spring plate.

4,930,031

APPARATUS FOR RECORDING AND REPRODUCING DIGITAL SIGNALS USING A HELICAL SCAN

Shinichi Nagahara; Tomoyuki Suzuki; Tomoyasu Yamada; Tokihiro Takahashi, and Ichiro Miyake, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,336
Claims priority, application Japan, Feb. 26, 1988, 63-42272; Mar. 4, 1988, 63-51305; Mar. 4, 1988, 63-51306
Int. Cl.[5] G11B *5/52, 21/18*
U.S. Cl. 360—107 3 Claims



1. An apparatus for recording and reproducing digital signals using a helical scan, comprising: a rotary drum; and two heads mounted on said drum at the same height in opposition to each other, a product of the diameter D of said drum and a wrap-around angle of a storage medium with respect to said rotary drum being constant while a rotational speed of said drum is increased to a rotational speed N times higher than a predetermined rotational speed, one of said two heads being mounted higher than the other by a distance of $(1-1/N)P$ to provide a step, and the other head being mounted at a position an angle behind a position at which the other head directly opposes the one of the heads, said angle being defined by the following equation:

$$\frac{(1-1/N)P}{\tan\Theta}\cdot\frac{C}{L\cdot D}$$

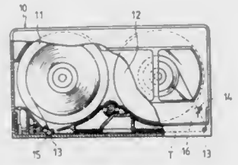
where L is a track length in a tape format obtained when said rotary drum rotates at said predetermined rotational speed, Θ is a track angle, P is a track pitch, and C is a constant dependent on said drum diameter D and said wrap-around angle.

4,930,032

MAGNETIC TAPE CASSETTE HAVING IMPROVED GUIDE POLE STRUCTURE

Takahito Miyoshi; Minoru Kanazawa; Tsutomu Sugisaki; Takuzi Yamada, and Yasutoshi Okuzawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1988, Ser. No. 205,759
Claims priority, application Japan, Jun. 15, 1987, 62-90717[U]; Jun. 26, 1987, 62-97437[U]
Int. Cl.[5] G11B *23/02*
U.S. Cl. 360—132 5 Claims



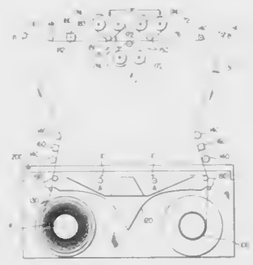
1. In a magnetic tape cassette containing a magnetic tape and having a metal guide pole which guides said magnetic tape while in sliding contact with a magnetic surface of said tape, the improvement wherein inorganic particles having a Moh's hardness of 9 or higher from pat of a surface of said guide pole in sliding contact with said magnetic surface of said tape.

4,930,033

TAPE CLEANER AND DEGAUSSER APPARATUS

Gregory Pergerson, Woodbridge, Va., assignor to E-Systems, Inc., Dallas, Tex.

Filed Aug. 5, 1988, Ser. No. 228,686
Int. Cl.[5] G11B *5/00*
U.S. Cl. 360—137 6 Claims



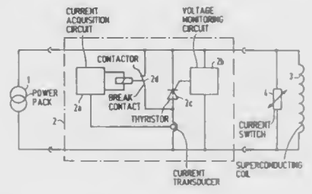
1. A tape cleaner and degausser apparatus for cleaning, conditioning and degaussing magnetic video tape comprising:
a wiper means for wiping the front and back of the surfaces of a video tape;
a scrapping means engaging the front surface of the video tape for removing debris and oxide therefrom;
a degaussing means for demagnetizing the video tape;
means for moving the video tape past the wiper means, scrapping means and degaussing means;
a front panel having a plurality of touch pad controls for controlling and managing the operation of the apparatus;
a bar condition station on the front panel containing a plurality of LED displays for providing information on the status of the scrapping means; and
a clear dust cover hinged to the rear top half of the apparatus providing easy access to the internal mechanism of the apparatus for replacing of the wiping and scrapping means.

4,930,034

PROTECTIVE CIRCUIT FOR A POWER PACK FOR EXCITATION OR DE-EXCITATION OF A SUPERCONDUCTION COIL SYSTEM

Bernd Kusserow, Erlangen; Klaus Gagneur, Baiersdorf, and Siegfried Hofler, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 217,970
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1987, 3723127
Int. Cl.[5] H02H *7/20*
U.S. Cl. 361—19 6 Claims



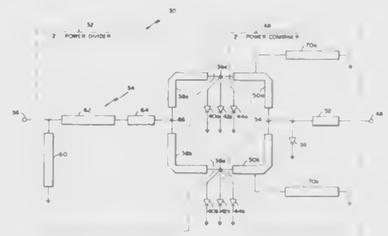
1. A protective circuit comprising:
means, adapted for connection across a power pack means for generating a supply voltage having a polarity at an output for exciting or deexciting a superconducting coil system, for monitoring a voltage across said output of the power pack means;
a switch connected in parallel to the output of said power pack means and being conductive, when closed, at least in a direction opposite to said polarity of said supply voltage; and
means, responsive to said means for monitoring, for closing said switch when said voltage across said output of said power pack means exceeds a predetermined value in a direction opposite said supply voltage of said power pack means so that current previously flowing in said superconducting coil is conducted through said switch.

4,930,035

RADIO FREQUENCY LIMITER CIRCUIT

Luis M. Viana, Melrose; Robert A. Cuozzo, North Andover; Michael L. Miceli, Hingham, and Kent A. Whitney, Lunenburg, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 3, 1989, Ser. No. 333,070
Int. Cl.[5] H04B *15/00*
U.S. Cl. 361—54 5 Claims



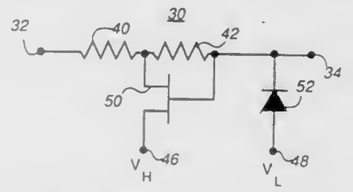
1. A radio frequency limiter circuit, comprising:
(a) a radio frequency power divider having an input and a plurality of outputs;
(b) a corresponding plurality of diodes, with each one of said diodes having a first electrode connected to a corresponding one of the plurality of outputs of the power divider and a second electrode connected to a reference potential; and
(c) a power combiner, having an output and a plurality of inputs, each one of such inputs being connected to a corresponding one of the outputs of the power divider.

4,930,036

ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT FOR AN INTEGRATED CIRCUIT

John E. Sitch, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 13, 1989, Ser. No. 379,126
Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—56 23 Claims



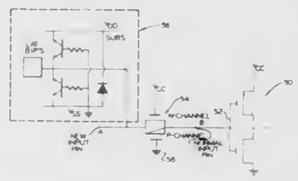
1. An electrostatic discharge protection circuit for a GaAs integrated circuit, comprising:
a first terminal;
second and third terminals for receiving respective high and low level supply voltages;
a transistor having a control electrode and a bidirectionally conductive controlled path coupled between the first terminal and the second terminal;
resistance means coupled between the control electrode and the first terminal for rendering the transistor conductive in a first direction in response to an electrostatic discharge potential of a first polarity at the first terminal;
diode means coupled between the control electrode and the third terminal for rendering the transistor conductive in a second direction in response to an electrostatic discharge potential of a second polarity at the first terminal, the second polarity being opposite to the first polarity; and
means for coupling a terminal of a GaAs integrated circuit to the resistance means.

4,930,037

INPUT VOLTAGE PROTECTION SYSTEM

Ann K. Woo, Cupertino, Calif., assignor to Advaced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 16, 1989, Ser. No. 311,270
Int. Cl.[5] H02H *3/20*
U.S. Cl. 361—58 8 Claims



1. A static electricity protection system for use with a voltage sensitive MOS component having a gate input with predetermined oxide layer thickness, the protection system comprising:
(a) a MOS component having a gate input; and

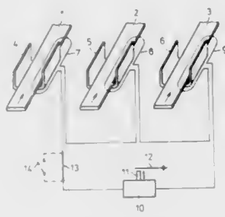
(b) a transmission gate having a source and a drain as an input and output, respectively, said transmission gate being connected to said MOS component gate input and having a higher voltage capacity than said MOS component for absorbing and for protecting said MOS component from sudden electrical voltage surge discharges.

4,930,038

CURRENT OVERLOAD TRIPPING DEVICE WITH LEADING TRIPPING ACTION

Bernhard Pfeiffer, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 28, 1988, Ser. No. 212,589
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1987, 3721848
Int. Cl.[5] G11B *15/68*
U.S. Cl. 361—92 3 Claims



1. In a current overload tripping device having a time-delayed leading tripping action during uneven loading of the phases of a multiphase circuit, said tripping device including a transformer current pickup for each phase of the multiphase circuit, which current pickup members are connected in series with each other and with an electromechanical converter, an improvement wherein each of the current pickup members comprises a winding surrounding a magnet yoke of an electromagnetic tripping device of each phase and said electromechanical converter comprises a temperature/time-dependent device operating to provide a time-delayed tripping signal.

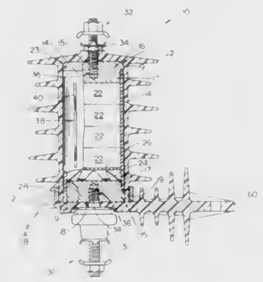
4,930,039

FAIL-SAFE SURGE ARRESTER

Jonathan J. Woodworth, Portville; Stephen P. Johnson, Olean; David R. Miller, Allegany; Jeffrey J. Kester, Olean, and Stanley S. Kershaw, Jr., Portville, all of N.Y., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 18, 1989, Ser. No. 339,577
Int. Cl.[5] H02H *7/04*
U.S. Cl. 361—127 52 Claims

43. A surge arrester comprising:
a plurality of nonlinear resistive elements;
an insulative module having side walls for retaining said resistive elements in a stacked relationship; and



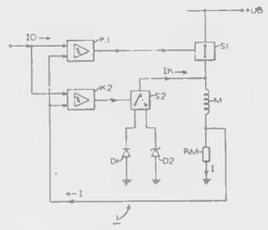
means spaced along the periphery of said module for radially venting gas through said side walls of said module.

4,930,040

CURRENT REGULATOR FOR INDUCTIVE LOADS

Jürgen Binarsch, Haste; Jürgen Bode, Hildesheim; Lutz Danne, Ronnenberg, and Norbert Lissel, Seelze, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,993
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1987, 3741765
Int. Cl.[5] H01H *47/32*
U.S. Cl. 361—154 10 Claims



6. The current controller, as defined in claim 1, wherein a precision resistor is connected in series with said electromagnetic coil.

4,930,041

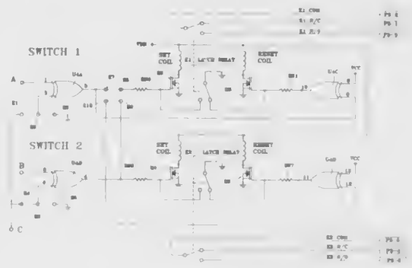
POTENTIOMETER POSITION SWITCH CIRCUIT

Peter P. Elderton, Fountain Valley; Richard P. Granada, West Covina, and Royal E. Howes, Anaheim, all of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 8, 1988. Ser. No. 282,365
Int. Cl.[5] H02H *5/00*
U.S. Cl. 361—190 5 Claims

1. A potentiometer position switch circuit comprising a meter mechanism,
a low friction potentiometer coupled to move with said meter mechanism and having input terminals and output terminals,
a set point potentiometer having input and output terminals,
a first source of voltage, means connecting said first source across the input terminals of said low friction and set point potentiometers,

a voltage comparator having input terminals and an output terminal,
means connecting the output of said low friction potentiometer to one input terminal of said comparator and the output of said set point potentiometer to the other input terminal of said comparator,
a magnetic latching double pole, double throw relay having set and reset relay coils,
means connecting the output of said comparator to the gate of a first voltage operated transistor through sufficient resistors to minimize current drain and through an inverter to the gate of a second voltage operated transistor through sufficient resistance to minimize current drain,



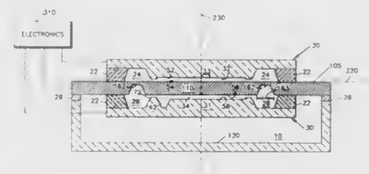
the output of said first transistor being connected from a second voltage source through said set relay coil to ground and the output of said second transistor being connected from said second voltage source through said reset relay coil to ground,
one set of contacts on said relay being connected to ground the gate on said second transistor when the voltage on the gate on said first transistor is high and to ground the gate on said first transistor when the gate on said second transistor goes high and the other set of contacts being connected to actuate a utilization circuit in one or the other positions.

4,930,042

CAPACITIVE ACCELEROMETER WITH SEPARABLE DAMPING AND SENSITIVITY

Walter J. Wiegand, Glastonbury; James L. Swindal, East Hampton; Richard E. Swarts, Simsbury; Robert H. Bullis, Avon; Mario T. Lopiccolo, Southington; Daniel H. Grantham, and Arthur G. Foyt, both of Glastonbury, all of Conn., assignors to United Technologies, Hartford, Conn.

Filed Feb. 28, 1989, Ser. No. 317,240
Int. Cl.[5] H01G *7/00*; G01P *15/08*
U.S. Cl. 361—280 16 Claims



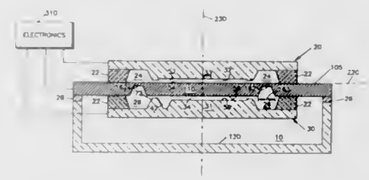
1. A solid-state accelerometer comprising:
a three-plate capacitor including fixed top and bottom plates and a movable sensing plate having a top surface separated from said top plate by a top gap and a bottom surface separated from said bottom plate by a bottom gap, defining a reference plane symmetrically disposed between said top and bottom surfaces, and being connected to support members by flexible connections extending across a support gap between said reference plate and said support members to move between said top and bottom plates in response to acceleration along an acceleration axis perpendicular to said reference plane, whereby acceleration along said acceleration axis displaces said sensing plate from said reference plane and alters the capacitance between said sensing plate and said top and bottom plates, in which;
said top and bottom plates and said support members are bonded together to form a rigid structure;
said sensing plate is connected to said support members by at least two flexures extending a predetermined hinge length along opposite sides of said sensing plate and having a predetermined hinge thickness less than the length of said sensing plate, so that a communication path is established between a top chamber between said top plate and said sensing plate and a bottom chamber between said bottom plate and said sensing plate; and
at least one chamber has motion stops disposed therein and grooves to facilitate squeeze-film damping in one of said sensing plate and said fixed plate, characterized in that:
a first side set of hinges are positioned along a first pair of sides of said sensing plate, have a predetermined total stiffness along each of said first pair of sides and are symmetric about a first plane defined by said acceleration axis and a first axis passing through said first pair of sides perpendicular to said first pair of sides and to said acceleration axis, said first side set of hinges also being symmetric about a second plane defined by said acceleration axis and a second axis passing through said acceleration axis perpendicular to said first axis;
a second side set of hinges are positioned along a second pair of sides, have said predetermined total stiffness along each of said second pair of sides, and are symmetric about said second and first planes in the same manner as said first side set of hinges are symmetric about said first and second planes, respectively; and
said first and second side sets of hinges are symmetrically disposed about a pair of diagonal planes perpendicular to said reference plane and having an angle of 45 degrees with respect to said first and second planes.

4,930,043

CLOSED-LOOP CAPACITIVE ACCELEROMETER WITH SPRING CONSTRAINT

Walter J. Wiegand, Glastonbury, Conn., assignor to United Technologies, Hartford, Conn.

Filed Feb. 28, 1989, Ser. No. 317,238
Int. Cl.[5] G01P *15/02*; H01G *7/00*
U.S. Cl. 361—283 3 Claims



1. A solid-state accelerometer for closed-loop operation to measure acceleration up to a predetermined maximum acceleration comprising:
a three-plate capacitor including fixed top and bottom plates and a movable sensing plate having a predetermined proof mass having a top surface separated from said top plate by a top gap and a bottom surface separated from said bottom plate by a bottom gap, defining a reference plane symmetrically disposed between said top and bottom surfaces and also defining top and bottom capacitors, and being connected to support members by flexible connections ex-

VOL 114 ISS 5 MY 29 990 UMI

tending across a support gap between said reference plate and said support members to move between said top and bottom plates in response to acceleration along an acceleration axis perpendicular to said reference plane, whereby acceleration along said acceleration axis displaces said sensing plate from said reference plane and alters the capacitance in said top and bottom capacitors, in which;

said top and bottom plates and said support members are bonded together to form a rigid structure;

said sensing plate is connected to said support members by at least two flexures extending a predetermined hinge length, less than the length of said sensing plate, along opposite sides of said sensing plate and having a predetermined hinge thickness to determine a total spring constant, whereby that a communication path is established between a top chamber between said top plate and said sensing plate and a bottom chamber between said bottom plate and said sensing plate;

at least one of said top and bottom chambers has motion stops disposed therein whereby said sensing plate may be displaced from said reference plane by less than a predetermined maximum displacement along said acceleration axis; and

electronics means for sensing displacement of said sensing plate from said reference plane and applying voltage to said three-plate capacitor to restore said sensing plate to said reference plane, characterized in that:

G_{max} said maximum acceleration to be measured, and G_{bottom}, the acceleration that will cause the sensing plate to contact said motion stops, are related by the condition $G_{bottom}/4 < G_{max} < 4G_{bottom}$, G_{bottom} being a function of said total spring constant of said flexible connections, whereby said maximum acceleration to be measured is limited by said total spring constant.

4,930,044

THIN-FILM CAPACITOR AND METHOD OF MANUFACTURING A HYBRID MICROWAVE INTEGRATED CIRCUIT

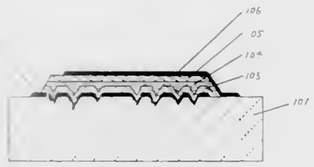
Kazuo Eda, Nara; Tetsuji Miwa, Neyagawa, and Yutaka Taguchi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 25, 1989, Ser. No. 398,731

Claims priority, application Japan, Aug. 25, 1988, 63-211005; Mar. 31, 1989, 1-83401

Int. Cl.[5] H01G *4/06, 7/00*

U.S. Cl. 361—313 **12 Claims**



1. A thin-film capacitor formed on a polycrystalline sintered body substrate and comprising a lower electrode, a dielectric film and an upper electrode, said dielectric film having a three layered structure comprising a first silicon oxide film formed by a chemical vapor-phase deposition method, a second silicon oxide film formed by coating on the first silicon oxide film a solution state silicon oxide precursor followed by denaturing by heat treatment, and a third silicon oxide film formed on the second silicon oxide film by a chemical vapor-phase deposition method.

4,930,045

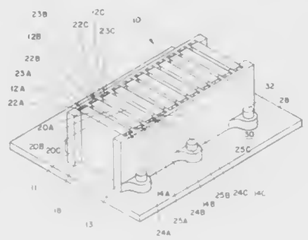
HIGH POWER, HIGH TEMPERATURE DISASSEMBLABLE CERAMIC CAPACITOR MOUNT

William E. Carlson, Rockford, and Mark W. Metzler, Davis, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 26, 1989, Ser. No. 428,272

Int. Cl.[5] H05K *7/20;* **H01B** *7/00*

U.S. Cl. 361—329 **17 Claims**



1. A disassemblable capacitor mount having in combination a plurality of rigid capacitors disposed between fixed, spaced-apart conductors, said capacitors having opposed electrode ends, said electrode ends disposed within spaced-apart lateral slots on facing planar sides of said conductors;

thermal expansion-absorbing contacts including compressible, electrically conductive means for relieving stress disposed within said slots between said electrode ends and said planar sides to provide a resilient biasing force against said electrode ends and said conductors, said stress caused by thermal expansion of said capacitors during operation, said slots spacing said capacitors apart to allow dissipation of heat in said capacitors generated during operation.

4,930,046

APPARATUS BY WHICH AUXILIARY SLIDE-IN UNITS ARE CONNECTED TO SLIDE-IN UNITS

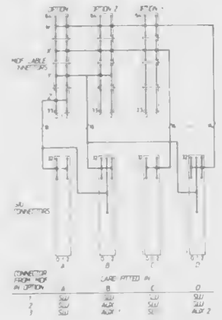
Raymond D. Smith, Reading, and Robert Marles, Berkshire, both of England, assignors to GEC Plessey Telecommunications Limited, England

Filed Oct. 20, 1988, Ser. No. 260,270

Claims priority, application United Kingdom, Oct. 20, 1987, 8724523

Int. Cl.[5] H05K *1/14*

U.S. Cl. 361—393 **6 Claims**



1. Apparatus by which auxiliary subscriber slide-in units are connected to subscriber slide-in units, wherein a plurality of subscriber slide-in unit connectors are provided for receiving the subscriber slide-in units or the auxiliary subscriber slide-in units, said subscriber slide-in unit connectors being connected to at least three cable connectors in such manner that when a first one of said cable connectors only is used, each subscriber slide-in unit connector is connected to receive a respective subscriber slide-in unit, when a second one of said cable connectors only is used, one of the subscriber slide-in unit connectors is connected to receive an auxiliary subscriber slide-in unit and the remaining subscriber slide-in unit connectors are connected to receive a respective subscriber slide-in unit; and when a third one of said cable connectors only is used, two of the subscriber slide-in unit connectors are connected to receive in series a respective auxiliary subscriber slide-in unit connectors are connected to receive a respective subscriber slide-in unit.

4,930,047

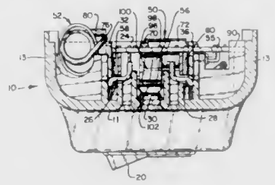
APPARATUS FOR INTERCONNECTING COMPONENTS OF A POWER OUTLET STRIP

Gerald E. Peterson, Riverside, Calif., assignor to The Toro Company, Minneapolis, Minn.

Filed Sep. 12, 1988, Ser. No. 242,579

Int. Cl.[5] H01H *83/02*

U.S. Cl. 361—395 **6 Claims**



1. A power outlet device comprising:

(a) a strip assembly comprising:

(i) an elongate conductive ground strip;

(ii) an elongate conductive neutral strip; and

(iii) an elongate conductive hot strip;

(b) a printed circuit board assembly comprising a power conditioning circuit;;

(c) a case receiving the strip and printed circuit board assemblies, the case comprising top and bottom surfaces which are substantially parallel to one another; and

(d) conductive resilient contact means connected to and extending from the printed circuit board assembly and operatively connecting the printed circuit board assembly to the strip assembly, wherein the assemblies are conductively interconnected simply by positioning the printed circuit board assembly relative to the strip assembly such that the contact means springingly engages the strip assembly, wherein:

(i) the ground strip forms a ground contact area substantially parallel to the top and bottom case surfaces;

(ii) the neutral and hot strips form neutral and hot contact areas substantially perpendicular to the top and bottom case surfaces;

(iii) the conductive resilient contact means comprises a dogleg-shaped ground contact spring engaging the ground contact area;

(iv) the contact means further comprises neutral and hot resilient conductive blades springingly engaging the neutral and hot contact areas, respectively;

(v) the printed circuit board assembly comprises a substrate substantially parallel to the top and bottom case surfaces and the ground contact spring comprises a first portion adjacent the substrate, and a second portion angling therefrom, wherein the free end of the second portion contacts the ground contact area; and

(vi) the neutral and hot contact blades each comprise a flat portion fixed to the substrate and perpendicular thereto, and a curved portion having a convex side and a concave side, wherein the concave sides of the blades face in opposite directions, and the convex sides of the blades engage the neutral and hot contact areas.

4,930,048

AIR-CONDITIONING CONTROL BOX

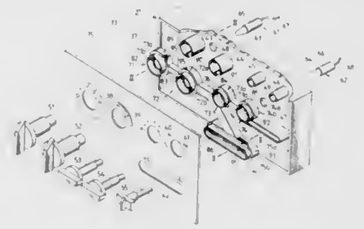
Kuniyasu Ito, Gifu, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Sep. 26, 1988, Ser. No. 248,718

Claims priority, application Japan, Sep. 26, 1987, 62-241760; Jun. 28, 1988, 63-159709

Int. Cl.[5] F21Y *33/00*

U.S. Cl. 362—26 **11 Claims**



1. A casing assembly, comprising:

a casing comprising a front panel and a rear box, said front panel formed with a hole therein;

a light source mounted in said casing;

control means disposed in the hole formed in the front panel and coupled to the casing;

a light transmission member made of a material that transmits light, said light transmission member including a light-incident surface disposed inside the casing and a light-emitting surface disposed at the hole; and

a shading coating that partially coats a portion of the light-incident surface of said light transmission member which portion is located to receive a larger amount of light, to make uniform the brightness of the light emitting surface.

4,930,049

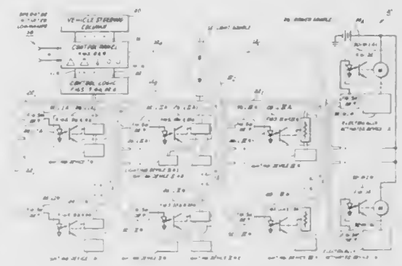
OPTICAL MULTIPLEXED ELECTRICAL DISTRIBUTION SYSTEM PARTICULARLY SUITED FOR VEHICLES

John M. Davenport, Lyndhurst, and Richard L. Hansler, Pepper Pike, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,005

Int. Cl.[5] F21V *7/04;* **G02F** *1/00*

U.S. Cl. 362—32 **36 Claims**

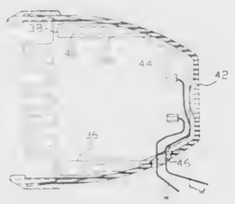


1. An control system for a vehicle comprising;

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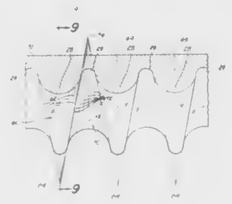
(a) a light source that generates light energy for a plurality of light busses which are routed within said vehicle and provide the light energy for lighting devices;
(b) a power source for a power buss that is routed to and provides electrical energy for electrical activation of devices of said vehicle;
(c) at least one control panel connected to one of said light busses and responsive to a plurality of operator initiated commands for controlling said electrically activated devices and for controlling lighting devices of said vehicle, said control panel being further responsive to operator initiated commands signalling the forthcoming motion of the vehicle, said control panel generating a plurality of output signals each respectively representative of said operator initiated commands.
(d) control logic responsive to said output signals of said control panel for generating corresponding control signals onto a control buss routed within said vehicle;
(e) a device for respectively interfacing each of said electrically activated devices and said lighting devices with said control buss, each of said control buss interfacing devices responding to the respective output signals related to said electrically activated devices along with said lighting devices and generating an output signal in response thereto;
(f) a device for respectively interfacing each of said lighting devices with a related light buss, each of said lighting buss interfacing devices coupling its respective lighting device to its related light buss in response to a respective output signals from said respective control buss interfacing device; and
(g) a device for respectively interfacing each of said electrically activated devices with said power buss, each of said power buss interfacing devices coupling respective electrically activated devices to said power buss in response to a respective output signal from said respective control buss interfacing device.

4,930,050
HOUSING FOR AUTOMOBILE LAMPS
Julius Poizner, 100 Westgate Boulevard, Downsview, Ontario, Canada M3H 1P3
Filed Aug. 21, 1989, Ser. No. 396,267
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—61 **14 Claims**



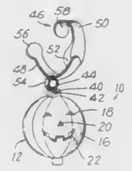
1. A housing for an automotive lamp or the like comprising:
a thin, deeply dished bowl of high impact, resilient thermopastic material, said bowl having a polar axis and a rim thereto;
said rim being defined by a plurality of longitudinally aligned fingers terminating in an equatorial plane, and
a cowl of elastomeric material covering said rim to form a seal for the lens of a lamp when contained within said housing,
said elastomeric material and said thermoplastic material being compatible and welded together at the interface therebetween.

4,930,051
HEADLAMP WITH SLOPED LENS INCLUDING BEAM-SPREADING FLUTES
Thomas M. Golz, Willoughby Hills, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Apr. 7, 1989, Ser. No. 334,629
Int. Cl.[5] B60Q *1/02*
U.S. Cl. 362—61 **28 Claims**



1. A headlamp for a motor vehicle comprising an envelope for enclosing a light source, the envelope comprising a lens and a reflector for reflecting light rays from said light source through said lens, said lens having:
(a) two regions that respectively are normally near the top and the bottom of said lens,
(b) a front surface that is normally sloped backwardly so that said bottom region is normally positioned forwardly of the top region, considered in the direction of normal forward motion of the vehicle,
(c) a back surface including in a localized zone of said lens side-by-side ridges, each having a summit as viewed in horizontal planes through the ridge, each summit extending lengthwise of the associated ridge along a ridge reference line, said ridge reference lines (i) extending generally parallel to said front surface and (ii) in a direction between said top and bottom regions, said ridges being individually characterized by having generally the form of a segment of an inverted, base-up cone, and
(d) a concave groove in said back surface located between said ridges and having a nadir as viewed in horizontal planes through the groove, said nadir extending lengthwise of the groove along a groove reference line, said groove being characterized by having generally the form of a segment of an upright, base-down cone and by having said groove reference line extending substantially parallel to said ridge reference line of a juxtaposed ridge.

4,930,052
ILLUMINABLE JEWELRY ITEM
Joel Beige, East Hills, N.Y., assignor to Rubie's Costume Co
Filed Jun. 13, 1989, Ser. No. 365,481
Int. Cl.[5] F21L *15/08*
U.S. Cl. 362—104 **1 Claim**



1. An illuminable jewelry item comprising:
a housing having an opening defining a thin guide slit;

illumination means positioned in said housing for supplying light;
power supply means positioned in said housing for selectively supplying power to said illumination means;
thin, fully non-conductive switch means extendible through said guide slit of said opening in said housing between said power supply means and said illumination means for selectively interrupting the supply of power from said power supply means to said illumination means; and
said switch means being fully detachable from said housing by pulling through said guide slit, and when so detached allowing said power supply means to contact and illuminate said illumination means.

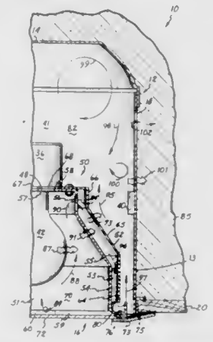
4,930,053
ELECTRICALLY LIGHTED ORNAMENT
Michael Vaught, 28 Windmill Rd., Armonk, N.Y. 10504
Filed Dec. 30, 1988, Ser. No. 292,427
Int. Cl.[5] F21P *1/02*
U.S. Cl. 362—121 **4 Claims**



1. A hollow ornament having a front wall and a back wall, the back wall and front wall being peripherally coextensive, joined at selected peripheral locations and providing peripheral apertures between the locations of joinder, at least the inner surfaces of at least one of said front and rear walls being light reflective, and means for mounting a light source within the ornament, an inner surface of said at least one of said front and rear walls being positioned relative to said mounting means so as to comprise means for reflecting light from a light source mounted in said mounting means through said peripheral apertures at non-radial angles.

4,930,054
DUAL CONE RECESSED LIGHTING FIXTURE
Werner W. Krebs, Crestview Hills, Ky., assignor to NuTone, Inc., Cincinnati, Ohio
Filed Dec. 9, 1988, Ser. No. 281,702
Int. Cl.[5] F21S *1/02*
U.S. Cl. 362—149 **28 Claims**

1. A thermally protected lighting fixture for recessed ceiling installation where the fixture will be surrounded by insulation, said fixture comprising:
a housing having an inside surface, an outside surface, and a downwardly facing open lower end, said outside surface being capable of contacting insulation when the fixture is installed in an insulated ceiling;
means for mounting the fixture to a ceiling so as to support said fixture with at least a portion of said housing above said ceiling and in contact with the insulation;
a downwardly facing reflector assembly supported from said housing and positioned in said housing across said open end to form a chamber between said reflector assembly and said inside surface of said housing;
said reflector assembly including an inner reflector, having a lower rim adjacent said housing opening, said inner reflector defining therein and surrounding an interior space above said rim;
said reflector assembly further including a downwardly concave outer reflector liner overlying at least a portion of said reflector and mounted spaced from said inner reflector so as to define an air gap between said liner and said inner reflector;
said liner having a first air passage therein spaced above said housing open end and above said inner reflector rim, said first air passage communicating said gap near the bottom thereof with said chamber;



said inner reflector having a second air passage therethrough connecting said space with said gap above said first passage;
a lamp socket mounted on said fixture so as to support a lamp within said space, and electrical conductors connected to said socket for connecting said lamp in a circuit with a power source; and
temperature responsive circuit interrupter means mounted inside of said housing in said chamber above said first passage, said interrupter including temperature sensor means electrically connected in said circuit and operative for interrupting said circuit in response to a predetermined temperature condition.

4,930,055
MARKER LAMP WITH HALO EFFECT
Robert A. Swadell, Henderson, Nev., assignor to Geisba Corporation, Henderson, Nev.
Filed Jun. 10, 1989, Ser. No. 360,171
Int. Cl.[5] F21V *5/00*
U.S. Cl. 362—244 **11 Claims**

1. An electric lamp comprising:
an elongated transparent tube having a transparent wall;
a plurality of incandescent, filament-type bulbs mounted within said tube and spaced substantially along the longitudinal axis thereof; and
straight, longitudinally extending striation means, in one of the inner and outer surfaces of said tube, for forming

inside said transparent wall, when said bulbs are illuminated, a plurality of corresponding halos centered on the



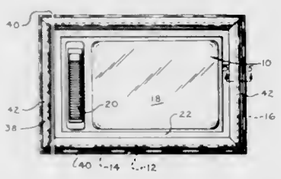
bulbs and lying in respective planes perpendicular to said longitudinal axis.

4,930,056

SNAP-ON FRAME FOR LIGHT FIXTURES

James G. Stephenson, Kalamazoo, and Mark D. Huggett, Battle Creek, both of Mich., assignors to Progressive Dynamics, Inc., Marshall, Mich.

Filed May 30, 1989, Ser. No. 358,169
Int. Cl.[5] F21V *17/00*
U.S. Cl. 362—364 8 Claims



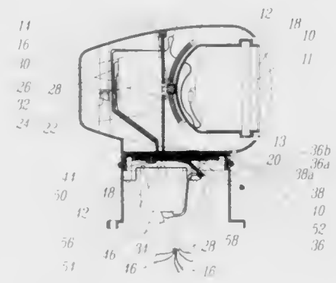
1. A snap-on frame for light fixtures having a circumference defined by a periphery having opposite sides and including an outer face and an edge transversely disposed to the outer face comprising, in combination, a frame formed of synthetic plastic semi-rigid flexible, resilient material having an overall generally planar configuration complementary to that of the light fixture periphery, said frame including opposite sides each including an abutment surface, a skirt having an inner surface and a plurality of elongated spaced ribs, said ribs being affixed to said skirt inner surface and transversely disposed to the general plane of said frame and each including an inner surface, said ribs' inner surface including a protuberance, the distance between the protuberances on opposite sides of said frame being slightly less than the distance separating opposite sides of the fixture periphery whereby placing said frame upon the periphery of the fixture causes said protuberances to engage the fixture edge slightly deforming the frame whereby said frame is frictionally held on the fixture periphery.

4,930,057

SEARCHLIGHT DRIVE MEANS AND APPARATUS

Jack L. Williams, Orange, Calif., assignor to ITT Corporation, New York, N.Y.

Filed May 15, 1989, Ser. No. 351,700
Int. Cl.[5] F21V *21/26*
U.S. Cl. 362—272 15 Claims



1. Searchlight apparatus comprising:
lamp means mounted in a lamp housing for vertical movement;
vertical drive means mounted in said lamp housing for vertically driving said lamp;
base means for mounting said lamp housing;
horizontal drive means for driving said lamp means and lamp housing in a horizontal plane less than 360 degrees; and
said lamp means including a bulb housing with a bearing means for mounting in said lamp housing, and said bulb housing including an integrally formed vertical gear member.

4,930,058

QUICK-RELEASE DENTAL LIGHT HANDLE

Arthur L. Jones, and George McGaha, both of Charlotte, N.C., assignors to The Pelton & Crane Company, Charlotte, N.C.

Filed Nov. 9, 1989, Ser. No. 434,387
Int. Cl.[5] F21L *15/12*
U.S. Cl. 362—400 18 Claims



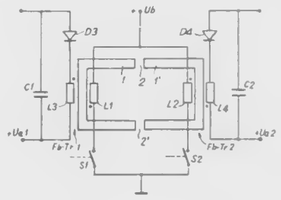
1. A unitary, quick-release handle for use on a dental, medical or similar lighting fixture, said handle comprising a first handgrip located at one end thereof, a second handgrip located at an opposite end thereof and attaching means located between said ends of said handle for releasably attaching said handle to a lighting fixture.

4,930,059

SWITCHED-MODE DC-TO-DC POWER CONVERTER

Winfried P. Rütt, Hauptstrasse 67, D-6087 Büttelborn 2, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 113,004
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637079
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—20 16 Claims



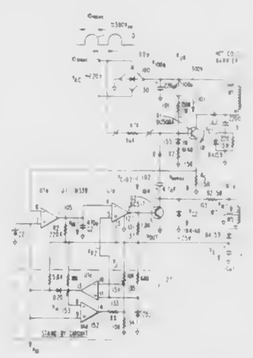
1. A switched-mode DC-to-DC power converter, which combines a flyback-type converter with a forward-type converter, containing at least one first flyback transformer and one second flyback transformer, each of said transformers respectively including at least one primary winding and one secondary winding, wherein a timed primary switch is wired in series with each of the primary windings, respectively, and a secondary switch is wired in series with each of the secondary windings, respectively, characterized in that the transformers are loosely linked with each other by a link circuit, which transmits energy respectively from the transformer which is just in the forward phase to the other transformer.

4,930,060

SWITCH-MODE POWER SUPPLY

Giovanni M. Leonardi, Zurich, Switzerland, assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Nov. 14, 1988, Ser. No. 270,877
Claims priority, application United Kingdom, Oct. 3, 1988, 8805759
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—21 26 Claims



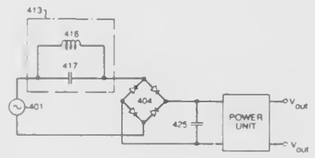
1. A switch mode power supply, comprising:
a source of an input supply voltage;
a transformer having first and second windings;
a controllable switch having a main current conducting terminal coupled to said first winding and to said source of said input supply voltage, said controllable switch being switched by a periodic first control signal for generating a first switching current in said first winding that stores magnetic energy in said transformer;
means coupled to said transformer and responsive to said first switching current for producing from said stored energy an output supply voltage that is coupled to a load;
a current sampling, first impedance coupled in a current path that includes said first winding for conducting at least a portion of said first switching current in said first impedance to develop in said first impedance a current sampling signal that is indicative of a level of said first switching current when said controllable switch is conductive;
means responsive to said current sampling signal for generating said first control signal to switch said controllable switch into nonconduction when said first switching current exceeds a predetermined level;
means for applying a low impedance to said second winding after a first conduction interval of said controllable switch has elapsed, to cause said first switching current to exceed said predetermined level; and
means for varying said first conduction interval in accordance with said output supply voltage such that a duty cycle of said controllable switch varies in a negative feedback manner for regulating said output supply voltage.

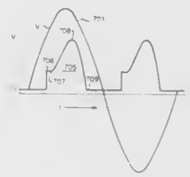
4,930,061

METHOD AND NETWORK FOR ENHANCING POWER FACTOR OF OFF-LINE SWITCHING CIRCUIT

William F. Slack, Lake Hiawatha, and James C. Wadlington, Mendham, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 7, 1989, Ser. No. 335,012
Int. Cl.[5] H02M *1/12*
U.S. Cl. 363—44 5 Claims





1. An input network for a switching circuit, comprising:
an input for accepting an AC voltage;
an output for coupling DC voltage to a power switching circuit;
a rectifier circuit intermediate the input and output, and including;
a rectifying network of rectifiers, and a voltage storage capacitor intermediate the rectifying network and output; and
a current waveform control circuit intermediate the input and the rectifying network, the current waveform control circuit having;
an inductor and a capacitor connector at least partially in parallel circuit with each other, and the parallel circuit connected in series with the input, the inductor and capac-

itor having component values selected such that its induced resonant ringing is at a frequency exceeding six times a frequency of the AC voltage and at a non-harmonic and non-integer multiple of the frequency of the AC voltage applied to the input such that a voltage induced across the capacitor adds to a voltage of a leading edge of the AC voltage to enhance biasing the rectifiers into conduction and a voltage induced across the inductor enhances conduction in the rectifiers during a trailing edge of the AC voltage;

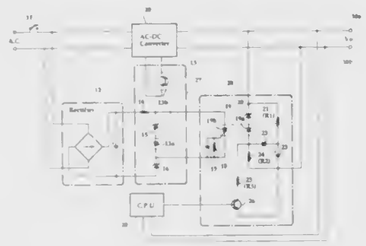
whereby the parallel circuit ringing is operative for inducing conduction of the rectifiers prior to a first time instant when the applied AC voltage magnitude would bias the rectifiers into conduction and extending conduction beyond a second time instant when the applied AC voltage magnitude would permit the rectifiers to terminate conduction.

4,930,062

COMPUTER POWER SUPPLY WITH OPTICALLY ISOLATED SHUTDOWN CIRCUITS

Masanori Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 14, 1989, Ser. No. 407,086
Claims priority, application Japan, Sep. 14, 1988, 63-232029
Int. Cl.[5] H02H *7/10*
U.S. Cl. 363—55 3 Claims



1 A direct-current power supply comprising:

AC-DC converter means for converting alternating-current power from an external AC power source to direct-current power;

rectifier means for converting alternating-current power from the external source to direct-current voltage;

a first light-emitting diode connected to the rectifier means for emitting light in response to a direct-current voltage therefrom;

a phototransistor optically coupled with the first light-emitting diode and connected in the AC-DC converter means for activating same in response to the light from the first light-emitting diode;

a second light-emitting diode;

a photo-thyristor connected to said rectifier means and optically coupled with the second light-emitting diode for establishing a low-impedance path across the first light-emitting diode in response to light from the second light-emitting diode;

switching means connected to output terminals of the AC-DC converter means and responsive to a shutdown command signal applied thereto for activating the second light-emitting diode to cause light to be emitted therefrom to the photo-thyristor; and

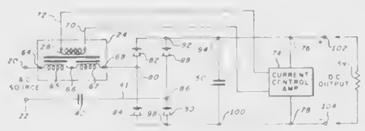
latching means connected between the rectifier means and a gate electrode of the photo-thyristor.

4,930,063

VARIABLE RESONANCE REGULATOR FOR POWER SUPPLY

Christopher P. Henze, Minnetonka, and Joseph H. Mulkern, St. Paul, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 17, 1989, Ser. No. 339,558
Int. Cl.[5] H02M *7/04*
U.S. Cl. 363—91 22 Claims



1. A frequency controlled resonant regulator comprising:

input means for receiving an alternating current signal operable at a predetermined frequency,

a control transformer having a primary winding and at least one pair of secondary windings, said secondary windings of said at least one pair being connected in series opposition, and said transformer being constructed and arranged to have a variable inductance that is substantially linearly proportional to a D.C. control current through said primary winding,

a load circuit for providing a regulated direct current power source, said secondary windings having a first end coupled to said input means and a second end coupled to said load circuit,

resonating capacitor means coupled to said input means and to said secondary windings for forming a tuned circuit with the inductance of said transformer, and

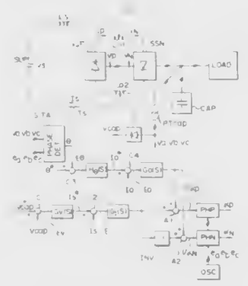
control means coupled to said load circuit for sensing the output of said regulator and for providing said control current to said transformer which thereby varies said inductance in order to regulate the output of said regulator in response to said output.

4,930,064

PHASE STABILIZED HIGH FREQUENCY LINK POWER CONVERTER APPARATUS HAVING A WIDE PHASE CONTROLLABLE RANGE

Shigeru Tanaka, and Kazutoshi Miura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 12, 1988, Ser. No. 256,574
Claims priority, application Japan, Oct. 12, 1987, 62-254571
Int. Cl.[5] G05F *1/70*
U.S. Cl. 363—161 6 Claims



1 A power converter apparatus comprising:

power source means for supplying electric power;

a capacitor, serving as a high frequency power source, to which a high frequency voltage is applied;

a circulating current type AC-AC converter having a terminal coupled to said capacitor and another terminal coupled to said power source means;

reference signal means for generating a phase reference signal; and

operation control means, coupled to said AC-AC converter and said reference signal means, and being responsive to a prescribed phase reference value and a phase difference between said high frequency voltage and said phase reference signal, for converging the phase difference to the prescribed phase reference value, and controlling operation of said AC-AC converter in accordance with the prescribed phase reference value;

wherein said operation control means includes:

voltage detector means, coupled to said capacitor, for detecting said high frequency voltage;

phase comparator means, coupled to said voltage detector mans and said reference signal means, for comparing a phase of said high frequency voltage with that of said phase reference signal, and generating a phase difference signal representing the phase difference between said high frequency voltage and said phase reference signal;

error detector means, coupled eo said phase comparator means and being responsive to said prescribed phase reference value, for detecting a phase error signal representing a difference between said prescribed phase reference value and said phase difference signal; and

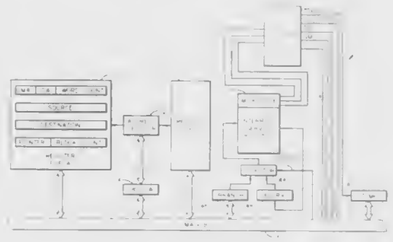
means coupled to said error detector means, said AC-AC converter, and said reference signal means, for controlling a circulating current flowing through said AC-AC converter in accordance with said phase error signal, so that the phase difference between said high frequency voltage and said phase reference signal is converged to said prescribe phase reference value.

4,930,065

AUTOMATIC DATA CHANNELS FOR A COMPUTER SYSTEM

Angus McLagan, Newport Beach; Gei-Jon Pao, Garden Grove; Chong S. Un, Anaheim, all of Calif., and John J. Pearce, Jr., Del Valle, Tex., assignors to David Computer Corporation, Irvine, Calif.

Continuation of Ser. No. 088,617, Aug. 20, 1987, abandoned. This application Aug. 21, 1989, Ser. No. 397,645
Int. Cl.[5] G06F *9/00, 9/22*
U.S. Cl. 364—200 21 Claims



1. A processor-controlled, interruptdriven data communications system for a computer having a central processing unit and a memory for transferring data between the memory and a plurality of peripheral devices without requiring an interrupt context switch for each data transfer, said system comprising:

a bus connecting said memory and said peripheral devices;

a resident microcode within said central processing unit that controls the gate and register level operation of said central processing unit, said resident microcode including an input/output service routine;

a plurality of register locations resident in said central processing unit dedicated to data communications; and

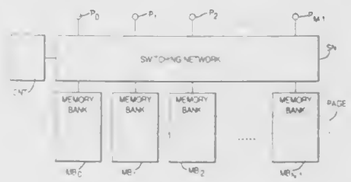
an address generator that generates an address vector when data is transferred between said memory and a first one of said peripheral devices in response to a request from said first peripheral device, said address vector generated in response to vector data on said bus uniquely associated with said first peripheral device, said address vector comprising an address of one of said register locations, said register location including a pointer to a location in memory that stores data transferred between said memory and said first peripheral device and an address of said input-/output service routine in said resident microcode, said resident microcode operating in response to said address from said register location to execute said input/output service routine and transfer data between said memory and said first peripheral device, said data transferred as blocks of data, said register location storing a data control block that includes a count that indicates a number of blocks of data to be transferred, a count of the amount of data remaining to be transferred in a block of data and a pointer to a data control block for a next block of data to be transferred, said resident microcode accessing said data control block to control the transfer of said blocks of data without requiring a context switch by said central processing unit while said blocks of data are being transferred, said address generator further responsive to requests from a second one of said peripheral devices to address a second register location that includes data to cause said resident microcode to interleave transfers of data between said memory and said second peripheral device with transfers of data between said memory and said first peripheral device, said resident microcode interleaving said transfers of data without requiring execution of instructions by said central processing unit when said interleaving occurs.

4,930,066

MULTIPORT MEMORY SYSTEM

Haruo Yokota, Kawasaki, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 10,274, Dec. 23, 1986, abandoned. This application Apr. 26, 1989, Ser. No. 344,507
Claims priority, application Japan, Oct. 15, 1985, 60-229537
Int. Cl.[5] G06F *13/00, 13/06*
U.S. Cl. 364—200 4 Claims



1. A multiport memory system, comprising:

a plurality of data input/output ports for providing page addresses only once per page;

a plurality of memory banks for storing pages of data, each page stored across all of said memory banks and addressed page by page using the page addresses from said data input/output ports, each of said memory banks including means for calculating addresses to access all of the data within each page; and

a switching network, connected to said data input/output ports and said memory banks, for rotating logical connections from each of said data input/output ports to all of said memory banks by sequential switching of data lines in

said switching network, for transferring the page addresses from said data input/output ports to any of said memory banks connected thereto when a page access is initiated and for transferring data from said memory banks to said data input/output ports connected thereto for each of the logical connections, each of said memory banks passing an address directly to another memory bank adjacent thereto in synchronization with the rotating of the logical connections.

4,930,067

MICROCOMPUTER HAVING A HIGH-SPEED OPERATION MODE AND A LOW-SPEED OPERATION MODE WITH INTERMITTENT DISABLING OF SENSE AMPLIFIERS

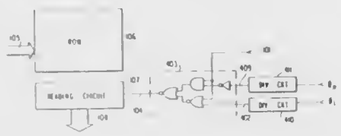
Michiya Nakamora, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 4,927, Jan. 20, 1987. This application Jan. 18, 1989, Ser. No. 298,436

Claims priority, application Japan, Jan. 20, 1986, 61-10419

Int. Cl.[5] **G06F** *3/00, 9/00, 13/38, 15/16*

U.S. Cl. 364—200 **2 Claims**



1. A microcomputer comprising a memory having a plurality of bit lines and a dummy line, a first current mirror type sense amplifier having a current input terminal connected to one of said plurality of bit lines through a first switching circuit, a second current mirror type sense amplifier having a current input terminal connected to said dummy line through a second switching circuit, a signal derived from an output terminal of said second current mirror type sense amplifier being applied as a reference signal to said first current mirror type sense amplifier, an output of said memory being derived from an output terminal of said first current mirror type sense amplifier, a first means for selectively generating a first enable signal which is always activated in a high-speed operation mode and a second enable signal which is intermittently activated in a low-speed operation mode, and a second means coupled between said first means and said first and second switching circuits for controlling said first and second switching circuits according to said first and second enable signals in such manner that said first and second switching circuits are continuously turned on in response to the activated state of said first enable signal thereby to continuously enable said first and second current mirror type sense amplifiers, and are intermittently turned on in response to the activate state of said second enable signal thereby to intermittently enable said first and second current mirror type sense amplifiers.

4,930,068

DATA PROCESSOR HAVING DIFFERENT INTERRUPT PROCESSING MODES

Tsuyoshi Katayose, and Yukio Maehashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,671

Claims priority, application Japan, Nov. 7, 1986, 61-265856; Nov. 7, 1986, 61-265858

Int. Cl.[5] **G06F** *13/00*

U.S. Cl. 364—200 **12 Claims**

1. A data processor comprising:

an interrupt processing request controller receiving a processing request from at least one processing request generating source for generating an interrupt request,

an execution unit including at least a program counter and a program status word and having a first mode of executing the interrupt processing in accordance with an user's program and a second mode of executing the interrupt processing in accordance with a microprogram while maintaining an internal condition of the execution unit including conditions of at least the program counter and the program status word and used for execution of a program, and

a mode designation flag provided for one processing request generating source so as to designate whether the first mode or the second mode should be executed, the mode designation flag being selectively set or reset in accordance with a content of a processing request from the same processing request generating source,

whereby, when the mode designation flag indicates the first mode, the controller operates to respond to the processing request from the processing request generating source so



as to control the execution unit so that an execution of a program being executed is discontinued and contents of the program counter and the program status word when the execution of the program is executed are saved and thereafter a head address of an interrupt processing routine stored in the user's program is set to the program counter so that the interrupt processing routine is executed using the program counter and the program status word, and

whereby, when the mode designation flag indicates the second mode, the controller operates to respond to the processing request from the processing request generating source so as to control the execution unit so that an execution of a program being executed is discontinued and an interrupt processing based on the processing request is executed by using the microprogram without saving contents of the program counter and the program status word and without using the user's program.

4,930,069

MECHANISM AND METHOD FOR TRANSFERRING DATA BETWEEN BUS UNITS HAVING VARYING MASTER AND SLAVE DMA CAPABILITIES

Surinder P. Batra; William E. Hammer, both of Rochester; Gene A. Lusbinsky, Mantorville; David W. Marquart, Rochester; Walter H. Schwane, Kasson, and Frederick J. Ziecina, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1987, Ser. No. 122,294

Int. Cl.[5] **G06F** *15/16, 13/00*

U.S. Cl. 364—200 **19 Claims**

1. A first bus unit having master DMA capability, coupled to a bus connecting other bus units which have processors and storage, at least one of which has slave DMA capability, the first bus unit comprising:

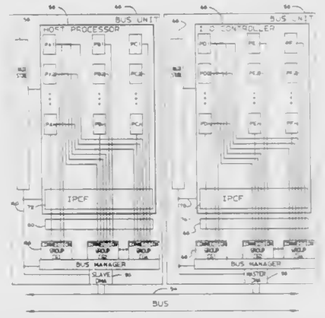
at least one processor which executes a plurality of processes, said processes requesting work from other processes on other bus units and serving work requests from other processes on other bus units, said work serving processes controlling the flow of data transfers associated with the work processing;

a bus manager for connecting said processes to the bus, and

for insulating said processes from communication management, the bus manager comprising:

means for receiving an original work request from a process on its associated bus unit, said work request identifying data associated with it and identifying a server bus unit which should serve the work request;

means for generating a message representative of the original work request;



means for sending the bus message to the bus unit identified in the original work request; and

means for receiving a second work request from the server bus unit in response to the message; and

means for sending data to the main storage of the server bus unit associated with the original work request to the main storage locations identified in the second work request received from the server bus unit.

4,930,070

INTERRUPT CONTROL METHOD FOR MULTIPROCESSOR SYSTEM

Mikio Yonekura, Hachioji, and Jiro Kinoshita, Yamato, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

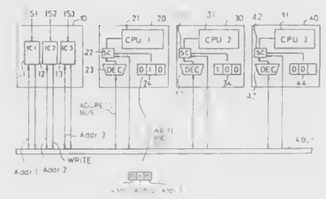
PCT No. PCT/JP87/00225, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/06370, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 10, 1987, Ser. No. 138,459

Claims priority, application Japan, Apr. 15, 1986, 61-086921

Int. Cl.[5] **G06F** *13/24*

U.S. Cl. 364—200 **5 Claims**



1. An interrupt control method for a multiprocessor system in which a plurality of processors including a plurality of control circuits and an interface circuit for causing interrupts are connected to a bus, the number of control circuits corresponding to the number of processors, the method comprising the steps of:

(a) employing a particular address having any number of bits as an interrupt address;

(b) applying an interrupt signal to an interrupt control circuit, the interrupt control circuit sending bit data of the particular address onto an address bus;

(c) selecting a mask bit, from a mask bit register, corresponding to the particular address in each processor;

(d) storing the mask bit in a register in each processor;

(e) reading the bit data on the address bus, decoding the data, and comparing the bit data with the mask bit data in the mask bit register;

(f) allowing signals from a bus cycle generator circuit in the interface circuit to occupy the bus in response to an interrupt signal;

(g) sending a bit, indicative of a cause of the interrupt and corresponding to the address, onto the address bus; and

(h) enabling the respective processor to recognize an interrupt from the bit on the address bus corresponding to the address and the mask bit stored in the register.

4,930,071

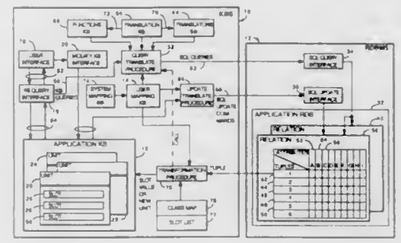
METHOD FOR INTEGRATING A KNOWLEDGE-BASED SYSTEM WITH AN ARBITRARY DATABASE SYSTEM

Frederich N. Tou, Sunnyvale, Calif., and Wagar Hasan, Allahabad, India, assignors to IntelliCorp, Inc., Mountain View, Calif.

Filed Jun. 19, 1987, Ser. No. 64,971

Int. Cl.[5] **G06F** *15/20*

U.S. Cl. 364—300 **32 Claims**



1. A method for manipulating an arbitrary relational database in a relational database management system on a computer system having a database query interface, said relational database including relations of tuples with attributes, in order to retrieve information for use in an application knowledge base on said computer system of a knowledge-based system, said method comprising the steps of:

(1) querying said relational database management system by means of a mapping system on said computer system on behalf of an application program associated with said application knowledge base as specified by a slot list and a class map of said mapping system for said arbitrary database, said class map having a slot whose values are slot maps, to return selected tuples;

(2) transforming by means of said mapping system said selected tuples into slot values; and

(3) supplying by means of said mapping system said slot values to slots of units of said application knowledge base.

4,930,072

METHOD FOR COMPUTING TRANSITIVE CLOSURE

Rakesh Agrawal, Chatham, and Hosagrahar V. Jagadish, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 31, 1987, Ser. No. 91,236

Int. Cl.[5] **G06F** *15/40, 15/31*

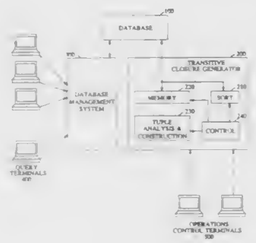
U.S. Cl. 364—300 **22 Claims**

1. In a system comprising a secondary memory and a controller with a primary memory, a method carried out in said controller for developing and storing in said second memory at least a portion of the transitive closure of a database stored in said secondary memory, where said database contains a plurality of entries and each entry contains a plurality of fields, whith each of said fields being assigned to a preselected attribute of

said database, and the signal value in each of said fields specifies the value associated with the corresponding attribute for that entry, and where said transitive closure is developed with respect to a selected field or fields of said database designated as a source node and a selected field or fields of said database designated as a destination node comprising:

a step of developing an ordering of said nodes in said database;

a step of developing a partition of said database and retrieving said partition from said secondary memory and placing it in said primary memory, where said partition contains all entries of said database that share a chosen set of source nodes;



a step of an entry by selecting one entry in said partition and one entry in either said partition or said database, where one entry is a head entry and one entry is a tail entry, and developing an entry for said transitive closure of said database with a source node being the source node of said head entry and a destination node being the destination node of said tail entry, when the destination node of said head entry is the same as the source node of said tail entry; and

a step of returning to said step of developing and retrieving a partition until the entire database has been partitioned.

4,930,073

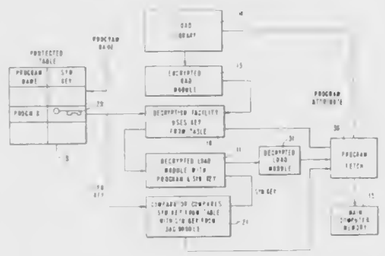
METHOD TO PREVENT USE OF INCORRECT PROGRAM VERSION IN A COMPUTER SYSTEM

Vincent J. Cina, Jr., Spring Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1987, Ser. No. 66,909

Int. Cl.[5] **G06F** *13/00, 11/00, 12/14;* **H04L** *9/00*

U.S. Cl. 364—300 **4 Claims**



1. A method of preventing an incorrect program from executing in a computer system, said method using a single processor of said system and said method assuming the one seeking to execute said program is authorized to execute said program, said method comprising the steps of:

(a) encrypting with a linking means a load module, containing a correct program version to be protected and a respective synchronization key, with the synchronization key when one wishes to store the correct program version for future execution;

(b) storing with a linking means the respective synchronization key and the name of the load module in a table of a secure memory when one wishes to store the correct program version as in step (a);

(c) obtaining with a decryption facility a synchronization key corresponding to the name of a requested program to be executed from the table in the secure memory if one wishes to execute the requested program, which requested program was stored in the same manner as provided for in steps (a) and (b);

(d) decrypting with a decryption facility the load module putatively containing the requested program with the synchronization key obtained in step (c) if one wishes to execute the requested program, the load module in this step being encrypted as in step (a) before being decrypted as in this step;

(e) extracting with a decryption facility the synchronization key in the decrypted load module of step (d) if one wishes to execute the requested program;

(f) comparing with a decryption facility the synchronization key obtained in step (c) with the synchronization key extracted in step (e) if one wishes to execute the requested program; and

(g) allowing with a decryption facility the requested program, which was decrypted in step (d), to be loaded into main memory and executed if the synchronization keys compared in step (f) are found to have some predetermined relationship.

4,930,074

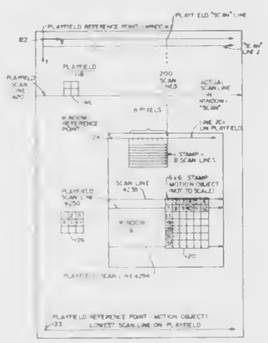
MULTIPLE STAMP MOTION OBJECTS IN A VIDEO GAME SYSTEM

Patrick J. McCarthy, San Jose, Calif., assignor to Atari Games Corporation, Milpitas, Calif.

Filed Oct. 15, 1986, Ser. No. 919,129

Int. Cl.[5] **G09G** *1/10*

U.S. Cl. 364—410 **9 Claims**



9. A method of calculating the address of pixel graphic data stored in a memory which describes the appearance of an object on a raster scanned video display, said object positioned on a playfield in playfield relative terms, said position being expressed as horizontal and vertical offsets from a reference point on said playfield, where said object is defined in said memory by an array of stamps having at least one row and at least one column of stamps of pixel graphic data where each stamp has a number and is comprised of a plurality of object scan lines each having a plurality of pixels of graphic data wherein said raster scanned video display includes sequentially scanned raster scan lines scanned from the top of said video

display to the bottom of each of said raster scan lines having a vertical position expressed in playfield relative terms as an offset from a reference raster scan line on said playfield, and a current raster scan line defined as the raster scan line being scanned at any particular moment comprising the steps of:

(1) determining from the vertical playfield relative positions of the object and the current raster scan line, the row in said array of stamps through which the current raster scan line would pass if the object had a predetermined size and the particular object scan line in said row which would coincide with the current raster scan line;

(2) calculating from the row determined in step 1 and from the vertical size of the object the offset of the current raster scan line from the top object scan line in the object;

(3) looking up a stamp offset defined as the number of stamps from the first stamp in the first row of the array to the stamp through which the current raster scan line first passes using the offset from the top object scan line to the current scan line determined in step 2 and the horizontal size of the object as pointers to the proper address in which the offset data is stored;

(4) determining a current stamp number from the stamp number calculated in step 3 using a signal from which can be derived the number of pixels of graphic data from said array which have been scanned; and

(5) generating the address in said memory of the pixel data for the current raster scan line and a current stamp defined as the stamp in said array having said current stamp number using the result of step 4 and a pointer address of the start of pixel data in said memory for said object.

4,930,075

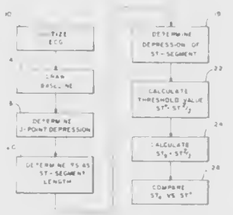
TECHNIQUE TO EVALUATE MYOCARDIAL ISCHEMIA FROM ECG PARAMETERS

Ricardo G. Kortas, Stanford, Calif., assignor to The Board of Trustees of The Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 73,335, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 646,224, Aug. 30, 1984, abandoned. This application Jun. 6, 1988, Ser. No. 221,798

Int. Cl.[5] **A61B** *5/04*

U.S. Cl. 364—413.06 **12 Claims**



2. A signal processing system for evaluating and assigning a patient to normal or ischemic categories comprising means for generating a digital representation of an electrocardiogram of said patient, means for analyzing said electrocardiogram and calculating a critical threshold value for said electrocardiogram as a function of the length of the ST-segment of said electrocardiogram, means for calculating a value representing ST-segment depression relative to a fixed baseline based on said digitized signal information representing said baseline and said ST-segment to transform signals representing the ST-segment morphology into signals representing an equivalent horizontal morphology, comparison means for comparing said signals representing said horizontal morphology to signals representing said threshold value and assigning said patient to a normal or ischemic classification based on the result of said comparison.

4,930,076

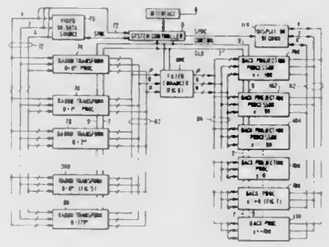
SYSTOLIC RADON TRANSFORM PROCESSOR

John R. Meckley, Voorhees Township, Camden County, N.J., assignor to General Electric Company, Moorestown, N.J.

Filed Nov. 9, 1988, Ser. No. 269,027

Int. Cl.[5] **G06F** *15/62*

U.S. Cl. 364—413.21 **9 Claims**



1. A line-scan-to-Radon-transform converter adapted for receiving words representing the x- and y-axis Cartesian coordinate location of each pixel and words representing the amplitude of said pixel, comprising:

first memory means preprogrammed with information relating to a particular value of θ, the angle relative to said x-axis at which the Radon transform is to be calculated;

first multiplying means coupled to said first memory means and to sequentially receive, for each pixel in its turn, said x-axis word representing the x-position of said pixel for producing a first product signal representative of said x-axis word multiplied by a trigonometric function of θ;

second multiplying means coupled to said first memory means and to receive said y-axis word representing the y-position of said pixel for producing a second product signal representative of said y-axis word multiplied by another trigonometric function of θ;

adder means coupled to said first and second multiplying means for combining said first and second product signals relating to the same pixel for generating a sum signal indicative of the value of ρ at which said pixel contributes to the Radon transform for said value of θ;

second memory means including individual storage locations addressed by each of a plurality of values of ρ, said second memory means being addressed by said sum signal for producing for each addressed storage location a cumulated signal representing the current value of a line integral at the value of ρ corresponding to said pixel for said value of θ;

summing means coupled to said second memory means for receiving said cumulated signal from said storage location addressed by said sum signal for updating said cumulated signal at said storage location addressed by said sum signal by adding to said cumulated signal said word representing the amplitude of said pixel; and

means coupled to said second memory means and adapted for being enabled for reading from said storage locations the value of said line integral for each value of ρ at said value of θ.

4,930,077

INFORMATION PROCESSING EXPERT SYSTEM FOR TEXT ANALYSIS AND PREDICTING PUBLIC OPINION BASED INFORMATION AVAILABLE TO THE PUBLIC

David P. Fan, 2115 Dudley, St. Paul, Minn. 55108

Filed Apr. 6, 1987, Ser. No. 35,080

Int. Cl.[5] **H04M** *11/00*

U.S. Cl. 364—419 **110 Claims**

1. A system for processing information to determine ex-

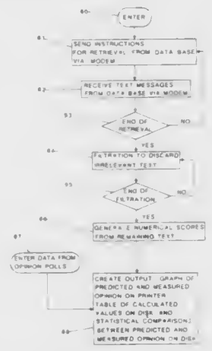
pected opinion in a specified population for a specified issue with two or more specified positions, said system comprising:

a digital computer;

software means operable in said computer for causing said computer to:

(a) maintain, for said issue, text comprised of a representative set of text messages used by members of said specified population over time for formulating opinions on said specified issue wherein said text messages are single packets of text information each able to support one or more of a plurality of said positions and transmitted in identical copies to the members of said specified population;

(b) search and operate on said text to determine the relationships in said text between one or more specified words within each text message;



(c) determine numerical scores for each said text message reflecting the extent said message favors each of said two or more specified positions on said issue, one of said numerical scores determined independently for the extent to which said message supports each of said specified positions based on said relationships of one or more specified words so that the value of each said numerical score is independent of the value of other scores determined for said message; and

(d) determine expected time trends of percentages of the population that favor said two or more positions on said issued based on determining changes in said percentages wherein said numerical scores are used to determine how said text messages will affect the opinions of members of said specified population to cause members to change from favoring one position to another.

4,930,078

SEMI-AUTOMATIC MECHANICAL TRANSMISSION CONTROL AND CONTROL METHOD

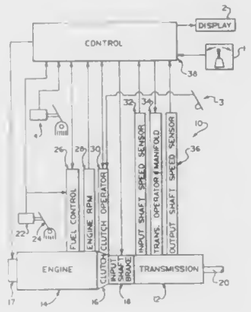
Michael W. Dunkley, Longridge, and John E. Stainton, Chorley, both of England, assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 899,564, Aug. 22, 1986, which is a division of Ser. No. 755,628, Jul. 16, 1985, Pat. No. 4,648,290. This application Nov. 16, 1987, Ser. No. 121,381

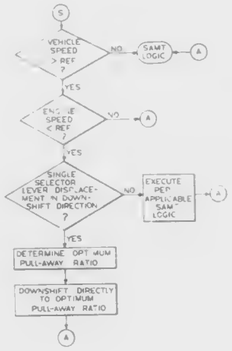
Claims priority, application European Pat. Off., Dec. 5, 1986, 86309479.3

Int. Cl.[5] B60K *41/08, 41/28*

U.S. Cl. 364—424.1 **18 Claims**



13. A control for a semi-automatic mechanical change gear transmission system (**10**) comprising a manual fuel throttle control (**24**), a fuel throttle controlled engine (**14**), a multi-speed change gear mechanical transmission (**12**), a friction master clutch (**16**) interposed the engine and transmission, a manually operated shift selection lever (**1**) moveable in a first direction from a centered position to select upshifts and in a second direction from said centered position to select downshifts from the currently engaged gear ratio, a central processing unit (**38**) for receiving inputs indicative of transmission input shaft and output shaft rotational speeds, of vehicle speed, of engine speed and of operation of said shift selection lever and for processing same according to predetermined logic rules to determined currently engaged gear ratio and to issue command output signals to non-manually controlled operators including a clutch operator (**30**), a fuel throttle control operator (**26**), and a transmission operator (**34**), logic rules causing said processing unit in a first mode of operation, to determine the transmission gear ratio selected by the operator to be



shifted into from the currently engaged ratio by assuming each displacement from the centered position of said shift selection lever in a given direction indicates operator selection of a change in ratio in said direction and in a second mode of operation causing said processing unit to interpret a single displacement of said shift selection lever from the centered position in the second direction as an operator selection of a downshift directly into an optimum pull-away ratio if vehicle speed is greater than a predetermined vehicle speed reference value and engine speed is less than a predetermined engine speed reference value.

4,930,079

THROTTLE-VALVE OPENING DEGREE CONTROL FOR AUTOMATIC STEP-WISE TRANSMISSION SYSTEM

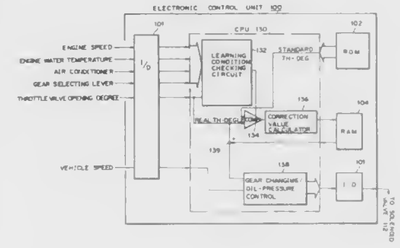
Shigeki Kondo, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 212,372

Claims priority, application Japan, Jul. 2, 1987, 62-167175

Int. Cl.[5] G06F *15/20;* H04L *25/06*

U.S. Cl. 364—424.1 **5 Claims**



1. A method for regulating an automatic step-wise transmission system of a vehicle including a vehicle engine, comprising the steps of:

sensing real throttle-valve opening degree sensor data of the vehicle engine;

determining whether the vehicle engine is under start-up conditions when said real throttle-valve opening degree sensor data is sensed;

calculating a difference between said real throttle-valve opening degree sensor data sensed under the start-up conditions and reference throttle-valve opening degree data previously stored so as to obtain a correction value for said real throttle-valve opening degree sensor data;

correcting said real throttle-valve opening degree data by adding said correction value to produce controlling throttle-valve opening degree data; and

controlling the automatic step-wise transmission system by inputting said controlling throttle-valve opening degree data to as to produce a gear-changing control signal and to perform a gear-changing operation of the vehicle engine;

wherein said determining step further includes the steps of:

determining whether an engine speed of the vehicle engine is within a predetermined engine speed range;

determining whether a plurality of said sensed real throttle-valve opening degree sensor data contained fluctuation; and

determining whether the engine is in an idling operation state by comparing said real throttle valve opening degree sensor data and said reference throttle valve opening degree data.

4,930,080

CONTROL ARRANGEMENT FOR AUTOMATIC TRANSMISSION

Yutaka Suzuki, Hatano, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 12, 1988, Ser. No. 192,973

Claims priority, application Japan, May 15, 1987, 62-72644

Int. Cl.[5] B60K *41/06*

U.S. Cl. 364—424.1 **8 Claims**

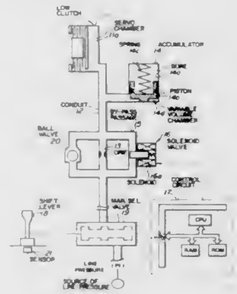
1. In a hydraulic control system including a source of hydraulic fluid

a friction element, said friction element having a fluid chamber, said fluid chamber being connected by conduit means with said source of hydraulic fluid;

an accumulator, said accumulator being fluidly communicated with said fluid chamber of said friction element;

a first valve disposed in said conduit means between said source and said fluid chamber of said friction element said first valve controlling fluid communication between said fluid chamber and said source of hydraulic fluid;

a manually operable device, said device being operatively connected with said first valve for selectively conditioning said first valve to supply said hydraulic fluid from said source to said friction element;



a one-way orifice disposed in said conduit means between said first valve and said fluid chamber of said friction element;

by-pass means for by-passing said one-way orifice, said by-pass means being responsive to said selectively operable device for bypassing said one-way orifice for a predetermined period following said value being conditioned by said manually operable device to supply said hydraulic fluid to said friction element.

4,930,081

SEMI-AUTOMATIC MECHANICAL TRANSMISSION CONTROL AND CONTROL METHOD

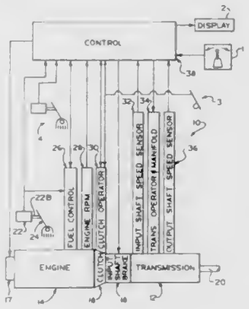
Michael W. Dunkley, Longridge Preston, and John E. Stainton, Chorley, both of England, assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 899,564, Aug. 22, 1986, Pat. No. 4,800,360, which is a division of Ser. No. 755,628, Jul. 16, 1985, Pat. No. 4,648,290. This application Nov. 16, 1987, Ser. No. 121,382

Claims priority, application European Pat. Off., Dec. 15, 1986, 86309747.3

Int. Cl.[5] B60K *41/18, 41/20;* G05D *17/02*

U.S. Cl. 364—424.1 **20 Claims**



1. A method of controlling a semi-automatic mechanical change gear transmission system (**10**) comprising a manual fuel throttle control (**24**), a fuel throttle controlled engine (**14**), a multi-speed change gear mechanical transmission (**12**), a fric-

tion master clutch (16) interposed the engine and transmission, a manually operated master clutch control (3), a manually operated shift selection lever (1) moveable in a first direction from a centered position to select upshifts and in a second direction from said centered position to select downshifts from the currently engaged gear ratio, a central processing unit (38) for receiving inputs indicative of transmission input shaft and output shaft rotational speeds, of vehicle speed, of engine speed and of operation of said shift selection lever and for processing same according to predetermined logic rules to issue command output signals to non-manually controlled operators including a clutch operator (30), a fuel throttle control operator (26), and a transmission operator (34), said processing unit sensing operation of said manual shift selection lever including the direction of movement thereof and the number of displacements of said lever within a predetermined period of time from said centered position, and, in a first mode of operation, determining the transmission gear ratio selected by the operator to be shifted directly into from the currently engaged ratio by assuming each repetition of displacement from the centered position of said shift selection lever in a given direction indicates operator selection of a change of one additional consecutive ratio in said direction; said method comprising:

providing said central processing unit with a signal (THPS) indicative of the operators manual engagement of the throttle control;

providing said central processing unit with a signal indicative of manual disengagement of the friction master clutch; and,

automatically selecting operation in a second mode of operation wherein a single displacement of said shift selection lever from the centered position in the second direction is interpreted as an operator selection of a downshift directly into transmission neutral if vehicle ground speed is less than a predetermined minimum vehicle ground speed reference value, the master clutch is manually disengaged and the operators manual engagement of the throttle control is not sensed.

11. A control system for a semi-automatic mechanical change gear transmission system (10) comprising a manual fuel throttle control (24), a fuel throttle controlled engine (14), a multi-speed change gear mechanical transmission (12), a friction master clutch (16) interposed the engine and transmission, a manually operated master clutch actuator (3), a manually operated shift selection lever (1) moveable in a first direction from a centered position to select upshifts and in a second direction from said centered position to select downshifts from the currently engaged gear ratio, a central processing unit (38) for receiving inputs indicative of transmission input shaft and output shaft rotational speeds, of vehicle speed, of engine speed and of operation of said shift selection lever and for processing same according to predetermined logic rules to issue command output signals to non-manually controlled operators including a clutch operator (30), a fuel throttle control operator (26), and a transmission operator (34), said processing unit sensing operation of said manual shift selection lever including the direction of movement thereof from said centered position, and, in a first mode of operation, determining the transmission gear ratio selected by the operator to be shifted into from the currently engaged ratio by assuming each displacement from the centered position of said shift selection lever in a given direction indicates operator selection of a change in ratio in said direction; said control characterized by:

means (22A) for providing a signal (THPS) to said central processing unit indicative of the operators manual engagement of the throttle control;

means for providing a signal to said central processing unit indicative of manual disengagement of the friction master clutch; and

means for automatically selecting operation in a second mode of operation wherein a single displacement of said shift selection lever from the centered position in the second direction is interpreted as an operator selection of a downshift directly into transmission neutral if vehicle ground speed is less than a predetermined minimum vehicle ground speed reference value, the master clutch is manually disengaged and the operators manual engagement of the throttle control is not sensed.

4,930,082

CONTROL APPARATUS FOR A VEHICULAR SUSPENSION SYSTEM

Mitsuhiko Harara; Shozo Takizawa; Tadao Tanaka, all of Okazaki, and Shunichi Wada, Himeji, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

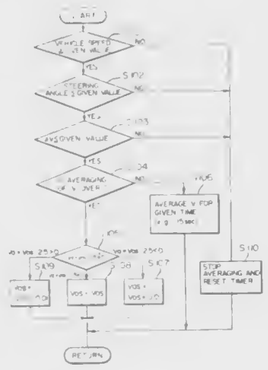
PCT No. PCT/JP88/00754, § 371 Date Mar. 6, 1989, § 102(e) Date Mar. 6, 1989, PCT Pub. No. WO89/00927, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 27, 1988, Ser. No. 353,625

Claims priority, application Japan, Jul. 28, 1987, 62-189383

Int. Cl.[5] B60G *17/00*

U.S. Cl. 364—424.05 **6 Claims**



1. A control apparatus for a vehicular suspension system comprising:

a plurality of suspension units each disposed between a road wheel and the body of a vehicle for suspending the corresponding road wheel from the vehicle body;

an acceleration sensor sensing a transverse acceleration of the vehicle and providing an output acceleration signal which is representative of the sensed transverse acceleration and which has a neutral point representative of a transverse acceleration of 0 G;

a vehicle-speed sensor sensing the speed of the vehicle and providing an output signal representative of the sensed vehicle speed;

a steering sensor sensing the steering condition of the vehicle and providing an output signal representative of the sensed steering ondition;

control means connected to receive the output signals from said acceleration sensor, said vehicle-speed sensor and said steering sensor for calculating the rolling state of the vehicle due to the transverse acceleration thereof and controlling said respective suspension units based on the calculated rolling state of the vehicle so as to suppress the rolling thereof; and

drift compensation means connected to receive the output signals from said acceleration sensor, said vehicle-speed sensor and said steering sensor for compensating for a drift of the neutral point of the output signal of said acceleration sensor based on said output signals.

4,930,083

ANTI-SKID BRAKE CONTROL SYSTEM

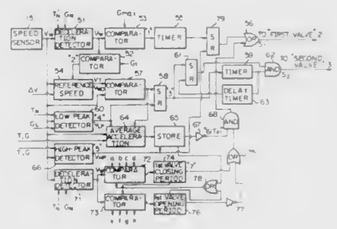
Akira Hoashi, Kawasaki; Hideo Akima, Yokohama; Haruki Shimanuki, Kasukabe, and Yuji Matsubara, Kazo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 28,543, Mar. 20, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 262,256

Claims priority, application Japan, Mar. 20, 1987, 61-062434

Int. Cl.[5] B61C *15/08*

U.S. Cl. 364—426.02 **6 Claims**



1. An anti-skid brake control system for a motor vehicle, comprising:

a wheel speed sensor which is disposed for each wheel of a vehicle and generates a pulse having a pulse cycle which corresponds to a revolutional speed of each wheel;

a pulse cycle measuring circuit for detecting the cycle of the pulses of the pulse signal from the wheel speed sensor; and,

condition setting means for setting anti-skid brake control condition factors in accordance with various wheel speeds by changing one of the factors of T_0, a predetermined time, and G_0, a predetermined value, responsive to wheel speed in accordance with the wheel speed classified as ranges of low speed, middle speed and high speed, where anti-skid brake control is started if a deceleration state, in which deceleration is greater than G_0, is continued for more than the predetermined T_0 and one of T_0 and G_0 is increased when wheel speed becomes high.

4,930,084

VEHICLE CONTROL SYSTEM

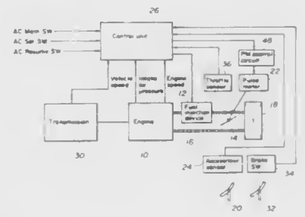
Takefumi Hosaka; Yasuhisa Arai, and Hiroki Matsui, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1988, Ser. No. 196,381

Claims priority, application Japan, May 19, 1987, 62-123061; May 19, 1987, 62-123062

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—426.04 **27 Claims**



9. A vehicle autocruise control system, comprising;

first means for detecting operating condition of the vehicle including vehicle speed, said operating condition having been assigned a fuzzy set with a membership function;

second means for carrying out fuzzy inference by applying the detected operating condition to the fuzzy set to determine a control value; and

actuator means for changing the vehicle speed in response to the control value.

4,930,085

METHOD FOR DETERMINING THE HEADING OF AN AIRCRAFT

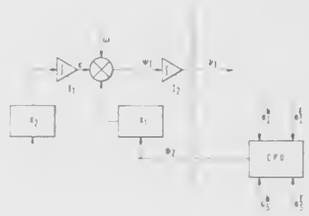
Michael Kleinschmidt, Schallstadt-Mengen, Fed. Rep. of Germany, assignor to Litef GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Oct. 15, 1987, Ser. No. 109,238

Claims priority, applicatioo European Pat. Off., Oct. 16, 1986, 86114345.1

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—449 **5 Claims**



1. A method for determining the heading of an aircraft equipped with at least one inertial navigation system that includes two accelerometers, and a device for receiving data obtained from the signals of navigation satellites and for computing the aircraft's position, velocity, and acceleration therefrom, said method comprising the steps of:

(a) determining data corresponding to the initial attitude of an aircraft-fixed coordinate system relative to an earth-fixed coordinate system during a pre-flight alignment of the aircraft's inertial navigation system; then

(b) storing said initial attitude data; then

(c) measuring the acceleration data occurring during operation with respect to the aircraft-fixed coordinate system; then

(d) converting the acceleration data from the aircraft-fixed coordinate system into a coordinate system which has been horizontally aligned with the earth-fixed coordinate system using the initial attitude data; then

(e) determining the heading from the difference angle (ϕ_Z) between the acceleration vector ($a_f^{N,E}$), as converted into the horizontally-aligned inertial coordinate system, and an acceleration vector ($a_S^{N,E}$), as computed in the earth-fixed coordinate system from the satellite data.

4,930,086

METHOD AND APPARATUS FOR SEQUENTIAL PRODUCT PROCESSING WITH LIMITED PRODUCT BAR CODE READING

Yoshibito Fukasawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1988, Ser. No. 167,193

Claims priority, application Japan, Mar. 19, 1987, 62-65141

Int. Cl.[5] G06F *15/46*

U.S. Cl. 364—468 **6 Claims**

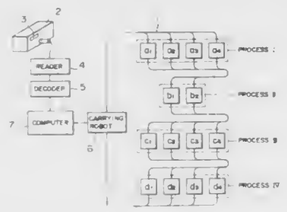
1. A method for manufacturing products produced by a plurality of processes for processing intermediary products sequentially at a plurality of processing stages to complete products while transferring said intermediary products or carriers for accommodating said intermediary products therein, each said processing stages comprising a plurality of

similar processing units capable of carrying out the process of that processing state, the method comprising the steps of:

reading discriminating codes associated with said intermediary products only prior to the first processing stage;

storing said read discrimination codes as basic information and storing corresponding processing information in regard to the processing by said processing units in memory means; and

selecting one processing unit from said plurality of processing units at a processing stage subsequent to said first processing stage on the basis of said processing information stored.



4,930,087

IMAGE FORMING APPARATUS

Jiro Egawa, Yokosuka; Koji Tanimoto, Yokohama, and Kunihiko Miura, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 9, 1988, Ser. No. 230,021

Claims priority, application Japan, Aug. 10, 1987, 62-198335; Aug. 13, 1987, 62-200995

Int. Cl.[5] G01D *15/00*

U.S. Cl. 364—518 **5 Claims**



1. A system for forming images comprising:

printer means for printing an image information, said printer means outputting a status signal indicating a state of said printer;

host computer means for controlling said printer in accordance with said status signal: and

interface means for providing a connection between said printer means and said host computer means, said interface means including status lines for transmitting said status signal to said host computer means and an attention line between said printer and said computer system, said attention line being indicative of at least one transition of said status signal from said printer.

4,930,088

ROTATED GRAPHIC PATTERN GENERATING SYSTEM

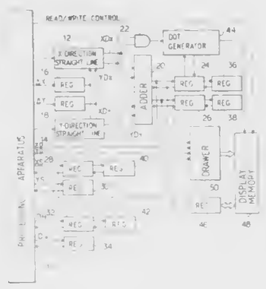
Ryuji Horiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 76,452

Claims priority, application Japan, Jul. 22, 1986, 61-173105

Int. Cl.[5] G06F *15/40*

U.S. Cl. 364—518 **3 Claims**



1. A rotated pattern generating system for generating destination coordinates from source coordinates comprising:

an X-direction straight line generator for calculating a difference in X- and Y- directions between the position of a given coordinate transformed from source coordinates to destination coordinates and a position of the next dot to be coordinate transformed, said differeoce determined by the difference in the source coordinates between a given dot and the next dot to be transformed and a required rotational angle θ;

a detector connected to the X-direction straight line generator for detecting whether or not a residual pattern occurs each time the X-direction straight line generator generates an output; and

a dot generator responsive to the output of the detector to generate, on the position of the residual pattern the same dot information as that of the dot adjacent to the residual pattern position in the destination coordinate when a residual pattern is detected by said detector.

4,930,089

METHOD FOR IDENTIFYING COORDINATE DATA FOR SELECTED LOCATIONS ON PREPRINTED PAPER AND SUPPLYING THE DATA TO A PRINTER FOR PRINTING AT CORRESPONDING LOCATIONS

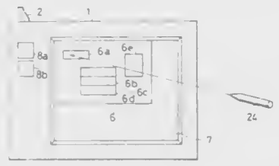
Motonobu Hatakeyama; Kohtaroh Yoshimura; Hidenori Naoi, and Nobuo Wakasugi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,478

Claims priority, application Japan, Mar. 11, 1987, 62-54209; May 18, 1987, 62-120723

Int. Cl.[5] G06F *3/03*

U.S. Cl. 361—519 **13 Claims**



1. A method for inputting, into a printer for storage in a memory means in the printer memory, printing initiation positions for on a standard preformed paper comprising the steps of:

providing a printing format input device, which is equipped with a touch panel capable of entering coordinate data through contact with a touch pen onto the panel,

superimposing the touch panel with the standard preformed paper which has with a printing format already preliminarily printed on the paper; and

entering, by means of the touch pen, coordinate data of the printing initiation positions of the printing format through the touch panel;

whereby the input coordinate data are input into the printer as the printing format data.

4,930,090

PEN RECORDER MOVED ACCORDING TO A DIGITAL SERVO CONTROLLER

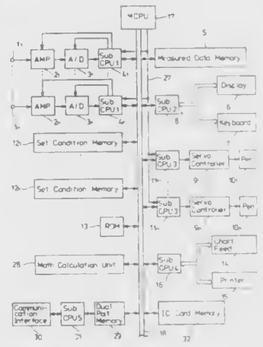
Toshio Kimura; Yoshibiro Okano; Masahiro Otani, and Shigenobu Miyamoto, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,402

Claims priority, application Japan, Jan. 14, 1988, 63-3538[U]; Feb. 29, 1988, 63-47157

Int. Cl.[5] G01D *15/16*

U.S. Cl. 364—520 **14 Claims**



1. A pen recorder apparatus comprising

at least one pen for writing on a chart;

measuring means for converting a measured analog signal into a digital signal;

man-machine interface means operated in an interactive mode with a display for inputting set conditions to said pen recorder apparatus;

servo controller means for moving said at least one pen in relation to said chart in accordance with a magnitude of said measured analog signal;

chart feed means for feeding said chart under said set conditions;

a first bus;

a main central processing unit; and

a plurality of subsidiary central processing units connected through said first bus to said main central processing unit, for performing dispersive control of said pen recorder apparatus; wherein

each of said plurality of subsidiary central processing units is a semiconductor integrated circuit comprising

a subsidiary central processing element,

an element for controlling said measuring means,

an element for controlling said man-machine interface means,

an element for controlling said servo controller means,

an element for controlling said chart feed means, and a second bus interconnecting said elements to each other.

4,930,091

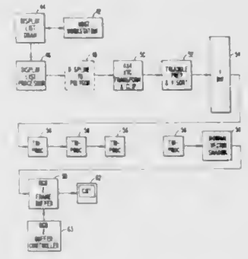
TRIANGLE CLASSIFICATION SETUP METHOD AND APPARATUS FOR 3-D GRAPHICS DISPLAY SYSTEM

Brian D. Schroeder, Lowell, Mass., and Michael F. Deering, Los Altos, Calif., assignors to Schlumberger Systems, Inc., Sunnyvale, Calif.

Filed Nov. 4, 1987, Ser. No. 116,999

Int. Cl.[5] G06F *3/14*

U.S. Cl. 364—522 **13 Claims**



1. A method for classifying triangles based upon the coordinates of the vertices of a triangle, comprising the steps of:

determining a plurality of parameters describing a triangle which can be calculated from said coordinates of said vertices, wherein one set of said parameters is a plurality of values indicating whether a particular edge of said triangle crosses an integral x or y boundary;

determining a triangle classification for every combination of at least a portion of said parameters;

storing in a look-up table said determined triangle classifications with said combinations of parameters as addresses;

calculating a plurality of parameters of said triangle from said coordinates of said vertices; and

determining the classification of said triangle by applying at least a portion of said parameters to said look-up table.

4,930,092

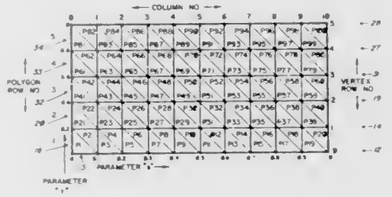
POLYGON DISPLAY APPARATUS AND METHOD

Shirley L. Reilly, Hillsboro, Oreg., assignor to Auto-trol Technology Corporation, Denver, Colo.

Filed Jan. 20, 1987, Ser. No. 5,252

Int. Cl.[5] G06F *15/62*

U.S. Cl. 364—522 **26 Claims**



1. A method of representing an object having a surface for graphical display on a video display screen by controlling values of electrical signals that represent coordinates of vertices that define points on the surface of said object, comprising the steps of:

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selecting equations having at least two parameters for defining said coordinates of said vertices;
identifying a first of said parameters and keeping the value of same at a first amount;
factoring said equations to express each of said coordinates in terms of a first constant and of a variable that is a function of a second one of said parameters;
sequentially solving said equations by substituting a predetermined series of values for said second one of said parameters to define first values for each of said coordinates for each vertex in a series of said vertices that form a first row of said points on the surface of said object;
controlling the values of certain of said electrical signals by using said first values for each of said coordinates in said first row to cause said signals to represent each of said coordinates of said vertices that form said first row of points;
repeating said factoring and solving steps using a second amount for the value of said first parameter and the same predetermined series of values for said second one of said parameters to define second values for each of said coordinates for each vertex in a second series of said vertices that form a second row of said points on the surface of said object;
controlling the values of certain other ones of said electrical signals by using said second values for each of said coordinates in said second row to cause said other signals to represent each of said coordinates of said vertices that form said second row of points;
the entire surface of said object being represented by more than two of said rows;
selecting said electrical signals that represent at least a first coordinate of first and second ones of said vertices at one end of said first row;
selecting said electrical signal that represents at least said first coordinate of one said vertex from the corresponding end of said second row;
said selecting steps identifying those electrical signals that represent a first polygon that defines certain of said points on the surface of said object to be displayed;
selecting said electrical signal that represents at least said first coordinate of a next vertex of said second row and discarding said electrical signal that represents said coordinate of said first vertex of said first row to generate and store those electrical signals that represent a next polygon adjacent said last-represented polygon for defining an additional point on the surface of said object; and
displaying said object on said video display screen in response to said signals that represent said first and next polygons.

4,930,093

METHOD OF MEASURING MESSAGE RESPONSE TIME PERFORMANCE OF A DATA PROCESSING SYSTEM INCLUDING DATA TERMINALS

James S. Houser, Cambridge, and Don C. Finfrock, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1988, Ser. No. 226,923
Int. Cl.[5] G04F *10/00*; G05B *23/00*
U.S. Cl. 364—551.01 12 Claims

1. A method of measuring message response time performance of a data processing system which includes a central processing unit having data storage, data processing and communications means and also including a plurality of data terminals each having communications means, timing means and means for recording time data, comprising the following steps:
sending a first system message to the central processing unit from a data terminal, said message including a sequence number previously provided to said data terminal by said central processing unit;
generating a first timing message by said data terminal at substantially the same time that said first system message is sent to said central processing unit, said first timing message including time data taken from the timing means in said data terminal at the time that said first data message is sent to said central processing unit from said data terminal, also including the sequence number included in said system message, and further including an identification of the message as being sent from said terminal to said central processing unit;
recording said first timing message;
sending a second system message from said central processing unit to said data terminal in response to said first system message, said second system message including a sequence number bearing a predetermined relationship to the sequence number contained in said first system message;
generating a second timing message by said data terminal at substantially the same time that said second system message is received by said data terminal, said second timing



message including time data taken from the timing means in said data terminal at the time that said second system message is received by said data terminal, also including the sequence number contained in said second system message, and further including an identification of the message as being sent from said central processing unit to said data terminal;
recording said second timing message;
associating said first timing message with said second timing message by virtue of the predetermined relationship between the sequence numbers included in said first and second timing messages; and
comparing the time data included in said first and second timing messages to establish the total time elapsed between the sending of said first system message by said data terminal and the receipt of said second system message by said data terminal.

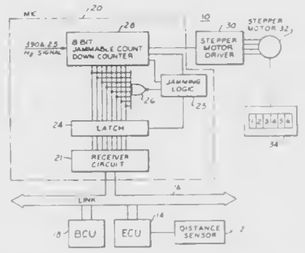
4,930,094

VEHICLE SERIAL BUS, MECHANICAL INSTRUMENT CLUSTER ODOMETER THEREFOR

William V. Luitje, Ann Arbor, and John M. McCambridge, Northville, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 11, 1988, Ser. No. 217,596
Int. Cl.[5] G01C *22/00*; G06F *15/20*
U.S. Cl. 364—561 7 Claims

1. A firmware/hardware analog odometer unit for deriving a stepper motor pulse rate for a stepper motor of an analog odometer from a digital signal derived from a series of ON and OFF ground switch closures in proportion to the distance traveled by a vehicle provided by a distance sensor unit coupled to a drive train of a vehicle, said system comprising:
(a) first computing means connected to the distance sensor unit for converting the series of switch closures of the digital signal into a series of integer distance counts numbers as the vehicle travels at various speeds over various distances, each distance counts number in the series representing an accumulated count of the switch closures during a chosen first time interval;
(b) second computing means connected to said first computing means for computing from each of the distance counts numbers a corresponding binary stepper motor rate number during a chosen second time interval representing the



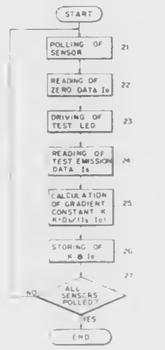
rate at which to issue stepper motor pulses sufficient to cause a rotor of the stepper motor to rotate substantially continuously as the vehicle moves; and
(c) stepper motor driver means connected to said second computing means for using said binary rate numbers to derive a series of pulses at a rate useful in driving the rotor of the stepper motor in response to changes in the value of the series of said distance count numbers so that the inertia of the rotor and a torque of the stepper motor produces generally regular odometer readings.

4,930,095

OUTPUT CORRECTION SYSTEM FOR ANALOG SENSOR

Sadataka Yuchi; Haruchika Machida, both of Sagamihara; Naoya Matsuoka, and Masamichi Kikuchi, both of Yokohama, all of Japan, assignors to Hochiki Corp., Tokyo, Japan

Filed Apr. 23, 1986, Ser. No. 854,937
Claims priority, application Japan, Apr. 26, 1985, 60-90093
Int. Cl.[5] G06F *15/20*; G08B *17/10*
U.S. Cl. 364—571.01 15 Claims



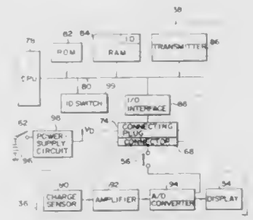
1. An analog output test and correction system for an analog detector which outputs an analog signal having a varying value representative of the value of a detectable variable physical quantity monitored and detected by the detector, the detector having means for developing a test and sensing signal for sensing and detecting the physical quantity and having means responsive to the test and sensing signal for developing as a function of the value of the physical quantity the analog output signal representative of the physical quantity, the test and correction system comprising, a control section for receiving the analog output of the detector under a condition where the output is representative of a condition where the physical quantity is at zero value and an output from the analog detector under a simulated condition in which the value of the physical quantity is a simulated predetermined value at which the detector detects the physical quantity, said control section having a first arithmetic section for calculating a gradient of values on the basis of the output under the zero value condition and the output under the simulated condition, a storage section for storing said zero value condition output and said gradient of values, and a second arithmetic section for calculating a value of the physical quantity corresponding to the predetermined output value from the analog detector on the basis of the detector output characteristics defined by said zero value condition outputs and said gradient of values of outputs, and means including means in said control section for adjustably correcting and maintaining said test and sensing signal at a level effective to maintain the detector output corresponding to the simulated condition even if said characteristics of the detector change, whereby the detector detects the physical quantity when said predetermined value thereof obtains even if the detector characteristics change.

4,930,096

DATA-TRANSMITTING APPARATUS HAVING CONNECTING PLUG

Giichiro Shimizu; Misao Shimizu; Hajime Takeuchi; Toshiharu Okuyama, and Yoshio Wakatuski, all of Tokyo, Japan, assignors to Man Design Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 111,672, Oct. 23, 1987, abandoned. This application May 2, 1989, Ser. No. 348,175
Claims priority, application Japan, Jan. 22, 1987, 62-12702; Feb. 6, 1987, 62-24786
Int. Cl.[5] G01B *7/18, 7/30*
U.S. Cl. 364—550 7 Claims



1. A data-transmitting apparatus which is connectable to digital output terminal of a digital measuring means for outputting a digital measured value, said digital measuring means including said digital output terminal, said data transmitting apparatus comprising:
housing means detachably mounted to the digital measuring means;
connecting plug means provided on said housing means for connecting with the digital measuring means digital output terminal and for receiving digital data output from the digital output terminal of the digital measuring means;
ID number setting means for storing at least one digit of desired digital data supplied from the digital measuring means through the connecting plug means as an ID number for identifying the data-transmitting apparatus;
microcomputer means provided with said housing means and coupled to said ID number setting means, for generating a serial measured data message including the digital

data supplied from the digital measuring means through the connecting plug means as a measured result of the digital measuring means; and

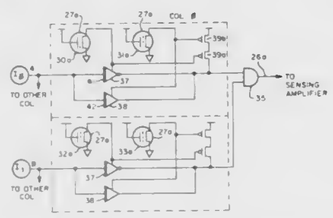
data transmitter means provided within said housing means and connected to said microcomputer means, for modulating an RF carrier signal with the serial measured data message formed in said microcomputer means and for radiating said modulated RF carrier signal to an external apparatus in the form of a radio message.

4,930,097

ARCHITECTURE FOR AN IMPROVED PERFORMANCE OF A PROGRAMMABLE LOGIC DEVICE

Gregory W. Ledenbach, Orangevale, and Michael J. Allen, Rescue, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1988, Ser. No. 292,464
Int. Cl.[5] H03K *19/177*
U.S. Cl. 364—716 18 Claims



1. In a programmable logic device (PLD) having a plurality of inputs and a plurality of outputs, an apparatus for operating on said inputs according to a stored program, comprising:

a plurality of memory cells for storing said program;

a plurality of buffers, wherein each of said buffers is coupled to receive a selective one of said inputs and, if enabled, provides a corresponding output;

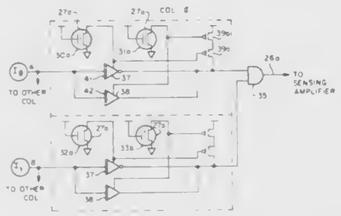
for each said buffer, a corresponding one of said memory cells is coupled to enable said buffer for passing said input signal as said corresponding output, wherein enablement of each said buffer is determined by a stored state of its corresponding memory cell and wherein said corresponding output from each said buffer provides for said plurality of outputs from said PLD.

4,930,098

SHIFT REGISTER PROGRAMMING FOR A PROGRAMMABLE LOGIC DEVICE

Michael J. Allen, Rescue, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1988, Ser. No. 292,462
Int. Cl.[5] H03K *14/177*
U.S. Cl. 364—716 7 Claims



1. In a programmable logic device (PLD) having a plurality of inputs and a plurality of outputs and a memory array for storing a program, an apparatus for operating on said inputs according to a stored program, comprising:

a plurality of memory cells comprising said memory array for storing said program;

a plurality of registers serially arranged, and wherein each register is coupled to its corresponding memory cell for latching a stored state of its memory cell;

a plurality of buffers, wherein each of said buffers is coupled to receive a selective one of said inputs and, if enabled, provides a corresponding output;

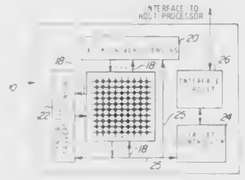
each said buffer also being coupled to its corresponding memory cell through its corresponding register such that enablement of said buffer is determined by said stored state of its corresponding memory cell.

4,930,099

WAVEFRONT VECTOR CORRELATION PROCESSOR AND METHOD

Patrick F. Castelaz, Yorba Linda, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 7, 1988, Ser. No. 255,053
Int. Cl.[5] G06G *7/12*
U.S. Cl. 364—820 17 Claims



1. In a processor having an array of similar processing elements, each processing element connected to neighboring processing elements, and capable of responding to an input pulse with an output pulse, the improvement comprising:

said processing elements being disposed in said array in positions that represent vectors in a vector space;

memory means within each processing element for storing a classification;

logic means within each processing element for transmitting a single pulse to each of said connected neighboring processing elements upon receipt of a pulse;

address means connected to each of said processing elements for permitting addressing of said processing elements;

controller means connected to said address means for transmitting signals to selected processing elements, said signals including classifying signals for assigning classifications to said selected processing elements;

said controller means also capable of transmitting a pulse to one or more selected cells having a first classification; and

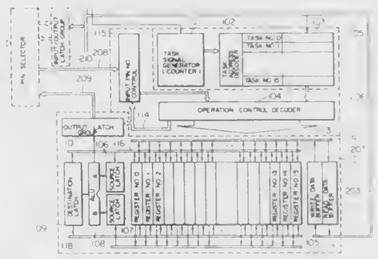
detection means for detecting when processing elements of a second classification receive pulses from one or more neighboring processing elements, wherein the time between transmission of a pulse from said processing element having a first classification and the receipt of said pulse by a processing element of a second classification provides a vector-to-vector correlation between the two processing elements.

4,930,100

PROGRAMMABLE PULSE INPUT/OUTPUT PROCESSING UNIT HAVING REGISTER TYPES SPECIFIED BY INSTRUCTIONS

Shigeki Morinaga, 10-12, Hanayamacho-2-chome, and Mitsuru Watabe, 19-5-302, Ishinazakacho-1-chome, both of Hitachi-shi, Japan

Continuation of Ser. No. 793,350, Oct. 31, 1985, abandoned.
This application Dec. 14, 1988, Ser. No. 284,388
Claims priority, application Japan, Nov. 2, 1984, 59-230202
Int. Cl.[5] G06F *7/02*; H03K *21/00*
U.S. Cl. 364—900 27 Claims



1. A counter/timer device for use with a microcomputer to perform counter/timer operations for said microcomputer comprising:

a plurality of I/O terminal pins for receiving signals from and sending signals to said microcomputer;

task instruction generating means for successively generating task instructions specifying counter/timer operations, registers to be used in performing said counter/timer operations and I/O terminal pins to be employed in receiving signals from and sending signals to said microcomputer in performing said counter/timer operations;

counter/timer operation means coupled to said I/O terminal pins for performing counter/timer operations including (a) a register group made up of a plurality of registers each being selectively programmable to perform any of a plurality of register functions necessary for said counter/timer operations, said plurality of register functions including a counter/timer function, a compare function such that the number of counter/timer function registers, compare function registers and capture function registers can be freely changed to accommodate various counter/timer operations and a capture function, (b) arithmetic unit means for performing an arithmetic/logic operation on the basis of data from said register group, and (c) bus means for transferring data between said register group and said arithmetic unit means; and

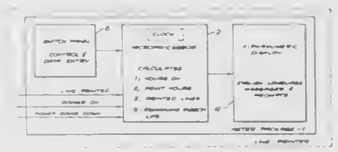
task instruction control means connected to said task instruction generating means and said counter/timer operation means, and being responsive to a task instruction generated by said task instruction generating means, for specifying (i) at least one I/O terminal pin for receipt of signals from or for supplying signals to said microcomputer and (ii) at least one of said plurality of registers included in said register group of said counter/timer operation means to be used for a particular counter/timer operation which is responsive to a signal received on said specified I/O terminal pin or which supplies a resultant signal to said specified I/O terminal pin, and for causing said arithmetic unit means to perform an arithmetic/logic operation corresponding to said particular counter/timer operation specified by said task instruction on the basis of data contained in said at least one of said plurality of registers.

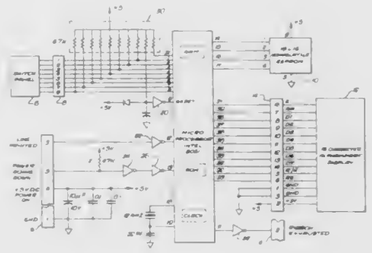
4,930,101

MICROPROCESSOR-CONTROLLED METER PACKAGE FOR A PRINTER

Yuen W. Wong, Glendale; Doina Mazilu, Woodland Hills, and Paul O. Amdahl, Granada Hills, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed May 9, 1986, Ser. No. 861,527
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—900 30 Claims





1. A meter, for use with an electrical printer that produces both a POWER ON signal which indicates when active that a printer operating voltage is on and a LINE PRINTED signal which indicates when active that a line is printed, comprising:

(a) POWER ON and LINE PRINTED sensing inputs for respectively receiving the POWER ON and LINE PRINTED signals from a printer.

(b) display means having a display input, for converting signals received at the display input into a corresponding meter display; and

(c) microprocessor means (i) having clock means for generating timing pulses, ROM and RAM memories, a program stored in the ROM memory, and HOURS ON and KILOLINES PRINTED variables stored in the RAM memory, and (ii) coupled to the sensing inputs to receive the POWER ON and LINE PRINTED signals and coupled for transmission to the display input;

the microprocessor means by executing the program being responsive to (i) the POWER ON signal and the timing pulses for incrementing the HOURS ON variable for each hour the printer operating voltage is on; (ii) the LINE PRINTED signal for incrementing the KILOLINES PRINTED variable for each 1000 times a line is printed; and (iii) the currently stored HOURS ON and KILOLINES PRINTED variables for transmitting their values to the display input for conversion by the display means to corresponding meter displays of HOURS ON and KILOLINES PRINTED.

4,930,102

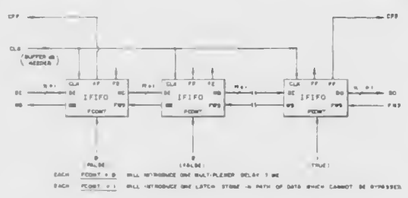
DYNAMIC ACTIVITY-CREATING DATA-DRIVEN COMPUTER ARCHITECTURE

Glenn A. Jennings, Riverside, Calif., assignor to The Regents of the University of California, Alameda, Calif.

Division of Ser. No. 490,154, Apr. 29, 1983. This application Oct. 6, 1986, Ser. No. 914,738

Int. Cl.[5] G11C *7/00*

U.S. Cl. 364—900 **10 Claims**



1. In a queue structure having FIFO organization comprising a plurality of stages into which data can be placed at input points and means for removing data at a plurality of output points from said queue structure upon the occurrence of respective clock pulses of a clock line to which it is synchronized and by which it is driven, the improvement comprising:

(a) status means for indicating the presence of data in said stages and interconnecting the stages for passing the status of each stage in the queue to the stage in front of it and behind it between the clock pulses;

(b) shifting means within each stage interconnecting the stages for shifting data between stages toward the output points over unused stages between clock pulses using combinatorial logic whereby the availability of data at the output points during the clock pulses is increased;

(c) at least one backward combinatorial logic circuit and at least one forward combinatorial logic circuit housed within each stage, the backward and forward combinatorial logic circuits being bidirectionally linked to each for data transfer and to said data shifting means;

(d) each of said combinatorial logic circuits being connected to at least one other of said stages, said forward logic circuit being linked to at least a forward stage and said backward logic circuit being linked to at least a forward stage, and said backward logic circuit being linked to at least a preceding stage, each logic circuit being so linked by stage-connecting signal paths; and

(e) said shifting means including: (1) a plurality of shaft latches within each stage, each latch capable of storing at least one data bit; (2) a plurality of bypass lines within each stage for bypassing said shift latches; and (3) a plurality of data lines connecting said shift latches and bypass lines to adjoining forward and backward other of said stages.

4,930,103

DATA TRANSMISSION METHOD IN A DIGITAL TRANSMISSION NETWORK AND APPARATUS FOR IMPLIMENTING SAME

Gerhard Geiger, Schliersee, and Michael Strafner, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 620,618, Jun. 14, 1984. This application Oct. 16, 1986, Ser. No. 918,692

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329228

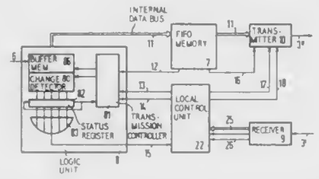
Int. Cl.[5] G06F *11/00, 11/28*

U.S. Cl. 364—900 **17 Claims**

1. A data transmission method for use in a hierarchically organized digital transmission network having at least one higher ranking unit and a plurality of lower ranking units connected thereto via a data bus system, said lower ranking units respectively exchanging data with a plurality of terminals via line connections, said data being forwarded to said higher ranking unit after a request/acknowledgement procedure, said method comprising the steps of:

(a) checking incoming data on said line connections at said lower ranking units in a regular routine for determining whether said incoming data has changed in comparison to data from an immediately preceding check;

(b) if said checking step shows a change in said incoming data, generating a flag and allocating said flag to the line connection from which changes incoming data is received;



(c) said higher ranking unit successively enabling said lower ranking units for transmitting data to said higher ranking unit;

(d) transmitting at least the changed data identified with said flag from said lower ranking unit to said higher ranking unit; and

(e) if no change in incoming data is shown by said check, transmitting an acknowledgement signal from said lower ranking unit to said higher ranking unit.

4,930,104

CONTENT-ADDRESSED MEMORY

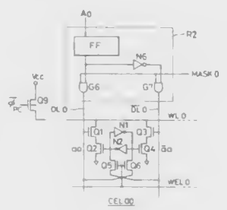
Norio Nakagawa, Kodaira; Katsuaki Takagi, Higashimurayama, and Hirokazu Aoki, Hachiohji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 909,928, Sep. 22, 1986, Pat. No. 4,831,586. This application May 8, 1989, Ser. No. 349,402

Claims priority, application Japan, Sep. 20, 1985, 60-206420

Int. Cl.[5] G11C *13/00, 11/40*

U.S. Cl. 365—49 **9 Claims**



2. An associative memory formed on a semiconductor substrate comprising:

means for generating input data;

a first memory coupled to receive said input data, said first memory including a plurality of storage sets each of which stores first data and includes means for comparing the input data with the first data stored therein and for generating a coincidence signal when the input data is coincident with the first data stored therein, and a first line to which the coincidence signal is applied;

a memory array including a plurality of memory cells and a plurality of selecting lines each of which is coupled to the memory cells; and

selecting means for selecting one of said plurality of selecting lines, said selecting means having inputs coupled to the first lines, respectively, and outputs coupled to said plurality of selecting lines, wherein said selecting means includes first means for selecting only one of said plurality of selecting lines in accordance with a predetermined rank of said first lines when said selecting means receives at said inputs a plurality of the coincidence signals on said first lines and for selecting one of said plurality of selecting lines in response to receipt of one coincidence signal on said first lines.

4,930,105

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH A DOUBLE GATE STRUCTURE

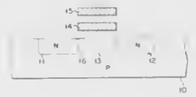
Osamu Matsumoto; Tadashi Maruyama; Hiroyoshi Murata, all of Yokohama; Isao Abe, Kawasaki; Tomohisa Shigematsu, Yokohama; Kazuyoshi Shinada, Yokohama; Yasoji Suzuki, Yokohama, and Ichiro Kobayashi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

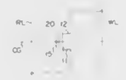
Filed Apr. 7, 1988, Ser. No. 178,609

Claims priority, application Japan, Apr. 9, 1987, 62-87482

Int. Cl.[5] G11C *7/00, 11/40;* **H01L** *29/78*

U.S. Cl. 365—185 **16 Claims**





1. A nonvolatile semiconductor memory device comprising:

a memory cell including a first conductivity type semiconductor substrate, first and second diffusion layers of a second conductivity type formed in said substrate, a channel region formed in the surface region of said substrate and located between said first and second diffusion layers, a floating gate electrode formed on said channel region, a control gate electrode formed on said floating gate electrode, and means for lessening an electric field concentration only between said first layer and said channel region;

a control gate line for supplying predetermined voltages to said control gate electrode, in a read mode and in a write mode;

a read line connected to said first diffusion layer, for reading out data from said memory cell; and

a write line connected to said second diffusion layer, for writing data into said memory cell.

4,930,106

DUAL CACHE RAM FOR RAPID INVALIDATION

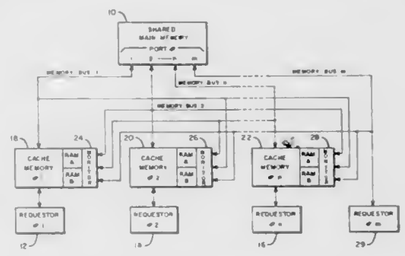
Michael Danilenko, West St. Paul; Clarence W. Dekarske, St. Paul Park, and John E. Larson, Eagan, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 29, 1988, Ser. No. 237,817

Int. Cl.[5] G11C *15/00*

U.S. Cl. 365—189.01 **2 Claims**

1. Storage means for storing validity bits in a multiprocessor cache memory comprising a plurality of random access storage means, switch means for initially enabling a first one of said plurality of random access storage means thereby enabling it to function as an active store of said validity bits in an operating cache memory, and for disabling the others of said plurality of random access storage means from functioning as an active store of said validity bits for said operating cache memory, said switch means also being operable to disable said first one of said random access storage means and to enable one other of said plurality of said random access storage means for function as an active store of said validity bits upon receipt of an invalidate signal by said cache memory means, and write means for



writing into memory locations of said first one of said random access storage means following the disablement of said first one of said random access storage means by said switch means until all of said memory locations are at a common logic level.

4,930,107

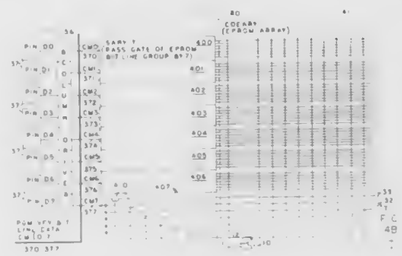
METHOD AND APPARATUS FOR PROGRAMMING AND VERIFYING PROGRAMMABLE ELEMENTS IN PROGRAMMABLE DEVICES

Yiu-Fai Chan, Saratoga, and Chuan-Yung Hung, Cupertino, both of Calif., assignors to Altera Corporation, San Jose, Calif.

Filed Aug. 8, 1988, Ser. No. 229,852

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—189.08 **24 Claims**



1. Apparatus for programming a programmable integrated circuit having at least one programmable logic array, said at least one programmable logic array having at least m word lines, at least n bit lines, and at least m×n programmable interconnections, said apparatus comprising:

means for applying programming data to said array; and

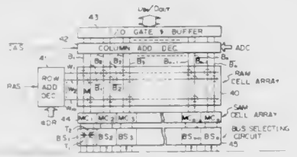
means for providing serial address information to said array for indicating, at random, for which of said programmable interconnections said programming data is intended.

4,930,108

SEMICONDUCTOR MEMORY DEVICE WITH SERIAL ACCESS MEMORY

Tsutomo Sugiyama, Kasugai, Japan, assignor to Fujitsu Limited, Kanagawa and Fujitsu VLSI Limited, Aichi, both of, Japan

Filed Dec. 1, 1988, Ser. No. 278,502
Claims priority, application Japan, Dec. 4, 1987, 62-307936
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—230.02 **15 Claims**



1. A semiconductor memory device comprising:
a first memory cell array having a plurality of random access memory cells arrayed in a row direction and a column direction;
a second memory cell array operatively connected to said first memory cell array and having at least serial access memory cells corresponding to a single row of said first memory cell array, said serial access memory cells having a first part corresponding to odd number addresses and a second part corresponding to even number addresses, one of said first and second parts including at least one specific serial access memory cell;
a first data bus allocated to said first part;
a second data bus allocated to said second part;
a third data bus allocated to said at least one specific serial access memory cell; and
a bus switching control circuit for controlling a connection of each of said serial access memory cells to one of the data buses and selecting one of the data buses to connect the selected data bus to an external terminal of said semiconductor memory device,
said bus switching control circuit outputting each of bit data in said serial access memory cells serially and alternately to said first and second data buses, when a plurality of transfer data blocks are serially read out from said second memory cell array, outputting a bit data in said at least one specific serial access memory cell corresponding to a head or last address in each of said transfer data blocks to said third data bus.

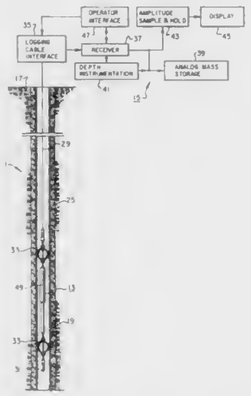
4,930,109

METHOD AND APPARATUS OF MEASURING ULTRASONIC TIME TRAVEL INFORMATION OBTAINED FROM LOGGING OPERATIONS IN A WELL BOREHOLE

Donald G. Kyle, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1988, Ser. No. 291,633
Int. Cl.[5] G01V *1/40*
U.S. Cl. 367—27 **11 Claims**

1. A method of measuring time of travel information of an acoustic return obtained from an ultrasonic logging apparatus operating in a well borehole, said ultrasonic logging apparatus generating an acoustic waveform and receiving the acoustic return from said generated acoustic waveform, said acoustic return having a peak amplitude, said time of travel of said acoustic return being measured from said generated acoustic waveform, comprising the steps of:
(a) providing ultrasonic receiver means and providing threshold detection means for determining a threshold level of said acoustic return;
(b) receiving said acoustic return with said receiver means and detecting a threshold amplitude of said acoustic return with said threshold detection means;
(c) measuring a first time interval from said generated acoustic waveform to said detected threshold amplitude;



(d) detecting said peak amplitude of said return, measuring a second time interval from said detected threshold amplitude to said peak amplitude;
(e) combining said first and second time intervals to obtain the time of travel of said acoustic return.

4,930,110

METHOD FOR CONDUCTING THREE-DIMENSIONAL SUBSURFACE SEISMIC SURVEYS

Douglas L. Bremner, Richardson; Gary A. Crews, and James A. Musser, both of Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 13, 1988, Ser. No. 218,662
Int. Cl.[5] G01V *1/20, 1/36*
U.S. Cl. 367—56 **3 Claims**



1. A method for conducting three-dimensional subsurface seismic surveys comprising the steps of:
disposing a plurality of seismic receivers in a plurality of orthogonally uniform patterns about selected points on the surface of the earth wherein gaps are formed between said plurality of orthogonally uniform patterns;
imparting seismic energy into the earth at a plurality of locations, each of said locations disposed in a particular azimuthal direction and a selected distance from said selected points;
simultaneously recording the responses of each of said plurality of seismic receivers to said seismic energy imparted at each of said plurality of locations;

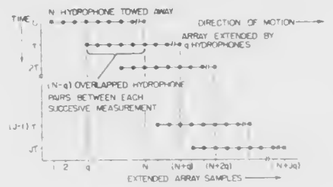
characterizing the time and spatial nature of unwanted noise within said recorded responses by utilizing the uniform sampling intervals provided by said orthogonally uniform patterns; and
processing the said recorded responses to remove said characterized unwanted noise.

4,930,111

OVERLAP CORRELATOR SYNTHETIC APERTURE PROCESSOR

Edmund J. Sullivan, Portsmouth, R.I., and Stergios Stergiopoulos, Athens, Greece, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1989, Ser. No. 374,679
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—130 **3 Claims**



1. A passive acoustic signal processing apparatus, comprising:
a N element physical hydrophone towed acoustic array, said array having a leading end, a trailing end and further being in motion at a preselected velocity; and
signal processing means, electrically connected to said N element moving towed array, for receiving J+1 sequential sets of N time sampled electrical signals from said N physical hydrophones of said towed array, the sampling time period τ being preselected such that said array has moved a distance equal to "q" hydrophone positions and therefore each signal set having the trailing N−q hydrophones of said N element array spatially overlapping the position previously occupied by the leading N−q hydrophones of said N element array during the previous measurement thus exploiting the N element finite physical aperture of the array in order to provide a direct estimate of a phase correction factor, and producing J such phase correction factors from said J+1 measurements, said J phase correction factors then being applied to correct said measurements so as to provide N physical hydrophone outputs plus Jq synthetic hydrophone outputs therefrom;
said signal processing means thereby providing a towed array having an effective aperture N+Jq which is substantially longer than the physical aperture N of said towed array.

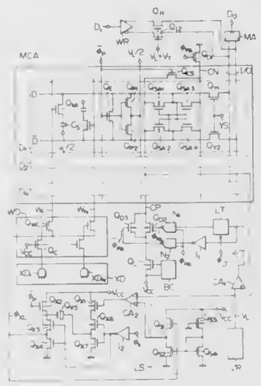
4,930,112

SEMICONDUCTOR DEVICE HAVING A VOLTAGE LIMITER

Hitoshi Tanaka, Tachikawa; Ryoichi Hori, Tokyo; Kiyoo Itoh, Higashikurume; Katsutaka Kimura, Sagamihara, and Katsuhiro Shimohigashi, Musashimurayama, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corporation, both of Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 934,546
Claims priority, applicaton Japan, Nov. 22, 1985, 60-251213
Int. Cl.[5] G11C *7/00; G060 11/00*
U.S. Cl. 365—226 **27 Claims**

1. A semiconductor device comprising:
a first and a second circuit coupled to at least one external power source; and
a plurality of voltage converter means each transforming a voltage of the external power source into an output voltage different than the voltage of the external power source,
wherein at least said first circuit is coupled to said external power source through one of said voltage converter means so that said first circuit is driven by the output voltage of said one voltage converter means, and further wherein said voltage converter means includes control means coupled to receive a first signal for controlling the output voltage of said one voltage converter means based on said first signal which corresponds to a second signal,



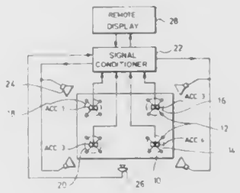
which second signal controls operation of said first circuit, thereby controlling load driving power of said one voltage converter means,
wherein said second signal is a load driving control signal applied to said first circuit to control the operation of said first circuit, and wherein said first signal is synchronized to said second signal and is applied to said voltage converter means to control the operation of said voltage converter means to be synchronized with the operation of the first circuit.

4,930,113

SUPPRESSION OF AIR-COUPLED NOISE PRODUCED BY SEISMIC VIBRATORS

John J. Sallas, Plano, Tex., assignor to Halliburton Geophysical Services, Inc., Dallas, Tex.

Filed Mar. 30, 1989, Ser. No. 331,615
Int. Cl.[5] G01V *1/02*
U.S. Cl. 367—190 **2 Claims**



1. Method for suppressing the propagation of sound waves in air resulting from the vibration of a baseplate on a seismic vibrator, comprising the steps of:
(a) attaching transducer means to the upper surface of the baseplate;

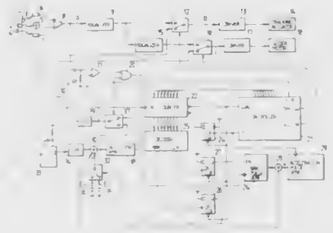
(b) activating the transducer means to generate a signal representing the acceleration of the baseplate;
(c) conditioning the signal received from the transducer means to produce a conditioned signal which is substantially in antiphase with and substantially proportional to the acceleration of the baseplate;
(d) feeding the conditioned signal to a least one loudspeaker mounted in proximity to the baseplate so that said loudspeaker produces and sound waves which are substantially in antiphase with and substantially proportional to the acceleration of the baseplate;
(e) measuring sound waves in the air at a prescribed distance from said baseplate and delivering a signal correlative thereto;
(f) determining the level of attenuation of sound waves in the air in response to said measured signal; and
(g) displaying the level of attenuation.

4,930,114

TRACK JUMP OPERATION CONTROL APPARATUS IN A DISK PLAYER

Kiyoshi Tateishi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,838
Claims priority, application Japan, Aug. 6, 1987, 62-196874
Int. Cl.[5] G11B *7/00*; H04N *21/08*
U.S. Cl. 369—32 **9 Claims**



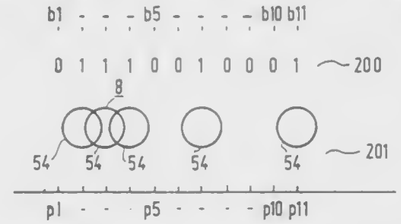
1. A track jump operation control apparatus in a disk player, said control apparatus comprising:
fine adjustment means for finely adjusting a relative position of an information detecting point of a pickup relative to a recorded disk to thereby make the information detecting point follow a reading track of the recorded disk;
rough adjustment means for roughly adjusting said relative position of said information detecting point so that said information detecting point is positioned within a controllable region of said fine adjustment means:
speed detection means for producing a speed detection signal corresponding to a radial moving speed of said information detection point relative to said recorded disk;
speed error signal generation means for generating a speed error signal corresponding to a difference between said speed detection signal and a reference speed signal representing a predetermined reference speed:
integrator means for integrating said speed error signal;
wherein, to perform a track jumping operation, said fine adjustment means being forcibly driven by said speed error signal and said rough adjustment means being forcibly driven by an output of said integrator means so that said information detecting point is controlled to jump over a designated number of tracks at said reference speed.

4,930,115

METHOD OF AND DEVICE FOR RECORDING INFORMATION, RECORD CARRIER, AND DEVICE FOR READING THE RECORDED INFORMATION

Johannes J. Verboom, Colorado Springs, Colo.; Constant P. M. J. Baggen, Baarlo, Netherlands; Cornelis M. J. Van Uijen, and Erik W. Gaal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed May 5, 1988, Ser. No. 190,558
Claims priority, application Netherlands, Dec. 3, 1987, 8702903
Int. Cl.[5] H04N *5/76*; G11B *5/09*
U.S. Cl. 369—59 **15 Claims**



1. A method of recording an information signal on a record carrier, an information signal being converted into a code signal comprising code words made up of bits, the number of successive bits of a first logic value within the code word being at least equal to P, the number of successive bits of the second logic value within each code word, which are situated between the groups of at least P bits of the first logic value, being at least equal to Q, P being an integer greater than or equal to 1 and Q being an integer greater than P, in which method an information pattern of recording marks corresponding to the code signal is formed on the record carrier, in which pattern the bits of the first logic value are represented by the recording marks, characterized in that the number of bits of the first logic value is codeword dependent, information words of consecutive values being converted into code words whose logic value is different for only one bit.

4,930,116

RECORD CARRIER CONTAINING INFORMATION IN AN OPTICALLY READABLE INFORMATION STRUCTURE

Jan G. Dil, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,613
Claims priority, application Netherlands, Oct. 19, 1978, 7810463
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—275.1 **18 Claims**



1. A record carrier comprising an optically readable information structure having information areas arranged in tracks and spaced from each other in the track direction by intermediate areas, said tracks being spaced from each other by intermediate lands, said information areas having a configuration such that, upon illumination thereof by a beam of radiation with which said information structure is to be read, said information

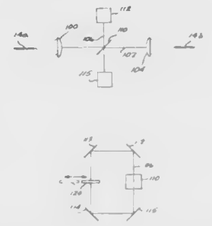
areas produce a substantially constant phase difference of approximately 180° between the zero order subbeam and the first order subbeam diffracted thereby and said intermediate areas differing optically from said lands and havig a configuration such that, upon illumination thereof by said radiation beam, said intermediate areas produce a substantially constant phase difference of between 95° and 145° between the zero and first order subbeams diffracted thereby.

4,930,117

WAVELENGTH DIVISION MULTIPLEXING SYSTEM USING OPTICAL SWITCH

Raymond W. Huggins, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 24, 1988, Ser. No. 211,382
Int. Cl.[5] H04B *9/00*
U.S. Cl. 370—3 **9 Claims**



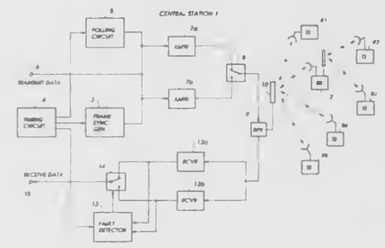
1. An optical wavelength division multiplexing system, comprising:
an optical bus;
an optical source for providing light having a plurality of wavelength bands and for coupling said light into the bus; and,
a plurality of optical switches serially coupled along the bus, each switch including means for reacting to an external stimulus by assuming one of at least two states, a first state being one in which light in all of said wavelength bands is substantially transmitted through the switch, a second state being one in which light in a modulation wavelength band is attenuated and light in the remaining wavelength bands is substantially transmitted through the switch, the modulation wavelength band being different for each switch, each switch comprising an optical stopband filter having a predetermined stopband and opposed first and second surfaces, means for coupling light from the optical bus onto the first surface of the stopband filter such that light within the stopband is substantially reflected by the stopband filter to produce a reflected beam, and light outside the stopband is substantially transmitted through the stopband filter to produce a transmitted beam, optical path means for causing the reflected beam to follow an optical path and to then strike the second surface of the stopband filter such that the reflected beam is rereflected by the stopband filter and combined with the transmitted beam to produce a recombined beam, the optical path means comprising first and second mirrors, and modulation means for selectively attenuating light traveling along said optical path in accordance with the external stimulus, to thereby selectively pass or attenuate light in said stopband.

4,930,118

FRAME-INTERVAL FAULT DETECTION IN A DEMAND ASSIGNMENT TDMA COMMUNICATION SYSTEM

Shigeru Sugihara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,734
Claims priority, application Japan, Nov. 30, 1987, 62-302574
Int. Cl.[5] H04J *3/02, 3/14*
U.S. Cl. 370—16 **8 Claims**



1. A demand assignment time division multiple access communication system having a central station and a plurality of terminal stations, said central station transmitting a frame sync and a polling signal at periodic intervals to said terminal stations to elicit a response thereform,
each of said terminal stations transmitting a test signal in response to reception of said frame sync from the central station, said central station comprising:
regular-channel receive means and spare-channel receive means for respectively establishing regular and spare channels to said terminal stations for receiving said test signal and an information signal as said elicited response;
fault detection means for detecting the strength of said test signals received by said regular-channel receive means and said spare-channel receive means and determining therefrom whether each of said regular-channel and spare-channel receive means is operating normally or abnormally; and
switch means for exclusively supplying said information signal received by said regular-channel receive means to utilization means when said regular-channel receive means is determined as operating normally, and exclusively supplying said information signal received by said spare-channel receive means to said utilization means when said regular-channel receive means is determined as operating abnormally while said spare-channel receive means is determined as operating normally.

4,930,119

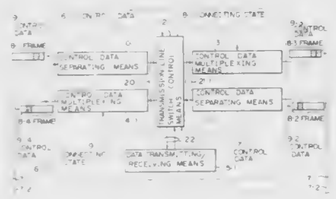
DUPLEX SYSTEM OF TRANSMISSION LINES IN A LOOP NETWORK

Kenzo Kobayashi, Kawasaki; Yutaka Iwagaki, Yokosuka; Mitsuyo Hasegawa, Tokyo, and Kazushi Suganuma, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 19, 1988, Ser. No. 286,614
Claims priority, application Japan, Dec. 19, 1987, 62-320134
Int. Cl.[5] H04J *3/14*
U.S. Cl. 370—16.1 **23 Claims**

1. A duplex system of a plurality of communication nodes connectable in a loop network, each of said communication nodes having data transmission/receive means, connected via duplex transmission lines, for transmitting data in two directions, each of said communication nodes comprising:
loop back means for effecting a loop back operation in response to a predetermined state of signals received from the two directions of the duplex transmission lines; and
return indication means for adding, to an output signal, a return indication that a received signal was returned when

the received signal could not be passed therethrough, each of said communication nodes autonomously beginning



and ending the loop back operation in response to the signals received from the two directions.

4,930,120

SIGNAL DISTRIBUTION NETWORK SYSTEM

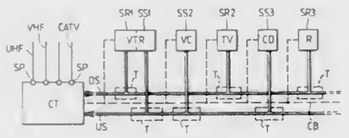
Thomas Baxter, Westerham, and Robert A. Barnes, Wallington, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 18, 1989, Ser. No. 298,537

Claims priority, application United Kingdom, Jan. 22, 1988, 8801441

Int. Cl.[5] H04H *1/08;* **H04J** *1/02*

U.S. Cl. 370—73 **6 Claims**



1. A signal distribution cable network system in which frequency division multiplexing is employed to provide a plurality of information channels which are defined by respective carrier frequencies, said network system comprising a channel allocation controller which is operable on request to allocate temporarily an unused channel for the transport of information signals from a local signal source to a signal destination receiver connected to the network, the controller including means for transmitting tuning command signals to the local signal source and signal destination receiver to cause them to be tuned to the carrier frequency of the allocated channel, and said network system being characterised in that the local signal source includes a programmable modulator arrangement comprising a first input connected to receive tuning command signals from the controller, a second input connected to receive baseband video/audio signals generated by the local signal source, a frequency generator which is responsive to a tuning command signal pertaining to a selected channel carrier frequency to produce a carrier signal of that frequency, and a modulator connected to receive said carrier signal and said baseband video/audio signals and responsive to produce a modulated carrier signal for transport over the selected channel.

4,930,121

NETWORK SYSTEM USING TOKEN-PASSING BUS WITH MULTIPLE PRIORITY LEVELS

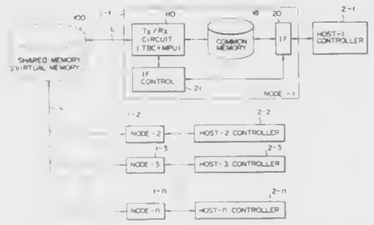
Yashuhisa Shiobara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 9, 1988, Ser. No. 242,262

Claims priority, application Japan, Sep. 9, 1987, 62-225516

Int. Cl.[5] H04J *3/02*

U.S. Cl. 370—85.4 **27 Claims**



1. A network system using a token passing bus access-method, comprising:

a bus type transmission path;

a plurality of nodes, coupled to said transmission path, for executing a priority processing algorithm based on a standard of an IEEE 802.4 token-passing bus or a standard of a bus functionally substantially equivalent to said token-passing bus;

a plurality of common memories respectively included in said plurality of nodes and each of said common memories having a mutually common address structure, said common memories being connected together to function as a shared virtual memory; and

a plurality of communication means, respectively included in said plurality of nodes, for communicating storage contents of said common memories of said plurality of nodes between said common memories through said transmission path in accordance with priority levels of said priority processing algorithm.

4,930,122

MESSAGE TRANSFER SYSTEM AND METHOD

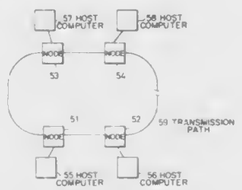
Yasuhiro Takahashi, Fujisawa, and Osamu Takada, Ebina, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,171

Claims priority, application Japan, Mar. 9, 1987, 62-53808

Int. Cl.[5] H04J *3/00*

U.S. Cl. 370—85.15 **8 Claims**



1. A message transfer system wherein messages are transferred between at least two nodes on a transmission loop by segmenting each of the messages into a plurality of packets, said system comprising:

storage means for registering a code that identifies the sender address from which messages are to be received;

message buffer means for receiving and reassembling the message from the received packets;

means for controlling the arrival of said packets at said message buffer means, in accordance with whether or not said packets correspond to the registered code which identifies the sender address.

4,930,123

METHOD FOR CONTROLLING ADDRESS PARAMETERS FOR INTERCONNECTING LAW AND ISDN

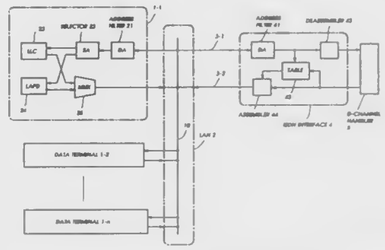
Hiroshi Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,250

Claims priority, application Japan, Mar. 4, 1988, 63-52155; Mar. 4, 1988, 63-52156

Int. Cl.[5] H04J *3/26*

U.S. Cl. 370—94.1 **12 Claims**



1. A method for interconnecting a plurality of data terminals of a local area network and an integrated services digital network (ISDN), said ISDN being capable of assigning Terminal Endpoint Identifier (TEI) values respectively to data terminals which are accessible through a common interface unit to said network, each of said data terminals being assigned an address value and capable of transmitting a terminal-to-network LAPD (Link Access Protocol on the D-channel) packet to said interface unit, said interface unit being assigned an address value, the method comprising:

transmitting from said interface unit to said data terminals a network-to-terminal LAPD packet containing a TEI value of group address, an action indicator set to an assigned TEI value and a destination address value of a group address of said data terminals; and

transmitting from the data terminal specified by the assigned TEI value a said terminal-to-network LAPD packet containing the address value of said interface unit as a destination address and said assigned TEI value contained in said network-to-terminal LAPD packet.

4,930,124

DECENTRALIZED AND SYNCHRONOUS DATA TRANSMISSION PROCESS AND NETWORK

Bertrand de Boisseron, Paris; Michel Salvan, Epinay S/Orge, and Michèle Gugenbein, Paris, all of France, assignors to Thomson-CSF, Puteaux, France

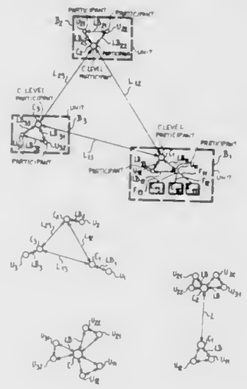
Filed Sep. 21, 1987, Ser. No. 86,082

Claims priority, application PCT Int'l Appl., Nov. 21, 1985, PCT/FR85/00327

Int. Cl.[5] H04J *3/24, 3/06*

U.S. Cl. 370—94.3 **7 Claims**

1. A method of data transmission between a plurality of stations, called participants, capable of transmitting and/or receiving data, wherein the data is transmitted by the participants by way of time multiplexing, each of the participants having a predefined transmission time within a period of time called a cycle wherein said cycle is divided into sequences and, for each sequence a single predefined participant may transmit data which is designated to one or more predefined participants; said method comprises at least one step for the initial synchronization of all of the participants with each other and, prior to any transmission of data other than synchronization data, the method further comprises a routing step, determining the participant receiving data information to be transmitted



wherein said data information is a function of the final destination of said data information and of the quality of the communication links between participants wherein said quality is based upon prior error counts of said connections.

4,930,125

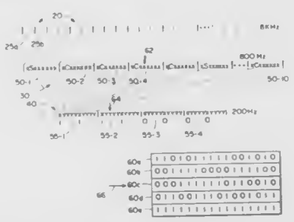
MULTIPLEXER FRAME SYNCHRONIZATION TECHNIQUE

Kuldip S. Bains, Watertown, Conn., assignor to General Data-Com, Inc., Middlebury, Conn.

Filed Jan. 30, 1989, Ser. No. 304,015

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—105 **16 Claims**



1. A method for determining loss of synchronization of a composite subaggregate frame comprised of a primary and secondary frame and contained within an independently synchronized aggregate, said method comprising:

(a) locating a plurality of synch bits in said secondary frame such that said synch bits are evenly spaced in the primary frame and such that when said composite subaggregate frame is synchronized said synch bits are chosen to be inserted into the same predetermined position in said independently synchronized aggregate;

(b) providing values for the synch bits in the secondary frame such that a collection of said synch bits of a composite frame provides an internally non-repeating pattern;

(c) collecting bits located in said predetermined location of the independently synchronized aggregate at predetermined intervals; and

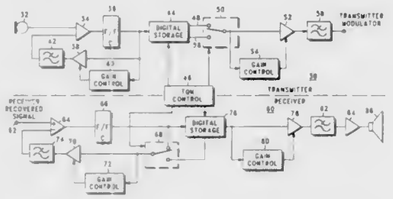
(d) determining whether the values of the collected bits correspond to the bit values of said non-repeating pattern.

4,930,126

TIME DIVISION MULTIPLEX SYSTEM SUITED FOR BURST ANALOG TRANSMISSION

Henry L. Kazecki, Arlington Heights, and James C. Baker, Hanover Park, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1989, Ser. No. 362,634
Int. Cl.[5] H04J *3/00*
U.S. Cl. 370—109 **17 Claims**



1. A time division multiplexed (TDM) transmitter in which an input signal is compressed in time before transmission to form a compressed signal, at least first and second time slots exist in each TDM frame with the transmitter transmitting said compressed signal during said first slot, the transmitter comprising:

means for storing digital data correspoding to said input signal;

means for converting said digital data into an analog signal used to modulate said transmitter;

first means for transferring said digital data stored during one frame to said conver**216**

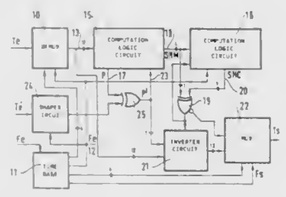
second means for transferring said digital data stored during one frame to said converting means during the slot preceding said first slot during the next frame to maintain magnitude continuity from the end of the first slot in the first frame to the beginning of the first slot in the next frame thereby minimizing undesired due to magnitude discontinuities.

4,930,127

METHOD AND DEVICE FOR TRANSMITTING A DIGITAL ENGINEERING SERVICE CHANNEL BY MEANS OF THE PARITY CHANNEL OF A DIGITAL BIT STREAM TRANSMITTED IN A CODE WITH PARITY CHECKING

Jean-Luc Abaziou, Pleumeur Bodou; Jean-Claude Billy, and Bernard Le Mouel, both of Saint Quay Perros, all of France, assignors to Societe Anonyme dite : Alcatel CIT, Paris, Frauce

Filed Dec. 15, 1988, Ser. No. 284,579
Claims priority, application France, Dec. 17, 1987, 87 17644
Int. Cl.[5] H04L *25/48*
U.S. Cl. 370—110.4 **6 Claims**



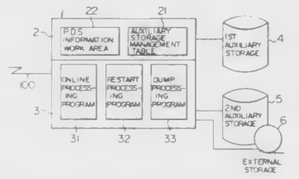
1. Method of transmitting a digital service channel by means of the parity channel of a digital bit stream transmitted in a code with parity checking with parity words inserted at specific times by modifying spaced groups of even numbers of consecutive parity words to violate the parity law of the parity checking code.

4,930,128

METHOD FOR RESTART OF ONLINE COMPUTER SYSTEM AND APPARATUS FOR CARRYING OUT THE SAME

Shuuji Suzuki, Yokobama; Kenzo Moriyama, Fujisawa, and Yuuji Sueoka, Yokobama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,045
Claims priority, application Japan, Jun. 26, 1987, 62-159347
Int. Cl.[5] G06F *11/20*
U.S. Cl. 371—12 **5 Claims**



1. A method for restarting, after a system goes down due to occurrence of a fault, an online processing system based on a computer which employs a virtual storage system comprised of a main storage, a first auxiliary storage and a second auxiliary storage, said method comprising the steps of:

effecting initialization of an online processing program;

storing data within said main storage of said virtual storage system into a first area of said second auxiliary storage immediately after the initialization of the online processing program;

registering information indicative of occupied/unoccupied status of individual data storage units in said first auxiliary storage into a first auxiliary storage management table of said main storage;

storing data present in said main storage at the time of occurrence of a fault and a consequent system down condition into a second area of said second auxiliary storage;

storing management information present in said first auxiliary storage management table at the time of the occurrence of the fault into a third area of said second auxiliary storage;

reloading the data, which is present in said main storage immediately after the initialization and which has been stored in said first area of said second auxiliary storage, into said main storage;

registering the management information, which has occurred at the time of the occurrence of the fault and then stored in said third area of said second auxiliary storage, into a second auxiliary storage management table of said main storage; and

restarting the online processing program and utilizing said virtual storage system by accessing said first and second auxiliary storage management tables.

4,930,129

IC CARD HAVING INTERNAL ERROR CHECKING CAPABILITY

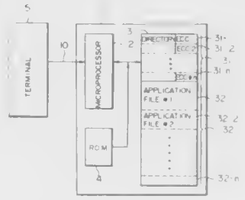
Kenichi Takahira, Hyogo Prefecture, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 11, 1988, Ser. No. 166,624
Claims priority, application Japan, Mar. 13, 1987, 62-59808
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—40.4 **9 Claims**

1. An IC card adapted to interface with at least one terminal for performing a plurality of applications, the IC card comprising in combination:

onboard memory means divided into a plurality of application blocks for storage of information related to the applications, some of the application blocks being of a size different from others, the memory means also having a protected block for storage of application block information including directory data and an error check code relating to each of the plurality of application blocks;

an onboard microprocessor for controlling access to the memory in such a way as to prevent access to the protected block by the terminal and to selectively allow



access to the application blocks by the terminal for selectively performing the applications; and

program means for causing the microprocessor

(a) to compute an error check code for a data group related to one of the plurality of applications, and to store the data group in a selected application block and the computed error check code in the protected block in the location associated with the selected application block when the data group is sent from the terminal,

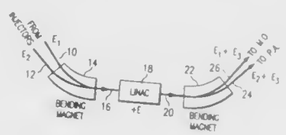
(b) to detect data error in the stored data group in an application block accessed from the terminal by using the data group and the error check code thereof when the data block is read out to the terminal.

4,930,130

BIMODAL LINEAR ACCELERATOR APPARATUS

Robert J. Burke, 1991 Rayshire St., Thousand Oaks, Calif. 91362

Filed Nov. 29, 1988, Ser. No. 277,158
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—2 **7 Claims**



1. A Multipurpose free electron laser apparatus comprising, in combination:

an electron injector first means for providing a first stream of. electrons at a first energy level;

an electron injector second means for providing a second stream of electrons at a second energy level which second level is higher than said first energy level;

a linear accelerator third means, including input means and output means, for increasing the energy of any electrons passing therethrough between said input means and said output means;

a bending magnet fourth means, including input means and output means, positioned and aligned between said first and second means and said third means said first stream of electrons is deflected more than said second stream of electrons and further whereby the two beams follow a common path upon exiting said fourth means at said output means thereof on the way to said third means;

a load fifth means for receiving said first stream of electrons;

a load sixth means for receiving said second stream of electrons; and

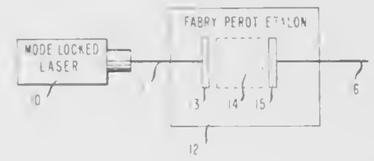
a bending magnet seventh means, including input means and output means, positioned and aligned between said third means and said fifth and sixth means in a manner whereby said first stream of electrons is deflected more than said second stream of electrons and further whereby the two beams follow a common path into said seventh means while exiting in separate paths toward said fifth and sixth means in accordance with their respective beam energy levels.

4,930,131

SOURCE OF HIGH REPETITION RATE, HIGH POWER OPTICAL PULSES

Theodore Sizer, II, Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 6, 1989, Ser. No. 294,034
Int. Cl.[5] H01S *3/098*
U.S. Cl. 372—18 **18 Claims**



1. An optical device for generating a stream of optical pulses comprising:

a source of modelocked optical pulses occurring at a first repetition rate, and

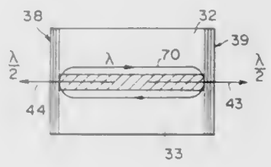
means coupled optically to said source for selecting at least two predetermined spectral modes output from said source to generate a stream of optical pulses at a second repetition rate, said second repetition rate being higher than the first repetition rate.

4,930,132

SECOND HARMONIC WAVE GENERATING DEVICE HAVING ACTIVE LAYER AND SECOND HARMONIC WAVE GENERATING LAYER ON SAME SUBSTRATE

Akira Shimizu, Inagi, and Sotomitsu Ikeda, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,457
Claims priority, application Japan, Dec. 28, 1987, 62-334972; Jun. 14, 1988, 63-144867
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—22 **21 Claims**

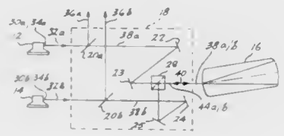


1. A second harmonic wave generating device comprising:

a substrate;

an active layer on said substrate for generating light of a wavelength λ in response to injection of a current;
a layer of a material on said substrate for generating light of a wavelength λ/2 from the light generated in said active layer; and
a pair of electrodes for supplying said active layer with a current.

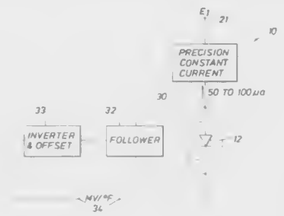
4,930,133
MULTIPLE LASER FREQUENCY STABILIZATION
William R. Babbitt, Bellevue; Raymond G. Beausoleil, Redmond, and David A. Leep, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Jun. 5, 1989, Ser. No. 361,148
Int. Cl.[5] H01S *3/13*
U.S. Cl. 372—32 **12 Claims**



1. A system for producing first and second laser beams having a stable frequency difference therebetween, the system comprising:
a first laser including a first optical input port, a first optical output port and means for producing the first laser beam at the first optical output port;
a second laser including a second optical input port, a second optical output port, and means for producing the second laser beam at the second optical output port;
an optical resonator; and,
coupling means including means for coupling portions of the first and second laser beams into the resonator such that the resonator produces first and second optical feedback beams, respectively, means for coupling the first optical feedback beam into the first input port, and means for coupling the second optical feedback into the second input port;
whereby the optical resonator provides optical feedback to each laser such that each laser locks to a resonant mode of the optical resonator.

4,930,134
PRECISION TEMPERATURE SENSOR
Anthony F. Macaione, Missouri City, and John V. Wright, Stafford, both of Tex., assignors tn Reiton Corporation, Houston, Tex.
Filed Jun. 5, 1989, Ser. No. 361,364
Int. Cl.[5] H01S *3/00, 3/13*
U.S. Cl. 372—33 **15 Claims**

1. A laser control system comprising:
(a) a laser emitting a light beam therefrom capable of illumination;
(b) a photodiode exposed to the laser in near proximity thereto for receiving illumination thereof;
(c) an optical feedback control means connected to said photodiode for providing a control signal for a laser power supply wherein the laser power supply provides controlled power for operation of said laser; and
(d) means for selectively switching the photodiode into connection with said control means for operation of said laser subject to control as measured by said photodiode,



and wherein said photodiode and said laser are supported for exposure to a common temperature.

4,930,135
LASER OSCILLATOR DEVICE
Norio Karube, Machida; Akira Egawa, Minamitsuru; Etsuo Yamazaki, Hachioji; Nobuaki Ichisa, Minamitsuru, and Mitsuo Manabe, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP88/00426, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO88/08630, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 28, 1988, Ser. No. 283,479
Claims priority, application Japan, Apr. 30, 1987, 62-107827
Int. Cl.[5] H01S *3/00*
U.S. Cl. 372—33 **9 Claims**

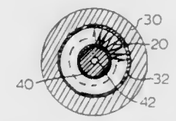


1. A laser oscillator device for applying a high-frequency voltage to a plurality of discharge regions through a dielectric to produce a high-frequency discharge for laser pumping, comprising:
DC power supply means for providing a DC voltage; and
high-frequency power supply means for converting the DC voltage into a high-frequency voltage, the DC power supply coupled to each other to prevent electromagnetic and other interferences, thereby stabilizing said laser oscillator.

4,930,136
SEGMENTED AIR COOLED LASER TUBE
Edwin G. Chaffee, Salt Lake City, Utah, assignor to American Laser Corporation, Salt Lake City, Utah
Filed Mar. 7, 1989, Ser. No. 319,661
Int. Cl.[5] H01S *3/03*
U.S. Cl. 372—62 **6 Claims**

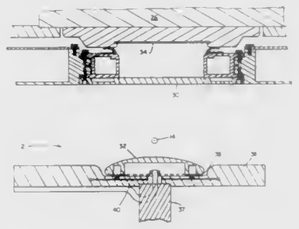
1. A laser tube comprising:
(a) a plurality of axially-aligned, elongated, thin wall cylindrical segments of electrically-insulating material successively disposed between electrodes at anode and cathode ends in hermetically bonded relationship with one another and forming an outer wall of the laser tube, each said cylindrical segment defining within the wall thereof a longitudinal extending central cavity;
(b) a plurality of axially-extending and axially-spaced heat

dissipating fin structures supported within and secured to the internal wall of each segment, each fin structure having a central cavity aligned with the central cavity of other fin structures within the same segment;
(c) a ferrule within each fin structure cavity providing a plurality of axially-spaced ferrules in each segment having an overall length less than the length of the segment in



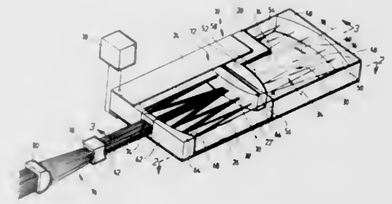
which such plurality of ferrules are installed, said segments each containing plural said ferrules establishing a gas discharge bore;
(d) metallic securing means disposed between and bonded to the facing end surfaces of adjacent ones of said cylindrical segments; and
(e) means operatively associated with said fin structures and ferrules establishing a gas return path.

4,930,137
INORGANIC TRIPLE POINT SCREEN
Edward G. Sergoyan, 18716 198th Ave., NE., Woodinville, Wash. 98072, and Michael von Dadelszen, 11811 103rd Ave., NE., Kirkland, Wash. 98034
Filed Nov. 8, 1988, Ser. No. 268,736
Int. Cl.[5] H01S *3/097*
U.S. Cl. 372—81 **10 Claims**



1. An insulator assembly for use with an electrode of an electrical discharge device containing a discharge gas, the electrode being held at a predetermined electrical potential with respect to a ground potential and generating an electric field adjacent the electrode, the insulator assembly comprising:
a block of an inorganic dielectric material, the block being contoured to receive the electrode and thereby defining a triple point where the dielectric material, the electrode, and the discharge gas meet, and
a conductive screen positioned to a side of the block of inorganic dielectric material away from the electrode, the screen being connectable to the predetermined electrical potential and extending in close proximity to the triple point, whereby the electric field intensity at the triple point is reduced.

4,930,138
WAVEGUIDE LASER SYSTEM
Hans Opower, Krailling, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt, Bonn, Fed. Rep. of Germany
Filed Aug. 24, 1989, Ser. No. 399,030
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 3828952
Int. Cl.[5] H01S *3/08*
U.S. Cl. 372—95 **34 Claims**



1. An electrically excited, diffusion-cooled laser system comprising two wall surfaces slightly spaced from one another and forming an optical waveguide, the width of said wall surfaces being a multiple of the space between them and said surfaces enclosing between them a flow-free discharge chamber, and also comprising an optically unstable resonator having a resonator axis extending approximately parallel to said wall surfaces and having a resonator beam path travelling through at least part of said discharge chamber, said beam path extending generally along and transversely away from said resonator axis to a point at which said beam path exits from said resonator into a laser amplifier having an amplifier beam path that travels through an additional part of said discharge chamber whereby a surface area of said waveguide can be maximized without degrading beam quality.

4,930,139
SPREAD SPECTRUM COMMUNICATION SYSTEM
Donald G. Chandler, Princeton; Steve J. Nossen, Somerset, and Raymond W. Simpson, Hamilton Square, all of N.J., assignors to O'Neill Communications, Inc., Princeton, N.J.
Filed May 31, 1989, Ser. No. 359,206
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 **19 Claims**

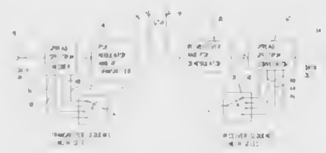


1. A digital communication system comprising:
input means for inputting a digital information signal, at a data rate, to be transmitted;
a chip stream generator means connected to said input means for converting said information signal into a chip stream having a chip rate greater than said data rate;
scrambler means for scrambling said chip stream to produce a scrambled chip stream signal; and
output means connected to said scrambler means for transmitting said scrambled chip stream signal as a radio signal.

4,930,140
CODE DIVISION MULTIPLEX SYSTEM USING SELECTABLE LENGTH SPREADING CODE SEQUENCES

Peter K. Cripps, New Hope, and Michael A. Plotnick, Southampton, both of Pa., assignors to Agilis Corporation, Mountain View, Calif.

Filed Jan. 13, 1989, Ser. No. 297,412
Int. Cl.[5] H04K *1/00*
U.S. Cl. 375—1 15 Claims



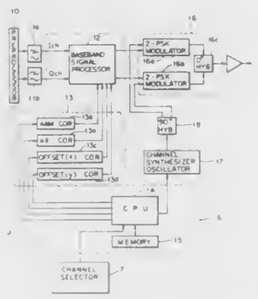
1. A method of communicating an input data signal between a transmitter and a receiver in a spread spectrum code division multiplex system, said method comprising the steps of:
selecting a transmitter spread spectrum spreading code sequence of a given length at said transmitter;
generating said transmitter spread spectrum spreading code sequence of said selected given length;
selecting a transmitter time delay substantially equal to the length of said selected transmitter spread spectrum spreading code sequence;
differentially encoding said spread spectrum spreading code sequence in accordance with said input data signal using said selected transmitter time delay; transmitting said differentially encoded spread spectrum spreading code sequence as a spread spectrum signal; and at said receiver;
receiving said differentially encoded spread spectrum spreading code sequence;
selecting a receiver time delay corresponding to a given length of a receiver spread spectrum spreading code sequence said receiver time delay having a length substantially equal to the length of said selected transmitter time delay;
differentially correlating said received spread spectrum signal with said selected given length of said receiver spread spectrum spreading code sequence using said selected receiver time delay substantially equal to the length of said selected receiver spread spectrum spreading code sequence to recover said input data signal.

4,930,141
MULTI-PHASE PSK MODULATION APPARATUS

Shinichi Ohmagari, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 226,012
Claims priority, application Japan, Jul. 31, 1987, 62-190127
Int. Cl.[5] H04L *25/49*
U.S. Cl. 375—60 1 Claim

1. A four-phase PSK modulation apparatus comprising:
(a) a four-phase PSK modulator comprising two sets of two-phase PSK modulators and a combiner to in-phase synthesize outputs thereof, for four-phase PSK modulating two carrier waves input to the two-phase PSK modulators by baseband signals respectively input to the two-phase PSK modulators, said two carrier waves having the same frequency but being different from each other in phases for 90°;
(b) a channel synthesizer for generating a carrier wave of a variable frequency;
(c) a 90° hybrid for receiving the carrier wave generated by the channel synthesizer, generating the two carrier waves, and transmitting them to the four-phase PSK modulator;
(d) a memory for storing modification data corresponding to various frequencies of the carrier waves;
(e) a central processing unit for receiving a frequency selection signal from a channel selector and controlling the variable frequency of the carrier wave to be generated by the channel synthesizer to the selected frequency and reading out from the memory the modification data corresponding to the selected frequency;

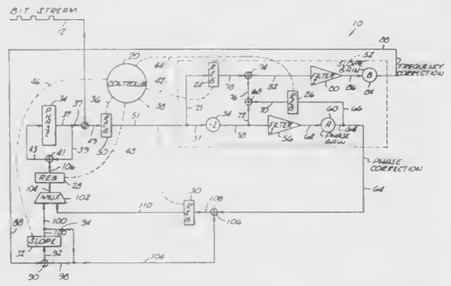


(f) a corrective network for controlling amounts of modification to be added to the baseband signal with respect to an offset error, an amplitude error and an orthogonality error in outputs of the four-phase PSK modulator, in response to the modification data read out by the central processing unit; and
(g) a baseband signal process for adding to the baseband signals the modifications in the amounts controlled by the corrective network and transmitting the modified baseband signals to the four-phase PSK modulator.

4,930,142
DIGITAL PHASE LOCK LOOP

Douglas L. Whiting, South Pasadena, and Glen A. George, Pasadena, both of Calif., assignors to STAC, Inc., Pasadena, Calif.

Filed Dec. 6, 1988, Ser. No. 281,305
Int. Cl.[5] H03D *3/20*
U.S. Cl. 375—120 14 Claims

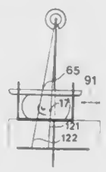


1. A method for generating a digital clock signal which is frequency and phase referenced to an external digital data signal, the phase of said digital data signal initialized to a phase lock point arbitrarily determined, the slope of said digital clock signal initialized to a desired initial slope value, said external digital data signal subject ot variations in data frequency and high frequency jitter unrelated to changes in said data frequency, said method comprising the steps of:
for each clock cycle of said digital clock signal;
adding the value of slope of the clock signal to the value of phase of the digital data signal to obtain an uncompensated value of phase, generating a clock pulse when said uncompensated value of phase is greater than or equal to a predetermined value, and reinitializing the value of phase by subtracting said predetermined value from said value of phase, minitoring said external digital data signal for a pulse of said external digital data;
operative when said pulse of external digital data is detected, subtracting said phase lock point from the value of phase to determine phase error, filtering said phase error to generate a phase correction value, adding said phase correction value to said uncompensated phase value to obtain a compensated phase value, determining the difference between the phase error for the current clock cycle and the previous clock cycle to obtain an uncompensated value of slope error, filtering said slope error to generate a slope correction value, adding the slope correction value to the slope to obtain a compensated slope value, and adding the compensated slope value to the compensated phase value to obtain a new phase value, said new phase value being the starting phase value of the next clock cycle, whereby the phase and/or slope are compensated in order to generate a digital clock signal which closely references said external digital data signal.

4,930,143
METHOD AND DEVICE FOR MAMMOGRAPHIC STEREOTACTIC PUNCTION OF PATHOLOGICAL LESIONS IN THE FEMALE BREAST

Bengt Lundgren, Norra Ringvägen 23, S-803 57 Gävle, and Anders Wallner, Skvattramsvägen 17, S-803 62 Gävle, both of Sweden

PCT No. PCT/SE87/00423, § 371 Date Jul. 13, 1988, § 102(e) Date Jul. 13, 1988, PCT Pub. No. WO88/01847, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 21, 1987, Ser. No. 199,033
Claims priority, application Sweden, Sep. 19, 1986, 8603965
Int. Cl.[5] A61B *6/04*
U.S. Cl. 378—37 4 Claims

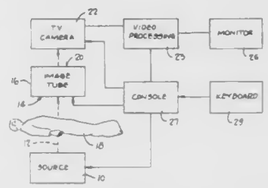


1. A mammographic unit for use in stereographic localisation in a breast of a lesion suspected of being cancerous, said unit comprising:
a stand;
an x-ray tube mounted on the stand so as to emit an x-ray beam in a defined field;
a holder means, laterally slidable with respect to said beam between a first imaging position within said field and a second imaging position within said field, for receiving a breast and for restraining the breast in a fixed shape, the fixed shape being maintained when the holder means is displaced between said first and second positions; and
means for holding a film, located within the x-ray field and held stationary relative to the x-ray tube, in a position such that a first picture of said breast taken at the first imaging position and a second picture of the breast taken at the second imaging position will be located side by side on the film.

4,930,144
RADIATION IMAGING MONITOR CONTROL IMPROVEMENT

Leonard F. Plut, Willowick, and David Nicolay, Fairview Park, both of Ohio, assignors to Picker International, Inc., Cleveland, Ohio

Continuation of Ser. No. 936,470, Nov. 25, 1986. This application May 25, 1988, Ser. No. 203,510
Int. Cl.[5] H05G *1/64*
U.S. Cl. 378—99 7 Claims

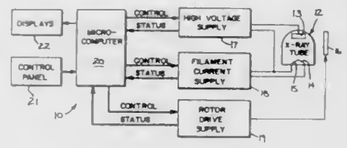


1. A radiation imaging system comprising:
(a) a source of penetrative radiation;
(b) acquisition means for detecting patterns of radiation from said source and for producing a video output representing said patterns in accordance with one of a set of selectable acquisition modes;
(c) control means for operating said acquisition means in accordance with a selected one among said set of operating modes;
(d) a monitor including input circuitry coupled to receive said video output and means including a cathode ray tube and an electron gun to produce in raster format a visual image corresponding to said radiation patterns represented by said video output, and means for adjusting the aspect ratio of said visual image;
(e) circuit means automatically operable on said monitor for adjusting the aspect ratio of said image acceptable by said monitor as a function of the format of said operating mode which is selected by said control means, and
(f) circuit means for adjusting the brightness of said image as a function of the aspect ratio of said image produced by said monitor.

4,930,145
X-RAY EXPOSURE REGULATOR

Karl F. Sherwin, and Manfred D. Boehm, both of Waukesha, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 15, 1988, Ser. No. 232,498
Int. Cl.[5] H05G *1/32*
U.S. Cl. 378—109 13 Claims



1. In an X-ray imaging apparatus having an X-ray tube, a source of an excitation voltage for the tube, and a source of filament current for the tube, the improvement being a filament current regulating circuit comprising:
a first means for comparing the filament current to a predefined reference current value;
a second means for comparing the excitation voltage to a predefined reference voltage value; and
means for regulating the filament current applied to the tube,

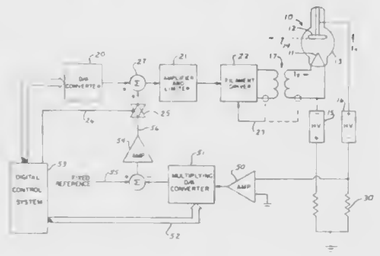
said means for regulating being responsive to only the first means for comparing during a first period of time from the start of an X-ray exposure, and after the first period of time being responsive to the second means for comparing.

4,930,146

X-RAY TUBE CURRENT CONTROL WITH CONSTANT LOOP GAIN

Gerald K. Flakas, Oconomowoc, and Harold J. Dalman, Brookfield, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jul. 10, 1989, Ser. No. 377,353
Int. Cl.[5] H05G *1/34*
U.S. Cl. 378—110 **3 Claims**



1. In a current control system for an x-ray tube having a filament driver which supplies current to the x-ray tube filament in response to a preheat command signal, the improvement comprising:

means for producing a tube current feedback signal which indicates the amount of current flowing between the filament and the anode of the x-ray tube;

means for producing a command signal which is proportional to the reciprocal of a tube current command;

multiplying means for multiplying the tube current feedback signal by the command signal to produce a tube current error signal;

subtraction means for subtracting the tube current error signal from a reference signal to produce a corrected tube current error signal;

summing means for combining the preheat command signal with the corrected tube current error signal to produce a filament command signal to control the tube filament temperature and cause the tube current to attain a value indicated by the tube current command; and

means for supplying said filament command signal to said filament drive.

4,930,147

CASSETTE FILM TRANSPORT

Paul E. Dieterlen, Kenton, Ky., and Lewis B. Mustain, Cincinnati, Ohio, assignors to Liebel-Flarsheim Company, Cincinnati, Ohio

Division of Ser. No. 45,877, May 1, 1987, Pat. No. 4,845,733.
This application Apr. 13, 1989, Ser. No. 337,647
Int. Cl.[5] G03B *42/02*
U.S. Cl. 378—176 **9 Claims**

1. An x-ray film apparatus comprising:

a housing;

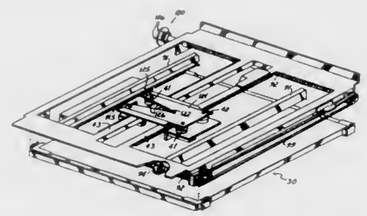
movable carriage means within said housing and movable relative said housing along a first path for moving an x-ray film cassette between a loading station and an x-ray station;

first drive means coupled to said carriage means for driving said carriage means between said stations;

cassette loading means attached to said movable carriage means for moving the cassette along a second path into and out of said carriage meas;

second drive means at said loading station for driving said cassette loading means whereby to move the cassette; and

interconnect means for selectively, physically connecting and disconnecting said second drive means to and from



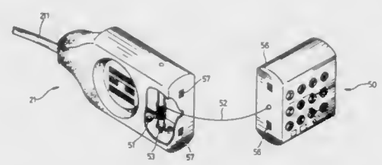
said cassette loading means, said second drive means being physically connected to said cassette loading means when said carriage means is at said loading station, said second drive means being physically disconnected from said cassette loading means when said carriage means is spaced away from said loading station.

4,930,148

HEADBAND RADIOPHONE COMBINATION SET

Hsiao-Chung Lee, 3F1., No. 77-8, Jenn Chien Street, Shu Lin Town, Taipei Hsien, Taiwan

Filed Oct. 23, 1989, Ser. No. 425,672
Int. Cl.[5] H01Q *7/04*
U.S. Cl. 379—58 **7 Claims**



1. A headband radiophone combination set, including comprising:

a headband radiophone including a circular supporting band having mounted thereon a charging board, a miniature antenna and a ringer and having connected thereto a first and a second adjusting bar respectively at both ends a main earphone having set therein a control circuit, a receiver-transmitter circuit, and a volume control knob, and being pivotably connected with a mouthpiece link at one end and fixedly connected with said first adjusting bar at the other end, an auxiliary earphone connected to said second adjusting bar by means of a connection, a mouthpiece fixedly connected to said mouthpiece link, and a keyboard movably connected to said mouthpiece; and

a main switching unit, comprising an input key portion for signal input, a receiver and a mouthpiece and a hand set for communication, a volume control knob for volume control, a receiver-transmitter circuit and an antenna for transmitting signal input through said input key portion to said headband radiophone;

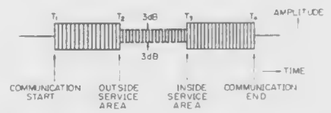
characterized in that said headband radiophone uses its control circuit, receiver-transmitter circuit and miniature antenna to reciprocally communicate with the antenna and the receiver-transmitter circuit of said main switching unit for internal, external or regular alternative telecommunication.

4,930,149

CORDLESS TELEPHONE COMMUNICATION SYSTEM

Kouji Matsushima, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 13, 1989, Ser. No. 406,564
Claims priority, applicatioo Japan, Sep. 13, 1988, 63-229264
Int. Cl.[5] H04B *7/26*
U.S. Cl. 379—61 **9 Claims**



1. A cordless telephone communication system wherein provision is made of a base unit and a handset unit connected to said base unit through a radio transmission channel and communication is performed between a remote telephone set and said handset unit through a public telephone line connected to said base unit, wherein provision is made in the said base unit of:

a detection means which detects if the handset unit is out of a service area by signals received from said handset unit and

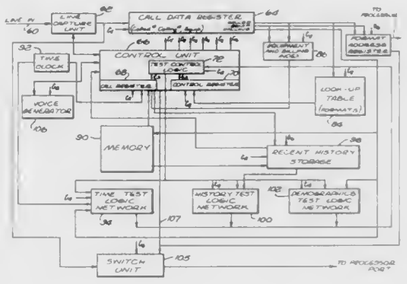
a semi-mute means for reducing the level of said received signals to lower than the level of said received signals in the case where the handset unit is within the service area by detection output from said detection means.

4,930,150

TELEPHONIC INTERFACE CONTROL SYSTEM

Ronald A. Katz, Los Angeles, Calif., assignor to First Data Resources Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 18,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of Ser. No. 753,299, Jul. 10, 1985, abandoned. This application Oct. 20, 1988, Ser. No. 260,104
The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.
Int. Cl.[5] H04M *11/06*
U.S. Cl. 379—93 **19 Claims**



1. An interface control system for use with, (1) a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of format, said interface control system comprising:

call data means for receiving calls from said remote terminals in association with ports of said multiple port, multiple format processor, said calls providing signalrepresented call data to said call data means;

selection means for selecting one format of said plurality of formats of said multiple port, multiple format processor, said selection means being controlled by said signal-represented call data from a calling remote terminal to thereby specify defined conditions for a connection to said multiple port, multiple format processor, at least one of said formats having at least one specified condition;

test means for testing the specified defined conditions for a calling remote terminal to provide approval signals; and

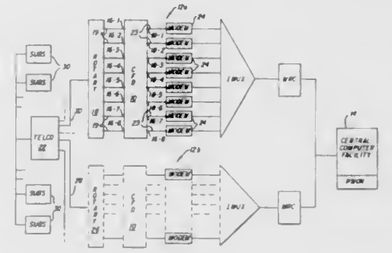
interconnect switch means for providing connections from the ports of said multiple port, multiple format processor to a calling remote terminal under control of said approval signal from said test means.

4,930,151

TELEPHONE CALL FORWARDING DEVICE

Paul B. Walton, Silver Spring; James Keough, Rockville, both of Md.; Richard L. Demers, Dale City, Va.; Leland A. Denny, Jr., Frederick, Md.; Robert E. Kaiser, Rockville, Md.; Cornellius Moses, Jr., Silver Spring, Md., and Vijay N. Wagh, Derwood, Md., assignors to General Electric Company, N.Y.

Filed May 16, 1989, Ser. No. 352,515
Int. Cl.[5] H04M *11/06, 3/54*
U.S. Cl. 379—94 **36 Claims**



1. A call forwarding device for installation between a telephone rotary switch having a plurality of outlet ports and an array of separate modems of a facility answering site, said call forwarding device including, in combination:

A. a channel bus including a plurality of alternate telecommunications channels,

B. a plurality of channel switches, each said channel switch having

(1) a rotary port connected with a different one of the rotary switch outlet ports,

(2) a modem port connected with a different modem of the modem array,

(3) an internal telecommunications channel normally interconnecting said rotary and modem ports,

(4) switching means selectively connecting its said channel switch into any one of said alternate channels; and

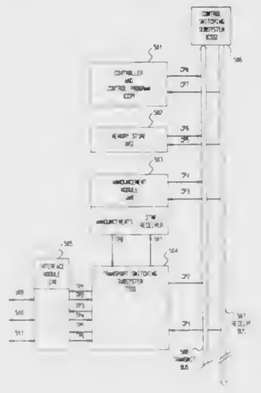
C. a central processing unit connected to each said channel switch by a system bus, said central processing unit acting in response to the failure of modem connected to said modem port of a first one of said channel switches to timely answer a telephone call inbound on said rotary port thereof to select an available second one of said channel switches and an available one of said alternate channels and to condition said switching means of said first and second ones of said channel switches such as to re-route the telephone call from said first one to said second one of said channel switches over said available one of said alternate telecommunications channels.

4,930,152

CALL RETURN TELEPHONE SERVICE

Patrick A. Miller, Red Bank, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 31, 1988, Ser. No. 238,738
Int. Cl.[5] H04M *3/50*
U.S. Cl. 379—214 **15 Claims**



12. A method of controlling a local telephone switch comprising memory and aural message announcement means to provide a subscribing customer access from any telephone station to specialized telephone call service associated with the customer telephone station served by said switch, said method comprising;

(a) storing in said memory a personal identification number (PIN) specific to said customer;

(b) storing in said memory an identifier of said customer station;

(c) acquiring an identifier of a party calling said customer station;

(d) retrieving from said memory said customer station identifier;

(e) comparing said customer station identifier with said calling party identifier;

(f) delivering aurally to said calling party from said message announcement means, in the event of a matching comparison of said identifiers, a request for the inputting of a PIN at the station of said calling party;

(g) retrieving from said memory said customer-specific PIN;

(h) comparing said customer-specific PIN with said calling party PIN; and

(i) providing said calling party, in the event of a matching comparison of said PINs, access to said specialized service.

4,930,153

PBX VOICE MAIL INTERFACE

Guenter E. Hagedorn, Minnetonka, Minn., assignor to Nicollet Technologies, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 169,964, Mar. 18, 1988, abandoned. This application Apr. 7, 1989, Ser. No. 338,514
Int. Cl.[5] H04M *3/50, 7/14*
U.S. Cl. 379—233 **1 Claim**

1. A POTS-to-PBX interface comprising:

first connection means for connecting to a POTS (Plain Old Telephone Surface) telephone line;

second connection means for connecting to a PBX (private branch exchange) telephone line;

a network separation relay connected between said first connection means and said second connection means;

a termination impedance selectively connected to said first connection means;

a battery source selectively connected to said second connection means;

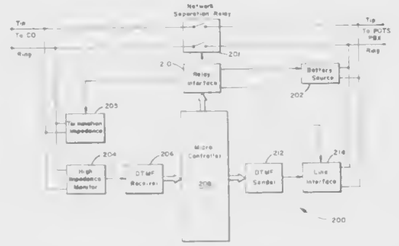
a receiver connected to said first connection means;

a transmitter connected to said second connection means; and

control means connected to said network separation relay, said termination impedance, said battery source, said receiver and said transmitter for performing the steps of:

(a) receiving the telephone number of a called party from the PBX through the receiver;

(b) storing in memory the digits of the received telephone number;



(c) monitoring the second connection means for a request to transmit the stored telephone number;

(d) receiving a request to transmit the stored telephone number;

(e) opening the network separation relay and simultaneously connecting the termination impedance to the first connection means and connecting the battery source to the second connection means;

(f) transmitting the stored telephone number; and

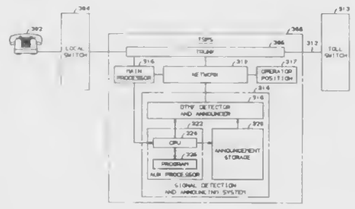
(g) closing the network separation relay and simultaneously disconnecting the battery source from the second connection means and the termination impedance from the first connection means.

4,930,154

AUDIBLE LOGO FOR IDENTIFYING A COMMON CARRIER

Thomas M. Bauer, Belle Mead; Thomas A. Dunn, Edison, both of N.J.; Christina M. Gurke, Naperville, Ill.; John W. Hopkins, Woodridge, Ill., and Richard D. Nafziger, Wheaton, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 21, 1989, Ser. No. 341,458
Int. Cl.[5] H04M *3/42*
U.S. Cl. 379—246 **30 Claims**



1. A method of processing a call from an originating customer to a terminating customer station over one of a plurality of common carrier networks, comprising the steps of:

responsive to receipt of a toll call, determining the identity of one of said common carriers for serving said toll call;

responsive to said determining, establishing a connection for said call to a common carrier switch serving said one common carrier;

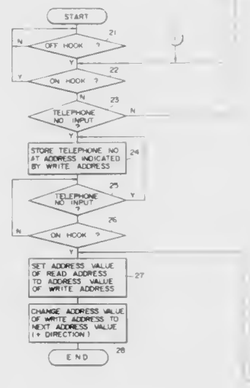
in said switch, responsive to said determining, prior to connecting said call to an operator position and prior to receipt of billing information from said originating customer, connecting said call to a source of an audible logo identifying said carrier.

4,930,155

MULTIPLE REDIALING SYSTEM

Shunji Kurokawa, Zama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,564
Claims priority, application Japan, Dec. 24, 1987, 62-328130
Int. Cl.[5] H04M *1/272*
U.S. Cl. 379—354 **8 Claims**



1. A radial system for use in a telephone unit having a handset and connected to a telephone network, comprising:

a plurality of manual selection buttons for inputting a phone number;

storing means for automatically storing the phone number in a memory immediately after the phone number is input, said memory having a capacity for storing a plurality of phone numbers;

input means connecting said plurality of manual selection buttons to said storing means;

retrieval means for retrieving the plurality of phone numbers located in the memory of said storing means on a last-in-first-out basis;

display means for displaying a desired phone number retrieved by said retrieval means; and

automatic call dialing means for automatically calling the desired phone number displayed on said display means when said handset is in an off-hook state.

4,930,156

TELEPHONE RECEIVER TRANSMITTER DEVICE

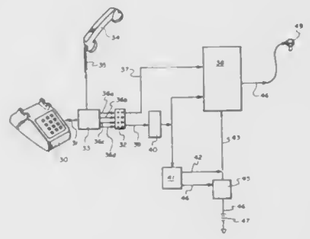
Elwood G. Norris, Poway, Calif., assignor to Norcom Electronics Corporation, Poway, Calif.

Filed Nov. 18, 1988, Ser. No. 273,216
Int. Cl.[5] H04R *1/06*
U.S. Cl. 379—388 **19 Claims**

1. A telephone speaker/microphone device for positioning at a user's ear and for coupling to microphone and speaker leads of a telephone or other communication device to enable hands-free communication in duplex mode without use of a handset, said device comprising:

control circuitry including telephone coupling leads for attachment to the telephone microphone and speaker leads for receiving incoming voice signals from the telephone and for transmitting outgoing voice signals from speaker microphone device to the telephone, said circuitry including secondary leads for transmittance of the respective voice signals to and from a speaker/microphone combination for positioning at the ear and separate from the telephone handset;

a speaker element including positive and negative input leads for driving the speaker element and being configured in size and shape for positioning at the ear, said speaker element being part of the speaker/microphone combination;



a microphone element having an attached drive line capable of carrying voice signal and being configured in size and shape for positioning at the ear and proximate to the speaker element, said speaker element being part of the speaker/microphone combination;

said speaker element and microphone element being wired such that voice signal carried on the drive line of the microphone element is approximately 180 degrees out of phase with voice signal delivered to the speaker element and being physically positioned sufficiently close to result in cancellation of feedback; and

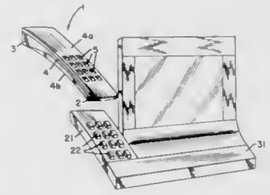
means for transmitting voice signal between the speaker/microphone combination and the control circuitry to electronically couple the speaker and microphone elements to the corresponding secondary leads of the control circuitry.

4,930,157

TELEPHONE HANDSET HAVING APERTURES FOR KEY ACCESS

Howard Citron, Katonah; Eric Chan, and Michael Dolan, both of New York, all of N.Y., assignors to Nynex Corporation, White Plains, N.Y.

Filed May 10, 1989, Ser. No. 350,095
Int. Cl.[5] H04M *1/02*
U.S. Cl. 379—433 **7 Claims**



1. A telephone handset for use with a telephone key pad

VOL
1114
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having a plurality of keys for key actuated dialing, the handset being separate from the key pad and the keys and being able to be brought to a position proximate to the key pad and the keys, the handset comprising:

a transmitter section;

a receiver section,

a body connecting said transmitter and receiver sections, said body having a plurality of apertures each for permitting access to a different one of the keys of the key pad when said body is brought to a position proximate to the key pad.

4,930,158

SELECTIVE VIDEO PLAYING SYSTEM

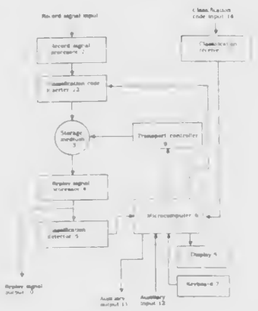
Peter S. Vogel, 28 Adeline St., Faulconbridge, NSW 2776, Australia

Filed Aug. 29, 1988, Ser. No. 237,175

Claims priority, application Australia, Sep. 2, 1987, PI4107

Int. Cl.[5] H04N *7/16*

U.S. Cl. 380—5 **22 Claims**



1. A video recording playing method comprising the steps of:

receiving, from a video storage medium, signals representative of a video program,

processing said signals to produce video signals of a form suitable for display,

detecting a classification code within the signals received from the storage medium, said detected code being indicative of a class of program being played,

inputting from the user a security code number, comparing the number input to a stored number and, if the numbers are equal, enabling selection of a set of classification codes which cause at least one of suspension or termination of playing,

comparing the detected code to said set of classification codes, and

selectively playing the video program according to the result of the comparison.

4,930,159

NETBIOS NAME AUTHENTICATION

Jeffrey K. Kravitz, and Charles C. Palmer, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1989, Ser. No. 298,387

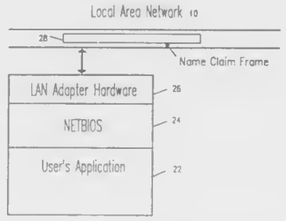
Int. Cl.[5] H04J *15/00*

U.S. Cl. 380—23 **18 Claims**

1. A method for preventing unauthorized workstations from being serviced on a local area network comprising the steps of:

monitoring all broadcast messages on the network to detect name-query messages from workstations attempting to claim names;

decoding a data frame in a name-query message to obtain a



requested name and a unique adapter address of a requesting workstation; and

verifying that a requested name matches a previously assigned adapter address.

4,930,160

AUTOMATIC CENSORSHIP OF VIDEO PROGRAMS

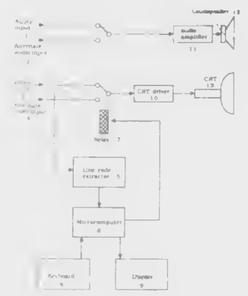
Peter S. Vogel, 28 Adeline Street, Faulconbridge NSW 2776, Australia

Filed Aug. 29, 1988, Ser. No. 237,176

Claims priority, application Australia, Sep. 2, 1987, PI4107

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—23 **26 Claims**



1. A video program reception method comprising the steps of:

storing in memory means a set of codes descriptive of video program classifications,

receiving a video signal and associated audio signal if present,

receiving a program classification code descriptive of said video signal,

accessing said memory means and comparing the contents thereof with said code, and,

if the result of said comparison indicates that the received program is to be displayed, causing the received video signal to be selected for display,

if the result of said comparison indicates that an alternative video signal is to be displayed, causing an alternative source of video signal to be selected for display; and

displaying the selected video signal on a video display means.

DESIGN PATENTS

GRANTED MAY 29, 1990

ERRATA

For CLASS	See PATENT NO.
D08-307	308,244

VOL
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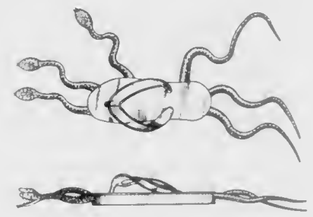
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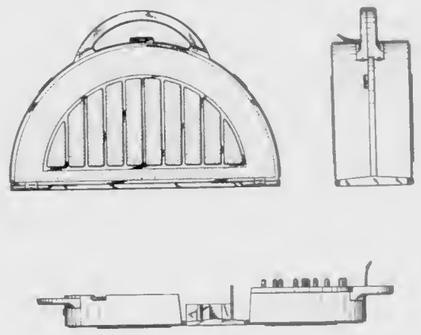
308,125
SANDAL
Peter I. Fraser, 912 Lawrence St., No. 1, Eugene, Oreg. 97401
Filed Jan. 25, 1988, Ser. No. 148,218
Term of patent 14 years
U.S. Cl. D2—270



308,126
SHOE SCUFF COVER
Carol D. Lee, 420 S. 17th Ave., Maywood, Ill. 60153
Filed Sep. 23, 1987, Ser. No. 99,986
Term of patent 14 years
U.S. Cl. D2—271



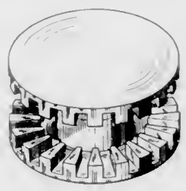
308,127
MINIATURE SEWING BOX
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Nov. 4, 1986, Ser. No. 927,410
Term of patent 14 years
U.S. Cl. D3—20



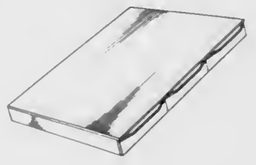
308,128
WATER-BOTTLE
Daniel Paquette, 3132 Desautels Street, Montreal, Canada (H1N 3B7)
Filed Dec. 18, 1986, Ser. No. 946,500
Term of patent 14 years
U.S. Cl. D3—30.1



308,129
TAPE CAROUSEL
Jack G. Walden, Oklahoma City, Okla., assignor to Lebever Co., Oklahoma City, Okla.
Filed Apr. 13, 1987, Ser. No. 37,403
Term of patent 14 years
U.S. Cl. D3—35

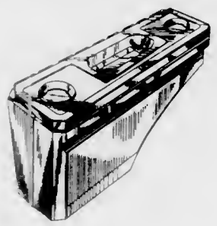


308,130
DISKETTE STORAGE UNIT
John E. Sherry, 2910 Neilson Way, #504, Santa Monica, Calif. 90405
Filed Dec. 3, 1986, Ser. No. 937,520
Term of patent 14 years
U.S. Cl. D3—35



VOL
1114
ISS
5
MY
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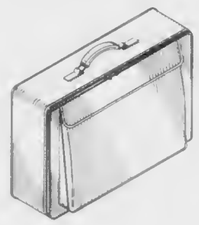
308,131
STORAGE BOX FOR USE IN VEHICLES
Ralph M. Marcantonio, 4343 Industrial Center, San Antonio, Tex. 78217
Filed Jun. 8, 1987, Ser. No. 59,870
Term of patent 14 years
U.S. Cl. D3—40



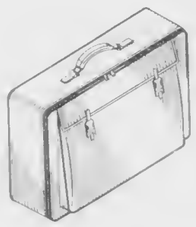
308,132
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 18, 1986, Ser. No. 886,630
The portion of the term of this patent subsequent to May 15, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—71



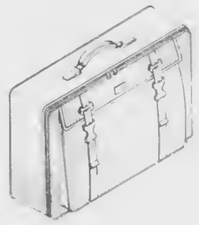
308,133
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 18, 1986, Ser. No. 886,629
The portion of the term of this patent subsequent to May 15, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—71



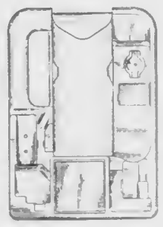
308,134
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 18, 1986, Ser. No. 886,627
The portion of the term of this patent subsequent to May 15, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—71



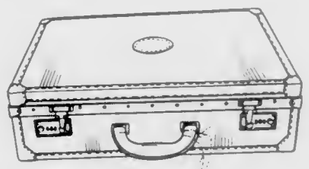
308,135
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 18, 1986, Ser. No. 886,887
The portion of the term of this patent subsequent to May 15, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—71



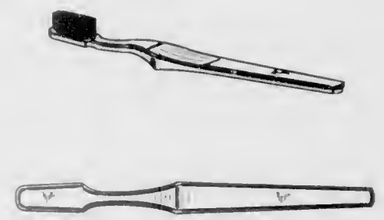
308,136
BASE FOR STORING AND CARRYING A PROPANE TORCH AND ACCESSORIES
David S. Chapin, and William C. Humphrey, both of Raleigh, N.C., assignors to Cooper Industries, Inc., Houston, Tex.
Filed May 1, 1986, Ser. No. 858,520
Term of patent 14 years
U.S. Cl. D3—73



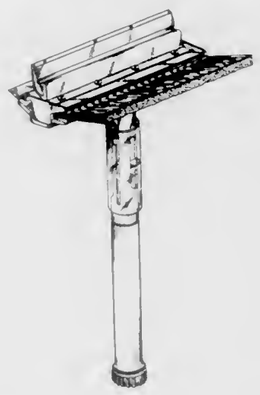
308,137
SUIT-CASE
Francesco Grecchi, Milan, Italy, assignor to Hunting World, Inc., New York, N.Y.
Filed Nov. 24, 1986, Ser. No. 934,528
Claims priority, application Italy, May 30, 1986, 22055/86[U]
Term of patent 14 years
U.S. Cl. D3—76



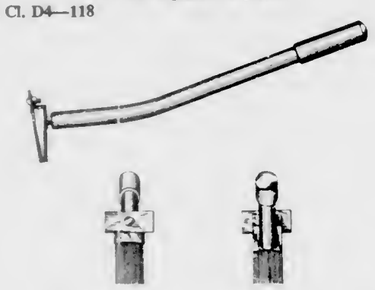
308,138
TOOTHBRUSH
John K. Redmond, Woollahra, Australia, assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.
Filed Nov. 23, 1987, Ser. No. 124,183
Claims priority, application Australia, Jun. 12, 1987, 1685/87
Term of patent 14 years
U.S. Cl. D4—104



308,139
TRIPLE HEAD SURFACE CLEANING DEVICE
Israel Viner, 1411 N. Curson Ave. #1, Los Angeles, Calif. 90046
Filed Apr. 10, 1987, Ser. No. 36,695
Term of patent 14 years
U.S. Cl. D4—118



308,140
COMBINED BRUSH AND SCRAPER
Thomas L. Klamm, 2053 N. Wisconsin St., Racine, Wis. 53402
Filed Sep. 25, 1987, Ser. No. 101,275
Term of patent 14 years
U.S. Cl. D4—118



308,141
CHAIR
John C. Genova; Nancy J. Genova, both of Villa Park, Calif.; George Merganov, Longwood, Fla.. and Charles Genova, La Verne, Calif., assignors to John Charles Designs, Inc., Cerritos, Calif.
Filed Oct. 16, 1989, Ser. No. 421,702
Term of patent 14 years
U.S. Cl. D6—334



308,142
FOLDING CHAIR
Michael C. Wilson, Glen Ellyn, Ill., assignor to Tyke Corporation, Chicago, Ill.
Filed Feb. 20, 1987, Ser. No. 17,196
Term of patent 14 years
U.S. Cl. D6—368



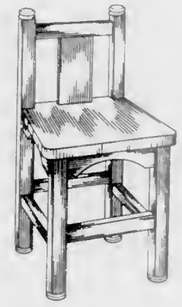
308,143
CHAIR
Hartmut Lohmeyer, Munich, Fed. Rep. of Germany, assignor to Krueger International, Inc., Green Bay, Wis.
Filed Sep. 16, 1985, Ser. No. 776,213
Term of patent 14 years
U.S. Cl. D6—379

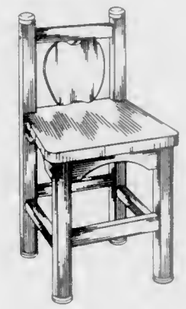


308,144
CHAIR
Richard D. McCarthy, 280 Halcyon Ave., and William P. Taylor, 244 Lamplighter Cir., both of Winston-Salem, N.C. 27104
Filed Mar. 13, 1987, Ser. No. 25,772
Term of patent 14 years
U.S. Cl. D6—380

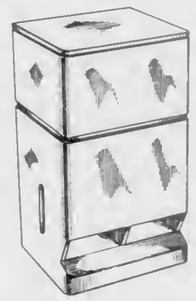


308,145
CHAIR
Phyllis J. Hoff, P.O. Box 1445, Sutter Creek, Calif. 95685
Filed Mar. 9, 1987, Ser. No. 23,524
Term of patent 14 years
U.S. Cl. D6—380

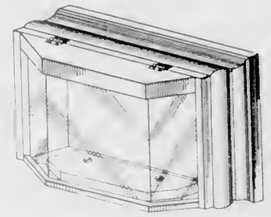




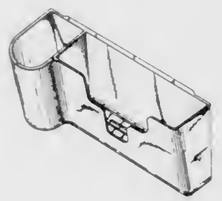
308,146
CONTACT LENS DISPENSER
Edwin A. Speaker, 228 East Ave., Brockport, N.Y. 14420
Filed Jan. 11, 1988, Ser. No. 141,660
Term of patent 14 years
U.S. Cl. D6—515



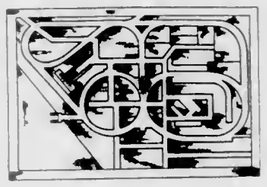
308,147
WALL MOUNTED DISPLAY CASE
Yen Pei-Ai, 5F No. 1, Lane 130, Chaochow St., Taipei, Taiwan
Filed Feb. 26, 1987, Ser. No. 19,224
Term of patent 14 years
U.S. Cl. D6—559



308,148
MAGNETIC-MOUNT SMALL ARTICLE HOLDER
Stephen T. Meyer, Carmel, Ind., assignor to Deflecto Corporation, Indianapolis, Ind.
Filed Dec. 8, 1986, Ser. No. 939,014
Term of patent 14 years
U.S. Cl. D6—567



308,149
PATTERNED MAT FOR TOY VEHICLES
Mary E. Lewis, St. Louis County, Mo., and Priscilla R. Middleton, King County, Wash., assignors to Brio Scanditoy Corporation, Milwaukee, Wis.
Filed Jun. 19, 1987, Ser. No. 63,850
Term of patent 14 years
U.S. Cl. D6—588



VOL
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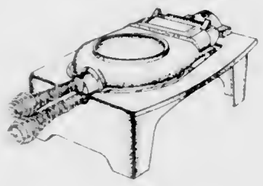
308,150
PILLOW
Stanley Salmirs, 70 W. 40th St., New York, N.Y. 10018
Filed Dec. 6, 1984, Ser. No. 679,125
Term of patent 14 years
U.S. Cl. D6—601



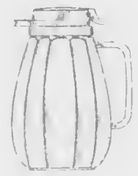
308,151
LADLE
Leo B. Roberts, and Emma F. Roberts, both of Rte. 1, Box 170, Marthasville, Mo. 63357
Filed Oct. 3, 1983, Ser. No. 538,336
Term of patent 14 years
U.S. Cl. D7—691



308,152
WAFFLE IRON
George Tzouflas, 38-15 10th St., Long Island City, N.Y. 11101
Filed Mar. 31, 1986, Ser. No. 847,587
Term of patent 14 years
U.S. Cl. D7—352



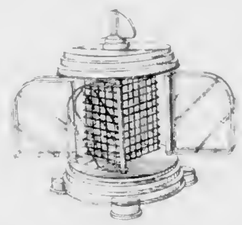
308,153
INSULATED BEVERAGE SERVER
Harry F. Collins, Minnetonka, Minn., assignor to Service Ideas, Inc., Minneapolis, Minn.
Filed Mar. 23, 1987, Ser. No. 29,462
Term of patent 14 years
U.S. Cl. D7—322



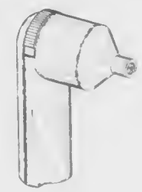
308,154
BABY BOTTLE WARMER
Gregory M. Tow, Ashfield, Australia, assignor to Sunbeam Corporation, Campsie, Australia
Filed Mar. 27, 1987, Ser. No. 32,074
Claims priority, application Australia, Jan. 27, 1987, 0229/87
Term of patent 14 years
U.S. Cl. D7—326



308,155
TOASTER
Brunhilde Lauer, Koppelgasse 5, 3573 Gemuenden, Fed. Rep. of Germany
Filed Dec. 28, 1987, Ser. No. 138,030
Term of patent 14 years
U.S. Cl. D7—328



308,156
MIXER
Jan F. van Asten, Leek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 10, 1986, Ser. No. 884,922
Claims priority, application Benelux, Jan. 17, 1986, 60733-01
Term of patent 14 years
U.S. Cl. D7—379



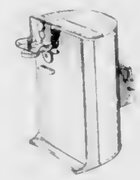
308,157
AUXILIARY HANDLE FOR A SHOVEL
Theodore R. Maxian, 48 Crestmont Rd., Binghamton, N.Y. 13905
Filed Feb. 25, 1987, Ser. No. 18,908
Term of patent 14 years
U.S. Cl. D8—10



308,158
END PORTIONS OF A DOUBLE-ENDED WRENCH
Charles M. Harris, 1071 Casilada Way, Sacramento, Calif. 95822
Filed Apr. 23, 1987, Ser. No. 41,769
Term of patent 14 years
U.S. Cl. D8—21

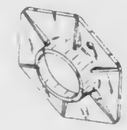


308,159
CAN OPENER
Franz A. Stützer, Offenbach am Main, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Mar. 28, 1988, Ser. No. 174,018
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 5MR10792
Term of patent 14 years
U.S. Cl. D8—35





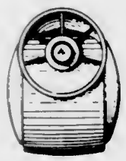
308,160
TORCH STAND
Henry D. Sweeny, Kitchener, and Antonio D. Sabbadin, Waterloo, both of Canada, assignors to Swenco Limited, Waterloo, Canada
Division of Ser. No. 39,059, Apr. 16, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 394,268
Claims priority, application Canada, Oct. 23, 1986, 23-10-86-2
Term of patent 14 years
U.S. Cl. D8—71



VOL
1114
ISS
5
MY
29
1990
UMI

308,161
FURNITURE CASTOR
Raymond R. J. Daniels, Norfolk, England, assignor to Guy-Raymond Engineering Company, Ltd., Norfolk, England
Filed Oct. 7, 1986, Ser. No. 916,463
Claims priority, application United Kingdom, Apr. 9, 1986, 1033324; Apr. 9, 1986, 1033326
Term of patent 14 years
U.S. Cl. D8—375

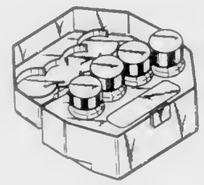




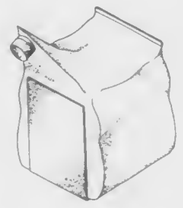
308,162
AEROSOL CONTAINER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Continuation-in-part of Ser. No. 925,931, Nov. 3, 1986. This application Mar. 3, 1987, Ser. No. 21,026
Claims priority, application Japan, Oct. 23, 1986, 61-41736
Term of patent 14 years
U.S. Cl. D9—300



308,163
FLUID CONTAINER OR THE LIKE
Robert C. Hollar, Wildwood, and Tung-Ming Huang, Elk Grove Village, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Jan. 27, 1986, Ser. No. 822,701
The portion of the term of this patent subsequent to Aug. 9, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—341



308,164
FLEXIBLE CONTAINER
Michel Cazes, 84, rue Jean Bouin, 88800 Vittel, France
Filed Oct. 24, 1986, Ser. No. 923,733
Claims priority, application France, Apr. 24, 1986, 140
Term of patent 14 years
U.S. Cl. D9—373



308,165
BOTTLE
Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics Corporation, Howell, N.J.
Filed Oct. 23, 1987, Ser. No. 111,706
Term of patent 14 years
U.S. Cl. D9—375



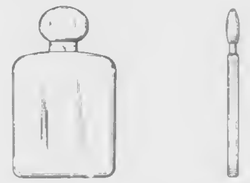
308,166
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio
Filed Feb. 16, 1988, Ser. No. 156,150
Term of patent 14 years
U.S. Cl. D9—375



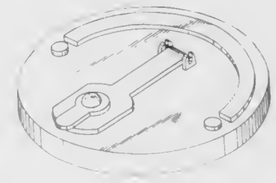
308,167
BOTTLE
Gary D. Holmes, Independence, Mo., assignor to Travomatic Corporation, Kansas City, Mo.
Filed Dec. 21, 1987, Ser. No. 135,284
Term of patent 14 years
U.S. Cl. D9—390



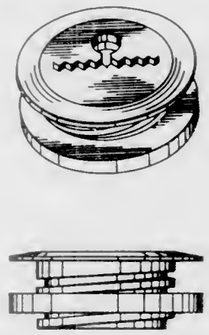
308,168
BOTTLE
Nicola Trussardi, Milan, Italy, assignor to Trussardi S.p.A., Milan, Italy
Filed Jan. 28, 1987, Ser. No. 7,566
Claims priority, application Italy, Jul. 28, 1986, 22664/86[U]
Term of patent 14 years
U.S. Cl. D9—403



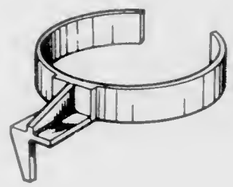
308,169
CAN CAP
Debora S. Auman, #1 Sargeant St., Hampton, Va. 23663
Filed Aug. 20, 1986, Ser. No. 898,089
Term of patent 14 years
U.S. Cl. D9—446



308,170
DISPENSING NOZZLE FOR PLASTIC BAGS
Harry B. Wilfong, Jr., Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.
Filed Jan. 22, 1988, Ser. No. 146,981
Term of patent 14 years
U.S. Cl. D9—447



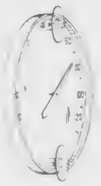
308,171
FEED DIAL TRAVELING INDICATOR
Edward T. Haas, Jr., 6882 Trigo Rd., Goleta, Calif. 93117
Filed Jul. 8, 1987, Ser. No. 71,053
Term of patent 14 years
U.S. Cl. D10—46



308,172
CLINICAL THERMOMETER
Hikaru Ishikawa, and Takashi Sano, both of Tokyo, Japan, assignors to Pigeon Co., Ltd., Tokyo, Japan
Filed Jun. 19, 1987, Ser. No. 64,124
Term of patent 14 years
U.S. Cl. D10—57



308,173
WINDOW THERMOMETER
Robert E. Bescherer, Bristol, and Barry D. Colvin, Hope, both of R.I., assignors to Aspects, Inc., Warren, R.I.
Filed May 24, 1989, Ser. No. 356,286
Term of patent 14 years
U.S. Cl. D10—57



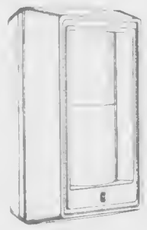
308,174
MEASURING INSTRUMENT
Cornelis E. Rijlaarsdam, 48 Julianastraat, Alphen aan den Rijn, Netherlands
Filed Oct. 9, 1985, Ser. No. 785,826
Term of patent 14 years
U.S. Cl. D10—70



308,175
LIGHTNING DETERRENT
Ihor Sulyma, Atco, N.J., assignor to Cross Keys Manufacturing, Inc., Berlin, N.J.
Filed Apr. 24, 1987, Ser. No. 41,918
Term of patent 14 years
U.S. Cl. D10—105



308,176
MICROWAVE AND PASSIVE INFRARED INTRUSION DETECTOR
Richard Soloway, 2 Richmond Rd., Lido Beach, N.Y. 11566, and Richard Farrell, 84 Claire Ct., West Babylon, N.Y. 11704
Filed Sep. 23, 1986, Ser. No. 910,768
The portion of the term of this patent subsequent to Aug. 22, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—106



308,177
TEMPERATURE ACTIVATED ALARM FOR FIRE FIGHTERS
Frederick A. Parker, Pheasant Run, and Mark P. Grady, Norristown, both of Pa., assignors to Rampart Corporation, Hatboro, Pa.
Filed Feb. 4, 1988, Ser. No. 152,059
Term of patent 14 years
U.S. Cl. D10—106



308,178
COMBINED DIAL AND HANDS FOR A TIMEPIECE
John Zaboyan, 321 Waterside Pl., Little Ferry, N.J. 07643
Filed Feb. 2, 1987, Ser. No. 10,123
Term of patent 14 years
U.S. Cl. D10—124



308,179
EARRING
David Perlmutter, and Jay Perlmutter, both of 520 SW. 62nd Way, Margate, Fla. 33068
Filed Nov. 5, 1986, Ser. No. 927,424
Term of patent 14 years
U.S. Cl. D11—44



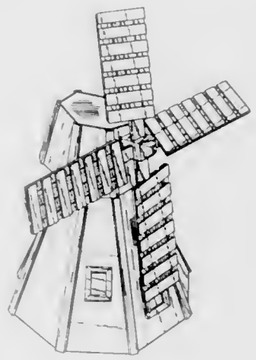
308,180
EARRING OR SIMILAR ARTICLE
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Jul. 13, 1988, Ser. No. 218,042
Claims priority, application Int'l Pat. Institute, Jan. 14, 1988, DM/010065
Term of patent 14 years
U.S. Cl. D11—76



308,181
CHAIN LINKS FOR A WATCHBAND
Damien Munnier, Damprichard, France, assignor to Mannier Freres S.A., Damprichard, France
Filed Nov. 24, 1986, Ser. No. 934,145
Claims priority, application World Int. Prop. O., May 26, 1986, DM/006967
Term of patent 14 years
U.S. Cl. D11—93



308,182
WINDMILL ORNAMENT OR THE LIKE
Henry V. Miller, Box 1366, McAlester, Okla. 74501
Filed Oct. 9, 1987, Ser. No. 116,111
Term of patent 14 years
U.S. Cl. D11—157



308,183
TABLE ORNAMENT
Jean W. Heap, Gwynedd, Wales, assignor to Pendelfin Studios Limited, England
Filed May 18, 1987, Ser. No. 51,040
Claims priority, application United Kingdom, Mar. 6, 1987, 1040552
Term of patent 14 years
U.S. Cl. D11—158



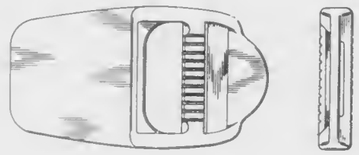
308,184
TABLE ORNAMENT
Doreen N. Roberts, Gwynedd, Wales, assignor to Pendelfin Studios Limited, England
Filed May 18, 1987, Ser. No. 51,074
Claims priority, application United Kingdom, Mar. 6, 1987, 1040551
Term of patent 14 years
U.S. Cl. D11—158



308,185
BOW FOR A PACKAGE
Carol A. Valkner, Rte. 3, Box 76523, 17th Ave., South Haven, Mich. 49090
Filed Oct. 14, 1986, Ser. No. 918,806
Term of patent 14 years
U.S. Cl. D11—184



308,186
FLEXIBLE WEB RESTRAINING BUCKLE
Mark J. Udelhofen, Park Ridge, and Timothy J. Rapinchuk, Des Plaines, both of Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.
Filed Feb. 24, 1987, Ser. No. 18,136
Term of patent 14 years
U.S. Cl. D11—218



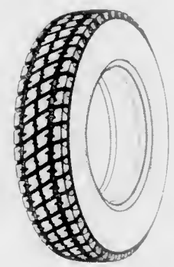
308,187
ARMORED VEHICLE
James A. Ottevaere; James C. LeBlanc, and Richard S. LeBlanc, all of 2340 Alger, Troy, Mich. 48083
Filed May 19, 1986, Ser. No. 864,907
Term of patent 14 years
U.S. Cl. D12—12



308,188
VEHICLE TIRE
Silvana Hinrichsen, and Alessandro Ceccarelli, both of Rome, Italy, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Dec. 18, 1987, Ser. No. 135,191
Claims priority, application Italy, Jul. 16, 1987, 53528/87[U]
Term of patent 14 years
U.S. Cl. D12—146



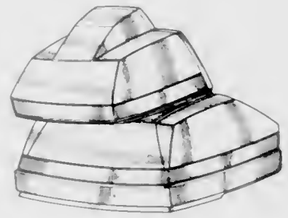
308,189
VEHICLE TIRE
Silvana Hinrichsen, and Alessandro Ceccarelli, both of Rome, Italy, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Dec. 18, 1987, Ser. No. 135,104
Claims priority, application Italy, Jul. 16, 1987, 53527/87[U]
Term of patent 14 years
U.S. Cl. D12—147



308,190
TIRE
Harold D. Fetty, Asheville, N.C., and Deborah K. Vaughn, Mogadore, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 21, 1988, Ser. No. 146,750
Term of patent 14 years
U.S. Cl. D12—147



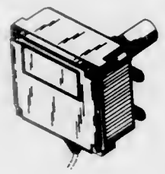
308,191
MOTORCYCLE REAR TRUNK UNIT
Toshiyuki Yamada, Saitama, and Eiji Hamano, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 20, 1987, Ser. No. 123,431
Term of patent 14 years
U.S. Cl. D12—158



308,192
BOAT FENDER
Richard P. Ellison, Alexandria, Va., assignor to Boat America Corporation, Alexandria, Va.
Filed Jan. 25, 1988, Ser. No. 147,918
Term of patent 14 years
U.S. Cl. D12—168



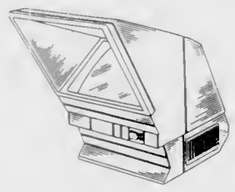
308,193
LEVEL SENSING SWITCH
Mark K. Gaalswyk, R.R. 1, Box 85, Welcome, Minn. 56181
Filed May 1, 1987, Ser. No. 44,570
Term of patent 14 years
U.S. Cl. D13—158



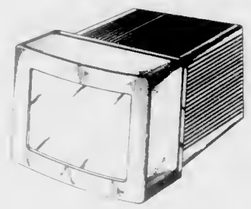
308,194
COMPUTER TERMINAL WITH DETACHABLE KEYBOARD
Stephen J. Messerschmidt, Laguna Hills, and James E. Grove, Van Noys, both of Calif., assignors to Informer, Inc., Garden Grove, Calif.
Filed Jun. 26, 1987, Ser. No. 66,646
Term of patent 14 years
U.S. Cl. D14—106



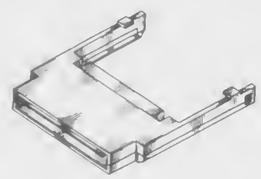
308,195
CRT VISUAL DISPLAY TERMINAL
Frank J. Profumo, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.
Filed Jul. 14, 1986, Ser. No. 885,501
Term of patent 14 years
U.S. Cl. D14—113



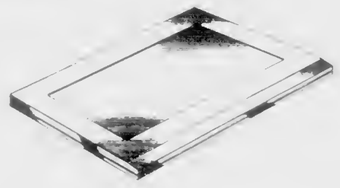
308,196
VIDEO DISPLAY FOR A COMPUTER
Sigmar Willnauer, Portola Valley, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Mar. 23, 1987, Ser. No. 29,407
The portion of the term of this patent subsequent to May 22, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—113



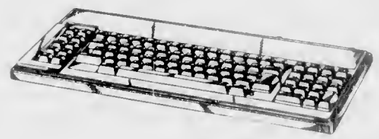
308,197
ADAPTOR FOR A GAME MACHINE CARTRIDGE
Yoshihiro Inoue, Kyoto, Japan, assignor to Nintendo Company Limited, Kyoto, Japan
Filed Jan. 9, 1987, Ser. No. 2,000
Claims priority, application Japan, Oct. 14, 1986, 61-40907
Term of patent 14 years
U.S. Cl. D14—114



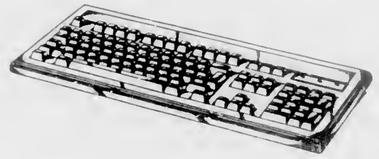
308,198
DIGITIZING TABLET FOR COMPUTER INPUT
Thomas A. Tedham, Salem, and Kenichi Akagi, Littleton, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Oct. 20, 1988, Ser. No. 260,546
The portion of the term of this patent subsequent to May 22, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



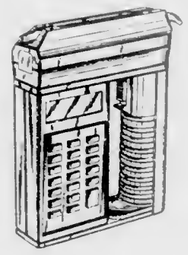
308,199
KEYBOARD
Ettore Sottsass, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Torino, Italy
Filed Dec. 7, 1987, Ser. No. 129,085
Claims priority, application Italy, Jun. 15, 1987, 53421/87[U]
Term of patent 14 years
U.S. Cl. D14—115



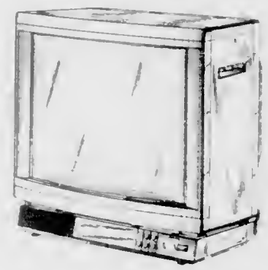
308,200
KEYBOARD
Ettore Sottsass, Milan, Italy, assignor to Ing C. Olivetti & C., S.p.A., Torino, Italy
Filed Dec. 7, 1987, Ser. No. 129,086
Claims priority, application Italy, Jun. 15, 1987, 55422-/87[U]
Term of patent 14 years
U.S. Cl. D14—115



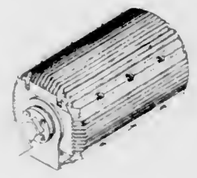
308,201
PORTABLE DATA SCANNER
John Doyle, West Chester, Pa.; Louis J. Frontino, Cherry Hill, N.J., and Bob M. Dobbins, Villanova, Pa., assignors to Mars Incorporated, McLean, Va.
Filed Sep. 25, 1987, Ser. No. 101,152
Term of patent 14 years
U.S. Cl. D14—116



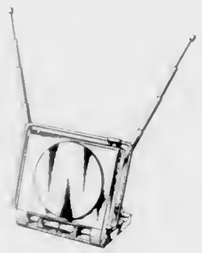
308,202
TELEVISION RECEIVER
Teiyu Gotoh, Urawa; Keiichi Totsuka, Hiratsuka, both of Japan, and Ira Diamond, Ramsey, N.J., assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 20, 1987, Ser. No. 75,079
Claims priority, application Japan, Mar. 6, 1987, 62-8402
Term of patent 14 years
U.S. Cl. D14—126



308,203
TRANSMISSION AND RECEPTION UNIT FOR A MINI-EARTH STATION
Yuhei Kosugi; Hirohisa Ozawa; Osamu Yamamoto, and Yoshio Minowa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jul. 17, 1986, Ser. No. 886,467
Claims priority, application Japan, Jan. 17, 1986, 61-1334; Apr. 17, 1986, 61-14450; May 2, 1986, 61-16734
Term of patent 14 years
U.S. Cl. D14—230



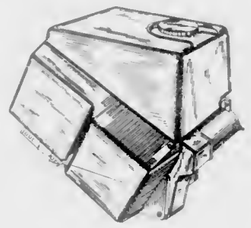
308,204
INDOOR ANTENNA
Akio Takizawa, Tokyo, Japan, assignor to Nippon Antenna Co., Ltd., Tokyo, Japan
Filed Jan. 8, 1987, Ser. No. 1,551
Claims priority, application Japan, Sep. 12, 1986, 61-36028
Term of patent 14 years
U.S. Cl. D14—235



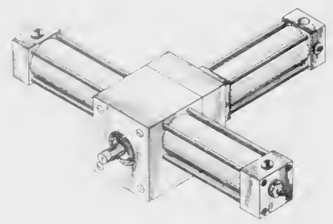
308,205
HOLDER FOR CELLULAR TELEPHONE
Ronald W. Tholberg, Encino, Calif., assignor to Elizabeth H. Tholberg, Tarzana, Calif.
Filed May 15, 1987, Ser. No. 50,073
Term of patent 14 years
U.S. Cl. D14—253



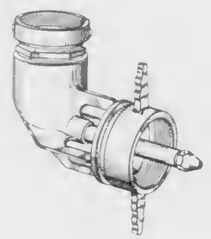
308,206
ENGINE
Gordon D. Kelly, Elm Grove, Wis., and Ronald J. Hoffman, Phoenix, Ariz., assignors to Kohler Co., Kohler, Wis.
Filed Jul. 21, 1988, Ser. No. 222,683
Term of patent 14 years
U.S. Cl. D15—1



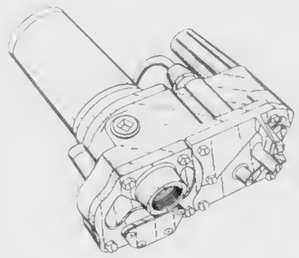
308,207
FLUID-OPERATED MULTIMOTION ACTUATOR
David W. Burke, Cape Elizabeth, Me., assignor to Motion Controls and Automation, Inc., Cape Elizabeth, Me.
Filed Jun. 27, 1988, Ser. No. 214,577
Term of patent 14 years
U.S. Cl. D15—7



308,208
JET FOOT PUMP
Michael P. Ziaylek, and Theodore Ziaylek, Jr., both of 140 Riverview Dr., Yardley, Pa. 19067
Filed Apr. 10, 1987, Ser. No. 36,812
Term of patent 14 years
U.S. Cl. D15—7



308,209
GEAR-PUMP ASSEMBLY FOR LIQUID PRODUCTS
Fred L. Laqua, and Robert E. Hall, both of Wichita, Kans., assignors to Great Plains Industries, Inc., Wichita, Kans.
Filed Nov. 17, 1987, Ser. No. 121,997
Term of patent 14 years
U.S. Cl. D15—7



308,210
PORTABLE INTERNAL COMBUSTION POWER TOOL
Katsumi Kiyooka, Warabi, and Hideko Inomata, Higashiyamato, both of Japan, assignors to Komatsu Zenoah Company, Tokyo, Japan
Filed Mar. 18, 1987, Ser. No. 27,668
Term of patent 14 years
U.S. Cl. D15—10







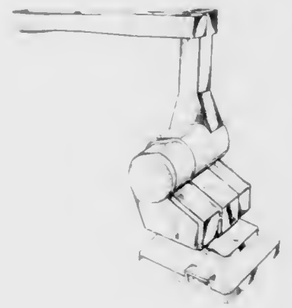
308,211
HYDRO JET EXCAVATION NOZZLE
George J. Magnera, 19188 Glendale, Hesperia, Calif. 92345
Filed Jun. 21, 1988, Ser. No. 209,357
Term of patent 14 years
U.S. Cl. D15—21



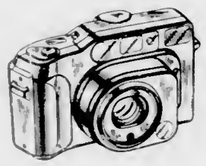
308,212
UPRIGHT REFRIGERATION UNIT
Brian L. Dallman, Hudson, Wis., assignor to Nor-Lake, Inc., Hudson, Wis.
Filed Oct. 26, 1987, Ser. No. 113,617
Term of patent 14 years
U.S. Cl. D15—85



308,213
ELECTRIC ROBOT
Gary L. Jones, Madison Heights; Robert J. Todd, Milford Township, Oakland County; Norman N. Fender, Hudson; Dale A. Wood, Canton, all of Mich., and Alexander Bally, Carnegie, Pa., assignors to Graco Inc., Minneapolis, Minn.
Filed Oct. 6, 1987, Ser. No. 106,706
Term of patent 14 years
U.S. Cl. D15—199



308,214
CAMERA
Noboru Tanaka, Kawasaki, and Michio Hirohata, Inagi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 16, 1986, Ser. No. 886,048
Claims priority, application Japan, Jan. 20, 1986, 61-1789
The portion of the term of this patent subsequent to Mar. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—209



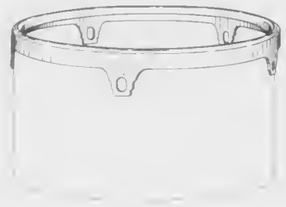
308,215
ELECTRONIC PIANO
Tatsuo Katsuhara, Hachioji, Japan, assignor to Caiso Computer Co., Ltd., Tokyo, Japan
Filed Aug. 31, 1987, Ser. No. 91,522
Term of patent 14 years
U.S. Cl. D17—7



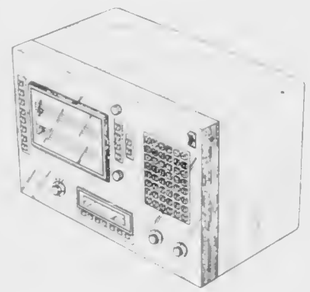
308,216
GUITAR
Joel M. Harriott, 3000 J St. SW., #1905, Cedar Rapids, Iowa 52404
Filed Feb. 27, 1987, Ser. No. 19,993
Term of patent 14 years
U.S. Cl. D17—14



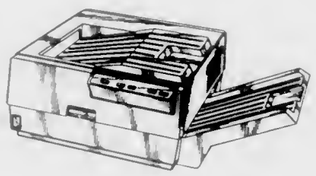
308,217
DRUM HEAD RING
Martin B. Cohen, North Bergen, N.J., assignor to Latin Percussion, Inc., Garfield, N.J.
Filed Mar. 18, 1988, Ser. No. 169,731
Term of patent 14 years
U.S. Cl. D17—22



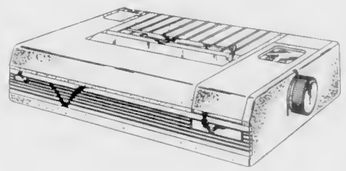
308,218
MUSICAL COMPOSER
Joseph R. Sinkler, Jr., 2731 Eastern, SE., Grand Rapids, Mich. 49507
Filed Apr. 20, 1987, Ser. No. 40,151
Term of patent 14 years
U.S. Cl. D17—99



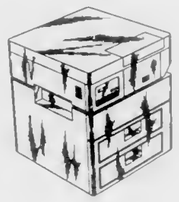
308,219
DESKTOP PAGE PRINTER
Kazuo Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Aug. 26, 1986, Ser. No. 900,630
Term of patent 14 years
U.S. Cl. D18—13



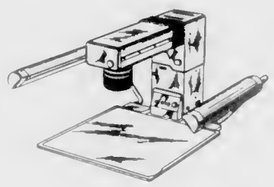
308,220
PRINTER
David S. Urbanus, North Easton, and Peter B. Barron, Billerica, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jul. 13, 1987, Ser. No. 56,837
Term of patent 14 years
U.S. Cl. D18—13



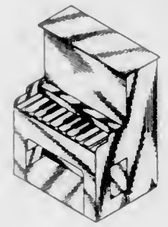
308,221
LASER BEAM PRINTER
Tatsuo Kojima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 2, 1987, Ser. No. 69,575
Claims priority, application Japan, Jan. 6, 1987, 62-190
Term of patent 14 years
U.S. Cl. D18—13



308,222
DOCUMENT RECORDER
Hiroshi Sano, Yokohama, and Tadashi Ishikawa, Urawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 23, 1986, Ser. No. 910,773
Claims priority, application Japan, Mar. 28, 1986, 61-11555
Term of patent 14 years
U.S. Cl. D18—36

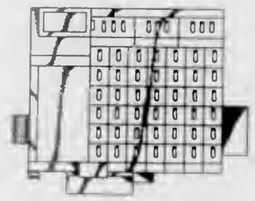


308,223
COMBINED COLLAPSIBLE GREETING CARD AND TOY
James R. Dudley, El Segundo, Calif., assignor to Gibson Greetings, Inc., Cincinnati, Ohio
Filed Jul. 16, 1987, Ser. No. 74,478
Term of patent 14 years
U.S. Cl. D19—1





308,224
COMBINED PERPETUAL CALENDAR AND FILE
Allan Blacker, 114 Barbara Cir., Ocean Springs, Miss. 39564
Filed Jul. 25, 1985, Ser. No. 758,867
Term of patent 14 years
U.S. Cl. D19—21



308,225
BOOK COVER
Timothy J. Dressler, North Hollywood, Calif., assignor to Mark L. Chutick, Chatsworth, Calif.
Filed Jul. 13, 1987, Ser. No. 72,580
Term of patent 14 years
U.S. Cl. D19—26



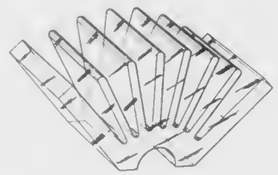
308,226
BALL-POINT PEN
Suk J. Kim, Seoul, Rep. of Korea; Atsushi Deguchi, Tokyo, and Sadao Yoshinaga, Ichikawa, both of Japan, assignors to Yoshinaga Prince Company Limited, Tokyo, Japan
Filed Feb. 26, 1987, Ser. No. 19,491
Claims priority, application Japan, Sep. 19, 1986, 61-37072
Term of patent 14 years
U.S. Cl. D19—42



308,227
COPY HOLDER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Apr. 21, 1986, Ser. No. 857,426
Term of patent 14 years
U.S. Cl. D19—88



308,228
DESK FILE
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jul. 15, 1987, Ser. No. 73,418
Claims priority, application Italy, Jan. 20, 1987, 20550/87[U]
Term of patent 14 years
U.S. Cl. D19—90



308,229
SIGN FOR ADVERTISING OR SIMILAR USE
Donald L. Jervis, Sr., 6017 Atlantic Blvd., Maywood, Calif. 90270
Filed Apr. 18, 1988, Ser. No. 183,036
Term of patent 14 years
U.S. Cl. D20—31



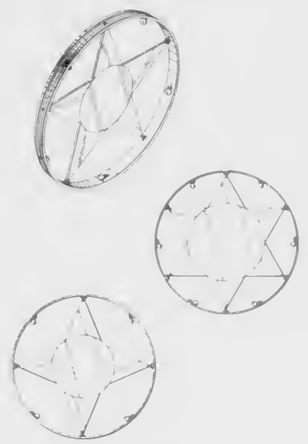
308,230
BEER TAP REPLICA ADVERTISING UNIT
Steve E. Holloway, 1202 Land Rush Dr., Arlington, Tex. 76012
Filed Jun. 5, 1986, Ser. No. 871,671
Term of patent 14 years
U.S. Cl. D20—37



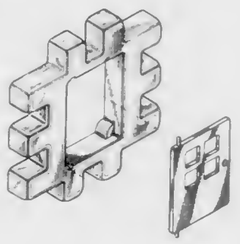
308,231
TOY GLIDER
John F. Winnick, 3051 Briand, La Jolla, Calif. 92037
Filed Nov. 21, 1986, Ser. No. 933,688
Term of patent 14 years
U.S. Cl. D21—89



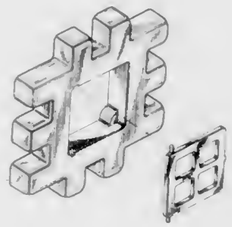
308,232
DECORATIVE WHEEL
Thayard A. McGuire, 11713 Winn Rd., Riverview, Fla. 33569
Continuation-in-part of Ser. No. 488,364, Apr. 25, 1983, Pat. No. 284,295. This application Jun. 17, 1986, Ser. No. 875,747
Term of patent 14 years
U.S. Cl. D21—101



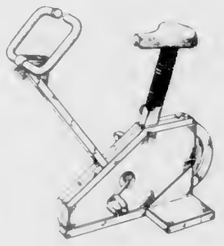
308,233
CONSTRUCTION TOY DOOR BLOCK
Thomas E. Fish, Jr., Wickliffe, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Sep. 16, 1988, Ser. No. 245,079
Term of patent 14 years
U.S. Cl. D21—108



308,234
CONSTRUCTION TOY WINDOW BLOCK
Thomas E. Fish, Jr., Wickliffe, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Sep. 16, 1988, Ser. No. 245,073
Term of patent 14 years
U.S. Cl. D21—108



308,235
EXERCISE BICYCLE
Edward H. Meisner, Short Hills, N.J., assignor to Voit Sports Incorporated, Fairport, N.Y.
Filed Aug. 4, 1988, Ser. No. 228,239
Term of patent 14 years
U.S. Cl. D21—194

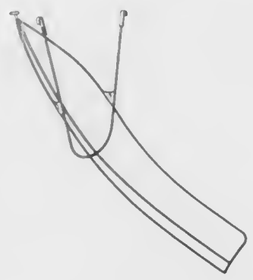


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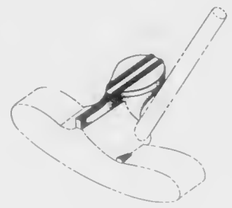
308,236
DOWN MARKER
James J. Egender, 8919 Booth, Kansas City, Mo. 64138
Filed Jul. 24, 1987, Ser. No. 77,320
Term of patent 14 years
U.S. Cl. D21—199



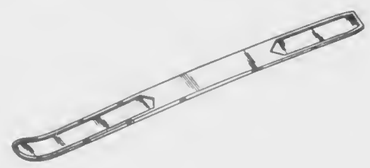
308,237
BASKETBALL RETURN DEVICE
Richard P. McCullough, 1204 Nicole, Apt. 1614, Ft. Worth, Tex. 76120
Filed Jul. 27, 1987, Ser. No. 78,574
Term of patent 14 years
U.S. Cl. D21—201



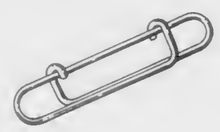
308,238
ALIGNMENT SYSTEM ELEMENTS OF A GOLF PUTTER
Nicholas J. Francu, 406 Iveys Scenic Dr., Albany, Ga. 31707
Filed Sep. 8, 1987, Ser. No. 93,861
Term of patent 14 years
U.S. Cl. D21—219



308,239
SKI
Philippe Olivier, Seynod, France, assignor to Salomon S.A., France
Filed Apr. 22, 1988, Ser. No. 184,700
Term of patent 14 years
U.S. Cl. D21—229



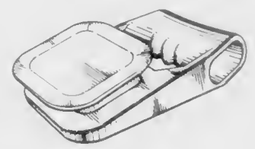
308,240
RECLOSABLE COUPLING FOR A FISHING LINE, OR THE LIKE
Carroll A. Buchanan, 11492 Catalina Dr., Lusby, Md. 20657
Filed May 12, 1987, Ser. No. 48,786
Term of patent 14 years
U.S. Cl. D22—134



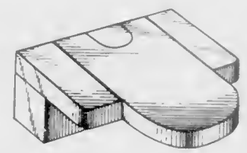
308,241
EXCHANGEABLE FISHING SINKER
John T. Underberg, 507 S. Walnut, Jefferson, Iowa 50129
Filed Jul. 6, 1987, Ser. No. 70,319
Term of patent 14 years
U.S. Cl. D22—145



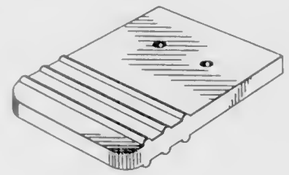
308,242
LURE RETRIEVER HANDLE
Steven D. Cedergreen, Seattle, Wash., assignor to Tempress Incorporated, Seattle, Wash.
Filed Aug. 3, 1987, Ser. No. 81,125
Term of patent 14 years
U.S. Cl. D22—149



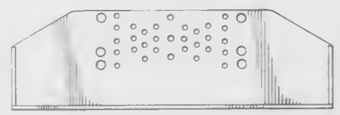
308,243
FAUCET
Joseph Strignano, New York, N.Y., assignor to I.W. Industries, Melville, N.Y.
Filed Apr. 16, 1987, Ser. No. 39,638
Term of patent 14 years
U.S. Cl. D23—241



308,244
TOILET SEAT LIFTING TAB
Demetria M. Leonakis, 16231 Eucalyptus, #22, Bellflower, Calif. 90706
Filed Jan. 19, 1988, Ser. No. 145,205
Term of patent 14 years
U.S. Cl. D8—307



308,245
ELECTRIC AMBIENT CONTROL UNIT FOR BEDS OR THE LIKE
John P. Stelmak, 33 Hudsonview Dr., Beacon, N.Y. 12508
Filed Dec. 23, 1986, Ser. No. 945,473
Term of patent 14 years
U.S. Cl. D23—332

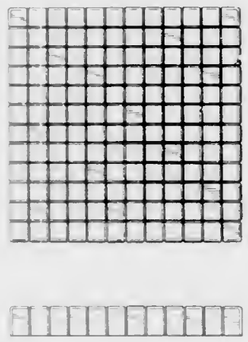


308,246
WOOD AND COAL BURNING STOVE
Duncan C. Syme, Norwich; Vance R. Smith, and Allan S. Wilker, both of Brookfield, all of Vt., assignors to Vermont Castings, Inc., Randolph, Vt.
Filed Mar. 23, 1988, Ser. No. 172,127
Term of patent 14 years
U.S. Cl. D23—346



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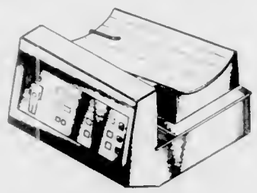
308,247
AIR CONDITIONER SUPPORT
Brian D. Adam, and Courtney L. Adam, both of Sioux City, Iowa, assignors to Bramec Corporation, North Sioux City, S. Dak.
Filed Mar. 10, 1987, Ser. No. 23,872
Term of patent 14 years
U.S. Cl. D23—354



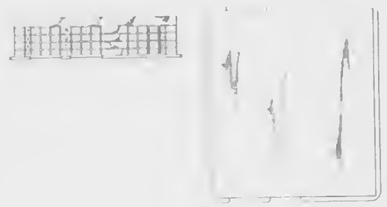
308,248
FIREPLACE INSERT FOR HOLDING MATERIAL TO BE BURNED
Frank J. Koch, Ogdensburg, N.Y., assignor to Linda Koch Beamish, Ontario, Canada
Filed Oct. 3, 1988, Ser. No. 252,445
Term of patent 14 years
U.S. Cl. D23—401



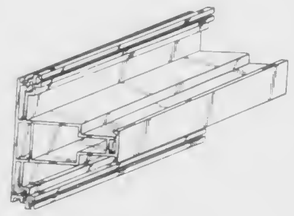
308,249
PERITONEAL DIALYSIS MACHINE
Francis D. Buckley, Freehold, N.J., assignor to Delmed, Inc., Concord, Calif.
Filed Sep. 25, 1987, Ser. No. 101,336
Term of patent 14 years
U.S. Cl. D24—8



308,250
SERVICE BUILDING AND THE LIKE
Alan E. Goldberg, New Caanan, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 22, 1987, Ser. No. 111,463
Term of patent 14 years
U.S. Cl. D25—34



308,251
WINDOW COMPONENT
Terence Hardy, Netber Heage, England, assignor to L.B. Plastics Limited, England
Filed Aug. 10, 1989, Ser. No. 392,251
Term of patent 14 years
U.S. Cl. D25—124



308,252
CANDLE LAMP
James R. Friese, Country Club Hills, Ill., assignor to Candle Corporation of America, Chicago, Ill.
Filed Jun. 22, 1987, Ser. No. 64,446
Term of patent 14 years
U.S. Cl. D26—11





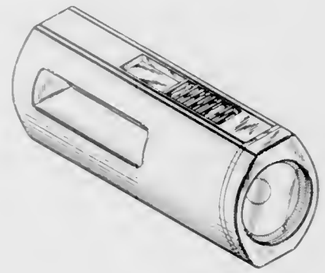
308,253
COMBINED FLASHLIGHT AND RECHARGER THEREFOR
Eugene P. Battles, P.O. Box 429, Cascade, Id. 83611, and Clayton Battles, 6355 W. Hauser Lake Rd., Post Falls, Id. 83854
Filed Jul. 17, 1986, Ser. No. 886,324
Term of patent 14 years
U.S. Cl. D26—38



308,254
COMBINED FLASHLIGHT AND FLUORESCENT LANTERN
Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co., Ltd., Shizuoka, Japan
Filed May 19, 1987, Ser. No. 51,305
Term of patent 14 years
U.S. Cl. D26—42



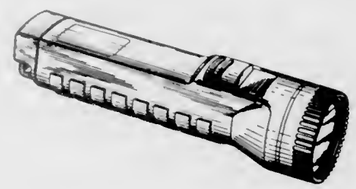
308,255
LANTERN
Ronald Emmerling, New City, N.Y., assignor to International Consumer Brands, Inc., Trumbull, Conn.
Filed Oct. 23, 1987, Ser. No. 111,822
Term of patent 14 years
U.S. Cl. D26—46



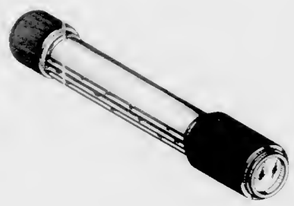
308,256
PORTABLE LIGHT
Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co., Ltd., Shizuoka, Japan
Filed May 20, 1987, Ser. No. 51,607
Claims priority, application Japan, Mar. 18, 1987, 62-10185
Term of patent 14 years
U.S. Cl. D26—48



308,257
FLASHLIGHT
Robert B. Staubitz, Avon, and Frank G. Marshall, Meriden, both of Conn., assignors to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.
Filed Sep. 18, 1987, Ser. No. 98,121
Term of patent 14 years
U.S. Cl. D26—49



308,258
MINIATURE FLASHLIGHT
Wen Kung-kit, Montecello, and Mak K. Biu, North Point, both of Hong Kong, assignors to International Consumer Brands, Inc., Trumbull, Conn.
Filed Oct. 23, 1987, Ser. No. 111,731
Term of patent 14 years
U.S. Cl. D26—49



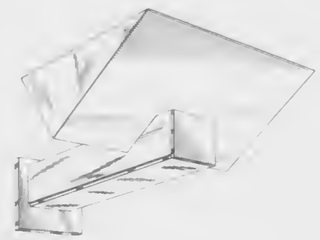
308,259
FLUORESCENT LIGHTING FIXTURE
Jack Burkarth, Dallas, Tex., assignor to Gulton Industries, Inc., Plano, Tex.
Filed Dec. 7, 1987, Ser. No. 129,731
Term of patent 14 years
U.S. Cl. D26—78



308,260
WALL MOUNTED INDIRECT LIGHTING FIXTURE
Sylvan R. Shemitz, Woodbridge, Conn., assignor to Sylvan R. Shemitz Associates, Inc., West Haven, Conn.
Filed Apr. 9, 1987, Ser. No. 36,843
Term of patent 14 years
U.S. Cl. D26—85



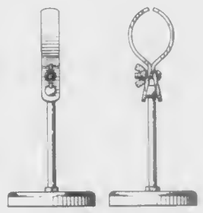
308,261
WALL MOUNTED INDIRECT LIGHTING FIXTURE
Sylvan R. Shemitz, Woodbridge, Conn., assignor to Sylvan R. Shemitz Associates, Inc., West Haven, Conn.
Filed Apr. 9, 1987, Ser. No. 36,842
Term of patent 14 years
U.S. Cl. D26—87



308,262
LAMP GLOBE
Ralph Flores, 5154 Garden Grove Ave., Tarzana, Calif. 91356
Filed Sep. 8, 1986, Ser. No. 905,610
Term of patent 14 years
U.S. Cl. D26—131



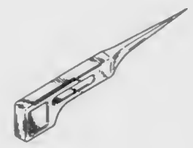
308,263
MAGNETIC TROUBLE LIGHT HOLDER
Estle A. Cook, Butler, Mo., assignor to CK Products, Inc., Butler, Mo.
Filed Apr. 15, 1987, Ser. No. 38,591
Term of patent 14 years
U.S. Cl. D26—140



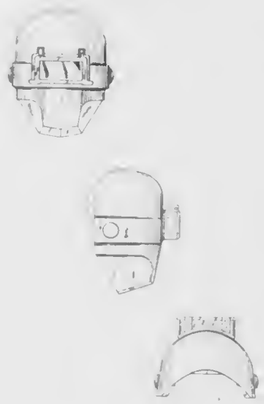
308,264
LOTION APPLICATOR OR SIMILAR ARTICLE
David B. Redmann, and Lee E. A. Redmann, both of 16601 Calico Pl., Tampa, Fla. 33618
Filed Mar. 5, 1987, Ser. No. 22,344
Term of patent 14 years
U.S. Cl. D28—7



308,265
TOOTHPICK
Richard J. Shaw, Brookfield, and James A. Bojar, Wauwatosa, both of Wis., assignors to International Floss Pick Corporation, Milwaukee, Wis.
Filed Aug. 15, 1988, Ser. No. 232,370
Term of patent 14 years
U.S. Cl. D28—64



308,266
WELDING HELMET
Dennis A. Van Wyk, 1097 Calvin St., Eugene, Oreg. 97401
Filed Aug. 3, 1987, Ser. No. 80,582
Term of patent 14 years
U.S. Cl. D29—15



VOL
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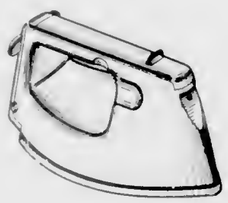
308,267
STORAGE RACK FOR A VACUUM CLEANER AND TOOLS
Sidney H. Bradd, Solon, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Apr. 20, 1987, Ser. No. 40,145
Term of patent 14 years
U.S. Cl. D32—31



308,268
WALL HAMPER
Pamela Phelps, 30 Quentin Ave., New Brunswick, N.J. 08901, and Roberta White, 511 Algair Ave., North Brunswick, N.J. 08902
Filed May 13, 1988, Ser. No. 193,635
Term of patent 14 years
U.S. Cl. D32—37



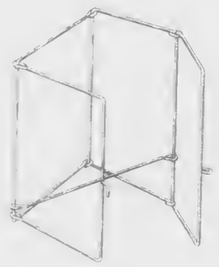
308,269
STEAM IRON
Aidan Petrie, and Stephen Lane, both of Boston, Mass., assignors to International Consumer Brands, Inc., Trumbull, Conn.
Filed Feb. 16, 1988, Ser. No. 155,754
Term of patent 14 years
U.S. Cl. D32—70



308,270
FUNNEL FOR PLASTIC BAG
Aurora Sarabia, 407 W. Longview, Stockton, Calif. 95207
Filed Sep. 23, 1988, Ser. No. 248,023
Term of patent 14 years
U.S. Cl. D34—5



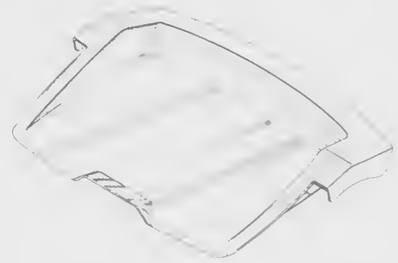
308,271
FOLDABLE TRASH BAG HOLDER OR SIMILAR ARTICLE
Richard Vreeken, 25814 Northwinds Dr., Romoland, Calif. 92380
Filed Mar. 14, 1988, Ser. No. 167,436
Term of patent 14 years
U.S. Cl. D34—6



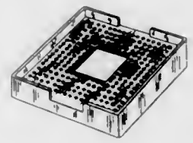
308,272
COMBINED WASTE BAG DISPENSER AND RECEPTACLE
William A. Koepsell, 16740 Greenwich Cir., Yorba Linda, Calif. 92686
Filed Oct. 17, 1988, Ser. No. 258,450
Term of patent 14 years
U.S. Cl. D34—6



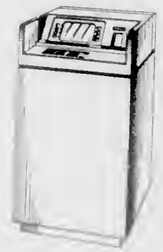
308,273
LID FOR WASTE BASKET
Thomas E. Hanna, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Nov. 2, 1988, Ser. No. 266,488
Term of patent 14 years
U.S. Cl. D34—11



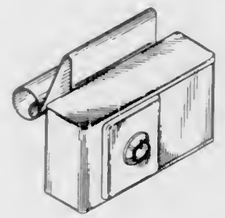
308,274
COMBINED SHIPPING AND HANDLING CARRIER
Roland Gosselin, Nashua, and Robert H. Murphy, Milford, both of N.H., assignors to R. H. Murphy Company, Co., Inc., Amherst, N.H.
Filed Jan. 7, 1987, Ser. No. 1,108
Term of patent 14 years
U.S. Cl. D34—40



308,275
AUTOMATIC TELLER MACHINE
Michael D. Garten, and Marina Naito, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 23, 1986, Ser. No. 867,868
Term of patent 14 years
U.S. Cl. D99—28



308,276
KEY SAFE FOR A VEHICLE
Paul Appelbaum, P.O. Box 27006, Denver, Colo. 80227
Filed Dec. 17, 1987, Ser. No. 134,448
Term of patent 14 years
U.S. Cl. D99—28

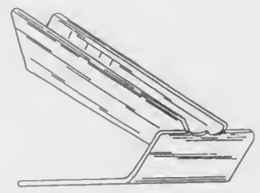


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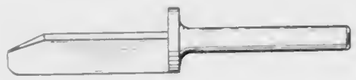
308,277
COIN COUNTER
Opal C. Walker, P.O. Box 3397, Quail Valley, Calif. 92380
Filed Apr. 7, 1986, Ser. No. 850,878
Term of patent 14 years
U.S. Cl. D99—34

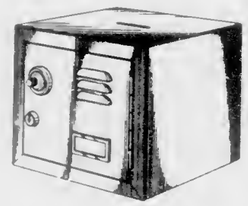


308,278
COIN STACKING AND COUNTING STAND
Lewis H. Edwards, 1500 Blossom Hill Rd., Castle Shannon, Pa. 15234
Filed Jun. 15, 1987, Ser. No. 61,401
Term of patent 14 years
U.S. Cl. D99—34



308,279
CASH BOX OR SIMILAR ARTICLE
A. Fred Hill, Richardson, Tex., assignor to Fred Hill, Inc., Richardson, Tex.
Filed Nov. 23, 1987, Ser. No. 124,473
Term of patent 14 years
U.S. Cl. D99—35





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TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MAY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Hakulin, Bertel K.; and Nieminen, Jorma J., 4,929,255, Cl. 48-197.00R.
Kiiskila, Erkki J.; and Virkola, Nils E., 4,929,307, Cl. 159-47.300.

A.B.X.: *See*—
Champseix, Henri; and Champseix, Serge, 4,928,539, Cl. 73-864.240.

A. C. Neilsen Company: *See*—
Kiewit, David A., 4,930,011, Cl. 358-84.000.

A/S Alfred Benzon: *See*—
Ibsen, Lars S., 4,929,448, Cl. 424-489.000.

AB Akerlund & Rausing: *See*—
Larsson, Lennart; and Andersson, Arne, 4,928,622, Cl. 118-70.000.

AB Aros Avancerad Butikskontroll: *See*—
Hultåker, Eric, 4,929,928, Cl. 340-572.000.

AB Hedemora Verkstader: *See*—
Ragnegård, Samuel; and Sjoberg, Arne, 4,929,355, Cl. 210-784.000.

AB Volvo: *See*—
Hultberg, Jimmy, 4,928,810, Cl. 198-699.100.

Abaziou, Jean-Luc; Billy, Jean-Claude; and Le Mouel, Bernard, to Societe Anonyme dite : Alcatel CIT. Method and device for transmitting a digital engineering service channel by means of the parity channel of a digital bit stream transmitted in a code with parity checking. 4,930,127, Cl. 370-110.400.

ABB Stal AB: *See*—
Hirbod, Modjtaba, 4,929,287, Cl. 148-276.000.

ABC Consulting Services, Inc.: *See*—
Florek, Bronislaw B., 4,928,912, Cl. 248-221.200.

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Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao; Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, 4,930,105, Cl. 365-185.000.

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Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, to Eisai Co., Ltd. Benzothiazole derivative. 4,929,623, Cl. 514-293.000.

Abe, Takao: *See*—
Tezuka, Toshiaki; Koshizuka, Kunihiro; and Abe, Takao, 4,929,593, Cl. 503-227.000.

Abe, Toyohiko: *See*—
Kohtoh, Noriaki; Tsuruoka, Yoshihiro; Abe, Toyohiko; and Fukuro, Hiroyoshi, 4,929,658, Cl. 524-219.000.

Abe, Yoshinori: *See*—
Kimoto, Tetsuo; and Abe, Yoshinori, 4,929,979, Cl. 355-38.000.

Abellana, Jovito N.: *See*—
Buan, Danilo P.; Abellana, Jovito N.; and Dolan, Donald T., 4,929,106, Cl. 400-649.000.

Abudardin, Vladimir Z.: *See*—
Ivannikov, Alfred V.; and Abudardin, Vladimir Z., 4,929,812, Cl. 219-137.200.

Accu-Ring Jaw Systems, Inc.: *See*—
Brown, Lawrence H., 4,928,981, Cl. 279-1.0SJ.

Acme Resin Corporation: *See*—
Armbruster, David R.; and Tse, Kwok-Tuen, 4,929,648, Cl. 523-147.000.

Acurex Corporation: *See*—
Washburn, Robert M.; and Dodson, Jerry D., 4,929,505, Cl. 728-408.000.

Acushnet Company: *See*—
Giza, John, 4,929,407, Cl. 264-101.000.

Adachi, Teruho: *See*—
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.

Adam, Colin M.: *See*—
Bye, Richard L., Jr.; Boxe, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., 4,929,511, Cl. 428-606.000.

Adams, Jeffrey S.: *See*—
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,928,346, Cl. 15-338.000.

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Walsh, Joseph C., 4,929,223, Cl. 493-56.000.

Adtec Incorporated: *See*—
McConnell, Lloyd T., 4,929,003, Cl. 292-144.000.

Advaced Micro Devices, Inc.: *See*—
Woo, Ann K., 4,930,037, Cl. 361-58.000.

Advanced Materials Corporation: *See*—
Wallace, W. Edward; Smith, H. Kevin; Lynch, W. Bryan; Craig, Raymond S.; and Pourarian, Fiaz, 4,928,496, Cl. 62-46.200.

Advanced Micro Devices, Inc.: *See*—
Thomas, Mammen; and Weinberg, Matthew, 4,929,992, Cl. 357-23.900.

Advantest Corporation: *See*—
Yoshida, Kenji, 4,929,888, Cl. 371-25.100.

AE PLC: *See*—
Rhodes, Michael L. P., 4,928,578, Cl. 92-187.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Delarue, Jean-Jacques; Patin, Michel; and Slama, Jean-Claude, 4,929,135, Cl. 411-354.000.

Aeschlimann, Peter: *See*—
Schwander, Hansrudolf; Tzikas, Athanassios; and Aeschlimann, Peter, 4,929,719, Cl. 534-604.000.

Aesculap-Werke AG vormals Jetter & Scheerer: *See*—
Braun, Karl, 4,929,239, Cl. 606-142.000.

Affleck, Robert J. Masonry drill assembly. 4,929,128, Cl. 408-139.000.

Agency of Industrial Science and Technology: *See*—
Kyono, Tetsuyuki; Ohnishi, Seiichiro; Hanano, Tohru; and Hotta, Tohru, 4,929,513, Cl. 428-611.000.
Watanabe, Tadahiko; Shobu, Kazuhisa; Kai, Yukio; Yamamoto, Hideki; Sudoh, Eiichi; Yagishita, Osamu; and Hayakawa, Junshiro, 4,929,417, Cl. 419-12.000.
Yokota, Haruo, 4,930,066, Cl. 364-200.000.

Agilis Corporation: *See*—
Cripps, Peter K.; and Plotnick, Michael A., 4,930,140, Cl. 375-1.000.

Agrawal, Rakesh; and Jagadish, Hosagrahar V., to AT&T Bell Laboratories. Method for computing transitive closure. 4,930,072, Cl. 364-300.000.

Agren, Lennart; and Holso, Eino, to Oy Uponor AB. Method in manufacturing a heat insulated tube and a device in extruders for manufacturing the tube. 4,929,409, Cl. 264-508.000.

Agrimont S.r.l.: *See*—
Colle, Roberto; Camaggi, Giovanni; Gozzo, Franco; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,929,631, Cl. 514-383.000.

Agui, Hideo: *See*—
Kanaoka, Masaharu; Kawanaka, Chigusa; Negoro, Takaharu; and Agui, Hideo, 4,929,547, Cl. 435-69.100.

Ahina, Lionel M.: *See*—
Thomas, Paul; and Ahina, Lionel M., 4,929,039, Cl. 312-213.000.

Ahmad, Anees; and Huse, Richard L., to Perkin-Elmer Corporation, The. Mounting for high resolution projection lenses. 4,929,054, Cl. 350-252.000.

Ainoya, Masayuki; Ishihara, Takeyuki; Kanno, Tesuo; Kikuchi, Takahiro; Mori, Seiichi; Nobumori, Shogo; and Shirakawa, Junji, to International Business Machines Corporation. Sheet path in an electrophotographic printer. 4,929,982, Cl. 355-311.000.

Air Products and Chemicals, Inc.: *See*—
King, John C. W.; Bowe, Donald J.; and Kilhefiner, Paul T., III, 4,929,283, Cl. 148-13.200.
Mullen, Walter T., 4,928,606, Cl. 110-347.000.

Airborne Express, Inc.: *See*—
Wiseman, Albert D., 4,929,133, Cl. 410-52.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, 4,929,072, Cl. 350-582.000.
Wakabayashi, Hideaki, 4,928,804, Cl. 192-83.000.

AIT Industries, Inc.: *See*—
Ramos, Rolando P.; Loreto, Wilfredo P.; and Vulich, Yordan, 4,928,439, Cl. 51-284.00E.

Aiuola, Franco; and Rueff, Herbert, to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A. Device for feeding flattened boxes in packaging machines. 4,928,942, Cl. 210-58.000.

Akaishi, Hakaru: *See*—
Mori, Kei; Akaishi, Hakaru; Kakihara, Kenji; and Kitayama, Yoshiro, 4,928,666, Cl. 126-440.000.

Akanuma, Hideo; Murata, Masashi; Inoue, Kiyoshi; and Ohgake, Ryoji, to Asahi Glass Co., Ltd.; and Nippon Oil Co., Ltd., a part interest. Lubricating oil compositions for chains. 4,929,372, Cl. 252-29.000.

VOL 114 ISS 5 MY 29 990 UMI

Akasaka, Kozo: *See—*
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.

Akashi, Ryojiro; and Taniguchi, Takashi, to Toray Industries, Inc. Photochromic compound. 4,929,693, Cl. 526-259.000.

Akebono Brake Industry Co. Ltd.: *See—*
Shimanuki, Haruki, 4,929,035, Cl. 303-106.000.

Akima, Hideo: *See—*
Hoashi, Akira; Akima, Hideo; Shimanuki, Haruki; and Matsubara, Yuji, 4,930,083, Cl. 364-426.020.

Akimoto, Kazuo: *See—*
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl. 354-420.000.

Akimoto, Osamu: *See—*
Daimon, Takashi; Sakamoto, Hideshi; and Akimoto, Osamu, 4,929,496, Cl. 428-246.000.

Akimoto, Ryosaku: *See—*
Itahana, Tsutomu; Kanno, Hideo; Ono, Tetsuo; Furuta, Futoru; Kobayashi, Susumu; Akimoto, Ryosaku; and Tanigaki, Ryuhei, 4,928,723, Cl. 137-116.300.

Akita, Shuichi; Suzuki, Fumitoshi; Kikuchi, Yasushi; and Oishi, Hideyuki, to Nippon Zeon Co., Ltd.; and Yokohama Rubber Co., Ltd., The. Rubber composition for tire tread. 4,929,679, Cl. 525-194.000.

Akiyama, Eitetsu: *See—*
Inoue, Kazuo; Kishi, Noriyuki; and Akiyama, Eitetsu, 4,928,489, Cl. 60-602.000.

Akiyama Printing Machine Manufacturing Company, Ltd.: *See—*
Kojima, Yasutaka, 4,928,623, Cl. 118-249.000.

Akutsu, Hiromi, to Juki Corporation. Sewing machine pneumatic decurler. 4,928,610, Cl. 112-153.000.

Akzo America Inc.: *See—*
Franklin, Ralph, 4,929,748, Cl. 558-276.000.

Akzo N.V.: *See—*
Noomen, Arie; and Peters, Petrus J., 4,929,661, Cl. 524-259.000.
Redpath, James; Logan, Robert T.; McFadzen, David B.; and Roy, Robert G., 4,929,636, Cl. 514-443.000.
van Calker, Freerk R., 4,928,812, Cl. 198-847.000.

Alazet, Alain: *See—*
Coquelet, Claude; Roussillon, Samia; Sincholle, Daniel; Bonne, Claude; and Alazet, Alain, 4,929,635, Cl. 514-438.000.

Albany International Corp.: *See—*
Mitchell, Larry L.; and Toney, Crayton G., 4,929,497, Cl 428-265.000.

Albeck, Michael: *See—*
Sredni, Benjamin, Pavliv, Leo; and Albeck, Michael, 4,929,739, Cl. 549-347.000.

Albrecht, Bernhard; and Beyrich, Jurgen, to Ciba-Geigy Corporation. Process for the preparation of 1-amine-2-naphthol-4-sulfonic acid. 4,929,752, Cl. 562-70.000.

Alcan International Limited: *See—*
Courval, Gregory J., 4,928,508, Cl. 72-42.000.
Jin, Iljoon; and Lloyd, David J., 4,929,421, Cl. 420-545.000.

Aldissi, Mahmoud, to United States of America, Energy. Water-soluble conductive polymers. 4,929,389, Cl. 252-500.000.

Alexander, James C., to Serco Corporation. Dock leveler. 4,928,340, Cl. 14-71.300.

Alexander, Michael E. Retaining and anchoring hardware for a ceramic fiber module. 4,928,466, Cl. 52-509.000.

Alexander, Walter A., Sr. Break-away sign post and post ground anchor. 4,928,446, Cl 52-98.000.

Alexeev, Vyacheslav M.: *See—*
Dryga, Alexandr I.; Alexeev, Vyacheslav M.; and Polovoi, Sergei A., 4,928,554, Cl. 74-87.000

Alfred Teves GmbH *See—*
Reinartz, Hans-Dieter; and Steffes, Helmut, 4,929,038, Cl. 303-119.000.

Alfred University: *See—*
Hexemer, Richard L., Jr.; Axelson, Scott R.; McCluskey, Philip H.; and Mroz, Thomas J., Jr., 4,929,433, Cl. 423-411.000.

Alkaril Chemicals, Inc.: *See—*
Anderson, Norman S.; Promislow, Albert L.; Rayborn, Randy L.; and Vukov, Rastko, 4,929,769, Cl. 568-614.000.

Allemann, James D., to Westhoff Toll and Die Company. Method and apparatus for a lineal machine tool. 4,929,131, Cl. 409-234.000.

Allen, Derek R. Self-sealing dual stethoscope head. 4,928,786, Cl. 181-137.000.

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Allen, Michael J.: *See—*
Ledenbach, Gregory W.; and Allen, Michael J. 4,930,097, Cl 364-716.000.

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Allergan, Inc.: *See—*
Paul, Lyle E., 4,928,815, Cl. 206-5.100.

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Boghean, Barry J.; Subbanna, Somanahalli N.; Redmon, Charles L.; and Wamser, Christian A., 4,929,435, Cl. 423-484.000.
Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., 4,929,511, Cl. 428-606.000.
Johannesen, Donald D.; and Taig, Alistair G., 4,928,543, Cl. 475-196.000.
Mohajer, Yousef; and Lazarus, Stanley D., 4,929,715, Cl. 528-272.000.
Peczkowski, Joseph L., 4,928,484, Cl. 60-240.000.
Rabinkin, Anatol, 4,928,872, Cl. 228-203.000.
Zander, Richard A.; Gaiser, Robert F.; Dillon, William F., Jr.; and Crumb, Donald A., 4,929,033, Cl. 303-9.630.

Allison, John D.; and Hanson, Gordon, to University of Minnesota, Regents of the; and Performance Attainment Associates, Inc., a part interest. Cervical range of motion measuring device. 4,928,709, Cl. 128-782.000.

Alpha Enterprises, Inc.: *See—*
Hehn, Bruce A., 4,928,825, Cl. 206-387.000.

Alps Electric Co.: *See—*
Fuse, Masashi, 4,929,965, Cl. 346-107.00R.

Alps Electric Co., Ltd.: *See—*
Bannai, Hiroyuki; Ida, Yuichi; and Kato, Hironori, 4,928,901, Cl. 242-85.000.
Ishikawa, Takatoshi, 4,929,968, Cl. 346-140.00R.

Altera Corporation: *See—*
Chan, Yiu-Fai; and Hung, Chuan-Yung, 4,930,107, Cl. 365-189.080.

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LaBarge, Robert L., 4,928,844, Cl. 220-207.000.
Martin, Edward S.; and Wieserman, Larry F., 4,929,589, Cl. 502-406.000.
Zaidi, Mohammad A., 4,929,285, Cl. 148-11.50A.

ALZA Corporation: *See—*
Roth, Nathan; and Yum, Su I., 4,929,233, Cl. 604-131.000.

AM International, Inc.: *See—*
Shepherd, Mark R., 4,929,256, Cl. 51-293.000.

Amdahl, Paul O.: *See—*
Wong, Yuen W.; Mazilu, Doina; and Amdahl, Paul O., 4,930,101, Cl. 364-900.000.

Amemiya, Hideto: *See—*
Suzuki, Takashi; and Amemiya, Hideto, 4,929,093, Cl. 374-208.000.

American Cyanamid: *See—*
Fleming, Shane D., 4,929,344, Cl. 209-166.000.

American Cyanamid Company: *See—*
Bartolucci, Raymond A., 4,929,446, Cl. 424-439.000.
Giglia, Robert D., 4,929,502, Cl. 428-357.000.
Herman, Rod A.; and Kukel, Christine F., 4,929,634, Cl. 514-426.000.
Jarovitzky, Peter A.; Fu, Yun-Lung; and Dexter, Robin W., 4,929,687, Cl. 525-328.200.
Mahmood, Tario, 4,929,608, Cl. 514-122.000.
Wang, Samuel S.; and Nagarai, D R., 4,929,343, Cl. 209-166.000.

American Holtzkraft, Inc.: *See—*
Apple, Phillip C., 4,928,718, Cl. 135-22.000.

American Home Products Corporation: *See—*
Barshay, Stanley F.; and Mayer, Peter, 4,928,840, Cl 220-8.000.

American Laser Corporation: *See—*
Chaffee, Edwin G., 4,930,136, Cl. 372-62.000.

American Metal Products Company: *See—*
Annestedt, James W., Sr., 4,929,000, Cl. 285-133.100.

American Standard Inc.: *See—*
Glamm, Paul R., 4,928,494, Cl. 62-222.000.
Nurczyk, Mark E., 4,928,750, Cl. 165-2.000.
Riffe, Delmar R., 4,928,503, Cl. 62-498.000.

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Schubert, Erdmann F., 4,929,064, Cl. 350-355.000.

Amir, Israel; and Higgins, Frank P., to AT&T Bell Laboratories. Method and apparatus for inspection of substrates. 4,929,845, Cl. 250-561.000.

Amoco Corporation: *See—*
Hussmann, Gregory P.; and Udovich, Carl A., 4,929,761, Cl. 568-319.000.
Luetkens, Melvin L., Jr., McKenna, Steve T.; and Melquist, John L., 4,929,763, Cl. 568-402.000.
Waynick, John A., 4,929,371, Cl. 252-25.000.

AMP Incorporated: *See—*
Emadi, Atahusain E.; Greer, Eric T.; Margosiak, John S.; Mignogna, Daniel J.; and Smith, Dennis E., 4,929,184, Cl 439-681.000.
Hatfield, John G., 4,928,380, Cl. 29-566.300.
Korsunsky, Iosif; and Schroepfer, Richard C., 4,929,194, Cl 439-571.000.

Ampex Corporation: *See—*
Steele, Robert B.; and Pasdera, Leonard A., 4,930,027, Cl 360-70.000

Amphenol Corporation *See—*
Paquin, Patrick J.; and Baran, Robert L., 4,928,379, Cl 29-566.300.

Amstelstaal B.V.: *See—*
Lassally, Gunter M., 4,928,923, Cl. 251-221.000.

Analog Devices, Inc.: *See—*
Gilbert, Barrie, 4,929,909, Cl. 330-256.000.

Anderson, Edmund J.; and Desrude, Wayne P., to Honeywell Inc. System for removing a pallet from a moving transfer mechanism and for accurately locking the pallet at a precise location. 4,928,806, Cl. 198-345.000.

Anderson, Eugene. Elevated sundeck. 4,928,449, Cl. 52-194.000.

Anderson, Eugene A.: *See—*
Huebner, Patrick H.; Sebranek, Joseph G.; Olson, Dennis G.; and Anderson, Eugene A., 4,928,892, Cl. 241-82.500.

Anderson, Johanna S., legal representative: *See—*
Anderson, William G., deceased; and Anderson, Johanna S., legal representative, 4,929,562, Cl. 436-126.000.

Anderson, Norman G.; and Anderson, Norman L., to Large Scale Biology. Method and apparatus for electronic and photographic image recording. 4,929,972, Cl. 354-75.000.

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Anderson, Norman G.; and Anderson, Norman L., 4,929,972, Cl. 354-75.000.

Anderson, Norman S.; Promislow, Albert L.; Rayborn, Randy L.; and Vukov, Rastko, to Hoechst Celanese Corporation; and Alkaril Chemicals, Inc. Novel polyether containing at least one 2-halomethyloxyethylene unit and 2,3 dihydroxypropyl end groups. 4,929,769, Cl. 568-614.000.

Anderson, Ronald L. Shaft mounted locking means. 4,929,118, Cl. 403-356.000.

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Andersson, Arne: *See—*
Larsson, Lennart; and Andersson, Arne, 4,928,622, Cl. 118-70.000.

Andersson, Tommy: *See—*
Qvint, Peter; Andersson, Tommy; and Eksell, Lennart, 4,928,992, Cl. 280-801.000.

Ando, Satoshi: *See—*
Hagiwara, Zenji; Ando, Satoshi; and Nohara, Saburo, 4,929,431, Cl. 423-328.000.

Ando, Tsuyoshi; Hirono, Nakayasu; Nakao, Hirotoshi; Mito, Akio; Kihara, Kazuyuki; Hatakenaka, Kosuke; and Ogawa, Hiroshi, to Tokyo Keiki Company, Ltd. Proportional electromagnetic valve having amplifier therein. 4,928,730, Cl. 137-554.000.

Annestedt, James W., Sr., to American Metal Products Company. Multiple walled chimney. 4,929,000, Cl. 285-133.100.

Ano, Tadami: *See—*
Kumada, Susumu; Mori, Mikio; Nagatani, Ryoji; and Ano, Tadami, 4,928,502, Cl. 62-440.000.

Antibes, Inc.: *See—*
Li, Shing-Lam, 4,929,212, Cl. 446-47.000.

Antonio, Anthony I., Jr.: *See—*
Richards, Toby D.; and Antonio, Anthony I., Jr., 4,928,734, Cl. 138-154.000.
Richards, Toby D.; and Antonio, Anthony I., Jr., 4,928,735, Cl. 138-154.000.

Antos, George J.: *See—*
Moser, Mark D.; Lawson, R. Joe; Antos, George J.; Wang, Li; and Parulekar, Vivekanand N., 4,929,332, Cl. 208-65.000.

Antranikian, Garabed; and Gottschalk, Gerhard, to Kali-Chemie AG. Thermostable amylases and pullulanases from two anaerobic microorganisms. 4,929,557, Cl. 435-202.000.

Ao, Meng-Sheng: *See—*
Keblys, Kestutis A.; Ao, Meng-Sheng; and Burton, Lester P. J., 4,929,745, Cl. 558-84.000.

Aoki, Akio, to Trion Corporation. Baseball catching apparatus. 4,928,320, Cl. 2-19.000.

Aoki, Hirokazu: *See—*
Nakagawa, Norio; Takagi, Katsuaki; and Aoki, Hirokazu, 4,930,104, Cl. 365-49.000.

Aoki, Ikumi: *See—*
Joyama, Norio; and Aoki, Ikumi, 4,928,590, Cl. 99-576.000.

Aoki, Kenji; Takei, Katsumori; Nakamura, Haruo; and Matsushita, Yoshikazu, to Seiko Epson Corporation. Liquid crystal optical device. 4,929,057, Cl. 350-333.000.

Aoki, Kozo: *See—*
Morigaki, Masakazu; and Aoki, Kozo, 4,929,538, Cl. 430-551.000.

Aoki, Masakazu; and Suzuki, Akira, to Hitachi, Ltd. Air-cooled oil-free rotary-type compressor. 4,929,161, Cl. 418-83.000.

Aoki, Takayoshi: *See—*
Shinoki, Masayoshi; Takagi, Masahiro; Nagatsuka, Ikutaroh; Kumashiro, Koichi; Aoki, Takayoshi; and Takeda, Masayuki, 4,929,528, Cl. 430-108.000.

Aoki, Yuichi: *See—*
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.
Ohkubo, Yukiharu; Hosoya, Manabu; Miura, Shinji; and Aoki, Yuichi, 4,928,936, Cl. 269-73.000.

Aoyagi, Takaaki: *See—*
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, 4,929,633, Cl. 514-423.000.

Aoyama, Hirokazu: *See—*
Furutaka, Yasuhisa; Aoyama, Hirokazu; and Honda, Tsunetoshi, 4,929,318, Cl. 204-157.600.

AP Parts Manufacturing Company: *See—*
Harwood, Jon W.; Karlgaard, Wayne A.; and Clegg, Michael W., 4,928,372, Cl. 29-890.080.

Appavoo, Darma L. Splash guard. 4,928,993, Cl. 280-851.000.

Apple, Phillip C., to American Holtzkraft, Inc. Umbrella. 4,928,718, Cl. 135-22.000.

Applied Materials, Inc.: *See—*
Carlson, David K.; and Lindstrom, Paul R., 4,928,626, Cl. 118-715.000.

Apsley Metals Limited: *See—*
Holroyd, Eric; and Wright, Anthony R., 4,929,292, Cl. 156-132.000.

Ara, Kouichi, to NEC Home Electronics Ltd. Circuit for generating image signal. 4,929,937, Cl. 340-728.000.

Arai, Yasuhisa: *See—*
Hosaka, Takefumi; Arai, Yasuhisa; and Matsui, Hiroki, 4,930,084, Cl. 364-426.040.

Arakawa, Yasuo: *See—*
Aso, Toshiyuki; and Arakawa, Yasuo, 4,929,809, Cl. 219-69.120.

Arbus Inc.: *See—*
Dye, Norman H., 4,928,596, Cl. 102-216.000.

Archibald, John P.: *See—*
Shekleton, Jack R.; Rodgers, Colin; and Archibald, John P., 4,928,479, Cl. 60-39.360.

Arco Chemical Technology, Inc.: *See—*
Dean, Barry D.; and Gastinger, Robert G., 4,929,677, Cl. 525-151.000.

Arena Recreations (Toronto) Limited: *See—*
Granzotto, Robert; and Wong, Wah K. J., 4,928,905, Cl. 242-201.000.

Arft, Dennis E., to Leggett & Platt, Incorporated. Adjustable seat pitch sofa sleeper mechanism. 4,928,331, Cl. 5-13.000.

Ariagno, Daniel: *See—*
Lagarde, Robert; Ariagno, Daniel; and Nys, Jacques, 4,929,460, Cl. 426-420.000.

Arimoto, Akira; Ishikawa, Sachiko; and Kataoka, Keiji, to Hitachi, Ltd. Optical pickup using waveguide. 4,929,044, Cl. 350-96.130.

Arjomari-Prioux: *See—*
Gerault, Patrice; Goguelin, Michel; and Fredenucci, Pierre, 4,929,308, Cl. 162-145.000.

Armbruster, David R.; and Tse, Kwok-Tuen, to Acme Resin Corporation. Alkaline phenolic resole resin binders. 4,929,648, Cl. 523-147.000.

Armstrong, Ralph: *See—*
Collette, Wayne N.; and Armstrong, Ralph, 4,928,835, Cl. 215-31.000.

Armstrong, Richard J Compressed gas motor. 4,928,576, Cl. 91-499.000.

Arnold, David: *See—*
Meiners, David J.; Morris, Robert A.; Arnold, David; Castonguay, Roger N.; and Palmieri, Joseph M., 4,929,920, Cl. 335-202.000.

Arnould Fabrique d'Appareillage Electrique: *See—*
Gonon, Jean-Louis; and Moulin, Pierre, 4,929,190, Cl. 439-409.000.

Arrington, Douglas C.: *See—*
Flesner, Larry D.; Eisenman, Welsey L.; Merriam, James D.; Bates, Richard L.; Dahle, Rolf N.; and Arrington, Douglas C., 4,929,831, Cl. 250-307.000.

Arthur, Hugh M., to Molins PLC. Cigarette making machines. 4,928,713, Cl. 131-84.100.

Arthurs, Raymond C., to Scepter Manufacturing Company Limited. Bottle tray. 4,928,841, Cl. 220-21.000.

Asahi Glass Co., Ltd.: *See—*
Akanuma, Hideo; Murata, Masashi; Inoue, Kiyoshi; and Ohgake, Ryoji, 4,929,372, Cl. 252-29.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ban, Kazuki; and Oyabu, Norio, 4,929,667, Cl. 524-718.000.

Asai, Hiromiotu: *See—*
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, 4,929,438, Cl. 424-10.000.

Asai, Seiichi: *See—*
Awano, Hikaru; Asai, Seiichi; Kaneko, Katsuo; Kaida, Hiroshi; and Yoshida, Fujio, 4,928,882, Cl. 239-112.000.

Asea Brown Boveri AG: *See—*
Bohnert, Klaus; Kaufmann, Meinolph; and Nehring, Jurgen, 4,929,830, Cl. 250-227.140.
Guning, Horst, 4,929,856, Cl. 307-633.000.
Meyer, Gundolf; Schonfeld, Erwin; and Verpoort, Clemens, 4,929,596, Cl. 505-1.000.

Ashely, Ravadean: *See—*
Evans, Jerry; and Ashely, Ravadean, 4,928,324, Cl. 2-424.000.

Ashley, Carol S.; and Reed, Scott T., to United States of America, Energy. Sol-gel antireflective coating on plastics. 4,929,278, Cl 106-287.120.

Aslam, Mohammad; Vicari, Richard; and Davenport, Kenneth G., to Hoechst Celanese Corporation. Copolymers of p-mercaptostyrene and its esters. 4,929,694, Cl. 526-262.000.

Aso, Toshiyuki; and Arakawa, Yasuo. Wire drive apparatus in a wire-cut electric discharge machine. 4,929,809, Cl. 219-69.120.

Asselin, Brian K., to Walbro Corporation. In-tank fuel reservoir with fuel level sensor. 4,928,657, Cl. 123-514.000.

ASTA Pharma Aktiengesellshaft: *See—*
Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, 4,929,607, Cl. 514-110.000.

AT&T Bell Laboratories: *See—*
Agrawal, Rakesh; and Jagadish, Hosagrahar V., 4,930,072, Cl 364-300.000.
Amir, Israel; and Higgins, Frank P., 4,929,845, Cl. 250-561.000.

Bauer, Thomas M.; Dunn, Thomas A.; Gurke, Christina M.; Hopkins, John W.; and Nafziger, Richard D., 4,930,154, Cl. 379-246.000.
Burger, Christian P.; Dudderar, Thomas D.; Gilbert, John A.; Peters, Bruce R.; and Smith, James A., 4,928,527, Cl. 73-657.000.
Sizer, Theodore, II, 4,930,131, Cl. 372-18.000.
Slack, William F.; and Wadlington, James C., 4,930,061, Cl. 363-44.000.

Atari Games Corporation: *See—*
McCarthy, Patrick J., 4,930,074, Cl. 364-410.000.

ATEC-Weiss KG: *See—*
Weiss, Hermann; and Weiss, Rudolf, 4,928,802, Cl. 192-56.00R.

Atkins, Paul V.: *See—*
Hodel, P. Lloyd; and Atkins, Paul V., 4,929,958, Cl. 342-432.000.

Atkinson, Robert W.; Crayton, John W.; Portscheller, James I.; and Wood, Daniel C., to Caterpillar Inc. Automatic starting fluid injection apparatus and method. 4,928,642, Cl. 123-180.00R.

Atlantic Richfield: *See—*
Spies, Brian R., 4,929,898, Cl. 324-242.000.

Atlantic Richfield Company: *See—*
Bremner, Douglas L.; Crews, Gary A.; and Musser, James A., 4,930,110, Cl. 367-56.000.
Kyle, Donald G., 4,930,109, Cl. 367-27.000.
Lara, Pedro F., 4,929,896, Cl. 324-240.000.
Siegfried, Robert W., II, 4,928,758, Cl. 166-66.000.
Siegfried, Robert W., II; Smith, Lonnie J.; and Cornette, H. Mitchell, 4,928,759, Cl. 166-65.100.

Atochem North America, Inc.: *See—*
Lindner, Georg H., 4,928,627, Cl. 118-718.000.

Atwell, William A.: *See—*
Kanafani, Hanny; Patrick, Bruce M.; and Atwell, William A., 4,929,465, Cl. 426-552.000.

Atwell, William H.; Burns, Gary T.; and Saha, Chandan K., to Dow Corning Corporation. Highly densified bodies from organopolysiloxanes filled with silicon carbide powders. 4,929,573, Cl. 501-90.000.

Audi AG: *See—*
Schaper, Siegfried; and Seufert, Martin, 4,929,315, Cl. 204-18.100.

Audren, Yves; and Tuffal, Guy, to Isover Saint-Gobain. Compression coiling machine. 4,928,898, Cl. 242-55.100.

Audsley, Edwin F. Process for forming multi-layer flexible molds. 4,929,403, Cl. 264-22.000.

Auerbach, David R., to Pitney Bowes Inc. Method and apparatus for turning flat articles. 4,928,807, Cl. 198-379.000.

Aufdembrink, Brent A.; and Landis, Michael E., to Mobil Oil Corporation. Method for intercalating organic-swelled layered metal chalcogenide with polymer chalcogenide by treatment with polymeric chalcogenide precursor in inert atmosphere. 4,929,587, Cl. 502-242.000.

Ausiello, Francesco Paolo, to Weber S.r.l. Fuel-injection pump with variable cylinder capacity for diesel engine injection systems. 4,928,656, Cl. 123-504.000.

Ausimont S.p.A.: *See—*
Banzi, Viviano; and Fabri, Roberto, 4,929,682, Cl. 525-257.000.

Ausnit, Steven; and Boeckmann, Hugo, to Minigrip, Inc. Method of making bags and bag material having hinged zipper strips. 4,929,225, Cl. 493-213.000.

Aute Gesellschaft fuer autogene Technik mbH: *See—*
Lotz, Horst K.; and Thomma, Gunther, 4,928,932, Cl. 266-58.000.

Auto-trol Technology Corporation: *See—*
Reilly, Shirley L., 4,930,092, Cl. 364-522.000.

Auto-Valve, Inc.: *See—*
Koller, Floyd G , 4,928,731, Cl. 137-599.000.

Automated Packaging Systems, Inc.: *See—*
Gereby, John L., Gifford, Eric P.; Wehrmann, Rick S.; and Easter, William M., 4,928,455, Cl. 53-570.000.

Automatic Findings, Inc.: *See—*
Seidman, Sheldon, 4,928,367, Cl. 24-705.000.

Automobiles Citroen: *See—*
Lecocq, Jean-Luc, 4,929,941, Cl. 340-825.140.

Automobiles Peugeot: *See—*
Lecocq, Jean-Luc, 4,929,941, Cl. 340-825.140.

Automotive Systems Laboratory, Inc.: *See—*
Thorn, William F., 4,928,991, Cl. 280-738.000.

AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr.Dr.h.c. Hans List: *See—*
Muhrer, Gerhard; Pannold, Reinhard; and Boschanig, Reinhard, 4,928,523, Cl. 73-167.000.

Avni, Eitan; Salama, Simon; and Turi, Eran, to Union Camp Corporation. Method of making high quality extrusion coated paper for quality printing. 4,929,474, Cl. 427-326.000.

Awano, Hikaru; Asai, Seiichi; Kaneko, Katsuo; Kaida, Hiroshi; and Yoshida, Fujio, to Cashew Company, Ltd. Coating gun. 4,928,882, Cl. 239-112.000.

Axelson, Scott R.: *See—*
Hexemer, Richard L., Jr.; Axelson, Scott R.; McCluskey, Philip H., and Mroz, Thomas J., Jr., 4,929,433, Cl. 423-411.000.

Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A.: *See—*
Aiuola, Franco; and Rueff, Herbert, 4,928,942, Cl. 210-58.000.

B. Braun Melsungen AG: *See—*
Koch, Heinrich, and Fuchs, Jugen, 4,929,243, Cl. 604-283.000.

B.F. Goodrich Company, The: *See—*
Phillips, Ronald W., II, 4,929,001, Cl. 285-158.000.
Stanislawczyk, Vic, 4,929,495, Cl. 428-288.000.
Turk, Herbert M., 4,929,664, Cl. 524-451.000.

Babbitt, William R.; Beausoleil, Raymond G.; and Leep, David A., to Boeing Company, The. Multiple laser frequency stabilization. 4,930,133, Cl. 372-32.000.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Fukayama, Yukio; and Oshima, Taku, 4,928,604, Cl. 110-103.000.
Kotaka, Ikuo, 4,928,753, Cl. 165-104.270.

Bachelder, Walter F.; Sullivan, John L.; Fiore, Peter J.; and Hansen, Godfrey L., to Testing Machines Inc. Burst testing apparatus. 4,928,533, Cl. 73-838.000.

Bachem, Henning; Suling, Carlhans; Muszik, Janos; and Schroer, Wolf-Dieter, to Bayer Aktiengesellschaft. Nitrogen-containing water-soluble polymeric compounds. 4,929,309, Cl. 162-164.300.

Bachomoff, Guy R.: *See—*
LeFort, Bernard; Maulat, Jean-Pierre; and Bachomoff, Guy R., 4,928,483, Cl. 60-226.100.

Bae, Myung H., to Samsung Semiconductor & Telecommunications Co. TTL to CMOS input buffer circuit. 4,929,852, Cl. 307-475.000.

Baggen, Constant P. M. J.: *See—*
Verboom, Johannes J.; Baggen, Constant P. M. J.; Van Uijen, Cornelis M. J.; and Gaal, Erik W., 4,930,115, Cl. 369-59.000.

Baggio, Giorgio; Gonella, Mario; and Sartor, Mariano, to NORDICA S.P.A. Ski boot with improved wearability. 4,928,408, Cl. 36-119.000.

Bagley, Brian G.; and Tarascon, Jean-Marie, to Bell Communications Research, Inc. Oxygen plasma treatment of yttrium barium copper oxide. 4,929,598, Cl. 505-1.000.

Bahl, Surinder K.; Canterino, Peter J.; Cunningham, Theresa L.; Evans, Susan P.; and Shaw, Richard G., to Mobil Oil Corporation. Blends of LLDPE, polypropylene and aromatic polymers and high modulus films thereof. 4,929,681, Cl. 525-240.000.

Bains, Kuldip S., to General DataCom, Inc. Multiplexer frame synchronization technique. 4,930,125, Cl. 370-105.000.

Baker, Gerald N., to Emerson Electric Co. Belt locator for locating a belt on a pulley. 4,929,219, Cl. 474-102.000.

Baker Hughes Incorporated: *See—*
Hopmann, Mark E., 4,928,772, Cl. 166-386.000.
Murray, Douglas J., 4,928,770, Cl. 166-385.000.
Peterson, Elmer R., 4,928,768, Cl. 166-380.000.
Vandevier, Joseph E., 4,928,771, Cl. 166-385.000.

Baker, James C.: *See—*
Kazecki, Henry L.; and Baker, James C., 4,930,126, Cl. 370-109.000.

Baker, John B. Rack loader. 4,929,140, Cl. 414-267.000.

Bakers Pride Oven Co.: *See—*
Nevin, Ira; and Nath, Narendra, 4,928,663, Cl. 126-21.00A.

Balazar, Leonard, to Hewlett-Packard Company. Ink delivery system for inkjet printer. 4,929,963, Cl. 346-1.100.

Baldwin, Chris J., to Sperry Marine, Inc. Marine compass rate-of-turn indicator. 4,929,943, Cl. 340-984.000.

Baldwin, John J.; Ponticello, Gerald S.; and Habecker, Charles N., to Merck & Co., Inc. Substituted thiophene-2-sulfonamide antiglaucoma agents. 4,929,637, Cl. 514-445.000.

Ballet, Jean-Noel, to ECIA - Equipements et Composants pour l'Industrie Automobile. Simplified and improved safety-belt buckle. 4,928,366, Cl. 24-641.000.

Ballway, John A. Combination drinking vessel and cup holder with convertible cap/coaster. 4,928,848, Cl. 220-444.000.

Balon, John, Jr.; and Egan, Richard J. Down draft re-circulating system. 4,929,262, Cl. 55-341.200.

Balson-Hercules Group Ltd., The: *See—*
Groelinger, Howard, 4,929,471, Cl. 427-173.000.

Balzers Aktiengesellschaft: *See—*
Buhl, Rainer, 4,929,321, Cl. 204-192.380.

Ban, Kazuki; and Oyabu, Norio, to Asahi Kasei Kogyo Kabushiki Kaisha. Urethane prepolymer composition and a polyurethane coating composition system. 4,929,667, Cl. 524-718.000.

Bang, Kook B. Power driven screw driver. 4,928,560, Cl. 81-463.000.

Bangerger, Timothy W. Sealed bearing lubricator. 4,928,794, Cl. 184-5.100.

Bannai, Hiroyuki; Ida, Yuichi; and Kato, Hironori, to Alps Electric Co., Ltd. Cable reel. 4,928,901, Cl 242-85.000.

Banner, Michael J.: *See—*
Lampotang, Samsun; Gravenstein, Dietrich; Gravenstein, Joachim S.; Gravenstein, Nikolaus; and Banner, Michael J., 4,928,687, Cl. 128-207.140.

Banzi, Viviano; and Fabri, Roberto, to Ausimont S.p.A. Process for crafting maleic anhydride on olefinic polymers. 4,929,682, Cl. 525-257.000.

Bar-Ilan University: *See—*
Sredni, Benjamin; Pavliv, Leo; and Albeck, Michael, 4,929,739, Cl. 549-347.000.

Baran, Robert L.: *See—*
Paquin, Patrick J.; and Baran, Robert L., 4,928,379, Cl. 29-566.300.

Baranovsky, Vladimir I.: *See—*
Kljuev, Vladimir V.; Kozlov, Valery S.; Volodchenko, Dmitry B.; Stepanenko, Alexandr V.; Baranovsky, Vladimir I.; Korolkov, Mikhail I.; and Semenov, Orest S., 4,930,026, Cl. 360-67.000.

Barasch, Stephen T. Hypodermic needle sheath protection shield apparatus. 4,928,824, Cl. 206-365.000.

Barbelet, Barry D. Seating structure with displaceable water bladder. 4,929,026, Cl. 257-454.000.

Barber, Lois M., to LMB Hand Rehab Products. Hygiene splint. 4,928,677, Cl. 128-87.00R.

Barder, Timothy J., to UOP. Separation of 2,7 diisopropylnaphthalene from a feed mixture comprising various diisopropylnaphthalene isomers with a zeolite adsorbent. 4,929,796, Cl. 585-828.000.

Barer, Sol J.; Maxwell, Peter C.; and Hsieh, Jih-Han, to Celgene Corporation. Production of hexamethylenediamine muconate salt. 4,929,396, Cl. 562-595.000.

Barlics, Glen D.: *See—*
Barlics, John J.; and Barlics, Glen D., 4,928,881, Cl. 239-44.000.

Barlics, John J.; and Barlics, Glen D., to Inman Mold Manufacturing Co., Inc. Air freshener. 4,928,881, Cl. 239-44.000.

Barlow, Gordon A., to Gordon Barlow Design. Latch & latch release mechanism for a game. 4,928,960, Cl. 273-1.0GG.

Barlow, Robert W. Remateable fiber optic splice. 4,929,046, Cl. 350-96.210.

Barnes Group Inc.: *See—*
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,928,378, Cl. 29-564.600.

Barnes, Michael W., to Thiokol Corporation. Propellant containing 2-hydroxymethyl-1,3-propanediol trinitrate. 4,929,291, Cl. 149-19.400.

Barnes, Robert A.: *See—*
Baxter, Thomas; and Barnes, Robert A., 4,930,120, Cl. 370-73.000.

Barnette, Darrish W.: *See—*
Frianeza-Kullberg, Teresita C.; and Barnette, Darrish W., 4,929,588, Cl. 502-402.000.

Barnsby, Roger M.: *See—*
Shaffer, Harold K.; and Barnsby, Roger M., 4,928,978, Cl. 277-25.000.

Baroid Technology, Inc.: *See—*
Jelsma, Henk H., 4,928,767, Cl. 166-377.000.

Barrett, Michael E.: *See—*
Laughon, Thomas C.; Nicholson, Roy V.; Barrett, Michael E.; and Beckmann, Robert C., 4,928,913, Cl. 248-224.100.

Barringer, Kevin J.: *See—*
Cregg, James M.; and Barringer, Kevin J., 4,929,555, Cl. 435-172.300.

Barrington, Burchus Q., to Halliburton Company. Plug release indicator. 4,928,520, Cl. 73-151.000.

Barry, Michael R.: *See—*
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J.; Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., 4,929,426, Cl. 422-63.000.

Barshay, Stanley F.; and Mayer, Peter, to American Home Products Corporation. Tamper proof encapsulated medicaments. 4,928,840, Cl. 220-8.000.

Bartczak, Andrzej; and Cetnar, Roman, to Magna International Inc. Latch mechanism. 4,929,007, Cl. 292-336.300.

Bartley, David W., to Ohio Gratings, Inc. Grating construction. 4,928,471, Cl. 52-664.000.

Bartolucci, Raymond A., to American Cyanamid Company. Unit dosage form. 4,929,446, Cl. 424-439.000.

Barton, Arthur A.; DeBolt, Frederick C.; Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A.; Miller, Mark T.; Rasch, Kenneth R.; and Szlucha, Thomas F., to Xerox Corporation. Stripper mechanism. 4,929,983, Cl. 355-315.000.

Barzuza, Ytzhak, to Filtration L.T.D. Method for filtering a fluid. 4,929,363, Cl. 210-741.000.

BASF Aktiengesellschaft: *See—*
Francke, Wittko, 4,929,779, Cl. 585-16.000.
Fukamachi, Chiharu; Schumacher, Horst; Bewert, Wolfgang; and Schneider, Joachim, 4,929,774, Cl. 568-824.000.
Goertz, Hans-Helmut; Denzinger, Walter; and Raubenheimer, Hans-Juergen, 4,929,690, Cl. 525-366.000.
Hansen, Guenter; Schefczik, Ernst; and Reichelt, Helmut, 4,929,720, Cl. 534-766.000.
Hesse, Michael; Hoelderich, Wolfgang; and Schwarzmann, Matthias, 4,929,733, Cl. 546-184.000.
Himmele, Walter; Bott, Kaspar; and Bronstert, Klaus, 4,929,786, Cl. 585-469.000.
Lechtken, Peter; and Kutschera, Peter, 4,929,249, Cl. 8-464.000.
Leyendecker, Joachim; Buerstinghaus, Rainer; Theobald, Hans; Kuenast, Christoph; and Hofmeister, Peter, 4,929,617, Cl. 514-252.000.
Smuda, Hubert; Hoelderich, Wolfgang; Goetz, Norbert; and Recker, Hans-Gert, 4,929,765, Cl. 568-427.000.
Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D.; and Saladin, Guenter, 4,929,758, Cl. 564-485.000.
Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D.; and Saladin, Guenter, 4,929,759, Cl. 564-485.000.

BASF Corporation: *See—*
Hays, Byron G., 4,929,279, Cl. 106-412.000.

Basics Corporation: *See—*
Holmberg, Goran I., 4,929,948, Cl. 340-407.000.

Basse, Hartwig, to Norddeutsche Seekabelwerke AG. Filling material for percolating filters for the treatment of liquids and process for producing and assembling it. 4,929,484, Cl. 428-53.000.

Bassett, C. Andrew L ; and Cook, Ian A., to Osteo-Dyne, Inc. Method and device for providing active exercise treatment for a patient suffering from a bone disorder. 4,928,959, Cl. 272-96.000.

Batcho, Andrew D.; Horst, Ronald L.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc.; and United States of America, Agriculture. 25, 28-dihydroxyergocalciferol and 1,25,28-trihydroxyergocalciferol compositions thereof and their use in the treatment of hyperproliferative disease. 4,929,609, Cl. 514-167.000.

Bates, Richard L.: *See—*
Flesner, Larry D.; Eisenman, Welsey L.; Merriam, James D.; Bates, Richard L.; Dahle, Rolf N.; and Arrington, Douglas C., 4,929,831, Cl. 250-307.000.

Batman, Eric S.: *See—*
Matthews, Charles W.; Batman, Eric S.; and King, Jeffrey F., 4,929,770, Cl. 568-756.000.

Batra, Surinder P.; Hammer, William E.; Lushinsky, Gene A.; Marquart, David W.; Schwane, Walter H.; and Ziecina, Frederick J., to International Business Machines Corporation. Mechanism and method for transferring data between bus units having varying master and slave DMA capabilities. 4,930,069, Cl. 364-200.000.

Battery Technologies Inc.: *See—*
Kordesch, Karl; and Harer, Wilhelm, 4,929,520, Cl. 429-94.000.

Bauer, John K. Steering system for tracking of wheels. 4,928,984, Cl. 280-95.100.

Bauer, Theodor, to Daimler-Benz AG. Convertible top for vehicles, particulary for motor cars. 4,929,015, Cl. 296-116.000.

Bauer, Thomas M.; Dunn, Thomas A.; Gurke, Christina M.; Hopkins, John W.; and Nafziger, Richard D., to AT&T Bell Laboratories. Audible logo for identifying a common carrier. 4,930,154, Cl. 379-246.000.

Bauerfeind GmbH & Co.: *See—*
Scheuermann, Rainer, 4,928,404, Cl. 36-37.000.

Bauerle, David D., to Colt Industries Inc. Adjustable air cleaner fastening assembly. 4,929,260, Cl. 55-510.000.

Baum, Thomas M., to Coeur Laboratories, Inc. Multi-pressure injector device. 4,929,238, Cl. 604-208.000.

Baumann, Marcus: *See—*
Moser, Hans; Pissiotas, Georg; Brunner, Hans-Georg; Bohner, Beat; and Baumann, Marcus, 4,929,272, Cl. 71-95.000.

Baumoel, Joseph. Fluoroether grease acoustic couplant. 4,929,368, Cl. 252-11.000.

Baxter International Inc.: *See—*
Desecki, Vince C.; and Prisco, Michael R., 4,929,242, Cl. 604-266.000.

Baxter, Thomas; and Barnes, Robert A., to U.S. Philips Corporation. Signal distribution network system. 4,930,120, Cl. 370-73.000.

Bayer Aktiengesellschaft: *See—*
Bachem, Henning; Suling, Carlhans; Muszik, Janos; and Schroer, Wolf-Dieter, 4,929,309, Cl. 162-164.300.
Dedden, Hubert; Gieger, Eckhard; and Lauer, Christian, 4,929,829, Cl. 250-208.400.
Dujardin, Ralf; Meyer, Rolf-Volker; and Siebourg, Wolfgang, 4,929,709, Cl. 528-198.000.
Engbert, Theodor; Frohlich, Jurg; Kubitza, Werner; Breidenbach, Peter; and Mennicken, Gerhard, 4,929,724, Cl. 540-202.000.
Forster, Heinz; Beck, Gunther; Klauke, Erich; Santel, Hans-Joachim; and Schmidt, Robert R., 4,929,743, Cl. 548-187.000.
Herd, Karl-Josef, 4,929,757, Cl. 564-423.000.
Jelich, Klaus; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,929,738, Cl. 549-76.000.
Klinkmann, Kurt; Herzhoff, Michael; and Burmeister, Gerhard, 4,929,784, Cl. 585-422.000.
Lindner, Werner; Becker, Benedikt; Steffens, Robert; Wachendorff-Neumann, Ulrike; Brandes, Wilhelm; Stendel, Wilhelm; and Dutzmann, Stefan, 4,929,642, Cl. 514-510.000.
Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, 4,929,705, Cl. 528-49.000.
Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, 4,929,689, Cl. 525-333.900.
Mohrs, Klaus; Raddatz, Siegfried; Fruchtmann, Romanis; Kohlsdorfer, Christian; and Muller-Peddinghaus, Reiner, 4,929,626, Cl. 514-311.000.
Nouvertne, Werner; Gielen, Franz-Josef; Tacke, Peter; Grigo, Ulrich; Quiring, Bernd; and Lindner, Christian, 4,929,674, Cl. 325-66.000.
Reiser, Wolf; and Feyen, Peter, 4,929,735, Cl. 548-268.800.
Schnatterer, Albert; and Fiege, Helmut, 4,929,766, Cl. 568-432.000.
Scholl, Thomas; Jabs, Gert; and Richartz, Adolf, 4,929,710, Cl. 528-205.000.

Bayerische Motoren Werke AG: *See—*
Mielsch, Goetz, 4,929,327, Cl. 204-272.000.

Bayon, Marco A. A. C.: *See—*
Possani, Lourival D. P.; Gurrola, Georgina B.; Bayon, Marco A. A. C.; and Sitges, Maria B., 4,929,718, Cl. 530-326.000.

Be, Anh: *See—*
Narula, Dipak B.; Be, Anh; and Swihart, Terence J., 4,929,703, Cl. 528-23.000.

Beam, Jerry E.: *See—*
Leonard, John F.; and Beam, Jerry E., 4,929,414, Cl. 419-2.000.

Bearss, James G.: *See—*
Chan, C. S.; Bearss, James G.; and Nelson, Terry M., 4,930,018, Cl. 358-298.000.

Beasom, James D.; and O'Mara, William E., Jr., to Harris Corporation. Method of isolating a top gate of a MESFET and the resulting device. 4,929,568, Cl. 437-40.000.

Beaston, Brook J., to Great Plains Industries, Inc. Calibration container. 4,928,514, Cl. 73-3.000.

Beausoleil, Raymond G.: *See—*
Babbitt, William R.; Beausoleil, Raymond G.; and Leep, David A., 4,930,133, Cl. 372-32.000.

Beauvias, Roger R., II. Passive resistance enhancer for safety seat belt 4,929,027, Cl. 297-482.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Beck, Gunther: *See—*
Forster, Heinz; Beck, Gunther; Klauke, Erich; Santel, Hans-Joachim; and Schmidt, Robert R., 4,929,743, Cl. 548-187.000.
Becker, Benedikt: *See—*
Lindner, Werner; Becker, Benedikt; Steffens, Robert; Wachendorff-Neumann, Ulrike; Brandes, Wilhelm; Stendel, Wilhelm; and Dutzmann, Stefan, 4,929,642, Cl. 514-510.000.
Becker, Dawn M., to Bye, Moms Inc. Portable, insulated storage container. 4,929,094, Cl. 383-7.000.
Beckman, William J. Bio-filtration apparatus and method for wastewater treatment. 4,929,349, Cl. 210-151.000.
Beckmann, Robert C. *See—*
Laughon, Thomas C.; Nicholson, Roy V.; Barrett, Michael E.; and Beckmann, Robert C., 4,928,913, Cl. 248-224.100.
Becton, Dickinson and Company: *See—*
Sweeney, Niall; and Gyure, Sandor, 4,929,232, Cl. 604-111.000.
Bedard, Michel: *See—*
Kuzuhara, Michio; Shibasaki, Jun; St. Louis, Andree; St. Laurent, Christian; and Bedard, Michel, 4,928,431, Cl. 49-479.000.
Beechko, Nicholas, to International Business Machines Corporation. Anisotropic etching method and etchant. 4,929,301, Cl. 156-657.000.
Beeckman, Jean W.: *See—*
Hegedus, Louis; Beeckman, Jean W.; Pan, Wie-Hin; and Solar, Jeffrey P., 4,929,586, Cl. 502-217.000.
Beery, Jack, to Mead Corporation, The. Encoded cartridge. 4,928,900, Cl. 242-71.100.
Beery, Jack, to Mead Corporation, The. Sheet feeders for soft coated sheet material. 4,928,947, Cl. 271-24.000.
Beghelli, Gian Pietro. Connection and fixing system for electronic unit. 4,929,192, Cl. 439-534.000.
Begout, Eric; Bourgeois, Alain; Gueuret, Raymond; and Lapeyre, Pascal, to Societe Anonyme dite: Alcatel Thomson Faisceaux Hertziens. Feed horn for a telecommunications antenna. 4,929,962, Cl. 343-786.000.
Beige, Joel, to Rubie's Costume Co. Illuminable jewelry item. 4,930,052, Cl. 362-104.000.
Beitman, Bruce A., to Harris Corporation. Method of making dielectrically isolated integrated circuits using oxygen implantation and expitaxial growth. 4,929,566, Cl. 437-24.000.
Bejarano-Wallens, Celso O.; Gage, Julie E.; and Hodapp, Donald, to Kraft General Foods, Inc. Melting tolerant sauce and seasoning particulate. 4,929,456, Cl. 426-99.000.
Belko, William R., Jr. Spring tension holding means. 4,928,821, Cl. 206-329.000.
Bell Communications Research, Inc.: *See—*
Bagley, Brian G.; and Tarascon, Jean-Marie, 4,929,598, Cl. 505-1.000.
Miller, Patrick A., 4,930,152, Cl. 379-214.000.
Bell, Dennis E., to Landoll Corporation. Cultivator with improved disc positioning means. 4,928,774, Cl. 172-430.000.
Bell & Howell Company: *See—*
Svyatsky, Eduard; Loftis, Jerry W.; and Faber, Thomas, 4,928,946, Cl. 271-10.000.
Svyatsky, Eduard, 4,928,952, Cl. 271-150.000.
Bell, James A.: *See—*
Tyers, Michael B.; Coates, Jan H.; Humber, David C.; Ewan, George B.; and Bell, James A., 4,929,632, Cl. 514-397.000.
Bell, Michael G.; and Stevens, Robert L. Locator and clamping means for a jug fixture. 4,928,939, Cl. 269-309.000.
Bell Microsensors, Inc.: *See—*
Bell, Robert L.; and Renger, Herman L., 4,929,890, Cl. 324-78.00R.
Bell, Robert L.; and Renger, Herman L., to Bell Microsensors, Inc. System for obtaining digital outputs from multiple transducers. 4,929,890, Cl. 324-78.00R.
Bell, Stephen: *See—*
Watson, Keith G; Drygala, Peter; and Bell, Stephen, 4,929,269, Cl. 71-92.000.
Belshaw, Douglas J.: *See—*
Toon, Donald A.; and Belshaw, Douglas J., 4,928,541, Cl. 73-864.630.
Bentley-Harris Manufacturing Company, The: *See—*
Conaghan, Thomas B.; Gladfelter, Harry F.; Kite, Joseph S., III; and Tresslar, Marie C., 4,929,478, Cl. 428-35.100.
Berg, Larry; Wright, Ricky A.; and Caswell, Philip A. Sports board. 4,929,110, Cl. 402-73.000.
Berger, Henry: *See—*
Johnston, Michael D.; and Berger, Henry, 4,929,444, Cl. 424-94.640.
Bergner, Arndt, to Hilti Aktiengesellschaft. Expansion dowel assembly. 4,929,134, Cl. 411-30.000.
Berkel, Werner, to Hewlett-Packard Company. Output amplifier. 4,929,907, Cl. 330-252.000.
Berneburg, Philip L.; and Rice, Roy W., to W.R. Grace & Co.-Conn. Ceramic composite valve for internal combustion engines and the like. 4,928,645, Cl. 123-188.0AA.
Bernstein, Leon M., to Kurt Manufacturing Company, Inc. Multi-purpose machine vise. 4,928,937, Cl. 269-136.000.
Bertolotti, Luigi, to Bertolotti S.p.A.; and Nuova Italsider S.p.A. Process for wrapping ribbon type metal coils. 4,928,454, Cl. 53-409.000.
Bertolotti S.p.A.: *See—*
Bertolotti, Luigi, 4,928,454, Cl. 53-409.000.
Besmann, Theodore M.; and Lowden, Richard A., to Martin Marietta Energy Systems, Inc. Titanium diboride ceramic fiber composites for Hall-Heroult cells. 4,929,328, Cl. 204-279.000.
Beta Raven, Inc.: *See—*
Volk, Joseph A. Jr., 4,929,163, Cl. 425-143.000.
Bettarini, Franco: *See—*
Massardo, Pietro; Bettarini, Franco; Piccardi, Paolo; and Rama, Franco, 4,929,772, Cl. 568-812.000.
Betz Laboratories, Inc.: *See—*
Chen, Fu, 4,929,362, Cl. 210-701.000.
Chen, Fu; and Carey, William S., 4,929,695, Cl. 526-297.000.
Polizzotti, David M., 4,929,361, Cl. 210-698.000.
Roling, Paul V., 4,929,778, Cl. 585-3.000.
Bewert, Wolfgang: *See—*
Fukamachi, Chiharu; Schumacher, Horst; Bewert, Wolfgang; and Schneider, Joachim, 4,929,774, Cl. 568-824.000.
Beyrich, Jurgen: *See—*
Albrecht, Bernhard; and Beyrich, Jurgen, 4,929,752, Cl. 562-70.000.
BF Goodrich Company, The: *See—*
Kletecka, George; Lai, John T.; and Son, Pyong N., 4,929,653, Cl. 524-96.000.
Bhatia, Sushil K.: *See—*
Pickering, John H.; Bhatia, Sushil K.; Rath, Mihira K.; and Chevrette, Roger N., 4,928,995, Cl. 281-29.000.
Billig, Ernst: *See—*
Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., 4,929,767, Cl. 568-454.000.
Billmers, Robert L.; Del Giudice, David M.; Tessler, Martin M.; and Hasuly, Michael J., to National Starch and Chemical Investment Holding Corporation. Polysaccharides containing aromatic aldehydes and their derivatization via amine-aldehyde interactions. 4,929,670, Cl. 525-54.100.
Billy, Jean-Claude: *See—*
Abaziou, Jean-Luc; Billy, Jean-Claude; and Le Mouel, Bernard, 4,930,127, Cl. 370-110.400.
Binarsch, Jurgen; Bode, Jurgen; Danne, Lutz; and Lissel, Norbert, to WABCO Westinghouse Fahrzeugbremsen GmbH. Current regulator for inductive loads. 4,930,040, Cl. 361-154.000.
Binder, Dieter; and Rovensky, Franz, to Chemisch Pharmazeutische Forschungsgesellschaft. Novel basic-substituted 5-halo-thienoisothiazol-3(2H)-one 1,1-dioxides, a process for the preparation thereof, and pharmaceutical preparations containing these compounds. 4,929,616, Cl. 514-253.000.
Binish, Patrick W.: *See—*
Clark, Robert J.; and Binish, Patrick W., 4,929,014, Cl. 296-97.800.
Biologix, Inc.: *See—*
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J.; Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., 4,929,426, Cl. 422-63.000.
Biomedical Devices Company, Inc.: *See—*
Ferkany, Michael A., 4,928,453, Cl. 53-67.000.
Bird, Philip H.; Coe, David J.; Paxman, David H.; and Korteling, Aart G., to U.S. Philips Corp. High voltage semiconductor with integrated low voltage circuitry. 4,929,884, Cl. 323-313.000.
Bitzel, Michael E.: *See—*
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J. Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,928,346, Cl. 15-338.000.
Black & Decker Inc.: *See—*
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,928,346, Cl. 15-338.000.
Krasznai, Charles Z.; and Kosten, Richard B., 4,928,347, Cl. 15-344.000.
Blackman, Steven T., to Thames Pharmacal Co., Inc. Anti-infective methods and compositions. 4,929,619, Cl. 514-263.000.
Blacknell, David: *See—*
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., 4,929,950, Cl. 342-25.000.
Blanchard, Richard A., to Siliconix Incorporated. Rugged lateral DMOS transistor structure. 4,929,991, Cl. 357-23.800.
Blanken, Pieter G., to U.S. Philips Corporation. Current mirror circuit, and video output amplifier circuit provided with the current mirror circuit. 4,929,912, Cl. 330-288.000.
Blankenship, George D., to Lincoln Electric Company, The. Plasma arc torch interlock with disabling control arrangement system. 4,929,811, Cl. 219-121.540.
Blenkush, Brian J.: *See—*
Krahn, Roy J.; and Blenkush, Brian J., 4,928,859, Cl. 222-402.140.
Bliss, William R. Electrically heated wiper blade utilizing fibrous carbon heating element. 4,928,344, Cl. 15-250.060.
Bloemendal, Berend J.; and Bromhaar, Marinus J. G., to Persluchtring Advies B.V. Fluid pressure operated push beam and apparatus comprising one or more of such push beams. 4,928,926, Cl. 254-93.00R.
Blome GmbH & Co. Kommanditgesellschaft, and Strabag Bau-Aktiengesellschaft: *See—*
Blome, Peter, 4,929,294, Cl. 156-187.000.
Blome, Peter, to Blome GmbH & Co. Kommanditgesellschaft, and Strabag Bau-Aktiengesellschaft. Method of creating profiling projections on plastic-covered steel parts. 4,929,294, Cl. 156-187.000.
Blum, Jerome V., to Visual Ease, Inc. Eye comfort panel. 4,929,865, Cl. 313-478.000.
Board of Regents, The University of Texas System: *See—*
Brewer, Cecil C., 4,928,830, Cl. 206-570.000.
Munford Robert S.; and Hall, Catherine L., 4,929,604, Cl. 514-53.000.
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J.; Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., to Biologix, Inc. Portable blood chemistry measuring apparatus. 4,929,426, Cl. 422-63.000.
Bode, Jurgen: *See—*
Binarsch, Jurgen; Bode, Jurgen; Danne, Lutz; and Lissel, Norbert, 4,930,040, Cl. 361-154.000.
Bodine, David B.; and Farkas, Joseph R. Alarm system. 4,929,925, Cl. 340-426.000.
Boeckmann, Hugo: *See—*
Ausnit, Steven; and Boeckmann, Hugo, 4,929,225, Cl. 493-213.000.
Boehm, Manfred D.: *See—*
Sherwin, Karl F.; and Boehm, Manfred D., 4,930,145, Cl. 378-109.000.
Boehringer Ingelheim KG: *See—*
Hilgers, Georg; and Hess, Joachim, 4,929,727, Cl. 544-317.000.
Boehringer Mannheim Corporation: *See—*
Freitag, Helmut, 4,929,545, Cl. 435-11.000.
Boehringer Mannheim GmbH: *See—*
Kientsch-Engel, Rosemarie; Worner, Walter; and Kleinhammer, Gerd, 4,929,543, Cl. 435-5.000.
Boeing Company, The: *See—*
Babbitt, William R.; Beausoleil, Raymond G.; and Leep, David A., 4,930,133, Cl. 372-32.000.
Huggins, Raymond W., 4,930,117, Cl. 370-3.000.
Voyce, Kenneth G.; and McCandless, Jay H., 4,929,906, Cl. 330-149.000.
Watts, Robert M., 4,928,904, Cl. 242-158.00R.
Weixelman, Lawrence M.; and Swanson, Richard D., 4,929,899, Cl. 324-253.000.
Bogatin, Yakov, to SPS Technologies, Inc. Magnetic alloy compositions and permanent magnets. 4,929,275, Cl. 75-246.000.
Boghean, Barry J.; Subbanna, Somanahalli N.; Redmon, Charles L.; and Wamser, Christian A., to Allied-Signal Inc. Manufacture of high purity low arsenic anhydrous hydrogen fluoride. 4,929,435, Cl. 423-484.000.
Bohm, Georg G. A.: *See—*
Roland, Charles M.; Bohm, Georg G. A.; and Schonfeld, Steven E., 4,929,684, Cl. 525-274.000.
Bohman, Carl E.; and Seymour, Shaun A., to Ford New Holland, Inc. Moisture sensing apparatus with movable probe in combination with an agricultural baler having a pickup. 4,929,904, Cl. 324-696.000.
Bohner, Beat: *See—*
Moser, Hans; Pissiotas, Georg; Brunner, Hans-Georg; Bohner, Beat; and Baumann, Marcus, 4,929,272, Cl. 71-95.000.
Bohnert, Klaus; Kaufmann, Meinolph; and Nehring, Jurgen, to Asea Brown Boveri AG. Fiber-optic electric field sensor with piezoelectric body sensor. 4,929,830, Cl. 250-227.140.
Bohnert, Thomas J., to Dow Chemical Company, The. Use of laminates containing superabsorbent polymers for asbestos abatement. 4,929,360, Cl. 210-679.000.
Bollfrass, Charles A.: *See—*
Landriault, L. Steven; Ortloff, Donald J.; and Bollfrass, Charles A., 4,928,999, Cl. 285-113.000.
Bonatz, Hans: *See—*
Ewert, Werner H., 4,928,333, Cl. 5-110.000.
Bonnaudet, Serge: *See—*
Cameron, Charles; Mimoun, Hubert; Bonnaudet, Serge; and Robine, Alain, 4,929,787, Cl. 585-500.000.
Bonne, Claude: *See—*
Coquelet, Claude; Roussillon, Samia; Sincholle, Daniel; Bonne, Claude; and Alazet, Alain, 4,929,635, Cl. 514-438.000.
Bonnefous, Odile M. A., to U.S. Philips Corporation. Device for measuring the speed of moving organs and blood flows by correlation. 4,928,698, Cl. 128-661.090.
Boots Company, PLC: *See—*
Jeffery, James E.; and Whybrow, Derek, 4,929,629, Cl. 514-646.000.
Bordaz, Pascal: *See—*
Prus, Eric; Frene, Andre; Bordaz, Pascal; Guerange, Patrick; and Thome, Caryl, 4,928,880, Cl. 239-8.000.
Bordt, Wolfgang; and Gerstenberger, Friedrich, to J. G. Anschuetz GmbH. Cocking device for a compressed air weapon. 4,928,661, Cl. 124-69.000.
Borel, Georg, to Hermann Wangner GmbH & Co. KG. Fabric for the sheet forming section of a papermaking machine. 4,928,737, Cl. 139-383.00A.
Borges, Robert J. Corrosion and abrasion resistant alloy. 4,929,288, Cl. 148-326.000.
Borisoff, Boris: *See—*
Borisoff, David J.; and Borisoff, Boris, 4,928,564, Cl. 84-313.000.
Borisoff, David J.; and Borisoff, Boris. Apparatus and method for stabilizing a tremolo on a musical instrument such as a guitar. 4,928,564, Cl. 84-313.000.
Bosch, Erhard: *See—*
Burger, Christa; Muller, Johann; and Bosch, Erhard, 4,929,647, Cl. 522-99.000.
Boschanig, Reinhard: *See—*
Muhrer, Gerhard; Pannold, Reinhard; and Boschanig, Reinhard, 4,928,523, Cl. 73-167.000.
Bose, Debasis: *See—*
Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., 4,929,511, Cl. 428-606.000.
Boskovic, Borislav. Ejector blade. 4,929,170, Cl. 425-556.000.
Bossenmaier, Alban, to Dasmler-Benz AG. Safety arrangement for proving the unauthorized opening of a housing. 4,929,137, Cl. 411-501.000.
Bostick, Charles R. Foldable rubber stamp handle. 4,928,594, Cl. 101-405.000.
Bothe, Lothar: *See—*
Dinter, Peter; Bothe, Lothar; and Gribbin, John D., 4,929,319, Cl. 204-164.000.
Bott, Kaspar: *See—*
Himmele, Walter; Bott, Kaspar; and Bronstert, Klaus, 4,929,786, Cl. 585-469.000.
Botzman, Thomas J.: *See—*
Wideman, Lawson G.; and Botzman, Thomas J., 4,929,280, Cl. 106-472.000.
Bouchard, Andre C., to GTE Products Corporation. Glow discharge lamp containing nitrogen. 4,929,868, Cl. 313-619.000.
Bouchard, John G. Elliptical ram air pressurized airfoil parachute. 4,928,909, Cl. 244-145.000.
Boudewijns, Arnoldus J. J., to U.S. Philips Corp. Integrated circuit having plural capacitances of different values. 4,929,998, Cl. 357-45.000.
Boudreau/Darque, Inc.: *See—*
Boudreau, Louis H., 4,928,417, Cl. 40-642.000.
Boudreau, Louis H., to Boudreau/Darque, Inc. Golf cup advertising device and method. 4,928,417, Cl. 40-642.000.
Bourgeois, Alain: *See—*
Begout, Eric; Bourgeois, Alain; Gueuret, Raymond; and Lapeyre, Pascal, 4,929,962, Cl. 343-786.000.
Bowe, Donald J.: *See—*
King, John C. W.; Bowe, Donald J.; and Kilhefiner, Paul T., III, 4,929,283, Cl. 148-13.200.
Bowen, Gerald K.; and Zagrodnik, Jeffrey P., to Globe-Union Inc. Removable protective electrode in a bipolar battery. 4,929,325, Cl. 204-268.000.
Bowes, William A., to Eastman Kodak Company. Printer and stand assembly. 4,928,918, Cl. 248-688.000.
Bowling, Larry D.: *See—*
Heilman, Marlin S.; Brandt, Arlan J.; Bowling, Larry D.; and Russial, Joseph F., 4,928,690, Cl. 128-421.000.
Bozza, Ireneo. Device for transferring articles from a first to a second conveyor with predetermined rotation of the articles during the said transfer. 4,928,809, Cl. 198-408.000.
Braatz, James A.: *See—*
Heifetz, Aaron H.; Wolfe, Richard A.; Braatz, James A.; and Luthra, Narender P., 4,929,706, Cl. 528-49.000.
Bradbury, Harold M.; Pfenning, Dwight B.; Corlett, William R.; and Mays, Roscoe, Jr., to Rainbarrel Corporation. Method and apparatus for vending a containerized product on multiple occasions following at least one refill of the container with the product. 4,929,818, Cl. 235-381.000.
Bradfield AG Inc.: *See—*
Bradfield, Athoi G., 4,928,322, Cl. 2-169.000.
Bradfield, Athoi G., to Bradfield AG Inc. Disposable glove. 4,928,322, Cl. 2-169.000.
Brady, Robert: *See—*
Henderson, Don J.; Brady, Robert; Gamble, Foster R.; Hardt, James V.; Friedfeld, Howard; Salerno, Don; Swanson, Tad; and Sansing, Maureen R., 4,928,696, Cl. 128-644.000.
Brammer, Hartmut: *See—*
Sohner, Gerhard; Roth, Helmut; Brammer, Hartmut; Schleupen, Richard; and Nubel, Karl-Heinz, 4,928,660, Cl. 123-647.000.
Brandener, Louis, to Societe Jacques DuBois. Flexible exhaust coupling. 4,928,998, Cl. 285-49.000.
Brandes, Wilhelm: *See—*
Jelich, Klaus; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,929,738, Cl. 549-76.000.
Lindner, Werner; Becker, Benedikt; Steffens, Robert; Wachendorff-Neumann, Ulrike; Brandes, Wilhelm; Stendel, Wilhelm; and Dutzmann, Stefan, 4,929,642, Cl. 514-510.000.
Brandstetter, Robert W., to Grumman Aerospace Corporation. Method and apparatus for continuous on line recording and processing of synthetic aperture radar signals in real time. 4,929,953, Cl. 342-190.000.
Brandt, Arlan J.: *See—*
Heilman, Marlin S.; Brandt, Arlan J.; Bowling, Larry D.; and Russial, Joseph F., 4,928,690, Cl. 128-421.000.
Brandt, Robert O., Jr. Force multiplying membrane instrument. 4,928,529, Cl. 73-726.000.
Branovich, Louis E.; Smith, ernard; Freeman, Gerard L.; and Eckart Donald W., to United States of America, Army. Method of making a cathode from tungsten powder. 4,929,418, Cl. 419-19.000.
Braschel, Volker; and Seitz, Dieter, to Robert Bosch GmbH. Anti-locking brake control system. 4,929,034, Cl. 303-103.000.
Braun, Karl, to Aesculap-Werke AG vormals Jetter & Scheerer. Device for filling the magazine of a scalp clip applicator with C-shaped scalp clips. 4,929,239, Cl. 606-142.000.
Breault, Richard D.: *See—*
Luoma, Warren L.; Martin, Ronald G.; and Breault, Richard D., 4,929,517, Cl. 429-34.000.
Breidenbach, Dieter; Oldengott, Hans; and Vitt, Burckard, to Ruhrkohle AG. Roof structure. 4,929,179, Cl. 432-247.000.
Breidenbach, Peter: *See—*
Engbert, Theodor; Frohlich, Jurg; Kubitza, Werner; Breidenbach, Peter; and Mennicken, Gerhard, 4,929,724, Cl. 540-202.000.
Breitenfelder, Wilheim; and Trenkner, Fritz, to Salvia-Werk Gesellschaft zur Herstellung chemischer and pharmazeutischer Erzeuginisse mbH. Apparatus for assistmg the spontaneous respiration of a patient. 4,928,684, Cl. 128-204.210.

Breivik, A. Norris: *See—*
Reigstad, Gordon H.; Breivik, A. Norris; and Reigstad, Hanley S., 4,928,451, Cl. 52-223.00L.

Bremner, Douglas L.; Crews, Gary A.; and Musser, James A., to Atlantic Richfield Company. Method for conducting three-dimensional subsurface seismic surveys. 4,930,110, Cl. 367-56.000.

Breuning, Kurt. Device for feeding rodlike workpieces. 4,929,138, Cl 414-16.000.

Breuninger, Robert K., to Texas Instruments Incorporated. Metastable resistant flip-flop. 4,929,850, Cl. 307-272.100.

Brewer, Cecil C., to Board of Regents, The University of Texas System. Suctioning supply kit. 4,928,830, Cl. 206-570.000.

Bricker, Jeffery C.: *See—*
Pollastrini, Sheila; Bricker, Jeffery C.; and Frame, Robert R., 4,929,340, Cl. 208-189.000.

Bridges, Mark E.; and Easterly, Robert W., to Eastman Kodak Company. Light bulb socket soft start and power interrupt assembly. 4,929,872, Cl. 315-209.00R.

Bridgestone Corporation: *See—*
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, 4,929,874, Cl. 318-128.000.

Bridgestone/Firestone, Inc.: *See—*
Roland, Charles M.; Bohm, Georg G. A.; and Schonfeld, Steven E., 4,929,684, Cl. 525-274.000.

Bright, Alfred N., to Saunders-Roe Development Limited. Self luminous characters and signs incorporating same. 4,928,414, Cl. 40-551.000.

Brigolle, Roger, to Societe Anonyme des Machines Osborn. Method for applying vibrations to a resilient support and apparatus for putting this method into practice. 4,929,087, Cl. 366-111.000.

Brillhart, Donald D. Fuel. 4,929,252, Cl. 44-53.000.

British Gas plc: *See—*
Carruthers; Alec R., 4,928,866, Cl. 225-106.000.

British Telecommunications public limited company: *See—*
Leaning, Anthony R., 4,930,013, Cl. 358-133.000.

Brock, Norbert: *See—*
Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, 4,929,607, Cl. 514-110.000.

Brockington and Marshall: *See—*
Marshall, Allen S., 4,928,876, Cl. 229-103.100.

Brode, George L., II *See—*
Partain, Emmett M., III; and Brode, George L., II, 4,929,722, Cl. 536-20.000.

Brodman, Bruce: *See—*
Gold, Kenneth; and Brodman, Bruce, 4,929,552, Cl. 435-128.000.

Bromhaar, Marinus J G.: *See—*
Bloemendal, Berend J.; and Bromhaar, Marinus J. G., 4,928,926, Cl. 254-93.00R.

Bronstert, Klaus: *See—*
Himmele, Walter; Bott, Kaspar; and Bronstert, Klaus, 4,929,786, Cl. 585-469.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Hara, Yoshimasa, 4,929,967, Cl. 346-110.00R.
Hirayama, Takanobu; Funahashi, Hiroyuki; Yokota, Eiji; Uehara, Mitsuyoshi; Kagami, Isao; Hasegawa, Makoto; and Mizuno, Masaru, 4,929,105, Cl. 400-625.000.
Ogawa, Yoshitake, 4,928,611, Cl. 112-217.000.
Yokoi, Takeshi; and Okamori, Shuhei, 4,929,104, Cl 400-605.000.

Brown, James. Paper clip. 4,928,361, Cl. 24-67.900.

Brown, Lawrence H., to Accu-Ring Jaw Systems, Inc. Jaw locking means for chucks. 4,928,981, Cl. 279-1.0SJ.

Brown, Paul: *See—*
DiSimone, John, Brown, Paul; and Huntington, Christopher, 4,929,166, Cl. 425-190.000.

Brown, Stephen: *See—*
Lionetto, Gene; and Brown, Stephen, 4,929,188, Cl. 439-349.000

Bruer, Dirk; Heidjann, Franz; and Hemker, Heinrich, to Claas OHG Self-propelling field chopping machine. 4,928,460, Cl. 56-14.600.

Brun, Gerard; Marin-Ayral, Rose-Marie; Maurin, Maurice; Pistoulet, Bernard; and Tedenac, Jean-Claude, to Centre National de la Recherche Scientifique. Silver, thallium, copper and tellurium-based thermoelectrical semiconductive thermoelectric material, preparation and application to thermoelectric converters. 4,929,282, Cl. 136-239.000.

Brunetti, Brunetto; and Prada, Marco, to Ellem Industria Farmaceutica, S.p.A. Tripeptides useful as immunostimulants as well as in the prevention of metastases. 4,929,601, Cl. 514-18.000.

Brunner, Hans-Georg: *See—*
Moser, Hans; Pissiotas, Georg; Brunner, Hans-Georg; Bohner, Beat; and Baumann, Marcus, 4,929,272, Cl. 71-95.000.

Brunner, Timothy A., to Xerox Corporation. Focus and overlay characterization and optimization for photolithographic exposure. 4,929,083, Cl. 356-400.000.

Brunswick Corporation: *See—*
Weed, Lyle E., 4,928,630, Cl. 123-73.00R.

Bruscino, Joseph A.: *See—*
Moorman, Charles T.; Sabadics, Joseph L.; and Bruscino, Joseph A., 4,929,462, Cl. 426-478.000.

Bryant, David R.: *See—*
Miller, David J., Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., 4,929,767, Cl. 568-454.000.

Buan, Danilo P.; Abellana, Jovito N.; and Dolan, Donald T., to Pitney Bowes Inc. Platen module. 4,929,106, Cl. 400-649.000.

Buchner, Fritz. Motor vehicle water and mud splash guard. 4,928,994, Cl. 280-851.000.

Buerstinghaus, Rainer: *See—*
Leyendecker, Joachim; Buerstinghaus, Rainer; Theobald, Hans; Kuenast, Christoph; and Hofmeister, Peter, 4,929,617, Cl. 514-252.000.

Buhl, Rainer, to Balzers Aktiengesellschaft. Method and apparatus for coating workpieces. 4,929,321, Cl. 204-192.380.

Buhnen, Heinz D.: *See—*
Payer, Wolfgang; Buhnen, Heinz D.; and Zoller, Wilhelm, 4,928,720, Cl. 137-13.000.

Bullis, Robert H.: *See—*
Wiegand, Walter J.; Swindal, James L.; Swarts, Richard E.; Bullis, Robert H.; Lopiccolo, Mario T.; Grantham, Daniel H.; and Foyt, Arthur G., 4,930,042, Cl. 361-280.000.

Bulman, Melvin J., to General Electric Company. Liquid propellant gun. 4,928,571, Cl. 89-7.000.

Bunker, James E., to Minnesota Mining and Manufacturing Company. Dentin and enamel adhesive. 4,929,746, Cl. 558-92.000.

Burdess, James S.; Fawcett, John N.; and Hewit, James R., to Burdess, James Stonehouse; and Fawcett, John Neville. Monitoring tension in an elongate flexible member. 4,928,538, Cl. 73-862.410.

Burdess, James Stonehouse: *See—*
Burdess, James S.; Fawcett, John N.; and Hewit, James R., 4,928,538, Cl. 73-862.410.

Burger, Christa; Muller, Johann; and Bosch, Erhard, to Wacker-Chemie GmbH. Compositions which can be crosslinked by radiation to form elastomers. 4,929,647, Cl. 522-99.000.

Burger, Christian P.; Dudderar, Thomas D.; Gilbert, John A.; Peters, Bruce R.; and Smith, James A., to AT&T Bell Laboratories. Method and device for nondestructive evaluation. 4,928,527, Cl. 73-657.000.

Burgess, Dale L.: *See—*
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,928,378, Cl. 29-564.600.

Burke, Robert J. Bimodal linear accelerator apparatus. 4,930,130, Cl. 372-2.000

Burle Technologies, Inc.: *See—*
Smith, Edgar M., 4,929,833, Cl. 250-338.100.

Burlington Industries, Inc.: *See—*
Morrison, Elbert F., 4,928,464, Cl. 57-224.000.

Burmeister, Gerhard: *See—*
Klinkmann, Kurt; Herzhoff, Michael; and Burmeister, Gerhard, 4,929,784, Cl. 585-422.000.

Burns, Gary T., to Dow Corning Corporation. Silane modified polysilacyclobutasilazanes. 4,929,742, Cl. 556-406.000.

Burns, Gary T.: *See—*
Atwell, William H.; Burns, Gary T.; and Saha, Chandan K., 4,929,573, Cl. 501-90.000.

Burns, Robert L. D.: *See—*
Watson, John C.; Gaskill, Stephen P., Russell, David F.; and Burns, Robert L. D., 4,928,798, Cl 188-218.0XL.

Burrington, James D.: *See—*
Cesa, Mark C.; Dubbert, Robert A.; and Burrington, James D., 4,929,755, Cl. 562-443.000.

Burroughs Wellcome Co.: *See—*
Johnston, Michael D.; and Berger, Henry, 4,929,444, Cl. 424-94.640.

Burstyn, Herschel, to Litton Systems, Inc. Apparatus for the optical measurement of spectra distribution. 4,929,080, Cl. 356-338.000.

Burton, Lester P. J.: *See—*
Keblys, Kestutis A.; Ao, Meng-Sheng; and Burton, Lester P. J., 4,929,745, Cl. 558-84.000.

Buslowski, Wolfgang: *See—*
Maury, Hans-Dietmar; and Buslowski, Wolfgang, 4,929,178, Cl 432-14.000.

Bussey, Howard; Dmochowska, Aleksandra; Thomas, David Y.; and Dignard, Daniel, to Canadian Patents & Development Ltd. Protease for specific processing of secreted proteins. 4,929,553, Cl. 435-172.300.

Buth, C. Eugene; Qureshy, Asif; Ross, Hayes E., Jr.; and Sicking, Dean L., to Texas A&M University System, The. Guardrail extruder terminal. 4,928,928, Cl. 256-13.100.

Butler, David R., Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, to Foseco International Limited. Moulds for metal casting and sleeves containing filters for use therein. 4,928,746, Cl. 164-362.000.

Buyak, William P.; Testa, Bruce V.; and Right, Robert W., to General Signal Corporation. Electronic alarm horn. 4,929,924, Cl. 340-384.00E.

Buzbee, James M.: *See—*
Hastings, Mark W.; and Buzbee, James M., 4,929,900, Cl. 324-525.000.

Bye, Moms Inc.: *See—*
Becker, Dawn M., 4,929,094, Cl 383-7.000.

Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., to Allied-Signal Inc. Low temperature aluminum based brazing alloys. 4,929,511, Cl. 428-606.000.

Byrom, David, to Imperial Chemical Industries plc. Process for the production of microbial cellulose. 4,929,550, Cl. 435-101.000.

C. A. Weidmuller GmbH & Co.: *See—*
Steinkuhle, Ferdinand; Strate, Klaus; Durkop, Willi; and Moller, Ulrich, 4,929,186, Cl. 439-78.000.
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Diekmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000.

C. R. Bard, Inc.: *See—*
Sinofsky, Edward L., 4,929,246, Cl. 606-8.000.

Cabison, Manuel R.: *See—*
Kimball, Dorr; Cox, Michael G.; and Cabison, Manuel R., 4,929,901, Cl. 324-529.000.

Cairns & Brother Inc.: *See—*
Gray, Robert E., 4,928,685, Cl 128-204.240.

Calfo, Raymond M.: *See—*
Scott, Dennis J.; and Calfo, Raymond M., 4,928,572, Cl. 89-8.000.

California Institute of Technology: *See—*
Rembaum, Alan; Rhim, Won-Kyu; Hyson, Michael T.; and Chang, Manchium, 4,929,400, Cl. 264-10.000.

Calundann, Gordon W.: *See—*
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., 4,929,696, Cl. 526-312.000.

Calvet, Alain P.; Junien, Jean-Louis; Pascal, Ives R.; Pascaud, Xavier B.; and Roman, Francois J., to Jouveinal S.A. Benzodiazepines, process and intermediates for the preparation thereof and their application in therapy. 4,929,614, Cl. 514-214.000.

Camaggi, Giovanni: *See—*
Colle, Roberto; Camaggi, Giovanni; Gozzo, Franco; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,929,631, Cl 514-383.000.

Cambridge Engineering, Inc.: *See—*
Potter, Gary J.; Schlote, David S.; and Reinkemeyer. Robert W., 4,929,541, Cl. 432-222.000.

Cameron, Charles; Mimoun, Hubert; Bonnaudet, Serge; and Robine, Alain, to Institut Francais du Petrole. Process for converging methane to higher hydrocarbons. 4,929,787, Cl. 585-500.000.

Campanelli, Anthony S.; and Matre, Daniel A., to Rosestar® Incorporated. Flower stem cutter. 4,928,424, Cl. 47-1.010.

Campbell, James P. Holder for staples, carpet tacks, nails, screws and other discrete magnetizable items. 4,928,823, Cl. 206-338.000.

Campbell, Steven M., to U.S. Divers Company, Inc. Breathing mouthpiece for a snorkel. 4,928,710, Cl. 128-861.000.

Canada, National Research Council of Canada/Conseil National de Reserches du: *See—*
Vandersluis. Ron; and Quittner, Erik, 4,929,009, Cl. 294-2.000.

Canadian Patents & Development Ltd.: *See—*
Bussey, Howard; Dmochowska, Alcksandra; Thomas, David Y.; and Dignard, Daniel, 4,929,553, Cl. 435-172.300.
de Lasa, Hugo I., 4,929,798, Cl. 585-922.000.

Cancot Industries Inc.: *See—*
Friedman, Herbert D.; and Friedman, Mark A., 4,928,342, Cl. 15-145.000.

Cannella, Vincent D.: *See—*
Yaniv, Zvi; Cannella, Vincent D.; Hansell, Gregory L.; and Swartz, Louis D., 4,929,569, Cl. 437-51.000.

Canon Kabushiki Kaisha: *See—*
Kubo, Takahiro; and Tajima, Hatsuo, 4,929,981, Cl. 355-253.000.
Masuda, Takashi; and Sekiguchi, Kyoji, 4,929,076, Cl. 351-212.000.
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.
Sato, Koichi; and Ikeda, Masami, 4,929,964, Cl. 346-1.100
Sato, Mitsuya; Ukaji, Takao; Yamaguchi, Nobuhito; Ohmori, Taro; and Murakami, Eiichi, 4,929,893, Cl. 324-158.00F.
Shimizu, Akira; and Ikeda, Sotomitsu, 4,930,132, Cl. 372-22.000.
Sugiura, Susumu; Kouzato, Yasuo; and Masuda, Yukio, 4,930,007, Cl. 358-75.000.
Tsuji, Sadahiko, 4,929,068, Cl. 350-422.000.
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, 4,928,941, Cl. 270-53.000.

Canterino, Peter J.: *See—*
Bahl, Surinder K.; Canterino, Peter J.; Cunningham, Theresa L.; Evans, Susan P.; and Shaw, Richard G., 4,929,681, Cl. 525-240.000.

Capamaggio, Scott A. Bookmarker. 4,928,621, Cl. 116-234.000.

Cardellina, John H., II; Stierle, Andrea C.; and Strobel, Gary A., to Research and Development Institute, Inc. at Montana State University. Method of inducing chlorosis in a knapweed plant. 4,929,270, Cl. 71-92.000.

Cardiac Pacemakers, Inc.: *See—*
Hauser, Robert G., 4,928,689, Cl. 128-419.00P.

Cardis, Angeline B., to Mobil Oil Corporation. Sulfurized olefin - glycerol monooleate adducts and lubricant compositions containing same. 4,929,253, Cl. 44-76.900.

Carey, David G.: *See—*
Nichols, Jerram B.; Hunter, Douglas; Herrington, Ronald M.; Serratelli, John F.; and Carey, David G., 4,929,646, Cl. 521-137.000.

Carey, Patrick H., Jr.; and Cowman, Charles D., Jr., to Minnesota Mining and Manufacturing Company. Stretchable insulating fabric. 4,929,492, Cl. 428-198.000.

Carey, William S.: *See—*
Chen, Fu; and Carey, William S., 4,929,695, Cl. 526-297.000.

Carlingswitch, Inc.: *See—*
Sorenson, Richard W., 4,929,807, Cl. 200-296.000.

Carlisle Corporation: *See—*
Goodman, Ronald L.; and Kelley, Richard E., Sr., 4,928,443, Cl. 52-58.000.

Carlson, David K.; and Lindstrom, Paul R., to Applied Materials, Inc. Reactant gas injection for IC processing 4,928,626, Cl. 118-715.000.

Carlson, William E.; and Metzler, Mark W., to Sundstrand Corporation. High power, high temperature disassemblable ceramic capacitor mount. 4,930,045, Cl. 361-329.000.

Carpenter, Larry L.; Hagerty, Robert J.; Maschmeyer, Richard O., Morrell, Mark L.; and Schrauth, Peter A., to Corning Incorporated. Method of molding glass optical elements. 4,929,265, Cl. 65-64.000.

Carpenter, Paul R., to P. D. Enterprises, Inc. Arm and leg powered cycle. 4,928,986, Cl. 280-234.000.

Carpenter Technology Corporation: *See—*
Wegman, Dwight D.; Wanner, Edward A.; Rehrer, Wilson P.; and Widge, Sunil, 4,929,419, Cl. 420-56.000.

Carruthers, Alec R., to British Gas plc. Pipe burster. 4,928,866, Cl. 225-106.000.

Carter, William H.: *See—*
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,928,378, Cl. 29-564.600.

Cartwright, Richard V., to Hercules Incorporated. Crash bag propellant composition and method for generating nitrogen gas. 4,929,290, Cl. 149-35.000.

Carty, William E., to U-Haul International. Truck ramp storage arrangement. 4,929,018, Cl. 296-204.000.

Casberg, John M., to Olin Corporation. Encased pool chemical capsule with extended ends and method of making the same. 4,928,813, Cl. 206-0.500.

Cashew Company, Ltd.: *See—*
Awano, Hikaru; Asai, Seiichi; Kaneko, Katsuo; Kaida, Hiroshi; and Yoshida, Fujio, 4,928,882, Cl. 239-112.000.

Casio Computer Co., Ltd.: *See—*
Murata, Yoshiyuki; and Manabe, Hajime, 4,928,563, Cl. 84-726.000.
Sugimoto, Naoshige; Yoshida, Tetsushi; and Toyama, Tadahisa, 4,929,060, Cl. 350-339.00F.

Caskey, Terrence L.; Trimmer, Johnny L.; and Jorgensen, Janine L., to Dow Chemical Company, The. Hollow fiber membrane fluid separation module for boreside feed. 4,929,259, Cl. 55-158.000.

Casserly, Edward W.: *See—*
Venier, Clifford G.; and Casserly, Edward W., 4,929,782, Cl. 585-375.000.

Castelaz, Patrick F., to Hughes Aircraft Company. Wavefront vector correlation processor and method. 4,930,099, Cl. 364-820.000.

Castelhano, Arlindo L.; DeYoung, Lawrence M.; Krantz, Alexander; Pliura, Diana H.; and Venuti, Michael C., to Syntex (U.S.A.) Inc. Transglutaminase inhibitors. 4,929,630, Cl. 514-380.000.

Castonguay, Roger N.: *See—*
Meiners, David J.; Morris, Robert A.; Arnold, David; Castonguay, Roger N.; and Palmieri, Joseph M., 4,929,920, Cl. 335-202.000.

Caswell, Philip A.: *See—*
Berg, Larry; Wright, Ricky A.; and Caswell, Philip A., 4,929,110, Cl. 402-73.000.

Caterpillar Inc.: *See—*
Atkinson, Robert W.; Crayton, John W.; Portscheller, James I.; and Wood, Daniel C., 4,928,642, Cl. 123-180.00R.

Caterpillar Paving Products Inc.: *See—*
Lent, Kevin C.; Rife, Conwell K., Jr.; Simmons, Gerald P.; and Speck, Albert J., 4,929,121, Cl. 404-84.000.

Catotti, Arthur J., to Gates Energy Products, Inc. Wound electrode assembly for an electrochemical cell. 4,929,519, Cl. 429-94.000.

Cavezzan, Jacques; Frances, Jean-Marc; and Lancelin, Pierre, to Rhone-Poulenc Chimie. Tin monochelate catalysis of organopolysiloxane compositions. 4,929,702, Cl. 528-18.000.

Cearley, James E.: *See—*
Dixon, Robert C.; Cearley, James E.; Van Diemen, Paul; Sayre, Edwin D.; and Gordon, Gerald M., 4,929,412, Cl. 376-260.000.

Celgene Corporation: *See—*
Barer, Sol J.; Maxwell, Peter C.; and Hsieh, Jih-Han, 4,929,396, Cl. 562-595.000.

Central Glass Company, Limited: *See—*
Gotoh, Yoshihiko; and Kawai, Toshikazu, 4,929,753, Cl. 562-411.000.

Centre National de la Recherche Scientifique: *See—*
Brun, Gerard; Marin-Ayral, Rose-Marie; Maurin, Maurice; Pistoulet, Bernard; and Tedenac, Jean-Claude, 4,929,282, Cl. 136-239.000.

Cesa, Mark C.; Dubbert, Robert A.; and Burrington, James D., to Standard Oil Company, The. Process for making an optically active mixture of an N-acyl-amino acid or ester containing at least two chiral centers. 4,929,755, Cl. 562-443.000.

Cestind - Centro Studi Industriali-S.R.L.: *See—*
Romagnoli, Andrea, 4,929,299, Cl. 156-466.000.

Cetnar, Roman: *See—*
Bartczak, Andrzej; and Cetnar, Roman, 4,929,007, Cl. 292-336.300.

Cetus Corporation: *See—*
Halenbeck, Robert; Koths, Kriston; Cowgill, Cynthia; and Laird, Walter J., 4,929,700, Cl. 530-351.000.

Chaffee, Edwin G., to American Laser Corporation. Segmented air cooled laser tube. 4,930,136, Cl. 372-62.000.

Chagneau, Francis; Levasseur, Michel; Landanger, Patrick; Langlais, Frantz; and Rolland, Jean-Jacques, to Landos Applications Orthopediques Francaises. Centro-medullary nailing rod. 4,928,679, Cl. 606-62.000.

Chambers, Timothy D. Thrown and bounced toy having a hand grip terminating in high bounce balls. 4,928,977, Cl. 273-428.000.

Champseix, Henri; and Champseix, Serge, to A.B.X. Device for automatically taking liquid from a bottle. 4,928,539, Cl. 73-864.240.

Champseix, Serge: *See—*
Champseix, Henri; and Champseix, Serge, 4,928,539, Cl. 73-864.240.

Chan, C. S.; Bearss, James G.; and Nelson, Terry M., to Hewlett-Packard Company. Method and system for enhancing the quality of both

color and black and white images produced by ink jet printers. 4,930,018, Cl. 358-298.000.

Chan, Eric: *See—*
Citron, Howard; Chan, Eric; and Dolan, Michael, 4,930,157, Cl. 379-433.000.

Chan, Yiu-Fai; and Hung, Chuan-Yung, to Altera Corporation. Method and apparatus for programming and verifying programmable elements in programmable devices. 4,930,107, Cl. 365-189.080.

Chandler, Donald G.; Nossen, Steve J.; and Simpson, Raymond W., to O'Neill Communications, Inc. Spread spectrum communication system. 4,930,139, Cl. 375-1.000.

Chang, Biau-Hung; Lee, Lester Y.; and Kwiatek, Jack, to Quantum Chemical Corporation. Process for converting polyketones to polyesters. 4,929,711, Cl. 528-220.000.

Chang, David B., to Hughes Aircraft Company. Dynamic infrared target. 4,929,841, Cl. 250-504.00R.

Chang, Jyh-Chin. Chair for reinforcement rod. 4,928,472, Cl. 52-678.000.

Chang, Manchium: *See—*
Rembaum, Alan; Rhim, Won-Kyu; Hyson, Michael T.; and Chang, Manchium, 4,929,400, Cl. 264-10.000.

Chang, Thomas T.: *See—*
Friedman, Don; and Chang, Thomas T., 4,929,936, Cl. 340-715.000.

Charcoal Cloth Limited: *See—*
Langston, Richard D.; Webb, Frances C.; and McBeath, Simon C., 4,928,681, Cl. 128-156.000.

Chauncey, Jeffrey B. Compactible futon. 4,928,337, Cl. 5-465.000.

Chauvel, Bernard: *See—*
Hogenmuller, Roger, Chauvel, Bernard; and Daniel, Jean-Claude, 4,929,662, Cl. 524-376.000.

Chemisch Pharmazeutische Forschungsgesellschaft: *See—*
Binder, Dieter; and Rovensky, Franz, 4,929,616, Cl. 514-253.000.

Chemische Fabrik Stockhausen GmbH: *See—*
Chmelir, Miroslav, 4,929,717, Cl. 528-490.000.

Chen, A-Ten. Automatic drip infusion set. 4,929,234, Cl. 604-132.000.

Chen, Chao-Yang. Speed-adjusting mechanism of a tread mill. 4,928,956, Cl. 272-69.000.

Chen, Chia-Yin: *See—*
Chern, Ji-Wang; Liu, Kang-Chien; and Chen, Chia-Yin, 4,929,728, Cl. 544-284.000.

Chen, Frank: *See—*
Lehto, Ari; and Chen, Frank, 4,928,530, Cl. 73-756.000.

Chen, Fu, to Betz Laboratories, Inc. Calcium phosphate scale control methods. 4,929,362, Cl. 210-701.000.

Chen, Fu; and Carey, William S., to Betz Laboratories, Inc. Water treatment polymers and methods of use thereof. 4,929,695, Cl. 526-297.000.

Chen, Samuel J., to Kendall Company, The. Acrylic adhesive compositions having improved stability. 4,929,660, Cl. 524-236.000.

Chen, Tu: *See—*
Yamashita, Tsutomu T.; Shir, Ching-Cheng; and Chen, Tu, 4,929,500, Cl. 428-336.000.

Cheng, Roberta C.; Wessling, Ritchie A.; and Schmidt, Donald L., to Dow Chemical Company, The. Enzyme immobilization with polysulfonium salts. 4,929,556, Cl. 435-180.000.

Chern, Ji-Wang; Liu, Kang-Chien; and Chen, Chia-Yin, to National Science Council. Process for preparing 3-(1H-tetrazol-5-yl)-4(3H)-quinazolinone. 4,929,728, Cl. 544-284.000.

Cherukuri, Satyam C.: *See—*
Pryor, Michael J.; Fister, Julius C.; Singhdeo, Narendra N.; Mahulikar, Deepak; and Cherukuri, Satyam C., 4,929,516, Cl. 428-620.000.

Chesapeake Display and Packaging Company: *See—*
Mahl, Robert R., 4,929,116, Cl. 403-263.000.

Cheskis, Harvey P.: *See—*
Rooney, James F.; and Cheskis, Harvey P., 4,928,512, Cl. 72-404.000.

Chesney, Peter F.: *See—*
Feest, Eric A.; Chesney, Peter F.; and Coombs, Jeffrey S., 4,928,745, Cl. 164-46.000.

Chevrette, Roger N.: *See—*
Pickering, John H.; Bhatia, Sushil K.; Rath, Mihira K.; and Chevrette, Roger N., 4,928,995, Cl. 281-29.000.

Chevron, Inc.: *See—*
Nespor, Ronald R., 4,929,142, Cl. 414-563.000.

Chevron Research Company: *See—*
Freitas, Elizabeth A., 4,928,760, Cl. 166-113.000.
Pasek, Eugene A.; and Morgan, Norman C., 4,929,583, Cl. 502-64.000.

Chidester, Patrick H. Vehicle door latch. 4,929,004, Cl. 292-267.000.

Chieli, Davide, to SGS-Thomson Mircroelectronics S.r.l. Circuit for sensing the transistor current waveform. 4,929,883, Cl. 323-282.000.

Chin-Hua, Wang. Method used to purify smoke pollutant. 4,929,258, Cl. 55-86.000.

Chisso Corporation: *See—*
Daimon, Takashi; Sakamoto, Hideshi; and Akimoto, Osamu, 4,929,496, Cl. 428-246.000.

Chiuminatta, Alan R.: *See—*
Chiuminatta, Edward; and Chiuminatta, Alan R., 4,928,662, Cl. 125-13.010.

Chiuminatta, Edward; and Chiuminatta, Alan R. Skid plate for cutting unhardened concrete. 4,928,662, Cl. 125-13.010.

Chivas Products Limited: *See—*
Lorence, Brian S.; Phelps, Richard A.; and Grabowski, David N., 4,928,865, Cl. 224-275.000.

Chmelir, Miroslav, to Chemische Fabrik Stockhausen GmbH. Method of preparing polymers with a low residual content of monomers. 4,929,717, Cl. 528-490.000.

Chmielewski, Thomas A., Jr.; and Tarzaiski, Richard J., to General Electric Company. Apparatus and method for determining a dimension of an object. 4,929,843, Cl. 250-561.000.

Choi, Byung C.: *See—*
Altman, Lawrence J.; Choi, Byung C.; and Karsner, Grant G., 4,929,335, Cl. 208-106.000.

Christensen, Ronald L.: *See—*
Lilienthal, Cal A.; and Christensen, Ronald L., 4,929,017, Cl. 296-153.000.

Christison, S. Grant. Constant tension hoisting member. 4,928,925, Cl. 254-272.000.

Chrysler Corporation: *See—*
Luitje, William V.; and McCambridge, John M., 4,930,094, Cl. 364-561.000.

Chu, Chi Wai. Multiple-user interactive audio/video apparatus with automatic response units. 4,930,019, Cl. 358-335.000.

Chuang, Chuan-Tien;. Toy having sliding rail. 4,928,955, Cl. 272-31.00R.

Chucholowski, Alexander W.; Roth, Bruce D.; and Sliskovic, Drago R., to Warner-Lambert Company. 5-pyrimidinyl-3,5-dihydroxy-6-heptenoic acid compounds useful as inhibitors of cholesterol biosynthesis. 4,929,620, Cl. 514-269.000.

Chun, Victor L.; Hunter, James R.; and Jaworski, George, to Murata Wiedemann, Inc. Multitool punch holder. 4,929,276, Cl. 83-552.000.

Chung, Dennis B.: *See—*
Ruckenstein, Eli; and Chung, Dennis B., 4,929,510, Cl. 428-520.000.

Chung, Paul W.; Gee, Ralph L.; Lang, Luke C. K.; and Saber, Paik, to International Business Machines Corporation. Setting and dynamically adjusting VCO free-running frequency at system level. 4,929,918, Cl. 331-10.000.

Chung, Yu-Kuei. Balustrade. 4,928,930, Cl. 256-67.000.

Ciba-Geigy Corporation: *See—*
Albrecht, Bernhard; and Beyrich, Jurgen, 4,929,752, Cl. 562-70.000.
Clausen, Martin; Rys, Paul; and Junkuan, Wang, 4,929,771, Cl. 568-798.000.
Goldenberg, Merrill, 4,929,692, Cl. 526-247.000.
Gugumus, Francois, 4,929,652, Cl. 524-91.000.
Hung, William M.; and Su, Kai C., 4,929,250, Cl. 8-507.000.
Jaeggi, Knut A., 4,929,606, Cl. 514-80.000.
Meier, Hans R.; and Evans, Samuel, 4,929,732, Cl. 546-158.000.
Moser, Hans; Pissiotas, Georg; Brunner, Hans-Georg; Bohner, Beat; and Baumann, Marcus, 4,929,272, Cl. 71-95.000.
Ravichandran, Ramanathan, 4,929,657, Cl. 524-196.000.
Ravichandran, Ramanathan, 4,929,659, Cl. 524-155.000.
Schwander, Hansrudolf; Tzikas, Athanassios; and Aeschlimann, Peter, 4,929,719, Cl. 534-604.000.

Cina, Vincent J., Jr., to International Business Machines Corporation. Method to prevent use of incorrect program version in a computer system. 4,930,073, Cl. 364-300.000.

Cipriano, Robert A.; Snelgrove, R. Vernon; and McCullough, Francis P., Jr., to Dow Chemical Company, The. Solid electrolyte battery. 4,929,521, Cl. 429-102.000.

Citron, Howard; Chan, Eric; and Dolan, Michael, to Nynex Corporation. Telephone handset having apertures for key access. 4,930,157, Cl. 379-433.000.

Claar, Klaus: *See—*
Schrader, Jurgen; and Claar, Klaus, 4,929,020, Cl. 296-118.000.

Claas OHG: *See—*
Bruer, Dirk; Heidjann, Franz; and Hemker, Heinrich, 4,928,460, Cl. 56-14.600.

Claeys, Shane C. Iron worker's seat protector and gripping device. 4,928,789, Cl. 182-3.000.

Clanton, James A., to General Electric Company. Water removable solder stop. 4,929,284, Cl. 148-23.000.

Clark, Christopher J.: *See—*
Gupta, Victor R.; and Clark, Christopher J., 4,929,789, Cl. 585-648.000.

Clark, Howard W., to Dow Chemical Company, The. Inorganic anion exchangers and preparation thereof. 4,929,381, Cl. 252-174.250.

Clark, James B.; and Langley, Deborah E., to Phillips Petroleum Co. Biofilm control. 4,929,365, Cl. 210-754.000.

Clark, John; Martel, Brian J., and Murray, James S. Automatic garage door operator with remote load control. 4,929,877, Cl. 318-560.000.

Clark, Robert J.; and Binish, Patrick W., to Prince. Full windshield sunshade. 4,929,014, Cl. 296-97.800.

Clausen, Martin; Rys, Paul; and Junkuan, Wang, to Ciba-Geigy Corporation. Process for the preparation of alkyl-substituted phenols or naphthols. 4,929,771, Cl. 568-798.000.

Claypool, Mark P., to Emhart Industries, Inc. Inspecting glass containers for line-over finish defects with bifurcated fiber optic bundle. 4,929,828, Cl. 280-223.00B.

Clayton, James E. Method and apparatus for removing and collecting dust. 4,928,348, Cl. 15-345.000.

Clegg, Michael W.: *See—*
Harwood, Jon W.; Karlgaard, Wayne A.; and Clegg, Michael W., 4,928,372, Cl. 29-890.080.

Clement, Heinz, to Rieter Machine Works, Ltd. Lap guide arrangement for a combing machine. 4,928,357, Cl. 19-225.000.

Clements, Thomas W.: *See—*
Fallon, Merton R.; and Clements, Thomas W., 4,928,850, Cl. 222-3.000.

Cliffe, Ian A., to John Wyeth and Brothers Limited. Ethers. 4,929,625, Cl. 514-304.000.

Clorox Company, The: *See—*
Haendler, Blanca L., 4,929,383, Cl. 252-187.260.

Clough, Robert L. Continuously variable transmission. 4,929,218, Cl. 474-83.000.

CMI Corporation: *See—*
Swisher, George W., Jr., 4,928,890, Cl. 241-24.000.

Coates, Jan H.: *See—*
Tyers, Michael B.; Coates, Jan H.; Humber, David C.; Ewan, George B.; and Bell, James A., 4,929,632, Cl. 514-397.000.

Cobar, Inc.: *See—*
Cohen, Jay B., 4,928,828, Cl. 206-444.000.

Coburn, Charles E.: *See—*
Schmidt, Donald L.; McCrackin, Perry J.; and Coburn, Charles E., 4,929,666, Cl. 524-516.000.

Coburn Optical Industries Inc.: *See—*
Gray, Roy R., 4,928,433, Cl. 51-33.00W.

Cochran, William H. Modular rigid inflatable aquatic vessel structure. 4,928,619, Cl. 114-345.000.

Cody, Ian A.; Hamner, Glen P., deceased (by Hamner, Annabelle, executrix); and Schorfheide, James T., to Exxon Research and Engineering Company. Method for isomerizing wax to lube base oils using an isomerization catalyst. 4,929,795, Cl. 585-739.000.

Coe, David J.: *See—*
Bird, Philip H.; Coe, David J.; Paxman, David H.; and Korteling, Aart G., 4,929,884, Cl. 323-313.000.

Coeur Laboratories, Inc.: *See—*
Baum, Thomas M., 4,929,238, Cl. 604-208.000.

Cogburn, Larry A., to University of Deleware. Endocrine manipulation to improve body composition of poultry. 4,929,600, Cl. 514-2.000.

Cohen, Jay B., to Cobar, Inc. Storage holder for computer diskettes 4,928,828, Cl. 206-444.000.

Coherent Communications Systems Corp.: *See—*
Paul, Christopher R., 4,929,849, Cl. 307-269.000.

Colanzi, Franco; and Vignotto, Angelo, to RIV-SKF Officine di Villar Perosa S.p.A. Method of making a seal for bearing assembly 4,928,371, Cl. 29-898.064.

Colgate-Palmolive Co.: *See—*
Thomas, James M.; and Kern, Ronald D., 4,929,367, Cl. 252-8.800.

Colin Electronics Co., Ltd.: *See—*
Harada, Chikao, 4,928,700, Cl. 128-672.000.
Harada, Chikao; and Niwa, Minoru, 4,928,701, Cl. 128-677.000.

Collas, Wolfgang; Wolfertz, Gunter; and Wolfertz, Roger, to Schaeffer GmbH. Button, particularly for articles of clothing. 4,928,362, Cl. 24-90.00R.

Colle, Roberto; Camaggi, Giovanni; Gozzo, Franco; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, to Agrimont S.r.l. Fungicide azolyl-derivatives. 4,929,631, Cl. 514-383.000.

Colles, Michael J.; and Smith, George R., to Medical Laser Uit of Heriot-Watt University of Research Park. Flexible guides for infrared energy. 4,929,052, Cl. 350-96.320.

Collette, Wayne N.; and Armstrong, Ralph, to Continental PET Technologies, Inc. Injection molded preform, method of treating same and container formed therefrom. 4,928,835, Cl. 215-31.000.

Collins, Dannie R.: *See—*
Gazda, Imre I.; and Collins, Dannie R., 4,928,761, Cl. 166-123.000.

Collins, Donald A., Jr., to NCR Corporation. Method and apparatus for customer performed article scanning in self-service shopping. 4,929,819, Cl. 235-383.000.

Colombo, Attilio, to Tonali S.p.A. Security vestibule entry for controlled access to banks and the like. 4,928,429, Cl. 49-41.000.

Colt Industries Inc.: *See—*
Bauerle, David D., 4,929,260, Cl. 55-510.000.

Columbia University in the City of New York, The Trustees of: *See—*
Rose, Eric; and Dresdale, Arthur, 4,928,603, Cl. 106-124.000.

Comelz S.p.A.: *See—*
Zorzolo, Luciano, 4,929,296, Cl. 156-357.000.

Comfortex Corporation: *See—*
Schnebly, John; and Marusak, Thomas J., 4,928,369, Cl. 29-24 500.

Commissariat a l'Energie Atomique: *See—*
Latge, Christian, 4,928,497, Cl. 62-55.500.
Valette, Serge, 4,929,302, Cl. 156-657.000.

Communications Satellite Corporation: *See—*
Sorbello, Robert M.; Effland, John E.; and Zaghloul, Amir I., 4,929,959, Cl. 343-700.0MS.

Conaghan, Thomas B.; Gladfelter, Harry F.; Kite, Joseph S., III; and Tresslar, Marie C., to Bentley-Harris Manufacturing Company, The. Protective fabric sleeves. 4,929,478, Cl. 428-35.100.

Conn-Weld Industries, Inc.: *See—*
Connelly, James D.; and Huff, Darrel, 4,928,551, Cl. 74-606.00R.

Connaughton, James M., Jr.; Sexton, James E.; and Hegener, James A., to Mallinckrodt, Inc. Flour-based pot pie crusts with improved texture. 4,929,455, Cl. 426-92.000.

Connelly, James D.; and Huff, Darrel, to Conn-Weld Industries, Inc. Vibrating mechanism. 4,928,551, Cl. 74-606.00R.

Container Products Corp.: *See—*
Hughes, Joel J., 4,928,440, Cl. 51-426.000.

Continental Baking Company: *See—*
Moshier, Mark; and Politte, Ron, 4,928,592, Cl. 99-450.800.

Continental PET Technologies, Inc.: *See—*
Collette, Wayne N.; and Armstrong, Ralph, 4,928,835, Cl. 215-31.000.

Cook, Ian A.: *See—*
Bassett, C. Andrew L.; and Cook, Ian A., 4,928,959, Cl. 272-96.000.

Cook, Peter, to National Research Development Corporation, The. Alloy useful particularly in dentistry. 4,929,420, Cl. 420-466.000.

Cookson Group plc: *See—*
Tucker, Kay L.; and Ma, Ulysses, 4,929,423, Cl. 420-561.000.

Coombs, Jeffrey S.: *See—*
Feest, Eric A.; Chesney, Peter F.; and Coombs, Jeffrey S., 4,928,745, Cl. 164-46.000.

Cooper, Gary F., to Syntex (U.S.A.) Inc. Process for making 16-phenoxy- and 16-(substituted phenoxy)-prostatrienoic acid derivatives. 4,929,740, Cl. 549-415.000.

Cooper Industries, Inc.: *See—*
Gurevich, Leon, 4,928,384, Cl. 29-623.000.
Kalra, Varinder K.; and Spalding, Keith A., 4,929,921, Cl 337-233.000.
Woodworth, Jonathan J.; Johnson, Stephen P.; Miller, David R.; Kester, Jeffrey J.; and Kershaw, Stanley S., Jr., 4,930,039, Cl 361-127.000.

Coppini, Massimo: *See—*
Vinciguerra, Constantino; and Coppini, Massimo, 4,929,119, Cl. 403-359.000.

Coquelet, Claude; Roussillon, Samia; Sincholle, Daniel; Bonne, Claude; and Alazet, Alain, to Laboratoires Chauvin-Blache. New derivatives of 4-vinyl benzoic acid, process for their preparation and their uses in therapeutics and as ligands. 4,929,635, Cl. 514-438.000.

Cordis Corporation: *See—*
Marques, Jose A., 4,928,528, Cl. 73-40.000.

Corenman, James E.: *See—*
Goodman, David E.; and Corenman, James E., 4,928,692, Cl. 128-633.000.

Conca, Joseph P. Surfboards for doing aerials. 4,929,208, Cl. 441-75.000.

Corlett, William R.: *See—*
Bradbury, Harold M.; Pfenning, Dwight B.; Corlett, William R.; and Mays, Roscoe, Jr., 4,929,818, Cl. 235-381.000.

Cornell, John, to Medi-Tech International Corporation. Transparent wound dressings in sheet form. 4,929,577, Cl. 514-58.000.

Cornell Research Foundation, Inc.: *See—*
Risley, Michael S., 4,929,542, Cl. 435-2.000.

Cornette, H. Mitchell: *See—*
Siegfried, Robert W., II; Smith, Lonnie J.; and Cornette, H. Mitchell, 4,928,759, Cl. 166-65.100.

Corning Incorporated: *See—*
Carpenter, Larry L.; Hagerty, Robert J.; Maschmeyer, Richard O.; Morrell, Mark L.; and Schrauth, Peter A., 4,929,265, Cl. 65-64.000.

Cosmo Oil Co., Ltd.: *See—*
Yamazoe, Seigo; Nakai, Sadao; and Fukui, Yukimasa, 4,929,847, Cl. 250-573.000.

Costello, Kenneth A.; and MacMillan, Hugh F., to Varian Associates, Inc. Two stage light converting vacuum tube. 4,929,867, Cl. 313-525.000.

Cotteret, Jean; and Grollier, Jean F., to L'Oreal. Cosmetic screening composition in the form of an oil-in-water emulsion comprising a UV-A screening compound and a UV-B screening compound and its use for the protection of the skin against ultra-violet radiation. 4,929,439, Cl. 424-59.000.

Coughenour, Linda L.; Davis, Robert E.; Downs, David A.; Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, to Warner-Lambert Company. Tetrahydropyridine oxime compounds. 4,929,734, Cl. 546-338.000.

Courval, Gregory J., to Alcan International Limited. Method of forming prelubricated finstock. 4,928,508, Cl. 72-42.000.

Cousin, Bernard M. Device for picking off and evaluating a pressure, in particular a pressure of a fluid. 4,928,702, Cl. 128-678.000.

Covex, S.A.: *See—*
Mondelo, Fernando C.; and Ferrero, Maria T. M., 4,929,440, Cl. 424-79.000.

Cowgill, Cynthia: *See—*
Halenbeck, Robert; Koths, Kriston; Cowgill, Cynthia; and Laird, Walter J., 4,929,700, Cl. 530-351.000.

Cowman, Charles D., Jr.: *See—*
Carey, Patrick H., Jr.; and Cowman, Charles D., Jr., 4,929,492, Cl 428-198.000.

Cox, Michael G.: *See—*
Kimball, Dorr; Cox, Michael G.; and Cabison, Manuel R., 4,929,901, Cl. 324-529.000.

Cozac, Daniel, and Simon, Jean-Francois, to Glaverbel. Method of manufacturing glass. 4,929,266, Cl. 65-135.000.

Cragun, E. Brent: *See—*
Isham, William R.; Cragun, E. Brent; Gault, Christopher; and Wermeling, William J., 4,928,853, Cl. 222-108.000.

Craig, Raymond S.: *See—*
Wallace, W. Edward; Smith, H. Kevin; Lynch, W. Bryan; Craig, Raymond S.; and Pourarian, Fiaz, 4,928,496, Cl. 62-46.200.

Crayton, John W.: *See—*
Atkinson, Robert W.; Crayton, John W.; Portscheller, James L.; and Wood, Daniel C., 4,928,642, Cl. 123-180.00R.

Cregg, James M.; and Barringer, Kevin J., to Phillips Petroleum Company. Pichia transformation. 4,929,555, Cl. 435-172.300.

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Bremner, Douglas L.; Crews, Gary A.; and Musser, James A., 4,930,110, Cl. 367-56.000.

Cripps, Peter K.; and Plotnick, Michael A., to Agilis Corporation. Code division multiplex system using selectable length spreading code sequences. 4,930,140, Cl. 375-1.000.

Crook, Troy N., to Exxon Production Research Company. Well borehole sound source. 4,928,783, Cl. 181-106.000.

Crossfield Electronics Limited: *See—*
MacDonald, Lindsay W., 4,930,010, Cl. 358-78.000.
Crucible Societe Anonyme: *See—*
Van Der Walt, Nicholaas T., 4,929,897, Cl. 324-240.000.
Crumb, Donald A.: *See—*
Zander, Richard A.; Gaiser, Robert F.; Dillon, William F., Jr.; and Crumb, Donald A., 4,929,033, Cl. 303-9.630.
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Di Vita, Pietro, 4,929,264, Cl. 65-12.000.
Culbertson, Townley P.; Domagala, John M.; Hagen, Susan E.; and Sanchez, Joseph P., to Warner-Lambert Company. Antibacterial agents. 4,929,613, Cl. 514-210.000.
Cummins Engine Company, Inc.: *See—*
Villanyi, Tibor J.; and Westerson, Kevin W., 4,928,647, Cl. 123-400.000.
Cunningham, John A.; Prestjohn, Mark O.; Reed, Bobby P.; and Smith, Martin D., to Jamieson Film Company. Film transport system. 4,929,976, Cl. 354-322.000.
Cunningham, Theresa L.: *See—*
Bahl, Surinder K.; Canterino, Peter J.; Cunningham, Theresa L.; Evans, Susan P.; and Shaw, Richard G., 4,929,681, Cl. 525-240.000.
Cuno, Incorporated: *See—*
Meyering, Mark T.; and Ostreicher, Eugene A., 4,929,354, Cl. 210-321.610.
Cuozzo, Robert A.: *See—*
Viana, Luis M.; Cuozzo, Robert A.; Miceli, Michael L.; and Whitney, Kent A., 4,930,035, Cl. 361-54.000.
Curiel, Yoram, to TSI, Incorporated. Tamper evident closure. 4,928,837, Cl. 215-250.000.
Currey, Lesley B. Seat pedestal mount. 4,928,620, Cl. 114-363.000.
Curtice-Burns, Inc.: *See—*
Meyer, Richard S., 4,929,463, Cl. 426-521.000.
Curtis, James H.: *See—*
Guzik, Andrzej T.; Curtis, James H.; Habbaba, Faris S.; and Shah, Kirit, 4,929,062, Cl 350-345.000.
Cushman, Robert B.: *See—*
Kirsch, Wolff M.; Zhu, Yong H.; and Cushman, Robert B., 4,929,240, Cl. 606-151.000.
Cuypers, Michel J., to Fiberview Corporation. Fiber optic display. 4,929,048, Cl. 350-96.240.
Cyanamid Canada Inc.: *See—*
Robertson, Allan J.; and Gallivan, James B., 4,929,393, Cl. 252-609.000.
Dacey, Ernest A., Jr., to Utica Enterprises, Inc. Single station hemming tooling. 4,928,388, Cl. 29-798.000.
Dahle, Rolf N.: *See—*
Flesner, Larry D.; Eisenman, Welsey L.; Merriam, James D.; Bates, Richard L.; Dahle, Rolf N.; and Arrington, Douglas C., 4,929,831, Cl. 250-307.000.
Dahlstrom, Jack A.: *See—*
Deziel, Edward W.; Rueb, John T.; Sorlien, Mark D.; Dahlstrom, Jack A.; and Erismann, David W., 4,929,029, Cl. 300-21.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Egashira, Noritaka; Suto, Kenichiro; and Muro, Atsushi, 4,929,591, Cl. 503-227.000.
Kanto, Jumpei; and Eguchi, Hiroshi, 4,929,592, Cl. 503-227.000.
Daicho, Norio; Kawahara, Masakatsu; Nitta, Jiro; Miyazaki, Koji; and Yonezawa, Keitaro, to Kabushiki Kaisha Neriki. Stop valve. 4,928,919, Cl. 251-89.000.
Daikin Industries Ltd.: *See—*
Furutaka, Yasuhisa; Aoyama, Hirokazu; and Honda, Tsunetoshi, 4,929,318, Cl. 204-157.600.
Osaka, Tatsuhiko; Terawaki, Hiroshi; and Okamoto, Mitsunari, 4,929,330, Cl. 204-402.000.
Daimler-Benz AG: *See—*
Bauer, Theodor, 4,929,015, Cl. 296-116.000.
Schrader, Jurgen; and Claar, Klaus, 4,929,020, Cl. 296-118.000.
Daimon, Takashi; Sakamoto, Hideshi; and Akimoto, Osamu, to Chisso Corporation. Electroconductive thermoplastic resin molded product. 4,929,496, Cl. 428-246.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Inoue, Toshio; Mine, Takayuki; Izutsu, Hitoshi; Yamaguchi, Toshihide; Kobata, Funiihiro; and Kawabata, Juheiji, 4,929,665, Cl. 524-500.000.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Wakimoto, Zenji; and Hayashi, Takahisa, 4,929,066, Cl. 350-415.000.
Yakame, Kazunori, 4,930,023, Cl. 358-460.000.
Daley, John G., to Daley, John G. Attic access stairway cover. 4,928,441, Cl. 52-19.000.
Dalman, Harold J.: *See—*
Flakas, Gerald K.; and Dalman, Harold J., 4,930,146, Cl. 378-110.000.
Dalmo Victor, Inc.: *See—*
Hodel, P. Lloyd; and Atkins, Paul V., 4,929,958, Cl. 342-432.000.
Damon Biotech, Inc.: *See—*
Edmunds, Timothy; and Foley, Susan F., 4,929,560, Cl. 435-226.000
Danby, Hal C.: *See—*
Danby, Philip C.; Danby, Hal C.; and Hungerman, Eric R., 4,929,329, Cl. 204-299.00R.
Danby, Philip C.; Danby, Hal C.; and Hungerman, Eric R., to EG&G, Inc. Electrophoresis cassette system with apparatus and method for filling same. 4,929,329, Cl. 204-299.00R.
Daniel, Jean-Claude: *See—*
Hogenmuller, Roger; Chauvel, Bernard; and Daniel, Jean-Claude, 4,929,662, Cl. 524-376.000.
Danilenko, Michael; Dekarske, Clarence W.; and Larson, John E., to Unisys Corporation. Dual cache RAM for rapid invalidation. 4,930,106, Cl. 365-189.010.
Danis, Sara L.; Skaggs, Charles L.; and Thomas, Charles A., to Mobil Oil Corporation. Tray including display. 4,928,411, Cl. 40-324.000.
Danne, Lutz: *See—*
Binarsch, Jurgen; Bode, Jurgen; Danne, Lutz; and Lissel, Norbert, 4,930,040, Cl. 361-154.000.
Dannenberg, Willem: *See—*
De Jong, Feike; Dannenberg, Willem; and Vermeule, Jacob, 4,929,374, Cl. 252-39.000.
Darr, Duane R.: *See—*
Graham, Scott M.; Ewing, Kenneth R.; Trackman, Marshall H.; and Darr, Duane R., 4,929,099, Cl. 400-76.000.
Das, Santosh K.: *See—*
Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., 4,929,511, Cl. 428-606.000.
Dash, Thomas E., to Wallace Computer Services, Inc. Apparatus and method for printing separating continuous forms into folded discrete jobs including accumulator. 4,928,940, Cl. 270-1.100.
Dasmler-Benz AG: *See—*
Bossenmaier, Alban, 4,929,137, Cl. 411-501.000.
Dataproducts Corporation: *See—*
Wong, Yuen W.; Mazilu, Doina; and Amdahl, Paul O., 4,930,101, Cl. 364-900.000.
Datta, Amitava: *See—*
Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., 4,929,511, Cl. 428-606.000.
Davenport, John M.; and Hansler, Richard L., to General Electric Company. Optical multiplexed electrical distribution system particularly suited for vehicles. 4,930,049, Cl. 362-32.000.
Davenport, Kenneth G.: *See—*
Aslam, Mohammad; Vicari, Richard; and Davenport, Kenneth G., 4,929,694, Cl. 526-262.000.
David Computer Corporation: *See—*
McLagan, Angus; Pao, Gei-Jon; Un, Chong S.; and Pearce, John J., Jr., 4,930,065, Cl. 364-200.000.
Davidson, Charles W., to Sundstrand Data Control, Inc. Method and apparatus for detecting receiver compression in multiple lobe guidance systems. 4,929,957, Cl. 342-410.000.
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, to U.S. Philips Corp. Push-pull output circuit having three transistors. 4,929,911, Cl. 330-264.000.
Davis, John W. Commode and removable seat. 4,928,328, Cl. 4-420.000.
Davis, Robert E.: *See—*
Coughenour, Linda L.; Davis, Robert E.; Downs, David A.; Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,929,734, Cl. 546-338.000.
Davis, Royston H.: *See—*
McArthur, Alastair; Davis, Royston H.; Hilton, Mark D.; Newton, Trevor W.; and Patel, Dinesh M., 4,929,628, Cl. 514-364.000.
Daw Technologies: *See—*
Daw, Terry L., 4,929,150, Cl. 415-157.000.
Daw, Terry L., to Daw Technologies. Apparatus for adjusting flow rate through a fan. 4,929,150, Cl. 415-157.000.
Dean, Barry D.; and Gastinger, Robert G., to Arco Chemical Technology, Inc. Acetophenone based bisphenol polyarylate resins. 4,929,677, Cl. 525-151.000.
Dean, Robert L.: *See—*
Vorreiter, John W.; and Dean, Robert L., 4,929,139, Cl. 414-217.000.
DeBiase, Robert: *See—*
Elliott, John D., Jr.; and DeBiase, Robert, 4,929,339, Cl. 208-131.000.
de Boisseron, Bertrand; Salvan, Michel; and Gugenhein, Michele, to Thomson-CSF. Decentralized and synchronous data transmission process and network. 4,930,124, Cl. 370-94.300.
DeBolt, Frederick C.: *See—*
Barton, Arthur A.; DeBolt, Frederick C., Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A.; Miller, Mark T.; Rasch, Kenneth R.; and Szlucha, Thomas F., 4,929,983, Cl. 355-315.000.
De Bruycker, Patricia: *See—*
Legrand, Franz; Lerot, Luc; and De Bruycker, Patricia, 4,929,436, Cl. 423-593.000.
Dedden, Hubert; Gieger, Eckhard; and Lauer, Christian, to Bayer Aktiengesellschaft. Method for detecting flooding of a surface. 4,929,829, Cl. 250-208.400.
Deering, Michael F.: *See—*
Schroeder, Brian D., and Deering, Michael F., 4,930,091, Cl. 364-522.000.
De Jong, Feike; Dannenberg, Willem; and Vermeule, Jacob, to Shell Oil Company. Lubricating oil composition. 4,929,374, Cl. 252-39.000.
de Jong, Hendrikus, to Hunter Douglas International N.V. Novel stoving lacquers and their use. 4,929,475, Cl. 427-407.100.
Dekarske, Clarence W.: *See—*
Danilenko, Michael; Dekarske, Clarence W.; and Larson, John E., 4,930,106, Cl. 365-189.010.

Delapp, Michael D.: *See—*
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J.; Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., 4,929,426, Cl. 422-63.000.
Delarue, Jean-Jacques; Patin, Michel; and Slama, Jean-Claude, to Aerospatiale Societe Nationale Industrielle. Device for temporarily coupling-uncoupling two members, and for subsequent separation thereof. 4,929,135, Cl. 411-354.000.
de Lasa, Hugo I., to Canadian Patents and Development Limited. Pseudoadiabatic reactor for exothermal catalytic conversions. 4,929,798, Cl. 585-922.000.
Del Castillo Von Haucke, Juan M. Modular privacy screen assemblies. 4,928,465, Cl. 52-239.000.
Delfiner, Michael. Anthropometer. 4,928,398, Cl. 33-512.000.
Delfour, Andre; Falempin, Francois; Isbert, Jacques; and Sans, Claude, to Office Nationl D'Etudes Et De Recherches Aerospatiales styled O.N.E.R.A. Optical granulometry process and devices for broad measuring ranges. 4,929,079, Cl. 356-336.000.
Del Gatto, Henry J.; and Trainor, John E., to NWL Transformers. Process for rapping of electrostatic precipitator surfaces. 4,928,456, Cl. 55-12.000.
Del Giudice, David M.: *See—*
Billmers, Robert L.; Del Giudice, David M.; Tessler, Martin M.; and Hasuly, Michael J., 4,929,670, Cl. 525-54.100.
DeLorenzo, Richard. Human knee joint stabilizing orthosis with semi-rigid, substantial encasement means for lower leg. 4,928,670, Cl. 128-80.00C.
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., to Hoechst Celanese Corp. Bisacrylate monomers and polymers exhibiting nonlinear optical response. 4,929,696, Cl. 526-312.000.
Demers, Richard L.: *See—*
Walton, Paul B.; Keough, James; Demers, Richard L.; Denny, Leland A., Jr.; Kaiser, Robert E.; Moses, Cornelius, Jr.; and Wagh, Vijay N., 4,930,151, Cl. 379-94.000.
Demuth, Robert; Staheli, Paul; Waber, Rene; Grundler, Christoph; and Machler, Franz, to Maschinenfabrik Rieter AG. Method and means for effecting a controllable change in the production of a fiber-processing machine. 4,928,353, Cl. 19-65.00A.
Dennison Manufacturing Company: *See—*
Pickering, John H.; Bhatia, Sushil K.; Rath, Mihira K.; and Chevrette, Roger N., 4,928,995, Cl. 281-29.000.
Denny, Leland A., Jr.: *See—*
Walton, Paul B.; Keough, James; Demers, Richard L.; Denny, Leland A., Jr.; Kaiser, Robert E.; Moses, Cornelius, Jr.; and Wagh, Vijay N., 4,930,151, Cl. 379-94.000.
Denzinger, Walter: *See—*
Goertz, Hans-Helmut; Denzinger, Walter; and Raubenheimer, Hans-Juergen, 4,929,690, Cl. 525-366.000.
Desecki, Vince C.; and Prisco, Michael R., to Baxter International Inc. Solution and method for maintaining patency of a catheter. 4,929,242, Cl. 604-266.000.
Designs For Leisure, Ltd.: *See—*
Kaye, Howard, 4,929,021, Cl. 297-193.000.
Despres, Dominique, to Valeo. Variable-force clamping mechanism between torque-variation damping flywheel and torque converter 4,928,486, Cl. 60-338.000.
Desrude, Wayne P.: *See—*
Anderson, Edmund J.; and Desrude, Wayne P., 4,928,806, Cl. 198-345.000.
Dessau, Ralph M., to Mobil Oil Corporation. Dehydrogenation, dehydrocyclization and reforming catalyst. 4,929,792, Cl. 585-661.000.
Deublin Company: *See—*
Reisener, Delbert C.; and Pearson, Dennis G., 4,928,997, Cl. 285-13.000.
Deuring, Hans. Sealing cover, particularly for motor vehicle crankcases and gear boxes. 4,928,980, Cl. 277-153.000.
Deutsche Forschungsanstalt fuer Luft- und Raumfahrt: *See—*
Opower, Hans, 4,930,138, Cl. 372-95.000.
Deutsche Texaco Aktiengesellschaft: *See—*
Zeibig, Winfried; and Huskes, Heinrich, 4,929,668, Cl. 524-745.000.
Deutsche Thomson Brandt GmbH: *See—*
Oberjatzas, Gunter; and Keesen, Heinz-Werner, 4,930,025, Cl. 360-64.000.
DeVilbiss Company, The: *See—*
Weinstein, Richard, 4,928,883, Cl. 239-223.000.
de Vries, Pieter: *See—*
van Mondfrans, Gerardus H.; and de Vries, Pieter, 4,928,585, Cl 101-129.000.
De Vroome, Clemens J. M.: *See—*
Jacobs, Thomas G. M.; and De Vroome, Clemens J. M., 4,929,173, Cl 431-215.000.
De Waard, Willem: *See—*
Steenbergen, Bastiaan G.; Hofman, Arie A.; and De Waard, Willem, 4,929,126, Cl. 405-267.000.
Dexter, Robin W.: *See—*
Jarovitzky, Peter A.; Fu, Yun-Lung; and Dexter, Robin W., 4,929,687, Cl. 525-328.200.
DeYoung, Lawrence M.: *See—*
Castelhano, Arlindo L.; DeYoung, Lawrence M.; Krantz, Alexander; Pliura, Diana H.; and Venuti, Michael C., 4,929,630, Cl. 514-380.000.
Deziel, Edward W.; Rueb, John T.; Sorlien, Mark D.; Dahlstrom, Jack A.; and Erismann, David W., to Minnesota Mining and Manufacturing Company. Brush manufacturing method. 4,929,029, Cl. 300-21.000.
Dharmadhikari, Vineet S., to Harris Corporation. Thin film resistors and method of trimming. 4,929,923, Cl. 338-308.000.
Di Bernardo, Pietro, to Interdibipack S.p.A. Device for tightly sealing bags destined to the vacuum packaging of various products, in particular foodstuffs. 4,928,829, Cl. 206-524.800.
Dickson, Russell A. Key cutting apparatus. 4,929,129, Cl. 409-81.000.
Diebolt, Richard A.; Kidd, Stephen; and Rivers, Donald E., Jr., to United Technologies Corporation. Grinding wheel guard apparatus. 4,929,130, Cl. 409-136.000.
Diekmann, Bernd: *See—*
Gebhardt, Axel; Diekmann, Bernd; and Schmidt, Rudiger, 4,928,428, Cl. 49-192.000.
Diekmann, Jorg: *See—*
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Diekmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000
Diesel Kiki Co., Ltd.: *See—*
Eitai, Kazuo; and Takayama, Hidehiko, 4,929,156, Cl. 417-295.000.
Dieterlen, Paul E.; and Mustain, Lewis B., to Liebel-Flarsheim Company. Cassette film transport. 4,930,147, Cl. 378-176.000.
Digging Trading Company N.V.: *See—*
Steenbergen, Bastiaan G.; Hofman, Arie A.; and De Waard, Willem, 4,929,126, Cl. 405-267.000.
Digital Equipment Corporation: *See—*
Seiler, Larry D.; Pappas, James L.; and Rose, Robert C., 4,929,889, Cl. 371-22.300.
Dignard, Daniel: *See—*
Bussey, Howard; Dmochowska, Aleksandra; Thomas, David Y.; and Dignard, Daniel, 4,929,553, Cl. 435-172.300.
Diloia, Albert A.: *See—*
Meltzer, Elliott A.; and Diloia, Albert A., 4,928,345, Cl. 15-250.060.
Dil, Jan G., to U.S. Philips Corporation. Record carrier containing information in an optically readable information structure. 4,930,116, Cl. 369-275.100.
Diller, Friedhelm, to Hella KG Hueck & Co. Coupling apparatus for a speed governor. 4,928,646, Cl. 123-376.000.
Dillon, William F., Jr.: *See—*
Zander, Richard A.; Gaiser, Robert F.; Dillon, William F., Jr.; and Crumb, Donald A., 4,929,033, Cl. 303-9.630.
Dingfelder, Howard E.: *See—*
Smith, Donald A.; Carter, William H., Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,928,378, Cl. 29-564.600
Dinter, Peter; Bothe, Lothar; and Gribbin, John D., to Hoechst Aktiengesellschaft. Process and device for surface pre-treatment of plastic by means of an electrical corona discharge. 4,929,319, Cl. 204-164.000.
Dipl.-Ing. Wrede & Niedecken Verwaltung GmbH: *See—*
Romer, Eike, 4,929,929, Cl. 340-613.000.
Dishman, Michael R., to Troxler Electronic Laboratories, Inc. Apparatus for measuring ground moisture content of soil. 4,929,885, Cl. 324-664.000.
DiSimone, John; Brown, Paul; and Huntington, Christopher, to Husky Injection Molding Systems Ltd. Support for quick mold changing. 4,929,166, Cl. 425-190.000.
Dislich, Heinz; and Richter, Horst, to Dislich, Heinz; and Krupp Stahl Method for controlling discharge of steel from a casting ladle. 4,928,931, Cl. 266-45.000.
Diversey Corporation: *See—*
Rossio, Charles E.; and Koziol, Wladyslaw W., 4,929,375, Cl 252-49.300.
Di Vita, Pietro, to Cselt Centro Studi E Laboratori Telecommunicazioni S.P.A. Apparatus for reducing optical-fiber attenuation 4,929,264, Cl. 65-12.000.
DiVita, Sam; and Rast, Howard E., Jr., to United States of America, Navy. Method for detecting pinholes and incomplete coverage of hermetic coatings on optical fiber waveguides. 4,929,837, Cl. 250-461.100.
Dixon, Robert C.; Cearley, James E.; Van Diemen, Paul; Sayre, Edwin D.; and Gordon, Gerald M., to General Electric Company. Control rod. 4,929,412, Cl. 376-260.000.
Dmochowska, Aleksandra: *See—*
Bussey, Howard; Dmochowska, Aleksandra; Thomas, David Y.; and Dignard, Daniel, 4,929,553, Cl 435-172.300.
Dobashi, Ritsu: *See—*
Uesugi, Akio; Dobashi, Ritsu; and Ohishi, Takeshi, 4,929,326, Cl 204-206.000.
Dobson, Marguerite A. R. Hood and hooded garment 4,928,321, Cl 2-84.000.
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Dodson, Jerry D.: *See—*
Washburn, Robert M., and Dodson, Jerry D., 4,929,505, Cl 728-408.000.
Doherty, Donald W.: *See—*
Schneider, Alan M., and Doherty, Donald W., 4,929,952, Cl 342-184.000.
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Buan, Danilo P.; Abellana, Jovito N.; and Dolan, Donald T., 4,929,106, Cl. 400-649.000.
Dolan, Michael: *See—*
Citron, Howard; Chan, Eric; and Dolan, Michael, 4,930,157, Cl. 379-433.000.

Domagala, John M.: *See—*
Culbertson, Townley P.; Domagala, John M.; Hagen, Susan E.; and Sanchez, Joseph P., 4,929,613, Cl. 514-210.000.
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Kunz, Horst; and Dombo, Berthold, 4,929,671, Cl. 525-54.110.
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Steinwandel, Juergen; Haas, Juergen; and Plog, Carsten, 4,929,581, Cl. 502-2.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Kitagawa, Kazuo; Komatsu, Fumiaki; Masaki, Takayoshi; Sawada, Yoshihisa; and Inada, Eiichi, 4,929,394, Cl. 252-633.000.
Otomura, Keiichiro; Yamashita, Takayuki; Kanemitsu, Setsuo; Nakabayashi, Shigetoshi; and Miki, Hideo, 4,929,430, Cl. 423-11.000.
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Bohnert, Thomas J., 4,929,360, Cl. 210-679.000.
Caskey, Terrence L.; Trimmer, Johnny L.; and Jorgensen, Janine L., 4,929,259, Cl. 55-158.000.
Cheng, Roberta C.; Wessling, Ritchie A.; and Schmidt, Donald L., 4,929,556, Cl. 435-180.000.
Cipriano, Robert A.; Snelgrove, R. Vernon; and McCullough, Francis P., Jr., 4,929,521, Cl. 429-102.000.
Clark, Howard W., 4,929,381, Cl. 252-174.250.
Khoury, Issam A.; and Langer, Horst G., 4,929,575, Cl. 501-137.000.
Kruelskie, Donald A., 4,928,839, Cl. 220-5.00R.
Laughner, Michael K.; and Ogoe, Samuel A., 4,929,663, Cl. 524-423.000.
Laughner, Michael K., 4,929,672, Cl. 525-63.000.
Laughner, Michael K.; Lancaster, Gerald M.; and Sun, Yun C., 4,929,673, Cl. 525-63.000.
Laughner, Michael K., 4,929,676, Cl. 525-67.000.
Moll, Norman G.; and Johnson, David R., 4,929,645, Cl. 521-98.000.
Nichols, Jerram B.; Hunter, Douglas; Herrington, Ronald M.; Serratelli, John F.; and Carey, David G., 4,929,646, Cl. 521-137.000.
Pews, R. Garth, 4,929,268, Cl. 71-88.000.
Schmidt, Donald L.; McCrackin, Perry J.; and Coburn, Charles E., 4,929,666, Cl. 524-516.000.
Simonson, Frederick, III; and Gunn, Timothy M., 4,929,314, Cl. 204-153.230.
Wilson, David R.; and Stevens, James C., 4,929,699, Cl. 525-339.000.
Wolf, Richard A.; and Grosso, Paul V., 4,929,721, Cl. 534-885.000.
Dow Corning Corporation: *See—*
Atwell, William H.; Burns, Gary T.; and Saha, Chandan K., 4,929,573, Cl. 501-90.000.
Burns, Gary T., 4,929,742, Cl. 556-406.000.
Fillmore, Danielle M.; Price, John G.; and Swihart, Terence J., 4,929,691, Cl. 525-477.000.
Jensen, Jary D., 4,929,669, Cl. 524-861.000.
Kroupa, Loretta N., 4,929,391, Cl. 252-511.000.
Narula, Dipak B.; Ee, Anh; and Swihart, Terence J., 4,929,703, Cl. 528-23.000.
Vincent, Gary A.; Sylvester, Judith M.; and Vincent, Harold L., 4,929,376, Cl. 252-62.560.
Downs, David A.: *See—*
Coughenour, Linda L.; Davis, Robert E.; Downs, David A.; Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,929,734, Cl. 546-338.000.
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Goldman, Leon; Drake, Ellet H.; and Goldman, Steven, 4,928,695, Cl. 128-642.000.
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Dresdale, Arthur: *See—*
Rose, Eric; and Dresdale, Arthur, 4,928,603, Cl. 106-124.000.
Dresser Industries, Inc.: *See—*
Todd, John A., 4,929,356, Cl. 210-248.000.
Drew Chemical Corporation: *See—*
Luttinger, Lionel B., 4,929,274, Cl. 423-25.000.
Drobshoff, Alexander: *See—*
Shull, William; Nissen, Rudolph; and Drobshoff, Alexander, 4,928,756, Cl. 165-182.000.
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Drygala, Peter: *See—*
Watson, Keith G.; Drygala, Peter; and Bell, Stephen, 4,929,269, Cl. 71-92.000.
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Cesa, Mark C.; Dubbert, Robert A.; and Burrington, James D., 4,929,755, Cl. 562-443.000.
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Dudderar, Thomas D.: *See—*
Burger, Christian P.; Dudderar, Thomas D.; Gilbert, John A.; Peters, Bruce R.; and Smith, James A., 4,928,527, Cl. 73-657.000.
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Bauer, Thomas M.; Dunn, Thomas A.; Gurke, Christina M.; Hopkins, John W.; and Nafziger, Richard D., 4,930,154, Cl. 379-246.000.
Duo-Fast Corporation: *See—*
Kerrigan, James E., 4,928,868, Cl. 227-131.000.
Du Pont de Nemours, E. I., and Company: *See—*
Gopalakrishnan, Jagannatha; and Subramanian, Munirpallam A., 4,929,594, Cl. 505-1.000.
Hagewood, John F., 4,929,698, Cl. 528-272.000.
Pennev, Penio; Rajagopalan, Parthasarathi; and Scribner, Richard M., 4,929,627, Cl. 514-320.000.
DuPont, Louis A.: *See—*
Gupta, Ved P.; and DuPont, Louis A., 4,929,749, Cl. 560-79.000.
Durand, William W.; and Peterson, Ronald E., to Honeywell Inc. Nonlinear tunable optical bandpass filter. 4,929,063, Cl. 350-353.000.
Durham, Dana: *See—*
Spak, Mark A.; Mammato, Donald; Durham, Dana; and Jain, Sangya, 4,929,536, Cl. 430-325.000.
Durkop, Willi: *See—*
Steinkuhle, Ferdinand; Strate, Klaus; Durkop, Willi; and Moller, Ulrich, 4,929,186, Cl. 439-78.000.
Dutton, Christopher; and Perry, David, to Pfizer Inc. C.25 [substituted(2-propenyl)]milbemycins. 4,929,638, Cl. 514-450.000.
Dutzmann, Stefan: *See—*
Lindner, Werner; Becker, Benedikt; Steffens, Robert; Wachendorff-Neumann, Ulrike; Brandes, Wilhelm; Stendel, Wilhelm; and Dutzmann, Stefan, 4,929,642, Cl. 514-510.000.
Dye, Norman H., to Arbus Inc. Fiber-optic contact fuze device. 4,928,596, Cl. 102-216.000.
Dyer, Tracy D.: *See—*
O'Brien, John T.; Thomas, Neil L.; and Dyer, Tracy D., 4,929,946, Cl. 341-87.000.
Dykstra, Jerald P.; and Ray, Andrew M., to Eaton Corporation. Wafer rotation control for an ion implanter. 4,929,840, Cl. 250-492.300.
E-Systems, Inc.: *See—*
Miles, Thomas O.; and Kreitzer, Carl E., 4,929,955, Cl. 342-371.000.
Pergerson, Gregory, 4,930,033, Cl. 360-137.000.
East, Anthony J.: *See—*
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., 4,929,696, Cl. 526-312.000.
Easter, William M.: *See—*
Gereby, John L.; Gifford, Eric P.; Wehrmann, Rick S.; and Easter, William M., 4,928,455, Cl. 53-570.000.
Easterly, Robert W.: *See—*
Bridges, Mark E.; and Easterly, Robert W., 4,929,872, Cl. 315-209.00R.
Eastman Kodak Company: *See—*
Bowes, William A., 4,928,918, Cl. 248-688.000.
Bridges, Mark E.; and Easterly, Robert W., 4,929,872, Cl. 315-209.00R.
Godfrey, Darryl A., 4,929,509, Cl. 428-461.000.
Irick, Gether, Jr.; Mercer, Patricia N.; and Simmons, Kenneth E., 4,929,777, Cl. 568-864.000.

Lentz, Carl M.; Mullins, Edward T.; and Gibson, Charles L., 4,929,737, Cl. 548-365.000.
Morris, Brian G., 4,929,969, Cl. 346-140.00R.
Sexton, Gregory J.; and Kopp, Gregory M., 4,929,966, Cl. 346-75.000.
Shipkowski, James P., 4,929,932, Cl. 340-644.000.
Trotter, Jimmy R.; and Sublett, Bobby J., 4,929,714, Cl. 528-272.000.
Wang, Richard H. S.; and Myers, Garry L., 4,929,654, Cl. 524-117.000.
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Dunkley, Michael W.; and Stainton, John E., 4,930,078, Cl. 364-424.100.
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Dykstra, Jerald P.; and Ray, Andrew M., 4,929,840, Cl. 250-492.300.
Link, Donald A.; Hubbard, Dean A.; and Larsen, Michael R., 4,929,919, Cl. 335-38.000.
Markyvech, Ronald K.; and Genise, Thomas A., 4,928,544, Cl. 74-335.000.
Ebe, Kazuyoshi: *See—*
Itou, Kazumi; Ebe, Kazuyoshi; and Minagawa, Toshio, 4,929,486, Cl. 428-77.000.
Eberhardt, Hans-Georg: *See—*
Pleschiutschnigg, Fritz-Peter; Moellers, Gerd; Eberhardt, Hans-Georg; Rahmfeld, Werner; Parschat, Lothar; and Ehrenberg, Hans-Juergen, 4,928,747, Cl. 164-418.000.
ECC International Limited: *See—*
Jones, Thomas R., 4,929,580, Cl. 501-148.000.
ECIA - Equipements et Composants pour l'Industrie Automobile: *See—*
Ballet, Jean-Noel, 4,928,366, Cl. 24-641.000
Eckart Donald W.: *See—*
Branovich, Louis E.; Smith, ernard; Freeman, Gerard L.; and Eckart Donald W., 4,929,418, Cl. 419-19.000.
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Eckold, Gerd-Jurgen; and Maass, Hans. Tool set for connecting superposed sheet metal work pieces. 4,928,370, Cl. 29-243.500.
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Edemsky, Vladimir K.: *See—*
Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B.; Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K., 4,929,416, Cl. 420-12.000.
Eder, Erich: *See—*
Kampichler, Guenter; and Eder, Erich, 4,928,643, Cl. 123-185.00B.
Edmunds, Timothy; and Foley, Susan F., to Damon Biotech, Inc. Recovery of tissue plasminogen activator. 4,929,560, Cl. 435-226.000.
Effland, John E.: *See—*
Sorbello, Robert M.; Effland, John E.; and Zaghloul, Amir I., 4,929,959, Cl. 343-700.0MS.
EG&G, Inc.: *See—*
Danby, Philip C.; Danby, Hal C.; and Hungerman, Eric R., 4,929,329, Cl. 204-299.00R.
Egan, Richard J.: *See—*
Balon, John, Jr.; and Egan, Richard J., 4,929,262, Cl. 55-341.200.
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Egawa, Akira: *See—*
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, 4,930,135, Cl. 372-33.000.
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Egerer, Josef, to Staedtler & Uhl. Top comb for textile machinery and process for cleaning same. 4,928,356, Cl. 19-129.00R
Eguchi, Hiroshi: *See—*
Kanto, Jumpei; and Eguchi, Hiroshi, 4,929,592, Cl. 503-227.000.
Eguchi, Ken: *See—*
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.
Eguchi, Tamotsu; Oshiro, Takashi; Kuge, Yukihiro; Mochida, Kenichi; and Uwajima, Takayuki, to Kyowa Hakko Kogyo Co., Ltd. Process for producing L(−)-tetrahydrofolic acid. 4,929,551, Cl. 435-106.000.
Ehrenberg, Hans-Juergen: *See—*
Pleschiutschnigg, Fritz-Peter; Moellers, Gerd; Eberhardt, Hans-Georg; Rahmfeld, Werner; Parschat, Lothar; and Ehrenberg, Hans-Juergen, 4,928,747, Cl. 164-418.000.
Ehret, Charles O.: *See—*
Taylor, Harry L.; and Ehret, Charles O., 4,928,583, Cl. 98-31.600.
Ehtyl Corporation: *See—*
Keblys, Kestutis A.; Ao, Meng-Sheng; and Burton, Lester P. J., 4,929,745, Cl. 558-84.000.
Einthoven, Willem G., to General Instrument Corporation Method for setting the threshold voltage of a power mosfet 4,929,987, Cl. 357-234.000.
Eisai Co., Ltd.: *See—*
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.
Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See—*
Konig, Hubert, 4,928,740, Cl. 152-243.000.
Eisenman, Welsey L.: *See—*
Flesner, Larry D.; Eisenman, Welsey L.; Merriam, James D.; Bates, Richard L.; Dahle, Rolf N.; and Arrington, Douglas C., 4,929,831, Cl. 250-307.000.
Eisert, Wolfgang: *See—*
Nickl, Josef; Heckel, Armin; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Eisert, Wolfgang; and Muller, Thomas, 4,929,754, Cl. 562-428.000.
Eitai, Kazuo; and Takayama, Hidehiko, to Diesel Kiki Co., Ltd. Variable capacity compressor. 4,929,156, Cl. 417-295.000.
Ejiri, Susumu: *See—*
Nishino, Hiroshi; Ejiri, Susumu; and Yokoyama, Nobuyoshi, 4,928,664, Cl. 126-391.000.
Eke, Alan B., to Lund Industries, Inc. Airflow deflector apparatus. 4,929,013, Cl. 296-91.000.
Eksell, Lennart: *See—*
Qvint, Peter; Andersson, Tommy; and Eksell, Lennart, 4,928,992, Cl. 280-801.000.
Elderton, Peter P.; Granada, Richard P.; and Howes, Royal E., to ITT Corporation. Potentiometer position switch circuit. 4,930,041, Cl. 361-190.000.
Eldon Corporation, The: *See—*
Fischer, Frank P., Jr., 4,928,751, Cl. 165-11.100.
Electronics and Telecommunications Research Institute: *See—*
Park, Hyung M.; and Kim, Dong G., 4,929,567, Cl. 437-41.000.
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White, Douglas S., 4,928,862, Cl. 222-604.000.
Elleaume, Philippe, to Thomson-CSF. Device for computing a sliding and nonrecursive discrete Fourier transform and its application to a radar system. 4,929,954, Cl. 342-194.000.
Ellem Industria Farmaceutica, S.p.A.: *See—*
Brunetti, Brunetto; and Prada, Marco, 4,929,601, Cl. 514-18.000.
Elliott, John D., Jr.; and DeBiase, Robert, to Foster Wheeler U.S.A. Corporation. Method for extended conditioning of delayed coke. 4,929,339, Cl. 208-131.000.
Ellson, George A.: *See—*
Henderson, Walter G.; Ellson, George A.; and Unrein, Edgar J., 4,929,880, Cl. 320-30.000.
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., to Black & Decker Inc. Hand-held vacuum cleaner with power brush. 4,928,346, Cl. 15-338.000.
Elter, Michael R.: *See—*
Barton, Arthur A.; DeBolt, Frederick C.; Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A.; Miller, Mark T.; Rasch, Kenneth R.; and Szlucha, Thomas F., 4,929,983, Cl. 355-315.000.
Emadi, Atahusain E.; Green, Eric T.; Margosiak, John S.; Mignogna, Daniel J.; and Smith, Dennis E., to AMP Incorporated. Keyed electrical connectors with jackscrews. 4,929,184, Cl. 439-681.000.
Emerson Electric Co.: *See—*
Baker, Gerald N., 4,929,219, Cl. 474-102.000.
Emhart Deutschland GmbH: *See—*
Farassat, Farhad, 4,928,871, Cl. 228-179.000.
Emhart Industries, Inc.: *See—*
Claypool, Mark P., 4,929,828, Cl. 280-223.00B
Emmett, John E., to Occidental Chemical Corporation. Piston for disc brakes. 4,928,579, Cl. 92-248.000.
Emmons, Stuart A.; and Hale, Perry, to Lever Brothers Company Stable, aqueous bleach compositions containing solid organic peroxy acid. 4,929,377, Cl. 251-100.000.
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Saeki, Keiso; and Endo, Tosiaki, 4,929,530, Cl. 430-138.000.
Engbert, Theodor; Frohlich, Jurg; Kubitza, Werner; Breidenbach, Peter; and Mennicken, Gerhard, to Bayer Aktiengesellschaft. Process for the production of uretdione group-containing compounds, the compounds obtained according to this process and the use thereof in the production of polyurethane plastics material 4,929,724, Cl 540-202.000.
Engelhardt, Dietmar: *See—*
Wirtz, Ulrich; and Engelhardt, Dietmar, 4,928,903, Cl. 242-130.000.
Engels, Walter: *See—*
Higgins, Kenneth B.; and Engels, Walter, 4,928,391, Cl. 30-293.000.
Enhanced Insulations, Inc.: *See—*
Phillip, Bradley L., 4,928,448, Cl. 52-174.000.
Enomoto, Hiroyuki: *See—*
Kobashi, Rikizo; Takase, Shigeyuki; Enomoto, Hiroyuki, Hayasaki, Yasushi; Kobayashi, Toyohisa; and Yamazaki, Shingo, 4,929,685, Cl 525-277.000.

Erickson, Jon B. Ported automotive speaker enclosure apparatus and method. 4,928,788, Cl. 181-141.000.
Erismann, David W.: *See*—
Deziel, Edward W.; Rueb, John T.; Sorlien, Mark D.; Dahlstrom, Jack A.; and Erismann, David W., 4,929,029, Cl. 300-21.000.
Esfandiary, Rahman A. Impact absorber for vehicles. 4,929,008, Cl. 293-108.000.
Espy, Lawrence M.: *See*—
Schiffman, Eric L.; Fricton, James R.; and Espy, Lawrence M., 4,928,707, Cl. 128-774.000.
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Estridge, Doug R.: *See*—
Rittenhouse, David A.; Neurohr, Fred; and Estridge, Doug R., 4,929,470, Cl. 427-55.000.
Ethyl Corporation: *See*—
Freskos, John N., 4,929,723, Cl. 536-23.000.
Hargis, Duane C., 4,929,764, Cl. 564-399.000.
Huang, C. S. Warren; and Meyer, Karl W., 4,929,788, Cl. 585-522.000.
Hussain, Saadat, 4,929,775, Cl. 568-844.000.
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Matthews, Charles W.; Batman, Eric S.; and King, Jeffrey F., 4,929,770, Cl. 568-756.000.
Smith, R. Scott, 4,929,783, Cl. 585-452.000.
Evangelista, Donato D.; LaTour, Norman E.; and Kirven, Bobby, to Xerox Corporation. Feeder reversing drive. 4,928,948, Cl. 271-110.000.
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Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,929,476, Cl. 428-34.200.
Evans, Jerry; and Ashely, Ravadean. Hard hat face shield bracket. 4,928,324, Cl. 2-424.000.
Evans, Robert B. Swim fin with flexible fin member having movable tips. 4,929,206, Cl. 441-64.000.
Evans, Samuel: *See*—
Meier, Hans R.; and Evans, Samuel, 4,929,732, Cl. 546-158.000.
Evans, Susan P.: *See*—
Bahl, Surinder K.; Canterino, Peter J.; Cunningham, Theresa L.; Evans, Susan P., and Shaw, Richard G., 4,929,681, Cl. 525-240.000.
Evionics, Inc.: *See*—
Wong, Jacob Y., 4,928,703, Cl. 128-719.000.
Ewan, George B.: *See*—
Tyers, Michael B.; Coates, Jan H.; Humber, David C.; Ewan, George B.; and Be", James A., 4,929,632, Cl. 514-397.000.
Ewert, Werner H., to Bonatz, Hans. Collapsible article of furniture. 4,928,333, Cl. 5-110.000.
Ewing, Kenneth R.: *See*—
Graham, Scott M.; Ewing, Kenneth R.; Trackman, Marshall H.; and Darr, Duane R., 4,929,099, Cl. 400-76.000.
Ewos Aktiebolag: *See*—
Knutsson, Maud I. C., 4,929,466, Cl. 426-615.000.
Exovir, Inc.: *See*—
Powell, Maxwell M., 4,929,442, Cl. 424-85.200.
Exxon Chemical Patents Inc.: *See*—
Sheth, Paresh J., 4,929,303, Cl. 156-209.000.
Exxon Production Research Company: *See*—
Crook, Troy N., 4,928,783, Cl. 181-106.000.
Exxon Research and Engineering Company: *See*—
Cody, Ian A.; Hamner, Glen P., deceased; and Schorfheide, James T., 4,929,795, Cl. 585-739.000.
Koenitzer, Bernd A., 4,929,358, Cl. 210-640.000.
Schucker, Robert C., 4,929,357, Cl. 210-640.000.
Ezzeddine, Amin K., to Grumman Corporation. High frequency switching device. 4,929,855, Cl. 307-571.000.
Faber, Thomas: *See*—
Svyatsky, Eduard; Loftis, Jerry W.; and Faber, Thomas, 4,928,946, Cl. 271-10.000.
Fabri, Roberto: *See*—
Banzi, Viviano; and Fabri, Roberto, 4,929,682, Cl. 525-257.000.
Fabricated Plastics, Inc.: *See*—
Richards, Toby D.; and Antonio, Anthony I., Jr., 4,928,734, Cl. 138-154.000.
Richards, Toby D.; and Antonio, Anthony I., Jr., 4,928,735, Cl. 138-154.000.
Falempin, Francois: *See*—
Delfour, Andre ; Falempin, Francois; Isbert, Jacques; and Sans, Claude, 4,929,079, Cl. 356-336.000.
Falgout, Thomas E., Sr. Deviation control tool. 4,928,776, Cl. 175-45.000.
Falk, David O., to Marathon Oil Company. Method of treating a permeable formation. 4,928,763, Cl. 166-250.000.
Fallon, Merton R.; and Clements, Thomas W., to McDantim, Inc. Gas blending apparatus. 4,928,850, Cl. 222-3.000.
Falz, Ulrich: *See*—
Lunke, Manfred; Falz, Ulrich; and Walter, Jurgen, 4,929,115, Cl. 403-228.000.
Fan, David P. Information processing expert system for text analysis and predicting public opinion based information available to the public. 4,930,077, Cl. 364-419.000.
Fansler, Kevin S.; and Lyon, David H., to United States of America, Army Silencer for saboted projectiles. 4,928,573, Cl. 89-14.400.
Fanuc Ltd.: *See*—
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, 4,930,135, Cl. 372-33.000.
Yonekura, Mikio; and Kinoshita, Jiro, 4,930,070, Cl. 364-200.000.
Farassat, Farhad, to Emhart Deutschland GmbH. Apparatus and method of controlled feed of a bonding wire to the "wedge" of a bonding head. 4,928,871, Cl. 228-179.000.
Farkas, Joseph R.: *See*—
Bodine, David B.; and Farkas, Joseph R., 4,929,925, Cl. 340-426.000.
Farr, Glyn P. R., to Lucas Industries public limited company. Hydraulic anti-lock braking systems for vehicles. 4,929,037, Cl. 303-116.000.
Fawcett, John N.: *See*—
Burdess, James S.; Fawcett, John N.; and Hewit, James R., 4,928,538, Cl. 73-862.410.
Fawcett, John Neville: *See*—
Burdess, James S.; Fawcett, John N.; and Hewit, James R., 4,928,538, Cl. 73-862.410.
Feest, Eric A.; Chesney, Peter F.; and Coombs, Jeffrey S., to United Kingdom Atomic Energy Authority. Metal matrix composite manufacture. 4,928,745, Cl. 164-46.000.
Feild, Eugene P., to Laminar Fluid Controls, Inc. Finely-adjustable flow control valve. 4,928,920, Cl. 251-118.000.
Fellows, Richard L.: *See*—
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J.; Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., 4,929,426, Cl. 422-63.000.
Ferag AG: *See*—
Reist, Walter, 4,928,899, Cl. 242-59.000.
Ferkany, Michael A., to Biomedical Devices Company, Inc. Apparatus for transferring elongated sample tube holders to and from workstations. 4,928,453, Cl. 53-67.000.
Ferrenberg, Allan J.; and Webber, William T. Regenerative internal combustion engine. 4,928,658, Cl. 123-543.000.
Ferrero, Maria T. M.: *See*—
Mondelo, Fernando C.; and Ferrero, Maria T. M., 4,929,440, Cl. 424-79.000.
Ferret: *See*—
McKinnon, Donald C., 4,929,199, Cl. 439-759.000.
Ferruti, Paolo; and Scapini, Giancarlo, to Nuovo Consorzio Sanitario Nazionale. Compounds having hypolipemizing activity. 4,929,750, Cl. 560-87.000.
Feyen, Peter: *See*—
Reiser, Wolf; and Feyen, Peter, 4,929,735, Cl. 548-268.800.
FIAM S.r.l.: *See*—
Livi, Vittorio, 4,929,488, Cl. 428-192.000.
FiberChem, Inc.: *See*—
Le Goullon, Donald; and Goswami, Kisholoy, 4,929,049, Cl. 350-96.290.
Fiberview Corporation: *See*—
Cuypers, Michel J., 4,929,048, Cl. 350-96.240.
Fiege, Helmut: *See*—
Schnatterer, Albert; and Fiege, Helmut, 4,929,766, Cl. 568-432.000.
Fillmore, Danielle M.; Price, John G.; and Swihart, Terence J., to Dow Corning Corporation. Liquid silicone resin compositions. 4,929,691, Cl. 525-477.000.
Filtration L.T.D.: *See*—
Barzuza, Vtzhak, 4,929,363, Cl. 210-741.000.
Findlay, David M., deceased (by Findlay, Jean, executrix); and Richardson, Neil G., to Domtar Inc. Wood treatment composition. 4,929,454, Cl. 424-638.000.
Findlay, Jean, executrix: *See*—
Findlay, David M., deceased; and Richardson, Neil G., 4,929,454, Cl. 424-638.000.
Finfrock, Don C.: *See*—
Houser, James S.; and Finfrock, Don C., 4,930,093, Cl. 364-551.010.
Fink, E. David: *See*—
Merry, Jack D.; and Fink, E. David, 4,929,235, Cl. 604-167.000.
Finley, Charles O. Grip enhanced football. 4,928,962, Cl. 273-65.0EG.
Finley, Ian P.: *See*—
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., 4,929,950, Cl. 342-25.000.
Finley, Richard O., to Plastiflex Company International. Method and apparatus for creating a secondary source of power by a pump. 4,929,155, Cl. 417-53.000.
Finney, Robert E., to ITT Corporation. High density connector. 4,929,197, Cl. 439-660.000.
Fiore, Peter J.: *See*—
Bachelder, Walter F.; Sullivan, John L.; Fiore, Peter J.; and Hansen, Godfrey L., 4,928,533, Cl. 73-838.000.
Firmenich SA: *See*—
Giersch, Wolfgang K.; and Schulte-Elte, Karl-Heinrich, 4,929,599, Cl. 512-18.000.
First Data Resources Inc.: *See*—
Katz, Ronald A., 4,930,150, Cl. 379-93.000.
Fischer, Artur, to Fischerwerke Artur Fischer GmbH & Co. KG. Drill bit for producing drilled holes with an undercut. 4,929,127, Cl. 408-81.000.
Fischer, Frank P., Jr., to Eldon Corporation, The. Computer controlled waste heat reclaimer. 4,928,751, Cl. 165-11.100.
Fischerwerke Artur Fischer GmbH & Co. KG: *See*—
Fischer, Artur, 4,929,127, Cl. 408-81.000.
Fischli, Albert; Gutknecht, Eva-Maria; and Obrecht, Daniel, to Hoffman-La Roche Inc. Propiolophenone derivatives. 4,929,741, Cl. 549-447.000.

Fisher Dynamics Corporation: *See*—
Secord, Tyrone R., 4,929,024, Cl. 297-362.000.
Fisher, Frederick A.: *See*—
Kaylor, William R.; and Fisher, Frederick A., 4,929,960, Cl. 343-703.000.
Fiskars Oy Ab: *See*—
Linden, Olavi, 4,928,436, Cl. 51-80.0BS.
Fister, Julius C.: *See*—
Pryor, Michael J.; Fister, Julius C.; Singhdeo, Narendra N.; Mahulikar, Deepak; and Cherukuri, Satyam C., 4,929,516, Cl. 428-620.000.
Fitts, Frederick L., to Precision Devices Inc. Surface measuring instrument link arm assembly. 4,928,517, Cl. 73-105.000.
Fitzgibbons, Gary W.: *See*—
Henry, Paul T.; Haase, Roger L.; and Fitzgibbons, Gary W., 4,928,874, Cl. 229-74.000.
Fitzpatrick, Colleen: *See*—
Kroetch, Keith; and Fitzpatrick, Colleen, 4,928,442, Cl. 52-2.00J.
Flachglas Aktiengesellschaft: *See*—
Tunker, Gerhard, 4,929,493, Cl. 428-207.000.
Flakas, Gerald K.; and Dalman, Harold J., to General Electric Company. X-ray tube current control with constant loop gain. 4,930,146, Cl. 378-110.000.
Flanigan, Sean: *See*—
Sampson, Robert; and Flanigan, Sean, 4,928,445, Cl. 52-72.000.
Fleming, Shane D., to American Cyanamid. Metals recovery by flotation. 4,929,344, Cl. 209-166.000.
Flesner, Larry D.; Eisenman, Welsey L.; Merriam, James D.; Bates, Richard L.; Dahle, Rolf N.; and Arrington, Douglas C., to United States of America, Navy. Electron beam apparatus for testing infrared detectors in a cryogenically shielded environment. 4,929,831, Cl. 250-307.000.
Flint, Hollis M.; and Merkle, John R., to United States of America, Agriculture. Unnatural sex attractants for male pink bollworms and pinkspotted bollworms and use thereof. 4,929,441, Cl. 424-84.000.
Flood, Ted C.: *See*—
Keesey, Charles R.; and Flood, Ted C., 4,929,141, Cl. 414-412.000.
Florek, Bronislaw B., to ABC Consulting Services, Inc. Pegboard hanger anchor. 4,928,912, Cl. 248-221.200.
Fluoroware, Inc.: *See*—
Osgar, Michael L., 4,929,293, Cl. 156-158.000.
Flyct AB: *See*—
Olsson, Staffan, 4,929,875, Cl. 318-362.000.
Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz, 4,928,817, Cl. 206-256.000.
Focke, Heinz; and Liedtke, Kurt, 4,929,226, Cl. 493-343.000.
Focke, Heinz, to Focke & Co. (GmbH & Co.). Packaging for a plurality of small packs, especially cigarette packs. 4,928,817, Cl. 206-256.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Process and apparatus for producing and conveying pack blanks. 4,929,226, Cl. 493-343.000.
Foley, Susan F.: *See*—
Edmunds, Timothy; and Foley, Susan F., 4,929,560, Cl. 435-226.000.
Fong, Dodd W.: *See*—
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., 4,929,425, Cl. 422-13.000.
Foote, James C.: *See*—
Stevenson, George F.; Foote, James C.; and Hamlin, Humphrey A. S., 4,928,682, Cl. 128-202.260.
Ford Motor Company: *See*—
Fraser, Ian, 4,929,144, Cl. 414-799.000.
Mansour, Tahir M., 4,929,846, Cl. 250-571.000.
Singer, John C., III, 4,928,545, Cl. 74-473.0SW.
Steele, Duane F.; Warman, Eugene C.; and Hutter, Robert J., 4,929,157, Cl. 417-312.000.
Ford New Holland, Inc.: *See*—
Bohman, Carl E.; and Seymour, Shaun A., 4,929,904, Cl. 324-696.000.
Lippens, Christiaan A. C.; and Naaktgeboren, Adrianus, 4,928,462, Cl. 56-341.000.
Foreman, Larry R.; Gomez, Veronica M.; and Thomas, Michael H Fixture for mounting small parts for processing. 4,929,306, Cl. 156-306.300.
Forman, Willis R., to Nilson, Ronald; and Sea View Enterprises, a part interest. Submersible observation vessel. 4,928,614, Cl. 114-66.000.
Formax, Inc.: *See*—
Lindee, Scott A., 4,928,591, Cl. 99-485.000.
Forrestal, Joseph M. Ice fishing apparatus and signaling device. 4,928,419, Cl. 43-17.000.
Forster, Heinz; Beck, Gunther; Klauke, Erich; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Novel 4,5-disubstituted 1,3-thiazol-2-yloxyacetamide herbicides. 4,929,743, Cl. 548-187.000.
Foseco International Limited: *See*—
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,928,746, Cl. 164-362.000.
Foster, John W.: *See*—
Hatch, William R.; and Foster, John W., 4,929,370, Cl. 252-12.200.
Foster-Miller, Inc.: *See*—
Smirlock, Martin E.; Ribich, William A.; Marinaccio, Paul J.; and Sawaf, Bernard E., 4,928,575, Cl. 89-36.020.
Foster Wheeler U.S.A. Corporation: *See*—
Elliott, John D., Jr.; and DeBiase, Robert, 4,929,339, Cl. 208-131.000.
Fouche, Claude, to S.A.: Societe Europeenne de Propulsion. Method and apparatus for ultra-precise machining applied to executing atypical surfaces of revolution and to servo-controlled machining. 4,928,561, Cl. 82-1.110.
Fountain Fresh, Inc.: *See*—
Isham, William R.; Cragun, E. Brent; Gault, Christopher; and Wermeling, William J., 4,928,853, Cl. 222-108.000.
Foyt, Arthur G.: *See*—
Wiegand, Walter J.; Swindal, James L.; Swarts, Richard E.; Bullis, Robert H.; Lopiccolo, Mario T.; Grantham, Daniel H.; and Foyt, Arthur G., 4,930,042, Cl. 361-280.000.
Frame, Robert R.: *See*—
Pollastrini, Sheila; Bricker, Jeffery C.; and Frame, Robert R., 4,929,340, Cl. 208-189.000.
Franaszek, Peter A.; and Georgiou, Christos J., to International Business Machines Corporation. Collision crossbar switch. 4,929,940, Cl. 340-825.020.
Frances, Jean-Marc: *See*—
Cavezzan, Jacques; Frances, Jean-Marc; and Lancelin, Pierre, 4,929,702, Cl. 528-18.000.
Francke, Wittko, to BASF Aktiengesellschaft. Method and compositions for controlling the pear leaf blister moth, *Leucoptera scitella*. 4,929,779, Cl. 585-16.000.
Franklin, Ralph, to Akzo America Inc. Method of preparing dialkyl dicarbonates. 4,929,748, Cl. 558-276.000.
Franks, Jerry L., to South Carolina State Ports Authority. Restraining device. 4,928,790, Cl. 182-3.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft GmbH: *See*—
Theurer, Josef; Oellerer, Friedrich; and Gruber, Leopold R., 4,929,816, Cl. 219-53.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Hansmann, Johann; and Ganz, Jorg, 4,928,599, Cl. 104-12.000.
Fraser, Ian, to Ford Motor Company. Apparatus for loading radiator fins into trays. 4,929,144, Cl. 414-799.000.
Frass, Werner: *See*—
Stephani, Trutz-Ulrich; Mohr, Dieter; Maisel, Britta; and Frass, Werner, 4,929,534, Cl. 430-191.000.
Fredenucci, Pierre: *See*—
Gerault, Patrice; Goguelin, Michel; and Fredenucci, Pierre, 4,929,308, Cl. 162-145.000.
Frederick, Earl, to Vehicle Safety Controls, Inc. Brake testing apparatus. 4,928,519, Cl. 73-126.000.
Fredrick, William R.; and Stuhler, Robert H. Lifting mechanism for heavy street gratings. 4,928,927, Cl. 254-279.000.
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., to General Electric Company, plc, The; and United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Synthetic aperture radar systems. 4,929,950, Cl. 342-25.000.
Freeman, Gerard L.: *See*—
Branovich, Louis E.; Smith, ernard; Freeman, Gerard L.; and Eckart Donald W., 4,929,418, Cl. 419-19.000.
Freitag, Helmut, to Boehringer Mannheim Corporation. Method and reagent for determination of an analyte via enzymatic means using a ferricyanide/ferric compound system. 4,929,545, Cl. 435-11.000.
Freitas, Elizabeth A., to Chevron Research Company. Downhole coupon holder. 4,928,760, Cl. 166-113.000.
Frenc, Andre : *See*—
Prus, Eric; Frenc, Andre ; Bordaz, Pascal; Guerange, Patrick; and Thome, Caryl, 4,928,880, Cl. 239-8.000.
Frentzel-Beyme, Johannes, to Palitex Project Company GmbH. Yarn brake mechanism for a two-for-one textile yarn twisting machine spindle assembly. 4,928,463, Cl. 57-58.860.
Freskos, John N., to Ethyl Corporation. Process for preparing 2-deoxynucleosides. 4,929,723, Cl. 536-23.000.
Frianeza-Kullberg, Teresita C.; and Barnette, Darrish W., to Lithium Corporation of America. Sodium removal, from brines. 4,929,588, Cl. 502-402.000.
Fricton, James R.: *See*—
Schiffman, Eric L.; Fricton, James R.; and Espy, Lawrence M., 4,928,707, Cl. 128-774.000.
Friedfeld, Howard: *See*—
Henderson, Don J.; Brady, Robert; Gamble, Foster R.; Hardt, James V.; Friedfeld, Howard; Salerno, Don; Swanson, Tad; and Sansing, Maureen R., 4,928,696, Cl. 128-644.000.
Friedman, Don; and Chang, Thomas T., to Home Security Systems, Inc. LED illuminated sign. 4,929,936, Cl. 340-715.000.
Friedman, Herbert D.; and Friedman, Mark A., to Cancot Industries Inc. Mop holder. 4,928,342, Cl. 15-145.000.
Friedman, Mark A.: *See*—
Friedman, Herbert D.; and Friedman, Mark A., 4,928,342, Cl. 15-145.000.
Friedrich Maurer Sohne GmbH & Co. KG: *See*—
Klawe, Ernst, 4,928,339, Cl. 14-16.100.
Friess, Alan; and Friess, Colin. Container for compact disks. 4,928,818, Cl. 206-309.000.
Friess, Colin: *See*—
Friess, Alan; and Friess, Colin, 4,928,818, Cl. 206-309.000.
Frito-Lay, Inc.: *See*—
Schonauer, Sylvia L.; Medina, Linda M.; and Neel, Donald V., 4,929,461, Cl. 426-438.000.
Froeschke, Wolfgang: *See*—
Veitenhansl, Rudolf; Froeschke, Wolfgang; and Piorr, Robert, 4,929,504, Cl. 428-395.000.

Frohlich, Jurg: *See—*
Engbert, Theodor; Frohlich, Jurg; Kubitza, Werner; Breidenbach, Peter; and Mennicken, Gerhard, 4,929,724, Cl. 540-202.000.

Fromm, Paul M.: *See—*
Barton, Arthur A.; DeBolt, Frederick C.; Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A.; Miller, Mark T.; Rasch, Kenneth R.; and Szlucha, Thomas F., 4,929,983, Cl. 355-315.000.

Fruchtmann, Romanis: *See—*
Mohrs, Klaus; Raddatz, Siegfried; Fruchtmann, Romanis; Kohlsdorfer, Christian; and Muller-Peddinghaus, Reiner, 4,929,626, Cl. 514-311.000.

FSK Kabushiki Kaisha: *See—*
Itou, Kazumi; Ebe, Kazuyoshi; and Minagawa, Toshio, 4,929,486, Cl. 428-77.000.

Fu, Chia M.: *See—*
Lowery, Richard E.; Fu, Chia M.; and Maholland, Michael K., 4,929,336, Cl. 208-120.000.

Fu, Yun-Lung: *See—*
Jarovitzky, Peter A.; Fu, Yun-Lung; and Dexter, Robin W., 4,929,687, Cl. 525-328.200.

Fuchs, Jugen: *See—*
Koch, Heinrich; and Fuchs, Jugen, 4,929,243, Cl. 604-283.000.

Fuji Electric Co., Ltd.: *See—*
Kuroda, Masami; Hattori, Yoshimasa; and Furusho, Noboru, 4,929,525, Cl. 430-75.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Abe, Kunihiro, 4,928,649, Cl. 123-414.000.
Hosaka, Hiroshi, 4,928,654, Cl. 123-486.000.
Naitoh, Takao; and Nakayama, Seidai, 4,928,637, Cl. 123-41.310.

Fuji Photo Film Co., Ltd.: *See—*
Furutachi, Nobuo; and Hirose, Takeshi, 4,929,540, Cl. 430-555.000.
Hara, Yoshio, 4,928,827, Cl. 206-416.000.
Hatori, Masami; Nozaki, Nobuharu; and Kamiyama, Kozi, 4,929,042, Cl. 350-96 130.
Hatori, Masami, 4,929,043, Cl. 350-96.130.
Inukai, Yuzo; and Nakayama, Mitsuyuki, 4,928,719, Cl. 137-1.000.
Kato, Eiichi; Ishii, Kazuo; Itakura, Ryosuke; and Sera, Hidefumi, 4,929,526, Cl. 430-87.000.
Kato, Eiichi; Ohno, Shigeru; Ishii, Kazuo; and Itakura, Ryosuke, 4,929,527, Cl. 430-92.000.
Kido, Keishiro; and Tezuka, Sigeru, 4,928,540, Cl. 73-864 110.
Miyazaki, Takao, 4,929,824, Cl. 364-525.000.
Miyoshi, Takahito; Kanazawa, Minoru; Sugisaki, Tsutomu; Yamada, Takuzi; and Okuzawa, Yasutoshi, 4,930,032, Cl. 360-132.000.
Morigaki, Masakazu; and Aoki, Kozo, 4,929,538, Cl. 430-551.000.
Murayama, Jin; Kudoh, Yoshimitsu; and Kondo, Ryuji, 4,930,006, Cl. 358-44.000.
Nishikawa, Nobuo; and Misu, Hiroshi, 4,929,533, Cl. 430-169.000.
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 4,928,996, Cl. 283-109.000.
Saeki, Keiso; and Endo, Tosiaki, 4,929,530, Cl. 430-138.000.
Sakamoto, Kiichiro; and Iwasaki, Hideo, 4,929,974, Cl. 354-299.000.
Satou, Hiroyuki; and Ookawa, Norio, 4,928,897, Cl. 242-55.000.
Shidara, Shinichi, 4,929,975, Cl. 354-317.000.
Shiota, Kazuo, 4,930,009, Cl. 358-76.000.
Takahashi, Toshiro; Kameoka, Kimitaka; and Inagaki, Yoshio, 4,929,535, Cl. 430-264.000.
Takemoto, Satoru, 4,929,815, Cl. 219-501.000.
Tanaka, Mitsugu; and Sakai, Takeo, 4,929,277, Cl. 106-22.000.
Tezuka, Sigeru, 4,929,428, Cl. 422-100.000.
Uesugi, Akio; Dobashi, Ritsu; and Ohishi, Takeshi, 4,929,326, Cl. 204-206.000.
Usami, Toshimasa; and Shimomura, Akihiro, 4,929,411, Cl. 503-213.000.
Yamada, Takashi; Nomura, Masaaki; Yamamoto, Ryoichi; Matsubaguchi, Satoshi; and Nahara, Akira, 4,929,320, Cl. 204-192.200.
Yazawa, Hiromi; Inoda, Masahiro; and Kimura, Hideaki, 4,930,016, Cl. 358-296.000.

Fuji Xerox Co., Ltd.: *See—*
Mukai, Toshio; and Yamashita, Yoshiro, 4,929,730, Cl. 544-345.000.
Shinoki, Masayoshi; Takagi, Masahiro; Nagatsuka, Ikutaroh; Kumashiro, Koichi; Aoki, Takayoshi; and Takeda, Masayuki, 4,929,528, Cl. 430-108.000.

Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, to Aisin Seiki Kabushiki Kaisha. Self cleaning mirror for a vehicle. 4,929,072, Cl. 350-582.000.

Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, to Mitsubishi Rayon Co. Working equipment for roughening the side of optical fiber. 4,929,169, Cl. 425-385.000.

Fujii, Etsuo: *See—*
Iwagawa, Yoshihiro; Yahagi, Toshio; and Fujii, Etsuo, 4,929,036, Cl. 303-115.000.

Fuji, Toshihiro: *See—*
Kimura, Tetsuya; Fuji, Toshihiro; and Nii, Hiroki, 4,929,469, Cl. 427-54.100.

Fujimura, Masaki: *See—*
Nakanishi, Tatsuo, Tadokoro, Toyohiko; and Fujimura, Masaki, 4,928,972, Cl. 273-78.000.

Fujinaga, Yoshikazu: *See—*
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,929,169, Cl. 425-385.000.

Fujino, Shuichi: *See—*
Takeshita, Takuo; Sugihara, Tadashi; and Fujino, Shuichi, 4,929,597, Cl. 505-1.000.

Fujisawa Pharmaceutical Company, Ltd.: *See—*
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 4,929,611, Cl. 514-183.000.
Setoi, Hiroyuki; Kuroda, Akio; Tanaka, Hirokazu; Hirai, Hideo; Marusawa, Hiroshi; and Hashimoto, Masashi, 4,929,639, Cl. 514-452.000.
Takenawa, Seishi; Takeda, Hideki; and Horikoshi, Mie, 4,929,451, Cl. 426-10.000.

Fujita, Akihiko: *See—*
Oikawa, Ryuetsu; and Fujita, Akihiko, 4,928,349, Cl. 16-2.000.

Fujita, Tadao, to Sony Corporation. Circuit for detecting motion in a video signal on the basis of detected correlation patterns. 4,930,012, Cl. 358-105.000.

Fujitsu Limited: *See—*
Hoashi, Akira; Akima, Hideo; Shimanuki, Haruki; and Matsubara, Yuji, 4,930,083, Cl. 364-426.020.
Iino, Hideyuki; Yoshitake, Akihiro; and Hida, Hidenori, 4,929,854, Cl. 307-480.000.
Kobayashi, Kenzo; Iwagaki, Yutaka; Hasegawa, Mitsuyo; and Suganuma, Kazushi, 4,930,119, Cl. 370-16.100.
Matsushima, Kouji, 4,930,149, Cl. 379-61.000.
Muto, Shunichi; Inata, Tsuguo; Takeuchi, Atsushi; and Sugiyama, Yoshihiro, 4,929,984, Cl. 357-4.000.
Okada, Yoshiyuki, 4,930,021, Cl. 358-451.000.
Sugiyama, Tsutomu, 4,930,108, Cl. 365-230.020.
Takasaki, Kanetake, 4,929,985, Cl. 357-15.000.
Yasuda, Hiroshi; and Suzuki, Masahiko, deceased, 4,929,838, Cl. 250-492.200.

Fujitsu Microcomputer Systems Limited: *See—*
Iino, Hideyuki; Yoshitake, Akihiro; and Hida, Hidenori, 4,929,854, Cl. 307-480.000.

Fujitsu VLSI Limited: *See—*
Sugiyama, Tsutomu, 4,930,108, Cl. 365-230.020.

Fujiwara, Hideo; Tottori, Takeshi; Inagoya, Osamu; and Mikami, Hirosuke, to Hitachi Maxell, Ltd. Method of the production of a magnetic head. 4,928,382, Cl. 29-603.000.

Fujiwara, Hiroshi: *See—*
Koda, Akihide; Kita, Jun'ichiro; Kuroki, Yoshiaki; Fujiwara, Hiroshi; Takamura, Shinji; and Yamano, Kayoko, 4,929,618, Cl. 514-253.000.

Fukamachi, Chiharu; Schumacher, Horst; Bewert, Wolfgang; and Schneider, Joachim, to BASF Aktiengesellschaft. Stable mixture containing oxidation-sensitive compounds, preparation thereof and use of a combination of substances for stabilizing oxidation-sensitive compounds. 4,929,774, Cl. 568-824.000.

Fukasawa, Yoshihito, to Kabushiki Kaisha Toshiba. Method and apparatus for sequential product processing with limited product bar code reading. 4,930,086, Cl. 364-468.000.

Fukayama, Yukio; and Oshima, Taku, to Babcock-Hitachi Kabushiki Kaisha. Control system for pulverized coal fired boiler. 4,928,604, Cl. 110-103.000.

Fukazawa, Minoru: *See—*
Sugihara, Kanji; Yamamoto, Motohiro; Kida, Tohru; and Fukazawa, Minoru, 4,929,472, Cl. 427-215.000.

Fukuda, Shinri, to NEC Corporation. Circuit for detecting a lock of a phase locked loop. 4,929,916, Cl. 331-1.00A.

Fukuhara, Hiroshi: *See—*
Matsunaga, Fujihisa; and Fukuhara, Hiroshi, 4,929,762, Cl. 568-361.000.

Fukui, Kazuyuki, to Minolta Camera Kabushiki Kaisha. Automatic paper feed device. 4,928,951, Cl. 271-113.000.

Fukui, Yukimasa: *See—*
Yamazoe, Seigo; Nakai, Sadao; and Fukui, Yukimasa, 4,929,847, Cl. 250-573.000.

Fukuro, Hiroyoshi: *See—*
Kohtoh, Noriaki; Tsuruoka, Yoshihiro; Abe, Toyohiko; and Fukuro, Hiroyoshi, 4,929,658, Cl. 524-219.000.

Fuller, Maurice J.: *See—*
Rysavy, Peter B.; and Fuller, Maurice J., 4,929,935, Cl. 340-712.000.

Fuller Research Corporation: *See—*
Fuller, Terry A., 4,929,045, Cl. 350-96.150.

Fuller, Terry A., to Fuller Research Corporation. Method and apparatus for aligning optical energy to a wave guide. 4,929,045, Cl. 350-96.150.

Funahashi, Hiroyuki: *See—*
Hirayama, Takanobu; Funahashi, Hiroyuki; Yokota, Eiji; Uehara, Mitsuyoshi; Kagami, Isao; Hasegawa, Makoto; and Mizuno, Masaru, 4,929,105, Cl. 400-625.000.

Funahashi, Nobuhiro; Yamashita, Toshio; and Ogawa, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha Control device for freezer. 4,928,500, Cl. 62-193.000.

Furuhashi, Kenshi; and Sawada, Hiroyuki, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Headlight dimmer switch device. 4,929,806, Cl. 200-61.540.

Furukawa Co., Ltd.: *See—*
Saito, Shigeaki; Matsueda, Toshiharu; Kubota, Yoshihiro; and Iguchi, Masaaki, 4,929,572, Cl. 437-164.000.

Furukawa, Eiji: *See—*
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, 4,929,438, Cl. 424-10.000.

Furukawa, Noriyuki: *See—*
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,929,169, Cl. 425-385.000.

Furushima, Masakazu: *See—*
Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi; Oda, Mitsunori; and Tanaka, Akinori, 4,929,267, Cl. 71-77.000.

Furusho, Noboru: *See—*
Kuroda, Masami; Hattori, Yoshimasa; and Furusho, Noboru, 4,929,525, Cl. 430-75.000.

Furuta, Futoru: *See—*
Itahana, Tsutomu; Kanno, Hideo; Ono, Tetsuo; Furuta, Futoru; Kobayashi, Susumu; Akimoto, Ryosaku; and Tanigaki, Ryuhei, 4,928,723, Cl. 137-116.300.

Furuta, Yoshikazu. Fishhook and method for producing the same. 4,928,423, Cl. 43-43.160.

Furutachi, Nobuo; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,929,540, Cl. 430-555.000.

Furutaka, Yasuhisa; Aoyama, Hirokazu; and Honda, Tsunetoshi, to Daikin Industries Ltd. Process for preparing halogenated alkane. 4,929,318, Cl. 204-157.600.

Fuse, Masashi, to Alps Electric Co. Optical writing head. 4,929,965, Cl. 346-107.00R.

Fuse, Toshikazu; Yamamoto, Atsushi; and Sano, Junji, to Kanebo Co., Ltd. Silk fiber having good abrasion resistance and good light resistance and methods for the preparation thereof. 4,929,248, Cl. 8-128.100.

Fuso Pharmaceutical Industries, Ltd.: *See—*
Shishido, Kihachi; Matsuoka, Masami; Ishihara, Noriyuki; and Tamura, Masahiro, 4,929,479, Cl. 428-35.200.

Futaba Denshi Kogyo K.K.: *See—*
Yamamoto, Michio; and Sekiya, Satoshi, 4,929,949, Cl. 341-176.000.

Gaal, Erik W.: *See—*
Verboom, Johannes J.; Baggen, Constant P. M. J.; Van Uijen, Cornelis M. J.; and Gaal, Erik W., 4,930,115, Cl. 369-59.000.

Gabriele, Darcy. Method and apparatus for power transmission from an engine. 4,928,552, Cl. 475-5.000.

Gage, Julie E.: *See—*
Bejarano-Wallens, Celso O.; Gage, Julie E.; and Hodapp, Donald, 4,929,456, Cl. 426-99.000.

Gagnebin, Gaston, to Omega SA. Extendable bracelet clasp with fine adjustment. 4,928,359, Cl. 24-71.00J.

Gagneur, Klaus: *See—*
Kusserow, Bernd; Gagneur, Klaus; and Hofler, Siegfried, 4,930,034, Cl. 361-19.000.

Gaiser, Robert F.: *See—*
Zander, Richard A.; Gaiser, Robert F.; Dillon, William F., Jr.; and Crumb, Donald A., 4,929,033, Cl. 303-9.630.

Gallivan, James B.: *See—*
Robertson, Allan J.; and Gallivan, James B., 4,929,393, Cl. 252-609.000.

Gamble, Foster R.: *See—*
Henderson, Don J.; Brady, Robert; Gamble, Foster R.; Hardt, James V.; Friedfeld, Howard; Salerno, Don; Swanson, Tad; and Sansing, Maureen R., 4,928,696, Cl. 128-644.000.

Ganz, Jorg: *See—*
Hansmann, Johann; and Ganz, Jorg, 4,928,599, Cl. 104-12.000.

Garavaglia, Carlo: *See—*
Colle, Roberto; Camaggi, Giovanni; Gozzo, Franco; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,929,631, Cl. 514-383.000.

Garbosch, Reinhold. Racket, particularly a tennis or squash racket. 4,928,963, Cl. 273-73.00D.

Gas Research Institute: *See—*
Lee, Anthony L.; Meyer, Howard S.; and Hill, Vern L., 4,929,585, Cl. 502-220.000.
Lee, Douglas W., 4,928,775, Cl. 175-19.000.

Gaskill, Stephen P.: *See—*
Watson, John C.; Gaskill, Stephen P.; Russell, David F.; and Burns, Robert L. D., 4,928,798, Cl. 188-218.0XL.

Gaslevic, Emeric: *See—*
Urmson, William T., Jr.; Gaslevic, Emeric; and Junk, Ronald K., 4,928,600, Cl. 104-17.100.

Gaspardo, Luigi, to Gaspardo S.p.A. Electronically controlled pneumatic seeder. 4,928,607, Cl. 111-185.000.

Gaspardo S.p.A.: *See—*
Gaspardo, Luigi, 4,928,607, Cl. 111-185.000.

Gassen, James R.; and Suchdev, Lakhbir S., to Textron, Inc. Carburetor and oil pump assembly and method of making the same. 4,928,390, Cl. 30-123.400.

Gassman, Max P.; Larson, David J.; and Trampel, Darrell W., to Iowa State University Research Foundation, Inc. Egg inoculation device and method of using same. 4,928,628, Cl. 119-1.000.

Gastinger, Robert G.: *See—*
Dean, Barry D.; and Gastinger, Robert G., 4,929,677, Cl. 525-151.000.

Gat-Liquornik, Martin; and Naoumidis, Aristides, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for joining ceramic parts with a reactive conducting material. 4,928,870, Cl. 228-107.000.

Gates, Alan B.: *See—*
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., 4,928,378, Cl. 29-564.600.

Gates Energy Products, Inc.: *See—*
Catotti, Arthur J., 4,929,519, Cl. 429-94.000.

Gauchel, James V.; Wilson, Edward L.; and Kerle, Edward J., to Owens-Corning Fiberglas Corporation. Process for forming thick ballistic resistant materials. 4,929,651, Cl. 523-505.000.

Gault, Christopher: *See—*
Isham, William R.; Cragun, E. Brent; Gault, Christopher; and Wermeling, William J., 4,928,853, Cl. 222-108.000.

Gazda, Imre I.; and Collins, Dannie R., to Otis Engineering Corporation. Two-way plugs for wells. 4,928,761, Cl. 166-123.000.

Gebert, Paul. Spinning top and projectile game. 4,928,968, Cl. 273-357.000.

Gebhardt, Axel; Diekmann, Bernd; and Schmidt, Rudiger, to Schuco Heinz Schurmann GmbH & Co. Lever-activated locking bar brace for a window or a door. 4,928,428, Cl. 49-192.000.

GEC Plessey Telecommunications Limited: *See—*
Smith, Raymond D.; and Marles, Robert, 4,930,046, Cl. 361-393.000.

Gee, Ralph L.: *See—*
Chung, Paul W.; Gee, Ralph L.; Lang, Luke C. K.; and Saber, Paik, 4,929,918, Cl. 331-10.000.

Gehl Company: *See—*
Dohnalik, Martin F., 4,929,143, Cl. 414-723.000.

Geiger, Gerhard; and Strafner, Michael, to Siemens Aktiengesellschaft. Data transmission method in a digital transmission network and apparatus for implimenting same. 4,930,103, Cl. 364-900.000.

Geisha Corporation: *See—*
Swadell, Robert A., 4,930,055, Cl. 362-244.000.

Geisser, Carl. Cable end sleeve magazine. 4,928,822, Cl. 206-330.000.

Gelfand, Mark: *See—*
Halperin, Henry; Tsitlik, Joshua; Weisfeldt, Myron; and Gelfand, Mark, 4,928,674, Cl. 128-30.200.

General DataCom, Inc.: *See—*
Bains, Kuldip S., 4,930,125, Cl. 370-105.000.

General Dispensing Systems Limited: *See—*
Young, Michael J. R., 4,928,584, Cl. 99-289.00T.

General Electric Company: *See—*
Bulman, Melvin J., 4,928,571, Cl. 89-7.000.
Chmielewski, Thomas A., Jr.; and Tarzaiski, Richard J., 4,929,843, Cl. 250-561.000.
Clanton, James A., 4,929,284, Cl. 148-23.000.
Davenport, John M.; and Hansler, Richard L., 4,930,049, Cl. 362-32.000.
Dixon, Robert C.; Cearley, James E.; Van Diemen, Paul; Sayre, Edwin D.; and Gordon, Gerald M., 4,929,412, Cl. 376-260.000.
Donaldson, Charles W., 4,928,392, Cl. 33-178.00E.
Flakas, Gerald K.; and Dalman, Harold J., 4,930,146, Cl. 378-110.000.
Golz, Thomas M., 4,930,051, Cl. 362-61.000.
Hibbert, David A., 4,929,801, Cl. 174-16.200.
Kerr, Stuart R., III; and Moore, James E., 4,929,506, Cl. 428-412.000.
Maslak, Chris E., 4,928,478, Cl. 60-39.050.
Meckley, John R., 4,930,076, Cl. 364-413.210.
Meiners, David J.; Morris, Robert A.; Arnold, David; Castonguay, Roger N.; and Palmieri, Joseph M., 4,929,920, Cl. 335-202.000.
Nutter, Norman E., 4,929,148, Cl. 415-32.000.
Oliver, Wayne R.; Moyer, Roy E.; and Girardin, Dennis R., 4,928,480, Cl. 60-39.092.
Sherwin, Karl F.; and Boehm, Manfred D., 4,930,145, Cl. 378-109.000.
Sudolnik, James M.; and Prince, Stephen R., 4,928,733, Cl 137-630.130.
Tyrell, John A.; and McGready, Russell J., 4,929,716, Cl. 528-353.000.
Wacker, Thomas P.; and Zabinski, Raymond J., 4,929,305, Cl. 156-273.300.
Walton, Paul B.; Keough, James; Demers, Richard L.; Denny, Leland A., Jr.; Kaiser, Robert E.; Moses, Cornellius, Jr.; and Wagh, Vijay N., 4,930,151, Cl. 379-94.000.

General Electric Company, plc, The: *See—*
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., 4,929,950, Cl. 342-25.000.

General Engineering (Netherlands) B.V.: *See—*
Qvint, Peter; Andersson, Tommy; and Eksell, Lennart, 4,928,992, Cl. 280-801.000.

General Instrument Corporation: *See—*
Einthoven, Willem G., 4,929,987, Cl. 357-234.000.

General Motors Corporation: *See—*
Allen, John J., 4,928,374, Cl. 29-436.000.

General Signal Corporation: *See—*
Buyak, William P.; Testa, Bruce V.; and Right, Robert W., 4,929,924, Cl. 340-384.00E.

Genise, Thomas A.: *See—*
Markyvech, Ronald K.; and Genise, Thomas A., 4,928,544, Cl. 74-335.000.

George, Glen A.: *See—*
Whiting, Douglas L.; and George, Glen A., 4,930,142, Cl. 375-120.000.

George, Harry. Pivotable bumper guard. 4,928,430, Cl. 49-460.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Georgia State University Foundation, Inc.: *See*—
Strekowski, Lucjan; Mokrosz, Maria; and Harden, Donald B., 4,929,726, Cl. 544-122.000.
Georgia Tech Research Corporation: *See*—
Zinn, Ben T.; and Reiner, David, 4,929,172, Cl. 431-1.000.
Georgiou, Christos J.: *See*—
Franaszek, Peter A.; and Georgiou, Christos J., 4,929,940, Cl. 340-825.020.
Varma, Anujan M.; and Georgiou, Christos J., 4,929,939, Cl. 340-825.800.
Geraci, Alexander. Chair having lift apparatus. 4,929,022, Cl. 297-313.000.
Gerault, Patrice; Goguelin, Michel; and Fredenucci, Pierre, to Arjomari-Prioux. Papermaking process and composition for the production of tridimensional products containing thermoplastics resin and reinforcing fibers. 4,929,308, Cl. 162-145.000.
Gereby, John L.; Gifford, Eric P.; Wehrmann, Rick S.; and Easter, William M., to Automated Packaging Systems, Inc. Packaging machine and method. 4,928,455, Cl. 53-570.000.
Gerfast, Sten R. Transformerless current-limiting circuit. 4,929,871, Cl. 315-205.000.
Gerke, Burton E., Jr.: *See*—
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,928,346, Cl. 15-338.000.
Gerstenberger, Friedrich: *See*—
Bordt, Wolfgang; and Gerstenberger, Friedrich, 4,928,661, Cl. 124-69.000.
Gerster, John F.; and Knafla, Roy T., to Minnesota Mining and Manufacturing Company. Olefinic 1H-imidazo(4,5-c)quinolin-4-amines. 4,929,624, Cl. 514-293.000.
Gerth, Howard L.: *See*—
O'Connor, Daniel G.; and Gerth, Howard L., 4,928,532, Cl. 73-856.000.
Getty, Edward E.: *See*—
Drago, Russell S.; and Getty, Edward E., 4,929,800, Cl. 585-744.000.
Geyer, Paul. Continuous rate feed hopper. 4,929,086, Cl. 366-76.000.
Gianfranco, Cassanelli, to Trimate. Lapping internal surfaces. 4,928,434, Cl. 51-3.40H.
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, to International Paper Company. Oxygen impermeable leak free container. 4,929,476, Cl. 428-34.200.
Gibson, Charles L.: *See*—
Lentz, Carl M.; Mullins, Edward T.; and Gibson, Charles L., 4,929,737, Cl. 548-365.000.
Gibson, Harry W.; and Jois, Yajnanarayana H. R., to Virginia Polytechnic Institute and State University. Preparation of open chain poly(-reissert compounds). 4,929,713, Cl. 528-230.000.
Gieger, Eckhard: *See*—
Dedden, Hubert; Gieger, Eckhard; and Lauer, Christian, 4,929,829, Cl. 250-208.400.
Gielen, Franz-Josef: *See*—
Nouvertne, Werner; Gielen, Franz-Josef; Tacke, Peter; Grigo, Ulrich; Quiring, Bernd; and Lindner, Christian, 4,929,674, Cl. 325-66.000.
Giersch, Wolfgang K.; and Schulte-Elte, Karl-Heinrich, to Firmenich SA. Perfuming ingredient. 4,929,599, Cl. 512-18.000.
Gifford, David R., to Honeywell Inc. Selective integrated circuit interconnection. 4,929,995, Cl. 357-34.000.
Gifford, Eric P.: *See*—
Gereby, John L.; Gifford, Eric P.; Wehrmann, Rick S.; and Easter, William M., 4,928,455, Cl. 53-570.000.
Giglia, Robert D., to American Cyanamid Company. Fibrillated fibers and articles made therefrom. 4,929,502, Cl. 428-357.000.
Gilbert, Barrie, to Analog Devices, Inc. Differential amplifier with gain compensation. 4,929,909, Cl. 330-256.000.
Gilbert, John A.: *See*—
Burger, Christian P.; Dudderar, Thomas D.; Gilbert, John A.; Peters, Bruce R.; and Smith, James A., 4,928,527, Cl. 73-657.000.
Gilbert, Scott J.: *See*—
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J.; Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., 4,929,426, Cl. 422-63.000.
Gilbertson, Thomas A.; Meyers, Michael R.; and Kinneberg, Bruce, to Reaction Thermal Systems, Inc. Ice building, chilled water system and method. 4,928,493, Cl. 62-185.000.
Girardin, Dennis R.: *See*—
Oliver, Wayne R.; Moyer, Roy E.; and Girardin, Dennis R., 4,928,480, Cl. 60-39.092.
Girault, Jean-Philippe, to Societe Europeenne de Propulsion. Turbopump with actine suspension for a propulsion system. 4,929,158, Cl. 417-405.000.
Giza, John, to Acushnet Company. Process of making a golf ball cover. 4,929,407, Cl. 264-101.000.
GKN Automotive, Inc.: *See*—
Hahn, Steven C., 4,929,203, Cl. 440-75.000.
Gladfelter, Harry F.: *See*—
Conaghan, Thomas B.; Gladfelter, Harry F.; Kite, Joseph S., III; and Tresslar, Marie C., 4,929,478, Cl. 428-35.100.
Glamkowski, Edward J.; and Kurys, Barbara E., to Hoechst-Roussel Pharmaceuticals Inc. 7H-benzo[b]pyrazino[1,2-d]pyrrolo[3,2,1-jk][1,4]benzodiazepines. 4,929,615, Cl. 514-219.000.
Glamm, Paul R., to American Standard Inc. Incremental electrically actuated valve. 4,928,494, Cl. 62-222.000.
Glaverbel: *See*—
Cozac, Daniel; and Simon, Jean-Francois, 4,929,266, Cl. 65-135.000.
Glaxo Group Limited: *See*—
Tyers, Michael B.; Coates, Jan H.; Humber, David C.; Ewan, George B.; and Bell, James A., 4,929,632, Cl. 514-397.000.
Globe-Union Inc.: *See*—
Bowen, Gerald K.; and Zagrodnik, Jeffrey P., 4,929,325, Cl. 204-268.000.
Glover, Douglas L., to Motorola Inc. Programmable pad printer. 4,928,587, Cl. 101-42.000.
Godfrey, Darryl A., to Eastman Kodak Company. Adhesives based on amorphous propylene/hexene copolymers. 4,929,509, Cl. 428-461.000.
Goeddel, David V.; and Gray, Patrick W. Human immune interferon. 4,929,554, Cl. 435-172.300.
Goertz, Hans-Helmut; Denzinger, Walter; and Raubenheimer, Hans-Juergen, to BASF Aktiengesellschaft. Preparation of metal salts of carboxyl-containing polymers. 4,929,690, Cl. 525-366.000.
Goetz, Norbert: *See*—
Smuda, Hubert; Hoelderich, Wolfgang; Goetz, Norbert; and Recker, Hans-Gert, 4,929,765, Cl. 568-427.000.
Goguelin, Michel: *See*—
Gerault, Patrice; Goguelin, Michel; and Fredenucci, Pierre, 4,929,308, Cl. 162-145.000.
Gohshi, Yoshihiro: *See*—
Matsubara, Saburo; Gohshi, Yoshihiro; Kobayashi, Seizo; and Usui, Katsumi, 4,929,680, Cl. 525-240.000.
Gold, Kenneth; and Brodman, Bruce, to United States of America, Army. Chemical and enzymatic process for the denitration of diethyleneglycol dinitrate, nitroglycerin and other nitrate esters. 4,929,552, Cl. 435-128.000.
Golden, Michael D., to Western Design Corporation. Ammunition magazine system. 4,928,574, Cl. 89-34.000.
Goldenberg, Merrill, to Ciba-Geigy Corporation. Crosslinked copolymers and ophthalmic devices made from vinylic macromers containing perfluoropolyalkyl ether and polyalkyl ether segments and minor amounts of vinylic comonomers. 4,929,692, Cl. 526-247.000.
Golder, Michael D., to Hoechst Celanese Corporation. Blends copolyester elastomers and chlorinated polyethylene. 4,929,656, Cl. 524-195.000.
Goldman, Leon; Drake, Ellet H.; and Goldman, Steven. Laser diagnostic and treatment device. 4,928,695, Cl. 128-642.000.
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Golicz, Roman M., to Intelligent Technologies Corporation. High speed sheet feeder singulator. 4,928,944, Cl. 271-6.000.
Golz, Thomas M., to General Electric Company. Headlamp with sloped lens including beam-spreading flutes. 4,930,051, Cl. 362-61.000.
Gomez, Veronica M.: *See*—
Foreman, Larry R.; Gomez, Veronica M.; and Thomas, Michael H., 4,929,306, Cl. 156-306.300.
Gonella, Mario: *See*—
Baggio, Giorgio; Gonella, Mario; and Sartor, Mariano, 4,928,408, Cl. 36-119.000.
Gonon, Jean-Louis; and Moulin, Pierre, to Arnould Fabrique d'Appareillage Electrique. Insulation displacement connector. 4,929,190, Cl. 439-409.000.
Gonpei, Katsuhiro: *See*—
Tominaga, Mamoru; Kokado, Naoyuki; Gonpei, Katsuhiro; Nira, Hisami; and Taya, Akira, 4,929,061, Cl. 350-338.000.
Good, Laverne C. Extensible level. 4,928,395, Cl. 33-374.000.
Goodin, Richard L.; Rydell, Mark A.; and Shockey, Rick L., to Schneider (USA), Inc. Pressure monitor catheter. 4,928,693, Cl. 128-637.000.
Goodman, David E.; and Corenman, James E. Method and apparatus for detecting optical pulses. 4,928,692, Cl. 128-633.000.
Goodman, Ronald L.; and Kelley, Richard E., Sr., to Carlisle Corporation. Pourable sealer pocket. 4,928,443, Cl. 52-58.000.
Goodyear Tire & Rubber Company, The: *See*—
Allen, Terry F.; and Schisler, Robert C., 4,929 688, Cl. 525-332.500.
Rye, Grover W.; and Pitman, John C., 4,928,741, Cl. 152-504.000.
Van Der Poel, Robert J.; and Wantz, Armand, 4,929,298, Cl. 156-414.000.
Wideman, Lawson G.; and Botzman, Thomas J., 4,929,280, Cl. 106-472.000.
Gopalakrishnan, Jagannatha; and Subramanian, Munirpallam A., to Du Pont de Nemours, E. I., and Company. Superconducting composition $Tl_2Ba_2CuO_{6+x}$ and process for manufacture. 4,929,594, Cl. 505-1.000.
Gordon Barlow Design: *See*—
Barlow, Gordon A., 4,928,960, Cl. 273-1.0GG.
Gordon, Gerald M.: *See*—
Dixon, Robert C.; Cearley, James E.; Van Diemen, Paul; Sayre, Edwin D.; and Gordon, Gerald M., 4,929,412, Cl. 376-260.000.
Gordon, Richard A. Cat toy. 4,928,632, Cl. 119-29.500.
Gosselin, Roland: *See*—
Murphy, Robert H.; and Gosselin, Roland, 4,928,820, Cl. 206-328.000.
Gossler, Ewald. Method and device for compression of gases. 4,928,498, Cl. 62-81.000.

Goswami, Kisholoy: *See*—
Le Goullon, Donald; and Goswami, Kisholoy, 4,929,049, Cl. 350-96.290.
Goto, Toshio: *See*—
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 4,929,611, Cl. 514-183.000.
Gotoh, Yoshihiko; and Kawai, Toshikazu, to Central Glass Company, Limited. Preparation of trifluoromethylbenzoic acid from hexafluoroxylene. 4,929,753, Cl. 562-411.000.
Gottschalk, Gerhard: *See*—
Antranikian, Garabed; and Gottschalk, Gerhard, 4,929,557, Cl. 435-202.000.
Gould, Ronald M.: *See*—
Wright, Bernard S.; Gould, Ronald M.; and Owen, Hartley, 4,929,780, Cl. 585-303.000.
Gozzo, Franco: *See*—
Colle, Roberto; Camaggi, Giovanni; Gozzo, Franco; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,929,631, Cl. 514-383.000.
Grabherr, Bernd: *See*—
Schaepers, Arno; and Grabherr, Bernd, 4,929,802, Cl. 174-35.0MS.
Grabowski, David N.: *See*—
Lorence, Brian S.; Phelps, Richard A., and Grabowski, David N., 4,928,865, Cl. 224-275.000.
Graham, Bruce L.: *See*—
Roeser, John O.; and Graham, Bruce L., 4,929,808, Cl. 200-467.000.
Graham, Scott M.; Ewing, Kenneth R.; Trackman, Marshall H.; and Darr, Duane R., to Qume Corporation. Multi-line serial printer. 4,929,099, Cl. 400-76.000.
Grahm, Isabelle. Temperature history indicatiang label. 4,929,090, Cl. 374-102.000.
Granada, Richard P.: *See*—
Elderton, Peter P.; Granada, Richard P.; and Howes, Royal E., 4,930,041, Cl. 361-190.000.
Grandon, Michael D.: *See*—
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J.; Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., 4,929,426, Cl. 422-63.000.
Grantham, Daniel H.: *See*—
Wiegand, Walter J.; Swindal, James L.; Swarts, Richard E.; Bullis, Robert H.; Lopiccolo, Mario T.; Grantham, Daniel H.; and Foyt, Arthur G., 4,930,042, Cl. 361-280.000.
Granzer, Ernold: *See*—
Lang, Hans-Jochen; Hropot, Max; Granzer, Ernold; and Kerekjarto, Bela, 4,929,643, Cl. 514-603.000.
Granzotto, Robert; and Wong, Wah K. J., to Arena Recreations (Toronto) Limited; and William Lawrence Heisey, A Partnership Trading as Single Play Video. One-way clutch assembly. 4,928,905, Cl. 242-201.000.
Grasser, Franz; Reichenberger, Helmut; Hassler, Dietrich; Naser, Georg; and Schmidt, Erhard, to Siemens Aktiengesellschaft. Shock-wave source having a centrally disposed ultrasound locating system. 4,928,672, Cl. 128-24.00A.
Grattan, David A.: *See*—
Reardon, Patricia A.; and Grattan, David A., 4,929,364, Cl. 210-750.000.
Gravenstein, Dietrich: *See*—
Lampotang, Samsun; Gravenstein, Dietrich; Gravenstein, Joachim S.; Gravenstein, Nikolaus; and Banner, Michael J., 4,928,687, Cl. 128-207.140.
Gravenstein, Joachim S.: *See*—
Lampotang, Samsun; Gravenstein, Dietrich; Gravenstein, Joachim S.; Gravenstein, Nikolaus; and Banner, Michael J., 4,928,687, Cl. 128-207.140.
Gravenstein, Nikolaus: *See*—
Lampotang, Samsun; Gravenstein, Dietrich; Gravenstein, Joachim S.; Gravenstein, Nikolaus; and Banner, Michael J., 4,928,687, Cl. 128-207.140.
Graves, John G. Combination plug and two-way check valve. 4,928,725, Cl. 137-269.500.
Gray, Patrick W.: *See*—
Goeddel, David V.; and Gray, Patrick W., 4,929,554, Cl. 435-172.300.
Gray, Robert E., to Cairns & Brother Inc. Closed-circuit positive pressure breathing apparatus with pneumatically operated storage chamber. 4,928,685, Cl. 128-204.240.
Gray, Roy R., to Coburn Optical Industries Inc. Apparatus for effecting rapid replacement of lens cutting tools. 4,928,433, Cl. 51-33.00W.
Great Plains Industries, Inc.: *See*—
Beaston, Brook J., 4,928,514, Cl. 73-3.000.
Green, Eric T.: *See*—
Emadi, Atahusain E.; Green, Eric T.; Margosiak, John S.; Mignogna, Daniel J.; and Smith, Dennis E., 4,929,184, Cl. 439-681.000.
Green, Stephen T.; and Van Hoye, Willibald, to Samsonite Corporation. Steering handle for luggage case. 4,928,800, Cl. 190-115.000.
Greene, Freddie W. Portable hair trimming device. 4,928,716, Cl 132-212.000.
Greenspan, Alexander, to Superstream, Inc. Gas blower. 4,929,149, Cl 415-99.000.
Greenspan, Jacob; and Sacco, Gasper J., to United States of America, Army. Method of diffusion bonding copper and titanium alloys to produce a projectile. 4,928,368, Cl. 29-1.220.
GRETAG Aktiengesellschaft: *See*—
Mast, Fred; and Knus, Jean A., 4,929,084, Cl. 356-446.000.
Gribbin, John D.: *See*—
Dinter, Peter; Bothe, Lothar; and Gribbin, John D., 4,929,319, Cl. 204-164.000.
Grigo, Ulrich: *See*—
Nouvertne, Werner; Gielen, Franz-Josef; Tacke, Peter; Grigo, Ulrich; Quiring, Bernd; and Lindner, Christian, 4,929,674, Cl. 325-66.000.
Grim, Tracy E., to Royce Medical Company. Soft-goods type, formable orthopaedic cast. 4,928,678, Cl. 128-90.000.
Groelinger, Howard, to Balson-Hercules Group Ltd., The. Method of treating polyester fabric. 4,929,471, Cl. 427-173.000.
Grollier, Jean F.: *See*—
Cotteret, Jean; and Grollier, Jean F., 4,929,439, Cl. 424-59.000.
Groshans, Michael J.: *See*—
Meier, Daniel A.; and Groshans, Michael J., 4,929,424, Cl. 422-9.000.
Grosselin, Jean-Michel; and Mercier, Claude, to Rhone-Poulenc Sante. Process for the preparation of unsaturated alcohols. 4,929,776, Cl. 568-862.000.
Grossi, Frank A.: *See*—
Barton, Arthur A.; DeBolt, Frederick C.; Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A.; Miller, Mark T.; Rasch, Kenneth R.; and Szlucha, Thomas F., 4,929,983, Cl. 355-315.000.
Grosso, Paul V.: *See*—
Wolf, Richard A.; and Grosso, Paul V., 4,929,721, Cl. 534-885.000.
Groutas, William C., to Wichita State University, Board of Trustees of the. Latent isocynate derivatives useful for deactivating enzymes. 4,929,736, Cl. 548-341.000.
Gruber, Leopold R.: *See*—
Theurer, Josef; Oellerer, Friedrich; and Gruber, Leopold R., 4,929,816, Cl. 219-53.000.
Grumman Aerospace Corporation: *See*—
Brandstetter, Robert W., 4,929,953, Cl. 342-190.000.
Leib, Kenneth G.; and Sullivan, Edward V., 4,929,056, Cl. 350-321.000.
Grumman Corporation: *See*—
Ezzeddine, Amin K., 4,929,855, Cl. 307-571.000.
Grundler, Christoph: *See*—
Demuth, Robert; Staheli, Paul; Waber, Rene; Grundler, Christoph; and Machler, Franz, 4,928,353, Cl. 19-65.00A.
GTE Products Corporation: *See*—
Bouchard, Andre C., 4,929,868, Cl. 313-619.000.
Reddy, Vaddi B., 4,929,384, Cl. 252-301.40R.
Reddy, Vaddi B., 4,929,385, Cl. 252-301.40R.
Reddy, Vaddi B., 4,929,386, Cl. 252-301.40R.
Guala, Piergiacomo. Equipment for measuring the erythrosettling rate of blood using pipettes. 4,929,427, Cl. 422-100.000.
Guerange, Patrick: *See*—
Prus, Eric; Frene, Andre ; Bordaz, Pascal; Guerange, Patrick; and Thome, Caryl, 4,928,880, Cl. 239-8.000.
Gueret, Jean-Louis, to L'Oreal. Applicator venting arrangement. 4,929,108, Cl. 401-126.000.
Gueuret, Raymond: *See*—
Begout, Eric; Bourgeois, Alain; Gueuret, Raymond; and Lapeyre, Pascal, 4,929,962, Cl. 343-786.000.
Guezou, Jean-Pierre; and Pichard, Jacques, to L'Etat Francais. Vessel provided with at least one water jet propulsion unit 4,929,200, Cl. 440-38.000.
Gugelmeyer, Robert J.: *See*—
Ponn, Timothy R.; Gutierrez, Mark; and Gugelmeyer, Robert J., 4,929,196, Cl. 439-620.000.
Gugenhein, Michele: *See*—
de Boisseron, Bertrand; Salvan, Michel; and Gugenhein, Michele, 4,930,124, Cl. 370-94.300.
Gugumus, Francois, to Ciba-Geigy Corporation. Polyolefins stabilized against damage caused by light. 4,929,652, Cl. 524-91.000.
Guiffary, Michel. Container of flexible material for receiving a liquid. 4,928,852, Cl. 222-107.000.
Guilbeaux, Ronald D., to Rheox, Inc. Thickened organic composition having biocidal activity and an additive for thickening and imparting biocidal activity to an organic composition. 4,929,644, Cl. 514-642.000.
Gulczynski, Zdzislaw. High accuracy reference ladder. 4,929,848, Cl. 307-246.000.
Gunderson, Roger. Integrated paint can and roller pan. 4,928,843, Cl. 220-90.000.
Guning, Horst, to Asea Brown Boveri AG. Heavy-duty circuit breaker 4,929,856, Cl. 307-633.000.
Gunn, Timothy M.: *See*—
Simonson, Frederick, III; and Gunn, Timothy M., 4,929,314, Cl. 204-153.230.
Gupta, Balaram; and Kalyanaraman, Palaiyur S., to Hoechst Celanese Corp. Photoresist compositions based on hydroxystyrene copolymers 4,929,537, Cl. 430-325.000.
Gupta, Ved P.; and DuPont, Louis A., to Synergistics Industries, Limited. Production of terephthalate esters by degradative transesterification of scrap or virgin terephthalate polyesters. 4,929,749, Cl 560-79.000.
Gupta, Victor R.; and Clark, Christopher J., to Standard Oil Company, The. Process for pyrolyzing or thermal cracking a gaseous or vaporized hydrocarbon feedstock using a novel gas-solids contacting device and an oxidation catalyst. 4,929,789, Cl. 585-648.000.
Gurevich, Leon, to Cooper Industries, Inc. Method of making a wire bonded microfuse. 4,928,384, Cl. 29-623.000.
Gurit-Essex AG: *See*—
Halg, Paul; and Rohrer, Paul, 4,929,483, Cl 428-47.000.

Gurke, Christina M.: *See—*
Bauer, Thomas M.; Dunn, Thomas A.; Gurke, Christina M.; Hopkins, John W.; and Nafziger, Richard D., 4,930,154, Cl. 379-246.000.

Gurrola, Georgina B.: *See—*
Possani, Lourival D. P.; Gurrola, Georgina B.; Bayon, Marco A. A. C.; and Sitges, Maria B., 4,929,718, Cl. 530-326.000.

Guthrie, Roderick I. L.; and Herbertson, Joseph G., to R. Guthrie Research Associates Inc. Continuous casting of thin metal strip. 4,928,748, Cl. 164-479.000.

Gutierrez, Mark: *See—*
Ponn, Timothy R.; Gutierrez, Mark; and Gugelmeyer, Robert J., 4,929,196, Cl. 439-620.000.

Gutknecht, Eva-Maria: *See—*
Fischli, Albert; Gutknecht, Eva-Maria; and Obrecht, Daniel, 4,929,741, Cl. 549-447.000.

Guzik, Andrzej T.; Curtis, James H.; Habbaba, Faris S.; and Shah, Kirit, to Motorola, Inc. Light guide for LCD. 4,929,062, Cl. 350-345.000.

Gyure, Sandor: *See—*
Sweeney, Niall; and Gyure, Sandor, 4,929,232, Cl. 604-111.000.

H. F. & Ph. F. Reemtsma GmbH & Co.: *See—*
Mentzel, Edgar; and Meixner, Ferdinand, 4,928,715, Cl. 131-365.000.

H. Novis Inc.: *See—*
McIntyre, Keith W.; and McIntyre, Scott J., 4,928,580, Cl. 98-2.100.

Haas, Juergen: *See—*
Steinwandel, Juergen; Haas, Juergen; and Plog, Carsten, 4,929,581, Cl. 502-2.000.

Haase, Roger L.: *See—*
Henry, Paul T.; Haase, Roger L.; and Fitzgibbons, Gary W., 4,928,874, Cl. 229-74.000.

Habbaba, Faris S.: *See—*
Guzik, Andrzej T.; Curtis, James H.; Habbaba, Faris S.; and Shah, Kirit, 4,929,062, Cl. 350-345.000.

Habecker, Charles N.: *See—*
Baldwin, John J.; Ponticello, Gerald S.; and Habecker, Charles N., 4,929,637, Cl. 514-445.000.

Hachisu, Mitsugu: *See—*
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, 4,929,633, Cl. 514-423.000.

Hackforth GmbH & Co., KG: *See—*
Lunke, Manfred; Falz, Ulrich; and Walter, Jurgen, 4,929,115, Cl. 403-228.000.

Hadaway, Bernard M. Method of forming a hollow fastener from sheet metal. 4,928,375, Cl. 29-509.000.

Haendler, Blanca L., to Clorox Company, The. Stable emulstified bleaching compositions. 4,929,383, Cl. 252-187.260.

Haga, Takahiro; Tsujii. Yasuhiro; Isogai, Tatsuo; Murai, Shigeo; and Tanaka, Toshihiro, to Ishihara Sangyo Kaisha Ltd. Process for producing 2-amino-4,6-dichloropyrimidine. 4,929,729, Cl. 544-330.000.

Hagan, Todd A.: *See—*
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,928,346, Cl. 15-338.000.

Hagedorn, Guenter E., to Nicollet Technologies, Inc. PBX voice mail interface. 4,930,153, Cl. 379-233.000.

Hagen, Susan E.: *See—*
Culbertson, Townley P.; Domagala, John M.; Hagen, Susan E.; and Sanchez, Joseph P., 4,929,613, Cl. 514-210.000.

Hagerty, James J.; and Pulsifer, David N., to ISOTEC Partners, Ltd. Glass plate fusion for macro-gradient refractive index materials. 4,929,065, Cl. 350-413.000.

Hagerty, Robert J.: *See—*
Carpenter, Larry L.; Hagerty, Robert J.; Maschmeyer, Richard O.; Morrell, Mark L.; and Schrauth, Peter A., 4,929,265, Cl. 65-64.000.

Hagewood, John F., to Du Pont de Nemours, E. I., and Company. New polyester yarns having pleasing aesthetics. 4,929,698, Cl. 528-272.000.

Hagiwara Research Corp.: *See—*
Hagiwara, Zenji; Ando, Satoshi; and Nohara, Saburo, 4,929,431, Cl. 423-328.000.

Hagiwara, Zenji; Ando, Satoshi; and Nohara, Saburo, to Hagiwara Research Corp.; and Kanebo Ltd. Process for producing amorphous aluminosilicates. 4,929,431, Cl. 423-328.000.

Hahn, Steven C., to GKN Automotive, Inc. Marine propeller drive system. 4,929,203, Cl. 440-75.000.

Haizmann, Robert S.: *See—*
Schmidt, Robert J.; and Haizmann, Robert S., 4,929,794, Cl. 585-737.000.

Hakulin, Bertel K.; and Nieminen, Jorma J., to A. Ahlstrom Corporation. Method for gasifying or combusting solid carbonaceous material. 4,929,255, Cl. 48-197.00R.

Hale, Perry: *See—*
Emmons, Stuart A.; and Hale, Perry, 4,929,377, Cl. 251-100.000.

Halenbeck, Robert; Koths, Kriston; Cowgill, Cynthia; and Laird, Walter J., to Cetus Corporation. Production of purified, biologically active, bacterially produced recombinant human CSF-1. 4,929,700, Cl. 530-351.000.

Halg, Paul; and Rohrer, Paul, to Gurit-Essex AG. Method of reinforcing sheet metal panels, shaped plastic panels or the like and a stiffening member usable for performing the method. 4,929,483, Cl. 428-47.000.

Hall, Catherine L.: *See—*
Munford, Robert S.; and Hall, Catherine L., 4,929,604, Cl. 514-53.000.

Hall, Tamuel A.: *See—*
Lanier, Joel P.; Hall, Tamuel A.; and Moore, Kent R., 4,928,957, Cl. 272-72.000.

Haller, Bernd: *See—*
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Diekmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000.

Halliar, William R.: *See—*
Yeates, Richard P.; Keating, Bruce E.; and Halliar, William R., 4,929,132, Cl. 410-56.000.

Halliburton Company: *See—*
Barrington, Burchus Q., 4,928,520, Cl. 73-151.000.
Mamke, Kevin R., 4,928,762, Cl. 166-192.000.

Halliburton Geophysical Services, Inc.: *See—*
Harrison, Earnest R., 4,928,785, Cl. 181-120.000.
Sallas, John J., 4,930,113, Cl. 367-190.000.

Halliburton Logging Services, Inc.: *See—*
Roessler, Dennis E., 4,928,764, Cl. 166-250.000.

Halperin, Henry; Tsitlik, Joshua; Weisfeldt, Myron; and Gelfand, Mark, to Johns Hopkins University, The. Cardiopulmonary resuscitation and assisted circulation system. 4,928,674, Cl. 128-30.200.

Hamada, Akihiko; Hiraoka, Hidenori; Nakamura, Yoshinobu; and Ohtsuru, Hiroshi, to Sumitomo Rubber Industries, Ltd. Rubber composition and a solid golf ball obtained therefrom. 4,929,678, Cl. 525-193.000.

Hamada, Yasuhiko: *See—*
Kato, Nobuhide; and Hamada, Yasuhiko, 4,929,331, Cl. 204-426.000.

Hamai, Kyugo: *See—*
Matayoshi, Yutaka; Yoshimura, Toru; Kamegaya, Shigeru; and Hamai, Kyugo, 4,928,650, Cl. 123-90.240.

Hamdy, Mostafa K., to University of Georgia Research Foundation, Inc. Method for rapidly fermenting alcoholic beverages. 4,929,452, Cl. 426-11.000.

Hamelin, Claude: *See—*
Holtermann, Henri; and Hamelin, Claude, 4,929,245, Cl. 604-338.000.

Hamilton, Danielle R.: *See—*
Hamilton, Gregory C.; and Hamilton, Danielle R., 4,929,862, Cl. 312-138.100.

Hamilton Fixture Company: *See—*
Overmann, John L., 4,928,832, Cl. 211-187.000.

Hamilton, Gregory C.; and Hamilton, Danielle R. Security shield for display cases. 4,929,862, Cl. 312-138.100.

Hamlin, Humphrey A. S.: *See—*
Stevenson, George F.; Foote, James C.; and Hamlin, Humphrey A. S., 4,928,682, Cl. 128-202.260.

Hammer, William E.: *See—*
Batra, Surinder P.; Hammer, William E.; Lushinsky, Gene A.; Marquart, David W.; Schwane, Walter H.; and Ziecina, Frederick J., 4,930,069, Cl. 364-200.000.

Hamner, Annabelle, executrix: *See—*
Cody, Ian A.; Hamner, Glen P., deceased; and Schorfheide, James T., 4,929,795, Cl. 585-739.000.

Hamner, Glen P., deceased: *See—*
Cody, Ian A.; Hamner, Glen P., deceased; and Schorfheide, James T., 4,929,795, Cl. 585-739.000.

Hanano, Tohru: *See—*
Kyono, Tetsuyuki; Ohnishi, Seiichiro; Hanano, Tohru; and Hotta, Tohru, 4,929,513, Cl. 428-611.000.

Hansell, Gregory L.: *See—*
Yaniv, Zvi; Cannella, Vincent D.; Hansell, Gregory L.; and Swartz, Louis D., 4,929,569, Cl. 437-51.000.

Hanselmann, Daniel; and Schlepfer, Walter, to Sulzer Brothers Limited. Method and apparatus for removal of fiber flocks from fiber bales. 4,928,354, Cl. 19-97.000.

Hansen, Godfrey L.: *See—*
Bachelder, Walter F.; Sullivan, John L.; Fiore, Peter J.; and Hansen, Godfrey L., 4,928,533, Cl. 73-838.000.

Hansen, Guenter; Schefczik, Ernst; and Reichelt, Helmut, to Basf Aktiengesellschaft. Isothiazoleazo hydroxypyridone dyes. 4,929,720, Cl. 534-766.000.

Hansen, John C.: *See—*
Moore, George G. I.; and Hansen, John C., 4,929,725, Cl. 544-87.000.

Hansen, Randall F., to United Technologies Automotive, Inc. Memory mirror control system for vehicles and the like. 4,929,878, Cl. 318-560.000.

Hansler, Richard L.: *See—*
Davenport, John M.; and Hansler, Richard L., 4,930,049, Cl. 362-32.000.

Hansmann, Johann; and Ganz, Jorg, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Continuously advancing track leveling, lining and tamping machine. 4,928,599, Cl. 104-12.000.

Hanson, Gordon: *See—*
Allison, John D.; and Hanson, Gordon, 4,928,709, Cl. 128-782.000.

Hanson, Stephen R.: *See—*
Harker, Laurence A.; and Hanson, Stephen R., 4,929,602, Cl. 514-18.000.

Hanson, Violet; and Johnson, Ralph, to Hanson, Violet. Plastic bag forming machine. 4,929,224, Cl. 493-194.000.

Hanssler, Gerd: *See—*
Jelich, Klaus; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,929,738, Cl. 549-76.000.

Hanwa Electronic Co., Ltd.: *See—*
Toshiyuki, Nakaie, 4,929,886, Cl. 324-691.000.

Hara, Hiroshi: *See—*
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 4,928,996, Cl. 283-109.000.

Hara, Yoshimasa, to Brother Kogyo Kabushiki Kaisha. Exposure device using CRT as exposure light source. 4,929,967, Cl. 346-110.00R.

Hara, Yoshio, to Fuji Photo Film Co., Ltd. Light-tight cassette. 4,928,827, Cl. 206-416.000.

Harada, Chikao, to Colin Electronics Co., Ltd. Pulse wave detecting apparatus. 4,928,700, Cl. 128-672.000.

Harada, Chikao; and Niwa, Minoru, to Colin Electronics Co., Ltd. Method and apparatus for monitoring blood pressure. 4,928,701, Cl. 128-677.000.

Harada Kogyo Kabushiki Kaisha: *See—*
Nakase, Kazuhiko, 4,929,961, Cl. 343-715.000.

Harakawa, Yoshihiro; Takahashi, Seiya; Izawa, Koji; Takeuchi, Hidemitsu; and Ikari, Keizo, to Niksuko Corporation. Method of manufacturing organic semi-conductor solid electrolytic capacitor. 4,929,316, Cl. 204-56.100.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corp. Fluid-bed reaction process. 4,929,334, Cl. 208-91.000.

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Harashima, Masakazu: *See—*
Ohno, Aritaka; Shitara, Kanji; and Harashima, Masakazu, 4,928,894, Cl. 242-7.090.

Harata, Motoo: *See—*
Suzuki, Toshitake;; Komoda, Norio; Oda, Susumu; and Harata, Motoo, 4,929,859, Cl. 310-328.000.

Harden, Donald B.: *See—*
Strekowski, Lucjan; Mokrosz, Maria; and Harden, Donald B., 4,929,726, Cl. 544-122.000.

Harder, Leroy; and Spector, George. Bike monorail system. 4,928,601, Cl. 104-53.000.

Hardt, James V., to MindCenter Corporation. EEG biofeedback method and system for training voluntary control of human EEG activity. 4,928,704, Cl. 128-732.000.

Hardt, James V.: *See—*
Henderson, Don J.; Brady, Robert; Gamble, Foster R.; Hardt, James V.; Friedfeld, Howard; Salerno, Don; Swanson, Tad; and Sansing, Maureen R., 4,928,696, Cl. 128-644.000.

Hardtke, Hans H., to Lisega GmbH. Supporting bracket for pipes. 4,928,911, Cl. 248-74.100.

Harer, Wilhelm: *See—*
Kordesch, Karl; and Harer, Wilhelm, 4,929,520, Cl. 429-94.000.

Hargis, Duane C., to Ethyl Corporation. Alkylation of aromatic amines. 4,929,764, Cl. 564-399.000.

Harigai, Noriaki: *See—*
Matsui, Fumio; Suzuki, Noboru; Takaishi, Minoru; Ogura, Ryushi; Harigai, Noriaki; Hashimoto, Tadayoshi; and Uematu, Tomoe, 4,929,494, Cl. 428-286.000.

Harju, Terho. Method for the transmission of control signals to the row drive circuits in the control of thin-film electroluminescent displays. 4,929,870, Cl. 315-169.300.

Harker, Laurence A.; and Hanson, Stephen R., to Scripps Clinic and Research Foundation. Method of inhibiting platelet dependent arterial thrombosis. 4,929,602, Cl. 514-18.000.

Harmon, Harold J., to Oklahoma State University. Conversion of dual wave beam spectrophotometer to dual wavelength spectrophotometer. 4,929,078, Cl. 356-320.000.

Harmon Industries, Inc.: *See—*
Utterback, Jeffery J.; and Mecca, Randall S., 4,928,910, Cl. 246-169.00A.

Harris Corporation: *See—*
Beasom, James D.; and O'Mara, William E., Jr., 4,929,568, Cl 437-40.000.
Beitman, Bruce A., 4,929,566, Cl. 437-24.000.
Dharmadhikari, Vineet S., 4,929,923, Cl. 338-308.000.

Harris, Ronald B. Portable liquid-solid separator for bulk sludge. 4,929,353, Cl. 210-237.000.

Harrison, Anthony W., to Lucas Industries Public Limited Company. Brake. 4,928,797, Cl. 188-156.000.

Harrison, Earnest R., to Halliburton Geophysical Services, Inc. Full flow solenoid valve for air gun operation. 4,928,785, Cl. 181-120.000.

Harsco Corporation: *See—*
Urmson, William T., Jr.; Gaslevic, Emeric; and Junk, Ronald K., 4,928,600, Cl. 104-17.100.

Hartman, George D.; and Prugh, John D., to Merck & Co., Inc. 5-carbamoylthieno[2,3-b]thiophene-2-sulfon-amides as topically active carbonic anhydrase inhibitors. 4,929,549, Cl. 514-227.800.

Haruyama, Satoshi: *See—*
Kawakami, Shin; Haruyama, Satoshi; and Okonogi, Hirotaka, 4,929,491, Cl. 428-195.000.

Harwood, Jon W.; Karlgaard, Wayne A.; and Clegg, Michael W., to AP Parts Manufacturing Company. Process for manufacturing stamp formed mufflers. 4,928,372, Cl. 29-890.080.

Hasan, Wagar: *See—*
Tou, Frederich N.; and Hasan, Wagar, 4,930,071, Cl. 364-300.000.

Hasegawa, Makoto: *See—*
Hirayama, Takanobu; Funahashi, Hiroyuki; Yokota, Eiji; Uehara, Mitsuyoshi; Kagami, Isao; Hasegawa, Makoto; and Mizuno, Masaru, 4,929,105, Cl. 400-625.000.

Hasegawa, Mitsuyo: *See—*
Kobayashi, Kenzo; Iwagaki, Yutaka; Hasegawa, Mitsuyo; and Suganuma, Kazushi, 4,930,119, Cl. 370-16.100.

Hashimoto, Masashi: *See—*
Setoi, Hiroyuki; Kuroda, Akio; Tanaka, Hirokazu; Hirai, Hideo; Marusawa, Hiroshi; and Hashimoto, Masashi, 4,929,639, Cl. 514-452.000.

Hashimoto, Masataka: *See—*
Matsumoto, Kazuyuki; Hashimoto, Masataka; and Iwata, Michiyoshi, 4,928,556, Cl. 475-149.000.

Hashimoto, Michio: *See—*
Kurauchi, Makoto; Hashimoto, Michio; Hayasaki, Kiyoshi; Minami, Toshikazu; Ohnishi, Mutsuhiko; and Suzuki, Yohei, 4,929,650, Cl. 523-455.000.

Hashimoto, Tadayoshi: *See—*
Matsui, Fumio; Suzuki, Noboru; Takaishi, Minoru; Ogura, Ryushi; Harigai, Noriaki; Hashimoto, Tadayoshi; and Uematu, Tomoe, 4,929,494, Cl. 428-286.000.

Haslanger, Martin F.; Neustadt, Bernard R.; and Smith, Elizabeth M., to Schering Corporation. Mercapto-acylamino acid antihypertensives. 4,929,641, Cl. 514-506.000.

Hassler, Dietrich: *See—*
Grasser, Franz; Reichenberger, Helmut; Hassler, Dietrich; Naser, Georg; and Schmidt, Erhard, 4,928,672, Cl. 128-24.00A.

Hastings, Mark W.; and Buzbee, James M., to Industrial Technology, Inc. Method for locating conductive faults in telephone and similar cables. 4,929,900, Cl. 324-525.000.

Hasuly, Michael J.: *See—*
Billmers, Robert L.; Del Giudice, David M.; Tessler, Martin M.; and Hasuly, Michael J., 4,929,670, Cl. 525-54.100.

Hatakenaka, Kosuke: *See—*
Ando, Tsuyoshi; Hirono, Nakayasu; Nakao, Hirotoshi; Mito, Akio; Kihara, Kazuyuki; Hatakenaka, Kosuke; and Ogawa, Hiroshi, 4,928,730, Cl. 137-554.000.

Hatakeyama, Motonobu; Yoshimura, Kohtaroh; Naoi, Hidenori; and Wakasugi, Nobuo, to Oki Electric Industry Co., Ltd. Method for identifying coordinate data for selected locations on preprinted paper and supplying the data to a printer for printing at corresponding locations. 4,930,089, Cl. 361-519.000.

Hatanaka, Hiroshi: *See—*
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 4,929,611, Cl. 514-183.000.

Hatanaka, Koji: *See—*
Masaka, Mitsusuke; Hatanaka, Koji; Maruta, Kenji; and Okazaki, Seiji, 4,929,813, Cl. 219-270.000.

Hatch, William R.; and Foster, John W., to Lubra Sheet Corporation. Dry lubricant drilling of thru-holes in printed circuit boards. 4,929,370, Cl. 252-12.200.

Hatfield, John G., to AMP Incorporated. Apparatus for terminating a cable to a two part circular connector. 4,928,380, Cl. 29-566.300.

Hatori, Masami; Nozaki, Nobuharu; and Kamiyama, Kozi, to Fuji Photo Film Co., Ltd. Variable acoustical deflection of an optical wave in an optical waveguide. 4,929,042, Cl. 350-96.130.

Hatori, Masami, to Fuji Photo Film Co., Ltd. Light beam deflector. 4,929,043, Cl. 350-96.130.

Hattori, Kouji: *See—*
Ueda, Kenichi; Hattori, Kouji; Terada, Akihiko; and Inohara, Kazuyoshi, 4,929,934, Cl. 340-706.000.

Hattori, Yoshimasa: *See—*
Kuroda, Masami; Hattori, Yoshimasa; and Furusho, Noboru, 4,929,525, Cl. 430-75.000.

Hauser, Robert G., to Cardiac Pacemakers, Inc. Rate adaptive cardiac pacer system having living cell tissue for sensing physiologic demand. 4,928,689, Cl. 128-419.00P

Havins, Felton H. Mounting apparatus for sonar transducer. 4,928,915, Cl. 248-288.500.

Hayakawa, Junshiro: *See—*
Watanabe, Tadahiko; Shobu, Kazuhisa; Kai, Yukio; Yamamoto, Hideki; Sudoh, Eiichi; Yagishita, Osamu; and Hayakawa, Junshiro, 4,929,417, Cl. 419-12.000.

Hayakawa Rubber Co., Ltd.: *See—*
Kimura, Tetsuya; Fujii, Toshihiro; and Nii, Hiroki, 4,929,469, Cl. 427-54.100.

Hayakawa, Teruyo: *See—*
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl. 354-420.000.

Hayano, Kiminori, to NEC Corporation. MOS type semiconductor device potential stabilizing circuit with series MOS capacitors. 4,929,989, Cl. 357-23.600.

Hayasaki, Hiroyuki: *See—*
Houjiyou, Yuji; Hayasaki, Hiroyuki; and Yonezawa, Kyoichi, 4,929,844, Cl. 250-561.000

Hayasaki, Kiyoshi: *See—*
Kurauchi, Makoto; Hashimoto, Michio; Hayasaki, Kiyoshi, Minami, Toshikazu; Ohnishi, Mutsuhiko; and Suzuki, Yohei, 4,929,650, Cl. 523-455.000.

Hayasaki, Yasushi: *See—*
Kobashi, Rikizo; Takase, Shigeyuki; Enomoto, Hiroyuki, Hayasaki, Yasushi; Kobayashi, Toyohisa; and Yamazaki, Shingo, 4,929,685, Cl. 525-277.000.

Hayase, Isao; Ushiku, Kenichi; Tejima, Kunisuke; Hayashi, Seiichi; and Satoh, Kazuhiko, to Hitachi, Ltd. Variable-displacement rotary compressor. 4,929,159, Cl. 417-295.000.
Hayashi, Kenji: *See—*
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.
Hayashi, Kuniharu: *See—*
Mizutani, Minoru; Kikuchi, Hiroshi; Watanabe, Shoichi; Hayashi, Kuniharu; and Maekawa, Masanori, 4,929,102, Cl. 400-248.000.
Hayashi, Seiichi: *See—*
Hayase, Isao; Ushiku, Kenichi; Tejima, Kunisuke; Hayashi, Seiichi; and Satoh, Kazuhiko, 4,929,159, Cl. 417-295.000.
Hayashi, Takahisa: *See—*
Wakimoto, Zenji; and Hayashi, Takahisa, 4,929,066, Cl. 350-415.000.
Hayashi, Yoshio; Nakamoto, Tetsuo; Kanada, Katsumi; and Kondo, Yoshikazu, to Toyo Kahan Co., Ltd. Composite polyvinylchloride plastisol coating and method of applying it to a metal sheet. 4,929,171, Cl. 427-54.100.
Hayden, Joseph S.; Sapak, David L.; and Ward, Julia M., to Schott Glass Technologies, Inc. Phosphate glass useful in high power lasers. 4,929,387, Cl. 252-301.40P.
Hays, Byron G., to BASF Corporation. Process for dispersing organic pigments with ultrasonic radiation. 4,929,279, Cl. 106-412.000.
Head Sportgeraete Gesellschaft m.b.H & Co. OHG: *See—*
Mayr, Bernhard; and Lampl, Heinz, 4,928,989, Cl. 280-610.000.
Heckel, Armin: *See—*
Nickl, Josef; Heckel, Armin; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Eisert, Wolfgang; and Muller, Thomas, 4,929,754, Cl. 562-428.000.
Heffner, Thomas G.: *See—*
Coughenour, Linda L.; Davis, Robert E.; Downs, David A.; Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,929,734, Cl. 546-338.000.
Hegedus, Louis; Beeckman, Jean W.; Pan, Wie-Hin; and Solar, Jeffrey P., to W. R. Grace & Co.-Conn. Catalysts for selective catalytic reduction DeNOx technology. 4,929,586, Cl. 502-217.000.
Hegener, James A.: *See—*
Connaughton, James M., Jr.; Sexton, James E.; and Hegener, James A., 4,929,455, Cl. 426-92.000.
Hehn, Bruce A., to Alpha Enterprises, Inc. Cassette storage container 4,928,825, Cl. 206-387.000.
Heidjann, Franz: *See—*
Bruer, Dirk; Heidjann, Franz; and Hemker, Heinrich, 4,928,460, Cl. 56-14.600.
Heifetz, Aaron H.; Wolfe, Richard A.; Braatz, James A.; and Luthra, Narender P., to W. R. Grace & Co.-Conn. Cell growth enhancers and/or antibody production stimulators comprising chemically modified hydrophilic polyurea-urethane prepolymers and polymers. 4,929,706, Cl. 528-49.000.
Heilman, Marlin S.; Brandt, Arlan J.; Bowling, Larry D.; and Russial, Joseph F., to Lifecor, Inc. Portable device for sensing cardiac function and automatically delivering electrical therapy. 4,928,690, Cl. 128-421.000.
Heina, Karl-Fritz; Schwarz, Horst; and Weber, Wolfgang, to Maschinenbau Oppenweiler Binder GmbH & Co. Rotary sheet feeder. 4,928,953, Cl. 271-185.000.
Heinen, Hans-Dieter, to S.A. Ets. R. Heinen N.V. Device for transferring electric power. 4,929,005, Cl. 292-251.500.
Hella KG Hueck & Co.: *See—*
Diller, Friedhelm, 4,928,646, Cl. 123-376.000.
Hemker, Heinrich: *See—*
Bruer, Dirk; Heidjann, Franz; and Hemker, Heinrich, 4,928,460, Cl. 56-14.600.
Hemmes, Simon N.: *See—*
Oldenburg, Willem; Hemmes, Simon N.; and Hobbel, Jaap E., 4,929,379, Cl. 252-109.000.
Henderson, Don J.; Brady, Robert; Gamble, Foster R.; Hardt, James V.; Friedfeld, Howard; Salerno, Don; Swanson, Tad; and Sansing, Maureen R., to MindCenter Corporation. Electrode-supporting headset. 4,928,696, Cl. 128-644.000.
Henderson, Walter G.; Ellson, George A.; and Unrein, Edgar J., to Supra Products, Inc. Electronic lock system with battery conservation features. 4,929,880, Cl. 320-30.000.
Hendricks, Katherine A., to Tabakoff, Boris; and Newton, John, part interest to each. Anti-motion sickness apparatus. 4,929,228, Cl. 600-27.000.
Hendrischk, Wolfgang, to Mannesmann AG. Shiftable guide for a matrix printhead. 4,929,103, Cl. 400-124.000.
Heneger, Floyd. Electric passive pedal exerciser. 4,928,673, Cl. 128-25.00R.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Veitenhansl, Rudolf; Froeschke, Wolfgang; and Piorr, Robert, 4,929,504, Cl. 428-395.000.
Henkel Kommanditgesellschaft aug Aktien: *See—*
Schulz, Paul; Schwadtke, Karl; and Smulders, Eduard, 4,929,380, Cl. 252-121.300.
Henning, Herbert: *See—*
Strate, Rudiger, Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Dickmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000.
Henry, Paul T.; Haase, Roger L.; and Fitzgibbons, Gary W., to Uarco Incorporated. Mailer-like business form with transparent front. 4,928,874, Cl. 229-74.000.
Henze, Christopher P.; and Mulkern, Joseph H., to Unisys Corporation. Variable resonance regulator for power supply. 4,930,063, Cl. 363-91.000.
Herbertson, Joseph G.: *See—*
Guthrie, Roderick I. L.; and Herbertson, Joseph G., 4,928,748, Cl. 164-479.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Process for catalytic cracking of heavy hydrocarbon feed to lighter products. 4,929,337, Cl. 208-120.000.
Hercules Incorporated: *See—*
Cartwright, Richard V., 4,929,290, Cl. 149-35.000.
Schwark, Joanne M., 4,929,704, Cl. 528-28.000.
Herd, Karl-Josef, to Bayer Aktiengesellschaft. Process for the preparation of 3-aminophenyl 2-hydroxy-ethyl sulphone. 4,929,757, Cl. 564-423.000.
Herkner, Ernst: *See—*
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Dickmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000.
Herman, Rod A.; and Kukel, Christine F., to American Cyanamid Company. Method of and bait compositions for controlling mollusks. 4,929,634, Cl. 514-426.000.
Hermann Wangner GmbH & Co. KG: *See—*
Borel, Georg, 4,928,737, Cl. 139-383.00A.
Hermans, Willem F., to Stork Amsterdam B.V. Method and apparatus for maintaining a mixture of products at a certain temperature. 4,929,152, Cl. 415-203.000.
Herrington, Ronald M.: *See—*
Nichols, Jerram B.; Hunter, Douglas; Herrington, Ronald M.; Serratelli, John F.; and Carey, David G., 4,929,646, Cl. 521-137.000.
Herzhoff, Michael: *See—*
Klinkmann, Kurt; Herzhoff, Michael; and Burmeister, Gerhard, 4,929,784, Cl. 585-422.000.
Hess, Joachim: *See—*
Hilgers, Georg; and Hess, Joachim, 4,929,727, Cl. 544-317.000.
Hesse, Michael; Hoelderich, Wolfgang; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Preparation of N-heterocycles. 4,929,733, Cl. 546-184.000.
Hewett, Richard H.; and Luscombe, Brian M., to May & Baker Limited. Herbicidal method using diflufenican. 4,929,271, Cl. 71-94.000.
Hewit, James R.: *See—*
Burdess, James S.; Fawcett, John N.; and Hewit, James R., 4,928,538, Cl. 73-862.410.
Hewlett-Packard Company: *See—*
Balazar, Leonard, 4,929,963, Cl. 346-1.100.
Berkel, Werner, 4,929,907, Cl. 330-252.000.
Chan, C. S.; Bearss, James G.; and Nelson, Terry M., 4,930,018, Cl. 358-298.000.
Natarajan, Bangalore R.; and Walmsley, Robert G., 4,929,514, Cl. 428-611.000.
Hexemer, Richard L., Jr.; Axelson, Scott R.; McCluskey, Philip H.; and Mroz, Thomas J., Jr., to Alfred University. Method for the preparation of sinterable nitrides. 4,929,433, Cl. 423-411.000.
Hibbert, David A., to General Electric Company. Thermally efficient ventilated electric busway system. 4,929,801, Cl. 174-16.200.
Hida, Hidenori: *See—*
Iino, Hideyuki; Yoshitake, Akihiro; and Hida, Hidenori, 4,929,854, Cl. 307-480.000.
Higgins, Frank P.: *See—*
Amir, Israel; and Higgins, Frank P., 4,929,845, Cl. 250-561.000.
Higgins, Kenneth B.; and Engels, Walter, to Milliken Research Corporation. Carpet tile cutting machine. 4,928,391, Cl. 30-293.000.
High Pressure Gas Safety Institute of Japan, The: *See—*
Namba, Mitsuo; and Uematsu, Reppei, 4,928,728, Cl. 137-486.000.
Higuchi, Mitsuhiro; and Yamamoto, Hirofumi, to Toto Ltd. Toilet seat structure capable of automatically feeding a seat covering paper onto a toilet seat. 4,928,325, Cl. 4-247.000.
Hijikigawa, Masaya: *See—*
Sugihara, Takashi; Uda, Kazutaka; Tabuchi, Hiroki; Inami, Yasuhiko; Hijikigawa, Masaya; and Kataoka, Shoei, 4,928,513, Cl. 73-1.00G.
Hilfiker, William K. Reinforced soil retaining wall and connector therefor. 4,929,125, Cl. 405-262.000.
Hilgers, Georg; and Hess, Joachim, to Boehringer Ingelheim KG. Improved process for precipitating cytosine from alkaline solutions with sulfuric acid. 4,929,727, Cl. 544-317.000.
Hill, Vern L.: *See—*
Lee, Anthony L.; Meyer, Howard S.; and Hill, Vern L., 4,929,585, Cl. 502-220.000.
Hillsted, Jerome, to Merit Enterprises, Inc. Ring coiling machine. 4,928,510, Cl. 72-131.000.
Hilti Aktiengesellschaft: *See—*
Bergner, Arndt, 4,929,134, Cl. 411-30.000.
Hilton, Mark D.: *See—*
McArthur, Alastair; Davis, Royston H.; Hilton, Mark D.; Newton, Trevor W.; and Patel, Dinesh M., 4,929,628, Cl. 514-364.000.
Himmele, Walter; Bott, Kaspar; and Bronstert, Klaus, to BASF Aktiengesellschaft. Preparation of 1-aryl-1-alkenes. 4,929,786, Cl. 585-469.000.
Hinnen, Hans R.; and Marelin, Miklos B., to Idex, Inc. Tool for tightening cable ties. 4,928,738, Cl. 140-93.400.
Hintsa, Roy A. Panel fastener. 4,928,467, Cl. 52-511.000.

Hirai, Hideo: *See—*
Setoi, Hiroyuki; Kuroda, Akio; Tanaka, Hirokazu; Hirai, Hideo; Marusawa, Hiroshi; and Hashimoto, Masashi, 4,929,639, Cl. 514-452.000.
Hirai, Yasuhiko: *See—*
Nishimura, Masakatsu; Okada, Naoya; Murata, Yasuo; and Hirai, Yasuhiko, 4,929,317, Cl. 204-59.00R.
Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, to Tokyo Juki Industrial Co., Ltd. Automatic sewing machine exclusively used for sewing zipper on workpiece. 4,928,612, Cl. 112-257.000.
Hirano, Takashi: *See—*
Suwa, Toshio; Kobayashi, Nobuaki; and Hirano, Takashi, 4,928,605, Cl. 110-261.000.
Hiraoka, Hidenori: *See—*
Hamada, Akihiko; Hiraoka, Hidenori; Nakamura, Yoshinobu; and Ohtsuru, Hiroshi, 4,929,678, Cl. 525-193.000.
Hirata Industrial Machineries Co., Ltd.: *See—*
Nakayama, Takahide, 4,929,827, Cl. 250-223.00R.
Hirata, Masahiro: *See—*
Mito, Kazunori; and Hirata, Masahiro, 4,929,817, Cl. 219-544.000.
Hirayama, Takanobu; Funahashi, Hiroyuki; Yokota, Eiji; Uehara, Mitsuyoshi; Kagami, Isao; Hasegawa, Makoto; and Mizuno, Masaru, to Brother Kogyo Kabushiki Kaisha. Paper feeding apparatus for printer. 4,929,105, Cl. 400-625.000.
Hirbod, Modjtaba, to ABB Stal AB. Method for surface treatment of metal alloys. 4,929,287, Cl. 148-276.000.
Hirofuji, Satoshi: *See—*
Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, 4,929,482, Cl. 428-36.400.
Hiroi, Masakazu: *See—*
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, 4,928,941, Cl. 270-53.000.
Hirono, Nakayasu: *See—*
Ando, Tsuyoshi; Hirono, Nakayasu; Nakao, Hirotoshi; Mito, Akio; Kihara, Kazuyuki; Hatakenaka, Kosuke; and Ogawa, Hiroshi, 4,928,730, Cl. 137-554.000.
Hirose, Takeshi: *See—*
Furutachi, Nobuo; and Hirose, Takeshi, 4,929,540, Cl. 430-555.000.
Hirose, Yukimi: *See—*
Nakamura, Nobuaki; Hirose, Yukimi; Kai, Masakatsu; and Itonaga, Makoto, 4,929,822, Cl. 250-201.400.
Hirota, Kozo: *See—*
Yamaguchi, Tatsuaki; and Hirota, Kozo, 4,929,797, Cl. 585-921.000.
Hirota, Mitugu: *See—*
Kanda, Shuhei; Hirota, Mitugu; and Narushima, Teruo, 4,930,024, Cl. 360-10.100.
Hirschfeld, Tomas B., to University of California, Regents of the. Absorption-emission optrode and methods of use thereof. 4,929,561, Cl. 436-116.000.
Hitachi, Ltd.: *See—*
Aoki, Masakazu; and Suzuki, Akira, 4,929,161, Cl. 418-83.000.
Arimoto, Akira; Ishikawa, Sachiko; and Kataoka, Keiji, 4,929,044, Cl. 350-96.130.
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Fujiwara, Hideo; Tottori, Takeshi; Inagoya, Osamu; and Mikami, Hirosuke, 4,928,382, Cl. 29-603.000.
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Oldenburg, Willem; Hemmes, Simon N.; and Hobbel, Jaap E., 4,929,379, Cl. 252-109.000.
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Yuchi, Sadataka; Machida, Haruchika; Matsuoka, Naoya; and Kikuchi, Masamichi, 4,930,095, Cl. 364-571.010.
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Bejarano-Wallens, Celso O.; Gage, Julie E.; and Hodapp, Donald, 4,929,456, Cl. 426-99.000.
Hodel, P. Lloyd; and Atkins, Paul V., to Dalmo Victor, Inc. High precision radar detection system and method. 4,929,958, Cl. 342-432.000.
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Dinter, Peter; Bothe, Lothar; and Gribbin, John D., 4,929,319, Cl. 204-164.000.
Lang, Hans-Jochen; Hropot, Max; Granzer, Ernold; and Kerekjarto, Bela, 4,929,643, Cl. 514-603.000.
Payer, Wolfgang; Buhnen, Heinz D.; and Zoller, Wilhelm, 4,928,720, Cl. 137-13.000.
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Anderson, Norman S.; Promislow, Albert L.; Rayborn, Randy L.; and Vukov, Rastko, 4,929,769, Cl. 568-614.000.
Aslam, Mohammad; Vicari, Richard; and Davenport, Kenneth G., 4,929,694, Cl. 526-262.000.
DeMartino, Ronald N.; East, Anthony J.; and Calundann, Gordon W., 4,929,696, Cl. 526-312.000.
Dunder, Thomas A., 4,929,532, Cl. 430-143.000.
Golder, Michael D., 4,929,656, Cl. 524-195.000.
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Ryan, Debra A., 4,929,773, Cl. 568-814.000.
Spak, Mark A.; Mammato, Donald; Durham, Dana; and Jain, Sangya, 4,929,536, Cl. 430-325.000.
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Allen, Richard C.; and Wettlaufer, David G., 4,929,622, Cl. 514-281.000.
Glamkowski, Edward J.; and Kurys, Barbara E., 4,929,615, Cl. 514-219.000.
Hoelderich, Wolfgang: *See—*
Hesse, Michael; Hoelderich, Wolfgang; and Schwarzmann, Matthias, 4,929,733, Cl. 546-184.000.
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Hoenk, Michael E.: *See—*
Vahala, Kerry J.; and Hoenk, Michael E., 4,929,041, Cl. 350-96.100.
Hoerner, Clinton C., Jr.: *See—*
Johnson, Jerry E.; and Hoerner, Clinton C., Jr., 4,928,726, Cl. 137-327.000.
Hoffman-La Roche Inc.: *See—*
Fischli, Albert; Gutknecht, Eva-Maria; and Obrecht, Daniel, 4,929,741, Cl. 549-447.000.
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Batcho, Andrew D.; Horst, Ronald L.; and Uskokovic, Milan R., 4,929,609, Cl. 514-167.000.
Meier, Werner; Rambeck, Walter A.; Weiser, Harald; and Zucker, Hermann, 4,929,610, Cl. 514-167.000.
Hofler, Siegfried: *See—*
Kusserow, Bernd; Gagneur, Klaus; and Hofler, Siegfried, 4,930,034, Cl. 361-19.000.
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Steenbergen, Bastiaan G.; Hofman, Arie A.; and De Waard, Willem, 4,929,126, Cl. 405-267.000.
Hofmann Werkstatt-Technik GmbH: *See—*
Lulay, Eugen, 4,928,548, Cl. 74-573.00F.
Hofmeister, Peter: *See—*
Leyendecker, Joachim; Buerstinghaus, Rainer; Theobald, Hans; Kuenast, Christoph; and Hofmeister, Peter, 4,929,617, Cl. 514-252.000.
Hogenmuller, Roger; Chauvel, Bernard; and Daniel, Jean-Claude, to Rhone-Poulenc Chimie. Process for the preparation of polymer particles possessing, implanted on their surface, amphophilic molecules carrying ion-forming or reactive groups, and a process for the preparation of a latex comprising these particles. 4,929,662, Cl 524-376.000.
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Hollander, David S.; and Rubenstein, Mark S. Apparatus for packaging refrigerated goods. 4,928,847, Cl. 220-408.000.
Hollweck, Walter, to Inter Control Hermann Kohler Elektrik GmbH. Temperature safety device for electric devices. 4,929,922, Cl 337-407.000.
Holmberg, Goran I., to Basics Corporation. Portable data system. 4,929,948, Cl. 340-407.000.
Holoubek, Andrew J.: *See—*
McCann, Gerald P.; and Holoubek, Andrew J., 4,928,854, Cl 222-129.100.
Holroyd, Eric; and Wright, Anthony R., to Apsley Metals Limited. Method for the manufacture of a pneumatic tire. 4,929,292, Cl 156-132.000.
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Agren, Lennart; and Holso, Eino, 4,929,409, Cl. 264-508.000.

Holtermann, Henri; and Hamelin, Claude, to Laboratoires Biotrol. Safety device for ostomy bag coupling system. 4,929,245, Cl. 604-338.000.

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Friedman, Don; and Chang, Thomas T., 4,929,936, Cl. 340-715.000.

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Muroya, Fumio; and Kotani, Yoshiaki, 4,928,458, Cl. 56-11.800.

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Noguchi, Hiroyuki; and Yamada, Ichiho, 4,928,385, Cl. 29-788.000.

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Inoue, Kazuo; Kishi, Noriyuki; and Akiyama, Eitetsu, 4,928,489, Cl. 60-602.000.

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Hosaka, Takefumi: Arai, Yasuhisa; and Matsui, Hiroki, 4,930,084, Cl. 364-426.040.
Iwagawa, Yoshihiro; Yahagi, Toshio; and Fujii, Etsuo, 4,929,036, Cl. 303-115.000.
Kawano, Shizuo, 4,928,781, Cl. 180-227.000.
Kita, Tetsuo, 4,928,334, Cl. 5-191.000.
Niizato, Tomonori; Tanai, Tsuneo; Kasahara, Kazuhiro; Saka, Tsutomu; and Oikawa, Toshihiro, 4,928,641, Cl. 123-90.160.
Otsubo, Kazumi, 4,929,805, Cl. 200-61.45R.

Honda, Tsunetoshi: *See—*
Furutaka, Yasuhisa; Aoyama, Hirokazu; and Honda, Tsunetoshi, 4,929,318, Cl. 264-157.600.

Honeywell Inc.: *See—*
Anderson, Edmund J.; and Desrude, Wayne P., 4,928,805, Cl. 198-345.000.
Durand, William W.; and Peterson, Ronald E., 4,929,063, Cl. 350-353.000.
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Hong, Chie F. Rope climber. 4,928,791, Cl. 182-135.000.

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Komai, Takeshi; Matsuyama Kazuo; and Honma, Isao, 4,929,747, Cl. 558-263.000.

Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., to Nalco Chemical Company. Cooling water corrosion inhibition method. 4,929,425, Cl. 422-13.000.

Hoover Group, Inc.: *See—*
Nichols, Dwight E., 4,928,922, Cl. 251-180.000.

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Bauer, Thomas M.; Dunn, Thomas A.; Gurke, Christina M.; Hopkins, John W.; and Nafziger, Richard D., 4,930,154, Cl. 379-246.000.

Hopmann, Mark E., to Baker Hughes Incorporated. Method and apparatus for shifting a ported member using continuous tubing. 4,928,772, Cl. 166-386.000.

Hori, Ryoichi: *See—*
Tanaka, Hitoshi; Hori, Ryoichi; Itoh, Kiyoo; Kimura, Katsutaka; and Shimohigashi, Katsuhiro, 4,930,112, Cl. 365-226.000.

Horie, Haruo: *See—*
Horie, Mitsukazu; Horie, Shigemitsu; and Horie, Haruo, 4,928,444, Cl. 52-66.000.

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Horie, Mitsukazu; Horie, Shigemitsu; and Horie, Haruo, 4,928,444, Cl. 52-66.000.

Horiguchi, Ryuji, to NEC Corporation. Area searching system. 4,929,938, Cl. 340-747.000.

Horiguchi, Ryuji, to NEC Corporation. Rotated graphic pattern generating system. 4,930,088, Cl. 364-518.000.

Horii, Shigeo, to Reiko Co., Ltd. Balloon made of metal vapor deposited film. 4,928,908, Cl. 244-31.000.

Horikoshi, Mie: *See—*
Takenawa, Seishi; Takeda, Hideki; and Horikoshi, Mie, 4,929,451, Cl. 426-10.000.

Hornak, Leonard P.: *See—*
Kaufmann, John W.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,929,413, Cl. 376-268.000.

Hornby, Michael J., to Siemens-Bendix Automotive Electronics L.P. Fuel pressure regulator valve. 4,928,729, Cl. 137-510.000.

Horst, Ronald L.: *See—*
Batcho, Andrew D.; Horst, Ronald L.; and Uskokovic, Milan R., 4,929,609, Cl. 514-167.000.

Hosaka, Hiroshi, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection control system for an automotive engine. 4,928,654, Cl. 123-486.000.

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Sekiguchi, Shigemi, 4,929,189, Cl. 439-352.000.

Hoskin, Dennis H., to Mobil Oil Corporation. Stabilizing agent for profile control gels and polymeric gels of improved stability. 4,928,766, Cl. 166-270.000.

Hosoi, Keiji: *See—*
Ohmura, Yukihiro; Kobayashi, Yoshiyuki; Hosoi, Keiji; and Shimoda, Kazuharu, 4,928,659, Cl. 123-588.000.

Hosokawa, Manabu: *See—*
Takakusaki, Nobuyuki; Mizutani, Yohji; Kishida, Nobuhiro; and Hosokawa, Manabu, 4,929,450, Cl. 425-526.000.

Hosono, Katsuaki; and Kushita, Kenji, to Mitsubishi Kinzoku Kabushiki Kaisha. Pulleys. 4,929,220, Cl. 474-152.000.

Hosoya, Manabu: *See—*
Ohkubo, Yukiharu; Hosoya, Manabu; Miura, Shinji; and Aoki, Yuichi, 4,928,936, Cl. 269-73.000.

Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Burst/continuous wave converting apparatus for converting continuous wave in response to bursts. 4,930,003, Cl. 358-19.000.

Hotta, Tohru: *See—*
Kyono, Tetsuyuki; Ohnishi, Seiichiro; Hanano, Tohru; and Hotta, Tohru, 4,929,513, Cl. 428-611.000.

Houjiyou, Yuji; Hayasaki, Hiroyuki; and Yonezawa, Kyoichi, to Sanyo Electric Co., Ltd. Apparatus for detecting the presence and size of a document. 4,929,844, Cl. 250-561.000.

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Howard, Henry H. Cryogenic product treating apparatus. 4,928,492, Cl. 62-63.000.

Howell, Paul J., to National Semiconductor Corporation. Selective epitaxy BiCMOS process. 4,929,570, Cl. 437-89.000.

Howes, Royal E.: *See—*
Elderton, Peter P.; Granada, Richard P.; and Howes, Royal E., 4,930,041, Cl. 361-190.000.

Hoxmeier, Ronald J.: *See—*
Slaugh, Lynn H.; Johnson, Thomas H.; and Hoxmeier, Ronald J., 4,929,584, Cl. 502-112.000.

Hropot, Max: *See—*
Lang, Hans-Jochen; Hropot, Max; Granzer, Ernold; and Kerekjarto, Bela, 4,929,643, Cl. 514-603.000.

Hsieh, Jih-Han: *See—*
Barer, Sol J.; Maxwell, Peter C.; and Hsieh, Jih-Han, 4,929,396, Cl. 562-595.000.

Hsieh, Wu H. Musical drum with pressure buffer element. 4,928,565, Cl. 84-411.00R.

Hsu, Hsiung, to Ohio State University, The. Non-contact high frequency tonometer. 4,928.697, Cl. 128-649.000.

Hu, Lee-Ping, to Hydrotek Corporation. Fluid faucet. 4,928,732, Cl. 137-607.000.

Huang, C. S. Warren; and Meyer, Karl W., to Ethyl Corporation. Process for separating 1-dodecene and 1-tetradecene from an aluminum alkyl chain growth product. 4,929,788, Cl. 585-522.000.

Huang, Shu-Jen W.: *See—*
Stenger, Claudia V.; and Huang, Shu-Jen W., 4,929,382, Cl. 252-181.000.

Hubbard, Dean A.: *See—*
Link, Donald A.; Hubbard, Dean A.; and Larsen, Michael R., 4,929,919, Cl. 335-38.000.

Huber, Joel E.: *See—*
VanRheenen, Verlan H.; and Huber, Joel E., 4,929,395, Cl. 540-4.000.

Hudson, Henry R.: *See—*
Hudson, Trudy M.; and Hudson, Henry R., 4,929,187, Cl. 439-334.000.

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Hue, Jean, to Salomon S.A. Safety binding for a ski. 4,928,988, Cl. 280-607.000.

Huebner, Patrick H.; Sebranek, Joseph G., Olson, Dennis G.; and Anderson, Eugene A., to Iowa State University Research Foundation, Inc. Apparatus and process for separating bone fragments, gristle and sinews from meat as the meat is being ground. 4,928,892, Cl. 241-82.500.

Huff, Darrel: *See—*
Connelly, James D.; and Huff, Darrel, 4,928,551, Cl. 74-606.00R.

Huggett, Mark D.: *See—*
Stephenson, James G.; and Huggett, Mark D., 4,930,056, Cl. 362-364.000.

Huggins, Raymond W., to Boeing Company, The. Wavelength division multiplexing system using optical switch. 4,930,117, Cl. 370-3.000.

Hughes Aircraft Company: *See—*
Castelaz, Patrick F., 4,930,099, Cl. 364-820.000.
Chang, David B., 4,929,841, Cl. 250-504.00R.
La Plante, John A.; and Schaefer, Robert D., 4,929,073, Cl. 350-609.000.
Larsen, Alan B., 4,929,892, Cl. 324-158.00F.
Lee, Jar J.; and Yen, Huan-Wun, 4,929,956, Cl. 342-376.000.
Sato, Robert N., 4,929,913, Cl. 330-308.000.
Small, James G., 4,929,951, Cl. 342-179.000.
Williams, Ronald L., 4,930,001, Cl. 357-71.000.

Hughes, Joel J., to Container Products Corp. Decontamination booth 4,928,440, Cl. 51-426.000.

Huik, Heikki: *See—*
Ogden, Ralph; and Huik, Heikki, 4,928,332, Cl. 5-68.000.

Huisen, Andre, to Wild Leitz AG. Interferometric range finder. 4,929,077, Cl. 356-4.500.

Huizenga, Lee M. Storage organizer system and means for installing the same. 4,928,833, Cl. 211-187.000.

Hull, Charles W., to 3D Systems, Inc. Method for production of three-dimensional objects by stereolithography. 4,929,402, Cl. 264-22.000.

Hulsing, Rand H., II; and Novack, Mitchell, to Sundstrand Data Control, Inc. Electrode configuration for vibrating beam transducers. 4,929,860, Cl. 310-366.000.

Hultberg, Jimmy, to AB Volvo. Conveyor. 4,928,810, Cl. 198-699.100.

Hultåker, Eric, to AB Aros Avancerad Butikskontroll. Magnetized ink, paint or dye used on merchandise to prevent theft. 4,929,928, Cl. 340-572.000.

Humber, David C.: *See—*
Tyers, Michael B.; Coates, Jan H.; Humber, David C.; Ewan, George B.; and Bell, James A., 4,929,632, Cl. 514-397.000.

Hung, Chuan-Yung: *See—*
Chan, Yiu-Fai; and Hung, Chuan-Yung, 4,930,107, Cl. 365-189.080.

Hung, William M.; and Su, Kai C., to Ciba-Geigy Corporation. Ultraviolet absorbing lenses and method of making the same. 4,929,250, Cl. 8-507.000.

Hunger, Walter. Hydraulically-operated support device for semitrailers. 4,928,488, Cl. 60-480.000.

Hunger, Walter. Fifth wheel coupling. 4,928,987, Cl. 280-435.000.

Hungerman, Eric R.: *See—*
Danby, Philip C.; Danby, Hal C.; and Hungerman, Eric R., 4,929,329, Cl. 204-299.00R.

Hunter, Douglas: *See—*
Nichols, Jerram B.; Hunter, Douglas; Herrington, Ronald M.; Serratelli, John F.; and Carey, David G., 4,929,646, Cl. 521-137.000.

Hunter Douglas International N.V.: *See—*
de Jong, Hendrikus, 4,929,475, Cl. 427-407.100.
Oskam, Herman, 4,928,744, Cl. 160-178.100.

Hunter, James R.: *See—*
Chun, Victor L.; Hunter, James R.; and Jaworski, George, 4,929,276, Cl. 83-552.000.

Huntington, Christopher: *See—*
DiSimone, John; Brown, Paul; and Huntington, Christopher, 4,929,166, Cl. 425-190.000.

Huse, Richard L.: *See—*
Ahmad, Anees; and Huse, Richard L., 4,929,054, Cl. 350-252.000.

Huskes, Heinrich: *See—*
Zeibig, Winfried; and Huskes, Heinrich, 4,929,668, Cl. 524-745.000.

Husky Injection Molding Systems Ltd: *See—*
DiSimone, John; Brown, Paul; and Huntington, Christopher, 4,929,166, Cl. 425-190.000.

Hussain, Saadat, to Ethyl Corporation. Process for preparing brominated pentaerythritols. 4,929,775, Cl. 568-844.000.

Hussain, Saadat, to Ethyl Corporation. Process for preparing diphenylalkane. 4,929,785, Cl. 585-426.000.

Hussmann, Gregory P.; and Udovich, Carl A., to Amoco Corporation. Preparation of substituted benzophenones. 4,929,761, Cl. 568-319.000.

Hutchinson, Wilbur P. Eccentric "Z" fold mailer with nesting capabilities. 4,928,875, Cl. 229-92.100.

Huttenes-Albertus Chemische Werke GmbH: *See—*
Torbus, Marek; Jerman, Franz; Ladegourdie, Gerard; Lingemann, Dirk; Seiss, Willi; and Vujevic, Aleksandar, 4,929,649, Cl. 523-145.000.

Hutter, Louis N., to Texas Instruments Incorporated. Trench bipolar transistor. 4,929,996, Cl. 357-34.000.

Hutter, Robert J.: *See—*
Steele, Duane F.; Warman, Eugene C.; and Hutter, Robert J., 4,929,157, Cl. 417-312.000.

Huyer, Johannes N., to Vermeulen-Hollandia Octrooien II B.V. Crank device. 4,928,547, Cl. 74-545.000.

Hydril Company: *See—*
Landriault, L. Steven; Ortloff, Donald J.; and Bollfrass, Charles A., 4,928,999, Cl. 285-113.000.

Hydrotek Corporation: *See—*
Hu, Lee-Ping, 4,928,732, Cl. 137-607.000.

Hyeon, Suong B.: *See—*
Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi, Oda, Mitsunori; and Tanaka, Akinori, 4,929,267, Cl. 71-77.000.

Hyogo, Yukihiro; and Kurihara, Akio, to Yazaki Corporation. Mounting construction for on-vehicle electrical connection apparatus. 4,929,182, Cl. 439-34.000.

Hyson, Michael T.: *See—*
Rembaum, Alan; Rhim, Won-Kyu; Hyson, Michael T.; and Chang, Manchium, 4,929,400, Cl. 264-10.000.

Ibsen, Lars S., to A/S Alfred Benzon. Oral composition containing particles comprising an active substance. 4,929,448, Cl. 424-489.000.

Ichimura, Kiyoshi: *See—*
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,929,169, Cl. 425-385.000.

Ichino, Kouji, to Kaijo Denki Co. Ltd. Socket structure for mounting ultrasonic gas flow measuring device with respect to gas flow pipe. 4,928,534, Cl. 73-861.180.

ICI Australia Operations Proprietary Limited: *See—*
Watson, Keith G.; Drygala, Peter; and Bell, Stephen, 4,929,269, Cl. 71-92.000.

Ida, Yuichi: *See—*
Bannai, Hiroyuki; Ida, Yuichi; and Kato, Hironori, 4,928,901, Cl. 242-85.000.

Idex, Inc.: *See—*
Hinnen, Hans R.; and Marelin, Miklos B., 4,928,738, Cl. 140-93.400.

Iehisa, Nobuaki: *See—*
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, 4,930,135, Cl. 372-33.000.

Iguchi, Masaaki: *See—*
Saito, Shigeaki; Matsueda, Toshiharu; Kubota, Yoshihiro; and Iguchi, Masaaki, 4,929,572, Cl. 437-164.000.

Ihara, Tadayoshi: *See—*
Matsuo, Teruo; Ihara, Tadayoshi; and Oyamada, Yoshinori, 4,929,209, Cl. 445-6.000.

Iida, Kazuyoshi: *See—*
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, 4,929,874, Cl. 318-128.000.

Iino, Hideyuki; Yoshitake, Akihiro; and Hida, Hidenori, to Fujitsu Limited; and Fujitsu Microcomputer Systems Limited. Clock circuit having a clocked output buffer. 4,929,854, Cl. 307-480.000.

Ikari, Keizo: *See—*
Harakawa, Yoshihiro; Takahashi, Seiya; Izawa, Koji; Takeuchi, Hidemitsu; and Ikari, Keizo, 4,929,316, Cl. 204-56.100.

Ikeda, Masahiro: *See—*
Tanimura, Toyokiti; and Ikeda, Masahiro, 4,928,562, Cl. 83-278.000.

Ikeda, Masami: *See—*
Sato, Koichi; and Ikeda, Masami, 4,929,964, Cl. 346-1.100.

Ikeda, Sotomitsu: *See—*
Shimizu, Akira; and Ikeda, Sotomitsu, 4,930,132, Cl. 372-22.000.

Ikeda, Yasuhiko, to NIFCO, Inc. Buckle. 4,928,364, Cl. 24-614.000.

Ikenaga, Yasunori, to Sharp Kabushiki Kaisha. Ink cartridge. 4,929,109, Cl. 101-134.000.

Iltis, Alain; and Maestro, Patrick, to Rhone-Poulenc Chimie. Electromagnetic wave absorbers comprised of barium titanate powders. 4,929,574, Cl. 501-137.000.

Imai, Masaaki; and Uemura, Minoru, to Sasakura Engineering Co., Ltd. Concentrating apparatus with reverse osmosis membrane. 4,929,347, Cl. 210-101.000.

Imaizumi, Tomoaki: *See—*
Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, 4,929,072, Cl. 350-582.000.

Imamura, Kaoru, to Kabushiki Kaisha Toshiba. Trimming process hy a laser beam. 4,928,838, Cl. 219-121.690.

Imamura, Naoya: *See—*
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.

Imanishi, Kazuo, to Kubushiki Kaisha Toshiba. Gain controllable amplifier circuit. 4,929,908, Cl. 330-254.000.

IMDEC S.A.: *See—*
Silvestrini, Jesus A., 4,929,459, Cl. 426-399.000.

Impact International Pty, Ltd.: *See—*
Lajovic, Dusan S., 4,928,877, Cl. 229-125.420.

Impact Systems, Inc.: *See—*
Typpo, Pekka M., 4,929,895, Cl. 324-231.000.

Imperial Chemical Industries plc: *See—*
Byrom, David, 4,929,550, Cl. 435-101.000.
Tury, Bernard, 4,929,369, Cl. 252-12.000.

Imura, Yoshio; and Takahashi, Tsugio, to Nikon Corporation. Camera and image output apparatus capable of trimmed photographing. 4,929,971, Cl. 354-75.000.

Inaba, Yoshiharu; Mitoguchi, Fumio; and Yamashita, Hiromasa. Direct-pressure mold clamping mechanism. 4,929,165, Cl. 425-150.000.

Inada, Eiichi: *See—*
Kitagawa, Kazuo; Komatsu, Fumiaki; Masaki, Takayoshi; Sawada, Yoshihisa; and Inada, Eiichi, 4,929,394, Cl. 252-633.000.

Inagaki, Yoshio: *See—*
Takahashi, Toshiro; Kameoka, Kimitaka; and Inagaki, Yoshio, 4,929,535, Cl. 430-264.000.

Inagoya, Osamu: *See—*
Fujiwara, Hideo; Tottori, Takeshi; Inagoya, Osamu; and Mikami, Hirosuke, 4,928,382, Cl. 29-603.000.

Inami, Yasuhiko: *See—*
Sugihara, Takashi; Uda, Kazutaka; Tabuchi, Hiroki; Inami, Yasuhiko; Hijikigawa, Masaya; and Kataoka, Shoei, 4,928,513, Cl. 73-1.00G.

Inata, Tsuguo: *See—*
Muto, Shunichi; Inata, Tsuguo; Takeuchi, Atsushi; and Sugiyama, Yoshihiro, 4,929,984, Cl. 357-4.000.

Industrial Energy Corporation: *See—*
Paull, James B., 4,928,749, Cl. 165-1.000.

Industrial Technology, Inc.: *See—*
Hastings, Mark W.; and Buzbee, James M., 4,929,900, Cl. 324-525.000.

Inman Mold Manufacturing Co., Inc.: *See—*
Barlics, John J.; and Barlics, Glen D., 4,928,881, Cl. 239-44.000.

Inoda, Masahiro: *See—*
Yazawa, Hiromi; Inoda, Masahiro; and Kimura, Hideaki, 4,930,016, Cl. 358-296.000.

Inohara, Kazuyoshi: *See—*
Ueda, Kenichi; Hattori, Kouji; Terada, Akihiko; and Inohara, Kazuyoshi, 4,929,934, Cl. 340-706.000.

Inomata, Teruhisa: *See—*
Murata, Hiroaki; Inomata, Teruhisa; and Tabira, Masatoshi, 4,929,866, Cl. 313-500.000.

Inoshita, Gen: *See—*
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 4,930,028, Cl. 360-85.000.

Inoue, Gentei: *See—*
Takata, Hirotoshi; Suruga, Eihiro; and Inoue, Gentei, 4,929,098, Cl. 384-450.000.

Inoue, Kazuo; Kishi, Noriyuki; and Akiyama, Eitetsu, to Honda Giken Kogyo K.K. Supercharging pressure control method for turbocharged internal combustion engines. 4,928,489, Cl. 60-602.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Inoue, Kiyoshi: *See—*
Akanuma, Hideo; Murata, Masashi; Inoue, Kiyoshi; and Ohgake, Ryoji, 4,929,372, Cl. 252-29.000.
Inoue, Toshinobu, to Kabushiki Kaisha Toshiba. Scroll compressor having exhausting pipe pressed into muffler chamber under pressure. 4,929,160, Cl. 418-55.000.
Inoue, Toshio; Mine, Takayuki; Izutsu, Hitoshi; Yamaguchi, Toshihide; Kobata, Fumihiro; and Kawabata, Juheiji, to Dainippon Ink and Chemicals, Inc. Thermoplastic resin composition. 4,929,665, Cl. 524-500.000.
Institut Fancais du Petrole: *See—*
Meynier, Patrick, 4,928,784, Cl. 181-106.000.
Institut Francais du Petrole: *See—*
Cameron, Charles; Mimoun, Hubert; Bonnaudet, Serge; and Robine, Alain, 4,929,787, Cl. 585-500.000.
Wittrisch, Christian, 4,929,915, Cl. 324-347.000.
Integrated Tech Systems, Inc.: *See—*
Lucas, Gary H., 4,928,889, Cl. 239-751.000.
Intel Corporation: *See—*
Allen, Michael J., 4,930,098, Cl. 364-716.000.
Ledenbach, Gregory W.; and Allen, Michael J., 4,930,097, Cl. 364-716.000.
IntelliCorp, Inc.: *See—*
Tou, Frederich N.; and Hasan, Wagar, 4,930,071, Cl. 364-300.000.
Intelligent Technologies Corporation: *See—*
Golicz, Roman M., 4,928,944, Cl. 271-6.000.
Inter Control Hermann Kohler Elektrik GmbH: *See—*
Hollweck, Walter, 4,929,922, Cl. 337-407.000.
Interdibipack S.p.A.: *See—*
Di Bernardo, Pietro, 4,928,829, Cl. 206-524.800.
International Baler Corp.: *See—*
Keesey, Charles R.; and Flood, Ted C., 4,929,141, Cl. 414-412.000.
International Business Machines Corporation: *See—*
Ainoya, Masayuki; Ishihara, Takeyuki; Kanno, Tesuo; Kikuchi, Takahiro; Mori, Seiichi; Nobumori, Shogo; and Shirakawa, Junji, 4,929,982, Cl. 355-311.000.
Batra, Surinder P.; Hammer, William E.; Lushinsky, Gene A.; Marquart, David W.; Schwane, Walter H.; and Ziecina, Frederick J., 4,930,069, Cl. 364-200.000.
Beechko, Nicholas, 4,929,301, Cl. 156-657.000.
Chung, Paul W.; Gee, Ralph L.; Lang, Luke C. K.; and Saber, Paik, 4,929,918, Cl. 331-10.000.
Cina, Vincent J., Jr., 4,930,073, Cl. 364-300.000.
Franaszek, Peter A.; and Georgiou, Christos J., 4,929,940, Cl. 340-825.020.
Kravitz, Jeffrey K.; and Palmer, Charles C., 4,930,159, Cl. 380-23.000.
Patterson, William A.; Tong, Dien H.; and Wooden, James R., 4,929,100, Cl. 400-124.000.
Varma, Anujan M.; and Georgiou, Christos J., 4,929,939, Cl. 340-825.800.
International Fuel Cells Corp.: *See—*
Luoma, Warren L.; Martin, Ronald G.; and Breault, Richard D., 4,929,517, Cl. 429-34.000.
International Paper Company: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whitlock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,929,476, Cl. 428-34.200.
Intevep, S. A.: *See—*
Marquez, Edmundo M.; Nowak, Jean-Francois; and Robles, Antonio, 4,929,473, Cl. 427-252.000.
Inui, Koichi, to Sharp Kabushiki Kaisha. Laser printer. 4,929,970, Cl. 346-160.000.
Inukai, Yuzo; and Nakayama, Mitsuyuki, to Fuji Photo Film Co., Ltd. Method and apparatus for preventing pulsations in a flowing fluid. 4,928,719, Cl. 137-1.000.
Iowa State University Research Foundation, Inc.: *See—*
Gassman, Max P.; Larson, David J.; and Trampel, Darrell W., 4,928,628, Cl. 119-1.000.
Huebner, Patrick H.; Sebranek, Joseph G.; Olson, Dennis G.; and Anderson, Eugene A., 4,928,892, Cl. 241-82.500.
Kostic, Nenad M.; and Zhou, Xia-Ying, 4,929,091, Cl. 374-162.000.
Trampel, Darrell W., 4,928,629, Cl. 119-1.000.
Irick, Gether, Jr.; Mercer, Patricia N.; and Simmons, Kenneth E., to Eastman Kodak Company. Catalyst compositions and the use thereof in the hydrogenation of carboxylic acid esters. 4,929,777, Cl. 568-864.000.
Isaacson, Manfred A. Emergency spare wheel and method and apparatus for installing same. 4,929,032, Cl. 301-38.00R.
Isbert, Jacques: *See—*
Delfour, Andre ; Falempin, Francois; Isbert, Jacques; and Sans, Claude, 4,929,079, Cl. 356-336.000.
ISG/AG: *See—*
Larsson, Karl O. A. H., 4,929,229, Cl. 604-74.000.
Isham, William R.; Cragun, E. Brent; Gault, Christopher; and Wermeling, William J., to Fountain Fresh, Inc. End aisle fluid mixing and dispensing system. 4,928,853, Cl. 222-108.000.
Ishigami, Toshihiko: *See—*
Yonezawa, Akihiro; Sasaki, Hiroki; Mitsuyuki, Yoichiro; Mori, Yasuki; and Ishigami, Toshihiko, 4,929,869, Cl. 313-639.000.
Ishihara, Noriyuki: *See—*
Shishido, Kihachi; Matsuoka, Masami; Ishihara, Noriyuki; and Tamura, Masahiro, 4,929,479, Cl. 428-35.200.
Ishihara Sangyo Kaisha Ltd.: *See—*
Haga, Takahiro; Tsujii, Yasuhiro; Isogai, Tatsuo; Murai, Shigeo; and Tanaka, Toshihiro, 4,929,729, Cl. 544-330.000.
Ishihara, Takeyuki: *See—*
Ainoya, Masayuki; Ishihara, Takeyuki; Kanno, Tesuo; Kikuchi, Takahiro; Mori, Seiichi; Nobumori, Shogo; and Shirakawa, Junji, 4,929,982, Cl. 355-311.000.
Ishii, Kazuo: *See—*
Kato, Eiichi; Ishii, Kazuo; Itakura, Ryosuke; and Sera, Hidefumi, 4,929,526, Cl. 430-87.000.
Kato, Eiichi; Ohno, Shigeru; Ishii, Kazuo; and Itakura, Ryosuke, 4,929,527, Cl. 430-92.000.
Ishii, Susumu; and Matsushima, Hideyuki, to Yoshida Kogyo K.K. Pull tab for slide fastener sliders. 4,928,358, Cl. 24-431.000.
Ishikawa, Fumiyasu: *See—*
Wakayama, Sachio; Ishikawa, Fumiyasu; and Oishi, Kunio, 4,929,548, Cl. 435-71.200.
Ishikawa, Osamu; and Watanabe, Kazuyoshi, to Tochigifujisangyo Kabushiki Kaisha. Power transmission apparatus. 4,928,803, Cl. 192-58.00B.
Ishikawa, Sachiko: *See—*
Arimoto, Akira; Ishikawa, Sachiko; and Kataoka, Keiji, 4,929,044, Cl. 350-96.130.
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, to Seikosha Co., Ltd. Flash photography changeover device. 4,929,977, Cl. 354-420.000.
Ishikawa, Takatoshi, to Alps Electric Co., Ltd. Printing head assembly. 4,929,968, Cl. 346-140.00R.
Ishikawajima-Harima Heavy Industries Co.: *See—*
Tsuchida, Yoshiki, 4,929,089, Cl. 374-44.000.
Ishikura, Keizaburo: *See—*
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Ishikura, Keizaburo; Sera, Akio; and Suehiro, Junji, 4,929,903, Cl. 324-544.000.
Ishitobi, Ken: *See—*
Miyazaki, Kunihiro; Ishitobi, Ken; and Yamaguchi, Yosinobu, 4,929,257, Cl. 51-309.000.
Ishiyama, Masamitsu: *See—*
Kyogoku, Tetsuo; Ishiyama, Masamitsu; and Mino, Masayuki, 4,929,980, Cl. 355-75.000.
Isobe, Noriyuki: *See—*
Nishihara, Yoshio; Isobe, Noriyuki; and Kotera, Satoshi, 4,929,507, Cl. 428-447.000.
Isogai, Tatsuo: *See—*
Haga, Takahiro; Tsujii, Yasuhiro; Isogai, Tatsuo; Murai, Shigeo; and Tanaka, Toshihiro, 4,929,729, Cl. 544-330.000.
ISOTEC Partners, Ltd.: *See—*
Hagerty, James J.; and Pulsifer, David N., 4,929,065, Cl. 350-413.000.
Isover Saint-Gobain: *See—*
Audren, Yves; and Tuffal, Guy, 4,928,898, Cl. 242-55.100.
Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Electric starter with biased fulcrum. 4,929,857, Cl. 310-83.000.
Istituto Guido Donegani: *See—*
Massardo, Pietro; Bettarini, Franco; Piccardi, Paolo; and Rama, Franco, 4,929,772, Cl. 568-812.000.
Itahana, Tsutomu; Kanno, Hideo; Ono, Tetsuo; Furuta, Futoru; Kobayashi, Susumu; Akimoto, Ryosaku; and Tanigaki, Ryuhei, to Mitsubishi Jukogyo Kabushiki Kaisha. Capacity control valve for a compressor. 4,928,723, Cl. 137-116.300.
Itakura, Ryosuke: *See—*
Kato, Eiichi; Ishii, Kazuo; Itakura, Ryosuke; and Sera, Hidefumi, 4,929,526, Cl. 430-87.000.
Kato, Eiichi; Ohno, Shigeru; Ishii, Kazuo; and Itakura, Ryosuke, 4,929,527, Cl. 430-92.000.
Ito, Kanji: *See—*
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl. 354-420.000.
Ito, Koji: *See—*
Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, 4,929,072, Cl. 350-582.000.
Ito, Kuniyasu, to Toyoda Gosei Co., Ltd. Air-conditioning control box. 4,930,048, Cl. 362-26.000.
Ito, Michiyasu: *See—*
Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, 4,928,438, Cl. 51-283.00R.
Ito, Tsuneo: *See—*
Sakai, Takeshi; and Ito, Tsuneo, 4,928,550, Cl. 74-595.000.
Itoh, Hiroshi: *See—*
Takada, Mitsuru; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,928,557, Cl. 74-867.000.
Itoh, Kiyoo: *See—*
Tanaka, Hitoshi; Hori, Ryoichi; Itoh, Kiyoo; Kimura, Katsutaka; and Shimohigashi, Katsuhiro, 4,930,112, Cl. 365-226.000.
Itonaga, Makoto: *See—*
Nakamura, Nobuaki; Hirose, Yukimi; Kai, Masakatsu; and Itonaga, Makoto, 4,929,822, Cl. 250-201.400.
Itou, Kazumi; Ebe, Kazuyoshi; and Minagawa, Toshio, to FSK Kabushiki Kaisha. Cover tape for sealing chip-holding parts of carrier tape. 4,929,486, Cl. 428-77.000.
ITT Corporation: *See—*
Elderton, Peter P.; Granada, Richard P.; and Howes, Royal E., 4,930,041, Cl. 361-190.000.
Finney, Robert E., 4,929,197, Cl. 439-660.000.
Williams, Jack L., 4,930,057, Cl. 362-272.000.

Iuchi, Shigeru: *See—*
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,929,169, Cl. 425-385.000.
Ivannikov, Alfred V.; and Abudardin, Vladimir Z., to Tsentr Nauchno-Tekhnicheskogo Tvorchestva Molodezhi "ASTRON" . Method for electrical arc spot welding with consumable electrode. 4,929,812, Cl. 219-137.200.
Iwagaki, Yutaka: *See—*
Kobayashi, Kenzo; Iwagaki, Yutaka; Hasegawa, Mitsuyo; and Suganuma, Kazushi, 4,930,119, Cl. 370-16.100.
Iwagawa, Yoshihiro; Yahagi, Toshio; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic brake pressure control device for a vehicle. 4,929,036, Cl. 303-115.000.
Iwamura, Kazumitsu: *See—*
Oku, Masahiro; and Iwamura, Kazumitsu, 4,928,742, Cl. 152-534.000.
Iwasa, Tadanobu, to Toyoda Gosei Co., Ltd. Weather strip for automobile. 4,929,481, Cl. 428-36.100.
Iwasa, Tadanobu, to Toyoda Gosei Co., Ltd. Window frame rubber moldings for automobile. 4,929,490, Cl. 428-195.000.
Iwasaki, Hideo: *See—*
Sakamoto, Kiichiro; and Iwasaki, Hideo, 4,929,974, Cl. 354-299.000.
Iwata, Michiyoshi: *See—*
Matsumoto, Kazuyuki; Hashimoto, Masataka; and Iwata, Michiyoshi, 4,928,556, Cl. 475-149.000.
Iwata, Tadao: *See—*
Tominaga, Kaoru; and Iwata, Tadao, 4,929,708, Cl. 528-118.000.
Iwata, Toshio: *See—*
Ohkubo, Satoru; and Iwata, Toshio, 4,928,653, Cl. 123-435.000.
Izawa, Koji: *See—*
Harakawa, Yoshihiro; Takahashi, Seiya; Izawa, Koji; Takeuchi, Hidemitsu; and Ikari, Keizo, 4,929,316, Cl. 204-56.100.
Izawa, Shoji, to Tokyo Electric Co., Ltd. Communication terminal device. 4,930,017, Cl. 358-296.000.
Izuhara, Seiji: *See—*
Morita, Yasuhiko; Kakiguchi, Yoshitomi; and Izuhara, Seiji, 4,929,378, Cl. 252-105.000.
Izutsu, Hitoshi: *See—*
Inoue, Toshio; Mine, Takayuki; Izutsu, Hitoshi; Yamaguchi, Toshihide; Kobata, Fumihiro; and Kawabata, Juheiji, 4,929,665, Cl. 524-500.000.
J. G. Anschuetz GmbH: *See—*
Bordt, Wolfgang; and Gerstenberger, Friedrich, 4,928,661, Cl. 124-69.000.
J. I. Case Company: *See—*
Thedford, Guy N.; and Wells, Gary L., 4,928,459, Cl. 56-13.300.
Jabs, Gert: *See—*
Scholl, Thomas; Jabs, Gert; and Richartz, Adolf, 4,929,710, Cl. 528-205.000.
Jache, Otto. Method for producing lead accumulator with thixotropic gel. 4,929,251, Cl. 29-623.500.
Jackson, Noel E. Collapsible downrigger arm assembly 4,928,420, Cl. 43-27.400.
Jacobs, Thomas G. M.; and De Vroome, Clemens J. M., to Stork Contiweb B.V. Heating appliance with combustion air preheat. 4,929,173, Cl. 431-215.000.
Jacobson, Earl B. Negative air control unit and closure structure. 4,928,581, Cl. 98-1.500.
Jacobson, Earl B. HEPA filter module. 4,929,261, Cl. 55-213.000.
Jaeger, Eduard A.: *See—*
Levine, Anthony H.; and Jaeger, Eduard A., 4,928,954, Cl. 272-8.00N.
Jaeggi, Knut A., to Ciba-Geigy Corporation. Azacycloalkylalkanediphosphonic acids useful for treating diseases attributed to calcium metabolism disorders. 4,929,606, Cl. 514-80.000.
Jagadish, Hosagrahar V.: *See—*
Agrawal, Rakesh; and Jagadish, Hosagrahar V., 4,930,072, Cl. 364-300.000.
Jager, Andreas, to Jager, Arnold. Apparatus for aerating water. 4,929,397, Cl. 261-65.000.
Jager, Arnold: *See—*
Jager, Andreas, 4,929,397, Cl. 261-65.000.
Jain, Sangya: *See—*
Spak, Mark A.; Mammato, Donald; Durham, Dana; and Jain, Sangya, 4,929,536, Cl. 430-325.000.
Jakobsen, Katherine, to Satter, Inc. Air permeable camera case. 4,928,819, Cl. 206-316.200.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM AB. Apparatus for producing a tubular object of polyethelene terephthalate or other thermoplastic material from a tubular blank of amorphous material. 4,929,168, Cl. 425-384.000.
James River Corporation: *See—*
Rittenhouse, David A.; Neurohr, Fred; and Estridge, Doug R., 4,929,470, Cl. 427-55.000.
James River Corporation of Virginia: *See—*
Suskind, Stuart P.; and Miller, Joseph H., 4,929,498, Cl. 428-288.000.
James, Robert B., Jr.; and Kalnes, Tom N., to UOP. Process for the simultaneous hydroconversion of a first feedstock comprising unsaturated, halogenated organic compounds and a second feedstock comprising saturated, halogenated organic compounds. 4,929,781, Cl. 585-310.000.
Jamieson Film Company: *See—*
Cunningham, John A.; Prestjohn, Mark O.; Reed, Bobby P.; and Smith, Martin D., 4,929,976, Cl. 354-322.000.
Janssen, Petrus C. H.: *See—*
van den Nieuwelaar, Adrianus J.; and Janssen, Petrus C. H., 4,928,351, Cl. 17-11.000.
Janssens, Luc. Trough for soil irrigation and moistening. 4,928,426, Cl. 47-48.500.
Jao, Tze-Chi: *See—*
Powers, William J., III; Matthews, Leonard A.; and Jao, Tze-Chi, 4,929,373, Cl. 252-33.000.
Japan Aviation Electronics Industry Limited: *See—*
Ohno, Aritaka; Shitara, Kanji; and Harashima, Masakazu, 4,928,894, Cl. 242-7.090.
Jardine, Stuart, to Schlumberger Technology Corporation. Method of determining drill bit wear. 4,928,521, Cl. 73-151.000.
Jarkko, Turpeinen: *See—*
Paakkonen, Taisto; Veijo, Vainino; and Jarkko, Turpeinen, 4,929,019, Cl. 296-223.000.
Jarovitzky, Peter A.; Fu, Yun-Lung; and Dexter, Robin W., to American Cyanamid Company. Polymers and process of making same. 4,929,687, Cl. 525-328.200.
Jaworski, George: *See—*
Chun, Victor L.; Hunter, James R.; and Jaworski, George, 4,929,276, Cl. 83-552.000.
Jeffery, James E.; and Whybrow, Derek, to Boots Company, PLC. Therapeutic compound. 4,929,629, Cl. 514-646.000.
Jelich, Klaus; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, to Bayer Aktiengesellschaft. Thienyl and furyl containing derivatives. 4,929,738, Cl. 549-76.000.
Jelsma, Henk H., to Baroid Technology, Inc. Method and apparatus for setting and retrieving a deflection tool. 4,928,767, Cl. 166-377.000.
Jenkner, Erwin. Process for conveying a transport platform to a lifting table of a stacking station. 4,929,147, Cl. 414-786.000.
Jennings, Glenn A., to University of California, The Regents of the. Dynamic activity-creating data-driven computer architecture. 4,930,102, Cl. 364-900.000.
Jennings, Norman T. Water supply apparatus. 4,928,633, Cl. 119-75.000.
Jensen, Jary D., to Dow Corning Corporation. Organosiloxane compositions yielding elastomers with improved recovery following prolonged compression. 4,929,669, Cl. 524-861.000.
Jensen, Mark B. System for positioning fasteners. 4,928,867, Cl. 227-7.000.
Jerman, Franz: *See—*
Torbus, Marek; Jerman, Franz; Ladegourdie, Gerard; Lingemann, Dirk; Seiss, Willi; and Vujevic, Aleksandar, 4,929,649, Cl. 523-145.000.
Jer's Pattern Project, Inc.: *See—*
Kragt, Gerald A., 4,928,399, Cl. 33-562.000.
Jervis B. Webb Company: *See—*
Duczkowski, Edward, Jr.; and McDonald, Clayton C., 4,928,602, Cl. 104-111.000.
Jespersen, Frank, to Milliken Denmark A/S. Procedure and label for bar code marking on vulcanizable or vulcanized rubber products. 4,929,820, Cl. 235-487.000.
Jidosha Denki Kogyo Kabushiki Kaisha: *See—*
Kato, Masaru, 4,929,876, Cl. 318-444.000.
Jidosha Kiki Co., Ltd.: *See—*
Masaka, Mitusuke; Hatanaka, Koji; Maruta, Kenji; and Okazaki, Seiji, 4,929,813, Cl. 219-270.000.
Jin, Iljoon; and Lloyd, David J., to Alcan International Limited. Aluminum alloys and a method of production. 4,929,421, Cl. 420-545.000.
Jobes, David R.: *See—*
Nicolson, Susan C.; and Jobes, David R., 4,928,691, Cl. 128-633.000.
Johann, Maischberger: *See—*
Schupp, Gerhard; Tscheschlok, Klaus; and Johann, Maischberger, 4,928,386, Cl. 29-824.000.
Johannesen, Donald D.; and Taig, Alistair G., to Allied-Signal Inc. Electrically operated drum brake. 4,928,543, Cl. 475-196.000.
John Fluke Mfg. Co., Inc.: *See—*
Rysavy, Peter B.; and Fuller, Maurice J., 4,929,935, Cl. 340-712.000.
John Wyeth and Brothers Limited: *See—*
Cliffe, Ian A., 4,929,625, Cl. 514-304.000.
Johns Hopkins University, The: *See—*
Halperin, Henry; Tsitlik, Joshua; Weisfeldt, Myron; and Gelfand, Mark, 4,928,674, Cl. 128-30.200.
Johnson, David R.: *See—*
Moll, Norman G.; and Johnson, David R., 4,929,645, Cl. 521-98.000.
Johnson, Donald A.: *See—*
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., 4,929,425, Cl. 422-13.000.
Johnson, Jerry E.; and Hoerner, Clinton C., Jr., to TRW Inc. Crossarm valve seat with pulling ledge. 4,928,726, Cl. 137-327.000.
Johnson, Ralph: *See—*
Hanson, Violet; and Johnson, Ralph, 4,929,224, Cl. 493-194.000.
Johnson, Stephen P.: *See—*
Woodworth, Jonathan J.; Johnson, Stephen P.; Miller, David R.; Kester, Jeffrey J.; and Kershaw, Stanley S., Jr., 4,930,039, Cl. 361-127.000.
Johnson, Thomas H.: *See—*
Slaugh, Lynn H.; Johnson, Thomas H.; and Hoxmeier, Ronald J., 4,929,584, Cl. 502-112.000.
Johnson, Wayne A. Foldable cup holder. 4,928,873, Cl. 229-1.50H.

Johnston, Gerald, to Lenco Machines & Tool Co. Apparatus and method for separating recyclable materials. 4,929,342, Cl. 209-12.000.

Johnston, Michael D.; and Berger, Henry, to Burroughs Wellcome Co. Low pH pharmaceutical formulation containing t-PA. 4,929,444, Cl. 424-94.640.

Johnston Pump/General Valve, Inc.: *See—*
Vahala, Kerry J.; and Hoenk, Michael E., 4,929,041, Cl. 350-96.100.

Jois, Yajnanarayana H. R.: *See—*
Gibson, Harry W., and Jois, Yajnanarayana H. R., 4,929,713, Cl. 528-230.000.

Jones, Arthur L.; and McGaha, George, to Pelton & Crane Company, The. Quick-release dental light handle. 4,930,058, Cl. 362-400.000.

Jones, Elene K. Leg immobilizer-drag for training swimmers. 4,929,205, Cl. 441-60.000.

Jones, Peter W. J. Anti-reflection technique. 4,929,055, Cl. 350-276.00R.

Jones, Thomas R., to ECC International Limited. Process for treating clay minerals. 4,929,580, Cl. 501-148.000.

Jorgensen, Janine L.: *See—*
Caskey, Terrence L.; Trimmer, Johnny L.; and Jorgensen, Janine L., 4,929,259, Cl. 55-158.000.

Joshi, Narendra D.; and Moreno, Frederick E., to PruTech II. Staged low NOx premix gas turbine combustor. 4,928,481, Cl. 60-737.000.

Jouveinal S.A.: *See—*
Calvet, Alain P.; Junien, Jean-Louis; Pascal, Ives R.; Pascaud, Xavier B.; and Roman, Francois J., 4,929,614, Cl. 514-214.000.

Joyama, Norio, and Aoki, Ikumi, to Meiji Seika Kaisha, Ltd. Nutcracker. 4,928,590, Cl. 99-576.000.

Juki Corporation: *See—*
Akutsu, Hiromi, 4,928,610, Cl. 112-153.000.

Junien, Jean-Louis: *See—*
Calvet, Alain P.; Junien, Jean-Louis; Pascal, Ives R.; Pascaud, Xavier B., and Roman, Francois J., 4,929,614, Cl. 514-214.000.

Junk, Ronald K.: *See—*
Urmson, William T., Jr.; Gaslevic, Emeric; and Junk, Ronald K., 4,928,600, Cl. 104-17.100.

Junkuan, Wang: *See—*
Clausen, Martin; Rys, Paul; and Junkuan, Wang, 4,929,771, Cl. 568-798.000.

Jupiter Denisu Co., Ltd.: *See—*
Seidoh, Masami, 4,929,195, Cl. 439-610.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Takeuchi, Hiroshi; and Yoshimura, Yoshinari, 4,928,805, Cl. 192-106.200.

Kabushiki Kaisha Hokkaido Nissin: *See—*
Emura, Tatuo; and Ohba, Kiyoshi, 4,929,453, Cl. 426-63.000.
Emura, Tatuo; and Ohba, Kiyoshi, 4,929,558, Cl. 435-252.500.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Kitagawa, Kazuo; Komatsu, Fumiaki; Masaki, Takayoshi; Sawada, Yoshihisa; and Inada, Eiichi, 4,929,394, Cl. 252-633.000.

Kabushiki Kaisha Mori Seiki Seisikusho: *See—*
Yaguchi, Yoshinori; Kubota, Masahiro; and Nakaminami, Masamitsu, 4,928,381, Cl. 29-568.000.

Kabushiki Kaisha Neriki: *See—*
Daicho, Norio; Kawahara, Masakatsu; Nitta, Jiro; Miyazaki, Koji; and Yonezawa, Keitaro, 4,928,919, Cl. 251-89.000.

Kabushiki Kaisha Okazaki Seisakusho: *See—*
Taguchi, Seizo; Oketani, Toshiharu; Ohashi, Michihiro; Tanaka, Hideaki, and Terao, Hiroshi, 4,929,092, Cl. 374-183.000.

Kabushiki Kaisha Sanwa Kagaku Kenkyusho: *See—*
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, 4,929,438, Cl. 424-10.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Furuhashi, Kenshi; and Sawada, Hiroyuki, 4,929,806, Cl. 200-61.540.
Yamada, Kazuhiko, 4,928,779, Cl. 180-178.000.

Kabushiki Kaisha Toshiba: *See—*
Egawa, Jiro; Tanimoto, Koji; and Miura, Kunihiko, 4,930,087, Cl. 364-518.000.
Fukasawa, Yoshihito, 4,930,086, Cl. 364-468.000.
Imamura, Kaoru, 4,928,838, Cl. 219-121.690.
Inoue, Toshinobu, 4,929,160, Cl. 418-55.000.
Kajihara, Shigehiro, 4,929,085, Cl. 364-518.000.
Kanda, Shuhei; Hirota, Mitugu; and Narushima, Teruo, 4,930,024, Cl. 360-10.100.
Kushiyama, Natsuki, 4,929,945, Cl. 341-50.000.
Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao; Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, 4,930,105, Cl. 365-185.000.
Morita, Isao, 4,930,029, Cl. 360-97.010.
Ohkawa, Hideki; and Ozawa, Norio, 4,929,485, Cl. 428-64.000.
Shiobara, Yashuhisa, 4,930,121, Cl. 370-85.400.
Tanaka, Shigeru; and Miura, Kazutoshi, 4,930,064, Cl. 363-161.000.
Tominaga, Mamoru; Kokado, Naoyuki; Gonpei, Katsuhiro; Nira, Hisami; and Taya, Akira, 4,929,061, Cl. 350-338.000.
Tsunoda, Yoshiaki; and Kanaya, Masatoshi, 4,929,563, Cl. 437-6.000.
Yonezawa, Akihiro; Sasaki, Hiroki; Mitsuyuki, Yoichiro; Mori, Yasuki; and Ishigami, Toshihiko, 4,929,869, Cl. 313-639.000.
Yoshikawa, Kuniyoshi, 4,929,988, Cl. 357-23.500.

Kaczmarek, James S.; and Kareta, Kenneth C., to Permaflex Company. Non-synchronous assembly system. 4,928,383, Cl. 29-711.000.

Kaeding, Warren W.; and Valyocsik, Ernest W., to Mobil Oil Corporation. Catalytic conversion of propane to ethylene over ZSM-23. 4,929,790, Cl. 585-651.000.

Kaeding, Warren W., to Mobil Oil Corporation. Catalytic conversion of propane to ethylene over ZSM-50. 4,929,791, Cl. 585-651.000.

Kagami, Isao: *See—*
Hirayama, Takanobu; Funahashi, Hiroyuki; Yokota, Eiji; Uehara, Mitsuyoshi; Kagami, Isao; Hasegawa, Makoto; and Mizuno, Masaru, 4,929,105, Cl. 400-625.000.

Kageyama, Shuhei; Suzuki, Takahiko; and Yamagishi, Yuichi, to Kotobuki & Co., Ltd. Swing-type mechanical pencil. 4,929,107, Cl. 401-65.000.

Kageyama, Tomoaki: *See—*
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Ishikura, Keizaburo; Sera, Akio; and Suehiro, Junji, 4,929,903, Cl. 324-544.000.

Kai, Masakatsu: *See—*
Nakamura, Nobuaki; Hirose, Yukimi; Kai, Masakatsu, and Itonaga, Makoto, 4,929,822, Cl. 250-201.400.

Kai, Yasunobu: *See—*
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.

Kai, Yukio: *See—*
Watanabe, Tadahiko; Shobu, Kazuhisa; Kai, Yukio; Yamamoto, Hideki; Sudoh, Eiichi; Yagishita, Osamu; and Hayakawa, Junshiro, 4,929,417, Cl. 419-12.000.

Kaida, Hiroshi: *See—*
Awano, Hikaru; Asai, Seiichi; Kaneko, Katsuo; Kaida, Hiroshi; and Yoshida, Fujio, 4,928,882, Cl. 239-112.000.

Kaijo Denki Co. Ltd.: *See—*
Ichino, Kouji, 4,928,534, Cl. 73-861.180.

Kainosho, Keiji; Shimakura, Haruhito; and Oda, Osamu, to Nippon Mining Co., Ltd. Method for producing compound semiconductor single crystals and method for producing compound semiconductor devices. 4,929,564, Cl. 437-20.000.

Kaiser, Robert E.: *See—*
Walton, Paul B., Keough, James; Demers, Richard L.; Denny, Leland A., Jr.; Kaiser, Robert E.; Moses, Cornelius, Jr.; and Wagh, Vijay N., 4,930,151, Cl. 379-94.000.

Kajihara, Shigehiro, to Kabushiki Kaisha Toshiba. Image data rotation processing method and apparatus therefor. 4,929,085, Cl. 364-518.000.

Kajimoto, Nobuyuki: *See—*
Nagata, Teruyuki; Okazaki, Koju; Kajimoto, Nobuyuki; Miura, Tohru; Kanemura, Yoshinobu; and Sasagawa, Katsuyoshi, 4,929,707, Cl. 528-76.000.

Kajita, Toshio: *See—*
Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi; Oda, Mitsunori; and Tanaka, Akinori, 4,929,267, Cl. 71-77.000.

Kakiguchi, Yoshitomi: *See—*
Morita, Yasuhiko; Kakiguchi, Yoshitomi; and Izuhara, Seiji, 4,928,378, Cl. 252-105.000.

Kakihara, Kenji: *See—*
Mori, Kei; Akaishi, Hakaru; Kakihara, Kenji; and Kitayama, Yoshiro, 4,928,666, Cl. 126-440.000.

Kako, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection controller for an internal combustion engine. 4,928,655, Cl. 123-488.000.

Kali-Chemie AG: *See—*
Antranikian, Garabed; and Gottschalk, Gerhard, 4,929,557, Cl. 435-202.000.

Kalitzki, Siegfried; Peters, Josef; and Schurmann, Gottfried, to W. Schlafhorst & Co. Process for forming a fiber or yarn contacted element of a textile machine. 4,928,477, Cl. 57-416.000.

Kallevig, Bruce: *See—*
Walsh, Warren J.; and Kallevig, Bruce, 4,928,722, Cl. 137-881.000.

Kalnes, Tom N.: *See—*
James, Robert B., Jr., and Kalnes, Tom N., 4,929,781, Cl. 585-310.000.

Kalra, Varinder K.; and Spalding, Keith A., to Cooper Industries, Inc. Automatable fuse. 4,929,921, Cl. 337-233.000.

Kalyanaraman, Palaiyur S.: *See—*
Gupta, Balaram; and Kalyanaraman, Palaiyur S., 4,929,537, Cl. 430-325.000.

Kameda, Takashi: *See—*
Takahashi, Kunimasa; Kameda, Takashi; and Shibatani, Haruo, 4,929,404, Cl. 264-29.500.

Kamegaya, Shigeru: *See—*
Matayoshi, Yutaka; Yoshimura, Toru; Kamegaya, Shigeru; and Hamai, Kyugo, 4,928,650, Cl. 123-90.240.

Kameoka, Kimitaka: *See—*
Takahashi, Toshiro; Kameoka, Kimitaka; and Inagaki, Yoshio, 4,929,535, Cl. 430-264.000.

Kamiya, Takashi: *See—*
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.

Kamiyama, Kozi: *See—*
Hatori, Masami, Nozaki, Nobuharu; and Kamiyama, Kozi, 4,929,042, Cl. 350-96.130.

Kampichler, Guenter; and Eder, Erich, to Motorenfabrik Hatz GmbH & Co. KG. Starter having a manual drive for internal combustion engines. 4,928,643, Cl. 123-185.00B

Kanada, Katsumi: *See—*
Hayashi, Yoshio; Nakamoto, Tetsuo; Kanada, Katsumi; and Kondo, Yoshikazu, 4,929,171, Cl. 427-54.100.

Kanafani, Hanny; Patrick, Bruce M.; and Atwell, William A., to Pillsbury Company, The. Control of symmetry of microwave cakes. 4,929,465, Cl. 426-552.000.

Kanamori, Katsuhiro; Kanno, Yoshimitsu; Kurosawa, Toshiharu; Kawakami, Hidehiko; Naka, Motohiko; and Kotera, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Color correction method for color copier utilizing correction table derived from printed color samples. 4,929,978, Cl. 355-38.000.

Kanaoka, Masaharu; Kawanaka, Chigusa; Negoro, Takaharu; and Agui, Hideo, to Ohgen Research Laboratories, Limited. Antitumor protein gene of streptococcus pyogenes Su, plasmids containing the gene, transformant cells harboring the plasmids, and process for producing the antitumor protein. 4,929,547, Cl. 435-69.100.

Kanaya, Masatoshi: *See—*
Tsunoda, Yoshiaki; and Kanaya, Masatoshi, 4,929,563, Cl. 437-6.000.

Kanazawa, Minoru: *See—*
Miyoshi, Takahito; Kanazawa, Minoru; Sugisaki, Tsutomu; Yamada, Takuzi; and Okuzawa, Yasutoshi, 4,930,032, Cl. 360-132.000.

Kanda, Shuhei; Hirota, Mitugu; and Narushima, Teruo, to Kabushiki Kaisha Toshiba. Variable speed magnetic medium recording and playback apparatus. 4,930,024, Cl. 360-10.100.

Kanebo Co., Ltd.: *See—*
Fuse, Toshikazu; Yamamoto, Atsushi; and Sano, Junji, 4,929,248, Cl. 8-128.100.

Kanebo Ltd.: *See—*
Hagiwara, Zenji; Ando, Satoshi; and Nohara, Saburo, 4,929,431, Cl. 423-328.000.

Kaneko, Katsuo: *See—*
Awano, Hikaru; Asai, Seiichi; Kaneko, Katsuo; Kaida, Hiroshi; and Yoshida, Fujio, 4,928,882, Cl. 239-112.000.

Kaneko, Tadashi: *See—*
Shinya, Yoshiyuki; Tabara, Yoshitaka; Okuno, Itaru; Kaneko, Tadashi; and Watanabe, Tomomi, 4,928,652, Cl. 123-417.000.

Kanemitsu, Setsuo: *See—*
Otomura, Keiichiro; Yamashita, Takayuki; Kanemitsu, Setsuo; Nakabayashi, Shigetoshi; and Miki, Hideo, 4,929,430, Cl. 423-11.000.

Kanemura, Yoshinobu: *See—*
Nagata, Teruyuki; Okazaki, Koju; Kajimoto, Nobuyuki; Miura, Tohru; Kanemura, Yoshinobu; and Sasagawa, Katsuyoshi, 4,929,707, Cl. 528-76.000.

Kanno, Hideo: *See—*
Itahana, Tsutomu; Kanno, Hideo; Ono, Tetsuo; Furuta, Futoru; Kobayashi, Susumu; Akimoto, Ryosaku; and Tanigaki, Ryuhei, 4,928,723, Cl. 137-116.300.

Kanno, Tesuo: *See—*
Ainoya, Masayuki; Ishihara, Takeyuki; Kanno, Tesuo; Kikuchi, Takahiro; Mori, Seiichi; Nobumori, Shogo; and Shirakawa, Junji, 4,929,982, Cl. 355-311.000.

Kanno, Yoshimitsu: *See—*
Kanamori, Katsuhiro; Kanno, Yoshimitsu; Kurosawa, Toshiharu; Kawakami, Hidehiko; Naka, Motohiko, and Kotera, Hiroaki, 4,929,978, Cl. 355-38.000.

Kanto, Jumpei; and Eguchi, Hiroshi, to Dai Nippon Insatsu Kabushiki Kaisha. Heat transfer sheet. 4,929,592, Cl. 503-227.000.

Kantz, Dieter, to Siemens Aktiengesellschaft. Terminal assembly for an integrated semiconductor circuit. 4,930,000, Cl. 357-68.000.

Karasev, Nikolai M.: *See—*
Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B.; Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K., 4,929,416, Cl. 420-12.000.

Kareta, Kenneth C.: *See—*
Kaczmarek, James S.; and Kareta, Kenneth C., 4,928,383, Cl. 29-711.000.

Karlgaard, Wayne A.: *See—*
Harwood, Jon W.; Karlgaard, Wayne A.; and Clegg, Michael W., 4,928,372, Cl. 29-890.080.

Karsner, Grant G.: *See—*
Altman, Lawrence J.; Choi, Byung C.; and Karsner, Grant G., 4,929,335, Cl. 208-106.000.

Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Ichisa, Nobuaki; and Manabe, Mitsuo, to Fanuc Ltd. Laser oscillator device. 4,930,135, Cl. 372-33.000.

Kasahara, Kazuhiro: *See—*
Niizato, Tomonori; Tanai, Tsuneo; Kasahara, Kazuhiro; Saka, Tsutomu; and Oikawa, Toshihiro, 4,928,641, Cl. 123-90.160.

Kasai, Kazumi, to Yoshida Kogyo K. K. Buckle. 4,928,365, Cl. 24-635.000.

Kastanis, Paraskevas N. Bi-directional roof mounted car protective device. 4,929,016, Cl. 296-136.000.

Kasugai, Joji, to Toyoda Gosei Co., Ltd. Air cleaner. 4,929,263, Cl. 55-502.000.

Kataoka, Keiji: *See—*
Arimoto, Akira; Ishikawa, Sachiko; and Kataoka, Keiji, 4,929,044, Cl. 350-96.130.

Kataoka, Shoei: *See—*
Sugihara, Takashi; Uda, Kazutaka; Tahuchi, Hiroki; Inami, Yasuhiko; Hijikigawa, Masaya; and Kataoka, Shoei, 4,928,513, Cl. 73-1.00G.

Katayama, Satoshi: *See—*
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.

Katayose, Tsuyoshi; and Machashi, Yukio, to NEC Corporation. Data processor having different interrupt processing modes. 4,930,068, Cl. 364-200.000.

Katchka, Jay R.: *See—*
Kelly, Samuel T.; and Katchka, Jay R., 4,928,721, Cl. 137-66.000.

Kato, Eiichi; Ishii, Kazuo; Itakura, Kyosuke; and Sera, Hidefumi, to Fuji Photo Film Co., Ltd. Electrophotographic lithographic printing plate precursor. 4,929,526, Cl. 430-87.000.

Kato, Eiichi; Ohno, Shigeru; Ishii, Kazuo; and Itakura, Ryosuke, to Fuji Photo Film Co., Ltd. Method of image formation which includes scanning exposure process. 4,929,527, Cl. 430-92.000.

Kato, Hironori: *See—*
Bannai, Hiroyuki; Ida, Yuichi; and Kato, Hironori, 4,928,901, Cl. 242-85.000.

Kato, Katsunori: *See—*
Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, 4,929,539, Cl. 430-553.000.

Kato, Makoto; Saimi, Tetsuo; and Ohara, Shunji, to Matsushita Electric Industrial Co., Ltd. Optical pickup head with holographic servo signal detection using a spot size detection system. 4,929,823, Cl. 250-201.500.

Kato, Masaru, to Jidosha Denki Kogyo Kabushiki Kaisha. Electric windshield wiping apparatus. 4,929,876, Cl. 318-444.000.

Kato, Nobuhide; and Hamada, Yasuhiko, to NGK Insulators, Ltd. Oxygen sensor. 4,929,331, Cl. 204-426.000.

Kato, Toshifumi, to Pioneer Electronic Corporation. Mobile speaker system. 4,928,787, Cl. 181-141.000.

Kato, Toshio: *See—*
Shibazaki, Osamu; Miyazawa, Yorikatu; and Kato, Toshio, 4,928,826, Cl. 206-409.000.

Katsu, Kanemasa: *See—*
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.

Katz, Ronald A., to First Data Resources Inc. Telephonic interface control system. 4,930,150, Cl. 379-93.000.

Kaufmann, John W.; Swidwa, Kenneth J.; and Hornak, Leonard P., to Westinghouse Electric Corp. Television alignment of mast assembly in refueling of nuclear reactor. 4,929,413, Cl. 376-268.000.

Kaufmann, Meinolph: *See—*
Bohnert, Klaus; Kaufmann, Meinolph; and Nehring, Jurgen, 4,929,830, Cl. 250-227.140.

Kawabata, Juheiji: *See—*
Inoue, Toshio; Mine, Takayuki; Izutsu, Hitoshi; Yamaguchi, Toshihide; Kobata, Fumihiro; and Kawabata, Juheiji, 4,929,665, Cl. 524-500.000.

Kawabe, Masaki: *See—*
Watanabe, Tsutomu; Sagiyama, Masari; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,323, Cl. 204-206.000.
Watanabe, Tsutomu; Sagiyama, Masaru; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,324, Cl. 204-206.000.

Kawada, Haruki: *See—*
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.

Kawahara, Masakatsu: *See—*
Daicho, Norio; Kawahara, Masakatsu; Nitta, Jiro; Miyazaki, Koji; and Yonezawa, Keitaro, 4,928,919, Cl. 251-89.000.

Kawahara, Tetsuya: *See—*
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.

Kawai, Kazumi: *See—*
Tanaka, Hiroyuki; Uto, Kuniharu; Kawai, Kazumi; Shaura, Tsuneo; and Yasuhuku, Motonobu, 4,929,221, Cl. 474-205.000.

Kawai, Michio: *See—*
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl. 354-420.000.

Kawai, Nobuyuki; and Nakamura, Mitsuhiro, to Toshiba Silicone Co., Ltd. Push button switch. 4,929,804, Cl. 200-5.00A.

Kawai, Syuji: *See—*
Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, 4,929,482, Cl. 428-36.400.

Kawai, Toshikazu: *See—*
Gotoh, Yoshihiko; and Kawai, Toshikazu, 4,929,753, Cl. 562-411.000.

Kawakami, Hidehiko: *See—*
Kanamori, Katsuhiro; Kanno, Yoshimitsu; Kurosawa, Toshiharu; Kawakami, Hidehiko; Naka, Motohiko; and Kotera, Hiroaki, 4,929,978, Cl. 355-38.000.

Kawakami, Shin; Haruyama, Satoshi; and Okonogi, Hirotaka, to Nippon CMK Corp. Printed wiring board. 4,929,491, Cl. 428-195.000.

Kawanaka, Chigusa: *See—*
Kanaoka, Masaharu; Kawanaka, Chigusa; Negoro, Takaharu; and Agui, Hideo, 4,929,547, Cl. 435-69.100.

Kawano, Mutsumi: *See—*
Takeda, Hisao; and Kawano, Mutsumi, 4,929,655, Cl. 524-458.000.

Kawano, Shizuo, to Honda Giken Kogyo Kabushiki Kaisha. Rear wheel suspension device for vehicles of small size. 4,928,781, Cl. 180-227.000.
Kawarabashi, Tsukasa: *See*—
Matsui, Isamu; Uehara, Masao; Noshi, Shinji; and Kawarabashi, Tsukasa, 4,928,475, Cl. 57-264.000.
Kawasaki, Kiyoshi, to Tachi-S Company, Ltd. Automatic sewing apparatus. 4,928,609, Cl. 112-121.120.
Kawase, Hiroyasu, to Mitsubishi Denki Kabushiki Kaisha. Wire cut electric discharge machine. 4,929,810, Cl. 219-69.120.
Kawata, Koichi: *See*—
Masaki, Takeshi; Kawata, Koichi; and Sakagaito, Yukuo, 4,928,435, Cl. 51-55.000.
Kayanoki, Hisayuki: *See*—
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki, Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.
Kaye, Howard, to Designs For Leisure, Ltd. Ornament displaying furniture. 4,929,021, Cl. 297-193.000
Kaylor, William R.; and Fisher, Frederick A., to North American Philips Corporation. Peak radiated energy locator. 4,929,960, Cl. 343-703.000.
Kazecki, Henry L.; and Baker, James C., to Motorola, Inc. Time division multiplex system suited for burst analog transmission. 4,930,126, Cl. 370-109.000.
Keating, Bruce E.: *See*—
Yeates, Richard P.; Keating, Bruce E.; and Halliar, William R., 4,929,132, Cl. 410-56.000.
Keblys, Kestutis A.; Ao, Meng-Sheng; and Burton, Lester P. J., to Ehtyl Corporation. Transhalogenation of halophosphorus compounds. 4,929,745, Cl. 558-84.000.
Keesen, Heinz-Werner: *See*—
Oberjatzas, Gunter; and Keesen, Heinz-Werner, 4,930,025, Cl. 360-64.000.
Keesey, Charles R.; and Flood, Ted C., to International Baler Corp. Bale-opening method and apparatus. 4,929,141, Cl. 414-412.000
Kelley, Richard E., Sr.: *See*—
Goodman, Ronald L.; and Kelley, Richard E., Sr., 4,928,443, Cl. 52-58.000.
Kelly, Samuel T.; and Katchka, Jay R. Fuel control valve construction, parts therefor and methods. 4,928,721, Cl. 137-66.000
Kemper, Nicolaas R.: *See*—
Koster, Marinus P.; Van Der Hoek, Willem; Kemper, Nicolaas R. and Soemers, Hermanus M. J. R., 4,929,146, Cl. 414-744.500.
Kenaston, Kenneth R.: *See*—
Wade, Mark G.; and Kenaston, Kenneth R., 4,929,350, Cl. 210-157.000.
Kendall Company, The: *See*—
Chen, Samuel J., 4,929,660, Cl. 524-236.000.
Kennametal Inc.: *See*—
Massa, Ted R.; and Siddle, David R., 4,928,373, Cl. 29-278.000.
Kennedy, Joseph P.; and Mishra, Munmaya K., to University of Akron Living polymerization of olefin to end-functionalized polymers. 4,929,683, Cl. 525-268.000.
Kennen, Henricus J.: *See*—
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 4,929,911, Cl. 330-264.000.
Keough, James: *See*—
Walton, Paul B.; Keough, James; Demers, Richard L.; Denny, Leland A., Jr.; Kaiser, Robert E.; Moses, Cornellius, Jr.; and Wagh, Vijay N., 4,930,151, Cl. 379-94.000.
Kerekjarto, Bela: *See*—
Lang, Hans-Jochen; Hropot, Max; Granzer, Ernold; and Kerekjarto, Bela, 4,929,643, Cl. 514-603.000.
Kerle, Edward J.: *See*—
Gauchel, James V.; Wilson, Edward L.; and Kerle, Edward J., 4,929,651, Cl. 523-505.000.
Kern, Ronald D.: *See*—
Thomas, James M.; and Kern, Ronald D., 4,929,367, Cl. 252-8.800.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Gat-Liquornik, Martin; and Naoumidis, Aristides, 4,928,870, Cl. 228-107.000.
Kerr, Stuart R., III; and Moore, James E., to General Electric Company. Coated polycarbonate articles. 4,929,506, Cl. 428-412.000.
Kerr, Walter B.: *See*—
Lindsay, Mitchell H.; and Kerr, Walter B., 4,928,491, Cl. 60-734.000.
Kerrigan, James E., to Duo-Fast Corporation. Fastener driving tool. 4,928,868, Cl. 227-131.000.
Kershaw, Stanley S., Jr.: *See*—
Woodworth, Jonathan J.; Johnson, Stephen P.; Miller, David R.; Kester, Jeffrey J.; and Kershaw, Stanley S., Jr., 4,930,039, Cl. 361-127.000.
Kester, Jeffrey J.: *See*—
Woodworth, Jonathan J.; Johnson, Stephen P.; Miller, David R.; Kester, Jeffrey J.; and Kershaw, Stanley S., Jr., 4,930,039, Cl. 361-127.000.
Khoury, Issam A.; and Langer, Horst G., to Dow Chemical Company, The. Melt processable, green, ceramic precursor powder. 4,929,575, Cl. 501-137.000.
Khozai, Bahram. Shoe cover package. 4,928,849, Cl. 221-45.000
Kibun Co., Ltd.: *See*—
Wakayama, Sachio; Ishikawa, Fumiyasu; and Oishi, Kunio, 4,929,548, Cl. 435-71.200.
Kictec Incorporation: *See*—
Niimi, Kikuo, 4,929,942, Cl. 340-908.100.
Kida, Kenji, to Kormori Printing Machinery Co., Ltd. Sheet reversing unit for sheet printing press. 4,928,586, Cl. 101-230.000.
Kida, Tohru: *See*—
Sugihara, Kanji; Yamamoto, Motohiro; Kida, Tohru; and Fukazawa, Minoru, 4,929,472, Cl. 427-215.000.
Kidd, Stephen: *See*—
Diebolt, Richard A.; Kidd, Stephen; and Rivers, Donald E., Jr., 4,929,130, Cl. 409-136.000.
Kido, Keishiro; and Tezuka, Sigeru, to Fuji Photo Film, Co., Ltd. Method of dispensing coagulative test liquid. 4,928,540, Cl. 73-864.110.
Kientsch-Engel, Rosemarie; Worner, Walter; and Kleinhammer, Gerd, to Boehringer Mannheim GmbH. Process for the determination of an antibody in human body fluids. 4,929,543, Cl. 435-5.000.
Kiewit, David A., to A. C. Neilsen Company. Method and apparatus for identifying individual members of a marketing and viewing audience. 4,930,011, Cl. 358-84.000.
Kihara, Kazuyuki: *See*—
Ando, Tsuyoshi; Hirono, Nakayasu; Nakao, Hirotoshi; Mito, Akio; Kihara, Kazuyuki; Hatakenaka, Kosuke; and Ogawa, Hiroshi 4,928,730, Cl. 137-554.000.
Kiiskila, Erkki J.; and Virkola, Nils E., to A. Ahlstrom Corporation. Method of decreasing black liquor viscosity 4,929,307, Cl. 159-47.300.
Kikuchi, Hiroshi: *See*—
Mizutani, Minoru; Kikuchi, Hiroshi; Watanabe, Shoichi; Hayashi, Kuniharu; and Maekawa, Masanori, 4,929,102, Cl. 400-248.000.
Kikuchi, Masamichi: *See*—
Yuchi, Sadataka; Machida, Haruchika; Matsuoka, Naoya; and Kikuchi, Masamichi, 4,930,095, Cl. 364-571.010.
Kikuchi, Takahiro: *See*—
Ainoya, Masayuki; Ishihara, Takeyuki; Kanno, Tesuo; Kikuchi, Takahiro; Mori, Seiichi; Nobumori, Shogo; and Shirakawa, Junji, 4,929,982, Cl. 355-311.000.
Kikuchi, Yasushi: *See*—
Akita, Shuichi; Suzuki, Fumitoshi; Kikuchi, Yasushi; and Oishi, Hideyuki, 4,929,679, Cl. 525-194.000.
Kilhefiner, Paul T., III: *See*—
King, John C. W.; Bowe, Donald J.; and Kilhefiner, Paul T., III, 4,929,283, Cl. 148-13.200.
Kim, Byeng-yun; and Park, Yong-bo, to Samsung Electronics, Co., Ltd. Input translating circuit for CMOS device. 4,929,853, Cl. 307-475.000.
Kim, Dong G.: *See*—
Park, Hyung M.; and Kim, Dong G., 4,929,567, Cl. 437-41.000.
Kimball, Dorr; Cox, Michael G.; and Cabison, Manuel R. DC ground fault detection. 4,929,901, Cl. 324-529.000.
Kimberly-Clark Corporation: *See*—
Midkiff, David G.; Rippl, Carl G.; Twyman, Nancy D.; and Wahlquist, Joseph D., 4,929,480, Cl. 428-35.600.
Kiminami, Ikuo; Sakamoto, Hideyuki; and Nose, Toshimitsu, to Nissan Motor Company, Limited. Automatic air conditioner system with variable displacement compressor for automotive vehicles. 4,928,499, Cl. 62-186.000.
Kimoto, Tetsuo; and Abe, Yoshinori, to Konica Corporation. Method and apparatus for processing image. 4,929,979, Cl. 355-38.000.
Kimura, Hideaki: *See*—
Yazawa, Hiromi; Inoda, Masahiro; and Kimura, Hideaki, 4,930,016, Cl. 358-296.000.
Kimura, Katsutaka: *See*—
Tanaka, Hitoshi; Hori, Ryoichi; Itoh, Kiyoo; Kimura, Katsutaka; and Shimohigashi, Katsuhiro, 4,930,112, Cl. 365-226.000.
Kimura, Tetsuya; Fujii, Toshihiro; and Nii, Hiroki, to Hayakawa Rubber Co., Ltd. Method of forming a tentative surface protective coating. 4,929,469, Cl. 427-54.100.
Kimura, Toshiaki: *See*—
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.
Kimura, Toshio; Okano, Yoshihiro; Otani, Masahiro; and Miyamoto, Shigenobu, to Yokogawa Electric Corporation. Pen recorder moved according to a digital servo controller. 4,930,090, Cl. 364-520.000.
Kinder, Jay. Construction safety netting. 4,928,929, Cl. 256-24.000.
King, Jeffrey F.: *See*—
Matthews, Charles W.; Batman, Eric S.; and King, Jeffrey F., 4,929,770, Cl. 568-756.000.
King, John C. W.; Bowe, Donald J.; and Kilhefiner, Paul T., III, to Air Products and Chemicals, Inc. Vapor phase artificial aging of metal alloys using fluorochemicals. 4,929,283, Cl. 148-13.200.
King, John S. Fruit picking assembly 4,928,461, Cl. 56-339.000.
Kinneberg, Bruce: *See*—
Gilbertson, Thomas A.; Meyers, Michael R.; and Kinneberg, Bruce, 4,928,493, Cl. 62-185.000.
Kino, Tohru: *See*—
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 4,929,611, Cl. 514-183.000.
Kinoshita, Jiro: *See*—
Yonekura, Mikio; and Kinoshita, Jiro, 4,930,070, Cl. 364-200.000.
Kinoshita, Koichi. Method of increasing sensitivity of digital photosensitive member. 4,929,529, Cl. 430-127.000.

Kirsch, Carol L. Garment-greeting card combination. 4,928,831, Cl. 206-575.000.
Kirsch, Wolff M.; Zhu, Yong H.; and Cushman, Robert B., to University of New Mexico. Surgical clip and applier. 4,929,240, Cl. 606-151.000.
Kirven, Bobby: *See*—
Evangelista, Donato D.; LaTour, Norman E.; and Kirven, Bobby, 4,928,548, Cl. 271-110.000.
Kiselev, Vladimir B.: *See*—
Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B.; Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K., 4,929,416, Cl. 420-12.000.
Kishi, Noriyuki: *See*—
Inoue, Kazuo; Kishi, Noriyuki; and Akiyama, Eitetsu, 4,928,489, Cl. 60-602.000.
Kishida, Nobuhiro: *See*—
Takakusaki, Nobuyuki; Mizutani, Yohji; Kishida, Nobuhiro; and Hosokawa, Manabu, 4,929,450, Cl. 425-526.000.
Kissinger, Mark R. Scouring pad tool. 4,928,343, Cl. 15-209.00D
Kister, Horst: *See*—
Schult, Klaus; Kister, Horst; and Quenzer, Michael, 4,928,531, Cl. 73-855.000.
Kita, Jun'ichiro: *See*—
Koda, Akihide; Kita, Jun'ichiro; Kuroki, Yoshiaki; Fujiwara, Hiroshi; Takamura, Shinji; and Yamano, Kayoko, 4,929,618, Cl. 514-253.000.
Kita, Tetsuo, to Honda Giken Kogyo Kabushiki Kaisha. Joint structure for fabric web having high modulus of elasticity. 4,928,334, Cl. 5-191.000.
Kitagawa, Kazuo; Komatsu, Fumiaki; Masaki, Takayoshi; Sawada, Yoshihisa; and Inada, Eiichi, to Kabushiki Kaisha Kobe Seiko Sho; and Doryokuro Kakunenryo Kaihatsu Jigyodan. Process for compacting radioactive metal wastes. 4,929,394, Cl. 252-633.000.
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, to Sumitomo Chemical Company Limited; and Nippon Sheet Glass Co., Ltd. Light control sheets. 4,929,523, Cl. 430-4.000.
Kitayama, Yoshiro: *See*—
Mori, Kei; Akaishi, Hakaru; Kakihara, Kenji; and Kitayama, Yoshiro, 4,928,666, Cl. 126-440.000.
Kitazume, Tomoya; Yamazaki, Takashi; and Rin, Seiten, to Showa Shell Sekiyu Kabushiki Kaisha. Fluorine-containing carbonyl compounds and method for preparing the same. 4,929,760, Cl. 568-308.000.
Kite, Joseph S., III: *See*—
Conaghan, Thomas B.; Gladfelter, Harry F.; Kite, Joseph S., III; and Tresslar, Marie C., 4,929,478, Cl. 428-35.100.
Kitoh, Kyosuke: *See*—
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.
Kittrell, James M.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,929,476, Cl. 428-34.200.
Kittrell, Wiley A.: *See*—
Parks, Lee R.; and Kittrell, Wiley A., 4,928,505, Cl. 68-253.00R.
Kivipelto, Pekka J., to Neles Oy. Valve. 4,928,924, Cl. 251-315.000.
Klauke, Erich: *See*—
Forster, Heinz; Beck, Gunther; Klauke, Erich; Santel, Hans-Joachim; and Schmidt, Robert R., 4,929,743, Cl. 548-187.000.
Klawe, Ernst, to Friedrich Maurer Sohne GmbH & Co. KG. Pot-type bearing for constructions such as bridges or the like. 4,928,339, Cl. 14-16.100.
Kleinhammer, Gerd: *See*—
Kientsch-Engel, Rosemarie; Worner, Walter, and Kleinhammer, Gerd, 4,929,543, Cl. 435-5.000.
Kleinschmidt, Michael, to Litef GmbH. Method for determining the heading of an aircraft. 4,930,085, Cl. 364-449.000.
Kletecka, George; Lai, John T.; and Son, Pyong N., to BF Goodrich Company, The. Stabilized pigmented polypropylene fiber resistant to gas fade. 4,929,653, Cl. 524-96.000.
Klier, Shimon; and Novik, Ofer, to Shimon Klier. Light transmissive insulation apparatus. 4,928,665, Cl. 126-415.000.
Klinkmann, Kurt; Herzhoff, Michael; and Burmeister, Gerhard, to Bayer Aktiengesellschaft. Process for the preparation of optionally substituted benzyl-benzenes. 4,929,784, Cl. 585-422.000.
Kljuev, Vladimir V.; Kozlov, Valery S.; Volodchenko, Dmitry B.; Stepanenko, Alexandr V.; Baranovsky, Vladimir I.; Korolkov, Mikhail I.; and Semenov, Orest S. Flaw detector for magnetographic quality inspection. 4,930,026, Cl. 360-67.000.
Knafla, Roy T.: *See*—
Gerster, John F.; and Knafla, Roy T., 4,929,624, Cl. 514-293.000.
Kneller, James F.: *See*—
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., 4,929,425, Cl. 422-13.000.
Knight, Jeffrey J. Dispensing container. 4,928,860, Cl. 222-466.000.
Knus, Jean A.: *See*—
Mast, Fred; and Knus, Jean A., 4,929,084, Cl. 356-446.000.
Knutsson, Maud I. C., to Ewos Aktiebolag. Food and feedstuff. 4,929,466, Cl. 426-615.000.
Kobashi, Rikizo; Takase, Shigeyuki; Enomoto, Hiroyuki; Hayasaki, Yasushi; Kobayashi, Toyohisa; and Yamazaki, Shingo, to Nippon Oil and Fats Co., Ltd.; and PPG Industries, Inc. Method for modifying the surface of polycarbonate resin. 4,929,685, Cl. 525-277.000.
Kobata, Fumihiro: *See*—
Inoue, Toshio; Mine, Takayuki; Izutsu, Hitoshi; Yamaguchi, Toshihide; Kobata, Fumihiro; and Kawabata, Juheiji, 4,929,665, Cl. 524-500.000.
Kobayashi, Ichiro: *See*—
Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao; Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, 4,930,105, Cl. 365-185.000.
Kobayashi, Kenji: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Natto, Masataka, 4,928,941, Cl. 270-53.000.
Kobayashi, Kenzo; Iwagaki, Yutaka; Hasegawa, Mitsuyo; and Suganuma, Kazushi, to Fujitsu Limited. Duplex system of transmission lines in a loop network. 4,930,119, Cl. 370-16.100.
Kobayashi, Nobuaki: *See*—
Suwa, Toshio; Kobayashi, Nobuaki; and Hirano, Takashi, 4,928,605, Cl. 110-261.000.
Kobayashi, Seizo: *See*—
Matsubara, Saburo; Gohshi, Yoshihiro; Kobayashi, Seizo; and Usui, Katsumi, 4,929,680, Cl. 525-240.000.
Kobayashi, Susumu: *See*—
Itahana, Tsutomu; Kanno, Hideo; Ono, Tetsuo; Furuta, Futoru; Kobayashi, Susumu; Akimoto, Ryosaku; and Tanigaki, Ryuhei, 4,928,723, Cl. 137-116.300.
Kobayashi, Toyohisa: *See*—
Kobashi, Rikizo; Takase, Shigeyuki; Enomoto, Hiroyuki; Hayasaki, Yasushi; Kobayashi, Toyohisa; and Yamazaki, Shingo, 4,929,685, Cl. 525-277.000.
Kobayashi, Yoshiyuki: *See*—
Ohmura, Yukihiro; Kobayashi, Yoshiyuki; Hosoi, Keiji; and Shimoda, Kazuharu, 4,928,659, Cl. 123-588.000.
Koch, Heinrich; and Fuchs, Jugen, to B. Braun Melsungen AG. Catheter coupling. 4,929,243, Cl. 604-283.000.
Kocks Technik GmbH & Co.: *See*—
Staat, Karlhans; and Moltner, Hermann, 4,928,507, Cl. 72-38.000.
Kocznar, Wolfram; and Wallerstorfer, Kurt, to Skidata Computer G.m.b.H. Method of forgery-protecting a data carrier, a forgery-protected data carrier and apparatuses for handling, processing and monitoring the data carrier. 4,929,821, Cl. 235-493.000.
Koda, Akihide; Kita, Jun'ichiro; Kuroki, Yoshiaki; Fujiwara, Hiroshi; Takamura, Shinji; and Yamano, Kayoko, to Ube Industries, Ltd. Piperdine and piperazine derivatives, and antihistaminic pharmaceutical compositions containing the same. 4,929,618, Cl. 514-253.000.
Koenitzer, Bernd A., to Exxon Research and Engineering Company. Polyurethane-imide membranes and their use for the separation of aromatics from non-aromatics. 4,929,358, Cl. 210-640.000.
Kohashi, Toru: *See*—
Nagao, Takeyoshi; and Kohashi, Toru, 4,928,473, Cl. 53-53.000.
Kohda, Hiromichi: *See*—
Nakagawa, Sumio; Toiyama, Masaoki; Uno, Yoshinobu; and Kohda, Hiromichi, 4,929,768, Cl. 568-473.000.
Kohlsdorfer, Christian: *See*—
Mobrs, Klaus; Raddatz, Siegfried; Fruchtmann, Romanis; Kohlsdorfer, Christian; and Muller-Peddinghaus, Reiner, 4,929,626, Cl. 514-311.000.
Kohn, Rachel S., to Hoechst Celanese Corp. Ultrathin polyimide polymer flims and their preparation. 4,929,405, Cl. 264-41.000.
Kohno, Hideki: *See*—
Yabusaki, Masao; Yamamoto, Etsuji; Takeuchi, Hiroyuki; and Kohno, Hideki, 4,929,881, Cl. 324-318.000.
Kohno, Yoshiaki; and Sakai, Norio, to Murata Manufacturing Co., Ltd. Method of manufacturing ceramic laminate. 4,929,295, Cl. 156-230.000.
Kohtoh, Noriaki; Tsuruoka, Yoshihiro; Abe, Toyohiko; and Fukuro, Hiroyoshi, to Nissan Chemical Industries Ltd. Composition for liquid crystal aligning agent. 4,929,658, Cl. 524-219.000.
Koike, Kiichi: *See*—
Yoshinaka, Minoru; Matsuo, Koujirou; Koike, Kiichi; Suzuki, Yoshie; and Sugimoto, Mansaku, 4,929,518, Cl. 429-54.000.
Kojima, Yasutaka, to Akiyama Printing Machine Manufacturing Company, Ltd. Varnish coating mechanism. 4,928,623, Cl. 118-249.000.
Kokado, Naoyuki: *See*—
Tominaga, Mamoru; Kokado, Naoyuki; Gonpei, Katsuhiro; Nira, Hisami; and Taya, Akira, 4,929,061, Cl. 350-338.000.
Kokan Kako Co., Ltd.: *See*—
Nakamura, Masanobu, 4,928,509, Cl. 72-61.000.
Koller, Floyd G., to Auto-Valve, Inc. Aircraft toilet tank filling valve assembly. 4,928,731, Cl. 137-599.000.
Komag, Inc.: *See*—
Yamashita, Tsutomu T.; Shir, Ching-Cheng; and Chen, Tu, 4,929,500, Cl. 428-336.000.
Komai, Takeshi; Matsuyama, Kazuo; and Honma, Isao, to Nippon Oil & Fats Company, Ltd. Organic peroxide having a polymerization-regulating ability. 4,929,747, Cl. 558-263.000.
Komakine, Shigeo: *See*—
Ochiai, Kuniaki; and Komakine, Shigeo, 4,929,101, Cl. 400-124.000.
Komatsu, Fumiaki: *See*—
Kitagawa, Kazuo; Komatsu, Fumiaki; Masaki, Takayoshi; Sawada, Yoshihisa; and Inada, Eiichi, 4,929,394, Cl. 252-633.000.
Komatsu, Hajime; Tanino, Mitsuru; Suga, Yozo; and Konno, Toychiko, to Nippon Steel Corporation. Method for producing a grain-oriented electrical steel sheet. 4,929,286, Cl. 148-111.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Komatsu, Kazuyoshi: *See*—
Narimatsu, Osamu Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, 4,928,438, Cl. 51-283.00R.

Komatu, Yuuki: *See*—
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.

Komoda, Norio: *See*—
Suzuki, Toshitake;; Komoda, Norio; Oda, Susumu; and Harata, Motoo, 4,929,859, Cl. 310-328.000.

Kondo, Ryuji: *See*—
Murayama, Jin; Kudoh, Yoshimitsu; and Kondo, Ryuji, 4,930,006, Cl. 358-44.000.

Kondo, Shigeki, to Mitsubishi Denki Kabushiki Kaisha. Throttle-valve opening degree control for automatic step-wise transmission system. 4,930,079, Cl. 364-424.100.

Kondo, Shinichi: *See*—
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, 4,929,633, Cl. 514-423.000.

Kondo, Yoshikazu: *See*—
Hayashi, Yoshio; Nakamoto, Tetsuo; Kanada, Katsumi; and Kondo, Yoshikazu, 4,929,171, Cl. 427-54.100.

Kondratjuk, Stanislav E.: *See*—
Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B.; Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K., 4,929,416, Cl. 420-12.000.

Konica Corporation: *See*—
Kimoto, Tetsuo; and Abe, Yoshinori, 4,929,979, Cl. 355-38.000.
Shibazaki, Osamu; Miyazawa, Yorikatu; and Kato, Toshio, 4,928,826, Cl. 206-409.000.
Tanimura, Toyokiti; and Ikeda, Masahiro, 4,928,562, Cl. 83-278.000.
Tezuka, Toshiaki; Koshizuka, Kunihiro; and Abe, Takao, 4,929,593, Cl. 503-227.000.

Konig, Hubert, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Stud link. 4,928,740, Cl. 152-243.000.

Konishi, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Starter with overrunning clutch and balanced armature. 4,929,858, Cl. 310-83.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, 4,929,539, Cl. 430-553.000.

Konno, Toyohiko: *See*—
Komatsu, Hajime; Tanino, Mitsuru; Suga, Yozo, and Konno, Toyohiko, 4,929,286, Cl. 148-111.000.

Kooiman, Cornelis A.; and McDevitt, John J., Sr., to SET Technology B.V. Down-draft fixed bed gasifier system. 4,929,254, Cl. 48-76.000.

Kopp, Gregory M.: *See*—
Sexton, Gregory J.; and Kopp, Gregory M., 4,929,966, Cl. 346-75.000.

Kordesch, Karl; and Harer, Wilhelm, to Battery Technologies Inc. Rechargeable alkaline manganese dioxide-zinc cell with low internal resistance and improved cycle life. 4,929,520, Cl. 429-94.000.

Korea Telecommunication Authority: *See*—
Park, Hyung M.; and Kim, Dong G., 4,929,567, Cl. 437-41.000.

Kormori Printing Machinery Co., Ltd.: *See*—
Kida, Kenji, 4,928,586, Cl. 101-230.000.

Kornaker, Walter, to Nokia Graetz. Cathode-ray tube supporting rack. 4,929,210, Cl. 445-73.000.

Korolkov, Mikhail I.: *See*—
Kljuev, Vladimir V.; Kozlov, Valery S.; Volodchenko, Dmitry B.; Stepanenko, Alexandr V.; Baranovsky, Vladimir I.; Korolkov, Mikhail I.; and Semenov, Orest S., 4,930,026, Cl. 360-67.000.

Korsunsky, Iosif; and Schroepfer, Richard C., to AMP Incorporated. Post means for use with a molded connector. 4,929,194, Cl. 439-571.000.

Kortas, Ricardo G., to Leland Stanford Junior University, The Board of Trustees of The. Technique to evaluate myocardial ischemia from ECG parameters. 4,930,075, Cl. 364-413.060.

Korteling, Aart G.: *See*—
Bird, Philip H.; Coe, David J.; Paxman, David H.; and Korteling, Aart G., 4,929,884, Cl. 323-313.000.

Koshizuka, Kunihiro: *See*—
Tezuka, Toshiaki; Koshizuka, Kunihiro; and Abe, Takao, 4,929,593, Cl. 503-227.000.

Kosten, Richard B.: *See*—
Krasznai, Charles Z.; and Kosten, Richard B., 4,928,347, Cl. 15-344.000.

Koster, Marinus P.; Van Der Hoek, Willem; Kemper, Nicolaas R.; and Soemers, Hermanus M. J. R., to U.S. Philips Corporation. Manipulator. 4,929,146, Cl. 414-744.500.

Kostic, Nenad M.; and Zhou, Xia-Ying, to Iowa State University Research Foundation, Inc. Thermochromic platinum complexes. 4,929,091, Cl. 374-162.000.

Kotaka, Ikuo, to Babcock-Hitachi Kabushiki Kaisha. Heat exchanger. 4,928,753, Cl. 165-104.270.

Kotani, Yoshiaki: *See*—
Muroya, Fumio; and Kotani, Yoshiaki, 4,928,458, Cl. 56-11.800.

Kotera, Hiroaki: *See*—
Kanamori, Katsuhiro; Kanno, Yoshimitsu; Kurosawa, Toshiharu; Kawakami, Hidehiko; Naka, Motohiko; and Kotera, Hiroaki, 4,929,978, Cl. 355-38.000.

Kotera, Satoshi: *See*—
Nishihara, Yoshio; Isobe, Noriyuki; and Kotera, Satoshi, 4,929,507, Cl. 428-447.000.

Koths, Kriston: *See*—
Halenbeck, Robert; Koths, Kriston, Cowgill, Cynthia; and Laird, Walter J., 4,929,700, Cl. 530-351.000.

Kotobuki & Co., Ltd.: *See*—
Kageyama, Shuhei; Suzuki, Takahiko; and Yamagishi, Yuichi, 4,929,107, Cl. 401-65.000.

Kouzato, Yasuo: *See*—
Sugiura, Susumu; Kouzato, Yasuo; and Masuda, Yukio, 4,930,007, Cl. 358-75.000.

Kovacs, Kerry: *See*—
Lee, Chuan; and Kovacs, Kerry, 4,929,531, Cl. 430-138.000.

Kozikowski, Alan P.; and Xia, Yan, to University of Pittsburgh. Method for the synthesis of huperzine A and analogs thereof and compounds useful therein. 4,929,731, Cl. 546-97.000.

Koziol, Władysław W.: *See*—
Rossio, Charles E.; and Koziol, Wladyslaw W., 4,929,375, Cl. 252-49.300.

Kozlov, Valery S.: *See*—
Kljuev, Vladimir V.; Kozlov, Valery S.; Volodchenko, Dmitry B.; Stepanenko, Alexandr V.; Baranovsky, Vladimir I.; Korolkov, Mikhail I.; and Semenov, Orest S., 4,930,026, Cl. 360-67.000.

Kraft General Foods, Inc.: *See*—
Bejarano-Wallens, Celso O.; Gage, Julie E.; and Hodapp, Donald, 4,929,456, Cl. 426-99.000.
Moorman, Charles T.; Sabadics, Joseph L.; and Bruscino, Joseph A., 4,929,462, Cl. 426-478.000.

Kragt, Gerald A., to Jer's Pattern Project, Inc. Marking template. 4,928,399, Cl. 33-562.000.

Krahn, Roy J.; and Blenkush, Brian J. Quick disconnect for aerosol spray can. 4,928,859, Cl. 222-402.140.

Krantz, Alexander: *See*—
Castelhano, Arlindo L.; DeYoung, Lawrence M.; Krantz, Alexander; Pliura, Diana H.; and Venuti, Michael C., 4,929,630, Cl. 514-380.000.

Krasznai, Charles Z.; and Kosten, Richard B., to Black & Decker Inc. Vacuum cleaner dust bowl latch and release system. 4,928,347, Cl. 15-344.000.

Krause, Gunther, to Krause Werk GmbH & Co. KG. Joint for ladders. 4,928,792, Cl. 182-163.000.

Krause Werk GmbH & Co. KG: *See*—
Krause, Gunther, 4,928,792, Cl. 182-163.000.

Kravitz, Jeffrey K.; and Palmer, Charles C., to International Business Machines Corporation. Netbios name authentication. 4,930,159, Cl. 380-23.000.

Krebs, Werner W., to NuTone, Inc. Dual cone recessed lighting fixture. 4,930,054, Cl. 362-149.000.

Kreitzer, Carl E.: *See*—
Miles, Thomas O.; and Kreitzer, Carl E., 4,929,955, Cl. 342-371.000.

Kroetch, Keith; and Fitzpatrick, Colleen. Inflatable tents. 4,928,442, Cl. 52-2.00J.

Kronberger, Maximilian H., to Voest-Alpine Automotive Gesellschaft M.B.H. Fuel injection nozzle. 4,928,886, Cl. 239-533.500.

Kronich, Peter G., to Tecumseh Products Company. Integral engine block air cooled engine oil cooler. 4,928,651, Cl. 123-196.0AB.

Kroupa, Loretta N., to Dow Corning Corporation. Electrically conductive silicon compositions. 4,929,391, Cl. 252-511.000.

Kruelskie, Donald A., to Dow Chemical Company, The. Plastic drums for storing or transporting liquid and solid products. 4,928,839, Cl. 220-5.00R.

Krupp Stahl: *See*—
Dislich, Heinz; and Richter, Horst, 4,928,931, Cl. 266-45.000.

Kruse, Klaus-Dieter: *See*—
ter Hasebrg, Jan L.; Nedwig, Joachim; and Kruse, Klaus-Dieter, 4,929,842, Cl. 250-551.000.

Krushed Kritter Kompany of California, Inc.: *See*—
Levine, Anthony H.; and Jaeger, Eduard A., 4,928,954, Cl. 272-8.00N.

Kubitza, Werner: *See*—
Engbert, Theodor; Frohlich, Jurg; Kubitza, Werner; Breidenbach, Peter; and Mennicken, Gerhard, 4,929,724, Cl. 540-202.000.

Kubli, Walter R. Connector for attaching a float to a small boat anchor line. 4,928,618, Cl. 114-293.000.

Kubo, Takahiro; and Tajima, Hatsuo, to Canon Kabushiki Kaisha. Developing apparatus. 4,929,981, Cl. 355-253.000.

Kubota, Masahiro: *See*—
Yaguchi, Yoshinori; Kubota, Masahiro; and Nakaminami, Masamitsu, 4,928,381, Cl. 29-568.000.

Kubota, Mineo, to Nippon Seimitsu Kogyo Kabushiki Kaisha. Method and device for image reduction in image processing. 4,930,022, Cl. 358-451.000.

Kubota, Yoshihiro: *See*—
Saito, Shigeaki; Matsueda, Toshiharu; Kubota, Yoshihiro; and Iguchi, Masaaki, 4,929,572, Cl. 437-164.000.

Kubushiki Kaisha Toshiba: *See*—
Imanishi, Kazuo, 4,929,908, Cl. 330-254.000.

Kudo, Masaki; and Suzuki, Hideo, to Yamaha Corporation. Envelope shape generator for tone signal control. 4,928,569, Cl. 84-626.000.

Kudo, Norio: *See*—
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 4,930,028, Cl. 360-85.000.

Kudoh, Yoshimitsu: *See*—
Murayama, Jin; Kudoh, Yoshimitsu; and Kondo, Ryuji, 4,930,006, Cl. 358-44.000.

Kuenast, Christoph: *See*—
Leyendecker, Joachim; Buerstinghaus, Rainer; Theobald, Hans; Kuenast, Christoph; and Hofmeister, Peter, 4,929,617, Cl. 514-252.000.

Kuga, Masao: *See*—
Yokota, Akira; and Kuga, Masao, 4,929,070, Cl. 350-432.000.

Kuge, Yukihiro: *See*—
Eguchi, Tamotsu; Oshiro, Takashi; Kuge, Yukihiro; Mochida, Kenichi; and Uwajima, Takayuki, 4,929,551, Cl. 435-106.000.

Kuhn, Dieter. Device for reducing rinsing water consumption. 4,928,327, Cl. 4-395.000.

KUKA Schweissanlagen and Roboter GmbH: *See*—
Schupp, Gerhard; Tscheschlok, Klaus; and Johann, Maischberger, 4,928,386, Cl. 29-824.000.

Kukel, Christine F.: *See*—
Herman, Rod A.; and Kukel, Christine F., 4,929,634, Cl. 514-426.000.

Kulli, John C. Medical needle puncture guard. 4,929,241, Cl. 604-263.000.

Kuma, Kiyoji, to Mitsubishi Kasei Corporation. Process for preparing oximes. 4,929,756, Cl. 564-267.000.

Kumada, Susumu; Mori, Mikio; Nagatani, Ryoji; and Ano, Tadami, to Mitsubishi Denki Kabushiki Kaisha. Equipment for storing blood. 4,928,502, Cl. 62-440.000.

Kumashiro, Koichi: *See*—
Shinoki, Masayoshi; Takagi, Masahiro; Nagatsuka, Ikutaroh; Kumashiro, Koichi; Aoki, Takayoshi; and Takeda, Masayuki, 4,929,528, Cl. 430-108.000.

Kummer, Rudolf: *See*—
Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D.; and Saladin, Guenter, 4,929,758, Cl. 564-485.000.
Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D.; and Saladin, Guenter, 4,929,759, Cl. 564-485.000.

Kuna, Wayne A.: *See*—
Morris, Lamont C.; Kuna, Wayne A.; and Terzian, Rouben T., 4,929,216, Cl. 446-324.000.

Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, to Pioneer Electronic Corporation. Tape recorder. 4,930,028, Cl. 360-85.000.

Kunka, Blair S.: *See*—
Vandenbergh, Peter A.; Pucci, Michael J.; Kunka, Blair S.; and Vedamuthu, Ebenezer R., 4,929,445, Cl. 424-115.000.

Kunz, Horst; and Dombo, Berthold, to Orpengen Medizinisch-Molekularbiologische Forschungsgesellschaft mbH. Allylic side chain-containing solid phase systems, processes for the preparation thereof and the use thereof in solid phase reactions. 4,929,671, Cl. 525-54.110.

Kupersmit, Julius B. Container for shipping laboratory animals. 4,928,630, Cl. 119-17.000.

Kuraray Co., Ltd.: *See*—
Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, 4,929,482, Cl. 428-36.400.

Kurauchi, Makoto; Hashimoto, Michio; Hayasaki, Kiyoshi; Minami, Toshikazu; Ohnishi, Mutsuhiko; and Suzuki, Yohei, to Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha; and Shinko Kosen Kogyo Kabushiki Kaisha. Coating material for tendon for prestressed concrete. 4,929,650, Cl. 523-455.000.

Kurihara, Akio: *See*—
Hyogo, Yukihiro; and Kurihara, Akio, 4,929,182, Cl. 439-34.000.

Kuroda, Akio: *See*—
Setoi, Hiroyuki; Kuroda, Akio; Tanaka, Hirokazu; Hirai, Hideo; Marusawa, Hiroshi; and Hashimoto, Masashi, 4,929,639, Cl. 514-452.000.

Kuroda, Masami; Hattori, Yoshimasa; and Furusho, Noboru, to Fuji Electric Co., Ltd. Photoconductor for electrophotography containing azo or disazo. 4,929,525, Cl. 430-75.000.

Kurokawa, Shunji, to Ricoh Company, Ltd. Multiple redialing system. 4,930,155, Cl. 379-354.000.

Kuroki, Yoshiaki: *See*—
Koda, Akihide; Kita, Jun'ichiro; Kuroki, Yoshiaki; Fujiwara, Hiroshi; Takamura, Shinji; and Yamano, Kayoko, 4,929,618, Cl. 514-253.000.

Kurono, Masayasu: *See*—
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, 4,929,438, Cl. 424-10.000.

Kurosaki, Makoto, to Yamaha Corporation. Clutch unit for high-hat cymbals. 4,928,567, Cl. 84-422.300.

Kurosawa, Toshiharu: *See*—
Kanamori, Katsuhiro; Kanno, Yoshimitsu; Kurosawa, Toshiharu; Kawakami, Hidehiko; Naka, Motohiko; and Kotera, Hiroaki, 4,929,978, Cl. 355-38.000.

Kurt Manufacturing Company, Inc.: *See*—
Bernstein, Leon M., 4,928,937, Cl. 269-136.000.

Kurys, Barbara E.: *See*—
Glamkowski, Edward J.; and Kurys, Barbara E., 4,929,615, Cl. 514-219.000.

Kushita, Kenji: *See*—
Hosono, Katsuaki; and Kushita, Kenji, 4,929,220, Cl. 474-152.000.

Kushiyama, Natsuki, to Kabushiki Kaisha Toshiba. Semiconductor memory device having a small number of signal lines. 4,929,945, Cl. 341-50.000.

Kusserow, Bernd; Gagneur, Klaus; and Hofler, Siegfried, to Siemens Aktiengesellschaft. Protective circuit for a power pack for excitation or de-excitation of a superconduction coil system. 4,930,034, Cl. 361-19.000.

Kutschera, Peter: *See*—
Lechtken, Peter; and Kutschera, Peter, 4,929,249, Cl. 8-464.000.

Kuzuhara, Michio; Shibasaki, Jun; St. Louis, Andree; St. Laurent, Christian; and Bedard, Michel, to Toyoda Gosei Co., Ltd.; and Waterville TG, Inc. Door weather strip for motor vehicle. 4,928,431, Cl. 49-479.000.

Kwiatek, Jack: *See*—
Chang, Biau-Hung; Lee, Lester Y.; and Kwiatek, Jack, 4,929,711, Cl. 528-220.000.

Kyle, Donald G., to Atlantic Richfield Company. Method and apparatus of measuring ultrasonic time travel information obtained from logging operations in a well borehole. 4,930,109, Cl. 367-27.000.

Kyogoku, Tetsuo; Ishiyama, Masamitsu; and Mino, Masayuki, to Minolta Camera Kabushiki Kaisha. Document support table with lubricant and method for forming the same. 4,929,980, Cl. 355-75.000.

Kyono, Tetsuyuki; Ohnishi, Seiichiro; Hanano, Tohru; and Hotta, Tohru, to Agency of Industrial Science and Technology. Preform wire for a carbon fiber reinforced aluminum composite material and a method for manufacturing the same. 4,929,513, Cl. 428-611.000.

Kyoritsu Yuki Co., Ltd.: *See*—
Takeda, Hisao; and Kawano, Mutsumi, 4,929,655, Cl. 524-458.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Eguchi, Tamotsu; Oshiro, Takashi; Kuge, Yukihiro; Mochida, Kenichi; and Uwajima, Takayuki, 4,929,551, Cl. 435-106.000.

LaBarge, Robert L., to Aluminum Company of America. Pressure release for carbonated beverage containers. 4,928,844, Cl. 220-207.000.

Laboratoires Biotrol: *See*—
Holtermann, Henri; and Hamelin, Claude, 4,929,245, Cl. 604-338.000.

Laboratoires Chauvin-Blache: *See*—
Coquelet, Claude; Roussillon, Samia; Sincholle, Daniel; Bonne, Claude; and Alazet, Alain, 4,929,635, Cl. 514-438.000.

Ladegourdie, Gerard: *See*—
Torbus, Marek; Jerman, Franz; Ladegourdie, Gerard; Lingemann, Dirk; Seiss, Willi; and Vujevic, Aleksandar, 4,929,649, Cl. 523-145.000.

Lagarde, Robert; Ariagno, Daniel; and Nys, Jacques, to Rhone-Poulenc Specialites Chimiques. Elastomeric silicone binding threads for cookable foodstuff items. 4,929,460, Cl. 426-420.000.

Lahti, Gary P. Portable lifter. 4,929,010, Cl. 294-16.000.

Lai, John T.: *See*—
Kletecka, George; Lai, John T.; and Son, Pyong N., 4,929,653, Cl. 524-96.000.

Laird, Walter J.: *See*—
Halenbeck, Robert; Koths, Kriston; Cowgill, Cynthia; and Laird, Walter J., 4,929,700, Cl. 530-351.000.

Lajovic, Dusan S., to Impact International Pty, Ltd. Method of making a laminated tubular body. 4,928,877, Cl. 229-125.420.

Laminar Fluid Controls, Inc.: *See*—
Feild, Eugene P., 4,928,920, Cl. 251-118.000.

Lampl, Heinz: *See*—
Mayr, Bernhard; and Lampl, Heinz, 4,928,989, Cl. 280-610.000.

Lampotang, Samsun; Gravenstein, Dietrich; Gravenstein, Joachim S.; Gravenstein, Nikolaus; and Banner, Michael J., to University of Florida, The. CO_2 diagnostic monitor. 4,928,687, Cl. 128-207.140.

Lancaster, Gerald M.: *See*—
Laughner, Michael K.; Lancaster, Gerald M.; and Sun, Yun C., 4,929,673, Cl. 525-63.000.

Lancelin, Pierre: *See*—
Cavezzan, Jacques; Frances, Jean-Marc; and Lancelin, Pierre, 4,929,702, Cl. 528-18.000.

Landanger, Patrick: *See*—
Chagneau, Francis; Levasseur, Michel; Landanger, Patrick; Langlais, Frantz; and Rolland, Jean-Jacques, 4,928,679, Cl. 606-62.000.

Landis, Michael E.: *See*—
Aufdembrink, Brent A.; and Landis, Michael E., 4,929,587, Cl. 502-242.000.

Landoll Corporation: *See*—
Bell, Dennis E., 4,928,774, Cl. 172-430.000.

Landos Applications Orthopediques Francaises: *See*—
Chagneau, Francis; Levasseur, Michel; Landanger, Patrick; Langlais, Frantz; and Rolland, Jean-Jacques, 4,928,679, Cl. 606-62.000.

Landriault, L. Steven; Ortloff, Donald J.; and Bollfrass, Charles A., to Hydril Company. Elastomeric guard seal for tubular connections. 4,928,999, Cl. 285-113.000.

Landwehr, Ulrich M.; and Rackwitz, Guenter. Reproducing human posture. 4,928,708, Cl. 128-774.000.

Lang, Hans-Jochen; Hropot, Max; Granzer, Ernold; and Kerekjarto, Bela, to Hoechst Aktiengesellschaft. Benzenesulfonamide derivatives and a process for the preparation thereof. 4,929,643, Cl. 514-603.000.

Lang, Luke C. K.: *See*—
Chung, Paul W.; Gee, Ralph L.; Lang, Luke C. K., and Saber, Paik, 4,929,918, Cl. 331-10.000.

Langer, Horst G.: *See*—
Khoury, Issam A.; and Langer, Horst G., 4,929,575, Cl. 501-137.000.

Langlais, Frantz: *See*—
Chagneau, Francis; Levasseur, Michel; Landanger, Patrick; Langlais, Frantz; and Rolland, Jean-Jacques, 4,928,679, Cl. 606-62.000.

Langley, Deborah E.: *See—*
Clark, James B.; and Langley, Deborah E., 4,929,365, Cl. 210-754.000.
Langston, Richard D.; Webb, Frances C.; and McBeath, Simon C., to Charcoal Cloth Limited. Wound dressing. 4,928,681, Cl. 128-156.000.
Lanham, Robert L.: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,929,476, Cl. 428-34.200.
Lanier, Joel P.; Hall, Tamuel A.; and Moore, Kent R., to University of Tennessee Research Corporation Exercise apparatus for actively exercising the upper body while passively exercising the lower body. 4,928,957, Cl. 272-72.000.
Laperle, Guy. Weed cutter. 4,928,457, Cl. 56-12.700.
Lapeyre, Pascal: *See—*
Begout, Eric; Bourgeois, Alain; Gueuret, Raymond; and Lapeyre, Pascal, 4,929,962, Cl. 343-786.000.
La Plante, John A.; and Schaefer, Robert D., to Hughes Aircraft Company. Kinematic mount. 4,929,073, Cl. 350-609.000.
Lara, Pedro F., to Atlantic Richfield Company. Transient electromagnetic method for detecting irregularies on conductive containers having variations in jacket thickness. 4,929,896, Cl. 324-240.000.
Large Scale Biology: *See—*
Anderson, Norman G.; and Anderson, Norman L., 4,929,972, Cl. 354-75.000.
Larsen, Alan B., to Hughes Aircraft Company. Process for electrically testing a component in transit to assembly and component test chuck. 4,929,892, Cl. 324-158.00F.
Larsen, Michael R.: *See—*
Link, Donald A.; Hubbard, Dean A.; and Larsen, Michael R., 4,929,919, Cl. 335-38.000.
Larsen, Steven D.: *See—*
Walters, Darrell L.; and Larsen, Steven D., 4,928,410, Cl. 37-117.500.
Larson, David J.: *See—*
Gassman, Max P.; Larson, David J.; and Trampel, Darrell W., 4,928,628, Cl. 119-1.000.
Larson, John E.: *See—*
Danilenko, Michael; Dekarske, Clarence W.; and Larson, John E., 4,930,106, Cl. 365-189.010.
Larsson, Karl O. A. H., to ISG/AG. Breastpump having improved valve mechanism. 4,929,229, Cl. 604-74.000.
Larsson, Lennart; and Andersson, Arne, to AB Akerlund & Rausing. Machine for applying adhesive to an elongate sheet material. 4,928,622, Cl. 118-70.000.
Lasczlo, Gunter M., to Amstelstaal B V. Flanged valve. 4,928,923, Cl. 251-221.000.
Lassiter, Perry B., to Premier Refractories & Chemicals Inc. Method of manufacturing cast fused silica articles. 4,929,579, Cl. 501-133.000.
Latge, Christian, to Commissariat a l'Energie Atomique. Cold trap for the purification of a liquid metal having separate trapping zones. 4,928,497, Cl. 62-55.500.
Latimer, Richard G., Jr. Bingo chip dispenser 4,928,970, Cl. 273-148.00R.
LaTour, Norman E.: *See—*
Evangelista, Donato D.; LaTour, Norman E.; and Kirven, Bobby, 4,928,948, Cl. 271-110.000.
Lauer, Christian: *See—*
Dedden, Hubert; Gieger, Eckhard; and Lauer, Christian, 4,929,829, Cl. 250-208.400.
Laughner, Michael K.; and Ogoe, Samuel A., to Dow Chemical Company, The. Fire retardant impact modified carbonate polymer composition. 4,929,663, Cl. 524-423.000.
Laughner, Michael K., to Dow Chemical Company, The. Polycarbonate modified with a grafted olefin copolymer. 4,929,672, Cl 525-63.000.
Laughner, Michael K.; Lancaster, Gerald M.; and Sun, Yun C., to Dow Chemical Company, The. Polycarbonate/styrenic blends modified with a grafted olefin copolymer. 4,929,673, Cl. 525-63.000.
Laughner, Michael K., to Dow Chemical Company, The. Impact and chemical resistant polycarbonate blend. 4,929,676, Cl. 525-67.000.
Laughon, Thomas C.; Nicholson, Roy V.; Barrett, Michael E.; and Beckmann, Robert C., to McCalla/Lackey Products Corporation. Wall mounting system 4,928,913, Cl. 248-224.100.
Laurent, Jean M., to SKF France. Self-centering freewheel mechanism. 4,928,801, Cl. 192-45.100.
Lauritano, Giuseppe. Tool manipulating harmonic balancer 4,929,111, Cl. 403-16.000.
Lawson, R. Joe: *See—*
Moser, Mark D.; Lawson, R. Joe; Antos, George J.; Wang, Li; and Parulekar, Vivekanand N., 4,929,332, Cl. 208-65.000.
Moser, Mark D.; Lawson, R. Joe; Wang, Li; and Parulekar, Vivekanand N., 4,929,333, Cl. 208-65.000.
Lazarus, Stanley D.: *See—*
Mohajer, Yousef; and Lazarus, Stanley D., 4,929,715, Cl. 528-272.000.
Leaning, Anthony R., to British Telecommunications public limited company. Pattern processing. 4,930,013, Cl. 358-133.000.
Lechtken, Peter; and Kutschera, Peter, to BASF Aktiengesellschaft. Discharge and discharge resist printing using aminoreductones. 4,929,249, Cl. 8-464.000.
Lecocq, Jean-Luc, to Automobiles Peugeot; Automobiles Citroen; and Regie Nationale des Usines Renault. Device for transmitting items of information for an automobile vehicle and a method of using said device. 4,929,941, Cl. 340-825.140.
Ledenbach, Gregory W.; and Allen, Michael J., to Intel Corporation. Architecture for an improved performance of a programmable logic device. 4,930,097, Cl. 364-716.000.
Ledley, Robert S. Methods and apparatus for determining distributions of radioactive materials. 4,929,832, Cl. 250-328.000.
Lee, Anthony L.; Meyer, Howard S.; and Hill, Vern L., to Gas Research Institute. Mixed-solid solution tri-metallic oxide/sulfide catalyst and process for its preparation. 4,929,585, Cl. 502-220.000.
Lee, Chuan; and Kovacs, Kerry, to Mead Corporation, The. Process for producing photosensitive composition capable of forming full color images from a single capsule batch. 4,929,531, Cl. 430-138.000.
Lee, Chung-tien: *See—*
Yang, Chin-lung; and Lee, Chung-tien, 4,928,432, Cl. 51-5.00C.
Lee, Douglas W., to Gas Research Institute. Downhole surge valve for earth boring apparatus. 4,928,775, Cl. 175-19.000.
Lee, Hsiao-Chung. Headband radiophone combination set. 4,930,148, Cl. 379-58.000.
Lee, Jar J.; and Yen, Huan-Wun, to Hughes Aircraft Company. Optical beam former for high frequency antenna arrays. 4,929,956, Cl. 342-376.000.
Lee, Lester Y.: *See—*
Chang, Biau-Hung; Lee, Lester Y.; and Kwiatek, Jack, 4,929,711, Cl. 528-220.000.
Lee, Sae D.: *See—*
Dougherty, Lawrence W.; Lee, Sae D.; and Rogers, Melvin F., 4,930,015, Cl. 358-246.000.
Leep, David A.: *See—*
Babbitt, William R.; Beausoleil, Raymond G.; and Leep, David A., 4,930,133, Cl. 372-32.000.
LeFort, Bernard; Maulat, Jean-Pierre; and Bachomoff, Guy R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA). Air tap and engine mount for a turbojet engine. 4,928,483, Cl. 60-226.100.
Legat, Denis: *See—*
Dubots, Patrick; Legat, Denis; and Vic, Raymond, 4,929,047, Cl. 350-96.230.
Leggett & Platt, Incorporated: *See—*
Arft, Dennis E., 4,928,331, Cl. 5-13.000.
Le Goullon, Donald; and Goswami, Kisholoy, to FiberChem, Inc. Fiber optic refractive index sensor using a metal clad. 4,929,049, Cl. 350-96.290.
Legrand, Franz; Lerot, Luc; and De Bruycker, Patricia, to Solvay & Cie (Societe Anonyme). Process for the manufacture of a powder of mixed metal oxides, and mixed metal oxide powders. 4,929,436, Cl. 423-593.000.
Lehto, Ari; and Chen, Frank, to Vaisala Oy. Pressure transducer. 4,928,530, Cl. 73-756.000.
Leib, Kenneth G.; and Sullivan, Edward V., to Grumman Aerospace Corporation. Apparatus for opening and holding a frame and a method of mounting an optical element in a frame. 4,929,056, Cl. 350-321.000.
Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Lap evener for a fiber processing machine. 4,928,355, Cl. 19-105.000.
Leland Stanford Junior University, The Board of Trustees of The: *See—*
Kortas, Ricardo G., 4,930,075, Cl. 364-413.060.
Lemons, Kyle E.: *See—*
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J.; Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., 4,929,426, Cl. 422-63.000.
Le Mouel, Bernard: *See—*
Abaziou, Jean-Luc; Billy, Jean-Claude; and Le Mouel, Bernard, 4,930,127, Cl. 370-110.400.
Lenco Machines & Tool Co.: *See—*
Johnston, Gerald, 4,929,342, Cl. 209-12.000.
Lenoir, Roland: *See—*
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,928,746, Cl. 164-362.000.
Lenox, Michael A.: *See—*
Aderholt, Gary L.; and Lenox, Michael A., 4,928,525, Cl. 73-290.00V.
Lent, Kevin C.; Rife, Conwell K., Jr.; Simmons, Gerald P.; and Speck, Albert J., to Caterpillar Paving Products Inc. Control system for a road planer. 4,929,121, Cl. 404-84.000.
Lentz, Carl M.; Mullins, Edward T.; and Gibson, Charles L., to Eastman Kodak Company. Hydrogenation of halonitroaromatic compounds. 4,929,737, Cl. 548-365.000.
Leonard, John F.; and Beam, Jerry E., to United States of America, Air Force. Method of manufacturing heat pipe wicks and arteries. 4,929,414, Cl. 419-2.000.
Leonardi, Giovanni M., to RCA Licensing Corporation. Switch-mode power supply. 4,930,060, Cl. 363-21.000
Le Parquier, Guy: *See—*
Esterlin, Jacques; Le Parquier, Guy; and Roux, Jean Pierre, 4,928,570, Cl. 89-6.500.
Lerot, Luc: *See—*
Legrand, Franz; Lerot, Luc; and De Bruycker, Patricia, 4,929,436, Cl. 423-593.000.
Lessig, William R., III: *See—*
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,928,346, Cl. 15-338.000.

L'Etat Francais: *See—*
Guezou, Jean-Pierre; and Pichard, Jacques, 4,929,200, Cl. 440-38.000.
Levasseur, Michel: *See—*
Chagneau, Francis; Levasseur, Michel; Landanger, Patrick; Langlais, Frantz; and Rolland, Jean-Jacques, 4,928,679, Cl. 606-62.000.
Lever Brothers Company: *See—*
Emmons, Stuart A.; and Hale, Perry, 4,929,377, Cl. 251-100.000.
Oldenburg, Willem; Hemmes, Simon N.; and Hobbel, Jaap E., 4,929,379, Cl. 252-109.000.
Levine, Anthony H.; and Jaeger, Eduard A., to Krushed Kritter Kompany of Kalifornia, Inc. Novelty figure with attachment means 4,928,954, Cl. 272-8.00N.
Leyendecker, Joachim; Buerstinghaus, Rainer; Theobald, Hans; Kuenast, Christoph; and Hofmeister, Peter, to BASF Aktiengesellschaft. 2-tert-butyl-5-isoxazolylmethylthio-3(2H)-pyridazin-3-one. 4,929,617, Cl. 514-252.000.
LGZ Landis & Gyr Zug AG: *See—*
Popovic, Radivoje, 4,929,993, Cl. 357-27.000.
Li, Shing-Lam, to Antibes, Inc. Aerial toy with on-board signaling device. 4,929,212, Cl. 446-47.000.
Licentia Patent-Verwaltungs GmbH: *See—*
ter Hasebrg, Jan L.; Nedwig, Joachim; and Kruse, Klaus-Dieter, 4,929,842, Cl. 250-551.000.
Liebel-Flarsheim Company: *See—*
Dieterlen, Paul E.; and Mustain, Lewis B., 4,930,147, Cl. 378-176.000.
Liebermann, Ron B. Inflatable enclosure and means to inflate same. 4,929,214, Cl. 446-221.000.
Liebson, Wilbur, to United States of America, Army. Thermal mask for cryogenic detectors in a thermal imaging device. 4,929,834, Cl. 250-352.000.
Liedtke, Kurt: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,929,226, Cl 493-343.000.
Lifecor, Inc.: *See—*
Heilman, Marlin S.; Brandt, Arlan J.; Bowling, Larry D., and Russial, Joseph F., 4,928,690, Cl. 128-421.000.
Lilienthal, Cal A.; and Christensen, Ronald L., to Purethane Incorporated. Armrest for vehicles and method of making same. 4,929,017, Cl. 296-153.000.
Lincoln Electric Company, The: *See—*
Blankenship, George D., 4,929,811, Cl. 219-121.540.
Lindblom, Ragnvald E.; and Rothman, Ulf S. Method of treating interferon sensitive diseases, and a method and device for preparing γ-interferon containing preparation. 4,929,443, Cl. 424-85.500.
Lindee, Scott A., to Formax, Inc. Molding mechanism for rod-shaped food product. 4,928,591, Cl. 99-485.000.
Linden, Olavi, to Fiskars Oy Ab. Device for sharpening knives. 4,928,436, Cl. 51-80.0BS.
Lindner, Christian: *See—*
Nouvertne, Werner; Gielen, Franz-Josef; Tacke, Peter; Grigo, Ulrich; Quiring, Bernd; and Lindner, Christian, 4,929,674, Cl. 325-66.000.
Lindner, Georg H., to Atochem North America, Inc. Apparatus for coating a substrate. 4,928,627, Cl. 118-718.000.
Lindner, Werner; Becker, Benedikt, Steffens, Robert; Wachendorff-Neumann, Ulrike; Brandes, Wilhelm; Stendel, Wilhelm; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Pest-combating agents based on substituted 1,4-naphthoquinones and new substituted 1,4-naphthoquinones. 4,929,642, Cl. 514-510.000.
Lindroos, Gunnar: *See—*
Olin, Henry; Lindroos. Gunnar; and Oldfelt, Sven, 4,928,326, Cl. 4-300.000.
Lindsay, Mitchell H.; and Kerr, Walter B., to United States of America, Air Force. Fuel supply device for supplying fuel to an engine combustor. 4,928,491, Cl. 60-734.000.
Lindstrom, Paul R.: *See—*
Carlson, David K.; and Lindstrom, Paul R., 4,928,626, Cl. 118-715.000.
Lingemann, Dirk: *See—*
Torbus, Marek; Jerman, Franz; Ladegourdie, Gerard; Lingemann, Dirk; Seiss, Willi; and Vujevic, Aleksandar, 4,929,649, Cl. 523-145.000.
Lingg, Jean M.: *See—*
Willyard, Marvin R.; and Lingg, Jean M., 4,929,464, Cl. 426-549.000.
LINGL GmbH & Co. KG: *See—*
Paul, Ernst, 4,929,177, Cl. 432-11.000.
Link, Donald A.; Hubbard, Dean A.; and Larsen, Michael R., to Eaton Corporation. Twin unit circuit breaker with improved magnet structure. 4,929,919, Cl. 335-38.000.
Lionetto, Gene; and Brown, Stephen, to M/A-Com Omni Spectra, Inc. Coaxial connector assembly. 4,929,188, Cl. 439-349.000
Lippens, Christiaan A. C.; and Naaktgeboren, Adrianus, to Ford New Holland, Inc. Agricultural baler with six stroke feeder mechanism. 4,928,462, Cl. 56-341.000.
Lisec, Peter. Apparatus for heating the marginal zone of glass sheets. 4,929,814, Cl. 219-388.000.
Lisega GmbH: *See—*
Hardtke, Hans H., 4,928,911, Cl. 248-74.100.
Zschiesche, Lothar, 4,928,799, Cl. 188-314.000.
Lissel, Norbert: *See—*
Binarsch, Jurgen; Bode, Jurgen; Danne, Lutz; and Lissel, Norbert, 4,930,040, Cl. 361-154.000.
Litef GmbH: *See—*
Kleinschmidt, Michael, 4,930,085, Cl 364-449.000.
Lithium Corporation of America: *See—*
Frianeza-Kullberg, Teresita C.; and Barnette, Darrish W., 4,929,588, Cl. 502-402.000.
Littlejohn, Douglas J.: *See—*
Bodai, Balazs I.; Grandon, Michael D.; Gilbert, Scott J., Littlejohn, Douglas J.; Lemons, Kyle E.; Fellows, Richard L.; Barry, Michael R.; and Delapp, Michael D., 4,929,426, Cl. 422-63.000.
Litton Systems, Inc.: *See—*
Burstyn, Herschel, 4,929,080, Cl. 356-338.000.
Liu, Benjamin Y. H.; and Szymanski, Wladyslaw W., to University of Minnesota, Regents of the. System for airborne particle measurement in a vacuum. 4,928,537, Cl. 73-863.860.
Liu, Kang-Chien: *See—*
Chern, Ji-Wang; Liu, Kang-Chien; and Chen, Chia-Yin, 4,929,728, Cl. 544-284.000.
Livi, Vittorio, to FIAM S.r.l. Piece of furniture made of glass and the like having a resting profile member of rubber 4,929,488, Cl. 428-192.000.
Lloyd, David J.: *See—*
Jin, Iljoon; and Lloyd, David J., 4,929,421, Cl. 420-545.000.
LMB Hand Rehab Products: *See—*
Barber, Lois M., 4,928,677, Cl. 128-87.00R.
Lobley, Derek G.; and Pinder, Kenneth. Catalytic generation of chlorine dioxide. 4,929,434, Cl. 423-479.000.
Lockett, Michael J.; and Victor, Richard A., to Union Carbide Industrial Gases Technology Inc. Structured column packing with liquid holdup. 4,929,399, Cl. 261-112.200.
Lockheed Missiles & Space Company, Inc.: *See—*
Mercado, Romeo I., 4,929,071, Cl. 350-463.000.
Lockwood, George S., to Ocean Farms of Hawaii Limited Partnership. Method and apparatus for constructing and moving long pipelines. 4,929,124, Cl. 405-165.000.
Lodder, Bernhard; Severieus, Hendrik; van Houten, Jan A.; and van Dijk, Berend J. Method of locating an electrical conductor between a first extruded tube and an extruded lining. 4,929,408, Cl. 264-149.000.
Loftis, Jerry W.: *See—*
Svyatsky, Eduard; Loftis, Jerry W.; and Faber, Thomas, 4,928,946, Cl. 271-10.000.
Logan, Kenneth C. Convertible running shoes/roller skates. 4,928,982, Cl. 280-11.220.
Logan, Robert T.: *See—*
Redpath, James; Logan, Robert T.; McFadzen, David B.; and Roy, Robert G., 4,929,636, Cl. 514-443.000.
Lone Star Industries, Inc.: *See—*
Muszynski, Larry C., 4,928,736, Cl. 138-178.000.
Long, Jacques; and Perrillat-Amede, Denis, to Societe Anonyme dite Alcatel Cit. Vacuum pump. 4,929,151, Cl. 415-177.000.
Lontex Corporation: *See—*
Nathan, Efraim, 4,928,323, Cl. 2-406.000.
Lopiccolo, Mario T.: *See—*
Wiegand, Walter J.; Swindal, James L.; Swarts, Richard E.; Bullis, Robert H.; Lopiccolo, Mario T.; Grantham, Daniel H., and Foyt, Arthur G., 4,930,042, Cl. 361-280.000.
L'Oreal: *See—*
Cotteret, Jean; and Grollier, Jean F., 4,929,439, Cl. 424-59.000
Gueret, Jean-Louis, 4,929,108, Cl. 401-126.000.
Lorence, Brian S.; Phelps, Richard A.; and Grabowski, David N., to Chivas Products Limited Bilateral beverage container holder 4,928,865, Cl. 224-275.000.
Lorenzo, John L.: *See—*
Ramsey, James S.; and Lorenzo, John L., 4,928,949, Cl 271-111.000.
Loreto, Wilfredo P.: *See—*
Ramos, Rolando P.; Loreto, Wilfredo P.; and Vulich, Yordan, 4,928,439, Cl. 51-284.00E.
Lotz, Horst K.; and Thomma, Gunther, to Aute Gesellschaft fuer autogene Technik mbH. Band casting-setting-burn-cutting machine in a line-like layout. 4,928,932, Cl. 266-58.000.
Louis Berkman Company, The: *See—*
Meriwether, Jon D., 4,928,617, Cl. 114-267.000.
Lovik, Craig J. Balloon sculpturing methods, apparatus and products. 4,929,215, Cl. 446-226.000.
Lowden, Richard A.: *See—*
Besmann, Theodore M.; and Lowden, Richard A., 4,929,328, Cl 204-279.000.
Lowery, Richard E.; Fu, Chia M.; and Maholland, Michael K., to Phillips Petroleum Company. Treatment of spent cracking catalysts 4,929,336, Cl. 208-120.000.
Lu, Chin S. Spring-loaded seat assembly. 4,929,025, Cl. 297-452.000.
Lubra Sheet Corporation: *See—*
Hatch, William R.; and Foster, John W., 4,929,370, Cl. 252-12.200.
Lucas, Gary H., to Integrated Tech Systems, Inc. Watering system for greenhouse. 4,928,889, Cl. 239-751.000.
Lucas Industries public limited company: *See—*
Farr, Glyn P. R., 4,929,037, Cl. 303-116.000.
Harrison, Anthony W., 4,928,797, Cl. 188-156.000.
Watson, John C.; Gaskill, Stephen P.; Russell, David F.; and Burns, Robert L. D., 4,928,798, Cl. 188-218.0XL.
Luetkens, Melvin L., Jr.; McKenna, Steve T.; and Melquist, John L., to Amoco Corporation. Alcohol conversion. 4,929,763, Cl. 568-402.000
Luitje, William V.; and McCambridge, John M., to Chrysler Corporation. Vehicle serial bus, mechanical instrument cluster odometer therefor. 4,930,094, Cl. 364-561.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Lulay, Eugen, to Hofmann Werkstatt-Technik GmbH. Arrangement for continuously compensating for unbalance on a rotary member. 4,928,548, Cl. 74-573.00F.

Lunardi, Pietro. Method for building large span tunnels by means of a cellular arch. 4,929,123, Cl. 405-150.000.

Lund Industries, Inc.: *See*—
Eke, Alan B., 4,929,013, Cl. 296-91.000.

Lundgren, Bengt; and Wallner, Anders. Method and device for mammographic stereotactic punction of pathological lesions in the female breast. 4,930,143, Cl. 378-37.000.

Lunke, Manfred, Falz, Ulrich; and Walter, Jurgen, to Hackforth GmbH & Co., KG. Resilient shaft coupling. 4,929,115, Cl. 403-228.000

Luoma, Warren L.; Martin, Ronald G.; and Breault, Richard D., to International Fuel Cells Corp. Electrochemical cell assembly. 4,929,517, Cl. 429-34.000.

Luscombe, Brian M.: *See*—
Hewett, Richard H.; and Luscombe, Brian M., 4,929,271, Cl. 71-94.000.

Lushinsky, Gene A.: *See*—
Batra, Surinder P.; Hammer, William E.; Lushinsky, Gene A., Marquart, David W.; Schwane, Walter H.; and Ziecina, Frederick J., 4,930,069, Cl. 364-200.000.

Luther, Hans W.: *See*—
Sabranski, Udo; Luther, Hans W.; Sabinski, Horst; and Winkelmann, Jurgen, 4,928,598, Cl. 102-467.000.

Luthra, Narender P.: *See*—
Heifetz, Aaron H.; Wolfe, Richard A.; Braatz, James A.; and Luthra, Narender P., 4,929,706, Cl. 528-49.000.

Lutsenko, Georgy G.. *See*—
Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B., Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K., 4,929,416, Cl. 420-12.000.

Luttinger, Lionel B., to Drew Chemical Corporation. Recovery of metal values from ores. 4,929,274, Cl. 423-25.000.

Lymn, Peter P. A. Solder leveller. 4,928,869, Cl. 228-20.000.

Lynch, W. Bryan: *See*—
Wallace, W. Edward; Smith, H. Kevin, Lynch, W. Bryan; Craig, Raymond S.; and Pourarian, Fiaz, 4,928,496, Cl. 62-46.200.

Lyon, David H.: *See*—
Fansler, Kevin S.; and Lyon, David H., 4,928,573, Cl. 89-14.400.

M/A-Com Omni Spectra, Inc.: *See*—
Lionetto, Gene; and Brown, Stephen, 4,929,188, Cl. 439-349.000.

Ma, Ulysses: *See*—
Tucker, Kay L.; and Ma, Ulysses, 4,929,423, Cl. 420-561.000.

Maass, Freimut Snow glider. 4,928,983, Cl. 280-18.000.

Maass, Hans: *See*—
Eckold, Gerd-Jurgen; and Maass, Hans, 4,928,370, Cl. 29-243.500.

Macaione, Anthony F.; and Wright, John V., to Reiton Corporation. Precision temperature sensor. 4,930,134, Cl. 372-33.000.

MacDonald, Lindsay W., to Crossfield Electronics Limited. Apparatus for generating a two-dimensional coloured display. 4,930,010, Cl. 358-78.000.

Machacek, Zdenek: *See*—
Tilman, Paul A.; Machacek, Zdenek; and Scott, Richmond, 4,929,487, Cl. 428-163.000.

Machida, Haruchika: *See*—
Yuchi, Sadataka; Machida, Haruchika; Matsuoka, Naoya; and Kikuchi, Masamichi, 4,930,095, Cl. 364-571.010.

Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, to Eisai Co., Ltd. Thiadiazolylacetamide cephem derivatives. 4,929,612, Cl. 514-202.000.

Machler, Franz: *See*—
Demuth, Robert; Staheli, Paul; Waber, Rene; Grundler, Christoph; and Machler, Franz, 4,928,353, Cl. 19-65.00A.

MacMillan, Hugh F.: *See*—
Costello, Kenneth A.; and MacMillan, Hugh F., 4,929,867, Cl. 313-525.000.

Madden, Raymond. Weight lifting apparatus. 4,928,961, Cl. 272-123.000.

Maeda, Koichi: *See*—
Kitayama, Shinichiro; Adachi, Teruhe; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.

Maeda, Satoru; Noguchi, Yasushi; Yasuda, Kazunori; and Takano, Shyunsuke, to Sony Corporation. Method and apparatus for processing a still picture signal. 4,930,014, Cl. 358-209.000.

Maehashi, Yukio: *See*—
Katayose, Tsuyoshi; and Maehashi, Yukio, 4,930,068, Cl. 364-200.000.

Maekawa, Masanori: *See*—
Mizutani, Minoru; Kikuchi, Hiroshi; Watanabe, Shoichi; Hayashi, Kuniharu; and Maekawa, Masanori, 4,929,102, Cl. 400-248.000.

Maestro, Patrick: *See*—
Iltis, Alain; and Maestro, Patrick, 4,929,574, Cl. 501-137.000.

Maeyama, Hachiro, to Tsuyama Mfg. Co., Ltd. Means for detecting damage to the card connecting the photosensor and main body pulsimeter. 4,929,825, Cl. 250-221.000.

Maezawa, Shigenari: *See*—
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Ishikura, Keizaburo; Sera, Akio; and Suehiro, Junji, 4,929,903, Cl. 324-544.000.

Magal Security Systems, Ltd.: *See*—
Porat, Chaim, 4,929,926, Cl. 340-541.000.

Magin, Berthold, to MTM Obermaier GmbH & Co. KG. Process for the wet treatment of textile material. 4,928,338, Cl. 8-149.100.

Magna International Inc.: *See*—
Bartczak, Andrzej; and Cetnar, Roman, 4,929,007, Cl. 292-336.300.

Magnetic Peripherals Inc.: *See*—
Shadzi, Bahram; and Weaver, Christopher A., 4,929,499, Cl. 428-336.000.

Mahl, Robert R., to Chesapeake Display and Packaging Company. Coupler assembly for connecting corrugated sheet material 4,929,116, Cl. 403-263.000.

Mahlkow, Hartmut; Romer, Michael; Rosskamp, Gunther; Seidenspinner, Hubert-Matthias; Stein, Ludwig; and Strache, Waltraud, to Schering Aktiengesellschaft. Process for the adhesive metallization of synthetic materials. 4,929,422, Cl. 427-57.000.

Mahmood, Tario, to American Cyanamid Company. Emulsifiable concentrates of malathion. 4,929,608, Cl. 514-122.000.

Maholland, Michael K.: *See*—
Lowery, Richard E.; Fu, Chia M.; and Maholland, Michael K., 4,929,336, Cl. 208-120.000.

Mahulikar, Deepak *See*—
Pryor, Michael J.; Fister, Julius C., Singhdeo, Narendra N.; Mahulikar, Deepak; and Cherukuri, Satyam C., 4,929,516, Cl. 428-620.000.

Maisel, Britta: *See*—
Stephani, Trutz-Ulrich; Mohr, Dieter; Maisel, Britta; and Frass, Werner, 4,929,534, Cl. 430-191.000.

Makhlouf, Samir B. Torque master. 4,928,558, Cl. 81-57.300.

Makino, Hiroyuki: *See*—
Urai, Muneharu; Makino, Hiroyuki; and Shimada, Makoto, 4,929,304, Cl. 156-245.000.

Mallinckrodt, Inc.: *See*—
Connaughton, James M., Jr.; Sexton, James E.; and Hegener, James A., 4,929,455, Cl. 426-92.000.

Maloney, Joseph J., to Reliance Electric Company. Lubrication apparatus. 4,928,795, Cl. 184-7.400.

Mamke, Kevin R., to Halliburton Company. Retrievable bridge plug and packer. 4,928,762, Cl. 166-192.000.

Mammato, Donald: *See*—
Spak, Mark A.; Mammato, Donald; Durham, Dana; and Jain, Sangya, 4,929,536, Cl. 430-325.000.

Man Design Co., Ltd.: *See*—
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatuski, Yoshio, 4,930,096, Cl. 364-550.000.

Manabe, Hajime: *See*—
Murata, Yoshiyuki; and Manabe, Hajime, 4,928,563, Cl. 84-726.000.

Manabe, Mitsuo: *See*—
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Iehisa, Nobuaki; and Manabe, Mitsuo, 4,930,135, Cl. 372-33.000.

Mannesmann AG: *See*—
Hendrischk, Wolfgang, 4,929,103, Cl. 400-124.000.
Osarek, Werner; Pempera, Franz G.; and Schonert, Dieter, 4,928,717, Cl. 134-64.00R.
Pleschiutschnigg, Fritz-Peter; Moellers, Gerd, Eberhardt, Hans-Georg; Rahmfeld, Werner; Parschat, Lothar; and Ehrenberg, Hans-Juergen, 4,928,747, Cl. 164-418.000.

Mannesmann Rexroth GmbH: *See*—
Nikolaus, Heinrich, 4,928,487, Cl. 60-414.000.

Manoury, Philippe; and Saarmets, Alfred, to Synthelabo. 1-1[(2-pyrimidinyl)amino-alkyl]piperidines, their preparation and their application in therapy. 4,929,621, Cl. 514-275.000.

Mansour, Tahir M., to Ford Motor Company. Surface quality analyzer apparatus and method. 4,929,846, Cl. 250-571.000.

Mantingh, Jan. Mobile earth mover bowl with loading rotor. 4,928,409, Cl. 37-9.000.

Marano, Gerald A.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M., Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,929,476, Cl. 428-34.200.

Marathon Oil Company: *See*—
Falk, David O., 4,928,763, Cl. 166-250.000.

Marcos, Juan A.: *See*—
Pollak, Robert R.; and Marcos, Juan A., 4,928,482, Cl. 60-39.161.

Marelin, Miklos B.: *See*—
Hinnen, Hans R.; and Marelin, Miklos B., 4,928,738, Cl. 140-93.400.

Margerum, Wayne R. Automatic wet tank drain valve. 4,928,724, Cl. 137-204.000.

Margosiak, John S.: *See*—
Emadi, Atahusain E.; Green, Eric T.; Margosiak, John S.; Mignogna, Daniel J.; and Smith, Dennis E., 4,929,184, Cl. 439-681.000.

Marin-Ayral, Rose-Marie: *See*—
Brun, Gerard; Marin-Ayral, Rose-Marie; Maurin, Maurice; Pistoulet, Bernard; and Tedenac, Jean-Claude, 4,929,282, Cl. 136-239.000.

Marinaccio, Paul J.: *See*—
Smirlock, Martin E.; Ribich, William A.; Marinaccio, Paul J.; and Sawaf, Bernard E., 4,928,575, Cl. 89-36.020.

Markyvech, Ronald K.; and Genise, Thomas A., to Eaton Corporation. Dual pressure pressurized fluid actuated shifting mechanism. 4,928,544, Cl. 74-335.000.

Marles, Robert: *See*—
Smith, Raymond D.; and Marles, Robert, 4,930,046, Cl. 361-393.000.

Marquart, David W.: *See*—
Batra, Surinder P.; Hammer, William E.; Lushinsky, Gene A.; Marquart, David W.; Schwane, Walter H.; and Ziecina, Frederick J., 4,930,069, Cl. 364-200.000.

Marques, Jose A., to Cordis Corporation. Arterial/venous simulator. 4,928,528, Cl. 73-40.000.

Marquez, Edmundo M.; Nowak, Jean-Francois; and Robles, Antonio, to Intevep, S. A. Corrosion resistance of low carbon steels in a vanadium, sulfur and sodium environment at high temperatures. 4,929,473, Cl. 427-252.000.

Marshall, Allen S., to Brockington and Marshall. Bifrustoconical beverage container, lid, multi-secitonal straw, and fastening devices. 4,928,876, Cl. 229-103.100.

Martel, Brian J.: *See*—
Clark, John; Martel, Brian J.; and Murray, James S., 4,929,877, Cl. 318-560.000.

Marti, Jaime S. Machine for unscrambling and positioning containers. 4,928,808, Cl. 198-397.000.

Martin, Edward S.; and Wieserman, Larry F., to Aluminum Company of America. Metal oxide/hydroxide particles coated with phosphate esters. 4,929,589, Cl. 502-406.000.

Martin, James F. Facsimile transmission of photographic images. 4,930,020, Cl. 358-400.000.

Martin Marietta Energy Systems, Inc.: *See*—
Besmann, Theodore M.; and Lowden, Richard A., 4,929,328, Cl. 204-279.000

Martin, Ronald G.: *See*—
Luoma, Warren L.; Martin, Ronald G.; and Breault, Richard D., 4,929,517, Cl. 429-34.000.

Marusak, Thomas J.: *See*—
Schnebly, John; and Marusak, Thomas J., 4,928,369, Cl. 29-24.500.

Marusawa, Hiroshi: *See*—
Setoi, Hiroyuki; Kuroda, Akio; Tanaka, Hirokazu; Hirai, Hideo; Marusawa, Hiroshi; and Hashimoto, Masashi, 4,929,639, Cl. 514-452.000.

Maruta, Keiichi; Ueda, Takashi; and Watanabe, Yasuhiko, to Ricoh Company, Ltd. Thermosensitive recording material. 4,929,590, Cl. 503-207.000.

Maruta, Kenji: *See*—
Masaka, Mitsuke; Hatanaka, Koji; Maruta, Kenji; and Okazaki, Seiji, 4,929,813, Cl. 219-270.000.

Maruyama, Tadashi: *See*—
Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao; Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, 4,930,105, Cl. 365-185.000.

Marvin Glass & Associates: *See*—
Morris, Lamont C.; Kuna, Wayne A.; and Terzian, Rouben T., 4,929,216, Cl. 446-324.000.

Masaka, Mitsuke; Hatanaka, Koji; Maruta, Kenji; and Okazaki, Seiji, to Jidosha Kiki Co., Ltd.; and Hitachi Metals, Ltd. Glow plug for diesel engine. 4,929,813, Cl. 219-270.000.

Masaki, Takayoshi: *See*—
Kitagawa, Kazuo; Komatsu, Fumiaki; Masaki, Takayoshi; Sawada, Yoshihisa; and Inada, Eiichi, 4,929,394, Cl. 252-633.000.

Masaki, Takeshi; Kawata, Koichi; and Sakagaito, Yukuo, to Matsushita Electric Industrial Co., Ltd. Apparatus for working curved surfaces on a workpiece. 4,928,435, Cl. 51-55.000.

Maschinenbau Oppenweiler Binder GmbH & Co.: *See*—
Heina, Karl-Fritz; Schwarz, Horst; and Weber, Wolfgang, 4,928,953, Cl. 271-185.000.

Maschinenfabrik Rieter AG: *See*—
Demuth, Robert; Staheli, Paul; Waber, Rene; Grundler, Christoph; and Machler, Franz, 4,928,353, Cl. 19-65.00A.
Symon, Georg, 4,928,896, Cl. 242-43.00R.

Maschmeyer, Richard O.: *See*—
Carpenter, Larry L.; Hagerty, Robert J.; Maschmeyer, Richard O.; Morrell, Mark L.; and Schrauth, Peter A., 4,929,265, Cl. 65-64.000.

Maslak, Chris E., to General Electric Company. Water and steam injection in cogeneration system. 4,928,478, Cl. 60-39.050.

Massa, Ted R.; and Siddle, David R., to Kennametal Inc. Collet tool. 4,928,373, Cl. 29-278.000.

Massachusetts Institute of Technology: *See*—
Wrighton, Mark S., 4,929,313, Cl. 204-153.100.

Massardo, Pietro; Bettarini, Franco; Piccardi, Paolo; and Rama, Franco, to Istituto Guido Donegani. Process for preparing polyhalogenated carbinols. 4,929,772, Cl. 568-812.000.

Massey-Ferguson Services N.V.: *See*—
Tite, Raymond C., 4,928,858, Cl. 222-312.000.

Mast, Fred; and Knus, Jean A., to GRETAG Aktiengesellschaft. Measuring head. 4,929,084, Cl. 356-446.000.

Masuda, Takashi; and Sekiguchi, Kyoji, to Canon Kabushiki Kaisha. Ophthalmic measuring apparatus. 4,929,076, Cl. 351-212.000.

Masuda, Yukio: *See*—
Sugiura, Susumu; Kouzato, Yasuo; and Masuda, Yukio, 4,930,007, Cl. 358-75.000.

Matayoshi, Yutaka; Yoshimura, Toru; Kamegaya, Shigeru; and Hamai, Kyugo, to Nissan Motor Co., Ltd. Operating arrangement for internal combustion engine poppet valves and the like. 4,928,650, Cl. 123-90.240.

Mather, John C.; and Young, Jerald A., to Rockwell International Corp. Temporary soldering aid for manufacture of printed wiring assemblies. 4,928,387, Cl. 29-840.000.

Mathis, Walter. Apparatus for dry printing onto a workpiece using a hot embossing film and an embossing die. 4,928,588, Cl. 101-9.000.

Matre, Daniel A.: *See*—
Campanelli, Anthony S.; and Matre, Daniel A., 4,928,424, Cl. 47-1.010.

Matsubaguchi, Satoshi: *See*—
Yamada, Takashi; Nomura, Masaaki; Yamamoto, Ryoichi; Matsubaguchi, Satoshi; and Nahara, Akira, 4,929,320, Cl. 204-192.200.

Matsubara, Saburo; Gohshi, Yoshihiro; Kobayashi, Seizo; and Usui, Katsumi, to Nippon Oil Co., Ltd. Preparation method of masterbatch composition for thermoplastic resin modification. 4,929,680, Cl. 525-240.000.

Matsubara, Yuji: *See*—
Hoashi, Akira; Akima, Hideo; Shimanuki, Haruki; and Matsubara, Yuji, 4,930,083, Cl. 364-426.020.

Matsuda, Hiroshi: *See*—
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.

Matsueda, Toshiharu: *See*—
Saito, Shigeaki; Matsueda, Toshiharu; Kubota, Yoshihiro; and Iguchi, Masaaki, 4,929,572, Cl. 437-164.000.

Matsuhashi, Yuji: *See*—
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, 4,929,633, Cl. 514-423.000.

Matsui, Fumio; Suzuki, Noboru; Takaishi, Minoru; Ogura, Ryushi; Harigai, Noriaki; Hashimoto, Tadayoshi; and Uematu, Tomoe, to Showa Denko Kabushiki Kaisha. Fibrous substrates impregnated with a curable composition. 4,929,494, Cl. 428-286.000.

Matsui, Hiroki: *See*—
Hosaka, Takefumi; Arai, Yasuhisa; and Matsui, Hiroki, 4,930,084, Cl. 364-426.040.

Matsui, Isamu; Uehara, Masao; Noshi, Shinji; and Kawarabashi, Tsukasa, to Murata Kikai Kabushiki Kaisha. Fixed length winding method in a two-for-one twister. 4,928,475, Cl. 57-264.000.

Matsui, Shinichi, to Nissan Motor Co., Ltd. Mounting arrangement for automotive engine or the like having multiple variable orifices. 4,928,935, Cl. 267-140.100.

Matsumoto, Kazuya, to Olympus Optical Co., Ltd. Solid-state imaging device with multiple dielectric layers. 4,929,994, Cl. 357-30.000.

Matsumoto, Kazuyuki; Hashimoto, Masataka; and Iwata, Michiyoshi, to Teijin Seiki Co., Ltd. Articulation drive apparatus of industrial robot. 4,928,556, Cl. 475-149.000.

Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao, Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory device with a double gate structure. 4,930,105, Cl. 365-185.000.

Matsumura, Keiji: *See*—
Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, 4,929,482, Cl. 428-36.400.

Matsunaga, Fujihisa; and Fukuhara, Hiroshi, to Mitsui Petrochemical Industries, Ltd. Process for producing a phenol and/or a cyclohexanone. 4,929,762, Cl. 568-361.000.

Matsuo, Koujirou: *See*—
Yoshinaka, Minoru; Matsuo, Koujirou; Koike, Kiichi; Suzuki, Yoshie; and Sugimoto, Mansaku, 4,929,518, Cl. 429-54.000.

Matsuo, Teruo; Ihara, Tadayoshi; and Oyamada, Yoshinori, to Hitachi, Ltd. Method of aging cathode-ray tube. 4,929,209, Cl. 445-6.000.

Matsuo, Yasutoshi: *See*—
Yamada, Hiroshi; Nakano, Ryo; Matsuo, Yasutoshi; and Mikami, Seiichi, 4,930,005, Cl. 358-36.000.

Matsuoka, Masami: *See*—
Shishido, Kihachi; Matsuoka, Masami; Ishihara, Noriyuki; and Tamura, Masahiro, 4,929,479, Cl. 428-35.200.

Matsuoka, Naoya: *See*—
Yuchi, Sadataka; Machida, Haruchika; Matsuoka, Naoya; and Kikuchi, Masamichi, 4,930,095, Cl. 364-571.010

Matsushima, Hideyuki: *See*—
Ishii, Susumu; and Matsushima, Hideyuki, 4,928,358, Cl. 24-431.000.

Matsushima, Kouji, to Fujitsu Limited. Cordless telephone communication system. 4,930,149, Cl. 379-61.000.

Matsushita, Akio: *See*—
Takematsu, Tetsuo; Yakeuchi, Yasutomo; Takenaka, Mitsuaki; Takamura, Seiji; and Matsushita, Akio, 4,929,273, Cl. 71-118.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Eda, Kazuo; Miwa, Tetsuji; and Taguchi, Yutaka, 4,930,044, Cl. 361-313.000.
Kanamori, Katsuhiro; Kanno, Yoshimitsu; Kurosawa, Toshiharu; Kawakami, Hidehiko; Naka, Motohiko; and Kotera, Hiroaki, 4,929,978, Cl. 355-38.000.
Kato, Makoto; Saimi, Tetsuo; and Ohara, Shunji, 4,929,823, Cl. 250-201.500.
Masaki, Takeshi; Kawata, Koichi; and Sakagaito, Yukuo, 4,928,435, Cl. 51-55.000.
Namba, Mitsuo; and Uematsu, Reppei, 4,928,728, Cl. 137-486.000.
Yoshinaka, Minoru; Matsuo, Koujirou; Koike, Kiichi; Suzuki, Yoshie; and Sugimoto, Mansaku, 4,929,518, Cl. 429-54.000.

Matsushita, Hiroomi: *See*—
Yamaguchi, Tetsuo; and Matsushita, Hiroomi, 4,928,965, Cl. 273-78.000.

Matsushita, Yoshikazu: *See*—
Aoki, Kenji; Takei, Katsumori; Nakamura, Haruo; and Matsushita, Yoshikazu, 4,929,057, Cl. 350-333.000.

Matsuyama, Kazuo: *See—*
Komai, Takeshi; Matsuyama, Kazuo; and Honma, Isao, 4,929,747, Cl. 558-263.000.

Matthews, Charles W., Batman, Eric S.; and King, Jeffrey F., to Ethyl Corporation. Aluminum phenoxide catalyst removal. 4,929,770, Cl. 568-756.000.

Matthews, Donald P.; McCarthy, James R.; and Whitten, Jeffrey P., to Merrell Dow Pharmaceuticals. Process for preparing heteroaromatic methyl)-2,2'-bi-1H-imidazoles. 4,929,744, Cl. 548-202.000.

Matthews, Leonard A : *See—*
Powers, William J , III; Matthews, Leonard A.; and Jao, Tze-Chi. 4,929,373, Cl. 252-33.000.

Matthews, Michael. *See—*
Truchsess, Joseph; and Matthews, Michael, 4,929,826, Cl. 250-221.000.

Matz, Richard; and Zirrgiebel, Jutta, to Siemens Aktiengesellschaft Insulating arrangement for optical insulation of integrated components and the method of manufacture. 4,929,515, Cl. 428-614.000

Maulat, Jean-Pierre: *See—*
LeFort, Bernard; Maulat, Jean-Pierre; and Bachomoff, Guy R., 4,928,483, Cl. 60-226.100.

Maurin, Maurice: *See—*
Brun, Gerard; Marin-Ayral, Rose-Marie; Maurin, Maurice; Pistoulet, Bernard; and Tedenac, Jean-Claude, 4,929,282, Cl 136-239.000

Maury, Hans-Dietmar; and Buslowski, Wolfgang, to O&K Orenstein & Koppel Aktiengesellschaft. Method for the heat treatment of finely granular material. 4,929,178, Cl. 432-14.000.

Maxwell, Peter C.: *See—*
Barer, Sol J.; Maxwell, Peter C.; and Hsieh, Jih-Han, 4,929,396, Cl. 562-595.000.

Maxwell, Thomas P., to Minnesota Mining and Manufacturing Company Intravascular blood parameter measurement system. 4,928,694, Cl. 128-637.000.

May & Baker Limited *See—*
Hewett, Richard H.; and Luscombe, Brian M., 4,929,271, Cl. 71-94.000.

Mayer, Peter *See—*
Barshay, Stanley F.; and Mayer, Peter, 4,928,840, Cl. 220-8.000.

Mayr, Bernhard; and Lampl, Heinz, to Head Sportgeraete Gesellschaft m.b.H. & Co. OHG. Ski having a core comprising angled profiles. 4,928,989, Cl. 280-610.000.

Mayra-Makinen, Annika, to Valio Meijerien Keskusosuusliike Test set and a process for the determination of antibiotics in milk and a novel streptococcus thermophilus strain to be used therein. 4,929,546, Cl. 435-29.000.

Mays, Roscoe, Jr . *See—*
Bradbury, Harold M.; Pfenning, Dwight B.; Corlett, William R : and Mays, Roscoe, Jr., 4,929,818, Cl. 235-381.000.

Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, to Bayer Aktiengesellschaft. New polyisocyanate-polyaddition compounds, a process for their preparation and their use for the dispersion of solids 4,929,705, Cl. 528-49.000.

Mazda Motor Corporation: *See—*
Shinya, Yoshiyuki; Tabara, Yoshitaka; Okuno, Itaru; Kaneko, Tadashi; and Watanabe, Tomomi, 4,928,652, Cl. 123-417.000.

Mazilu, Doina *See—*
Wong, Yuen W.; Mazilu, Doina; and Amdahl, Paul O , 4,930,101, Cl. 364-900.000

Mc Cann's Engineering and Manufacturing and Co.: *See—*
McCann, Gerald P.; and Holoubek, Andrew J , 4,928,854, Cl. 222-129.100.

McAdory, George D : *See—*
Smith, R. Arnold. 4,929,640, Cl. 514-474.000.

McArthur, Alastair; Davis, Royston H.; Hilton, Mark D.; Newton, Trevor W ; and Patel, Dinesh M., to Shell Internationale Research Maatschappij, B. V Oxadiazole compounds, their preparation and their use as pesticides. 4,929,628, Cl. 514-364.000.

McBeath, Les L.; Sheikholeslami, Amir M ; and Turro, Glenn T , to Zenith Electronics Corporations. Digital color video monitor 4,929,933, Cl. 340-703.000.

McBeath, Simon C.: *See—*
Langston, Richard D ; Webb, Frances C.; and McBeath, Simon C., 4,928,681, Cl. 128-156.000.

McCalla/Lackey Products Corporation: *See—*
Laughon, Thomas C.; Nicholson, Roy V.; Barrett, Michael E.; and Beckmann, Robert C., 4,928,913, Cl. 248-224 100.

McCambridge, John M.: *See—*
Luttje, William V ; and McCambridge, John M., 4,930,094, Cl. 364-561.000.

McCandless, Jay H : *See—*
Voyce, Kenneth G.; and McCandless, Jay H., 4,929,906, Cl. 330-149.000.

McCann, Gerald P., and Holoubek, Andrew J , to Mc Cann's Engineering and Manufacturing and Co. Superflow diffuser and spout-assembly. 4,928,854, Cl. 222-129 100.

McCarthy, James R.: *See—*
Matthews, Donald P.; McCarthy, James R.; and Whitten, Jeffrey P., 4,929,744, Cl. 548-202.000

McCarthy, Patrick J., to Atari Games Corporation Multiple stamp motion objects in a video game system 4,930,074, Cl. 364-410.000.

McCluskey, Philip H : *See—*
Hexemer, Richard L., Jr.; Axelson, Scott R.; McCluskey, Philip H ; and Mroz, Thomas J., Jr., 4,929,433, Cl. 423-411.000.

McConnell, Lloyd T., to Adtec Incorporated. Motorized locking mechanism for a door. 4,929,003, Cl. 292-144.000.

McCrackin, Perry J.: *See—*
Schmidt, Donald L.; McCrackin, Perry J.; and Coburn, Charles E., 4,929,666, Cl. 524-516.000.

McCuen, Steven W., to Honeywell Inc. Battery monitor. 4,929,931, Cl. 340-636.000.

McCullough, Francis P., Jr.: *See—*
Cipriano, Robert A.; Snelgrove, R. Vernon; and McCullough, Francis P., Jr., 4,929,521, Cl. 429-102.000.

McDantim, Inc.: *See—*
Fallon, Merton R.; and Clements, Thomas W., 4,928,850, Cl. 222-3.000.

McDevitt, John J., Sr.: *See—*
Kooiman, Cornelis A., and McDevitt, John J., Sr., 4,929,254, Cl 48-76.000

McDonald, Clayton C : *See—*
Duczkowski, Edward, Jr.; and McDonald, Clayton C., 4,928,602, Cl. 104-111 000.

McFadzen, David B.: *See—*
Redpath, James; Logan, Robert T.; McFadzen, David B.; and Roy, Robert G., 4,929,636, Cl. 514-443.000.

McGaha, George: *See—*
Jones, Arthur L., and McGaha, George, 4,930,058, Cl. 362-400.000.

McGready, Russell J.: *See—*
Tyrell, John A.; and McGready, Russell J., 4,929,716, Cl. 528-353.000.

McIntyre, Keith W ; and McIntyre, Scott J., to H Novis Inc Automobile windscreen cleaning system. 4,928,580, Cl. 98-2 100.

McIntyre, Scott J.: *See—*
McIntyre, Keith W.; and McIntyre, Scott J., 4,928,580, Cl 98-2 100.

McKenna, Steve T.: *See—*
Luetkens, Melvin L., Jr.; McKenna, Steve T.; and Melquist, John L., 4,929,763, Cl. 568-402.000.

McKinnon, Donald C., to Ferret. Battery cable clip and cable connection 4,929,199, Cl. 439-759.000.

McLagan, Angus; Pao, Gei-Jon; Un, Chong S.; and Pearce, John J., Jr., to David Computer Corporation. Automatic data channels for a computer system. 4,930,065, Cl. 364-200.000.

McQueen, Robert W.: *See—*
Schellstede, Herman J.; McQueen, Robert W , and Peters, Alan D , 4,928,757, Cl. 166-55.100.

Mead Corporation, The: *See—*
Beery, Jack, 4,928,900, Cl 242-71 100.
Beery, Jack, 4,928,947, Cl. 271-24.000.
Lee, Chuan; and Kovacs, Kerry, 4,929,531, Cl. 430-138.000.

Meador, Hilman J. Carpet sweeper. 4,929,345, Cl. 209-215.000.

Mecca, Randall S.: *See—*
Utterback, Jeffery J.; and Mecca, Randall S., 4,928,910, Cl. 246-169.00A.

Meckley, John R., to General Electric Company. Systolic radon transform processor. 4,930,076, Cl. 364-413.210.

Medi-Tech International Corporation: *See—*
Cornell, John, 4,929,577, Cl. 514-58.000.

Medical College of Ohio: *See—*
Sabin, Jeffrey J , 4,928,958, Cl. 272-96.000.

Medical Engineering Corporation. *See—*
Trick, Robert E., 4,928,706, Cl. 128-774.000.

Medical Laser Uit of Heriot-Watt University of Research Park: *See—*
Colles, Michael J.; and Smith, George R., 4,929,052, Cl. 350-96.320.

Medina, Linda M.: *See—*
Schonauer, Sylvia L.; Medina, Linda M.; and Neel, Donald V., 4,929,461, Cl. 426-438.000.

Medway, David. Hypodermic needle protection device. 4,929,237, Cl. 604-198.000.

Mee, Francis H. A., to Spar Aerospace Limited. Floating Matable element. 4,929,136, Cl. 411-432.000

Menne, Georg: *See—*
Schatz, Oskar; Mehne, Georg; and Steidele, Thomas, 4,928,648, Cl. 123-403.000.

Meier, Daniel A., and Groshans, Michael J., to Nalco Chemical Company. Prevention of vapor phase corrosion caused by halogens in brewery pasteurizers. 4,929,424, Cl. 422-9.000.

Meier, Hans R., and Evans, Samuel, to Ciba-Geigy Corporation. N-substituted tetrahydroquinolines for use as antioxidants in lubricants. 4,929,732, Cl. 546-158.000.

Meier, Werner; Rambeck, Walter A.; Weiser, Harald; and Zucker, Hermann, to Hoffmann-La Roche Inc. Composition which contain hydroxylated derivatives of vitamin D3 . 4,929,610, Cl 514-167.000.

Meiji Seika Kaisha, Ltd.: *See—*
Joyama, Norio; and Aoki, Ikumi, 4,928,590, Cl. 99-576.000.
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, 4,929,633, Cl. 514-423.000.

Meiners, David J.; Morris, Robert A.; Arnold, David; Castonguay, Roger N.; and Palmieri, Joseph M., to General Electric Company. Compact circuit breaker with an electronic trip unit. 4,929,920, Cl 335-202.000.

Meixner, Ferdinand: *See—*
Mentzel, Edgar; and Meixner, Ferdinand, 4,928,715, Cl. 131-365.000

Mele, William D. Intravenous boards. 4,928,712, Cl. 128-877.000.

Melquist, John L.: *See—*
Luetkens, Melvin L., Jr.; McKenna, Steve T.; and Melquist, John L., 4,929,763, Cl. 568-402.000.

Meltzer, Elliott A.; and Diloia, Albert A., to Thermo-Blade, Inc. Heated windshield wiper blade and holder. 4,928,345, Cl. 15-250.060.

Meltzer, Leonard T.: *See—*
Coughenour, Linda L.; Davis, Robert E.; Downs, David A.; Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,929,734, Cl. 546-338.000.

Melwisch, Harald; and Schneider, Norbert, to U.S Philips Corp. Shaving head for a dry-shaving apparatus. 4,928,389, Cl. 30-43.920.

Memory Technology: *See—*
Monett, Michael R., 4,929,894, Cl. 324-212.000

Mennicken, Gerhard: *See—*
Engbert, Theodor; Frohlich, Jurg; Kubitza, Werner; Breidenbach, Peter; and Mennicken, Gerhard, 4,929,724, Cl. 540-202.000.

Mentzel, Edgar; and Meixner, Ferdinand, to H F. & Ph. F. Reemtsma GmbH & Co.; and Schoeller & Hoesch GmbH. Cigarette. 4,928,715, Cl. 131-365.000.

Merbler, Rudolph, to Xerox Corporation. Variable speed pulley 4,929,217, Cl. 474-54.000.

Mercado, Romeo I., to Lockheed Missiles & Space Company, Inc Long-focus color-corrected petzval-type optical objective. 4,929,071, Cl. 350-463.000.

Mercer, Patricia N.: *See—*
Irick, Gether, Jr.; Mercer, Patricia N.; and Simmons, Kenneth E., 4,929,777, Cl. 568-864.000.

Mercier, Claude: *See—*
Grosselin, Jean-Michel; and Mercier, Claude, 4,929,776, Cl 568-862 000.

Merck & Co., Inc.: *See—*
Baldwin, John J.; Ponticello, Gerald S.; and Habecker, Charles N., 4,929,637, Cl. 514-445.000.
Hartman, George D.; and Prugh, John D., 4,929,549, Cl 514-227.800.
Tobert, Jonathan A , 4,929,437, Cl. 424-10.000

Merit Enterprises, Inc.: *See—*
Hillsted, Jerome, 4,928,510, Cl. 72-131.000.

Meriwether, Jon D., to Louis Berkman Company, The Modular float drum system. 4,928,617, Cl. 114-267.000.

Merkle, John R.: *See—*
Flint, Hollis M.; and Merkle, John R., 4,929,441. Cl. 424-84.000.

Merrell Dow Pharmaceuticals: *See—*
Matthews, Donald P.; McCarthy, James R.; and Whitten, Jeffrey P., 4,929,744, Cl. 548-202.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Domet, Jack; and Shah, Dhiren N., 4,929,605, Cl. 514-54.000.

Merriam, James D.: *See—*
Flesner, Larry D.; Eisenman, Welsey L.; Merriam, James D., Bates, Richard L.; Dahle, Rolf N.; and Arrington, Douglas C., 4,929,831, Cl. 250-307.000.

Merry, Jack D.; and Fink, E. David, to Universal Medical Instrument Corp. Self-sealing percutaneous tube introducer 4,929,235, Cl 604-167.000.

Merry, Richard P., to Minnesota Mining and Manufacturing Company. Catalytic converter. 4,929,429, Cl. 422-179.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Sturm, Richard, 4,928,906, Cl. 244-3.220.

Metallgesellschaft AG: *See—*
Saft, Helmut, 4,929,310, Cl. 202-158.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Saft, Helmut, 4,929,311, Cl. 202-158.000.

Metcalf, Darrell J. Quick release latching and dispensing device. 4,929,861, Cl. 312-18.000.

Metzler, Mark W.: *See—*
Carlson, William E.; and Metzler, Mark W., 4,930,045, Cl. 361-329.000.

Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, to Bayer Aktiengesellschaft. Polyolefinecarboxylic acids, their preparation and their use for preparing polyolefine-polycarbonate block copolymers. 4,929,689, Cl. 525-333.900.

Meyer, Eric W.; and Van Coney, Robert H., to Procter & Gamble Company, The. Method for blow-molding a container having a neck-portion with internal attachment means. 4,929,410, Cl. 264-533.000.

Meyer, Gundolf; Schonfeld, Erwin; and Verpoort, Clemens, to Asea Brown Boveri AG. Process for producing a multiple-filament oxide superconductor. 4,929,596, Cl. 505-1 000.

Meyer, Howard S.: *See—*
Lee, Anthony L.; Meyer, Howard S.; and Hill, Vern L., 4,929,585, Cl. 502-220.000.

Meyer, Karl W.: *See—*
Huang, C. S. Warren; and Meyer, Karl W., 4,929,788, Cl 585-522.000.

Meyer, Richard S., to Curtice-Burns, Inc. Process for aseptic preparation of particulate food products. 4,929,463, Cl 426-521 000.

Meyer, Rolf-Volker: *See—*
Dujardin, Ralf; Meyer, Rolf-Volker; and Siebourg, Wolfgang, 4,929,709, Cl. 528-198.000.

Meyering, Mark T., and Ostreicher, Eugene A , to Cuno, Incorporated Filter element having microporous membrane 4,929,354. Cl. 210-321.610.

Meyers, Michael R.: *See—*
Gilbertson, Thomas A , Meyers, Michael R , and Kinneberg, Bruce, 4,928,493, Cl. 62-185.000.

Meynier, Patrick, to Institut Fancais du Petrole. Anti-bounce device for preventing the multiple shocks of a moving mass after a first impact against another element. 4,928,784, Cl. 181-106.000.

Miceli, Michael L.: *See—*
Viana, Luis M.; Ciozzo, Robert A.; Miceli, Michael L.; and Whitney, Kent A., 4,930,035, Cl. 361-54.000.

Michishita, Hisashi: *See—*
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, 4,929,438, Cl. 424-10.000.

MicroBeam Inc.: *See—*
Parker, Norman W.; and Robinson, William P., 4,929,839, Cl 250-492.300.

Microlife Technics, Inc.: *See—*
Vandenbergh, Peter A.; Pucci, Michael J.; Kunka, Blair S.; and Vedamuthu, Ebenezer R., 4,929,445, Cl. 424-115.000.

Midkiff, David G.; Rippl, Carl G.; Twyman, Nancy D.; and Wahlquist, Joseph D., to Kimberly-Clark Corporation. Absorbent structure for absorbing food product liquids. 4,929,480, Cl. 428-35.600.

Mielsch, Goetz, to Bayerische Motoren Werke AG. Arrangement for producing dispersion layers. 4,929,327, Cl. 204-272.000.

Miettaux, Marc, to Renault Vehicules Industriels. Cylindrical guide device with operating play compensation for fuel injection system 4,928,887, Cl. 239-584.000.

Mignogna, Daniel J.: *See—*
Emadi, Atahusain E.; Green, Eric T.; Margosiak, John S.; Mignogna, Daniel J.; and Smith, Dennis E., 4,929,184, Cl. 439-681.000.

Mikami, Hirosuke: *See—*
Fujiwara, Hideo; Tottori, Takeshi; Inagoya, Osamu, and Mikami, Hirosuke, 4,928.382, Cl. 29-603.000.

Mikami, Noboru: *See—*
Yamamoto, Yoko; Tanaka, Hitoshi; and Mikami, Noboru. 4,929,081, Cl. 356-354.000.

Mikami, Seiichi: *See—*
Yamada, Hiroshi; Nakano, Ryo; Matsuo, Yasutoshi; and Mikami, Seiichi, 4,930,005, Cl. 358-36.000.

Miki, Hideo: *See—*
Otomura, Keiichiro; Yamashita, Takayuki; Kanemitsu, Setsuo, Nakabayashi, Shigetoshi; and Miki, Hideo, 4,929,430, Cl 423-11.000.

Milberger, Lionel J.; Nobileau, Philippe C.; and Watkins, Bruce L. to Vetco Gray Inc. Casing hanger running tool using string weight 4,928,769, Cl. 166-382.000.

Miles, Thomas O.; and Kreitzer, Carl E., to E-Systems, Inc. Circular waveguide amplitude commutator. 4,929,955, Cl. 342-371.000.

Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., to Union Carbide Chemicals and Plastics Company Inc. Treatment of rhodium catalysts. 4,929,767, Cl. 568-454.000.

Miller, David R.: *See—*
Woodworth, Jonathan J.; Johnson, Stephen P., Miller, David R., Kester, Jeffrey J.; and Kershaw, Stanley S., Jr., 4,930,039, Cl 361-127.000.

Miller, Joseph H.: *See—*
Suskind, Stuart P.; and Miller, Joseph H., 4,929,498, Cl 428-288.000.

Miller, Mark T.: *See—*
Barton, Arthur A.; DeBolt, Frederick C.; Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A., Miller, Mark T., Rasch, Kenneth R.; and Szlucha, Thomas F., 4,929,983, Cl. 355-315.000.

Miller, Omer E. Ground simulator. 4,928,966, Cl. 273-195.00A

Miller, Patrick A., to Bell Communications Research, Inc Call return telephone service. 4,930,152, Cl. 379-214.000.

Milliken Denmark A/S: *See—*
Jespersen, Frank, 4,929,820, Cl. 235-487.000

Milliken Research Corporation: *See—*
Higgins, Kenneth B.; and Engels, Walter, 4,928,391, Cl 30-293.000

Mimoun, Hubert: *See—*
Cameron, Charles, Mimoun, Hubert; Bonnaudet, Serge; and Robine, Alain, 4,929,787, Cl. 585-500.000.

Minagawa, Toshio: *See—*
Itou, Kazumi; Ebe, Kazuyoshi; and Minagawa, Toshio, 4,929,486, Cl. 428-77.000.

Minami, Toshikazu: *See—*
Kurauchi, Makoto; Hashimoto, Michio; Hayasaki, Kiyoshi; Minami, Toshikazu; Ohnishi, Mutsuhiko, and Suzuki, Yohei, 4,929,650, Cl. 523-455.000.

MindCenter Corporation: *See—*
Hardt, James V., 4,928,704, Cl 128-732.000.
Henderson, Don J.; Brady, Robert; Gamble, Foster R., Hardt, James V.; Friedfeld, Howard; Salerno, Don; Swanson, Tad; and Sansing, Maureen R., 4,928,696, Cl. 128-644.000.

Mine, Takayuki: *See—*
Inoue, Toshio, Mine, Takayuki; Izutsu, Hitoshi; Yamaguchi, Toshihide; Kobata, Fumihiro; and Kawabata, Juheiji, 4,929,665, Cl. 524-500.000.

Minigrip, Inc.: *See—*
Ausnit, Steven; and Boeckmann, Hugo. 4,929,225. Cl 493-213.000
Tilman, Paul A.; Machacek, Zdenek; and Scott, Richmond, 4,929,487. Cl. 428-163.000.

Minnesota Mining & Manufacturing Comp : *See—*
Rondot, Klaus; and Schlichting, Jorg, 4,928,814, Cl 206-215.000

Minnesota Mining and Manufacturing Company: *See—*
Bunker, James E., 4,929,746, Cl. 558-92.000.
Carey, Patrick H , Jr , and Cowman, Charles D., Jr., 4,929,492, Cl 428-198.000.

Deziel, Edward W.; Rueb, John T.; Sorlien, Mark D.; Dahlstrom, Jack A.; and Erismann, David W., 4,929,029, Cl. 300-21.000.
Gerster, John F.; and Knafla, Roy T., 4,929,624, Cl. 514-293.000.
Maxwell, Thomas P., 4,928,694, Cl. 128-637.000.
Merry, Richard P., 4,929,429, Cl. 422-179.000.
Robitaille, James M.; and Wilson, Robert W., 4,929,887, Cl. 324-66.000.
Sowman, Harold G., 4,929,578, Cl. 501-95.000.
Trend, John E., 4,929,392, Cl. 252-582.000.

Mino, Masayuki: *See*—
Kyogoku, Tetsuo; Ishiyama, Masamitsu; and Mino, Masayuki, 4,929,980, Cl. 355-75.000.

Minolta Camera Kabushiki Kaisha: *See*—
Fukui, Kazuyuki, 4,928,951, Cl. 271-113.000.
Kyogoku, Tetsuo; Ishiyama, Masamitsu; and Mino, Masayuki, 4,929,980, Cl. 355-75.000.

Mirenna, Luigi: *See*—
Colle, Roberto; Camaggi, Giovanni; Gozzo, Franco; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,929,631, Cl. 514-383.000.

Mirowski, Mieczyslaw: *See*—
Mower, Morton M., 4,928,688, Cl. 128-419.0PG.

Mishra, Munmaya K.: *See*—
Kennedy, Joseph P.; and Mishra, Munmaya K., 4,929,683, Cl. 525-268.000.

Misu, Hiroshi: *See*—
Nishikawa, Nobuo; and Misu, Hiroshi, 4,929,533, Cl. 430-169.000.

Mitani, Takahiko: *See*—
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, 4,929,438, Cl. 424-10.000.

Mitchell, Larry L.; and Toney, Crayton G., to Albany International Corp. Flame retardant rolling door. 4,929,497, Cl. 428-265.000.

Mito, Akio: *See*—
Ando, Tsuyoshi; Hirono, Nakayasu; Nakao, Hirotoshi; Mito, Akio; Kihara, Kazuyuki, Hatakenaka, Kosuke; and Ogawa, Hiroshi, 4,928,730, Cl. 137-554.000.

Mito, Kazunori; and Hirata, Masahiro, to Mitsui Petrochemical Industries, Ltd. Electrofusion joint. 4,929,817, Cl. 219-544.000.

Mitoguchi, Fumio: *See*—
Inaba, Yoshiharu; Mitoguchi, Fumio; and Yamashita, Hiromasa, 4,929,165, Cl. 425-150.000.

Mitsubishi Cable Industries, Ltd.: *See*—
Murata, Hiroaki; Inomata, Teruhisa; and Tabira, Masatoshi, 4,929,866, Cl. 313-500.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Harara, Mitsuhiko; Takizawa, Shozo; Tanaka, Tadao; and Wada, Shunichi, 4,930,082, Cl. 364-424.050.
Isozumi, Shuzoo, 4,929,857, Cl. 310-83.000.
Kako, Hajime, 4,928,655, Cl. 123-488.000.
Kawase, Hiroyasu, 4,929,810, Cl. 219-69.120.
Kondo, Shigeki, 4,930,079, Cl. 364-424.100.
Konishi, Keiichi, 4,929,858, Cl. 310-83.000.
Kumada, Susumu; Mori, Mikio; Nagatani, Ryoji; and Ano, Tadami, 4,928,502, Cl. 62-440.000.
Ohkubo, Satoru; and Iwata, Toshio, 4,928,653, Cl. 123-435.000.
Omura, Etsuji; and Namizaki, Hirofumi, 4,929,571, Cl. 437-129.000.
Takahira, Kenichi, 4,930,129, Cl. 371-40.400.
Yabu, Atsuhiro; and Tsukahara, Toshiro, 4,930,030, Cl. 360-107.000.
Yamamoto, Yoko; Tanaka, Hitoshi; and Mikami, Noboru, 4,929,081, Cl. 356-354.000.
Yoneda, Masahiro, 4,929,990, Cl. 357-23.600.

Mitsubishi Gas Chemical Company: *See*—
Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi; Oda, Mitsunori; and Tanaka, Akinori, 4,929,267, Cl. 71-77.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Harara, Mitsuhiko; Takizawa, Shozo; Tanaka, Tadao; and Wada, Shunichi, 4,930,082, Cl. 364-424.050.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Funahashi, Nobuhiro; Yamashita, Toshio; and Ogawa, Hiroshi, 4,928,500, Cl. 62-193.000.
Itahana, Tsutomu; Kanno, Hideo; Ono, Tetsuo; Furuta, Futoru; Kobayashi, Susumu; Akimoto, Ryosaku; and Tanigaki, Ryuhei, 4,928,723, Cl. 137-116.300.
Sato, Hiroshi, 4,929,297, Cl. 156-361.000.
Taguchi, Seizo; Oketani, Toshiharu; Ohashi, Michihiro; Tanaka, Hideaki; and Terao, Hiroshi, 4,929,092, Cl. 374-183.000.

Mitsubishi Kasei Corporation: *See*—
Kuma, Kiyoji, 4,929,756, Cl. 564-267.000.
Yamaguchi, Tatsuaki; and Hirota, Kozo, 4,929,797, Cl. 585-921.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Hosono, Katsuaki; and Kushita, Kenji, 4,929,220, Cl. 474-152.000.

Mitsubishi Metal Corporation: *See*—
Takeshita, Takuo; Sugihara, Tadashi; and Fujino, Shuichi, 4,929,597, Cl. 505-1.000.

Mitsubishi Petrochemical Company Limited: *See*—
Takahashi, Kunimasa; Kameda, Takashi; and Shibatani, Haruo, 4,929,404, Cl. 264-29.500.

Mitsubishi Rayon Co.: *See*—
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,929,169, Cl. 425-385.000.

Mitsuboshi Belting Ltd.: *See*—
Tanaka, Hiroyuki; Uto, Kuniharu; Kawai, Kazumi; Shaura, Tsuneo; and Yasuhuku, Motonobu, 4,929,221, Cl. 474-205.000.

Mitsui & Co., Ltd.: *See*—
Nakamura, Masanobu, 4,928,509, Cl. 72-61.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Matsunaga, Fujihisa; and Fukuhara, Hiroshi, 4,929,762, Cl. 568-361.000.
Mito, Kazunori; and Hirata, Masahiro, 4,929,817, Cl. 219-544.000.
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Ishikura, Keizaburo; Sera, Akio; and Suehiro, Junji, 4,929,903, Cl. 324-544.000.

Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha: *See*—
Kurauchi, Makoto; Hashimoto, Michio; Hayasaki, Kiyoshi; Minami, Toshikazu; Ohnishi, Mutsuhiko; and Suzuki, Yohei, 4,929,650, Cl. 523-455.000.
Tominaga, Kaoru; and Iwata, Tadao, 4,929,708, Cl. 528-118.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Nagata, Teruyuki; Okazaki, Koju; Kajimoto, Nobuyuki; Miura, Tohru; Kanemura, Yoshinobu; and Sasagawa Katsuyoshi, 4,929,707, Cl. 528-76.000.
Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, 4,928,438, Cl. 51-283.00R.

Mitsuyuki, Yoichiro: *See*—
Yonezawa, Akihiro; Sasaki, Hiroki; Mitsuyuki, Yoichiro; Mori, Yasuki; and Ishigami, Toshihiko, 4,929,869, Cl 313-639.000.

Miura, Katsuyoshi: *See*—
Yoneda, Akira; and Miura, Katsuyoshi, 4,929,891, Cl. 324-154 0PB.

Miura, Kazutoshi: *See*—
Tanaka, Shigeru; and Miura, Kazutoshi, 4,930,064, Cl. 363-161.000.

Miura, Kunihiko: *See*—
Egawa, Jiro; Tanimoto, Koji; and Miura, Kunihiko, 4,930,087, Cl. 364-518.000.

Miura, Shinji: *See*—
Ohkubo, Yukiharu; Hosoya, Manabu; Miura, Shinji; and Aoki, Yuichi, 4,928,936, Cl. 269-73.000.

Miura, Tohru: *See*—
Nagata, Teruyuki; Okazaki, Koju; Kajimoto, Nobuyuki; Miura, Tohru; Kanemura, Yoshinobu; and Sasagawa, Katsuyoshi, 4,929,707, Cl. 528-76.000.

Miwa, Tetsuji: *See*—
Eda, Kazuo; Miwa, Tetsuji; and Taguchi, Yutaka, 4,930,044, Cl. 361-313.000.

Miyake, Ichiro: *See*—
Nagahara, Shinichi; Suzuki, Tomoyuki, Yamada, Tomoyasu; Takahashi, Tokihiro; and Miyake, Ichiro, 4,930,031, Cl. 360-107.000.

Miyamoto, Mitsuaki: *See*—
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.

Miyamoto, Shigenobu: *See*—
Kimura, Toshio; Okano, Yoshihiro; Otani, Masahiro; and Miyamoto, Shigenobu, 4,930,090, Cl. 364-520.000.

Miyazaki, Koji: *See*—
Daicho, Norio; Kawahara, Masakatsu; Nitta, Jiro; Miyazaki, Koji; and Yonezawa, Keitaro, 4,928,919, Cl. 251-89.000.

Miyazaki, Kunihiro; Ishitobi, Ken; and Yamaguchi, Yosinobu, to Showa Denko Kabushiki Kaisha; and Yamaguchi Seiken Kogyo Kabushiki Kaisha. Abrasive composition and process for polishing. 4,929,257, Cl. 51-309.000.

Miyazaki, Takao, to Fuji Photo Film Co., Ltd. light metering device with detector matrix and mean value detection. 4,929,824, Cl. 364-525.000.

Miyazaki, Toshihiko: *See*—
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.

Miyazawa, Yorikatu: *See*—
Shibazaki, Osamu; Miyazawa, Yorikatu; and Kato, Toshio, 4,928,826, Cl. 206-409.000.

Miyoshi, Takahito; Kanazawa, Minoru; Sugisaki, Tsutomu; Yamada, Takuzi; and Okuzawa, Yasutoshi, to Fuji Photo Film Co., Ltd. Magnetic tape cassette having improved guide pole structure. 4,930,032, Cl. 360-132.000.

Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, to Bridgestone Corporation. Vibration control system. 4,929,874, Cl. 318-128.000.

Mizuno, Masaru: *See*—
Hirayama, Takanobu; Funahashi, Hiroyuki; Yokota, Eiji; Uehara, Mitsuyoshi; Kagami, Isao; Hasegawa, Makoto; and Mizuno, Masaru, 4,929,105, Cl. 400-625.000.

Mizushima, Shoji; and Yamagata, Hideo, to Sankyo Company Limited. DNA containing the prolipoprotein signal peptidase gene. 4,929,559, Cl. 435-252.330.

Mizutani, Minoru; Kikuchi, Hiroshi; Watanabe, Shoichi; Hayashi, Kuniharu; and Maekawa, Masanori, to Oki Electric Co., Ltd. Ribbon protector including electro-conductive elements and platen gap adjustment device incorporating the same. 4,929,102, Cl. 400-248.000.

Mizutani, Yohji: *See*—
Takakusaki, Nobuyuki; Mizutani, Yohji; Kishida, Nobuhiro; and Hosokawa, Manabu, 4,929,450, Cl. 425-526.000.

Mobay Corporation: *See*—
Nodelman, Neil H., 4,929,697, Cl. 528-77.000.

Mobil Oil Corporation. *See*—
Altman, Lawrence J.; Choi, Byung C., and Karsner, Grant G., 4,929,335, Cl. 208-106.000.
Aufdembrink, Brent A.; and Landis, Michael E., 4,929,587, Cl. 502-242.000.
Bahl, Surinder K.; Canterino, Peter J.; Cunningham, Theresa L.; Evans, Susan P.; and Shaw, Richard G., 4,929,681, Cl. 525-240.000.
Cardis, Angeline B., 4,929,253, Cl. 44-76.000.
Danis, Sara L.; Skaggs, Charles L.; and Thomas, Charles A., 4,928,411, Cl. 40-324.000.
Dessau, Ralph M., 4,929.792, Cl. 585-661.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,929,334, Cl. 208-91.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,929,337, Cl. 208-120.000.
Hoskin, Dennis H., 4,928,766, Cl. 166-270.000.
Kaeding, Warren W.; and Valyocsik, Ernest W., 4,929,790, Cl. 585-651.000.
Kaeding, Warren W., 4,929,791, Cl. 585-651.000.
Morrison, Roger A., 4,929,793, Cl. 585-708.000.
Tsao, Ying-Yen P.; and von Ballmoos, Roland, 4,929,576, Cl. 502-35.000.
Wright, Bernard S.; Gould, Ronald M.; and Owen, Hartley, 4,929,780, Cl. 585-303.000.

Mochida, Kenichi. *See*—
Eguchi, Tamotsu; Oshiro, Takashi; Kuge, Yukihiro; Mochida, Kenichi; and Uwajima, Takayuki, 4,929,551, Cl. 435-106.000.

Mochizuki, Mitsuhiro: *See*—
Sugiyama, Noriyuki; and Mochizuki, Mitsuhiro, 4,929,712, Cl. 528-230.000.

Moellers, Gerd: *See*—
Pleschiutschnigg, Fritz-Peter; Moellers, Gerd; Eberhardt, Hans-Georg; Rahmfeld, Werner; Parschat, Lothar; and Ehrenberg, Hans-Juergen, 4,928,747, Cl. 164-418.000.

Mohajer, Yousef; and Lazarus, Stanley D., to Allied-Signal Inc. Reduction of carboxyl end groups in polyester with dilactim ethers. 4,929,715, Cl. 528-272.000.

Mohr, Dieter: *See*—
Stephani, Trutz-Ulrich; Mohr, Dieter; Maisel, Britta; and Frass, Werner, 4,929,534, Cl. 430-191.000.

Mohrs, Klaus; Raddatz, Siegfried; Fruchtmann, Romanis; Kohlsdorfer, Christian; and Muller-Peddinghaus, Reiner, to Bayer Aktiengesellschaft. α-substituted 4-(quinolin-2-yl-methoxy)phenylacetic acids and esters and lipoxygenase inhibition therewith. 4,929,626, Cl. 514-311.000.

Mokrosz, Maria: *See*—
Strekowski, Lucjan; Mokrosz, Maria; and Harden, Donald B., 4,929,726, Cl. 544-122.000.

Molex Incorporated: *See*—
Ponn, Timothy R.; Gutierrez, Mark; and Gugelmeyer, Robert J., 4,929,196, Cl. 439-620.000.

Molins PLC: *See*—
Arthur, Hugh M., 4,928,713, Cl. 131-84.100.

Moll, Norman G.; and Johnson, David R., to Dow Chemical Company, The. Expandable and expanded plastic materials and methods for casting metal castings employing such expanded cellular plastic materials. 4,929,645, Cl. 521-98.000.

Moller, Ulrich: *See*—
Steinkuhle, Ferdinand; Strate, Klaus; Durkop, Willi; and Moller, Ulrich, 4,929,186, Cl. 439-78.000.

Molloy, John F. Ceiling panel installation support with telescoping panel rest for ease of carrying. 4,928,916, Cl. 248-354.100.

Moltner, Hermann: *See*—
Staat, Karlhans; and Moltner, Hermann, 4,928,507, Cl. 72-38.000.

Mondelo, Fernando C.; and Ferrero, Maria T. M., to Covex, S.A. Process for the preparation of (−) eburnamenin-14-(15H)-one resinates. 4,929,440, Cl. 424-79.000.

Monett, Michael R., to Memory Technology. Method and apparatus for increasing throughput on disk drive quality control testing. 4,929,894, Cl. 324-212.000.

Montfort, Benoit, to Salomon S. A. Slide device for adjusting the relative elements of a ski boot. 4,928,406, Cl. 36-117.000.

Moore, Arnold L. Handicap bathtub lift. 4,928,330, Cl. 4-562.000.

Moore, George G. I.; and Hansen, John C. Perfluoroaminoethers 4,929,725, Cl. 544-87.000.

Moore, James E.: *See*—
Kerr, Stuart R., III; and Moore, James E., 4,929,506, Cl. 428-412.000.

Moore, Kent R.: *See*—
Lanier, Joel P.; Hall, Tamuel A.; and Moore, Kent R., 4,928,957, Cl. 272-72.000.

Moorman, Charles T.; Sabadics, Joseph L.; and Bruscino, Joseph A., to Kraft General Foods, Inc. Method and apparatus for continuous contact of supercritical fluid with particulate solids. 4,929,462, Cl. 426-478.000.

Moos, Walter H.: *See*—
Coughenour, Linda L.; Davis, Robert E.; Downs, David A., Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H., Moreland, David W.; and Tecle, Haile, 4,929,734, Cl. 546-338.000.

Moreland, David W.: *See*—
Coughenour, Linda L.; Davis, Robert E.; Downs, David A.; Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,929,734, Cl. 546-338.000.

Moreno, Frederick E.: *See*—
Joshi, Narendra D.; and Moreno, Frederick E., 4,928,481, Cl. 60-737.000.

Moreschini, Ronald. Stay full-easy load "turbo" prophylactic polishing cup. 4,929,180, Cl. 433-166.000.

Morgan, James C. Multiple axis hidden hinge. 4,928,350. Cl. 16-297.000.

Morgan, Norman C.: *See*—
Pasek, Eugene A.; and Morgan, Norman C., 4,929,583, Cl. 502-64.000.

Morgan, Richard H. Flexible foam pictures. 4,929,213, Cl. 446-97.000.

Morgan, Robert D. Bicycle rack for carrying sport boards. 4,928,863, Cl. 224-39.000.

Mori, Hiroshi: *See*—
Abe, Fumio; Mori, Hiroshi; and Takagi, Shigekazu, 4,929,406, Cl. 264-45.500.

Mori, Kei; Akaishi, Hakaru; Kakihara, Kenji; and Kitayama, Yoshiro, to Mori, Kei. Container for accommodating a solar ray-collecting device. 4,928,666, Cl. 126-440.000.

Mori, Mikio: *See*—
Kumada, Susumu; Mori, Mikio; Nagatani, Ryoji; and Ano, Tadami, 4,928,502, Cl. 62-440.000.

Mori, Seiichi: *See*—
Ainoya, Masayuki; Ishihara, Takeyuki; Kanno, Tesuo; Kikuchi, Takahiro; Mori, Seiichi; Nobumori, Shogo; and Shirakawa, Junji, 4,929,982, Cl. 355-311.000.

Mori, Shigeki: *See*—
Otoshima, Hiroo; Tsuji, Hiroshi; Mori, Shigeki; and Nishimura, Yoshihiro, 4,928,476, Cl. 57-268.000.

Mori, Yasuki: *See*—
Yonezawa, Akihiro; Sasaki, Hiroki; Mitsuyuki, Yoichiro; Mori, Yasuki; and Ishigami, Toshihiko, 4,929,869, Cl. 313-639.000.

Mori, Yasuo: *See*—
Sugi, Tokio; Mori, Yasuo; and Takahashi, Yugi, 4,928,524, Cl. 73-200.000.

Morigaki, Masakazu; and Aoki, Kozo, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,929,538, Cl. 430-551.000.

Morinaga, Shigeki; and Watabe, Mitsuru. Programmable pulse input-/output processing unit having register types specified by instructions. 4,930,100, Cl. 364-900.000.

Morita, Isao, to Kabushiki Kaisha Toshiba. Magnetic disk apparatus. 4,930,029, Cl. 360-97.010.

Morita, Yasuhiko; Kakiguchi, Yoshitomi; and Izuhara, Seiji, to Takeda Chemical Industries, Ltd. Bath preparation. 4,929,378, Cl. 252-105.000.

Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, to Kuraray Co., Ltd. Heat resistant container. 4,929,482, Cl. 428-36.400.

Moriya, Yutaka, Sanpei, Tetsuya; and Tagawa, Hisatoshi, to NKK Corporation. Iron-based shape-memory alloy excellent in shape-memory property and corrosion resistance. 4,929,289, Cl. 148-402.000.

Moriyama, Kenzo: *See*—
Suzuki, Shuuji; Moriyama, Kenzo; and Sueoka, Yuuji, 4,930,128, Cl. 371-12.000.

Morrell, Mark L.: *See*—
Carpenter, Larry L.; Hagerty, Robert J.; Maschmeyer, Richard O.; Morrell, Mark L.; and Schrauth, Peter A., 4,929,265, Cl. 65-64.000.

Morris, Brian G., to Eastman Kodak Company. Ink supply construction and printing method for drop-on-demand ink jet printing. 4,929,969, Cl. 346-140.00R.

Morris, Lamont C.; Kuna, Wayne A.; and Terzian, Rouben T., to Marvin Glass & Associates. Rotating ring and character toy 4,929,216, Cl. 446-324.000.

Morris, Robert A.: *See*—
Meiners, David J.; Morris, Robert A.; Arnold, David, Castonguay, Roger N.; and Palmieri, Joseph M., 4,929,920, Cl. 335-202.000.

Morrison, Elbert F., to Burlington Industries, Inc. Yarn produced by spinning with vacuum. 4,928,464, Cl. 57-224.000.

Morrison, Roger A., to Mobil Oil Corporation. Production of middle distillates by paraffin disproportionation. 4,929,793, Cl. 585-708.000.

Morton, William D., Jr., to Precision Monolithics, Inc. Positive retention chip carrier. 4,928,934, Cl. 206-328.000.

Moser, Hans; Pissiotas, Georg; Brunner, Hans-Georg; Bohner, Beat; and Baumann, Marcus, to Ciba-Geigy Corporation. N-phenyl-maleimides and N-phenyl-succinimides and their use in a herbicidal and/or plant growth regulating action. 4,929,272, Cl. 71-95.000.

Moser, Mark D.; Lawson, R. Joe; Antos, George J.; Wang, Li; and Parulekar, Vivekanand N., to UOP. Multizone catalytic reforming process. 4,929,332, Cl. 208-65.000.

Moser, Mark D.; Lawson, R. Joe; Wang, Li; and Parulekar, Vivekanand N., to UOP. Multizone catalytic reforming process. 4,929,333, Cl. 208-65.000.

Moses, Cornellius, Jr.: *See*—
Walton, Paul B.; Keough, James; Demers, Richard L.; Denny, Leland A., Jr.; Kaiser, Robert E.; Moses, Cornellius, Jr., and Wagh, Vijay N., 4,930,151, Cl. 379-94.000.

Moshier, Mark, and Politte, Ron, to Continental Baking Company. Dual injection cake filler apparatus. 4,928,592, Cl. 99-450.800

Motomura, Noriyuki, to Toshiba Kikai Kabushiki Kaisha. Electromagnetic molten metal supply system. 4,928,933, Cl. 266-237.000.

Motorenfabrik Hatz GmbH & Co. KG: *See*—
Kampichler, Guenter; and Eder, Erich, 4,928,643, Cl. 123-185.00B

Motorola Inc.: *See*—
Glover, Douglas L., 4,928,587, Cl. 101-42.000.

Guzik, Andrzej T.; Curtis, James H.; Habbaba, Faris S.; and Shah, Kirit, 4,929,062, Cl. 350-345.000.
Kazecki, Henry L.; and Baker, James C., 4,930,126, Cl. 370-109.000.
Pace, Gary L., 4,929,851, Cl. 307-359.000.
Pace, Gary L.; and Overton, David H., 4,929,910, Cl. 330-257.000.
Parrillo, Louis C., 4,929,565, Cl. 437-34.000.
Poglitsch, Lawrence R., 4,928,376, Cl. 29-530.000.

Mottate, Tatsuo, to Nippon Thompson Co., Ltd. Thin-walled reciprocating rectilinear motion rolling guide unit equipped with stress-resisting ball retainer. 4,929,097, Cl. 384-49.000.

Moulin, Pierre: *See*—
Gonon, Jean-Louis; and Moulin, Pierre, 4,929,190, Cl. 439-409.000.

Movick, Nyle O. Apparatus for determining the center of gravity of a spherical ball. 4,928,516, Cl. 73-65.000.

Mower, Morton M., to Mirowski, Mieczyslaw. Method and apparatus for treating hemodynamic disfunction. 4,928,688, Cl. 128-419.0PG.

Moyer, Roy E.: *See*—
Oliver, Wayne R.; Moyer, Roy E.; and Girardin, Dennis R., 4,928,480, Cl. 60-39.092.

Mross, Wolf D.: *See*—
Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D., and Saladin, Guenter, 4,929,758, Cl. 564-485.000.
Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D., and Saladin, Guenter, 4,929,759, Cl. 564-485.000.

Mroz, Thomas J., Jr.: *See*—
Hexemer, Richard L., Jr.; Axelson, Scott R.; McCluskey, Philip H.; and Mroz, Thomas J., Jr., 4,929,433, Cl. 423-411.000.

MTM Obermaier GmbH & Co. KG: *See*—
Magin, Berthold, 4,928,338, Cl. 8-149.100.

MTU Motoren-und Turbinen-Union Munchen: *See*—
Wildner, Walter, 4,929,154, Cl. 416-230.000.

Muhr und Bender Maschinenbau GmbH: *See*—
Schulte, Karl-Heinz, 4,928,377, Cl. 29-560.000.

Muhrer, Gerhard; Pannold, Reinhard; and Boschanig, Reinhard, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr.Dr.h.c. Hans List. Method and apparatus for identifying ballistic characteristics within a weapon barrel. 4,928,523, Cl. 73-167.000.

Mukai, Toshio; and Yamashita, Yoshiro, to Fuji Xerox Co., Ltd.; and Mukai, Toshio. Bis(1,2,5)thiadiazolo(3,4-b:3',4'-E) pyrazine, a process for the preparation thereof and a method of using same. 4,929,730, Cl. 544-345.000.

Mulkern, Joseph H.: *See*—
Henze, Christopher P., and Mulkern, Joseph H., 4,930,063, Cl. 363-91.000.

Mullen, Walter T., to Air Products and Chemicals, Inc. Combustion of low B.T.U./high moisture content fuels. 4,928,606, Cl. 110-347.000.

Mullendore, Arthur W., to United States of America, Energy. Formation of amorphous metal alloys by chemical vapor deposition. 4,929,468, Cl. 427-47.000.

Muller, Erich: *See*—
Nickl, Josef; Heckel, Armin; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Eisert, Wolfgang; and Muller, Thomas, 4,929,754, Cl. 562-428.000.

Muller, Hanns P.: *See*—
Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, 4,929,705, Cl. 528-49.000.

Muller, Johann: *See*—
Burger, Christa; Muller, Johann; and Bosch, Erhard, 4,929,647, Cl. 522-99.000.

Muller-Peddinghaus, Reiner: *See*—
Mohrs, Klaus; Raddatz, Siegfried; Fruchtmann, Romanis; Kohlsdorfer, Christian; and Muller-Peddinghaus, Reiner, 4,929,626, Cl. 514-311.000.

Muller-Stute, Friedrich; and Weil, Gunter, to U.S. Philips Corporation. Display unit and optical waveguide for use in same. 4,929,053, Cl. 350-96.340.

Muller, Thomas: *See*—
Nickl, Josef; Heckel, Armin; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Eisert, Wolfgang; and Muller, Thomas, 4,929,754, Cl. 562-428.000.

Muller, Walter: *See*—
Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, 4,929,705, Cl. 528-49.000.

Mullins, Edward T.: *See*—
Lentz, Carl M.; Mullins, Edward T.; and Gibson, Charles L., 4,929,737, Cl. 548-365.000.

Munford, Robert S.; and Hall, Catherine L., to Board of Regents, The University of Texas System. Lipopolysaccharides of reduced toxicity and the production thereof. 4,929,604, Cl. 514-53.000.

Murai, Shigeo: *See*—
Haga, Takahiro; Tsujii, Yasuhiro; Isogai, Tatsuo; Murai, Shigeo; and Tanaka, Toshihiro, 4,929,729, Cl. 544-330.000.

Murakami, Eiichi: *See*—
Sato, Mitsuya; Ukaji, Takao; Yamaguchi, Nobuhito; Ohmori, Taro; and Murakami, Eiichi, 4,929,893, Cl. 324-158.00F.

Murakami, Kazutomo: *See*—
Mizuno, Keiichiro; Iida, Kazuyoshi; and Murakami, Kazutomo, 4,929,874, Cl. 318-128.000.

Murakami, Koichi: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, 4,928,941, Cl. 270-53.000.

Murakami, Kunio: *See*—
Okada, Takuji; and Murakami, Kunio, 4,929,501, Cl. 428-337.000.

Muraoka, Kiyoshige: *See*—
Nishimura, Yoshifumi; Yamamoto, Susumu; Nakata, Hidekazu; Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, 4,929,512, Cl. 428-610.000.

Murata, Hiroaki; Inomata, Teruhisa; and Tabira, Masatoshi, to Mitsubishi Cable Industries, Ltd. Light emitting diode lamp. 4,929,866, Cl. 313-500.000.

Murata, Hiroyoshi: *See*—
Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao; Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, 4,930,105, Cl. 365-185.000.

Murata Kikai Kabushiki Kaisha: *See*—
Matsui, Isamu; Uehara, Masao; Noshi, Shinji; and Kawarabashi, Tsukasa, 4,928,475, Cl. 57-264.000.
Otoshima, Hiroo; Tsuji, Hiroshi; Mori, Shigeki; and Nishimura, Yoshihiro, 4,928,476, Cl. 57-268.000.

Murata Manufacturing Co., Ltd.: *See*—
Kohno, Yoshiaki; and Sakai, Norio, 4,929,295, Cl. 156-230.000.

Murata, Masashi: *See*—
Akanuma, Hideo; Murata, Masashi; Inoue, Kiyoshi; and Ohgake, Ryoji, 4,929,372, Cl. 252-29.000.

Murata Wiedemann, Inc.: *See*—
Chun, Victor L.; Hunter, James R.; and Jaworski, George, 4,929,276, Cl. 83-552.000.

Murata, Yasuo: *See*—
Nishimura, Masakatsu; Okada, Naoya; Murata, Yasuo; and Hirai, Yasuhiko, 4,929,317, Cl. 204-59.00R.

Murata, Yoshiyuki; and Manabe, Hajime, to Casio Computer Co., Ltd. Electronic tuning apparatus for an electronic stringed musical instrument. 4,928,563, Cl. 84-726.000.

Murayama, Jin; Kudoh, Yoshimitsu; and Kondo, Ryuji, to Fuji Photo Film Co., Ltd. Color solid state image pickup element with plural photocells of a same color within a subunit thereof controlled by a common control line and outputting to a common signal line. 4,930,006, Cl. 358-44.000.

Muro, Atsushi: *See*—
Egashira, Noritaka; Suto, Kenichiro; and Muro, Atsushi, 4,929,591, Cl. 503-227.000.

Muroya, Fumio; and Kotani, Yoshiaki, to Honda Giken Kabushiki Kaisha. Engine control device for mower. 4,928,458, Cl. 56-11.800.

Murphy, Robert H.; and Gosselin, Roland, to R. H. Murphy Company, Inc. Snap on bumper for electronic packages. 4,928,820, Cl. 206-328.000.

Murray, Douglas J., to Baker Hughes Incorporated. Mechanical manipulation tool with hydraulic hammer. 4,928,770, Cl. 166-385.000.

Murray, James S.: *See*—
Clark, John; Martel, Brian J.; and Murray, James S., 4,929,877, Cl. 318-560.000.

Murray, Malcolm G., Jr. Shaft alignment system. 4,928,401, Cl. 33-645.000.

Murrin, John A., Jr. Paint can construction. 4,928,846, Cl. 220-354.000.

Murugesan, Natesan: *See*—
Wasserman, Harry H.; Murugesan, Natesan; and Van Duzer, John H., 4,929,751, Cl. 560-174.000.

Musser, James A.: *See*—
Bremner, Douglas L.; Crews, Gary A., and Musser, James A., 4,930,110, Cl. 367-56.000.

Mustain, Lewis B.: *See*—
Dieterlen, Paul E.; and Mustain, Lewis B., 4,930,147, Cl. 378-176.000.

Muszik, Janos: *See*—
Bachem, Henning; Suling, Carlhans; Muszik, Janos; and Schroer, Wolf-Dieter, 4,929,309, Cl. 162-164.300.

Muszynski, Larry C., to Lone Star Industries, Inc. Pipeline casing insulator. 4,928,736, Cl. 138-178.000.

Muto, Shunichi; Inata, Tsuguo; Takeuchi, Atsushi; and Sugiyama, Yoshihiro, to Fujitsu Limited. Resonant tunnelling barrier structure device. 4,929,984, Cl. 357-4.000.

Myakishev, Anatoly K.: *See*—
Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B.; Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K., 4,929,416, Cl. 420-12.000.

Myers, Garry L.: *See*—
Wang, Richard H. S.; and Myers, Garry L., 4,929,654, Cl. 524-117.000.

Naaktgeboren, Adrianus: *See*—
Lippens, Christiaan A. C.; and Naaktgeboren, Adrianus, 4,928,462, Cl. 56-341.000.

Nafziger, Richard D.: *See*—
Bauer, Thomas M.; Dunn, Thomas A.; Gurke, Christina M.; Hopkins, John W.; and Nafziger, Richard D., 4,930,154, Cl. 379-246.000.

Nagahara, Shinichi; Suzuki, Tomoyuki; Yamada, Tomoyasu; Takahashi, Tokihiro; and Miyake, Ichiro, to Pioneer Electronic Corporation. Apparatus for recording and reproducing digital signals using a helical scan. 4,930,031, Cl. 360-107.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Pedal for a bicycle. 4,928,549, Cl. 74-594.600.

Nagao, Takeyoshi; and Kohashi, Toru, to Yamato Scale Company, Limited. Device for automatically filling and packing predetermined weight of product in containers. 4,928,473, Cl. 53-53.000.

Nagarai, D. R.: *See*—
Wang, Samuel S.; and Nagarai, D. R., 4,929,343, Cl. 209-166.000.

Nagasawa, Shinji, to NOK Corporation. Sealing apparatus. 4,928,979, Cl. 277-38.000.

Nagata, Teruyuki; Okazaki, Koju; Kajimoto, Nobuyuki; Miura, Tohru; Kanemura, Yoshinobu; and Sasagawa, Katsuyoshi, to Mitsui Toatsu Chemicals, Inc. Polyurethane base lens resin, plastic lens comprising the resin and preparation method of the lens. 4,929,707, Cl. 528-76.000.

Nagatani, Ryoji: *See*—
Kumada, Susumu; Mori, Mikio; Nagatani, Ryoji; and Ano, Tadami, 4,928,502, Cl. 62-440.000.

Nagatori, Wesley S. Arrowhead. 4,928,969, Cl. 273-422.000.

Nagatsuka, Ikutaroh: *See*—
Shinoki, Masayoshi; Takagi, Masahiro; Nagatsuka, Ikutaroh; Kumashiro, Koichi; Aoki, Takayoshi; and Takeda, Masayuki, 4,929,528, Cl. 430-108.000.

Nahara, Akira: *See*—
Yamada, Takashi; Nomura, Masaaki; Yamamoto, Ryoichi; Matsubaguchi, Satoshi; and Nahara, Akira, 4,929,320, Cl. 204-192.200.

Naito, Masataka: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, 4,928,941, Cl. 270-53.000.

Naito, Ryuichi: *See*—
Yokogawa, Fumihiko; and Naito, Ryuichi, 4,929,917, Cl. 331-1.00A.

Naito, Toshihiko: *See*—
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.

Naitoh, Takao; and Nakayama, Seidai, to Fuji Jukogyo Kabushiki Kaisha. System for cooling an internal combustion engine including a turbocharger. 4,928,637, Cl. 123-41.310.

Naka, Motohiko: *See*—
Kanamori, Katsuhiro; Kanno, Yoshimitsu; Kurosawa, Toshiharu; Kawakami, Hidehiko; Naka, Motohiko; and Kotera, Hiroaki, 4,929,978, Cl. 355-38.000.

Nakabayashi, Shigetoshi: *See*—
Otomura, Keiichiro; Yamashita, Takayuki; Kanemitsu, Setsuo; Nakabayashi, Shigetoshi; and Miki, Hideo, 4,929,430, Cl. 423-11.000.

Nakagawa, Norio, Takagi, Katsuaki; and Aoki, Hirokazu, to Hitachi, Ltd. Content-addressed memory. 4,930,104, Cl. 365-49.000.

Nakagawa, Sumio; Toiyama, Masaoki; Uno, Yoshinobu; and Kohda, Hiromichi, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing dialdehyde. 4,929,768, Cl. 568-473.000.

Nakai, Sadao: *See*—
Yamazoe, Seigo; Nakai, Sadao; and Fukui, Yukimasa, 4,929,847, Cl. 250-573.000.

Nakajima, Akira, to NEC Corporation. Key input apparatus. 4,929,944, Cl. 341-24.000.

Nakajima, Shigeo: *See*—
Yoshida, Masaru; Yoshikawa, Mitsuhiko; Yoshimoto, Yoshikazu; Wada, Hiroshi; Suzuki, Tomonari; and Nakajima, Shigeo, 4,929,803, Cl. 174-117.00M.

Nakaminami, Masamitsu: *See*—
Yaguchi, Yoshinori; Kubota, Masahiro; and Nakaminami, Masamitsu, 4,928,381, Cl. 29-568.000.

Nakamoto, Tetsuo: *See*—
Hayashi, Yoshio; Nakamoto, Tetsuo; Kanada, Katsumi; and Kondo, Yoshikazu, 4,929,171, Cl. 427-54.100.

Nakamura, Atsushi: *See*—
Yamamoto, Hisao; and Nakamura, Atsushi, 4,929,366, Cl. 252-8.600.

Nakamura, Haruo: *See*—
Aoki, Kenji; Takei, Katsumori; Nakamura, Haruo; and Matsushita, Yoshikazu, 4,929,027, Cl. 350-333.000.

Nakamura, Keizi, to Roman Shoji Co., Ltd. Plastic heels of shoes and boots. 4,928,403, Cl. 36-34.00A.

Nakamura, Kikuo, to Sigma Incorporated. Reel driving device for use in the slot machine. 4,928,964, Cl. 273-143.00R.

Nakamura, Masanobu, to Mitsui & Co., Ltd.; and Kokan Kako Co., Ltd. Method for manufacturing a pipe with projections. 4,928,509, Cl. 72-61.000.

Nakamura, Michiya, to NEC Corporation. Microcomputer having a high-speed operation mode and a low-speed operation mode with intermittent disabling of sense amplifiers. 4,930,067, Cl. 364-200.000.

Nakamura, Mitsuhiro: *See*—
Kawai, Nobuyuki; and Nakamura, Mitsuhiro, 4,929,804, Cl. 200-5.00A.

Nakamura, Nobuaki; Hirose, Yukimi; Kai, Masakatsu; and Itonaga, Makoto, to Victor Company of Japan, Ltd. Detection system with an optical encoder to optically detect displacement amount of a movable device. 4,929,822, Cl. 250-201.400.

Nakamura, Takaharu: *See*—
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.

Nakamura, Yoshinobu: *See*—
Hamada, Akihiko; Hiraoka, Hidenori; Nakamura, Yoshinobu; and Ohtsuru, Hiroshi, 4,929,678, Cl. 525-193.000.

Nakanishi, Tatsuo; Tadokoro, Toyohiko; and Fujimura, Masaki, to Yamaha Corporation. Iron club head for golf. 4,928,972, Cl. 273-78.000.

Nakano, Masaki, to Nissan Motor Co., Ltd. Continuously variable traction roller transmission. 4,928,542, Cl. 74-200.000.

Nakano, Ryo: *See*—
Yamada, Hiroshi; Nakano, Ryo; Matsuo, Yasutoshi; and Mikami, Seiichi, 4,930,005, Cl. 358-36.000.

Nakao, Haruki, to Nikki Co., Ltd. Nozzle device. 4,928,885, Cl. 239-417.000.

Nakao, Hirotoshi: *See*—
Ando, Tsuyoshi; Hirono, Nakayasu; Nakao, Hirotoshi; Mito, Akio; Kihara, Kazuyuki; Hatakenaka, Kosuke; and Ogawa, Hiroshi, 4,928,730, Cl. 137-554.000.

Nakase, Kazuhiko, to Harada Kogyo Kabushiki Kaisha. Non-grounded type ultrahigh frequency antenna. 4,929,961, Cl. 343-715.000.

Nakata, Hidekazu: *See*—
Nishimura, Yoshifumi; Yamamoto, Susumu; Nakata, Hidekazu; Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, 4,929,512, Cl. 428-610.000.

Nakatani, Kouichiro, to Velbon International Corporation. Panhead with quick release shoe. 4,929,973, Cl. 354-293.000.

Nakayama, Mitsuyuki: *See*—
Inukai, Yuzo; and Nakayama, Mitsuyuki, 4,928,719, Cl. 137-1.000.

Nakayama, Seidai: *See*—
Naitoh, Takao; and Nakayama, Seidai, 4,928,637, Cl. 123-41.310.

Nakayama, Takahide, to Hirata Industrial Machineries Co., Ltd. Intelligent pallet. 4,929,827, Cl. 250-223.00R.

Nalco Chemical Company: *See*—
Hoots, John E.; Johnson, Donald A.; Fong, Dodd W.; and Kneller, James F., 4,929,425, Cl. 422-13.000.
Meier, Daniel A.; and Groshans, Michael J., 4,929,424, Cl. 422-9.000.
Reardon, Patricia A.; and Grattan, David A., 4,929,364, Cl. 210-750.000.
Stenger, Claudia V.; and Huang, Shu-Jen W., 4,929,382, Cl. 252-181.000.

Namba, Mitsuo; and Uematsu, Reppei, to Matsushita Electric Industrial Co., Ltd.; and High Pressure Gas Safety Institute of Japan, The. Gas shutoff apparatus. 4,928,728, Cl. 137-486.000.

Namizaki, Hirofumi: *See*—
Omura, Etsuji; and Namizaki, Hirofumi, 4,929,571, Cl. 437-129.000.

Naoi, Hidenori: *See*—
Hatakeyama, Motonobu; Yoshimura, Kohtaroh; Naoi, Hidenori; and Wakasugi, Nohuo, 4,930,089, Cl. 361-519.000.

Naoumidis, Aristides: *See*—
Gat-Liquornik, Martin; and Naoumidis, Aristides, 4,928,870, Cl. 228-107.000.

Narasimhan, M. Jeersannidhi, Jr.: *See*—
Thirumalachar, M. Jeersannidhi; and Narasimhan, M. Jeersannidhi, Jr., 4,929,341, Cl. 208-390.000.

Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, to Mitsui Toatsu Chemicals, Incorporated. Wafer processing film. 4,928,438, Cl. 51-283.00R.

Narr, Berthold: *See*—
Nickl, Josef; Heckel, Armin; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Eisert, Wolfgang; and Muller, Thomas, 4,929,754, Cl. 562-428.000.

Narula, Dipak B.; Be, Anh; and Swihart, Terence J., to Dow Corning Corporation. Solventless silicone coating composition. 4,929,703, Cl. 528-23.000.

Narushima, Teruo: *See*—
Kanda, Shuhei; Hirota, Mitugu; and Narushima, Teruo, 4,930,024, Cl. 360-10.100.

Naser, Georg: *See*—
Grasser, Franz; Reichenberger, Helmut; Hassler, Dietrich; Naser, Georg; and Schmidt, Erhard, 4,928,672, Cl. 128-24.00A.
Reichenberger, Helmut; and Naser, Georg, 4,928,671, Cl. 128-24.00A.

Natarajan, Bangalore R.; and Walmsley, Robert G., to Hewlett-Packard Company. Thin film media for high density longitudinal magnetic recording. 4,929,514, Cl. 428-611.000.

Nath, Narendra: *See*—
Nevin, Ira; and Nath, Narendra, 4,928,663, Cl. 126-21.00A.

Nathan, Efraim, to Lontex Corporation. Garments and parts thereof. 4,928,323, Cl. 2-406.000.

National Research Counsil of Canada/Conseil National de Recherches du Canada: *See*—
Vandersluis, Ron; and Quittner, Erik, 4,929,011, Cl. 294-86.400.

National Research Development Corporation, The: *See*—
Cook, Peter, 4,929,420, Cl. 420-466.000.

National Science Council: *See*—
Chern, Ji-Wang; Liu, Kang-Chen; and Chen, Chia-Yin, 4,929,728, Cl. 544-284.000.

National Semiconductor Corporation: *See*—
Howell, Paul J., 4,929,570, Cl. 437-89.000.
Szepesi, Tamas S., 4,929,882, Cl. 323-222.000.

National Starch and Chemical Investment Holding Corporation: *See*—
Billmers, Robert L.; Del Giudice, David M.; Tessler, Martin M.; and Hasuly, Michael J., 4,929,670, Cl. 525-54.100.

Nautical Development, Inc.: *See*—
Speer, Stephen R., 4,929,153, Cl. 416-46.000.

VOL
1114
ISS
5
MY
29
1990
UMI

NCR Corporation: *See*—
Collins, Donald A., Jr., 4,929,819, Cl. 235-383.000.
Houser, James S.; and Finfrock, Don C., 4,930,093, Cl. 364-551.010.
NDC Company, Ltd.: *See*—
Sakai, Takeshi; and Ito, Tsuneo, 4,928,550, Cl. 74-595.000.
NEC Corporation: *See*—
Fukuda, Shinri, 4,929,916, Cl. 331-1.00A.
Hayano, Kiminori, 4,929,989, Cl. 357-23.600.
Honjo, Kazuhiko; and Tanaka, Shin-Ichi, 4,929,997, Cl. 357-34.000.
Horiguchi, Ryuji, 4,929,938, Cl. 340-747.000.
Horiguchi, Ryuji, 4,930,088, Cl. 364-518.000.
Katayose, Tsuyoshi; and Machashi, Yukio, 4,930,068, Cl. 364-200.000.
Nakajima, Akira, 4,929,944, Cl. 341-24.000.
Nakamura, Michiya, 4,930,067, Cl. 364-200.000.
Ohmagari, Shinichi, 4,930,141, Cl. 375-60.000.
Shimizu, Hiroshi, 4,930,123, Cl. 370-94.100.
Sugihara, Shigeru, 4,930,118, Cl. 370-16.000.
Yamada, Masanori, 4,930,062, Cl. 363-55.000.
NEC Home Electronics Ltd.: *See*—
Ara, Kouichi, 4,929,937, Cl. 340-728.000.
Nedwig, Joachim: *See*—
ter Hasebrg, Jan L.; Nedwig, Joachim; and Kruse, Klaus-Dieter, 4,929,842, Cl. 250-551.000.
Neel, Donald V.: *See*—
Schonauer, Sylvia L.; Medina, Linda M.; and Neel, Donald V., 4,929,461, Cl. 426-438.000.
Negi, Shigeto: *See*—
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.
Negi, Taichi: *See*—
Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, 4,929,432, Cl. 428-36.400.
Negishi, Kozabro, to Sanden Corporation. Cold preserving container 4,928,501, Cl. 62-406.000.
Negoro, Takaharu: *See*—
Kanaoka, Masaharu; Kawanaka, Chigusa; Negoro, Takaharu, and Agui, Hideo, 4,929,547, Cl. 435-69.100.
Nehring, Jurgen: *See*—
Bohnert, Klaus; Kaufmann, Meinolph; and Nehring, Jurgen, 4,929,830, Cl. 250-227.140.
Neiman, Richard D., to Vesper Corporation Safety beam lock. 4,928,834, Cl. 211-191.000.
Nelepka, Guy S Lightweight breathing device. 4,928,686, Cl. 128-205.240.
Neles Oy: *See*—
Kivipelto, Pekka J., 4,928,924, Cl. 251-315.000.
Nelleor Incorporated: *See*—
Nicolson, Susan C.; and Jobes, David R., 4,928,691, Cl. 128-633.000.
Nelson, Terry M: *See*—
Chan, C. S.; Bearss, James G.; and Nelson, Terry M., 4,930,018, Cl. 358-298.000.
Nelson, William A., III Multiple size cable testing device. 4,929,902, Cl. 324-542.000.
Nespor, Ronald R., to Chevron, Inc. Vehicle carrier with wheel lift. 4,929,142, Cl. 414-563.000.
Netsu, Tositada: *See*—
Takenaka, Takaji Netsu, Tositada; Shigi, Hidetaka; and Yamamoto, Masakazu, 4,930,002, Cl. 357-75.000.
Neu, Max G.: *See*—
Butler, David R., Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,928,746, Cl. 164-362.000
Neurohr, Fred: *See*—
Rittenhouse, David A.; Neurohr, Fred; and Estridge, Doug R., 4,929,470, Cl. 427-55.000.
Neustadt, Bernard R.: *See*—
Haslanger, Martin F.; Neustadt, Bernard R.; and Smith, Elizabeth M., 4,929,641, Cl. 514-506.000.
Nevin, Ira; and Nath, Narendra, to Bakers Pride Oven Co. Enhanced air-flow convection oven. 4,928,663, Cl. 126-21.00A
Newton, John: *See*—
Hendricks, Katherine A., 4,929,228, Cl. 600-27.000.
Newton, Trevor W.: *See*—
McArthur, Alastair; Davis, Royston H.; Hilton, Mark D.; Newton, Trevor W.; and Patel, Dinesh M., 4,929,628, Cl. 514-364.000
NGK Insulators, Ltd.: *See*—
Abe, Fumio; Mori, Hiroshi; and Takagi, Shigekazu, 4,929,406, Cl. 264-45.500.
Kato, Nobuhide; and Hamada, Yasuhiko, 4,929,331, Cl. 204-426.000.
Nichols, Dwight E., to Hoover Group, Inc. Butterfly discharge valve assembly for a liquid bulk container. 4,928,922, Cl. 251-180.000.
Nichols, Jerram B.; Hunter, Douglas; Herrington, Ronald M.; Serratelli, John F.; and Carey, David G., to Dow Chemical Company, The. Polyurethane foam prepared using high functionality cell openers. 4,929,646, Cl. 521-137.000.
Nicholson, Roy V.: *See*—
Laughon, Thomas C.; Nicholson, Roy V.; Barrett, Michael E.; and Beckmann, Robert C., 4,928,913, Cl. 248-224.100.
Nickl, Josef; Heckel, Armin; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Eisert, Wolfgang; and Muller, Thomas, to Dr. Karl Thomae GmbH. Benzenesulphonamidoindanyl compounds. 4,929,754, Cl. 562-428.000.
Nicolay, David: *See*—
Plut, Leonard F.; and Nicolay, David, 4,930,144, Cl. 378-99.000.
Nicollet Technologies, Inc.: *See*—
Hagedorn, Guenter E., 4,930,153, Cl. 379-233.000.
Nicolson, Susan C.; and Jobes, David R., to Nellcor Incorporated Lingual oximeter probe. 4,928,691, Cl. 128-633.000.
Nielson, Donald H., to Ramex Syn-Fuels International. Method and apparatus for shale gas recovery. 4,928,765, Cl. 166-251.000.
Niemeyer, Ulf: *See*—
Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, 4,929,607, Cl. 514-110.000.
Nieminen, Jorma J.: *See*—
Hakulin, Bertel K.; and Nieminen, Jorma J., 4,929,255, Cl. 48-197.00R.
NIFCO, Inc.: *See*—
Ikeda, Yasuhiko, 4,928,364, Cl. 24-614.000.
Nii, Hiroki: *See*—
Kimura, Tetsuya, Fujii, Toshihiro; and Nii, Hiroki, 4,929,469, Cl. 427-54.100.
Niimi, Kikuo, to Kictec Incorporation. Lighting peg. 4,929,942, Cl. 340-908.100.
Niizato, Tomonori; Tanai, Tsuneo; Kasahara, Kazuhiro; Saka, Tsutomu; and Oikawa, Toshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Lubricant supplying system for DOHC type multi-cylinder internal combustion engine. 4,928,641, Cl. 123-90.160.
Nikki Co., Ltd.: *See*—
Nakao, Haruki, 4,928,885, Cl. 239-417.000.
Nikolaus, Heinrich, to Mannesmann Rexroth GmbH. Control apparatus for double acting hydraulic cylinder units. 4,928,487, Cl. 60-414.000.
Nikon Corporation: *See*—
Imura, Yoshio; and Takahashi, Tsugio, 4,929,971, Cl. 354-75.000.
Ohkubo, Yukiharu; Hosoya, Manabu; Miura, Shinji; and Aoki, Yuichi, 4,928,936, Cl. 269-73.000.
Shibayama, Atsushi, 4,929,069, Cl. 350-423.000.
Niksuko Corporation: *See*—
Harakawa, Yoshihiro; Takahashi, Seiya, Izawa, Koji; Takeuchi, Hidemitsu; and Ikari, Keizo, 4,929,316, Cl. 204-56.100.
Nilson, Ronald: *See*—
Forman, Willis R., 4,928,614, Cl. 114-66.000.
Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,929,168, Cl. 425-384.000.
Ninomiya, Naohisa: *See*—
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, 4,929,438, Cl. 424-10.000.
Nippon CMK Corp.: *See*—
Kawakami, Shin; Haruyama, Satoshi; and Okonogi, Hirotaka, 4,929,491, Cl. 428-195.000.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakagawa, Sumio; Toiyama, Masaoki; Uno, Yoshinobu; and Kohda, Hiromichi, 4,929,768, Cl. 568-473.000.
Nippon Mektron Ltd.: *See*—
Sonoi, Takehiro; and Yamada, Okimasa, 4,929,686, Cl. 525-279.000.
Nippon Mining Co., Ltd.: *See*—
Kainosho, Keiji; Shimakura, Haruhito; and Oda, Osamu, 4,929,564, Cl. 437-20.000.
Nippon Oil Co., Ltd.: *See*—
Akanuma, Hideo; Murata, Masashi; Inoue, Kiyoshi; and Ohgake, Ryoji, 4,929,372, Cl. 252-29.000.
Matsubara, Saburo; Gohshi, Yoshihiro; Kobayashi, Seizo; and Usui, Katsumi, 4,929,680, Cl. 525-240.000.
Nippon Oil and Fats Co., Ltd.: *See*—
Kobashi, Rikizo; Takase, Shigeyuki; Enomoto, Hiroyuki; Hayasaki, Yasushi; Kobayashi, Toyohisa; and Yamazaki, Shingo, 4,929,685, Cl. 525-277.000.
Komai, Takeshi; Matsuyama, Kazuo; and Honma, Isao, 4,929,747, Cl. 558-263.000.
Nippon Precision Circuits Ltd.: *See*—
Toyama, Akira, 4,929,947, Cl. 341-146.000.
Nippon Sanso Kabushiki Kaisha: *See*—
Suwa, Toshio; Kobayashi, Nobuaki; and Hirano, Takashi, 4,928,605, Cl. 110-261.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Osawa, Nobuyuki, 4,929,095, Cl. 384-45.000.
Osawa, Nobuyuki, 4,929,096, Cl. 384-45.000.
Takata, Hirotoshi; Suruga, Eihiro; and Inoue, Gentei, 4,929,098, Cl. 384-450.000.
Nippon Seimitsu Kogyo Kabushiki Kaisha: *See*—
Kubota, Mineo, 4,930,022, Cl. 358-451.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.
Nippon Steel Corporation: *See*—
Komatsu, Hajime; Tanino, Mitsuru; Suga, Yozo; and Konno, Toyohiko, 4,929,286, Cl. 148-111.000.
Nippon Thompson Co., Ltd.: *See*—
Mottate, Tatsuo, 4,929,097, Cl. 384-49.000.
Nippon Zeon Co., Ltd.: *See*—
Akita, Shuichi; Suzuki, Fumitoshi; Kikuchi, Yasushi; and Oishi, Hideyuki, 4,929,679, Cl. 525-194.000.

Nira, Hisami: *See*—
Tominaga, Mamoru; Kokado, Naoyuki; Gonpei, Katsuhiro; Nira, Hisami; and Taya, Akira, 4,929,061, Cl. 350-338.000.
Nishibori, Toshiki, to Sharp Kabushiki Kaisha. Sheet feeding arrangement. 4,928,943, Cl. 271-4.000.
Nishihara, Yoshio; Isobe, Noriyuki; and Kotera, Satoshi, to Ube Industries, Ltd. Heat-resistant paint comprising polymetallocarbosilane. 4,929,507, Cl. 428-447.000.
Nishikawa, Nobuo; and Misu, Hiroshi, to Fuji Photo Film Co., Ltd. Process for producing presensitized diazo resin lithographic printing plate using 1-methoxy-2-propanol as coating solvent. 4,929,533, Cl. 430-169.000.
Nishimura, Masakatsu; Okada, Naoya; Murata, Yasuo; and Hirai, Yasuhiko, to Tokuyama Soda Kabushiki Kaisha. Process for preparation of perfluoro organic compounds. 4,929,317, Cl. 204-59.00R.
Nishimura, Yoshifumi; Yamamoto, Susumu; Nakata, Hidekazu; Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, to Sumitomo Electric Industries, Ltd.; and Sumitomo Rubber Industries, Ltd. Metal and composite material made of the metal and rubber. 4,929,512, Cl. 428-610.000.
Nishimura, Yoshihiro: *See*—
Otoshima, Hiroo; Tsuji, Hitoshi; Mori, Shigeki; and Nishimura, Yoshihiro, 4,928,476, Cl. 57-268.000.
Nishino, Hiroshi; Ejiri, Susumu; and Yokoyama, Nobuyoshi, to Paloma Kogyo Kabushiki Kaisha. Pulse combustion heating apparatus. 4,928,664, Cl. 126-391.000.
Nishio, Taichi: *See*—
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takashi; and Tsuji, Mitsuji, 4,929,675, Cl. 525-66.000.
Nishiyama, Gary S. Decorative cup. 4,928,412, Cl. 40-324.000
Nissan Chemical Industries Ltd.: *See*—
Kohtoh, Noriaki; Tsuruoka, Yoshihiro; Abe, Toyohiko; and Fukuro, Hiroyoshi, 4,929,658, Cl. 524-219.000.
Nissan Motor Company, Limited *See*—
Kiminami, Ikuo; Sakamoto, Hideyuki; and Nose, Toshimitsu, 4,928,499, Cl. 62-186.000.
Matayoshi, Yutaka; Yoshimura, Toru; Kamegaya, Shigeru; and Hamai, Kyugo, 4,928,650, Cl. 123-90.240.
Matsui, Shinichi, 4,928,935, Cl. 267-140.100.
Nakano, Masaki, 4,928,542, Cl. 74-200.000.
Suzuki, Yutaka, 4,930,080, Cl. 364-424.100.
Tamura, Hideyuki, 4,928,518, Cl. 73-117.300.
Nissen, Rudolph: *See*—
Shull, William; Nissen, Rudolph; and Drobshoff, Alexander, 4,928,756, Cl. 165-182.000.
Nitta, Jiro: *See*—
Daicho, Norio; Kawahara, Masakatsu; Nitta, Jiro; Miyazaki, Koji; and Yonezawa, Keitaro, 4,928,919, Cl. 251-89.000.
Nitta, Tomio, to Tokai Corporation Noncontrolling type valve 4,929,175, Cl. 431-344.000.
Nitta, Tomio, to Tokai Corporation Noncontrolling type valve 4,929,176, Cl. 431-344.000.
Nittan Company: *See*—
Suzuki, Takashi; and Amemiya, Hideto, 4,929,093, Cl. 374-208.000.
Niwa, Minoru: *See*—
Harada, Chikao; and Niwa, Minoru, 4,928,701, Cl. 128-677.000
NKK Corporation: *See*—
Moriya, Yutaka; Sanpei, Tetsuya; and Tagawa, Hisatoshi, 4,929,289, Cl. 148-402.000.
Watanabe, Tsutomu; Sagiyama, Masari; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,323, Cl. 204-206.000.
Watanabe, Tsutomu; Sagiyama, Masaru; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,324, Cl. 204-206.000.
NL Petroleum Products Limited: *See*—
Shirley-Fisher, David N., 4,928,777, Cl. 175-329.000.
Nobileau, Philippe C.: *See*—
Milberger, Lionel J.; Nobileau, Philippe C.; and Watkins, Bruce J., 4,928,769, Cl. 166-382.000.
Nobumori, Shogo: *See*—
Ainoya, Masayuki; Ishihara, Takeyuki; Kanno, Tesuo; Kikuchi, Takahiro; Mori, Seiichi; Nobumori, Shogo; and Shirakawa, Junji, 4,929,982, Cl. 355-311.000.
Nodelman, Neil H., to Mobay Corporation. Use of ester group containing polyols in a rim process. 4,929,697, Cl. 528-77.000.
Noguchi, Hiroyuki; and Yamada, Ichiho, to Honda Giken Kogyo Automotive door handle assembling robot. 4,928,385, Cl. 29-788.000.
Noguchi, Yasushi: *See*—
Maeda, Satoru; Noguchi, Yasushi; Yasuda, Kazunori, and Takano, Shyunsuke, 4,930,014, Cl. 358-209.000.
Nohara, Saburo: *See*—
Hagiwara, Zenji; Ando, Satoshi; and Nohara, Saburo, 4,929,431, Cl. 423-328.000.
NOK Corporation: *See*—
Nagasawa, Shinji, 4,928,979, Cl. 277-38.000.
Nokia Graetz: *See*—
Kornaker, Walter, 4,929,210, Cl. 445-73.000.
Nomura, Masaaki: *See*—
Yamada, Takashi; Nomura, Masaaki; Yamamoto, Ryoichi, Matsubaguchi, Satoshi; and Nahara, Akira, 4,929,320, Cl. 204-192.200.
Noomen, Arie; and Peters, Petrus J., to Akzo N V Aqueous coating composition containing a functional organic compound, a curing agent, and a dispersing agent. 4,929,661, Cl. 524-259.000.
Norcom Electronics Corporation: *See*—
Norris, Elwood G., 4,930,156, Cl. 379-388.000
Norda S.P.A. Via Vallecamonica: *See*—
Duina, Gianfranco, 4,929,164, Cl. 425-145.000.
Norddeutsche Seekabelwerke AG: *See*—
Basse, Hartwig, 4,929,484, Cl. 428-53.000.
NORDICA S.P.A.: *See*—
Baggio, Giorgio; Gonella, Mario; and Sartor, Mariano, 4,928,408, Cl. 36-119.000.
Normalair-Garrett (Holdings) Limited: *See*—
Stevenson, George F.; Foote, James C.; and Hamlin, Humphrey A S., 4,928,682, Cl. 128-202.260.
Norris, Elwood G., to Norcom Electronics Corporation. Telephone receiver transmitter device. 4,930,156, Cl. 379-388.000.
North American Philips Corporation. *See*—
Kaylor, William R., and Fisher, Frederick A., 4,929,960, Cl. 343-703.000.
Sicignano, Albert, and Vaez-Iravani, Mehdi, 4,929,836, Cl. 250-397.000.
North American Specialities Corporation: *See*—
Taylor, Robert, 4,929,193, Cl. 439-567.000.
Northern Telecom Limited. *See*—
Sitch, John E., 4,930,036, Cl. 361-56.000
Nose, Toshimitsu: *See*—
Kiminami, Ikuo; Sakamoto, Hideyuki; and Nose, Toshimitsu, 4,928,499, Cl. 62-186.000.
Noshi, Shinji: *See*—
Matsui, Isamu; Uehara, Masao; Noshi, Shinji, and Kawarabashi, Tsukasa, 4,928,475, Cl. 57-264.000.
Nossen, Steve J.: *See*—
Chandler, Donald G.; Nossen, Steve J., and Simpson, Raymond W., 4,930,139, Cl. 375-1.000
Nouvertne, Werner; Gielen, Franz-Josef; Tacke, Peter; Grigo, Ulrich; Quring, Bernd; and Lindner, Christian, to Bayer Aktiengesellschaft Mixtures of thermoplastic poly(ester) carbonates with thermoplastic polyurethanes. 4,929,674, Cl. 525-66.000.
Novack, Mitchell: *See*—
Hulsing, Rand H. II; and Novack, Mitchell, 4,929,860, Cl. 310-366.000.
Novik, Ofer: *See*—
Klier, Shimon; and Novik, Ofer, 4,928,665, Cl. 126-415.000.
Nowak, Jean-Francois: *See*—
Marquez, Edmundo M.; Nowak, Jean-Francois, and Robles, Antonio, 4,929,473, Cl. 427-252.000.
Nowlin, Bobby R. Bicycle buggy apparatus. 4,928,985, Cl. 280-204.000
Nozaki, Nobuharu: *See*—
Hatori, Masami; Nozaki, Nobuharu, and Kamiyama, Kozi, 4,929,042, Cl. 350-96.130.
NRC Corporation: *See*—
Wong, Daniel T., and Speraw, Floyd G., 4,929,185, Cl. 439-74.000
Nubel, Karl-Heinz: *See*—
Sohner, Gerhard; Roth, Helmut; Brammer, Hartmut, Schleupen, Richard, and Nubel, Karl-Heinz, 4,928,660, Cl. 123-647.000.
NUKEM GmbH *See*—
Worner, Jorg, 4,929,281, Cl. 136-201.000.
Numao, Takaji, to Sharp Kabushiki Kaisha. Method for driving a display device. 4,929,058, Cl. 350-333.000.
Nuova Italsider S.p.A.: *See*—
Bertolotti, Luigi, 4,928,454, Cl. 53-469.000
Nuovo Consorzio Sanitario Nazionale: *See*—
Ferruti, Paolo; and Scapini, Giancarlo, 4,929,750, Cl. 560-87.000
Nuovopignone-Industrie Meccaniche e Fonderia, S.p.A.: *See*—
Vinciguerra, Constantino; and Coppini, Massimo, 4,929,119, Cl. 403-359.000.
Nurczyk, Mark E., to American Standard Inc. VaV valve with PWM hot water coil. 4,928,750, Cl. 165-2.000.
Nuti, Marco, to Piaggio & C. S.p.A. Automatic transmission for vehicles in general. 4,928,555, Cl. 74-745.000
NuTone, Inc.: *See*—
Krebs, Werner W., 4,930,054, Cl. 362-149.000
Nutter, Norman E., to General Electric Company. Turbine trip throttle valve control system. 4,929,146, Cl. 415-32.000.
Nuyens, Angela M.: *See*—
Resnick, Susan D.; and Nuyens, Angela M., 4,929,211, Cl. 446-14.000.
NWL Transformers: *See*—
Del Gatto, Henry J.; and Trainor, John E., 4,928,456, Cl. 55-12.000
Nynex Corporation: *See*—
Citron, Howard; Chan, Eric; and Dolan, Michael, 4,930,157, Cl. 379-433.000
Nys, Jacques: *See*—
Lagarde, Robert; Ariagno, Daniel, and Nys, Jacques, 4,929,460, Cl. 426-420.000.
O&K Orenstein & Koppel Aktiengesellschaft: *See*—
Maury, Hans-Dietmar; and Buslowski, Wolfgang, 4,929,178, Cl. 432-14.000.
Oberjatzas, Gunter; and Keesen, Heinz-Werner, to Deutsche Thomson Brandt GmbH. Arrangement for indicating angular position of head-wheel disk in a tape recorder. 4,930,025, Cl. 360-64.000.
Obrecht, Daniel: *See*—
Fischli, Albert; Gutknecht, Eva-Maria; and Obrecht, Daniel, 4,929,741, Cl. 549-447.000.
O'Brien, John T.; Thomas, Neil I., and Dyer, Tracy D., to Storage Technology Corporation. Adaptive data compression apparatus including run length encoding for a tape drive system. 4,929,946, Cl. 341-87.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Occidental Chemical Corporation: *See—*
Emmett, John E., 4,928,579, Cl. 92-248.000.
Ocean Farms of Hawaii Limited Partnership: *See—*
Lockwood, George S., 4,929,124, Cl. 405-165.000.
Ochiai, Kuniaki; and Komakine, Shigeo, to Tokyo Electric Company, Ltd. Release-type dot print head. 4,929,101, Cl. 400-124.000.
O'Connell, Cormac M.: *See—*
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 4,929,911, Cl. 330-264.000.
O'Connor, Daniel G., and Gerth, Howard L., to United States of America, Energy. Hydrostatic self-aligning axial/torsional mechanism. 4,928,532, Cl 73-856.000.
Oda, Hidemasa: *See—*
Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, 4,929,482, Cl. 428-36.400.
Oda, Mitsunori: *See—*
Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi; Oda, Mitsunori; and Tanaka, Akinori, 4,929,267, Cl. 71-77.000.
Oda, Osamu. *See—*
Kainosho, Keiji; Shimakura, Haruhito; and Oda, Osamu, 4,929,564, Cl. 437-20.000.
Oda, Susumu: *See—*
Suzuki, Toshitake;; Komoda, Norio; Oda, Susumu; and Harata, Motoo, 4,929,859, Cl. 310-328.000.
Oellerer, Friedrich: *See—*
Theurer, Josef; Oellerer, Friedrich; and Gruber, Leopold R., 4,929,816, Cl. 219-53.000.
Office Natioanl D'Etudes Et De Recherches Aerospatiales styled O.N.E.R.A. *See—*
Delfour, Andre ; Falempin, Francois; Isbert, Jacques; and Sans, Claude, 4,929,079, Cl. 356-336.000.
Ogawa, Hiroshi: *See—*
Ando, Tsuyoshi; Hirono, Nakayasu; Nakao, Hirotoshi; Mito, Akio; Kihara, Kazuyuki; Hatakenaka, Kosuke; and Ogawa, Hiroshi, 4,928,730, Cl. 137-554.000.
Funahashi, Nobuhiro; Yamashita, Toshio; and Ogawa, Hiroshi, 4,928,500, Cl. 62-193.000.
Ogawa, Yoshitake, to Brother Kogyo Kabushiki Kaisha. Sewing machine with guide and ironing means for folding back and pressing stitched fabric margins. 4,928,611, Cl. 112-217.000.
Ogden, Ralph; and Huik, Heikki. Adjustable mattress foundation for beds. 4,928,332, Cl. 5-68.000.
Ogoe, Samuel A.: *See—*
Laughner, Michael K. and Ogoe, Samuel A., 4,929,663, Cl. 524-423.000.
Ogura, Ryushi: *See—*
Matsui, Fumio; Suzuki, Noboru; Takaishi, Minoru; Ogura, Ryushi; Harigai, Noriaki; Hashimoto, Tadayoshi; and Uematu, Tomoe, 4,929,494, Cl. 428-286.000.
Ohara, Shunji: *See—*
Kato, Makoto; Sami, Tetsuo; and Ohara, Shunji, 4,929,823, Cl. 250-201.500.
Ohashi, Michihiro: *See—*
Taguchi, Seizo; Oketani, Toshiharu; Ohashi, Michihiro; Tanaka, Hideaki; and Terao, Hiroshi, 4,929,092, Cl. 374-183.000.
Ohba, Kiyoshi: *See—*
Emura, Tatuo; and Ohba, Kiyoshi, 4,929,453, Cl. 426-63.000.
Emura, Tatuo; and Ohba, Kiyoshi, 4,929,558, Cl. 435-252.500.
Ohchi, Torao: *See—*
Hiramatsu, Tohru. Tami, Kazuya; and Ohchi, Torao, 4,928,612, Cl. 112-257.000.
Ohgake, Ryoji: *See—*
Akanuma, Hideo; Murata, Masashi, Inoue, Kiyoshi; and Ohgake, Ryoji, 4,929,372, Cl. 252-29.000.
Ohgen Research Laboratories, Limited: *See—*
Kanaoka, Masaharu; Kawanaka, Chigusa; Negoro, Takaharu; and Agui, Hideo, 4,929,547, Cl. 435-69.100.
Ohio Gratings, Inc.: *See—*
Bartley, David W., 4,928,471, Cl. 52-664.000.
Ohio State University, The: *See—*
Hsu, Hsiung, 4,928,697, Cl. 128-649.000.
Ohishi, Takeshi: *See—*
Uesugi, Akio; Dobashi, Ritsu; and Ohishi, Takeshi, 4,929,326, Cl. 204-206.000.
Ohkawa, Hideki; and Ozawa, Norio, to Kabushiki Kaisha Toshiba. Information storage medium and method of manufacturing the same. 4,929,485, Cl. 428-64.000.
Ohkubo, Satoru; and Iwata, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Air-fuel ratio control device for an internal combustion engine. 4,928,653, Cl. 123-435.000.
Ohkubo, Yukiharu; Hosoya, Manabu; Miura, Shinji; and Aoki, Yuichi, to Nikon Corporation. Loading apparatus. 4,928,936, Cl. 269-73.000.
Ohmagari, Shinichi, to NEC Corporation. Multi-phase PSK modulation apparatus. 4,930,141, Cl. 375-60.000.
Ohmori, Taro: *See—*
Sato, Mitsuya; Ukaji, Takao; Yamaguchi, Nobuhito; Ohmori, Taro; and Murakami, Eiichi, 4,929,893, Cl. 324-158.00F.
Ohmura, Yukihiro; Kobayashi, Yoshiyuki; Hosoi, Keiji; and Shimoda, Kazuharu, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Apparatus for supplying air-fuel mixture in internal combustion engine. 4,928,659, Cl. 123-588.000.
Ohnishi, Mutsuhiko: *See—*
Kurauchi, Makoto; Hashimoto, Michio; Hayasaki, Kiyoshi; Minami, Toshikazu; Ohnishi, Mutsuhiko; and Suzuki, Yohei, 4,929,650, Cl. 523-455.000.
Ohnishi, Seiichiro: *See—*
Kyono, Tetsuyuki; Ohnishi, Seiichiro; Hanano, Tohru; and Hotta, Tohru, 4,929,513, Cl. 428-611.000.
Ohno, Aritaka; Shitara, Kanji; and Harashima, Masakazu, to Japan Aviation Electronics Industry Limited. Coil winding machine and coil winding method using the same. 4,928,894, Cl. 242-7.090.
Ohno, Shigeru: *See—*
Kato, Eiichi; Ohno, Shigeru; Ishii, Kazuo; and Itakura, Ryosuke, 4,929,527, Cl. 430-92.000.
Ohtsuru, Hiroshi: *See—*
Hamada, Akihiko; Hiraoka, Hidenori; Nakamura, Yoshinobu; and Ohtsuru, Hiroshi, 4,929,678, Cl. 525-193.000.
Oikawa, Ryuetsu; and Fujita, Akihiko, to Yazaki Corporation. Grommet structure. 4,928,349, Cl. 16-2.000.
Oikawa, Toshihiro: *See—*
Niizato, Tomonori; Tanai, Tsuneo; Kasahara, Kazuhiro; Saka, Tsutomu; and Oikawa, Toshihiro, 4,928,641, Cl. 123-90.160.
Oishi, Hideyuki: *See—*
Akita, Shuichi; Suzuki, Fumitoshi; Kikuchi, Yasushi; and Oishi, Hideyuki, 4,929,679, Cl. 525-194.000.
Oishi, Kunio: *See—*
Wakayama, Sachio; Ishikawa, Fumiyasu, and Oishi, Kunio, 4,929,548, Cl. 435-71.200.
Okada, Naoya: *See—*
Nishimura, Masakatsu; Okada, Naoya; Murata, Yasuo; and Hirai, Yasuhiko, 4,929,317, Cl. 204-59.00R.
Okada, Shoji: *See—*
Fujie, Naofumi; Imaizumi, Tomoaki; Ito, Koji; and Okada, Shoji, 4,929,072, Cl. 350-582.000.
Okada, Takuji; and Murakami, Kunio, to Stamicarbon B.V. Thermal transfer medium. 4,929,501, Cl. 428-337.000.
Okada, Yoshiyuki, to Fujitsu Limited. Process and apparatus for reducing a picture with fine line disappearance prevention. 4,930,021, Cl. 358-451.000.
Okamori, Shuhei: *See—*
Yokoi, Takeshi; and Okamori, Shuhei, 4,929,104, Cl. 400-605.000.
Okamoto, Mitsunari: *See—*
Osaka, Tatsuhiko; Terawaki, Hiroshi; and Okamoto, Mitsunari, 4,929,330, Cl. 204-402.000.
Okano, Yoshihiro: *See—*
Kimura, Toshio; Okano, Yoshihiro; Otani, Masahiro; and Miyamoto, Shigenobu, 4,930,090, Cl. 364-520.000.
Okazaki, Kenji. Method of sintering powder. 4,929,415, Cl. 419-52.000.
Okazaki, Koju: *See—*
Nagata, Teruyuki; Okazaki, Koju; Kajimoto, Nobuyuki; Miura, Tohru, Kanemura, Yoshinobu; and Sasagawa, Katsuyoshi, 4,929,707, Cl. 528-76.000.
Okazaki, Seiji: *See—*
Masaka, Mitsuske; Hatanaka, Koji, Maruta, Kenji; and Okazaki, Seiji, 4,929,813, Cl. 219-270.000.
Oketani, Toshiharu: *See—*
Taguchi, Seizo; Oketani, Toshiharu; Ohashi, Michihiro; Tanaka, Hideaki; and Terao, Hiroshi, 4,929,092, Cl. 374-183.000.
Oki Electric Co., Ltd.: *See—*
Mizutani, Minoru; Kikuchi, Hiroshi; Watanabe, Shoichi; Hayashi, Kuniharu; and Maekawa, Masanori, 4,929,102, Cl. 400-248.000.
Oki Electric Industry Co., Ltd.: *See—*
Hatakeyama, Motonobu; Yoshimura, Kohtaroh; Naoi, Hidenori, and Wakasugi, Nobuo, 4,930,089, Cl. 361-519.000
Ueda, Kenichi; Hattori, Kouji; Terada, Akihiko; and Inohara, Kazuyoshi, 4,929,934, Cl. 340-706.000.
Oklahoma State University: *See—*
Harmon, Harold J., 4,929,078, Cl. 356-320.000.
Okonogi, Hirotaka: *See—*
Kawakami, Shin; Haruyama, Satoshi; and Okonogi, Hirotaka, 4,929,491, Cl. 428-195.000.
Oku, Masahiro; and Iwamura, Kazumitsu, to Sumitomo Rubber Industries, Ltd. Pneumatic radial tire. 4,928,742, Cl. 152-534.000.
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, to Fujisawa Pharmaceutical Company, Ltd. Method for immunosuppression. 4,929,611, Cl. 514-183.000.
Okuno, Itaru: *See—*
Shinya, Yoshiyuki; Tabara, Yoshitaka; Okuno, Itaru; Kaneko, Tadashi; and Watanabe, Tomomi, 4,928,652, Cl. 123-417.000.
Okuyama, Toshiharu: *See—*
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatuski, Yoshio, 4,930,096, Cl. 364-550.000.
Okuzawa, Yasutoshi: *See—*
Miyoshi, Takahito; Kanazawa, Minoru; Sugisaki, Tsutomu; Yamada, Takuzi; and Okuzawa, Yasutoshi, 4,930,032, Cl. 360-132.000.
Oldenburg, Willem; Hemmes, Simon N.; and Hobbel, Jaap E., to Lever Brothers Company. Particulate detergent composition. 4,929,379, Cl. 252-109.000.
Oldengott, Hans: *See—*
Breidenbach, Dieter; Oldengott, Hans; and Vitt, Burckard, 4,929,179, Cl. 432-247.000.
Oldfelt, Sven: *See—*
Olin, Henry; Lindroos, Gunnar; and Oldfelt, Sven, 4,928,326, Cl. 4-300.000.
Olin Corporation. *See—*
Casberg, John M., 4,928,813, Cl. 206-0.500

Pryor, Michael J., Fister, Julius C.; Singhdeo, Narendra N., Mahulikar, Deepak; and Cherukuri, Satyam C., 4,929,516, Cl 428-620.000.
Rooney, James F.; and Cheskis, Harvey P., 4,928,512, Cl. 72-404.000.
Olin, Henry; Lindroos, Gunnar; and Oldfelt, Sven, to Oy Wartsila Ab. Vacuum sewer arrangement. 4,928,326, Cl. 4-300.000.
Oliver, Christopher J.: *See—*
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G. and Wood, James W., 4,929,950, Cl. 342-25.000.
Oliver, Wayne R.; Moyer, Roy E.; and Girardin, Dennis R., to General Electric Company. Separator having multiple particle extraction passageways. 4,928,480, Cl 60-39.092.
Olson, Dennis G.: *See—*
Huebner, Patrick H.; Sebranek, Joseph G.; Olson, Dennis G., and Anderson, Eugene A., 4,928,892, Cl. 241-82.500.
Olsson, Staffan, to Flyct AB. Method to control stops of an intermittently operating driving motor. 4,929,875, Cl. 318-362.000.
Olympus Optical Co., Ltd.: *See—*
Matsumoto, Kazuya, 4,929,994, Cl. 357-30.000.
Sasai, Tsuguhisa, 4,928,699, Cl. 128-662.060.
Yokota, Akira; and Kuga, Masao, 4,929,070, Cl. 350-432.000.
O'Mara, William E., Jr.: *See—*
Beasom, James D.; and O'Mara, William E., Jr., 4,929,568, Cl 437-40.000.
Omega SA: *See—*
Gagnebin, Gaston, 4,928,359, Cl. 24-71.00J
Omura, Etsuji; and Namizaki, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Method of making a buried crescent laser with air gap insulator. 4,929,571, Cl. 437-129.000.
O'Neill Communications, Inc.: *See—*
Chandler, Donald G.; Nossen, Steve J.; and Simpson, Raymond W., 4,930,139, Cl. 375-1.000.
Ono, Tetsuo: *See—*
Itahana, Tsutomu; Kanno, Hideo; Ono, Tetsuo; Furuta, Futoru; Kobayashi, Susumu; Akimoto, Ryosaku; and Tanigaki, Ryuhei, 4,928,723, Cl. 137-116.300.
Ontrop, Hans: *See—*
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 4,929,911, Cl 330-264.000.
Ookawa, Norio: *See—*
Satou, Hiroyuki; and Ookawa, Norio, 4,928,897, Cl. 242-55.000.
Opower, Hans, to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt. Waveguide laser system. 4,930,138, Cl. 372-95.000.
Orpengen Medizinisch-Molekularbiologische Forschungsgesellschaft mbH: *See—*
Kunz, Horst; and Dombo, Berthold, 4,929,671, Cl. 525-54.110.
Ortloff, Donald J.: *See—*
Landriault, L. Steven; Ortloff, Donald J.; and Bollfrass, Charles A., 4,928,999, Cl. 285-113.000.
Osaka, Tatsuhiko; Terawaki, Hiroshi; and Okamoto, Mitsunari, to Daikin Industries, Ltd. Diffusion-limiting membrane holding means for sensor. 4,929,330, Cl 204-402.000.
Osarek, Werner; Pempera, Franz G.; and Schmarl, Dieter, to Mannesmann AG. Equipment for surface treatment of continuously, running strips particularly pickling equipment. 4,928,717, Cl. 134-64.00R.
Osawa, Nobuyuki, to Nippon Seiko Kabushiki Kaisha. Ball retainer of a linear guide apparatus. 4,929,095, Cl. 384-45.000.
Osawa, Nobuyuki, to Nippon Seiko Kabushiki Kaisha. Linear guide apparatus. 4,929,096, Cl. 384-45.000.
Osgar, Michael L., to Fluoroware, Inc. Welding fluoropolymer pipe and fittings. 4,929,293, Cl. 156-158.000.
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, to Fuji Photo Film Co., Ltd. Booklet with photograph. 4,928,996, Cl. 283-109.000.
Oshima, Taku: *See—*
Fukayama, Yukio; and Oshima, Taku, 4,928,604, Cl. 110-103.000.
Oshiro, Takashi: *See—*
Eguchi, Tamotsu; Oshiro, Takashi; Kuge, Yukihiro; Mochida, Kenichi; and Uwajima, Takayuki, 4,929,551, Cl. 435-106.000.
Oshman's Sporting Goods, Inc.: *See—*
Perryman, John S., 4,928,535, Cl. 73-862.020.
Oskam, Herman, to Hunter Douglas International N.V. Clutch for a vertical louvre blind. 4,928,744, Cl. 160-178.100.
Osteo-Dyne, Inc.: *See—*
Bassett, C. Andrew L.; and Cook, Ian A., 4,928,959, Cl. 272-96.000
Ostreicher, Eugene A.: *See—*
Meyering, Mark T.; and Ostreicher, Eugene A., 4,929,354, Cl 210-321.610.
Otani, Masahiro: *See—*
Kimura, Toshio; Okano, Yoshihiro; Otani, Masahiro; and Miyamoto, Shigenobu, 4,930,090, Cl. 364-520.000.
Otis Engineering Corporation: *See—*
Gazda, Imre I.; and Collins, Dannie R., 4,928,761, Cl. 166-123.000.
Otomura, Keiichiro; Yamashita, Takayuki; Kanemitsu, Seisuo; Nakabayashi, Shigetoshi; and Miki, Hideo, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Process for preparation of uranium tetrafluoride. 4,929,430, Cl. 423-11.000.
Otora, Takahito: *See—*
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl 354-420.000.
Otoshima, Hiroo; Tsuji, Hiroshi; Mori, Shigeki; and Nishimura, Yoshihiro, to Murata Kikai Kabushiki Kaisha. Two-for-one twisting machine. 4,928,476, Cl. 57-268.000.
Otsubo, Kazumi, to Honda Giken Kogyo Kabushiki Kaisha. Gas damped deceleration switch. 4,929,805, Cl. 200-61.45R.
Ottieri, Marco T. Ski boot having a hinged sole. 4,928,407, Cl. 36-119.000.
Otto Engineering, Inc.: *See—*
Roeser, John O.; and Graham, Bruce L., 4,929,808, Cl. 200-467.000.
Overbeck, Wayne W. Variable intake manifold. 4,928,638, Cl. 123-52.00M.
Overmann, John L., to Hamilton Fixture Company. Adjustable merchandise display rack. 4,928,832, Cl. 211-187.000.
Overton, David H.: *See—*
Pace, Gary L.; and Overton, David H., 4,929,910, Cl. 330-257.000.
Overton, Duncan E., Jr. Powder spray booth with overspray collection system. 4,928,624, Cl. 118-308.000.
Ovonic Imaging Systems, Inc.: *See—*
Yaniv, Zvi; Cannella, Vincent D.; Hansell, Gregory L.; and Swartz, Louis D., 4,929,569, Cl. 437-51.000.
Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 4,929,334, Cl. 208-91.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,929,337, Cl. 208-120.000.
Wright, Bernard S.; Gould, Ronald M.; and Owen, Hartley, 4,929,780, Cl. 585-303.000.
Owens-Corning Fiberglas Corporation: *See—*
Gauchel, James V.; Wilson, Edward L.; and Kerle, Edward J., 4,929,651, Cl. 523-505.000.
Oy Parton Ab: *See—*
Paakkonen, Taisto; Veijo, Vainino; and Jarkko, Turpeinen, 4,929,019, Cl. 296-223.000.
Oy Uponor AB: *See—*
Agren, Lennart; and Holso, Eino, 4,929,409, Cl. 264-508.000
Oy Wartsila Ab: *See—*
Olin, Henry; Lindroos, Gunnar; and Oldfelt, Sven, 4,928,326, Cl. 4-300.000.
Oyabu, Norio: *See—*
Ban, Kazuki; and Oyabu, Norio, 4,929,667, Cl. 524-718.000.
Oyamada, Yoshinori: *See—*
Matsuo, Teruo; Ihara, Tadayoshi; and Oyamada, Yoshinori, 4,929,209, Cl. 445-6.000.
Ozawa, Norio: *See—*
Ohkawa, Hideki; and Ozawa, Norio, 4,929,485, Cl 428-64.000.
P D Enterprises, Inc.: *See—*
Carpenter, Paul R., 4,928,986, Cl. 280-234.000.
Paakkonen, Taisto; Veijo, Vainino; and Jarkko, Turpeinen, to Oy Parton Ab. Device for opening and closing the roof hatch of a vehicle. 4,929,019, Cl. 296-223.000.
Pace, Gary L., to Motorola, Inc. Data limiter for a radio pager. 4,929,851, Cl. 307-359.000.
Pace, Gary L.; and Overton, David H., to Motorola, Inc. Low current amplifier with controlled hysteresis. 4,929,910, Cl. 330-257.000.
Pacione, Albert J. Attachment for a squeeze mop. 4,928,341, Cl. 15-105.000.
Pagano, Thomas S.; and Turtle, RObert R., to Santa Barbara Research Center. Five mirror, two perpendicular plane image derotator. 4,929,040, Cl. 350-6.500.
Palitex Project Company GmbH: *See—*
Frentzel-Beyme, Johannes, 4,928,463, Cl. 57-58.860.
Palmer, Charles C.: *See—*
Kravitz, Jeffrey K.; and Palmer, Charles C., 4,930,159, Cl. 380-23.000.
Palmeri, Richard P. Bathroom assembly for handicapped individuals. 4,928,329, Cl. 4-552.000.
Palmieri, Joseph M.: *See—*
Meiners, David J.; Morris, Robert A.; Arnold, David; Castonguay, Roger N.; and Palmieri, Joseph M., 4,929,920, Cl. 335-202.000.
Paloma Kogyo Kabushiki Kaisha: *See—*
Nishino, Hiroshi; Ejiri, Susumu; and Yokoyama, Nobuyoshi, 4,928,664, Cl. 126-391.000
Pan, Wie-Hin: *See—*
Hegedus, Louis; Beeckman, Jean W.; Pan, Wie-Hin; and Solar, Jeffrey P., 4,929,586, Cl. 502-217.000.
Pannold, Reinhard: *See—*
Muhrer, Gerhard; Pannold, Reinhard; and Boschanig, Reinhard, 4,928,523, Cl. 73-167.000.
Pansiera, Timothy. Knee brace with flexible secondary joint. 4,928,676, Cl. 128-80.00F.
Pao, Gei-Jon: *See—*
McLagan, Angus; Pao, Gei-Jon; Un, Chong S.; and Pearce, John J., Jr., 4,930,065, Cl. 364-200.000.
Papastavros, Demos. Turbine housing power system with gear housing. 4,928,490, Cl. 60-670.000.
Pappas, James L.: *See—*
Seiler, Larry D.; Pappas, James L.; and Rose, Robert C., 4,929,889, Cl. 371-22.300.
Paquin, Patrick J.; and Baran, Robert L., to Amphenol Corporation. Press for use in aligning and terminating flat cable. 4,928,379, Cl. 29-566.300.
Park, Hyung M.; and Kim, Dong G., to Electronics and Telecommunications Research Institute; and Korea Telecommunication Authority. Method of manufacturing a self-aligned GaAs MESFET with T type tungsten gate. 4,929,567, Cl. 437-41.000.
Park, Seung M. Stationary member on automotive hub cap. 4,929,030, Cl. 301-37.00N

VOL
1114
ISS
5
MY
29
1990
UMI

Park, Yong-bo: *See—*
Kim, Byeng-yun; and Park, Yong-bo, 4,929,853, Cl. 307-475.000.
Parker, Norman W.; and Robinson, William P., to MicroBeam Inc. Focused ion beam column. 4,929,839, Cl. 250-492.300.
Parks, Lee R.; and Kittrell, Wiley A., to Parks, Lee R. Powered portable wringer. 4,928,505, Cl. 68-253.00R.
Parrillo, Louis C., to Motorola, Inc. High/low doping profile for twin well process. 4,929,565, Cl. 437-34.000.
Parschat, Lothar: *See—*
Pleschiutschnigg, Fritz-Peter; Moellers, Gerd; Eberhardt, Hans-Georg; Rahmfeld, Werner; Parschat, Lothar; and Ehrenberg, Hans-Juergen, 4,928,747, Cl. 164-418.000.
Partain, Emmett M., III; and Brode, George L., II, to Union Carbide Chemicals and Plastics Company Inc. Acid decrystallization of aminopolysaccharides and derivatives thereof. 4,929,722, Cl. 536-20.000.
Parulekar, Vivekanand N.: *See—*
Moser, Mark D.; Lawson, R. Joe; Antos, George J.; Wang, Li; and Parulekar, Vivekanand N., 4,929,332, Cl. 208-65.000.
Moser, Mark D.; Lawson, R. Joe; Wang, Li; and Parulekar, Vivekanand N., 4,929,333, Cl. 208-65.000.
Pascal, Ives R.: *See—*
Calvet, Alain P.; Junien, Jean-Louis; Pascal, Ives R.; Pascaud, Xavier B.; and Roman, Francois J., 4,929,614, Cl. 514-214.000.
Pascaud, Xavier B.: *See—*
Calvet, Alain P.; Junien, Jean-Louis; Pascal, Ives R.; Pascaud, Xavier B.; and Roman, Francois J., 4,929,614, Cl. 514-214.000.
Pasdera, Leonard A.: *See—*
Steele, Robert B.; and Pasdera, Leonard A., 4,930,027, Cl. 360-70.000.
Pasek, Eugene A.; and Morgan, Norman C., to Chevron Research Company. Vanadium passivation in a hydrocarbon catalytic cracking process. 4,929,583, Cl. 502-64.000.
Patel, Dinesh M.: *See—*
McArthur, Alastair; Davis, Royston H.; Hilton, Mark D.; Newton, Trevor W.; and Patel, Dinesh M., 4,929,628, Cl. 514-364.000.
Patin, Michel: *See—*
Delarue, Jean-Jacques; Patin, Michel; and Slama, Jean-Claude, 4,929,135, Cl. 411-354.000.
Patrick, Bruce M.: *See—*
Kanafani, Hanny; Patrick, Bruce M.; and Atwell, William A., 4,929,465, Cl. 426-552.000.
Patterson, James A. Irrigation system. 4,928,427, Cl. 47-58.000.
Patterson, William A.; Tong, Dien H.; and Wooden, James R., to International Business Machines Corp. Taut band piezoelectric actuator for wire matrix printing elements. 4,929,100, Cl. 400-124.000.
Paul, Christopher R., to Coherent Communications Systems Corp. Noise suppression in recovery of clock from NRZ data. 4,929,849, Cl. 307-269.000.
Paul, Ernst, to LINGL GmbH & Co. KG. Transfer apparatus for laterally transferring kiln cars between tunnel kilns. 4,929,177, Cl. 432-11.000.
Paul, Lyle E., to Allergan, Inc. Lens container assembly. 4,928,815, Cl. 206-5.100.
Paulat, Volker: *See—*
Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, 4,929,705, Cl. 528-49.000.
Paull, James B., to Industrial Energy Corporation. Heat exchange recovery method. 4,928,749, Cl. 165-1.000.
Pavliv, Leo: *See—*
Sredni, Benjamin; Pavliv, Leo; and Albeck, Michael, 4,929,739, Cl. 549-347.000.
Pavljuk, Vladimir D.: *See—*
Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B.; Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K., 4,929,416, Cl. 420-12.000.
Pawlikowski, Mark A. Non-reusable hypodermic syringe. 4,929,231, Cl. 604-110.000.
Paxman, David H.: *See—*
Bird, Philip H.; Coe, David J.; Paxman, David H.; and Korteling, Aart G., 4,929,884, Cl. 323-313.000.
Payer, Wolfgang; Buhnen, Heinz D.; and Zoller, Wilhelm, to Hoechst Aktiengesellschaft. Copolymers of ethylene and methoxyacetic acid vinyl ester and their use as additives for mineral oil distillates. 4,928,720, Cl. 137-13.000.
Pearce, John J., Jr.: *See—*
McLagan, Angus; Pao, Gei-Jon; Un, Chong S.; and Pearce, John J., Jr., 4,930,065, Cl. 364-200.000.
Pearl Musical Instrument Co.: *See—*
Yanagisawa, Mitsuo, 4,928,566, Cl. 84-413.000.
Pearson, Dennis G.: *See—*
Reisener, Delbert C.; and Pearson, Dennis G., 4,928,997, Cl. 285-13.000.
Peczkowski, Joseph L., to Allied-Signal Inc. Nonlinear multivariable control system. 4,928,484, Cl. 60-240.000.
Pedersen, George C. Tower packing cartridge. 4,929,398, Cl. 261-94.000.
Pedrow, John. Orthopedic pillow and sizing kit therefor. 4,928,335, Cl. 5-436.000.
Peerless Industries, Inc.: *See—*
Snodell, W. S., 4,928,914, Cl. 248-274.000.
Pegel, Karl H.; and Walker, Hans, to Rooperal (NA) NV. Use of phytosteryl glycosides for the treatment of epoxycholesterol levels. 4,929,603, Cl. 514-26.000.
Pelton & Crane Company, The: *See—*
Jones, Arthur L.; and McGaha, George, 4,930,058, Cl. 362-400.000.
Pempera, Franz G.: *See—*
Osarek, Werner; Pempera, Franz G.; and Schonert, Dieter, 4,928,717, Cl. 134-64.00R.
Penetrators, Inc.: *See—*
Schellstede, Herman J.; McQueen, Robert W.; and Peters, Alan D., 4,928,757, Cl. 166-55.100.
Pennev, Penio; Rajagopalan, Parthasarathi; and Scribner, Richard M., to Du Pont de Nemours, E. I., and Company. Benzo-fused cycloalkane and oxa- and thia-, cycloalkane trans-1,2-diamine derivatives. 4,929,627, Cl. 514-320.000.
Penno, Gianluca. An accessory for attachment of promotional characters to pens, key holders and the like. 4,928,416, Cl. 40-618.000.
Pennzoil Products Company: *See—*
Venier, Clifford G.; and Casserly, Edward W., 4,929,782, Cl. 585-375.000.
Pepper, Kenneth V. Apparatus for producing a helical tube. 4,929,167, Cl. 425-325.000.
Perez, Maria I. Assembly pieces for metallic carpentry sections. 4,928,470, Cl. 56-656.000.
Performance Attainment Associates, Inc.: *See—*
Allison, John D.; and Hanson, Gordon, 4,928,709, Cl. 128-782.000.
Pergerson, Gregory, to E-Systems, Inc. Tape cleaner and degausser apparatus. 4,930,033, Cl. 360-137.000.
Perkin-Elmer Corporation, The: *See—*
Ahmad, Anees; and Huse, Richard L., 4,929,054, Cl. 350-252.000.
Rotolico, Anthony J., 4,928,879, Cl. 239-8.000.
Vorreiter, John W.; and Dean, Robert L., 4,929,139, Cl. 414-217.000.
Permaflex Company: *See—*
Kaczmarek, James S.; and Kareta, Kenneth C., 4,928,383, Cl. 29-711.000.
Perrillat-Amede, Denis: *See—*
Long, Jacques; and Perrillat-Amede, Denis, 4,929,151, Cl. 415-177.000.
Perry, David: *See—*
Dutton, Christopher; and Perry, David, 4,929,638, Cl. 514-450.000.
Perry, Ralph; and Weaver, Edgar N., Jr. Method and course for playing a golf-like game. 4,928,973, Cl. 273-176.00A.
Perryman, John S., to Oshman's Sporting Goods, Inc. Methods and apparatus for measuring ski boot binding torque. 4,928,535, Cl. 73-862.020.
Persluchtring Advies B.V.: *See—*
Bloemendal, Berend J.; and Bromhaar, Marinus J. G., 4,928,926, Cl. 254-93.00R.
Peters, Alan D.: *See—*
Schellstede, Herman J.; McQueen, Robert W.; and Peters, Alan D., 4,928,757, Cl. 166-55.100.
Peters, Bruce R.: *See—*
Burger, Christian P.; Dudderar, Thomas D.; Gilbert, John A.; Peters, Bruce R.; and Smith, James A., 4,928,527, Cl. 73-657.000.
Peters, Josef: *See—*
Kalitzki, Siegfried; Peters, Josef; and Schurmann, Gottfried, 4,928,477, Cl. 57-416.000.
Peters, Petrus J.: *See—*
Noomen, Arie; and Peters, Petrus J., 4,929,661, Cl. 524-259.000.
Peters, Petrus J. M.: *See—*
Hoeberechts, Arthur M. E.; and Peters, Petrus J. M., 4,929,999, Cl. 357-68.000.
Peterson, Elmer R., to Baker Hughes Incorporated. Sump packer latching mechanism. 4,928,768, Cl. 166-380.000.
Peterson, Gerald E., to Toro Company, The. Apparatus for interconnecting components of a power outlet strip. 4,930,047, Cl 361-395.000.
Peterson, Ronald E.: *See—*
Durand, William W.; and Peterson, Ronald E., 4,929,063, Cl. 350-353.000.
Petillo, John J., Sr. Combined inflatable headrest and storage device. 4,928,336, Cl. 5-441.000.
Pews, R. Garth, to Dow Chemical Company, The. Substituted oxirane compounds. 4,929,268, Cl. 71-88.000.
Pfeiffer, Bernhard, to Siemens Aktiengesellschaft. Current overload tripping device with leading tripping action. 4,930,038, Cl. 361-92.000.
Pfenning, Dwight B.: *See—*
Bradbury, Harold M.; Pfenning, Dwight B.; Corlett, William R.; and Mays, Roscoe, Jr., 4,929,818, Cl. 235-381.000.
Pfennings, Leonardus C. M. G., deceased: *See—*
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 4,929,911, Cl. 330-264.000.
Pfizer Inc.: *See—*
Dutton, Christopher; and Perry, David, 4,929,638, Cl. 514-450.000.
Pfleger, Frederick W. Syringe construction. 4,929,230, Cl. 604-90.000.
Ph. Orth Co.: *See—*
Willyard, Marvin R.; and Lingg, Jean M., 4,929,464, Cl. 426-549.000.
Phelan, Cathal G.: *See—*
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 4,929,911, Cl. 330-264.000.

Phelps, Richard A.: *See—*
Lorence, Brian S.; Phelps, Richard A.; and Grabowski, David N., 4,928,865, Cl. 224-275.000.
Phillip, Bradley L., to Enhanced Insulations, Inc. Thermally insulating window and method of forming. 4,928,448, Cl. 52-174.000.
Phillips, Edward H. Building panel module. 4,928,468, Cl. 52-574.000.
Phillips Petroleum Co.: *See—*
Clark, James B.; and Langley, Deborah E., 4,929,365, Cl. 210-754.000.
Cregg, James M.; and Barringer, Kevin J., 4,929,555, Cl. 435-172.300.
Lowery, Richard E.; Fu, Chia M.; and Maholland, Michael K., 4,929,336, Cl. 208-120.000.
Phillips, Ronald W., II, to B.F. Goodrich Company, The. Tubular connector. 4,929,001, Cl. 285-158.000.
Piaggio & C. S.p.A.: *See—*
Nuti, Marco, 4,928,555, Cl. 74-745.000.
Piatt, John A. Body surfboard with added flotation. 4,929,207, Cl. 441-65.000.
Piccardi, Paolo: *See—*
Massardo, Pietro; Bettarini, Franco; Piccardi, Paolo; and Rama, Franco, 4,929,772, Cl. 568-812.000.
Pichard, Jacques: *See—*
Guezou, Jean-Pierre; and Pichard, Jacques, 4,929,200, Cl. 440-38.000.
Picker International, Inc.: *See—*
Plut, Leonard F.; and Nicolay, David, 4,930,144, Cl. 378-99.000.
Pickering, John H.; Bhatia, Sushil K.; Rath, Mihira K.; and Chevrette, Roger N., to Dennison Manufacturing Company. Bindable cover folders. 4,928,995, Cl. 281-29.000.
Pillsbury Company, The: *See—*
Kanafani, Hanny; Patrick, Bruce M.; and Atwell, William A., 4,929,465, Cl. 426-552.000.
Pinder, Kenneth: *See—*
Lobley, Derek G.; and Pinder, Kenneth, 4,929,434, Cl. 423-479.000.
Pioneer Electronic Corporation: *See—*
Kato, Toshifumi, 4,928,787, Cl. 181-141.000.
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 4,930,028, Cl. 360-85.000.
Nagahara, Shinichi; Suzuki, Tomoyuki; Yamada, Tomoyasu; Takahashi, Tokihiro; and Miyake, Ichiro, 4,930,031, Cl. 360-107.000.
Tateishi, Kiyoshi, 4,930,114, Cl. 369-32.000.
Yokogawa, Fumihiko; and Naito, Ryuichi, 4,929,917, Cl. 331-1.00A.
Piorr, Robert: *See—*
Veitenhansl, Rudolf; Froeschke, Wolfgang; and Piorr, Robert, 4,929,504, Cl. 428-395.000.
Pissiotas, Georg: *See—*
Moser, Hans; Pissiotas, Georg; Brunner, Hans-Georg; Bohner, Beat; and Baumann, Marcus, 4,929,272, Cl. 71-95.000.
Pistoulet, Bernard: *See—*
Brun, Gerard; Marin-Ayral, Rose-Marie; Maurin, Maurice; Pistoulet, Bernard; and Tedenac, Jean-Claude, 4,929,282, Cl. 136-239.000.
Pitman, John C.: *See—*
Rye, Grover W.; and Pitman, John C., 4,928,741, Cl. 152-504.000.
Pitney Bowes Inc.: *See—*
Auerbach, David R., 4,928,807, Cl. 198-379.000.
Buan, Danilo P.; Abellana, Jovito N.; and Dolan, Donald T., 4,929,106, Cl. 400-649.000.
Ramsey, James S.; and Lorenzo, John L., 4,928,949, Cl. 271-111.000.
Pitre, Michael G. Artificial bait crab-like fishing lure. 4,928,422, Cl. 43-42.000.
Pitt, Donald R., to Vari-Prop, Inc. Variable pitch marine propeller system. 4,929,201, Cl. 440-50.000.
Planeta, Mirek. Air rings for production of blown plastic film. 4,929,162, Cl. 425-72.100.
Plastiflex Company International: *See—*
Finley, Richard O., 4,929,155, Cl. 417-53.000.
Pleschiutschnigg, Fritz-Peter; Moellers, Gerd; Eberhardt, Hans-Georg; Rahmfeld, Werner; Parschat, Lothar; and Ehrenberg, Hans-Juergen, to Mannesmann AG. Side wall geometry for molds for casting of thin slabs. 4,928,747, Cl. 164-418.000.
Pliura, Diana H.: *See—*
Castelhano, Arlindo L.; DeYoung, Lawrence M.; Krantz, Alexander; Pliura, Diana H.; and Venuti, Michael C., 4,929,630, Cl. 514-380.000.
PLM AB: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,929,168, Cl. 425-384.000.
Plockmatic International AB: *See—*
Soderberg, Terje; Sodersteen, Rolf; and Toreman, Ulrik, 4,928,945, Cl. 271-9.000.
Plog, Carsten: *See—*
Steinwandel, Juergen; Haas, Juergen; and Plog, Carsten, 4,929,581, Cl. 502-2.000.
Plotnick, Michael A.: *See—*
Cripps, Peter K.; and Plotnick, Michael A., 4,930,140, Cl. 375-1.000.
Plut, Leonard F.; and Nicolay, David, to Picker International, Inc. Radiation imaging monitor control improvement. 4,930,144, Cl. 378-99.000.
Poglitsch, Lawrence R., to Motorola Inc. Method for filling a cavity, such as a sensor cavity, with an incompressible fluid. 4,928,376, Cl. 29-530.000.
Pohl, Jorg: *See—*
Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, 4,929,607, Cl. 514-110.000.
Poizner, Julius. Housing for automobile lamps. 4,930,050, Cl. 362-61.000.
Politte, Ron: *See—*
Moshier, Mark; and Politte, Ron, 4,928,592, Cl. 99-450.800.
Polizzotti, David M., to Betz Laboratories, Inc. Method of inhibiting fouling in protein-containing fluids. 4,929,361, Cl. 210-698.000.
Pollak, Robert R.; and Marcos, Juan A., to United Technologies Corporation. Control of high compressor vanes and fuel for a gas turbine engine. 4,928,482, Cl. 60-39.161.
Pollastrini, Sheila; Bricker, Jeffery C.; and Frame, Robert R., to UOP. Catalyst and process for sweetening a sour hydrocarbon fraction using dipolar compounds. 4,929,340, Cl. 208-189.000.
Polovoi, Sergei A.: *See—*
Dryga, Alexandr I.; Alexeev, Vyacheslav M.; and Polovoi, Sergei A., 4,928,554, Cl. 74-87.000.
Polyplastics Co., Ltd.: *See—*
Sugiyama, Noriyuki; and Mochizuki, Mitsuhiro, 4,929,712, Cl. 528-230.000.
Ponn, Timothy R.; Gutierrez, Mark; and Gugelmeyer, Robert J., to Molex Incorporated. Insert molded filter connector. 4,929,196, Cl. 439-620.000.
Ponticello, Gerald S.: *See—*
Baldwin, John J.; Ponticello, Gerald S.; and Habecker, Charles N., 4,929,637, Cl. 514-445.000.
Poon, Otto L. Lift. 4,928,796, Cl. 187-89.000.
Popovic, Radivoje, to LGZ Landis & Gyr Zug AG. Hall element device with depletion region protection barrier. 4,929,993, Cl. 357-27.000.
Porat, Chaim, to Magal Security Systems, Ltd. Intrusion detection barrier. 4,929,926, Cl. 340-541.000.
Portscheller, James I.: *See—*
Atkinson, Robert W.; Crayton, John W.; Portscheller, James I.; and Wood, Daniel C., 4,928,642, Cl. 123-180.00R.
Possani, Lourival D. P.; Gurrola, Georgina B.; Bayon, Marco A. A. C.; and Sitges, Maria B., to Universidad Nacional Autonoma De Mexico. Synthetic noxiustoxin related peptides. 4,929,718, Cl. 530-326.000.
Potter, Gary J.; Schlote, David S.; and Reinkemeyer, Robert W., to Cambridge Engineering, Inc. Direct gas fired industrial air heater burner. 4,929,541, Cl. 432-222.000.
Pourarian, Fiaz: *See—*
Wallace, W. Edward; Smith, H. Kevin; Lynch, W. Bryan; Craig, Raymond S.; and Pourarian, Fiaz, 4,928,496, Cl. 62-46.200.
Powell, Maxwell M., to Exovir, Inc. Compositions suitable for human topical application including a growth factor and/or related materials. 4,929,442, Cl. 424-85.200.
Powers, William J., III; Matthews, Leonard A.; and Jao, Tze-Chi, to Texaco Inc. Process for preparing overbased calcium sulfonates. 4,929,373, Cl. 252-33.000.
Powr-Ups Corporation: *See—*
Summer, Steven E., 4,929,873, Cl. 315-219.000.
PPG Industries, Inc.: *See—*
Kobashi, Rikizo; Takase, Shigeyuki; Enomoto, Hiroyuki; Hayasaki, Yasushi; Kobayashi, Toyohisa; and Yamazaki, Shingo, 4,929,685, Cl. 525-277.000.
Prada, Marco: *See—*
Brunetti, Brunetto; and Prada, Marco, 4,929,601, Cl. 514-18.000.
Precision Devices Inc.: *See—*
Fitts, Frederick L., 4,928,517, Cl. 73-105.000.
Precision Monolithics, Inc.: *See—*
Morton, William D., Jr., 4,928,934, Cl. 206-328.000.
Premier Refractories & Chemicals Inc.: *See—*
Lassiter, Perry B., 4,929,579, Cl. 501-133.000.
Prestjohn, Mark O.: *See—*
Cunningham, John A.; Prestjohn, Mark O.; Reed, Bobby P.; and Smith, Martin D., 4,929,976, Cl. 354-322.000.
Price, John G.: *See—*
Fillmore, Danielle M.; Price, John G.; and Swihart, Terence J., 4,929,691, Cl. 525-477.000.
Prince: *See—*
Clark, Robert J.; and Binish, Patrick W., 4,929,014, Cl. 296-97.800.
Prince, Stephen R.: *See—*
Sudolnik, James M.; and Prince, Stephen R., 4,928,733, Cl. 137-630.130.
Prindle, William A., to Robinson Knife Manufacturing Co., Inc. Food processor. 4,928,893, Cl. 241-95.000.
Prisco, Michael R.: *See—*
Desecki, Vince C.; and Prisco, Michael R., 4,929,242, Cl. 604-266.000.
Process Technology Inc.: *See—*
Rezabek, Dennis J., 4,929,930, Cl. 340-622.000
Procter & Gamble Company, The: *See—*
Meyer, Eric W.; and Van Coney, Robert H., 4,929,410, Cl 264-533.000.
Production Data, Inc.: *See—*
Tonnelli, Gerald J., 4,928,522, Cl 73-155.000.
Progressive Dynamics, Inc.: *See—*
Stephenson, James G.; and Huggett, Mark D., 4,930,056, Cl 362-364.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Promislow, Albert L.: *See—*
Anderson, Norman S.; Promislow, Albert L.; Rayborn, Randy L.; and Vukov, Rastko, 4,929,769, Cl. 568-614.000.
Prugh, John D.: *See—*
Hartman, George D.; and Prugh, John D., 4,929,549, Cl. 514-227.800.
Prus, Eric; Frene, Andre ; Bordaz, Pascal; Guerange, Patrick; and Thome, Caryl, to Sames S.A. Pumped coating product spraying installation. 4,928,880, Cl. 239-8.000.
PruTech II: *See—*
Joshi, Narendra D ; and Moreno, Frederick E., 4,928,481, Cl. 60-737.000.
Pryor, Michael J.; Fister, Julius C.; Singhdeo, Narendra N.; Mahulikar, Deepak; and Cherukuri, Satyam C., to Olin Corporation. Semiconductor die attach system. 4,929,516, Cl. 428-620.000.
Pucci, Michael J.: *See—*
Vandenbergh, Peter A.; Pucci, Michael J.; Kunka, Blair S.; and Vedamuthu, Ebenezer R., 4,929,445, Cl. 424-115.000.
Pulsifer, David N. *See—*
Hagerty, James J ; and Pulsifer, David N., 4,929,065, Cl. 350-413.000.
Purethane Incorporated *See—*
Lilienthal, Cal A.; and Christensen, Ronald L., 4,929,017, Cl. 296-153.000.
Pyramid, Inc.: *See—*
Smith, Thomas R.; and Tripp, Thomas M., 4,929,222, Cl. 474-255.000.
Quantum Chemical Corporation: *See—*
Chang, Biau-Hung; Lee, Lester Y.; and Kwiatek, Jack, 4,929,711, Cl. 528-220.000.
Quegan, Shaun: *See—*
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., 4,929,950, Cl. 342-25.000.
Quenzer, Michael: *See—*
Schult, Klaus; Kister, Horst; and Quenzer, Michael, 4,928,531, Cl. 73-855.000.
Quiring, Bernd: *See—*
Nouvertne, Werner; Gielen, Franz-Josef; Tacke, Peter; Grigo, Ulrich; Quiring, Bernd; and Lindner, Christian, 4,929,674, Cl. 325-66.000.
Quittner, Erik: *See—*
Vandersluis, Ron; and Quittner, Erik, 4,929,009, Cl. 294-2.000.
Vandersluis, Ron; and Quittner, Erik, 4,929,011, Cl. 294-86.400.
Qume Corporation: *See—*
Graham, Scott M.; Ewing, Kenneth R.; Trackman, Marshall H.; and Darr, Duane R., 4,929,099, Cl. 400-76.000.
Qureshy, Asif: *See—*
Buth, C. Eugene; Qureshy, Asif; Ross, Hayes E., Jr.; and Sicking, Dean L., 4,928,928, Cl. 256-13.100.
Qvint, Peter; Andersson, Tommy; and Eksell, Lennart, to General Engineering (Netherlands) B.V. Seat belt buckle arrangement. 4,928,992, Cl. 280-801.000.
R. Guthrie Research Associates Inc.: *See—*
Guthrie, Roderick I. L.; and Herbertson, Joseph G., 4,928,748, Cl. 164-479.000.
R. H. Murphy Company, Inc.: *See—*
Murphy, Robert H.; and Gosselin, Roland, 4,928,820, Cl. 206-328.000.
R. J. Reynolds Tobacco Company: *See—*
Shannon, Michael D., 4,928,714, Cl. 131-359.000.
Rabinkin, Anatol, to Allied-Signal Inc. Method of brazing employing bag-group homogeneous microcrystalline brazing powders. 4,928,872, Cl. 228-203.000.
Rackwitz, Guenter: *See—*
Landwehr, Ulrich M.; and Rackwitz, Guenter, 4,928,708, Cl. 128-774.000.
Raddatz, Siegfried: *See—*
Mohrs, Klaus; Raddatz, Siegfried; Fruchtmann, Romanis; Kohlsdorfer, Christian; and Muller-Peddinghaus, Reiner, 4,929,626, Cl. 514-311.000.
Radziewicz, Edmund. Anti-theft locking valve for motor vehicles. 4,928,506, Cl. 70-176.000.
Ragnegård, Samuel; and Sjoberg, Arne, to AB Hedemora Verkstader. Method and apparatus for the separation of caustic liquor, lime sludge and sludge in a causticizing process. 4,929,355, Cl. 210-784.000.
Rahmfeld, Werner: *See—*
Pleschiutschnigg, Fritz-Peter; Moellers, Gerd; Eberhardt, Hans-Georg; Rahmfeld, Werner; Parschat, Lothar; and Ehrenberg, Hans-Juergen, 4,928,747, Cl. 164-418.000.
Rainbarrel Corporation: *See—*
Bradbury, Harold M.; Pfenning, Dwight B.; Corlett, William R.; and Mays, Roscoe, Jr., 4,929,818, Cl. 235-381.000.
Rajagopalan, Parthasarathi: *See—*
Pennev, Penio; Rajagopalan, Parthasarathi; and Scribner, Richard M., 4,929,627, Cl. 514-320.000.
Raleigh, Freddie L., to Warner & Swasey Company, The. Coordinate measuring machine with improved carriage drive system. 4,928,396, Cl. 33-503.000.
Ralph McKay Limited *See—*
Young, Hartley F., 4,928,878, Cl. 238-351.000.
Rama, Franco: *See—*
Massardo, Pietro; Bettarini, Franco; Piccardi, Paolo; and Rama, Franco, 4,929,772, Cl. 568-812.000.
Rambeck, Walter A.: *See—*
Meier, Werner; Rambeck, Walter A.; Weiser, Harald; and Zucker, Hermann, 4,929,610, Cl. 514-167.000.
Ramex Syn-Fuels International: *See—*
Nielson, Donald H., 4,928,765, Cl. 166-251.000.
Ramos, Rolando P.; Loreto, Wilfredo P.; and Vulich, Yordan, to AIT Industries, Inc. Lens edging machine and method. 4,928,439, Cl. 51-284.00E.
Ramsey, James S.; and Lorenzo, John L., to Pitney Bowes Inc. Low paper indicator. 4,928,949, Cl. 271-111.000.
Ramsey, John A. Dispenser apparatus for beverage bottles. 4,928,855, Cl. 222-131.000.
Rapid Mounting & Finishing Company: *See—*
Rutchik, Robert K., 4,928,413, Cl. 40-511.000.
Rasch, Kenneth R.: *See—*
Barton, Arthur A.; DeBolt, Frederick C.; Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A.; Miller, Mark T.; Rasch, Kenneth R.; and Szlucha, Thomas F., 4,929,983, Cl. 355-315.000.
Rasmussen GmbH: *See—*
Sauer, Heinz, 4,929,002, Cl. 285-319.000.
Rasmussen, Lyle S. Position-adjusting apparatus for mounting a reclining chair on a pedestal base. 4,929,023, Cl. 297-330.000.
Rast, Howard E., Jr.: *See—*
DiVita, Sam; and Rast, Howard E., Jr., 4,929,837, Cl 250-461.100.
Rath, Mihira K.: *See—*
Pickering, John H.; Bhatia, Sushil K.; Rath, Mihira K.; and Chevrette, Roger N., 4,928,995, Cl. 281-29.000.
Ratti, Giuseppina: *See—*
Colle, Roberto; Camaggi, Giovanni; Gozzo, Franco; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,929,631, Cl. 514-383.000.
Raubenheimer, Hans-Juergen: *See—*
Goertz, Hans-Helmut; Denzinger, Walter; and Raubenheimer, Hans-Juergen, 4,929,690, Cl. 525-366.000.
Ravichandran, Ramanathan, to Ciba-Geigy Corporation. Substituted aminoxy-propionamides. 4,929,657, Cl. 524-196.000.
Ravichandran, Ramanathan, to Ciba-Geigy Corporation. Substituted aminoxyethyl sulfoxides and sulfones. 4,929,659, Cl. 524-155.000.
Ray, Andrew M.: *See—*
Dykstra, Jerald P.; and Ray, Andrew M., 4,929,840, Cl. 250-492.300.
Rayborn, Randy L.: *See—*
Anderson, Norman S.; Promislow, Albert L.; Rayborn, Randy L.; and Vukov, Rastko, 4,929,769, Cl. 568-614.000.
Rayhack, John M. Bone compression and distraction device. 4,929,247, Cl. 606-53.000.
Raytheon Company: *See—*
Viana, Luis M.; Cuozzo, Robert A.; Miceli, Michael L.; and Whitney, Kent A., 4,930,035, Cl. 361-54.000.
RCA Licensing Corporation: *See—*
Leonardi, Giovanni M., 4,930,060, Cl. 363-21.000.
Reaction Thermal Systems, Inc.: *See—*
Gilbertson, Thomas A.; Meyers, Michael R.; and Kinneberg, Bruce, 4,928,493, Cl. 62-185.000.
Reardon, Patricia A.; and Grattan, David A., to Nalco Chemical Company. Amine/gallic acid blends as oxygen scavengers. 4,929,364, Cl. 210-750.000.
Recker, Hans-Gert: *See—*
Smuda, Hubert; Hoeldrich, Wolfgang; Goetz, Norbert; and Recker, Hans-Gert, 4,929,765, Cl. 568-427.000.
Reddy, Vaddi B , to GTE Products Corporation. Process for improving the luminescence of niobium activated yttrium tantalate X-ray phosphor 4,929,384, Cl. 252-301.40R.
Reddy, Vaddi B., to GTE Products Corporation. Freon free process for preparing a niobium activated yttrium tantalate X-ray phosphor. 4,929,385, Cl. 252-301.40R.
Reddy, Vaddi B., to GTE Products Corporation. Process for preparing a niobium activated yttrium tantalate X-ray phosphor. 4,929,386, Cl. 252-301.40R.
Redmon, Charles L.: *See—*
Boghean, Barry J.; Subbanna, Somanahalli N.; Redmon, Charles L.; and Wamser, Christian A., 4,929,435, Cl. 423-484.000.
Redpath, James; Logan, Robert T.; McFadzen, David B.; and Roy, Robert G., to Akzo N.V. Positive inotrophic benzothiazole and benzothiophene compositions and method of use therefor. 4,929,636, Cl. 514-443.000.
Reed, Bobby P.: *See—*
Cunningham, John A.; Prestjohn, Mark O.; Reed, Bobby P.; and Smith, Martin D., 4,929,976, Cl. 354-322.000.
Reed, Scott T.: *See—*
Ashley, Carol S.; and Reed, Scott T., 4,929,278, Cl. 106-287.120.
Regie Nationale des Usines Renault: *See—*
Lecocq, Jean-Luc, 4,929,941, Cl. 340-825.140.
Rehrer, Wilson P.: *See—*
Wegman, Dwight D.; Wanner, Edward A., Rehrer, Wilson P.; and Widge, Sunil, 4,929,419, Cl. 420-56.000.
Reichelt, Helmut: *See—*
Hansen, Guenter; Schefczik, Ernst; and Reichelt, Helmut, 4,929,720, Cl. 534-766.000.
Reichenberger, Helmut; and Naser, Georg, to Siemens Aktiengesellschaft. Shock wave generator for generating an acoustical shock wave pulse. 4,928,671, Cl. 128-24.00A.
Reichenberger, Helmut: *See—*
Grasser, Franz; Reichenberger, Helmut; Hassler, Dietrich; Naser, Georg; and Schmidt, Erhard, 4,928,672, Cl. 128-24.00A.

Reigstad, Gordon H.; Breivik, A. Norris; and Reigstad, Hanley S., to Tech Research, Inc. Anchor apparatus for a tendon in prestressed concrete slab. 4,928,451, Cl. 52-223.00L.
Reigstad, Hanley S.: *See—*
Reigstad, Gordon H.; Breivik, A. Norris; and Reigstad, Hanley S., 4,928,451, Cl. 52-223.00L.
Reiko Co., Ltd.: *See—*
Horii, Shigeo, 4,928,908, Cl. 244-31.000.
Reilly, Shirley L., to Auto-trol Technology Corporation. Polygon display apparatus and method. 4,930,092, Cl. 364-522.000.
Reinartz, Hans-Dieter; and Steffes, Helmut, to Alfred Teves GmbH. Hydraulic unit. 4,929,038, Cl. 303-119.000.
Reinecke, Paul: *See—*
Jelich, Klaus; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,929,738, Cl. 549-76.000.
Reiner, David: *See—*
Zinn, Ben T.; and Reiner, David, 4,929,172, Cl. 431-1.000.
Reinkemeyer, Robert W.: *See—*
Potter, Gary J.; Schlote, David S.; and Reinkemeyer, Robert W., 4,929,541, Cl. 432-222.000.
Reisener, Delbert C.; and Pearson, Dennis G., to Deublin Company. Rotating union with carbon graphite labyrinthine seal. 4,928,997, Cl. 285-13.000.
Reiser, Wolf; and Feyen, Peter, to Bayer Aktiengesellschaft Process for the preparation of oxiranes. 4,929,735, Cl. 548-268.800.
Reist, Walter, to Ferag AG. Mobile storage unit for processing printed products, such as newspapers, periodicals and the like. 4,928,899, Cl. 242-59.000.
Reiton Corporation: *See—*
Macaione, Anthony F.; and Wright, John V , 4,930,134, Cl 372-33.000.
Reliance Electric Company: *See—*
Maloney, Joseph J., 4,928,795, Cl. 184-7.400.
Rembaum, Alan; Rhim, Won-Kyu; Hyson, Michael T.; and Chang, Manchium, to California Institute of Technology. Production of monodisperse, polymeric microspheres. 4,929,400, Cl. 264-10.000.
Remote Automation & Control Electronics Inc.: *See—*
Tin, Joshua K., 4,928,778, Cl. 180-167.000.
Renault Vehicules Industriels: *See—*
Miettaux, Marc, 4,928,887, Cl. 239-584.000.
Renger, Herman L.: *See—*
Bell, Robert L.; and Renger, Herman L., 4,929,890, Cl. 324-78.00R.
Research and Development Institute, Inc. at Montana State University: *See—*
Cardellina, John H., II; Stierle, Andrea C.; and Strobel, Gary A., 4,929,270, Cl. 71-92.000.
Resnick, Susan D.; and Nuyens, Angela M., to Softspot, Inc. Hand held tactile toy. 4,929,211, Cl. 446-14.000.
Reusch, Frederick J., Sr., to Reusch, Frederick J., Sr.; Reusch, J., Jr.; and Reusch, Paul R., Sr. Fireplace damper indicator. 4,928,668, Cl. 126-537.000.
Reusch, J., Jr.: *See—*
Reusch, Frederick J., Sr., 4,928,668, Cl 126-537.000.
Reusch, Paul R., Sr.: *See—*
Reusch, Frederick J., Sr., 4,928,668, Cl. 126-537.000.
Rezabek, Dennis J., to Process Technology Inc. Liquid level controller utilizing the rate of change of a thermocouple. 4,929,930, Cl. 340-622.000.
Rheinmetall GmbH: *See—*
Sabranski, Udo; Luther, Hans W.; Sabinski, Horst; and Winkelmann, Jurgen, 4,928,598, Cl. 102-467.000.
Rheox, Inc.: *See—*
Guilbeaux, Ronald D., 4,929,644, Cl. 514-642.000.
Rhim, Won-Kyu: *See—*
Rembaum, Alan; Rhim, Won-Kyu; Hyson, Michael T.; and Chang, Manchium, 4,929,400, Cl. 264-10.000.
Rhodes, Michael L. P., to AE PLC. Pistons with bearing members. 4,928,578, Cl. 92-187.000.
Rhone-Poulenc Chimie: *See—*
Cavezzan, Jacques; Frances, Jean-Marc; and Lancelin, Pierre, 4,929,702, Cl. 528-18.000.
Hogenmuller, Roger; Chauvel, Bernard; and Daniel, Jean-Claude, 4,929,662, Cl. 524-376.000.
Iltis, Alain; and Maestro, Patrick, 4,929,574, Cl. 501-137.000.
Rhone-Poulenc Sante: *See—*
Grosselin, Jean-Michel; and Mercier, Claude, 4,929,776, Cl. 568-862.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Lagarde, Robert; Ariagno, Daniel; and Nys, Jacques, 4,929,460, Cl. 426-420.000.
Ribich, William A.: *See—*
Smirlock, Martin E.; Ribich, William A.; Marinaccio, Paul J.; and Sawaf, Bernard E., 4,928,575, Cl. 89-36.020.
Ricco, Mario, to Weber S.r.l. Fast solenoid valve, particularly a fuel injection pilot valve for diesel engines. 4,928,888, Cl. 239-533.800.
Rice, Roy W.: *See—*
Berneburg, Philip L.; and Rice, Roy W., 4,928,645, Cl. 123-188.0AA.
Rice, Wayne K., to Rice, Wayne K. Apparatus for carrying out extractions in subterranean well. 4,929,348, Cl. 210-109.000.
Richards, Toby D.; and Antonio, Anthony I., Jr., to Fabricated Plastics, Inc. Reinforced strip and flexible hoses produced therewith. 4,928,734, Cl. 138-154.000.
Richards, Toby D.; and Antonio, Anthony I., Jr., to Fabricated Plastics, Inc. Reinforced strip and flexible hoses produced therewith. 4,928,735, Cl. 138-154.000.
Richardson, Larie; and Steingold, Harold. Crushing apparatus having a fluid supply means associated with a rotary crusher. 4,928,891, Cl. 247-41.000.
Richardson, Neil G.: *See—*
Findlay, David M., deceased; and Richardson, Neil G., 4,929,454, Cl. 424-638.000.
Richartz, Adolf: *See—*
Scholl, Thomas; Jabs, Gert, and Richartz, Adolf, 4,929,710, Cl 528-205.000.
Richter, Horst: *See—*
Dislich, Heinz; and Richter, Horst, 4,928,931, Cl 266-45.000.
Ricoh Company, Ltd.: *See—*
Kurokawa, Shunji, 4,930,155, Cl. 379-354.000.
Maruta, Keiichi; Ueda, Takashi; and Watanabe, Yasuhiko, 4,929,590, Cl. 503-207.000.
Rieter Machine Works, Ltd.: *See—*
Clement, Heinz, 4,928,357, Cl. 19-225.000.
Rife, Conwell K., Jr.: *See—*
Lent, Kevin C.; Rife, Conwell K., Jr.; Simmons, Gerald P.; and Speck, Albert J., 4,929,121, Cl. 404-84.000.
Riffe, Delmar R., to American Standard Inc. Scroll apparatus with pressure regulation. 4,928,503, Cl. 62-498.000.
Right, Robert W.: *See—*
Buyak, William P.; Testa, Bruce V.; and Right, Robert W., 4,929,924, Cl. 340-384.00E.
Rin, Seiten: *See—*
Kitazume, Tomoya; Yamazaki, Takashi; and Rin, Seiten, 4,929,760, Cl. 568-308.000.
Rinneburger, Klaus P. K., to U.S. Philips Corporation. Device for electrically interconnecting electrical and/or electromechanical assemblies, method of electrically interconnecting such assemblies, and apparatus manufactured in accordance with the method. 4,929,183, Cl. 439-67.000.
Rippl, Carl G.: *See—*
Midkiff, David G.; Rippl, Carl G.; Twyman, Nancy D.; and Wahlquist, Joseph D., 4,929,480, Cl. 428-35.600.
Risley, Michael S., to Cornell Research Foundation, Inc. In vitro screening test for mutagenicity and genotoxicity during spermatogenesis. 4,929,542, Cl. 435-2.000.
Rittenhouse, David A.; Neurohr, Fred; and Estridge, Doug R., to James River Corporation. Method of making decorative cast-coated paper. 4,929,470, Cl. 427-55.000.
RIV-SKF Officine di Villar Perosa S.p.A : *See—*
Colanzi, Franco; and Vignotto, Angelo, 4,928,371, Cl. 29-898.064
Rivers, Donald E., Jr.: *See—*
Diebolt, Richard A.; Kidd, Stephen; and Rivers, Donald E., Jr., 4,929,130, Cl. 409-136.000.
RJS Corporation: *See—*
Slezak, Raymond J., 4,929,012, Cl. 294-86.410.
Robert Bosch GmbH: *See—*
Braschel, Volker; and Seitz, Dieter, 4,929,034, Cl. 303-103.000.
Sohner, Gerhard; Roth, Helmut; Brammer, Hartmut; Schleupen, Richard; and Nubel, Karl-Heinz, 4,928,660, Cl. 123-647.000.
Robertson, Allan J.; and Gallivan, James B., to Cyanamid Canada Inc. 1,4-Disubstituted-2,3,5,6-tetrahydroxy-1,4-diphosphorinanes and their oxides or sulfides. 4,929,393, Cl. 252-609.000.
Robine, Alain: *See—*
Cameron, Charles; Mimoun, Hubert; Bonnaudet, Serge; and Robine, Alain, 4,929,787, Cl. 585-500.000.
Robinson Knife Manufacturing Co., Inc.: *See—*
Prindle, William A., 4,928,893, Cl. 241-95.000.
Robinson, William P.: *See—*
Parker, Norman W.; and Robinson, William P., 4,929,839, Cl. 250-492.300.
Robishaw, Alces P.; and Robishaw, Paul A., to Robishaw Engineering, Inc. Construction transporation system. 4,928,616, Cl. 114-267.000.
Robishaw Engineering, Inc.: *See—*
Robishaw, Alces P.; and Robishaw, Paul A., 4,928,616, Cl. 114-267.000.
Robishaw, Paul A.: *See—*
Robishaw, Alces P.; and Robishaw, Paul A., 4,928,616, Cl. 114-267.000.
Robitaille, James M.; and Wilson, Robert W., to Minnesota Mining and Manufacturing Company. Electrical outlet monitor. 4,929,887, Cl. 324-66.000.
Robles, Antonio: *See—*
Marquez, Edmundo M.; Nowak, Jean-Francois; and Robles, Antonio, 4,929,473, Cl. 427-252.000.
Rockwell International Corp.: *See—*
Mather, John C.; and Young, Jerald A., 4,928,387, Cl. 29-840.000.
Rodgers, Colin: *See—*
Shekleton, Jack R.; Rodgers, Colin; and Archibald, John P., 4,928,479, Cl. 60-39.360.
Rodowsky, Stanley J., Jr.: *See—*
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,928,346, Cl. 15-338.000.
Roeser, John O.; and Graham, Bruce L., to Otto Engineering, Inc. Electrical switch component and switches formed thereby. 4,929,808, Cl. 200-467.000.
Roessler, Dennis E., to Halliburton Logging Services, Inc. Wireline tool cable head overload apparatus. 4,928,764, Cl. 166-250.000.
Rogers, Melvin F.: *See—*
Dougherty, Lawrence W.; Lee, Sae D.; and Rogers, Melvin F., 4,930,015, Cl. 358-246.000.

Rogler, Wolfgang; Weitemeyer, Christian; Wewers, Dietmar; Zapf, Frederic; and Stapp, Bernhard, to Siemens Aktiengesellschaft. Optical glass fiber with a primary coating of organo-polysiloxanes containing acrylic acid ester groups. 4,929,051, Cl. 350-96.300.

Rohrer, Paul: *See*—
Halg, Paul; and Rohrer, Paul, 4,929,483, Cl. 428-47.000.

Roland, Charles M.; Bohm, Georg G. A.; and Schonfeld, Steven E., to Bridgestone/Firestone, Inc. Stiff sidewalls for pneumatic tires. 4,929,684, Cl. 525-274.000.

Roling, Paul V., to Betz Laboratories, Inc. Methods and compositions for inhibiting styrene polymerization. 4,929,778, Cl. 585-3.000.

Rolland, Jean-Jacques: *See*—
Chagneau, Francis; Levasseur, Michel; Landanger, Patrick; Langlais, Frantz; and Rolland, Jean-Jacques, 4,928,679, Cl. 606-62.000.

Romagnoli, Andrea, to Cestind - Centro Studi Industriali-S.R.L. Sealing device with multiple differential action for machines producing dual-use filter sachets for infusion products. 4,929,299, Cl. 156-466.000.

Roman, Francois J.: *See*—
Calvet, Alain P.; Junien, Jean-Louis; Pascal, Ives R.; Pascaud, Xavier B.; and Roman, Francois J., 4,929,614, Cl. 514-214.000.

Roman Shoji Co., Ltd.: *See*—
Nakamura, Keizi, 4,928,403, Cl. 36-34.00A.

Romer, Eike, to Dipl.-Ing. Wrede & Niedecken Verwaltung GmbH Leakage control mechanism. 4,929,929, Cl. 340-613.000.

Romer, Michael: *See*—
Mahlkow, Hartmut; Romer, Michael; Rosskamp, Gunther; Seidenspinner, Hubert-Matthias; Stein, Ludwig; and Strache, Waltraud, 4,929,422, Cl. 427-57.000.

Rondot, Klaus; and Schlichting, Jorg, to Minnesota Mining & Manufacturing Comp. Pad enclosure. 4,928,814, Cl. 206-215.000.

Rooney, James F.; and Cheskis, Harvey P., to Olin Corporation. Die set for the formation of cavities for metal packages to house electronic devices. 4,928,512, Cl. 72-404.000.

Rooperal (NA) NV: *See*—
Pegel, Karl H.; and Walker, Hans, 4,929,603, Cl. 514-26.000.

Rorison, Allen H.: *See*—
Wiley, Patrick C.; and Rorison, Allen H., 4,929,120, Cl. 404-77.000.

Rosaen, Nils O. Oil mist sensor. 4,928,515, Cl. 73-61.00R.

Rose, Eric; and Dresdale, Arthur, to Columbia University in the City of New York, The Trustees of Method of preparing a cryoprecipitated suspension and use thereof. 4,928,603, Cl. 106-124.000.

Rose, Robert C.: *See*—
Seiler, Larry D.; Pappas, James L.; and Rose, Robert C., 4,929,889, Cl. 371-22.300.

Rosestar* Incorporated: *See*—
Campanelli, Anthony S.; and Matre, Daniel A., 4,928,424, Cl. 47-1.010.

Ross, Hayes E., Jr.: *See*—
Buth, C. Eugene; Qureshy, Asif; Ross, Hayes E., Jr.; and Sicking, Dean L., 4,928,928, Cl. 256-13.100.

Ross, Leo R. Clamping device. 4,928,938, Cl. 269-261.000.

Rossio, Charles E.; and Koziol, Wladyslaw W., to Diversey Corporation. Conveyor lubricant containing alkyl amine coupling agents. 4,929,375, Cl. 252-49.300.

Rosskamp, Gunther: *See*—
Mahlkow, Hartmut; Romer, Michael; Rosskamp, Gunther; Seidenspinner, Hubert-Matthias; Stein, Ludwig; and Strache, Waltraud, 4,929,422, Cl. 427-57.000.

Roth, Bruce D.: *See*—
Chucholowski, Alexander W.; Roth, Bruce D.; and Sliskovic, Drago R., 4,929,620, Cl. 514-269.000.

Roth, Helmut: *See*—
Sohner, Gerhard; Roth, Helmut; Brammer, Hartmut; Schleupen, Richard; and Nubel, Karl-Heinz, 4,928,660, Cl. 123-647.000.

Roth, Nathan; and Yum, Su I., to ALZA Corporation. Implantable fluid imbibing pump with improved closure. 4,929,233, Cl. 604-131.000.

Rothman, Ulf S.: *See*—
Lindblom, Ragnvald E.; and Rothman, Ulf S., 4,929,443, Cl. 424-85.500.

Rotolico, Anthony J., to Perkin-Elmer Corporation, The. Wire and power thermal spray gun. 4,928,879, Cl. 239-8.000.

Roussillon, Samia: *See*—
Coquelet, Claude; Roussillon, Samia; Sincholle, Daniel; Bonne, Claude; and Alazet, Alain, 4,929,635, Cl. 514-438.000.

Roux, Jean Pierre: *See*—
Esterlin, Jacques; Le Parquier, Guy; and Roux, Jean Pierre, 4,928,570, Cl. 89-6.500.

Rovensky, Franz: *See*—
Binder, Dieter; and Rovensky, Franz, 4,929,616, Cl. 514-253.000.

Roy, Robert G.: *See*—
Redpath, James; Logan, Robert T.; McFadzen, David B.; and Roy, Robert G., 4,929,636, Cl. 514-443.000.

Royce Medical Company: *See*—
Grim, Tracy E., 4,928,678, Cl. 128-90.000.

Rubenstein, Mark S.: *See*—
Hollander, David S.; and Rubenstein, Mark S., 4,928,847, Cl. 220-408.000.

Rubie's Costume Co: *See*—
Beige, Joel, 4,930,052, Cl. 362-104.000.

Ruckenstein, Eli; and Chung, Dennis B., to State University of New York. Biocompatible polymer articles. 4,929,510, Cl. 428-520.000.

Ruckl, Siegfried, to Schablonentechnik Kufstein GmbH. Tensioning roller, and device provided with such a tensioning roller. 4,928,593, Cl. 101-389.100.

Rudolf, William B. Retractable steering device for cargo barges that increases maneuverability by providing a pivot point or points when altering course. 4,928,613, Cl. 114-26.000.

Rueb, John T.: *See*—
Deziel, Edward W.; Rueb, John T.; Sorlien, Mark D.; Dahlstrom, Jack A.; and Erismann, David W., 4,929,029, Cl. 300-21.000.

Rueff, Herbert: *See*—
Aiuola, Franco; and Rueff, Herbert, 4,928,942, Cl. 210-58.000.

Ruhrkohle AG: *See*—
Breidenbach, Dieter; Oldengott, Hans; and Vitt, Burckard, 4,929,179, Cl. 432-247.000.

Ruitenburg, Leonardus J. M., to U.S. Philips Corporation. Synchronous demodulation circuit for a carrier-modulated television signal. 4,929,905, Cl. 329-358.000.

Rullier, Pierre, to Salomon S.A. Freely slidable antifriction plate which automatically recenters for safety binding. 4,928,990, Cl. 280-625.000.

Russell, David F.: *See*—
Watson, John C.; Gaskill, Stephen P.; Russell, David F.; and Burns, Robert L. D., 4,928,798, Cl. 188-218.0XL.

Russial, Joseph F.: *See*—
Heilman, Marlin S.; Brandt, Arlan J.; Bowling, Larry D.; and Russial, Joseph F., 4,928,690, Cl. 128-421.000.

Rutchik, Robert K., to Rapid Mounting & Finishing Company. Display device. 4,928,413, Cl. 40-511.000.

Rutledge, F. Wayne. Panel system for windows. 4,928,450, Cl. 52-202.000.

Rutt, Winfried P. Switched-mode DC-to-DC power converter. 4,930,059, Cl. 363-20.000.

RXS Schrumpftechnik-Garnituren GmbH, Firma: *See*—
Will, Horst, 4,929,477, Cl. 428-34.900.

Ryan, Debra A., to Hoechst Celanese Corporation. Method of producing 1-(4'-isobutylphenyl)ethanol. 4,929,773, Cl. 568-814.000.

Rydell, Mark A.: *See*—
Goodin, Richard L.; Rydell, Mark A.; and Shockey, Rick L., 4,928,693, Cl. 128-637.000.

Rye, Grover W.; and Pitman, John C., to Goodyear Tire & Rubber Company, The. Rubber tire having polyvinylidene chloride/elastomer inner liner coating. 4,928,741, Cl. 152-504.000

Rys, Paul: *See*—
Clausen, Martin; Rys, Paul; and Junkuan, Wang, 4,929,771, Cl. 568-798.000.

Rysavy, Peter B.; and Fuller, Maurice J., to John Fluke Mfg. Co., Inc. Apparatus for aligning raster scanned image to touch panel. 4,929,935, Cl. 340-712.000.

Saab-Scania Aktiebolag: *See*—
Elfverson, Sven E., 4,928,582, Cl. 98-2.000.

Saarmets, Alfred: *See*—
Manoury, Philippe; and Saarmets, Alfred, 4,929,621, Cl. 514-275.000.

Sabadics, Joseph L.: *See*—
Moorman, Charles T., Sabadics, Joseph L.; and Bruscino, Joseph A., 4,929,462, Cl. 426-478.000.

Saber, Paik: *See*—
Chung, Paul W.; Gee, Ralph L., Lang, Luke C. K.; and Saber, Paik, 4,929,918, Cl. 331-10.000

Sabin, Jeffrey J., to Medical College of Ohio. Exercise device. 4,928,958, Cl. 272-96.000

Sabinski, Horst: *See*—
Sabranski, Udo; Luther, Hans W.; Sabinski, Horst; and Winkelmann, Jurgen, 4,928,598, Cl. 102-467.000.

Sabranski, Udo; Luther, Hans W.; Sabinski, Horst; and Winkelmann, Jurgen, to Rheinmetall GmbH Propelling charge case. 4,928,598, Cl. 102-467.000.

Sacco, Gasper J.: *See*—
Greenspan, Jacob; and Sacco, Gasper J., 4,928,368, Cl. 29-1.220.

Sacks, Charles H. Building structure. 4,928,452, Cl. 52-236.300.

Saeki, Keiso; and Endo, Tosiaki, to Fuji Photo Film Co., Ltd. Light image forming material and image-recording method using such. 4,929,530, Cl. 430-138.000.

Saft, Helmut, to Metallgesellschaft AG. Apparatus for deodorizing organic liquids. 4,929,310, Cl. 202-158.000.

Saft, Helmut, to Metallgesellschaft Aktiengesellschaft. Apparatus for deodorizing an organic liquid. 4,929,311, Cl. 202-158.000.

Sager, Thomas C.: *See*—
Holcombe, Thomas C.; Sager, Thomas C.; Volles, Warren K.; and Zarchy, Andrew S., 4,929,799, Cl. 585-737.000.

Sagiyama, Masari: *See*—
Watanabe, Tsutomu; Sagiyama, Masari; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,323, Cl. 204-206.000.

Sagiyama, Masaru: *See*—
Watanabe, Tsutomu; Sagiyama, Masaru; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,324, Cl. 204-206.000.

Saha, Chandan K.: *See*—
Atwell, William H.; Burns, Gary T.; and Saha, Chandan K., 4,929,573, Cl. 501-90.000.

Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Ishikura, Keizaburo; Sera, Akio; and Suehiro, Junji, to Mitsui Petrochemical Industries, Ltd. Method of and apparatus for assessing insulation conditions. 4,929,903, Cl. 324-544.000.

Saimi, Tetsuo: *See*—
Kato, Makoto; Saimi, Tetsuo; and Ohara, Shunji, 4,929,823, Cl. 250-201.500.

St. Laurent, Christian: *See*—
Kuzuhara, Michio; Shibasaki, Jun; St. Louis, Andree; St. Laurent, Christian; and Bedard, Michel, 4,928,431, Cl. 49-479.000.

St. Louis, Andree: *See*—
Kuzuhara, Michio; Shibasaki, Jun; St. Louis, Andree; St. Laurent, Christian; and Bedard, Michel, 4,928,431, Cl. 49-479.000.

Saito, Jun: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, 4,928,941, Cl. 270-53.000.

Saito, Junya: *See*—
Yamamoto, Yoshihiro; Saito, Junya; and Suzuki, Masakazu, 4,930,004, Cl. 358-29.000.

Saito, Kenji: *See*—
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.

Saito, Shigeaki; Matsueda, Toshiharu; Kubota, Yoshihiro; and Iguchi, Masaaki, to Furukawa Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Dopant of arsenic, method for the preparation thereof and method for doping of semiconductor therewith. 4,929,572, Cl. 437-164.000.

Saka, Tsutomu: *See*—
Niizato, Tomonori; Tanai, Tsuneo; Kasahara, Kazuhiro; Saka, Tsutomu; and Oikawa, Toshihiro, 4,928,641, Cl. 123-90.160.

Sakagaito, Yukuo: *See*—
Masaki, Takeshi; Kawata, Koichi; and Sakagaito, Yukuo, 4,928,435, Cl. 51-55.000.

Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, to Canon Kabushiki Kaisha Organic photo conductive medium. 4,929,524, Cl. 430-56.000.

Sakai, Norio: *See*—
Kohno, Yoshiaki; and Sakai, Norio, 4,929,295, Cl. 156-230.000.

Sakai, Takeo: *See*—
Tanaka, Mitsugu; and Sakai, Takeo, 4,929,277, Cl. 106-22.000.

Sakai, Takeshi; and Ito, Tsuneo, to NDC Company, Ltd. Sliding bearing and crankshaft used for crankshaft-connecting rod assembly 4,928,[illegible]0, Cl. 74-595.000.

Sakamoto, Hideshi: *See*—
Daimon, Takashi; Sakamoto, Hideshi; and Akimoto, Osamu, 4,929,496, Cl. 428-246.000.

Sakamoto, Hideyuki: *See*—
Kiminami, Ikuo; Sakamoto, Hideyuki; and Nose, Toshimitsu, 4,928,499, Cl. 62-186.000.

Sakamoto, Kiichiro; and Iwasaki, Hideo, to Fuji Photo Film Co., Ltd. Developing apparatus. 4,929,974, Cl. 354-299.000.

Sakamoto, Kiichiro: *See*—
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 4,928,996, Cl. 283-109.000.

Sakuma, Yoshinori: *See*—
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki, Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.

Saladin, Guenter: *See*—
Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D.; and Saladin, Guenter, 4,929,758, Cl. 564-485.000.
Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D.; and Saladin, Guenter, 4,929,759, Cl. 564-485.000.

Salama, Simon: *See*—
Avni, Eitan; Salama, Simon; and Turi, Eran, 4,929,474, Cl. 427-326.000.

Salerno, Don: *See*—
Henderson, Don J.; Brady, Robert; Gamble, Foster R., Hardt, James V.; Friedfeld, Howard; Salerno, Don; Swanson, Tad; and Sansing, Maureen R., 4,928,696, Cl. 128-644.000.

Sallas, John J., to Halliburton Geophysical Services, Inc. Suppression of air-coupled noise produced by seismic vibrators. 4,930,113, Cl. 367-190.000.

Salomon S. A.: *See*—
Montfort, Benoit, 4,928,406, Cl. 36-117.000.

Salomon S.A.: *See*—
Hue, Jean, 4,928,988, Cl. 280-607.000.
Rullier, Pierre, 4,928,990, Cl. 280-625.000.

Salvan, Michel. *See*—
de Beisseron, Bertrand; Salvan, Michel; and Gugenhein, Michele, 4,930,124, Cl. 370-94.300.

Salvia-Werk Gesellschaft zur Herstellung chemischer and pharmazeutischer Erzeuginisse mbH: *See*—
Breitenfelder, Wilheim; and Trenkner, Fritz, 4,928,684, Cl. 128-204.210.

Sames S.A.: *See*—
Prus, Eric; Frene, Andre; Bordaz, Pascal; Guerange, Patrick; and Thome, Caryl, 4,928,880, Cl. 239-8.000.

Sampson, Edward J., to Shiley Infusaid, Inc. Snap-lock fitting catheter for an implantable device. 4,929,236, Cl. 604-175.000

Sampson, Robert; and Flanigan, Sean, to Wasco Products, Inc. Skylight construction. 4,928,445, Cl. 52-72.000.

Samsonite Corporation: *See*—
Green, Stephen T.; and Van Hoye, Willibald, 4,928,800, Cl. 190-115.000.

Samsung Electronics, Co., Ltd.: *See*—
Kim, Byeng-yun; and Park, Yong-bo, 4,929,853, Cl. 307-475.000

Samsung Semiconductor & Telecommunications Co.: *See*—
Bae, Myung H., 4,929,852, Cl. 307-475.000.

Sanada, Takashi: *See*—
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takashi, and Tsuji, Mitsuji, 4,929,675, Cl. 525-66.000.

Sanborn, George W., to Sanborn, Inc. Portable ultra-filtration system 4,929,351, Cl. 210-195.200.

Sanborn, Inc.: *See*—
Sanborn, George W., 4,929,351, Cl. 210-195.200.

Sanchez, Joseph P.: *See*—
Culbertson, Townley P.; Domagala, John M., Hagen, Susan E.; and Sanchez, Joseph P., 4,929,613, Cl. 514-210.000.

Sandbank, Barry M., to Smith & Nephew plc. Adhesive coated dressing and applicators therefor. 4,928,680, Cl. 128-155.000.

Sanden Corporation: *See*—
Negishi, Kozabro, 4,928,501, Cl. 62-406.000.

Sander, Ingolf, to Verbatim Corporation. Method and apparatus for anamorphically shaping and deflecting electromagnetic beams. 4,929,067, Cl. 350-421.000.

Sandford, Philip: *See*—
Butler, David R.; Snow, George, Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,928,746, Cl. 164-362.000.

Sankyo Company Limited *See*—
Mizushima, Shoji; and Yamagata, Hideo, 4,929,559, Cl. 435-252.330.

Sano, Junji: *See*—
Fuse, Toshikazu; Yamamoto, Atsushi, and Sano, Junji, 4,929,248, Cl. 8-128.100.

Sanpei, Tetsuya: *See*—
Moriya, Yutaka; Sanpei, Tetsuya, and Tagawa, Hisatoshi, 4,929,289, Cl. 148-402.000.

Sans, Claude: *See*—
Delfour, Andre; Falempin, Francois; Isbert, Jacques; and Sans, Claude, 4,929,079, Cl. 356-336.000

Sanshin Kogyo Kabushiki Kaisha: *See*—
Shiozawa, Shigeki, 4,929,204, Cl. 440-112.000.

Sansing, Maureen R.: *See*—
Henderson, Don J.; Brady, Robert, Gamble, Foster R.; Hardt, James V.; Friedfeld, Howard, Salerno, Don; Swanson, Tad, and Sansing, Maureen R., 4,928,696, Cl. 128-644.000.

Santa Barbara Research Center *See*—
Pagano, Thomas S.; and Turtle, RObert R., 4,929,040, Cl. 350-6.500.

Santel, Hans-Joachim: *See*—
Forster, Heinz, Beck, Gunther, Klauke, Erich; Santel, Hans-Joachim; and Schmidt, Robert R., 4,929,743, Cl. 548-187.000.

Sanyo Electric Co., Ltd.: *See*—
Hosoya, Nobukazu, 4,930,003, Cl. 358-19.000.
Houjiyou, Yuji; Hayasaki, Hiroyuki; and Yonezawa, Kyoichi, 4,929,844, Cl. 250-561.000.

Sapak, David L.: *See*—
Hayden, Joseph S.; Sapak, David L.; and Ward, Julia M., 4,929,387, Cl. 252-301.40P

Sardella, Louis M. Rotary type feeder machines and methods 4,928,950, Cl. 271-112.000.

Sartor, Mariano: *See*—
Baggio, Giorgio; Gonella, Mario; and Sartor, Mariano, 4,928,408, Cl. 36-119.000.

Sasagawa, Katsuyoshi: *See*—
Nagata, Teruyuki; Okazaki, Koju; Kajimoto, Nobuyuki, Miura, Tohru; Kanemura, Yoshinobu; and Sasagawa, Katsuyoshi, 4,929,707, Cl. 528-76.000.

Sasai, Tsuguhisa, to Olympus Optical Co., Ltd Ultrasonic diagnosis device. 4,928,699, Cl. 128-662.060.

Sasaki, Hiroki: *See*—
Yonezawa, Akihiro; Sasaki, Hiroki; Mitsuyuki, Yoichiro; Mori, Yasuki; and Ishigami, Toshihiko, 4,929,869, Cl. 313-639.000.

Sasaki, Takashi: *See*—
Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, 4,929,539, Cl. 430-553.000.

Sasakura Engineering Co., Ltd.: *See*—
Imai, Masaaki; and Uemura, Minoru, 4,929,347, Cl. 210-101.000.

Sato, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha Splicing system. 4,929,297, Cl. 156-361.000.

Sato, Koichi; and Ikeda, Masami, to Canon Kabushiki Kaisha Method for preparing liquid jet recording head, liquid jet recording head prepared by said method and liquid jet recording device having said liquid jet recording head mounted thereon. 4,929,964, Cl. 346-1.100

Sato, Mitsuya; Ukaji, Takao; Yamaguchi, Nobuhito; Ohmori, Taro, and Murakami, Eiichi, to Canon Kabushiki Kaisha. Wafer prober 4,929,893, Cl. 324-158.00F.

Sato, Robert N., to Hughes Aircraft Company. GaAs focal plane array readout. 4,929,913, Cl. 330-308.000.

Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Silver halide photosensitive materials for color photography. 4,929,539, Cl. 430-553.000.

Sato, Shogo: *See*—
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 4,930,028, Cl. 360-85.000.

Sato, Takayoshi. Ice-cream cones. 4,929,457, Cl. 426-139.000

Sato, Takayuki: *See*—
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki, Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl. 354-420.000

VOL
1114
ISS
5
MY
29
1990
UMI

Sato, Toshiaki: *See*—
Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, 4,929,482, Cl. 428-36.400.

Satoh, Kazuhiko: *See*—
Hayase, Isao; Ushiku, Kenichi; Tejima, Kunisuke; Hayashi, Seiichi; and Satoh, Kazuhiko, 4,929,159, Cl. 417-295.000.

Satou, Hiroyuki; and Ookawa, Norio, to Fuji Photo Film Co., Ltd. Feeder for feeding photosensitive material. 4,928,897, Cl. 242-55.000.

Satter, Inc.: *See*—
Jakobsen, Katherine, 4,928,819, Cl. 206-316.200.

Sauer, Heinz, to Rasmussen GmbH. Device for coupling a hose to a pipe. 4,929,002, Cl. 285-319.000.

Saunders-Roe Development Limited: *See*—
Bright, Alfred N., 4,928,414, Cl. 40-551.000.

Sawada, Hiroyuki: *See*—
Furuhashi, Kenshi; and Sawada, Hiroyuki, 4,929,806, Cl. 200-61.540.

Sawada, Yoshihisa: *See*—
Kitagawa, Kazuo; Komatsu, Fumiaki; Masaki, Takayoshi; Sawada, Yoshihisa; and Inada, Eiichi, 4,929,394, Cl. 252-633.000.

Sawaf, Bernard E.: *See*—
Smirlock, Martin E.; Ribich, William A.; Marinaccio, Paul J.; and Sawaf, Bernard E., 4,928,575, Cl. 89-36.020.

Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, to Kabushiki Kaisha Sanwa Kagaku Kenkyusho. Preventives and remedies for medicinal and alcoholic poisoning. 4,929,438, Cl. 424-10.000.

Sayles, Delbert E., Sr., to Sayles & Scheel Enterprises, Incorporated. Conductive composition and method of use. 4,929,390, Cl. 252-510.000.

Sayles & Scheel Enterprises, Incorporated: *See*—
Sayles, Delbert E., Sr., 4,929,390, Cl. 252-510.000.

Sayre, Edwin D.: *See*—
Dixon, Robert C.; Cearley, James E.; Van Diemen, Paul; Sayre, Edwin D.; and Gordon, Gerald M., 4,929,412, Cl. 376-260.000.

Scalbassi, Robert J.: *See*—
Sekhar, Laligam N.; Scalbassi, Robert J.; Sun, Mingui; and Wasserman, Jacob F., 4,928,705, Cl. 128-773.000.

Scapini, Giancarlo: *See*—
Ferruti, Paolo; and Scapini, Giancarlo, 4,929,750, Cl. 560-87.000.

Scepter Manufacturing Company Limited: *See*—
Arthurs, Raymond C., 4,928,841, Cl. 220-21.000.

Schablonentechnik Kufstein GmbH: *See*—
Ruckl, Siegfried, 4,928,593, Cl. 101-389.100.

Schaefer, Robert D.: *See*—
La Plante, John A.; and Schaefer, Robert D., 4,929,073, Cl. 350-609.000.

Schaeffer GmbH: *See*—
Collas, Wolfgang; Wolfertz, Gunter; and Wolfertz, Roger, 4,928,362, Cl. 24-90.00R.

Schaepers, Arno; and Grabherr, Bernd, to Zeppelin-Metallwerke GmbH. Electromagnetically shielded cabin. 4,929,802, Cl. 174 35.0MS.

Schaper, Siegfried; and Seufert, Martin, to Audi AG. Method for electroplating a conducting surface. 4,929,315, Cl. 204-18.100.

Schatz, Oskar. Multicylinder IC engine with a stroke charging device 4,928,639, Cl. 123-52.0ME.

Schatz, Oskar; Mehne, Georg; and Steidele, Thomas. Method of operating an IC engine and an IC engine for performing the method. 4,928,648, Cl. 123-403.000.

Schefczik, Ernst: *See*—
Hansen, Guenter; Schefczik, Ernst; and Reichelt, Helmut, 4,929,720, Cl. 534-766.000.

Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, to ASTA Pharma Aktiengesellshaft. oxazaphosphorin-4-thio alkanesulphonic acids, neutral salts thereof and method to treat cancer diseases and to produce immunosuppression. 4,929,607, Cl. 514-110.000.

Schellstede, Herman J.; McQueen, Robert W.; and Peters, Alan D., to Penetrators, Inc. Hydraulic well penetration apparatus. 4,928,757, Cl. 166-55.100.

Schering Aktiengesellschaft: *See*—
Mahlkow, Hartmut; Romer, Michael; Rosskamp, Gunther; Seidenspinner, Hubert-Matthias; Stein, Ludwig; and Strache, Waltraud, 4,929,422, Cl. 427-57.000.

Schering Corporation: *See*—
Haslanger, Martin F.; Neustadt, Bernard R.; and Smith, Elizabeth M., 4,929,641, Cl. 514-506.000

Scheuermann, Rainer, to Bauerfeind GmbH & Co. Heel cushion. 4,928,404, Cl. 36-37.000.

Schiemann, Wolfram. Plastic-canister screw closure. 4,928,861, Cl 222-481.500.

Schiffman, Eric L.; Friction, James R.; and Espy, Lawrence M., to University of Minnesota, Regents of the. Electronic pressure algometer apparatus. 4,928,707, Cl. 128-774.000.

Schipper, Paul H.: *See*—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,929,337, Cl. 208-120.000.

Schips, Helmut. Apparatus for joining the pocket trimming and the pocket bag in trouser pockets. 4,928,608, Cl. 112-121.120.

Schirmer, Henry G., to W. R. Grace & Co.-Conn. Oxygen-barrier retort pouch. 4,928,474, Cl. 53-425.000.

Schisler, Robert C.: *See*—
Allen, Terry F.; and Schisler, Robert C., 4,929,688, Cl. 525-332.500.

Schlepfer, Walter: *See*—
Hanselmann, Daniel; and Schlepfer, Walter, 4,928,354, Cl. 19-97.000.

Schleupen, Richard: *See*—
Sohner, Gerhard; Roth, Helmut; Brammer, Hartmut; Schleupen, Richard; and Nubel, Karl-Heinz, 4,928,660, Cl. 123-647.000.

Schlichting, Jorg: *See*—
Rondot, Klaus; and Schlichting, Jorg, 4,928,814, Cl. 206-215.000.

Schlote, David S.: *See*—
Potter, Gary J.; Schlote, David S.; and Reinkemeyer, Robert W., 4,929,541, Cl. 432-222.000.

Schlumberger Systems, Inc.: *See*—
Schroeder, Brian D.; and Deering, Michael F., 4,930,091, Cl. 364-522.000.

Schlumberger Technology Corporation: *See*—
Jardine, Stuart, 4,928,521, Cl. 73-151.000.

Schmidt, Donald L.; McCrackin, Perry J.; and Coburn, Charles E., to Dow Chemical Company, The. Fluorocarbon containing, reactive polymeric surfactants and coating compositions therefrom. 4,929,666, Cl. 524-516.000.

Schmidt, Donald L.: *See*—
Cheng, Roberta C.; Wessling, Ritchie A.; and Schmidt, Donald L., 4,929,556, Cl. 435-180.000.

Schmidt, Erhard: *See*—
Grasser, Franz; Reichenberger, Helmut; Hassler, Dietrich; Naser, Georg; and Schmidt, Erhard, 4,928,672, Cl. 128-24.00A.

Schmidt, Robert J.; and Haizmann, Robert S., to UOP. Hydrothreatment-isomerization without hydrogen recycle. 4,929,794, Cl. 585-737.000.

Schmidt, Robert R.: *See*—
Forster, Heinz; Beck, Gunther; Klauke, Erich; Santel, Hans-Joachim; and Schmidt, Robert R., 4,929,743, Cl. 548-187.000.

Schmidt, Rudiger: *See*—
Gebhardt, Axel; Diekmann, Bernd; and Schmidt, Rudiger, 4,928,428, Cl. 49-192.000.

Schnatterer, Albert; and Fiege, Helmut, to Bayer Aktiengesellschaft. Process are the preparation of p-hydroxy-benzaldehydes. 4,929,766, Cl. 568-432.000.

Schnatwinkel, Michael: *See*—
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Diekmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000.

Schnebly, John; and Marusak, Thomas J., to Comfortex Corporation. Method of making a pleated blind with articulative slat extensions. 4,928,369, Cl. 29-24.500.

Schneider, Alan M., and Doherty, Donald W., to United States of America, Navy. Search-radar azimuth correction. 4,929,952, Cl. 342-184.000.

Schneider, Joachim: *See*—
Fukamachi, Chiharu; Schumacher, Horst; Bewert, Wolfgang; and Schneider, Joachim, 4,929,774, Cl. 568-824.000.

Schneider, Norbert: *See*—
Melwisch, Harald; and Schneider, Norbert, 4,928,389, Cl. 30-43.920.

Schneider (USA), Inc.: *See*—
Goodin, Richard L.; Rydell, Mark A.; and Shockey, Rick L., 4,928,693, Cl. 128-637.000.

Schoeller & Hoesch GmbH: *See*—
Mentzel, Edgar; and Meixner, Ferdinand, 4,928,715, Cl. 131-365.000.

Schofield, Robert C. Squeeze roll and actuator assembly utilizing inflatable bags. 4,928,589, Cl. 100-170.000.

Scholl, Thomas; Jabs, Gert; and Richartz, Adolf, to Bayer Aktiengesellschaft. Hydroxycarboxylic acid/Unsaturated aromatic hydrocarbon resin useful as recording material. 4,929,710, Cl. 528-205.000.

Schonauer, Sylvia L.; Medina, Linda M.; and Neel, Donald V., to Frito-Lay, Inc. Process for producing batch type potato chips on a continuous basis. 4,929,461, Cl. 426-438.000.

Schonert, Dieter: *See*—
Osarek, Werner; Pempera, Franz G.; and Schonert, Dieter, 4,928,717, Cl. 134-64.00R.

Schonfeld, Erwin: *See*—
Meyer, Gundolf; Schonfeld, Erwin; and Verpoort, Clemens, 4,929,596, Cl. 505-1.000.

Schonfeld, Steven E.: *See*—
Roland, Charles M.; Bohm, Georg G. A.; and Schonfeld, Steven E., 4,929,684, Cl. 525-274.000.

Schorfheide, James T.: *See*—
Cody, Ian A.; Hamner, Glen P., deceased; and Schorfheide, James T., 4,929,795, Cl. 585-739.000.

Schott Glass Technologies, Inc.: *See*—
Hayden, Joseph S.; Sapak, David L.; and Ward, Julia M., 4,929,387, Cl. 252-301.40P.

Schrader, Jurgen; and Claar, Klaus, to Daimler-Benz AG. Strut for a folding vehicle cover. 4,929,020, Cl. 296-118.000.

Schrauth, Peter A.: *See*—
Carpenter, Larry L.; Hagerty, Robert J.; Maschmeyer, Richard O.; Morrell, Mark L.; and Schrauth, Peter A., 4,929,265, Cl. 65-64.000.

Schroeder, Brian D.; and Deering, Michael F., to Schlumberger Systems, Inc. Triangle classification setup method and apparatus for 3-D graphics display system. 4,930,091, Cl. 364-522.000.

Schroepfer, Richard C.: *See*—
Korsunsky, Iosif; and Schroepfer, Richard C., 4,929,194, Cl. 439-571.000.

Schroer, Wolf-Dieter: *See*—
Bachem, Henning; Suling, Carlhans; Muszik, Janos; and Schroer, Wolf-Dieter, 4,929,309, Cl. 162-164.300.

Schubert, Erdmann F., to American Telephone and Telegraph Company. Optical communications modulator device. 4,929,064, Cl. 350-355.000.

Schucker, Robert C., to Exxon Research and Engineering Company. Isocyanurate crosslinked polyurethane membranes and their use for the separation of aromatics from non-aromatics. 4,929,357, Cl. 210-640.000.

Schuco Heinz Schurmann GmbH & Co.: *See*—
Gebhardt, Axel; Diekmann, Bernd; and Schmidt, Rudiger, 4,928,428, Cl. 49-192.000.

Schuh, David N. Bearing clearance detector. 4,928,400, Cl. 33-605.000.

Schult, Klaus; Kister, Horst; and Quenzer, Michael, to VDO Adolf Schindling AG. Fastening device for the attaching of an electric transmitter. 4,928,531, Cl. 73-855.000.

Schulte-Elte, Karl-Heinrich: *See*—
Giersch, Wolfgang K.; and Schulte-Elte, Karl-Heinrich, 4,929,599, Cl. 512-18.000.

Schulte, Karl-Heinz, to Muhr und Bender Maschinenbau GmbH. Machine tool. 4,928,377, Cl. 29-560.000.

Schulz, Paul; Schwadtke, Karl; and Smulders, Eduard, to Henkel Kommanditgesellschaft aug Aktien. Process for the preparation of a storage-stable liquid detergent composition. 4,929,380, Cl. 252-121.000.

Schulze, Rainer: *See*—
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Diekmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000.

Schumacher, Horst: *See*—
Fukamachi, Chiharu; Schumacher, Horst; Bewert, Wolfgang; and Schneider, Joachim, 4,929,774, Cl. 568-824.000.

Schupp, Gerhard; Tscheschlok, Klaus; and Johann, Maischberger, to KUKA Schweissanlagen and Roboter GmbH. Mounting arrangement for the automatic assembly of aggregates prefabricated parts to a car body from below. 4,928,386, Cl. 29-824.000.

Schurmann, Gottfried: *See*—
Kalitzki, Siegfried; Peters, Josef; and Schurmann, Gottfried, 4,928,477, Cl. 57-416.000.

Schwadtke, Karl: *See*—
Schulz, Paul; Schwadtke, Karl; and Smulders, Eduard, 4,929,380, Cl. 252-121.000.

Schwander, Hansrudolf; Tzikas, Athanassios; and Aeschlimann, Peter, to Ciba-Geigy Corporation. Fiber-reactive dyes containing an aniline radical which carries two different vinylsulfonyl moieties. 4,929,719, Cl. 534-604.000.

Schwane, Walter H.: *See*—
Batra, Surinder P.; Hammer, William E.; Lushinsky, Gene A.; Marquart, David W.; Schwane, Walter H.; and Ziecina, Frederick J., 4,930,069, Cl. 364-200.000.

Schwark, Joanne M., to Hercules Incorporated. Isocyanate- and isothiocyanate-modified polysilazane ceramic precursors. 4,929,704, Cl. 528-28.000.

Schwarz, Horst: *See*—
Heiua, Karl-Fritz; Schwarz, Horst; and Weber, Wolfgang, 4,928,953, Cl. 271-185.000.

Schwarzmann, Matthias: *See*—
Hesse, Michael; Hoelderich, Wolfgang; and Schwarzmann, Matthias, 4,929,733, Cl. 546-184.000.

Scott, Dennis J.; and Calfo, Raymond M., to Westinghouse Electric Corp. Pulsed AC electromagnetic projectile launcher apparatus. 4,928,572, Cl. 89-8.000.

Scott, Richmond: *See*—
Tilman, Paul A.; Machacek, Zdenek; and Scott, Richmond, 4,929,487, Cl. 428-163.000.

Scribner, Richard M.: *See*—
Pennev, Penio; Rajagopalan, Parthasarathi; and Scribner, Richard M., 4,929,627, Cl. 514-320.000.

Scripps Clinic and Research Foundation: *See*—
Harker, Laurence A.; and Hanson, Stephen R., 4,929,602, Cl. 514-18.000.

Sea View Enterprises: *See*—
Forman, Willis R., 4,928,614, Cl. 114-66.000.

Sebranek, Joseph G.: *See*—
Huebner, Patrick H.; Sebranek, Joseph G.; Olson, Dennis G.; and Anderson, Eugene A., 4,928,892, Cl. 241-82.500.

Secord, Tyrone R., to Fisher Dynamics Corporation. Power seat recliner. 4,929,024, Cl. 297-362.000.

Seevinck, Evert: *See*—
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 4,929,911, Cl. 330-264.000.

Seidenspinner, Hubert-Matthias: *See*—
Mahlkow, Hartmut; Romer, Michael; Rosskamp, Gunther; Seidenspinner, Hubert-Matthias; Stein, Ludwig; and Strache, Waltraud, 4,929,422, Cl. 427-57.000.

Seidman, Sheldon, to Automatic Findings, Inc. Earring clutch. 4,928,367, Cl. 24-705.000.

Seidoh, Masami, to Jupiter Dentsu Co., Ltd. Shield connector. 4,929,195, Cl. 439-610.000.

Seiko Epson Corporation: *See*—
Aoki, Kenji; Takei, Katsumori; Nakamura, Haruo; and Matsushita, Yoshikazu, 4,929,057, Cl. 350-333.000.
Takahashi, Kotoyoshi, 4,929,059, Cl. 350-334.000.

Seikosha Co., Ltd.: *See*—
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl. 354-420.000.

Seiler, Larry D.; Pappas, James L.; and Rose, Robert C., to Digital Equipment Corporation. Data path chip test architecture. 4,929,889, Cl. 371-22.300.

Seiss, Willi: *See*—
Torbus, Marek; Jerman, Franz; Ladegourdie, Gerard; Lingemann, Dirk; Seiss, Willi; and Vujevic, Aleksandar, 4,929,649, Cl. 523-145.000.

Seitz, Dieter: *See*—
Braschel, Volker; and Seitz, Dieter, 4,929,034, Cl. 303-103.000.

Sekhar, Laligam N.; Scalbassi, Robert J.; Sun, Mingui; and Wasserman, Jacob F., to United States of America, Higher Education; and United States of America, Tennessee Research Corporation. Acoustic aneurysm detector and associated method. 4,928,705, Cl. 128-773.000.

Sekiguchi, Kyoji: *See*—
Masuda, Takashi; and Sekiguchi, Kyoji, 4,929,076, Cl. 351-212.000.

Sekiguchi, Shigemi, to Hosiden Electronics Co., Ltd. Connector with locking mechanism. 4,929,189, Cl. 439-352.000.

Sekiya, Satoshi: *See*—
Yamamoto, Michio; and Sekiya, Satoshi, 4,929,949, Cl. 341-176.000.

Semenov, Orest S.: *See*—
Kljuev, Vladimir V.; Kozlov, Valery S.; Volodchenko, Dmitry B.; Stepanenko, Alexandr V.; Baranovsky, Vladimir I.; Korolkov, Mikhail I.; and Semenov, Orest S., 4,930,026, Cl. 360-67.000.

Sequa Corporation: *See*—
Sirvet, Enn, 4,928,511, Cl. 72-361.000.

Sera, Akio: *See*—
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Ishikura, Keizaburo; Sera, Akio; and Suehiro, Junji, 4,929,903, Cl. 324-544.000.

Sera, Hidefumi: *See*—
Kato, Eiichi; Ishii, Kazuo; Itakura, Ryosuke; and Sera, Hidefumi, 4,929,526, Cl. 430-87.000.

Serco Corporation: *See*—
Alexander, James C., 4,928,340, Cl. 14-71.300.

Sergoyan, Edward G.; and von Dadelszen, Michael. Inorganic triple point screen. 4,930,137, Cl. 372-81.000.

Serratelli, John F.: *See*—
Nichols, Jerram B.; Hunter, Douglas; Herrington, Ronald M.; Serratelli, John F.; and Carey, David G., 4,929,646, Cl. 521-137.000.

SET Technology B.V.: *See*—
Kooiman, Cornelis A.; and McDevitt, John J., Sr., 4,929,254, Cl. 48-76.000.

Setoi, Hiroyuki; Kuroda, Akio; Tanaka, Hirokazu; Hirai, Hideo; Marusawa, Hiroshi; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Company, Ltd. Oxygen-containing heterocyclic compound. 4,929,639, Cl. 514-452.000.

Seufert, Martin: *See*—
Schaper, Siegfried; and Seufert, Martin, 4,929,315, Cl. 204-18.100.

Severiens, Hendrik: *See*—
Lodder, Bernhard; Severiens, Hendrik; van Houten, Jan A.; and van Dijk, Berend J., 4,929,408, Cl. 264-149.000.

Sexton, Gregory J.; and Kopp, Gregory M., to Eastman Kodak Company. Continuous ink jet printer with a gravity drain, catcher return system. 4,929,966, Cl. 346-75.000.

Sexton, James E.: *See*—
Connaughton, James M., Jr.; Sexton, James E.; and Hegener, James A., 4,929,455, Cl. 426-92.000.

Seymour, Shaun A.: *See*—
Bohman, Carl E.; and Seymour, Shaun A., 4,929,904, Cl. 324-696.000.

SGS-Thomson Microelectronics S.r.l.: *See*—
Chieli, Davide, 4,929,883, Cl. 323-282.000.

Shadzi, Bahram; and Weaver, Christopher A., to Magnetic Peripherals Inc. Use of nickel-phosphorous undercoat for particulate media in magnetic storage devices. 4,929,499, Cl. 428-336.000.

Shaffer, Harold K.; and Barnsby, Roger M., to United Technologies Corporation. Rotating shaft seal. 4,928,978, Cl. 277-25.000.

Shah, Dhiren N.: *See*—
Domet, Jack; and Shah, Dhiren N., 4,929,605, Cl. 514-54.000.

Shah, Kirit: *See*—
Guzik, Andrzej T.; Curtis, James H.; Habbaba, Faris S.; and Shah, Kirit, 4,929,062, Cl. 350-345.000.

Shannon, Michael D., to R. J. Reynolds Tobacco Company. Smoking article with embedded substrate. 4,928,714, Cl. 131-359.000.

Sharma, Shri C.; Shaw, James J.; and Yang, Robert K., to Warner-Lambert Company. Novel drug delivery system for antitussives. 4,929,508, Cl. 424-439.000.

Sharp Kabushiki Kaisha: *See*—
Ikenaga, Yasunori, 4,929,109, Cl. 101-134.000.
Inui, Koichi, 4,929,970, Cl. 346-160.000.
Nishibori, Toshiki, 4,928,943, Cl. 271-4.000.
Numao, Takaji, 4,929,058, Cl. 350-333.000.
Sugihara, Takashi; Uda, Kazutaka; Tabuchi, Hiroki; Inami, Yasuhiko; Hijikigawa, Masaya; and Kataoka, Shoei, 4,928,513, Cl. 73-1.00G.
Yoshida, Masaru; Yoshikawa, Mitsuhiko; Yoshimoto, Yoshikazu; Wada, Hiroshi; Suzuki, Tomonari; and Nakajima, Shigeo, 4,929,803, Cl. 174-117.00M.

Shaura, Tsuneo: *See*—
Tanaka, Hiroyuki; Uto, Kuniharu; Kawai, Kazumi; Shaura, Tsuneo; and Yasuhuku, Motonobu, 4,929,221, Cl. 474-205.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Shaw, Bernard L.: *See*—
Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., 4,929,767, Cl. 568-454.000.
Shaw, James J.: *See*—
Sharma, Shri C.; Shaw, James J.; and Yang, Robert K., 4,929,508, Cl. 424-439.000.
Shaw, Richard G.: *See*—
Bahl, Surinder K.; Canterino, Peter J.; Cunningham, Theresa L.; Evans, Susan P.; and Shaw, Richard G., 4,929,681, Cl. 525-240.000.
Shaw, William S., to Tri Fire Holdings, Ltd. Gas fire heating unit. 4,928,667, Cl. 126-512.000.
Sheikholeslami, Amir M.: *See*—
McBeath, Les L.; Sheikholeslami, Amir M.; and Turro, Glenn T., 4,929,933, Cl. 340-703.000.
Shekleton, Jack R.; Rodgers, Colin; and Archibald, John P., to Sundstrand Corporation. Annular combustor with tangential cooling air injection. 4,928,479, Cl. 60-39.360.
Shell Internationale Research Maatschappij, B. V.: *See*—
McArthur, Alastair; Davis, Royston H.; Hilton, Mark D.; Newton, Trevor W.; and Patel, Dinesh M., 4,929,628, Cl. 514-364.000.
Shell Oil Company: *See*—
De Jong, Feike; Dannenberg, Willem; and Vermeule, Jacob, 4,929,374, Cl. 252-39.000.
Slaugh, Lynn H.; Johnson, Thomas H.; and Hoxmeier, Ronald J., 4,929,584, Cl. 502-112.000.
van Broekhoven, Johannes A. M., 4,929,701, Cl. 525-539.000.
Shelor, Mack. Power plant and method of retrofitting existing power plants. 4,928,635, Cl. 122-7.00R.
Shen, Wei-Ming, to Union Carbide Corporation. Process for producing crystalline silicon nitride powder. 4,929,432, Cl. 423-344.000.
Shenq-Gwo, Liou. Structure of hub cap for car wheel. 4,929,031, Cl. 301-37.00P.
Shepherd, Mark R., to AM International, Inc. Multi-disc cutter and method of manufacture. 4,929,256, Cl. 51-293.000.
Sherman, James R. Sight for archery bow. 4,928,394, Cl. 33-265.000.
Sherwin, Karl F.; and Boehm, Manfred D., to General Electric Company. X-ray exposure regulator. 4,930,145, Cl. 378-109.000.
Sherwood Medical Company: *See*—
Swisher, David R., 4,929,244, Cl. 604-319.000.
Sheth, Paresh J., to Exxon Chemical Patents Inc. Composite breathable housewrap films. 4,929,303, Cl. 156-209.000.
Sheu, Yin-Ping. Knuckle joint. 4,929,113, Cl. 403-157.000.
Shiba, Katsuhiro: *See*—
Kunimaru, Noritaka; Shiba, Katsuhiro; Kudo, Norio; Inoshita, Gen; and Sato, Shogo, 4,930,028, Cl. 360-85.000.
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai; and Meiji Seika Kaisha, Ltd. Actinonin derivatives having physiological activities. 4,929,633, Cl. 514-423.000.
Shibasaki, Jun: *See*—
Kuzuhara, Michio; Shibasaki, Jun; St. Louis, Andree; St. Laurent, Christian; and Bedard, Michel, 4,928,431, Cl. 49-479.000.
Shibata, Yasuhiro: *See*—
Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, 4,928,438, Cl. 51-283.00R.
Shibatani, Haruo: *See*—
Takahashi, Kuninasa; Kameda, Takashi; and Shibatani, Haruo, 4,929,404, Cl. 264-29.500.
Shibayama, Atsushi, to Nikon Corporation. Zoom lens. 4,929,069, Cl. 350-423.000.
Shibazaki, Osamu; Miyazawa, Yorikatu; and Kato, Toshio, to Konica Corporation. Patrone for photographic film. 4,928,826, Cl. 206-409.000.
Shibuya, Yukio: *See*—
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,929,169, Cl. 425-385.000.
Shidara, Shinichi, to Fuji Photo Film Co., Ltd. Automatic film processor. 4,929,975, Cl. 354-317.000.
Shido, Hironori: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, 4,928,941, Cl. 270-53.000.
Shigematsu, Tomohisa: *See*—
Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao; Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, 4,930,105, Cl. 365-185.000.
Shigi, Hidetaka: *See*—
Takenaka, Takaji; Netsu, Tositada; Shigi, Hidetaka; and Yamamoto, Masakazu, 4,930,002, Cl. 357-75.000.
Shiiki, Satoshi: *See*—
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.
Shiley Infusaid, Inc.: *See*—
Sampson, Edward J., 4,929,236, Cl. 604-175.000.
Shimada, Makoto: *See*—
Urai, Muneharu; Makino, Hiroyuki; and Shimada, Makoto, 4,929,304, Cl. 156-245.000.
Shimakura, Haruhito *See*—
Kainosho, Keiji; Shimakura, Haruhito; and Oda, Osamu, 4,929,564, Cl. 437-20.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,928,549, Cl. 74-594.600.
Shimanuki, Haruki, to Akebono Brake Industry Co. Ltd. Anti-lock control system for motor vehicles. 4,929,035, Cl. 303-106.000.
Shimanuki, Haruki: *See*—
Hoashi, Akira; Akima, Hideo; Shimanuki, Haruki; and Matsubara, Yuji, 4,930,083, Cl. 364-426.020.
Shimizu, Akira; and Ikeda, Sotomitsu, to Canon Kabushiki Kaisha. Second harmonic wave generating device having active layer and second harmonic wave generating layer on same substrate. 4,930,132, Cl. 372-22.000.
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatuski, Yoshio, to Man Design Co., Ltd. Data-transmitting apparatus having connecting plug. 4,930,096, Cl. 364-550.000.
Shimizu, Hiroshi, to NEC Corporation. Method for controlling address parameters for interconnecting law and ISDN. 4,930,123, Cl. 370-94.100.
Shimizu, Misao: *See*—
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatuski, Yoshio, 4,930,096, Cl. 364-550.000.
Shimoda, Kazuharu: *See*—
Ohmura, Yukihiro; Kobayashi, Yoshiyuki; Hosoi, Keiji; and Shimoda, Kazuharu, 4,928,659, Cl 123-588.000.
Shimohigashi, Katsuhiro: *See*—
Tanaka, Hitoshi; Hori, Ryoichi; Itoh, Kiyoo; Kimura, Katsutaka; and Shimohigashi, Katsuhiro, 4,930,112, Cl. 365-226.000.
Shimomura, Akihiro: *See*—
Usami, Toshimasa; and Shimomura, Akihiro, 4,929,411, Cl. 503-213.000.
Shimon Klier: *See*—
Klier, Shimon; and Novik, Ofer, 4,928,665, Cl. 126-415.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Saito, Shigeaki; Matsueda, Toshiharu; Kubota, Yoshihiro; and Iguchi, Masaaki, 4,929,572, Cl. 437-164.000.
Shinada, Kazuyoshi: *See*—
Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao; Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, 4,930,105, Cl. 365-185.000.
Shinko Kosen Kogyo Kabushiki Kaisha: *See*—
Kurauchi, Makoto; Hashimoto, Michio; Hayasaki, Kiyoshi; Minami, Toshikazu; Ohnishi, Mutsuhiko; and Suzuki, Yohei, 4,929,650, Cl. 523-455.000.
Shinoki, Masayoshi; Takagi, Masahiro; Nagatsuka, Ikutaroh; Kumashiro, Koichi; Aoki, Takayoshi; and Takeda, Masayuki, to Fuji Xerox Co., Ltd. Coated carrier for developer. 4,929,528, Cl. 430-108.000.
Shinya, Yoshiyuki; Tabara, Yoshitaka; Okuno, Itaru; Kaneko, Tadashi; and Watanabe, Tomomi, to Mazda Motor Corporation. Engine control system for suppressing car body vibration. 4,928,652, Cl. 123-417.000.
Shiobara, Yashuhisa, to Kabushiki Kaisha Toshiba. Network system using token-passing bus with multiple priority levels. 4,930,121, Cl. 370-85.400.
Shiota, Kazuo, to Fuji Photo Film Co., Ltd. Method of making a print of color slide. 4,930,009, Cl. 358-76.000.
Shiota, Kazuo: *See*—
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 4,928,996, Cl. 283-109.000.
Shiozawa, Shigeki, to Sanshin Kogyo Kabushiki Kaisha. Water entry preventing structure for inboard/outboard motor. 4,929,204, Cl. 440-112.000.
Shipkowski, James P., to Eastman Kodak Company. Solid state relay having visual contact monitor. 4,929,932, Cl. 340-644.000.
Shippen, Mark A. Method of making a reusable adhesive product. 4,929,401, Cl. 264-22.000.
Shir, Ching-Cheng: *See*—
Yamashita, Tsutomu T.; Shir, Ching-Cheng; and Chen, Tu, 4,929,500, Cl. 428-336.000.
Shirakawa, Junji: *See*—
Ainoya, Masayuki; Ishihara, Takeyuki; Kanno, Tesuo; Kikuchi, Takahiro; Mori, Seiichi; Nobumori, Shogo; and Shirakawa, Junji, 4,929,982, Cl. 355-311.000.
Shirasaki, Yoshikazu; and Tadokoro, Yoshio, to Toyo Boseki Kabushiki Kaisha. Composite fibrous material. 4,929,503, Cl. 428-373.000.
Shirley-Fisher, David N., to NL Petroleum Products Limited. Cutting elements for rotary drill bits. 4,928,777, Cl. 175-329.000.
Shishido, Kihachi; Matsuoka, Masami; Ishihara, Noriyuki; and Tamura, Masahiro, to Showa Denko Kabushiki Kaisha; and Fuso Pharmaceutical Industries, Ltd. Medical bag. 4,929,479, Cl. 428-35.200.
Shitara, Kanji: *See*—
Ohno, Aritaka; Shitara, Kanji; and Harashima, Masakazu, 4,928,894, Cl. 242-7.090.
Shobu, Kazuhisa: *See*—
Watanabe, Tadahiko; Shobu, Kazuhisa; Kai, Yukio; Yamamoto, Hideki; Sudoh, Eiichi; Yagishita, Osamu; and Hayakawa, Junshiro, 4,929,417, Cl. 419-12.000.
Shockey, Rick L.: *See*—
Goodin, Richard L.; Rydell, Mark A.; and Shockey, Rick L., 4,928,693, Cl. 128-637.000.
Showa Denko Kabushiki Kaisha: *See*—
Matsui, Fumio; Suzuki, Noboru; Takaishi, Minoru; Ogura, Ryushi; Harigai, Noriaki; Hashimoto, Tadayoshi; and Uematu, Tomoe, 4,929,494, Cl. 428-286.000.
Miyazaki, Kunihiro; Ishitobi, Ken; and Yamaguchi, Yosinobu, 4,929,257, Cl. 51-309.000.

Shishido, Kihachi; Matsuoka, Masami; Ishihara, Noriyuki; and Tamura, Masahiro, 4,929,479, Cl. 428-35.200.
Showa Shell Sekiyu Kabushiki Kaisha: *See*—
Kitazume, Tomoya; Yamazaki, Takashi; and Rin, Seiten, 4,929,760, Cl. 568-308.000.
Shull, William; Nissen, Rudolph; and Drobshoff, Alexander, to Spectra-Physics. Heat dissipating fin and method for making fin assembly. 4,928,756, Cl. 165-182.000.
Si-Lin, Yu. Vibratory separtor screen assembly. 4,929,346, Cl. 209-323.000.
Sicignano, Albert; and Vaez-Iravani, Mehdi, to North American Philips Corporation. Focusing in instruments, such as SEMs and CRTs. 4,929,836, Cl. 250-397.000.
Sicking, Dean L.: *See*—
Buth C. Eugene; Qureshy, Asif; Ross, Hayes E., Jr.; and Sicking, Dean L., 4,928,928, Cl. 256-13.100.
Siddle, David R.: *See*—
Massa, Ted R.; and Siddle, David R., 4,928,373, Cl. 29-278.000.
Siebourg, Wolfgang: *See*—
Dujardin, Ralf; Meyer, Rolf-Volker; and Siebourg, Wolfgang, 4,929,709, Cl. 528-198.000.
Siegel, Israel. Self cooling and self heating container. 4,928,495, Cl. 62-4.000.
Siegfried, Robert W., II, to Atlantic Richfield Company. Downhole wellbore flowmeter tool. 4,928,758, Cl. 166-66.000.
Siegfried, Robert W., II; Smith, Lonnie J.; and Cornette, H. Mitchell, to Atlantic Richfield Company. Tubing conveyed wellbore fluid flow measurement system. 4,928,759, Cl. 166-65.100.
Siemens Aktiengesellschaft: *See*—
Geiger, Gerhard; and Strafner, Michael, 4,930,103, Cl. 364-900.000.
Grasser, Franz; Reichenberger, Helmut; Hassler, Dietrich; Naser, Georg; and Schmidt, Erhard, 4,928,672, Cl. 128-24.00A.
Kantz, Dieter, 4,930,000, Cl. 357-68.000.
Kusserow, Bernd; Gagneur, Klaus; and Hofler, Siegfried, 4,930,034, Cl. 361-19.000.
Matz, Richard; and Zirrgiebel, Jutta, 4,929,515, Cl. 428-614.000.
Pfeiffer, Bernhard, 4,930,038, Cl. 361-92.000.
Reichenberger, Helmut; and Naser, Georg, 4,928,671, Cl. 128-24.00A.
Rogler, Wolfgang; Weitemeyer, Christian; Wewers, Dietmar; Zapf, Frederic; and Stapp, Bernhard, 4,929,051, Cl. 350-96.300.
Wegleiter, Walter, 4,929,300, Cl. 156-645.000.
Siemens-Bendix Automotive Electronics L.P.: *See*—
Hornby, Michael J., 4,928,729, Cl. 137-510.000.
van Vuuren, Willem N. J.; and Wakeman, Russell J., 4,928,640, Cl. 123-90.170.
Wright, Danny O.; and Wiggins, Kregg S., 4,929,879, Cl. 318-696.000.
Sigma Incorporated: *See*—
Nakamura, Kikuo, 4,928,964, Cl. 273-143.00R.
Siliconix Incorporated: *See*—
Blanchard, Richard A., 4,929,991, Cl. 357-23.800.
Silvestrini, Jesus A., to IMDEC S.A. Method of filling drums with cooked solid food products. 4,929,459, Cl. 426-399.000.
Simmons, Gerald P.: *See*—
Lent, Kevin C.; Rife, Conwell K., Jr.; Simmons, Gerald P.; and Speck, Albert J., 4,929,121, Cl. 404-84.000.
Simmons, Kenneth E.: *See*—
Irick, Gether, Jr.; Mercer, Patricia N.; and Simmons, Kenneth E., 4,929,777, Cl. 568-864.000.
Simon, Jean-Francois: *See*—
Cozac, Daniel; and Simon, Jean-Francois, 4,929,266, Cl. 65-135.000.
Simonson, Frederick, III; and Gunn, Timothy M., to Dow Chemical Company, The. Coulometric titrator apparatus and method. 4,929,314, Cl. 204-153.230.
Simpson, Raymond W.: *See*—
Chandler, Donald G.; Nossen, Steve J.; and Simpson, Raymond W., 4,930,139, Cl. 375-1.000.
Sincholle, Daniel: *See*—
Coquelet, Claude; Roussillon, Samia; Sincholle, Daniel; Bonne, Claude; and Alazet, Alain, 4,929,635, Cl. 514-438.000.
Singer, John C., III, to Ford Motor Company. Steering column mounted transmission gear shift mechanism. 4,928,545, Cl. 74-473.0SW.
Singhdeo, Narendra N.: *See*—
Pryor, Michael J.; Fister, Julius C.; Singhdeo, Narendra N.; Mahulikar, Deepak; and Cherukuri, Satyam C., 4,929,516, Cl. 428-620.000.
Sinofsky, Edward L., to C. R. Bard, Inc. Method for closing and sealing an artery after removing a catheter. 4,929,246, Cl. 606-8.000.
Sirvet, Enn, to Sequa Corporation. Rotary cup infeed. 4,928,511, Cl. 72-361.000.
Sitch, John E., to Northern Telecom Limited. Electrostatic discharge protection circuit for an integrated circuit. 4,930,036, Cl. 361-56.000.
Sitges, Maria B.: *See*—
Possani, Lourival D. P.; Gurrola, Georgina B.; Bayon, Marco A. A. C.; and Sitges, Maria B., 4,929,718, Cl. 530-326.000.
Sizer, Theodore, II, to AT&T Bell Laboratories. Source of high repetition rate, high power optical pulses. 4,930,131, Cl. 372-18.000.
Sjoberg, Arne: *See*—
Ragnegård, Samuel; and Sjoberg, Arne, 4,929,355, Cl. 210-784.000.
Skaggs, Charles L.: *See*—
Danis, Sara L.; Skaggs, Charles L.; and Thomas, Charles A., 4,928,411, Cl. 40-324.000.
Skelley, Keith; and Skelley, William G. Golf putting practice apparatus. 4,928,975, Cl. 273-192.000.
Skelley, William G.: *See*—
Skelley, Keith; and Skelley, William G., 4,928,975, Cl. 273-192.000.
SKF France: *See*—
Laurent, Jean M., 4,928,801, Cl. 192-45.100.
Skidata Computer G.m.b.H.: *See*—
Kocznar, Wolfram; and Wallerstorfer, Kurt, 4,929,821, Cl. 235-493.000.
Slack, William F.; and Wadlington, James C., to AT&T Bell Laboratories. Method and network for enhancing power factor of off-line switching circuit. 4,930,061, Cl. 363-44.000.
Slama, Jean-Claude: *See*—
Delarue, Jean-Jacques; Patin, Michel; and Slama, Jean-Claude, 4,929,135, Cl. 411-354.000.
Slaugh, Lynn H.; Johnson, Thomas H.; and Hoxmeier, Ronald J., to Shell Oil Company. Alkylation of Benzene compounds with detergent range olefins. 4,929,584, Cl. 502-112.000.
Slezak, Raymond J., to RJS Corporation. Creel loading apparatus. 4,929,012, Cl. 294-86.410.
Slimak, Karen M. Processes for products from lotus. 4,929,467, Cl. 426-637.000.
Sliskovic, Drago R.: *See*—
Chucholowski, Alexander W.; Roth, Bruce D.; and Sliskovic, Drago R., 4,929,620, Cl. 514-269.000.
Small, James G., to Hughes Aircraft Company. Apparatus and method for transform space scanning imaging. 4,929,951, Cl. 342-179.000.
Smietana, Leo P. Method of making a conically shaped tortilla shell. 4,929,458, Cl. 426-391.000.
Smirlock, Martin E.; Ribich, William A.; Marinaccio, Paul J.; and Sawaf, Bernard E., to Foster-Miller, Inc. Survivability enhancement. 4,928,575, Cl. 89-36.020.
Smith, Charles R., to Vortab Corporation. Static fluid flow mixing apparatus. 4,929,088, Cl. 366-337.000.
Smith, Cliff A. Bluebird house. 4,928,631, Cl. 119-23.000.
Smith, Dennis E.: *See*—
Emadi, Atahusain E.; Green, Eric T.; Margosiak, John S.; Mignogna, Daniel J.; and Smith, Dennis E., 4,929,184, Cl. 439-681.000.
Smith, Donald A.; Carter, William H.; Dingfelder, Howard E.; Burgess, Dale L.; and Gates, Alan B., to Barnes Group Inc. Apparatus for making plastic leaded chip carrier connectors. 4,928,378, Cl. 29-564.600.
Smith, Edgar M., to Burle Technologies, Inc. Feedback stabilized digital infrared detector circuit. 4,929,833, Cl. 250-338.100.
Smith, Elizabeth M.: *See*—
Haslanger, Martin F.; Neustadt, Bernard R.; and Smith, Elizabeth M., 4,929,641, Cl. 514-506.000.
Smith, ernard: *See*—
Branovich, Louis E.; Smith, ernard; Freeman, Gerard L.; and Eckart Donald W., 4,929,418, Cl. 419-19.000.
Smith, Gary L. Fluid assist airless spray nozzle. 4,928,884, Cl. 239-290.000.
Smith, George R.: *See*—
Colles, Michael J.; and Smith, George R., 4,929,052, Cl. 350-96.320.
Smith, H. Kevin: *See*—
Wallace, W. Edward; Smith, H. Kevin; Lynch, W. Bryan; Craig, Raymond S.; and Pourarian, Fiaz, 4,928,496, Cl. 62-46.200.
Smith, James A.: *See*—
Burger, Christian P.; Dudderar, Thomas D.; Gilbert, John A.; Peters, Bruce R.; and Smith, James A., 4,928,527, Cl. 73-657.000.
Smith, Lonnie J.: *See*—
Siegfried, Robert W., II; Smith, Lonnie J.; and Cornette, H. Mitchell, 4,928,759, Cl. 166-65.100.
Smith, Martin D.: *See*—
Cunningham, John A.; Prestjohn, Mark O.; Reed, Bobby P.; and Smith, Martin D., 4,929,976, Cl. 354-322.000.
Smith & Nephew plc: *See*—
Sandbank, Barry M., 4,928,680, Cl. 128-155.000.
Smith, R. Arnold, to McAdory, George D. Medicaments intended for combined use in the improvement of lymphocyte function. 4,929,640, Cl. 514-474.000.
Smith, R. Scott, to Ethyl Corporation. Coupling process. 4,929,783, Cl. 585-452.000.
Smith, Raymond D.; and Marles, Robert, to GEC Plessey Telecommunications Limited. Apparatus by which auxiliary slide-in units are connected to slide-in units. 4,930,046, Cl. 361-393.000.
Smith, Thomas R.; and Tripp, Thomas M., to Pyramid, Inc. Connectable belt and method for forming same. 4,929,222, Cl. 474-255.000.
Smuda, Hubert; Hoelderich, Wolfgang; Goetz, Norbert; and Recker, Hans-Gert, to BASF Aktiengesellschaft. Preparation of phenylacetaldehydes. 4,929,765, Cl. 568-427.000.
Smulders, Eduard: *See*—
Schulz, Paul; Schwadtke, Karl; and Smulders, Eduard, 4,929,380, Cl. 252-121.000.
Snavely, Donald E. Color organ display device. 4,928,568, Cl. 84-464.00R.
Snelgrove, R. Vernon: *See*—
Cipriano, Robert A.; Snelgrove, R. Vernon; and McCullough, Francis P., Jr., 4,929,521, Cl. 429-102.000.
Snodell, W. S., to Peerless Industries, Inc. Tiltable mounting bracket. 4,928,914, Cl. 248-274.000.
Snow, George: *See*—
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,928,746, Cl. 164-362.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Societe Anonyme des Machines Osborn: *See—*
Brigolle, Roger, 4,929,087, Cl. 366-111.000.
Societe Anonyme dite : Alcatel CIT: *See—*
Abaziou, Jean-Luc; Billy, Jean-Claude; and Le Mouel, Bernard, 4,930,127, Cl. 370-110.400.
Long, Jacques; and Perrillat-Amede, Denis, 4,929,151, Cl. 415-177.000.
Societe Anonyme dite: Alcatel Thomson Faisceaux Hertziens: *See—*
Begout, Eric; Bourgeois, Alain; Gueuret, Raymond; and Lapeyre, Pascal, 4,929,962, Cl. 343-786.000.
Societe Anonyme dite: Compagnie Generale D'Electricite: *See—*
Dubots, Patrick; Legat, Denis; and Vic, Raymond, 4,929,047, Cl. 350-96.230.
S.A. Ets. R. Heinen N.V.: *See—*
Heinen, Hans-Dieter, 4,929,005, Cl. 292-251.500.
S.A.: Societe Europeenne de Propulsion: *See—*
Fouche, Claude, 4,928,561, Cl. 82-1.110.
Societe Europeenne de Propulsion: *See—*
Girault, Jean-Philippe, 4,929,158, Cl. 417-405.000.
Societe Jacques DuBois *See—*
Brandener, Louis, 4,928,998, Cl. 285-49.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA): *See—*
LeFort, Bernard; Maulat, Jean-Pierre; and Bachomoff, Guy R., 4,928,483, Cl. 60-226.100.
Soderberg, Terje; Sodersteen, Rolf; and Toreman, Ulrik, to Plockmatic International AB. Sheet collating machine with automatic double feed prevention. 4,928,945, Cl. 271-9.000.
Sodersteen, Rolf: *See—*
Soderberg, Terje; Sodersteen, Rolf; and Toreman, Ulrik, 4,928,945, Cl. 271-9.000.
Soemers, Hermanus M. J. R.: *See—*
Koster, Marinus P.; Van Der Hoek, Willem; Kemper, Nicolaas R.; and Soemers, Hermanus M. J. R., 4,929,146, Cl. 414-744.500.
Softspot, Inc.: *See—*
Resnick, Susan D; and Nuyens, Angela M., 4,929,211, Cl. 446-14.000.
Sohner, Gerhard; Roth, Helmut; Brammer, Hartmut; Schleupen, Richard; and Nubel, Karl-Heinz, to Robert Bosch GmbH. Protective case for combination ignition coil and electronic control. 4,928,660, Cl. 123-647.000.
Solar, Jeffrey P.: *See—*
Hegedus, Louis; Beeckman, Jean W.; Pan, Wie-Hin; and Solar, Jeffrey P., 4,929,586, Cl. 502-217.000.
Soles, Thomas D., Jr. Alignment system. 4,928,971, Cl. 273-164.000.
Solinst Canada Limited *See—*
Toon, Donald A.; and Belshaw, Douglas J., 4,928,541, Cl. 73-864.630.
Solvay & Cie (Societe Anonyme): *See—*
Legrand, Franz; Lerot, Luc; and De Bruycker, Patricia, 4,929,436, Cl. 423-593.000.
Sommer, Hans D., to Steyr-Daimler-Puch AG. Motor vehicle comprising two driven axles. 4,928,782, Cl. 180-244.000.
Son, Pyong N.: *See—*
Kletecka, George; Lai, John T.; and Son, Pyong N., 4,929,653, Cl. 524-96.000.
Sonoi, Takehiro; and Yamada, Okimasa, to Nippon Mektron Ltd. Fluorine-containing elastomer composition. 4,929,686, Cl. 525-279.000.
Sony Corporation: *See—*
Fujita, Tadao, 4,930,012, Cl. 358-105.000.
Maeda, Satoru; Noguchi, Yasushi; Yasuda, Kazunori; and Takano, Shyunsuke, 4,930,014, Cl. 358-209.000.
Suzuki, Kiyosuke; and Wanami, Hideki, 4,930,008, Cl. 358-75.000.
Yamamoto, Yoshihiro; Saito, Junya; and Suzuki, Masakazu, 4,930,004, Cl. 358-29.000.
Sorbello, Robert M.; Ettland, John E.; and Zaghloul, Amir I., to Communications Satellite Corporation. Dual-polarized printed circuit antenna having its elements capacitively coupled to feedlines. 4,929,959, Cl. 343-700.0MS.
Sorenson, Richard W., to Carlingswitch, Inc. Miniature illuminated rocker switch and case therefore. 4,929,807, Cl. 200-296.000.
Sorlien, Mark D.: *See—*
Deziel, Edward W.; Rueb, John T.; Sorlien, Mark D.; Dahlstrom, Jack A.; and Erismann, David W., 4,929,029, Cl. 300-21.000.
Source Technology Earth Oils, Inc.: *See—*
Thirumalachar, M. Jeersannidhi; and Narasimhan, M. Jeersannidhi, Jr., 4,929,341, Cl. 208-390.000.
South Carolina State Ports Authority: *See—*
Franks, Jerry L., 4,928,790, Cl. 182-3.000.
Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Refractory fibers of alumina and organic residue. 4,929,578, Cl. 501-95.000.
Spademan, Richard G. Shoe dynamic fitting system. 4,928,405, Cl. 36-30.000.
Spak, Mark A.; Mammato, Donald; Durham, Dana; and Jain, Sangya, to Hoechst Celanese Corporation. Image reversal negative working O-naptboquinone diazide and cross-linking compound containing photoresist process with thermal curing. 4,929,536, Cl. 430-325.000.
Spalding, Keith A.: *See—*
Kalra, Varinder K.; and Spalding, Keith A., 4,929,921, Cl. 337-233.000.
Spar Aerospace Limited: *See—*
Mee, Francis H. A., 4,929,136, Cl. 411-432.000.
Speck, Albert J.: *See—*
Lent, Kevin C.; Rife, Conwell K., Jr.; Simmons, Gerald P.; and Speck, Albert J., 4,929,121, Cl. 404-84.000.
Spector, George: *See—*
Harder, Leroy; and Spector, George, 4,928,601, Cl. 104-53.000.
Spectra-Physics: *See—*
Shull, William; Nissen, Rudolph; and Drobshoff, Alexander, 4,928,756, Cl. 165-182.000.
Speer, Stephen R., to Nautical Development, Inc. Self-actuating variable pitch marine propeller. 4,929,153, Cl. 416-46.000.
Speraw, Floyd G.: *See—*
Wong, Daniel T.; and Speraw, Floyd G., 4,929,185, Cl. 439-74.000.
Sperry Marine, Inc.: *See—*
Baldwin, Chris J., 4,929,943, Cl. 340-984.000.
Spettel, Gary: *See—*
Westimayer, Anthony J.; and Spettel, Gary, 4,928,793, Cl. 182-187.000.
Spies, Brian R., to Atlantic Richfield. Transient electromagnetic method for detecting irregularities on conductive containers. 4,929,898, Cl. 324-242.000.
Spirotron Corporation: *See—*
Woods, William A., 4,928,625, Cl. 118-323.000.
Spitzmesser, Jonathan B.: *See—*
Doty, Francis D.; and Spitzmesser, Jonathan B., 4,928,755, Cl. 165-168.000.
SPS Technologies, Inc.: *See—*
Bogatin, Yakov, 4,929,275, Cl. 75-246.000.
Sredni, Benjamin; Pavliv, Leo; and Albeck, Michael, to Bar-Ilan University. Complexes of tellurium and selenium derivatives. 4,929,739, Cl. 549-347.000.
SRI International: *See—*
Vold, Barbara S., 4,929,544, Cl. 435-6.000.
Staat, Karlhans; and Moltner, Hermann, to Kocks Technik GmbH & Co. Methods and apparatus for manufacturing seamless tube. 4,928,507, Cl. 72-38.000.
STAC, Inc.: *See—*
Whiting, Douglas L.; and George, Glen A., 4,930,142, Cl. 375-120.000.
Staedtler & Uhl: *See—*
Egerer, Josef, 4,928,356, Cl. 19-129.00R.
Staheli, Paul: *See—*
Demuth, Robert; Staheli, Paul; Waber, Rene; Grundler, Christoph; and Machler, Franz, 4,928,353, Cl. 19-65.00A.
Stainton, John E.: *See—*
Dunkley, Michael W.; and Stainton, John E., 4,930,078, Cl. 364-424.100.
Dunkley, Michael W.; and Stainton, John E., 4,930,081, Cl. 364-424.100.
Stamicarbon B.V.: *See—*
Okada, Takuji; and Murakami, Kunio, 4,929,501, Cl. 428-337.000.
Standard Oil Company, The: *See—*
Cesa, Mark C.; Dubbert, Robert A.; and Burrington, James D., 4,929,755, Cl. 562-443.000.
Gupta, Victor R.; and Clark, Christopher J., 4,929,789, Cl. 585-648.000.
Stanislawczyk, Vic, to B.F. Goodrich Company, The. Nonwoven fabric coated with carboxylated acrylate polymers, and process for making the nonwoven fabric. 4,929,495, Cl. 428-288.000.
Stapp, Bernhard: *See—*
Rogler, Wolfgang; Weitemeyer, Christian; Wewers, Dietmar; Zapf, Frederic; and Stapp, Bernhard, 4,929,051, Cl. 350-96.300.
State University of New York: *See—*
Ruckenstein, Eli; and Chung, Dennis B., 4,929,510, Cl. 428-520.000.
Staudner, Janet L.: *See—*
Staudner, Rupert A., 4,928,421, Cl. 43-36.000.
Staudner, Rupert A., to Staudner, Janet L. Fishhook device and method of making same. 4,928,421, Cl. 43-36.000.
Steele, Duane F.; Warman, Eugene C.; and Hutter, Robert J., to Ford Motor Company. Pulsation damper for air conditioning compressor. 4,929,157, Cl. 417-312.000.
Steele, John, to T K Valve Limited. Ball valves for pipelines. 4,928,921, Cl. 251-175.000.
Steele, Robert B.; and Pasdera, Leonard A., to Ampex Corporation. Method and apparatus for tape speed override operation when recovering helical audio. 4,930,027, Cl. 360-70.000.
Steenbergen, Bastiaan G.; Hofman, Arie A.; and De Waard, Willem, to Digging Trading Company N.V. Method for installing a screen of flexible material in the soil. 4,929,126, Cl. 405-267.000.
Steffens, Robert: *See—*
Lindner, Werner; Becker, Benedikt; Steffens, Robert; Wachendorff-Neumann, Ulrike; Brandes, Wilhelm; Stendel, Wilhelm; and Dutzmann, Stefan, 4,929,642, Cl. 514-510.000.
Steffes, Helmut: *See—*
Reinartz, Hans-Dieter; and Steffes, Helmut, 4,929,038, Cl. 303-119.000.
Steidele, Thomas: *See—*
Schatz, Oskar; Mehne, Georg; and Steidele, Thomas, 4,928,648, Cl. 123-403.000.
Stein, Ludwig: *See—*
Mahlkow, Hartmut; Romer, Michael; Rosskamp, Gunther; Seidenspinner, Hubert-Matthias; Stein, Ludwig; and Strache, Waltraud, 4,929,422, Cl. 427-57.000.
Steingold, Harold: *See—*
Richardson, Larie; and Steingold, Harold, 4,928,891, Cl. 247-41.000.

Steinkuhle, Ferdinand; Strate, Klaus; Durkop, Willi; and Moller, Ulrich, to C. A. Weidmuller GmbH & Co. Circuit board terminal assembly. 4,929,186, Cl. 439-78.000.
Steinwandel, Juergen; Haas, Juergen; and Plog, Carsten, to Dornier-System GmbH. Catalytic diesel soot filter. 4,929,581, Cl. 502-2.000.
Stelly, Mark. Expandable goose decoy. 4,928,418, Cl. 43-3.000.
Stendel, Wilhelm: *See—*
Lindner, Werner; Becker, Benedikt; Steffens, Robert; Wachendorff-Neumann, Ulrike; Brandes, Wilhelm; Stendel, Wilhelm; and Dutzmann, Stefan, 4,929,642, Cl. 514-510.000.
Stenger, Claudia V.; and Huang, Shu-Jen W., to Nalco Chemical Company. Cationic coagulants plus colloidal silica for use in paint detackification. 4,929,382, Cl. 252-181.000.
Stepanenko, Alexandr V.: *See—*
Kljuev, Vladimir V.; Kozlov, Valery S.; Volodchenko, Dmitry B.; Stepanenko, Alexandr V.; Baranovsky, Vladimir I.; Korolkov, Mikhail I.; and Semenov, Orest S., 4,930,026, Cl. 360-67.000.
Stephani, Trutz-Ulrich; Mohr, Dieter; Maisel, Britta; and Frass, Werner, to Hoechst Aktiengesellschaft. Positive-working photosensitive mixture and photolithographic copying material produced therefrom with o-quinone dialide sulfonyl ester and azo coupler. 4,929,534, Cl. 430-191.000.
Stephens, Howard P.: *See—*
Dosch, Robert G.; and Stephens, Howard P., 4,929,582, Cl. 502-11.000.
Stephenson, James G.; and Huggett, Mark D., to Progressive Dynamics, Inc. Snap-on frame for light fixtures. 4,930,056, Cl. 362-364.000.
Stergiopoulos, Stergios: *See—*
Sullivan, Edmund J.; and Stergiopoulos, Stergios, 4,930,111, Cl. 367-130.000.
Stevens, James C.: *See—*
Wilson, David R.; and Stevens, James C., 4,929,699, Cl. 525-339.000.
Stevens, Robert L.: *See—*
Bell, Michael G.; and Stevens, Robert L., 4,928,939, Cl. 269-309.000.
Stevenson, George F.; Foote, James C.; and Hamlin, Humphrey A. S., to Normalair-Garrett (Holdings) Limited. Aircraft on-board oxygen generating systems. 4,928,682, Cl. 128-202.260.
Stewart Warner Instrument Corporation: *See—*
Weaver, Frank C., 4,928,526, Cl. 73-313.000.
Steyr-Daimler-Puch AG: *See—*
Sommer, Hans D., 4,928,782, Cl. 180-244.000.
Zedrosser, Ulrich, 4,928,597, Cl. 102-430.000.
Stielow, Erwin H. Ratchet wrench. 4,928,559, Cl. 81-63.000.
Stierle, Andrea C.: *See—*
Cardellina, John H., II; Stierle, Andrea C.; and Strobel, Gary A., 4,929,270, Cl. 71-92.000.
Stoecklein, Walter. Crypt insulation panel and method of installation. 4,928,447, Cl. 52-136.000.
Stoll, Kurt. Piston and cylinder unit. 4,928,577, Cl. 92-177.000.
Storage Technology Corporation: *See—*
O'Brien, John T.; Thomas, Neil L.; and Dyer, Tracy D., 4,929,946, Cl. 341-87.000.
Stork Amsterdam B.V.: *See—*
Hermans, Willem F., 4,929,152, Cl. 415-203.000.
Stork Brabant B.V.: *See—*
van Mondfrans, Gerardus H.; and de Vries, Pieter, 4,928,585, Cl 101-129.000.
Stork Contiweb B.V.: *See—*
Jacobs, Thomas G. M.; and De Vroome, Clemens J M., 4,929,173, Cl. 431-215.000.
Stork PMT B.V.: *See—*
van den Nieuwelaar, Adrianus J.; and Janssen, Petrus C. H., 4,928,351, Cl. 17-11.000.
Strache, Waltraud: *See—*
Mahlkow, Hartmut; Romer, Michael; Rosskamp, Gunther; Seidenspinner, Hubert-Matthias; Stein, Ludwig; and Strache, Waltraud, 4,929,422, Cl. 427-57.000.
Strafner, Michael: *See—*
Geiger, Gerhard; and Strafner, Michael, 4,930,103, Cl. 364-900.000.
Strate, Klaus: *See—*
Steinkuhle, Ferdinand; Strate, Klaus; Durkop, Willi; and Moller, Ulrich, 4,929,186, Cl. 439-78.000.
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Diekmann, Jorg; and Henning, Herbert, to C. A. Weidmuller GmbH & Co. Conductor connection assembly. 4,929,198, Cl. 439-709.000.
Strekowski, Lucjan; Mokrosz, Maria; and Harden, Donald B., to Georgia State University Foundation, Inc. Novel diazines and their method of preparation. 4,929,726, Cl. 544-122.000.
Strobel, Gary A.: *See—*
Cardellina, John H., II; Stierle, Andrea C.; and Strobel, Gary A., 4,929,270, Cl. 71-92.000.
Stuhler, Robert H.: *See—*
Fredrick, William R.; and Stuhler, Robert H., 4,928,927, Cl. 254-279.000.
Sturm, Richard, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Remote control system for a rolling flying body. 4,928,906, Cl. 244-3.220.
Su, Kai C.: *See—*
Hung, William M.; and Su, Kai C., 4,929,250, Cl 8-507.000.
Subbanna, Somanahalli N.: *See—*
Boghean, Barry J.; Subbanna, Somanahalli N.; Redmon, Charles L., and Wamser, Christian A., 4,929,435, Cl. 423-484.000.
Sublett, Bobby J.: *See—*
Trotter, Jimmy R.; and Sublett, Bobby J., 4,929,714, Cl. 528-272.000.
Subramanian, Munirpallam A.: *See—*
Gopalakrishnan, Jagannatha; and Subramanian, Munirpallam A., 4,929,594, Cl. 505-1.000.
Suchdev, Lakhbir S.: *See—*
Gassen, James R.; and Suchdev, Lakhbir S., 4,928,390, Cl. 30-123.400.
Sudoh, Eiichi: *See—*
Watanabe, Tadahiko; Shobu, Kazuhisa; Kai, Yukio; Yamamoto, Hideki; Sudoh, Eiichi; Yagishita, Osamu; and Hayakawa, Junshiro, 4,929,417, Cl. 419-12.000.
Sudolnik, James M.; and Prince, Stephen R., to General Electric Company. Steam valve with variable actuation forces. 4,928,733, Cl. 137-630.130.
Sue, Jiinjen A.; and Troue, Harden H., to Union Carbide Corporation. Apparatus and process for arc vapor depositing a coating in an evacuated chamber. 4,929,322, Cl. 204-192.380.
Suehiro, Junji: *See—*
Saigo, Akira; Maezawa, Shigenari; Kageyama, Tomoaki; Ishikura, Keizaburo; Sera, Akio; and Suehiro, Junji, 4,929,903, Cl. 324-544.000.
Sueoka, Yuuji: *See—*
Suzuki, Shuuji; Moriyama, Kenzo; and Sueoka, Yuuji, 4,930,128, Cl. 371-12.000.
Suga, Yozo: *See—*
Komatsu, Hajime; Tanino, Mitsuru; Suga, Yozo; and Konno, Toyohiko, 4,929,286, Cl. 148-111.000.
Suganuma, Kazushi: *See—*
Kobayashi, Kenzo; Iwagaki, Yutaka; Hasegawa, Mitsuyo; and Suganuma, Kazushi, 4,930,119, Cl. 370-16.100.
Suganuma, Yoshimi: *See—*
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 4,928,996, Cl. 283-109.000.
Sugi, Tokio; Mori, Yasuo; and Takahashi, Yugi, to Tokyo Keiso Co., Ltd. Method and apparatus for measuring flow rate of a gas containing condensable components and mists. 4,928,524, Cl. 73-200.000.
Sugihara, Kanji; Yamamoto, Motohiro; Kida, Tohru; and Fukazawa, Minoru, to Tokai Carbon Co., Ltd. Surface-coated SiC whiskers, processes for preparing the same, ceramic reinforced with the same, and process for preparing said reinforced ceramic. 4,929,472, Cl. 427-215.000.
Sugihara, Shigeru, to NEC Corporation. Frame-interval fault detection in a demand assignment TDMA communication system. 4,930,118, Cl. 370-16.000.
Sugihara, Tadashi: *See—*
Takeshita, Takuo; Sugihara, Tadashi; and Fujino, Shuichi, 4,929,597, Cl. 505-1.000.
Sugihara, Takashi; Uda, Kazutaka; Tabuchi, Hiroki; Inami, Yasuhiko; Hijikigawa, Masaya; and Kataoka, Shoei, to Sharp Kabushiki Kaisha. Sensor. 4,928,513, Cl. 73-1.00G.
Sugimoto, Mansaku: *See—*
Yoshinaka, Minoru; Matsuo, Koujirou; Koike, Kiichi; Suzuki, Yoshie; and Sugimoto, Mansaku, 4,929,518, Cl. 429-54.000.
Sugimoto, Naoshige; Yoshida, Tetsushi; and Toyama, Tadahisa, to Casio Computer Co., Ltd. Color liquid crystal display device. 4,929,060, Cl. 350-339.00F.
Sugisaki, Tsutomu: *See—*
Miyoshi, Takahito; Kanazawa, Minoru; Sugisaki, Tsutomu; Yamada, Takuzi; and Okuzawa, Yasutoshi, 4,930,032, Cl. 360-132.000.
Sugita, Hiroshi: *See—*
Sato, Ryosuke; Kato, Katsunori; Sasaki, Takashi; and Sugita, Hiroshi, 4,929,539, Cl. 430-553.000.
Sugiura, Susumu; Kouzato, Yasuo; and Masuda, Yukio, to Canon Kabushiki Kaisha. Digital color image processing method and apparatus for discriminating high resolution areas of a color image signal and controlling image processing in accordance with the discrimination. 4,930,007, Cl. 358-75.000.
Sugiyama, Isao: *See—*
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.
Sugiyama, Noriyuki; and Mochizuki, Mitsuhiro, to Polyplastics Co., Ltd. Polyacetal resin composition. 4,929,712, Cl. 528-230.000.
Sugiyama, Takao: *See—*
Sawai, Kiichi; Kurono, Masayasu; Asai, Hiromiotu; Mitani, Takahiko; Ninomiya, Naohisa; Sugiyama, Takao; Furukawa, Eiji; and Michishita, Hisashi, 4,929,438, Cl. 424-10.000.
Sugiyama, Tsutomu, to Fujitsu Limited; and Fujitsu VLSI Limited. Semiconductor memory device with serial access memory. 4,930,108, Cl. 365-230.020.
Sugiyama, Yoshihiro: *See—*
Muto, Shunichi; Inata, Tsuguo; Takeuchi, Atsushi; and Sugiyama, Yoshihiro, 4,929,984, Cl. 357-4.000.
Suling, Carlhans: *See—*
Bachem, Henning; Suling, Carlhans; Muszik, Janos; and Schroer, Wolf-Dieter, 4,929,309, Cl. 162-164.300.
Sullivan, Edmund J.; and Stergiopoulos, Stergios, to United States of America, Navy. Overlap correlator synthetic aperture processor 4,930,111, Cl. 367-130.000.

Sullivan, Edward V.: *See—*
Leib, Kenneth G.; and Sullivan, Edward V., 4,929,056, Cl. 350-321.000.

Sullivan, John L.: *See—*
Bachelder, Walter F.; Sullivan, John L.; Fiore, Peter J.; and Hansen, Godfrey L., 4,928,533, Cl. 73-838.000.

Sullivan, Michael J. Straightening device for flexible tubular structures. 4,928,669, Cl. 128-4.000.

Sulzer Brothers Limited: *See—*
Hanselmann, Daniel; and Schlepfer, Walter, 4,928,354, Cl. 19-97.000.

Sumitomo Chemical Company, Ltd.: *See—*
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takashi; and Tsuji, Mitsuji, 4,929,675, Cl. 525-66.000.
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.

Sumitomo Electric Industries, Ltd.: *See—*
Nishimura, Yoshifumi; Yamamoto, Susumu; Nakata, Hidekazu; Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, 4,929,512, Cl. 428-610.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Hamada, Akihiko; Hiraoka, Hidenori; Nakamura, Yoshinobu; and Ohtsuru, Hiroshi, 4,929,678, Cl. 525-193.000.
Nishimura, Yoshifumi; Yamamoto, Susumu; Nakata, Hidekazu; Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, 4,929,512, Cl. 428-610.000.
Oku, Masahiro; and Iwamura, Kazumitsu, 4,928,742, Cl. 152-534.000.
Yamaguchi, Tetsuo; and Matsushita, Hiroomi, 4,928,965, Cl. 273-78.000.

Summer, Steven E., to Powr-Ups Corporation. Luminaire system. 4,929,873, Cl. 315-219.000.

Sun, Mingui: *See—*
Sekhar, Laligam N.; Scalbassi, Robert J.; Sun, Mingui; and Wasserman, Jacob F., 4,928,705, Cl. 128-773.000.

Sun, Yun C.: *See—*
Laughner, Michael K.; Lancaster, Gerald M.; and Sun, Yun C., 4,929,673, Cl. 525-63.000.

Sundstrand Corporation: *See—*
Carlson, William E.; and Metzler, Mark W., 4,930,045, Cl. 361-329.000.
Shekleton, Jack R.; Rodgers, Colin; and Archibald, John P., 4,928,479, Cl. 60-39.360.

Sundstrand Data Control, Inc.: *See—*
Davidson, Charles W., 4,929,957, Cl. 342-410.000.
Hulsing, Rand H., II; and Novack, Mitchell, 4,929,860, Cl. 310-366.000.

Superstream, Inc.: *See—*
Greenspan, Alexander, 4,929,149, Cl. 415-99.000

Supra Products, Inc.: *See—*
Henderson, Walter G.; Ellson, George A.; and Unrein, Edgar J., 4,929,880, Cl. 320-30.000.

Suruga, Eihiro: *See—*
Takata, Hirotoshi; Suruga, Eihiro; and Inoue, Gentei, 4,929,098, Cl. 384-450.000.

Suskind, Stuart P.; and Miller, Joseph H., to James River Corporation of Virginia. Engineered-pulp wet wiper fabric. 4,929,498, Cl. 428-288.000.

Suto, Kenichiro: *See—*
Egashira, Noritaka; Suto, Kenichiro; and Muro, Atsushi, 4,929,591, Cl. 503-227.000.

Suwa, Toshio; Kobayashi, Nobuaki; and Hirano, Takashi, to Nippon Sanso Kabushiki Kaisha. Oxygen heater, hot oxygen lance having an oxygen heater and pulverized solid fuel burner. 4,928,605, Cl. 110-261.000.

Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi; Oda, Mitsunori; and Tanaka, Akinori, to Mitsubishi Gas Chemical Company. Plant growth promotion. 4,929,267, Cl. 71-77.000.

Suzuki, Akira: *See—*
Aoki, Masakazu; and Suzuki, Akira, 4,929,161, Cl. 418-83.000.

Suzuki, Fumitoshi: *See—*
Akita, Shuichi; Suzuki, Fumitoshi; Kikuchi, Yasushi; and Oishi, Hideyuki, 4,929,679, Cl. 525-194.000.

Suzuki, Hideo: *See—*
Kudo, Masaki; and Suzuki, Hideo, 4,928,569, Cl. 84-626.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Ohmura, Yukihiro; Kobayashi, Yoshiyuki; Hosoi, Keiji; and Shimoda, Kazuharu, 4,928,659, Cl. 123-588.000.

Suzuki, Kiyosuke; and Wanami, Hideki, to Sony Corporation. Scanner for reading color image. 4,930,008, Cl. 358-75.000.

Suzuki, Masahiko, deceased: *See—*
Yasuda, Hiroshi; and Suzuki, Masahiko, deceased, 4,929,838, Cl. 250-492.200.

Suzuki, Masakazu: *See—*
Yamamoto, Yoshihiro; Saito, Junya; and Suzuki, Masakazu, 4,930,004, Cl. 358-29.000.

Suzuki, Noboru: *See—*
Matsui, Fumio; Suzuki, Noboru; Takaishi, Minoru; Ogura, Ryushi; Harigai, Noriaki; Hashimoto, Tadayoshi; and Uematu, Tomoe, 4,929,494, Cl. 428-286.000.

Suzuki, Shuuji; Moriyama, Kenzo; and Sueoka, Yuuji, to Hitachi, Ltd. Method for restart of online computer system and apparatus for carrying out the same. 4,930,128, Cl. 371-12.000.

Suzuki, Takahiko: *See—*
Kageyama, Shuhei; Suzuki, Takahiko; and Yamagishi, Yuichi, 4,929,107, Cl. 401-65.000.

Suzuki, Takashi; and Amemiya, Hideto, to Nittan Company. Fire detector having a protective cover. 4,929,093, Cl. 374-208.000.

Suzuki, Takashi: *See—*
Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi; Oda, Mitsunori, and Tanaka, Akinori, 4,929,267, Cl. 71-77.000.

Suzuki, Takeshi: *See—*
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.

Suzuki, Tomonari: *See—*
Yoshida, Masaru; Yoshikawa, Mitsuhiko; Yoshimoto, Yoshikazu; Wada, Hiroshi; Suzuki, Tomonari; and Nakajima, Shigeo, 4,929,803, Cl. 174-117.00M

Suzuki, Tomoyuki: *See—*
Nagahara, Shinichi; Suzuki, Tomoyuki; Yamada, Tomoyasu; Takahashi, Tokihiro; and Miyake, Ichiro, 4,930,031, Cl. 360-107.000.

Suzuki, Toshitake;; Komoda, Norio; Oda, Susumu; and Harata, Motoo, to Toyota Jidosha Kabushiki Kaisha. Piezoelectric actuator having parallel arrangement of a single piezoelectric element and a pair of displacement magnification arms. 4,929,859, Cl. 310-328.000.

Suzuki, Yasoji: *See—*
Matsumoto, Osamu; Maruyama, Tadashi; Murata, Hiroyoshi; Abe, Isao; Shigematsu, Tomohisa; Shinada, Kazuyoshi; Suzuki, Yasoji; and Kobayashi, Ichiro, 4,930,105, Cl. 365-185.000.

Suzuki, Yasurou: *See—*
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takashi; and Tsuji, Mitsuji, 4,929,675, Cl. 525-66.000.

Suzuki, Yohei: *See—*
Kurauchi, Makoto; Hashimoto, Michio; Hayasaki, Kiyoshi; Minami, Toshikazu; Ohnishi, Mutsuhiko; and Suzuki, Yohei, 4,929,650, Cl. 523-455.000.

Suzuki, Yoshie: *See—*
Yoshinaka, Minoru; Matsuo, Koujirou; Koike, Kiichi; Suzuki, Yoshie; and Sugimoto, Mansaku, 4,929,518, Cl. 429-54.000.

Suzuki, Yoshikazu, Fumie Suzuki, heirs: *See—*
Yasuda, Hiroshi; and Suzuki, Masahiko, deceased, 4,929,838, Cl. 250-492.200.

Suzuki, Yutaka, to Nissan Motor Co., Ltd. Control arrangement for automatic transmission. 4,930,080, Cl. 364-424.100.

Svyatsky, Eduard, Loftis, Jerry W.; and Faber, Thomas, to Bell & Howell Company. Vertical feed mechanism for documents. 4,928,946, Cl. 271-10.000.

Svyatsky, Eduard, to Bell & Howell Co. Mechanical document feed apparatus. 4,928,952, Cl. 271-150.000.

Swadell, Robert A., to Geisha Corporation. Marker lamp with halo effect. 4,930,055, Cl. 362-244.000

Swanson, Richard D.: *See—*
Weixelman, Lawrence M.; and Swanson, Richard D., 4,929,899, Cl. 324-253.000.

Swanson, Tad: *See—*
Henderson, Don J.; Brady, Robert; Gamble, Foster R.; Hardt, James V.; Friedfeld, Howard; Salerno, Don; Swanson, Tad; and Sansing, Maureen R., 4,928,696, Cl. 128-644.000.

Swarts, Richard E.: *See—*
Wiegand, Walter J.; Swindal, James L.; Swarts, Richard E.; Bullis, Robert H.; Lopiccolo, Mario T.; Grantham, Daniel H.; and Foyt, Arthur G., 4,930,042, Cl. 361-280.000.

Swartz, Louis D.: *See—*
Yaniv, Zvi; Cannella, Vincent D.; Hansell, Gregory L.; and Swartz, Louis D., 4,929,569, Cl. 437-51.000.

Sweeney, Niall; and Gyure, Sandor, to Becton, Dickinson and Company. Syringe having tamper evidence features. 4,929,232, Cl. 604-111.000.

Swenson, Julius A. Device for stopping the spillage of popcorn. 4,928,842, Cl. 220-85.00R

Swidwa, Kenneth J.: *See—*
Kaufmann, John W.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,929,413, Cl. 376-268.000.

Swihart, Terence J.: *See—*
Fillmore, Danielle M.; Price, John G., and Swihart, Terence J., 4,929,691, Cl. 525-477.000.
Narula, Dipak B., Be, Anh; and Swihart, Terence J., 4,929,703, Cl. 528-23.000.

Swindal, James L.: *See—*
Wiegand, Walter J.; Swindal, James L.; Swarts, Richard E.; Bullis, Robert H.; Lopiccolo, Mario T.; Grantham, Daniel H.; and Foyt, Arthur G., 4,930,042, Cl. 361-280.000.

Swisher, David R., to Sherwood Medical Company. Baffle system for use in underwater drainage devices. 4,929,244, Cl. 604-319.000.

Swisher, George W., Jr., to CMI Corporation. Apparatus and method for producing cold mix asphalt. 4,928,890, Cl. 241-24.000.

Sylvester, Gerd: *See—*
Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, 4,929,689, Cl. 525-333.900.

Sylvester, Judith M.: *See—*
Vincent, Gary A.; Sylvester, Judith M.; and Vincent, Harold L., 4,929,376, Cl. 252-62.560.

Symon, Georg, to Maschinenfabrik Rieter AG. Traversing apparatus for traversing a longitudinally moving yarn which is to be wound up throughout a traversing stroke. 4,928,896, Cl. 242-43.00R.

Synergistics Industries, Limited: *See—*
Gupta, Ved P.; and DuPont, Louis A., 4,929,749, Cl. 560-79.000.

Syntex (U.S.A.) Inc.: *See—*
Castelhano, Arlindo L.; DeYoung, Lawrence M.; Krantz, Alexander; Pliura, Diana H.; and Venuti, Michael C., 4,929,630, Cl. 514-380.000.
Cooper, Gary F., 4,929,740, Cl. 549-415.000.

Synthelabo: *See—*
Manoury, Philippe; and Saarmets, Alfred, 4,929,621, Cl. 514-275.000.

Szepesi, Tamas S., to National Semiconductor Corporation. Apparatus for converting DC to DC having non-feed back variable hysteretic current-mode control for maintaining approximately constant frequency. 4,929,882, Cl. 323-222.000.

Szlucha, Thomas F.: *See—*
Barton, Arthur A.; DeBolt, Frederick C.; Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A.; Miller, Mark T.; Rasch, Kenneth R.; and Szlucha, Thomas F., 4,929,983, Cl. 355-315.000.

Szymanski, Wladyslaw W.: *See—*
Liu, Benjamin Y. H.; and Szymanski, Wladyslaw W., 4,928,537, Cl. 73-863.860.

T K Valve Limited: *See—*
Steele, John, 4,928,921, Cl. 251-175.000.

Tabakoff, Boris: *See—*
Hendricks, Katherine A., 4,929,228, Cl. 600-27.000.

Tabara, Yoshitaka: *See—*
Shinya, Yoshiyuki; Tabara, Yoshitaka; Okuno, Itaru; Kaneko, Tadashi; and Watanabe, Tomomi, 4,928,652, Cl. 123-417.000.

Tabira, Masatoshi: *See—*
Murata, Hiroaki; Inomata, Teruhisa; and Tabira, Masatoshi, 4,929,866, Cl. 313-500.000.

Tabuchi, Hiroki: *See—*
Sugihara, Takashi; Uda, Kazutaka; Tabuchi, Hiroki; Inami, Yasuhiko; Hijikigawa, Masaya; and Kataoka, Shoei, 4,928,513, Cl. 73-1.00G.

Tachi-S Company, Ltd.: *See—*
Kawasaki, Kiyoshi, 4,928,609, Cl. 112-121.120.
Urai, Muneharu; Makino, Hiroyuki; and Shimada, Makoto, 4,929,304, Cl. 156-245.000.

Tacke, Peter: *See—*
Nouvertne, Werner; Gielen, Franz-Josef; Tacke, Peter; Grigo, Ulrich; Quiring, Bernd; and Lindner, Christian, 4,929,674, Cl. 325-66.000

Tada, Tetsuya, to Toyota Jidosha Kabushiki Kaisha. Speed control apparatus with compensation for actuator link play. 4,928,780, Cl. 180-179.000.

Tadokoro, Toyohiko: *See—*
Nakanishi, Tatsuo; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,928,972, Cl. 273-78.000.

Tadokoro, Yoshio: *See—*
Shirasaki, Yoshikazu; and Tadokoro, Yoshio, 4,929,503, Cl. 428-373.000.

Tagami, Shigeru: *See—*
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl. 354-420.000.

Tagawa, Hisatoshi: *See—*
Moriya, Yutaka; Sanpei, Tetsuya; and Tagawa, Hisatoshi, 4,929,289, Cl. 148-402.000.

Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D.; and Saladin, Guenter, to BASF Aktiengesellschaft. Preparation of tert-butylamine from isobutene. 4,929,758, Cl. 564-485.000.

Taglieber, Volker; Hoelderich, Wolfgang; Kummer, Rudolf; Mross, Wolf D.; and Saladin, Guenter, to BASF Aktiengesellschaft. Production of amines from an olefin and ammonia or a primary or secondary amine. 4,929,759, Cl. 564-485.000.

Taguchi, Seizo; Oketani, Toshiharu; Ohashi, Michihiro; Tanaka, Hideaki; and Terao, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kabushiki Kaisha Okazaki Seisakusho. Resistance temperature detector. 4,929,092, Cl. 374-183.000.

Taguchi, Takafumi: *See—*
Nishimura, Yoshifumi; Yamamoto, Susumu; Nakata, Hidekazu; Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, 4,929,512, Cl. 428-610.000.

Taguchi, Yutaka: *See—*
Eda, Kazuo; Miwa, Tetsuji; and Taguchi, Yutaka, 4,930,044, Cl. 361-313.000.

Taig, Alistair G.: *See—*
Johannesen, Donald D.; and Taig, Alistair G., 4,928,543, Cl. 475-196.000.

Tajima, Hatsuo: *See—*
Kubo, Takahiro; and Tajima, Hatsuo, 4,929,981, Cl. 355-253.000.

Takada, Mitsuru; Takahashi, Tokuyuki; and Itoh, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Hydraulic transmission controller with coupling pressure compensation. 4,928,557, Cl. 74-867.000.

Takada, Osamu: *See—*
Takahashi, Yasuhiro; and Takada, Osamu, 4,930,122, Cl. 370-85.150.

Takagi, Katsuaki: *See—*
Nakagawa, Norio; Takagi, Katsuaki; and Aoki, Hirokazu, 4,930,104, Cl. 365-49.000.

Takagi, Masahiro: *See—*
Shinoki, Masayoshi; Takagi, Masahiro; Nagatsuka, Ikutaroh; Kumashiro, Koichi; Aoki, Takayoshi; and Takeda, Masayuki, 4,929,528, Cl. 430-108.000.

Takagi, Shigekazu: *See—*
Abe, Fumio; Mori, Hiroshi; and Takagi, Shigekazu, 4,929,406, Cl. 264-45.500.

Takahashi, Kotoyoshi, to Seiko Epson Corporation. Non-linear element for liquid crystal displays. 4,929,059, Cl. 350-334.000.

Takahashi, Kunimasa; Kameda, Takashi; and Shibata.ii, Haruo, to Mitsubishi Petrochemical Company Limited. Graphitic or carbonaceous moldings and processes for producing the same. 4,929,404, Cl. 264-29.500.

Takahashi, Seiya: *See—*
Harakawa, Yoshihiro; Takahashi, Seiya; Izawa, Koji; Takeuchi, Hidemitsu; and Ikari, Keizo, 4,929,316, Cl. 204-56.100.

Takahashi, Tokihiro: *See—*
Nagahara, Shinichi; Suzuki, Tomoyuki; Yamada, Tomoyasu; Takahashi, Tokihiro; and Miyake, Ichiro, 4,930,031, Cl. 360-107.000.

Takahashi, Tokuyuki: *See—*
Takada, Mitsuru; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,928,557, Cl. 74-867.000.

Takahashi, Toshiro; Kameoka, Kimitaka; and Inagaki, Yoshio, to Fuji Photo Film Co., Ltd. High contrast negative image-forming process. 4,929,535, Cl. 430-264.000.

Takahashi, Tsugio: *See—*
Imura, Yoshio; and Takahashi, Tsugio, 4,929,971, Cl. 354-75.000.

Takahashi, Yasuhiro; and Takada, Osamu, to Hitachi, Ltd. Message transfer system and method. 4,930,122, Cl. 370-85.150.

Takahashi, Yugi: *See—*
Sugi, Tokio; Mori, Yasuo; and Takahashi, Yugi, 4,928,524, Cl. 73-200.000.

Takahashi, Yukiko: *See—*
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, 4,929,633, Cl. 514-423.000.

Takahira, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. IC card having internal error checking capability. 4,930,129, Cl. 371-40.400.

Takaishi, Minoru: *See—*
Matsui, Fumio; Suzuki, Noboru; Takaishi, Minoru; Ogura, Ryushi; Harigai, Noriaki; Hashimoto, Tadayoshi; and Uematu, Tomoe, 4,929,494, Cl. 428-286.000.

Takakusaki, Nobuyuki; Mizutani, Yohji; Kishida, Nobuhiro; and Hosokawa, Manabu, to Toyo Seikan Kaisha, Ltd. Delivery apparatus in machine for preparing plastic hollow vessels. 4,929,450, Cl. 425-526.000.

Takamura, Seiji: *See—*
Takematsu, Tetsuo; Yakeuchi, Yasutomo; Takenaka, Mitsuaki; Takamura, Seiji; and Matsushita, Akio, 4,929,273, Cl. 71-118.000.

Takamura, Shinji: *See—*
Koda, Akihide; Kita, Jun'ichiro; Kuroki, Yoshiaki; Fujiwara, Hiroshi; Takamura, Shinji; and Yamano, Kayoko, 4,929,618, Cl. 514-253.000.

Takano, Shyunsuke: *See—*
Maeda, Satoru; Noguchi, Yasushi; Yasuda, Kazunori; and Takano, Shyunsuke, 4,930,014, Cl. 358-209.000.

Takasaki, Kanetake, to Fujitsu Limited. Compound semiconductor device. 4,929,985, Cl. 357-15.000.

Takase, Shigeyuki: *See—*
Kobashi, Rikizo; Takase, Shigeyuki; Enomoto, Hiroyuki; Hayasaki, Yasushi; Kobayashi, Toyohisa; and Yamazaki, Shingo, 4,929,685, Cl. 525-277.000.

Takata Corporation: *See—*
Tsuji, Yasuo, 4,928,902, Cl. 242-107.200.

Takata, Hirotoshi; Suruga, Eihiro; and Inoue, Gentei, to Nippon Seiko Kabushiki Kaisha. Self-aligning roller bearing. 4,929,098, Cl. 384-450.000.

Takayama, Hidehiko: *See—*
Eitai, Kazuo; and Takayama, Hidehiko, 4,929,156, Cl. 417-295.000.

Takeda Chemical Industries, Ltd.: *See—*
Morita, Yasuhiko; Kakiguchi, Yoshitomi; and Izuhara, Seiji, 4,929,378, Cl. 252-105.000.

Takeda, Hideki: *See—*
Takenawa, Seishi; Takeda, Hideki; and Horikoshi, Mie, 4,929,451, Cl. 426-10.000.

Takeda, Hisao; and Kawano, Mutsumi, to Kyoritsu Yuki Co., Ltd. Process for production of water-soluble polymer dispersion. 4,929,655, Cl. 524-458.000.

Takeda, Masayuki: *See—*
Shinoki, Masayoshi; Takagi, Masahiro; Nagatsuka, Ikutaroh; Kumashiro, Koichi; Aoki, Takayoshi; and Takeda, Masayuki, 4,929,528, Cl. 430-108.000.

Takehara, Nobumitsu: *See—*
Oshikoshi, Yuji; Suganuma, Yoshimi; Hara, Hiroshi; Shiota, Kazuo; Takehara, Nobumitsu; and Sakamoto, Kiichiro, 4,928,996, Cl. 283-109.000.

Takei, Katsumori: *See—*
Aoki, Kenji; Takei, Katsumori; Nakamura, Haruo; and Matsushita, Yoshikazu, 4,929,057, Cl. 350-333.000.

Takematsu, Tetsuo; Yakeuchi, Yasutomo; Takenaka, Mitsuaki; Takamura, Seiji; and Matsushita, Akio, to Ube Industries, Ltd. N-benzyl-2-(4-fluoro-3-trifluoromethylphenoxy)butanoic amide and herbicidal composition containing the same. 4,929,273, Cl. 71-118.000.

Takemoto, Satoru, to Fuji Photo Film Co., Ltd. Heating resistor driving circuit which suppresses current spikes. 4,929,815, Cl. 219-501.000.

Takemoto Yushi Kabushiki Kaisha: *See—*
Yamamoto, Hisao; and Nakamura, Atsushi, 4,929,366, Cl. 252-8.600.

Takenaka, Mitsuaki: *See—*
Takematsu, Tetsuo; Yakeuchi, Yasutomo; **Takenaka, Mitsuaki**; Takamura, Seiji; and Matsushita, Akio, 4,929,273, Cl. 71-118.000.

Takenaka, Takaji; Netsu, Tositada; Shigi, Hidetaka; and Yamamoto, Masakazu, to Hitachi, Ltd. Multi-chip module structure. 4,930,002, Cl. 357-75.000.

Takenawa, Seishi; Takeda, Hideki; and Horikoshi, Mie, to Fujisawa Pharmaceutical Company, Ltd. Process for eliminating disagreeable odor from soya milk. 4,929,451, Cl. 426-10.000.

Takeshita, Takuo; Sugihara, Tadashi; and Fujino, Shuichi, to Mitsubishi Metal Corporation. Superconductor containing internal stress absorber. 4,929,597, Cl. 505-1.000.

Takeuchi, Atsushi: *See—*
Muto, Shunichi; Inata, Tsuguo; Takeuchi, Atsushi; and Sugiyama, Yoshihiro, 4,929,984, Cl. 357-4.000.

Takeuchi, Hajime: *See—*
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatuski, Yoshio, 4,930,096, Cl. 364-550.000.

Takeuchi, Hidemitsu: *See—*
Harakawa, Yoshihiro; Takahashi, Seiya; Izawa, Koji; Takeuchi, Hidemitsu; and Ikari, Keizo, 4,929,316, Cl. 204-56.100.

Takeuchi, Hiroshi; and Yoshimura, Yoshinari, to Kabushiki Kaisha Daikin Seisakusho. Friction device in a damper disk. 4,928,805, Cl. 192-106.200.

Takeuchi, Hiroyuki: *See—*
Yabusaki, Masao; Yamamoto, Etsuji; Takeuchi, Hiroyuki; and Kohno, Hideki, 4,929,881, Cl. 324-318.000.

Takeuchi, Tomio: *See—*
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, 4,929,633, Cl. 514-423.000.

Takigawa, Akio: *See—*
Kitayama, Shinichiro; Adachi, Teruho; Ueda, **Masahiro**; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.

Takimoto, Kiyoshi: *See—*
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.

Takizawa, Shozo: *See—*
Harara, Mitsuhiko; Takizawa, Shozo; Tanaka, Tadao; and Wada, Shunichi, 4,930,082, Cl. 364-424.050.

Takushima, Shigehiro: *See—*
Watanabe, Tsutomu; Sagiyama, Masari; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,323, Cl. 204-206.000.
Watanabe, Tsutomu; Sagiyama, Masaru; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,324, Cl. 204-206.000.

Tami, Kazuya: *See—*
Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, 4,928,612, Cl. 112-257.000.

Tamura, Hideyuki, to Nissan Motor Company, Limited. Oxygen sensor operability sensing arrangement. 4,928,518, Cl. 73-117.300.

Tamura, Masahiro: *See—*
Shishido, Kihachi; Matsuoka, Masami; Ishihara, Noriyuki; and Tamura, Masahiro, 4,929,479, Cl. 428-35.200.

Tanai, Tsuneo: *See—*
Niizato, Tomonori; Tanai, Tsuneo; Kasahara, Kazuhiro; Saka, Tsutomu; and Oikawa, Toshihiro, 4,928,641, Cl. 123-90.160.

Tanaka, Akinori: *See—*
Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi; Oda, Mitsunori; and Tanaka, Akinori, 4,929,267, Cl. 71-77.000.

Tanaka, Hideaki: *See—*
Taguchi, Seizo; Oketani, Toshiharu; Ohashi, Michihiro; Tanaka, Hideaki; and Terao, Hiroshi, 4,929,092, Cl. 374-183.000.

Tanaka, Hirokazu: *See—*
Okuhara, Masakuni; Tanaka, Hirokazu; Goto, Toshio; Kino, Tohru; and Hatanaka, Hiroshi, 4,929,611, Cl. 514-183.000.
Setoi, Hiroyuki; Kuroda, Akio; Tanaka, Hirokazu; Hirai, Hideo; Marusawa, Hiroshi; and Hashimoto, Masashi, 4,929,639, Cl. 514-452.000.

Tanaka, Hiroyuki; Uto, Kuniharu; Kawai, Kazumi; Shaura, Tsuneo; and Yasuhuku, Motonobu, to Mitsuboshi Belting Ltd. Power transmission toothed belt and drive. 4,929,221, Cl. 474-205.000.

Tanaka, Hitoshi; Hori, Ryoichi; Itoh, Kiyoo; Kimura, Katsutaka; and Shimohigashi, Katsuhiro, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corporation. Semiconductor device having a voltage limiter. 4,930,112, Cl. 365-226.000.

Tanaka, Hitoshi: *See—*
Yamamoto, Yoko; Tanaka, Hitoshi; and Mikami, Noboru, 4,929,081, Cl. 356-354.000.

Tanaka, Masayuki: *See—*
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.

Tanaka, Mitsugu; and Sakai, Takeo, to Fuji Photo Film Co., Ltd. Recording liquid. 4,929,277, Cl. 106-22.000.

Tanaka, Nobuo: *See—*
Moritani, Tohei; Oda, Hidemasa; Sato, Toshiaki; Negi, Taichi; Matsumura, Keiji; Kawai, Syuji; Tanaka, Nobuo; and Hirofuji, Satoshi, 4,929,482, Cl. 428-36.400.

Tanaka, Shigeru; and Miura, Kazutoshi, to Kabushiki Kaisha Toshiba. **Phase stabilized high frequency link power converter apparatus having a wide phase controllable range.** 4,930,064, Cl. 363-161.000.

Tanaka, Shin-Ichi: *See—*
Honjo, Kazuhiko; and Tanaka, Shin-Ichi, 4,929,997, Cl. 357-34.000.

Tanaka, Tadao: *See—*
Harara, Mitsuhiko; Takizawa, Shozo; Tanaka, Tadao; and Wada, Shunichi, 4,930,082, Cl. 364-424.050.

Tanaka, Toshihiro: *See—*
Haga, Takahiro; Tsujii, Yasuhiro; Isogai, Tatsuo; Murai, Shigeo; and Tanaka, Toshihiro, 4,929,729, Cl. 544-330.000.

Tanigaki, Ryuhei: *See—*
Itahana, Tsutomu; Kanno, Hideo; Ono, Tetsuo; Furuta, Futoru; Kobayashi, Susumu; Akimoto, Ryosaku; and Tanigaki, Ryuhei, 4,928,723, Cl. 137-116.300.

Taniguchi, Takashi: *See—*
Akashi, Ryojiro; and Taniguchi, Takashi, 4,929,693, Cl. 526-259.000.

Tanimoto, Koji: *See—*
Egawa, Jiro; Tanimoto, Koji; and Miura, Kunihiko, 4,930,087, Cl. 364-518.000.

Tanimura, Toyokiti; and Ikeda, Masahiro, to Konica Corporation. Film perforator. 4,928,562, Cl. 83-278.000.

Tanino, Mitsuru: *See—*
Komatsu, Hajime; Tanino, Mitsuru; Suga, Yozo; and Konno, Toyohiko, 4,929,286, Cl. 148-111.000.

Tarascon, Jean-Marie: *See—*
Bagley, Brian G.; and Tarascon, Jean-Marie, 4,929,598, Cl. 505-1.000.

Tarzaiski, Richard J.: *See—*
Chmielewski, Thomas A., Jr.; and Tarzaiski, Richard J., 4,929,843, Cl. 250-561.000.

Tateishi, Kiyoshi, to Pioneer Electronic Corporation. Track jump operation control apparatus in a disk player. 4,930,114, Cl. 369-32.000.

Taya, Akira: *See—*
Tominaga, Mamoru; Kokado, Naoyuki; Gonpei, Katsuhiro; Nira, Hisami; and Taya, Akira, 4,929,061, Cl. 350-338.000.

Taylor, Harry L.; and Ehret, Charles O. Air flow control system. 4,928,583, Cl. 98-31.600.

Taylor, Robert, to North American Specialities Corporation. Connector. 4,929,193, Cl. 439-567.000.

Tech Research, Inc.: *See—*
Reigstad, Gordon H.; Breivik, A. Norris; and Reigstad, Hanley S., 4,928,451, Cl. 52-223.00L.

Tecle, Haile: *See—*
Coughenour, Linda L.; Davis, Robert E.; Downs, David A.; Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,929,734, Cl. 546-338.000.

Tecumseh Products Company: *See—*
Kronich, Peter G., 4,928,651, Cl. 123-196.0AB.

Tedenac, Jean-Claude: *See—*
Brun, Gerard; Marin-Ayral, Rose-Marie; Maurin, Maurice; Pistoulet, Bernard; and Tedenac, Jean-Claude, 4,929,282, Cl. 136-239.000.

Teijin Seiki Co., Ltd.: *See—*
Matsumoto, Kazuyuki; Hashimoto, Masataka; and Iwata, Michiyoshi, 4,928,556, Cl. 475-149.000.

Tejima, Kunisuke: *See—*
Hayase, Isao; Ushiku, Kenichi; Tejima, Kunisuke; Hayashi, Seiichi; and Satoh, Kazuhiko, 4,929,159, Cl. 417-295.000.

Tengelitsch, John J. Power trim cylinder protective locking device for an inboard/outboard boat motor. 4,929,202, Cl. 440-55.000.

Terada, Akihiko: *See—*
Ueda, Kenichi; Hattori, Kouji; Terada, Akihiko; and Inohara, Kazuyoshi, 4,929,934, Cl. 340-706.000.

Terao, Hiroshi: *See—*
Taguchi, Seizo; Oketani, Toshiharu; Ohashi, Michihiro; Tanaka, Hideaki; and Terao, Hiroshi, 4,929,092, Cl. 374-183.000.

Terawaki, Hiroshi: *See—*
Osaka, Tatsuhiko; Terawaki, Hiroshi; and Okamoto, Mitsunari, 4,929,330, Cl. 204-402.000.

ter Hasebrg, Jan L.; Nedwig, Joachim; and Kruse, Klaus-Dieter, to Licentia Patent-Verwaltungs GmbH. Electro-optical measuring and transmission device using overload and overvoltage protection circuits. 4,929,842, Cl. 250-551.000.

Terzian, Rouben T.: *See—*
Morris, Lamont C.; Kuna, Wayne A.; and Terzian, Rouben T., 4,929,216, Cl. 446-324.000.

Tessler, Martin M.: *See—*
Billmers, Robert L.; Del Giudice, David M.; Tessler, Martin M.; and Hasuly, Michael J., 4,929,670, Cl. 525-54.100.

Testa, Bruce V.: *See—*
Buyak, William P.; Testa, Bruce V.; and Right, Robert W., 4,929,924, Cl. 340-384.00E.

Testing Machines Inc.: *See—*
Bachelder, Walter F.; Sullivan, John L.; Fiore, Peter J.; and Hansen, Godfrey L., 4,928,533, Cl. 73-838.000.

Teubert, Joachim. Mold filling method and transport apparatus for bead-like resilient material transported by a fluid. 4,928,739, Cl. 141-5.000.

Texaco Inc.: *See—*
Powers, William J., III; Matthews, Leonard A.; and Jao, Tze-Chi, 4,929,373, Cl. 252-33.000.

Texas A&M University System, The: *See—*
Buth, C. Eugene; Qureshy, Asif; Ross, Hayes E., Jr.; and Sicking, Dean L., 4,928,928, Cl. 256-13.100.

Texas Instruments Incorporated: *See—*
Breuninger, Robert K., 4,929,850, Cl. 307-272.100.
Hutter, Louis N., 4,929,996, Cl. 357-34.000.

Textron, Inc.: *See—*
Gassen, James R.; and Suchdev, Lakhbir S., 4,928,390, Cl. 30-123.400.

Teyssedre, Alain: *See—*
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssedre, Alain; and Lenoir, Roland, 4,928,746, Cl. 164-362.000.

Tezuka, Sigeru, to Fuji Photo Film Co., Ltd. Quantitative pipette. 4,929,428, Cl. 422-100.000.

Tezuka, Sigeru: *See—*
Kido, Keishiro; and Tezuka, Sigeru, 4,928,540, Cl. 73-864.110.

Tezuka, Toshiaki; Koshizuka, Kunihiro; and Abe, Takao, to Konica Corporation. Thermal transfer recording material. 4,929,593, Cl. 503-227.000.

Thames Pharmacal Co., Inc.: *See—*
Blackman, Steven T., 4,929,619, Cl. 514-263.000.

Thedford, Guy N.; and Wells, Gary L., to J. I. Case Company. Air system for a cotton harvester. 4,928,459, Cl. 56-13.300.

Theobald, Hans: *See—*
Leyendecker, Joachim; Buerstinghaus, Rainer; Theobald, Hans; Kuenast, Christoph; and Hofmeister, Peter, 4,929,617, Cl. 514-252.000.

Thermo-Blade, Inc.: *See—*
Meltzer, Elliott A.; and Diloia, Albert A., 4,928,345, Cl. 15-250.060.

Theuer, Werner: *See—*
Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, 4,929,705, Cl. 528-49.000.

Theurer, Josef; Oellerer, Friedrich; and Gruber, Leopold R., to Franz Plasser Bahnbaumaschinen-Industriegesellschaft GmbH. Electric flash-butt welding machine and method of providing a welded joint between adjacent ends of rail sections. 4,929,816, Cl. 219-53.000.

Thibodeaux, Glenn. Crawfish peeling apparatus. 4,928,352, Cl. 17-73.000.

Thiokol Corporation: *See—*
Barnes, Michael W., 4,929,291, Cl. 149-19.400.

Thirumalachar, M. Jeersannidhi; and Narasimban, M. Jeersannidhi, Jr., to Source Technology Earth Oils, Inc. Process and system for recovering oil from oil bearing soil such as shale and tar sands and oil produced by such process. 4,929,341, Cl. 208-390.000.

Thomas, Charles A.: *See—*
Danis, Sara L.; Skaggs, Charles L.; and Thomas, Charles A., 4,928,411, Cl. 40-324.000.

Thomas, David Y.: *See—*
Bursey, Howard; Dmochowska, Aleksandra; Thomas, David Y.; and Dignard, Danie', 4,929,553, Cl. 435-172.300.

Thomas, James M.; and Kern, Ronald D., to Colgate-Palmolive Co. Antistatic and fabric softening laundry wash cycle additive composition in filtering pouch. 4,929,367, Cl. 252-8.800.

Thomas, Mammen; and Weinberg, Matthew, to Advanced Micro Devices, Inc. MOS transistor construction with self aligned silicided contacts to gate, source, and drain regions. 4,929,992, Cl. 357-23.900.

Thomas, Michael H.: *See—*
Foreman, Larry R.; Gomez, Veronica M.; and Thomas, Michael H., 4,929,306, Cl. 156-306.300.

Thomas, Neil L.: *See—*
O'Brien, John T.; Thomas, Neil L.; and Dyer, Tracy D., 4,929,946, Cl. 341-87.000.

Thomas, Paul; and Ahina, Lionel M. Toothbrush cabinet for holding of toothbrushes and toothpaste in bathroom. 4,929,039, Cl. 312-213.000.

Thome, Caryl: *See—*
Prus, Eric; Frenc, Andre ; Bordaz, Pascal; Guerange, Patrick; and Thome, Caryl, 4,928,880, Cl. 239-8.000.

Thomma, Gunther: *See—*
Lotz, Horst K.; and Thomma, Gunther, 4,928,932, Cl. 266-58.000.

Thompson, George O. Forklift adapter for stocking vertical racks. 4,929,145, Cl. 414-607.000.

Thomson Brandt Armements: *See—*
Esterlin, Jacques; Le Parquier, Guy; and Roux, Jean Pierre, 4,928,570, Cl. 89-6.500.

Thomson-CSF: *See—*
de Boisseron, Bertrand; Salvan, Michel; and Gugenhein, Michele, 4,930,124, Cl. 370-94.300.
Elleaume, Philippe, 4,929,954, Cl. 342-194.000.

Thorn, William F., to Automotive Systems Laboratory, Inc. Aspirating inflator assembly. 4,928,991, Cl. 280-738.000.

Thornton, Thomas F. Dental treatment apparatus. 4,928,675, Cl. 128-66.000.

Tiernan, Joan E., to United States of America, Energy. Treatment of concentrated industrial wastewaters originating from oil shale and the like by electrolysis polyurethane foam interaction. 4,929,359, Cl. 210-663.000.

Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B.; Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K. Cast steel. 4,929,416, Cl. 420-12.000.

Tilman, Paul A.; Machacek, Zdenek; and Scott, Richmond, to Minigrip, Inc. Bag making material having fastener profiles and alignment ribs with reinforcing and stabilizing beam effect ridge means. 4,929,487, Cl. 428-163.000.

Tin, Joshua K., to Remote Automation & Control Electronics Inc. Remote control car starter. 4,928,778, Cl. 180-167.000.

Tite, Raymond C., to Massey-Ferguson Services N.V. Metering device for seed or fertilizer. 4,928,858, Cl. 222-312.000.

Tobert, Jonathan A., to Merck & Co., Inc. Coenzyme Q_{10} with HMG-CoA reductase inhibitors. 4,929,437, Cl. 424-10.000.

Tochigifujisangyo Kabushiki Kaisha: *See—*
Ishikawa, Osamu; and Watanabe, Kazuyoshi, 4,928,803, Cl. 192-58.00B.

Todd, John A., to Dresser Industries, Inc. Environment protector for replaceable cartridge filters. 4,929,356, Cl. 210-248.000.

Toiyama, Masaoki: *See—*
Nakagawa, Sumio; Toiyama, Masaoki; Uno, Yoshinobu; and Kohda, Hiromichi, 4,929,768, Cl. 568-473.000.

Tokai Carbon Co., Ltd.: *See—*
Sugihara, Kanji; Yamamoto, Motohiro; Kida, Tohru; and Fukazawa, Minoru, 4,929,472, Cl. 427-215.000.

Tokai Corporation: *See—*
Nitta, Tomio, 4,929,175, Cl. 431-344.000.
Nitta, Tomio, 4,929,176, Cl. 431-344.000.

Tokuda, Shuichiro: *See—*
Fujigaki, Takashi; Fujinaga, Yoshikazu; Tokuda, Shuichiro; Furukawa, Noriyuki; Ichimura, Kiyoshi; Shibuya, Yukio; and Iuchi, Shigeru, 4,929,169, Cl. 425-385.000.

Tokuyama Soda Kabushiki Kaisha: *See—*
Nishimura, Masakatsu; Okada, Naoya; Murata, Yasuo; and Hirai, Yasuhiko, 4,929,317, Cl. 204-59.00R.

Tokyo Electric Co., Ltd.: *See—*
Izawa, Shoji, 4,930,017, Cl. 358-296.000.
Ochiai, Kuniaki; and Komakine, Shigeo, 4,929,101, Cl. 400-124.000.

Tokyo Juki Industrial Co., Ltd.: *See—*
Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, 4,928,612, Cl. 112-257.000.

Tokyo Keiki Company, Ltd.: *See—*
Ando, Tsuyoshi; Hirono, Nakayasu; Nakao, Hirotoshi; Mito, Akio; Kihara, Kazuyuki; Hatakenaka, Kosuke; and Ogawa, Hiroshi, 4,928,730, Cl. 137-554.000.

Tokyo Keiso Co., Ltd.: *See—*
Sugi, Tokio; Mori, Yasuo; and Takahashi, Yugi, 4,928,524, Cl. 73-200.000.

Tomida, Yoshinori: *See—*
Sakai, Kunihiro; Miyazaki, Toshihiko; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Kimura, Toshiaki; Matsuda, Hiroshi; Takimoto, Kiyoshi; and Saito, Kenji, 4,929,524, Cl. 430-56.000.

Tominaga, Kaoru; and Iwata, Tadao, to Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha. Epoxy resin compositions. 4,929,708, Cl. 528-118.000.

Tominaga, Mamoru; Kokado, Naoyuki; Gonpei, Katsuhiro; Nira, Hisami; and Taya, Akira, to Kabushiki Kaisha Toshiba. Color liquid crystal display device. 4,929,061, Cl. 350-338.000.

Tonali S.p.A.: *See—*
Colombo, Attilio, 4,928,429, Cl. 49-41.000.

Toney, Crayton G.: *See—*
Mitchell, Larry L.; and Toney, Crayton G., 4,929,497, Cl. 428-265.000.

Tong, Dien H.: *See—*
Patterson, William A.; Tong, Dien H.; and Wooden, James R., 4,929,100, Cl. 400-124.000.

Tong, Hua Sou, to Zenith Electronics Corporation. NI-based FTM shadow masks having a nickel phosphide black layer. 4,929,864, Cl. 313-402.000.

Tonnelli, Gerald J., to Production Data, Inc. Steam injection survey apparatus and method for testing wells. 4,928,522, Cl. 73-155.000.

Toon, Donald A.; and Belshaw, Douglas J., to Solinst Canada Limited. Groundwater sampling apparatus. 4,928,541, Cl. 73-864.630.

Toray Industries, Inc.: *See—*
Akashi, Ryojiro; and Taniguchi, Takashi, 4,929,693, Cl. 526-259.000.

Torbus, Marek; Jerman, Franz; Ladegourdie, Gerard; Lingemann, Dirk; Seiss, Willi; and Vujevic, Aleksandar, to Huttenes-Albertus Chemische Werke GmbH. Cold-setting moulding binders and their use (phenols and gaseous acetals). 4,929,649, Cl. 523-145.000.

Toreman, Ulrik: *See—*
Soderberg, Terje; Sodersteen, Rolf; and Toreman, Ulrik, 4,928,945, Cl. 271-9.000.

Toro Company, The: *See—*
Peterson, Gerald E., 4,930,047, Cl. 361-395.000.

Torus Corporation: *See—*
Allen, Donavan J., 4,928,402, Cl. 34-97.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
Motomura, Noriyuki, 4,928,933, Cl. 266-237.000.

Toshiba Silicone Co., Ltd.: *See—*
Kawai, Nobuyuki; and Nakamura, Mitsuhiro, 4,929,804, Cl. 200-5.00A.

Toshiyuki, Nakaie, to Hanwa Electronic Co., Ltd. Apparatus for detecting noise in the measurement of very small resistance. 4,929,886, Cl. 324-691.000.

Toto Ltd.: *See—*
Higuchi, Mitsuhiro; and Yamamoto, Hirofumi, 4,928,325, Cl. 4-247.000.

Tottori, Takeshi: *See—*
Fujiwara, Hideo; Tottori, Takeshi; Inagoya, Osamu; and Mikami, Hirosuke, 4,928,382, Cl. 29-603.000.

Tou, Frederich N.; and Hasan, Wagar, to IntelliCorp, Inc. Method for integrating a knowledge-based system with an arbitrary database system. 4,930,071, Cl. 364-300.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Toyama, Akira, to Nippon Precision Circuits Ltd. Constant width pulse distribution in a digital to analog converter for serial digital data. 4,929,947, Cl. 341-146.000.
Toyama, Tadahisa: *See—*
Sugimoto, Naoshige; Yoshida, Tetsushi; and Toyama, Tadahisa, 4,929,060, Cl. 350-339.00F.
Toyo Boseki Kabushiki Kaisha: *See—*
Shirasaki, Yoshikazu; and Tadokoro, Yoshio, 4,929,503, Cl. 428-373.000.
Toyo Kahan Co., Ltd.: *See—*
Hayashi, Yoshio; Nakamoto, Tetsuo; Kanada, Katsumi; and Kondo, Yoshikazu, 4,929,171, Cl. 427-54.100.
Toyo Seikan Kaisha, Ltd.: *See—*
Takakusaki, Nobuyuki; Mizutani, Yohji; Kishida, Nobuhiro; and Hosokawa, Manabu, 4,929,450, Cl. 425-526.000.
Toyoda Gosei Co., Ltd.: *See—*
Ito, Kuniyasu, 4,930,048, Cl. 362-26.000.
Iwasa, Tadanobu, 4,929,481, Cl. 428-36.100.
Iwasa, Tadanobu, 4,929,490, Cl. 428-195.000.
Kasugai, Joji, 4,929,263, Cl. 55-502.000.
Kuzuhara, Michio; Shibasaki, Jun; St. Louis, Andree; St. Laurent, Christian; and Bedard, Michel, 4,928,431, Cl. 49-479.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Suzuki, Toshitake;; Komoda, Norio; Oda, Susumu; and Harata, Motoo, 4,929,859, Cl. 310-328.000.
Tada, Tetsuya, 4,928,780, Cl. 180-179.000.
Takada, Mitsuru; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,928,557, Cl. 74-867.000.
Trackman, Marshall H.: *See—*
Graham, Scott M.; Ewing, Kenneth R.; Trackman, Marshall H.; and Darr, Duane R., 4,929,099, Cl. 400-76.000.
Trailer Train Company: *See—*
Yeates, Richard P.; Keating, Bruce E.; and Halliar, William R., 4,929,132, Cl. 410-56.000.
Trainor, John E.: *See—*
Del Gatto, Henry J.; and Trainor, John E., 4,928,456, Cl. 55-12.000.
Trampel, Darrell W., to Iowa State University Research Foundation, Inc. Egg inoculation method. 4,928,629, Cl. 119-1.000.
Trampel, Darrell W.: *See—*
Gassman, Max P.; Larson, David J.; and Trampel, Darrell W., 4,928,628, Cl. 119-1.000.
Travis, Gilbert E. Lubrication control. 4,928,644, Cl. 123-188.00P
Trend, John E., to Minnesota Mining and Manufacturing Company. Inclusion complexes providing second harmonic generation 4,929,392, Cl. 252-582.000.
Trenkner, Fritz: *See—*
Breitenfelder, Wilheim: and Trenkner, Fritz, 4,928,684, Cl 128-204.210.
Tresslar, Marie C.: *See—*
Conaghan, Thomas B.; Gladfelter, Harry F.; Kite, Joseph S., III; and Tresslar, Marie C., 4,929,478, Cl. 428-35.100.
Tri Fire Holdings, Ltd.: *See—*
Shaw, William S, 4,928,667, Cl. 126-512.000.
Trick, Robert E., to Medical Engineering Corporation. Nocturnal penile tumescence and rigidity monitor. 4,928,706, Cl. 128-774.000.
Trimate: *See—*
Gianfranco, Cassanelli, 4,928,434, Cl 51-3.40H
Trimmer, Johnny L.: *See—*
Caskey, Terrence L.; Trimmer, Johnny L.; and Jorgensen, Janine L., 4,929,259, Cl. 55-158.000.
Trion Corporation: *See—*
Aoki, Akio, 4,928,320, Cl. 2-19.000.
Tripp, Thomas M.: *See—*
Smith, Thomas R.; and Tripp, Thomas M., 4,929,222, Cl. 474-255.000.
Trotter, Jimmy R.; and Sublett, Bobby J., to Eastman Kodak Company. Flexible, biaxially oriented films of modified poly (ethylene terephthalate). 4,929,714, Cl. 528-272.000.
Troue, Harden H.: *See—*
Sue, Jiinjen A.; and Troue, Harden H., 4,929,322, Cl. 204-192.380.
Troxler Electronic Laboratories, Inc.: *See—*
Dishman, Michael R., 4,929,885, Cl. 324-664.000.
Truchsess, Joseph; and Matthews, Michael. Mouth-operated control device. 4,929,826, Cl. 250-221.000.
Trutzschler GmbH & Co. KG. *See—*
Leifeld, Ferdinand, 4,928,355, Cl. 19-105.000.
TRW Inc.: *See—*
Johnson, Jerry E.; and Hoerner, Clinton C., Jr., 4,928,726, Cl. 137-327.000.
Tsao, Ying-Yen P.; and von Ballmoos, Roland, to Mobil Oil Corporation. Reactivating catalysts containing noble metals on molecular sieves containing oxides of aluminum and phosphorus. 4,929,576, Cl. 502-35.000.
Tsay, Wen-Her. Structure of sealing string. 4,929,006, Cl. 292-324.000.
Tscheschlok, Klaus: *See—*
Schupp, Gerhard; Tscheschlok, Klaus; and Johann, Maischberger, 4,928,386, Cl. 29-824.000.
Tse, Kwok-Tuen: *See—*
Armbruster, David R.; and Tse, Kwok-Tuen, 4,929,648, Cl. 523-147.000.
Tsentr Nauchno-Tekhnicheskogo Tvorchestva Molodezhi "ASTRON". *See—*
Ivannikov, Alfred V.; and Abudardin, Vladimir Z., 4,929,812, Cl. 219-137.200.
Tsitlik, Joshua: *See—*
Halperin, Henry; Tsitlik, Joshua; Weisfeldt, Myron; and Gelfand, Mark, 4,928,674, Cl. 128-30.200.
TSL Incorporated: *See—*
Curiel, Yoram, 4,928,837, Cl. 215-250.000.
Tsuchida, Yoshiki, to Ishikawajima-Harima Heavy Industries Co. Apparatus for measuring temperatures indicative of thermal conductivity. 4,929,089, Cl. 374-44.000.
Tsuji, Hiroshi: *See—*
Otoshima, Hiroo; Tsuji, Hiroshi; Mori, Shigeki; and Nishimura, Yoshihiro, 4,928,476, Cl. 57-268.000.
Tsuji, Mitsuji: *See—*
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Sanada, Takashi; and Tsuji, Mitsuji, 4,929,675, Cl. 525-66.000.
Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Conversion lens. 4,929,068, Cl. 350-422.000.
Tsuji, Yasuo, to Takata Corporation Vehicle seat belt retractor. 4,928,902, Cl. 242-107.200.
Tsujihara, Toshiyuki: *See—*
Watanabe, Tsutomu; Sagiyama, Masari; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,323, Cl. 204-206.000.
Watanabe, Tsutomu; Sagiyama, Masaru; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, 4,929,324, Cl. 204-206.000.
Tsujii, Yasuhiro: *See—*
Haga, Takahiro; Tsujii, Yasuhiro; Isogai, Tatsuo; Murai, Shigeo; and Tanaka, Toshihiro, 4,929,729, Cl. 544-330.000.
Tsukahara, Toshiro: *See—*
Yahu, Atsuhiro; and Tsukahara, Toshiro, 4,930,030, Cl. 360-107.000.
Tsunoda, Yoshiaki; and Kanaya, Masatoshi, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor device with overvoltage self-protection. 4,929,563, Cl. 437-6.000.
Tsuruoka, Yoshihiro: *See—*
Kohtoh, Noriaki; Tsuruoka, Yoshihiro; Abe, Toyohiko; and Fukuro, Hiroyoshi, 4,929,658, Cl. 524-219.000.
Tsuyama Mfg. Co., Ltd.: *See—*
Maeyama, Hachiro, 4,929,825, Cl. 250-221.000.
Tsuyuki, Hiroto: *See—*
Ishikawa, Tadashi; Tagami, Shigeru; Akimoto, Kazuo; Tsuyuki, Hiroto; Kawai, Michio; Ito, Kanji; Sato, Takayuki; Otora, Takahito; and Hayakawa, Teruyo, 4,929,977, Cl. 354-420.000.
Tucker, Kay L.; and Ma, Ulysses, to Cookson Group plc. Low toxicity alloy compositions for joining and sealing. 4,929,423, Cl. 420-561.000.
Tuffal, Guy: *See—*
Audren, Yves; and Tuffal, Guy, 4,928,898, Cl. 242-55.100.
Tunker, Gerhard, to Flachglas Aktiengesellschaft. Method of applying a coloration coating to a glass pane. 4,929,493, Cl. 428-207.000.
Tuppini Bigiotterie S.r.l.: *See—*
Tuppini, Remigio, 4,928,504, Cl. 63-9.000.
Tuppini, Remigio, to Tuppini Bigiotterie S.r.l. Articulated bracelet with composite elements. 4,928,504, Cl. 63-9.000.
Turi, Eran: *See—*
Avni, Eitan; Salama, Simon; and Turi, Eran, 4,929,474, Cl. 427-326.000.
Turk, Herbert M., to B.F. Goodrich Company, The. Crosslinkable silicone polymers with talc reinforcing agents having improved non-sag and modulus properties. 4,929,664, Cl. 524-451.000.
Turro, Glenn T.: *See—*
McBeath, Les L.; Sheikholeslami, Amir M.; and Turro, Glenn T., 4,929,933, Cl. 340-703.000.
Turtle, RObert R.: *See—*
Pagano, Thomas S.; and Turtle, RObert R., 4,929,040, Cl. 350-6.500.
Tury, Bernard, to Imperial Chemical Industries PLC. Grease composition. 4,929,369, Cl. 252-12.000.
Twyman, Nancy D.: *See—*
Midkiff, David G.; Rippl, Carl G.; Twyman, Nancy D.; and Wahlquist, Joseph D., 4,929,480, Cl. 428-35.600.
Tyers, Michael B.; Coates, Jan H.; Humber, David C.; Ewan, George B.; and Bell, James A., to Glaxo Group Limited. Medicaments. 4,929,632, Cl. 514-397.000.
Typpo, Pekka M., to Impact Systems, Inc. Thickness gauge for moving sheet material with inner and outer flexibly mounted bearings. 4,929,895, Cl. 324-231.000.
Tyrell, John A.; and McGready, Russell J., to General Electric Company. Polyoxyalkylene polyimide polymers. 4,929,716, Cl. 528-353.000.
Tzikas, Athanassios: *See—*
Schwander, Hansrudolf; Tzikas, Athanassios; and Aeschlimann, Peter, 4,929,719, Cl. 534-604.000.
U-Haul International: *See—*
Carty, William E., 4,929,018, Cl. 296-204.000.
Uarco Incorporated: *See—*
Henry, Paul T.; Haase, Roger L.; and Fitzgibbons, Gary W., 4,928,874, Cl. 229-74.000.
Ube Industries, Ltd.: *See—*
Koda, Akihide; Kita, Jun'ichiro; Kuroki, Yoshiaki; Fujiwara, Hiroshi; Takamura, Shinji; and Yamano, Kayoko, 4,929,618, Cl. 514-253.000.
Nishihara, Yoshio; Isobe, Noriyuki; and Kotera, Satoshi, 4,929,507, Cl. 428-447.000.
Takematsu, Tetsuo; Yakeuchi, Yasutomo; Takenaka, Mitsuaki; Takamura, Seiji; and Matsushita, Akio, 4,929,273, Cl. 71-118.000.

Uchida, Hiroshi: *See—*
Yamashita, Takaji; and Uchida, Hiroshi, 4,929,835, Cl. 250-367.000
Uchida, Mamoru: *See—*
Nishimura, Yoshifumi; Yamamoto, Susumu; Nakata, Hidekazu; Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, 4,929,512, Cl. 428-610.000.
Uda, Kazutaka: *See—*
Sugihara, Takashi; Uda, Kazutaka; Tabuchi, Hiroki; Inami, Yasuhiko; Hijikigawa, Masaya; and Kataoka, Shoei, 4,928,513, Cl. 73-1.00G.
Udovich, Carl A.: *See—*
Hussmann, Gregory P.; and Udovich, Carl A., 4,929,761, Cl 568-319.000.
Ueda, Kenichi; Hattori, Kouji; Terada, Akihiko; and Inohara, Kazuyoshi, to Oki Electric Industry Co., Ltd. Pressure-sensitive input apparatus. 4,929,934, Cl. 340-706.000.
Ueda, Masahiro: *See—*
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Naoya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.
Ueda, Takashi: *See—*
Maruta, Keiichi; Ueda, Takashi; and Watanabe, Yasuhiko, 4,929,590, Cl. 503-207.000.
Uehara, Masao: *See—*
Matsui, Isamu; Uehara, Masao; Noshi, Shinji; and Kawarabashi, Tsukasa, 4,928,475, Cl. 57-264.000.
Uehara, Mitsuyoshi: *See—*
Hirayama, Takanobu; Funahashi, Hiroyuki; Yokota, Eiji; Uehara, Mitsuyoshi; Kagami, Isao; Hasegawa, Makoto; and Mizuno, Masaru, 4,929,105, Cl. 400-625.000.
Uematsu, Reppei: *See—*
Namba, Mitsuo; and Uematsu, Reppei, 4,928,728, Cl. 137-486.000.
Uematu, Tomoe: *See—*
Matsui, Fumio; Suzuki, Noboru; Takaishi, Minoru; Ogura, Ryushi; Harigai, Noriaki; Hashimoto, Tadayoshi; and Uematu, Tomoe, 4,929,494, Cl. 428-286.000.
Uemura, Minoru: *See—*
Imai, Masaaki; and Uemura, Minoru, 4,929,347, Cl. 210-101.000.
Uesugi, Akio; Dobashi, Ritsu; and Ohishi, Takeshi, to Fuji Photo Film Co., Ltd. Electrolytic treatment apparatus. 4,929,326, Cl. 204-206.000.
Uhlin, Per A. Surveillance installation. 4,929,927, Cl. 340-547.000.
Ukaji, Takao: *See—*
Sato, Mitsuya; Ukaji, Takao; Yamaguchi, Nobuhito; Ohmori, Taro; and Murakami, Eiichi, 4,929,893, Cl. 324-158.00F.
Un, Chong S.: *See—*
McLagan, Angus; Pao, Gei-Jon; Un, Chong S.; and Pearce, John J. Jr., 4,930,065, Cl. 364-200.000.
Underwood, Lowell A. Lift hitch. 4,929,028, Cl. 298-19.00R.
Undlin, Becky A. Toy & instructional apparatus. 4,929,161, Cl. 434-236.000.
Union Camp Corporation: *See—*
Avni, Eitan; Salama, Simon; and Turi, Eran, 4,929,474, Cl. 427-326.000.
Union Carbide Chemicals and Plastics Company Inc.: *See—*
Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., 4,929,767, Cl. 568-454.000.
Partain, Emmett M., III; and Brode, George L., II, 4,929,722, Cl 536-20.000.
Union Carbide Corporation: *See—*
Shen, Wei-Ming, 4,929,432, Cl 423-344.000.
Sue, Jiinjen A.; and Troue, Harden H., 4,929,322, Cl. 204-192.380.
Union Carbide Industrial Gases Technology Inc.: *See—*
Lockett, Michael J.; and Victor, Richard A., 4,929,399, Cl. 261-112.200.
Unisys Corporation: *See—*
Danilenko, Michael; Dekarske, Clarence W.; and Larson, John E., 4,930,106, Cl. 365-189.010.
Henze, Christopher P.; and Mulkern, Joseph H., 4,930,063, Cl. 363-91.000.
Wilson, Mark L., 4,929,050, Cl. 250-227.170.
United Kingdom Atomic Energy Authority: *See—*
Feest, Eric A.; Chesney, Peter F.; and Coombs, Jeffrey S., 4,928,745, Cl. 164-46.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., 4,929,950, Cl. 342-25.000.
U.S. Divers Company, Inc.: *See—*
Campbell, Steven M., 4,928,710, Cl. 128-861.000.
United States of America
Agriculture: *See—*
Batcho, Andrew D.; Horst, Ronald L.; and Uskokovic, Milan R., 4,929,609, Cl. 514-167.000.
Flint, Hollis M.; and Merkle, John R., 4,929,441, Cl. 424-84.000.
Air Force: *See—*
Leonard, John F.; and Beam, Jerry E., 4,929,414, Cl. 419-2.000.
Lindsay, Mitchell H.; and Kerr, Walter B., 4,928,491, Cl. 60-734.000.
Army: *See—*
Branovich, Louis E.; Smith, ernard; Freeman, Gerard L.; and Eckart Donald W., 4,929,418, Cl. 419-19.000.
Fansler, Kevin S.; and Lyon, David H., 4,928,573, Cl. 89-14.400.
Gold, Kenneth; and Brodman, Bruce, 4,929,552, Cl. 435-128.000.
Greenspan, Jacob; and Sacco, Gasper J., 4,928,368, Cl. 29-1 220.
Liebson, Wilbur, 4,929,834, Cl. 250-352.000.
Energy: *See—*
Aldissi, Mahmoud, 4,929,389, Cl. 252-500.000.
Ashley, Carol S.; and Reed, Scott T., 4,929,278, Cl. 106-287.120.
Dosch, Robert G.; and Stephens, Howard P., 4,929,582, Cl. 502-11.000.
Mullendore, Arthur W., 4,929,468, Cl. 427-47.000.
O'Connor, Daniel G.; and Gerth, Howard L., 4,928,532, Cl. 73-856.000.
Tiernan, Joan E., 4,929,359, Cl. 210-663.000.
Weingart, Richard C., 4,928,595, Cl. 102-202.700.
Higher Education: *See—*
Sekhar, Laligam N.; Scalbassi, Robert J.; Sun, Mingui; and Wasserman, Jacob F., 4,928,705, Cl. 128-773.000.
Navy: *See—*
DiVita, Sam; and Rast, Howard E., Jr., 4,929,837, Cl. 250-461.100.
Flesner, Larry D.; Eisenman, Welsey L.; Merriam, James D.; Bates, Richard L.; Dahle, Rolf N.; and Arrington, Douglas C., 4,929,831, Cl. 250-307.000.
Schneider, Alan M.; and Doherty, Donald W., 4,929,952, Cl. 342-184.000.
Sullivan, Edmund J.; and Stergiopoulos, Stergios, 4,930,111, Cl. 367-130.000.
Yoder, Max N., 4,929,986, Cl. 357-22.000.
Tennessee Researach Corporation: *See—*
Sekhar, Laligam N.; Scalbassi, Robert J.; Sun, Mingui; and Wasserman, Jacob F., 4,928,705, Cl. 128-773.000.
U.S. Philips Corporation: *See—*
Baxter, Thomas; and Barnes, Robert A., 4,930,120, Cl. 370-73.000.
Bird, Philip H.; Coe, David J.; Paxman, David H.; and Korteling, Aart G., 4,929,884, Cl. 323-313.000.
Blanken, Pieter G., 4,929,912, Cl. 330-288.000.
Bonnefous, Odile M. A., 4,928,698, Cl. 128-661.090.
Boudewijns, Arnoldus J. J., 4,929,998, Cl. 357-45.000.
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 4,929,911, Cl 330-264.000.
Dil, Jan G., 4,930,116, Cl. 369-275.100.
Hoeberechts, Arthur M. E.; and Peters, Petrus J. M., 4,929,999, Cl 357-68.000.
Koster, Marinus P.; Van Der Hoek, Willem; Kemper, Nicolaas R.; and Soemers, Hermanus M. J. R., 4,929,146, Cl. 414-744.500
Melwisch, Harald; and Schneider, Norbert, 4,928,389, Cl. 30-43.920.
Muller-Stute, Friedrich; and Weil, Gunter, 4,929,053, Cl. 350-96.340.
Rinneburger, Klaus P. K., 4,929,183, Cl. 439-67.000.
Ruitenburg, Leonardus J. M., 4,929,905, Cl. 329-358.000.
Verbeek, Willibrordus G. C.; Wijbenga, Hendrik; and Vossen-Bergmans, Marie-Madelene, 4,929,863, Cl. 313-113.000.
Verboom, Johannes J.; Baggen, Constant P. M. J.; Van Uijen, Cornelis M. J.; and Gaal, Erik W., 4,930,115, Cl. 369-59.000.
United Technologies: *See—*
Wiegand, Walter J.; Swindal, James L.; Swarts, Richard E.; Bullis, Robert H.; Lopiccolo, Mario T.; Grantham, Daniel H; and Feyt, Arthur G., 4,930,042, Cl. 361-280.000.
Wiegand, Walter J., 4,930,043, Cl. 361-283.000.
United Technologies Automotive, Inc.: *See—*
Hansen, Randall F., 4,929,878, Cl. 318-560.000.
United Technologies Corporation: *See—*
Diebolt, Richard A.; Kidd, Stephen; and Rivers, Donald E., Jr., 4,929,130, Cl. 409-136.000.
Pollak, Robert R.; and Marcos, Juan A., 4,928,482, Cl. 60-39.161.
Shaffer, Harold K.; and Barnsby, Roger M., 4,928,978, Cl. 277-25.000.
Universal Medical Instrument Corp.: *See—*
Merry, Jack D.; and Fink, E. David, 4,929,235, Cl. 604-167.000.
Universidad Nacional Autonoma De Mexico: *See—*
Possani, Lourival D. P.; Gurrola, Georgina B.; Bayon, Marco A A C.; and Sitges, Maria B., 4,929,718, Cl. 530-326.000.
University of Akron: *See—*
Kennedy, Joseph P.; and Mishra, Munmaya K., 4,929,683, Cl 525-268.000.
University of Alabama at Huntsville, The: *See—*
Wu, Maw-Kuen, 4,929,595, Cl. 505-1.000.
University of California, The Regents of the: *See—*
Anderson, William G., deceased; and Anderson, Johanna S., legal representative, 4,929,562, Cl. 436-126.000.
Hirschfeld, Tomas B., 4,929,561, Cl. 436-116.000.
Jennings, Glenn A., 4,930,102, Cl. 364-900.000.
University of Deleware: *See—*
Cogburn, Larry A., 4,929,600, Cl. 514-2.000.
University of Florida: *See—*
Drago, Russell S.; and Getty, Edward E., 4,929,800, Cl. 585-744.000.
Lampotang, Samsun; Gravenstein, Dietrich; Gravenstein, Joachim S.; Gravenstein, Nikolaus; and Banner, Michael J., 4,928,687, Cl 128-207.140.
University of Georgia Research Foundation, Inc.: *See—*
Hamdy, Mostafa K., 4,929,452, Cl. 426-11.000.
University of Minnesota, Regents of the: *See—*
Allison, John D.; and Hanson, Gordon, 4,928,709, Cl. 128-782.000.

Liu, Benjamin Y. H.; and Szymanski, Wladyslaw W., 4,928,537, Cl. 73-863.860.
Schiffman, Eric L.; Fricton, James R.; and Espy, Lawrence M., 4,928,707, Cl. 128-774.000.
University of New Mexico: *See—*
Kirsch, Wolff M.; Zhu, Yong H.; and Cushman, Robert B., 4,929,240, Cl. 606-151.000.
University of Pittsburgh: *See—*
Kozikowski, Alan P.; and Xia, Yan, 4,929,731, Cl. 546-97.000.
University of Tennessee Research Corporation: *See—*
Lanier, Joel P.; Hall, Tamuel A.; and Moore, Kent R., 4,928,957, Cl. 272-72.000.
Uno, Yoshinobu: *See—*
Nakagawa, Sumio; Toiyama, Masaoki; Uno, Yoshinobu; and Kohda, Hiromichi, 4,929,768, Cl. 568-473.000.
Unrein, Edgar J.: *See—*
Henderson, Walter G.; Ellson, George A.; and Unrein, Edgar J., 4,929,880, Cl. 320-30.000.
UOP: *See—*
Barder, Timothy J , 4,929,796, Cl. 585-828.000.
Holcombe, Thomas C.; Sager, Thomas C.; Volles, Warren K.; and Zarchy, Andrew S., 4,929,799, Cl. 585-737.000.
James, Robert B, Jr.; and Kalnes, Tom N., 4,929,781, Cl. 585-310.000.
Moser, Mark D.; Lawson, R. Joe; Antos, George J.; Wang, Li; and Parulekar, Vivekanand N., 4,929,332, Cl. 208-65.000.
Moser, Mark D.; Lawson, R. Joe; Wang, Li; and Parulekar, Vivekanand N., 4,929,333, Cl. 208-65.000.
Pollastrini, Sheila; Bricker, Jeffery C.; and Frame, Robert R., 4,929,340, Cl. 208-189.000.
Schmidt, Robert J.; and Haizmann, Robert S., 4,929,794, Cl. 585-737.000.
Upjohn Company, The: *See—*
VanRheenen, Verlan H.; and Huber, Joel E., 4,929,395, Cl. 540-4.000.
Urai, Muneharu; Makino, Hiroyuki; and Shimada, Makoto, to Tachi-S Co., Ltd. Method for manufacturing automotive seat. 4,929,304, Cl. 156-245.000.
Urban, Milfred W. Mirror and bracket assembly. 4,929,074, Cl. 350-625.000.
Urmson, William T., Jr.; Gaslevic, Emeric; and Junk, Ronald K., to Harsco Corporation. Railroad spike holding apparatus with acute angled jaws. 4,928,600, Cl. 104-17.100.
Usami, Toshimasa; and Shimomura, Akihiro, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,929,411, Cl. 503-213.000.
Ushiku, Kenichi: *See—*
Hayase, Isao; Ushiku, Kenichi; Tejima, Kunisuke; Hayashi, Seiichi; and Satoh, Kazuhiko, 4,929,159, Cl. 417-295.000.
Uskokovic, Milan R.: *See—*
Batcho, Andrew D.; Horst, Ronald L.; and Uskokovic, Milan R., 4,929,609, Cl. 514-167.000.
Usui, Katsumi: *See—*
Matsubara, Saburo, Gohshi, Yoshihiro; Kobayashi, Seizo; and Usui, Katsumi, 4,929,680, Cl. 525-240.000.
Utica Enterprises, Inc. *See—*
Dacey, Ernest A., Jr., 4,928,388, Cl. 29-798.000.
Uto, Kuniharu: *See—*
Tanaka, Hiroyuki; Uto, Kuniharu; Kawai, Kazumi; Shaura, Tsuneo; and Yasuhuku, Motonobu, 4,929,221, Cl. 474-205.000.
Uto, Nobutaka; Sbido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, to Canon Kabushiki Kaisha. Sheet sorter with stapler. 4,928,941, Cl. 270-53.000.
Utterback, Jeffery J.; and Mecca, Randall S., to Harmon Industries, Inc. Detection of overheated railroad wheel and axle components. 4,928,910, Cl. 246-169.00A.
Uwajima, Takayuki: *See—*
Eguchi, Tamotsu; Oshiro, Takashi; Kuge, Yukihiro; Mochida, Kenichi; and Uwajima, Takayuki, 4,929,551, Cl. 435-106.000.
Vaez-Iravani, Mehdi: *See—*
Sicignano, Albert; and Vaez-Iravani, Mehdi, 4,929,836, Cl. 250-397.000.
Vahala, Kerry J.; and Hoenk, Michael E., to Johnston Pump/General Valve, Inc. Cathodoluminescence system for use in a scanning electron microscope including means for controlling optical fiber aperture. 4,929,041, Cl. 350-96.100.
Vaisala Oy: *See—*
Lehto, Ari; and Chen, Frank, 4,928,530, Cl. 73-756.000.
Valeo: *See—*
Despres, Dominique, 4,928,486, Cl. 60-338.000.
Valette, Serge, to Commissariat a l'Energie Atomique. Process for the production of light microguides with low optical propagation losses by multicoating deposition. 4,929,302, Cl. 156-657.000.
Valio Meijerien Keskusosuusliike: *See—*
Mayra-Makinen, Annika, 4,929,546, Cl. 435-29.000.
Valyocsik, Ernest W.: *See—*
Kaeding, Warren W.; and Valyocsik, Ernest W., 4,929,790, Cl 585-651.000.
van Broekhoven, Johannes A. M., to Shell Oil Company. Hydrogenation of CO/olefin copolymer. 4,929,701, Cl. 525-539.000.
van Calker, Freerk R., to Akzo NV. Conveyor belt of PVC provided with a compound layer of reinforcing material and a process of weaving said reinforcing layer. 4,928,812, Cl. 198-847.000.
Van Coney, Robert H : *See—*
Meyer, Eric W.; and Van Coney, Robert H., 4,929,410, Cl. 264-533.000.
Vandenbergh, Peter A.; Pucci, Michael J.; Kunka, Blair S.; and Vedamuthu, Ebenezer R., to Microlife Technics, Inc. Method for inhibiting *Listeria monocytogenes* using a bacteriocin. 4,929,445, Cl. 424-115.000.
van den Nieuwelaar, Adrianus J.; and Janssen, Petrus C. H., to Stork PMT B.V. Method and device for operating an installation for dividing up slaughtered poultry and for temporarily interrupting the transport of poultry carcasses or parts. 4,928,351, Cl. 17-11.000.
Van Der Hoek, Willem: *See—*
Koster, Marinus P.; Van Der Hoek, Willem; Kemper, Nicolaas R.; and Soemers, Hermanus M. J. R., 4,929,146, Cl. 414-744.500.
Van Der Poel, Robert J.; and Wantz, Armand, to Goodyear Tire & Rubber Company, The. Tire building drum including an expandable segmental cylinder assembly and a vacuum chamber. 4,929,298, Cl. 156-414.000.
Vandersluis, Ron; and Quittner, Erik, to Canada, National Research Council of Canada/Conseil National de Reserches du. End effector. 4,929,009, Cl. 294-2.000.
Vandersluis, Ron; and Quittner, Erik, to National Research Counsil of Canada/Conseil National de Recherches du Canada. Grapple fixture. 4,929,011, Cl. 294-86.400.
Van Der Walt, Nicholaas T., to Crucible Societe Anonyme. Method and apparatus for detecting cross sectional area variations in a elongate object by measuring radial magnetic flux variations using spaced-apart coils. 4,929,897, Cl. 324-240.000.
Vandevier, Joseph E., to Baker Hughes Incorporated. Cable suspended pumping system. 4,928,771, Cl. 166-385.000.
Van Diemen, Paul: *See—*
Dixon, Robert C.; Cearley, James E.; Van Diemen, Paul; Sayre, Edwin D.; and Gordon, Gerald M., 4,929,412, Cl. 376-260.000.
van Dijk, Berend J.: *See—*
Lodder, Bernhard; Severiens, Hendrik; van Houten, Jan A.; and van Dijk, Berend J., 4,929,408, Cl. 264-149.000.
Van Dijk, Geert: *See—*
Westerkamp, Bart; and Van Dijk, Geert, 4,928,683, Cl. 128-203.120.
Van Duzer, John H.: *See—*
Wasserman, Harry H.; Murugesan, Natesan; and Van Duzer, John H., 4,929,751, Cl. 560-174.000.
van Houten, Jan A.: *See—*
Lodder, Bernhard; Severiens, Hendrik; van Houten, Jan A.; and van Dijk, Berend J., 4,929,408, Cl. 264-149.000.
Van Hoye, Willibald: *See—*
Green, Stephen T.; and Van Hoye, Willibald, 4,928,800, Cl. 190-115.000.
VanKirk, Raymond J. Golf swing trainer. 4,928,974, Cl. 273-186.00R.
van Mondfrans, Gerardus H.; and de Vries, Pieter, to Stork Brabant B.V. Method for controlling the passage of fabric through a rotary screen printing installation. 4,928,585, Cl. 101-129.000.
Vano, Barbara; and Vano, Bruno. Word question association game. 4,928,976, Cl. 273-240.000.
Vano, Bruno: *See—*
Vano, Barbara; and Vano, Bruno, 4,928,976, Cl. 273-240.000.
VanRheenen, Verlan H.; and Huber, Joel E., to Upjohn Company, The. 16α-methylation process. 4,929,395, Cl. 540-4.000.
Van Schaack, Wilbur B. Lane marker steering guide. 4,928,393, Cl. 33-264.000.
Van Uijen, Cornelis M. J.: *See—*
Verboom, Johannes J.; Baggen, Constant P. M. J.; Van Uijen, Cornelis M. J.; and Gaal, Erik W., 4,930,115, Cl. 369-59.000.
van Vuuren, Willem N. J.; and Wakeman, Russell J., to Siemens-Bendix Automotive Electronics L.P. Autocalibration of camshaft phasing feedback in a variable valve timing system. 4,928,640, Cl. 123-90.170.
Vari-Prop, Inc.: *See—*
Pitt, Donald R., 4,929,201, Cl. 440-50.000.
Varian Associates, Inc.: *See—*
Costello, Kenneth A.; and MacMillan, Hugh F., 4,929,867, Cl. 313-525.000.
Varma, Anujan M.; and Georgiou, Christos J., to International Business Machines Corporation. High-speed switching system with flexible protocol capability. 4,929,939, Cl. 340-825.800.
Vaught, Michael. Electrically lighted ornament. 4,930,053, Cl. 362-121.000.
VDO Adolf Schindling AG: *See—*
Schult, Klaus; Kister, Horst; and Quenzer, Michael, 4,928,531, Cl. 73-855.000.
Vedamuthu, Ebenezer R.: *See—*
Vandenbergh, Peter A.; Pucci, Michael J.; Kunka, Blair S.; and Vedamuthu, Ebenezer R., 4,929,445, Cl. 424-115.000.
Veech, Richard L. Containers for redox active electrolytes and method of using same. 4,929,449, Cl. 424-700.000.
Vehicle Safety Controls, Inc.: *See—*
Frederick, Earl, 4,928,519, Cl. 73-126.000.
Veijo, Vainino: *See—*
Paakkonen, Taisto; Veijo, Vainino; and Jarkko, Turpeinen, 4,929,019, Cl. 296-223.000.
Vettenhansl, Rudolf; Froeschke, Wolfgang; and Piorr, Robert, to Henkel Kommanditgesellschaft auf Aktien. Ether sulfonates as antistatic agents. 4,929,504, Cl. 428-395.000.
Velbon International Corporation: *See—*
Nakatani, Kouichiro, 4,929,973, Cl. 354-293.000.
Venier, Clifford G.; and Casserly, Edward W., to Pennzoil Products Company. Lubricants comprising novel cyclopentanes, cyclopentadienes, cyclopentenes, and mixtures thereof and methods of manufacture. 4,929,782, Cl. 585-375.000.
Venuti, Michael C.: *See—*
Castelhano, Arlindo L.; DeYoung, Lawrence M.; Krantz, Alexander; Pliura, Diana H.; and Venuti, Michael C., 4,929,630, Cl. 514-380.000.

Verbatim Corporation: *See—*
Sander, Ingolf, 4,929,067, Cl. 350-421.000.
Verbeek, Willibrordus G. C.; Wijbenga, Hendrik; and Vossen-Bergmans, Marie-Madelene, to U.S. Philips Corporation. High-pressure gas discharge lamp and luminaire provided with said lamp. 4,929,863, Cl. 313-113.000.
Verboom, Johannes J.; Baggen, Constant P. M. J.; Van Uijen, Cornelis M. J.; and Gaal, Erik W., to U.S. Philips Corp. Method of and device for recording information, record carrier, and device for reading the recorded information. 4,930,115, Cl. 369-59.000.
Vermeule, Jacob: *See—*
De Jong, Feike; Dannenberg, Willem; and Vermeule, Jacob, 4,929,374, Cl. 252-39.000.
Vermeulen-Hollandia Octrooien II B.V.: *See—*
Huyer, Johannes N., 4,928,547, Cl. 74-545.000.
Verpoort, Clemens: *See—*
Meyer, Gundolf; Schonfeld, Erwin; and Verpoort, Clemens, 4,929,596, Cl. 505-1.000.
Vesper Corporation: *See—*
Neiman, Richard D., 4,928,834, Cl. 211-191.000.
Vetco Gray Inc.: *See—*
Milberger, Lionel J.; Nobileau, Philippe C.; and Watkins, Bruce J., 4,928,769, Cl. 166-382.000.
Viana, Luis M.; Cuozzo, Robert A.; Miceli, Michael L.; and Whitney, Kent A., to Raytheon Company. Radio frequency limiter circuit. 4,930,035, Cl. 361-54.000.
Vic, Raymond: *See—*
Dubots, Patrick; Legat, Denis; and Vic, Raymond, 4,929,047, Cl. 350-96.230.
Vicari, Richard: *See—*
Aslam, Mohammad; Vicari, Richard; and Davenport, Kenneth G., 4,929,694, Cl. 526-262.000.
Victor Company of Japan, Ltd.: *See—*
Nakamura, Nobuaki; Hirose, Yukimi; Kai, Masakatsu; and Itonaga, Makoto, 4,929,822, Cl. 250-201.400.
Yamada, Hiroshi; Nakano, Ryo; Matsuo, Yasutoshi; and Mikami, Seiichi, 4,930,005, Cl. 358-36.000.
Victor, Richard A.: *See—*
Lockett, Michael J.; and Victor, Richard A., 4,929,399, Cl. 261-112.200.
Vignotto, Angelo: *See—*
Colanzi, Franco; and Vignotto, Angelo, 4,928,371, Cl. 29-898.064.
Villani, Jean P.: *See—*
Butler, David R.; Snow, George; Sandford, Philip; Neu, Max G.; Villani, Jean P.; Teyssière, Alain; and Lenoir, Roland, 4,928,746, Cl. 164-362.000.
Villanyi, Tibor J.; and Westerson, Kevin W., to Cummins Engine Company, Inc. Dual acting-double breakover throttle lever. 4,928,647, Cl. 123-400.000.
Vincent, Gary A.; Sylvester, Judith M.; and Vincent, Harold L., to Dow Corning Corporation. Quaternary ammonium salt of an alkoxysilane as a dispersant for magnetic pigment. 4,929,376, Cl. 252-62.560.
Vincent, Harold L.: *See—*
Vincent, Gary A.; Sylvester, Judith M.; and Vincent, Harold L., 4,929,376, Cl. 252-62.560.
Vinciguerra, Constantino; and Coppini, Massimo, to Nuovopignone-Industrie Meccaniche e Fonderia, S.p.A. System for disengageably coupling a rotor body to the shaft of rotary machines, in particular gas turbines and rotary dobbies. 4,929,119, Cl. 403-359.000.
Vinokur, Bertold B.: *See—*
Tikhonovich, Vadim I.; Pavljuk, Vladimir D.; Vinokur, Bertold B.; Kondratjuk, Stanislav E.; Lutsenko, Georgy G.; Edemsky, Vladimir K.; Kiselev, Vladimir B.; Karasev, Nikolai M.; and Myakishev, Anatoly K., 4,929,416, Cl. 420-12.000.
Virginia Polytechnic Institute and State University: *See—*
Gibson, Harry W.; and Jois, Yajnanarayana H. R., 4,929,713, Cl. 528-230.000.
Virkola, Nils E.: *See—*
Kiiskila, Erkki J.; and Virkola, Nils E., 4,929,307, Cl. 159-47.300.
Visual Ease, Inc.: *See—*
Blum, Jerome V., 4,929,865, Cl. 313-478.000.
Vitt, Burckard: *See—*
Breidenbach, Dieter; Oldengott, Hans; and Vitt, Burckard, 4,929,179, Cl. 432-247.000.
Voest-Alpine Automotive Gesellschaft M.B.H.: *See—*
Kronberger, Maximilian H., 4,928,886, Cl. 239-533.500.
Vogel, Peter S. Selective video playing system. 4,930,158, Cl. 380-5.000.
Vogel, Peter S. Automatic censorship of video programs. 4,930,160, Cl. 380-23.000.
Voigt, Dean J. Honda breakaway. 4,928,634, Cl. 119-153.000.
Vold, Barbara S., to SRI International. Reagents, methods, and test kit for diagnosing/monitoring cancer in humans. 4,929,544, Cl. 435-6.000.
Volk, Joseph A., Jr., to Beta Raven, Inc. Apparatus for a pellet mill without steam addition. 4,929,163, Cl. 425-143.000.
Volles, Warren K.: *See—*
Holcombe, Thomas C.; Sager, Thomas C.; Volles, Warren K.; and Zarchy, Andrew S., 4,929,799, Cl. 585-737.000.
Volodchenko, Dmitry B.: *See—*
Kljuev, Vladimir V.; Kozlov, Valery S.; Volodchenko, Dmitry B.; Stepanenko, Alexandr V.; Baranovsky, Vladimir I.; Korolkov, Mikhail I.; and Semenov, Orest S., 4,930,026, Cl. 360-67.000.
von Ballmoos, Roland: *See—*
Tsao, Ying-Yen P.; and von Ballmoos, Roland, 4,929,576, Cl. 502-35.000.
von Dadelszen, Michael: *See—*
Sergoyan, Edward G.; and von Dadelszen, Michael, 4,930,137, Cl. 372-81.000.
von Gizycki, Ulrich: *See—*
Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, 4,929,705, Cl. 528-49.000.
Von Platen, Magnus H. Method for recovering latent heat from a heat transfer medium. 4,928,752, Cl. 165-104.170.
Vorreiter, John W.; and Dean, Robert L., to Perkin-Elmer Corporation, The. Passive electrostatic vacuum particle collector. 4,929,139, Cl. 414-217.000.
Vortab Corporation: *See—*
Smith, Charles R., 4,929,088, Cl. 366-337.000.
Voss, Peter H.: *See—*
Davies, Thomas J.; Seevinck, Evert; Pfennings, Leonardus C. M. G., deceased; Kennen, Henricus J.; Voss, Peter H.; O'Connell, Cormac M.; Phelan, Cathal G.; and Ontrop, Hans, 4,929,911, Cl. 330-264.000.
Vossen-Bergmans, Marie-Madelene: *See—*
Verbeek, Willibrordus G. C.; Wijbenga, Hendrik; and Vossen-Bergmans, Marie-Madelene, 4,929,863, Cl. 313-113.000.
Voyce, Kenneth G.; and McCandless, Jay H., to Boeing Company, The. Amplifier linearization using down/up conversion. 4,929,906, Cl. 330-149.000.
Vujevic, Aleksandar: *See—*
Torbus, Marek; Jerman, Franz; Ladegourdie, Gerard; Lingemann, Dirk; Seiss, Willi; and Vujevic, Aleksandar, 4,929,649, Cl. 523-145.000.
Vukov, Rastko: *See—*
Anderson, Norman S.; Promislow, Albert L.; Rayborn, Randy L.; and Vukov, Rastko, 4,929,769, Cl. 568-614.000.
Vulich, Yordan: *See—*
Ramos, Rolando P.; Loreto, Wilfredo P.; and Vulich, Yordan, 4,928,439, Cl. 51-284.00E.
W.R. Grace & Co.-Conn.: *See—*
Berneburg, Philip L.; and Rice, Roy W., 4,928,645, Cl. 123-188.0AA.
Hegedus, Louis; Beeckman, Jean W.; Pan, Wie-Hin; and Soler, Jeffrey P., 4,929,586, Cl. 502-217.000.
Heifetz, Aaron H.; Wolfe, Richard A.; Braatz, James A.; and Luthra, Narender P., 4,929,706, Cl. 528-49.000.
Schirmer, Henry G., 4,928,474, Cl. 53-425.000.
Whittenberger, William A., 4,928,485, Cl. 60-299.000.
Wormsbecher, Richard F., 4,929,338, Cl. 208-120.000.
W. Schlafhorst & Co.: *See—*
Kalitzki, Siegfried; Peters, Josef; and Schurmann, Gottfried, 4,928,477, Cl. 57-416.000.
Wey, Edmund, 4,928,895, Cl. 242-35.50A.
Wirtz, Ulrich; and Engelhardt, Dietmar, 4,928,903, Cl. 242-130.000.
WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Binarsch, Jurgen; Bode, Jurgen; Danne, Lutz; and Lissel, Norbert, 4,930,040, Cl. 361-154.000.
Waber, Rene: *See—*
Demuth, Robert; Staheli, Paul; Waber, Rene; Grundler, Christoph; and Machler, Franz, 4,928,353, Cl. 19-65.00A.
Wachendorff-Neumann, Ulrike: *See—*
Lindner, Werner; Becker, Benedikt; Steffens, Robert; Wachendorff-Neumann, Ulrike; Brandes, Wilhelm; Stendel, Wilhelm; and Dutzmann, Stefan, 4,929,642, Cl. 514-510.000.
Wacker-Chemie GmbH: *See—*
Burger, Christa; Muller, Johann; and Bosch, Erhard, 4,929,647, Cl. 522-99.000.
Wacker, Thomas P.; and Zabinski, Raymond J., to General Electric Company. Method of bonding using UV curable epoxy resin compositions with delayed cure. 4,929,305, Cl. 156-273.300.
Wada, Hiroshi: *See—*
Yoshida, Masaru; Yoshikawa, Mitsuhiko; Yoshimoto, Yoshikazu; Wada, Hiroshi; Suzuki, Tomonari; and Nakajima, Shigeo, 4,929,803, Cl. 174-117.00M.
Wada, Shunichi: *See—*
Harara, Mitsuhiko; Takizawa, Shozo; Tanaka, Tadao; and Wada, Shunichi, 4,930,082, Cl. 364-424.050.
Waddell, Troy: *See—*
Walker, Jerry; and Waddell, Troy, 4,928,864, Cl. 224-162.000.
Wade, Mark G.; and Kenaston, Kenneth R. Rotary screw fish collector. 4,929,350, Cl. 210-157.000.
Wadlington, James C.: *See—*
Slack, William F.; and Wadlington, James C., 4,930,061, Cl. 363-44.000.
Waelti, Werner, to Werkzeugmaschinenfabrik Tschudin. Means and method for resetting a cylindrical grinding machine. 4,928,437, Cl. 51-165.710.
Wagh, Vijay N.: *See—*
Walton, Paul B.; Keough, James; Demers, Richard L.; Denny, Leland A., Jr.; Kaiser, Robert E.; Moses, Cornellius, Jr.; and Wagh, Vijay N., 4,930,151, Cl. 379-94.000.
Wagner, Georg: *See—*
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Diekmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000.
Wagner, John T. Variable-inertia flywheels and transmission. 4,928,553, Cl. 475-268.000.
Wagner Spray Tech Corporation: *See—*
Walsh, Warren J.; and Kallevig, Bruce, 4,928,722, Cl. 137-881.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Wahlquist, Joseph D.: *See—*
Midkiff, David G.; Rippl, Carl G.; Twyman, Nancy D.; and Wahlquist, Joseph D., 4,929,480, Cl. 428-35.600.
Waineo, Glenn. Walking beam apparatus. 4,928,811, Cl. 198-774.000.
Wakabayashi, Hideaki, to Aisin Seiki Kabushiki Kaisha. Free wheel hub clutch. 4,928,804, Cl. 192-83.000.
Wakasugi, Nobuo: *See—*
Hatakeyama, Motonobu; Yoshimura, Kohtaroh; Naoi, Hidenori; and Wakasugi, Nobuo, 4,930,089, Cl. 361-519.000.
Wakatuski, Yoshio: *See—*
Shimizu, Giichiro; Shimizu, Misao; Takeuchi, Hajime; Okuyama, Toshiharu; and Wakatuski, Yoshio, 4,930,096, Cl. 364-550.000.
Wakayama, Sachio; Ishikawa, Fumiyasu; and Oishi, Kunio, to Kibun Co., Ltd. Substance GIF-2 and process for production of the same. 4,929,548, Cl. 435-71.200.
Wakeman, Russell J.: *See—*
van Vuuren, Willem N. J.; and Wakeman, Russell J., 4,928,640, Cl. 123-90.170.
Wakimoto, Zenji; and Hayashi, Takahisa, to Dainippon Screen Mfg. Co., Ltd. Telecentric image-forming optical system for large image size. 4,929,066, Cl. 350-415.000.
Walbro Corporation *See—*
Asselin, Brian K., 4,928,657, Cl. 123-514.000.
Walker, Hans: *See—*
Pegel, Karl H.; and Walker, Hans, 4,929,603, Cl. 514-26.000.
Walker, Jerry; and Waddell, Troy. Hand clasp tape dispenser. 4,928,864, Cl. 224-162.000.
Walker, Laura B.: *See—*
Walker, Robert M., Jr.; Walker, Robert M., Sr.; and Walker, Laura B., 4,928,425, Cl. 47-18.000.
Walker, Robert M., Jr.; Walker, Robert M., Sr.; and Walker, Laura B. Greenhouse with integral humidifier 4,928,425, Cl. 47-18.000.
Walker, Robert M., Sr.: *See—*
Walker, Robert M., Jr.; Walker, Robert M., Sr.; and Walker, Laura B., 4,928,425, Cl. 47-18.000.
Wallace Computer Services, Inc.: *See—*
Dash, Thomas E., 4,928,940, Cl. 270-1.100.
Wallace, W. Edward; Smith, H. Kevin; Lynch, W. Bryan; Craig, Raymond S.; and Pourarian, Fiaz, to Advanced Materials Corporation. Hydrogen heat pump. 4,928,496, Cl. 62-46.200.
Wallerstorfer, Kurt: *See—*
Kocznar, Wolfram; and Wallerstorfer, Kurt, 4,929,821, Cl. 235-493.000.
Wallner, Anders: *See—*
Lundgren, Bengt; and Wallner, Anders, 4,930,143, Cl. 378-37.000.
Walmsley, Robert G.: *See—*
Natarajan, Bangalore R.; and Walmsley, Robert G., 4,929,514, Cl. 428-611.000.
Walsh, Joseph C., to Adolph Coors Company. Packaging alignment system. 4,929,223, Cl. 493-56.000.
Walsh, Warren J.; and Kallevig, Bruce, to Wagner Spray Tech Corporation. Pressure relief after electric shut-off of pump. 4,928,722, Cl. 137-881.000.
Walter, Jurgen: *See—*
Lunke, Manfred, Falz, Ulrich; and Walter, Jurgen, 4,929,115, Cl. 403-228.000.
Walters, Dale E. Folding sign. 4,928,415, Cl. 40-610.000.
Walters, Darrell L., and Larsen, Steven D. Reversible clam shell bucket. 4,928,410, Cl. 37-117.500.
Walters, David A. Robotic devices. 4,928,546, Cl. 74-479.000.
Walton, Paul B.; Keough, James; Demers, Richard L.; Denny, Leland A., Jr.; Kaiser, Robert E.; Moses, Cornellius, Jr.; and Wagh, Vijay N., to General Electric Company. Telephone call forwarding device. 4,930,151, Cl. 379-94.000.
Wamser, Christian A.: *See—*
Boghean, Barry J.; Subbanna, Somanahalli N.; Redmon, Charles L.; and Wamser, Christian A., 4,929,435, Cl. 423-484.000.
Wanami, Hideki: *See—*
Suzuki, Kiyosuke; and Wanami, Hideki, 4,930,008, Cl. 358-75.000.
Wang, Kuen-Yi. Golf club head surveying instrument. 4,928,397, Cl. 33-508.000.
Wang, Li: *See—*
Moser, Mark D., Lawson, R. Joe; Antos, George J.; Wang, Li; and Parulekar, Vivekanand N., 4,929,332, Cl. 208-65.000.
Moser, Mark D.; Lawson, R. Joe; Wang, Li; and Parulekar, Vivekanand N., 4,929,333, Cl. 208-65.000.
Wang, Ming-I. Gas lighter with spark ignition. 4,929,174, Cl. 431-276.000.
Wang, Richard H. S.; and Myers, Garry L., to Eastman Kodak Company. Cyclic phosphites and stabilized polymeric compositions. 4,929,654, Cl. 524-117.000.
Wang, Samuel S.; and Nagarai, D. R., to American Cyanamid Company. Novel collectors and processes for making and using same. 4,929,343, Cl. 209-166.000.
Waniczek, Helmut: *See—*
Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, 4,929,689, Cl. 525-333.900.
Wanner, Edward A.: *See—*
Wegman, Dwight D.; Wanner, Edward A.; Rehrer, Wilson P.; and Widge, Sunil, 4,929,419, Cl. 420-56.000.
Wantz, Armand: *See—*
Van Der Poel, Robert J.; and Wantz, Armand, 4,929,298, Cl. 156-414.000.
Ward, Edwin J.; and Ward, Thomas C., II. High current capacity electrical corrosive electrolyte battery electrical interconnection system. 4,929,522, Cl. 429-178.000.
Ward, Ian A.: *See—*
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., 4,929,950, Cl. 342-25.000.
Ward, Julia M.: *See—*
Hayden, Joseph S.; Sapak, David L.; and Ward, Julia M., 4,929,387, Cl. 252-301.40P.
Ward, Thomas C., II: *See—*
Ward, Edwin J.; and Ward, Thomas C., II, 4,929,522, Cl. 429-178.000.
Warman, Eugene C.: *See—*
Steele, Duane F.; Warman, Eugene C.; and Hutter, Robert J., 4,929,157, Cl. 417-312.000.
Warner-Lambert Company: *See—*
Chucholowski, Alexander W.; Roth, Bruce D.; and Sliskovic, Drago R., 4,929,620, Cl. 514-269.000.
Coughenour, Linda L.; Davis, Robert E.; Downs, David A.; Heffner, Thomas G.; Meltzer, Leonard T.; Moos, Walter H.; Moreland, David W.; and Tecle, Haile, 4,929,734, Cl. 546-338.000.
Culbertson, Townley P.; Domagala, John M.; Hagen, Susan E.; and Sanchez, Joseph P., 4,929,613, Cl. 514-210.000.
Sharma, Shri C.; Shaw, James J.; and Yang, Robert K., 4,929,508, Cl. 424-439.000.
Yang, Robert K., 4,929,447, Cl. 424-440.000.
Warner & Swasey Company, The: *See—*
Raleigh, Freddie L., 4,928,396, Cl. 33-503.000.
Wasco Products, Inc.: *See—*
Sampson, Robert; and Flanigan, Sean, 4,928,445, Cl. 52-72.000.
Washburn, Robert M.; and Dodson, Jerry D., to Acurex Corporation. Carbon-carbon composite structural assemblies and methods of making the same. 4,929,505, Cl. 728-408.000.
Wasserman, Harry H.; Murugesan, Natesan; and Van Duzer, John H., to Yale University. Vinyl tricarbonyl compounds and methods of making the same. 4,929,751, Cl. 560-174.000.
Wasserman, Jacob F.: *See—*
Sekhar, Laligam N.; Scalbassi, Robert J.; Sun, Mingui; and Wasserman, Jacob F., 4,928,705, Cl. 128-773.000.
Watabe, Mitsuru: *See—*
Morinaga, Shigeki; and Watabe, Mitsuru, 4,930,100, Cl. 364-900.000.
Watanabe, Kazuyoshi: *See—*
Ishikawa, Osamu; and Watanabe, Kazuyoshi, 4,928,803, Cl. 192-58.00B.
Watanabe, Shoichi: *See—*
Mizutani, Minoru; Kikuchi, Hiroshi; Watanabe, Shoichi; Hayashi, Kuniharu; and Maekawa, Masanori, 4,929,102, Cl. 400-248.000.
Watanabe, Tadahiko; Shobu, Kazuhisa; Kai, Yukio; Yamamoto, Hideki; Sudoh, Eiichi; Yagishita, Osamu; and Hayakawa, Junshiro, to Agency of Industrial Science and Technology. Method of manufacture metal diboride ceramics. 4,929,417, Cl. 419-12.000.
Watanabe, Tomomi: *See—*
Shinya, Yoshiyuki; Tabara, Yoshitaka; Okuno, Itaru; Kaneko, Tadashi; and Watanabe, Tomomi, 4,928,652, Cl. 123-417.000.
Watanabe, Tsutomu; Sagiyama, Masari; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, to NKK Corporation. Apparatus for removing electroplating metal deposited onto surface of conductor roll. 4,929,323, Cl. 204-206.000.
Watanabe, Tsutomu; Sagiyama, Masaru; Kawabe, Masaki; Tsujihara, Toshiyuki; and Takushima, Shigehiro, to NKK Corporation. Apparatus for removing electroplating metal deposited onto surface of conductor roll. 4,929,324, Cl. 204-206.000.
Watanabe, Yasuhiko: *See—*
Maruta, Keiichi; Ueda, Takashi; and Watanabe, Yasuhiko, 4,929,590, Cl. 503-207.000.
Waterville TG, Inc.: *See—*
Kuzuhara, Michio; Shibasaki, Jun; St. Louis, Andree; St. Laurent, Christian; and Bedard, Michel, 4,928,431, Cl. 49-479.000.
Watkins, Bruce J.: *See—*
Milberger, Lionel J.; Nobileau, Philippe C.; and Watkins, Bruce J., 4,928,769, Cl. 166-382.000.
Watson, John C.; Gaskill, Stephen P.; Russell, David F.; and Burns, Robert L. D., to Lucas Industries public limited company. Disc for disc brakes. 4,928,798, Cl. 188-218.0XL.
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Watts, Robert M., to Boeing Company, The. Gap, overwind, and lead angle sensor for fiber optic bobbins. 4,928,904, Cl. 242-158.00R.
Waynick, John A., to Amoco Corporation. Steel mill grease. 4,929,371, Cl. 252-25.000.
Weaver, Christopher A.: *See—*
Shadzi, Bahram; and Weaver, Christopher A., 4,929,499, Cl. 428-336.000.
Weaver, Edgar N., Jr.: *See—*
Perry, Ralph; and Weaver, Edgar N., Jr., 4,928,973, Cl. 273-176.00A.
Weaver, Frank C., to Stewart Warner Instrument Corporation. Universal fuel sender. 4,928,526, Cl. 73-313.000.
Webb, Frances C.: *See—*
Langston, Richard D.; Webb, Frances C.; and McBeath, Simon C., 4,928,681, Cl. 128-156.000.
Webber Gage Division of L.S.: *See—*
Webber, George B., 4,929,082, Cl. 356-358.000.

Webber, George B., to Webber Gage Division of L.S. Laser linear distance measurement system and apparatus. 4,929,082, Cl. 356-358.000.
Webber, William T.: *See—*
Ferrenberg, Allan J.; and Webber, William T., 4,928,658, Cl. 123-543.000.
Weber S.r.l.: *See—*
Ausiello, Francesco Paolo, 4,928,656, Cl. 123-504.000.
Ricco, Mario, 4,928,888, Cl. 239-533.800.
Weber, Wolfgang: *See—*
Heina, Karl-Fritz; Schwarz, Horst; and Weber, Wolfgang, 4,928,953, Cl. 271-185.000.
Weed, Lyle E., to Brunswick Corporation. Equalizer port. 4,928,636, Cl. 123-73.00R.
Wegleiter, Walter, to Siemens Aktiengesellschaft. Process for the separation of monolithic LED chip arrangements generated on a semiconductor substrate wafer. 4,929,300, Cl. 156-645.000.
Wegman, Dwight D.; Wanner, Edward A.; Rehrer, Wilson P.; and Widge, Sunil, to Carpenter Technology Corporation. Heat, corrosion, and wear resistant steel alloy and article. 4,929,419, Cl. 420-56.000.
Wehrmann, Rick S.: *See—*
Gereby, John L.; Gifford, Eric P.; Wehrmann, Rick S.; and Easter, William M., 4,928,455, Cl. 53-570.000.
Weil, Gunter: *See—*
Muller-Stute, Friedrich; and Weil, Gunter, 4,929,053, Cl. 350-96.340.
Weinberg, Matthew: *See—*
Thomas, Mammen; and Weinberg, Matthew, 4,929,992, Cl. 357-23.900.
Weingart, Richard C., to United States of America, Energy. Reverse slapper detonator. 4,928,595, Cl. 102-202.700.
Weinstein, Richard, to DeVilbiss Company, The. Air turbine driven rotary atomizer. 4,928,883, Cl. 239-223.000.
Weisenberger, Johannes: *See—*
Nickl, Josef; Heckel, Armin; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Eisert, Wolfgang; and Muller, Thomas, 4,929,754, Cl. 562-428.000.
Weiser, Harald: *See—*
Meier, Werner; Rambeck, Walter A.; Weiser, Harald; and Zucker, Hermann, 4,929,610, Cl. 514-167.000.
Weisfeldt, Myron: *See—*
Halperin, Henry; Tsitlik, Joshua; Weisfeldt, Myron; and Gelfand, Mark, 4,928,674, Cl. 128-30.200.
Weiss, Hermann; and Weiss, Rudolf, to ATEC-Weiss KG. Overload release clutch for the transmission of rotary movement between shafts. 4,928,802, Cl. 192-56.00R.
Weiss, Rudolf: *See—*
Weiss, Hermann; and Weiss, Rudolf, 4,928,802, Cl. 192-56.00R.
Weitemeyer, Christian: *See—*
Rogler, Wolfgang; Weitemeyer, Christian; Wewers, Dietmar; Zapf, Frederic; and Stapp, Bernhard, 4,929,051, Cl. 350-96.300.
Weixelman, Lawrence M.; and Swanson, Richard D., to Boeing Company. Fluxgate magnetometer apparatus and adjustment method to maintain accuracy over a wide temperature range. 4,929,899, Cl. 324-253.000.
Welker, Brian H., to Welker Engineering Company. Fluid sample apparatus featuring integral construction with a motor driven sampling system. 4,928,536, Cl. 73-863.830.
Welker Engineering Company: *See—*
Welker, Brian H., 4,928,536, Cl. 73-863.830
Wells, Gary L.: *See—*
Thedford, Guy N.; and Wells, Gary L., 4,928,459, Cl. 56-13.300.
Werkzeugmaschinenfabrik Tschudin: *See—*
Waelti, Werner, 4,928,437, Cl. 51-165.710.
Wermeling, William J.: *See—*
Isham, William R.; Cragun, E. Brent; Gault, Christopher; and Wermeling, William J., 4,928,853, Cl. 222-108.000.
Wessling, Bernhard M., to Zipperling Kessler & Co. (GmbH & Co.). Antistatic or electrically semiconducting thermoplastic polymer blends, method of making same and their use. 4,929,388, Cl. 252-500.000.
Wessling, Ritchie A.: *See—*
Cheng, Roberta C.; Wessling, Ritchie A.; and Schmidt, Donald L., 4,929,556, Cl. 435-180.000.
Westcott, Robert D. Solvent recovery apparatus and method. 4,929,312, Cl. 203-2.000.
Westerberg, Anders. Heat exchanging apparatus. 4,928,754, Cl. 165-134.100.
Westerkamp, Bart; and Van Dijk, Geert. Respirating apparatus for patients. 4,928,683, Cl. 128-203.120.
Western Design Corporation: *See—*
Golden, Michael D., 4,928,574, Cl. 89-34.000.
Westerson, Kevin W.: *See—*
Villanyi, Tibor J.; and Westerson, Kevin W., 4,928,647, Cl. 123-400.00.
Westfalia Separator AG: *See—*
Zettler, Karl-Heinz, 4,929,227, Cl. 494-41.000.
Westhoff Toll and Die Company: *See—*
Allemann, James D., 4,929,131, Cl. 409-234.000.
Westimayer, Anthony J.; and Spettel, Gary. Rigid tree seat. 4,928,793, Cl. 182-187.000.
Westinghouse Electric Corp.: *See—*
Kaufmann, John W.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,929,413, Cl. 376-268.000.
Scott, Dennis J.; and Calfo, Raymond M., 4,928,572, Cl. 89-8.000.
Wettlaufer, David G.: *See—*
Allen, Richard C.; and Wettlaufer, David G., 4,929,622, Cl. 514-281.000.
Wewers, Dietmar: *See—*
Rogler, Wolfgang; Weitemeyer, Christian; Wewers, Dietmar; Zapf, Frederic; and Stapp, Bernhard, 4,929,051, Cl. 350-96.300.
Wey, Edmund, to W. Schlafhorst & Co. Method and apparatus for assembling a plurality of packages for transport along a textile machine. 4,928,895, Cl. 242-35.50A.
Whillock, Allan A.: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,929,476, Cl. 428-34.200.
White, Douglas S., to Elkem a/s. Tiltable ladle and cover for such ladle. 4,928,862, Cl. 222-604.000.
White, Jerry H. Fire sprinkler head jig. 4,928,773, Cl. 169-37.000.
White, Jonathan Z. Bottled water dispensing system. 4,928,856, Cl. 222-174.000.
White, Richard G.: *See—*
Freeman, Anthony; Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., 4,929,950, Cl. 342-25.000.
Whiting, Douglas L.; and George, Glen A., to STAC, Inc. Digital phase lock loop. 4,930,142, Cl. 375-120.000.
Whitney, Kent A.: *See—*
Viana, Luis M.; Cuozzo, Robert A.; Miceli, Michael L.; and Whitney, Kent A., 4,930,035, Cl. 361-54.000.
Whitten, Jeffrey P.: *See—*
Matthews, Donald P.; McCarthy, James R.; and Whitten, Jeffrey P., 4,929,744, Cl. 548-202.000.
Whittenberger, William A., to W. R. Grace & Co.,-Conn. Metallic core member for catalytic converter and catalytic converter containing same. 4,928,485, Cl. 60-299.000.
Whybrow, Derek: *See—*
Jeffery, James E.; and Whybrow, Derek, 4,929,629, Cl. 514-646.000.
Wichita State University, Board of Trustees of the: *See—*
Groutas, William C., 4,929,736, Cl. 548-341.000.
Wideman, Lawson G.; and Botzman, Thomas J., to Goodyear Tire & Rubber Company, The. Hydroformylation of carbon black. 4,929,280, Cl. 106-472.000.
Widge, Sunil: *See—*
Wegman, Dwight D.; Wanner, Edward A.; Rehrer, Wilson P.; and Widge, Sunil, 4,929,419, Cl. 420-56.000.
Wiegand, Walter J.; Swindal, James L.; Swarts, Richard E.; Bullis, Robert H.; Lopiccolo, Mario T.; Grantham, Daniel H.; and Foyt, Arthur G., to United Technologies. Capacitive accelerometer with separable damping and sensitivity. 4,930,042, Cl. 361-280.000.
Wiegand, Walter J., to United Technologies. Closed-loop capacitive accelerometer with spring constraint. 4,930,043, Cl. 361-283.000
Wienkenhover, Martin: *See—*
Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, 4,929,705, Cl. 528-49.000.
Wieser, Karl-Heinz: *See—*
Mazanek, Jan; von Gizycki, Ulrich; Muller, Hanns P.; Wienkenhover, Martin; Wieser, Karl-Heinz; Paulat, Volker; Theuer, Werner; and Muller, Walter, 4,929,705, Cl. 528-49.000.
Wieserman, Larry F.: *See—*
Martin, Edward S.; and Wieserman, Larry F., 4,929,589, Cl. 502-406.000.
Wiggins, Kregg S.: *See—*
Wright, Danny O.; and Wiggins, Kregg S., 4,929,879, Cl. 318-696.000.
Wijbenga, Hendrik: *See—*
Verbeek, Willibrordus G. C.; Wijbenga, Hendrik; and Vossen-Bergmans, Marie-Madelene, 4,929,863, Cl. 313-113.000.
Wilbanks, John W. Board anchor. 4,928,360, Cl. 24-235.000.
Wilcox, Robert. Tool handle with pivoting head. 4,929,112, Cl. 403-93.000.
Wild Leitz AG: *See—*
Huisen, Andre, 4,929,077, Cl. 356-4.500.
Wilder, Bruce A.: *See—*
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,928,346, Cl. 15-338.000.
Wildner, Walter, to MTU Motoren-und Turbinen-Union Munchen. Blade arrangement for a propulsion rotor. 4,929,154, Cl. 416-230.000.
Wiley, Patrick C.; and Rorison, Allen H., to 373249 B.C. Ltd. Two stage process for rejuvenating asphalt-paved road surfaces. 4,929,120, Cl. 404-77.000.
Will, Horst, to RXS Schrumpftechnik-Garnituren GmbH, Firma. Heat-shrinkable sleeve and the process for the production thereof. 4,929,477, Cl. 428-34.900.
William Lawrence Heisey, A Partnership Trading as Single Play Video: *See—*
Granzotto, Robert; and Wong, Wah K. J., 4,928,905, Cl. 242-201.000.
Williams, Gary R. Head immobilizer and method for immobilizing. 4,928,711, Cl. 128-869.000.
Williams, Jack L., to ITT Corporation. Searchlight drive means and apparatus. 4,930,057, Cl. 362-272.000.
Williams, John E. Hatch cover. 4,928,615, Cl. 114-203.000.

Williams, Ronald L., to Hughes Aircraft Company. Alloy bonded indium bumps and methods of processing same. 4,930,001, Cl. 357-71.000.
Willyard, Marvin R.; and Lingg, Jean M., to Ph. Orth Co. Frozen donut batter and method for preparing cooked product therefrom. 4,929,464, Cl. 426-549.000.
Wilmes, Manfred: *See—*
Strate, Rudiger; Schulze, Rainer; Schnatwinkel, Michael; Wagner, Georg; Wilmes, Manfred; Haller, Bernd; Herkner, Ernst; Diekmann, Jorg; and Henning, Herbert, 4,929,198, Cl. 439-709.000.
Wilson, David R.; and Stevens, James C., to Dow Chemical Company, The. Process for hydrogenation of polymers. 4,929,699, Cl. 525-339.000.
Wilson, Edward L.: *See—*
Gauchel, James V.; Wilson, Edward L.; and Kerle, Edward J., 4,929,651, Cl. 523-505.000.
Wilson, Mark L., to Unisys Corporation. Traveling wave fiber optic interferometric sensor and method of polarization poling fiber optic. 4,929,050, Cl. 250-227.170.
Wilson, Robert W.: *See—*
Robitaille, James M.; and Wilson, Robert W., 4,929,887, Cl. 324-66.000.
Winkelmann, Jurgen: *See—*
Sabranski, Udo; Luther, Hans W.; Sabinski, Horst; and Winkelmann, Jurgen, 4,928,598, Cl. 102-467.000.
Wirtz, Ulrich; and Engelhardt, Dietmar, to W. Schlafhorst & Co. Pallet for transporting cops. 4,928,903, Cl. 242-130.000.
Wiseman, Albert D., to Airborne Express, Inc. Loading pallet for aircraft cargo containers. 4,929,133, Cl. 410-52.000.
Witte, Josef: *See—*
Meurer, Kurt P.; Waniczek, Helmut; Sylvester, Gerd; and Witte, Josef, 4,929,689, Cl. 525-333.900.
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Wojtysiak, Pamela. Single rod and lock bracket soft shade system, kit and method. 4,928,743, Cl. 160-84.100.
Wolf, Hans-Joachim. Holding fixture, in particular for medical use. 4,928,917, Cl. 248-507.000.
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Wolf, Richard A.; and Grosso, Paul V., to Dow Chemical Company, The. Polymerizable aromatic-azo-aliphatic compounds capable of generating photoinitiated free radicals 4,929,721, Cl. 534-885.000.
Wolfe, Richard A.: *See—*
Heifetz, Aaron H.; Wolfe, Richard A.; Braatz, James A.; and Luthra, Narender P., 4,929,706, Cl. 528-49.000.
Wolfertz, Gunter: *See—*
Collas, Wolfgang; Wolfertz, Gunter; and Wolfertz, Roger, 4,928,362, Cl. 24-90.00R.
Wolfertz, Roger: *See—*
Collas, Wolfgang; Wolfertz, Gunter; and Wolfertz, Roger, 4,928,362, Cl. 24-90.00R.
Wong, Daniel T.; and Speraw, Floyd G., to NRC Corporation. Printed circuit board assembly. 4,929,185, Cl. 439-74.000.
Wong, Jacob Y., to Evionics, Inc. Non-contact respiration rate and apnea monitor using pulmonary gas exchange technique. 4,928,703, Cl. 128-719.000.
Wong, Wah K. J.: *See—*
Granzotto, Robert; and Wong, Wah K J., 4,928,905, Cl. 242-201.000.
Wong, Yuen W.; Mazilu, Doina; and Amdahl, Paul O., to Dataproducts Corporation. Microprocessor-controlled meter package for a printer. 4,930,101, Cl. 364-900.000.
Woo, Ann K., to Advaced Micro Devices, Inc. Input voltage protection system. 4,930,037, Cl. 361-58.000.
Wood, Daniel C.: *See—*
Atkinson, Robert W.; Crayton, John W.; Portschellcr, James I.; and Wood, Daniel C., 4,928,642, Cl. 123-180.00R.
Wood, James W.: *See—*
Freeman, Anthony Blacknell, David; Quegan, Shaun; Ward, Ian A.; Oliver, Christopher J.; Finley, Ian P.; White, Richard G.; and Wood, James W., 4,929,950, Cl. 342-25.000.
Wooden, James R.: *See—*
Patterson, William A.; Tong, Dien H.; and Wooden, James R., 4,929,100, Cl. 400-124.000.
Woodliff, Ann S. Map board game. 4,928,967, Cl. 273-254.000.
Woods, William A., to Spirotron Corporation. Pendulum mounted airbrush. 4,928,625, Cl. 118-323.000.
Woodworth, Jonathan J.; Johnson, Stephen P.; Miller, David R.; Kester, Jeffrey J.; and Kershaw, Stanley S., Jr., to Cooper Industries, Inc. Fail-safe surge arrester. 4,930,039, Cl. 361-127.000.
Wormsbecher, Richard F., to W. R. Grace & Co. - Conn. Catalytic cracking catalyst and process. 4,929,338, Cl. 208-120.000.
Worner, Jorg, to NUKEM GmbH. Method for producing thin-film solar cells in a series-connected array. 4,929,281, Cl. 136-201.000.
Worner, Walter: *See—*
Kientsch-Engel, Rosemarie; Worner, Walter; and Kleinhammer, Gerd, 4,929,543, Cl. 435-5.000.
Wright, Anthony R.: *See—*
Holroyd, Eric; and Wright, Anthony R., 4,929,292, Cl. 156-132.000.
Wright, Bernard S.; Gould, Ronald M.; and Owen, Hartley, to Mobil Oil Corporation. Multistage process for converting oxygenates to liquid hydrocarbons and ethene. 4,929,780, Cl. 585-303.000.
Wright, Danny O.; and Wiggins, Kregg S., to Siemens-Bendix Automotive Electronics L.P. Microstepping of an unipolar stepping motor. 4,929,879, Cl. 318-696.000.
Wright, John V.: *See—*
Macaione, Anthony F.; and Wright, John V., 4,930,134, Cl. 372-33.000.
Wright, Ricky A.: *See—*
Berg, Larry; Wright, Ricky A.; and Caswell, Philip A., 4,929,110, Cl. 402-73.000.
Wrighton, Mark S., to Massachusetts Institute of Technology. Amperometric electrochemical ion sensors and method for determining ion concentration. 4,929,313, Cl. 204-153.100.
Wu, Andrew H.: *See—*
Wu, Min-Yu; and Wu, Andrew H., 4,928,836, Cl. 215-11.500.
Wu, Maw-Kuen, to University of Alabama at Huntsville, The. Superconducting thin film fabrication. 4,929,595, Cl. 505-1.000.
Wu, Min-Yu; and Wu, Andrew H. Baby bottle with air valve. 4,928,836, Cl. 215-11.500.
Xerox Corporation: *See—*
Barton, Arthur A.; DeBolt, Frederick C.; Elter, Michael R.; Fromm, Paul M.; Grossi, Frank A.; Miller, Mark T.; Rasch, Kenneth R.; and Szlucha, Thomas F., 4,929,983, Cl. 355-315.000.
Brunner, Timothy A., 4,929,083, Cl. 356-400.000.
Evangelista, Donato D.; LaTour, Norman E.; and Kirven, Bobby, 4,928,948, Cl. 271-110.000.
Merbler, Rudolph, 4,929,217, Cl. 474-54.000.
Xia, Yan: *See—*
Kozikowski, Alan P.; and Xia, Yan, 4,929,731, Cl. 546-97.000.
Y & B Investment Corporation: *See—*
Zuck, Daniel R., 4,928,907, Cl. 244-6.000.
Yabu, Atsuhiro; and Tsukahara, Toshiro, to Mitsubishi Denki Kabushiki Kaisha. Signal recording/reproducing device. 4,930,030, Cl. 360-107.000.
Yabusaki, Masao; Yamamoto, Etsuji; Takeuchi, Hiroyuki; and Kohno, Hideki, to Hitachi, Ltd.; and Hitachi Medical Corporation. Probe for nuclear magnetic resonance apparatus. 4,929,881, Cl. 324-318.000.
Yagishita, Osamu: *See—*
Watanabe, Tadahiko; Shobu, Kazuhisa; Kai, Yukio; Yamamoto, Hideki; Sudoh, Eiichi; Yagishita, Osamu; and Hayakawa, Junshiro, 4,929,417, Cl. 419-12.000.
Yaguchi, Yoshinori; Kubota, Masahiro; and Nakaminami, Masamitsu, to Kabushiki Kaisha Mori Seiki Seisikusho. Automatic tool changer. 4,928,381, Cl. 29-568.000.
Yahagi, Toshio: *See—*
Iwagawa, Yoshihiro; Yahagi, Toshio; and Fujii, Etsuo, 4,929,036, Cl. 303-115.000.
Yakame, Kazunori, to Dainippon Screen Mfg. Co. Ltd. Halftone dot generator using grained screen patterns. 4,930,023, Cl. 358-460.000.
Yakeuchi, Yasutomo: *See—*
Takematsu, Tetsuo; Yakeuchi, Yasutomo; Takenaka, Mitsuaki; Takamura, Seiji; and Matsushita, Akio, 4,929,273, Cl. 71-118.000.
Yale University: *See—*
Wasserman, Harry H.; Murugesan, Natesan; and Van Duzer, John H., 4,929,751, Cl. 560-174.000.
Yamada, Hiroshi; Nakano, Ryo; Matsuo, Yasutoshi; and Mikami, Seiichi, to Victor Company of Japan, Ltd. Circuit for removing crosstalk components in a carrier chrominance signal. 4,930,005, Cl. 358-36.000.
Yamada, Ichiho: *See—*
Noguchi, Hiroyuki; and Yamada, Ichiho, 4,928,385, Cl. 29-788.000.
Yamada, Kazuhiko, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Vehicle speed control device. 4,928,779, Cl. 180-178.000.
Yamada, Masanori, to NEC Corporation. Computer power supply with optically isolated shutdown circuits. 4,930,062, Cl. 363-55.000.
Yamada, Okimasa: *See—*
Sonoi, Takehiro; and Yamada, Okimasa, 4,929,686, Cl. 525-279.000.
Yamada, Takashi; Nomura, Masaaki; Yamamoto, Ryoichi; Matsubaguchi, Satoshi; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Method of making magneto-optical recording medium. 4,929,320, Cl. 204-192.200.
Yamada, Takuzi: *See—*
Miyoshi, Takahito; Kanazawa, Minoru; Sugisaki, Tsutomu; Yamada, Takuzi; and Okuzawa, Yasutoshi, 4,930,032, Cl. 360-132.000.
Yamada, Tomoyasu: *See—*
Nagahara, Shinichi; Suzuki, Tomoyuki; Yamada, Tomoyasu; Takahashi, Tokihiro; and Miyake, Ichiro, 4,930,031, Cl. 360-107.000.
Yamagata, Hideo: *See—*
Mizushima, Shoji; and Yamagata, Hideo, 4,929,559, Cl. 435-252.330.
Yamagishi, Yuichi: *See—*
Kageyama, Shuhei; Suzuki, Takahiko; and Yamagishi, Yuichi, 4,929,107, Cl. 401-65.000.
Yamaguchi, Nobuhito: *See—*
Sato, Mitsuya; Ukaji, Takao; Yamaguchi, Nobuhito; Ohmori, Taro; and Murakami, Eiichi, 4,929,893, Cl. 324-158.00F.
Yamaguchi Seiken Kogyo Kabushiki Kaisha: *See—*
Miyazaki, Kunihiro; Ishitobi, Ken; and Yamaguchi, Yosinobu, 4,929,257, Cl. 51-309.000.
Yamaguchi, Tatsuaki; and Hirota, Kozo, to Mitsubishi Kasei Corporation. Method for producing hydrocarbons having two carbon atoms. 4,929,797, Cl. 585-921.000.
Yamaguchi, Tetsuo; and Matsushita, Hiroomi, to Sumitomo Rubber Industries, Ltd. Golf club and method of designing same. 4,928,965, Cl. 273-78.000.

Yamaguchi, Toshihide: *See—*
Inoue, Toshio; Mine, Takayuki; Izutsu, Hitoshi; Yamaguchi, Toshihide; Kobata, Fumihiro; and Kawabata, Juheiji, 4,929,665, Cl. 524-500.000.
Yamaguchi, Yosinobu: *See—*
Miyazaki, Kunihiro; Ishitobi, Ken; and Yamaguchi, Yosinobu, 4,929,257, Cl. 51-309.000.
Yamaha Corporation: *See—*
Kudo, Masaki; and Suzuki, Hideo, 4,928,569, Cl. 84-626.000.
Kurosaki, Makoto, 4,928,567, Cl. 84-422.300.
Nakanishi, Tatsuo; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,928,972, Cl. 273-78.000.
Yamamoto, Atsushi: *See—*
Fuse, Toshikazu; Yamamoto, Atsushi; and Sano, Junji, 4,929,248, Cl. 8-128.100.
Yamamoto, Etsuji: *See—*
Yabusaki, Masao; Yamamoto, Etsuji; Takeuchi, Hiroyuki; and Kohno, Hideki, 4,929,881, Cl. 324-318.000.
Yamamoto, Hideki: *See—*
Watanabe, Tadahiko; Shobu, Kazuhisa; Kai, Yukio; Yamamoto, Hideki; Sudoh, Eiichi; Yagishita, Osamu; and Hayakawa, Junshiro, 4,929,417, Cl. 419-12.000.
Yamamoto, Hirofumi: *See—*
Higuchi, Mitsuhiro; and Yamamoto, Hirofumi, 4,928,325, Cl. 4-247.000.
Yamamoto, Hisao; and Nakamura, Atsushi, to Takemoto Yushi Kabushiki Kaisha. Finish compositions for synthetic yarns. 4,929,366, Cl. 252-8.600.
Yamamoto, Masakazu: *See—*
Takenaka, Takaji; Netsu, Tositada; Shigi, Hidetaka; and Yamamoto, Masakazu, 4,930,002, Cl. 357-75.000.
Yamamoto, Michio; and Sekiya, Satoshi, to Futaba Denshi Kogyo K.K. Radio control transmitter having improved display characteristics. 4,929,949, Cl. 341-176.000.
Yamamoto, Motohiro: *See—*
Sugihara, Kanji; Yamamoto, Motohiro; Kida, Tohru; and Fukazawa, Minoru, 4,929,472, Cl. 427-215.000.
Yamamoto, Ryoichi: *See—*
Yamada, Takashi; Nomura, Masaaki; Yamamoto, Ryoichi; Matsubaguchi, Satoshi; and Nahara, Akira, 4,929,320, Cl. 204-192.200.
Yamamoto, Susumu: *See—*
Nishimura, Yoshifumi; Yamamoto, Susumu; Nakata, Hidekazu; Muraoka, Kiyoshige; Uchida, Mamoru; and Taguchi, Takafumi, 4,929,512, Cl. 428-610.000.
Yamamoto, Yoko; Tanaka, Hitoshi; and Mikami, Noboru, to Mitsubishi Denki Kabushiki Kaisha. System for detecting defects in a regularly arranged pattern such as an integrated circuit or the like. 4,929,081, Cl. 356-354.000.
Yamamoto, Yoshihiro; Saito, Junya; and Suzuki, Masakazu, to Sony Corporation. Automatic level adjusting system for a television receiver. 4,930,004, Cl. 358-29.000.
Yamano, Kayoko: *See—*
Koda, Akihide; Kita, Jun'ichiro; Kuroki, Yoshiaki; Fujiwara, Hiroshi; Takamura, Shinji; and Yamano, Kayoko, 4,929,618, Cl. 514-253.000.
Yamanoi, Seijichi, to Yamanoi Seiki Co., Ltd. Mechanism for detacheably fitting a male fixing member and a female engaging member. 4,929,117, Cl. 403-328.000.
Yamanoi Seiki Co., Ltd.: *See—*
Yamanoi, Seijichi, 4,929,117, Cl. 403-328.000.
Yamashita, Hiromasa: *See—*
Inaba, Yoshiharu; Mitoguchi, Fumio; and Yamashita, Hiromasa, 4,929,165, Cl. 425-150.000.
Yamashita, Takaji; and Uchida, Hiroshi. Position-sensitive radiation detector. 4,929,835, Cl. 250-367.000.
Yamashita, Takayuki: *See—*
Otomura, Keiichiro; Yamashita, Takayuki; Kanemitsu, Setsuo; Nakabayashi, Shigetoshi; and Miki, Hideo, 4,929,430, Cl. 423-11.000.
Yamashita, Toshio: *See—*
Funahashi, Nobuhiro; Yamashita, Toshio; and Ogawa, Hiroshi, 4,928,500, Cl. 62-193.000.
Yamashita, Tsutomu T.; Shir, Ching-Cheng; and Chen, Tu, to Komag, Inc. Corrosion resistant magnetic disk. 4,929,500, Cl. 428-336.000.
Yamashita, Yoshiro: *See—*
Mukai, Toshio; and Yamashita, Yoshiro, 4,929,730, Cl. 544-345.000.
Yamato Scale Company, Limited: *See—*
Nagao, Takeyoshi; and Kohashi, Toru, 4,928,473, Cl. 53-53.000.
Yamatsu, Isao: *See—*
Abe, Shinya; Miyamoto, Mitsuaki; Tanaka, Masayuki; Akasaka, Kozo; Hayashi, Kenji; Kawahara, Tetsuya; Katayama, Satoshi; Sakuma, Yoshinori; Suzuki, Takeshi; and Yamatsu, Isao, 4,929,623, Cl. 514-293.000.
Yamauchi, Hiroshi: *See—*
Machida, Yoshimasa; Negi, Shigeto; Kamiya, Takashi; Komatu, Yuuki; Sugiyama, Isao; Kai, Yasunobu; Nakamura, Takaharu; Naito, Toshihiko; Kitoh, Kyosuke; Katsu, Kanemasa; and Yamauchi, Hiroshi, 4,929,612, Cl. 514-202.000.
Yamazaki, Etsuo: *See—*
Karube, Norio; Egawa, Akira; Yamazaki, Etsuo; Ichisa, Nobuaki; and Manabe, Mitsuo, 4,930,135, Cl. 372-33.000.
Yamazaki, Shingo: *See—*
Kobashi, Rikizo; Takase, Shigeyuki; Enomoto, Hiroyuki; Hayasaki, Yasushi; Kobayashi, Toyohisa; and Yamazaki, Shingo, 4,929,685, Cl. 525-277.000.
Yamazaki, Takashi: *See—*
Kitazume, Tomoya; Yamazaki, Takashi; and Rin, Seiten, 4,929,760, Cl. 568-308.000.
Yamazoe, Seigo; Nakai, Sadao; and Fukui, Yukimasa, to Cosmo Oil Co., Ltd. Rapid determination of sludge content and device therefor. 4,929,847, Cl. 250-573.000.
Yanagisawa, Mitsuo, to Pearl Musical Instrument Co. Device for applying tension to a pair of drum heads. 4,928,566, Cl. 84-413.000.
Yang, Chin-lung; and Lee, Chung-tien. Rods precision cutting-off and end surface grinding machine. 4,928,432, Cl. 51-5.00C.
Yang, Robert K., to Warner-Lambert Company. Encapsulation composition for use with chewing gum and edible products. 4,929,447, Cl. 424-440.000.
Yang, Robert K.: *See—*
Sharma, Shri C.; Shaw, James J.; and Yang, Robert K., 4,929,508, Cl. 424-439.000.
Yaniv, Zvi; Cannella, Vincent D.; Hansell, Gregory L.; and Swartz, Louis D., to Ovonic Imaging Systems, Inc. Method of fabricating amorphous silican diode addressed liquid crystal display. 4,929,569, Cl. 437-51.000.
Yasuda, Hiroshi; and Suzuki, Masahiko, deceased (by Suzuki, Yoshikazu, Fumie Suzuki, heirs), to Fujitsu Limited. Magnetic object lens for an electron beam exposure apparatus which processes a wafer carried on a continuously moving stage. 4,929,838, Cl. 250-492.200.
Yasuda, Kazunori: *See—*
Maeda, Satoru; Noguchi, Yasushi; Yasuda, Kazunori; and Takano, Shyunsuke, 4,930,014, Cl. 358-209.000.
Yasuhuku, Motonobu: *See—*
Tanaka, Hiroyuki; Uto, Kuniharu; Kawai, Kazumi; Shaura, Tsuneo; and Yasuhuku, Motonobu, 4,929,221, Cl. 474-205.000.
Yazaki Corporation: *See—*
Hyogo, Yukihiro; and Kurihara, Akio, 4,929,182, Cl. 439-34.000.
Oikawa, Ryuetsu; and Fujita, Akihiko, 4,928,349, Cl. 16-2.000.
Yazawa, Hiromi; Inoda, Masahiro; and Kimura, Hideaki, to Fuji Photo Film, Co., Ltd. Image scanning reading and recording system. 4,930,016, Cl. 358-296.000.
Yeates, Richard P.; Keating, Bruce E.; and Halliar, William R., to Trailer Train Company. Articulated platform car for three or four trailers. 4,929,132, Cl. 410-56.000.
Yen, Huan-Wun: *See—*
Lee, Jar J.; and Yen, Huan-Wun, 4,929,956, Cl. 342-376.000.
Yoas, Harold E. Fish protection system for dams. 4,929,122, Cl 405-81.000.
Yoder, Max N., to United States of America, Navy. High power diamond traveling wave amplifier. 4,929,986, Cl. 357-22.000.
Yokogawa Electric Corporation: *See—*
Kimura, Toshio; Okano, Yoshihiro; Otani, Masahiro; and Miyamoto, Shigenobu, 4,930,090, Cl. 364-520.000.
Yoneda, Akira; and Miura, Katsuyoshi, 4,929,891, Cl. 324-154 0PB.
Yokogawa, Fumihiko; and Naito, Ryuichi, to Pioneer Electronic Corporation. Phase-locked loop circuit. 4,929,917, Cl. 331-1.00A.
Yokohama Rubber Co., Ltd., The: *See—*
Akita, Shuichi; Suzuki, Fumitoshi; Kikuchi, Yasushi; and Oishi, Hideyuki, 4,929,679, Cl. 525-194.000.
Yokoi, Takeshi; and Okamori, Shuhei, to Brother Kogyo Kabushiki Kaisha. Printer system for enabling user to select various forms-feed modes. 4,929,104, Cl. 400-605.000.
Yokota, Akira; and Kuga, Masao, to Olympus Optical Co. Ltd. Illumination optical system for endoscopes. 4,929,070, Cl. 350-432.000.
Yokota, Eiji: *See—*
Hirayama, Takanobu; Funahashi, Hiroyuki; Yokota, Eiji; Uehara, Mitsuyoshi; Kagami, Isao; Hasegawa, Makoto; and Mizuno, Masaru, 4,929,105, Cl. 400-625.000.
Yokota, Haruo, to Agency of Industrial Science and Technology Multiport memory system. 4,930,066, Cl. 364-200.000.
Yokoyama, Nobuyoshi: *See—*
Nishino, Hiroshi; Ejiri, Susumu; and Yokoyama, Nobuyoshi, 4,928,664, Cl. 126-391.000.
Yoneda, Akira; and Miura, Katsuyoshi, to Yokogawa Electric Corporation. Exciting unit for internal magnet type meters. 4,929,891, Cl. 324-154.0PB.
Yoneda, Masahiro, to Mitsubishi Denki Kabushiki Kaisha Semiconductor memory device. 4,929,990, Cl. 357-23.600.
Yonekura, Mikio; and Kinoshita, Jiro, to Fanuc Ltd. Interrupt control method for multiprocessor system. 4,930,070, Cl. 364-200.000.
Yonezawa, Akihiro; Sasaki, Hiroki; Mitsuyuki, Yoichiro; Mori, Yasuki; and Ishigami, Toshihiko, to Kabushiki Kaisha Toshiba. High intensity discharge lamp containing iron and silver in the arc tube filling. 4,929,869, Cl. 313-639.000.
Yonezawa, Keitaro: *See—*
Daicho, Norio; Kawahara, Masakatsu; Nitta, Jiro; Miyazaki, Koji; and Yonezawa, Keitaro, 4,928,919, Cl. 251-89.000.
Yonezawa, Kyoichi: *See—*
Houjiyou, Yuji; Hayasaki, Hiroyuki; and Yonezawa, Kyoichi, 4,929,844, Cl. 250-561.000.
Yoshida, Fujio: *See—*
Awano, Hikaru; Asai, Seiichi; Kaneko, Katsuo; Kaida, Hiroshi; and Yoshida, Fujio, 4,928,882, Cl. 239-112.000.
Yoshida, Kenji, to Advantest Corporation. Pin electronics device having a phase adjustment function for IC testers and phase adjustment method therefor. 4,929,888, Cl. 371-25.100.
Yoshida Kogyo K. K.: *See—*
Kasai, Kazumi, 4,928,365, Cl. 24-635.000.
Yoshida Kogyo K.K.: *See—*
Ishii, Susumu; and Matsushima, Hideyuki, 4,928,358, Cl. 24-431.000.

VOL
1114
ISS
5
MY
29
1990
UMI

Yoshida, Masaru; Yoshikawa, Mitsuhiko; Yoshimoto, Yoshikazu; Wada, Hiroshi; Suzuki, Tomonari; and Nakajima, Shigeo, to Sharp Kabushiki Kaisha. Planar conductive piece with electrical anisotrophy. 4,929,803, Cl. 174-117.00M.

Yoshida, Motoaki: *See—*
Kitayama, Shinichiro; Adachi, Teruho; Ueda, Masahiro; Aoki, Yuichi; Shiiki, Satoshi; Takigawa, Akio; Yoshida, Motoaki; Imamura, Nacya; Maeda, Koichi; and Kayanoki, Hisayuki, 4,929,523, Cl. 430-4.000.

Yoshida, Tetsushi: *See—*
Sugimoto, Naoshige; Yoshida, Tetsushi; and Toyama, Tadahisa, 4,929,060, Cl. 350-339.00F.

Yoshikawa, Kuniyoshi, to Kabushiki Kaisha Toshiba. Non-volatile semiconductor memory device and method of the manufacture thereof. 4,929,988, Cl. 357-23.500.

Yoshikawa, Mitsuhiko: *See—*
Yoshida, Masaru; Yoshikawa, Mitsuhiko; Yoshimoto, Yoshikazu; Wada, Hiroshi; Suzuki, Tomonari; and Nakajima, Shigeo, 4,929,803, Cl. 174-117.00M.

Yoshimoto, Yoshikazu: *See—*
Yoshida, Masaru; Yoshikawa, Mitsuhiko; Yoshimoto, Yoshikazu; Wada, Hiroshi; Suzuki, Tomonari; and Nakajima, Shigeo, 4,929,803, Cl. 174-117.00M.

Yoshimura, Kohtaroh: *See—*
Hatakeyama, Motonobu; Yoshimura, Kohtaroh; Naoi, Hidenori; and Wakasugi, Nobuo, 4,930,089, Cl. 361-519.000.

Yoshimura, Toru: *See—*
Matayoshi, Yutaka; Yoshimura, Toru; Kamegaya, Shigeru; and Hamai, Kyugo, 4,928,650, Cl. 123-90.240.

Yoshimura, Yoshinari *See—*
Takeuchi, Hiroshi; and Yoshimura, Yoshinari, 4,928,805, Cl. 192-106.200.

Yoshinaka, Minoru; Matsuo, Koujirou; Koike, Kiichi; Suzuki, Yoshie; and Sugimoto, Mansaku, to Matsushita Electric Industrial Co., Ltd. Sealed lead-acid storage battery. 4,929,518, Cl. 429-54.000.

Yoshinaka, Shigeo: *See—*
Suzuki, Akinori; Hyeon, Suong B.; Kajita, Toshio; Furushima, Masakazu; Yoshinaka, Shigeo; Suzuki, Takashi; Oda, Mitsunori; and Tanaka, Akinori, 4,929,267, Cl. 71-77.000.

Yoshitake, Akihiro: *See—*
Iino, Hideyuki; Yoshitake, Akihiro; and Hida, Hidenori, 4,929,854, Cl. 307-480.000

Young, Errol D. Tubing connector. 4,929,114, Cl. 403-172.000.

Young, Hartley F., to Ralph McKay Limited. Fastening rails to wooden sleepers. 4,928,878, Cl. 238-351.000.

Young, Jerald A.: *See—*
Mather, John C.; and Young, Jerald A., 4,928,387, Cl. 29-840.000.

Young, Michael J. R., to General Dispensing Systems Limited. Infuser. 4,928,584, Cl. 99-289.00T.

Yuchi, Sadataka; Machida, Haruchika; Matsuoka, Naoya; and Kikuchi, Masamichi, to Hochiki Corp. Output correction system for analog sensor. 4,930,095, Cl. 364-571.010.

Yum, Su I.: *See—*
Roth, Nathan; and Yum, Su I., 4,929,233, Cl. 604-131.000.

Zabinski, Raymond J. *See—*
Wacker, Thomas P.; and Zabinski, Raymond J., 4,929,305, Cl. 156-273.300.

Zaghloul, Amir I.: *See—*
Sorbello, Robert M.; Effland, John E.; and Zaghloul, Amir I., 4,929,959, Cl. 343-700.0MS.

Zagrodnik, Jeffrey P.: *See—*
Bowen, Gerald K.; and Zagrodnik, Jeffrey P., 4,929,325, Cl. 204-268.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Shibahara, Seiji; Takahashi, Yukiko; Matsuhashi, Yuji; Hachisu, Mitsugu; Kondo, Shinichi; Takeuchi, Tomio; and Aoyagi, Takaaki, 4,929,633, Cl. 514-423.000.

Zaidi, Mohammad A., to Aluminum Company of America. Aluminum sheet product having reduced earing and method of making. 4,929,285, Cl. 148-11.50A.

Zander, Richard A.; Gaiser, Robert F.; Dillon, William F., Jr.; and Crumb, Donald A., to Allied-Signal Inc. Primary and secondary pressure-balanced proportioning valve. 4,929,033, Cl. 303-9.630.

Zapf, Frederic: *See—*
Rogler, Wolfgang; Weitemeyer, Christian; Wewers, Dietmar; Zapf, Frederic; and Stapp, Bernhard, 4,929,051, Cl. 350-96.300.

Zarchy, Andrew S.: *See—*
Holcombe, Thomas C.; Sager, Thomas C.; Volles, Warren K.; and Zarchy, Andrew S., 4,929,799, Cl. 585-737.000.

Zedrosser, Ulrich, to Steyr-Daimler-Puch AG. Ring fuze for firearm ammunition. 4,928,597, Cl. 102-430.000.

Zeibig, Winfried; and Huskes, Heinrich, to Deutsche Texaco Aktiengesellschaft. Aqueous synthetic dispersions. 4,929,668, Cl. 524-745.000.

Zeller, Edward J.: *See—*
Dreschhoff, Gisela A. M.; and Zeller, Edward J., 4,929,489, Cl. 428-195.000.

Zenith Electronics Corporation: *See—*
Dougherty, Lawrence W.; Lee, Sae D.; and Rogers, Melvin F., 4,930,015, Cl. 358-246.000.
Tong, Hua Sou, 4,929,864, Cl. 313-402.000.

Zenith Electronics Corporations: *See—*
McBeath, Les L.; Sheikholeslami, Amir M.; and Turro, Glenn T., 4,929,933, Cl. 340-703.000.

Zeppelin-Metallwerke GmbH: *See—*
Schaepers, Arno; and Grabherr, Bernd, 4,929,802, Cl. 174-35.0MS.

Zettler, Karl-Heinz, to Westfalia Separator AG. Centrifuge drum for separating mixtures of liquids. 4,929,227, Cl. 494-41.000.

Zhou, Xia-Ying: *See—*
Kostic, Nenad M.; and Zhou, Xia-Ying, 4,929,091, Cl. 374-162.000.

Zhu, Yong H.: *See—*
Kirsch, Wolff M.; Zhu, Yong H.; and Cushman, Robert B., 4,929,240, Cl. 606-151.000.

Ziecina, Frederick J.: *See—*
Batra, Surinder P.; Hammer, William E.; Lushinsky, Gene A.; Marquart, David W.; Schwane, Walter H.; and Ziecina, Frederick J., 4,930,069, Cl. 364-200.000.

Zinn, Ben T.; and Reiner, David, to Georgia Tech Research Corporation. Stably operating pulse combustor and method. 4,929,172, Cl. 431-1.000.

Zipperling Kessler & Co. (GmbH & Co.): *See—*
Wessling, Bernhard M., 4,929,388, Cl. 252-500.000.

Zirrgiebel, Jutta: *See—*
Matz, Richard; and Zirrgiebel, Jutta, 4,929,515, Cl. 428-614.000.

Zoller, Wilhelm: *See—*
Payer, Wolfgang; Buhnen, Heinz D.; and Zoller, Wilhelm, 4,928,720, Cl. 137-13.000.

Zorzolo, Luciano, to Comelz S.p.A. Machine for glueing and folding sheet-like materials. 4,929,296, Cl. 156-357.000.

Zschiesche, Lothar, to LISEGA GmbH. Hydraulic dashpot. 4,928,799, Cl. 188-314.000.

Zuck, Daniel R., to Y & B Investment Corporation. Compound helicopter with no tail rotor. 4,928,907, Cl. 244-6.000.

Zucker, Hermann: *See—*
Meier, Werner; Rambeck, Walter A.; Weiser, Harald; and Zucker, Hermann, 4,929,610, Cl. 514-167.000.

Zusy, Matthew S. Apparatus for manipulating compact disc jewel boxed. 4,928,816, Cl. 206-232.000.

3D Systems, Inc.: *See—*
Hull, Charles W., 4,929,402, Cl. 264-22.000.

373249 B.C. Ltd.: *See—*
Wiley, Patrick C., and Rorison, Allen H., 4,929,120, Cl. 404-77.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MAY, 1990

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Thermal, L.P.: *See—*
Zebuhr, William H., Re. 33,222, Cl. 122-13.00R.

Bayer Aktiengesellschaft: *See—*
Jonas, Friedrich; and Hocker, Jurgen, Re. 33,223, Cl. 252-518.000.

Hocker, Jurgen: *See—*
Jonas, Friedrich; and Hocker, Jurgen, Re. 33,223, Cl. 252-518.000.

Irwin Magnetic Systems, Inc.: *See—*
Speigelstein, Wolfgang, Re. 33,224, Cl. 360-93.000.

Jonas, Friedrich; and Hocker, Jurgen, to Bayer Aktiengesellschaft. Organic polymers containing TCNQ complexes and stabilized against the emission of HCN. Re. 33,223, Cl. 252-518.000.

Speigelstein, Wolfgang, to Irwin Magnetic Systems, Inc. Drive for end loading and transversely shifting tape cartridge. Re. 33,224, Cl. 360-93.000.

Wichmann, Janice L., to Zenith Electronics Corporation. Method for mating television CRT cathode components. Re. 33,225, Cl. 445-36.000.

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Zenith Electronics Corporation: *See—*
Wichmann, Janice L., Re. 33,225, Cl. 445-36.000

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Advanced Cardiovascular Systems, Inc.: *See—*
Simpson, John B.; and Robert, Edward W., B1 4,323,071, Cl. 128-343.000.

Ajaxon, Bengt M.: *See—*
Wretlind, Karl A. J.; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt M., B1 1,032,393, Cl. 514-219.000.

Akasaka, Nobuhiro: *See—*
Fukuma, Masumi; and Akasaka, Nobuhiro, B1 4,802,732, Cl. 350-96.230.

Bane, William. Reusable insulated box and method of manufacture. B1 4,642,970, 5-29-90, Cl. 53-433.000.

British Petroleum Co.: *See—*
Calvert, Paul D.; Ellul, Raymond M.; and Moyle, Brian D., B1 4,806,579, Cl. 524-99.000.

Brooks, Harry F.: *See—*
Malizio, Andrew B.; Rice, Martin A.; and Brooks, Harry F., B1 3,905,809, Cl. 420-578.000.

Cadtrak Corporation: *See—*
Sukonick, Josef S.; and Tilden, Greg J., B1 1,031,200, Cl. 340-721.000.

Calvert, Paul D.; Ellul, Raymond M.; and Moyle, Brian D., to British Petroleum Co. Polymer composites. B1 4,806,579, 5-29-90, Cl. 524-99.000.

Cook, Benjamin H.: *See—*
von Gunten, Marc K.; Cook, Benjamin H.; and Gerstenberger, David C., B1 4,615,034, Cl. 372-99.000.

Ellul, Raymond M.: *See—*
Calvert, Paul D.; Ellul, Raymond M.; and Moyle, Brian D., B1 4,806,579, Cl. 524-99.000.

Fukuma, Masumi; and Akasaka, Nobuhiro, to Sumitomo Electric Industries, Inc. Ltd. Optical fiber cable preventing water from spreading toward cable interior. B1 4,802,732, 5-29-90, Cl. 350-96.230.

Gerber Scientific Products Inc.: *See—*
Logan, David J., B1 4,591,999, Cl. 364-523.000.

Gerstenberger, David C.: *See—*
von Gunten, Marc K.; Cook, Benjamin H.; and Gerstenberger, David C., B1 4,615,034, Cl. 372-99.000.

Hakansson, Ivan: *See—*
Wretlind, Karl A. J.; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt M., B1 1,032,393, Cl. 514-219.000.

KabiVitrum AB: *See—*
Wretlind, Karl A. J.; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt M., B1 1,032,393, Cl. 514-219.000.

Kimura, Kazuo; and Maruyama, Masao, to Tsubakimoto Chain Co. Tensioner for toothed drive belts. B1 4,708,696, 5-29-90, Cl. 474-103.000.

Lemelson, Jerome H., to Patent Incentives, Inc. Information storage and reproduction system. B1 1,031,239, 5-29-90, Cl. 358-102.000.

Ljungberg, Stellan: *See—*
Wretlind, Karl A. J.; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt M., B1 1,032,393, Cl. 514-219.000.

Logan, David J., to Gerber Scientific Products Inc. Method and apparatus for automatically spacing characters during composition. B1 4,591,999, 5-29-90, Cl. 364-523.000.

Malizio, Andrew B.; Rice, Martin A.; and Brooks, Harry F., to United States Pipe and Foundry Company. Alloy for making ductile iron. B1 3,905,809, 5-29-90, Cl. 420-578.000.

Maruyama, Masao: *See—*
Kimura, Kazuo; and Maruyama, Masao, B1 4,708,696, Cl. 474-103.000.

Moyle, Brian D.: *See—*
Calvert, Paul D.; Ellul, Raymond M.; and Moyle, Brian D., B1 4,806,579, Cl. 524-99.000.

Patent Incentives, Inc.: *See—*
Lemelson, Jerome H., B1 1,031,239, Cl. 358-102.000

Rice, Martin A.: *See—*
Malizio, Andrew B.; Rice, Martin A.; and Brooks, Harry F., B1 3,905,809, Cl. 420-578.000.

Robert, Edward W.: *See—*
Simpson, John B.; and Robert, Edward W., B1 4,323,071, Cl. 128-343.000.

Simpson, John B.; and Robert, Edward W., to Advanced Cardiovascular Systems, Inc. Vascular guiding catheter assembly and vascular dilating catheter assembly and a combination thereof and methods of making the same. B1 4,323,071, 5-29-90, Cl. 128-343.000.

Spectra-Physics, Inc.: *See—*
von Gunten, Marc K.; Cook, Benjamin H.; and Gerstenberger, David C., B1 4,615,034, Cl. 372-99.000.

Sukonick, Josef S.; and Tilden, Greg J., to Cadtrak Corporation. Raster scan display apparatus for dynamically viewing image elements stored in a random access memory array. B1 1,031,200, 5-29-90, Cl. 340-721.000.

Sumitomo Electric Industries, Inc. Ltd.: *See—*
Fukuma, Masumi; and Akasaka, Nobuhiro, B1 4,802,732, Cl. 350-96.230.

Taglarino, Joseph. Water saving trap primer. B1 4,218,786, 5-29-90, Cl. 4-206.000.

Tilden, Greg J.: *See—*
Sukonick, Josef S.; and Tilden, Greg J., B1 1,031,200, Cl. 340-721.000.

Tsubakimoto Chain Co.: *See—*
Kimura, Kazuo; and Maruyama, Masao, B1 4,708,696, Cl. 474-103.000.

United States Pipe and Foundry Company: *See—*
Malizio, Andrew B.; Rice, Martin A.; and Brooks, Harry F., B1 3,905,809, Cl. 420-578.000.

von Gunten, Marc K.; Cook, Benjamin H.; and Gerstenberger, David C., to Spectra-Physics, Inc. Ultra-narrow bandwith optical thin film interference coating for single wavelength lasers. B1 4,615,034, 5-29-90, Cl. 372-99.000.

Wretlind, Karl A. J.; Ljungberg, Stellan; Hakansson, Ivan; and Ajaxon, Bengt M., to KabiVitrum AB. Composition for enhancing the administration of pharmacologically active agents. B1 1,032,393, 5-29-90, Cl. 514-219.000.

VOL
1114
ISS
5
MY
29
1990
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LIST OF DESIGN PATENTEES

Abbott Laboratories: *See—*
Hollar, Robert C.; and Huang, Tung-Ming, 308,163, Cl. D9-341.000.
Adam, Brian D.; and Adam, Courtney L., to Bramec Corporation. Air conditioner support. 308,247, 5-29-90, Cl. D23-354.000.
Adam, Courtney L.: *See—*
Adam, Brian D.; and Adam, Courtney L., 308,247, Cl. D23-354.000.
Airway Industries, Inc.: *See—*
Kim, Hyun S., 308,132, Cl. D3-71.000.
Kim, Hyun S., 308,133, Cl. D3-71.000.
Kim, Hyun S., 308,134, Cl. D3-71.000.
Kim, Hyun S., 308,135, Cl. D3-71.000.
Akagi, Kenichi: *See—*
Tedham, Thomas A., and Akagi, Kenichi, 308,198, Cl D14-114.000.
Appelbaum, Paul. Key safe for a vehicle. 308,276, 5-29-90, Cl. D99-28.000.
Apple Computer, Inc.: *See—*
Willnauer, Sigmar, 308,196, Cl. D14-113.000.
Aspects, Inc.: *See—*
Bescherer, Robert E.; and Colvin, Barry D., 308,173, Cl. D10-57.000.
Auman, Debora S. Can cap 308,169, 5-29-90, Cl. D9-446.000.
Bally, Alexander: *See—*
Jones, Gary L.; Todd, Robert J.; Fender, Norman N.; Wood, Dale A.; and Bally, Alexander, 308,213, Cl. D15-199.000.
Barron, Peter B.: *See—*
Urbanus, David S.; and Barron, Peter B., 308,220, Cl. D18-13.000
Battles, Clayton: *See—*
Battles, Eugene P.; and Battles, Clayton, 308,253, Cl. D26-38.000.
Battles, Eugene P.; and Battles, Clayton. Combined flashlight and recharger therefor. 308,253, 5-29-90, Cl. D26-38.000.
Beamish, Linda Koch: *See—*
Koch, Frank J., 308,248, Cl. D23-401.000.
Bescherer, Robert E.; and Colvin, Barry D., to Aspects, Inc. Window thermometer. 308,173, 5-29-90, Cl. D10-57.000.
Biu, Mak K.: *See—*
Kung-kit, Wen; and Biu, Mak K., 308,258, Cl. D26-49.000.
Blacker, Allan. Combined perpetual calendar and file 308,224, 5-29-90, Cl. D19-21.000.
Boat America Corporation: *See—*
Ellison, Richard P., 308,192, Cl. D12-168.000.
Bojar, James A.: *See—*
Shaw, Richard J.; and Bojar, James A., 308,265, Cl. D28-64.000.
Bradd, Sidney H., to Hoover Company, The. Storage rack for a vacuum cleaner and tools. 308,267, 5-29-90, Cl. D32-31.000.
Bramec Corporation: *See—*
Adam, Brian D.; and Adam, Courtney L., 308,247, Cl. D23-354.000.
Bridgeport Metal Goods Manufacturing Company, The: *See—*
Staubitz, Robert B.; and Marshall, Frank G., 308,257, Cl. D26-49.000.
Bridgestone/Firestone, Inc.: *See—*
Hinrichsen, Silvana; and Ceccarelli, Alessandro, 308,188, Cl. D12-146.000.
Hinrichsen, Silvana; and Ceccarelli, Alessandro, 308,189, Cl. D12-147.000.
Brio Scanditoy Corporation: *See—*
Lewis, Mary E.; and Middleton, Priscilla R., 308,149, Cl. D6-588.000.
Buchanan, Carroll A. Releasable coupling for a fishing line, or the like. 308,240, 5-29-90, Cl. D22-134.000.
Buckley, Francis D., to Delmed, Inc. Peritoneal dialysis machine. 308,249, 5-29-90, Cl. D24-8.000.
Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Earring or similar article. 308,180, 5-29-90, Cl. D11-76.000.
Burkarth, Jack, to Gulton Industries, Inc. Fluorescent lighting fixture. 308,259, 5-29-90, Cl. D26-78.000.
Burke, David W., to Motion Controls and Automation, Inc. Fluid-operated multimotion actuator. 308,207, 5-29-90, Cl. D15-7.000.
Caiso Computer Co., Ltd.: *See—*
Katsuhara, Tatsuo, 308,215, Cl. D17-7.000.
Candle Corporation of America: *See—*
Friese, James R., 308,252, Cl. D26-11.000.
Canon Kabushiki Kaisha: *See—*
Kojima, Tatsuo, 308,221, Cl. D18-13.000.
Sano, Hiroshi; and Ishikawa, Tadashi, 308,222, Cl. D18-36.000.
Tanaka, Noboru; and Hirohata, Michio, 308,214, Cl. D16-209.000.
Cazes, Michel. Flexible container. 308,164, 5-29-90, Cl. D9-373.000.
Ceccarelli, Alessandro: *See—*
Hinrichsen, Silvana; and Ceccarelli, Alessandro, 308,188, Cl. D12-146.000.
Hinrichsen, Silvana; and Ceccarelli, Alessandro, 308,189, Cl. D12-147.000.
Cedergreen, Steven D., to Tempress Incorporated. Lure retriever handle. 308,242, 5-29-90, Cl. D22-149.000.
Chapin, David S.; and Humphrey, William C., to Cooper Industries, Inc. Base for storing and carrying a propane torch and accessories 308,136, 5-29-90, Cl. D3-73.000.
Chutick, Mark L.: *See—*
Dressler, Timothy J., 308,225, Cl. D19-26.000.
CK Products, Inc.: *See—*
Cook, Estle A., 308,263, Cl. D26-140.000.
Cohen, Martin B., to Latin Percussion, Inc. Drum head ring. 308,217, 5-29-90, Cl. D17-22.000.
Collins, Harry F., to Service Ideas, Inc. Insulated beverage server. 308,153, 5-29-90, Cl. D7-322.000.
Colvin, Barry D.: *See—*
Bescherer, Robert E.; and Colvin, Barry D., 308,173, Cl. D10-57.000.
Cook, Estle A., to CK Products, Inc. Magnetic trouble light holder. 308,263, 5-29-90, Cl. D26-140.000.
Cooper Industries, Inc.: *See—*
Chapin, David S.; and Humphrey, William C., 308,136, Cl. D3-73.000.
Cross Keys Manufacturing, Inc.: *See—*
Sulyma, Ihor, 308,175, Cl. D10-105.000.
Dallman, Brian L., to Nor-Lake, Inc. Upright refrigeration unit. 308,212, 5-29-90, Cl. D15-85.000.
Daniels, Raymond R. J., to Guy-Raymond Engineering Company, Ltd. Furniture castor. 308,161, 5-29-90, Cl. D8-375.000.
Deflecto Corporation: *See—*
Meyer, Stephen T., 308,148, Cl. D6-567.000.
Deguchi, Atsushi: *See—*
Kim, Suk J.; Deguchi, Atsushi; and Yoshinaga, Sadao, 308,226, Cl. D19-42.000.
Delmed, Inc.: *See—*
Buckley, Francis D., 308,249, Cl. D24-8.000.
Diamond, Ira: *See—*
Gotoh, Teiyu; Totsuka, Keiichi; and Diamond, Ira, 308,202, Cl. D14-126.000.
Digital Equipment Corporation: *See—*
Urbanus, David S.; and Barron, Peter B., 308,220, Cl. D18-13.000.
Dobbins, Bob M.: *See—*
Doyle, John; Frontino, Louis J.; and Dobbins, Bob M., 308,201, Cl. D14-116.000.
Doyel, John S. Miniature sewing box. 308,127, 5-29-90, Cl. D3-20.000.
Doyle, John; Frontino, Louis J.; and Dobbins, Bob M., to Mars Incorporated. Portable data scanner. 308,201, 5-29-90, Cl. D14-116.000.
Dressler, Timothy J., to Chutick, Mark L. Book cover. 308,225, 5-29-90, Cl. D19-26.000.
Dudley, James R., to Gibson Greetings, Inc. Combined collapsible greeting card and toy. 308,223, 5-29-90, Cl. D19-1.000.
Edwards, Lewis H. Coin stacking and counting stand. 308,278, 5-29-90, Cl. D99-34.000.
Egender, James J. Down marker 308,236, 5-29-90, Cl. D21-199.000.
Eldon Industries, Inc.: *See—*
Evenson, Mel, 308,227, Cl. D19-88.000.
Ellison, Richard P., to Boat America Corporation. Boat fender. 308,192, 5-29-90, Cl. D12-168.000.
Emmerling, Ronald, to International Consumer Brands, Inc. Lantern. 308,255, 5-29-90, Cl. D26-46.000.
Evenson, Mel, to Eldon Industries, Inc. Copy holder. 308,227, 5-29-90, Cl. D19-88.000.
Farrell, Richard: *See—*
Soloway, Richard; and Farrell, Richard, 308,176, Cl. D10-106.000.
Fender, Norman N.: *See—*
Jones, Gary L.; Todd, Robert J.; Fender, Norman N.; Wood, Dale A.; and Bally, Alexander, 308,213, Cl. D15-199.000.
Fetty, Harold D.; and Vaughn, Deborah K., to Goodyear Tire & Rubber Company, The. Tire. 308,190, 5-29-90, Cl. D12-147.000.
Fish, Thomas E., Jr., to Little Tikes Company, The. Construction toy door block. 308,233, 5-29-90, Cl. D21-108.000.
Fish, Thomas E., Jr., to Little Tikes Company, The. Construction toy window block. 308,234, 5-29-90, Cl. D21-108.000.
Flores, Ralph. Lamp globe. 308,262, 5-29-90, Cl. D26-131.000.
Franzu, Nicholas J. Alignment system elements of a golf putter. 308,238, 5-29-90, Cl. D21-219.000.
Fraser, Peter I. Sandal 308,125, 5-29-90, Cl. D2-270.000.
Fratelli Guzzini S.p.A.: *See—*
Gecchelin, Bruno, 308,228, Cl. D19-90.000.
Fred Hill, Inc.: *See—*
Hill, A. Fred, 308,279, Cl. D99-35.000.
Friese, James R., to Candle Corporation of America. Candle lamp. 308,252, 5-29-90, Cl. D26-11.000.
Frontino, Louis J.: *See—*
Doyle, John; Frontino, Louis J.; and Dobbins, Bob M., 308,201, Cl. D14-116.000.
Gaalswyk, Mark K. Level sensing switch. 308,193, 5-29-90, Cl. D13-158.000.
Garten, Michael D.; and Naito, Marina, to International Business Machines Corporation. Automatic teller machine. 308,275, 5-29-90, Cl. D99-28.000.
Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Desk file. 308,228, 5-29-90, Cl. D19-90.000.
Genova, Charles: *See—*
Genova, John C.; Genova, Nancy J.; Merganov, George; and Genova, Charles, 308,141, Cl. D6-334.000.
Genova, John C.; Genova, Nancy J.; Merganov, George; and Genova, Charles, to John Charles Designs, Inc. Chair. 308,141, 5-29-90, Cl. D6-334.000.

Genova, Nancy J.: *See—*
Genova, John C.; Genova, Nancy J.; Merganov, George; and Genova, Charles, 308,141, Cl. D6-334.000.
Gibson Greetings, Inc.: *See—*
Dudley, James R., 308,223, Cl. D19-1.000.
Goldberg, Alan E., to Mobil Oil Corporation. Service building and the like. 308,250, 5-29-90, Cl. D25-34.000.
Goodyear Tire & Rubber Company, The: *See—*
Fetty, Harold D.; and Vaughn, Deborah K., 308,190, Cl. D12-147.000.
Gosselin, Roland; and Murphy, Robert H., to R. H. Murphy Company, Co., Inc. Combined shipping and handling carrier 308,274, 5-29-90, Cl. D34-40.000.
Gotoh, Teiyu; Totsuka, Keiichi; and Diamond, Ira, to Sony Corporation. Television receiver. 308,202, 5-29-90, Cl. D14-126.000.
Graco Inc.: *See—*
Jones, Gary L.; Todd, Robert J.; Fender, Norman N.; Wood, Dale A.; and Bally, Alexander, 308,213, Cl. D15-199.000.
Grady, Mark P.: *See—*
Parker, Frederick A.; and Grady, Mark P., 308,177, Cl. D10-106.000.
Great Plains Industries, Inc.: *See—*
Laqua, Fred L.; and Hall, Robert E., 308,209, Cl D15-7.000.
Grecchi, Francesco, to Hunting World, Inc. Suit-case. 308,137, 5-29-90, Cl. D3-76.000.
Grove, James E.: *See—*
Messerschmidt, Stephen J.; and Grove, James E., 308,194, Cl. D14-106.000.
Gulton Industries, Inc.: *See—*
Burkarth, Jack, 308,259, Cl. D26-78.000.
Guy-Raymond Engineering Company, Ltd.: *See—*
Daniels, Raymond R. J., 308,161, Cl. D8-375.000.
Haas, Edward T., Jr. Feed dial traveling indicator. 308,171, 5-29-90, Cl. D10-46.000.
Hall, Robert E.: *See—*
Laqua, Fred L.; and Hall, Robert E., 308,209, Cl. D15-7.000
Hamano, Eiji: *See—*
Yamada, Toshiyuki; and Hamano, Eiji, 308,191, Cl. D12-158.000.
Hanna, Thomas E., to Rubbermaid Incorporated. Lid for waste basket. 308,273, 5-29-90, Cl. D34-11.000.
Hardy, Terence, to L.B. Plastics Limited. Window component 308,251, 5-29-90, Cl. D25-124.000.
Harriott, Joel M. Guitar. 308,216, 5-29-90, Cl. D17-14.000.
Harris, Charles M. End portions of a double-ended wrench. 308,158, 5-29-90, Cl. D8-21.000.
Heap, Jean W., to Pendelfin Studios Limited. Table ornament. 308,183, 5-29-90, Cl. D11-158.000.
Hill, A. Fred, to Fred Hill, Inc. Cash box or similar article. 308,279, 5-29-90, Cl. D99-35.000.
Hinrichsen, Silvana; and Ceccarelli, Alessandro, to Bridgestone/Firestone, Inc. Vehicle tire. 308,188, 5-29-90, Cl. D12-146.000.
Hinrichsen, Silvana; and Ceccarelli, Alessandro, to Bridgestone/Firestone, Inc. Vehicle tire. 308,189, 5-29-90, Cl. D12-147.000
Hirohata, Michio: *See—*
Tanaka, Noboru; and Hirohata, Michio, 308,214, Cl. D16-209.000.
Hoff, Phyllis J. Chair. 308,145, 5-29-90, Cl. D6-380.000.
Hoffman, Ronald J.: *See—*
Kelly, Gordon D.; and Hoffman, Ronald J., 308,206, Cl D15-1.000.
Hollar, Robert C.; and Huang, Tung-Ming, to Abbott Laboratories. Fluid container or the like. 308,163, 5-29-90, Cl. D9-341.000.
Holloway, Steve E. Beer tap replica advertising unit. 308,230, 5-29-90, Cl. D20-37.000.
Holmes, Gary D., to Travomatic Corporation. Bottle. 308,167, 5-29-90, Cl. D9-390.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Yamada, Toshiyuki; and Hamano, Eiji, 308,191, Cl D12-158.000.
Hoover Company, The: *See—*
Bradd, Sidney H., 308,267, Cl. D32-31.000.
Huang, Tung-Ming: *See—*
Hollar, Robert C.; and Huang, Tung-Ming, 308,163, Cl. D9-341.000.
Humphrey, William C.: *See—*
Chapin, David S.; and Humphrey, William C., 308,136, Cl. D3-73.000.
Hunting World, Inc.: *See—*
Grecchi, Francesco, 308,137, Cl. D3-76.000.
I W. Industries: *See—*
Strignano, Joseph, 308,243, Cl. D23-241.000.
Illinois Tool Works, Inc.: *See—*
Udelhofen, Mark J.; and Rapinchuk, Timothy J., 308,186, Cl. D11-218.000.
Informer, Inc.: *See—*
Messerschmidt, Stephen J.; and Grove, James E., 308,194, Cl. D14-106.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Sottsass, Ettore, 308,199, Cl. D14-115.000.
Sottsass, Ettore, 308,200, Cl. D14-115.000.
Inomata, Hideko: *See—*
Kiyooka, Katsumi; and Inomata, Hideko, 308,210, Cl. D15-10.000.
Inoue, Yoshihiro, to Nintendo Company Limited. Adaptor for a game machine cartridge. 308,197, 5-29-90, Cl. D14-114.000.
International Business Machines Corporation: *See—*
Garten, Michael D.; and Naito, Marina, 308,275, Cl. D99-28.000.
International Consumer Brands, Inc.: *See—*
Emmerling, Ronald, 308,255, Cl. D26-46.000.
Kung-kit, Wen; and Biu, Mak K., 308,258, Cl. D26-49.000.
Petrie, Aidan; and Lane, Stephen, 308,269, Cl. D32-70.000.
International Floss Pick Corporation: *See—*
Shaw, Richard J.; and Bojar, James A., 308,265, Cl. D28-64.000.
Ishikawa, Hikaru; and Sano, Takashi, to Pigeon Co., Ltd. Clinical thermometer. 308,172, 5-29-90, Cl. D10-57.000.
Ishikawa, Tadashi: *See—*
Sano, Hiroshi; and Ishikawa, Tadashi, 308,222, Cl. D18-36.000.
Jervis, Donald L., Sr. Sign for advertising or similar use. 308,229, 5-29-90, Cl. D20-31.000.
John Charles Designs, Inc.: *See—*
Genova, John C.; Genova, Nancy J.; Merganov, George; and Genova, Charles, 308,141, Cl. D6-334.000.
Johnson & Johnson Consumer Products, Inc.: *See—*
Redmond, John K., 308,138, Cl. D4-104.000.
Jones, Gary L.; Todd, Robert J.; Fender, Norman N.; Wood, Dale A.; and Bally, Alexander, to Graco Inc. Electric robot. 308,213, 5-29-90, Cl. D15-199.000.
Katsuhara, Tatsuo, to Caiso Computer Co., Ltd. Electronic piano. 308,215, 5-29-90, Cl. D17-7.000.
Kelly, Gordon D.; and Hoffman, Ronald J., to Kohler Co. Engine. 308,206, 5-29-90, Cl. D15-1.000.
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 308,132, 5-29-90, Cl. D3-71.000.
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 308,133, 5-29-90, Cl. D3-71.000.
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 308,134, 5-29-90, Cl. D3-71.000.
Kim, Hyun S., to Airway Industries, Inc. Luggage case. 308,135, 5-29-90, Cl. D3-71.000.
Kim, Suk J.; Deguchi, Atsushi; and Yoshinaga, Sadao, to Yoshinaga Prince Company Limited. Ball-point pen. 308,226, 5-29-90, Cl. D19-42.000.
Kiyooka, Katsumi; and Inomata, Hideko, to Komatsu Zenoah Company. Portable internal combustion power tool. 308,210, 5-29-90, Cl. D15-10.000.
Klamm, Thomas L. Combined brush and scraper 308,140, 5-29-90, Cl. D4-118.000.
Koch, Frank J., to Beamish, Linda Koch. Fireplace insert for holding material to be burned. 308,248, 5-29-90, Cl. D23-401.000.
Koepsell, William A. Combined waste bag dispenser and receptacle. 308,272, 5-29-90, Cl. D34-6.000.
Kohler Co.: *See—*
Kelly, Gordon D.; and Hoffman, Ronald J., 308,206, Cl. D15-1.000.
Kojima, Tatsuo, to Canon Kabushiki Kaisha. Laser beam printer 308,221, 5-29-90, Cl. D18-13.000.
Komatsu Zenoah Company: *See—*
Kiyooka, Katsumi; and Inomata, Hideko, 308,210, Cl. D15-10.000.
Kosugi, Yuhei; Ozawa, Hirohisa; Yamamoto, Osamu; and Minowa, Yoshio, to NEC Corporation. Transmission and reception unit for a mini-earth station. 308,203, 5-29-90, Cl D14-230.000.
Krueger International, Inc.: *See—*
Lohmeyer, Hartmut, 308,143, Cl. D6-379.000.
Kung-kit, Wen; and Biu, Mak K., to International Consumer Brands, Inc. Miniature flashlight. 308,258, 5-29-90, Cl. D26-49.000.
L.B. Plastics Limited: *See—*
Hardy, Terence, 308,251, Cl. D25-124.000.
Laitram Corporation, The: *See—*
Profumo, Frank J., 308,195, Cl. D14-113.000.
Lane, Stephen: *See—*
Petrie, Aidan; and Lane, Stephen, 308,269, Cl. D32-70.000.
Laqua, Fred L.; and Hall, Robert E., to Great Plains Industries, Inc. Gear-pump assembly for liquid products. 308,209, 5-29-90, Cl. D15-7.000.
Latin Percussion, Inc.: *See—*
Cohen, Martin B., 308,217, Cl. D17-22.000.
Lauer, Brunhilde. Toaster. 308,155, 5-29-90, Cl. D7-328.000
Lebever Co.: *See—*
Walden, Jack G., 308,129, Cl. D3-35.000.
LeBlanc, James C.: *See—*
Ottevaere, James A.; LeBlanc, James C.; and LeBlanc, Richard S., 308,187, Cl. D12-12.000.
LeBlanc, Richard S.: *See—*
Ottevaere, James A.; LeBlanc, James C.; and LeBlanc, Richard S., 308,187, Cl. D12-12.000.
Lee, Carol D. Shoe scuff cover. 308,126, 5-29-90, Cl. D2-271.000.
Leonakis, Demetria M. Toilet seat lifting tab. 308,244, 5-29-90, Cl. D8-307.000.
Lewis, Mary E.; and Middleton, Priscilla R., to Brio Scanditoy Corporation. Patterned mat for toy vehicles 308,149, 5-29-90, Cl. D6-588.000.
Little Tikes Company, The: *See—*
Fish, Thomas E., Jr., 308,233, Cl. D21-108.000.
Fish, Thomas E., Jr., 308,234, Cl. D21-108.000.
Lohmeyer, Hartmut, to Krueger International, Inc. Chair 308,143, 5-29-90, Cl. D6-379.000.
Magnera, George J. Hydro jet excavation nozzle. 308,211, 5-29-90, Cl D15-21.000.
Marcantonio, Ralph M. Storage box for use in vehicles. 308,131, 5-29-90, Cl. D3-40.000.
Mars Incorporated: *See—*
Doyle, John; Frontino, Louis J.; and Dobbins, Bob M., 308,201, Cl D14-116.000.
Marshall, Frank G.: *See—*
Staubitz, Robert B.; and Marshall, Frank G., 308,257, Cl. D26-49.000.

Maxian, Theodore R. Auxiliary handle for a shovel. 308,157, 5-29-90, Cl. D8-10.000.
McCarthy, Richard D.; and Taylor, William P. Chair. 308,144, 5-29-90, Cl. D6-380.000.
McCullough, Richard P. Basketball return device. 308,237, 5-29-90, Cl. D21-201.000.
McGuire, Thayard A. Decorative wheel. 308,232, 5-29-90, Cl. D21-101.000.
Mednis, Juris M., to Universal Symetrics Corporation. Bottle. 308,165, 5-29-90, Cl. D9-375.000.
Meisner, Edward H., to Voit Sports Incorporated. Exercise bicycle. 308,235, 5-29-90, Cl. D21-194.000.
Merganov, George: *See—*
Genova, John C.; Genova, Nancy J.; Merganov, George; and Genova, Charles, 308,141, Cl. D6-334.000.
Messerschmidt, Stephen J.; and Grove, James E., to Informer, Inc. Computer terminal with detachable keyboard. 308,194, 5-29-90, Cl. D14-106.000.
Meyer, Stephen T., to Deflecto Corporation. Magnetic-mount small article holder. 308,148, 5-29-90, Cl. D6-567.000.
Middleton, Priscilla R.: *See—*
Lewis, Mary E.; and Middleton, Priscilla R., 308,149, Cl. D6-588.000.
Miller, Henry V. Windmill ornament or the like. 308,182, 5-29-90, Cl. D11-157.000.
Minowa, Yoshio: *See—*
Kosugi, Yuhei; Ozawa, Hirohisa; Yamamoto, Osamu; and Minowa, Yoshio, 308,203, Cl. D14-230.000.
Mobil Oil Corporation: *See—*
Goldberg, Alan E., 308,250, Cl. D25-34.000.
Motion Controls and Automation, Inc.: *See—*
Burke, David W., 308,207, Cl. D15-7.000.
Munnier, Damien, to Munnier Freres S.A. Chain links for a watchband. 308,181, 5-29-90, Cl. D11-93.000.
Munnier Freres S.A.: *See—*
Munnier, Damien, 308,181, Cl. D11-93.000.
Murphy, Robert H.: *See—*
Gosselin, Roland; and Murphy, Robert H., 308,274, Cl. D34-40.000.
Naito, Marina: *See—*
Garten, Michael D.; and Naito, Marina, 308,275, Cl. D99-28.000.
NEC Corporation: *See—*
Kosugi, Yuhei; Ozawa, Hirohisa; Yamamoto, Osamu; and Minowa, Yoshio, 308,203, Cl. D14-230.000.
Nintendo Company Limited: *See—*
Inoue, Yoshihiro, 308,197, Cl. D14-114.000.
Nippon Antenna Co., Ltd.: *See—*
Takizawa, Akio, 308,204, Cl. D14-235.000.
Nitta, Tomio, to Tokai Corporation. Aerosol container. 308,162, 5-29-90, Cl. D9-300.000.
Nor-Lake, Inc.: *See—*
Dallman, Brian L., 308,212, Cl. D15-85.000.
Ohashi, Keiichi, to Skylite Industry Co., Ltd. Combined flashlight and fluorescent lantern. 308,254, 5-29-90, Cl. D26-42.000.
Ohashi, Keiichi, to Skylite Industry Co., Ltd. Portable light. 308,256, 5-29-90, Cl. D26-48.000.
Oki Electric Industry Co., Ltd.: *See—*
Yoshida, Kazuo, 308,219, Cl. D18-13.000.
Olivier, Philippe, to Salomon S.A. Ski. 308,239, 5-29-90, Cl. D21-229.000.
Ottevaere, James A.; LeBlanc, James C.; and LeBlanc, Richard S. Armored vehicle. 308,187, 5-29-90, Cl. D12-12.000.
Owens-Illinois Plastic Products Inc.: *See—*
Weckman, Richard L., 308,166, Cl. D9-375.000.
Ozawa, Hirohisa: *See—*
Kosugi, Yuhei; Ozawa, Hirohisa; Yamamoto, Osamu; and Minowa, Yoshio, 308,203, Cl. D14-230.000.
Paquette, Daniel. Water-bottle. 308,128, 5-29-90, Cl. D3-30.100.
Parker, Frederick A.; and Grady, Mark P., to Rampart Corporation. Temperature activated alarm for fire fighters. 308,177, 5-29-90, Cl. D10-106.000.
Partecipazioni Bulgari S.p.A.: *See—*
Bulgari, Paolo, 308,180, Cl. D11-76.000.
Pei-Ai, Yen. Wall mounted display case. 308,147, 5-29-90, Cl. D6-559.000.
Pendelfin Studios Limited: *See—*
Heap, Jean W., 308,183, Cl. D11-158.000.
Roberts, Doreen N., 308,184, Cl. D11-158.000.
Perlmutter, David; and Perlmutter, Jay. Earring. 308,179, 5-29-90, Cl. D11-44.000.
Perlmutter, Jay: *See—*
Perlmutter, David; and Perlmutter, Jay, 308,179, Cl. D11-44.000.
Petrie, Aidan; and Lane, Stephen, to International Consumer Brands, Inc. Steam iron. 308,269, 5-29-90, Cl. D32-70.000.
Phelps, Pamela; and White, Roberta. Wall hamper. 308,268, 5-29-90, Cl. D32-37.000.
Pigeon Co., Ltd.: *See—*
Ishikawa, Hikaru; and Sano, Takashi, 308,172, Cl. D10-57.000.
Profumo, Frank J., to Laitram Corporation, The. CRT visual display terminal. 308,195, 5-29-90, Cl. D14-113.000.
R. H. Murphy Company, Co., Inc.: *See—*
Gosselin, Roland; and Murphy, Robert H., 308,274, Cl. D34-40.000.
Rampart Corporation: *See—*
Parker, Frederick A.; and Grady, Mark P., 308,177, Cl. D10-106.000.
Rapinchuk, Timothy J.: *See—*
Udelhofen, Mark J.; and Rapinchuk, Timothy J., 308,186, Cl. D11-218.000.
Redmann, David B.; and Redmann, Lee E. A. Lotion applicator or similar article. 308,264, 5-29-90, Cl. D28-7.000.
Redmann, Lee E. A.: *See—*
Redmann, David B.; and Redmann, Lee E. A., 308,264, Cl. D28-7.000.
Redmond, John K., to Johnson & Johnson Consumer Products, Inc. Toothbrush. 308,138, 5-29-90, Cl. D4-104.000.
Rijlaarsdam, Cornelis E. Measuring instrument. 308,174, 5-29-90, Cl. D10-70.000.
Roberts, Doreen N., to Pendelfin Studios Limited. Table ornament. 308,184, 5-29-90, Cl. D11-158.000.
Roberts, Emma F.: *See—*
Roberts, Leo B.; and Roberts, Emma F., 308,151, Cl. D7-691.000.
Roberts, Leo B.; and Roberts, Emma F. Ladle. 308,151, 5-29-90, Cl. D7-691.000.
Rowenta-Werke GmbH: *See—*
Stutzer, Franz A., 308,159, Cl. D8-35.000.
Rubbermaid Incorporated: *See—*
Hanna, Thomas E., 308,273, Cl. D34-11.000.
Sabbadin, Antonio D.: *See—*
Sweeny, Henry D.; and Sabbadin, Antonio D., 308,160, Cl. D8-71.000.
Salmirs, Stanley. Pillow. 308,150, 5-29-90, Cl. D6-601.000.
Salomon S.A.: *See—*
Olivier, Philippe, 308,239, Cl. D21-229.000.
Sano, Hiroshi; and Ishikawa, Tadashi, to Canon Kabushiki Kaisha. Document recorder. 308,222, 5-29-90, Cl. D18-36.000.
Sano, Takashi: *See—*
Ishikawa, Hikaru; and Sano, Takashi, 308,172, Cl. D10-57.000.
Sarabia, Aurora. Funnel for plastic bag. 308,270, 5-29-90, Cl. D34-5.000.
Service Ideas, Inc.: *See—*
Collins, Harry F., 308,153, Cl. D7-322.000.
Shaw, Richard J.; and Bojar, James A., to International Floss Pick Corporation. Toothpick. 308,265, 5-29-90, Cl. D28-64.000.
Shemitz, Sylvan R., to Sylvan R. Shemitz Associates, Inc. Wall mounted indirect lighting fixture. 308,260, 5-29-90, Cl. D26-85.000.
Shemitz, Sylvan R., to Sylvan R. Shemitz Associates, Inc. Wall mounted indirect lighting fixture. 308,261, 5-29-90, Cl. D26-87.000.
Sherry, John E. Diskette storage unit. 308,130, 5-29-90, Cl. D3-35.000.
Sinkler, Joseph R., Jr. Musical composer. 308,218, 5-29-90, Cl. D17-99.000.
Skylite Industry Co., Ltd.: *See—*
Ohashi, Keiichi, 308,254, Cl. D26-42.000.
Ohashi, Keiichi, 308,256, Cl. D26-48.000.
Smith, Vance R.: *See—*
Syme, Duncan C.; Smith, Vance R.; and Wilker, Allan S., 308,246, Cl. D23-346.000.
Soloway, Richard; and Farrell, Richard. Microwave and passive infrared intrusion detector. 308,176, 5-29-90, Cl. D10-106.000.
Sonoco Products Company: *See—*
Wilfong, Harry B., Jr., 308,170, Cl. D9-447.000.
Sony Corporation: *See—*
Gotoh, Teiyu; Totsuka, Keiichi; and Diamond, Ira, 308,202, Cl. D14-126.000.
Sottsass, Ettore, to Ing. C. Olivetti & C., S.p.A. Keyboard. 308,199, 5-29-90, Cl. D14-115.000.
Sottsass, Ettore, to Ing C. Olivetti & C., S.p.A. Keyboard. 308,200, 5-29-90, Cl. D14-115.000.
Speaker, Edwin A. Contact lens dispenser. 308,146, 5-29-90, Cl. D6-515.000.
Staubitz, Robert B.; and Marshall, Frank G., to Bridgeport Metal Goods Manufacturing Company, The. Flashlight. 308,257, 5-29-90, Cl. D26-49.000.
Stelmak, John P. Electric ambient control unit for beds or the like. 308,245, 5-29-90, Cl. D23-332.000.
Strignano, Joseph, to I.W. Industries. Faucet. 308,243, 5-29-90, Cl. D23-241.000.
Stutzer, Franz A., to Rowenta-Werke GmbH. Can opener. 308,159, 5-29-90, Cl. D8-35.000.
Sulyma, Ihor, to Cross Keys Manufacturing, Inc. Lightning deterrent. 308,175, 5-29-90, Cl. D10-105.000.
Sunbeam Corporation: *See—*
Tow, Gregory M., 308,154, Cl. D7-326.000.
Sweeny, Henry D.; and Sabbadin, Antonio D., to Swenco Limited. Torch stand. 308,160, 5-29-90, Cl. D8-71.000.
Swenco Limited: *See—*
Sweeny, Henry D.; and Sabbadin, Antonio D., 308,160, Cl. D8-71.000.
Sylvan R. Shemitz Associates, Inc.: *See—*
Shemitz, Sylvan R., 308,260, Cl. D26-85.000.
Shemitz, Sylvan R., 308,261, Cl. D26-87.000.
Syme, Duncan C.; Smith, Vance R.; and Wilker, Allan S., to Vermont Castings, Inc. Wood and coal burning stove. 308,246, 5-29-90, Cl. D23-346.000.
Takizawa, Akio, to Nippon Antenna Co., Ltd. Indoor antenna. 308,204, 5-29-90, Cl. D14-235.000.
Tanaka, Noboru; and Hirohata, Michio, to Canon Kabushiki Kaisha. Camera. 308,214, 5-29-90, Cl. D16-209.000.
Taylor, William P.: *See—*
McCarthy, Richard D.; and Taylor, William P., 308,144, Cl. D6-380.000.
Tedham, Thomas A.; and Akagi, Kenichi, to Wang Laboratories, Inc. Digitizing tablet. 308,198, 5-29-90, Cl. D14-114.000.

Tempress Incorporated: *See—*
Cedergreen, Steven D., 308,242, Cl. D22-149.000.
Tholberg, Elizabeth H.: *See—*
Tholberg, Ronald W., 308,205, Cl. D14-253.000.
Tholberg, Ronald W., to Tholberg, Elizabeth H. Holder for cellular telephone. 308,205, 5-29-90, Cl. D14-253.000.
Todd, Robert J.: *See—*
Jones, Gary L.; Todd, Robert J.; Fender, Norman N.; Wood, Dale A.; and Bally, Alexander, 308,213, Cl. D15-199.000.
Tokai Corporation: *See—*
Nitta, Tomio, 308,162, Cl. D9-300.000.
Totsuka, Keiichi: *See—*
Gotoh, Teiyu; Totsuka, Keiichi; and Diamond, Ira, 308,202, Cl. D14-126.000.
Tow, Gregory M., to Sunbeam Corporation. Baby bottle warmer. 308,154, 5-29-90, Cl. D7-326.000.
Travomatic Corporation: *See—*
Holmes, Gary D., 308,167, Cl. D9-390.000.
Trussardi, Nicola, to Trussardi S.p.A. Bottle. 308,168, 5-29-90, Cl. D9-403.000.
Trussardi S.p.A.: *See—*
Trussardi, Nicola, 308,168, Cl. D9-403.000.
Tyke Corporation: *See—*
Wilson, Michael C., 308,142, Cl. D6-368.000.
Tzouflas, George. Waffle iron. 308,152, 5-29-90, Cl. D7-352.000.
Udelhofen, Mark J.; and Rapinchuk, Timothy J., to Illinois Tool Works, Inc. Flexible web restraining buckle. 308,186, 5-29-90, Cl. D11-218.000.
Underberg, John T. Exchangeable fishing sinker. 308,241, 5-29-90, Cl. D22-145.000.
U.S. Philips Corporation: *See—*
van Asten, Jan F., 308,156, Cl. D7-379.000.
Universal Symetrics Corporation: *See—*
Mednis, Juris M., 308,165, Cl. D9-375.000.
Urbanus, David S.; and Barron, Peter B., to Digital Equipment Corporation. Printer. 308,220, 5-29-90, Cl. D18-13.000.
Valkner, Carol A. Bow for a package. 308,185, 5-29-90, Cl. D11-184.000.
van Asten, Jan F., to U.S. Philips Corporation. Mixer. 308,156, 5-29-90, Cl. D7-379.000.
Van Wyk, Dennis A. Welding helmet. 308,266, 5-29-90, Cl. D29-15.000.
Vaughn, Deborah K.: *See—*
Fetty, Harold D.; and Vaughn, Deborah K., 308,190, Cl. D12-147.000.
Vermont Castings, Inc.: *See—*
Syme, Duncan C.; Smith, Vance R.; and Wilker, Allan S., 308,246, Cl. D23-346.000.
Viner, Israel. Triple head surface cleaning device. 308,139, 5-29-90, Cl. D4-118.000.
Voit Sports Incorporated: *See—*
Meisner, Edward H., 308,235, Cl. D21-194.000.
Vreeken, Richard. Foldable trash bag holder or similar article. 308,271, 5-29-90, Cl. D34-6.000.
Walden, Jack G., to Lebever Co. Tape carousel. 308,129, 5-29-90, Cl. D3-35.000.
Walker, Opal C. Coin counter. 308,277, 5-29-90, Cl. D99-34.000.
Wang Laboratories, Inc.: *See—*
Tedham, Thomas A.; and Akagi, Kenichi, 308,198, Cl. D14-114.000.
Weckman, Richard L., to Owens-Illinois Plastic Products Inc. Bottle. 308,166, 5-29-90, Cl. D9-375.000.
White, Roberta: *See—*
Phelps, Pamela; and White, Roberta, 308,268, Cl. D32-37.000.
Wilfong, Harry B., Jr., to Sonoco Products Company. Dispensing nozzle for plastic bags. 308,170, 5-29-90, Cl. D9-447.000.
Wilker, Allan S.: *See—*
Syme, Duncan C.; Smith, Vance R.; and Wilker, Allan S., 308,246, Cl. D23-346.000.
Willnauer, Sigmar, to Apple Computer, Inc. Video display for a computer. 308,196, 5-29-90, Cl. D14-113.000.
Wilson, Michael C., to Tyke Corporation. Folding chair. 308,142, 5-29-90, Cl. D6-368.000.
Winnick, John F. Toy glider. 308,231, 5-29-90, Cl. D21-89.000.
Wood, Dale A.: *See—*
Jones, Gary L.; Todd, Robert J.; Fender, Norman N.; Wood, Dale A.; and Bally, Alexander, 308,213, Cl. D15-199.000.
Yamada, Toshiyuki; and Hamano, Fiji, to Honda Giken Kogyo Kabushiki Keisha. Motorcycle rear trunk unit. 308,191, 5-29-90, Cl. D12-158.000.
Yamamoto, Osamu: *See—*
Kosugi, Yuhei; Ozawa, Hirohisa; Yamamoto, Osamu; and Minowa, Yoshio, 308,203, Cl. D14-230.000.
Yoshida, Kazuo, to Oki Electric Industry Co., Ltd. Desktop page printer. 308,219, 5-29-90, Cl. D18-13.000.
Yoshinaga Prince Company Limited: *See—*
Kim, Suk J.; Deguchi, Atsushi; and Yoshinaga, Sadao, 308,226, Cl. D19-42.000.
Yoshinaga, Sadao: *See—*
Kim, Suk J.; Deguchi, Atsushi; and Yoshinaga, Sadao, 308,226, Cl. D19-42.000.
Zaboyan, John. Combined dial and hands for a timepiece. 308,178, 5-29-90, Cl. D10-124.000.
Ziaylek, Michael P.; and Ziaylek, Theodore, Jr. Jet foot pump. 308,208, 5-29-90, Cl. D15-7.000.
Ziaylek, Theodore, Jr.: *See—*
Ziaylek, Michael P.; and Ziaylek, Theodore, Jr., 308,208, Cl. D15-7.000.

VOL 1114 ISS 5 MY 29 1990 UMI

VOL
1114
ISS
5
MY
29
1990
UMI

LIST OF PLANT PATENTEES

Burks, Larry J., to Burks, Larry J. Rose plant named Buralp. 7,236, 5-29-90, Cl. 21.000.

H.J.A. Rooyakkers B.V.: *See*—
van Eijk, Joseph P., 7,239, Cl. 68.000.

Sali, Kasper B. Apple Tree: "Sali variety" . 7,237, 5-29-90, Cl. 35.000.

Segers, Th. A., to Twyford Plant Laboratories, Inc. Gerbera plant named "Bismut". 7,238, 5-29-90, Cl. 68.000.

Twyford Plant Laboratories, Inc.: *See*—
Segers, Th. A., 7,238, Cl. 68.000.

van Eijk, Joseph P., to H.J.A. Rooyakkers B.V.; and World Flower B.V. Iris plant named Tokyo. 7,239, 5-29-90, Cl. 68.000.

World Flower B.V.: *See*—
van Eijk, Joseph P., 7,239, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 29, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

19 4,928,320
84 4,928,321
169 4,928,322
406 4,928,323
424 4,928,324

CLASS 4

206 B1 4,218,786
247 4,928,325
300 4,928,326
395 4,928,327
420 4,928,328
552 4,928,329
562 4,928,330

CLASS 5

13 4,928,331
68 4,928,332
110 4,928,333
191 4,928,334
436 4,928,335
441 4,928,336
465 4,928,337

CLASS 8

128.1 4,929,248
149.1 4,928,338
464 4,929,249
507 4,929,250

CLASS 14

16.1 4,928,339
71.3 4,928,340

CLASS 15

105 4,928,341
145 4,928,342
209 D 4,928,343
250.06 4,928,344
4,928,345
338 4,928,346
344 4,928,347
345 4,928,348

CLASS 16

2 4,928,349
297 4,928,350

CLASS 17

11 4,928,351
73 4,928,352

CLASS 19

65 A 4,928,353
97 4,928,354
105 4,928,355
129 R 4,928,356
225 4,928,357

CLASS 24

67.9 4,928,361
71 J 4,928,359
90 R 4,928,362
235 4,928,360
390 4,928,363
431 4,928,358
614 4,928,364
635 4,928,365
641 4,928,366
705 4,928,367

CLASS 29

1.22 4,928,368
24.5 4,928,369
243.5 4,928,370
278 4,928,373
436 4,928,374
509 4,928,375
530 4,928,376
560 4,928,377
564.6 4,928,378
566.3 4,928,379
4,928,380
568 4,928,381
603 4,928,382
623 4,928,384
623.5 4,929,251
711 4,928,383
788 4,928,385
798 4,928,388
824 4,928,386
840 4,928,387
890.08 4,928,372
898.064 4,928,371

CLASS 30

43.92 4,928,389
123.4 4,928,390
293 4,928,391

CLASS 33

178 E 4,928,392
264 4,928,393
265 4,928,394
374 4,928,395
503 4,928,396
508 4,928,397
512 4,928,398
562 4,928,399
605 4,928,400
645 4,928,401

CLASS 34

97 4,928,402

CLASS 36

34 A 4,928,403
37 4,928,404
50 4,928,405
117 4,928,406
119 4,928,407
4,928,408

CLASS 37

9 4,928,409
117.5 4,928,410

CLASS 40

324 4,928,411
4,928,412
511 4,928,413
551 4,928,414
610 4,928,415
618 4,928,416
642 4,928,417

CLASS 43

3 4,928,418
17 4,928,419
27.4 4,928,420
36 4,928,421
42 4,928,422
43.16 4,928,423

CLASS 44

53 4,929,252
76 4,929,253

CLASS 47

1.01 4,928,424
18 4,928,425
48.5 4,928,426
58 4,928,427

CLASS 48

76 4,928,254
197 R 4,929,255

CLASS 49

41 4,928,429
192 4,928,428
460 4,928,430
479 4,928,431

CLASS 51

3.4 H 4,928,434
5 C 4,928,432
33 W 4,928,433
55 4,928,435
80 BS 4,928,436
165.71 4,928,437
283 R 4,928,438
284 E 4,928,439
293 4,929,256
309 4,929,257
426 4,928,440

CLASS 52

2 J 4,928,442
19 4,928,441
58 4,928,443
66 4,928,444
72 4,928,445
98 4,928,446
136 4,928,447
174 4,928,448
194 4,928,449
202 4,928,450
223 L 4,928,451
236.3 4,928,452
239 4,928,465
509 4,928,466
511 4,928,467
574 4,928,468
607 4,928,469
664 4,928,471
678 4,928,472

CLASS 53

53 4,928,473
67 4,928,453
409 4,928,454
425 4,928,474
433 B1 4,642,970
570 4,928,455

CLASS 55

12 4,928,456
86 4,929,258
158 4,929,259
213 4,929,261
341.2 4,929,262
502 4,929,263
510 4,929,260

CLASS 56

11.8 4,928,458
12.7 4,928,457
13.3 4,928,459
14.6 4,928,460
339 4,928,461
341 4,928,462
656 4,928,470

CLASS 57

58.86 4,928,463
224 4,928,464
264 4,928,475
268 4,928,476
416 4,928,477

CLASS 60

39.05 4,928,478
39.092 4,928,480
39.161 4,928,482
39.36 4,928,479
226.1 4,928,483
240 4,928,484
299 4,928,485
338 4,928,486
414 4,928,487
480 4,928,488
602 4,928,489
670 4,928,490
734 4,928,491
737 4,928,481

CLASS 62

4 4,928,495
46.2 4,928,496
55.5 4,928,497
63 4,928,492
81 4,928,498
185 4,928,493
186 4,928,499
193 4,928,500
222 4,928,494
406 4,928,501
440 4,928,502
498 4,928,503

CLASS 63

9 4,928,504

CLASS 65

12 4,929,264
64 4,929,265
135 4,929,266

CLASS 68

253 R 4,928,505

CLASS 70

176 4,928,506

CLASS 71

77 4,929,267
88 4,929,268
92 4,929,269
4,929,270
94 4,929,271
95 4,929,272
118 4,929,273

CLASS 72

38 4,928,507
42 4,928,508
61 4,928,509
131 4,928,510
361 4,928,511
404 4,928,512

CLASS 73

1 G 4,928,513
3 4,928,514
40 4,928,528
61 R 4,928,515
65 4,928,516
105 4,928,517
117.3 4,928,518
126 4,928,519
151 4,928,520
4,928,521
155 4,928,522
167 4,928,523
200 4,928,524
290 V 4,928,525
313 4,928,526
657 4,928,527
726 4,928,529
756 4,928,530
838 4,928,533
855 4,928,531
856 4,928,532
861.18 4,928,534
862.02 4,928,535
862.41 4,928,538
863.83 4,928,536
863.86 4,928,537
864.11 4,928,540
864.24 4,928,539
864.63 4,928,541

CLASS 74

87 4,928,554
200 4,928,542
335 4,928,544
473 SW 4,928,545
479 4,928,546
545 4,928,547
573 F 4,928,548
594.6 4,928,549
595 4,928,550
606 R 4,928,551
745 4,928,555
867 4,928,557

CLASS 75

246 4,929,275

CLASS 81

57.3 4,928,558
63 4,928,559
463 4,928,560

CLASS 82

1.11 4,928,561

CLASS 83

278 4,928,562
552 4,929,276

CLASS 84

313 4,928,564
411 R 4,928,565
413 4,928,566
422.3 4,928,567
464 R 4,928,568
626 4,928,569
726 4,928,563

CLASS 89

6.5 4,928,570
7 4,928,571
8 4,928,572
14.4 4,928,573
34 4,928,574
36.02 4,928,575

CLASS 91

499 4,928,576

CLASS 92

177 4,928,577
187 4,928,578
248 4,928,579

CLASS 98

1.5 4,928,581
2 4,928,582
2.1 4,928,580
31.6 4,928,583

CLASS 99

289 T 4,928,584
450.8 4,928,592
485 4,928,591
576 4,928,590

CLASS 100

170 4,928,589

CLASS 101

9 4,928,588
42 4,928,587
129 4,928,585
134 4,929,109
230 4,928,586
389.1 4,928,593
405 4,928,594

CLASS 102

202.7 4,928,595
216 4,928,596
430 4,928,597
467 4,928,598

CLASS 104

12 4,928,599
17.1 4,928,600
53 4,928,601
111 4,928,602

CLASS 106

22 4,929,277
124 4,928,603
287.12 4,929,278
412 4,929,279
472 4,929,280

CLASS 110

103 4,928,604
261 4,928,605
347 4,928,606

CLASS 111

185 4,928,607

CLASS 112

121.12 4,928,608
4,928,609
153 4,928,610
217 4,928,611
257 4,928,612

CLASS 114

26 4,928,613
66 4,928,614
203 4,928,615
267 4,928,616
4,928,617
293 4,928,618
345 4,928,619
363 4,928,620

CLASS 116

234 4,928,621

CLASS 118

70 4,928,622
249 4,928,623
308 4,928,624
323 4,928,625
715 4,928,626
718 4,928,627

CLASS 119

1 4,928,628
4,928,629
17 4,928,630
23 4,928,631
29.5 4,928,632
75 4,928,633
153 4,928,634

CLASS 122

7 R 4,928,635
13 R Re.33,222

CLASS 123

41.31 4,928,637
52 M 4,928,638
52 MF 4,928,639
73 R 4,928,636
90.16 4,928,641
90.17 4,928,640
90.24 4,928,650
180 R 4,928,642
185 B 4,928,643
188 AA 4,928,645
188 P 4,928,644
196 AB 4,928,651
376 4,928,646
400 4,928,647
403 4,928,648
414 4,928,649
417 4,928,652
435 4,928,653
486 4,928,654
488 4,928,655
504 4,928,656
514 4,928,657
543 4,928,658
588 4,928,659
647 4,928,660

CLASS 124

69 4,928,661

CLASS 125

13.01 4,928,662

CLASS 126

21 A 4,928,663
391 4,928,664
415 4,928,665
440 4,928,666
512 4,928,667
537 4,928,668

CLASS 128

4 4,928,669
24 A 4,928,671
4,928,672
25 R 4,928,673
30.2 4,928,674
66 4,928,675
80 C 4,928,670
80 F 4,928,676
87 R 4,928,677
90 4,928,678
155 4,928,680
156 4,928,681
202.26 4,928,682
203.12 4,928,683
204.21 4,928,684
204.24 4,928,685
205.24 4,928,686
207.14 4,928,687
343 B1 4,323,071
419 P 4,928,689
419 PG 4,928,688
421 4,928,690
633 4,928,691
4,928,692
637 4,928,693
4,928,694
642 4,928,695
644 4,928,696
649 4,928,697
661.09 4,928,698
662.06 4,928,699
672 4,928,700
677 4,928,701
678 4,928,702
719 4,928,703
732 4,928,704
773 4,928,705
774 4,928,706
4,928,707
4,928,708
782 4,928,709
861 4,928,710
869 4,928,711
877 4,928,712

CLASS 131

84.1 4,928,713
359 4,928,714
365 4,928,715

CLASS 132

212 4,928,716

VOL
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CLASS 134

64 R 4,928,717

CLASS 135

22 4,928,718

CLASS 136

201 4,929,281
239 4,929,282

CLASS 137

1 4,928,719
13 4,928,720
66 4,928,721
116.3 4,928,723
204 4,928,724
269.5 4,928,725
327 4,928,726
360 4,928,727
486 4,928,728
510 4,928,729
554 4,928,730
599 4,928,731
607 4,928,732
630.13 4,928,733
881 4,928,722

CLASS 138

154 4,928,734
4,928,735
178 4,928,736

CLASS 139

383 A 4,928,737

CLASS 140

93 4 4,928,738

CLASS 141

5 4,928,739

CLASS 148

11.5 A 4,929,285
13.2 4,929,283
23 4,929,284
111 4,929,286
276 4,929,287
326 4,929,288
402 4,929,289

CLASS 149

19.4 4,929,291
35 4,929,290

CLASS 152

243 4,928,740
504 4,928,741
534 4,928,742

CLASS 156

132 4,929,292
158 4,929,293
187 4,929,294
209 4,929,303
230 4,929,295
245 4,929,304
273.3 4,929,305
306.3 4,929,306
357 4,929,296
361 4,929,297
414 4,929,298
466 4,929,299
645 4,929,300
657 4,929,301
4,929,302

CLASS 159

47.3 4,929,307

CLASS 160

84.1 4,928,743
178.1 4,928,744

CLASS 162

145 4,929,308
164.3 4,929,309

CLASS 164

46 4,928,745
362 4,928,746
418 4,928,747
479 4,928,748

CLASS 165

1 4,928,749
2 4,928,750
11.1 4,928,751
104.17 4,928,752
104.27 4,928,753
134.1 4,928,754
168 4,928,755
182 4,928,756

CLASS 166

55.1 4,928,757
65.1 4,928,759
66 4,928,758
113 4,928,760
123 4,928,761
192 4,928,762
250 4,928,763
4,928,764
251 4,928,765
270 4,928,766
377 4,928,767
380 4,928,768
382 4,928,769
385 4,928,770
4,928,771
386 4,928,772

CLASS 169

17 4,928,773

CLASS 172

410 4,928,774

CLASS 174

16.2 4,929,801
35 MS 4,929,802
117 M 4,929,803

CLASS 175

19 4,928,775
45 4,928,776
329 4,928,777

CLASS 180

157 4,928,778
178 4,928,779
179 4,928,780
227 4,928,781
244 4,928,782

CLASS 181

106 4,928,783
4,928,784
120 4,928,785
137 4,928,786
141 4,928,787
4,928,788

CLASS 182

3 4,928,789
4,928,790
135 4,928,791
163 4,928,792
187 4,928,793

CLASS 184

5.1 4,928,794
7.4 4,928,795

CLASS 187

89 4,928,796

CLASS 188

156 4,928,797
218 XL 4,928,798
314 4,928,799

CLASS 190

115 4,928,800

CLASS 192

45.1 4,928,801
56 R 4,928,802
58 B 4,928,803
83 4,928,804
106.2 4,928,805

CLASS 198

345 4,928,806
379 4,928,807
397 4,928,808
408 4,928,809
699.1 4,928,810
774 4,928,811
847 4,928,812

CLASS 200

5 A 4,929,804
61.45 R 4,929,805
61.54 4,929,806
296 4,929,807
467 4,929,808

CLASS 202

158 4,929,310
4,929,311

CLASS 203

2 4,929,312

CLASS 204

18.1 4,929,315
56.1 4,929,316
59 R 4,929,317
153.1 4,929,313
153.23 4,929,314
157.6 4,929,318
164 4,929,319
192.2 4,929,320
192.38 4,929,321
4,929,322
206 4,929,323
4,929,324
4,929,326
268 4,929,325
272 4,929,327
279 4,929,328
299 R 4,929,329
402 4,929,330
426 4,929,331

CLASS 206

0.5 4,928,813
5.1 4,928,815
215 4,928,814
232 4,928,816
256 4,928,817
309 4,928,818
316.2 4,928,819
328 4,928,820
4,928,934
329 4,928,821
330 4,928,822
338 4,928,823
365 4,928,824
387 4,928,825
409 4,928,826
416 4,928,827
444 4,928,828
524.8 4,928,829
570 4,928,830
575 4,928,831

CLASS 208

65 4,929,332
4,929,333
91 4,929,334
106 4,929,335
120 4,929,336
4,929,337
4,929,338
131 4,929,339
189 4,929,340
390 4,929,341

CLASS 209

12 4,929,342
166 4,929,343
4,929,344
215 4,929,345
323 4,929,346

CLASS 210

58 4,928,942
101 4,929,347
109 4,929,348
151 4,929,349
157 4,929,350
195.2 4,929,351
232 4,929,352
237 4,929,353
248 4,929,356
321.61 4,929,354
640 4,929,357
4,929,358
663 4,929,359
679 4,929,360
698 4,929,361
701 4,929,362
741 4,929,363
750 4,929,364
754 4,929,365
784 4,929,355

CLASS 211

187 4,928,832
4,928,833
191 4,928,834

CLASS 215

11.5 4,928,836
31 4,928,835
250 4,928,837

CLASS 219

53 4,929,816
69.12 4,929,809
4,929,810
121.54 4,929,811
121.69 4,928,838
137.2 4,929,812
270 4,929,813
388 4,929,814
501 4,929,815
544 4,929,817

CLASS 220

5 R 4,928,839
8 4,928,840
21 4,928,841
85 R 4,928,842
90 4,928,843
207 4,928,844
271 4,928,845
354 4,928,846
408 4,928,847
444 4,928,848

CLASS 221

45 4,928,849

CLASS 222

3 4,928,850
103 4,928,851
107 4,928,852
108 4,928,853
129.1 4,928,854
131 4,928,855
174 4,928,856
211 4,928,857
312 4,928,858
402.14 4,928,859
466 4,928,860
481.5 4,928,861
604 4,928,862

CLASS 224

39 4,928,863
162 4,928,864
275 4,928,865

CLASS 225

106 4,928,866

CLASS 227

7 4,928,867
131 4,928,868

CLASS 228

20 4,928,869
107 4,928,870
179 4,928,871
203 4,928,872

CLASS 229

1.5 H 4,928,873
74 4,928,874
92.1 4,928,875
103.1 4,928,876
125 42 4,928,877

CLASS 235

381 4,929,818
383 4,929,819
487 4,929,820
493 4,929,821

CLASS 238

351 4,928,878

CLASS 239

8 4,928,879
4,928,880
44 4,928,881
112 4,928,882
223 4,928,883
290 4,928,884
*17 4,928,885
533.5 4,928,886
533.8 4,928,887
584 4,928,887
751 4,928,889

CLASS 241

24 4,928,890
82.5 4,928,892
95 4,928,893

CLASS 242

7.09 4,928,894
35.5 A 4,928,895
43 R 4,928,896
55 4,928,897
55.1 4,928,898
59 4,928,899
71.1 4,928,900
85 4,928,901
107.2 4,928,902
130 4,928,903
158 R 4,928,904
201 4,928,905

CLASS 244

3.22 4,928,906
6 4,928,907
31 4,928,908
145 4,928,909

CLASS 246

169 A 4,928,910

CLASS 247

41 4,928,891

CLASS 248

74.1 4,928,911
221.2 4,928,912
224.1 4,928,913
274 4,928,914
288.5 4,928,915
354.1 4,928,916
507 4,928,917
688 4,928,918

CLASS 250

201.4 4,929,822
201.5 4,929,823
208.4 4,929,829
221 4,929,825
4,929,826
223 R 4,929,827
227.14 4,929,830
227.17 4,929,050
307 4,929,831
328 4,929,832
338.1 4,929,833
352 4,929,834
367 4,929,835
397 4,929,836
461.1 4,929,837
492.2 4,929,838
492.3 4,929,839
4,929,840
504 R 4,929,841
551 4,929,842
561 4,929,843
4,929,844
4,929,845
571 4,929,846
573 4,929,847

CLASS 251

89 4,928,919
100 4,929,377
118 4,928,920
175 4,928,921
180 4,928,922
221 4,928,923
315 4,928,924

CLASS 252

8.6 4,929,366
8.8 4,929,367
11 4,929,368
12 4,929,369
12.2 4,929,370
25 4,929,371
29 4,929,372
33 4,929,373
39 4,929,374
49.3 4,929,375
62.56 4,929,376
105 4,929,378
109 4,929,379
121 4,929,380
174.25 4,929,381
181 4,929,382
187.26 4,929,383
301 4 P 4,929,387
301 4 R 4,929,384
4,929,385
4,929,386
500 4,929,388
4,929,389
510 4,929,390
511 4,929,391
518 Re.33,223
582 4,929,392
609 4,929,393
633 4,929,394

CLASS 254

93 R 4,928,926
272 4,528,925
279 4,928,927

CLASS 256

13.1 4,928,928
24 4,928,929
67 4,928,930

CLASS 257

454 4,929,026

CLASS 261

65 4,929,397
94 4,929,398
112.2 4,929,399

CLASS 264

10 4,929,400
22 4,929,401
4,929,402
4,929,403
29.5 4,929,404
41 4,929,405
45.5 4,929,406
101 4,929,407
149 4,929,408
508 4,929,409
533 4,929,410

CLASS 266

45 4,928,931
58 4,928,932
237 4,928,933

CLASS 267

140.1 4,928,935

CLASS 269

73 4,928,936
136 4,928,937
261 4,928,938
309 4,928,939

CLASS 270

1.1 4,928,940
53 4,928,941

CLASS 271

4 4,928,942
6 4,928,944
9 4,928,945
10 4,928,946
24 4,928,947
110 4,928,948
111 4,928,949
112 4,928,950
113 4,928,951
150 4,928,952
185 4,928,953

CLASS 272

8 N 4,928,954
31 R 4,928,955
69 4,928,956
72 4,928,957
96 4,928,958
4,928,959
123 4,928,961

CLASS 273

1 GG 4,928,960
65 E G 4,928,962
73 D 4,928,963
78 4,928,965
4,928,972
143 R 4,928,964
148 R 4,928,970
164 4,928,971
176 A 4,928,973
186 R 4,928,974
192 4,928,975
195 A 4,928,966
240 4,928,976
254 4,928,967
357 4,928,968
422 4,928,969
428 4,928,977

CLASS 277

25 4,928,978
38 4,928,979
153 4,928,980

CLASS 279

1 SJ 4,928,981

CLASS 280

11.22 4,928,982
18 4,928,983
95.1 4,928,984
204 4,928,985
223 B 4,929,828
234 4,928,986
435 4,928,987
607 4,928,988
610 4,928,989
625 4,928,990
738 4,928,991
801 4,928,992
851 4,928,993
4,928,994

CLASS 281

29 4,928,995

CLASS 283

109 4,928,996

CLASS 285

13 4,928,997
49 4,928,998
113 4,928,999
133.1 4,929,000
158 4,929,001
319 4,929,002

CLASS 292

144 4,929,003
251.5 4,929,005
267 4,929,004
324 4,929,006
336.3 4,929,007

CLASS 293

108 4,929,008

CLASS 294

2 4,929,009
16 4,929,010
86.4 4,929,011
86.41 4,929,012

CLASS 296

91 4,929,013
97.8 4,929,014
116 4,929,015
118 4,929,020
136 4,929,016
153 4,929,017
204 4,929,018

223 4,929,019

CLASS 297

193 4,929,021
313 4,929,022
330 4,929,023
362 4,929,024
452 4,929,025
482 4,929,027

CLASS 298

19 R 4,929,028

CLASS 300

21 4,929,029

CLASS 301

37 N 4,929,030
37 P 4,929,031
38 R 4,929,032

CLASS 303

9.63 4,929,033
103 4,929,034
106 4,929,035
115 4,929,036
116 4,929,037
119 4,929,038

CLASS 307

246 4,929,848
269 4,929,849
272.1 4,929,850
359 4,929,851
475 4,929,852
4,929,853
480 4,929,854
571 4,929,855
633 4,929,856

CLASS 310

83 4,929,857
4,929,858
328 4,929,859
366 4,929,860

CLASS 312

18 4,929,861
138.1 4,929,862
213 4,929,039

CLASS 313

113 4,929,863
402 4,929,864
478 4,929,865
500 4,929,866
525 4,929,867
619 4,929,868
639 4,929,869

CLASS 315

169.3 4,929,870
205 4,929,871
209 R 4,929,872
219 4,929,873

CLASS 318

128 4,929,874
362 4,929,875
444 4,929,876
560 4,929,877
4,929,878
696 4,929,879

CLASS 320

30 4,929,880

CLASS 323

222 4,929,882
282 4,929,883
313 4,929,884

CLASS 324

66 4,929,887
78 R 4,929,890
154 PB 4,929,891
158 F 4,929,892
4,929,893
212 4,929,894
231 4,929,895
240 4,929,896
4,929,897
242 4,929,898
253 4,929,899
318 4,929,881
347 4,929,915
525 4,929,900
529 4,929,901
542 4,929,902
544 4,929,903
664 4,929,885
691 4,929,886
696 4,929,904

CLASS 325

66 4,929,674

CLASS 329

358 4,929,905

CLASS 330

149 4,929,906
252 4,929,907
254 4,929,908
256 4,929,909
257 4,929,910
264 4,929,911
288 4,929,912
308 4,929,913

CLASS 331

1 A 4,929,916
4,929,917
10 4,929,918

CLASS 335

38 4,929,919
202 4,929,920

CLASS 337

233 4,929,921
407 4,929,922

CLASS 338

308 4,929,923

CLASS 340

384 E 4,929,924
407 4,929,948
426 4,929,925
541 4,929,926
547 4,929,927
572 4,929,928
613 4,929,929
622 4,929,930
636 4,929,931
644 4,929,932
703 4,929,933
706 4,929,934
712 4,929,935
715 4,929,936
721 B1 Re.31,200
728 4,929,937
747 4,929,938
825.020 4,929,940
825.14 4,929,941
825.800 4,929,939
908.1 4,929,942
984 4,929,943

CLASS 341

24 4,929,944
50 4,929,945
87 4,929,946
146 4,929,947
176 4,929,949

CLASS 342

25 4,929,950
179 4,929,951
184 4,929,952
190 4,929,953
194 4,929,954
371 4,929,955
376 4,929,956
410 4,929,957
432 4,929,958

CLASS 343

700 MS 4,929,959
703 4,929,960
715 4,929,961
786 4,929,962

CLASS 346

1 1 4,929,963
4,929,964
75 4,929,966
107 R 4,929,965
110 R 4,929,967
140 R 4,929,968
4,929,969
160 4,929,970

CLASS 350

6.5 4,929,040
96.10 4,929,041
96 13 4,929,042
4,929,043
4,929,044
9c.15 4,929,045
96.21 4,929,046
96.23 4,929,047
B1 4,802,732
96.24 4,929,048
96.29 4,929,049
96.30 4,929,051
96.32 4,929,052
96.34 4,929,053
252 4,929,054
276 R 4,929,055
321 4,929,056
333 4,929,057
4,929,058
324 4,929,059
338 4,929,061
339 F 4,929,060
345 4,929,062
353 4,929,063
355 4,929,064
413 4,929,065
415 4,929,066
421 4,929,067
422 4,929,068
423 4,929,069
432 4,929,070
463 4,929,071
582 4,929,072
609 4,929,073
625 4,929,074

CLASS 351

158 4,929,075
212 4,929,076

CLASS 354

75 4,929,971
4,929,972
293 4,929,973
299 4,929,974
317 4,929,975
322 4,929,976
420 4,929,977

CLASS 355

38 4,929,978
4,929,979
75 4,929,980
253 4,929,981
311 4,929,982
315 4,929,983

CLASS 356

4 5 4,929,077
320 4,929,078
336 4,929,079
338 4,929,080
354 4,929,081
358 4,929,082
400 4,929,083
446 4,929,084

CLASS 357

4 4,929,984
15 4,929,985
22 4,929,986
23.5 4,929,988
23.6 4,929,989
4,929,990
23 8 4,929,991
23.9 4,929,992
27 4,929,993
30 4,929,994
34 4,929,995
4,929,996
4,929,997
45 4,929,998
68 4,929,999
4,930,000
71 4,930,001
75 4,930,002
234 4,929,987

CLASS 358

19 4,930,003
29 4,930,004
36 4,930,005
44 4,930,006
75 4,930,007
4,930,008
76 4,930,009
78 4,930,010
84 4,930,011
102 B1 Re.31,239
105 4,930,012
133 4,930,013
209 4,930,014
246 4,930,015
296 4,930,016
4,930,017
298 4,930,018
335 4,930,019
400 4,930,020
451 4,930,021
4,930,022
460 4,930,023

CLASS 360

10.1 4,930,024
64 4,930,025
67 4,930,026
70 4,930,027
85 4,930,028
93 Re.33,224
97.01 4,930,029
107 4,930,030
4,930,031
132 4,930,032
137 4,930,033

CLASS 361

19 4,930,034
54 4,930,035
56 4,930,036
58 4,930,037
92 4,930,038
127 4,930,039
154 4,930,040
190 4,930,041
280 4,930,042
283 4,930,043
313 4,930,044
329 4,930,045
393 4,930,046
395 4,930,047
519 4,930,089

CLASS 362

26 4,930,048
32 4,930,049
61 4,930,050
4,930,051
104 4,930,052
121 4,930,053
149 4,930,054
244 4,930,055
272 4,930,057
364 4,930,056
400 4,930,058

CLASS 363

20 4,930,059
21 4,930,060
44 4,930,061
55 4,930,062
91 4,930,063
161 4,930,064

CLASS 364

200 4,930,065
4,930,066
4,930,067
4,930,068
4,930,069
4,930,070
300 4,930,071
4,930,072
4,930,073
410 4,930,074
413.06 4,930,075
413.21 4,930,076
419 4,930,077
424.05 4,930,082
424 1 4,930,078
4,930,079
4,930,080
4,930,081
426.02 4,930,083
426.04 4,930,084
449 4,930,085
468 4,930,086
518 4,929,085
4,930,087
4,930,088
520 4,930,090
522 4,930,091
4,930,092
523 B1 4,591,999
525 4,929,824
550 4,930,096
551.01 4,930,093
561 4,930,094
571.01 4,930,095
716 4,930,097
4,930,098
820 4,930,099
900 4,930,100
4,930,101
4,930,102
4,930,103

CLASS 365

49 4,930,104
185 4,930,105
189.01 4,930,106
189.08 4,930,107
226 4,930,112
230.02 4,930,108

CLASS 366

76 4,929,086
111 4,929,087
337 4,929,088

CLASS 367

27 4,930,109
56 4,930,110
130 4,930,111
190 4,930,113

CLASS 369

32 4,930,114
59 4,930,115
275 4,930,116

CLASS 370

3 4,930,117
16 4,930,118
16.1 4,930,119
73 4,930,120
85.15 4,930,122
85.4 4,930,121
94.1 4,930,123
94.3 4,930,124
105 4,930,125
109 4,930,126
110.4 4,930,127

CLASS 371

12 4,930,128
22.3 4,929,889
25.1 4,929,888
40.4 4,930,129

CLASS 372

2 4,930,130
18 4,930,131
22 4,930,132
32 4,930,133
33 4,930,134
4,930,135
62 4,930,136
81 4,930,137
95 4,930,138
99 B1 4,615,034

CLASS 374

44 4,929,089
102 4,929,090
162 4,929,091
183 4,929,092
208 4,929,093

CLASS 375

1 4,930,139
4,930,140
60 4,930,141
120 4,930,142

CLASS 376

260 4,929,412
268 4,929,413

CLASS 378

37 4,930,143
99 4,930,144
109 4,930,145
110 4,930,146
176 4,930,147

CLASS 379

58 4,930,148
61 4,930,149
93 4,930,150
94 4,930,151
214 4,930,152
233 4,930,153
246 4,930,154
354 4,930,155
388 4,930,156
433 4,930,157

CLASS 380

5 4,930,158
23 4,930,159
4,930,160

CLASS 383

7 4,929,094

CLASS 384

45 4,929,095
4,929,096
49 4,929,097
450 4,929,098

CLASS 400

76 4,929,099
124 4,929,100
4,929,101
4,929,103
248 4,929,102
605 4,929,104
625 4,929,105
649 4,929,106

CLASS 401

65 4,929,107
126 4,929,108

CLASS 402

73 4,929,110

CLASS 403

16 4,929,111
93 4,929,112
157 4,929,113
172 4,929,114
228 4,929,115
263 4,929,116
328 4,929,117
356 4,929,118
359 4,929,119

CLASS 404

77 4,929,120
84 4,929,121

CLASS 405

81 4,929,122
150 4,929,123
165 4,929,124
262 4,929,125
267 4,929,126

CLASS 408

81 4,929,127
139 4,929,128

CLASS 409

81 4,929,129
136 4,929,130
234 4,929,131

CLASS 410

52 4,929,133
56 4,929,132

CLASS 411

30 4,929,134
354 4,929,135
432 4,929,136
501 4,929,137

CLASS 414

16 4,929,138
217 4,929,139
267 4,929,140
412 4,929,141
563 4,929,142
607 4,929,145
723 4,929,143
744.5 4,929,146
786 4,929,147
799 4,929,144

CLASS 415

32 4,929,148
99 4,929,149
157 4,929,150
177 4,929,151
203 4,929,152

CLASS 416

46 4,929,153
230 4,929,154

CLASS 417

53 4,929,155
295 4,929,156
4,929,159
312 4,929,157
405 4,929,158

CLASS 418

55 4,929,160
83 4,929,161

CLASS 419

2 4,929,414
12 4,929,417
19 4,929,418
52 4,929,415

CLASS 420

12 4,929,416
56 4,929,419
466 4,929,420
545 4,929,421
561 4,929,423
578 B1 3,905,809

CLASS 422

9 4,929,424
13 4,929,425
63 4,929,426
100 4,929,427
4,929,428
179 4,929,429

CLASS 423

11 4,929,430
25 4,929,274
328 4,929,431
344 4,929,432
411 4,929,433
479 4,929,434
484 4,929,435
593 4,929,436

CLASS 424

10 4,929,437
4,929,438
59 4,929,439
79 4,929,440
84 4,929,441
85.2 4,929,442
85.5 4,929,443
94.64 4,929,444
115 4,929,445
439 4,929,446
4,929,508
440 4,929,447
489 4,929,448
638 4,929,454

700 4,929,449

CLASS 425

72.1 4,929,162
143 4,929,163
145 4,929,164
150 4,929,165
190 4,929,166
325 4,929,167
384 4,929,168
385 4,929,169
526 4,929,450
556 4,929.170

CLASS 426

10 4,929,451
11 4,929,452
63 4,929,453
92 4,929,455
99 4,929,456
139 4,929,457
391 4,929,458
399 4,929,459
420 4,929,460
438 4,929,461
478 4,929,462
521 4,929,463
549 4,929,464
552 4,929,465
615 4,929,466
637 4,929,467

CLASS 427

47 4,929,468
54.1 4,929,171
4,929,469
55 4,929,470
57 4,929,422
173 4,929,471
215 4,929,472
252 4,929,473
325 4,929,474
407.1 4,929,475

CLASS 428

34.2 4,929,476
34.9 4,929,477
35.1 4,929,478
35.2 4,929,479
35.6 4,929,480
36.1 4,929,481
36.4 4,929,482
47 4,929,483
53 4,929,484
64 4,929,485
77 4,929,486
163 4,929,487
192 4,929,488
195 4,929,489
4,929,490
4,929,491
198 4,929,492
207 4,929,493
246 4,929,496
265 4,929,497
286 4,929,494
288 4,929,495
4,929,498
336 4,929,499
4,929,500
337 4,929,501
357 4,929,502
373 4,929,503
395 4,929,504
412 4,929,506
447 4,929,507
461 4,929,509
520 4,929,510
606 4,929,511
610 4,929,512
611 4,929,513
4,929,514
614 4,929,515
620 4,929,516

CLASS 429

34 4,929,517
54 4,929,518
94 4,929,519
4,929,520
102 4,929,521
178 4,929,522

CLASS 430

4 4,929,523
56 4,929,524
75 4,929,525
87 4,929,526
92 4,929,527
108 4,929,528
127 4,929,529
138 4,929,530
4,929,531
143 4,929,532
169 4,929,533
191 4,929,534
264 4,929,535
325 4,929,536
4,929,537
551 4,929,538
553 4,929,539
555 4,929,540

CLASS 431

1 4,929,172
215 4,929,173
276 4,929,174
344 4,929,175
4,929,176

CLASS 432

11 4,929,177
14 4,929,178
222 4,929,541
247 4,929,179

CLASS 433

166 4,929,180

CLASS 434

236 4,929,181

CLASS 435

2 4,929,542
5 4,929,543
6 4,929,544
11 4,929,545
29 4,929,546
69 1 4,929,547
71 2 4,929,548
101 4,929,550
106 4,929,551
128 4,929,552
172 3 4,929,553
4,929,554
4,929,555
180 4,929,556
202 4,929,557
226 4,929,560
252 33 4,929,559
252 5 4,929,558

CLASS 436

116 4,929,561
126 4,929,562

CLASS 437

6 4,929,563
20 4,929,564
24 4,929,566
34 4,929,565
40 4,929,568
41 4,929,567
51 4,929,569
89 4,929,570
129 4,929,571
164 4,929,572

CLASS 439

34 4,929,182
67 4,929,183
74 4,929,185
78 4,929,186
334 4,929,187
349 4,929,188
352 4,929,189
409 4,929,190
429 4,929,191
534 4,929,192
567 4,929,193
571 4,929,194
610 4,929,195
620 4,929,196
660 4,929,197
681 4,929,184

709 4,929,198
759 4,929,199

CLASS 440

4,929,200
4,929,201
4,929,202
4,929,203
4,929,204

CLASS 441

60 4,929,205
64 4,929,206
65 4,929,207
75 4,929,208

CLASS 445

4,929,209
Re.33,225
4,929,210

CLASS 446

14 4,929,211
47 4,929,212
97 4,929,213
4,929,214
226 4,929,215
324 4,929,216

CLASS 474

54 4,929,217
83 4,929,218
102 4,929,219
103 B1 4,708,696
152 4,929,220
205 4,929,221
255 4,929,222

CLASS 475

5 4,928,552
149 4,928,556
196 4,928,543
268 4,928,553

CLASS 493

56 4,929,223
194 4,929,224
213 4,929,225
343 4,929,226

CLASS 494

41 4,929,227

CLASS 501

90 4,929,573
95 4,929,578
133 4,929,579
137 4,929,574
4,929,575
148 4,929,580

CLASS 502

2 4,929,581
11 4,929,582
35 4,929,576
64 4,929,583
112 4,929,584
217 4,929,586
220 4,929,585
242 4,929,587
402 4,929,588
406 4,929,589

CLASS 503

207 4,929,590
213 4,929,411
227 4,929,591
4,929,592
4,929,593

CLASS 505

1 4,929,594
4,929,595
4,929,596
4,929,597
4,929,598

CLASS 512

18 4,929,599

CLASS 514

2 4,929,600
18 4,929,601
4,929,602

26 4,929,603
53 4,929,604
54 4,929,605
58 4,929,577
80 4,929,606
110 4,929,607
122 4,929,608
167 4,929,609
4,929,610
183 4,929,611
202 4,929,612
210 4,929,613
214 4,929,614
219 4,929,615
B1 Re.32,393
227.8 4,929,549
252 4,929,617
253 4,929,616
4,929,618
4,929,619
269 4,929,620
275 4,929,621
281 4,929,622
293 4,929,623
4,929,624
304 4,929,625
311 4,929,626
320 4,929,627
364 4,929,628
380 4,929,630
383 4,929,631
397 4,929,632
423 4,929,633
426 4,929,634
438 4,929,635
443 4,929,636
445 4,929,637
450 4,929,638
452 4,929,639
474 4,929,640
506 4,929,641
510 4,929,642
603 4,929,643
642 4,929,644
646 4,929,629

CLASS 521

98 4,929,645
137 4,929,646

CLASS 522

99 4,929,647

CLASS 523

145 4,929,649
147 4,929,648
455 4,929,650
505 4,929,651

CLASS 524

91 4,929,652
96 4,929,653
99 B1 4,806,579
117 4,929,654
155 4,929,659
195 4,929,656
196 4,929,657
219 4,929,658
236 4,929,660
259 4,929,661
376 4,929,662
423 4,929,663
451 4,929,664
458 4,929,655
500 4,929,665
516 4,929,666
718 4,929,667
745 4,929,668
861 4,929,669

CLASS 525

54 1 4,929,670
54 11 4,929,671
63 4,929,672
4,929,673
66 4,929,675
67 4,929,676
151 4,929,677
193 4,929,678
194 4,929,679
240 4,929,680
4,929,681

257 4,929,682
268 4,929,683
274 4,929,684
277 4,929,685
279 4,929,686
328.2 4,929,687
332.5 4,929,688
333.9 4,929,689
339 4,929,699
366 4,929,690
477 4,929,691
539 4,929,701

CLASS 526

247 4,929,692
259 4,929,693
262 4,929,694
297 4,929,695
312 4,929,696

CLASS 528

18 4,929,702
23 4,929,703
28 4,929,704
49 4,929,705
4,929,706
76 4,929,707
77 4,929,697
118 4,929,708
198 4,929,709
205 4,929,710
220 4,929,711
230 4,929,712
4,929,713
272 4,929,698
4,929,714
4,929,715
353 4,929,716
490 4,929,717

CLASS 530

326 4,929,718
351 4,929,700

CLASS 534

604 4,929,719
766 4,929,720
885 4,929,721

CLASS 536

20 4,929,722
23 4,929,723

CLASS 540

4 4,929,395
202 4,929,724

CLASS 544

87 4,929,725
122 4,929,726
284 4,929,728
317 4,929,727
330 4,929,729
345 4,929,730

CLASS 546

97 4,929,731
158 4,929,732
184 4,929,733
338 4,929,734

CLASS 548

187 4,929,743
202 4,929,744
268.8 4,929,735
341 4,929,736
365 4,929,737

CLASS 549

76 4,929,738
347 4,929,739
415 4,929,740
447 4,929,741

CLASS 556

406 4,929,742

CLASS 558

84 4,929,745
92 4,929,746
263 4,929,747
276 4,929,748

CLASS 560

79 4,929,749
87 4,929,750
174 4,929,751

CLASS 562

70 4,929,752
411 4,929,753
428 4,929,754
443 4,929,755
595 4,929,396

CLASS 564

267 4,929,756
399 4,929,764
423 4,929,757
485 4,929,758
4,929,759

CLASS 568

308 4,929,760
319 4,929,761
361 4,929,762
402 4,929,763
427 4,929,765
432 4,929,766
454 4,929,767
473 4,929,768
614 4,929,769
756 4,929,770
798 4,929,771
812 4,929,772
814 4,929,773
824 4,929,774
844 4,929,775
862 4,929,776
864 4,929,777

CLASS 585

3 4,929,778
16 4,929,779
303 4,929,780
310 4,929,781
375 4,929,782
422 4,929,784
426 4,929,785
452 4,929,783
469 4,929,786
500 4,929,787
522 4,929,788
648 4,929,789
651 4,929,790
4,929,791
661 4,929,792
708 4,929,793
737 4,929,794
4,929,799
739 4,929,795
744 4,929,800
828 4,929,796
921 4,929,797
922 4,929,798

CLASS 600

27 4,929,228

CLASS 604

74 4,929,229
90 4,929,230
110 4,929,231
111 4,929,232
131 4,929,233
132 4,929,234
167 4,929,235
175 4,929,236
198 4,929,237
208 4,929,238
263 4,929,241
266 4,929,242
283 4,929,243
319 4,929,244
338 4,929,245

CLASS 606

8 4,929,246
53 4,929,247
62 4,928,679
142 4,929,239
151 4,929,240

CLASS 728

408 4,929,505

D2— 270 308,125
271 308,126
D3— 20 308,127
30.1 308,128
35 308,129
308,130
40 308,131
71 308,132
308,133
308,134
308,135
73 308,136
76 308,137
D4— 104 308,138
118 308,139
308,140
D6— 334 308,141
368 308,142
379 308,143
380 308,144
308,145
515 308,146
559 308,147
567 308,148
588 308,149
601 308,150

D7— 322 308,153
326 308,154
328 308,155
352 308,152
379 308,156
691 308,151
D8— 10 308,157
21 308,158
35 308,159
71 308,160
307 308,244
375 308,161
D9— 300 308,162
341 308,163
373 308,164
375 308,165
308,166
390 308,167
403 308,168
446 308,169
447 308,170
D10— 46 308,171
57 308,172
308,173
70 308,174
105 308,175

106 308,176
308,177
124 308,178
D11— 44 308,179
76 308,180
93 308,181
157 308,182
158 308,183
308,184
184 308,185
218 308,186
D12— 12 308,187
146 308,188
147 308,189
308,190
158 308,191
168 308,192
D13— 158 308,193
D14— 106 308,194
113 308,195
36 308,196
114 308,197
308,198
115 308,199
308,200
116 308,201

126 308,202
230 308,203
235 308,204
253 308,205
D15— 1 308,206
7 308,207
308,208
308,209
10 308,210
21 308,211
85 308,212
199 308,213
D16— 209 308,214
D17— 7 308,215
14 308,216
22 308,217
99 308,218
D18— 13 308,219
308,220
308,221
36 308,222
D19— 1 308,223
21 308,224
26 308,225
42 308,226
88 308,227

90 308,228
D20— 31 308,229
37 308,230
D21— 89 308,231
101 308,232
108 308,233
308,234
194 308,235
199 308,236
201 308,237
219 308,238
229 308,239
D22— 134 308,240
145 308,241
149 308,242
D23— 241 308,243
332 308,245
346 308,246
354 308,247
401 308,248
D24— 8 308,249
D25— 34 308,250
124 308,251
D26— 11 308,252
38 308,253
42 308,254

46 308,255
48 308,256
49 308,257
308,258
78 308,259
85 308,260
87 308,261
131 308,262
140 308,263
D28— 7 308,264
64 308,265
D29— 15 308,266
D32— 31 308,267
37 308,268
70 308,269
D34— 5 308,270
6 308,271
308,272
11 308,273
40 308,274
D99— 28 308,275
308,276
34 308,277
308,278
35 308,279

CLASSIFICATION OF PLANTS

P— 21 7,236
35 7,237
68 7,238
7,239

VOL 1114 ISS 5 MY 29 1990 UMI

VOL
1114
ISS
5
MY
29
1990
UMI

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States. Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	4,928,525		4,928,815		4,929,514		4,615,034	11	4,928,971		4,928,413
	4,928,904		4,928,821		4,929,544	08	4,928,343	12	4,928,341		4,928,430
	4,929,401		4,928,831		4,929,554		4,928,468		4,928,393		4,928,439
	4,929,476		4,928,836		4,929,555		4,928,516		4,928,421		4,928,459
	4,929,595		4,928,843		4,929,561		4,928,673		4,928,427		4,928,526
04	4,928,329		4,928,850		4,929,562		4,928,738		4,928,452		4,928,581
	4,928,417		4,928,851		4,929,602		4,928,760		4,928,461		4,928,591
	4,928,481		4,928,854		4,929,700		4,928,763		4,928,482		4,928,642
	4,928,587		4,928,863		4,929,740		4,928,819		4,928,490		4,928,868
	4,928,788		4,928,884		4,929,831		4,928,837		4,928,491		4,928,874
	4,928,867		4,928,891		4,929,839		4,928,986		4,928,495		4,928,875
	4,929,018		4,928,893		4,929,841		4,929,048		4,928,528		4,928,912
	4,929,191		4,928,907		4,929,861		4,929,180		4,928,676		4,928,914
	4,929,441		4,928,934		4,929,862		4,929,223		4,928,687		4,928,940
05	4,928,350		4,928,939		4,929,865		4,929,946		4,928,824		4,928,946
	4,928,620		4,928,954		4,929,867		4,930,115		4,928,857		4,928,952
06	Re.33,224		4,929,004		4,929,882	09	4,928,347		4,928,984		4,928,960
	4,928,337		4,929,008		4,929,890		4,923,379		4,929,062		4,928,962
	4,928,361		4,929,040		4,929,894		4,928,512		4,929,129		4,928,997
	4,928,410		4,929,041		4,929,895		4,928,675		4,929,141		4,929,022
	4,928,412		4,929,049		4,929,901		4,928,807		4,929,205		4,929,045
	4,928,425		4,929,065		4,929,913		4,928,813		4,929,247		4,929,132
	4,928,448		4,929,067		4,929,918		4,928,916		4,929,398		4,929,170
	4,928,479		4,929,071		4,929,950		4,928,944		4,929,445		4,929,196
	4,928,492		4,929,083		4,929,951		4,928,949		4,929,519		4,929,216
	4,928,493		4,929,090		4,929,952		4,928,978		4,929,566		4,929,228
	4,928,505		4,929,094		4,929,956		4,929,021		4,929,568		4,929,242
	4,928,522		4,929,099		4,929,958		4,929,054		4,929,800		4,929,261
	4,928,564		4,929,111		4,929,963		4,929,106		4,929,851		4,929,332
	4,928,574		4,929,112		4,929,991		4,929,130		4,929,910		4,929,333
	4,928,594		4,929,124		4,929,992		4,929,140		4,929,923		4,929,340
	4,928,595		4,929,125		4,930,001		4,929,231		4,929,948		4,929,364
	4,928,601		4,929,139		4,930,027		4,929,343		4,929,955		4,929,371
	4,928,614		4,929,155		4,930,037		4,929,354		4,930,011		4,929,382
	4,928,626		4,929,197		4,930,041		4,929,516		4,218,786		4,929,424
	4,928,638		4,929,206		4,930,047		4,929,517	13	4,928,391		4,929,425
	4,928,658		4,929,207		4,930,057		4,929,687		4,928,446		4,929,585
	4,928,662		4,929,208		4,930,065		4,929,751		4,928,968		4,929,648
	4,928,677		4,929,213		4,930,071		4,929,801		4,928,975		4,929,748
	4,928,686		4,929,233		4,930,074		4,929,807		4,929,172		4,929,761
	4,928,692		4,929,237		4,930,075		4,929,920		4,929,250		4,929,763
	4,928,694		4,929,259		4,930,097		4,929,924		4,929,452		4,929,781
	4,928,695		4,929,341		4,930,098		4,929,925		4,929,455		4,929,794
	4,928,696		4,929,359		4,930,099		4,930,042		4,929,480		4,929,796
	4,928,703		4,929,370		4,930,101		4,930,043		4,929,726		4,929,808
	4,928,704		4,929,383		4,930,102		4,930,125	15	4,928,969		4,929,864
	4,928,710		4,929,400		4,930,107		4,591,999		4,929,039		4,929,931
	4,928,711		4,929,402		4,930,130	10	4,928,344	16	4,928,394		4,929,933
	4,928,712		4,929,412		4,930,142		4,928,670		4,928,442		4,930,015
	4,928,721		4,929,426		4,930,150		4,929,587		4,930,018		4,930,045
	4,928,756		4,929,458		4,930,156		4,929,594	17	Re.33,225		4,930,126
	4,928,773		4,929,500		1,031,200		4,929,704		4,928,363	18	4,928,332
	4,928,786		4,929,505		4,323,071		4,642,970		4,928,376		4,928,484

	4,928,543		4,928,974		4,928,535		4,929,497	41	4,928,330		4,928,762
	4,928,589		4,928,976		4,928,691		4,929,502		4,928,580		4,928,764
	4,928,647		4,929,014		4,928,716		4,929,510		4,928,618		4,928,767
	4,928,743		4,929,024		4,928,724		4,929,542		4,929,118		4,928,768
	4,928,774		4,929,032		4,928,734		4,929,552		4,929,122		4,928,769
	4,928,795		4,929,033		4,928,735		4,929,619		4,929,145		4,928,783
	4,928,920		4,929,086		4,928,766		4,929,638		4,929,312		4,928,785
	4,929,322		4,929,157		4,928,848		4,929,657		4,929,350		4,928,830
	4,929,348		4,929,199		4,928,872		4,929,659		4,929,880		4,928,855
	4,929,506		4,929,209		4,928,881		4,929,799		4,929,909		4,928,864
	4,929,545		4,929,303		4,928,889		4,929,826		4,930,092		4,928,873
19	4,928,387		4,929,260		4,928,927		4,929,828	42	4,928,323		4,928,915
	4,928,628		4,929,268		4,928,929		4,929,836		4,928,335		4,928,928
	4,928,629		4,929,342		4,929,064		4,929,849		4,928,373		4,928,999
	4,928,892		4,929,360		4,929,080		4,929,872		4,928,378		4,929,003
	4,929,017		4,929,375		4,929,230		4,929,873		4,928,380		4,929,028
	4,929,091		4,929,376		4,929,232		4,929,932		4,928,395		4,929,303
	4,929,222		4,929,381		4,929,253		4,929,939		4,928,443		4,929,373
20	4,928,514		4,929,391		4,929,279		4,929,940		4,928,447		4,929,461
	4,928,794		4,929,395		4,929,284		4,929,953		4,928,496		4,929,509
	4,929,074		4,929,556		4,929,290		4,929,983		4,928,553		4,929,521
	4,929,489		4,929,569		4,929,334		4,930,039		4,928,559		4,929,565
	4,929,736		4,929,573		4,929,335		4,930,052		4,928,560		4,929,584
	4,929,899		4,929,575		4,929,337		4,930,053		4,928,568		4,929,604
21	4,929,214		4,929,613		4,929,339		4,930,073		4,928,572		4,929,646
	4,929,415		4,929,620		4,929,344		4,930,157		4,928,600		4,929,650
	4,930,054		4,929,645		4,929,367		4,930,159		4,928,685		4,929,663
	4,930,147		4,929,666		4,929,396	37	4,928,390		4,928,690		4,929,672
22	4,928,328		4,929,669		4,929,405		4,928,440		4,928,705		4,929,673
	4,928,352		4,929,691		4,929,418		4,928,441		4,928,718		4,929,676
	4,928,422		4,929,699		4,929,437		4,928,529		4,928,828		4,929,694
	4,928,631		4,929,703		4,929,447		4,928,714		4,928,834		4,929,773
	4,928,751		4,929,721		4,929,456		4,928,913		4,928,844		4,929,778
	4,928,757		4,929,734		4,929,462		4,929,016		4,928,961		4,929,782
	4,928,776		4,929,742		4,929,508		4,929,026		4,928,981		4,929,840
	4,928,839		4,929,846		4,929,511		4,929,100		4,929,001		4,929,850
	4,929,314		4,929,877		4,929,536		4,929,238		4,929,046		4,929,896
	4,929,345		4,929,878		4,929,537		4,929,532		4,929,088		4,929,898
	4,929,353		4,930,056		4,929,598		4,929,588		4,929,142		4,929,900
	4,929,357		4,930,094		4,929,608		4,929,698		4,929,184		4,929,976
	4,929,723	27	4,928,451		4,929,609		4,929,769		4,929,194		4,929,995
	4,929,745		4,928,510		4,929,615		4,929,885		4,929,274		4,929,996
	4,929,764		4,928,537		4,929,622		4,930,058		4,929,275		4,930,109
	4,929,775		4,928,689		4,929,634	38	4,928,634		4,929,276		4,930,110
	4,929,783		4,928,693		4,929,641	39	4,928,372		4,929,283		4,930,113
	4,929,785		4,928,707		4,929,656		4,928,385		4,929,285		4,930,134
23	4,928,445		4,928,709		4,929,670		4,928,392		4,929,361	49	4,928,765
24	4,928,346		4,928,722		4,929,692		4,928,396		4,929,362		4,928,853
	4,928,374		4,928,806		4,929,696		4,928,455		4,929,384		4,929,023
	4,928,573		4,928,859		4,929,722		4,928,471		4,929,385		4,929,150
	4,928,645		4,928,937		4,929,780		4,928,485		4,929,386		4,929,201
	4,928,674		4,929,029		4,929,790		4,928,644		4,929,387		4,929,291
	4,928,688		4,929,050		4,929,791		4,928,697		4,929,403		4,929,892
	4,928,950		4,929,063		4,929,792		4,928,731		4,929,413		4,930,136
	4,929,338		4,929,121		4,929,793		4,928,741		4,929,419	50	4,928,571
	4,929,356		4,929,181		4,929,837		4,928,816		4,929,549		4,929,301
	4,929,449		4,929,293		4,929,845		4,928,825		4,929,576	51	4,928,324
	4,929,478		4,929,392		4,929,855		4,928,832		4,929,577		4,928,411
	4,929,586		4,929,429		4,929,902		4,928,883		4,929,583		4,928,464
	4,929,684		4,929,465		4,929,987		4,928,900		4,929,589		4,928,635
	4,929,706		4,929,492		4,930,061		4,928,918		4,929,600		4,928,640
	4,929,832		4,929,578		4,930,072		4,928,947		4,929,627		4,928,729
	4,929,959		4,929,624		4,930,076		4,928,958		4,929,637		4,928,849
	4,929,972		4,929,725		4,930,131		4,928,985		4,929,644		4,928,856
	4,930,151		4,929,746		4,930,139		4,929,012		4,929,677		4,928,973
25	4,928,368		4,929,871		4,930,152		4,929,082		4,929,695		4,929,467
	4,928,398		4,930,063		4,930,154		4,929,116		4,929,697		4,929,470
	4,928,480		4,930,069		1,031,239		4,929,133		4,929,731		4,929,713
	4,928,575		4,930,077		3,905,809		4,929,149		4,929,833		4,929,715
	4,928,668		4,930,106	35	4,928,519		4,929,252		4,929,843		4,929,834
	4,928,733		4,930,153		4,929,240		4,929,280		4,929,904		4,929,879
	4,928,749	28	4,928,613		4,929,278		4,929,349		4,930,140		4,929,943
	4,928,823		4,929,640		4,929,306		4,929,414	44	4,928,619		4,929,986
	4,928,846	29	4,928,331		4,929,389		4,929,432		4,928,860		4,930,020
	4,928,938		4,928,384		4,929,4oo		4,929,495		4,929,193		4,930,033
	4,928,995		4,928,415		4,929,522		4,929,531		4,930,111	53	4,928,615
	4,929,010		4,928,546		4,929,582		4,929,605	45	4,928,402		4 928,925
	4,929,055		4,928,583	36	4,928,367		4,929,651		4,928,474		4,928,967
	4,929,073		4,928,592		4,928,369		4,929,653		4,928,755		4,928,977
	4,929,148		4,928,910		4,928,407		4,929,664		4,928,790		4,928,991
	4,929,236		4,929,027		4,928,478		4,929,683		4,928,842		4,929,153
	4,929,246		4,929,131		4,928,533		4,929,688		4,928,876		4,929,215
	4,929,313		4,929,163		4,928,558		4,929,711		4,928,966		4,929,463
	4,929,329		4,929,219		4,928,603		4,929,744		4,929,185		4,929,570
	4,929,351		4,929,244		4,928,621		4,929,755		4,929,498		4,929,860
	4,929,407		4,929,288		4,928,630		4,929,789		4,929,770		4,929,906
	4,929,560		4,929,541		4,928,632		4,929,811	46	4,929,143		4,929,935
	4,929,660		4,929,788		4,928,663		4,929,819	47	4,928,532		4,929,957
	4,929,716		4,929,921		4,928,840		4,929,887		4,928,624		4,930,117
	4,929,848	30	4,929,270		4,928,847		4,929,930		4,928,669		4,930,133
	4,929,868	31	4,928,405		4,928,879		4,929,966		4,928,957		4,930,137
	4,929,889		4,928,789		4,928,948		4,929,969		4,929,000	54	4,928,551
	4,930,035		4,928,922		4,928,959		4,930,049		4,929,328		4,928,617
	4,930,091		4,929,114		4,928,970		4,930,051		4,929,579		4,929,767
26	4,928,383		4,929,390		4,929,056		4,930,093		4,929,654	55	4,928,419
	4,928,388		4,929,499		4,929,211		4,930,144		4,929,714		4,928,424
	4,928,399	32	4,928,596		4,929,217		4,928,433		4,929,737		4,928,494
	4,928,420		4,929,936		4,929,224	40	4,928,466		4,929,777		4,928,503
	4,928,449		4,930,055		4,929,225		4,928,520		4,929,960		4,928,636
	4,928,453	33	Re.33,222		4,929,235		4,928,678	48	4,928,360		4,928,651
	4,928,515		4,928,820		4,929,241		4,928,725		4,928,401		4,928,706
	4,928,517		4,928,835		4,929,265		4,928,770		4,928,418		4,928,750
	4,928,544		4,928,909		4,929,305		4,928,771		4,928,527		4,928,793
	4,928,545		4,929,188		4,929,368		4,928,772		4,928,536		4,929,013
	4,928,579		4,929,262		4,929,399		4,928,775		4,928,616		4,929,167
	4,928,602	34	4,928,336		4,929,433		4,928,890		4,928,726		4,929,325
	4,928,625		4,928,345		4,929,442		4,929,078		4,928,736		4,929,464
	4,928,657		4,928,348		4,929,446		4,929,336		4,928,758		4,929,919
	4,928,811		4,928,456		4,929,471		4,929,365		4,928,759		4,930,145
	4,928,833		4,928,506		4,929,474		4,929,818		4,928,761		4,930,146
	4,928,865		4,928,511		4,929,487						

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DESIGN PATENTS

06	308,130		308,272		308,241		308,236		308,255		308,201
	308,139		308,277		308,247		308,263	37	308,136		308,208
	308,141	08	308,276	20	308,209	33	308,274		308,144		308,278
	308,145	09	308,250	22	308,195	34	308,165		308,190	44	308,173
	308,158		308,257	23	308,207		308,175		308,275	45	308,170
	308,171		308,260	24	308,240		308,178	39	308,166	48	308,131
	308,194		308,261	25	308,198		308,217		308,233		308,230
	308,196	12	308,179		308,220		308,235		308,234		308,237
	308,205		308,232		308,269		308,249		308,267		308,259
	308,211		308,264	26	308,185		308,268		308,273		308,279
	308,223	13	308,238		308,187	36	308,127	40	308,129	50	308,246
	308,225	16	308,253		308,213		308,146		308,182	51	308,169
	308,227	17	308,126		308,218		308,150	41	308,125		308,192
	308,229		308,142	27	308,153		308,152		308,266	53	308,242
	308,231		308,163		308,193		308,157	42	308,132	55	308,140
	308,244		308,186	28	308,224		308,176		308,133		308,206
	308,262		308,252	29	308,149		308,243		308,134		308,212
	308,270	18	308,148		308,151		308,245		308,135		308,265
	308,271	19	308,216		308,167		308,248		308,177		

PLANT PATENTS

48	7,236	53	7,237				

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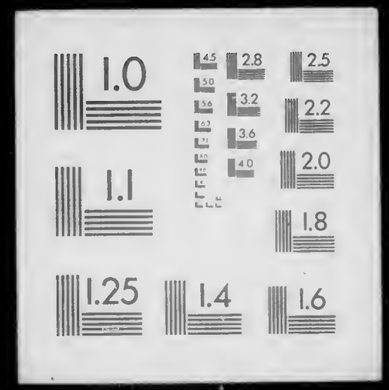
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